



Alberta Environment and Parks (AEP)
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September 28, 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 July 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 July 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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, with the exception of electronic submission for the results of 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 me.



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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 #: 2833-2017-07-1-C

July 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **September 25, 2017**

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SUMMARY

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

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

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

SO₂, NO_x, THC: The channels were placed in "maintenance" mode on July 14 for sample manifold cleaning, two hours of downtime were recorded.

TRS, NO_x, O₃: The scheduled daily zero-span check failed to execute on July 24. The analyzers were restarted onsite on July 25. Thirty-six hours of downtime were incurred as a result.

THC: Thirty-seven hours of downtime were incurred due to a sample pump failure and the corrective actions performed to address it.

O₃: On July 13, a response check was conducted on the Ozone channel, resulting in one hour of downtime. This was done to verify the reference points obtained during the Gas Phase Titration portion of NO_x calibration.

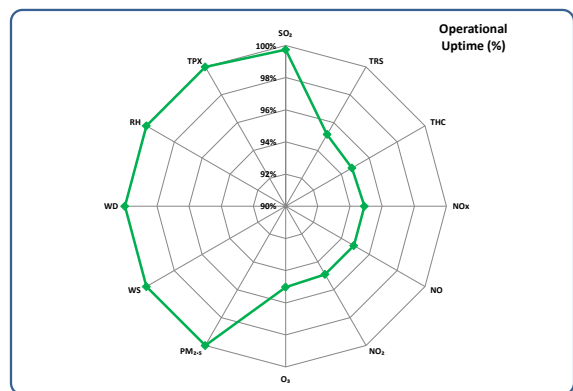
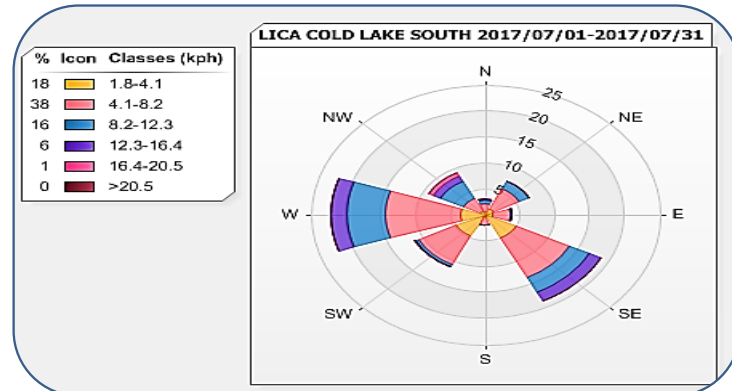
The summary of results is presented on the following pages.

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 403-219-3678 or toll-free at 1-800-386-7247.

July 2017 Monthly Report Summary

Pollutants	Unit	Monthly Records		1-Hour Records					24-Hour Records			
		Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0	99.7%	1	July 3	5	172	0	0	July 1	48	0
TRS	ppb	0	95.2%	4	July 19	6	-	-	1	July 9	-	-
THC	ppm	2.17	94.8%	3.50	July 30	2	-	-	2.53	July 12	-	-
NO _x	ppb	2	94.9%	11	July 6	6	-	-	4	July 6	-	-
NO	ppb	0	94.9%	4	July 6	6	-	-	1	July 6	-	-
NO ₂	ppb	2	94.9%	7	July 6	6	159	0	3	July 6	-	-
O ₃	ppb	25.0	95.0%	52.1	July 26	15	82	0	36.5	July 10	-	-
PM _{2.5}	µg/m ³	8	100.0%	62	July 16	21	80	0	24	July 16	30	0
WS	%	1.3	100.0%	20.4	July 13	21	-	-	8.8	July 15	-	-
WD	degree	255 (WSW)	100.0%	-	-	-	-	-	-	-	-	-
RH	mm	70	100.0%	100	July 1	0	-	-	91	July 24	-	-
AmbTPX	°C	18.5	100.0%	29.8	July 27	17	-	-	21.9	July 15	-	-



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

SO₂, NO_x, THC: The channels were placed in "maintenance" mode on July 14 for sample manifold cleaning, two hours of downtime were recorded.

TRS, NO_x, O₃: The scheduled daily zero-span check failed to execute on July 24. The analyzers were restarted onsite on July 25. Thirty-six hours of downtime were incurred as a result.

THC: Thirty-seven hours of downtime were incurred due to a sample pump failure and the corrective actions performed to address it.

O₃: On July 13, a response check was conducted on the Ozone channel, resulting in one hour of downtime. This was done to verify the reference points obtained during the GPT portion of NO_x calibration.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0	1	3	5	7.2	SE	0	1	99.7
TRS (ppb)	-	-	-	-	0	4	19	6	1.9	SSW	1	9	95.2
THC (ppm)	-	-	-	-	2.17	3.50	30	2	0.8	NNE	2.53	12	94.8
NO ₂ (ppb)	159	-	0	-	2	7	6	6	1.7	WSW	3	6	94.9
NO (ppb)	-	-	-	-	0	4	6	6	1.7	WSW	1	6	94.9
NO _x (ppb)	-	-	-	-	2	11	6	6	1.7	WSW	4	6	94.9
O ₃ (ppb)	82	-	0	-	25.0	52.1	26	15	4.7	SW	36.5	10	95.0
PM _{2.5} (µg/m ³)	80	30	0	0	8	62	16	21	7.5	WSW	24	16	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	70	100	1	0	0.5	E	91	24	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	18.5	29.8	27	17	4.9	SSE	21.9	15	100.0
VECTOR WS (kph)	-	-	-	-	1.3	20.4	13	21	-	NW	8.8	15	100.0
VECTOR WD (sec)	-	-	-	-	255 (WSW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

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.

Passive Sampler Summary

	Sulphur Dioxide (ppb)
Mean	0.4
Minimum	0.2
Maximum	0.9

Note: Access papers for stations #12 and #25 were not provided, and stations #11 and #26 could not be accessed due to road conditions. As a result, data was not available at these stations.

	Hydrogen Sulphide (ppb)
Mean	0.25
Minimum	0.06
Maximum	0.71

Note: Access papers for stations #12 and #25 were not provided, and stations #11 and #26 could not be accessed due to road conditions. As a result, data was not available at these stations.

	Nitrogen Dioxide (ppb)
Mean	0.6
Minimum	<0.1
Maximum	1.7

Note: Access papers for station #12 were not provided and station #11 could not be accessed due to road conditions. As a result, data was not available at these stations.

	Ozone (ppb)
Mean	26.90
Minimum	20.90
Maximum	32.80

Note: Access papers for station #12 were not provided and station #11 could not be accessed due to road conditions. As a result, data was not available at these stations.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
July 6, 2017	5.5	Acetone
July 12, 2017	10.7	Acetone
July 18, 2017	2.3	Acetone
July 24, 2017	3.3	Acetone
July 30, 2017	6.5	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading (µg/puf)	Semi-Volatile Organic
July 6, 2017	1.97	2-Methylnaphthalene
July 12, 2017	0.23	Acenaphthene
July 18, 2017	0.11	Phenanthrene
July 24, 2017	0.12	Phenanthrene
July 30, 2017	0.38	Phenanthrene

Note: NA

Partisol Sampler Summary

Sample Collection Date	Concentration ($\mu\text{g}/\text{puf}$)
July 6, 2017	0.063
July 12, 2017	0.096
July 18, 2017	0.018
July 24, 2017	0.045
July 30, 2017	0.228

Note: NA

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The non-continuous monitoring data results for Partisol, VOCs, PAHs and Passive samples are also included in this report.

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 99.7%, equivalent to two hours of downtime.
- The routine monthly calibration was performed on July 13.
- The channel was placed in "maintenance" mode on July 14 for sample manifold cleaning, two hours of downtime were recorded.
- Eight additional instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL REDUCED SULPHUR (TRS)

- Operational time, for the monitoring period was 95.2%, equivalent to thirty-six hours of downtime.
- The routine monthly calibration was performed on July 14.
- The scheduled daily zero-span check failed to execute on July 24, likely due to a power surge. A repeat attempt on July 25 also proved abortive. This prompted an immediate site visit where the analyzer was manually restarted and a successful zero-span check was subsequently completed. Data was invalidated back to the last valid zero-span check which was on July 23, at hour 20:00. Thirty-six hours of downtime were incurred as a result.
- Seven additional instances of maximum instantaneous data were discarded this month due to brief power outages.
- One instance of maximum instantaneous data could not be retrieved on July 2 at 06:00.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 94.8% equivalent to thirty-nine hours of downtime.
- The sample pump failed on July 12 at hour 05:00. The pump was rebuilt on July 13, followed by a successful post-repair calibration. Thirty-seven hours of downtime were incurred due to this event.
- The channel was placed in "maintenance" mode on July 14 for sample manifold cleaning, two hours of downtime were recorded.
- Eight additional instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 94.9% equivalent to thirty-eight hours of downtime.
- The routine monthly calibration was performed on July 13.
- The channel was placed in "maintenance" mode on July 14 for sample manifold cleaning, two hours of downtime were recorded.
- The scheduled daily zero-span check failed to execute on July 24, likely due to a power surge. A repeat attempt on July 25 also proved abortive. This prompted an immediate site visit where the analyzer was manually restarted and a successful zero-span check was subsequently completed. Data was invalidated back to the last valid zero-span check which was on July 23, at hour 20:00. Thirty-six hours of downtime were incurred as a result.
- Seven additional instances of maximum instantaneous data were discarded this month due to brief power outages.

OZONE (O₃)

- Operational time, for the monitoring period was 95.0% equivalent to thirty-seven hours of downtime.
- On July 13, a response check was conducted on the Ozone channel, resulting in one hour of downtime. This was done to verify the reference points obtained during the Gas Phase Titration portion of NOx calibration.
- The routine monthly calibration was performed on July 14.
- The scheduled daily zero-span check failed to execute on July 24, likely due to a power surge. A repeat attempt on July 25 also proved abortive. This prompted an immediate site visit where the analyzer was manually restarted and a successful zero-span check was subsequently completed. Data was invalidated back to the last valid zero-span check which was on July 23, at hour 20:00. Thirty-six hours of downtime were incurred as a result.
- Seven additional instances of maximum instantaneous data were discarded this month due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on July 21.
- 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. No hourly data was invalidated as all measurements were above $-3 \mu\text{g}/\text{m}^3$ this month.

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

- Operational time, for the monitoring period, was 100%.
- Eight instances of maximum instantaneous data were discarded due to brief power outages.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

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

AMBIENT TEMPERATURE (AmbTPX)

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

VOC SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on July 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.

PAH SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on July 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.

PARTISOL SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on July 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.

PASSIVE SAMPLES

- Samples were collected over the months of June and July. Samples were collected at all designated stations, except stations #12 and #25 as access documents were not provided by client. In addition, stations #11 and #26 could not be accessed due to road conditions. Analytical results are included in this report. Passive results are reported in ppb.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

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

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- 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-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- Maxxam PTC SOP-00148: Monitoring NO₂ in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00149: Monitoring SO₂ in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00150: Monitoring H₂S in the Atm. by using All-Season Passive
- Maxxam PTC SOP-00151: Mass Determination of Particulate Matter (PM_{2.5} and PM₁₀)
- Maxxam PTC SOP-00197: Monitoring O₃ in the Atm. by Using Maxxam All-Season Passive

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 (L449PM_{2.5}) - Thermo 5030 SHARP Units
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832
- Partisol - R&P 2000H Unit
- PAH - TISCH PUF Plus
- VOC - XONTECH 910A Gaseous Air Sampler

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

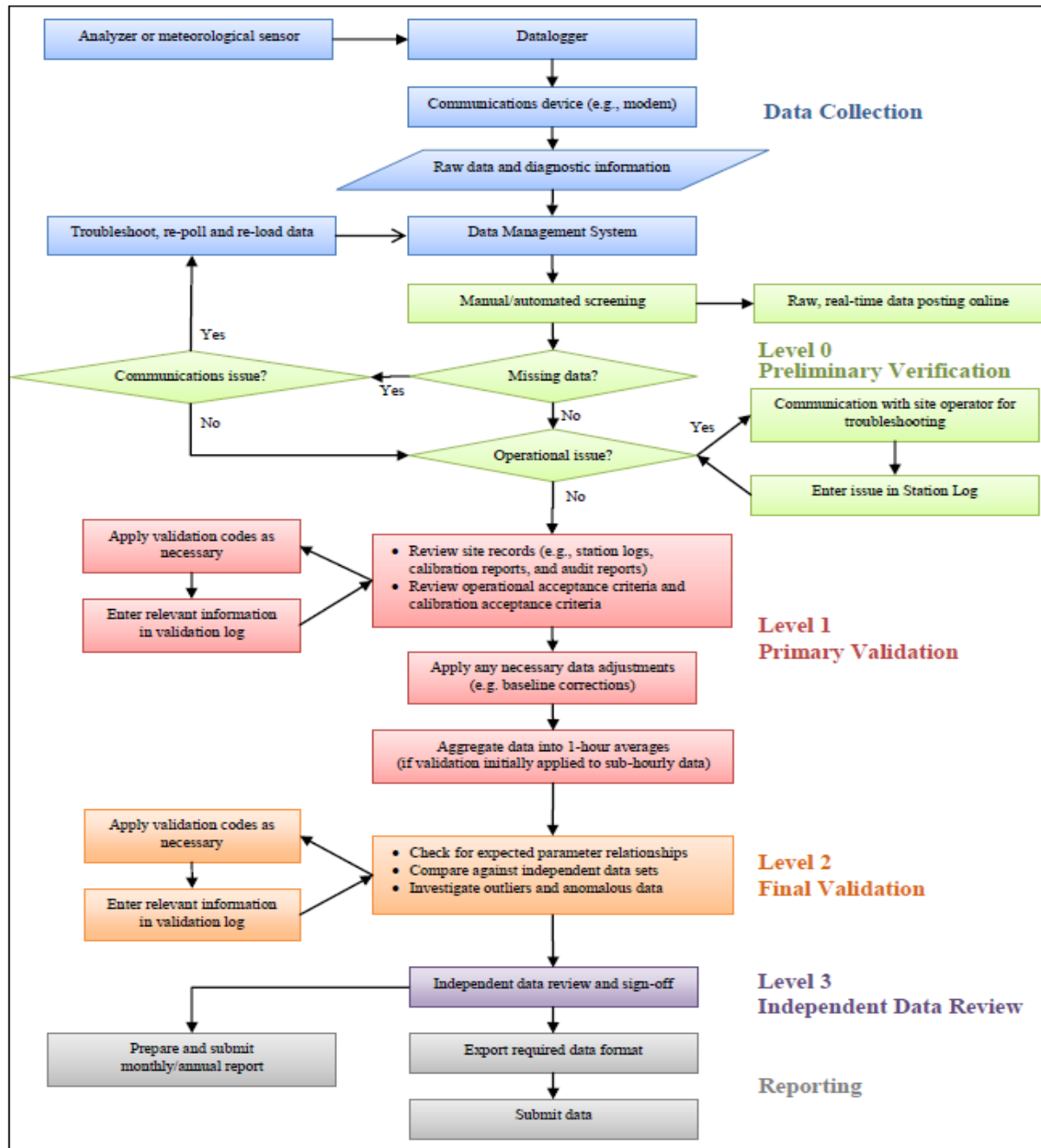
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

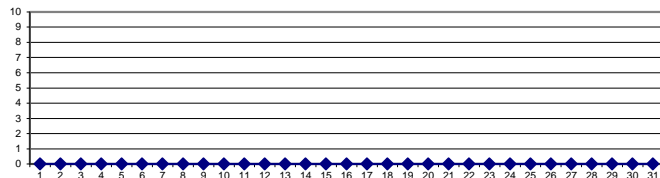
OBJECTIVE LIMIT:

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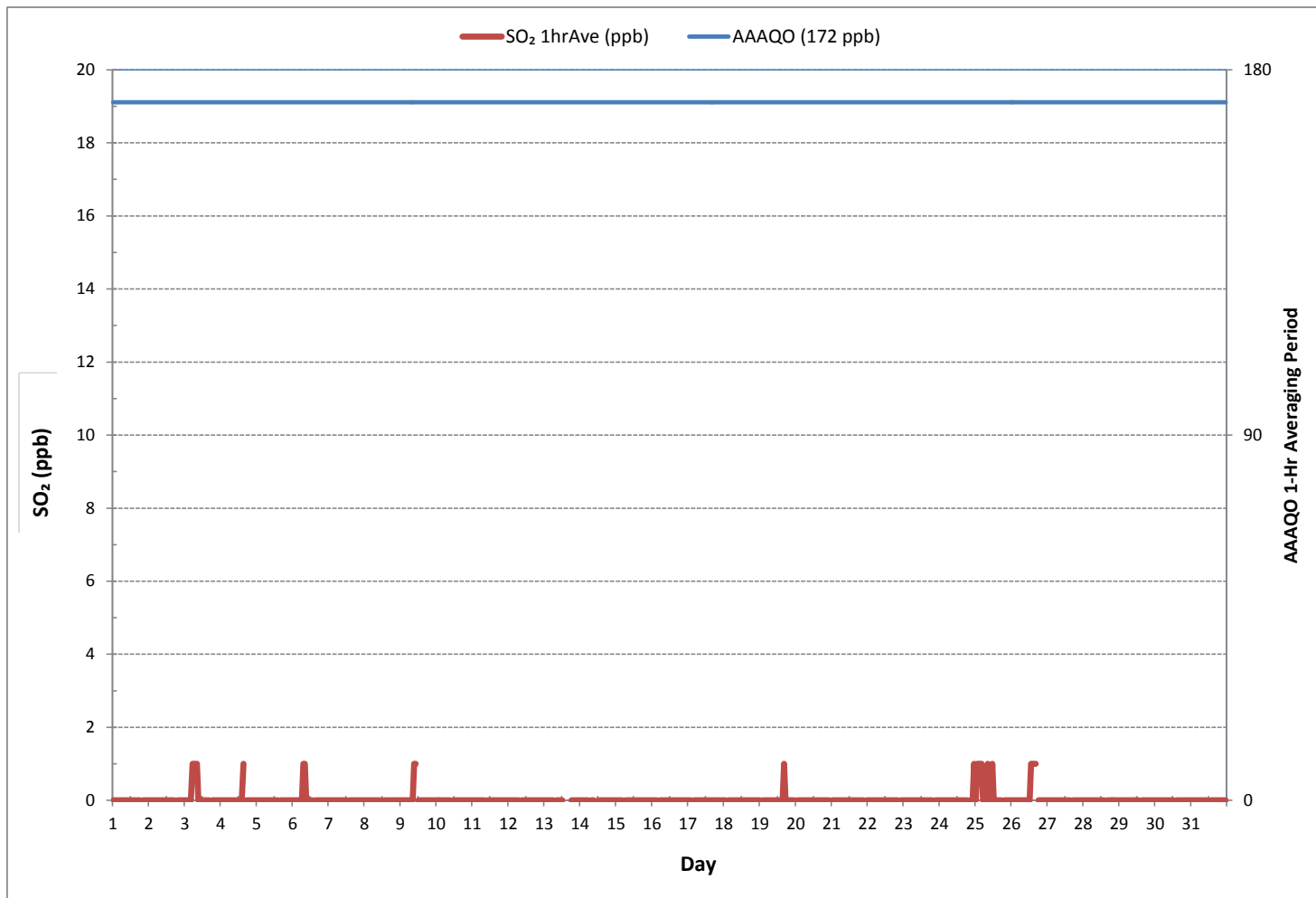
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	21
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR ON DAY 3
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	742 hrs
AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES July 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





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

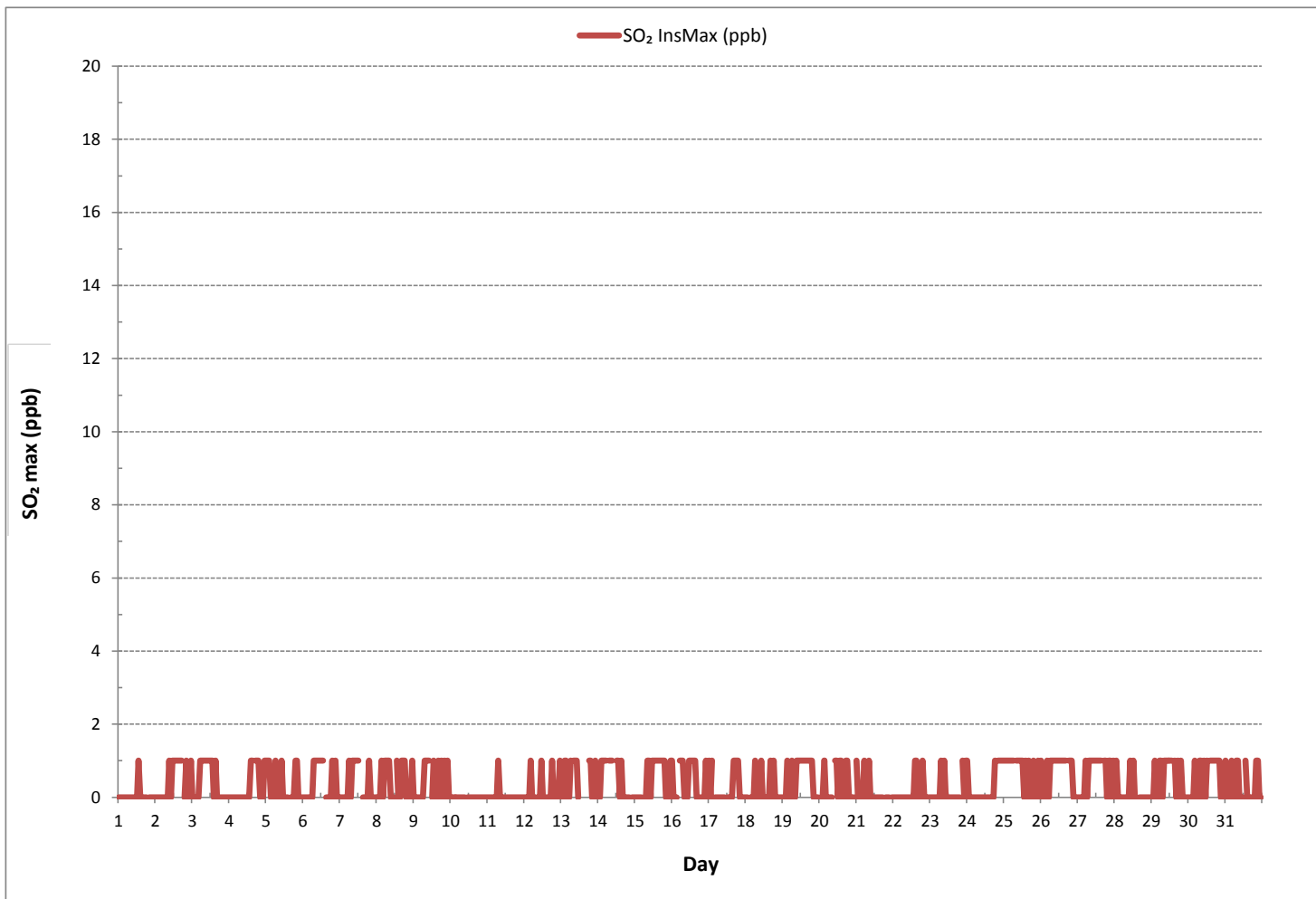
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	242
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 13 ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	0

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

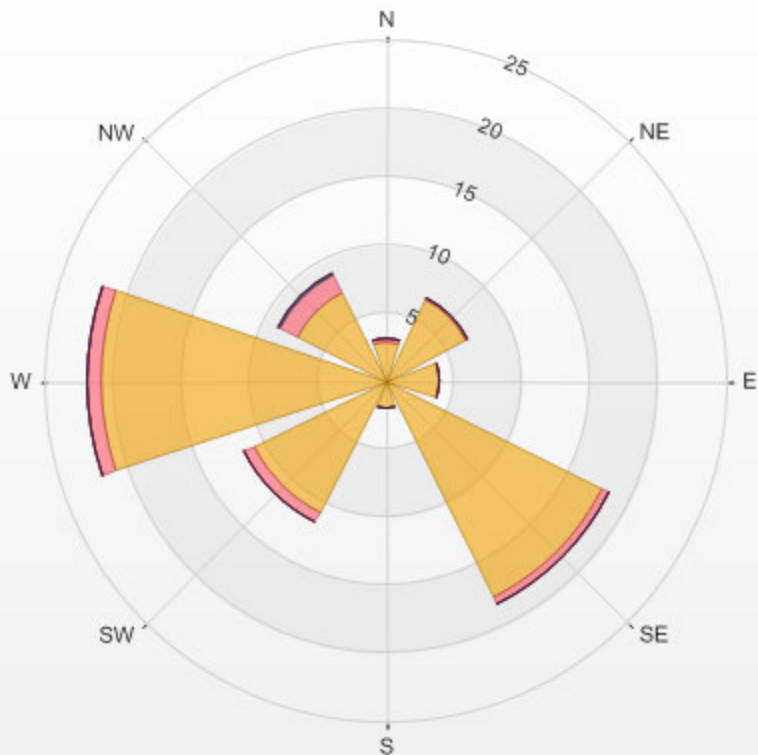
Calm: 23.13%

Calm Avg: 0.04 [ppb]

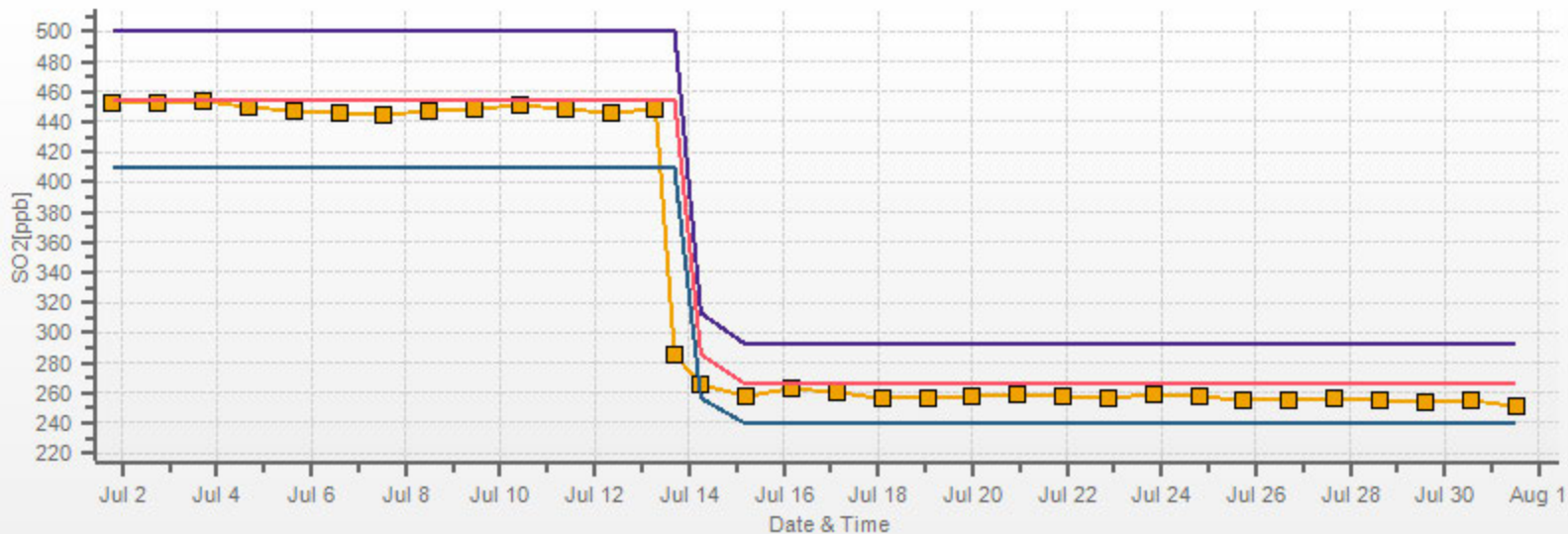
Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	2.9	0.3	0.0	0.0	0.0	0.0	3.2
NE	6.6	0.1	0.0	0.0	0.0	0.0	6.8
E	4.0	0.0	0.0	0.0	0.0	0.0	4.0
SE	17.7	0.7	0.0	0.0	0.0	0.0	18.4
S	2.0	0.0	0.0	0.0	0.0	0.0	2.0
SW	10.8	0.9	0.0	0.0	0.0	0.0	11.6
W	20.8	1.2	0.0	0.0	0.0	0.0	22.0
NW	7.3	1.4	0.1	0.0	0.0	0.0	8.9
Summary	72.1	4.6	0.1	0.0	0.0	0.0	76.9

% Icon	Classes (ppb)	72	0.0-0.4	5	0.4-0.8	0	0.8-1.2	0	1.2-1.6	0	1.6-2.0	0	>2.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 23.13% Calm Poll Avg: 0.04[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

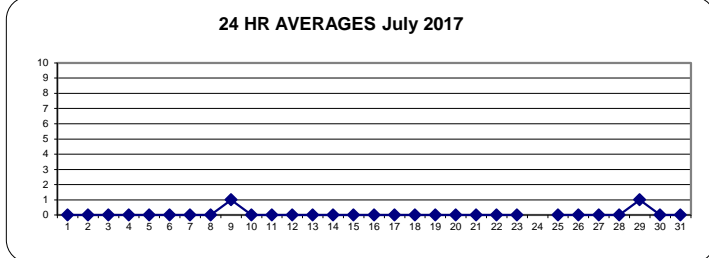
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

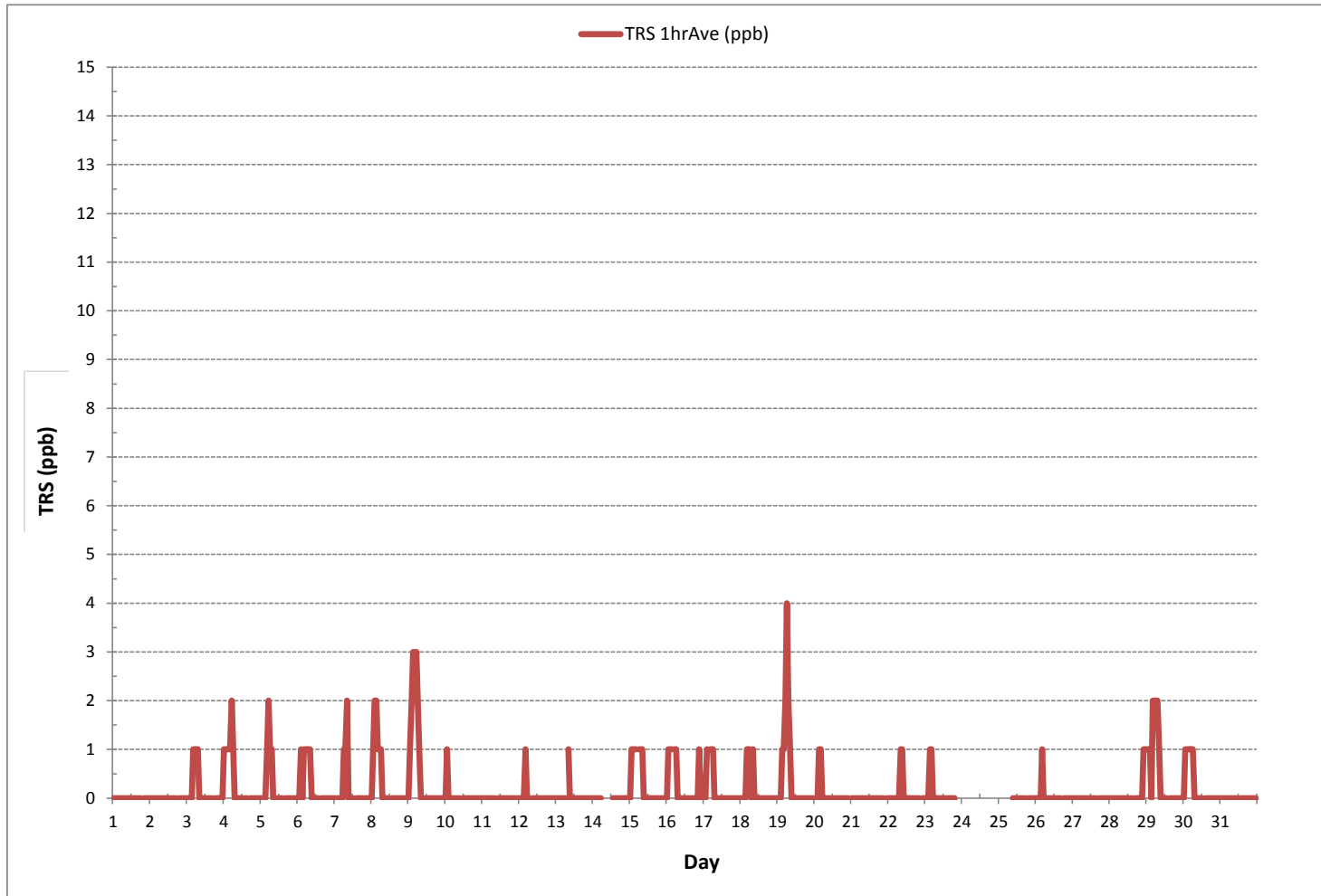
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	90			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	4	ppb @ HOUR	6	ON DAY 19
MAXIMUM 24-HR AVERAGE:	1	ppb		ON DAY 9
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	708 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	95.2 %
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





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

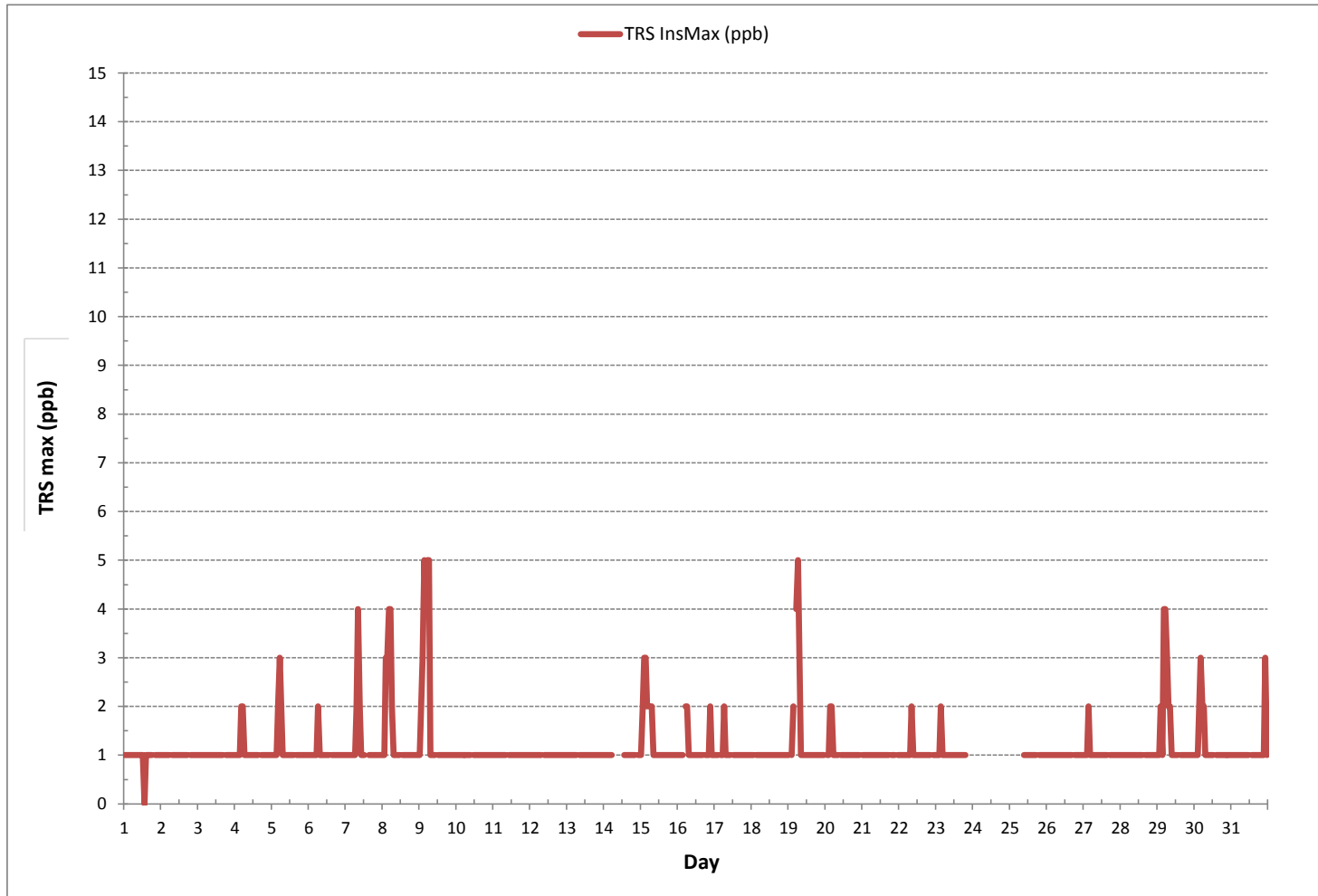
STATUS FLAG CODES

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:	663
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 3 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	700 hrs
STANDARD DEVIATION:	1

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



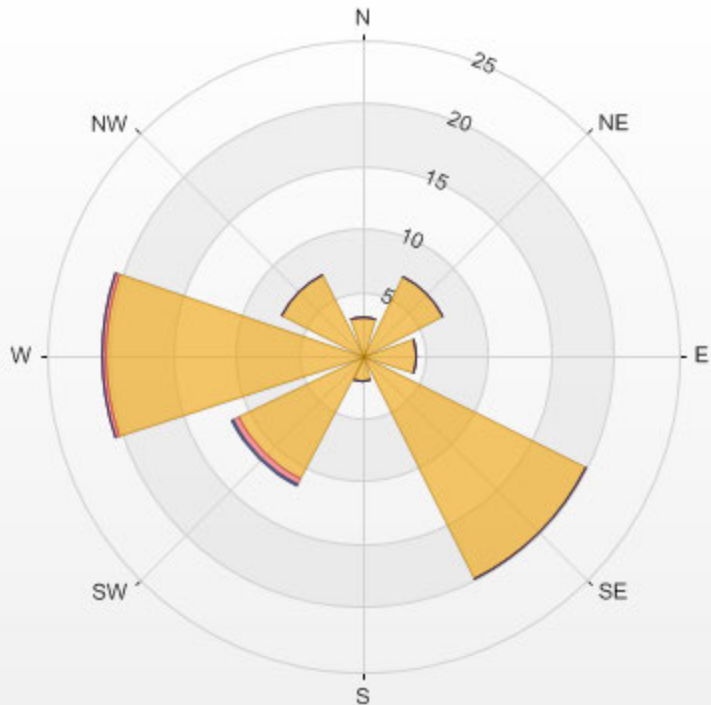
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 24.25% Calm Avg: 0.52 [ppb]

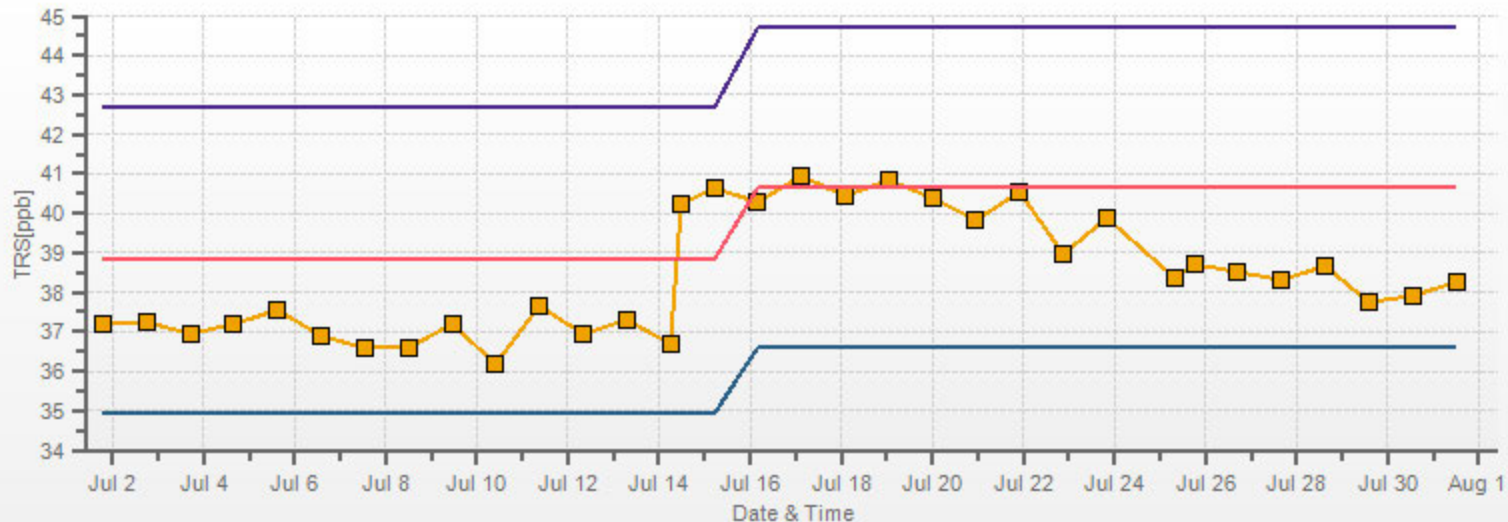
Direction	0.0-1.7	1.7-3.3	3.3-5.0	>5.0	Total
N	3.2	0.0	0.0	0.0	3.2
NE	7.1	0.0	0.0	0.0	7.1
E	4.2	0.0	0.0	0.0	4.2
SE	19.7	0.0	0.0	0.0	19.7
S	2.1	0.0	0.0	0.0	2.1
SW	11.0	0.5	0.2	0.0	11.6
W	20.3	0.3	0.0	0.0	20.6
NW	7.2	0.0	0.0	0.0	7.2
Summary	74.9	0.8	0.2	0.0	75.8

% Icon Classes (ppb) 75 0.0-1.7 1 1.7-3.3 0 3.3-5.0 0 >5.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 24.25% Calm Poll Avg: 0.52[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 Type: Span



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

TOTAL HYDROCARBON



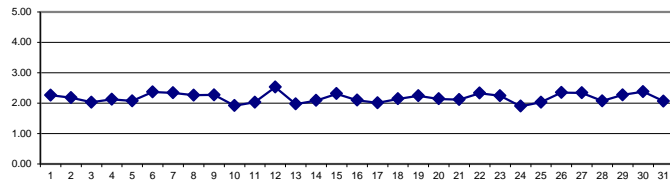
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.47	2.70	2.65	2.70	2.56	2.64	2.46	2.38	2.31	2.17	2.10	2.08	2.06	2.05	2.02	2.04	2.02	1.99	1.99	S	2.03	2.15	2.17	2.14	1.99	2.70	2.26	24	
2	2.13	2.24	2.30	2.34	2.49	2.60	2.27	2.27	2.33	2.24	2.19	2.07	2.00	2.01	2.03	2.02	1.99	1.98	S	1.97	2.05	2.16	2.20	2.16	1.97	2.60	2.18	24	
3	2.21	2.15	2.11	2.13	2.11	2.10	2.13	2.08	2.05	2.04	2.05	2.06	2.00	1.95	1.95	1.93	1.92	S	1.91	1.94	1.95	1.98	1.99	2.01	1.91	2.21	2.03	24	
4	2.14	2.31	2.34	2.34	2.29	2.16	2.12	2.08	2.08	2.04	2.04	2.03	2.02	1.99	1.97	S	1.93	1.94	1.95	2.11	2.29	2.35	2.48	1.93	2.48	2.13	24		
5	2.18	2.03	2.06	2.11	2.31	2.45	2.24	2.15	2.14	2.04	1.98	1.97	1.97	1.97	1.96	S	1.92	1.91	1.92	1.93	1.93	2.04	2.12	2.32	1.91	2.45	2.07	24	
6	2.46	2.54	2.68	2.81	2.92	3.08	3.00	2.79	2.58	2.37	2.24	2.06	2.07	2.05	S	1.96	1.95	1.93	1.93	1.97	2.02	2.17	2.42	2.40	1.93	3.08	2.37	24	
7	2.46	2.65	2.69	2.85	2.94	2.91	2.61	2.40	2.59	2.27	2.03	2.05	2.06	S	2.01	2.04	2.02	1.99	1.94	2.02	2.16	2.24	2.38	2.43	1.94	2.94	2.34	24	
8	2.70	2.76	2.67	2.78	2.93	2.51	2.16	2.23	2.20	2.10	2.09	2.11	S	2.03	2.05	2.02	2.03	2.02	1.99	1.94	1.92	2.21	2.23	2.36	1.94	2.93	2.26	24	
9	2.38	2.55	2.87	2.96	2.82	2.92	2.59	2.27	2.21	2.06	2.01	S	1.99	2.00	2.03	2.01	2.00	1.99	2.05	2.11	2.15	2.10	2.06	2.12	1.99	2.96	2.27	24	
10	1.97	1.99	1.95	1.95	1.95	1.95	1.95	1.92	1.92	1.94	S	1.88	1.89	1.92	1.92	1.90	1.89	1.88	1.89	1.91	1.93	1.95	1.93	1.86	1.86	1.99	1.92	24	
11	1.87	1.87	1.91	1.94	2.09	2.11	1.97	1.95	1.99	S	1.94	1.96	1.96	1.96	1.96	1.97	2.00	2.01	2.02	2.05	2.09	2.22	2.39	2.50	1.87	2.50	2.03	24	
12	2.49	2.37	2.45	2.53	2.83	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.37	2.83	2.53	5
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	1.98	1.95	1.99	1.95	1.99	1.97	6	
14	2.01	2.01	1.99	2.03	2.02	2.14	S	1.99	2.06	2.09	Y	Y	1.98	1.95	1.94	1.97	1.95	1.97	1.98	2.02	2.32	2.55	2.51	2.34	1.94	2.55	2.09	22	
15	2.86	2.64	2.89	2.95	3.22	S	2.46	2.45	2.50	2.37	2.18	2.09	2.07	2.04	2.02	1.99	2.00	2.01	2.03	2.02	2.04	2.08	2.08	2.08	1.99	3.22	2.31	24	
16	2.15	2.23	2.27	2.88	S	2.45	2.20	2.03	2.03	2.02	2.01	1.99	1.98	1.98	1.95	1.95	1.97	2.01	1.99	2.03	2.06	2.08	2.02	2.05	1.95	2.88	2.10	24	
17	2.01	2.04	2.05	S	2.05	2.05	2.00	1.96	2.01	1.99	1.98	1.98	1.99	1.96	1.93	1.94	1.98	1.96	1.94	1.99	1.98	2.03	2.12	2.22	1.93	2.22	2.01	24	
18	2.33	2.33	S	2.40	2.40	2.29	2.20	2.14	2.17	2.13	2.09	2.05	1.99	1.96	1.96	1.95	1.96	1.97	1.97	2.01	2.10	2.17	2.26	2.42	1.95	2.42	2.14	24	
19	2.60	S	2.69	2.78	2.89	2.84	2.86	2.51	2.13	2.08	2.00	1.99	1.99	1.95	1.95	1.94	1.95	1.98	2.08	2.14	2.10	1.95	2.08	1.94	2.89	2.24	24		
20	S	2.24	2.43	2.37	2.41	2.39	2.24	2.00	2.04	2.03	2.05	2.16	2.17	2.08	2.11	2.08	2.04	2.02	2.01	2.03	2.05	2.13	S	2.00	2.43	2.14	24		
21	2.02	2.07	2.06	2.04	2.05	2.11	2.16	2.17	2.24	2.09	1.96	2.01	2.08	2.08	2.04	2.06	2.11	2.11	2.11	2.12	2.27	2.34	S	2.35	1.96	2.35	2.12	24	
22	2.45	2.61	2.64	2.64	2.65	2.59	2.66	2.78	2.74	2.42	2.28	2.18	2.05	2.02	2.01	1.99	1.95	1.97	2.02	2.04	2.11	S	2.39	2.36	1.95	2.78	2.33	24	
23	2.50	2.86	2.96	2.92	2.63	2.52	2.48	2.36	2.13	2.09	2.02	1.99	1.96	1.95	1.96	1.96	1.96	1.98	1.97	2.07	S	2.06	2.08	2.03	1.95	2.96	2.24	24	
24	1.92	1.88	1.92	1.94	1.95	1.85	1.85	1.87	1.87	1.85	1.90	1.89	1.91	1.89	1.91	1.89	1.86	1.90	1.88	S	1.95	1.96	1.96	1.94	1.85	1.96	1.90	24	
25	1.95	1.97	1.98	1.98	1.99	2.06	2.04	2.08	2.06	2.00	2.01	1.98	1.95	1.97	1.97	1.94	1.97	1.99	S	1.97	2.07	2.13	2.30	2.44	1.94	2.44	2.03	24	
26	2.59	2.62	2.70	2.74	2.89	2.82	2.90	2.72	2.53	2.34	2.16	2.01	1.98	2.02	2.01	2.02	2.01	S	1.95	2.00	2.20	2.32	2.31	2.28	1.95	2.90	2.35	24	
27	2.80	3.18	2.72	2.96	2.52	2.25	2.30	2.19	2.22	2.30	2.29	2.21	2.18	2.09	2.04	2.07	S	2.01	2.03	2.23	2.56	2.40	2.29	1.99	1.99	3.18	2.34	24	
28	1.93	1.94	1.96	2.03	2.11	2.19	2.20	2.21	2.17	2.06	2.03	1.96	1.92	1.93	1.93	S	1.94	1.96	1.96	1.94	2.17	2.26	2.39	2.39	1.92	2.39	2.07	24	
29	2.37	2.45	2.67	2.62	2.59	2.70	2.63	2.51	2.24	2.08	2.07	2.05	1.97	1.93	S	1.90	1.91	1.95	2.00	2.06	2.17	2.34	2.56	2.51	1.90	2.70	2.27	24	
30	2.89	2.89	3.50	3.38	3.09	2.55	2.40	2.43	2.38	2.33	2.22	2.19	2.09	S	2.07	2.04	1.95	1.95	1.96	1.99	2.03	2.15	2.10	2.13	1.95	3.50	2.38	24	
31	2.20	2.28	2.37	2.27	2.20	2.17	2.12	2.09	1.97	1.92	1.94	1.94	S	1.88	1.92	1.92	1.90	1.90	1.89	1.94	2.00	2.20	2.24	2.23	1.88	2.37	2.06	24	
HOURLY MAX	2.89	3.18	3.50	3.38	3.22	3.08	3.00	2.79	2.74	2.42	2.29	2.21	2.18	2.17	2.08	2.11	2.11	2.11	2.11	2.23	2.56	2.55	2.56	2.51					
HOURLY AVG	2.31	2.36	2.43	2.50	2.48	2.41	2.33	2.24	2.20	2.12	2.07	2.03	2.01	1.99	1.99	1.98	1.97	1.97	1.97	2.01	2.09	2.16	2.20	2.23					

STATUS FLAG CODES

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

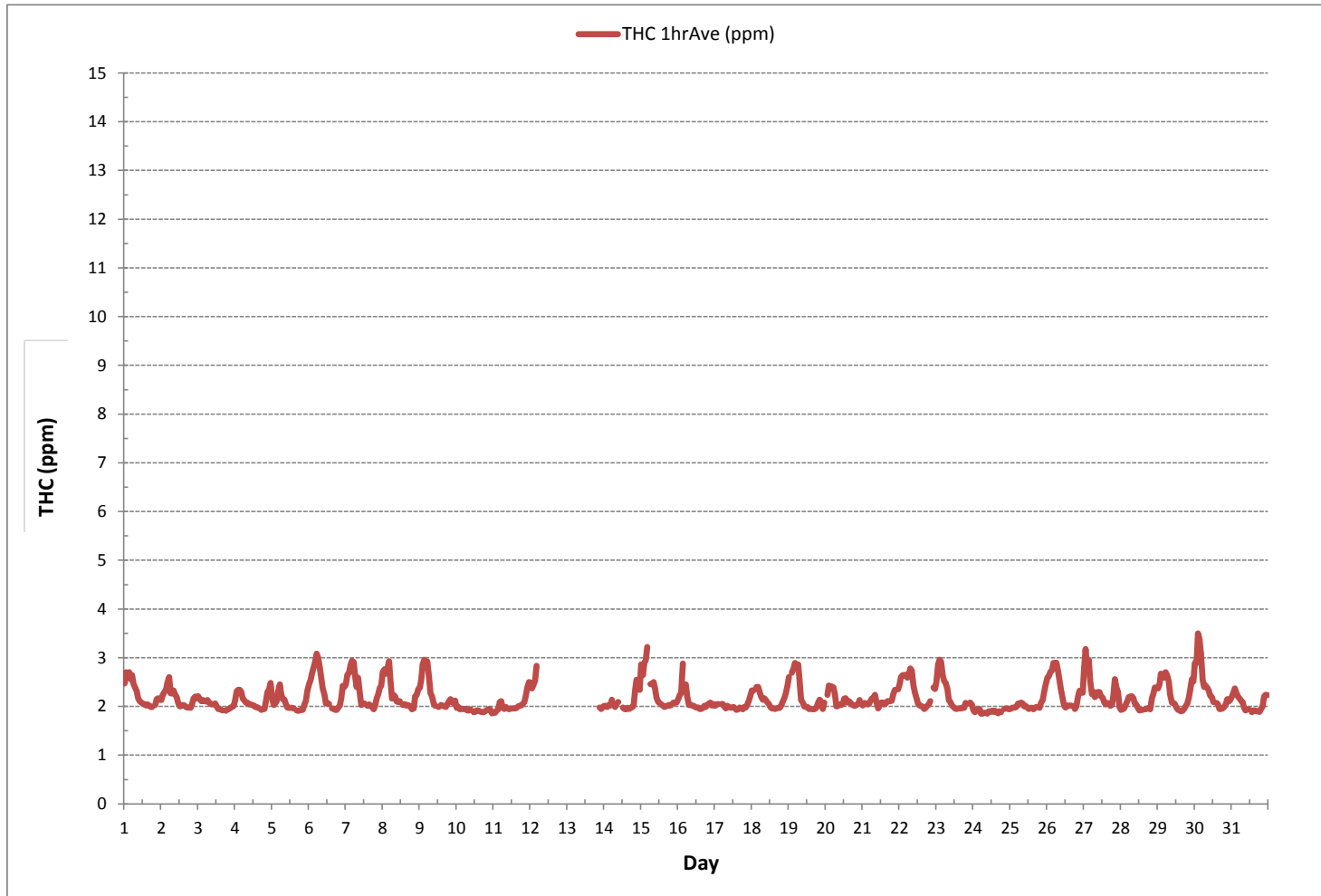
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672			
MINIMUM 1-HR AVERAGE:	1.85 ppm	@ HOUR	5	ON DAY 24
MAXIMUM 1-HR AVERAGE:	3.50 ppm	@ HOUR	2	ON DAY 30
MAXIMUM 24-HR AVERAGE:	2.53 ppm			ON DAY 12
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	705	hrs
MONTHLY CALIBRATION TIME:	3 hrs	AMD OPERATION UPTIME:	94.8	%
STANDARD DEVIATION:	0.28	MONTHLY AVERAGE:	2.17	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	3.22	3.65	3.28	3.22	2.88	2.94	2.79	2.63	2.58	2.49	2.33	2.32	2.31	2.52	2.25	2.26	2.26	2.22	2.23	S	2.26	2.76	2.69	2.56	2.22	3.65	2.64	24
2	2.38	2.56	2.60	2.91	2.93	3.07	2.72	2.53	2.55	2.58	2.43	2.33	2.25	2.22	2.26	2.26	2.25	2.17	S	2.17	2.34	2.46	2.48	2.40	2.17	3.07	2.47	24
3	2.45	2.38	2.32	2.34	2.35	2.31	2.34	2.29	2.87	2.25	2.26	2.23	2.23	2.14	2.13	2.11	2.09	S	2.11	2.14	2.19	2.23	2.22	2.55	2.09	2.87	2.28	24
4	2.54	2.58	2.66	2.63	2.57	2.42	2.39	2.37	2.34	2.31	2.40	2.43	2.28	2.23	2.23	2.23	S	2.20	2.20	2.23	3.62	3.37	2.79	3.11	2.20	3.62	2.53	24
5	2.87	2.52	2.55	2.63	2.74	2.80	2.62	2.48	2.60	2.99	2.32	2.28	2.29	2.31	2.29	S	2.26	2.25	2.26	2.29	2.32	2.57	2.66	3.02	2.25	3.02	2.52	24
6	2.89	2.99	3.18	3.28	3.67	3.56	3.43	3.45	3.09	2.85	4.93	2.50	2.60	2.48	S	2.65	2.34	2.34	2.34	2.38	2.57	2.63	3.00	2.82	2.34	4.93	2.96	24
7	3.11	3.37	3.18	3.34	3.49	3.47	3.13	2.97	3.08	2.93	2.38	2.40	2.43	S	P	2.38	2.35	2.32	2.29	2.48	2.94	3.07	3.16	3.03	2.29	3.49	2.88	23
8	3.53	3.34	3.19	3.48	3.54	3.22	2.58	2.70	2.51	2.40	2.62	2.42	S	2.32	2.33	2.31	2.38	2.31	2.31	2.25	2.60	2.90	2.81	2.85	2.25	3.54	2.73	24
9	3.22	3.34	3.57	3.49	3.34	3.45	3.17	2.67	2.62	2.44	2.32	S	2.29	2.31	2.34	2.37	2.29	2.29	2.75	2.73	2.70	2.45	2.52	2.94	2.29	3.57	2.77	24
10	2.37	2.33	2.31	2.23	2.45	2.20	2.20	2.16	2.17	2.20	S	2.14	2.17	2.20	2.20	2.16	2.19	2.14	2.16	2.17	2.20	2.22	2.20	2.17	2.14	2.45	2.21	24
11	2.16	2.19	2.25	2.34	2.72	2.57	2.26	2.26	2.28	S	2.22	2.31	2.30	2.23	2.31	2.26	2.26	2.26	2.28	2.32	2.42	2.88	3.13	3.10	2.16	3.13	2.40	24
12	3.25	2.79	3.06	3.59	3.37	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.79	3.59	3.21	5
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C	C	C	C	C	C	2.13	2.11	2.14	6
14	2.14	2.16	2.17	2.19	2.23	2.36	S	2.14	3.23	2.37	Y	Y	2.16	2.30	2.11	2.11	2.10	2.13	2.13	2.33	3.00	P	3.10	2.76	2.10	3.23	2.36	21
15	3.77	3.05	3.46	3.91	3.65	S	2.75	2.58	2.63	2.57	2.32	2.22	2.14	2.11	2.08	2.11	2.05	2.11	2.45	2.02	2.05	2.08	2.08	2.10	2.02	3.91	2.53	24
16	2.20	3.22	2.50	3.89	S	2.90	2.44	1.99	2.01	1.99	1.98	1.98	1.94	2.10	1.94	1.95	1.99	P	2.01	2.13	2.08	2.23	2.07	2.07	1.94	3.89	2.26	23
17	2.03	2.06	2.06	S	2.06	2.06	2.23	2.01	2.07	2.05	2.05	P	2.05	2.13	2.02	2.00	2.09	2.01	2.02	2.08	2.08	2.14	2.20	2.41	2.00	2.41	2.09	23
18	2.56	2.47	S	2.52	2.53	2.44	2.34	2.28	2.29	2.28	2.21	2.18	2.14	2.08	2.25	2.07	2.08	2.11	2.08	2.17	2.35	2.43	2.55	2.73	2.07	2.73	2.31	24
19	2.90	S	3.03	3.11	P	3.04	3.07	2.80	2.46	2.20	2.11	2.08	2.11	2.23	2.13	2.11	2.01	2.02	2.05	2.31	2.39	2.48	2.07	2.42	2.01	3.11	2.42	23
20	S	2.63	2.70	2.52	2.84	2.63	2.60	2.07	2.07	P	2.10	2.16	2.26	2.23	2.16	2.17	2.13	2.08	2.08	2.07	2.26	2.08	2.90	S	2.07	2.90	2.32	23
21	2.07	2.26	2.38	2.11	2.07	2.16	2.18	2.20	2.39	2.26	1.99	2.08	2.20	2.11	2.13	2.10	2.11	2.11	P	2.26	2.78	2.69	S	2.57	1.99	2.78	2.24	23
22	2.57	2.78	2.79	2.76	2.85	2.73	2.73	3.62	2.93	2.60	2.35	2.28	2.10	2.08	2.03	2.07	2.04	2.14	2.30	2.30	2.50	S	2.83	2.64	2.04	3.62	2.52	24
23	2.73	3.79	3.96	3.19	3.18	2.91	2.60	2.57	2.23	2.20	2.08	2.06	1.99	1.98	1.99	1.99	2.02	2.04	2.05	2.85	S	2.36	2.17	2.08	1.98	3.96	2.48	24
24	1.96	1.92	1.98	1.99	2.01	1.92	1.92	1.96	1.96	1.96	1.98	2.07	2.01	2.14	1.99	1.98	1.96	1.98	1.95	S	2.02	2.08	2.05	2.05	1.92	2.14	1.99	24
25	2.05	2.08	2.13	2.11	2.19	2.26	2.19	P	2.23	2.17	2.18	2.14	2.14	2.13	2.16	2.14	2.16	2.19	S	2.22	2.70	2.67	2.73	2.80	2.05	2.80	2.26	23
26	3.03	3.13	2.99	3.07	3.60	3.22	3.13	3.10	2.85	2.56	2.45	2.22	2.20	2.22	2.24	2.20	2.20	S	2.13	2.39	2.57	2.63	2.63	2.58	2.13	3.60	2.67	24
27	4.05	3.99	3.55	3.47	3.20	2.41	2.54	2.42	2.40	2.44	2.51	2.36	2.30	2.23	2.16	2.19	S	2.21	2.29	2.51	4.42	3.46	3.53	2.14	2.14	4.42	2.82	24
28	2.08	2.11	2.26	2.26	2.27	2.33	2.35	2.36	2.36	2.23	2.20	2.23	2.13	2.16	2.10	S	2.13	2.14	2.14	2.17	2.83	2.87	2.97	3.02	2.08	3.02	2.33	24
29	2.77	2.82	3.30	3.20	3.03	3.19	3.44	2.79	2.60	2.32	2.29	2.33	2.23	2.20	S	2.15	2.14	2.17	2.54	2.36	2.70	2.80	3.68	3.07	2.14	3.68	2.70	24
30	3.71	3.62	4.12	3.83	3.79	3.19	2.76	2.69	2.69	2.59	2.47	2.39	2.32	S	2.28	2.26	2.17	2.16	2.17	2.20	2.33	2.67	2.63	2.45	2.16	4.12	2.76	24
31	2.48	2.56	3.04	2.58	2.51	2.48	2.38	2.38	2.29	2.20	2.90	2.21	S	2.16	2.20	2.22	2.17	2.17	2.20	2.33	2.39	2.75	2.72	2.73	2.16	3.04	2.44	24
HOURLY MAX	4.05	3.99	4.12	3.91	3.79	3.56	3.44	3.62	3.23	2.99	4.93	2.50	2.60	2.52	2.34	2.65	2.38	2.34	2.75	2.85	4.42	3.46	3.68	3.11				
HOURLY AVG	2.73	2.78	2.85	2.90	2.86	2.72	2.62	2.52	2.50	2.39	2.38	2.24	2.21	2.21	2.17	2.18	2.16	2.16	2.21	2.29	2.56	2.57	2.64	2.60				

