



Alberta Environment and Parks (AEP)
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November 8, 2017

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 September 2017.

The air monitoring program consists of continuous air monitoring, passive sampling, intermittent sampling, including both VOC and PAH sampling program, and VOC canister 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 September 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016), with the exception of PM2.5.

There were three 1-hour exceedances and two 24-hours exceedances reported to AEP this month. 1-hour exceedances were recorded on September 8, at hour 6, 7 and 8, concentrations of 116, 115 and 90 µg/m³, AEP reference number: 329487. 24-hour exceedances were recorded on September 8, concentration of 36 µg/m³, AEP reference number: 329487, and on September 9, concentration of 40 µg/m³, AEP reference number: 329504.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that 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 certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's



Lakeland Industry & Community Association
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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 passive samples, intermittent samples and VOC canister samples. The results for both intermittent samples and VOC canister samples is scheduled to be submitted by the end of January 2018.

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 CONTINUOUS MONITORING STATION

JOB #: 2833-2017-09-1-C

September 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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BONNYVILLE, ALBERTA
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Attention: MIKE BISAGA

DATE: **November 3, 2017**

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Project Manager, Customer Service, Air Services

SUMMARY

In September 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake 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 & Community Association.

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

- Three 1-hour exceedances were reported to AEP for PM_{2.5} this month. On September 8, between the hours of 06:00 to 08:00, concentrations of 116, 115 and 90 µg/m³ were recorded. All three exceedances were reported under Alberta Environment and Parks (AEP) reference number 329487.
- Two 24-hour exceedances were reported to AEP for PM_{2.5} this month. A concentration of 36 µg/m³ on September 8 was reported under AEP reference number 329487. A concentration of 40 µg/m³ on September 9 was reported under AEP reference number 329504.

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

- **THC:** One hour of downtime was recorded due to an additional zero-span check performed on September 25 at 09:00, to provide a reference concentration for updating the expected span value, following a span gas change out.
- **O₃:** Three hours of downtime were incurred as a calibrator cross check was performed on the channel following the calibration on September 13.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake 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	2	24	11	5.2	SSW	0	1	100.0
TRS (ppb)	-	-	-	-	0	2	6	7	2.3	WSW	0	1	100.0
THC (ppm)	-	-	-	-	2.15	3.49	7	6	0	SSW	2.60	6	99.9
NO ₂ (ppb)	159	-	0	-	2	10	6	8	1.8	WSW	4	27	100.0
NO (ppb)	-	-	-	-	0	23	7	7	1.4	NE	2	7	100.0
NO _x (ppb)	-	-	-	-	3	31	7	7	1.4	NE	5	6	100.0
O ₃ (ppb)	82	-	0	-	20.8	64.5	7	15	9.4	SE	32.3	8	99.6
PM _{2.5} (µg/m ³)	80	30	3	2	6	116	8	6	6.1	SE	40	9	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	70	99	10	1	5.2	W	85	21	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	11.9	27.9	8	15	3	SSW	18.8	8	100.0
VECTOR WS (kph)	-	-	-	-	0.8	18.1	10	12	-	W	10.7	10	100.0
VECTOR WD (sec)	-	-	-	-	224 (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 (µg/m ³)	WS (kph)	WD (deg)	AEP Reference #
September 8	6:00	116	6.1	135	329487
September 8	7:00	115	7.6	136	329487
September 8	8:00	90	7.5	138	329487

PM_{2.5} 24-Hour Exceedances

DATE	READING (µg/m ³)	WS (kph)	WD (deg)	AEP Reference #
September 8	36	2.1	101	329487
September 9	40	3.5	4	329504

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).

Sample filters for all continuous air monitors are changed 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 September 12.

TOTAL REDUCED SULPHUR (TRS)

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

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- The routine monthly calibration was performed on September 13.
- The span gas cylinder was changed on September 25. An additional zero-span check was performed at 09:00 to provide a reference concentration for updating the expected span value. One hour of downtime was recorded due to the additional span check.

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

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

OZONE (O₃)

- Operational time, for the monitoring period, was 99.6% equivalent to three hours of downtime.
- The routine monthly calibration was performed on September 13. The analyzer was left in "maintenance" mode for a calibrator cross check. Three hours of downtime were incurred as a result.
- On September 6, at hour 18:00, one hour of maximum instantaneous data was invalidated as the analyzer yielded a "below range" error from 18:41 to 18:43.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period, was 100%.
- There were three 1-hour exceedances reported to AEP this month. On September 8, between the hours of 06:00 to 08:00, concentrations of 116, 115 and 90 µg/m³ were recorded. All three exceedances were reported under Alberta Environment and Parks (AEP) reference number 329487.
- There were two 24-hour exceedance reported to AEP this month. A concentration of 36 µg/m³ on September 8 was reported under AEP reference number 329487. A concentration of 40 µg/m³ on September 9 was reported under AEP reference number 329504.
- The routine monthly audit was performed on September 20.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. No hourly data was invalidated as all measurements were above -3 µg/m³ this month.

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

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

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period, was 100%.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

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

- Three 1-hour exceedances were reported to AEP for PM_{2.5} this month. On September 8, between the hours of 06:00 to 08:00, concentrations of 116, 115 and 90 µg/m³ were recorded. All three exceedances were reported under Alberta Environment and Parks (AEP) reference number 329487.
- Two 24-hour exceedances were reported to AEP for PM_{2.5} this month. A concentration of 36 µg/m³ on September 8 was reported under AEP reference number 329487. A concentration of 40 µg/m³ on September 9 was reported under AEP reference number 329504.

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

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-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-00010: Thermo Model 5030 SHARP Monitor
- Met One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo 5030 SHARP Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

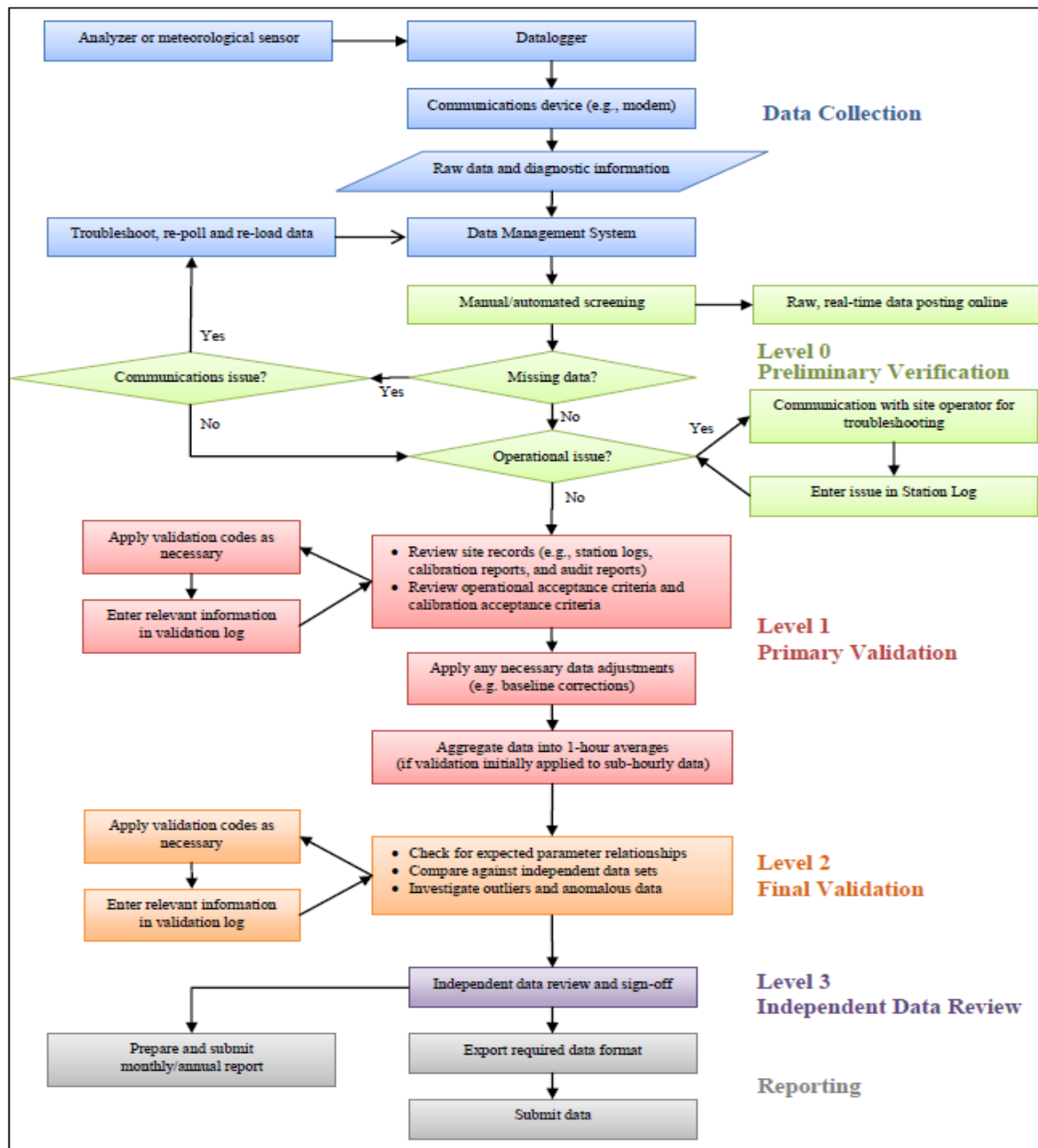
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

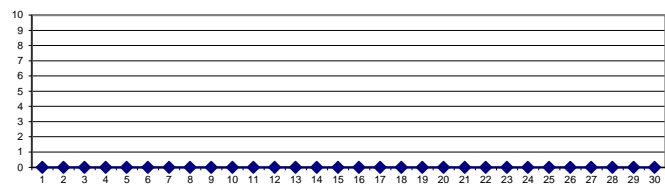
OBJECTIVE LIMIT:

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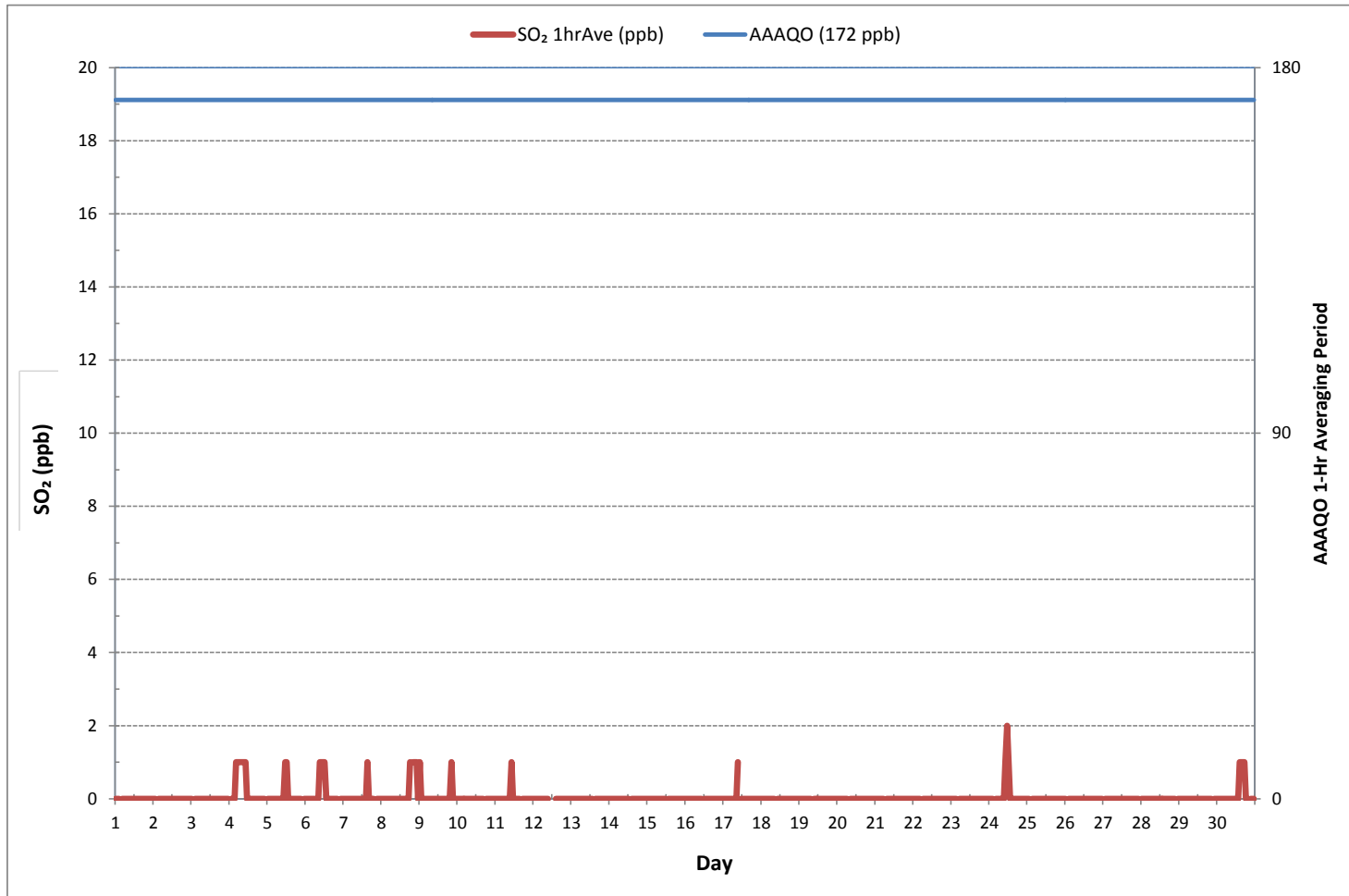
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	29					
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	2	ppb	@ HOUR	11	ON DAY	24
MAXIMUM 24-HR AVERAGE:	0	ppb			ON DAY	1
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 September 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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

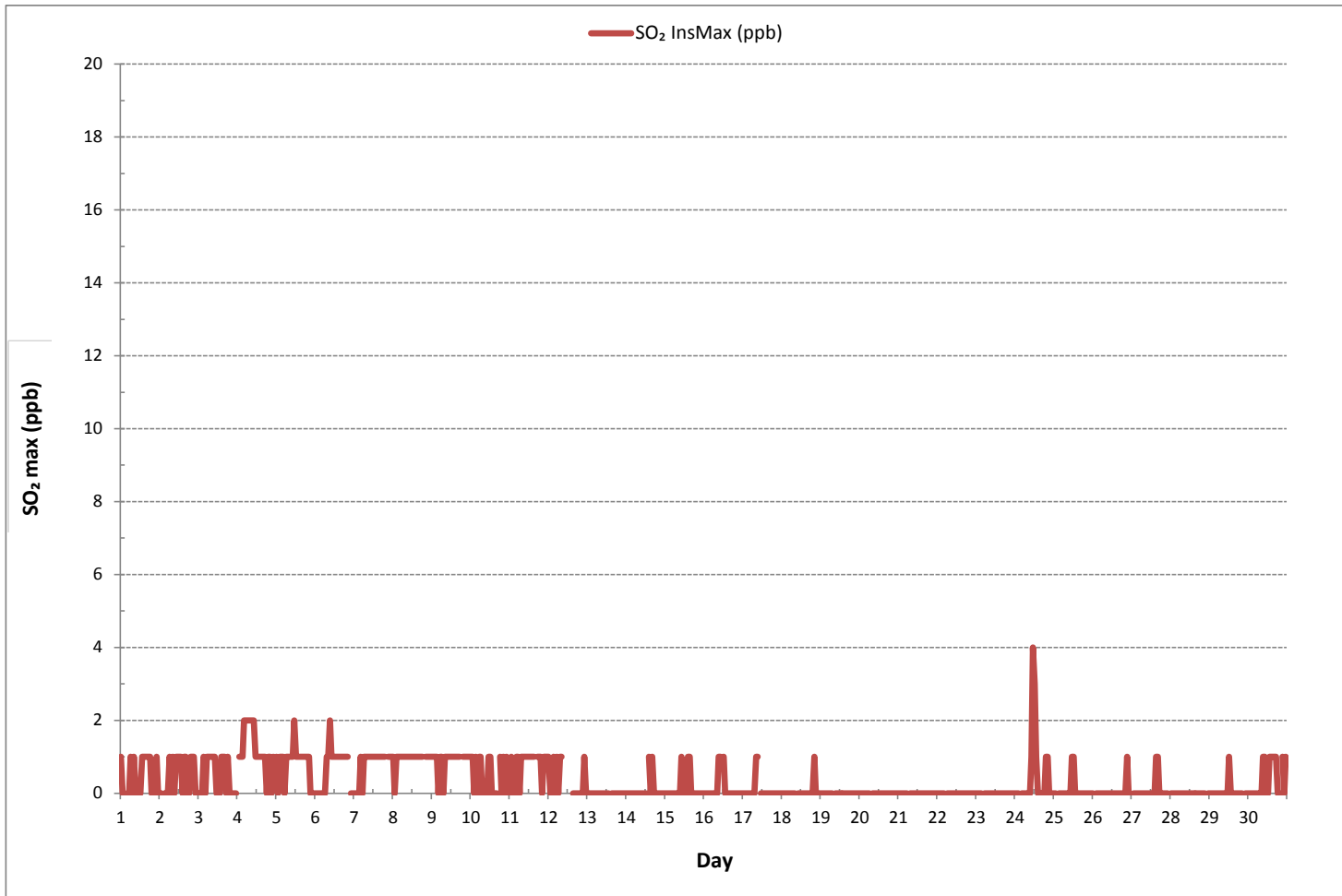
STATUS FLAG CODES

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:	212
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 11 ON DAY 24
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

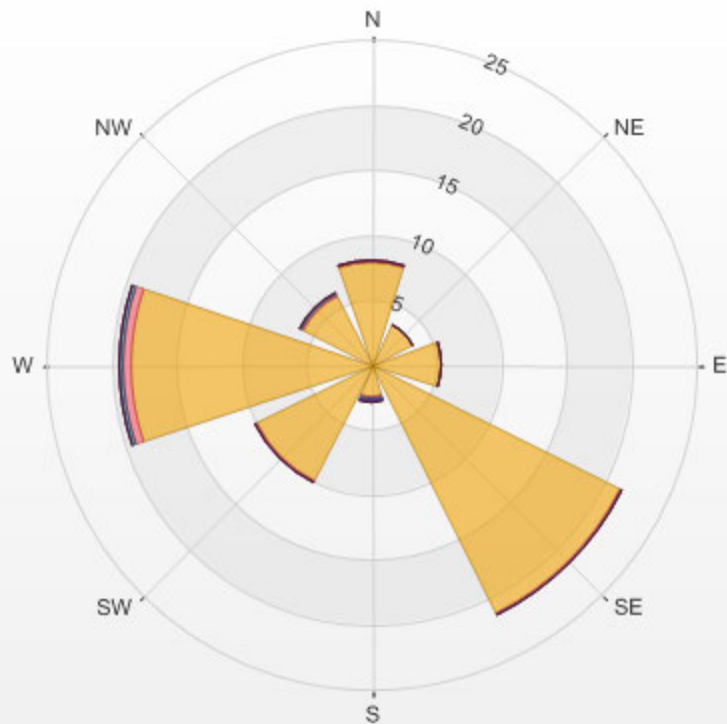
Calm: 22.84%

Calm Avg: 0.05 [ppb]

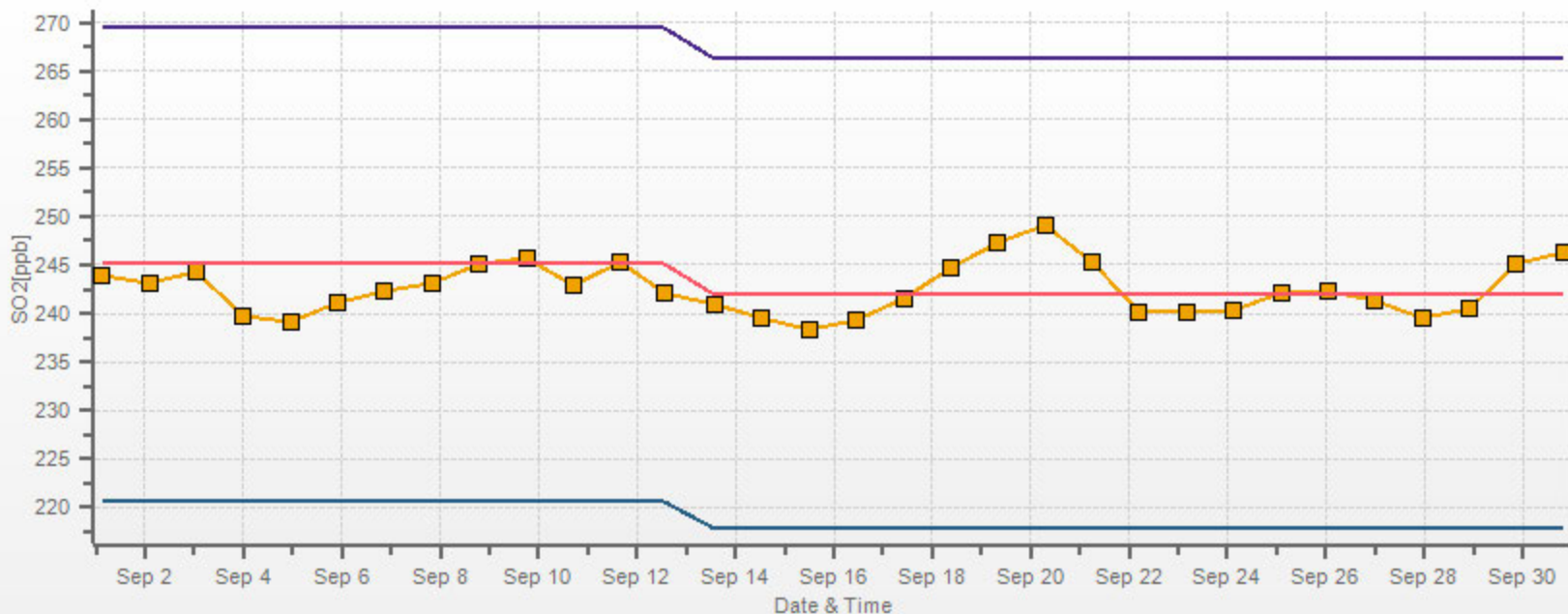
Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	7.9	0.2	0.0	0.0	0.0	0.0	8.1
NE	3.5	0.0	0.0	0.0	0.0	0.0	3.5
E	5.4	0.0	0.0	0.0	0.0	0.0	5.4
SE	21.4	0.2	0.0	0.0	0.0	0.0	21.5
S	2.5	0.2	0.2	0.2	0.0	0.0	2.9
SW	10.0	0.2	0.0	0.0	0.0	0.0	10.1
W	18.6	0.6	0.3	0.0	0.0	0.0	19.5
NW	5.9	0.2	0.2	0.0	0.0	0.0	6.2
Summary	75.1	1.3	0.6	0.2	0.0	0.0	77.2

% Icon	Classes (ppb)	75	0.0-0.6	1	0.6-1.2	1	1.2-1.8	0	1.8-2.4	0	2.4-3.0	0	>3.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.84% Calm Poll Avg: 0.05[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

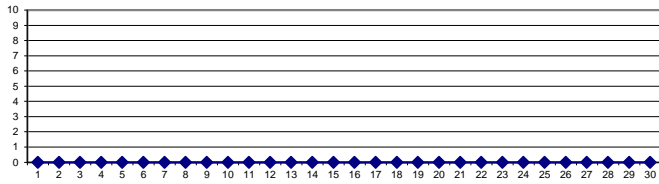
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

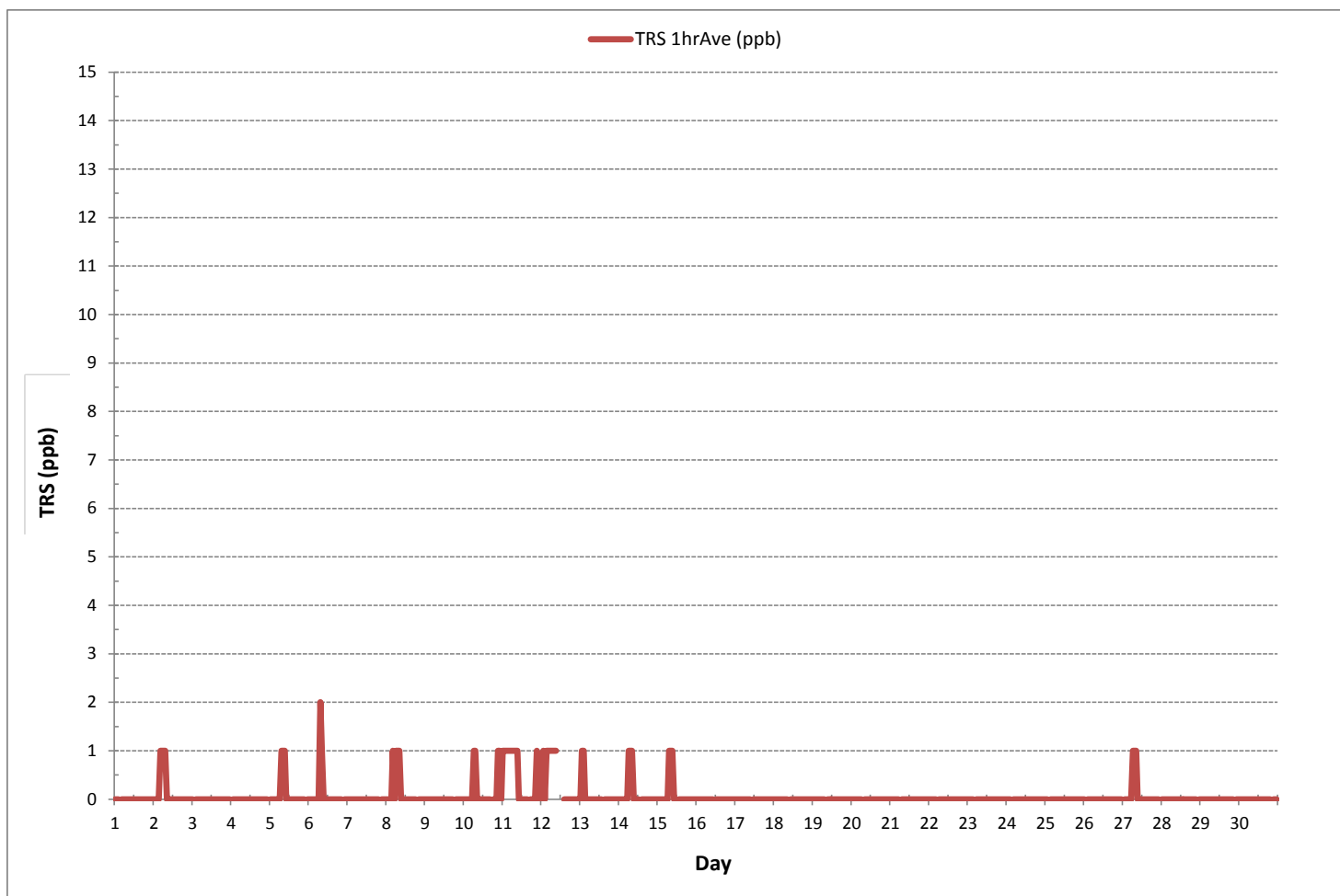
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	47		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb	@ HOUR	7 ON DAY 6
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY 1
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

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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

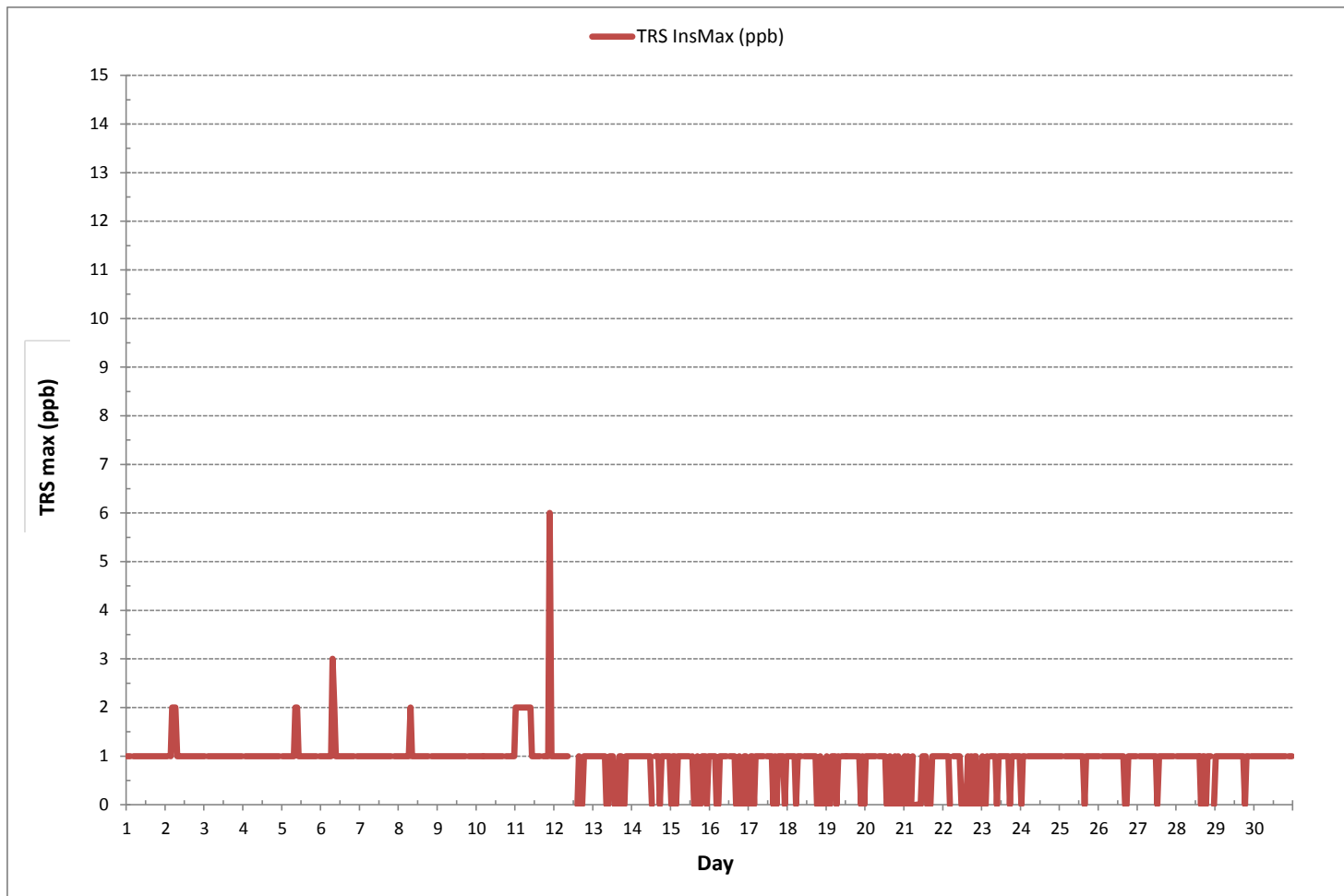
STATUS FLAG CODES

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:	602
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 21 ON DAY 11
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	720 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



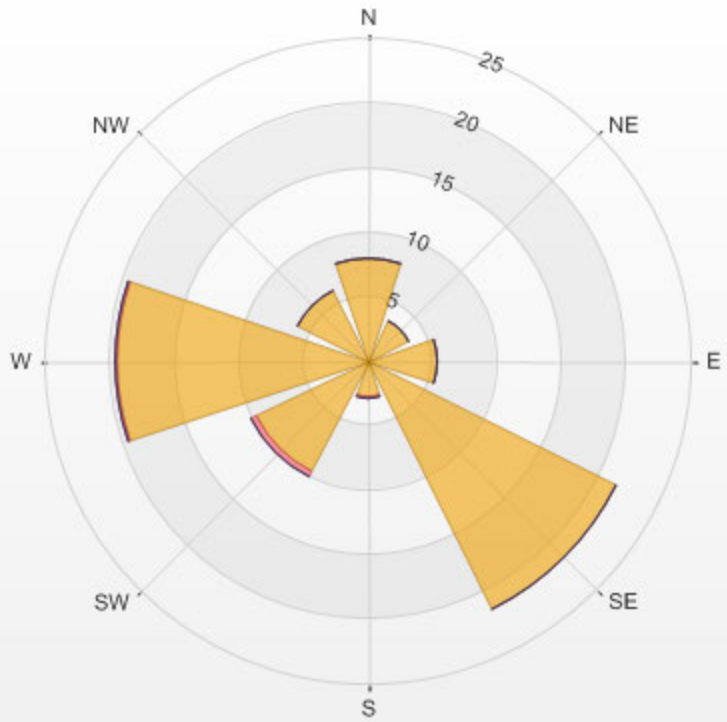
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.81% Calm Avg: 0.31 [ppb]

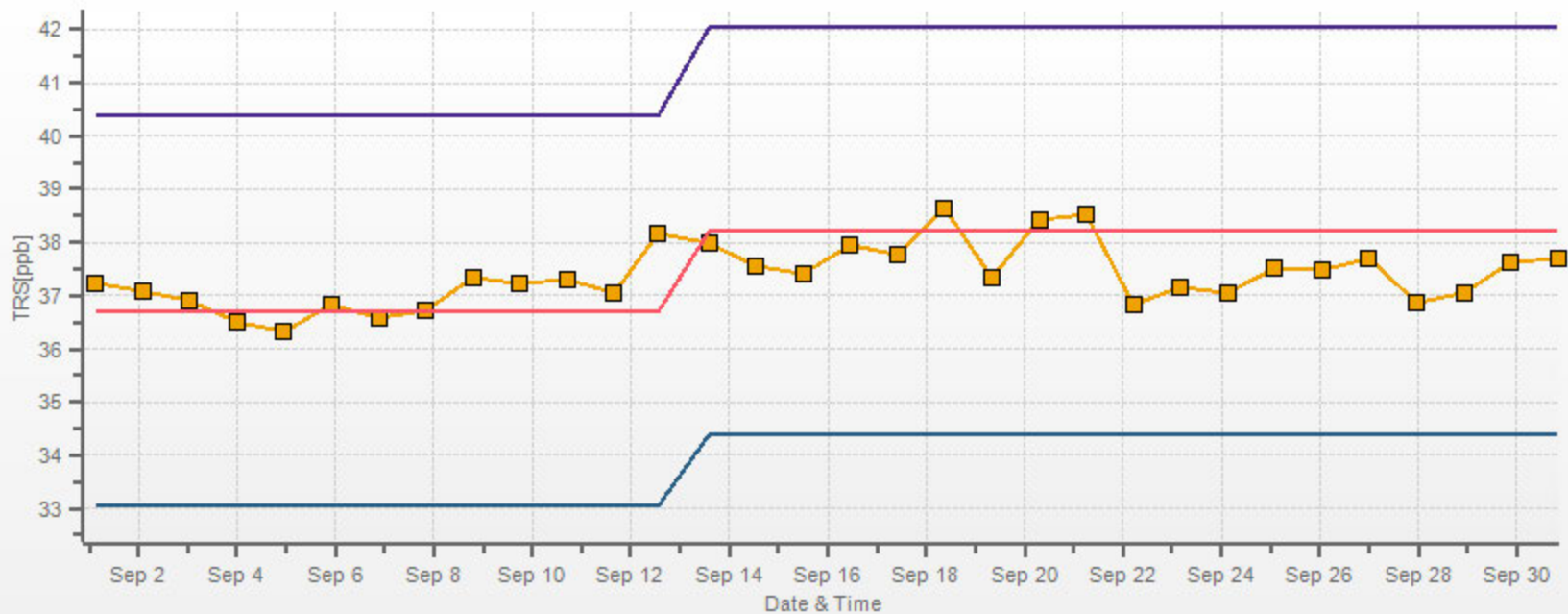
Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
N	8.0	0.0	0.0	0.0	8.0
NE	3.5	0.0	0.0	0.0	3.5
E	5.4	0.0	0.0	0.0	5.4
SE	21.5	0.0	0.0	0.0	21.5
S	2.8	0.2	0.0	0.0	2.9
SW	9.7	0.4	0.0	0.0	10.1
W	19.4	0.2	0.0	0.0	19.6
NW	6.1	0.0	0.0	0.0	6.1
Summary	76.5	0.7	0.0	0.0	77.2

% Icon	Classes (ppb)	76	0.0-1.0	1	1.0-2.0	0	2.0-3.0	0	>3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.81% Calm Poll Avg: 0.31[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



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

TOTAL HYDROCARBON



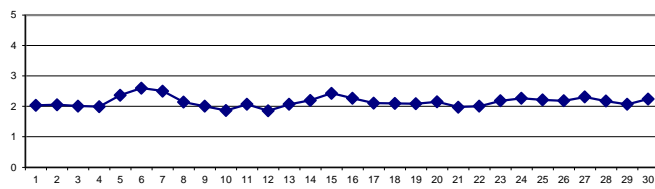
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.15	2.20	2.16	S	2.02	2.07	2.09	2.06	2.07	2.05	2.02	2.01	2.00	1.98	1.97	1.97	1.97	1.96	1.98	1.99	2.01	2.03	2.07	2.02	1.96	2.20	2.04	24	
2	2.03	2.04	S	2.02	2.02	2.08	2.09	2.07	2.06	2.04	2.04	2.01	2.03	2.02	1.99	1.97	1.96	1.99	2.02	2.12	2.10	2.10	2.14	2.27	1.96	2.27	2.05	24	
3	2.25	S	2.27	2.24	2.18	2.05	1.97	2.01	1.95	1.95	1.95	1.91	1.94	1.95	1.93	1.90	1.86	1.89	1.90	1.96	1.97	2.02	2.10	2.06	1.86	2.27	2.01	24	
4	S	2.09	2.16	2.17	2.16	2.12	2.09	2.01	1.94	1.96	1.95	1.94	1.92	1.91	1.90	1.89	1.86	1.87	1.87	1.91	1.89	2.07	2.18	S	1.86	2.18	1.99	24	
5	2.38	2.46	2.57	2.74	2.79	2.86	2.94	2.89	2.52	2.38	2.16	2.10	2.04	2.05	2.10	2.04	1.99	2.00	2.10	2.09	2.24	2.36	S	2.74	1.99	2.94	2.37	24	
6	2.88	3.03	2.95	2.91	3.00	3.10	3.08	3.36	3.20	2.91	2.54	2.26	2.12	2.13	2.12	2.11	2.06	2.11	2.23	2.27	2.29	S	2.53	2.57	2.06	3.36	2.60	24	
7	2.79	3.03	3.01	3.14	3.29	3.46	3.49	3.24	2.44	2.30	2.30	2.12	2.07	2.00	2.07	2.18	2.13	2.05	2.02	2.06	S	2.13	2.14	2.16	2.00	3.49	2.51	24	
8	2.28	2.30	2.26	2.31	2.18	2.21	2.11	2.13	2.20	2.18	2.13	2.12	2.05	2.02	1.99	2.05	2.11	2.21	2.19	S	2.10	2.06	2.08	2.08	1.99	2.31	2.15	24	
9	2.07	2.02	2.01	2.01	1.94	1.89	1.88	1.92	1.93	1.96	1.97	1.98	2.01	1.97	1.97	1.97	1.96	2.03	S	2.20	2.20	2.19	2.02	2.07	1.88	2.20	2.01	24	
10	2.06	1.99	1.92	1.92	1.84	1.81	1.78	1.79	1.82	1.84	1.82	1.82	1.84	1.82	1.81	1.81	1.81	S	1.84	1.86	1.88	1.87	1.95	2.03	1.78	2.06	1.87	24	
11	2.12	2.12	2.14	2.14	2.21	2.24	2.25	2.17	2.17	2.24	2.09	2.00	1.95	1.95	1.94	1.93	S	1.86	1.95	2.12	2.13	2.15	1.94	1.82	1.82	2.25	2.07	24	
12	1.83	1.80	1.80	1.79	1.81	1.82	1.80	1.86	1.80	1.87	1.92	1.86	1.82	1.81	1.80	S	1.84	1.82	1.88	1.96	1.97	2.06	1.92	1.89	1.79	2.06	1.86	24	
13	1.93	2.02	2.15	2.18	2.29	2.26	2.12	2.02	2.14	2.17	C	C	C	C	2.03	1.98	1.95	1.95	1.99	2.02	2.02	2.01	2.04	2.15	1.93	2.29	2.07	24	
14	2.24	2.17	2.13	2.15	2.22	2.28	2.40	2.55	2.44	2.17	2.05	2.01	2.06	S	1.99	2.00	2.00	2.05	2.20	2.24	2.22	2.31	2.35	2.39	1.99	2.55	2.20	24	
15	2.48	2.47	2.55	2.69	2.85	3.00	3.32	3.31	3.07	2.42	2.18	2.06	S	2.04	2.05	2.03	2.02	2.02	2.03	2.14	2.23	2.20	2.30	2.43	2.02	3.32	2.43	24	
16	2.50	2.52	2.59	2.80	2.84	2.82	2.82	2.59	2.14	2.00	2.04	S	1.97	1.96	1.94	2.02	1.98	1.96	1.91	2.14	2.24	2.27	2.10	2.05	1.91	2.84	2.27	24	
17	2.07	2.10	2.14	2.26	2.31	2.36	2.31	2.18	2.15	2.11	S	2.01	2.02	2.05	2.03	2.05	2.03	2.02	2.03	2.03	2.04	2.01	2.07	2.08	2.01	2.36	2.11	24	
18	2.10	2.12	2.11	2.12	2.15	2.17	2.18	2.16	2.11	S	2.10	2.10	2.09	2.09	2.10	2.10	2.09	2.07	2.07	2.07	2.05	2.06	2.07	2.05	2.05	2.05	2.18	2.10	24
19	2.06	2.06	2.08	2.07	2.07	2.07	2.09	2.03	S	2.02	2.01	2.04	2.03	2.09	2.17	2.06	2.03	2.08	2.13	2.12	2.13	2.15	2.24	2.25	2.01	2.25	2.09	24	
20	2.30	2.29	2.52	2.59	2.62	2.65	2.65	S	2.41	2.12	1.97	1.98	1.96	1.95	1.94	1.94	2.01	1.97	1.99	1.95	2.00	1.92	1.93	1.92	1.92	2.65	2.16	24	
21	1.99	1.96	1.99	1.94	1.97	1.97	S	1.94	1.91	1.96	1.95	1.99	1.94	1.96	1.94	2.00	1.97	2.02	1.99	2.05	2.00	2.03	1.98	2.04	1.91	2.05	1.98	24	
22	2.02	2.02	2.02	2.01	2.06	S	2.02	1.99	2.04	2.01	1.97	2.00	1.96	1.96	1.99	1.92	1.92	1.99	2.02	2.03	2.00	1.98	2.07	2.14	1.92	2.14	2.01	24	
23	2.16	2.33	2.23	2.21	S	2.20	2.26	2.44	2.26	2.18	2.02	2.03	2.09	2.09	2.13	2.13	2.14	2.13	2.15	2.18	2.18	2.22	2.24	2.26	2.02	2.44	2.19	24	
24	2.27	2.28	2.27	S	2.43	2.54	2.46	2.48	2.46	2.46	2.26	2.23	2.19	2.15	2.11	2.11	2.13	2.11	2.15	2.16	2.19	2.27	2.24	2.23	2.11	2.54	2.27	24	
25	2.23	2.21	S	2.12	2.20	2.19	2.21	2.21	2.26	S1	2.26	2.32	2.28	2.29	2.20	2.21	2.14	2.14	2.08	2.16	2.15	2.26	2.27	2.33	2.08	2.33	2.21	23	
26	2.38	S	2.47	2.47	2.26	2.22	2.19	2.17	2.28	2.28	2.20	2.10	2.08	2.07	2.04	2.02	2.01	2.01	2.01	2.02	2.17	2.20	2.23	2.37	2.01	2.47	2.18	24	
27	S	2.54	2.63	2.72	2.72	2.73	2.60	2.55	2.58	2.32	2.09	2.04	2.09	2.02	1.99	2.00	2.00	2.03	2.14	2.17	2.28	2.27	2.30	S	1.99	2.73	2.31	24	
28	2.37	2.51	2.53	2.38	2.35	2.17	2.17	2.02	2.10	2.16	2.18	2.17	2.09	2.07	2.08	2.15	2.20	2.10	2.09	2.03	2.02	2.03	S	2.07	2.02	2.53	2.18	24	
29	2.03	2.06	1.98	2.01	2.05	2.04	2.05	2.06	2.17	2.14	2.13	2.07	2.06	2.03	2.06	2.07	2.04	2.06	2.13	2.07	2.06	S	2.08	2.21	1.98	2.21	2.07	24	
30	2.21	2.29	2.33	2.40	2.40	2.49	2.58	2.63	2.28	2.32	2.30	2.25	2.24	2.25	2.20	2.20	2.22	2.05	2.04	2.08	S	1.97	1.92	1.96	1.92	2.63	2.24	24	
HOURLY MAX	2.88	3.03	3.01	3.14	3.29	3.46	3.49	3.36	3.20	2.91	2.54	2.32	2.28	2.29	2.20	2.21	2.22	2.21	2.23	2.27	2.29	2.36	2.53	2.74					
HOURLY AVG	2.22	2.25	2.28	2.30	2.32	2.34	2.34	2.30	2.24	2.16	2.09	2.05	2.03	2.02	2.02	2.03	2.01	2.02	2.04	2.08	2.10	2.11	2.13	2.17					

STATUS FLAG CODES

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

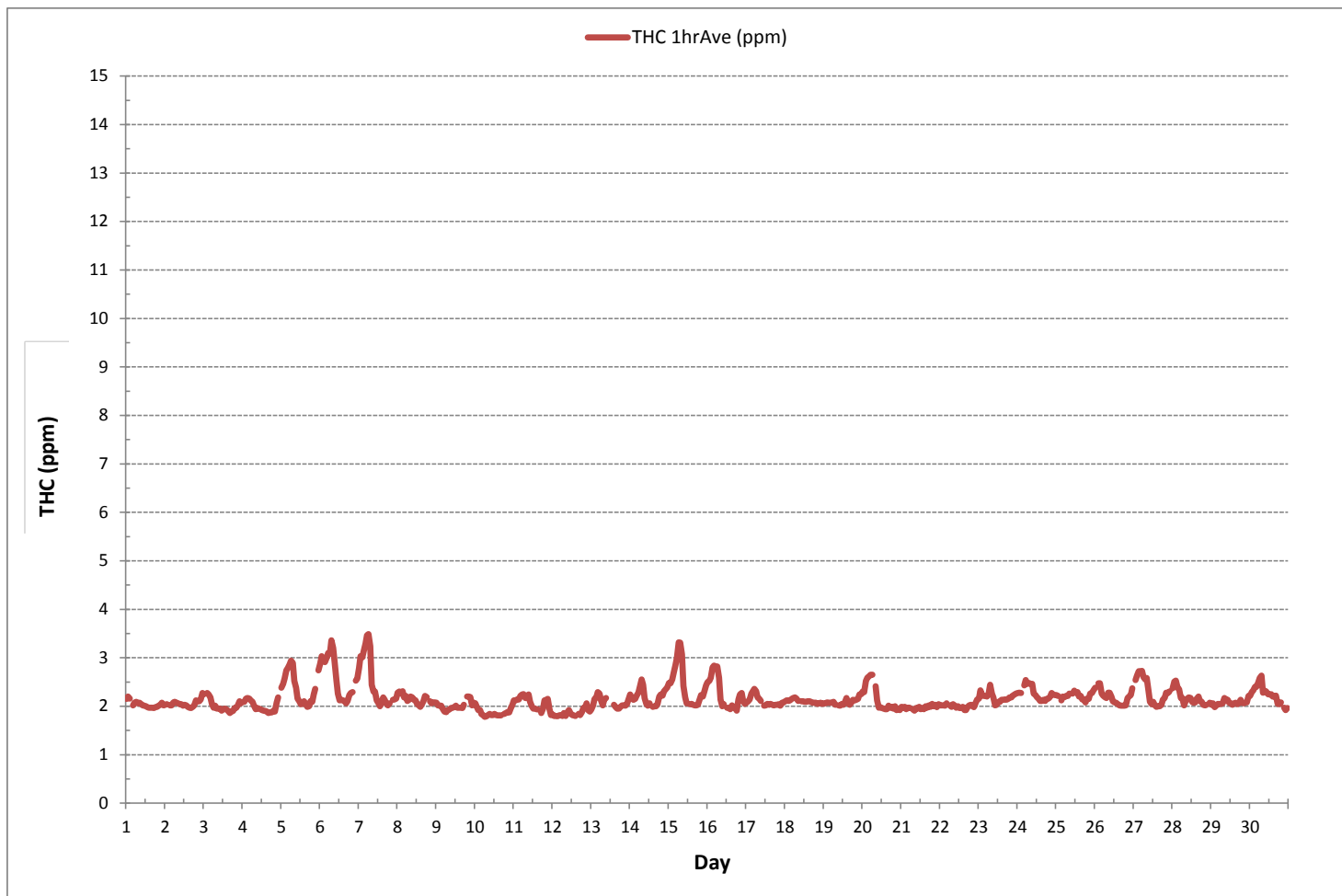
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MINIMUM 1-HR AVERAGE:	1.78 ppm @ HOUR 6 ON DAY 10
MAXIMUM 1-HR AVERAGE:	3.49 ppm @ HOUR 6 ON DAY 7
MAXIMUM 24-HR AVERAGE:	2.60 ppm ON DAY 6
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	719 hrs
AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	0.26
MONTHLY AVERAGE:	2.15 ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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	2.36	2.47	2.36	S	2.23	2.33	2.30	2.30	2.30	2.28	2.25	2.23	2.23	2.19	2.39	2.23	2.17	2.17	2.20	2.23	2.23	2.35	2.57	2.33	2.17	2.57	2.29	24	
2	2.27	2.24	S	2.21	2.23	2.29	2.33	2.33	2.30	2.26	2.26	2.25	2.26	2.26	2.24	2.20	2.21	2.23	2.32	2.56	2.51	2.54	2.47	2.57	2.20	2.57	2.32	24	
3	2.56	S	2.54	2.53	2.48	2.36	2.30	2.36	2.27	2.26	2.25	2.23	2.30	2.29	2.26	2.25	2.21	2.25	2.29	2.35	2.36	2.44	2.45	2.44	2.21	2.56	2.35	24	
4	S	2.50	2.57	2.56	2.61	2.61	2.67	2.47	2.41	2.42	2.41	2.39	2.38	2.36	2.38	2.38	2.35	2.36	2.48	2.48	2.45	2.70	2.83	S	2.35	2.83	2.49	24	
5	2.93	2.99	3.21	3.31	3.59	3.35	3.52	3.47	3.13	2.88	2.67	2.50	2.42	2.51	2.48	2.42	2.36	2.57	3.18	2.63	2.85	2.76	S	3.25	2.36	3.59	2.91	24	
6	3.34	3.50	3.74	3.40	3.56	3.56	3.71	3.74	3.60	3.37	3.01	2.64	2.97	2.53	2.63	2.41	2.35	2.63	2.70	3.00	3.21	S	3.26	2.99	2.35	3.74	3.12	24	
7	3.38	3.48	3.50	3.56	3.77	3.99	3.89	3.79	3.19	2.78	2.73	2.48	2.36	2.29	2.36	2.45	2.42	2.33	2.29	2.36	S	2.38	2.45	2.45	2.29	3.99	2.90	24	
8	2.67	2.70	3.03	2.71	2.75	2.67	2.48	2.42	2.51	2.48	2.36	2.36	2.29	2.26	2.21	2.33	2.39	2.44	2.42	S	2.35	2.26	2.30	2.30	2.21	3.03	2.46	24	
9	2.26	2.21	2.20	2.23	2.18	2.11	2.11	2.14	2.13	2.17	2.17	2.17	2.20	2.20	2.13	2.11	2.11	2.30	S	2.44	2.76	2.76	2.51	2.30	2.11	2.76	2.26	24	
10	2.27	2.23	2.13	2.15	2.10	2.07	2.05	2.05	2.10	2.16	2.11	2.14	2.16	2.14	2.13	2.14	2.16	S	2.17	2.17	2.21	2.17	2.42	2.48	2.05	2.48	2.17	24	
11	2.57	2.44	2.42	2.47	2.58	2.87	2.67	2.45	2.51	2.56	2.37	2.26	2.23	2.20	2.18	2.17	S	2.21	2.85	2.95	2.70	2.73	2.51	2.13	2.13	2.95	2.48	24	
12	2.17	2.11	2.29	2.16	2.20	2.21	2.22	2.28	2.23	2.42	2.40	2.31	2.23	2.23	2.26	S	2.29	2.23	2.33	2.45	2.42	2.50	2.47	2.23	2.11	2.50	2.29	24	
13	2.30	2.45	2.64	2.53	2.53	2.63	2.53	2.28	2.33	C	C	C	C	C	2.19	2.14	2.04	2.04	2.08	2.11	2.11	2.08	2.17	2.26	2.04	2.64	2.29	24	
14	2.35	2.32	2.20	2.27	2.39	2.45	2.63	2.69	2.70	2.32	2.30	2.08	2.13	S	2.10	2.13	2.08	2.25	2.48	2.39	2.39	2.50	2.60	2.57	2.08	2.70	2.36	24	
15	2.67	2.67	2.79	2.93	3.22	3.49	3.83	3.71	3.53	2.76	2.41	2.35	S	2.29	2.44	2.31	2.28	2.36	2.48	2.76	2.64	2.51	2.64	2.82	2.28	3.83	2.78	24	
16	2.79	2.87	3.09	3.16	3.26	3.31	3.24	3.07	2.75	2.32	2.42	S	2.32	2.32	2.29	2.37	2.32	2.26	2.23	2.45	2.60	2.58	2.45	2.26	2.23	3.31	2.64	24	
17	2.26	2.29	2.33	2.48	2.58	2.56	2.53	2.32	2.30	2.30	S	2.14	2.14	2.17	2.14	2.14	2.11	2.14	2.07	2.08	2.17	2.02	2.08	2.05	2.02	2.58	2.23	24	
18	2.26	2.08	2.08	2.08	2.11	2.11	2.10	2.08	2.02	S	2.05	2.05	2.02	2.02	2.01	2.01	2.02	1.98	2.07	1.99	1.96	1.95	1.98	1.98	1.95	2.26	2.04	24	
19	1.96	1.95	1.98	1.93	1.94	2.06	1.93	1.88	S	1.91	1.86	1.94	1.95	2.02	2.07	2.02	1.93	2.02	2.02	2.07	2.04	2.11	2.27	2.29	1.86	2.29	2.01	24	
20	2.30	2.29	2.60	2.70	2.76	2.70	2.67	S	2.51	2.33	4.85	1.93	1.95	1.96	1.93	2.01	2.03	2.00	1.99	1.96	2.02	1.93	1.96	1.93	1.93	4.85	2.32	24	
21	2.05	2.02	2.04	2.02	2.04	2.08	S	2.02	2.02	2.10	2.08	2.11	2.08	2.08	2.08	2.16	2.13	2.20	2.16	2.21	2.17	2.20	2.16	2.26	2.02	2.26	2.11	24	
22	2.25	2.26	2.23	2.25	2.30	S	2.26	2.23	2.29	2.27	2.23	2.26	2.23	2.33	2.42	2.20	2.23	2.32	2.43	2.53	2.30	2.41	2.54	2.54	2.20	2.54	2.32	24	
23	2.56	2.72	2.59	2.60	S	2.57	2.60	2.87	2.67	2.48	2.67	2.48	2.39	2.39	2.42	2.44	2.53	2.44	2.44	2.44	2.54	2.46	2.49	2.52	2.49	2.39	2.87	2.53	24
24	2.49	2.52	2.47	S	2.72	2.78	2.67	2.72	2.66	2.72	2.66	2.47	2.42	2.36	2.32	2.32	2.33	2.33	2.40	2.37	2.40	2.48	2.45	2.42	2.32	2.78	2.50	24	
25	2.56	2.45	S	2.35	2.41	2.38	2.45	2.38	S1	S1	2.47	2.51	2.48	2.47	2.42	2.37	2.36	4.11	2.39	2.37	2.32	2.48	2.66	2.70	2.32	4.11	2.53	22	
26	2.54	S	2.72	3.24	2.49	2.37	2.37	2.35	2.50	2.50	2.73	2.30	2.29	2.26	2.23	2.22	2.23	2.23	2.25	2.29	2.60	2.53	2.54	2.66	2.22	3.24	2.45	24	
27	S	2.90	2.97	3.16	3.35	3.09	3.00	2.87	3.03	2.82	2.45	2.35	2.42	2.38	2.33	2.33	2.33	2.38	2.56	2.57	2.76	2.63	2.79	S	2.33	3.35	2.70	24	
28	2.79	3.03	2.93	2.79	2.78	2.67	2.85	2.41	2.47	2.59	2.53	2.52	2.48	2.41	2.42	2.51	2.57	2.45	2.48	2.38	2.36	2.42	S	2.44	2.36	3.03	2.58	24	
29	2.37	2.39	2.30	2.33	2.33	2.36	2.37	2.37	2.45	2.42	2.38	2.32	2.28	2.23	2.29	2.28	2.25	2.25	2.36	2.31	2.25	S	2.29	2.44	2.23	2.45	2.33	24	
30	2.66	2.50	2.76	2.76	2.79	2.70	2.85	2.87	2.54	2.47	2.45	2.38	2.39	2.38	2.39	2.32	2.42	2.22	2.16	2.20	S	2.17	2.07	2.08	2.07	2.87	2.46	24	
HOURLY MAX	3.38	3.50	3.74	3.56	3.77	3.99	3.89	3.79	3.60	3.37	4.85	2.64	2.97	2.53	2.63	2.51	2.57	4.11	3.18	3.00	3.21	2.76	3.26	3.25					
HOURLY AVG	2.50	2.52	2.60	2.60	2.63	2.65	2.66	2.58	2.55	2.46	2.47	2.29	2.29	2.27	2.28	2.25	2.25	2.33	2.36	2.38	2.42	2.40	2.44	2.42					

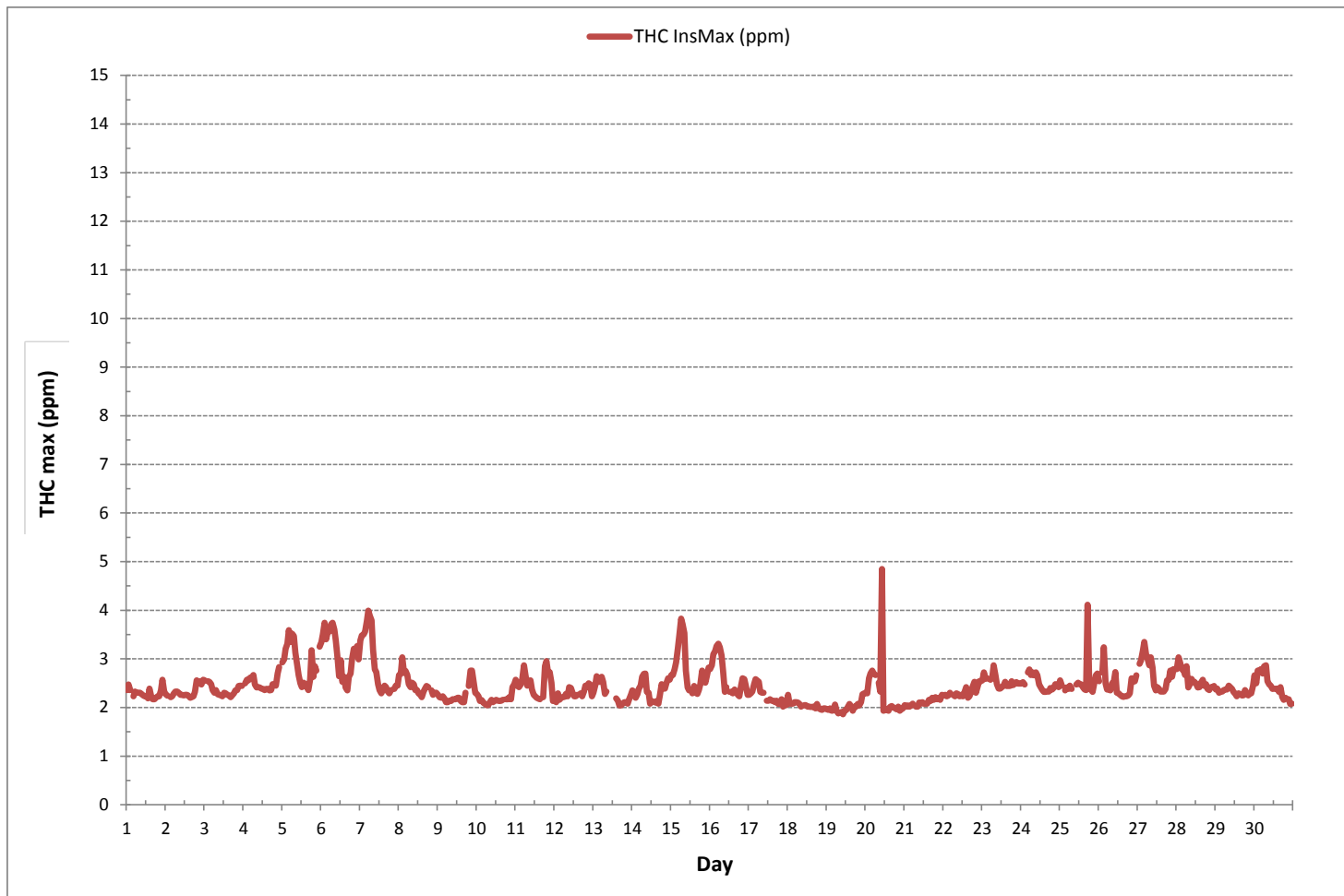
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	4.85 ppm @ HOUR 10 ON DAY 20
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	718 hrs
STANDARD DEVIATION:	0.37

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



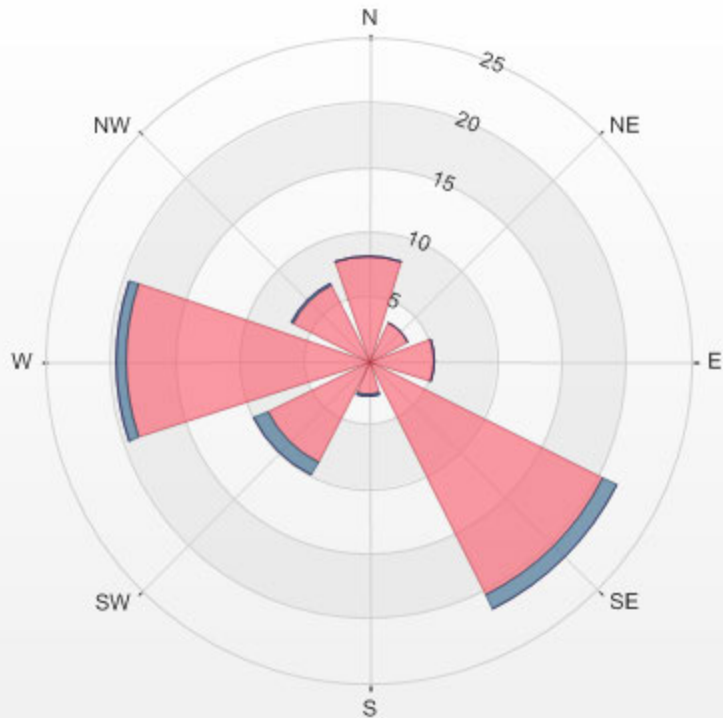
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.73% Calm Avg: 2.42 [ppm]

Direction	0.0-1.2	1.2-2.3	2.3-3.5	>3.5	Total
N	0.0	8.1	0.0	0.0	8.1
NE	0.0	3.4	0.0	0.0	3.4
E	0.0	5.1	0.0	0.0	5.1
SE	0.0	20.2	1.3	0.0	21.6
S	0.0	2.6	0.2	0.0	2.8
SW	0.0	8.8	1.2	0.0	10.0
W	0.0	18.8	0.9	0.0	19.7
NW	0.0	6.6	0.2	0.0	6.8
Summary	0.0	73.6	3.7	0.0	77.3

% Icon	Classes (ppm)	0	0.0-1.2	74	1.2-2.3	4	2.3-3.5	0	>3.5

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.73% Calm Poll Avg: 2.42[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



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

OXIDES OF NITROGEN



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

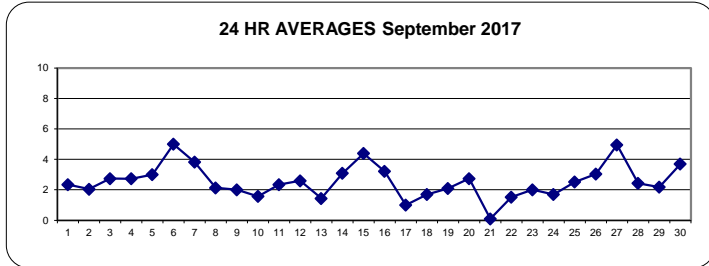
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

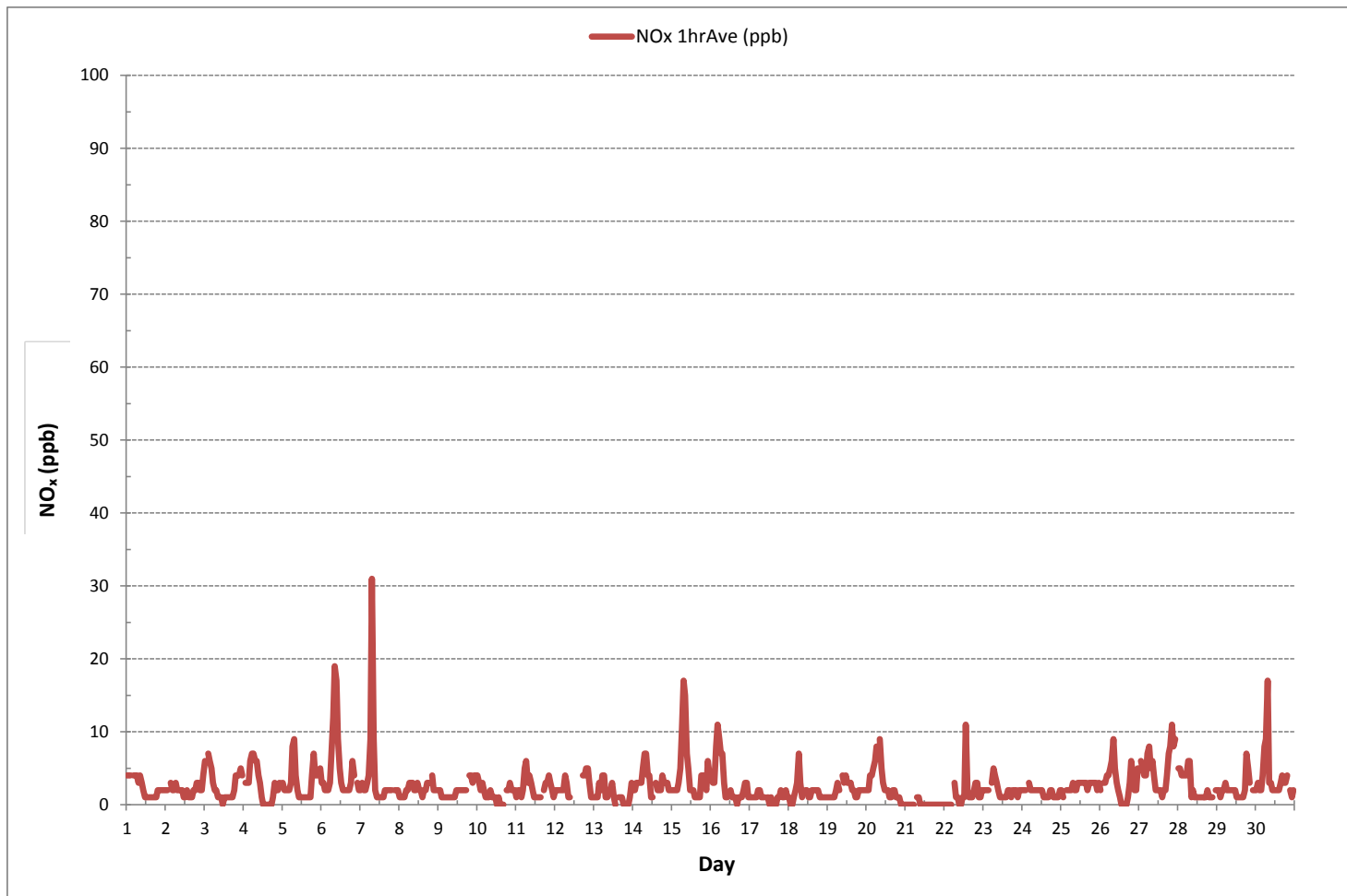
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	624			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	11	ON DAY 3
MAXIMUM 1-HR AVERAGE:	31	ppb @ HOUR	7	ON DAY 7
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY 6
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	3 ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	5	5	5	S	7	5	6	5	7	4	4	3	4	6	2	2	2	2	3	3	3	3	3	3	2	7	4	24	
2	3	3	S	6	3	3	4	3	3	3	3	2	2	3	3	6	3	2	3	7	3	4	4	5	2	7	4	24	
3	9	S	10	7	6	5	3	3	2	2	1	1	2	3	1	1	1	2	4	5	5	5	6	6	1	10	4	24	
4	S	5	3	5	7	8	8	10	7	7	9	2	1	1	1	2	1	1	4	6	4	4	4	S	1	10	5	24	
5	5	3	4	4	4	5	16	15	6	4	3	3	2	6	3	9	8	2	13	36	8	6	S	7	2	36	7	24	
6	5	5	3	3	3	9	11	16	25	24	12	9	4	5	4	12	3	4	6	10	10	S	5	4	3	25	8	24	
7	5	9	3	3	4	9	15	52	26	7	3	5	6	2	3	6	3	9	5	S	4	4	3	2	52	8	24		
8	2	2	2	2	2	4	4	4	4	3	9	6	4	2	2	3	4	4	4	4	S	7	4	3	3	2	9	4	24
9	3	3	2	2	1	2	2	2	3	2	5	5	10	5	4	4	3	4	S	5	7	5	4	5	1	10	4	24	
10	5	4	3	3	3	3	2	2	5	3	2	1	1	1	2	1	1	S	3	4	3	4	3	5	2	1	5	3	24
11	2	3	2	2	4	15	15	4	4	4	5	2	3	2	2	2	S	4	5	7	12	5	5	2	2	15	5	24	
12	3	3	2	3	4	3	7	6	2	C	C	C	C	C	C	C	C	C	6	6	9	5	4	1	1	9	4	24	
13	8	8	1	14	8	18	9	4	4	3	7	8	3	1	S	3	2	1	1	1	1	1	3	4	1	18	5	24	
14	2	3	4	5	5	6	14	10	11	8	62	1	2	S	4	3	4	5	8	5	6	6	3	5	1	62	8	24	
15	4	3	3	3	6	9	13	21	18	13	7	6	S	3	2	1	5	2	6	7	5	5	35	27	1	35	9	24	
16	6	5	6	12	24	14	10	13	8	2	2	S	7	2	1	3	1	4	3	2	4	6	33	3	1	33	7	24	
17	3	2	5	2	2	3	3	2	2	4	S	4	1	2	1	3	3	1	4	6	8	6	10	3	1	10	3	24	
18	5	1	1	3	6	6	17	6	2	S	3	4	3	3	4	3	4	4	3	3	3	1	1	2	1	17	4	24	
19	2	2	3	2	3	4	6	4	S	5	5	6	6	10	6	5	5	2	3	3	3	6	3	5	2	10	4	24	
20	3	3	6	6	6	10	10	S	11	9	5	3	3	6	2	5	3	2	2	1	2	1	0	0	0	11	4	24	
21	0	0	1	1	0	1	S	3	2	1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0	3	1	24	
22	0	0	1	1	1	S	7	2	1	2	1	4	2	55	25	3	4	4	3	15	5	4	2	4	0	55	6	24	
23	5	5	5	4	S	7	13	11	5	3	3	2	2	2	3	3	3	3	6	5	7	3	4	3	2	13	5	24	
24	3	5	4	S	5	3	3	3	3	3	4	3	3	1	4	6	1	7	3	4	2	2	3	2	1	7	3	24	
25	3	2	S	4	4	4	3	8	3	5	5	5	5	4	3	6	5	7	11	5	6	4	3	8	2	11	5	24	
26	8	S	4	4	6	5	6	7	14	7	5	3	2	1	0	1	1	2	9	20	7	3	3	9	0	20	6	24	
27	S	12	9	9	7	15	13	7	8	9	4	3	3	3	3	4	6	22	12	43	11	38	S	3	43	11	24		
28	7	7	6	9	7	9	12	10	4	9	6	2	2	2	3	9	7	2	2	6	5	2	S	4	2	12	6	24	
29	2	2	2	2	2	16	2	4	4	4	3	4	3	1	2	4	2	6	25	46	30	S	4	2	1	46	7	24	
30	4	6	2	8	9	15	27	41	11	3	2	2	2	5	3	7	5	4	4	5	S	4	3	2	2	41	8	24	
HOURLY MAX	9	12	10	14	24	18	27	52	26	24	62	9	10	55	25	12	8	7	25	46	43	11	38	27					
HOURLY AVG	4	4	4	5	5	7	9	10	7	5	6	4	3	5	3	4	3	3	6	8	8	4	7	4					

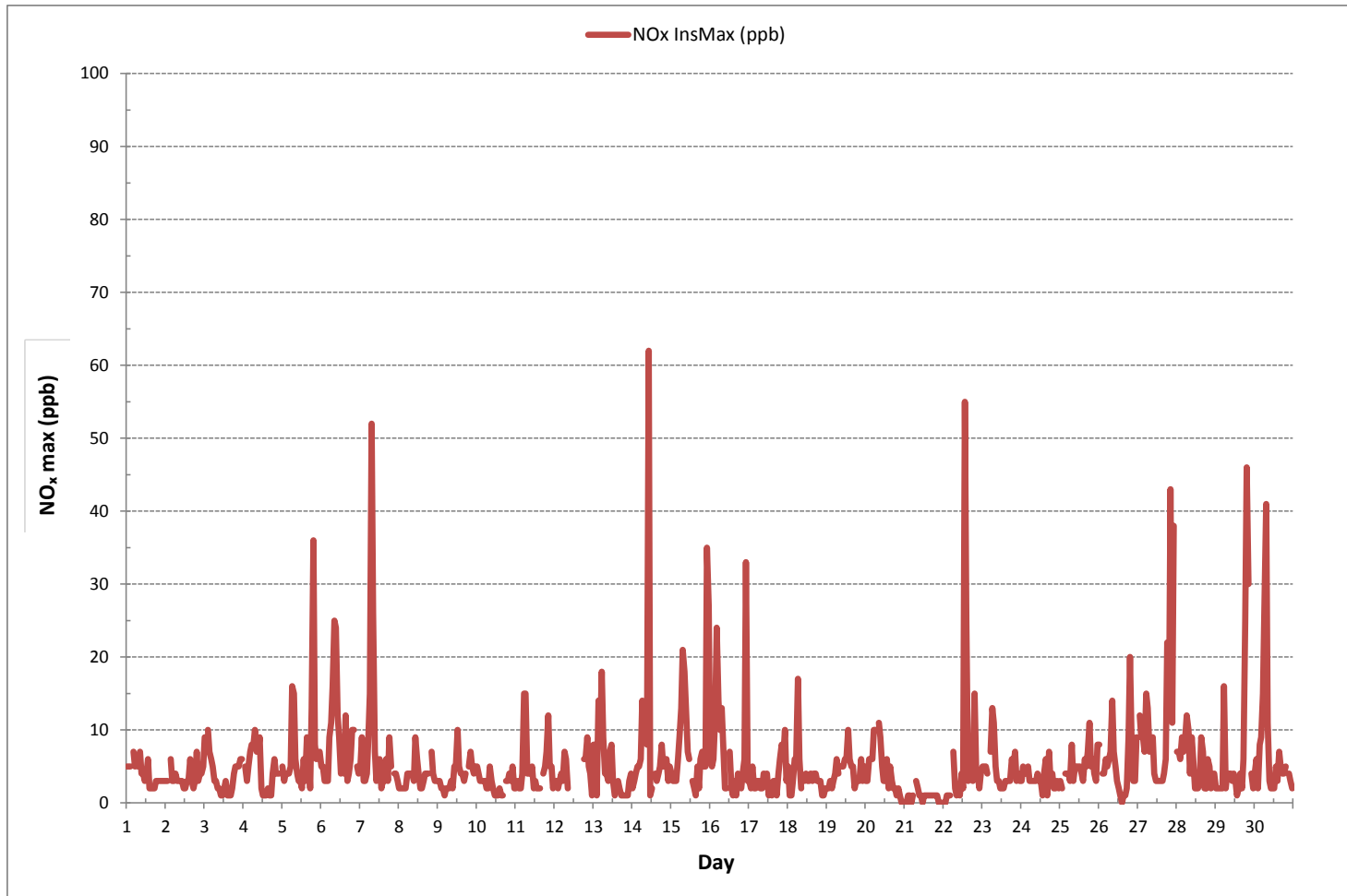
STATUS FLAG CODES

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:	668
MAXIMUM INSTANTANEOUS VALUE:	62 ppb @ HOUR 10 ON DAY 14
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	720 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NOX[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.94% Calm Avg: 4.16 [ppb]

Direction	0.0-10.7	10.7-21.3	21.3-32.0	>32.0	Total
N	8.1	0.0	0.0	0.0	8.1
NE	3.4	0.2	0.0	0.0	3.5
E	5.4	0.0	0.0	0.0	5.4
SE	21.6	0.0	0.0	0.0	21.6
S	2.9	0.0	0.0	0.0	2.9
SW	9.9	0.3	0.0	0.0	10.1
W	19.0	0.2	0.0	0.0	19.1
NW	6.2	0.0	0.0	0.0	6.2
Summary	76.5	0.6	0.0	0.0	77.1

% Icon Classes (ppb)

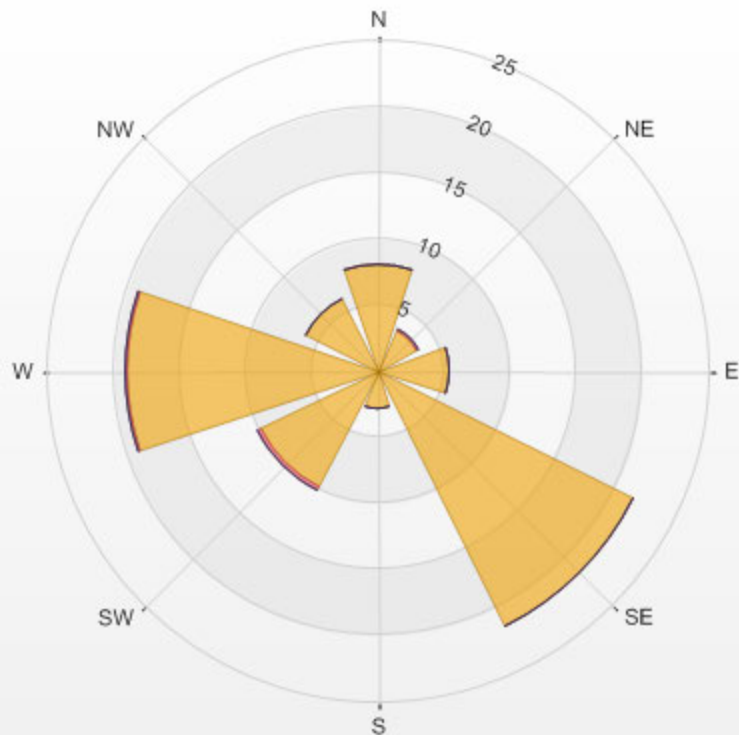
76 0.0-10.7

1 10.7-21.3

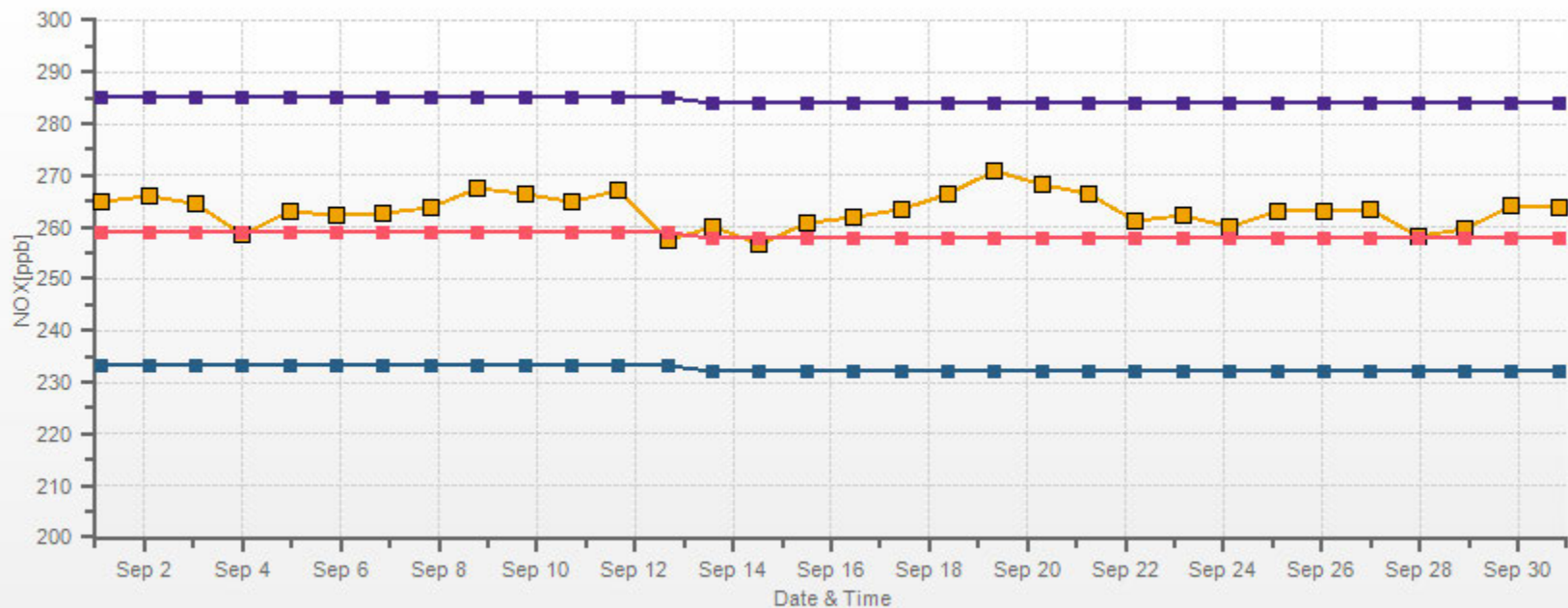
0 21.3-32.0

0 >32.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.94% Calm Poll Avg: 4.16[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



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

NITRIC OXIDES

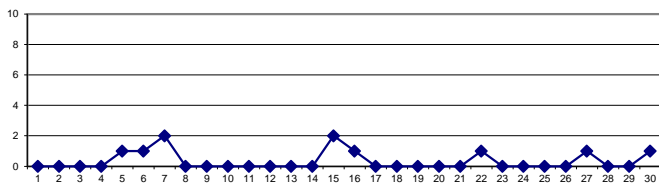
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

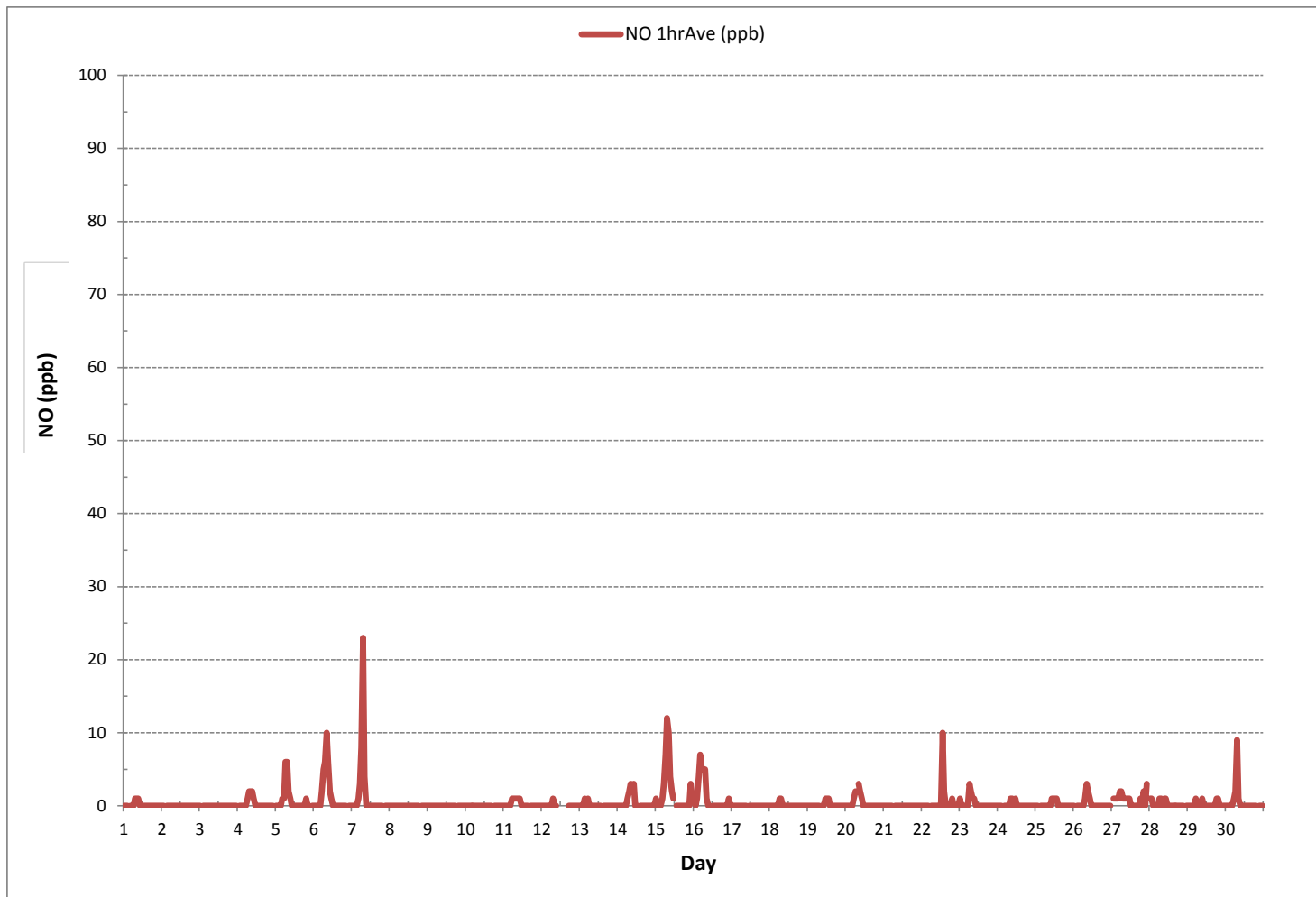
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	118			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY
MAXIMUM 1-HR AVERAGE:	23	ppb @ HOUR	7	ON DAY
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	0
				ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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	S	0	1	1	1	2	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24
2	0	0	S	0	0	0	1	1	1	1	1	0	0	1	1	3	1	0	0	3	0	0	0	0	0	0	3	1	24
3	0	S	0	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
4	S	0	0	0	0	1	2	4	3	3	1	1	0	0	0	0	0	0	0	0	0	1	0	S	0	0	4	1	24
5	1	1	1	1	2	3	13	11	3	2	1	1	1	1	1	5	4	0	1	11	1	0	S	0	0	0	13	3	24
6	1	1	1	1	1	9	9	9	12	11	3	1	1	1	0	4	0	0	0	1	S	1	1	0	1	0	12	3	24
7	1	6	1	1	2	6	12	41	17	4	1	1	4	1	0	2	2	0	2	1	S	0	2	0	0	41	5	24	
8	0	0	0	0	1	0	0	1	1	1	3	1	1	1	0	0	0	0	0	S	1	0	1	0	0	3	1	24	
9	0	0	0	0	0	1	0	0	1	0	3	2	6	4	3	1	0	1	S	0	1	0	0	0	0	6	1	24	
10	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	S	0	0	0	0	1	0	0	1	0	24	
11	0	0	0	0	0	13	10	1	1	2	5	1	1	0	0	1	S	0	0	1	4	0	0	0	0	13	2	24	
12	0	0	0	0	0	0	1	1	1	C	C	C	C	C	C	C	C	C	C	0	0	3	0	1	0	0	3	0	24
13	2	2	0	8	3	10	1	2	1	1	2	3	1	0	S	0	1	0	0	0	0	0	0	0	0	0	10	2	24
14	0	0	0	1	1	1	9	3	4	5	47	0	0	S	0	1	1	1	2	0	1	2	0	3	0	47	4	24	
15	2	1	1	1	4	5	10	15	12	8	3	2	S	0	0	0	1	0	0	0	0	0	30	24	0	30	5	24	
16	2	1	2	8	18	9	7	9	4	1	1	S	2	0	0	1	0	4	1	0	0	1	22	1	0	22	4	24	
17	0	1	1	0	0	0	0	0	0	4	S	0	0	0	1	1	2	0	1	1	3	3	6	0	0	6	1	24	
18	1	0	0	1	2	1	5	1	0	S	1	1	1	0	1	1	1	0	3	1	1	0	0	0	0	5	1	24	
19	2	1	1	0	1	4	2	1	S	1	2	2	8	9	2	3	1	0	0	0	0	2	0	1	0	9	2	24	
20	0	0	0	1	0	4	5	S	4	4	2	1	1	2	1	2	0	0	0	0	0	0	0	0	0	5	1	24	
21	0	0	0	0	0	0	S	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	2	0	24	
22	0	0	0	0	1	S	2	0	0	0	0	2	1	73	35	1	2	0	0	11	1	1	0	2	0	73	6	24	
23	2	3	4	4	S	3	8	6	2	1	1	1	1	0	2	2	1	0	1	1	2	1	1	1	0	8	2	24	
24	1	1	1	S	1	1	0	0	2	1	2	1	1	0	2	2	0	2	0	1	0	0	2	0	0	2	1	24	
25	0	0	S	0	1	0	1	3	0	2	2	1	3	1	2	2	2	2	4	0	1	0	0	2	0	4	1	24	
26	3	S	0	0	1	0	1	2	6	3	2	1	0	0	0	0	0	0	0	4	0	0	0	4	0	6	1	24	
27	S	3	3	4	2	6	6	1	2	5	1	1	1	1	0	0	0	0	11	1	24	1	28	S	0	28	5	24	
28	2	1	2	4	2	4	2	3	1	5	20	1	0	1	2	1	1	0	0	3	2	0	S	0	0	20	2	24	
29	0	0	0	0	0	9	0	1	2	2	2	2	1	0	0	1	0	4	9	16	7	S	0	0	0	16	2	24	
30	0	2	0	2	2	4	16	29	4	1	0	0	0	3	1	2	1	0	0	0	0	S	0	0	0	0	29	3	24
HOURLY MAX	3	6	4	8	18	13	16	41	17	11	47	3	8	73	35	5	4	4	11	16	24	3	30	24					
HOURLY AVG	1	1	1	1	2	3	4	5	3	3	4	1	1	4	2	1	1	1	1	2	2	0	3	1					

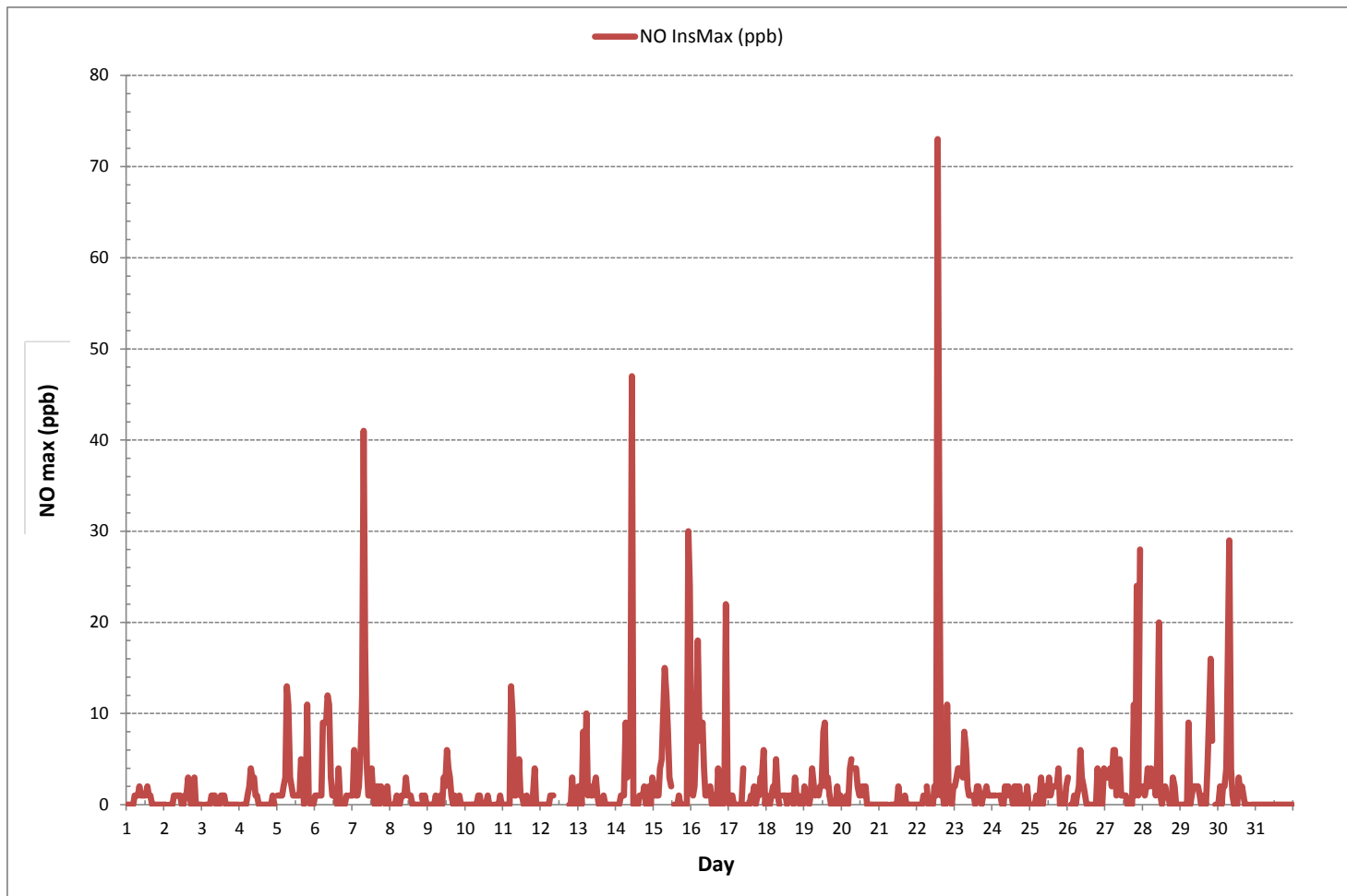
STATUS FLAG CODES

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:	382
MAXIMUM INSTANTANEOUS VALUE:	73 ppb @ HOUR 13 ON DAY 22
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	720 hrs
STANDARD DEVIATION:	5

NITRIC OXIDE Instantaneous Maximum (NO ppb)



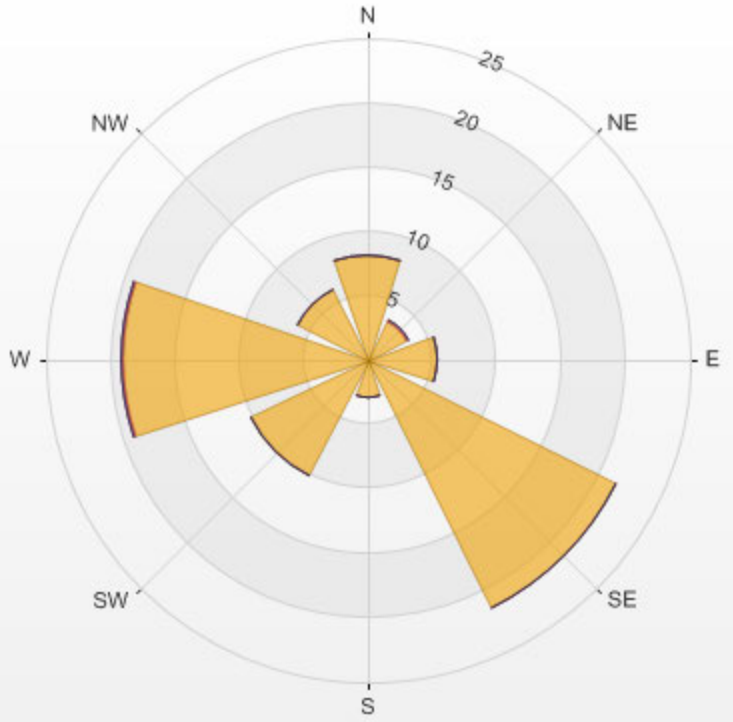
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.94% Calm Avg: 1.15 [ppb]

Direction	0.0-8.0	8.0-16.0	16.0-24.0	>24.0	Total
N	8.1	0.0	0.0	0.0	8.1
NE	3.4	0.2	0.0	0.0	3.5
E	5.4	0.0	0.0	0.0	5.4
SE	21.6	0.0	0.0	0.0	21.6
S	2.9	0.0	0.0	0.0	2.9
SW	10.2	0.0	0.0	0.0	10.2
W	19.0	0.2	0.0	0.0	19.1
NW	6.2	0.0	0.0	0.0	6.2
Summary	76.8	0.3	0.0	0.0	77.1

% Icon Classes (ppb) 77 0.0-8.0 0 8.0-16.0 0 16.0-24.0 0 >24.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.94% Calm Poll Avg: 1.15[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

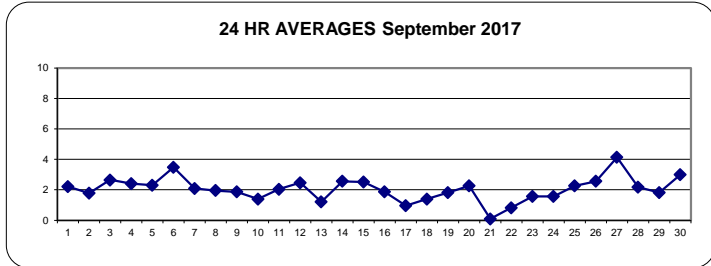
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	615		
MINIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	10 ON DAY 3
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	8 ON DAY 6
MAXIMUM 24-HR AVERAGE:	4 ppb		ON DAY 27
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	2 ppb

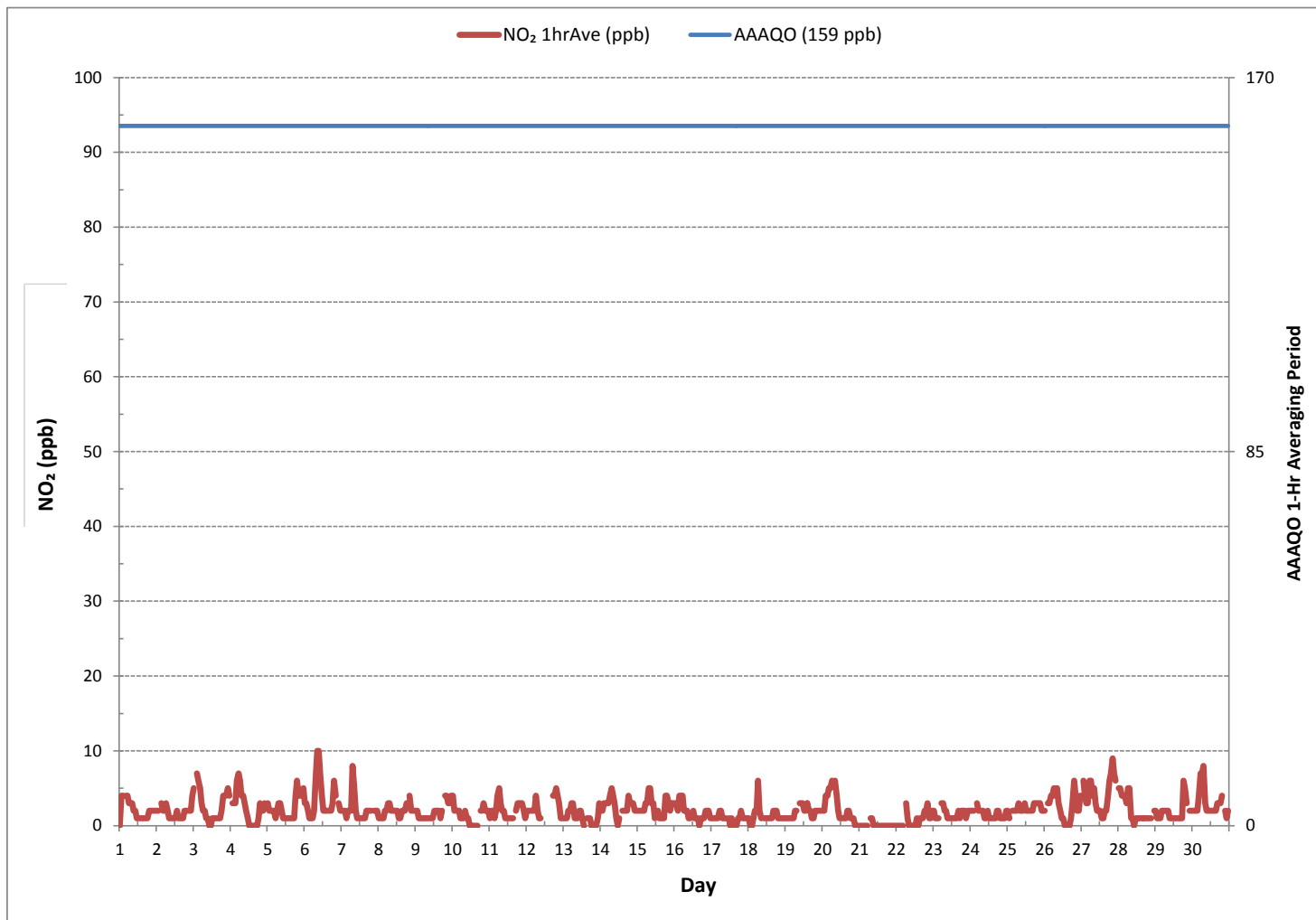
24 HR AVERAGES September 2017





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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

