

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 June 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 June 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: Six one-hour exceedances were recorded on June 23: concentrations of 84 µg/m³ at hour 05:00, 91 µg/m³ at hour 06:00, 85 µg/m³ at hour 07:00, 83 µg/m³ at hour 08:00, 87 µg/m³ at hour 14:00, and 93 µg/m³ at hour 21:00. One 24-hour exceedance was also recorded on June 23 at a concentration of 70 µg/m³. AEP under reference number: 340001.

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 #: 2833-2018-06-1-C

June 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **August 13, 2018**

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SUMMARY

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

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

With the exception of $PM_{2.5}$, the remaining data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017). Six one-hour exceedances were recorded on June 23: concentrations of $84 \mu\text{g}/\text{m}^3$ at hour 05:00, $91 \mu\text{g}/\text{m}^3$ at hour 06:00, $85 \mu\text{g}/\text{m}^3$ at hour 07:00, $83 \mu\text{g}/\text{m}^3$ at hour 08:00, $87 \mu\text{g}/\text{m}^3$ at hour 14:00, and $93 \mu\text{g}/\text{m}^3$ at hour 21:00. One 24-hour exceedance was also recorded on June 23 at a concentration of $70 \mu\text{g}/\text{m}^3$. These events were reported to AEP under reference number: 340001.

All Gas Parameters: Due to issues arising from the datalogger transition, the automated daily zero-span check scheduled for May 31 did not execute properly. A valid zero-span check was manually triggered at hour 08:00 on June 1, incurring one hour of downtime.

SO₂: In response to an elevated, abrupt span drift, a successful shut-down calibration was performed on June 13. The sample pump was repaired and the analyzer was left offline to stabilize overnight. A successful post-repair calibration was performed on June 14. Nineteen hours of downtime were incurred due to this event.

O₃: On June 5, the scheduled span verification failed by a large margin. It was determined that the datalogger reset the analyzer's Level 1 span reference unexpectedly. Two additional span verifications were initiated to re-establish the proper span level, resulting in three hours of downtime. On June 6, a shut-down and post-repair calibration was performed; between calibrations the Level 1 span was confirmed and annual pump maintenance was completed.

PM_{2.5}:

- On June 1, two hours of downtime was incurred at hours 03:00 and 04:00, as data was missing and could not be recovered. This was likely a result of interference caused by station activities during the datalogger upgrade.
- On June 11, the Thermo 5030 Sharp unit recorded anomalous, negative readings between the hours of 00:00 to 06:00. These six hours were rejected as the data collected was outside the instrument's specifications.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	2	19	8	5.5	SW	0	1	97.2
TRS (ppb)	-	-	-	-	0	3	20	6	5.3	SW	1	19	99.9
THC (ppm)	-	-	-	-	2.19	6.15	30	4	0.6	W	2.42	24	99.9
NO ₂ (ppb)	159	-	0	-	2	10	19	8	5.5	SW	3	5	99.9
NO (ppb)	-	-	-	-	0	6	5	6	4.6	WSW	1	5	99.9
NO _x (ppb)	-	-	-	-	2	13	5	6	4.6	WSW	4	5	99.9
O ₃ (ppb)	82	-	0	-	30.1	67.9	20	11	9.7	SW	45.1	20	99.4
PM _{2.5} (µg/m ³)	80	30	6	1	8	93	23	21	1.2	ENE	70	23	98.8
RELATIVE HUMIDITY (%)	-	-	-	-	67	100	1	23	2.4	NNW	90	1	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.1	30.0	21	14	2.4	SW	23.5	21	100.0
VECTOR WS (kph)	-	-	-	-	1.8	20.9	8	18	-	SE	15.2	12	100.0
VECTOR WD (sec)	-	-	-	-	228 (SW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (deg)	ESRD Reference #
June 23	5:00	84	3.8	78	340001
June 23	6:00	91	6.5	110	340001
June 23	7:00	85	7.0	118	340001
June 23	8:00	83	6.0	87	340001
June 23	14:00	87	7.4	101	340001
June 23	21:00	93	1.2	64	340001

PM_{2.5} 24-Hour Exceedances

DATE	READING (µg/m ³)	WS (kph)	WD (deg)	ESRD Reference #
June 23	70	2.9	94	340001

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 97.2%, equivalent to 20 hours of downtime.
- Due to issues arising from the datalogger transition, the automated daily zero-span check scheduled for May 31 did not properly execute. A valid zero-span check was manually triggered at hour 08:00 on June 1, incurring one hour of downtime. This quality check extended into hour 09:00 on the instantaneous maximum channel, rendering the hour invalid.
- The routine monthly calibration was performed on June 5.
- The analyzer spanned outside the upper acceptance limit on June 13. The abrupt change in span response prompted an immediate site visit, which revealed the sample pump had failed. Following a successful shut-down calibration, the sample pump was repaired and the analyzer was left offline to stabilize overnight. A successful post-repair calibration was performed on June 14. Nineteen hours of downtime were incurred due to this event.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Due to issues arising from the datalogger transition, the automated daily zero-span check scheduled for May 31 did not properly execute. A valid zero-span check was manually triggered at hour 08:00 on June 1, incurring one hour of downtime. This quality check extended into hour 09:00 on the instantaneous maximum channel, rendering the hour invalid.
- The routine monthly calibration was performed on June 5.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Due to issues arising from the datalogger transition, the automated daily zero-span check scheduled for May 31 did not properly execute. A valid zero-span check was manually triggered at hour 08:00 on June 1, incurring one hour of downtime. This quality check extended into hour 09:00 on the instantaneous maximum channel, rendering the hour invalid.
- The routine monthly calibration was performed on June 6.

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

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Due to issues arising from the datalogger transition process, the automated daily zero-span check scheduled for May 31 was not properly executed. A valid zero-span check was manually triggered at hour 08:00 on June 1. One hour of downtime was incurred due to the additional zero-span check.
- The routine monthly calibration was performed on June 5.

OZONE (O₃)

- Operational time for the monitoring period was 99.4%, equivalent to 4 hours of downtime.
- Due to issues arising from the datalogger transition, the automated daily zero-span check scheduled for May 31 did not properly execute. A valid zero-span check was manually triggered at hour 08:00 on June 1, incurring one hour of downtime. This quality check extended into hour 09:00 on the instantaneous maximum channel, rendering the hour invalid.
- On June 5 the daily zero-span check spanned outside the upper acceptance limit by a large margin. It was determined that the datalogger reset the analyzer's Level 1 span reference unexpectedly. In order to restore the proper span level, a repeat zero-span check across hour 09:00 and 10:00 was performed. At hour 11:00 the analyzer was challenged with a partial zero-span phase for further testing. A rebuild of the zero-span pump was also completed on June 5, with no interruption in sampling. Following these quality checks, the Level 1 span reference was successfully re-established.
- A site visit on June 6 began with a shut-down calibration in order to validate data, despite the invalid span verifications recorded on June 5. A successful post-repair calibration was performed after the Level 1 span reference was confirmed and annual sample pump maintenance was completed. As both calibrations met AMD requirements, no data was rejected. However, three hours of downtime were incurred as a result of the additional quality checks.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- On June 1, two hours of downtime was incurred at hours 03:00 and 04:00, as data was missing and could not be recovered. This was likely a result of interference caused by station activities during the datalogger upgrade.
- On June 11, the Thermo 5030 Sharp unit recorded anomalous, negative readings between the hours of 00:00 to 06:00. These seven hours were rejected as the data collected was outside the instrument's specifications.
- The routine monthly audit was performed on June 22.
- Six one-hour exceedances were recorded on June 23: concentrations of 84 µg/m³ at hour 05:00, 91 µg/m³ at hour 06:00, 85 µg/m³ at hour 07:00, 83 µg/m³ at hour 08:00, 87 µg/m³ at hour 14:00, and 93 µg/m³ at hour 21:00. One 24-hour exceedance was also recorded on June 23: concentration of 70 µg/m³. This was reported under AEP reference number: 340001.

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

- Operational time for the monitoring period was 100%
- Two instances of maximum instantaneous data were discarded on June 1 at hour 21:00 and 22:00, due to a few missing minute data that could not be recovered - reason unknown.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

Operational time for the monitoring period was 100%

AMBIENT TEMPERATURE (AmbTPX)

Operational time for the monitoring period was 100%

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

With the exception of PM_{2.5}, the remaining data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

Six one-hour PM_{2.5} exceedances were recorded on June 23: concentrations of 84 µg/m³ at hour 05:00, 91 µg/m³ at hour 06:00, 85 µg/m³ at hour 07:00, 83 µg/m³ at hour 08:00, 87 µg/m³ at hour 14:00, and 93 µg/m³ at hour 21:00. One 24-hour exceedance was also recorded on June 23 at a concentration of 70 µg/m³. These events were reported to AEP under reference number: 340001.

4.0 Calculations and Results

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

WS/WD/STDWD:

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

Summary of Hourly Wind Data Revised After Data Treatment					
Date	Time	Date	Time	Date	Time
01/06/2018	12:00	15/06/2018	05:00	21/06/2018	09:00
01/06/2018	13:00	15/06/2018	06:00	21/06/2018	14:00
01/06/2018	18:00	15/06/2018	07:00	21/06/2018	19:00
01/06/2018	19:00	15/06/2018	20:00	21/06/2018	21:00
01/06/2018	20:00	15/06/2018	21:00	21/06/2018	22:00
01/06/2018	23:00	15/06/2018	22:00	21/06/2018	23:00
02/06/2018	00:00	15/06/2018	23:00	22/06/2018	00:00
02/06/2018	20:00	16/06/2018	00:00	22/06/2018	01:00
02/06/2018	21:00	16/06/2018	01:00	22/06/2018	02:00
02/06/2018	22:00	16/06/2018	02:00	22/06/2018	03:00
02/06/2018	23:00	16/06/2018	03:00	22/06/2018	04:00
03/06/2018	00:00	16/06/2018	04:00	22/06/2018	05:00
03/06/2018	01:00	16/06/2018	05:00	22/06/2018	06:00
03/06/2018	02:00	16/06/2018	06:00	22/06/2018	07:00
03/06/2018	17:00	16/06/2018	07:00	22/06/2018	08:00
03/06/2018	18:00	16/06/2018	08:00	22/06/2018	09:00
03/06/2018	19:00	16/06/2018	09:00	22/06/2018	10:00
04/06/2018	20:00	16/06/2018	19:00	22/06/2018	11:00
04/06/2018	21:00	16/06/2018	20:00	22/06/2018	20:00
04/06/2018	22:00	16/06/2018	21:00	22/06/2018	21:00
05/06/2018	00:00	16/06/2018	22:00	22/06/2018	22:00
05/06/2018	01:00	16/06/2018	23:00	22/06/2018	23:00
05/06/2018	03:00	17/06/2018	00:00	23/06/2018	01:00
05/06/2018	04:00	17/06/2018	01:00	23/06/2018	02:00
05/06/2018	05:00	17/06/2018	02:00	23/06/2018	03:00
05/06/2018	20:00	17/06/2018	03:00	23/06/2018	04:00
05/06/2018	22:00	17/06/2018	04:00	23/06/2018	16:00
05/06/2018	23:00	17/06/2018	05:00	23/06/2018	18:00
06/06/2018	00:00	17/06/2018	06:00	23/06/2018	19:00
06/06/2018	01:00	17/06/2018	08:00	23/06/2018	20:00
06/06/2018	02:00	17/06/2018	20:00	23/06/2018	21:00
06/06/2018	03:00	17/06/2018	21:00	23/06/2018	22:00
06/06/2018	16:00	17/06/2018	22:00	23/06/2018	23:00
06/06/2018	17:00	17/06/2018	23:00	24/06/2018	00:00
06/06/2018	18:00	18/06/2018	00:00	24/06/2018	01:00
06/06/2018	20:00	18/06/2018	01:00	24/06/2018	02:00
06/06/2018	21:00	18/06/2018	02:00	24/06/2018	03:00
06/06/2018	22:00	18/06/2018	03:00	24/06/2018	07:00
06/06/2018	23:00	18/06/2018	05:00	24/06/2018	21:00
07/06/2018	00:00	18/06/2018	06:00	24/06/2018	23:00
07/06/2018	01:00	18/06/2018	20:00	25/06/2018	00:00
07/06/2018	02:00	18/06/2018	21:00	25/06/2018	01:00
07/06/2018	03:00	18/06/2018	22:00	25/06/2018	02:00
07/06/2018	04:00	18/06/2018	23:00	26/06/2018	05:00
10/06/2018	03:00	19/06/2018	00:00	26/06/2018	16:00
10/06/2018	04:00	19/06/2018	01:00	26/06/2018	17:00
10/06/2018	05:00	19/06/2018	02:00	27/06/2018	01:00
10/06/2018	06:00	19/06/2018	03:00	28/06/2018	14:00
10/06/2018	10:00	19/06/2018	04:00	28/06/2018	21:00
10/06/2018	11:00	19/06/2018	05:00	29/06/2018	02:00
13/06/2018	02:00	19/06/2018	23:00	29/06/2018	03:00
13/06/2018	20:00	20/06/2018	00:00	29/06/2018	04:00
14/06/2018	00:00	20/06/2018	01:00	29/06/2018	16:00
14/06/2018	01:00	20/06/2018	02:00	29/06/2018	20:00
14/06/2018	02:00	20/06/2018	03:00	29/06/2018	21:00
14/06/2018	03:00	20/06/2018	05:00	30/06/2018	00:00
14/06/2018	04:00	20/06/2018	20:00	30/06/2018	01:00
14/06/2018	05:00	20/06/2018	23:00	30/06/2018	02:00
14/06/2018	21:00	21/06/2018	00:00	30/06/2018	03:00
14/06/2018	22:00	21/06/2018	01:00	30/06/2018	04:00
14/06/2018	23:00	21/06/2018	02:00	30/06/2018	05:00
15/06/2018	00:00	21/06/2018	03:00	30/06/2018	18:00
15/06/2018	01:00	21/06/2018	04:00	30/06/2018	22:00
15/06/2018	02:00	21/06/2018	05:00	30/06/2018	23:00
15/06/2018	03:00	21/06/2018	06:00		
15/06/2018	04:00	21/06/2018	07:00		

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 - 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

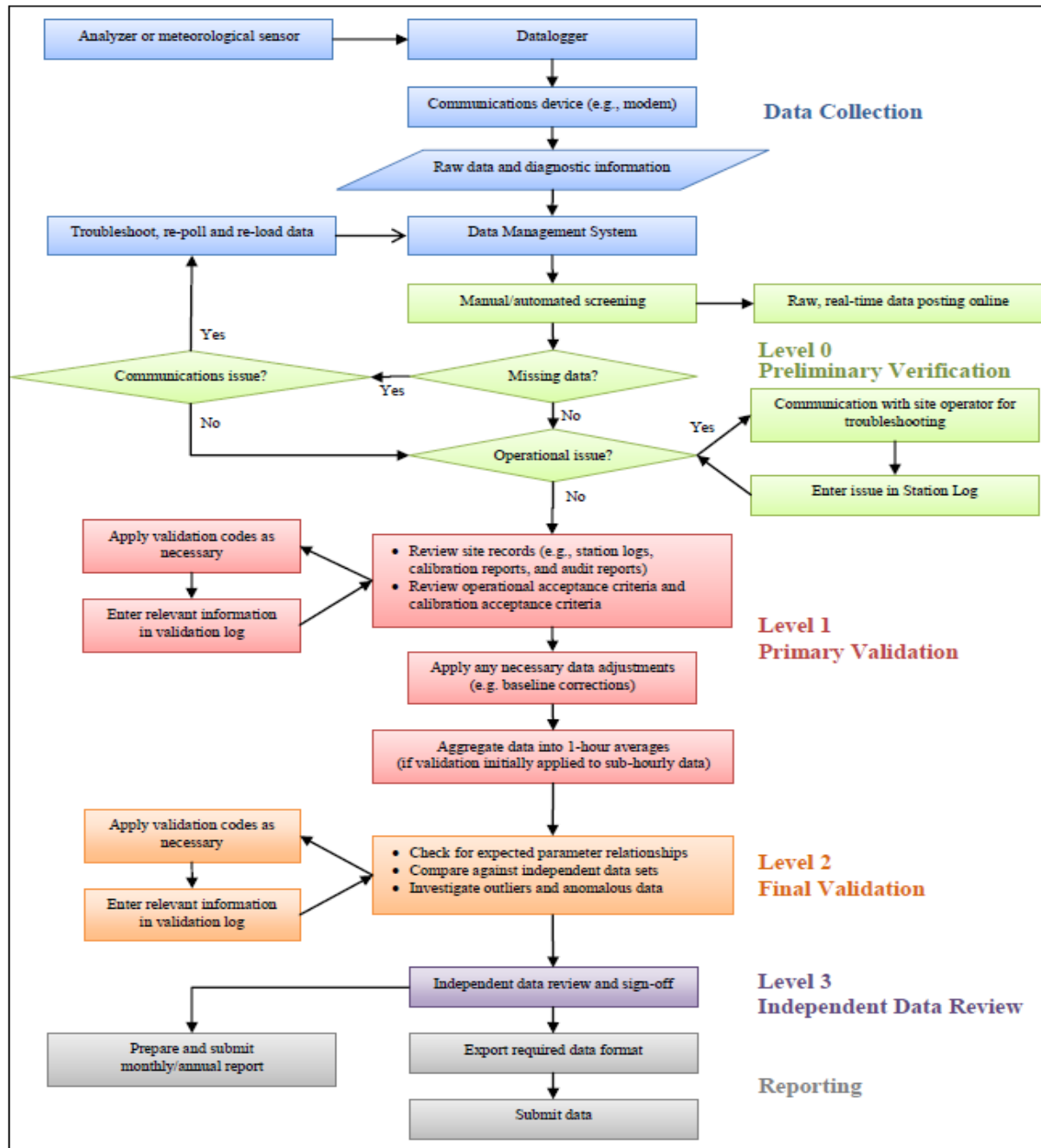
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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

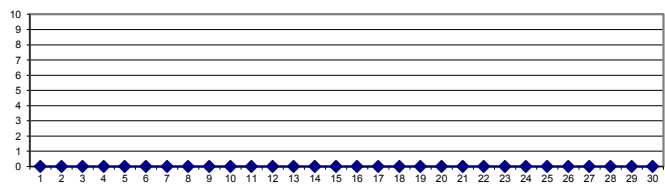
OBJECTIVE LIMIT:

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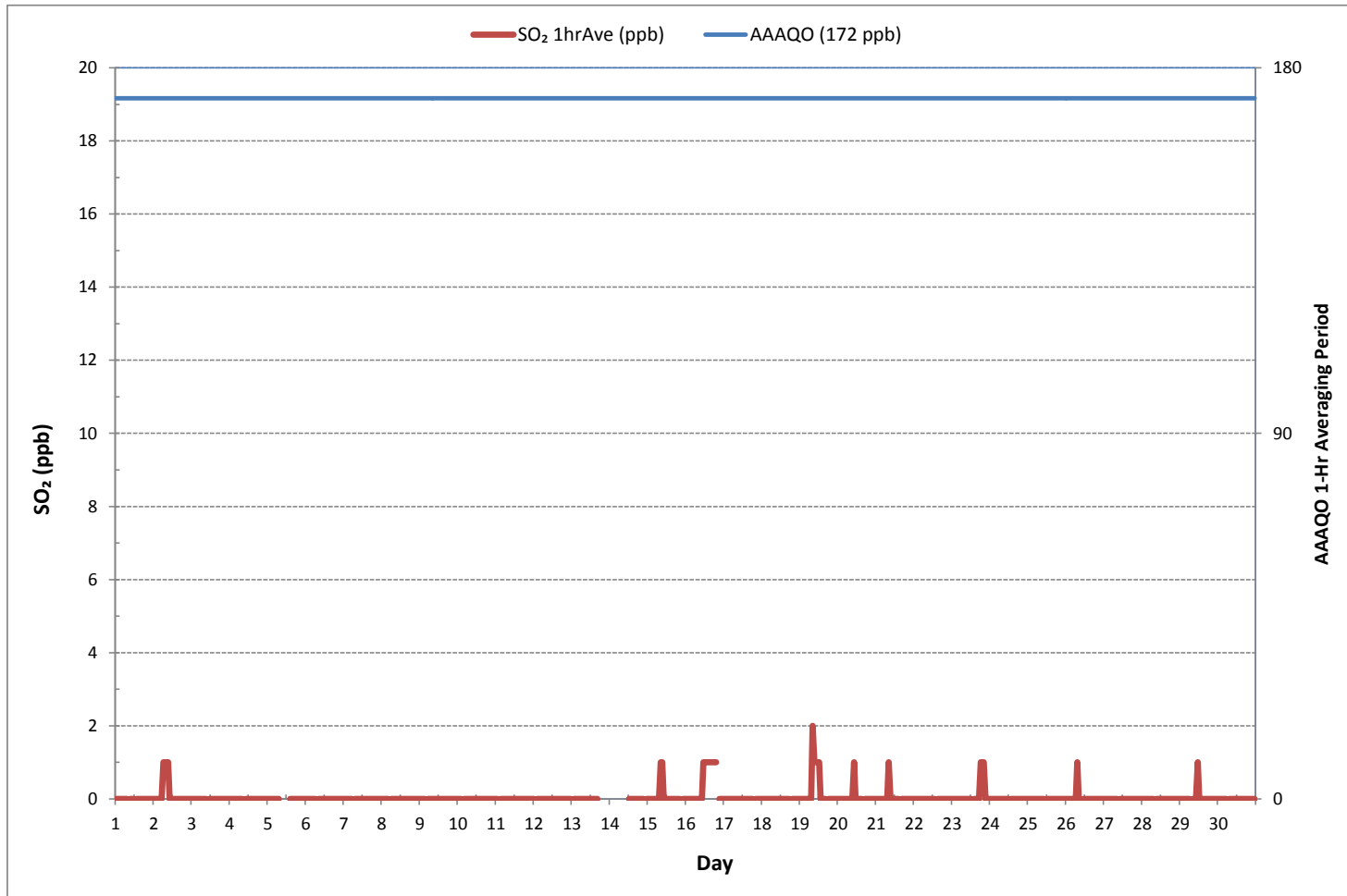
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	27				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	8	ON DAY	19	
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY	1	
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	700	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	97.2	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES June 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO₂ [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

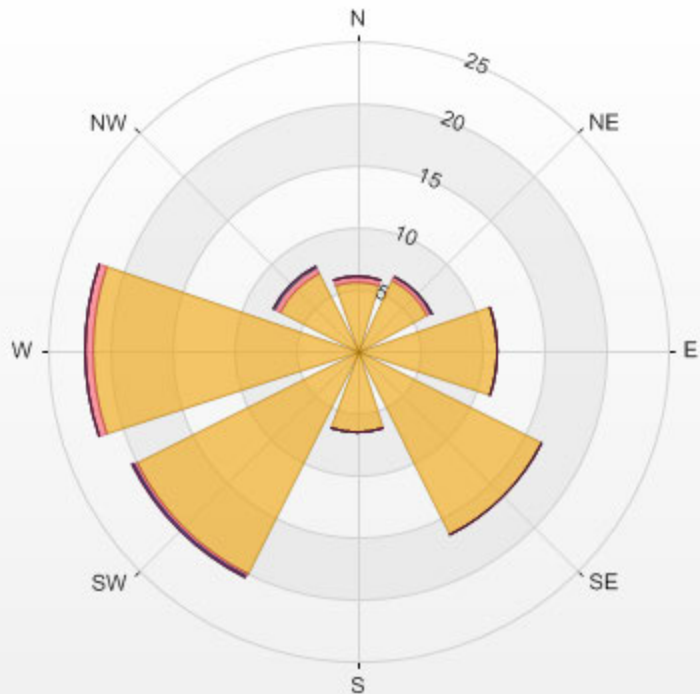
Calm: 2.71%

Calm Avg: 0.10 [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	5.6	0.5	0.0	0.0	0.0	0.0	6.0
NE	6.3	0.3	0.2	0.0	0.0	0.0	6.8
E	11.3	0.0	0.0	0.0	0.0	0.0	11.3
SE	16.5	0.0	0.0	0.0	0.0	0.0	16.5
S	6.6	0.0	0.0	0.0	0.0	0.0	6.6
SW	20.0	0.3	0.0	0.2	0.0	0.0	20.5
W	21.4	0.6	0.0	0.0	0.0	0.0	22.0
NW	7.1	0.5	0.2	0.0	0.0	0.0	7.7
Summary	94.7	2.1	0.3	0.2	0.0	0.0	97.3

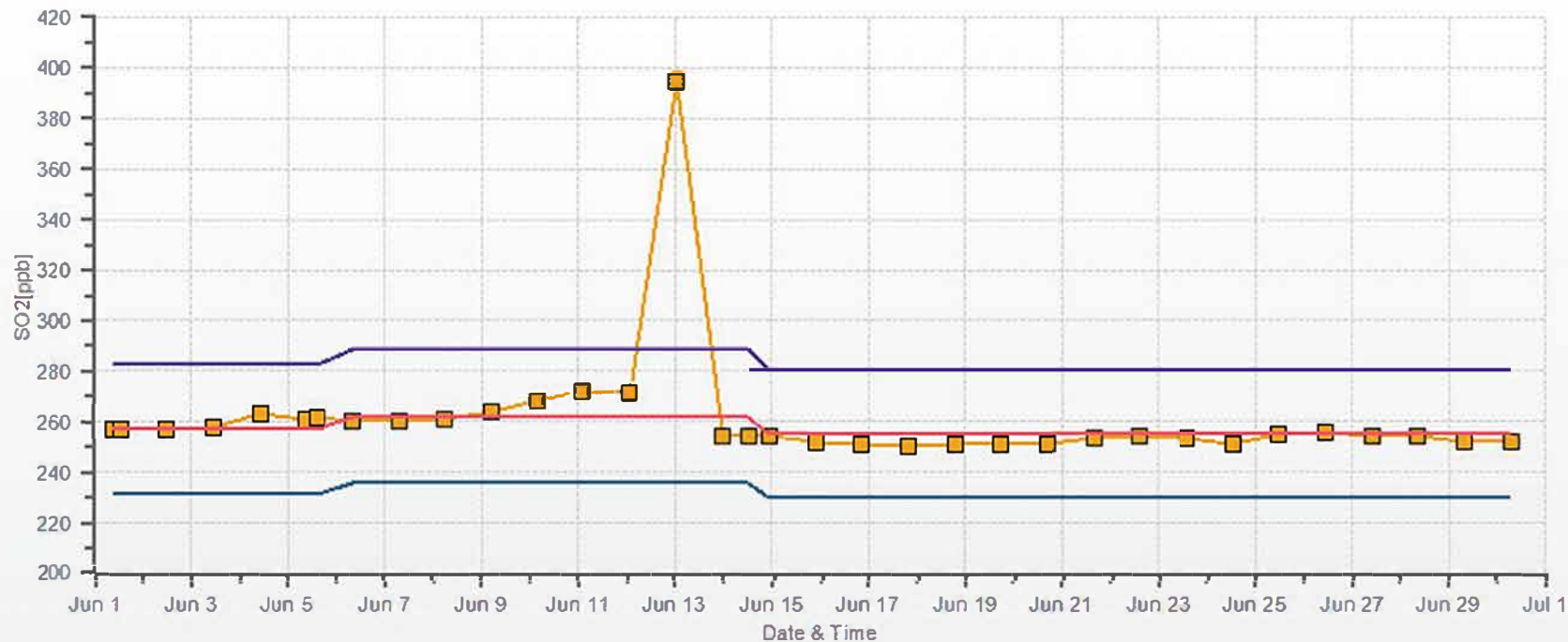
% Icon	Classes (ppb)	95	0.0-0.6	2	0.6-1.2	0	1.2-1.8	0	1.8-2.4	0	2.4-3.0	0	>3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.71% Calm Poll Avg: 0.10[ppb]



SO₂ [ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR

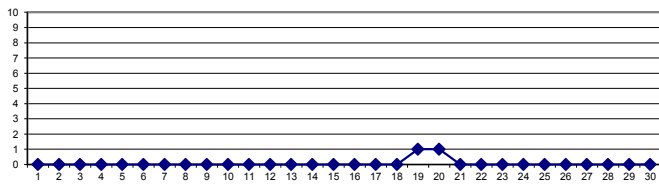
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

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

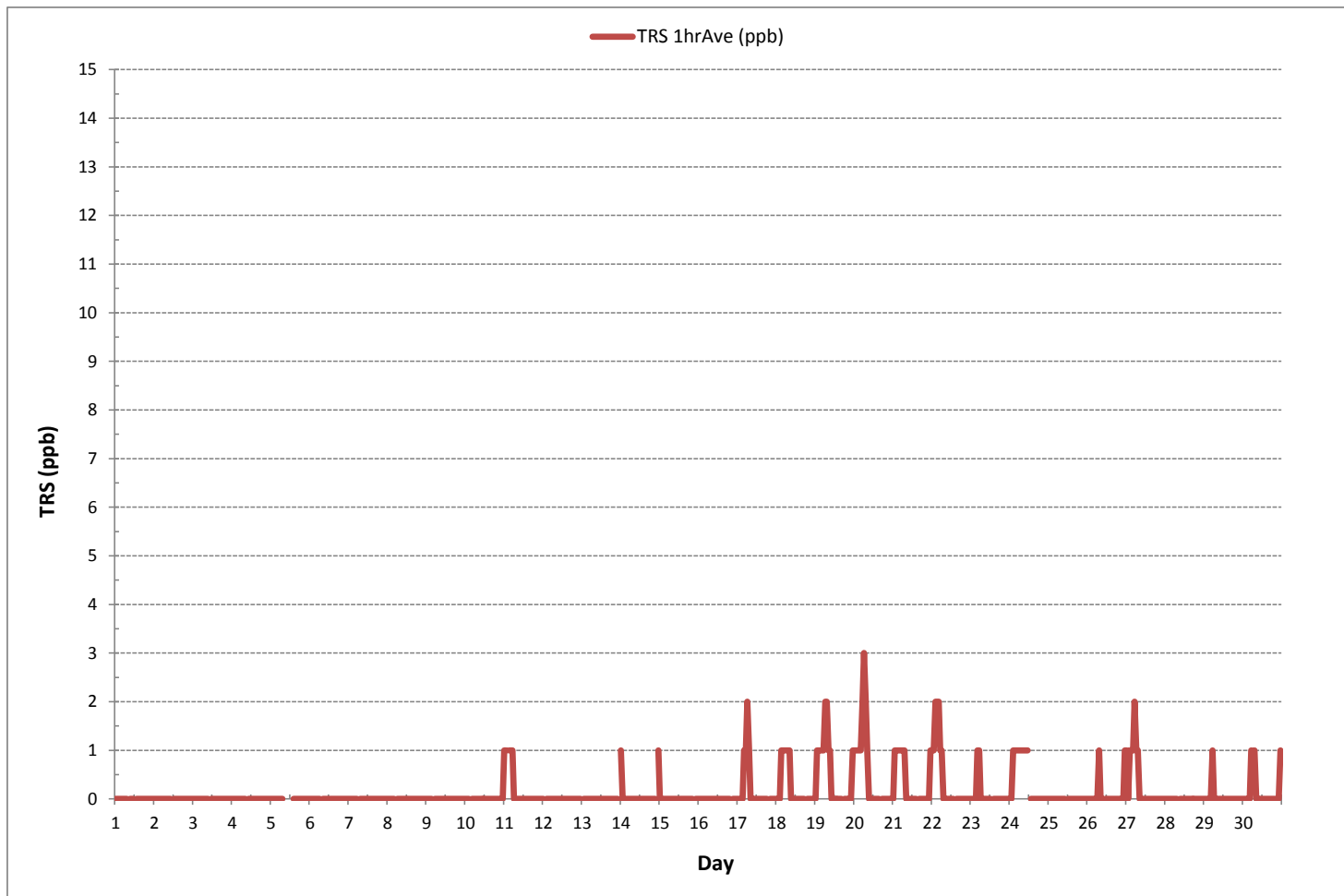
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	76				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	3	ppb @ HOUR	6	ON DAY 20	
MAXIMUM 24-HR AVERAGE:	1	ppb		ON DAY 19	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	719	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



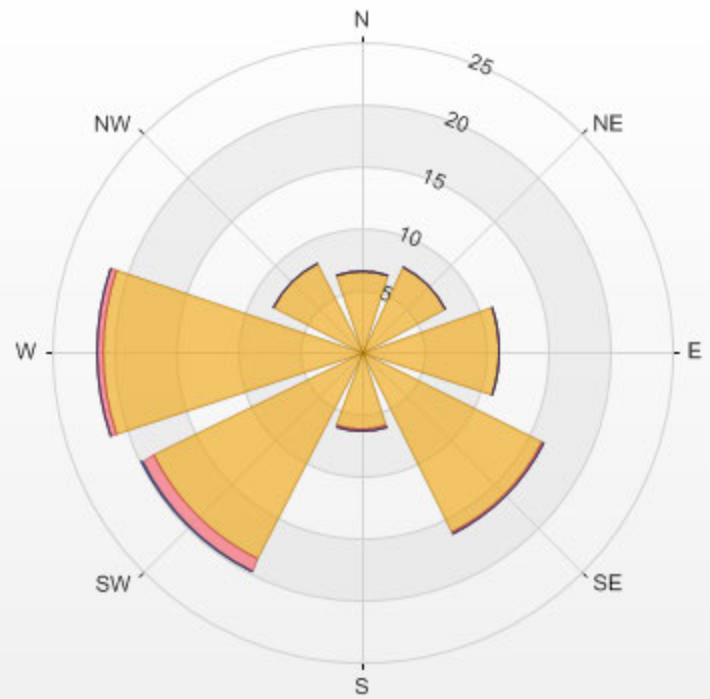
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.64% Calm Avg: 0.43 [ppb]

Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	6.6	0.0	0.0	0.0	6.6
NE	7.6	0.0	0.0	0.0	7.6
E	11.1	0.0	0.0	0.0	11.1
SE	16.3	0.2	0.0	0.0	16.4
S	6.3	0.2	0.0	0.0	6.5
SW	18.7	1.0	0.2	0.0	19.9
W	20.9	0.4	0.0	0.0	21.4
NW	7.9	0.0	0.0	0.0	7.9
Summary	95.5	1.8	0.2	0.0	97.4

% Icon Classes (ppb) 95 0.0-1.3 2 1.3-2.7 0 2.7-4.0 0 >4.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.64% Calm Poll Avg: 0.43[ppb]



TRS [ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High

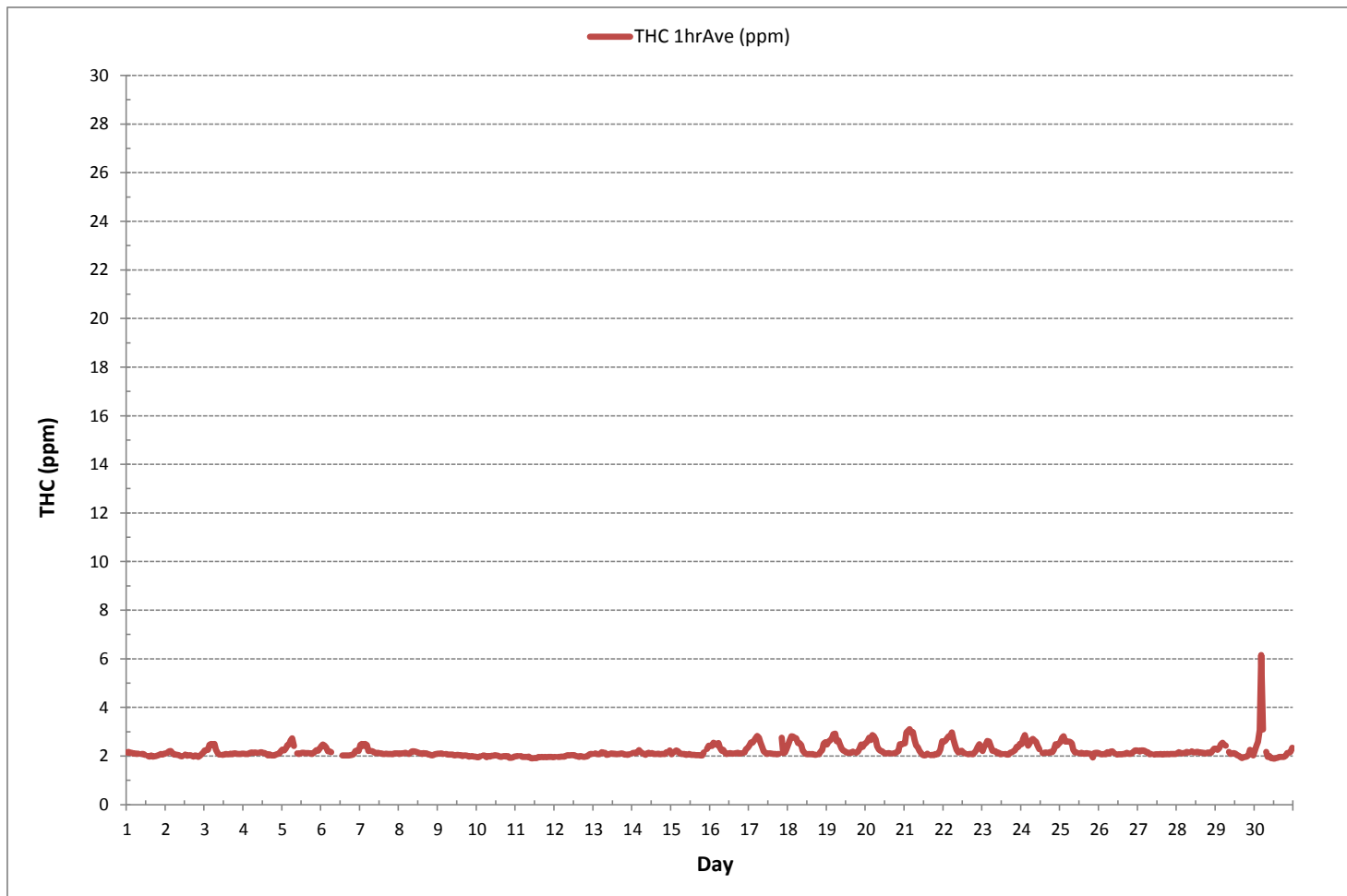


TOTAL HYDROCARBON



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

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC [ppm]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.64% Calm Avg: 2.65 [ppm]

Direction	0.0-2.1	2.1-4.1	4.1-6.2	>6.2	Total
N	1.5	5.1	0.0	0.0	6.6
NE	2.9	4.4	0.0	0.0	7.3
E	2.1	8.8	0.0	0.0	10.8
SE	2.8	13.6	0.0	0.0	16.4
S	1.8	4.7	0.0	0.0	6.5
SW	4.3	15.8	0.0	0.0	20.1
W	6.0	15.4	0.2	0.0	21.5
NW	1.6	6.6	0.0	0.0	8.2
Summary	22.8	74.4	0.2	0.0	97.4

% Icon Classes (ppm)

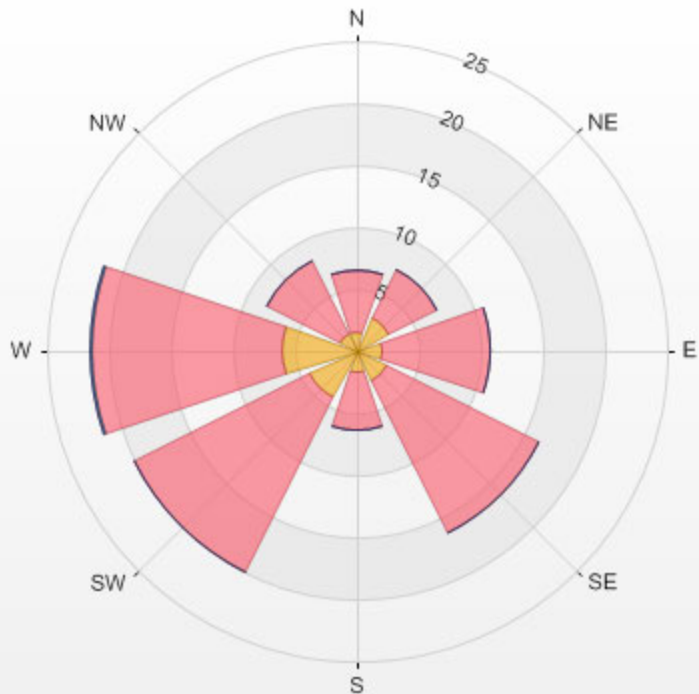
23 0.0-2.1

74 2.1-4.1

0 4.1-6.2

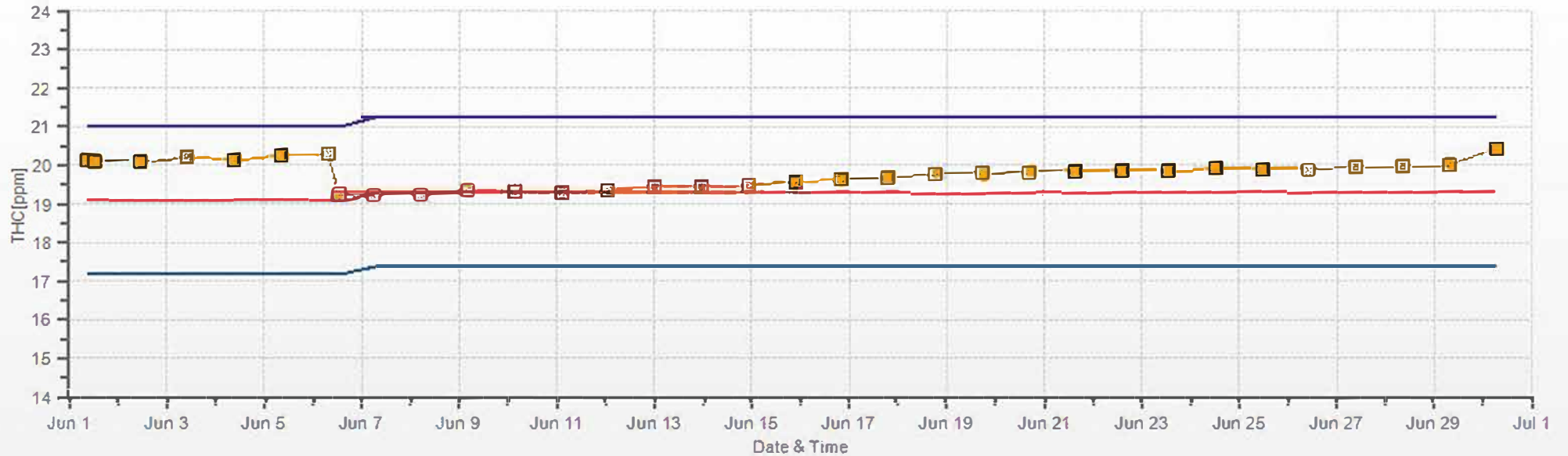
0 >6.2

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.64% Calm Poll Avg: 2.65[ppm]



THC [ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



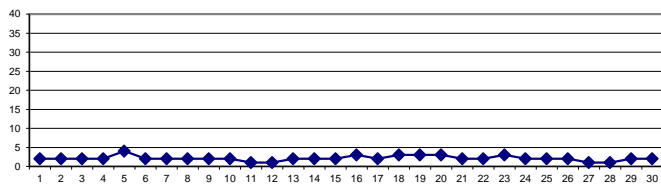
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

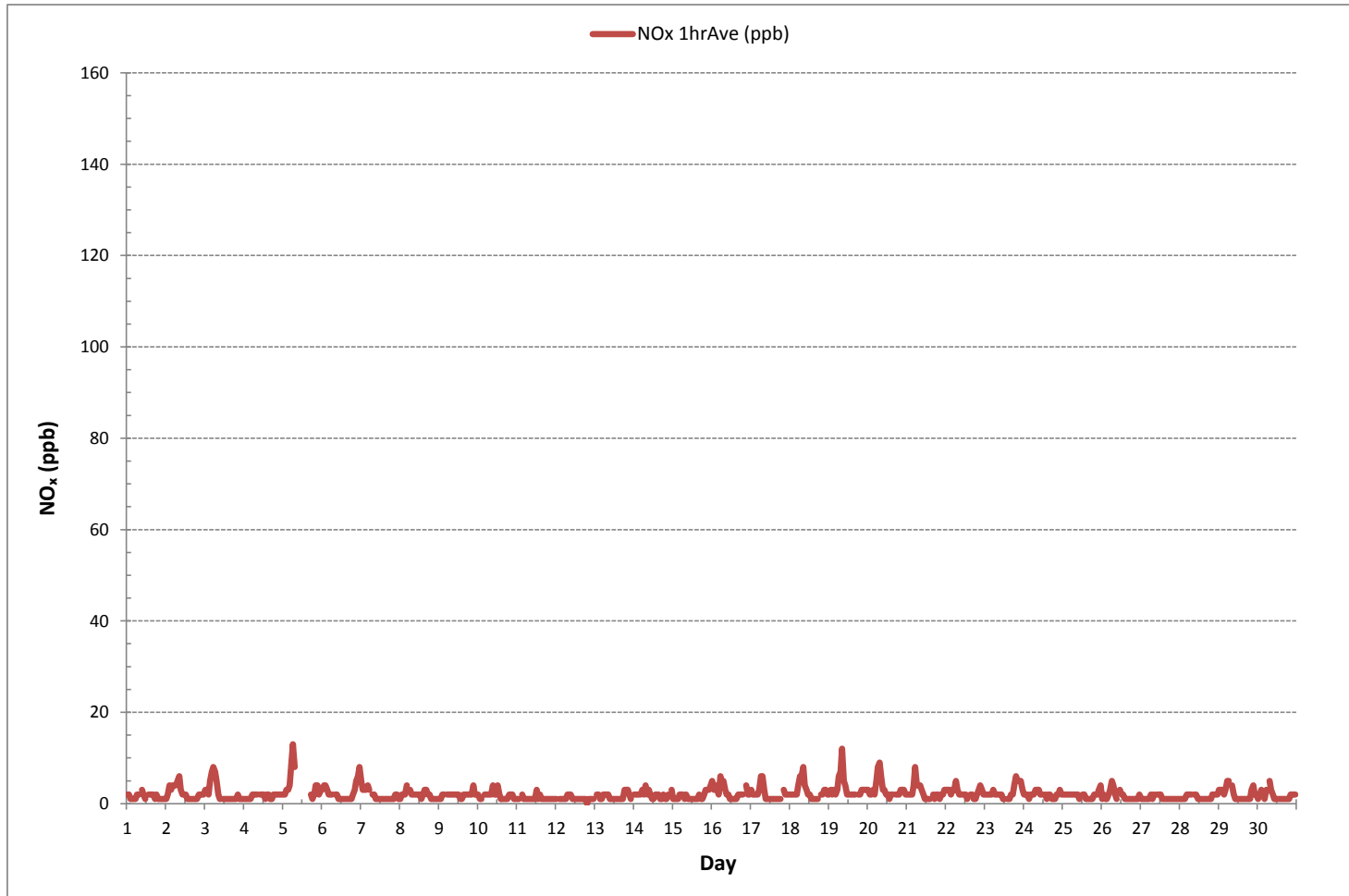
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	679			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	19	ON DAY 12
MAXIMUM 1-HR AVERAGE:	13 ppb	@ HOUR	6	ON DAY 5
MAXIMUM 24-HR AVERAGE:	4 ppb			ON DAY 5
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	2 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



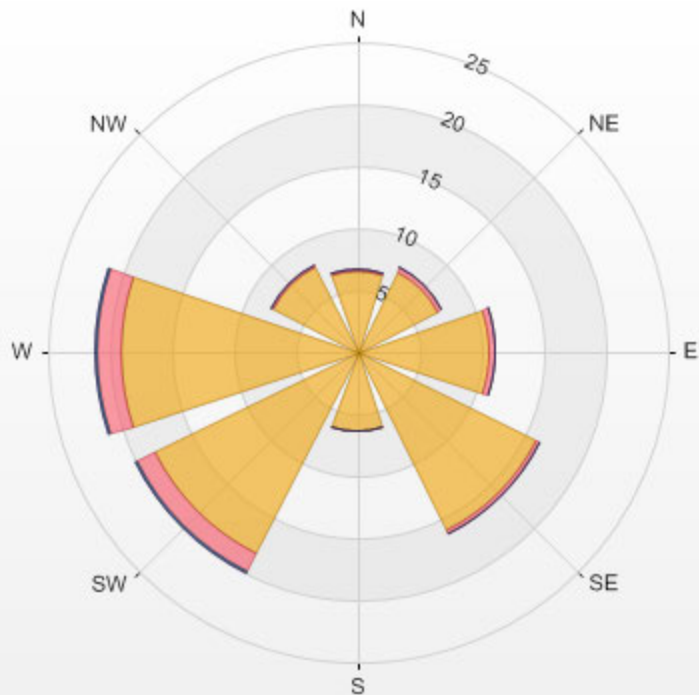
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NO_x [ppb]
Monthly: 18/06
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 2.65% Calm Avg: 2.41 [ppb]

Direction	0.0-4.7	4.7-9.3	9.3-14.0	>14.0	Total
N	6.5	0.2	0.0	0.0	6.6
NE	7.2	0.4	0.0	0.0	7.7
E	10.6	0.6	0.0	0.0	11.2
SE	16.2	0.3	0.0	0.0	16.5
S	6.5	0.0	0.0	0.0	6.5
SW	18.2	1.6	0.2	0.0	20.0
W	19.1	1.9	0.2	0.0	21.2
NW	7.7	0.2	0.0	0.0	7.8
Summary	91.9	5.2	0.3	0.0	97.4

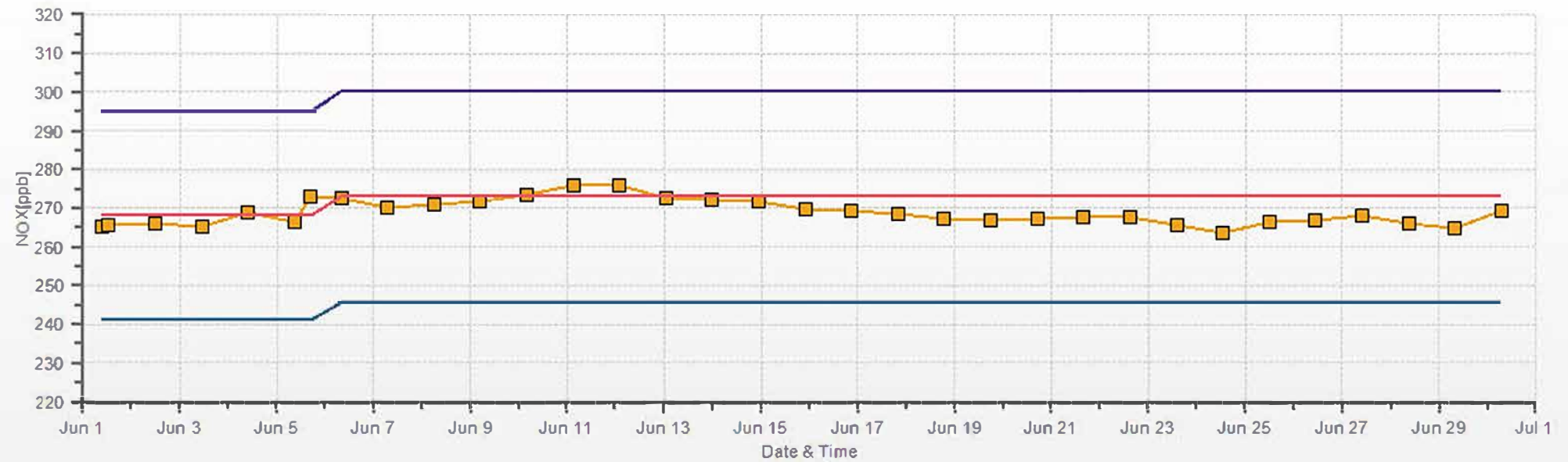
% Icon	Classes (ppb)	92	0.0-4.7	5	4.7-9.3	0	9.3-14.0	0	>14.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.65% Calm Poll Avg: 2.41[ppb]



NOX [ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/06 Type:

Span   Span Meas  Span Ref  Span Low  Span High



NITRIC OXIDES

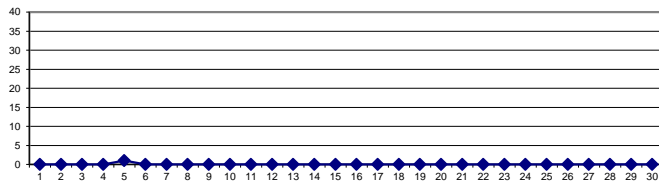
NITRIC OXIDE Hourly Averages (NO ppb)

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

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

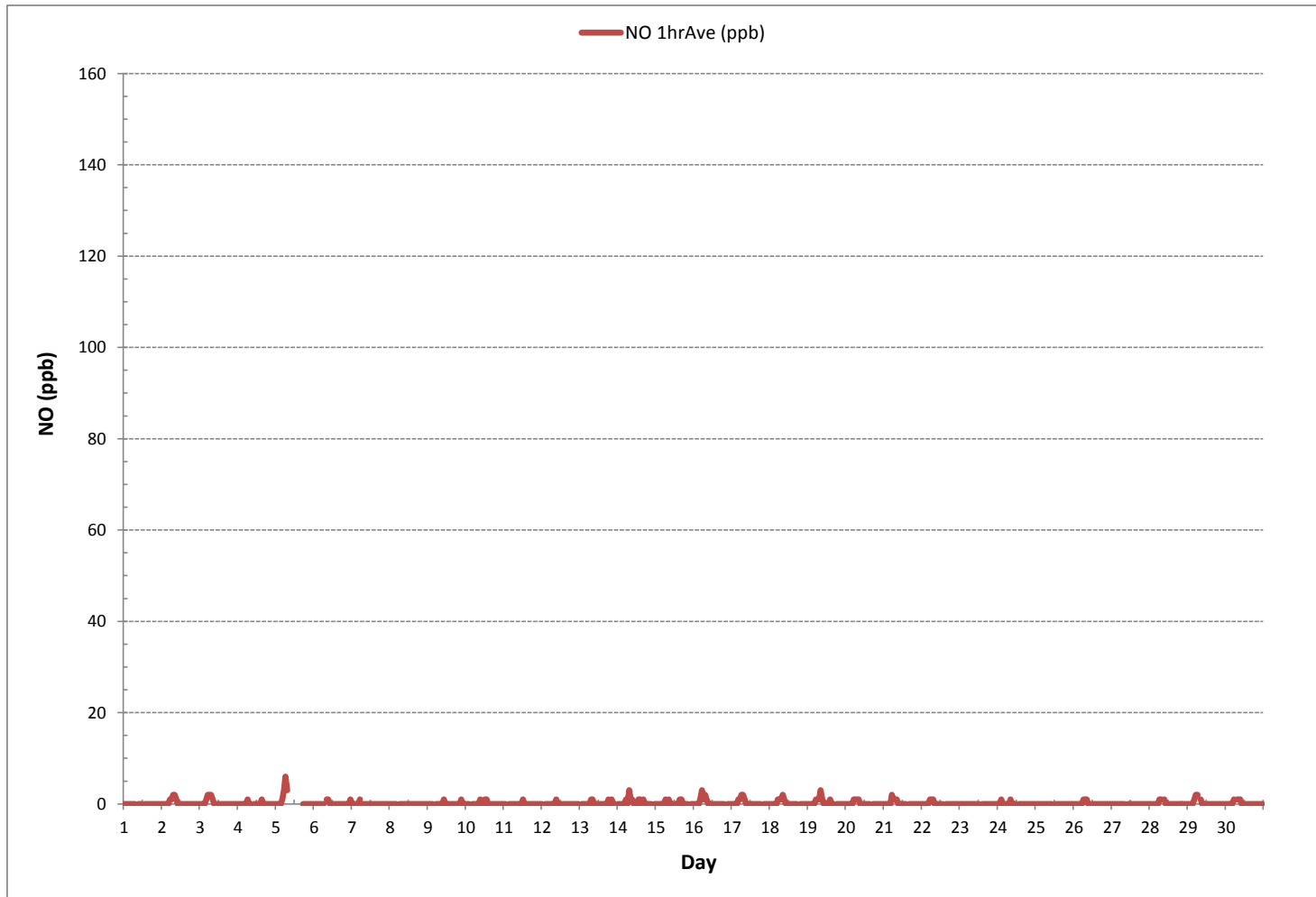
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	90		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY
MAXIMUM 1-HR AVERAGE:	6 ppb	@ HOUR	6 ON DAY
MAXIMUM 24-HR AVERAGE:	1 ppb		1 ON DAY
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

NITRIC OXIDE Hourly Averages (NO ppb)



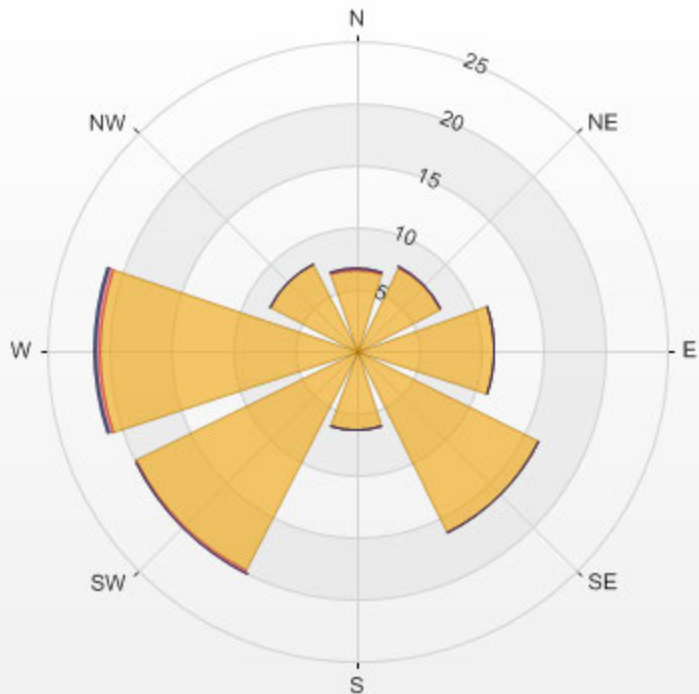
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.65% Calm Avg: 0.27 [ppb]

Direction	0.0-2.3	2.3-4.7	4.7-7.0	>7.0	Total
N	6.5	0.2	0.0	0.0	6.6
NE	7.5	0.2	0.0	0.0	7.7
E	11.2	0.0	0.0	0.0	11.2
SE	16.5	0.0	0.0	0.0	16.5
S	6.5	0.0	0.0	0.0	6.5
SW	19.9	0.2	0.0	0.0	20.0
W	20.7	0.3	0.2	0.0	21.2
NW	7.8	0.0	0.0	0.0	7.8
Summary	96.5	0.7	0.2	0.0	97.4

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

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.65% Calm Poll Avg: 0.27[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

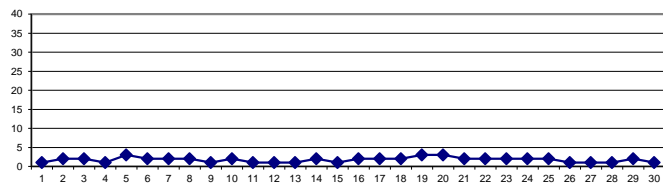
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	670			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	21	ON DAY 1
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	8	ON DAY 19
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 5
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	2 ppb	

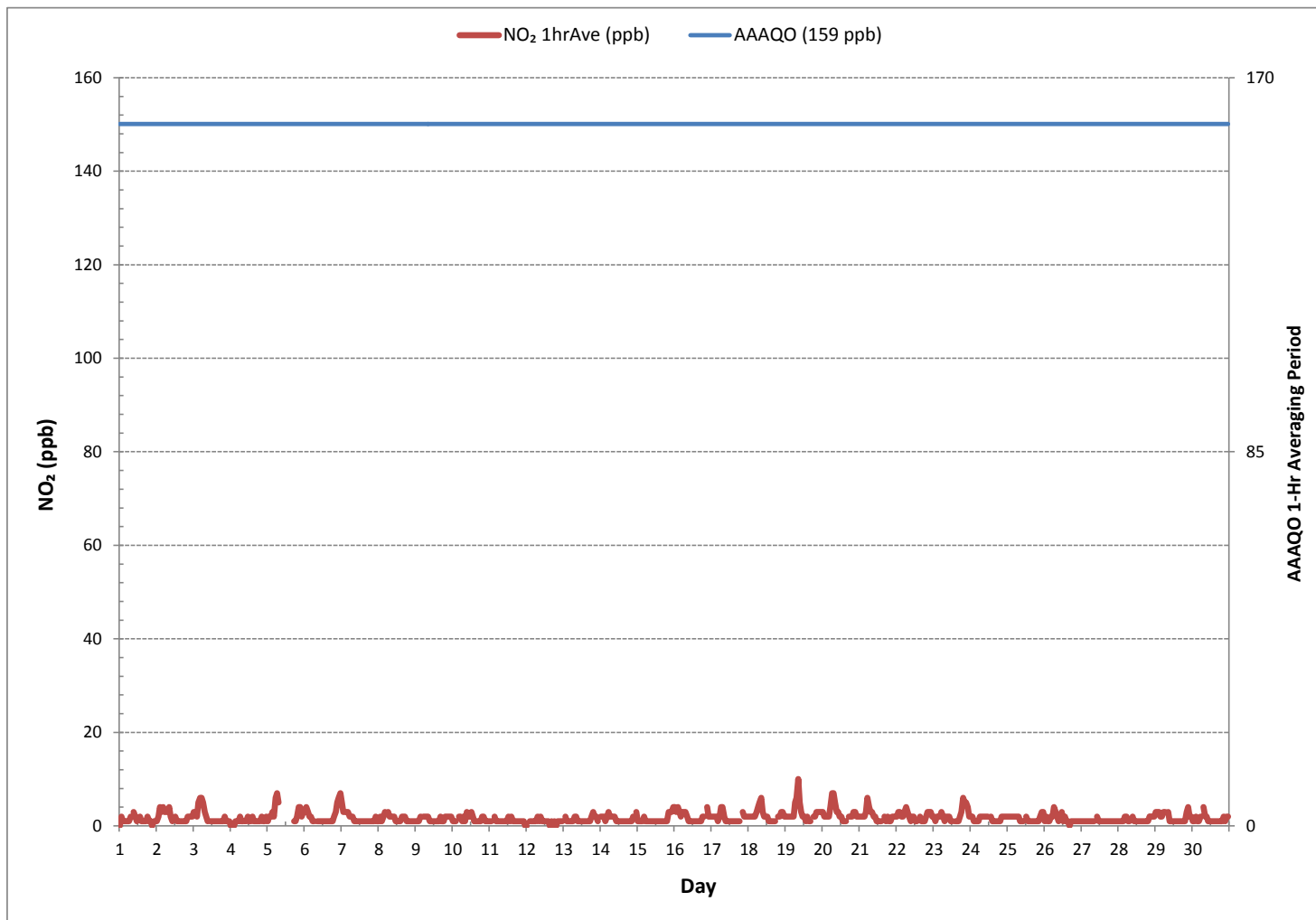
24 HR AVERAGES June 2018





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

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



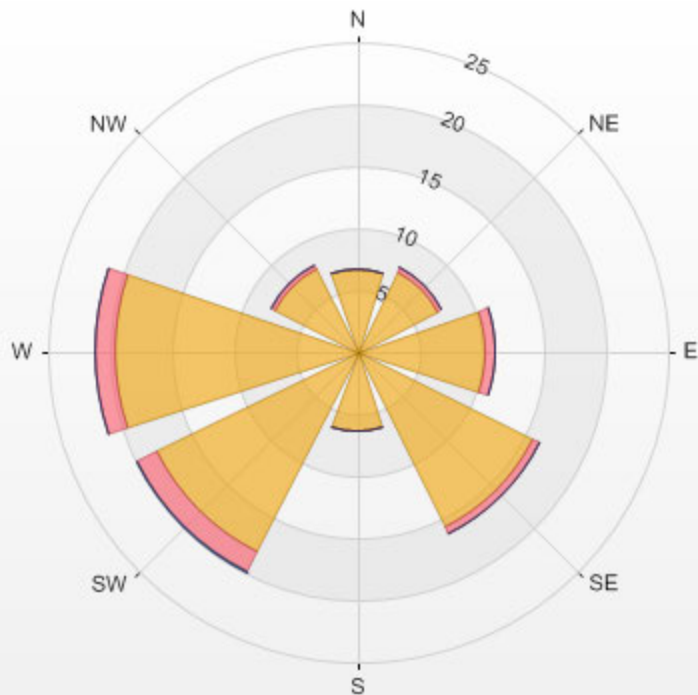
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO₂ [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.65% Calm Avg: 2.14 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	6.6	0.0	0.0	0.0	6.6
NE	7.2	0.4	0.0	0.0	7.7
E	10.3	0.9	0.0	0.0	11.2
SE	15.7	0.7	0.0	0.0	16.5
S	6.5	0.0	0.0	0.0	6.5
SW	18.1	1.8	0.2	0.0	20.0
W	19.6	1.6	0.0	0.0	21.2
NW	7.5	0.3	0.0	0.0	7.8
Summary	91.5	5.7	0.2	0.0	97.4

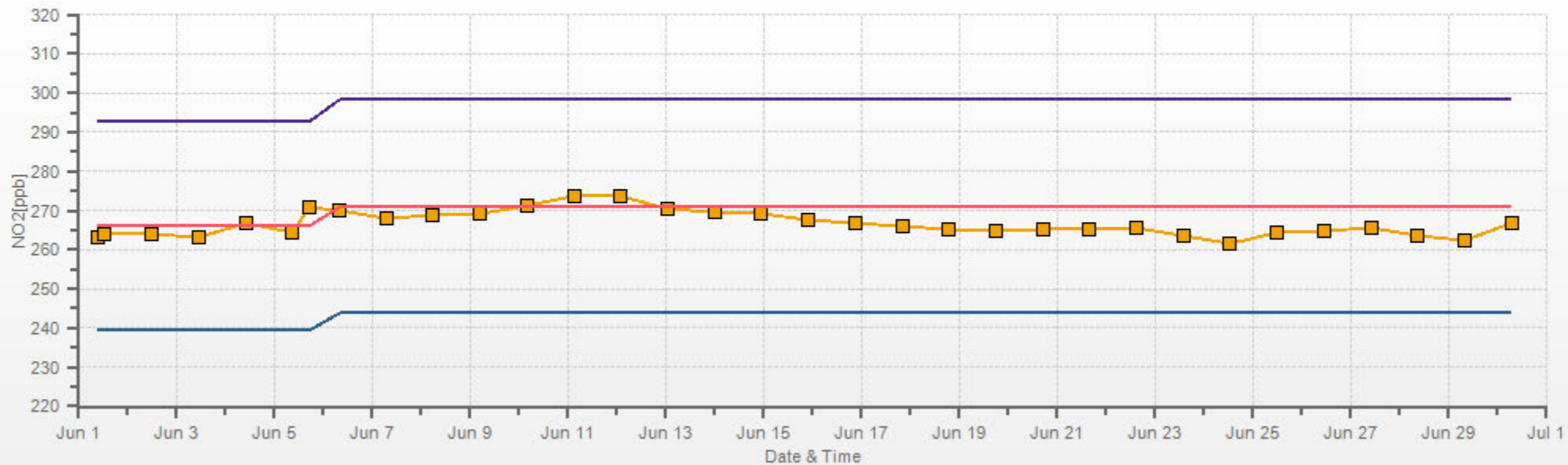
% Icon	Classes (ppb)	91	0.0-3.7	6	3.7-7.3	0	7.3-11.0	0	>11.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.65% Calm Poll Avg: 2.14[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



OZONE



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

OZONE Hourly Averages (O₃ ppb)

DAY	HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	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.	
1	21.6	18.3	18.4	16.9	15.6	15.8	20.0	21.0	S1	24.6	25.5	26.8	S	22.8	21.7	20.7	20.2	19.8	17.9	16.0	14.2	13.6	12.6	10.9	10.9	26.8	18.9	23	
2	8.9	9.0	6.9	6.3	7.9	11.6	12.6	11.4	14.9	20.4	25.3	S	28.3	32.5	36.2	37.0	37.1	37.6	38.6	37.9	40.0	25.7	19.6	15.9	6.3	40.0	22.7	24	
3	9.6	5.3	6.8	14.0	14.9	16.7	20.6	26.9	33.4	38.8	S	45.0	46.6	48.7	49.5	50.6	50.2	50.6	50.7	38.8	30.9	28.5	26.2	24.4	5.3	50.7	31.6	24	
4	25.1	26.0	25.1	23.0	19.8	18.2	19.6	21.0	21.6	S	23.9	22.6	21.8	21.7	20.1	18.7	20.8	20.4	19.3	19.2	16.9	9.0	5.0	6.5	5.0	26.0	19.4	24	
5	3.1	2.0	3.1	2.9	1.9	7.2	11.0	17.3	S	S1	S1	X	35.6	38.1	38.0	38.9	39.6	40.3	41.1	37.2	26.6	18.5	16.0	11.3	1.9	41.1	21.5	21	
6	7.9	6.3	7.8	10.1	18.8	20.2	18.2	S	C	C	C	C	C	C	C	41.8	42.6	46.0	48.9	49.5	45.6	34.4	21.0	16.7	12.1	6.3	49.5	26.3	24
7	7.4	12.7	15.0	8.2	12.8	26.1	S	34.2	40.9	47.8	50.8	52.2	55.0	57.3	59.6	61.9	63.3	65.4	64.6	63.4	60.9	56.9	54.0	51.9	7.4	65.4	44.4	24	
8	48.3	46.1	44.1	40.5	35.0	S	33.0	34.1	35.4	38.9	38.6	40.9	45.5	49.9	52.5	45.1	40.3	40.4	52.7	57.7	57.7	53.7	46.2	41.0	33.0	57.7	44.2	24	
9	38.1	34.2	31.6	30.4	S	27.1	29.0	32.0	32.7	34.4	36.1	38.8	39.6	41.1	42.4	43.7	40.5	40.3	47.1	45.7	46.2	41.1	42.1	42.6	27.1	47.1	38.1	24	
10	42.5	39.8	37.3	S	27.3	25.4	29.9	27.7	28.4	23.8	26.6	21.0	22.8	26.5	31.0	33.7	36.5	44.6	49.7	34.6	27.2	26.0	23.8	24.1	21.0	49.7	30.9	24	
11	24.7	25.3	S	26.6	30.1	31.4	32.9	32.6	30.5	27.2	25.8	26.2	25.1	25.9	25.7	27.0	26.8	27.2	27.3	27.1	26.5	26.8	26.8	27.0	24.7	32.9	27.5	24	
12	27.1	S	28.5	28.6	29.2	29.6	28.9	27.9	28.7	28.3	28.2	27.9	28.0	26.0	26.4	26.5	29.1	30.0	31.1	28.9	28.0	27.1	25.6	25.6	31.1	28.1	24		
13	S	21.2	22.6	25.1	24.0	22.8	23.1	25.0	29.2	33.9	35.5	36.3	36.6	36.6	37.7	38.2	38.8	38.2	35.3	33.7	30.9	28.1	26.4	S	21.2	38.8	30.9	24	
14	23.0	19.4	17.2	15.2	12.5	15.1	17.7	17.9	21.3	25.3	30.4	32.9	33.9	34.4	34.9	34.4	34.7	34.3	33.0	31.3	27.3	20.9	S	17.0	12.5	34.9	25.4	24	
15	21.4	17.2	15.2	12.7	12.5	12.5	13.4	17.9	26.6	28.8	29.7	29.8	29.7	30.6	32.1	33.3	33.9	32.7	31.3	30.0	24.9	S	12.2	7.5	7.5	33.9	23.3	24	
16	5.7	6.9	3.2	3.0	2.3	3.3	10.1	12.6	20.1	25.8	32.2	39.4	38.1	38.7	38.5	40.1	41.7	40.2	38.7	38.1	S	22.2	16.7	11.5	2.3	41.7	23.0	24	
17	7.2	6.6	4.5	3.4	1.9	5.5	16.3	19.2	27.3	31.4	33.1	35.2	37.0	38.2	38.8	40.0	40.9	42.4	43.0	S	31.7	27.1	25.5	29.2	1.9	43.0	25.5	24	
18	21.3	17.2	14.0	11.8	10.4	9.3	23.8	32.6	38.2	46.7	53.6	56.9	56.8	55.0	53.8	55.9	56.7	56.2	S	53.5	45.0	33.7	23.3	19.2	9.3	56.9	36.7	24	
19	19.8	13.4	11.6	11.0	7.0	8.0	29.6	34.7	39.3	47.5	59.1	63.5	64.6	64.1	63.4	63.4	63.9	S	63.4	60.6	51.8	43.6	41.9	37.8	7.0	64.6	41.9	24	
20	31.7	21.7	17.4	14.6	13.0	25.8	34.7	41.1	49.2	57.7	63.1	67.9	66.1	65.3	65.4	65.6	S	66.7	66.0	60.3	50.2	35.3	30.5	27.0	13.0	67.9	45.1	24	
21	28.3	20.9	14.3	9.3	8.4	11.4	34.9	42.6	47.5	54.9	57.2	57.4	56.9	56.9	56.2	S	58.4	58.0	55.8	51.5	57.8	50.3	37.9	26.5	8.4	58.4	41.4	24	
22	22.5	19.8	18.4	13.5	11.2	15.5	25.1	38.6	48.6	56.6	59.6	58.9	61.5	61.3	S	57.3	57.5	55.7	56.2	50.6	44.9	32.8	28.5	29.8	11.2	61.5	40.2	24	
23	33.8	23.3	15.3	8.8	7.9	15.6	26.8	29.8	31.7	39.7	40.6	41.4	44.5	S	29.9	26.7	26.0	35.4	35.3	33.7	28.4	17.7	15.2	11.0	7.9	44.5	26.9	24	
24	6.8	3.4	1.5	6.6	12.2	12.2	14.2	16.4	22.1	29.0	39.0	43.5	S	41.1	41.5	43.5	40.9	43.8	44.3	44.1	39.5	28.8	27.3	27.0	1.5	44.3	27.3	24	
25	19.1	10.7	6.2	21.6	24.2	26.7	26.6	29.8	37.5	44.3	49.9	S	52.0	52.0	50.5	52.1	52.9	53.6	54.1	55.5	44.4	36.2	32.0	26.5	6.2	55.5	37.3	24	
26	31.4	28.6	27.8	25.5	23.2	15.6	18.6	18.7	24.2	27.1	S	33.1	37.7	37.3	38.9	40.3	42.4	39.9	34.8	35.0	32.2	26.5	25.7	25.1	15.6	42.4	30.0	24	
27	23.7	18.0	17.9	20.7	19.9	21.1	20.9	24.2	24.8	S	24.7	24.6	24.5	24.0	24.0	23.2	23.9	24.2	24.2	23.9	22.7	23.9	21.6	21.4	17.9	24.8	22.7	24	
28	21.4	19.3	17.7	17.3	15.9	16.5	17.8	19.6	S	22.7	24.5	25.5	26.4	26.7	26.6	27.9	29.1	26.6	24.6	22.2	17.6	17.4	11.9	11.7	11.7	29.1	21.2	24	
29	12.7	10.4	6.5	3.2	2.1	7.0	S	17.9	23.6	28.1	33.3	34.6	34.9	34.9	36.7	36.0	34.5	37.5	37.1	28.0	20.4	26.5	33.1	2.1	37.5	23.9	24		
30	24.5	15.9	8.4	4.1	2.4	6.7	S	21.8	31.7	36.6	36.8	35.8	34.6	34.7	34.6	35.3	35.2	34.4	30.8	29.5	26.8	26.7	21.4	13.9	2.4	36.8	25.3	24	
HOURLY MAX		48.3	46.1	44.1	40.5	35.0	31.4	34.9	42.6	49.2	57.7	63.1	67.9	66.1	65.3	65.4	65.6	63.9	66.7	66.0	63.4	60.9	56.9	54.0	51.9				
HOURLY AVG		21.3	17.9	16.0	15.0	14.6	16.5	22.1	26.0	30.9	35.2	37.6	39.1	40.1	40.1	39.5	40.0	40.0	40.7	41.3	39.5	35.0	28.9	25.5	23.1				

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 |

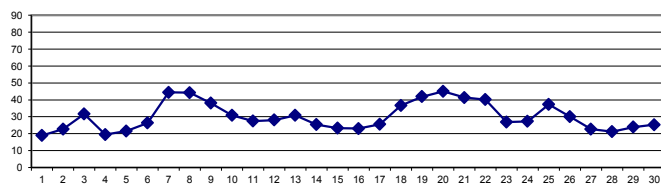
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: **1-HR 82 ppb**

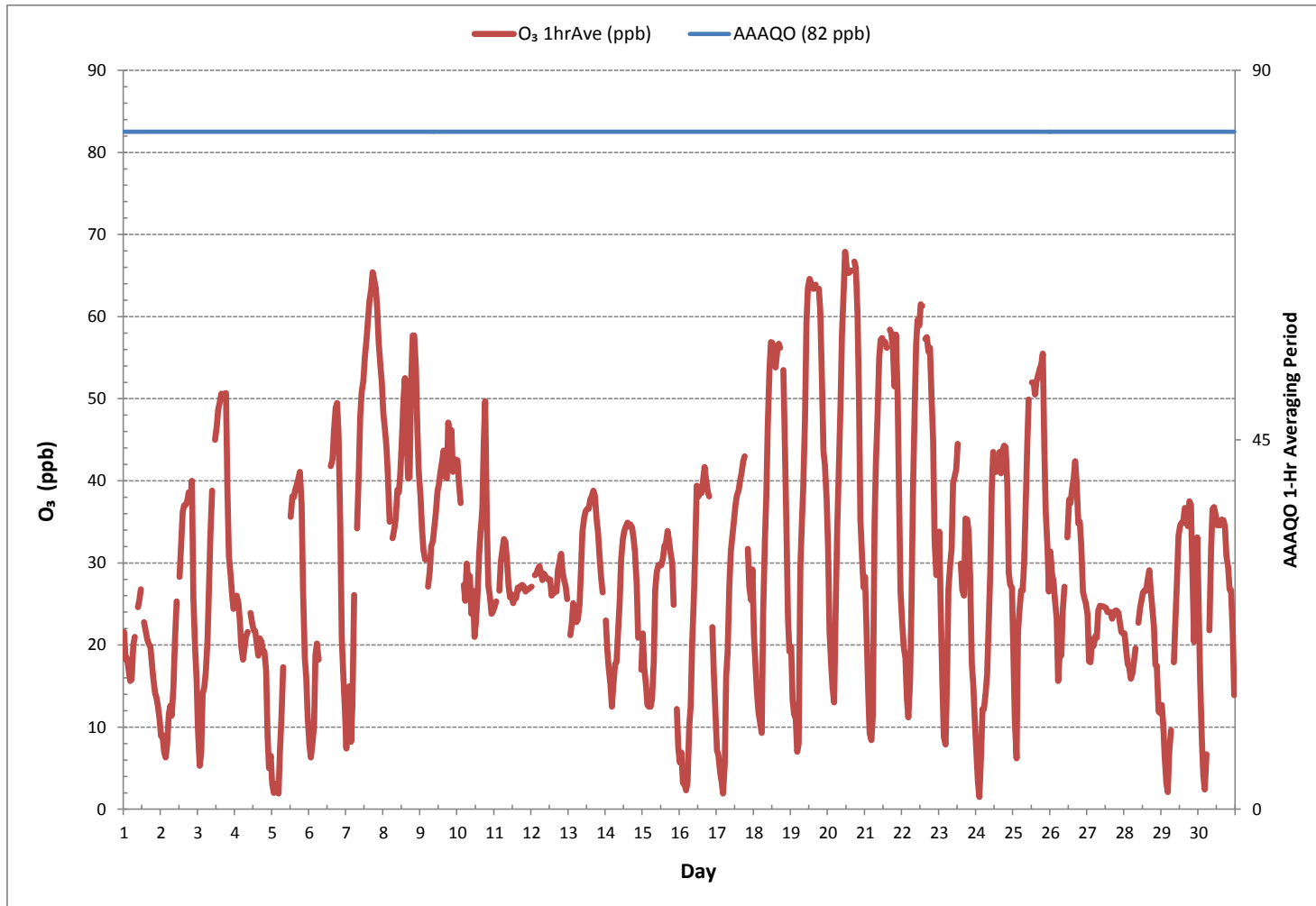
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	679				
MINIMUM 1-HR AVERAGE:	1.5 ppb	@ HOUR	2	ON DAY	24
MAXIMUM 1-HR AVERAGE:	67.9 ppb	@ HOUR	11	ON DAY	20
MAXIMUM 24-HR AVERAGE:	45.1 ppb				ON DAY 20
I2S CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	716	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	99.4	%
STANDARD DEVIATION:	14.8				MONTHLY AVERAGE: 30.1 ppb

24 HR AVERAGES June 2018



OZONE Hourly Averages (O₃ ppb)



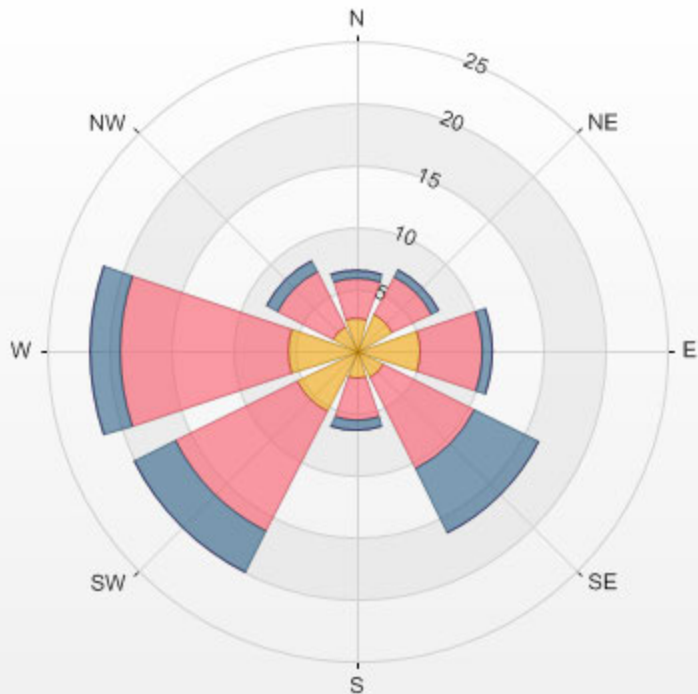
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O₃ [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.65% Calm Avg: 11.00 [ppb]

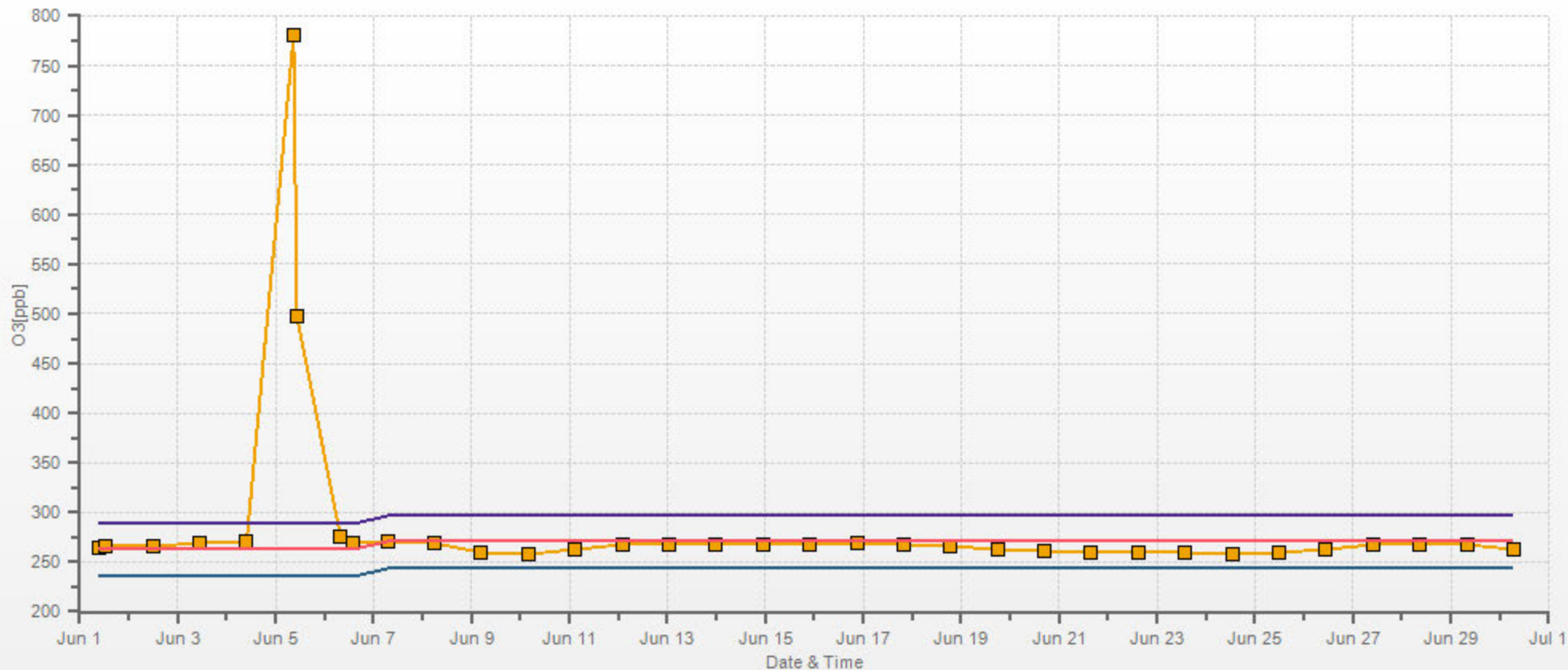
Direction	0.0-22.7	22.7-45.3	45.3-68.0	>68.0	Total
N	2.7	3.2	0.6	0.0	6.5
NE	3.2	3.5	0.6	0.0	7.4
E	5.2	5.0	0.7	0.0	10.9
SE	2.4	8.3	5.9	0.0	16.5
S	2.2	3.4	0.9	0.0	6.5
SW	5.5	10.9	3.7	0.0	20.0
W	5.6	13.6	2.4	0.0	21.5
NW	2.2	5.0	0.9	0.0	8.1
Summary	28.9	52.9	15.6	0.0	97.4

% Icon Classes (ppb) 29 0.0-22.7 53 22.7-45.3 16 45.3-68.0 0 >68.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.65% Calm Poll Avg: 11.00[ppb]



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	0	0	0	X	X	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	22
2	0	0	0	0	1	2	3	2	1	1	2	3	6	11	7	5	4	4	3	2	2	2	2	2	0	11	3	24
3	2	2	2	2	2	3	2	2	2	2	1	1	1	1	2	2	2	1	1	1	10	29	47	21	7	1	47	6
4	4	3	10	7	11	11	12	13	12	8	4	4	3	2	4	6	5	3	5	7	6	9	8	10	2	13	7	24
5	7	4	3	3	2	2	4	5	5	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	1	7	3	24
6	2	2	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	7	12	16	17	1	17	3
7	16	11	9	8	8	8	8	7	5	5	4	3	3	4	3	4	4	6	6	4	7	6	5	8	3	16	6	24
8	11	11	10	11	34	17	18	10	5	3	2	4	4	5	7	16	18	11	12	16	11	9	8	18	2	34	11	24
9	13	14	12	10	11	12	13	13	11	10	9	7	8	8	8	7	7	6	6	6	4	4	3	2	2	2	14	9
10	2	3	3	4	5	5	3	4	5	7	6	5	5	5	4	3	2	3	3	2	1	0	0	0	0	7	3	24
11	X	X	X	X	X	X	X	0	0	0	0	1	1	1	1	0	1	0	1	1	1	0	1	0	0	1	1	17
12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	0	24
13	0	0	0	0	0	1	2	3	3	3	1	1	2	2	1	1	1	1	2	3	6	7	6	7	0	7	2	24
14	7	7	6	6	4	5	4	4	3	2	2	2	2	2	2	2	3	2	1	2	4	5	4	8	1	8	4	24
15	6	5	4	4	3	3	3	3	3	4	4	3	3	3	2	3	3	3	6	7	9	14	17	22	2	22	6	24
16	20	16	12	11	10	11	9	10	8	7	6	6	5	4	6	7	8	7	7	10	11	15	17	19	4	20	10	24
17	22	16	15	14	13	15	15	12	7	3	1	1	1	1	1	1	1	1	2	2	3	4	9	13	1	22	7	24
18	13	13	12	11	10	11	9	7	5	2	2	1	1	1	1	1	1	1	1	1	2	4	5	7	1	13	5	24
19	8	9	11	13	12	12	7	6	4	4	3	2	3	4	4	5	6	6	7	6	7	7	9	11	2	13	7	24
20	12	13	13	14	14	15	14	12	8	6	5	5	6	6	6	7	7	7	9	9	9	10	10	5	15	9	9	24
21	11	13	16	17	19	21	11	9	6	4	4	3	3	3	4	4	5	4	6	7	6	7	7	7	3	21	8	24
22	8	8	8	8	9	10	10	9	6	6	C	C	2	2	2	2	2	1	1	2	2	24	68	66	1	68	12	24
23	69	68	63	64	65	84	91	85	83	72	68	64	60	75	87	79	65	53	51	53	71	93	62	57	51	93	70	24
24	65	68	62	67	52	73	8	3	6	15	12	10	8	7	6	6	7	6	6	6	6	7	7	3	73	22	24	
25	7	7	7	7	7	7	7	7	7	2	2	1	1	1	1	1	1	1	1	2	18	14	9	8	1	18	5	24
26	3	2	2	2	3	3	4	3	3	2	3	1	1	1	1	0	0	0	0	3	2	2	1	2	0	4	2	24
27	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	4	4	4	3	3	2	2	2	1	4	2	24
28	2	3	3	2	2	3	4	4	4	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	4	2	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	3	2	1	8	1	24
30	2	2	2	18	20	25	21	19	17	15	13	11	11	11	10	10	14	15	12	8	10	8	7	2	25	13	24	
HOURLY MAX	69	68	63	67	65	84	91	85	83	72	68	64	60	75	87	79	65	53	51	53	71	93	68	66				
HOURLY AVG	11	10	10	11	11	12	10	9	8	7	6	5	5	6	6	6	6	5	5	6	8	11	10	11				

STATUS FLAG CODES

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

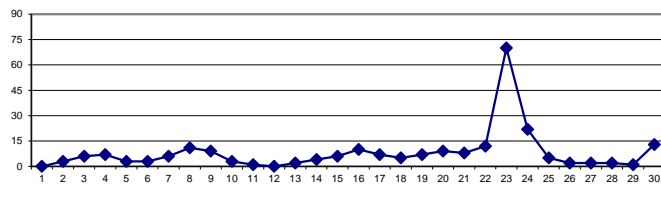
OBJECTIVE LIMIT:

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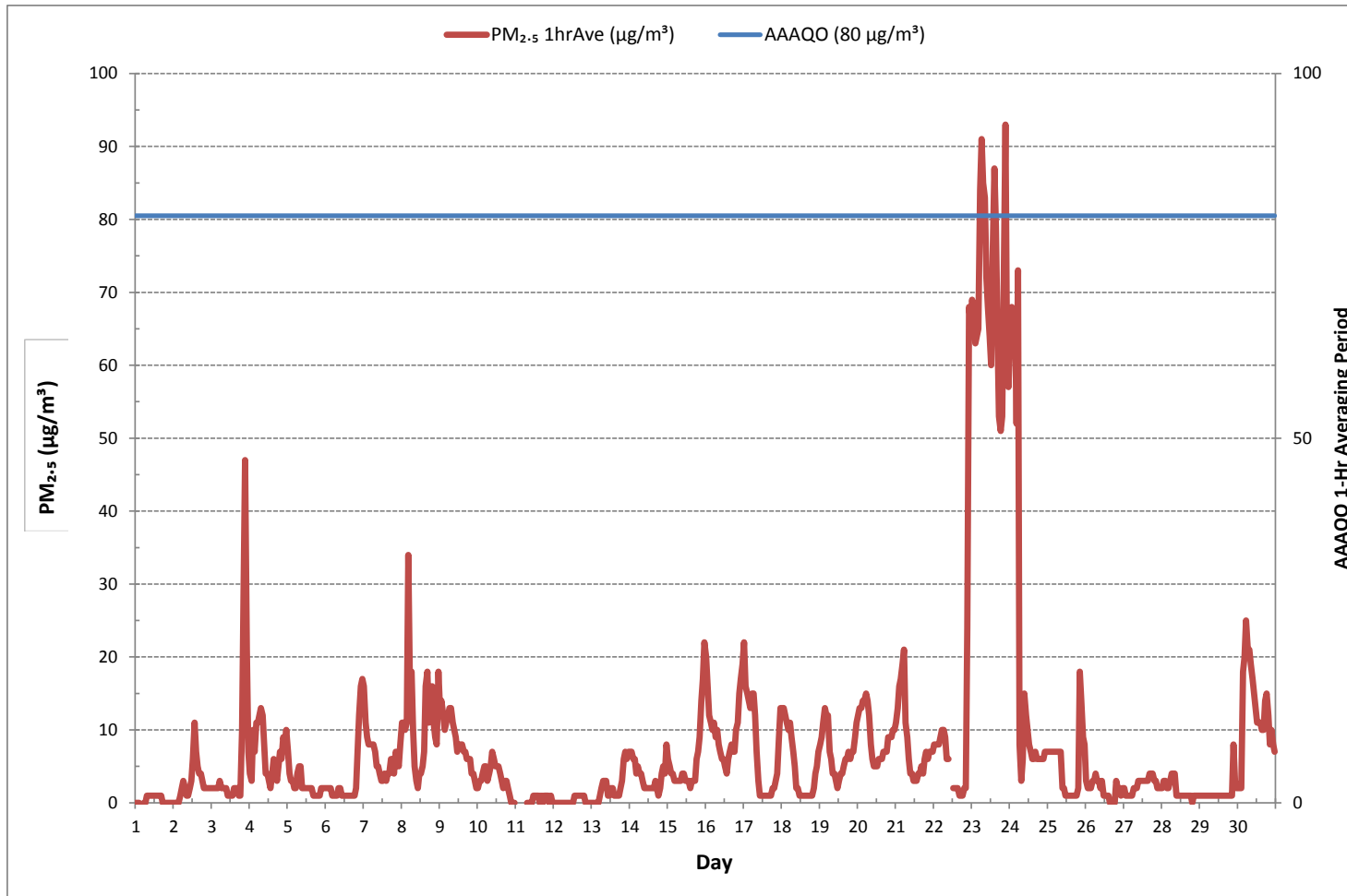
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	6				
NUMBER OF 24-HR EXCEEDANCES:	1				
NUMBER OF NON-ZERO READINGS:	655				
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	93 µg/m ³ @ HOUR	21	ON DAY	23	
MAXIMUM 24-HR AVERAGE:	70 µg/m ³		ON DAY	23	
MONTHLY CALIBRATION TIME:	2	hrs	OPERATIONAL TIME:	711	hrs
STANDARD DEVIATION:	14		AMD OPERATION UPTIME:	98.8	%
			MONTHLY AVERAGE:	8	µg/m ³

24 HR AVERAGES June 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} [ug/m³]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.84%

Calm Avg: 11.98 [ug/m³]

Direction	0.0-18.8	18.8-37.6	37.6-56.4	56.4-75.2	75.2-94.0	>94.0	Total
N	6.5	0.0	0.0	0.1	0.0	0.0	6.7
NE	6.8	0.0	0.1	0.4	0.1	0.0	7.5
E	8.0	0.9	0.1	0.7	0.7	0.0	10.4
SE	15.1	0.1	0.1	0.6	0.3	0.0	16.2
S	5.4	0.3	0.0	0.3	0.0	0.0	6.0
SW	19.5	0.3	0.0	0.3	0.0	0.0	20.1
W	21.3	0.3	0.0	0.3	0.0	0.0	21.9
NW	8.0	0.0	0.3	0.1	0.0	0.0	8.4
Summary	90.6	1.8	0.7	2.8	1.1	0.0	97.1

% Icon Classes (ug/m3(L))

91 0.0-18.8

2 18.8-37.6

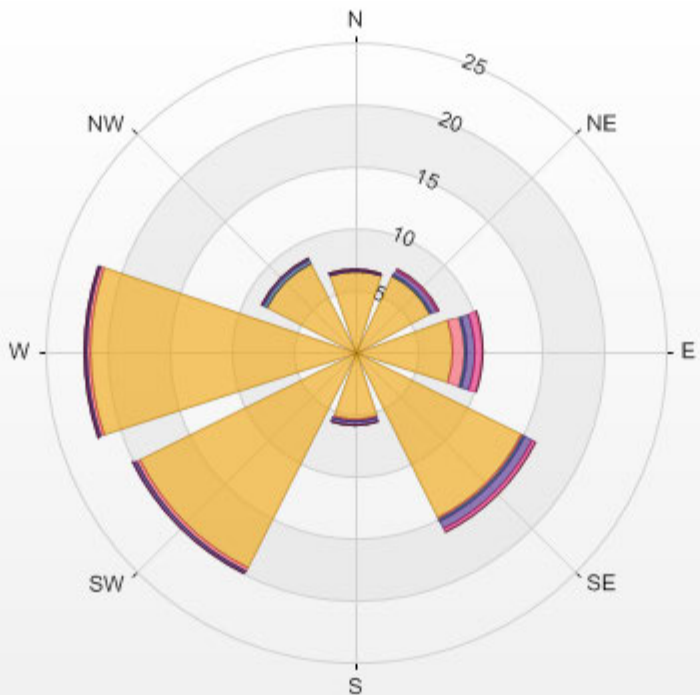
1 37.6-56.4

3 56.4-75.2

1 75.2-94.0

0 >94.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5 [ug/m³] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.84% Calm Poll Avg: 11.98[ug/m³]



WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - June 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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	6.0	6.3	6.8	6.9	7.3	7.5	9.5	9.4	9.0	8.5	7.7	7.3	5.4	5.6	7.5	7.0	6.9	6.3	5.4	4.1	3.6	3.9	4.2	2.4	2.4	9.5	5.2	24
2	2.6	3.8	3.8	4.3	5.8	6.9	6.0	6.0	6.3	4.7	7.3	7.9	8.8	10.5	11.4	9.9	12.1	9.7	7.6	7.1	6.3	1.7	0.8	1.9	0.8	12.1	6.0	24
3	0.2	0.5	2.9	5.2	5.3	5.6	6.9	6.5	7.2	9.4	11.6	9.5	9.5	9.3	9.5	8.5	5.6	3.5	2.0	6.0	8.4	10.5	11.3	11.7	0.2	11.7	2.8	24
4	13.7	12.5	11.3	7.7	6.8	9.0	11.2	14.9	17.6	15.1	8.2	8.2	8.7	8.2	5.6	7.4	5.8	7.1	4.8	3.1	1.7	1.1	2.4	3.2	1.1	17.6	6.7	24
5	2.2	2.0	3.4	2.2	1.3	3.2	4.6	4.4	4.0	5.3	5.4	7.3	11.0	6.4	4.7	6.3	6.9	8.9	7.6	3.5	2.0	0.8	0.7	1.0	0.7	11.0	3.7	24
6	0.2	0.6	1.2	1.7	3.9	5.0	7.3	7.6	7.8	7.3	8.8	9.5	9.4	8.0	3.1	3.2	2.5	2.6	1.8	2.3	1.1	1.2	1.1	1.6	0.2	9.5	3.2	24
7	1.1	1.9	1.2	1.8	2.6	5.1	5.8	6.6	13.4	15.7	16.8	16.3	14.5	12.6	11.8	12.4	10.9	11.7	14.0	14.8	10.6	10.2	10.6	10.4	1.1	16.8	9.6	24
8	8.1	8.2	6.3	3.4	3.7	5.8	6.5	7.0	5.0	6.3	7.7	11.0	13.4	12.2	11.6	4.7	6.9	1.4	20.9	15.1	13.0	15.6	14.1	11.0	1.4	20.9	8.4	24
9	10.2	6.4	4.3	5.1	7.0	10.3	11.5	15.4	13.8	15.0	12.7	13.5	13.3	13.5	14.1	13.0	13.7	8.9	19.6	7.6	10.1	10.9	11.5	10.6	4.3	19.6	9.2	24
10	7.4	8.1	4.2	4.9	1.4	3.6	2.2	4.5	4.4	4.0	2.0	2.2	3.5	3.5	9.1	9.3	8.9	8.3	9.2	10.3	9.5	9.5	9.0	10.0	1.4	10.3	4.2	24
11	9.8	11.0	9.2	8.3	8.8	9.0	12.0	15.9	15.6	14.4	15.6	15.7	15.9	16.3	17.0	18.7	16.3	17.5	18.1	17.2	15.9	16.0	16.5	16.5	8.3	18.7	13.0	24
12	16.0	18.5	19.0	18.4	18.4	17.3	17.5	16.5	15.5	15.1	15.9	15.2	18.8	18.3	17.8	18.0	15.5	16.8	14.0	15.6	8.7	8.5	8.2	5.7	5.7	19.0	15.2	24
13	3.7	4.3	5.1	6.1	4.6	4.2	5.3	5.4	6.5	7.1	8.4	9.8	7.9	10.0	10.7	11.8	10.2	6.0	6.7	5.2	2.7	3.5	4.6	5.7	2.7	11.8	4.5	24
14	2.1	1.2	1.0	2.5	1.1	2.8	5.9	6.2	5.7	4.2	6.1	10.1	11.7	9.0	7.8	3.0	4.7	5.6	5.5	5.9	4.9	2.6	0.3	4.2	0.3	11.7	4.0	24
15	2.2	1.0	1.0	0.8	1.6	1.4	1.8	2.7	9.5	8.8	10.3	9.8	7.1	5.6	6.8	6.3	7.7	7.7	5.7	5.1	2.3	0.2	0.2	0.4	0.2	10.3	3.1	24
16	0.5	0.4	0.8	1.3	0.2	0.6	0.9	1.0	2.7	2.5	2.5	4.2	4.6	5.4	4.6	4.9	7.2	3.3	4.2	2.9	2.3	1.9	0.5	0.2	0.2	7.2	1.3	24
17	1.0	0.7	0.6	0.3	0.3	0.8	3.3	3.1	3.1	4.2	6.4	7.6	4.2	6.4	7.3	7.6	8.3	7.1	6.2	3.8	0.8	1.6	1.4	1.3	0.3	8.3	3.3	24
18	0.6	0.3	0.1	0.2	0.1	2.3	4.0	5.4	6.5	9.9	10.1	9.7	9.9	9.0	8.5	7.8	7.5	7.1	5.1	2.7	0.8	1.0	0.9	0.1	10.1	4.5	24	
19	2.0	0.7	0.7	0.3	0.3	0.6	3.9	5.0	5.5	6.9	6.7	7.9	8.4	8.3	7.8	7.8	9.4	8.6	7.8	5.6	4.3	3.1	3.6	2.7	0.3	9.4	4.8	24
20	1.0	0.4	0.8	0.8	1.0	4.4	5.3	4.6	5.1	6.1	6.6	9.7	8.7	8.3	7.5	7.8	6.4	6.5	5.8	3.6	1.5	0.9	0.6	0.6	0.4	9.7	4.1	24
21	0.5	0.2	0.4	0.4	0.6	1.4	1.7	1.2	1.9	2.4	1.1	2.1	4.6	3.5	2.4	4.6	3.4	1.9	6.5	1.6	8.1	0.7	0.8	0.8	0.2	8.1	1.3	24
22	1.3	0.6	0.9	1.8	0.8	1.0	2.2	1.0	2.3	0.8	2.4	4.6	5.1	6.5	13.4	10.3	5.8	5.1	4.5	4.7	2.8	0.1	2.0	2.8	0.1	13.4	1.6	24
23	3.5	0.6	2.1	0.4	0.9	3.8	6.5	7.0	6.0	8.4	7.1	9.4	10.8	7.6	7.4	5.5	3.5	6.3	2.4	2.5	1.3	1.2	1.5	0.9	0.4	10.8	2.9	24
24	0.6	1.0	0.4	3.7	6.5	4.5	2.9	3.5	3.1	3.1	2.5	3.1	2.3	3.5	2.4	7.9	9.8	12.5	10.1	7.2	4.0	0.8	4.0	3.1	0.4	12.5	3.4	24
25	1.9	0.3	1.0	4.0	5.2	8.6	9.9	11.2	11.5	13.7	17.8	17.4	16.0	18.7	18.5	17.0	18.3	17.0	8.4	10.0	8.2	9.8	7.1	4.5	0.3	18.7	7.7	24
26	8.4	4.1	4.5	4.1	3.3	1.6	5.3	8.3	12.6	10.6	14.4	11.8	14.3	13.3	12.8	11.0	1.6	1.3	2.6	7.1	6.4	3.5	4.0	5.2	1.3	14.4	5.7	24
27	6.9	3.4	4.7	5.6	5.2	7.0	6.8	12.7	14.3	15.3	16.6	15.8	16.5	15.6	17.8	15.4	14.5	12.7	14.6	12.6	12.8	11.8	12.2	12.0	3.4	17.8	11.5	24
28	10.2	9.1	8.1	8.9	7.4	9.7	11.2	12.2	11.0	10.6	12.1	12.9	11.7	12.2	11.6	12.1	16.5	8.3	8.6	7.2	3.9	3.9	2.1	3.6	2.1	16.5	8.5	24
29	4.5	3.5	2.9	1.3	1.4	4.2	3.6	4.7	4.7	7.2	7.1	9.8	9.9	7.3	6.2	10.8	2.3	3.8	4.7	4.5	1.2	1.2	3.9	2.7	1.2	10.8	3.9	24
30	2.0	1.2	0.6	0.3	0.6	1.0	3.1	3.5	3.9	5.9	7.8	10.1	11.7	11.2	9.7	10.5	9.2	11.6	3.7	3.4	3.6	4.7	1.9	0.8	0.3	11.7	4.8	24
HOURLY MAX	16.0	18.5	19.0	18.4	18.4	17.3	17.5	16.5	17.6	15.7	17.8	17.4	18.8	18.7	18.5	18.7	18.3	17.5	20.9	17.2	15.9	16.0	16.5	16.5				

STATUS FLAG CODES

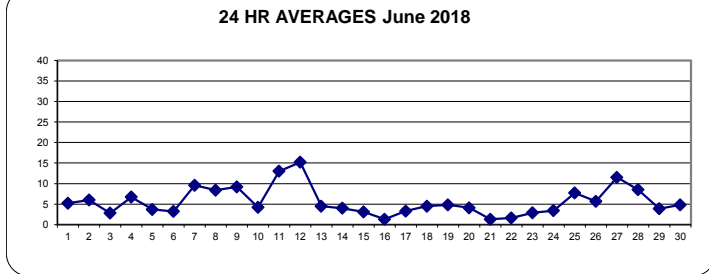
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

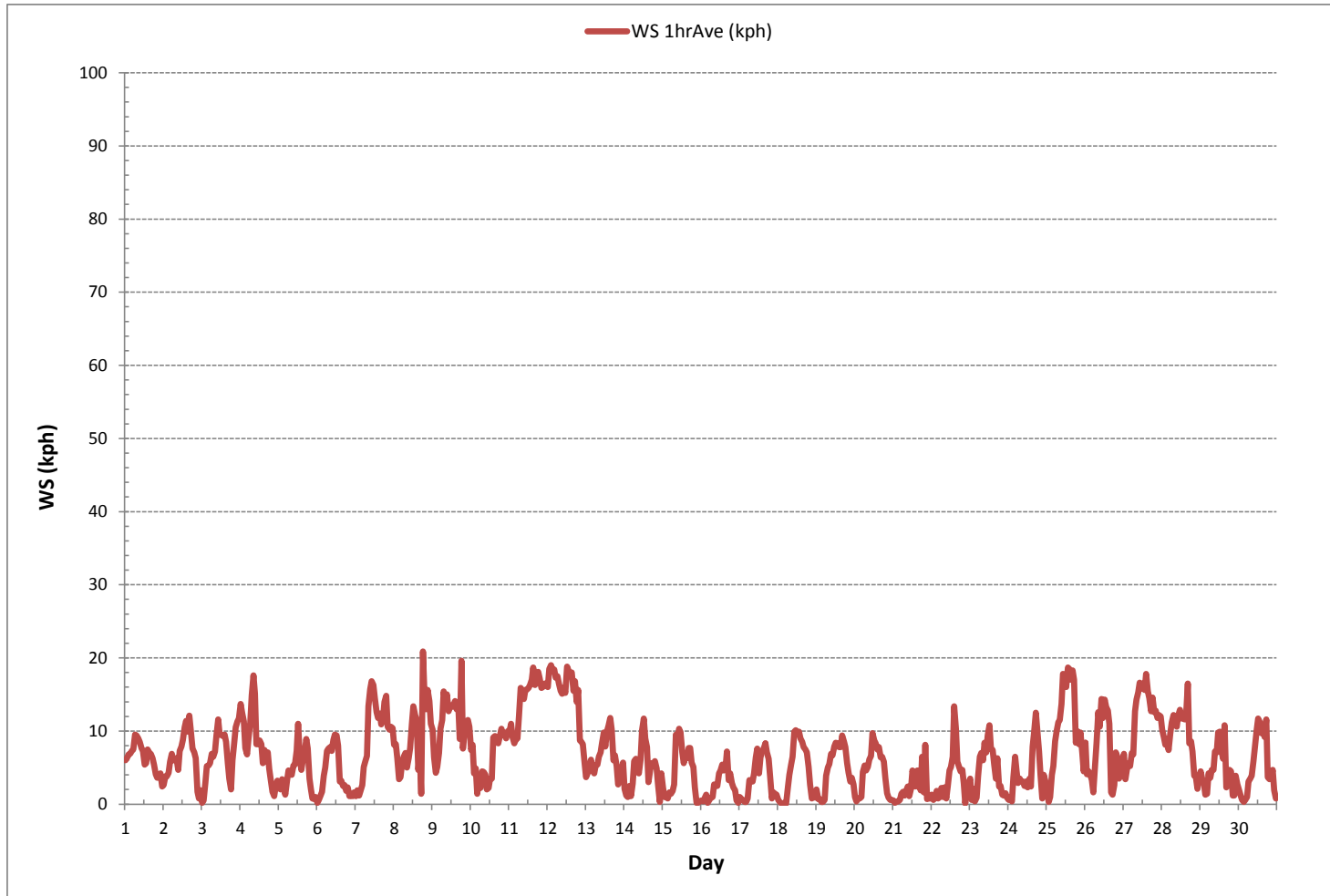
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 2 ON DAY 18
MAXIMUM 1-HR AVERAGE:	20.9 kph @ HOUR 18 ON DAY 8
MAXIMUM 24-HR AVERAGE:	15.2 kph ON DAY 12
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.8
MONTHLY AVERAGE:	1.8 kph

24 HR AVERAGES June 2018





WIND SPEED Hourly Averages (WS kph)



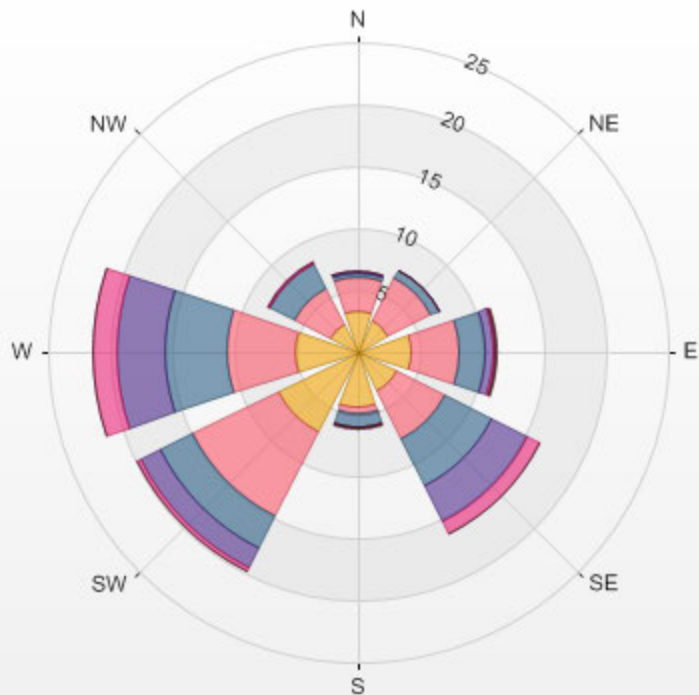
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 18/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 2.78%

Direction	0.4-4.2	4.2-8.4	8.4-12.6	12.6-16.8	16.8-21.0	>21.0	Total
N	3.3	2.8	0.3	0.1	0.0	0.0	6.5
NE	2.8	3.9	0.7	0.0	0.0	0.0	7.4
E	4.3	3.9	2.1	0.7	0.1	0.1	11.3
SE	3.6	4.3	4.2	3.2	1.1	0.0	16.4
S	4.6	0.4	1.1	0.0	0.0	0.1	6.3
SW	7.2	7.6	2.9	1.8	0.3	0.0	19.9
W	5.1	5.4	5.0	3.9	1.9	0.0	21.4
NW	2.5	3.2	2.2	0.1	0.1	0.0	8.2
Summary	33.5	31.5	18.5	9.9	3.6	0.3	97.2

%	Icon	Classes (kph)	33	32	18	10	4	0
								
			0.4-4.2	4.2-8.4	8.4-12.6	12.6-16.8	16.8-21.0	>21.0

LICA COLD LAKE SOUTH 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 2.78% Calm Wind Avg Speed: 0.21(kph)



WIND DIRECTION



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

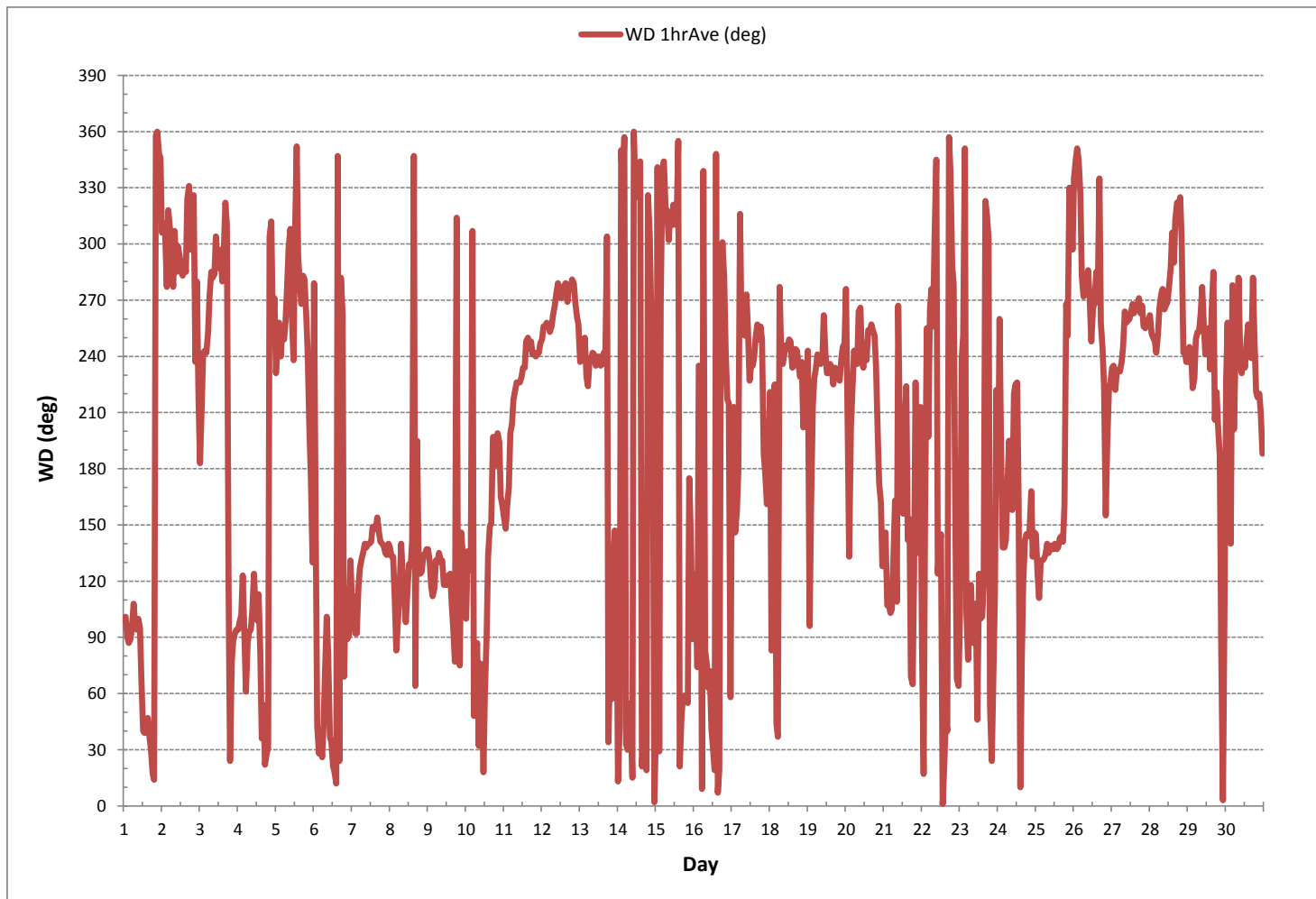
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	90		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	228 (SW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	18	19	19	20	21	23	22	21	20	22	24	24	16	15	18	20	18	20	15	16	14	18	16	15	24	
2	12	14	14	21	24	19	25	21	20	37	32	30	28	26	26	24	30	26	23	21	12	7	8	8	24	
3	10	12	9	13	16	17	21	24	26	24	28	29	33	31	30	31	33	19	16	15	23	19	19	20	24	
4	18	19	20	23	27	19	20	19	18	22	28	21	24	24	30	21	29	22	21	27	11	11	8	15	24	
5	6	6	16	9	17	16	21	32	37	40	39	27	34	25	49	35	29	25	22	18	7	8	9	12	24	
6	11	11	12	14	35	25	25	24	25	25	21	23	23	28	62	56	19	21	17	40	9	8	12	10	24	
7	14	15	13	9	12	18	18	23	16	16	15	16	20	26	28	27	29	20	14	13	13	11	11	12	24	
8	13	13	16	20	23	19	25	22	30	29	31	28	19	23	17	52	26	72	13	21	19	13	12	13	24	
9	13	17	21	25	22	16	16	14	17	18	23	23	24	22	21	24	19	42	39	43	24	20	17	31	24	
10	22	15	22	16	13	13	13	32	38	39	17	13	34	28	18	20	22	32	32	34	33	34	33	29	24	
11	26	21	30	33	31	31	25	19	19	19	18	19	20	19	20	19	20	20	19	19	18	19	18	19	24	
12	19	18	18	17	18	18	18	20	21	22	22	22	21	22	22	21	21	21	20	20	23	21	19	18	24	
13	20	20	17	18	17	18	22	28	28	27	25	28	30	22	25	24	24	56	31	36	17	19	16	45	24	
14	14	12	11	12	13	20	21	22	24	40	41	29	25	28	35	54	42	30	21	26	15	9	19	13	24	
15	14	15	17	13	14	16	19	20	20	26	24	30	33	36	32	32	22	21	18	18	13	19	12	8	24	
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17	8	20	17	9	14	17	16	32	22	38	36	30	50	36	26	29	26	26	24	19	13	14	20	24	24	
18	20	16	20	11	19	23	14	28	25	25	23	27	28	23	25	27	24	21	20	17	13	12	12	13	24	
19	7	9	13	11	10	17	21	21	21	23	33	26	25	26	27	24	19	20	18	18	15	19	17	12	24	
20	13	14	7	12	15	16	18	22	27	29	30	22	24	26	27	26	27	24	21	22	13	9	13	10	24	
21	13	14	8	11	15	12	16	15	43	18	73	66	48	50	24	39	53	64	21	14	18	14	8	8	24	
22	11	11	8	8	8	11	14	19	19	19	15	15	36	48	28	20	26	22	46	24	11	13	12	13	24	
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24	8	8	17	14	11	25	37	38	45	44	55	54	57	55	66	33	25	14	17	14	16	20	12	13	24	
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26	18	37	49	48	34	15	20	22	22	22	22	22	20	22	23	23	18	17	46	38	22	36	29	22	24	
27	19	17	21	19	19	18	19	20	21	19	20	21	21	22	20	24	19	21	20	20	18	19	19	18	24	
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29	18	16	11	9	13	19	34	24	27	28	28	24	23	27	29	25	16	30	23	27	22	18	44	38	24	
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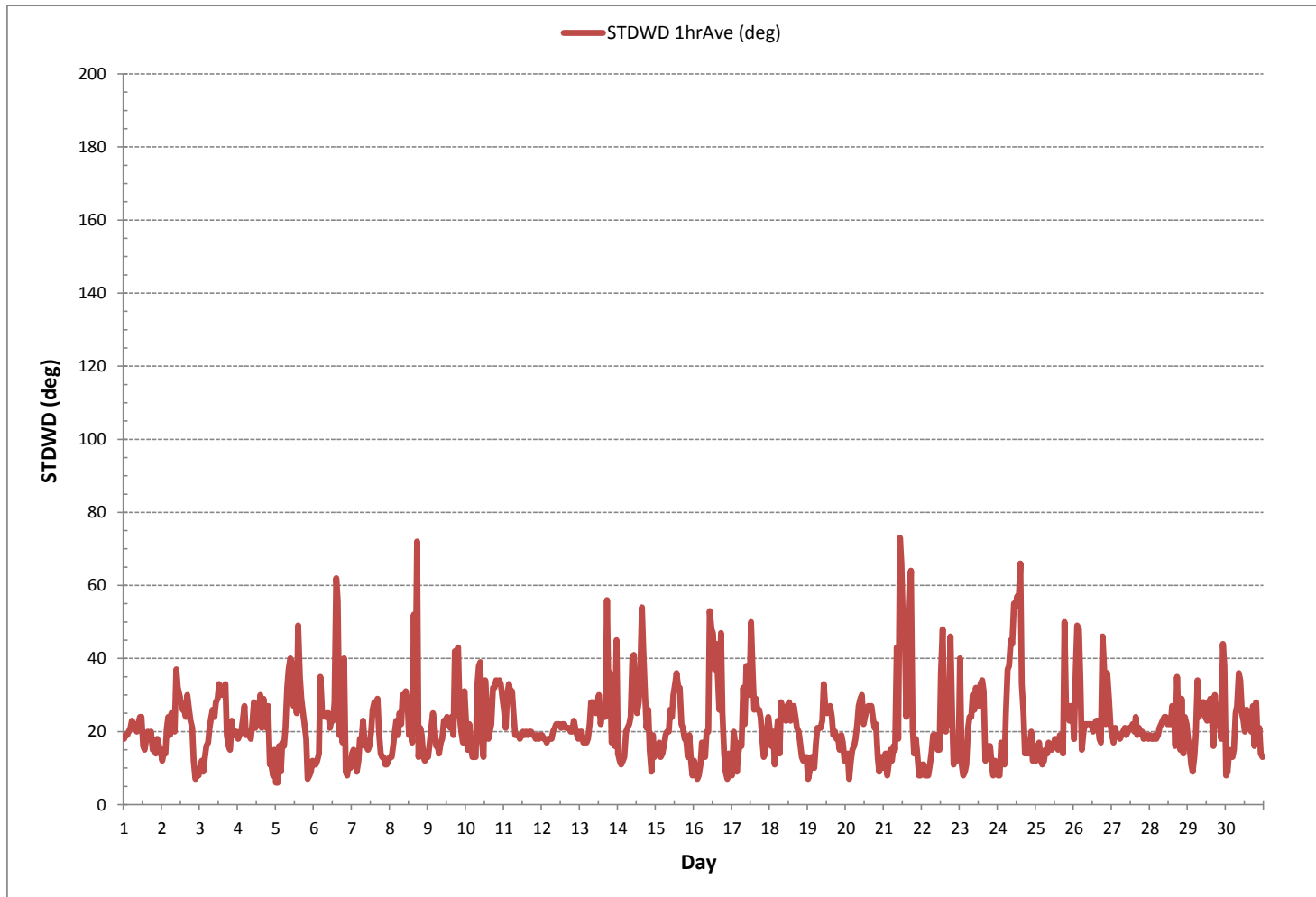
STATUS FLAG CODES

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

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



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

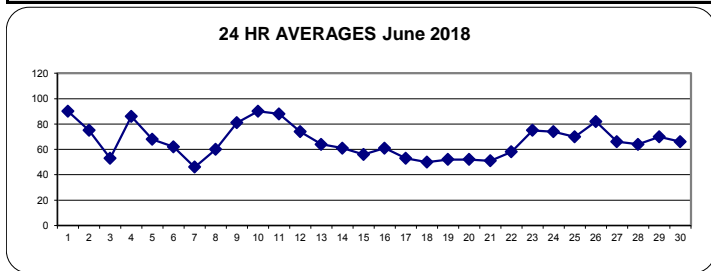
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
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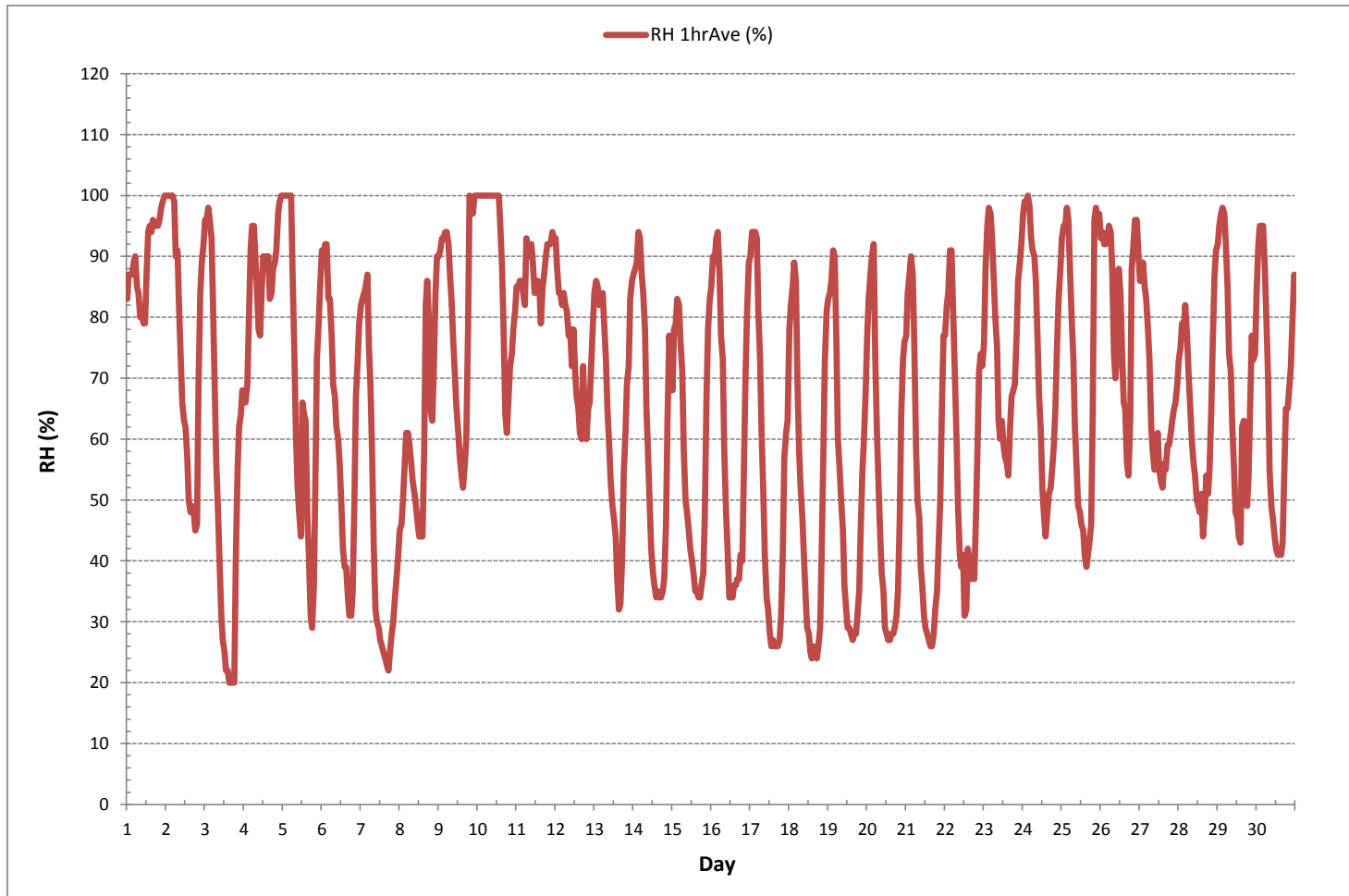
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	20	%	@ HOUR	15	ON DAY	3
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	23	ON DAY	1
MAXIMUM 24-HR AVERAGE:	90	%			ON DAY	1
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	23		MONTHLY AVERAGE:	67	%	

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE

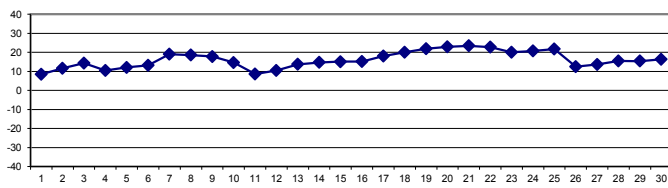
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	8.2	7.6	8.2	8.4	8.5	8.7	8.8	8.8	9.2	9.0	9.0	9.3	8.8	8.3	8.4	8.4	8.4	8.4	8.4	8.2	8.2	8.1	7.9	7.9	7.6	9.3	8.5	24	
2	7.7	7.7	7.4	6.8	6.5	7.2	8.6	8.5	9.7	11.8	13.0	13.8	14.8	16.2	17.5	17.9	17.4	16.8	17.7	16.7	11.3	9.0	7.1	6.1	6.1	17.9	11.6	24	
3	4.9	3.9	3.3	4.2	4.9	7.0	9.8	12.8	15.4	17.1	18.3	19.2	19.8	20.4	21.0	21.1	21.5	21.3	21.1	18.4	16.3	14.7	13.4	12.2	3.3	21.5	14.3	24	
4	11.3	11.0	10.6	10.0	9.0	8.8	9.1	9.7	10.6	11.9	11.9	11.4	10.9	11.2	11.2	11.0	12.4	12.1	11.0	11.1	10.6	9.2	8.1	7.6	7.6	12.4	10.5	24	
5	6.3	5.0	4.8	5.0	5.6	7.8	10.3	12.7	15.2	15.3	16.1	16.9	12.8	14.7	14.2	17.7	18.0	18.6	17.9	16.7	14.3	10.1	7.8	6.1	4.8	18.6	12.1	24	
6	4.9	4.9	4.5	5.4	7.4	8.0	8.3	10.0	12.9	13.7	14.1	14.8	16.7	18.6	19.5	19.8	20.6	21.4	21.2	20.1	16.7	13.0	10.1	11.2	9.8	4.5	21.4	13.2	24
7	8.7	8.5	8.7	8.9	9.1	12.1	13.3	16.3	18.8	21.1	21.8	22.7	24.2	25.1	26.1	26.6	26.7	26.4	25.4	24.2	22.6	20.9	19.3	18.2	8.5	26.7	19.0	24	
8	16.9	16.8	16.0	14.8	13.8	14.6	16.4	18.2	19.9	21.3	22.7	24.0	24.6	24.8	24.5	21.4	16.9	16.6	16.7	18.4	18.1	17.0	16.0	15.8	13.8	24.8	18.6	24	
9	15.6	15.1	14.6	14.3	14.2	14.3	14.6	15.1	16.1	17.3	19.1	20.3	21.9	23.5	24.6	25.1	24.7	23.6	18.5	15.0	15.0	14.7	14.6	14.2	25.1	17.8	24		
10	14.6	14.3	14.3	13.7	13.1	13.0	13.4	14.3	14.3	14.3	14.5	14.7	15.0	16.1	17.0	17.9	19.3	19.8	18.7	15.9	12.7	11.2	9.5	8.5	8.5	19.8	14.6	24	
11	8.0	8.1	8.3	8.2	8.3	8.3	7.4	7.7	8.2	8.6	9.2	9.8	10.1	10.3	9.6	9.5	9.2	8.9	8.7	8.3	8.2	8.1	7.9	8.1	7.4	10.3	8.6	24	
12	8.1	8.6	8.9	8.8	9.0	9.0	9.1	9.5	10.0	10.1	11.0	10.9	12.1	12.5	13.1	13.3	13.4	11.3	12.1	11.7	10.8	10.6	9.5	8.3	8.1	13.4	10.5	24	
13	7.6	7.6	7.9	8.1	8.0	8.3	9.7	11.3	13.3	14.8	16.3	17.5	18.3	19.2	20.4	21.0	21.1	19.1	15.7	14.5	13.5	12.6	11.0	10.8	7.6	21.1	13.7	24	
14	10.3	10.0	9.7	8.7	9.0	10.4	10.0	10.8	13.0	15.2	16.7	17.8	18.6	19.4	20.2	20.1	20.3	20.6	20.0	19.6	17.0	13.8	10.9	10.9	8.7	20.6	14.7	24	
15	11.3	9.9	9.4	9.1	9.4	11.1	12.9	15.7	16.1	16.7	17.7	18.3	19.1	19.8	20.2	19.8	20.0	19.9	19.0	18.6	16.7	12.7	10.3	8.9	8.9	20.2	15.1	24	
16	8.1	7.2	6.6	6.3	6.8	9.2	12.4	14.1	17.1	18.3	19.1	20.6	20.8	21.4	20.4	20.9	20.6	21.4	20.2	20.9	17.5	13.7	11.6	9.9	6.3	21.4	15.2	24	
17	8.8	7.9	7.1	6.6	7.2	11.0	14.2	17.1	19.9	21.8	22.6	23.2	23.8	24.7	24.6	25.0	25.0	24.8	24.6	24.1	21.2	16.4	15.1	14.5	6.6	25.0	18.0	24	
18	12.1	10.8	9.5	8.5	9.1	13.4	17.7	19.3	21.5	23.5	25.0	25.7	26.3	26.7	27.0	27.0	27.1	27.3	26.6	25.8	22.6	18.3	15.7	14.0	8.5	27.3	20.0	24	
19	12.9	12.1	11.1	10.2	10.6	14.5	18.3	20.3	22.9	24.9	26.7	27.8	28.2	28.8	29.4	29.4	29.1	29.1	28.3	27.2	24.5	21.2	19.4	18.1	10.2	29.4	21.9	24	
20	16.2	14.9	13.8	12.9	12.9	16.1	19.3	22.1	25.1	26.8	28.0	28.4	29.2	29.4	29.8	29.6	29.5	29.5	28.7	27.8	24.2	20.2	18.0	17.0	12.9	29.8	22.9	24	
21	16.4	15.6	14.6	13.7	13.8	16.8	21.1	23.6	24.9	26.8	27.9	28.5	29.3	29.8	30.0	29.7	29.8	29.8	29.0	28.0	24.7	22.7	19.6	17.3	13.7	30.0	23.5	24	
22	16.5	15.9	15.6	14.8	14.9	17.4	20.9	23.4	26.0	27.3	27.4	27.5	29.2	28.8	26.2	25.8	26.3	27.0	27.1	25.4	22.7	20.1	19.6	19.9	14.8	29.2	22.7	24	
23	19.6	17.0	15.4	14.5	14.5	16.0	18.1	19.0	20.0	22.7	23.7	23.2	23.4	25.0	24.7	24.1	23.0	21.5	21.2	21.4	20.2	18.4	17.6	16.4	14.5	25.0	20.0	24	
24	15.2	14.1	13.9	14.6	16.0	16.9	17.6	18.0	18.8	20.9	22.7	24.0	25.9	26.4	26.5	25.8	25.8	24.8	24.5	24.0	22.4	20.0	18.7	18.3	13.9	26.5	20.7	24	
25	17.1	15.7	14.7	16.0	16.7	18.1	19.4	21.3	23.9	25.6	26.4	26.9	27.6	28.0	28.4	28.8	28.4	27.9	26.2	20.3	16.1	16.0	15.6	14.6	14.6	28.8	21.7	24	
26	13.4	12.9	12.9	12.6	12.2	12.1	12.9	13.7	15.3	15.8	13.7	11.7	12.3	12.6	13.8	13.0	14.0	14.2	13.6	10.1	9.6	9.0	10.0	9.0	15.8	12.5	24		
27	10.6	10.2	9.9	9.7	9.7	11.2	12.2	13.9	14.3	14.8	14.5	14.4	15.7	16.2	16.3	15.9	15.6	15.2	15.0	14.8	14.5	14.3	14.1	13.7	9.7	16.3	13.6	24	
28	13.2	12.7	12.0	12.0	11.1	11.9	13.3	14.8	16.3	17.7	17.9	18.4	18.7	19.0	19.0	20.3	18.8	17.7	18.3	17.4	15.6	13.5	11.4	10.5	10.5	20.3	15.5	24	
29	10.6	10.0	8.9	7.7	7.9	10.1	12.2	14.3	15.1	16.6	18.5	19.7	20.5	21.2	21.5	16.8	17.5	18.6	20.2	19.6	16.9	14.8	14.9	14.4	7.7	21.5	15.4	24	
30	12.6	10.6	9.5	8.5	8.1	10.8	13.8	16.1	18.9	19.7	20.4	21.4	22.2	22.8	22.8	22.8	22.1	18.0	16.7	17.0	16.3	15.1	13.3	11.4	8.1	22.8	16.3	24	
HOURLY MAX	19.6	17.0	16.0	16.0	16.7	18.1	21.1	23.6	26.0	27.3	28.0	28.5	29.3	29.8	30.0	29.7	29.8	29.8	29.0	28.0	24.7	22.7	19.6	19.9					
HOURLY AVG	11.6	10.9	10.4	10.1	10.2	11.8	13.5	15.1	16.8	18.0	18.9	19.4	20.0	20.7	20.9	20.9	20.8	20.4	19.7	18.7	16.7	14.7	13.3	12.5					

STATUS FLAG CODES

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

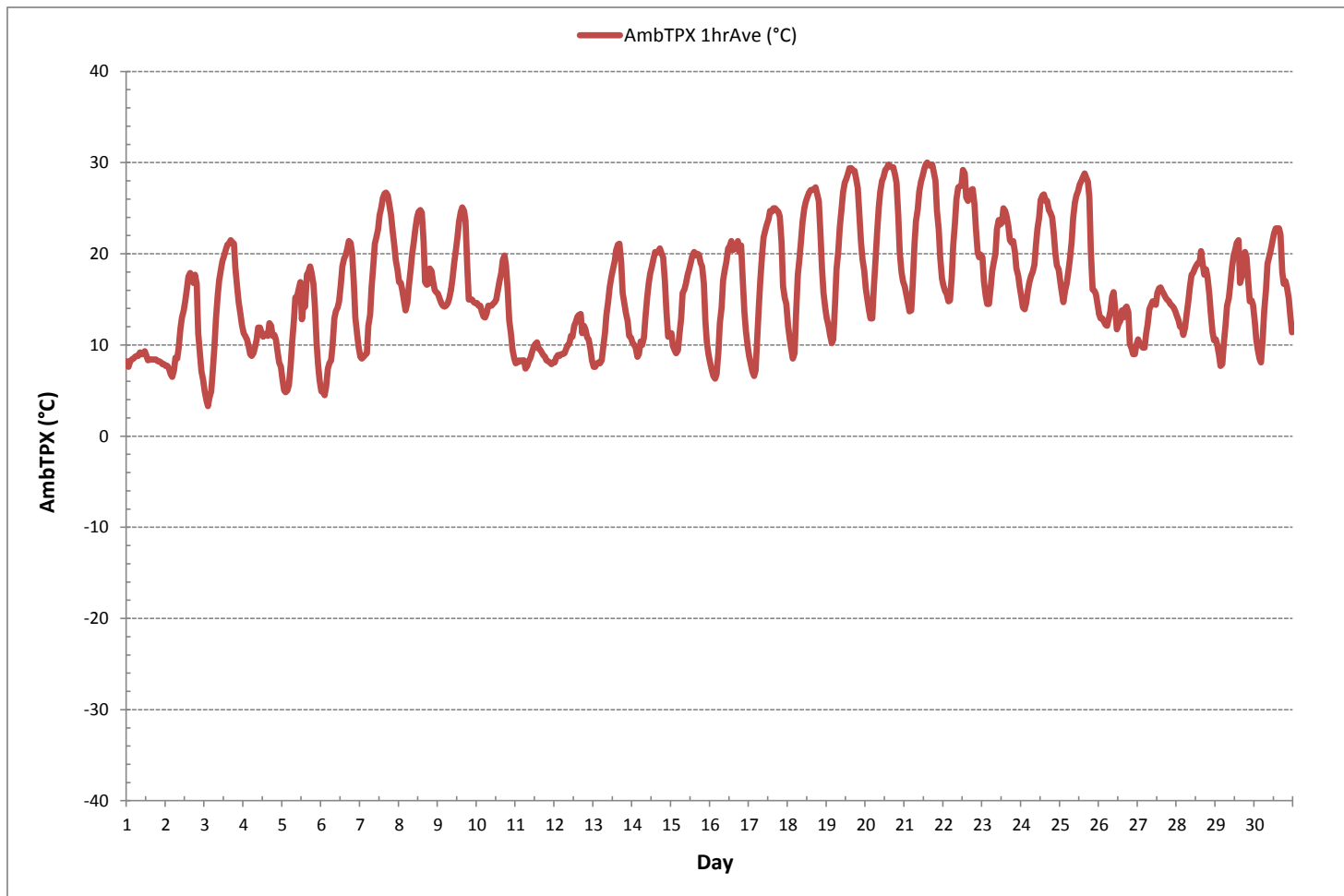
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	3.3	°C	@ HOUR	2	ON DAY	3
MAXIMUM 1-HR AVERAGE:	30.0	°C	@ HOUR	14	ON DAY	21
MAXIMUM 24-HR AVERAGE:	23.5	°C			ON DAY	21
OPERATIONAL TIME:					720	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	6.2		MONTHLY AVERAGE:		16.1	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	June 5, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	944	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:	routine monthly		
Start Time 24 hr. (mst):	9:10	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:14	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 25, 2018	As Found C.F.:	1.001
	Previous C.F.:	1.000	New C.F.:	1.001

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

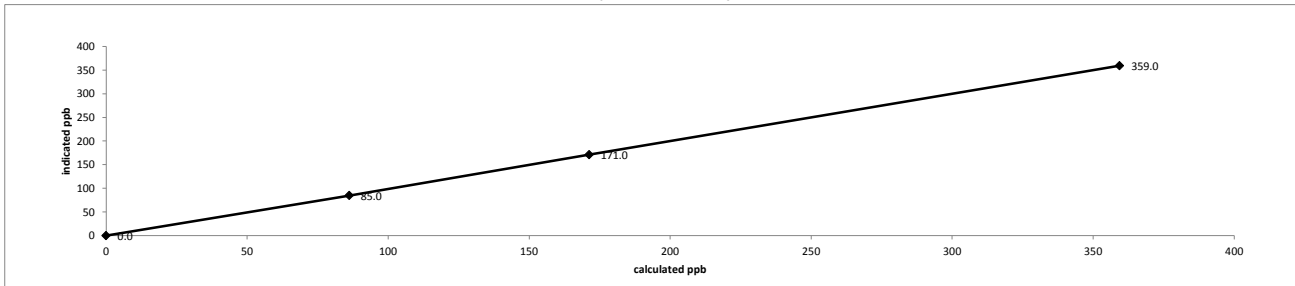
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5065	0.00	5065	0.0	0.0	n/a
as found high	5027	36.99	5064	359.4	359.0	1.001
adjusted zero	5065	0.00	5065	0.0	0.0	n/a
adjusted high	5027	36.99	5064	359.4	359.0	1.001
mid	5023	17.55	5041	171.3	171.0	1.002
low	5034	8.84	5043	86.2	85.0	1.015
calibrator zero	5065	0.00	5065	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

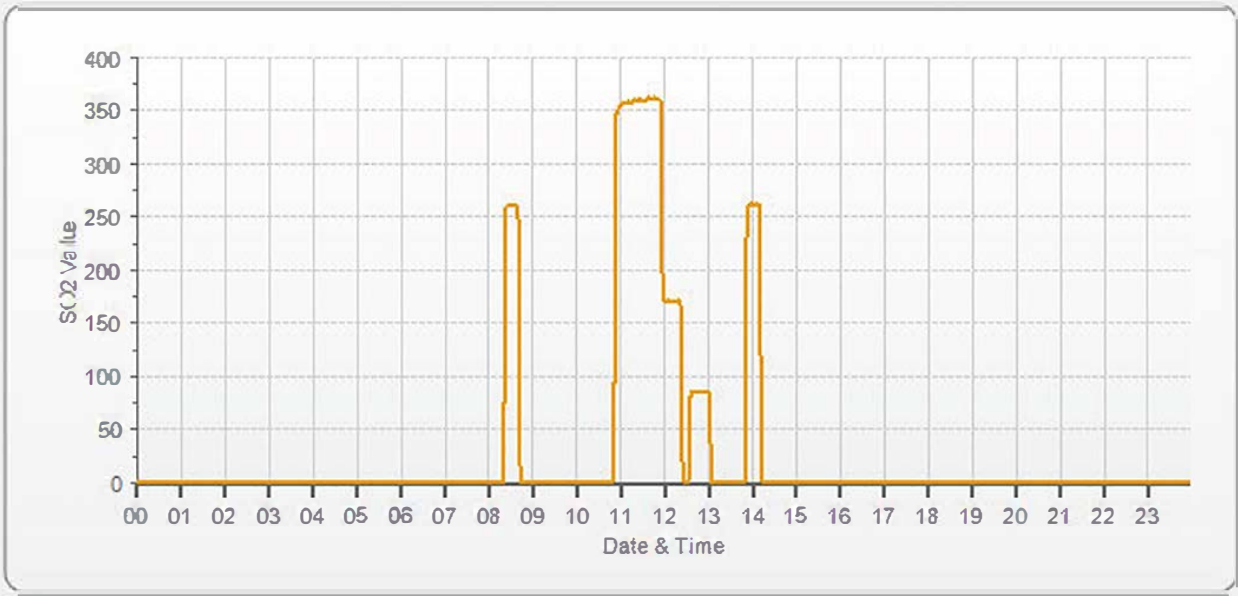
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.10%		± 3% F.S.
% change in C.F. from last cal =	-0.11%		± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	8.6	Bkg:	8.6
Coef:	0.968	Coef:	0.970
Pmt:	-624.2	Pmt:	-624.2
Flash:	766	Flash:	766
Internal:	27.9	Internal:	27.9
Chamber:	45.0	Chamber:	45.2
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.24	Perm Oven Heater:	44.24
Pressure:	678.0	Pressure:	677.7
Sample Flow:	0.462	Sample Flow:	0.462
Lamp Intensity:	97	Lamp Intensity:	97
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	257.0	Expected Value:	262.0

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]



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	June 13, 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:	Mix of sun and clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	16:46	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	18:54	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

Analyzer:	Serial Number/Owner:	806528242	LICA	Range ppb:	500
	Last Calibration Date:	June 5, 2018		As Found C.F.:	0.994
	Previous C.F.:	1.001		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
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

Point	ppb
High	380
Mid	180
Low	90

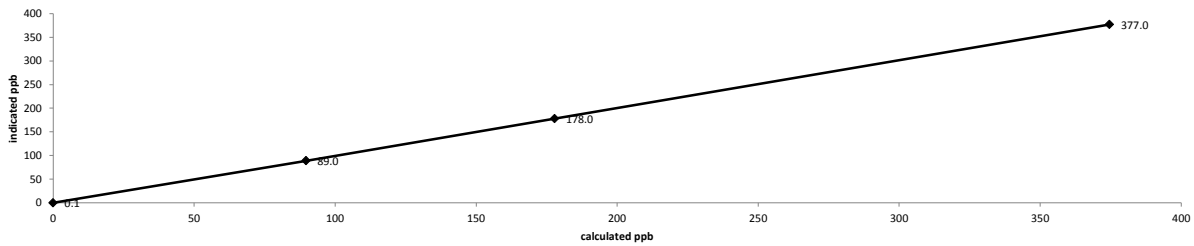
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5072	0.00	5072	0.0	0.1	n/a
as found high	5034	38.62	5073	374.6	377.0	0.994
mid	5053	18.33	5071	177.8	178.0	1.000
low	5065	9.25	5074	89.7	89.0	1.009
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.993		0.90-1.10
b (Intercept as % of full scale) =	0.13%		± 3% F.S.
% change in C.F. from last cal =	0.72%		± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration

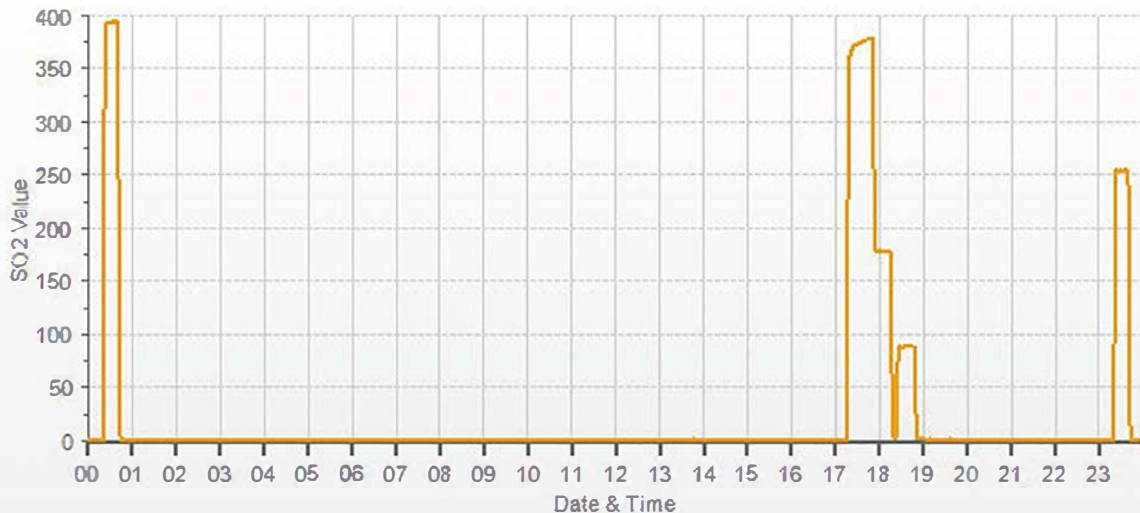


As found:	As left:
Bkg: 8.5	Bkg: n/a
Coef: 0.970	Coef: n/a
Pmt: -624.2	Pmt: n/a
Flash: 761	Flash: n/a
Internal: 29.6	Internal: n/a
Chamber: 45.2	Chamber: n/a
Perm Oven Gas: 45.00	Perm Oven Gas: n/a
Perm Oven Heater: 44.25	Perm Oven Heater: n/a
Pressure: 686.1	Pressure: n/a
Sample Flow: 0.297	Sample Flow: n/a
Lamp Intensity: 97	Lamp Intensity: n/a
Converter: n/a	Converter: n/a
Converter Set: n/a	Converter Set: n/a
Averaging Time: 120	Averaging Time: n/a
Expected Value: 262.0	Expected Value: n/a

Comments: No high point adjustment was required/made. The manifold blower was found to be working normally.

A Shutdown calibration was completed to perform a repair of a sample pump. The analyzer failed a daily ZS check and was found with the active alarm: Low Sample Flow. The sample pump was fixed.

SO₂ [ppb] Station: LICA COLD LAKE SOUTH Daily: 18/06/13 Type: AVG 1 Min. [1 Min.]



— SO₂ [ppb]



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	June 14, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	942	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:	post repair		
Start Time 24 hr. (mst):	8:16	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	12:09	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:	June 5, 2018	As Found C.F.:	n/a
	Previous C.F.:	1.001	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>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								

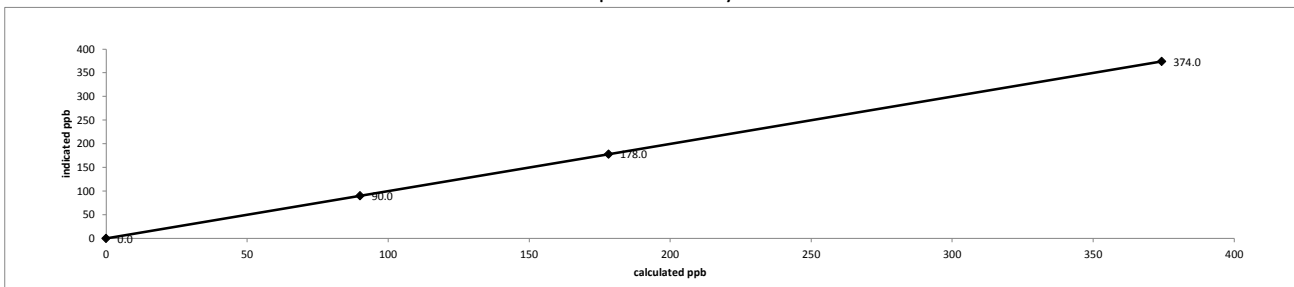
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
adjusted zero	5064	0.00	5064	0.0	0.0	n/a
adjusted high	5024	38.52	5063	374.3	374.0	1.001
mid	5051	18.36	5069	178.2	178.0	1.001
low	5054	9.27	5063	90.1	90.0	1.001
0	5064	0.00	5064	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)=	0.00%		± 3% F.S.
% change in C.F. from last cal=	n/a		n/a

Thermo 43i Sulphur Dioxide Analyzer Calibration



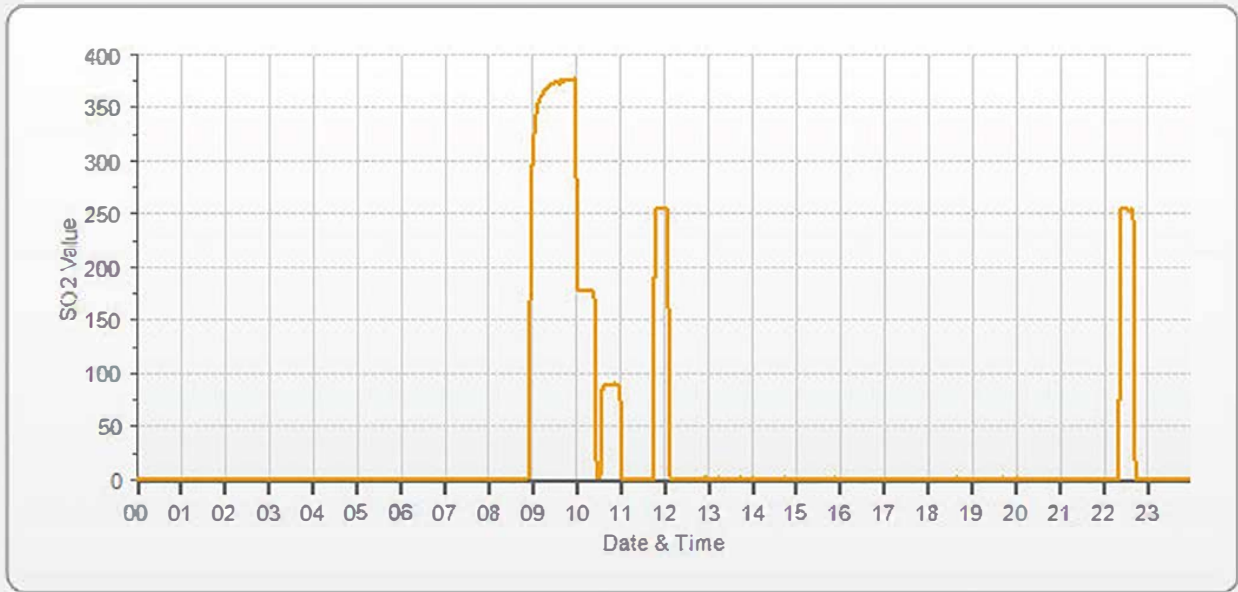
As found:	As left:
Bkg: n/a	Bkg: 8.6
Coef: n/a	Coef: 0.971
Pmt: n/a	Pmt: -624.2
Flash: n/a	Flash: 763
Internal: n/a	Internal: 29.6
Chamber: n/a	Chamber: 45.2
Perm Oven Gas: n/a	Perm Oven Gas: 45.00
Perm Oven Heater: n/a	Perm Oven Heater: 44.25
Pressure: n/a	Pressure: 675.0
Sample Flow: n/a	Sample Flow: 0.479
Lamp Intensity: n/a	Lamp Intensity: 97
Converter: n/a	Converter: n/a
Converter Set: n/a	Converter Set: n/a
Averaging Time: n/a	Averaging Time: 120
Expected Value: n/a	Expected Value: 255.0

Comments:

The manifold blower was found to be working normally.

The Post-repair calibration was completed after the sample pump was rebuilt and the analyzer stabilized overnight.

SO₂ [ppb] Station: LICA COLD LAKE SOUTH Daily: 18/06/14 Type: AVG 1 Min. [1 Min.]



— SO₂ [ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: <u>June 5, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 15, 2019</u>	<u>944</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>Cold Lake South</u>	Weather Conditions: <u>Mix of sun and clouds</u>		
Parameter: <u>Total Reduced Sulphur</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>9:10</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Rob Fisher</u>
End Time 24 hr. (mst): <u>14:14</u>	Cal Gas Expiry Date: <u>July 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>CDNOVA / Model CDN - 101/ #501</u>		

Analyzer:	Serial Number/Owner: <u>812728560</u> <u>LICA</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>May 8, 2018</u>	As Found C.F.: <u>1.053</u>	
	Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <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	Start/End Time 24 hr.: <u>10:28 / 10:38</u>
Point		ppb								
High		78								
Mid		38								
Low	19									
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>	SO2 Analyzer Range: <u>500</u>									
Calibrator ID/Expiry Date: <u>Envionics id# 4760 expires March 2, 2019</u>	Target Concentration (ppb): <u>380</u>									
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>	As Found Zero: <u>0.0</u>	Analyzer Response: (ppb): <u>0.0</u>								
Cal Gas Conc. (ppm): <u>10.2</u>		Zero Corrected Result (ppb): <u>0.0</u>								

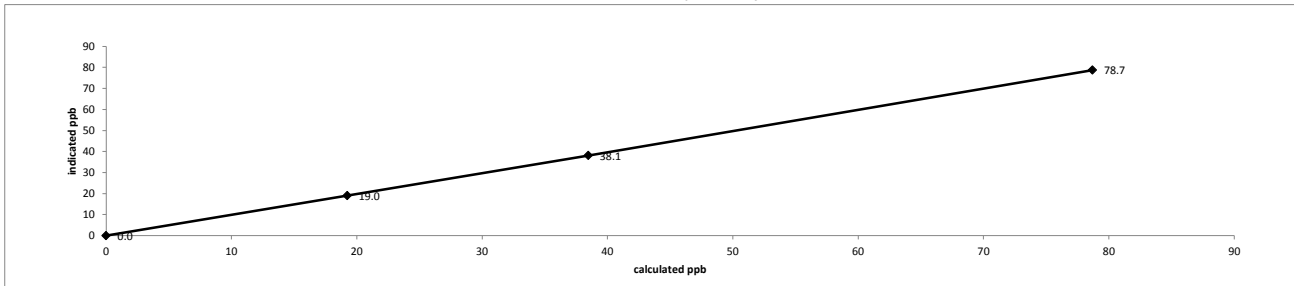
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7464	0.00	7464	0.0	0.3	n/a
as found high	7404	57.57	7462	78.7	75.0	1.053
adjusted zero	7464	0.00	7464	0.0	0.0	n/a
adjusted high	7404	57.57	7462	78.7	78.7	1.000
mid	7422	28.10	7450	38.5	38.1	1.010
low	7443	14.07	7457	19.2	19.0	1.013
0	7464	0.00	7464	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

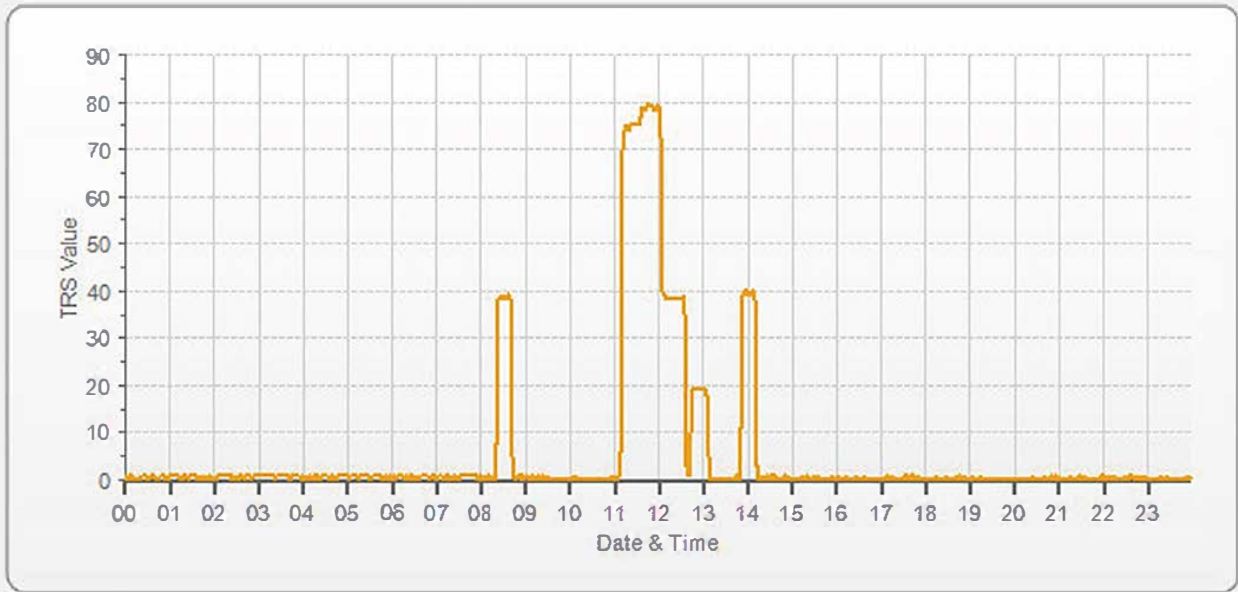
Correlation Coefficient =	<u>1.000</u>	LIMITS
Slope =	<u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>0.18%</u>	0.95-1.05
% change in C.F. from last cal =	<u>-5.35%</u>	± 3% F.S.
		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



<p style="text-align: center;">As found:</p> <table style="width: 100%;"> <tr><td>Bkg:</td><td><u>14.6</u></td></tr> <tr><td>Coef:</td><td><u>0.910</u></td></tr> <tr><td>Pmt:</td><td><u>-651.2</u></td></tr> <tr><td>Flash:</td><td><u>746</u></td></tr> <tr><td>Internal:</td><td><u>31.2</u></td></tr> <tr><td>Chamber:</td><td><u>45.1</u></td></tr> <tr><td>Converter Temp:</td><td><u>825</u></td></tr> <tr><td>Converter Set:</td><td><u>825</u></td></tr> <tr><td>Perm Oven Gas:</td><td><u>44.99</u></td></tr> <tr><td>Perm Oven Htr:</td><td><u>44.37</u></td></tr> <tr><td>Pressure:</td><td><u>629.1</u></td></tr> <tr><td>Sample Flow:</td><td><u>0.489</u></td></tr> <tr><td>Lamp Intensity:</td><td><u>91</u></td></tr> <tr><td>Averaging Time:</td><td><u>120</u></td></tr> <tr><td>Expected Value:</td><td><u>38.0</u></td></tr> </table>	Bkg:	<u>14.6</u>	Coef:	<u>0.910</u>	Pmt:	<u>-651.2</u>	Flash:	<u>746</u>	Internal:	<u>31.2</u>	Chamber:	<u>45.1</u>	Converter Temp:	<u>825</u>	Converter Set:	<u>825</u>	Perm Oven Gas:	<u>44.99</u>	Perm Oven Htr:	<u>44.37</u>	Pressure:	<u>629.1</u>	Sample Flow:	<u>0.489</u>	Lamp Intensity:	<u>91</u>	Averaging Time:	<u>120</u>	Expected Value:	<u>38.0</u>	<p style="text-align: center;">As left:</p> <table style="width: 100%;"> <tr><td>Bkg:</td><td><u>15.4</u></td></tr> <tr><td>Coef:</td><td><u>0.938</u></td></tr> <tr><td>Pmt:</td><td><u>-651.2</u></td></tr> <tr><td>Flash:</td><td><u>746</u></td></tr> <tr><td>Internal:</td><td><u>31.3</u></td></tr> <tr><td>Chamber:</td><td><u>45.0</u></td></tr> <tr><td>Converter Temp:</td><td><u>825</u></td></tr> <tr><td>Converter Set:</td><td><u>825</u></td></tr> <tr><td>Perm Oven Gas:</td><td><u>45.00</u></td></tr> <tr><td>Perm Oven Htr:</td><td><u>44.37</u></td></tr> <tr><td>Pressure:</td><td><u>628.5</u></td></tr> <tr><td>Sample Flow:</td><td><u>0.491</u></td></tr> <tr><td>Lamp Intensity:</td><td><u>92</u></td></tr> <tr><td>Averaging Time:</td><td><u>120</u></td></tr> <tr><td>Expected Value:</td><td><u>40.1</u></td></tr> </table>	Bkg:	<u>15.4</u>	Coef:	<u>0.938</u>	Pmt:	<u>-651.2</u>	Flash:	<u>746</u>	Internal:	<u>31.3</u>	Chamber:	<u>45.0</u>	Converter Temp:	<u>825</u>	Converter Set:	<u>825</u>	Perm Oven Gas:	<u>45.00</u>	Perm Oven Htr:	<u>44.37</u>	Pressure:	<u>628.5</u>	Sample Flow:	<u>0.491</u>	Lamp Intensity:	<u>92</u>	Averaging Time:	<u>120</u>	Expected Value:	<u>40.1</u>
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Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.
The manifold blower was found to be working normally.



— TRS [ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: June 6, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 8:38 / 13:08 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 1118249035 Maxxam Last Calibration Date: May 9, 2018 Previous Cal High Point 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: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: November 24, 2022 Range ppm: 50 As Found C.F.: 0.955 New C.F.: 1.000
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Calibration Standards:

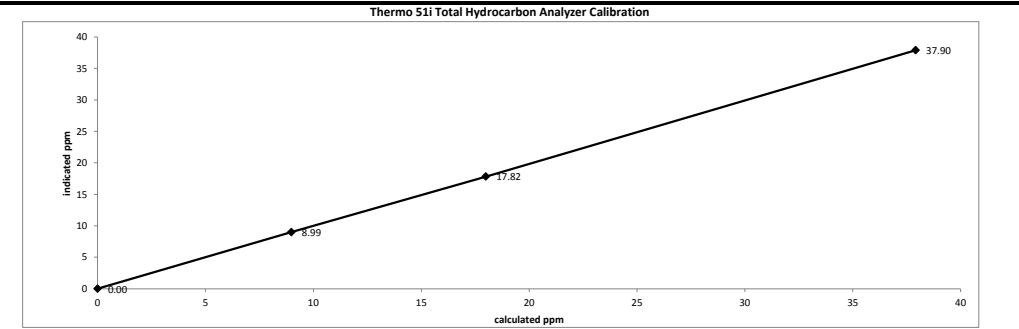
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: EnviroNics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: LL 165367 CH₄/C₂H₆ Cylinder Conc. (ppm): CH ₄ as propane/total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

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2516	0.00	2516	0.0	0.10	n/a
as found high	2430	82.16	2512	37.92	39.80	0.955
adjusted zero	2516	0.00	2516	0.00	0.00	n/a
adjusted high	2430	82.16	2512	37.92	37.90	1.000
mid	2471	38.96	2510	17.99	17.82	1.010
low	2492	19.46	2511	8.98	8.99	0.999
calibrator zero	2516	0.00	2516	0.0	0.00	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

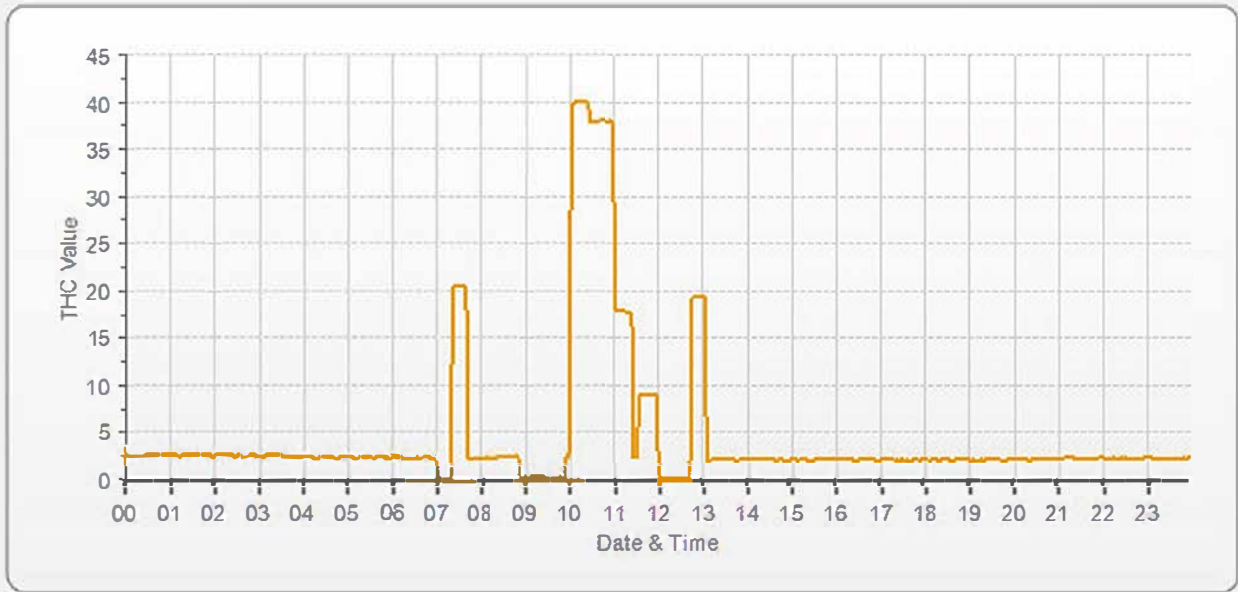
Correlation Coefficient = 1.000 Slope = 1.001 b (Intercept as % of full scale) = 0.06% % change in C.F. from last cal = 4.59%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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As found: Bkg: 1.05 Coef: 4.472 Bias Supply: -291 Detector Base: 125.2 Filter: 124.9 Pump: n/a Flame: 156.4 Internal: 27.5 Sample: 8.3 Fuel: 20.9 Air: 39.5 Signal: 217 Status: UT	As left: Bkg: 1.08 Coef: 4.257 Bias Supply: -291 Detector Base: 125.1 Filter: 124.9 Pump: n/a Flame: 156.5 Internal: 28.3 Sample: 8.3 Fuel: 20.9 Air: 39.5 Signal: 220 Status: LIT
--	--

Cylinder/Regulator Pressures: H2 Cylinder (psi): 1100 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 50 Span Cylinder (psi): 1600 Span Cylinder reg set (psi): 22 Measured Flow: 1214 Expected Value: 19.10	H2 Cylinder (psi): 1100 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 50 Span Cylinder (psi): 1600 Span Cylinder reg set (psi): 22 Measured Flow: n/a Expected Value: 19.30
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Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.



— THC [ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: June 5, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 9:10 / 16:50 G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale Calibration Method: Gas Dilution & Gas Phase Titration	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: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
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Analyzer: Serial Number/Owner: 1505664393 LICA Last Calibration Date: May 8, 2018 Range ppb: 500	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.019</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>1.021</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.019	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.001	1.021	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.019	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.001	1.021	1.000														

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: EnviroNics idR 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>330</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>245</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>175</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>133</td> <td><-mid ozone</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>53</td> <td><-low ozone</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	330	<-high ozone	Mid	180	245	n/a	Low	90	175	n/a	Extra Point #1	n/a	133	<-mid ozone	Extra Point #2	n/a	53	<-low ozone
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	330	<-high ozone																						
Mid	180	245	n/a																						
Low	90	175	n/a																						
Extra Point #1	n/a	133	<-mid ozone																						
Extra Point #2	n/a	53	<-low ozone																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5065	0.0	5065	0	0	0.0	0.0	n/a	n/a
as found high	5027	37.0	5064	376.2	376.9	369.0	369.0	1.019	1.021
adjusted zero	5065	0.00	5065	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5027	36.99	5064	376.2	376.9	376.0	377.0	1.000	1.000
mid	5023	17.55	5041	179.3	179.6	178.0	179.0	1.007	1.004
low	5034	8.84	5043	90.3	90.5	90.0	90.0	1.003	1.005
calibrator zero	5065	0.00	5065	0	0	0.0	0.0	n/a	n/a
Average C.F. =								1.004	1.003

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	5027	36.99	5064	0.0	378.0	378.0	0.0	0.0	0.0	
as found high NO2	5027	36.99	5064	255.0	133.0	378.0	245.0	245.0	245.0	1.000
adjusted high NO2	5027	36.99	5064	255.0	133.0	378.0	245.0	245.0	245.0	1.000
gpt mid	5027	36.99	5064	137.0	247.0	378.0	131.0	131.0	131.0	1.000
gpt low	5027	36.99	5064	50.0	318.0	378.0	60.0	60.0	60.0	1.000
Average NO₂ C.F. =										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	0.999	1.000	0.95-1.05
b (Intercept as % of full scale) =	-0.07%	-0.07%	0.00%	± 3% F.S.
% change in C.F. from last cal =	-2.05%	-2.04%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.0	NO Bkg:	4.0
NOx Bkg:	4.2	NOx Bkg:	4.2
NO Coef:	1.002	NO Coef:	1.022
NO ₂ Coef:	1.000	NO ₂ Coef:	1.000
NOx Coef:	1.001	NOx Coef:	1.001
PMT:	-855.1	PMT:	-854.7
Internal:	25.6	Internal:	26.1
Chamber:	50.3	Chamber:	50.1
Cooler:	-2.7	Cooler:	-2.8
NO ₂ Converter:	323.7	NO ₂ Converter:	324.2
NO ₂ Converter Set:	325.0	NO ₂ Converter Set:	325.0
Perm Oven Gas:	35.00	Perm Oven Gas:	35.00
Perm Oven Heater:	34.23	Perm Oven Heater:	34.24
Pressure:	178.4	Pressure:	178.1
Flow:	0.760	Flow:	0.761
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO ₂ :	266	Expected Value NO ₂ :	271
Expected Value NOx:	268	Expected Value NOx:	273

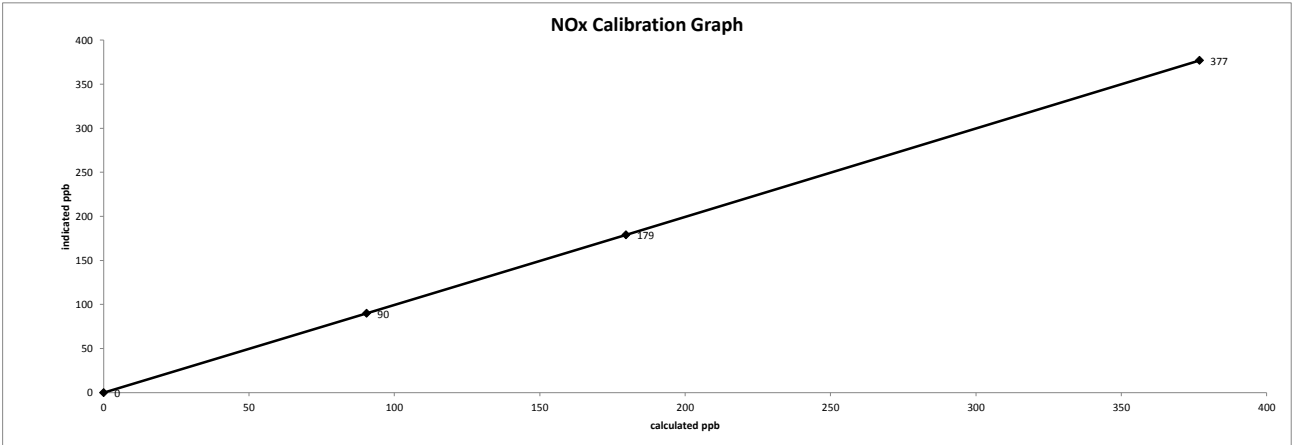
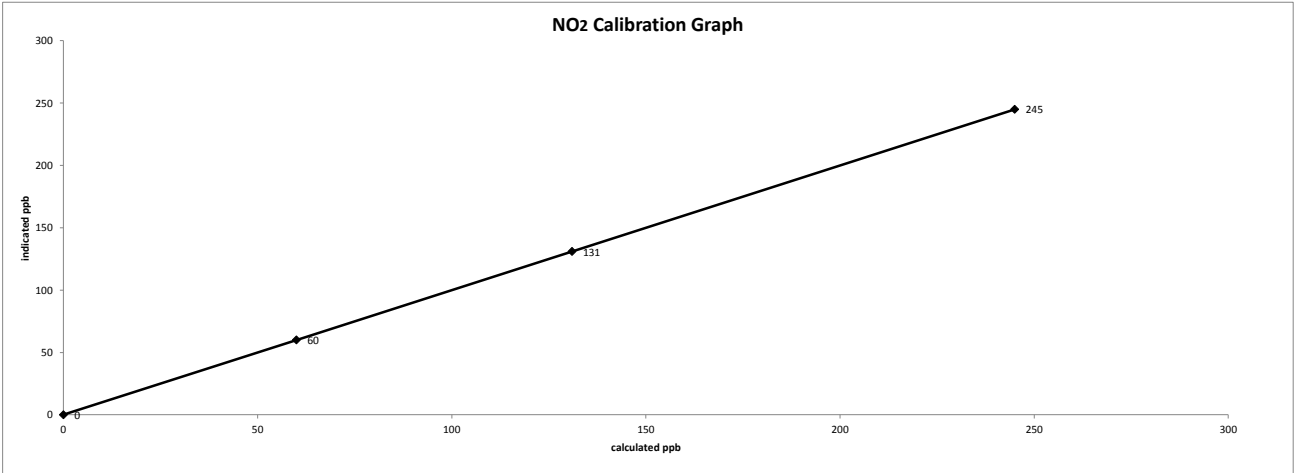
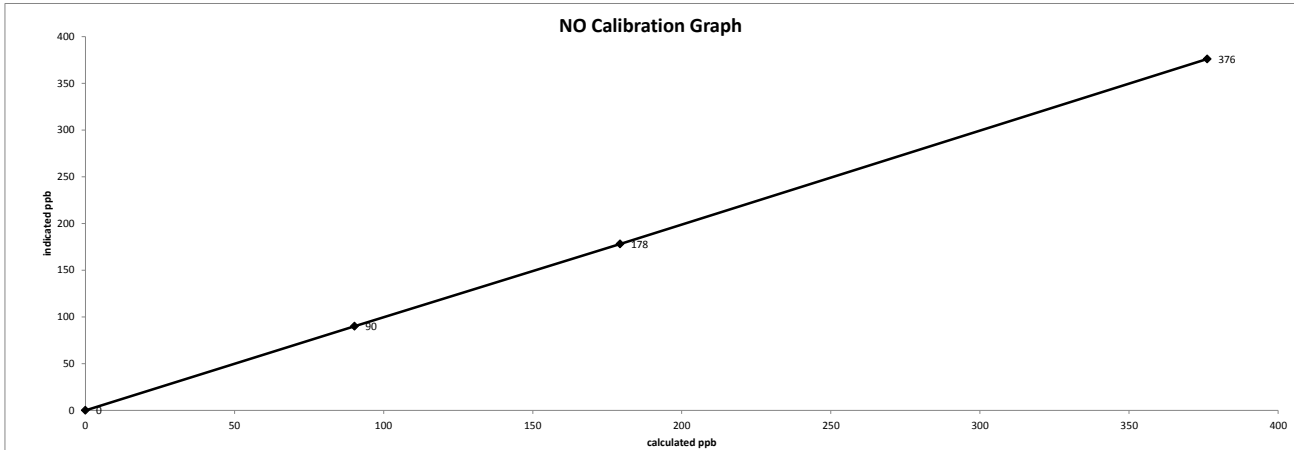
Comments:
 The analyzer sample inlet filter was changed. No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.
 The manifold blower was found to be working normally.
 The analyzer cooling fan filter(s) were cleaned.

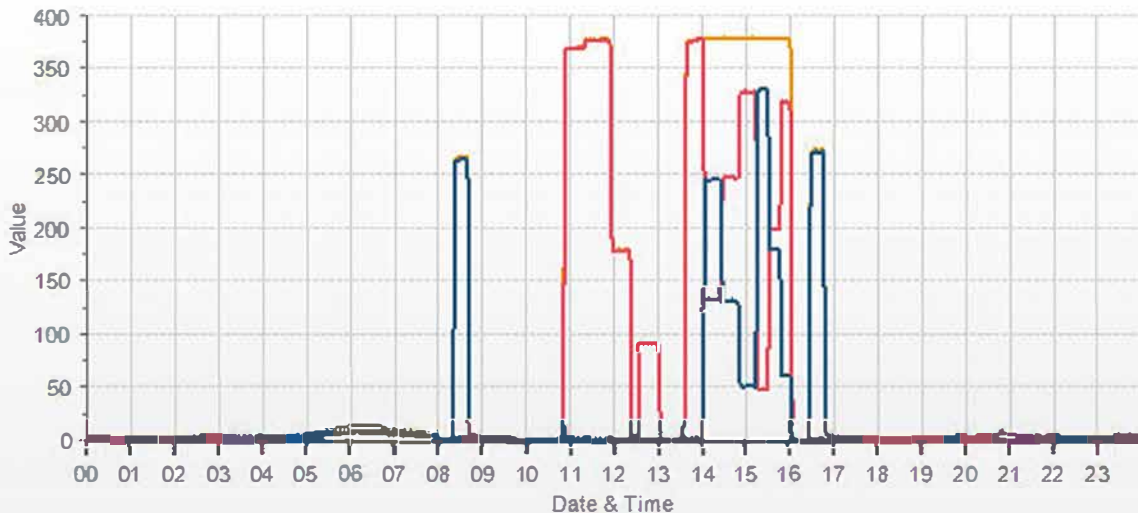
The GPT for O₃ (ppb): O₃ set = 345, NO drop = 330 (O₃ high); O₃ set = 187, NO drop = 180 (O₃ mid), O₃ set = 62, NO drop = 60 (O₃ low)

Date: June 5, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:10 / 16:50
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





OZONE



Thermo 49i Ozone Analyzer Calibration

Date: June 6, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:38 / 10:47 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: June 5, 2018 Analyzer: Serial Number/Owner: 700419951 LICA Last Calibration Date: May 9, 2018 Previous Cal High Point C.F.: 1.000	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: shut down Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 0.988 New C.F.: n/a
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Calibration Standards:
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date: Enviroics id# 5212 expires March 1, 2019
Cal Gas Cylinder I.D. #: LL 104225

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

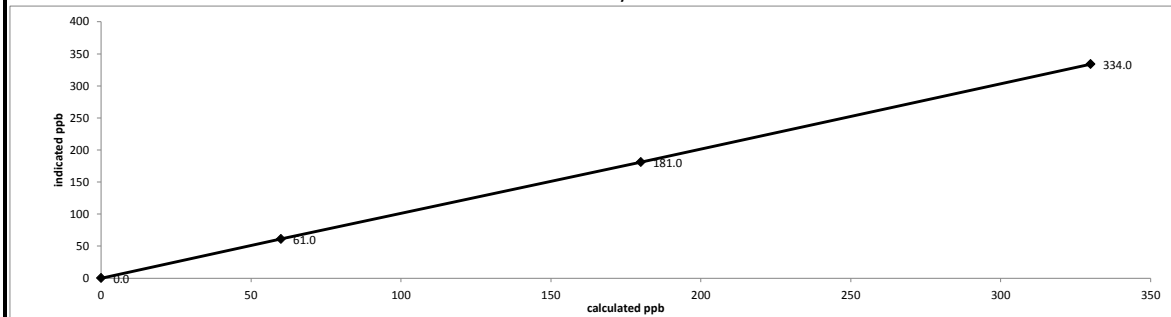
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	334.0	0.988
mid	5000	5000	180.0	180.0	181.0	0.994
low	5000	5000	60.0	60.0	61.0	0.984
Average C.F. =						0.989

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.989</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.02%</u>	0.90-1.10
% change in C.F. from last cal = <u>1.20%</u>	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	<u>0.1</u>
O3 Coef:	<u>1.024</u>
Photo Lamp:	<u>9.6</u>
O3 Lamp:	<u>8.1</u>
Bench:	<u>28.3</u>
Bench Lamp:	<u>53.4</u>
O3 Lamp:	<u>67.5</u>
Pressure:	<u>705.9</u>
Cell A lpm:	<u>0.717</u>
Cell B lpm:	<u>0.757</u>
O3 ppb:	<u>0.6</u>
Cell A ppb:	<u>2.8</u>
Cell B ppb:	<u>-1.6</u>
Cell A int (Hz):	<u>80825</u>
Cell B int (Hz):	<u>81944</u>
Expected Value:	<u>262.0</u>

As left:

O3 Bkg:	<u>n/a</u>
O3 Coef:	<u>n/a</u>
Photo Lamp:	<u>n/a</u>
O3 Lamp:	<u>n/a</u>
Bench:	<u>n/a</u>
Bench Lamp:	<u>n/a</u>
O3 Lamp:	<u>n/a</u>
Pressure:	<u>n/a</u>
Cell A lpm:	<u>n/a</u>
Cell B lpm:	<u>n/a</u>
O3 ppb:	<u>n/a</u>
Cell A ppb:	<u>n/a</u>
Cell B ppb:	<u>n/a</u>
Cell A int (Hz):	<u>n/a</u>
Cell B int (Hz):	<u>n/a</u>
Expected Value:	<u>n/a</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.