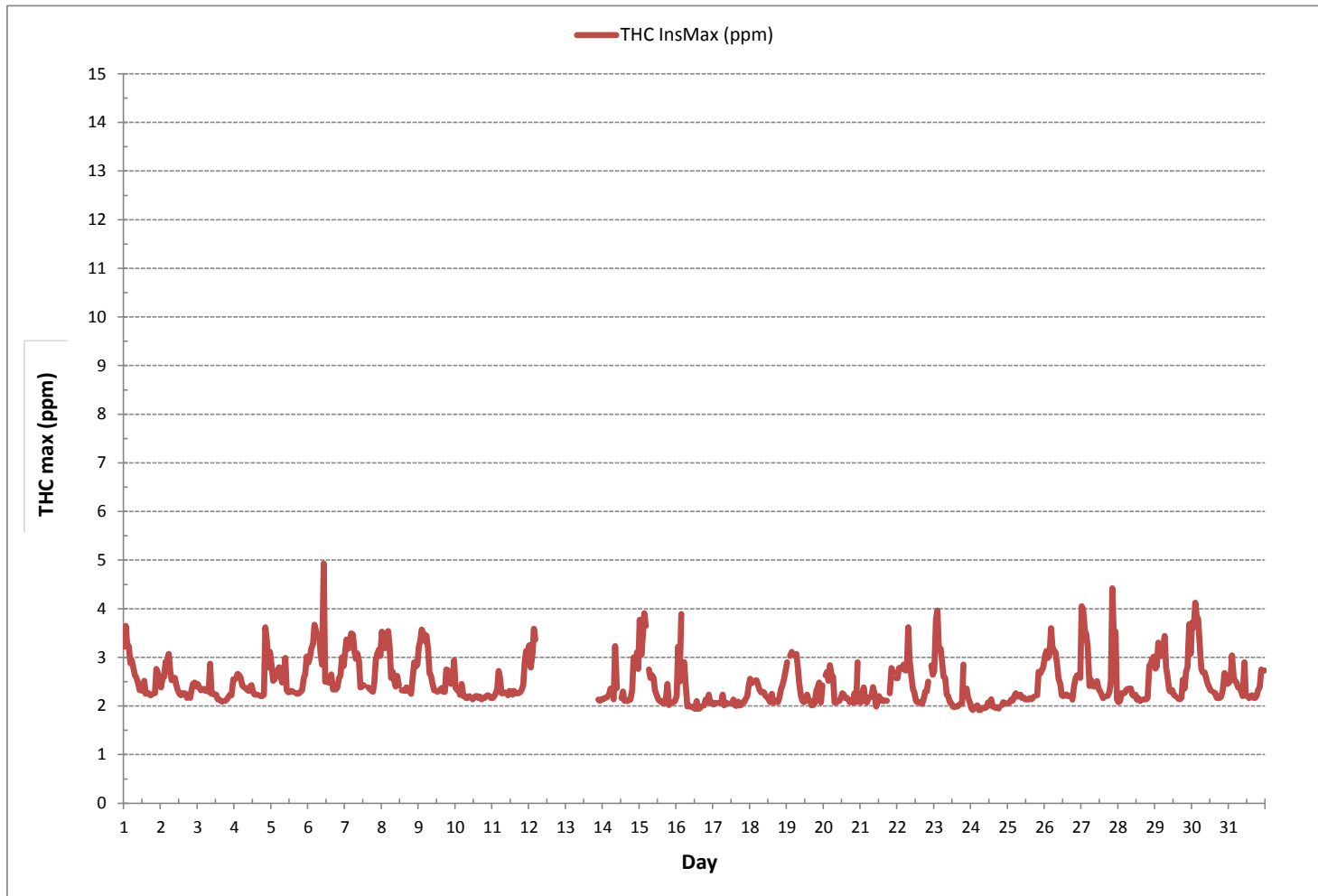
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	664
MAXIMUM INSTANTANEOUS VALUE:	4.93 ppm @ HOUR 10 ON DAY 6
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	3 hrs
OPERATIONAL TIME:	697 hrs
STANDARD DEVIATION:	0.45

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



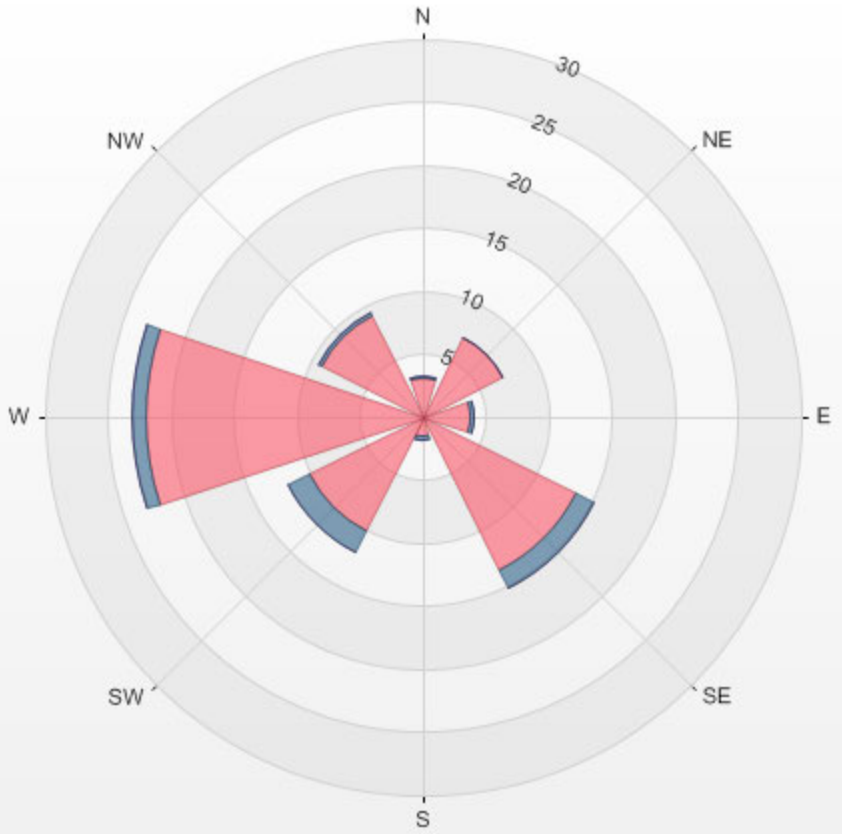
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.95% Calm Avg: 2.50 [ppm]

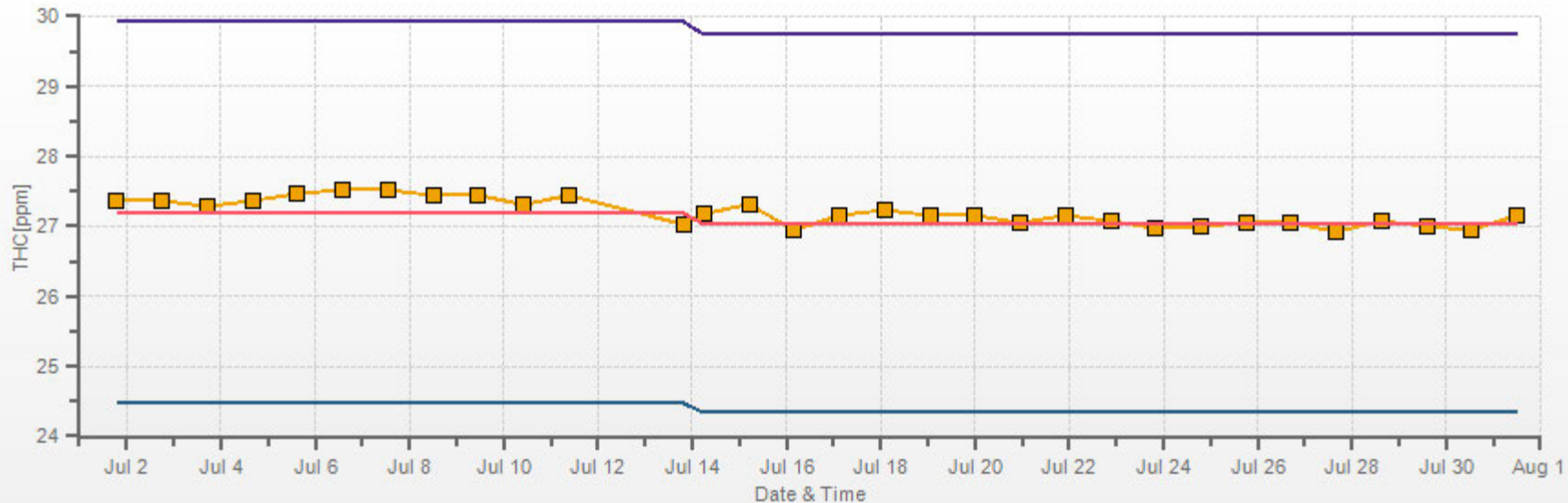
Direction	0.0-1.2	1.2-2.3	2.3-3.5	>3.5	Total
N	0.0	3.2	0.2	0.0	3.3
NE	0.0	7.1	0.0	0.0	7.1
E	0.0	3.8	0.3	0.0	4.1
SE	0.0	13.7	1.5	0.0	15.2
S	0.0	1.7	0.3	0.0	2.0
SW	0.0	10.1	2.0	0.0	12.1
W	0.0	22.0	1.1	0.0	23.0
NW	0.0	8.9	0.5	0.0	9.3
Summary	0.0	70.3	5.7	0.0	76.1

% Icon Classes (ppm) 0 0.0-1.2 70 1.2-2.3 6 2.3-3.5 0 >3.5

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 23.95% Calm Poll Avg: 2.50[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



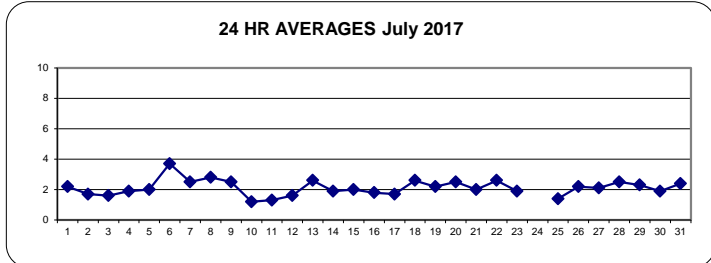
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

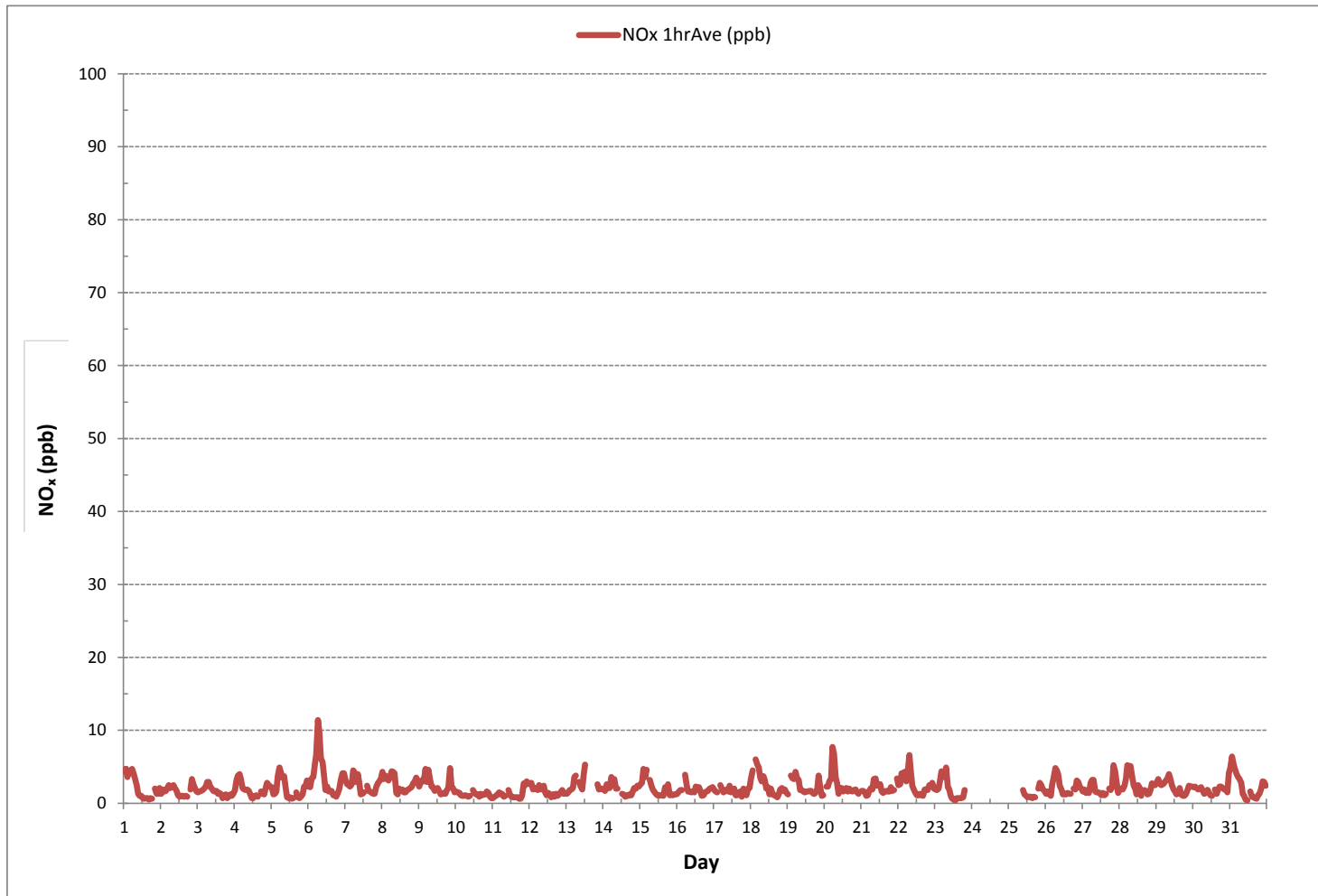
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	668			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	13	ON DAY 23
MAXIMUM 1-HR AVERAGE:	11 ppb	@ HOUR	6	ON DAY 6
MAXIMUM 24-HR AVERAGE:	4 ppb			ON DAY 6
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	706 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	94.9 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	2 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





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

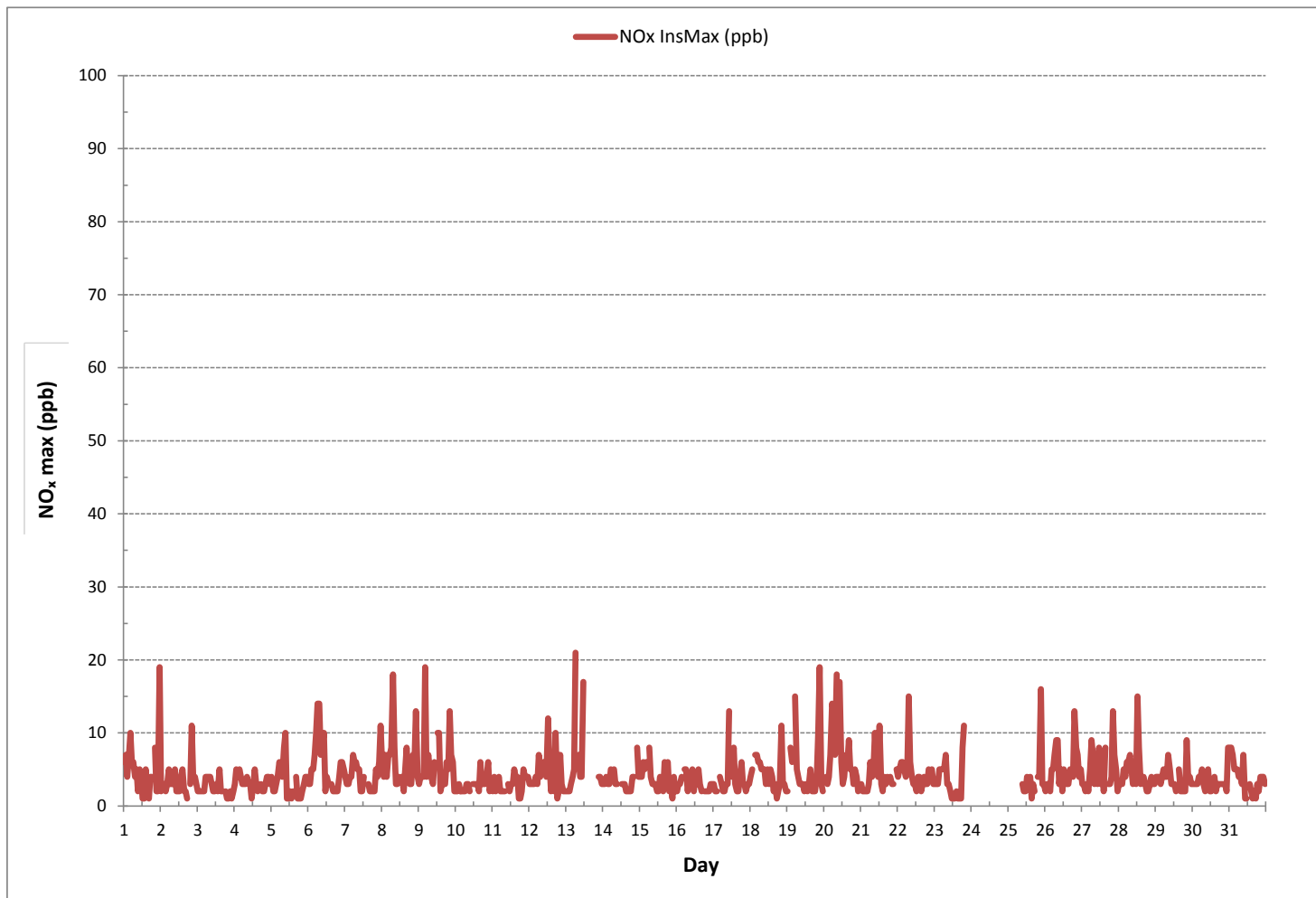
STATUS FLAG CODES

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:	659
MAXIMUM INSTANTANEOUS VALUE:	21 ppb @ HOUR 6 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	699 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



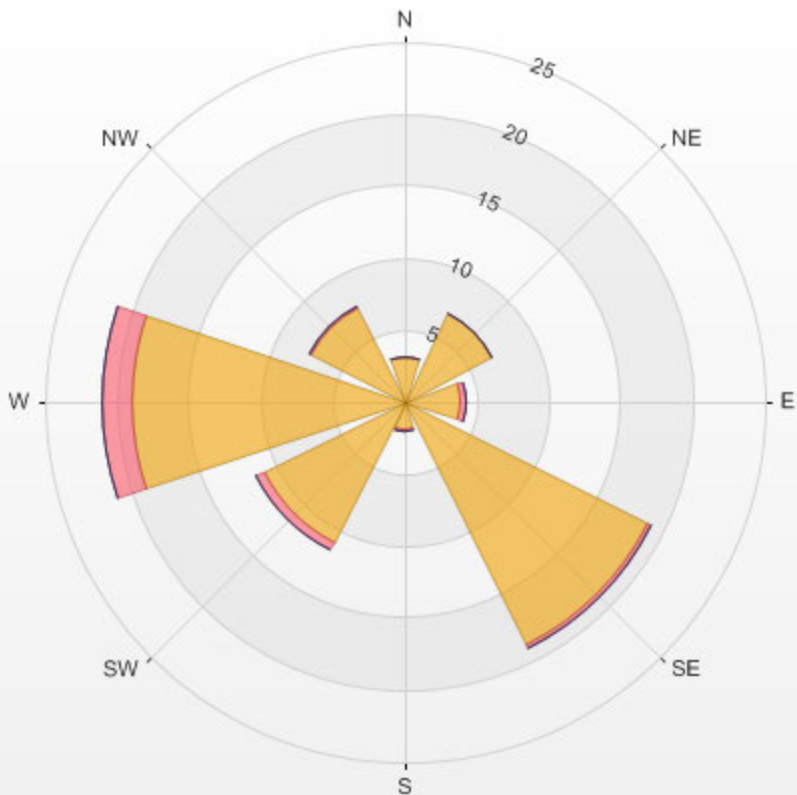
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NOX[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 24.43% Calm Avg: 2.88 [ppb]

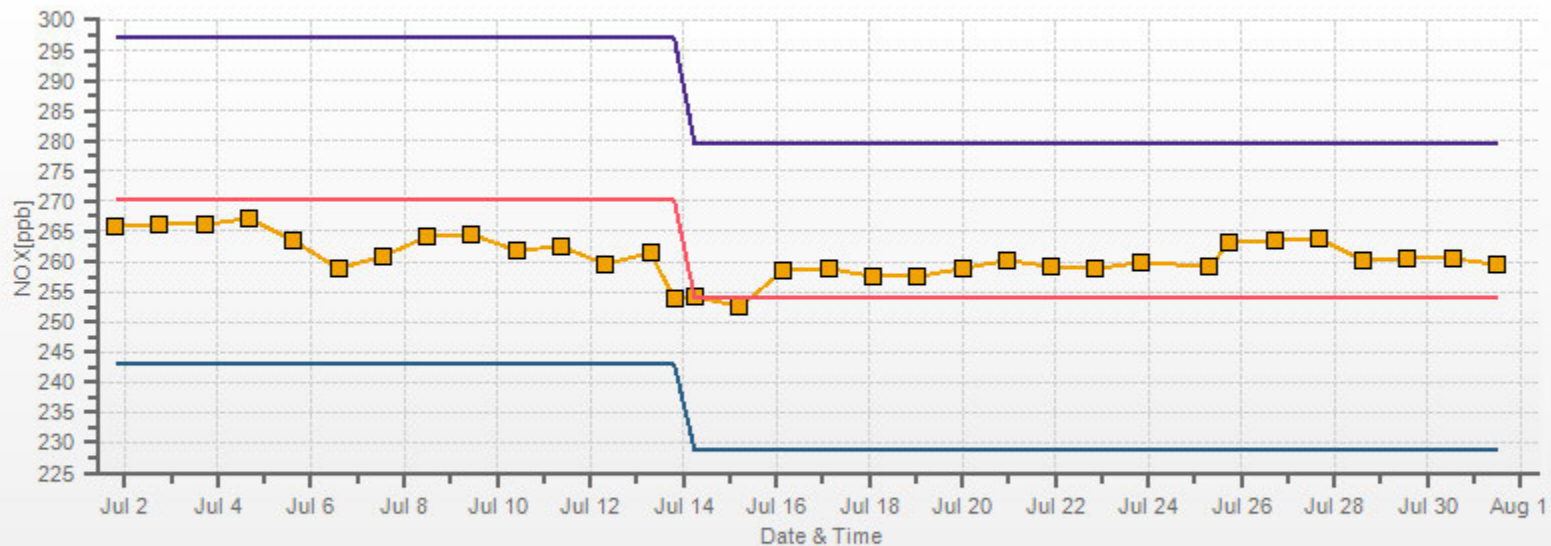
Direction	0.0-4.0	4.0-8.0	8.0-12.0	>12.0	Total
N	3.2	0.0	0.0	0.0	3.2
NE	6.8	0.0	0.0	0.0	6.8
E	4.0	0.3	0.0	0.0	4.3
SE	18.8	0.3	0.0	0.0	19.1
S	2.0	0.2	0.0	0.0	2.1
SW	10.9	0.6	0.0	0.0	11.5
W	19.0	2.1	0.0	0.0	21.1
NW	7.3	0.2	0.0	0.0	7.4
Summary	71.9	3.6	0.0	0.0	75.6

% Icon Classes (ppb) 72 0.0-4.0 4 4.0-8.0 0 8.0-12.0 0 >12.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 24.43% Calm Poll Avg: 2.88[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 Type: Span



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

NITRIC OXIDES

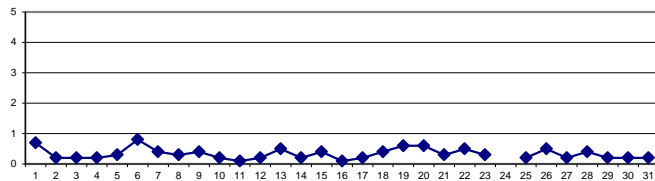
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

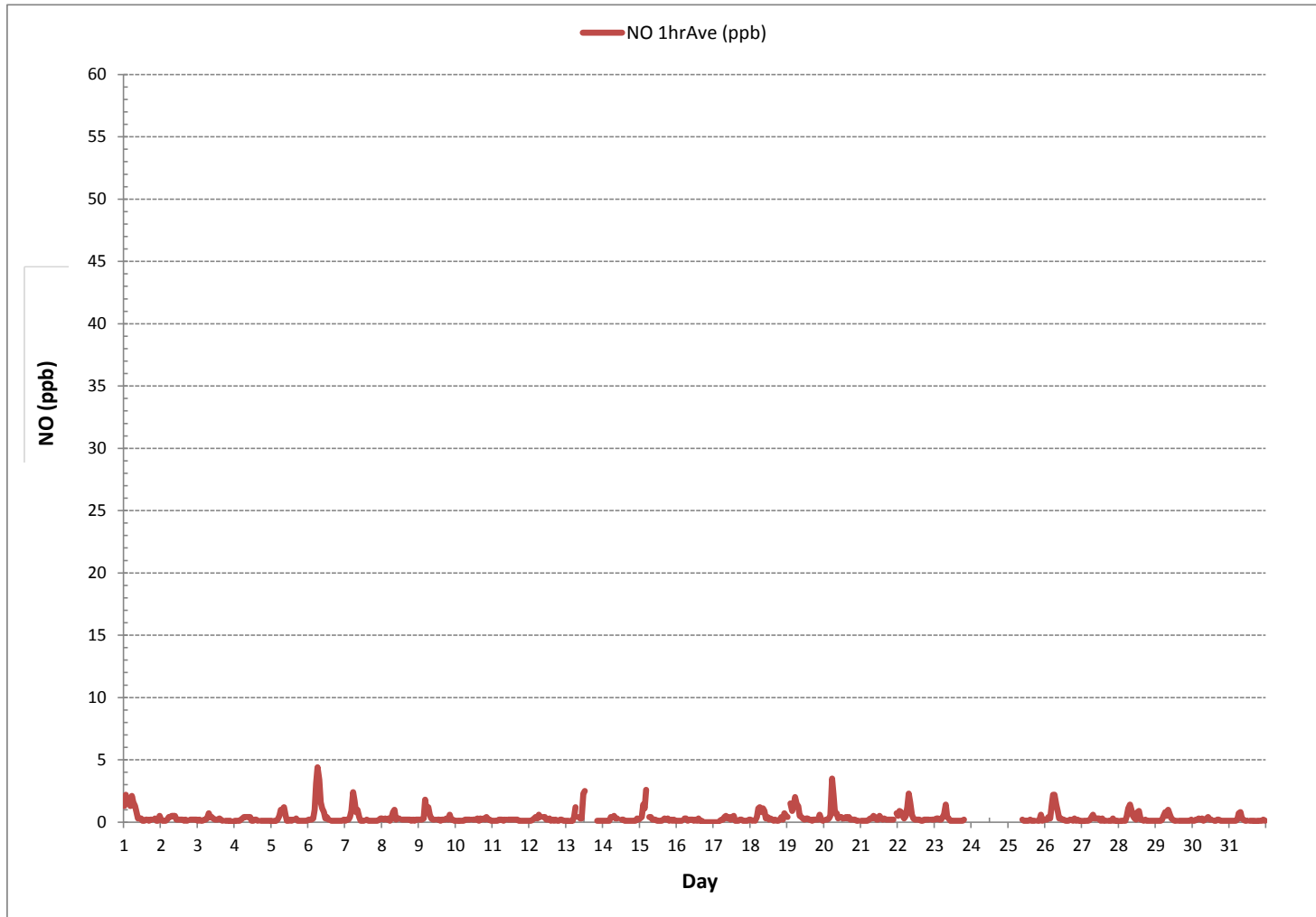
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	651			
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	22	ON DAY	3
MAXIMUM 1-HR AVERAGE:	4 ppb @ HOUR	6	ON DAY	6
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	6
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	706 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	94.9 %	
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





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

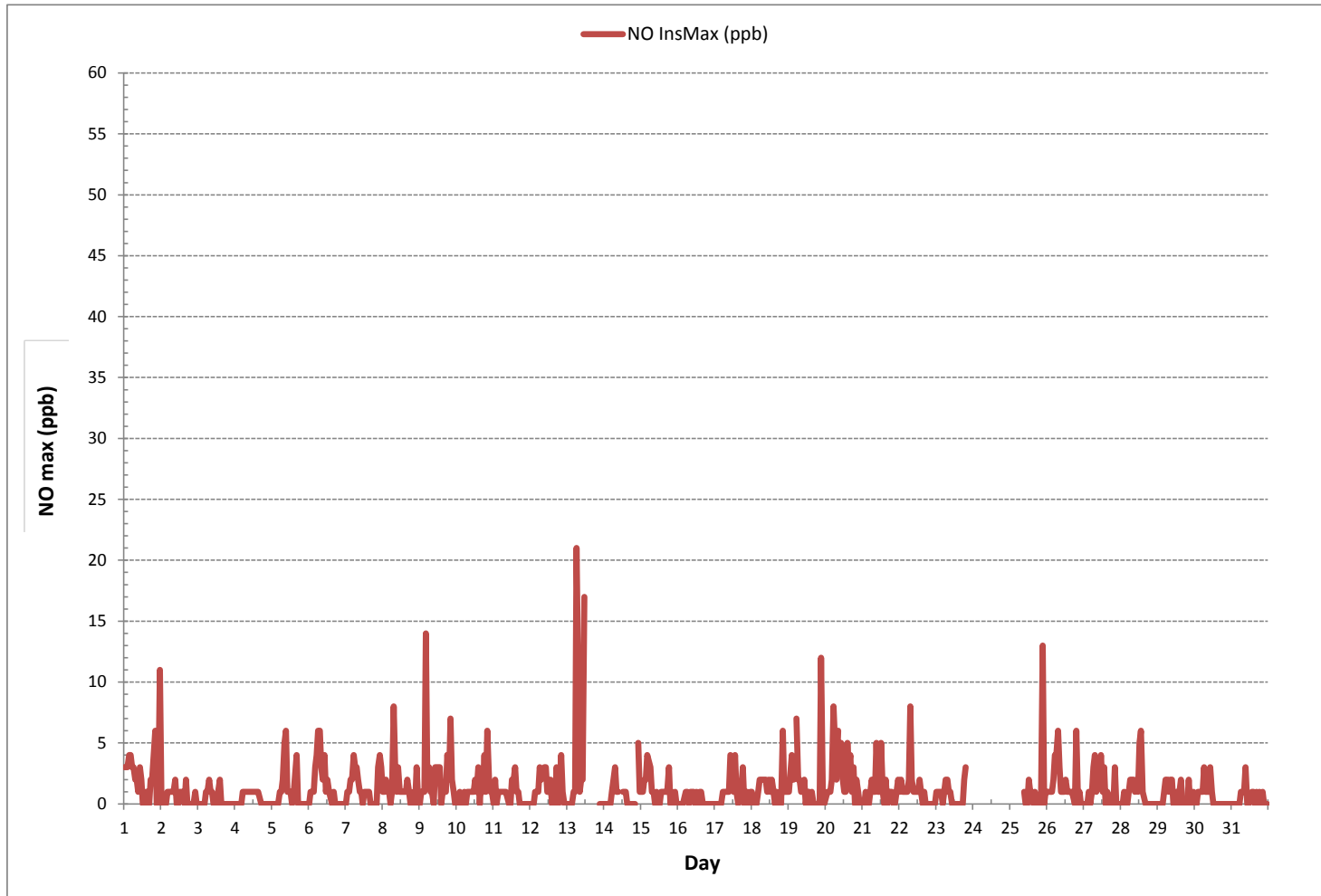
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	392
MAXIMUM INSTANTANEOUS VALUE:	21 ppb @ HOUR 6 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	699 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



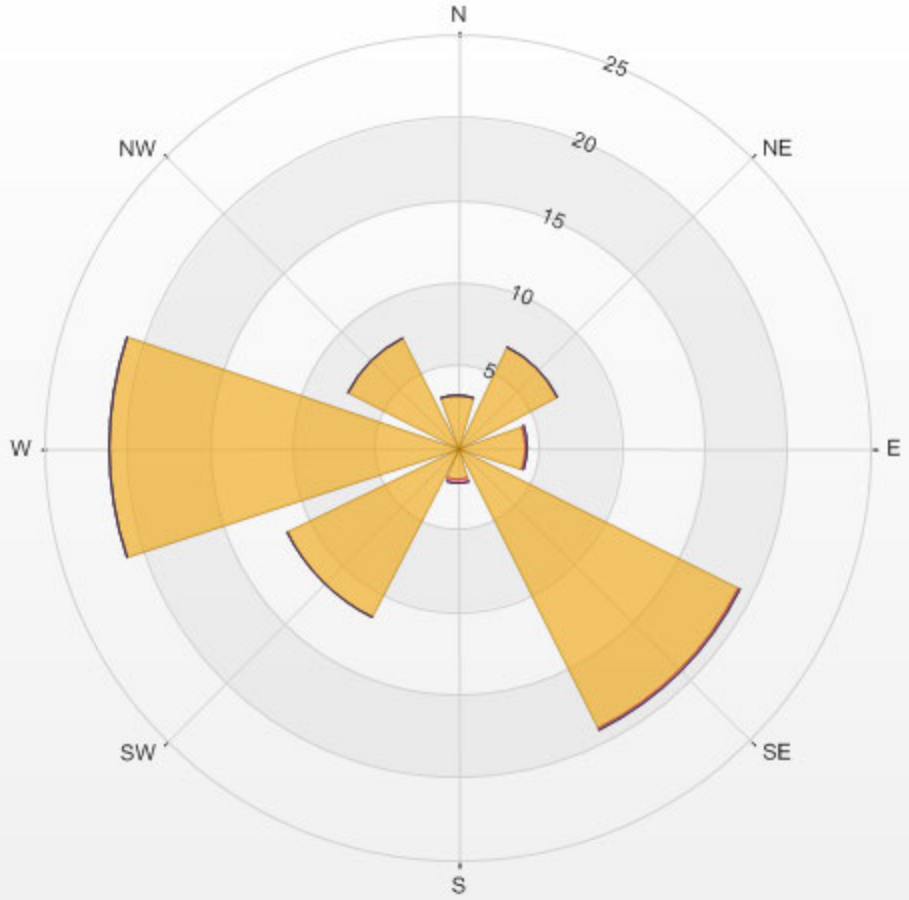
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 24.43% Calm Avg: 0.54 [ppb]

Direction	0.0-1.7	1.7-3.3	3.3-5.0	>5.0	Total
N	3.2	0.0	0.0	0.0	3.2
NE	6.8	0.0	0.0	0.0	6.8
E	4.1	0.2	0.0	0.0	4.3
SE	19.0	0.2	0.0	0.0	19.1
S	2.0	0.2	0.0	0.0	2.1
SW	11.5	0.0	0.0	0.0	11.5
W	21.1	0.0	0.0	0.0	21.1
NW	7.4	0.0	0.0	0.0	7.4
Summary	75.1	0.5	0.0	0.0	75.6

% Icon	Classes (ppb)	75	0	0	0
	0.0-1.7		1.7-3.3		3.3-5.0
	>5.0				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 24.43% Calm Poll Avg: 0.54[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

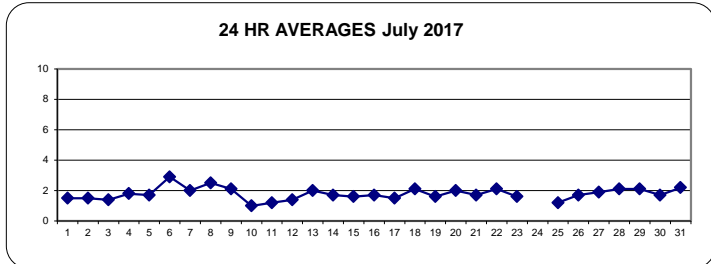
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

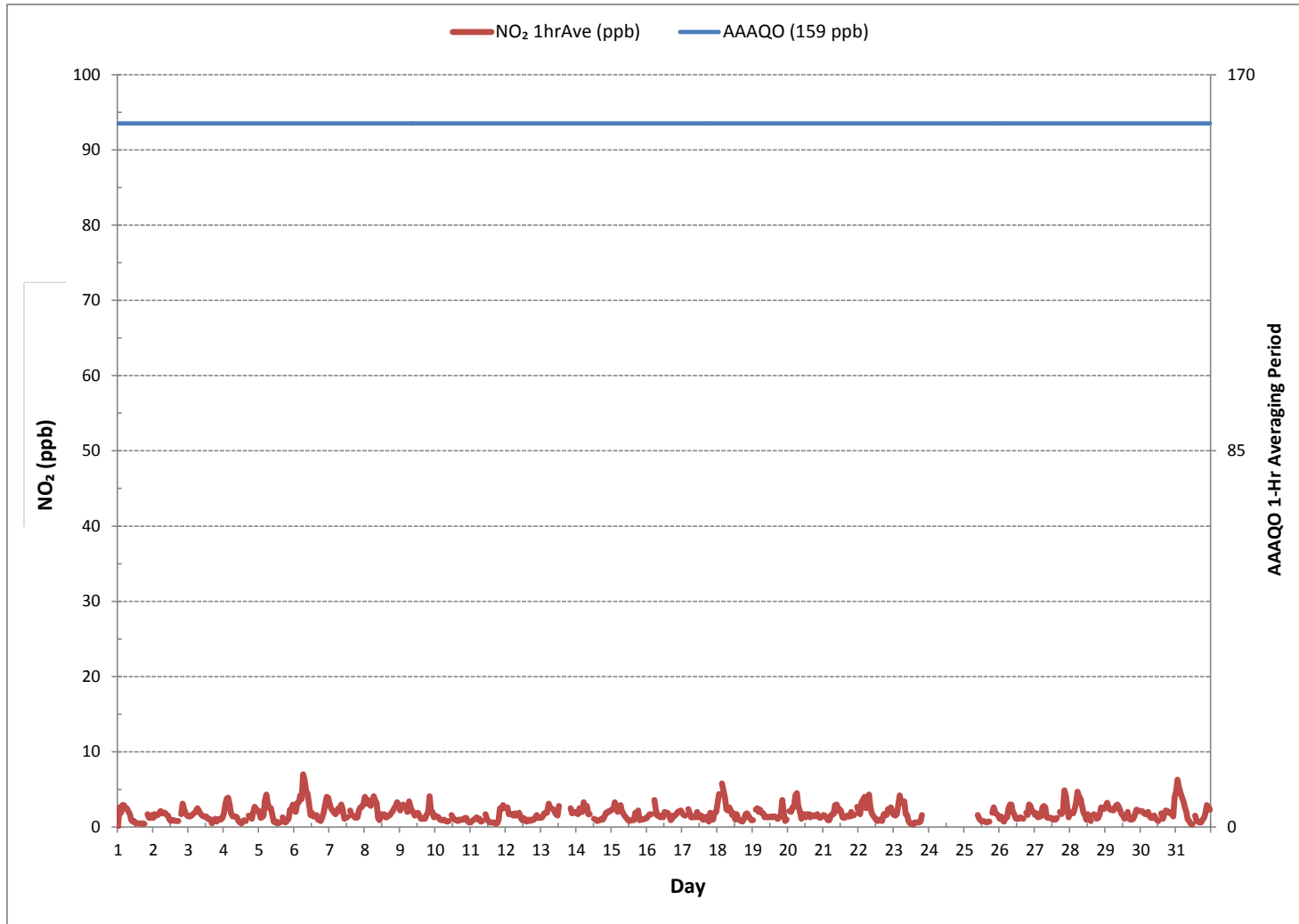
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	668			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	13	ON DAY 23
MAXIMUM 1-HR AVERAGE:	7 ppb	@ HOUR	6	ON DAY 6
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 6
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	706 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	94.9 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	2 ppb	

24 HR AVERAGES July 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





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

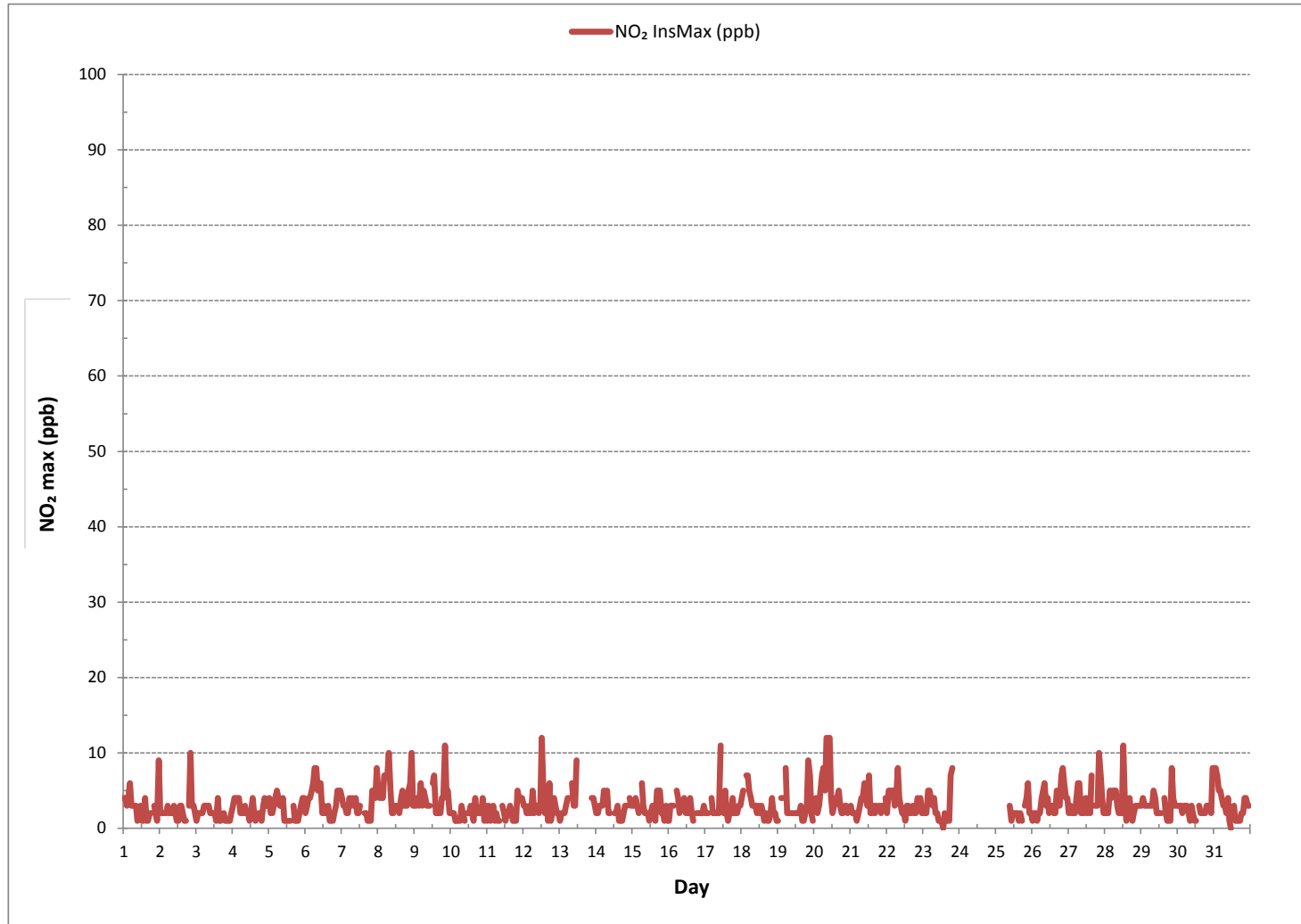
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	657
MAXIMUM INSTANTANEOUS VALUE:	12 ppb @ HOUR 12 ON DAY 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	699 hrs
STANDARD DEVIATION:	2

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



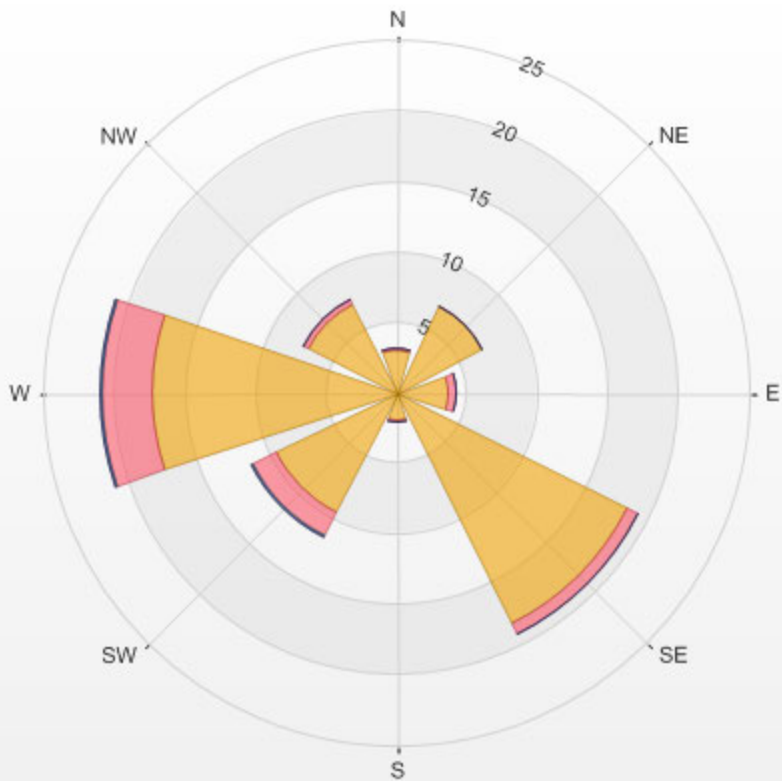
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 24.43% Calm Avg: 2.34 [ppb]

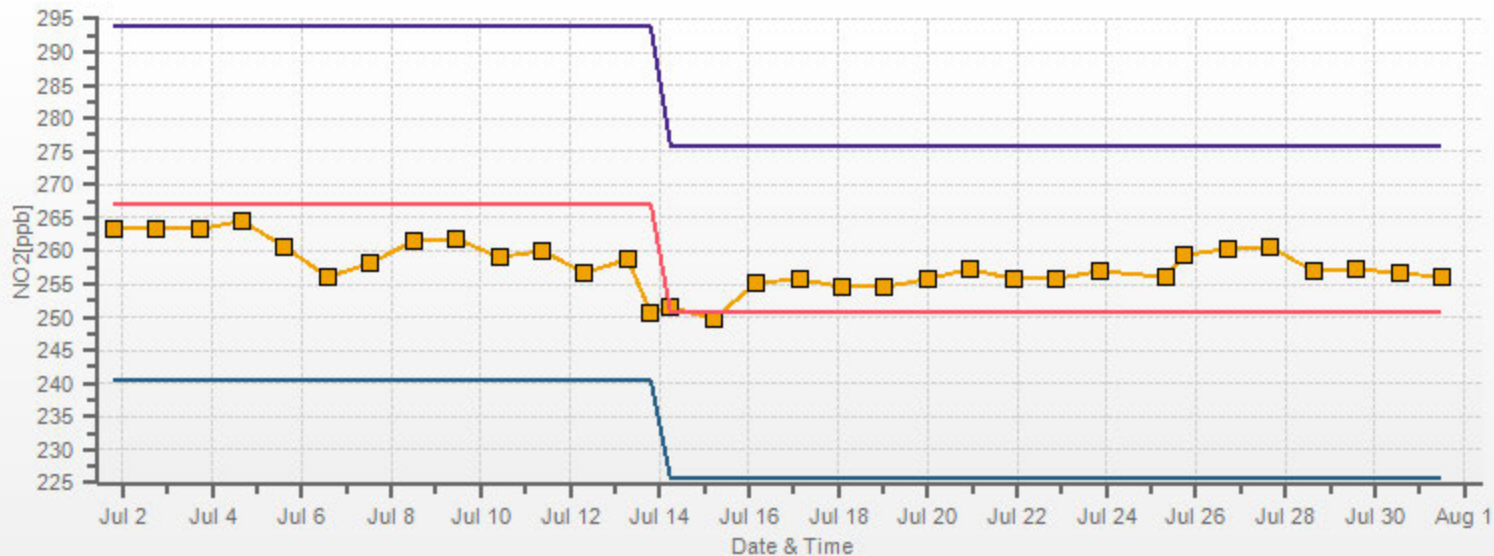
Direction	0.0-2.7	2.7-5.3	5.3-8.0	>8.0	Total
N	3.0	0.2	0.0	0.0	3.2
NE	6.8	0.0	0.0	0.0	6.8
E	3.6	0.6	0.0	0.0	4.3
SE	18.2	0.9	0.0	0.0	19.1
S	2.0	0.2	0.0	0.0	2.1
SW	9.6	1.8	0.2	0.0	11.5
W	17.3	3.6	0.2	0.0	21.1
NW	7.0	0.5	0.0	0.0	7.4
Summary	67.5	7.7	0.3	0.0	75.6