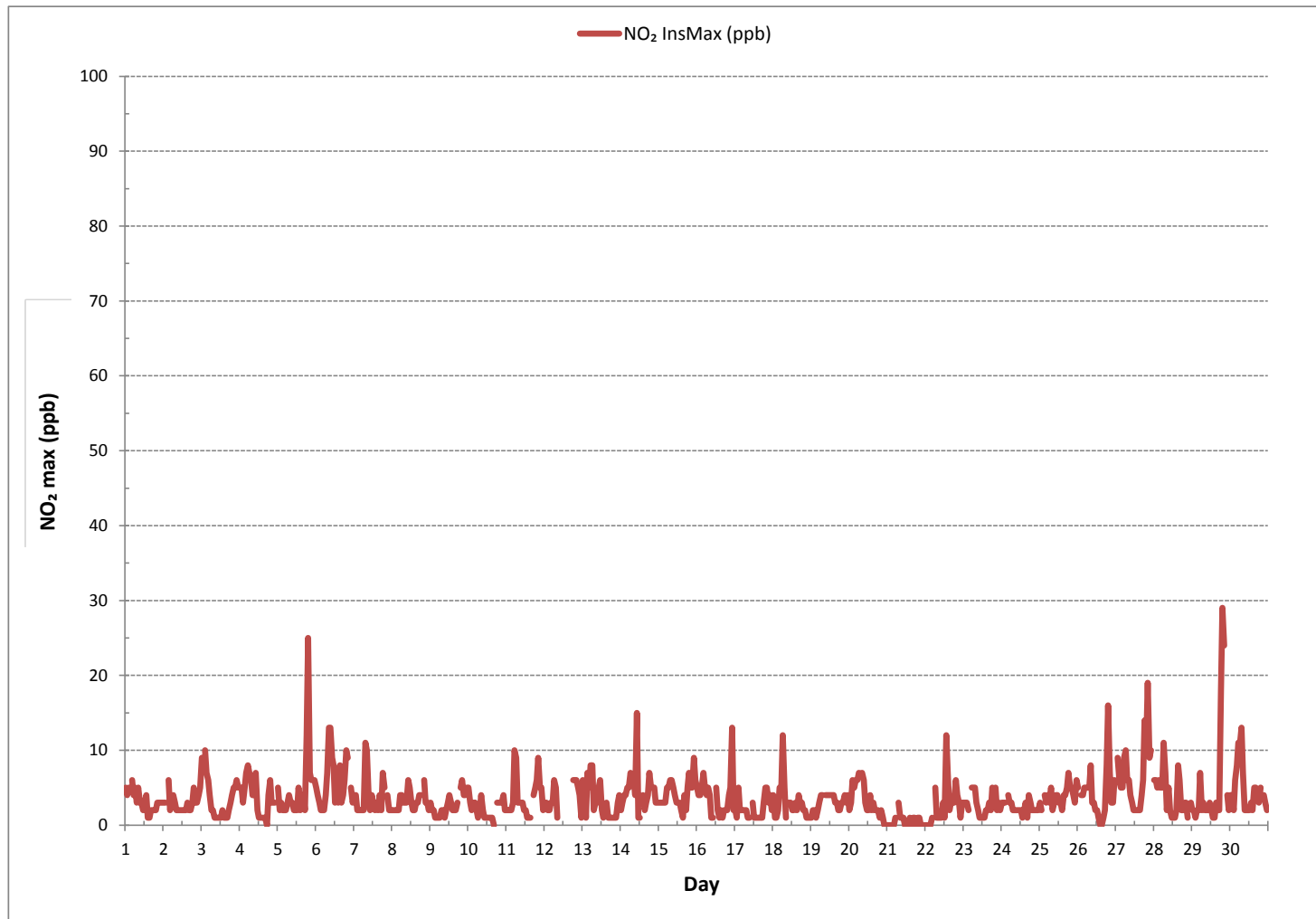
STATUS FLAG CODES

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:	657
MAXIMUM INSTANTANEOUS VALUE:	29 ppb @ HOUR 19 ON DAY 29
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	720 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



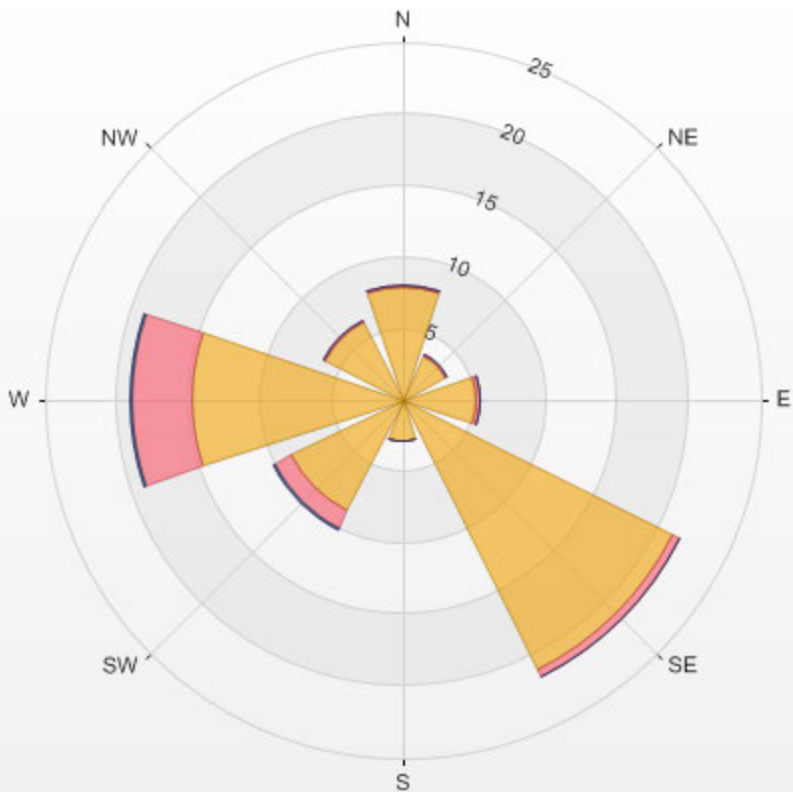
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.94% Calm Avg: 3.01 [ppb]

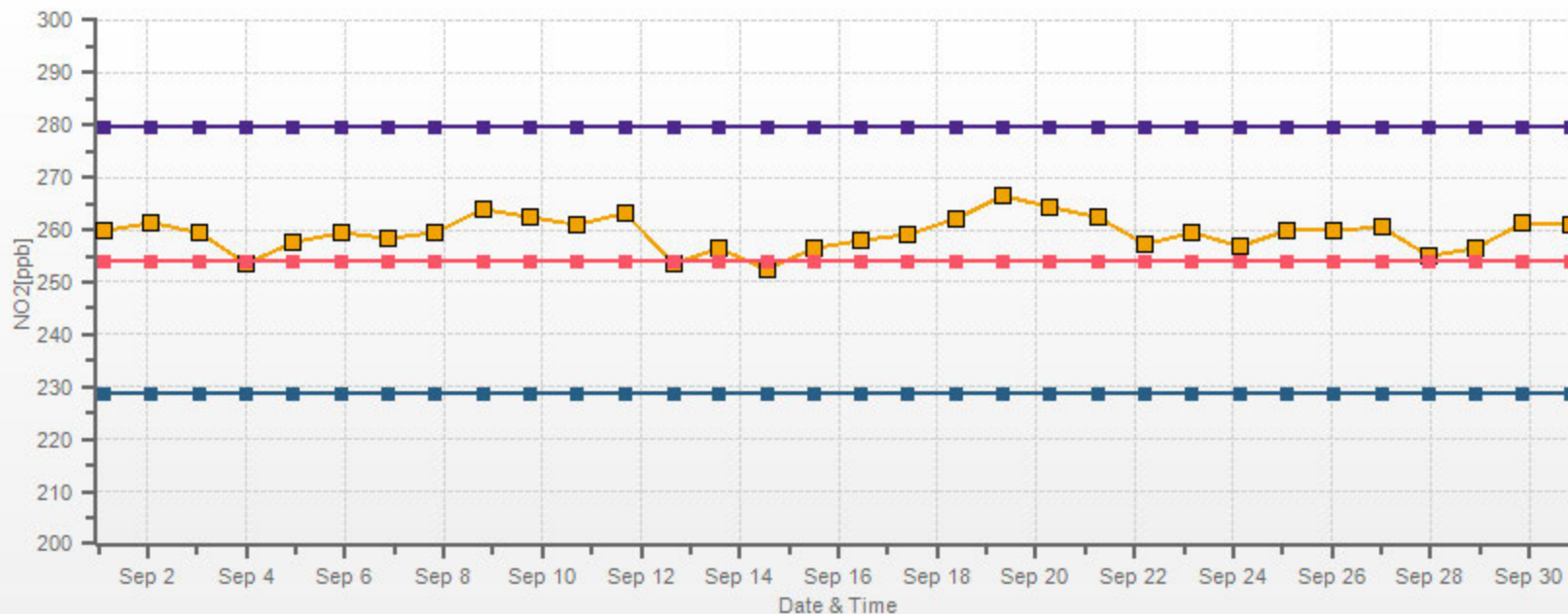
Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	7.9	0.2	0.0	0.0	8.1
NE	3.4	0.2	0.0	0.0	3.5
E	5.2	0.3	0.0	0.0	5.4
SE	21.0	0.6	0.0	0.0	21.6
S	2.9	0.0	0.0	0.0	2.9
SW	8.7	1.3	0.2	0.0	10.2
W	14.7	4.3	0.2	0.0	19.1
NW	6.0	0.2	0.0	0.0	6.2
Summary	69.9	6.9	0.3	0.0	77.1

% Icon	Classes (ppb)	70	0.0-3.7	7	3.7-7.3	0	7.3-11.0	0	>11.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.94% Calm Poll Avg: 3.01[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



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

OZONE



OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	17.8	18.3	18.8	S	21.0	19.3	18.4	21.4	23.3	26.5	29.3	31.7	38.5	39.5	41.5	43.4	42.1	39.4	36.9	33.6	31.4	28.0	25.1	25.4	17.8	43.4	29.2	24
2	24.6	22.9	S	21.5	21.1	18.2	17.8	19.7	23.3	26.6	27.7	27.5	23.8	22.6	25.1	25.0	23.1	21.2	16.2	8.6	6.1	7.1	8.3	6.9	6.1	27.7	19.3	24
3	7.1	S	5.8	5.6	8.3	12.2	14.6	17.8	24.4	27.5	28.9	29.9	31.2	31.0	29.4	28.5	26.2	25.5	22.4	17.4	14.9	12.7	9.9	12.4	5.6	31.2	19.3	24
4	S	13.7	12.7	14.6	12.3	10.6	10.0	14.1	16.7	20.4	25.0	26.8	26.7	26.4	27.2	27.4	27.4	26.7	23.4	14.1	11.0	6.9	5.0	S	5.0	27.4	18.1	24
5	3.3	2.7	1.6	0.8	0.7	0.4	0.8	4.7	15.4	22.3	34.2	43.1	46.2	48.7	48.8	47.9	46.8	44.1	29.7	18.9	14.4	10.1	S	4.7	0.4	48.8	21.3	24
6	2.9	1.9	1.7	1.0	0.8	0.6	0.9	5.8	10.3	19.9	35.0	49.2	54.0	56.0	59.2	59.1	57.9	53.0	39.4	23.9	19.4	S	10.3	5.9	0.6	59.2	24.7	24
7	3.6	2.0	1.1	0.8	0.5	0.5	0.6	2.4	22.0	34.0	36.1	47.5	52.5	56.9	62.4	64.5	63.6	59.0	51.2	44.8	S	39.8	40.1	38.2	0.5	64.5	31.5	24
8	31.6	23.8	20.5	14.6	20.9	14.8	23.6	25.8	26.3	30.0	34.3	40.2	44.0	46.6	48.4	47.9	43.4	40.9	36.7	S	32.1	33.9	31.4	30.6	14.6	48.4	32.3	24
9	29.4	28.9	26.5	24.6	25.5	26.9	26.5	25.5	26.5	27.0	28.0	28.6	29.4	30.0	30.5	28.6	27.6	24.7	S	18.3	16.6	14.6	17.0	15.3	14.6	30.5	25.1	24
10	13.2	11.3	15.3	15.5	17.0	21.9	24.6	22.1	20.5	22.5	25.0	26.8	27.2	27.9	28.7	28.6	28.4	S	25.4	21.5	18.7	18.6	16.7	11.7	11.3	28.7	21.3	24
11	11.8	16.3	16.2	13.3	6.7	4.3	9.3	13.9	17.8	23.9	31.7	36.1	38.4	40.4	42.7	44.7	S	38.0	26.3	18.8	12.8	13.2	29.1	27.0	4.3	44.7	23.2	24
12	19.6	20.9	20.9	23.7	23.1	22.7	22.0	22.5	25.5	26.3	26.9	27.5	27.6	28.0	28.2	S	27.7	26.0	20.3	12.1	8.4	7.7	17.8	21.1	7.7	28.2	22.0	24
13	18.1	13.9	8.4	5.5	3.7	5.4	11.6	22.8	23.8	23.4	C	C	C	Y	Y	Y	23.6	24.9	22.7	23.1	24.2	23.9	20.8	17.5	3.7	24.9	17.6	21
14	18.5	17.0	14.6	8.7	6.5	6.1	7.7	7.8	9.7	19.4	26.4	27.7	27.4	S	27.4	27.7	26.1	23.5	13.6	7.6	5.8	3.9	3.5	2.5	2.5	27.7	14.7	24
15	0.9	0.5	0.7	0.4	0.3	0.2	0.8	2.3	3.9	10.6	18.2	25.4	S	30.7	31.9	32.6	32.5	30.8	18.9	13.7	11.6	9.7	4.7	4.2	0.2	32.6	12.4	24
16	1.4	1.5	1.4	0.4	0.2	0.3	0.4	2.6	16.3	20.7	22.1	S	28.2	29.3	29.5	29.5	30.1	28.6	25.8	20.3	15.1	13.3	17.7	19.5	0.2	30.1	15.4	24
17	19.0	19.2	19.0	17.3	15.5	14.2	14.3	15.5	17.5	20.2	S	28.1	29.0	29.9	30.7	31.3	31.6	31.4	28.6	23.0	26.2	27.0	25.2	25.3	14.2	31.6	23.4	24
18	24.8	23.7	23.8	23.8	22.3	20.9	17.8	20.9	24.7	S	29.1	29.6	30.4	30.2	30.7	30.8	30.1	29.5	29.0	29.2	29.4	29.6	28.7	28.1	17.8	30.8	26.8	24
19	27.4	26.5	25.8	25.1	24.0	23.0	21.7	21.3	S	19.2	16.8	15.6	14.8	13.4	15.4	17.1	16.6	18.0	15.4	13.7	7.8	6.5	5.1	2.9	2.9	27.4	17.1	24
20	3.3	2.7	4.7	3.4	3.0	1.6	2.0	S	9.4	13.4	18.2	21.6	24.0	25.6	26.7	26.7	20.6	20.9	21.4	16.6	12.9	13.6	17.1	18.1	1.6	26.7	14.2	24
21	19.4	18.2	18.4	18.9	19.2	19.2	S	18.2	18.5	18.8	19.3	19.5	19.6	19.8	19.6	18.6	18.1	17.8	17.2	15.9	16.6	17.8	17.9	18.9	15.9	19.8	18.5	24
22	19.7	20.3	20.0	18.2	18.6	S	19.7	19.6	20.8	22.6	23.1	22.7	22.3	21.1	23.9	22.8	21.0	16.4	10.1	12.6	10.8	6.9	3.5	2.2	2.2	23.9	17.3	24
23	1.0	1.0	2.1	4.6	S	3.7	1.2	4.7	8.0	11.9	19.0	22.9	21.5	23.5	25.3	23.9	24.0	21.3	16.0	17.1	17.1	17.6	15.5	13.3	1.0	25.3	13.7	24
24	12.9	11.6	12.2	S	12.3	12.3	11.8	11.9	12.3	12.5	16.7	18.5	20.4	20.3	23.6	23.1	22.3	21.6	20.7	22.3	23.1	22.1	22.5	23.4	11.6	23.6	18.0	24
25	24.2	24.9	S	24.9	24.1	22.4	21.5	19.2	19.8	19.9	20.9	19.7	20.1	21.0	22.2	22.2	22.4	19.8	16.4	13.4	11.9	10.5	9.9	5.9	5.9	24.9	19.0	24
26	4.7	S	4.8	8.4	11.9	10.6	9.8	9.2	10.0	14.1	18.5	21.2	24.9	30.2	32.8	32.2	32.1	31.7	26.0	16.1	10.2	10.8	8.0	7.7	4.7	32.8	16.8	24
27	S	2.6	1.4	1.2	2.0	1.4	2.6	5.5	10.1	17.1	24.0	24.8	27.2	28.1	27.8	26.1	25.4	22.3	15.0	10.1	6.5	5.8	3.1	S	1.2	28.1	13.2	24
28	2.3	1.4	2.2	4.6	5.2	11.6	10.9	14.3	18.7	19.9	21.9	25.0	29.1	31.4	32.6	33.9	35.3	34.0	31.1	30.2	30.6	29.3	S	29.0	1.4	35.3	21.1	24
29	28.3	27.2	26.8	25.4	23.9	22.4	21.3	20.9	21.1	23.5	27.7	31.8	34.6	38.4	39.5	40.7	41.9	41.0	32.5	33.8	37.1	S	37.3	36.1	20.9	41.9	31.0	24
30	31.4	25.9	27.6	15.9	11.6	6.1	5.3	4.4	23.7	26.7	29.1	31.7	34.8	37.7	40.7	41.6	39.5	31.4	27.6	23.8	S	30.2	31.9	30.6	4.4	41.6	26.5	24
HOURLY MAX	31.6	28.9	27.6	25.4	25.5	26.9	26.5	25.8	26.5	34.0	36.1	49.2	54.0	56.9	62.4	64.5	63.6	59.0	51.2	44.8	37.1	39.8	40.1	38.2				
HOURLY AVG	15.1	14.3	12.7	12.2	12.5	11.5	12.1	14.4	17.9	21.4	25.5	28.6	30.3	31.7	32.8	33.1	31.3	29.8	24.7	19.8	17.2	16.8	17.3	17.3				

STATUS FLAG CODES

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

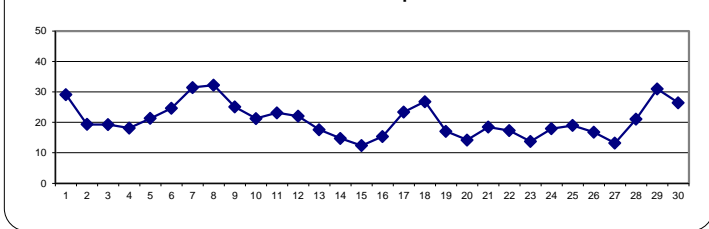
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

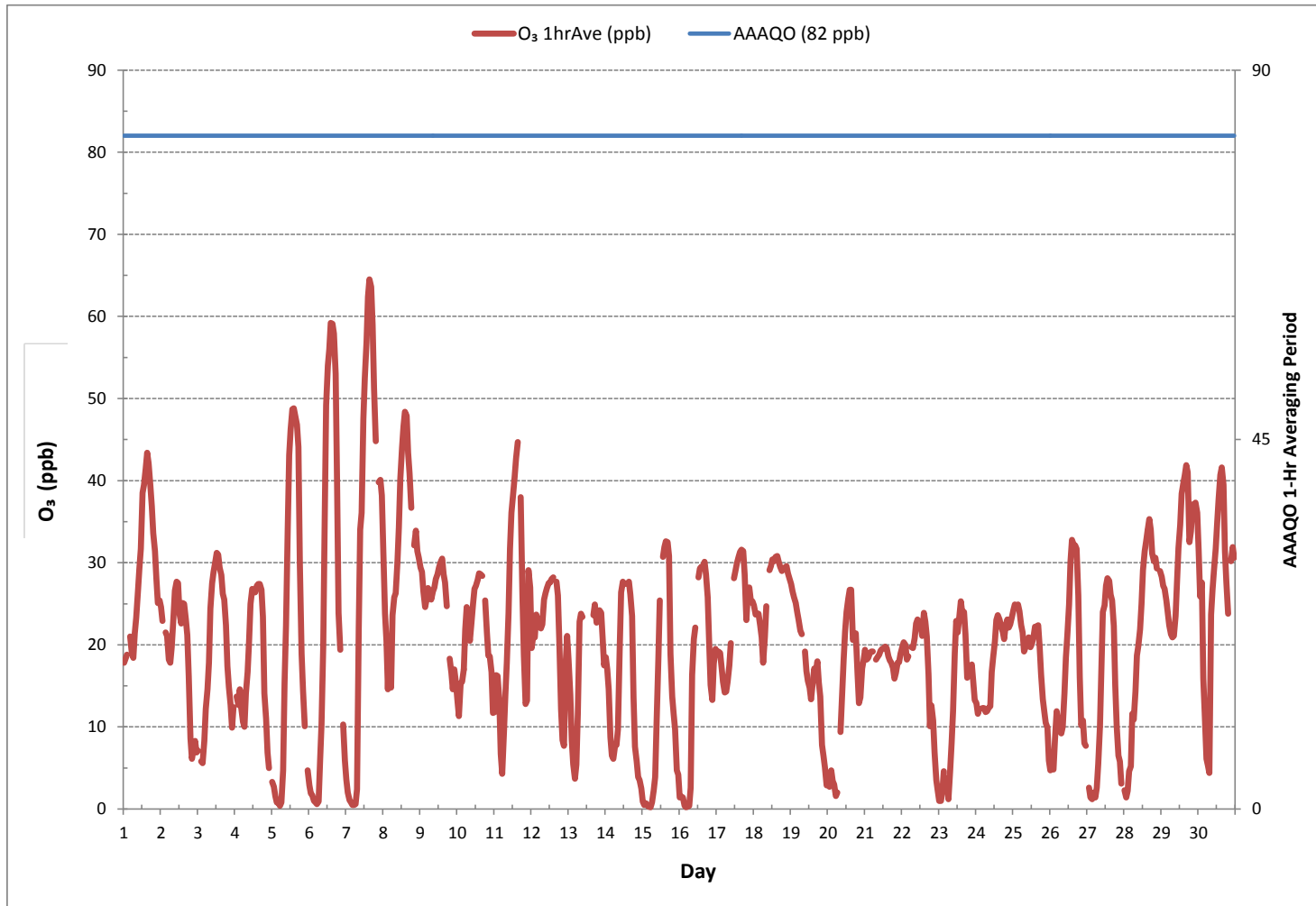
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	683				
MINIMUM 1-HR AVERAGE:	0.2 ppb	@ HOUR	5	ON DAY	15
MAXIMUM 1-HR AVERAGE:	64.5 ppb	@ HOUR	15	ON DAY	7
MAXIMUM 24-HR AVERAGE:	32.3 ppb			ON DAY	8
I2S CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	717	hrs
MONTHLY CALIBRATION TIME:	3	hrs	AMD OPERATION UPTIME:	99.6	%
STANDARD DEVIATION:	11.8		MONTHLY AVERAGE:	20.8	ppb

24 HR AVERAGES September 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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	18.9	19.4	19.3	S	21.1	20.4	18.9	23.4	24.5	27.8	30.2	34.5	40.7	40.6	43.0	44.3	43.7	41.9	38.4	34.3	32.5	30.2	27.5	26.6	18.9	44.3	30.5	24
2	25.3	24.1	S	22.2	21.9	19.4	18.6	22.2	25.3	27.8	28.7	28.4	25.1	23.7	26.5	26.4	24.2	22.8	20.0	11.4	9.4	8.7	9.3	7.9	7.9	28.7	20.8	24
3	8.2	S	6.3	6.1	10.2	13.0	15.3	22.2	27.4	29.2	30.2	30.9	32.4	31.9	29.8	29.9	29.6	27.7	23.7	19.3	15.6	14.2	10.7	14.8	6.1	32.4	20.8	24
4	S	15.1	13.3	15.3	13.5	12.3	12.0	15.4	17.4	22.5	26.9	27.7	27.8	27.1	28.9	28.7	28.4	27.2	26.6	17.7	13.5	9.8	6.1	S	6.1	28.9	19.7	24
5	4.7	3.6	1.5	0.9	1.0	0.3	0.9	10.5	17.8	27.8	38.1	45.4	49.0	49.6	50.1	49.3	48.2	47.3	41.5	29.5	21.3	15.0	S	7.3	0.3	50.1	24.4	24
6	3.7	2.3	2.1	1.2	0.9	0.6	3.1	6.3	15.7	28.7	43.1	53.1	56.1	58.4	60.4	61.3	59.7	58.7	X	31.1	25.9	S	18.1	9.1	0.6	61.3	27.3	23
7	5.0	3.7	1.0	0.7	0.2	0.2	0.5	4.6	34.5	35.9	40.5	52.2	53.8	61.3	64.5	65.5	65.7	61.8	55.2	46.6	S	40.0	40.3	39.7	0.2	65.7	33.6	24
8	37.7	28.3	27.1	19.7	25.2	22.2	25.9	26.3	28.4	32.0	38.2	43.1	46.2	48.1	50.2	50.1	46.9	43.1	37.5	S	32.7	34.6	32.5	30.8	19.7	50.2	35.1	24
9	30.2	29.3	27.7	24.9	26.0	27.1	26.9	26.6	27.1	27.2	29.2	29.3	30.3	30.9	31.4	29.9	28.6	27.5	S	20.7	20.3	17.5	18.4	18.0	17.5	31.4	26.3	24
10	14.5	13.3	17.1	15.7	17.8	23.9	25.9	23.0	21.6	24.5	26.5	27.2	27.5	28.7	29.0	29.0	28.7	S	26.6	23.6	19.6	19.3	19.5	16.0	13.3	29.0	22.5	24
11	17.7	17.4	16.7	16.9	9.9	6.4	13.6	14.8	21.5	27.7	34.6	38.0	39.2	41.8	43.6	45.7	S	40.9	33.1	23.4	16.9	23.6	30.0	29.6	6.4	45.7	26.2	24
12	23.4	22.2	23.0	25.3	23.9	24.1	23.7	25.1	26.0	27.8	28.3	28.1	28.7	28.9	S	28.6	27.4	24.8	16.7	12.5	9.9	20.7	21.8	9.9	28.9	23.9	24	
13	20.4	18.4	11.7	8.4	5.6	7.4	21.5	24.1	24.5	C	C	C	C	Y	Y	Y	Y	27.1	24.3	24.8	25.1	24.7	23.1	19.8	5.6	27.1	19.4	20
14	20.0	18.0	16.6	12.2	10.5	9.2	10.4	8.9	13.9	26.2	29.0	29.3	29.6	S	28.9	29.3	27.4	26.0	18.6	10.4	7.7	6.1	6.4	4.0	4.0	29.6	17.3	24
15	1.8	0.6	0.9	0.5	0.5	0.3	1.3	2.8	8.2	14.2	20.3	27.8	S	32.4	33.6	33.1	33.6	33.1	28.1	19.3	15.6	12.8	7.7	7.3	0.3	33.6	14.6	24
16	2.5	2.1	2.5	0.6	0.5	0.9	0.9	6.4	19.6	21.6	24.2	S	29.0	30.5	30.3	30.8	30.9	30.2	27.7	23.9	18.3	18.1	19.2	20.0	0.5	30.9	17.0	24
17	19.2	19.6	19.6	18.1	16.3	14.7	14.5	16.3	20.0	22.1	S	29.2	29.8	30.5	31.6	31.8	32.2	31.9	31.4	24.5	27.2	27.8	26.3	25.9	14.5	32.2	24.4	24
18	25.5	24.1	24.5	24.7	23.4	22.4	20.3	23.0	26.0	S	30.1	30.6	31.1	30.8	31.7	32.2	31.6	30.1	29.5	29.6	29.8	29.9	29.2	28.4	20.3	32.2	27.8	24
19	27.7	26.9	26.4	25.5	24.7	23.9	22.9	22.2	S	21.2	18.6	16.3	16.2	14.5	18.7	18.7	17.7	20.3	18.9	17.5	11.1	8.7	7.9	4.9	4.9	27.7	18.8	24
20	5.5	5.3	6.1	5.8	4.2	2.9	3.4	S	12.6	15.9	20.0	23.6	25.4	26.9	27.4	28.3	21.5	22.8	23.3	19.2	13.6	17.2	17.7	20.3	2.9	28.3	16.0	24
21	20.6	18.9	18.9	19.3	19.6	19.6	S	18.9	19.0	19.5	20.0	20.3	20.2	20.4	20.3	19.6	19.3	18.7	17.7	17.2	17.7	18.7	18.9	19.4	17.2	20.6	19.2	24
22	20.6	20.7	21.0	19.2	20.3	S	21.0	22.5	22.1	23.6	24.8	23.6	23.1	23.9	25.1	24.1	22.7	20.0	13.8	15.4	14.1	9.6	5.3	5.5	5.3	25.1	19.2	24
23	1.5	2.3	2.8	7.9	S	5.8	1.8	6.3	11.3	15.1	24.9	25.2	22.8	26.9	26.8	25.5	25.1	24.0	18.4	19.6	18.4	18.5	16.8	14.6	1.5	26.9	15.8	24
24	13.5	12.2	13.1	S	13.2	13.0	12.0	12.2	12.7	13.2	18.3	19.9	21.4	24.1	24.5	23.9	22.8	23.0	21.5	23.3	23.6	22.7	22.9	24.1	12.0	24.5	18.7	24
25	25.6	25.6	S	25.3	25.2	23.9	23.1	20.8	20.7	21.4	21.6	20.8	20.9	21.6	23.9	23.3	24.1	23.4	20.4	16.7	15.6	13.3	14.5	10.2	10.2	25.6	21.0	24
26	8.5	S	9.0	14.1	12.7	11.2	11.0	10.9	11.6	16.7	20.1	22.7	30.6	31.8	37.4	33.1	32.8	33.0	30.8	22.4	15.0	13.8	11.0	10.8	8.5	37.4	19.6	24
27	S	5.8	1.8	2.1	4.2	2.1	5.2	8.8	11.7	23.3	24.9	26.3	28.0	29.0	29.3	27.4	26.9	25.3	19.9	15.6	11.7	8.0	7.3	S	1.8	29.3	15.7	24
28	4.5	1.8	4.3	8.4	7.6	17.5	15.7	16.2	19.7	21.5	23.1	27.5	30.3	32.7	33.1	35.1	36.0	35.4	32.5	30.8	30.9	30.2	S	29.2	1.8	36.0	22.8	24
29	28.9	27.8	27.1	26.1	24.5	23.1	21.6	21.2	21.3	25.6	30.2	33.4	37.2	39.0	40.2	41.7	42.3	42.1	39.7	37.4	37.8	S	37.7	36.8	21.2	42.3	32.3	24
30	35.2	33.0	33.3	20.9	16.2	9.8	8.4	14.2	26.2	27.7	31.1	33.4	36.2	40.2	41.5	43.4	43.1	33.9	29.2	26.0	S	31.4	32.4	31.6	8.4	43.4	29.5	24
HOURLY MAX	37.7	33.0	33.3	26.1	26.0	27.1	26.9	26.6	34.5	35.9	43.1	53.1	56.1	61.3	64.5	65.5	65.7	61.8	55.2	46.6	37.8	40.0	40.3	39.7				
HOURLY AVG	16.8	15.8	14.1	13.9	13.8	13.0	13.8	16.4	20.3	23.8	27.7	30.3	31.7	33.1	34.2	34.3	32.9	32.0	27.6	23.0	19.8	19.1	19.2	19.1				

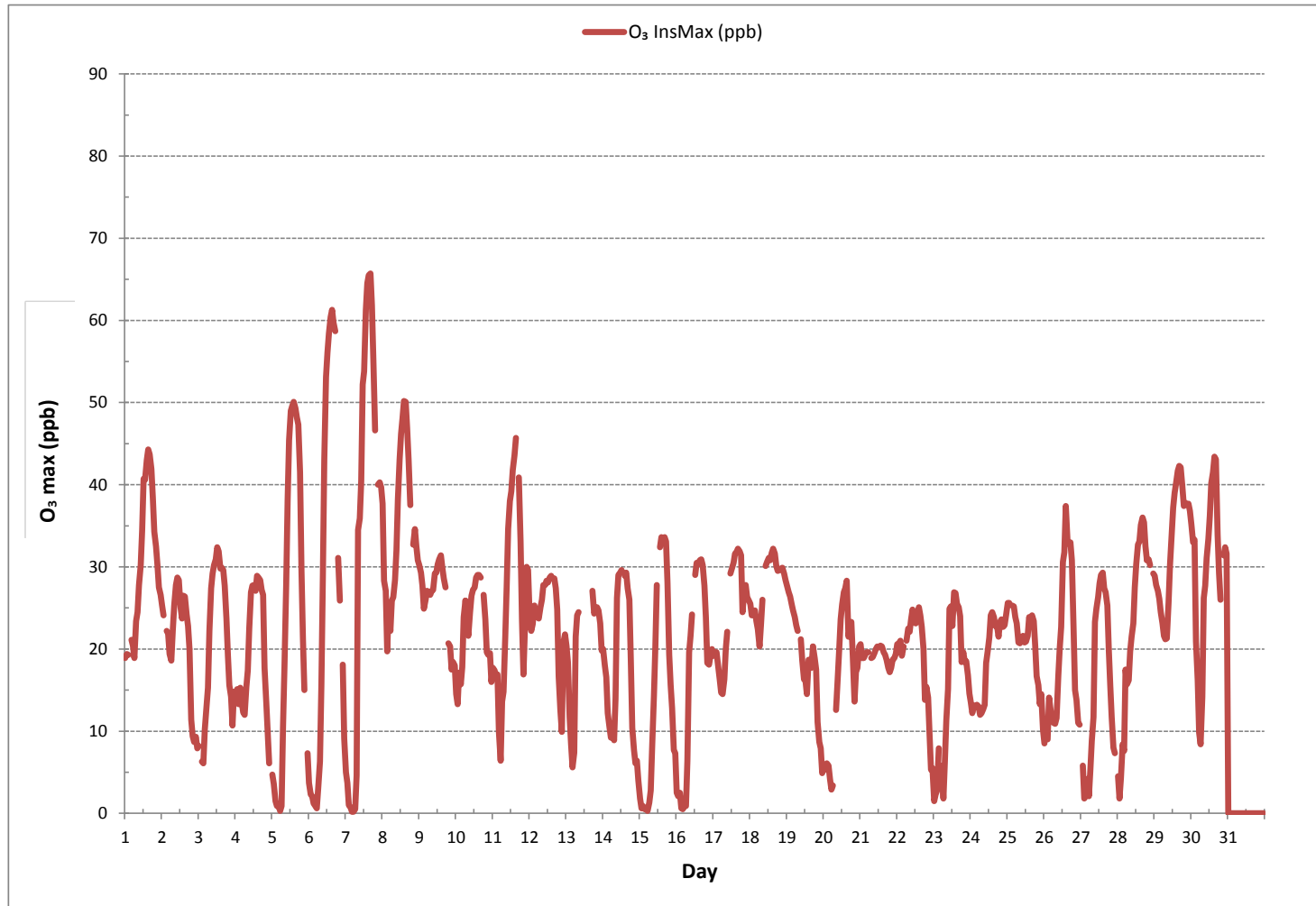
STATUS FLAG CODES

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:	680
MAXIMUM INSTANTANEOUS VALUE:	65.7 ppb @ HOUR 16 ON DAY 7
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	11.9
OPERATIONAL TIME:	715 hrs

OZONE Instantaneous Maximum (O₃ ppb)



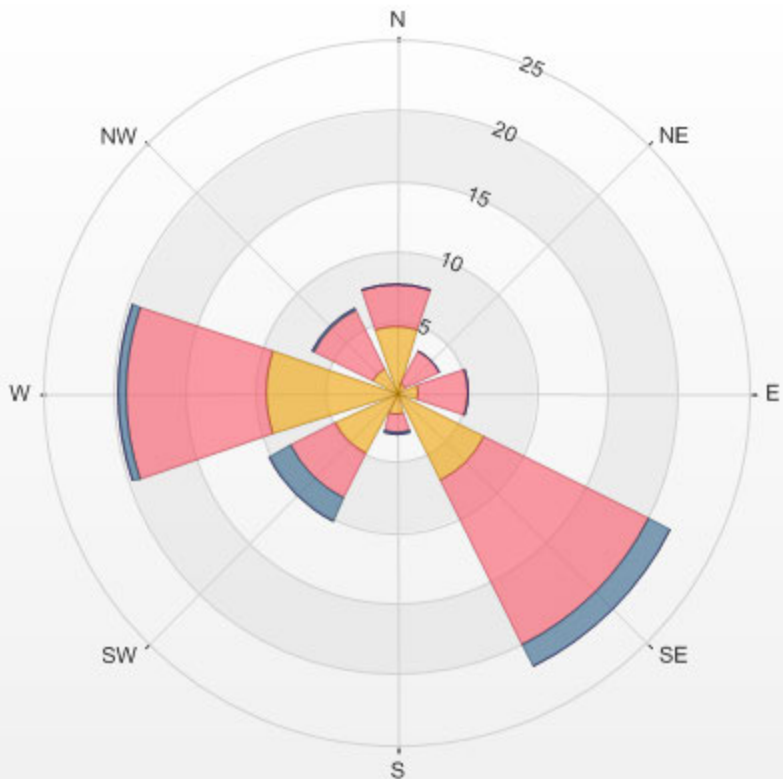
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-O3[ppb]
Monthly: 17/09
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 22.65% Calm Avg: 8.45 [ppb]

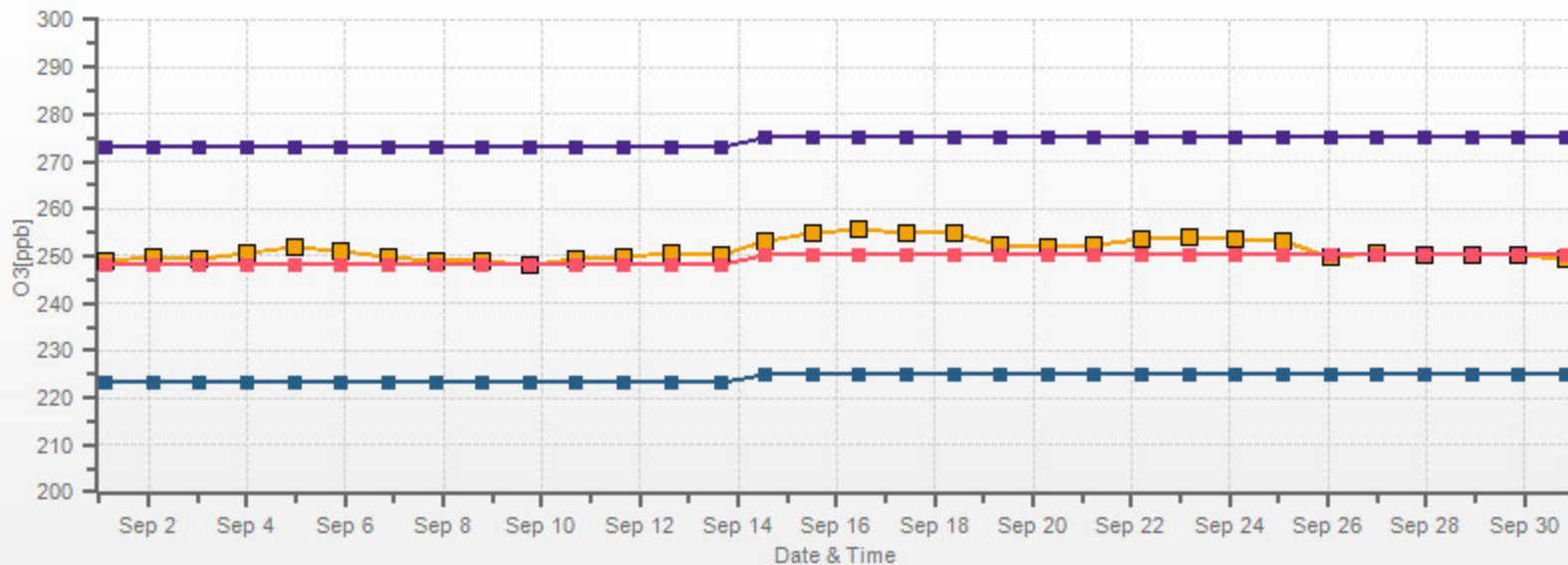
Direction	0.0-21.5	21.5-43.1	43.1-64.6	>64.6	Total
N	4.7	2.9	0.0	0.0	7.7
NE	0.7	2.7	0.0	0.0	3.4
E	1.6	3.5	0.0	0.0	5.2
SE	6.9	13.1	1.6	0.0	21.6
S	1.6	1.2	0.2	0.0	3.0
SW	4.9	3.5	1.8	0.0	10.1
W	9.3	10.0	0.4	0.0	19.7
NW	1.9	4.7	0.2	0.0	6.8
Summary	31.6	41.6	4.1	0.0	77.4

% Icon	Classes (ppb)	32	42	4	0
	0.0-21.5				
	21.5-43.1				
	43.1-64.6				
	>64.6				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.65% Calm Poll Avg: 8.45[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/09 Type: Span



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

PARTICULATE MATTER 2.5



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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	6	4	3	2	2	2	2	1	1	1	1	1	1	1	3	4	6	30	39	40	41	42	42	41	1	42	13	24
2	35	26	19	14	13	14	11	8	5	3	2	2	4	5	4	3	3	3	3	4	4	3	3	4	2	35	8	24
3	3	3	3	4	3	3	2	2	1	1	1	0	0	1	1	2	3	3	3	3	4	4	5	5	0	5	3	24
4	4	4	4	5	5	5	4	3	2	2	1	2	2	1	1	1	1	1	1	2	3	3	4	4	1	5	3	24
5	3	3	3	3	3	3	3	4	4	4	3	2	2	2	2	3	3	5	8	11	12	11	14	2	14	5	24	
6	13	12	11	9	8	7	8	8	9	8	6	6	5	5	5	6	6	8	11	14	14	13	13	5	14	9	24	
7	13	13	12	11	11	10	11	14	13	9	8	7	4	4	5	6	7	8	9	11	12	12	11	11	4	14	10	24
8	11	12	14	13	31	44	116	115	90	71	60	47	32	22	17	18	21	26	20	19	15	14	20	18	11	116	36	24
9	31	37	34	32	27	23	24	28	29	30	36	43	46	49	53	47	45	49	51	56	54	48	36	23	56	40	24	
10	34	31	31	28	17	5	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	34	6	24	
11	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	1	24
12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	0	24
13	1	1	1	1	1	1	1	0	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	2	1	24
14	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	24
15	1	1	1	1	1	1	1	2	2	2	2	1	1	1	0	0	0	0	1	2	3	2	3	4	0	4	1	24
16	5	7	5	8	8	6	6	5	3	3	2	1	1	1	1	1	1	1	1	1	2	2	1	2	1	8	3	24
17	2	4	7	9	11	14	17	16	12	10	7	4	4	4	3	2	2	2	2	3	4	4	3	4	2	17	6	24
18	6	8	10	9	9	8	10	10	7	6	6	5	5	6	6	6	6	7	7	6	5	4	4	4	4	10	7	24
19	3	4	4	6	6	7	7	7	6	6	6	6	5	5	8	3	1	1	0	1	1	1	2	2	0	8	4	24
20	2	3	3	3	4	4	4	4	5	3	C	1	1	0	0	0	1	1	1	0	0	0	0	0	5	2	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	24
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	0	24
23	1	1	0	0	0	0	0	0	0	0	0	0	1	1	3	2	1	2	3	2	1	1	2	4	0	4	1	24
24	4	5	5	5	4	3	3	3	3	3	3	3	3	2	2	2	2	2	4	3	4	4	3	3	2	5	3	24
25	2	2	2	2	2	3	3	3	3	2	2	3	2	2	2	2	1	1	1	1	1	1	1	1	1	3	2	24
26	1	1	1	1	2	2	2	2	2	1	1	1	1	1	0	0	1	1	2	2	3	2	2	3	0	3	1	24
27	3	3	3	3	3	3	3	2	3	2	2	2	2	1	2	2	3	3	4	6	7	8	10	7	1	10	4	24
28	6	7	7	5	5	5	6	6	4	2	2	1	1	1	1	1	1	1	3	3	4	5	5	5	1	7	4	24
29	5	5	5	6	5	6	6	6	5	4	3	3	2	1	1	2	2	5	5	5	5	6	6	1	6	6	4	24
30	6	7	6	6	7	7	8	9	5	4	3	3	3	3	2	3	6	8	8	7	5	2	2	2	2	9	5	24
HOURLY MAX	35	37	34	32	31	44	116	115	90	71	60	47	46	49	53	47	45	49	51	56	54	48	42	41				
HOURLY AVG	7	7	6	6	6	6	9	9	7	6	5	5	4	4	4	4	4	5	6	7	7	7	7	7				

STATUS FLAG CODES

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

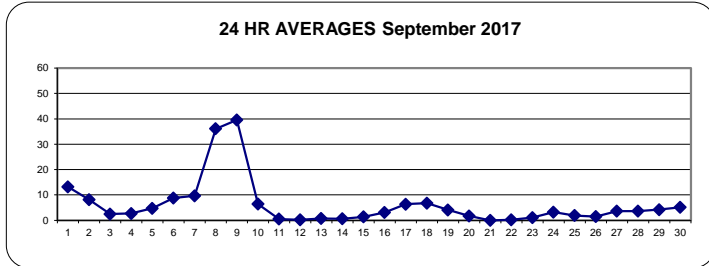
OBJECTIVE LIMIT:

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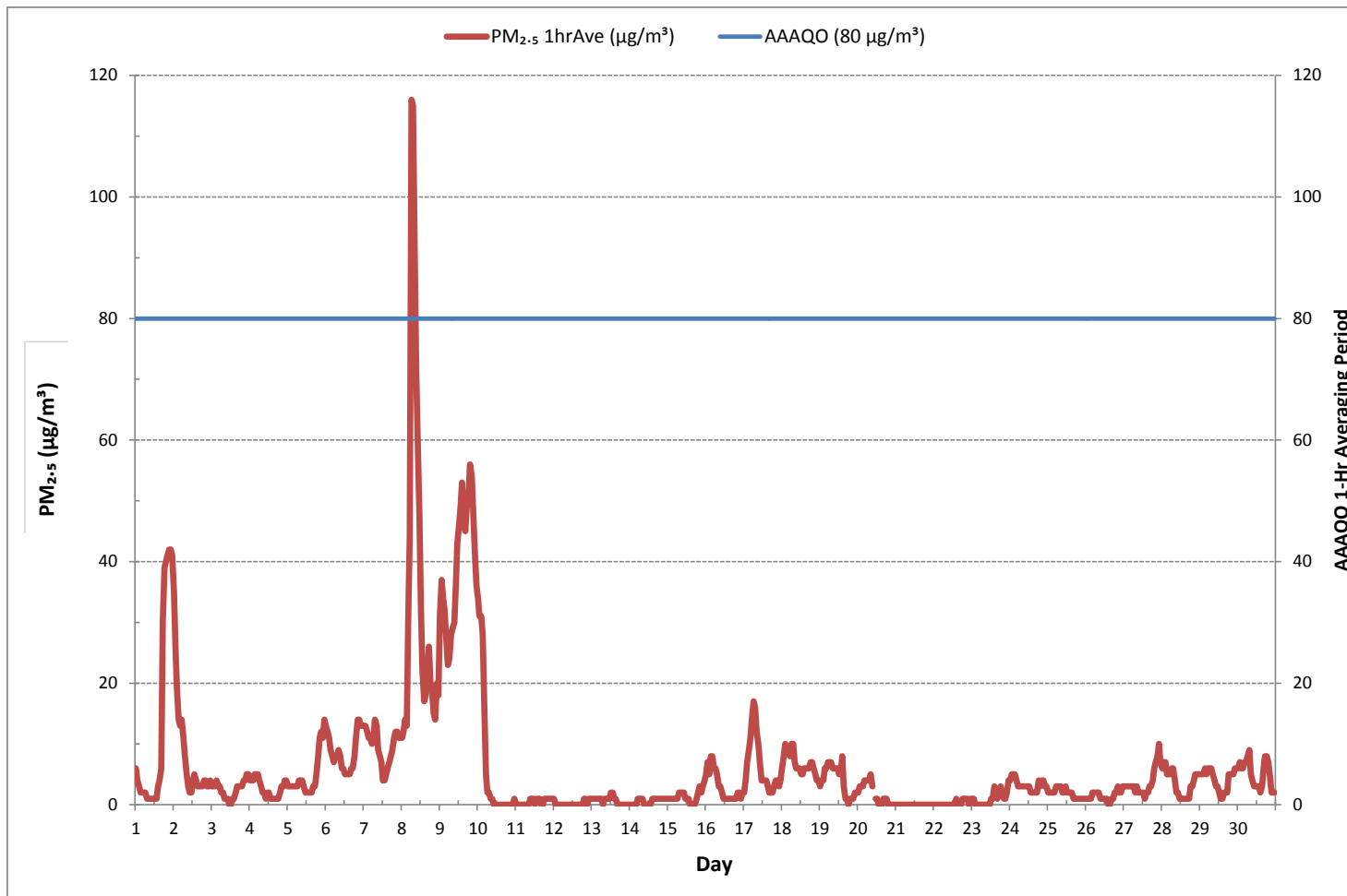
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	3				
NUMBER OF 24-HR EXCEEDANCES:	2				
NUMBER OF NON-ZERO READINGS:	587				
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	11	ON DAY	3	
MAXIMUM 1-HR AVERAGE:	116 µg/m ³ @ HOUR	6	ON DAY	8	
MAXIMUM 24-HR AVERAGE:	40 µg/m ³		ON DAY	9	
MONTHLY CALIBRATION TIME:	1	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	12		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	6	µg/m ³

24 HR AVERAGES September 2017



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



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

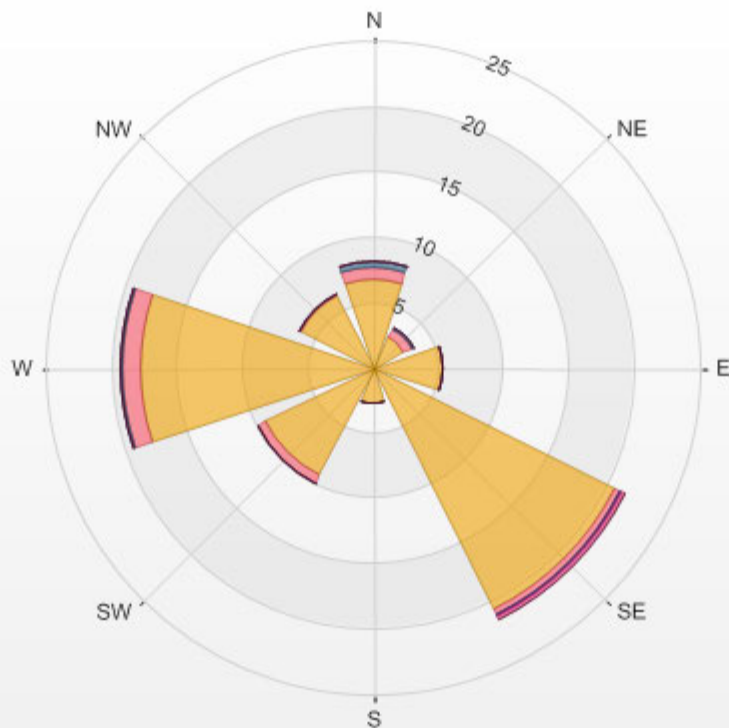
Calm: 22.98%

Calm Avg: 5.62 [ug/m3(L)]

Direction	0.0-23.4	23.4-46.8	46.8-70.2	70.2-93.6	93.6-117.0	>117.0	Total
N	6.8	0.8	0.6	0.0	0.0	0.0	8.2
NE	2.7	0.7	0.1	0.0	0.0	0.0	3.5
E	5.3	0.0	0.0	0.0	0.0	0.0	5.3
SE	20.6	0.4	0.0	0.3	0.3	0.0	21.6
S	2.8	0.0	0.0	0.0	0.0	0.0	2.8
SW	9.2	0.7	0.0	0.0	0.0	0.0	9.9
W	17.8	1.4	0.1	0.0	0.0	0.0	19.4
NW	6.1	0.3	0.0	0.0	0.0	0.0	6.4
Summary	71.3	4.3	0.8	0.3	0.3	0.0	77.0

% Icon	Classes (ug/m3(L))	71	4	1	0	0	0
	0.0-23.4						
	23.4-46.8						
	46.8-70.2						
	70.2-93.6						
	93.6-117.0						
	>117.0						

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.98% Calm Poll Avg: 5.62[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	4.4	4.8	5.3	7.8	8.3	5.9	6.1	8.3	9.1	8.5	11.5	9.5	13.6	14.5	16.3	13.0	11.4	9.4	7.2	5.5	5.2	4.0	3.9	4.2	3.9	16.3	8.1	24				
2	5.4	5.2	5.0	5.5	5.4	4.2	4.9	5.5	7.3	7.0	6.3	6.1	6.1	4.9	6.2	4.4	3.3	3.1	1.7	0.9	1.7	2.3	3.2	3.2	0.9	7.3	4.4	24				
3	3.8	4.8	4.5	5.5	5.1	4.7	4.7	6.7	8.1	9.2	8.7	8.9	8.9	10.8	11.2	10.6	3.9	8.0	7.9	5.9	6.4	6.1	6.2	5.9	3.8	11.2	6.8	24				
4	4.2	3.6	4.0	4.2	3.0	3.5	3.2	3.5	5.1	6.6	9.3	9.4	9.2	8.5	9.2	6.3	6.9	6.0	3.8	3.5	1.8	0.7	0.7	1.0	0.7	9.4	4.3	24				
5	0.3	0.5	0.6	0.4	0.2	0.7	0.0	1.0	2.1	3.6	4.0	5.8	7.4	9.4	8.3	7.8	6.6	3.1	0.8	1.2	0.5	0.4	0.1	0.8	0.0	9.4	2.4	24				
6	0.2	0.8	0.8	0.2	1.1	0.4	0.5	2.3	1.8	3.1	2.7	2.2	1.7	0.7	3.0	4.8	5.0	2.9	1.1	0.8	0.8	0.7	0.6	0.3	0.2	5.0	1.4	24				
7	0.7	0.3	2.0	0.4	0.3	0.5	0.3	1.4	2.9	5.9	8.3	9.4	10.1	10.4	8.1	9.4	8.1	8.2	6.5	4.9	6.6	9.2	8.4	5.0	0.3	10.4	5.1	24				
8	0.7	0.6	1.0	1.6	5.0	0.9	6.1	7.6	7.5	5.6	1.2	3.6	8.5	11.4	7.0	2.5	3.7	8.8	6.0	3.7	6.9	6.0	4.5	4.9	0.6	11.4	2.1	24				
9	5.0	6.8	5.7	5.9	6.8	6.9	5.4	4.3	5.5	6.2	4.8	3.9	1.4	3.7	2.9	4.9	5.7	2.3	1.4	3.5	0.6	2.6	5.6	6.3	0.6	6.9	3.5	24				
10	4.5	5.2	7.5	10.0	10.8	10.6	11.4	10.6	11.2	15.5	15.8	18.0	18.1	18.0	17.8	17.3	15.9	14.3	9.5	4.5	5.0	4.4	2.9	1.9	1.9	18.1	10.7	24				
11	2.6	4.4	3.9	1.5	0.5	0.9	1.8	1.7	3.0	4.7	4.9	5.5	6.1	7.0	6.0	6.8	5.7	3.5	1.3	0.6	0.9	2.0	9.5	5.2	0.5	9.5	2.7	24				
12	3.9	4.7	4.8	7.4	5.0	4.2	4.9	6.9	13.1	9.8	6.8	10.4	12.1	11.5	8.0	8.2	5.1	3.7	2.8	2.3	1.5	0.6	6.7	5.2	0.6	13.1	5.0	24				
13	3.1	1.6	0.3	0.4	0.7	1.2	5.2	10.5	9.5	5.3	3.5	0.8	6.0	9.0	10.1	6.9	6.1	5.2	6.2	6.4	6.5	3.5	1.5	0.3	10.5	3.9	24					
14	2.7	3.0	1.9	1.4	1.7	1.8	1.7	3.7	1.9	2.7	4.0	4.4	3.4	1.3	3.1	3.1	4.3	2.1	0.6	0.5	1.2	0.9	1.0	0.6	0.5	4.4	1.3	24				
15	0.7	1.2	1.0	0.8	0.4	1.1	0.3	1.2	1.2	0.6	2.6	3.1	5.1	3.4	3.4	3.2	2.8	2.6	0.8	1.1	0.4	1.1	0.4	0.4	0.3	5.1	0.7	24				
16	0.3	0.9	0.7	0.9	0.7	0.1	0.8	0.6	5.3	6.5	6.1	10.5	8.8	7.2	4.1	4.5	6.9	7.1	5.3	2.3	1.7	2.3	4.5	5.7	0.1	10.5	3.7	24				
17	6.8	9.1	9.2	8.5	7.9	6.2	6.6	9.3	8.2	9.2	9.6	9.7	10.5	10.6	11.1	13.5	11.4	8.9	4.5	2.9	5.5	6.0	4.4	6.2	2.9	13.5	8.1	24				
18	8.3	7.4	7.4	5.0	3.9	5.2	5.9	6.5	9.2	11.6	11.2	11.4	11.8	10.6	12.1	11.5	10.5	8.4	8.7	8.3	8.1	10.4	10.6	11.3	3.9	12.1	8.7	24				
19	9.5	6.5	7.8	9.2	7.8	7.7	11.3	11.2	9.1	8.7	7.3	7.0	4.2	3.6	6.4	6.7	5.4	3.9	2.0	2.0	0.8	1.3	0.4	1.1	0.4	11.3	3.8	24				
20	0.8	1.4	2.2	1.3	2.3	1.7	1.1	1.9	3.9	6.2	7.2	8.0	9.0	9.4	8.2	7.5	7.3	7.2	4.3	6.7	6.6	7.7	9.3	10.0	0.8	10.0	4.3	24				
21	8.9	7.9	8.8	9.5	10.1	9.6	8.4	8.8	10.8	11.2	11.4	11.9	10.4	9.8	8.8	8.9	9.9	8.4	8.6	7.1	7.9	9.1	8.6	7.5	7.1	11.9	9.2	24				
22	8.5	8.2	7.4	6.1	4.2	2.2	2.3	1.9	7.6	6.3	4.8	4.7	4.8	6.9	4.9	4.5	0.7	0.9	0.8	2.9	0.3	0.2	0.6	0.5	0.2	8.5	3.0	24				
23	0.9	0.6	1.1	1.4	0.5	0.6	1.6	2.2	2.9	5.5	3.6	1.2	1.8	3.2	3.7	2.5	3.2	1.8	2.2	2.8	3.8	5.0	2.8	2.4	0.5	5.5	1.9	24				
24	3.9	2.3	1.9	2.9	5.0	6.1	7.8	7.6	7.9	6.4	4.5	5.2	6.9	5.9	5.1	4.2	3.5	4.0	5.6	7.3	7.3	7.3	7.0	5.3	1.9	7.9	5.1	24				
25	4.4	4.3	3.9	3.2	2.9	1.6	1.8	2.5	2.8	3.2	5.0	3.6	4.0	4.0	4.3	4.1	3.4	1.6	2.2	2.2	1.7	0.6	1.2	0.5	0.5	5.0	2.4	24				
26	0.2	0.8	0.8	3.0	3.9	4.4	5.0	5.2	4.7	7.5	6.7	8.5	9.9	9.6	11.1	10.7	6.3	3.6	2.9	1.4	1.0	1.3	1.1	2.0	0.2	11.1	4.2	24				
27	0.3	0.3	0.4	0.6	0.6	0.4	0.8	2.0	3.5	5.4	5.3	5.4	7.6	6.4	5.5	4.4	3.2	2.3	0.8	1.7	1.2	0.7	0.2	0.4	0.2	7.6	1.6	24				
28	0.5	0.2	0.7	1.2	1.3	2.1	2.3	3.5	7.1	7.4	8.4	7.7	7.0	8.9	8.0	8.0	8.6	7.2	6.3	7.7	10.9	9.4	10.7	10.0	0.2	10.9	5.8	24				
29	10.0	9.1	11.8	10.9	8.6	7.5	8.7	11.6	11.4	13.6	12.3	12.0	11.4	12.3	11.5	10.1	8.4	7.4	2.4	5.0	6.6	7.7	6.2	4.7	2.4	13.6	9.2	24				
30	3.4	3.3	2.0	0.6	0.1	1.6	0.6	1.1	7.0	3.2	3.7	4.0	2.1	1.5	4.4	4.3	5.6	6.5	4.9	4.4	6.4	8.2	9.1	8.6	0.1	9.1	2.2	24				
HOURLY MAX	10.0	9.1	11.8	10.9	10.8	10.6	11.4	11.6	13.1	15.5	15.8	18.0	18.1	18.0	17.8	17.3	15.9	14.3	9.5	8.3	10.9	10.4	10.7	11.3								
HOURLY AVG	0.5	0.4	0.7	0.7	0.6	0.2	0.7	0.5	0.7	1.2	1.3	1.6	1.6	1.8	2.6	2.0	1.7	1.3	0.8	0.5	0.7	0.5	0.1	0.3								

STATUS FLAG CODES

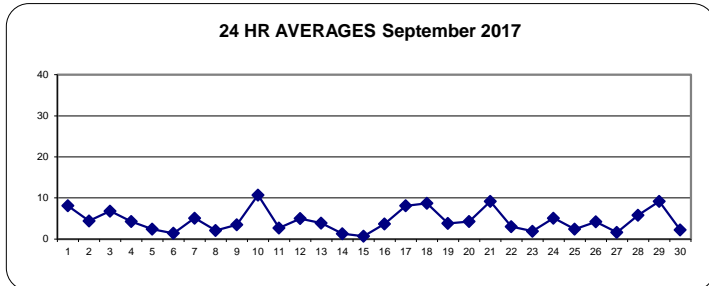
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

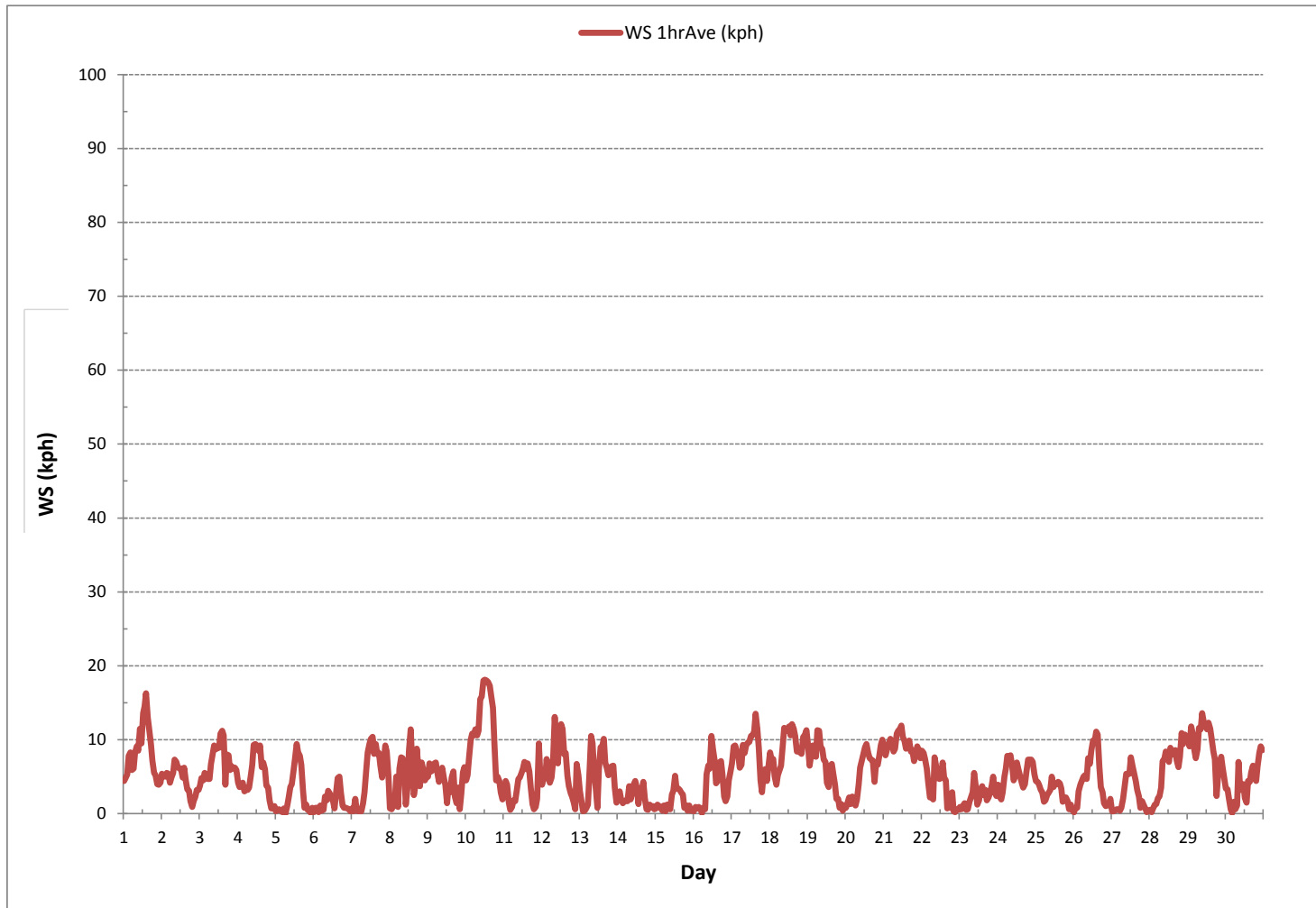
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719
MINIMUM 1-HR AVERAGE	0.0 kph @ HOUR 6 ON DAY 5
MAXIMUM 1-HR AVERAGE:	18.1 kph @ HOUR 12 ON DAY 10
MAXIMUM 24-HR AVERAGE:	10.7 kph ON DAY 10
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.6
MONTHLY AVERAGE:	0.8 kph

24 HR AVERAGES September 2017



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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	6.4	7.6	7.8	10.6	11.2	8.7	10.4	13.4	14.2	15.0	20.2	16.3	22.2	21.3	25.3	22.4	18.0	15.1	14.1	8.5	8.2	8.0	6.1	6.9	6.1	25.3	13.2	24
2	7.1	7.8	7.6	8.7	9.7	6.3	7.8	9.5	12.3	13.1	9.9	11.7	10.0	8.4	10.8	8.7	6.3	4.4	4.4	6.2	6.8	5.7	5.5	6.3	4.4	13.1	8.1	24
3	5.9	7.5	8.1	8.8	9.7	7.3	8.7	11.8	15.4	16.1	14.8	14.9	14.0	17.3	18.0	21.4	13.3	12.2	10.8	7.3	8.9	8.5	11.0	9.7	5.9	21.4	11.7	24
4	7.5	5.3	5.4	6.0	5.4	5.3	4.7	6.6	8.5	13.1	15.7	15.9	19.3	15.4	15.7	15.8	12.8	11.1	7.6	4.6	3.4	2.8	2.1	2.0	2.0	19.3	8.8	24
5	1.6	1.9	3.7	1.4	3.1	1.8	1.6	3.6	6.6	8.5	10.4	12.2	13.7	14.9	17.0	15.6	12.6	6.8	2.0	2.4	1.9	1.9	2.5	2.3	1.4	17.0	6.3	24
6	2.1	2.5	2.1	1.8	3.1	2.0	3.0	5.5	4.6	6.4	6.6	6.2	7.4	7.8	8.2	10.2	9.6	8.0	2.8	2.8	2.3	3.0	2.5	2.3	1.8	10.2	4.7	24
7	2.4	2.9	4.0	2.6	2.6	1.8	2.9	2.9	8.1	10.4	13.2	15.0	16.6	17.7	15.1	17.1	13.2	11.2	8.6	7.4	8.6	10.8	10.9	7.4	1.8	17.7	8.9	24
8	2.9	3.7	7.0	4.2	9.8	4.8	10.1	13.4	13.2	9.5	8.8	11.3	16.4	15.6	15.0	6.4	7.6	17.4	10.5	6.5	10.1	11.4	8.2	8.3	2.9	17.4	9.7	24
9	8.9	9.7	9.3	8.9	10.6	11.6	8.8	8.3	10.8	11.0	9.6	8.1	7.1	7.8	7.3	8.2	7.8	4.9	3.1	6.4	4.8	4.5	10.2	11.5	3.1	11.6	8.3	24
10	9.2	10.5	10.7	18.1	16.2	16.1	22.3	18.0	20.8	24.0	21.9	25.9	29.2	26.1	30.5	27.2	24.4	23.3	15.7	8.0	8.0	7.7	6.4	4.2	4.2	30.5	17.7	24
11	4.8	6.6	5.8	3.7	3.0	3.0	4.8	5.3	6.7	10.4	11.9	11.2	12.0	13.3	12.7	13.4	10.8	7.3	3.0	3.8	3.5	9.1	17.9	10.5	3.0	17.9	8.1	24
12	7.9	9.2	11.4	11.8	7.7	7.7	7.7	14.2	20.7	19.2	11.3	20.6	18.3	20.9	12.2	15.1	9.6	6.8	4.4	3.4	3.1	7.0	9.9	9.4	3.1	20.9	11.2	24
13	5.8	4.0	2.3	3.6	3.9	3.2	11.2	15.6	15.5	9.4	6.4	6.5	10.2	12.8	12.8	17.6	11.7	9.9	8.5	10.5	9.2	9.4	6.9	3.9	2.3	17.6	8.8	24
14	4.4	5.4	3.8	3.4	4.6	5.3	4.4	7.9	5.9	9.9	11.5	8.2	10.2	5.8	7.0	6.9	9.3	5.8	2.4	2.6	8.4	3.3	2.4	2.5	2.4	11.5	5.9	24
15	3.4	3.0	2.5	2.3	2.7	3.4	2.0	3.4	3.1	5.0	6.5	7.9	10.6	9.7	10.0	7.8	6.0	5.0	2.5	2.1	1.5	1.7	1.3	1.8	1.3	10.6	4.4	24
16	0.7	1.7	1.7	1.9	2.0	2.1	2.9	2.8	10.9	11.2	12.5	19.2	18.3	13.2	8.5	9.4	12.7	12.2	9.2	5.4	2.7	3.8	5.7	7.2	0.7	19.2	7.4	24
17	9.5	11.5	11.6	11.6	11.0	8.6	10.4	12.2	12.8	14.3	16.1	22.2	19.8	18.0	21.8	23.0	19.0	16.5	8.9	4.5	7.9	9.4	7.7	10.3	4.5	23.0	13.3	24
18	13.5	11.2	10.6	9.8	7.0	9.1	11.3	12.1	17.5	21.8	19.0	17.8	21.9	18.2	21.4	18.2	17.2	15.6	13.5	13.0	15.9	15.3	17.7	19.4	7.0	21.9	15.3	24
19	15.8	18.0	16.2	15.9	13.4	14.2	18.5	18.2	16.3	14.2	11.8	11.9	7.9	11.0	12.6	12.5	11.6	9.3	5.4	5.4	2.5	2.8	3.1	2.8	2.5	18.5	11.3	24
20	3.1	3.5	4.0	3.9	4.2	4.3	3.6	4.0	8.4	10.4	13.1	15.7	15.6	14.6	13.3	14.2	12.2	10.9	8.6	15.5	10.5	12.5	15.5	14.9	3.1	15.7	9.9	24
21	15.2	12.2	12.6	14.4	17.0	13.8	11.7	12.8	15.9	17.6	16.6	19.6	17.2	16.2	15.9	16.5	16.1	13.7	14.1	11.1	13.2	16.6	13.1	11.9	11.1	19.6	14.8	24
22	12.2	12.7	13.3	11.1	7.4	7.1	5.1	5.4	13.9	13.4	8.5	9.3	9.5	11.1	13.4	8.6	3.2	2.7	3.1	5.9	4.2	2.5	2.0	2.6	2.0	13.9	7.8	24
23	1.7	3.1	4.6	4.2	4.8	5.7	3.4	6.3	6.8	8.3	9.6	8.7	7.0	9.8	8.4	7.6	5.6	4.3	3.9	4.5	5.5	7.0	5.7	7.0	1.7	9.8	6.0	24
24	9.4	6.1	7.8	4.1	7.5	8.9	11.5	10.8	11.3	11.0	8.5	10.9	13.1	13.0	11.3	8.7	6.6	6.5	7.4	9.6	11.6	11.6	9.1	8.1	4.1	13.1	9.4	24
25	6.9	6.9	6.5	6.6	6.3	4.2	4.6	5.8	5.7	7.1	9.9	8.2	9.2	9.7	8.9	7.5	7.6	5.8	4.7	4.3	3.9	3.9	3.1	4.2	3.1	9.9	6.3	24
26	1.2	2.4	2.5	5.3	8.4	6.2	7.1	6.9	7.6	12.6	12.9	14.5	24.8	16.0	20.2	17.1	10.4	7.1	4.6	3.8	3.1	3.0	3.5	4.8	1.2	24.8	8.6	24
27	1.8	3.1	2.2	2.0	4.5	3.0	3.8	4.7	5.8	8.9	8.9	9.0	14.5	11.2	11.6	10.3	11.2	5.0	2.9	3.2	2.6	3.0	1.8	2.9	1.8	14.5	5.7	24
28	2.8	4.1	2.4	3.0	3.0	5.5	5.7	7.8	11.3	12.3	13.3	13.6	12.2	16.6	13.7	14.0	15.4	10.3	9.7	12.6	15.2	14.3	13.1	13.6	2.4	16.6	10.2	24
29	14.0	12.8	16.0	14.8	12.7	12.7	13.8	16.2	17.0	18.7	17.2	17.3	18.5	18.7	19.1	16.7	13.1	11.4	5.2	7.1	8.8	9.5	8.1	8.2	5.2	19.1	13.7	24
30	6.7	8.8	7.7	3.8	5.2	4.2	3.9	5.7	12.1	10.6	8.7	8.0	6.2	11.4	12.3	7.4	9.1	9.6	7.5	6.5	11.3	14.6	14.0	13.4	3.8	14.6	8.7	24
HOURLY MAX	15.8	18.0	16.2	18.1	17.0	16.1	22.3	18.2	20.8	24.0	21.9	25.9	29.2	26.1	30.5	27.2	24.4	23.3	15.7	15.5	15.9	16.6	17.9	19.4				
HOURLY AVG	6.5	6.9	7.0	6.9	7.3	6.6	7.6	9.0	11.3	12.4	12.2	13.3	14.4	14.1	14.3	13.5	11.5	9.7	7.0	6.5	6.9	7.5	7.6	7.3				

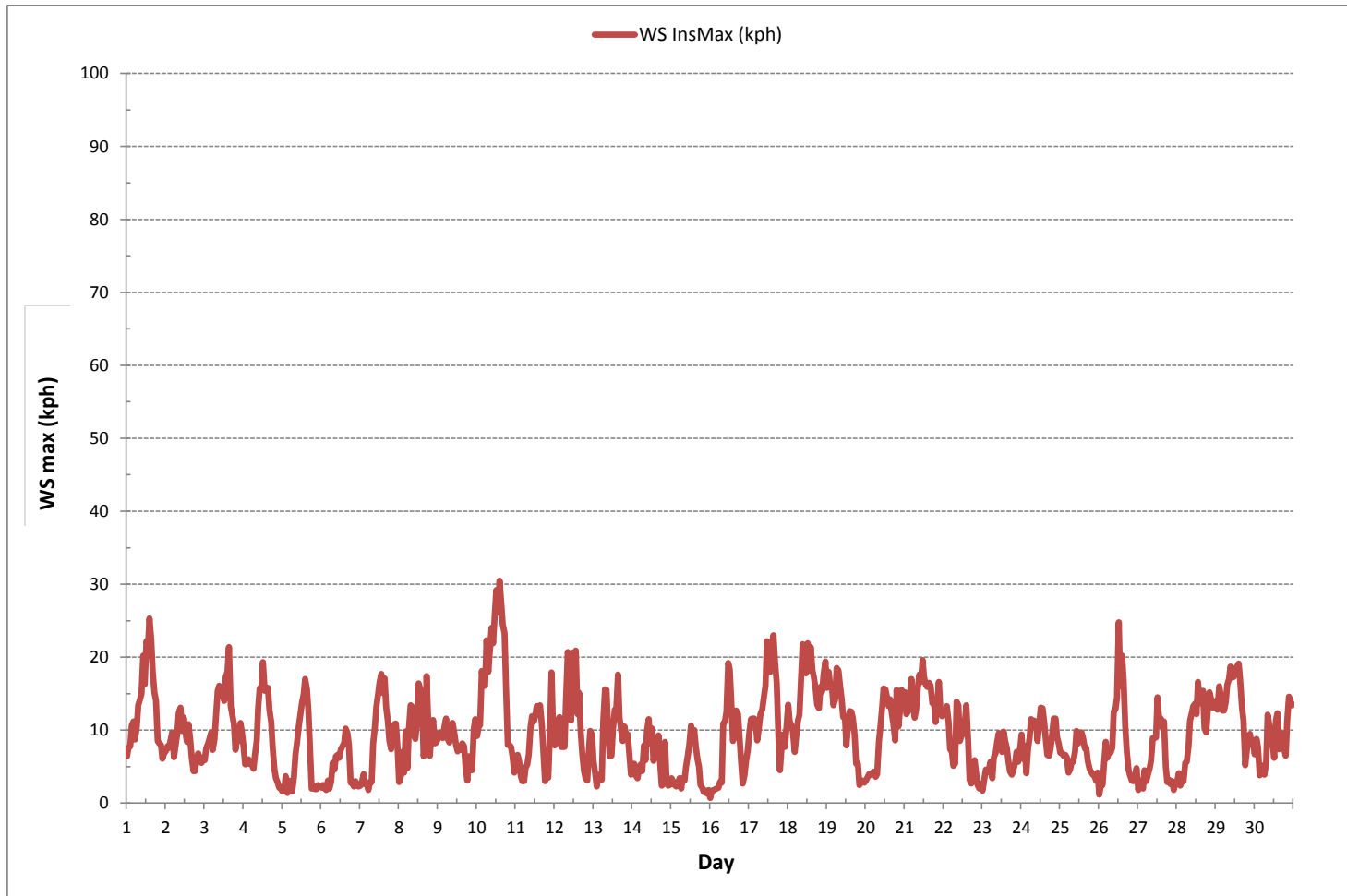
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	30.5	kph	@ HOUR	14	ON DAY	10	
OPERATIONAL TIME:						720	hrs

WIND SPEED Instantaneous Maximum (WS kph)



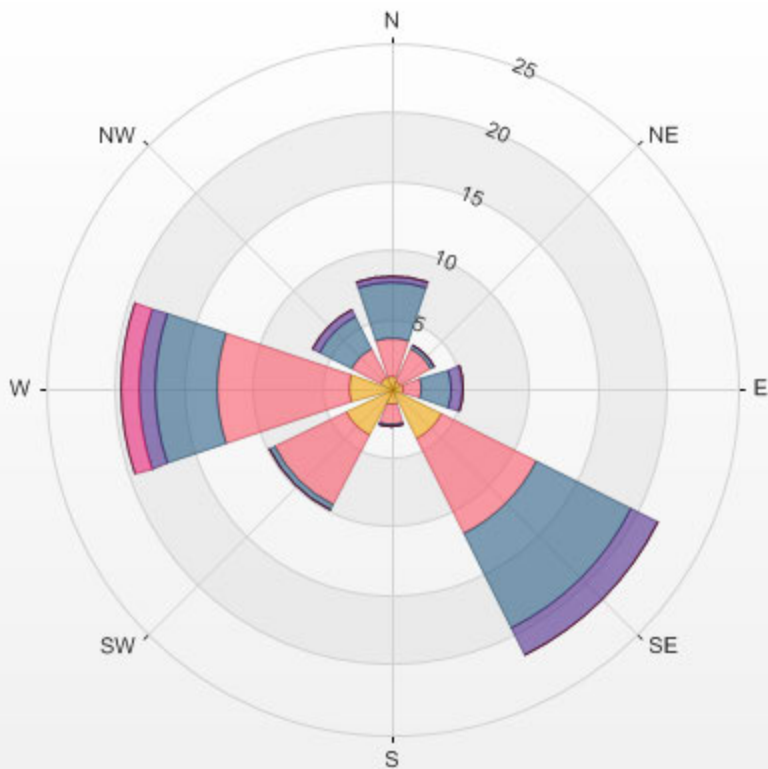
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 17/09
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.92%

Direction	1.8-3.6	3.6-7.3	7.3-10.9	10.9-14.6	14.6-18.2	>18.2	Total
N	1.0	2.8	4.0	0.4	0.0	0.0	8.2
NE	0.7	2.5	0.3	0.0	0.0	0.0	3.5
E	0.8	1.4	2.1	1.0	0.0	0.0	5.3
SE	4.0	7.6	7.6	2.2	0.0	0.0	21.5
S	1.1	1.5	0.1	0.0	0.0	0.0	2.8
SW	3.8	5.7	0.4	0.0	0.0	0.0	9.9
W	3.1	9.6	4.4	1.3	1.3	0.0	19.6
NW	1.0	2.2	2.6	0.6	0.0	0.0	6.4
Summary	15.4	33.3	21.7	5.4	1.3	0.0	77.1

% Icon Classes (kph)	15	1.8-3.6	33	3.6-7.3	22	7.3-10.9	5	10.9-14.6	1	14.6-18.2	0	>18.2
----------------------	----	---------	----	---------	----	----------	---	-----------	---	-----------	---	-------

LICA COLD LAKE SOUTH 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 22.92% Calm Wind Avg Speed: 0.86(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

WIND DIRECTION Hourly Averages (WD)

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

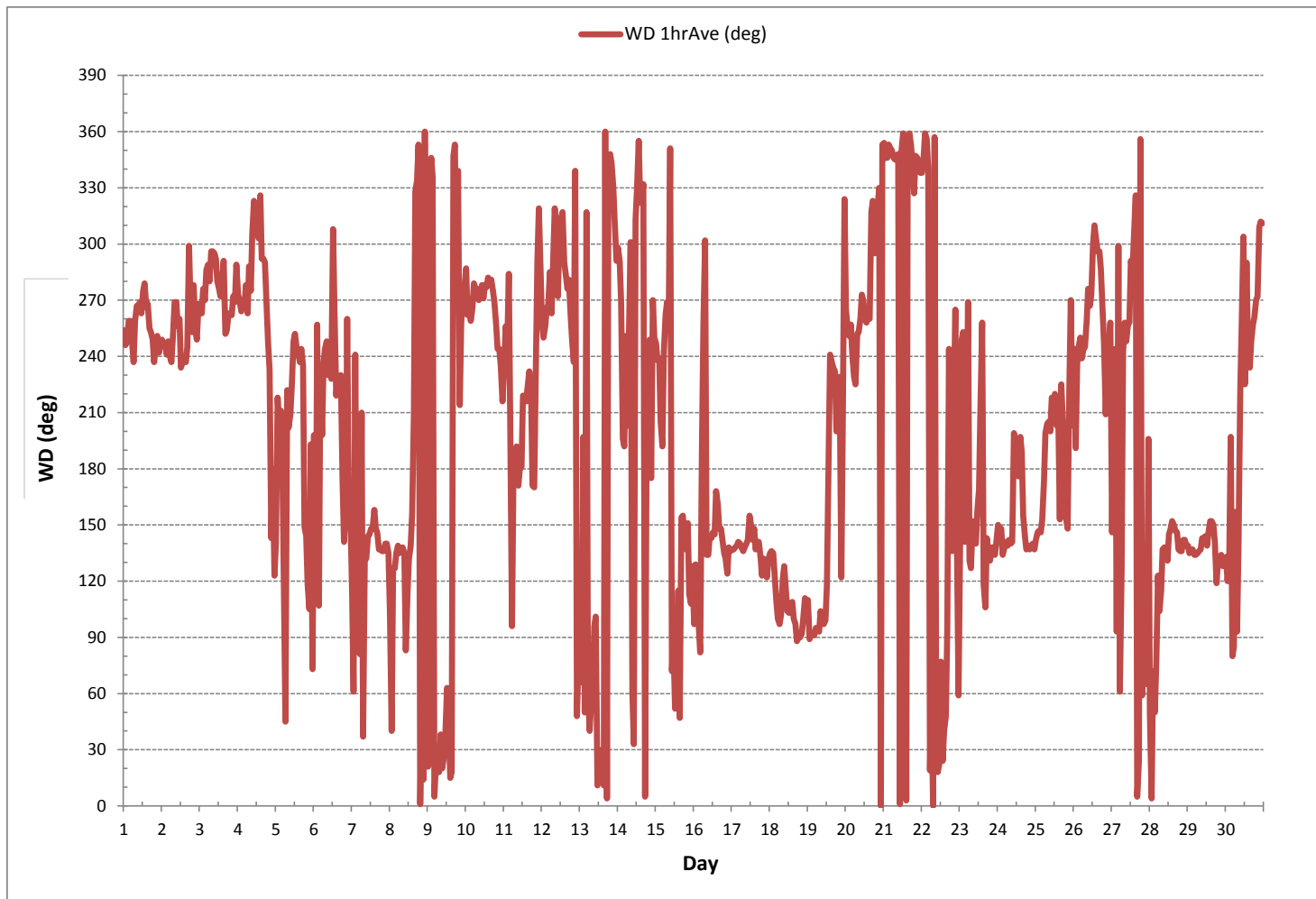
STATUS FLAG CODES

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

LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	89		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	224 (SW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

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	15	17	17	17	17	18	20	21	23	25	23	27	27	25	24	23	22	22	21	25	20	20	20	21	24	
2	18	18	19	20	20	20	20	23	26	26	26	22	23	23	25	25	22	18	27	64	62	39	28	25	24	
3	21	19	21	20	23	20	23	23	25	25	27	30	29	27	24	23	44	21	18	16	17	19	18	19	24	
4	16	17	17	17	36	14	15	22	27	31	22	23	25	30	28	31	24	23	16	10	26	53	33	21	24	
5	56	59	37	46	58	43	52	63	53	43	50	33	32	26	31	30	27	32	40	28	48	57	56	39	24	
6	45	49	59	40	37	63	41	30	43	35	49	68	64	81	48	35	29	30	24	45	41	51	57	52	24	
7	56	56	15	47	44	43	63	23	35	22	23	29	28	26	34	26	21	12	11	12	12	12	12	15	24	
8	55	54	57	55	26	69	16	19	20	64	40	21	16	32	37	22	16	19	19	18	22	28	22	24	24	
9	23	22	18	15	17	20	19	25	28	26	35	37	51	43	43	20	16	23	31	22	59	24	20	21	24	
10	35	22	21	21	20	21	21	21	22	24	23	24	24	24	23	23	23	22	20	17	22	21	32	43	24	
11	25	21	17	36	46	52	49	44	40	41	43	45	37	36	37	31	29	28	35	59	40	36	15	20	24	
12	22	21	24	20	20	20	19	21	18	21	23	26	23	28	24	24	23	19	15	10	37	59	17	20	24	
13	19	52	54	71	57	40	30	17	19	25	26	63	20	17	20	18	19	19	17	17	16	14	13	47	24	
14	19	19	34	34	24	32	45	26	47	42	45	32	44	59	36	36	18	39	45	46	45	52	53	45	24	
15	57	30	46	55	62	36	78	44	42	71	55	50	45	46	63	54	47	22	48	19	55	21	54	41	24	
16	51	19	33	25	40	63	62	52	21	23	30	23	28	28	40	39	25	20	12	19	22	12	10	11	24	
17	10	11	11	11	12	12	11	11	17	19	24	35	29	23	27	19	18	14	12	12	13	16	20	20	24	
18	15	14	15	20	22	23	23	26	25	24	25	25	25	25	24	23	22	22	21	22	23	21	24	24	24	
19	25	31	26	21	26	26	21	23	23	22	20	21	25	27	21	22	26	29	31	33	39	32	39	37	24	
20	55	39	21	47	27	44	48	32	32	27	27	32	28	25	26	32	17	18	24	16	14	16	18	17	24	
21	17	16	16	17	17	17	17	20	19	19	21	19	22	22	20	19	21	18	16	13	18	16	15	15	24	
22	18	17	19	16	19	33	31	35	19	25	27	27	34	26	39	24	68	37	34	17	28	39	52	50	24	
23	30	69	54	60	72	79	18	29	36	23	48	58	61	42	43	42	29	17	14	13	11	11	28	49	24	
24	23	47	46	13	11	16	10	14	15	26	41	40	38	41	41	37	33	14	11	12	13	13	14	13	24	
25	17	22	24	32	34	41	46	40	37	36	32	41	40	45	40	28	29	36	33	36	41	59	41	52	24	
26	49	36	54	19	19	15	15	17	22	26	32	28	26	25	24	23	21	21	14	28	47	31	45	45	24	
27	76	67	48	36	58	58	60	33	22	23	27	34	30	34	26	24	26	23	37	19	21	48	32	64	24	
28	65	48	29	46	33	25	23	21	17	20	24	26	34	32	31	30	19	14	12	11	12	15	13	14	24	
29	14	13	12	13	14	15	15	14	15	15	15	17	22	24	27	28	23	15	21	11	12	11	13	16	24	
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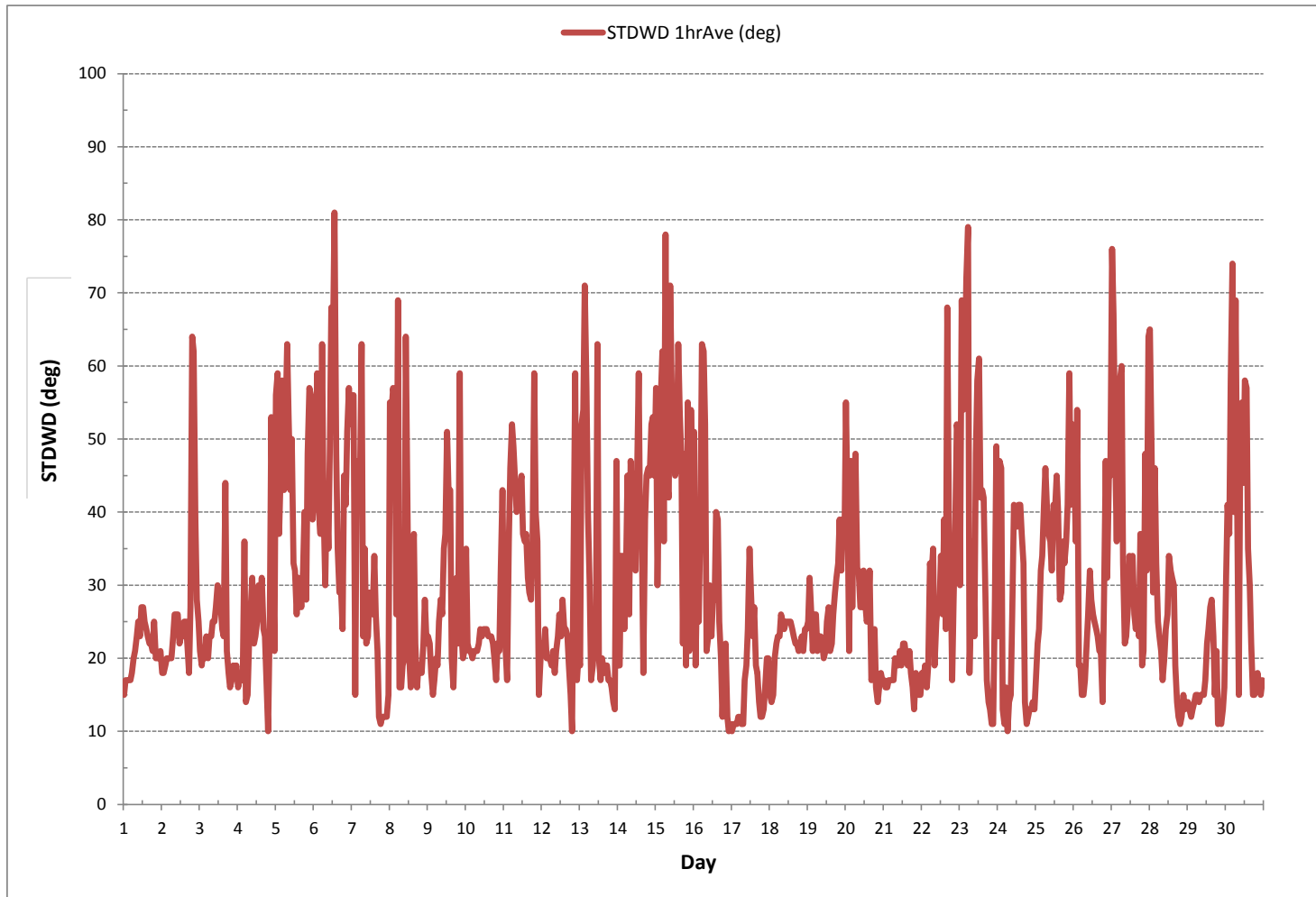
STATUS FLAG CODES

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: April 1, 2015

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - September 2017

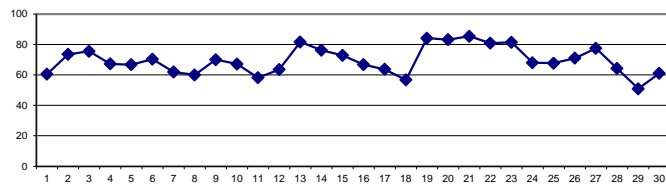
RELATIVE HUMIDITY Hourly Averages (RH %)

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

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

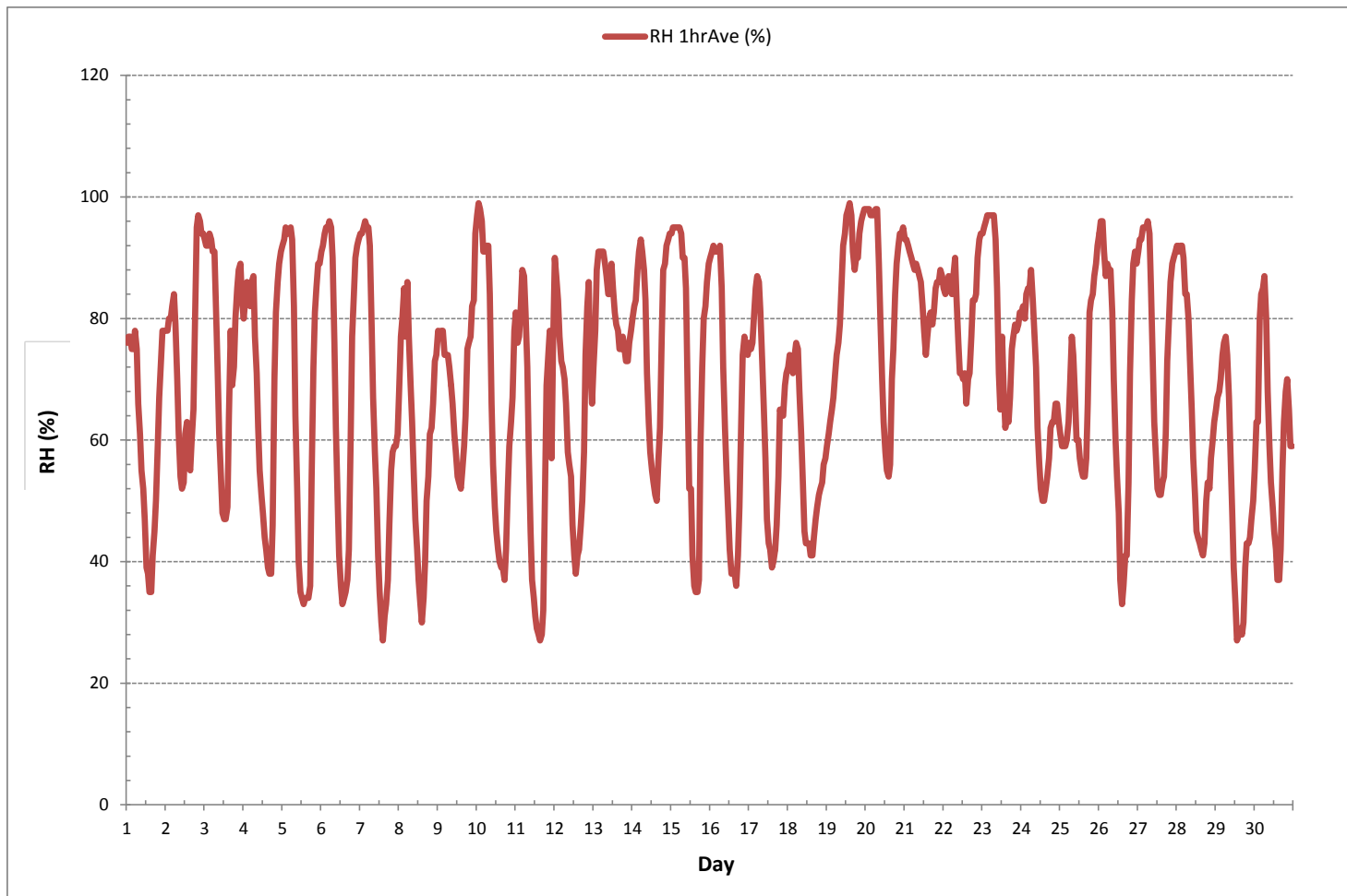
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27	%	@ HOUR	14	ON DAY	7
MAXIMUM 1-HR AVERAGE:	99	%	@ HOUR	1	ON DAY	10
MAXIMUM 24-HR AVERAGE:	85	%			ON DAY	21
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	19		MONTHLY AVERAGE:			70 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