Shutdown calibration was completed to adjust SPAN Level 1 to 22% and perform annual maintenance to the sample pump.



Thermo 49i Ozone Analyzer Calibration

Date: June 6, 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: Cold Lake South	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 10:48 / 13:45	Calibration Purpose: post repair
Ozone Calibration Method: Direct G.P.T.	Performed By/Reviewer: Alex Yakupov Rob Fisher
G.P.T. Date: June 5, 2018	Cal Gas Expiry Date: October 24, 2020

Analyzer:	Ozone Range ppb: 500
Serial Number/Owner: 700419951 LICA	As Found C.F.: n/a
Last Calibration Date: May 9, 2018	New C.F.: 1.000
Previous Cal High Point C.F.: 1.000	

Calibration Standards:	
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	
Calibrator ID/Expiry Date: Enviroics id# 5212 expires March 1, 2019	
Cal Gas Cylinder I.D. # : LL104225	

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

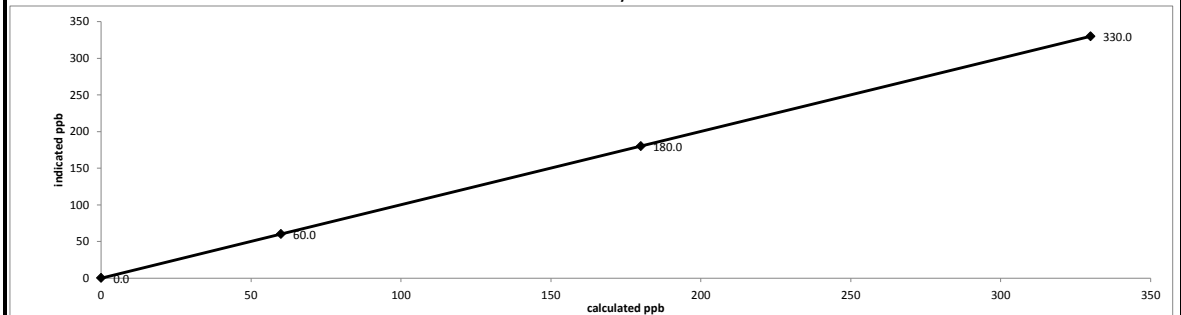
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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)	
adjusted zero	5000	5000	0.0	n/a	0.0	n/a
adjusted high	5000	5000	330.0	330.0	330.0	1.000
mid	5000	5000	180.0	180.0	179.0	1.006
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	0.0	0.0	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

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

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	n/a
O3 Coef:	n/a
Photo Lamp:	n/a
O3 Lamp:	n/a
Bench:	n/a
Bench Lamp:	n/a
O3 Lamp:	n/a
Pressure:	n/a
Cell A lpm:	n/a
Cell B lpm:	n/a
O3 ppb:	n/a
Cell A ppb:	n/a
Cell B ppb:	n/a
Cell A int (Hz):	n/a
Cell B int (Hz):	n/a
Expected Value:	n/a

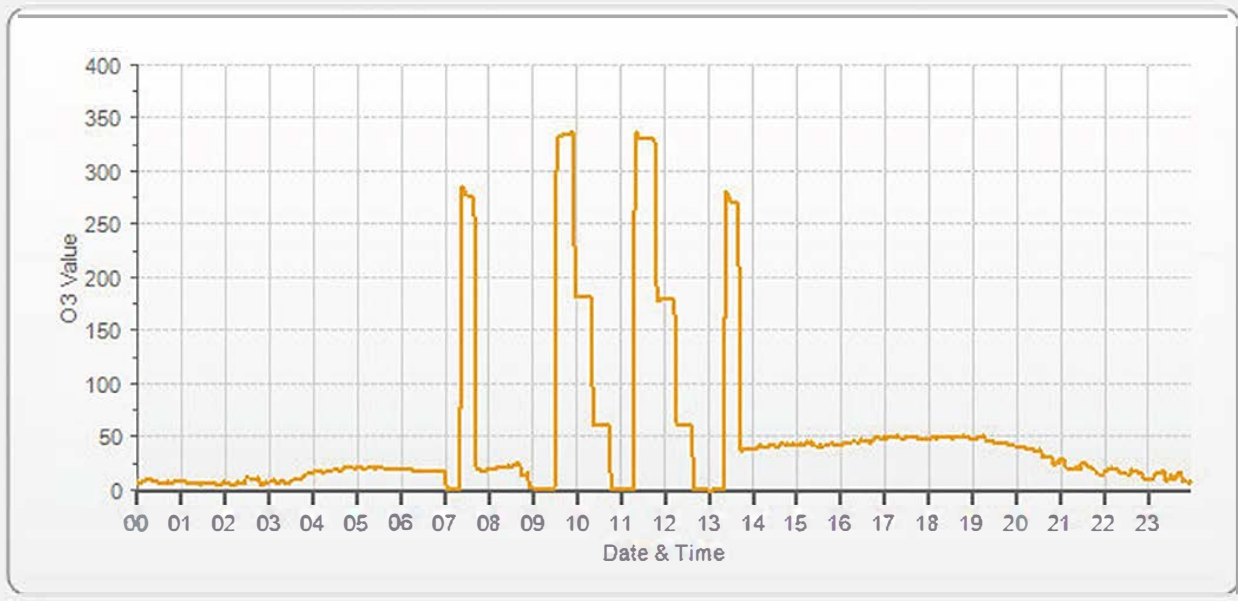
As left:

O3 Bkg:	0.0
O3 Coef:	1.004
Photo Lamp:	9.6
O3 Lamp:	8.1
Bench:	28.2
Bench Lamp:	53.4
O3 Lamp:	67.5
Pressure:	705.3
Cell A lpm:	0.716
Cell B lpm:	0.756
O3 ppb:	-0.3
Cell A ppb:	14.0
Cell B ppb:	-14.5
Cell A int (Hz):	80886
Cell B int (Hz):	81986
Expected Value:	270.0

Comments:

Post-repair calibration was completed after performing the sample pump maintenance check and Level 1 SPAN power was adjusted to 22%.

O₃[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/06/06 Type: AVG 1 Min. [1 Min.]



— O₃[ppb]

PARTICULATE MATTER 2.5



Thermo 5030 SHARP Monitor Audit

Date:	June 22, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	10:24	
Station Name/Location:	Cold Lake South	End Time (mst):	11:16	
Previous Audit Date:	May 11, 2018	Calibration Purpose:	routine monthly	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

SHARP Information and Status:

Serial Number/Owner:	CM - 2209	LICA	Status Code	0
Approx. % Tape Reaming	60%		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:	27	n/a	n/a	n/a	941	n/a	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%
Reference:	27.5	n/a	n/a	n/a	941.0	n/a	
Difference:	0.5	#VALUE!	#VALUE!	#VALUE!	0.0	#VALUE!	

As Left Temperature and Pressure (same as above if as found adequate):

	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)	
SHARP:	27	n/a	n/a	n/a	941	n/a	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%
Reference:	27.5	n/a	n/a	n/a	941.0	n/a	
Difference:	0.5	#VALUE!	#VALUE!	#VALUE!	0.0	#VALUE!	

Mass Foil Calibration:

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

Nephelometer Zero:

	As Found	As Left
Analog	n/a	n/a
NEPH	n/a	n/a
C14	n/a	n/a
Conc	n/a	n/a

Flow rate:

	As Found	As Left	
SHARP AirFlow l/hr	1000	1000	$%D = 100 \times \frac{Q_m - Q_i}{Q_i}$ Tolerance +/- 5%
Reference AirFlow (l/min)	16.49	16.66	
Reference AirFlow (l/hr)	989	1000	
% Difference:	1.1%	0.0%	

Inlet Assembly:

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

Pump Assembly:

	Yes/No?	If no, explain:
Pump Inspected / Cleaned	yes	
Pump Vanes Replaced	no	Not Required

Comments:

WIND SYSTEM



Met One Instruments

Sonic Wind Sensor Certificate of Calibration

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

Instrument Condition Within Tolerance: As Found As Left X
 Corrective Action: No Adjustment Adjust X 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 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 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)*

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

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



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 (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.00752	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	
		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 - June 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

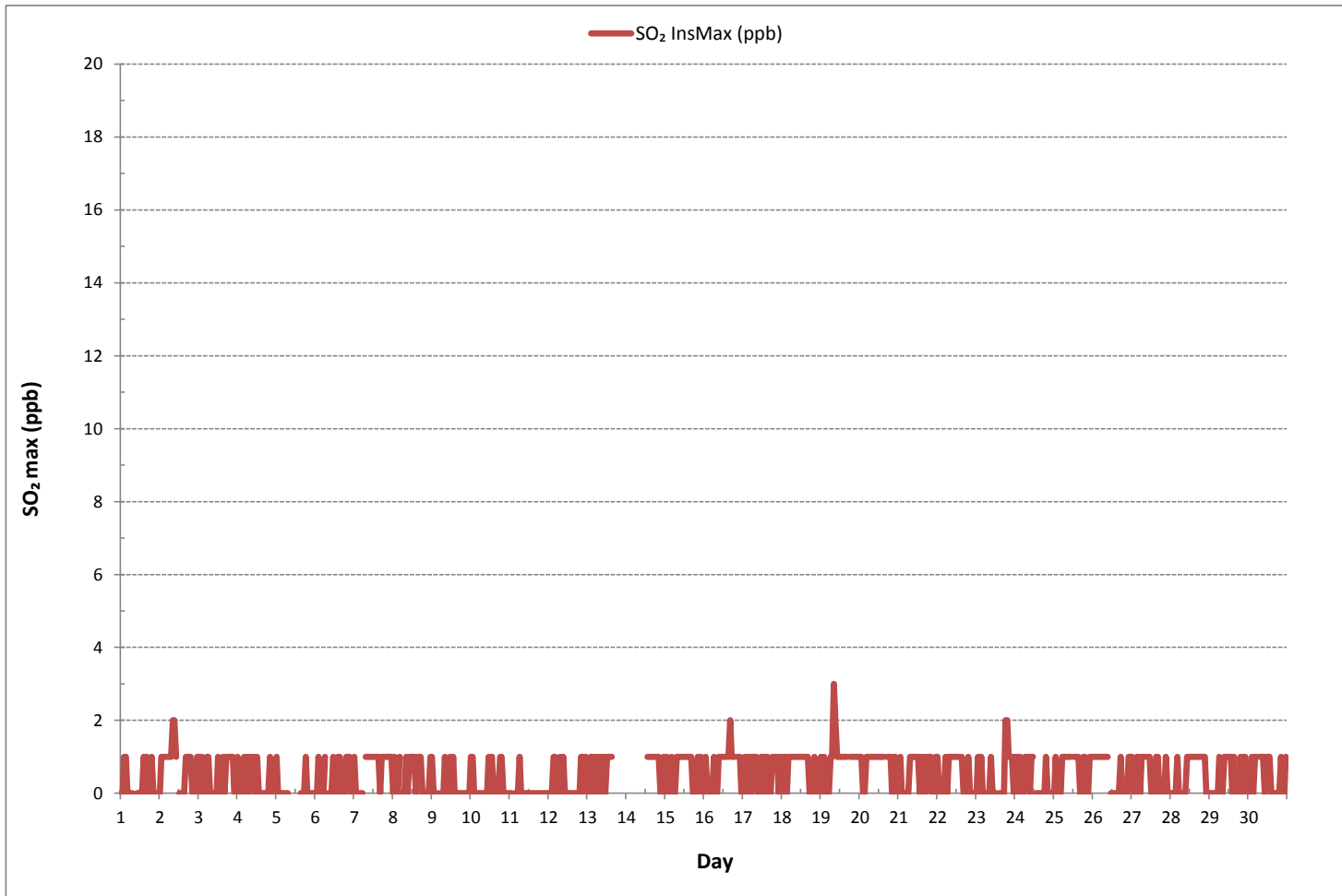
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	324
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 8 ON DAY 19
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	697 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





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

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

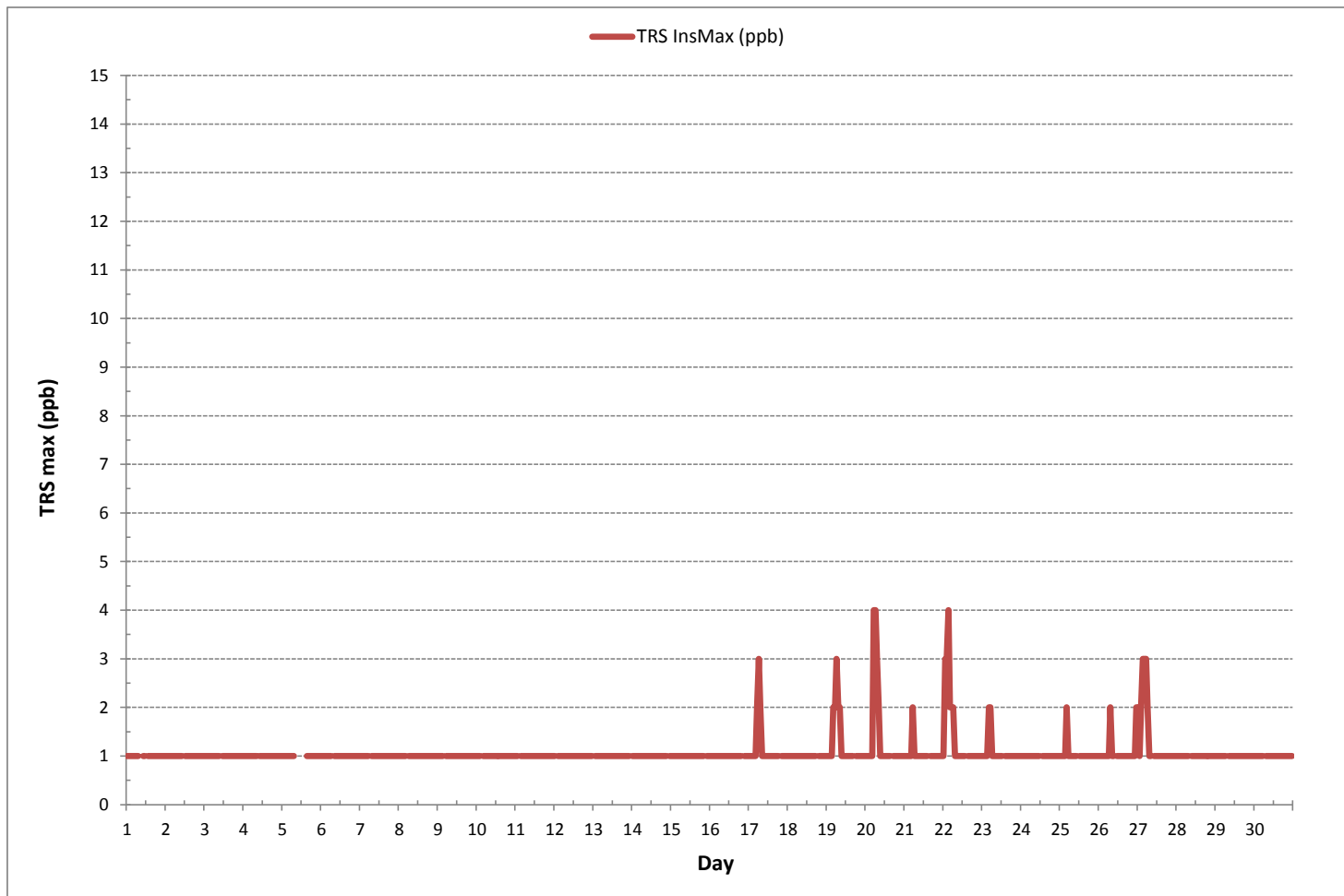
STATUS FLAG CODES

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:	681
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 5 ON DAY 20
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	718 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - June 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	2.31	2.32	2.27	2.30	2.27	2.28	2.25	2.29	S1	S1	2.26	2.27	S	2.20	2.18	2.21	2.20	2.18	2.19	2.24	2.23	2.30	2.29	2.31	2.18	2.32	2.25	2.2											
2	2.32	2.37	2.44	2.57	2.37	2.31	2.34	2.28	2.30	2.27	2.22	S	2.28	2.26	2.29	2.26	2.25	2.23	2.25	2.22	2.22	2.29	2.36	2.43	2.22	2.57	2.31	24											
3	2.54	2.51	2.52	2.71	2.75	2.68	2.78	2.52	2.41	2.29	S	2.29	2.29	2.33	2.30	2.29	2.28	2.26	2.26	2.28	2.29	2.23	2.24	2.25	2.23	2.78	2.40	24											
4	2.24	2.27	2.15	2.16	2.23	2.23	2.20	2.22	2.17	S	2.25	2.24	2.25	2.22	2.17	2.13	2.19	2.13	2.20	2.18	2.21	2.41	2.25	2.37	2.13	2.41	2.22	24											
5	2.49	2.38	2.52	2.63	2.71	2.91	3.01	2.70	S	2.37	2.31	2.37	2.36	2.35	2.35	2.32	2.33	2.33	2.31	2.34	2.38	2.53	2.46	2.48	2.31	3.01	2.48	24											
6	2.65	2.70	2.64	2.56	2.34	2.35	2.32	S	C	C	C	C	C	C	2.17	2.21	2.18	2.09	2.12	2.15	2.31	2.38	2.39	2.40	2.09	2.70	2.35	24											
7	2.55	2.60	2.46	2.57	2.54	2.31	S	2.20	2.19	2.15	2.13	2.14	2.10	2.12	2.11	2.10	2.11	2.08	2.13	2.11	2.07	2.16	2.13	2.15	2.07	2.60	2.23	24											
8	2.11	2.14	2.21	2.19	2.19	S	2.13	2.22	2.22	2.20	2.21	2.23	2.18	2.18	2.11	2.16	2.18	2.15	2.11	2.12	2.06	2.06	2.11	2.17	2.06	2.23	2.16	24											
9	2.14	2.22	2.17	2.15	S	2.15	2.14	2.14	2.15	2.17	2.10	2.15	2.13	2.15	2.11	2.07	2.12	2.09	2.17	2.06	2.14	2.06	2.08	2.05	2.05	2.22	2.13	24											
10	2.05	2.02	2.08	S	2.19	2.20	2.05	2.11	2.05	2.11	2.08	2.15	2.11	2.13	2.07	2.04	2.09	2.08	2.06	2.14	2.05	2.05	2.04	2.09	2.02	2.20	2.09	24											
11	2.07	2.09	S	2.09	2.07	2.06	2.04	2.03	1.99	1.96	1.95	1.93	2.00	1.96	2.00	1.99	1.95	1.94	2.00	1.98	1.97	2.00	1.99	1.95	1.93	2.09	2.00	24											
12	1.97	S	2.01	1.95	1.99	1.99	1.98	2.02	2.08	2.04	2.03	2.06	2.05	2.01	1.99	2.04	2.01	1.97	1.96	1.97	1.96	2.07	2.06	2.11	1.95	2.11	2.01	24											
13	S	2.10	2.12	2.08	2.09	2.16	2.14	2.18	2.07	2.09	2.12	2.11	2.12	2.14	2.07	2.07	2.17	2.15	2.12	2.13	2.14	2.06	2.13	S	2.06	2.18	2.12	24											
14	2.14	2.14	2.14	2.20	2.32	2.20	2.15	2.11	2.08	2.14	2.21	2.12	2.15	2.12	2.16	2.13	2.16	2.11	2.11	2.18	2.21	S	2.48	2.08	2.48	2.17	24												
15	2.24	2.39	2.24	2.29	2.24	2.21	2.12	2.18	2.15	2.10	2.13	2.13	2.13	2.12	2.14	2.11	2.14	2.13	2.09	2.14	2.66	S	2.47	2.64	2.09	2.66	2.23	24											
16	2.61	2.60	2.79	2.72	2.57	2.73	2.49	2.31	2.35	2.30	2.20	2.19	2.24	2.20	2.16	2.18	2.18	2.18	2.16	2.15	S	2.23	2.42	2.49	2.15	2.79	2.37	24											
17	2.59	2.67	2.65	2.82	2.91	2.93	2.90	2.70	2.51	2.30	2.25	2.20	2.24	2.20	2.19	2.20	2.19	2.20	2.21	S	6.23	2.26	2.31	2.94	2.19	6.23	2.63	24											
18	2.99	3.47	3.51	3.59	3.56	2.88	2.77	2.70	2.62	2.41	2.30	2.25	2.22	2.22	2.25	2.23	2.23	2.21	S	2.23	2.46	2.59	2.74	2.77	2.21	3.59	2.66	24											
19	2.68	3.01	2.96	2.95	3.15	3.16	2.94	2.81	2.67	2.45	2.39	2.32	2.26	2.23	2.29	2.23	2.27	S	2.25	2.29	2.42	3.52	2.59	2.95	2.23	3.52	2.64	24											
20	3.02	3.08	4.31	2.95	3.33	3.13	2.98	2.58	2.45	2.35	2.37	2.25	2.29	2.25	2.26	2.28	S	2.33	2.28	2.42	2.43	2.83	2.91	3.21	2.25	4.31	2.71	24											
21	3.28	3.48	3.31	3.84	3.55	3.39	2.91	2.69	2.55	2.43	2.34	2.25	2.23	2.25	2.36	S	2.31	2.27	2.22	2.47	2.52	2.44	2.62	3.07	2.22	3.84	2.73	24											
22	3.16	3.06	3.44	3.27	3.13	3.82	3.02	2.62	2.49	2.29	2.35	2.39	2.28	2.24	S	2.25	2.23	2.22	2.24	2.27	2.46	2.62	2.84	2.72	2.22	3.82	2.67	24											
23	2.47	2.79	2.80	2.93	3.15	2.65	2.34	2.36	2.35	2.29	2.28	2.24	2.24	S	2.22	2.22	2.23	2.34	2.34	2.37	2.50	2.60	2.67	3.08	2.22	3.15	2.50	24											
24	2.78	3.04	3.11	3.02	2.58	2.73	2.85	2.93	2.89	2.82	2.65	2.48	S	2.31	2.39	2.32	2.28	2.35	2.32	2.31	2.47	2.89	2.70	2.73	2.28	3.11	2.65	24											
25	2.71	2.97	3.26	2.72	2.72	3.25	2.68	2.71	2.40	2.24	2.24	S	2.16	2.22	2.18	2.17	2.15	2.17	2.16	2.18	5.27	2.14	2.19	2.22	2.14	5.27	2.57	24											
26	2.17	2.09	2.10	2.11	2.13	2.32	2.11	2.27	2.29	2.15	S	2.03	2.09	2.14	2.11	2.08	2.14	2.16	2.17	2.11	2.14	2.24	2.28	2.28	2.03	2.32	2.16	24											
27	2.28	2.20	2.26	2.26	2.27	2.20	2.28	2.14	2.15	S	2.09	2.13	2.16	2.11	2.12	2.09	2.17	2.15	2.13	2.11	2.15	2.12	2.15	2.13	2.09	2.28	2.17	24											
28	2.21	2.22	2.16	2.14	2.14	2.17	2.19	2.17	S	2.21	2.21	2.20	2.20	2.24	2.18	2.21	2.19	2.25	2.18	2.22	2.27	2.23	2.52	2.65	2.14	2.65	2.23	24											
29	2.38	2.30	2.67	3.00	2.73	2.75	2.49	S	2.27	2.19	2.22	2.27	2.23	2.22	2.21	2.17	2.14	2.16	2.24	2.20	2.44	2.60	2.71	2.34	2.14	3.00	2.39	24											
30	2.63	2.88	2.98	11.10	21.93	4.43	S	2.54	2.43	2.40	2.28	2.22	2.17	2.20	2.18	2.25	2.19	2.19	2.17	2.19	2.45	2.31	2.69	2.81	2.17	21.93	3.72	24											
HOURLY MAX	3.28	3.48	4.31	11.10	21.93	4.43	3.02	2.93	2.89	2.82	2.65	2.48	2.36	2.35	2.39	2.32	2.33	2.35	2.34	2.47	6.23	3.52	2.91	3.21															
HOURLY AVG	2.48	2.56	2.63	2.89	3.25	2.64	2.45	2.38	2.32	2.26	2.23	2.21	2.19	2.19	2.18	2.17	2.18	2.18	2.18	2.20	2.52	2.36	2.39	2.49															

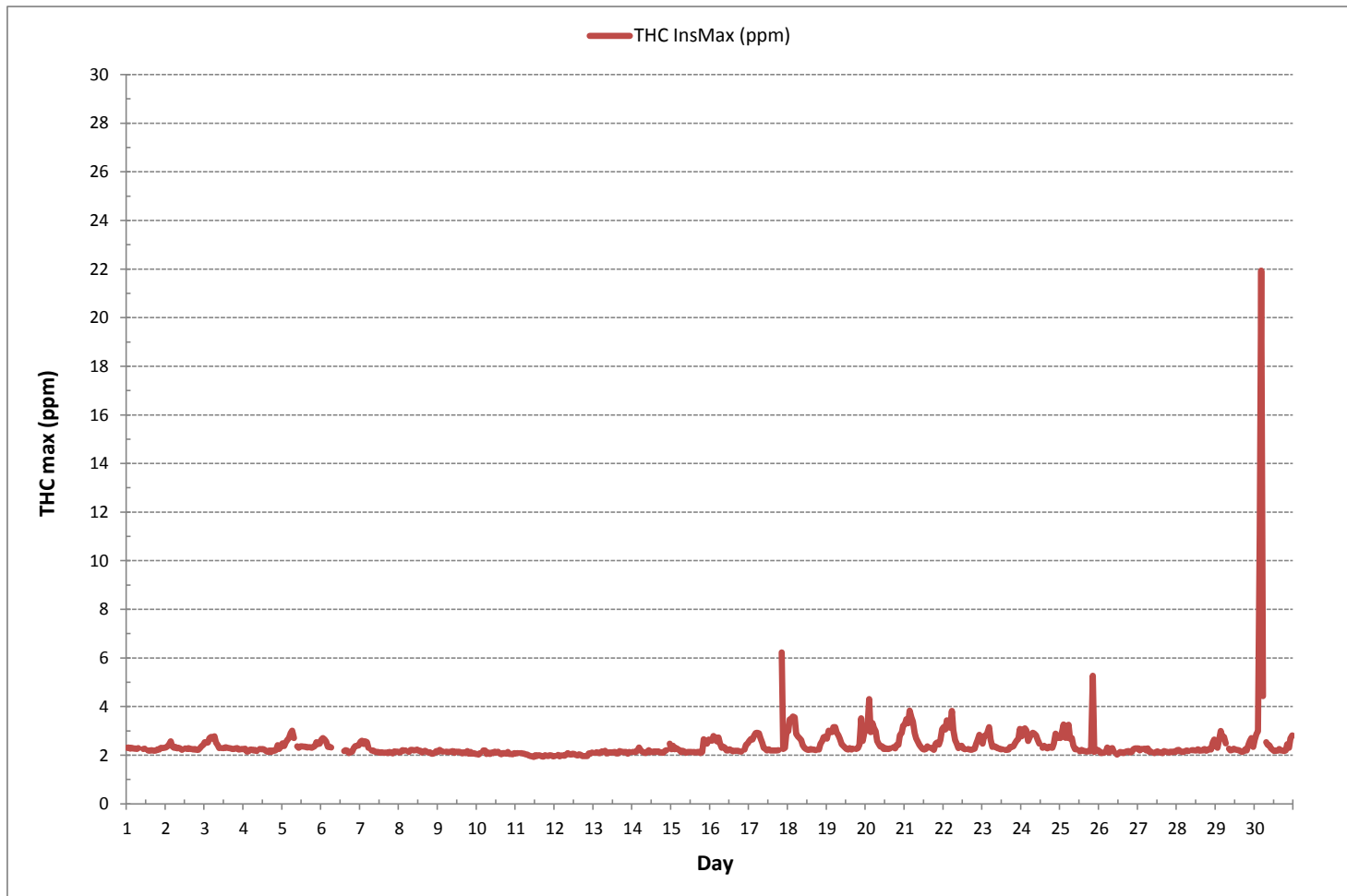
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	21.93 ppm @ HOUR 4 ON DAY 30
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	718 hrs
STANDARD DEVIATION:	0.90

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY																													
1	3	4	2	3	2	2	4	3	S1	S1	8	2	S	4	3	4	2	4	3	3	1	1	1	3	1	8	3	22	
2	1	3	5	5	5	6	5	8	8	6	2	S	3	2	1	2	2	2	1	1	4	3	5	4	1	8	4	24	
3	5	5	4	6	8	8	8	6	3	2	S	2	1	2	1	1	1	1	2	2	7	2	1	1	1	8	3	24	
4	1	1	1	1	3	3	8	4	2	S	4	3	3	3	6	3	3	3	3	3	3	3	3	3	3	1	8	3	24
5	2	2	4	4	7	13	15	11	S	C	C	C	C	C	C	C	C	3	1	3	10	6	3	5	1	15	6	24	
6	5	5	6	5	5	5	3	S	3	4	2	2	3	1	2	2	3	2	2	4	7	11	10	26	1	26	5	24	
7	6	4	5	5	6	8	S	6	3	1	2	3	6	6	2	2	2	2	3	2	2	3	2	2	2	1	8	4	24
8	2	4	2	3	6	S	5	7	3	3	3	2	5	3	3	4	5	3	2	3	2	2	1	1	1	7	3	24	
9	1	2	2	2	S	3	2	2	2	2	3	2	3	3	2	2	3	2	3	10	4	43	2	2	1	43	4	24	
10	3	2	2	S	3	3	2	5	3	21	4	4	6	9	3	2	2	1	1	3	2	2	2	1	1	21	4	24	
11	1	1	S	3	1	1	1	1	1	2	4	2	12	2	12	4	2	1	1	1	1	1	1	1	1	12	2	24	
12	1	S	2	1	1	2	2	5	11	6	2	2	3	1	1	2	2	1	1	1	1	2	2	2	1	11	2	24	
13	S	3	2	2	2	2	3	3	5	3	3	3	2	6	2	4	9	3	22	12	11	5	2	S	2	22	5	24	
14	3	3	4	3	4	9	5	15	5	36	3	2	4	17	6	7	8	7	8	2	1	3	S	7	1	36	7	24	
15	4	3	3	2	3	3	10	2	3	2	1	1	2	2	2	7	13	4	3	5	16	S	4	6	1	16	4	24	
16	6	4	8	6	4	13	9	7	4	3	3	2	2	2	3	2	2	2	2	2	S	7	3	3	2	13	4	24	
17	3	4	3	3	4	5	9	9	5	2	1	1	1	2	6	2	2	1	2	S	4	3	3	2	1	9	3	24	
18	3	3	3	3	3	6	9	10	12	7	5	4	5	2	4	3	4	1	S	2	4	4	4	4	1	12	5	24	
19	3	3	4	4	3	6	9	12	19	7	9	3	3	2	14	5	6	S	2	2	4	4	4	4	4	2	19	6	24
20	4	3	7	11	3	6	10	13	8	7	6	6	4	3	2	3	S	4	4	7	5	7	3	3	2	13	6	24	
21	3	4	3	3	7	10	10	7	6	4	3	3	2	4	2	S	6	2	4	3	2	3	4	5	2	10	4	24	
22	3	5	4	3	9	11	9	5	3	2	4	3	5	2	S	3	2	2	2	3	4	6	5	3	2	11	4	24	
23	2	3	3	3	4	5	3	4	3	5	11	5	2	S	2	2	7	2	5	9	9	12	6	4	2	12	5	24	
24	3	3	3	2	4	2	2	3	4	4	3	3	S	4	3	4	4	1	2	2	7	4	3	3	1	7	3	24	
25	4	3	4	2	3	4	5	5	3	6	5	S	3	4	4	2	5	2	2	2	3	2	4	4	2	6	4	24	
26	4	2	2	2	4	5	7	5	4	2	S	7	3	3	2	2	1	1	7	1	2	2	1	2	1	7	3	24	
27	2	1	1	1	2	2	2	2	4	S	4	3	3	3	2	1	2	1	1	1	1	1	1	1	1	1	4	2	24
28	2	2	2	2	2	2	2	2	S	4	3	2	2	2	4	4	1	3	2	2	3	3	3	3	1	4	2	24	
29	5	4	4	5	4	6	6	S	6	3	2	2	1	2	2	2	2	1	1	1	1	9	7	5	3	1	9	4	24
30	2	15	7	2	2	4	S	6	4	3	3	2	1	1	3	5	1	1	1	3	2	2	2	3	1	15	3	24	
HOURLY MAX	6	15	8	11	9	13	15	15	19	36	11	7	12	17	14	7	13	7	22	12	16	43	10	26					
HOURLY AVG	3	3	4	3	4	5	6	6	5	6	4	3	3	3	4	3	4	2	3	3	5	5	3	4					

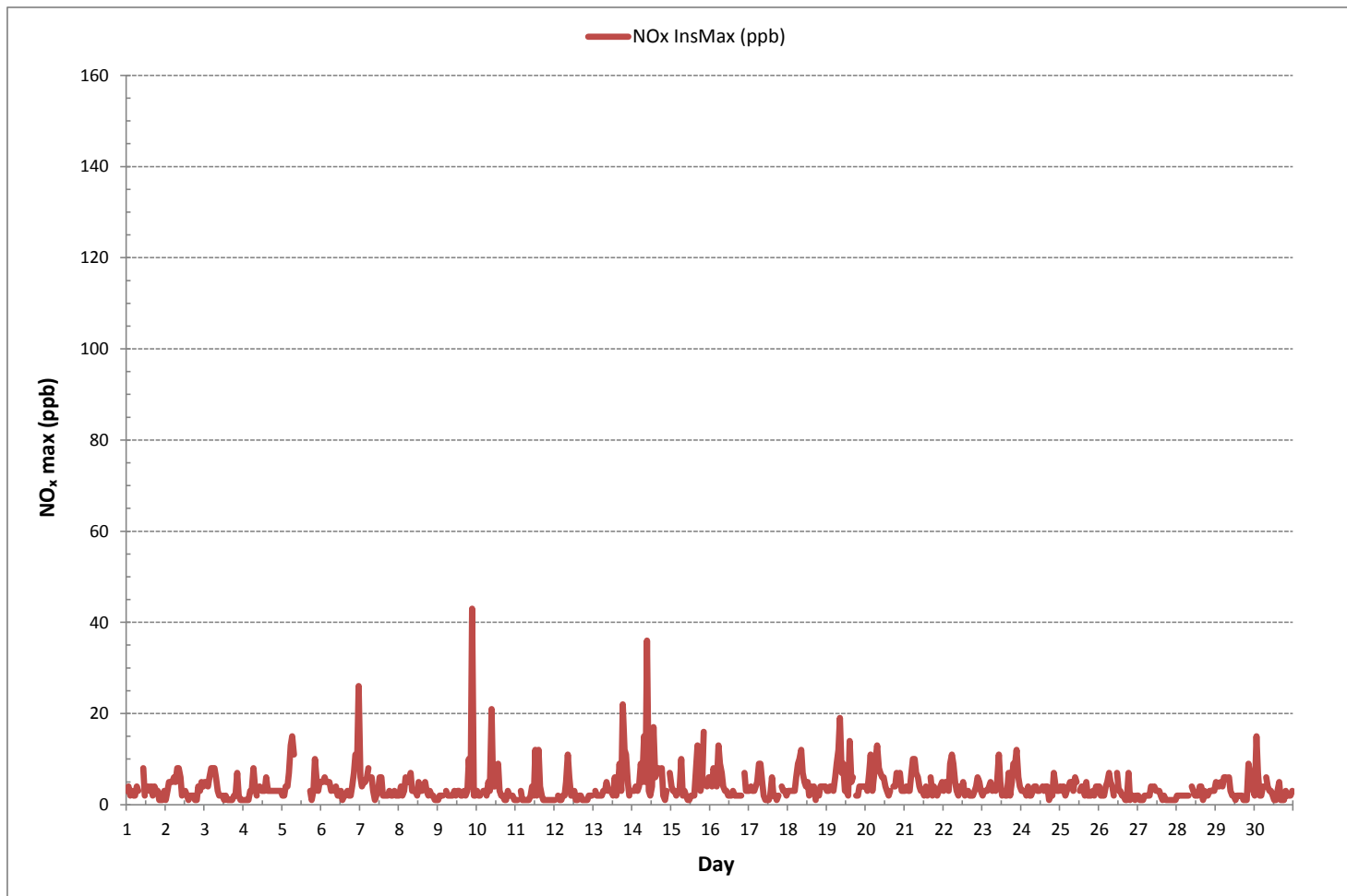
STATUS FLAG CODES

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:	679
MAXIMUM INSTANTANEOUS VALUE:	43 ppb @ HOUR 21 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	718 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





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

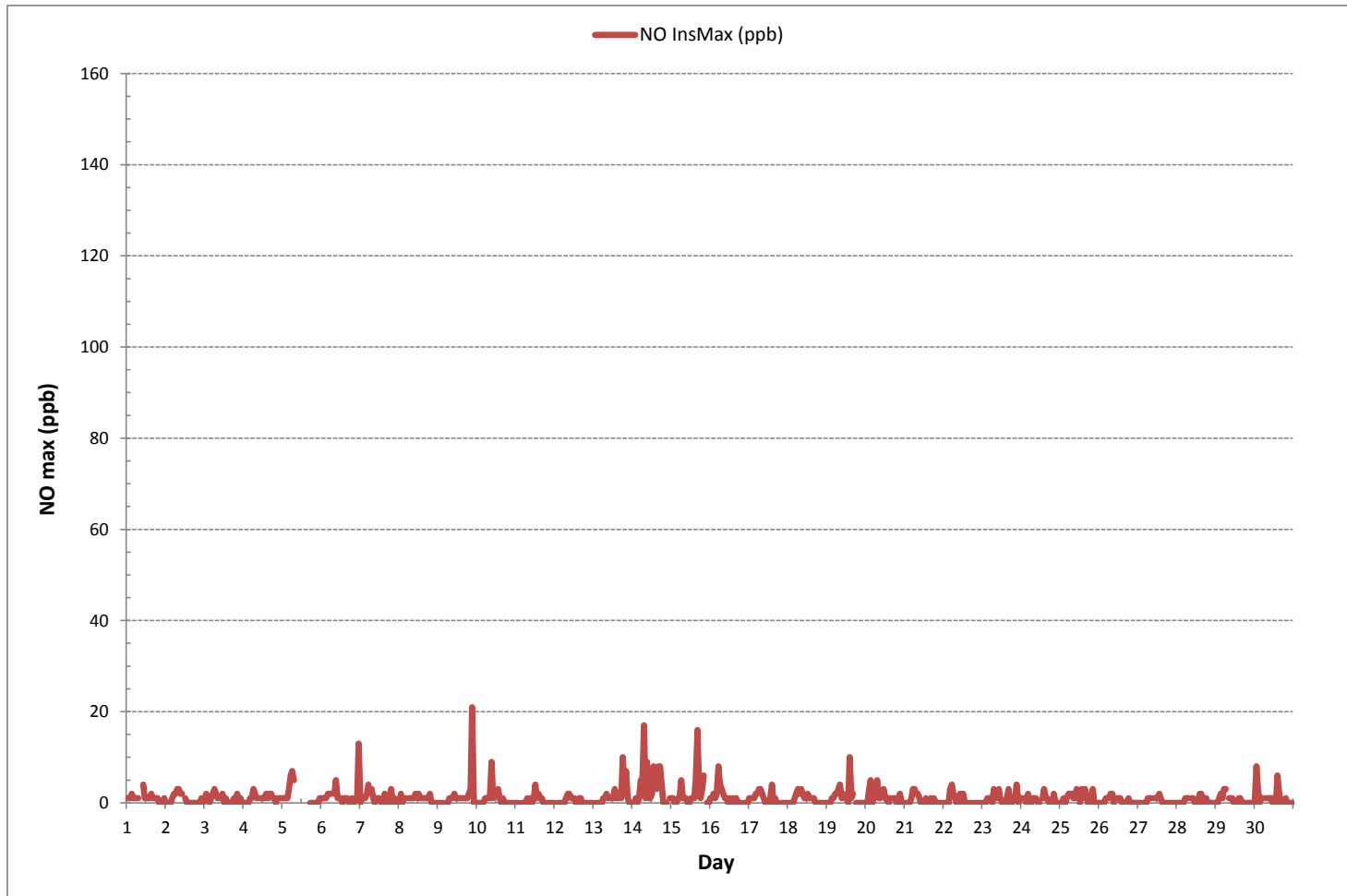
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	381
MAXIMUM INSTANTANEOUS VALUE:	21 ppb @ HOUR 21 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	718 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

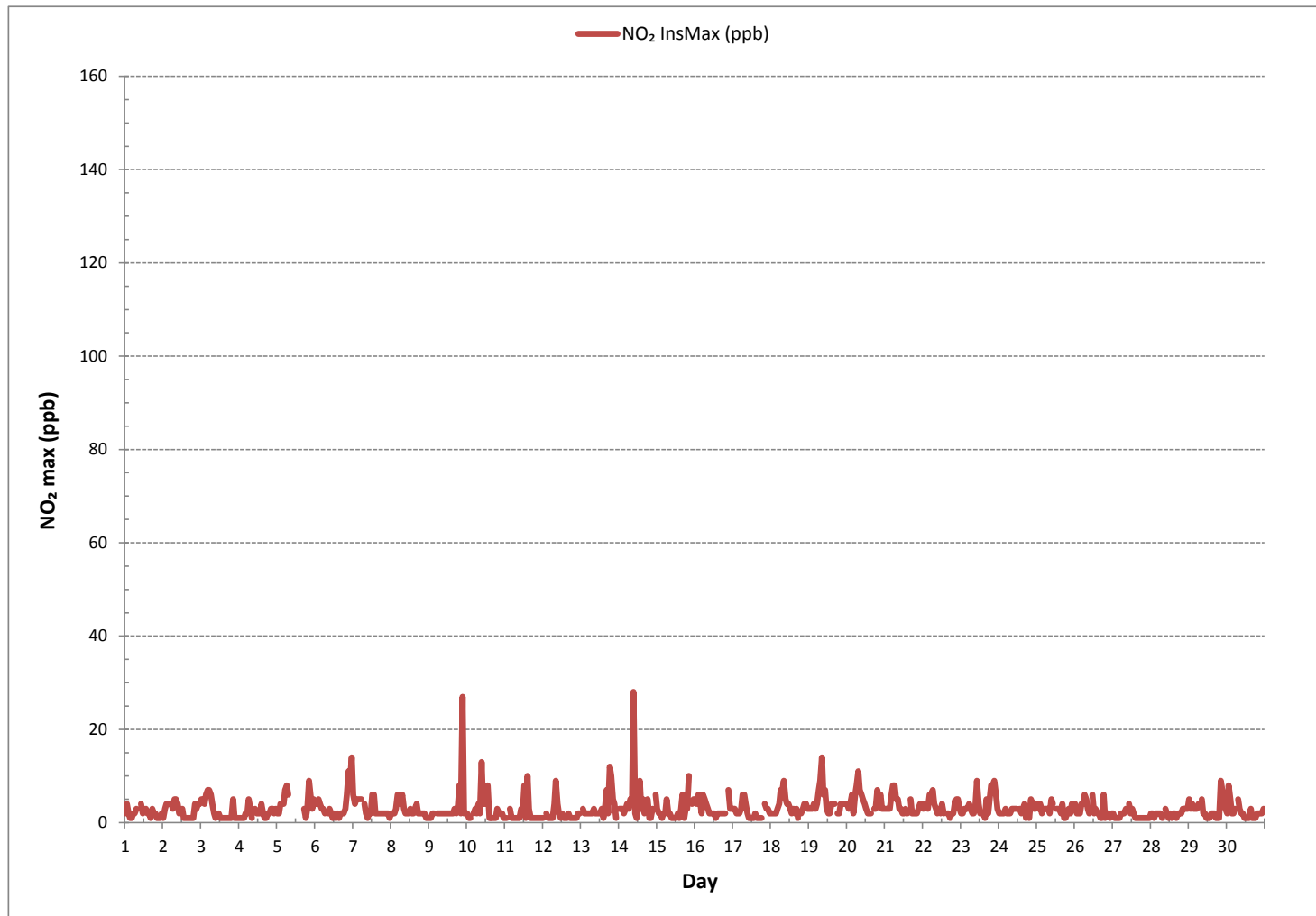
STATUS FLAG CODES

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:	679
MAXIMUM INSTANTANEOUS VALUE:	28 ppb @ HOUR 9 ON DAY 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	718 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	22.6	20.0	19.2	17.2	16.2	17.5	22.0	21.7	S1	S1	26.8	28.1	S	24.6	22.6	22.1	21.1	20.8	18.6	16.5	15.3	14.3	13.0	12.1	12.1	28.1	19.9	22	
2	9.2	9.6	8.1	7.1	12.6	13.2	14.3	12.2	19.0	25.4	29.6	S	30.7	34.6	37.6	37.6	39.5	38.6	40.2	39.7	44.9	32.3	25.0	19.4	7.1	44.9	25.2	24	
3	15.7	7.2	16.2	17.9	17.0	18.0	23.7	29.6	36.8	41.6	S	46.2	48.5	50.6	50.6	52.6	52.2	51.9	52.3	50.9	32.4	29.1	27.5	24.6	7.2	52.6	34.5	24	
4	25.8	26.0	25.8	23.9	21.3	19.5	21.5	21.8	22.7	S	25.0	23.8	22.4	22.4	21.4	20.2	21.5	21.0	20.5	20.0	20.7	12.1	9.0	8.2	8.2	26.0	20.7	24	
5	7.8	3.0	6.4	5.4	4.1	8.1	13.9	19.8	S	S1	S1	X	42.0	41.4	40.2	40.9	40.8	41.2	42.8	40.5	36.1	20.3	20.9	19.5	3.0	42.8	24.8	21	
6	10.7	8.9	13.5	16.6	21.0	20.9	19.8	S	C	C	C	C	C	C	43.6	45.3	50.0	50.8	51.0	51.1	40.1	30.7	21.6	18.8	8.9	51.1	30.3	24	
7	16.3	25.0	21.0	17.0	21.1	28.7	S	37.3	46.2	50.8	52.3	54.3	56.9	59.2	62.1	62.8	64.8	66.6	66.2	63.8	62.3	59.1	54.9	53.4	16.3	66.6	47.9	24	
8	50.1	47.0	45.3	41.7	38.1	S	34.6	34.9	37.4	40.6	40.2	44.4	47.6	50.9	54.0	53.3	42.4	52.1	59.4	59.7	58.6	57.5	49.2	42.9	34.6	59.7	47.0	24	
9	39.2	35.7	32.8	31.0	S	28.0	31.3	33.2	34.6	35.7	37.4	39.6	40.7	41.8	43.4	45.8	42.7	41.2	51.4	46.9	48.4	42.9	42.3	43.4	28.0	51.4	39.5	24	
10	43.2	40.7	38.4	S	36.1	33.4	34.4	29.5	27.0	28.2	24.3	24.8	28.6	32.2	36.9	40.8	48.6	50.7	47.6	28.9	27.8	24.1	24.6	24.1	24.6	24.1	50.7	33.9	24
11	25.5	25.5	S	27.0	31.3	31.9	34.0	33.4	31.7	28.6	26.2	26.7	26.2	26.4	27.8	28.7	27.6	27.9	27.6	27.3	26.6	27.2	27.1	27.2	25.5	34.0	28.2	24	
12	27.7	S	28.9	28.9	30.2	30.0	29.6	28.8	29.8	29.3	29.0	28.7	28.9	27.1	27.3	27.3	27.4	30.1	31.8	31.8	30.0	28.9	28.0	26.2	26.2	31.8	28.9	24	
13	S	21.9	24.6	26.2	24.9	23.6	24.9	28.9	32.2	35.9	36.4	38.1	37.7	38.0	38.4	39.0	40.1	40.7	36.3	34.6	33.1	30.7	28.3	S	21.9	40.7	32.5	24	
14	25.3	22.8	19.1	17.3	15.8	17.5	18.1	20.1	23.2	28.1	34.0	34.0	34.8	35.4	36.1	36.3	35.9	36.0	35.0	33.7	29.0	26.6	S	25.4	15.8	36.3	27.8	24	
15	25.4	20.6	18.8	15.7	13.3	13.7	14.0	28.1	28.4	30.7	30.6	30.8	31.1	32.5	33.1	33.5	34.8	34.0	32.5	30.9	29.2	S	16.1	9.4	9.4	34.8	25.5	24	
16	9.9	13.6	4.5	4.3	3.9	7.0	14.8	15.6	25.5	29.6	38.1	42.6	38.9	39.8	39.2	41.5	42.7	41.5	41.0	39.7	S	27.1	20.7	15.0	3.9	42.7	25.9	24	
17	9.6	9.2	6.1	4.8	3.3	13.0	18.4	22.1	31.2	32.6	34.3	36.6	38.4	39.4	39.7	41.3	41.7	44.4	43.7	S	39.6	31.9	31.8	32.9	3.3	44.4	28.1	24	
18	29.4	26.0	19.2	16.4	16.0	13.1	30.9	36.9	41.4	50.5	58.7	58.6	58.2	57.0	55.5	58.5	58.0	S	56.2	51.3	41.2	28.7	23.3	13.1	58.7	41.0	24		
19	25.8	21.6	14.1	16.6	9.9	15.1	36.0	41.2	44.9	52.2	63.0	65.8	66.6	65.4	65.7	65.0	65.4	S	64.7	63.0	59.1	48.4	46.4	44.8	9.9	66.6	46.1	24	
20	40.1	31.1	25.0	22.2	15.7	35.6	37.9	46.8	56.1	63.4	67.3	70.7	68.6	67.3	66.7	67.1	S	68.1	67.8	65.1	58.8	44.2	37.4	36.9	15.7	70.7	50.4	24	
21	39.0	30.8	21.4	12.1	13.8	24.0	38.9	47.3	51.0	57.5	59.3	59.9	58.1	58.6	57.7	S	59.9	61.4	56.7	57.2	59.5	58.0	44.0	33.3	12.1	61.4	46.1	24	
22	31.8	23.7	24.3	19.6	15.1	23.9	34.7	42.8	56.5	60.2	62.9	64.1	64.6	63.6	S	59.8	59.7	58.7	59.8	51.8	50.5	39.1	33.4	33.9	15.1	64.6	45.0	24	
23	35.6	30.8	19.6	12.1	10.0	24.1	27.7	32.3	41.1	44.4	43.7	43.3	47.8	S	32.1	27.3	31.5	38.7	37.9	36.6	33.3	22.5	17.9	15.7	10.0	47.8	30.7	24	
24	8.6	4.9	2.3	10.5	12.5	12.7	15.2	17.1	27.5	33.2	43.0	45.5	S	42.0	43.8	44.7	43.6	45.0	45.2	44.7	42.2	38.2	31.3	31.2	2.3	45.5	29.8	24	
25	24.5	16.8	20.5	23.3	26.5	27.1	27.3	34.7	41.5	47.8	51.3	S	52.6	52.5	51.8	53.1	54.1	54.0	59.3	59.4	50.3	38.4	34.5	29.2	16.8	59.4	40.5	24	
26	32.5	30.3	31.6	26.8	24.7	23.1	20.8	20.6	28.4	28.1	S	35.3	39.6	39.3	39.8	42.2	43.8	42.6	38.0	37.7	34.9	28.5	27.3	27.8	20.6	43.8	32.3	24	
27	25.2	22.9	20.7	21.9	20.8	21.8	22.4	25.8	26.0	S	25.5	25.6	25.9	24.9	24.4	24.8	23.8	25.0	25.2	24.5	24.2	23.6	22.0	21.5	20.7	26.0	23.8	24	
28	21.5	20.6	18.3	17.7	16.5	17.0	18.8	20.1	S	23.9	25.5	26.4	27.8	28.0	28.6	29.2	32.2	29.3	25.4	23.6	19.9	19.5	16.9	14.2	14.2	32.2	22.6	24	
29	13.5	12.4	8.1	6.7	4.3	7.7	14.6	S	22.3	26.9	31.7	35.7	36.0	36.4	36.9	38.6	39.7	38.8	39.6	38.2	37.4	24.8	33.0	35.1	4.3	39.7	26.9	24	
30	32.4	22.1	13.8	5.4	3.6	13.7	S	24.2	36.8	38.2	37.9	36.8	35.1	35.4	35.7	36.2	36.2	35.9	32.4	30.1	30.8	29.3	27.2	18.3	3.6	38.2	28.2	24	
HOURLY MAX	50.1	47.0	45.3	41.7	38.1	35.6	38.9	47.3	56.5	63.4	67.3	70.7	68.6	67.3	66.7	67.1	65.4	68.1	67.8	65.1	62.3	59.1	54.9	53.4					
HOURLY AVG	25.0	21.7	19.6	17.7	17.2	20.1	24.8	28.8	34.7	38.5	39.9	41.0	41.9	41.5	41.0	41.8	41.9	42.9	43.2	42.2	38.9	32.9	28.9	26.5					

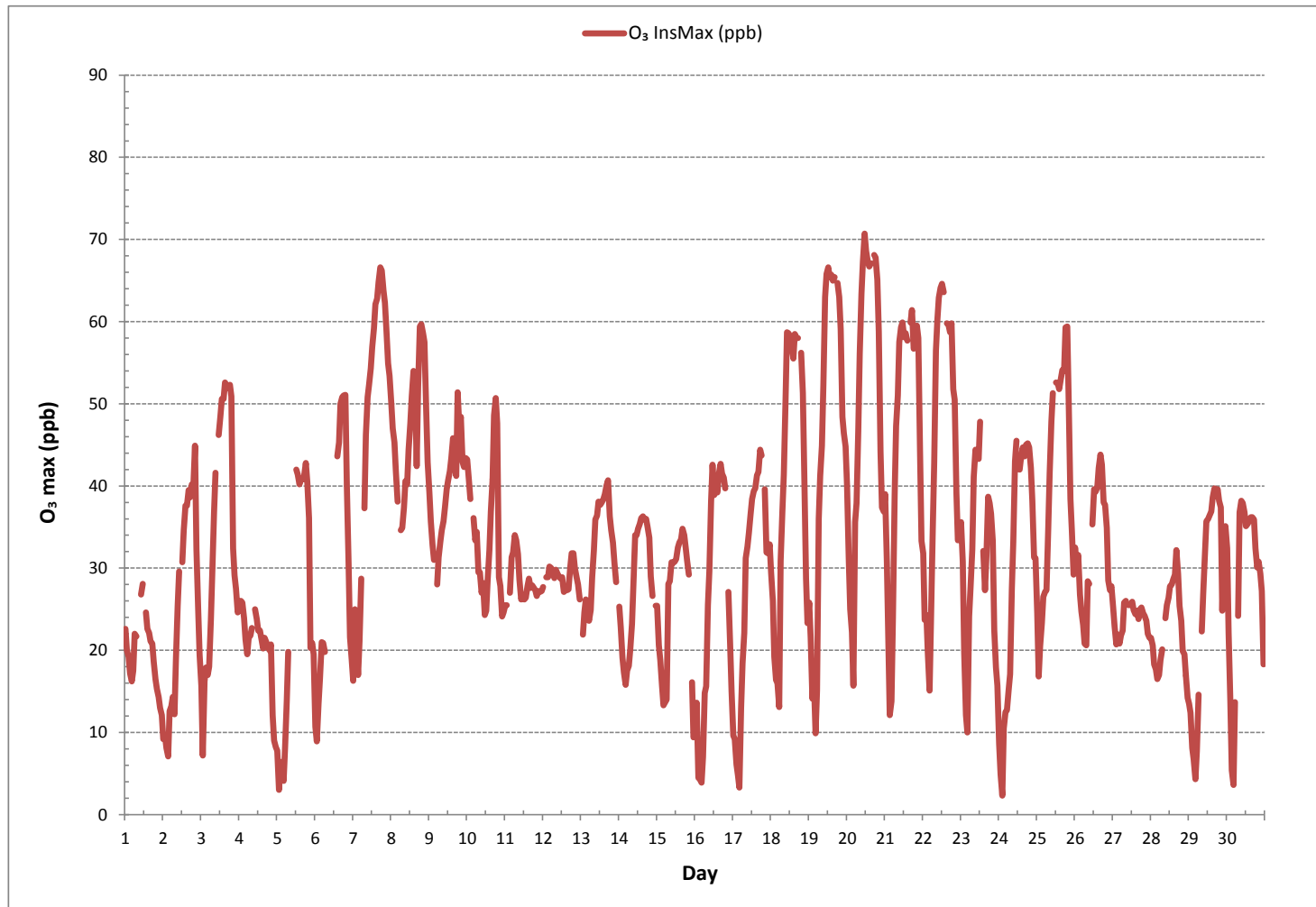
STATUS FLAG CODES

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:	678
MAXIMUM INSTANTANEOUS VALUE:	70.7 ppb @ HOUR 11 ON DAY 20
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	14.7
OPERATIONAL TIME:	715 hrs

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - June 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	15.9	18.3	19.2	16.5	19.2	22.6	24.9	26.8	23.8	22.9	18.7	17.0	13.9	14.3	19.2	17.0	14.8	16.0	14.1	10.4	9.1	X	X	7.1	7.1	26.8	17.4	22	
2	5.4	8.4	9.1	10.8	16.1	17.8	13.9	13.7	14.6	14.8	18.6	22.3	28.2	31.9	30.1	24.6	54.9	24.2	24.2	58.2	38.7	4.9	7.3	6.4	4.9	58.2	20.8	24	
3	4.9	4.5	8.5	11.7	14.1	13.0	19.8	19.2	20.5	20.7	30.5	27.9	30.5	25.8	29.9	28.4	16.5	18.5	12.2	18.9	29.9	29.5	32.5	31.0	4.5	32.5	20.8	24	
4	32.1	33.7	43.5	25.6	20.3	23.5	33.0	45.5	50.3	42.6	30.3	25.7	29.3	21.5	18.3	14.8	15.4	16.1	11.3	8.4	6.9	4.4	6.2	6.2	4.4	50.3	23.5	24	
5	5.0	4.4	8.2	5.5	4.9	8.8	13.0	12.3	14.3	18.1	21.6	27.1	40.3	18.9	31.8	22.2	19.6	25.5	26.2	12.6	5.8	3.8	2.9	5.1	2.9	40.3	14.9	24	
6	8.9	3.2	6.0	7.8	12.3	13.9	22.4	20.0	22.7	18.5	20.3	21.1	26.4	22.2	20.4	17.4	12.1	12.7	9.8	8.4	5.3	5.2	3.2	5.8	3.2	26.4	13.6	24	
7	3.8	6.0	4.7	4.5	7.1	12.1	14.8	17.2	30.1	39.1	36.2	37.1	35.3	39.3	37.9	31.6	32.1	31.4	31.4	32.5	22.9	19.4	19.4	22.1	3.8	39.3	23.7	24	
8	16.3	17.2	17.6	8.7	11.7	17.8	21.3	19.0	14.1	18.7	22.8	26.8	35.3	46.5	25.0	30.8	26.2	27.8	48.3	40.6	32.8	38.9	28.4	26.4	8.7	48.3	25.8	24	
9	21.9	17.0	14.1	17.0	17.0	24.4	29.5	31.0	29.0	32.5	42.6	34.3	34.9	38.4	40.8	42.4	44.3	42.4	88.8	27.9	31.4	28.4	26.6	31.2	14.1	88.8	32.8	24	
10	22.2	20.3	11.9	14.8	4.1	11.3	12.8	13.9	16.3	20.9	28.4	9.9	11.3	10.3	18.7	25.7	25.1	32.3	38.0	39.1	39.8	34.7	29.3	32.3	4.1	39.8	21.8	24	
11	36.5	30.0	30.5	32.5	36.3	34.7	37.6	42.9	42.2	43.7	44.0	46.8	61.7	43.7	64.8	59.1	57.6	57.6	49.1	49.0	42.6	37.4	47.7	47.6	30.0	64.8	44.8	24	
12	42.4	53.3	64.1	61.9	52.7	45.7	57.9	52.1	47.2	44.6	58.2	50.7	58.4	68.5	56.9	49.2	44.6	45.3	45.5	53.6	24.4	36.3	22.9	17.2	17.2	68.5	48.1	24	
13	10.4	13.0	15.3	17.6	11.0	10.6	15.4	20.5	18.9	24.0	25.1	25.5	26.2	24.0	34.1	30.9	29.2	29.3	19.9	14.1	11.5	9.3	13.9	16.5	9.3	34.1	19.4	24	
14	7.3	6.9	5.3	8.0	4.4	15.6	13.7	15.9	13.9	15.6	19.8	36.0	40.4	25.9	27.9	14.5	16.7	17.1	12.6	19.4	14.1	7.5	7.8	16.0	4.4	40.4	15.9	24	
15	9.1	5.8	4.0	4.7	5.6	6.0	6.0	18.0	21.1	24.6	26.6	25.5	20.9	20.2	28.5	18.7	17.2	19.8	15.9	12.8	8.6	1.8	2.8	3.8	1.8	28.5	13.7	24	
16	2.6	2.5	3.9	3.4	3.7	3.2	6.4	6.2	9.5	7.9	12.7	16.1	20.0	23.9	17.4	19.1	19.5	12.1	11.4	7.7	7.0	4.8	2.7	2.4	2.4	23.9	9.4	24	
17	2.9	3.2	2.7	3.2	2.5	4.4	9.5	8.8	10.1	16.6	23.9	22.2	19.1	19.1	21.7	29.4	25.7	22.8	17.4	11.2	4.1	7.1	8.4	6.9	2.5	29.4	12.6	24	
18	4.9	3.2	3.0	5.1	1.8	1.8	8.2	11.5	14.5	19.8	30.5	33.4	28.8	31.0	23.7	23.5	23.1	19.5	19.1	14.3	10.2	2.7	3.6	2.9	1.8	33.4	14.2	24	
19	3.5	3.2	3.2	2.1	2.3	2.7	11.7	12.1	13.0	21.9	21.5	23.3	25.9	25.3	28.8	23.5	24.2	28.1	21.9	14.1	11.9	8.6	9.3	8.3	2.1	28.8	14.6	24	
20	4.2	2.7	2.5	2.9	3.8	13.0	14.7	12.1	15.4	21.5	21.3	23.3	29.2	21.5	21.3	28.4	19.7	17.5	19.5	10.7	8.9	2.3	2.3	1.8	1.8	29.2	13.4	24	
21	2.1	1.6	2.5	3.2	2.7	6.0	4.6	8.4	7.3	10.5	14.1	18.7	22.0	17.8	21.5	14.3	15.4	16.0	15.8	9.7	25.3	12.8	3.2	3.4	1.6	25.3	10.8	24	
22	4.0	9.8	4.7	5.6	3.7	4.3	10.3	8.4	42.6	8.8	9.5	10.5	17.1	33.1	31.0	24.2	15.6	11.0	17.6	12.8	8.8	4.9	6.2	11.3	3.7	42.6	13.2	24	
23	13.4	4.4	6.6	5.3	3.6	12.6	19.1	22.9	20.2	21.1	19.6	23.1	23.9	26.6	20.3	16.3	11.8	13.4	12.7	7.8	7.8	4.9	4.0	4.4	3.6	26.6	13.6	24	
24	2.9	4.0	2.9	9.5	14.1	9.9	9.6	11.3	10.2	12.7	11.5	14.5	12.3	16.5	38.4	23.5	25.5	24.4	23.7	19.1	9.4	6.7	8.9	9.1	2.9	38.4	13.8	24	
25	5.5	2.8	8.6	9.1	12.3	16.1	20.5	23.1	31.0	29.9	38.2	36.4	38.6	41.3	40.6	39.1	46.5	39.1	50.7	33.9	28.6	27.7	18.7	15.4	2.8	50.7	27.2	24	
26	19.6	11.3	15.2	15.6	9.1	9.9	14.3	27.0	43.5	32.1	39.3	34.7	42.1	48.1	47.4	33.9	11.5	9.7	14.8	36.4	18.9	13.7	14.8	16.2	9.1	48.1	24.1	24	
27	22.9	16.5	15.2	19.8	15.6	19.2	21.0	40.8	47.6	48.4	49.0	50.3	52.9	51.6	53.7	47.7	40.2	39.4	46.6	36.1	32.1	31.7	33.2	31.4	15.2	53.7	36.0	24	
28	25.7	21.1	22.9	26.8	21.8	29.3	37.1	44.2	32.5	33.6	35.2	35.9	35.8	35.1	36.7	34.7	34.9	23.1	21.0	18.9	11.0	11.3	4.9	11.5	4.9	44.2	26.9	24	
29	11.0	9.1	6.4	3.8	5.5	8.7	11.5	11.3	13.7	19.7	19.4	27.6	33.6	24.6	18.0	34.3	17.0	12.7	14.1	14.8	7.8	6.9	14.5	8.4	3.8	34.3	14.8	24	
30	4.0	5.3	4.9	2.1	3.0	4.7	8.2	9.8	13.6	25.7	21.5	33.3	31.2	36.9	30.5	35.3	27.1	48.9	14.2	9.4	10.9	16.8	7.1	3.6	2.1	48.9	17.0	24	
HOURLY MAX	42.4	53.3	64.1	61.9	52.7	45.7	57.9	52.1	50.3	48.4	58.2	50.7	61.7	68.5	64.8	59.1	57.6	57.6	88.8	58.2	42.6	38.9	47.7	47.6					

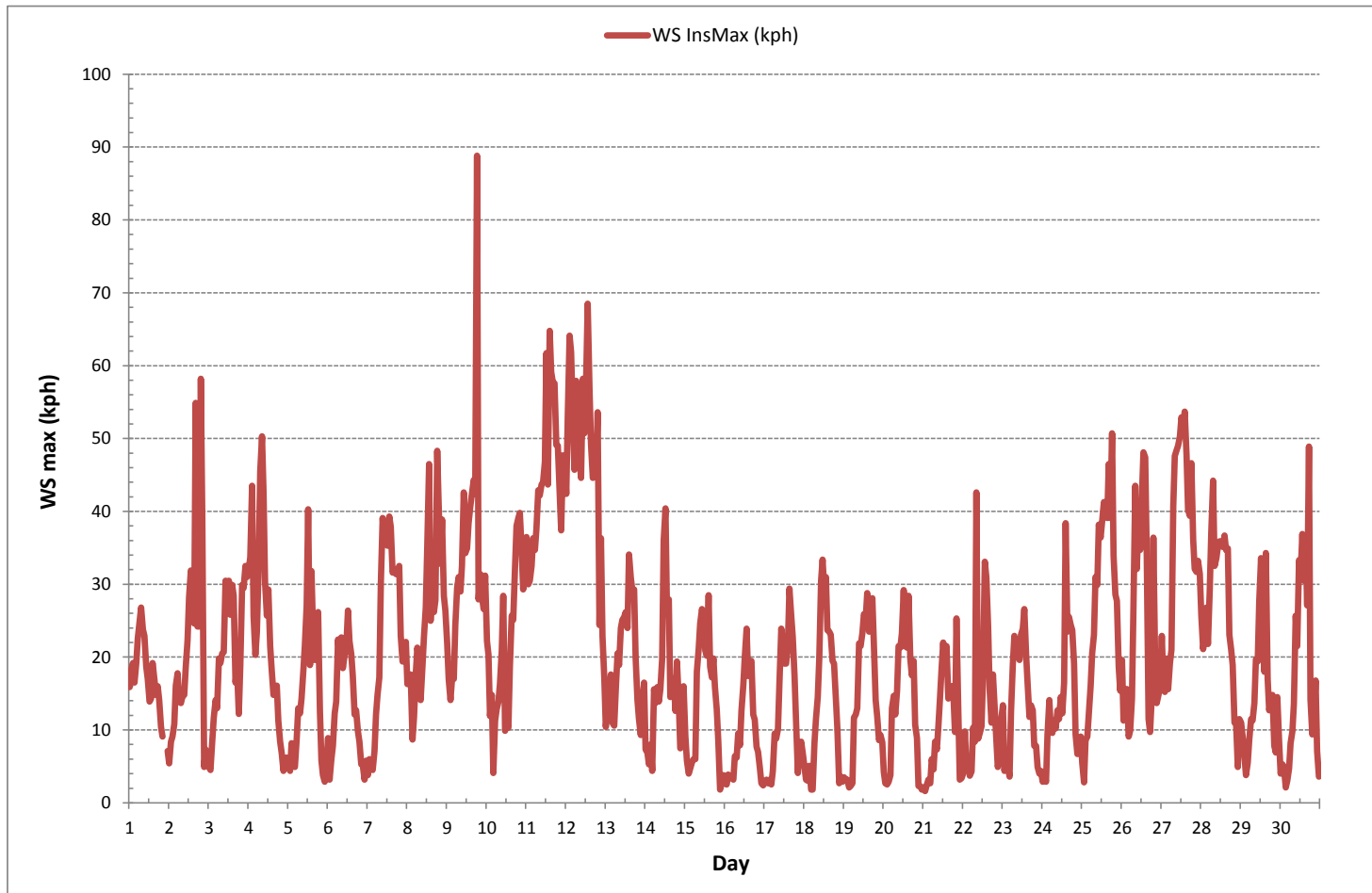
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	88.8 kph	@ HOUR	18	ON DAY	9
OPERATIONAL TIME:	718 hrs				

WIND SPEED Instantaneous Maximum (WS kph)

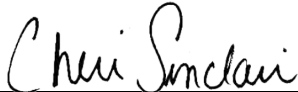


***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable))
YES	NA
Company Name (if applicable)(e)	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
Cheri Sinclair	Supervisor, 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	B.Sc.

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

13-08-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-06-1-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>July 10, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>July 10, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>Aug. 13, 2018</u>
Level 3 Independent Data Review	<u>Cheri Sinclair</u>	Date <u>Aug. 13, 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 June 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 June was compliant with the requirements outlined in the Air Monitoring Directive 2016 (AMD 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems, except PM2.5.

Non-Conformance: The equipment uptime for PM2.5 was 64.7% (254 hours of downtime). Upon arrival onsite on July 11, the technician observed that the TEOM unit had no flow. Troubleshooting was taken, and the unit was back to the service mode on July 11. Data was discarded back to the last valid audit check, which was on June 21. AEP reference number: 340863.

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

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

Respectfully,



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

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

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

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

Lily Lin
Data & Reporting Specialist
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Toll Free 800-386-7247
Fax 403-219-3673

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

JOB #: 2833-2018-06-30-C

June 2018

Prepared for:

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

Attention: MIKE BISAGA

DATE: **August 13, 2018**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Cheri Sinclair*

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

In June 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 were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

With the exception of PM_{2.5}, the operational time for each monitoring analyzer, meteorological system and data acquisition system was above the 90% requirement, in accordance with the Alberta Air Monitoring Directive (AMD, 2016). The equipment uptime for PM_{2.5} was 64.7% (254 hours of downtime), and this contravention was reported to AEP under reference number 340863. Upon arrival onsite on July 11, the technician observed that the TEOM unit had no flow. Data was discarded back to the last valid audit check, which was on June 21.

Gas and Meteorological Parameters: Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

THC:

- A repeat calibration was performed on June 11 to address the zero drift in daily zero checks, resulting in 5 hours of downtime.
- Data collected between June 1 at hour 00:00 and June 7 at hour 13:00 were baseline-corrected using the daily zero results while data collected between June 7 at hour 20:00 and June 11 at hour 12:00 were baseline-corrected using the June 11 repeat calibration as-found zero. Similarly, data collected from June 11 hour 18:00 to the end of the month were baseline-corrected using the calibrator zero of the June 11 repeat calibration.
- The reported data between June 7 and June 30 were noticeably higher than normal after baseline correction using the as-found zero result from the multi-point calibrations. However, due to unstable zero system, the daily zero check results were not reliable and their use was avoided for baseline correction. In order to present a better data trend, calibration zero point check result was used instead.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0	6	30	6	2.9	WNW	1	30	99.9
H ₂ S (ppb)	10	3	0	0	0	3	9	3	4.2	E	1	9	99.9
THC (ppm)	-	-	-	-	2.28	3.17	16	6	0.4	ESE	2.66	19	99.2
NO ₂ (ppb)	159	-	0	-	1	13	14	22	1.8	NNW	3	19	99.9
NO (ppb)	-	-	-	-	0	4	3	6	3.7	WNW	0	1	99.9
NO _x (ppb)	-	-	-	-	2	14	14	22	1.8	NNW	3	9	99.9
PM _{2.5} (µg/m ³)	80	30	0	0	6	37	9	17	5.0	NNW	19	3	64.7
RELATIVE HUMIDITY (%)	-	-	-	-	70	100	1	22	3.1	NNE	95	1	99.9
BAROMETRIC PRESSURE (millibar)	-	-	-	-	934	945	18	8	5.0	SSW	944	18	99.9
AMBIENT TEMPERATURE (°C)	-	-	-	-	15.1	29.4	21	16	2.9	SSE	22.6	20	99.9
PRECIPITATION (mm)	-	-	-	-	0.2	32.0	9	17	5.0	NNW	2.8	9	99.9
VECTOR WS (kph)	-	-	-	-	1.3	14.2	11	5	-	S	8.9	11	99.9
VECTOR WD (sec)	-	-	-	-	203 (SSW)	-	-	-	-	-	-	-	99.9

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on June 7.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on June 7.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.2%, equivalent to 6 hours of downtime.
- The routine monthly calibration was performed on June 7. The as found zero was repeated as the automated THC daily calibration check was accidentally started, which impacted the as found zero result. It was found that an incorrect connection between the NO_x analyzer and the THC analyzer was set during the Ultimate logger installation. The error was fixed on June 7.
- A repeat calibration was performed on June 11 to address the zero drift in daily zero checks, resulting in 5 hours of downtime.
- While the repeat calibration on June 11 met all AMD criteria, the zero response began to drift high. Although the daily zero check results were within tolerance, they did show persistent elevation for the remainder of the month. As a result, daily zero results were not applied for baseline correction on data.
- Data collected between June 1 at hour 00:00 and June 7 at hour 13:00 were baseline-corrected using the daily zero results while data collected between June 7 at hour 20:00 and June 11 at hour 12:00 were baseline-corrected using the June 11 repeat calibration as-found zero. Similarly, data collected from June 11 hour 18:00 to the end of the month were baseline-corrected using the calibrator zero of the June 11 repeat calibration.
- The reported data between June 7 and June 30 were noticeably higher than normal after baseline correction using the as-found zero result from the multi-point calibrations. However, due to unstable zero system, the daily zero check results were not reliable and their use was avoided for baseline correction. In order to present a better data trend, calibration zero point check result was used instead.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

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

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on June 7.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 64.7%, equivalent to 254 hours of downtime.
- Equipment uptime did not meet the AMD's 90% requirement. This was reported under AEP reference number: 340863.
- The first of the bi-monthly routine audits was performed on June 7, the second audit was performed on June 21.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.
- Upon arrival onsite on July 11 for the first of the bi-monthly routine audits, the technician observed that the TEOM unit had no flow. Data was discarded back to the last valid audit check, which was on June 21 which resulted in 228 hours of downtime.
- 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. Twenty-six 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 99.9%, equivalent to 1 hour of downtime.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered after several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The quarterly audit was performed on June 21.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Over 15 minutes of data at hour 12:00 on June 12 were missing and could not be recovered despite several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

With the exception of PM2.5, the operational time for each monitoring analyzer, meteorological system and data acquisition system was above the 90% requirement, in accordance with the Alberta Air Monitoring Directive (AMD, 2016). The equipment uptime for PM2.5 was 64.7% (254 hours of downtime), and this contravention was reported to AEP under reference number 340863. Upon arrival onsite on July 11, the technician observed that the TEOM unit had no flow. Data was discarded back to the last valid audit check, which was on June 21.

4.0 Calculations and Results

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

WS/WD/STDWD:

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

Summary of Hourly Wind Data Revised After Data Treatment							
Date	Time	Date	Time	Date	Time	Date	Time
01/06/2018	00:00	02/06/2018	23:00	05/06/2018	20:00	16/06/2018	20:00
01/06/2018	19:00	03/06/2018	00:00	05/06/2018	22:00	16/06/2018	21:00
01/06/2018	20:00	03/06/2018	01:00	06/06/2018	00:00	17/06/2018	05:00
01/06/2018	21:00	03/06/2018	02:00	07/06/2018	19:00	21/06/2018	03:00
01/06/2018	23:00	03/06/2018	04:00	13/06/2018	23:00	21/06/2018	07:00
02/06/2018	00:00	03/06/2018	05:00	14/06/2018	16:00	22/06/2018	05:00
02/06/2018	02:00	04/06/2018	18:00	14/06/2018	20:00	23/06/2018	21:00
02/06/2018	05:00	04/06/2018	19:00	15/06/2018	02:00	23/06/2018	20:00
02/06/2018	06:00	04/06/2018	20:00	15/06/2018	05:00	24/06/2018	04:00
02/06/2018	07:00	04/06/2018	21:00	16/06/2018	00:00	30/06/2018	00:00
02/06/2018	20:00	04/06/2018	22:00	16/06/2018	04:00	30/06/2018	05:00
02/06/2018	21:00	05/06/2018	03:00	16/06/2018	05:00	30/06/2018	18:00
02/06/2018	22:00	05/06/2018	04:00	16/06/2018	07:00		

5.0 Methods and Procedures

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

- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E 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 - Met One Unit
- Relative Humidity - Rotronic Hygroclip Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Rotronic Hygroclip Unit
- Precipitation - Met One Unit
- Datalogger - Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

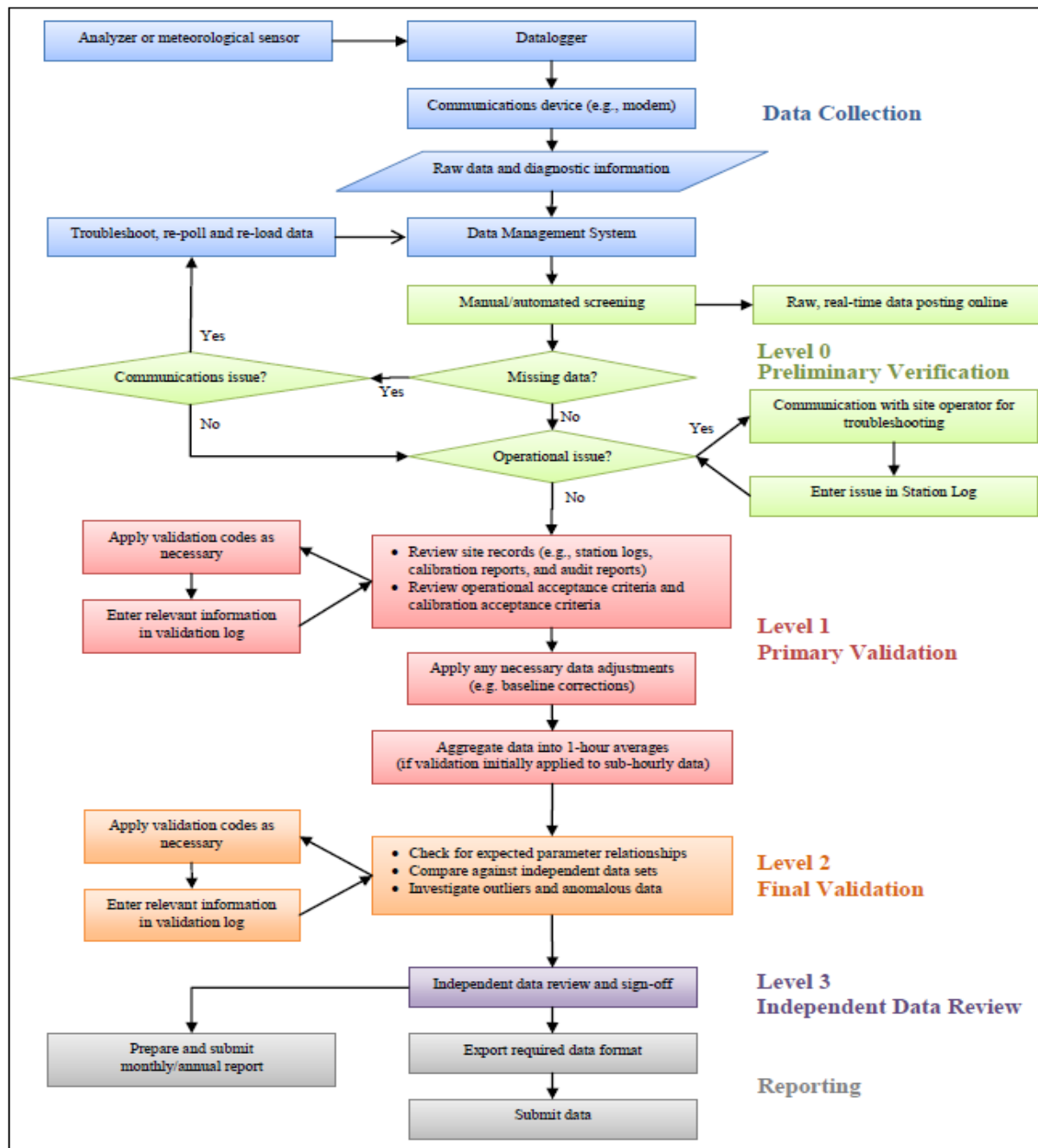
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



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

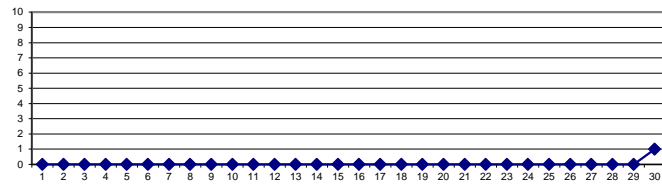
OBJECTIVE LIMIT:

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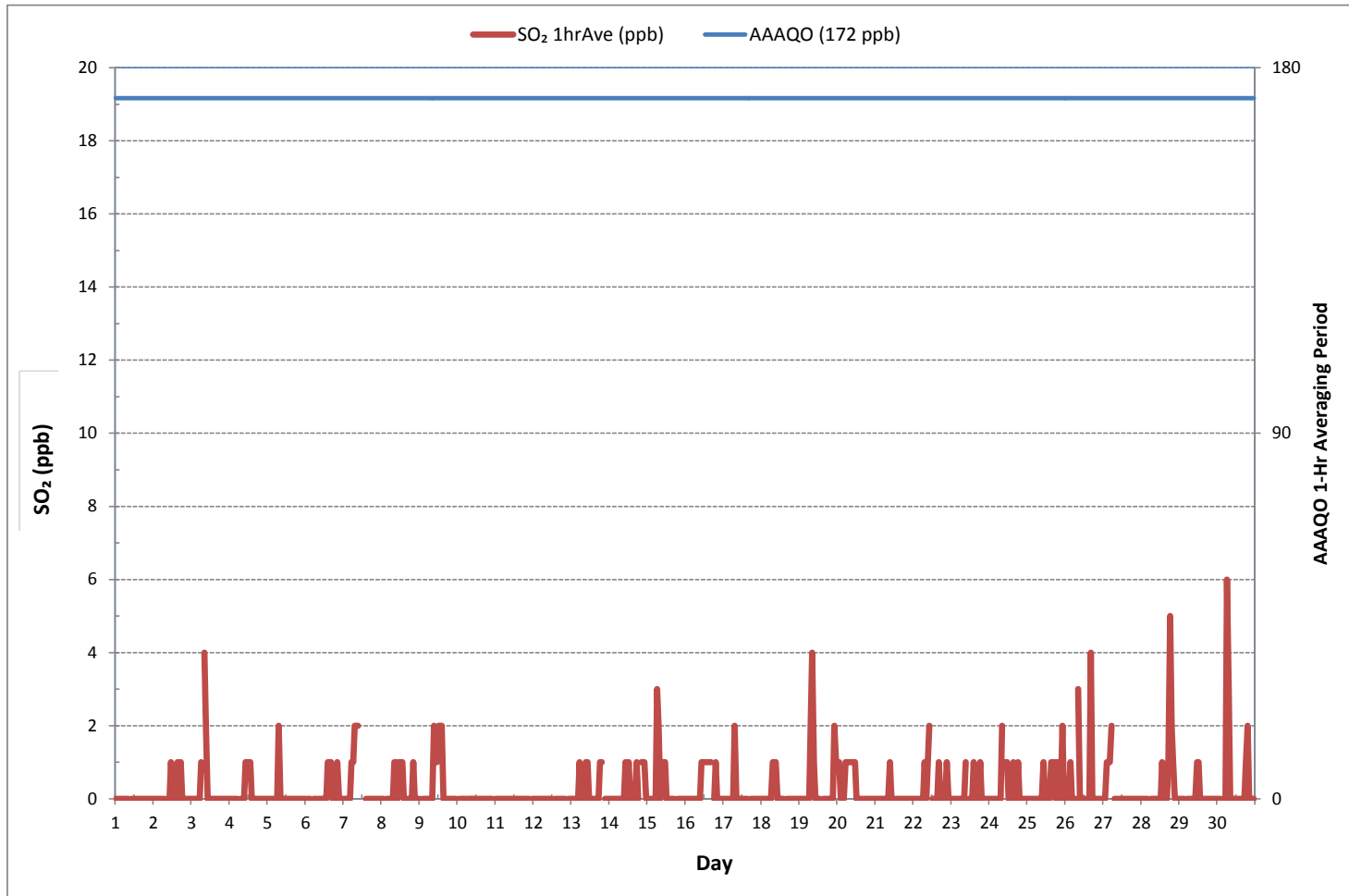
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	113		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	6 ppb @ HOUR	6 ON DAY	30
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	30
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES June 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO₂ [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

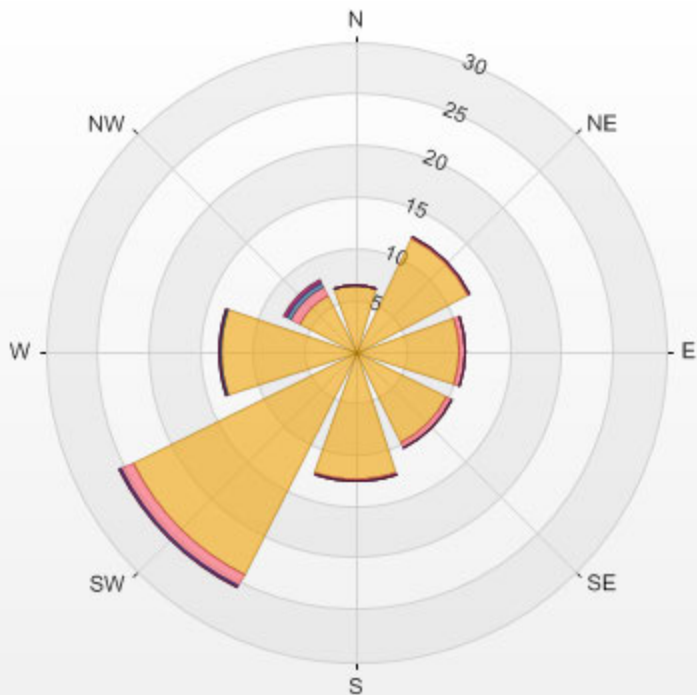
Calm: 0.58%

Calm Avg: 0.03 [ppb]

Direction	0.0-1.4	1.4-2.8	2.8-4.2	4.2-5.6	5.6-7.0	>7.0	Total
N	6.4	0.0	0.0	0.0	0.0	0.0	6.4
NE	12.3	0.2	0.0	0.0	0.0	0.0	12.4
E	10.1	0.6	0.0	0.0	0.0	0.0	10.7
SE	9.9	0.4	0.2	0.0	0.0	0.0	10.5
S	12.4	0.2	0.0	0.0	0.0	0.0	12.6
SW	24.1	1.3	0.0	0.2	0.0	0.0	25.6
W	13.2	0.0	0.2	0.0	0.0	0.0	13.3
NW	6.1	1.0	0.3	0.3	0.2	0.0	7.9
Summary	94.6	3.7	0.6	0.4	0.2	0.0	99.4

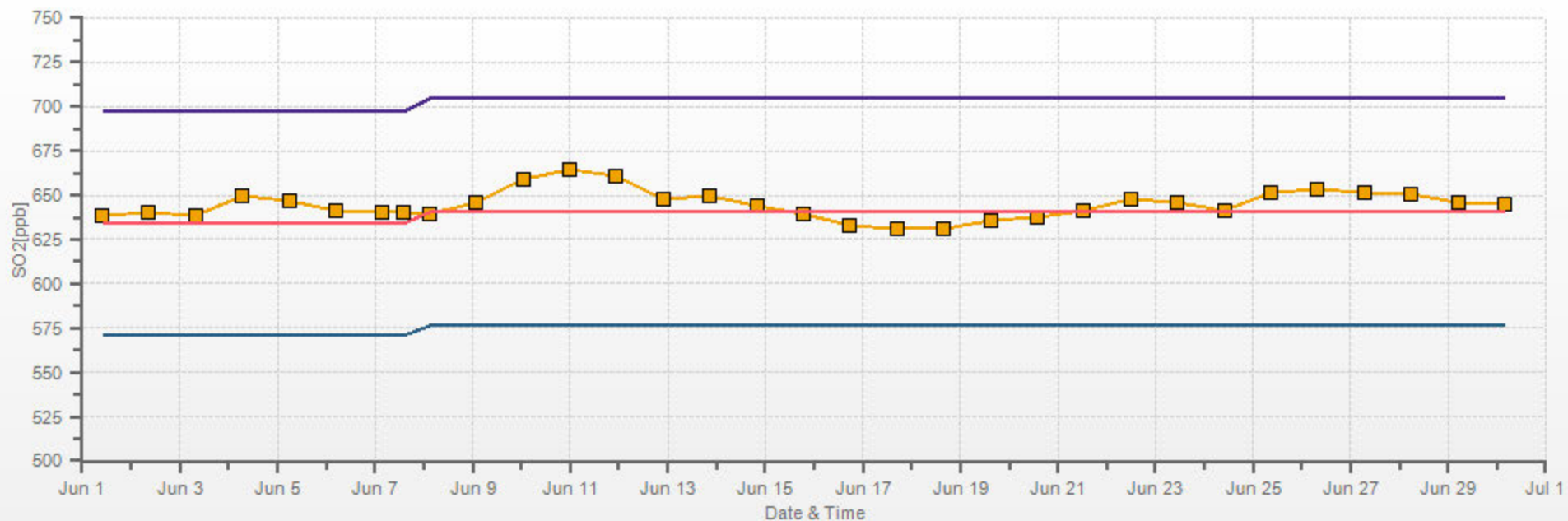
% Icon Classes (ppb) 95 0.0-1.4 4 1.4-2.8 1 2.8-4.2 0 4.2-5.6 0 5.6-7.0 0 >7.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.58% Calm Poll Avg: 0.03[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/06 Type: Span

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



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

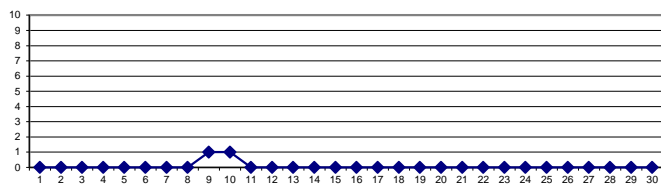
OBJECTIVE LIMIT:

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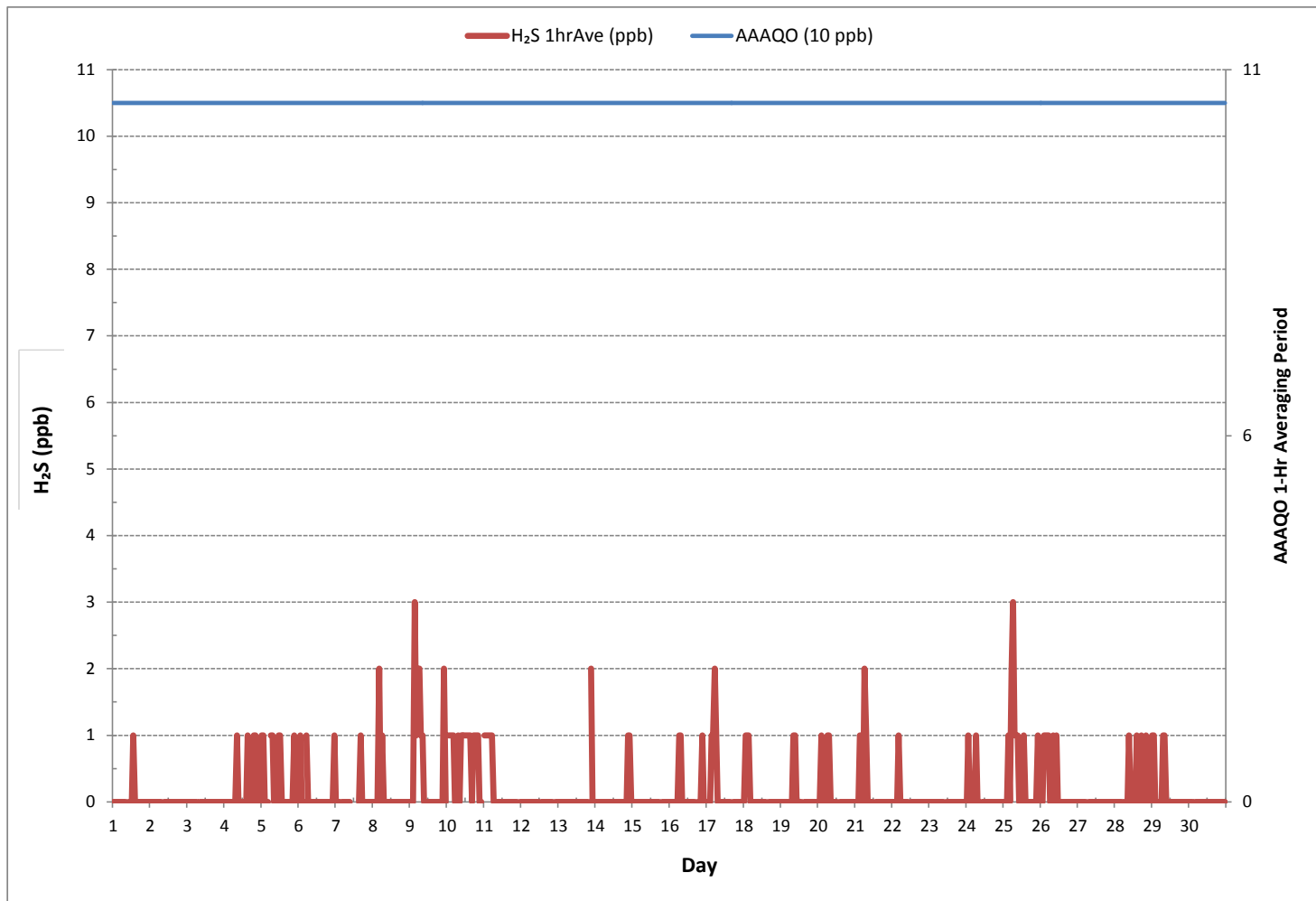
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	93		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	3 ON DAY	9
MAXIMUM 24-HR AVERAGE:	1 ppb	1 ON DAY	9
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES June 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-H₂S [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.59%

Calm Avg: 0.40 [ppb]

Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	6.4	0.0	0.0	0.0	6.4
NE	12.3	0.2	0.0	0.0	12.5
E	10.3	0.4	0.0	0.0	10.7
SE	9.7	0.6	0.2	0.0	10.4
S	12.6	0.0	0.0	0.0	12.6
SW	25.6	0.0	0.0	0.0	25.6
W	13.2	0.2	0.0	0.0	13.3
NW	7.9	0.0	0.0	0.0	7.9
Summary	98.0	1.3	0.2	0.0	99.4

% Icon Classes (ppb)

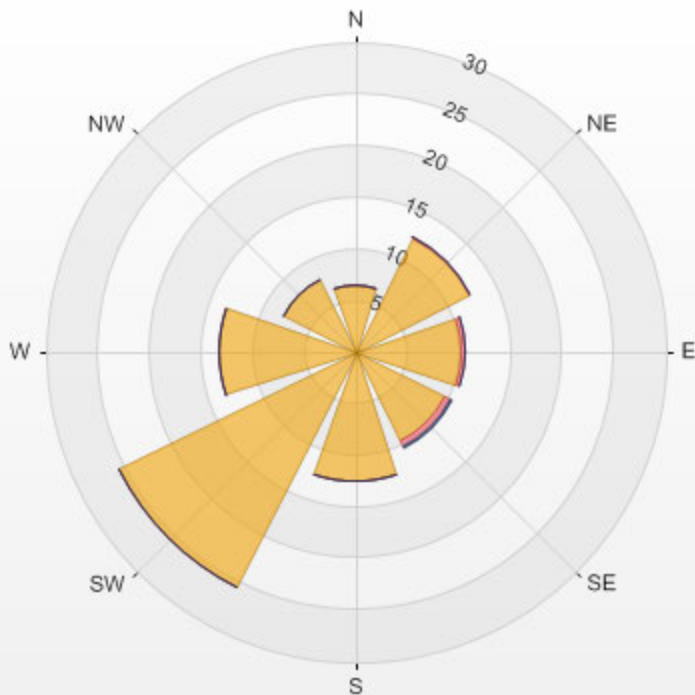
98 0.0-1.3

1 1.3-2.7

0 2.7-4.0

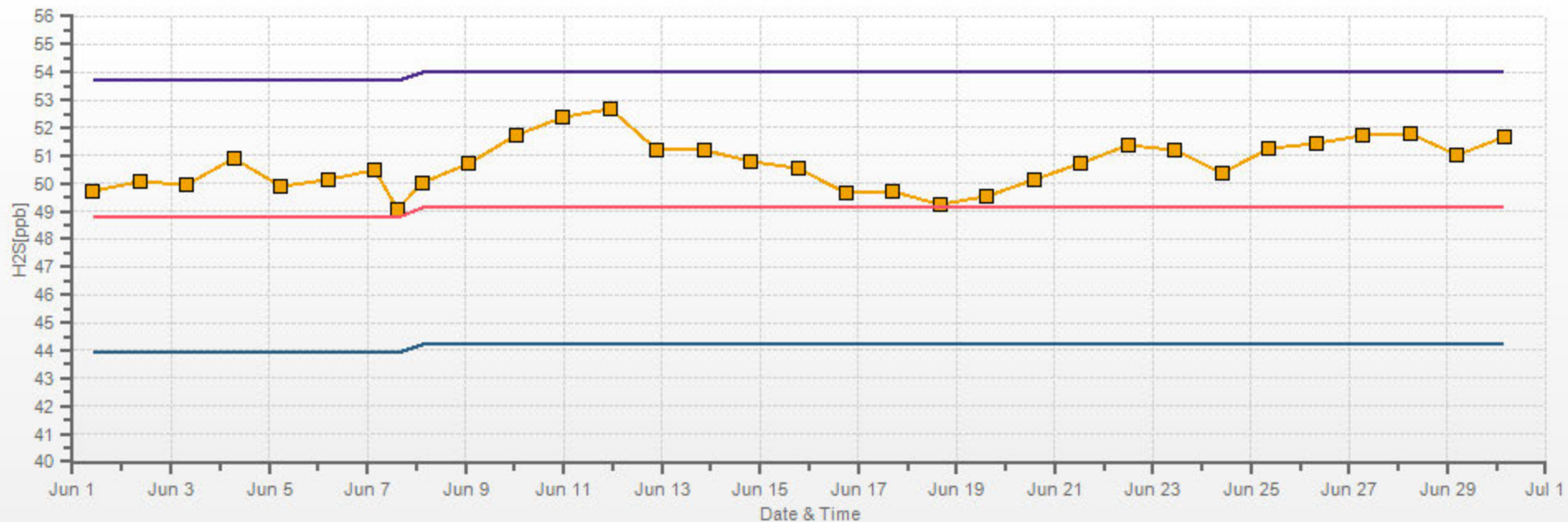
0 >4.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.59% Calm Poll Avg: 0.40[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



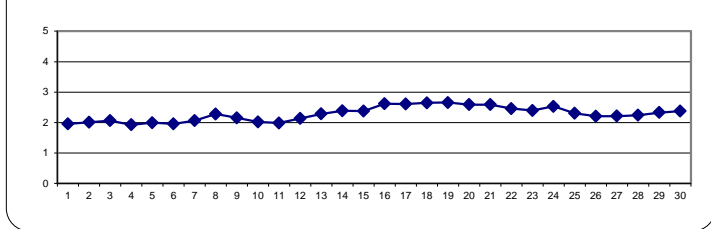
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.02	2.01	2.00	2.01	2.00	1.99	1.99	1.98	1.96	S	1.92	1.91	1.92	1.92	1.92	1.93	1.94	1.93	1.92	1.95	1.96	1.96	1.97	1.96	1.91	2.02	1.96	24	
2	2.02	2.11	2.02	2.00	1.99	2.11	2.21	2.05	S	2.01	1.99	1.98	1.93	1.93	1.96	1.99	1.93	1.97	1.95	1.96	1.94	1.95	2.17	2.09	1.93	2.21	2.01	24	
3	2.16	2.13	2.25	2.17	2.09	2.11	2.81	S	2.09	2.00	2.00	2.00	1.99	1.98	1.99	1.98	1.96	1.97	1.96	1.95	1.96	1.95	1.96	1.98	1.97	1.95	2.81	2.06	24
4	1.96	1.94	1.93	1.93	1.93	1.93	S	1.89	1.86	1.89	1.92	1.90	1.89	1.89	1.89	1.88	1.88	1.87	1.89	1.88	1.92	2.03	2.10	2.08	1.86	2.10	1.93	24	
5	2.05	2.06	2.04	2.05	2.10	S	2.08	2.02	1.92	1.90	1.87	1.89	1.96	1.87	1.88	1.89	1.92	1.90	1.91	1.91	1.92	1.95	2.07	2.71	1.87	2.71	1.99	24	
6	2.32	2.21	2.03	1.99	S	1.98	1.95	1.92	1.90	1.88	1.87	1.85	1.87	1.90	1.92	1.91	1.91	1.91	1.91	1.91	1.93	1.97	2.02	2.02	1.85	2.32	1.96	24	
7	2.02	2.04	2.06	S	2.08	2.07	2.10	1.96	1.95	1.94	1.93	1.93	1.89	1.88	C	C	C	C	C	C	C	2.34	2.31	2.30	2.31	1.88	2.34	2.07	24
8	2.30	2.29	S	2.31	2.37	2.37	2.31	2.33	2.35	2.33	2.32	2.32	2.29	2.28	2.25	2.21	2.23	2.25	2.26	2.21	2.24	2.20	2.19	2.19	2.19	2.37	2.28	24	
9	2.20	S	2.18	2.26	2.24	2.20	2.19	2.18	2.18	2.19	2.19	2.22	2.18	2.17	2.16	2.13	2.11	2.19	2.07	2.02	2.05	2.07	2.09	2.10	2.02	2.26	2.16	24	
10	S	2.02	2.05	2.08	2.06	2.08	2.01	2.04	2.01	2.04	2.00	2.03	2.03	1.97	1.96	1.98	2.01	2.03	1.96	1.97	2.00	2.05	2.05	S	1.96	2.08	2.02	24	
11	2.00	2.00	1.98	1.96	1.96	1.96	1.98	1.98	1.93	1.95	1.97	1.95	1.94	C1	C1	C1	C1	C1	C1	2.02	2.02	2.05	2.06	S	2.04	1.93	2.06	1.99	19
12	2.05	2.05	2.05	2.06	2.06	2.07	2.08	2.08	2.05	2.06	2.07	2.11	X	2.19	2.19	2.23	2.23	2.23	2.23	2.23	2.23	2.22	S	2.21	2.24	2.05	2.24	2.14	23
13	2.26	2.30	2.34	2.39	2.35	2.35	2.31	2.30	2.33	2.32	2.27	2.25	2.25	2.26	2.25	2.24	2.24	2.20	2.21	2.24	S	2.28	2.30	2.27	2.20	2.39	2.28	24	
14	2.35	2.42	2.57	2.67	2.42	2.34	2.32	2.31	2.28	2.24	2.27	2.28	2.30	2.34	2.32	2.32	2.28	2.29	2.31	S	2.38	2.70	2.80	2.36	2.24	2.80	2.39	24	
15	2.28	2.30	2.39	2.44	2.39	2.37	2.43	2.35	2.29	2.33	2.34	2.35	2.35	2.36	2.32	2.38	2.39	2.35	S	2.34	2.37	2.47	2.49	2.60	2.28	2.60	2.38	24	
16	2.63	2.62	2.96	2.64	2.68	2.72	3.17	2.96	2.52	2.48	2.52	2.49	2.51	2.46	2.48	2.48	2.49	S	2.47	2.50	2.50	2.54	2.70	2.65	2.46	3.17	2.62	24	
17	2.57	2.58	2.62	2.83	2.92	2.98	2.94	2.74	2.62	2.57	2.61	2.53	2.52	2.49	2.50	2.49	S	2.48	2.48	2.49	2.47	2.50	2.54	2.58	2.47	2.98	2.61	24	
18	2.73	2.80	2.79	2.95	2.85	2.82	2.68	2.65	2.71	2.72	2.62	2.55	2.54	2.52	2.52	S	2.53	2.54	2.54	2.53	2.53	2.58	2.58	2.58	2.52	2.95	2.65	24	
19	2.63	2.72	2.79	2.79	3.02	2.95	2.72	2.77	2.93	2.85	2.61	2.58	2.52	2.53	S	2.48	2.50	2.49	2.51	2.52	2.54	2.53	2.55	2.60	2.48	3.02	2.66	24	
20	2.60	2.68	2.81	2.79	2.70	2.71	2.88	2.80	2.61	2.53	2.52	2.53	2.47	S	2.47	2.48	2.47	2.46	2.46	2.47	2.48	2.51	2.58	2.56	2.46	2.88	2.59	24	
21	2.67	2.98	2.91	2.83	2.97	2.96	2.90	2.73	2.56	2.47	2.42	2.39	S	2.43	2.42	2.39	2.40	2.40	2.39	2.41	2.42	2.43	2.45	2.56	2.39	2.98	2.59	24	
22	2.82	2.58	2.62	2.75	2.69	2.73	2.55	2.51	2.43	2.37	2.34	S	2.35	2.32	2.28	2.28	2.31	2.34	2.34	2.35	2.41	2.40	2.39	2.39	2.28	2.82	2.46	24	
23	2.38	2.38	2.43	2.48	2.52	2.46	2.38	2.37	2.38	2.37	S	2.33	2.31	2.31	2.33	2.35	2.40	2.39	2.36	2.38	2.38	2.43	2.58	2.37	2.31	2.58	2.39	24	
24	2.42	2.54	2.60	2.51	2.53	2.63	2.69	2.77	2.73	S	2.63	2.65	2.56	2.47	2.42	2.41	2.43	2.43	2.44	2.46	2.45	2.46	2.48	2.47	2.41	2.77	2.53	24	
25	2.49	2.53	2.56	2.58	2.53	2.54	2.55	2.49	S	2.33	2.23	2.20	2.21	2.19	2.18	2.18	2.18	2.16	2.16	2.13	2.11	2.13	2.13	2.12	2.11	2.58	2.30	24	
26	2.23	2.23	2.23	2.24	2.18	2.18	2.27	S	2.16	2.11	2.13	2.16	2.22	2.20	2.21	2.21	2.18	2.16	2.19	2.25	2.20	2.21	2.28	2.33	2.11	2.33	2.21	24	
27	2.37	2.33	2.34	2.34	2.35	2.34	S	2.28	2.21	2.17	2.17	2.13	2.16	2.14	2.15	2.16	2.16	2.16	2.15	2.15	2.16	2.16	2.14	2.17	2.17	2.14	2.37	2.21	24
28	2.17	2.19	2.19	2.19	2.31	S	2.23	2.21	2.17	2.19	2.19	2.23	2.21	2.22	2.23	2.24	2.24	2.24	2.28	2.26	2.25	2.25	2.32	2.47	2.17	2.47	2.24	24	
29	2.41	2.41	2.39	2.41	S	2.45	2.44	2.30	2.36	2.29	2.29	2.27	2.31	2.31	2.31	2.29	2.27	2.30	2.31	2.30	2.32	2.30	2.25	2.27	2.25	2.45	2.33	24	
30	2.38	2.53	2.59	S	2.72	2.76	2.52	2.30	2.30	2.33	2.35	2.31	2.30	2.29	2.28	2.28	2.27	2.24	2.25	2.26	2.30	2.35	2.32	2.32	2.24	2.76	2.37	24	
HOURLY MAX	2.82	2.98	2.96	2.95	3.02	2.98	3.17	2.96	2.93	2.85	2.63	2.65	2.56	2.53	2.52	2.49	2.53	2.54	2.54	2.53	2.54	2.70	2.80	2.71					
HOURLY AVG	2.33	2.34	2.37	2.38	2.39	2.40	2.42	2.33	2.28	2.25	2.23	2.22	2.21	2.21	2.22	2.21	2.22	2.22	2.21	2.22	2.23	2.27	2.31	2.32					

STATUS FLAG CODES

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

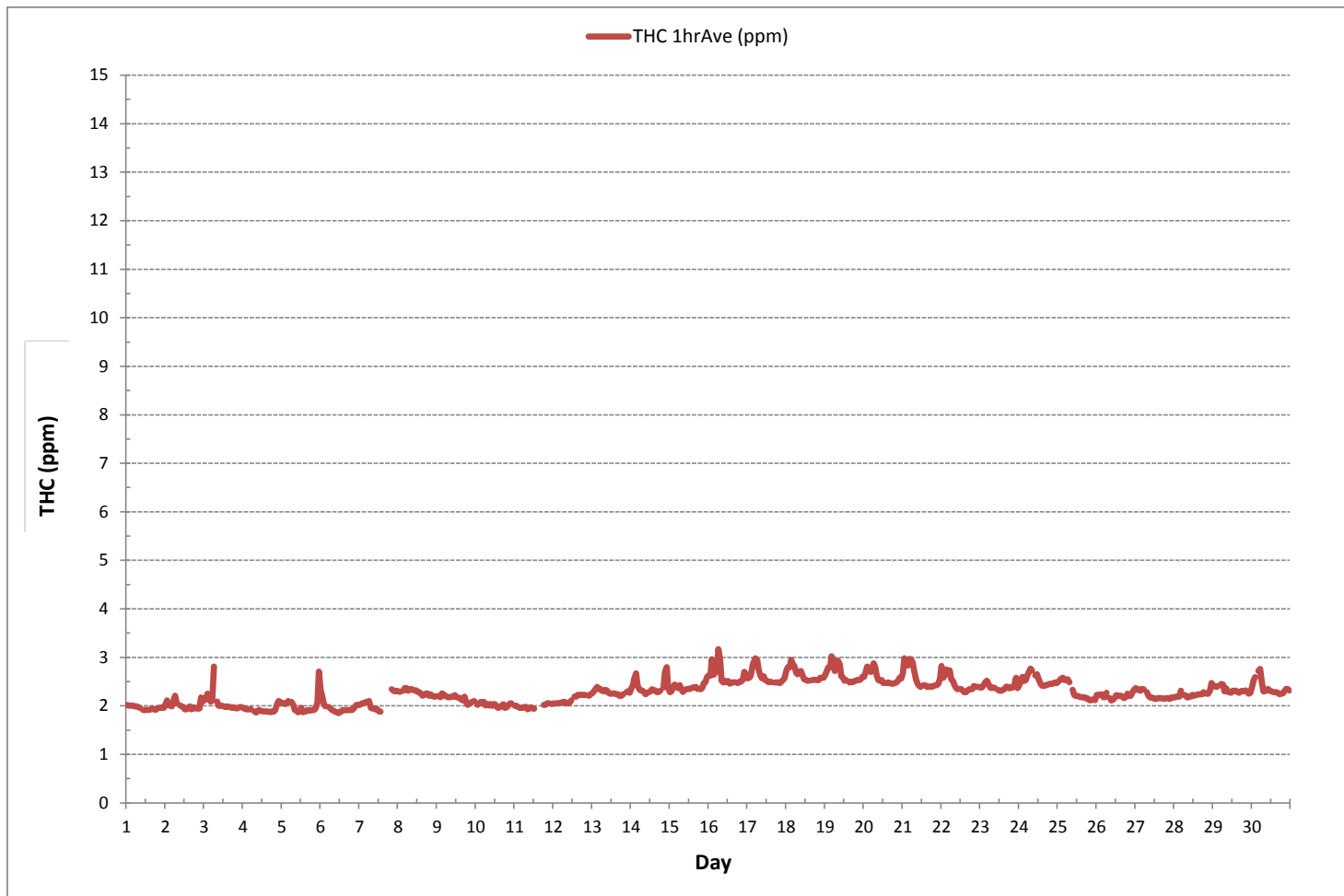
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	677			
MINIMUM 1-HR AVERAGE:	1.85 ppm	@ HOUR	11	ON DAY 6
MAXIMUM 1-HR AVERAGE:	3.17 ppm	@ HOUR	6	ON DAY 16
MAXIMUM 24-HR AVERAGE:	2.66 ppm			ON DAY 19
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	714	hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	99.2	%
STANDARD DEVIATION:	0.26	MONTHLY AVERAGE:	2.28	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



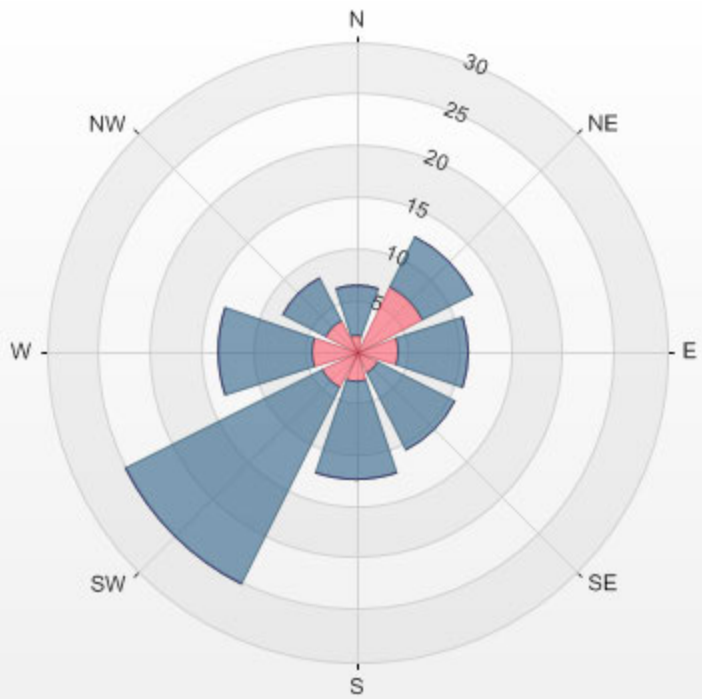
Wind: LICA MASKWA
Poll.: LICA MASKWA-THC [ppm]
Monthly: 18/06
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.59% Calm Avg: 2.50 [ppm]

Direction	0.0-1.1	1.1-2.1	2.1-3.2	>3.2	Total
N	0.0	1.6	4.9	0.0	6.5
NE	0.0	7.1	5.5	0.0	12.6
E	0.0	4.1	6.7	0.0	10.8
SE	0.0	2.4	8.3	0.0	10.6
S	0.0	3.0	9.5	0.0	12.4
SW	0.0	3.8	21.3	0.0	25.1
W	0.0	4.4	9.0	0.0	13.4
NW	0.0	3.4	4.6	0.0	8.0
Summary	0.0	29.8	69.6	0.0	99.4

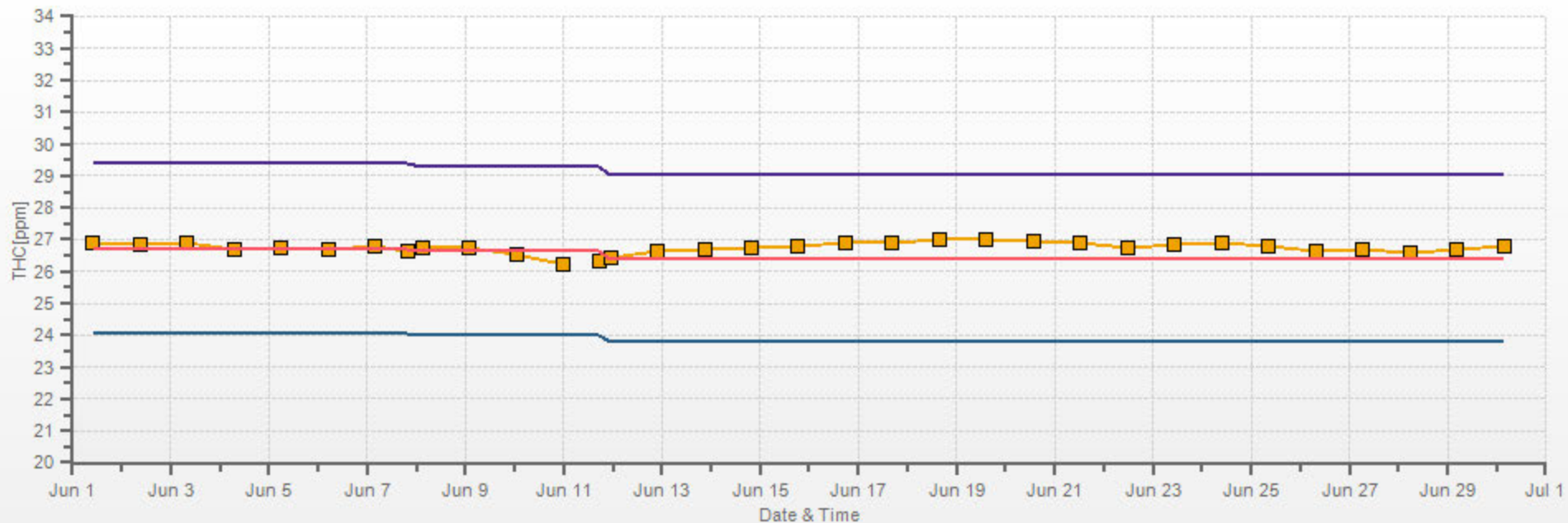
% Icon	Classes (ppm)	0	0.0-1.1	30	1.1-2.1	70	2.1-3.2	0	>3.2
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LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.59% Calm Poll Avg: 2.50[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/06 Type: Span

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



OXIDES OF NITROGEN



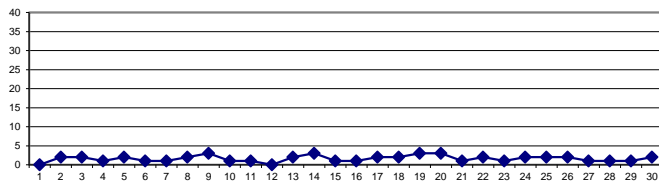
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

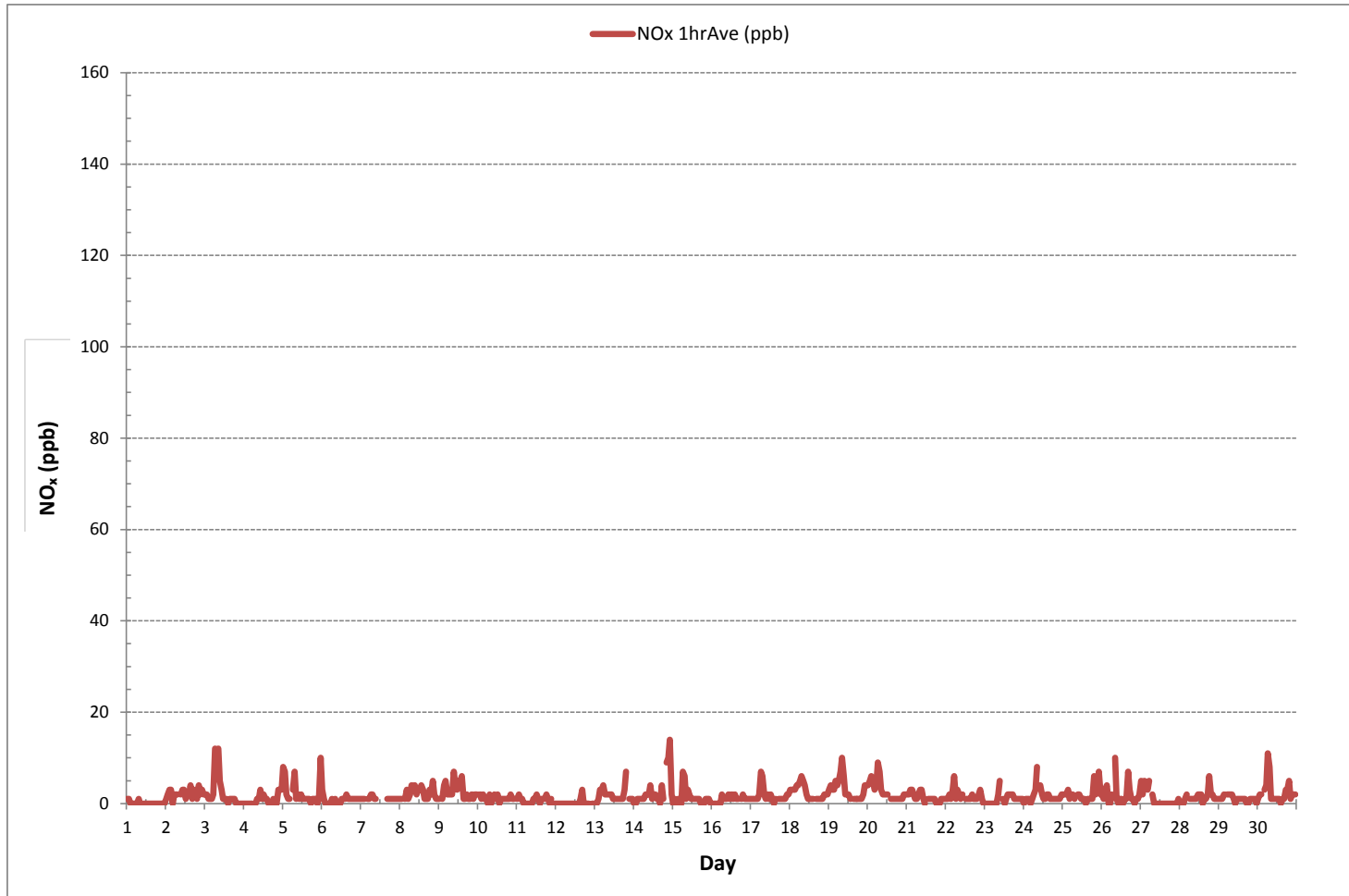
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	538			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	2	ON DAY 1
MAXIMUM 1-HR AVERAGE:	14 ppb	@ HOUR	22	ON DAY 14
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 9
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	2	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



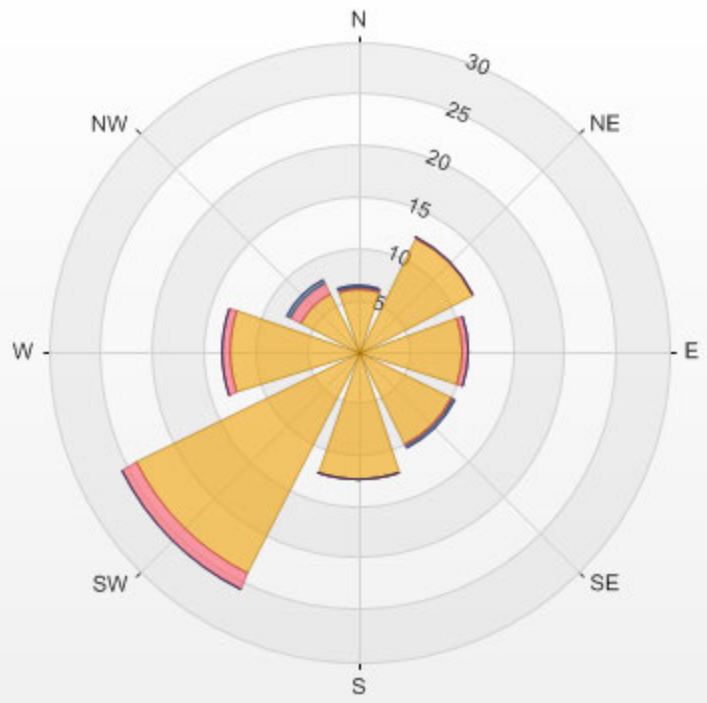
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO_x [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.59% Calm Avg: 1.49 [ppb]

Direction	0.0-5.0	5.0-10.0	10.0-15.0	>15.0	Total
N	6.2	0.2	0.2	0.0	6.5
NE	12.3	0.2	0.0	0.0	12.5
E	10.1	0.6	0.0	0.0	10.7
SE	10.1	0.2	0.2	0.0	10.4
S	12.3	0.2	0.0	0.0	12.5
SW	24.1	1.6	0.0	0.0	25.7
W	12.5	0.9	0.0	0.0	13.3
NW	6.3	1.2	0.4	0.0	7.9
Summary	93.9	4.9	0.7	0.0	99.4

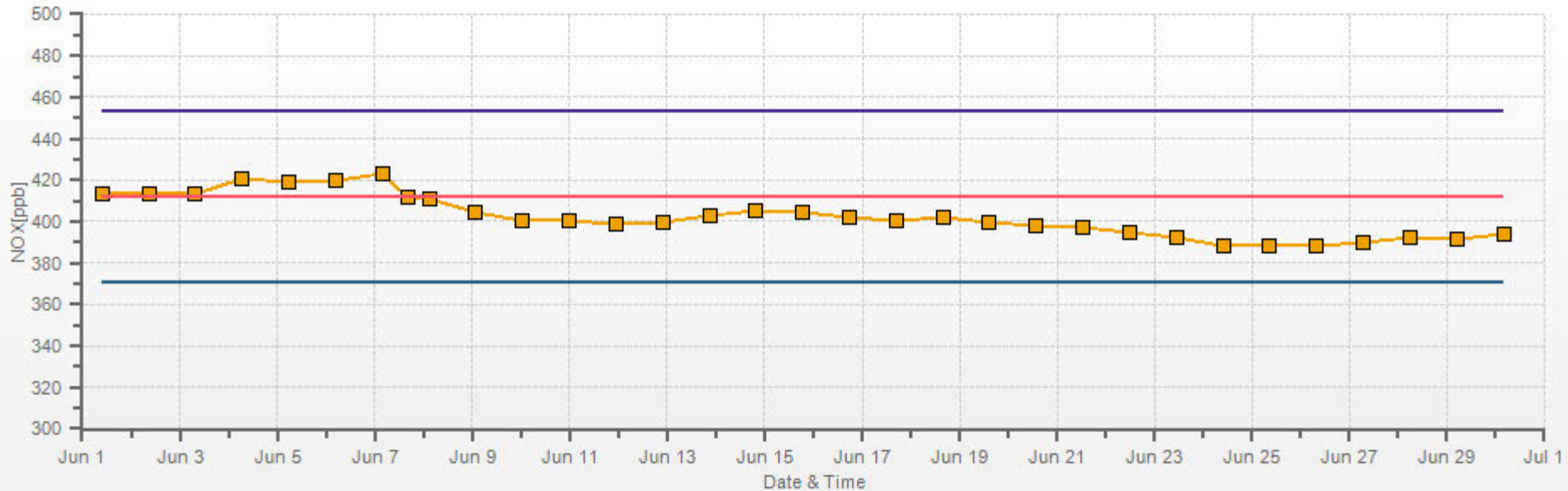
% Icon Classes (ppb) 94 0.0-5.0 5 5.0-10.0 1 10.0-15.0 0 >15.0

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.59% Calm Poll Avg: 1.49[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

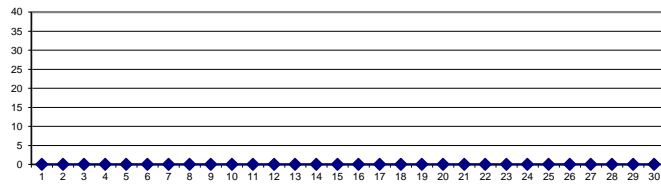
NITRIC OXIDE Hourly Averages (NO ppb)

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

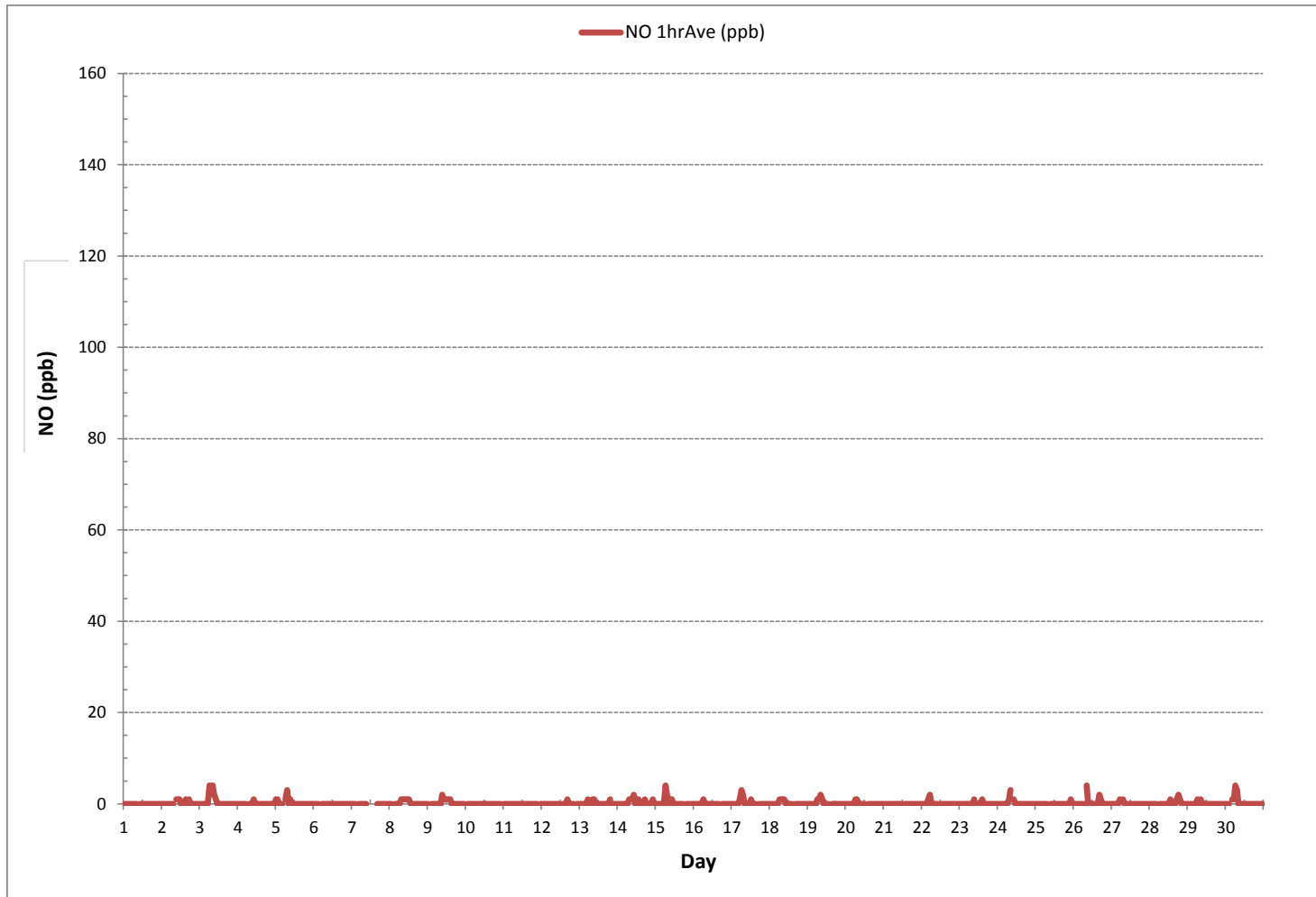
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	82		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	4 ppb	@ HOUR	6 ON DAY 3
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY 1
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb





NITRIC OXIDE Hourly Averages (NO ppb)



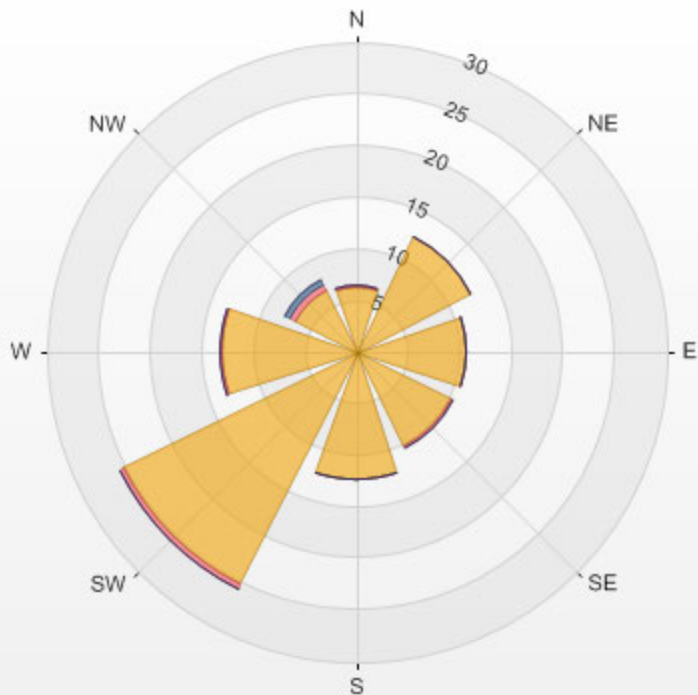
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO [ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.59% Calm Avg: 0.03 [ppb]

Direction	0.0-1.7	1.7-3.3	3.3-5.0	>5.0	Total
N	6.3	0.2	0.0	0.0	6.5
NE	12.5	0.0	0.0	0.0	12.5
E	10.6	0.2	0.0	0.0	10.7
SE	10.3	0.2	0.0	0.0	10.4
S	12.5	0.0	0.0	0.0	12.5
SW	25.2	0.4	0.0	0.0	25.7
W	13.1	0.3	0.0	0.0	13.3
NW	6.7	0.4	0.7	0.0	7.9
Summary	97.1	1.6	0.7	0.0	99.4

% Icon	Classes (ppb)	97	 0.0-1.7	2	 1.7-3.3	1	 3.3-5.0	0	 >5.0
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LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.59% Calm Poll Avg: 0.03[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

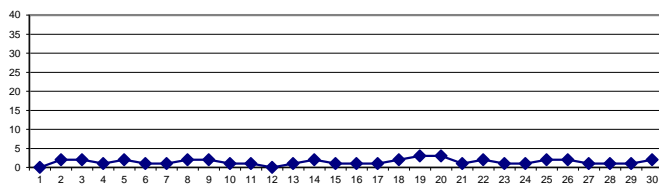
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

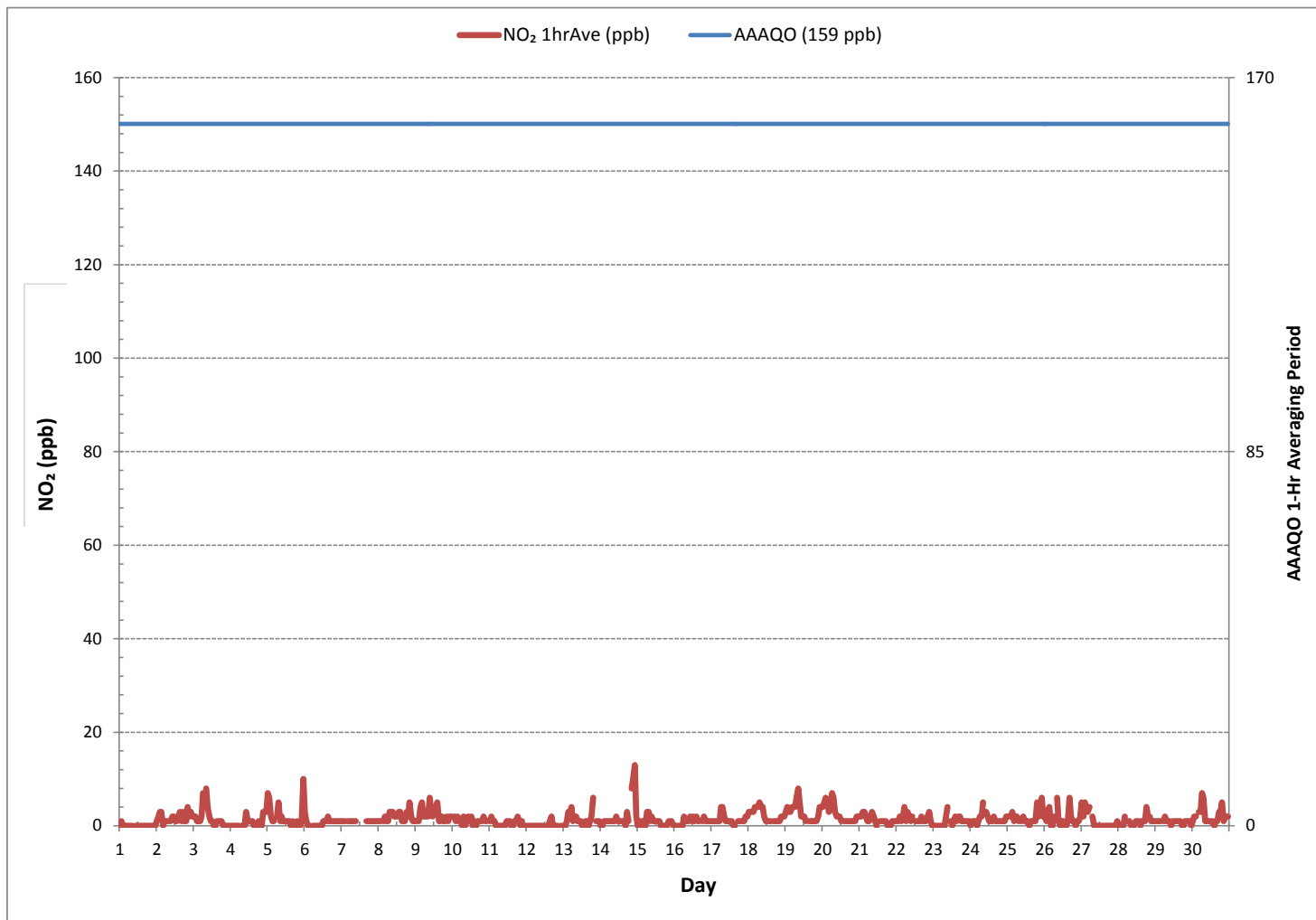
NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	515			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	2	ON DAY
MAXIMUM 1-HR AVERAGE:	13	ppb @ HOUR	22	ON DAY
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	719
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	99.9
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	1
				ppb

24 HR AVERAGES June 2018





NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Wind: LICA MASKWA
Poll.: LICA MASKWA-NO₂ [ppb]
Monthly: 18/06
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.59%

Calm Avg: 1.47 [ppb]

Direction	0.0-4.7	4.7-9.3	9.3-14.0	>14.0	Total
N	6.3	0.0	0.2	0.0	6.5
NE	12.5	0.0	0.0	0.0	12.5
E	10.4	0.3	0.0	0.0	10.7
SE	10.1	0.2	0.2	0.0	10.4
S	12.5	0.0	0.0	0.0	12.5
SW	23.9	1.8	0.0	0.0	25.7
W	12.6	0.6	0.2	0.0	13.4
NW	7.0	0.9	0.0	0.0	7.9
Summary	95.3	3.7	0.5	0.0	99.4

% Icon Classes (ppb)

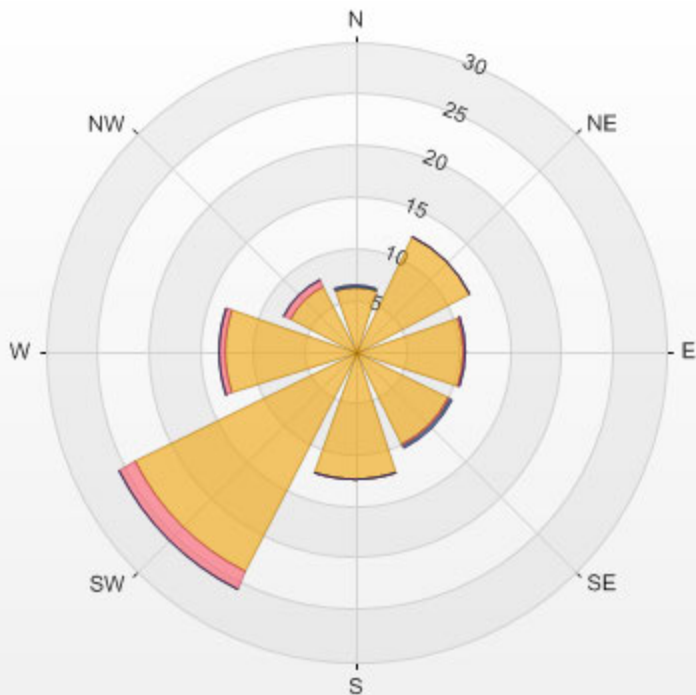
95 0.0-4.7

4 4.7-9.3

0 9.3-14.0

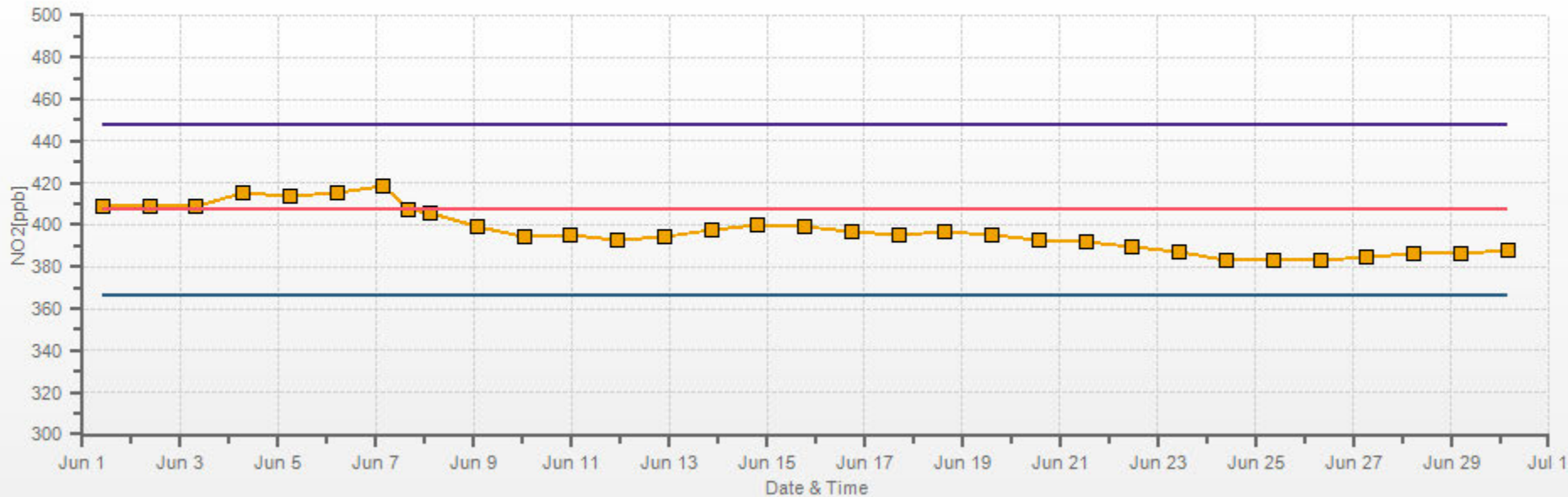
0 >14.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.59% Calm Poll Avg: 1.47[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/06 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	24	20	21	23	20	20	19	16	16	18	18	16	15	13	14	15	15	13	12	12	14	15	17	17	12	24	17	24
2	16	16	17	21	21	24	20	19	17	7	6	12	11	11	15	14	27	6	26	29	6	9	20	23	6	29	16	24
3	24	29	21	18	25	21	23	15	13	12	18	20	20	20	17	21	22	16	10	27	18	12	10	16	10	29	19	24
4	16	18	19	18	14	8	6	8	7	7	8	5	2	4	3	6	0	0	1	2	1	7	14	14	0	19	8	24
5	13	18	9	X	X	X	0	1	2	2	0	0	0	2	0	3	0	0	0	18	24	20	19	21	0	24	7	21
6	20	15	14	18	26	22	18	14	12	13	11	6	13	16	17	11	15	10	10	15	11	14	20	3	3	26	14	24
7	0	0	0	0	4	5	0	1	2	0	4	3	0	0	0	2	C	C	1	0	0	0	1	0	0	5	1	24
8	X	X	8	4	0	3	2	4	18	0	X	X	X	X	1	5	35	21	X	X	3	2	0	4	0	35	7	16
9	0	3	0	0	0	1	1	2	5	3	0	1	20	X	24	X	X	37	18	5	12	0	0	0	0	37	6	21
10	X	1	4	0	0	X	X	3	0	X	7	1	1	8	8	8	X	X	0	3	4	0	0	1	0	8	3	18
11	4	0	0	0	0	0	0	2	0	3	0	0	1	0	0	1	0	0	0	0	2	0	2	0	0	4	1	24
12	0	1	0	0	0	1	0	1	0	0	1	2	X	0	0	0	0	0	0	0	0	2	1	0	0	2	0	23
13	2	0	0	0	0	1	3	1	1	3	1	1	2	0	1	0	1	0	2	3	0	1	1	3	0	3	1	24
14	2	1	1	1	1	1	1	1	1	1	5	5	0	2	2	0	0	1	0	1	4	1	2	2	0	5	2	24
15	0	1	2	1	1	0	1	0	0	0	1	0	0	3	2	0	0	0	1	0	0	1	1	1	0	3	1	24
16	0	2	2	3	0	0	0	2	1	0	2	2	3	2	1	2	2	0	2	3	3	0	3	2	0	3	2	24
17	3	2	2	0	2	4	2	0	4	0	1	1	0	2	3	1	0	0	1	1	3	1	0	2	0	4	1	24
18	2	2	2	2	2	1	0	2	2	2	0	0	1	0	0	1	8	4	0	0	2	4	1	1	0	8	2	24
19	3	0	1	2	3	5	2	3	5	2	3	3	2	4	6	6	2	2	2	2	X	X	0	X	0	6	3	21
20	X	2	2	1	2	0	6	3	6	0	2	1	5	9	3	4	4	0	2	0	X	3	4	0	0	9	3	22
21	0	0	0	1	3	3	0	11	14	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	0	14	4	12
22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0
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	X	-	-	0
28	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
29	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
30	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
HOURLY MAX	24	29	21	23	26	24	23	19	18	18	18	20	20	20	24	21	35	37	26	29	24	20	20	23				
HOURLY AVG	7	7	6	6	6	6	5	5	6	4	5	4	5	5	6	5	8	6	5	6	6	5	6	6				

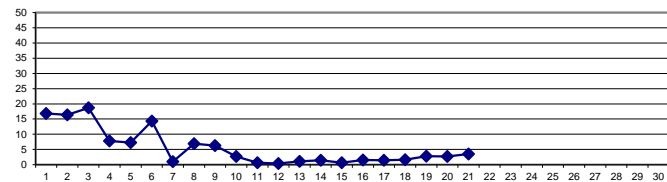
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 80 µg/m³ 24-HR 30 µg/m³

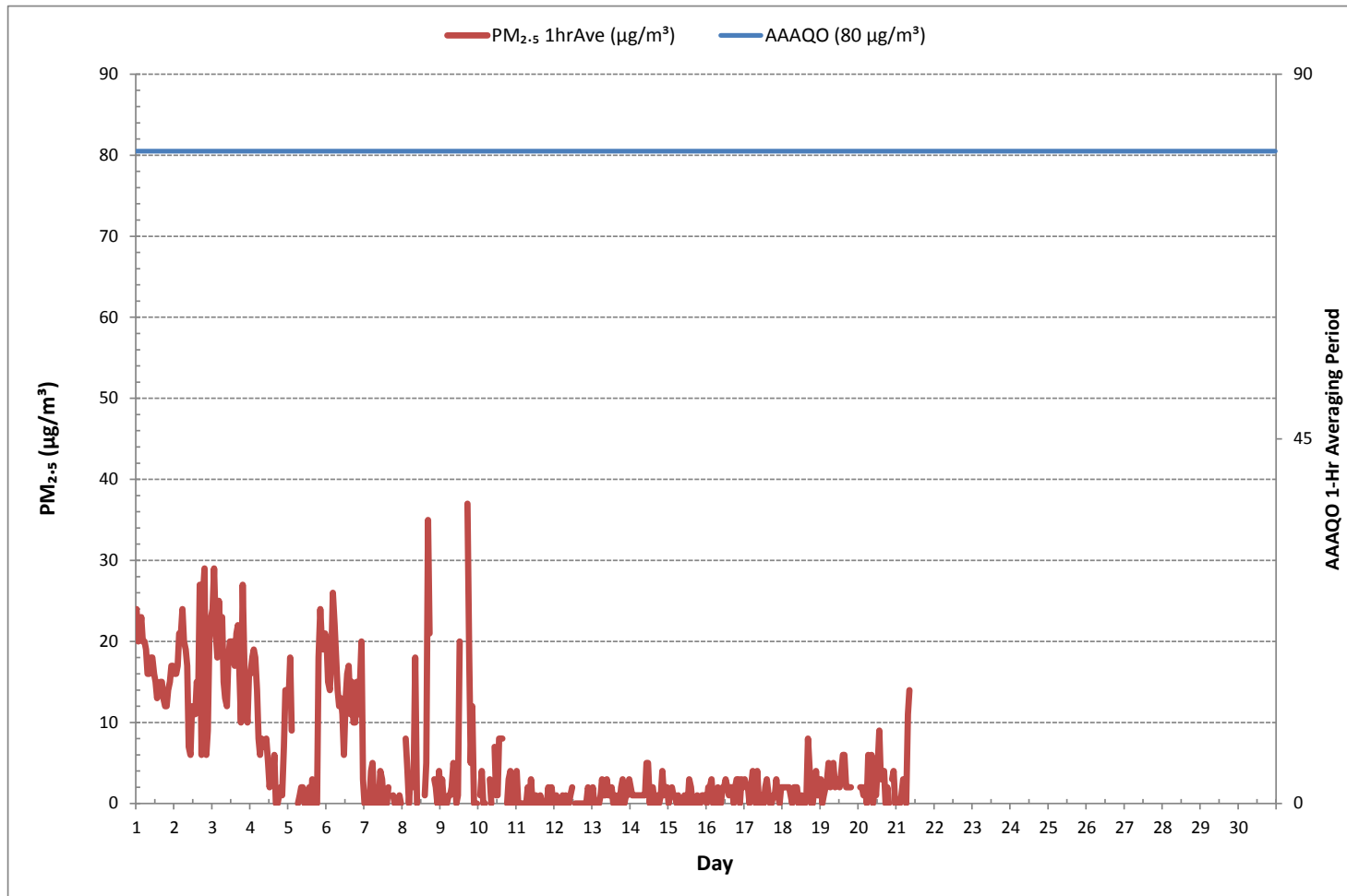
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	332			
MINIMUM 1-HR AVERAGE:	0 µg/m ³	@ HOUR	16	ON DAY
MAXIMUM 1-HR AVERAGE:	37 µg/m ³	@ HOUR	17	ON DAY
MAXIMUM 24-HR AVERAGE:	19 µg/m ³			ON DAY
MONTHLY CALIBRATION TIME:	5	hrs	OPERATIONAL TIME:	466
STANDARD DEVIATION:	8		AMD OPERATION UPTIME:	64.7
			MONTHLY AVERAGE:	6 µg/m ³

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



Wind: LICA MASKWA
 Poll.: LICA MASKWA-PM2.5[ug/m³]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

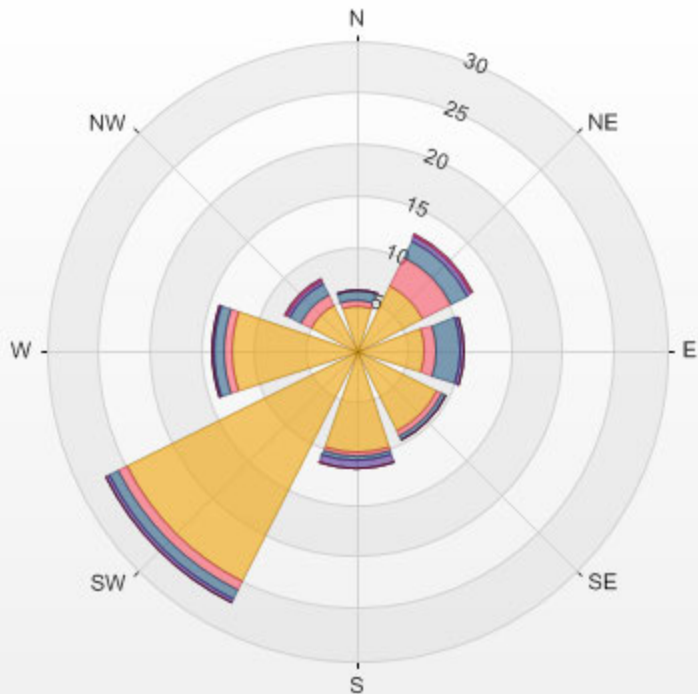
Calm: 0.63%

Calm Avg: 7.86 [ug/m³]

Direction	0.0-7.6	7.6-15.2	15.2-22.8	22.8-30.4	30.4-38.0	>38.0	Total
N	4.4	0.5	1.0	0.2	0.0	0.0	6.0
NE	7.1	3.2	1.7	0.5	0.2	0.0	12.6
E	6.6	1.1	2.4	0.3	0.0	0.0	10.4
SE	8.7	0.6	0.3	0.0	0.0	0.0	9.6
S	9.8	0.5	0.5	0.6	0.2	0.0	11.5
SW	24.9	1.0	1.0	0.5	0.0	0.0	27.3
W	12.2	0.8	1.0	0.2	0.0	0.0	14.1
NW	4.9	1.3	1.1	0.5	0.2	0.0	7.9
Summary	78.6	8.8	8.9	2.7	0.5	0.0	99.4

% Icon	Classes (ug/m3(L))	79	0.0-7.6	9	7.6-15.2	9	15.2-22.8	3	22.8-30.4	0	30.4-38.0	0	>38.0
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LICA MASKWA Poll.: LICA MASKWA-PM2.5 [ug/m³] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.63% Calm Poll Avg: 7.86[ug/m³]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	2.1	3.3	4.0	4.7	5.4	4.9	5.4	6.2	6.0	7.2	6.3	6.6	6.0	7.3	7.3	6.7	5.8	6.1	3.6	2.7	3.3	3.0	3.1	2.9	2.1	7.3	4.8	24
2	2.1	2.4	2.5	4.1	3.4	2.5	3.1	2.5	2.6	4.4	4.4	4.4	4.8	5.2	5.9	6.9	7.4	5.6	5.2	5.6	3.1	2.4	0.1	3.2	0.1	7.4	3.2	24
3	2.6	1.4	3.0	5.2	2.1	1.8	3.7	5.1	5.4	5.3	7.1	6.1	4.9	5.1	4.6	3.7	1.9	4.0	9.3	6.7	6.7	7.5	8.5	8.4	1.4	9.3	1.5	24
4	9.1	8.6	7.2	5.7	4.7	8.5	10.0	10.2	12.2	11.0	7.5	6.7	7.4	5.5	5.4	6.4	5.2	4.8	1.8	1.9	1.2	2.4	1.1	1.9	1.1	12.2	5.5	24
5	2.3	2.5	2.3	1.5	1.6	2.3	4.5	6.5	4.8	4.9	4.3	5.6	4.6	5.7	5.9	5.8	5.3	5.3	5.0	3.4	1.5	2.1	1.0	1.4	1.0	6.5	3.1	24
6	1.1	1.6	2.9	2.8	4.7	4.4	6.2	6.5	5.6	6.8	6.1	8.3	7.3	4.5	5.6	4.8	2.5	3.8	2.5	1.6	3.7	4.0	1.6	0.7	0.7	8.3	3.0	24
7	1.8	1.9	1.3	1.5	2.1	1.3	1.7	4.0	6.5	9.0	9.5	10.5	11.0	11.1	10.2	9.8	9.1	9.0	9.4	7.6	7.6	6.4	7.4	7.2	1.3	11.1	5.8	24
8	4.3	4.1	4.9	3.2	3.1	3.8	1.3	2.7	2.5	3.4	5.2	8.0	7.8	8.1	5.2	8.2	7.7	6.8	6.4	5.1	2.8	5.5	5.8	4.3	1.3	8.2	4.0	24
9	5.2	5.2	3.5	4.2	4.1	5.6	6.0	6.2	8.0	7.2	9.9	9.8	10.1	9.4	10.2	7.2	8.0	5.0	9.2	9.1	6.0	7.2	8.4	6.4	3.5	10.2	5.8	24
10	6.4	4.7	1.8	3.2	2.7	4.4	4.4	4.0	6.0	4.9	2.6	1.3	3.6	4.6	3.2	6.1	5.7	7.3	10.7	10.9	13.9	11.1	11.4	10.4	1.3	13.9	4.1	24
11	9.6	10.8	11.8	11.9	13.1	14.2	12.0	9.8	13.1	10.7	7.4	10.0	10.2	9.6	9.5	10.3	9.8	9.6	9.5	9.5	8.9	8.9	8.7	7.4	7.4	14.2	8.9	24
12	7.4	7.2	8.3	6.4	6.9	6.7	6.1	7.6	9.2	7.9	9.5	11.4	X	9.7	9.9	8.7	9.4	7.4	7.3	6.7	3.8	5.0	3.3	1.7	1.7	11.4	7.1	23
13	3.0	2.6	2.3	4.9	4.8	4.0	2.4	3.7	5.2	5.4	5.2	7.7	8.8	10.1	10.2	10.3	5.4	5.7	2.2	2.3	3.9	4.1	1.5	1.2	1.2	10.3	3.6	24
14	1.4	0.9	0.5	0.9	3.0	3.6	5.0	6.2	6.2	5.3	6.4	6.4	6.0	6.4	5.3	4.7	2.8	3.8	3.2	5.2	2.5	2.8	1.8	1.1	0.5	6.4	3.1	24
15	2.3	0.8	0.8	0.9	0.3	0.5	1.9	3.6	4.3	5.6	5.8	5.2	5.7	4.9	5.4	5.6	6.4	8.5	4.3	2.8	2.3	0.9	1.1	1.2	0.3	8.5	2.5	24
16	0.6	0.8	1.4	1.4	1.1	0.1	0.4	0.8	0.6	1.5	3.5	3.3	2.3	5.3	0.8	9.6	6.1	4.2	3.3	1.8	0.6	1.9	2.2	1.4	0.1	9.6	1.0	24
17	1.5	2.3	0.7	1.7	0.8	0.7	1.5	3.0	3.3	5.6	8.1	7.8	7.5	6.7	7.5	6.1	6.9	6.6	6.6	5.3	3.2	2.6	3.6	3.3	0.7	8.1	4.1	24
18	4.0	4.2	2.6	2.8	4.7	6.3	6.7	5.2	5.0	6.2	8.8	6.4	6.5	8.1	6.4	6.1	6.7	8.0	7.2	5.8	4.1	4.3	4.5	4.3	2.6	8.8	5.5	24
19	2.5	1.2	2.3	2.3	1.7	2.9	2.9	5.7	5.6	5.6	5.3	5.8	6.9	6.4	7.1	8.0	8.9	9.1	8.2	7.4	5.0	4.7	4.5	5.2	1.2	9.1	5.2	24
20	3.8	5.0	2.7	3.1	1.3	3.6	4.6	4.6	3.8	5.6	6.0	7.1	6.3	9.0	8.3	5.8	7.2	7.0	5.6	4.2	2.5	3.1	2.5	1.0	1.0	9.0	4.6	24
21	1.5	1.2	0.5	0.5	1.5	1.9	1.3	0.1	2.8	2.7	5.2	5.7	5.2	4.2	4.1	4.5	2.9	4.4	4.2	3.5	4.3	4.8	3.2	0.6	0.1	5.7	2.4	24
22	2.2	1.2	0.7	1.8	1.2	0.8	1.5	0.7	2.9	2.3	4.7	6.1	5.7	10.9	11.4	4.1	4.3	3.6	2.4	2.9	1.7	1.8	2.5	4.3	0.7	11.4	1.1	24
23	4.0	1.0	0.7	1.4	2.8	4.8	4.6	5.7	7.5	3.2	3.9	7.6	7.6	4.7	6.8	5.2	3.1	2.6	2.1	1.9	0.8	0.9	2.3	3.1	0.7	7.6	2.9	24
24	1.5	1.2	1.7	2.0	0.4	1.6	1.3	2.8	0.7	3.0	5.6	5.6	5.1	8.7	6.5	6.8	7.6	7.1	7.7	6.7	6.2	5.4	5.2	3.6	0.4	8.7	3.7	24
25	4.2	2.1	2.1	1.8	3.5	3.7	4.9	7.2	8.5	7.4	10.0	12.4	10.3	11.9	12.1	11.7	12.8	10.8	7.6	5.3	2.9	3.2	4.2	4.3	1.8	12.8	5.0	24
26	4.5	4.5	2.2	4.3	4.2	1.6	2.3	4.4	9.0	7.0	8.1	6.3	5.1	4.8	4.4	3.4	0.8	1.0	4.1	4.4	3.5	7.2	6.9	6.0	0.8	9.0	2.5	24
27	5.0	3.7	4.6	4.8	4.5	6.5	6.3	7.1	7.1	7.7	7.1	7.5	7.7	6.5	8.1	6.8	7.8	7.3	7.2	6.0	5.3	5.9	6.3	7.1	3.7	8.1	6.2	24
28	6.6	6.6	8.0	5.9	5.1	5.1	5.9	5.9	7.3	9.0	8.1	7.1	6.8	6.9	6.8	8.0	7.3	7.4	5.2	4.9	2.2	1.9	1.8	2.5	1.8	9.0	5.4	24
29	2.3	2.4	2.6	2.1	2.5	2.2	2.2	3.2	5.3	5.2	6.0	6.3	5.6	6.0	4.0	11.8	11.1	7.5	6.9	3.2	1.8	4.2	4.1	0.5	0.5	11.8	3.5	24
30	0.7	1.8	1.4	0.6	0.9	0.6	2.9	2.8	2.9	4.5	7.6	6.9	7.2	5.6	6.1	5.4	7.6	5.4	0.8	3.8	4.9	3.8	4.9	5.4	0.6	7.6	3.3	24
HOURLY MAX	9.6	10.8	11.8	11.9	13.1	14.2	12.0	10.2	13.1	11.0	10.0	12.4	11.0	11.9	12.1	11.8	12.8	10.8	10.7	10.9	13.9	11.1	11.4	10.4				

STATUS FLAG CODES

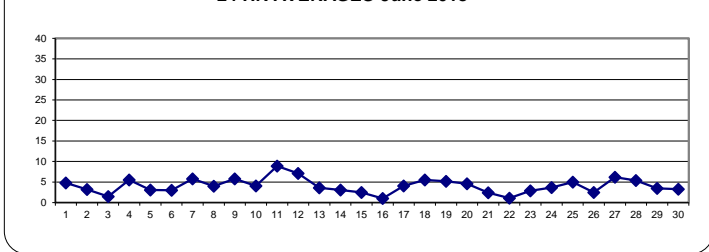
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

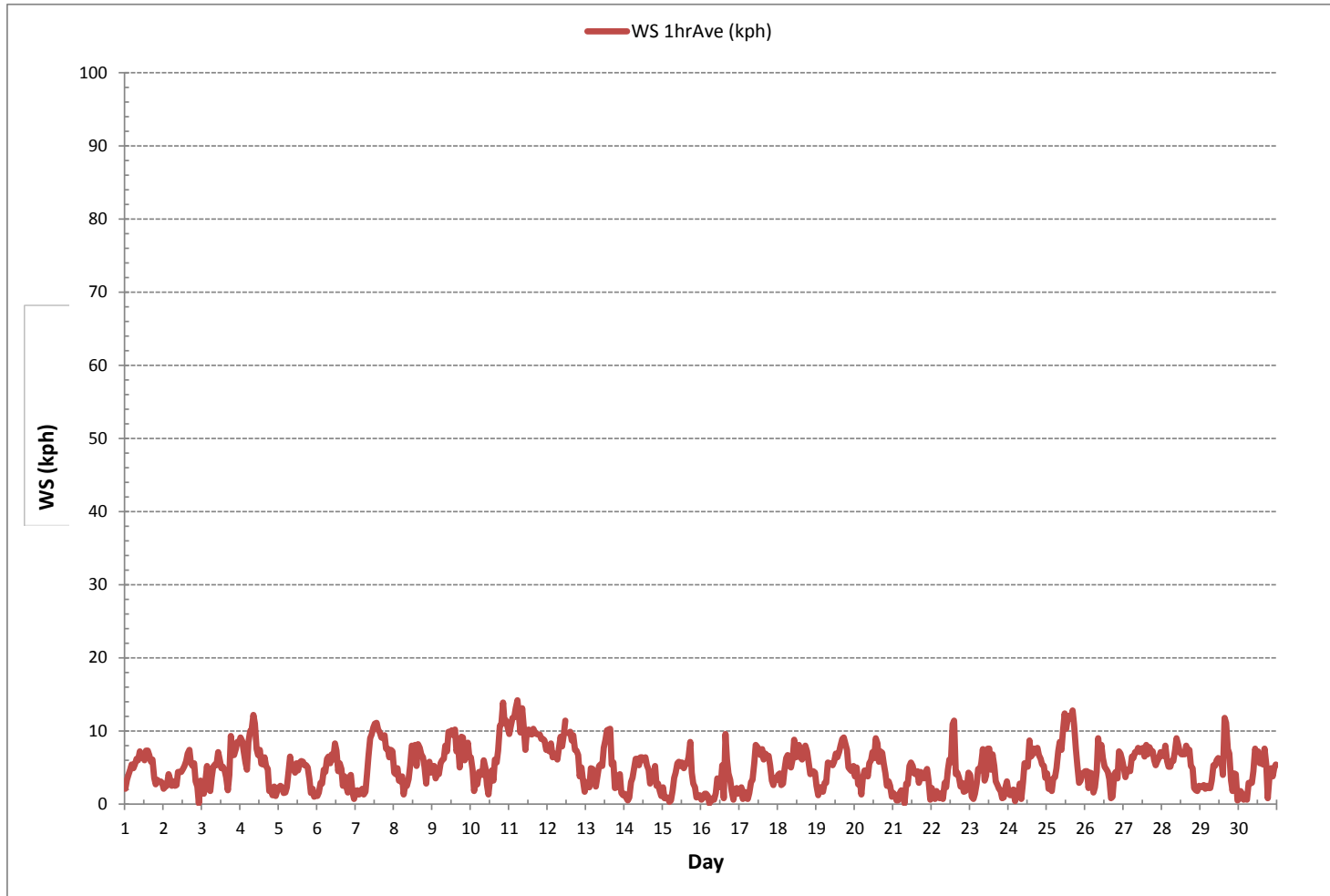
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 22 ON DAY 2
MAXIMUM 1-HR AVERAGE:	14.2 kph @ HOUR 5 ON DAY 11
MAXIMUM 24-HR AVERAGE:	8.9 kph ON DAY 11
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	719 hrs
AMT OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	2.8
MONTHLY AVERAGE:	1.3 kph

24 HR AVERAGES June 2018



WIND SPEED Hourly Averages (WS kph)



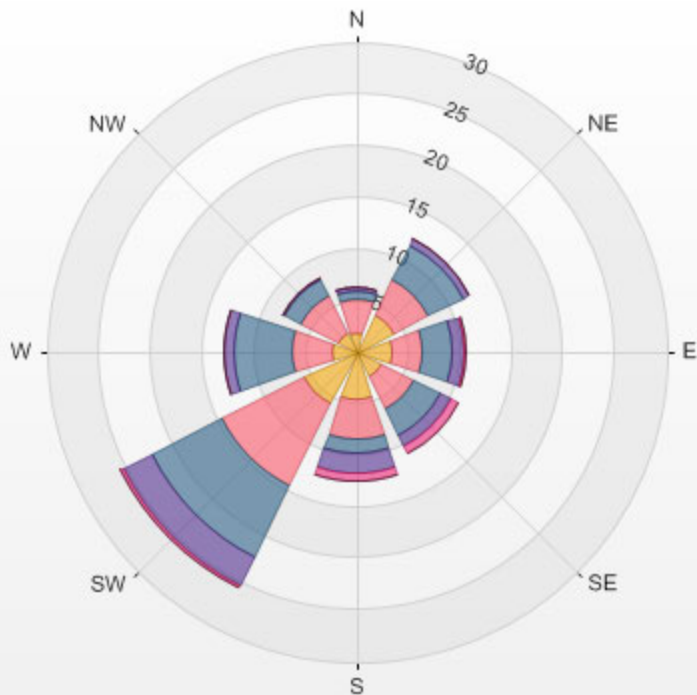
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 18/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.56%

Direction	0.4-2.9	2.9-5.7	5.7-8.6	8.6-11.4	11.4-14.3	>14.3	Total
N	1.8	3.3	0.8	0.3	0.0	0.0	6.3
NE	4.0	3.8	3.8	0.7	0.0	0.0	12.3
E	3.5	2.9	2.9	1.1	0.1	0.1	10.7
SE	2.6	3.5	3.1	1.1	0.7	0.0	11.0
S	4.7	3.8	1.4	2.0	0.8	0.0	12.7
SW	5.7	8.9	7.7	3.1	0.3	0.0	25.6
W	2.5	3.8	5.7	1.0	0.0	0.0	12.9
NW	2.1	4.0	1.7	0.3	0.0	0.0	8.1
Summary	27.0	34.0	27.0	9.5	2.0	0.1	99.5

% Icon	Classes (kph)	27	34	27	9	2	0
							
		0.4-2.9	2.9-5.7	5.7-8.6	8.6-11.4	11.4-14.3	>14.3

LICA MASKWA 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.56% Calm Wind Avg Speed: 0.15(kph)



WIND DIRECTION



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

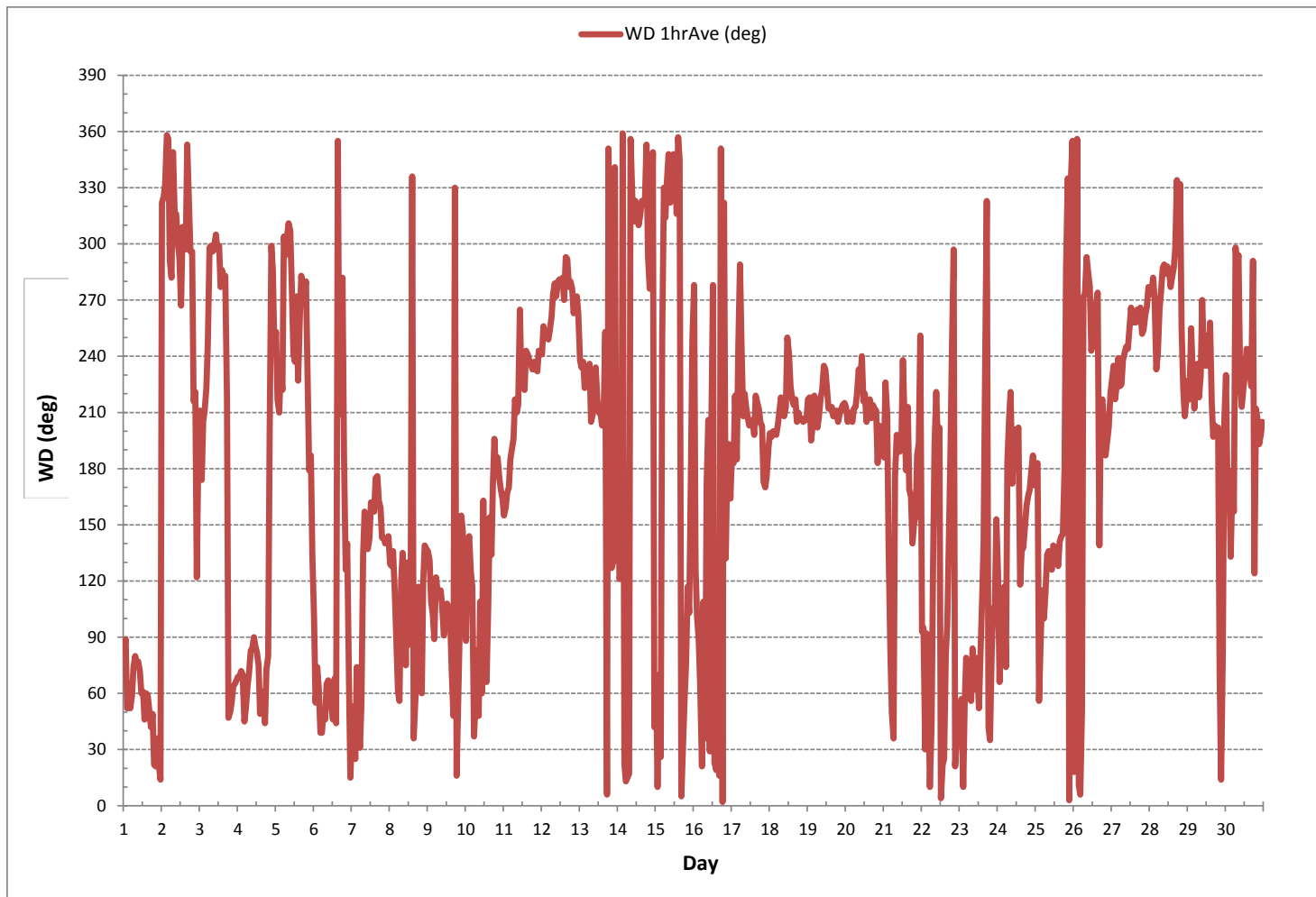
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	719	hrs
STANDARD DEVIATION:	90		AMD OPERATION UPTIME:	99.9	%
			MONTHLY AVERAGE:	203 (SSW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	18	26	21	19	20	24	30	28	30	29	27	26	24	20	24	25	22	19	20	15	16	13	15	17	24	
2	24	34	28	33	32	23	31	24	43	37	37	43	42	39	38	34	37	36	37	35	17	19	18	7	24	
3	13	9	13	14	19	21	27	29	31	35	34	39	45	42	47	53	67	37	26	23	22	24	24	25	24	
4	25	26	27	25	20	20	24	26	28	30	31	29	28	28	20	25	26	24	20	16	12	25	25	39	24	
5	37	23	24	25	23	19	28	29	36	36	44	42	50	42	34	40	40	38	37	18	31	42	45	24	24	
6	49	31	22	30	21	27	25	21	28	28	36	27	27	46	40	38	62	46	46	33	16	11	38	57	24	
7	33	32	42	41	35	36	51	33	32	30	31	30	30	31	31	31	28	26	27	23	22	21	21	23	24	
8	23	23	25	30	44	38	67	50	54	48	48	37	36	30	49	18	24	25	33	29	33	31	30	35	24	
9	27	24	31	31	34	34	32	33	28	30	28	31	33	33	29	27	23	46	46	38	53	31	30	44	24	
10	32	29	41	29	36	17	29	39	24	31	67	61	32	26	50	38	31	32	22	24	22	25	24	26	24	
11	26	23	24	26	24	22	32	48	30	31	44	29	30	27	33	34	33	32	30	32	35	32	33	36	24	
12	34	42	35	45	36	35	37	35	32	34	32	29	X	35	32	35	31	32	29	31	33	32	36	41	23	
13	33	34	37	28	29	33	42	25	33	33	39	29	25	25	27	27	58	33	53	63	34	20	43	51	24	
14	51	60	72	62	24	25	25	26	36	40	36	37	40	37	40	45	50	37	49	30	37	32	50	40	24	
15	21	49	35	51	71	66	44	41	44	38	39	42	43	46	43	42	40	15	33	30	21	36	48	67	24	
16	73	53	49	39	12	79	72	63	65	51	39	45	58	24	73	19	34	37	39	56	65	28	27	40	24	
17	29	23	56	42	57	56	44	35	39	31	27	31	32	31	32	35	29	26	22	16	14	12	13	19	24	
18	14	13	12	15	15	15	18	24	25	27	25	38	39	31	35	33	29	21	20	17	15	11	10	10	24	
19	22	48	14	27	36	15	22	22	25	31	37	38	35	35	33	28	23	22	21	17	16	15	18	17	24	
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21	30	37	59	61	41	24	27	79	36	44	30	35	41	45	49	35	52	33	25	15	18	18	10	62	24	
22	48	41	61	32	45	57	47	66	30	52	41	40	49	20	17	43	35	42	56	40	50	42	21	20	24	
23	16	61	57	37	20	19	26	28	31	34	47	29	28	43	37	46	56	39	35	24	33	10	28	21	24	
24	45	45	29	27	16	21	54	35	69	41	24	35	35	23	49	34	29	26	25	22	20	19	17	21	24	
25	20	34	21	42	24	26	31	28	28	33	31	26	29	28	27	28	27	27	47	42	59	56	38	35	24	
26	19	21	55	47	32	37	39	33	29	31	33	35	36	35	37	46	68	63	40	26	32	18	18	24	24	
27	29	33	25	26	33	25	29	32	37	36	35	36	36	38	35	38	33	38	36	35	38	36	34	31	24	
28	34	34	29	33	32	35	34	37	35	32	37	32	34	37	36	31	39	35	34	37	39	33	26	31	24	
29	32	28	34	32	26	32	35	31	34	40	38	37	42	38	48	27	19	22	20	55	47	44	33	71	24	
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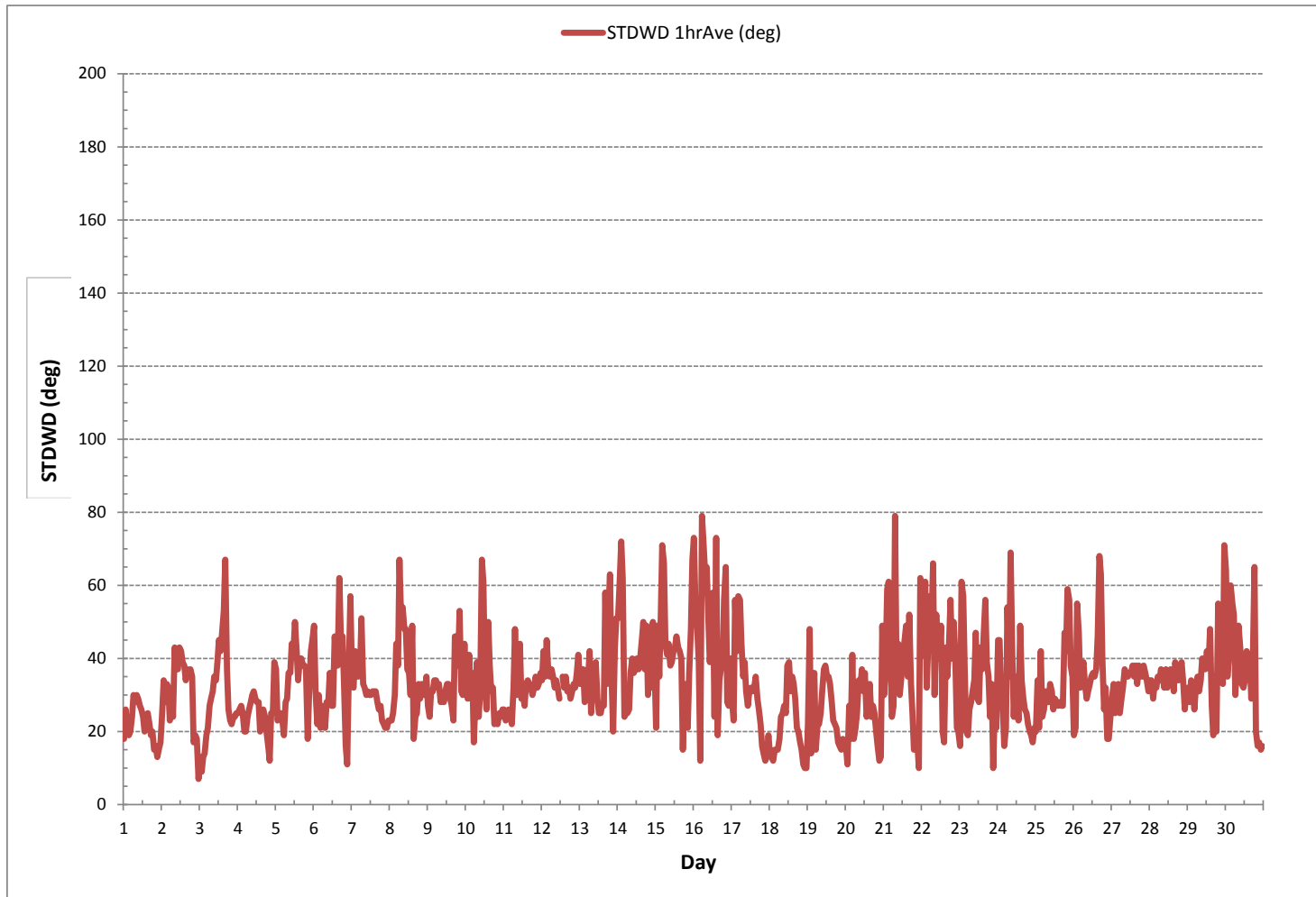
STATUS FLAG CODES

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: January 9, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 719 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



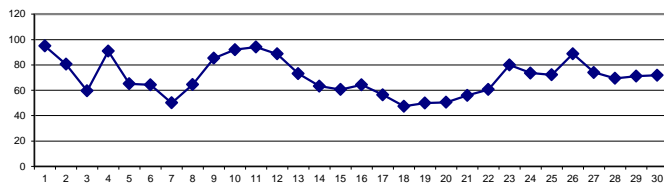
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