% Icon Classes (ppb) 68 0.0-2.7 8 2.7-5.3 0 5.3-8.0 0 >8.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 24.43% Calm Poll Avg: 2.34[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 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	1.2	0.8	0.6	0.8	1.6	2.7	7.9	10.9	17.3	24.5	26.9	29.6	30.4	30.9	31.0	29.0	29.4	29.5	29.2	S	22.9	22.0	19.6	19.7	0.6	31.0	18.2	24	
2	21.1	16.9	16.8	12.4	9.2	8.0	17.7	19.7	21.0	30.4	46.2	49.0	51.0	51.4	51.1	50.4	50.1	51.9	S	49.4	40.4	35.1	34.5	32.3	8.0	51.9	33.3	24	
3	30.3	27.8	26.7	23.5	21.6	20.3	19.1	21.9	25.2	32.7	32.8	37.0	37.5	39.1	41.5	43.3	38.6	S	37.8	34.4	36.1	33.8	32.6	30.3	19.1	43.3	31.5	24	
4	19.5	15.3	17.5	17.3	17.0	19.3	21.8	26.5	28.8	30.5	31.2	32.3	34.2	36.1	39.8	43.5	S	41.8	44.2	44.2	35.7	24.5	20.0	14.2	14.2	44.2	28.5	24	
5	27.0	30.5	22.0	17.9	19.6	17.2	19.3	24.0	26.4	28.4	30.2	30.8	31.9	33.6	34.3	S	36.2	36.3	36.1	34.9	33.5	24.1	19.1	14.5	14.5	36.3	27.3	24	
6	10.5	8.3	7.0	4.9	3.8	3.9	9.2	18.0	22.8	29.1	32.6	35.9	42.4	43.7	S	39.4	37.5	39.1	37.4	35.6	31.6	20.5	14.1	11.3	3.8	43.7	23.4	24	
7	9.6	5.6	3.3	1.7	1.3	3.1	10.3	17.7	25.0	34.7	34.9	37.3	39.1	S	43.3	45.8	47.4	44.5	41.3	37.0	26.5	19.4	13.7	10.2	1.3	47.4	24.0	24	
8	6.6	5.4	6.9	5.2	5.9	17.1	20.8	15.9	23.2	30.5	32.2	32.7	S	33.2	33.4	34.2	32.4	33.2	33.7	42.0	42.7	31.1	22.6	15.3	5.2	42.7	24.2	24	
9	13.2	9.3	5.5	4.4	3.0	3.7	10.5	24.0	36.2	46.6	51.2	S	46.5	46.8	46.1	46.0	45.8	47.3	42.5	36.1	33.5	34.5	36.6	34.3	3.0	51.2	30.6	24	
10	36.7	34.8	37.3	41.6	33.7	31.3	30.2	33.9	37.7	40.2	S	42.6	43.1	42.2	40.6	39.9	40.2	41.3	38.4	34.8	31.4	29.2	29.6	29.9	29.2	43.1	36.5	24	
11	30.8	29.2	24.3	19.7	13.0	13.6	20.8	22.3	23.9	S	29.2	27.3	26.3	25.7	25.8	26.5	25.2	25.1	25.9	24.2	21.5	14.5	10.7	7.4	7.4	30.8	22.3	24	
12	8.8	10.7	4.0	4.4	4.4	9.9	13.9	20.1	S	28.6	32.8	39.0	39.1	37.1	37.7	36.3	37.4	37.2	36.2	35.1	33.5	30.7	29.2	27.0	4.0	39.1	25.8	24	
13	32.3	31.4	30.0	22.5	15.4	17.1	23.6	S	28.4	32.3	36.7	39.6	36.6	38.9	46.8	47.4	48.2	49.3	47.7	Y	47.0	51.1	43.0	37.8	15.4	51.1	36.5	23	
14	33.1	30.1	35.7	34.4	32.6	28.5	S	30.6	C	C	C	C	C	C	39.0	41.2	41.9	45.6	42.5	38.2	30.9	19.3	12.5	6.0	6.5	6.0	45.6	30.5	24
15	2.4	1.2	1.0	0.7	0.7	S	26.2	30.9	33.6	37.3	45.4	49.6	50.7	50.6	49.3	50.2	48.5	46.7	43.7	43.2	41.0	39.7	39.9	39.7	0.7	50.7	33.6	24	
16	38.9	33.0	28.7	15.4	S	19.6	26.3	33.9	36.5	38.7	38.3	38.8	37.9	32.6	28.2	27.6	23.2	19.9	19.2	18.2	17.8	18.2	19.6	17.2	15.4	38.9	27.3	24	
17	17.9	17.9	17.2	S	14.9	13.8	14.5	15.2	15.6	18.4	19.6	20.6	21.6	23.7	25.4	25.4	18.9	18.9	19.8	16.3	10.8	6.2	8.8	5.6	5.6	25.4	16.8	24	
18	5.4	6.6	S	5.5	5.8	7.2	10.8	12.3	11.9	15.2	18.1	19.6	24.0	22.9	24.8	24.7	25.2	24.6	23.9	20.8	11.5	5.3	1.6	1.2	1.2	25.2	14.3	24	
19	1.5	S	0.6	1.5	1.4	2.0	4.6	8.5	18.0	23.4	28.7	31.8	33.1	33.8	36.0	38.9	41.2	40.0	38.1	30.7	17.6	22.5	26.4	15.4	0.6	41.2	21.6	24	
20	S	6.5	5.6	5.6	4.3	2.2	10.4	22.3	24.3	26.1	27.8	27.3	26.7	25.7	26.6	25.8	29.0	29.3	28.4	26.4	23.8	22.7	20.1	S	2.2	29.3	20.3	24	
21	22.8	16.2	19.5	20.0	16.7	14.2	13.6	15.1	10.7	31.1	48.0	38.5	32.3	32.0	42.1	40.8	36.6	40.9	38.3	34.3	19.7	8.3	S	1.9	1.9	48.0	25.8	24	
22	1.9	1.0	1.0	3.3	6.4	8.2	8.9	10.4	14.9	23.7	31.0	35.4	37.3	36.8	36.0	35.0	32.2	28.7	19.3	16.2	8.8	S	11.2	7.6	1.0	37.3	18.1	24	
23	6.6	4.6	4.6	7.4	12.0	11.3	13.7	18.8	28.3	31.5	31.1	28.6	28.4	28.7	27.7	27.1	28.7	29.0	23.8	S	X	X	X	X	4.6	31.5	21.0	21	
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
25	X	X	X	X	X	X	X	X	S1	28.7	30.8	31.9	32.1	31.9	31.4	32.4	36.4	40.6	S	31.2	17.7	13.6	9.0	5.9	5.9	40.6	26.7	15	
26	4.2	2.5	1.7	1.2	1.0	1.3	8.0	19.0	26.2	35.0	37.4	39.7	40.3	44.8	48.9	S2.1	50.6	S	42.6	37.3	23.1	15.9	17.8	23.3	1.0	52.1	25.0	24	
27	16.0	7.7	9.3	5.2	17.1	25.7	23.3	26.0	27.6	28.9	30.4	31.8	31.8	34.1	37.1	37.8	S	43.1	37.6	23.1	12.4	20.1	21.6	22.4	5.2	43.1	24.8	24	
28	22.1	18.2	19.9	15.8	16.6	16.1	17.2	17.8	20.2	24.8	29.6	29.3	28.2	26.8	27.4	S	29.0	28.2	28.0	25.8	16.5	11.1	10.1	13.0	10.1	29.6	21.4	24	
29	10.7	8.3	3.5	2.4	6.7	5.3	9.1	11.7	16.5	29.7	39.7	42.1	43.8	42.1	S	42.0	41.1	39.8	38.8	35.9	29.0	16.0	12.0	8.6	2.4	43.8	23.3	24	
30	6.6	3.6	2.7	2.4	4.8	14.6	18.6	16.9	16.0	18.5	20.8	26.2	31.2	S	30.8	31.5	36.5	36.5	33.3	27.9	24.6	15.8	17.3	16.1	2.4	36.5	19.7	24	
31	14.3	13.4	10.3	10.4	12.0	13.7	17.6	20.8	24.0	25.8	27.5	28.1	S	26.7	26.9	26.7	25.2	24.9	24.1	20.1	16.0	10.2	8.1	7.3	7.3	28.1	18.9	24	
HOURLY MAX	38.9	34.8	37.3	41.6	33.7	31.3	30.2	33.9	37.7	46.6	51.2	49.6	51.0	51.4	51.1	52.1	50.6	51.9	47.7	49.4	47.0	51.1	43.0	39.7					
HOURLY AVG	16.1	14.2	13.0	11.0	10.8	12.5	16.0	20.2	23.7	29.5	32.9	34.0	35.5	35.4	36.1	37.2	36.3	36.1	34.0	31.1	25.7	21.7	19.8	17.0					

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

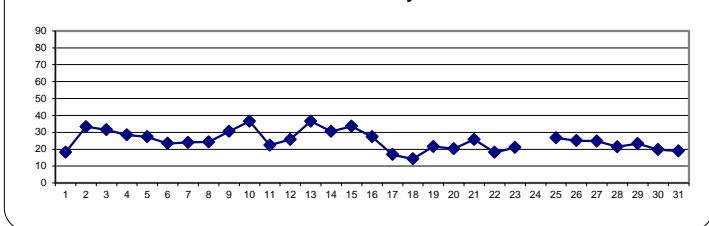
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

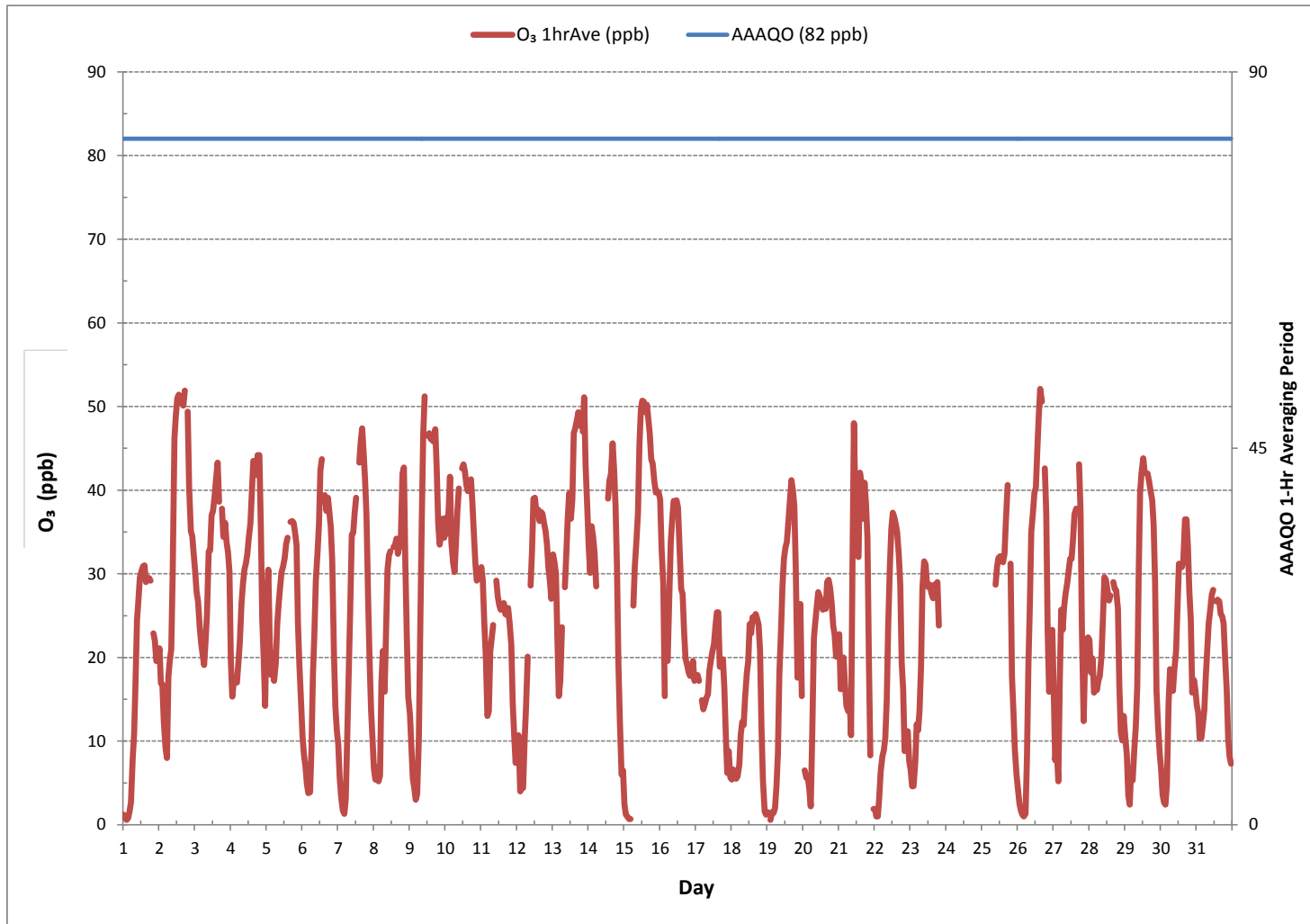
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	671			
MINIMUM 1-HR AVERAGE:	0.6	ppb	@ HOUR	2 ON DAY 1
MAXIMUM 1-HR AVERAGE:	52.1	ppb	@ HOUR	15 ON DAY 26
MAXIMUM 24-HR AVERAGE:	36.5	ppb		ON DAY 10
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	707 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	95.0 %
STANDARD DEVIATION:	13.0		MONTHLY AVERAGE:	25.0 ppb

24 HR AVERAGES July 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - July 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	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2.2	1.2	0.9	0.9	2.3	3.9	10.2	14.7	22.1	28.1	29.0	31.1	31.8	32.0	32.5	30.2	30.6	30.9	30.3	S	24.8	24.4	22.0	21.5	0.9	32.5	19.9	24	
2	21.6	20.0	19.7	14.5	12.5	11.3	19.3	20.9	22.1	39.1	49.2	51.5	52.8	52.9	52.6	52.2	51.6	53.4	S	51.9	43.9	38.5	35.5	33.1	11.3	53.4	35.7	24	
3	32.2	28.7	27.5	25.5	22.2	21.2	21.3	25.0	30.2	36.9	37.8	40.0	40.5	41.1	43.1	46.4	43.1	S	41.5	35.2	37.2	36.0	33.1	32.3	21.2	46.4	33.8	24	
4	26.0	18.1	19.6	18.4	19.3	20.2	23.7	28.6	29.8	32.4	32.5	34.3	35.7	37.4	41.6	45.2	S	44.2	45.3	45.3	43.0	31.5	24.2	17.0	17.0	45.3	31.0	24	
5	34.0	34.5	29.0	22.9	22.1	18.9	22.5	25.6	27.4	30.3	31.1	32.0	33.3	35.2	35.5	S	37.4	37.4	38.1	37.1	34.5	31.4	23.1	19.6	18.9	38.1	30.1	24	
6	11.9	10.5	9.0	7.0	4.9	7.7	12.2	20.9	25.7	34.5	36.0	38.7	48.2	48.5	S	44.5	39.1	40.4	38.5	36.9	34.2	27.1	16.7	13.8	4.9	48.5	26.4	24	
7	13.8	8.0	4.9	2.8	1.7	6.5	15.1	20.9	30.9	38.5	37.1	40.5	41.1	S	P	49.2	49.6	46.7	43.0	40.3	34.6	24.1	18.0	14.8	1.7	49.6	26.5	23	
8	12.2	7.2	8.4	7.0	13.2	22.1	23.3	18.7	28.3	32.5	33.4	34.2	S	34.0	34.5	35.7	34.6	35.2	41.2	43.3	45.5	37.8	29.9	18.8	7.0	45.5	27.4	24	
9	16.7	12.5	6.9	7.9	4.7	7.8	17.0	30.3	43.3	50.5	53.4	S	51.0	48.2	48.4	47.8	47.9	48.8	48.7	38.2	36.3	35.9	37.7	38.5	4.7	53.4	33.8	24	
10	39.1	38.4	41.6	43.3	38.1	34.5	32.2	36.8	42.1	44.3	S	45.8	45.2	45.5	43.7	42.2	42.1	43.3	42.5	37.5	33.7	30.2	32.7	33.1	30.2	45.8	39.5	24	
11	33.0	30.3	26.5	23.4	19.4	20.4	22.4	23.4	26.8	S	30.9	28.0	27.5	27.1	27.1	27.7	27.1	26.5	26.9	26.1	24.6	18.1	15.7	11.4	11.4	33.0	24.8	24	
12	11.9	15.4	9.3	7.6	8.2	11.4	19.0	21.5	S	30.6	35.5	40.9	41.5	38.8	38.5	37.4	38.5	38.5	36.9	35.5	34.9	33.4	31.6	31.8	7.6	41.5	28.2	24	
13	33.0	32.0	31.1	29.3	18.9	20.7	25.9	S	31.1	34.6	40.5	41.6	41.2	41.1	48.4	49.5	49.9	50.4	49.7	Y	56.9	52.0	49.3	42.0	18.9	56.9	39.5	23	
14	34.8	32.2	37.8	36.6	34.6	31.3	S	32.7	C	C	C	C	C	41.6	43.7	44.0	48.1	44.2	40.9	35.5	26.8	P	8.5	10.2	8.5	48.1	34.3	23	
15	4.0	1.3	1.0	0.5	0.8	S	29.9	33.3	35.5	40.7	48.1	52.3	51.6	52.5	51.0	51.6	51.1	48.1	45.3	43.7	42.1	39.9	40.0	40.0	0.5	52.5	35.0	24	
16	38.9	38.2	33.4	22.8	S	21.2	30.9	35.7	36.9	40.1	41.0	42.5	39.9	39.1	31.3	29.6	24.8	P	20.3	18.6	18.3	19.3	20.2	18.0	18.0	42.5	30.0	23	
17	19.5	18.9	17.2	S	15.3	14.1	14.7	15.5	16.0	20.0	19.9	P	22.8	24.9	30.8	30.6	22.8	20.6	20.9	18.6	16.0	10.9	11.5	10.6	10.6	30.8	18.7	23	
18	6.6	7.2	S	6.2	6.2	8.2	12.5	13.0	12.9	18.3	20.3	23.1	26.6	24.7	26.5	26.5	26.4	25.7	25.9	23.9	16.6	8.7	2.4	2.5	2.4	26.6	16.1	24	
19	2.1	S	0.9	1.7	P	4.0	5.2	11.6	21.0	26.3	31.7	33.1	34.5	35.1	38.1	41.1	42.5	40.9	40.3	36.6	25.9	28.1	28.3	21.8	0.9	42.5	25.0	23	
20	S	12.3	8.0	6.2	5.5	4.0	19.0	23.6	25.6	P	29.0	28.7	28.6	26.6	28.3	28.6	31.3	36.6	29.5	27.4	25.1	23.1	21.1	S	4.0	36.6	22.3	23	
21	32.0	18.9	24.1	22.2	17.5	15.4	14.2	17.1	13.6	48.7	52.0	43.9	35.5	35.4	45.3	46.9	38.2	43.6	P	41.7	29.8	12.8	S	4.5	4.5	52.0	29.7	23	
22	2.9	1.8	1.2	6.0	10.1	13.9	9.9	11.6	18.4	30.2	32.8	37.9	38.7	38.1	37.5	39.4	33.9	31.4	24.5	22.4	13.6	S	15.9	11.7	1.2	39.4	21.0	24	
23	12.5	8.4	11.4	10.6	15.1	15.4	15.6	23.9	30.8	32.8	30.2	29.8	29.6	30.0	28.4	29.6	30.9	30.6	27.8	S	X	X	X	X	8.4	32.8	23.5	21	
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
25	X	X	X	X	X	X	X	X	S1	32.0	32.3	34.5	33.3	32.8	32.4	34.2	39.7	42.3	S	35.7	26.6	21.5	11.9	10.0	10.0	42.3	26.7	15	
26	7.1	3.4	2.0	1.5	1.3	2.1	13.6	23.0	32.1	39.1	39.2	41.6	42.2	47.9	51.1	54.1	52.5	S	45.5	40.3	32.8	18.9	21.0	28.1	1.3	54.1	27.8	24	
27	24.8	10.8	14.5	6.4	26.5	26.9	24.8	30.0	29.0	29.8	31.8	33.3	33.0	36.8	38.4	38.7	S	45.1	43.9	32.5	16.0	25.6	35.4	25.6	6.4	45.1	28.7	24	
28	24.7	21.0	21.8	17.8	17.5	16.5	17.7	19.4	21.2	29.0	30.6	30.5	29.9	28.3	28.0	S	29.6	29.0	28.3	27.5	22.1	14.1	13.3	15.9	13.3	30.6	23.2	24	
29	12.6	10.1	5.5	2.9	9.1	8.9	11.9	13.2	22.1	37.4	42.8	44.0	45.5	44.5	S	43.4	42.1	40.7	41.4	38.0	34.9	19.5	19.0	11.1	2.9	45.5	26.1	24	
30	8.9	5.3	5.5	2.6	7.9	20.3	20.2	19.0	17.6	21.8	24.6	28.7	33.3	S	32.3	40.7	40.9	38.0	36.0	31.1	26.9	24.4	20.4	19.4	2.6	40.9	22.9	24	
31	16.2	15.3	11.4	11.6	12.9	15.4	19.6	22.4	25.3	27.2	28.4	29.2	S	27.7	27.7	27.5	26.0	27.4	25.5	21.9	18.0	15.3	9.2	9.1	9.1	29.2	20.4	24	
HOURLY MAX	39.1	38.4	41.6	43.3	38.1	34.5	32.2	36.8	43.3	50.5	53.4	52.3	52.8	52.9	52.6	54.1	52.5	53.4	49.7	51.9	56.9	52.0	49.3	42.0					
HOURLY AVG	19.1	16.5	15.4	13.1	13.6	15.2	18.7	22.6	26.6	33.5	35.1	36.7	37.6	37.4	37.7	39.8	38.3	38.5	36.3	33.9	30.2	26.0	23.1	20.2					

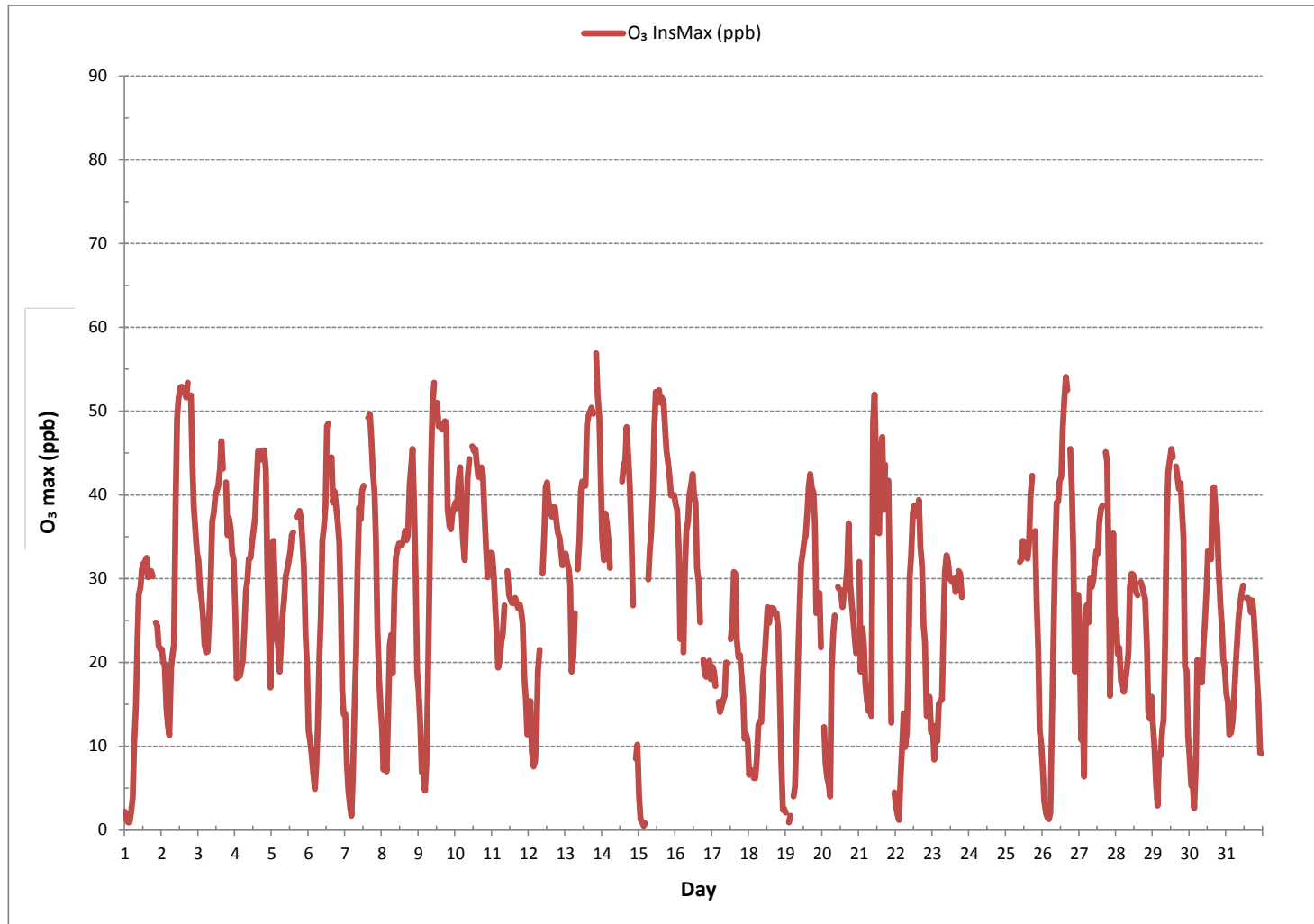
STATUS FLAG CODES

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:	664
MAXIMUM INSTANTANEOUS VALUE:	56.9 ppb @ HOUR 20 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	700 hrs
STANDARD DEVIATION:	13.0

OZONE Instantaneous Maximum (O₃ ppb)



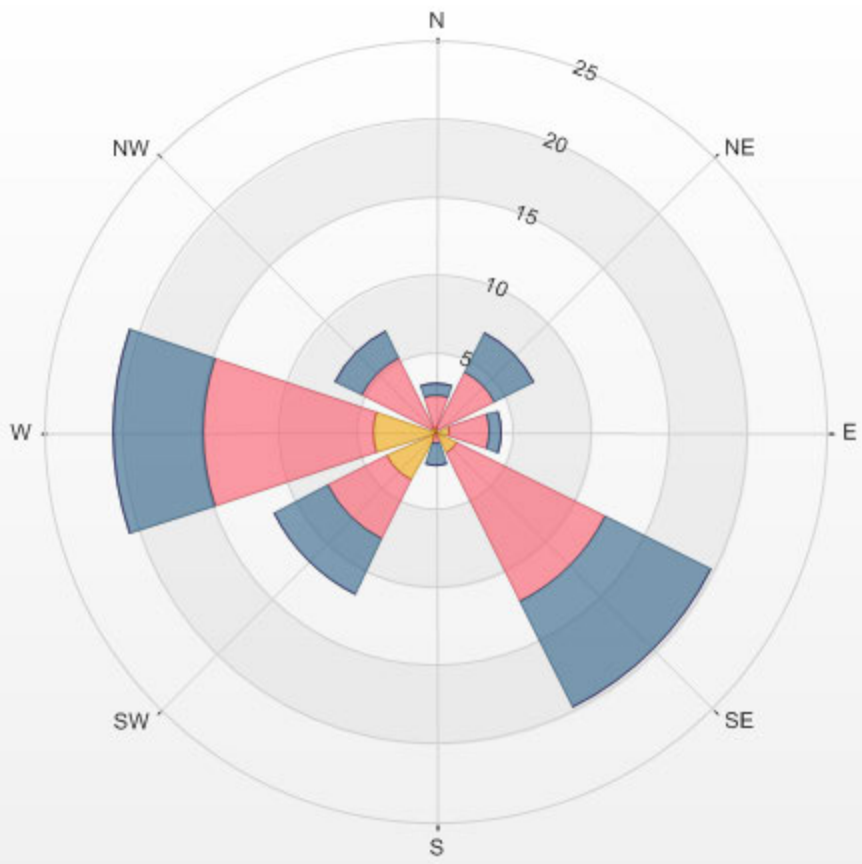
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O3[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 24.25% Calm Avg: 10.56 [ppb]

Direction	0.0-17.4	17.4-34.8	34.8-52.2	>52.2	Total
N	0.3	2.1	0.8	0.0	3.2
NE	0.2	4.1	2.9	0.0	7.1
E	0.9	2.6	0.8	0.0	4.2
SE	1.5	10.7	7.5	0.0	19.7
S	0.2	0.6	1.4	0.0	2.1
SW	3.5	4.2	3.9	0.0	11.6
W	4.1	10.8	5.7	0.0	20.6
NW	0.3	5.0	2.0	0.0	7.2
Summary	10.8	40.1	24.9	0.0	75.8

% Icon	Classes (ppb)	11	0.0-17.4	40	17.4-34.8	25	34.8-52.2	0	>52.2
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 24.25% Calm Poll Avg: 10.56[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/07 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	14	21	12	8	4	4	4	6	8	6	4	4	3	3	2	2	2	2	3	3	5	6	8	10	2	21	6	24
2	11	10	10	12	12	13	10	8	7	4	2	1	1	1	1	1	2	2	2	2	4	7	10	12	1	13	6	24
3	13	12	12	12	11	9	13	10	7	6	7	8	7	5	5	4	2	1	2	2	2	2	3	4	1	13	7	24
4	5	5	6	5	4	4	3	3	3	3	4	3	3	3	3	3	2	2	3	4	5	7	9	9	2	9	4	24
5	8	5	5	5	5	5	4	3	3	2	1	1	1	1	1	2	2	2	3	3	4	6	7	8	1	8	4	24
6	8	8	11	9	10	10	9	7	5	4	2	2	2	1	2	2	3	3	4	5	6	12	15	15	1	15	6	24
7	13	12	12	11	11	11	9	6	4	3	3	3	3	3	3	3	4	4	5	6	10	14	15	3	15	7	24	
8	23	21	25	23	19	14	12	11	10	6	4	6	5	5	5	5	6	6	8	20	25	25	27	27	4	27	14	24
9	25	25	24	24	23	23	25	23	22	19	18	17	15	15	13	14	13	12	13	15	16	18	20	17	12	25	19	24
10	9	7	7	8	10	14	12	11	10	9	9	7	9	9	9	9	7	11	11	14	15	16	12	11	7	16	10	24
11	8	8	7	6	6	6	5	4	3	3	3	3	3	3	3	3	3	3	3	4	6	6	7	3	6	7	3	24
12	8	9	8	8	8	9	7	5	4	3	3	2	2	2	2	3	3	3	4	4	5	6	6	7	2	9	5	24
13	6	6	7	7	9	8	7	6	6	6	6	7	8	7	7	7	8	8	10	9	5	5	6	5	5	10	7	24
14	7	10	18	20	20	17	13	13	12	11	12	12	12	11	10	11	13	15	17	18	20	23	23	24	7	24	15	24
15	21	21	21	18	17	18	15	12	11	10	13	12	11	10	9	9	9	10	10	10	10	10	9	9	9	21	13	24
16	8	8	9	9	9	10	14	20	18	15	14	23	32	35	33	43	20	6	15	30	57	62	51	37	6	62	24	24
17	19	9	6	4	3	3	1	0	0	1	1	2	2	2	2	3	1	0	0	0	0	0	0	0	0	0	2	24
18	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	24
19	1	1	1	2	2	2	2	2	2	1	1	3	4	5	6	8	8	9	10	12	15	12	5	5	1	15	5	24
20	6	6	7	6	7	8	9	7	6	6	7	8	10	11	13	12	16	14	13	11	10	10	9	6	6	16	9	24
21	12	12	16	13	10	10	8	8	10	11	5	C	8	12	11	9	10	10	10	11	11	10	8	8	5	16	10	24
22	8	9	7	6	4	3	2	4	6	5	7	11	12	12	11	9	8	8	9	9	10	11	14	13	2	14	8	24
23	14	13	15	17	14	9	8	5	3	3	3	2	1	1	1	1	1	1	1	1	5	4	4	4	1	17	5	24
24	3	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	10	12	13	12	0	13	3	24
25	13	15	16	23	23	18	15	12	9	8	15	12	7	6	4	3	2	1	2	1	2	3	3	4	1	23	9	24
26	4	5	5	4	5	6	6	5	5	4	3	2	2	3	3	3	3	3	4	4	7	12	13	13	2	13	5	24
27	13	13	12	11	12	13	11	10	8	7	6	5	5	5	5	6	6	6	7	7	9	9	9	9	5	13	9	24
28	9	9	9	9	11	16	18	17	15	14	10	4	2	1	1	1	0	0	1	1	2	4	6	8	0	18	7	24
29	8	9	8	8	9	9	9	8	8	8	6	6	6	5	4	5	5	5	6	7	8	12	14	14	4	14	8	24
30	14	16	17	14	11	10	9	8	8	8	7	7	6	6	6	7	12	16	18	19	21	22	24	24	6	24	13	24
31	22	21	19	16	13	10	7	4	3	2	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	22	5	24
HOURLY MAX	25	25	25	24	23	23	25	23	22	19	18	23	32	35	33	43	20	16	18	30	57	62	51	37				
HOURLY AVG	11	11	11	10	10	9	9	8	7	6	6	6	6	6	6	6	5	5	6	8	10	11	11	11				

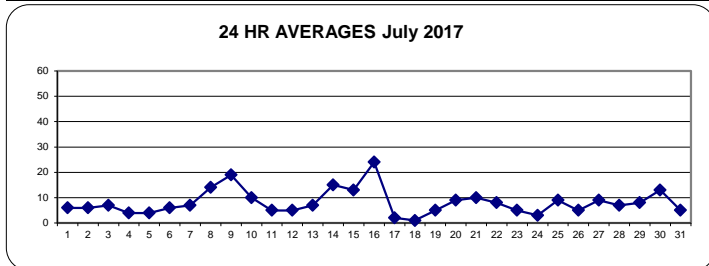
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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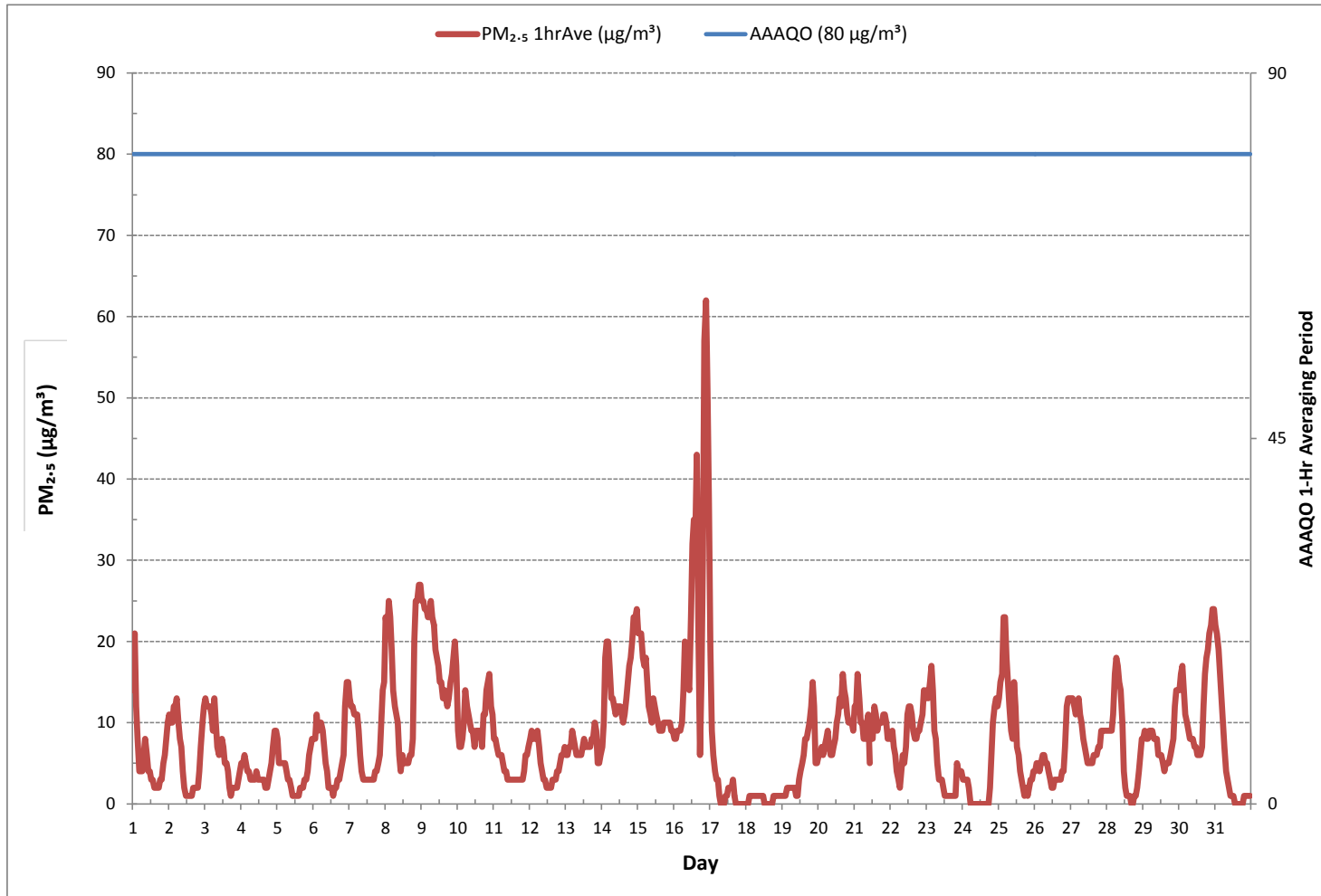
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	704			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	7	ON DAY	17
MAXIMUM 1-HR AVERAGE:	62 µg/m ³ @ HOUR	21	ON DAY	16
MAXIMUM 24-HR AVERAGE:	24 µg/m ³		ON DAY	16
MONTHLY CALIBRATION TIME:	1 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	7	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	8 µg/m ³	

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: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.72%

Calm Avg: 10.05 [ug/m3(L)]

Direction	0.0-12.6	12.6-25.2	25.2-37.8	37.8-50.4	50.4-63.0	>63.0	Total
N	2.3	0.7	0.1	0.0	0.0	0.0	3.1
NE	6.4	0.7	0.0	0.0	0.0	0.0	7.1
E	3.0	0.8	0.0	0.0	0.0	0.0	3.8
SE	15.8	2.9	0.0	0.0	0.0	0.0	18.6
S	2.0	0.1	0.0	0.0	0.0	0.0	2.2
SW	10.5	0.5	0.3	0.0	0.1	0.0	11.4
W	18.2	3.4	0.0	0.0	0.3	0.0	21.9
NW	6.8	1.9	0.3	0.1	0.0	0.0	9.1
Summary	65.0	11.0	0.7	0.1	0.4	0.0	77.3

% Icon Classes (ug/m3(L))

65 0.0-12.6

11 12.6-25.2

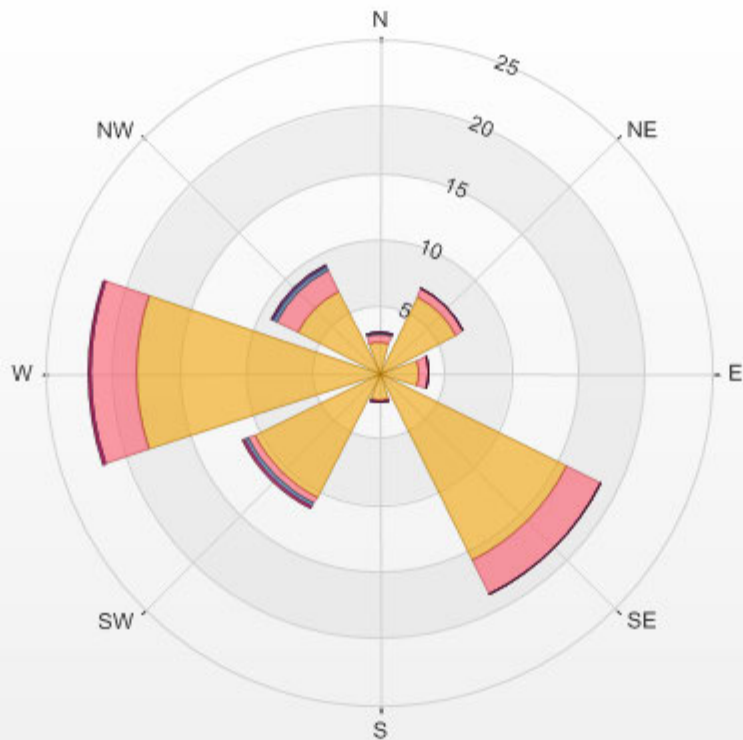
1 25.2-37.8

0 37.8-50.4

0 50.4-63.0

0 >63.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 22.72% Calm Poll Avg: 10.05[ug/m3(L)]



WIND SPEED



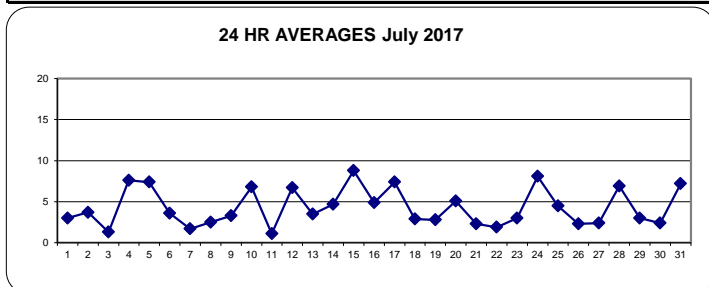
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY 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	0.5	0.8	0.4	0.5	0.9	1.2	0.8	1.9	2.5	3.8	4.3	5.3	6.1	3.8	4.2	5.6	4.5	3.9	7.2	6.2	4.0	3.8	2.4	4.3	0.4	7.2	3.0	24
2	4.0	0.8	2.1	1.3	0.3	0.8	5.5	5.6	4.6	4.4	4.6	5.9	5.8	4.1	4.4	6.4	6.3	4.3	4.1	3.1	4.2	3.7	5.4	6.6	0.3	6.6	3.7	24
3	8.2	8.2	8.4	7.6	13.2	7.2	2.2	5.9	5.5	6.3	5.6	2.2	8.3	6.4	6.3	3.3	8.3	11.8	14.5	11.4	6.5	5.5	5.1	4.0	2.2	14.5	1.3	24
4	1.8	2.6	3.2	3.2	3.5	5.2	7.5	10.7	12.3	11.8	12.9	12.0	10.4	12.2	13.2	12.9	11.8	9.5	8.2	2.2	1.0	1.6	1.0	1.0	1.0	13.2	7.6	24
5	4.9	2.2	1.7	2.1	4.0	4.2	6.2	8.5	9.9	10.9	12.7	12.9	13.6	13.6	12.8	11.8	13.1	12.2	10.2	5.8	4.3	3.4	2.1	1.0	1.0	13.6	7.4	24
6	0.6	0.5	0.3	0.5	0.5	1.0	1.7	1.6	2.3	2.1	2.8	5.8	6.4	8.6	9.0	9.1	8.1	9.0	8.0	6.2	3.4	1.2	0.6	1.5	0.3	9.1	3.6	24
7	0.4	0.4	0.4	0.5	0.3	0.7	1.1	1.3	1.1	1.8	4.0	5.1	5.0	5.8	4.5	4.7	4.4	4.7	4.3	2.7	1.0	1.1	0.3	0.6	0.3	5.8	1.7	24
8	0.5	1.2	1.7	0.4	4.1	5.9	5.6	0.5	0.9	3.8	6.3	7.6	7.5	5.8	5.1	3.1	4.4	4.4	4.9	7.2	3.9	0.9	0.4	1.0	0.4	7.6	2.5	24
9	0.2	0.2	0.7	0.7	0.3	0.9	1.5	3.1	3.9	5.2	6.2	4.9	6.7	5.5	4.6	6.6	7.7	7.1	4.4	3.1	3.1	4.2	6.6	5.2	0.2	7.7	3.3	24
10	5.0	3.0	8.0	10.5	1.9	4.8	6.4	8.2	8.5	8.4	8.3	8.4	7.8	7.0	7.9	9.3	7.8	10.3	8.5	7.6	5.5	10.4	8.3	1.9	10.5	6.8	24	
11	4.6	3.4	3.2	2.4	0.8	2.2	4.4	5.4	5.9	6.6	5.4	6.6	4.7	6.9	5.6	5.5	5.2	4.9	4.6	4.5	3.8	2.4	1.3	0.9	0.8	6.9	1.1	24
12	0.6	2.3	1.1	1.7	0.8	3.1	5.7	8.4	9.9	10.5	12.9	11.8	11.6	15.4	12.9	6.7	7.5	10.7	7.2	7.4	4.7	3.1	2.8	3.6	0.6	15.4	6.7	24
13	5.4	6.7	3.4	0.4	1.5	2.5	3.4	3.8	2.9	4.4	7.0	6.7	6.3	7.0	9.9	10.6	11.2	12.6	10.6	9.0	7.6	20.4	1.5	5.5	0.4	20.4	3.5	24
14	6.2	8.7	11.4	10.9	6.6	3.7	6.4	7.2	6.8	7.6	6.6	5.7	4.8	4.6	5.4	7.1	7.5	6.2	4.7	1.9	0.9	0.3	0.6	0.5	0.3	11.4	4.7	24
15	0.6	0.6	1.4	0.4	1.0	1.3	7.6	6.9	9.5	10.8	14.7	14.6	13.5	14.1	15.2	15.9	12.6	9.7	9.5	13.9	11.9	11.5	8.3	8.7	0.4	15.9	8.8	24
16	6.7	2.2	2.3	0.3	2.2	3.4	11.6	14.0	9.8	8.6	6.2	17.6	19.3	7.7	6.4	13.0	10.0	11.1	6.9	5.2	7.2	7.5	8.3	5.4	0.3	19.3	4.9	24
17	7.4	6.2	6.4	8.6	6.7	5.9	8.7	12.1	12.3	12.0	12.0	12.5	11.9	11.4	9.8	8.4	12.6	12.1	7.1	3.2	1.8	1.6	2.7	1.8	1.6	12.6	7.4	24
18	2.9	3.3	3.5	3.1	4.6	4.6	4.3	4.5	3.8	4.0	6.1	5.7	4.1	1.8	1.4	1.0	1.8	3.2	3.9	2.4	1.5	1.3	0.8	0.4	0.4	6.1	2.9	24
19	0.8	0.6	0.7	0.2	0.1	0.5	1.9	2.8	4.0	4.4	6.0	7.3	6.9	8.2	7.0	7.0	7.6	6.5	4.9	2.0	0.9	5.1	4.4	0.8	0.1	8.2	2.8	24
20	0.7	0.8	1.1	2.1	1.5	1.4	3.0	6.2	5.1	7.6	7.1	7.1	8.6	7.4	5.1	5.4	8.0	9.8	8.4	7.4	6.3	5.9	5.7	7.5	0.7	9.8	5.1	24
21	6.9	2.0	2.2	8.0	7.2	3.6	4.6	1.6	0.1	7.9	5.7	6.2	6.7	6.8	4.4	0.7	4.3	2.2	3.9	2.4	1.0	0.5	0.7	0.5	0.1	8.0	2.3	24
22	1.5	0.7	1.1	0.8	0.3	1.0	1.1	2.0	3.4	4.1	2.9	5.2	5.6	6.5	7.9	7.4	3.4	1.7	1.2	0.8	1.0	0.3	1.7	1.6	0.3	7.9	1.9	24
23	0.9	0.5	1.4	1.7	3.1	1.6	2.3	3.5	5.5	5.0	7.3	7.3	5.7	6.7	5.2	5.7	3.4	1.5	3.4	1.5	1.8	3.3	6.3	10.9	0.5	10.9	3.0	24
24	12.1	8.3	2.9	6.1	9.5	12.6	12.6	11.7	9.5	9.2	7.5	7.7	7.5	5.8	9.8	10.5	7.2	6.4	13.3	16.9	14.9	15.2	12.6	12.0	2.9	16.9	8.1	24
25	8.7	9.4	9.2	5.4	4.8	3.7	4.1	4.8	6.3	8.4	8.8	8.2	6.8	4.1	3.8	4.4	6.2	5.9	3.7	1.8	1.4	0.8	0.9	1.1	0.8	9.4	4.5	24
26	0.6	0.2	0.4	0.4	0.9	0.2	0.8	2.8	4.7	5.4	5.6	5.5	5.1	6.4	5.9	4.7	4.3	4.2	5.6	3.3	1.7	1.4	1.9	3.4	0.2	6.4	2.3	24
27	0.8	1.0	0.9	0.6	4.1	3.9	1.5	4.0	5.9	6.6	5.3	5.6	5.8	6.3	8.8	9.2	8.4	4.9	1.9	0.5	1.1	1.7	10.5	11.6	0.5	11.6	2.4	24
28	5.5	4.6	2.6	5.1	5.8	6.1	6.4	7.2	7.1	8.5	9.5	12.0	11.2	12.8	13.1	12.4	11.4	10.1	8.5	6.2	1.9	1.8	2.6	3.4	1.8	13.1	6.9	24
29	2.6	1.7	0.9	0.7	2.7	0.4	2.0	3.6	5.4	6.1	5.9	5.7	5.5	5.4	5.2	6.6	5.7	5.5	4.2	2.6	1.3	0.6	0.3	0.6	0.3	6.6	3.0	24
30	0.5	0.8	0.8	0.6	0.6	2.5	4.9	1.9	1.1	1.5	3.5	4.3	7.3	8.2	6.6	8.7	10.8	10.9	8.4	4.1	3.5	2.2	3.9	3.9	0.5	10.9	2.4	24
31	4.9	4.9	2.8	4.7	5.2	6.4	8.5	10.0	10.3	11.0	12.9	13.3	12.3	12.1	10.0	9.8	9.4	10.3	6.7	4.1	2.8	1.6	1.7	1.6	1.6	13.3	7.2	24
HOURLY MAX	12.1	9.4	11.4	10.9	13.2	12.6	12.6	14.0	12.3	12.0	14.7	17.6	19.3	15.4	15.2	15.9	13.1	12.6	14.5	16.9	14.9	20.4	12.6	12.0				
HOURLY AVG	0.4	0.7	0.2	0.6	1.1	1.3	1.1	1.4	1.7	1.3	1.8	2.2	2.0	2.3	2.3	2.5	2.7	2.5	1.8	0.9	0.8	0.5	0.6	0.8				

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

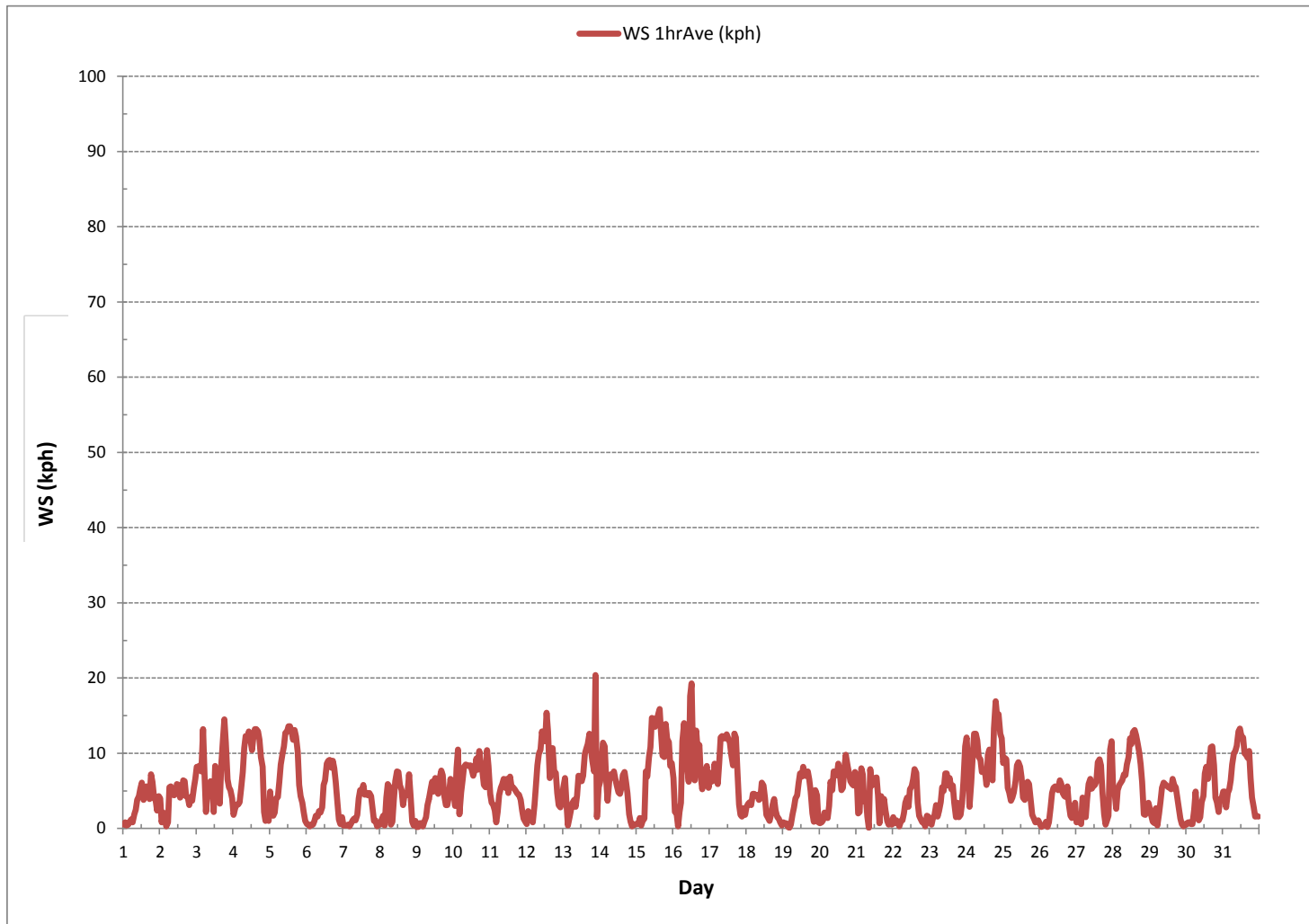
LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 14 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 4 ON DAY 19
MAXIMUM 1-HR AVERAGE:	20.4 kph @ HOUR 21 ON DAY 13
MAXIMUM 24-HR AVERAGE:	8.8 kph ON DAY 15
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.8
MONTHLY AVERAGE:	1.3 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - July 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	3.5	3.7	2.4	3.3	3.5	2.9	2.8	5.5	6.9	8.4	10.6	11.5	11.1	9.8	8.5	9.7	11.9	10.1	10.9	11.8	6.2	6.5	4.3	7.5	2.4	11.9	7.2	24	
2	7.9	7.4	8.3	4.1	3.8	4.1	9.6	10.0	9.1	10.7	9.9	16.5	12.7	12.3	10.2	14.2	13.3	10.9	9.9	6.8	5.9	5.0	8.0	9.5	3.8	16.5	9.2	24	
3	9.8	11.1	11.9	12.4	20.4	22.2	12.2	9.9	12.3	11.1	13.8	9.7	13.0	15.3	12.0	10.9	14.7	23.6	22.0	22.7	13.3	10.4	7.7	7.3	7.3	23.6	13.7	24	
4	3.6	4.3	5.7	6.5	5.7	9.2	13.3	18.4	18.1	18.8	21.6	21.0	17.3	22.4	22.9	22.4	21.4	19.6	16.5	15.4	7.8	3.3	4.5	3.7	3.3	22.9	13.5	24	
5	13.7	8.1	4.4	6.0	5.5	6.9	10.8	12.6	14.9	18.7	22.5	20.1	24.2	20.7	20.2	18.8	21.0	17.6	17.3	9.7	6.4	4.5	4.1	3.3	3.3	24.2	13.0	24	
6	1.7	2.4	4.4	2.2	2.3	2.9	3.7	4.4	5.3	7.6	8.4	11.8	13.9	20.0	15.7	17.2	13.8	14.8	13.2	9.4	6.8	3.7	2.5	3.8	1.7	20.0	8.0	24	
7	2.3	2.1	2.0	2.4	2.1	2.2	3.3	4.2	4.8	9.5	13.5	13.7	11.7	14.4	P	11.4	9.5	9.8	8.3	6.6	2.6	4.6	1.9	2.5	1.9	14.4	6.3	23	
8	3.2	3.8	3.5	3.8	15.9	11.3	10.0	4.8	5.5	8.1	10.0	11.7	12.0	9.9	11.9	10.5	8.9	8.4	13.3	13.3	10.2	3.8	2.8	1.9	1.9	15.9	8.3	24	
9	4.0	2.8	2.5	2.6	2.4	3.4	5.3	5.6	7.8	10.3	11.1	11.6	14.8	14.7	15.3	13.5	16.4	12.1	9.1	7.7	6.2	8.3	11.9	20.5	2.4	20.5	9.2	24	
10	12.0	9.3	12.6	15.6	15.7	7.0	10.3	14.9	14.0	13.0	14.4	14.3	12.4	14.3	12.6	15.2	13.5	16.7	15.5	11.4	10.8	11.8	16.9	12.1	7.0	16.9	13.2	24	
11	8.3	6.0	5.6	4.3	4.1	4.4	8.9	8.6	10.2	10.3	11.6	10.1	10.8	13.7	12.7	16.2	10.7	8.8	11.3	8.3	7.6	4.3	3.3	2.2	2.2	16.2	8.4	24	
12	6.1	9.6	2.6	4.8	4.5	4.5	9.4	11.7	17.8	17.3	18.8	19.8	19.7	22.6	24.9	15.0	14.9	15.8	10.8	11.1	7.7	5.7	6.9	7.6	2.6	24.9	12.1	24	
13	7.9	9.5	8.7	2.7	2.7	4.3	5.5	9.6	8.4	8.0	11.4	12.2	14.2	13.3	15.4	17.9	17.7	19.2	18.6	14.6	30.3	33.6	12.1	11.2	2.7	33.6	12.9	24	
14	10.0	14.4	17.3	14.8	11.2	8.9	12.8	13.9	11.8	14.5	11.7	11.5	11.3	12.8	11.5	15.4	12.7	12.1	9.8	4.4	1.8	P	1.8	2.6	1.8	1.8	17.3	10.8	23
15	2.1	1.9	2.9	1.7	2.1	5.3	10.2	11.8	15.9	17.1	20.6	25.1	22.7	24.4	22.8	26.5	22.8	16.4	14.6	17.7	15.1	14.9	12.0	11.7	1.7	26.5	14.1	24	
16	10.2	6.4	7.2	3.5	12.9	12.9	18.1	20.4	17.2	14.2	12.4	29.8	30.6	27.8	13.7	20.8	20.1	P	10.8	10.2	14.8	11.8	12.1	9.0	3.5	30.6	15.1	23	
17	12.0	12.1	10.1	14.6	11.0	9.8	16.7	17.3	17.9	21.0	19.8	P	20.2	19.5	23.7	18.2	21.6	18.3	11.0	5.8	4.9	4.2	6.2	3.6	3.6	23.7	13.9	23	
18	5.6	5.1	5.4	5.9	8.6	7.3	7.6	7.8	6.8	8.4	10.3	8.6	9.0	5.0	4.3	4.4	6.2	7.0	7.2	7.5	3.8	2.4	2.2	1.4	1.4	10.3	6.2	24	
19	2.9	2.0	3.6	3.6	P	2.4	5.5	5.5	8.6	9.2	12.0	15.2	15.4	15.8	14.4	14.1	13.7	13.3	9.8	5.3	1.9	12.3	10.5	2.9	1.9	15.8	8.7	23	
20	2.6	3.9	3.5	4.9	2.8	3.0	8.3	11.8	8.6	P	12.5	12.1	14.4	13.6	12.2	13.6	12.6	16.5	17.9	14.0	13.3	9.0	11.0	15.2	2.6	17.9	10.3	23	
21	17.2	6.7	7.0	12.7	12.7	8.0	8.1	7.3	5.5	18.5	10.7	10.5	11.8	11.6	11.3	8.1	8.2	7.3	P	5.5	3.8	4.5	3.3	3.6	3.3	18.5	8.9	23	
22	4.8	4.0	3.6	2.8	2.2	4.3	5.1	5.7	6.8	10.0	9.0	12.5	12.4	14.5	15.4	13.3	7.5	4.3	2.8	3.3	2.0	2.0	2.9	2.8	2.0	15.4	6.4	24	
23	2.5	2.3	4.1	7.3	6.0	4.0	5.3	7.4	9.6	11.2	13.2	14.8	14.1	11.9	12.4	8.9	8.1	5.5	6.6	5.8	5.2	7.5	12.6	17.0	2.3	17.0	8.5	24	
24	19.2	14.1	8.2	12.4	15.6	20.0	23.4	19.3	16.1	18.2	15.2	14.4	15.1	12.4	17.5	17.1	12.5	10.4	20.4	23.4	23.6	21.1	22.5	17.8	8.2	23.6	17.1	24	
25	17.1	17.0	12.9	10.7	7.8	7.9	8.5	P	11.1	15.8	14.7	15.1	12.2	12.7	9.4	10.2	13.9	11.4	7.9	4.2	2.6	1.6	2.4	2.2	1.6	17.1	10.0	23	
26	2.1	1.5	1.6	1.4	2.2	1.9	3.3	6.5	7.6	8.9	11.3	10.6	12.0	11.8	12.0	10.2	9.9	9.6	8.7	5.8	3.0	2.5	3.1	5.1	1.4	12.0	6.4	24	
27	4.3	2.4	3.3	1.9	7.8	8.1	5.1	12.8	9.2	11.9	10.8	10.9	12.0	13.2	15.2	16.7	14.9	11.8	6.2	3.8	4.5	5.5	41.1	33.7	1.9	41.1	11.1	24	
28	22.6	11.2	7.8	10.4	9.9	8.1	11.6	12.8	13.0	14.8	16.3	20.4	18.9	20.6	19.2	23.5	18.6	17.4	12.7	13.1	3.6	3.3	4.5	5.5	3.3	23.5	13.3	24	
29	5.0	4.2	2.7	2.6	6.7	4.2	5.0	7.7	9.6	11.0	11.8	11.1	10.8	10.7	12.4	13.1	12.8	8.9	8.9	5.6	4.5	2.3	1.8	2.4	1.8	13.1	7.3	24	
30	2.3	2.9	2.7	2.1	5.9	9.7	12.8	17.9	13.1	8.6	8.5	11.3	14.2	12.6	11.1	19.1	16.3	15.9	14.7	8.2	5.0	4.5	5.6	5.6	2.1	19.1	9.6	24	
31	6.9	7.3	5.2	7.0	8.1	9.0	13.8	16.0	16.2	19.3	18.7	21.0	22.3	19.6	16.6	21.1	16.4	22.1	13.8	8.3	8.6	3.2	3.9	3.6	3.2	22.3	12.8	24	
HOURLY MAX	22.6	17.0	17.3	15.6	20.4	22.2	23.4	20.4	18.1	21.0	22.5	29.8	30.6	27.8	24.9	26.5	22.8	23.6	22.0	23.4	30.3	33.6	41.1	33.7					
HOURLY AVG	7.5	6.4	5.9	6.2	7.4	7.1	9.2	10.7	11.0	12.8	13.5	14.6	15.1	15.3	14.6	15.1	14.1	13.2	12.0	9.7	7.9	7.3	7.9	7.7					