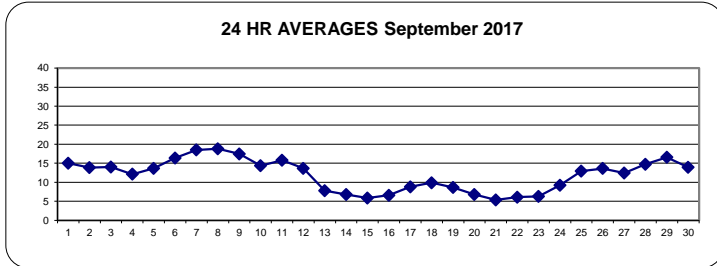
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	11.8	11.1	10.5	10.5	10.3	9.3	9.9	12.6	14.1	15.9	16.7	18.6	20.6	21.0	21.6	21.2	20.0	18.7	17.9	16.4	14.6	13.2	12.1	11.9	9.3	21.6	15.0	24
2	11.5	11.0	10.6	10.1	9.8	9.3	10.1	12.5	15.0	17.1	17.8	17.5	16.8	16.7	17.8	17.9	17.2	16.3	14.8	13.2	12.8	12.5	12.4	12.1	9.3	17.9	13.9	24
3	12.0	12.0	12.0	11.7	11.6	11.5	11.4	13.0	14.6	16.2	17.6	18.7	19.1	19.3	19.0	16.6	14.0	15.3	14.4	13.1	11.9	11.2	10.5	9.8	9.8	19.3	14.0	24
4	8.9	7.5	6.7	6.5	6.4	5.8	6.5	10.0	12.6	14.6	15.8	16.4	17.3	18.3	18.7	19.5	19.3	19.2	17.1	12.7	10.0	8.4	6.8	5.8	5.8	19.5	12.1	24
5	5.0	4.4	3.8	3.1	2.7	2.4	3.6	8.8	13.5	16.8	19.3	20.9	22.1	22.9	23.5	24.0	24.3	24.1	20.8	15.9	13.4	11.8	10.6	9.8	2.4	24.3	13.6	24
6	8.7	7.9	7.2	6.5	5.9	5.4	6.3	10.3	14.6	18.4	22.0	24.6	26.0	27.2	27.4	27.4	26.6	25.8	22.4	18.1	15.7	14.1	12.8	11.8	5.4	27.4	16.4	24
7	10.9	10.1	9.2	8.6	8.0	7.5	8.4	13.1	18.3	20.7	23.0	25.2	26.4	27.2	27.8	27.7	27.4	26.2	23.4	20.8	19.9	19.4	18.2	16.5	7.5	27.8	18.5	24
8	14.4	12.2	11.4	10.3	12.3	10.0	12.3	14.4	16.3	19.3	22.2	24.2	25.7	26.9	27.8	27.9	26.9	23.2	20.9	19.2	19.2	18.9	17.4	17.1	10.0	27.9	18.8	24
9	17.2	17.2	16.5	14.9	14.5	14.2	14.3	15.0	15.6	16.5	17.5	18.6	20.3	21.1	21.7	21.7	21.1	20.3	18.5	17.9	17.3	16.3	15.9	14.8	14.2	21.7	17.5	24
10	14.4	14.2	14.1	14.1	14.1	13.4	12.5	11.8	12.7	14.5	15.6	16.5	17.3	18.0	18.2	18.1	17.7	17.6	16.0	13.5	11.9	11.1	10.1	7.7	7.7	18.2	14.4	24
11	6.9	7.6	7.4	6.2	5.4	6.2	7.7	9.9	13.3	16.8	19.3	21.5	23.3	24.1	25.1	25.8	25.6	25.0	20.4	16.2	15.0	15.0	18.4	16.6	5.4	25.8	15.8	24
12	15.1	14.6	14.0	13.9	13.6	13.0	12.4	13.3	13.7	13.3	13.5	15.4	16.4	17.1	16.7	15.8	15.7	15.1	13.7	11.8	9.8	8.7	10.9	10.8	8.7	17.1	13.7	24
13	9.9	9.0	7.0	6.2	6.4	7.1	8.3	8.0	8.0	8.4	8.4	8.6	8.9	8.7	8.6	7.9	7.8	7.8	7.6	7.2	7.0	6.8	6.5	6.3	6.2	9.9	7.8	24
14	5.8	5.7	5.5	4.7	3.8	3.8	4.3	5.2	6.6	8.6	9.4	10.3	10.4	10.7	10.8	11.1	10.3	9.6	7.5	5.1	4.6	3.5	3.1	2.5	2.5	11.1	6.8	24
15	1.3	0.2	-0.6	-1.1	-1.3	-1.7	-0.9	1.6	4.2	8.0	10.8	12.6	12.5	13.3	14.3	14.3	14.2	13.5	9.9	5.9	3.7	2.7	1.6	0.8	-1.7	14.3	5.8	24
16	0.1	-0.6	-1.0	-1.3	-1.4	-1.5	-1.4	2.6	7.5	9.2	11.7	13.0	13.3	13.7	13.6	13.8	13.6	12.5	10.8	8.3	6.0	5.1	5.3	5.6	-1.5	13.8	6.6	24
17	5.4	5.7	5.6	4.6	3.8	3.2	3.5	5.1	7.3	9.6	12.0	13.6	13.9	14.0	14.6	14.3	13.7	12.7	10.8	8.3	8.2	8.1	7.1	6.6	3.2	14.6	8.8	24
18	6.2	5.5	5.4	5.1	4.3	3.7	3.7	5.4	7.5	10.0	12.5	13.6	14.0	14.0	14.9	14.7	13.9	13.4	12.6	12.0	11.6	11.3	10.7	10.8	3.7	14.9	9.9	24
19	10.9	10.9	10.7	10.6	10.3	10.0	9.8	10.0	10.1	9.7	9.6	9.7	9.9	10.0	8.9	8.1	7.7	7.2	6.4	6.1	5.6	5.2	5.1	4.9	4.9	10.9	8.6	24
20	4.9	4.6	4.2	3.8	3.3	3.1	2.9	3.6	5.7	7.1	8.2	9.5	10.7	11.0	11.1	10.8	9.8	9.0	7.7	7.3	7.3	6.9	6.1	4.9	2.9	11.1	6.8	24
21	4.0	3.9	4.0	4.0	3.9	3.7	3.8	3.9	4.4	4.8	5.3	6.1	6.8	7.4	7.0	6.7	6.6	6.6	6.2	5.8	5.9	5.8	5.6	5.6	3.7	7.4	5.3	24
22	5.7	5.7	5.5	5.1	5.1	5.5	5.3	5.3	5.8	6.4	6.7	7.0	7.7	7.7	8.1	7.6	7.7	7.3	6.7	6.3	5.7	4.8	3.8	3.2	3.2	8.1	6.1	24
23	1.6	0.9	1.9	3.1	3.6	2.5	1.9	3.7	5.4	6.3	8.4	9.3	8.4	9.4	9.9	10.1	9.9	9.3	8.4	7.9	7.4	7.3	7.3	6.9	0.9	10.1	6.3	24
24	6.8	6.6	6.6	5.8	5.2	5.0	4.1	5.3	6.8	8.7	10.7	11.7	12.7	13.0	12.7	12.6	12.8	12.2	11.0	10.6	10.4	10.0	9.9	10.1	4.1	13.0	9.2	24
25	10.4	10.7	10.6	10.6	10.5	10.2	9.7	9.3	10.0	11.5	13.0	14.1	15.9	16.5	17.7	17.7	17.7	16.3	14.4	13.8	13.1	12.5	12.1	11.6	9.3	17.7	12.9	24
26	11.2	10.9	10.8	11.2	11.7	10.6	10.2	10.3	12.1	14.6	17.1	18.5	19.6	20.7	21.2	20.6	19.0	18.9	15.3	11.6	9.0	7.5	7.1	7.1	7.1	21.2	13.6	24
27	5.9	5.3	4.7	4.4	5.3	6.4	7.3	8.6	10.4	13.4	16.4	18.4	19.7	20.0	19.4	19.6	19.1	17.6	15.5	14.1	12.5	11.4	11.1	11.1	4.4	20.0	12.4	24
28	10.9	10.8	10.7	10.7	10.6	10.5	9.4	10.1	11.8	14.2	16.4	18.2	20.2	20.8	20.9	21.0	20.5	19.1	16.7	15.3	14.7	13.7	13.4	12.9	9.4	21.0	14.7	24
29	12.6	12.1	11.8	11.2	10.4	9.9	9.3	9.9	11.7	14.6	17.8	20.7	23.4	24.8	24.5	24.5	24.4	23.1	19.6	17.6	17.4	16.6	15.6	14.3	9.3	24.8	16.6	24
30	13.3	11.2	11.6	7.5	6.3	5.5	4.9	7.2	12.6	15.2	16.7	17.9	19.1	20.5	21.7	21.9	21.0	18.3	16.0	14.4	13.3	13.0	13.0	12.7	4.9	21.9	14.0	24
HOURLY MAX	17.2	17.2	16.5	14.9	14.5	14.2	14.3	15.0	18.3	20.7	23.0	25.2	26.4	27.2	27.8	27.9	27.4	26.2	23.4	20.8	19.9	19.4	18.4	17.1				
HOURLY AVG	8.8	8.3	7.9	7.4	7.2	6.9	7.1	8.7	10.7	12.7	14.4	15.7	16.6	17.2	17.5	17.4	16.9	16.0	14.1	12.2	11.2	10.4	10.0	9.4				

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

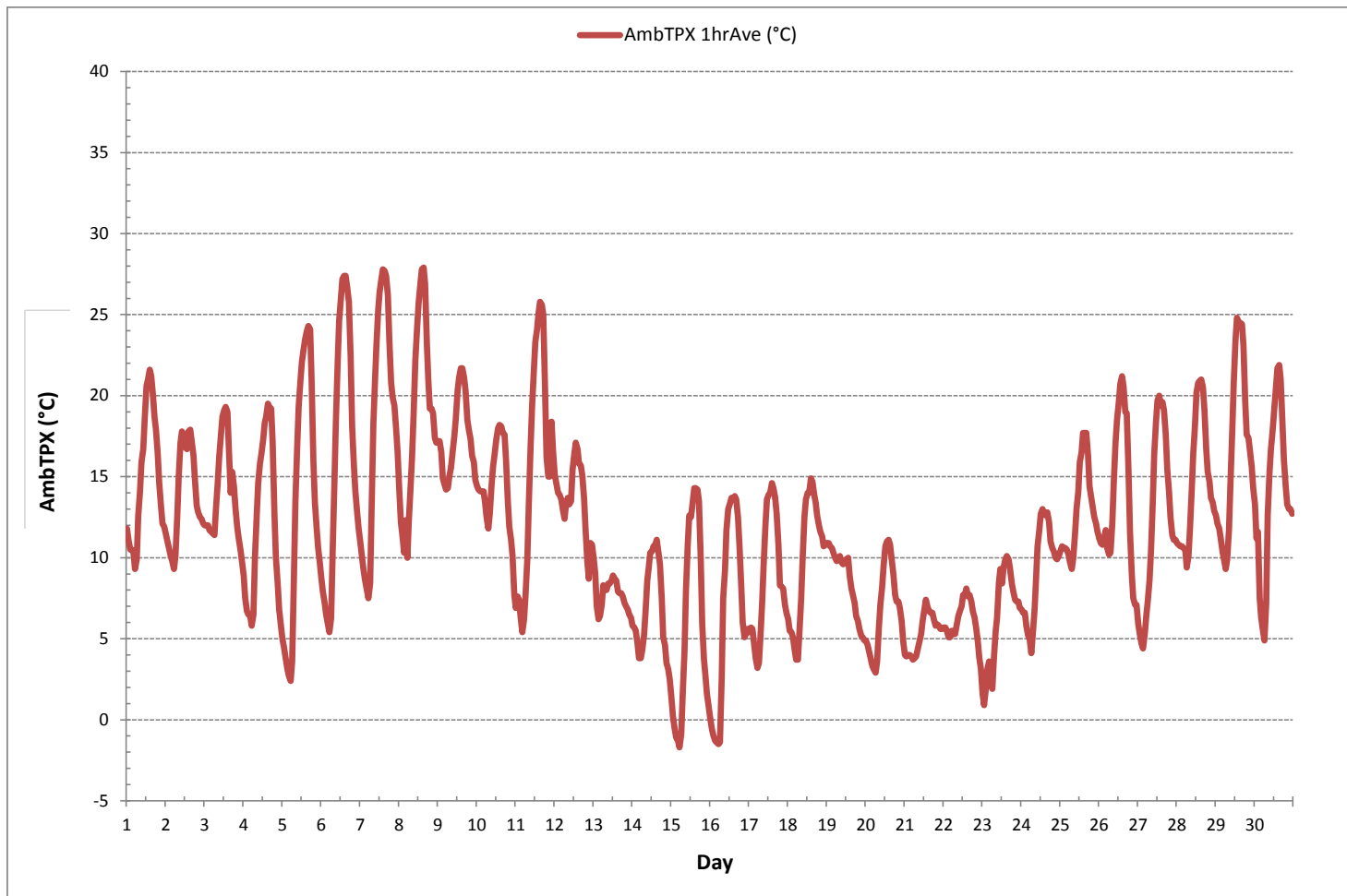
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-1.7 °C	@ HOUR	5	ON DAY	15
MAXIMUM 1-HR AVERAGE:	27.9 °C	@ HOUR	15	ON DAY	8
MAXIMUM 24-HR AVERAGE:	18.8 °C			ON DAY	8
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	6.1	MONTHLY AVERAGE:			11.9 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: <u>September 12, 2017</u>	Barometer/B.P./units: <u>F.S. 170286131 expires April 19, 2019</u>	<u>942</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>Mainly sunny</u>		
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>9:59</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Tom Bourque</u>
End Time 24 hr. (mst): <u>14:05</u>	Cal Gas Expiry Date: <u>July 18, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer ID# or Serial Number: <u>80652842</u>	Range ppb: <u>500</u>
Last Calibration Date: <u>August 16, 2017</u>	As Found C.F.: <u>1.000</u>
Previous C.F.: <u>1.001</u>	New C.F.: <u>0.999</u>

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u> High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u> Calibrator ID/Expiry Date: <u>API id# 627 expires January 27, 2018</u> Cal Gas Cylinder I.D. #: <u>LL 104222</u> Cal Gas Conc. (ppm): <u>50.6</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

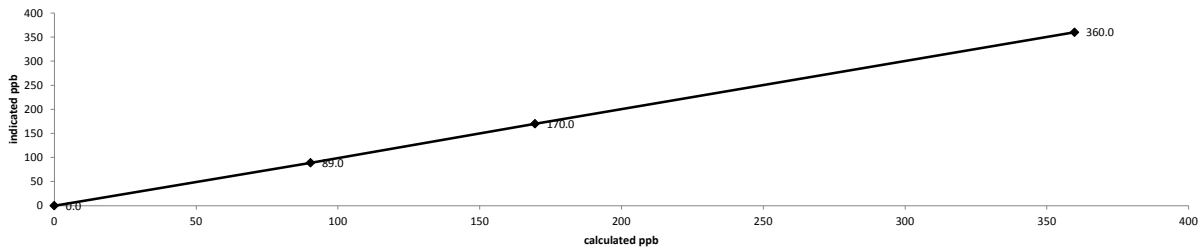
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5184	0.00	5184	0.0	0.1	n/a
as found high	5282	37.83	5320	359.8	360.0	1.000
adjusted zero	5184	0.00	5184	0.0	0.0	n/a
adjusted high	5282	37.83	5320	359.8	360.0	0.999
mid	5298	17.81	5316	169.5	170.0	0.997
low	5295	9.47	5304	90.3	89.0	1.015
calibrator zero	5184	0.00	5184	0.0	0.0	n/a
Average C.F. =						1.004

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS
Slope =	<u>0.998</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>0.09%</u>	0.95-1.05
% change in C.F. from last cal =	<u>0.12%</u>	± 3% F.S.
		± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration



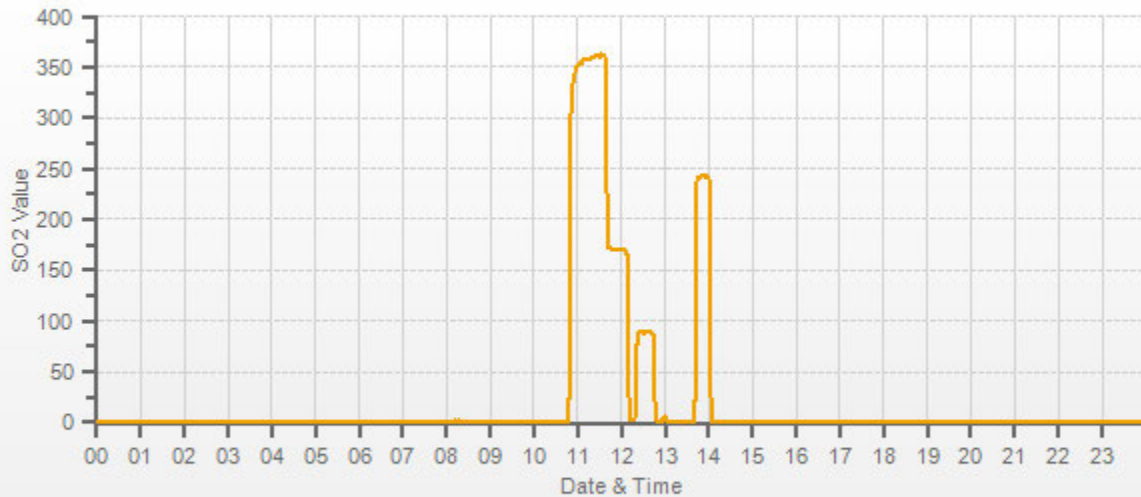
As found: Bkg: <u>7.8</u> Coef: <u>0.917</u> Pmt: <u>-624.2</u> Flash: <u>766</u> Internal: <u>26.0</u> Chamber: <u>45.0</u> Perm Oven Gas: <u>34.99</u> Perm Oven Heater: <u>34.22</u> Pressure: <u>679.8</u> Sample Flow: <u>0.474</u> Lamp Intensity: <u>96</u> Converter: <u>n/a</u> Converter Set: <u>n/a</u> Averaging Time: <u>120</u> Expected Value: <u>245.0</u>	As left: Bkg: <u>8.0</u> Coef: <u>0.917</u> Pmt: <u>-624.2</u> Flash: <u>764</u> Internal: <u>27.1</u> Chamber: <u>45.0</u> Perm Oven Gas: <u>35.00</u> Perm Oven Heater: <u>34.33</u> Pressure: <u>679.2</u> Sample Flow: <u>0.474</u> Lamp Intensity: <u>96</u> Converter: <u>n/a</u> Converter Set: <u>n/a</u> Averaging Time: <u>120</u> Expected Value: <u>242.0</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.
 No high point adjustment was required/made.

Flow measurement after mid-point.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 17/09/12 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: <u>September 12, 2017</u>	Barometer/B.P./units: <u>F.S. 170286131 expires April 19, 2019</u>	<u>942</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>Mainly sunny</u>		
Parameter: <u>Total Reduced Sulphur</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>9:59</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Tom Bourque</u>	
End Time 24 hr. (mst): <u>13:59</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>CD Nova Model CDN-101 / #501</u>		

Analyzer:	ID# or Serial Number: <u>812728560</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>August 16, 2017</u>	As Found C.F.: <u>1.046</u>	
	Previous C.F.: <u>1.000</u>	New C.F.: <u>1.002</u>	

Calibration Standards:		Standard Calibration Points for Ranges	
Low Flow Meter ID/Expiry Date: <u>Defender Low 152020 expires November 21, 2017</u>		Point	ppb
High Flow Meter ID/Expiry Date: <u>Defender High 148943 expires November 21, 2017</u>		High	78
Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u>		Mid	38
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>		Low	19
Cal Gas Conc. (ppm): <u>10.2</u>			10:50 / 11:00
			500
			380
			0.0
			0.0
			0.0

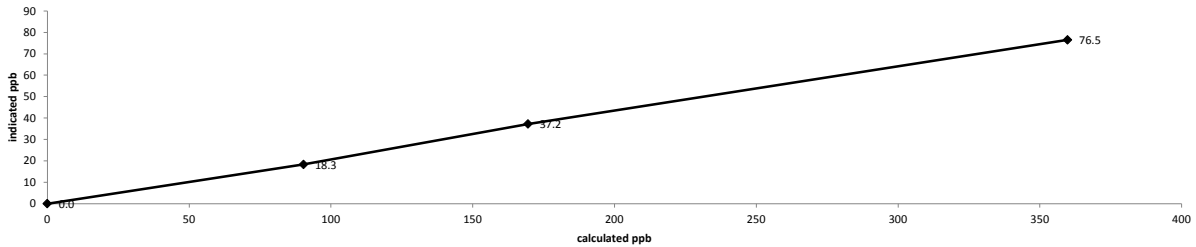
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7929	0.00	7929	0.0	0.3	n/a
as found high	7843	59.37	7902	76.6	73.6	1.046
adjusted zero	7929	0.00	7929	0.0	0.0	n/a
adjusted high	7843	59.37	7902	76.6	76.5	1.002
mid	7887	29.00	7916	37.4	37.2	1.004
low	7912	14.48	7926	18.6	18.3	1.018
calibrator zero	7929	0.00	7929	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>1.001</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.14%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-4.55%</u>	± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



	As found:		As left:
Bkg:	<u>13.4</u>	Bkg:	<u>14.2</u>
Coef:	<u>0.860</u>	Coef:	<u>0.891</u>
Pmt:	<u>-651.2</u>	Pmt:	<u>-651.2</u>
Flash:	<u>738</u>	Flash:	<u>740</u>
Internal:	<u>29.2</u>	Internal:	<u>37.0</u>
Chamber:	<u>45.0</u>	Chamber:	<u>45.0</u>
Converter Temp:	<u>825</u>	Converter Temp:	<u>825</u>
Converter Set:	<u>825</u>	Converter Set:	<u>825</u>
Perm Oven Gas:	<u>44.99</u>	Perm Oven Gas:	<u>45.00</u>
Perm Oven Htr:	<u>44.37</u>	Perm Oven Htr:	<u>44.38</u>
Pressure:	<u>633.7</u>	Pressure:	<u>633.1</u>
Sample Flow:	<u>0.490</u>	Sample Flow:	<u>0.492</u>
Lamp Intensity:	<u>92</u>	Lamp Intensity:	<u>92</u>
Averaging Time:	<u>120</u>	Averaging Time:	<u>120</u>
Expected Value:	<u>36.7</u>	Expected Value:	<u>38.2</u>

Comments:

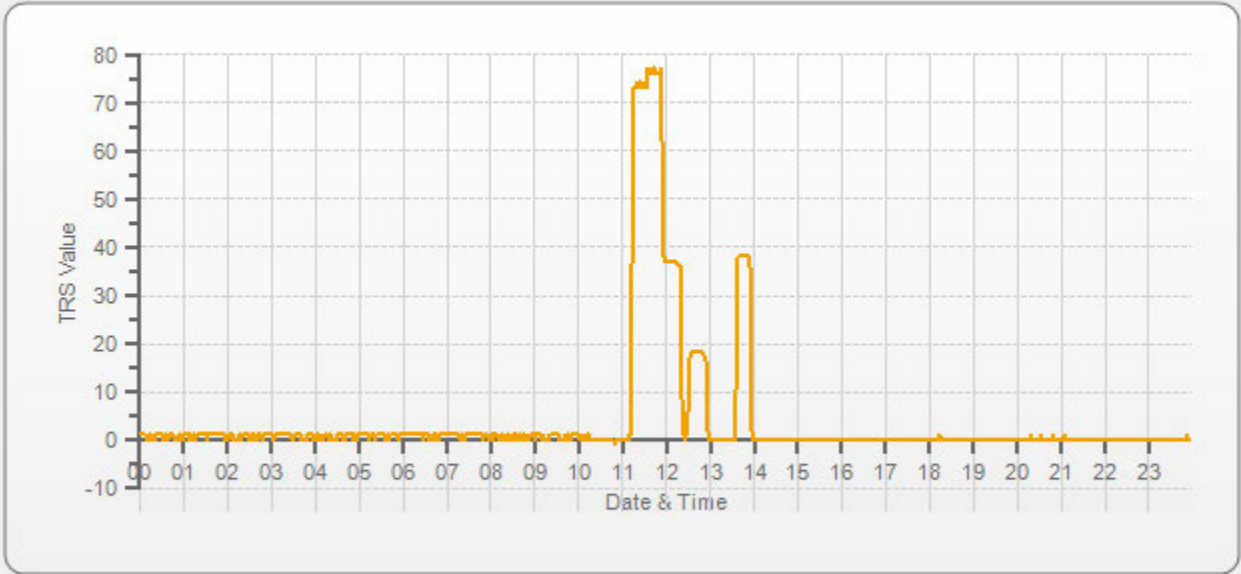
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

Flow measurement after mid-point.

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 17/09/12 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total HydrocarbonTHC Analyzer Calibration

Date:	September 13, 2019	Barometer/B.P./units:	F.S. 170286131 expires April 19, 2019	943	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	9:50 / 13:44	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	Range ppm:
ID# or Serial Number:	50
Last Calibration Date:	As Found C.F.:
August 16, 2017	1.074
Previous Cal High Point C.F.:	New C.F.:
1.000	1.000

Calibration Standards:									
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018 Cal Gas Cylinder I.D. #: LL 165372	Standard Calibration Points for a Range of: 50 ppm								
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 606.0 212.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm								
High	38								
Mid	18								
Low	9								

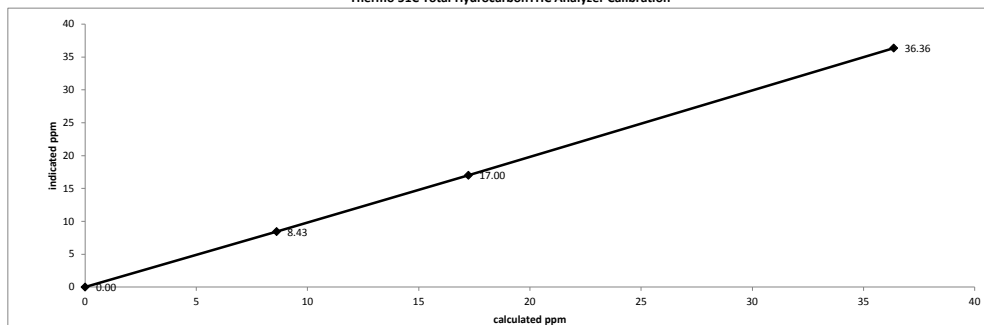
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2060	0.00	2060	0.0	0.35	n/a
as found high	1995	62.93	2058	36.36	34.20	1.074
adjusted zero	2060	0.00	2060	0.00	0.00	n/a
adjusted high	1995	62.93	2058	36.36	36.36	1.000
mid	2033	29.90	2063	17.23	17.00	1.014
low	2047	14.93	2062	8.61	8.43	1.021
calibrator zero	2060	0.00	2060	0.0	0.00	n/a
Average C.F.=						1.012

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000		LIMITS
Slope =	0.999		> or = 0.995
b (Intercept as % of full scale) =	0.24%		0.95-1.05
% change in C.F. from last cal =	-7.41%		± 3% F.S.
			± 10%

Thermo 51C Total HydrocarbonTHC Analyzer Calibration

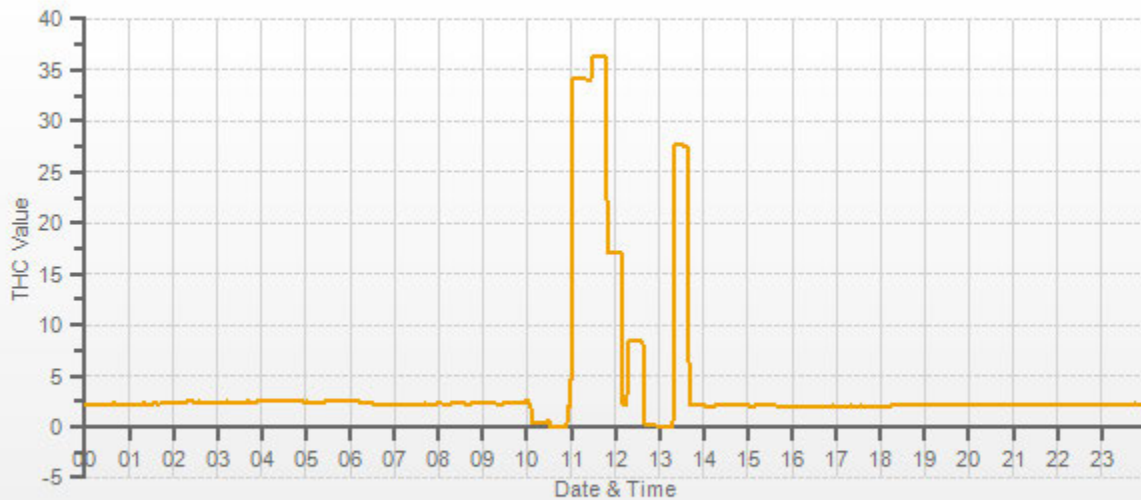


As found: H2 cylinder (psi): 400 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 150 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 42 measurement alarms: None service alarms: None cnt: 1480 rng: 1 try: 0 flm: 182.1 det: 125.5 Flame: 182 Filter: 125 Base: 125 Sample psi: 06.49 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 0.614 Expected Value: 25.70	As left: H2 cylinder (psi): 400 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 400 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 42 measurement alarms: None service alarms: None cnt: 1514 rng: 1 try: 0 flm: 182.8 det: 125.1 Flame: 182 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 27.50
---	--

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.

Flow measurement after mid-point.

THC[ppm] Station: LICA COLD LAKE SOUTH Daily: 17/09/13 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: September 12, 2017	Barometer/B.P./units: F.S. 170286131 expires April 19, 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: Mainly sunny		
Start/End Time 24 hr. (mst): 9:59 / 17:00	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov Tom Bourque		
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 1505664393	Previous C.F.: As Found C.F.: New C.F.:
Last Calibration Date: August 16, 2017	NO = 1.000 0.994 0.999
Range ppb: 500	NO ₂ = 1.000 1.000 1.000
	NOx = 1.000 0.994 0.999

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.7 50.9	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	5184	0.0	5184	0	0	0.2	0.2	n/a	n/a
as found high	5282	37.8	5320	360.5	360.5	363.0	363.0	0.994	0.994
adjusted zero	5184	0.00	5184	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5282	37.83	5320	360.5	360.5	361.0	361.0	0.999	0.999
mid	5298	17.81	5316	169.9	169.9	171.0	171.0	0.993	0.993
low	5295	9.47	5304	90.5	90.5	90.0	90.0	1.006	1.006
calibrator zero	5184	0.00	5184	0	0	0.0	0.0	n/a	n/a
Average C.F.=								0.999	0.999

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5282	37.83	5320	0.0	361.0	361.0	0.0	0.0	0.0	
as found high NO2	5282	37.83	5320	255.0	112.0	361.0	249.0	249.0	249.0	1.000
adjusted high NO2	5282	37.83	5320	255.0	112.0	361.0	249.0	249.0	249.0	1.000
gpt mid	5282	37.83	5320	145.0	219.0	361.0	142.0	142.0	142.0	1.000
gpt low	5282	37.83	5320	50.0	311.0	361.0	50.0	50.0	50.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.000	0.95-1.05
b (Intercept as % of full scale)=	-0.01%	-0.01%	0.00%	± 3% F.S.
% change in C.F. from last cal=	0.63%	0.63%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:	As left:
NO Bkg: 3.5	NO Bkg: 3.7
NOx Bkg: 3.7	NOx Bkg: 3.9
NO Coef: 0.966	NO Coef: 0.959
NO ₂ Coef: 0.990	NO ₂ Coef: 0.990
NOx Coef: 0.998	NOx Coef: 0.997
PMT: -854.7	PMT: -855.1
Internal: 24.7	Internal: 25.0
Chamber: 50.6	Chamber: 50.6
Cooler: -3.1	Cooler: -2.7
NO ₂ Converter: 325.0	NO ₂ Converter: 327.4
NO ₂ Converter Set: 325.0	NO ₂ Converter Set: 325.0
Perm Oven Gas: 34.98	Perm Oven Gas: 35.00
Perm Oven Heater: 34.19	Perm Oven Heater: 34.23
Pressure: 176.9	Pressure: 177.2
Flow: 0.770	Flow: 0.769
Ozonator Flow: OK	Ozonator Flow: OK
Expected Value NO: 4	Expected Value NO: 3
Expected Value NO ₂ : 254	Expected Value NO ₂ : 254
Expected Value NOx: 259	Expected Value NOx: 258

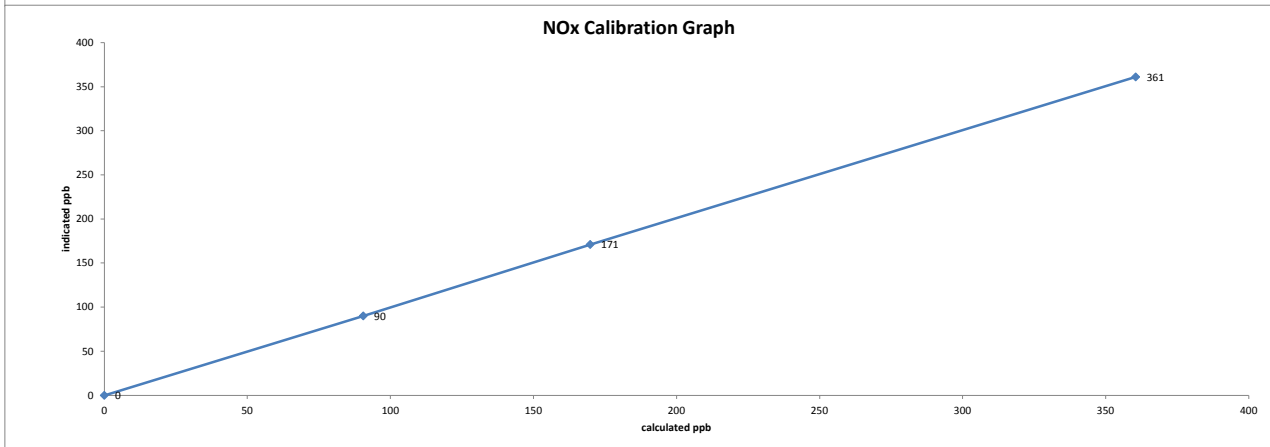
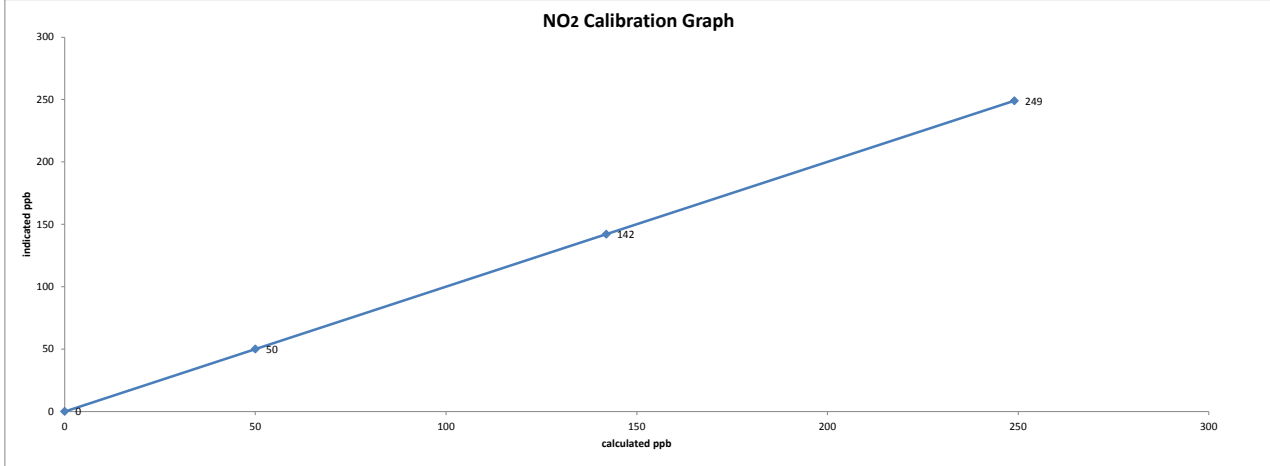
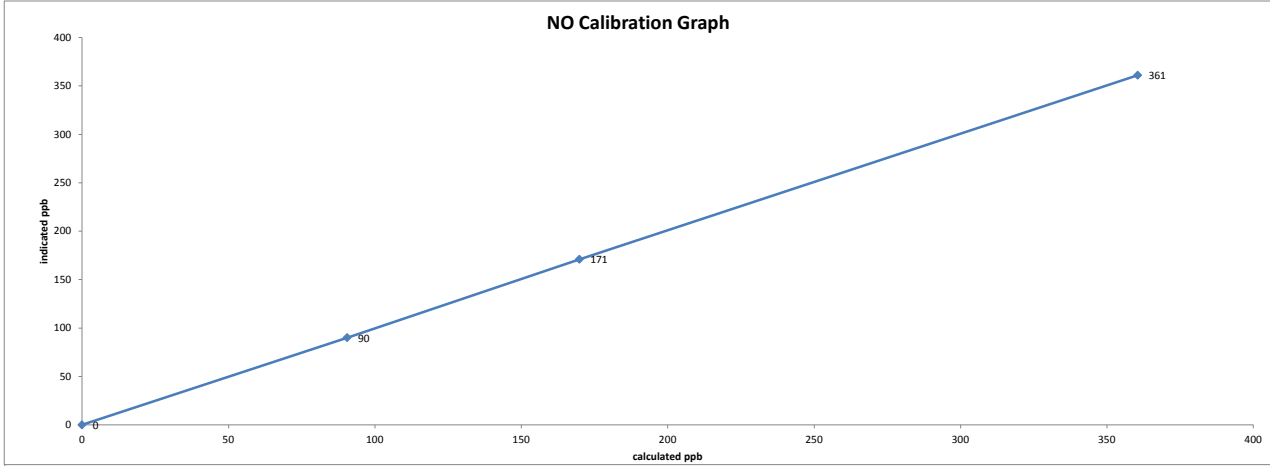
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 No high point NO₂ adjustment was required/made.

Flow measurement after mid-point.
 The analyzer cooling fan filter(s) were cleaned.
 GPT for O₃ three points: High O₃= 350 , High NO drop= 341; Mid O₃= 182, Mid NO drop= 177; Low O₃= 60, Low NO drop= 59.

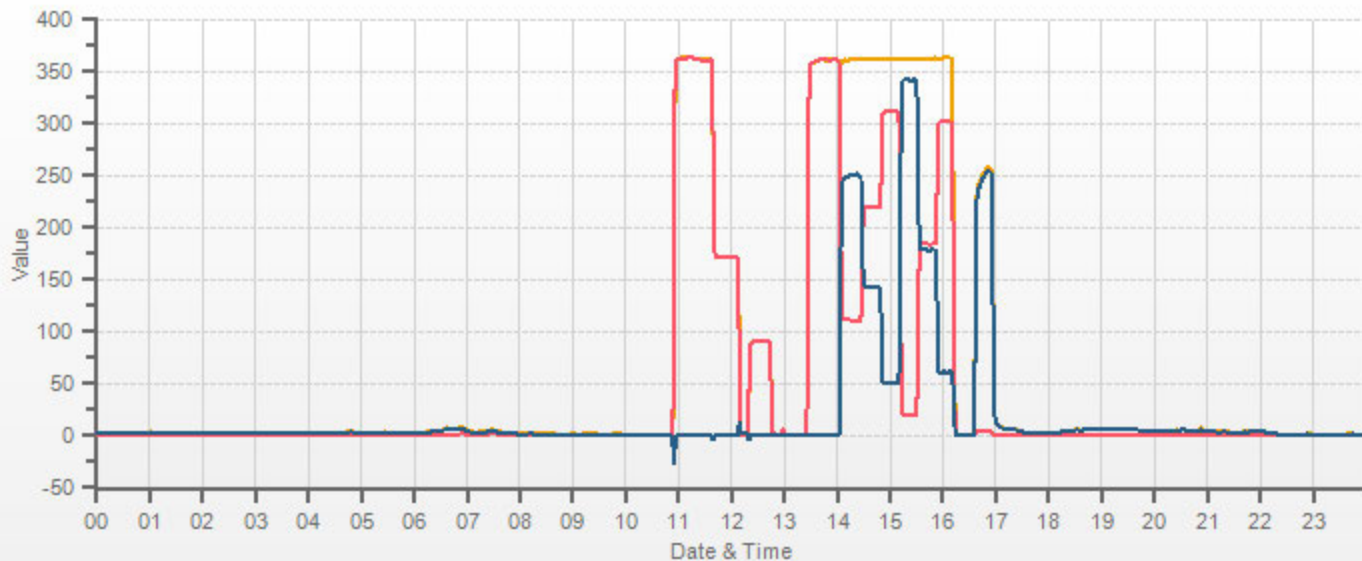
Date: September 12, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:59 / 17:00
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



Station: LICA COLD LAKE SOUTH Daily: 17/09/12 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: September 13, 2017 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 9:50 / 13:00 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: September 12, 2017	Barometer/B.P./units: F.S. 170286131 expires April 19, 2019 943 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 Tom Bourque Cal Gas Expiry Date: July 18, 2019
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Analyzer: ID# or Serial Number: 700419951 Last Calibration Date: August 17, 2017 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 0.994 New C.F.: 1.000
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Calibration Standards:									
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL104222	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

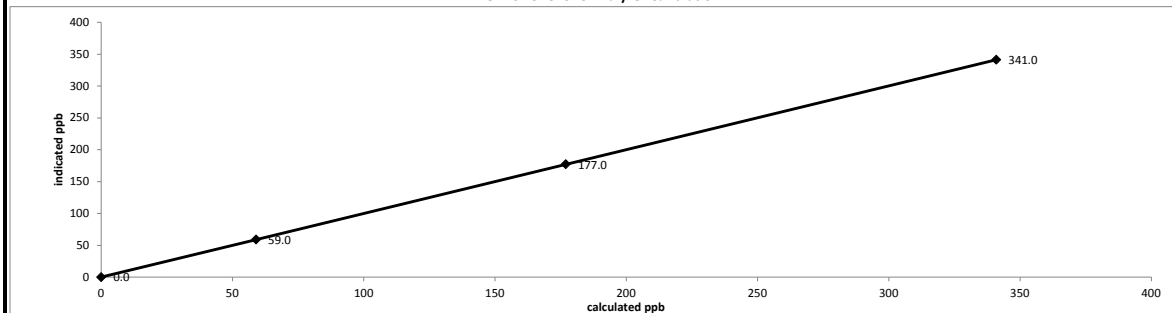
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	341.0	341.0	343.0	0.994
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	341.0	341.0	341.0	1.000
mid	5000	5000	177.0	177.0	177.0	1.000
low	5000	5000	59.0	59.0	59.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	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= 0.58%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration

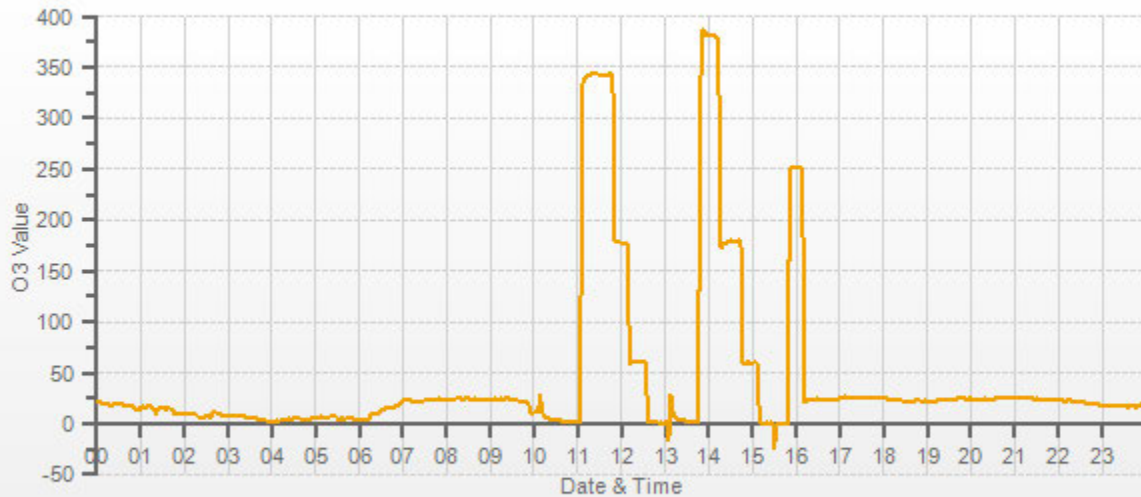


As found: O3 Bkg: 0.4 O3 Coef: 0.991 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 27.1 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 708.0 Cell A lpm: 0.718 Cell B lpm: 0.759 O3 ppb: 2.5 Cell A ppb: -4.1 Cell B ppb: 9.1 Cell A int: 86489 Cell B int: 86702.0 Expected Value: 248.0	As left: O3 Bkg: 0.2 O3 Coef: 0.984 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 26.7 Bench Lamp: 53.4 O3 Lamp: 57.3 Pressure: 707.7 Cell A lpm: 0.718 Cell B lpm: 0.759 O3 ppb: -0.1 Cell A ppb: -19.5 Cell B ppb: 19.7 Cell A int: 86498 Cell B int: 86719.0 Expected Value: 248.0
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Comments:

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

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 17/09/13 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER



Thermo 5030 SHARP Monitor Monthly Audit

Date: September 20, 2017
Company: LICA
Station Name/Location: Cold Lake South
Previous Audit Date: August 24, 2017
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
Start Time (mst): 9:53
End Time (mst): 10:40
Calibration Purpose: routine monthly
Weather Conditions: A few clouds

SHARP Information and Status:

Serial Number: CM-2209 **Status:** 0.00
Approx Tape remaining: 8/10 **Error Code:** 0.00

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:	Temperature:
Make:	Dwyer	Chinook Eng.	Fisher Scientific	Fisher Scientific
Model:	475 Mk.III	FTS	FB1291	11-661-7A, 11745843
Serial Number:	#3	I.D.#2, s.n. 091001	05544	170286131
Calibration Date:	January 2, 2017	March 24, 2017	December 5, 2016	April 19, 2017

As found temperature and pressure:

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>9.0</u></p> <p>Reference °C: <u>8.3</u></p> <p>Difference °C: <u>-0.7</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>931.000</u></p> <p>Reference (hPa): <u>928.000</u></p> <p>Difference (hPa) : <u>3.000</u></p>
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As left temperature and pressure (same as above if as found adequate):

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>9.0</u></p> <p>Reference °C: <u>8.3</u></p> <p>Difference °C: <u>-0.7</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>931.000</u></p> <p>Reference (hPa): <u>928.000</u></p> <p>Difference : <u>3.000</u></p>
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As found flows:

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>44.60</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.85</u></p> <p>Difference (l/min) <u>0.18</u></p>
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As left flows (same as above if as found adequate):

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>44.60</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.85</u></p> <p>Difference (l/min) <u>0.18</u></p>
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Inlet Assembly:

	Yes/No?	If No, give reason
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

Comments:

WIND SYSTEM



Met One Instruments
1600 NW Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

Sonic Wind Sensor Certificate of Calibration

Sensor Model No: 50.5H Sonic Sensor Serial No: F1644
 Customer: _____ P.O. No: _____ Sales Order: _____
 Final Calibration By: Kevin Ricks Calibration Date: 04-01-15
 Quality Control Inspected By: AJR Inspection Date: APR 03 2015
 New Unit Repair/Adjust Re-Calibration As Found
 Unit Within Tolerance as Found Unit Within Tolerance as Left

Calibration Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Digital Multimeter 1	Agilent/HP	34401A	MY41039534	4/11/2015
Digital Multimeter 2	Agilent/HP	34401A	US36094551	8/26/2015
Frequency Counter	Agilent/HP	53131A	MY40009285	5/22/2015
Standard Sensor	MOI	010C-1	P22383	7/11/2017
Temperature Probe	MOI	920005/PC8340	E3402	9/03/2015

Test 1: Average Wind Tunnel Speed: 3.08 Meters per Second FirmwareVersion: 3194-01 R2.62

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .20 m/s)	Output Type:
30	.084	30.3	.3	3.06	.059	2.96	-.1	0 to 1 volt <input checked="" type="checkbox"/>
60	.165	59.3	-.7	3.07	.059	2.94	-.13	0 to 2.5 volt <input type="checkbox"/>
120	.334	120.2	.2	3.08	.059	2.94	-.14	0 to 5 volt <input type="checkbox"/>
150	.415	149.5	-.5	3.07	.059	2.94	-.13	RS-232 <input checked="" type="checkbox"/>
210	.583	210	0	3.08	.059	2.95	-.12	SDI-12 <input type="checkbox"/>
240	.668	240.3	.3	3.08	.06	2.98	-.1	RS-422 <input type="checkbox"/>
300	.834	300.4	.4	3.07	.06	3.02	-.04	RS-485 <input type="checkbox"/>
330	.916	329.8	-.2	3.09	.059	2.97	-.12	<input type="checkbox"/>

Test 2: Average Wind Tunnel Speed: 11.85 Meters per Second Output Range: 0-50 m/s

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .24 m/s)	Test Items:
30	.081	29.3	-.7	11.79	.235	11.76	-.04	Array Alignment <input checked="" type="checkbox"/>
60	.165	59.5	-.5	11.85	.237	11.87	.01	Jumper Config <input checked="" type="checkbox"/>
120	.331	119.1	-.9	11.85	.236	11.81	-.03	Firmware Config <input checked="" type="checkbox"/>
150	.415	149.3	-.7	11.88	.236	11.8	-.08	Zero Calibration <input checked="" type="checkbox"/>
210	.582	209.5	-.5	11.81	.236	11.79	-.02	Low Speed Test OK <input checked="" type="checkbox"/>
240	.666	239.9	-.1	11.88	.235	11.73	-.16	High Speed Test OK <input checked="" type="checkbox"/>
300	.833	299.7	-.3	11.87	.235	11.73	-.13	Sensor Function <input checked="" type="checkbox"/>
330	.915	329.6	-.4	11.84	.238	11.9	.06	Physical Inspection <input checked="" type="checkbox"/>

The standards used for this calibration have accuracies equal to or greater than the instruments tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated hereon, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A. Calibration performed by direct comparison to the above standard following test procedure: 50.5-6100 Rev E

CALIBRATORS

Company Maxxam/SIA Operator: Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU1809</u>	Last Calibration Date <u>January 25, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u> NOx [PPM]		<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

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)=	1.0301	0.90-1.10		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9926	0.90-1.10
b (Intercept % of FS)=	0.0925	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
SRM Gas Cylinder No.	<u>CAL018140</u>
Cylinder Conc. (ppm)	<u>48.79</u>
	Make/Model
	<u>Thermo 42i</u>
	Serial/AMU Number
	<u>1868</u>
	Last Calibration Date
	<u>March 15, 2017</u>
	Full Scale (ppm)
	<u>1.0</u>
	Cylinder Gas Expiry Date
	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: LL104222 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Expiry Date: July 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>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623

Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0

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	0.000	0.0000	0.0000	0.000
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

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

Single Component Cylinder Gas

File No. 2016-334CGA

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

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			
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. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Bios D
Temp. °C 24.5
B.P. 698mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
Operator Signature: _____

Date: January 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner
Cylinder #: LL104222 **Conc (PPM)** 50.7/50.9 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:
 Make/Model Teco 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0
 Last Calibration: Date: Oct 18/16 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				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</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 Contains 50.6 ppm SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

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

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Cold Lake Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Ghaleb	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Maram Ghaleb

Signature of the Representative of the Person Responsible / External Person Certifying the Report

November 3, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-09-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>October 6, 2017</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>October 6, 2017</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>October 25, 2017</u>
Level 3 Independent Data Review	<u>Chris Smith</u>	Date <u>November 3, 2017</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

December 5, 2017

Subject: Monthly Report Submission for the LICA Maskwa station (Revision)

Lakeland Industry & Community Association (LICA) is submitting the revised ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of September 2017.

Two editions were made in the revision report.

- 1) The Teom unit was removed on October 2 as the temporary monitoring program ended on September 30. The removal Teom audit result was omitted in the report (September 2017). The audit result is included in this revision report (September 2017 (Revised)).
- 2) An incorrect statement was noticed in the NO₂/NO/NO_x discussion in the report (September 2017). It was stated that the Thermo 42C, S/N: 42CTL-65974-351 was owned by LICA. However, it was the Maxxam supplied unit. The error was corrected in this revision report (September 2017 (Revised)).

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 September 2017 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, with the exception of NO_x/NO/NO₂.

NO₂/NO/NO_x: A total of 142 hours of downtime was recorded this month. Operational uptime was 80.3%. AEP reference number: 329594.

- The analyzer was recording elevated readings in the hour following the zero/span cycle between September 1 and September 6. The hour following the daily zero/span check was invalidated.
- The Maxxam supplied analyzer (API 200A, s/n: 2015) was removed and the other Maxxam supplied analyzer (Thermo 42C, s/n: 42CTL-65974-351) was installed on September 6 after it had undergone manufacturer's maintenance. Sixteen hours of downtime were recorded due to this event.



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

- The Thermo 42C analyzer failed the as-found response check, which was performed on September 11. Data was discarded back to the last known valid calibration, which was on September 7. 104 hours of downtime were recorded due to this event.
- The analyzer however continued to exhibit instability in span response after the repeat calibration on September 11. Maintenance was performed on the analyzer. Sixteen hours of downtime were recorded between September 12 and September 19 due to additional zero/span checks, an as-found response check and a repeat calibration.

PM2.5: A TEOM unit was installed on July 27. Valid data collection began on August 20 and ended on September 30. Hourly data collected in August was also included in this September monthly report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that 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 certify 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 me.

Respectfully,

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

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

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

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



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

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

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

JOB #: 2833-2017-09-30-C

September 2017 (Revised)

Prepared for:

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

Attention: MIKE BISAGA

DATE: December 1, 2017

This report supersedes all previous reports with the same Maxxam project number.

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Wunmi Adekanmbi*

Wunmi Adekanmbi, M.Sc., EPT.
Project Manager, Customer Service, Air Services

SUMMARY

In September, 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.

This is a revised report. Edits to the NO_x/NO/NO₂ discussion were made to clarify analyzer ownership. The shutdown calibration report for PM_{2.5} was also included in Appendix II.

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of NO_x/NO/NO₂, were above the 90% requirement.

SO₂: On September 11 at 15:00, one hour of downtime was recorded due to a calibrator cross-check.

H₂S: One hour of downtime was recorded due to an additional zero/span check performed on September 21, at 06:00, to assess a biased high zero response.

THC: Two hours of downtime were recorded on September 8, from 17:00 to 18:00, due to a calibrator cross-check. One more hour of downtime was incurred on September 10 due to an additional quality check performed in response to low concentrations recorded by the analyzer.

PM_{2.5}: As per LICA's request, a TEOM unit was installed on July 27 for a temporary PM_{2.5} monitoring program. Valid data collection began on August 20 and ended on September 30. Forty hours of data in August and thirty-one hours of data in September were invalidated as the data were below $-3 \mu\text{g}/\text{m}^3$.

NO_x/NO/NO₂: 142 hours of downtime were recorded this month.

- The analyzer was recording elevated readings in the hour following the zero/span cycle. These data were invalidated as they were not representative of ambient concentrations. Six hours of downtime were recorded as a result.
- Maxxam's analyzer (Thermo 42C s/n: 42CTL-65974-351) was installed on September 6 and calibrated on September 7. Sixteen hours of downtime were recorded due to this event.
- An as-found response check was performed on September 11 to assess a drift in span response. However, the results were outside of AMD required limits. A repeat calibration was performed to correct the drift and the analyzer was back online on September 11. Data was discarded back to the last known valid calibration, which was on September 7. 104 hours of downtime were recorded due to this event.
- Sixteen hours of downtime were recorded between September 12 and September 19 due to additional zero/span checks, an as-found response check and a repeat calibration performed to assess and address an unstable span response.
- Equipment uptime (80.3%) did not meet the 90% AMD requirement. This event was reported to AEP under reference number 329594.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	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	8	11	21	5.5	WNW	2	4	99.9
H ₂ S (ppb)	10	3	0	0	0	8	7	2	0.5	SSE	1	6	99.9
THC (ppm)	-	-	-	-	2.09	3.00	6	7	0.2	SE	2.36	7	99.6
NO ₂ (ppb)	159	-	0	-	2	15	11	21	5.5	WNW	11	11	80.3
NO (ppb)	-	-	-	-	1	10	6	6	1.8	WNW	4	6	80.3
NO _x (ppb)	-	-	-	-	3	20	6	8	1.8	WNW	13	11	80.3
PM _{2.5} (µg/m ³)	80	30	0	0	3	41	9	23	2.9	W	18	9	95.7
RELATIVE HUMIDITY (%)	-	-	-	-	71	94	6	6	2.2	SSW	87	21	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	941	957	4	8	4.3	NNW	955	4	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	11.3	28.6	6	14	3.6	SW	18.1	7	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	4.6	19	12	4.6	NE	0.6	19	100.0
VECTOR WS (kph)	-	-	-	-	1.1	12.5	10	14	-	W	7.1	10	100.0
VECTOR WD (sec)	-	-	-	-	202 (SSW)	-	-	-	-	-	-	-	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.

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).

Sample filters for all continuous air monitors are changed 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 one hour of downtime.
- The routine monthly calibration was performed on September 7.
- The NO_x and SO₂ analyzers run on the same calibration gas. One hour of downtime was recorded on September 11 at hour 15:00 as a calibrator cross-check was being performed on the NO_x analyzer.
- One instance of maximum instantaneous data was discarded due to brief power outage on September 18 at hour 09:00.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 99.9% equivalent to one hour of downtime. This was incurred due to an additional zero/span check performed on September 21, at 06:00, to assess a biased high zero response.
- The routine monthly calibration was performed on September 6.
- One instance of maximum instantaneous data was discarded due to brief power outage on September 18 at hour 09:00.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 99.6% equivalent to three hours of downtime.
- The routine monthly calibration was performed on September 7.
- Two hours of downtime were recorded on September 8, from 17:00 to 18:00, as a calibrator cross-check was performed on the channel.
- The analyzer recorded concentrations that were lower than Maxxam's internal alert limits (concentration set at 1.8ppm) between hour 03:00 and 08:00 on September 10. An additional zero/span check was performed as a diagnostic to assess the state of the span gas. The result showed no bias in span response. No further action was taken. One hour of downtime was incurred due to the additional quality check.
- One instance of maximum instantaneous data was discarded due to brief power outage on September 18 at hour 09:00.

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

- Operational time, for the monitoring period was 80.3% equivalent to 142 hours of downtime.
- From September 1 to 6, the hour following the daily zero/span check was invalidated. The analyzer was recording elevated readings in the hour following the zero/span cycle. These elevated readings were caused by a delay of the reaction cell purging with ambient air and re-stabilizing at ambient baseline levels; and were therefore invalidated. Six hours of downtime were incurred as a result.
- Following a successful shut-down calibration and subsequent removal of the resident analyzer (API 200A, s/n: 2015) on September 6, a Thermo 42C analyzer (s/n: 42CTL-65974-351) was installed. The analyzer was left in "Maintenance" mode to stabilize until the following day when a successful installation calibration was performed. The removed and installed analyzers were both from Maxxam's inventory. Sixteen hours of downtime were recorded due to this event.
- Due to a drift in span response following the installation of the Thermo 42C analyzer, an as-found response check was performed on September 11. However, the results were outside of AMD required limits. It was suspected this was because the analyzer did not have sufficient stabilization time before the installation calibration on September 7. A repeat calibration was therefore completed immediately. Data was discarded back to the last known valid calibration, which was on September 7. 104 hours of downtime were recorded due to this event.
- The analyzer however continued to exhibit instability in span response after the repeat calibration on September 11. A successful as-found response check was performed on September 14. A new oven for the zero/span system was installed and the permeation tube was replaced on September 15. The new oven was allowed time to stabilize and a full repeat calibration was completed on September 18. The expected span value was updated on September 19 after a repeat zero/span check. Sixteen hours of downtime were recorded between September 12 and September 19 due to additional zero/span checks, an as-found response check and a repeat calibration.
- One instance of maximum instantaneous data was discarded due to brief power outage on September 18 at hour 09:00.
- Equipment uptime did not meet the 90% AMD requirement. This event was reported to AEP under reference number 329594.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 95.7% equivalent to thirty-one hours of downtime.
- The TEOM unit was installed on July 27 upon LICA's request for a temporary PM_{2.5} monitoring program. Due to operational issues, valid data collection began after a successful audit that was performed on the TEOM unit on August 20. Data prior to August 20 were discarded. Data between August 20 and August 31 are included in this report as per LICA's request.
- The routine monthly audits were performed on September 11 and 26.
- The temporary PM_{2.5} monitoring program ended on October 2 at LICA's request.
- 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. Forty hours of data in August and thirty-one hour of data in September were invalidated as the data were 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 100%.
- One instance of maximum instantaneous data was discarded due to brief power outage on September 18 at hour 09:00.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period, was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period, was 100%.

PRECIPITATION (PRECIP)

- Operational time, for the monitoring period, was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period, was 100%.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of NOX/NO/NO₂, were above the 90% requirement. This event was reported to AEP under reference number 329594.

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- 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
- Oxides of Nitrogen - Thermo 42 C Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

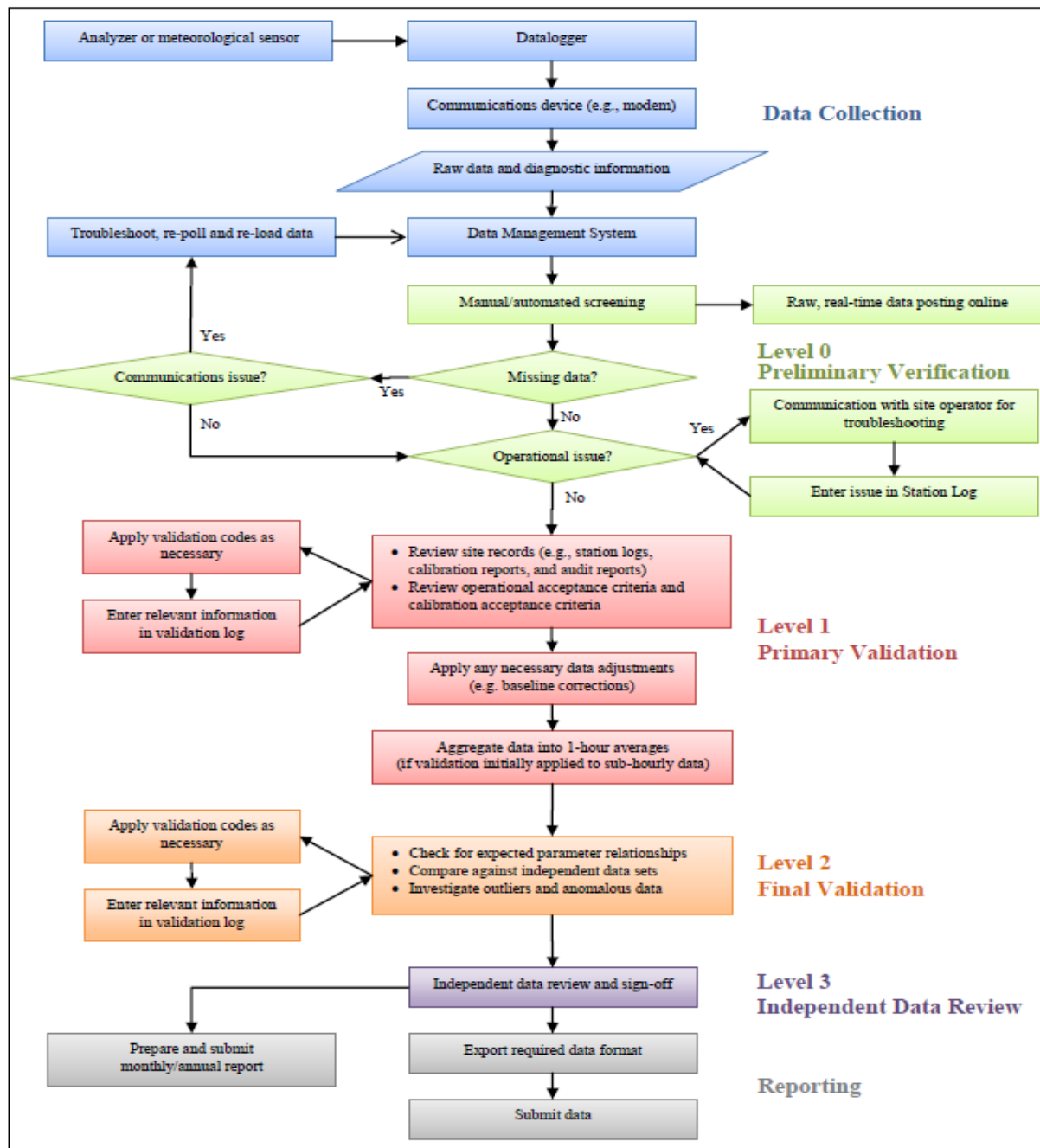
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

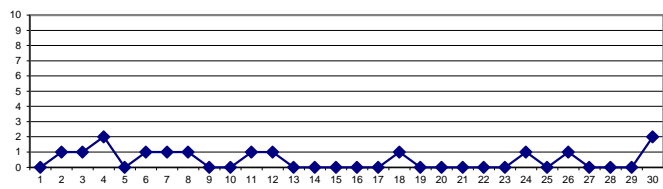
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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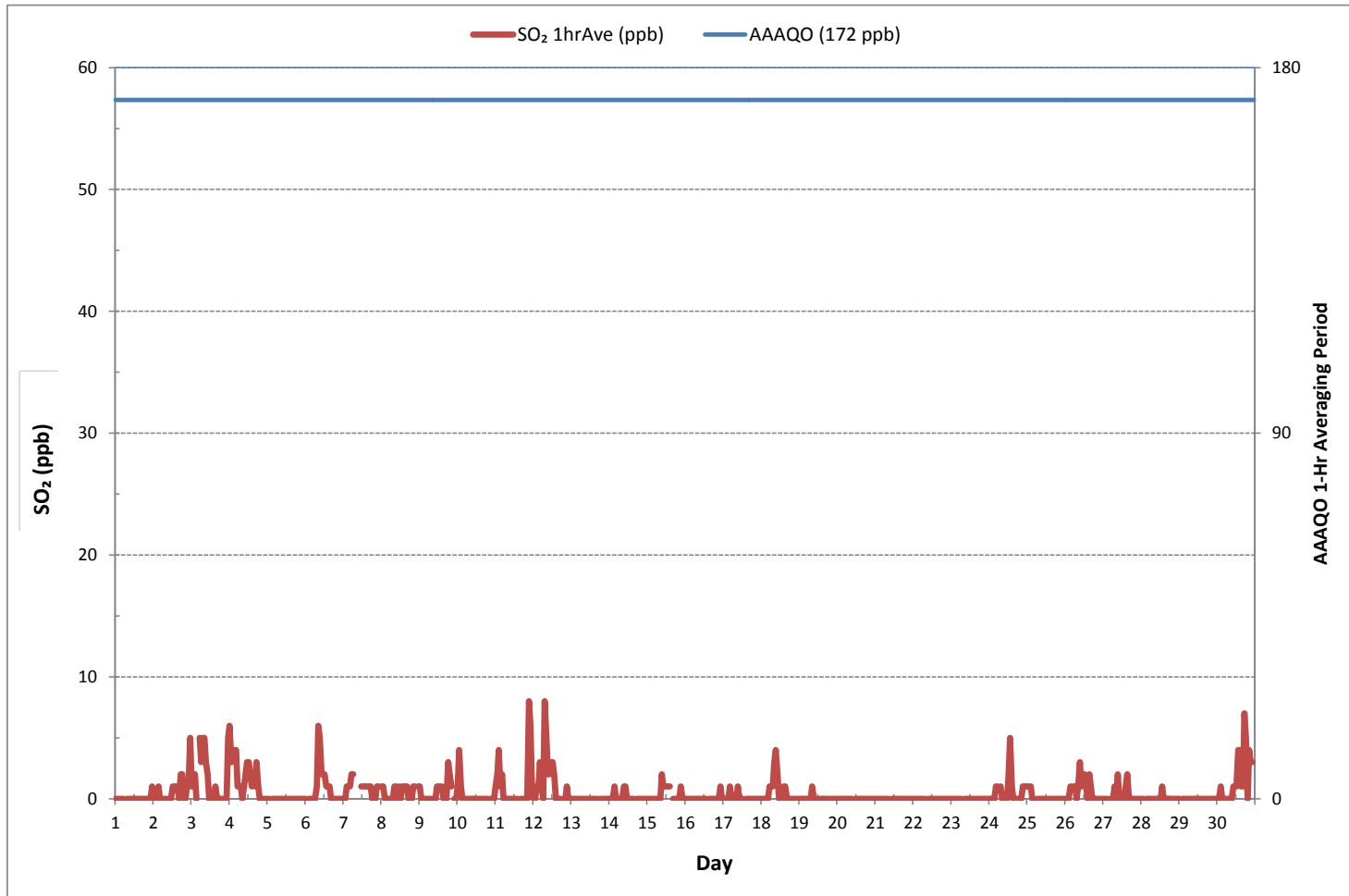
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	168
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	8 ppb @ HOUR 21 ON DAY 11
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 4
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	719 hrs
AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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

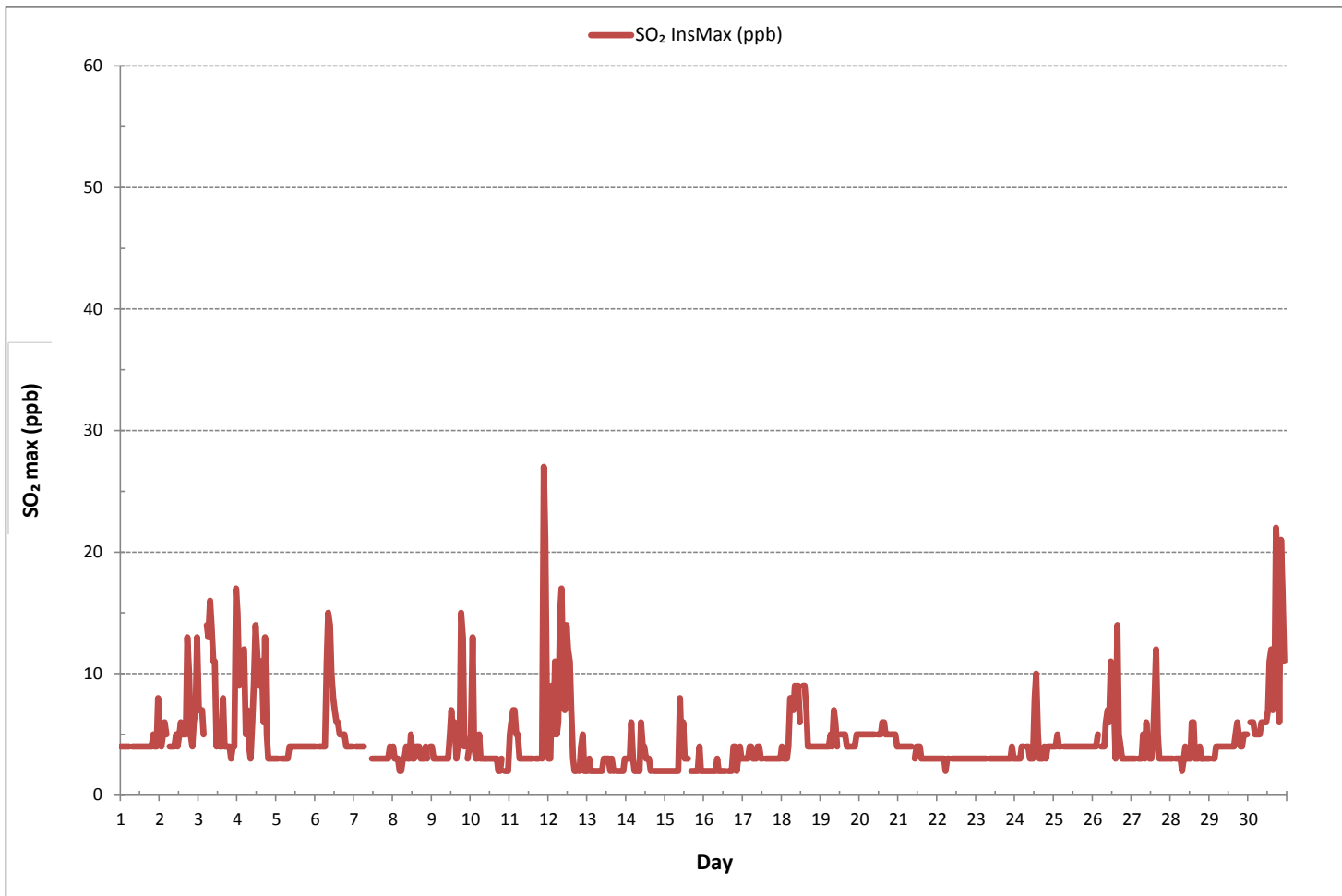
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	27 ppb @ HOUR 21 ON DAY 11
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	718 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

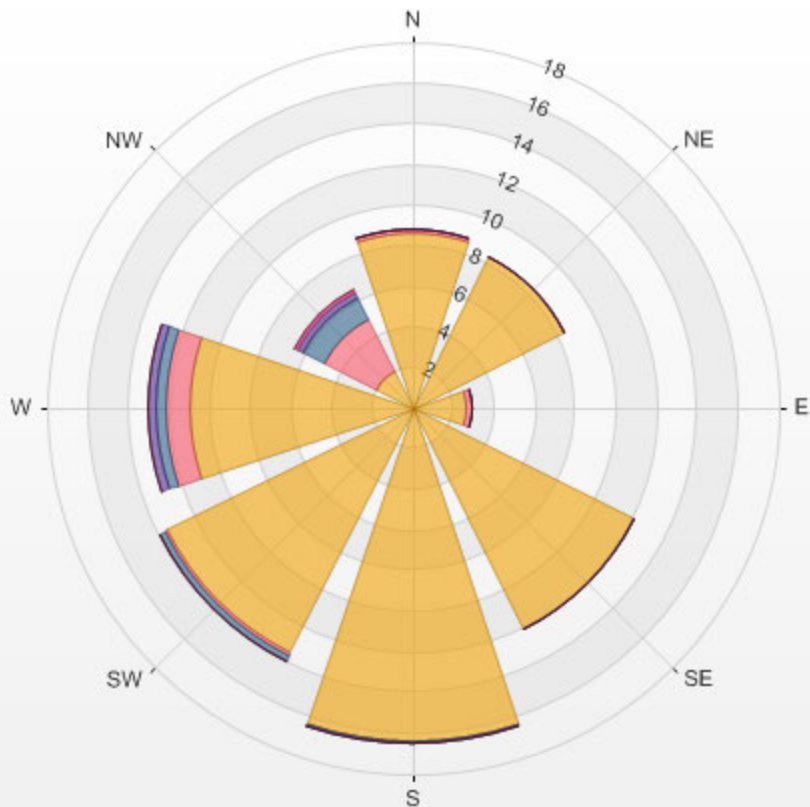
Calm: 17.60%

Calm Avg: 0.21 [ppb]

Direction	0.0-1.8	1.8-3.6	3.6-5.4	5.4-7.2	7.2-9.0	>9.0	Total
N	8.7	0.2	0.0	0.0	0.0	0.0	8.8
NE	8.4	0.0	0.0	0.0	0.0	0.0	8.4
E	2.6	0.3	0.0	0.0	0.0	0.0	2.9
SE	12.2	0.0	0.0	0.0	0.0	0.0	12.2
S	16.4	0.0	0.2	0.0	0.0	0.0	16.6
SW	13.5	0.2	0.3	0.0	0.0	0.0	13.9
W	11.0	1.2	0.4	0.4	0.0	0.0	13.1
NW	2.1	2.8	1.2	0.3	0.3	0.0	6.6
Summary	74.8	4.6	2.1	0.7	0.3	0.0	82.4

% Icon	Classes (ppb)	75	5	2	1	0	0
	0.0-1.8						
	1.8-3.6						
	3.6-5.4						
	5.4-7.2						
	7.2-9.0						
	>9.0						

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.60% Calm Poll Avg: 0.21[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 17/09 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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	24		
3	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	
4	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
5	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	4	0	24	
6	4	S	4	2	1	1	1	4	3	2	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
7	S	1	8	5	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	8	1	24	
8	0	0	0	1	1	2	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	1	0	0	0	1	0	24	
10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
11	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	0	0	1	0	24	
12	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
18	0	0	0	0	0	4	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	24	
19	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
20	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	1	0	24
21	0	0	0	0	0	0	S1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
22	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
24	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
25	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	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
27	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
28	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
29	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
30	S	0	0	0	0	2	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	5	1	24		
HOURLY MAX	4	1	8	5	2	4	5	4	3	2	1	0	1	0	1	0	0	1	1	0	0	1	1	4						
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						

STATUS FLAG CODES

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

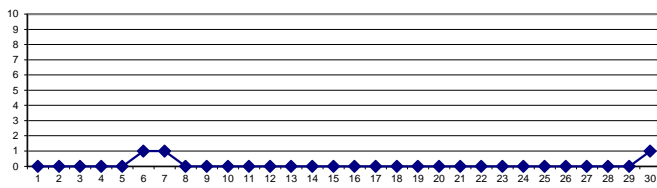
OBJECTIVE LIMIT:

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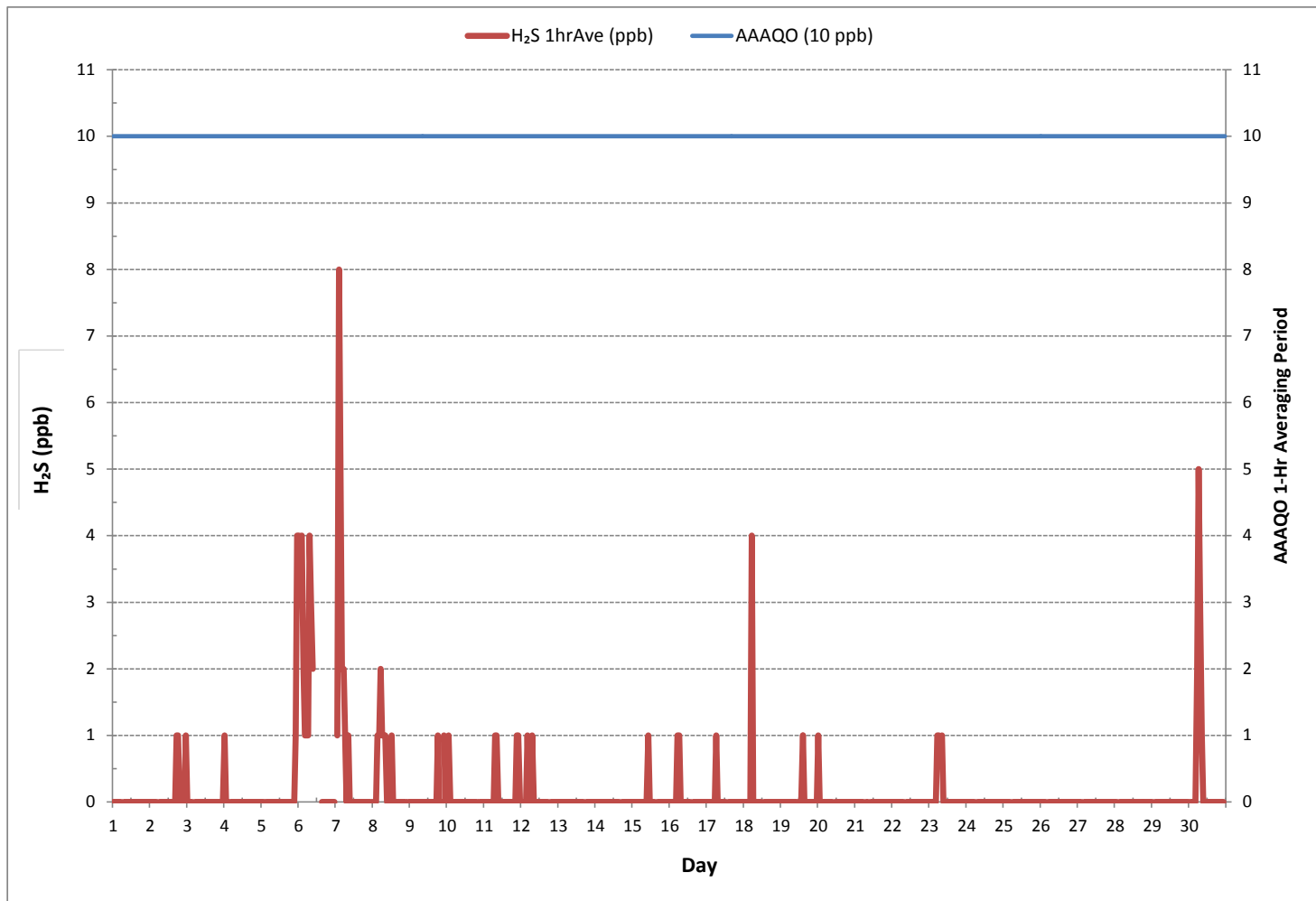
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	52		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	8 ppb @ HOUR	2 ON DAY	7
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	6
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES September 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S 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	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	
3	3	2	2	2	S	2	2	3	3	2	2	2	2	2	1	2	1	1	1	1	1	1	1	2	1	1	3	
4	3	2	1	S	2	1	1	1	1	1	1	2	2	2	1	1	1	2	1	1	1	1	1	2	1	1	3	
5	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	2	12	1	12	2	
6	9	S	6	4	2	3	2	15	13	4	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	15	4	
7	S	3	17	10	3	3	4	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	17	3	
8	1	1	1	3	2	3	3	2	3	2	1	2	2	2	1	2	2	2	2	2	2	1	S	2	1	3	2	
9	1	2	1	1	1	1	1	1	1	2	1	2	1	2	2	2	2	2	9	5	2	S	3	3	1	9	2	
10	3	5	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	5	1	
11	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	3	1	2	2	S	3	4	5	1	1	5	2	
12	1	2	3	1	5	1	1	3	2	2	2	3	2	2	1	1	1	1	S	1	2	2	1	1	1	5	2	
13	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	
14	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	S	1	1	1	1	1	2	1	0	2	1	
15	1	0	1	1	1	0	1	0	1	1	2	1	1	0	1	S	1	0	1	0	0	0	0	0	0	2	1	
16	0	0	1	1	2	3	2	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	3	1	
17	1	1	1	1	1	1	2	2	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	1	2	1
18	2	3	2	2	4	9	3	2	2	P	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	9	3	
19	2	2	2	2	2	2	2	2	2	2	2	S	2	2	3	2	2	2	2	2	2	2	2	2	2	3	2	
20	3	3	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	3	2	2	3	2	3	2	
21	2	2	2	2	2	2	S1	S1	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	
22	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	
23	1	1	1	1	1	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	
24	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	
25	1	2	1	1	1	S	1	2	1	2	2	2	1	2	1	2	1	1	1	1	1	1	1	1	1	2	1	
26	1	2	1	1	S	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	
27	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	
28	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	
29	3	S	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	3	
30	S	2	2	2	3	5	9	6	4	2	2	2	2	3	3	2	2	2	2	2	2	3	2	S	2	9	3	
HOURLY MAX	9	5	17	10	5	9	9	15	13	4	2	3	2	3	3	3	2	3	9	5	3	4	5	12	2	9	3	
HOURLY AVG	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	2	1	1	1	2	2	2	2	2	

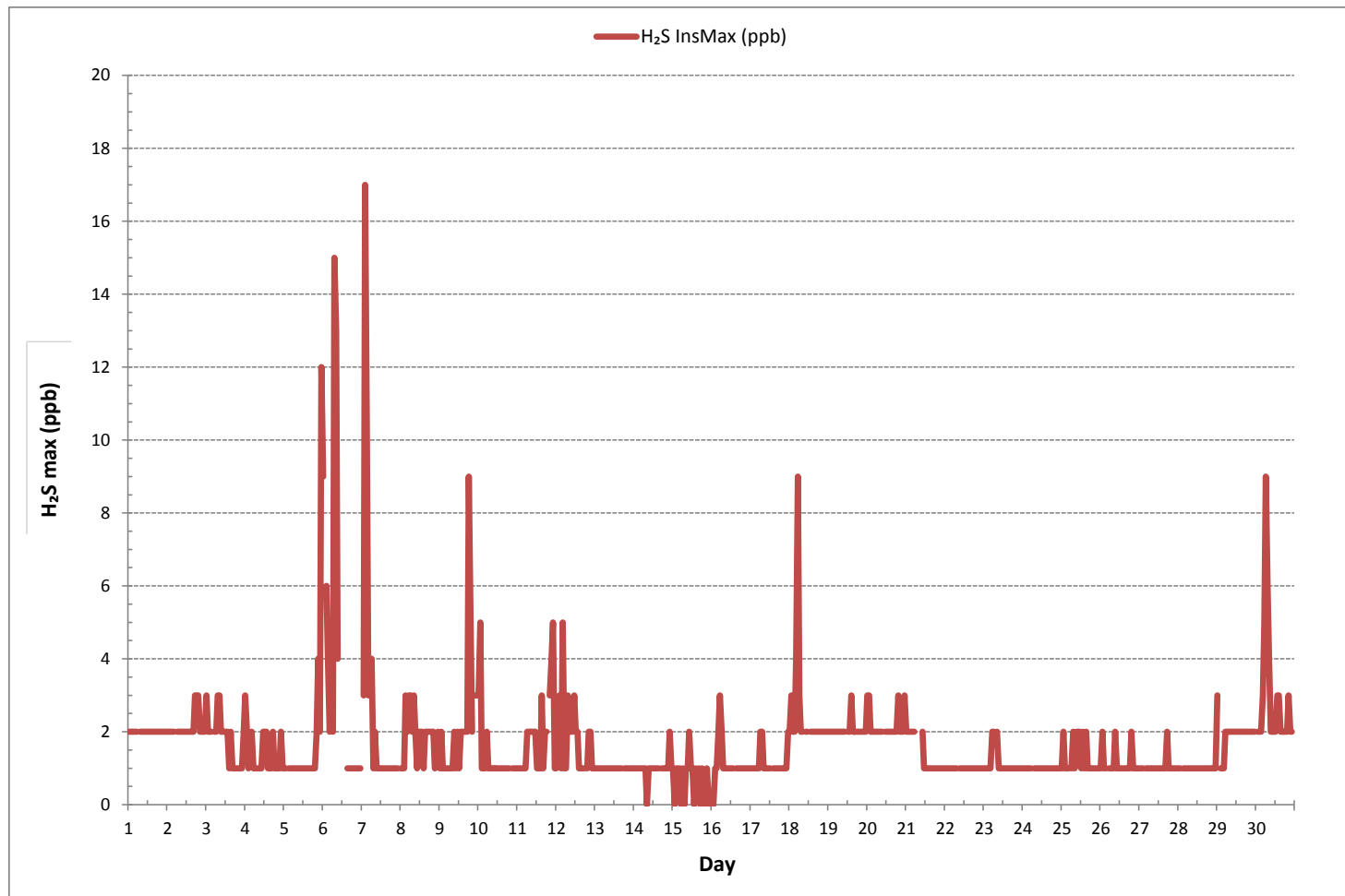
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	668
MAXIMUM INSTANTANEOUS VALUE:	17 ppb @ HOUR 2 ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	717 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-H2S[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 17.79% Calm Avg: 0.54 [ppb]

Direction	0.0-3.0	3.0-6.0	6.0-9.0	>9.0	Total
N	8.5	0.0	0.0	0.0	8.5
NE	8.5	0.0	0.0	0.0	8.5
E	2.8	0.2	0.0	0.0	2.9
SE	12.4	0.0	0.0	0.0	12.4
S	16.8	0.0	0.0	0.0	16.8
SW	13.8	0.0	0.0	0.0	13.8
W	12.9	0.2	0.0	0.0	13.1
NW	6.2	0.0	0.0	0.0	6.2
Summary	81.9	0.3	0.0	0.0	82.2

% Icon Classes (ppb)

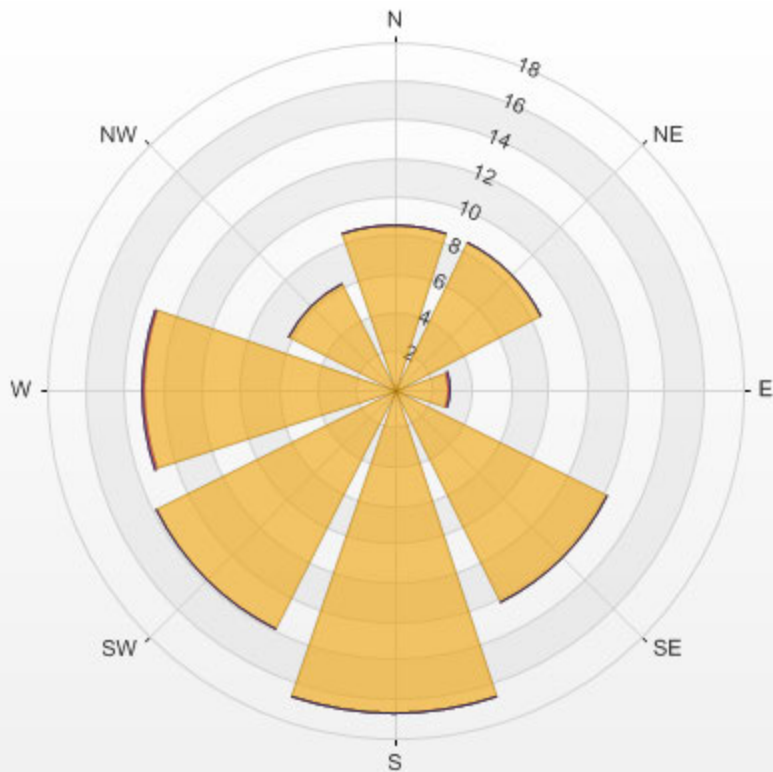
82 0.0-3.0

0 3.0-6.0

0 6.0-9.0

0 >9.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.79% Calm Poll Avg: 0.54[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



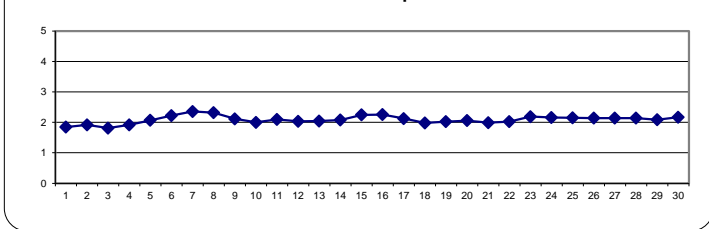
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	1.79	1.81	1.84	1.87	1.91	1.95	S	1.88	1.82	1.82	1.82	1.81	1.84	1.83	1.82	1.83	1.81	1.80	1.83	1.84	1.93	1.92	1.88	1.96	1.79	1.96	1.85	24
2	2.02	2.02	2.09	2.10	2.07	S	1.98	1.93	1.83	1.84	1.83	1.81	1.84	1.87	1.90	1.87	1.88	1.95	1.88	1.82	1.80	1.84	1.87	2.03	1.80	2.10	1.92	24
3	1.93	1.85	1.88	1.89	S	1.81	1.82	1.86	1.81	1.81	1.81	1.79	1.79	1.78	1.74	1.69	1.72	1.72	1.70	1.74	1.85	1.87	1.86	1.95	1.69	1.95	1.81	24
4	2.01	1.96	2.03	S	1.95	1.88	1.89	1.88	1.88	1.82	1.83	1.84	1.82	1.83	1.84	1.87	1.84	1.84	1.81	1.85	1.92	2.10	2.19	2.24	1.81	2.24	1.92	24
5	2.21	2.11	S	2.29	2.27	2.35	2.42	2.56	2.04	2.00	2.09	2.08	2.05	1.95	1.88	1.85	1.84	1.83	1.81	1.89	1.94	1.98	2.10	2.16	1.81	2.56	2.07	24
6	2.14	S	2.52	2.58	2.48	2.90	2.87	2.96	2.72	2.24	1.88	1.80	1.80	1.77	1.86	1.96	1.96	1.95	1.96	1.97	2.07	2.26	2.22	2.22	1.77	2.96	2.22	24
7	S	2.37	2.51	2.59	2.73	2.88	2.76	C	C	C	C	C	2.27	2.27	2.19	2.19	2.30	2.25	2.23	2.12	2.09	2.14	2.17	S	2.09	2.88	2.36	24
8	2.31	2.36	2.36	2.45	2.42	2.42	2.37	2.23	2.24	2.27	2.32	2.31	2.29	2.25	2.26	2.30	2.40	2.21	2.24	2.08	2.08	S	2.11	2.08	2.04	2.24	2.12	24
9	2.21	2.23	2.19	2.12	2.06	2.06	2.04	2.08	2.07	2.04	2.07	2.12	2.13	2.15	2.15	2.14	2.13	2.21	2.24	2.08	2.08	S	2.11	2.08	2.04	2.24	2.12	24
10	2.06	2.07	2.00	1.99	1.98	1.95	1.91	S1	1.95	1.95	1.98	1.98	1.99	1.99	2.00	2.03	2.01	2.01	2.03	2.02	S	2.03	2.02	2.10	1.91	2.10	2.00	23
11	2.22	2.37	2.34	2.35	2.30	2.28	2.18	2.20	2.11	1.99	2.07	2.06	2.03	2.05	1.99	1.92	1.84	1.85	1.83	S	2.09	2.19	2.03	1.96	1.83	2.37	2.10	24
12	1.98	1.99	2.01	2.00	2.09	2.03	2.03	2.09	2.05	2.07	2.08	2.06	2.05	2.06	2.02	2.00	1.99	1.98	S	1.97	2.05	2.20	2.10	2.06	1.97	2.20	2.04	24
13	2.11	2.14	2.12	2.12	2.17	2.17	2.11	2.01	1.99	2.00	2.01	2.02	2.01	2.01	2.01	1.99	1.99	S	1.99	2.01	2.03	2.02	2.03	2.09	1.99	2.17	2.05	24
14	2.07	2.07	2.04	2.04	2.05	2.10	2.17	2.12	2.08	2.01	2.01	1.99	1.97	1.94	1.97	2.02	S	2.01	2.09	2.10	2.23	2.23	2.23	2.25	1.94	2.25	2.08	24
15	2.31	2.22	2.30	2.02	2.53	2.62	2.66	2.71	2.41	2.24	2.16	2.09	2.07	2.07	2.07	S	2.03	2.02	2.07	2.12	2.15	2.13	2.18	2.26	2.02	2.71	2.25	24
16	2.32	2.35	2.45	2.36	2.50	2.53	2.49	2.60	2.56	2.18	2.11	2.12	2.14	2.10	S	2.08	2.19	2.15	2.09	2.16	2.16	2.13	2.11	2.13	2.08	2.60	2.26	24
17	2.15	2.14	2.18	2.23	2.28	2.47	2.47	2.43	2.21	2.11	2.04	2.07	2.04	S	2.01	2.03	2.02	1.99	1.95	2.01	2.05	2.02	2.00	1.99	1.95	2.47	2.13	24
18	2.02	2.02	2.01	2.20	2.00	2.03	2.01	2.01	2.02	2.01	2.00	2.00	S	1.98	1.95	1.94	1.92	1.90	1.91	1.91	1.93	1.98	2.01	2.01	1.90	2.03	1.98	24
19	2.02	1.98	1.99	2.02	2.01	2.02	2.00	2.00	2.03	1.94	2.01	S	2.02	2.01	2.02	2.09	2.03	2.04	2.06	2.07	2.08	2.08	2.07	2.06	1.94	2.09	2.03	24
20	2.13	2.14	2.13	2.13	2.15	2.19	2.20	2.19	2.12	2.08	S	2.02	2.02	2.05	2.04	2.05	2.00	2.00	1.99	1.97	1.96	1.95	1.96	1.96	1.95	2.20	2.06	24
21	1.95	1.95	1.94	1.94	1.95	1.95	1.96	1.97	2.00	S	1.98	1.99	1.99	1.97	2.01	2.02	2.00	2.01	2.02	2.04	2.04	2.03	2.04	2.04	1.94	2.04	1.99	24
22	2.04	2.03	2.01	2.00	2.01	2.03	2.05	2.02	S	2.00	2.02	2.02	2.02	2.01	2.01	2.00	2.01	2.01	2.05	2.07	2.06	2.03	2.05	2.07	2.00	2.07	2.03	24
23	2.08	2.10	2.16	2.24	2.29	2.32	2.34	S	2.20	2.11	2.13	2.12	2.13	2.18	2.16	2.18	2.21	2.19	2.17	2.20	2.19	2.18	2.22	2.22	2.08	2.34	2.19	24
24	2.25	2.27	2.28	2.26	2.26	2.32	S	2.33	2.35	2.28	2.28	2.21	2.09	2.05	2.02	2.03	2.01	2.00	2.02	2.05	2.07	2.08	2.10	2.14	2.00	2.35	2.16	24
25	2.18	2.20	2.21	2.24	2.27	S	2.29	2.31	2.30	2.25	2.22	2.21	2.12	2.08	2.05	2.03	2.00	2.01	2.00	2.01	2.06	2.11	2.14	2.18	2.00	2.31	2.15	24
26	2.30	2.33	2.27	2.33	S	2.45	2.56	2.36	2.10	1.97	1.98	2.05	2.05	2.06	2.04	2.04	2.02	1.98	1.97	1.96	2.10	2.11	2.13	2.14	1.96	2.56	2.14	24
27	2.10	2.09	2.18	S	2.28	2.30	2.32	2.48	2.76	2.54	2.18	2.16	1.93	1.98	1.99	2.00	1.95	1.95	1.94	1.97	1.97	2.01	2.02	2.02	1.93	2.76	2.14	24
28	2.03	2.06	S	2.15	2.20	2.25	2.24	2.23	2.18	2.08	2.09	2.11	2.17	2.14	2.11	2.16	2.21	2.16	2.17	2.12	2.06	2.05	2.07	2.08	2.03	2.25	2.14	24
29	2.06	S	2.04	2.02	2.05	2.10	2.13	2.15	2.11	2.10	2.13	2.16	2.13	2.06	2.06	2.12	2.16	2.10	2.07	2.07	2.05	2.08	2.13	2.02	2.16	2.09	24	
30	S	2.23	2.22	2.24	2.39	2.31	2.36	2.45	2.34	2.23	2.25	2.23	2.26	2.21	2.18	2.20	2.03	1.94	1.94	1.94	1.94	1.93	1.93	S	1.93	2.45	2.17	24
HOURLY MAX	2.32	2.37	2.52	2.59	2.73	2.90	2.87	2.96	2.76	2.54	2.32	2.31	2.29	2.27	2.26	2.30	2.40	2.25	2.24	2.28	2.24	2.31	2.23	2.28				
HOURLY AVG	2.11	2.12	2.15	2.18	2.20	2.24	2.24	2.22	2.15	2.07	2.05	2.04	2.04	2.02	2.01	2.02	2.02	1.99	1.99	2.01	2.04	2.07	2.07	2.10				