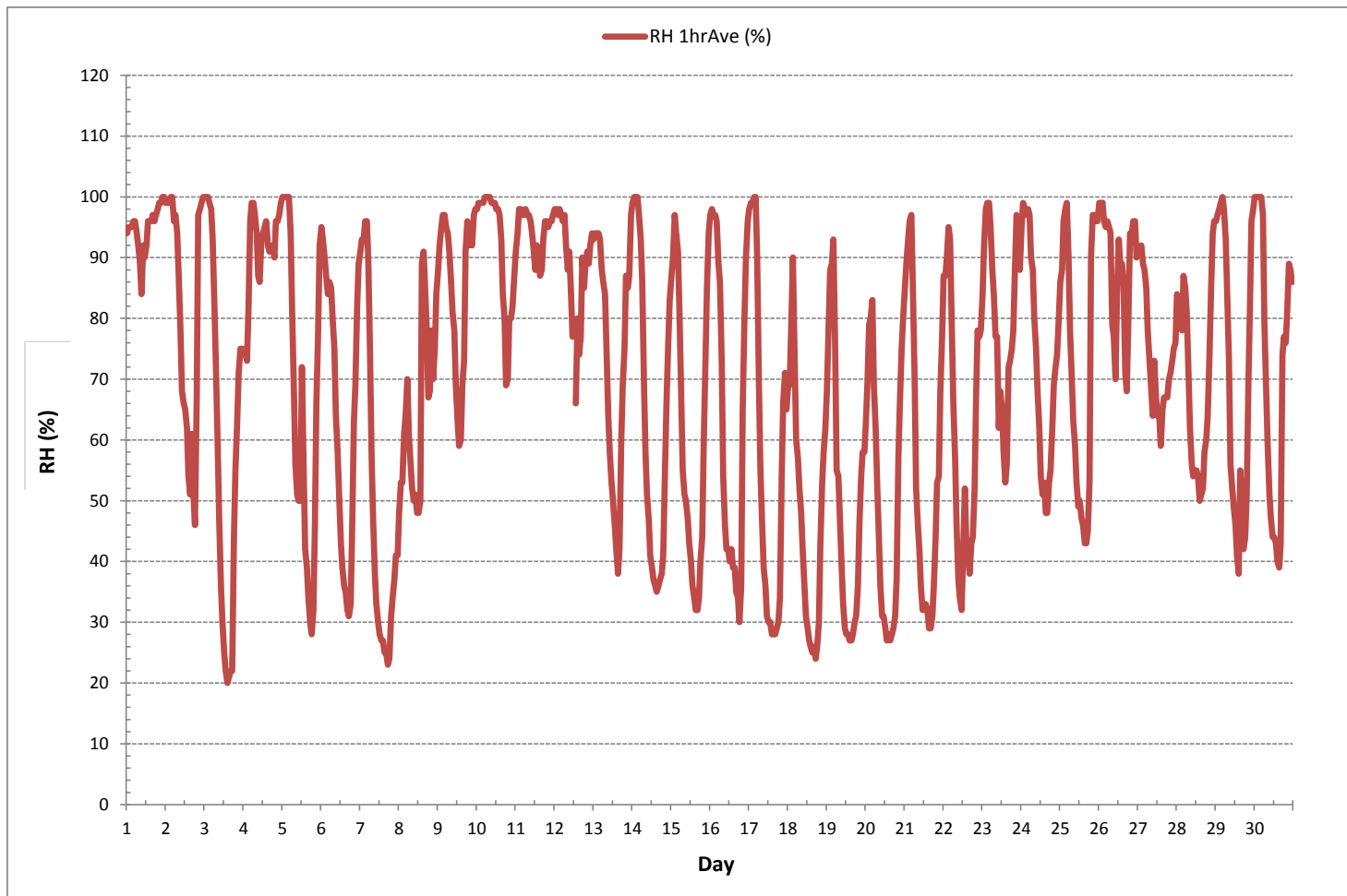
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	20	%	@ HOUR	14	ON DAY	3
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	22	ON DAY	1
MAXIMUM 24-HR AVERAGE:	95	%			ON DAY	1
OPERATIONAL TIME:						719 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	24		MONTHLY AVERAGE:			70 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



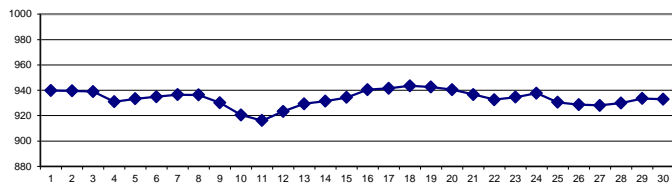
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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 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	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	939	939	940	939	939	939	939	939	939	940	940	24	
2	939	939	939	939	939	939	940	940	940	941	941	941	940	940	940	940	940	940	940	940	940	939	939	939	939	939	939	941	940	24
3	939	939	939	939	939	939	939	940	940	941	941	941	940	940	939	939	939	938	938	938	937	937	937	936	936	936	941	939	24	
4	936	935	934	934	934	933	931	931	929	928	929	929	929	929	929	929	930	930	930	930	931	931	931	931	928	936	931	24		
5	931	931	931	931	932	932	933	934	935	935	934	934	934	934	934	934	934	934	934	934	934	934	933	933	931	935	933	24		
6	933	933	934	934	934	935	935	935	935	936	936	936	936	935	936	936	935	935	935	935	935	935	935	935	933	936	935	24		
7	935	935	936	936	936	937	937	938	938	938	938	938	938	937	937	936	936	936	936	936	936	936	936	936	936	935	938	937	24	
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9	934	934	934	933	933	933	933	933	932	932	932	932	931	930	929	928	927	927	927	926	925	926	927	927	925	934	930	24		
10	925	925	925	924	923	922	923	924	922	922	920	920	919	919	919	918	918	918	918	918	918	918	918	917	917	925	921	24		
11	916	916	915	915	914	914	914	914	915	915	915	916	916	916	917	917	918	918	918	918	918	918	917	917	914	918	916	24		
12	917	918	918	919	919	920	920	921	921	922	922	923	X	925	925	926	926	927	927	927	927	928	928	929	929	917	929	923	23	
13	929	929	929	929	929	930	930	930	930	930	930	930	930	930	929	929	929	929	929	930	929	929	929	929	929	929	930	929	24	
14	929	929	929	930	931	931	932	932	932	933	933	933	933	933	932	932	932	932	932	932	932	931	931	931	931	929	933	932	24	
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16	938	938	938	939	939	940	941	941	942	942	942	942	942	941	941	941	941	941	941	941	941	941	941	940	940	938	942	941	24	
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18	942	942	942	942	942	943	944	944	945	945	945	944	944	944	944	944	944	944	944	943	943	943	943	943	943	942	945	944	24	
19	942	942	942	942	942	943	944	944	944	944	944	944	943	943	943	942	942	942	942	942	942	941	941	941	941	941	944	943	24	
20	941	941	941	941	941	942	942	942	942	942	941	941	941	940	940	940	940	940	939	939	939	938	938	938	938	942	941	24		
21	938	938	937	937	937	938	938	939	939	938	938	937	937	937	936	935	935	935	935	935	935	934	934	934	934	934	939	937	24	
22	934	933	933	933	933	933	934	934	934	933	933	933	933	933	932	932	931	932	932	932	932	932	931	931	931	931	934	933	24	
23	931	931	931	932	932	933	933	934	935	935	935	935	935	935	935	936	936	936	936	936	937	937	937	937	931	937	935	24		
24	937	937	937	937	938	938	939	939	939	939	939	939	939	938	938	938	938	937	937	937	937	937	936	936	936	936	939	938	24	
25	935	935	934	934	933	933	933	933	932	932	932	931	930	929	929	928	927	926	926	927	928	929	928	929	926	935	931	24		
26	928	928	928	928	927	927	928	928	928	928	928	928	929	929	930	930	930	930	930	930	929	929	929	929	927	930	929	24		
27	929	929	929	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	929	928	24	
28	928	928	928	928	928	929	929	929	930	930	930	930	930	930	930	931	931	931	932	932	932	931	931	931	928	932	930	24		
29	931	932	932	932	932	933	933	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	935	934	931	935	934	24		
30	934	934	934	934	934	934	935	935	935	935	935	934	934	933	932	932	932	932	931	931	931	931	930	930	930	930	935	933	24	
HOURLY MAX	942	942	942	942	942	943	944	944	945	945	945	945	944	944	944	944	944	944	944	944	943	943	943	943	943	940	943	24		
HOURLY AVG	933	933	933	933	933	934	934	934	934	934	934	934	934	934	934	934	934	933	934	933	933	933	933	933	933	933	933	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

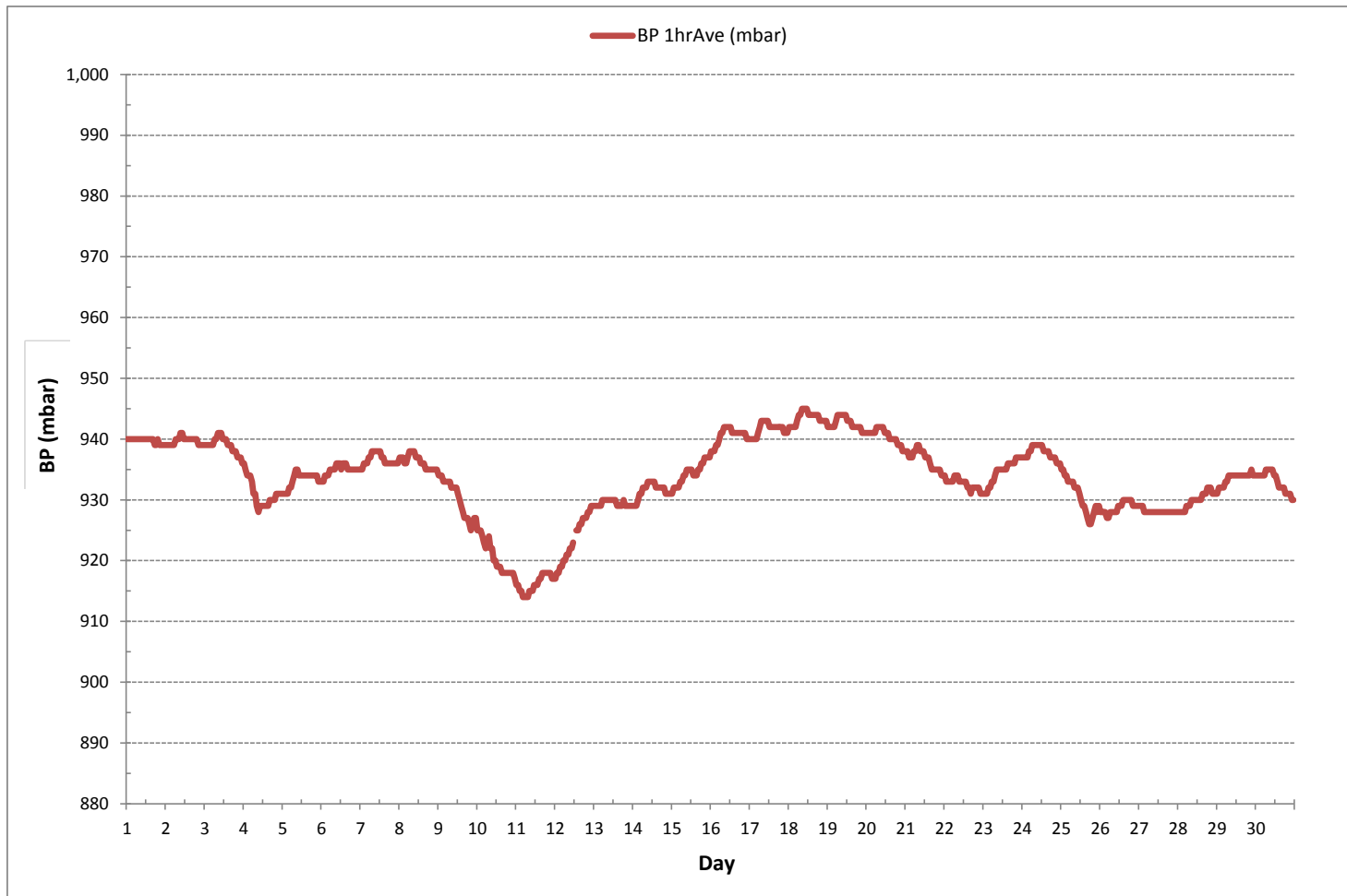
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	914	mbar	@ HOUR	4	ON DAY	11
MAXIMUM 1-HR AVERAGE:	945	mbar	@ HOUR	8	ON DAY	18
MAXIMUM 24-HR AVERAGE:	944	mbar			ON DAY	18
OPERATIONAL TIME:						719 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	6				MONTHLY AVERAGE:	934 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



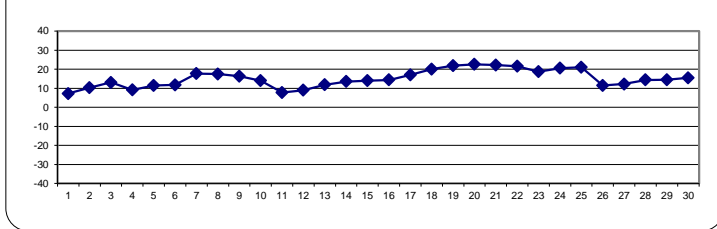
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	5.1	4.9	5.5	6.2	6.4	6.8	7.4	7.8	8.1	8.5	8.0	8.3	8.2	8.0	7.6	7.6	7.7	7.9	7.9	7.7	7.4	7.0	7.0	6.9	4.9	8.5	7.2	24
2	7.0	6.9	6.5	5.9	5.7	6.5	6.5	7.6	9.0	10.9	12.5	13.3	14.1	14.7	16.5	16.8	14.5	16.5	16.9	13.0	8.6	7.1	5.7	4.5	4.5	16.9	10.3	24
3	4.7	3.3	2.7	4.3	4.5	6.1	9.2	11.4	13.8	16.0	17.3	18.3	18.9	19.7	20.3	20.3	20.4	20.3	17.8	16.0	14.1	12.7	11.6	10.4	2.7	20.4	13.1	24
4	9.8	9.4	9.2	8.7	7.8	7.6	7.5	8.4	9.2	10.2	10.2	9.8	9.7	9.6	9.3	10.2	10.7	10.6	10.6	11.0	9.7	8.5	7.1	6.1	6.1	11.0	9.2	24
5	5.4	5.2	5.0	5.3	5.8	7.4	10.4	12.4	13.6	14.6	15.0	15.0	11.7	14.3	16.2	17.5	17.7	17.8	17.5	16.6	12.5	8.4	5.8	4.2	4.2	17.8	11.5	24
6	3.2	3.5	3.4	4.3	5.2	5.8	7.3	8.8	9.8	11.8	13.5	14.7	16.6	18.4	19.1	19.0	19.7	20.4	20.1	18.0	13.4	11.1	8.6	6.9	3.2	20.4	11.8	24
7	5.9	5.5	5.8	5.7	5.6	7.4	11.8	15.7	18.3	20.5	22.2	22.9	23.9	24.7	25.5	26.2	25.8	26.2	25.6	23.0	21.4	19.8	18.5	17.9	5.5	26.2	17.7	24
8	16.0	14.9	15.1	13.4	13.0	12.6	15.6	17.6	19.6	21.2	21.6	23.0	23.8	22.7	16.4	16.0	18.2	19.3	20.2	17.8	14.9	15.7	16.4	15.9	12.6	23.8	17.5	24
9	15.4	14.6	13.7	13.1	13.1	13.8	13.8	14.3	15.2	16.4	16.8	19.0	20.9	22.5	22.7	21.0	19.8	17.8	15.7	15.5	14.9	14.6	14.4	14.1	13.1	22.7	16.4	24
10	13.5	13.2	13.1	12.7	12.6	12.3	12.8	13.4	13.5	14.1	14.2	14.5	15.1	15.2	15.6	16.7	18.9	18.7	17.7	16.0	12.8	11.3	9.5	8.0	8.0	18.9	14.0	24
11	7.5	7.3	7.4	7.4	7.2	7.0	6.9	7.0	7.1	7.5	8.1	8.5	9.0	8.9	8.8	8.6	8.3	7.8	7.6	7.6	7.5	7.3	7.3	7.5	6.9	9.0	7.7	24
12	7.7	7.9	7.8	7.7	7.8	7.9	7.9	8.6	9.0	8.7	9.6	10.7	X	12.5	11.0	11.6	11.0	9.4	9.8	8.9	8.3	7.8	7.6	7.3	7.3	12.5	9.0	23
13	6.3	5.7	6.0	6.5	7.0	8.0	8.7	9.3	11.3	13.3	15.0	16.3	17.4	18.3	19.3	19.8	18.2	14.0	13.2	12.5	11.3	10.6	9.7	7.6	5.7	19.8	11.9	24
14	6.9	6.8	6.9	7.7	8.4	8.8	9.2	11.2	13.4	14.9	15.6	16.5	17.9	18.9	19.5	20.0	19.6	19.2	19.1	18.0	15.0	12.6	10.7	8.8	6.8	20.0	13.6	24
15	7.6	7.2	6.4	7.4	8.2	10.1	12.5	14.2	15.5	16.0	16.7	17.8	18.6	19.6	20.2	20.7	20.5	19.6	18.4	17.9	14.3	11.2	8.9	7.6	6.4	20.7	14.0	24
16	6.9	6.4	6.7	6.8	7.8	9.8	11.6	14.4	16.6	18.1	18.4	19.0	19.7	18.8	19.5	19.7	20.6	20.4	20.5	19.7	14.9	11.8	9.7	8.3	6.4	20.6	14.4	24
17	7.5	6.7	6.5	6.1	6.4	10.2	14.8	17.3	19.6	21.1	21.8	22.6	23.2	23.5	24.1	24.4	24.1	23.8	23.3	22.3	17.3	14.1	13.0	13.8	6.1	24.4	17.0	24
18	13.2	13.3	11.2	9.5	11.9	14.8	16.6	18.6	20.7	22.9	24.0	25.0	25.5	25.8	26.5	26.8	26.7	26.4	26.0	24.7	20.9	17.7	16.5	15.6	9.5	26.8	20.0	24
19	14.6	12.8	10.9	10.1	10.1	14.2	18.8	20.1	22.5	25.0	26.6	27.4	27.8	28.6	28.8	28.9	28.9	28.5	27.9	26.5	23.8	21.5	20.2	19.8	10.1	28.9	21.8	24
20	18.3	17.0	15.6	14.8	14.2	17.1	19.4	21.8	24.7	26.5	27.5	28.0	28.6	28.8	29.0	29.2	28.9	28.4	27.8	26.2	21.2	18.4	16.3	15.2	14.2	29.2	22.6	24
21	14.5	13.8	13.0	12.2	12.1	14.8	19.1	23.3	24.6	25.8	27.1	27.5	27.9	28.3	29.0	28.9	29.4	28.8	28.1	25.4	22.9	21.6	18.1	16.5	12.1	29.4	22.2	24
22	15.3	14.8	14.1	13.6	13.6	16.9	19.9	22.8	25.4	27.1	27.9	28.7	26.3	23.5	24.4	25.1	26.7	26.3	26.2	24.3	21.4	18.8	18.0	17.7	13.6	28.7	21.6	24
23	16.6	14.9	13.8	13.2	13.4	15.2	17.8	18.4	19.6	19.4	22.7	21.3	21.9	22.9	25.2	24.6	19.9	20.3	20.1	19.9	17.8	16.2	16.3	17.1	13.2	25.2	18.7	24
24	15.2	14.4	14.8	15.1	14.7	15.1	17.5	18.0	19.7	20.8	22.0	23.7	25.2	25.3	25.0	26.1	26.5	25.1	25.0	23.6	21.9	20.8	20.0	18.9	14.4	26.5	20.6	24
25	18.3	17.6	14.9	13.7	15.1	17.5	20.1	21.9	23.5	25.2	26.2	26.7	26.6	27.4	27.7	28.0	27.7	27.3	24.4	16.7	15.6	15.2	14.0	12.9	12.9	28.0	21.0	24
26	11.8	11.2	11.4	11.7	11.5	11.2	12.0	12.1	14.4	14.7	13.9	11.6	10.9	11.2	10.9	11.0	13.0	13.5	11.7	10.1	9.2	8.6	8.9	9.8	8.6	14.7	11.5	24
27	9.7	9.5	9.4	9.4	9.1	9.6	10.8	12.1	12.6	13.2	13.2	13.2	13.5	13.9	14.7	14.0	13.8	13.9	13.6	13.3	13.3	13.1	13.0	12.7	9.1	14.7	12.2	24
28	12.0	12.1	12.4	12.5	11.0	11.7	14.0	15.9	17.2	17.5	17.0	17.2	17.5	19.1	18.0	17.6	17.2	16.5	15.6	13.4	11.3	9.1	9.0	9.0	19.1	14.4	24	
29	9.1	8.6	8.4	8.0	7.7	8.8	10.7	12.3	14.4	17.3	18.0	18.8	19.9	21.0	21.4	17.1	18.5	19.9	19.7	18.2	14.9	13.5	11.7	10.8	7.7	21.4	14.5	24
30	9.7	8.8	8.9	9.4	8.9	11.0	14.5	15.9	17.7	19.1	19.8	20.6	21.0	21.5	22.0	22.2	21.2	15.2	15.2	15.5	14.6	12.9	12.5	12.3	8.8	22.2	15.4	24
HOURLY MAX	18.3	17.6	15.6	15.1	15.1	17.5	20.1	23.3	25.4	27.1	27.9	28.7	28.6	28.8	29.0	29.2	29.4	28.8	28.1	26.5	23.8	21.6	20.2	19.8				
HOURLY AVG	10.5	9.9	9.6	9.4	9.5	10.8	12.8	14.4	15.9	17.3	18.1	18.7	19.3	19.5	19.8	19.9	19.8	19.4	18.8	17.4	15.0	13.4	12.2	11.5				

STATUS FLAG CODES

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

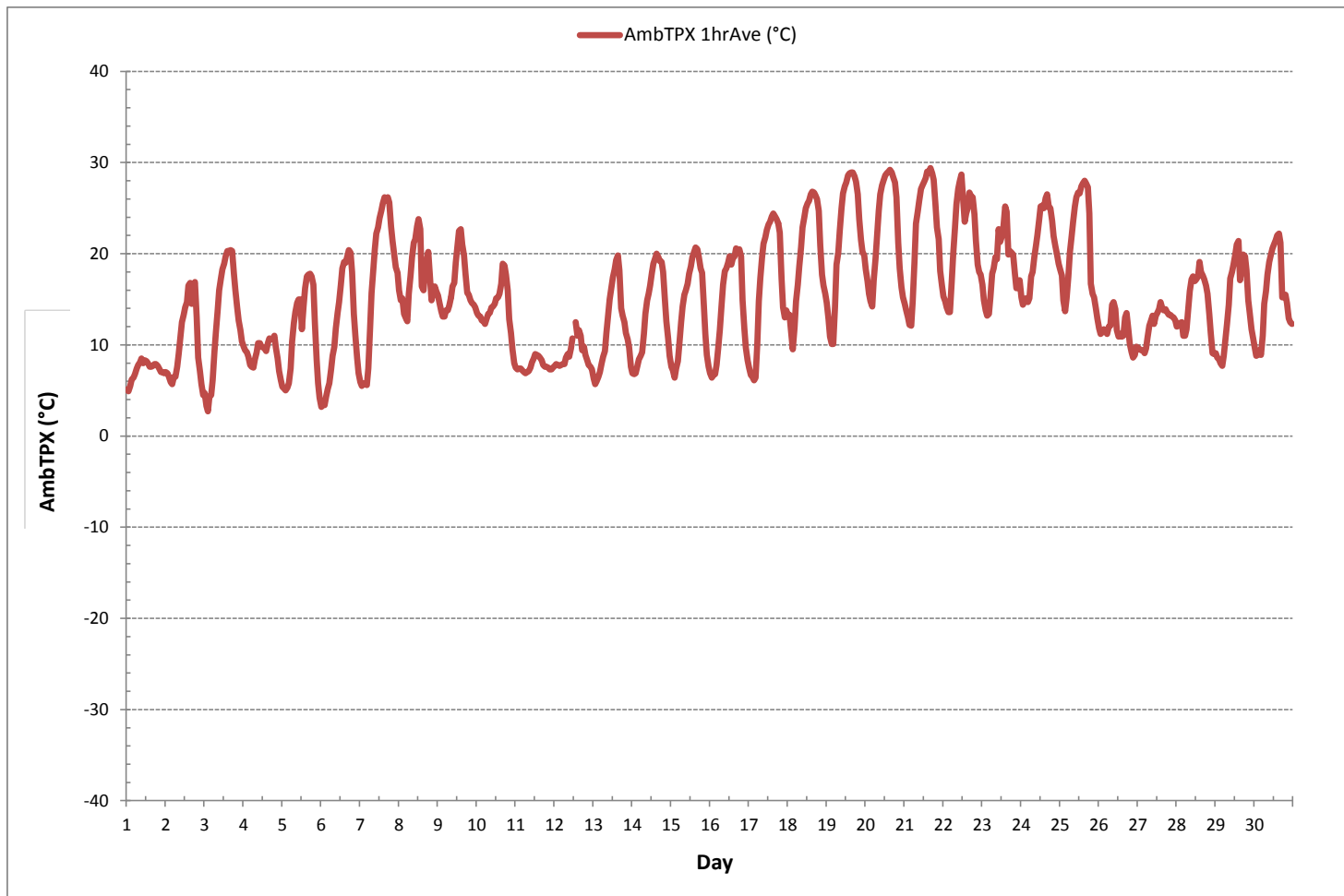
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	2.7 °C	@ HOUR	2	ON DAY	3
MAXIMUM 1-HR AVERAGE:	29.4 °C	@ HOUR	16	ON DAY	21
MAXIMUM 24-HR AVERAGE:	22.6 °C			ON DAY	20
OPERATIONAL TIME:				719	hrs
AMD OPERATION UPTIME:				99.9	%
STANDARD DEVIATION:	6.4	MONTHLY AVERAGE:	15.1	°C	

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



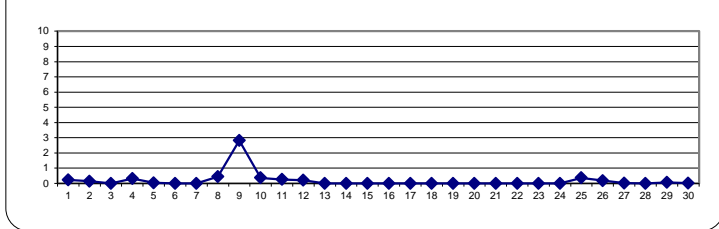
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	1.3	1.3	0.7	0.6	0.3	0.0	0.1	0.0	0.1	0.1	0.0	0.0	1.3	0.2	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	3.5	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	24
4	0.0	0.0	0.0	0.5	2.4	3.5	0.2	0.0	0.0	0.0	0.0	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.3	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	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.5	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	32.0	24.3	2.5	0.8	0.3	3.3	4.5	0.0	32.0	2.8	24
10	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.1	0.3	3.6	1.3	0.3	0.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.4	24
11	0.0	0.0	0.1	0.2	0.0	0.3	0.3	0.4	0.6	0.2	0.5	0.2	0.2	0.7	0.2	0.0	0.2	0.4	0.2	0.1	0.2	0.5	0.1	0.6	0.0	0.7	0.3	24
12	1.3	0.4	0.3	0.2	0.1	0.1	0.3	0.0	0.0	0.1	0.0	0.0	X	0.0	0.3	0.0	0.5	0.2	0.9	0.1	0.0	0.0	0.0	0.0	0.0	1.3	0.2	23
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	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	3.2	0.5	0.0	0.1	0.0	5.0	0.4	24
26	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.8	0.6	0.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	24
27	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
28	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
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.3	0.1	0.0	1.3	0.1	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24
HOURLY MAX	1.3	0.4	0.3	0.5	2.4	3.5	0.3	1.1	0.6	3.6	1.3	1.1	1.0	1.4	10.8	0.7	0.6	32.0	24.3	5.0	3.2	1.3	3.3	4.5				
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.0	0.0	1.1	0.9	0.4	0.1	0.1	0.1	0.2				

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

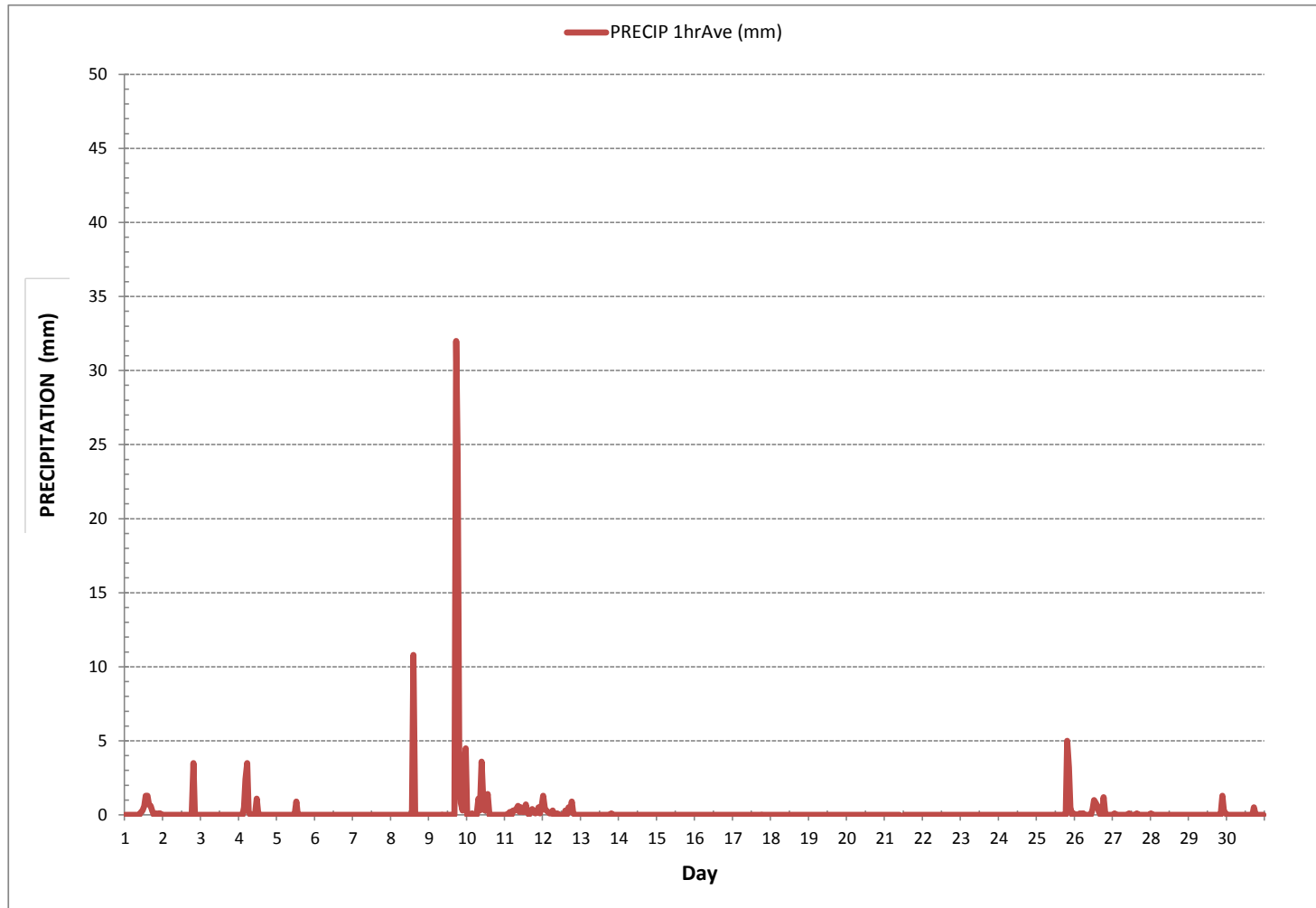
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	32.0	mm	@ HOUR	17	ON DAY	9
MAXIMUM 24-HR AVERAGE:	2.8	mm			ON DAY	9
MONTHLY TOTAL	132.0	mm				
OPERATIONAL TIME:					719	hrs
AMD OPERATION UPTIME:					99.9	%
STANDARD DEVIATION:	1.6		MONTHLY AVERAGE:		0.2	mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	June 7, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	938	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		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:02	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:01	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:	May 10, 2018		As Found C.F.:	1.006
	Previous C.F.:	1.000		New C.F.:	1.001

Calibration Standards:	Standard Calibration Points for Ranges
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

Point	ppb
High	780
Mid	380
Low	190

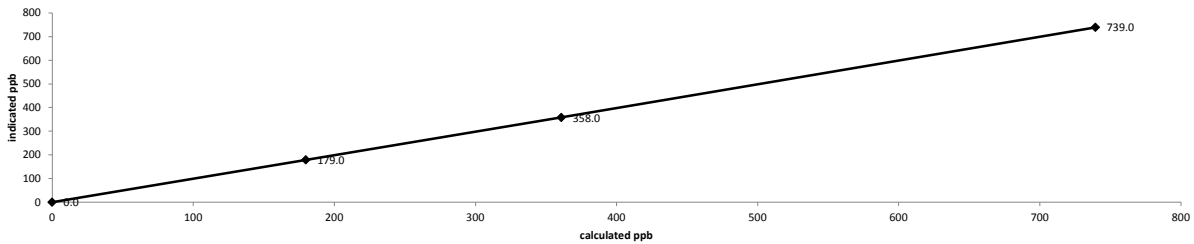
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5067	0.00	5067	0.0	3.0	n/a
as found high	4985	76.06	5061	739.4	738.0	1.006
adjusted zero	5067	0.00	5067	0.0	0.0	n/a
adjusted high	4985	76.06	5061	739.4	739.0	1.001
mid	5019	37.09	5056	360.9	358.0	1.008
low	5038	18.48	5056	179.8	179.0	1.005
0	5067	0.00	5067	0.0	0.0	n/a
Average C.F. =						1.004

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) =	0.09%		± 3% F.S.
% change in C.F. from last cal =	-0.60%		± 10%

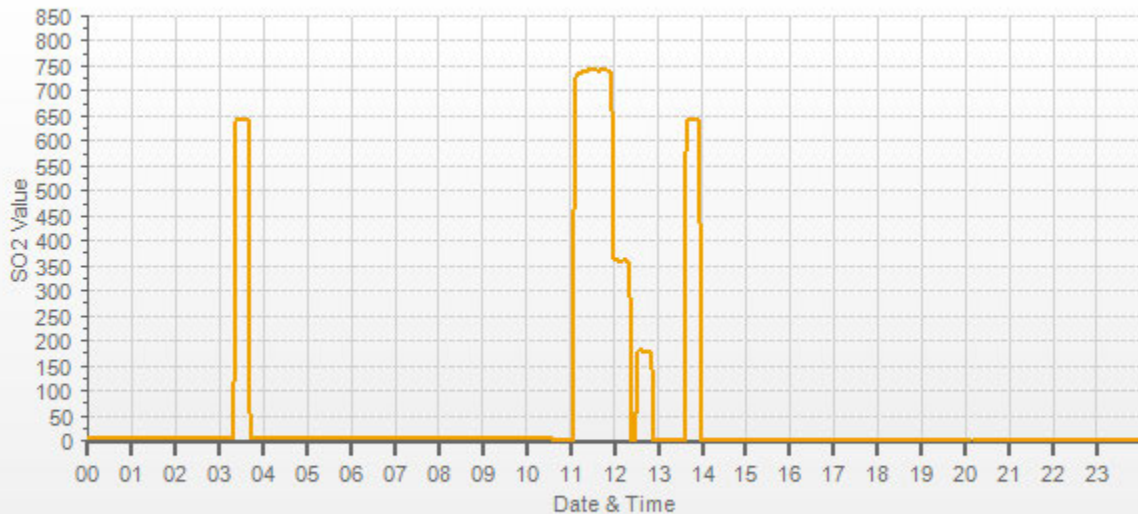
API 100E Sulphur Dioxide Analyzer Calibration



As found:	Slope:	0.935	As left:	Slope:	0.933
Offset:	176.0	Offset:	182.5		
Hvps:	483	Hvps:	483		
Rcell Temp:	50.0	Rcell Temp:	50.0		
Box Temp:	30.2	Box Temp:	30.8		
Pmt Temp:	7.7	Pmt Temp:	7.7		
Izs Temp:	50.0	Izs Temp:	50.0		
Pres:	24.7	Pres:	24.7		
Samp Fl:	579	Samp Fl:	579		
Norm Pmt:	182.3	Norm Pmt:	182.4		
Uv Lamp:	2210.4	Uv Lamp:	2210.2		
Lamp Ratio:	80.7	Lamp Ratio:	80.7		
Str Lgt:	82.2	Str Lgt:	85.1		
Drk Pmt:	10.4	Drk Pmt:	10.7		
Expected Value:	634.0	Expected Value:	640.0		

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

SO2[ppb] Station: LICA MASKWA Daily: 18/06/07 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>June 7, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 15, 2019</u>	<u>938</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>10:02</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Rob Fisher</u>
End Time 24 hr. (mst): <u>14:41</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>May 16, 2018</u>	As Found C.F.: <u>1.000</u>	
	Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <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	Start/End Time 24 hr.: <u>10:46 / 10:56</u>
Point		ppb								
High		78								
Mid		38								
Low	19									
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>		SO2 Analyzer Range: <u>1000</u>								
Calibrator ID/Expiry Date: <u>Envionics id# 4760 expires March 2, 2019</u>		Target Concentration (ppb): <u>780</u>								
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>		As Found Zero: <u>0.0</u>								
Cal Gas Conc. (ppm): <u>10.2</u>		Analyzer Response (ppb): <u>0.0</u>								
		Zero Corrected Result (ppb): <u>0.0</u>								

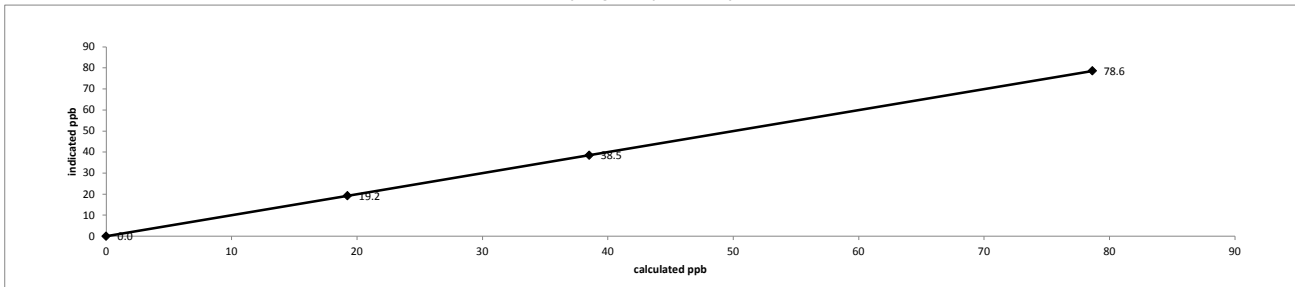
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7461	0.00	7461	0.0	0.3	n/a
as found high	7399	57.48	7456	78.6	78.9	1.000
adjusted zero	7461	0.00	7461	0.0	0.0	n/a
adjusted high	7399	57.48	7456	78.6	78.6	1.000
mid	7428	28.16	7456	38.5	38.5	1.001
low	7444	14.07	7458	19.2	19.2	1.002
0	7461	0.00	7461	0.0	0.0	n/a
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.02%</u>	0.95-1.05
% change in C.F. from last cal = <u>-0.04%</u>	± 3% F.S.
	± 10%

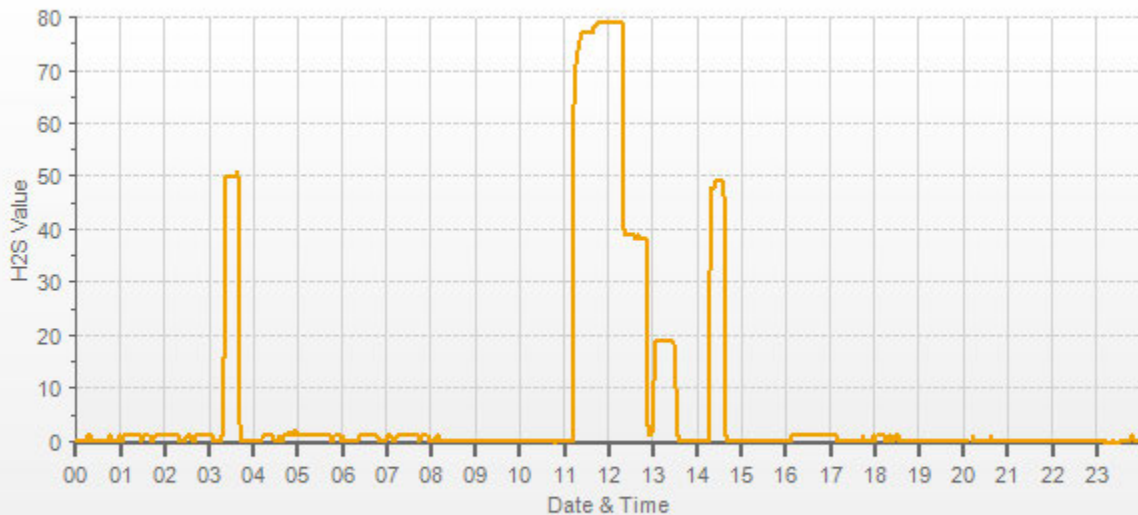
API 101E Hydrogen Sulphide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: <u>0.978</u> Offset: <u>34.6</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.3</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>315.2</u> Pres: <u>20.0</u> Samp Fl: <u>524</u> Uv Lamp: <u>2771.7</u> Lamp Ratio: <u>82.4</u> Str Lgt: <u>16.9</u> Drk Pmt: <u>34.8</u> Expected Value: <u>48.8</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.977</u> Offset: <u>34.8</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>35.0</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>315.2</u> Pres: <u>20.0</u> Samp Fl: <u>523</u> Uv Lamp: <u>2770.2</u> Lamp Ratio: <u>82.4</u> Str Lgt: <u>17.0</u> Drk Pmt: <u>35.2</u> Expected Value: <u>49.1</u>
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Comments:
The analyzer sample inlet filter was changed.
The manifold blower was found to be working normally.

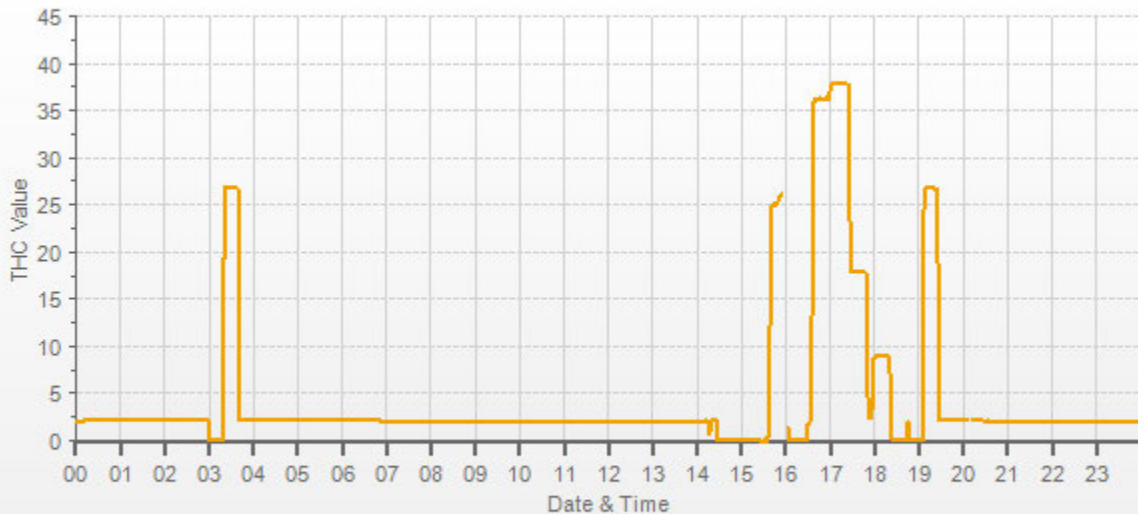
H2S[ppb] Station: LICA MASKWA Daily: 18/06/07 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

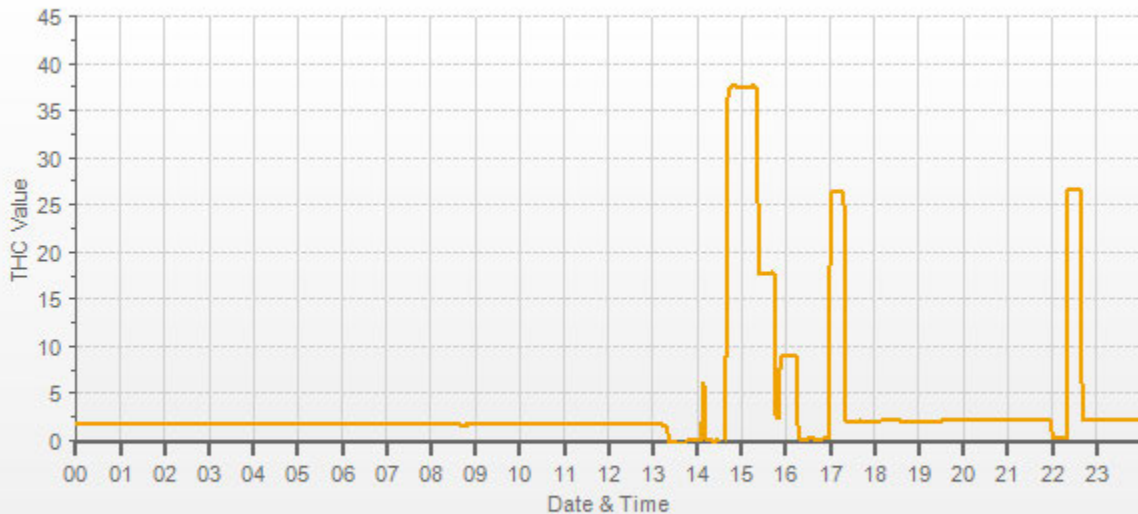
TOTAL HYDROCARBON

Maxxam <small>ANALYTICAL SERVICES</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration											
Date: June 7, 2018		Barometer/B.P./units: F.S. 05544 expires January 15, 2019		938	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											
Parameter: Total Hydrocarbon		Calibration Purpose: routine monthly											
Start/End Time 24 hr. (mst): 14:07 / 19:31		Performed By/Reviewer: Alex Yakupov		Rob Fisher									
Calibration Method: Gas Dilution		Cal Gas Expiry Date: November 24, 2022											
Analyzer:													
Serial Number/Owner: 436609738 LICA		Range ppm: 50											
Last Calibration Date: May 20, 2018		As Found C.F.: 1.040											
Previous Cal High Point 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: Enviroconics id# 5212 expires March 1, 2019													
Cal Gas Cylinder I.D. #: LL 165367													
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):		Standard Calibration Points for a Range of: 50 ppm											
CH ₄ as propane/total CH ₄ equivalents (ppm):		<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												
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)													
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:							
as found zero	2511	0.00	2511	0.0	-0.03	n/a							
as found high	2433	81.96	2515	37.78	36.30	1.040							
adjusted zero	2511	0.00	2511	0.00	0.00	n/a							
adjusted high	2433	81.96	2515	37.78	37.78	1.000							
mid	2473	38.90	2512	17.95	17.84	1.006							
low	2493	19.45	2512	8.98	8.94	1.004							
calibrator zero	2511	0.00	2511	0.0	0.00	n/a							
Average C.F.=						1.003							
Linear Regression/Calibration Results:													
Correlation Coefficient = 1.000			LIMITS										
Slope = 1.000			> or = 0.995										
b (Intercept as % of full scale) = 0.08%			0.95-1.05										
% change in C.F. from last cal = -3.99%			± 3% F.S.										
			± 10%										
Thermo 51C Total Hydrocarbon Analyzer Calibration													
As found:			As left:										
measurement alarms:	n/a		measurement alarms:	n/a									
service alarms:	n/a		service alarms:	n/a									
cnt:	1921		cnt:	2735									
rng:	1		rng:	1									
try:	0		try:	4									
flm:	202.3		flm:	214.8									
det:	126.8		det:	125.3									
Flame:	202		Flame:	214									
Filter:	126		Filter:	125									
Base:	126		Base:	125									
Sample psi:	07.53		Sample psi:	07.53									
Internal Air Pressure:	20		Internal Air Pressure:	20									
Internal Fuel Pressure:	13		Internal Fuel Pressure:	13									
Cylinder/Regulator Pressures:	H2 Cylinder (psi): 1800		H2 Cylinder (psi): 1800										
	H2 cylinder reg.set (psi): 22		H2 cylinder reg.set (psi): 22										
	Zero Air Gen Pressure: 42		Zero Air Gen Pressure: 42										
	Span Cylinder (psi): 1700		Span Cylinder (psi): 1700										
	Span Cylinder reg.set (psi): 22		Span Cylinder reg.set (psi): 22										
	Measured Flow: 0.874		Measured Flow: n/a										
	Expected Value: 26.70		Expected Value: 26.64										
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.													
The ZS check for THC started at the same time as the NOx post-calibration ZS check, which interrupted the THC calibration. The THC calibration was restarted from the beginning (Adjusted Zero starts at 16:05). An improper connection /channel of the newly installed datalogger was corrected.													



— THC[ppm]

MaxAm		Thermo 51C Total Hydrocarbon Analyzer Calibration	
Date: June 11, 2018		Barometer/B.P./units: F.S. 05544 expires January 15, 2019 916 millibars	
Company/Airshed: LICA		Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C	
Location/Station Name: Maskwa		Weather Conditions: Light rain/scattered showers	
Parameter: Total Hydrocarbon		Calibration Purpose: repeat	
Start/End Time 24 hr. (mst): 13:17 / 17:24		Performed By/Reviewer: Alex Yakupov Rob Fisher	
Calibration Method: Gas Dilution		Cal Gas Expiry Date: November 24, 2022	
Analyzer:			
Serial Number/Owner: 436609738 LICA		Range ppm: 50	
Last Calibration Date: June 7, 2018		As Found C.F.: 0.991	
Previous Cal High Point 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: EnviroNics id# 4760 expires March 2, 2019			
Cal Gas Cylinder I.D. #: LL 165367			
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):		Standard Calibration Points for a Range of: 50 ppm	
CH ₄ as propane/total CH ₄ equivalents (ppm):			
590.0	207.0	Point	Target ppm
569.3	1159.3	High	38
		Mid	18
		Low	9
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015			
Calibrator Flow Rates (cc/min)		Calculated Concentration:	Indicated Concentration:
Point	Diluent	Cal Gas	Total
as found zero	2519	0.00	2519
as found high	2441	81.33	2522
adjusted zero	2519	0.00	2519
adjusted high	2441	81.33	2522
mid	2477	38.88	2516
low	2497	19.47	2516
calibrator zero	2519	0.00	2519
		ppm	ppm
		0.0	-0.32
		37.38	37.40
		0.00	0.00
		37.38	37.40
		17.91	17.72
		8.97	8.85
		0.00	0.00
Average C.F.=			1.008
Linear Regression/Calibration Results:			
Correlation Coefficient = 1.000		LIMITS	
Slope = 0.999		> or = 0.995	
b (Intercept as % of full scale) = 0.19%		0.95-1.05	
% change in C.F. from last cal = 0.89%		± 3% F.S.	
		± 10%	
Thermo 51C Total Hydrocarbon Analyzer Calibration			
As found:		As left:	
measurement alarms:	None	measurement alarms:	None
service alarms:	None	service alarms:	None
cnt:	2564	cnt:	2520
rng:	1	rng:	1
try:	4	try:	1
flm:	211.3	flm:	211.9
det:	125.5	det:	125.8
Flame:	211	Flame:	211
Filter:	125	Filter:	125
Base:	125	Base:	125
Sample psi:	07.52	Sample psi:	07.52
Internal Air Pressure:	20	Internal Air Pressure:	20
Internal Fuel Pressure:	13	Internal Fuel Pressure:	13
Cylinder/Regulator Pressures:	H2 Cylinder (psi): 1800	Cylinder/Regulator Pressures:	H2 Cylinder (psi): 1800
	H2 cylinder reg set (psi): 22		H2 cylinder reg set (psi): 22
	Zero Air Gen Pressure: 42		Zero Air Gen Pressure: 42
	Span Cylinder (psi): 1700		Span Cylinder (psi): 1700
	Span Cylinder reg set (psi): 22		Span Cylinder reg set (psi): 22
	Measured Flow: 0.876		Measured Flow: n/a
	Expected Value: 26.64		Expected Value: 26.40
Comments:			
No high point adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes. The manifold blower was found to be working normally.			
A Repeat calibration was completed to correct a ZERO drift (daily readings because of the Zero drift were reported to be less than 1.8 ppm). As Found High Point starts at 15:02 because of power reset to the analyzer.			



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: June 7, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 10:02 / 16:03 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 938 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: n/a
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Analyzer: Serial Number/Owner: 1899 Maxxam Last Calibration Date: May 4, 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>1.001</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.986</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.002</td> <td>1.001</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.001	1.000	NO ₂ =	1.000	0.986	1.000	NOx =	1.000	1.002	1.001
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.001	1.000														
NO ₂ =	1.000	0.986	1.000														
NOx =	1.000	1.002	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: Environics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

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	5067	0.0	5067	0	0	0.0	0.0	n/a	n/a
as found high	4985	76.1	5061	774.0	775.5	773.0	774.0	1.001	1.002
adjusted zero	5067	0.00	5067	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4985	76.06	5061	774.0	775.5	774.0	775.0	1.000	1.001
mid	5019	37.09	5056	377.8	378.5	371.0	372.0	1.018	1.018
low	5038	18.48	5056	188.2	188.6	182.0	183.0	1.034	1.031
calibrator zero	5067	0.00	5067	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.018	1.016

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4985	76.06	5061	0.0	774.0	777.0	3.0	0.0	3.0	
as found high NO2	4985	76.06	5061	510.0	283.0	784.0	501.0	491.0	498.0	0.986
adjusted high NO2	4985	76.06	5061	510.0	282.0	777.0	495.0	492.0	492.0	1.000
gpt mid	4985	76.06	5061	280.0	502.0	777.0	275.0	272.0	272.0	1.000
gpt low	4985	76.06	5061	105.0	673.0	777.0	104.0	101.0	101.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.999	1.005	0.95-1.05
b (Intercept as % of full scale)=	-0.39%	-0.35%	0.18%	± 3% F.S.
% change in C.F. from last cal=	-0.13%	-0.19%	1.41%	± 10%
NO2 converter efficiency			0.98	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	1.035	NOx SLOPE:	1.036
NOx OFFS:	-0.1	NOx OFFS:	-0.1
NO SLOPE:	1.042	NO SLOPE:	1.041
NO OFFS:	-0.8	NO OFFS:	-0.8
SAMP FLW:	552	SAMP FLW:	551
OZONE FL:	78	OZONE FL:	78
NORM PMT:	-1.5	NORM PMT:	0.0
AZERO:	21.3	AZERO:	20.9
HVPS:	670	HVPS:	669
DCPS:	2554	DCPS:	2563
RCELL:	50.0	RCELL:	49.8
BOX TEMP:	30.2	BOX TEMP:	30.0
IZS TEMP:	50.0	IZS TEMP:	50.2
MOLY TEMP:	315.0	MOLY TEMP:	314.1
RCEL:	6.5	RCEL:	6.5
SAMP:	25.9	SAMP:	25.9
Expected Value NO:	4	Expected Value NO:	5
Expected Value NO2:	407	Expected Value NO2:	407
Expected Value NOx:	412	Expected Value NOx:	412

Comments:

The analyzer sample inlet filter was changed.

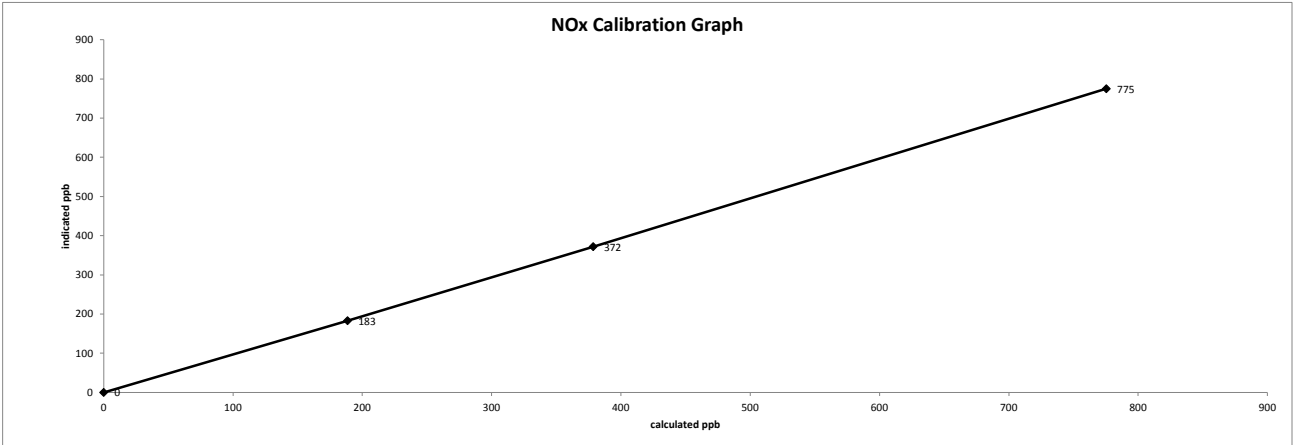
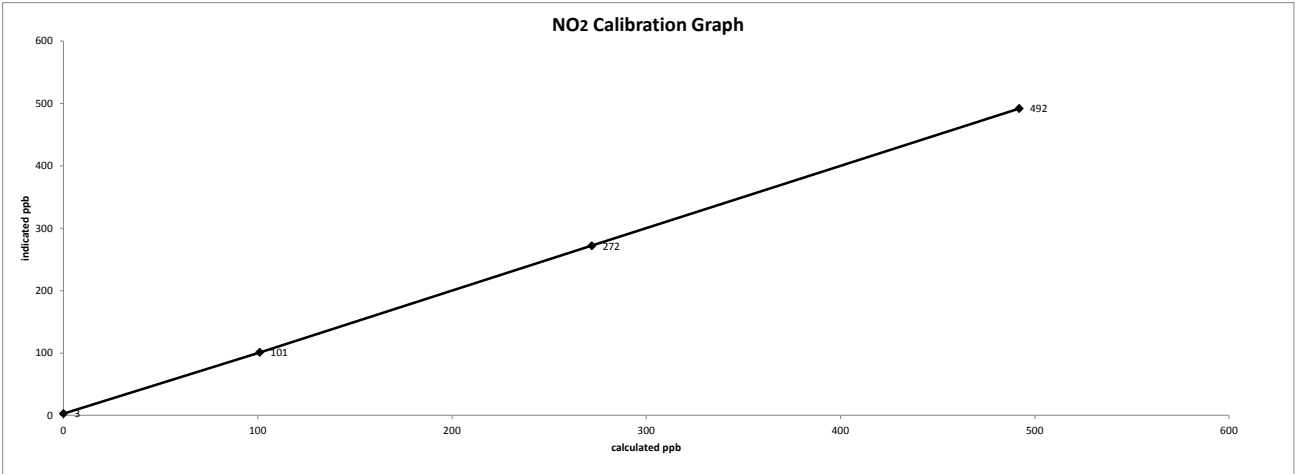
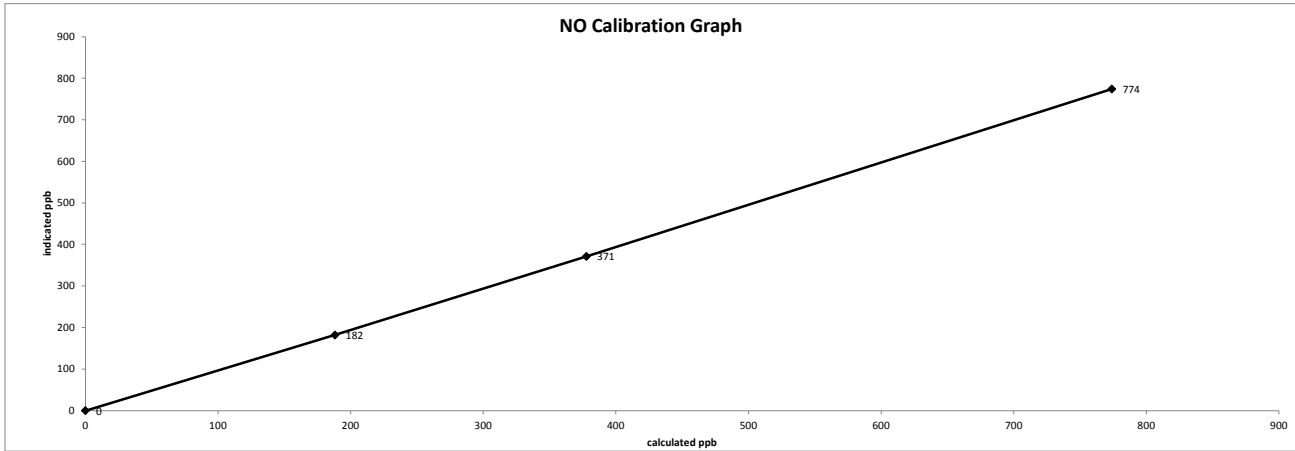
The manifold blower was found to be working normally.

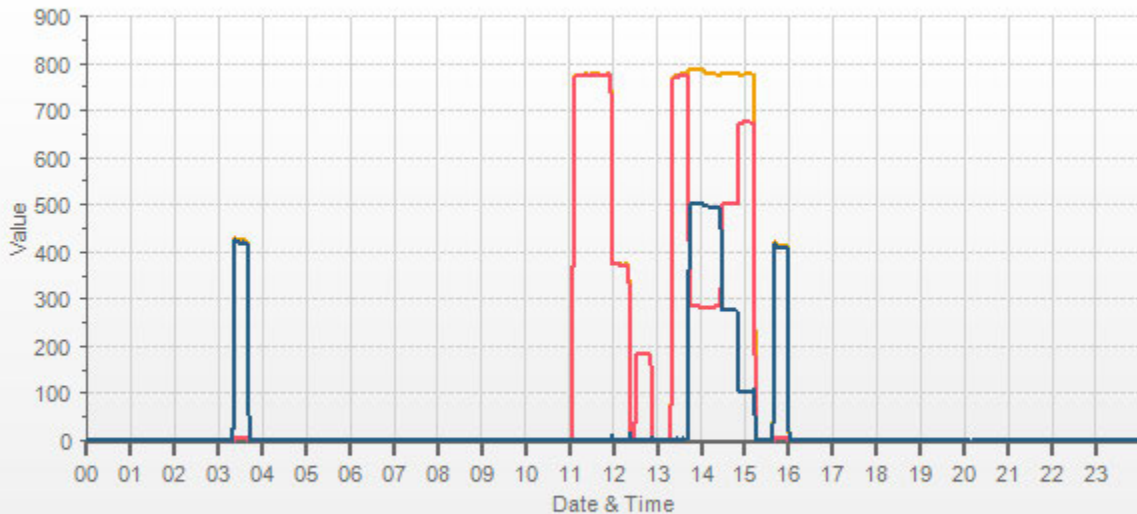
No high point adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: June 7, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:02 / 16:03
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOx[ppb] — NO[ppb] — NO2[ppb]

PARTICULATE MATTER 2.5



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

Date:	June 7, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	16:41	
Station Name/Location:	Maskwa	End Time (mst):	17:44	
Previous Audit Date:	May 28, 2018	Calibration Purpose:	Bi-monthly #1	
Parameter:	PM 2.5	Weather Conditions:	Mix of sun and clouds	

1400A Information and Status:

Serial Number/Owner:	1405A208301003	LICA	As Found Filter Loading %:	2%
Ko Factor:	13125		As Left Filter Loading %:	2%
Ambient Temperature °C:	25.28		As Found Noise:	0.008
Ambient Pressure atm:	0.919		As Left Noise:	0.007
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. 05544 expires January 16, 2019
Pressure:	F.S. 05544 expires January 15, 2019

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	2.49	0.00	2.49
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.91	0.00	-0.91
	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	0.00	2.49	0.00	2.49
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.91	0.00	-0.91
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

1405F temperature °C:	25.3	1405F pressure atm:	0.919
reference temperature °C:	25.6	reference pressure:	0.923
tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
difference °C:	0.3	difference :	-0.004

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

1405F temperature °C:	25.3	1405F pressure atm:	0.923
reference temperature °C:	25.6	reference pressure:	0.923
tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
difference °C:	0.3	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: 3.13	reference total/aux flow lpm: 13.87
difference lpm: 0.13	difference lpm: 0.20

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: 3.04	reference total/aux flow lpm: 13.66
difference lpm: 0.04	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 TEOM intake head and associated sharp cut components were cleaned.
 The 47 mm FDMS filter was changed.

WIND SYSTEM

METEOROLOGICAL SYSTEM



Meteorological System Checklist

Date:	June 21, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	F4481
PRECIPITATION SENSOR CHECK			
Checklist:	Reply:	Comments:	
Previous check date:	March 15, 2018	n/a	
Is the sensor Level?	yes	n/a	
Is the heater operating properly?	yes	n/a	
Are the bucket drain holes clean?	yes	n/a	
Is the screen on the housing? (screen should be on between July and September)	yes	n/a	
Is the housing clean?	yes	Cleaning was completed	
Is the area around the housing clean and free from obstacles?	yes	Grass cutting was performed. 10:11 - channel flagged "M" for testing	
TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)			
# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml	
10	1.00	0.00	

CALIBRATORS

Company: Maxxam **Operator:** Chris W

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

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

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

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

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

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

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

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9880	0.90-1.10
b (Intercept % of FS)=	0.1153	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Teco 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: *Chris W* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

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

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

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

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

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

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

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9836	0.90-1.10
b (Intercept % of FS)= 0.1675	± 3% F.S.

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

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark 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

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	132.895	10.2
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2
 Percent variance from Stated: 1

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

Auditor: Al Clark Date: October 19, 2016
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2015-029CGA

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

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

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

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	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***



SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

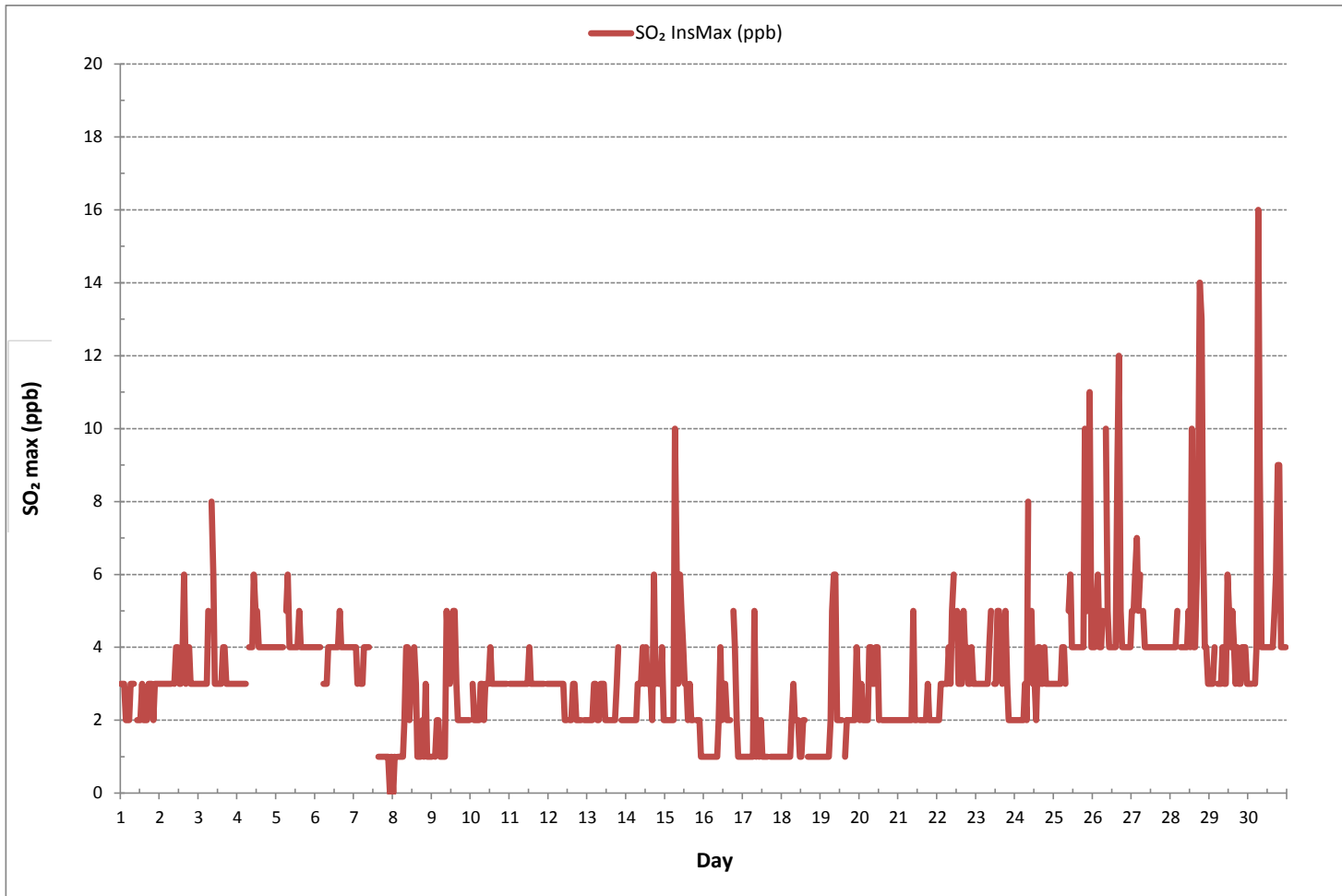
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	16 ppb @ HOUR 6 ON DAY 30
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	719 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

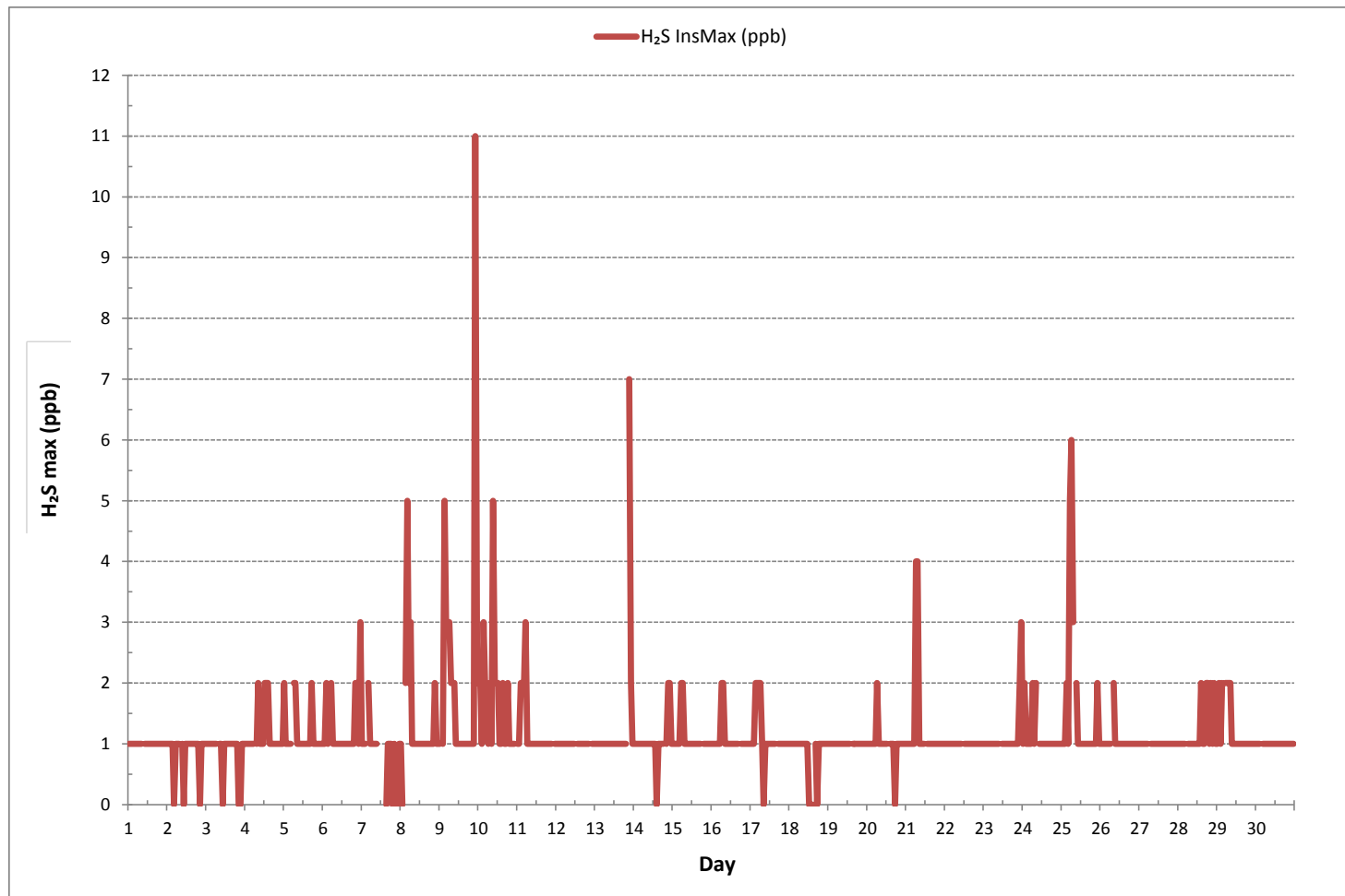
STATUS FLAG CODES

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:	665
MAXIMUM INSTANTANEOUS VALUE:	11 ppb @ HOUR 22 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	719 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - June 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	2.11	2.04	2.03	2.02	2.03	2.01	2.01	2.06	1.98	S	1.94	1.94	1.95	1.94	1.95	1.96	1.96	1.95	1.95	1.98	1.98	1.99	1.99	1.99	1.94	2.11	1.99	24	
2	2.40	3.28	2.14	2.03	2.02	2.43	2.73	2.28	S	2.30	2.15	2.10	2.06	2.04	2.05	2.13	2.01	2.07	2.02	2.07	1.98	1.99	2.37	2.17	1.98	3.28	2.21	24	
3	2.21	2.21	2.38	2.38	2.13	2.15	3.61	S	2.33	2.26	2.25	2.19	2.27	2.06	2.05	2.02	2.05	1.96	1.96	1.94	1.94	1.93	1.95	1.94	1.93	3.61	2.18	24	
4	1.92	1.90	1.88	1.89	1.88	1.87	S	1.83	1.81	1.86	1.89	1.86	1.88	1.85	1.85	1.85	1.84	1.84	1.88	1.86	1.89	2.19	2.49	2.44	1.81	2.49	1.93	24	
5	2.07	2.07	2.05	2.11	2.13	S	2.28	2.31	2.09	2.01	1.99	2.11	2.23	2.08	1.89	1.90	2.12	1.96	1.91	1.92	1.96	2.82	3.75	1.89	3.75	1.89	3.75	2.16	24
6	2.38	2.32	2.13	2.03	S	2.03	1.97	1.95	1.92	1.90	1.89	1.88	1.89	1.94	1.94	1.94	1.94	1.95	1.95	1.93	2.01	2.04	2.12	2.12	1.88	2.38	2.01	24	
7	2.05	2.07	2.12	S	2.19	2.12	2.26	2.01	2.00	1.99	2.01	1.99	1.95	1.94	C	C	C	C	C	C	C	2.05	2.01	2.00	2.01	1.94	2.26	2.05	24
8	2.01	2.00	S	2.08	2.08	2.08	2.08	2.07	2.08	2.05	2.03	2.04	2.01	2.01	2.10	1.92	1.93	1.97	1.98	1.94	1.99	1.93	1.90	1.89	1.89	2.10	2.01	24	
9	1.90	S	1.89	2.01	1.99	1.89	1.88	1.88	1.89	1.91	1.92	2.23	1.90	1.88	1.88	1.84	1.81	2.04	2.32	1.77	1.80	1.79	1.80	1.83	1.77	2.32	1.92	24	
10	S	1.74	1.76	1.89	1.78	1.83	1.72	1.80	1.73	1.79	1.72	1.74	1.85	1.71	1.68	1.70	1.72	1.74	1.67	1.68	1.71	1.76	1.77	S	1.67	1.89	1.75	24	
11	1.69	1.69	1.69	1.65	1.65	1.66	1.68	1.68	1.65	1.66	1.67	1.66	1.65	C1	C1	C1	C1	C1	2.04	2.05	2.07	2.08	S	2.06	1.65	2.08	1.78	19	
12	2.07	2.07	2.06	2.07	2.07	2.08	2.09	2.09	2.07	2.09	2.11	2.16	X	2.29	2.21	2.32	2.31	2.26	2.26	2.25	2.25	S	2.25	2.25	2.06	2.32	2.17	23	
13	2.29	2.33	2.38	2.44	2.38	2.39	2.35	2.34	2.36	2.36	2.30	2.28	2.27	2.28	2.28	2.28	2.28	2.23	2.24	2.39	S	2.34	2.38	2.31	2.23	2.44	2.33	24	
14	2.65	2.52	2.91	2.86	2.56	2.36	2.35	2.34	2.32	2.30	2.31	2.31	2.37	2.50	2.39	2.36	2.33	2.32	2.58	S	2.73	3.37	3.18	2.46	2.30	3.37	2.54	24	
15	2.32	2.39	2.45	2.54	2.46	2.40	2.87	2.69	2.36	2.50	2.40	2.44	2.38	2.38	2.55	2.55	2.73	2.37	S	2.37	2.46	2.53	2.53	3.02	2.32	3.02	2.51	24	
16	2.75	2.91	3.11	2.88	2.77	2.81	3.67	3.31	2.59	2.53	2.57	2.51	2.55	2.51	2.52	2.52	2.52	S	2.70	2.74	2.56	2.59	3.06	2.79	2.51	3.67	2.76	24	
17	2.61	2.63	2.77	3.25	3.08	3.04	3.01	2.84	2.70	2.70	2.74	2.56	2.54	2.52	2.52	2.51	S	2.50	2.51	2.52	2.51	2.54	2.57	2.63	2.50	3.25	2.69	24	
18	2.83	2.85	2.90	3.15	2.96	2.88	2.75	2.68	2.78	2.77	2.69	2.60	2.56	2.56	2.55	S	2.55	2.57	2.56	2.56	2.56	2.61	2.64	2.64	2.55	3.15	2.70	24	
19	2.83	2.80	2.86	2.87	3.33	3.31	2.78	2.85	3.01	3.00	2.67	2.64	2.54	2.56	S	2.52	2.52	2.52	2.52	2.53	2.55	2.57	2.56	2.60	2.63	2.52	3.33	2.74	24
20	2.64	2.77	2.85	2.90	2.79	2.81	2.97	2.92	2.70	2.59	2.57	2.62	2.49	S	2.49	2.51	2.50	2.49	2.49	2.50	2.51	2.56	2.64	2.70	2.49	2.97	2.65	24	
21	2.93	3.17	3.07	3.06	3.02	3.11	2.95	2.95	2.61	2.54	2.49	2.43	S	2.47	2.47	2.41	2.43	2.43	2.42	2.45	2.45	2.48	2.55	2.88	2.41	3.17	2.69	24	
22	3.32	2.71	2.79	2.83	2.80	2.91	2.67	2.57	2.52	2.43	2.37	S	2.41	2.35	2.31	2.31	2.36	2.37	2.37	2.38	2.49	2.46	2.43	2.42	2.31	3.32	2.55	24	
23	2.40	2.44	2.58	2.57	2.58	2.53	2.41	2.40	2.43	2.41	S	2.37	2.35	2.36	2.37	2.46	2.50	2.42	2.41	2.42	2.42	2.66	2.90	2.41	2.35	2.90	2.47	24	
24	2.50	2.73	2.72	2.57	2.56	2.76	2.74	2.80	2.81	S	2.70	2.73	2.60	2.53	2.48	2.44	2.46	2.46	2.48	2.48	2.49	2.47	2.52	2.53	2.50	2.44	2.81	2.59	24
25	2.52	2.82	2.78	2.63	2.59	2.58	2.58	2.53	S	2.37	2.33	2.23	2.24	2.22	2.21	2.22	2.21	2.20	2.26	2.24	2.18	2.22	2.18	2.22	2.18	2.82	2.37	24	
26	2.27	2.29	2.36	2.29	2.21	2.22	2.41	S	2.26	2.17	2.17	2.22	2.24	2.23	2.24	2.24	2.21	2.19	2.28	2.29	2.23	2.25	2.33	2.37	2.17	2.41	2.26	24	
27	2.40	2.36	2.36	2.36	2.38	2.39	S	2.32	2.25	2.20	2.20	2.20	2.17	2.18	2.18	2.19	2.19	2.17	2.18	2.18	2.18	2.18	2.19	2.18	2.17	2.40	2.24	24	
28	2.19	2.21	2.20	2.22	2.40	S	2.25	2.25	2.25	2.29	2.24	2.28	2.24	2.34	2.35	2.31	2.33	2.31	2.45	2.43	2.49	2.55	2.63	2.56	2.19	2.63	2.34	24	
29	2.68	2.51	2.60	2.50	S	2.51	2.51	2.35	2.40	2.34	2.32	2.31	2.36	2.32	2.38	2.40	2.34	2.34	2.35	2.38	2.36	2.43	2.29	2.33	2.29	2.68	2.40	24	
30	2.52	2.58	2.64	S	2.80	2.83	2.85	2.35	2.35	2.38	2.41	2.37	2.32	2.31	2.30	2.30	2.29	2.31	2.33	2.30	2.35	2.40	2.39	2.35	2.29	2.85	2.44	24	
HOURLY MAX	3.32	3.28	3.11	3.25	3.33	3.31	3.67	3.31	3.01	3.00	2.74	2.73	2.60	2.56	2.55	2.55	2.73	2.57	2.70	2.74	2.73	3.37	3.18	3.75					
HOURLY AVG	2.40	2.43	2.43	2.43	2.42	2.43	2.52	2.37	2.29	2.28	2.24	2.24	2.22	2.23	2.23	2.23	2.24	2.22	2.25	2.24	2.25	2.31	2.40	2.41					

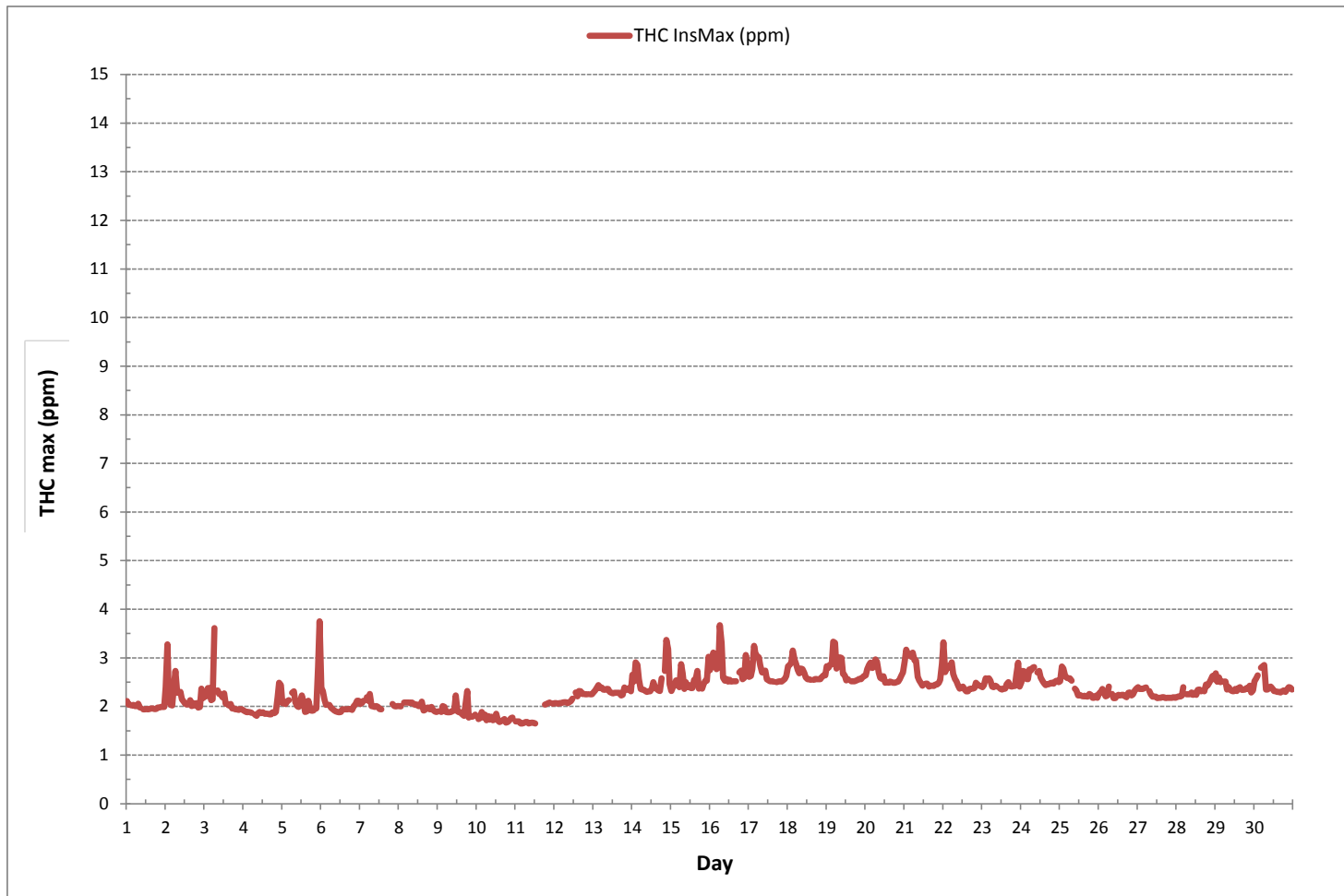
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	3.75 ppm @ HOUR 23 ON DAY 5
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	714 hrs
STANDARD DEVIATION:	0.35

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	5	2	1	0	0	0	1	3	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	1	24	
2	3	4	4	6	1	4	4	4	S	4	6	6	1	3	3	9	5	7	4	4	5	4	6	3	1	9	4	24	
3	2	2	2	2	2	3	20	S	17	10	4	2	2	1	1	2	2	1	1	0	0	0	0	0	0	20	3	24	
4	0	0	0	0	0	0	S	0	1	1	8	3	5	1	1	0	0	0	1	1	0	7	7	4	0	8	2	24	
5	11	9	5	1	1	S	6	12	3	3	2	4	2	1	1	1	2	0	0	2	0	1	4	22	0	22	4	24	
6	5	2	1	0	S	1	1	1	1	1	0	0	1	2	1	4	1	1	1	1	1	1	1	1	0	5	1	24	
7	0	0	0	S	1	1	2	2	1	1	C	C	C	C	C	C	C	1	1	2	2	1	2	1	0	2	1	24	
8	1	1	S	3	4	2	3	22	7	7	5	7	5	9	7	1	1	1	7	4	12	4	1	1	1	22	5	24	
9	1	S	2	10	10	3	2	2	3	13	9	6	6	9	10	4	1	4	1	2	4	3	6	4	1	13	5	24	
10	S	11	2	3	2	2	0	8	0	6	6	2	5	1	2	1	1	1	1	2	2	2	1	S	0	11	3	24	
11	2	2	1	1	0	0	1	1	1	1	2	2	2	1	1	2	1	2	2	2	2	1	1	S	0	2	1	24	
12	1	0	0	0	0	0	0	1	1	1	1	1	X	0	0	6	7	4	0	0	S	2	0	0	7	1	23		
13	1	1	2	5	5	6	2	3	3	3	2	1	1	1	8	1	3	4	4	13	S	2	1	1	1	13	3	24	
14	0	1	1	1	1	1	1	4	4	4	6	5	4	3	3	2	1	10	3	S	13	11	23	4	0	23	5	24	
15	1	2	1	3	1	1	21	11	3	8	4	3	2	4	3	2	2	0	S	0	1	1	1	0	0	21	3	24	
16	0	0	0	0	0	0	4	2	2	1	4	2	3	3	3	1	1	S	6	3	2	1	1	1	0	6	2	24	
17	1	1	1	1	1	1	5	8	8	3	2	3	4	19	3	0	1	S	2	1	1	1	2	2	0	19	3	24	
18	3	3	3	3	5	5	6	6	5	5	4	2	1	1	1	S	3	3	1	1	1	1	2	2	3	6	3	24	
19	4	4	3	3	21	5	6	10	20	10	3	3	5	2	S	1	1	1	1	1	1	2	6	4	1	21	5	24	
20	5	5	6	6	4	6	28	12	3	2	2	3	2	S	1	2	1	1	2	2	1	1	2	2	1	28	4	24	
21	2	3	3	3	3	1	2	3	3	5	1	0	S	1	1	1	1	1	0	1	1	1	2	1	0	5	2	24	
22	3	1	2	1	58	50	1	6	2	3	4	S	4	1	1	1	5	3	2	1	3	4	1	0	0	58	7	24	
23	0	0	0	0	0	0	0	1	4	8	S	1	0	5	7	4	3	4	4	1	1	1	2	1	0	8	2	24	
24	0	1	2	1	0	1	3	3	18	S	6	3	1	1	5	5	1	1	2	1	1	1	2	0	18	3	24		
25	2	2	2	3	1	5	4	1	S	5	7	1	1	1	1	1	1	1	1	1	23	6	6	22	2	1	23	4	24
26	3	1	9	12	1	1	7	S	16	4	1	2	1	1	3	11	12	5	1	1	1	2	1	4	1	16	4	24	
27	8	5	8	7	6	7	S	5	1	1	1	0	0	0	1	1	0	0	0	0	0	1	1	1	0	8	2	24	
28	0	0	0	1	3	S	2	1	1	2	1	7	6	9	0	2	3	6	10	8	6	3	2	1	0	10	3	24	
29	2	1	1	5	S	2	4	4	3	1	0	2	2	1	5	4	1	0	1	1	1	1	4	4	1	5	2	24	
30	1	2	3	S	5	7	15	18	1	1	2	1	1	1	2	1	11	9	9	2	4	2	2	1	18	4	24		
HOURLY MAX	11	11	9	12	58	50	28	22	20	13	9	7	19	9	10	11	12	11	10	23	13	11	23	22					
HOURLY AVG	2	2	2	3	5	4	6	6	5	4	3	3	3	2	2	3	2	3	2	3	2	3	4	2					

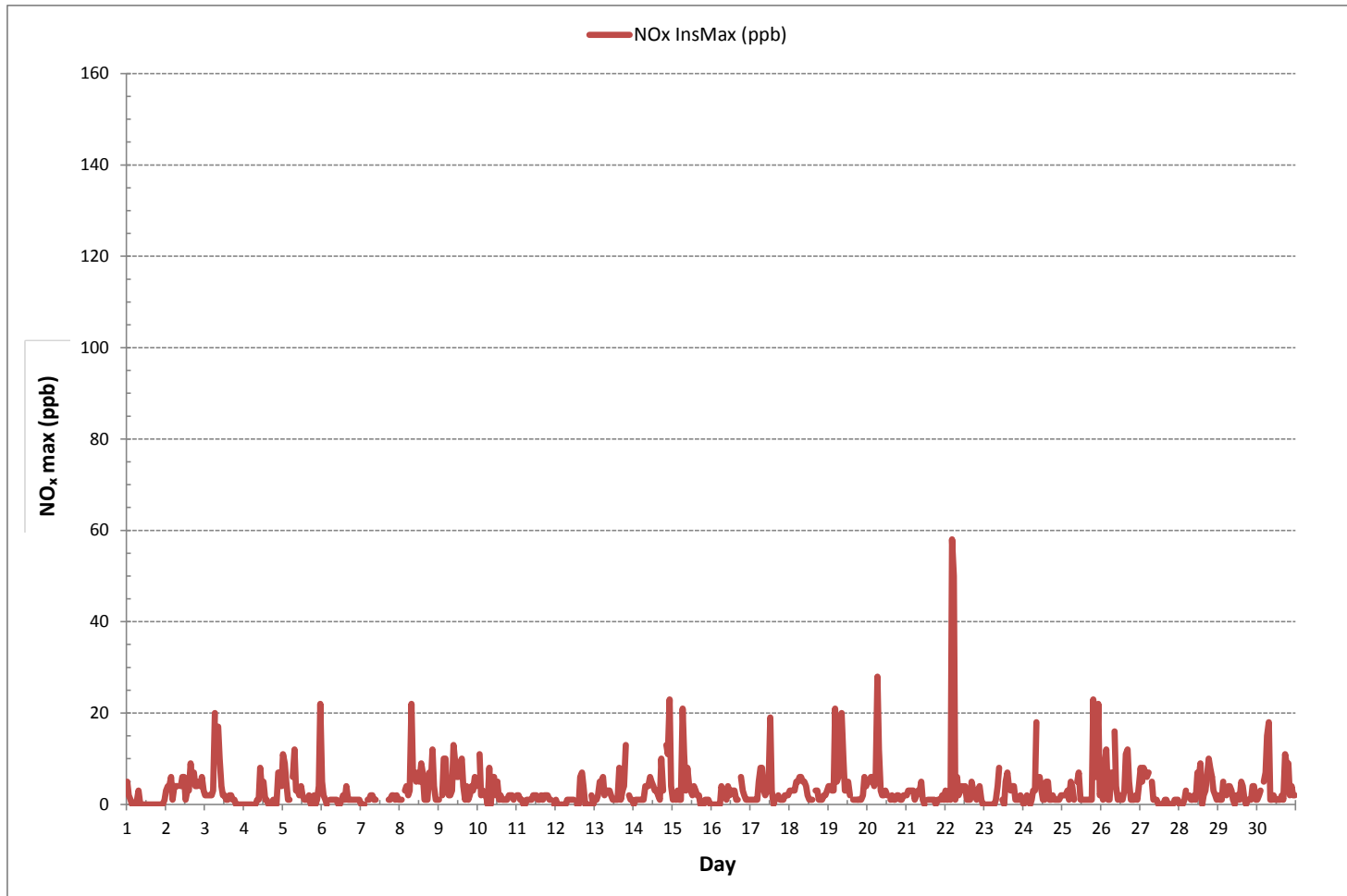
STATUS FLAG CODES

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:	584
MAXIMUM INSTANTANEOUS VALUE:	58 ppb @ HOUR 4 ON DAY 22
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	719 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