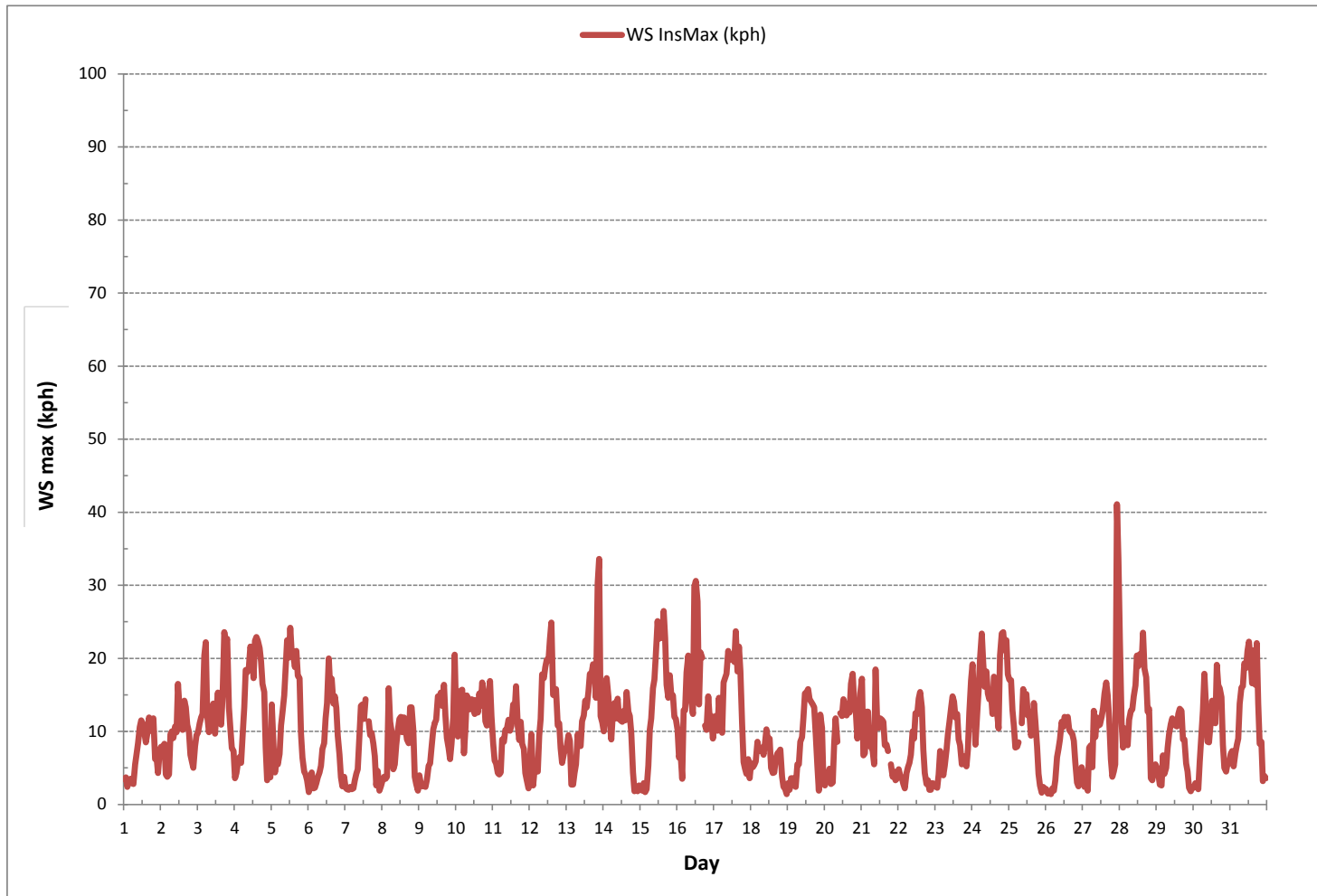
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	41.1	kph	@ HOUR	22	ON DAY	27	
OPERATIONAL TIME:						736	hrs

WIND SPEED Instantaneous Maximum (WS kph)



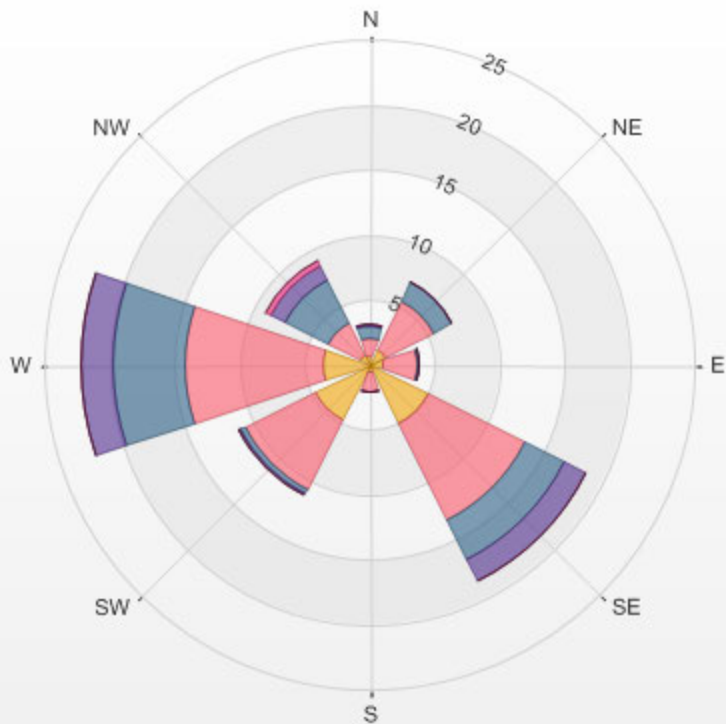
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 17/07
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 22.72%

Direction	1.8-4.1	4.1-8.2	8.2-12.3	12.3-16.4	16.4-20.5	>20.5	Total
N	0.7	1.5	0.8	0.1	0.0	0.0	3.1
NE	1.3	4.2	1.6	0.0	0.0	0.0	7.1
E	1.1	2.6	0.3	0.0	0.0	0.0	3.9
SE	5.1	8.3	3.4	1.8	0.0	0.0	18.6
S	0.5	1.6	0.0	0.0	0.0	0.0	2.2
SW	4.7	6.1	0.4	0.1	0.0	0.0	11.3
W	3.6	10.6	5.5	2.4	0.0	0.0	22.2
NW	0.8	2.8	3.6	1.2	0.5	0.0	9.0
Summary	17.9	37.6	15.6	5.6	0.5	0.0	77.3

% Icon	Classes (kph)	18		1.8-4.1	38		4.1-8.2	16		8.2-12.3	6		12.3-16.4	1		16.4-20.5	0		>20.5
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LICA COLD LAKE SOUTH 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 22.72% Calm Wind Avg Speed: 0.93(kph)



WIND DIRECTION



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

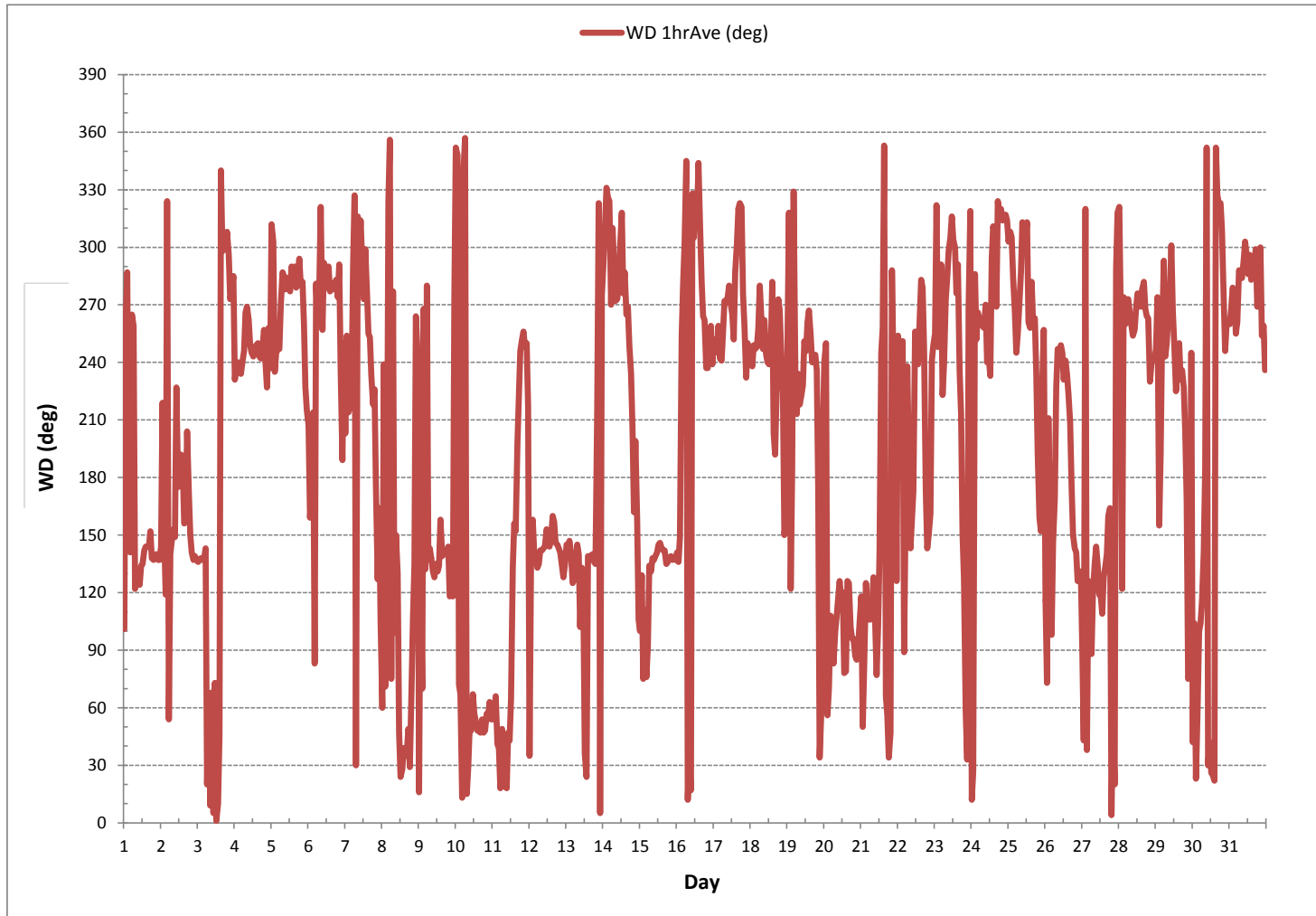
STATUS FLAG CODES

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 14 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	89		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	255 (WSW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - July 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	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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	60	53	53	58	55	48	65	46	45	46	47	38	28	53	35	27	52	32	20	15	11	20	26	11	24	
2	35	43	25	46	70	64	18	25	33	52	39	52	46	42	46	40	35	43	33	27	10	10	9	9	24	
3	11	11	12	13	14	33	43	27	23	26	29	51	25	28	31	43	23	23	20	19	21	21	22	20	24	
4	30	29	25	28	28	24	26	24	23	26	26	26	31	27	28	26	25	24	25	22	36	49	47	29	24	
5	25	43	38	34	17	23	21	24	23	25	27	25	24	24	25	25	24	24	22	20	19	12	23	30	24	
6	34	44	51	59	45	45	39	49	38	48	63	34	34	31	26	30	27	24	22	19	21	55	48	34	24	
7	59	64	53	52	49	39	47	46	51	51	50	54	52	51	59	43	42	38	33	32	49	39	69	46	24	
8	58	36	24	39	49	28	27	62	45	33	27	23	25	34	44	53	33	27	23	20	24	35	50	36	24	
9	29	77	61	43	67	36	59	26	32	32	37	46	37	37	59	32	22	24	21	31	19	19	22	33	24	
10	41	54	21	19	49	17	18	20	23	23	24	26	26	29	27	25	26	23	22	21	22	20	17	19	24	
11	21	21	19	23	37	33	23	22	19	21	27	26	41	37	35	42	43	36	26	20	17	16	45	40	24	
12	59	56	41	40	69	14	14	15	15	16	18	28	31	21	25	35	33	21	20	17	14	14	19	22	24	
13	20	15	45	54	29	17	21	38	58	34	27	30	32	38	20	20	16	15	14	15	33	19	37	20	24	
14	21	17	15	14	19	28	22	24	27	29	34	37	45	43	41	26	26	25	27	27	33	74	54	65	24	
15	37	46	20	34	27	36	12	20	18	18	15	18	23	22	17	18	14	18	16	13	12	12	12	11	24	
16	16	36	33	50	71	34	18	21	24	29	25	21	18	37	34	21	23	20	23	26	23	24	21	23	24	
17	21	24	24	21	25	26	24	23	23	23	24	24	24	26	23	20	17	15	20	20	29	25	24	22	24	
18	17	19	19	22	20	20	24	32	30	33	26	26	27	43	51	57	48	37	26	32	41	24	46	61	24	
19	56	54	33	57	67	60	40	39	41	41	38	29	35	30	33	30	30	30	26	55	34	48	22	57	24	
20	63	45	44	25	29	28	25	22	30	25	24	25	19	23	31	28	22	23	24	22	23	18	21	20	24	
21	34	54	48	19	24	33	25	55	56	29	24	25	29	27	45	50	31	49	30	28	43	50	50	47	24	
22	59	60	52	56	66	56	58	48	36	44	46	42	42	33	25	25	30	26	30	47	46	70	29	17	24	
23	36	45	49	49	29	45	33	35	26	33	29	35	43	30	42	23	34	51	31	54	36	36	30	18	24	
24	20	24	41	23	22	22	20	22	24	26	27	29	32	29	20	23	30	30	23	16	18	15	16	17	24	
25	21	20	18	22	20	24	23	26	26	21	23	26	34	43	49	44	31	29	32	26	25	41	33	41	24	
26	48	47	45	57	44	63	69	34	27	30	37	37	44	35	39	45	43	41	24	18	17	21	18	14	24	
27	47	30	48	58	37	19	42	34	20	27	37	31	36	29	23	22	21	33	35	36	59	40	30	34	24	
28	59	42	49	32	20	18	22	21	25	25	30	25	26	24	25	25	24	21	20	17	29	30	24	18	24	
29	20	29	33	48	32	50	36	21	23	31	30	35	40	47	47	32	36	28	28	34	36	58	63	64	24	
30	49	54	59	53	55	45	32	68	44	57	54	37	23	24	27	23	19	17	14	14	17	23	16	15	24	
31	15	20	21	19	19	20	23	23	23	24	23	23	26	23	30	26	27	23	21	28	20	26	28	47	24	

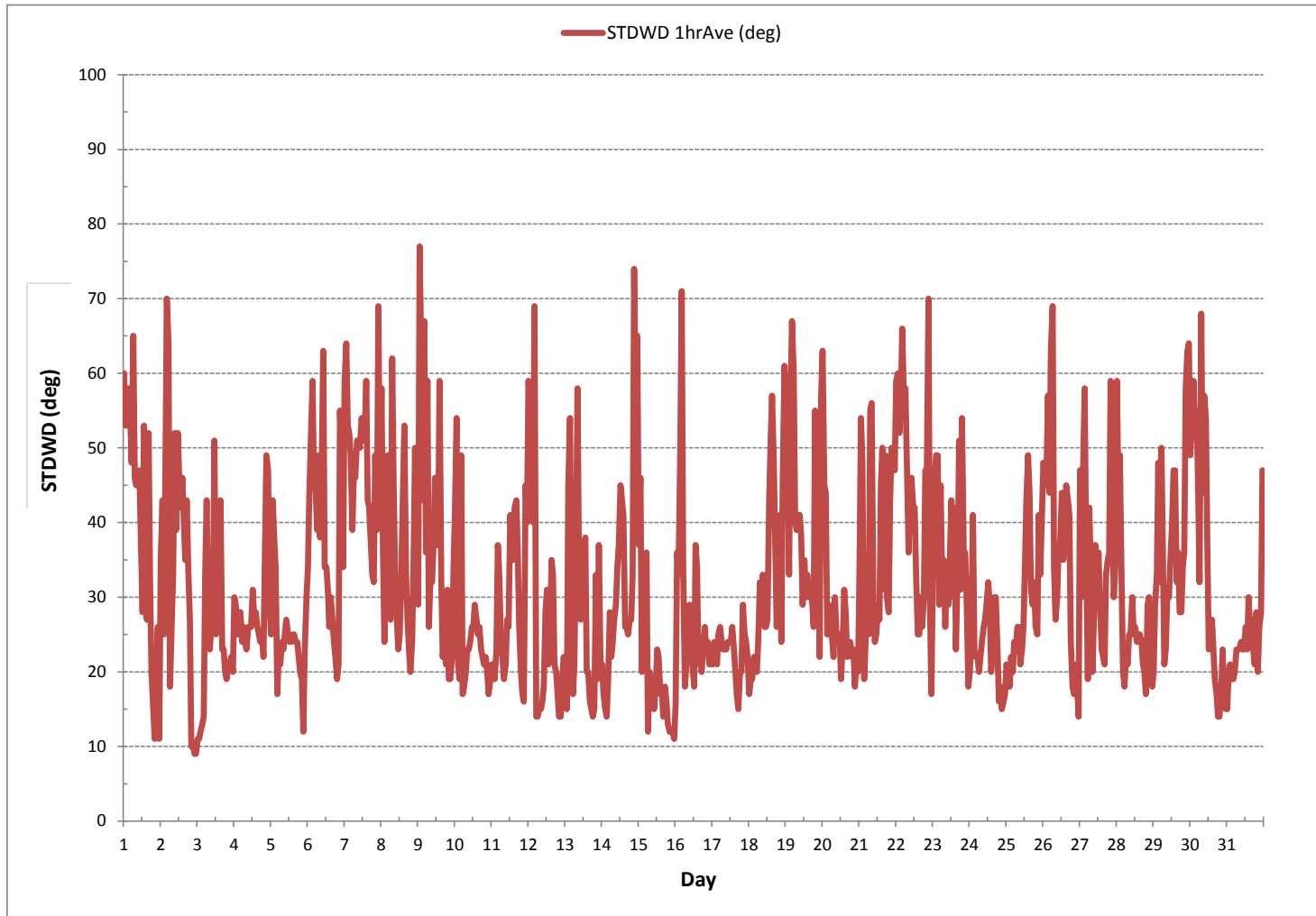
STATUS FLAG CODES

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

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



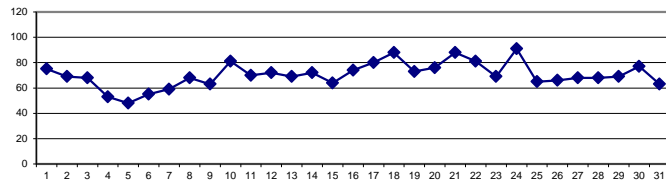
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

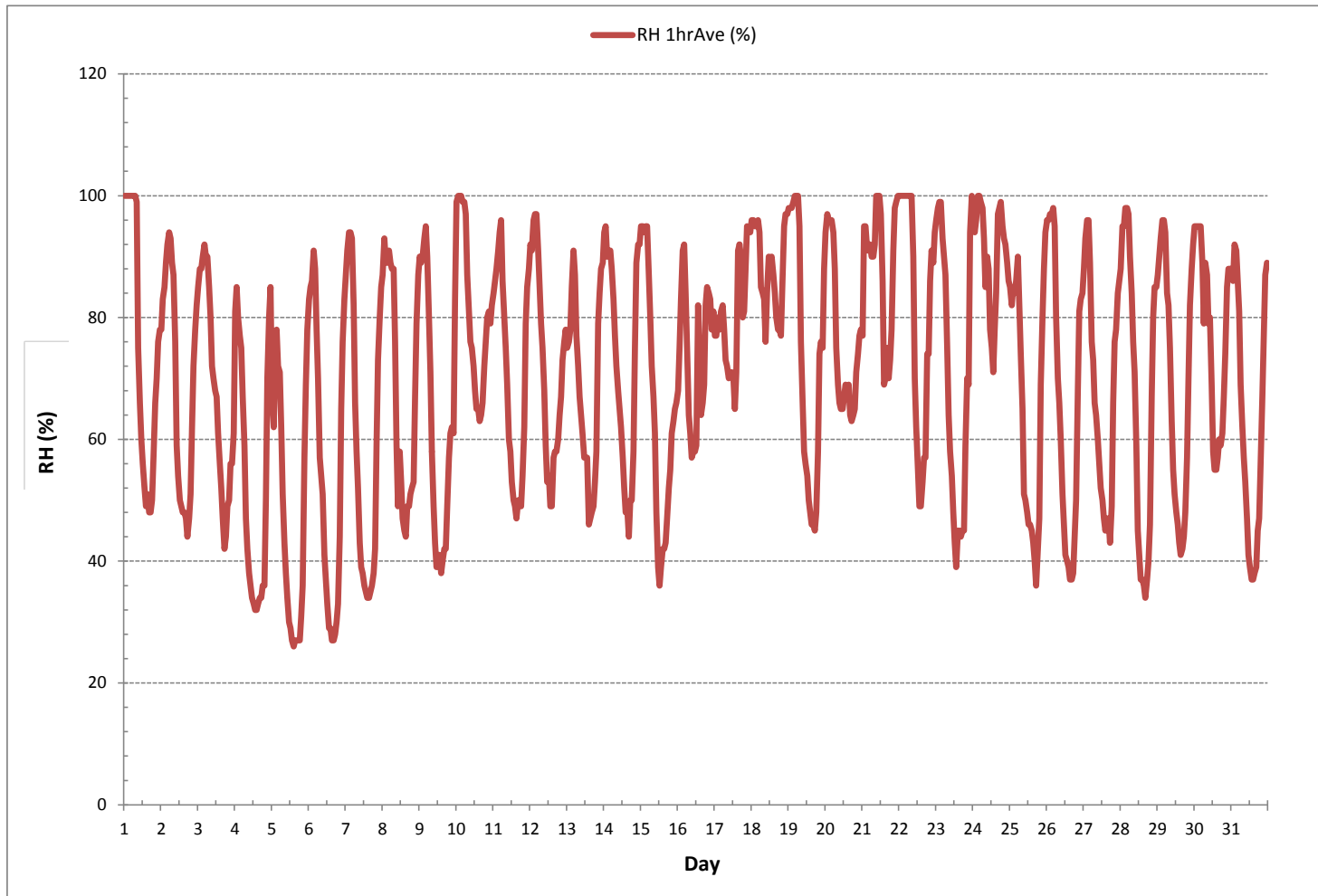
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	26	%	@ HOUR	14	ON DAY	5
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	0	ON DAY	1
MAXIMUM 24-HR AVERAGE:	91	%			ON DAY	24
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	20					MONTHLY AVERAGE: 70 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



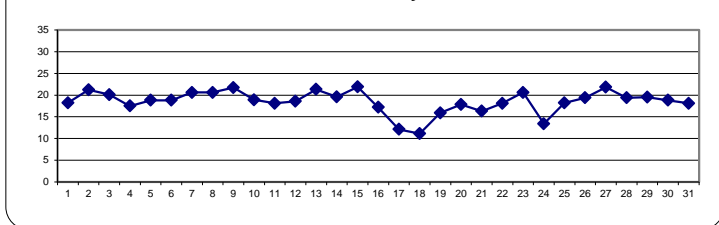
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	13.0	11.8	11.5	11.5	11.2	11.7	12.8	13.9	15.7	19.4	20.5	21.3	21.9	23.1	23.5	23.2	24.2	24.1	23.9	22.2	20.5	19.6	18.3	18.0	11.2	24.2	18.2	24				
2	18.0	17.2	16.9	16.4	16.2	16.5	17.5	18.2	18.9	21.0	22.8	23.6	24.4	24.7	25.5	25.6	26.2	26.5	25.9	24.9	22.4	20.8	19.8	18.9	16.2	26.5	21.2	24				
3	18.4	17.7	17.4	17.0	16.8	17.0	17.7	18.7	19.4	20.9	21.7	22.4	22.4	23.5	24.4	25.3	25.3	25.2	23.3	20.8	19.4	17.3	15.8	14.5	14.5	25.3	20.1	24				
4	11.3	10.1	10.6	10.3	10.1	11.6	13.8	15.9	17.4	18.9	19.7	20.6	21.5	21.9	22.8	23.4	23.9	24.2	24.0	23.2	20.5	16.5	14.4	13.2	10.1	24.2	17.5	24				
5	14.7	14.7	13.4	12.1	12.8	13.5	15.8	17.8	19.5	20.8	21.5	22.3	22.5	23.0	23.7	24.3	24.5	24.4	24.0	23.1	20.8	16.6	13.5	11.5	11.5	24.5	18.8	24				
6	10.2	9.1	8.6	7.8	8.0	11.3	14.3	17.4	19.7	21.0	23.2	24.1	24.7	25.8	26.1	26.6	26.7	26.5	26.0	24.9	22.5	18.0	15.6	13.7	7.8	26.7	18.8	24				
7	12.5	11.5	10.6	9.9	9.8	13.2	17.6	20.4	22.8	24.1	24.9	25.8	26.7	26.9	27.6	27.9	27.9	27.9	27.2	26.4	22.4	18.8	16.8	15.7	9.8	27.9	20.6	24				
8	14.9	14.0	14.5	14.7	15.1	16.4	16.8	17.5	20.3	23.6	24.9	24.7	25.6	26.7	27.4	27.5	26.4	26.2	25.2	22.7	21.0	18.2	15.9	14.5	14.0	27.5	20.6	24				
9	13.7	14.2	13.7	13.0	12.8	13.9	17.3	20.2	22.1	23.6	24.7	26.0	26.6	27.4	28.2	27.8	27.8	27.8	26.5	24.9	23.7	23.0	22.9	20.1	12.8	28.2	21.7	24				
10	17.5	17.2	17.0	17.1	17.2	17.0	17.5	18.4	19.3	19.6	19.6	20.2	21.0	21.6	21.6	22.1	22.0	21.1	20.0	18.9	17.9	17.0	16.5	15.5	15.5	22.1	18.9	24				
11	14.8	14.1	13.7	13.2	12.4	12.8	15.1	15.8	16.4	17.4	19.4	20.8	22.3	23.2	23.0	23.4	23.3	22.3	22.4	21.5	19.2	16.4	15.5	15.1	12.4	23.4	18.1	24				
12	15.3	15.4	14.3	14.0	14.1	15.2	16.2	17.5	18.3	19.0	20.6	21.4	22.1	22.9	22.1	21.5	21.1	21.0	20.6	20.2	19.7	18.6	17.9	17.5	14.0	22.9	18.6	24				
13	17.8	17.3	16.8	15.4	14.0	15.2	17.4	18.9	20.6	22.0	23.3	25.1	25.8	26.3	28.3	28.3	28.2	28.2	27.0	25.5	20.7	16.4	16.5	16.2	14.0	28.3	21.3	24				
14	15.5	15.5	15.9	15.5	15.2	15.7	16.9	18.3	19.9	21.1	22.3	23.0	23.9	24.5	24.9	24.8	24.6	24.3	23.1	21.8	19.0	16.3	14.7	13.8	13.8	24.9	19.6	24				
15	12.9	12.3	12.2	11.8	11.8	14.2	17.6	20.0	21.7	23.8	25.7	27.1	28.2	28.5	28.5	28.2	27.8	27.3	26.6	26.1	24.5	23.8	23.1	22.1	11.8	28.5	21.9	24				
16	21.3	19.9	18.0	16.0	15.7	18.0	19.8	21.0	21.4	22.4	22.3	21.8	20.2	15.3	17.8	17.8	16.1	14.7	12.7	12.3	12.2	12.2	12.5	11.5	11.5	22.4	17.2	24				
17	11.1	10.6	10.0	10.2	9.6	9.3	10.2	11.8	12.6	13.9	14.2	14.7	15.5	16.7	16.2	13.5	13.1	11.9	12.6	11.8	11.3	10.2	10.4	9.5	9.3	16.7	12.1	24				
18	8.9	9.0	9.1	9.2	8.9	9.4	11.5	12.2	12.5	13.4	12.3	11.5	11.0	11.1	11.7	12.4	13.0	13.7	13.7	14.1	12.2	9.5	8.0	6.9	6.9	14.1	11.1	24				
19	6.1	5.8	5.1	5.0	5.4	7.3	9.1	12.2	15.5	17.3	18.9	20.6	21.8	22.6	23.4	23.8	23.6	24.0	23.5	22.2	19.3	17.6	16.8	14.5	5.0	24.0	15.9	24				
20	12.8	11.9	11.3	11.0	10.9	12.1	14.6	16.8	18.5	19.6	20.3	20.7	21.1	20.8	21.0	21.2	21.9	22.1	21.8	21.2	19.9	19.0	18.3	17.8	10.9	22.1	17.8	24				
21	17.7	16.0	15.5	15.6	15.4	15.1	15.1	14.9	15.3	14.8	13.7	14.9	15.8	17.9	20.2	20.1	19.4	20.0	19.5	18.2	16.0	14.2	13.1	12.3	12.3	20.2	16.3	24				
22	11.9	11.4	11.7	12.3	12.5	12.6	13.0	13.7	15.6	18.4	21.5	23.2	24.5	25.2	24.9	23.9	22.9	23.0	21.2	21.5	18.7	17.1	17.4	16.2	11.4	25.2	18.1	24				
23	15.9	15.7	15.5	15.6	16.2	16.3	17.1	19.5	21.5	23.1	24.0	24.4	25.6	25.9	24.9	24.3	24.6	24.8	24.6	22.1	20.3	20.1	17.1	15.3	15.3	25.9	20.6	24				
24	14.1	14.4	14.2	13.4	12.7	11.6	11.4	11.8	12.4	11.5	12.4	13.4	13.6	14.8	14.0	13.9	12.4	13.5	14.2	14.3	14.5	14.4	14.8	14.8	11.4	14.8	13.4	24				
25	14.7	14.6	13.6	13.0	12.2	11.9	13.9	16.1	18.1	19.9	20.7	21.4	22.3	23.5	24.0	24.2	24.0	24.1	23.6	21.7	17.5	14.8	13.4	12.4	11.9	24.2	18.2	24				
26	11.7	11.1	10.4	9.9	9.5	10.8	15.4	17.8	20.0	22.1	23.8	25.0	25.7	26.2	26.6	26.8	26.7	26.6	25.4	24.0	20.4	17.6	16.4	15.8	9.5	26.8	19.4	24				
27	14.8	13.7	12.7	12.3	13.7	16.5	18.0	19.7	20.3	21.8	23.8	25.4	26.8	27.6	28.3	28.9	29.3	29.8	29.2	26.0	23.6	22.2	20.8	18.2	12.3	29.8	21.8	24				
28	16.9	16.1	15.9	15.2	14.6	14.4	15.5	16.9	18.7	20.3	21.9	22.7	23.4	23.9	24.3	24.4	24.3	23.7	23.4	22.5	18.9	16.5	15.5	15.4	14.4	24.4	19.4	24				
29	14.6	13.7	12.8	11.7	12.4	13.4	15.5	16.7	18.2	20.9	22.8	24.0	24.6	25.1	25.7	25.8	25.6	25.4	24.6	23.4	20.5	18.0	16.4	15.2	11.7	25.8	19.5	24				
30	14.6	13.9	13.3	12.8	13.2	15.3	17.2	16.4	17.6	19.3	19.8	21.4	23.0	24.0	24.8	24.6	24.2	23.6	22.7	21.6	19.5	17.1	16.1	15.6	12.8	24.8	18.8	24				
31	14.8	14.7	13.4	13.2	13.3	13.7	15.7	17.1	18.2	19.6	20.7	21.8	22.6	23.2	23.6	23.9	23.5	21.7	20.6	20.0	17.5	15.7	13.4	12.2	12.2	23.9	18.1	24				
HOURLY MAX	21.3	19.9	18.0	17.1	17.2	18.0	19.8	21.0	22.8	24.1	25.7	27.1	28.2	28.5	28.5	28.9	29.3	29.8	29.2	26.4	24.5	23.8	23.1	22.1								
HOURLY AVG	14.3	13.7	13.2	12.8	12.7	13.6	15.4	16.9	18.3	19.8	20.9	21.8	22.5	23.0	23.5	23.5	23.4	23.2	22.5	21.4	19.2	17.2	16.1	15.0								

STATUS FLAG CODES

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

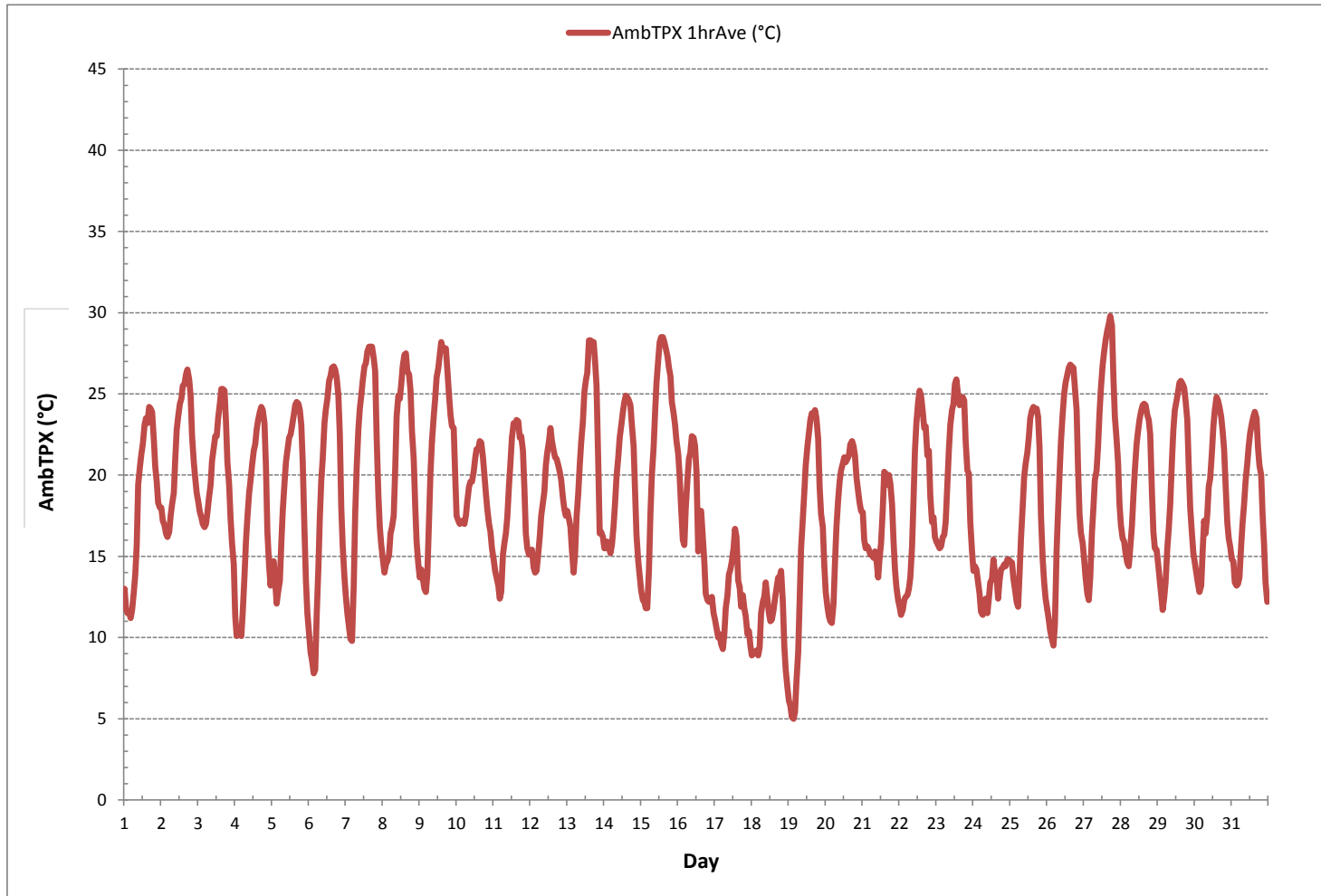
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	5.0 °C	@ HOUR	3	ON DAY	19
MAXIMUM 1-HR AVERAGE:	29.8 °C	@ HOUR	17	ON DAY	27
MAXIMUM 24-HR AVERAGE:	21.9 °C			ON DAY	15
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.2	MONTHLY AVERAGE:		18.5	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

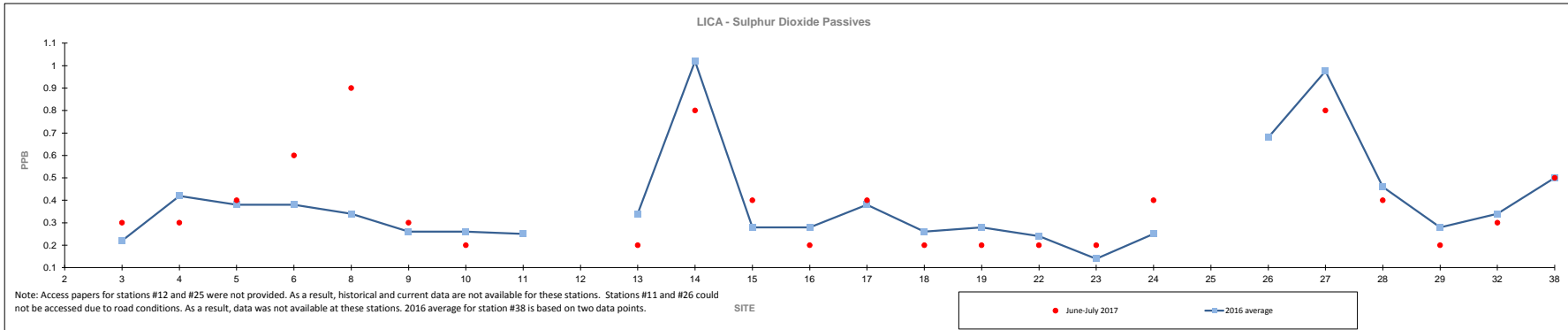


APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

PASSIVE RESULTS

Passive Summary Results for June 2017 - July 2017 Lakeland Industry & Community Association

		Sulphur Dioxide ppb																										June - July 2017			
		2016																										Reading	Site		
Mean		2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	25	26	27	28	29	32	38	0.4	-	
Minimum	NA	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	NA	0.2	0.8	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.2	NA	0.4	0.8	0.3	0.2	0.2	0.3	0.2	0.2	0.2	Various
Maximum	NA	0.4	0.6	0.5	0.6	0.5	0.3	0.4	0.3	NA	0.5	1.3	0.4	0.5	0.6	0.4	0.6	0.4	0.2	0.2	0.4	NA	1.3	1.3	0.6	0.4	0.6	0.7	0.9	#8	

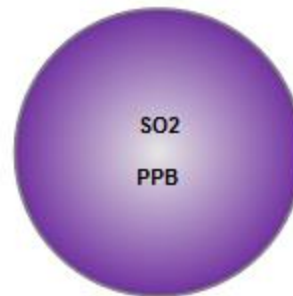


Lakeland Industry & Community Association SO₂ Passive Bubble Map

JUNE 2017 – JULY 300 2017

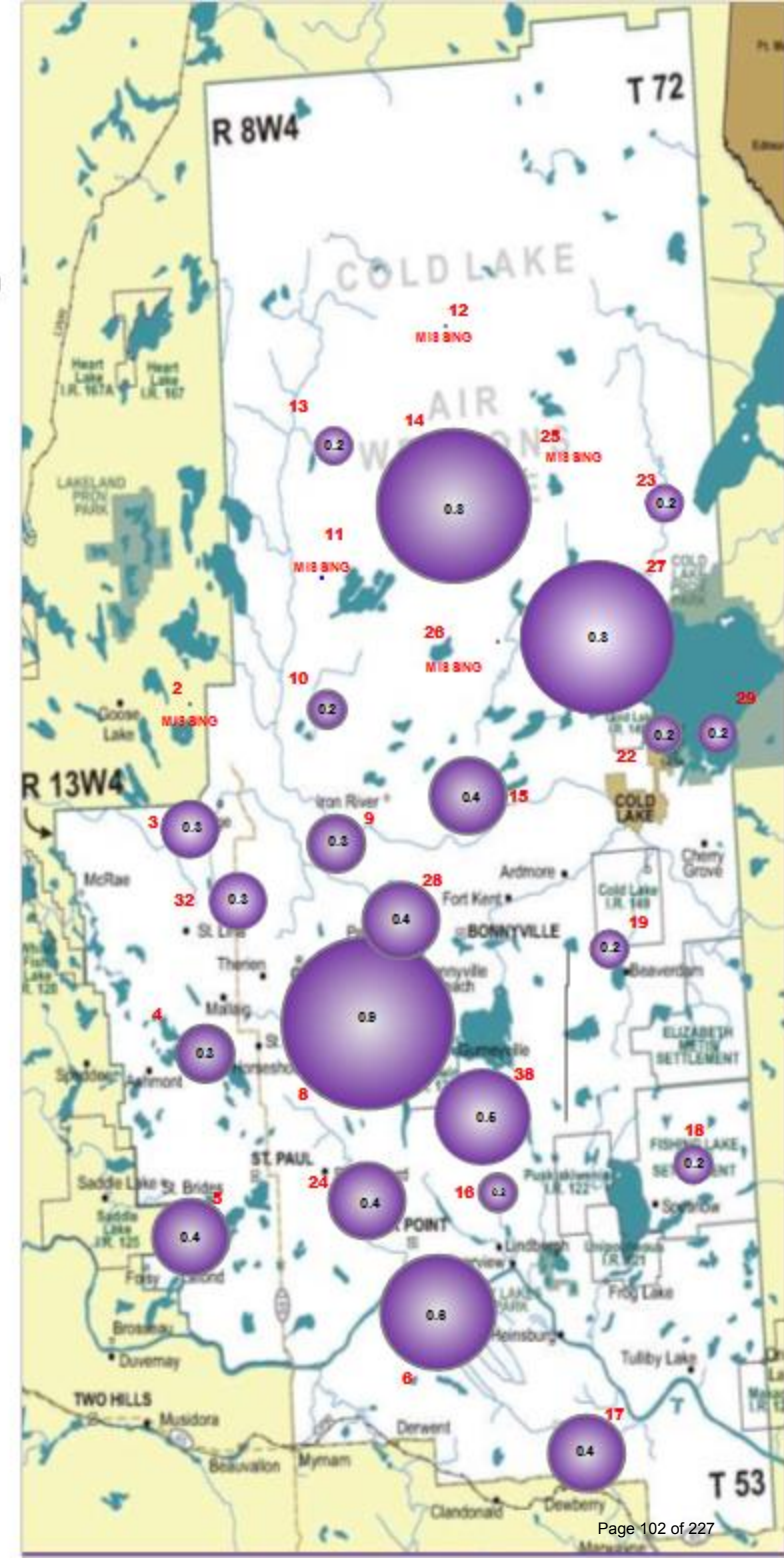
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	0.3 PPB	NA
4 – Flat Lake	0.3 PPB	NA
5 – Lake Eliza	0.4 PPB	NA
6 – Telegraph Creek	0.6 PPB	NA
8 – Muriel-Kehewin	0.9 PPB	NA
9 – Dupre	0.3 PPB	NA
10 – La Corey	0.2 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.2 PPB	NA
14 – Maskwa	0.8 PPB	NA
15 – Ardmore	0.4 PPB	NA
16 – Frog Lake	0.2 PPB	NA
17 – Clear Range	0.4 PPB	NA
18 – Fishing Lake	0.2 PPB	NA
19 – Beaverdam	0.2 PPB	NA
22 – Cold Lake South	0.2 PPB	NA
23 – Medley-Martineau	0.2 PPB	NA
24 – Fort George	0.3 PPB	0.4 PPB
25 – Burnt Lake	MISSING	NA
26 – Mahikan	MISSING	NA
27 – Mahkeses	0.8 PPB	0.8 PPB
28 – Town of Bonnyville	0.4 PPB	NA
29 – Cold Lake South 2	0.2 PPB	NA
32 – St. Lina	0.3 PPB	NA
38 – Bonnyville	0.5 PPB	NA



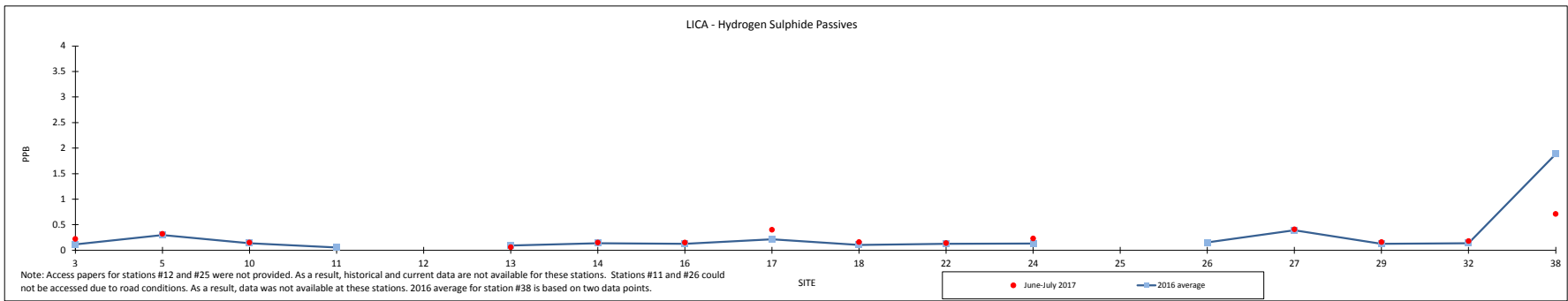
Summary

Minimum : 0.2 PPB – Various Stations
 Maximum: 0.9 PPB – Muriel-Kehewin
 Average: 0.4 PPB *Includes Duplicates



Passive Summary Results for April 2017 - May 2017 Lakeland Industry & Community Association

Hydrogen Sulphide ppb																		June - July 2017		
	3	5	10	11	12	13	14	2016 16	17	18	22	24	25	26	27	29	32	38	Reading	Site
Mean	0.11	0.30	0.14	0.05	NA	0.09	0.14	0.13	0.22	0.11	0.13	0.13	NA	0.15	0.39	0.13	0.14	1.86	0.25	-
Minimum	0.08	0.13	0.09	0.05	NA	0.08	0.10	0.09	0.14	0.05	0.06	0.09	NA	0.14	0.15	0.08	0.08	0.16	0.06	#13
Maximum	0.17	0.51	0.21	0.06	NA	0.12	0.17	0.16	0.33	0.14	0.20	0.19	NA	0.17	0.67	0.17	0.20	3.61	0.71	#38

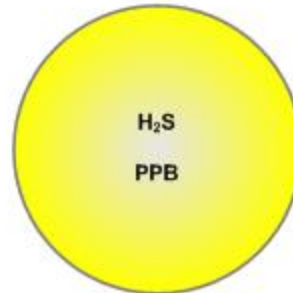


Lakeland Industry & Community Association H₂S Passive Bubble Map

JUNE 2017 - JULY 2017

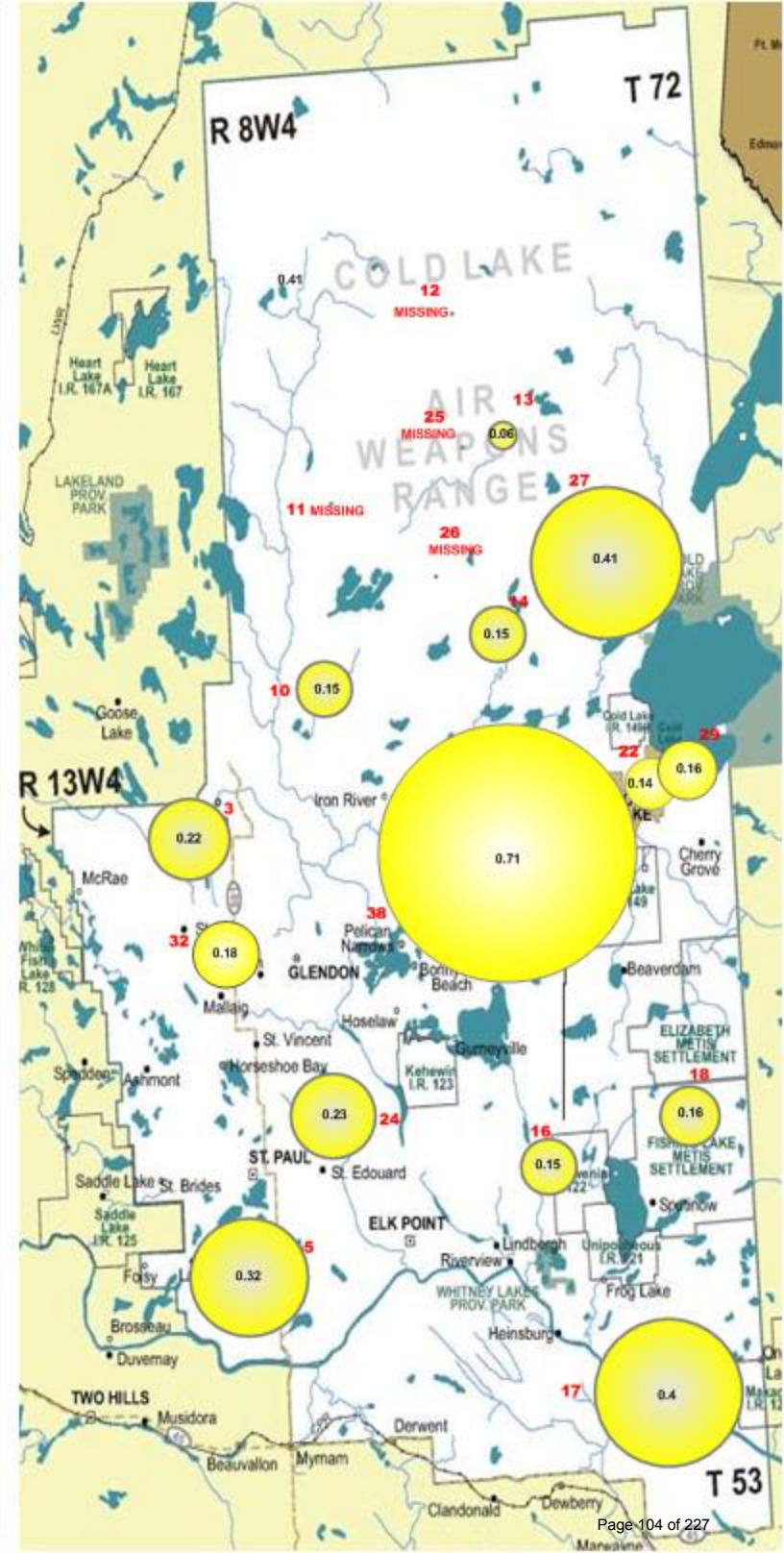
PASSIVE STATIONS

Station	Reading	Duplicate
3 – Therien	0.22 PPB	NA
5 – Lake Eliza	0.32 PPB	NA
10 – La Corey	0.15 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.06 PPB	NA
14 – Maskwa	0.15 PPB	NA
16 – Frog Lake	0.15 PPB	NA
17 – Clear Range	0.40 PPB	NA
18 – Fishing Lake	0.16 PPB	NA
22 – Cold Lake South	0.14 PPB	NA
24 – Fort George	0.23 PPB	NA
25 – Burnt Lake	MISSING	NA
26 – Mahihkan	MISSING	NA
27 – Mahkeses	0.41 PPB	NA
29 – Cold Lake South 2	0.16 PPB	0.16 PPB
32 – St. Lina	0.18 PPB	0.18 PPB
38 – Bonnyville	0.71 PPB	NA



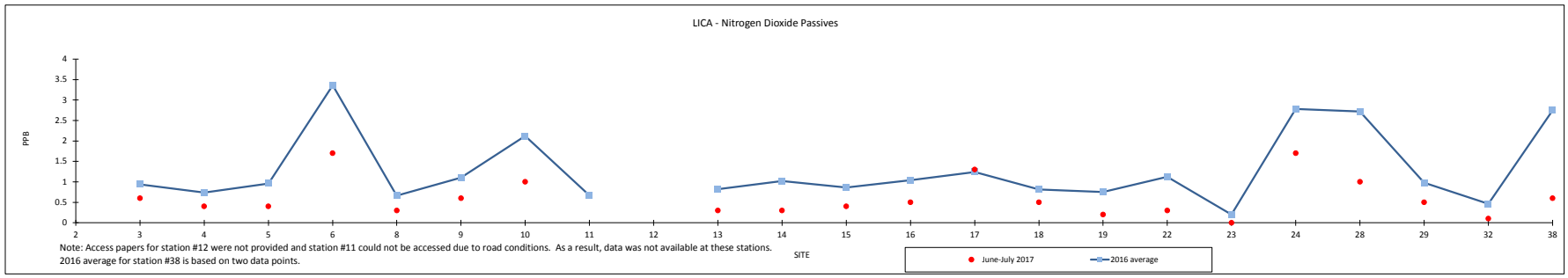
Summary

Minimum : 0.06 PPB – Primrose
Maximum: 0.71 PPB – Bonnyville
Average: 0.25 PPB *Includes Duplicates



Passive Summary Results for June 2017 - July 2017 Lakeland Industry & Community Association

	Nitrogen Dioxide ppb																				June - July 2017					
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	28	29	32	38	Reading	Site
Mean	NA	0.9	0.7	1.0	3.4	0.7	1.1	2.1	0.7	NA	0.8	1.0	0.9	1.0	1.2	0.8	0.8	1.1	0.2	2.8	2.7	1.0	0.5	2.8	0.6	-
Minimum	NA	0.5	0.3	0.4	2.1	0.3	0.2	1.2	0.3	NA	0.2	0.5	0.3	0.5	0.6	0.4	0.4	0.5	0.1	1.6	1.4	0.4	0.2	1.3	<0.1	#23
Maximum	NA	1.8	1.4	2.2	5.0	1.4	2.2	3.7	1.1	NA	2.6	2.6	1.4	2.3	2.1	1.4	1.5	2.4	0.4	4.6	4.9	2.3	1.1	4.2	1.7	#6, #24



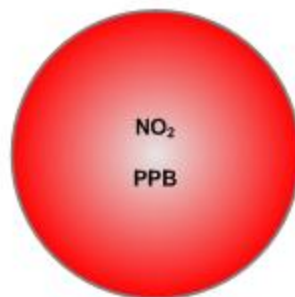
Lakeland Industry & Community Association

NO₂ Passive Bubble Map

JUNE 2017 – JULY 2017

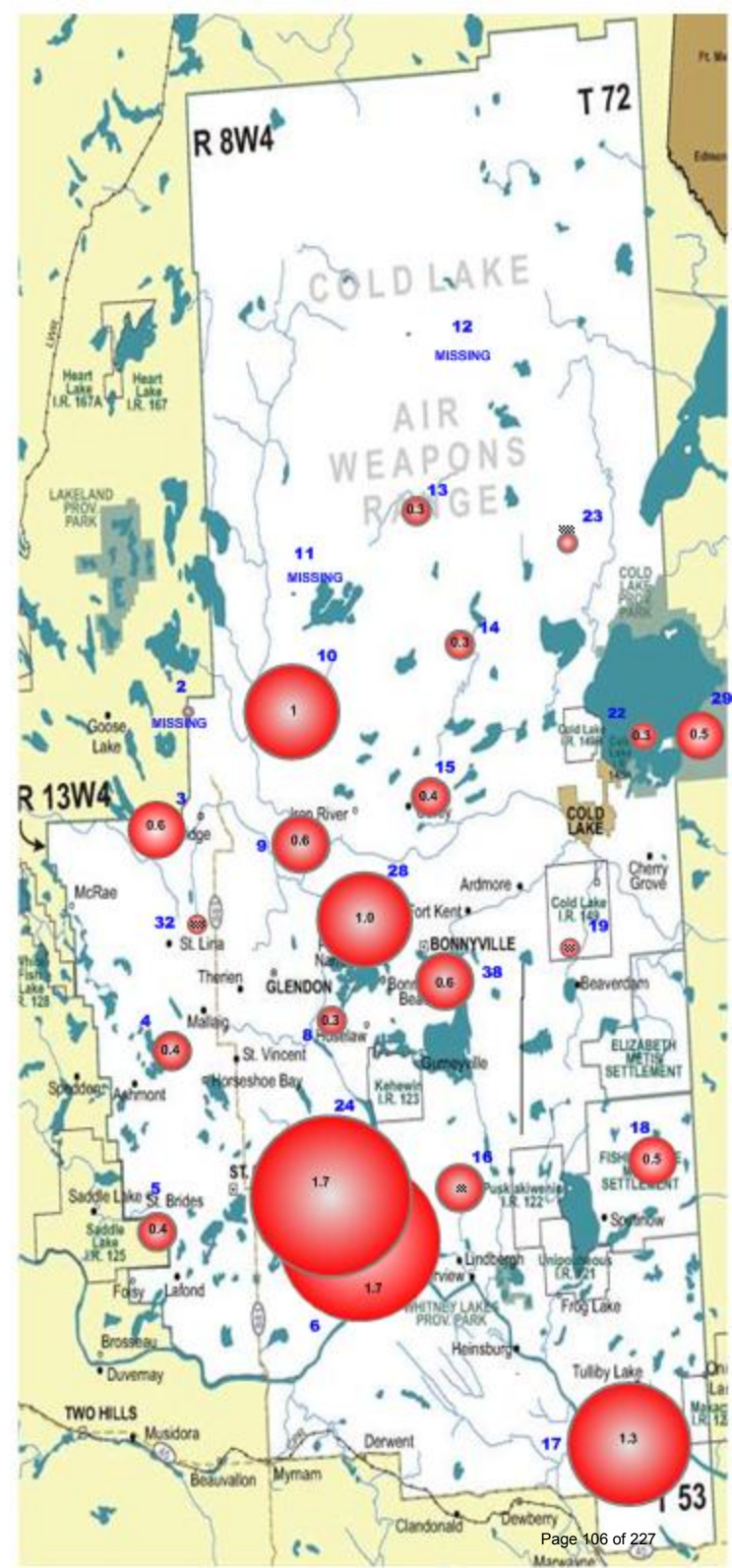
PASSIVE STATIONS

STATION	CONCENTRATION	DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	0.6 PPB	NA
4 – Flat Lake	0.4 PPB	NA
5 – Lake Eliza	0.4 PPB	NA
6 – Telegraph Creek	1.7 PPB	NA
8 – Muriel-Kehewin	0.3 PPB	NA
9 – Dupre	0.6 PPB	NA
10 – La Corey	1.0 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.3 PPB	0.3 PPB
14 – Maskwa	0.3 PPB	NA
15 – Ardmore	0.4 PPB	NA
16 – Frog Lake	0.5 PPB	NA
17 – Clear Range	1.3 PPB	NA
18 – Fishing Lake	0.5 PPB	NA
19 – Beaverdam	0.2 PPB	NA
22 – Cold Lake South	0.3 PPB	NA
23 – Medley-Martineau	<0.1 PPB	NA
24 – Fort George	1.7 PPB	NA
28 – Town of Bonnyville	1.0 PPB	NA
29 – Cold Lake South 2	0.5 PPB	NA
32 – St. Lina	0.1 PPB	NA
38 – Bonnyville	0.6 PPB	NA