STATUS FLAG CODES

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

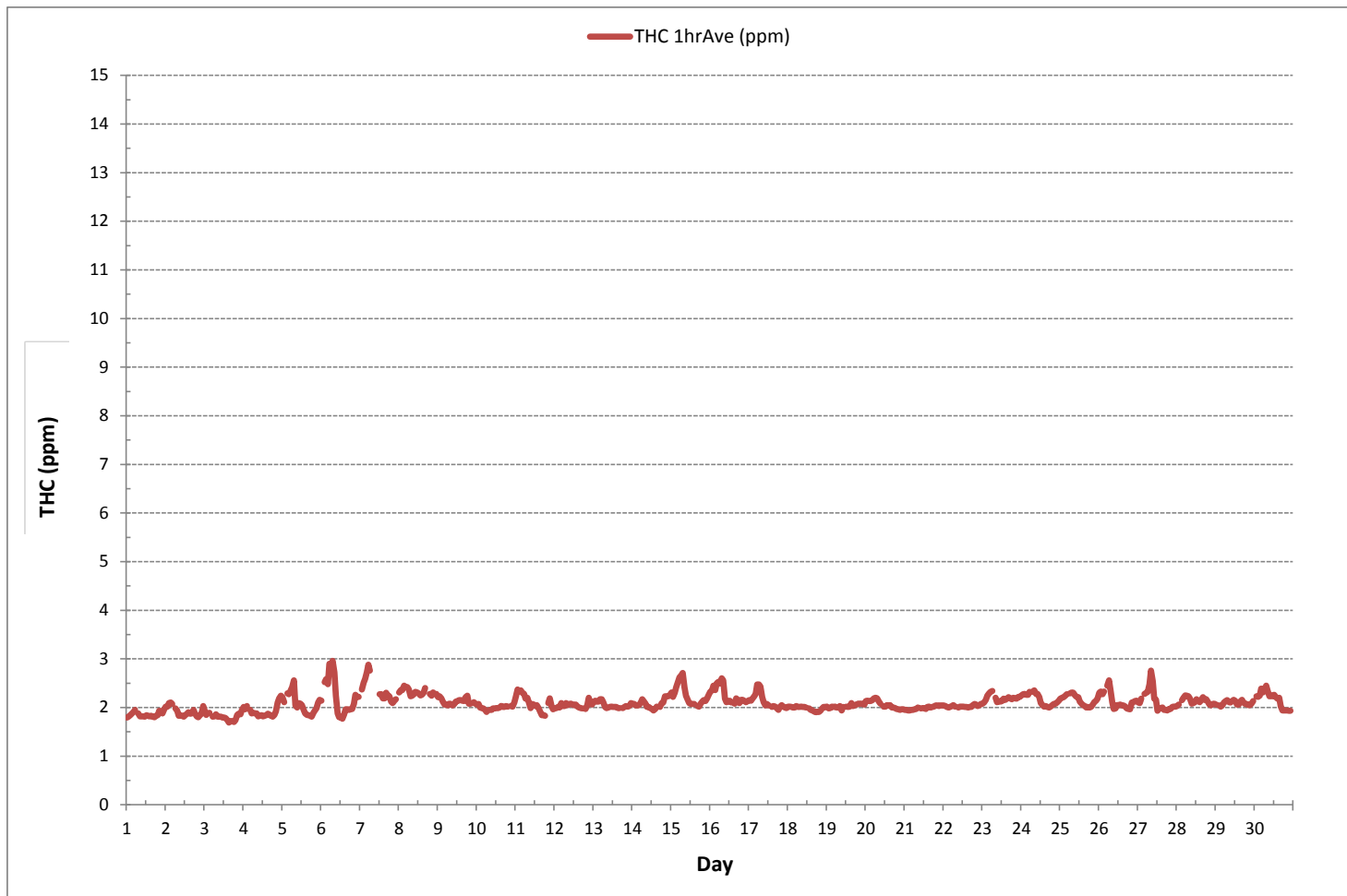
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	680			
MINIMUM 1-HR AVERAGE:	1.69 ppm	@ HOUR	15	ON DAY 3
MAXIMUM 1-HR AVERAGE:	2.96 ppm	@ HOUR	7	ON DAY 6
MAXIMUM 24-HR AVERAGE:	2.36 ppm			ON DAY 7
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	717 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.6 %	
STANDARD DEVIATION:	0.18	MONTHLY AVERAGE:	2.09 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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	2.24	2.28	2.33	2.37	2.40	2.46	S	2.38	2.31	2.31	2.31	2.31	2.33	2.33	2.31	2.33	2.31	2.33	2.33	2.34	2.44	2.44	2.38	2.56	2.24	2.56	2.35	24
2	2.51	2.53	2.62	2.62	2.58	S	2.51	2.48	2.36	2.34	2.34	2.33	2.38	2.40	2.41	2.41	2.41	2.55	2.50	2.38	2.34	2.41	2.43	2.68	2.33	2.68	2.46	24
3	2.54	2.40	2.43	2.43	S	2.40	2.40	2.46	2.44	2.44	2.46	2.43	2.47	2.43	2.43	2.43	2.41	2.41	2.40	2.52	2.59	2.62	2.61	2.82	2.40	2.82	2.48	24
4	2.82	2.77	2.85	S	2.83	2.68	2.69	2.68	2.68	2.65	2.65	2.69	2.67	2.69	2.68	2.70	2.67	2.70	2.64	2.73	2.92	3.09	3.20	3.17	2.64	3.20	2.78	24
5	3.13	3.01	S	3.22	3.17	3.23	3.38	3.72	2.83	2.80	2.84	2.83	2.84	2.73	2.64	2.58	2.56	2.55	2.53	2.87	2.83	2.71	2.80	2.89	2.53	3.72	2.90	24
6	3.01	S	3.25	3.41	3.29	3.77	3.69	3.78	3.93	3.23	2.56	2.44	2.43	2.40	2.55	2.55	2.58	2.56	2.56	2.61	2.71	3.01	2.94	3.02	2.40	3.93	2.97	24
7	S	2.92	2.99	2.99	3.13	3.23	3.07	C	C	C	C	C	2.33	2.31	2.27	2.22	2.31	2.27	2.27	2.12	2.06	2.10	2.15	S	2.06	3.23	2.51	24
8	2.38	2.36	2.46	2.65	2.44	2.37	2.33	2.15	2.15	2.15	2.19	2.18	2.16	2.12	2.12	2.21	2.27	Y	Y	2.12	2.07	2.28	S	2.13	2.07	2.65	2.25	22
9	2.06	2.04	2.12	1.94	1.86	1.86	1.84	1.89	1.89	1.84	1.89	1.92	1.95	1.95	1.94	1.94	1.92	2.07	2.18	1.92	1.92	S	1.94	1.95	1.84	2.18	1.95	24
10	1.97	2.01	1.84	1.82	1.81	1.86	1.75	S1	1.81	1.82	1.85	1.85	1.88	1.88	1.91	1.95	1.92	1.94	1.97	1.97	S	1.97	2.00	2.10	1.75	2.10	1.90	23
11	2.33	2.38	2.33	2.34	2.30	2.30	2.18	2.21	2.18	2.01	2.12	2.11	2.09	2.09	2.08	2.00	1.90	1.91	1.95	S	2.25	2.44	2.30	2.06	1.90	2.40	2.17	24
12	2.09	2.10	2.27	2.13	2.40	2.19	2.24	2.31	2.28	2.33	2.30	2.36	2.30	2.36	2.24	2.21	2.21	2.19	S	2.24	2.46	2.49	2.37	2.34	2.09	2.49	2.28	24
13	2.43	2.43	2.40	2.43	2.46	2.46	2.44	2.33	2.28	2.31	2.31	2.33	2.33	2.33	2.33	2.33	S	2.34	2.37	2.39	2.39	2.42	2.47	2.28	2.47	2.38	24	
14	2.46	2.46	2.43	2.43	2.46	2.53	2.61	2.56	2.49	2.46	2.46	2.42	2.40	2.40	2.44	2.49	S	2.64	2.58	2.80	2.80	2.71	2.68	2.77	2.40	2.80	2.54	24
15	2.79	2.71	2.80	2.97	3.04	3.13	3.20	3.26	3.04	2.76	2.64	2.58	2.53	2.53	2.56	S	2.49	2.47	2.56	2.58	2.63	2.63	2.64	2.74	2.47	3.26	2.75	24
16	2.77	2.87	2.98	2.80	2.98	2.95	3.00	3.11	3.16	2.61	2.53	2.53	2.56	2.53	S	2.53	2.58	2.55	2.46	2.53	2.52	2.47	2.43	2.44	2.43	3.16	2.69	24
17	2.46	2.43	2.49	2.52	2.58	2.82	2.89	2.74	2.52	2.36	2.28	2.27	2.25	S	2.21	2.21	2.19	2.18	2.13	2.21	2.22	2.19	2.16	2.15	2.13	2.89	2.37	24
18	2.18	2.18	2.16	2.15	2.13	2.22	2.19	2.18	2.18	P	2.15	2.12	S	2.08	2.05	2.03	2.00	1.95	1.95	1.94	1.95	2.00	2.02	2.01	1.94	2.22	2.08	23
19	2.06	1.94	1.92	1.95	1.95	1.95	1.92	1.89	1.97	1.97	1.88	S	1.87	1.87	1.87	2.01	2.00	1.88	1.89	1.89	1.89	1.91	1.89	1.87	1.87	2.06	1.93	24
20	2.00	1.95	1.92	1.94	1.97	1.97	2.00	2.00	1.94	1.91	S	1.82	1.84	1.88	1.89	1.92	1.85	1.87	1.87	1.85	1.85	1.85	1.87	1.88	1.82	2.00	1.91	24
21	1.89	1.89	1.89	1.92	1.92	1.95	1.95	2.00	2.03	S	2.03	2.04	2.08	2.08	2.12	2.15	2.12	2.15	2.18	2.19	2.21	2.21	2.24	2.24	1.89	2.24	2.06	24
22	2.25	2.27	2.25	2.25	2.28	2.33	2.34	2.33	S	2.31	2.33	2.33	2.31	2.31	2.31	2.30	2.31	2.30	2.36	2.37	2.36	2.34	2.34	2.37	2.25	2.37	2.32	24
23	2.37	2.41	2.47	2.56	2.64	2.61	2.61	S	2.50	2.40	2.43	2.40	2.43	2.49	2.43	2.46	2.49	2.46	2.49	2.46	2.46	2.46	2.49	2.49	2.37	2.64	2.48	24
24	2.52	2.55	2.58	2.55	2.56	2.61	S	2.61	2.64	2.56	2.55	2.49	2.39	2.30	2.27	2.28	2.27	2.25	2.28	2.28	2.30	2.31	2.34	2.38	2.25	2.64	2.43	24
25	2.40	2.43	2.43	2.46	2.49	S	2.50	2.53	2.52	2.47	2.42	2.40	2.33	2.28	2.24	2.21	2.18	2.18	2.18	2.19	2.21	2.27	2.30	2.33	2.18	2.53	2.35	24
26	2.49	2.49	2.43	2.46	S	2.67	2.74	2.68	2.43	2.15	2.19	2.27	2.27	2.28	2.27	2.33	2.28	2.24	2.21	2.22	2.44	2.43	2.43	2.49	2.15	2.74	2.39	24
27	2.40	2.43	2.64	S	2.64	2.64	2.95	2.88	3.27	3.16	2.59	2.68	2.30	2.33	2.37	2.34	2.30	2.27	2.27	2.31	2.31	2.39	2.36	2.37	2.27	3.27	2.53	24
28	2.39	2.46	S	2.50	2.55	2.59	2.58	2.55	2.64	2.39	2.40	2.43	2.47	2.46	2.41	2.49	2.52	2.46	2.46	2.43	2.34	2.31	2.33	2.33	2.31	2.64	2.46	24
29	2.31	S	2.27	2.27	2.25	2.31	2.33	2.33	2.30	2.25	2.27	2.30	2.28	2.22	2.18	2.25	2.27	2.22	2.13	2.13	2.11	2.09	2.11	2.19	2.09	2.33	2.23	24
30	S	2.25	2.36	2.55	2.55	2.36	2.43	2.53	2.46	2.24	2.24	2.24	2.27	2.21	2.18	2.19	2.11	1.97	1.97	1.91	1.94	1.89	1.90	S	1.89	2.55	2.22	24
HOURLY MAX	3.13	3.01	3.25	3.41	3.29	3.77	3.69	3.78	3.93	3.23	2.84	2.83	2.84	2.73	2.68	2.70	2.67	2.70	2.64	2.87	2.92	3.09	3.20	3.17				
HOURLY AVG	2.40	2.39	2.43	2.45	2.49	2.52	2.53	2.54	2.47	2.38	2.33	2.33	2.30	2.29	2.27	2.28	2.26	2.27	2.27	2.29	2.33	2.36	2.35	2.40				

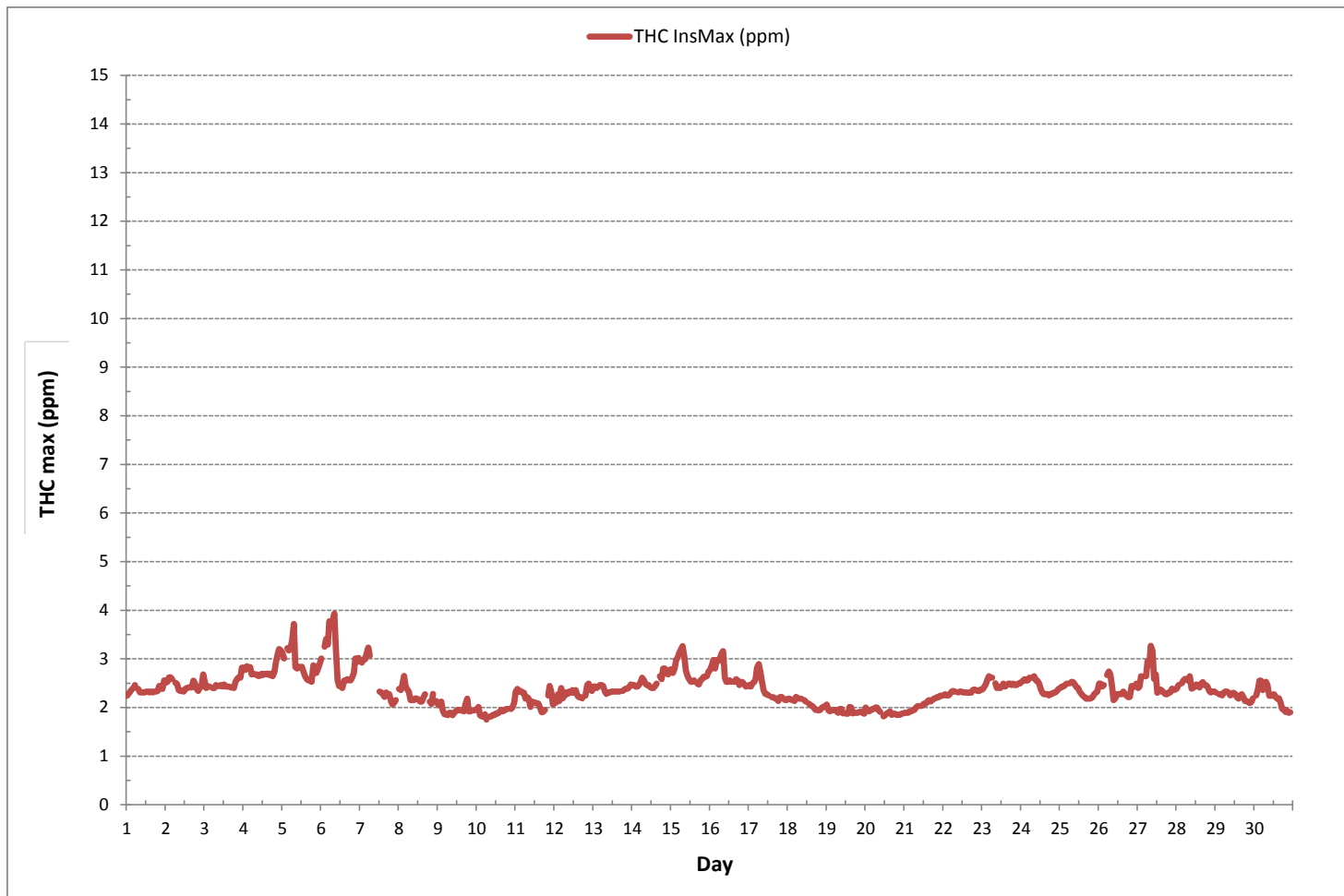
STATUS FLAG CODES

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:	3.93 ppm @ HOUR 8 ON DAY 6
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	716 hrs
STANDARD DEVIATION:	0.33

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA MASKWA
Poll.: LICA MASKWA-THC[ppm]
Monthly: 17/09
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

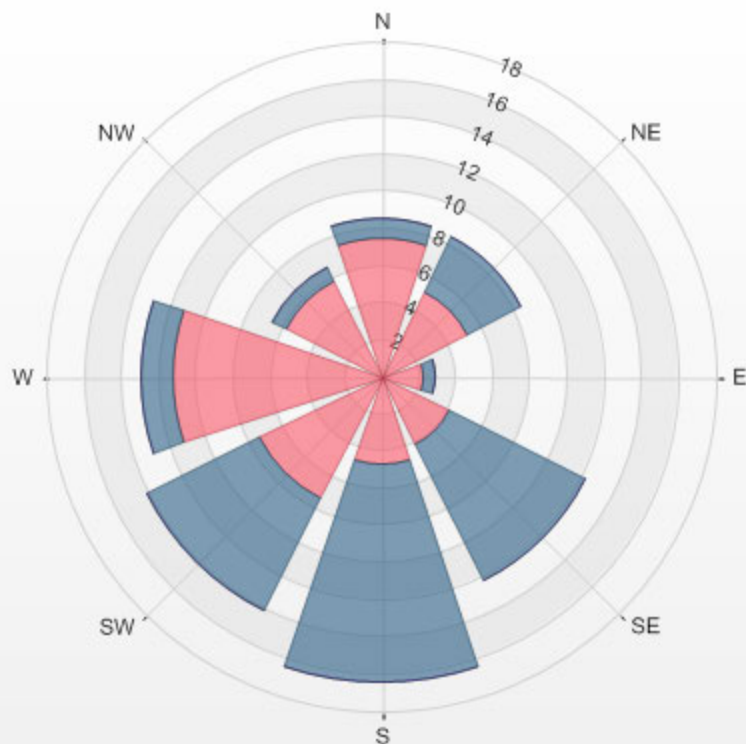
Calm: 17.67%

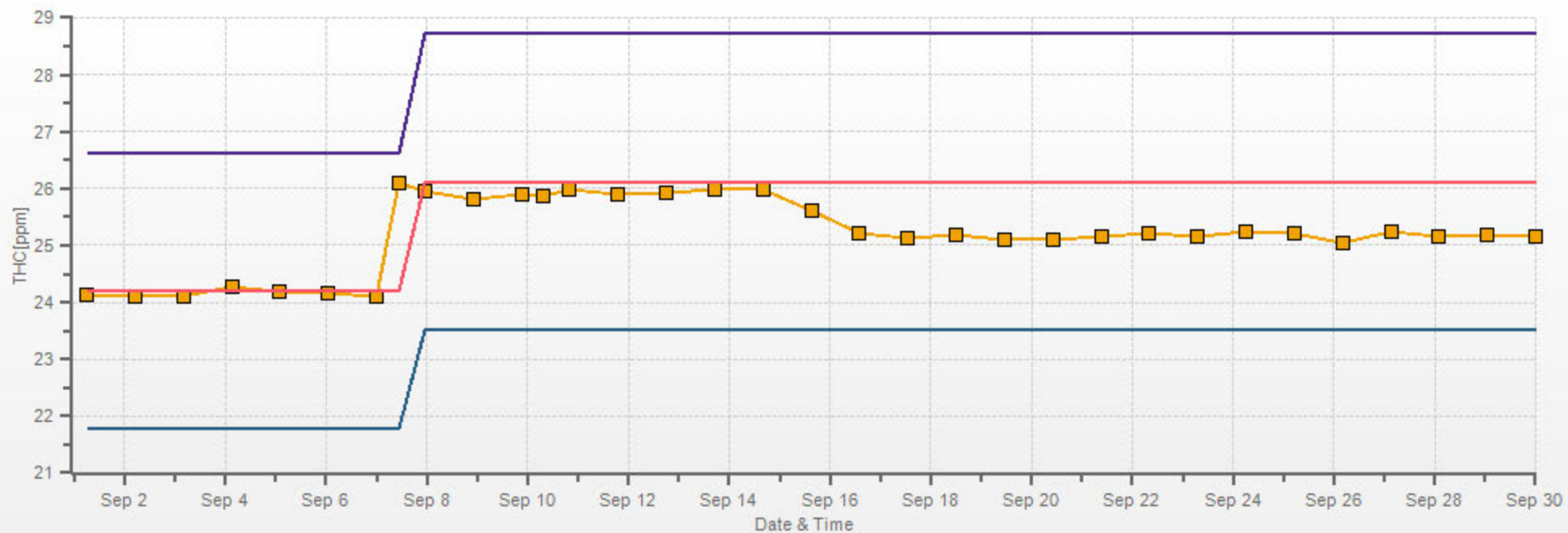
Calm Avg: 2.22 [ppm]

Direction	0.0-1.0	1.0-2.1	2.1-3.1	>3.1	Total
N	0.0	7.5	1.0	0.0	8.5
NE	0.0	5.2	3.2	0.0	8.4
E	0.0	2.2	0.7	0.0	3.0
SE	0.0	4.1	8.1	0.0	12.2
S	0.0	4.7	11.8	0.0	16.5
SW	0.0	7.4	6.8	0.0	14.1
W	0.0	11.2	1.8	0.0	13.0
NW	0.0	5.7	0.9	0.0	6.6
Summary	0.0	48.0	34.3	0.0	82.3

% Icon Classes (ppm) 0 0.0-1.0 48 1.0-2.1 34 2.1-3.1 0 >3.1

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.67% Calm Poll Avg: 2.22[ppm]





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

OXIDES OF NITROGEN



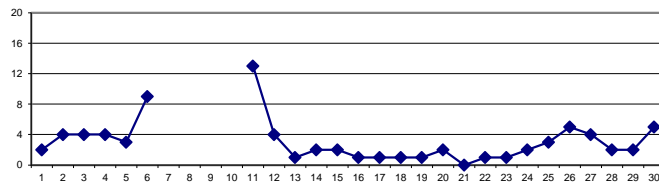
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

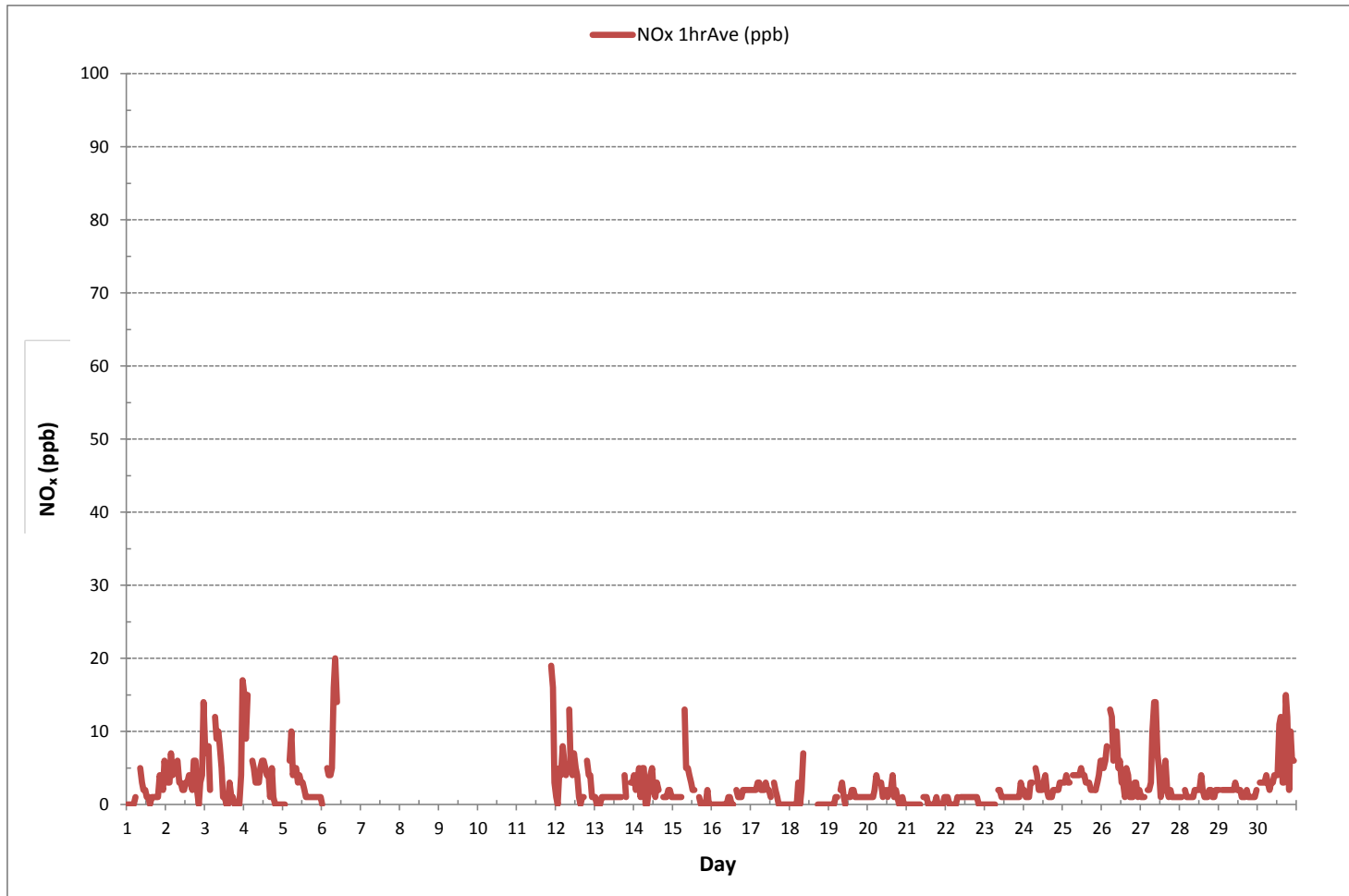
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	434			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	20 ppb	@ HOUR	8	ON DAY 6
MAXIMUM 24-HR AVERAGE:	13 ppb			ON DAY 11
IZS CALIBRATION TIME:	24 hrs	OPERATIONAL TIME:	578 hrs	
MONTHLY CALIBRATION TIME:	11 hrs	AMD OPERATION UPTIME:	80.3 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59						
DAY																														
1	1	1	1	0	1	4	S	X	7	4	3	2	9	2	1	2	2	2	2	2	6	4	3	14	0	14	3	23		
2	8	4	4	11	7	S	X	9	4	3	4	4	5	5	6	6	3	16	12	7	1	6	12	31	1	31	8	23		
3	13	13	10	6	S	X	29	16	17	17	9	2	3	2	2	12	2	2	1	1	1	0	9	40	0	40	9	23		
4	33	13	28	S	X	12	17	4	5	12	12	18	18	14	18	12	4	15	6	0	0	0	1	0	0	33	11	23		
5	0	0	S	X	9	45	5	10	7	13	4	4	3	2	2	2	2	2	2	2	2	1	1	2	0	45	5	23		
6	2	S	X	6	3	4	5	45	47	20	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	47	17	14		
7	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	6	
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
11	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	51	36	20	20	51	36	3
12	4	3	27	11	20	34	17	S1	36	21	12	28	17	14	5	2	18	1	S	11	9	10	1	1	1	36	14	23		
13	1	1	1	1	1	1	2	0	0	0	1	2	1	1	6	1	0	S	9	2	S1	S1	6	4	0	9	2	22		
14	6	4	4	12	2	S7	37	1	0	9	8	9	3	5	5	C1	C1	C1	1	1	2	2	2	1	0	S7	8	21		
15	1	1	0	1	0	1	S1	S1	11	16	6	10	2	S1	S1	S	6	1	1	0	0	7	3	1	0	16	4	20		
16	1	1	0	0	0	0	0	0	2	0	4	0	0	0	S	3	0	0	4	1	1	2	1	0	4	1	24			
17	1	1	0	1	3	3	1	1	1	1	1	1	0	S	4	1	0	0	0	0	0	0	0	0	0	4	1	24		
18	0	0	0	0	0	12	10	14	C1	C1	C1	C1	C1	C1	C1	C1	3	2	2	1	1	1	1	0	14	4	16			
19	1	1	1	1	1	1	S1	4	9	7	1	S	3	3	5	4	2	2	2	2	1	2	1	1	1	9	3	23		
20	1	1	1	2	2	42	3	6	10	1	S	4	2	11	8	13	3	3	2	0	0	0	0	0	0	42	5	24		
21	0	0	0	0	0	0	0	0	0	S	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	24		
22	1	0	0	0	0	0	0	0	S	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	24		
23	0	0	0	0	0	0	0	S	3	1	1	0	0	0	0	0	1	0	0	0	0	0	2	2	0	3	0	24		
24	1	1	0	1	4	3	S	4	3	1	1	1	3	5	1	1	0	2	0	0	0	1	1	1	0	5	2	24		
25	2	2	3	1	1	S	4	3	3	3	3	3	3	3	2	1	2	2	1	1	2	2	4	5	1	5	2	24		
26	6	6	6	8	S	18	14	9	10	13	11	14	9	11	3	19	6	2	0	0	2	2	0	1	0	19	7	24		
27	0	0	0	S	0	0	6	16	17	15	8	6	2	2	13	23	4	0	0	0	0	0	0	0	0	23	5	24		
28	0	0	S	1	0	0	1	1	0	0	1	1	2	7	7	2	2	0	2	0	0	0	0	0	0	7	1	24		
29	0	S	1	0	0	3	0	0	1	1	2	0	0	0	0	2	0	2	0	0	0	0	0	0	0	3	1	24		
30	S	2	2	1	2	15	2	0	3	2	3	2	5	17	18	6	12	34	31	2	37	29	14	S	0	37	11	24		
HOURLY MAX	33	13	28	12	20	57	37	45	47	21	12	28	18	17	18	23	18	34	31	11	37	51	36	40						
HOURLY AVG	3	2	4	3	3	12	8	7	9	7	4	5	4	5	5	5	3	4	3	2	3	5	4	5						

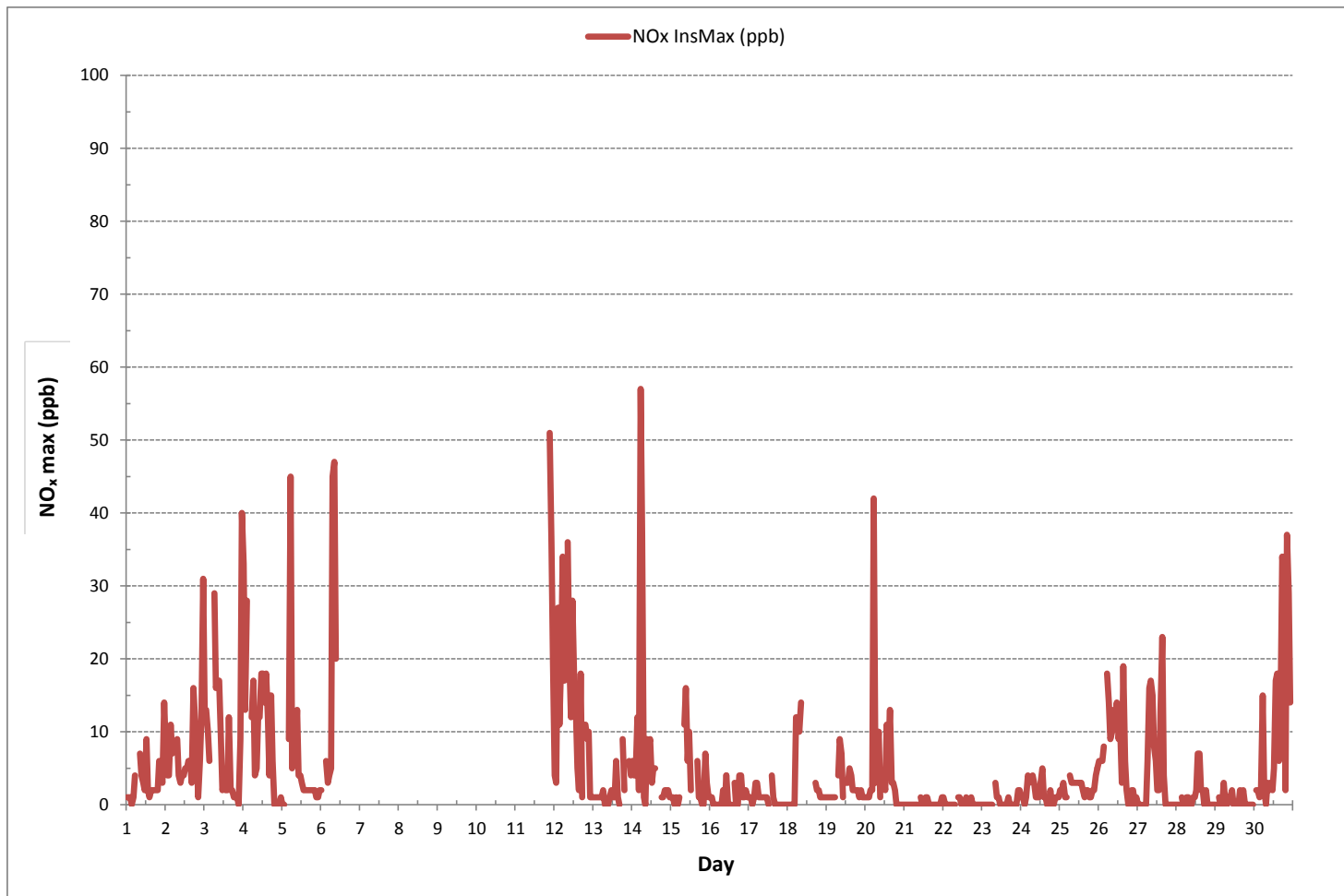
STATUS FLAG CODES

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:	388
MAXIMUM INSTANTANEOUS VALUE:	57 ppb @ HOUR 5 ON DAY 14
IZS CALIBRATION TIME:	24 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	575 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NOX[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 17.96% Calm Avg: 1.84 [ppb]

Direction	0.0-7.0	7.0-14.0	14.0-21.0	>21.0	Total
N	9.1	0.0	0.0	0.0	9.1
NE	8.7	0.0	0.0	0.0	8.7
E	1.7	0.0	0.0	0.0	1.7
SE	13.0	0.0	0.0	0.0	13.0
S	17.2	0.0	0.0	0.0	17.2
SW	12.0	1.5	0.0	0.0	13.5
W	9.6	1.3	0.9	0.0	11.9
NW	5.2	1.1	0.7	0.0	7.0
Summary	76.5	3.9	1.7	0.0	82.0

% Icon Classes (ppb)

76

0.0-7.0

4

7.0-14.0

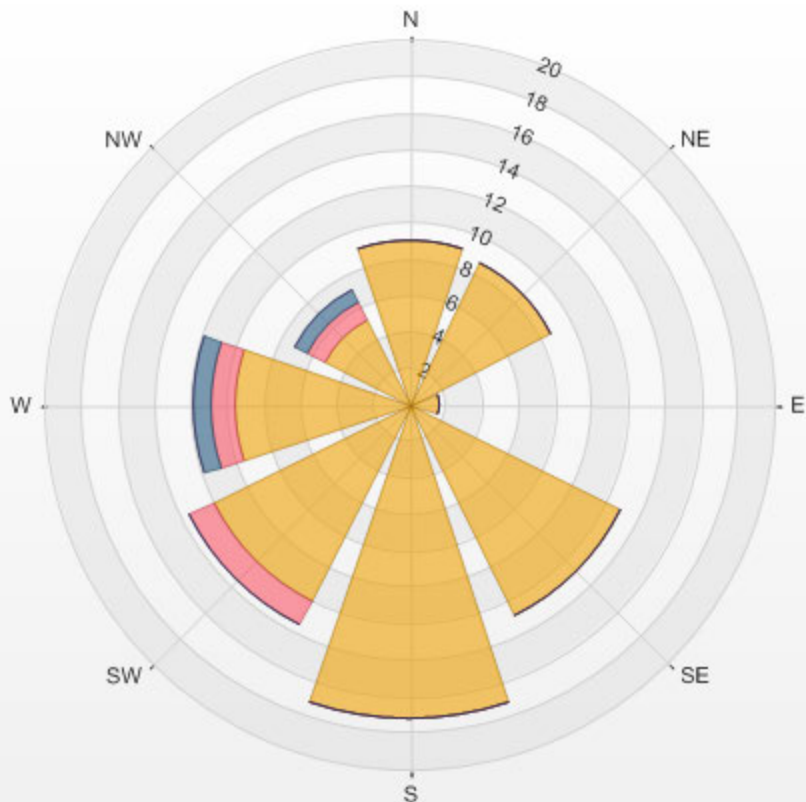
2

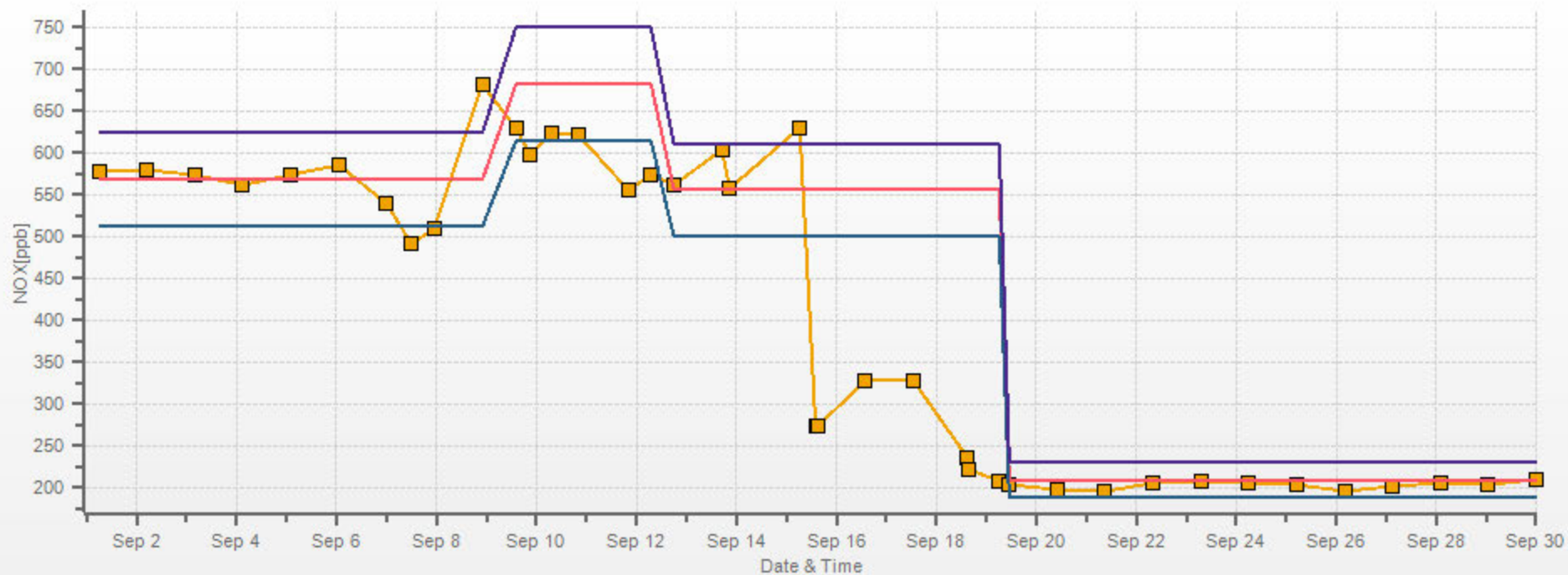
14.0-21.0

0

>21.0

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.96% Calm Poll Avg: 1.84[ppb]





Span Meas Span Ref Span Low Span High

NITRIC OXIDES

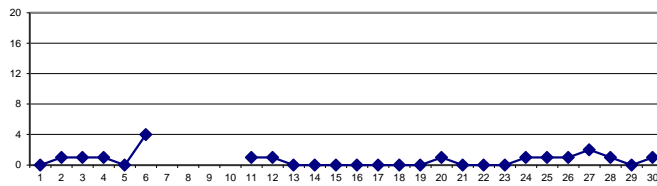
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

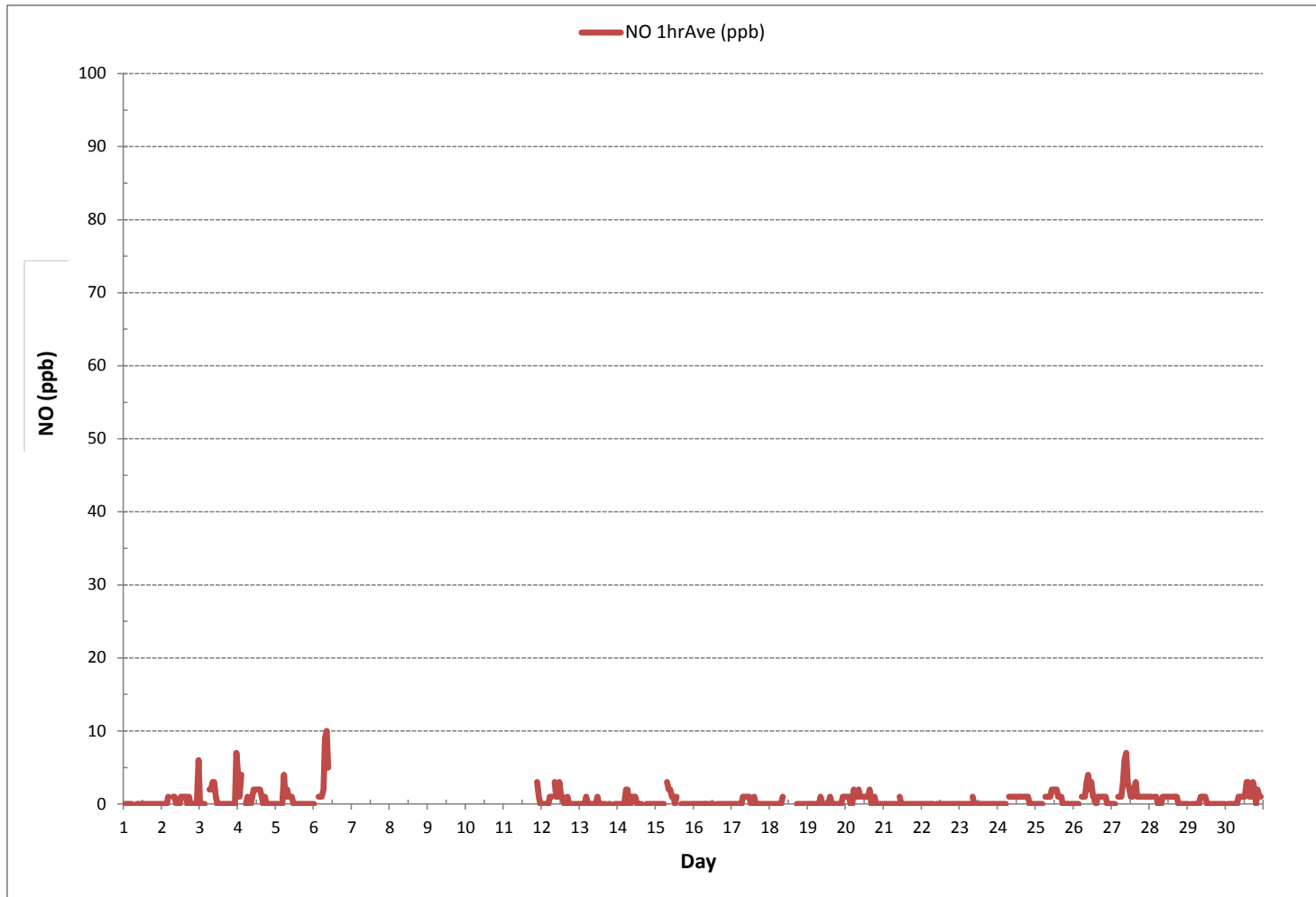
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	183		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	6 ON DAY 6
MAXIMUM 24-HR AVERAGE:	4 ppb		ON DAY 6
IZS CALIBRATION TIME:	24 hrs	OPERATIONAL TIME:	578 hrs
MONTHLY CALIBRATION TIME:	11 hrs	AMD OPERATION UPTIME:	80.3 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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 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	S	X	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	23		
2	0	0	0	0	0	S	X	1	0	0	1	1	1	1	1	1	0	3	1	0	0	0	3	17	0	17	1	23			
3	1	1	1	0	S	X	7	5	7	7	3	1	1	0	0	2	0	0	0	0	0	0	1	21	0	21	3	23			
4	15	3	12	S	X	3	5	1	1	5	5	8	8	7	8	5	1	5	1	0	0	0	0	0	0	15	4	23			
5	0	0	S	X	0	37	1	6	3	10	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	37	3	23			
6	0	S	X	0	0	1	1	29	30	7	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	30	9	14		
7	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	6		
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-		
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-		
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-		
11	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	21	11	2	2	21	11	3
12	2	1	5	1	5	18	7	S1	16	9	5	15	7	5	2	0	14	0	S	0	0	0	0	0	0	0	18	5	23		
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	S	0	0	S1	S1	0	0	0	2	0	2	0	22	
14	0	0	0	1	0	44	26	0	0	3	1	3	1	6	0	C1	C1	C1	0	0	0	0	0	0	0	0	44	4	21		
15	0	0	0	0	0	0	S1	S1	4	6	2	4	0	S1	S1	S	1	0	0	0	0	0	0	0	0	0	6	1	20		
16	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	1	0	24		
17	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	
18	0	0	0	0	0	0	0	2	3	C1	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	3	0	16		
19	0	0	0	0	0	0	S1	0	2	1	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	23		
20	0	0	0	0	0	36	0	1	8	0	S	1	0	9	4	3	0	0	0	0	0	0	0	0	0	36	3	24			
21	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
22	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
23	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	
24	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
25	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
26	0	0	0	0	0	S	4	1	0	4	5	5	6	3	3	0	9	0	0	0	0	0	0	0	0	0	9	2	24		
27	0	0	0	0	S	0	0	0	6	7	6	2	2	0	0	5	9	0	0	0	0	0	0	0	0	0	9	2	24		
28	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
29	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	
30	S	0	0	0	0	7	0	0	0	0	0	0	0	4	4	0	0	10	9	0	11	6	2	S	0	11	2	24			
HOURLY MAX	15	3	12	1	5	44	26	29	30	10	5	15	8	9	8	9	14	10	9	0	11	21	11	21							
HOURLY AVG	1	0	1	0	0	7	2	2	4	3	1	2	1	2	1	1	1	1	0	0	0	1	1	2							

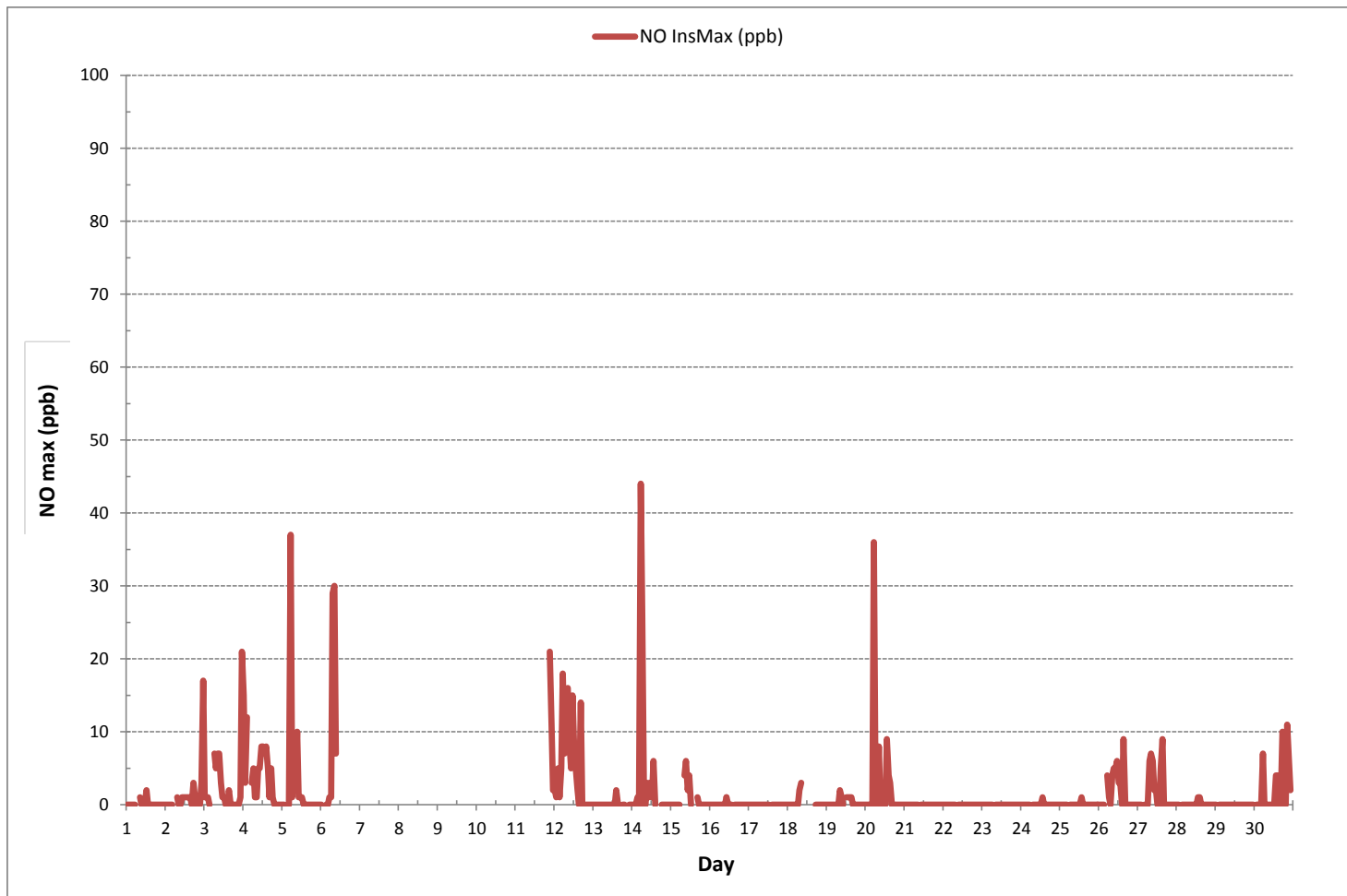
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	132
MAXIMUM INSTANTANEOUS VALUE:	44 ppb @ HOUR 5 ON DAY 14
IZS CALIBRATION TIME:	24 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	575 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



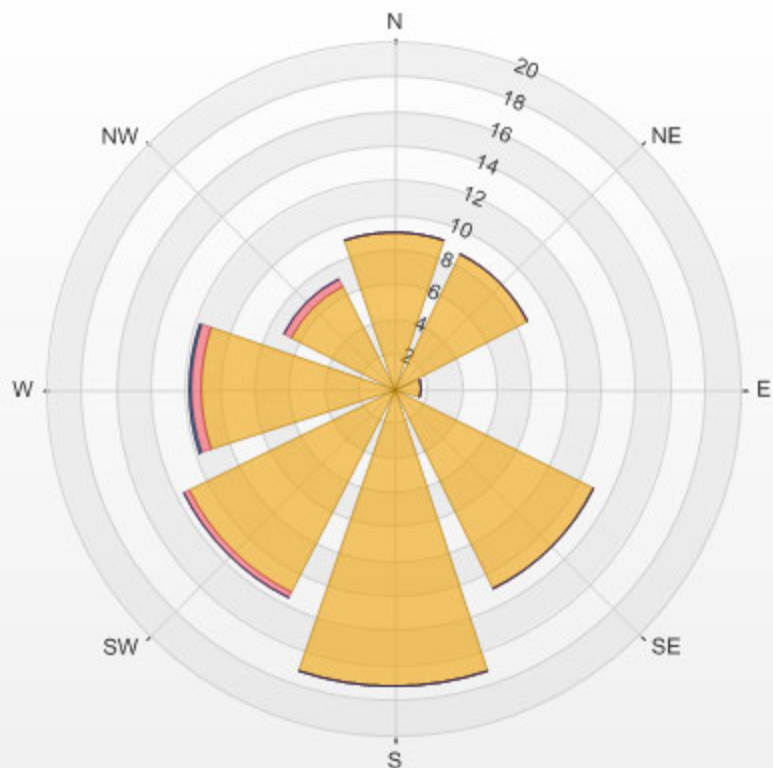
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 17.96% Calm Avg: 0.48 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	9.1	0.0	0.0	0.0	9.1
NE	8.7	0.0	0.0	0.0	8.7
E	1.7	0.0	0.0	0.0	1.7
SE	13.0	0.0	0.0	0.0	13.0
S	17.2	0.0	0.0	0.0	17.2
SW	13.2	0.4	0.0	0.0	13.5
W	11.1	0.6	0.2	0.0	11.9
NW	6.7	0.4	0.0	0.0	7.0
Summary	80.6	1.3	0.2	0.0	82.0

% Icon Classes (ppb) 81 0.0-3.7 1 3.7-7.3 0 7.3-11.0 0 >11.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.96% Calm Poll Avg: 0.48[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

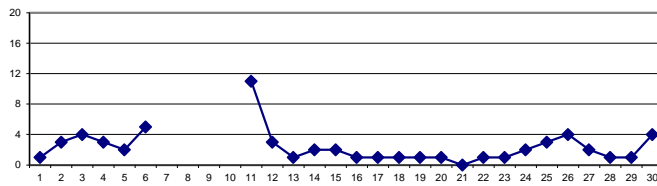
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

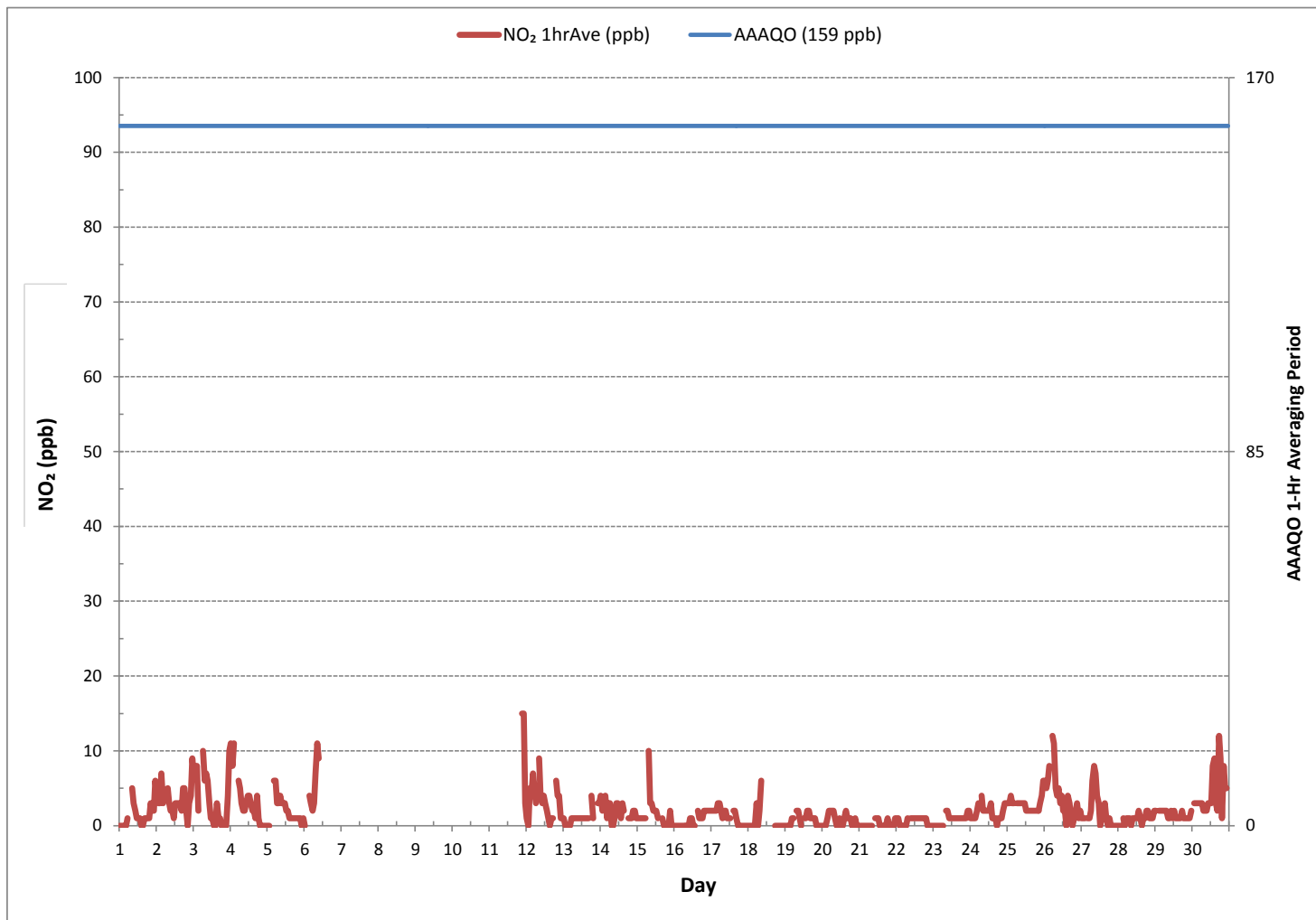
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	406			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY
MAXIMUM 1-HR AVERAGE:	15 ppb	@ HOUR	21	ON DAY
MAXIMUM 24-HR AVERAGE:	11 ppb			ON DAY
IZS CALIBRATION TIME:	24 hrs	OPERATIONAL TIME:	578 hrs	
MONTHLY CALIBRATION TIME:	11 hrs	AMD OPERATION UPTIME:	80.3 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	2 ppb	

24 HR AVERAGES September 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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

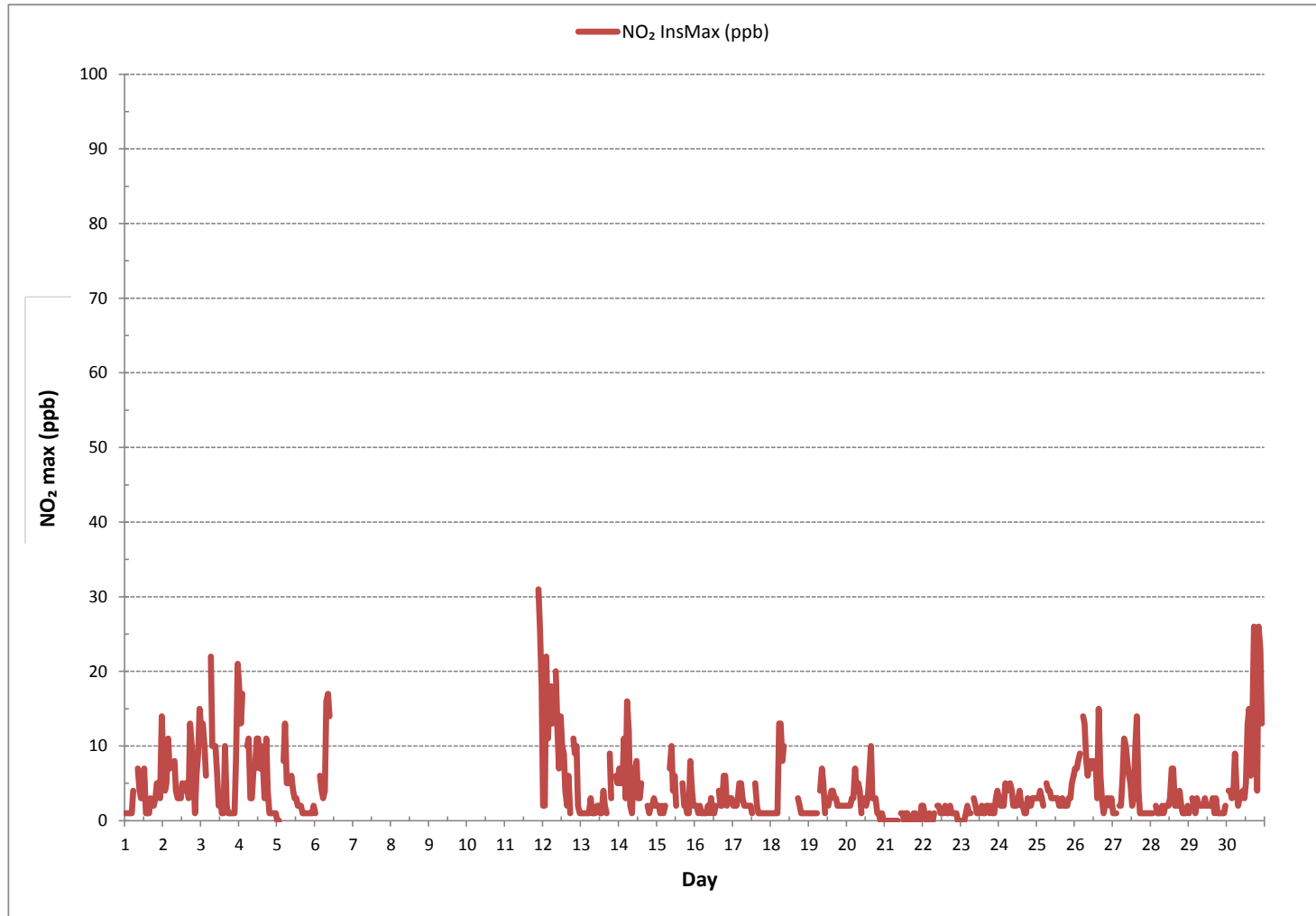
STATUS FLAG CODES

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:	511
MAXIMUM INSTANTANEOUS VALUE:	31 ppb @ HOUR 21 ON DAY 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	24 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	575 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

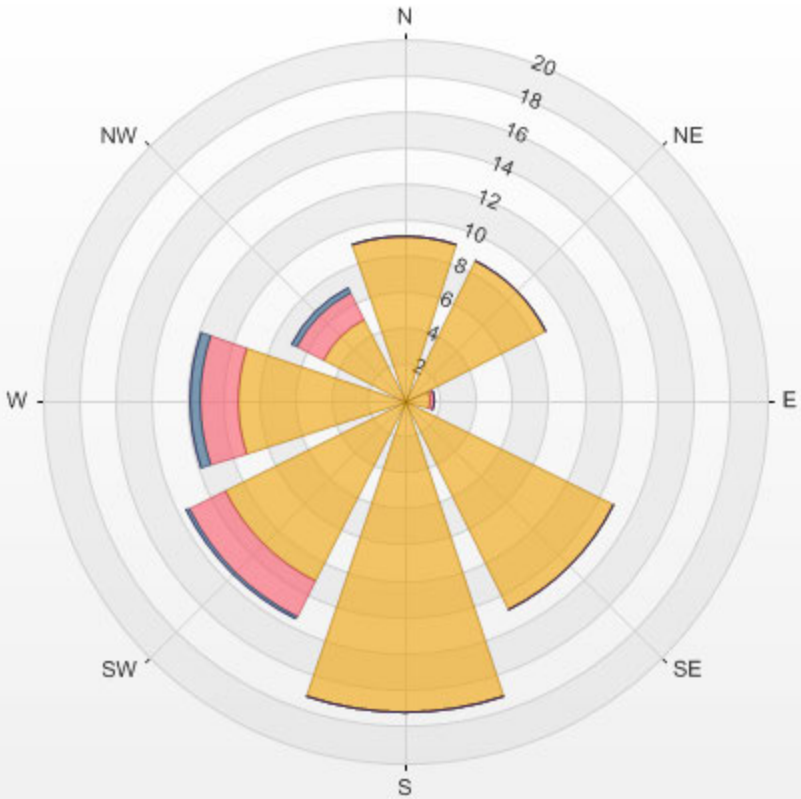
Calm: 17.96%

Calm Avg: 1.35 [ppb]

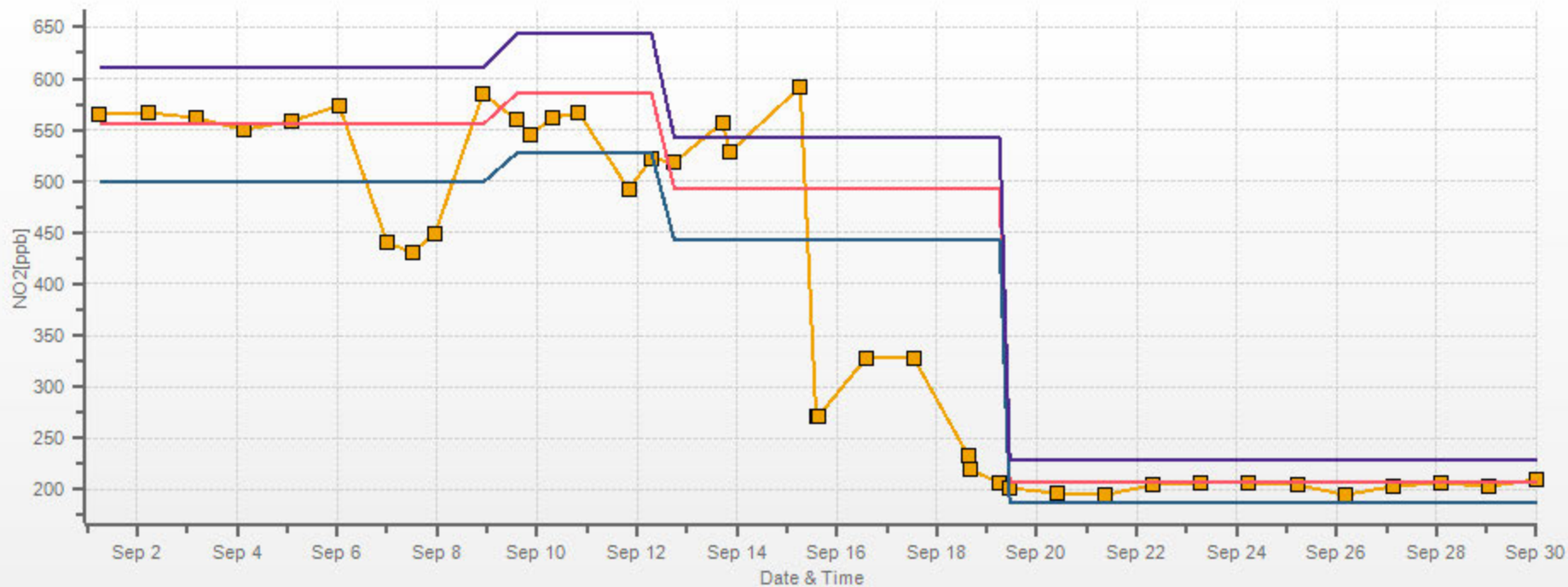
Direction	0.0-5.3	5.3-10.7	10.7-16.0	>16.0	Total
N	9.1	0.0	0.0	0.0	9.1
NE	8.7	0.0	0.0	0.0	8.7
E	1.5	0.2	0.0	0.0	1.7
SE	13.0	0.0	0.0	0.0	13.0
S	17.2	0.0	0.0	0.0	17.2
SW	11.1	2.2	0.2	0.0	13.5
W	9.3	2.0	0.6	0.0	11.9
NW	5.0	1.7	0.4	0.0	7.0
Summary	74.8	6.1	1.1	0.0	82.0

% Icon Classes (ppb) 75 0.0-5.3 6 5.3-10.7 1 10.7-16.0 0 >16.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.96% Calm Poll Avg: 1.35[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 17/09 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																												0	
2																												0	
3																												0	
4																												0	
5																												0	
6																												0	
7																												0	
8																												0	
9																												0	
10																												0	
11																												0	
12																												0	
13																												0	
14																												0	
15																												0	
16																												0	
17																												0	
18																												0	
19																												0	
20											C	C	C	C	X	X	X	X	X	X	X	0	7	10	1	0	10	5	8
21	X	0	0	0	0	4	1	2	0	6	5	3	2	3	2	4	0	0	7	0	2	7	2	4	0	7	2	23	
22	3	2	5	12	X	6	5	0	47	10	1	0	1	3	0	0	0	X	29	X	7	10	0	3	0	47	7	21	
23	0	4	4	0	4	2	5	3	32	X	1	5	21	0	X	8	15	0	X	30	6	1	0	2	0	32	7	21	
24	1	6	13	10	5	2	X	13	0	4	5	11	9	1	X	0	X	13	X	61	6	22	1	0	0	61	9	20	
25	0	X	0	7	0	X	0	2	2	2	2	2	0	X	6	0	X	0	1	X	0	2	5	6	0	7	2	19	
26	5	1	2	3	6	1	0	5	6	0	3	7	14	2	X	14	0	6	6	5	0	0	2	11	0	14	4	23	
27	8	10	X	1	1	9	2	3	0	X	X	1	0	X	6	4	1	9	X	18	X	17	12	15	0	18	7	18	
28	0	33	31	19	X	0	X	6	0	X	X	0	X	X	X	1	3	0	0	0	0	6	0	0	0	33	6	17	
29	4	2	0	4	0	X	2	5	0	2	2	6	0	3	7	4	2	6	3	8	0	8	1	5	0	8	3	23	
30	5	5	6	0	6	0	4	6	9	6	6	6	8	7	4	9	18	3	16	3	7	3	X	11	0	18	6	23	
31	10	2	4	2	4	5	7	7	X	16	11	15	0	12	4	5	8	2	4	1	1	7	2	1	0	16	6	23	
HOURLY MAX	10	33	31	19	6	9	7	13	47	16	11	15	21	12	7	14	18	13	29	61	7	22	12	15					
HOURLY AVG	4	7	7	5	3	3	3	5	10	6	4	5	6	4	4	4	5	4	8	14	3	8	3	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

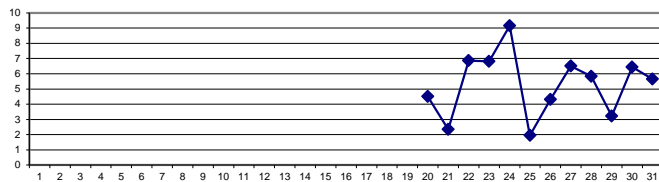
OBJECTIVE LIMIT:

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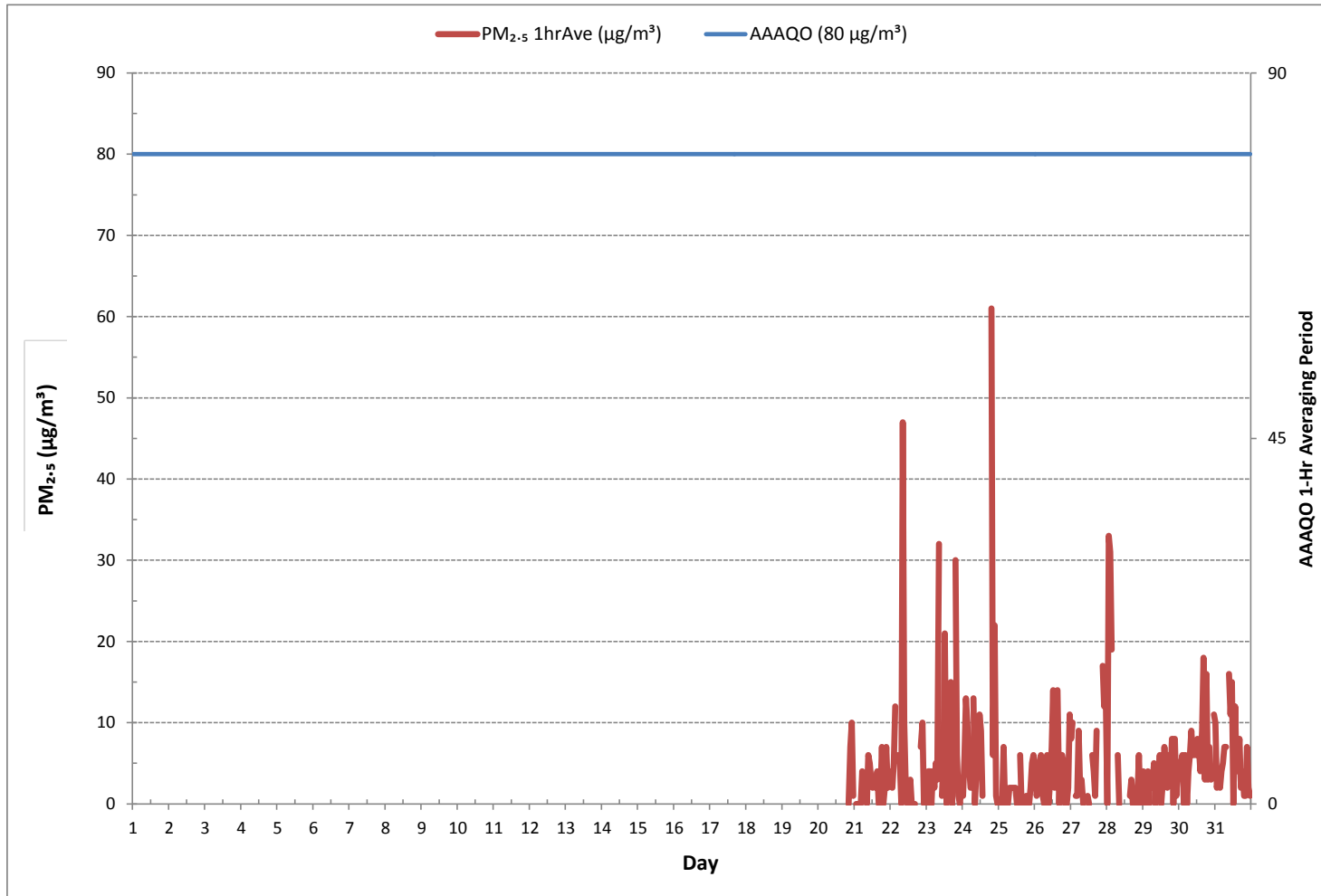
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	179		
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	20 ON DAY	20
MAXIMUM 1-HR AVERAGE:	61 µg/m ³ @ HOUR	19 ON DAY	24
MAXIMUM 24-HR AVERAGE:	9 µg/m ³	ON DAY	24
MONTHLY CALIBRATION TIME:	4 hrs	OPERATIONAL TIME:	239 hrs
STANDARD DEVIATION:	7	AMD OPERATION UPTIME:	32.1 %
		MONTHLY AVERAGE:	5 µg/m ³

24 HR AVERAGES August 2017



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



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	5	0	4	6	1	6	6	1	5	1	3	1	0	5	0	6	6	13	10	8	7	7	15	0	15	5	24
2	11	13	9	6	7	3	4	2	1	2	7	5	1	0	2	5	11	0	3	4	6	2	2	X	0	13	5	23
3	2	10	7	0	3	0	5	8	2	2	6	4	1	0	X	0	6	X	0	0	7	9	4	1	0	10	4	22
4	4	0	1	4	6	1	1	7	2	1	0	3	7	1	5	X	X	0	0	0	0	0	3	2	0	7	2	22
5	5	0	1	1	0	5	4	4	0	4	4	0	8	0	5	4	5	6	4	5	3	1	3	5	0	8	3	24
6	3	4	0	4	3	3	5	6	X	X	32	12	11	4	6	15	16	21	24	20	X	8	X	2	0	32	10	
7	5	4	5	5	7	6	9	1	17	X	1	5	23	1	X	X	29	4	0	0	11	5	3	1	0	29	7	21
8	7	6	5	3	7	4	10	19	23	20	20	11	20	9	14	19	8	0	0	4	14	31	X	9	0	31	11	
9	15	X	19	36	20	9	13	7	8	11	14	15	22	25	22	33	24	X	28	15	7	4	X	41	4	41	18	
10	X	X	X	X	X	11	7	6	9	4	1	5	0	1	4	4	1	3	5	11	8	2	3	2	0	11	5	19
11	0	4	6	2	3	1	7	0	1	3	2	3	4	0	X	4	C	C	0	0	0	3	0	X	0	7	2	22
12	X	2	0	2	0	0	2	0	0	0	0	0	3	3	1	3	0	3	3	0	0	1	1	1	0	3	1	23
13	2	0	0	0	0	0	2	0	0	0	3	2	0	0	1	0	1	0	1	1	1	0	0	X	0	3	1	23
14	0	0	0	1	0	2	1	2	1	2	0	0	0	0	0	1	1	0	0	X	2	0	0	0	0	2	1	23
15	1	0	0	0	0	1	0	2	0	0	0	0	1	1	0	2	2	0	0	2	0	1	3	0	0	3	1	24
16	1	2	2	1	0	0	2	2	2	1	0	1	1	1	0	0	0	0	1	0	1	1	0	1	0	2	1	24
17	0	2	0	2	2	2	2	3	3	3	2	3	4	1	1	3	1	0	0	0	1	0	3	1	0	4	2	24
18	0	2	2	3	1	5	2	2	0	0	0	2	4	3	3	3	1	3	4	1	2	2	2	0	0	5	2	24
19	0	0	1	0	1	0	2	0	0	0	3	2	3	2	3	0	1	1	0	4	2	2	1	1	0	4	1	24
20	1	2	0	0	0	2	4	0	0	0	2	0	1	0	0	1	1	1	1	0	0	0	1	0	0	4	1	24
21	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	1	2	3	2	4	4	0	4	1	24
22	1	0	2	0	0	0	4	0	X	0	0	0	0	2	2	0	2	0	0	0	4	0	0	2	0	4	1	23
23	1	2	0	0	2	3	0	X	0	0	2	0	1	2	2	2	0	2	0	0	0	1	0	0	0	3	1	23
24	0	0	1	2	1	0	0	2	1	0	1	0	1	4	0	1	1	0	1	1	1	1	2	1	0	4	1	24
25	0	1	0	1	0	0	0	1	0	2	3	0	0	2	1	0	2	6	5	1	2	7	0	4	0	7	2	24
26	5	0	0	0	0	2	3	2	1	2	0	C	0	1	1	2	3	0	6	0	4	0	1	1	0	6	1	24
27	1	0	2	7	0	0	0	1	2	0	3	0	0	0	19	X	6	8	X	0	4	3	2	0	0	19	3	22
28	3	0	2	0	4	0	4	0	0	4	0	1	5	8	16	3	6	0	1	0	0	2	0	1	0	16	3	24
29	0	4	2	0	3	3	1	2	1	0	4	3	4	0	2	1	0	3	1	3	2	2	0	1	0	4	2	24
30	2	2	5	3	2	2	2	0	1	4	0	1	3	4	3	2	X	5	4	5	1	0	0	1	0	5	2	23
HOURLY MAX	15	13	19	36	20	11	13	19	23	20	32	15	23	25	22	33	29	21	28	20	14	31	7	41				
HOURLY AVG	3	2	2	3	3	2	3	3	3	3	4	3	4	3	4	4	5	3	4	3	3	3	2	4				

STATUS FLAG CODES

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

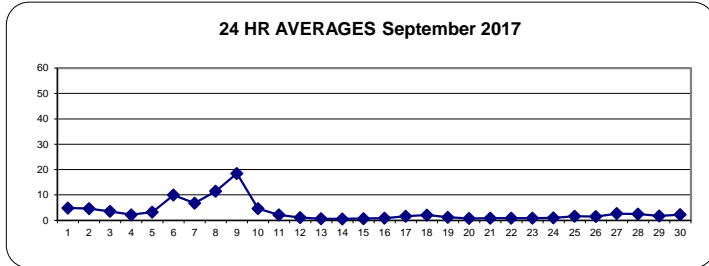
OBJECTIVE LIMIT:

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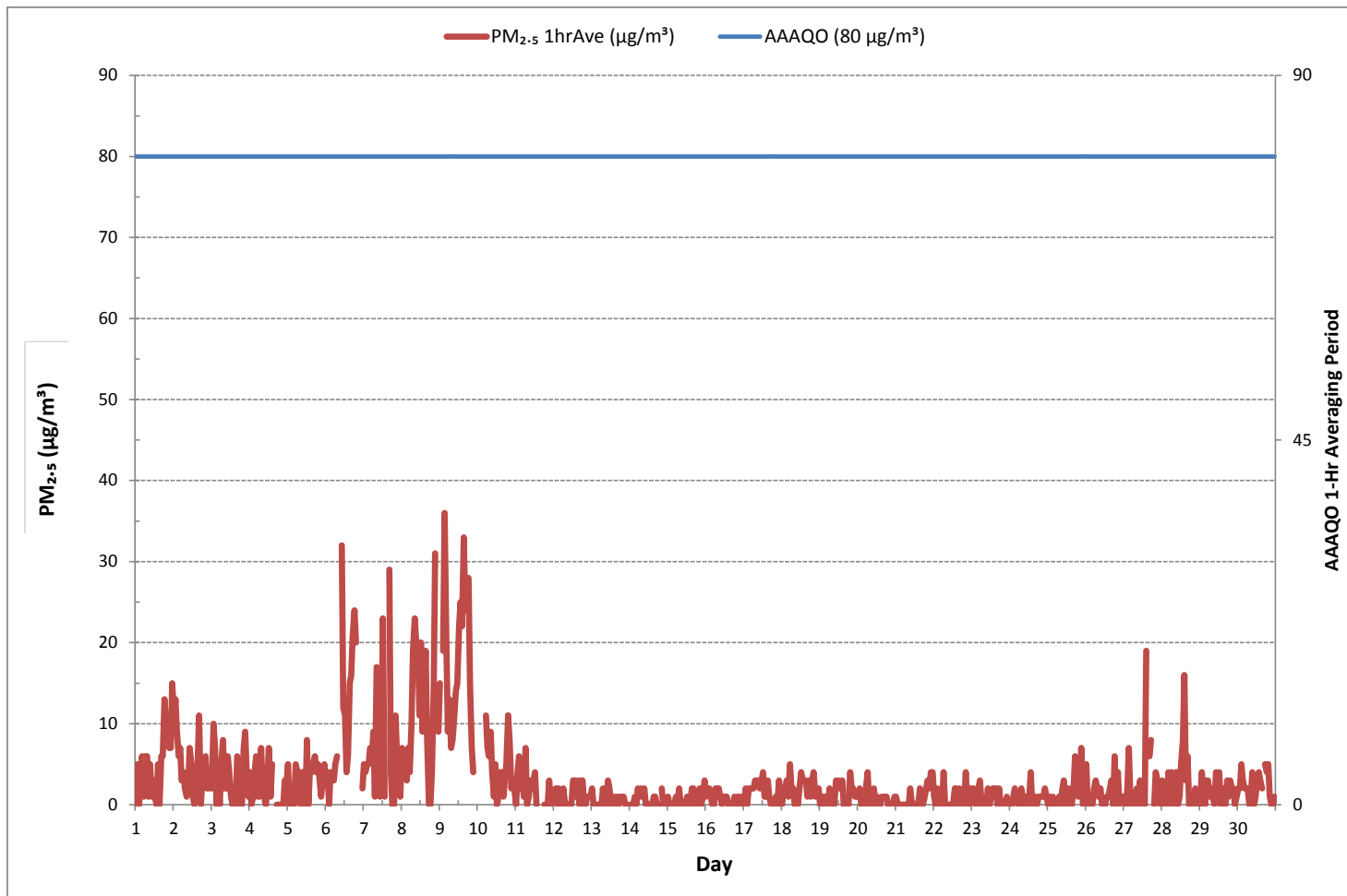
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	456				
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	41 µg/m ³ @ HOUR	23	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	18 µg/m ³		ON DAY	9	
MONTHLY CALIBRATION TIME:	3	hrs	OPERATIONAL TIME:	689	hrs
STANDARD DEVIATION:	5		AMD OPERATION UPTIME:	95.7	%
			MONTHLY AVERAGE:	3	µg/m ³

24 HR AVERAGES September 2017



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



Wind: LICA MASKWA
 Poll.: LICA MASKWA-PM25[ug/m3(L)]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

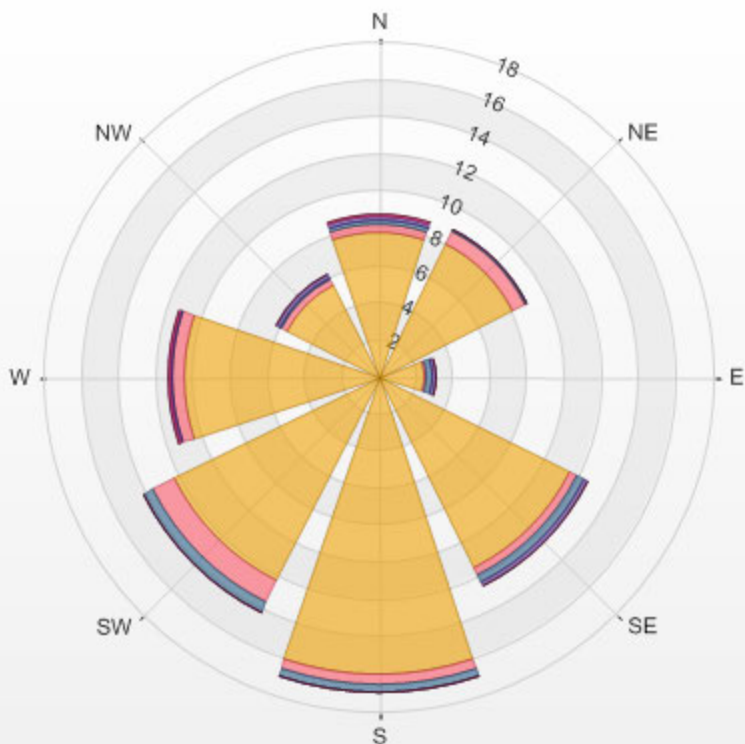
Calm: 18.10%

Calm Avg: 2.40 [ug/m3(L)]

Direction	0.0-8.4	8.4-16.8	16.8-25.2	25.2-33.6	33.6-42.0	>42.0	Total
N	7.7	0.4	0.3	0.2	0.2	0.0	8.8
NE	8.0	0.7	0.2	0.0	0.0	0.0	8.9
E	2.5	0.2	0.3	0.2	0.0	0.0	3.1
SE	11.5	0.4	0.4	0.2	0.0	0.0	12.6
S	16.1	0.4	0.4	0.0	0.0	0.0	16.9
SW	12.3	1.3	0.6	0.0	0.0	0.0	14.2
W	10.5	0.6	0.0	0.2	0.2	0.0	11.4
NW	5.6	0.3	0.2	0.2	0.0	0.0	6.1
Summary	74.2	4.4	2.3	0.8	0.3	0.0	81.9

% Icon	Classes (ug/m3(L))	74	0.0-8.4	4	8.4-16.8	2	16.8-25.2	1	25.2-33.6	0	33.6-42.0	0	>42.0
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LICA MASKWA Poll.: LICA MASKWA-PM25[ug/m3(L)] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 18.10% Calm Poll Avg: 2.40[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	5.6	4.7	4.7	3.3	3.0	3.8	4.9	4.2	4.7	5.4	5.5	7.4	8.6	9.2	9.6	8.6	6.0	5.3	4.5	2.9	3.8	4.6	4.5	5.1	2.9	9.6	5.1	24
2	3.8	3.5	4.4	5.4	4.9	5.7	4.3	3.7	4.6	4.4	5.8	5.2	3.9	5.2	4.1	3.4	2.2	2.7	1.8	0.6	0.6	1.4	2.2	2.5	0.6	5.8	3.4	24
3	3.4	3.7	3.3	3.2	4.4	4.3	4.1	6.3	5.9	6.5	4.9	6.4	8.0	7.8	6.5	3.4	2.6	3.1	3.9	2.8	3.0	4.4	4.2	4.1	2.6	8.0	4.3	24
4	3.0	3.2	3.1	3.8	4.2	4.8	4.2	4.8	4.3	5.0	5.6	6.6	5.5	5.5	4.4	4.6	4.4	3.8	1.8	2.5	1.9	2.2	1.9	1.3	1.3	6.6	3.0	24
5	1.0	1.2	1.0	0.9	0.2	0.5	0.4	1.6	5.3	6.5	6.3	5.7	4.4	6.4	8.2	7.6	6.5	4.0	2.1	2.3	1.3	0.9	0.2	1.6	0.2	8.2	3.0	24
6	0.2	1.4	0.0	0.9	1.6	2.3	2.2	0.2	1.8	2.1	3.3	2.6	2.4	2.8	3.6	6.9	6.5	5.1	4.9	3.9	3.4	2.3	1.3	0.8	0.0	6.9	2.0	24
7	1.0	0.8	0.5	0.7	0.5	1.1	1.3	2.1	1.0	4.7	5.9	6.7	8.3	8.4	7.3	6.7	6.6	4.7	5.0	5.8	8.6	7.9	6.1	5.2	0.5	8.6	4.1	24
8	3.0	1.1	1.2	1.9	1.9	1.6	2.4	2.7	3.9	2.5	4.8	5.5	4.8	5.5	3.4	3.0	4.0	2.2	2.0	2.2	4.3	2.4	2.3	5.6	1.1	5.6	1.0	24
9	6.9	3.0	4.0	4.3	5.2	3.0	2.0	1.5	4.6	5.6	3.5	1.4	2.6	3.4	4.5	3.8	0.8	0.7	4.5	3.8	1.6	0.5	2.4	2.9	0.5	6.9	2.2	24
10	5.2	5.0	4.5	5.6	7.7	9.6	8.1	7.1	5.9	8.0	10.8	10.4	9.8	10.9	12.5	11.7	9.4	9.6	4.4	3.0	3.8	3.9	4.0	4.4	3.0	12.5	7.1	24
11	6.9	7.9	7.3	6.5	6.2	5.5	5.6	5.9	4.4	6.9	8.1	6.4	8.9	10.1	9.1	7.9	6.1	2.5	1.9	1.4	1.1	5.5	5.7	2.7	1.1	10.1	5.2	24
12	4.1	4.9	6.4	6.1	7.8	5.4	6.1	7.3	7.1	6.8	7.3	6.8	5.8	5.7	5.4	5.9	4.6	3.8	2.4	1.7	1.1	2.6	3.5	3.0	1.1	7.8	4.3	24
13	1.3	1.2	0.8	0.7	1.7	2.7	6.8	7.6	7.3	5.8	6.9	8.1	5.5	8.1	9.1	8.8	8.1	6.8	4.5	5.2	3.6	1.7	0.8	1.9	0.7	9.1	4.5	24
14	1.5	2.5	2.3	1.3	1.2	0.8	1.0	1.9	1.5	1.6	2.0	1.5	2.1	5.3	4.4	3.9	2.3	1.3	2.0	0.8	1.6	2.0	1.4	1.9	0.8	5.3	1.0	24
15	1.2	1.3	2.0	1.3	1.3	1.1	0.7	0.5	2.7	1.9	2.4	3.4	2.4	2.0	4.9	4.6	3.0	3.5	3.2	4.3	3.3	3.6	3.5	4.7	0.5	4.9	1.9	24
16	4.0	0.1	1.0	0.9	1.1	0.5	0.8	1.8	1.7	4.6	6.3	6.2	5.0	5.4	6.8	6.2	4.3	5.5	5.0	5.2	5.3	5.8	6.4	6.5	0.1	6.8	3.6	24
17	6.4	6.5	6.7	6.0	3.9	1.1	2.0	2.7	5.8	6.3	8.2	8.7	7.7	8.4	8.0	7.8	8.3	6.9	4.7	4.7	6.1	6.6	7.9	8.8	1.1	8.8	5.9	24
18	9.2	9.9	7.9	5.0	4.4	3.8	4.0	4.7	5.2	8.1	8.3	8.8	8.2	8.3	9.6	8.7	8.5	5.9	6.7	5.3	5.6	5.3	5.5	5.8	3.8	9.9	5.9	24
19	5.3	5.8	6.4	7.2	6.8	6.5	7.7	7.6	6.2	7.1	5.0	6.0	4.6	2.2	4.9	7.9	6.4	6.1	3.6	2.4	2.3	1.6	0.9	0.8	0.8	7.9	2.5	24
20	0.8	1.5	1.5	2.3	2.6	2.8	2.3	2.2	3.1	4.1	3.6	4.8	3.6	4.4	4.3	4.9	4.0	2.6	1.6	3.8	5.7	7.7	8.4	6.3	0.8	8.4	2.0	24
21	5.1	5.0	4.8	6.2	6.1	5.6	5.7	6.0	6.3	7.0	6.8	8.6	9.1	9.8	7.3	10.0	8.5	5.6	3.9	4.1	4.2	4.5	2.9	3.1	2.9	10.0	6.0	24
22	3.6	3.6	4.0	3.4	2.4	1.7	2.0	3.8	3.0	4.7	5.3	4.8	5.6	5.1	5.2	3.3	0.3	1.0	0.8	0.4	1.8	1.2	1.3	1.1	0.3	5.6	2.4	24
23	0.7	0.6	0.5	1.4	0.2	1.0	0.3	1.7	1.6	3.6	4.8	6.0	6.0	5.2	5.1	5.0	2.9	2.0	2.7	2.4	4.2	4.7	4.7	4.2	0.2	6.0	2.5	24
24	4.5	4.8	4.5	5.2	4.8	5.4	6.2	7.0	5.3	7.1	6.6	8.6	11.0	11.0	8.9	6.8	5.9	4.8	4.4	5.3	5.3	5.9	5.6	5.3	4.4	11.0	6.0	24
25	4.4	4.2	4.4	5.3	5.4	5.8	8.0	7.4	8.1	7.0	6.8	8.5	9.3	9.3	8.1	5.2	4.9	4.6	4.3	5.7	5.4	5.2	4.9	3.8	3.8	9.3	6.0	24
26	4.9	4.7	4.8	4.5	4.9	4.9	4.4	2.8	3.6	4.9	5.8	6.7	6.1	4.7	4.5	4.6	3.2	3.6	1.1	1.9	2.8	2.4	1.1	2.3	1.1	6.7	2.6	24
27	1.5	1.9	1.0	0.5	1.7	1.2	0.9	2.7	4.9	4.9	3.1	4.2	4.7	4.7	5.0	4.3	3.5	2.4	0.8	0.7	2.2	0.8	1.3	0.6	0.5	5.0	0.9	24
28	2.5	1.2	2.3	2.4	2.3	1.4	1.8	1.7	2.6	5.8	5.9	6.1	7.2	5.5	5.3	9.3	7.3	5.6	5.1	6.0	8.6	9.6	9.1	8.3	1.2	9.6	4.2	24
29	7.4	5.5	4.8	4.7	4.5	3.6	3.4	4.1	5.9	5.7	6.7	7.9	9.4	9.5	10.8	10.1	8.1	5.7	5.7	5.9	5.7	5.4	4.5	1.4	1.4	10.8	5.8	24
30	1.4	4.2	4.8	2.0	0.4	1.1	0.9	0.9	2.3	4.3	1.1	1.5	2.5	0.9	1.9	4.2	6.2	5.5	4.4	3.7	6.6	7.0	7.8	7.3	0.4	7.8	1.6	24
HOURLY MAX	9.2	9.9	7.9	7.2	7.8	9.6	8.1	7.6	8.1	8.1	10.8	10.4	11.0	11.0	12.5	11.7	9.4	9.6	6.7	6.0	8.6	9.6	9.1	8.8				
HOURLY AVG	1.0	1.1	0.8	0.7	0.5	0.5	0.3	0.5	0.4	1.1	1.6	1.8	1.5	1.9	2.3	2.6	1.9	1.3	1.1	1.1	1.3	1.1	1.0	0.9				

STATUS FLAG CODES

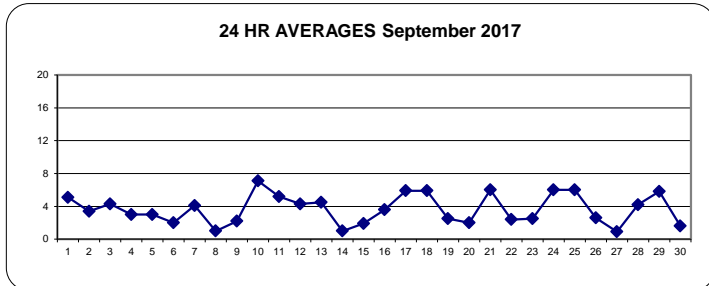
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	March 30, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

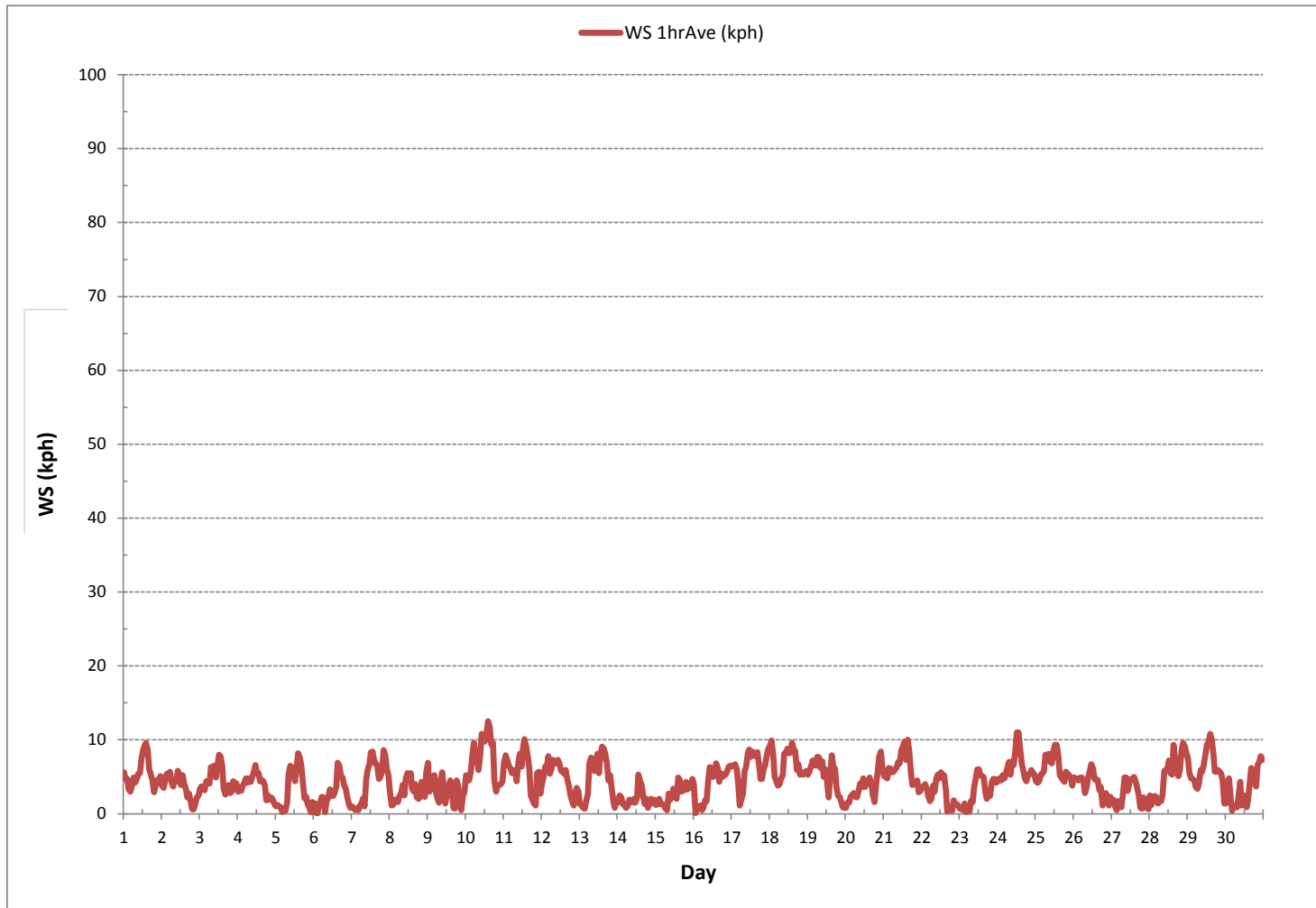
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719
MINIMUM 1-HR AVERAGE	0.0 kph @ HOUR 2 ON DAY 6
MAXIMUM 1-HR AVERAGE:	12.5 kph @ HOUR 14 ON DAY 10
MAXIMUM 24-HR AVERAGE:	7.1 kph ON DAY 10
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.5
MONTHLY AVERAGE:	1.1 kph