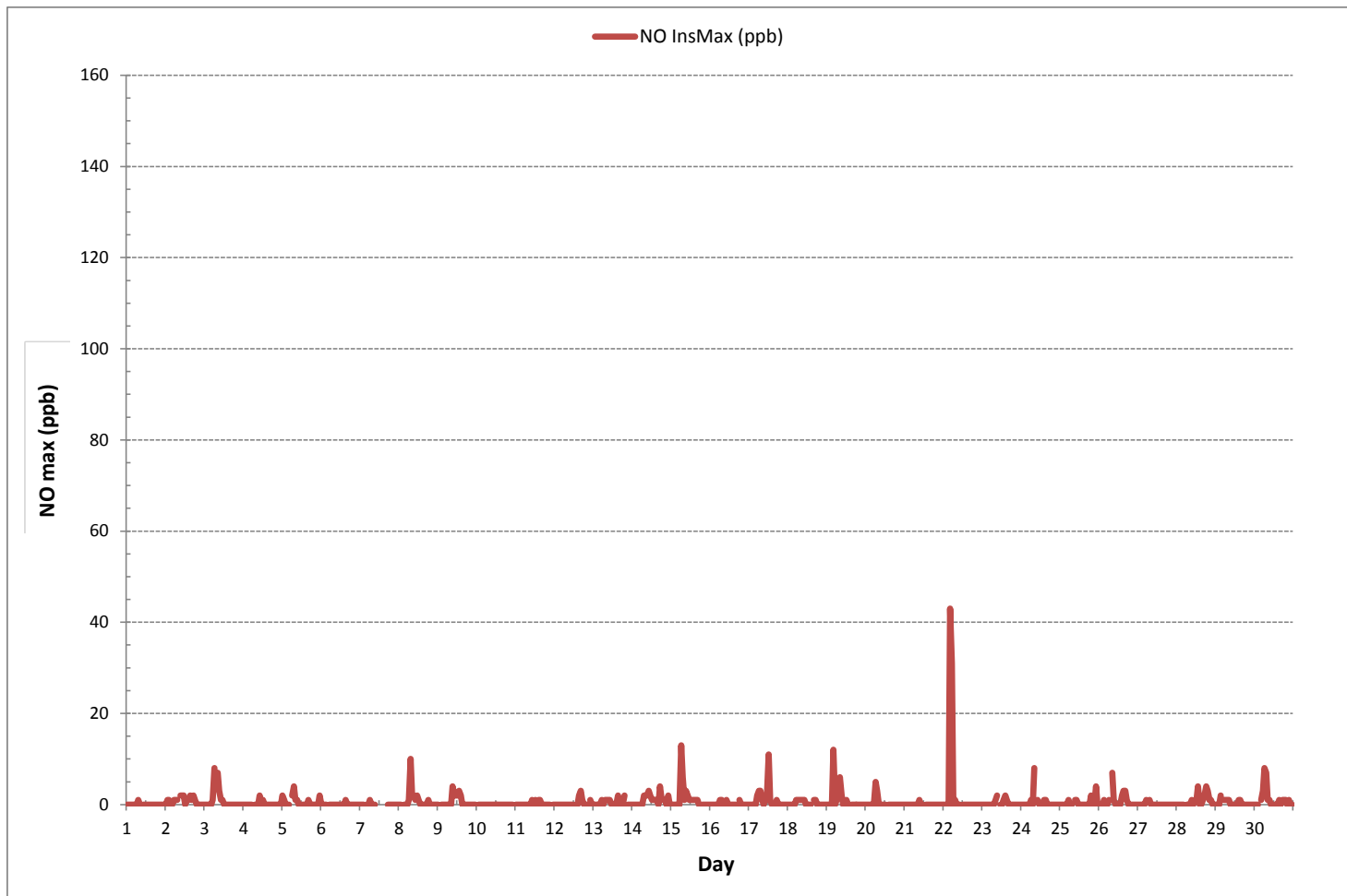
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	172
MAXIMUM INSTANTANEOUS VALUE:	43 ppb @ HOUR 4 ON DAY 22
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	719 hrs
STANDARD DEVIATION:	2

NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

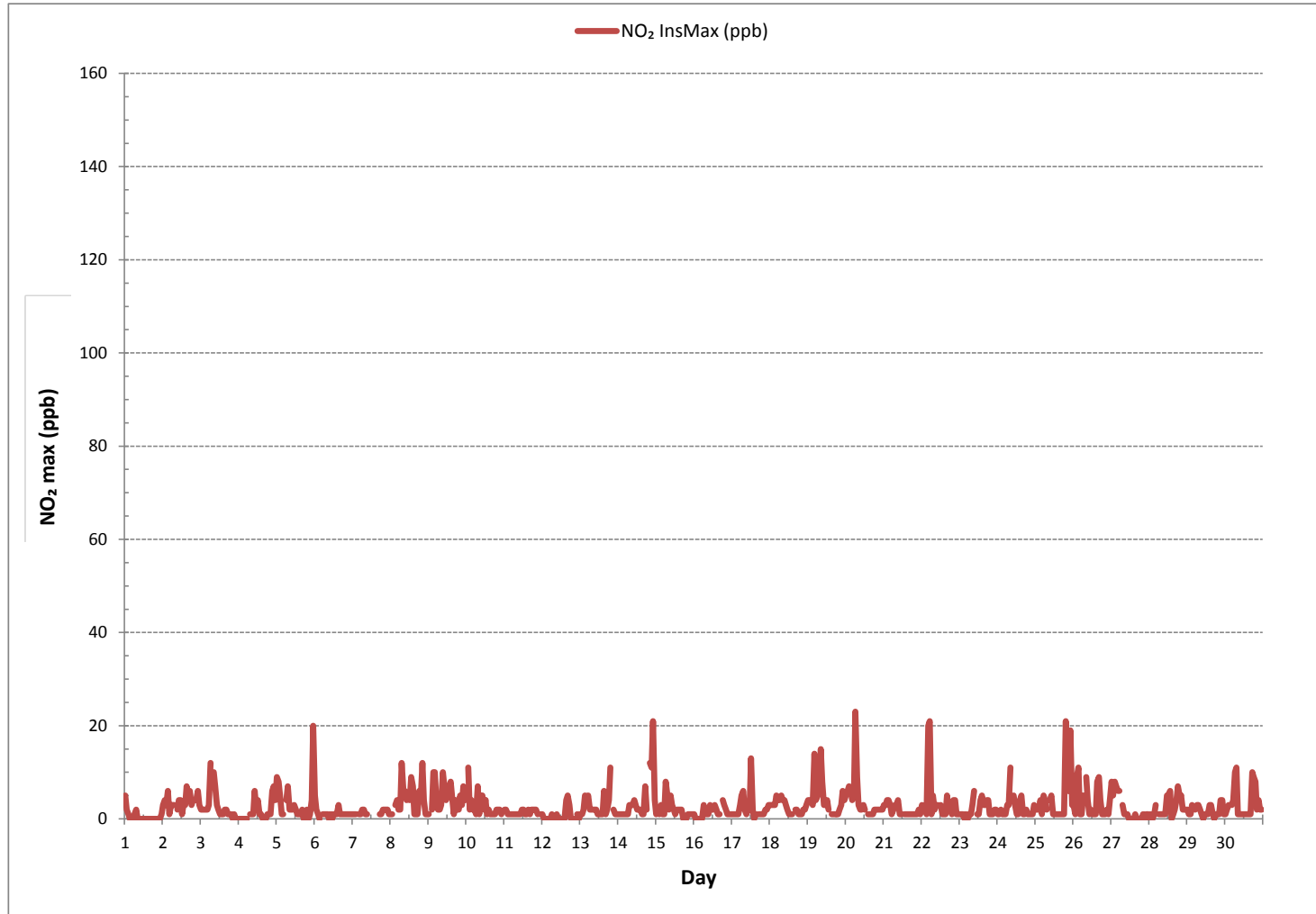
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	607
MAXIMUM INSTANTANEOUS VALUE:	23 ppb @ HOUR 6 ON DAY 20
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	719 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - June 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 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	8.3	12.0	9.5	11.8	13.3	13.2	19.5	25.6	19.3	30.8	17.5	17.0	19.2	17.0	22.3	22.7	17.5	15.7	8.9	7.4	10.7	7.6	6.9	8.3	6.9	30.8	15.1	24	
2	8.0	10.2	12.3	14.0	14.0	10.9	12.0	8.0	12.7	17.2	16.5	18.6	19.2	23.8	24.7	28.8	38.7	26.9	23.8	37.9	8.5	8.5	6.1	6.5	6.1	38.7	17.0	24	
3	8.3	5.7	7.6	12.0	7.7	7.4	11.1	26.2	17.8	21.0	35.6	36.3	25.0	24.4	22.7	19.4	22.7	11.9	33.9	17.5	17.0	24.5	30.6	23.6	5.7	36.3	19.6	24	
4	33.7	30.4	22.9	19.4	12.9	22.3	27.2	38.9	49.0	38.1	34.6	31.5	29.7	24.5	11.1	17.5	17.2	11.8	12.7	14.4	5.7	12.4	8.9	6.8	5.7	49.0	22.2	24	
5	9.6	6.1	6.9	7.8	6.9	7.8	21.6	23.8	18.8	19.7	26.9	28.4	35.0	32.6	22.7	24.9	21.4	26.9	29.4	15.9	10.9	4.7	3.7	4.6	3.7	35.0	17.4	24	
6	5.0	5.0	7.4	7.7	11.6	14.2	14.8	15.8	28.9	23.8	20.3	25.6	19.4	26.4	20.3	17.9	21.8	22.7	11.8	5.7	7.1	7.6	7.1	3.5	3.5	28.9	14.6	24	
7	8.7	10.0	5.7	5.7	5.9	4.7	9.4	14.0	21.4	32.6	35.4	30.2	48.7	40.0	32.9	30.7	26.0	28.9	29.5	24.4	24.4	21.0	21.4	23.8	4.7	48.7	22.3	24	
8	18.1	13.7	16.4	11.6	15.3	16.6	14.6	13.9	17.0	17.5	28.8	34.1	35.6	32.3	39.1	22.5	25.2	24.0	24.4	21.0	11.3	23.8	29.1	16.5	11.3	39.1	21.8	24	
9	21.8	18.9	13.7	16.6	17.2	24.0	18.6	25.8	29.2	27.3	33.4	32.6	39.4	34.3	43.3	35.0	29.7	30.8	46.4	48.6	32.4	25.6	26.9	31.3	13.7	48.6	29.3	24	
10	38.1	16.6	6.3	10.0	13.3	12.5	11.1	18.0	17.2	18.2	30.0	9.1	10.2	12.7	17.0	21.8	17.6	28.6	30.2	38.0	42.0	34.5	34.6	30.2	6.3	42.0	21.6	24	
11	34.3	33.7	34.3	33.7	34.6	37.0	31.3	32.6	34.6	30.0	39.6	36.3	33.7	34.6	34.1	37.0	39.6	34.1	35.2	39.0	35.0	32.0	33.2	30.8	30.0	39.6	34.6	24	
12	30.8	38.3	42.9	32.1	29.7	28.1	33.0	34.3	34.6	35.9	42.0	41.5	X	54.2	53.7	32.4	42.0	26.4	28.6	27.5	16.2	24.8	13.5	10.9	10.9	54.2	32.8	23	
13	10.7	9.6	9.1	15.1	15.3	13.7	10.7	10.0	15.3	15.3	24.0	28.6	24.0	26.9	31.0	27.5	34.4	27.7	18.3	19.7	10.2	10.9	6.8	5.4	5.4	34.4	17.5	24	
14	7.0	4.6	6.0	5.4	11.1	10.7	14.6	19.2	18.8	21.0	23.4	24.9	29.7	26.0	18.8	17.5	15.3	21.2	20.5	23.1	14.0	9.8	8.7	5.2	4.6	29.7	15.7	24	
15	6.1	3.7	2.4	4.4	5.5	4.3	12.2	12.9	19.4	25.8	24.4	24.0	23.1	25.1	24.4	21.4	24.4	25.1	20.3	13.7	6.3	4.1	3.7	15.5	2.4	25.8	14.7	24	
16	15.2	4.1	4.6	4.3	4.4	3.2	5.1	5.8	6.1	7.1	16.6	14.6	13.7	16.1	16.1	25.1	20.6	16.8	12.4	11.8	6.1	5.2	6.3	7.4	3.2	25.1	10.4	24	
17	4.3	4.4	4.4	5.2	4.1	4.1	6.4	10.4	11.8	18.8	26.2	22.7	25.8	24.0	26.4	18.3	22.9	20.7	17.0	14.6	5.6	6.1	9.8	8.0	4.1	26.4	13.4	24	
18	8.5	8.8	5.0	7.4	10.9	14.4	15.5	12.9	14.2	18.9	26.2	29.9	30.1	32.1	22.0	23.8	20.9	20.6	19.0	16.8	9.1	9.1	8.3	9.4	5.0	32.1	16.4	24	
19	8.3	5.0	4.6	5.4	5.4	7.4	9.8	14.1	16.1	17.2	22.2	21.2	22.0	23.1	22.5	23.6	26.6	24.6	22.2	17.9	12.1	9.6	12.6	11.8	4.6	26.6	15.2	24	
20	11.1	9.6	11.1	7.4	5.3	9.6	12.9	12.0	17.4	18.8	23.8	25.5	20.7	21.4	27.9	19.4	19.0	20.7	19.4	14.1	5.6	6.1	4.6	5.2	4.6	27.9	14.5	24	
21	3.5	5.5	4.2	2.8	10.8	4.6	3.2	12.6	11.3	13.7	20.6	18.3	20.9	17.7	19.5	19.4	19.4	14.8	18.3	8.9	13.9	15.7	5.9	5.2	2.8	20.9	12.1	24	
22	10.5	6.3	4.1	5.2	5.2	5.4	6.8	6.3	8.7	16.9	23.6	19.0	27.7	27.5	30.6	17.1	20.9	15.3	17.0	13.3	9.8	8.0	6.9	11.6	4.1	30.6	13.5	24	
23	9.4	5.1	3.2	6.9	7.6	12.5	17.3	14.4	31.9	20.5	19.9	25.5	24.2	22.0	29.5	22.2	26.6	11.3	6.3	6.6	3.0	4.1	6.9	8.5	3.0	31.9	14.4	24	
24	7.4	4.1	6.3	8.3	5.9	4.3	8.0	8.7	7.7	9.8	14.6	16.4	16.3	25.8	32.5	25.8	25.5	27.1	20.3	21.2	15.8	12.0	13.8	10.1	4.1	32.5	14.5	24	
25	14.1	9.6	4.8	8.9	10.5	13.7	21.2	25.1	29.7	27.1	35.6	35.4	40.4	44.3	41.4	50.2	43.7	39.3	61.9	29.5	17.7	21.6	19.2	15.5	4.8	61.9	27.5	24	
26	10.2	13.5	13.3	19.7	14.2	7.3	12.0	17.0	32.1	35.0	32.1	25.6	20.5	31.7	19.4	21.4	6.6	11.6	19.0	13.7	13.1	17.3	15.5	17.3	6.6	35.0	18.3	24	
27	18.8	16.5	12.7	16.6	15.5	21.4	22.3	29.7	29.5	48.8	35.0	30.8	34.5	35.3	36.7	34.5	38.1	39.4	34.8	20.3	27.7	32.8	27.7	32.4	12.7	48.8	28.8	24	
28	28.6	30.2	29.7	31.1	19.8	26.0	28.0	23.4	32.8	40.2	31.0	28.8	38.5	35.6	33.9	36.9	29.7	29.9	18.6	20.7	11.3	10.0	6.5	8.7	6.5	40.2	26.2	24	
29	8.5	8.5	14.8	6.8	7.8	7.8	7.5	13.0	23.8	19.7	25.8	26.6	24.2	26.2	21.8	34.7	26.6	17.6	16.8	18.1	7.8	17.9	19.7	6.7	6.7	34.7	17.0	24	
30	4.8	4.8	4.4	3.9	4.6	5.1	11.3	14.8	16.6	22.7	23.5	24.5	26.5	26.8	26.2	20.3	44.8	34.1	7.4	9.4	10.4	9.8	12.9	13.5	3.9	44.8	16.0	24	
HOURLY MAX	38.1	38.3	42.9	33.7	34.6	37.0	33.0	38.9	49.0	48.8	42.0	41.5	48.7	54.2	53.7	50.2	44.8	39.4	61.9	48.6	42.0	34.5	34.6	32.4					

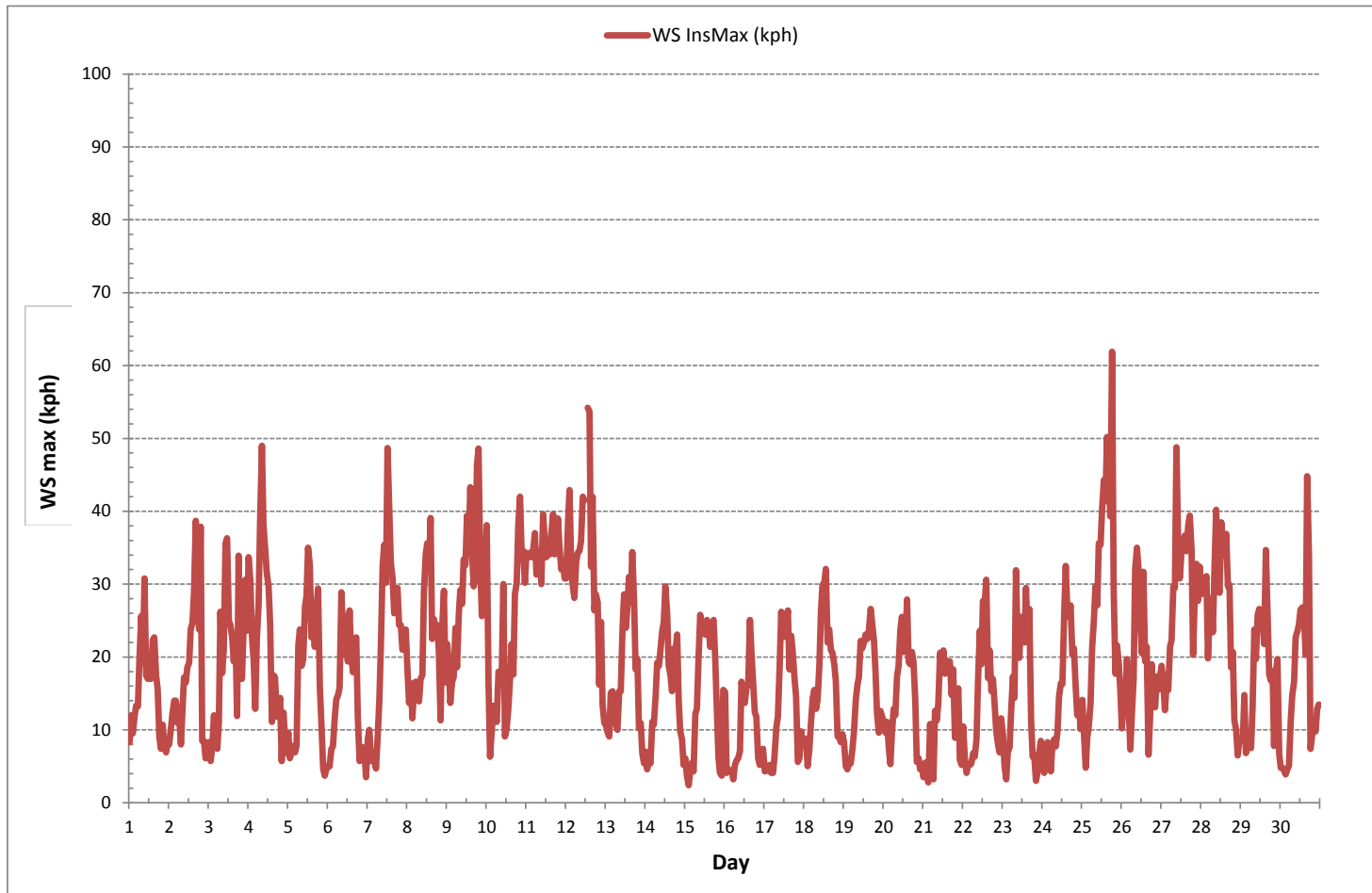
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	61.9 kph	@ HOUR	18	ON DAY	25
OPERATIONAL TIME:	719 hrs				

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	Maskwa Continuous Monitoring Station
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Cheri Sinclair	Supervisor, 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	B.Sc.

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

13-08-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-06-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>July 10, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>July 10, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>Aug 13, 2018</u>
Level 3 Independent Data Review	<u>Cheri Smclair</u>	Date <u>Aug 13, 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 June 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 June 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

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

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

Respectfully,



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

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

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

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

Lily Lin
Data & Reporting Specialist
587-225-2248
rebbaca@gmail.com



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T2E 6P7

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Fax 403-219-3673

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

JOB #: 2833-2018-06-31-C

June 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **August 13, 2018**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Cheri Sinclair*

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

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

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

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

THC: Thirty hours of downtime were recorded resulting from a sample pump failure. A shut-down calibration was attempted on June 25, but failed at the as-found high point. Twenty-four hours of downtime was incurred due to the rejection of data back to the determined point of failure on June 24, at hour 11:00. An additional six hours of down time was recorded due to the pump repair and post-repair calibration.

O₃: After the datalogger upgrade in May, 2018 the daily span checks were exceeding the upper acceptance limit. Two additional zero-span checks were initiated on June 1 to assess the drift, resulting in three hours of downtime. A successful multi-point calibration was completed on June 2, but the drift persisted. 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.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	2	12	10	34	W	1	13	100.0
H ₂ S (ppb)	10	3	0	0	0	4	26	5	10.9	WSW	0	1	100.0
THC (ppm)	-	-	-	-	2.18	2.64	14	0	4.5	NW	2.30	20	95.8
NO ₂ (ppb)	159	-	0	-	1	6	18	4	9.7	SSW	2	7	100.0
NO (ppb)	-	-	-	-	0	3	19	6	7.5	SW	0	1	100.0
NO _x (ppb)	-	-	-	-	1	9	19	6	7.5	SW	3	18	100.0
O ₃ (ppb)	82	-	0	-	35.6	70.6	20	18	7.8	SSW	54.3	20	99.6
PM _{2.5} (µg/m ³)	80	30	0	0	5	20	22	16	6.8	S	9	7	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	63	99	10	10	4.7	ENE	94	1	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	927	940	18	9	13.3	SW	938	18	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	15.7	29.0	22	13	5.1	SSW	23.8	21	100.0
PRECIPITATION (mm)	-	-	-	-	0.2	16.0	9	15	17.9	NNW	0.9	9	100.0
VECTOR WS (kph)	-	-	-	-	4.2	49.8	11	20	-	W	35.8	11	100.0
VECTOR WD (sec)	-	-	-	-	248 (WSW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

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

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

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

HYDROGEN SULPHIDE (H₂S)

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

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 95.8%, equivalent to 30 hours of downtime.
- The routine monthly calibration was performed on June 13.
- The analyzer spanned close to the lower acceptance limit on June 21 – 23 and suddenly plummeted on June 24. A site visit on June 25 revealed the sample pump had failed. A shutdown calibration was attempted but failed at the as-found high point. The calibration was aborted and the technician proceeded to repair the pump. A successful post-repair calibration was performed and monitoring resumed on June 25, at hour 17:00. Data was invalidated back to the point of failure which was determined to be at hour 11:00 on June 24. Thirty hours of downtime were incurred due to this event.
- The station temperature was unstable throughout the month, due to insufficient air conditioning. The analyzer spanned outside the upper acceptance limit on June 27 – 30. It was suspected that unstable station temperatures negatively impacted the analyzer performance. This was evident during a site visit on July 1, where the technician observed the station temperature to be 16°C upon arrival. The technician kept the station door open which increased the temperature to 20°C. Shortly after the temperature had increased, the daily zero-span on July 1 was run and the results were back within acceptance limits. A successful multi-point calibration was completed on July 1, confirming analyzer performance. Repairs for the air conditioning system are scheduled for July, 2018.

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

- Operational time for the monitoring period was 100%
- A GPT calibration was performed on June 2 to obtain reference points for Ozone calibration. No analyzer adjustments were made, but hourly averages are absent during these hours.
- The routine monthly calibration was performed on June 12.

OZONE (O₃)

- Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime.
- After the datalogger upgrade, the analyzer spanned outside the upper acceptance limit on May 30 and May 31. To assess the drift, two repeat zero-span checks were triggered on June 1, at hour 07:00 and 11:00, yielding the same outcome. The pump for the zero-span system was also renewed on June 1. The routine monthly calibration was performed 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. There was no data rejected as the failed span verifications were not related to analyzer performance. However, three hours of downtime were incurred due to the additional quality checks.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%
- The monthly audit was performed on June 26.

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

- Operational time for the monitoring period was 100%
- Twenty-three instances of maximum instantaneous data were discarded on June 1 from hour 00:00 to 22:00 due to programming error that was resolved remotely.
- Two instances of maximum instantaneous data were discarded on June 12 at hour 17:00, and June 13 at hour 13:00, due to a few missing minute data that could not be recovered - reason unknown.
- One instance of maximum instantaneous data was invalidated on June 21 at hour 23:00, due to an anomalous spike, as it was not supported by minute data.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%
- The quarterly audit was performed on June 26.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

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

4.0 Calculations and Results

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

WS/WD/STDWD:

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected for the month of June 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
02/06/2018	06:00	22/06/2018	00:00
02/06/2018	07:00	23/06/2018	03:00
02/06/2018	08:00	23/06/2018	06:00
02/06/2018	20:00	23/06/2018	18:00
03/06/2018	15:00	23/06/2018	19:00
03/06/2018	16:00	23/06/2018	21:00
03/06/2018	17:00	24/06/2018	03:00
03/06/2018	18:00	24/06/2018	06:00
04/06/2018	12:00	26/06/2018	14:00
04/06/2018	13:00	29/06/2018	14:00
05/06/2018	09:00	30/06/2018	00:00
05/06/2018	20:00	30/06/2018	01:00
21/06/2018	23:00	30/06/2018	17:00

5.0 Methods and Procedures

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

- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-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 Unit
- Relative Humidity - RM Young Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - RM Young Unit
- Precipitation - Met One Unit
- Datalogger - Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

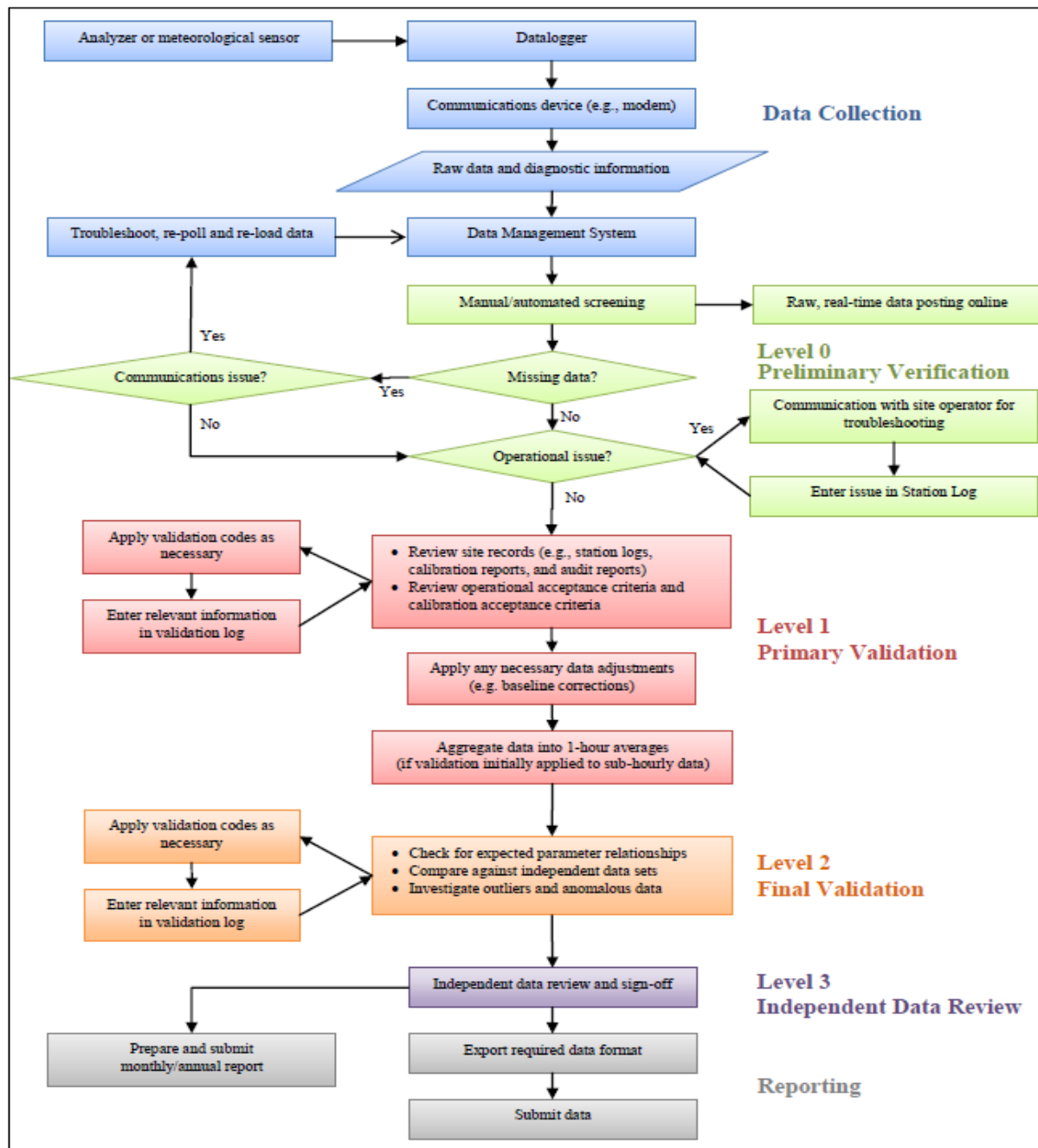
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (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	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24			
2	0	0	0	0	0	0	0	0	0	0	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		
3	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	0	0	0	0	0	24		
4	0	0	0	0	0	0	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
6	0	0	0	0	0	0	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
7	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
8	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
9	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
10	0	0	0	0	0	0	0	0	0	S	0	1	1	1	1	1	1	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	24		
11	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	0	0	0	0	0	24		
12	0	0	0	0	0	0	S	0	1	1	2	C	C	C	C	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	S	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	24	
14	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
16	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
18	S	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
19	0	0	0	0	0	0	1	2	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	0	0	0	0	0	0	0	2	2	1	1	1	0	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	S	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	2	2	2	1	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	0	0	0	0	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	0	0	0	24	
24	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	0	0	0	0	0	0	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	24	
HOURLY MAX	0	0	1	0	1	1	1	2	2	2	2	2	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	
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

STATUS FLAG CODES

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

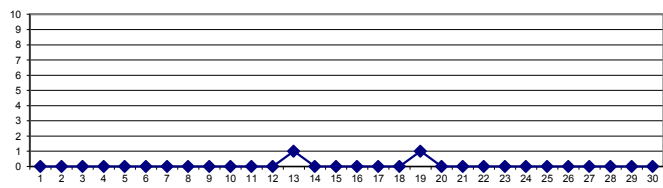
OBJECTIVE LIMIT:

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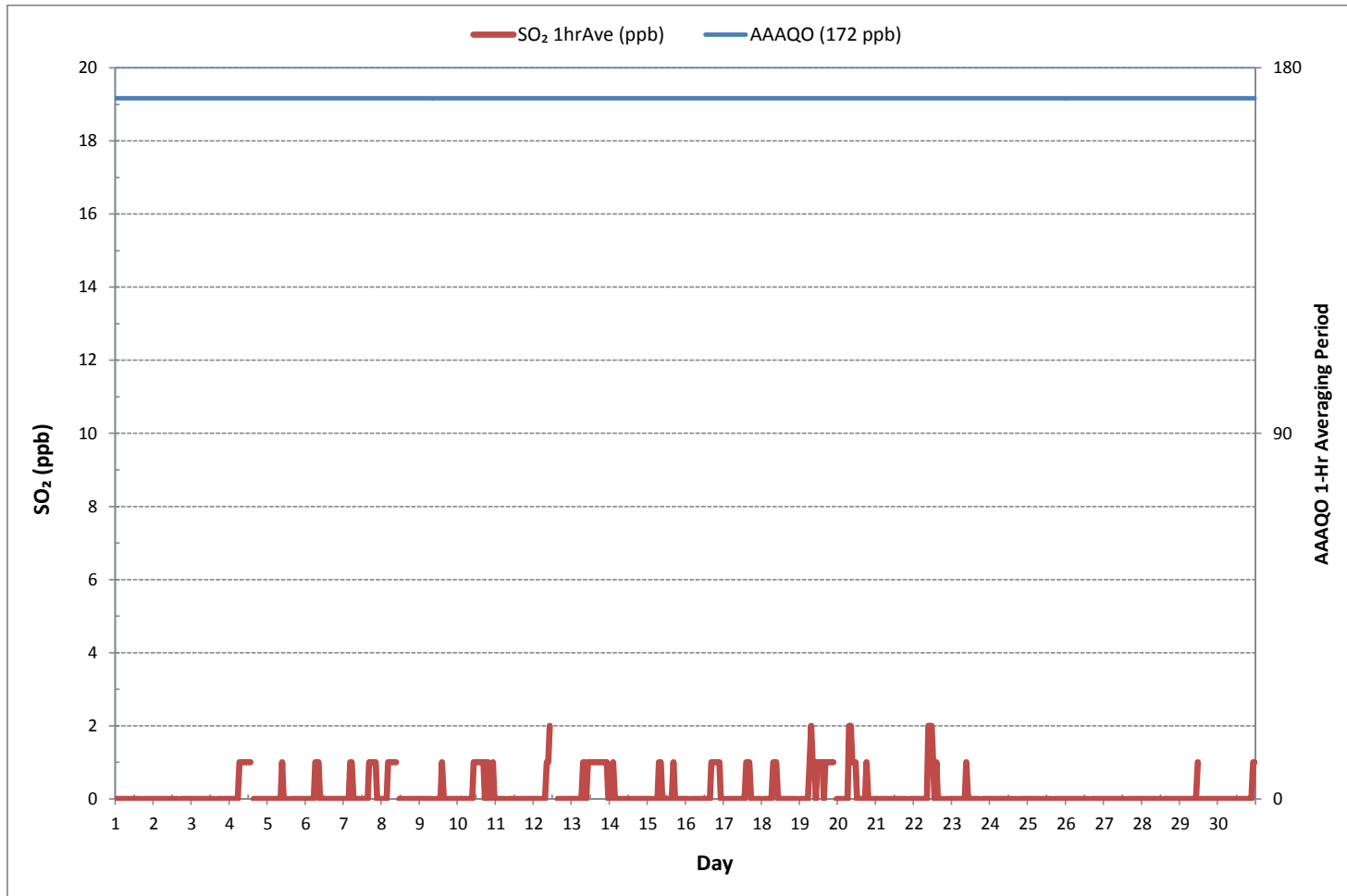
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	99		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1		
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 10 ON DAY 12		
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 13		
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES June 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO₂[ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.00%

Calm Avg: 0.00 [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	8.6	0.2	0.0	0.0	0.0	0.0	8.8
NE	6.0	0.4	0.0	0.0	0.0	0.0	6.4
E	9.8	0.9	0.0	0.0	0.0	0.0	10.7
SE	7.9	1.0	0.0	0.0	0.0	0.0	8.9
S	10.1	0.4	0.0	0.0	0.0	0.0	10.5
SW	15.9	2.9	0.6	0.4	0.0	0.0	19.9
W	23.1	0.9	0.6	0.0	0.2	0.0	24.7
NW	10.2	0.0	0.0	0.0	0.0	0.0	10.2
Summary	91.5	6.7	1.2	0.4	0.2	0.0	100.0

% Icon Classes (ppb)

92



0.0-0.6

7



0.6-1.2

1



1.2-1.8

0



1.8-2.4

0



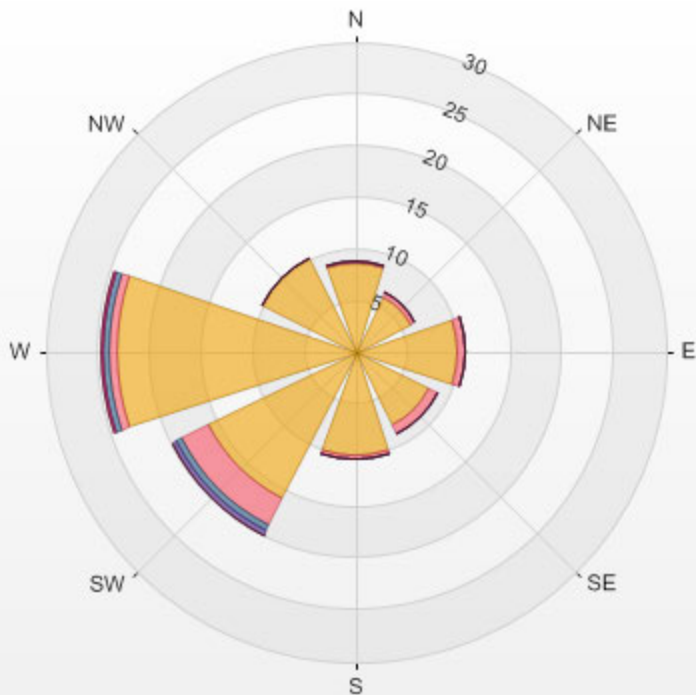
2.4-3.0

0



>3.0

LICA ST. LINA Poll.: LICA ST. LINA-SO₂[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



SO₂ [ppb] Calibration: LICAST, LINA Monthly: 18/06 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	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	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	24
4	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
5	0	0	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24
6	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
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	24
8	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	0	0	1	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	2	0	24
10	0	0	0	0	0	0	0	0	S	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
11	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
12	0	0	0	0	0	0	S	0	0	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0	1	0	24
13	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
14	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	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
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	24
17	0	S	1	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
18	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24
19	0	0	1	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24
20	0	0	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	2	0	24
21	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24
22	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24
23	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
24	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	2	0	24
25	0	0	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
26	0	0	0	1	1	4	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	4	0	24
27	1	0	0	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
28	0	0	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	1	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
30	0	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
HOURLY MAX	1	1	1	2	2	4	2	2	1	1	1	1	1	0	0	0	0	0	0	0	2	1	0	0				
HOURLY AVG	0	0	0	1	1	1	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

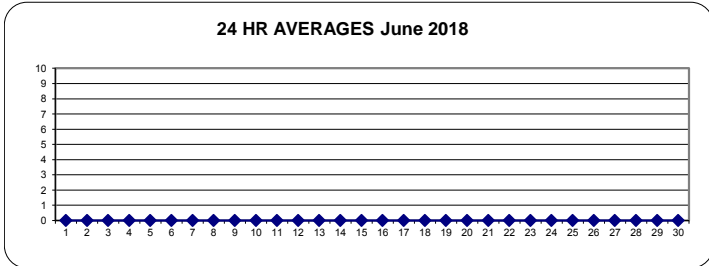
OBJECTIVE LIMIT:

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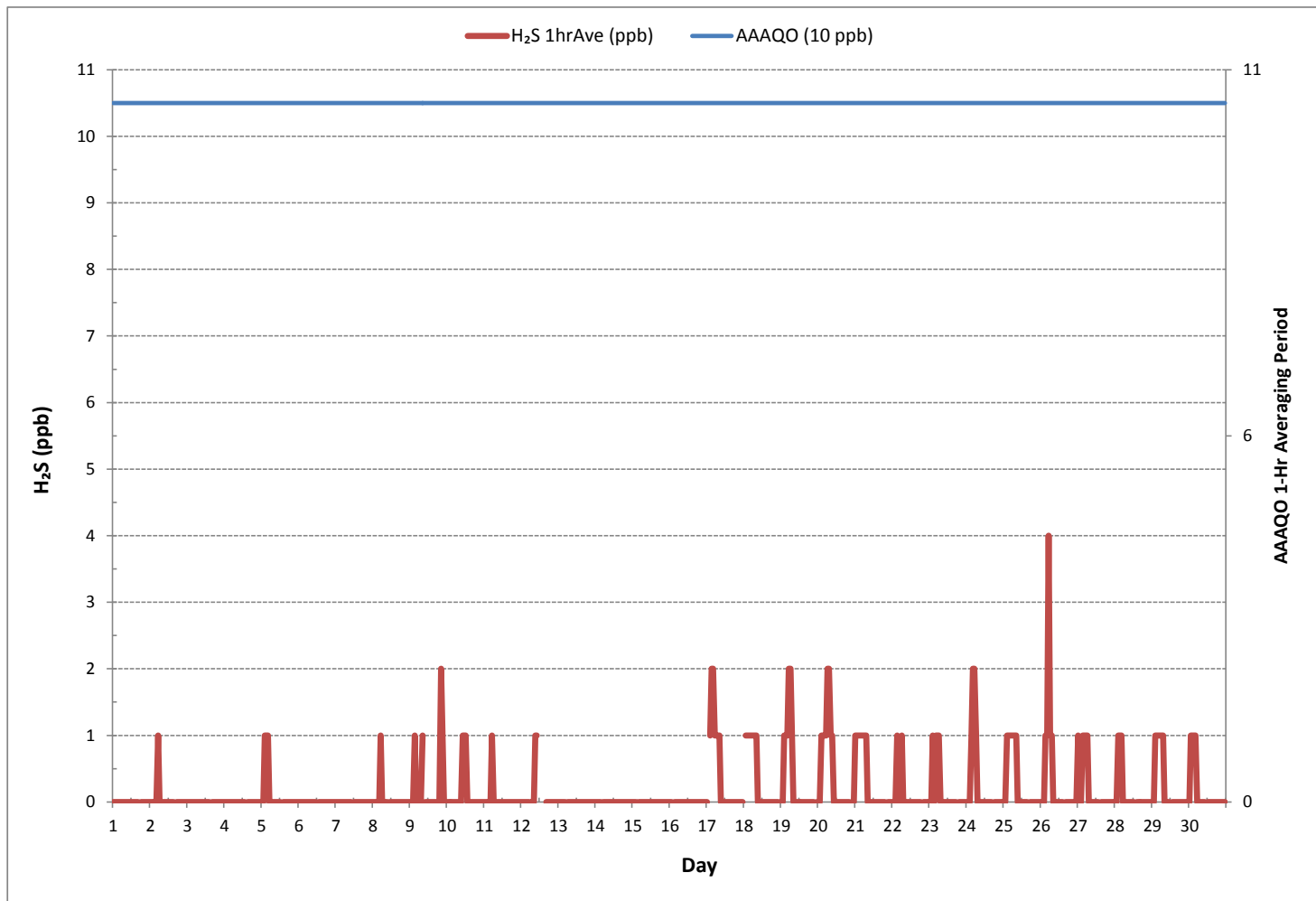
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	92		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	4 ppb @ HOUR	5 ON DAY	26
MAXIMUM 24-HR AVERAGE:	0 ppb	ON DAY	1
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES June 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



% Icon Classes (ppb)

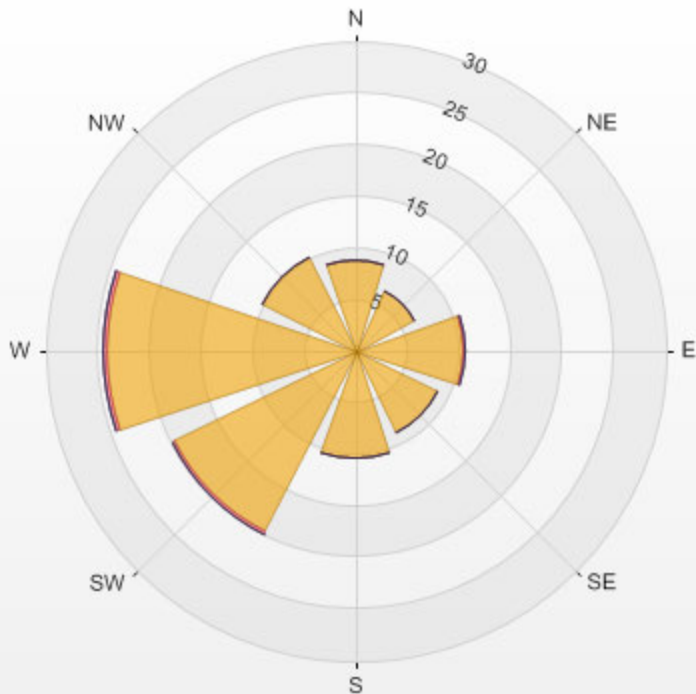
99 0.0-1.7

1 1.7-3.3

0 3.3-5.0

0 >5.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



H₂S [ppb] Calibration: LICA ST. LINA Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



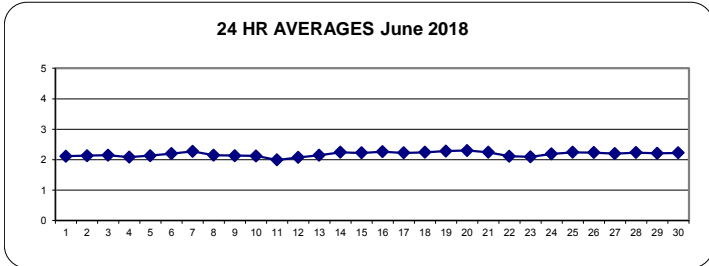
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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 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	2.17	2.12	2.16	2.19	2.20	2.17	2.21	2.20	2.18	2.11	2.10	2.09	2.05	2.04	2.04	2.03	2.02	S	2.03	2.05	2.06	2.10	2.12	2.14	2.02	2.21	2.11	24	
2	2.15	2.10	2.12	2.09	2.18	2.19	2.11	2.10	2.07	2.08	2.24	2.20	2.14	2.09	2.08	2.09	S	2.14	2.15	2.10	2.11	2.10	2.16	2.14	2.07	2.24	2.13	24	
3	2.15	2.16	2.15	2.15	2.14	2.14	2.12	2.13	2.10	2.16	2.15	2.14	2.15	2.14	2.14	S	2.17	2.16	2.16	2.14	2.14	2.14	2.14	2.14	2.10	2.17	2.14	24	
4	2.11	2.11	2.10	2.03	2.04	2.03	2.09	2.13	2.13	2.03	2.04	2.01	1.97	1.96	S	2.19	2.15	2.13	2.13	2.06	2.08	2.10	2.10	2.10	1.96	2.19	2.08	24	
5	2.09	2.10	2.16	2.18	2.17	2.14	2.13	2.09	2.06	2.08	2.15	2.09	2.14	S	2.13	2.13	2.14	2.15	2.12	2.08	2.11	2.13	2.14	2.20	2.06	2.20	2.13	24	
6	2.21	2.21	2.20	2.19	2.22	2.20	2.24	2.25	2.22	2.19	2.17	2.16	S	2.16	2.26	2.19	2.17	2.17	2.17	2.14	2.19	2.25	2.21	2.19	2.14	2.26	2.20	24	
7	2.25	2.30	2.34	2.39	2.42	2.46	2.44	2.34	2.40	2.29	2.24	S	2.23	2.23	2.22	2.18	2.14	2.14	2.15	2.19	2.17	2.19	2.23	2.18	2.14	2.46	2.27	24	
8	2.18	2.16	2.12	2.18	2.15	2.17	2.14	2.04	2.11	2.19	S	2.18	2.17	2.19	2.15	2.17	2.15	2.13	2.12	2.10	2.11	2.10	2.14	2.12	2.04	2.19	2.14	24	
9	2.14	2.17	2.19	2.18	2.19	2.17	2.19	2.17	2.15	S	2.13	2.14	2.15	2.15	2.13	2.13	2.09	2.08	2.06	2.08	2.05	2.04	2.05	2.10	2.04	2.19	2.13	24	
10	2.10	2.08	2.06	2.08	2.07	2.19	2.19	2.12	S	2.22	2.21	2.20	2.25	2.23	2.22	2.07	2.05	2.06	2.06	2.00	2.03	2.05	2.04	2.07	2.00	2.25	2.12	24	
11	2.01	2.01	2.02	1.98	1.99	1.98	2.00	S	2.00	1.98	1.97	2.00	2.00	2.01	2.01	1.99	2.00	2.02	2.00	1.97	1.97	1.97	1.99	1.99	1.97	2.02	1.99	24	
12	2.00	2.02	2.01	2.00	2.02	2.02	S	2.02	2.03	2.03	2.13	2.12	2.10	2.10	2.10	2.06	2.06	2.04	2.08	2.11	2.09	2.09	2.19	2.19	2.00	2.19	2.07	24	
13	2.10	2.08	2.15	2.14	2.16	S	2.14	2.10	2.04	C	C	C	C	C	C	2.20	2.18	2.16	2.17	2.13	2.15	2.12	2.17	2.13	2.21	2.04	2.21	2.14	24
14	2.64	2.45	2.46	2.20	S	2.13	2.16	2.18	2.16	2.21	2.21	2.21	2.20	2.22	2.24	2.22	2.22	2.25	2.29	2.23	2.15	2.15	2.13	2.18	2.13	2.64	2.24	24	
15	2.24	2.16	2.07	S	2.27	2.31	2.23	2.17	2.11	2.23	2.25	2.27	2.25	2.25	2.24	2.23	2.25	2.32	2.30	2.22	2.17	2.27	2.24	2.05	2.05	2.32	2.22	24	
16	2.32	2.16	S	2.22	2.27	2.40	2.36	2.17	2.27	2.33	2.28	2.30	2.26	2.25	2.25	2.25	2.27	2.25	2.26	2.29	2.23	2.20	2.20	2.24	2.16	2.40	2.26	24	
17	2.23	S	2.31	2.38	2.21	2.14	2.10	2.04	2.21	2.23	2.24	2.22	2.22	2.22	2.23	2.19	2.23	2.24	2.22	2.22	2.23	2.30	2.26	2.04	2.38	2.22	24		
18	S	2.24	2.27	2.23	2.16	2.20	2.16	2.16	2.32	2.30	2.24	2.25	2.23	2.24	2.25	2.26	2.25	2.23	2.24	2.24	2.26	2.27	2.27	S	2.16	2.32	2.24	24	
19	2.26	2.14	2.24	2.39	2.49	2.40	2.29	2.32	2.37	2.30	2.24	2.23	2.25	2.26	2.24	2.24	2.23	2.22	2.25	2.23	2.27	2.31	S	2.32	2.14	2.49	2.28	24	
20	2.32	2.36	2.27	2.24	2.25	2.25	2.41	2.57	2.46	2.39	2.27	2.25	2.24	2.25	2.25	2.25	2.24	2.24	2.23	2.24	2.30	S	2.32	2.34	2.23	2.57	2.30	24	
21	2.39	2.38	2.38	2.42	2.38	2.41	2.41	2.37	2.30	2.30	2.31	2.21	2.24	2.27	2.33	2.29	2.17	1.97	1.97	2.02	S	1.97	1.96	2.01	1.96	2.42	2.24	24	
22	2.00	1.99	2.06	2.21	2.28	2.47	2.35	2.23	2.21	2.08	2.04	2.04	2.02	2.01	2.01	2.03	2.03	1.99	2.01	S	2.00	2.20	2.15	2.15	1.99	2.47	2.11	24	
23	2.09	2.09	2.04	2.07	2.14	2.11	2.21	2.13	2.10	2.14	2.22	2.15	2.06	2.06	2.00	2.01	2.04	2.02	S	2.12	2.09	2.08	2.10	2.08	2.00	2.22	2.09	24	
24	2.23	2.31	2.10	2.20	2.38	2.37	2.26	2.10	2.11	2.05	2.03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.03	2.38	2.19	11
25	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	2.17	2.27	2.27	2.28	2.31	2.21	2.15	2.15	2.31	2.24	7	
26	2.23	2.24	2.31	2.33	2.34	2.41	2.32	2.33	2.15	2.14	2.09	2.21	2.25	2.20	2.22	S	2.03	2.03	2.17	2.23	2.30	2.31	2.25	2.15	2.03	2.41	2.23	24	
27	2.23	2.10	2.04	2.15	2.15	2.20	2.20	2.14	2.19	2.24	2.21	2.23	2.29	2.25	S	2.26	2.25	2.21	2.26	2.21	2.26	2.21	2.19	2.22	2.04	2.29	2.20	24	
28	2.20	2.21	2.21	2.25	2.26	2.25	2.26	2.27	2.27	2.26	2.26	2.25	2.24	S	2.25	2.25	2.21	2.26	2.26	2.18	2.20	2.14	2.18	2.20	2.14	2.27	2.23	24	
29	2.24	2.21	2.23	2.24	2.29	2.34	2.30	2.19	2.01	2.05	2.24	2.26	S	2.22	2.17	2.28	2.27	2.25	2.28	2.28	2.22	2.14	2.11	2.07	2.01	2.34	2.21	24	
30	2.05	2.18	2.16	2.21	2.25	2.12	2.01	1.96	2.01	2.17	2.19	S	2.23	2.29	2.32	2.33	2.37	2.39	2.42	2.47	2.43	2.25	2.16	2.10	1.96	2.47	2.22	24	
HOURLY MAX	2.64	2.45	2.46	2.42	2.49	2.47	2.44	2.57	2.46	2.39	2.31	2.30	2.29	2.29	2.33	2.33	2.37	2.39	2.42	2.47	2.43	2.31	2.32	2.34					
HOURLY AVG	2.19	2.17	2.18	2.20	2.22	2.23	2.22	2.18	2.17	2.18	2.18	2.18	2.17	2.17	2.18	2.17	2.16	2.16	2.17	2.17	2.16	2.16	2.16	2.15					

STATUS FLAG CODES

C	- MONTHLY SRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT SRATION	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 June 2018



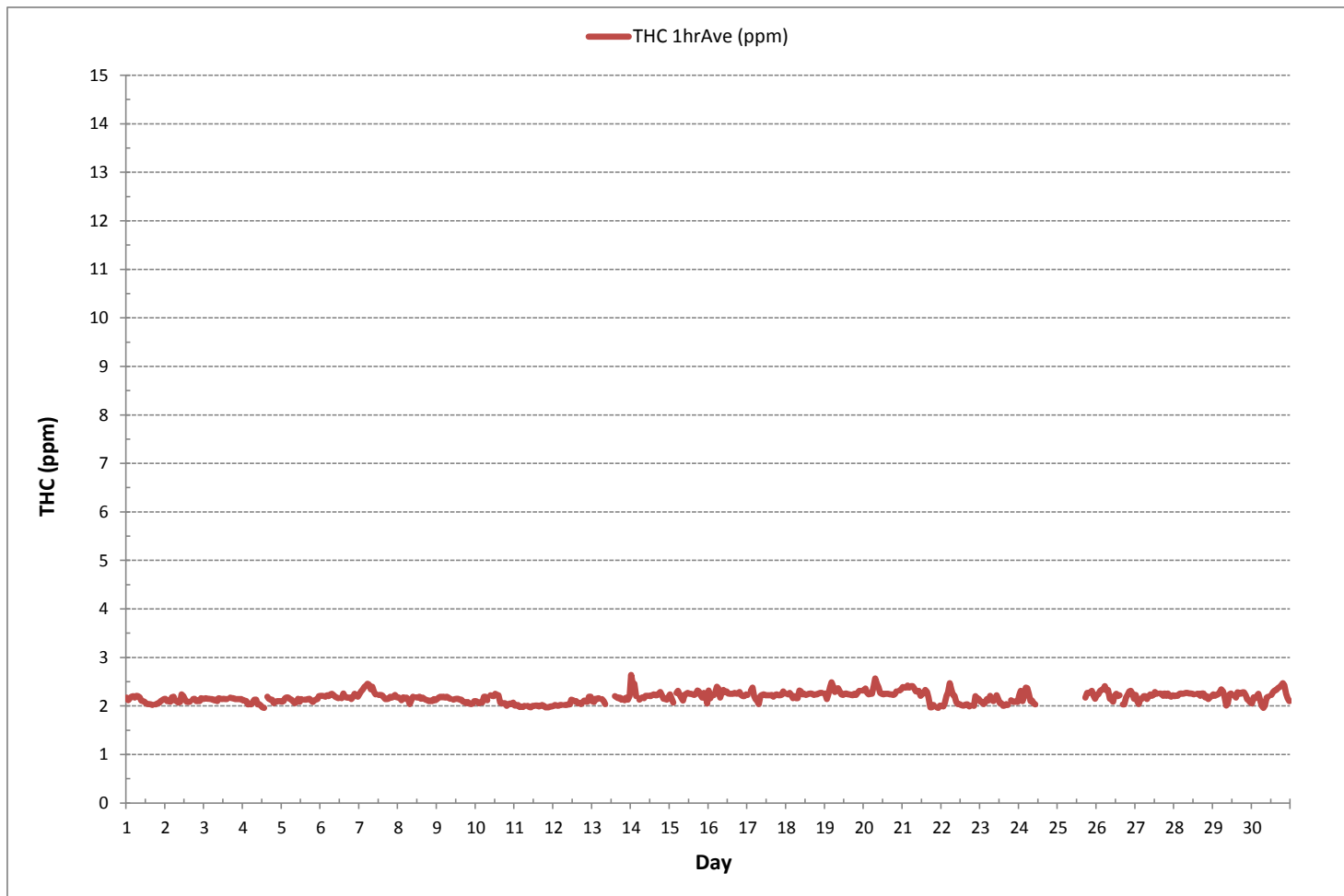
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	656			
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR	13	ON DAY 4
MAXIMUM 1-HR AVERAGE:	2.64 ppm	@ HOUR	0	ON DAY 14
MAXIMUM 24-HR AVERAGE:	2.30 ppm			ON DAY 20
IZS SRATION TIME:	29 hrs	OPERATIONAL TIME:	690 hrs	
MONTHLY SRATION TIME:	5 hrs	AMD OPERATION UPTIME:	95.8 %	
STANDARD DEVIATION:	0.11	MONTHLY AVERAGE:	2.18 ppm	



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

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-THC[ppm]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppm]

Direction	0.0-0.9	0.9-1.8	1.8-2.7	>2.7	Total
N	0.0	0.0	9.2	0.0	9.2
NE	0.0	0.0	6.7	0.0	6.7
E	0.0	0.0	11.1	0.0	11.1
SE	0.0	0.0	6.6	0.0	6.6
S	0.0	0.0	10.2	0.0	10.2
SW	0.0	0.0	19.7	0.0	19.7
W	0.0	0.0	25.9	0.0	25.9
NW	0.0	0.0	10.7	0.0	10.7
Summary	0.0	0.0	100.0	0.0	100.0

% Icon Classes (ppm)

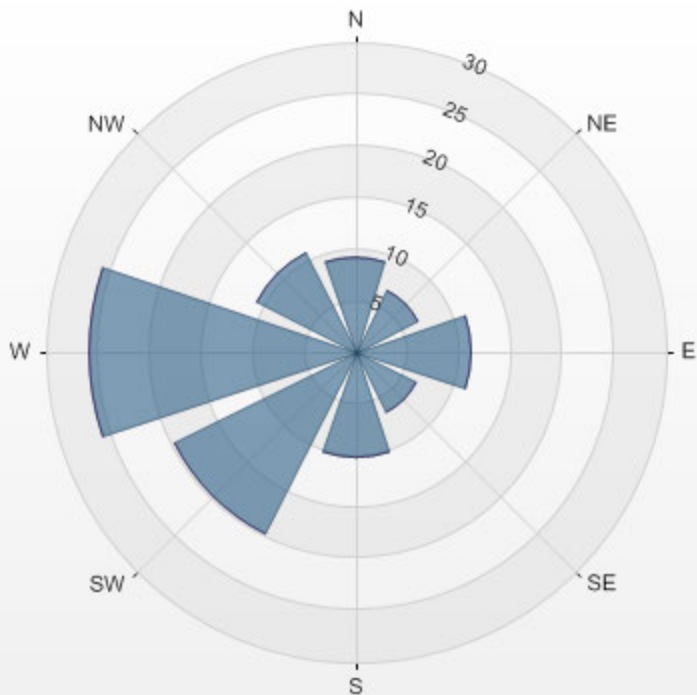
0  0.0-0.9

0  0.9-1.8

100  1.8-2.7

0  >2.7

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



THC [ppm] Calibration: LICA ST. LINA Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



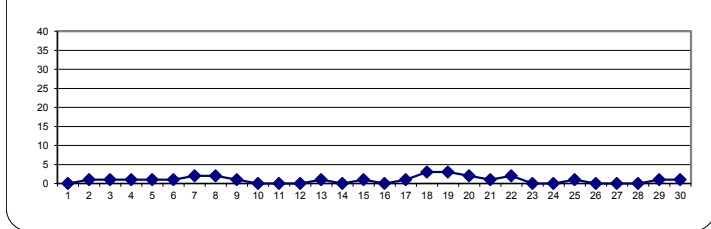
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

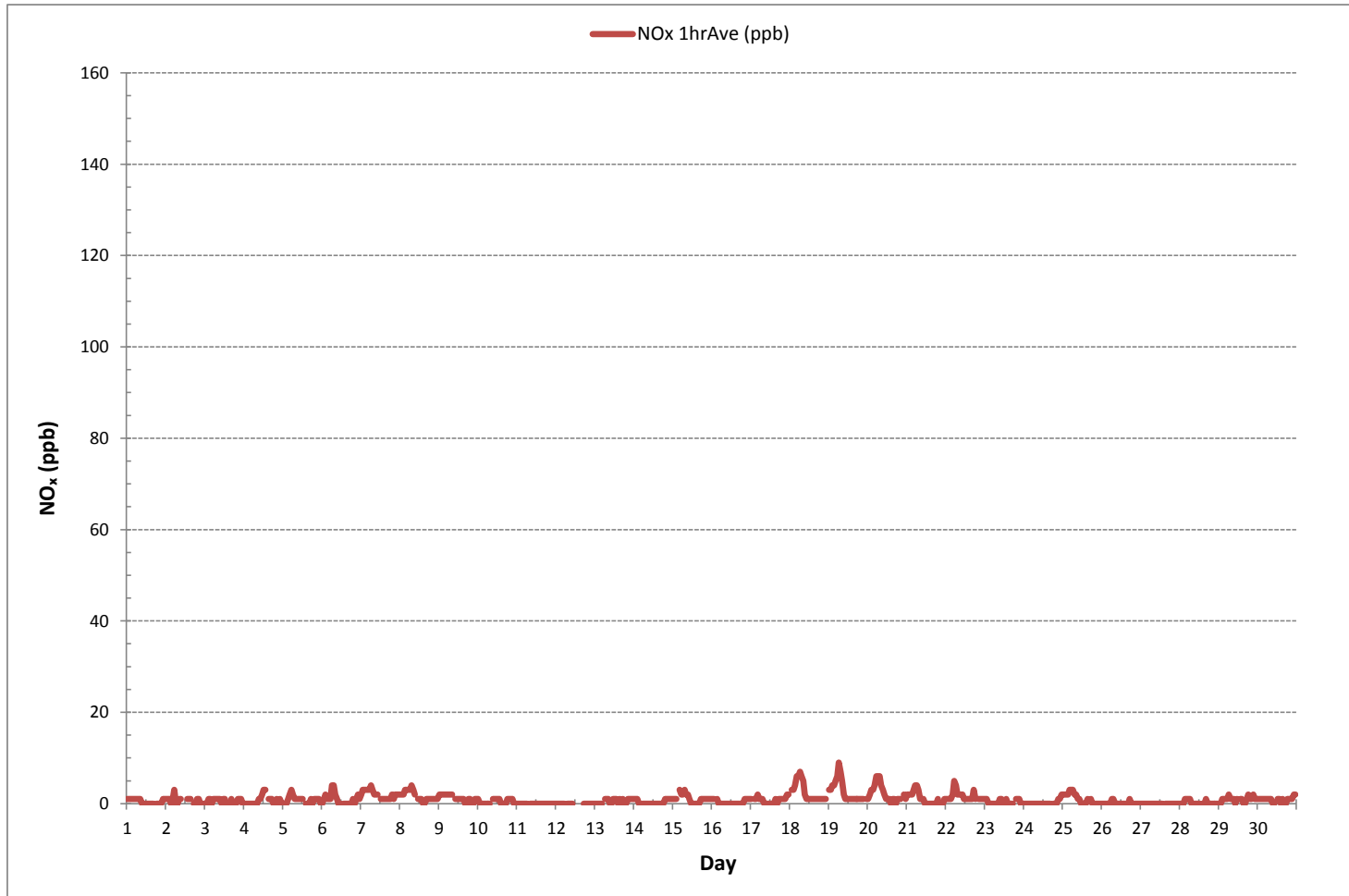
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	376			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	9	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9 ppb	@ HOUR	6	ON DAY 19
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 18
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



% Icon Classes (ppb)

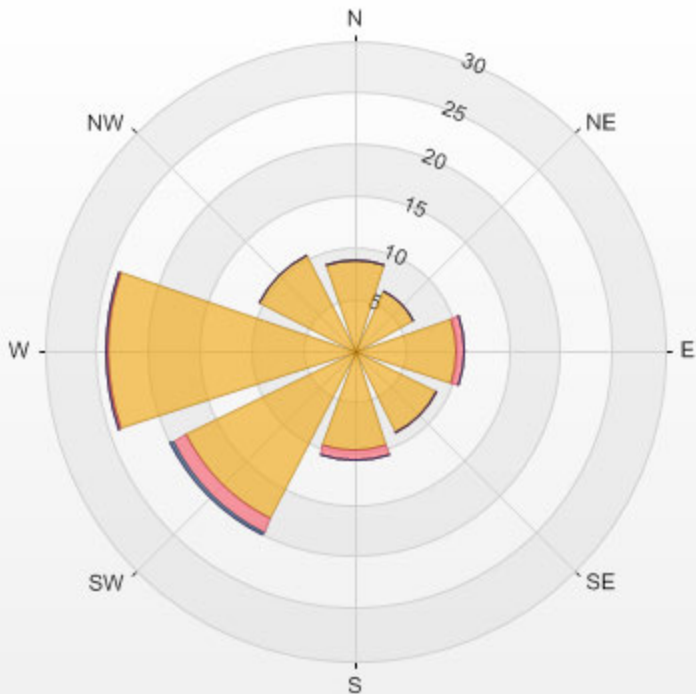
96 0.0-3.3

4 3.3-6.7

0 6.7-10.0

0 >10.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



NO_x [ppb] Calibration: LICA ST. LINA Monthly: 18/06 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES



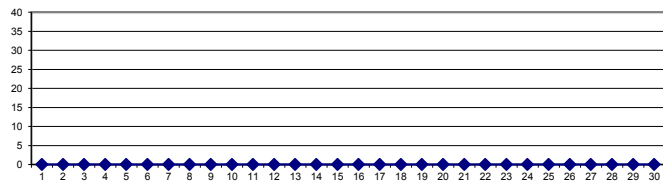
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

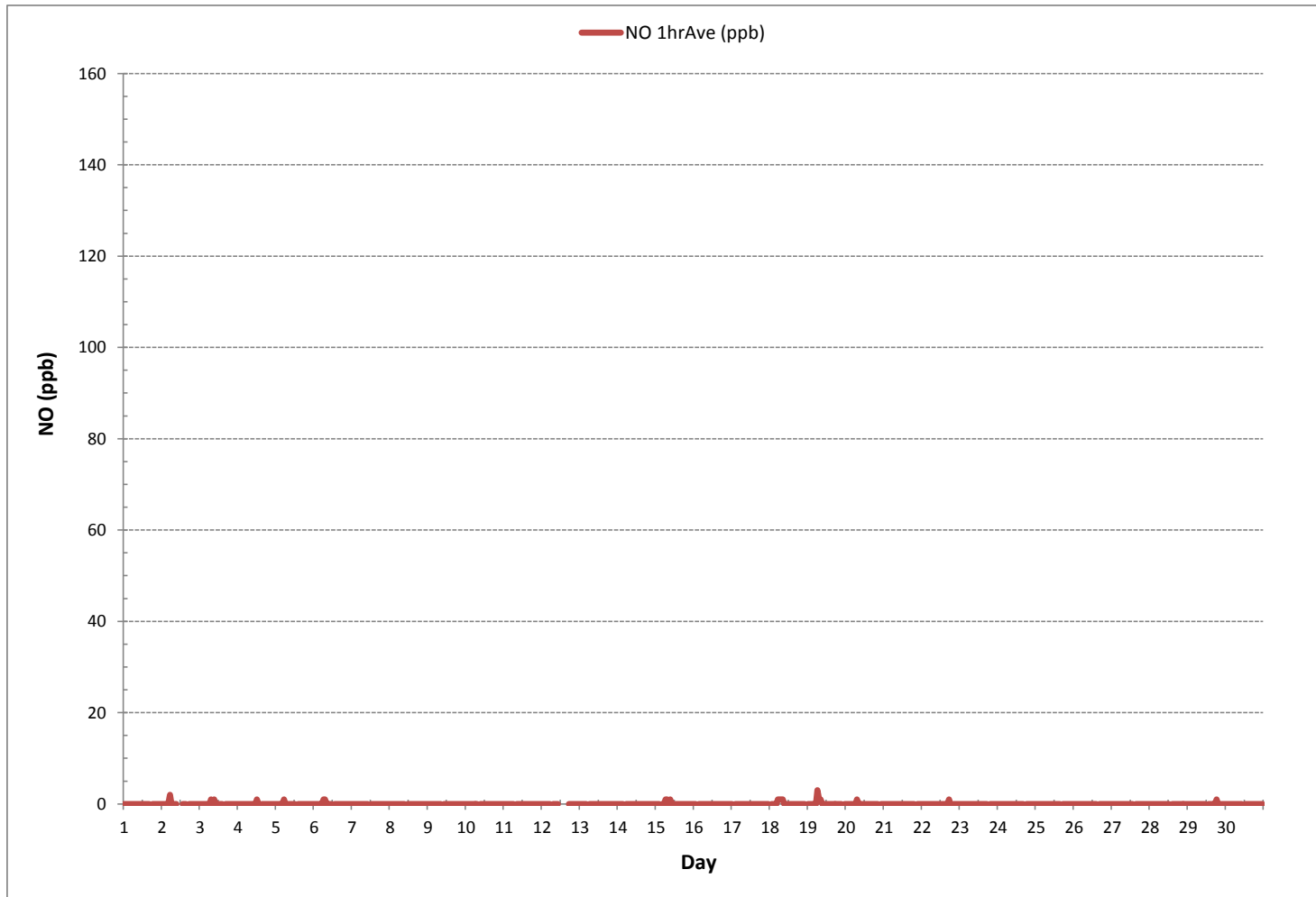
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	20				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	3	ppb @ HOUR	6	ON DAY	19
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY	1
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



% Icon Classes (ppb)

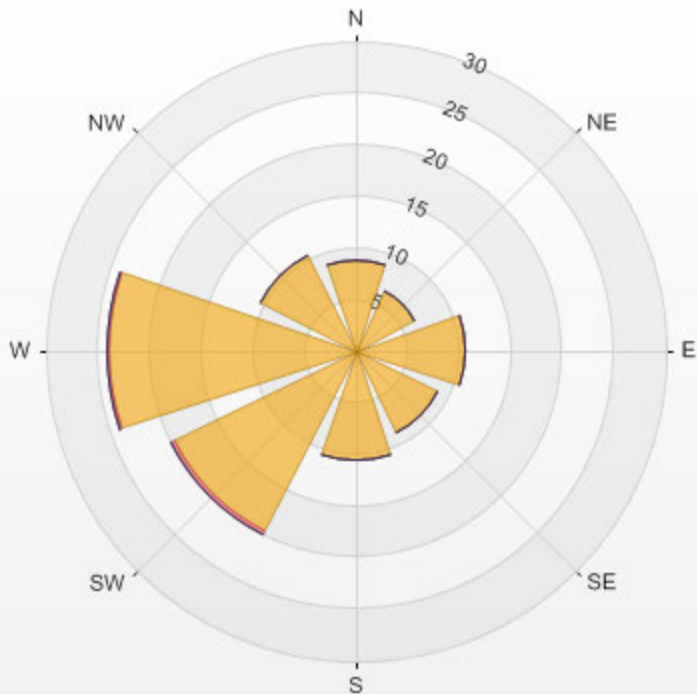
99  0.0-1.3

1  1.3-2.7

0  2.7-4.0

0  >4.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/06/01 00:00 - 2018/06/30 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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	1	1	0	1	0	24	
2	1	1	1	0	1	1	0	0	0	1	Q	Q	Q	1	1	0	S	0	0	1	1	0	0	0	0	0	1	1	24
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	1	1	1	0	0	0	1	0	24
4	0	0	0	0	0	0	0	0	0	1	1	1	2	2	S	1	0	0	0	0	1	0	1	0	0	0	2	0	24
5	0	0	0	1	2	2	1	1	1	1	1	1	S	0	0	0	0	0	0	1	1	1	1	0	0	2	1	24	
6	0	1	2	1	1	1	3	3	2	1	0	0	S	0	0	0	0	0	0	1	0	1	2	1	0	3	1	24	
7	2	3	3	3	3	3	3	3	2	2	2	S	1	1	1	1	1	1	1	2	1	2	2	2	1	3	2	24	
8	2	2	2	3	3	3	3	4	3	2	S	1	1	1	0	0	1	1	1	1	1	1	1	1	0	4	2	24	
9	2	2	2	2	2	2	2	2	S	1	1	1	1	1	1	0	0	1	1	0	0	1	1	0	2	1	2	24	
10	1	0	0	0	0	0	0	0	S	1	1	1	1	1	0	0	0	0	0	1	1	1	1	0	0	1	0	24	
11	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	
12	0	0	0	0	0	0	S	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	24	
13	0	0	0	0	0	S	1	1	1	0	0	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	1	24	
14	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	24	
15	0	0	1	S	3	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	1	24	
16	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	24	
17	1	S	1	1	2	1	1	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	2	2	0	2	1	24	
18	S	3	3	4	6	6	5	4	2	1	1	1	1	1	1	0	1	1	1	1	1	1	1	S	0	6	2	24	
19	2	3	4	4	5	5	6	5	4	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	6	2	24	
20	1	2	3	3	4	6	5	5	4	3	2	1	1	1	0	1	1	0	1	1	1	S	2	1	0	6	2	24	
21	2	2	2	2	3	4	4	2	1	1	1	0	0	0	0	0	0	0	0	1	S	0	0	1	0	4	1	24	
22	1	1	1	1	2	5	4	2	2	2	2	1	1	1	1	1	1	2	1	S	0	1	1	1	0	5	2	24	
23	1	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	S	1	1	1	0	0	0	1	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	1	2	0	2	0	24	
25	2	2	2	2	3	3	2	2	2	1	1	0	0	0	0	1	S	1	0	0	0	0	0	0	0	3	1	24	
26	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	1	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	24	
28	0	0	0	1	1	1	1	0	0	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	1	1	1	1	1	1	1	1	0	1	S	1	1	0	0	1	1	1	1	1	1	1	0	1	1	24	
30	1	1	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	1	1	1	2	2	0	2	1	24	
HOURLY MAX	2	3	4	4	6	6	6	5	4	3	2	1	2	2	1	1	1	2	1	2	1	2	2	2	2				
HOURLY AVG	1	1	1	1	2	2	2	1	1	1	1	0	0	1	0	0	0	0	0	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

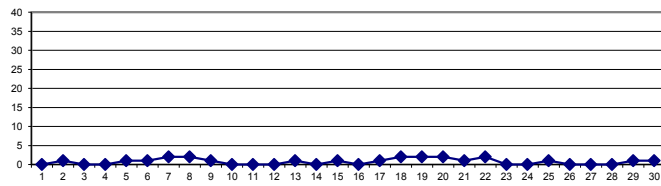
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	349		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	9 ON DAY 1
MAXIMUM 1-HR AVERAGE:	6 ppb	@ HOUR	4 ON DAY 18
MAXIMUM 24-HR AVERAGE:	2 ppb		ON DAY 7
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

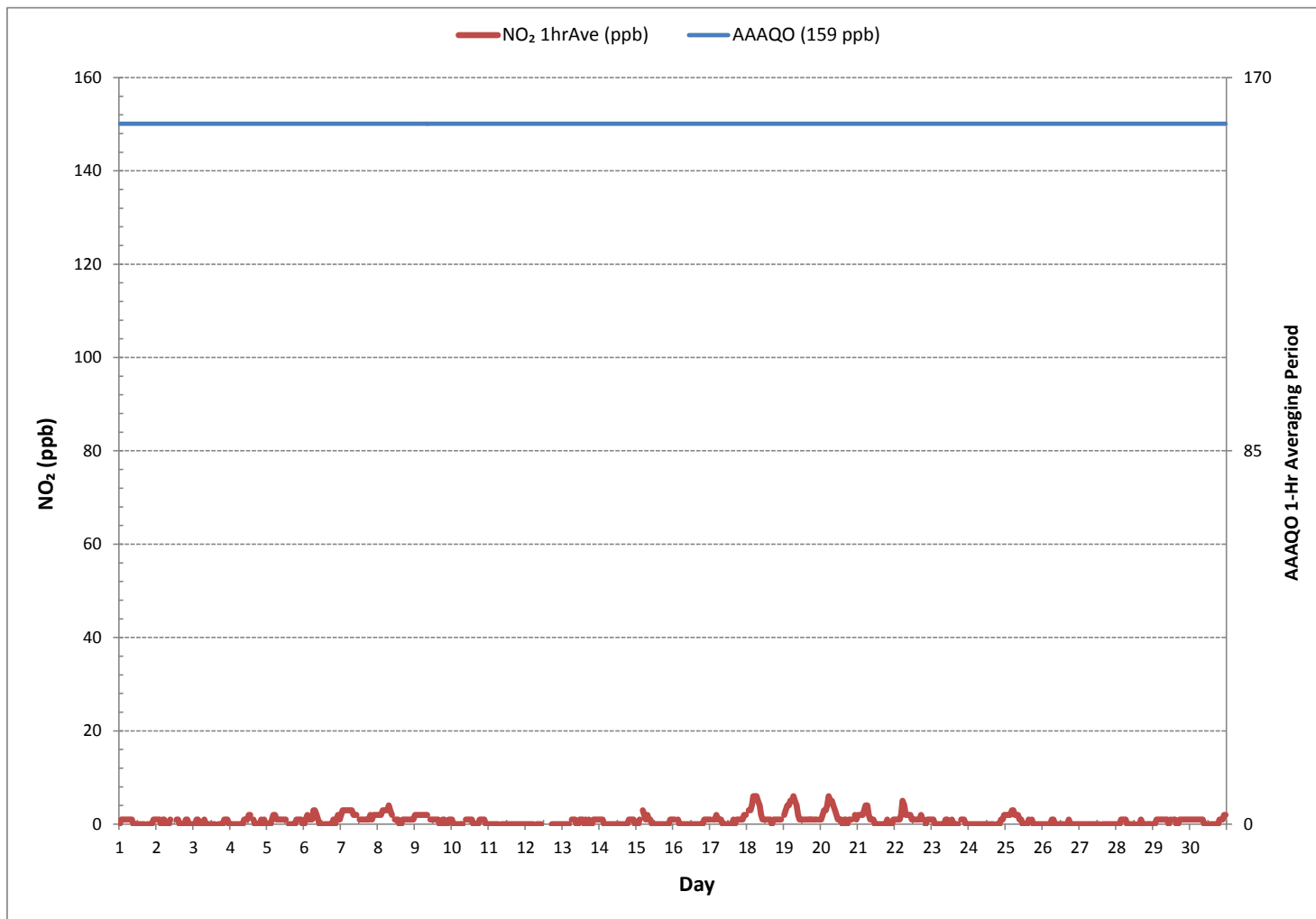
24 HR AVERAGES June 2018





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

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



% Icon Classes (ppb)

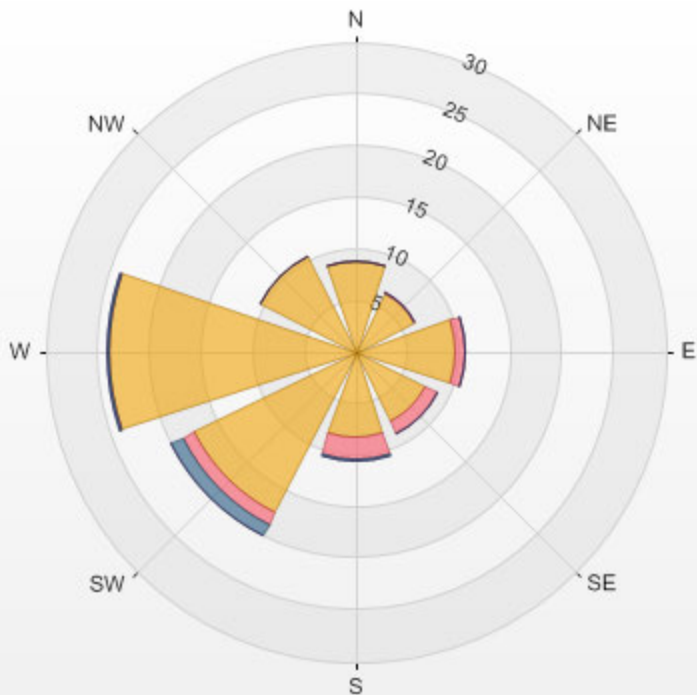
92 0.0-2.3

6 2.3-4.7

2 4.7-7.0

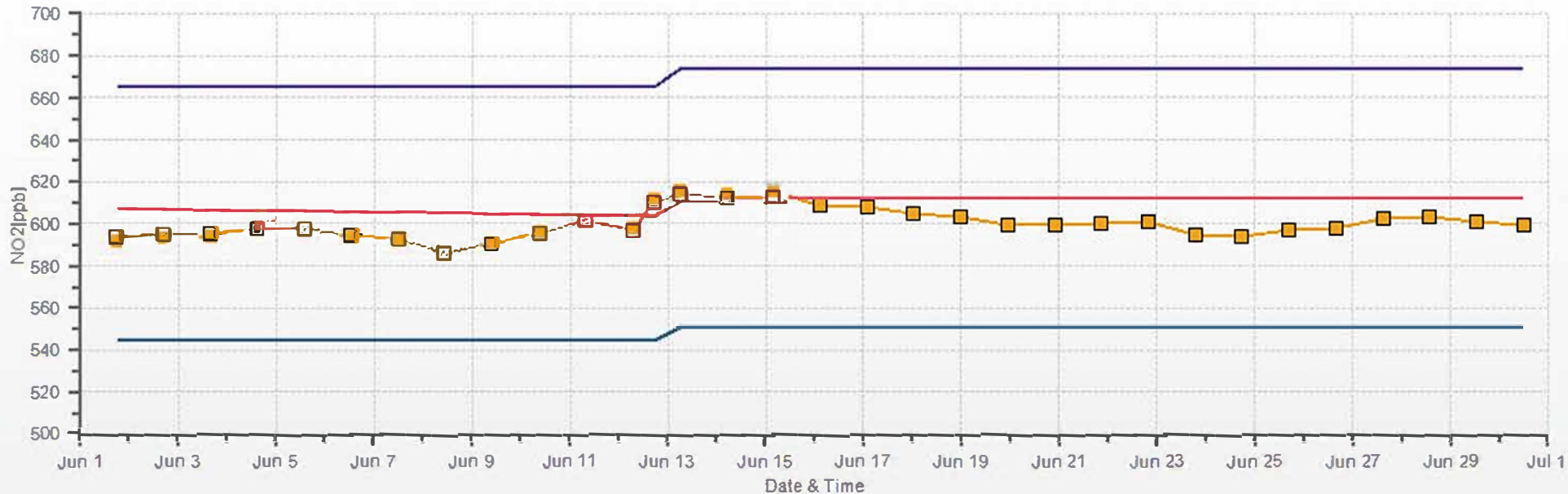
0 >7.0

LICA ST. LINA Poll.: LICA ST. LINA-NO₂[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



NO₂ [ppb] Calibration: LICA ST. LINA Monthly: 18/06 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	24.2	24.3	21.0	17.8	15.6	13.5	11.7	S1	S1	15.8	17.6	S1	20.6	21.2	22.7	23.9	23.6	S	20.8	19.8	18.0	16.3	15.5	14.4	11.7	24.3	18.9	21	
2	16.1	15.8	14.9	18.5	11.7	9.7	16.3	20.7	24.0	27.1	29.7	34.2	37.6	C	C	C	C	39.9	39.7	40.5	41.6	40.4	37.4	36.6	9.7	41.6	27.6	24	
3	33.3	29.7	30.5	31.5	33.8	32.1	34.3	35.3	40.7	42.5	43.6	43.4	42.9	42.5	42.9	S	43.7	46.9	44.1	42.6	39.6	40.0	30.7	27.7	27.7	46.9	38.0	24	
4	25.8	24.9	22.9	22.1	22.0	22.8	23.2	22.2	22.5	28.0	30.9	30.0	31.4	31.9	S	36.3	32.6	31.8	31.0	31.6	29.7	28.3	27.8	28.3	22.0	36.3	27.7	24	
5	27.3	20.8	20.6	21.5	21.4	22.8	25.4	31.2	35.1	36.7	35.7	36.1	38.1	S	40.8	42.8	43.1	42.8	41.9	39.8	40.4	37.9	37.9	35.4	20.6	43.1	33.7	24	
6	33.4	31.8	29.1	27.4	25.8	24.0	23.0	23.4	27.7	34.2	40.6	45.2	S	48.3	48.2	47.7	47.6	47.3	47.2	46.4	45.3	41.7	44.3	45.8	23.0	48.3	38.1	24	
7	39.6	36.0	35.5	35.3	35.3	34.8	33.9	39.2	44.3	47.5	51.3	S	60.3	63.6	65.3	63.6	63.5	63.1	63.2	61.4	60.7	57.4	53.1	50.4	33.9	65.3	50.4	24	
8	49.2	46.7	42.9	38.6	35.7	33.4	31.4	30.2	34.6	42.1	S	52.1	50.6	39.6	40.7	40.6	44.5	49.6	52.0	52.6	51.3	48.8	45.5	44.3	30.2	52.6	43.3	24	
9	41.0	35.3	30.8	27.4	24.3	24.8	26.2	27.8	31.3	S	39.3	43.1	45.4	46.3	45.9	44.6	38.9	43.3	42.1	42.9	46.2	44.0	38.4	35.9	24.3	46.3	37.6	24	
10	36.2	37.0	36.5	37.4	37.2	32.4	30.3	28.5	S	26.1	24.7	24.2	25.1	28.7	34.5	38.2	38.7	35.4	28.0	24.9	23.1	23.6	26.7	30.9	23.1	38.7	30.8	24	
11	31.6	31.9	35.3	34.6	36.0	35.2	33.8	S	26.7	26.2	26.3	26.3	26.8	27.6	28.2	28.6	28.4	28.4	28.3	28.3	28.7	28.3	28.6	29.0	26.2	36.0	29.7	24	
12	29.5	30.5	29.7	30.1	29.1	28.6	S	31.8	32.2	31.5	31.6	27.4	29.5	29.1	32.3	34.1	34.8	34.2	35.5	35.0	34.0	33.0	32.0	29.3	27.4	35.5	31.5	24	
13	27.5	26.1	21.9	18.2	17.8	S	19.1	25.3	30.5	33.5	34.6	36.6	37.7	37.3	38.1	38.1	38.8	34.9	33.7	35.2	32.5	30.9	30.7	30.7	17.8	38.8	30.9	24	
14	29.7	30.3	25.7	23.1	S	18.1	20.9	23.6	27.4	28.1	29.5	30.6	30.7	31.1	31.1	30.6	30.2	31.3	31.5	30.9	30.4	30.2	29.9	29.2	18.1	31.5	28.4	24	
15	26.6	24.6	23.9	S	21.8	19.7	18.5	19.5	24.5	28.7	30.6	30.9	30.2	30.3	31.9	33.8	33.9	32.3	31.3	29.1	27.2	27.0	26.4	25.0	18.5	33.9	27.3	24	
16	23.4	21.2	S	18.0	17.9	17.7	16.1	19.4	23.8	27.5	29.6	30.1	31.6	31.0	30.5	33.7	37.5	37.9	35.4	36.9	37.1	36.5	35.5	33.2	16.1	37.9	28.8	24	
17	32.0	S	25.2	17.0	18.5	19.6	20.5	24.1	28.1	33.1	34.0	35.6	38.2	41.4	41.8	45.9	46.3	47.6	48.7	47.2	47.7	46.9	44.6	42.8	17.0	48.7	35.9	24	
18	S	39.2	36.9	34.6	32.4	30.0	27.7	28.7	34.6	44.7	50.1	50.8	51.7	52.4	52.9	53.0	54.6	55.9	56.5	55.2	55.4	55.5	55.0	S	27.7	56.5	45.8	24	
19	48.7	46.8	38.8	33.1	30.0	25.2	24.1	32.8	44.0	55.0	61.5	63.5	63.8	65.7	64.9	63.5	64.0	64.2	67.5	66.2	63.8	59.7	S	55.1	24.1	67.5	52.3	24	
20	53.5	48.8	43.1	40.3	35.9	31.8	32.4	35.0	42.9	52.8	60.9	61.9	63.2	63.8	66.2	64.6	66.2	68.1	70.6	68.3	63.7	S	58.5	56.5	31.8	70.6	54.3	24	
21	52.0	48.6	46.4	44.3	43.5	41.6	41.0	42.1	48.4	51.6	53.2	55.2	58.0	60.3	62.5	62.7	60.9	63.3	61.2	59.4	S	63.1	60.5	56.3	41.0	63.3	53.7	24	
22	58.6	59.5	55.2	49.2	47.4	41.9	42.1	45.9	49.4	56.4	62.3	64.4	64.5	63.7	62.5	53.1	51.1	51.8	62.8	S	64.9	38.2	36.1	34.4	34.4	64.9	52.8	24	
23	46.2	39.5	44.9	47.3	39.0	32.1	27.5	33.5	36.2	43.4	45.3	47.1	53.7	50.0	47.8	45.5	44.3	45.2	S	34.8	35.1	30.9	31.9	37.9	27.5	53.7	40.8	24	
24	31.0	28.1	38.5	32.5	19.0	22.6	24.8	31.2	27.6	32.0	34.9	39.1	39.5	39.5	39.8	40.7	41.9	S	42.8	41.3	39.9	41.3	44.4	41.1	19.0	44.4	35.4	24	
25	38.6	38.3	37.4	34.7	29.9	26.1	24.6	27.8	34.3	42.9	48.7	54.0	54.5	53.0	52.8	51.8	S	44.5	39.5	36.5	34.5	36.7	33.4	30.8	24.6	54.5	39.4	24	
26	29.4	26.8	26.5	25.8	23.7	21.1	23.1	26.4	32.0	35.9	39.1	37.4	35.0	35.3	33.8	S	35.7	37.4	33.1	28.6	28.2	25.5	25.1	23.3	21.1	39.1	29.9	24	
27	23.7	27.4	24.7	25.1	24.7	25.2	25.8	27.3	27.8	27.5	26.5	25.9	25.6	25.0	S	24.4	25.0	23.2	25.4	26.1	23.9	22.6	22.1	21.1	21.1	21.1	27.8	25.0	24
28	20.2	18.6	18.8	17.4	17.4	19.1	20.3	21.9	23.5	24.8	24.8	26.3	27.5	S	27.4	26.8	25.9	26.1	29.3	25.2	19.5	17.9	17.4	15.1	15.1	29.3	22.2	24	
29	18.9	20.8	18.6	18.6	15.5	12.3	15.1	23.0	27.5	28.4	34.1	37.8	S	37.5	33.5	34.3	34.2	35.9	36.7	33.5	32.3	30.0	30.1	30.6	12.3	37.8	27.8	24	
30	28.0	25.1	21.8	23.5	22.0	26.9	25.9	27.9	30.5	32.8	32.4	S	33.6	33.4	33.5	34.1	32.7	31.8	28.0	22.6	25.1	29.8	28.0	25.4	21.8	34.1	28.5	24	
HOURLY MAX	58.6	59.5	55.2	49.2	47.4	41.9	42.1	45.9	49.4	56.4	62.3	64.4	64.5	65.7	66.2	64.6	66.2	68.1	70.6	68.3	64.9	63.1	60.5	56.5					
HOURLY AVG	33.6	32.2	31.0	29.1	27.0	25.7	25.5	28.8	32.6	35.8	38.0	40.3	41.0	41.8	42.7	42.1	41.5	42.6	41.6	39.4	38.6	36.6	35.4	34.4					