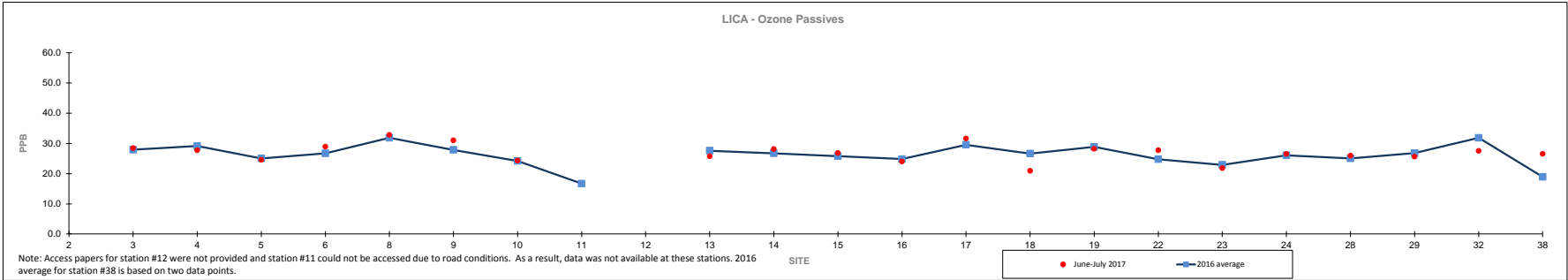
Summary

Minimum : <0.1 PPB – Medley-Martineau
 Maximum: 1.7 PPB – Telegraph Creek and Fort George
 Average: 0.6 PPB *Includes Duplicates



Passive Summary Results for June 2017 - July 2017 Lakeland Industry & Community Association

	Ozone ppb																		June - July 2017								
	2	3	4	5	6	8	9	10	11	12	2016	13	14	15	16	17	18	19	22	23	24	28	29	32	38	Reading	Site
Mean	NA	27.9	29.1	25.0	26.7	31.8	27.8	24.2	16.7	NA	27.6	26.7	25.7	24.8	29.5	26.6	28.8	24.8	22.9	26.0	25.0	26.7	31.8	18.9	26.9	-	
Minimum	NA	14.9	17.0	16.0	14.9	19.3	17.7	13.1	11.8	NA	16.5	16.9	14.9	13.0	19.4	15.1	19.0	14.5	12.2	15.9	16.2	16.1	22.9	16.3	20.9	#18	
Maximum	NA	41.8	47.4	32.8	47.3	43.8	43.3	38.7	21.5	NA	37.7	40.0	39.3	35.3	49.3	41.4	46.5	32.6	33.2	40.8	34.2	36.7	39.1	21.5	32.8	#8	



Lakeland Industry & Community Association O₃ Passive Bubble Map

JUNE 2017 – JULY 2017

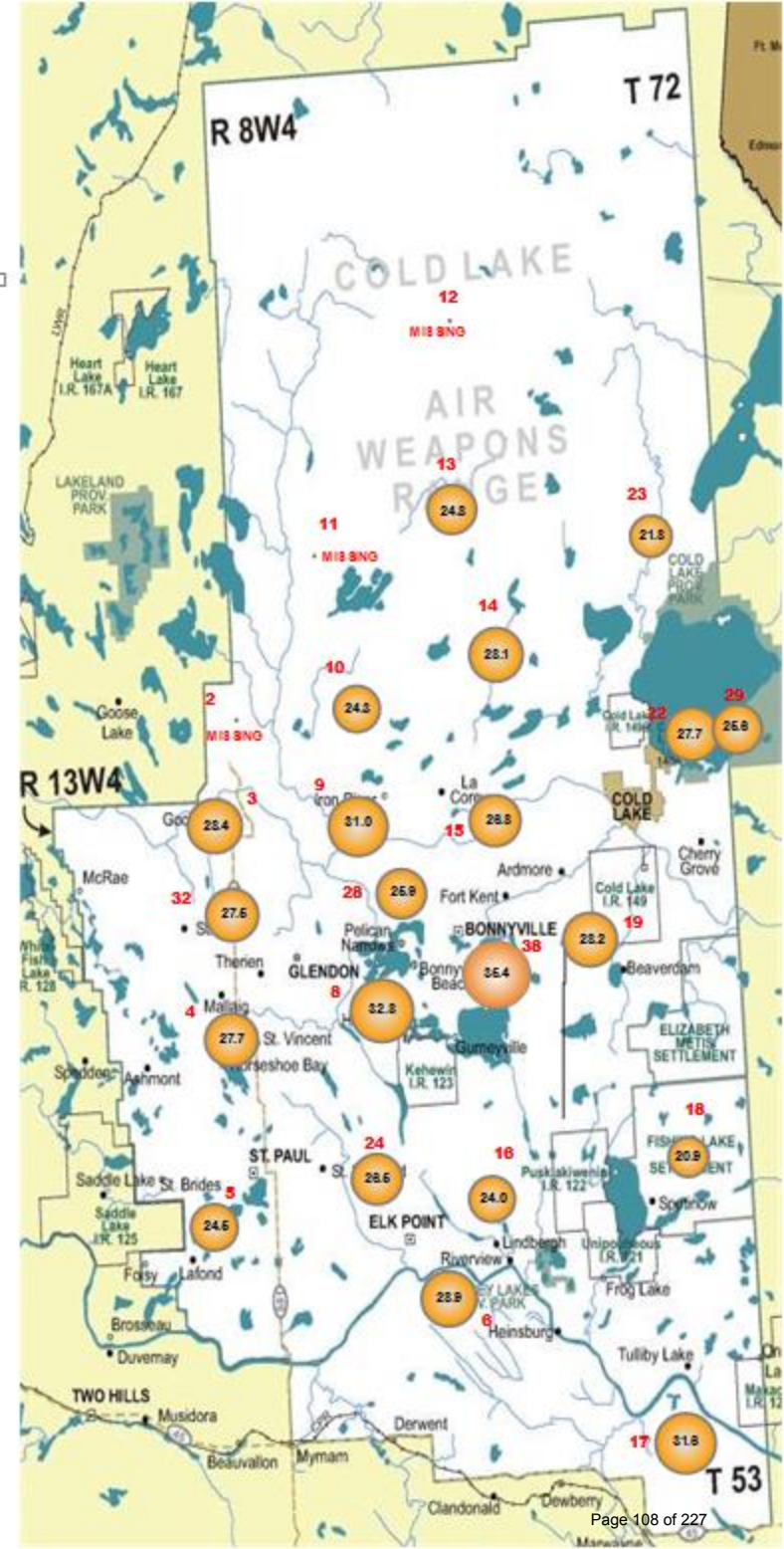
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	28.4 PPB	NA
4 – Flat Lake	27.7 PPB	NA
5 – Lake Eliza	24.5 PPB	NA
6 – Telegraph Creek	28.9 PPB	NA
8 – Muriel-Kehewin	32.8 PPB	NA
9 – Dupre	31.0 PPB	NA
10 – La Corey	24.3 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	24.8 PPB	26.5 PPB
14 – Maskwa	28.1 PPB	NA
15 – Ardmore	26.8 PPB	NA
16 – Frog Lake	24.0 PPB	NA
17 – Clear Range	31.6 PPB	NA
18 – Fishing Lake	20.9 PPB	NA
19 – Beaverdam	28.2 PPB	NA
22 – Cold Lake South	27.7 PPB	NA
23 – Medley-Martineau	21.8 PPB	NA
24 – Fort George	26.5 PPB	NA
28 – Town of Bonnyville	25.9 PPB	NA
29 – Cold Lake South 2	25.6 PPB	NA
32 – St. Lina	27.5 PPB	NA
38 – Bonnyville	35.4 PPB	NA



Summary

Minimum: 20.9 PPB – Fishing Lake
 Maximum: 32.8 PPB – Muriel-Kehewin
 Average: 26.9 PPB *Includes Duplicates



Passive Sampler Data Sheet for LICA June-July 2017

ID	SAMPLER				START		END		NOTES
					DATE	TIME	DATE	TIME	
2		SO ₂	NO ₂	O ₃	n/a	n/a	n/a	n/a	Samplers were removed
3	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	17:12	Aug 01, 2017	16:35	
4	---	SO ₂	NO ₂	O ₃	May 31, 2017	11:18	Aug 02, 2017	10:58	
5	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	12:07	Aug 02, 2017	12:05	
6	---	SO ₂	NO ₂	O ₃	May 31, 2017	13:27	Aug 02, 2017	13:31	
8	---	SO ₂	NO ₂	O ₃	May 31, 2017	10:09	Aug 02, 2017	09:43	
9	---	SO ₂	NO ₂	O ₃	Feb 27, 2015 / May 31, 2017	11:21	Aug 01, 2017	18:45	
10	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	16:14	Aug 01, 2017	15:24	
11	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	15:21	no access / mud, rain		See "Duplicates" (+2)
12	H ₂ S	SO ₂	NO ₂	O ₃	Feb 27, 2015	17:36	no access / CLAWR		
13	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	13:35	Aug 01, 2017	13:58	See "Duplicates" (+2)
14	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	12:47	Aug 01, 2017	12:54	
15	---	SO ₂	NO ₂	O ₃	May 30, 2017	20:06	Aug 01, 2017	20:48	
16	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	16:51	Aug 02, 2017	16:56	
17	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	14:31	Aug 02, 2017	14:29	
18	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	16:10	Aug 02, 2017	16:15	
19	---	SO ₂	NO ₂	O ₃	May 30, 2017	19:07	Aug 02, 2017	17:49	
22	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	09:56	Aug 01, 2017	09:39	
23	---	SO ₂	NO ₂	O ₃	May 30, 2017	11:09	Aug 01, 2017	11:26	
24	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	12:46	Aug 02, 2017	12:44	See "Duplicates" (+1)
25	H ₂ S	SO ₂	---	---	Feb 27, 2015	18:58	no access / CLAWR		
26	H ₂ S	SO ₂	---	---	May 30, 2017	12:57	Aug 01, 2017	13:24	See "Duplicates" (+1) no access / road closed
27	H ₂ S	SO ₂	---	---	May 30, 2017	12:27	Aug 01, 2017	12:31	See "Duplicates" (+1)
28	---	SO ₂	NO ₂	O ₃	May 30, 2017	19:25	Aug 01, 2017	19:12	
29	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	10:04	Aug 01, 2017	09:45	See "Duplicates" (+1)
32	H ₂ S	SO ₂	NO ₂	O ₃	May 30, 2017	17:55	Aug 01, 2017	17:38	See "Duplicates" (+1)
38	H ₂ S	SO ₂	NO ₂	O ₃	May 31, 2017	09:20	Aug 01, 2017	19:47	
DUPLICATES									
11	---	---	NO ₂	O ₃	May 30, 2017	15:21	no access / mud, rain		
13	---	---	NO ₂	O ₃	May 30, 2017	13:35	Aug 01, 2017	13:58	
24	---	SO ₂	---	---	May 30, 2017	12:46	Aug 02, 2017	12:44	
26	---	SO ₂	---	---	May 30, 2017	12:57	Aug 01, 2017	13:24	no access / road closed
27	---	SO ₂	---	---	May 30, 2017	12:27	Aug 01, 2017	12:31	
29	H ₂ S	---	---	---	May 30, 2017	10:04	Aug 01, 2017	09:45	
32	H ₂ S	---	---	---	May 30, 2017	17:55	Aug 01, 2017	17:38	

VOC RESULTS

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 11036
 Station ID: LICA 01 Installation Date/Time (mst): July 04, 2017 @ 09:12
 Sample ID: LICA/VOC/CLS/July 06, 2017 Removal Date/Time (mst): July 11, 2017 @ 08:46

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 06, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>July 07, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+24.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: June 24, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: June 24, 2017 (due every 6 months)

****Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required****

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 11, 2017



Volatile Organics Data Results

Date: July 6, 2017
Canister ID: 11036

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	0.02
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.07
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	5.5
Acrolein	< 0.3
Benzene	0.05
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.04
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	2.8
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.31
Freon-113	0.1

Volatile Organics Data Results

Date: July 6, 2017
Canister ID: 11036

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.38
Isopentane	0.34
Isoprene	0.92
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.06
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	0.4
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.06
n-Nonane	0.02
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.09
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: H3298
 Station ID: LICA 01 Installation Date/Time (mst): July 11, 2017 @ 08:46
 Sample ID: LICA/VOC/CLS/July 12, 2017 Removal Date/Time (mst): July 17, 2017 @ 16:22

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 12, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>July 13, 2017</u> <u>A.Y.</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+23.4</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: June 21, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: June 21, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov

Date: July 17, 2017

Sample ID: 17070167-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/July 12, 2017



Volatile Organics Data Results

Date: July 12, 2017
Canister ID: H3298

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.2
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	10.7
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.11
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	2
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.26
Freon-113	0.08

Volatile Organics Data Results

Date: July 12, 2017
Canister ID: H3298

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.56
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.37
Isopentane	0.27
Isoprene	0.68
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.22
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.03
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.05
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 17070222-001

Customer ID: LICA
Cust Samp ID: LICAVOC/CLS/July 18, 2017

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: <u>LICA</u>	Sampler S/N: <u>6167</u>
Location: <u>Cold Lake South</u>	Canister ID: <u>H3303</u>
Station ID: <u>LICA 01</u>	Installation Date/Time (mst): <u>July 17, 2017 @ 16:22</u>
Sample ID: <u>LICA/VOC/CLS/July 18, 2017</u>	Removal Date/Time (mst): <u>July 21, 2017 @ 08:29</u>

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 18, 2017</u>	<u>00:00</u>	<u>00:00 July 19, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>27.5</u>	<u>+ 23.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst

Final leak check deployment vacuum (in. Hg) = - @ - mst

Total leak rate = - psi over - minutes

Timer reset to zero prior to sampling? YES (yes/no)

Date of last flow calibration: JUNE 21, 2017 (due every 3 months)

Last date of sample line & fitting replacement: JUNE 21, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 21, 2017



Volatile Organics Data Results

Date: July 18, 2017
Canister ID: H3303

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.1
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.05
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	2.3
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	1.09
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.43
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.3
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.32
Freon-113	0.1

Volatile Organics Data Results

Date: July 18, 2017
Canister ID: H3303

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.65
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.06
Isopentane	0.16
Isoprene	0.02
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.07
Methylcyclopentane	0.06
Methylene chloride	< 0.3
n-Butane	0.07
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.04
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.06
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 2477
 Station ID: LICA 01 Installation Date/Time (mst): July 21, 2017@ 08:29
 Sample ID: LICA/VOC/CLS/July 24, 2017 Removal Date/Time (mst): July 28, 2017@ 08:47

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 24, 2017</u>	<u>00:00</u>	<u>00:00 July 25, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+22.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: JUNE 21, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: JUNE 21, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 28, 2017



Sample ID: 17070338-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/July 24, 2017

Volatile Organics Data Results

Date: July 24, 2017
Canister ID: 2477

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.12
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.01
Acetone	3.3
Acrolein	< 0.3
Benzene	0.03
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.73
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.55
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.6
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.29
Freon-113	0.09

Volatile Organics Data Results

Date: July 24, 2017
Canister ID: 2477

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.2
Isopentane	0.26
Isoprene	0.34
Isopropyl alcohol	0.5
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	0.02
Methylene chloride	< 0.3
n-Butane	0.08
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01
n-Hexane	0.06
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 1138
 Station ID: LICA 01 Installation Date/Time (mst): July 28, 2017 @ 08:47
 Sample ID: LICA/VOC/CLS/July 30, 2017 Removal Date/Time (mst): Aug 02, 2017 @ 18:57

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 30, 2017</u>	<u>00:00</u>	<u>00:00 July 31, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+24.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: June 21, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: June 21, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Aug 02, 2017

Sample ID: 17080052-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/July 30, 2017



Volatile Organics Data Results

Date: July 30, 2017
Canister ID: 1138

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	6.5
Acrolein	< 0.3
Benzene	0.08
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	1.83
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.43
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.32
Freon-113	0.09

Volatile Organics Data Results

Date: July 30, 2017
Canister ID: 1138

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.19
Isopentane	0.21
Isoprene	1.44
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.3
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.05
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.12
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 17070098-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/July 06, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-07</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>July 04, 2017 / 09:00</u>
Field Sample ID:	<u>LICA/PUF/CLS/July 06, 2017</u>	Removal Date/Time:	<u>July 11, 2017 / 08:36</u>

Sample Data Collection Information

Sample Date:	<u>July 06, 2017</u>	Average Pressure (mmHg)	<u>716</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 July 07, 2017</u>	Average Temperature (°C)	<u>20.7°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Apr 05, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yankov</u>	
Collected By:	<u>Alex Yankov</u>	<u>Date: July 11, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 6, 2017
PUF S/N: TE-07

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	1.34
2-Methylnaphthalene	1.97
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.21
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	0.02
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.04
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.07
Perylene	< 0.01
Phenanthrene	0.26
Pyrene	0.04
Retene	0.03

Sample ID: 17070167-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/July 12, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-06</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>July 11, 2017/08:36</u>
Field Sample ID:	<u>LICA/PUF/CLS/July 12, 2017</u>	Removal Date/Time:	<u>July 17, 2017/16:29</u>

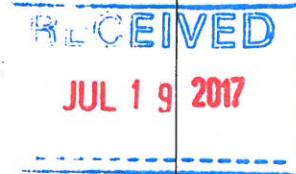
Sample Data Collection Information

Sample Date:	<u>July 12, 2017</u>	Average Pressure (mmHg)	<u>712</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 July 13, 2017</u>	Average Temperature (°C)	<u>19.2°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.22</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>April 05, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: July 17, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

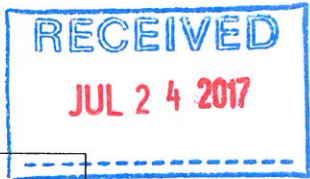
Date: July 12, 2017
PUF S/N: TE-06

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.05
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.23
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	0.02
Dibenzo(a,l)pyrene	0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.03
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	< 0.01
Perylene	< 0.01
Phenanthrene	0.17
Pyrene	0.03
Retene	0.03

Sample ID: 17070222-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/July 18, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	TE-01
Location:	Cold Lake South	Motor S/N:	11381 100-1020
Station ID:	LICA 01	Installation Date/Time:	July 17, 2017/16:29
Field Sample ID:	LICA/PUF/CLS/July 18, 2017	Removal Date/Time:	July 21, 2017/08:06

Sample Data Collection Information

Sample Date:	July 18, 2017	Average Pressure (mmHg)	713
Start Time (mst):	00:00	Average Flow (Q _{std})	229
End Time (mst):	00:00 July 19, 2017	Average Temperature (°C)	12.6°
Elapsed Time (Hours):	24.0	Volume (V _{std} m ³)	330.20

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	Apr 05, 2017	
Other observations?	n/a	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: July 21, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 18, 2017
PUF S/N: TE-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.01
2-Methylnaphthalene	0.03
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	0.02
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.01
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.11
Pyrene	0.01
Retene	0.04

Sample ID: 17070338-001

Customer ID: LICA
Cust Samp ID: LICAVOC/CLS/July 24, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>A13-02</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138 / 100 -1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>July 21, 2017 / 08:06</u>
Field Sample ID:	<u>LICA/PUF/CLS/July 24, 2017</u>	Removal Date/Time:	<u>July 28, 2017 / 08:57</u>

Sample Data Collection Information

Sample Date:	<u>July 24, 2017</u>	Average Pressure (mmHg)	<u>704</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 July 25, 2017</u>	Average Temperature (°C)	<u>14.3°</u>
Elapsed Time (Hours):	<u>24:00</u>	Volume (V _{std} m ³)	<u>330.18</u>

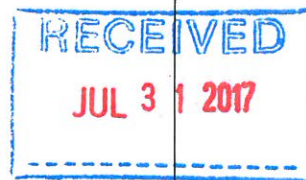
Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>July 21, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: July 28, 2017



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 24, 2017
PUF S/N: A13-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.01
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	0.05
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.01
Fluorene	0.03
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	< 0.01
Perylene	< 0.01
Phenanthrene	0.12
Pyrene	0.02
Retene	0.01

Sample ID: 17080052-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/July 30, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-08</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA01</u>	Installation Date/Time:	<u>July 28, 2017/08:57</u>
Field Sample ID:	<u>LICA/PUF/CLS/July 30, 2017</u>	Removal Date/Time:	<u>Aug 02, 2017/18:48</u>

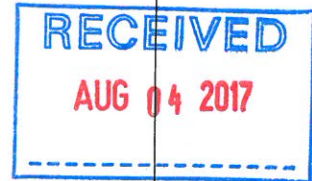
Sample Data Collection Information

Sample Date:	<u>July 30, 2017</u>	Average Pressure (mmHg)	<u>712</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 July 31, 2017</u>	Average Temperature (°C)	<u>20.1°</u>
Elapsed Time (Hours):	<u>24:00</u>	Volume (V _{std} m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>July 21, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Aug 02, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 30, 2017
PUF S/N: TE-08

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.01
2-Methylnaphthalene	0.02
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.06
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.38
Pyrene	0.03
Retene	0.05

PARTISOL RESULTS

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: July 06, 2017
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P619 45 56

PM2.5

Start Time 00:00 July 06, 2017
End Time 00:00 July 07, 2017
Status OK
Std Vol 23.234
Valid Time 24.0
Total Time 24.0

Comments: Weather Conditions, etc.

Date of last audit: Apr 20, 2017

Technician Signature:

Alex Yawpov
Date: July 11, 2017
Time: 09:03

Programming

- 1) Make sure system is in "Stop Mode"
2) "ESC" to Time Screen then "Program"
3) Enter Beg 1 0:00
4) Enter Dur 24:00:00
5) Enter Beg D dd-Aug
6) Enter End D dd-Aug
7) "Stop/Run"

Note: Beginning & End Date should be same date

Sample ID: 17070169-001

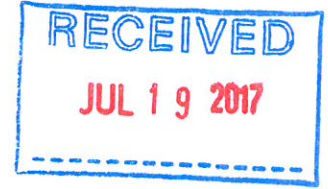
Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA Flt #P6129433

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: July 12, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P612 9433

Start Time 00:00 July 12, 2017

End Time 00:00 July 13, 2017

Status OK

Std Vol 23.127

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

Four horizontal lines for handwritten comments.

Date of last audit: Apr 20, 2017

Technician Signature: Alex Yakupov

Date: July 17, 2017

Time: 17:38

Programming

- 1) Make sure system is in "Stop Mode"
2) "ESC" to Time Screen then "Program"
3) Enter Beg 1 0:00
4) Enter Dur 24:00:00
5) Enter Beg D dd-Aug
6) Enter End D dd-Aug
7) "Stop/Run"

Note: Beginning & End Date should be same date

Sample ID: 17070223-001

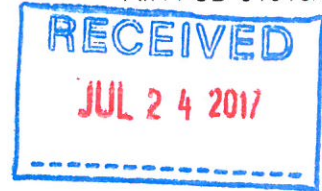
Customer ID: LICA

Cust Samp ID: P6130081

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: July 18, 2017
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P6130081

PM2.5

Start Time: 00:00 July 18, 2017
End Time: 00:00 July 19, 2017
Status: OK
Std Vol: 23,748
Valid Time: 24:00
Total Time: 24.0

Comments: Weather Conditions, etc.

n/a

Date of last audit: Apr 20, 2017

Technician Signature: Alex Yakupov

Date: July 21, 2017
Time: 08:38

Programming

- 1) Make sure system is in "Stop Mode"
2) "ESC" to Time Screen then "Program"
3) Enter Beg 1 0:00
4) Enter Dur 24:00:00
5) Enter Beg D dd-Aug
6) Enter End D dd-Aug
7) "Stop/Run"

Note: Beginning & End Date should be same date

Sample ID: 17070337-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: Filter # P6130097

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: July 24, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P613 00 97

Start Time 00:00 July 24, 2017

End Time 00:00 July 25, 2017

Status OK

Std Vol 23,255

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

na

Date of last audit: July 21, 2017

Technician Signature: Alex Yakupov
Date: July 28, 2017
Time: 10:16

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"
- 8) **Make Sure it is left in RUN mode**

Note: Beginning & End Date should be same date

Partisol Sample Data Sheet



Date Sampled: July 30, 2017
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P 619 45 53

PM2.5

Sample ID: 17080053-001

Customer ID: LICA
Cust Samp ID: P6194553

Priority: Normal

Start Time: 00:00 July 30, 2017
End Time: 00:00 July 31, 2017
Status: OK
Std Vol: 23.097
Valid Time: 24:00
Total Time: 24.0

Comments: Weather Conditions, etc.

n/a

Date of last audit : July 21, 2017

Technician Signature: Alex Yakupov
Date: Aug 02, 2017
Time: 19:08

Programming

- 1) Make sure system is in "Stop Mode"
2) "ESC" to Time Screen then "Program"
3) Enter Beg 1 0:00
4) Enter Dur 24:00:00
5) Enter Beg D dd-Aug
6) Enter End D dd-Aug
7) "Stop/Run"
8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

Partisol Sampler Results

Date	Filter NO.	Concentration (mg)
July 6	P6194556	0.063
July 12	P6129433	0.096
July 18	P6130081	0.018
July 24	P6130097	0.045
July 30	P6194553	0.228

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43iSulphur Dioxide Analyzer Calibration

Date: July 13, 2017	Barometer Data/B.P.: Brunton 5490, December 4, 2016	28.04 inHg
Company/Airshed: LICA	Thermometer Data/Station Temp °C: fisher Scientific 160348895, April 8, 2017	21 °C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny	
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly	
Start Time 24 hr. (mst): 12:50	Performed By/Reviewer: Limin Li	Trina Whitsitt
End Time 24 hr. (mst): 17:25	Cal Gas Expiry Date: December 8, 2019	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	Range ppb: 500	
ID# or Serial Number: 806528242	As Found C.F.: 0.995	
Last Calibration Date: June 20, 2017	New C.F.: 1.000	
Previous C.F.: 1.000		

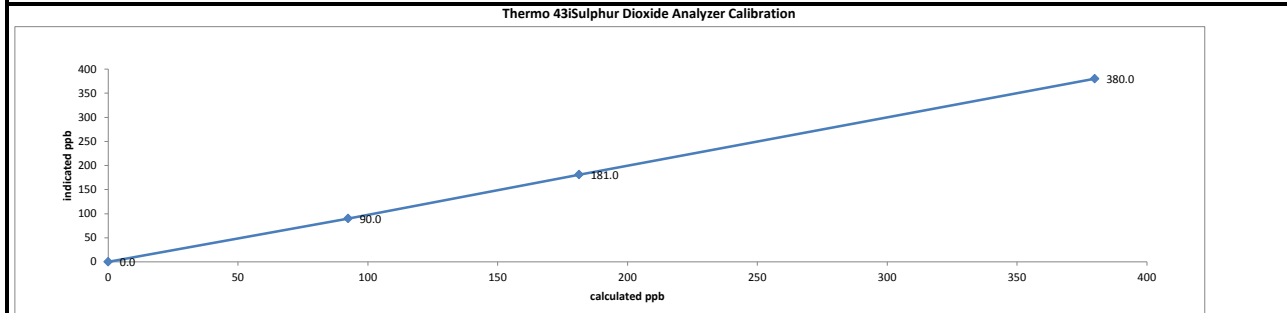
Calibration Standards: Low Flow Meter ID/Cert. Date: SIA Defender Low ID# 153358 Jan19, 2017 High Flow Meter ID/Cert. Date: SIA Defender High ID# 152571 Jan19, 2017 Calibrator ID/Cert. Date: Sabio 2010 sn 17200415, May 16, 2017 Cal Gas Cylinder I.D. #: EY0000769 Cal Gas Conc. (ppm): 50.5	Standard Calibration 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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:		Indicated Concentration:		Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	(ppb)	(ppb)	
as found zero	5932	0.00	5932	0.0	0.0			n/a
as found high	5890	44.65	5935	379.9	382.0			0.995
adjusted zero	5932	0.00	5932	0.0	0.0			n/a
adjusted high	5890	44.65	5935	379.9	380.0			1.000
mid	5928	21.36	5949	181.3	181.0			1.002
low	5946	10.90	5957	92.4	90.0			1.027
calibrator zero	5953	0.00	5953	0.0	0.1			n/a
Average C.F.=								1.009

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.998	> or = 0.995
b (Intercept as % of full scale) = 0.21%	.95-1.05
% change in C.F. from last cal = 0.54%	± 3% F.S.
	± 10%

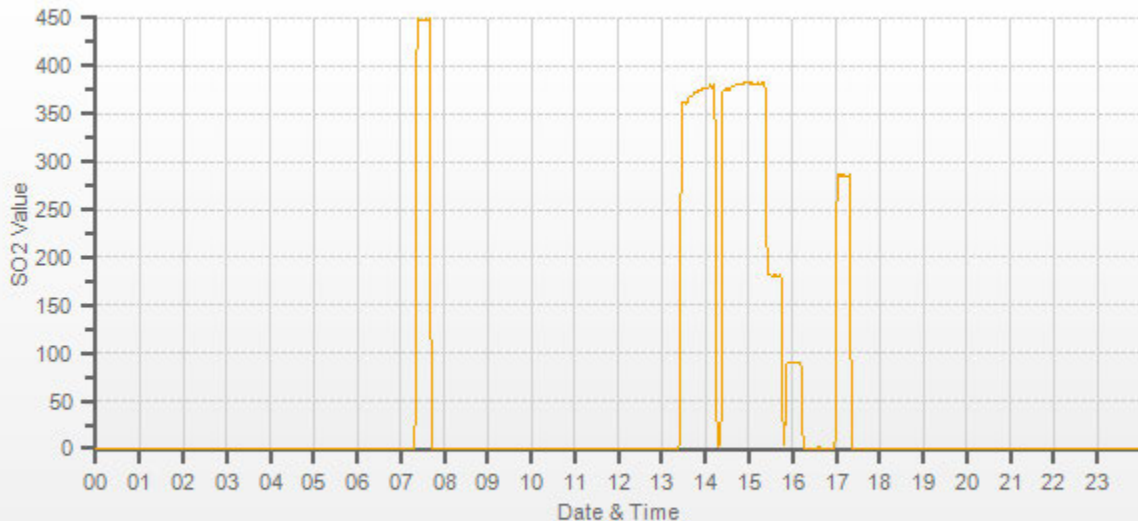


As found: Bkg: 8.1 Coef: 0.962 Pmt: -624.6 V Flash: 766 V Internal: 28.9 °C Chamber: 45.2 °C Perm Oven Gas: 45 °C Perm Oven Heater: 44.19 °C Pressure: 678.6 mmHg Sample Flow: 0.473 L/MIN Lamp Intensity: 96% Averaging Time: 120 Second Expected Value: 454.0	As left: Bkg: 8.0 Coef: 0.956 Pmt: -624.6 V Flash: 766 V Internal: 30.1 °C Chamber: 45.0 °C Perm Oven Gas: 35.0 °C Perm Oven Heater: 34.25 °C Pressure: 678.6 mmHg Sample Flow: 0.473 L/min Lamp Intensity: 90% Averaging Time: 120 Second Expected Value: 265.3
---	--

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.

No zero adjustment was required/made. The "as found" zero value was copied to the adjusted zero value field for linearity calculation purposes.
 Flow measurements after mid-point.

SO2 span EV higher than 80%. Reduce SO2 IZS temp from 45 to 35 degC.
 High point response slowly. Repurge gas regulator. Then redo as found high point.



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	July 14, 2017	Barometer Data/B.P.:	Brunton 5490, December 4, 2016	28.19 inHg
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	fisher Scientific 160348895, April 8, 2017	21 °C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny	
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly	
Start Time 24 hr. (mst):	8:00	Performed By/Reviewer:	Limin Li	Trina Whitsitt
End Time 24 hr. (mst):	12:30	Cal Gas Expiry Date:	January 6, 2018	
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	Internal	

Analyzer:	ID# or Serial Number:	812728560	Range ppb:	100
	Last Calibration Date:	June 20, 2017	As Found C.F.:	1.072
	Previous C.F.:	1.002	New C.F.:	1.000

Calibration Standards: Low Flow Meter ID/Cert. Date: SIA Defender Low ID# 153358 Jan19, 2017 High Flow Meter ID/Cert. Date: SIA Defender High ID# 152571 Jan19, 2016 Calibrator ID/Cert. Date: Envirocons 2000 sn1991, March 16, 2017 Cal Gas Cylinder I.D. #: BLM002508 Cal Gas Conc. (ppm): 10.2	Standard Calibration Points for Ranges <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

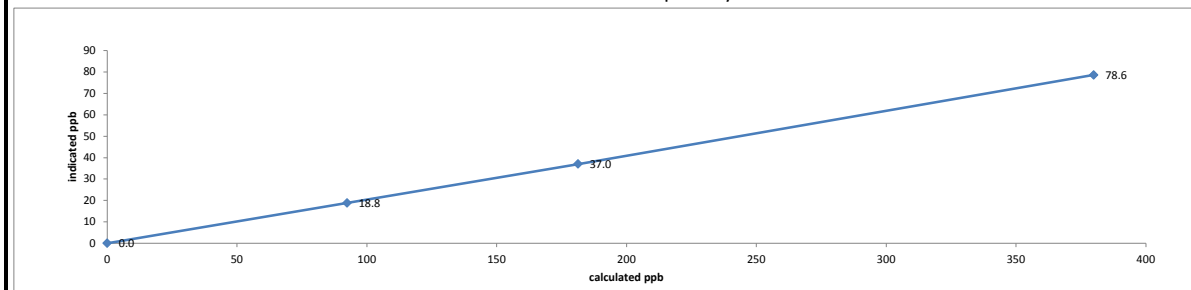
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7557	0.00	7557	0.0	0.0	n/a
as found high	7504	58.25	7562	78.6	73.3	1.072
adjusted zero	7557	0.00	7557	0.0	0.0	n/a
adjusted high	7504	58.25	7562	78.6	78.6	1.000
mid	7522	28.36	7550	38.3	37.0	1.036
low	7544	14.22	7558	19.2	18.8	1.021
calibrator zero	7526	0.00	7526	0.0	0.2	n/a
Average C.F.=						1.019

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	> or =	0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.45%		± 3% F.S.
% change in C.F. from last cal =	-6.98%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration

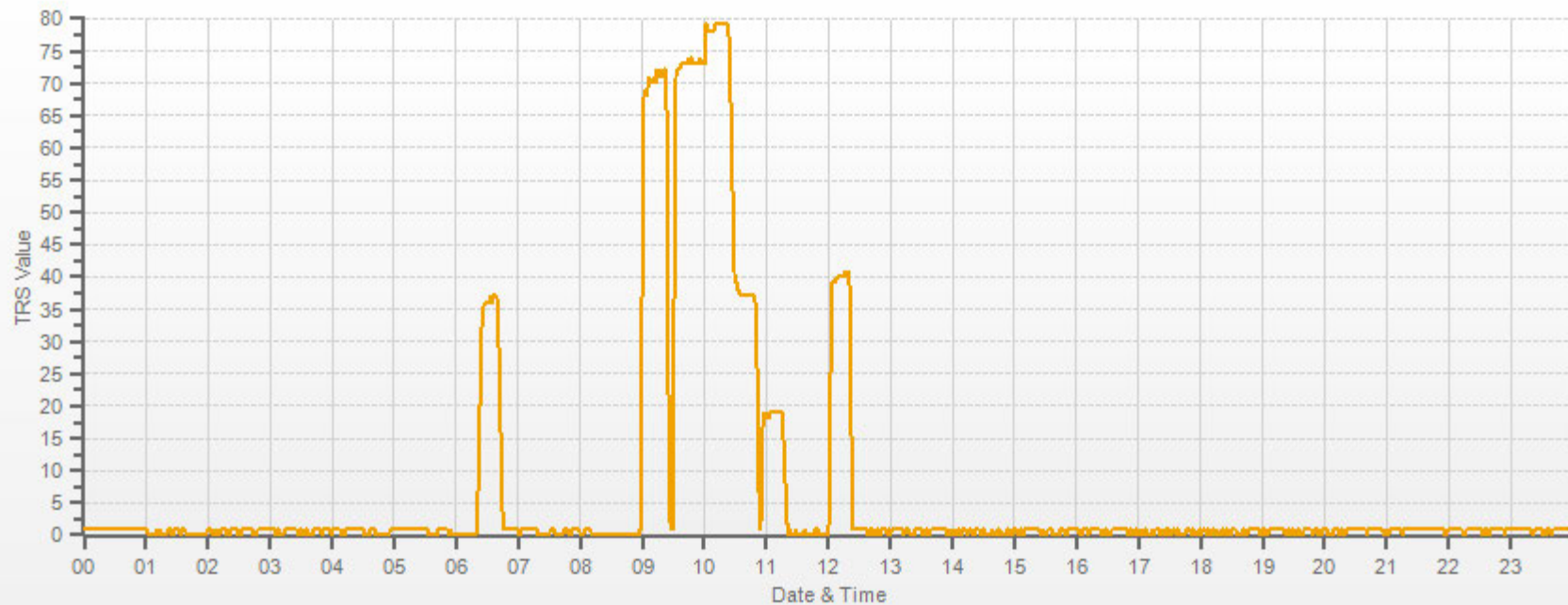


As found: Bkg: 13.9 Coef: 0.892 Pmt: -651.2 V Flash: 740 V Internal: 31.6°C Chamber: 45.3°C Converter Temp: 825°C Converter Set: 825°C Perm Oven Gas: 45°C Perm Oven Htr: 44.37°C Pressure: 630.1 mmHg Sample Flow: 0.483 L/MIN Lamp Intensity: 91% Averaging Time: 120 Second Expected Value: 38.8	As left: Bkg: 14.6 Coef: 0.953 Pmt: -615.3 V Flash: 739 V Internal: 31.6°C Chamber: 45.1°C Converter Temp: 825°C Converter Set: 825°C Perm Oven Gas: 45°C Perm Oven Htr: 44.37°C Pressure: 640.4 mmHg Sample Flow: 0.493 L/MIN Lamp Intensity: 91% Averaging Time: 120 Second Expected Value: 40.6
---	--

Comments:

The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.
 Flow measurements after mid-point.

Regulator was re-purged during the H2S as found high.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: July 13, 2017	Barometer Data/B.P.: Brunton 5490, December 4, 2016	28.04 inHg
Company/Airshed: LICA	Thermometer Data/Station Temp °C: Fisher Scientific 160348895, April 8, 2017	21°C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny	
Parameter: Total Hydrocarbon	Calibration Purpose: post repair	
Start/End Time 24 hr. (mst): 18:00/20:40	Performed By/Reviewer: Limin Li	Trina Whitsitt
Calibration Method: Gas Dilution	Cal Gas Expiry Date: November 24, 2022	

Analyzer:	ID# or Serial Number: 427408718	Range ppm: 50
	Last Calibration Date: n/a	As Found C.F.: n/a
	Previous Cal High Point C.F.: n/a	New C.F.: 0.998

Calibration Standards:

Low Flow Meter ID/Cert. Date: SIA Defender Low ID# 153358 Jan19, 2017	Standard Calibration Points for a Range of: 50 ppm
High Flow Meter ID/Cert. Date: SIA Defender High ID# 152571 Jan19, 2017	
Calibrator ID/Cert. Date: Envirotronics 2000 sn 1991, March 16, 2017	
Cal Gas Cylinder I.D. #: LL165367	
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	
CH ₄ as propane/total CH ₄ equivalents (ppm):	

590.0	207.0
569.3	1159.3

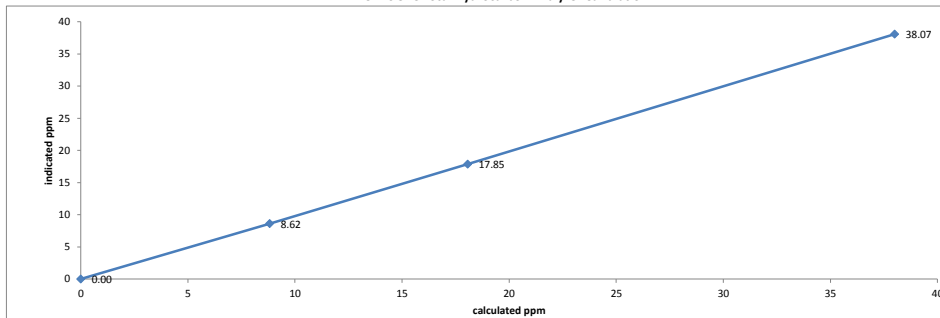
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
adjusted zero	2102	0.00	2102	0.0	0.00	n/a
adjusted high	2107	71.39	2178	38.00	38.07	0.998
mid	2105	33.32	2138	18.07	17.85	1.012
low	2109	16.17	2125	8.82	8.62	1.023
calibrator zero	2102	0.00	2102	0.00	0.00	n/a
Average C.F. =						1.011

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	> or = 0.995
Slope =	0.997	.95-1.05
b (Intercept as % of full scale) =	0.28%	± 3% F.S.
% change in C.F. from last cal =	n/a	± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration

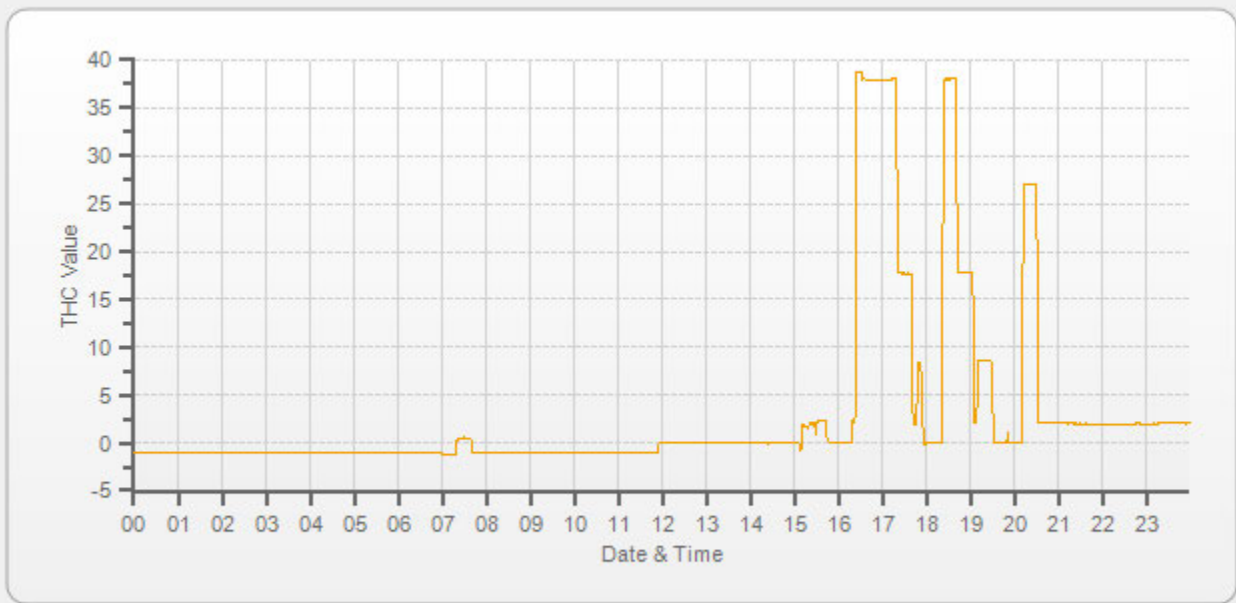


<p>As found:</p> <p>H2 cylinder (psi): n/a</p> <p>H2 cylinder reg set (psi): n/a</p> <p>Span Cylinder (psi): n/a</p> <p>Span Cylinder Reg Set (psi): n/a</p> <p>Zero Air Gen Pressure: n/a</p> <p>measurement alarms: n/a</p> <p>service alarms: n/a</p> <p>cnt: n/a</p> <p>rng: n/a</p> <p>try: n/a</p> <p>det: n/a</p> <p>Flame: n/a</p> <p>Filter: n/a</p> <p>Base: n/a</p> <p>Sample psi: n/a</p> <p>Internal Air Pressure: n/a</p> <p>Internal Fuel Pressure: n/a</p> <p>Measured Flow: n/a</p> <p>Expected Value: n/a</p>	<p>As left:</p> <p>H2 cylinder (psi): 500</p> <p>H2 cylinder reg set (psi): 24</p> <p>Span Cylinder (psi): 1350</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 40psi</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 1227</p> <p>rng: 1</p> <p>try: 0</p> <p>det: 125.3 °C</p> <p>Flame: 178 °C</p> <p>Filter: 125 °C</p> <p>Base: 125 °C</p> <p>Sample psi: 6.5 psi</p> <p>Internal Air Pressure: 20 psi</p> <p>Internal Fuel Pressure: 13 psi</p> <p>Measured Flow: 0.5337 SLPM</p> <p>Expected Value: 27.03</p>
--	---

Comments:
 The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.
 Flow measurements after mid-point.

No shut down calibration was complete due to pump failure. The pump was rebuilt. The back-pressure was adjusted from 27psi to 33psi to increase sample pressure to 6.5psi. The sample flow rate is still 0.5337 slpm after pump rebuild. Sample line tube (capillary) may need replacing soon.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: July 13, 2017	Barometer Data/B.P.: Brunton 5490, December 4, 2016	28.04 inHg
Company/Airshed: LICA	Thermometer Data/Station Temp °C: fisher Scientific 160348895, April 8, 2017	21 °C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny	
Start/End Time 24 hr. (mst): 12:50/20:10	Calibration Purpose: routine monthly	
G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale	Performed By/Reviewer: Limin Li	Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 8, 2019	

Analyzer:	Correction Factors:																
ID# or Serial Number: 1505664393	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td>NO =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">0.973</td> <td style="text-align: center;">1.001</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.004</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">0.975</td> <td style="text-align: center;">1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.973	1.001	NO ₂ =	1.000	1.004	1.000	NOx =	0.999	0.975	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	0.973	1.001														
NO ₂ =	1.000	1.004	1.000														
NOx =	0.999	0.975	1.000														
Last Calibration Date: June 20, 2017																	
Range ppb: 500																	

Calibration Standards:	Standard Calibration Points for a Range of: 500 ppb																								
Low Flow Meter ID/Cert. Date: SIA Defender Low ID# 153358 Jan19, 2017	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td style="text-align: center;">380</td> <td style="text-align: center;">330</td> <td style="text-align: center;"><--high ozone</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">180</td> <td style="text-align: center;">245</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">90</td> <td style="text-align: center;">175</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #1</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">133</td> <td style="text-align: center;"><--mid ozone</td> </tr> <tr> <td>Extra Point #2</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">53</td> <td style="text-align: center;"><--low ozone</td> </tr> </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																						
High Flow Meter ID/Cert. Date: SIA Defender High ID# 152571 Jan19, 2017																									
Calibrator ID/Cert. Date: Sabio 2010 sn 17200415, May 16, 2017																									
Cal Gas Cylinder I.D. #: EY0000769																									
Cal Gas Conc. (ppm): 51.1 51.2																									

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

Point	Calibrator Flow Rates (cc/min)			Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
	Diluent	Cal Gas	Total Flow						
as found zero	5932	0.0	5932	0	0	0.0	0.0	n/a	n/a
as found high	5890	44.7	5935	384.4	385.2	395.0	395.0	0.973	0.975
adjusted zero	5932	0.00	5932	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5890	44.65	5935	384.4	385.2	384.0	385.0	1.001	1.000
mid	5928	21.36	5949	183.5	183.8	184.0	184.0	0.997	0.999
low	5946	10.90	5957	93.5	93.7	93.0	94.0	1.005	0.997
calibrator zero	5953	0.00	5953	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.001	0.999

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

Point	Calibrator Flow Rates (cc/min)			Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F. (ppb)
	Diluent	Cal Gas	Total Flow							
NOx reference	5911	44.70	5956	0.0	382.0	383.0	1.0	0.0	1.0	1.000
as found high NO2	5911	44.70	5956	245.0	141.0	382.0	241.0	241.0	240.0	1.004
adjusted high NO2	5911	44.70	5956	245.0	141.0	383.0	242.0	241.0	241.0	1.000
gpt mid	5911	44.70	5956	133.0	250.0	383.0	133.0	132.0	132.0	1.000
gpt low	5911	44.70	5956	53.0	332.0	383.0	51.0	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 =	1.001	1.001	1.003	.95-1.05
b (Intercept as % of full scale)=	0.00%	0.04%	0.12%	± 3% F.S.
% change in C.F. from last cal=	2.58%	2.39%	-0.42%	± 10%
NO2 converter efficiency	1.00			0.96 to 1.04

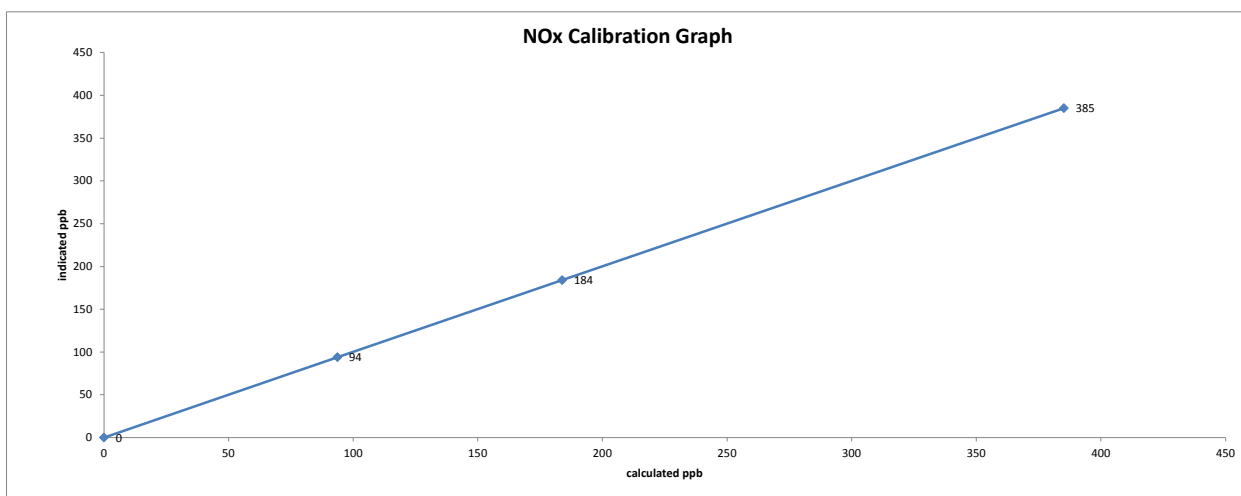
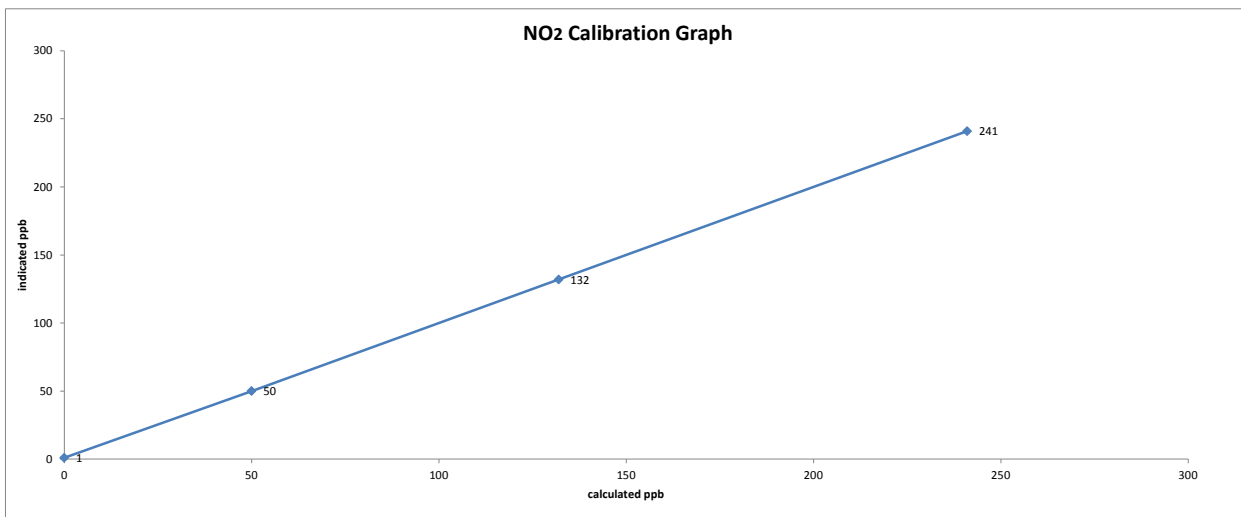
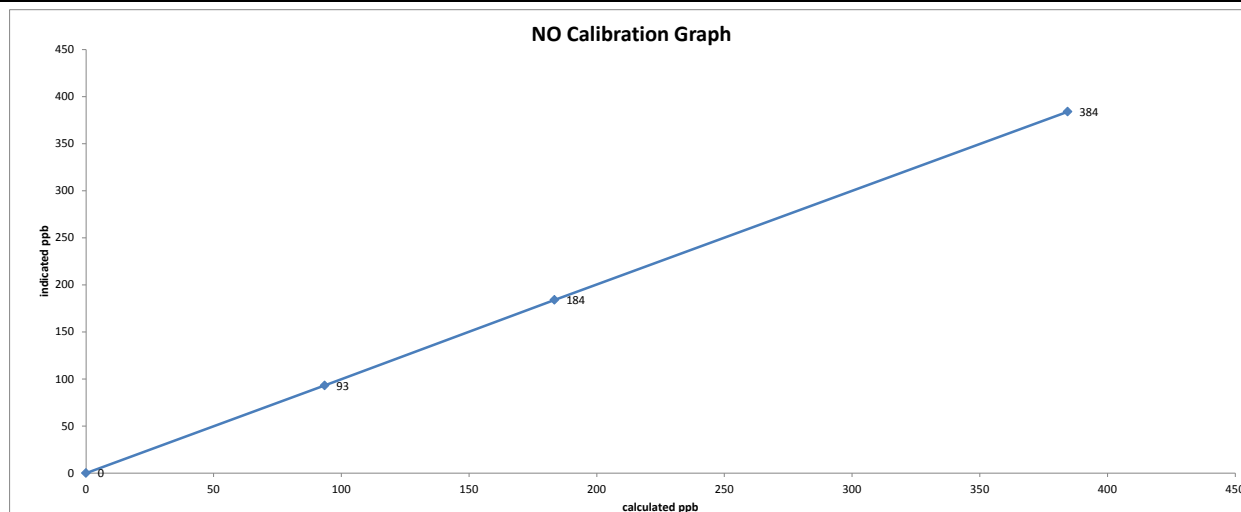
As found:	As left:
NO Bkg: 3.7	NO Bkg: 3.6
NOx Bkg: 3.8	NOx Bkg: 3.7
NO Coef: 1.011	NO Coef: 0.983
NO2 Coef: 0.995	NO2 Coef: 0.990
NOx Coef: 0.998	NOx Coef: 1.000
PMT: -855.1 V	PMT: -854.7 V
Internal: 25.4 °C	Internal: 27.0 °C
Chamber: 50.6 °C	Chamber: 50.0 °C
Cooler: -3.0 °C	Cooler: -3.0 °C
NO2 Converter: 326.6 °C	NO2 Converter: 324.5 °C
NO2 Converter Set: 325 °C	NO2 Converter Set: 325 °C
Pressure: 177.5 mmHg	Pressure: 176.9 mmHg
Flow: 0.770 LPM	Flow: 0.770 LPM
Ozonator Flow: OK	Ozonator Flow: OK
0 Perm Gas=35.00 °C	0 Perm Gas=35.00 °C
0 Perm Heat=34.24 °C	0 Perm Heat=34.24 °C
Expected Value NO: 2.5	Expected Value NO: 2.7
Expected Value NO2: 267.0	Expected Value NO2: 250.7
Expected Value NOx: 270.0	Expected Value NOx: 253.9

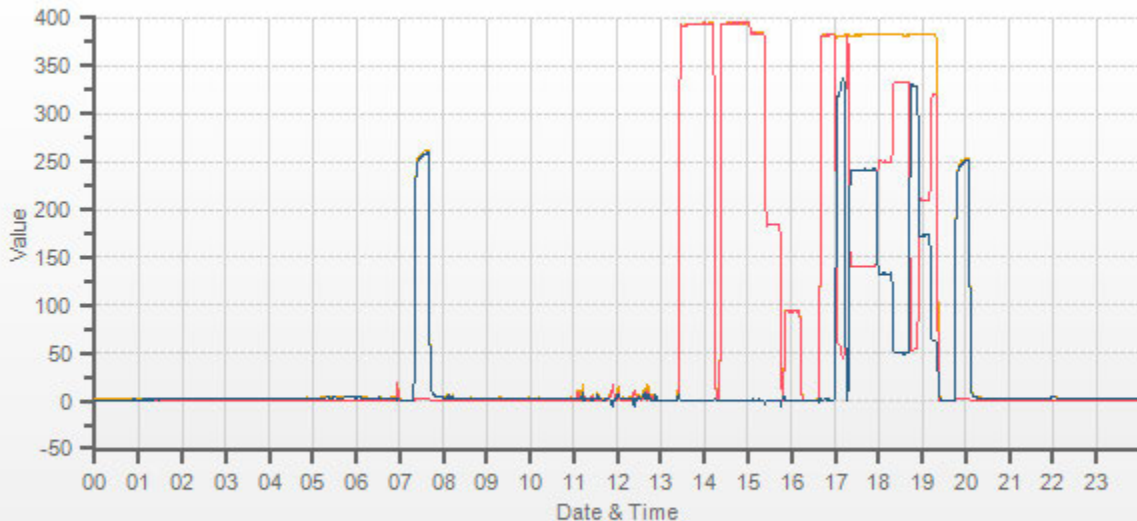
Comments:
 The analyzer sample inlet filter was changed.
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.
 Flow measurements after mid-point.
 The analyzer cooling fan filter(s) were cleaned.