24 HR AVERAGES September 2017



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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	19.9	18.8	17.2	15.9	14.8	13.5	15.7	18.4	18.9	22.1	25.0	39.2	39.2	52.3	41.6	46.1	29.3	33.2	17.4	12.4	14.4	16.8	15.9	19.0	12.4	52.3	24.0	24
2	13.9	15.0	11.3	15.3	12.4	13.9	14.6	16.1	19.0	18.6	17.7	22.5	14.6	15.3	14.8	14.8	9.6	13.5	11.5	7.8	8.7	8.3	10.8	13.8	7.8	22.5	13.9	24
3	14.0	16.2	18.0	13.9	17.0	20.3	16.6	19.6	20.5	22.0	19.2	32.6	33.0	37.1	28.8	28.2	8.0	14.4	19.4	9.8	12.4	15.0	16.1	23.8	8.0	37.1	19.8	24
4	11.1	12.0	14.6	15.9	15.9	18.7	17.3	20.3	19.6	21.2	20.7	27.5	23.4	23.6	18.5	22.5	25.5	21.6	8.7	7.4	4.8	4.8	3.6	3.0	3.0	27.5	15.9	24
5	3.0	4.8	2.8	4.5	2.1	2.3	2.2	11.4	14.4	16.1	17.0	15.9	18.1	18.8	24.0	22.7	20.5	14.4	4.8	6.5	5.8	3.6	1.9	4.3	1.9	24.0	10.1	24
6	3.2	3.2	2.1	4.8	4.3	5.6	5.6	2.8	6.1	11.5	12.6	12.2	14.4	13.5	17.4	14.8	17.9	11.1	8.9	9.3	7.0	6.4	5.5	4.4	2.1	17.9	8.5	24
7	3.2	3.4	3.9	2.8	2.1	4.1	7.8	5.6	6.9	16.6	19.0	20.9	27.5	25.3	23.3	22.2	21.8	17.9	16.1	18.3	28.1	26.0	21.1	17.0	2.1	28.1	15.0	24
8	13.3	10.9	6.3	6.5	6.7	6.7	9.2	12.5	15.4	10.7	15.3	23.7	25.6	24.2	14.4	13.3	25.3	14.8	8.0	10.4	11.3	8.9	9.3	14.2	6.3	25.6	13.2	24
9	15.3	10.9	11.3	15.9	13.9	11.5	10.7	8.0	12.9	17.9	14.6	12.4	13.5	17.7	12.8	16.6	9.6	5.6	24.9	17.2	7.6	5.0	11.8	19.4	5.0	24.9	13.2	24
10	21.6	22.7	22.1	30.0	29.6	34.0	34.3	25.1	33.0	33.7	49.2	48.5	47.0	46.6	53.6	52.9	45.5	40.0	20.7	12.4	17.0	19.4	16.8	14.2	12.4	53.6	32.1	24
11	20.7	19.2	19.9	14.2	22.5	17.2	12.6	14.4	15.1	20.0	23.0	20.2	22.7	26.0	31.0	24.2	17.9	15.2	6.9	5.0	5.6	35.2	31.2	13.1	5.0	35.2	18.9	24
12	21.0	27.1	26.6	25.5	38.9	21.6	23.4	30.4	29.1	28.2	29.5	30.2	23.8	24.7	27.1	19.6	17.7	14.6	8.7	7.8	10.0	18.1	9.1	8.3	7.8	38.9	21.7	24
13	5.5	4.8	3.9	5.0	6.1	8.0	14.2	17.7	20.5	14.8	16.4	19.4	16.4	21.8	26.6	22.1	20.5	18.4	12.7	13.1	11.1	7.6	6.5	7.1	3.9	26.6	13.3	24
14	7.1	10.7	11.3	10.0	6.7	6.5	6.3	7.8	7.0	10.9	9.9	9.4	10.7	19.4	22.1	11.6	5.9	3.4	4.3	7.8	6.1	5.9	3.4	4.3	3.4	22.1	8.7	24
15	3.4	9.6	9.2	2.9	3.4	3.4	2.3	3.0	5.9	8.0	9.1	15.9	12.0	12.9	12.9	15.7	8.9	10.0	6.7	8.5	9.0	10.3	9.2	10.0	2.3	15.9	8.4	24
16	8.0	3.4	10.5	10.5	9.1	2.1	9.6	5.0	12.2	18.0	21.3	28.0	21.1	21.6	20.5	21.8	13.5	16.6	12.6	12.2	12.4	13.9	17.2	15.5	2.1	28.0	14.0	24
17	16.6	17.7	24.0	15.9	12.9	8.7	5.5	11.3	25.3	28.6	29.5	36.5	28.6	29.5	37.6	28.4	30.2	24.7	14.6	14.6	18.3	21.6	28.2	29.5	5.5	37.6	22.4	24
18	29.1	43.1	24.5	22.3	16.7	16.5	14.2	20.3	24.2	P	36.1	36.7	33.9	37.6	40.2	37.6	41.1	25.8	25.1	25.3	17.9	13.7	15.0	14.5	13.7	43.1	26.6	23
19	18.4	19.1	20.5	20.3	23.4	19.2	28.0	26.9	29.9	28.4	17.0	13.5	12.4	10.7	18.8	30.4	20.5	15.9	14.8	9.6	6.1	4.6	3.7	3.9	3.7	30.4	17.3	24
20	8.3	4.8	6.3	10.2	10.7	11.6	10.2	10.0	12.2	16.4	15.7	17.2	14.5	13.4	15.1	20.3	15.9	11.6	10.9	15.1	21.4	23.6	27.1	25.1	4.8	27.1	14.5	24
21	17.7	19.4	16.2	19.0	18.6	16.5	21.0	18.8	19.7	23.4	23.2	25.1	28.0	33.0	26.0	27.7	32.2	25.8	15.5	13.1	14.9	16.0	11.4	14.4	11.4	33.0	20.7	24
22	14.6	12.7	14.4	11.3	8.7	6.3	6.5	11.3	10.7	14.4	13.5	17.1	16.9	16.5	15.7	8.5	4.8	3.2	3.6	5.0	6.9	6.1	3.9	4.1	3.2	17.1	9.9	24
23	3.6	2.6	4.3	9.6	3.3	4.1	3.4	5.2	6.1	13.5	18.8	16.8	18.6	14.6	19.2	17.9	9.6	5.2	8.3	7.1	12.6	13.5	13.8	10.8	2.6	19.2	10.1	24
24	13.6	13.7	15.0	13.7	12.9	13.3	19.4	22.9	16.4	27.5	25.1	26.2	33.9	30.4	25.3	22.0	17.5	14.4	13.9	17.0	16.2	17.3	15.8	15.9	12.9	33.9	19.1	24
25	14.4	12.2	13.3	13.9	14.4	15.5	25.3	19.4	19.2	19.9	19.4	20.3	19.9	23.8	23.6	16.8	16.1	13.1	10.9	10.9	12.4	10.4	12.9	10.0	10.0	25.3	16.2	24
26	11.1	9.6	10.8	11.6	10.3	11.1	11.3	9.1	17.5	17.7	25.5	27.3	22.3	24.4	17.2	23.4	15.0	15.7	12.4	6.9	6.1	5.2	5.9	5.9	5.2	27.3	13.9	24
27	5.0	4.5	6.3	6.3	5.9	5.1	16.0	9.1	15.3	13.3	12.2	17.7	20.1	17.7	18.8	19.6	12.4	14.1	6.5	3.6	6.3	3.2	5.0	5.8	3.2	20.1	10.4	24
28	6.5	5.4	9.3	6.3	6.7	5.9	5.6	5.2	14.2	15.3	19.5	19.5	23.4	26.1	22.6	23.4	22.0	18.1	13.7	17.5	25.3	31.5	30.4	28.8	5.2	31.5	16.8	24
29	26.7	17.9	17.7	17.0	14.6	14.2	13.7	20.7	20.7	22.5	22.5	25.8	30.4	53.5	40.2	36.9	28.8	15.2	14.4	17.9	14.6	15.5	11.8	10.9	10.9	53.5	21.8	24
30	6.8	11.9	16.2	11.4	3.0	4.5	4.8	3.7	14.4	16.1	11.8	11.8	8.9	12.6	11.3	12.6	23.8	23.6	21.8	17.0	33.9	31.2	29.7	32.1	3.0	33.9	15.6	24
HOURLY MAX	29.1	43.1	26.6	30.0	38.9	34.0	34.3	30.4	33.0	33.7	49.2	48.5	47.0	53.5	53.6	52.9	45.5	40.0	25.1	25.3	33.9	35.2	31.2	32.1				
HOURLY AVG	12.6	12.9	13.0	12.7	12.3	11.4	12.9	13.7	16.7	18.9	20.3	23.0	22.5	24.8	24.0	23.2	19.6	16.4	12.6	11.6	12.8	14.0	13.5	13.4				

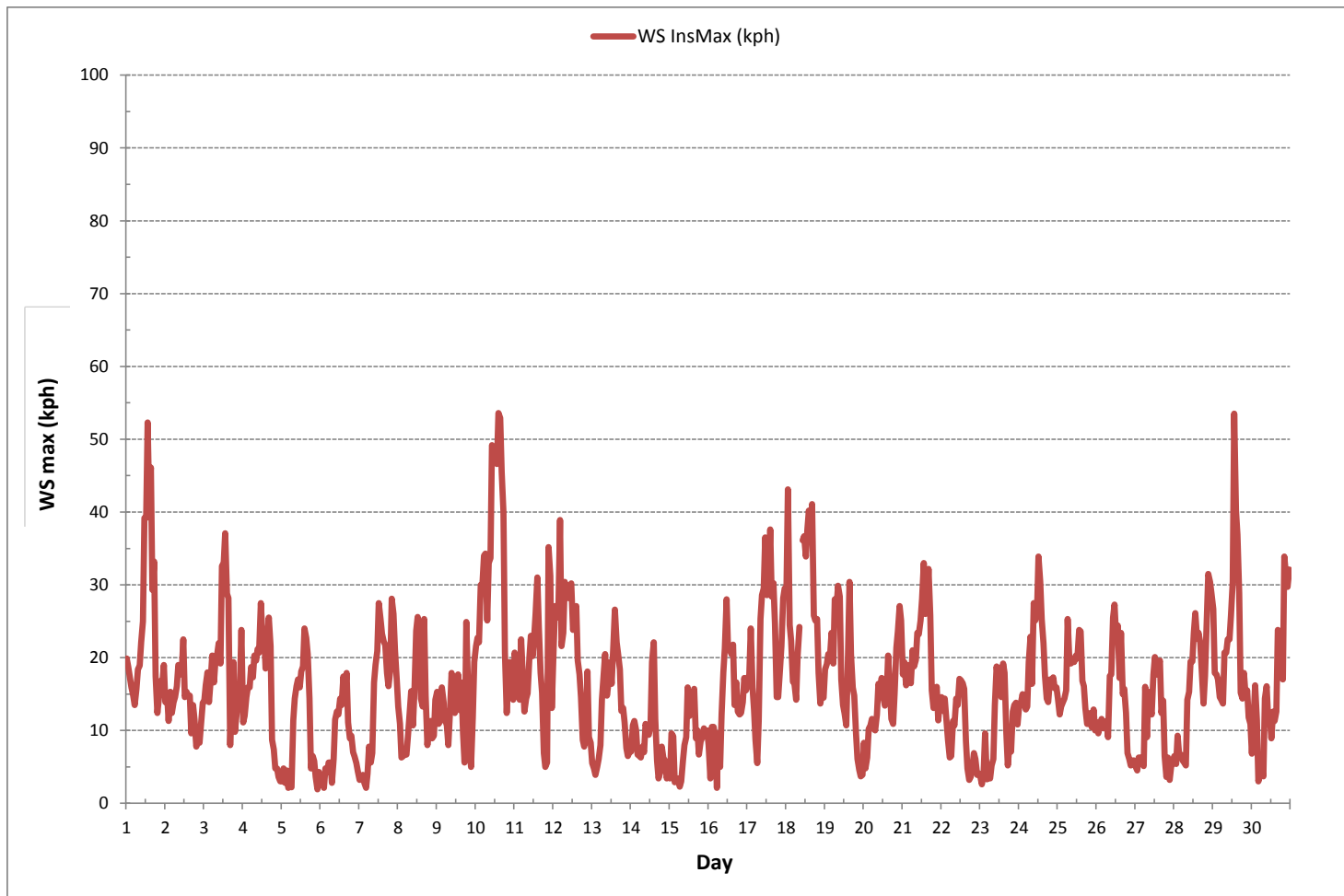
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	53.6	kph	@ HOUR	14	ON DAY	10
OPERATIONAL TIME:					719	hrs







WIND SPEED Instantaneous Maximum (WS kph)



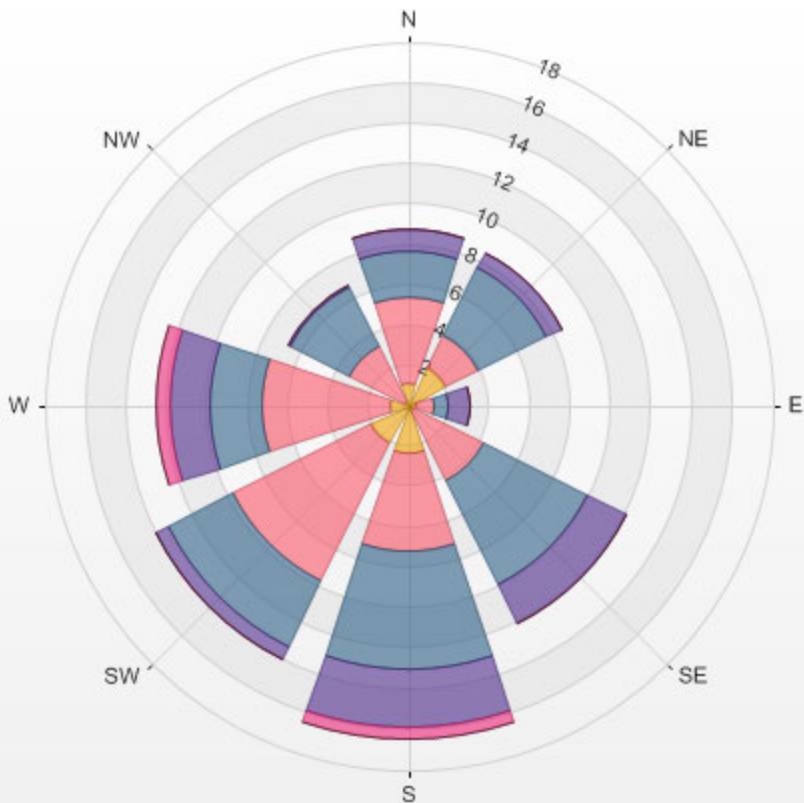
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 17/09
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 17.92%

Direction	1.8-2.5	2.5-5.0	5.0-7.6	7.6-10.1	10.1-12.6	>12.6	Total
N	1.1	4.3	2.2	1.1	0.0	0.0	8.8
NE	2.1	1.8	3.8	0.8	0.0	0.0	8.5
E	0.4	0.8	0.7	1.1	0.0	0.0	3.1
SE	0.3	3.9	5.7	2.2	0.0	0.0	12.1
S	2.4	4.9	5.8	2.9	0.6	0.0	16.5
SW	2.1	7.6	3.6	0.7	0.0	0.0	14.0
W	1.0	6.3	2.6	1.9	0.7	0.0	12.5
NW	0.3	3.1	3.2	0.1	0.0	0.0	6.7
Summary	9.6	32.7	27.6	11.0	1.3	0.0	82.1

% Icon	Classes (kph)	10		1.8-2.5	33		2.5-5.0	28		5.0-7.6	11		7.6-10.1	1		10.1-12.6	0		>12.6
--------	---------------	----	---	---------	----	---	---------	----	---	---------	----	---	----------	---	---	-----------	---	---	-------

LICA MASKWA 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 17.92% Calm Wind Avg Speed: 1.05(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

WIND DIRECTION Hourly Averages (WD)

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

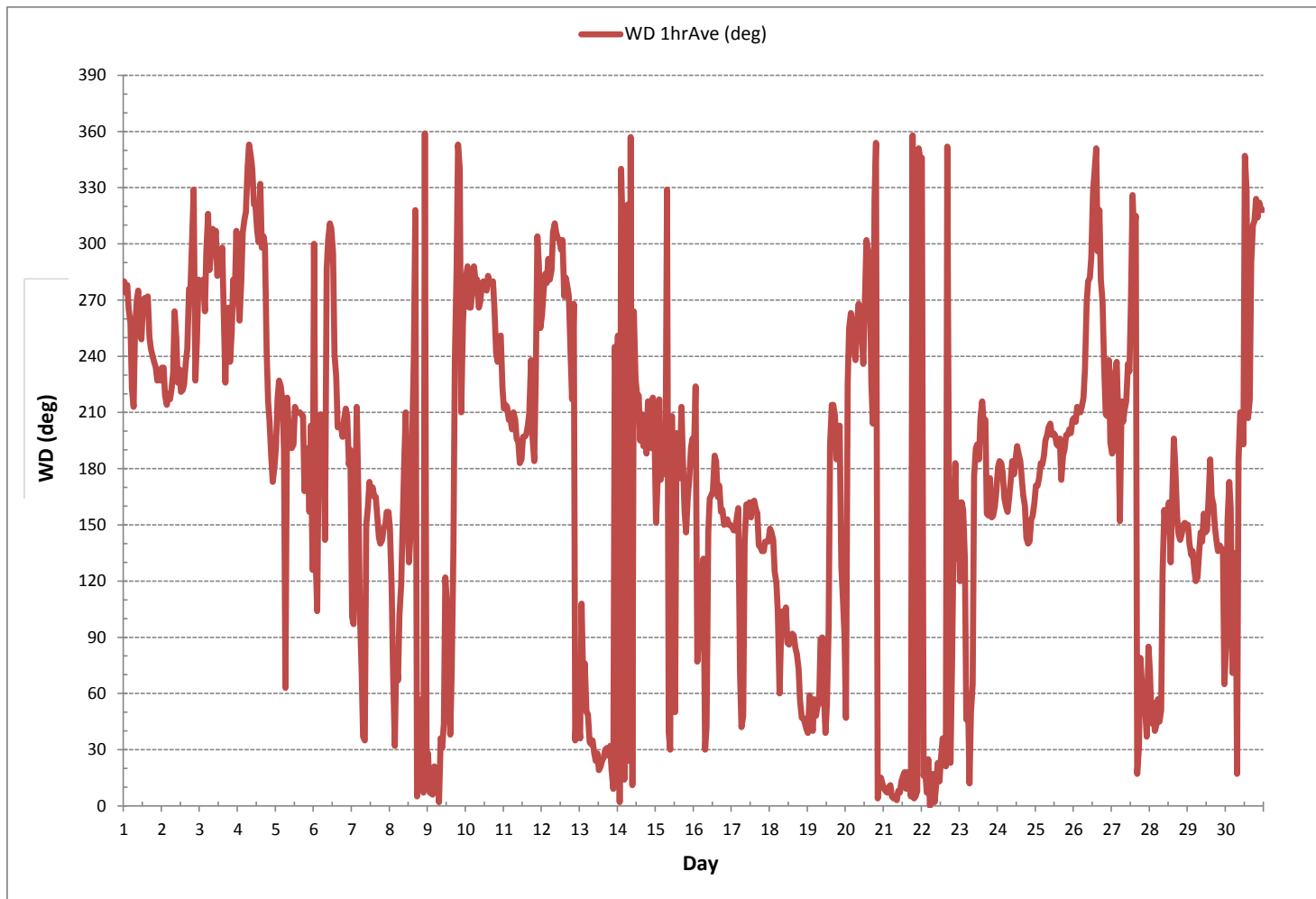
STATUS FLAG CODES

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:	March 30, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	92		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	202 (SSW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - September 2017

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	32	33	34	35	34	28	19	41	44	44	43	42	44	42	43	43	42	40	40	39	34	29	33	30	24
2	36	31	19	18	22	17	22	30	39	42	34	33	28	28	32	38	36	39	57	78	87	59	44	54	24
3	38	36	41	36	40	44	40	34	38	35	47	43	39	42	44	41	30	42	34	30	33	31	33	41	24
4	36	33	37	36	43	39	40	37	42	44	47	40	46	44	50	48	45	47	37	23	17	10	11	14	24
5	48	49	33	55	40	49	57	31	22	24	27	33	48	34	27	28	26	23	14	43	39	44	61	38	24
6	57	27	59	43	31	11	25	67	38	52	41	59	56	53	51	21	17	14	10	21	20	32	45	38	24
7	37	47	49	38	53	32	42	22	54	35	35	35	32	29	34	29	27	24	18	18	23	24	23	23	24
8	38	63	48	37	39	52	28	48	46	51	34	36	49	37	38	42	42	46	31	37	20	31	32	20	24
9	15	22	25	26	16	45	27	59	24	28	39	68	59	46	27	33	42	46	43	42	40	58	40	51	24
10	37	41	34	36	38	33	37	35	41	41	38	41	41	41	40	39	42	38	44	33	38	39	36	28	24
11	18	18	19	15	15	19	19	18	34	24	28	34	24	24	26	24	28	45	52	51	65	37	33	36	24
12	42	37	35	38	34	35	32	40	39	44	40	42	45	49	44	38	37	33	31	37	67	29	17	21	24
13	43	49	40	53	36	25	15	16	22	19	18	16	27	23	19	20	19	17	17	15	24	48	57	35	24
14	44	40	55	55	54	56	46	45	55	61	58	64	49	37	35	23	43	13	47	39	24	17	28	24	
15	28	36	17	32	23	50	27	56	16	51	46	55	48	35	22	34	36	20	10	10	15	18	18	12	24
16	10	61	40	49	34	54	42	35	32	42	36	44	40	39	29	28	29	24	16	15	14	15	17	18	24
17	19	20	22	23	26	36	25	22	31	35	33	32	38	33	34	33	31	28	24	20	24	25	26	27	24
18	27	26	29	34	27	34	25	35	43	37	40	40	37	39	36	34	36	35	29	25	23	21	21	19	24
19	21	27	25	19	26	23	26	29	38	36	28	18	23	41	29	24	26	19	27	25	26	28	36	48	24
20	52	47	39	36	34	37	36	37	38	42	42	38	46	37	37	35	28	41	45	34	26	22	22	23	24
21	27	26	29	25	24	31	29	28	30	26	28	27	24	23	30	24	24	28	31	33	33	28	39	42	24
22	35	30	27	27	30	30	32	22	37	31	25	35	27	31	27	25	48	35	60	59	44	46	50	41	24
23	64	54	58	45	58	40	63	29	45	34	36	28	33	31	34	28	38	21	21	20	19	21	21	24	24
24	21	21	22	22	24	21	24	25	30	26	30	29	23	26	27	28	27	23	23	25	28	24	24	24	24
25	27	26	23	22	24	23	19	18	20	28	24	24	21	23	24	28	27	19	14	12	12	14	16	14	24
26	11	13	16	17	14	14	15	29	41	37	38	36	41	44	38	37	41	40	50	31	17	19	49	17	24
27	56	20	41	50	50	51	55	50	21	30	42	41	41	41	42	37	33	27	49	37	25	28	39	47	24
28	18	40	28	21	27	46	25	34	45	33	37	38	33	39	38	26	26	21	19	24	24	24	26	25	24
29	28	29	31	34	29	33	37	41	39	39	34	33	30	32	25	27	27	19	17	17	19	19	19	47	24
30	48	22	31	35	62	47	59	44	47	38	69	69	51	76	42	32	32	38	37	39	35	38	36	36	24

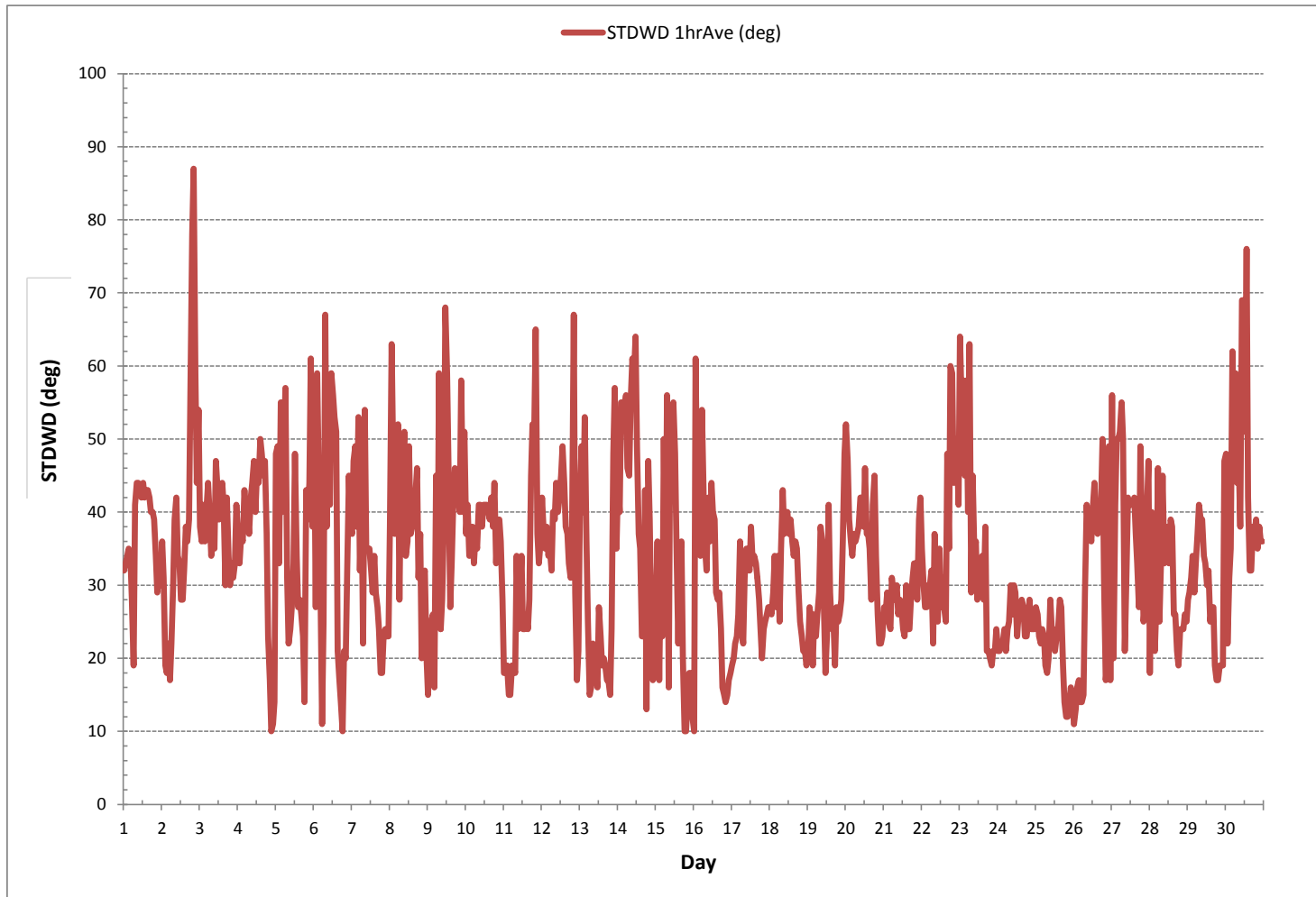
STATUS FLAG CODES

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: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

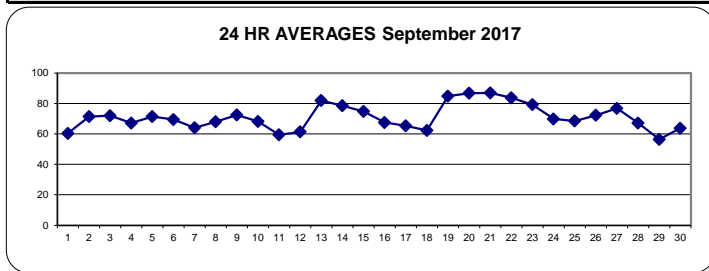


RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

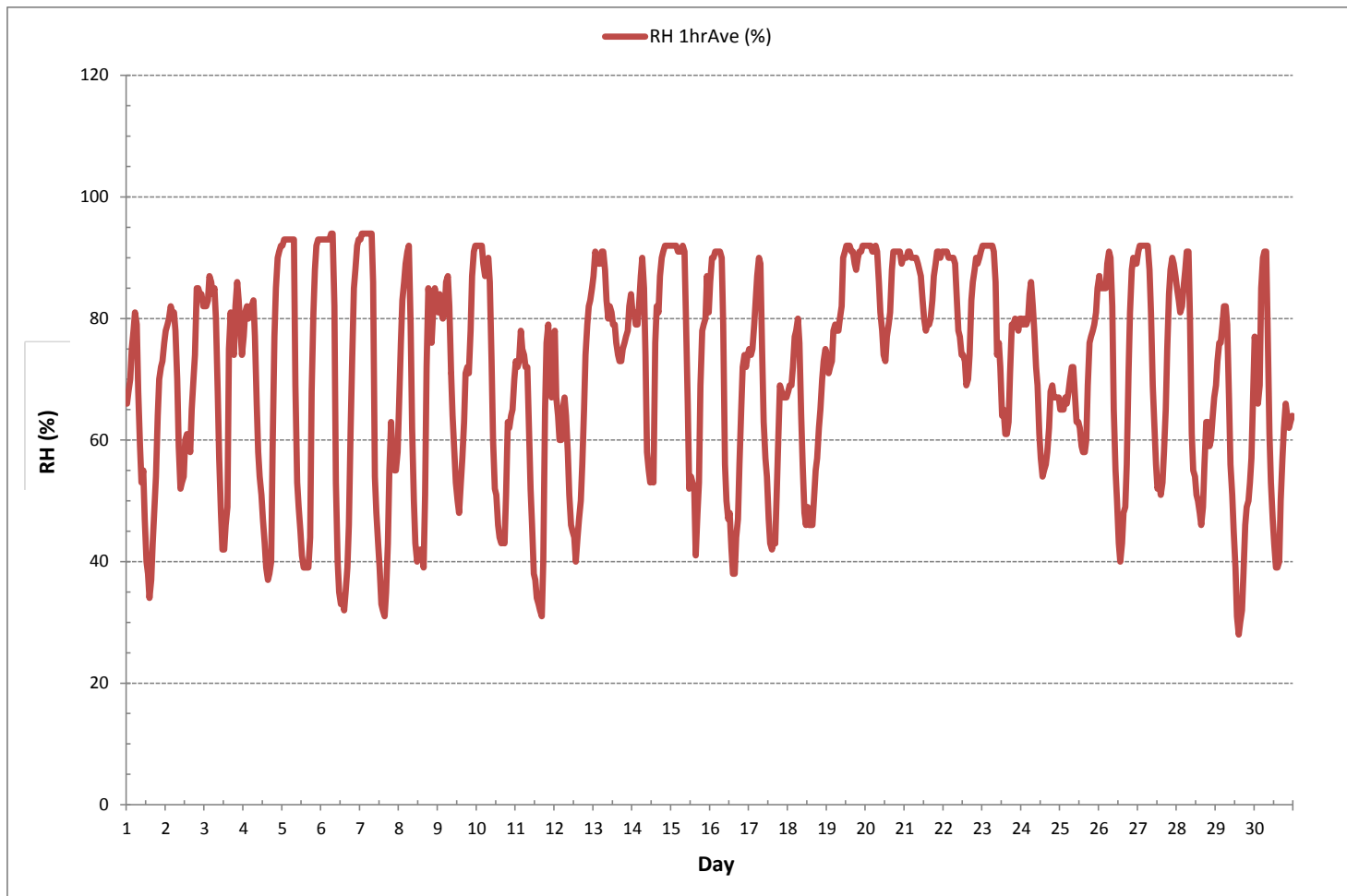
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	28	%	@ HOUR	14	ON DAY	29
MAXIMUM 1-HR AVERAGE:	94	%	@ HOUR	6	ON DAY	6
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	21
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	17					MONTHLY AVERAGE: 71 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



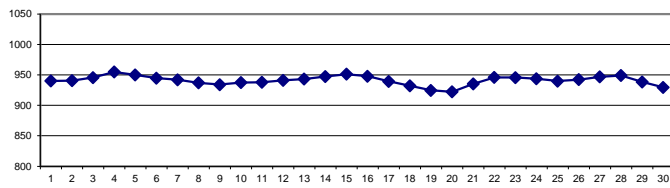
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	939	939	939	939	940	940	940	941	941	941	941	941	941	940	940	940	940	940	940	940	940	940	940	940	939	941	940	24	
2	940	940	940	940	941	941	941	941	942	942	942	941	941	941	940	940	940	940	940	940	940	940	940	940	940	940	940	941	24
3	940	941	942	942	942	943	944	945	946	946	947	947	947	947	947	947	947	947	947	947	947	948	949	949	950	940	950	946	24
4	951	952	952	953	954	954	955	956	957	957	957	957	957	957	957	956	956	956	955	954	954	954	953	953	951	957	955	24	
5	953	953	953	952	952	952	952	952	952	952	953	952	952	951	950	949	949	948	948	947	946	946	946	946	946	946	953	950	24
6	945	945	945	945	944	944	944	945	946	946	947	946	946	946	945	945	944	944	944	944	944	943	943	943	943	943	947	945	24
7	943	943	943	943	943	943	943	943	944	944	944	944	943	943	942	942	941	941	940	940	939	939	939	939	939	939	944	942	24
8	939	938	938	938	937	937	937	937	938	938	939	938	937	937	937	937	937	936	936	936	936	936	936	936	935	935	939	937	24
9	935	935	935	935	935	935	935	935	935	936	936	935	935	934	934	934	934	934	934	933	933	932	932	932	932	932	936	934	24
10	932	932	932	933	934	935	936	936	937	937	938	938	939	939	940	940	941	941	941	941	941	941	941	941	941	932	941	938	24
11	941	941	941	941	941	941	941	940	940	939	939	938	938	937	937	936	936	936	935	935	935	936	937	937	937	935	941	938	24
12	938	938	938	939	940	940	941	942	942	943	943	942	942	943	942	942	942	942	942	942	942	942	942	942	942	938	943	941	24
13	942	942	942	942	942	943	943	943	943	943	943	943	943	943	944	944	944	944	945	945	945	945	945	945	942	945	943	24	
14	946	946	946	946	946	946	946	947	947	948	948	948	948	948	948	947	948	948	948	948	948	948	949	949	949	946	949	947	24
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16	950	950	950	949	949	949	949	949	950	950	951	950	950	949	948	948	947	947	946	945	945	944	944	944	944	944	951	948	24
17	943	943	942	942	941	941	940	940	941	941	941	941	940	940	939	939	938	938	937	936	936	936	935	935	935	935	943	939	24
18	935	934	934	934	934	933	933	933	934	934	933	932	932	932	931	931	931	930	930	929	929	929	928	928	928	928	935	932	24
19	928	928	927	926	926	926	925	925	925	925	924	924	924	923	923	923	924	924	924	924	924	924	924	923	923	928	925	24	
20	923	922	922	921	921	921	921	921	920	920	921	921	921	922	922	922	923	923	923	924	924	925	926	926	920	926	922	24	
21	927	927	928	929	929	930	931	932	933	933	934	935	936	937	938	938	939	940	941	942	942	943	943	944	927	944	935	24	
22	945	945	944	945	946	946	947	947	947	947	947	947	947	947	947	946	946	946	946	946	946	945	945	945	944	947	946	24	
23	945	945	945	945	945	945	945	945	946	947	947	946	946	946	946	946	946	946	946	946	946	946	946	946	945	947	946	24	
24	946	946	946	945	945	945	944	944	945	945	945	945	944	944	944	943	943	943	942	942	941	941	941	941	941	941	946	944	24
25	940	940	940	940	940	940	939	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	939	940	940	24	
26	940	940	940	940	940	940	941	941	942	942	943	943	943	943	943	943	944	944	944	944	944	944	944	944	940	944	942	24	
27	944	944	945	945	945	945	945	946	946	946	947	947	947	948	948	948	948	948	948	948	948	949	949	949	944	949	947	24	
28	949	950	950	950	950	950	950	950	951	951	952	951	951	950	949	949	948	947	947	946	946	946	945	945	945	945	952	949	24
29	945	944	944	943	942	942	941	941	940	940	940	940	939	938	937	937	936	936	935	934	934	933	932	932	932	932	945	939	24
30	931	931	931	930	930	929	929	929	929	930	930	930	929	929	929	929	929	929	929	929	929	929	930	930	929	929	931	930	24
HOURLY MAX	953	953	953	953	954	954	955	956	957	957	957	957	957	957	957	956	956	956	955	954	954	954	953	953					
HOURLY AVG	941	941	941	941	941	941	941	941	942	942	942	942	942	942	941	941	941	941	941	941	941	941	941	940					

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

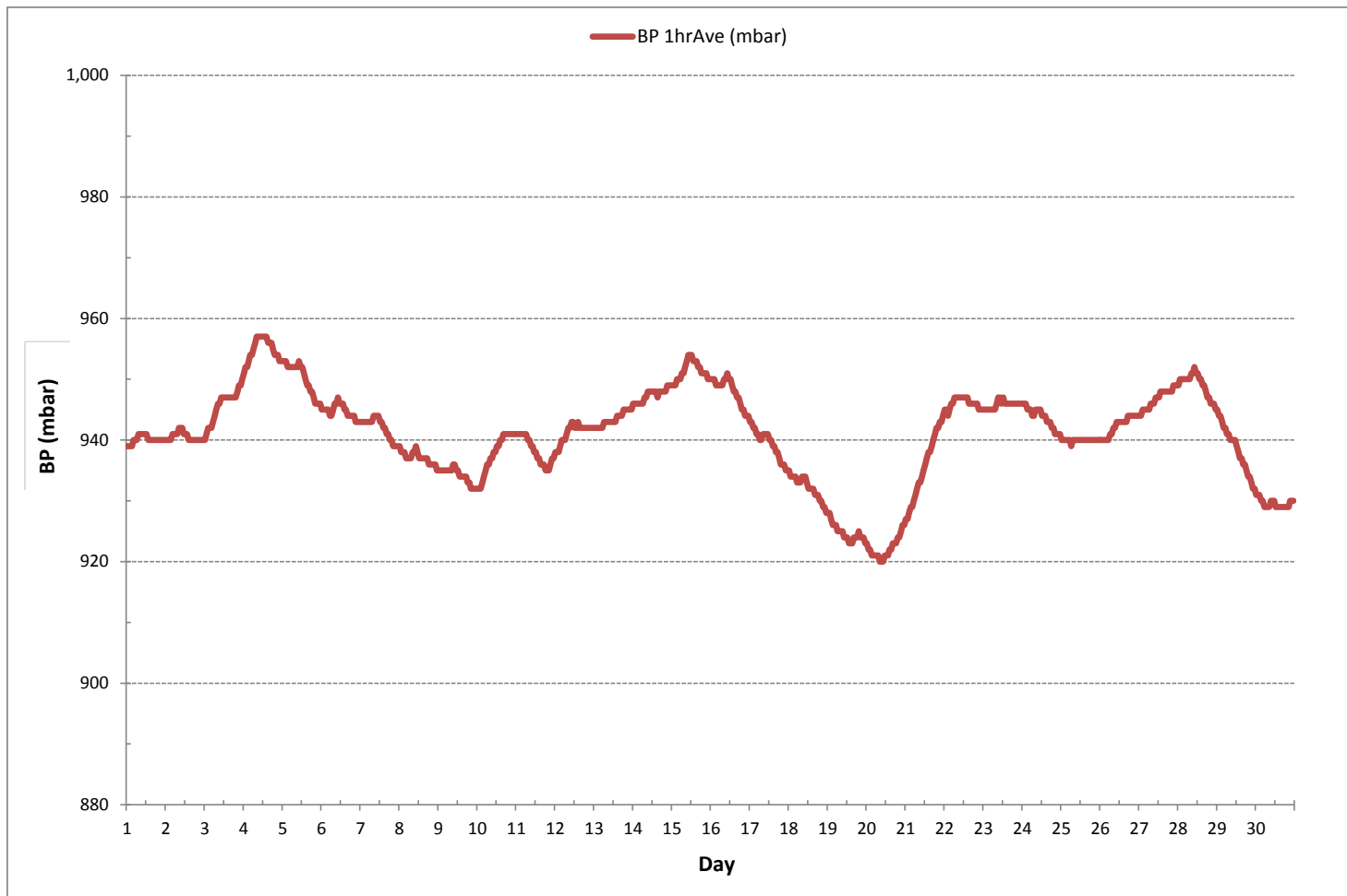
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	920 mbar	@ HOUR	8	ON DAY	20
MAXIMUM 1-HR AVERAGE:	957 mbar	@ HOUR	8	ON DAY	4
MAXIMUM 24-HR AVERAGE:	955 mbar			ON DAY	4
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	8	MONTHLY AVERAGE:			941 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



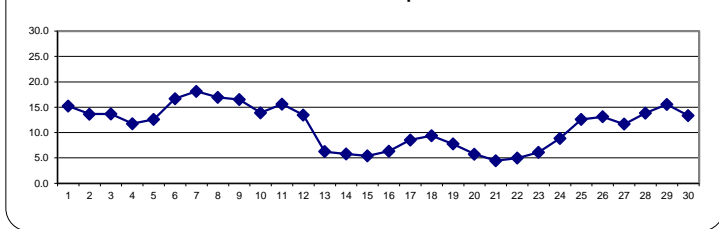
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	12.5	11.9	11.3	10.2	9.5	8.6	9.4	12.9	15.7	17.7	17.1	19.5	21.4	22.2	22.3	21.2	20.0	18.4	17.6	14.9	13.6	13.1	12.7	12.1	8.6	22.3	15.2	24
2	11.3	10.6	10.1	9.4	9.2	8.9	9.7	12.5	16.2	18.8	18.7	17.5	16.5	16.4	17.2	17.7	16.3	15.3	13.9	12.4	12.2	12.1	12.1	12.3	8.9	18.8	13.6	24
3	11.9	12.0	11.4	10.7	11.3	11.6	11.1	12.4	15.0	17.2	19.5	20.7	20.4	20.0	19.0	13.7	14.9	15.9	13.5	10.7	9.1	8.8	8.6	8.8	8.6	20.7	13.7	24
4	7.3	6.0	5.5	6.4	6.4	6.6	7.0	9.6	12.9	15.5	16.7	16.9	18.2	18.9	20.2	20.5	19.6	18.6	14.1	10.1	8.2	6.7	5.6	4.8	4.8	20.5	11.8	24
5	4.1	3.6	3.3	2.8	2.3	2.0	2.2	6.3	13.1	16.3	18.4	20.4	22.4	23.0	23.3	23.7	23.8	22.6	17.5	13.4	11.2	9.9	8.8	8.4	2.0	23.8	12.6	24
6	7.6	7.0	6.2	5.9	5.9	5.6	6.7	10.3	16.0	22.6	25.8	27.3	27.9	28.1	28.6	27.8	26.7	25.0	21.0	17.6	14.6	13.5	11.9	11.1	5.6	28.6	16.7	24
7	9.9	9.0	8.3	7.8	7.2	6.5	7.0	10.0	15.8	22.7	24.7	26.2	27.2	28.1	28.6	28.6	28.0	25.3	21.1	18.5	19.8	19.6	18.4	16.9	6.5	28.6	18.1	24
8	14.2	11.4	9.5	8.6	8.0	7.7	8.4	13.0	17.0	20.2	22.3	24.2	26.1	26.7	27.1	26.7	23.1	19.3	16.4	14.9	16.2	15.4	14.6	15.7	7.7	27.1	16.9	24
9	15.8	14.2	13.8	12.8	11.6	10.1	10.1	12.1	14.6	16.6	18.9	21.5	22.7	23.5	22.0	21.8	20.8	19.3	18.1	17.1	15.9	14.7	14.3	14.0	10.1	23.5	16.5	24
10	13.8	13.5	12.9	13.0	13.3	12.5	11.7	11.1	11.6	13.9	15.8	17.2	17.4	18.4	18.3	18.2	17.0	16.4	14.4	11.5	11.3	10.8	10.3	9.1	9.1	18.4	13.9	24
11	8.6	8.4	8.2	7.1	8.0	8.4	9.0	10.0	12.5	15.8	18.5	21.5	22.0	23.7	24.5	25.0	25.2	23.0	17.1	14.4	13.8	16.3	17.4	15.9	7.1	25.2	15.6	24
12	15.3	15.5	14.7	14.6	13.8	12.3	11.0	11.9	13.3	15.1	16.5	16.4	16.8	18.4	17.2	16.3	15.7	14.6	12.5	10.3	9.0	8.2	7.2	6.5	6.5	18.4	13.5	24
13	5.5	4.5	5.2	5.2	5.9	4.1	4.9	6.1	7.7	8.0	7.7	7.7	7.9	7.6	7.5	7.1	7.1	6.9	6.7	6.2	5.9	5.6	4.5	4.4	4.1	8.0	6.2	24
14	4.8	4.8	5.2	5.3	4.9	3.0	1.7	3.5	6.4	10.2	10.5	10.7	10.6	11.4	7.9	7.4	8.4	7.5	5.3	3.7	2.6	1.4	1.1	0.2	0.2	11.4	5.8	24
15	-0.4	-0.7	-1.0	-1.8	-1.9	-2.1	-2.1	-0.2	4.2	9.1	11.8	14.7	12.6	12.9	13.0	14.8	13.0	11.5	7.6	5.0	3.5	2.5	1.1	2.9	-2.1	14.8	5.4	24
16	1.6	-0.7	-1.8	-2.1	-2.6	-3.0	-2.7	-0.5	6.0	11.9	13.4	14.6	13.3	14.1	13.7	13.3	13.0	12.0	9.1	7.0	5.7	5.5	5.6	5.3	-3.0	14.6	6.3	24
17	5.2	5.5	5.4	4.5	3.4	1.6	-0.1	2.5	7.5	10.7	12.8	13.7	15.1	15.2	15.3	14.7	14.2	12.0	9.4	7.1	7.1	7.4	7.4	7.3	-0.1	15.3	8.5	24
18	6.8	6.1	5.8	4.7	3.4	3.3	3.7	5.5	8.8	11.2	13.3	14.2	13.4	14.6	14.4	14.6	13.2	11.9	11.5	10.4	9.6	8.3	7.9	8.1	3.3	14.6	9.4	24
19	8.1	9.8	9.5	9.1	8.6	8.3	8.5	9.2	9.6	9.8	9.3	8.6	8.9	9.6	9.7	7.8	6.5	6.3	5.6	5.3	4.9	4.7	4.3	4.0	4.0	9.8	7.8	24
20	4.2	4.3	4.3	4.0	3.4	3.1	3.1	4.0	5.5	6.7	7.5	8.5	9.0	8.7	8.4	8.2	6.8	6.6	6.6	6.1	5.8	5.4	4.5	3.3	3.1	9.0	5.8	24
21	3.1	2.9	3.0	3.0	2.7	2.6	2.6	2.9	3.2	4.1	4.7	5.8	6.4	6.7	6.5	6.3	6.1	5.8	5.0	4.8	4.6	4.5	4.5	4.5	2.6	6.7	4.4	24
22	4.3	4.2	3.6	3.4	3.6	3.5	3.6	4.1	5.2	5.9	6.1	6.7	6.7	7.2	7.7	7.2	7.1	6.1	5.4	4.6	3.8	4.2	3.0	1.7	1.7	7.7	5.0	24
23	1.4	1.4	2.2	2.8	3.1	2.9	3.0	4.4	6.1	7.5	7.6	8.7	9.9	9.0	9.4	9.5	9.3	8.4	7.0	6.6	6.4	6.7	6.8	6.4	1.4	9.9	6.1	24
24	6.3	6.4	6.1	6.0	5.9	4.8	4.2	5.5	6.7	8.4	10.0	11.4	12.2	12.9	12.5	12.4	12.0	11.1	10.0	9.7	9.6	9.6	9.6	9.5	4.2	12.9	8.9	24
25	9.7	9.7	9.5	9.3	9.2	9.1	9.0	8.9	9.7	11.7	13.4	14.1	15.2	17.0	17.9	17.9	17.7	15.5	13.9	13.5	13.3	12.9	12.6	11.0	8.9	17.9	12.6	24
26	10.9	11.7	11.6	11.3	10.9	9.7	8.8	9.3	11.8	16.3	18.7	20.2	21.0	20.8	19.3	18.1	18.0	16.7	13.0	10.0	7.9	7.0	6.5	5.1	5.1	21.0	13.1	24
27	4.1	3.8	4.2	3.8	5.2	6.4	7.1	8.8	10.0	13.6	16.6	19.3	20.3	20.2	20.4	19.7	18.2	16.4	13.9	11.4	9.6	8.6	9.0	9.3	3.8	20.4	11.7	24
28	9.3	9.1	9.0	8.9	8.6	7.6	6.7	7.7	11.2	15.3	17.9	19.3	20.4	20.8	21.6	21.5	20.1	17.4	14.5	13.6	13.8	13.4	12.7	12.1	6.7	21.6	13.9	24
29	11.8	10.8	10.0	9.7	9.0	8.2	8.1	9.2	12.4	16.1	18.5	20.9	23.1	25.2	25.0	24.6	23.5	20.4	17.5	16.1	15.3	14.3	12.8	10.4	8.1	25.2	15.5	24
30	8.3	8.4	10.5	9.4	5.1	4.0	3.4	4.2	9.9	14.8	17.2	19.1	20.8	22.1	22.5	22.3	20.3	17.8	15.8	14.2	13.8	13.0	12.1	11.5	3.4	22.5	13.4	24
HOURLY MAX	15.8	15.5	14.7	14.6	13.8	12.5	11.7	13.0	17.0	22.7	25.8	27.3	27.9	28.1	28.6	28.6	28.0	25.3	21.1	18.5	19.8	19.6	18.4	16.9				
HOURLY AVG	7.9	7.5	7.3	6.9	6.5	5.9	5.9	7.6	10.5	13.5	15.0	16.3	16.9	17.4	17.4	17.0	16.2	14.8	12.5	10.7	9.9	9.5	8.9	8.4				

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

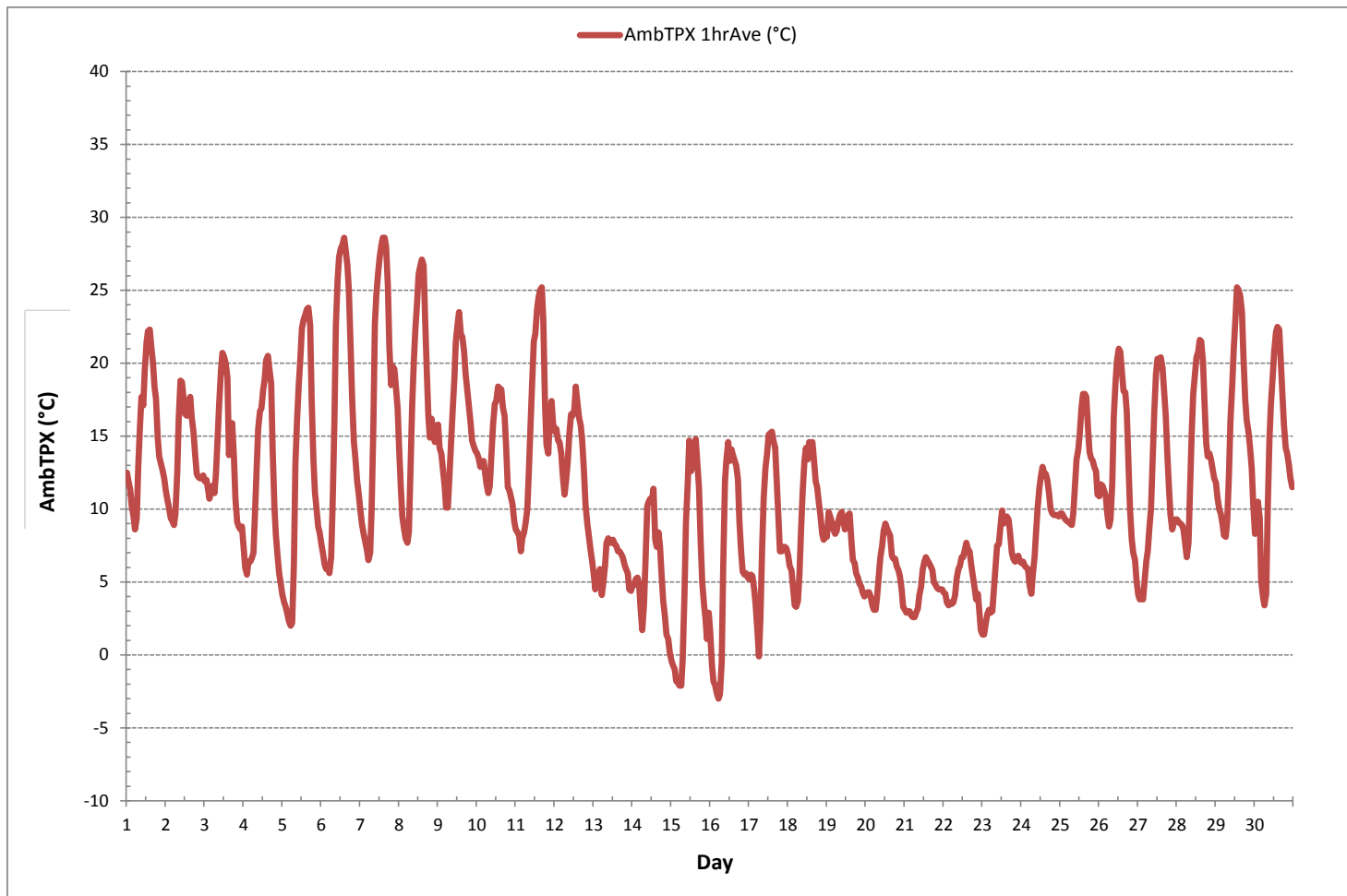
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-3.0 °C	@ HOUR	5	ON DAY	16
MAXIMUM 1-HR AVERAGE:	28.6 °C	@ HOUR	14	ON DAY	6
MAXIMUM 24-HR AVERAGE:	18.1 °C			ON DAY	7
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	6.4	MONTHLY AVERAGE:			11.3 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



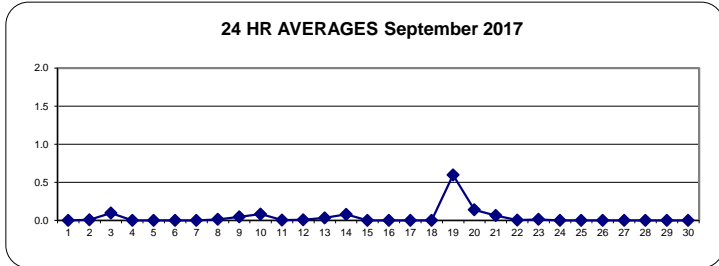
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.1	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.5	0.0	24
10	0.0	0.0	0.0	0.0	0.2	0.4	0.7	0.7	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	0.7	0.1	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	24
12	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
13	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	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	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.1	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	0.5	0.8	3.2	4.6	4.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.6	24
20	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	0.5	0.5	0.1	0.0	0.3	0.4	0.3	1.0	0.0	0.0	1.0	0.1	24
21	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24
22	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
23	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	0.0	0.0	0.0	0.3	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.5	0.2	0.0	0.0	0.6	0.4	0.7	0.7	0.2	0.5	0.8	3.2	4.6	4.5	1.9	2.3	0.5	0.5	0.2	0.0	0.3	0.4	0.3	1.0				
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1				

STATUS FLAG CODES

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

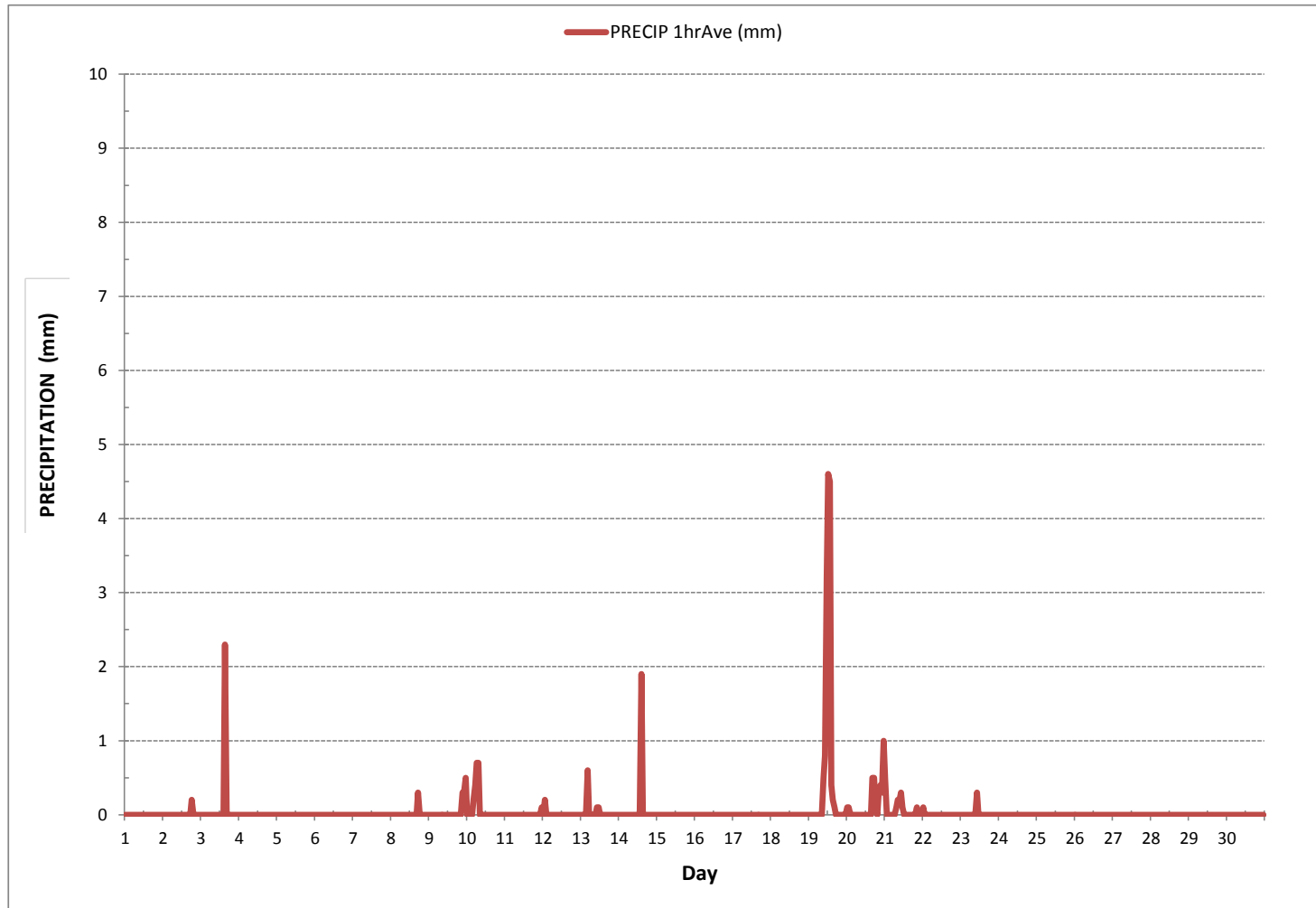
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	4.6	mm	@ HOUR	12	ON DAY	19
MAXIMUM 24-HR AVERAGE:	0.6	mm			ON DAY	19
MONTHLY TOTAL	28.4	mm				
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.3					
MONTHLY AVERAGE:						0.0 mm

PRECIPITATION Hourly Averages (mm)



***APPENDIX II
EQUIPMENT CALIBRATION RESULTS***

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: September 7, 2017	Barometer/B.P./units: Brunton 05535 expires December 5, 2017	944	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 160459244 expires May 18, 2018	23	°C
Location/Station Name: Maskwa	Weather Conditions: Sunny		
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 7:11	Performed By/Reviewer: Chris Wesson	Tom Bourque	
End Time 24 hr. (mst): 10:55	Cal Gas Expiry Date: December 8, 2019		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		

Analyzer:	
ID# or Serial Number: 436609739	Range ppb: 1000
Last Calibration Date: August 11, 2017	As Found C.F.: 1.031
Previous C.F.: 0.999	New C.F.: 1.000

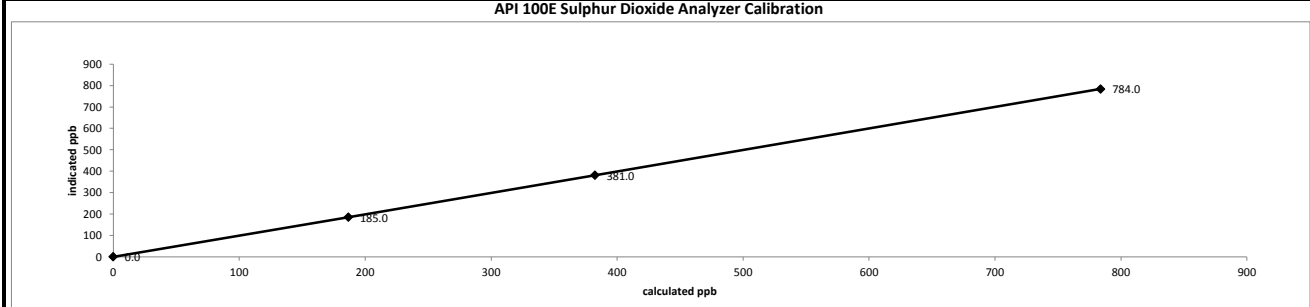
Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Defender Low 153358 expires January 19, 2018	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
High Flow Meter ID/Expiry Date: Defender High 152571 expires January 19, 2018									
Calibrator ID/Expiry Date: Sabio id# 17100415 expires May 16, 2018									
Cal Gas Cylinder I.D. # : EY0000597									
Cal Gas Conc. (ppm): 50.4									

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	5031	0.00	5031	0.0	3.0	n/a
as found high	4951	78.22	5029	783.9	763.0	1.031
adjusted zero	5031	0.00	5031	0.0	0.0	n/a
adjusted high	4951	78.22	5029	783.9	784.0	1.000
mid	5000	38.23	5038	382.5	381.0	1.004
low	5031	18.71	5050	186.7	185.0	1.009
calibrator zero	5031	0.00	5031	0.0	0.0	n/a
Average C.F. =						1.004

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.999	0.95-1.05
b (Intercept as % of full scale) = 0.10%	± 3% F.S.
% change in C.F. from last cal = -3.25%	± 10%

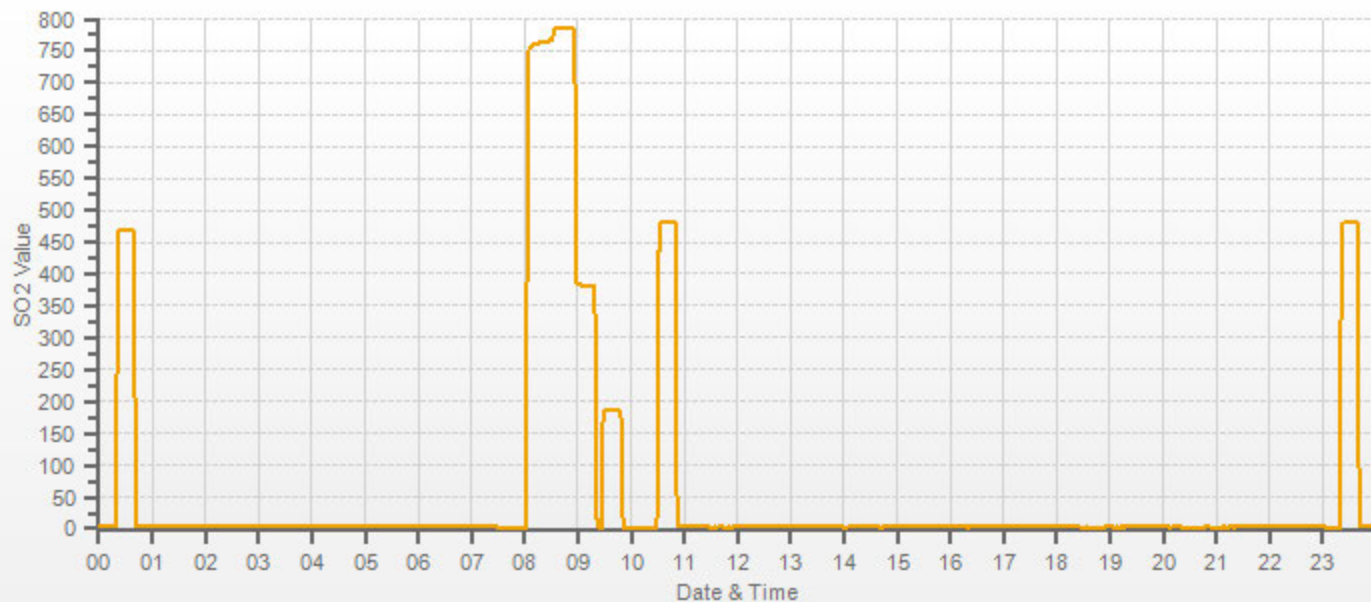


As found:	As left:
Slope: 0.922	Slope: 0.949
Offset: 145.0	Offset: 150.3
Hvps: 483	Hvps: 483
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 31.1	Box Temp: 31.1
Pmt Temp: 7.7	Pmt Temp: 7.7
Izs Temp: 50.0	Izs Temp: 50.0
Pres: 24.7	Pres: 24.6
Samp Fl: 583	Samp Fl: 583
Norm Pmt: 150.4	Norm Pmt: 151.0
Uv Lamp: 2523	Uv Lamp: 2524
Lamp Ratio: 92.2	Lamp Ratio: 92.1
Str Lgt: 66.8	Str Lgt: 71.3
Drk Pmt: 10.3	Drk Pmt: 10.9
Drk Lmp: -0.6	Drk Lmp: -0.6
Expected Value: 458.0	Expected Value: 479.0

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

Flow measurements after mid-point

SO2[ppb] Station: LICA MASKWA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: September 6, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 10:30 End Time 24 hr. (mst): 14:29 Calibration Method: Gas Dilution	Barometer/B.P./units: Brunton 05535 expires December 5, 2017 945 millibars Thermometer/Station Temp: F.S. 160459244 expires May 18, 2018 23 °C Weather Conditions: Sunny Calibration Purpose: routine monthly Performed By/Reviewer: Chris Wesson Tom Bourque Cal Gas Expiry Date: May 16, 2020 Converter Model & s/n (if applicable): Internal
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Analyzer: ID# or Serial Number: 722 Last Calibration Date: August 11, 2017 Previous C.F.: 1.000	Range ppb: 100 As Found C.F.: 1.062 New C.F.: 0.999
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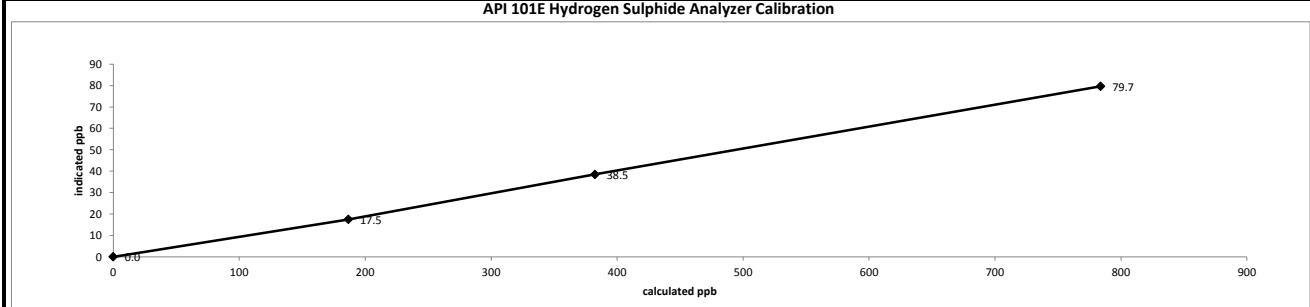
Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 153358 expires January 19, 2018 High Flow Meter ID/Expiry Date: Defender High 152571 expires January 19, 2018 Calibrator ID/Expiry Date: API id# 830 expires February 14, 2018 Cal Gas Cylinder I.D. #: LL119420 Cal Gas Conc. (ppm): 10.2	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb)	Indicated Concentration (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7511	0.00	7511	0.0	1.0	n/a
as found high	7447	58.62	7506	79.7	76.0	1.062
adjusted zero	7511	0.00	7511	0.0	0.0	n/a
adjusted high	7447	58.62	7506	79.7	79.7	0.999
mid	7487	28.52	7516	38.7	38.5	1.005
low	7499	13.46	7512	18.3	17.5	1.044
calibrator zero	7511	0.00	7511	0.0	0.5	n/a
Average C.F. =						1.016

Linear Regression/Calibration Results:

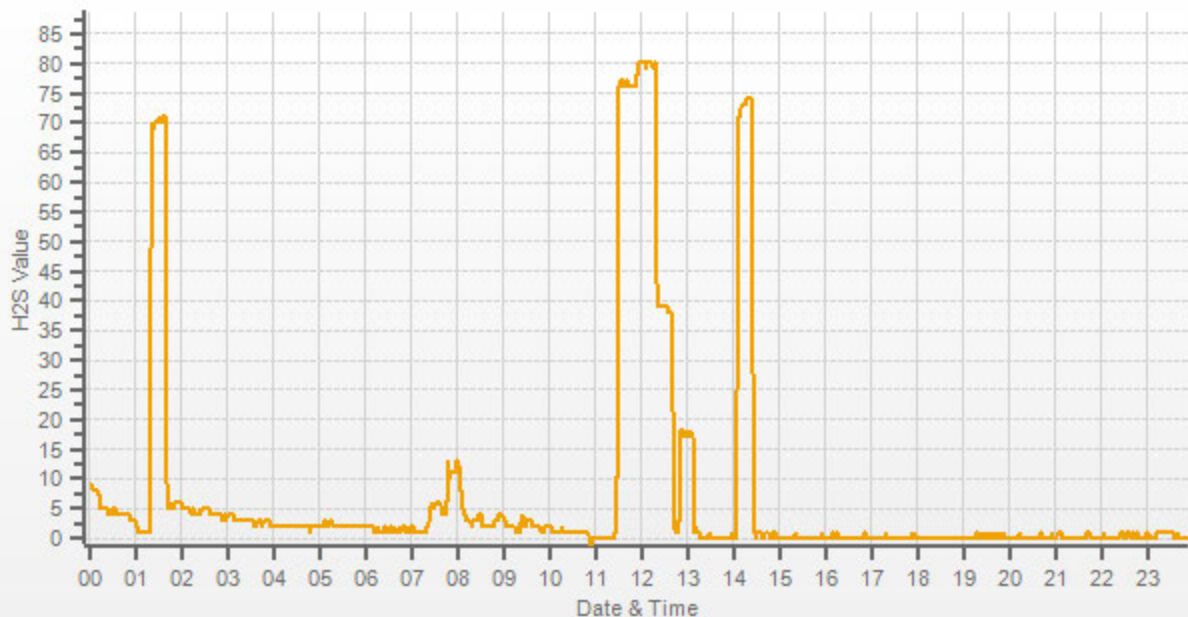
Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.996	0.95-1.05
b (Intercept as % of full scale) = 0.37%	± 3% F.S.
% change in C.F. from last cal = -6.20%	± 10%



As found: Slope: 0.824 Offset: 100.1 Hvps: 583 Rcell Temp: 50.0 Box Temp: 31.4 Pmt Temp: 8.2 Izs Temp: 32.0 Converter Temp: 314.7 Pres: 23.3 Samp Fl: 617 Uv Lamp: 3246 Lamp Ratio: 99.3 Str Lgt: 41.2 Drk Pmt: 24.7 Drk Lmp: 3.6 Expected Value: 69.7	As left: Slope: 0.874 Offset: 102.3 Hvps: 582 Rcell Temp: 50.0 Box Temp: 31.9 Pmt Temp: 8.2 Izs Temp: 32.0 Converter Temp: 314.6 Pres: 23.3 Samp Fl: 615 Uv Lamp: 3247 Lamp Ratio: 99.4 Str Lgt: 44.7 Drk Pmt: 24.9 Drk Lmp: 3.6 Expected Value: 73.9
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Comments:
 The analyzer sample inlet filter was changed. The manifold blower was found to be working normally.

Flow measurements after mid-point



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon THC Analyzer Calibration

Date:	September 7, 2017	Barometer/B.P./units:	Brunton 05535 expires December 5, 2017	944	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 160459244 expires May 18, 2018	23	°C
Location/Station Name:	Maskwa	Weather Conditions:	Sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	07:27 / 11:25	Performed By/Reviewer:	Chris Wesson	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	Range ppm:
ID# or Serial Number:	50
Last Calibration Date:	As Found C.F.:
August 11, 2017	1.098
Previous Cal High Point C.F.:	New C.F.:
1.000	0.999

Calibration Standards:	
Low Flow Meter ID/Expiry Date:	Defender Low 153358 expires January 19, 2018
High Flow Meter ID/Expiry Date:	Defender High 152571 expires January 19, 2018
Calibrator ID/Expiry Date:	API id# 830 expires February 14, 2018
Cal Gas Cylinder I.D. #:	LL86139
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	599.0 211.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	580.3 1179.3
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

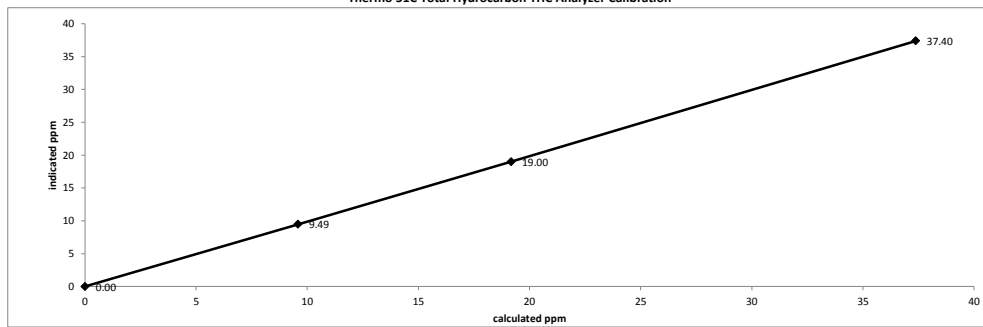
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2503	0.00	2503	0.0	0.55	n/a
as found high	2424	79.33	2503	37.37	34.60	1.098
adjusted zero	2503	0.00	2503	0.00	0.00	n/a
adjusted high	2424	79.33	2503	37.37	37.40	0.999
mid	2466	40.76	2507	19.17	19.00	1.009
low	2482	20.33	2502	9.58	9.49	1.010
calibrator zero	2503	0.00	2503	0.0	0.00	n/a
Average C.F.=						1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale) =	0.15%	0.95-1.05
% change in C.F. from last cal =	-9.76%	± 3% F.S.
		± 10%

Thermo 51C Total Hydrocarbon THC Analyzer Calibration



<p style="text-align: center;">As found:</p> <p>H2 cylinder (psi): 700</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 700</p> <p>Span Cylinder Reg Set (psi): 25</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 3070</p> <p>rng: 1</p> <p>try: 3</p> <p>flm: 216.2</p> <p>det: 125.7</p> <p>Flame: 216</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.80</p> <p>Internal Air Pressure: 22</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: 0.95 lpm</p> <p>Expected Value: 24.18</p>	<p style="text-align: center;">As left:</p> <p>H2 cylinder (psi): 700</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 700</p> <p>Span Cylinder Reg Set (psi): 25</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 3100</p> <p>rng: 1</p> <p>try: 3</p> <p>flm: 216.3</p> <p>det: 125.4</p> <p>Flame: 216</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.80</p> <p>Internal Air Pressure: 22</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: n/a</p> <p>Expected Value: 26.11</p>
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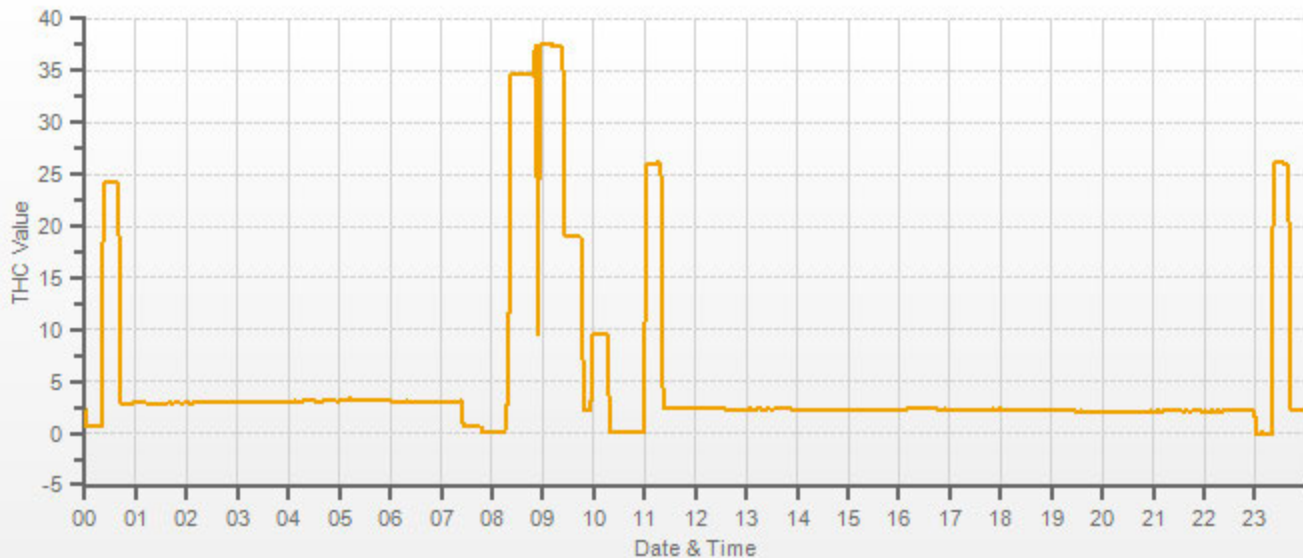
Comments:

Flow measurements after mid-point

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

Flow rates confirmed between as-found and adjusted high due to marked change in response.

THC[ppm] Station: LICA MASKWA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: September 6, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 10:30 / 14:14 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: Brunton 05535 expires December 5, 2017 945 millibars Thermometer/Station Temp: F.S. 160459244 expires May 18, 2018 23 °C Weather Conditions: Sunny Calibration Purpose: shut down Performed By/Reviewer: Chris Wesson Tom Bourque Cal Gas Expiry Date: December 8, 2019
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Analyzer: ID# or Serial Number: 2051 Last Calibration Date: August 6, 2017 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>1.058</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.002</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.056</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.058	n/a	NO ₂ =	1.000	1.002	n/a	NOx =	1.000	1.056	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.058	n/a														
NO ₂ =	1.000	1.002	n/a														
NOx =	1.000	1.056	n/a														

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 153358 expires January 19, 2018 High Flow Meter ID/Expiry Date: Defender High 152571 expires January 19, 2018 Calibrator ID/Expiry Date: Sabio id# 17100415 expires May 16, 2018 Cal Gas Cylinder I.D. #: EY0000597 Cal Gas Conc. (ppm): 49.0 49.0	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	5030	0.0	5030	0	0	0.0	0.0	n/a	n/a
as found high	4951	80.0	5031	779.4	779.4	737.0	738.0	1.058	1.056
mid	4990	39.13	5029	381.3	381.3	355.0	355.0	1.074	1.074
low	5011	19.68	5031	191.6	191.6	175.0	176.0	1.095	1.089
Average C.F.=								1.076	1.073

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	4951	80.03	5031	0.0	738.0	738.0	0.0	0.0	0.0	
as found high NO ₂	4951	80.03	5031	490.0	230.0	737.0	507.0	508.0	507.0	1.002
gpt mid	4951	80.03	5031	265.0	460.0	738.0	278.0	278.0	278.0	1.000
gpt low	4951	80.03	5031	90.0	645.0	738.0	94.0	93.0	94.0	0.989
Average NO₂ C.F.=									0.997	

Linear Regression/Calibration Results:				LIMITS
	NO	NOx	NO ₂	
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.055	1.054	1.003	0.90-1.10
b (Intercept as % of full scale)=	-0.36%	-0.34%	0.06%	± 3% F.S.
% change in C.F. from last cal=	-5.76%	-0.20%	-5.62%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	1.008	NOx SLOPE:	n/a
NOx OFFS:	-1.2	NOx OFFS:	n/a
NO SLOPE:	1.009	NO SLOPE:	n/a
NO OFFS:	-3.0	NO OFFS:	n/a
SAMP FLW:	502	SAMP FLW:	n/a
OZONE FL:	81	OZONE FL:	n/a
NORM PMT:	-3.1	NORM PMT:	n/a
AZERO:	46.4	AZERO:	n/a
HVPS:	707	HVPS:	n/a
DCPS:	2571	DCPS:	n/a
RCELL:	50.2	RCELL:	n/a
BOX TEMP:	31.1	BOX TEMP:	n/a
IZS TEMP:	50.0	IZS TEMP:	n/a
MOLY TEMP:	316.0	MOLY TEMP:	n/a
RCEL:	6.6	RCEL:	n/a
SAMP:	29.6	SAMP:	n/a
PMT Temp:	6.4	PMT Temp:	n/a
Expected Value NO:	n/a	Expected Value NO:	n/a
Expected Value NO ₂ :	n/a	Expected Value NO ₂ :	n/a
Expected Value NOx:	n/a	Expected Value NOx:	n/a

Comments:

The manifold blower was found to be working normally.

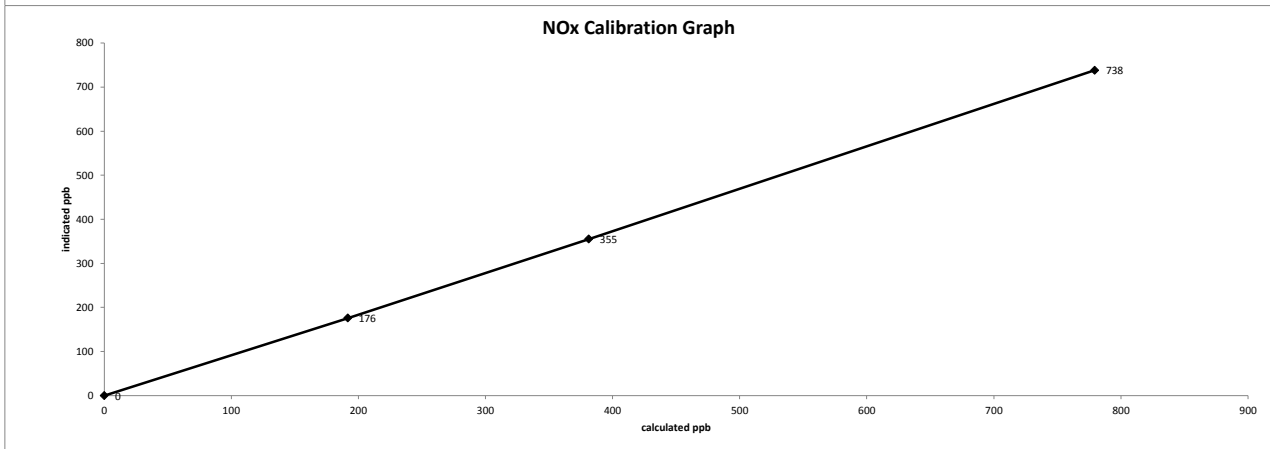
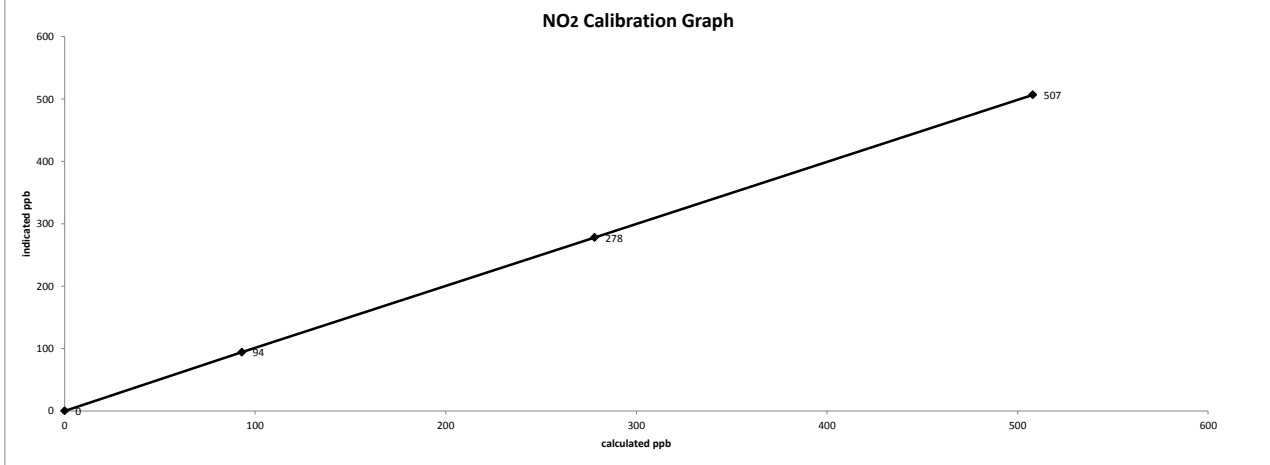
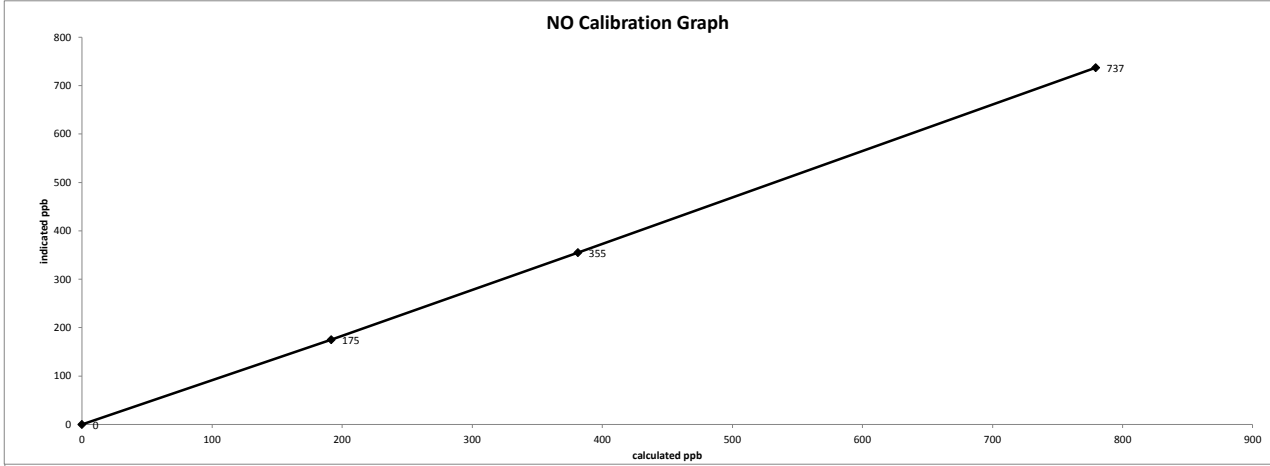
Flow measurements after mid-point

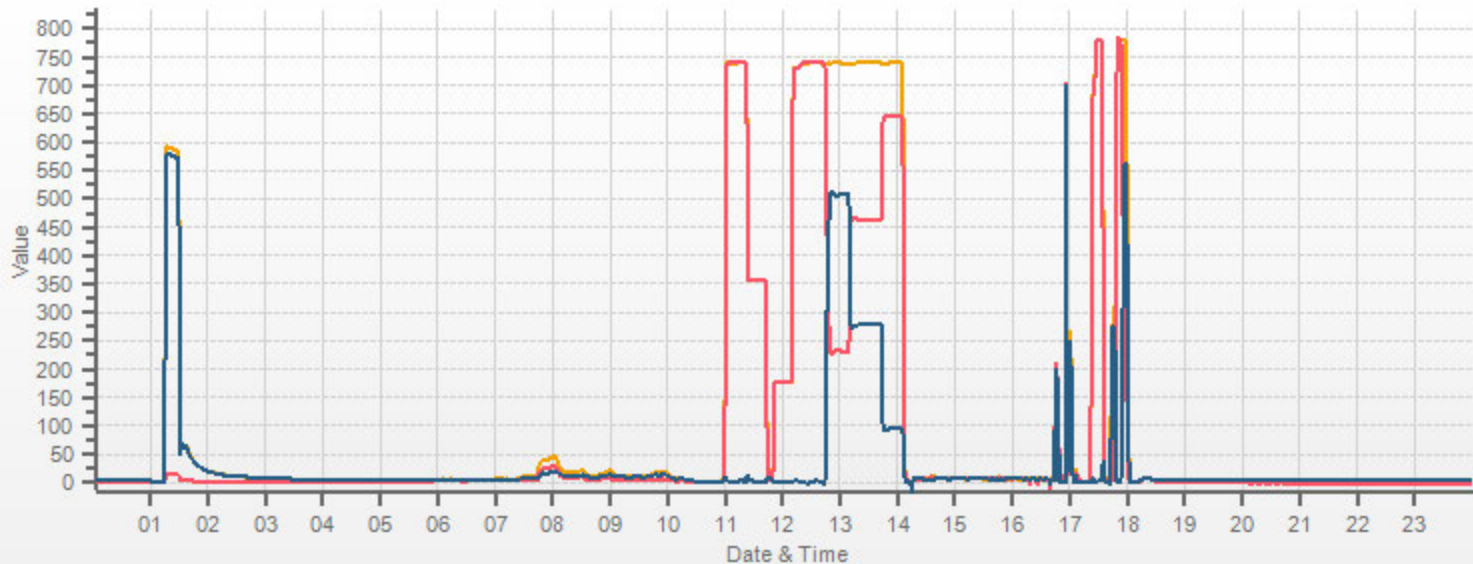
This analyzer was removed from service due to slow recovery from the daily span.

Date: September 6, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:30 / 14:14
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: September 7, 2017	Barometer/B.P./units: Brunton 05535 expires December 5, 2017	944	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 160459244 expires May 18, 2018	23	°C
Location/Station Name: Maskwa	Weather Conditions: Sunny		
Start/End Time 24 hr. (mst): 07:11 / 13:01	Calibration Purpose: Installation		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Chris Wesson	Tom Bourque	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date:	December 8, 2019	

Analyzer:		Correction Factors:		
ID# or Serial Number: 42CTL-65974-351		Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: n/a		NO = n/a	NO ₂ = n/a	NOx = n/a
Range ppb: 1000		n/a	n/a	1.000
		n/a	n/a	0.998
		n/a	n/a	1.000

Calibration Standards:		Standard Calibration Points for a Range of: 1000 ppb			
Low Flow Meter ID/Expiry Date: Defender Low 153358 expires January 19, 2018		Point	Target NO (ppb)	Target NO₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date: Defender High 152571 expires January 19, 2018		High	780	500	n/a
Calibrator ID/Expiry Date: Sabio id# 17100415 expires May 16, 2018		Mid	380	275	n/a
Cal Gas Cylinder I.D. #: EY0000597		Low	190	100	n/a
Cal Gas Conc. (ppm): 49.0 49.0		Extra Point #1	n/a	n/a	n/a
		Extra Point #2	n/a	n/a	n/a

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5031	0.0	5031	0	0	0.0	0.0	n/a	n/a
adjusted high	4951	78.2	5029	762.1	762.1	762.0	762.0	1.000	1.000
mid	5000	38.23	5038	371.8	371.8	366.0	367.0	1.016	1.013
low	5031	18.71	5050	181.5	181.5	177.0	178.0	1.026	1.020
calibrator zero	5031	0.00	5031	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F. =								1.014	1.011

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	4951	78.22	5029	0.0	762.0	759.0	-3.0	0.0	-3.0	
adjusted high NO2	4951	78.22	5029	460.0	238.0	761.0	522.0	524.0	525.0	0.998
gpt mid	4951	78.22	5029	265.0	474.0	761.0	287.0	288.0	290.0	0.993
gpt low	4951	78.22	5029	90.0	673.0	761.0	88.0	89.0	91.0	0.978
Average NO₂ C.F. =										0.990

Linear Regression/Calibration Results:			
Correlation Coefficient =	1.000	1.000	1.000
Slope =	0.999	0.999	0.995
b (Intercept as % of full scale) =	-0.30%	-0.24%	-0.06%
% change in C.F. from last cal =	n/a	n/a	n/a
NO2 converter efficiency	n/a	n/a	1.00
	LIMITS		
	> or = 0.995		
	0.95-1.05		
	± 3% F.S.		
	n/a		
	0.96 to 1.04		

As found:		As left:	
NO Bkg ppb:	26.9	NO Bkg ppb:	19.9
NOx Bkg ppb:	27.7	NOx Bkg ppb:	20.5
NO Coef:	1.011	NO Coef:	1.000
NOx Coef:	1.007	NOx Coef:	1.007
NO2 Coef:	0.996	NO2 Coef:	0.996
PMT:	-659	PMT:	-659
Battery:	3.1	Battery:	3.1
Internal:	29.9	Internal:	29.7
Chamber:	50.7	Chamber:	50.0
Cooler:	-3.7	Cooler:	-3.6
Converter:	327	Converter:	326
Converter Set:	328	Converter Set:	328
Pressure:	240.6	Pressure:	237.9
Sample Flow:	0.985	Sample Flow:	0.978
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	n/a	Expected Value NO:	95
Expected Value NO2:	n/a	Expected Value NO2:	585
Expected Value NOx:	n/a	Expected Value NOx:	681

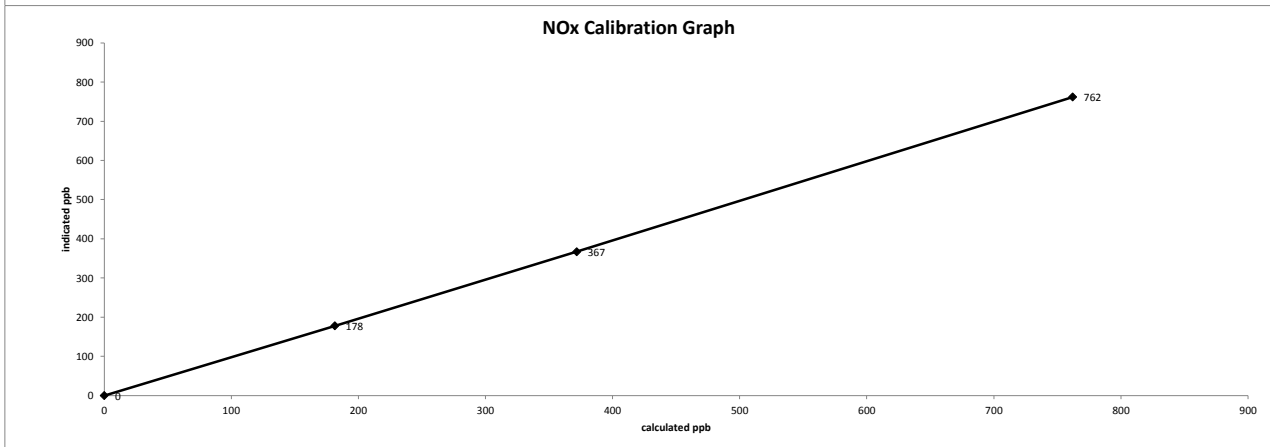
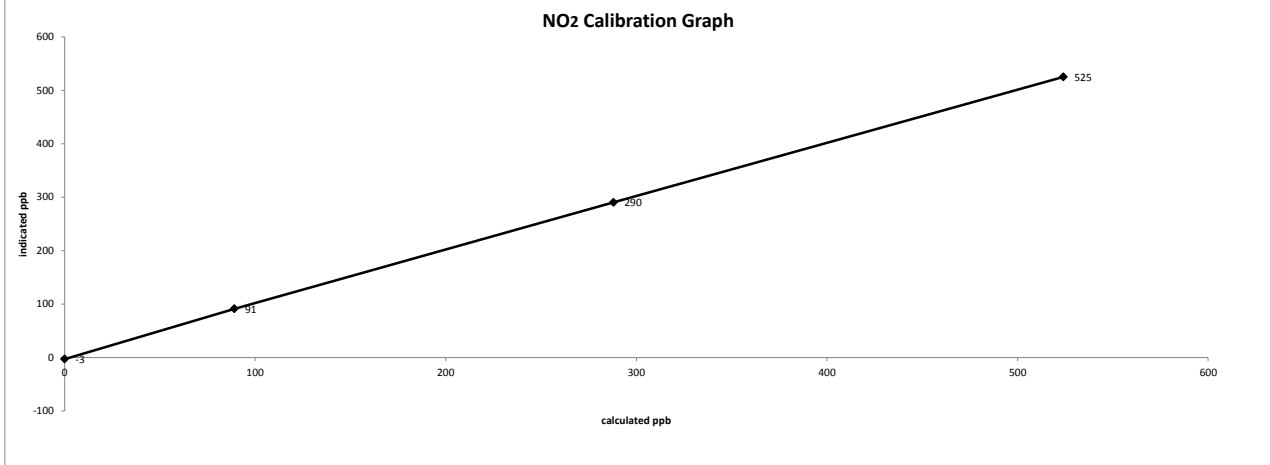
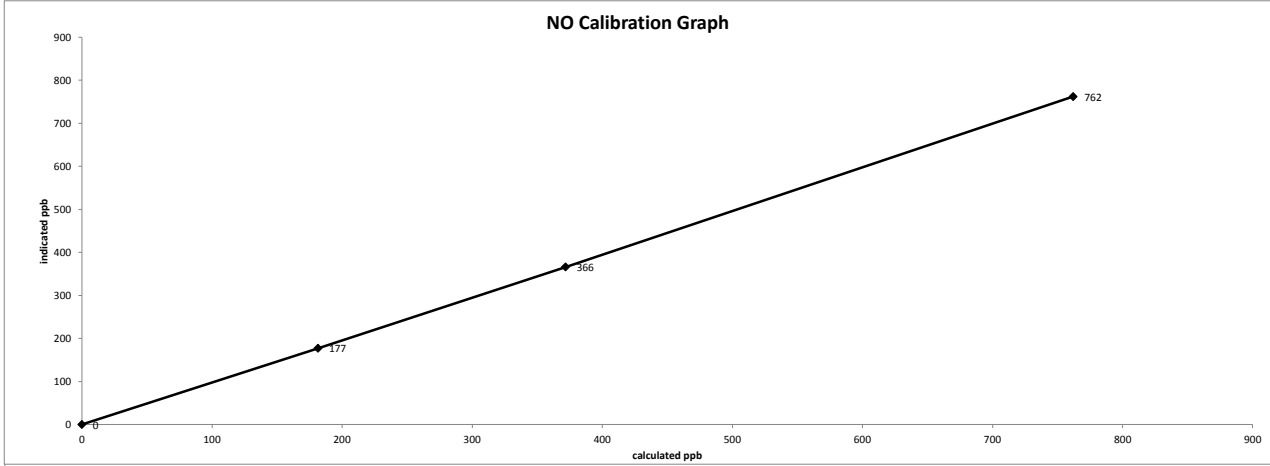
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.

Flow measurements after mid-point
 This analyzer was installed because the previous analyzer was slow to recover from the daily span.

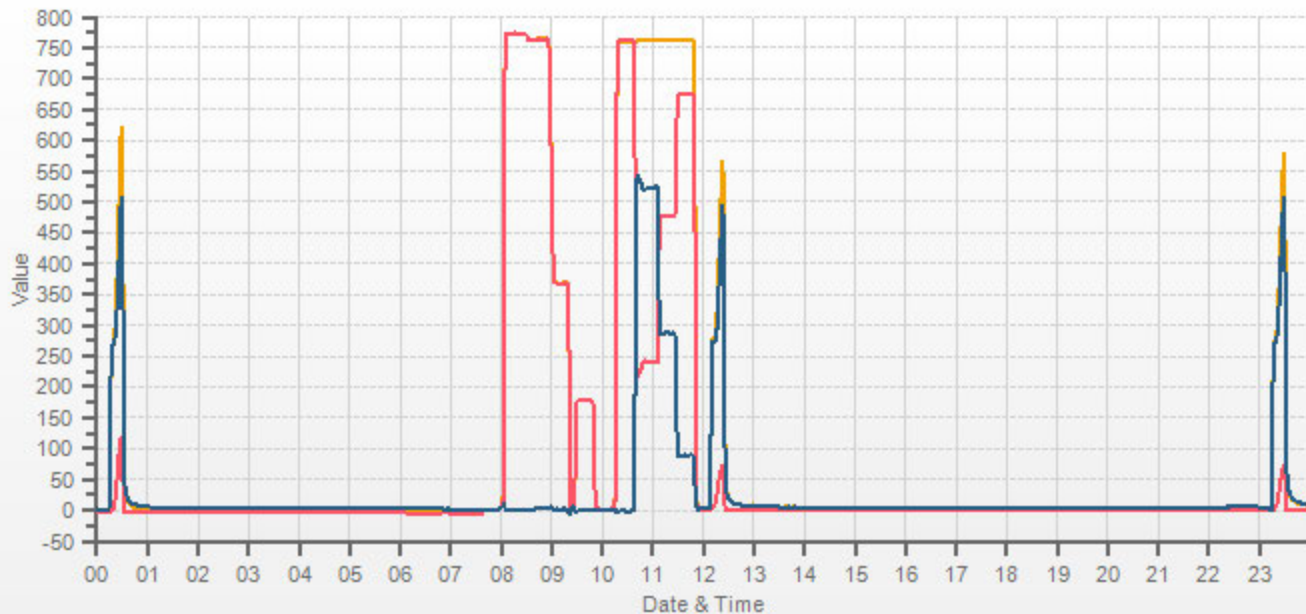
Date: September 7, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 07:11 / 13:01
Calibration Purpose: Installation
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42C NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: September 11, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	937	millibars
Company/Airshed: LICA	Thermometer/Station Temp: Fluke 4295 expires November 14, 2017	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 13:10 / 20:49	Calibration Purpose: repeat		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque		
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 42CTL-65974-351	Previous C.F.: As Found C.F.: New C.F.:
Last Calibration Date: September 6, 2017	NO = 1.000 0.846 1.001
Range ppb: 1000	NO ₂ = 0.998 1.000 1.000
	NOx = 1.000 0.846 1.001

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.7 50.9	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <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)		
adjusted zero	5327	0.00	5327	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5259	77.73	5337	738.4	738.4	738.0	738.0	1.001	1.001
mid	5300	37.79	5338	358.9	358.9	354.0	354.0	1.014	1.014
low	5315	18.86	5334	179.3	179.3	175.0	175.0	1.024	1.024
calibrator zero	5327	0.00	5327	0	0	0.0	0.0	n/a	n/a
								Average C.F. =	1.013

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	5259	77.73	5337	0.0	737.0	737.0	0.0	0.0	0.0	
as found high NO2	5259	77.73	5337	500.0	253.0	737.0	484.0	484.0	484.0	1.000
adjusted high NO2	5259	77.73	5337	500.0	253.0	737.0	484.0	484.0	484.0	1.000
gpt mid	5259	77.73	5337	280.0	465.0	737.0	272.0	272.0	272.0	1.000
gpt low	5259	77.73	5337	100.0	641.0	737.0	96.0	96.0	96.0	1.000
									Average NO ₂ C.F. =	1.000

Linear Regression/Calibration Results:			
	NO	NOx	NO ₂
Correlation Coefficient =	1.000	1.000	1.000
Slope =	0.999	0.999	1.000
b (Intercept as % of full scale) =	-0.26%	-0.26%	0.00%
% change in C.F. from last cal =	15.42%	15.42%	-0.20%
NO2 converter efficiency			1.00

LIMITS	
> or = 0.995	
0.95-1.05	
± 3% F.S.	
± 10%	
0.96 to 1.04	

As found:	As left:
NO Bkg ppb: 19.9	NO Bkg ppb: 11.6
NOx Bkg ppb: 20.4	NOx Bkg ppb: 12.0
NO Coef: 1.000	NO Coef: 0.852
NOx Coef: 1.007	NOx Coef: 1.008
NO2 Coef: 0.996	NO2 Coef: 0.996
PMT: -659	PMT: -659
Battery: 3.1	Battery: 3.2
Internal: 29.2	Internal: 29.6
Chamber: 50.1	Chamber: 50.3
Cooler: -3.7	Cooler: -3.6
Converter: 327	Converter: 327
Converter Set: 328	Converter Set: 328
Pressure: 239.3	Pressure: 237.9
Sample Flow: 0.965	Sample Flow: 0.978
Ozonator Flow: OK	Ozonator Flow: OK
Expected Value NO: 95	Expected Value NO: 95
Expected Value NO2: 585	Expected Value NO2: 585
Expected Value NOx: 681	Expected Value NOx: 681

Comments:

The manifold blower was found to be working normally.