STATUS FLAG CODES

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

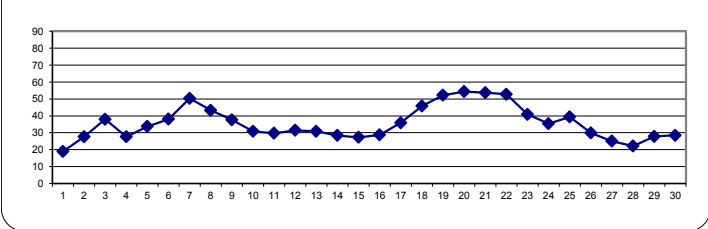
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

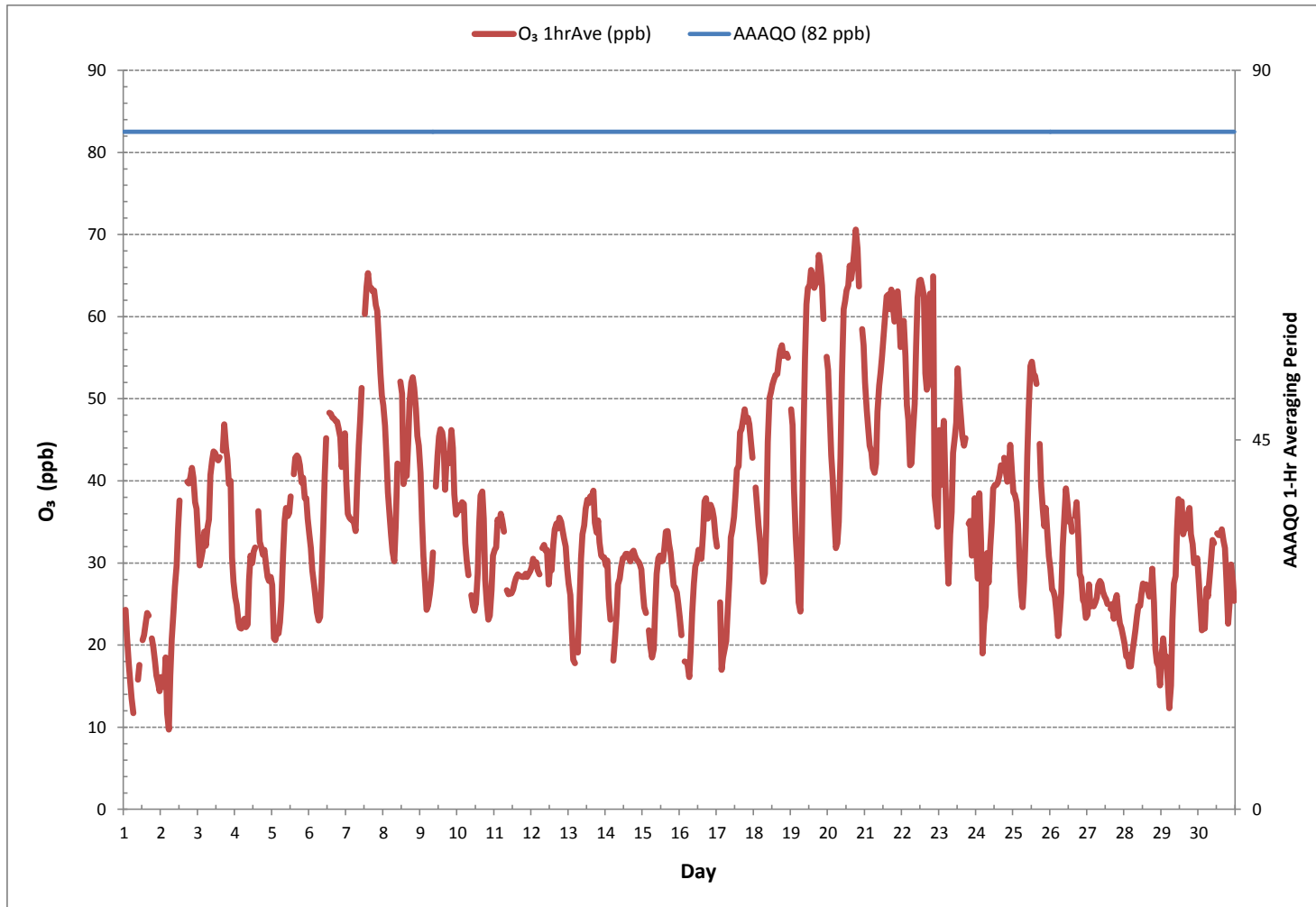
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	683					
MINIMUM 1-HR AVERAGE:	9.7	ppb	@ HOUR	5	ON DAY	2
MAXIMUM 1-HR AVERAGE:	70.6	ppb	@ HOUR	18	ON DAY	20
MAXIMUM 24-HR AVERAGE:	54.3	ppb			ON DAY	20
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	717	hrs	
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	99.6	%	
STANDARD DEVIATION:	12.3		MONTHLY AVERAGE:	35.6	ppb	

24 HR AVERAGES June 2018



OZONE Hourly Averages (O₃ ppb)



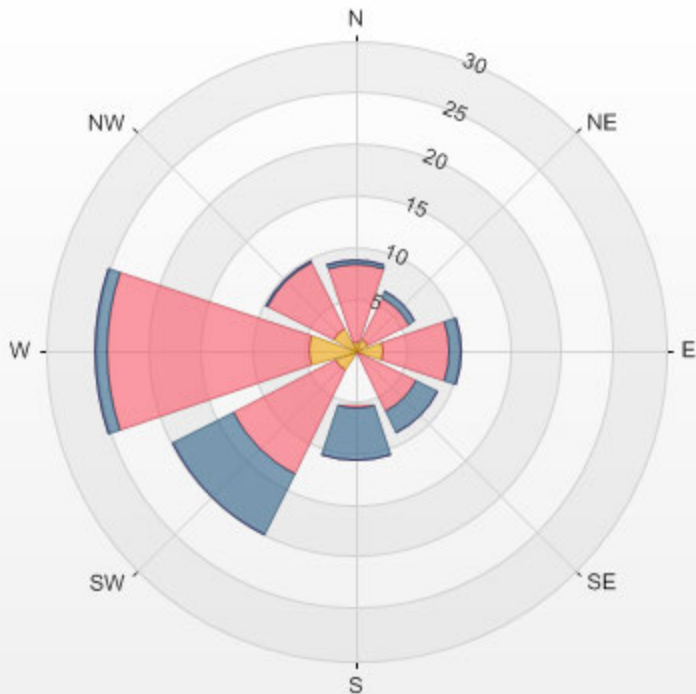
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-O₃[ppb]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency) Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

Direction	0.0-23.6	23.6-47.1	47.1-70.7	>70.7	Total
N	0.9	7.6	0.3	0.0	8.8
NE	1.3	4.4	0.7	0.0	6.4
E	2.6	6.4	1.2	0.0	10.3
SE	0.0	6.6	2.3	0.0	8.9
S	0.2	5.4	5.0	0.0	10.6
SW	2.2	11.1	6.6	0.0	19.9
W	4.5	19.6	1.2	0.0	25.3
NW	2.3	7.2	0.3	0.0	9.8
Summary	14.1	68.4	17.6	0.0	100.0

% Icon Classes (ppb) 14 0.0-23.6 68 23.6-47.1 18 47.1-70.7 0 >70.7

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



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

STATUS FLAG CODES

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

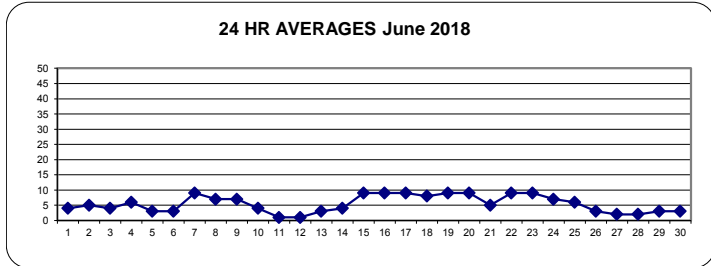
OBJECTIVE LIMIT:

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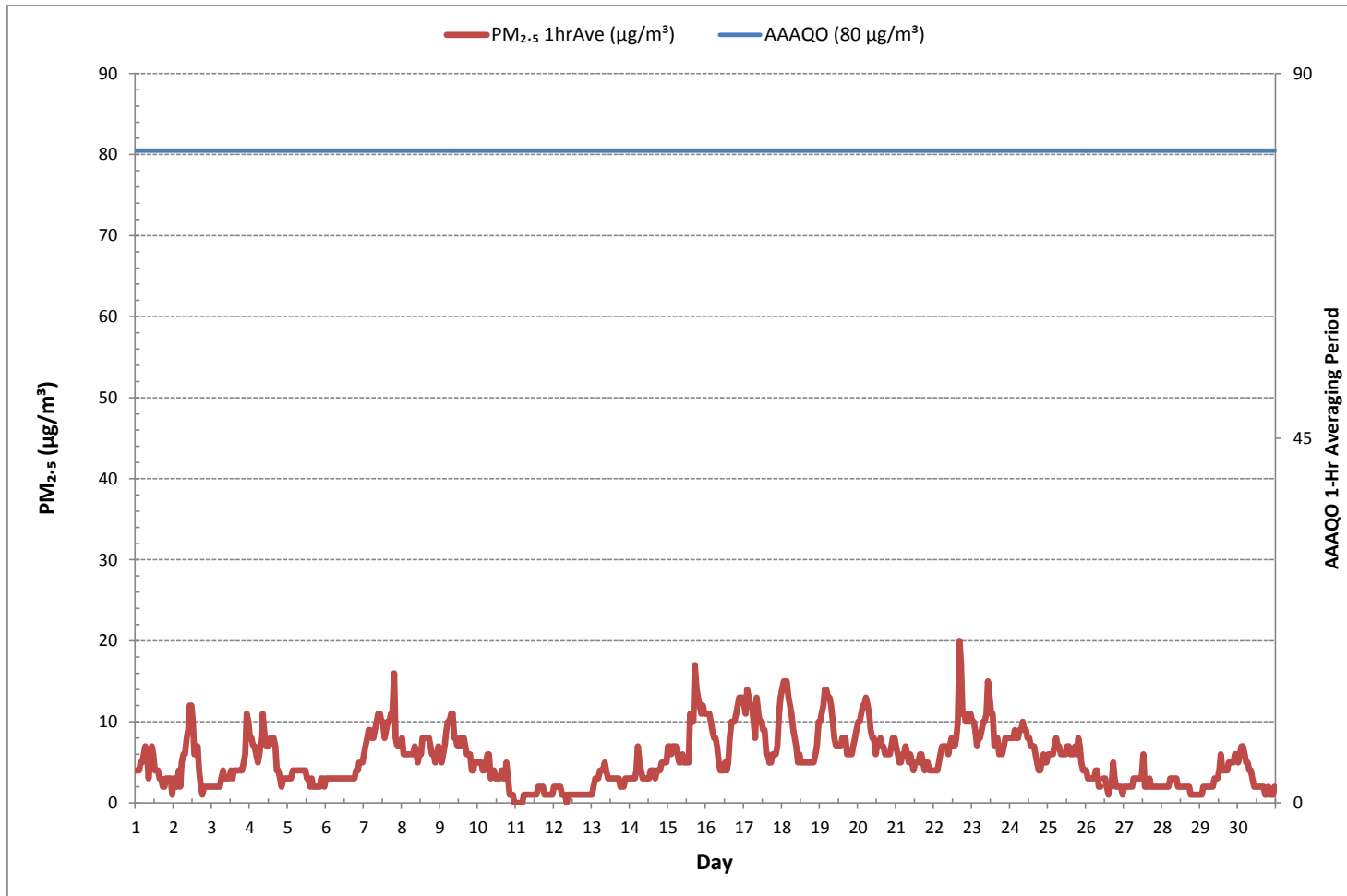
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	712				
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	23	ON DAY	10	
MAXIMUM 1-HR AVERAGE:	20 µg/m ³ @ HOUR	16	ON DAY	22	
MAXIMUM 24-HR AVERAGE:	9 µg/m ³		ON DAY	7	
MONTHLY CALIBRATION TIME:	1	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	3		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	5	µg/m ³

24 HR AVERAGES June 2018



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



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM_{2.5} [ug/m³]
 Monthly: 18/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

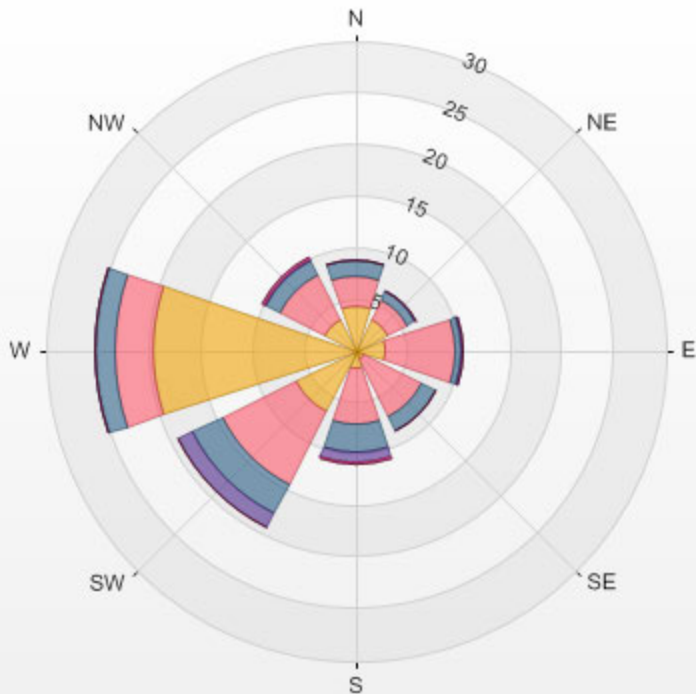
Calm: 0.00%

Calm Avg: 0.00 [ug/m³]

Direction	0.0-4.2	4.2-8.4	8.4-12.6	12.6-16.8	16.8-21.0	>21.0	Total
N	4.5	2.8	1.5	0.0	0.0	0.0	8.8
NE	3.5	2.1	0.8	0.1	0.0	0.0	6.5
E	2.9	6.7	0.7	0.1	0.0	0.0	10.4
SE	1.0	6.3	1.5	0.0	0.0	0.0	8.8
S	1.7	5.4	2.8	1.0	0.1	0.0	11.0
SW	6.5	7.9	3.2	1.5	0.0	0.0	19.2
W	19.6	3.8	1.8	0.0	0.0	0.0	25.2
NW	3.5	4.7	1.5	0.3	0.1	0.0	10.2
Summary	43.1	39.7	13.9	3.1	0.3	0.0	100.0

% Icon Classes (ug/m3(L)) 43 0.0-4.2 40 4.2-8.4 14 8.4-12.6 3 12.6-16.8 0 16.8-21.0 0 >21.0

LICA ST. LINA Poll.: LICA ST. LINA-PM2.5 [ug/m³] 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

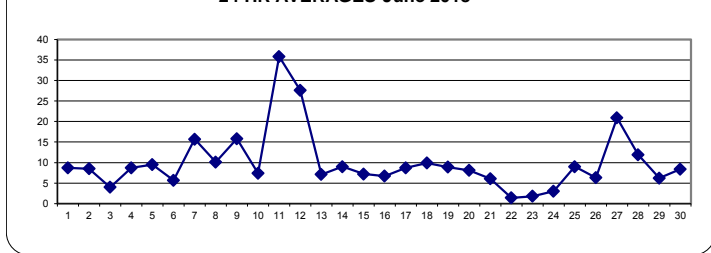
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	10.0	10.4	10.1	10.7	9.5	8.6	9.5	9.1	10.6	12.0	9.7	12.7	12.8	11.4	10.2	10.1	10.6	8.0	6.8	5.2	4.3	6.1	5.9	5.9	4.3	12.8	8.7	24
2	5.5	5.9	5.3	4.7	5.4	4.7	2.3	3.3	5.2	7.7	10.9	11.8	12.3	15.4	16.3	15.5	16.9	16.8	12.7	12.4	5.6	8.0	7.3	9.1	2.3	16.9	8.5	24
3	10.8	9.8	10.9	11.0	11.0	9.9	10.5	10.3	12.6	12.6	11.5	11.0	11.5	11.4	11.6	5.6	3.0	1.8	5.4	8.2	11.4	15.7	20.0	23.2	1.8	23.2	4.0	24
4	22.1	23.1	17.9	15.6	19.7	25.9	24.2	24.0	15.6	12.5	15.1	14.3	6.3	3.4	9.2	16.2	16.3	19.1	13.4	11.8	8.3	6.7	4.6	4.9	3.4	25.9	8.7	24
5	4.7	6.0	8.8	10.0	10.4	10.7	10.6	10.6	7.9	8.3	7.9	11.0	17.8	20.7	16.5	19.2	17.2	14.2	11.3	7.6	2.6	5.7	0.9	8.0	0.9	20.7	9.5	24
6	7.3	8.7	8.1	9.8	10.0	8.6	13.2	11.6	11.3	11.6	8.3	2.7	2.6	7.1	7.6	5.0	6.4	3.5	4.1	5.7	7.1	9.5	11.8	12.7	2.6	13.2	5.7	24
7	11.2	10.9	11.3	11.3	11.5	11.1	12.1	15.8	19.2	22.2	19.7	20.3	20.0	17.5	16.7	15.8	18.3	17.2	18.0	14.2	17.6	17.3	18.0	21.8	10.9	22.2	15.7	24
8	24.5	20.1	18.6	18.2	15.0	8.3	10.2	8.9	13.1	14.1	13.7	9.9	9.0	19.1	17.0	20.1	16.1	15.5	11.9	9.5	10.7	10.4	10.1	12.9	8.3	24.5	10.1	24
9	15.3	13.3	12.7	13.4	14.4	17.6	17.4	18.1	20.0	19.1	18.5	20.3	21.1	21.6	16.6	17.9	18.6	21.8	23.9	22.9	20.5	20.1	17.9	17.6	12.7	23.9	15.8	24
10	20.9	17.5	11.9	9.6	6.1	4.6	4.9	11.6	5.9	7.2	4.7	5.4	6.9	3.0	6.9	18.7	17.1	15.5	16.1	16.0	19.4	19.5	18.1	23.0	3.0	23.0	7.4	24
11	25.1	23.4	26.9	25.4	30.9	33.9	36.3	30.5	28.7	32.1	30.0	29.2	37.9	43.2	39.2	42.0	41.4	45.1	45.8	46.9	49.8	44.6	42.3	40.4	23.4	49.8	35.8	24
12	36.6	35.9	33.7	31.0	33.3	32.5	33.0	28.6	28.2	27.7	34.0	30.2	29.6	30.8	31.5	31.3	28.9	25.5	25.8	19.9	17.7	16.9	12.6	13.4	12.6	36.6	27.6	24
13	10.8	8.5	9.3	9.6	7.7	6.0	10.5	10.9	11.9	12.4	14.8	17.5	18.2	18.9	17.2	17.4	15.4	9.7	8.4	8.9	8.2	8.9	4.9	3.7	3.7	18.9	7.1	24
14	4.5	5.8	8.0	7.1	10.8	12.2	14.2	12.6	12.0	13.8	12.6	10.3	11.9	10.7	11.0	9.7	9.7	7.0	6.1	5.5	7.0	8.9	7.3	7.3	4.5	14.2	9.0	24
15	7.6	6.3	7.3	8.4	5.9	6.6	5.2	4.6	7.7	7.7	8.6	9.4	10.3	9.7	10.5	9.6	10.9	18.6	13.4	9.6	10.2	8.5	8.5	7.7	4.6	18.6	7.2	24
16	6.4	5.9	7.3	9.3	8.7	8.4	7.8	9.4	11.7	13.4	10.5	11.1	10.5	8.6	13.7	11.8	9.5	10.8	9.8	5.7	2.2	4.7	7.2	7.6	2.2	13.7	6.7	24
17	7.2	7.9	6.3	8.5	8.7	7.0	4.9	5.8	7.3	10.3	12.4	11.5	12.1	11.2	13.0	12.3	14.1	11.4	12.0	6.8	4.8	8.7	9.7	10.6	4.8	14.1	8.7	24
18	11.2	10.8	10.8	10.0	9.7	8.3	7.8	7.3	8.0	13.3	14.4	16.4	15.2	13.9	13.6	13.3	13.0	11.8	9.7	7.8	6.2	6.4	6.4	8.7	6.2	16.4	9.9	24
19	7.1	7.5	9.1	8.2	8.6	8.2	7.5	8.8	8.1	10.4	11.8	11.0	12.2	10.0	8.6	9.2	8.7	10.2	12.2	10.1	8.8	8.8	9.6	8.7	7.1	12.2	8.9	24
20	8.4	8.0	8.0	7.9	8.6	6.3	6.4	6.3	7.0	10.4	14.0	13.9	10.3	8.9	9.8	11.6	8.7	10.5	7.8	5.9	7.2	8.1	9.3	9.6	5.9	14.0	8.1	24
21	10.3	10.6	11.4	10.8	10.4	7.5	6.1	4.8	3.1	5.9	6.7	8.7	9.3	7.4	6.0	7.0	9.0	4.8	4.3	6.2	10.7	11.1	4.1	4.4	3.1	11.4	6.1	24
22	0.7	4.6	8.5	6.1	8.5	8.1	4.5	5.8	5.6	8.7	5.9	7.0	5.9	5.1	9.3	4.8	6.8	6.7	2.1	3.9	3.1	6.7	8.7	4.1	0.7	9.3	1.4	24
23	5.5	9.3	11.0	2.7	0.6	0.7	4.7	5.1	7.0	8.5	5.3	4.5	3.0	9.5	4.9	8.6	6.8	2.9	1.4	1.2	4.4	4.9	4.4	6.7	0.6	11.0	1.8	24
24	6.3	5.8	3.3	3.1	6.5	6.6	2.8	4.6	2.4	4.5	4.3	4.8	5.1	1.9	11.3	7.0	7.0	7.7	8.0	6.6	6.3	10.2	11.1	11.9	1.9	11.9	3.0	24
25	10.4	9.7	9.6	10.1	11.0	10.8	9.8	13.0	15.7	17.6	22.7	25.7	25.5	23.9	23.8	23.3	23.3	12.3	15.4	17.9	7.1	11.5	8.1	7.8	7.1	25.7	9.0	24
26	8.7	5.2	7.2	4.6	6.3	10.9	14.4	15.5	13.4	15.7	15.2	8.3	4.4	5.2	1.9	10.6	13.8	22.4	0.8	7.8	8.7	8.2	14.0	10.5	0.8	22.4	6.3	24
27	12.0	19.6	13.0	16.7	17.9	16.0	23.1	28.0	31.1	33.4	31.2	32.6	29.8	31.8	29.3	25.8	19.3	12.1	16.8	18.0	13.8	15.9	14.1	12.7	12.0	33.4	20.9	24
28	13.0	12.0	13.1	12.3	12.9	13.6	15.2	17.3	18.3	16.2	14.5	18.5	18.0	19.3	20.9	15.3	9.8	7.0	9.1	9.8	5.6	6.7	7.1	8.4	5.6	20.9	11.9	24
29	8.8	7.9	8.6	8.4	6.7	8.3	4.0	8.5	8.2	11.3	10.4	11.1	10.8	15.0	5.8	3.5	4.4	7.2	11.0	9.0	7.1	4.7	5.9	5.1	3.5	15.0	6.2	24
30	4.0	2.5	4.7	9.2	10.7	8.3	7.0	8.9	10.7	12.1	13.7	14.3	17.4	14.3	15.2	18.1	8.8	0.9	6.0	4.8	7.3	7.6	7.7	9.6	0.9	18.1	8.4	24
HOURLY MAX	36.6	35.9	33.7	31.0	33.3	33.9	36.3	30.5	31.1	33.4	34.0	32.6	37.9	43.2	39.2	42.0	41.4	45.1	45.8	46.9	49.8	44.6	42.3	40.4				

STATUS FLAG CODES

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

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

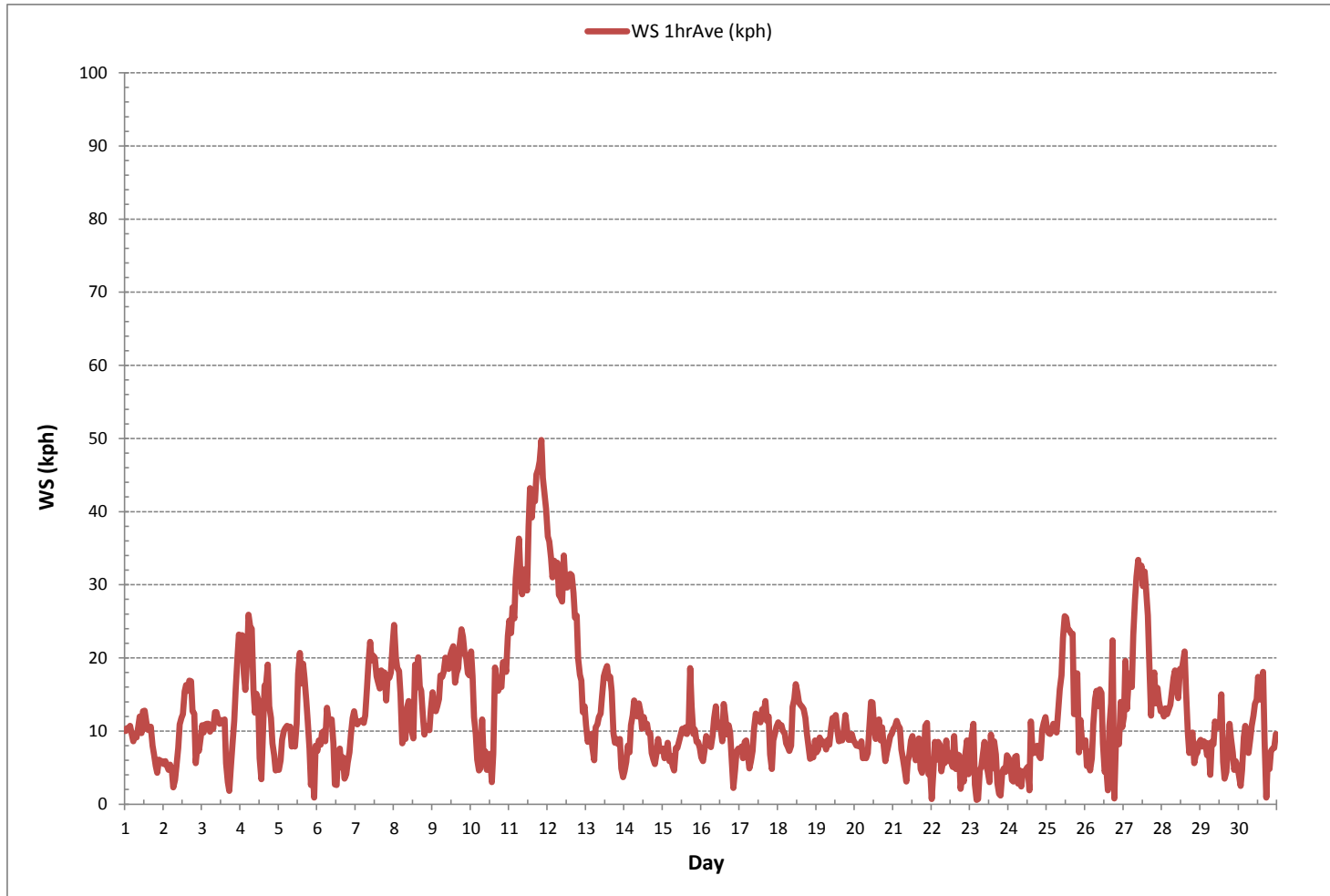
24 HR AVERAGES June 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE:	0.6 kph @ HOUR 4 ON DAY 23
MAXIMUM 1-HR AVERAGE:	49.8 kph @ HOUR 20 ON DAY 11
MAXIMUM 24-HR AVERAGE:	35.8 kph ON DAY 11
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	7.8
MONTHLY AVERAGE:	4.2 kph




WIND SPEED Hourly Averages (WS kph)



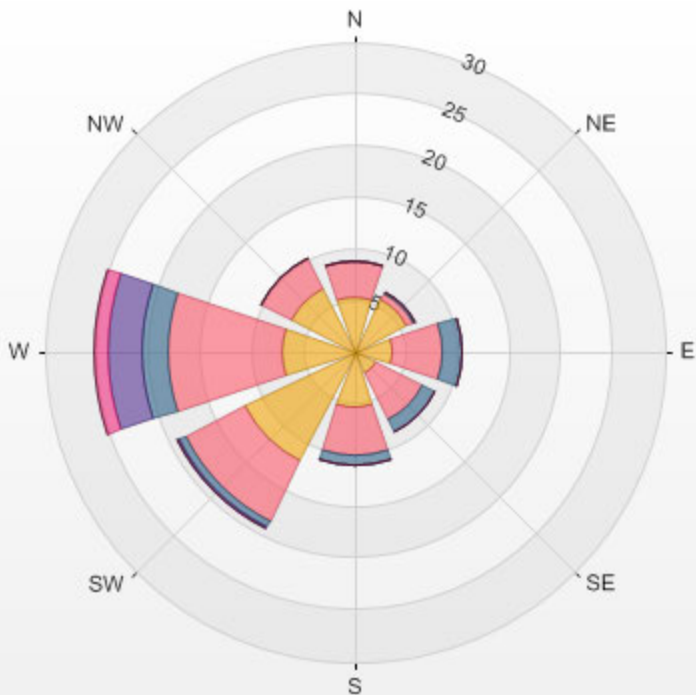
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 18/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.00%

Direction	0.4-10.0	10.0-20.0	20.0-30.0	30.0-40.0	40.0-50.0	>50.0	Total
N	5.3	3.5	0.0	0.0	0.0	0.0	8.8
NE	5.7	0.7	0.1	0.0	0.0	0.0	6.5
E	3.8	4.9	1.8	0.0	0.0	0.0	10.4
SE	2.4	5.0	1.4	0.0	0.0	0.0	8.8
S	5.4	4.6	1.0	0.0	0.0	0.0	11.0
SW	11.8	6.5	0.7	0.1	0.0	0.0	19.2
W	7.1	11.1	2.4	3.3	1.4	0.0	25.3
NW	6.8	3.3	0.0	0.0	0.0	0.0	10.1
Summary	48.2	39.6	7.4	3.5	1.4	0.0	100.0

% Icon	Classes (kph)	48		0.4-10.0	40		10.0-20.0	7		20.0-30.0	3		30.0-40.0	1		40.0-50.0	0		>50.0
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LICA ST. LINA 2018/06/01 00:00 - 2018/06/30 23:00 Calm: 0.00%



WIND DIRECTION



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

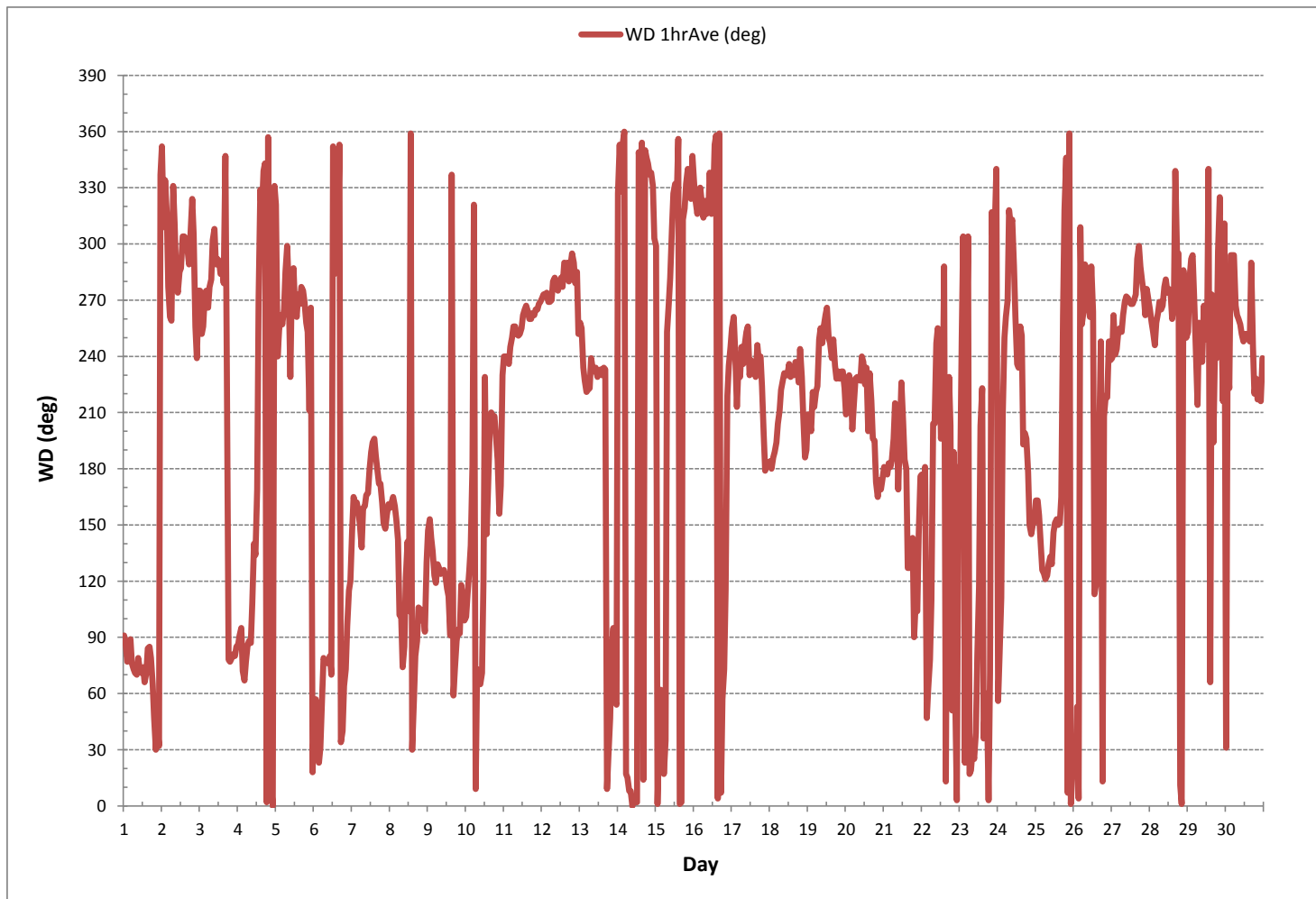
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	93		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	248 (WSW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.
DAY																									
1	11	11	12	12	13	13	13	15	14	15	15	15	15	15	16	16	16	16	16	17	18	14	18	19	24
2	14	21	19	28	12	13	15	16	15	23	24	26	25	17	20	19	21	19	20	25	9	12	14	21	24
3	7	9	5	11	9	6	13	17	19	22	32	29	29	30	28	22	21	16	14	11	11	12	12	12	24
4	13	13	14	15	14	13	12	13	15	21	17	17	17	17	28	21	17	18	18	18	17	12	17	13	24
5	18	18	5	7	8	9	20	18	31	17	45	29	21	15	18	20	19	18	15	15	6	14	71	10	24
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7	14	12	12	11	12	16	15	15	16	16	20	19	19	21	20	22	17	16	14	14	14	13	14	14	24
8	13	14	14	14	17	46	17	19	15	19	24	24	36	26	17	13	19	14	17	14	11	9	11	15	24
9	15	14	15	12	12	12	14	14	14	16	19	17	16	16	24	40	17	15	13	11	14	14	15	12	24
10	12	14	16	16	36	31	37	14	34	14	26	37	20	40	32	17	16	15	17	16	16	17	19	15	24
11	10	10	10	11	10	10	11	11	10	10	11	11	11	11	12	11	10	11	10	9	10	10	11	11	24
12	12	12	13	13	12	12	12	16	16	17	15	16	15	16	17	16	17	16	17	16	16	15	17	12	24
13	11	14	10	9	10	13	13	17	17	17	16	18	17	16	18	15	14	31	18	17	15	11	31	46	24
14	25	20	21	18	23	16	15	18	20	20	20	26	23	27	29	30	23	32	32	21	11	12	10	13	24
15	18	20	13	11	22	10	26	23	27	31	31	27	27	33	32	26	24	17	15	17	14	13	12	17	24
16	13	20	18	13	12	13	15	16	15	17	25	23	28	30	22	23	26	22	20	15	23	16	5	10	24
17	5	5	17	6	8	6	13	17	25	20	17	19	20	24	22	22	17	17	15	15	16	11	8	6	24
18	7	7	9	9	11	11	13	15	16	14	19	14	21	22	20	16	18	15	15	14	8	7	13	8	24
19	8	10	9	7	12	9	10	16	16	16	20	24	21	20	30	28	21	18	12	8	6	6	4	16	24
20	13	13	9	11	8	10	8	11	15	15	17	17	26	37	28	19	24	22	21	17	10	5	5	6	24
21	7	5	5	6	7	12	15	16	33	30	34	35	31	32	43	40	21	32	37	18	17	24	42	8	24
22	9	21	10	36	16	12	44	21	22	20	28	26	39	47	32	66	57	24	58	25	33	31	28	57	24
23	36	7	24	13	74	74	18	25	25	19	32	36	62	29	25	28	20	31	13	11	12	6	25	24	24
24	23	17	18	3	8	15	16	27	52	37	44	38	41	66	22	35	27	21	21	11	16	11	13	14	24
25	13	12	17	16	13	13	17	15	17	17	15	17	17	18	17	16	17	48	19	20	39	19	24	25	24
26	19	18	12	52	39	10	13	20	16	13	13	18	47	28	65	21	18	23	76	17	15	14	13	14	24
27	16	12	10	10	17	15	11	14	13	13	13	13	15	13	14	15	19	18	18	15	15	13	14	15	24
28	11	8	13	11	12	13	13	15	15	20	19	18	20	18	16	31	22	43	21	22	39	14	14	8	24
29	10	13	19	21	24	11	27	21	17	18	26	25	23	32	17	40	37	28	16	22	12	30	26	35	24
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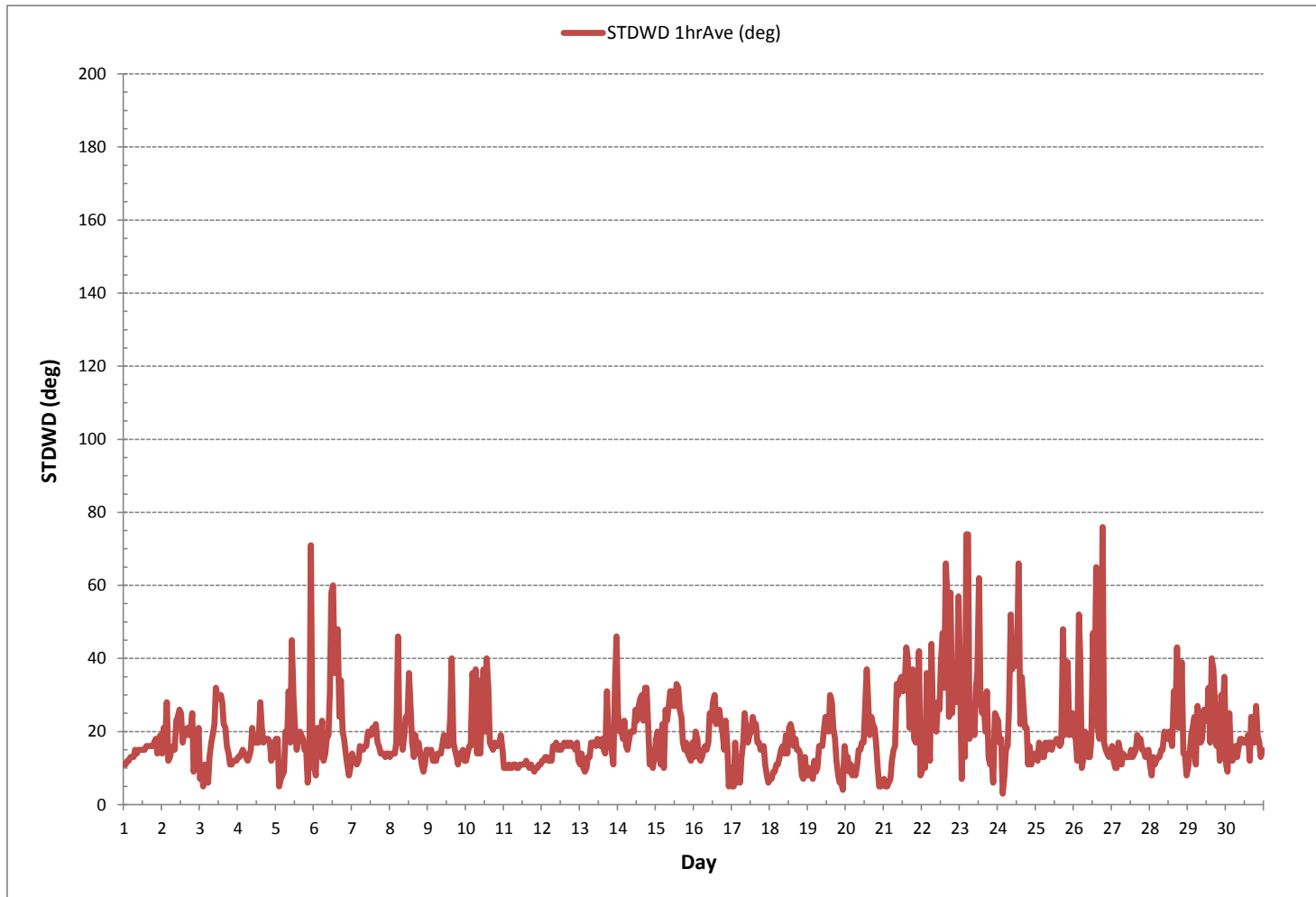
STATUS FLAG CODES

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

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



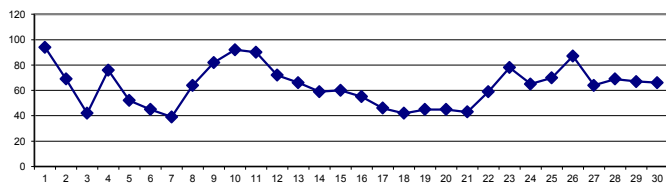
RELATIVE HUMIDITY Hourly Averages (RH %)

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

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

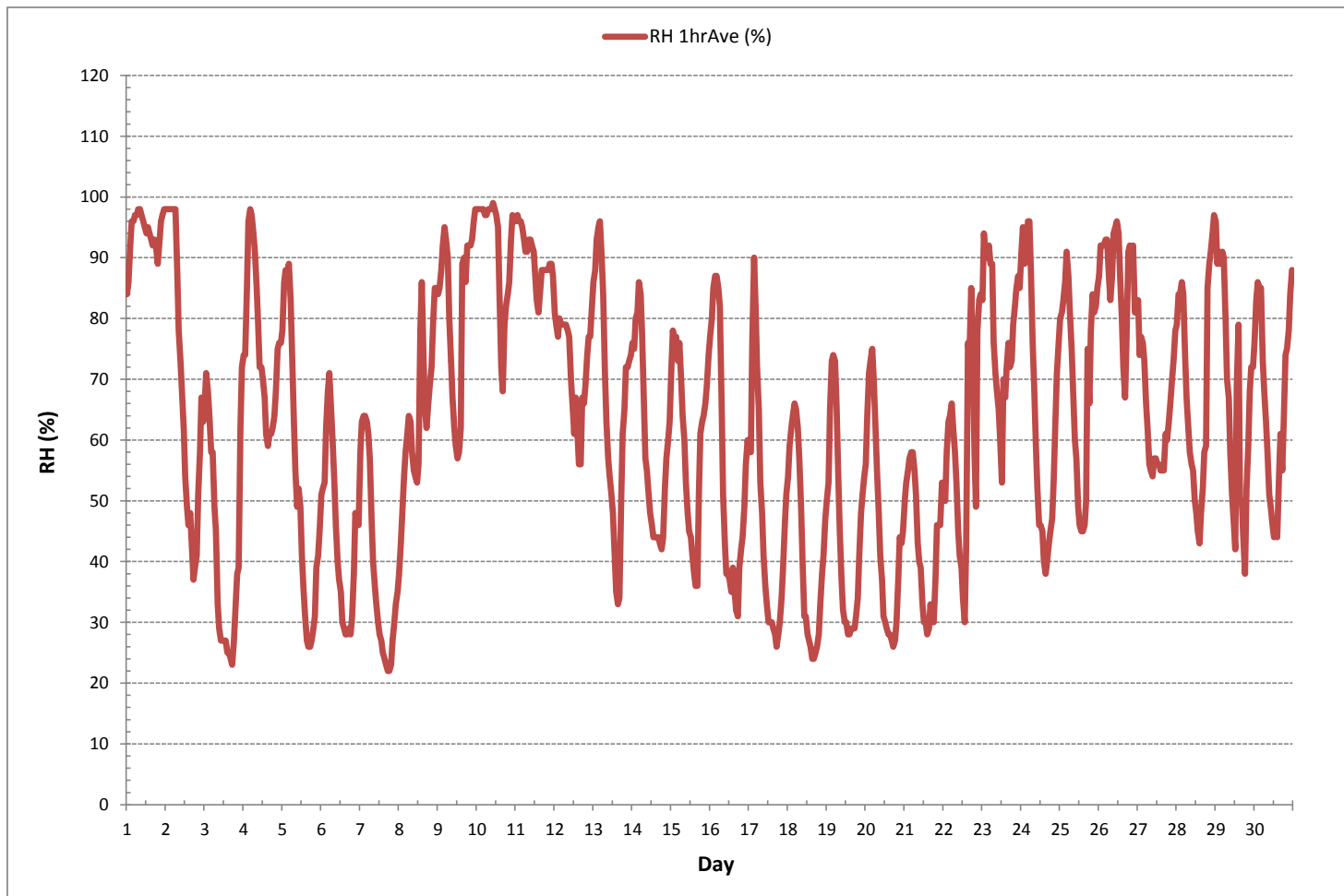
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	22	%	@ HOUR	17	ON DAY	7
MAXIMUM 1-HR AVERAGE:	99	%	@ HOUR	10	ON DAY	10
MAXIMUM 24-HR AVERAGE:	94	%			ON DAY	1
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	22		MONTHLY AVERAGE:			63 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



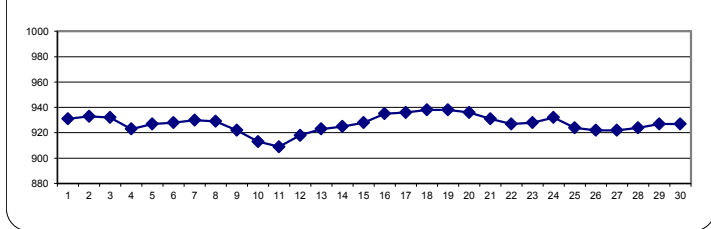
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	931	931	931	931	931	931	931	931	931	931	932	931	931	931	931	932	932	932	932	932	932	931	931	931	931	931	932	931	24
2	931	931	931	931	931	931	932	932	933	934	934	934	934	934	934	934	934	934	934	934	935	934	933	933	933	931	935	933	24
3	932	932	932	932	933	933	933	934	934	935	934	934	934	934	934	934	934	933	933	931	930	929	928	927	927	927	935	932	24
4	926	925	925	925	923	921	921	920	920	920	921	921	922	922	923	923	924	924	924	924	924	924	924	924	925	920	926	923	24
5	925	925	925	925	925	925	926	927	927	928	928	927	927	928	928	928	928	928	928	928	928	928	927	927	927	925	928	927	24
6	926	926	927	927	927	926	927	927	928	929	929	929	930	930	930	930	930	929	930	930	930	929	928	928	928	926	930	928	24
7	928	929	929	929	929	929	929	930	930	931	931	931	931	931	931	931	930	929	929	929	929	929	929	929	929	928	931	930	24
8	929	929	929	929	929	929	929	930	930	930	931	930	929	929	929	929	929	929	929	929	929	929	928	927	927	927	931	929	24
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10	916	917	917	916	916	915	915	915	914	914	913	912	912	912	912	912	911	911	910	909	908	908	907	907	907	917	913	24	
11	907	907	907	907	906	906	907	907	908	908	908	909	909	909	910	911	911	911	912	912	912	912	912	912	912	906	912	909	24
12	912	913	913	914	914	914	915	915	916	916	917	918	919	919	920	921	921	921	922	922	922	922	922	922	922	922	922	918	24
13	922	922	922	921	921	921	922	923	923	924	924	924	924	924	924	924	924	923	923	923	923	922	922	922	922	921	924	923	24
14	922	922	923	923	924	924	925	925	926	926	927	927	927	927	927	927	927	927	928	927	926	925	925	925	922	928	925	24	
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20	936	935	935	935	935	935	936	936	937	937	937	937	937	937	937	936	936	936	935	934	933	933	932	932	932	937	936	24	
21	932	932	931	931	931	931	932	932	933	933	933	933	933	933	932	931	931	931	931	930	929	929	928	928	928	933	931	24	
22	928	928	927	927	927	928	928	928	929	928	929	928	928	927	925	927	926	925	925	925	925	925	925	925	925	925	929	927	24
23	925	925	925	925	925	926	926	927	928	929	930	930	930	929	929	930	930	930	930	930	931	931	930	930	925	931	928	24	
24	930	930	930	931	931	931	932	933	933	934	934	935	934	934	934	934	934	933	933	932	932	931	930	929	929	935	932	24	
25	929	928	927	927	926	925	925	925	925	925	924	924	923	923	922	921	920	920	921	922	922	922	922	921	920	929	924	24	
26	921	921	921	921	920	922	922	922	922	922	922	922	922	922	923	923	923	923	923	922	922	923	923	923	923	920	923	922	24
27	922	922	922	921	921	921	922	922	922	922	922	922	923	923	922	923	923	923	923	923	923	923	923	923	921	923	922	24	
28	922	922	922	922	922	923	924	924	924	924	924	925	925	924	925	925	926	926	925	925	925	925	925	925	922	926	924	24	
29	925	925	925	925	925	926	927	927	928	928	928	928	928	927	929	929	929	929	928	928	928	928	928	928	925	929	927	24	
30	927	927	927	927	927	927	928	929	929	929	929	929	929	928	927	926	926	926	926	925	925	924	923	923	923	923	929	927	24
HOURLY MAX	937	937	936	936	936	936	937	938	939	940	940	940	940	940	940	940	940	940	940	940	939	938	938	937					
HOURLY AVG	926	926	926	926	926	926	927	927	928	928	928	928	928	928	928	928	928	928	928	928	927	927	927	926					

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

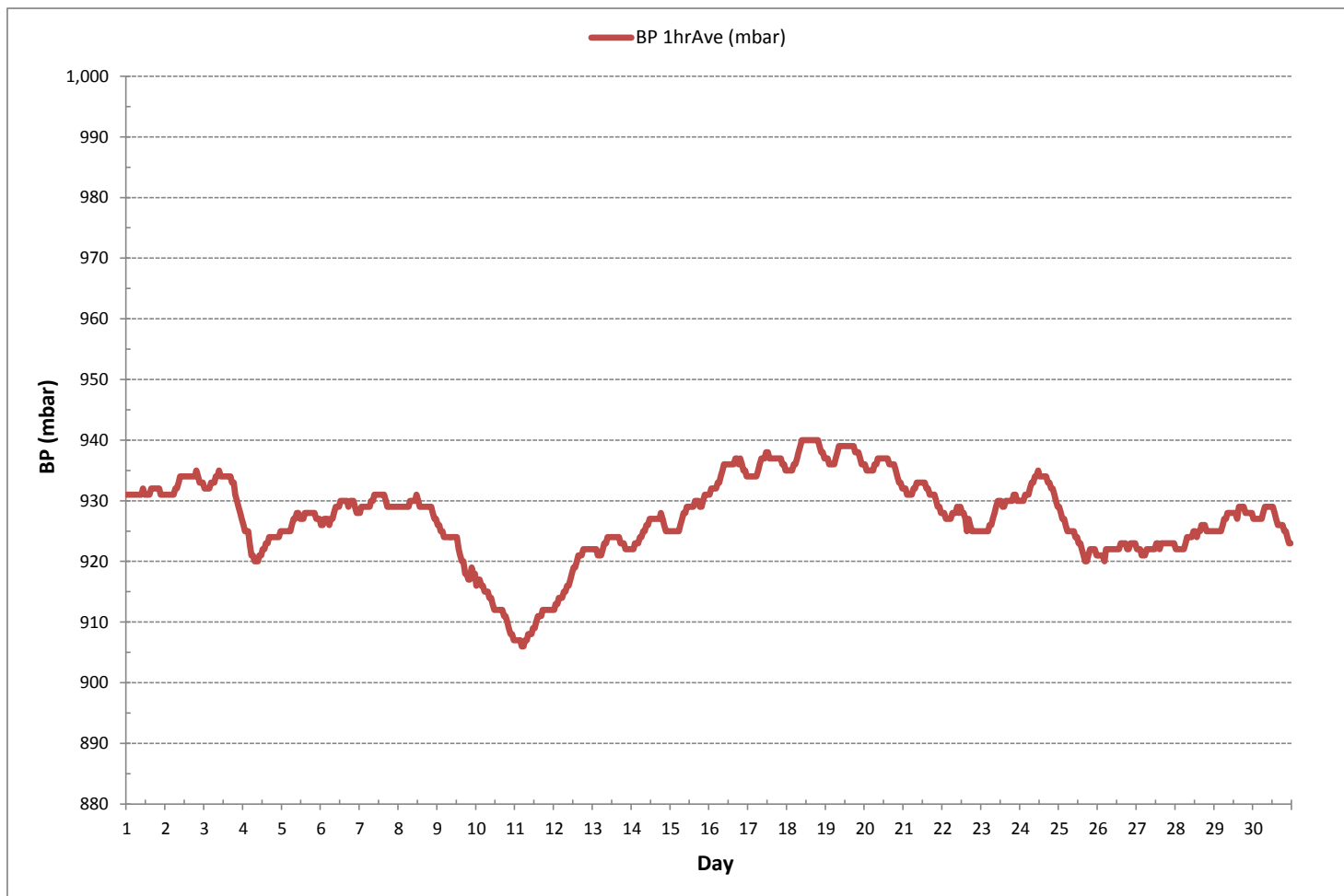
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	906	mbar	@ HOUR	4	ON DAY	11
MAXIMUM 1-HR AVERAGE:	940	mbar	@ HOUR	9	ON DAY	18
MAXIMUM 24-HR AVERAGE:	938	mbar			ON DAY	18
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	7					
MONTHLY AVERAGE:						927 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



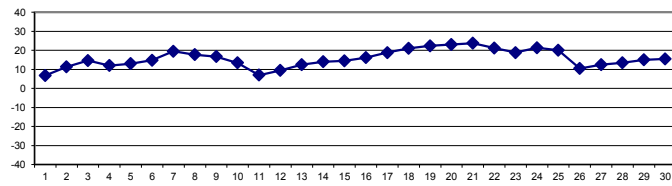
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	6.7	6.0	5.2	5.1	5.4	6.0	6.4	6.8	7.2	7.5	7.5	7.6	7.7	7.6	7.7	7.7	7.7	7.5	7.6	7.7	6.7	5.6	5.1	4.8	4.8	7.7	6.7	24
2	4.9	4.5	4.6	5.1	4.6	5.4	7.1	9.1	10.5	11.2	12.9	14.4	16.0	16.1	16.6	16.7	16.9	17.1	16.6	15.4	12.9	11.4	10.0	10.3	4.5	17.1	11.3	24
3	9.6	7.6	7.4	7.5	7.9	8.3	10.4	12.9	15.0	16.1	17.0	17.8	18.6	18.8	19.8	20.8	21.2	21.0	19.9	17.8	15.8	14.6	12.8	12.2	7.4	21.2	14.6	24
4	11.5	11.0	9.8	8.6	8.1	7.8	8.6	9.5	11.3	12.3	13.2	13.4	14.7	15.3	16.3	16.6	15.7	14.9	14.3	13.0	11.5	10.3	10.0	10.0	7.8	16.6	12.0	24
5	9.8	8.4	8.5	8.0	6.9	7.7	9.2	11.3	13.2	15.1	15.0	14.5	15.4	15.8	16.3	17.4	16.8	16.9	16.2	16.3	15.1	13.3	12.6	11.4	6.9	17.4	13.0	24
6	10.0	9.6	9.7	8.4	7.8	7.7	9.3	11.5	14.0	15.7	17.0	17.9	18.2	19.5	19.6	19.9	19.8	19.8	20.3	19.0	16.9	15.0	14.5	14.2	7.7	20.3	14.8	24
7	13.3	12.5	11.9	11.5	11.4	12.3	13.8	16.1	17.7	19.3	21.1	22.8	24.1	25.1	25.8	26.2	26.1	25.7	25.4	24.1	22.4	20.8	19.6	19.2	11.4	26.2	19.5	24
8	18.6	17.5	16.5	15.4	14.9	14.5	14.4	15.7	18.2	20.4	21.4	21.6	21.5	16.3	17.2	19.4	20.7	20.7	19.4	18.2	16.9	15.3	14.4	14.7	14.4	21.6	17.7	24
9	15.5	15.4	14.6	13.7	13.0	13.4	14.1	16.2	17.8	19.7	21.2	22.3	23.1	22.9	21.8	17.0	17.5	16.3	15.5	14.9	14.2	14.0	13.8	13.7	13.0	23.1	16.7	24
10	13.7	13.5	13.7	13.4	13.4	13.7	13.8	13.6	12.7	12.8	13.1	14.2	14.5	15.0	17.3	18.2	18.3	15.7	13.9	11.8	10.1	8.3	8.7	8.2	8.2	18.3	13.4	24
11	7.4	6.9	6.4	6.0	5.7	5.7	5.8	6.3	6.7	7.0	7.3	7.4	7.9	7.9	7.8	7.8	7.6	7.5	7.2	7.1	7.0	7.0	6.8	6.9	5.7	7.9	7.0	24
12	7.5	7.7	7.8	7.7	7.5	7.5	7.8	8.1	8.6	9.3	10.0	10.9	11.7	11.2	11.8	12.1	12.0	11.0	10.8	10.0	9.2	8.8	8.2	7.4	7.4	12.1	9.4	24
13	6.6	6.4	5.5	5.1	5.1	6.6	7.8	11.0	13.0	14.4	15.5	16.8	17.8	19.0	19.5	20.1	19.5	15.8	14.2	13.1	11.8	11.6	11.6	11.2	5.1	20.1	12.5	24
14	10.9	10.9	10.3	10.2	9.5	9.6	9.5	11.4	12.9	13.5	14.5	15.7	16.4	16.9	17.7	18.1	18.0	18.0	18.2	17.7	15.5	14.1	13.5	12.9	9.5	18.2	14.0	24
15	11.7	10.5	9.6	8.8	9.3	9.4	11.3	13.5	14.1	15.5	16.6	17.7	18.6	19.3	20.1	20.5	20.1	16.6	14.7	14.8	14.7	14.3	13.6	12.9	8.8	20.5	14.5	24
16	12.5	12.0	11.3	10.8	10.7	10.7	11.3	14.4	16.5	17.7	18.8	18.9	19.5	20.2	19.7	20.7	21.0	20.7	19.5	18.5	18.0	16.7	14.9	14.1	10.7	21.0	16.2	24
17	14.1	13.6	11.5	9.6	9.9	12.0	14.7	18.1	19.5	20.1	20.9	22.3	22.7	23.3	23.5	23.7	24.0	24.5	23.8	23.5	21.6	19.5	18.0	16.4	9.6	24.5	18.8	24
18	15.4	14.2	13.6	13.3	12.9	13.7	15.7	18.4	21.0	23.0	24.1	24.6	25.0	25.7	26.4	26.8	26.8	26.7	26.6	25.7	23.5	21.6	20.7	19.2	12.9	26.8	21.0	24
19	18.3	17.6	15.3	14.1	13.7	14.4	17.0	20.2	22.9	24.9	25.6	26.2	26.7	27.4	28.2	28.3	28.5	28.7	27.7	26.6	24.0	21.8	20.7	19.7	13.7	28.7	22.4	24
20	19.2	17.8	16.5	15.8	14.9	16.1	18.9	21.6	24.0	25.7	26.0	26.8	27.4	27.6	28.1	28.7	28.8	27.8	27.4	26.5	24.3	22.6	21.8	21.0	14.9	28.8	23.1	24
21	19.9	18.9	18.4	18.0	17.8	18.4	20.2	22.5	25.4	26.0	27.0	27.2	27.9	28.2	28.4	28.5	27.4	27.9	27.9	26.4	24.1	22.3	21.8	20.7	17.8	28.5	23.8	24
22	21.3	21.3	20.1	18.4	17.9	18.6	20.3	21.8	23.3	24.7	26.0	27.2	27.9	29.0	25.9	20.1	19.3	15.7	17.4	19.5	20.6	17.4	17.1	16.9	15.7	29.0	21.2	24
23	16.4	15.1	15.5	15.0	15.2	16.3	16.9	19.3	21.4	21.8	23.1	23.6	24.2	20.2	20.5	19.9	19.4	19.9	19.8	19.1	18.0	17.1	16.4	16.2	15.0	24.2	18.8	24
24	15.1	15.1	15.7	15.8	14.9	14.6	17.1	19.4	21.4	22.9	24.3	24.7	25.9	25.4	26.6	27.1	26.7	26.7	25.9	24.8	23.1	21.2	20.2	19.3	14.6	27.1	21.4	24
25	18.7	18.2	17.7	17.0	16.4	17.2	18.7	20.4	22.1	23.9	24.9	25.9	26.8	26.9	27.0	26.9	26.0	19.3	19.3	16.4	14.6	13.8	13.0	12.2	12.2	27.0	20.1	24
26	11.5	10.6	10.5	10.2	9.9	11.1	12.5	12.2	10.6	9.2	8.6	8.5	8.7	9.7	11.1	12.6	14.0	11.5	8.9	9.5	9.5	9.6	10.0	9.6	8.5	14.0	10.4	24
27	9.4	10.1	9.5	9.3	9.7	10.9	11.9	13.1	13.2	13.3	13.1	13.5	14.1	14.1	14.3	14.7	14.5	14.1	14.1	13.6	13.2	12.5	12.0	11.0	9.3	14.7	12.5	24
28	10.4	9.4	9.3	8.6	8.6	10.3	12.0	13.4	14.5	15.7	16.6	17.5	17.6	18.2	19.3	18.4	18.0	17.0	16.0	11.9	11.4	11.0	10.3	9.1	8.6	19.3	13.5	24
29	8.9	9.8	9.6	9.6	9.1	10.2	12.6	14.3	14.8	17.5	18.0	19.5	20.4	14.2	14.6	19.8	20.0	20.6	21.5	17.3	15.8	14.0	13.4	13.3	8.9	21.5	15.0	24
30	12.2	11.5	11.5	11.2	10.4	11.8	13.7	15.3	16.8	18.2	19.2	20.2	20.6	20.6	20.8	17.7	16.6	17.8	17.6	16.5	15.4	13.7	11.9	11.2	10.4	20.8	15.5	24
HOURLY MAX	21.3	21.3	20.1	18.4	17.9	18.6	20.3	22.5	25.4	26.0	27.0	27.2	27.9	29.0	28.4	28.7	28.8	28.7	27.9	26.6	24.3	22.6	21.8	21.0				
HOURLY AVG	12.7	12.1	11.6	11.0	10.8	11.4	12.8	14.6	16.0	17.1	18.0	18.7	19.4	19.2	19.7	19.7	19.6	18.8	18.3	17.2	15.9	14.6	13.9	13.3				

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

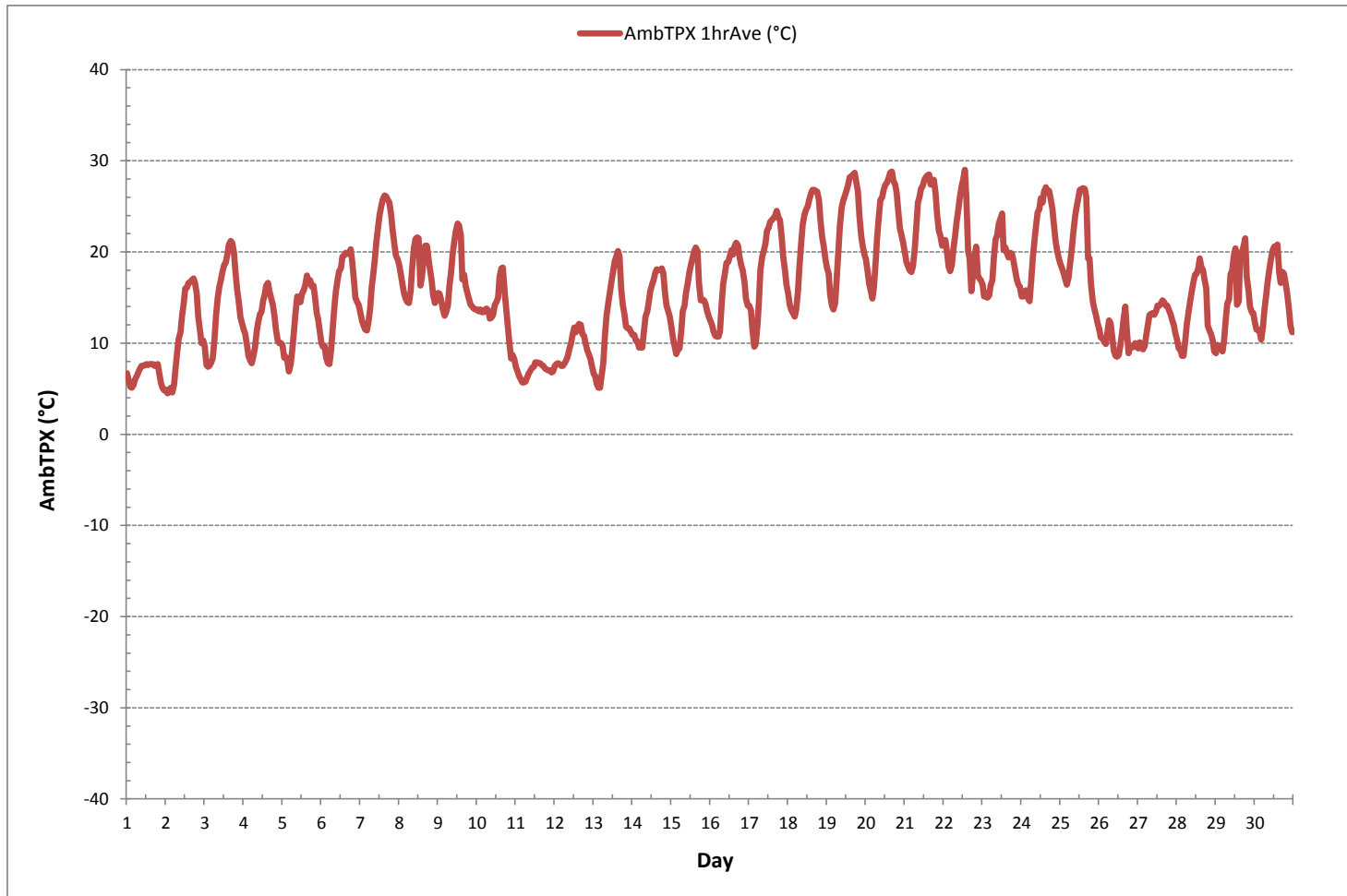
24 HR AVERAGES June 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	4.5 °C	@ HOUR	1	ON DAY	2
MAXIMUM 1-HR AVERAGE:	29.0 °C	@ HOUR	13	ON DAY	22
MAXIMUM 24-HR AVERAGE:	23.8 °C			ON DAY	21
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	5.9	MONTHLY AVERAGE:			15.7 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.8	0.6	0.9	0.6	1.1	0.7	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	24
2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	2.4	3.6	1.8	0.0	0.0	0.1	0.3	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.4	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	7.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.3	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	16.0	0.0	0.1	3.4	0.0	0.0	0.7	1.6	0.0	0.0	16.0	0.9	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	2.4	3.5	0.1	2.2	0.5	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	8.0	0.7	24
11	0.0	0.2	0.1	0.2	0.2	0.5	0.5	0.6	0.8	0.5	0.7	0.5	0.1	0.2	0.1	0.5	1.0	1.2	0.9	1.0	0.8	1.0	1.2	0.2	0.0	1.2	0.5	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	24
16	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	24
18	0.0	0.0	0.0	0.0	0.1	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	0.1	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	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	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	1.4	13.6	0.2	2.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	0.8	24
23	0.9	1.3	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.1	0.0	0.0	0.4	0.0	0.1	0.2	0.0	0.0	3.1	0.2	24
26	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.5	3.2	4.0	C	3.8	0.0	0.0	0.0	0.0	1.5	1.5	0.1	0.0	0.0	0.0	0.5	0.0	0.0	4.0	0.7	24
27	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	0.1	0.7	1.0	0.0	0.1	0.1	0.1	0.0	0.0	1.0	0.1	24
29	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	7.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.3	24
30	0.1	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
HOURLY MAX	0.9	1.3	2.4	3.6	1.8	0.5	0.5	0.6	8.0	3.2	4.0	0.9	3.8	7.3	1.4	16.0	1.0	3.1	3.4	1.0	0.8	1.0	1.6	0.5				
HOURLY AVG	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.2	0.3	0.1	0.2	0.6	0.1	1.0	0.1	0.3	0.3	0.1	0.0	0.1	0.1	0.0				

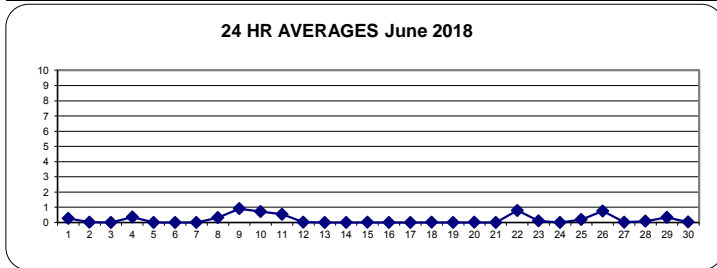
STATUS FLAG CODES

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

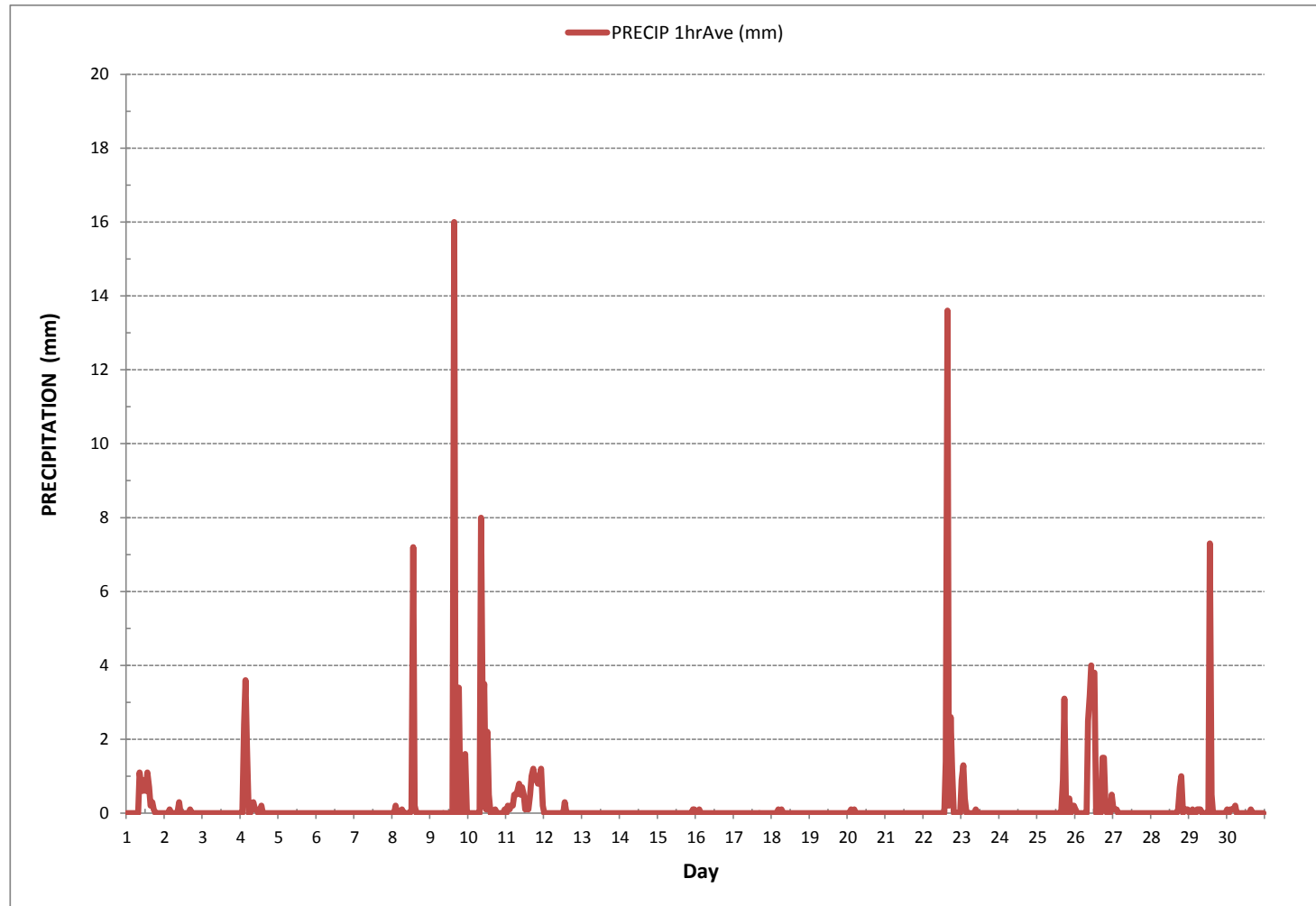
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	16.0	mm	@ HOUR	15	ON DAY	9
MAXIMUM 24-HR AVERAGE:	0.9	mm			ON DAY	9
MONTHLY TOTAL	130.9	mm				
OPERATIONAL TIME:					720	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	1.0		MONTHLY AVERAGE:		0.2	mm

24 HR AVERAGES June 2018



PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	June 12, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	916	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:55	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:57	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:	May 14, 2018	As Found C.F.:	1.003		
Previous C.F.:	1.001	New C.F.:	1.000		

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

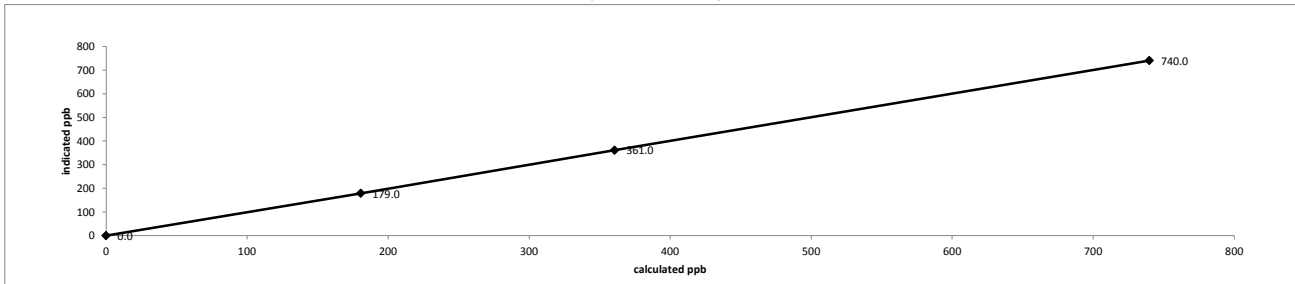
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5068	0.00	5068	0.0	2.6	n/a
as found high	4983	76.08	5059	739.9	740.0	1.003
adjusted zero	5068	0.00	5068	0.0	0.0	n/a
adjusted high	4983	76.08	5059	739.9	740.0	1.000
mid	5026	37.12	5063	360.7	361.0	0.999
low	5035	18.56	5054	180.7	179.0	1.009
0	5068	0.00	5068	0.0	0.0	n/a
Average C.F. =						1.003

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 =	-0.24%		± 10%

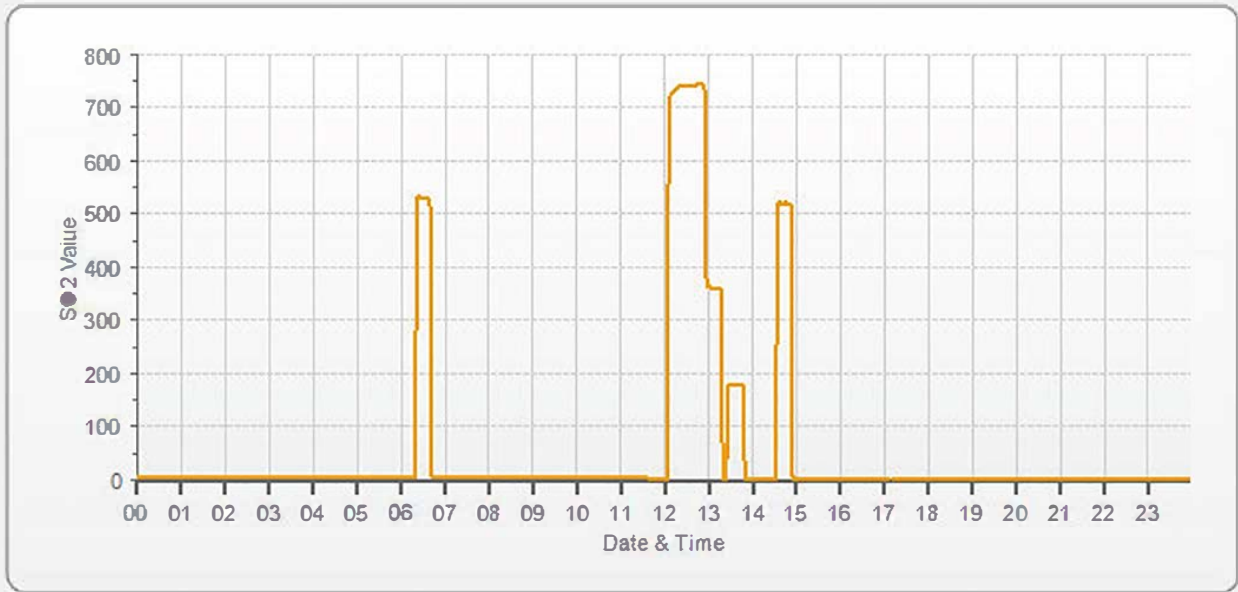
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:		
Slope:	0.955	Slope:	0.959
Offset:	153.6	Offset:	159.4
Hvps:	651	Hvps:	651
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	29.3	Box Temp:	29.1
Pmt Temp:	7.9	Pmt Temp:	7.9
Izs Temp:	45.0	Izs Temp:	45.0
Pres:	23.5	Pres:	23.6
Samp Fl:	595	Samp Fl:	596
Norm Pmt:	158.5	Norm Pmt:	159.4
Uv Lamp:	2744.7	Uv Lamp:	2741.3
Lamp Ratio:	87.1	Lamp Ratio:	87.1
Str Lgt:	73.4	Str Lgt:	76.4
Drk Pmt:	5.8	Drk Pmt:	6.1
Expected Value:	520.0	Expected Value:	518.0

Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 No high point adjustment was required/made.

SO₂ [ppb] Station: LICA ST LINA Daily: 18/06/12 Type: AVG 1 Min. [1 Min.]



— SO₂ [ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: June 12, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 10:55 End Time 24 hr. (mst): 15:33 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 509 LICA Last Calibration Date: May 14, 2018 Previous C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 916 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: June 14, 2019 Converter Model & s/n (if applicable): n/a Range ppb: 100 As Found C.F.: 1.033 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: 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" style="width: 100%; border-collapse: collapse;"> <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.: 12:01 / 12:11 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

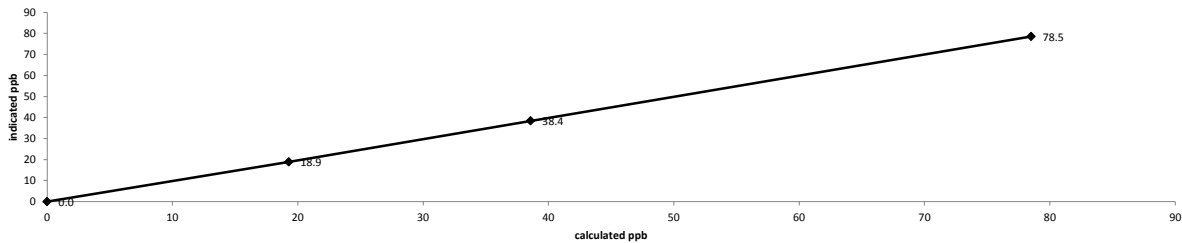
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7461	0.00	7461	0.0	1.2	n/a
as found high	7403	57.42	7460	78.5	77.2	1.033
adjusted zero	7461	0.00	7461	0.0	0.0	n/a
adjusted high	7403	57.42	7460	78.5	78.5	1.000
mid	7417	28.16	7445	38.6	38.4	1.005
low	7427	14.07	7441	19.3	18.9	1.020
0	7461	0.00	7461	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.19%</u>	0.95-1.05
% change in C.F. from last cal = <u>-3.30%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

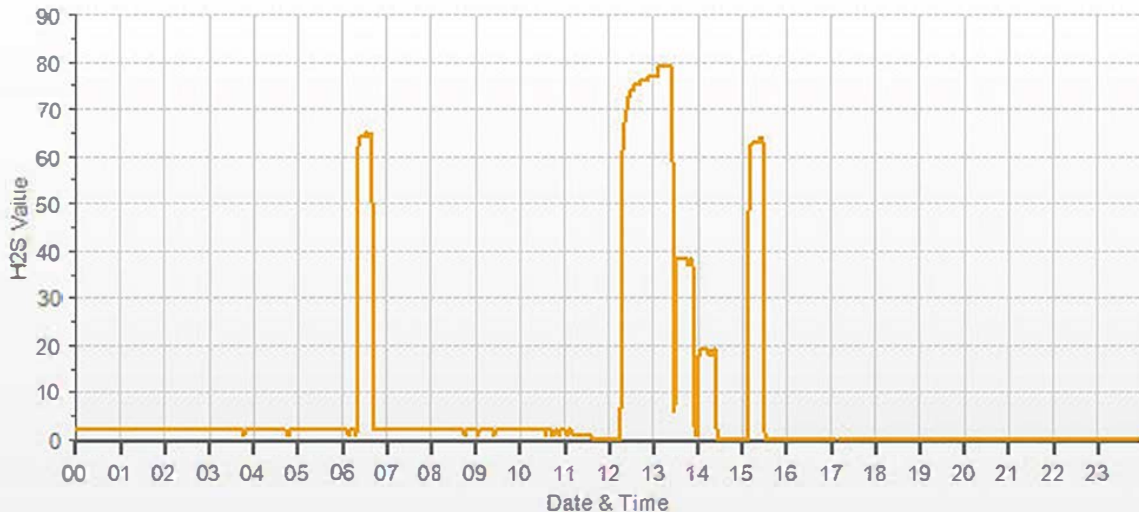


As found: Slope: <u>0.894</u> Offset: <u>73.5</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.7</u> Pmt Temp: <u>7.9</u> Izs Temp: <u>48.0</u> Converter Temp: <u>314.0</u> Pres: <u>19.8</u> Samp Fl: <u>513</u> Uv Lamp: <u>3117.5</u> Lamp Ratio: <u>92.9</u> Str Lgt: <u>32.8</u> Drk Pmt: <u>0.6</u> Expected Value: <u>61.0</u>	As left: Slope: <u>0.925</u> Offset: <u>76.3</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>29.7</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>315.6</u> Pres: <u>19.9</u> Samp Fl: <u>515</u> Uv Lamp: <u>3121.9</u> Lamp Ratio: <u>93.1</u> Str Lgt: <u>35.3</u> Drk Pmt: <u>0.6</u> Expected Value: <u>63.5</u>
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Comments:
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

H₂S [ppb] Station: LICA ST. LINA Daily: 18/06/12 Type: AVG 1 Min. [1 Min.]



— H₂S[ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: June 13, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 9:18 / 13:44 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 925436893 Maxxam Last Calibration Date: May 23, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 923 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: A few clouds 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.: 1.008 New C.F.: 1.000
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Calibration Standards:

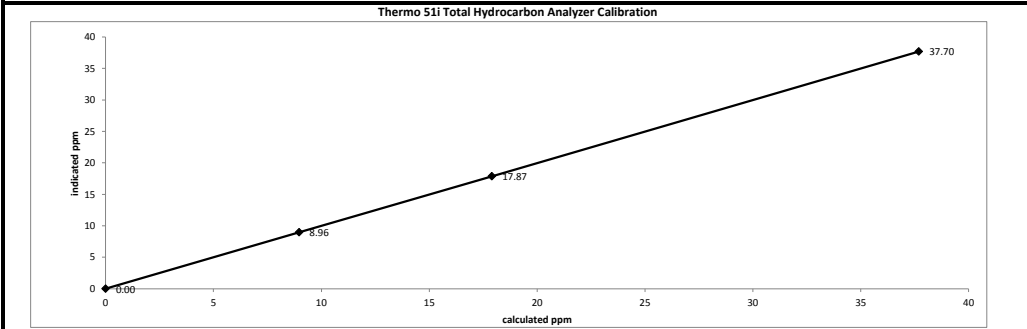
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 50 ppm								
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</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: 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):	<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	-0.05	n/a
as found high	2435	81.84	2517	37.69	37.33	1.008
adjusted zero	2515	0.00	2515	0.00	0.00	n/a
adjusted high	2435	81.84	2517	37.69	37.70	1.000
mid	2471	38.76	2510	17.90	17.87	1.002
low	2494	19.44	2513	8.97	8.96	1.001
calibrator zero	2515	0.00	2515	0.0	0.00	n/a
Average C.F.=						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = 0.02% % change in C.F. from last cal = -0.84%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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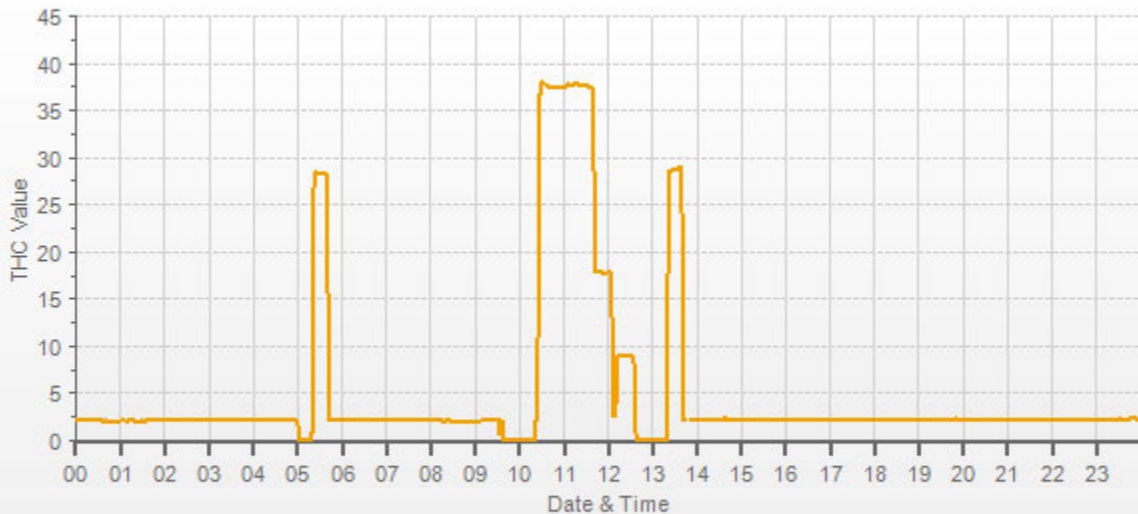
As found: Bkg: 3.70 Coef: 3.373 Bias Supply: -298 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 143.4 Internal: 27.0 Sample: 9.5 Fuel: 19.9 Air: 39.8 Signal: 920 Status: UT	As left: Bkg: 3.75 Coef: 3.456 Bias Supply: -298 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 143.3 Internal: 29.3 Sample: 9.4 Fuel: 19.9 Air: 39.8 Signal: 903 Status: LIT
--	--

Cylinder/Regulator Pressures: H2 Cylinder (psi): 1000 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 44 Span Cylinder (psi): 1200 Span Cylinder reg set (psi): 22 Measured Flow: 0.797 Expected Value: 29.71	H2 Cylinder (psi): 1000 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 44 Span Cylinder (psi): 1200 Span Cylinder reg set (psi): 22 Measured Flow: n/a Expected Value: 28.94
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Comments:
 The analyzer sample inlet filter was changed.

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

THC [ppm] Station: LICA ST. LINA Daily: 18/06/13 Type: AVG 1 Min. [1 Min.]



— THC [ppm]



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: June 25, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 12:51 / 16:45 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 925436893 Maxxam Last Calibration Date: June 13, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 924 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: November 24, 2022 Range ppm: 50 As Found C.F.: n/a 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: EnviroNics 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

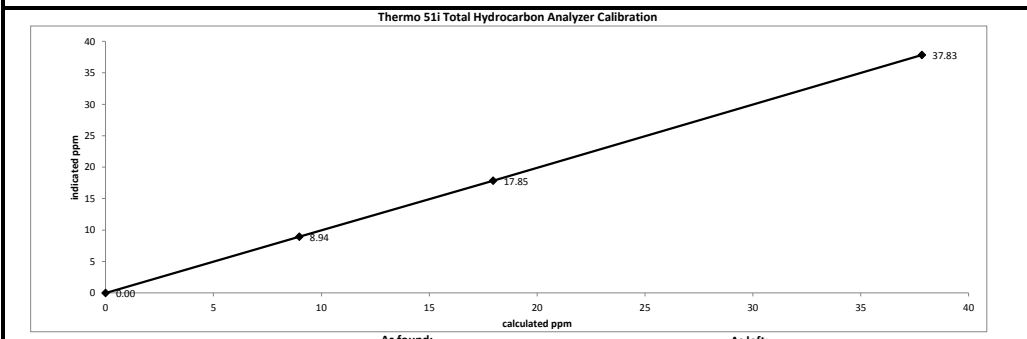
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
adjusted zero	2522	0.00	2522	0.0	0.00	n/a
adjusted high	2445	82.48	2527	37.84	37.83	1.000
mid	2487	39.14	2526	17.96	17.85	1.006
low	2505	19.56	2525	8.98	8.94	1.004
calibrator zero	2522	0.00	2522	0.00	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 = n/a	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. n/a
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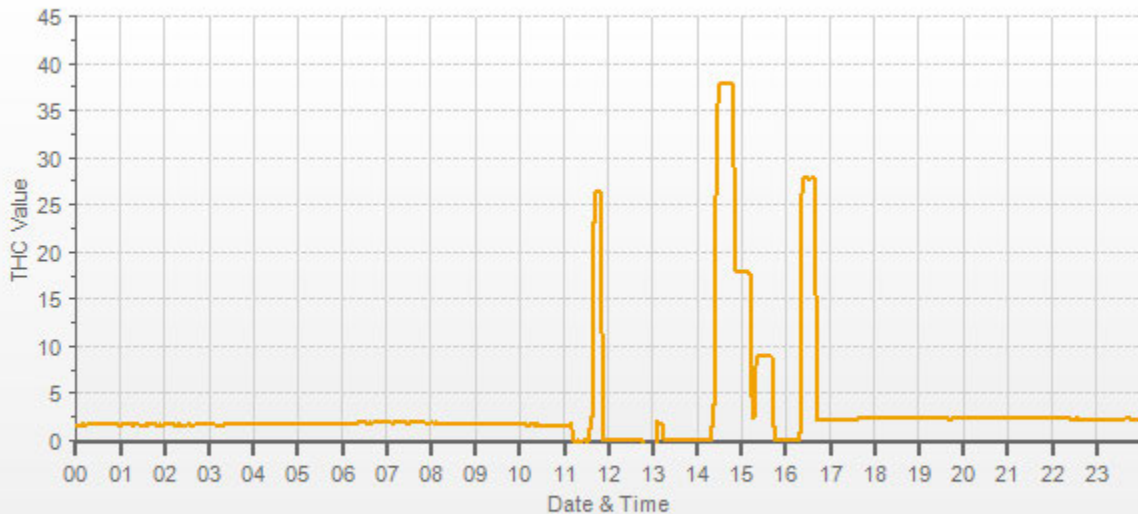
Cylinder/Regulator Pressures: H2 Cylinder (psi): n/a H2 cylinder reg set (psi): n/a Zero Air Gen Pressure: n/a Span Cylinder (psi): n/a Span Cylinder reg set (psi): n/a Measured Flow: n/a Expected Value: n/a	H2 Cylinder (psi): 1000 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 44 Span Cylinder (psi): 950 Span Cylinder reg set (psi): 22 Measured Flow: 0.700 Expected Value: 27.74
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Comments:

The manifold blower was found to be working normally.