SO2 as found high responded slowly. It was paused to re-purge the gas regulator. Second as found high point successful. NOx GPT high point was initially done at 333ppb; however, it was stopped and redone at 245ppb.

Date: July 13, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 12:50/20:10
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: July 14, 2017 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 08:00/12:30 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: July 13, 2017	Barometer Data/B.P.: Brunton 5490, December 4, 2016 Thermometer Data/Station Temp °C: Fisher Scientific 160348895, April 8, 2017 Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Limin Li / Trina Whitsitt Cal Gas Expiry Date: December 8, 2019
---	--

Analyzer: ID# or Serial Number: 700419951 Last Calibration Date: June 21, 2017 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 0.980 New C.F.: 1.000
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Calibration Standards: Low Flow Meter ID/Cert. Date: n/a High Flow Meter ID/Cert. Date: SIA Defender High ID# 152571 Jan19, 2017 Calibrator ID/Cert. Date: Sabio 2010 sn 17200415, May 16, 2017 Cal Gas Cylinder I.D. # : EY0000769	<table border="1" style="margin: auto;"> <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>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

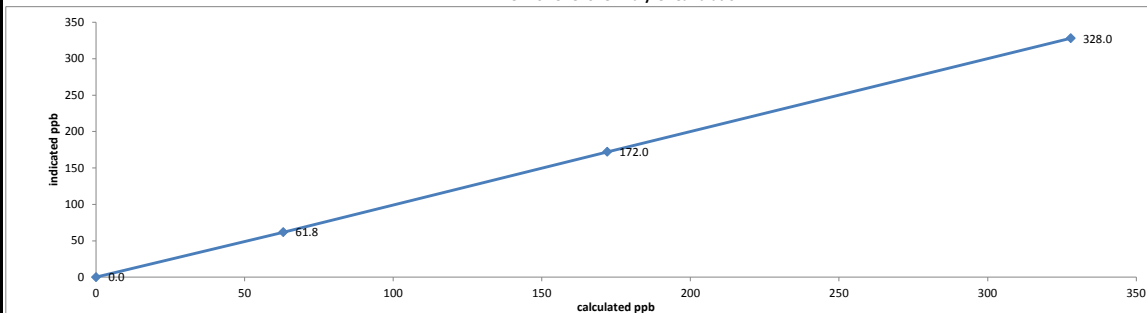
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	5956	5956	0.0	n/a	1.2	n/a
as found high	5956	5956	328.0	328.0	336.0	0.980
adjusted zero	5956	5956	0.0	0.0	0.0	n/a
adjusted high	5956	5956	328.0	328.0	328.0	1.000
mid	5956	5956	172.0	172.0	172.0	1.000
low	5956	5956	63.0	63.0	61.8	1.019
calibrator zero	5956	5956	0.0	n/a	0.2	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 0.998 b (Intercept as % of full scale) = 0.10% % change in C.F. from last cal = 2.03%	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%
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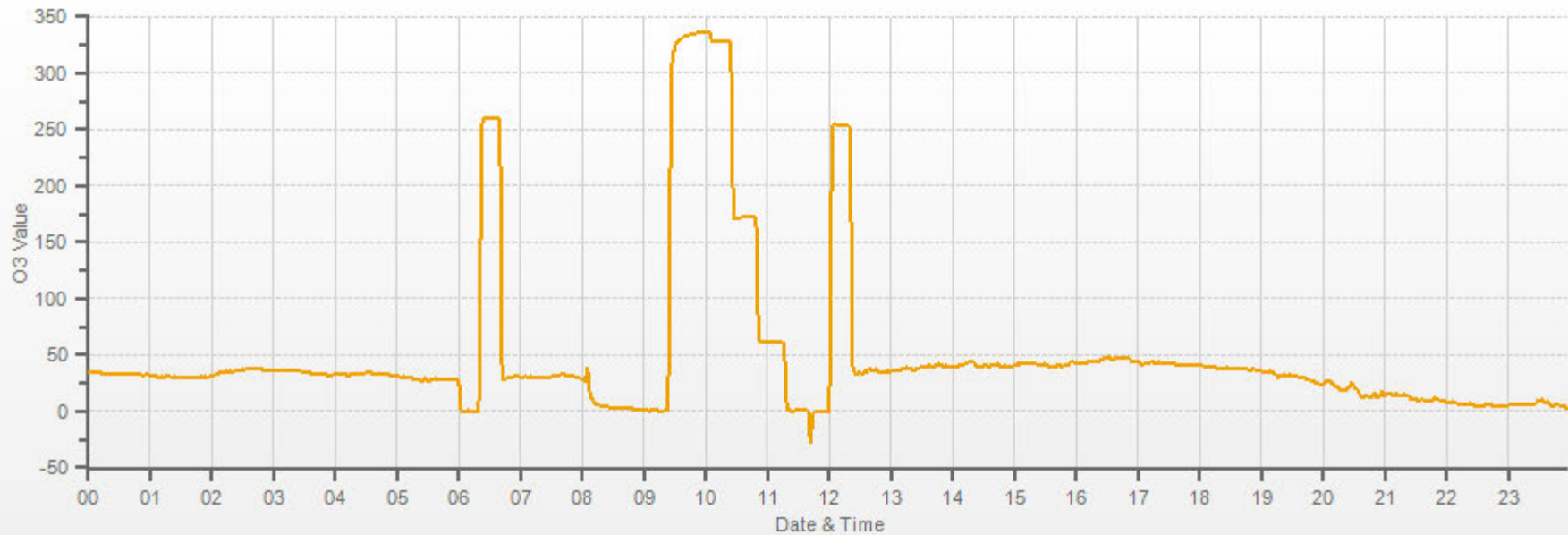
Thermo 49i Ozone Analyzer Calibration



As found: O3 Bkg: 0.0 O3 Coef: 1.033 Photo Lamp: 9.6 V O3 Lamp: 9.0 V Bench: 28.4 °C Bench Lamp: 53.5 °C O3 Lamp: 67.4 °C Pressure: 700.8 mmHg Cell A lpm: 0.713 Cell B lpm: 0.753 O3 ppb: 48.7 Cell A ppb: 75.4 Cell B ppb: 22.1 Cell A int: 87883 Expected Value: 260.0 0 Cell B: 87668	As left: O3 Bkg: 0.4 O3 Coef: 1.004 Photo Lamp: 9.6 V O3 Lamp: 9.0 V Bench: 28.1 °C Bench Lamp: 53.4 °C O3 Lamp: 67.3 °C Pressure: 700.1 mmHg Cell A lpm: 0.720 Cell B lpm: 0.760 O3 ppb: 0.1 Cell A ppb: 3.8 Cell B ppb: -4.1 Cell A int: 87674 Expected Value: 252.1 0 Cell B: 87711
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Comments:

The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.



O3[ppb]

PARTICULATE MATTER

Thermo 5030 SHARP Monitor Monthly Audit

Date: <u>July 21, 2017</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
Company: <u>LICA</u>	Start Time (mst): <u>11:02</u>
Station Name/Location: <u>Cold Lake South</u>	End Time (mst): <u>11:47</u>
Previous Audit Date: <u>June 6, 2017</u>	Calibration Purpose: <u>routine monthly</u>
Parameter: <u>PM 2.5</u>	Weather Conditions: <u>Rain fall heavy at times</u>

SHARP Information and Status:

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

Reference Standards:

Air Flow			
Manometer	Orifice	Pressure:	Temperature:
Make: <u>Dwyer</u>	<u>Chinnok Eng.</u>	<u>Fisher Scientific</u>	<u>FLUKE</u>
Model: <u>475 Mk.III</u>	<u>FTS</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number: <u>#3</u>	<u>I.D.#2, s.n. 091001</u>	<u>055544</u>	<u>4295</u>
Calibration Date: <u>January 1, 2017</u>	<u>March 24, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

As found temperature and pressure:

Tolerance +/- 4°C SHARP T1 °C: <u>13.0</u> Reference °C: <u>14.6</u> Difference °C: <u>1.6</u>	Tolerance +/- 13.33 hPa SHARP P3 (hPa): <u>945.000</u> Reference (hPa): <u>944.000</u> Difference (hPa): <u>1.000</u>
---	--

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

Tolerance +/- 4°C SHARP T1 °C: <u>13.0</u> Reference °C: <u>14.6</u> Difference °C: <u>1.6</u>	Tolerance +/- 13.33 hPa SHARP P3 (hPa): <u>945.000</u> Reference (hPa): <u>944.000</u> Difference : <u>1.000</u>
---	---

As found flows:

Targets: 1000 l/hr / <90% SHARP AirFlow l/hr <u>1000.00</u> Pump Voltage (%) <u>44.00</u>	Flow Tolerance 16.67 lpm +/- 0.67 lpm SHARP Airflow (l/min) <u>16.67</u> Reference AirFlow (l/min) <u>16.87</u> Difference (l/min) <u>0.20</u>
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As left flows (same as above if as found adequate):

Targets: 1000 l/hr / <90% SHARP AirFlow l/hr <u>1000.00</u> Pump Voltage (%) <u>44.00</u>	Flow Tolerance 16.67 lpm +/- 0.67 lpm SHARP Airflow (l/min) <u>16.67</u> Reference AirFlow (l/min) <u>16.87</u> Difference (l/min) <u>0.20</u>
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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 <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>17200415</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
5028	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4930	78.7	0.783	0.783	0.809	-0.012	0.797	3%	2%
4936	38.6	0.383	0.383	0.396	-0.006	0.390	3%	2%
4935	19.4	0.193	0.193	0.199	-0.003	0.196	3%	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)= 1.0334	0.90-1.10	m (Slope)= 1.0181
b (Intercept % of FS)= -0.0105	± 3% F.S.	b (Intercept % of FS)= -0.0148

Flow	O ₂ Conc (LC)	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4930	0.000	0.000	0.806	-0.013	0.795	NO ₂	% Diff. Limit
4930	1.425	0.523	0.283	0.511	0.794	0%	± 10%
4930	0.825	0.278	0.528	0.266	0.795	0%	± 10%
4930	0.386	0.095	0.711	0.085	0.796	3%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 0.9998	0.90-1.10	
b (Intercept % of FS)= -1.1702	± 3% F.S.	

AENV Standards Audit Calibrator	NO_x Analyzer
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
SRM Gas Cylinder No. <u>CAL018101</u>	Last Calibration Date <u>May 16, 2017</u>
Cylinder Conc. (ppm) <u>48.79</u>	Full Scale (ppm) <u>1.0</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>EnviroNics 2000</u>		Make/Model	<u>Bios Defender 530</u>	
Serial Number	<u>1991</u>		Serial Number	<u>HI148944 Lo 152019</u>	
Last Verification Date	<u>March 31, 2016</u>		Temperature (°C)	<u>24.5</u>	
NO Cylinder S/N	<u>EY0000597</u>		Barometric Pressure	<u>699</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>4902</u>	Pt. #2	<u>4935</u>	Pt. #3	<u>4957</u>
Gas Flow (sccm)					
Pt. #1	<u>79.3</u>	Pt. #2	<u>38.7</u>	Pt. #3	<u>19.4</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4976	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4981	79.3	0.7801	0.7801	0.7898	0.0000	0.7898	1%	1%
4972	38.7	0.3814	0.3814	0.3841	0.0002	0.3843	1%	1%
4976	19.4	0.1910	0.1910	0.1913	0.0003	0.1916	0%	0%
Absolute Average Percent Difference							1%	1%

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

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0130	0.90-1.10	m (Slope)= 1.0129
b (Intercept % of FS)= -0.1190	± 3% F.S.	b (Intercept % of FS)= -0.1029

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4981	0.000	0.0000	0.7925	-0.0001	0.7924	NO ₂	% Diff. Limit
4981	0.400	0.5347	0.2578	0.5279	0.7857	-1%	± 10%
4981	0.200	0.2490	0.5435	0.2478	0.7913	0%	± 10%
4981	0.090	0.1090	0.6835	0.1095	0.7927	1%	± 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)= 0.9864	0.90-1.10
b (Intercept % of FS)= 0.1136	± 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>1868</u>
Serial/AMU Number <u>1809</u>	Last Calibration Date <u>March 15, 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 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: March 16, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-436CGA

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

Cylinder #: EY0000769 Concentration PPM: 50.5 Tolerance(%) 1.6 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 (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4911	0.0	0.000	0.01574	63.540	50.9
4918	77.4	0.801	0.01574	63.540	50.9
4918	38.5	0.398	0.00783	127.740	50.9
4915	19.2	0.196	0.00391	255.990	50.0
Average Cylinder Concentration:					50.6

Previous Stated Concentration PPM: 50.5

Percent variance from Stated: 0.2

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

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002508 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU1690
 Last Verification Date: March 31, 2015
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00353	283.687	9.6
5066	9.1	0.0170	0.00180	556.703	9.5
Average Cylinder Concentration:					9.6

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

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: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-029CGA

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

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

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on CH4 only

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

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



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-437CGA

Company: Maxxam **Operators name:** Chris
Cylinder #: EY0000769 **Conc (PPM)** 51.1 **Tolerance (%)** 0.7 **Certified By:** Praxair
Expiry Date: December 8, 2019

Reference Calibrator and Gas:		Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Bios Definer 220</u>
Serial Number	<u>AMU 1809</u>	Serial Number	<u>AMU 1941</u>
Last Verification Date	<u>January 26, 2017</u>	Temp.°C	<u>24.4</u>
Gas Type	<u>NO</u> Conc. <u>48.79</u>	B.P.	<u>704.7</u>
Cylinder Number	<u>CAL018140</u>		
Expiry Date	<u>March 25, 2019</u>		

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 (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4911	0.0	0.000	0.000	X	X	X	X
4918	77.4	0.822	0.822	0.016	63.540	52.2	52.2
4918	38.5	0.408	0.408	0.008	127.740	52.2	52.1
4915	19.2	0.202	0.202	0.004	255.990	51.7	51.7
Average Cylinder Concentration:						52.0	52.0

	<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM:	<u>51.1</u>	<u>51.2</u>
Percent variance from Stated:	<u>1.8</u>	<u>1.6</u>

Cylinder gas tolerances based on NO only
 Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration 50.5 PPM SO2
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton **Date:** January 26, 2017
Operator Signature: _____ **Location:** McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

PASSIVE SAMPLES

Your Project #: 2017/05/30
Site Location: LICA

Attention: MICHAEL BISAGA

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
PO BOX 8237
5107W- 50TH STREET
BONNYVILLE, AB
CANADA T9N 2J5

Report Date: 2017/08/11
Report #: R2426542
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B765767

Received: 2017/08/04, 15:02

Sample Matrix: Air
Samples Received: 33

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
H2S Passive Analysis (1)	20	2017/08/09	2017/08/11	PTC SOP-00150	Tang.Passive H2S in
NO2 Passive Analysis (1)	25	2017/08/10	2017/08/11	PTC SOP-00148	Passive NO2 in ATM
O3 Passive Analysis (1)	25	2017/08/10	2017/08/11	PTC SOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	29	2017/08/09	2017/08/11	PTC SOP-00149	Passive SO2 in Air

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Project Manager
Email: LManchak@maxxam.ca
Phone# (780)468-3536

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B765767
Report Date: 2017/08/11

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2017/05/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		RR1058	RR1059	RR1060	RR1061	RR1062	RR1063	RR1064		
Sampling Date		2017/05/30 17:12	2017/05/31 11:18	2017/05/31 12:07	2017/05/31 13:27	2017/05/31 10:09	2017/05/31 17:26	2017/05/30 16:14		
	UNITS	3	4	5	6	8	9	10	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.22		0.32				0.15	0.02	8721214
Calculated NO2	ppb	0.6	0.4	0.4	1.7	0.3	0.6	1.0	0.1	8721531
Calculated O3	ppb	28.4	27.7	24.5	28.9	32.8	31.0	24.3	0.1	8721614
Calculated SO2	ppb	0.3	0.3	0.4	0.6	0.9	0.3	0.2	0.1	8720692
RDL = Reportable Detection Limit										

Maxxam ID		RR1065	RR1066	RR1067	RR1068	RR1069	RR1070		
Sampling Date		2017/05/30 15:21	2017/02/27 17:36	2017/05/30 13:35	2017/05/30 12:47	2017/05/30 20:06	2017/05/31 16:51		
	UNITS	11	12	13	14	15	16	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	MISSING	MISSING	0.06	0.15		0.15	0.02	8721214	
Calculated NO2	ppb	MISSING	MISSING	0.3	0.3	0.4	0.5	0.1	8721531	
Calculated O3	ppb	MISSING	MISSING	24.8	28.1	26.8	24.0	0.1	8721614	
Calculated SO2	ppb	MISSING	MISSING	0.2	0.8	0.4	0.2	0.1	8720692	
RDL = Reportable Detection Limit										

Maxxam ID		RR1071	RR1072	RR1073	RR1074	RR1075	RR1076	RR1077		
Sampling Date		2017/05/31 14:31	2017/05/31 16:10	2017/05/30 19:07	2017/05/30 09:56	2017/05/30 11:09	2017/05/31 12:46			
	UNITS	17	18	19	22	23	24	25	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.40	0.16		0.14		0.23	MISSING	0.02	8721214
Calculated NO2	ppb	1.3	0.5	0.2	0.3	<0.1	1.7		0.1	8721536
Calculated O3	ppb	31.6	20.9	28.2	27.7	21.8	26.5		0.1	8721614
Calculated SO2	ppb	0.4	0.2	0.2	0.2	0.2	0.3	MISSING	0.1	8720692
RDL = Reportable Detection Limit										

Maxxam ID		RR1078	RR1079		RR1080	RR1081		RR1082		
Sampling Date		2017/05/30 12:57	2017/05/30 12:27		2017/05/30 19:25	2017/05/30 10:04		2017/05/30 17:55		
	UNITS	26	27	QC Batch	28	29	QC Batch	32	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	MISSING	0.41	8721214		0.16	8721214	0.18	0.02	8721216
Calculated NO2	ppb			8721536	1.0	0.5	8721536	0.1	0.1	8721536
Calculated O3	ppb			8721614	25.9	25.6	8721618	27.5	0.1	8721618
Calculated SO2	ppb	MISSING	0.8	8720692	0.4	0.2	8720699	0.3	0.1	8720699
RDL = Reportable Detection Limit										

Maxxam Job #: B765767
Report Date: 2017/08/11

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2017/05/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		RR1083	RR1086	RR1087	RR1088	RR1089	RR1090	RR1091		
Sampling Date		2017/05/31 09:20	2017/05/30	2017/05/30 13:35	2017/05/31 12:46	2017/05/30 12:57	2017/05/30 12:27	2017/05/30 10:04		
	UNITS	38	11 DUP	13 DUP	24 DUP	26 DUP	27 DUP	29 DUP	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.71						0.16	0.02	8721216
Calculated NO2	ppb	0.6	MISSING	0.3					0.1	8721536
Calculated O3	ppb	35.4	MISSING	26.5					0.1	8721618
Calculated SO2	ppb	0.5			0.4	MISSING	0.8		0.1	8720699

RDL = Reportable Detection Limit

Maxxam ID		RR1092		
Sampling Date		2017/05/30 17:55		
	UNITS	32 DUP	RDL	QC Batch

Passive Monitoring				
Calculated H2S	ppb	0.18	0.02	8721216

RDL = Reportable Detection Limit

Maxxam Job #: B765767
Report Date: 2017/08/11

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2017/05/30
Site Location: LICA
Sampler Initials: AY

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B765767
Report Date: 2017/08/11

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2017/05/30
Site Location: LICA
Sampler Initials: AY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8720692	OZ	Spiked Blank	Calculated SO2	2017/08/09		96	%	90 - 110
8720692	OZ	Method Blank	Calculated SO2	2017/08/09	<0.1		ppb	
8720699	OZ	Spiked Blank	Calculated SO2	2017/08/09		97	%	90 - 110
8720699	OZ	Method Blank	Calculated SO2	2017/08/09	<0.1		ppb	
8721214	LCH	Spiked Blank	Calculated H2S	2017/08/09		101	%	90 - 110
8721216	LCH	Spiked Blank	Calculated H2S	2017/08/09		101	%	90 - 110
8721531	SS6	Spiked Blank	Calculated NO2	2017/08/10		98	%	90 - 110
8721531	SS6	Method Blank	Calculated NO2	2017/08/10	<0.1		ppb	
8721536	SS6	Spiked Blank	Calculated NO2	2017/08/10		108	%	90 - 110
8721536	SS6	Method Blank	Calculated NO2	2017/08/10	<0.1		ppb	
8721614	SS6	Spiked Blank	Calculated O3	2017/08/10		99	%	90 - 110
8721614	SS6	Method Blank	Calculated O3	2017/08/10	<0.1		ppb	
8721618	SS6	Spiked Blank	Calculated O3	2017/08/10		100	%	90 - 110
8721618	SS6	Method Blank	Calculated O3	2017/08/10	<0.1		ppb	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam Job #: B765767
Report Date: 2017/08/11

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2017/05/30
Site Location: LICA
Sampler Initials: AY

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 06, 2017	11036	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070098-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070098-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jul-17
17070098-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	20-Jul-17
17070098-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jul-17
17070098-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jul-17
17070098-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	20-Jul-17
17070098-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070098-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	1-Butene		0.07	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	20-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 06, 2017	11036	Ambient Air	06-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070098-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	2-Methylpentane		0.07	ppbv	0.01	AC-058	20-Jul-17
17070098-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Acetone		5.5	ppbv	0.4	AC-058	20-Jul-17
17070098-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070098-001	Benzene		0.05	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Chloroform	I	0.03	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Chloromethane		0.51	ppbv	0.02	AC-058	20-Jul-17
17070098-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070098-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Cyclohexane		0.04	ppbv	0.02	AC-058	20-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 06, 2017	11036	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070098-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Ethanol		2.8	ppbv	0.3	AC-058	20-Jul-17
17070098-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Freon-11		0.31	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Freon-113	I	0.10	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Freon-114	I	0.02	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Freon-12		0.64	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jul-17
17070098-001	Isobutane		0.38	ppbv	0.02	AC-058	20-Jul-17
17070098-001	Isopentane		0.34	ppbv	0.03	AC-058	20-Jul-17
17070098-001	Isoprene		0.92	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070098-001	m,p-Xylene		0.04	ppbv	0.03	AC-058	20-Jul-17
17070098-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070098-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jul-17
17070098-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jul-17
17070098-001	Methyl ethyl ketone		0.3	ppbv	0.3	AC-058	20-Jul-17
17070098-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070098-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jul-17
17070098-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jul-17
17070098-001	Methylcyclohexane		0.06	ppbv	0.01	AC-058	20-Jul-17
17070098-001	Methylcyclopentane		0.07	ppbv	0.02	AC-058	20-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 06, 2017	11036	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070098-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	20-Jul-17
17070098-001	n-Butane		0.40 ppbv	0.03	AC-058	20-Jul-17
17070098-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	20-Jul-17
17070098-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070098-001	n-Heptane		0.04 ppbv	0.01	AC-058	20-Jul-17
17070098-001	n-Hexane		0.06 ppbv	0.01	AC-058	20-Jul-17
17070098-001	n-Octane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070098-001	n-Pentane		0.2 ppbv	0.1	AC-058	20-Jul-17
17070098-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	20-Jul-17
17070098-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	20-Jul-17
17070098-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	20-Jul-17
17070098-001	n-Nonane		0.02 ppbv	0.01	AC-058	20-Jul-17
17070098-001	o-Ethyltoluene	I	0.01 ppbv	0.01	AC-058	20-Jul-17
17070098-001	o-Xylene		0.01 ppbv	0.01	AC-058	20-Jul-17
17070098-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070098-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	20-Jul-17
17070098-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070098-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070098-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070098-001	Toluene		0.09 ppbv	0.01	AC-058	20-Jul-17
17070098-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	20-Jul-17
17070098-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070098-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	20-Jul-17
17070098-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070098-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 06, 2017	11036	Ambient Air	06-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070098-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070098-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 12, 2017	H3298	Ambient Air	12-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070167-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	21-Jul-17
17070167-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	21-Jul-17
17070167-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	21-Jul-17
17070167-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	21-Jul-17
17070167-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070167-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	1-Butene		0.20	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2,3-Dimethylbutane		0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 12, 2017	H3298	Ambient Air	12-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070167-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	21-Jul-17
17070167-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Acetone		10.7	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070167-001	Benzene		0.03	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Carbon disulfide	I	0.11	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Chloroform	I	0.03	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Chloromethane		0.52	ppbv	0.02	AC-058	21-Jul-17
17070167-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 12, 2017	H3298	Ambient Air	12-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070167-001	Cyclopentane		0.02	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Ethanol		2.0	ppbv	0.3	AC-058	21-Jul-17
17070167-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Freon-11	I	0.26	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Freon-113	I	0.08	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Freon-12		0.56	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	21-Jul-17
17070167-001	Isobutane		0.37	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Isopentane		0.27	ppbv	0.03	AC-058	21-Jul-17
17070167-001	Isoprene		0.68	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	21-Jul-17
17070167-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	21-Jul-17
17070167-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	21-Jul-17
17070167-001	Methyl ethyl ketone		0.5	ppbv	0.3	AC-058	21-Jul-17
17070167-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	21-Jul-17
17070167-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	21-Jul-17
17070167-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	21-Jul-17
17070167-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	21-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 12, 2017	H3298	Ambient Air	12-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070167-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070167-001	n-Butane		0.22	ppbv	0.03	AC-058	21-Jul-17
17070167-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	21-Jul-17
17070167-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	n-Heptane		0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	n-Hexane		0.03	ppbv	0.01	AC-058	21-Jul-17
17070167-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	n-Pentane		0.1	ppbv	0.1	AC-058	21-Jul-17
17070167-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	21-Jul-17
17070167-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	21-Jul-17
17070167-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	21-Jul-17
17070167-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	21-Jul-17
17070167-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070167-001	Toluene		0.05	ppbv	0.01	AC-058	21-Jul-17
17070167-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070167-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070167-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070167-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17

Report certified by:	Colleen McGerrigle, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	August-09-17	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 12, 2017	H3298	Ambient Air	12-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070167-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	21-Jul-17
17070167-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	21-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 18, 2017	H3303	Ambient Air	18-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070222-001	1,1,1-Trichloroethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,1,2,2-Tetrachloroethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,1,2-Trichloroethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,1-Dichloroethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,1-Dichloroethylene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	1,2,3-Trimethylbenzene	Q	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070222-001	1,2,4-Trichlorobenzene	Q	< 0.8	ppbv	0.8	AC-058	02-Aug-17
17070222-001	1,2,4-Trimethylbenzene	Q	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070222-001	1,2-Dibromoethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,2-Dichlorobenzene	Q	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070222-001	1,2-Dichloroethane	Q	0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	1,2-Dichloropropane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	1,3,5-Trimethylbenzene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,3-Butadiene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1,3-Dichlorobenzene	Q	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070222-001	1,4-Dichlorobenzene	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	1,4-Dioxane	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	1-Butene		0.10	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1-Hexene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	1-Pentene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2,2,4-Trimethylpentane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2,2-Dimethylbutane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2,3,4-Trimethylpentane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2,3-Dimethylbutane	Q	0.05	ppbv	0.02	AC-058	02-Aug-17
17070222-001	2,3-Dimethylpentane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	Tuesday, August 22, 2017	Inquiries:	(780) 632 8455	E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 18, 2017	H3303	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070222-001	2,4-Dimethylpentane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2-Methylheptane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2-Methylhexane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	2-Methylpentane	Q	0.03	ppbv	0.01	AC-058	02-Aug-17
17070222-001	3-Methylheptane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	3-Methylhexane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	3-Methylpentane	Q	0.02	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Acetone	Q	2.3	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Acrolein	Q	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070222-001	Benzene	Q	0.04	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Benzyl chloride	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Bromodichloromethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Bromoform	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Bromomethane	Q	0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Carbon disulfide	Q	1.09	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Carbon tetrachloride	Q	0.10	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Chlorobenzene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Chloroethane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Chloroform	Q	0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Chloromethane	Q	0.43	ppbv	0.02	AC-058	02-Aug-17
17070222-001	cis-1,2-Dichloroethene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	cis-1,3-Dichloropropene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	cis-2-Butene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	cis-2-Pentene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Cyclohexane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 18, 2017	H3303	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070222-001	Cyclopentane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Dibromochloromethane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Ethanol	Q	1.3	ppbv	0.3	AC-058	02-Aug-17
17070222-001	Ethyl acetate	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Ethylbenzene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Freon-11	Q	0.32	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Freon-113	Q	0.10	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Freon-114	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Freon-12	Q	0.65	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Hexachloro-1,3-butadiene	Q	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070222-001	Isobutane	Q	0.06	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Isopentane	Q	0.16	ppbv	0.03	AC-058	02-Aug-17
17070222-001	Isoprene	Q	0.02	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Isopropyl alcohol	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Isopropylbenzene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	m,p-Xylene	Q	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070222-001	m-Diethylbenzene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	m-Ethyltoluene	Q	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070222-001	Methyl butyl ketone	Q	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070222-001	Methyl ethyl ketone	Q	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070222-001	Methyl isobutyl ketone	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Methyl methacrylate	Q	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070222-001	Methyl tert butyl ether	Q	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070222-001	Methylcyclohexane	Q	0.07	ppbv	0.01	AC-058	02-Aug-17
17070222-001	Methylcyclopentane	Q	0.06	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 18, 2017	H3303	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070222-001	Methylene chloride	Q	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070222-001	n-Butane	Q	0.07	ppbv	0.03	AC-058	02-Aug-17
17070222-001	n-Decane	Q	< 0.06	ppbv	0.06	AC-058	02-Aug-17
17070222-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	n-Heptane	Q	0.02	ppbv	0.01	AC-058	02-Aug-17
17070222-001	n-Hexane	Q	0.04	ppbv	0.01	AC-058	02-Aug-17
17070222-001	n-Octane	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	n-Pentane	Q	< 0.1	ppbv	0.1	AC-058	02-Aug-17
17070222-001	n-Propylbenzene	Q	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070222-001	n-Undecane	Q	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070222-001	Naphthalene	Q	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070222-001	n-Nonane	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	o-Ethyltoluene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	o-Xylene	Q	0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	p-Diethylbenzene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	p-Ethyltoluene	Q	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070222-001	Styrene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	Tetrachloroethylene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	Tetrahydrofuran	Q	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070222-001	Toluene	Q	0.06	ppbv	0.01	AC-058	02-Aug-17
17070222-001	trans-1,2-Dichloroethylene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	trans-1,3-Dichloropropylene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070222-001	trans-2-Butene	Q	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070222-001	trans-2-Pentene	Q	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070222-001	Trichloroethylene	Q	< 0.04	ppbv	0.04	AC-058	02-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 18, 2017	H3303	Ambient Air	18-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070222-001	Vinyl acetate	Q	< 0.4 ppbv	0.4	AC-058	02-Aug-17
17070222-001	Vinyl chloride	Q	< 0.02 ppbv	0.02	AC-058	02-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/July 24, 2017	2477	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070338-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070338-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Aug-17
17070338-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070338-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070338-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070338-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	1-Butene		0.12	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	August-23-17	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 24, 2017	2477	Ambient Air	24-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070338-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070338-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	3-Methylpentane		0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Acetone		3.3	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070338-001	Benzene		0.03	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Carbon disulfide		0.73	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Chloroform	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Chloromethane		0.55	ppbv	0.02	AC-058	02-Aug-17
17070338-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
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		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 24, 2017	2477	Ambient Air	24-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070338-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Ethanol		1.6	ppbv	0.3	AC-058	02-Aug-17
17070338-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Freon-11	I	0.29	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Freon-113	I	0.09	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Freon-114	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Freon-12		0.64	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070338-001	Isobutane		0.20	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Isopentane		0.26	ppbv	0.03	AC-058	02-Aug-17
17070338-001	Isoprene		0.34	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Isopropyl alcohol		0.5	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070338-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070338-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070338-001	Methyl ethyl ketone		0.3	ppbv	0.3	AC-058	02-Aug-17
17070338-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070338-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070338-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070338-001	Methylcyclopentane		0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	August-23-17	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 24, 2017	2477	Ambient Air	24-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070338-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070338-001	n-Butane		0.08	ppbv	0.03	AC-058	02-Aug-17
17070338-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Aug-17
17070338-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	n-Heptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	n-Hexane		0.06	ppbv	0.01	AC-058	02-Aug-17
17070338-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	n-Pentane		0.1	ppbv	0.1	AC-058	02-Aug-17
17070338-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070338-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070338-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070338-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	o-Xylene		0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070338-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070338-001	Toluene		0.04	ppbv	0.01	AC-058	02-Aug-17
17070338-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070338-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070338-001	trans-2-Butene		0.03	ppbv	0.01	AC-058	02-Aug-17
17070338-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070338-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-23-17

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 24, 2017	2477	Ambient Air	24-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070338-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Aug-17
17070338-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-23-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 30, 2017	1138	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080052-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Aug-17
17080052-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080052-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Aug-17
17080052-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080052-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	1-Butene		0.06	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	1-Pentene		0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	16-Aug-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Monday, August 21, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 30, 2017	1138	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-001	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	16-Aug-17
17080052-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Acetone		6.5	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080052-001	Benzene		0.08	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Carbon disulfide		1.83	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Chloroform	I	0.03	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Chloromethane		0.43	ppbv	0.02	AC-058	16-Aug-17
17080052-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Monday, August 21, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 30, 2017	1138	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-001	Cyclopentane		0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Ethanol		1.5	ppbv	0.3	AC-058	16-Aug-17
17080052-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Freon-11		0.32	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Freon-113	I	0.09	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Freon-114	I	0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Freon-12		0.63	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Aug-17
17080052-001	Isobutane		0.19	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Isopentane		0.21	ppbv	0.03	AC-058	16-Aug-17
17080052-001	Isoprene		1.44	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	m,p-Xylene		0.06	ppbv	0.03	AC-058	16-Aug-17
17080052-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Aug-17
17080052-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Aug-17
17080052-001	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	16-Aug-17
17080052-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Aug-17
17080052-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Aug-17
17080052-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	16-Aug-17
17080052-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	16-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Monday, August 21, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 30, 2017	1138	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080052-001	n-Butane		0.30	ppbv	0.03	AC-058	16-Aug-17
17080052-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Aug-17
17080052-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	n-Heptane		0.04	ppbv	0.01	AC-058	16-Aug-17
17080052-001	n-Hexane		0.05	ppbv	0.01	AC-058	16-Aug-17
17080052-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	n-Pentane		0.1	ppbv	0.1	AC-058	16-Aug-17
17080052-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080052-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Aug-17
17080052-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Aug-17
17080052-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	o-Xylene		0.03	ppbv	0.01	AC-058	16-Aug-17
17080052-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Aug-17
17080052-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080052-001	Toluene		0.12	ppbv	0.01	AC-058	16-Aug-17
17080052-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080052-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080052-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080052-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Monday, August 21, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca



PO Bag 4000
 Vegreville, Alberta
 Canada T9C 1T4
 (780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/July 30, 2017	1138	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17080052-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Aug-17
17080052-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Monday, August 21, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

PAHS SAMPLES

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID Matrix Priority LICA/PUF/CLS/July 06, 2017 TE-07 Air Filter Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 06-Jul-17 0:00 DATE RECEIVED: 13-Jul-17</p> <p>REPORT CREATED: 09-Aug-17 REPORT NUMBER: 17070098</p> <p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070098-002	1-Methylnaphthalene		1.34	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	2-Methylnaphthalene		1.97	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Acenaphthene		0.21	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Acenaphthylene		0.05	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Anthracene		0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(a)anthracene		0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Chrysene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Dibenzo(a,i)pyrene		0.02	ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/July 06, 2017	TE-07	Air Filter	06-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070098	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070098-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Fluoranthene		0.04 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Fluorene		0.09 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Naphthalene		0.07 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Phenanthrene		0.26 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Pyrene		0.04 ug/PUF	0.01	NA-017	27-Jul-17
17070098-002	Retene		0.03 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID</p> <p>LICA/PUF/CLS/July 12, 2017 TE-06</p>	<p>Matrix</p> <p>Air Filter</p>	<p>Priority</p> <p>Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 12-Jul-17 0:00 DATE RECEIVED: 19-Jul-17</p> <p>REPORT CREATED: 09-Aug-17 REPORT NUMBER: 17070167</p> <p>VERSION: Version 01</p>		

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070167-002	1-Methylnaphthalene		0.02 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	2-Methylnaphthalene		0.05 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Acenaphthene		0.23 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Acenaphthylene		0.05 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Anthracene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(a)anthracene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(b,j,k)fluoranthene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Chrysene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Dibenzo(a,i)pyrene		0.02 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Dibenzo(a,l)pyrene		0.01 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/July 12, 2017	TE-06	Air Filter	12-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070167	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070167-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Fluoranthene		0.03 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Fluorene		0.03 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Naphthalene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Phenanthrene		0.17 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Pyrene		0.03 ug/PUF	0.01	NA-017	27-Jul-17
17070167-002	Retene		0.03 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID Matrix Priority LICA/PUF/CLS/July 18, 2017 TE-01 Air Filter Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 18-Jul-17 0:00 DATE RECEIVED: 24-Jul-17</p> <p>REPORT CREATED: 22-Aug-17 REPORT NUMBER: 17070222</p> <p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070222-002	1-Methylnaphthalene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	2-Methylnaphthalene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Acenaphthene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Benzo(ghi)perylene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Chrysene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/July 18, 2017	TE-01	Air Filter	18-Jul-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17070222	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070222-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Fluoranthene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Fluorene		0.04 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Naphthalene		0.02 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Phenanthrene		0.11 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Pyrene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070222-002	Retene		0.04 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS: Cheri Sinclair Lakeland Industry and Community Assn	403-819-9139	CLIENT SAMPLE ID LICA/PUF/CLS/July 24, 2017	CANISTER ID A13-02	Matrix Air Filter	Priority Normal
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB	780 812 2182 T9N 2J5	DESCRIPTION: Cold Lake South	DATE SAMPLED: 24-Jul-17 0:00	DATE RECEIVED: 31-Jul-17	REPORT NUMBER: 17070338 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070338-002	1-Methylnaphthalene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	2-Methylnaphthalene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Acenaphthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Acenaphthylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(c)phenanthrene		0.05 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Chrysene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-23-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/July 24, 2017	A13-02	Air Filter	24-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17070338	REPORT CREATED:	23-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070338-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Fluoranthene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Fluorene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Naphthalene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Phenanthrene		0.12	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Pyrene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070338-002	Retene		0.01	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-23-17

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn	CLIENT SAMPLE ID LICA/PUF/CLS/July 30, 2017	CANISTER ID TE-08	Matrix Air Filter	Priority Normal
DESCRIPTION: Cold Lake South				
INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 30-Jul-17 0:00	DATE RECEIVED: 04-Aug-17	REPORT NUMBER: 17080052 VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-002	1-Methylnaphthalene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	2-Methylnaphthalene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Acenaphthene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Anthracene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Chrysene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Monday, August 21, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/July 30, 2017	TE-08	Air Filter	30-Jul-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17080052	REPORT CREATED:	21-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080052-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Fluoranthene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Fluorene		0.06	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Naphthalene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Phenanthrene		0.38	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Pyrene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080052-002	Retene		0.05	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	Monday, August 21, 2017	Inquiries:	(780) 632 8455	E-mail: EAS.Results@innotechalberta.ca

PARTISOL SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6194556</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 06-Jul-17 0:00</p> <p>REPORT CREATED: 24-Jul-17</p> <p>DATE RECEIVED: 13-Jul-17</p> <p>REPORT NUMBER: 17070096</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070096-001	Particulate Weight		0.063 mg	0.004	AC-029	18-Jul-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Monday, July 24, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID LICA Filter # P6129433</p>	<p>CANISTER ID</p>	<p>Matrix Air Filter</p>	<p>Priority Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 12-Jul-17 0:00 DATE RECEIVED: 19-Jul-17</p> <p>REPORT CREATED: 08-Sep-17 REPORT NUMBER: 17070169</p> <p>VERSION: Version 01</p>			

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070169-001	Particulate Weight		0.096 mg	0.004	AC-029	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: September-08-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID P6130081</p>	<p>CANISTER ID</p>	<p>Matrix Air Filter</p>	<p>Priority Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Cold Lake South</p>		<p>DATE SAMPLED: 18-Jul-17 0:00</p>	<p>DATE RECEIVED: 24-Jul-17</p>
	<p>REPORT CREATED: 17-Aug-17</p>		<p>REPORT NUMBER: 17070223</p>	<p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070223-001	Particulate Weight		0.018	mg	0.004	AC-029	01-Aug-17

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: August-17-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID Filter # P6130097</p>	<p>CANISTER ID</p>	<p>Matrix Air Filter</p>	<p>Priority Normal</p>
<p>DESCRIPTION: Cold Lake South</p>				
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DATE SAMPLED: 24-Jul-17 0:00</p>	<p>DATE RECEIVED: 31-Jul-17</p>		
		<p>REPORT CREATED: 15-Aug-17</p>	<p>REPORT NUMBER: 17070337</p>	
		<p>VERSION: Version 01</p>		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070337-001	Particulate Weight		0.045	mg	0.004	AC-029	08-Aug-17

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, August 15, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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 Canada T9C 1T4
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn	CLIENT SAMPLE ID P6194553	CANISTER ID	Matrix Air Filter	Priority Normal
INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DESCRIPTION: Cold Lake South		DATE RECEIVED: 04-Aug-17	REPORT NUMBER: 17080053
	DATE SAMPLED: 30-Jul-17 0:00		VERSION: Version 01	
	REPORT CREATED: 17-Aug-17			

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17080053-001	Particulate Weight		0.228 mg	0.004	AC-029	08-Aug-17

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: August-17-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

APPENDIX V
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
September 25, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-07-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification Maram Ghaleb Date August 24, 2017

Level 1 Primary Validation Maram Ghaleb Date August 24, 2017

Level 2 Final Validation Maram Ghaleb Date September 11, 2017

Level 3 Independent Data Review CSA-Lombard Date September 20, 2017

Post-Final Validation NA Date NA

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



Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

September 28, 2017

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of July 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), 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 August 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 H₂S.

The H₂S analyzer did not meet the AMD's calibration response time requirement on July 10. The analyzer was replaced on July 13 after several troubleshooting and maintenance attempts. Data was discarded back to the last valid calibration, which was on July 6. 163 hours of downtime were incurred due to this event. AEP reference number: 329492.

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
Technical Program Managers
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



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

JOB #: 2833-2017-07-30-C

July 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 St.
Bonnyville, Alberta
T9N 2J7

Attention: MIKE BISAGA

DATE: **September 25, 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 July 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

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

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems, with the exception of H₂S, were above the 90% requirement.

H₂S: 168 hours of downtime were recorded this month.

- Four hours were attributed to additional quality checks performed to address a biased low span response.
- The scheduled daily zero/span did not execute properly on July 1. One hour of downtime was incurred.
- The analyzer did not meet the AMD's calibration response time requirement on July 10. The analyzer was replaced on July 13 after several troubleshooting and maintenance attempts. Data was discarded back to the last valid calibration, which was on July 6. 163 hours of downtime were incurred due to this event. The 90% operational time requirement was not met. AEP reference number: 329492.

THC: Forty-three hours of downtime were recorded due a sample pump failure and an analyzer replacement event that was performed to address it.

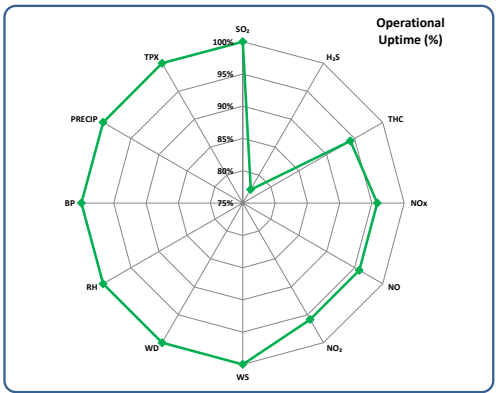
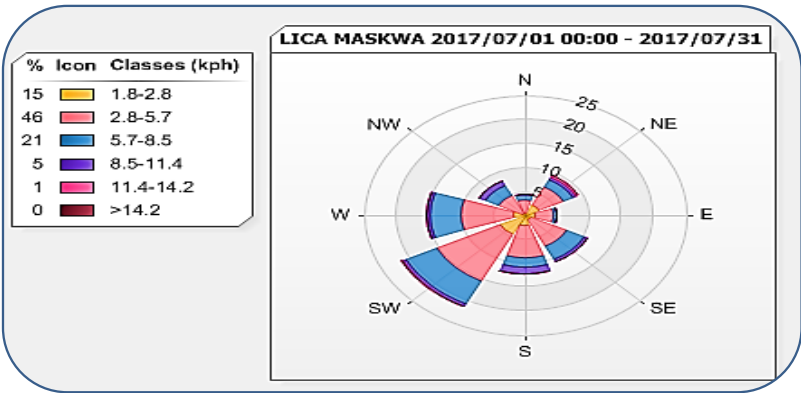
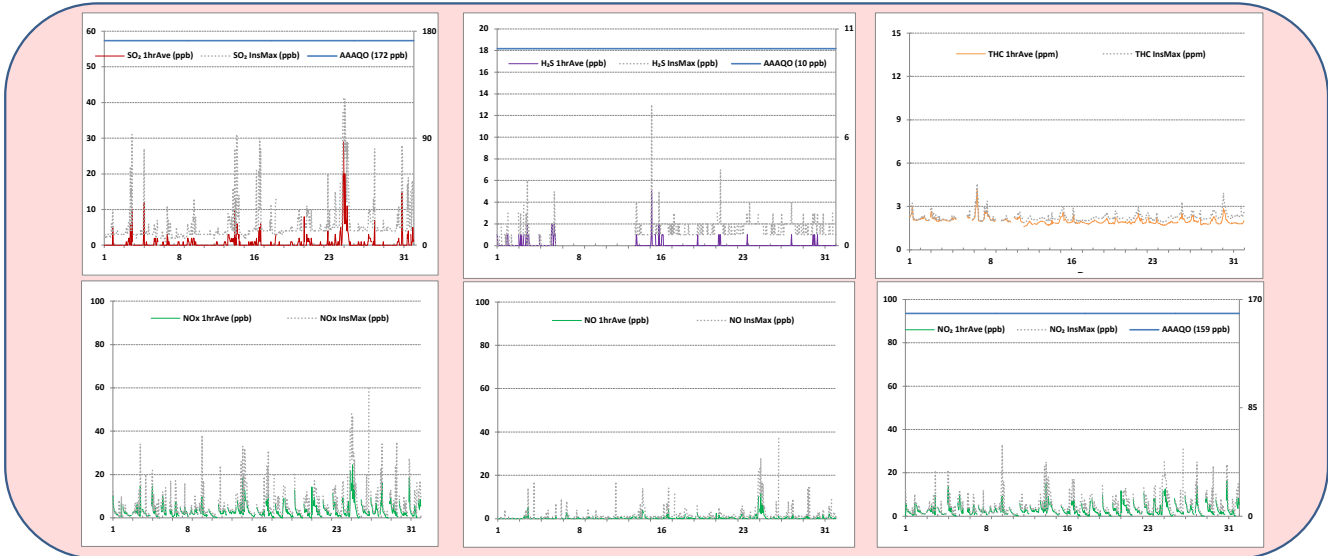
NOX/NO/NO₂: The analyzer was recording elevated readings in the hour following the zero/span cycle. These data were invalidated as they were not representative of ambient concentrations. Thirty-one hours of downtime were therefore incurred this month.

The summary of results is presented on the following pages.

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

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3678 or toll-free at 1-800-386-7247.

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	1	100.0%	29	July 24	23	172	0	4	July 25	48	0
H ₂ S	ppb	0	77.4%	5	July 15	3	10	0	1	July 6	3	0
THC	ppm	2.00	94.2%	4.12	July 7	6	-	-	2.44	July 7	-	-
NO _x	ppb	3	95.8%	24	July 25	2	-	-	7	July 25	-	-
NO	ppb	0	95.8%	12	July 25	25	-	-	2	July 25	-	-
NO ₂	ppb	3	95.8%	16	July 30	19	159	0	4	July 25	-	-
WS	kph	1.3	100.0%	14.1	July 16	7	-	-	5.7	July 4	-	-
WD	degree	225 (SW)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	71	100.0%	94	July 1	0	-	-	88	July 24	-	-
BP	mbar	943	100.0%	953	July 31	23	-	-	951	July 31	-	-
PRECIP	mm	0.2	100.0%	22.9	July 9	23	-	-	1.1	July 21	-	-
AmbTPX	°C	18.1	100.0%	29.8	July 13	15	-	-	21.4	July 15	-	-



Monthly Update

- All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%, with the exception of H₂S.

Operational Issues

- H₂S:** 168 hours of downtime were recorded this month.
- Four hours were attributed to additional quality checks performed to address a biased low span response.
- The analyzer did not meet the AMD's calibration response time requirement on July 10. The analyzer was replaced on July 13 after several troubleshooting and maintenance attempts. Data was discarded back to the last valid calibration, which was on July 6. 164 hours of downtime were incurred due to this event. The 90% operational time requirement was not met. AEP reference number: 329492.
- THC:** Forty-three hours of downtime were recorded due to a sample pump failure and an analyzer replacement event that was performed to address it.
- NOX/NO/NO₂:** 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. Thirty-one hours of downtime were therefore incurred this month.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	1	29	24	23	6.7	NW	4	25	100.0
H ₂ S (ppb)	10	3	0	0	0	5	15	3	0.9	NE	1	6	77.4
THC (ppm)	-	-	-	-	2.00	4.12	7	6	0.8	N	2.44	7	94.2
NO ₂ (ppb)	159	-	0	-	3	16	30	19	4.0	WNW	4	25	95.8
NO (ppb)	-	-	-	-	0	12	25	25	5.4	NW	2	25	95.8
NO _x (ppb)	-	-	-	-	3	24	25	2	5.4	NW	7	25	95.8
RELATIVE HUMIDITY (%)	-	-	-	-	71	94	1	0	1.1	S	88	24	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	943	953	31	23	1.1	NNW	951	31	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	18.1	29.8	13	15	6.3	ESE	21.4	15	100.0
PRECIPITATION (mm)	-	-	-	-	0.2	22.9	9	23	4.1	W	1.1	21	100.0
VECTOR WS (kph)	-	-	-	-	1.3	14.1	16	7	-	NNE	5.7	4	100.0
VECTOR WD (sec)	-	-	-	-	225 (SW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

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

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 July 6.
- Ten instances of maximum instantaneous data were discarded due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 77.4%, equivalent to 168 hours of downtime.
- The analyzer spanned towards the lower limit on June 30. On July 1, at hour 07:00, a repeat zero/span check was triggered and the response was still poor. This prompted an immediate site visit on July 1, where a successful as-found response check was completed and the permeation tube was replaced. Four hours of downtime were recorded due to the additional quality checks. The newly-installed permeation tube was allowed time to stabilize prior to updating the expected value.
- The scheduled daily zero/span check failed to execute properly on July 1, at hour 22:00. However, the as-found response was completed prior, so a valid daily span was already obtained. One hour of downtime was incurred.
- Between July 2 and July 3 the span response was still unstable. On July 4 and July 5 the span response appeared to have stabilized. The monthly calibration was scheduled for July 6, at which time the new expected value would be set.
- The monthly calibration was initiated on July 6, but the technician noted the analyzer response was slow during concentration changes. The technician identified that the analyzer's SO₂ scrubber material required renewal and switched his process to a shut down calibration. Following a successful shut-down calibration, the manifold was cleaned and the scrubber beads were replenished. A post-repair calibration was successfully completed afterwards and the expected value was then updated.
- The analyzer spanned below the lower acceptance limit on July 8 as the expected span value appeared to have been prematurely set and was no longer stable following the renewal of the SO₂ scrubber material. The span response was beyond the lower acceptance limit again on July 9, prompting the need for a repeat calibration.
- Calibrations were attempted on July 10 and July 11, but both failed due to slow analyzer response. Various troubleshooting activities were performed which included leak checks, a new pump installation to increase flow and the rebuild of the SO₂ scrubber unit. A subsequent attempt at a post-repair calibration was unsuccessful. The malfunctioning analyzer [API 101A S/N: 324] was removed and a replacement [API 101E S/N: 722] was installed on July 12. The analyzer was allowed time to stabilize overnight and a successful installation calibration was performed on July 13, following an output voltage calibration. The expected span value was updated on July 15. Data was invalidated back to the last valid calibration on July 6. A total of 163 hours of downtime were recorded due to this event.
- Nine instances of maximum instantaneous data were discarded due to brief power outages.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 94.2%, equivalent to forty-three hours of downtime.
- The sample pump seized on July 5 and was restarted manually during the site visit on July 6. Twenty-four hours of data were invalidated due to the pump malfunction.
- The routine monthly calibration was performed on July 6.
- The pump failed again on July 8 and was restarted on July 9. Another thirteen hours of data were invalidated due to the pump malfunction.
- Following a successful shut-down calibration on July 10, the resident analyzer [s/n: 436609738] was removed for maintenance and an installation calibration was performed on the replacement analyzer [s/n: 436609739]. Six hours of downtime were incurred due to the additional calibrations.
- Ten instances of maximum instantaneous data were discarded due to brief power outages.

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

- Operational time, for the monitoring period was 95.8% equivalent to thirty-one hours of downtime.
- The routine monthly calibration was performed on July 6.
- It was observed that 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. Arrangements will be made to temporarily replace the resident analyzer with a Maxxam supplied analyzer, upon assessment of available Maxxam inventory. The resident analyzer will be sent to the manufacturer for repairs and re-installed once it is returned. This issue resulted in thirty-one hours of downtime.
- Ten instances of maximum instantaneous data were discarded due to brief power outages.