Flow measurements after mid-point

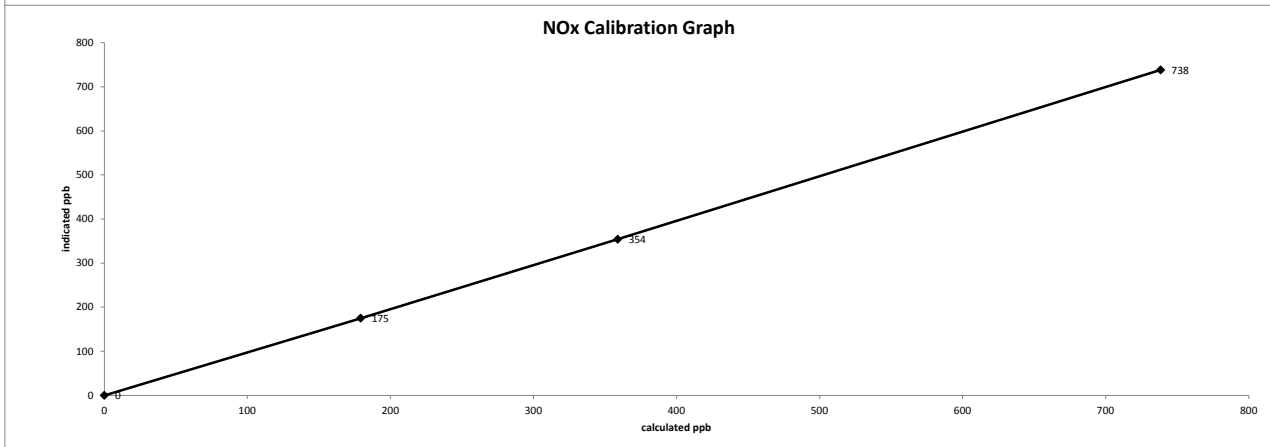
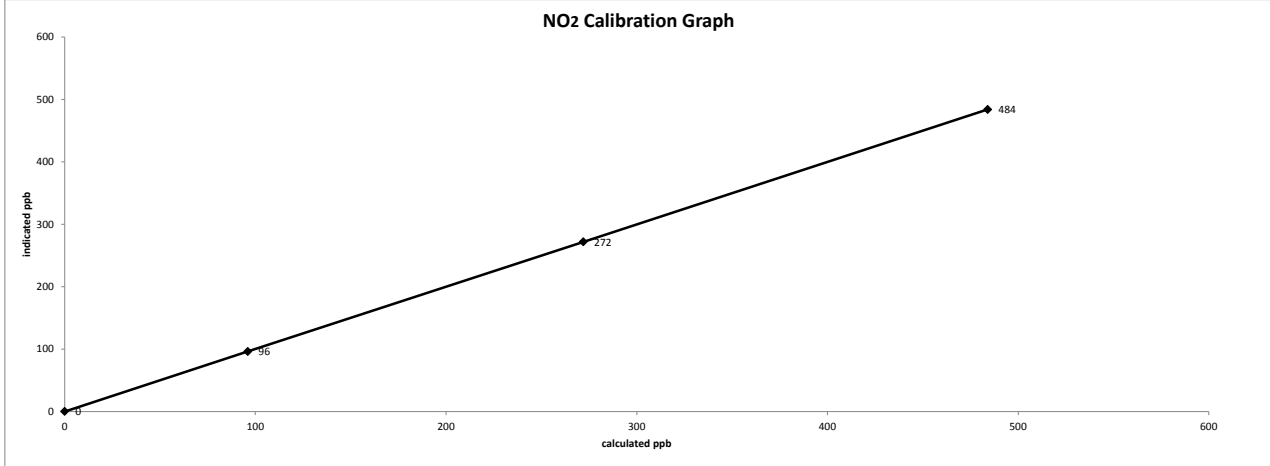
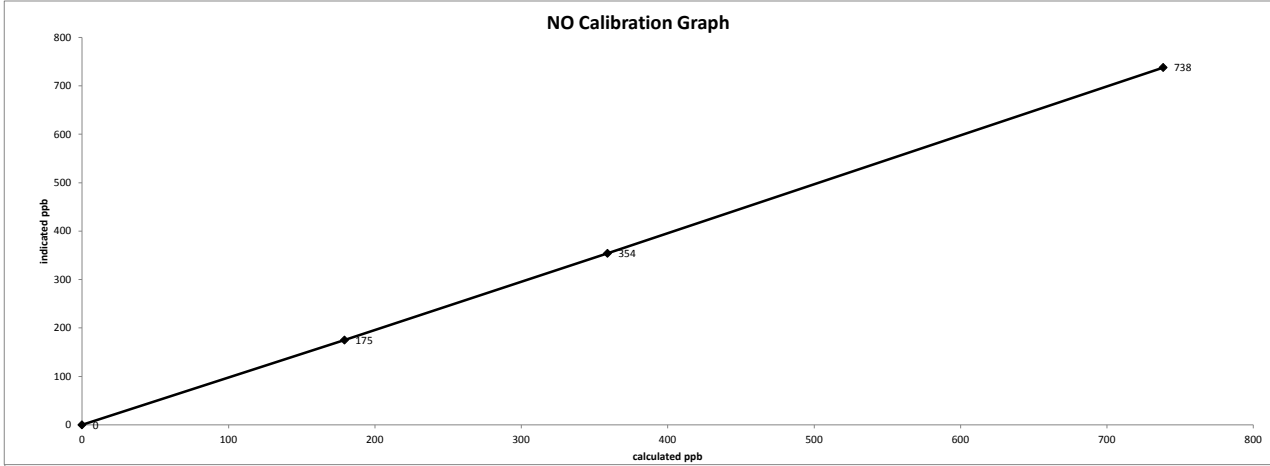
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Repeat calibration was completed because of drift. The corrective action did not involve any physical or mechanical changes, a re-calibration was all that was required since the analyzer drifted after the initial installation. Starting at 13:10, an as found zero, adjusted zero and as found high were performed. Then a calibrator cross check was performed. A second as found high starts at 16:11, followed by adjusted high, etc... SO2 is in "M" - 15:25-15:56 As Found High starts at 16:11 because calibration gear was cross-checked using SO2 analyzer. SO2 is in "M" - 15:25-15:56

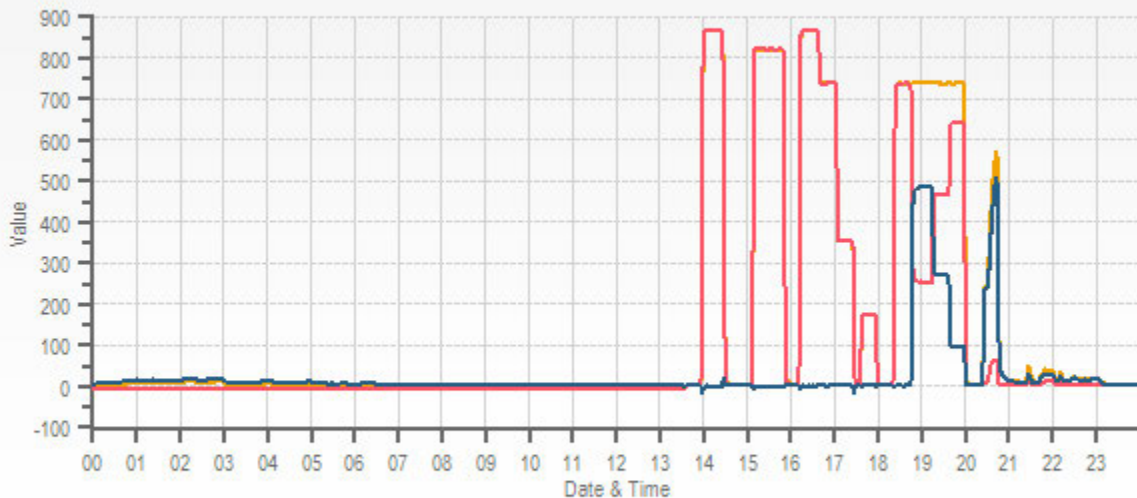
Date: September 11, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 13:10 / 20:49
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42C NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 17/09/11 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: September 14, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	947	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		
Start/End Time 24 hr. (mst): 15:45 / 17:30	Calibration Purpose: as found		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov	Tom Bourque	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer: ID# or Serial Number: 42CTL-65974-351 Last Calibration Date: September 11, 2017 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>1.001</td> <td>0.975</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NO_x =</td> <td>1.001</td> <td>0.975</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	0.975	n/a	NO ₂ =	1.000	1.000	n/a	NO _x =	1.001	0.975	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	0.975	n/a														
NO ₂ =	1.000	1.000	n/a														
NO _x =	1.001	0.975	n/a														

Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.7 50.9	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	5311	0.0	5311	0	0	-0.7	-0.8	n/a	n/a
as found high	5233	77.8	5311	742.8	742.8	761.0	761.0	0.975	0.975
Average C.F.=								n/a	n/a

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	5233	77.81	5311	0.0	761.0	761.0	0.0	-0.7	0.0	
as found high NO ₂	5233	77.81	5311	500.0	256.0	761.0	505.0	505.0	505.0	1.000
Average NO ₂ C.F.=										n/a

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	n/a	n/a	n/a	n/a
Slope =	n/a	n/a	n/a	n/a
b (Intercept as % of full scale)=	n/a	n/a	n/a	n/a
% change in C.F. from last cal=	n/a	n/a	n/a	n/a
NO ₂ converter efficiency			1.00	0.96 to 1.04

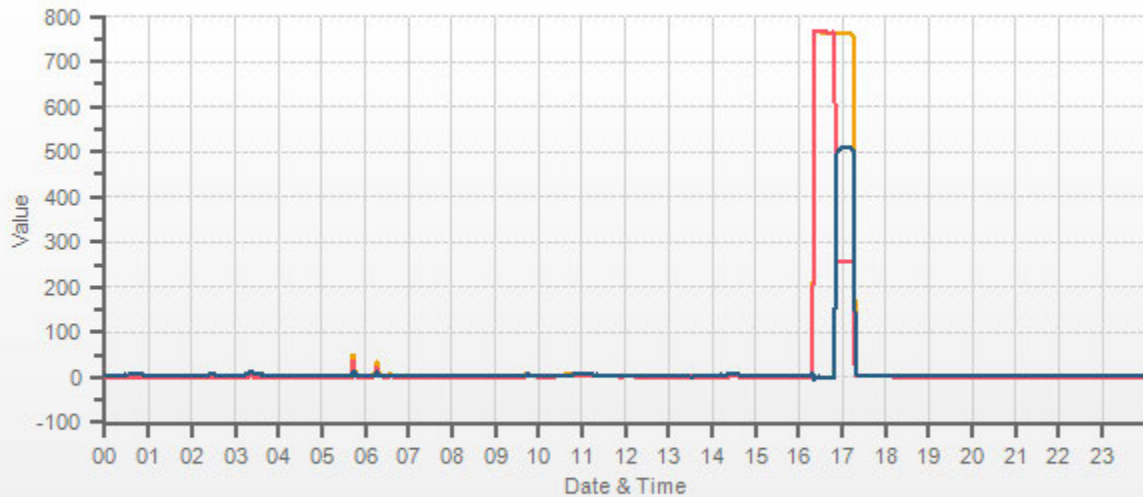
As found:	As left:
NO Bkg ppb: 11.6	NO Bkg ppb: 11.6
NOx Bkg ppb: 12.0	NOx Bkg ppb: 12.0
NO Coef: 0.852	NO Coef: 0.852
NOx Coef: 1.008	NOx Coef: 1.008
NO ₂ Coef: 0.996	NO ₂ Coef: 0.996
PMT: -659	PMT: -659
Battery: 3.2	Battery: 3.2
Internal: 29.2	Internal: 30.0
Chamber: 50.5	Chamber: 50.5
Cooler: -3.7	Cooler: -3.6
Converter: 327	Converter: 326
Converter Set: 328	Converter Set: 328
Pressure: 241.1	Pressure: 244.3
Sample Flow: 0.985	Sample Flow: 1.009
Ozonator Flow: OK	Ozonator Flow: OK
Expected Value NO: 63	Expected Value NO: 63
Expected Value NO ₂ : 492	Expected Value NO ₂ : 492
Expected Value NOx: 555	Expected Value NOx: 555

Comments:

The manifold blower was found to be working normally.
 No zero adjustment was required/made
 No high point NO₂ adjustment was required/made.

No high point NOx/NO adjustments were made. As Found calibration was completed because, according to a daily report, NO₂ span was inconsistent.

Station: LICA MASKWA Daily: 17/09/14 Type: AVG 1 Min. [1 Min.] [RAW]



— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 42C NO-NO2-NOx Analyzer Calibration

Date: September 18, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	222	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 9:37 / 16:29	Calibration Purpose: repeat		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov		Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:												
ID# or Serial Number: 42CLT-65974-351	Previous C.F.:												
Last Calibration Date: September 11, 2017	As Found C.F.:												
Range ppb: 1000	New C.F.:												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>NO =</td> <td>1.001</td> <td>0.952</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>0.952</td> <td>1.000</td> </tr> </table>	NO =	1.001	0.952	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.001	0.952	1.000
NO =	1.001	0.952	1.000										
NO ₂ =	1.000	1.000	1.000										
NOx =	1.001	0.952	1.000										

Calibration Standards:	Standard Calibration Points for a Range of: 1000 ppb																								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<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																						
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017																									
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018																									
Cal Gas Cylinder I.D. #: LL 104222																									
Cal Gas Conc. (ppm): 50.7 50.9																									

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

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
as found zero	5183	0.0	5183	0	0	-2.0	-2.0	n/a	n/a
as found high	5230	77.7	5308	742.3	742.3	778.0	778.0	0.952	0.952
adjusted zero	5183	0.00	5183	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5230	77.71	5308	742.3	742.3	742.0	742.0	1.000	1.000
mid	5269	37.70	5307	360.2	360.2	356.0	356.0	1.012	1.012
low	5276	18.81	5295	180.1	180.1	175.0	175.0	1.029	1.029
calibrator zero	5183	0.00	5183	0	0	0.0	0.0	n/a	n/a
Average C.F. =								1.014	1.014

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

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F.
NOx reference	5230	77.71	5308	0.0	743.0	743.0	0.0	0.0	0.0	
as found high NO2	5230	77.71	5308	500.0	250.0	743.0	493.0	493.0	493.0	1.000
adjusted high NO2	5230	77.71	5308	500.0	250.0	743.0	493.0	493.0	493.0	1.000
gpt mid	5230	77.71	5308	280.0	467.0	743.0	276.0	276.0	276.0	1.000
gpt low	5230	77.71	5308	100.0	647.0	743.0	96.0	96.0	96.0	1.000
Average NO₂ C.F. =									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.000	0.95-1.05
b (Intercept as % of full scale) =	-0.29%	-0.29%	0.00%	± 3% F.S.
% change in C.F. from last cal =	4.93%	4.93%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg ppb:	11.6	NO Bkg ppb:	9.4
NOx Bkg ppb:	12.0	NOx Bkg ppb:	9.7
NO Coef:	0.852	NO Coef:	0.803
NOx Coef:	1.008	NOx Coef:	1.008
NO2 Coef:	0.996	NO2 Coef:	0.996
PMT:	-659	PMT:	-660
Battery:	3.2	Battery:	3.2
Internal:	30.2	Internal:	29.8
Chamber:	50.3	Chamber:	50.0
Cooler:	-3.6	Cooler:	-3.7
Converter:	327	Converter:	327
Converter Set:	328	Converter Set:	328
Pressure:	238.4	Pressure:	237.0
Sample Flow:	0.978	Sample Flow:	0.975
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	63	Expected Value NO:	63
Expected Value NO2:	492	Expected Value NO2:	492
Expected Value NOx:	555	Expected Value NOx:	555

Comments:

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.

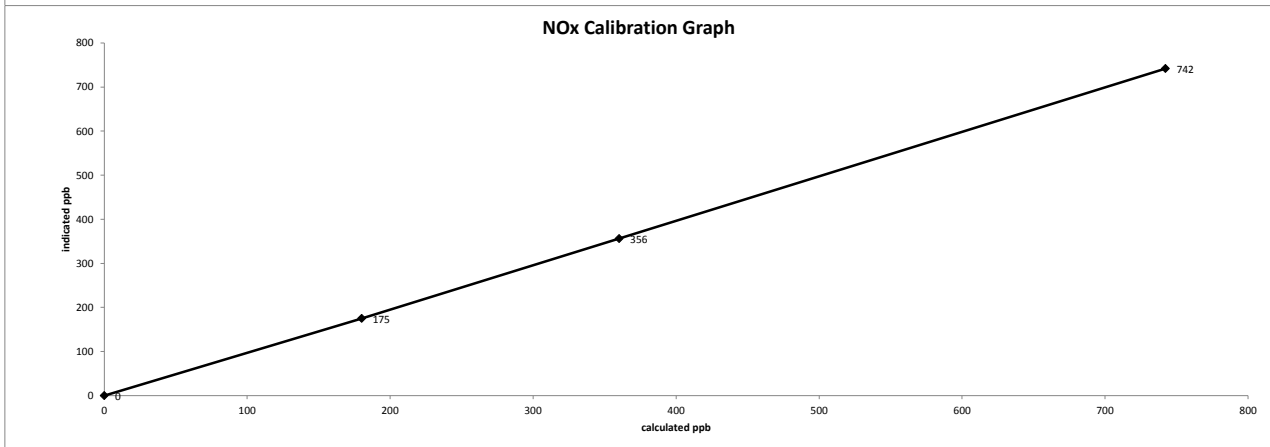
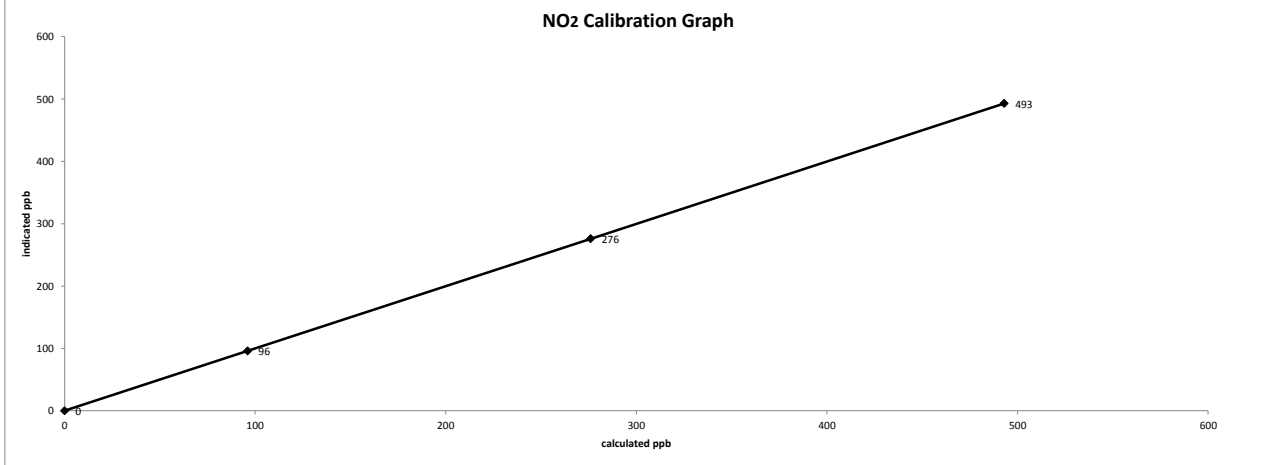
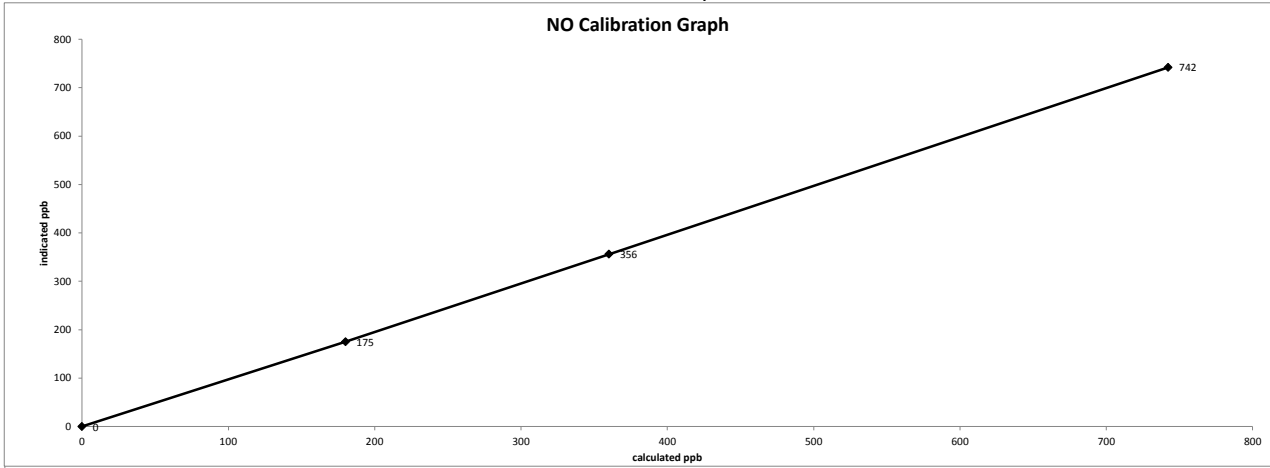
Flow measurements after mid-point

Repeat calibration was completed to adjust the EV after a new ZS oven had been installed and a permeation tube stabilized. Oven flow was re-adjusted and the EV will be adjusted in 24 hours after the first scheduled ZS check.

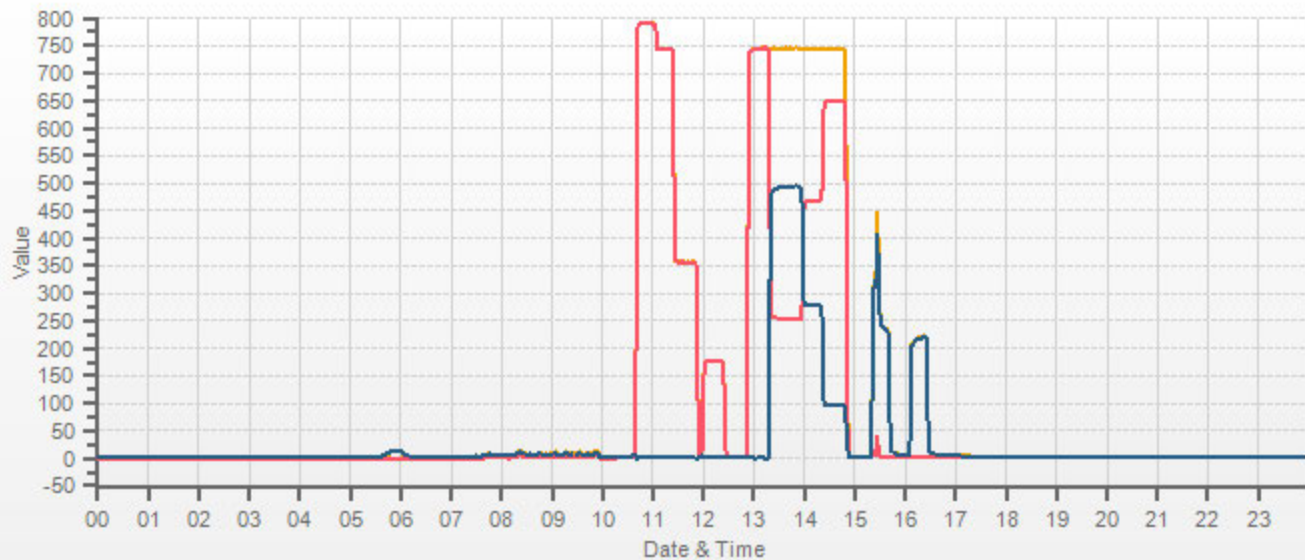
Date: September 18, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:37 / 16:29
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42C NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 17/09/18 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

PARTICULATE MATTER 2.5



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

Date: August 20, 2017
 Company: LICA
 Station Name/Location: Maskwa
 Previous Audit Date: August 15, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | not yet reviewed
 Start Time (mst): 9:30
 End Time (mst): 12:45
 Calibration Purpose: post repair
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 14%
 Ko Factor: 13125 As Left Filter Loading %: 14%
 Ambient Temperature °C: 18.27 As Found Noise: 0.007
 Ambient Pressure atm: 0.927 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.28
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Expiry Date:

Low Flow: Airmetrics/Chinook Low Maxxam ID #3 expires March 24, 2018
 High Flow: Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
 Digital Manometer: Dwyer 475 Mark III id# 2 expires January 6, 2018
 Temperature: Fluke 4295 expires November 14, 2017
 Pressure: F.S. 05544 expires December 5, 2018

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	2.14	0.86	2.13	0.86
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	14.50	-0.84	14.49	-0.84
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.86	-0.01	0.87
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	-0.01	-0.84	0.00	-0.85
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

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

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

1405F temperature °C: 18.3 tolerance +/- 2.0°C
 reference temperature °C: 18.3
 difference °C: 0.0
 1405F pressure atm: 0.927 tolerance +/- 0.01 atm
 reference pressure: 0.927
 difference : 0.000

As found flows:

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

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

main flow tolerance 3.00 lpm +/- 0.20 lpm total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
 1405F main flow lpm: 3.00 1400A total/aux flow lpm: 13.67
 reference main flow lpm: 2.99 reference total/aux flow lpm: 13.61
 difference lpm: -0.01 difference lpm: -0.06

K_o Audit:

Last K_o audit date: July 27, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13182.8000
 % difference: 0.44

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.

O-ring in the switching valve was found folded up. Switching valve was rebuilt. Flows were calibrated.



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

Date: September 11, 2017
 Company: LICA
 Station Name/Location: Maskwa
 Previous Audit Date: August 25, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 16:21
 End Time (mst): 17:17
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 6%
 Ko Factor: 13125 As Left Filter Loading %: 7%
 Ambient Temperature °C: 25.44 As Found Noise: 0.006
 Ambient Pressure atm: 0.918 As Left Noise: 0.009
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.27
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Expiry Date:

Low Flow: Airmetrics/Chinook Low Maxxam ID #3 expires March 24, 2018
 High Flow: Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
 Digital Manometer: Dwyer 475 Mark III id# 2 expires January 6, 2018
 Temperature: Fluke 4295 expires November 14, 2017
 Pressure: F.S. 05544 expires December 5, 2018

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	-1.09	0.00	-1.08
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	-1.09	0.00	-1.08
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C
 1405F temperature °C: 25.4
 reference temperature °C: 24.4
 difference °C: -1.0

tolerance +/- 0.01 atm
 1405F pressure atm: 0.918
 reference pressure: 0.922
 difference : -0.004

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

tolerance +/- 2.0°C
 1405F temperature °C: 24.4
 reference temperature °C: 24.4
 difference °C: 0.0

tolerance +/- 0.01 atm
 1405F pressure atm: 0.922
 reference pressure: 0.922
 difference : 0.000

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.03
 difference lpm: 0.03

total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.67
 difference lpm: 0.00

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

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.03
 difference lpm: 0.03

total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.67
 difference lpm: 0.00

K₀ Audit:

Last K₀ audit date: July 27, 2017
 1405F K₀ factor: 13125
 Measured K₀ factor: 13182.0000
 % difference: 0.44

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.



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

Date: September 26, 2017
 Company: LICA
 Station Name/Location: Maskwa
 Previous Audit Date: September 11, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 10:59
 End Time (mst): 12:11
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number:	<u>1405A208301003</u>	As Found Filter Loading %:	<u>7%</u>
Ko Factor:	<u>13125</u>	As Left Filter Loading %:	<u>8%</u>
Ambient Temperature °C:	<u>18.39</u>	As Found Noise:	<u>0.004</u>
Ambient Pressure atm:	<u>0.927</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.29</u>
Aux Flow Reading lpm:	<u>13.67</u>	Warnings:	<u>None</u>

Reference Standards/I.D./Expiry Date:

Low Flow: Airmetrics/Chinook Low Maxxam ID #3 expires March 24, 2018
 High Flow: Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
 Digital Manometer: Dwyer 475 Mark III id# 3 expires January 3, 2018
 Temperature: F.S. 170286131 expires April 19, 2019
 Pressure: F.S. 05544 expires December 5, 2018

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.00	-1.10	0.00	-1.08
	limit	0.60	X	0.60	X

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.00	-1.10	0.00	-1.08
	limit	0.60	X	0.60	X

As found temperature and pressure:

1405F temperature °C:	<u>18.4</u>	1405F pressure atm:	<u>0.927</u>
reference temperature °C:	<u>19.2</u>	reference pressure:	<u>0.928</u>
difference °C:	<u>0.8</u>	difference :	<u>-0.001</u>

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

1405F temperature °C:	<u>19.2</u>	1405F pressure atm:	<u>0.927</u>
reference temperature °C:	<u>19.2</u>	reference pressure:	<u>0.927</u>
difference °C:	<u>0.0</u>	difference :	<u>0.000</u>

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: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.14</u>	reference total/aux flow lpm: <u>16.67</u>
difference lpm: <u>0.14</u>	difference lpm: <u>0.00</u>

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: <u>3.00</u>	1400A total/aux flow lpm: <u>13.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>13.68</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.01</u>

K_o Audit:

Last K_o audit date: July 27, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13125.0000
 % difference: 0.44

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.

Flows were calibrated



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

Date: October 2, 2017
 Company: LICA
 Station Name/Location: Maskwa
 Previous Audit Date: September 26, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 13:11
 End Time (mst): 13:43
 Calibration Purpose: shut down
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 8%
 Ko Factor: 13125 As Left Filter Loading %: n/a
 Ambient Temperature °C: 3.08 As Found Noise: 0.004
 Ambient Pressure atm: 0.932 As Left Noise: n/a
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Expiry Date:

Low Flow: Airmetrics/Chinook Low Maxxam ID #3 expires March 24, 2018
 High Flow: Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
 Digital Manometer: Dwyer 475 Mark III id# 1 expires April 24, 2018
 Temperature: F.S. 170286131 expires April 19, 2019
 Pressure: F.S. 05544 expires December 5, 2018

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	2.25	0.15	2.25
Bypass Flow	actual	0.00	-1.10	0.00	-1.08
	limit	0.60	-1.10	0.60	-1.08

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	2.25	0.00	2.25
	limit	0.15	2.25	0.15	2.25
Bypass Flow	actual	0.00	-1.10	0.00	-1.08
	limit	0.60	-1.10	0.60	-1.08

As found temperature and pressure:

tolerance +/- 2.0°C
 1405F temperature °C: 3.1
 reference temperature °C: 3.2
 difference °C: 0.1

tolerance +/- 0.01 atm
 1405F pressure atm: 0.932
 reference pressure: 0.932
 difference : 0.000

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

tolerance +/- 2.0°C
 1405F temperature °C: 3.1
 reference temperature °C: 3.2
 difference °C: 0.1

tolerance +/- 0.01 atm
 1405F pressure atm: 0.932
 reference pressure: 0.932
 difference : 0.000

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.01
 difference lpm: 0.01

total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.71
 difference lpm: 0.04

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

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.01
 difference lpm: 0.01

total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.71
 difference lpm: 0.04

K_o Audit:

Last K_o audit date: July 27, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13182.0000
 % difference: 0.44

Comments:

Shutdown Audit was completed because of the end of Fire Season 2017.

WIND SYSTEM

CALIBRATORS

Company <u>Maxxam</u>		Operator: <u>Micheal Espiritu</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>17100415</u>	Serial Number	<u>L-152019 H-148944</u>
Last Verification Date	<u>May 2016</u>	Temperature (°C)	<u>25.0 C</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>697 mmhg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 2019</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
4996	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5029	80.3	0.784	0.783	0.808	-0.013	0.794	3%	1%
5054	38.8	0.376	0.376	0.392	-0.006	0.386	4%	3%
5051	19.5	0.189	0.189	0.196	-0.003	0.193	4%	2%
Absolute Average Percent Difference							4%	2%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO		LIMITS		NOx	
Correlation=	1.0000	≥	0.990	Correlation=	1.0000
m (Slope)=	1.0311		0.90-1.10	m (Slope)=	1.0140
b (Intercept % of FS)=	0.1350	±	3% F.S.	b (Intercept % of FS)=	0.1531

Flow	O ₂ Conc (LC)	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5029	0.000	0.000	0.803	-0.013	0.790	NO ₂	% Diff. Limit
5029	1.508	0.568	0.235	0.552	0.787	-1%	± 10%
5029	0.882	0.312	0.491	0.298	0.789	0%	± 10%
5029	0.390	0.108	0.695	0.095	0.789	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO₂		LIMITS			
Correlation=	1.0000	≥	0.995		
m (Slope)=	0.9945		0.90-1.10		
b (Intercept % of FS)=	-1.2646	±	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>May 16, 2017</u>
SRM Gas Cylinder No.	<u>CAL018101</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 2019</u>

COMMENTS: Contains 50.4 ppm SO₂.

Auditor: Al Clark
Operator Signature:

Date: May 16, 2017
Location: McIntyre Center Edmonton

Company: Maxxam **Operator:** Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Bios Defender 530+</u>
Serial Number	<u>830</u>	Serial Number	<u>Hi148944 Lo 152019</u>
Last Verification Date	<u>January 19, 2016</u>	Temperature (°C)	<u>24.6</u>
SO ₂ Cylinder Conc.	<u>50.5</u>	Barometric Pressure	<u>701.4mmHg</u>
SO ₂ Cylinder S/N	<u>EY0000769</u>		
Expiry Date	<u>December 8, 2019</u>		

Flow Measurements

Pt. No. 1 78.0 **Pt. No. 2** 37.7 **Pt. No. 3** 18.6

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
4978	0.0000	0.0000		
4974	0.7920	0.7912	0%	± 10%
4978	0.3825	0.3825	0%	± 10%
4975	0.1900	0.1908	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

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

<u>SO₂</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9986	0.90-1.10
b (Intercept % of FS)=	0.0477	± 3% F.S.

AENV Standards		SO₂ Analyzer	
Audit Calibrator		Make/Model	<u>Themro 43i</u>
Make/Model	<u>R&R MFC 201</u>	Serial/AMU Number	<u>1623</u>
Serial/AMU Number	<u>1690</u>	Last Calibration Date	<u>January 31, 2017</u>
SO ₂		Full Scale (ppm)	<u>1.0</u>
SRM Gas Cylinder No.	<u>CAL016625</u>	Expiry Date	<u>January 5, 2019</u>
Cylinder Conc. (ppm)	<u>98.07</u>		

COMMENTS: Analyzer verified prior to audit

Auditor: Shea Beaton Date: February 14, 2017
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company Maxxam/SIA Operator: Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0041	0.90-1.10		m (Slope)=	1.0046
b (Intercept % of FS)=	-0.1118	± 3% F.S.		b (Intercept % of FS)=	-0.0871

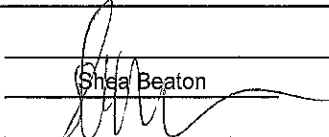
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

<u>NO₂</u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9924	0.90-1.10	
b (Intercept % of FS)=	0.1755	± 3% F.S.	

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-438CGA

Company: Maxxam **Operator's Name:** Chris

Cylinder #: EY0000597 Concentration PPM: 50.4 Tolerance(%) 1.0 Certified By: Praxair

Expiry Date: December 8, 2019

Reference Calibrator and Gas:

Make/Model: Thermo 146i

Serial Number: AMU 1809

Last Verification Date: January 26, 2017

Gas Type: SO2 Conc. 98.07

Cylinder Number: CAL016625

Expiry Date: January 5, 2019

Flow Measurement Device:

Make/Model: Bios Befiner 220

Serial Number: AMU1941

Temp. °C: 24.4

B.P. 704.7

Reference Analyzer:

Make/Model: Themro 43C Serial/AMU Number: AMU 1623

Instrument Settings: Zero: 9.5 Span: 1.023 Range: 1.0

Last Calibration: Date: 25-Jan-17 C.F. 1.000 Done By: SB

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4923	0.0	0.000	0.01642	60.917	50.8
4916	80.7	0.834	0.01642	60.917	50.8
4902	40.3	0.416	0.00822	121.638	50.6
4916	19.9	0.206	0.00405	247.035	50.9
Average Cylinder Concentration:					50.7

Previous Stated Concentration PPM: 50.4

Percent variance from Stated: 0.7

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: Shea Beaton

Operator Signature: _____

Date: January 26, 2017

Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-091CGA

Company: Maxxam Operators name: Chris Wesson
 Cylinder #: LL86139 Conc CH4 (PPM) 599/211 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
 Serial Number Bios D
 Temp. °C 23
 B.P. 599mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2583	0.00	0.00	0.00	0.02145	46.621	597	213
2635	56.52	12.80	12.59	0.02145	46.621	597	213
2592	19.72	4.54	4.49	0.00761	131.440	597	215
2584	9.69	2.25	2.24	0.00375	266.667	600	217
Average Cylinder Concentration:						598	215

	<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM:	<u>599</u>	<u>211</u>
Percent variance from Stated:	<u>0.2</u>	<u>1.9</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
 Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-439CGA

Company: Maxxam **Operators name:** Chris

Cylinder #: EY0000597 Conc (PPM) 49 Tolerance (% 0.7) Certified By: Praxair

Expiry Date: December 8, 2019

Reference Calibrator and Gas:

Make/Model Thermo 146i

Serial Number AMU 1809

Last Verification Date January 26, 2017

Gas Type NO Conc. 48.79

Cylinder Number CAL018140

Expiry Date March 25, 2019

Flow Measurement Device:

Make/Model Bios Definer 220

Serial Number AMU 1941

Temp. °C 24.4

B.P. 704.7

Reference Analyzer:

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

Instrument Settings Zero: 4.5 Span: 1.110 Range: 1.0

Last Calibration: Date: 25-Jan-17 C.F. 1.000 Done By: SB

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4923	0.0	0.000	0.000	0.016	60.917	49.5	49.5
4916	80.7	0.812	0.813	0.016	60.917	49.5	49.5
4902	40.3	0.405	0.405	0.008	121.638	49.3	49.2
4916	19.9	0.200	0.200	0.004	247.035	49.4	49.4
Average Cylinder Concentration:						49.4	49.4

	<u>NO</u>		<u>NOx</u>
Previous Stated Concentration PPM:	<u>49.0</u>		<u>49.0</u>
Percent variance from Stated:	<u>0.8</u>		<u>0.8</u>

Cylinder gas tolerances based on NO only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration 50.4 PPM SO2

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

Auditor: Shea Beaton Date: January 26, 2017

Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner

Cylinder #: LL104222 Conc (PPM) 50.7/50.9 Tolerance (%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:

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

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 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				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</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 Contains 50.6 ppm SO2.

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

Auditor: Al Clark Date: October 19, 2016

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

***APPENDIX III
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 (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Ghaleb	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Maram Ghaleb

Signature of the Representative of the Person Responsible / External Person Certifying the Report

October 31, 2017

Report Issued Date (dd-mm-yyyy)

***APPENDIX IV
DATA VALIDATION CERTIFICATION FORM***



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-09-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>October 06, 2017</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>October 06, 2017</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>October 27, 2017</u>
Level 3 Independent Data Review	<u>MSB</u>	Date <u>October 31, 2017</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

November 8, 2017

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 September 2017.

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 September 2017 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, with the exception of PM2.5.

PM2.5: A total of 124 hours of downtime was recorded this month. Operational uptime was 82.8%. AEP reference number: 330261.

The Sharp unit was found unresponsive on September 28. Based on minute data review, malfunction occurred starting from September 23 at hour 17. Data collected between September 23 at hour 17 and September 28 at hour 21 was invalidated.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that 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 certify 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 me.



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

Respectfully,

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

Michael Bisaga
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A handwritten signature in blue ink that reads 'Lily Lin'.

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

JOB #: 2833-2017-09-31-C

September 2017

Prepared for:

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

Attention: MIKE BISAGA

DATE: **November 3, 2017**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Wunmi Adekanmbi*

Wunmi Adekanmbi, M.Sc., EPt.
Project Manager, Customer Service, Air Services

SUMMARY

In September 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of PM_{2.5}, were above the 90% requirement. This event was reported to AEP under reference number 330261.

THC: Three hours of downtime were recorded on September 14 due to an as-found response check performed to assess analyzer performance after a drift in span response.

NO_x/NO/NO₂: One hour of downtime was incurred due to an additional zero/span check, completed on September 10, to assess span response after the expected span value was updated.

O₃: Three hours of downtime were recorded on September 22 due to additional quality checks performed to address a biased high span response.

PM_{2.5}: Equipment uptime (82.8%) did not meet the AMD's 90% requirement this month. 124 hours of downtime were recorded due to analyzer malfunction. This event was reported to AEP under reference number 330261.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	2	7	10	10.6	SSE	1	7	100.0
H ₂ S (ppb)	10	3	0	0	0	2	2	6	9.2	SW	1	6	100.0
THC (ppm)	-	-	-	-	2.12	2.77	7	7	9.6	SSE	2.51	4	99.6
NO ₂ (ppb)	159	-	0	-	1	10	13	7	8.3	NE	3	13	99.9
NO (ppb)	-	-	-	-	0	2	27	27	6.0	SW	0	27	99.9
NO _x (ppb)	-	-	-	-	1	11	13	7	8.3	NE	3	13	99.9
O ₃ (ppb)	82	-	0	-	26.0	62.7	7	14	11.3	SSE	55.4	7	99.6
PM _{2.5} (µg/m ³)	80	30	0	0	6	48	8	22	10.9	N	28	9	82.8
RELATIVE HUMIDITY (%)	-	-	-	-	65	91	9	22	7.5	WNW	86	21	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	930	947	4	9	5.0	NW	945	4	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	11.1	27.9	7	15	11.5	SSE	20.1	7	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	3.4	19	8	11.2	ENE	0.3	21	100.0
VECTOR WS (kph)	-	-	-	-	2.4	27.5	10	12	-	W	17.2	10	100.0
VECTOR WD (sec)	-	-	-	-	221 (SW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

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).

Sample filters for all continuous air monitors are changed 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 September 7.
- The O₃ and SO₂ span programs are designed to run concurrently. Four instances of quality check were recorded on the SO₂ channel on September 8 and September 22 due to activities on the Ozone channel.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on September 7.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 99.6%, equivalent to three hours of downtime.
- Unstable zero readings, observed during the August monitoring period, continued into September. The daily zero readings met AMD requirements and the analyzer was operating within manufacturer's specifications. However, if applied, the daily zero would result in a non-historical data trend. The calibrator zero obtained from the August 15 multi-point calibration was applied for baseline correction on data collected from September 1, at hour 00:00 to September 8 at hour 08:00.
- The routine monthly calibration was performed on September 8, during which the issue of zero instability was addressed.
- The analyzer began to span beyond the lower acceptance limit on September 11. Upon arrival at the station on September 14, the span gas cylinder was found empty. To verify that analyzer performance was not impacted, an as-found response check was completed. A new span gas cylinder was installed and the expected span value was subsequently updated. As the poor span response was proven to be directly related only to the empty span gas and not analyzer performance, evidenced by the successful as-found response check, no data was invalidated due to this event. However, three hours of downtime were incurred due to the additional quality check.
- Unstable zero readings were again observed later in the month. The calibrator zero obtained from the September 14 as-found response check was applied for baseline correction on data collected from September 14, at hour 14:00 to September 30, at hour 22:00. Data recorded between the calibration on September 8 and the as-found response check on September 14 appear to trend lower than those recorded the rest of the month. This is attributable to the difference in baseline corrections applied.

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

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- The routine monthly calibration was performed on September 7. The expected span value was updated after the scheduled zero/span check on September 9. An additional zero/span check was completed on September 10 to assess span response after the update, incurring one hour of downtime.

OZONE (O₃)

- Operational time, for the monitoring period was 99.6%, equivalent to three hours of downtime.
- The ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the ozone channel on September 7 due to activities on the SO₂ channel.
- The routine monthly calibration was performed on September 8.
- The analyzer spanned above the upper acceptance limit on September 21. A zero/span check was triggered on September 22, at hour 06:00, to assess span response, which was still outside the upper acceptance limit. This prompted an immediate site visit to assess the analyzer. It was discovered that the diaphragm was broken. A new diaphragm was installed and the zero/span pump was rebuilt. Following this event, a zero/span check was triggered at hour 11:00 to assess span response, confirming it was back in control. As the malfunction was contained in the zero/span system and analyzer performance was not impacted, no data was discarded due to this event. However, three hours of downtime were recorded due to the additional quality checks.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 82.8%, equivalent to 124 hours of downtime.
- The routine monthly audit was performed on September 8.
- Upon arrival at the station on September 28, the analyzer had a blank screen and was unresponsive. Functionality was restored at hour 21:00 by power cycling. Based on minute data review, anomalous data (which were not evident in hourly averages) were identified starting from September 23 at hour 17:00 and were subsequently invalidated. 124 hours of downtime were recorded due to this event.
- Equipment uptime did not meet the AMD's 90% requirement. This event was reported to AEP under reference number 330261.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. No hourly data was invalidated as all measurements were above -3 µg/m³ this month.

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

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

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of $PM_{2.5}$, were above the 90% requirement. This event was reported to AEP under reference number 330261.

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

Maxxam AIR SOP-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
Maxxam AIR SOP-00010: Thermo Model 5030i SHARP Monitor
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

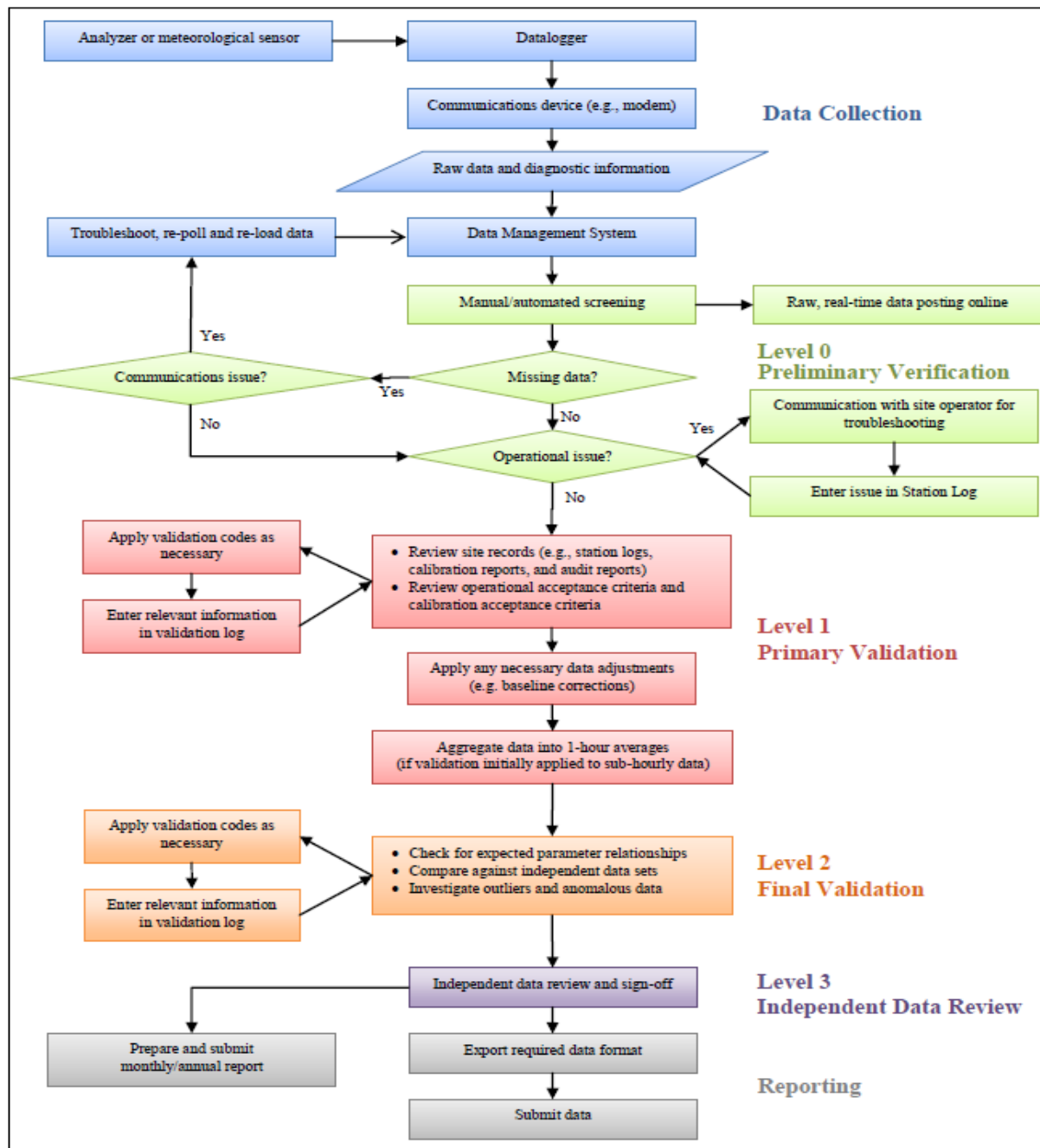
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

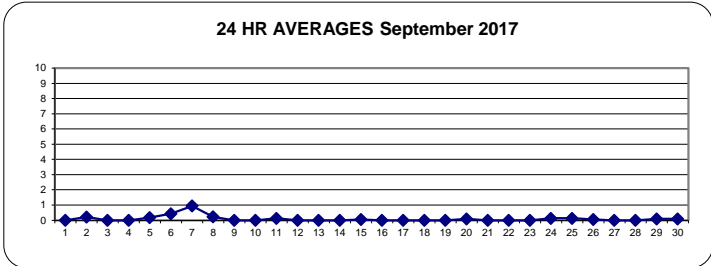
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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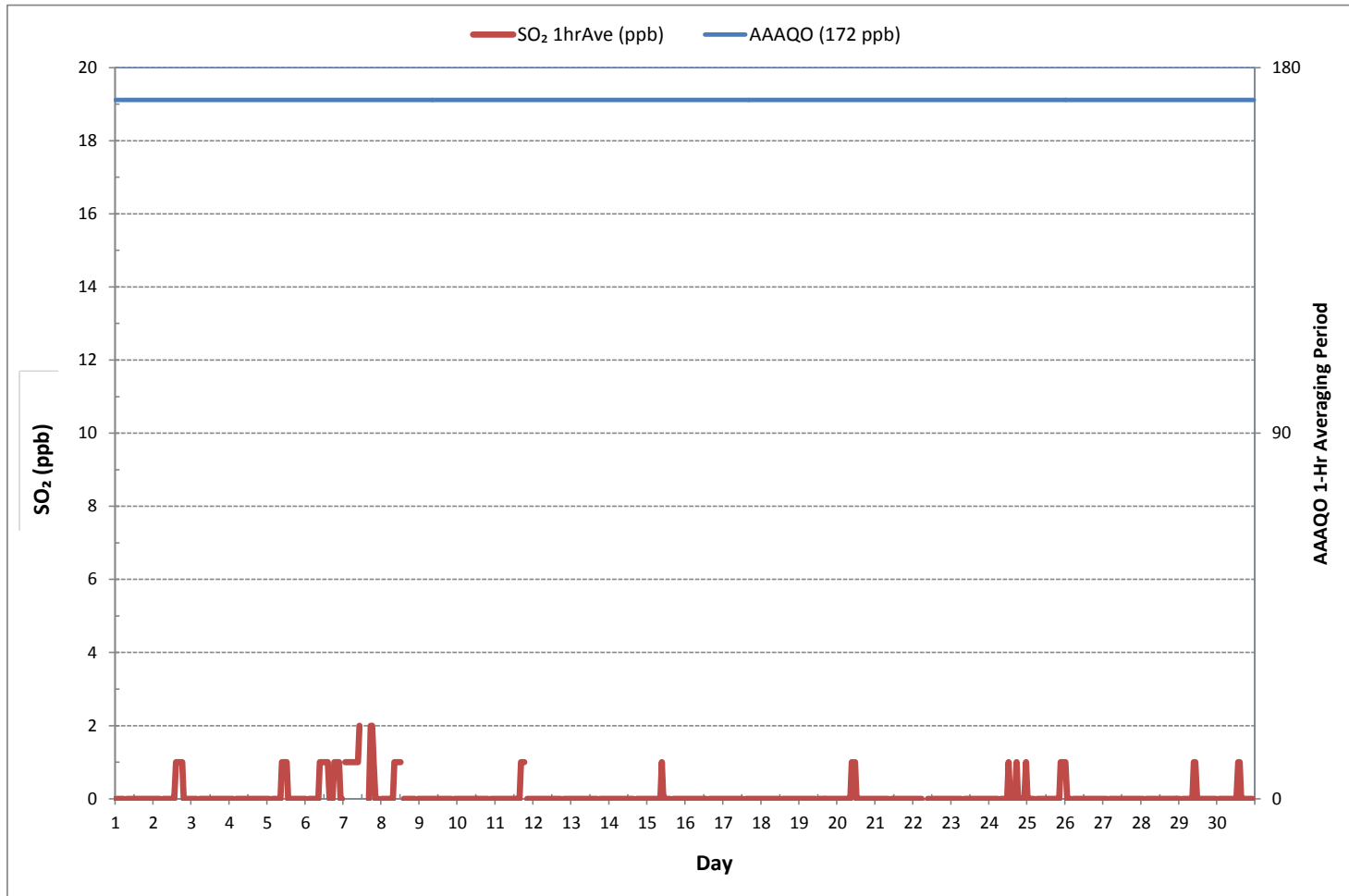
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	54
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 10 ON DAY 7
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





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	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24		
2	3	3	3	3	3	S	3	3	3	3	3	4	4	3	4	4	3	4	3	3	3	3	4	3	3	3	4	3	24	
3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	24	
4	3	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
5	3	2	S	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	24	
6	3	S	3	3	3	3	3	3	4	4	4	4	4	3	3	4	3	3	4	4	4	4	4	3	3	3	4	3	24	
7	S	4	4	4	4	4	4	4	4	4	4	C	C	C	C	C	C	6	5	3	3	2	3	S	2	6	4	24		
8	2	2	2	3	3	3	3	3	3	4	4	3	Q	Q	2	2	2	2	3	2	2	2	S	2	2	4	3	24		
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11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	S	3	2	2	2	2	2	3	2	24	
12	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	S	2	2	2	2	2	2	1	2	2	24	
13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	S	1	1	1	1	1	1	1	1	2	2	24	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	24	
15	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	1	24	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	2	2	2	2	2	2	1	2	24
17	2	2	2	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	24
18	2	3	2	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24	
19	3	3	3	3	3	3	3	3	3	4	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	24
20	3	3	3	3	3	4	3	3	4	4	S	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	24
21	3	3	3	3	3	3	2	2	S	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	3	2	24	
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25	3	3	3	3	3	S	3	2	3	3	3	3	2	3	3	2	3	3	2	3	3	4	4	4	2	4	3	24		
26	4	3	3	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	24		
27	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2	1	2	2	24		
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30	S	3	4	3	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	3	3	3	4	S	3	4	4	24		
HOURLY MAX	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	5	4	4	4	4	4	4	4	4	4	24	
HOURLY AVG	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24	

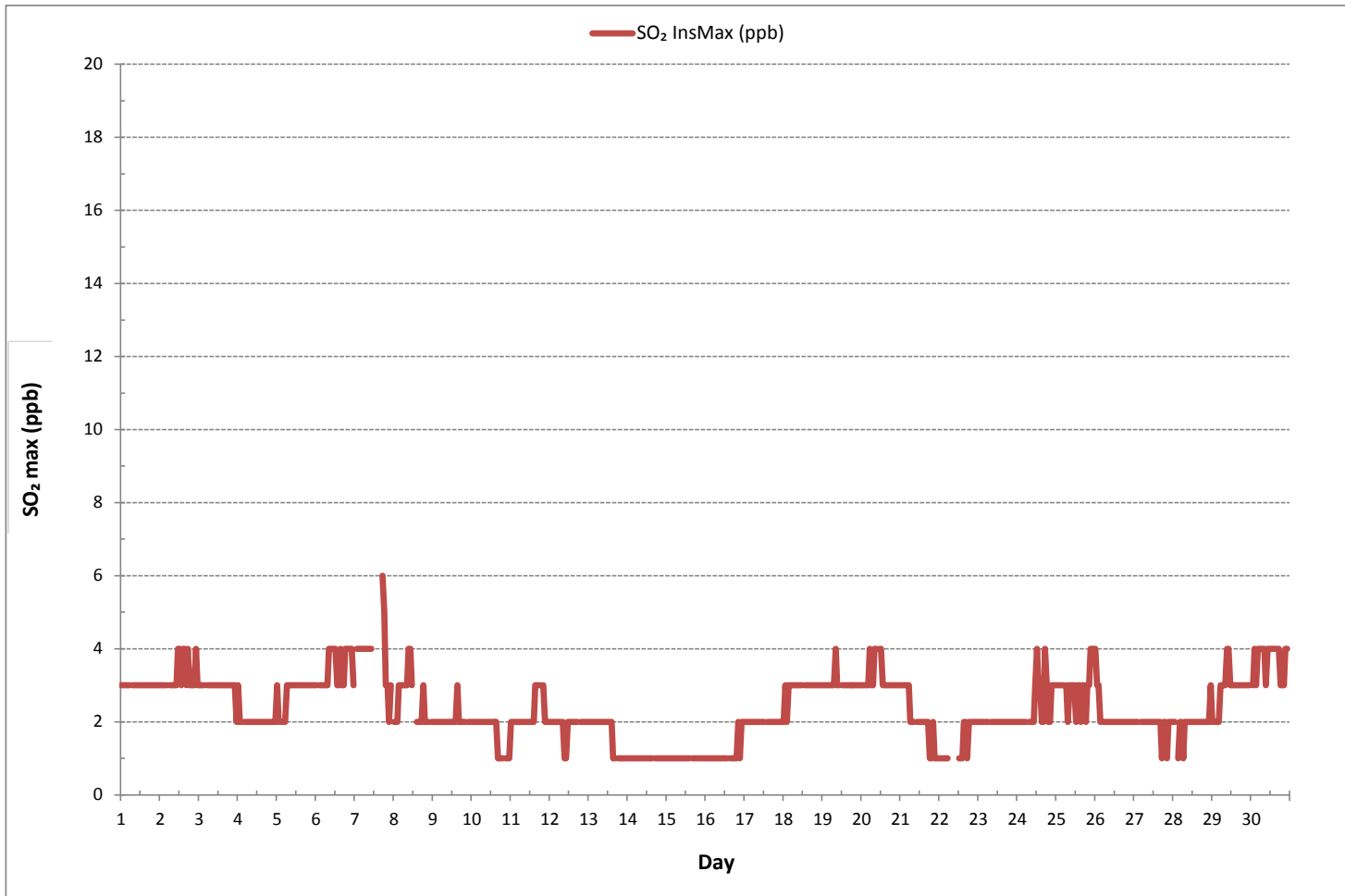
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	676
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 17 ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.11%

Calm Avg: 0.32 [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	10.4	0.2	0.0	0.0	0.0	0.0	10.5
NE	6.1	0.2	0.0	0.0	0.0	0.0	6.2
E	5.3	0.0	0.0	0.0	0.0	0.0	5.3
SE	12.7	0.3	0.3	0.0	0.2	0.0	13.5
S	19.4	1.5	0.7	0.0	0.0	0.0	21.6
SW	8.4	0.4	0.2	0.0	0.0	0.0	9.0
W	17.3	0.4	0.0	0.0	0.0	0.0	17.8
NW	12.9	0.2	0.0	0.0	0.0	0.0	13.0
Summary	92.5	3.1	1.2	0.0	0.2	0.0	96.9

% Icon Classes (ppb)

92 0.0-0.6

3 0.6-1.2

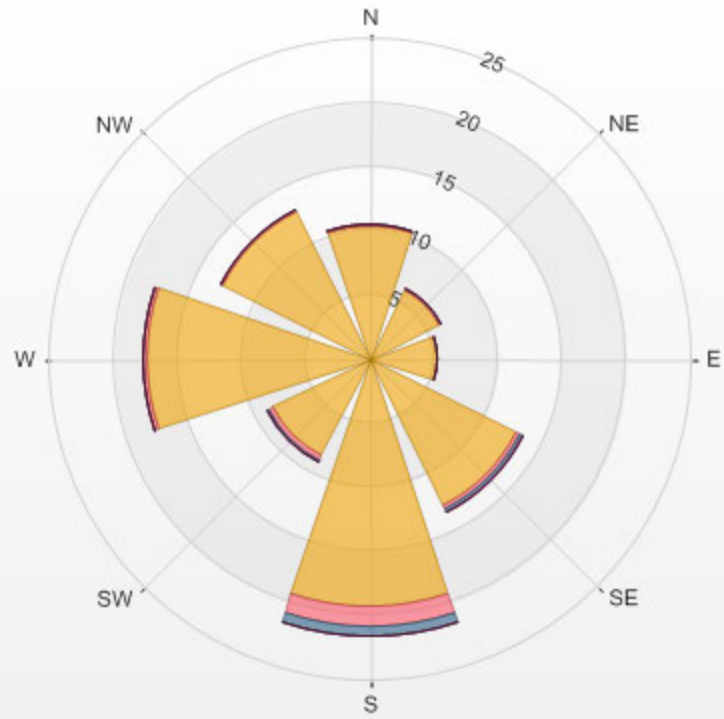
1 1.2-1.8

0 1.8-2.4

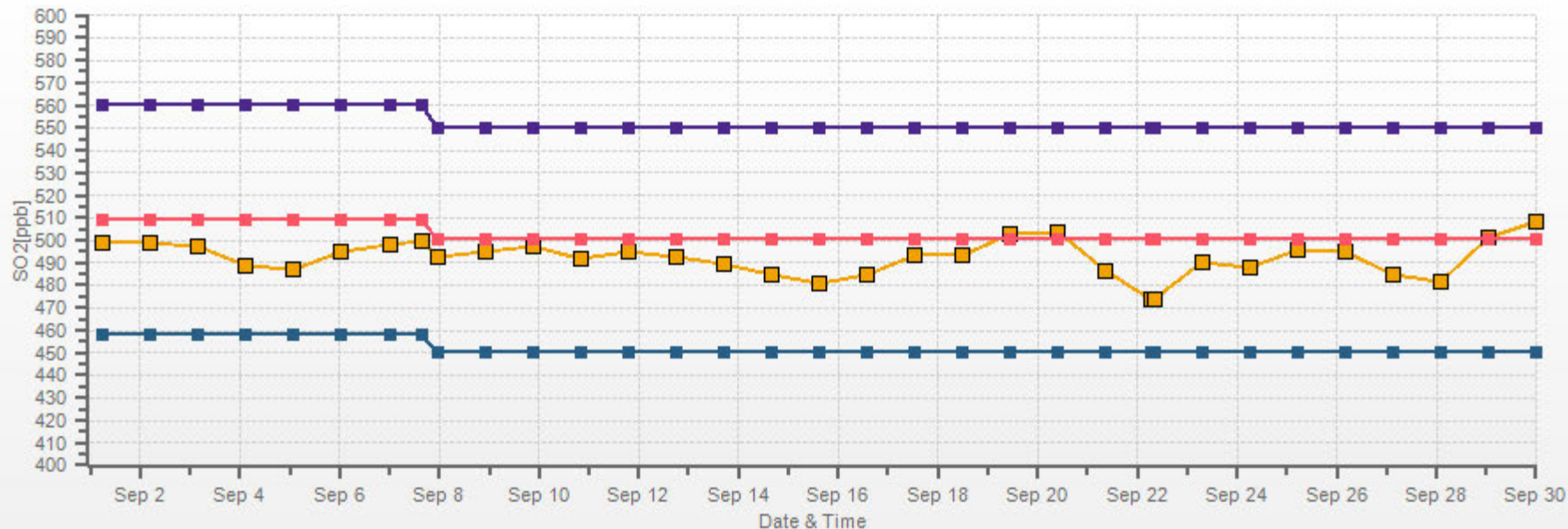
0 2.4-3.0

0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.11% Calm Poll Avg: 0.32[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

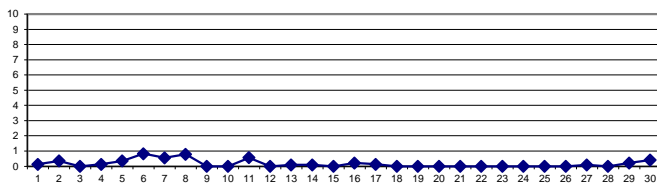
OBJECTIVE LIMIT:

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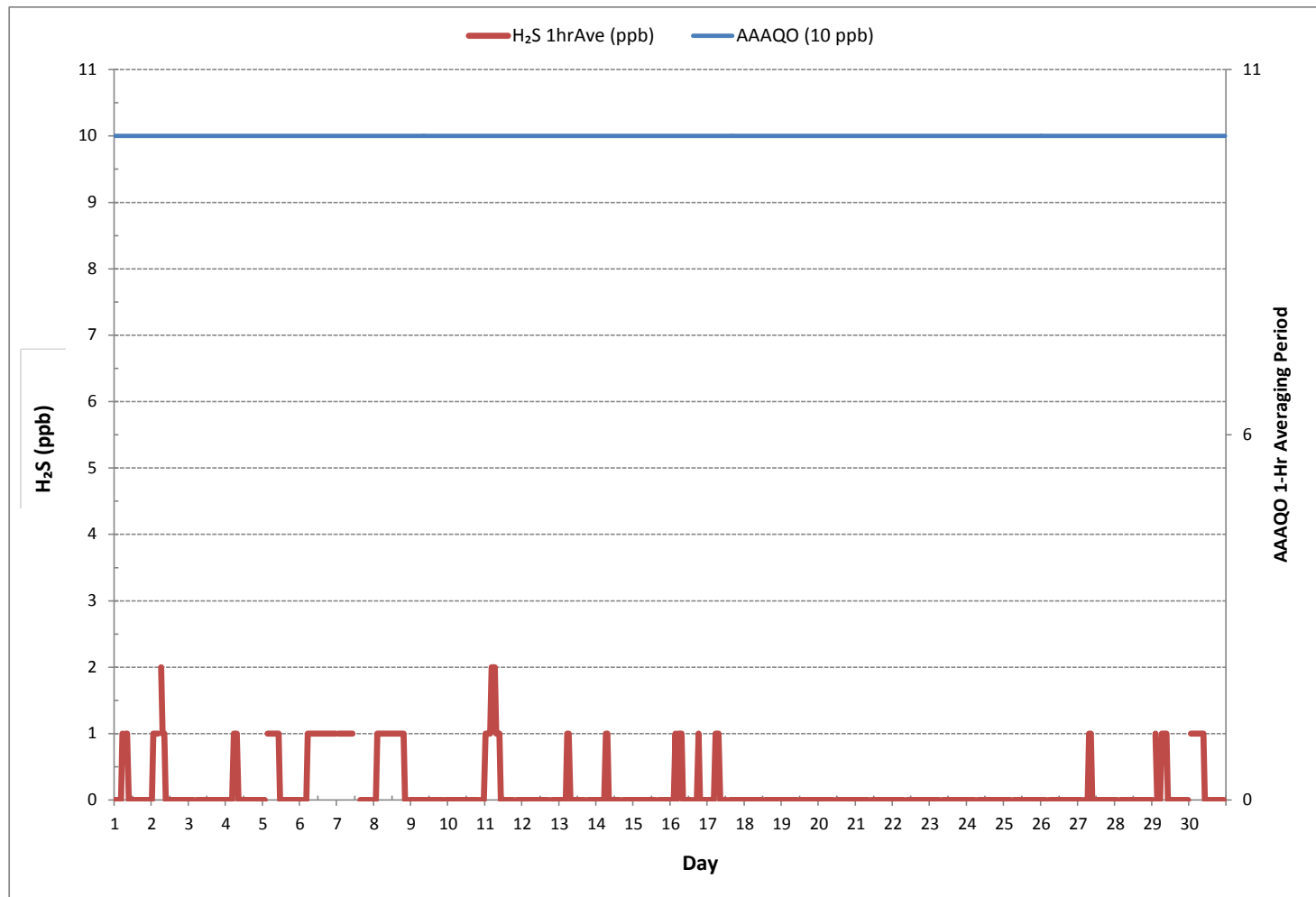
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	106		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	6 ON DAY	2
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	6
IZS CALIBRATION TIME:	32 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 September 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S 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	2	2	S	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24		
2	1	2	2	2	2	S	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24		
3	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		
4	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	24		
5	1	1	S	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24		
6	1	S	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24		
7	S	1	1	1	1	1	1	1	1	1	1	C	C	C	C	1	1	1	1	1	1	1	1	1	S	1	1	24		
8	1	1	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	2	1	24		
9	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		
10	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	S	0	1	1	0	1	24		
11	1	1	1	2	3	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	3	1	24		
12	1	1	1	0	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	1	0	1	24		
13	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	24		
14	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	24		
15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	24		
16	0	0	0	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	4	1	0	0	1	1	0	4	1	24		
17	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24		
18	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		
19	1	1	1	1	1	1	1	1	1	1	2	S	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
20	1	1	1	2	2	1	1	2	2	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
21	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	24	
22	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
23	0	1	1	0	1	1	1	S	1	1	1	0	0	0	1	0	0	1	1	1	1	0	1	1	1	0	1	1	24	
24	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	
25	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
26	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	1	24	
27	1	1	1	S	1	1	1	1	1	1	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	1	24
28	1	0	S	0	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	24	
29	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	24	
30	S	2	2	2	2	2	2	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	S	1	3	2	24		
HOURLY MAX	1	2	2	2	3	2	4	2	3	2	2	2	1	2	1	1	1	1	1	4	1	1	1	2	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					

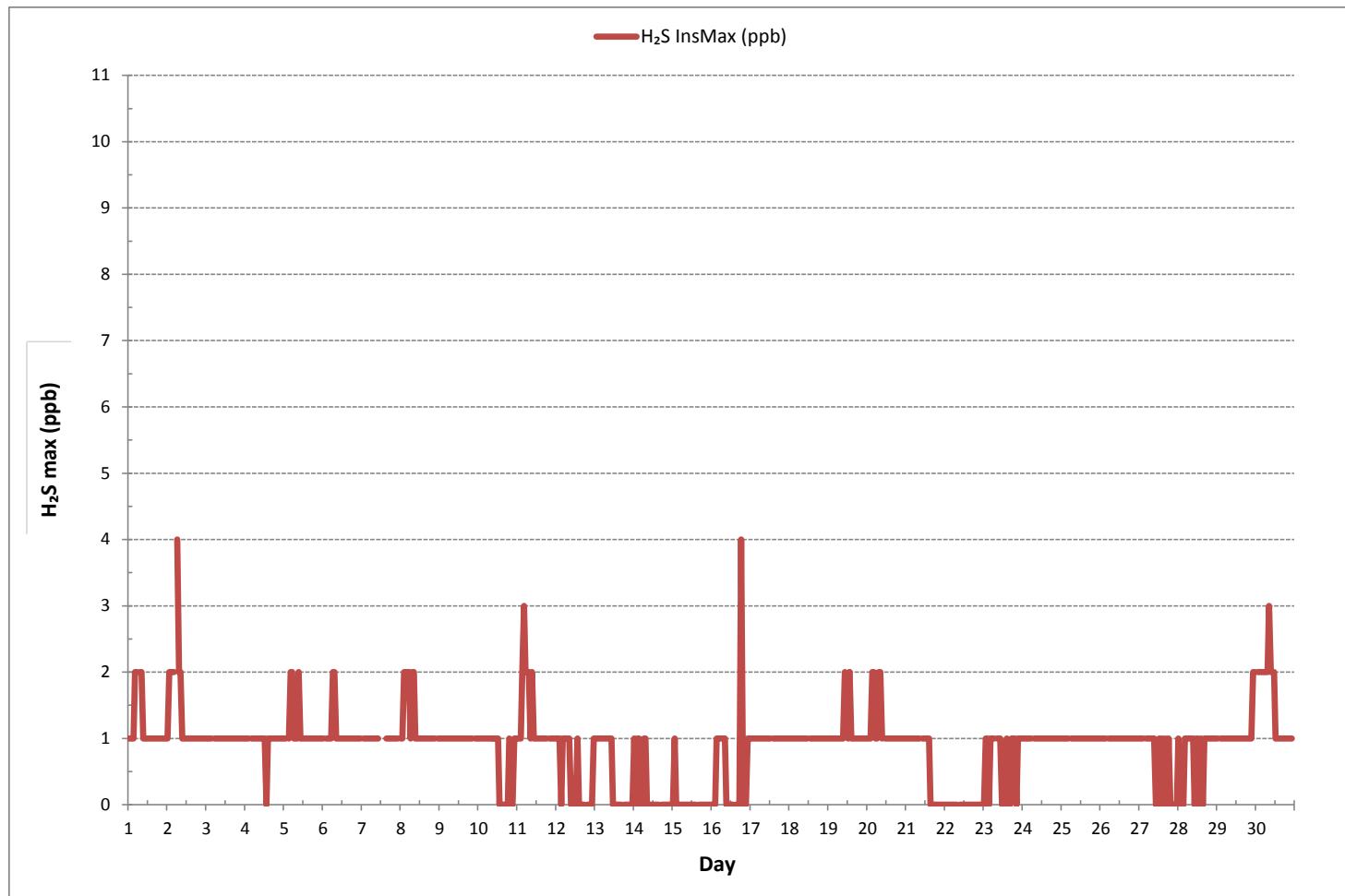
STATUS FLAG CODES

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:	543
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 6 ON DAY 2
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	720 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



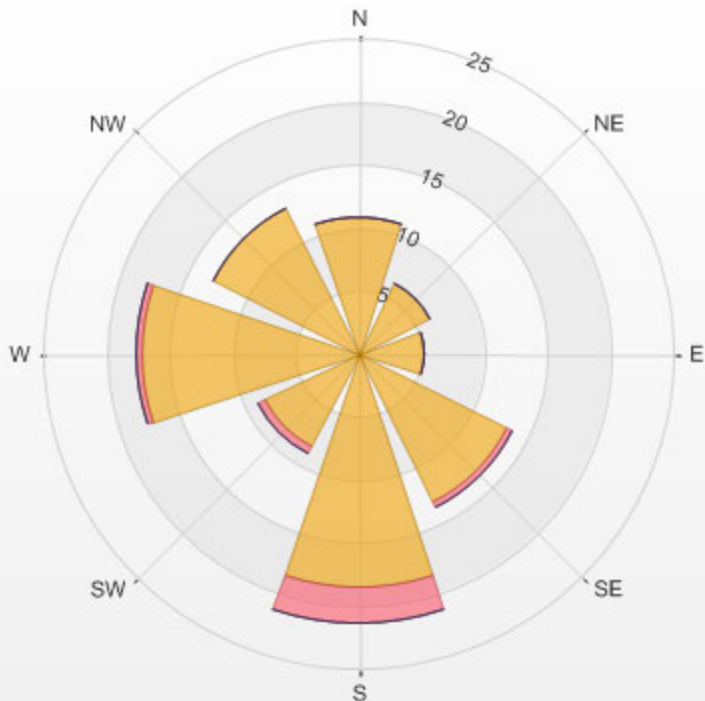
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-H2S[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.07% Calm Avg: 0.34 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
N	10.8	0.0	0.0	0.0	10.8
NE	6.3	0.0	0.0	0.0	6.3
E	5.3	0.0	0.0	0.0	5.3
SE	13.2	0.4	0.0	0.0	13.6
S	18.6	2.9	0.0	0.0	21.5
SW	8.3	0.6	0.0	0.0	8.9
W	17.3	0.4	0.0	0.0	17.7
NW	12.9	0.0	0.0	0.0	12.9
Summary	92.6	4.4	0.0	0.0	96.9

% Icon Classes (ppb) 93 0.0-1.0 4 1.0-2.0 0 2.0-3.0 0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.07% Calm Poll Avg: 0.34[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 17/09 Type: Span



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

TOTAL HYDROCARBON



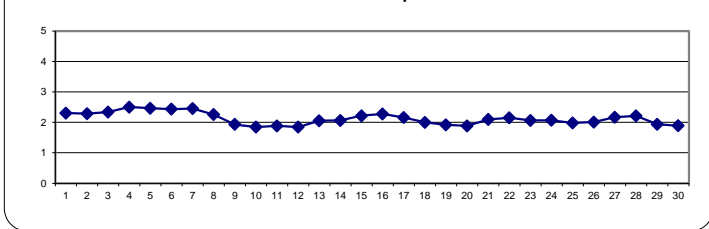
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.29	2.29	2.29	2.28	2.30	2.31	S	2.30	2.30	2.32	2.32	2.32	2.29	2.31	2.31	2.32	2.31	2.33	2.34	2.27	2.29	2.31	2.31	2.30	2.27	2.34	2.30	24
2	2.29	2.36	2.38	2.41	2.38	S	2.39	2.36	2.28	2.31	2.29	2.15	2.23	2.19	2.18	2.25	2.19	2.10	2.20	2.32	2.32	2.37	2.32	2.38	2.10	2.41	2.29	24
3	2.42	2.39	2.34	2.31	S	2.29	2.32	2.33	2.30	2.19	2.16	2.38	2.38	2.34	2.35	2.36	2.29	2.31	2.32	2.35	2.40	2.41	2.42	2.41	2.16	2.42	2.34	24
4	2.44	2.46	2.47	S	2.53	2.60	2.61	2.60	2.59	2.44	2.52	2.53	2.52	2.52	2.52	2.51	2.52	2.47	2.46	2.47	2.43	2.42	2.45	2.54	2.42	2.61	2.51	24
5	2.55	2.52	S	2.58	2.61	2.57	2.55	2.58	2.51	2.45	2.49	2.47	2.45	2.44	2.44	2.43	2.42	2.42	2.42	2.42	2.41	2.34	2.34	2.32	2.32	2.61	2.47	24
6	2.35	S	2.47	2.44	2.35	2.45	2.70	2.58	2.36	2.51	2.47	2.46	2.48	2.45	2.45	2.44	2.43	2.40	2.41	2.40	2.38	2.39	2.39	2.35	2.35	2.70	2.44	24
7	S	2.38	2.43	2.49	2.56	2.63	2.65	2.59	2.70	2.77	2.52	2.51	2.50	2.37	2.28	2.19	2.19	2.21	2.30	2.39	2.48	2.46	2.47	S	2.19	2.77	2.46	24
8	2.28	2.25	2.36	2.43	2.48	2.57	2.60	2.55	2.50	C	C	C	C	C	2.08	2.16	2.09	2.09	2.03	2.10	2.06	1.95	S	2.03	1.95	2.60	2.26	24
9	2.02	1.94	1.91	1.93	1.91	1.94	1.95	1.96	1.88	1.89	1.94	1.94	1.93	1.94	1.95	1.97	1.98	1.92	1.92	1.94	1.92	S	1.92	1.91	1.88	2.02	1.94	24
10	1.87	1.88	1.81	1.75	1.75	1.78	1.77	1.80	1.80	1.77	1.87	1.87	1.87	1.90	1.91	1.91	1.94	1.94	1.85	1.86	S	1.86	1.89	1.89	1.75	1.94	1.85	24
11	1.95	2.01	1.98	1.98	1.99	1.98	1.96	1.91	1.87	1.82	1.77	1.89	1.86	1.83	1.86	1.85	1.87	1.89	1.84	S	1.84	1.85	1.81	1.79	1.77	2.01	1.89	24
12	1.80	1.79	1.78	1.80	1.82	1.85	1.84	1.86	1.86	1.83	1.80	1.83	1.79	1.74	1.86	1.87	1.87	1.89	S	1.93	1.91	1.94	1.92	1.90	1.74	1.94	1.85	24
13	2.06	2.31	2.17	1.97	2.13	2.32	2.39	2.40	2.28	2.20	2.07	1.96	1.96	1.93	1.90	1.91	1.90	S	1.90	1.89	1.88	1.89	1.91	1.97	1.88	2.40	2.06	24
14	2.02	2.02	2.06	1.99	1.98	1.97	2.03	2.04	1.91	1.92	1.88	C1	C1	C1	2.08	2.09	S	2.10	2.17	2.18	2.30	2.21	2.16	2.20	1.88	2.30	2.07	21
15	2.17	2.16	2.27	2.21	2.15	2.23	2.19	2.23	2.22	2.21	2.20	2.19	2.21	2.20	2.21	S	2.19	2.19	2.18	2.16	2.32	2.33	2.31	2.32	2.15	2.33	2.22	24
16	2.28	2.29	2.30	2.33	2.31	2.48	2.63	2.52	2.48	2.42	2.26	2.18	2.22	2.24	S	2.13	2.13	2.12	2.14	2.16	2.18	2.24	2.23	2.21	2.12	2.63	2.28	24
17	2.19	2.28	2.33	2.34	2.36	2.36	2.39	2.39	2.32	2.16	2.12	2.07	2.04	S	2.01	2.02	2.00	1.99	1.99	1.98	2.02	2.04	2.11	2.16	1.98	2.39	2.16	24
18	2.12	2.13	2.13	2.09	2.07	2.01	2.01	2.00	2.04	2.00	1.96	2.00	S	1.99	1.97	1.96	1.98	1.91	1.95	1.91	1.84	1.98	1.98	1.97	1.84	2.13	2.00	24
19	1.98	1.96	1.95	1.93	1.94	1.97	1.94	1.91	1.91	1.91	1.95	S	1.85	1.87	1.87	1.87	1.86	1.87	1.85	1.92	1.94	1.93	1.96	1.97	1.85	1.98	1.92	24
20	2.02	1.99	2.02	1.93	1.91	1.88	1.86	1.84	1.83	1.82	S	1.78	1.83	1.85	1.86	1.89	1.89	1.90	1.88	1.88	1.87	1.88	1.90	1.91	1.78	2.02	1.89	24
21	1.92	1.92	1.93	1.94	1.96	1.96	1.97	2.01	2.12	S	2.12	2.12	2.13	2.14	2.15	2.17	2.19	2.18	2.21	2.24	2.24	2.25	2.26	2.25	1.92	2.26	2.10	24
22	2.28	2.30	2.27	2.29	2.32	2.34	2.33	2.33	S	2.29	2.20	2.00	2.05	2.05	2.03	2.03	2.01	2.04	2.02	2.04	2.05	2.06	2.07	2.05	2.00	2.34	2.15	24
23	2.07	2.10	2.16	2.13	2.11	2.13	S	2.10	2.11	2.08	2.02	1.98	1.94	1.97	2.01	2.12	2.04	2.02	2.03	2.05	2.07	2.08	2.11	1.94	2.16	2.07	24	
24	2.10	2.12	2.16	2.19	2.23	2.21	S	2.18	2.14	2.10	2.06	2.03	2.00	1.98	1.98	2.01	2.01	2.00	2.02	2.03	2.06	2.00	1.96	1.96	2.23	2.07	24	
25	1.95	1.98	2.00	2.00	2.01	S	2.01	2.02	2.03	2.06	2.05	2.06	2.04	1.96	1.97	1.96	1.85	1.90	1.92	1.93	2.00	1.93	1.98	1.94	1.85	2.06	1.98	24
26	1.93	1.97	1.99	1.94	S	1.92	1.93	1.95	1.95	1.98	1.98	1.98	2.01	2.02	2.05	2.03	2.07	1.99	1.99	1.99	2.14	2.14	2.15	2.17	1.92	2.17	2.01	24
27	2.18	2.23	2.21	S	2.12	2.07	2.07	2.20	2.20	2.14	2.16	2.13	2.11	2.14	2.15	2.15	2.16	2.18	2.18	2.17	2.16	2.15	2.20	2.39	2.07	2.39	2.17	24
28	2.29	2.27	S	2.24	2.34	2.25	2.40	2.44	2.41	2.30	2.38	2.39	2.33	2.28	2.18	2.15	2.15	2.06	1.93	1.96	2.00	2.05	2.07	2.04	1.93	2.44	2.21	24
29	1.94	S	1.98	2.00	2.05	2.10	2.09	2.16	2.13	2.00	1.98	1.95	1.88	1.85	1.84	1.84	1.84	1.84	1.84	1.78	1.81	1.85	1.90	1.92	1.78	2.16	1.94	24
30	S	1.98	1.95	1.94	1.96	2.01	2.09	2.19	2.19	2.02	1.88	1.83	1.80	1.78	1.76	1.76	1.78	1.79	1.81	1.79	1.79	1.74	S	1.74	2.19	1.89	24	
HOURLY MAX	2.55	2.52	2.47	2.58	2.61	2.63	2.70	2.60	2.70	2.77	2.52	2.53	2.52	2.52	2.52	2.51	2.52	2.47	2.46	2.47	2.48	2.46	2.47	2.54				
HOURLY AVG	2.13	2.15	2.15	2.14	2.17	2.19	2.21	2.21	2.18	2.14	2.12	2.11	2.10	2.08	2.07	2.08	2.08	2.07	2.07	2.09	2.11	2.11	2.11	2.12				

STATUS FLAG CODES

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

24 HR AVERAGES September 2017

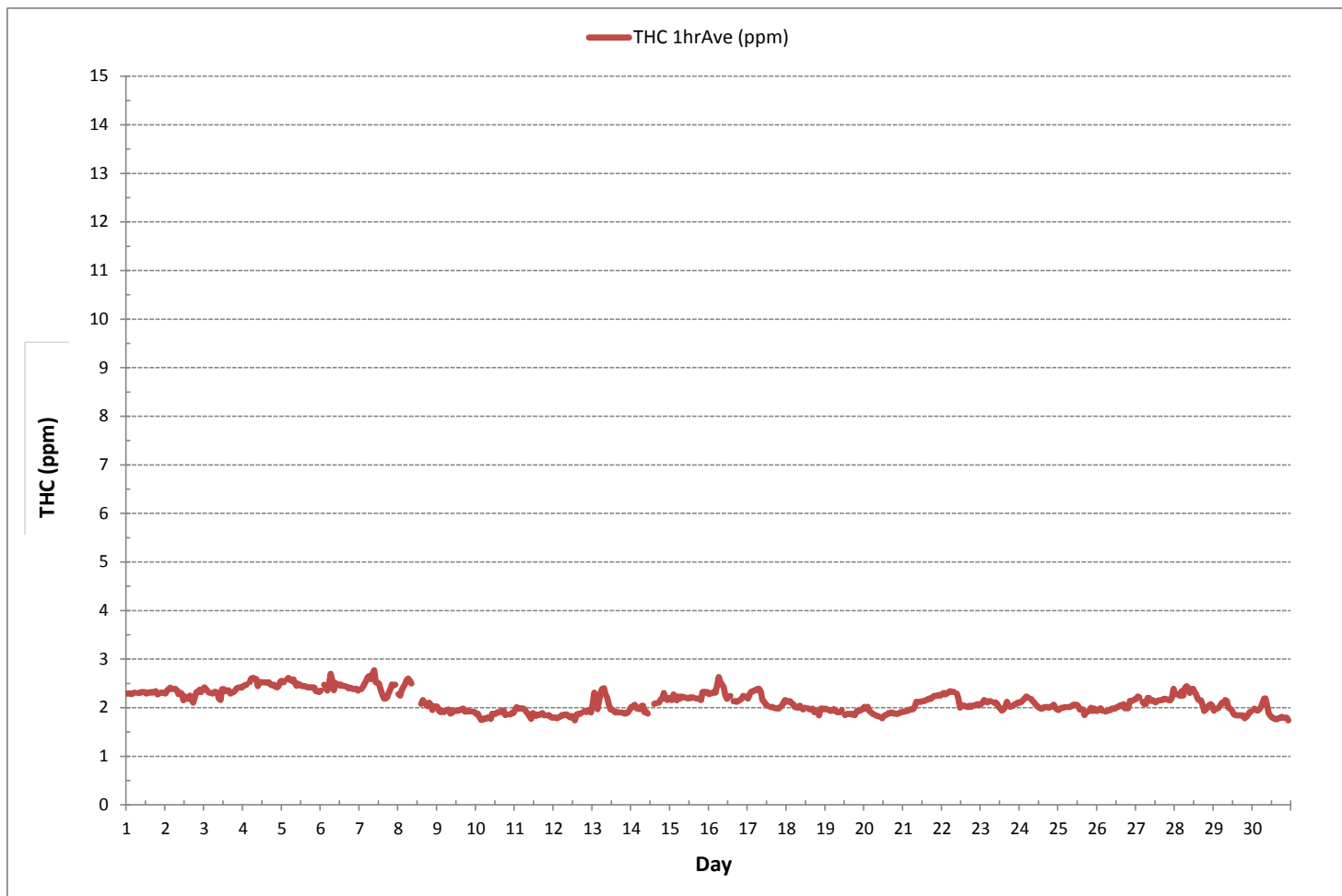


MONTHLY SUMMARY

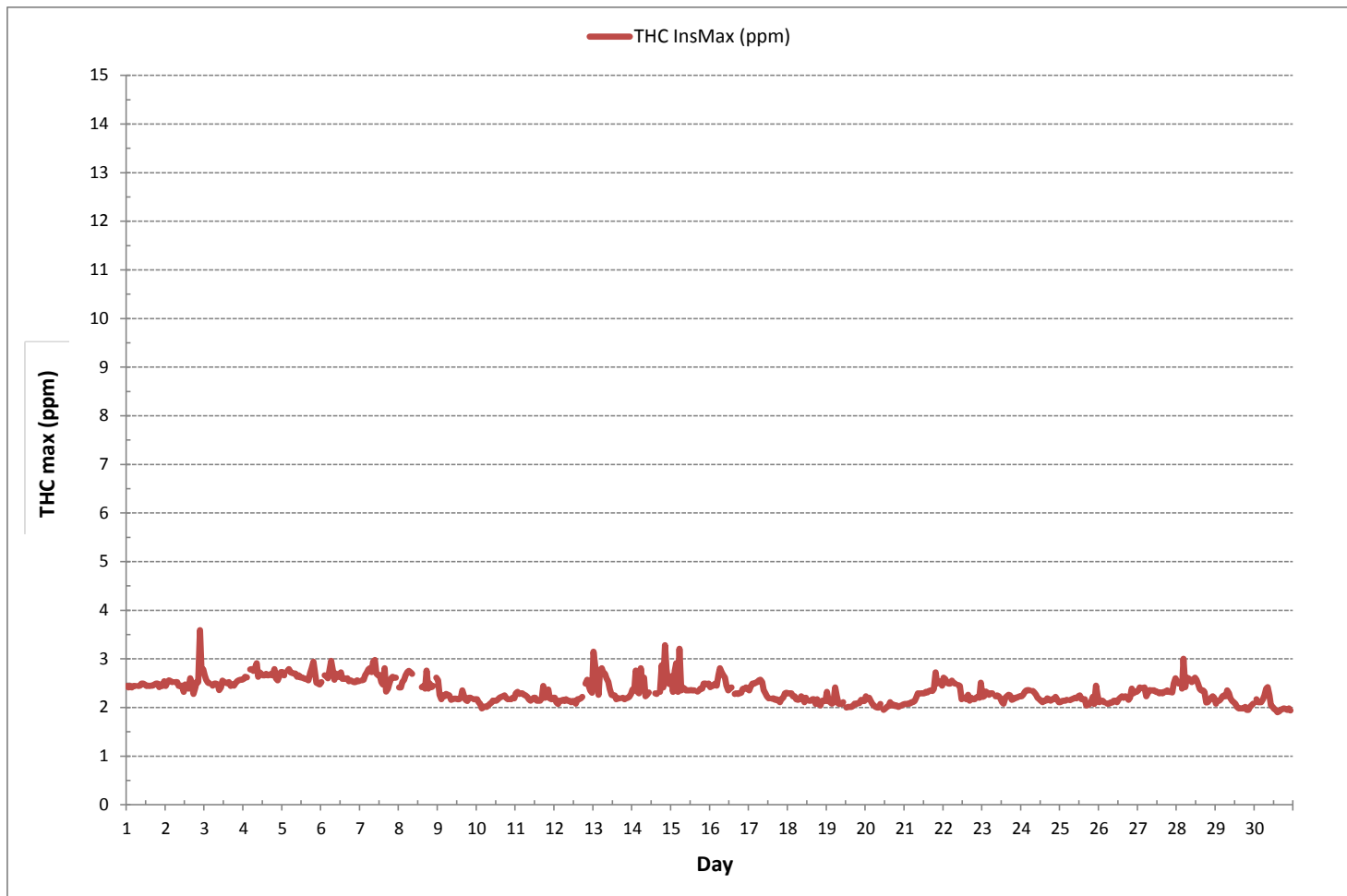
NUMBER OF NON-ZERO READINGS:	680			
MINIMUM 1-HR AVERAGE:	1.74 ppm	@ HOUR	13 ON DAY	12
MAXIMUM 1-HR AVERAGE:	2.77 ppm	@ HOUR	9 ON DAY	7
MAXIMUM 24-HR AVERAGE:	2.51 ppm		ON DAY	4
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:		717 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:		99.6 %
STANDARD DEVIATION:	0.22	MONTHLY AVERAGE:		2.12 ppm



TOTAL HYDROCARBONS Hourly Averages (THC ppm)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



% Icon Classes (ppm)

0



0.0-0.9

9



0.9-1.9

88



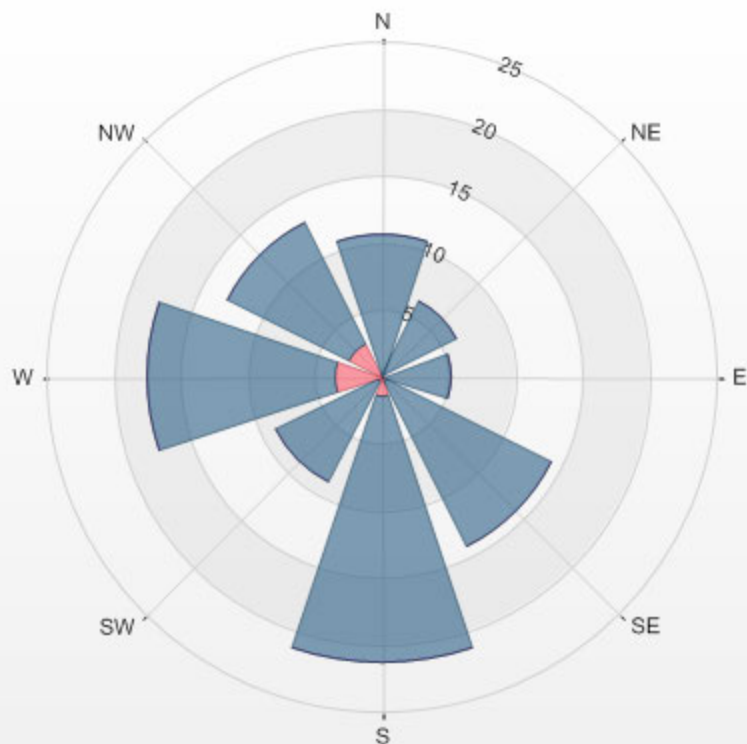
1.9-2.8

0

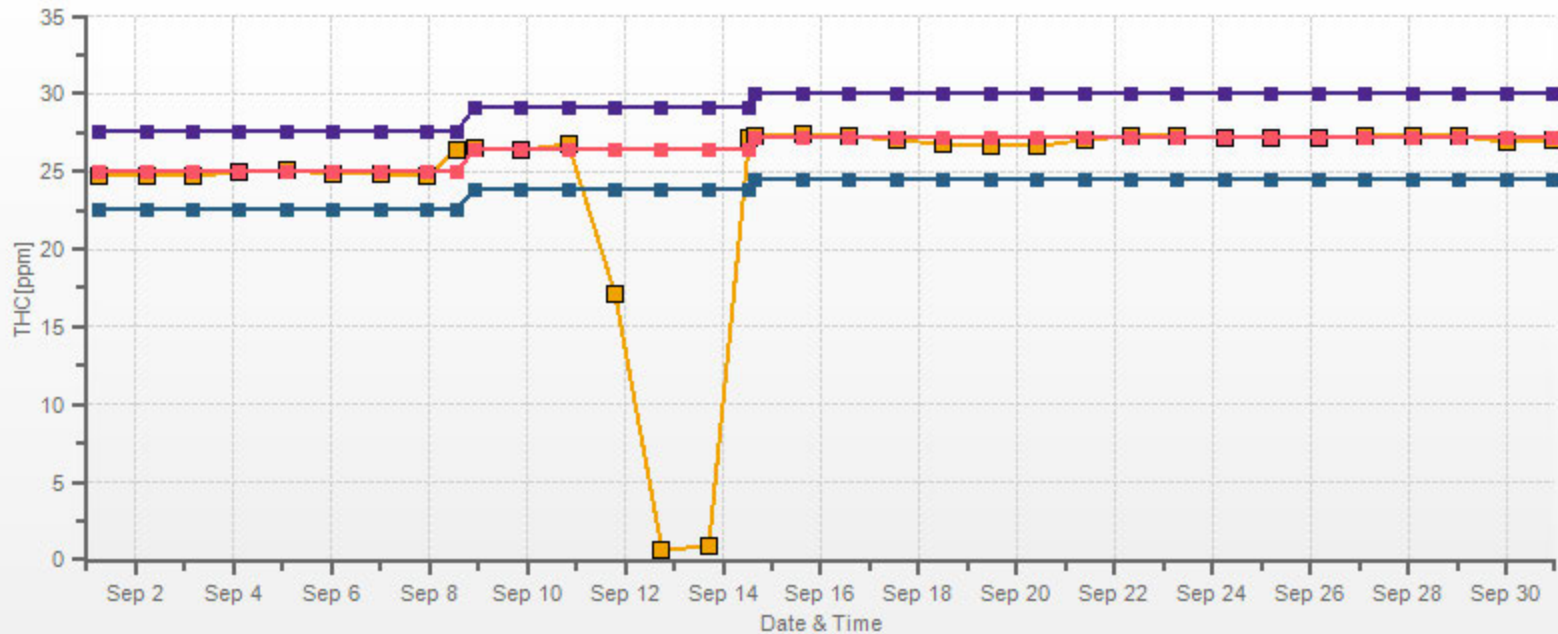


>2.8

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 2.94% Calm Poll Avg: 2.17[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



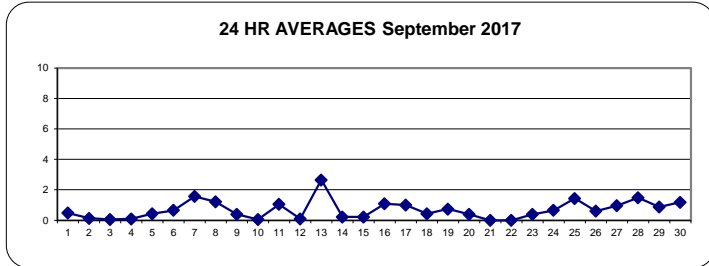
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