A Post-repair calibration was completed after repairing the sample pump.

THC [ppm] Station: LICA ST. LINA Daily: 18/06/25 Type: AVG 1 Min. [1 Min.]



— THC [ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: June 2, 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	21	°C
Location/Station Name: St. Lina	Weather Conditions: A few clouds		
Start/End Time 24 hr. (mst): 10:26 / 12:44	Calibration Purpose: shut down		
G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

Analyzer:		Correction Factors:		
Serial Number/Owner: 594 LICA	NO =	Previous C.F.: 0.999	As Found C.F.: 1.032	New C.F.: n/a
Last Calibration Date: May 15, 2018	NO ₂ =	1.000	0.994	n/a
Range ppb: 1000	NOx =	1.000	1.040	n/a

Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: EnviroNics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 1000 ppb																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>610</td> <td>375</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>190</td> <td><-mid ozone</td> </tr> <tr> <td>Low</td> <td>190</td> <td>70</td> <td><-low ozone</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	610	375	<-high ozone	Mid	380	190	<-mid ozone	Low	190	70	<-low ozone	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	610	375	<-high ozone																						
Mid	380	190	<-mid ozone																						
Low	190	70	<-low ozone																						
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	5058	0.0	5058	0	0	0.3	0.4	n/a	n/a
as found high	4994	76.0	5070	772.0	773.5	748.0	744.0	1.032	1.040
Average C.F.=								#VALUE!	#VALUE!

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	4994	76.00	5070	0.0	748.0	745.0	-3.0	0.3	-3.0	
as found high NO2	4994	76.00	5070	520.0	282.0	749.0	466.0	466.0	469.0	0.994
gpt mid	4994	76.00	5070	190.0	580.0	748.0	167.0	168.0	170.0	0.988
gpt low	4994	76.00	5070	80.0	680.0	748.0	69.0	68.0	72.0	0.944
Average NO ₂ C.F.=										0.975

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	#VALUE!	#VALUE!	1.000	> or = 0.995
Slope =	#VALUE!	#VALUE!	0.992	0.90-1.10
b (Intercept as % of full scale)=	#VALUE!	#VALUE!	0.00%	± 3% F.S.
% change in C.F. from last cal=	-3.35%	0.64%	-4.02%	± 10%
NO ₂ converter efficiency			0.98	0.96 to 1.04

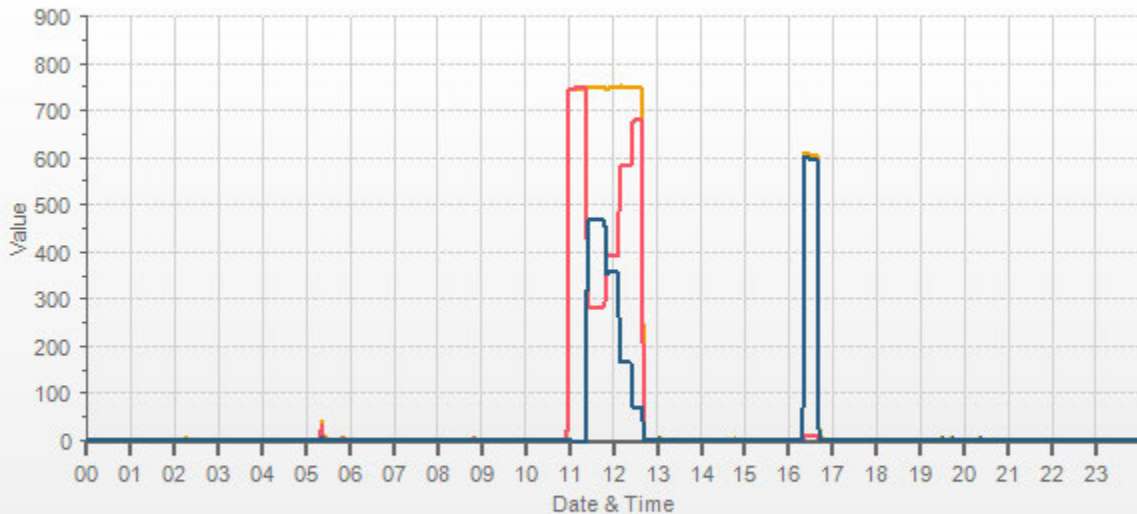
As found:		As left:	
NOx SLOPE:	1.103	NOx SLOPE:	1.103
NOx OFFS:	0.1	NOx OFFS:	0.1
NO SLOPE:	1.099	NO SLOPE:	1.099
NO OFFS:	-1.3	NO OFFS:	-1.3
SAMP FLW:	483	SAMP FLW:	483
OZONE FL:	78	OZONE FL:	78
PMT:	17.4	PMT:	15.9
NORM PMT:	-1.6	NORM PMT:	-0.6
AZERO:	16.8	AZERO:	17.4
HVPS:	759	HVPS:	759
RCELL TEMP:	49.9	RCELL TEMP:	50.0
BOX TEMP:	31.4	BOX TEMP:	32.6
PMT TEMP:	6.7	PMT TEMP:	6.7
IZS TEMP:	45.1	IZS TEMP:	45.4
MOLY TEMP:	315.0	MOLY TEMP:	316.7
RCEL:	5.2	RCEL:	5.2
SAMP:	26.6	SAMP:	26.6
Expected Value NO:	10	Expected Value NO:	10
Expected Value NO ₂ :	605	Expected Value NO ₂ :	605
Expected Value NOx:	615	Expected Value NOx:	615

Comments:

No high point NO2 adjustment was required/made.

The manifold blower was found to be working normally.
No zero adjustment was required/made.

This is NOT a shutdown calibration. This is an As Found calibration. The Shutdown in the "calibration purpose" was chosen to display the GPT three points needed for the O3 calibration. O3 High Point = 400, O3 Mid Point = 190, O3 Low Point = 80, O3 High Point GPT for O3: NOx= 749, NO=391, NO2=358, NO Drop=357, NO2 gain=360.



— NOX [ppb] — NO [ppb] — NO2 [ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date:	June 12, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	916	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	A few clouds		
Start/End Time 24 hr. (mst):	10:55 / 17:04	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:		Correction Factors:			
Serial Number/Owner:	594 LICA	NO =	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date:	May 15, 2018	NO ₂ =	1.000	1.048	1.001
Range ppb:	1000	NOx =	1.000	0.990	1.000
			1.000	1.052	1.000

Calibration Standards:			
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018		
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018		
Calibrator ID/Expiry Date:	Environics id# 5212 expires March 1, 2019		
Cal Gas Cylinder I.D. #:	LL 104225		
Cal Gas Conc. (ppm):	51.5	51.6	

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	5068	0.0	5068	0	0	0.3	0.6	n/a	n/a
as found high	4983	76.1	5059	774.5	776.0	739.0	738.0	1.048	1.052
adjusted zero	5068	0.00	5068	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4983	76.08	5059	774.5	776.0	774.0	776.0	1.001	1.000
mid	5026	37.12	5063	377.6	378.3	377.0	378.0	1.002	1.001
low	5035	18.56	5054	189.1	189.5	189.0	189.0	1.001	1.003
calibrator zero	5068	0.00	5068	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.001	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	4983	76.08	5059	0.0	775.0	777.0	2.0	0.0	2.0	
as found high NO2	4983	76.08	5059	520.0	272.0	782.0	510.0	503.0	508.0	0.990
adjusted high NO2	4983	76.08	5059	520.0	271.0	777.0	506.0	504.0	504.0	1.000
gpt mid	4983	76.08	5059	285.0	496.0	779.0	283.0	279.0	281.0	0.993
gpt low	4983	76.08	5059	100.0	679.0	779.0	99.0	96.0	97.0	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 =	1.001	1.000	1.003	0.95-1.05
b (Intercept as % of full scale)=	-0.01%	-0.03%	0.19%	± 3% F.S.
% change in C.F. from last cal=	-4.84%	-5.23%	0.98%	± 10%
NO2 converter efficiency			0.99	0.96 to 1.04

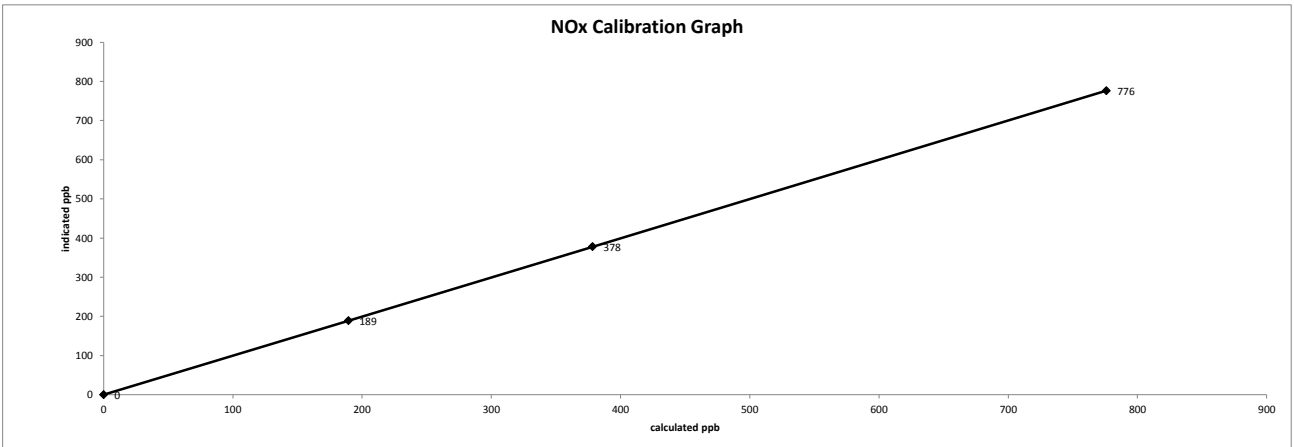
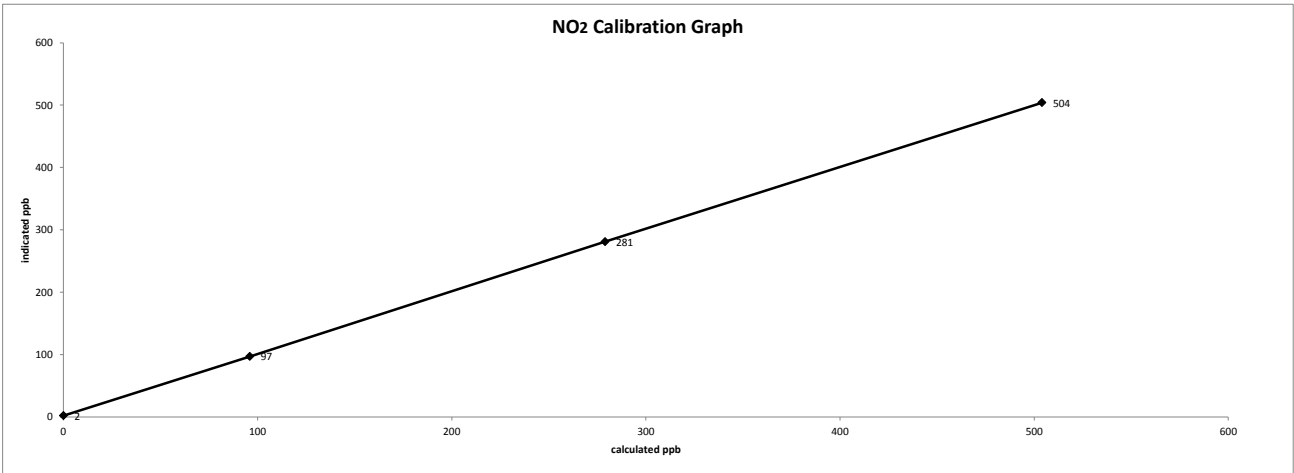
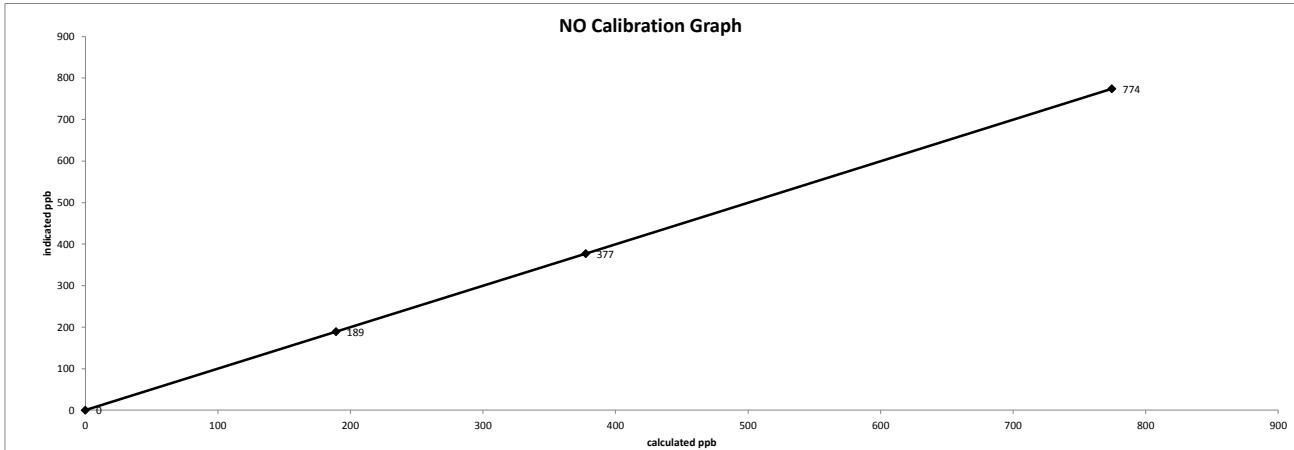
<p>As found:</p> NOx SLOPE: 1.103 NOx OFFS: 0.1 NO SLOPE: 1.099 NO OFFS: -1.3 SAMP FLW: 475 OZONE FL: 77 PMT: 12.1 NORM PMT: -1.6 AZERO: 16.9 HVPS: 759 RCELL TEMP: 50.0 BOX TEMP: 31.4 PMT TEMP: 6.7 IZS TEMP: 45.0 MOLY TEMP: 315.3 RCEL: 5.0 SAMP: 26.2 Expected Value NO: 10 Expected Value NO2: 605 Expected Value NOx: 615	<p>As left:</p> NOx SLOPE: 1.160 NOx OFFS: 0.8 NO SLOPE: 1.152 NO OFFS: -1.3 SAMP FLW: 476 OZONE FL: 77 PMT: 14.8 NORM PMT: 2.3 AZERO: 17.5 HVPS: 759 RCELL TEMP: 49.8 BOX TEMP: 31.8 PMT TEMP: 6.7 IZS TEMP: 45.2 MOLY TEMP: 314.4 RCEL: 5.0 SAMP: 26.3 Expected Value NO: 11 Expected Value NO2: 612 Expected Value NOx: 622
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Comments:
The analyzer sample inlet filter was changed.
The manifold blower was found to be working normally.

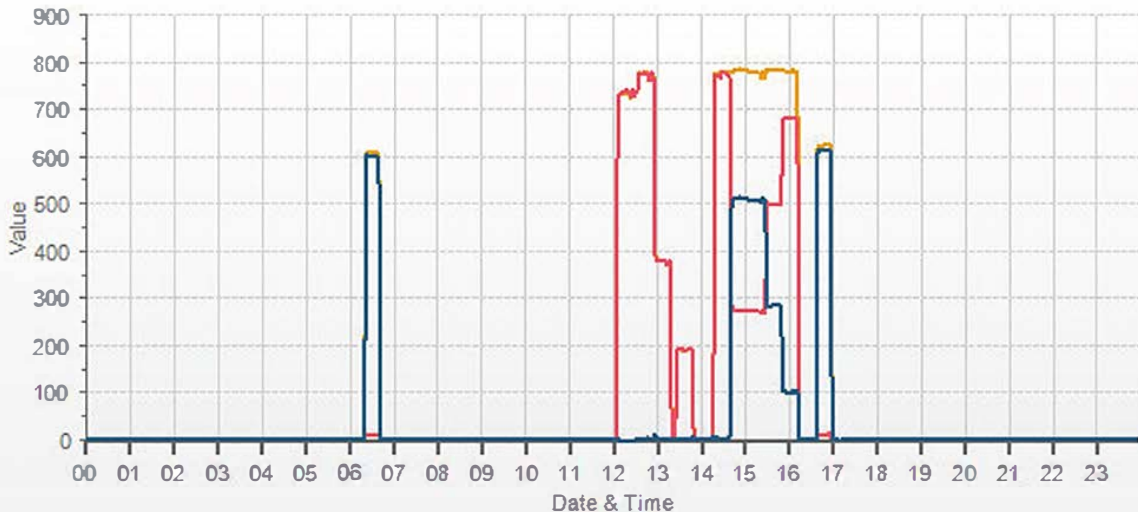
Date: June 12, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:55 / 17:04
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/06/12 Type: AVG 1 Min. [1 Min.]



— NOX [ppb] — NO [ppb] — NO2 [ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: June 2, 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 21 °C
Location/Station Name: St. Lina	Weather Conditions: A few clouds
Start/End Time 24 hr. (mst): 12:46 / 16:45	Calibration Purpose: routine monthly
Ozone Calibration Method: Direct G.P.T.	Performed By/Reviewer: Alex Yakupov Rob Fisher
G.P.T. Date: June 2, 2018	Cal Gas Expiry Date: October 24, 2020
Analyzer:	Ozone Range ppb: 500
Serial Number/Owner: 1002240371 LICA	As Found C.F.: 0.999
Last Calibration Date: May 23, 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	Point
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	High
Calibrator ID/Expiry Date: Envirionics id# 5212 expires March 1, 2019	Mid
Cal Gas Cylinder I.D. #: LL 104225	Low

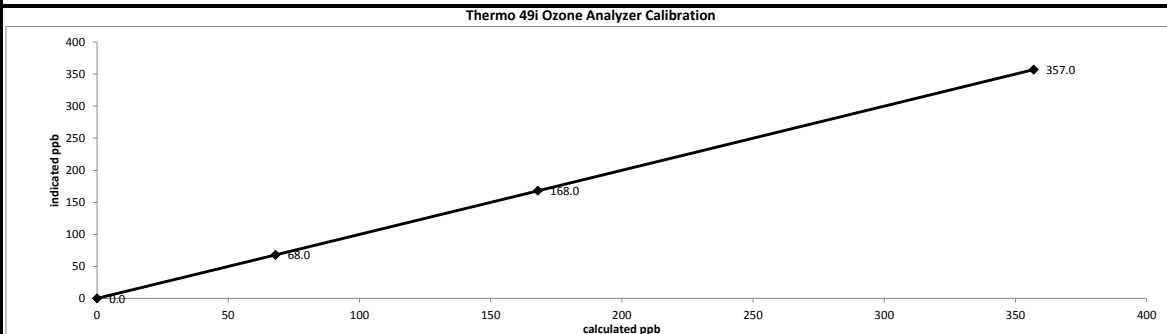
Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-100 ppb

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	0.6	n/a
as found high	5000	5000	357.0	357.0	358.0	0.999
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	357.0	357.0	357.0	1.000
mid	5000	5000	168.0	168.0	168.0	1.000
low	5000	5000	68.0	68.0	68.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.00%</u>	0.95-1.05
% change in C.F. from last cal = <u>0.11%</u>	± 3% F.S.
	± 10%

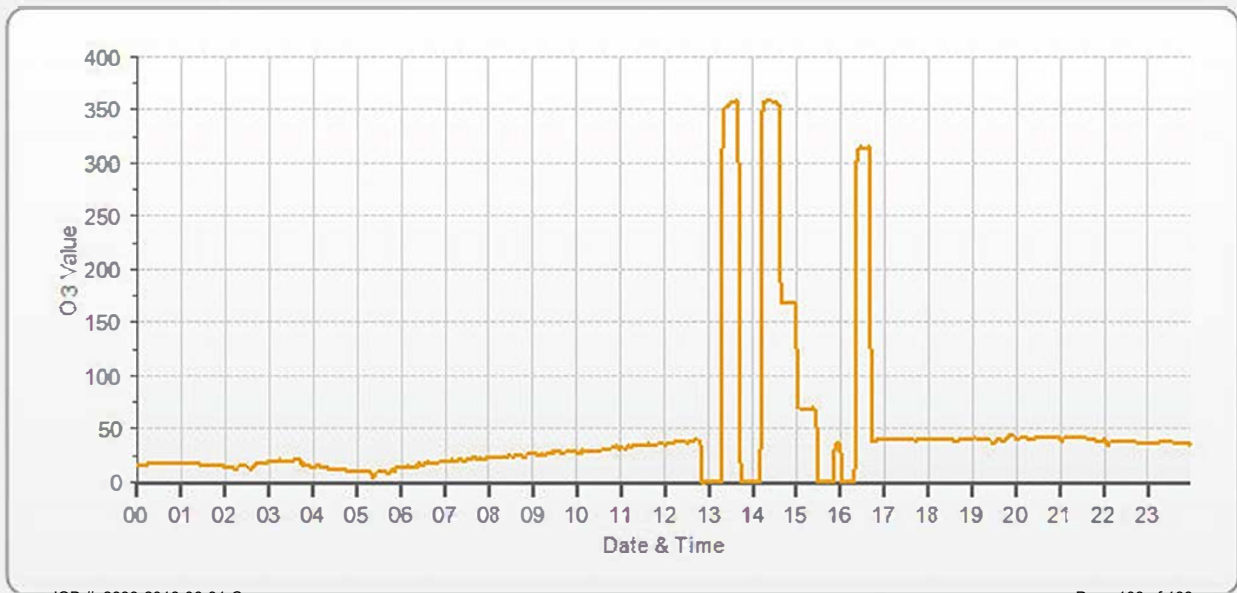


<p style="text-align: center;">As found:</p> <p>O3 Bkg: <u>-0.8</u></p> <p>O3 Coef: <u>0.961</u></p> <p>Photo Lamp: <u>10.7</u></p> <p>O3 Lamp: <u>8.2</u></p> <p>Bench: <u>29.7</u></p> <p>Bench Lamp: <u>53.6</u></p> <p>O3 Lamp: <u>67.8</u></p> <p>Pressure: <u>682.6</u></p> <p>Cell A lpm: <u>0.732</u></p> <p>Cell B lpm: <u>0.772</u></p> <p>O3 ppb: <u>-0.6</u></p> <p>Cell A ppb: <u>-0.5</u></p> <p>Cell B ppb: <u>-0.7</u></p> <p>Cell A int (Hz): <u>76272</u></p> <p>Cell B int (Hz): <u>96045</u></p> <p>Expected Value: <u>284.0</u></p>	<p style="text-align: center;">As left:</p> <p>O3 Bkg: <u>0.0</u></p> <p>O3 Coef: <u>0.952</u></p> <p>Photo Lamp: <u>10.7</u></p> <p>O3 Lamp: <u>8.2</u></p> <p>Bench: <u>30.6</u></p> <p>Bench Lamp: <u>53.7</u></p> <p>O3 Lamp: <u>67.8</u></p> <p>Pressure: <u>682.0</u></p> <p>Cell A lpm: <u>0.732</u></p> <p>Cell B lpm: <u>0.774</u></p> <p>O3 ppb: <u>0.0</u></p> <p>Cell A ppb: <u>1.3</u></p> <p>Cell B ppb: <u>0.0</u></p> <p>Cell A int (Hz): <u>76277</u></p> <p>Cell B int (Hz): <u>96063</u></p> <p>Expected Value: <u>314.0</u></p>
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Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.

The O3 analyzer failed ZS check on June 1st, 2018. The SPAN check was 10.8%. The As Found Zero and As Found High Point were measured first; no adjustments were made after the Zero and High Point As Finds points. The Adjusted Zero and Adjusted High Point were completed after the As Finds were fully completed. The Zero Air check pump was renewed (replaced with a different rebuilt pump) on June 1st. The Expected Value was updated.

— O3[ppb]



PARTICULATE MATTER



Thermo 5030i SHARP Monitor Monthly Audit

Date: June 26, 2018
Company: LICA
Station Name/Location: St Lina
Previous Audit Date: May 24, 2018
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher
Start Time (mst): 10:01
End Time (mst): 10:40
Calibration Purpose: Monthly
Weather Conditions: Moderate rain

SHARP 5030i Information and Status:

Serial Number: CM17091001 **Filter Tape Counter:** 134

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:	Temp / RH:
Make:	Dwyer	Chinook	Fisher Scientific	Fisher Scientific
Model:	475 Mk.III	CHN0901	FB 1291	11-661-7A, 11745843
Serial Number:	#3	#2	130168457 / 05544	170286131
Calibration Date:	January 9, 2019	April 24, 2019	January 15, 2019	April 19, 2019

Ambient Temperature (°C)

Reference	SHARP	Difference	Range	Action
#1 8.70	9.3	-0.6	< ± 2°C	OK
			2-3 °C	Recalibrate
			> 3°C	Fail

Ambient Relative Humidity (%RH)

As Found:	Reference	SHARP	Difference	Range	Action
#1 94.00	94.00	95.4	-1.4	< ± 2 %RH	OK
				2-5 %RH	Recalibrate
				> 5 %RH	Fail

Barometric Pressure (mmHg)

As Found:	Reference	SHARP	Difference	Range	Action
#1 691.4	691.4	691.9	-0.5	< ± 10 mmHg	OK
				10-12 mmHg	Recalibrate
				> 12 %RH	Fail

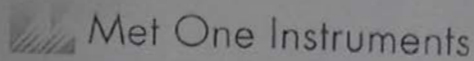
Flow Audit (L/min)

As Found:	Reference	SHARP	% Difference	Range	Action
#1 16.65	16.65	16.65	-0.040008002	< ± 4%	OK
#2 16.66	16.65			4-5%	Recalibrate
#3 16.68	16.67			>5%	Fail
Average 16.66	16.66				

Leak Check (L/min)

#1	Without Leak Check Adapter			With leak Check Adapter			Leak Limit: 0.08 L/min
	Reference	SHARP	Difference	Reference	SHARP	Difference	
#1	16.66	16.66	0.00	16.61	16.64	-0.03	
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 CHECK



Meteorological System Checklist

Date:	June 26, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	n/a
PRECIPITATION SENSOR CHECK			
Checklist:	Reply:	Comments:	
Previous check date:	March 13, 2018	n/a	
Is the sensor Level?	yes	n/a	
Is the heater operating properly?	yes	n/a	
Are the bucket drain holes clean?	yes	n/a	
Is the screen on the housing? (screen should be on between July and September)	yes	The screens have been installed	
Is the housing clean?	yes	n/a	
Is the area around the housing clean and free from obstacles?	yes	n/a	
TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)			
# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml	
10	1.00	0.00	

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

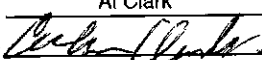
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference	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

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

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9880	0.90-1.10
b (Intercept % of FS)=	0.1153	± 3% F.S.

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

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
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 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

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



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	0.00752	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***



SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

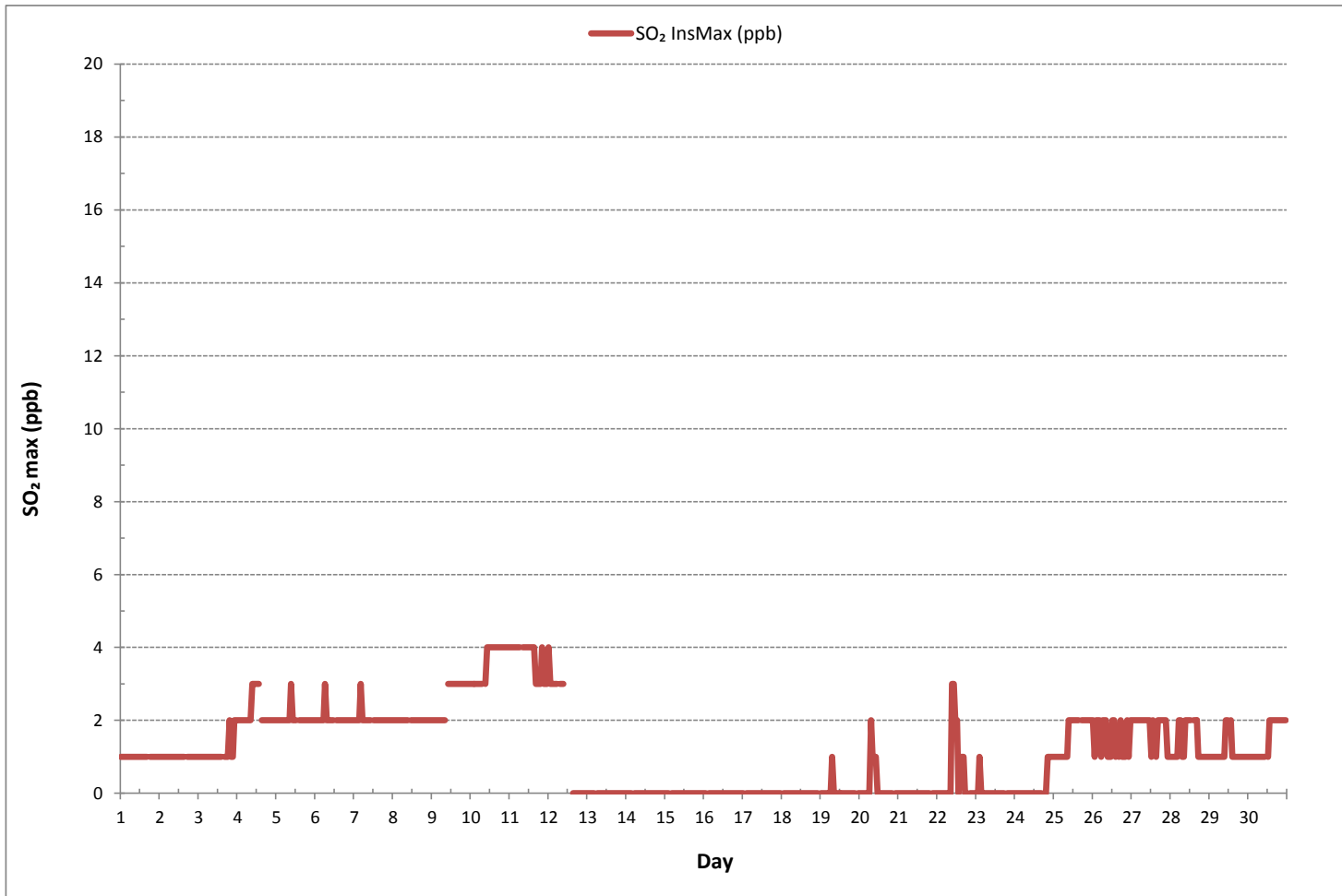
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	417
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 10 ON DAY 10
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

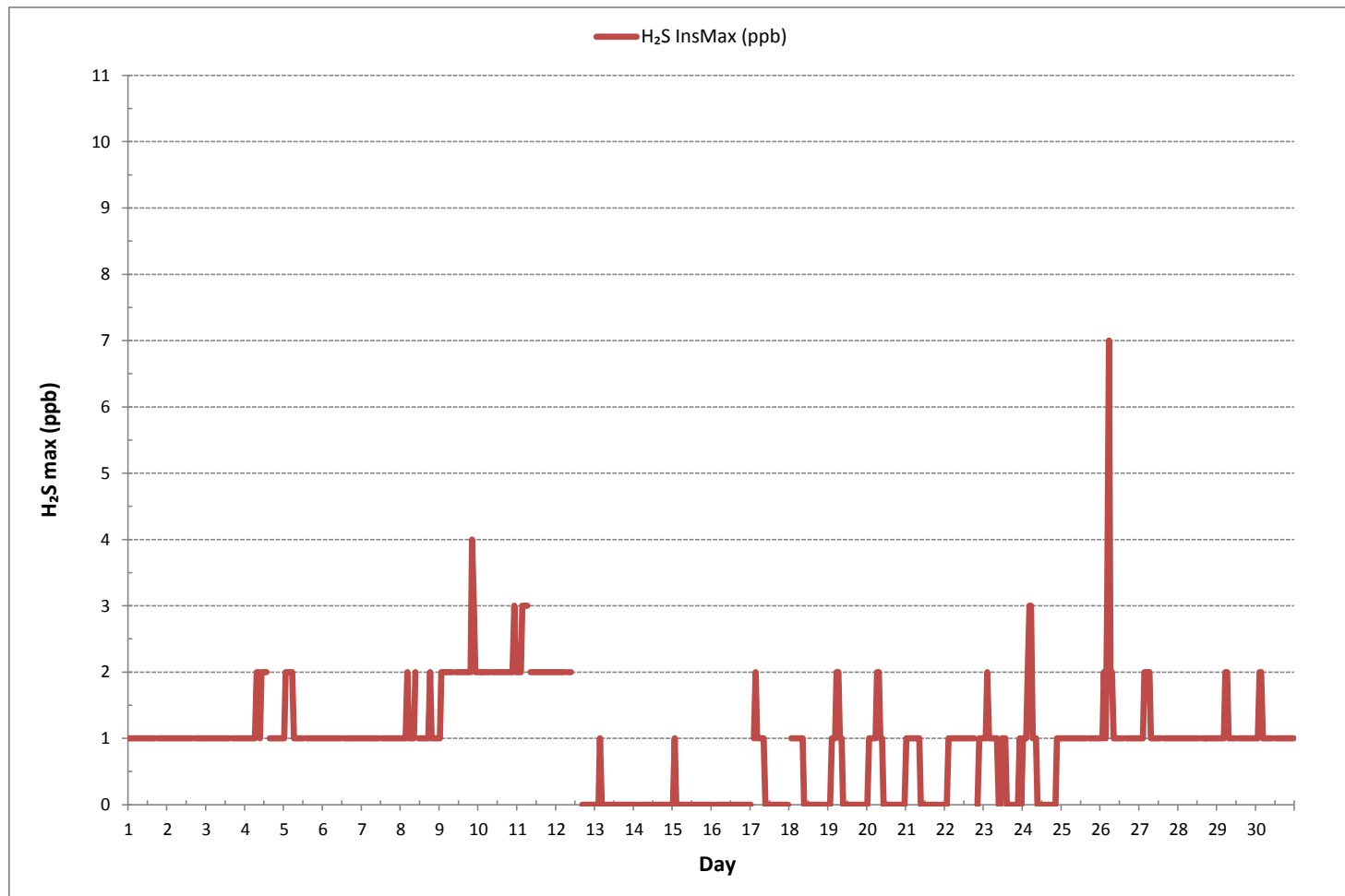
STATUS FLAG CODES

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:	487
MAXIMUM INSTANTANEOUS VALUE:	7 ppb @ HOUR 5 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - June 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	2.27	2.18	2.23	2.26	2.27	2.26	2.30	2.28	2.25	2.20	2.20	2.16	2.16	2.13	2.13	2.11	2.13	S	2.12	2.16	2.15	2.22	2.21	2.23	2.11	2.30	2.20	24	
2	2.23	2.18	2.19	2.21	2.27	2.28	2.19	2.17	2.15	2.29	2.30	2.24	2.21	2.15	2.11	2.17	S	2.17	2.17	2.15	2.16	2.14	2.20	2.17	2.11	2.30	2.20	24	
3	2.22	2.19	2.19	2.17	2.18	2.17	2.16	2.19	2.15	2.21	2.21	2.17	2.19	2.19	2.20	S	2.26	2.22	2.21	2.18	2.17	2.18	2.18	2.19	2.15	2.26	2.19	24	
4	2.15	2.15	2.14	2.07	2.08	2.09	2.18	2.16	2.17	2.04	2.04	2.04	1.99	2.04	S	2.23	2.18	2.14	2.16	2.08	2.11	2.12	2.11	2.15	1.99	2.23	2.11	24	
5	2.14	2.16	2.19	2.21	2.25	2.17	2.17	2.15	2.11	2.16	2.19	2.13	2.16	S	2.18	2.17	2.20	2.19	2.17	2.10	2.15	2.17	2.32	2.24	2.10	2.32	2.18	24	
6	2.26	2.26	2.28	2.23	2.26	2.26	2.28	2.33	2.26	2.22	2.21	2.20	S	2.24	2.30	2.24	2.18	2.20	2.19	2.19	2.28	2.32	2.25	2.21	2.18	2.33	2.25	24	
7	2.27	2.35	2.36	2.45	2.44	2.51	2.49	2.38	2.43	2.35	2.26	S	2.25	2.24	2.27	2.20	2.18	2.17	2.17	2.28	2.23	2.23	2.31	2.21	2.17	2.51	2.31	24	
8	2.24	2.21	2.17	2.21	2.21	2.22	2.21	2.13	2.26	2.26	S	2.28	2.22	2.28	2.19	2.23	2.20	2.17	2.17	2.14	2.19	2.14	2.24	2.17	2.17	2.28	2.21	24	
9	2.19	2.24	2.28	2.26	2.24	2.24	2.25	2.23	2.19	S	2.18	2.19	2.19	2.21	2.17	2.26	2.12	2.13	2.09	2.12	2.07	2.08	2.10	2.14	2.07	2.28	2.18	24	
10	2.12	2.11	2.08	2.11	2.19	3.29	2.46	2.17	S	2.31	2.26	2.24	2.27	2.25	2.28	2.08	2.07	2.06	2.07	2.01	2.02	2.12	2.11	2.11	2.01	3.29	2.21	24	
11	2.04	2.00	2.02	1.97	1.99	1.99	1.99	S	2.01	1.96	1.98	2.00	2.03	2.00	2.00	2.00	1.99	2.01	2.00	1.94	1.97	1.98	1.98	1.99	1.94	2.04	1.99	24	
12	1.98	2.01	2.00	2.00	2.03	2.00	S	2.01	2.05	2.03	2.04	2.19	2.11	2.11	2.11	2.06	2.05	2.03	2.13	2.15	2.09	2.12	2.21	2.19	1.98	2.21	2.07	24	
13	2.11	2.07	2.15	2.14	2.21	S	2.17	2.11	2.09	C	C	C	C	C	2.24	2.23	2.22	2.21	2.18	2.26	2.20	2.26	2.20	2.47	2.07	2.47	2.20	24	
14	9.46	6.16	7.45	2.25	S	2.21	2.19	2.24	2.22	2.24	2.27	2.35	2.24	2.31	2.33	2.36	2.31	2.60	2.76	2.70	2.68	2.19	3.01	2.83	2.19	9.46	3.10	24	
15	2.86	2.57	2.23	S	2.35	2.39	2.33	2.29	2.21	2.39	2.36	2.36	2.40	2.35	2.36	2.29	2.28	2.43	2.39	2.65	2.21	2.58	2.52	2.18	2.18	2.86	2.39	24	
16	3.51	3.21	S	2.47	2.54	2.63	2.55	2.39	2.38	2.41	2.37	2.39	2.36	2.34	2.37	2.34	2.44	2.30	2.35	2.37	2.31	2.28	2.27	2.34	2.27	3.51	2.47	24	
17	2.32	S	2.52	2.52	2.34	2.28	2.22	2.23	2.34	2.35	2.35	2.33	2.36	2.34	2.31	2.32	2.29	2.33	2.36	2.33	2.31	2.34	2.40	2.39	2.22	2.52	2.34	24	
18	S	2.34	2.39	2.35	2.27	2.32	2.29	2.34	2.44	2.43	2.36	2.38	2.37	2.32	2.35	2.37	2.34	2.35	2.34	2.33	2.39	2.38	2.40	S	2.27	2.44	2.36	24	
19	2.46	2.30	2.36	2.55	2.58	2.57	2.42	2.44	2.48	2.43	2.39	2.34	2.39	2.38	2.39	2.35	2.34	2.35	2.37	2.34	2.40	2.42	S	2.43	2.30	2.58	2.41	24	
20	2.45	2.51	2.39	2.36	2.38	2.36	2.60	2.69	2.62	2.53	2.43	2.37	2.36	2.38	2.36	2.39	2.34	2.35	2.34	2.35	2.45	S	2.45	2.43	2.34	2.69	2.43	24	
21	2.49	2.49	2.51	2.52	2.48	2.51	2.50	2.48	2.41	2.47	2.43	2.28	2.32	2.36	2.40	2.36	2.38	2.04	2.09	2.17	S	2.06	2.00	2.09	2.00	2.52	2.34	24	
22	2.05	2.05	2.12	2.35	2.39	2.55	2.43	2.32	2.32	2.19	2.09	2.08	2.06	2.06	2.05	2.09	2.08	2.05	2.04	S	2.04	2.53	2.24	2.22	2.04	2.55	2.19	24	
23	2.21	2.14	2.12	2.20	2.29	2.18	2.31	2.34	2.17	2.27	2.31	2.23	2.19	2.16	2.09	2.13	2.11	S	2.39	2.33	2.28	2.23	2.35	2.09	2.39	2.22	24		
24	2.51	2.70	2.27	2.41	2.44	2.47	2.34	2.19	2.19	2.10	2.10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.10	2.70	2.34	11
25	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	2.33	2.36	2.37	2.41	2.43	2.37	2.29	2.29	2.43	2.37	7	
26	2.36	2.33	2.49	2.48	2.51	2.58	2.47	2.48	2.35	2.33	2.25	2.40	2.43	2.37	2.41	S	2.20	2.18	2.61	2.40	2.46	2.46	2.46	2.31	2.18	2.61	2.41	24	
27	2.41	2.28	2.17	2.38	2.36	2.38	2.38	2.27	2.34	2.36	2.33	2.36	2.40	2.35	S	2.38	2.35	2.35	2.37	2.34	2.38	2.33	2.31	2.36	2.17	2.41	2.35	24	
28	2.31	2.34	2.34	2.40	2.38	2.36	2.38	2.38	2.39	2.36	2.33	2.33	2.35	S	2.36	2.38	2.38	2.38	2.38	2.37	2.33	2.32	2.25	2.30	2.34	2.25	2.40	2.35	24
29	2.44	2.33	2.38	2.38	2.48	2.53	2.46	2.41	2.15	2.25	2.39	2.40	S	2.38	2.38	2.43	2.40	2.38	2.46	2.44	2.43	2.27	2.25	2.25	2.15	2.53	2.38	24	
30	2.21	2.44	2.42	2.44	2.41	2.31	2.18	2.09	2.20	2.30	2.34	S	2.36	2.44	2.46	2.45	2.48	2.53	2.56	2.64	2.61	2.45	2.34	2.23	2.09	2.64	2.39	24	
HOURLY MAX	9.46	6.16	7.45	2.55	2.58	3.29	2.60	2.69	2.62	2.53	2.43	2.40	2.43	2.44	2.46	2.45	2.48	2.60	2.76	2.70	2.68	2.58	3.01	2.83					
HOURLY AVG	2.58	2.44	2.44	2.30	2.32	2.36	2.32	2.28	2.26	2.28	2.26	2.26	2.25	2.26	2.26	2.25	2.24	2.24	2.27	2.28	2.27	2.26	2.28	2.27					

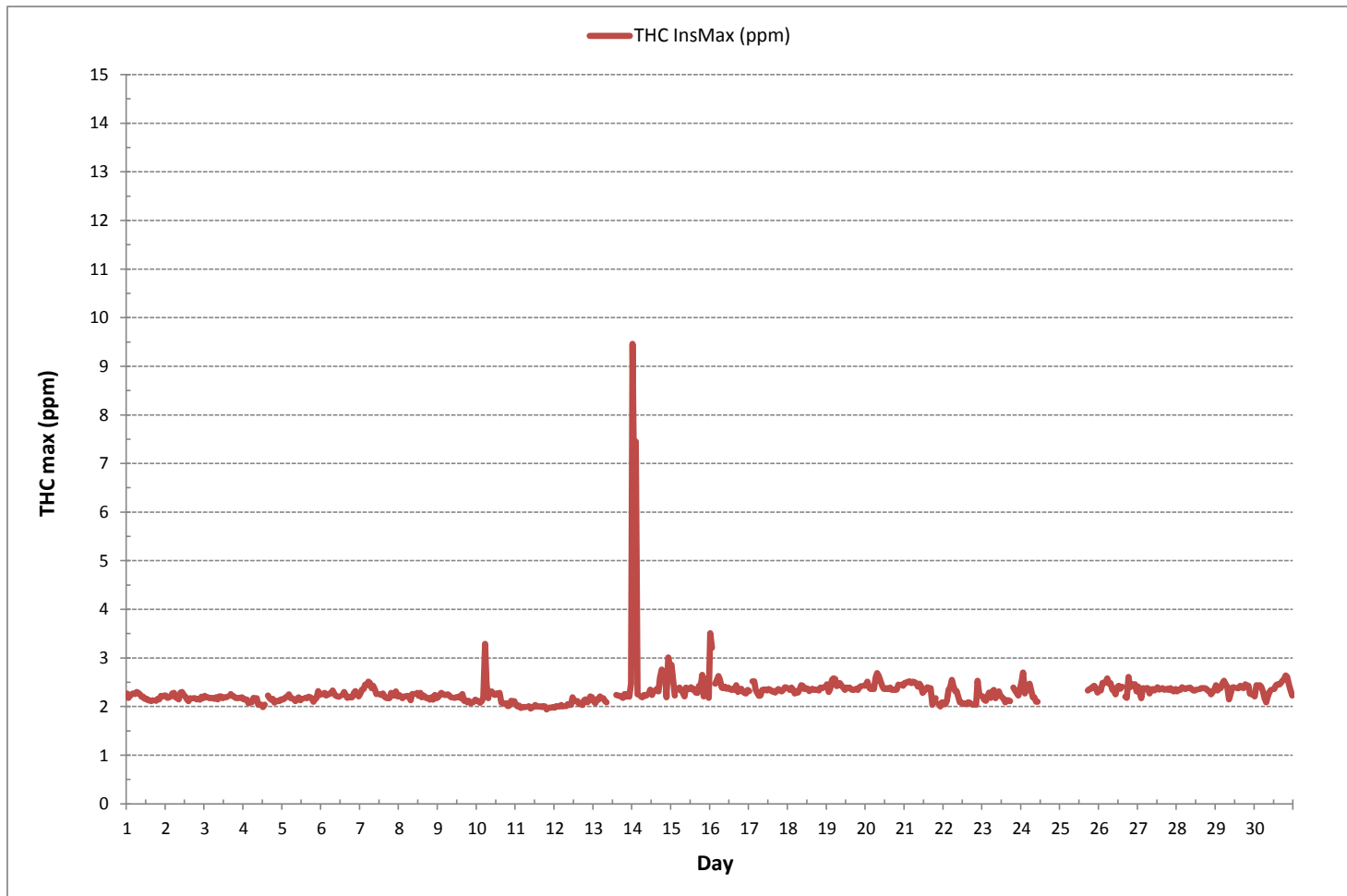
STATUS FLAG CODES

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:	656
MAXIMUM INSTANTANEOUS VALUE:	9.46 ppm @ HOUR 0 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	690 hrs
STANDARD DEVIATION:	0.41

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	S	1	1	2	1	2	2	1	2	24	
2	2	2	3	1	1	56	1	1	4	2	Q	Q	Q	6	4	2	S	2	1	5	4	2	2	1	1	56	5	24
3	1	1	2	2	1	20	15	16	3	11	2	4	12	3	6	S	2	2	1	1	2	2	2	1	1	20	5	24
4	1	1	1	1	1	1	1	1	1	2	2	3	20	7	S	2	5	5	1	1	4	1	4	1	1	20	3	24
5	1	1	1	2	2	21	3	3	4	12	2	2	2	S	1	2	1	1	1	2	1	2	2	2	1	21	3	24
6	1	2	4	3	2	2	5	6	3	3	1	1	S	2	1	2	1	1	1	1	1	2	3	2	1	6	2	24
7	3	4	3	4	4	4	4	4	3	3	3	S	2	2	2	2	2	2	2	4	3	3	3	3	2	4	3	24
8	3	3	3	3	4	4	5	5	4	2	S	2	2	2	1	1	1	2	2	2	2	2	2	2	1	5	3	24
9	3	3	3	3	3	3	3	4	3	S	3	2	2	2	2	2	1	1	2	2	1	2	2	2	1	4	2	24
10	2	1	2	1	1	1	1	2	S	3	2	2	4	2	1	1	1	1	3	2	2	2	2	1	1	4	2	24
11	1	1	1	1	1	1	1	S	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
12	1	1	1	1	1	1	S	1	1	1	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	1	24
13	0	0	0	0	0	S	2	2	2	1	1	16	1	14	2	2	1	19	0	1	2	2	2	1	0	19	3	24
14	1	1	1	1	S	1	0	0	0	0	0	0	1	0	1	1	0	0	1	2	4	5	2	3	0	5	1	24
15	0	1	1	S	3	3	3	5	3	38	1	1	0	0	1	0	0	1	1	1	1	1	1	1	0	38	3	24
16	1	1	S	1	1	2	0	1	1	1	0	0	1	1	1	1	2	1	1	1	1	2	1	0	2	1	24	
17	1	S	2	2	2	2	2	2	0	2	1	1	11	1	2	2	1	1	1	4	2	2	3	2	0	11	2	24
18	S	3	3	5	6	7	9	7	5	3	2	3	2	1	12	27	1	3	1	4	4	3	2	S	1	27	5	24
19	3	3	4	5	8	7	79	9	38	3	1	3	29	2	1	1	1	1	1	2	4	S	2	1	79	9	24	
20	2	2	3	4	5	10	9	30	6	5	3	2	10	1	1	2	2	2	3	1	2	S	3	2	1	30	5	24
21	3	3	3	3	4	4	5	4	2	3	2	1	2	2	1	1	1	1	1	2	S	1	1	1	1	5	2	24
22	1	1	1	2	4	6	5	3	3	3	2	2	3	2	3	3	5	61	2	S	1	1	2	2	1	61	5	24
23	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	1	S	2	2	2	1	2	1	2	1	24
24	1	1	1	1	1	1	1	1	1	1	0	2	1	2	2	1	1	S	1	1	1	2	2	3	0	3	1	24
25	3	3	3	3	4	4	4	3	3	2	1	2	1	1	1	2	S	2	1	0	0	1	1	0	4	2	24	
26	1	1	1	1	1	1	2	2	1	1	1	1	0	0	1	S	1	1	2	1	1	2	2	1	0	2	1	24
27	1	1	1	1	1	0	1	1	1	1	1	0	2	1	S	1	1	2	1	0	3	4	1	0	0	4	1	24
28	1	1	1	1	1	1	3	1	2	2	2	1	14	S	1	1	1	1	1	1	1	1	1	1	1	14	2	24
29	1	1	1	1	1	2	4	2	2	4	1	1	S	1	1	1	1	3	16	2	4	29	1	1	29	4	24	
30	1	1	1	1	1	1	1	1	1	0	0	S	1	1	1	1	1	1	2	2	1	2	36	2	0	36	3	24
HOURLY MAX	3	4	4	5	8	56	79	30	38	38	3	16	29	14	12	27	5	61	16	5	4	29	36	3	0	36	3	24
HOURLY AVG	1	2	2	2	2	6	6	4	4	4	1	2	5	2	2	2	1	4	2	2	2	3	3	2	0	36	3	24

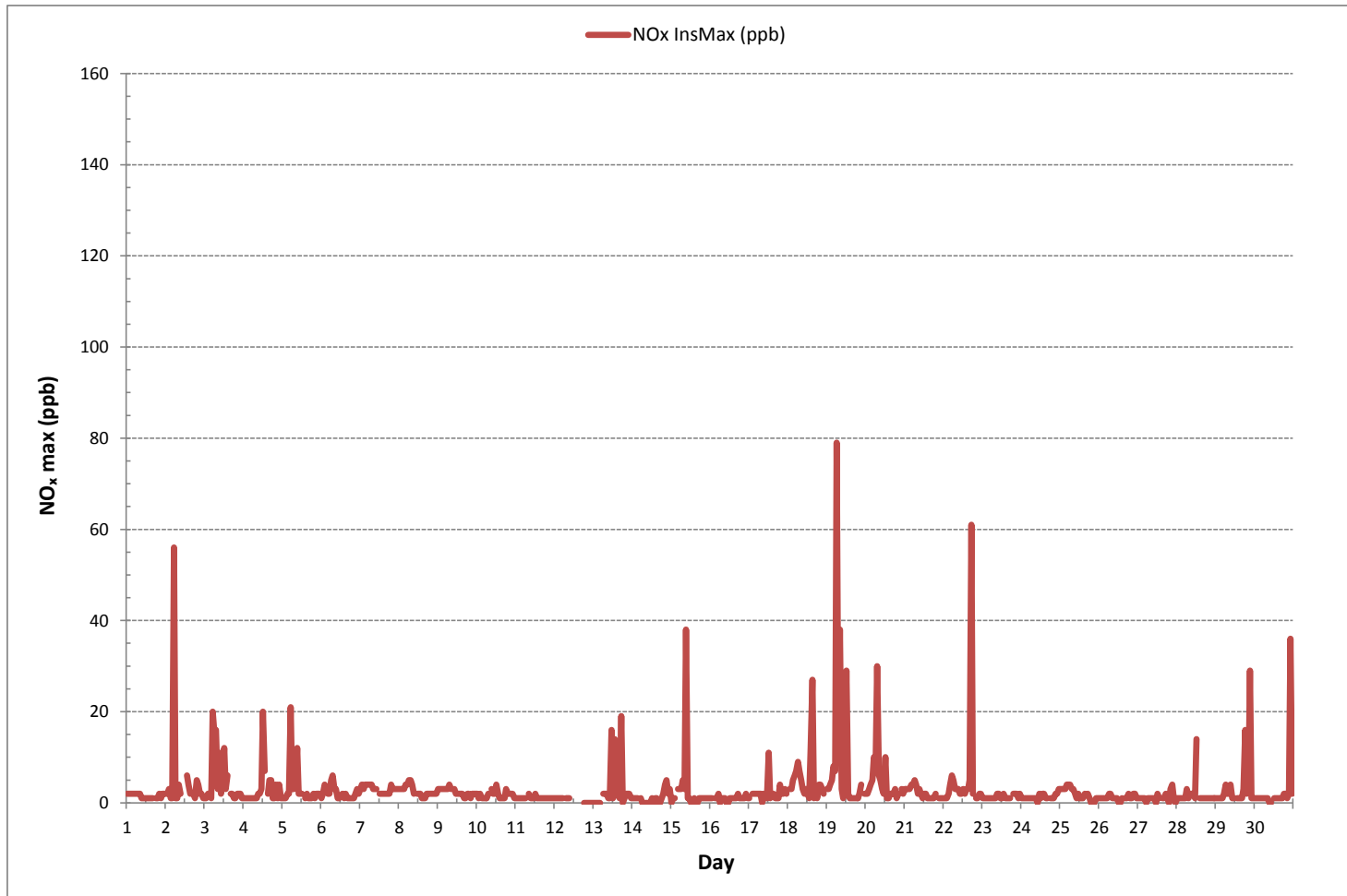
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	636
MAXIMUM INSTANTANEOUS VALUE:	79 ppb @ HOUR 6 ON DAY 19
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	720 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

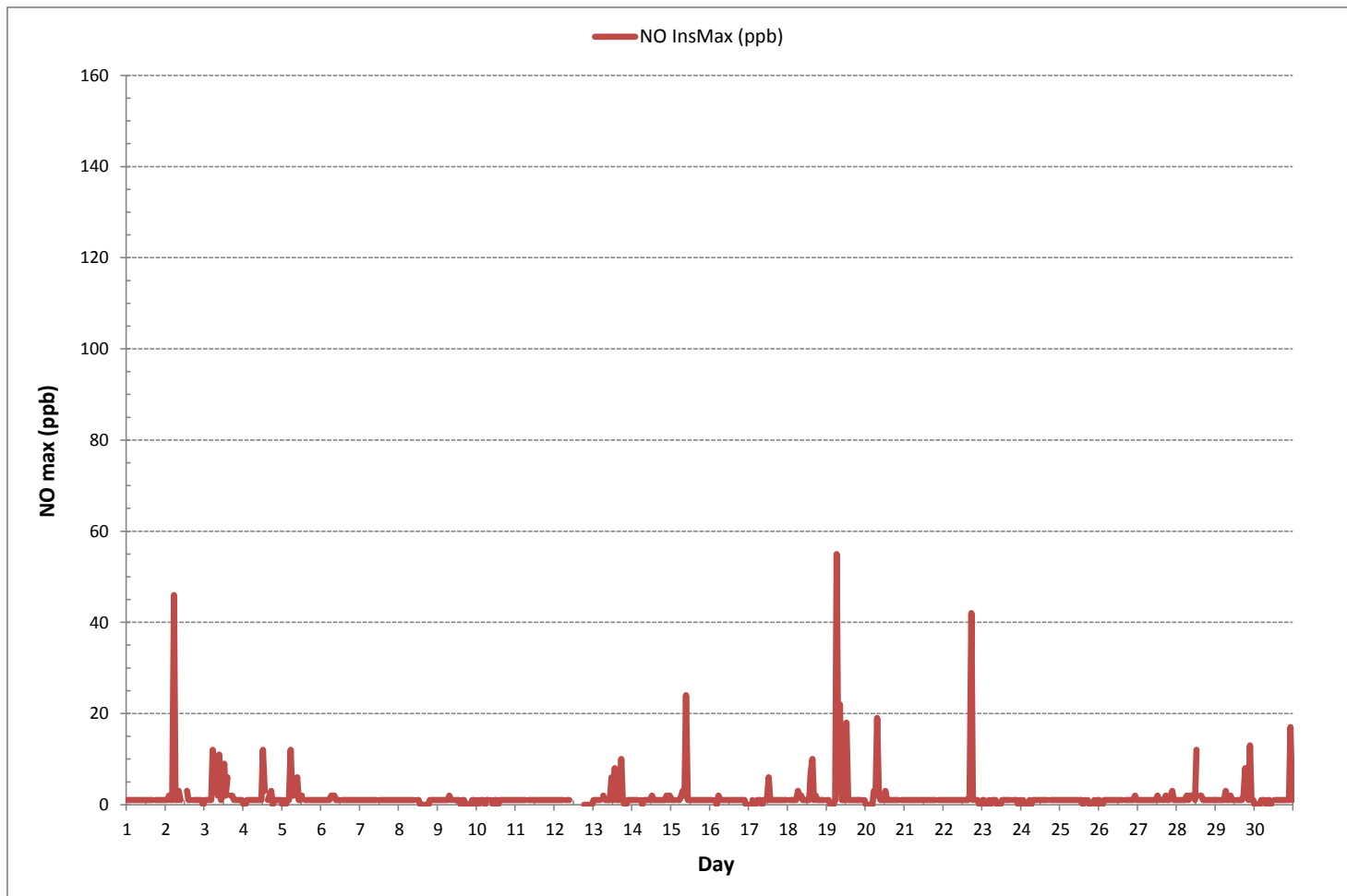
STATUS FLAG CODES

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:	605
MAXIMUM INSTANTANEOUS VALUE:	55 ppb @ HOUR 6 ON DAY 19
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	720 hrs
STANDARD DEVIATION:	4

NITRIC OXIDE Instantaneous Maximum (NO ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	1	1	2	2	1	1	1	1	1	1	1	1	1	0	0	0	S	1	1	1	1	2	2	0	2	1	24		
2	1	1	2	1	1	13	1	1	1	1	Q	Q	Q	3	3	1	S	1	1	4	3	1	2	1	1	13	2	24	
3	1	1	1	1	1	9	8	8	1	4	1	2	4	1	4	S	1	1	1	1	1	2	2	1	1	9	2	24	
4	1	1	1	1	1	1	1	1	1	1	2	2	10	4	S	2	3	3	1	1	3	1	2	0	0	10	2	24	
5	0	1	1	2	2	9	2	1	2	7	1	1	1	S	0	1	0	0	0	1	1	1	2	1	0	9	2	24	
6	0	2	3	2	2	2	3	4	2	2	1	1	S	1	1	1	1	0	1	1	1	2	2	2	0	4	2	24	
7	2	3	3	3	3	3	3	3	3	2	2	S	1	1	1	1	2	1	1	3	3	2	3	2	1	3	2	24	
8	2	2	3	3	3	4	4	4	3	2	S	2	2	2	1	1	1	2	2	2	2	2	2	2	1	4	2	24	
9	2	3	3	3	3	3	3	3	2	S	2	2	2	2	2	2	1	1	2	2	1	1	2	2	1	3	2	24	
10	2	1	1	1	1	1	1	2	S	2	2	2	3	2	1	1	1	2	2	2	2	2	1	0	0	3	1	24	
11	1	0	0	0	0	1	0	S	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	S	0	0	0	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	24		
13	0	0	0	0	0	S	1	0	1	0	0	10	0	7	1	1	0	12	0	0	1	1	1	1	0	12	2	24	
14	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	1	1	0	3	1	24	
15	0	0	1	S	2	2	1	2	1	15	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	15	1	24	
16	1	0	S	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	2	1	0	2	1	24	
17	1	S	2	2	2	1	1	1	1	1	0	0	8	1	1	1	0	1	1	3	2	1	2	2	0	8	2	24	
18	S	3	3	4	6	6	6	5	4	3	1	2	1	1	7	20	1	2	1	3	3	3	1	S	1	20	4	24	
19	2	3	4	5	8	6	34	6	17	2	1	2	13	2	1	1	1	1	1	1	2	3	S	2	1	34	5	24	
20	2	2	3	4	5	8	6	16	5	4	2	2	8	1	1	1	1	1	3	1	2	S	2	2	1	16	4	24	
21	2	2	3	3	4	4	4	3	2	2	1	1	1	1	1	1	1	1	2	S	1	1	1	1	1	4	2	24	
22	1	1	1	2	4	5	4	3	3	2	2	2	2	1	2	2	3	20	2	S	0	1	2	2	0	20	3	24	
23	1	1	1	1	0	1	1	1	1	2	2	1	1	2	1	1	1	1	S	2	2	2	2	1	2	0	2	1	24
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	S	1	1	1	2	2	3	0	3	1	24	
25	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	S	1	1	1	1	1	0	0	1	0	3	2	24
26	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	S	0	1	1	0	0	1	1	0	0	1	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	1	0	0	1	0	24	
28	0	0	0	1	1	1	0	0	0	0	1	0	3	S	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
29	0	0	0	0	0	0	1	0	1	1	0	1	S	1	0	0	0	1	10	1	2	17	1	1	0	17	2	24	
30	1	1	1	1	0	0	0	0	0	0	0	S	0	1	0	0	1	0	1	1	1	1	19	1	0	19	1	24	
HOURLY MAX	3	3	4	5	8	13	34	16	17	15	2	10	13	7	7	20	3	20	10	4	3	17	19	3					
HOURLY AVG	1	1	2	2	2	3	3	2	2	2	1	1	2	1	1	1	1	2	1	1	1	2	2	1					

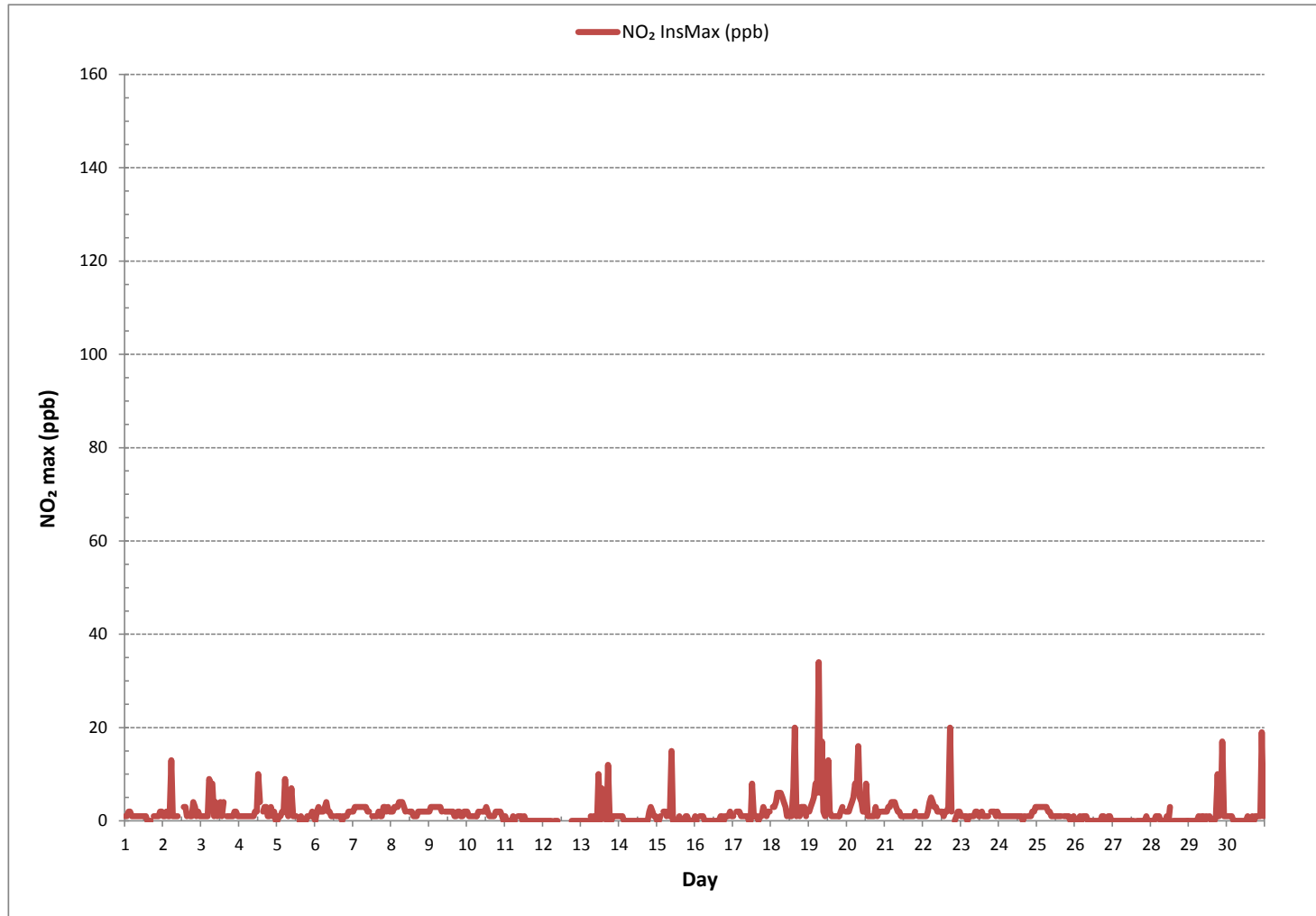
STATUS FLAG CODES

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:	497
MAXIMUM INSTANTANEOUS VALUE:	34 ppb @ HOUR 6 ON DAY 19
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	720 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	25.7	26.0	22.9	19.7	17.2	16.0	13.4	S1	S1	18.0	S1	S1	23.2	22.9	25.2	25.9	25.2	S	23.1	21.6	20.5	18.4	16.5	15.8	13.4	26.0	20.9	20
2	17.6	17.7	19.3	21.7	14.9	14.0	19.8	23.2	27.3	29.5	33.3	36.5	C	C	C	C	C	40.4	40.8	43.6	42.4	41.6	39.0	37.6	14.0	43.6	29.5	24
3	34.7	33.0	31.2	33.9	34.5	33.5	35.1	37.9	43.0	43.5	44.4	44.6	43.8	43.5	44.1	S	46.6	48.2	47.6	44.0	41.1	41.6	35.9	28.4	28.4	48.2	39.7	24
4	26.6	25.5	24.5	22.6	22.6	24.0	23.8	23.1	26.6	31.4	31.6	31.0	32.9	33.5	S	37.8	36.2	34.5	31.9	32.2	32.0	28.8	28.4	28.5	22.6	37.8	29.1	24
5	28.2	28.6	22.5	22.6	22.8	23.8	28.6	34.9	36.1	38.5	36.6	37.1	40.4	S	42.8	43.9	43.6	43.6	42.5	41.7	40.7	39.8	41.5	36.6	22.5	43.9	35.5	24
6	35.3	33.5	30.7	29.1	26.5	25.0	23.5	25.3	32.5	40.7	44.5	46.9	S	49.3	49.0	49.4	48.6	49.4	49.2	47.1	46.5	44.0	45.7	46.8	23.5	49.4	39.9	24
7	42.8	36.8	36.2	36.2	35.8	35.5	35.4	41.3	46.6	48.4	55.0	S	62.8	65.3	66.4	64.8	65.1	64.2	64.1	62.7	62.1	60.1	55.4	50.8	35.4	66.4	51.9	24
8	50.0	48.4	44.5	40.1	37.1	33.7	32.7	32.5	38.6	45.4	S	53.7	54.6	44.3	44.1	43.7	49.3	52.0	53.5	54.2	52.1	50.5	46.3	44.9	32.5	54.6	45.5	24
9	43.1	37.7	32.1	28.7	25.5	25.4	26.4	28.3	33.6	S	41.3	44.5	46.5	47.3	46.6	47.2	42.1	44.1	43.6	45.3	46.6	44.8	41.5	36.3	25.4	47.3	39.1	24
10	36.6	37.6	37.9	39.2	39.4	36.2	32.1	30.9	S	28.0	26.0	24.8	27.3	33.2	36.8	41.8	40.1	38.2	36.7	26.2	24.0	23.8	28.0	32.9	23.8	41.8	32.9	24
11	32.5	32.5	37.1	36.2	36.6	36.3	34.9	S	28.0	26.5	26.6	26.8	28.1	28.1	28.5	29.0	28.9	28.9	28.7	28.6	29.0	28.5	28.7	29.3	26.5	37.1	30.4	24
12	29.7	31.1	30.1	30.9	30.5	29.3	S	32.6	32.8	32.4	32.1	31.2	30.2	30.5	33.7	34.4	35.8	35.6	37.0	36.4	34.7	33.4	32.8	31.0	29.3	37.0	32.5	24
13	28.5	27.4	24.1	18.7	18.7	S	22.0	27.2	33.5	34.4	35.9	37.9	38.4	38.3	39.1	39.0	39.7	38.3	37.4	37.5	34.4	31.9	31.4	32.1	18.7	39.7	32.4	24
14	32.8	32.4	32.9	24.5	S	20.6	24.4	25.1	29.4	29.1	30.3	31.9	31.6	32.0	31.9	31.2	31.1	32.9	32.9	32.2	30.9	30.6	30.4	29.8	20.6	32.9	30.0	24
15	29.0	24.9	24.7	S	22.1	20.9	19.3	21.7	28.7	30.1	31.4	31.4	30.9	30.7	33.6	35.4	34.7	33.9	31.7	30.8	28.5	28.1	26.4	25.6	19.3	35.4	28.5	24
16	23.9	22.7	S	18.1	18.2	18.3	17.0	21.5	26.0	29.6	30.2	31.4	32.5	32.2	33.5	36.9	38.7	38.7	36.9	37.8	37.3	37.4	36.2	34.5	17.0	38.7	30.0	24
17	32.9	S	30.4	20.5	20.7	21.4	23.0	26.4	33.5	34.8	35.1	38.1	40.0	43.5	45.1	47.0	47.5	49.2	50.2	49.2	48.5	48.3	46.2	43.7	20.5	50.2	38.1	24
18	S	40.1	38.0	35.5	33.9	31.3	28.9	31.8	39.2	51.8	53.0	52.9	53.2	54.2	54.3	54.9	56.5	57.7	57.8	58.4	56.6	56.2	56.6	S	28.9	58.4	47.9	24
19	49.7	49.1	43.0	34.3	31.3	27.3	26.2	40.4	50.2	60.1	64.0	66.4	65.4	67.3	66.6	65.5	66.8	66.5	68.9	69.0	65.0	61.2	S	56.5	26.2	69.0	54.8	24
20	54.9	52.0	44.9	41.6	37.8	34.8	35.1	37.8	47.9	59.5	63.4	65.3	65.4	65.1	68.4	67.3	69.3	71.6	72.0	70.2	66.0	S	58.8	57.7	34.8	72.0	56.8	24
21	54.0	49.7	47.1	45.2	43.5	42.4	41.9	44.7	51.6	53.6	55.4	56.4	60.2	62.4	64.0	63.6	63.6	65.5	62.4	61.3	S	65.1	65.1	57.4	41.9	65.5	55.5	24
22	60.6	60.2	59.4	54.7	48.3	45.1	44.2	49.8	55.0	59.6	63.7	66.8	66.6	65.0	66.0	64.2	57.4	64.9	66.6	S	66.9	63.6	39.0	39.3	39.0	66.9	57.7	24
23	53.7	43.0	56.7	54.8	51.6	39.5	29.0	35.5	40.4	46.1	47.1	50.8	58.1	52.3	49.0	48.8	45.8	46.6	S	40.3	38.1	33.1	39.4	41.7	29.0	58.1	45.3	24
24	40.5	42.1	46.1	46.9	22.9	31.0	29.6	32.8	31.3	33.9	38.6	43.7	43.1	40.2	40.9	41.5	42.9	S	43.4	43.0	40.4	45.4	45.5	42.4	22.9	46.9	39.5	24
25	38.9	38.2	38.5	36.4	31.9	26.8	25.0	29.8	37.3	46.1	50.4	55.8	55.3	53.0	53.2	52.5	S	50.7	42.2	39.1	36.7	38.7	34.6	31.6	25.0	55.8	41.0	24
26	30.5	27.6	27.8	27.3	26.3	22.5	24.6	27.7	34.2	39.6	40.3	39.3	37.1	37.3	38.1	S	36.9	40.3	38.6	30.3	29.3	26.9	25.8	24.3	22.5	40.3	31.9	24
27	27.8	28.6	25.9	25.8	27.2	27.3	26.8	27.9	28.5	28.1	27.2	26.4	26.5	26.5	S	24.9	26.3	24.3	27.0	26.7	25.1	23.2	22.7	21.7	21.7	28.6	26.2	24
28	20.9	19.3	19.4	18.7	18.4	19.7	21.8	23.1	24.3	25.4	25.5	27.3	28.5	S	28.4	27.6	26.7	29.2	30.3	29.9	21.8	20.4	19.3	18.1	18.1	30.3	23.7	24
29	21.0	21.7	20.7	21.2	20.7	15.5	19.6	27.4	29.1	30.2	38.0	39.6	S	41.8	36.0	36.1	35.9	37.9	38.8	36.9	32.9	32.8	31.6	32.6	15.5	41.8	30.3	24
30	28.8	28.2	27.6	27.0	26.1	31.6	28.0	29.4	33.5	34.0	33.7	S	34.8	34.4	35.2	35.7	34.8	35.2	33.2	24.6	28.9	31.4	30.9	27.1	24.6	35.7	31.0	24
HOURLY MAX	60.6	60.2	59.4	54.8	51.6	45.1	44.2	49.8	55.0	60.1	64.0	66.8	66.6	67.3	68.4	67.3	69.3	71.6	72.0	70.2	66.9	65.1	65.1	57.7				
HOURLY AVG	35.6	34.3	33.7	31.5	29.1	27.9	27.3	31.1	35.7	38.2	40.5	42.2	42.9	43.5	44.5	44.1	43.4	45.1	43.8	41.4	40.0	39.0	37.2	35.7				

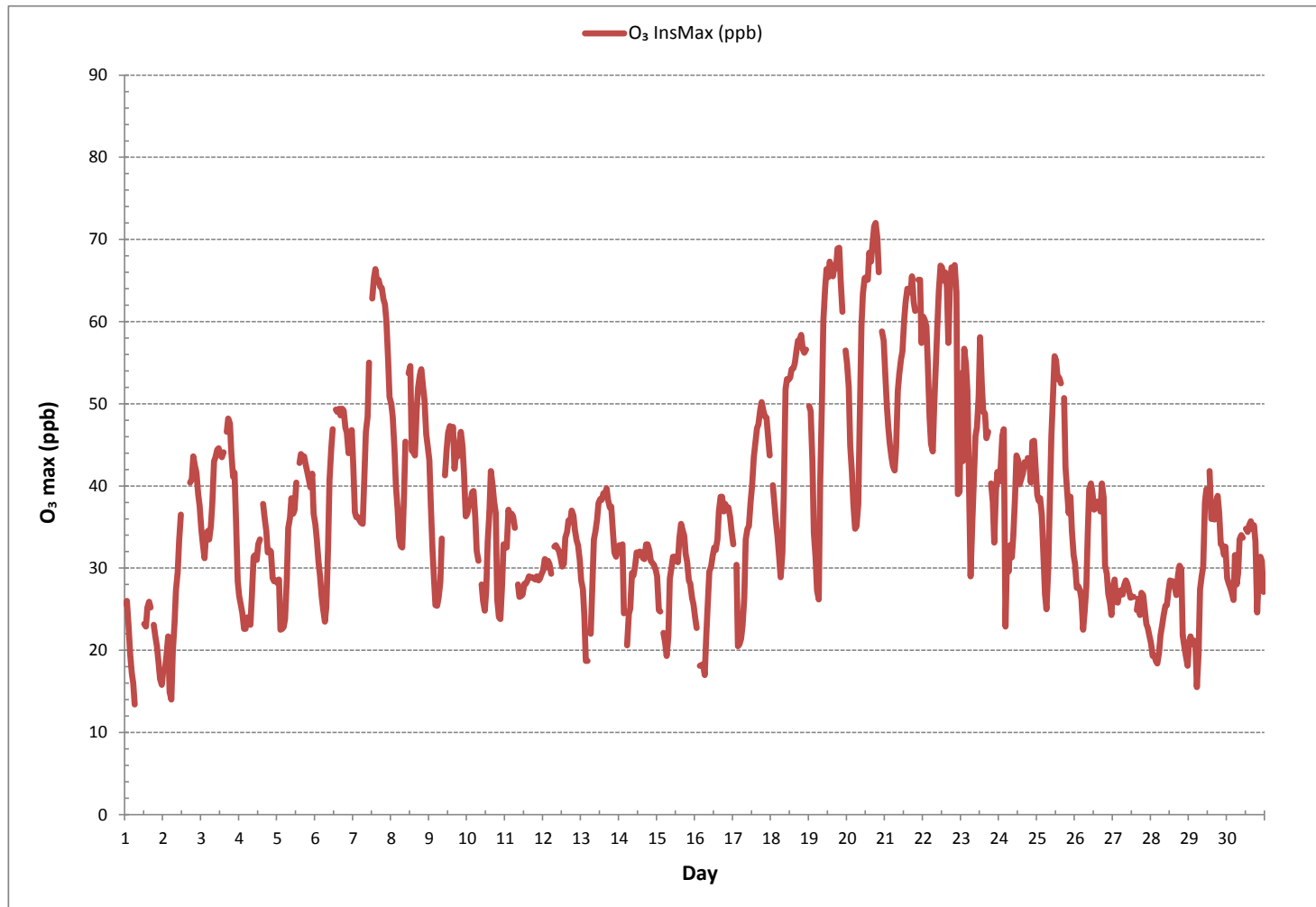
STATUS FLAG CODES

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:	681
MAXIMUM INSTANTANEOUS VALUE:	72.0 ppb @ HOUR 18 ON DAY 20
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	12.6
OPERATIONAL TIME:	716 hrs

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - June 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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10.8	10.8	10.8	10.8	1
2	8.1	12.3	9.7	9.2	11.0	11.6	11.6	11.0	17.3	18.0	40.5	27.4	33.3	34.8	43.0	37.0	52.8	41.2	30.0	58.7	15.8	11.0	11.8	16.5	8.1	58.7	23.9	24	
3	16.0	14.3	15.4	17.6	16.5	14.7	20.6	21.0	30.0	30.0	34.4	29.1	30.0	45.5	33.3	29.1	25.2	15.3	14.9	18.8	22.4	50.6	56.7	58.9	14.3	58.9	27.5	24	
4	59.3	58.7	56.1	44.3	56.3	62.2	67.4	64.4	50.4	35.9	34.4	33.8	28.3	16.0	30.7	41.0	39.2	44.2	37.7	38.5	29.6	15.6	9.2	7.9	7.9	67.4	40.0	24	
5	8.6	9.3	12.3	14.7	15.1	19.9	23.7	23.7	23.9	26.5	31.3	32.2	43.6	53.4	50.1	55.1	46.2	37.3	25.0	16.4	4.9	9.2	12.7	11.8	4.9	55.1	25.3	24	
6	12.5	15.1	26.3	19.7	30.0	16.9	37.9	24.3	25.2	24.5	24.3	21.5	19.5	33.5	28.3	39.4	24.5	11.8	12.3	12.9	11.4	17.1	18.6	23.4	11.4	39.4	22.1	24	
7	24.1	22.8	20.8	21.2	24.8	23.4	24.8	39.6	41.0	48.7	42.5	47.5	47.3	44.9	39.4	39.9	40.9	44.9	42.7	39.0	40.5	36.8	45.1	49.9	20.8	49.9	37.2	24	
8	51.2	46.9	41.6	42.7	33.3	35.0	26.3	23.2	34.4	36.6	35.7	26.8	27.4	59.3	38.8	39.4	51.7	44.0	35.0	21.5	19.9	18.9	19.5	29.8	18.9	59.3	35.0	24	
9	35.9	35.7	29.6	26.3	28.5	36.4	35.7	36.2	42.5	42.0	39.0	49.5	52.5	50.1	42.9	71.8	56.7	55.6	60.9	65.2	60.0	41.6	41.0	46.6	26.3	71.8	45.1	24	
10	52.8	43.1	30.5	27.6	21.7	12.9	12.7	30.5	23.7	16.2	11.6	14.3	17.1	12.5	31.1	55.6	39.9	44.4	39.0	44.0	56.5	42.3	39.7	47.5	11.6	56.5	32.0	24	
11	42.0	43.1	46.2	50.1	59.8	66.8	72.0	81.4	51.2	57.6	68.7	79.0	89.1	90.0	89.8	86.9	92.2	85.4	88.9	84.5	93.0	85.4	78.2	82.6	42.0	93.0	73.5	24	
12	73.3	72.3	71.4	66.6	78.6	70.7	75.3	69.4	66.0	64.2	88.0	64.6	66.4	77.5	75.8	75.7	76.4	X	61.8	54.3	38.8	46.0	30.9	21.5	21.5	88.0	64.6	23	
13	17.8	14.1	15.8	17.3	12.1	10.1	18.9	23.2	23.2	27.2	31.8	36.7	41.2	X	40.3	32.4	31.8	32.7	21.1	24.1	16.2	16.7	14.0	10.3	10.1	41.2	23.0	23	
14	9.9	9.3	24.1	18.0	27.6	30.2	37.2	32.0	31.8	34.2	35.3	27.2	32.7	32.4	32.9	30.9	25.6	22.3	15.1	13.6	13.6	16.0	12.9	12.1	9.3	37.2	24.0	24	
15	14.2	12.5	11.0	12.5	10.1	12.5	13.4	11.6	16.5	19.5	27.0	29.1	31.3	32.7	32.0	33.6	29.1	49.2	30.9	22.1	27.8	19.1	16.9	15.8	10.1	49.2	22.1	24	
16	14.7	13.6	16.7	23.0	16.7	16.0	15.6	23.4	25.0	34.2	32.0	31.3	28.9	29.8	41.6	35.2	36.3	35.3	28.0	14.5	4.2	7.9	8.8	10.1	4.2	41.6	22.6	24	
17	10.3	10.5	8.6	11.2	12.1	9.3	8.6	10.5	19.3	24.4	30.5	29.8	28.5	28.3	30.5	29.4	40.1	30.2	25.6	16.4	8.8	13.6	16.2	18.0	8.6	40.1	19.6	24	
18	17.7	17.1	16.9	16.0	16.2	13.8	14.7	14.0	19.7	29.8	32.6	35.9	36.2	31.8	30.7	32.9	29.0	26.7	19.5	14.5	9.3	9.4	9.6	12.9	9.3	36.2	21.1	24	
19	14.0	12.1	14.5	11.2	13.8	12.5	13.6	15.6	18.0	25.6	32.4	32.4	30.9	30.9	24.3	26.5	29.3	22.3	21.9	17.1	13.6	12.7	12.3	13.8	11.2	32.4	19.6	24	
20	11.6	12.1	11.2	15.8	12.9	10.5	9.9	11.0	12.5	25.6	26.1	30.4	28.5	35.5	28.3	26.9	24.1	28.5	24.7	13.0	12.1	16.0	12.3	16.4	9.9	35.5	19.0	24	
21	16.9	14.3	16.3	15.6	14.7	14.2	12.9	11.2	14.0	16.2	24.5	27.8	26.5	24.7	27.6	24.5	23.4	14.7	14.9	14.5	35.2	32.0	12.5	X	11.2	35.2	19.5	23	
22	5.3	9.4	12.3	15.8	16.9	15.1	13.4	13.4	15.6	20.2	15.1	17.5	17.7	26.7	24.5	53.4	50.8	19.5	7.9	7.5	7.5	18.8	21.7	27.4	5.3	53.4	18.9	24	
23	17.5	14.2	22.8	14.0	8.3	11.4	15.6	14.5	24.7	23.2	20.8	15.3	34.0	31.8	17.1	32.4	25.0	11.2	8.8	5.1	11.4	11.4	10.6	13.6	5.1	34.0	17.3	24	
24	10.4	8.0	6.2	6.2	11.0	13.4	11.2	12.9	12.1	18.8	17.3	19.7	24.2	17.3	30.0	20.6	26.0	20.8	22.8	22.3	11.4	17.3	22.3	23.0	6.2	30.0	16.9	24	
25	20.0	17.3	18.0	21.0	21.5	22.6	21.0	28.3	37.4	47.9	47.7	54.9	61.9	64.6	54.8	59.3	55.6	72.4	44.9	49.0	40.1	35.3	20.8	17.1	17.1	72.4	38.9	24	
26	20.6	14.3	18.9	19.3	13.9	21.0	30.1	41.2	29.2	29.8	34.6	18.8	19.9	12.7	18.2	29.8	31.6	76.8	22.8	18.2	22.6	17.5	24.1	26.1	12.7	76.8	25.5	24	
27	44.7	52.8	28.3	34.0	55.0	47.6	51.0	60.9	78.8	75.1	64.8	75.3	63.9	65.9	78.1	57.0	53.6	38.8	44.9	45.3	32.7	44.0	33.7	24.3	24.3	78.8	52.1	24	
28	22.8	20.6	23.9	22.3	31.1	24.8	42.5	43.8	47.3	36.8	42.3	49.0	53.6	55.6	44.9	41.8	34.6	34.0	40.5	29.6	21.0	12.1	12.7	10.7	10.7	55.6	33.3	24	
29	13.8	13.6	15.1	15.8	11.7	17.7	11.8	19.3	16.4	23.2	25.8	31.8	30.7	46.0	19.1	12.7	13.4	28.7	25.8	24.3	15.1	8.4	10.1	12.5	8.4	46.0	19.3	24	
30	9.9	7.9	8.2	20.2	19.3	15.8	12.5	14.3	21.7	29.8	29.0	32.5	40.7	29.8	35.5	43.6	29.8	11.4	19.1	9.6	20.2	18.9	13.6	15.3	7.9	43.6	21.2	24	
HOURLY MAX	73.3	72.3	71.4	66.6	78.6	70.7	75.3	81.4	78.8	75.1	88.0	79.0	89.1	90.0	89.8	86.9	92.2	85.4	88.9	84.5	93.0	85.4	78.2	82.6					

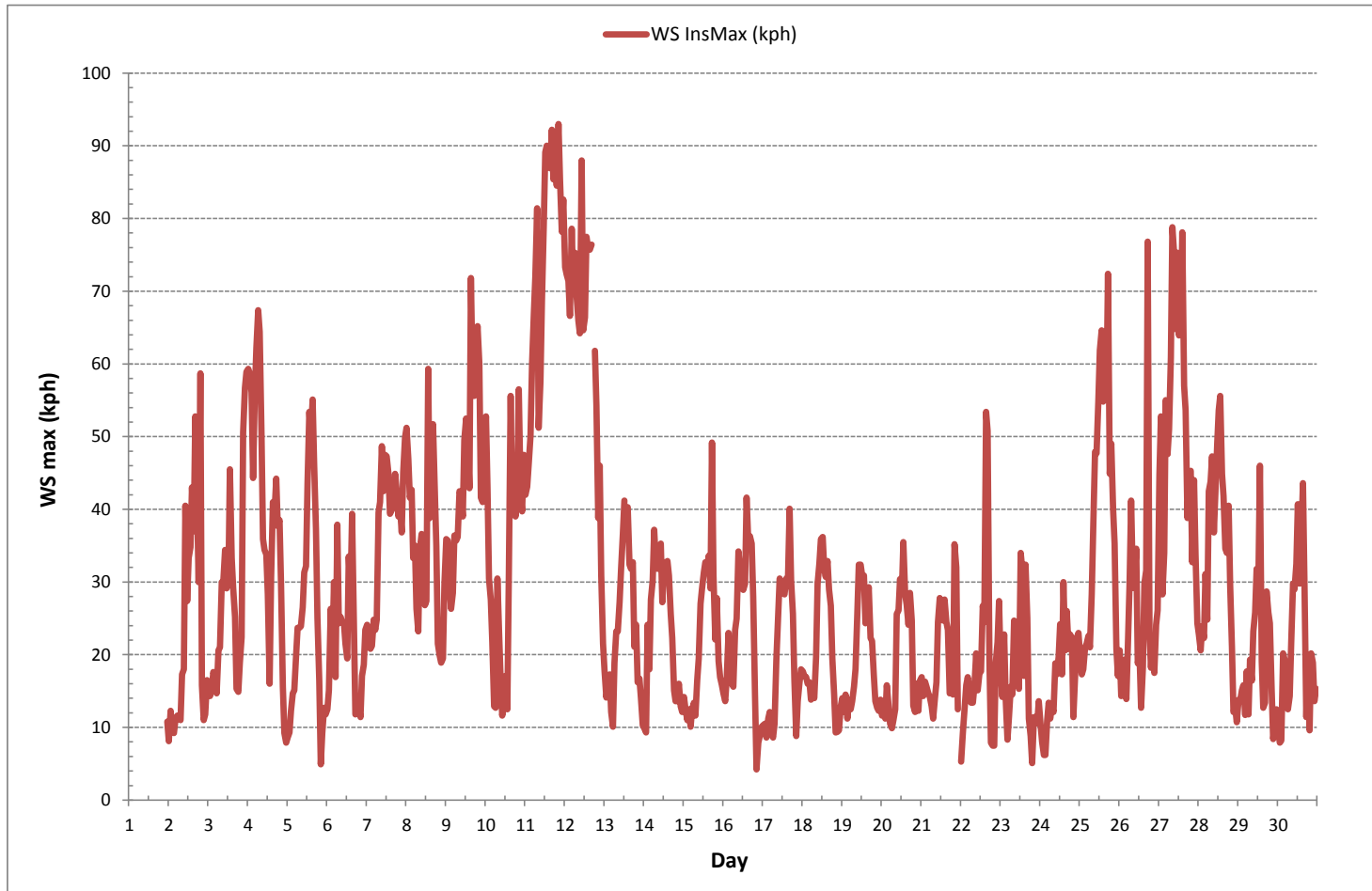
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	93.0	kph	@ HOUR	20	ON DAY	11	
OPERATIONAL TIME:						694	hrs

WIND SPEED Instantaneous Maximum (WS kph)

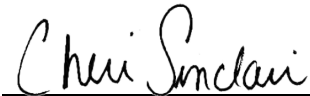


APPENDIX IV
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
NO	N/A
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? (If 'Yes', fill in the fields below for the external person.)	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Cheri Sinclair	Supervisor, Customer Service, Air Services
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	B.Sc.

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

13-08-2018

Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-06-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>09-Jul-2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>09-Jul-2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>13-Jul-2018</u>
Level 3 Independent Data Review	<u>Cheri Smclain</u>	Date <u>13-Aug-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.