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

- Operational time, for the monitoring period, was 100%.
- Ten instances of maximum instantaneous data were discarded due to brief power outages.
- One instance of maximum instantaneous data was invalidated on July 16 at hour 11:00, due to an anomalous spike. Review of the minute data, bracketing the spike, did not support the validity of the elevated measurement.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from

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 H₂S, 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-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101A UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
- Wind System - 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

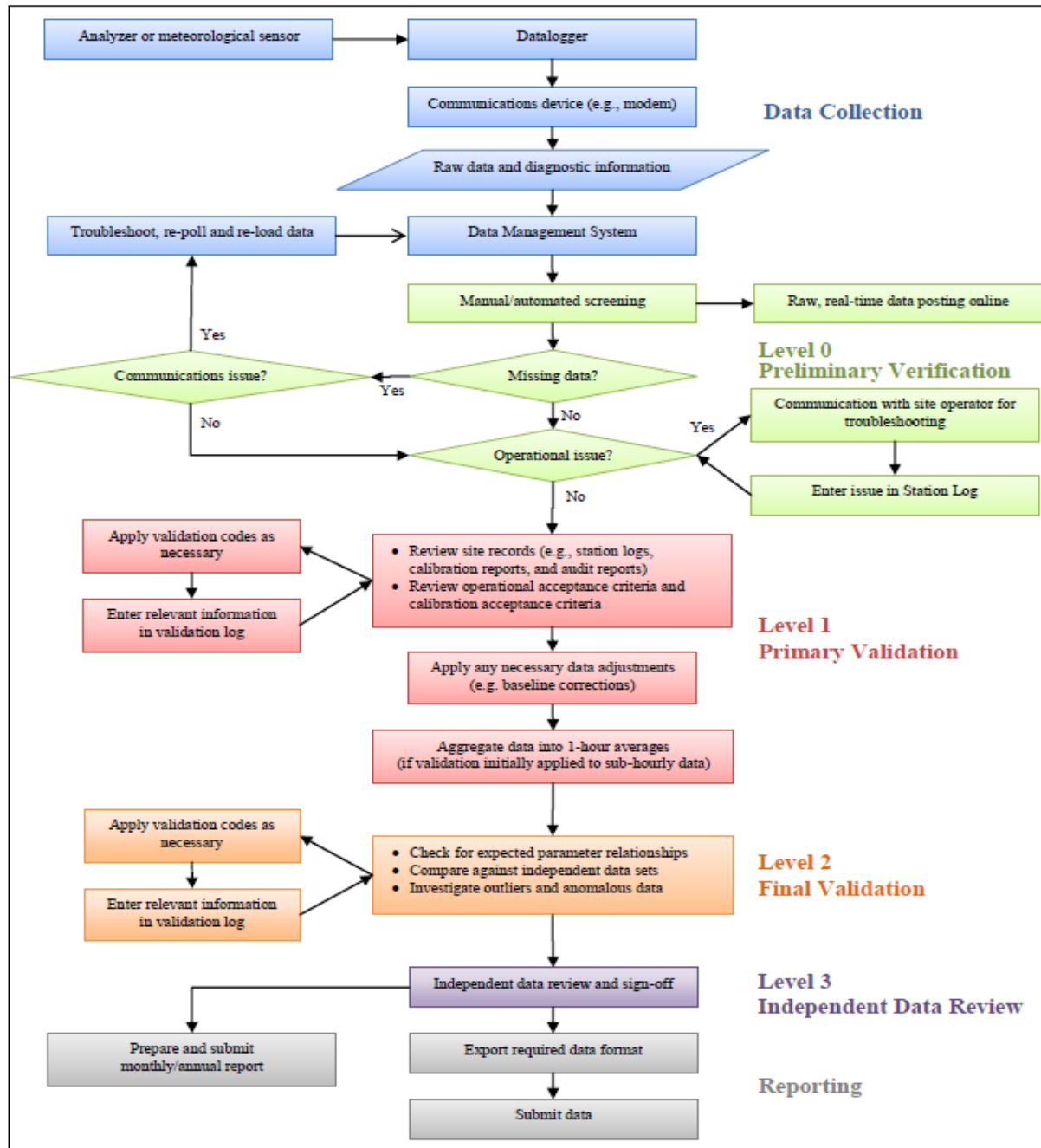
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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

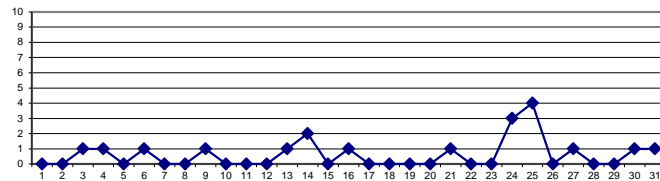
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

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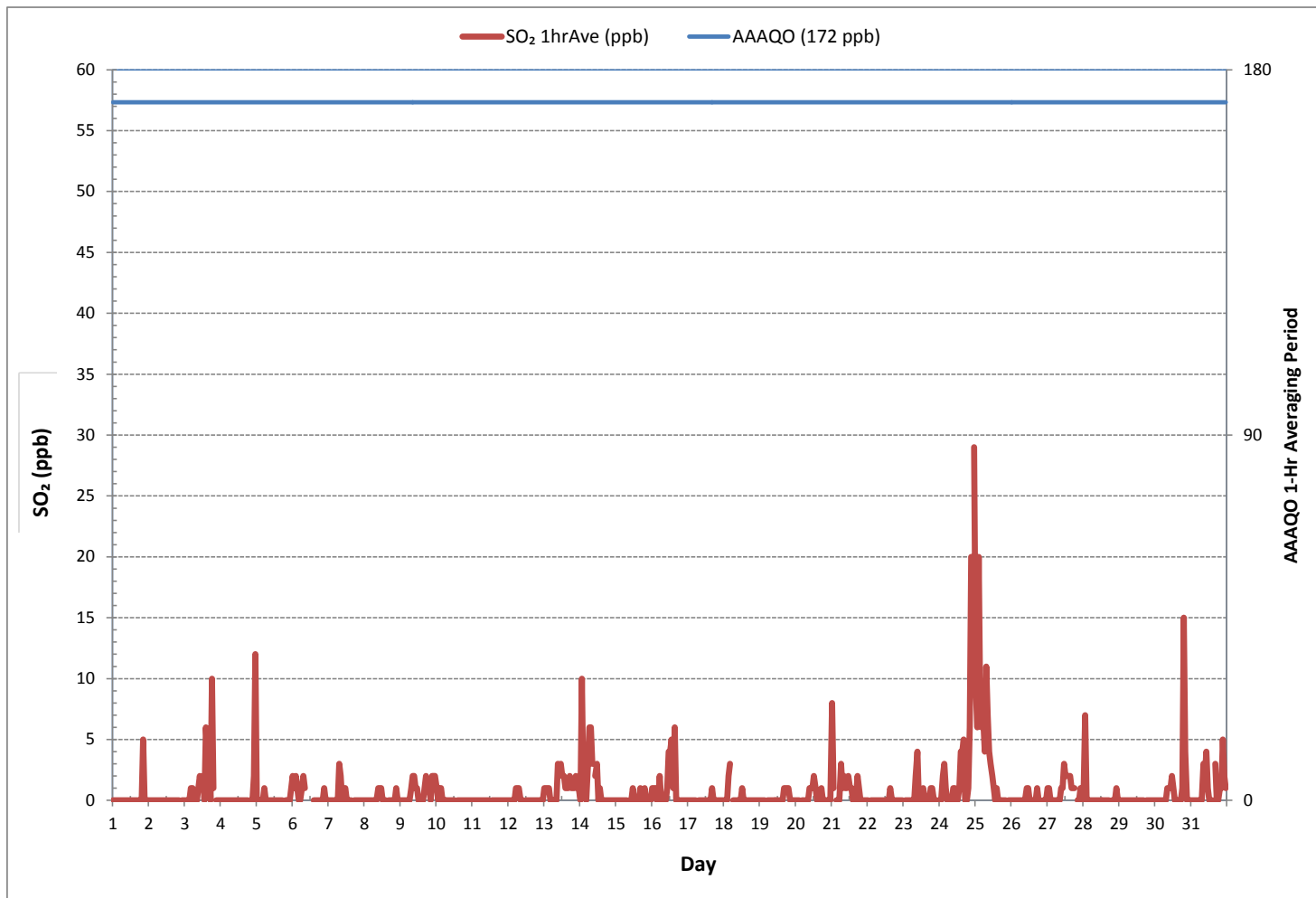
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	187
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	29 ppb @ HOUR 23 ON DAY 24
MAXIMUM 24-HR AVERAGE:	4 ppb ON DAY 25
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2
MONTHLY AVERAGE:	1 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - July 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	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2	3	3	2	2	2	3	3	3	3	3	3	3	3	2	3	3	6	3	7	10	4	S	3	2	10	3	24	
2	3	3	3	3	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	4	3	24	
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24	5	5	13	15	11	5	5	5	5	5	5	5	5	6	14	18	P	5	6	7	29	38	S	41	5	41	12	23	
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26	4	4	4	4	4	4	4	4	4	4	6	6	4	4	5	5	P	5	5	P	S	4	5	5	4	6	4	22	
27	5	5	5	4	4	4	4	4	5	P	6	10	9	9	10	7	6	6	P	S	5	5	13	13	4	13	7	22	
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30	4	4	4	4	4	4	6	5	9	8	6	11	5	5	5	5	S	5	17	28	25	5	4	4	4	28	8	24	
31	4	4	4	4	4	4	4	4	17	10	19	8	5	5	12	S	15	4	5	18	18	16	9	6	4	19	9	24	
HOURLY MAX	40	27	41	30	26	29	31	29	24	29	19	21	19	30	22	27	16	10	31	28	29	38	13	41					
HOURLY AVG	5	6	5	5	5	5	5	6	6	6	6	7	5	6	6	6	5	5	5	5	6	6	5	6					

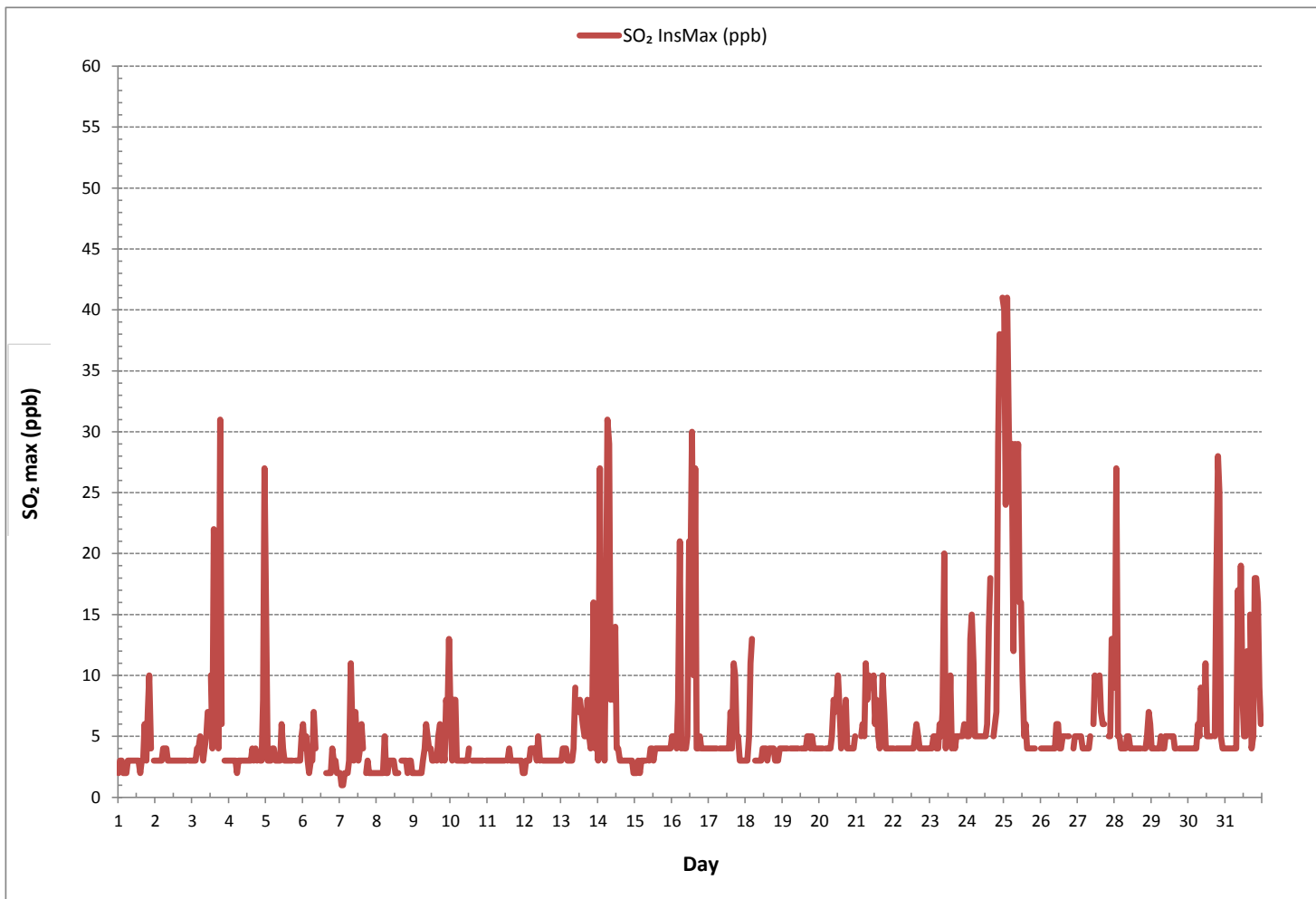
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	41 ppb @ HOUR 23 ON DAY 24
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	5

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

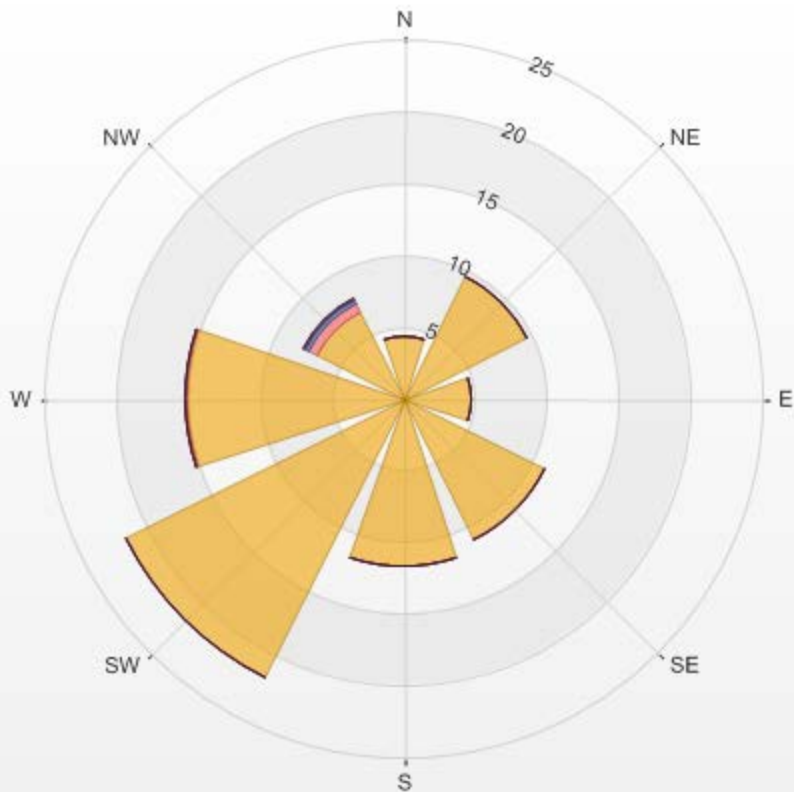
Calm: 13.63%

Calm Avg: 0.22 [ppb]

Direction	0.0-8.2	8.2-16.4	16.4-24.6	24.6-32.8	32.8-41.0	>41.0	Total
N	4.5	0.0	0.0	0.0	0.0	0.0	4.5
NE	9.6	0.0	0.0	0.0	0.0	0.0	9.6
E	4.7	0.0	0.0	0.0	0.0	0.0	4.7
SE	11.1	0.0	0.0	0.0	0.0	0.0	11.1
S	11.8	0.0	0.0	0.0	0.0	0.0	11.8
SW	21.7	0.0	0.0	0.0	0.0	0.0	21.7
W	15.1	0.1	0.0	0.0	0.0	0.0	15.2
NW	6.7	0.7	0.3	0.1	0.0	0.0	7.9
Summary	85.1	0.9	0.3	0.1	0.0	0.0	86.4

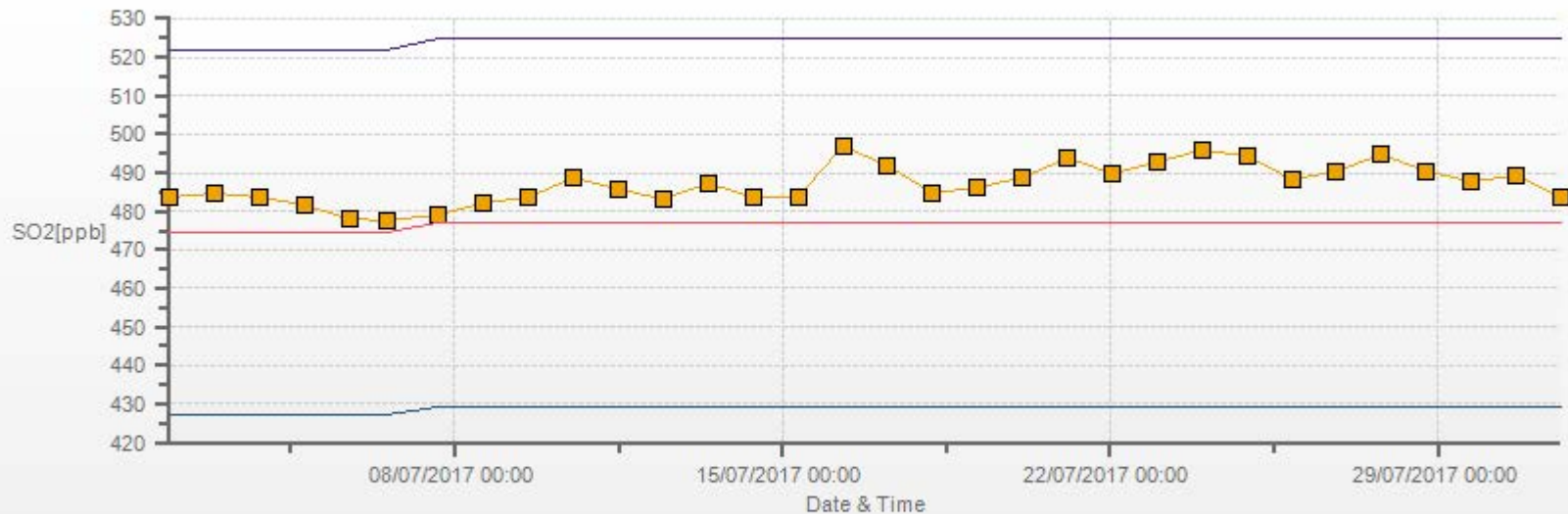
% Icon	Classes (ppb)	85	1	0	0	0					
	0.0-8.2		8.2-16.4		16.4-24.6		24.6-32.8		32.8-41.0		>41.0

LICA MASKWA Poll.: LICA MASKWA-SO₂[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 13.63% Calm Poll Avg: 0.22[ppb]



HYDROGEN SULPHIDE

SO2[ppb] Calibration: LICA MASKWA Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

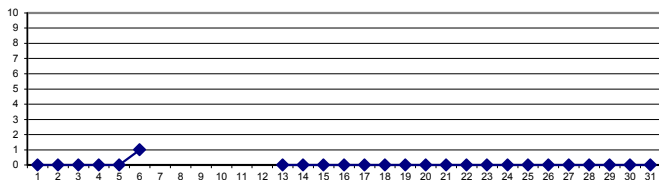
OBJECTIVE LIMIT:

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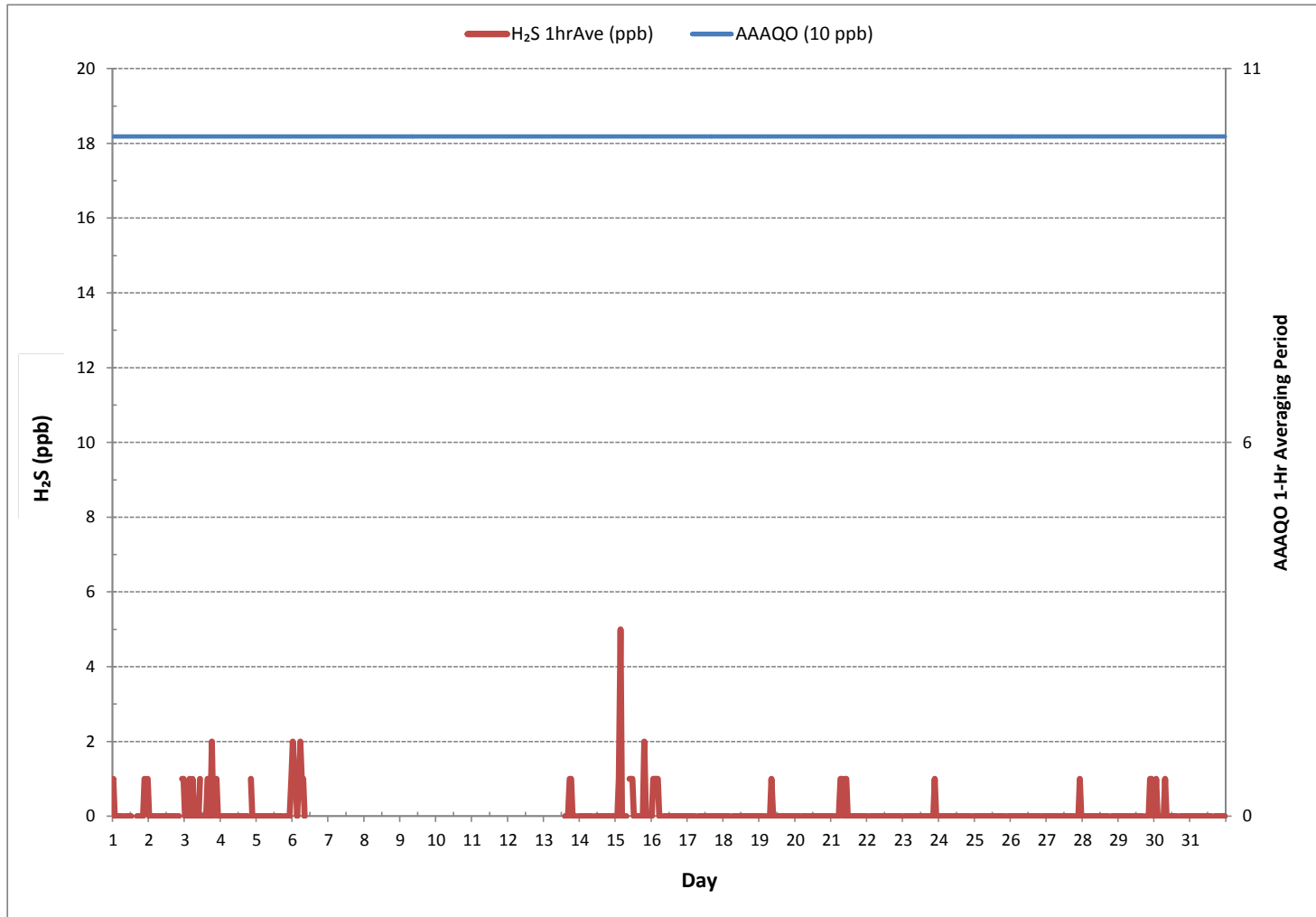
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	44		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 1 ON DAY 1		
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR 3 ON DAY 15		
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 6		
IZS CALIBRATION TIME:	25 hrs	OPERATIONAL TIME:	576 hrs
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	77.4 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

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

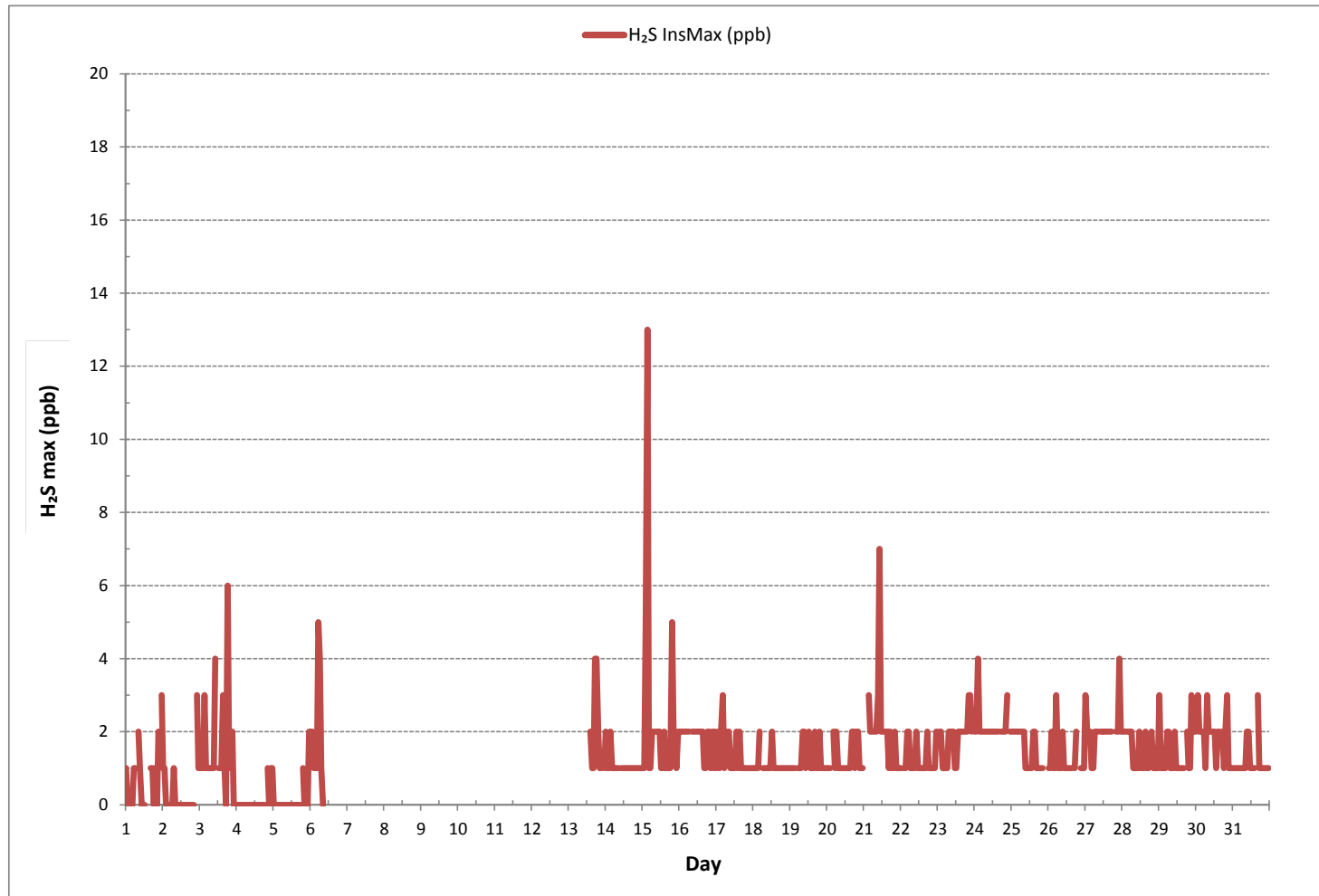
STATUS FLAG CODES

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:	461
MAXIMUM INSTANTANEOUS VALUE:	13 ppb @ HOUR 3 ON DAY 15
IZS CALIBRATION TIME:	25 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	549 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-H2S[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.82% Calm Avg: 0.37 [ppb]

Direction	0.0-2.0	2.0-4.0	4.0-6.0	>6.0	Total
N	4.1	0.0	0.0	0.0	4.1
NE	6.6	0.0	0.0	0.0	6.6
E	4.3	0.0	0.0	0.0	4.3
SE	9.2	0.0	0.0	0.0	9.2
S	10.1	0.0	0.0	0.0	10.1
SW	26.3	0.0	0.0	0.0	26.3
W	18.2	0.0	0.0	0.0	18.2
NW	9.2	0.2	0.0	0.0	9.4
Summary	88.0	0.2	0.0	0.0	88.2

% Icon Classes (ppb)

88 0.0-2.0

0

2.0-4.0

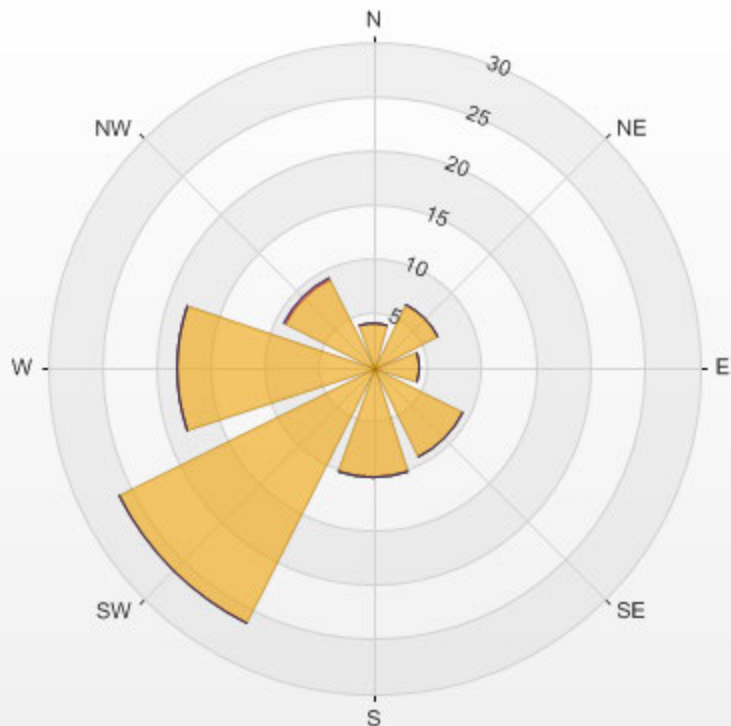
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4.0-6.0

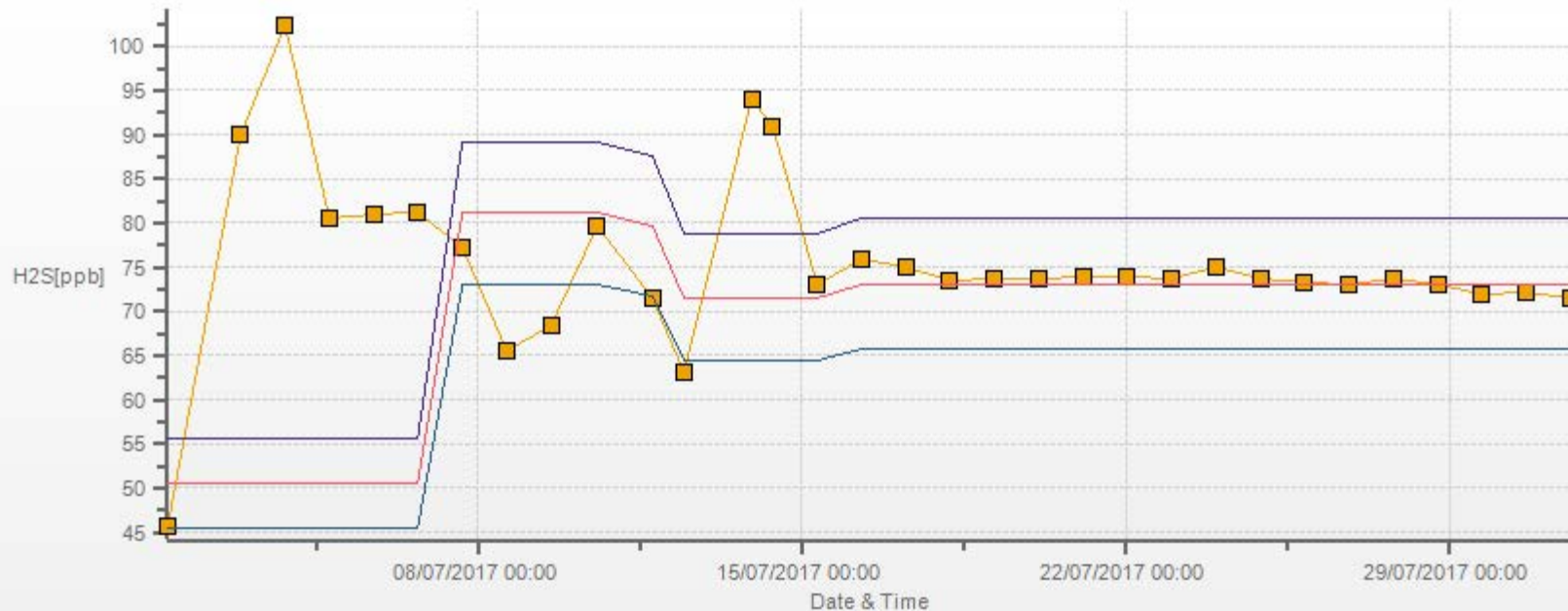
0

>6.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 11.82% Calm Poll Avg: 0.37[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 17/07 Type: Span



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

TOTAL HYDROCARBON

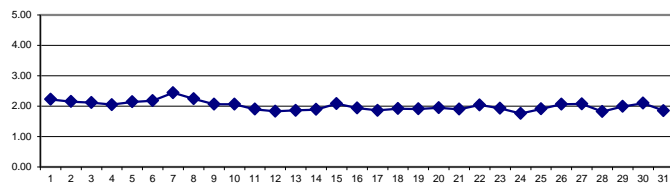
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.28	2.27	2.37	2.42	2.48	2.68	3.01	2.49	2.08	2.05	2.06	2.10	2.09	2.06	2.04	2.02	2.02	2.04	2.05	2.08	2.09	2.08	S	2.10	2.02	3.01	2.22	24
2	2.15	2.21	2.21	2.14	2.16	2.18	2.14	2.29	2.32	2.30	2.18	2.11	2.06	2.03	2.02	2.02	2.02	2.02	2.04	2.08	S	2.27	2.54	2.02	2.54	2.15	24	
3	2.67	2.62	2.17	2.15	2.14	2.22	2.19	2.17	2.09	2.07	2.25	2.04	1.99	1.97	1.97	1.99	1.98	1.96	2.12	2.00	S	2.01	2.01	2.04	1.96	2.67	2.12	24
4	2.07	2.08	2.09	2.06	2.06	2.09	2.08	2.05	2.04	2.02	2.02	2.01	2.01	2.01	2.01	2.00	2.00	2.00	2.01	S	2.04	2.08	2.22	2.18	2.00	2.22	2.05	24
5	2.06	2.08	2.15	2.21	2.18	2.22	2.14	2.09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.06	2.22	2.14	8
6	X	X	X	X	X	X	X	X	2.32	2.24	2.21	2.25	2.21	2.26	2.20	C	C	C	C	2.04	2.04	2.09	2.13	2.17	2.04	2.32	2.18	16
7	2.19	2.29	2.74	3.01	3.20	3.65	4.12	3.30	2.59	2.01	2.00	2.00	1.99	1.99	1.99	S	1.98	2.01	2.05	2.07	2.11	2.25	2.68	1.98	4.12	2.44	24	
8	2.53	2.51	2.54	2.59	2.72	2.37	2.29	2.42	2.37	2.29	2.15	2.09	2.04	2.03	2.03	S	2.02	2.19	2.11	1.98	1.96	2.01	2.05	X	1.96	2.72	2.24	23
9	X	X	X	X	X	X	X	X	X	X	X	X	2.01	2.04	S	2.03	2.04	2.04	2.05	2.09	2.08	2.14	2.07	2.12	2.01	2.14	2.06	12
10	2.07	2.04	1.95	1.92	1.95	2.01	2.00	1.99	1.94	1.91	C1	C1	C1	C1	C1	C1	2.25	2.22	2.18	2.15	2.14	2.14	2.13	2.10	1.91	2.25	2.06	18
11	2.19	2.24	2.17	2.30	2.27	2.30	2.06	1.99	1.94	1.91	1.91	1.92	S	1.60	1.61	1.63	1.64	1.64	1.68	1.68	1.68	1.74	1.79	1.84	1.60	2.30	1.90	24
12	1.89	1.88	1.98	1.97	1.91	1.85	1.85	1.80	1.75	1.75	1.74	S	1.82	1.82	1.80	1.79	1.78	1.77	1.75	1.79	1.85	1.86	1.86	1.88	1.74	1.98	1.83	24
13	1.91	1.94	1.95	1.98	1.98	1.99	2.00	1.96	1.94	1.96	S	1.93	1.93	1.90	1.80	1.81	1.78	1.74	1.71	1.71	1.71	1.69	1.74	1.69	2.00	1.86	24	
14	1.76	1.81	1.76	1.86	2.04	1.81	1.85	1.89	1.89	S	1.85	1.85	1.85	1.85	1.84	1.83	1.83	1.83	1.83	1.86	1.93	2.03	2.06	2.27	1.76	2.27	1.89	24
15	2.27	2.28	2.28	2.34	2.57	2.57	2.56	2.00	S	2.09	2.14	2.07	1.97	1.95	1.89	1.86	1.87	1.87	1.86	1.87	1.89	1.90	1.92	1.91	1.86	2.57	2.08	24
16	1.92	1.93	1.93	2.20	2.47	2.11	1.90	S	1.83	1.83	1.87	1.91	1.85	1.82	1.84	1.88	1.84	1.87	1.87	1.92	1.95	1.98	1.96	1.91	1.82	2.47	1.94	24
17	1.90	1.89	1.91	1.90	1.86	1.85	S	1.82	1.83	1.82	1.82	1.80	1.77	1.76	1.81	1.81	1.82	1.84	1.85	1.86	1.91	1.94	1.97	1.96	1.76	1.97	1.86	24
18	1.96	1.95	2.02	2.06	2.01	S	2.00	1.97	1.93	1.94	1.92	1.88	1.88	1.86	1.86	1.85	1.84	1.84	1.84	1.85	1.87	1.90	1.90	1.93	1.84	2.06	1.92	24
19	1.96	1.98	1.97	2.08	S	2.08	2.18	2.11	2.04	1.98	1.85	1.81	1.84	1.84	1.82	1.82	1.81	1.82	1.84	1.85	1.90	1.83	1.77	1.84	1.77	2.18	1.91	24
20	1.93	2.09	2.26	S	2.15	2.03	1.99	1.93	1.88	1.88	1.90	1.89	1.91	1.94	1.93	1.92	1.92	1.95	1.93	1.90	1.89	1.91	1.92	1.90	1.88	2.26	1.95	24
21	1.95	1.88	S	1.80	1.85	1.86	1.91	1.92	1.96	1.98	1.84	1.81	1.77	1.85	1.90	1.89	1.93	1.92	1.89	1.86	1.90	2.01	2.03	2.10	1.77	2.10	1.90	24
22	2.20	S	2.17	2.28	2.51	2.34	2.23	2.10	1.97	2.05	2.18	2.13	1.98	1.85	1.80	1.83	1.83	1.84	1.87	1.86	1.84	1.90	1.99	2.13	1.80	2.51	2.04	24
23	S	2.26	2.20	2.20	1.89	1.87	1.96	1.89	1.89	1.88	1.86	1.87	1.84	1.84	1.84	1.83	1.82	1.82	1.83	1.87	1.93	2.18	1.90	S	1.82	2.26	1.93	24
24	1.81	1.84	1.83	1.84	1.81	1.77	1.74	1.74	1.74	1.75	1.72	1.69	1.71	1.72	1.73	1.70	1.71	1.71	1.74	1.78	1.78	1.83	S	1.86	1.69	1.86	1.76	24
25	1.83	1.90	1.89	1.87	1.96	1.99	1.98	1.97	1.87	1.86	1.88	1.87	1.86	1.86	1.88	1.86	1.88	1.87	1.88	1.93	1.92	S	2.06	2.12	1.83	2.12	1.91	24
26	2.12	2.18	2.25	2.20	2.17	2.54	2.21	2.12	2.17	2.16	2.14	2.02	1.95	1.90	1.90	1.89	1.90	1.88	1.91	1.95	S	1.92	1.97	1.99	1.88	2.54	2.06	24
27	2.02	2.06	2.20	2.35	2.41	2.32	2.37	1.97	1.97	2.02	1.99	1.99	1.97	2.01	1.92	1.93	1.92	1.96	2.01	S	2.14	2.23	2.19	1.76	2.41	2.07	24	
28	1.72	1.74	1.77	1.80	1.78	1.83	1.81	1.78	1.81	1.82	1.81	1.81	1.79	1.77	1.76	1.78	1.78	1.79	S	1.80	1.82	1.91	2.03	2.10	1.72	2.10	1.82	24
29	2.00	2.09	2.18	2.28	2.22	2.27	2.23	2.10	1.88	1.85	1.84	1.85	1.82	1.78	1.78	1.81	S	1.80	1.85	1.85	1.96	1.96	2.25	1.78	2.28	1.99	24	
30	2.30	2.84	2.67	2.73	2.56	2.52	2.21	2.07	2.10	2.04	1.98	1.93	1.89	1.89	1.88	1.85	S	1.80	1.80	1.88	1.88	1.82	1.85	1.84	1.80	2.84	2.10	24
31	1.84	1.87	1.86	1.87	1.90	1.86	1.83	1.83	1.85	1.83	1.81	1.81	1.81	1.80	1.81	S	1.83	1.78	1.81	1.82	1.82	1.92	1.97	2.01	1.78	2.01	1.85	24
HOURLY MAX	2.67	2.84	2.74	3.01	3.20	3.65	4.12	3.30	2.59	2.30	2.25	2.25	2.21	2.26	2.20	2.03	2.25	2.22	2.18	2.15	2.14	2.23	2.27	2.68				
HOURLY AVG	2.05	2.10	2.12	2.16	2.19	2.19	2.17	2.06	2.01	1.98	1.96	1.94	1.92	1.90	1.88	1.87	1.88	1.89	1.90	1.90	1.93	1.97	2.00	2.05				

STATUS FLAG CODES

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

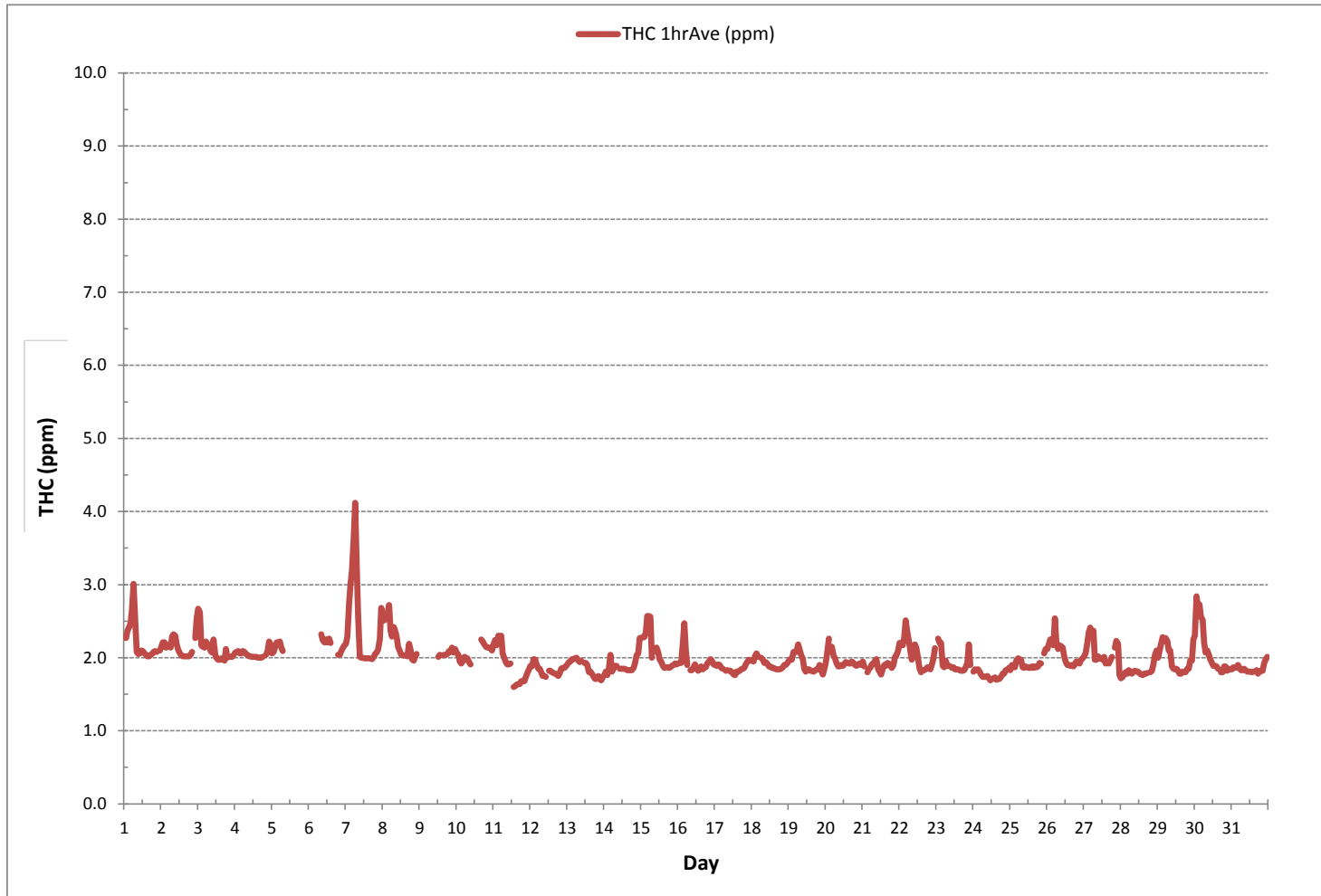
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	668			
MINIMUM 1-HR AVERAGE:	1.60 ppm	@ HOUR	13	ON DAY 11
MAXIMUM 1-HR AVERAGE:	4.12 ppm	@ HOUR	6	ON DAY 7
MAXIMUM 24-HR AVERAGE:	2.44 ppm			ON DAY 7
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	701 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	94.2 %	
STANDARD DEVIATION:	0.24	MONTHLY AVERAGE:	2.00 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.37	2.37	2.49	2.54	2.53	3.13	3.25	2.80	2.22	2.08	2.18	2.18	2.12	2.09	2.06	2.09	2.03	2.06	2.09	2.11	2.12	2.12	S	2.12	2.03	3.25	2.31	24
2	2.22	2.27	2.29	2.17	2.20	2.30	2.22	2.36	2.36	2.35	2.30	2.18	2.09	2.06	2.05	2.03	2.03	2.03	2.05	2.08	2.17	S	2.80	2.85	2.03	2.85	2.24	24
3	2.83	2.90	2.26	2.22	2.17	2.59	2.34	2.29	2.12	2.12	2.51	P	2.12	2.09	2.09	2.29	2.09	2.06	2.36	2.12	S	2.05	2.05	2.08	2.05	2.90	2.26	23
4	2.15	2.15	2.14	2.12	2.12	2.12	2.12	2.09	2.08	2.06	2.06	2.05	2.05	2.05	2.03	2.03	2.03	2.03	2.05	S	2.09	2.17	2.38	2.34	2.03	2.38	2.11	24
5	2.15	2.15	2.22	2.36	2.32	2.29	2.22	2.15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.15	2.36	2.23	8
6	X	X	X	X	X	X	X	X	2.37	2.37	2.26	2.35	2.26	2.77	2.38	C	C	C	C	C	2.11	2.13	2.21	2.27	2.11	2.77	2.32	16
7	2.30	2.57	3.43	3.15	3.32	4.22	4.58	3.70	3.49	2.08	2.06	2.08	2.03	2.03	2.00	2.02	S	2.00	2.05	2.08	2.11	2.21	3.00	2.93	2.00	4.58	2.67	24
8	2.79	2.62	2.77	2.68	3.37	2.67	2.40	2.46	2.45	2.35	2.26	2.15	2.08	2.05	2.06	S	2.06	2.29	2.30	1.99	1.97	2.03	2.12	X	1.97	3.37	2.36	23
9	X	X	X	X	X	X	X	X	X	X	X	X	2.03	2.06	S	2.05	2.05	2.05	2.09	2.14	2.11	2.19	2.18	2.37	2.03	2.37	2.12	12
10	2.15	2.09	2.02	1.99	2.00	2.05	2.05	2.03	2.03	C1	C1	C1	C1	C1	C1	C1	C1	2.29	2.24	2.22	2.24	2.27	P	2.22	1.99	2.29	2.13	15
11	2.46	2.47	2.39	2.61	2.59	2.64	2.36	2.24	2.18	2.17	2.18	2.19	S	1.90	1.90	1.91	1.91	1.93	1.96	2.01	1.97	2.05	2.08	2.18	1.90	2.64	2.19	24
12	2.22	2.24	2.27	2.33	2.33	2.15	2.13	2.12	2.03	2.03	2.03	S	2.09	2.09	2.08	2.06	2.06	2.05	2.06	2.06	2.12	2.12	2.12	2.13	2.03	2.33	2.13	24
13	2.16	2.18	2.19	2.24	2.22	2.22	2.24	2.21	2.16	2.22	S	2.18	2.19	2.18	2.06	2.06	2.04	2.00	1.98	1.95	2.45	2.00	2.00	2.01	1.95	2.45	2.14	24
14	2.06	2.18	2.13	2.31	2.59	2.12	2.19	2.21	2.19	S	2.13	2.13	2.13	2.15	2.13	2.13	2.12	2.12	2.12	2.15	2.27	2.36	2.38	2.61	2.06	2.61	2.21	24
15	2.59	2.66	2.68	2.94	2.96	2.95	2.99	2.35	S	2.38	2.42	2.41	2.23	2.19	2.13	2.07	2.07	2.07	2.06	2.04	2.06	2.06	2.06	2.06	2.04	2.99	2.37	24
16	2.06	2.12	2.13	2.92	2.75	2.54	2.03	S	1.89	1.89	1.97	2.06	2.00	1.94	1.94	2.04	1.95	2.00	2.01	2.04	2.09	2.12	2.10	2.06	1.89	2.92	2.12	24
17	2.04	2.04	2.09	2.09	2.03	2.03	S	2.03	2.01	2.01	2.01	2.00	1.98	2.03	2.03	2.04	2.04	2.12	2.09	2.10	2.19	2.21	2.25	2.23	1.98	2.25	2.07	24
18	2.23	2.23	2.33	2.34	2.35	S	2.30	2.27	2.27	2.25	2.24	2.19	2.18	2.18	2.16	2.15	2.15	2.15	2.18	2.18	2.21	2.28	2.23	2.30	2.15	2.35	2.23	24
19	2.37	2.33	2.35	2.50	S	2.46	2.61	2.51	2.40	2.36	2.21	P	2.16	2.16	2.15	2.15	2.13	2.15	2.15	2.18	2.24	2.30	2.09	2.18	2.09	2.61	2.28	23
20	2.30	2.69	2.65	S	2.53	2.35	2.27	2.27	2.18	2.18	2.19	2.15	2.18	2.21	2.19	2.18	2.18	2.21	2.18	2.15	2.15	2.15	2.15	2.15	2.15	2.69	2.25	24
21	P	2.12	S	2.06	2.09	2.13	2.18	2.18	2.23	2.25	2.18	2.09	2.06	2.15	2.18	2.18	2.21	2.21	2.18	2.16	2.24	2.37	2.40	2.50	2.06	2.50	2.20	23
22	2.66	S	2.51	2.72	3.07	2.69	2.66	2.43	2.33	2.44	2.48	2.45	2.35	2.18	2.10	2.12	2.13	2.13	2.15	2.16	2.18	2.37	2.35	2.53	2.10	3.07	2.40	24
23	S	2.56	2.51	2.54	2.29	2.15	2.23	2.18	2.25	2.15	2.12	2.16	2.07	2.15	2.06	2.04	2.04	2.03	2.04	2.18	2.30	2.57	2.19	S	2.03	2.57	2.22	24
24	2.03	2.06	2.04	2.06	2.04	2.00	1.95	1.97	1.97	2.00	1.97	1.94	1.95	1.98	2.00	2.04	P	1.97	2.01	2.06	2.09	2.15	S	2.25	1.94	2.25	2.02	23
25	2.22	2.25	2.25	2.28	2.30	2.35	2.33	2.30	2.21	2.19	2.21	2.21	2.18	2.18	2.26	2.19	2.21	2.21	2.27	2.30	2.30	S	2.44	P	2.18	2.44	2.26	23
26	2.47	2.54	2.63	2.56	2.54	3.31	2.84	2.47	2.51	2.50	2.50	2.42	2.30	2.24	2.21	2.21	P	2.21	2.25	P	S	2.25	2.30	2.30	2.21	3.31	2.46	22
27	2.33	2.41	2.54	2.74	2.74	2.63	2.75	2.51	2.31	P	2.30	2.30	2.27	2.33	2.23	2.25	2.22	2.24	P	S	2.50	2.68	2.72	2.12	2.12	2.75	2.43	24
28	2.03	2.07	2.13	2.13	2.12	2.15	2.13	2.10	2.16	2.15	2.15	2.15	2.13	2.12	2.12	2.12	2.13	2.15	S	2.18	2.22	2.34	2.44	2.48	2.03	2.48	2.17	24
29	2.40	2.54	2.72	2.75	2.80	2.66	2.63	2.59	2.65	2.33	2.25	2.24	2.25	2.24	2.19	2.21	2.24	S	2.24	2.27	2.33	2.51	2.54	3.23	2.19	3.23	2.47	24
30	3.25	3.92	3.38	3.29	3.01	3.09	2.87	2.57	2.54	2.43	2.38	2.33	2.27	2.27	2.24	S	2.19	2.19	2.19	2.35	2.40	2.23	2.29	2.26	2.19	3.92	2.61	24
31	2.28	2.30	2.30	2.33	2.35	2.33	2.30	2.31	2.37	2.43	2.37	2.31	2.33	2.30	2.31	S	2.89	2.30	2.34	2.34	2.34	2.51	2.56	2.59	2.28	2.89	2.38	24
HOURLY MAX	3.25	3.92	3.43	3.29	3.37	4.22	4.58	3.70	3.49	2.50	2.51	2.45	2.35	2.77	2.38	2.29	2.89	2.30	2.36	2.35	2.50	2.68	3.00	3.23				
HOURLY AVG	2.34	2.39	2.42	2.46	2.49	2.51	2.47	2.35	2.28	2.22	2.22	2.20	2.15	2.15	2.12	2.11	2.13	2.12	2.14	2.14	2.20	2.24	2.31	2.35				

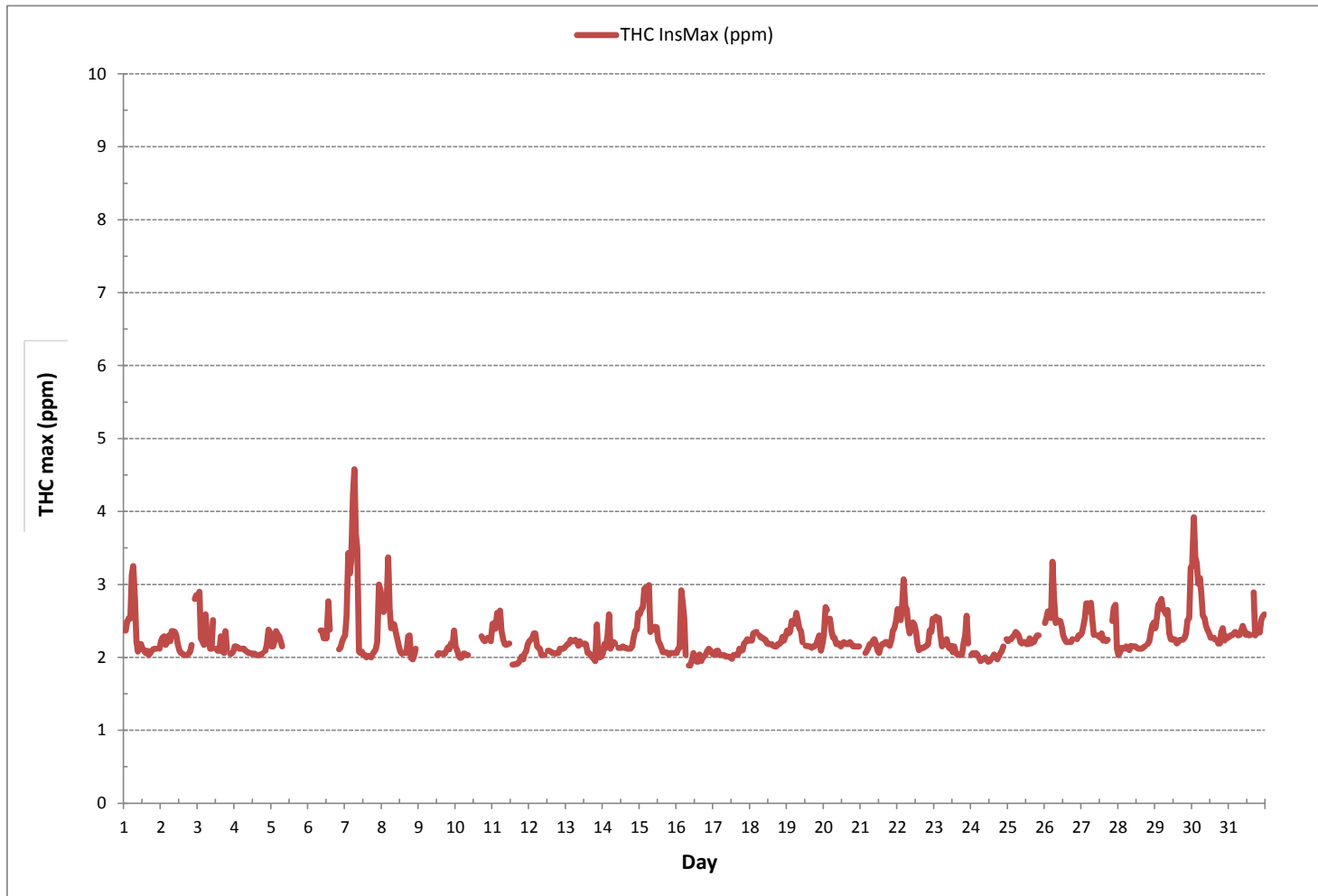
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	655
MAXIMUM INSTANTANEOUS VALUE:	4.58 ppm @ HOUR 6 ON DAY 7
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	689 hrs
STANDARD DEVIATION:	0.29

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



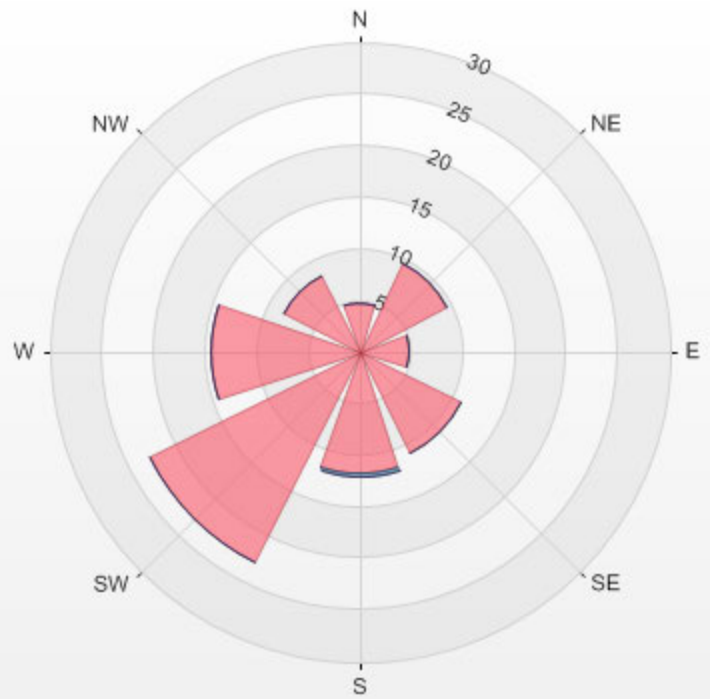
Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC[ppm]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.31% Calm Avg: 2.28 [ppm]

Direction	0.0-1.4	1.4-2.8	2.8-4.1	>4.1	Total
N	0.0	4.7	0.0	0.0	4.7
NE	0.0	9.6	0.0	0.0	9.6
E	0.0	4.9	0.0	0.0	4.9
SE	0.0	11.1	0.0	0.0	11.1
S	0.0	11.9	0.2	0.0	12.0
SW	0.0	22.8	0.0	0.0	22.8
W	0.0	14.4	0.0	0.0	14.4
NW	0.0	8.2	0.0	0.0	8.2
Summary	0.0	87.5	0.2	0.0	87.7

% Icon Classes (ppm) 0 0.0-1.4 88 1.4-2.8 0 2.8-4.1 0 >4.1

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 12.31% Calm Poll Avg: 2.28[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 17/07 Type: Span



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

OXIDES OF NITROGEN



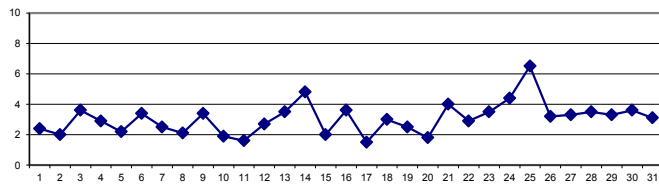
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