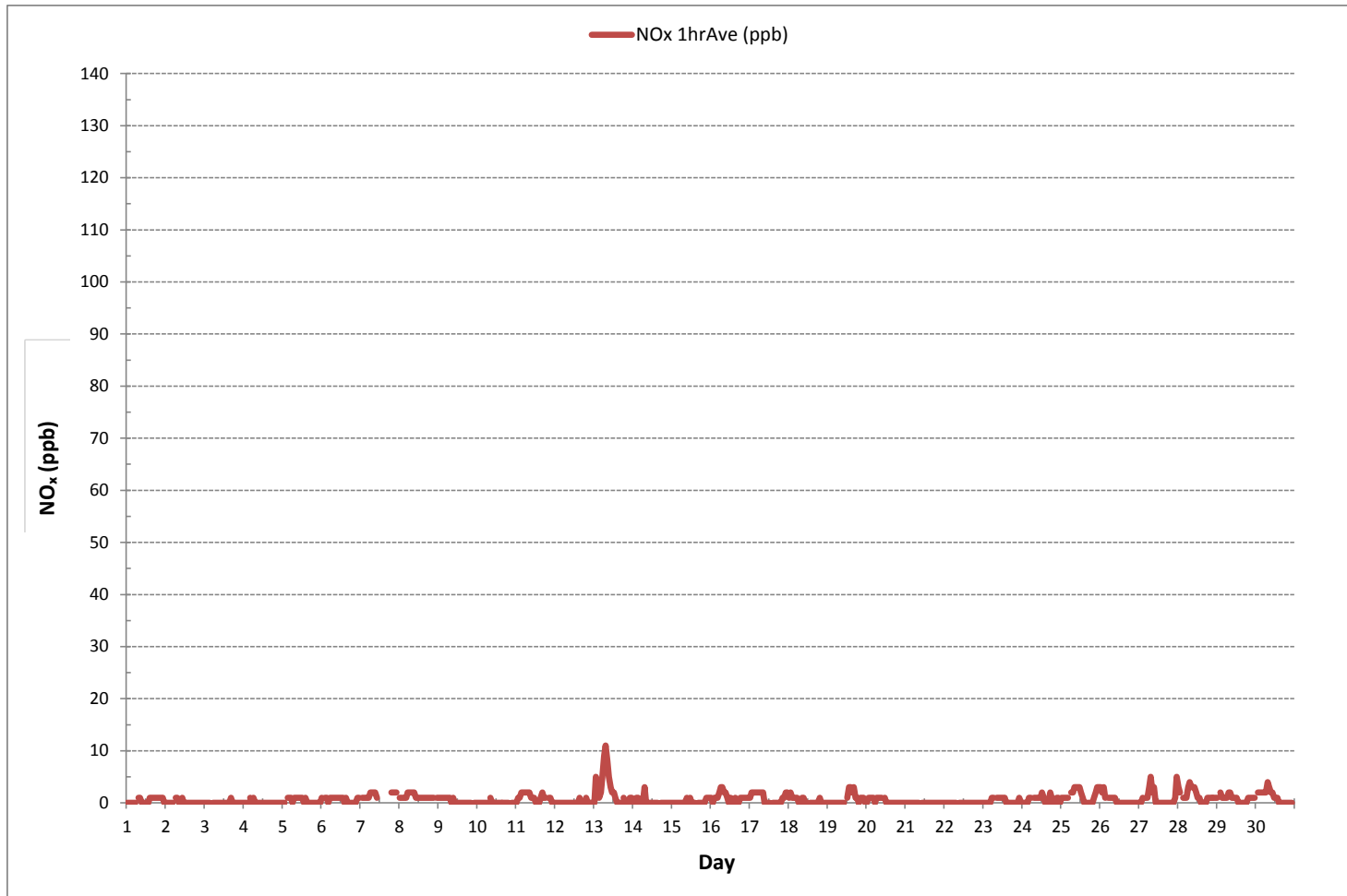
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	297			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	11 ppb	@ HOUR	7 ON DAY	13
MAXIMUM 24-HR AVERAGE:	3 ppb		ON DAY	13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	1	1	1	1	1	4	S	1	4	2	3	1	2	2	2	3	2	3	2	2	2	2	2	2	1	4	2	24	
2	1	1	1	1	1	S	2	2	2	2	25	2	2	1	2	1	1	1	1	1	1	1	2	1	1	1	25	2	24
3	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	1	7	1	1	1	1	2	1	1	1	1	7	1	24
4	1	1	1	S	1	1	2	2	1	2	2	1	1	1	2	1	1	1	4	1	1	1	1	1	1	1	4	1	24
5	1	0	S	2	2	2	1	1	2	2	2	2	4	3	3	17	3	1	3	1	1	1	1	1	1	0	17	2	24
6	2	S	3	2	1	3	3	4	2	3	2	2	2	2	1	2	1	1	1	1	1	1	1	2	1	1	4	2	24
7	S	2	3	2	2	2	3	3	4	3	3	C	C	C	C	C	C	C	C	C	C	3	3	2	S	2	4	3	24
8	2	2	2	2	2	3	3	4	6	6	3	2	2	3	3	3	4	2	3	2	2	2	S	2	2	2	6	3	24
9	2	3	3	3	2	2	4	5	2	2	3	2	2	2	2	2	3	2	3	2	3	S	2	2	2	5	3	24	
10	3	2	2	1	1	1	1	S1	S1	1	1	2	1	1	1	1	1	1	3	1	S	1	2	1	1	3	1	22	
11	2	2	2	3	3	4	3	4	3	2	3	3	2	24	3	4	5	6	3	S	3	2	2	2	1	1	24	4	24
12	1	1	1	1	1	1	2	3	1	1	1	1	1	1	4	3	2	2	S	4	2	2	1	1	1	4	2	24	
13	2	9	8	2	4	9	12	12	10	7	5	3	3	2	1	1	1	S	2	2	1	1	2	2	1	12	4	24	
14	1	2	2	2	2	2	1	14	2	3	5	1	1	1	3	1	S	1	2	2	1	1	1	1	1	14	2	24	
15	1	1	1	1	1	1	1	2	1	3	2	2	1	1	3	S	2	3	3	1	1	2	2	2	1	3	2	24	
16	2	1	2	2	2	3	4	4	3	3	2	1	1	1	S	1	1	1	5	1	2	2	2	2	1	5	2	24	
17	2	3	3	3	3	3	3	3	3	2	1	1	1	S	2	1	1	1	1	2	2	3	3	3	1	3	2	24	
18	3	3	3	2	2	2	2	2	2	2	2	1	S	2	2	1	1	2	2	2	2	2	2	2	1	3	2	24	
19	2	2	1	2	1	2	2	2	2	1	2	S	3	28	48	4	20	6	4	2	2	3	2	2	1	48	6	24	
20	2	3	3	2	2	2	3	2	3	3	S	5	2	1	3	3	2	3	1	1	1	1	1	1	1	5	2	24	
21	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	2	2	1	2	2	2	2	3	1	3	1	24	
22	2	2	2	2	2	2	2	S	4	1	1	1	1	1	1	2	1	2	2	2	1	1	1	2	1	4	2	24	
23	1	1	1	1	1	1	2	S	2	2	2	2	1	2	2	1	1	1	1	1	1	2	2	2	1	2	1	24	
24	2	1	1	1	2	2	S	3	2	4	3	2	4	2	2	1	2	4	2	2	2	2	2	2	1	4	2	24	
25	2	2	2	2	2	S	5	6	29	6	5	6	4	20	10	1	1	1	1	2	3	4	5	5	1	29	5	24	
26	5	4	4	3	S	2	18	4	13	28	1	16	1	1	10	1	2	2	4	1	1	1	1	2	1	28	5	24	
27	2	2	2	S	2	3	66	89	4	41	3	2	2	1	2	1	1	1	1	1	1	1	4	6	1	89	10	24	
28	5	3	S	2	3	3	5	5	5	4	5	4	3	2	1	1	1	2	3	3	2	2	2	2	1	5	3	24	
29	2	S	3	2	2	2	3	3	3	3	2	2	2	1	2	3	2	2	2	3	2	2	3	3	1	3	2	24	
30	S	4	3	3	3	3	4	5	5	5	3	5	2	2	2	2	2	2	1	1	2	1	1	S	1	5	3	24	
HOURLY MAX	5	9	8	3	4	9	66	89	29	41	25	16	4	28	48	17	20	6	5	4	3	4	5	6					
HOURLY AVG	2	2	2	2	2	2	6	7	4	5	3	3	2	4	4	2	3	2	2	2	2	2	2	2					

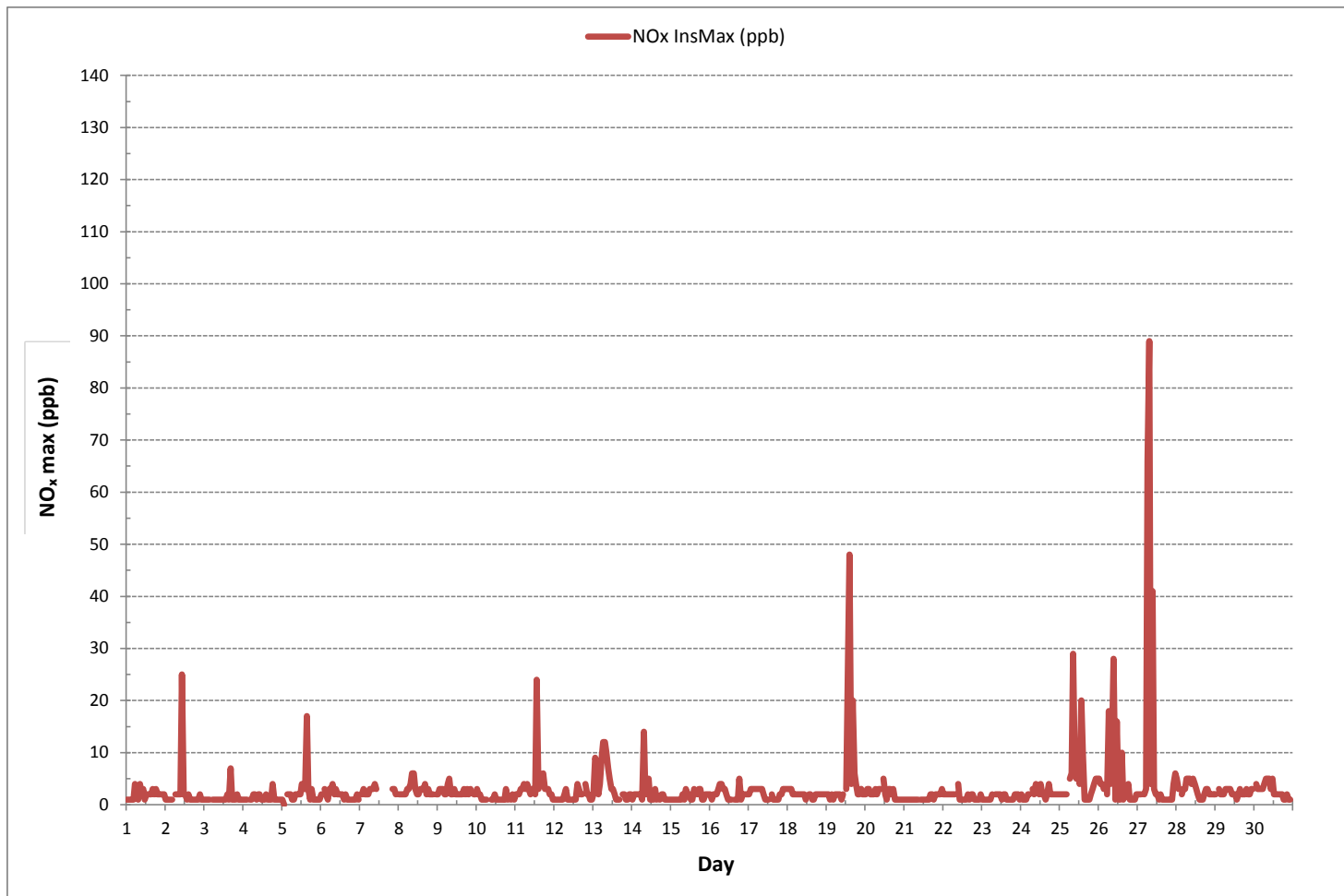
STATUS FLAG CODES

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

MONTHLY SUMMARY

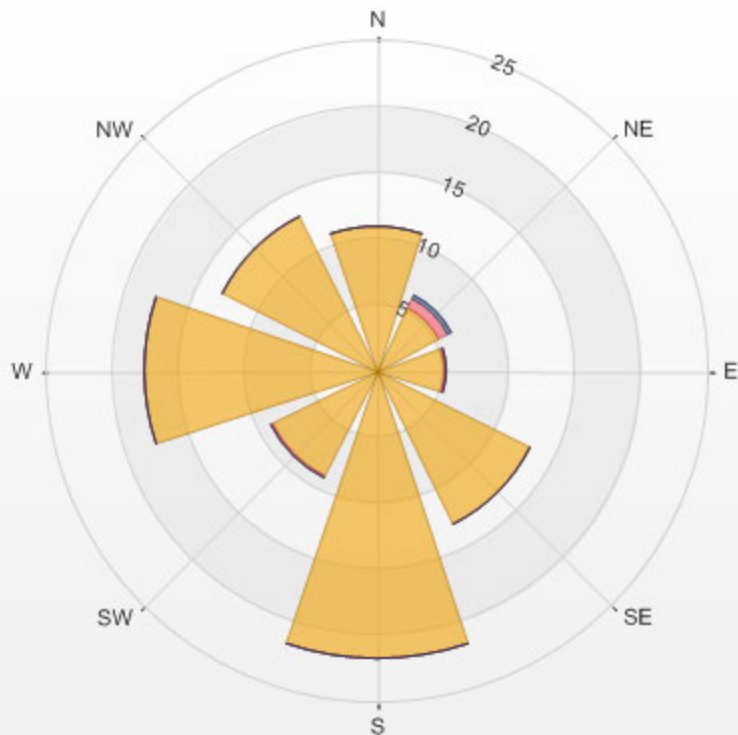
NUMBER OF NON-ZERO READINGS:	676
MAXIMUM INSTANTANEOUS VALUE:	89 ppb @ HOUR 7 ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	718 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

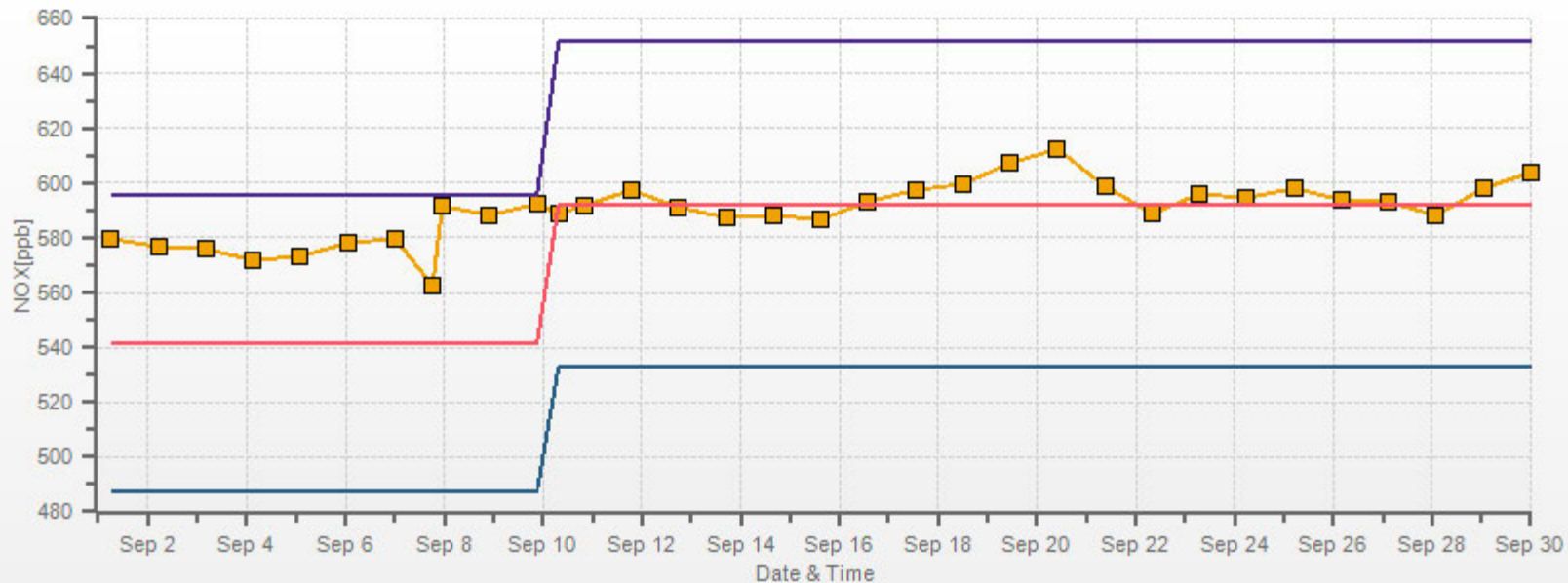


% Icon Classes (ppb) 96 0.0-4.0 1 4.0-8.0 0 8.0-12.0 0 >12.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.10% Calm Poll Avg: 0.44[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

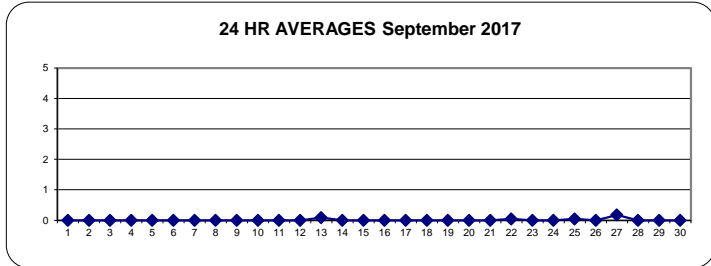
NITRIC OXIDE Hourly Averages (NO ppb)

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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	S	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	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
5	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
6	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
7	S	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	0	S	0	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24	
9	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	
10	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	23	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24	
13	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
15	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	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	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	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	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	24	
23	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	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	
25	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	S	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	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	24	
30	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	24	
HOURLY MAX	0	0	0	0	0	0	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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

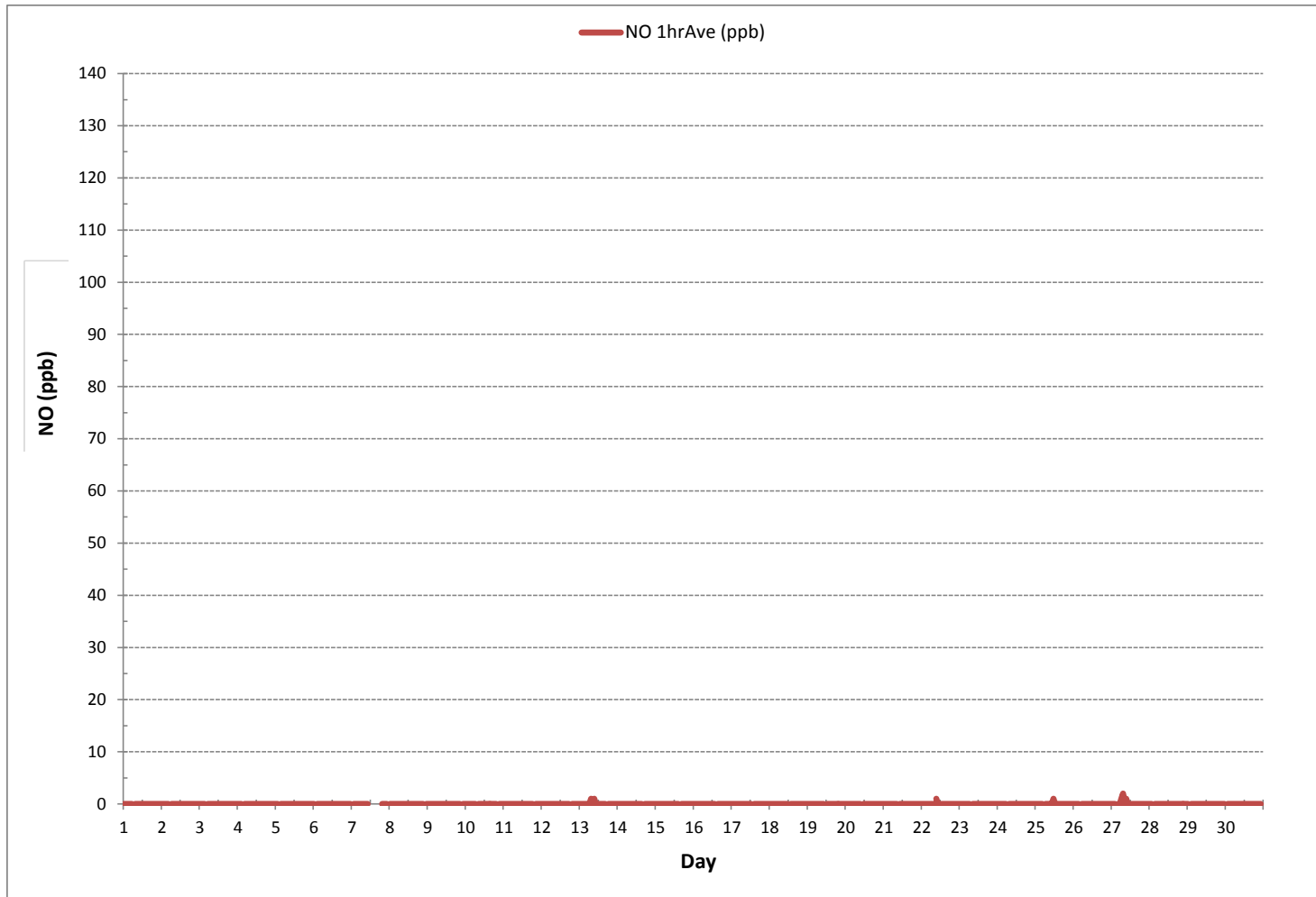
24 HR AVERAGES September 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	7
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 27 ON DAY 24
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	719 hrs
AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

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	3	S	2	3	2	2	1	2	2	2	1	2	2	2	1	1	1	1	1	1	1	3	2	24	
2	1	1	1	1	1	S	2	2	2	1	17	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	17	2	24	
3	1	1	2	1	S	2	1	2	1	2	2	1	1	2	3	2	4	1	2	1	1	1	1	1	1	1	4	2	24	
4	1	1	1	S	1	1	2	2	2	2	2	1	1	2	2	2	2	2	3	1	1	1	1	1	1	1	3	2	24	
5	1	1	S	1	1	1	1	2	2	2	1	2	2	2	2	5	2	1	1	1	1	1	1	1	1	1	5	2	24	
6	1	S	2	2	1	2	2	3	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	3	1	24	
7	S	2	2	1	1	2	1	2	2	2	1	C	C	C	C	C	C	C	C	C	C	2	1	1	S	1	2	2	24	
8	1	1	1	1	1	1	1	2	4	4	1	1	1	2	2	2	2	1	1	1	1	1	1	S	2	1	4	2	24	
9	1	1	1	1	1	1	2	2	1	2	2	1	2	1	2	1	2	1	2	1	2	1	2	S	2	1	1	2	1	24
10	2	1	2	1	1	1	2	S1	S1	2	2	2	2	2	1	2	2	1	3	1	S	1	1	1	1	1	3	2	22	
11	1	1	1	1	1	2	2	2	2	2	2	2	2	15	3	3	2	2	1	S	2	2	2	1	1	1	15	2	24	
12	2	1	1	1	2	1	2	2	2	2	2	2	2	1	3	3	2	2	S	2	1	2	2	1	1	1	3	2	24	
13	1	1	1	1	2	2	3	3	3	3	3	2	2	1	1	2	1	S	2	1	1	1	1	1	1	1	3	2	24	
14	1	1	1	1	1	1	1	9	2	2	4	1	2	2	2	2	S	2	2	2	2	1	1	1	1	1	9	2	24	
15	1	1	1	1	1	1	1	2	1	2	1	2	1	2	2	S	2	1	1	1	1	1	2	2	1	2	2	1	24	
16	2	1	2	1	2	2	2	2	2	2	2	1	2	1	S	2	2	1	1	1	1	1	1	1	1	1	2	2	24	
17	1	1	1	1	1	1	1	2	2	1	2	1	2	S	2	2	2	2	1	1	1	1	1	1	1	1	2	1	24	
18	1	1	1	1	1	1	1	1	2	2	2	2	S	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	24	
19	2	2	2	2	2	2	2	2	2	2	2	S	2	18	29	3	17	3	3	2	2	2	2	2	2	2	29	5	24	
20	2	2	2	2	2	2	2	2	2	2	S	3	2	2	2	3	2	3	2	2	2	2	2	2	2	2	3	2	24	
21	2	2	2	2	2	2	2	2	2	S	3	2	2	2	3	2	3	3	3	2	3	3	3	3	3	3	3	2	24	
22	3	2	2	2	3	3	2	2	S	4	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	4	2	24	
23	1	2	1	1	1	1	1	S	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
24	1	1	1	1	1	1	S	2	2	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	3	1	24	
25	1	1	1	1	1	1	S	2	4	22	3	3	4	3	14	10	2	1	1	1	1	2	2	1	1	1	22	4	24	
26	2	1	1	1	S	2	12	3	12	16	2	9	2	1	5	2	2	2	2	1	2	1	2	2	1	16	4	24		
27	2	2	2	S	2	2	58	61	3	27	3	2	2	2	2	2	2	2	2	2	1	2	2	1	2	61	8	24		
28	2	2	S	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	1	1	1	1	1	2	2	24	
29	1	S	1	1	1	1	1	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	24	
30	S	2	1	1	1	1	1	2	2	3	2	4	2	1	2	2	2	2	1	1	2	1	1	1	S	1	4	2	24	
HOURLY MAX	3	2	2	2	3	3	58	61	22	27	17	9	3	18	29	5	17	3	3	2	3	3	3	3	3					
HOURLY AVG	1	1	1	1	1	2	4	5	3	4	3	2	2	3	3	2	2	2	2	1	1	1	1	1						

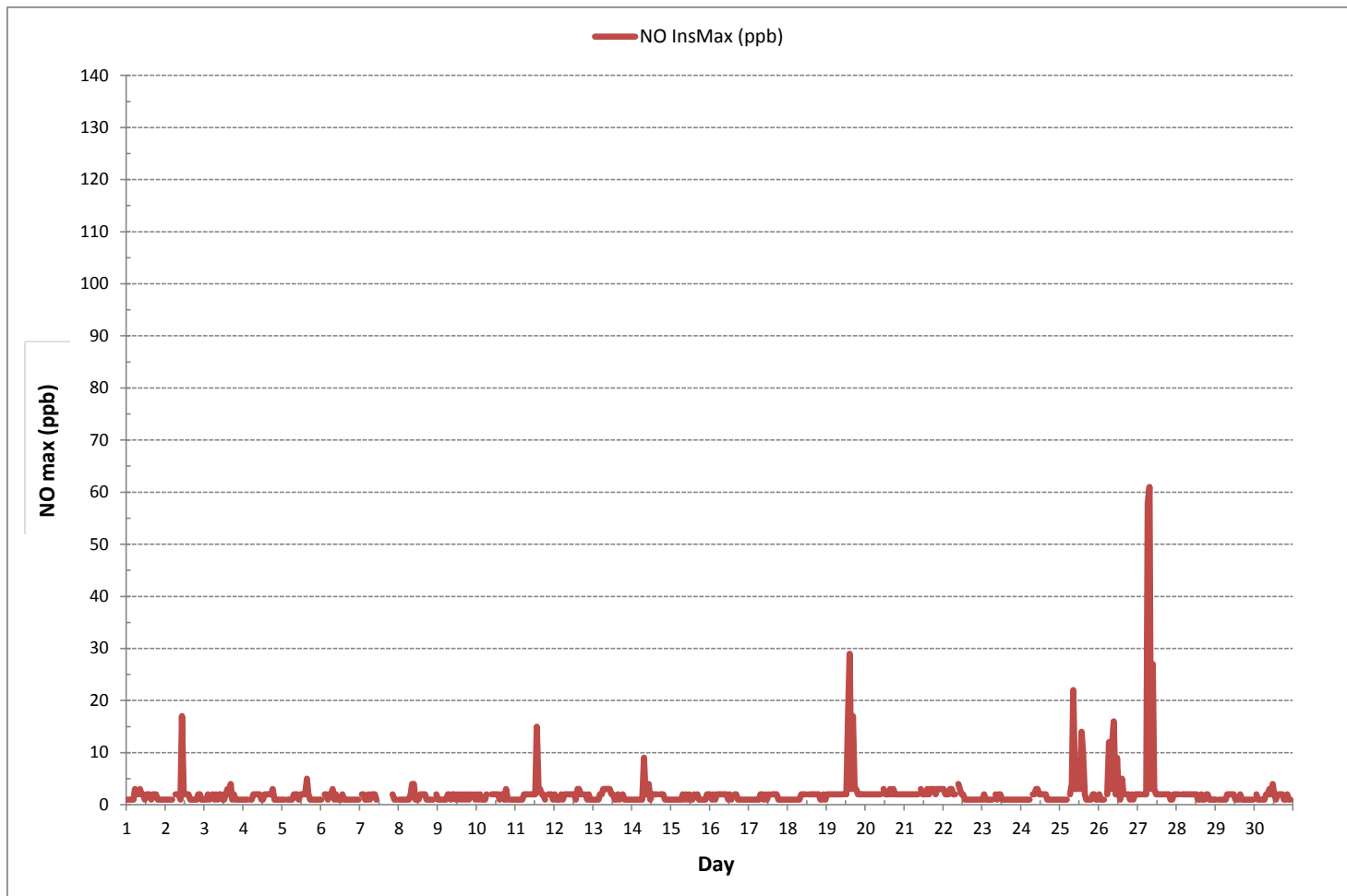
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	61 ppb @ HOUR 7 ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	718 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



% Icon Classes (ppb)

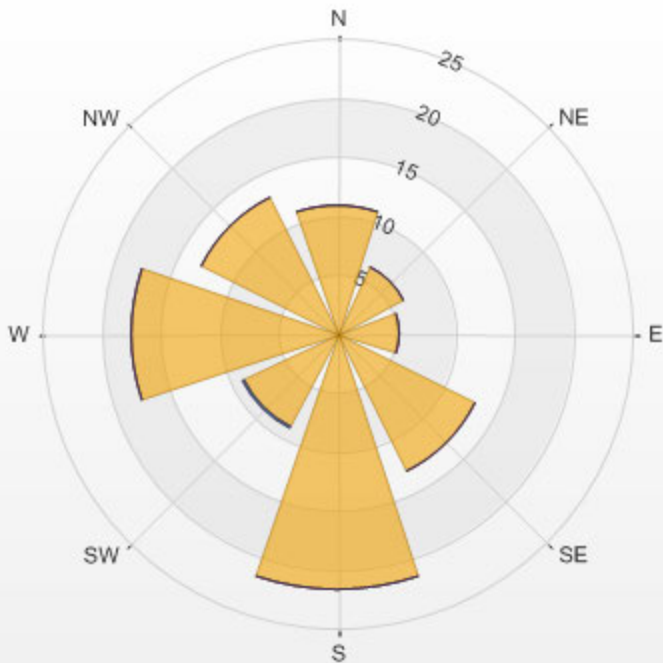
97 0.0-1.0

0 1.0-2.0

0 2.0-3.0

0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.10% Calm Poll Avg: 0.02[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

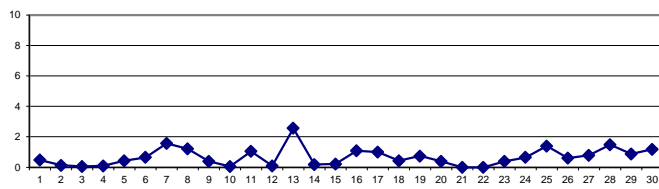
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	297			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY
MAXIMUM 1-HR AVERAGE:	10	ppb @ HOUR	7	ON DAY
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	719
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	99.9
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	1
				ppb

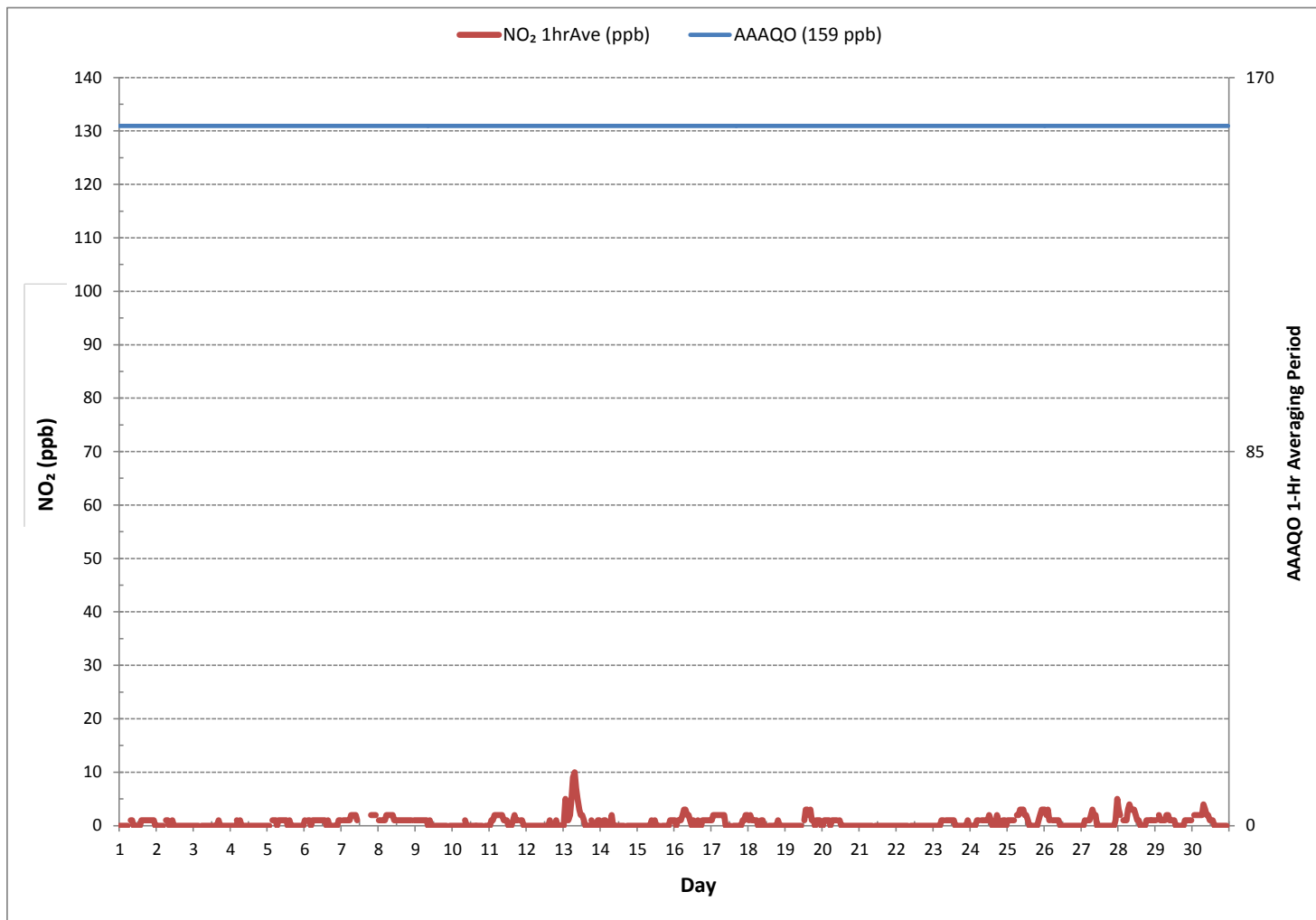
24 HR AVERAGES September 2017





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

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

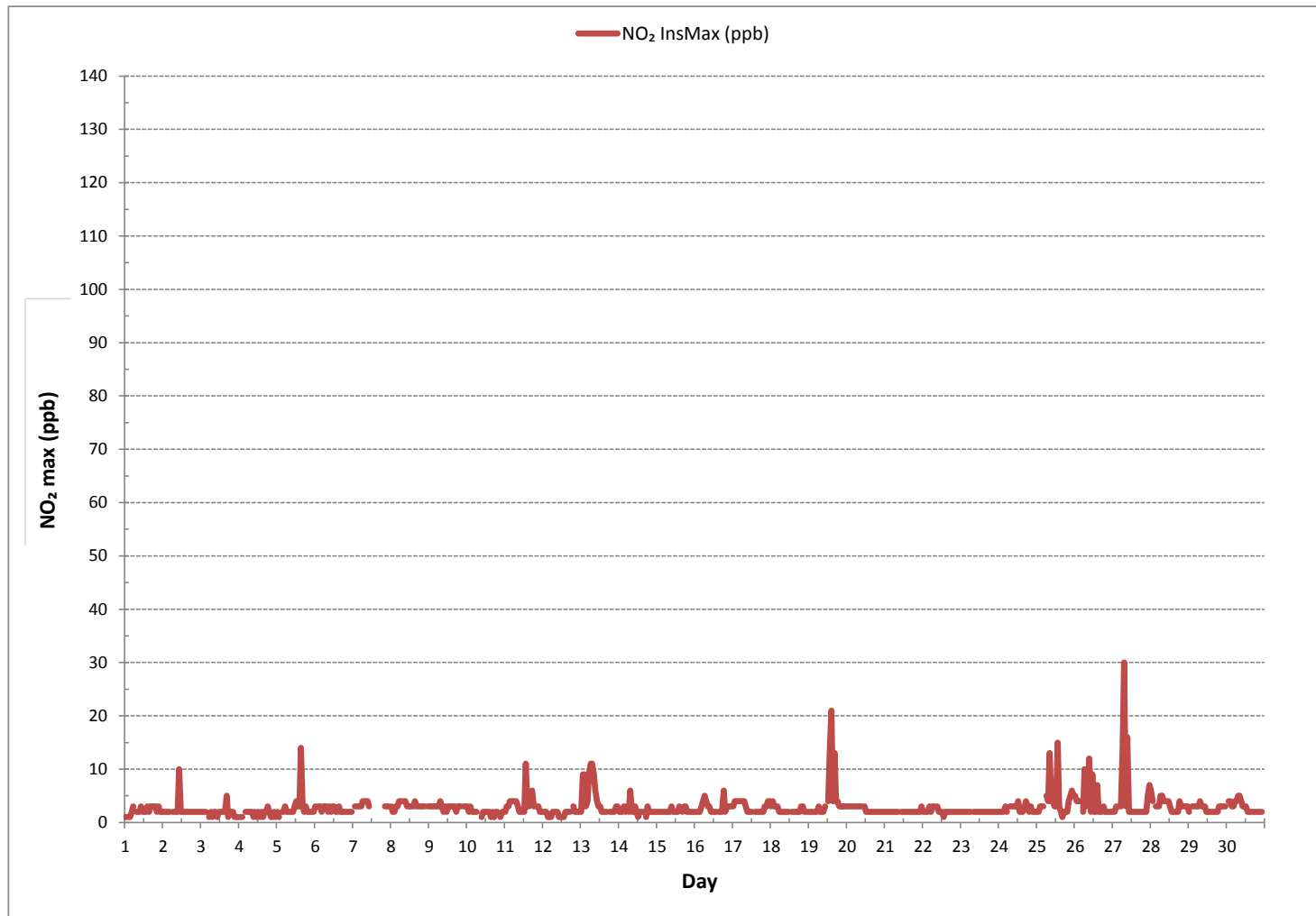
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	30 ppb @ HOUR 7 ON DAY 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	718 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO2[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.10% Calm Avg: 0.42 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	10.9	0.0	0.0	0.0	10.9
NE	5.3	0.6	0.4	0.0	6.4
E	5.2	0.2	0.0	0.0	5.3
SE	13.0	0.0	0.0	0.0	13.0
S	21.7	0.0	0.0	0.0	21.7
SW	9.0	0.0	0.0	0.0	9.0
W	17.6	0.0	0.0	0.0	17.6
NW	13.0	0.0	0.0	0.0	13.0
Summary	95.7	0.7	0.4	0.0	96.9

% Icon Classes (ppb)

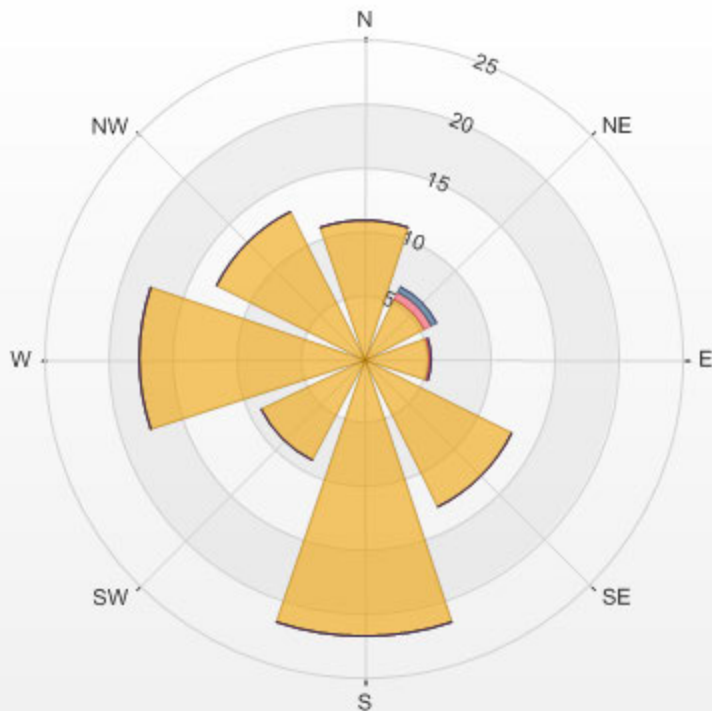
96 0.0-3.7

1 3.7-7.3

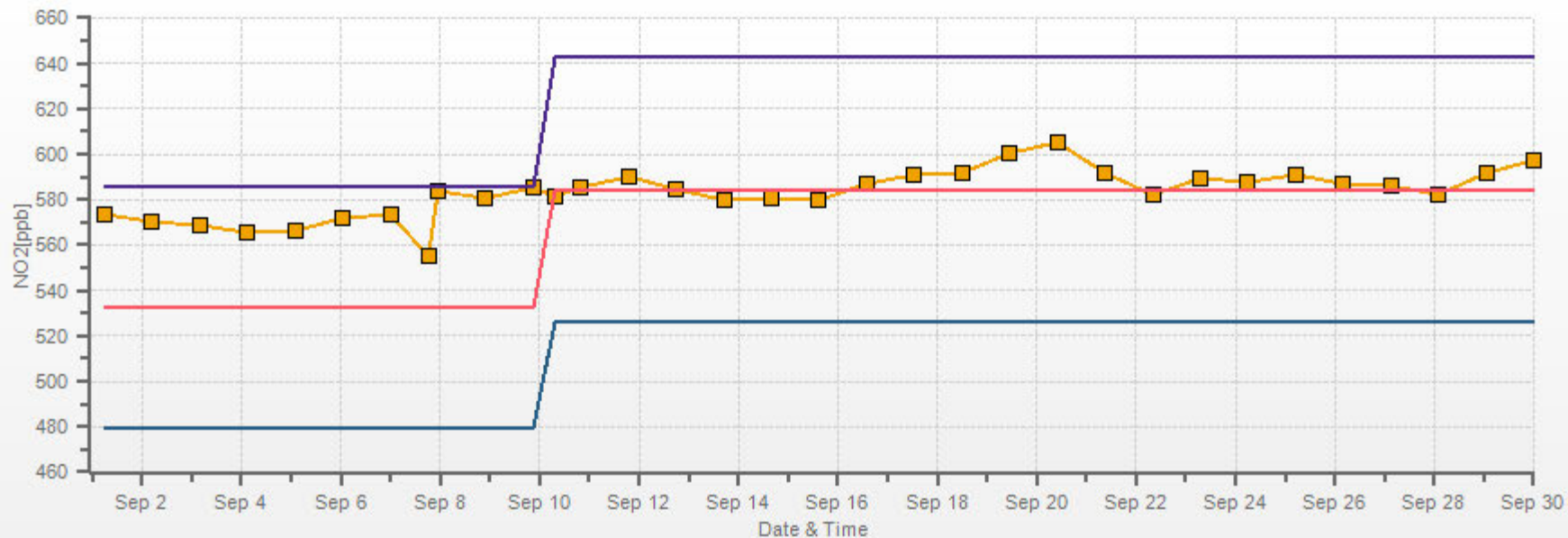
0 7.3-11.0

0 >11.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.10% Calm Poll Avg: 0.42[ppb]



NO2[ppb] Calibration: LICA ST. LINA Monthly: 17/09 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	27.5	28.5	27.2	26.7	25.5	23.6	S	21.9	22.5	27.5	31.3	32.2	35.1	38.5	38.9	37.6	39.0	37.8	36.0	35.8	34.4	33.0	31.6	31.9	21.9	39.0	31.5	24
2	30.2	24.8	21.7	20.9	21.4	S	18.9	20.2	22.2	21.9	21.8	23.8	24.7	23.5	26.0	27.2	21.7	19.4	20.8	18.2	17.6	17.2	18.6	16.3	16.3	30.2	21.7	24
3	9.6	11.7	16.2	17.4	S	18.7	17.7	19.7	22.9	23.3	25.2	24.7	24.2	26.7	27.4	28.9	28.5	28.1	25.1	21.5	18.7	16.9	18.1	18.0	9.6	28.9	21.3	24
4	17.8	17.1	16.3	S	15.9	17.6	16.9	18.0	17.8	22.5	24.3	26.1	26.7	26.6	27.1	28.4	29.0	28.5	27.0	28.8	29.5	30.2	28.7	24.5	15.9	30.2	23.7	24
5	23.3	23.9	S	18.4	18.8	22.1	23.0	21.8	24.3	29.6	34.0	38.3	41.9	44.5	45.1	45.3	45.0	45.4	46.5	46.6	46.1	45.8	47.3	47.0	18.4	47.3	35.8	24
6	45.8	S	39.1	39.9	45.4	36.8	16.8	16.5	35.1	42.3	52.0	52.4	52.5	53.7	53.5	52.2	51.7	51.7	52.0	53.3	54.6	55.4	54.2	54.0	16.5	55.4	46.1	24
7	S	53.1	50.9	51.0	50.2	50.5	53.7	51.8	50.4	50.2	57.2	60.7	62.6	62.0	62.7	Q	60.0	62.1	60.6	58.2	55.2	52.2	48.8	S	48.8	62.7	55.4	24
8	46.6	46.2	43.4	41.4	38.8	34.8	30.7	28.8	30.1	C	C	C	C	C	38.7	32.2	32.9	33.4	32.5	32.0	24.6	21.7	S	21.1	21.1	46.6	33.9	24
9	20.8	19.6	21.9	23.5	22.4	22.1	19.3	17.0	21.9	26.3	29.5	30.6	32.9	34.9	35.7	33.7	30.5	25.3	24.0	23.6	20.3	S	15.4	15.3	15.3	35.7	24.6	24
10	14.7	13.8	17.5	25.4	24.8	22.1	21.4	21.3	22.4	23.6	25.1	25.9	25.7	27.0	27.1	26.7	26.9	27.3	27.3	26.2	S	26.5	22.9	22.1	13.8	27.3	23.6	24
11	21.3	19.8	18.8	16.3	14.0	13.9	15.5	19.6	24.0	27.1	31.9	34.8	36.7	38.6	41.0	44.2	47.8	45.6	46.9	S	42.3	31.1	28.3	24.0	13.9	47.8	29.7	24
12	24.7	28.0	30.2	29.7	29.4	28.3	26.9	25.3	25.3	25.7	27.7	28.7	29.1	28.6	28.1	28.6	27.8	26.4	S	25.2	24.6	24.1	23.1	21.3	21.3	30.2	26.8	24
13	19.2	10.4	11.2	16.1	11.6	7.2	5.3	5.1	6.3	8.0	11.4	15.3	14.8	15.4	16.5	16.9	19.0	S	24.3	26.4	25.0	23.1	21.0	21.9	5.1	26.4	15.3	24
14	22.0	22.0	21.1	23.1	23.3	22.9	14.2	13.8	22.8	23.3	25.3	26.5	27.3	26.6	26.6	26.1	S	26.9	24.0	22.9	23.6	25.0	25.4	23.3	13.8	27.3	23.4	24
15	21.9	21.2	20.0	19.6	21.5	20.4	18.9	16.1	20.9	21.4	25.4	27.0	29.7	31.0	31.2	S	31.6	31.7	30.6	31.2	29.5	27.7	26.5	24.9	16.1	31.7	25.2	24
16	24.5	24.0	24.1	23.5	24.0	20.8	18.1	20.4	21.2	23.1	27.0	29.3	28.7	28.7	S	29.5	29.1	28.8	26.2	25.2	24.6	23.1	22.5	22.5	18.1	29.5	24.7	24
17	22.0	20.0	18.8	18.5	17.3	16.1	15.3	16.2	18.5	22.2	26.7	28.0	29.5	S	32.1	32.4	32.7	31.9	29.8	27.8	26.3	25.0	23.5	21.7	15.3	32.7	24.0	24
18	21.6	20.4	21.3	20.6	19.8	20.5	20.7	22.0	26.1	28.6	30.9	31.8	S	32.6	31.4	30.3	28.6	28.5	27.4	26.2	26.3	26.0	25.1	24.5	19.8	32.6	25.7	24
19	24.7	24.0	23.1	22.7	22.0	19.9	19.4	19.1	17.4	16.5	14.8	S	20.0	18.3	18.9	19.3	18.6	19.5	19.4	19.7	18.7	17.6	17.0	15.4	14.8	24.7	19.4	24
20	14.5	12.5	11.5	10.2	11.0	12.2	12.8	13.7	14.6	18.3	S	20.7	22.9	24.6	24.5	23.5	21.6	19.7	17.7	16.3	16.7	16.5	16.2	17.4	10.2	24.6	16.9	24
21	18.4	18.8	19.7	19.4	19.9	19.3	18.5	18.4	18.0	S	18.2	18.3	19.0	19.2	18.7	17.9	17.1	17.0	16.0	14.9	14.5	13.9	14.3	14.6	13.9	19.9	17.6	24
22	14.2	13.9	13.1	13.8	13.3	12.3	S1	S1	S	15.6	16.8	S1	19.6	19.0	20.2	20.6	20.1	18.0	18.0	16.7	17.2	17.6	18.6	19.6	12.3	20.6	16.9	21
23	20.4	16.8	12.7	16.1	15.6	16.8	18.6	S	20.7	19.3	19.7	24.8	26.2	25.2	21.9	21.0	19.9	19.1	18.1	16.5	15.8	15.0	15.2	15.5	12.7	26.2	18.7	24
24	15.4	15.2	14.6	14.1	13.5	13.4	S	13.2	14.2	16.4	18.8	18.6	20.0	23.7	26.6	27.4	27.1	25.0	24.7	24.7	24.6	25.5	26.7	27.6	13.2	27.6	20.5	24
25	26.8	26.4	25.2	23.3	21.8	S	20.0	18.8	16.4	14.4	14.2	16.0	20.0	25.0	27.0	27.9	27.5	25.8	25.3	24.8	23.0	21.5	18.7	17.1	14.2	27.9	22.0	24
26	17.5	13.8	16.2	19.4	S	18.5	17.5	16.5	15.8	17.5	20.6	21.9	24.7	28.1	32.7	34.7	33.8	34.2	32.4	32.6	32.8	32.3	31.4	30.2	13.8	34.7	25.0	24
27	26.4	24.7	24.9	S	23.4	24.0	21.1	11.2	13.1	18.5	22.5	24.0	25.4	28.0	28.5	30.1	30.5	29.9	28.9	29.0	29.7	29.7	25.9	17.9	11.2	30.5	24.7	24
28	21.2	22.6	S	22.8	19.2	18.4	18.2	18.9	19.7	21.2	24.7	28.3	32.4	33.4	33.2	34.5	35.0	33.8	31.5	30.6	32.1	30.9	30.2	29.5	18.2	35.0	27.1	24
29	29.8	S	28.4	26.5	24.1	22.9	22.3	21.4	22.2	25.5	28.9	31.1	34.6	37.9	39.3	40.1	40.3	38.8	38.2	37.9	36.9	34.4	32.0	30.5	21.4	40.3	31.5	24
30	S	27.6	27.5	27.3	27.1	25.9	24.0	21.6	22.1	25.1	26.8	29.2	32.0	33.7	35.0	38.1	39.3	38.0	37.0	35.5	34.5	34.0	33.0	S	21.6	39.3	30.7	24
HOURLY MAX	46.6	53.1	50.9	51.0	50.2	50.5	53.7	51.8	50.4	50.2	57.2	60.7	62.6	62.0	62.7	62.7	60.0	62.1	60.6	58.2	55.2	55.4	54.2	54.0				
HOURLY AVG	23.0	22.2	22.7	23.1	22.7	21.5	20.2	19.6	21.7	23.4	26.2	28.5	29.2	30.5	31.6	30.5	31.5	31.0	29.9	28.6	28.3	27.3	26.2	23.9				

STATUS FLAG CODES

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

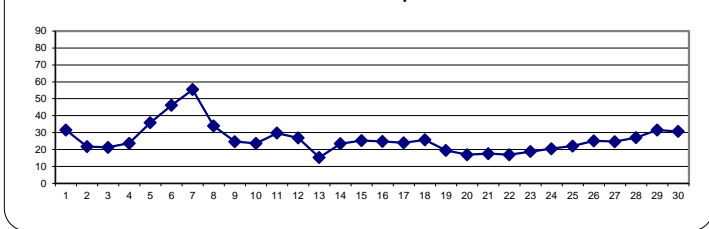
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

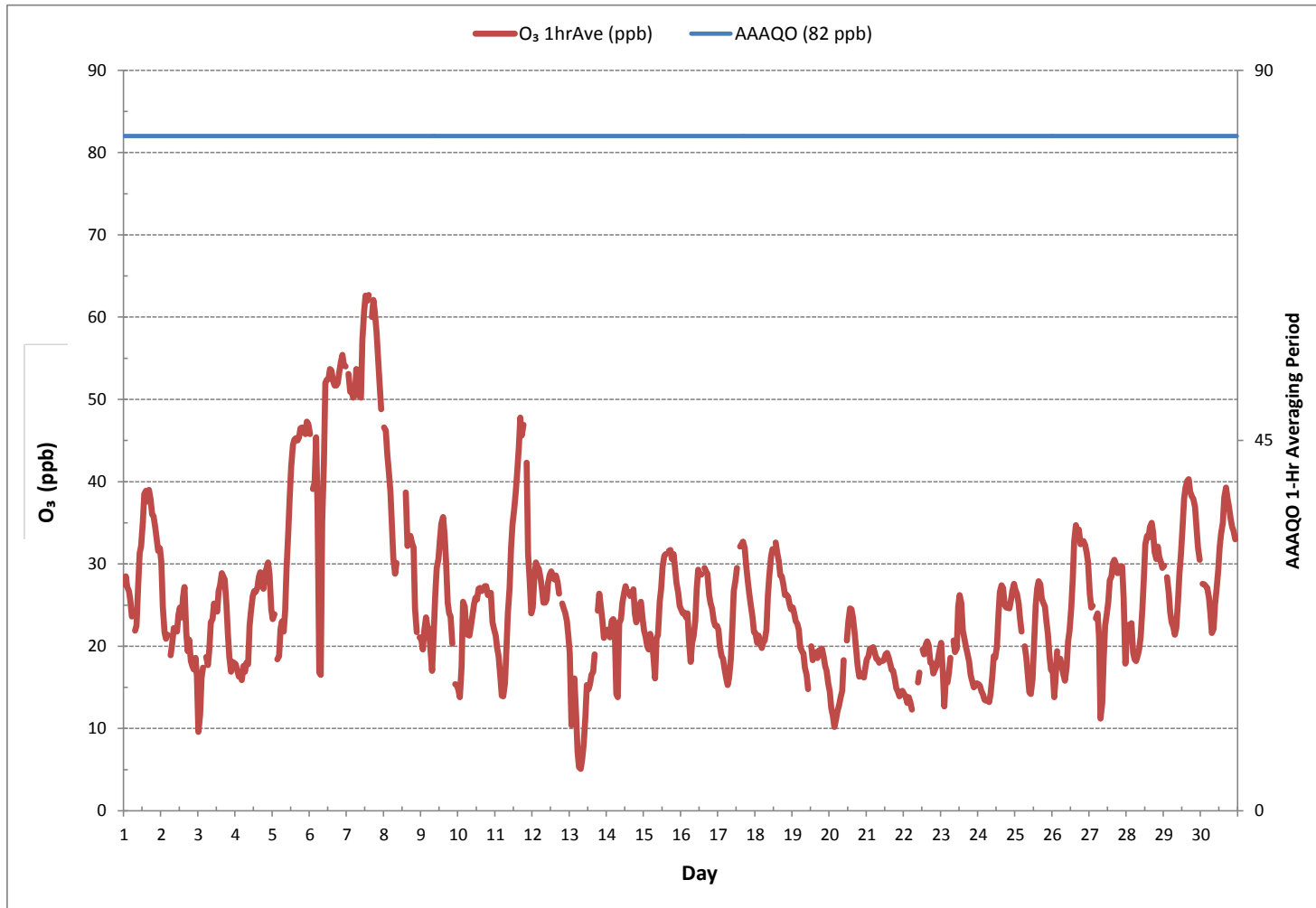
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	679			
MINIMUM 1-HR AVERAGE:	5.1 ppb	@ HOUR	7	ON DAY
MAXIMUM 1-HR AVERAGE:	62.7 ppb	@ HOUR	14	ON DAY
MAXIMUM 24-HR AVERAGE:	55.4 ppb			ON DAY
I2S CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	717 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.6 %	
STANDARD DEVIATION:	10.0	MONTHLY AVERAGE:	26.0 ppb	

24 HR AVERAGES September 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

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	28.5	29.2	28.5	27.3	26.1	26.5	S	22.7	25.1	29.8	34.0	34.4	36.9	40.3	40.5	39.2	40.8	39.3	37.0	36.9	35.2	34.2	33.4	33.2	22.7	40.8	33.0	24
2	32.1	27.6	23.4	22.3	22.3	S	20.3	22.5	23.0	23.1	23.7	26.0	26.8	25.6	28.2	29.6	25.2	20.5	22.5	22.2	21.0	19.2	21.4	20.0	19.2	32.1	23.8	24
3	10.9	15.1	18.6	18.3	S	19.5	18.5	21.4	24.1	25.4	27.7	26.4	26.2	27.9	28.9	33.4	31.9	28.9	27.7	23.3	20.7	17.7	18.5	18.3	10.9	33.4	23.0	24
4	18.2	17.8	17.4	S	16.4	18.8	17.8	19.6	19.9	25.4	25.9	27.3	27.7	27.6	27.7	29.6	29.6	29.3	28.6	35.8	30.1	30.6	30.1	26.4	16.4	35.8	25.1	24
5	24.2	25.0	S	19.6	21.0	23.7	24.1	22.3	27.7	32.1	36.9	40.6	44.9	45.8	46.6	47.2	46.4	47.5	49.0	49.2	48.5	47.2	48.6	47.6	19.6	49.2	37.6	24
6	47.9	S	43.5	46.2	46.3	45.6	26.0	23.3	40.2	46.9	56.3	56.0	54.7	55.2	55.7	55.4	54.0	53.1	53.8	54.4	55.2	56.4	55.7	55.6	23.3	56.4	49.5	24
7	S	54.9	51.7	51.9	51.3	53.3	54.9	53.7	52.0	53.4	60.3	62.5	63.6	63.6	64.0	Q	Q	63.6	61.9	60.0	56.8	53.5	50.6	S	50.6	64.0	56.9	24
8	47.1	46.5	45.2	42.5	40.6	37.1	32.5	29.8	31.7	C	C	C	C	C	43.4	33.5	35.9	35.2	35.2	33.1	28.1	22.5	S	21.9	21.9	47.1	35.7	24
9	22.9	21.7	22.7	24.2	23.0	23.2	21.4	20.9	25.4	27.7	30.9	31.8	35.3	36.5	37.0	37.8	32.8	26.6	25.2	24.9	22.9	S	15.8	16.1	15.8	37.8	26.4	24
10	15.5	14.6	23.7	27.2	26.9	24.3	23.1	21.9	23.1	24.6	25.8	26.3	26.5	27.4	27.7	27.2	27.3	28.0	28.3	27.4	S	27.7	23.7	23.5	14.6	28.3	24.9	24
11	22.3	21.1	19.4	17.7	16.0	14.5	17.5	22.7	25.6	31.0	34.2	36.1	37.9	41.0	42.2	49.7	49.7	47.3	47.9	S	47.0	36.6	30.0	28.3	14.5	49.7	32.0	24
12	27.6	30.5	31.2	30.3	30.3	29.2	27.7	26.6	25.9	26.8	28.9	29.6	30.4	29.5	29.1	30.0	29.8	27.3	S	25.6	25.4	24.7	23.8	22.6	22.6	31.2	27.9	24
13	21.7	17.7	16.2	17.1	15.1	9.7	7.1	6.6	8.0	10.5	15.1	16.2	16.6	18.3	18.5	18.2	21.4	S	27.7	29.0	26.2	25.0	23.0	22.9	6.6	29.0	17.7	24
14	23.1	23.4	23.3	24.7	24.6	27.3	21.0	20.3	25.3	26.8	26.5	28.0	28.6	28.8	28.0	27.0	S	28.5	26.1	26.5	25.2	26.6	26.2	24.3	20.3	28.8	25.7	24
15	24.2	23.4	21.0	21.7	22.9	21.4	20.4	18.2	23.4	23.5	27.6	28.2	31.6	32.2	32.5	S	33.2	33.1	32.1	32.4	31.7	28.1	27.9	25.6	18.2	33.2	26.8	24
16	25.1	24.6	24.6	24.3	25.2	23.7	19.2	21.8	22.1	25.9	29.2	30.5	29.8	29.5	S	30.1	29.7	29.4	28.5	26.1	25.5	23.5	23.0	23.0	19.2	30.5	25.8	24
17	22.5	21.3	19.1	19.0	18.2	16.6	16.1	17.5	20.1	24.8	28.5	28.8	30.3	S	32.9	33.1	33.9	32.9	31.5	29.3	26.8	25.5	24.7	22.6	16.1	33.9	25.0	24
18	22.5	20.9	21.9	21.7	20.4	21.0	21.5	24.7	27.9	30.4	31.7	32.9	S	33.2	32.7	31.3	29.8	29.3	28.4	26.8	26.8	26.4	26.0	25.0	20.4	33.2	26.7	24
19	25.2	24.6	23.7	23.2	23.2	20.8	20.0	20.0	18.4	17.4	16.0	S	21.4	19.9	20.4	20.7	20.4	20.5	20.7	20.7	19.7	18.7	17.9	17.3	16.0	25.2	20.5	24
20	16.4	14.0	13.6	12.3	12.4	13.6	14.1	15.2	17.5	21.0	S	22.8	24.2	25.7	25.5	25.6	23.2	23.0	19.5	17.1	17.3	17.1	17.4	18.2	12.3	25.7	18.6	24
21	19.4	19.9	20.7	20.4	21.0	20.3	19.2	19.1	18.6	S	19.1	19.2	21.0	20.0	19.4	19.0	18.4	17.7	17.1	16.2	15.3	14.3	15.3	15.3	14.3	21.0	18.5	24
22	14.8	14.9	13.8	14.5	14.1	13.7	S1	S1	S	17.1	S1	S1	21.6	20.6	21.7	22.1	21.5	21.6	19.2	19.0	20.5	21.9	21.8	21.8	13.7	22.1	18.7	20
23	22.2	18.8	17.1	18.6	17.7	18.7	21.6	S	23.4	21.3	21.7	29.1	27.4	27.3	22.9	21.8	20.6	19.9	19.2	17.4	16.4	15.7	15.6	15.9	15.6	29.1	20.4	24
24	15.8	15.6	15.2	14.5	14.1	13.7	S	13.7	15.6	19.1	19.7	19.6	22.9	26.4	27.8	28.2	27.7	27.1	25.4	25.0	25.1	26.4	27.7	28.1	13.7	28.2	21.5	24
25	27.6	27.2	26.1	24.6	22.8	S	21.4	19.7	18.1	15.2	15.2	17.8	24.4	26.5	28.4	28.8	28.3	27.6	26.2	26.2	24.1	22.6	23.4	23.4	15.2	28.8	23.7	24
26	19.8	16.0	19.0	20.1	S	19.2	18.1	17.8	17.1	19.1	21.7	23.7	27.2	30.0	36.2	36.0	36.0	35.6	33.2	33.0	33.4	33.1	31.9	31.6	16.0	36.2	26.5	24
27	29.2	27.6	28.1	S	28.9	28.1	27.9	12.9	14.2	22.3	23.9	24.7	27.1	29.8	29.6	32.0	31.3	31.1	29.5	29.5	30.0	30.0	29.3	18.8	12.9	32.0	26.8	24
28	23.3	23.8	S	23.3	22.7	19.1	19.1	19.5	21.0	22.2	27.3	30.1	33.5	34.1	33.8	35.1	35.3	34.6	32.4	31.7	32.2	31.5	30.4	29.5	19.1	35.3	28.1	24
29	29.7	S	28.8	27.1	25.1	23.0	22.9	21.8	23.3	28.2	30.0	32.4	36.5	38.8	40.1	40.6	40.8	40.1	38.5	38.7	37.8	35.7	33.0	31.2	21.8	40.8	32.4	24
30	S	28.1	27.9	27.7	27.7	26.8	24.7	23.7	24.2	26.5	28.1	31.9	33.8	35.0	37.1	40.1	40.0	38.8	38.1	36.3	35.2	34.4	33.8	S	23.7	40.1	31.8	24
HOURLY MAX	47.9	54.9	51.7	51.9	51.3	53.3	54.9	53.7	52.0	53.4	60.3	62.5	63.6	63.6	64.0	55.4	54.0	63.6	61.9	60.0	56.8	56.4	55.7	55.6				
HOURLY AVG	24.3	23.8	24.5	24.4	24.2	23.3	22.2	21.4	23.5	25.6	28.4	30.1	31.0	32.0	33.1	32.2	32.0	32.3	31.4	30.1	29.7	28.5	27.6	25.3				

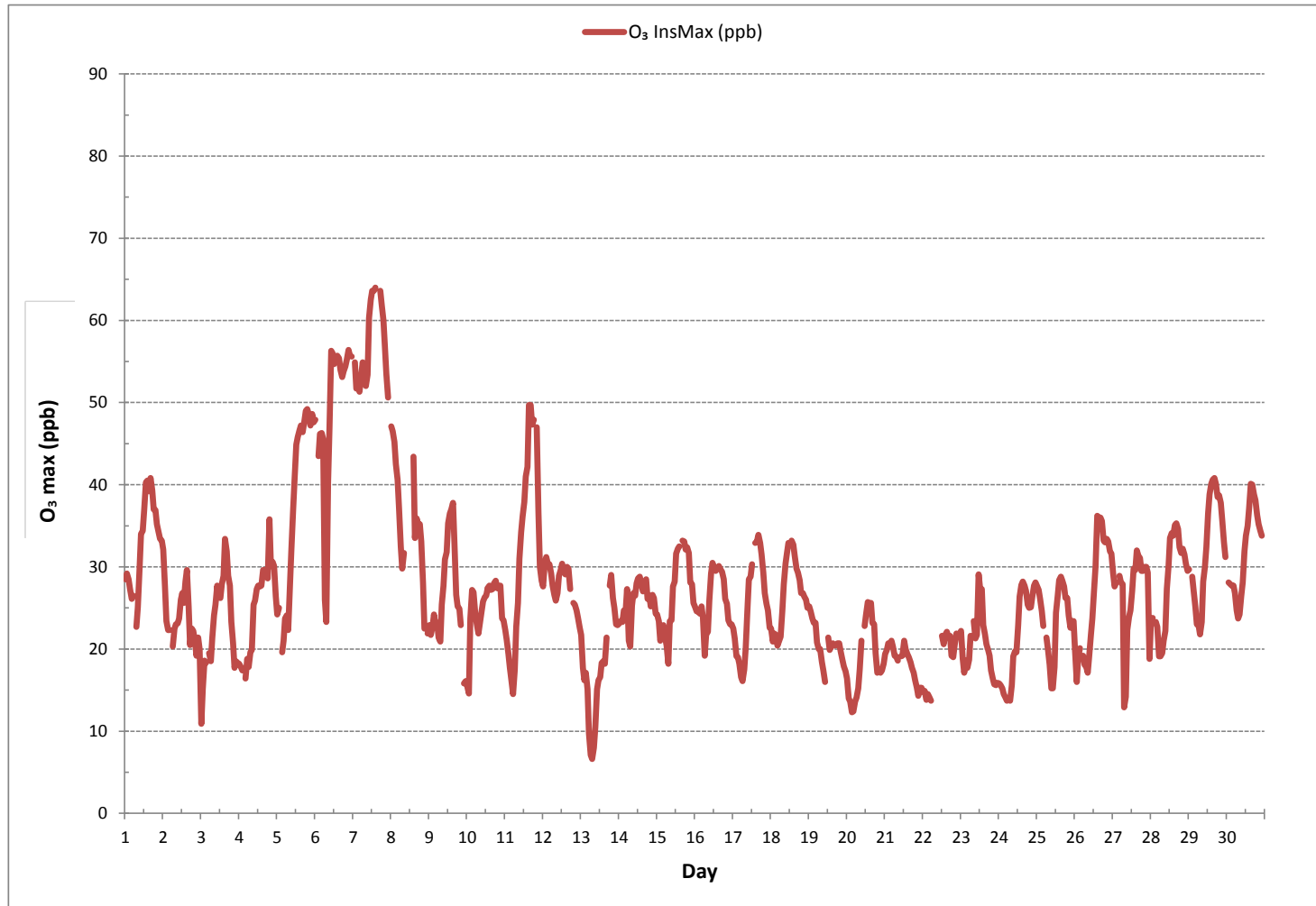
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	64.0 ppb @ HOUR 14 ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	10.0
OPERATIONAL TIME:	716 hrs

OZONE Instantaneous Maximum (O₃ ppb)



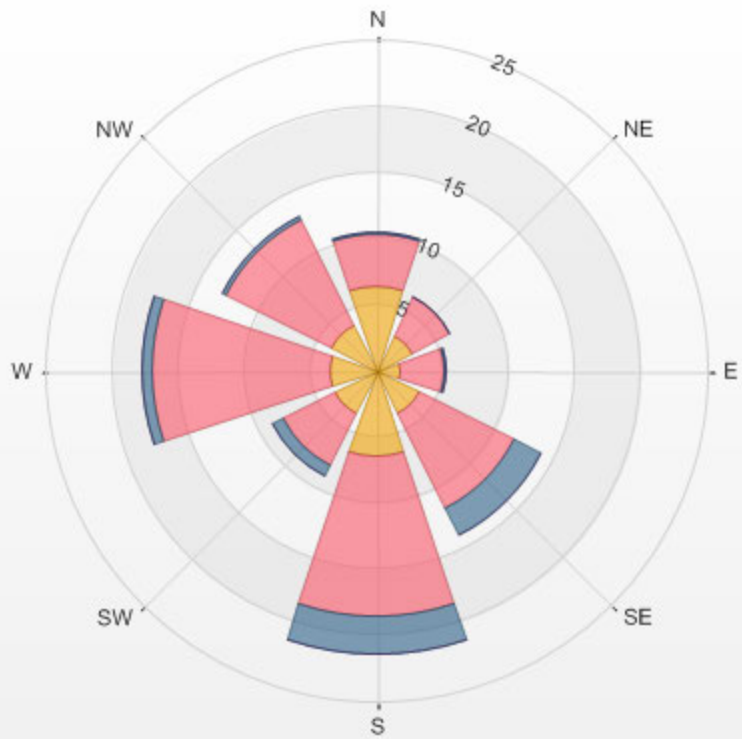
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-O3[ppb]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.10% Calm Avg: 31.98 [ppb]

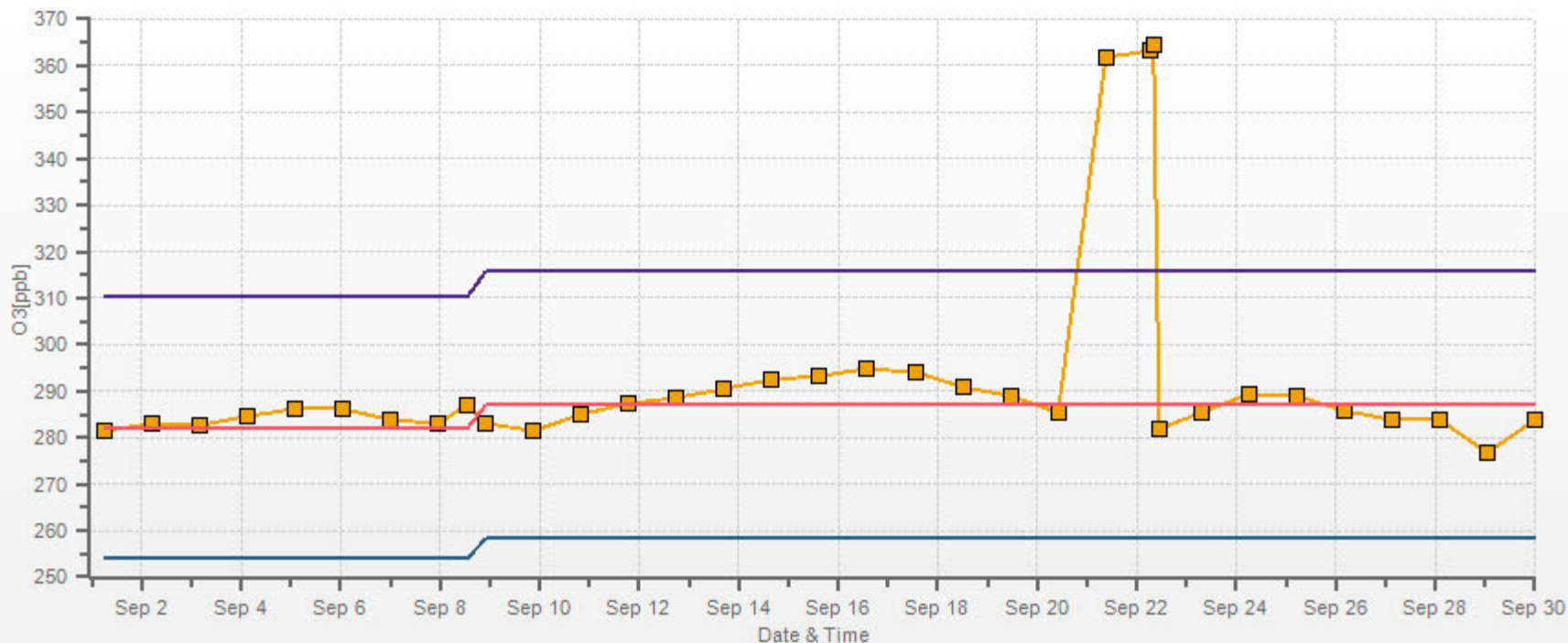
Direction	0.0-20.9	20.9-41.9	41.9-62.8	>62.8	Total
N	6.4	4.0	0.2	0.0	10.5
NE	3.0	3.3	0.0	0.0	6.2
E	1.8	3.4	0.2	0.0	5.3
SE	3.7	8.0	2.2	0.0	13.9
S	6.5	12.1	2.8	0.0	21.4
SW	3.6	4.4	0.9	0.0	8.9
W	3.6	13.4	0.7	0.0	17.7
NW	3.8	8.9	0.3	0.0	13.0
Summary	32.2	57.5	7.3	0.0	96.9

% Icon Classes (ppb)	32	0.0-20.9	57	20.9-41.9	7	41.9-62.8	0	>62.8
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LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.10% Calm Poll Avg: 31.98[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 17/09 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	3	2	2	2	2	2	2	2	2	2	2	3	6	8	12	30	34	33	36	40	39	36	31	22	2	40	15	24	
2	18	24	23	19	17	15	14	10	7	6	6	4	4	3	2	2	2	3	3	3	3	3	3	3	2	24	8	24	
3	4	5	4	3	4	4	4	4	3	3	2	3	3	3	3	3	3	3	3	4	4	3	4	4	2	5	3	24	
4	4	4	4	4	6	13	14	15	11	5	5	4	3	5	4	3	2	2	2	4	2	2	2	2	2	15	5	24	
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6	7	7	8	9	8	9	9	8	9	9	9	9	8	8	7	7	7	7	7	7	7	7	8	9	7	9	8	24	
7	9	9	10	9	10	11	11	12	13	14	14	15	15	15	16	15	15	16	16	16	16	14	13	13	12	9	16	13	24
8	11	10	11	11	12	13	13	14	14	10	11	13	17	C	13	9	8	9	13	16	27	46	48	47	8	48	17	24	
9	44	36	30	24	22	22	21	19	18	22	29	32	34	34	33	34	31	23	25	27	28	25	24	27	18	44	28	24	
10	28	26	17	4	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28	4	24	
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16	5	4	5	5	5	6	6	5	3	3	2	2	2	3	3	2	2	2	4	3	5	5	5	6	2	6	4	24	
17	8	9	11	14	15	15	14	12	11	10	6	5	4	3	3	3	4	5	4	4	3	3	3	3	3	15	7	24	
18	3	2	4	5	7	7	7	7	7	6	6	6	6	7	7	8	10	11	10	10	10	10	9	2	11	7	24		
19	8	7	7	7	6	6	7	8	9	7	7	6	3	3	2	2	2	1	1	1	1	2	3	2	1	9	5	24	
20	1	1	1	2	3	3	2	2	2	2	2	2	2	2	3	5	3	0	0	0	0	0	0	0	0	5	2	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2	2	2	2	2	2	0	24	
22	2	3	4	3	4	5	4	3	2	1	1	1	2	1	1	1	3	3	3	3	2	2	3	3	1	5	3	24	
23	3	4	4	4	4	4	4	2	3	5	7	10	9	8	4	3	3	X	X	X	X	X	X	X	2	10	5	17	
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	-	-	-	-	
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	
28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	3	4	4	3	4	4	3	
29	4	4	4	4	4	4	4	4	3	4	3	4	4	4	4	4	5	5	5	11	9	6	6	6	3	11	5	24	
30	6	6	6	6	5	4	3	3	3	4	4	4	4	4	3	2	1	2	2	2	2	2	2	2	1	6	3	24	
HOURLY MAX	44	36	30	24	22	22	21	19	18	22	29	32	34	34	33	34	34	33	36	40	39	46	48	47					
HOURLY AVG	7	7	7	6	6	6	6	6	6	5	5	6	6	6	6	6	6	6	7	7	7	8	8	7					

STATUS FLAG CODES

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

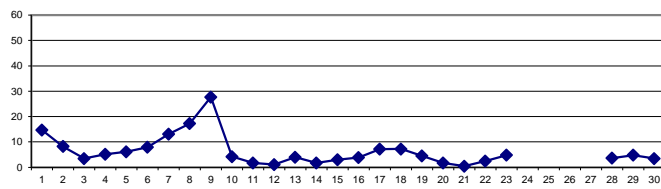
OBJECTIVE LIMIT:

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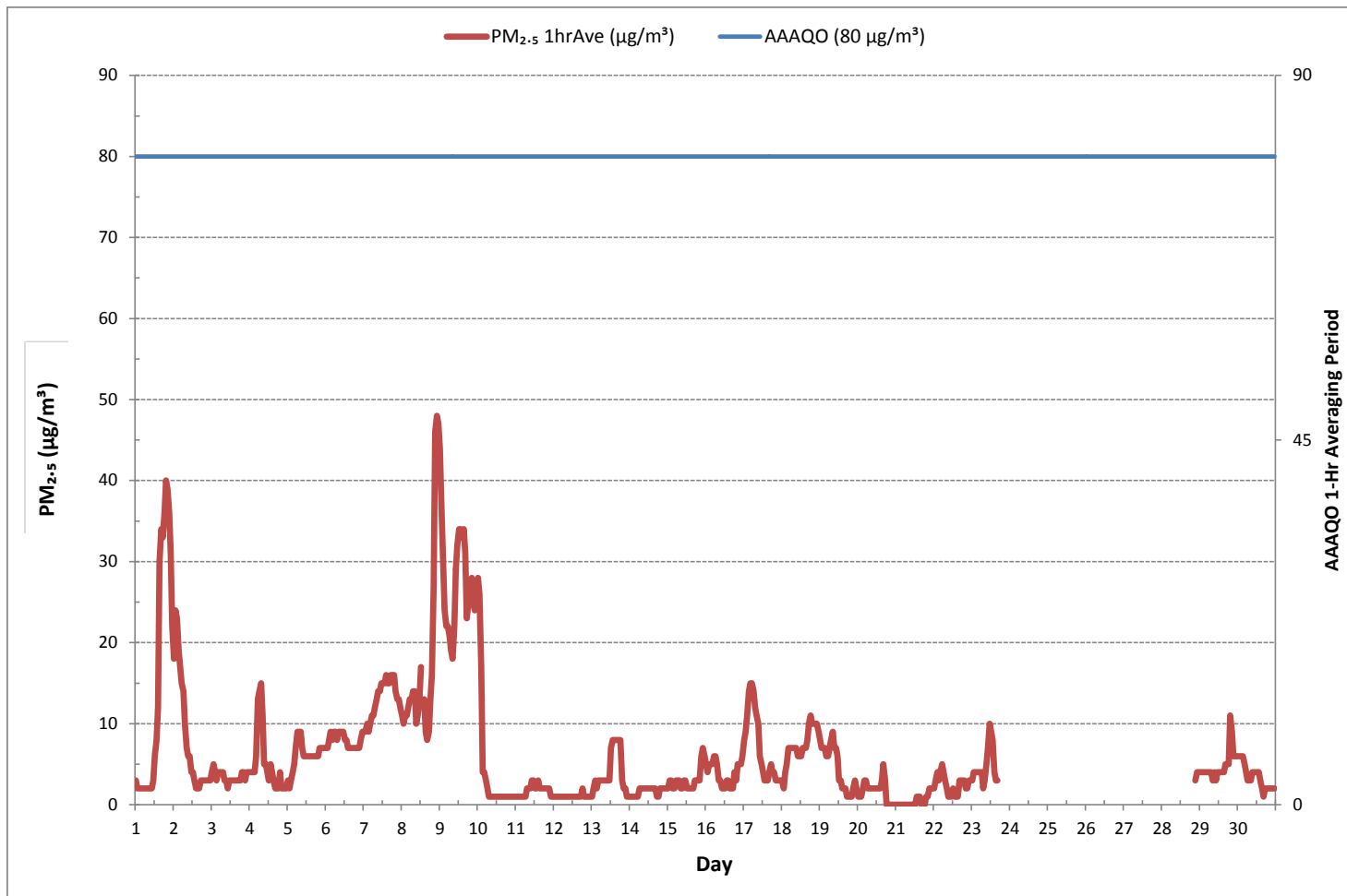
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	573			
MINIMUM 1-HR AVERAGE:	0 µg/m ³	@ HOUR	18	ON DAY
MAXIMUM 1-HR AVERAGE:	48 µg/m ³	@ HOUR	22	ON DAY
MAXIMUM 24-HR AVERAGE:	28 µg/m ³			ON DAY
OPERATIONAL TIME:				596 hrs
MONTHLY CALIBRATION TIME:	1	hrs	AMD OPERATION UPTIME:	82.8 %
STANDARD DEVIATION:	8		MONTHLY AVERAGE:	6 µg/m ³

24 HR AVERAGES September 2017



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









Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3(L)]
 Monthly: 17/09
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

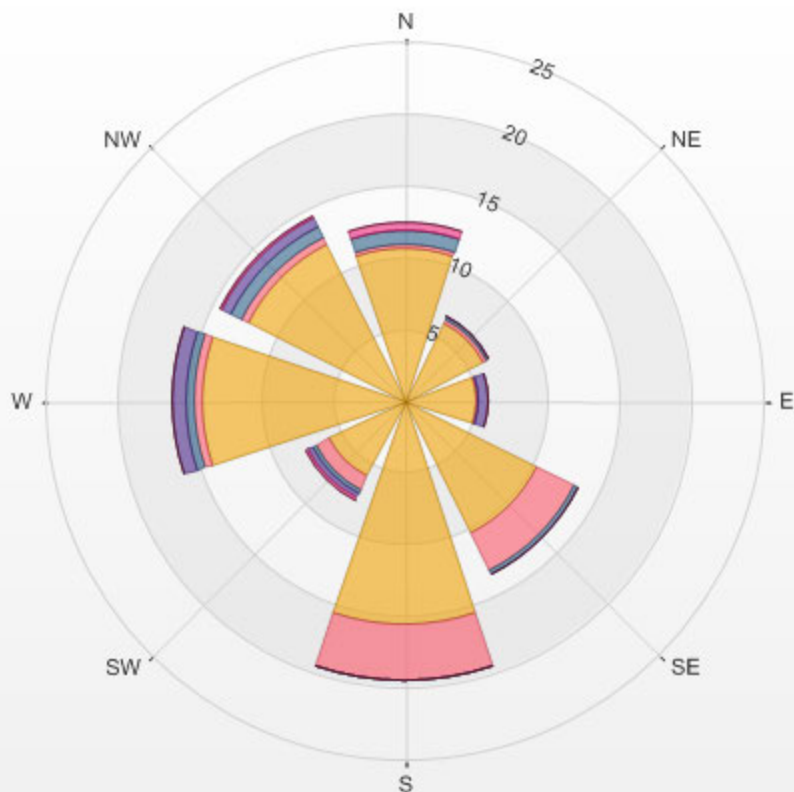
Calm: 3.70%

Calm Avg: 4.54 [ug/m3(L)]

Direction	0.0-9.8	9.8-19.6	19.6-29.4	29.4-39.2	39.2-49.0	>49.0	Total
N	10.6	0.3	1.0	0.0	0.5	0.0	12.5
NE	6.1	0.3	0.2	0.0	0.0	0.0	6.6
E	5.1	0.2	0.0	0.7	0.0	0.0	5.9
SE	10.3	3.0	0.2	0.0	0.0	0.0	13.5
S	15.7	3.9	0.0	0.0	0.0	0.0	19.5
SW	5.9	1.0	0.3	0.3	0.2	0.0	7.8
W	14.1	0.5	0.7	0.8	0.0	0.0	16.2
NW	12.1	0.7	0.8	0.7	0.2	0.0	14.5
Summary	79.8	9.9	3.2	2.5	0.9	0.0	96.3

% Icon	Classes (ug/m3(L))	80	 0.0-9.8	10	 9.8-19.6	3	 19.6-29.4	3	 29.4-39.2	1	 39.2-49.0	0	 >49.0
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LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.70% Calm Poll Avg: 4.54[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	9.7	9.9	10.5	11.6	11.7	10.6	12.4	11.3	10.1	12.4	14.9	19.0	20.2	25.0	22.9	22.0	25.8	20.7	16.0	17.0	14.2	12.5	8.9	8.2	8.2	25.8	14.7	24	
2	8.4	7.2	7.7	8.0	10.2	10.3	9.2	10.0	9.8	9.3	7.9	8.5	6.4	5.0	3.0	0.6	5.7	7.7	3.8	4.4	3.9	3.9	4.5	5.3	0.6	10.3	4.4	24	
3	6.7	7.5	6.8	8.0	10.9	10.5	7.5	7.6	8.7	8.7	10.2	14.4	16.9	15.9	18.5	12.2	6.0	9.6	7.7	9.2	8.8	9.3	10.9	12.0	6.0	18.5	9.7	24	
4	11.2	8.5	8.1	8.7	7.4	9.0	8.1	6.6	5.9	5.0	5.8	6.5	8.1	6.9	8.8	8.0	7.2	5.1	3.7	3.8	4.0	2.5	4.0	7.9	2.5	11.2	5.3	24	
5	8.3	8.5	8.5	9.4	10.1	10.0	8.8	8.5	8.4	6.8	8.9	8.8	8.4	8.7	9.8	8.3	8.7	5.2	2.7	0.9	5.8	8.1	6.7	6.7	0.9	10.1	6.5	24	
6	6.9	5.4	5.8	5.4	6.3	6.0	4.8	3.5	2.4	2.4	1.2	3.2	2.2	0.5	0.9	1.7	1.4	0.6	4.1	5.6	4.2	3.8	5.0	7.3	0.5	7.3	1.9	24	
7	8.5	8.2	8.8	9.7	8.7	8.4	10.2	10.0	9.1	9.6	10.6	11.7	11.3	11.1	11.3	11.5	10.3	9.1	10.2	12.8	12.8	13.2	11.5	12.9	8.2	13.2	10.2	24	
8	13.1	13.6	13.6	14.4	12.1	14.4	13.8	14.3	11.3	8.9	7.2	8.5	6.7	6.0	8.7	10.3	8.8	6.8	7.5	6.9	8.2	8.7	10.9	9.2	6.0	14.4	3.1	24	
9	8.5	13.2	10.1	10.8	10.6	8.2	6.8	1.3	3.2	2.7	2.5	3.9	4.2	5.1	3.4	3.3	9.5	9.2	6.8	5.6	2.8	6.5	7.5	6.5	1.3	13.2	4.5	24	
10	6.5	14.0	16.3	17.7	16.4	12.4	14.3	19.4	20.3	22.9	25.7	26.9	27.5	26.6	25.7	24.4	23.4	17.7	14.8	10.7	11.5	9.3	8.3	7.8	6.5	27.5	17.2	24	
11	7.5	7.2	7.0	8.9	9.0	6.4	10.1	12.7	12.9	11.0	11.2	12.2	13.5	13.0	12.6	13.3	8.4	3.4	1.3	0.8	8.0	11.6	6.3	8.4	0.8	13.5	6.7	24	
12	9.3	10.2	9.7	9.6	8.1	8.4	9.8	10.3	12.4	12.0	11.9	9.7	9.9	8.9	6.9	6.9	6.5	5.1	4.2	5.3	5.1	5.4	5.2	5.4	4.2	12.4	7.9	24	
13	4.5	9.5	10.8	10.9	6.6	5.5	6.4	8.3	7.6	6.7	7.4	6.6	9.0	9.0	7.9	7.6	7.9	7.1	7.4	6.8	5.5	4.9	3.6	4.7	3.6	10.9	6.9	24	
14	6.6	6.3	5.1	5.1	4.7	2.3	2.5	1.6	0.8	1.7	3.6	1.5	1.9	2.5	9.6	10.5	2.8	4.4	4.0	5.5	5.8	4.1	6.0	6.1	0.8	10.5	3.4	24	
15	5.2	6.5	5.2	2.7	4.7	6.0	5.7	3.8	3.1	2.5	2.5	1.4	3.1	3.2	3.9	2.0	3.5	2.4	2.9	5.5	7.2	8.7	9.4	9.6	1.4	9.6	1.5	24	
16	9.0	8.6	8.3	8.8	9.1	8.9	9.0	7.5	7.1	7.3	12.6	13.3	14.2	12.4	12.3	11.5	12.0	10.9	8.9	10.7	10.5	9.8	9.1	9.2	7.1	14.2	9.8	24	
17	8.9	8.6	8.8	9.4	9.1	8.9	8.9	10.0	12.4	13.0	16.2	16.9	15.1	15.6	15.6	14.9	14.9	11.1	9.6	11.3	12.7	13.4	12.4	12.1	8.6	16.9	11.6	24	
18	11.0	10.8	11.7	10.8	11.6	11.4	9.4	11.9	17.3	19.7	19.4	16.0	16.4	14.9	15.3	14.5	13.2	14.3	12.1	13.0	14.7	15.3	14.5	13.7	9.4	19.7	13.2	24	
19	14.4	13.5	13.1	12.7	13.2	11.1	11.4	13.2	11.2	11.0	7.8	9.7	9.4	9.8	11.3	12.0	11.4	8.2	6.5	8.8	6.9	6.1	3.3	1.3	1.3	14.4	3.5	24	
20	1.9	3.2	2.6	2.9	3.2	2.4	3.1	2.2	2.8	3.5	4.9	5.7	4.7	5.8	4.9	6.2	8.0	7.1	12.5	11.8	12.1	10.7	10.0	10.7	1.9	12.5	3.8	24	
21	9.9	10.1	10.3	9.8	11.7	12.2	10.6	11.2	11.4	10.8	10.9	10.2	12.9	11.6	11.7	10.6	9.7	10.3	8.8	8.5	8.5	8.5	8.0	7.6	7.6	12.9	10.2	24	
22	6.4	5.9	6.4	5.5	3.7	2.0	2.0	2.1	3.6	4.2	3.2	3.8	2.0	2.1	2.3	0.6	3.1	2.1	1.3	1.8	1.0	1.6	2.4	2.1	0.6	6.4	1.8	24	
23	1.9	2.8	3.4	2.7	4.7	5.1	4.1	2.7	2.9	4.4	3.3	3.5	4.7	4.4	4.8	4.1	5.0	5.1	6.5	6.7	6.9	7.1	7.6	7.4	1.9	7.6	4.4	24	
24	8.4	10.3	9.8	9.4	10.5	11.1	11.5	10.9	11.0	12.1	13.4	13.1	13.6	14.1	12.7	10.5	11.2	9.6	8.9	10.0	9.8	9.2	9.8	10.9	8.4	14.1	10.7	24	
25	10.6	9.2	8.1	8.2	8.1	8.2	7.8	9.3	8.4	9.1	7.5	10.5	13.2	19.5	18.8	10.9	6.1	2.9	4.4	4.4	5.3	4.9	3.7	5.8	2.9	19.5	7.8	24	
26	7.1	7.2	8.4	8.5	8.4	9.1	9.3	9.0	10.2	10.8	13.3	13.6	12.7	12.4	14.0	13.1	10.8	9.7	7.0	7.3	8.1	6.5	7.0	5.9	5.9	14.0	8.9	24	
27	6.8	7.2	8.5	8.0	4.2	3.8	5.0	6.0	6.4	6.7	8.0	7.9	10.5	11.8	9.5	10.4	6.9	4.7	4.0	5.3	5.0	4.2	6.5	8.2	3.8	11.8	3.7	24	
28	8.5	7.8	8.6	7.9	5.4	7.5	8.3	7.8	7.8	8.1	9.5	10.0	12.2	12.4	12.8	12.7	13.3	11.3	12.1	13.0	12.7	14.8	14.8	13.9	5.4	14.8	10.1	24	
29	14.8	14.9	13.7	10.6	12.0	12.0	12.6	11.2	11.0	11.4	13.9	14.0	13.7	18.9	18.3	16.2	11.9	8.2	8.7	8.8	9.6	9.8	10.1	10.5	8.2	18.9	12.2	24	
30	10.0	9.4	10.0	10.0	10.1	10.4	7.6	6.0	6.3	7.0	10.2	12.1	11.8	12.9	11.5	11.2	12.3	10.2	14.5	15.8	15.3	14.8	12.6	12.8	6.0	15.8	6.0	24	
HOURLY MAX	14.8	14.9	16.3	17.7	16.4	14.4	14.3	19.4	20.3	22.9	25.7	26.9	27.5	26.6	25.7	24.4	25.8	20.7	16.0	17.0	15.3	15.3	14.8	13.9					
HOURLY AVG	2.2	2.3	2.8	2.2	2.0	2.3	3.0	3.0	3.1	3.0	3.6	4.0	4.4	5.0	5.2	4.0	2.7	1.3	0.1	0.3	0.3	0.7	1.1	1.5					

STATUS FLAG CODES

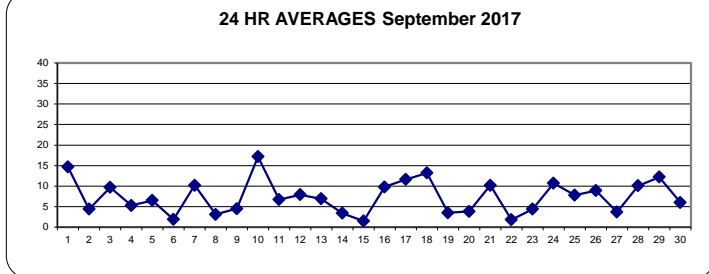
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

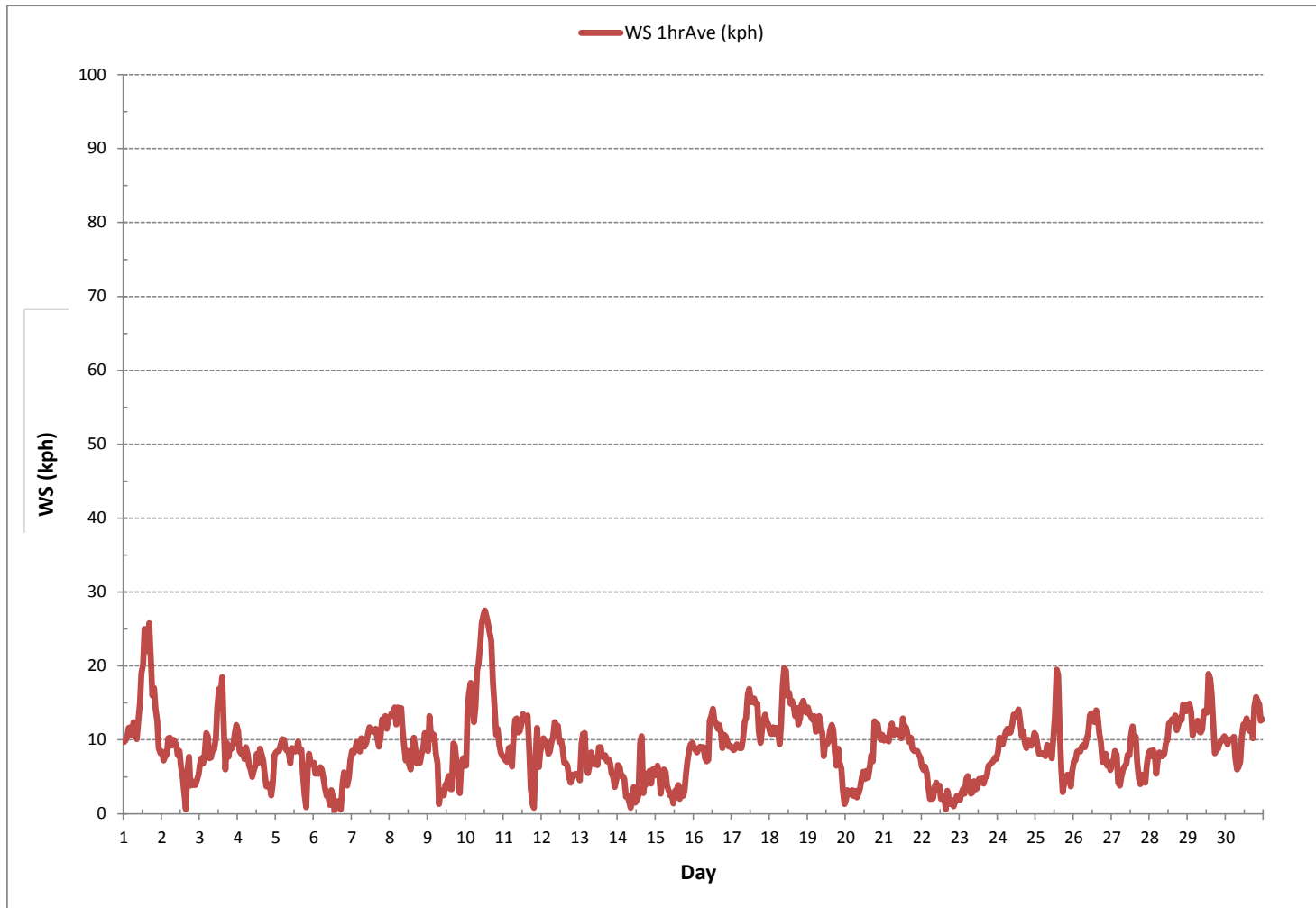
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.5 kph @ HOUR 13 ON DAY 6
MAXIMUM 1-HR AVERAGE:	27.5 kph @ HOUR 12 ON DAY 10
MAXIMUM 24-HR AVERAGE:	17.2 kph ON DAY 10
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.4
MONTHLY AVERAGE:	2.4 kph

24 HR AVERAGES September 2017



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

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	18.1	18.4	20.8	20.5	23.1	20.3	21.8	17.1	27.0	34.7	46.5	50.7	47.1	57.2	48.9	52.3	59.6	54.3	30.9	29.3	26.6	21.9	18.6	16.6	16.6	59.6	32.6	24
2	17.5	13.8	13.3	13.3	17.3	17.0	13.6	24.1	18.2	15.7	15.4	16.6	14.3	10.1	9.2	8.6	13.8	23.4	10.9	9.3	14.6	12.8	11.6	12.9	8.6	24.1	14.5	24
3	15.1	18.4	15.7	19.0	35.2	31.7	18.6	19.7	20.4	19.3	20.4	28.5	32.9	46.9	47.8	45.1	20.3	20.7	15.7	13.5	15.7	18.6	24.7	28.9	13.5	47.8	24.7	24
4	25.6	22.7	18.5	21.2	17.7	19.4	16.8	19.0	13.8	15.8	20.4	21.3	24.8	26.7	23.7	22.6	20.4	15.8	11.6	5.5	5.2	3.8	8.1	12.1	3.8	26.7	17.2	24
5	12.3	13.4	14.7	15.1	17.1	22.3	16.0	19.7	19.8	17.2	22.0	31.0	25.5	24.0	22.6	25.3	25.3	15.2	5.2	7.7	9.7	10.4	9.9	9.5	5.2	31.0	17.1	24
6	9.3	7.9	7.3	8.6	9.4	9.3	7.2	7.3	12.1	11.5	11.1	10.7	12.2	11.8	11.6	8.0	14.8	10.2	5.5	7.1	6.7	5.2	6.0	10.4	5.2	14.8	9.2	24
7	12.8	10.6	13.4	14.5	13.4	13.8	17.5	19.6	26.6	25.8	28.4	31.0	32.1	33.5	29.5	30.6	25.0	21.4	22.7	25.0	29.2	37.7	26.6	28.3	10.6	37.7	23.7	24
8	27.9	29.7	32.9	30.9	26.7	34.2	35.1	38.1	29.4	23.1	21.4	22.8	22.7	18.0	22.4	23.3	27.7	17.8	20.8	27.8	23.4	27.8	31.6	26.1	17.8	38.1	26.7	24
9	22.1	32.8	23.2	31.3	36.1	21.9	15.5	7.0	11.8	11.2	10.4	13.2	15.5	15.0	12.2	9.9	35.1	31.3	21.5	16.4	13.1	15.7	19.9	18.6	7.0	36.1	19.2	24
10	17.3	26.3	49.0	53.6	43.3	31.1	40.7	50.4	51.9	61.7	63.9	73.5	70.3	67.2	64.7	75.3	60.2	54.1	42.3	23.2	35.7	25.4	14.5	15.1	14.5	75.3	46.3	24
11	16.0	12.7	11.2	17.3	18.8	14.6	21.4	29.5	28.9	31.2	26.6	33.2	33.2	33.0	32.5	34.0	29.9	10.6	3.6	5.1	19.6	36.8	30.9	19.7	3.6	36.8	22.9	24
12	26.9	28.3	25.2	21.5	20.1	24.1	19.9	28.7	30.3	32.0	26.3	24.8	26.7	22.8	20.6	16.5	17.1	12.5	10.5	11.1	9.0	11.4	10.3	14.2	9.0	32.0	20.5	24
13	11.6	22.9	24.9	28.7	16.7	14.0	17.2	19.5	22.0	19.9	22.1	19.0	26.6	23.8	21.4	19.4	22.2	21.0	28.2	22.0	14.0	11.4	7.9	8.5	7.9	28.7	19.4	24
14	10.4	10.2	10.0	8.7	9.3	5.2	9.1	6.5	6.4	10.3	16.9	10.3	8.2	14.2	40.5	28.9	17.0	14.2	8.5	11.3	10.1	11.1	10.2	10.3	5.2	40.5	12.4	24
15	10.0	12.0	10.7	7.1	7.6	8.0	9.2	8.3	7.5	9.9	13.2	12.0	16.9	15.2	17.4	10.1	9.6	6.4	6.8	8.3	14.4	14.2	17.1	14.2	6.4	17.4	11.1	24
16	13.8	12.9	12.2	14.0	15.5	16.1	15.3	14.4	17.7	27.6	33.1	42.1	37.5	32.8	34.2	30.0	32.8	28.9	19.4	21.0	25.1	20.3	19.7	22.1	12.2	42.1	23.3	24
17	20.6	19.1	17.3	18.4	22.0	19.7	19.0	30.2	30.2	35.7	41.2	41.4	40.1	42.5	40.1	41.6	37.4	33.5	23.6	23.2	32.8	27.8	25.2	24.9	17.3	42.5	29.5	24
18	22.7	21.2	22.0	21.2	31.5	38.5	24.9	45.1	42.5	56.1	55.7	49.7	50.6	57.4	55.9	49.7	44.0	46.4	35.9	33.0	42.7	37.9	40.5	32.2	21.2	57.4	39.9	24
19	44.7	30.0	28.7	38.3	42.0	27.3	29.8	42.5	30.2	33.7	24.5	27.6	30.0	30.4	30.2	24.7	28.4	21.8	17.7	23.4	17.5	16.9	11.1	3.9	3.9	44.7	27.3	24
20	5.7	7.2	6.5	7.2	8.1	7.6	6.8	6.1	9.2	12.2	17.3	16.6	17.5	17.5	14.9	23.3	20.5	20.9	34.1	31.7	34.7	33.2	31.0	35.2	5.7	35.2	17.7	24
21	30.6	31.0	37.4	30.4	37.3	36.7	31.9	34.7	36.5	35.0	34.1	34.1	43.3	34.8	36.5	30.8	32.3	34.5	28.0	23.8	22.3	25.1	19.0	21.4	19.0	43.3	31.7	24
22	26.4	15.7	14.9	14.6	12.0	7.8	7.0	6.7	11.8	12.7	10.7	22.3	9.8	9.4	7.9	7.3	11.3	7.2	8.3	8.5	4.3	4.0	4.8	4.8	4.0	26.4	10.4	24
23	4.1	5.0	14.8	5.3	15.9	17.7	15.3	12.2	18.8	11.5	10.3	12.9	13.3	15.1	15.5	13.5	14.0	13.5	13.3	14.6	17.9	16.2	19.1	16.4	4.1	19.1	13.6	24
24	25.6	27.6	31.3	24.9	23.4	30.6	30.4	25.3	28.4	35.7	35.0	33.9	36.1	36.3	34.4	28.2	33.7	23.6	20.4	26.9	26.2	23.4	23.7	25.4	20.4	36.3	28.8	24
25	26.9	20.4	16.2	17.1	17.5	24.3	16.0	18.4	17.5	18.4	17.1	22.4	38.8	41.0	41.9	35.1	14.9	10.1	7.2	8.6	9.9	13.4	13.8	11.8	7.2	41.9	19.9	24
26	11.8	11.4	16.4	14.7	16.8	22.7	15.5	16.9	22.4	24.8	34.0	31.6	34.2	33.6	34.2	32.0	30.9	24.4	17.6	16.0	16.4	13.6	13.3	10.3	10.3	34.2	21.5	24
27	8.6	11.4	14.7	17.3	10.9	6.8	9.2	9.8	11.4	19.1	21.5	24.2	28.1	32.3	26.4	32.4	27.0	18.8	7.5	9.0	7.1	8.8	12.5	15.2	6.8	32.4	16.3	24
28	17.1	16.5	14.7	12.7	10.3	14.7	16.4	17.5	22.8	25.1	23.3	31.4	37.0	36.2	36.0	36.2	30.7	26.1	31.3	30.4	32.8	35.2	40.0	33.5	10.3	40.0	26.2	24
29	39.2	42.0	37.2	22.8	28.6	28.4	32.6	27.6	31.6	32.0	38.6	37.5	36.0	51.1	46.5	40.4	40.1	25.5	18.2	16.9	17.8	18.6	16.6	24.7	16.6	51.1	31.3	24
30	25.6	23.6	23.2	16.2	16.6	24.0	16.1	16.1	14.8	22.8	28.2	35.1	32.0	37.5	37.1	34.2	33.7	33.5	41.3	39.8	38.7	35.4	29.1	31.1	14.8	41.3	28.6	24
HOURLY MAX	44.7	42.0	49.0	53.6	43.3	38.5	40.7	50.4	51.9	61.7	63.9	73.5	70.3	67.2	64.7	75.3	60.2	54.3	42.3	39.8	42.7	37.9	40.5	35.2				
HOURLY AVG	19.2	19.2	19.9	19.5	20.7	20.3	18.9	21.3	22.4	24.7	26.3	28.7	29.8	30.9	30.6	29.0	27.7	23.3	19.0	18.3	19.8	19.8	18.9	18.6				

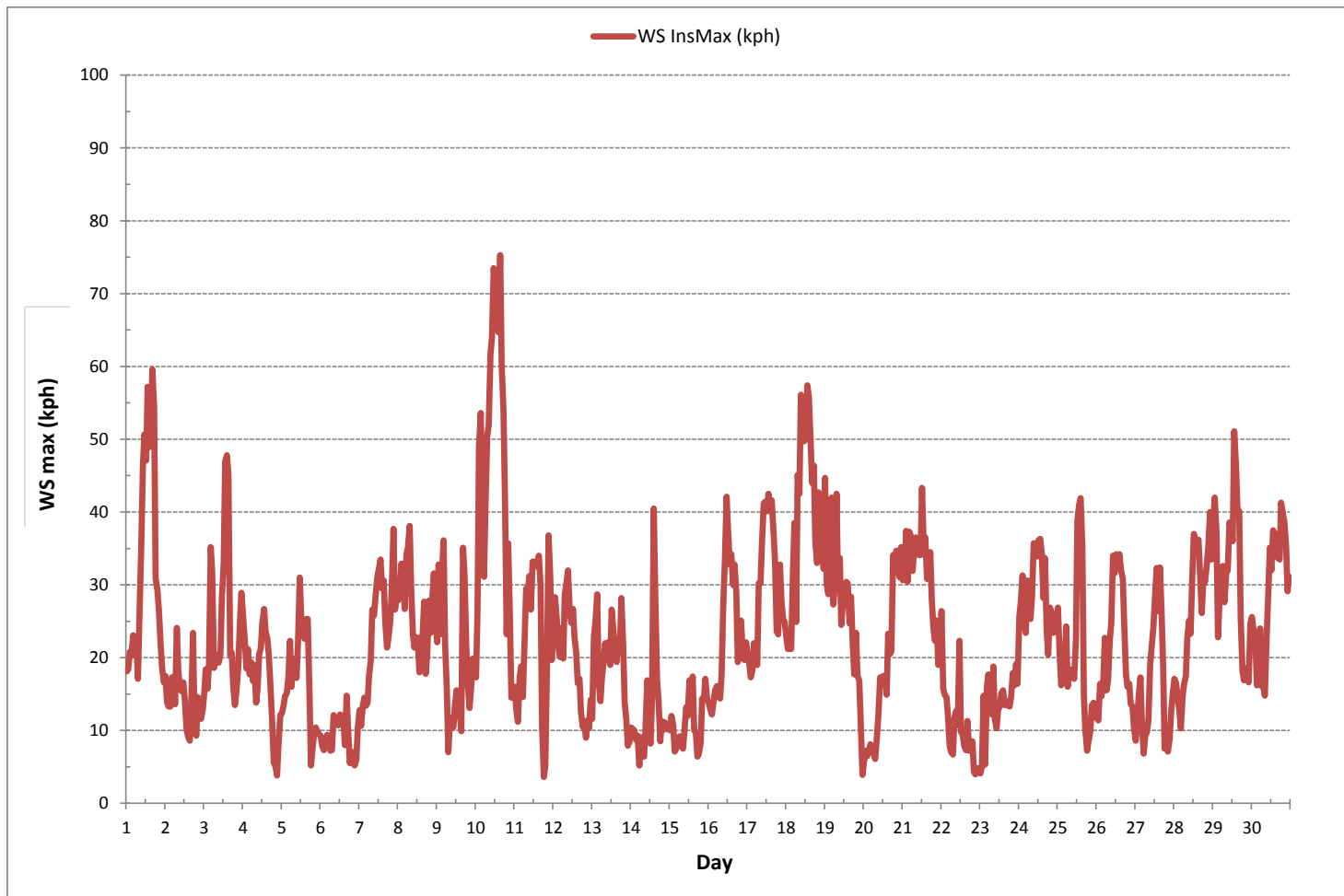
STATUS FLAG CODES

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:	75.3	kph	@ HOUR	15	ON DAY	10	
OPERATIONAL TIME:						720	hrs

WIND SPEED Instantaneous Maximum (WS kph)



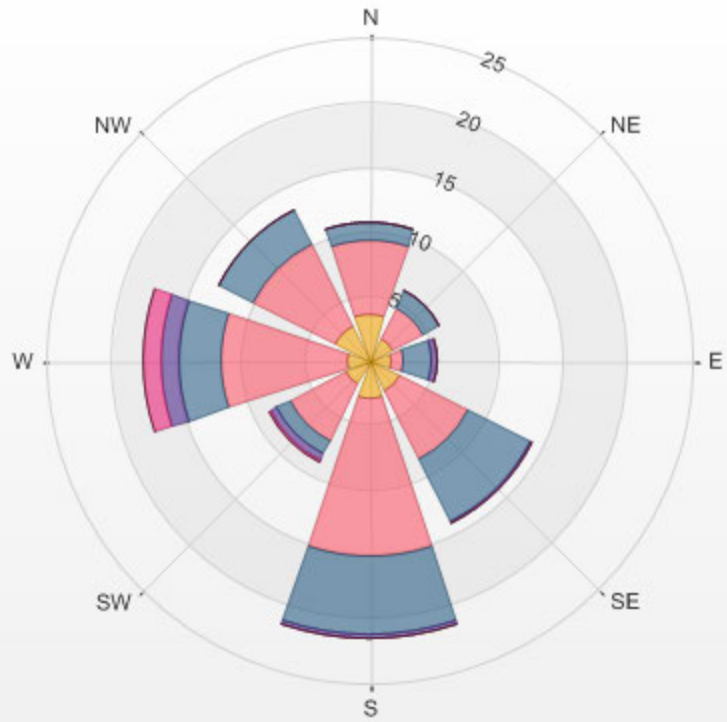
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 17/09
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 3.06%

Direction	1.8-5.5	5.5-11.0	11.0-16.6	16.6-22.1	22.1-27.6	>27.6	Total
N	3.6	5.8	1.3	0.0	0.0	0.0	10.7
NE	1.9	2.6	1.5	0.0	0.0	0.0	6.1
E	1.7	1.0	2.2	0.4	0.0	0.0	5.3
SE	2.6	5.8	5.4	0.1	0.0	0.0	14.0
S	2.9	12.2	6.1	0.3	0.0	0.0	21.5
SW	2.1	4.9	1.1	0.6	0.1	0.0	8.8
W	1.8	9.7	3.3	1.3	1.4	0.0	17.5
NW	3.1	7.1	2.9	0.0	0.0	0.0	13.1
Summary	19.7	49.2	23.9	2.7	1.5	0.0	97.0

% Icon Classes (kph) 20 1.8-5.5 49 5.5-11.0 24 11.0-16.6 3 16.6-22.1 2 22.1-27.6 0 >27.6

LICA ST. LINA 2017/09/01 00:00 - 2017/09/30 23:00 Calm: 3.06% Calm Wind Avg Speed: 1.18(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

WIND DIRECTION Hourly Averages (WD)

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

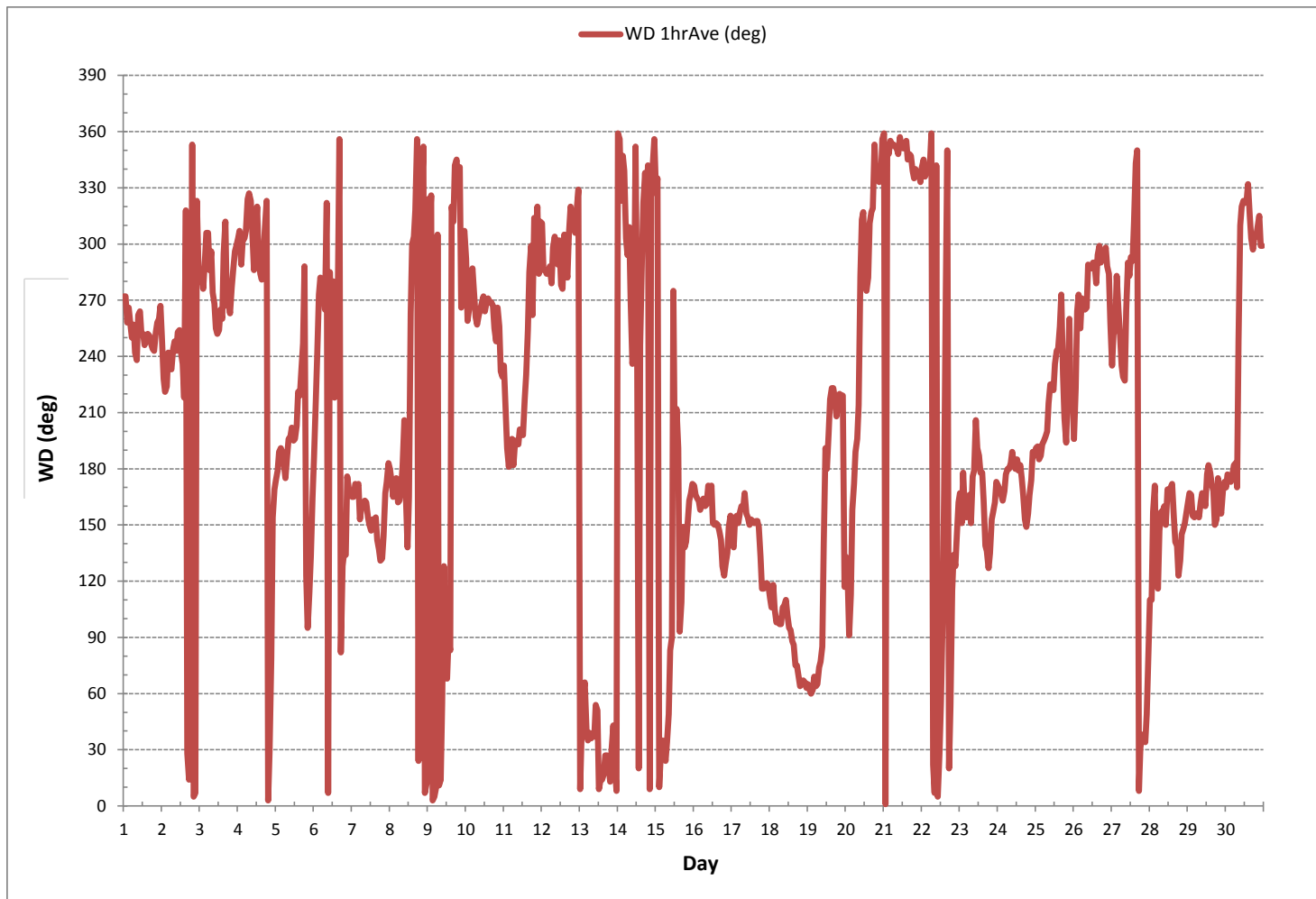
STATUS FLAG CODES

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:	221 (SW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - September 2017

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	10	10	7	10	7	7	9	6	12	18	19	13	15	14	12	12	11	10	9	9	9	10	9	15	24
2	11	9	8	6	6	6	5	9	9	9	12	15	16	13	21	39	15	15	20	18	35	26	16	15	24
3	14	14	14	17	18	17	17	19	20	21	17	15	14	18	13	23	24	12	10	6	10	12	14	14	24
4	14	14	12	15	15	12	12	15	18	29	33	37	28	38	33	27	22	25	10	5	4	4	9	6	24
5	5	6	6	7	7	9	11	14	18	19	19	23	29	20	21	22	16	12	15	27	6	4	6	4	24
6	4	4	4	7	7	5	9	10	32	41	46	34	43	62	60	46	48	32	5	3	7	6	4	4	24
7	5	4	6	7	6	7	10	12	15	17	18	21	21	23	20	18	17	14	11	13	15	14	10	9	24
8	10	10	10	10	9	13	13	13	16	20	24	23	22	20	19	16	17	25	17	32	18	21	16	14	24
9	13	14	13	17	16	18	14	40	35	36	42	32	28	24	30	20	15	19	19	25	27	20	23	19	24
10	21	11	14	16	18	15	14	12	15	17	17	18	15	17	18	17	17	15	9	7	13	20	8	11	24
11	9	9	7	10	12	12	11	14	16	18	20	18	18	19	17	15	21	12	19	29	11	17	18	13	24
12	16	16	16	18	17	16	13	17	18	19	20	20	26	25	20	22	18	14	15	10	9	10	10	11	24
13	11	13	13	14	16	13	14	14	15	17	19	23	19	17	22	18	18	17	18	16	15	12	11	8	24
14	7	8	11	9	10	11	28	29	36	58	46	66	53	45	25	21	38	22	11	11	8	18	9	8	24
15	9	7	8	30	8	4	6	12	22	42	46	63	60	58	38	53	9	15	15	9	8	7	9	7	24
16	7	7	7	7	9	8	9	13	18	25	22	23	23	19	18	19	20	18	12	12	13	14	15	14	24
17	13	13	12	13	15	14	12	16	17	20	19	20	21	21	20	21	18	18	12	11	13	13	13	12	24
18	11	12	11	12	14	14	15	16	16	17	17	18	19	20	19	19	18	17	15	13	14	14	14	14	24
19	14	14	14	15	15	15	16	16	16	16	21	18	20	17	16	15	15	16	17	17	15	14	22	16	24
20	15	14	13	13	15	12	14	23	23	24	30	29	34	29	28	30	16	19	18	17	17	20	18	19	24
21	20	19	19	24	19	18	19	19	19	22	19	22	20	21	20	23	19	19	18	16	18	22	18	17	24
22	18	18	17	22	19	29	19	19	23	24	28	27	48	32	31	34	19	16	19	16	19	17	8	7	24
23	8	14	13	12	10	11	10	13	22	21	33	39	23	28	25	27	17	15	11	13	15	15	16	14	24
24	13	13	13	13	11	11	12	13	15	16	17	17	16	17	18	17	15	16	17	16	16	13	13	13	24
25	12	14	13	12	14	15	13	14	13	12	17	16	18	13	13	19	15	11	8	10	8	17	21	16	24
26	12	7	9	9	7	9	7	9	14	19	18	20	20	24	19	20	18	16	11	10	12	12	10	8	24
27	5	5	5	15	17	13	9	5	11	19	26	28	23	24	22	21	23	16	9	7	4	7	8	10	24
28	10	10	9	7	16	8	11	14	16	19	21	23	24	25	21	20	17	15	12	15	18	17	17	16	24
29	16	16	15	15	16	16	16	18	19	20	19	20	19	17	18	18	17	15	11	10	10	11	9	9	24
30	11	10	10	9	8	9	10	19	18	22	19	17	18	19	21	19	18	16	16	16	15	15	16	15	24

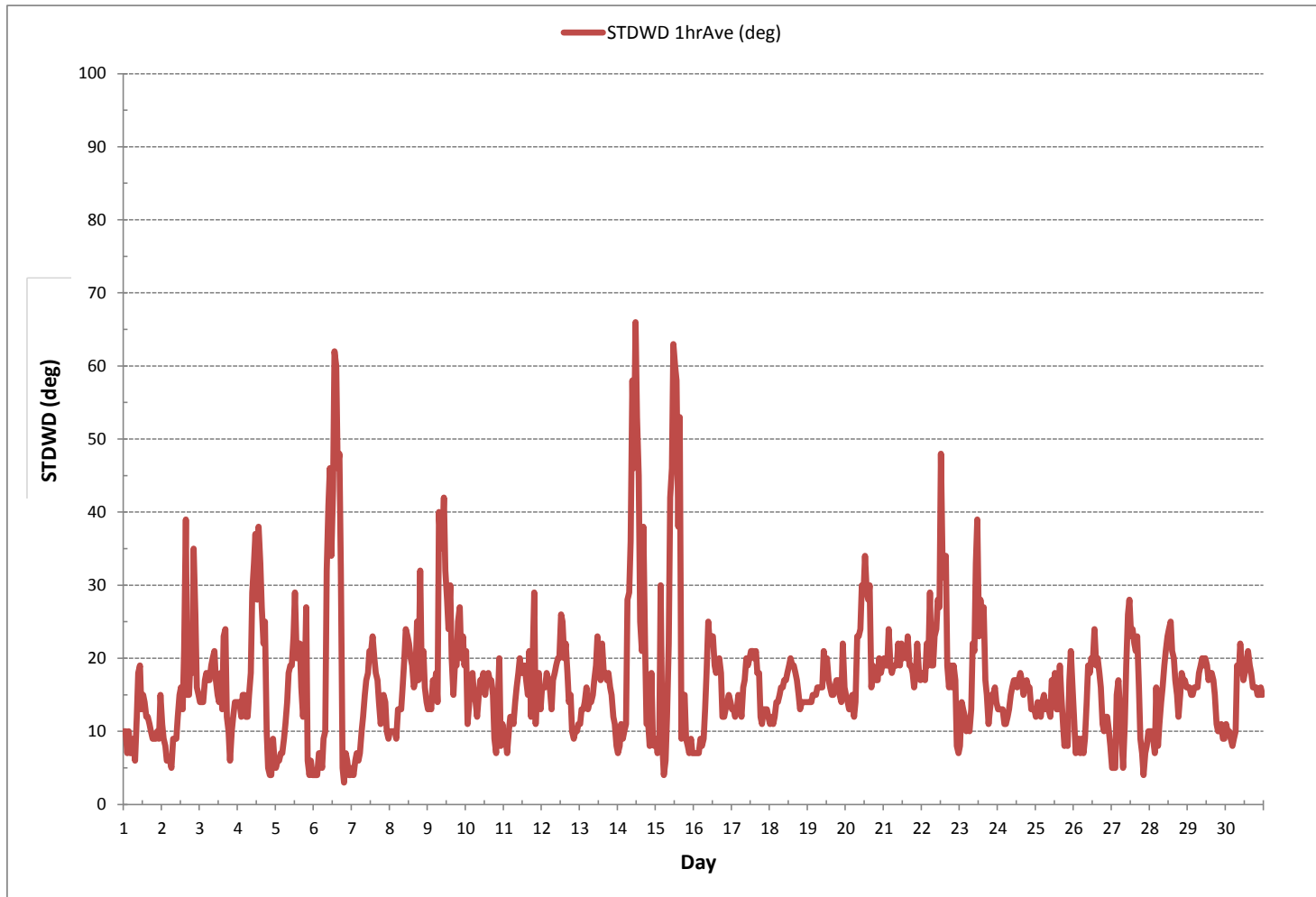
STATUS FLAG CODES

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

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



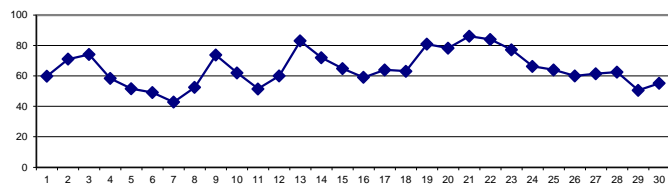
RELATIVE HUMIDITY Hourly Averages (RH %)

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

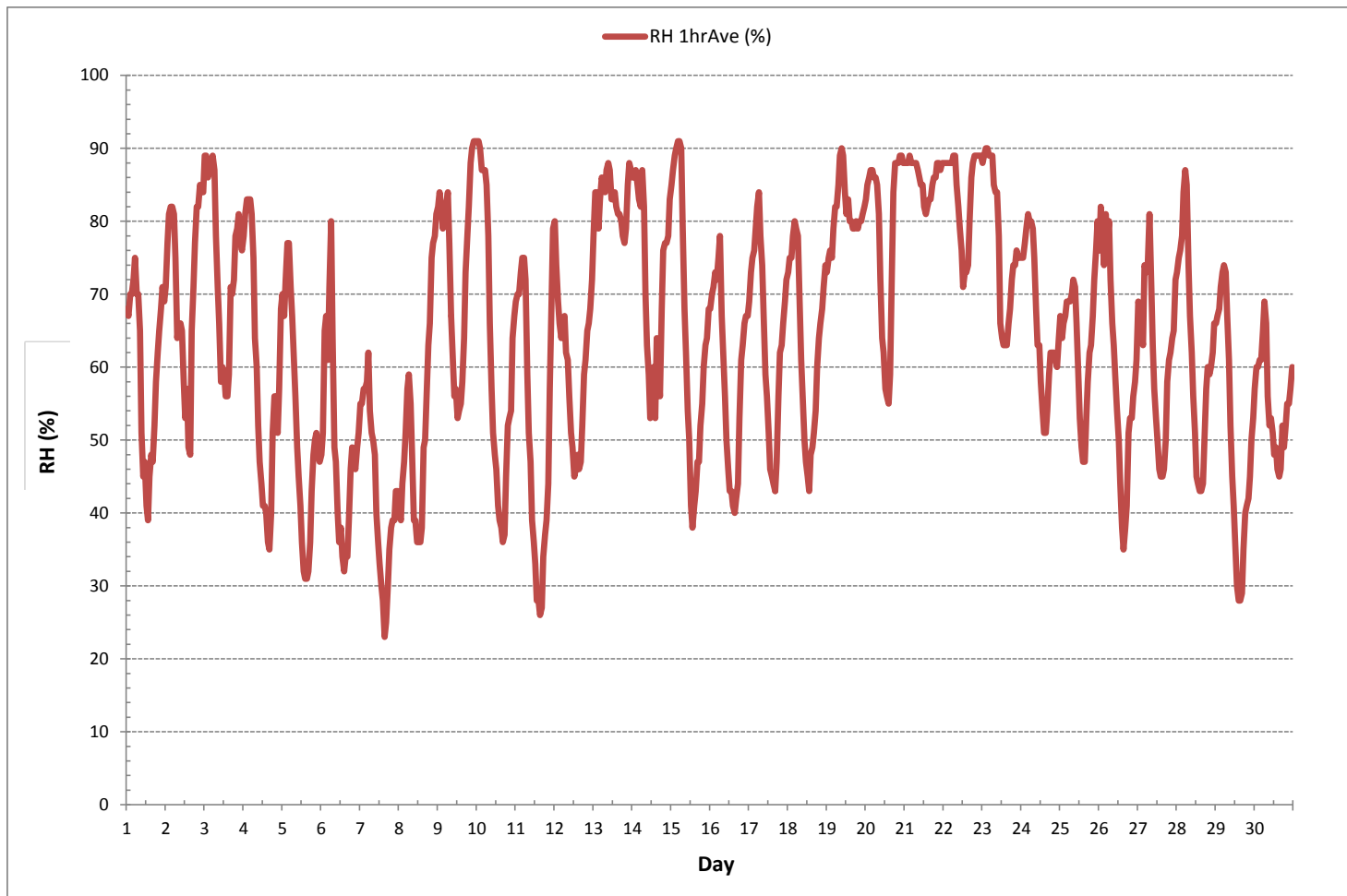
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	23	%	@ HOUR	15	ON DAY	7
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR	22	ON DAY	9
MAXIMUM 24-HR AVERAGE:	86	%			ON DAY	21
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	17				MONTHLY AVERAGE:	65 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



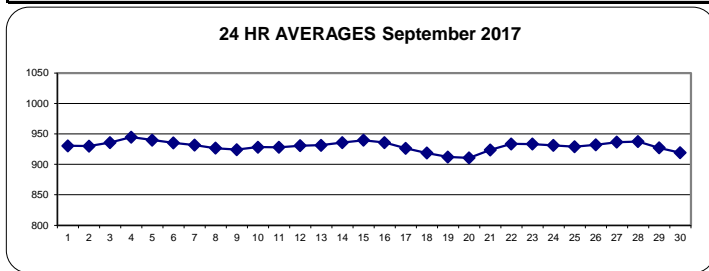
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	929	929	929	929	929	929	930	930	931	932	932	932	932	932	931	931	931	931	931	930	930	930	930	930	930	929	932	930	24				
2	930	930	930	930	930	930	930	931	931	931	931	931	931	931	930	930	929	930	929	929	929	929	929	929	929	929	931	930	24				
3	930	931	931	932	932	933	933	935	935	936	937	937	937	937	938	938	937	937	937	938	938	939	939	940	940	930	940	936	24				
4	941	941	942	942	943	943	944	945	946	947	947	947	947	947	947	947	947	947	946	944	944	943	943	943	941	947	945	24					
5	942	942	942	941	941	941	940	941	941	941	941	941	941	941	941	940	940	939	937	937	936	936	936	936	936	936	942	940	24				
6	936	935	935	935	935	934	934	934	935	937	937	937	937	937	937	937	937	936	935	934	934	934	934	934	934	934	937	936	24				
7	933	933	933	933	933	932	932	932	933	933	934	934	934	933	933	933	932	931	931	930	929	929	928	928	928	934	932	24					
8	928	928	927	927	926	926	925	925	926	928	928	927	927	928	928	928	928	926	926	926	926	926	925	925	925	925	928	927	24				
9	925	925	925	924	924	924	925	924	925	925	926	926	925	925	925	925	925	924	923	922	922	922	922	922	922	922	926	924	24				
10	922	923	923	924	925	926	926	926	927	928	928	929	930	930	931	932	932	932	932	932	931	931	931	931	930	922	932	928	24				
11	930	930	930	930	929	929	928	928	928	928	928	928	927	928	928	928	927	926	926	927	927	927	927	927	927	926	930	928	24				
12	928	928	928	929	930	930	930	931	931	932	932	932	932	932	932	932	932	932	932	931	931	931	931	930	928	933	931	24					
13	930	930	930	930	930	930	930	930	931	931	931	932	932	932	932	932	932	932	933	933	933	933	933	933	933	930	933	932	24				
14	933	933	933	933	934	934	934	935	935	936	937	937	937	937	937	937	936	937	937	937	937	937	937	937	937	933	937	936	24				
15	937	937	937	938	938	938	939	939	940	941	942	942	943	943	943	941	940	940	939	939	939	939	939	938	937	937	943	940	24				
16	938	938	937	937	937	936	936	937	937	938	938	938	938	937	936	936	935	935	934	933	932	932	931	931	931	931	938	936	24				
17	930	929	929	928	928	928	927	927	928	928	928	928	928	927	927	926	926	925	924	923	923	922	921	921	921	930	927	24					
18	921	920	920	920	919	919	919	919	920	920	920	920	920	920	920	919	919	919	918	917	916	916	915	915	915	915	921	919	24				
19	914	914	913	913	913	912	912	912	912	911	912	912	912	912	912	912	912	912	912	912	912	911	911	911	911	911	914	912	24				
20	911	910	910	910	909	909	909	909	909	909	909	910	910	911	911	912	912	912	912	913	913	914	914	914	909	914	911	24					
21	915	916	916	917	918	918	919	920	921	922	923	924	924	925	926	927	928	928	929	930	931	931	932	932	915	932	924	24					
22	933	933	932	933	934	934	934	934	934	935	935	935	935	935	934	934	934	934	933	934	933	933	933	932	932	935	934	24					
23	932	932	933	933	932	932	932	933	933	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	932	934	933	24					
24	933	933	933	932	932	932	931	931	932	932	932	932	932	932	932	931	931	931	930	930	929	929	928	928	928	933	931	24					
25	928	928	928	928	928	928	928	928	928	929	929	930	930	930	930	930	930	930	930	930	930	930	929	929	928	930	929	24					
26	929	929	930	930	930	930	930	931	932	932	933	933	934	934	934	934	935	934	934	934	934	934	934	934	929	935	932	24					
27	934	934	934	934	934	934	934	935	935	936	937	937	938	938	938	939	939	938	938	938	938	938	938	938	934	939	937	24					
28	938	939	939	938	938	938	938	938	939	940	940	940	940	939	939	939	938	937	936	935	935	934	934	933	933	940	938	24					
29	933	932	931	931	930	929	928	928	928	928	928	928	928	928	927	927	926	925	924	924	923	922	921	921	921	933	927	24					
30	920	920	919	919	918	918	917	918	919	919	919	920	919	919	920	920	920	919	920	920	920	920	920	920	917	920	919	24					
HOURLY MAX	942	942	942	942	943	943	944	945	946	947	947	947	947	947	947	947	947	947	946	944	944	943	943	943									
HOURLY AVG	929	929	929	929	929	929	929	930	930	931	931	931	931	931	931	931	931	931	930	930	930	930	929	929									

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

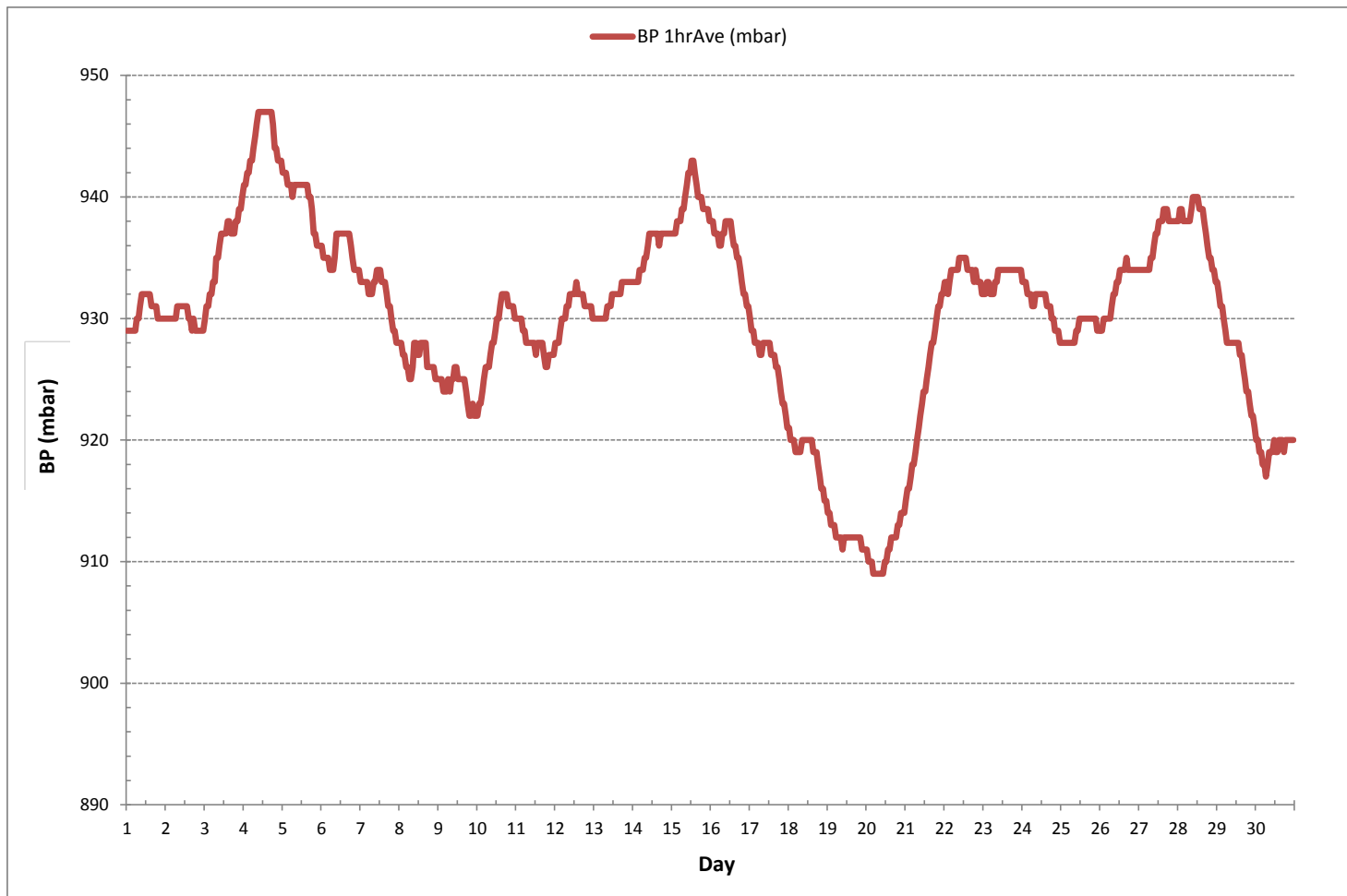
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	909	mbar	@ HOUR	4	ON DAY	20
MAXIMUM 1-HR AVERAGE:	947	mbar	@ HOUR	9	ON DAY	4
MAXIMUM 24-HR AVERAGE:	945	mbar			ON DAY	4
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	8				MONTHLY AVERAGE:	930 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

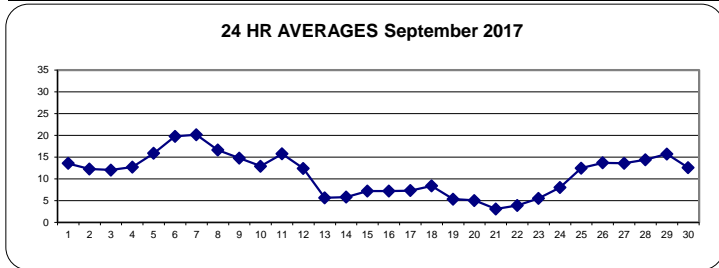


AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	10.7	10.2	9.0	8.9	8.1	7.3	8.7	9.7	11.9	16.5	18.5	18.3	19.7	20.0	17.9	17.6	17.8	16.9	15.6	13.9	12.9	12.3	11.3	11.4	7.3	20.0	13.5	24
2	10.6	9.2	8.1	7.3	6.9	6.9	8.5	12.9	12.8	13.1	13.8	15.9	17.7	16.8	18.6	18.3	15.4	14.0	12.3	11.5	11.1	10.4	10.6	10.7	6.9	18.6	12.2	24
3	10.2	9.9	9.7	9.5	9.7	8.8	9.0	11.3	13.2	14.7	16.6	16.1	16.5	16.8	16.9	15.0	12.4	12.4	11.8	10.2	9.9	9.5	9.5	9.0	8.8	16.9	12.0	24
4	8.4	7.4	6.5	6.2	5.5	5.7	7.1	11.1	13.4	15.9	17.0	17.8	18.4	19.0	18.9	18.9	18.9	17.5	14.5	12.3	11.6	12.1	11.2	9.4	5.5	19.0	12.7	24
5	9.0	9.2	8.3	7.2	6.7	7.2	8.0	9.9	12.6	16.1	18.5	20.3	22.2	23.6	24.7	25.2	25.1	23.6	20.0	18.0	17.2	16.2	16.3	16.5	6.7	25.2	15.9	24
6	15.9	14.7	12.7	12.1	12.8	11.4	11.3	16.4	21.0	23.3	24.9	26.0	25.4	26.6	26.9	26.8	26.7	24.7	20.9	19.6	19.4	19.5	18.7	17.3	11.3	26.9	19.8	24
7	15.8	15.6	14.9	14.7	14.3	12.9	14.5	16.8	18.6	20.5	22.9	24.5	25.8	27.0	27.5	27.9	27.5	25.5	22.8	20.9	19.8	19.1	17.3	16.3	12.9	27.9	20.1	24
8	16.0	15.8	14.7	13.9	12.5	11.7	11.8	13.3	16.2	19.2	19.6	21.9	22.9	24.2	23.4	20.4	18.6	16.2	15.2	15.0	14.6	14.4	14.1	13.4	11.7	24.2	16.6	24
9	12.9	11.4	10.7	10.9	10.4	9.9	9.3	11.4	14.7	16.5	18.6	19.7	21.6	21.3	21.0	20.7	18.9	15.8	14.5	13.8	13.0	12.7	12.5	12.4	9.3	21.6	14.8	24
10	12.2	12.1	12.0	11.5	10.8	10.3	9.7	10.6	12.5	13.7	14.6	15.3	16.2	17.0	17.1	17.2	17.1	16.3	14.0	11.6	11.0	10.8	8.2	7.6	7.6	17.2	12.9	24
11	7.0	6.7	6.9	5.9	5.7	6.0	6.3	9.8	12.8	15.7	19.3	20.8	22.3	24.8	25.9	26.0	25.4	22.8	20.9	20.0	19.5	17.6	15.7	14.3	5.7	26.0	15.8	24
12	13.6	13.1	12.5	12.2	11.5	10.7	10.1	12.0	12.4	13.6	14.1	14.2	15.5	15.4	14.9	14.8	14.3	13.2	11.5	10.7	9.9	9.8	9.1	8.4	8.4	15.5	12.4	24
13	7.4	5.8	6.1	6.9	6.1	5.1	5.4	5.6	5.5	6.1	7.1	8.4	8.1	7.2	7.3	7.0	6.1	5.5	5.0	4.5	4.0	2.3	1.4	1.5	1.4	8.4	5.6	24
14	1.6	1.5	0.9	1.6	2.4	2.6	2.2	4.3	7.1	8.9	9.7	11.3	9.8	9.2	11.4	9.1	9.3	9.1	7.1	5.3	4.4	3.3	3.6	3.0	0.9	11.4	5.8	24
15	2.5	2.4	2.0	1.5	1.8	1.7	1.8	5.1	8.7	10.5	11.9	12.5	14.3	14.2	12.9	12.1	9.8	10.1	8.9	7.5	6.4	5.4	4.9	4.1	1.5	14.3	7.2	24
16	3.7	3.2	3.1	2.8	2.8	2.2	1.7	5.2	7.9	10.4	11.6	11.9	12.5	11.3	11.3	11.7	11.5	10.6	8.5	7.1	6.4	5.6	5.0	4.7	1.7	12.5	7.2	24
17	4.1	3.4	2.8	2.5	2.3	1.8	1.7	3.7	5.9	8.5	10.3	11.2	12.3	12.9	13.1	13.1	12.7	11.6	9.4	7.8	7.1	6.3	5.6	4.9	1.7	13.1	7.3	24
18	4.3	3.5	3.5	2.9	2.4	2.4	2.6	5.3	8.7	10.2	12.2	13.9	14.5	15.4	13.8	14.2	13.7	11.8	9.9	8.4	8.0	7.2	6.4	5.9	2.4	15.4	8.4	24
19	6.0	5.5	5.6	6.4	6.6	6.3	6.4	6.3	6.1	6.5	6.7	7.1	6.7	5.5	5.5	4.9	4.1	4.0	3.8	3.9	3.5	3.5	3.4	3.1	3.1	7.1	5.3	24
20	3.1	3.0	3.0	2.9	2.9	2.8	2.4	2.9	4.1	6.0	7.2	8.0	9.2	8.9	9.4	9.0	7.1	5.8	4.7	4.2	3.7	3.4	3.4	3.2	2.4	9.4	5.0	24
21	2.7	2.4	2.0	2.0	1.9	1.8	1.7	1.7	2.1	2.7	3.6	3.9	4.5	4.6	4.4	4.3	4.2	3.9	3.5	3.3	3.1	2.9	2.9	2.9	1.7	4.6	3.0	24
22	2.8	2.8	2.6	2.6	2.6	2.7	2.7	2.9	3.7	4.4	4.9	5.4	6.5	6.0	5.8	5.6	4.9	4.3	3.7	3.5	3.4	3.4	3.2	3.0	2.6	6.5	3.9	24
23	3.1	3.0	2.9	2.9	2.8	2.7	2.6	3.7	4.3	4.6	6.1	7.5	7.5	7.8	8.3	8.5	8.2	7.6	6.8	6.3	6.2	6.1	6.0	2.6	8.5	5.5	24	
24	5.9	5.8	5.4	4.6	4.0	4.0	3.9	4.2	5.5	7.5	8.5	9.0	9.8	10.7	11.6	11.9	11.5	10.9	10.1	9.9	9.7	9.5	9.5	8.9	3.9	11.9	8.0	24
25	8.4	8.6	8.3	8.1	8.0	8.0	7.9	8.2	8.9	11.0	13.8	16.4	18.1	18.7	19.1	18.6	16.5	15.3	14.3	14.0	13.2	12.4	11.7	11.2	7.9	19.1	12.4	24
26	11.1	10.0	10.3	10.8	9.5	10.1	9.3	11.3	13.5	14.9	16.0	17.2	18.3	19.4	19.8	19.7	18.7	16.5	13.9	12.8	12.4	11.8	10.9	10.1	9.3	19.8	13.7	24
27	8.4	8.6	9.1	10.0	8.9	9.1	8.9	9.1	12.1	15.7	17.5	18.9	19.3	19.7	20.0	19.2	19.1	17.0	13.9	13.2	12.5	12.0	12.4	11.6	8.4	20.0	13.6	24
28	11.4	10.9	10.5	10.0	8.4	7.8	8.5	11.1	13.5	15.8	17.3	18.5	19.6	20.1	20.5	20.4	19.8	17.8	15.6	14.5	14.3	13.6	13.0	12.2	7.8	20.5	14.4	24
29	12.0	11.6	11.1	10.3	9.4	8.8	8.7	10.2	12.3	15.3	17.7	19.5	21.9	23.2	23.5	23.6	23.0	20.8	18.4	17.3	16.7	15.2	13.6	12.4	8.7	23.6	15.7	24
30	11.1	10.2	9.6	9.1	8.8	7.8	6.9	8.1	11.7	14.1	16.3	17.3	18.5	18.0	18.7	18.1	17.2	14.4	12.9	11.7	10.8	10.9	10.2	9.7	6.9	18.7	12.6	24
HOURLY MAX	16.0	15.8	14.9	14.7	14.3	12.9	14.5	16.8	21.0	23.3	24.9	26.0	25.8	27.0	27.5	27.9	27.5	25.5	22.8	20.9	19.8	19.5	18.7	17.3				
HOURLY AVG	8.4	7.9	7.5	7.3	6.9	6.6	6.7	8.5	10.5	12.4	13.9	15.0	15.9	16.2	16.3	16.0	15.2	13.9	12.1	11.1	10.5	10.0	9.4	8.8				

STATUS FLAG CODES

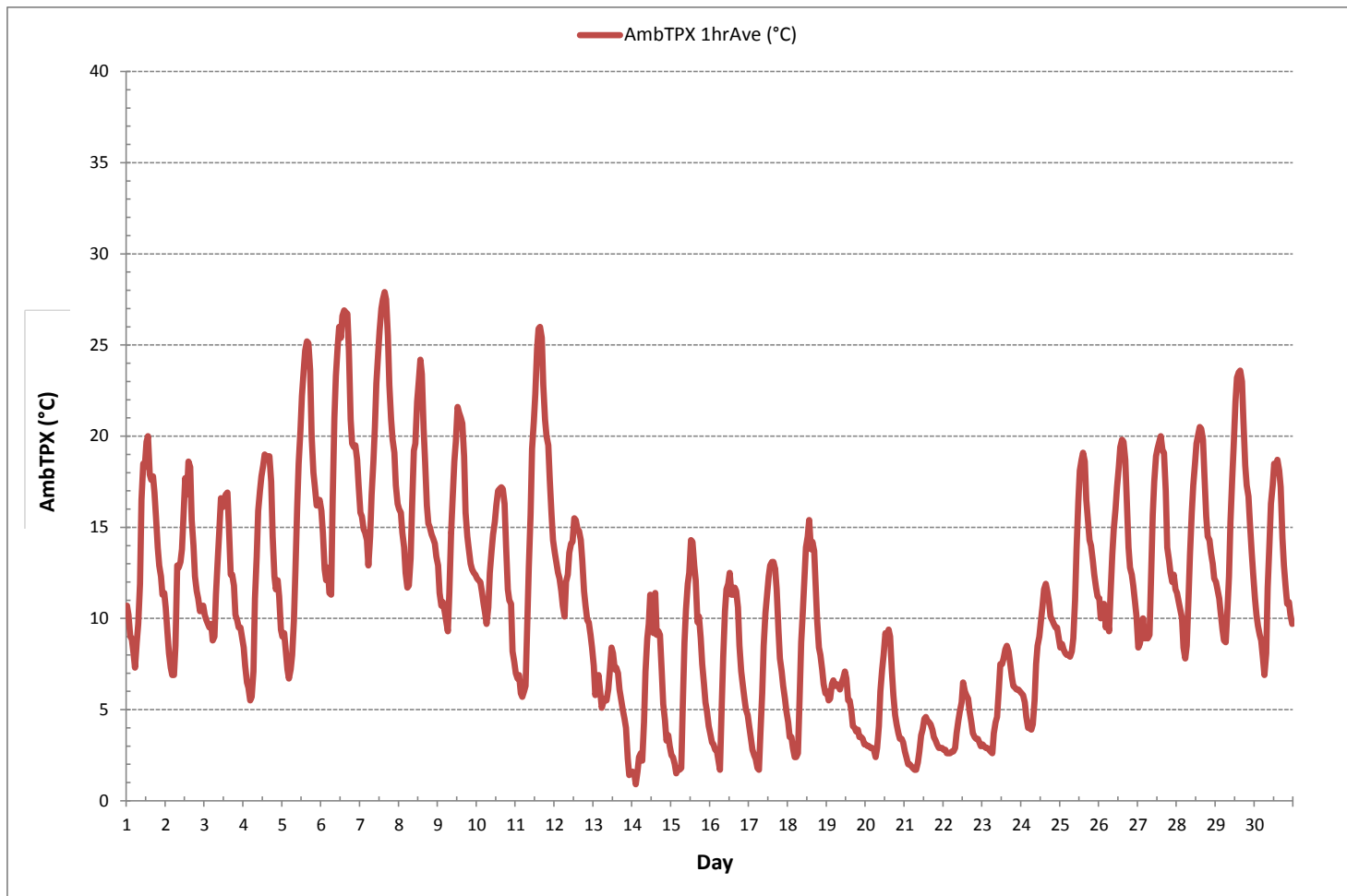
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.9	°C	@ HOUR	2	ON DAY	14
MAXIMUM 1-HR AVERAGE:	27.9	°C	@ HOUR	15	ON DAY	7
MAXIMUM 24-HR AVERAGE:	20.1	°C			ON DAY	7
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	6.0		MONTHLY AVERAGE:			11.1 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



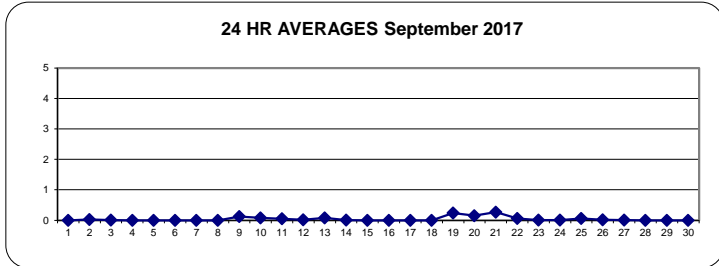
PRECIPITATION Hourly Averages (mm)

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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	2.3	0.5	0.0	0.0	2.3	0.1	24
10	0.4	0.1	0.0	0.4	0.4	0.4	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	0.4	0.1	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.0	0.0	0.8	0.1	24
12	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	0.0	0.1	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3	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	1.3	0.1	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	3.4	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	0.0	0.0	0.0	0.0	3.4	0.2	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	0.8	0.5	0.0	0.1	0.1	1.0	1.2	0.0	1.2	0.2	24	
21	1.1	1.1	0.3	0.4	0.3	0.2	0.1	0.2	0.6	0.4	0.6	0.7	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	24
22	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	0.4	0.5	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.5	0.1	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	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	0.1	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.6	0.0	0.0	0.6	0.1	24
26	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
27	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	1.1	1.1	0.3	0.4	0.4	0.4	0.1	1.3	3.4	1.3	0.6	0.7	0.1	0.1	0.1	0.1	0.0	0.8	0.5	0.1	0.2	2.3	1.0	1.2					
HOURLY AVG	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1					

STATUS FLAG CODES

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

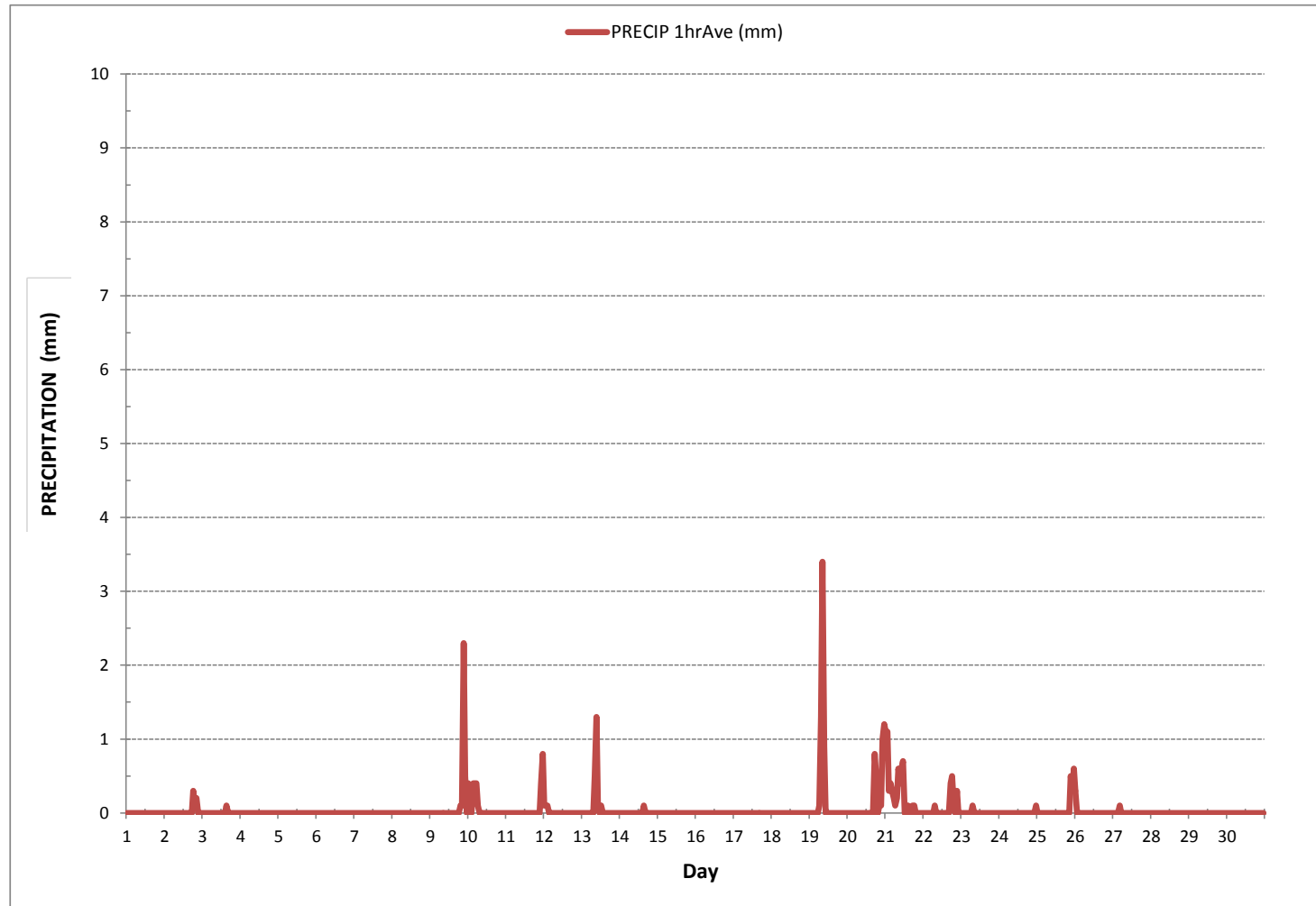
24 HR AVERAGES September 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	3.4	mm	@ HOUR	8	ON DAY	19
MAXIMUM 24-HR AVERAGE:	0.3	mm			ON DAY	21
MONTHLY TOTAL	28.3	mm				
OPERATIONAL TIME:					720	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.2		MONTHLY AVERAGE:		0.0	mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: September 7, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed: LICA	Thermometer/Station Temp: Fluke 4295 expires November 14, 2017	22	°C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny		
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 11:00	Performed By/Reviewer: Alex Yakupov		Tom Bourque
End Time 24 hr. (mst): 16:07	Cal Gas Expiry Date: July 18, 2019		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		

Analyzer:	ID# or Serial Number: 468	Range ppb: 1000	
	Last Calibration Date: August 9, 2017	As Found C.F.: 0.990	
	Previous C.F.: 0.999	New C.F.: 0.998	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017									
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018									
Cal Gas Cylinder I.D. # : LL 104222									
Cal Gas Conc. (ppm): 50.6									

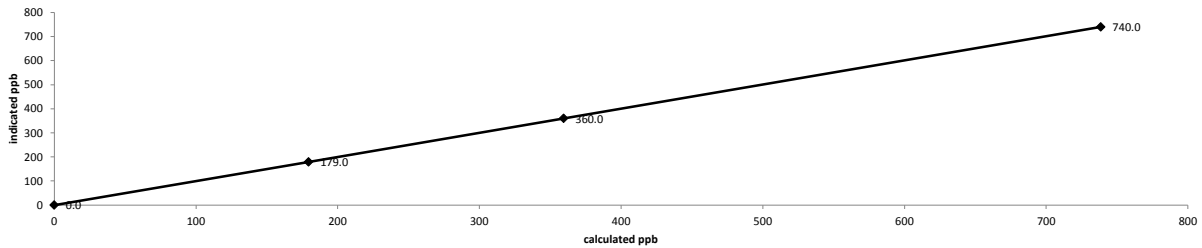
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5212	0.00	5212	0.0	2.0	n/a
as found high	5266	78.00	5344	738.5	748.0	0.990
adjusted zero	5212	0.00	5212	0.0	0.0	n/a
adjusted high	5266	78.00	5344	738.5	740.0	0.998
mid	5297	37.91	5335	359.6	360.0	0.999
low	5322	18.95	5341	179.5	179.0	1.003
calibrator zero	5212	0.00	5212	0.0	0.0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.998	> or = 0.995
b (Intercept as % of full scale) = 0.04%	0.95-1.05
% change in C.F. from last cal = 0.90%	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
Slope: 0.946	Slope: 0.938
Offset: 132.8	Offset: 137.4
Hvps: 651	Hvps: 651
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 30.1	Box Temp: 31.6
Pmt Temp: 7.9	Pmt Temp: 7.9
Izs Temp: 45.0	Izs Temp: 45.0
Pres: 23.9	Pres: 23.9
Samp Fl: 607	Samp Fl: 604
Norm Pmt: 134.8	Norm Pmt: 137.0
Uv Lamp: 2979.9	Uv Lamp: 2978.8
Lamp Ratio: 94.7	Lamp Ratio: 94.7
Str Lgt: 62.8	Str Lgt: 64.4
Drk Pmt: 5.3	Drk Pmt: 5.4
Expected Value: 509.0	Expected Value: 500.0

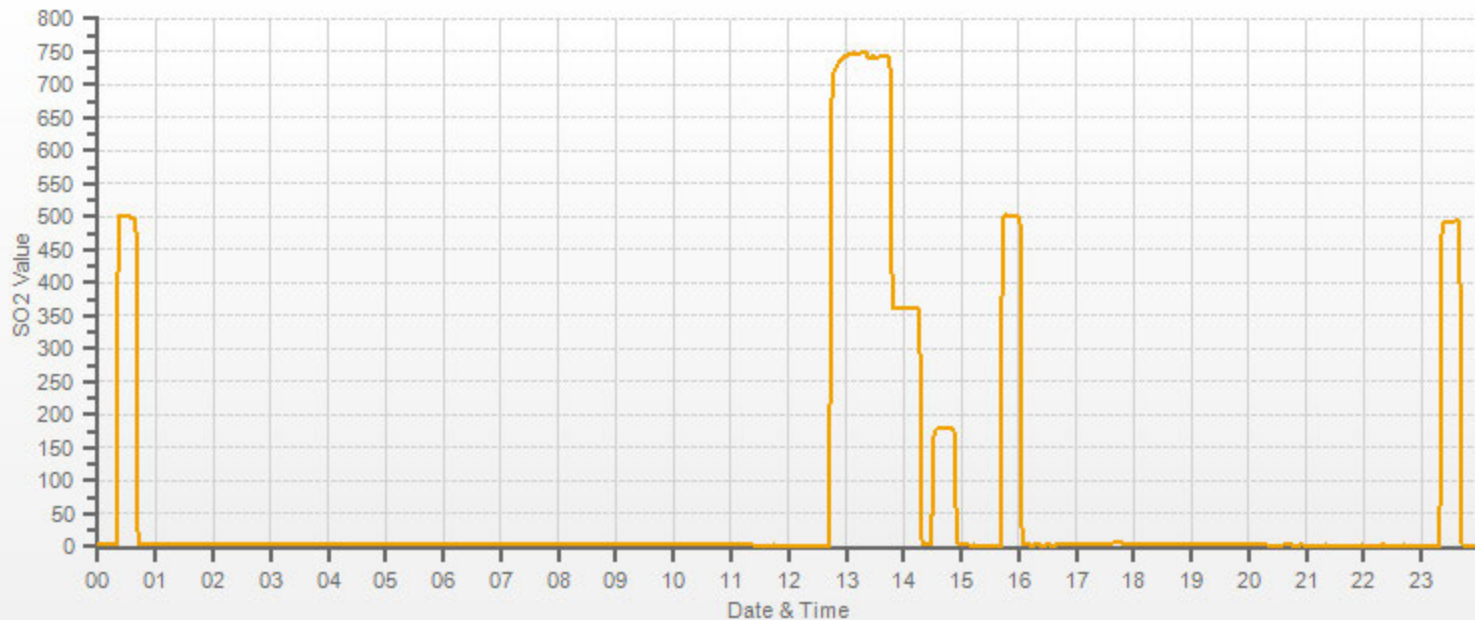
Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

Flow measurements after mid-point.

SO2[ppb] Station: LICA ST. LINA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: September 7, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed: LICA	Thermometer/Station Temp: Fluke 4295 expires November 14, 2017	22	°C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny		
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 11:00	Performed By/Reviewer: Alex Yakupov	Tom Bourque	
End Time 24 hr. (mst): 14:55	Cal Gas Expiry Date: June 14, 2019		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		

Analyzer:	ID# or Serial Number: 509	Range ppb: 100	
	Last Calibration Date: August 9, 2017	As Found C.F.: 1.053	
	Previous C.F.: 1.000	New C.F.: 1.000	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017									
Calibrator ID/Expiry Date: Sabio id# 11900613 expires March 16, 2018									
Cal Gas Cylinder I.D. # : EY 0000654									
Cal Gas Conc. (ppm): 10.2									

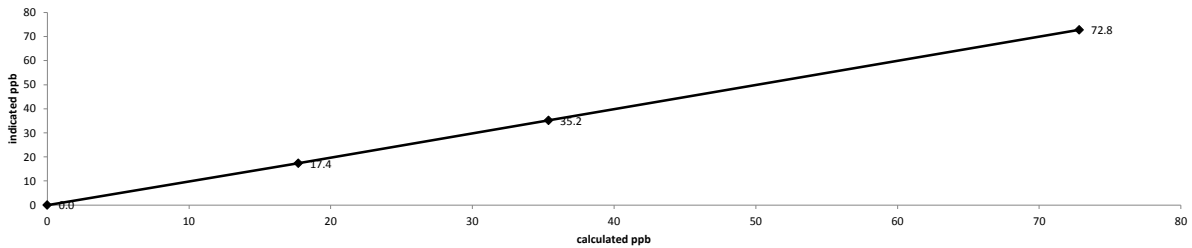
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7933	0.00	7933	0.0	0.9	n/a
as found high	7875	56.64	7932	72.8	70.1	1.053
adjusted zero	7933	0.00	7933	0.0	0.0	n/a
adjusted high	7875	56.64	7932	72.8	72.8	1.000
mid	7938	27.63	7966	35.4	35.2	1.005
low	7935	13.81	7949	17.7	17.4	1.018
calibrator zero	7933	0.00	7933	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = 1.000	> or = 0.995
Slope = 0.999	0.95-1.05
b (Intercept as % of full scale) = 0.16%	± 3% F.S.
% change in C.F. from last cal = -5.25%	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
Slope: 0.875	Slope: 0.921
Offset: 63.5	Offset: 65.7
Hvps: 671	Hvps: 671
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 31.5	Box Temp: 32.6
Pmt Temp: 7.9	Pmt Temp: 8.0
Izs Temp: 48.0	Izs Temp: 48.0
Converter Temp: 315.5	Converter Temp: 314.8
Pres: 20.5	Pres: 20.4
Samp Fl: 528	Samp Fl: 525
Uv Lamp: 3225.8	Uv Lamp: 3227.5
Lamp Ratio: 96.2	Lamp Ratio: 96.3
Str Lgt: 27.8	Str Lgt: 30.3
Drk Pmt: 0.5	Drk Pmt: 0.6
Expected Value: 60.4	Expected Value: 62.5

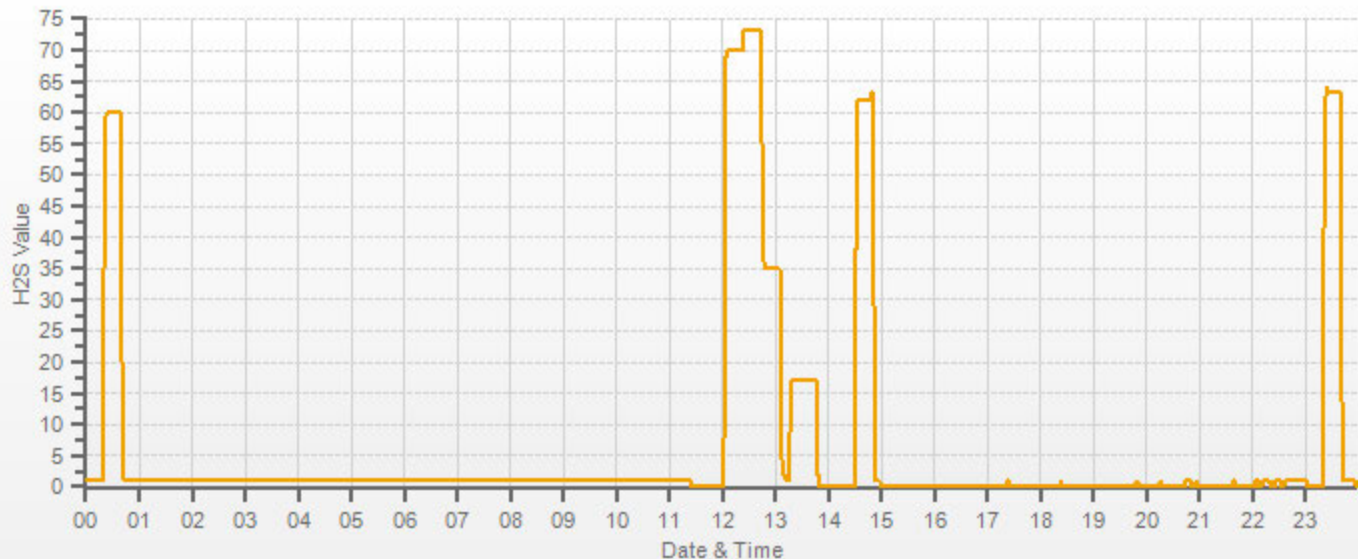
Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

Flow measurements after mid-point.

H2S[ppb] Station: LICA ST. LINA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total HydrocarbonTHC Analyzer Calibration

Date:	September 8, 2017	Barometer/B.P./units:	F.S. 05544 expires December 5, 2018	926	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	Fluke 4295 expires November 14, 2017	24	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	9:17 / 13:46	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023		

Analyzer:	ID# or Serial Number:	51CLT-77021-384	Range ppm:	50
	Last Calibration Date:	August 15, 2017	As Found C.F.:	1.084
	Previous Cal High Point C.F.:	0.999	New C.F.:	1.000

Calibration Standards:		Standard Calibration Points for a Range of: 50 ppm	
Low Flow Meter ID/Expiry Date:	Defender Low 152020 expires November 21, 2017	Point	Target ppm
High Flow Meter ID/Expiry Date:	Defender High 148943 expires November 21, 2017	High	38
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires March 16, 2018	Mid	18
Cal Gas Cylinder I.D. #:	LL165372	Low	9
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0 212.0		
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0		

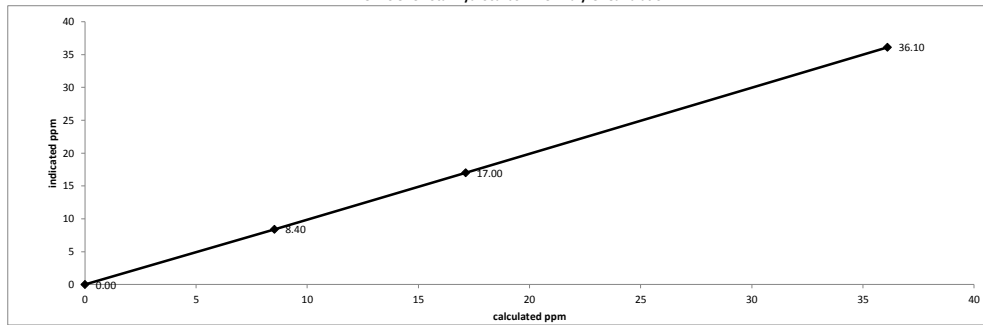
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
as found zero	2081	0.00	2081	0.0	0.30	n/a
as found high	2020	63.25	2083	36.10	33.60	1.084
adjusted zero	2081	0.00	2081	0.00	0.00	n/a
adjusted high	2020	63.25	2083	36.10	36.10	1.000
mid	2051	29.98	2081	17.13	17.00	1.008
low	2070	14.95	2085	8.53	8.40	1.015
calibrator zero	2081	0.00	2081	0.0	0.00	n/a
Average C.F.=						1.008

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)=	0.15%		± 3% F.S.
% change in C.F. from last cal=	-8.53%		± 10%

Thermo 51C Total HydrocarbonTHC Analyzer Calibration



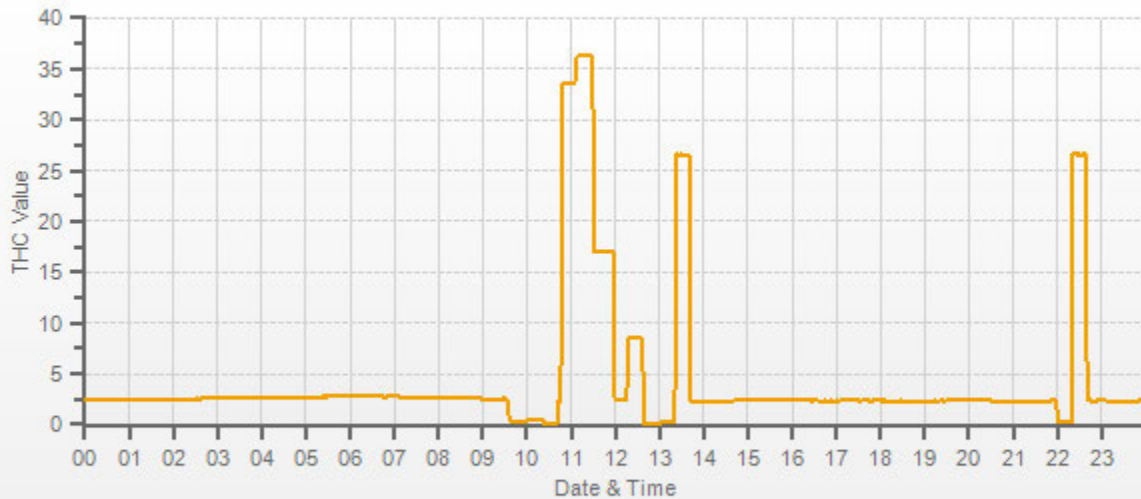
As found:	As left:
H2 cylinder (psi): 1500	H2 cylinder (psi): 1500
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 350	Span Cylinder (psi): 350
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 41	Zero Air Gen Pressure: 41
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 2032	cnt: 2135
rng: 1	rng: 1
try: 1	try: 1
flm: 193.3	flm: 194.9
det: 125.7	det: 125.2
Flame: 193	Flame: 194
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.92	Sample psi: 06.92
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Measured Flow: 0.1039	Measured Flow: n/a
Expected Value: 25.00	Expected Value: 26.40

Comments: The analyzer sample inlet filter was changed.


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

Flow measurements after mid-point.

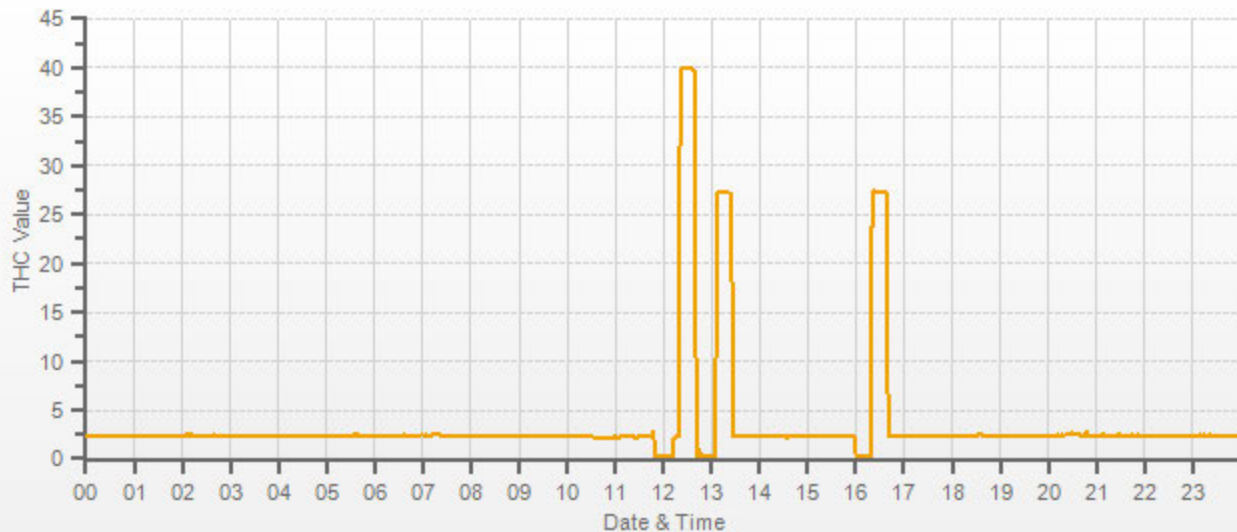
THC[ppm] Station: LICA ST. LINA Daily: 17/09/08 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

		<h3 style="margin: 0;">Thermo 51C Total Hydrocarbon THC Analyzer Calibration</h3>							
Date: September 14, 2017 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 11:36 / 12:46 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. 170286131 expires April 19, 2019 937 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: A few clouds Calibration Purpose: as found Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: November 25, 2023								
Analyzer: ID# or Serial Number: 51CLT-77021-384 Range ppm: 50 Last Calibration Date: September 8, 2017 As Found C.F.: 0.964 Previous Cal High Point C.F.: 1.000 New C.F.: n/a									
Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 165372 CH₄/C₃H₈ Cylinder Conc. (ppm): 606.0 212.0 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0									
Standard Calibration Points for a Range of: 50 ppm									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Point</th> <th style="width: 50%;">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								
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)	(ppm)			
as found zero	2684	0.00	2684	0.0	0.10	n/a			
as found high	2703	89.78	2793	38.22	39.73	0.964			
Average C.F.=						n/a			
Linear Regression/Calibration Results:									
				LIMITS					
Correlation Coefficient =				n/a					
Slope =				n/a					
b (Intercept as % of full scale) =				n/a					
% change in C.F. from last cal =				n/a					
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 0 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2232 rng: 1 try: 1 flm: 196.9 det: 125.5 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 1.061 Expected Value: 26.40 </td> <td style="width: 50%; vertical-align: top;"> As left: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 2000 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2215 rng: 1 try: 1 flm: 196.4 det: 125.7 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 26.40 </td> </tr> </table>							As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 0 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2232 rng: 1 try: 1 flm: 196.9 det: 125.5 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 1.061 Expected Value: 26.40	As left: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 2000 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2215 rng: 1 try: 1 flm: 196.4 det: 125.7 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 26.40	
As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 0 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2232 rng: 1 try: 1 flm: 196.9 det: 125.5 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 1.061 Expected Value: 26.40	As left: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 2000 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 47 measurement alarms: None service alarms: None cnt: 2215 rng: 1 try: 1 flm: 196.4 det: 125.7 Flame: 196 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 26.40								
Comments: <div style="text-align: center;"> <p>No zero adjustment was required/made.</p> <p>No high point adjustment was required/made.</p> </div> <p>A new span gas cylinder was installed. The manifold blower was found to be working normally.</p>									
As Found calibration was completed to verify data because SPAN check was not done timely (the cylinder was found empty)									

THC[ppm] Station: LICA ST. LINA Daily: 17/09/14 Type: AVG 1 Min. [1 Min.] [RAW]



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: September 7, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018	933	millibars
Company/Airshed: LICA	Thermometer/Station Temp: Fluke 4295 expires November 14, 2017	22	°C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 11:00 / 19:03	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov		Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: July 18, 2019		

Analyzer:	Correction Factors:
ID# or Serial Number: 594	Previous C.F.: NO = 0.998, NO ₂ = 0.976, NOx = 0.998
Last Calibration Date: August 9, 2017	As Found C.F.: 1.016, 0.974, 1.016
Range ppb: 1000	New C.F.: 0.997, 0.974, 0.997

Calibration Standards:

Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017 High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017 Calibrator ID/Expiry Date: API Id# 627 expires January 27, 2018 Cal Gas Cylinder I.D. #: LL 104222 Cal Gas Conc. (ppm): 50.7 50.9	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	5212	0.0	5212	0	0	0.0	2.0	n/a	n/a
as found high	5266	78.0	5344	740.0	740.0	728.0	730.0	1.016	1.016
adjusted zero	5212	0.00	5212	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5266	78.00	5344	740.0	740.0	742.0	742.0	0.997	0.997
mid	5297	37.91	5335	360.3	360.3	360.0	360.0	1.001	1.001
low	5322	18.95	5341	179.9	179.9	179.0	179.0	1.005	1.005
calibrator zero	5212	0.00	5212	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	5266	78.00	5344	0.0	742.0	743.0	2.0	0.0	2.0	
as found high NO2	5266	78.00	5344	530.0	251.0	755.0	506.0	491.0	504.0	0.974
adjusted high NO2	5266	78.00	5344	530.0	251.0	755.0	506.0	491.0	504.0	0.974
gpt mid	5266	78.00	5344	270.0	487.0	747.0	262.0	255.0	260.0	0.981
gpt low	5266	78.00	5344	100.0	653.0	744.0	93.0	89.0	91.0	0.978
Average NO₂ C.F. =										0.978

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.997	0.997	0.977	0.95-1.05
b (Intercept as % of full scale) =	-0.08%	-0.08%	0.07%	± 3% F.S.
% change in C.F. from last cal =	-1.85%	-1.85%	0.18%	± 10%
NO ₂ converter efficiency			0.97	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	0.933	NOx SLOPE:	0.951
NOx OFFS:	3.6	NOx OFFS:	2.8
NO SLOPE:	0.936	NO SLOPE:	0.952
NO OFFS:	1.6	NO OFFS:	1.2
SAMP FLW:	482	SAMP FLW:	481
OZONE FL:	78	OZONE FL:	78
PMT:	34.5	PMT:	18.8
NORM PMT:	17.4	NORM PMT:	1.9
AZERO:	16.6	AZERO:	17.0
HVPS:	767	HVPS:	767
RCCELL TEMP:	50.0	RCCELL TEMP:	50.0
BOX TEMP:	30.9	BOX TEMP:	32.5
PMT TEMP:	6.7	PMT TEMP:	6.7
IZS TEMP:	45.1	IZS TEMP:	45.3
MOLY TEMP:	316.4	MOLY TEMP:	313.9
RCEL:	5.6	RCEL:	5.5
SAMP:	26.1	SAMP:	26.0
Expected Value NO:	9	Expected Value NO:	10
Expected Value NO ₂ :	532	Expected Value NO ₂ :	584
Expected Value NOx:	541	Expected Value NOx:	592

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.

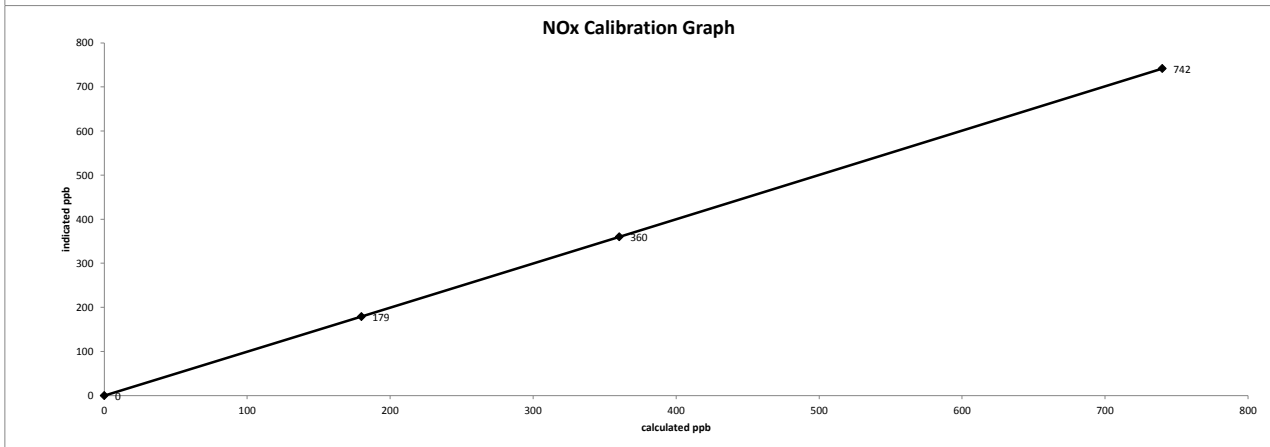
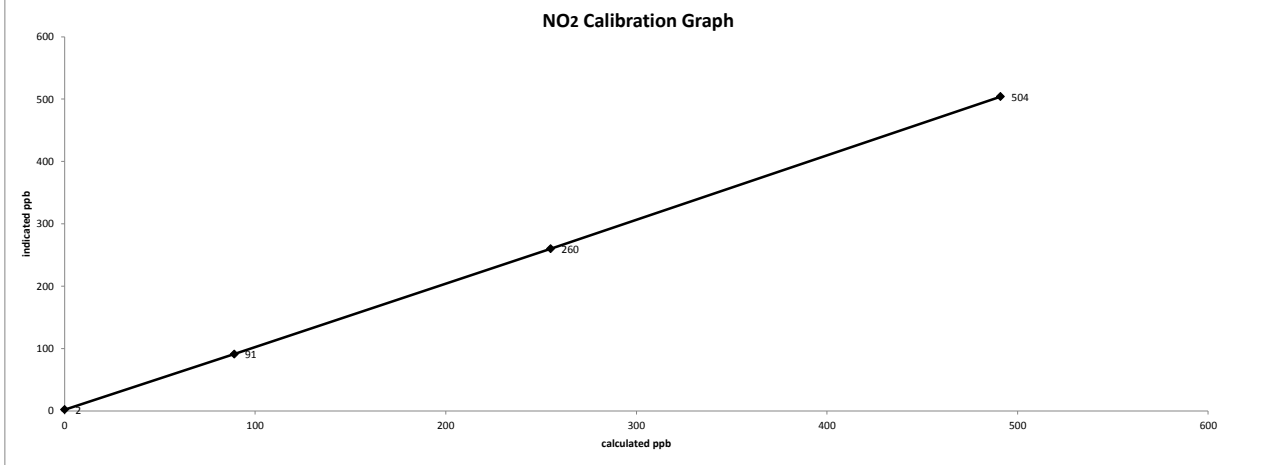
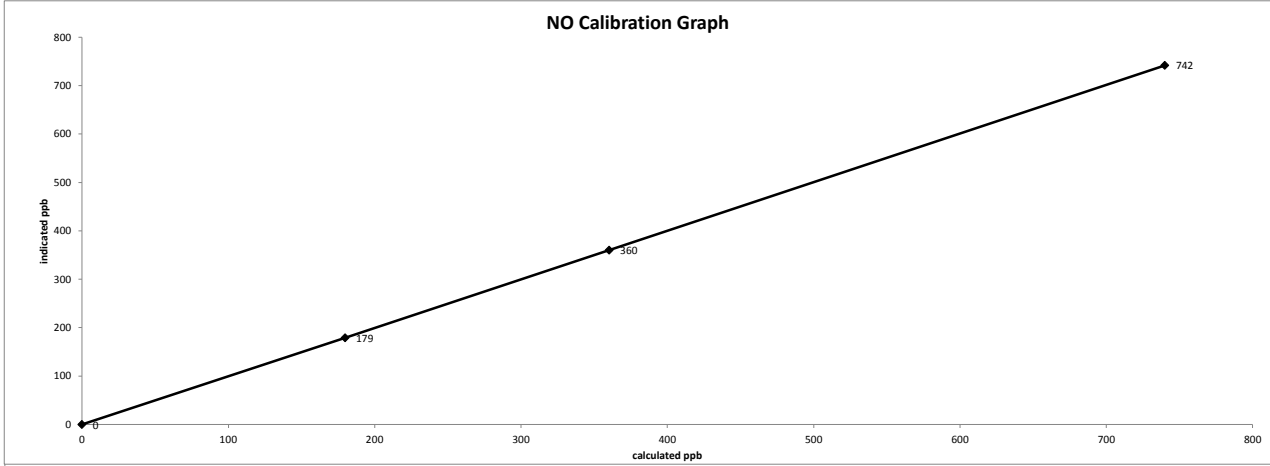
Flow measurements after mid-point.

GPT for O3 three points: High O3= 385 , High NO drop= 366 ; Mid O3=200 , Mid NO drop= 189; Low O3= 70, Low NO drop= 66.

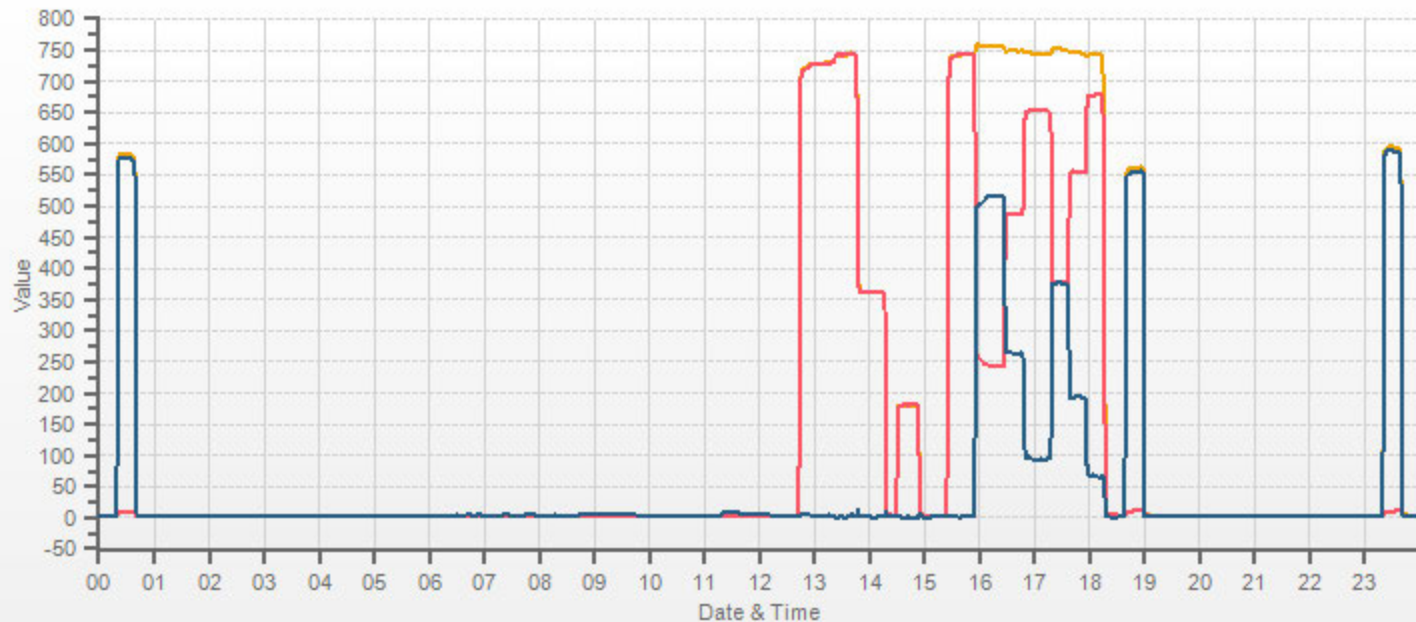
Date: September 7, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:00 / 19:03
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 17/09/07 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: September 8, 2017	Barometer/B.P./units: F.S. 05544 expires December 5, 2018
Company/Airshed: LICA	926 millibars
Location/Station Name: St. Lina	Thermometer/Station Temp: Fluke 4295 expires November 14, 2017
Start/End Time 24 hr. (mst): 9:17 / 13:34	24 °C
Ozone Calibration Method: Direct G.P.T.	Weather Conditions: Mainly sunny
G.P.T. Date: September 7, 2017	Calibration Purpose: routine monthly
	Performed By/Reviewer: Alex Yakupov Tom Bourque
	Cal Gas Expiry Date: July 18, 2019

Analyzer:	Ozone Range ppb: 500
ID# or Serial Number: 1002240371	As Found C.F.: 1.003
Last Calibration Date: August 10, 2017	New C.F.: 1.000
Previous Cal High Point C.F.: 1.000	

Calibration Standards:	
Low Flow Meter ID/Expiry Date: Defender Low 152020 expires November 21, 2017	
High Flow Meter ID/Expiry Date: Defender High 148943 expires November 21, 2017	
Calibrator ID/Expiry Date: API id# 627 expires January 27, 2018	
Cal Gas Cylinder I.D. #: n/a	

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

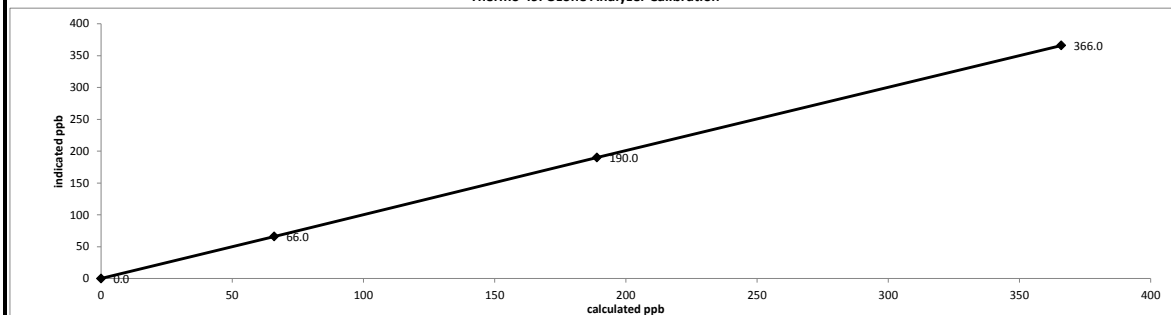
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	366.0	366.0	365.0	1.003
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	366.0	366.0	366.0	1.000
mid	5000	5000	189.0	189.0	190.0	0.995
low	5000	5000	66.0	66.0	66.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =						0.998

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = -0.04%	0.95-1.05
% change in C.F. from last cal = -0.27%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



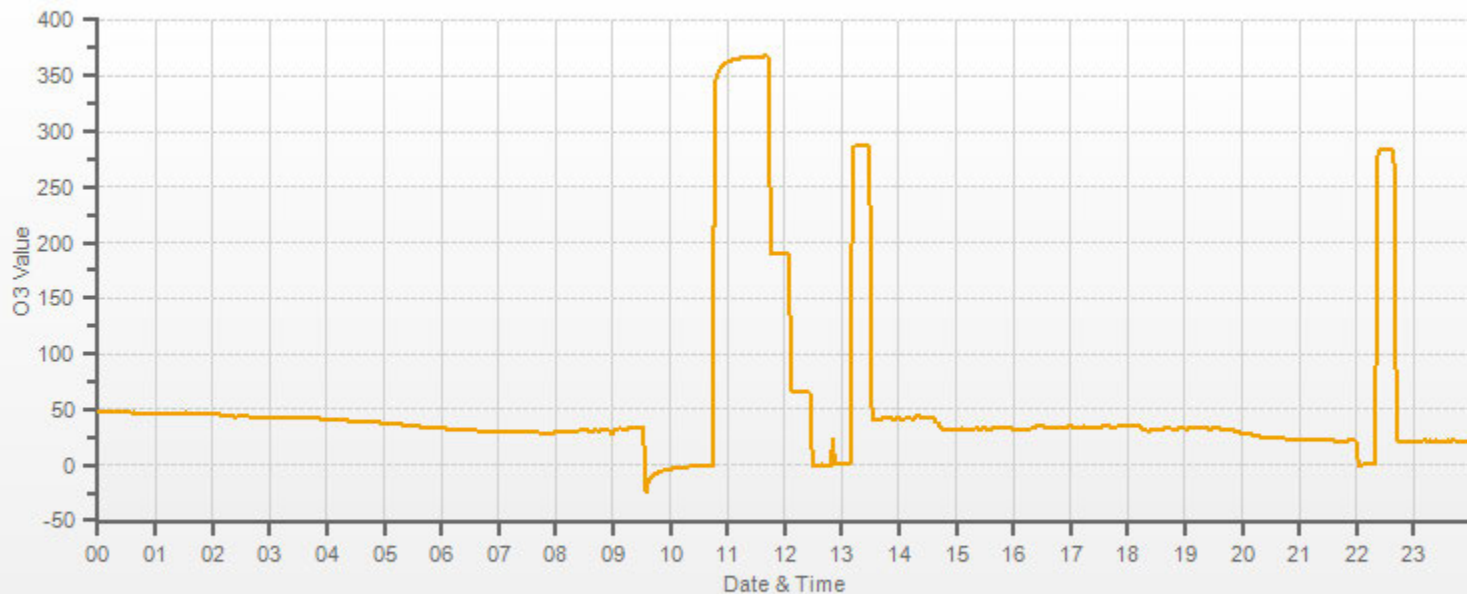
As found:

O3 Bkg:	-0.1
O3 Coef:	0.934
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	31.5
Bench Lamp:	53.7
O3 Lamp:	67.9
Pressure:	676.1
Cell A lpm:	0.729
Cell B lpm:	0.778
O3 ppb:	-5.1
Cell A ppb:	-3.1
Cell B ppb:	-7.0
Cell A int:	82103
Cell B int:	102826.0
Expected Value:	282.0

As left:

O3 Bkg:	-0.1
O3 Coef:	0.937
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	28.3
Bench Lamp:	53.7
O3 Lamp:	67.9
Pressure:	675.5
Cell A lpm:	0.729
Cell B lpm:	0.776
O3 ppb:	-0.2
Cell A ppb:	0.9
Cell B ppb:	-1.3
Cell A int:	82119
Cell B int:	102893.0
Expected Value:	287.0

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



— O3[ppb]

PARTICULATE MATTER

Thermo 5030i SHARP Monitor Monthly Audit

Date: September 8, 2017
Company: LICA
Station Name/Location: St Lina
Previous Audit Date: August 24, 2017
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
Start Time (mst): 13:03
End Time (mst): 14:05
Calibration Purpose: monthly
Weather Conditions: Mainly sunny

SHARP 5030i Information and Status:

Serial Number: CM17091001 **Filter Tape Counter** 1/2

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:	Temp / RH:
Make:	Dwyer	Chinook	Fisher Scientific	Fisher Scientific
Model:	475 Mk.III	CHN0901	n/a	11-661-7A, 11745843
Serial Number:	#3	#2	05544	170286131
Calibration Date:	January 1, 2017	March 24, 2017	December 5, 2016	April 19, 2017

Ambient Temperature (°C)

	Reference	SHARP	Difference	Range	Action
#1	25.20	25.6	-0.4	< ± 2°C	OK
				2-3 °C	Recalibrate
				> 3°C	Fail

Ambient Relative Humidity (%RH)

	Reference	SHARP	Difference	Range	Action
As Found:				< ± 2 %RH	OK
#1	37.30	36.8	0.5	2-5 %RH	Recalibrate
				> 5 %RH	Fail

Barometric Pressure (mmHg)

	Reference	SHARP	Difference	Range	Action
As Found:				< ± 10 mmHg	OK
#1	694.0	695.0	-1.0	10-12 mmHg	Recalibrate
				> 12 %RH	Fail

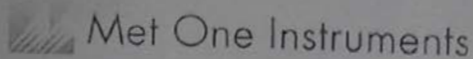
Flow Audit (L/min)

	Reference	SHARP	% Difference	Range	Action
As Found:				< ± 4%	OK
#1	16.80	16.66	-0.6	4-5%	Recalibrate
#2	16.74	16.67		>5%	Fail
#3	16.75	16.67			
Average	16.76	16.67			

Leak Check (L/min)

	Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference	
#1	16.71	16.65	0.06	16.60	16.67	-0.07	<i>Leak Limit: 0.08 L/min</i>
						LEAK RATE: -0.13	

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company Maxxam/SIA Operator: Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards	NO _x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU1809</u>	Last Calibration Date <u>January 25, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

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)=	1.0301	0.90-1.10		m (Slope)=	1.0291
b (Intercept % of FS)=	-0.0919	± 3% F.S.		b (Intercept % of FS)=	-0.0881

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

NO₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9926	0.90-1.10
b (Intercept % of FS)=	0.0925	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
SRM Gas Cylinder No.	<u>CAL018140</u>
Cylinder Conc. (ppm)	<u>48.79</u>
	Make/Model
	<u>Thermo 42i</u>
	Serial/AMU Number
	<u>1868</u>
	Last Calibration Date
	<u>March 15, 2017</u>
	Full Scale (ppm)
	<u>1.0</u>
	Cylinder Gas Expiry Date
	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature:

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner
Cylinder #: LL104222 **Concentration PPM:** 50.6 **Tolerance(%)** 1 **Certified By:** Praxair
Expiry Date: July 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>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
Make/Model: Teco 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 9.2 **Span:** 1.024 **Range:** 1.0
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	0.000	0.0000	0.0000	0.0000
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

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

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
 Operator Signature: *Al Clark*

Date: October 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
 Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
 Serial Number Blos D
 Temp. °C 24.5
 B.P. 698mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

CH4	C3H8
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
 Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner

Cylinder #: LL104222 Conc (PPM) 50.7/50.9 Tolerance (%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:

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

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 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				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</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 Contains 50.6 ppm SO2.

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

Auditor: Al Clark Date: October 19, 2016

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

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Ghaleb	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.

Maram ghaleb

Signature of the Representative of the Person
Responsible / External Person Certifying the Report

November 3, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-09-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram ghaieb</u>	Date <u>October 12, 2017</u>
Level 1 Primary Validation	<u>Maram ghaieb</u>	Date <u>October 12, 2017</u>
Level 2 Final Validation	<u>Maram ghaieb</u>	Date <u>October 30, 2017</u>
Level 3 Independent Data Review	<u>CSA-LMB</u>	Date <u>November 3, 2017</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.