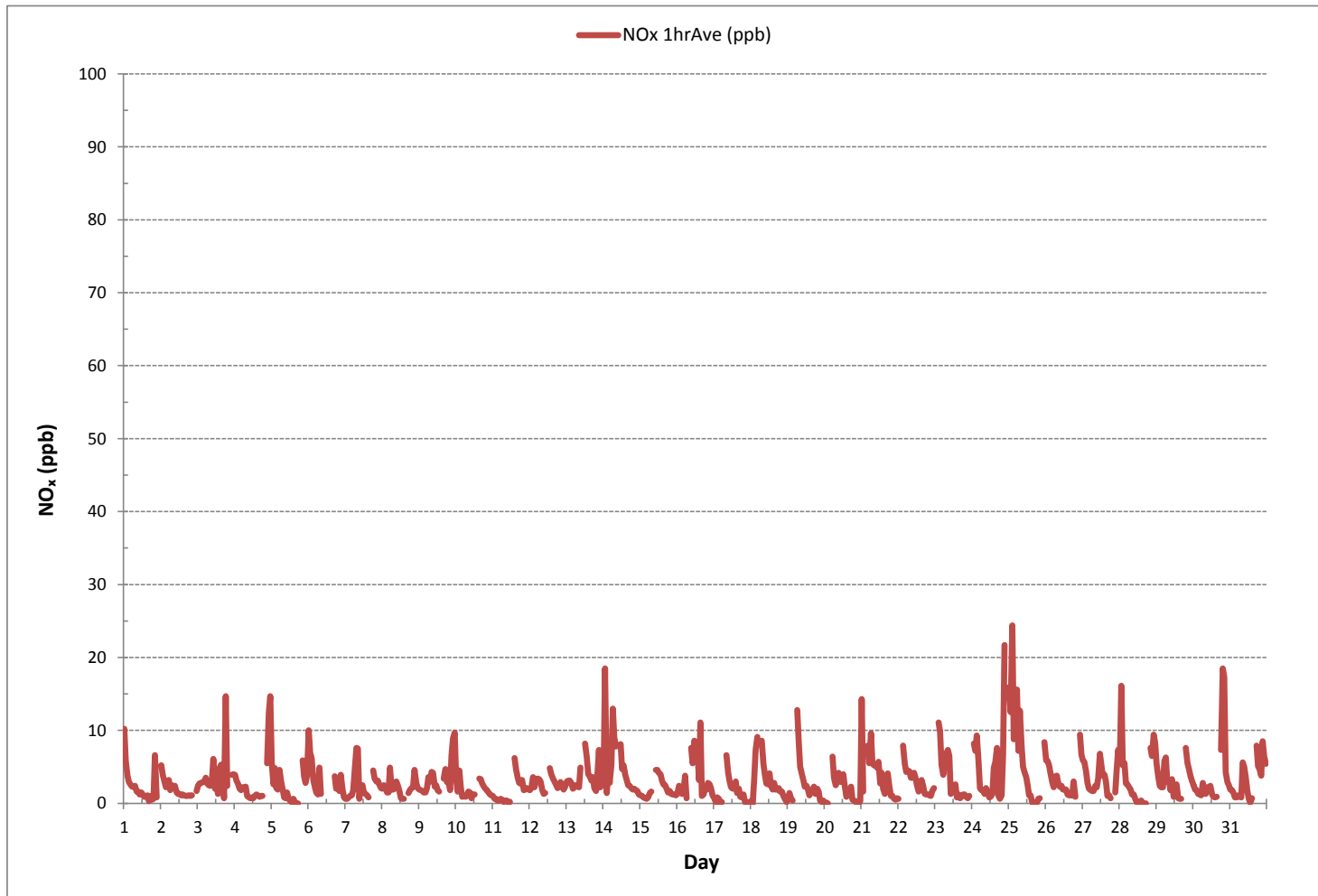
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	661			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	16	ON DAY 1
MAXIMUM 1-HR AVERAGE:	24 ppb	@ HOUR	2	ON DAY 25
MAXIMUM 24-HR AVERAGE:	7 ppb			ON DAY 25
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	713 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	95.8 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - July 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	12	7	4	3	2	2	3	3	2	2	2	2	1	1	1	8	0	3	0	4	10	1	S	X		0	12	3	23				
2	6	4	3	3	3	6	4	3	2	2	2	1	1	1	1	1	0	0	0	0	1	S	X	2	0	6	2	23					
3	2	2	2	3	2	7	6	2	3	4	8		7	1	12	13	12	2	34	9	S	X	3	3	1	34	7	23					
4	3	3	3	2	2	2	3	20	1	0	0	1	0	1	2	1	1	1	1	S	X	6	21	22	0	22	4	23					
5	12	3	11	7	3	6	4	2	1	2	7	3	0	1	9	0	0	0	S	X	7	4	3	10	0	12	4	23					
6	12	9	9	6	4	2	2	14	3	C	C	C	C	C	C	C	X	7	3	17	5	6	3	2	2	17	7	23					
7	2	2	2	2	2	3	8	17	13	2	6	6	2	3	3	2	S	X	5	3	3	3	3	2	2	17	4	23					
8	3	3	2	2	2	16	2	2	2	3	3	2	1	1	0	S	X	2	2	2	3	6	3	2	0	16	3	23					
9	2	2	2	2	2	2	10	4	6	6	4	5	2	2	S	X	5	7	3	5	2	13	21	38	2	38	7	23					
10	16	2	17	16	2	2	2	3	3	2	2	2	3	S	X	4	4	3	3	3	2	2	P	2	2	17	5	22					
11	2	2	1	1	1	2	2	1	1	1	1	1	S	X	8	7	5	3	3	24	3	3	3	3	1	24	4	23					
12	3	3	5	3	7	6	4	4	3	3	2	S	X	6	5	4	4	3	3	4	3	3	3	3	2	7	4	23					
13	4	4	4	3	3	3	3	3	4	11	S	X	11	10	6	6	5	7	3	3	9	26	3	7	3	26	6	23					
14	11	33	2	20	4	16	32	26	14	S	X	16	6	8	7	4	3	3	3	3	3	2	2	2	2	33	10	23					
15	2	2	2	2	2	2	3	3	S	X	6	6	5	5	4	3	3	3	2	3	2	2	2	2	2	6	3	23					
16	3	4	4	3	9	19	2	S	X	10	8	24	23	23	9	31	6	3	4	4	5	4	4	3	2	31	9	23					
17	3	2	3	3	2	20	S	X	10	8	5	4	4	6	10	4	10	9	4	4	2	2	2	2	2	20	5	23					
18	2	1	10	11	16	S	X	14	7	6	4	4	9	6	5	4	4	5	3	3	2	2	2	2	1	16	6	23					
19	2	3	2	2	S	X	20	11	7	5	5	P	4	3	2	3	4	4	3	4	3	2	2	2	2	20	4	22					
20	2	1	1	S	X	9	6	4	7	10	7	8	12	7	2	3	4	9	2	2	2	2	2	3	1	12	5	22					
21	P	16	S	X	12	9	17	14	12	13	14	9	9	4	2	5	10	8	2	2	2	2	2	2	2	17	8	22					
22	2	S	X	10	7	6	6	6	4	5	5	4	4	3	6	6	5	3	2	2	2	2	2	3	2	10	4	23					
23	S	X	13	13	7	5	14	14	12	15	3	7	4	10	2	4	3	3	2	2	2	2	4	S	2	15	7	22					
24	X	10	15	17	16	4	3	3	3	4	3	3	2	3	10	20	P	3	2	4	28	41	S	X	2	41	10	21					
25	48	27	47	29	28	30	13	27	18	10	16	14	9	4	5	2	2	1	2	2	2	2	S	X	P	1	48	16	22				
26	7	7	6	6	4	3	5	6	4	4	3	20	10	2	2	P	2	61	P	S	X	12	8	2	61	9	21						
27	7	7	6	4	3	3	3	2	4	P	6	11	9	7	11	14	2	2	P	S	X	3	22	23	2	23	7	21					
28	12	34	7	8	4	3	3	3	2	2	2	1	1	2	3	1	1	1	S	X	11	9	13	12	1	34	6	23					
29	7	6	4	4	5	7	8	5	5	3	24	3	27	35	2	2	2	S	X	10	7	6	5	4	2	35	8	23					
30	4	3	3	3	3	2	10	4	6	7	3	8	3	2	2	3	S	X	15	27	26	15	4	4	2	27	7	23					
31	3	3	3	2	2	3	2	3	13	11	11	5	4	2	17	S	X	12	7	13	14	17	12	9	2	17	8	23					
HOURLY MAX	48	34	47	29	28	30	32	27	18	15	24	24	27	35	17	31	12	12	61	27	28	41	22	38									
HOURLY AVG	7	7	7	7	5	7	7	8	6	6	6	6	7	6	5	6	4	4	7	6	6	7	6	7									

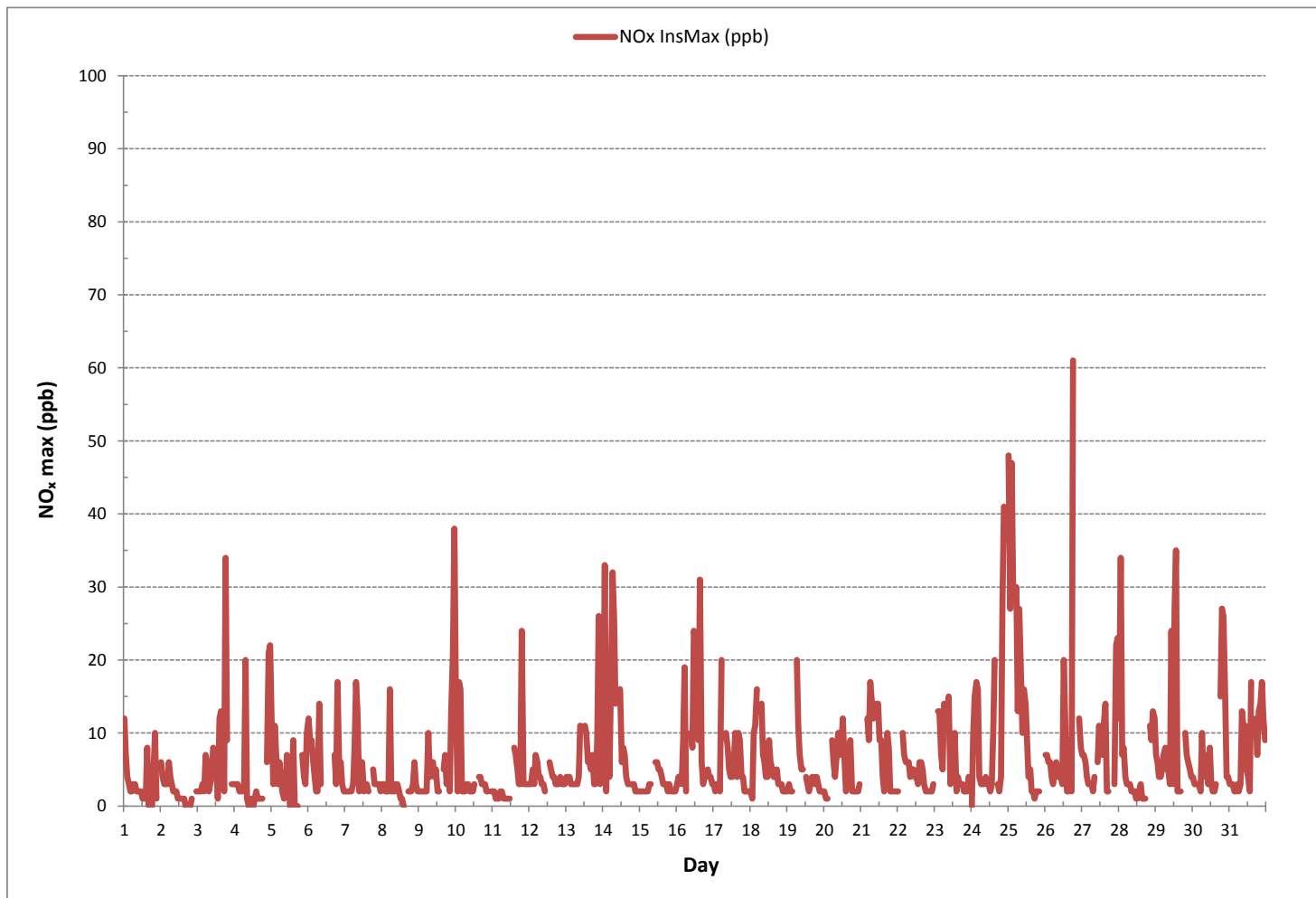
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	650
MAXIMUM INSTANTANEOUS VALUE:	61 ppb @ HOUR 18 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	701 hrs
STANDARD DEVIATION:	7

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



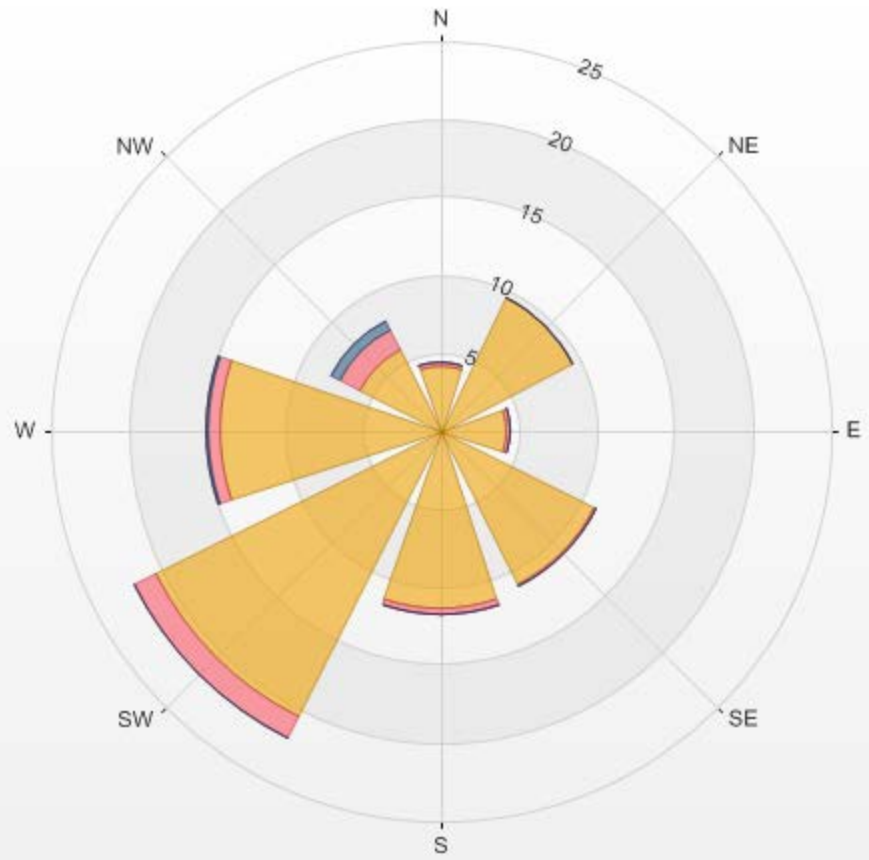
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NOX[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.86% Calm Avg: 2.49 [ppb]

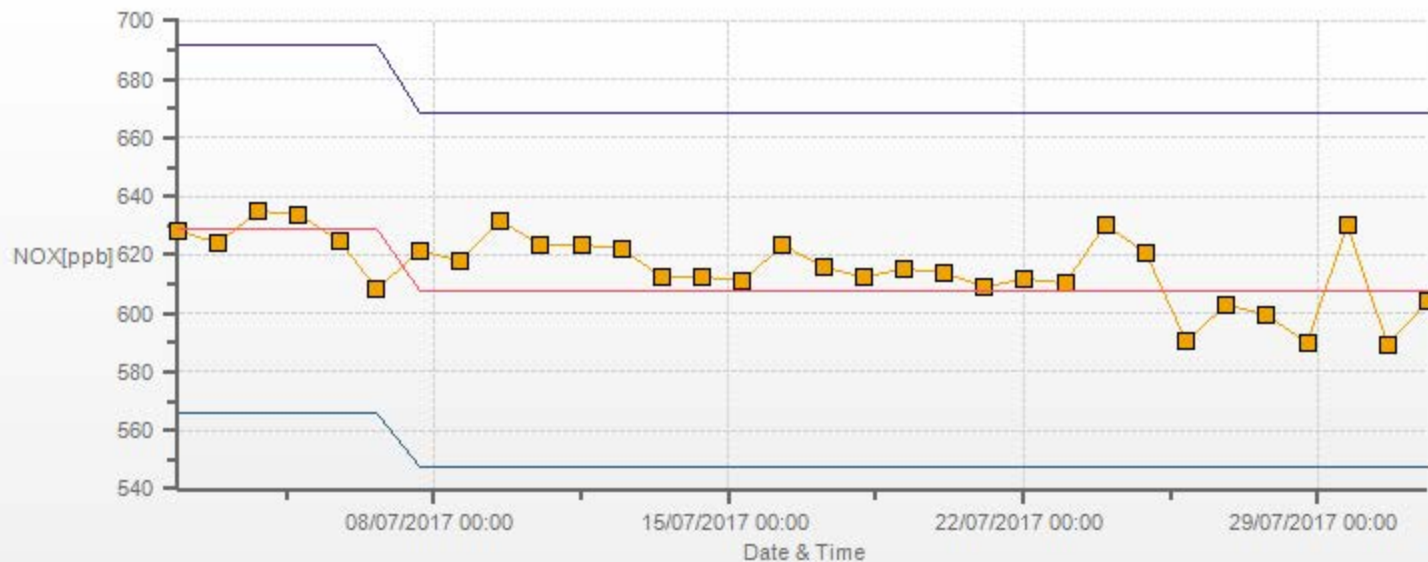
Direction	0.0-8.2	8.2-16.3	16.3-24.5	>24.5	Total
N	4.2	0.2	0.0	0.0	4.4
NE	9.5	0.0	0.0	0.0	9.5
E	4.2	0.3	0.0	0.0	4.5
SE	11.0	0.2	0.0	0.0	11.1
S	11.5	0.3	0.0	0.0	11.8
SW	20.5	1.5	0.0	0.0	22.0
W	14.2	0.8	0.2	0.0	15.1
NW	5.9	1.4	0.6	0.0	7.8
Summary	80.9	4.5	0.8	0.0	86.2

% Icon Classes (ppb) 81 0.0-8.2 5 8.2-16.3 1 16.3-24.5 0 >24.5

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 13.86% Calm Poll Avg: 2.49[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

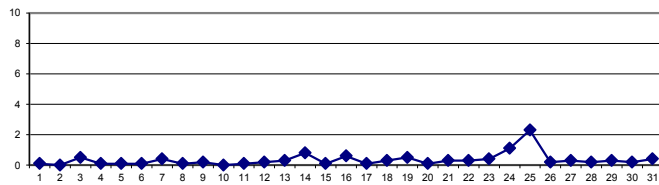
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

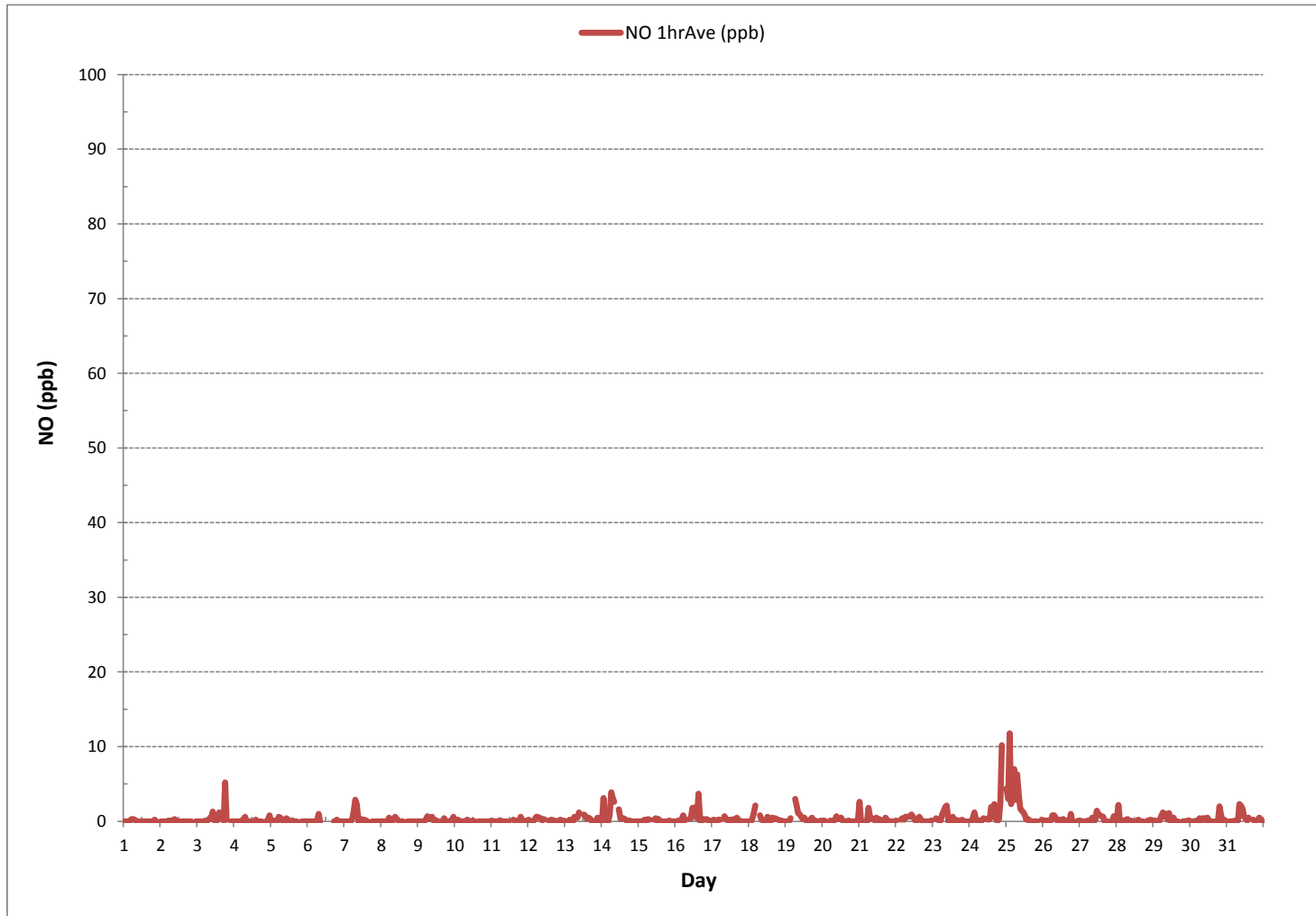
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	354				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	12	ppb @ HOUR	25	ON DAY	25
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY	25
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	713	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	95.8	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0	ppb

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

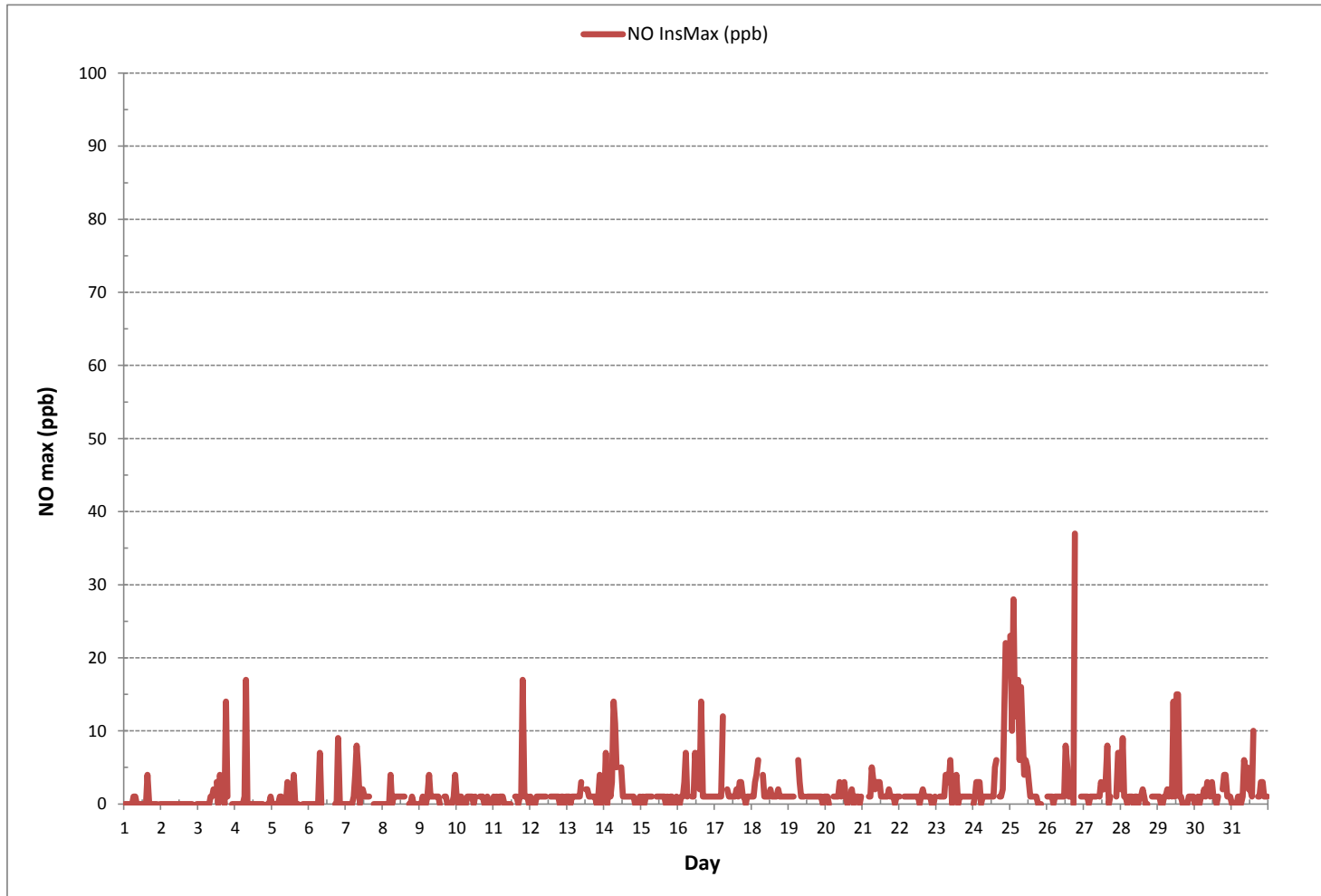
STATUS FLAG CODES

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:	452
MAXIMUM INSTANTANEOUS VALUE:	37 ppb @ HOUR 18 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	701 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



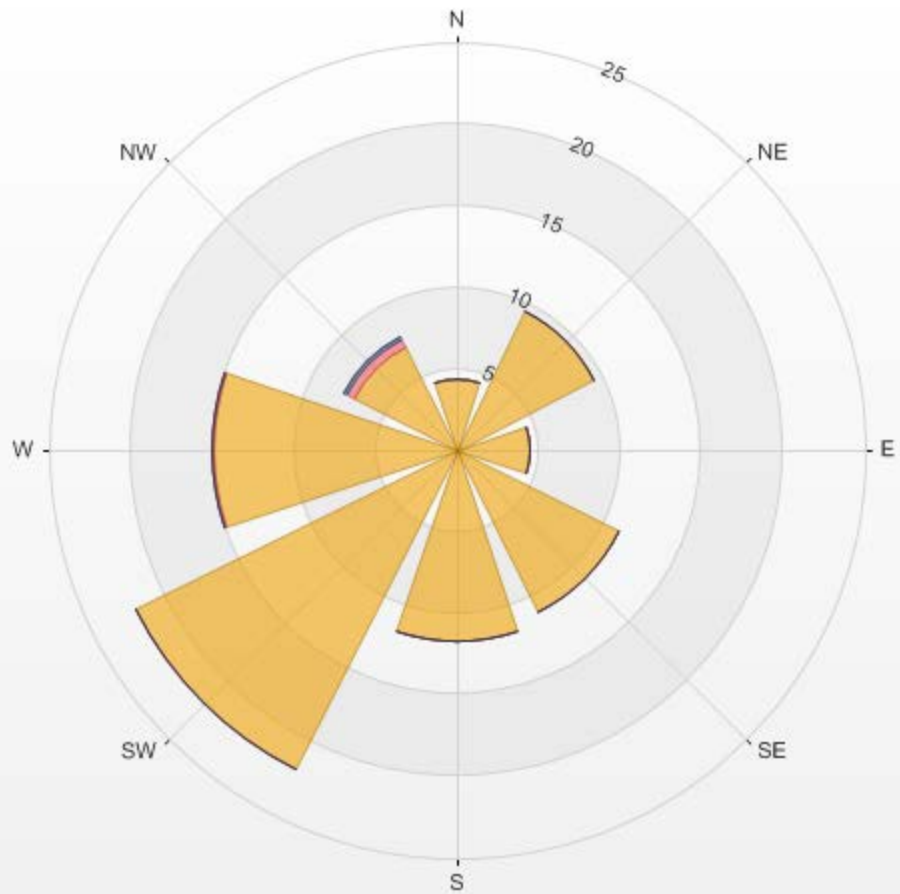
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.86% Calm Avg: 0.14 [ppb]

Direction	0.0-4.0	4.0-7.9	7.9-11.9	>11.9	Total
N	4.4	0.0	0.0	0.0	4.4
NE	9.5	0.0	0.0	0.0	9.5
E	4.5	0.0	0.0	0.0	4.5
SE	11.1	0.0	0.0	0.0	11.1
S	11.8	0.0	0.0	0.0	11.8
SW	22.0	0.0	0.0	0.0	22.0
W	14.9	0.2	0.0	0.0	15.1
NW	7.1	0.5	0.3	0.0	7.8
Summary	85.3	0.6	0.3	0.0	86.2

% Icon	Classes (ppb)	85	1	0	0
	0.0-4.0				
	4.0-7.9				
	7.9-11.9				
	>11.9				

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 13.86% Calm Poll Avg: 0.14[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	10	6	4	3	3	2	2	2	2	2	1	2	1	1	1	1	0	1	1	1	1	6	1	S	X	0	10	2	23
2	5	4	3	2	2	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	S	X	2	1	5	2	23
3	2	3	3	3	3	3	3	2	2	3	5	2	2	1	4	4	4	1	10	2	S	X	4	4	1	10	3	23	
4	4	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	S	X	6	12	14	1	14	3	23	
5	6	3	5	2	2	4	3	2	1	1	1	0	0	0	1	0	0	0	S	X	6	4	3	4	0	6	2	23	
6	10	7	6	3	2	2	1	4	1	C	C	C	C	C	C	C	X	4	2	3	2	4	2	1	1	10	3	23	
7	1	1	1	1	1	1	3	5	5	1	2	2	1	1	1	1	S	X	4	3	3	3	3	2	1	5	2	23	
8	2	3	2	2	2	5	2	2	2	2	2	1	1	1	1	S	X	1	2	2	2	5	3	2	1	5	2	23	
9	2	2	2	2	2	2	3	3	4	4	2	2	2	2	S	X	3	4	3	3	2	7	9	9	2	9	3	23	
10	3	2	4	2	1	1	1	1	1	1	1	1	1	S	X	3	3	3	2	2	2	2	1	1	1	4	2	23	
11	1	1	1	0	0	1	1	0	0	0	0	0	S	X	6	5	4	3	3	2	2	2	2	2	0	6	2	23	
12	2	2	4	2	3	3	3	3	1	1	1	S	X	5	4	3	3	3	2	2	3	2	2	2	1	5	3	23	
13	3	3	3	3	2	2	2	2	2	S	X	7	6	4	3	3	4	2	2	2	4	7	2	3	2	7	3	23	
14	3	15	1	4	3	5	9	6	5	S	X	7	4	5	4	3	2	2	2	2	2	2	2	1	1	15	4	23	
15	1	1	1	1	0	1	1	1	S	X	4	4	4	4	3	3	3	2	2	2	1	1	1	1	0	4	2	23	
16	1	2	2	1	1	3	1	S	X	7	5	7	6	6	3	7	1	1	2	2	3	2	2	1	1	7	3	23	
17	1	0	1	1	0	0	S	X	6	4	3	2	2	2	3	1	2	1	1	1	0	0	0	0	0	6	1	23	
18	0	0	3	6	7	S	X	8	5	4	3	3	4	2	2	2	2	2	2	1	2	1	1	0	0	8	3	23	
19	1	1	1	0	S	X	10	6	4	3	3	2	2	2	1	2	2	2	1	2	2	0	0	0	0	10	2	23	
20	0	0	0	S	X	6	4	3	3	4	3	3	4	2	1	1	1	2	1	0	0	0	0	0	0	6	2	23	
21	12	2	S	X	8	6	8	5	5	5	5	5	3	4	2	1	2	4	2	1	1	1	1	1	1	12	4	23	
22	1	S	X	11	8	5	4	4	4	3	3	3	2	2	2	3	2	1	1	1	1	1	2	2	1	8	3	23	
23	S	X	8	10	5	4	5	5	5	5	1	2	1	2	1	1	1	1	1	1	1	1	1	1	S	11	3	23	
24	X	8	7	8	6	2	2	2	1	2	1	1	1	1	3	4	5	1	1	1	4	12	S	X	1	12	3	23	
25	12	10	13	7	8	9	4	7	5	3	3	2	2	1	1	0	0	0	1	1	S	X	8	0	13	4	23		
26	6	6	5	4	3	2	3	3	2	2	2	2	2	2	1	1	1	2	1	2	1	S	X	9	7	1	9	3	23
27	6	6	4	3	2	2	2	2	2	2	3	5	4	3	3	2	1	1	1	S	X	2	4	7	1	7	3	23	
28	6	14	5	5	3	3	2	2	1	1	0	0	0	0	0	0	0	S	X	8	6	9	8	0	14	3	23		
29	5	4	2	2	2	5	5	2	2	2	2	1	2	2	1	1	1	S	X	8	5	5	4	3	1	8	3	23	
30	3	2	2	1	1	1	2	2	1	2	2	2	1	1	1	S	X	7	16	16	4	3	3	1	16	3	23		
31	2	2	1	1	1	1	1	1	3	3	2	1	0	0	0	S	X	8	5	5	4	8	6	5	0	8	3	23	
HOURLY MAX	12	15	13	10	8	9	10	8	6	7	5	7	7	6	6	7	5	8	10	16	16	12	12	14					
HOURLY AVG	4	4	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3	3	3					

STATUS FLAG CODES

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

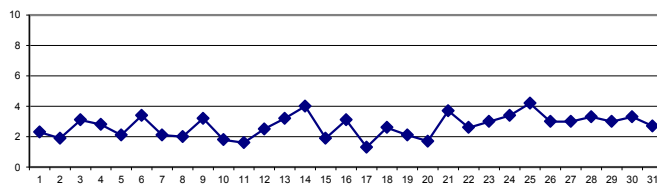
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

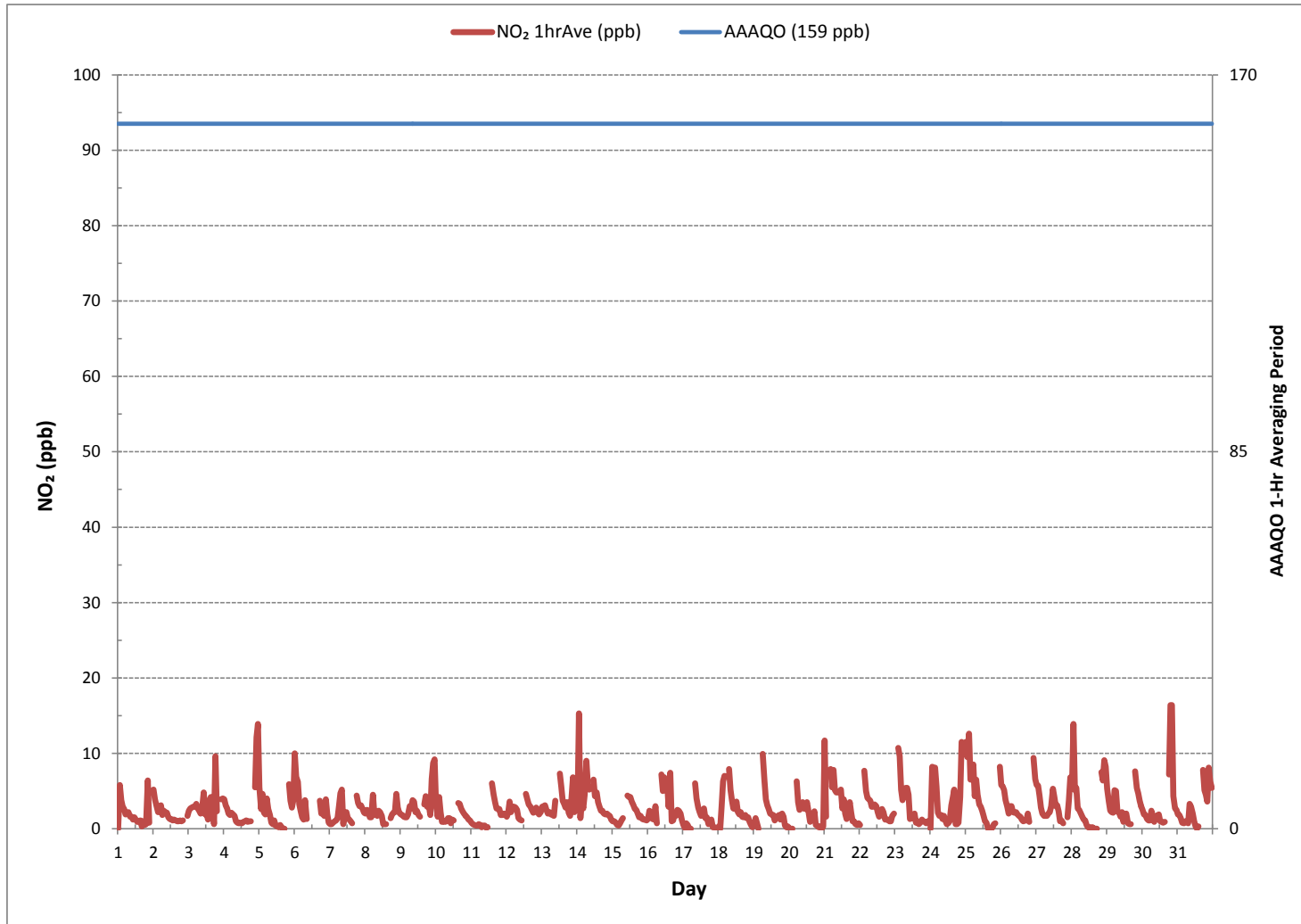
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	656					
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	16	ON DAY	1
MAXIMUM 1-HR AVERAGE:	16	ppb	@ HOUR	19	ON DAY	30
MAXIMUM 24-HR AVERAGE:	4	ppb			ON DAY	25
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	713	hrs	
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	95.8	%	
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	3	ppb	

24 HR AVERAGES July 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





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

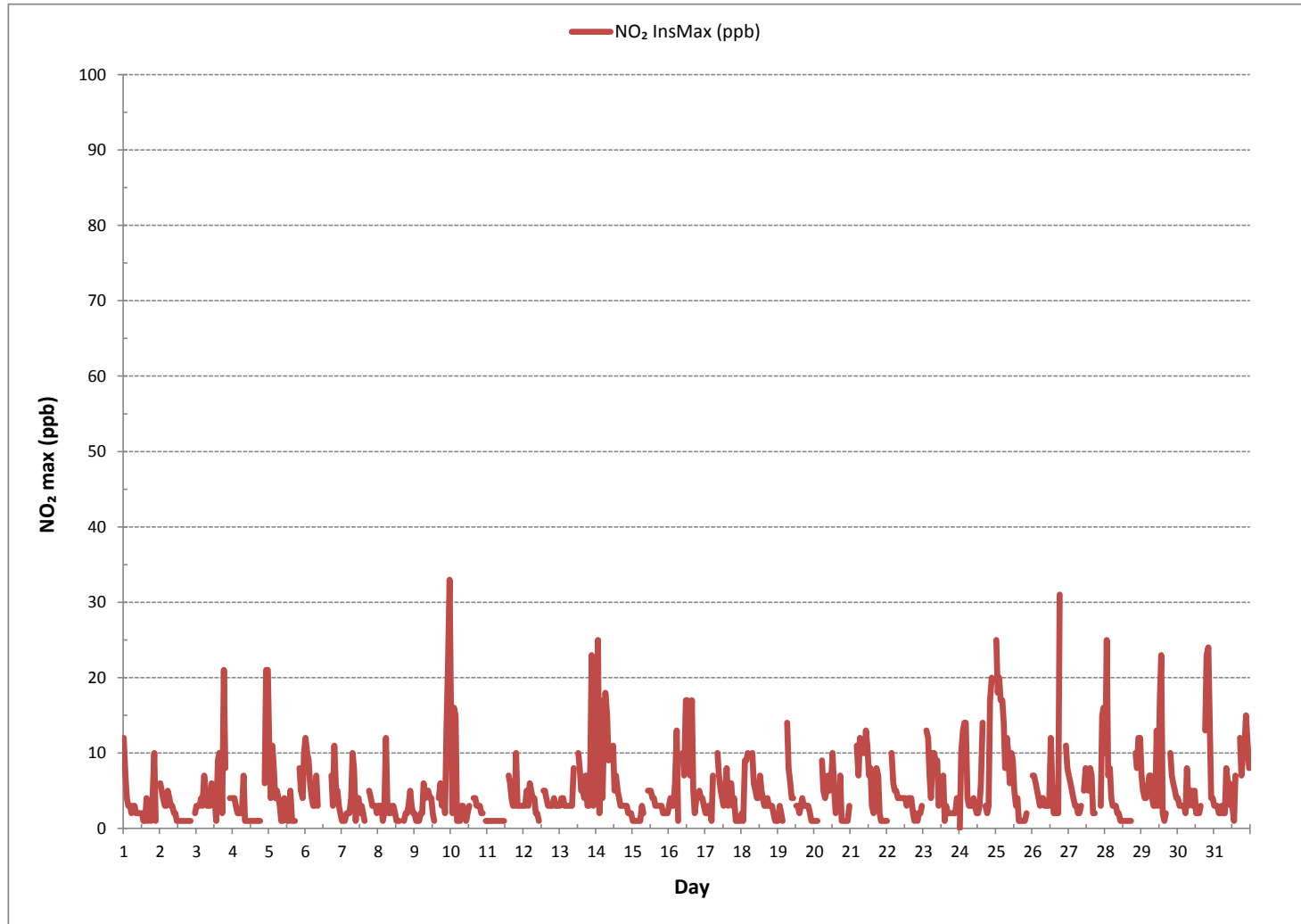
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	664
MAXIMUM INSTANTANEOUS VALUE:	33 ppb @ HOUR 23 ON DAY 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	701 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



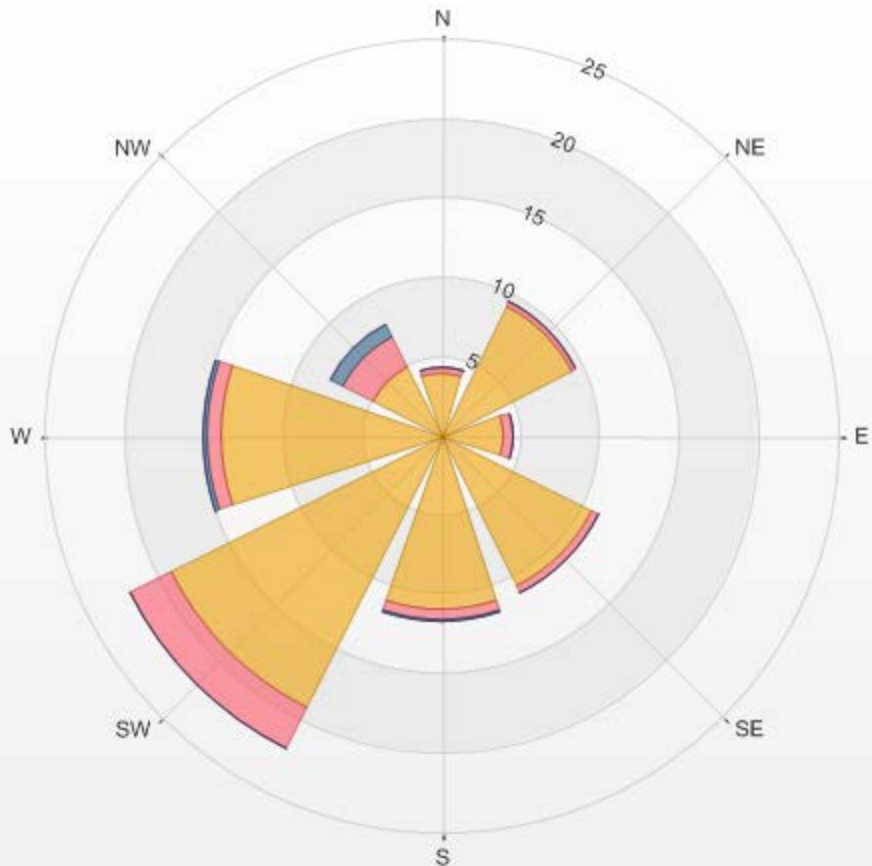
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.86% Calm Avg: 2.35 [ppb]

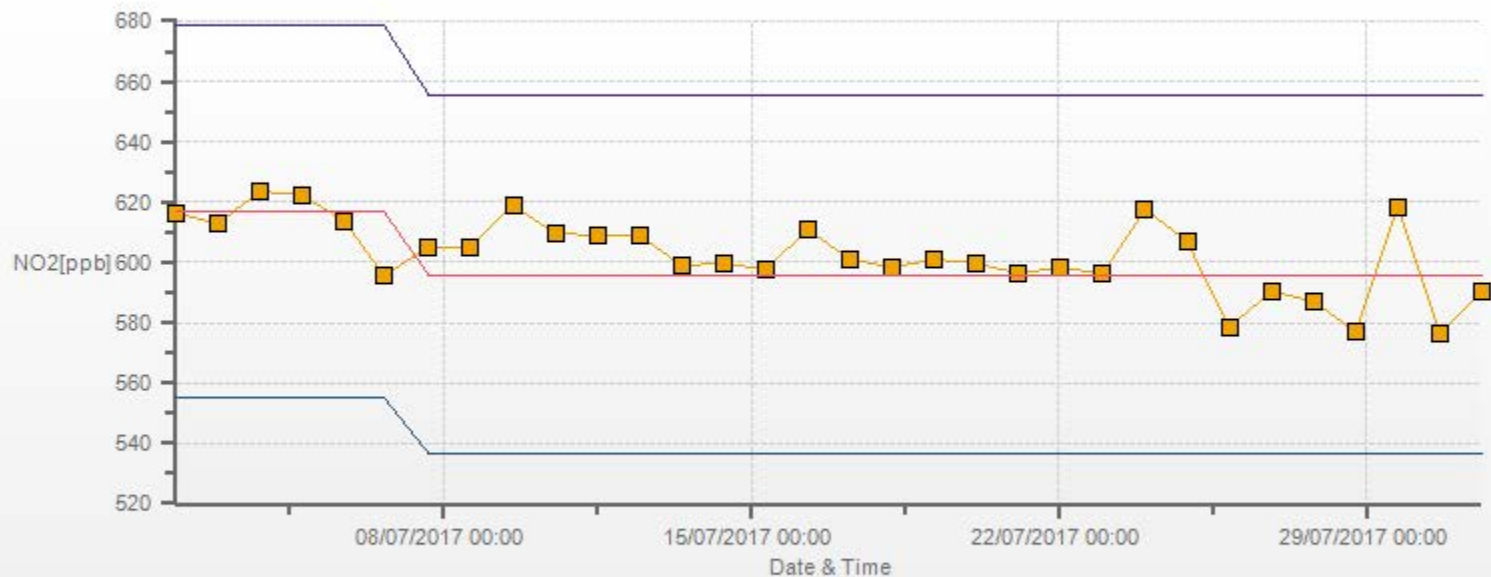
Direction	0.0-5.5	5.5-11.0	11.0-16.5	>16.5	Total
N	3.9	0.5	0.0	0.0	4.4
NE	9.2	0.3	0.0	0.0	9.5
E	3.9	0.6	0.0	0.0	4.5
SE	10.5	0.6	0.0	0.0	11.1
S	11.0	0.6	0.2	0.0	11.7
SW	19.1	2.9	0.0	0.0	22.0
W	13.9	0.9	0.3	0.0	15.1
NW	4.8	2.1	0.9	0.0	7.8
Summary	76.4	8.4	1.4	0.0	86.1

% Icon Classes (ppb) 76 0.0-5.5 8 5.5-11.0 1 11.0-16.5 0 >16.5

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 13.86% Calm Poll Avg: 2.35[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

WIND SPEED



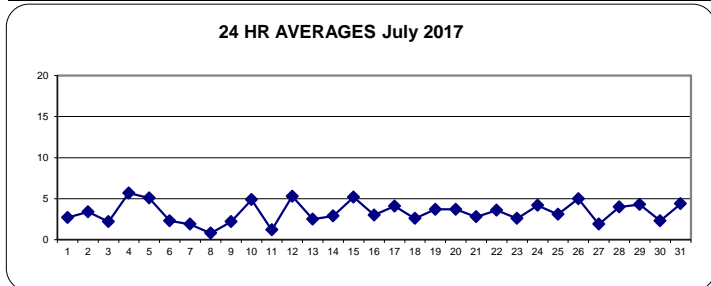
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	1.1	0.7	0.4	0.8	0.5	0.5	1.7	0.4	1.7	4.1	6.2	5.7	5.5	5.6	5.1	4.9	4.1	4.6	4.1	3.6	3.0	3.7	4.2	6.3	0.4	6.3	2.7	24
2	4.0	0.5	2.5	2.1	2.7	3.0	2.5	5.3	4.6	5.4	7.3	8.5	8.5	8.3	7.6	7.4	6.8	5.3	6.2	3.6	2.1	3.0	0.8	1.4	0.5	8.5	3.4	24
3	3.0	1.4	3.1	4.2	7.9	2.3	1.4	4.8	4.7	5.1	4.0	5.9	6.1	4.4	3.9	4.8	5.2	8.8	10.9	5.5	4.8	6.4	3.9	3.6	1.4	10.9	2.2	24
4	3.2	3.3	3.7	4.2	4.2	4.8	5.1	6.8	6.0	7.1	7.5	7.7	8.0	8.6	12.0	11.1	9.9	8.4	7.4	4.1	2.9	2.7	3.8	2.6	2.6	12.0	5.7	24
5	4.0	2.2	2.3	4.1	5.6	5.5	3.2	4.2	7.0	8.5	9.1	8.6	9.1	8.3	8.3	8.3	8.9	8.4	6.8	5.5	3.3	2.3	1.7	2.3	1.7	9.1	5.1	24
6	2.1	1.1	2.0	2.0	1.6	0.4	0.5	2.4	4.5	2.3	2.7	3.2	5.2	6.1	6.8	7.0	6.1	5.4	4.6	2.6	1.9	1.1	1.0	1.4	0.4	7.0	2.3	24
7	2.1	1.4	2.4	1.8	2.1	1.1	0.8	1.3	2.2	4.1	2.8	3.8	4.1	4.4	3.3	3.6	4.4	4.9	6.6	5.7	4.6	3.4	1.6	2.0	0.8	6.6	1.9	24
8	2.8	1.2	0.7	1.4	2.2	2.6	3.6	2.2	2.0	2.0	3.0	0.8	2.0	3.3	1.9	1.9	6.4	2.9	5.1	4.2	2.2	0.5	1.6	1.1	0.5	6.4	0.8	24
9	0.5	1.3	1.3	1.5	1.7	1.1	1.1	1.8	2.7	4.5	5.0	4.3	5.1	4.7	4.3	4.6	4.3	5.1	3.2	2.0	1.9	2.7	2.2	4.1	0.5	5.1	2.2	24
10	4.4	3.2	8.2	3.9	3.1	3.8	4.8	2.8	6.6	7.9	5.9	2.9	1.6	2.4	3.9	7.3	8.6	11.3	11.5	9.5	5.8	2.1	4.7	3.3	1.6	11.5	4.9	24
11	1.5	1.0	0.9	1.9	0.8	2.9	5.9	5.8	3.9	3.0	5.5	4.6	6.3	4.5	4.9	7.1	6.9	7.7	7.2	2.8	2.4	2.4	1.6	2.5	0.8	7.7	1.2	24
12	2.3	1.3	1.8	1.4	3.3	5.1	4.4	6.2	8.0	8.2	7.5	9.1	10.4	10.1	10.3	11.1	8.5	5.3	2.0	1.8	2.7	4.5	3.9	4.5	1.3	11.1	5.3	24
13	5.5	5.0	4.7	3.3	4.2	2.8	5.1	2.1	2.1	2.0	4.9	5.4	5.1	5.7	6.5	6.3	6.1	4.8	6.0	5.9	6.6	10.3	8.3	3.6	2.0	10.3	2.5	24
14	4.0	5.5	4.8	4.8	3.8	3.1	5.0	6.2	5.7	5.8	5.4	4.4	3.6	3.3	3.7	4.5	4.0	3.5	2.8	2.2	3.0	1.8	1.7	1.9	1.7	6.2	2.9	24
15	1.1	1.0	1.4	0.9	0.5	2.5	3.7	4.3	5.9	5.5	6.2	7.1	8.8	10.2	10.9	12.2	8.6	7.0	6.1	6.4	6.9	7.9	6.6	5.4	0.5	12.2	5.2	24
16	3.4	2.1	1.3	0.2	1.3	5.5	11.4	14.1	13.4	5.7	4.2	11.4	9.2	8.2	5.8	7.7	8.1	4.6	5.9	8.0	6.2	6.9	4.8	5.4	0.2	14.1	3.0	24
17	5.2	4.5	5.4	5.7	5.2	5.4	5.3	6.1	5.9	7.0	6.1	6.7	6.3	4.3	4.2	4.7	6.9	5.4	3.1	2.4	3.8	2.5	2.1	2.0	2.0	7.0	4.1	24
18	2.9	2.2	1.9	0.9	1.9	3.5	3.6	2.7	2.5	2.2	2.3	1.3	2.4	3.3	4.3	3.9	4.6	4.9	4.6	2.8	3.3	3.5	2.4	2.8	0.9	4.9	2.6	24
19	3.3	4.4	2.1	1.5	4.2	3.2	5.7	6.2	4.8	5.5	6.2	6.6	7.1	6.5	5.1	5.1	6.1	5.9	2.4	2.4	2.8	5.9	2.9	1.1	1.1	7.1	3.7	24
20	1.7	1.1	1.3	2.5	3.2	3.7	4.1	4.7	4.9	5.5	5.8	5.7	5.1	4.2	9.9	3.2	8.2	5.0	5.9	4.3	4.5	3.5	4.3	4.4	1.1	9.9	3.7	24
21	5.4	6.1	4.6	2.3	3.4	5.2	3.9	2.3	1.7	3.5	6.1	4.7	4.7	4.1	6.5	5.1	1.5	3.7	2.5	2.7	0.8	1.2	0.9	1.3	0.8	6.5	2.8	24
22	0.1	0.8	0.4	1.2	0.8	0.4	1.3	2.8	5.3	6.8	5.4	6.3	5.9	4.3	7.2	5.3	3.8	5.2	5.2	3.7	3.5	4.3	5.0	5.8	0.1	7.2	3.6	24
23	4.5	5.8	4.3	4.1	3.0	2.1	2.0	3.3	5.2	4.7	5.1	5.4	4.8	4.4	3.9	3.4	3.5	3.3	2.7	1.4	2.0	1.9	7.4	6.8	1.4	7.4	2.6	24
24	13.4	5.3	3.2	1.7	3.5	5.3	6.4	6.1	5.7	5.9	7.0	6.8	5.6	2.4	5.7	7.3	6.8	8.0	8.9	9.7	9.6	8.8	8.3	6.7	1.7	13.4	4.2	24
25	7.4	5.3	5.4	5.0	3.6	4.4	4.4	4.6	4.2	5.0	5.5	4.1	4.0	3.1	3.7	4.9	4.1	3.9	4.3	4.6	4.2	4.0	4.4	5.0	3.1	7.4	3.1	24
26	3.9	3.4	3.2	2.9	0.4	0.8	5.2	4.6	4.3	5.6	5.9	6.4	8.3	9.6	9.5	8.8	7.1	7.3	4.7	3.5	4.5	4.4	5.3	5.6	0.4	9.6	5.0	24
27	4.2	1.9	0.8	2.5	2.3	2.6	1.5	4.2	4.4	4.2	3.4	3.5	5.2	5.1	5.0	4.8	5.0	3.4	2.1	0.8	1.0	0.6	6.5	4.4	0.6	6.5	1.9	24
28	2.0	2.1	1.3	2.9	3.1	2.5	2.8	3.8	3.5	5.1	6.2	6.5	7.0	6.6	7.4	6.8	5.7	5.3	4.4	3.8	4.0	5.1	4.4	2.8	1.3	7.4	4.0	24
29	2.8	2.0	1.5	2.9	5.0	5.0	2.3	2.2	5.0	3.9	4.3	5.9	8.3	7.9	8.3	7.8	6.9	8.7	6.4	4.5	3.1	3.0	2.7	0.3	0.3	8.7	4.3	24
30	1.1	0.7	1.1	2.3	2.1	2.9	3.8	1.3	4.1	2.6	4.1	6.8	7.1	6.1	5.3	6.4	6.3	5.0	4.5	4.0	3.4	3.1	2.7	3.4	0.7	7.1	2.3	24
31	3.4	3.3	3.1	2.9	3.5	4.7	5.7	7.2	8.4	7.5	7.1	6.0	6.3	5.8	6.0	6.0	7.3	5.3	3.8	2.8	3.2	2.1	2.3	1.1	1.1	8.4	4.4	24
HOURLY MAX	13.4	6.1	8.2	5.7	7.9	5.5	11.4	14.1	13.4	8.5	9.1	11.4	10.4	10.2	12.0	12.2	9.9	11.3	11.5	9.7	9.6	10.3	8.3	6.8				
HOURLY AVG	0.9	1.0	0.5	0.5	1.0	0.7	0.5	0.6	0.8	1.1	1.5	1.9	2.2	2.2	2.2	2.7	2.4	2.1	1.6	1.0	1.1	1.2	1.1	1.2				

STATUS FLAG CODES

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

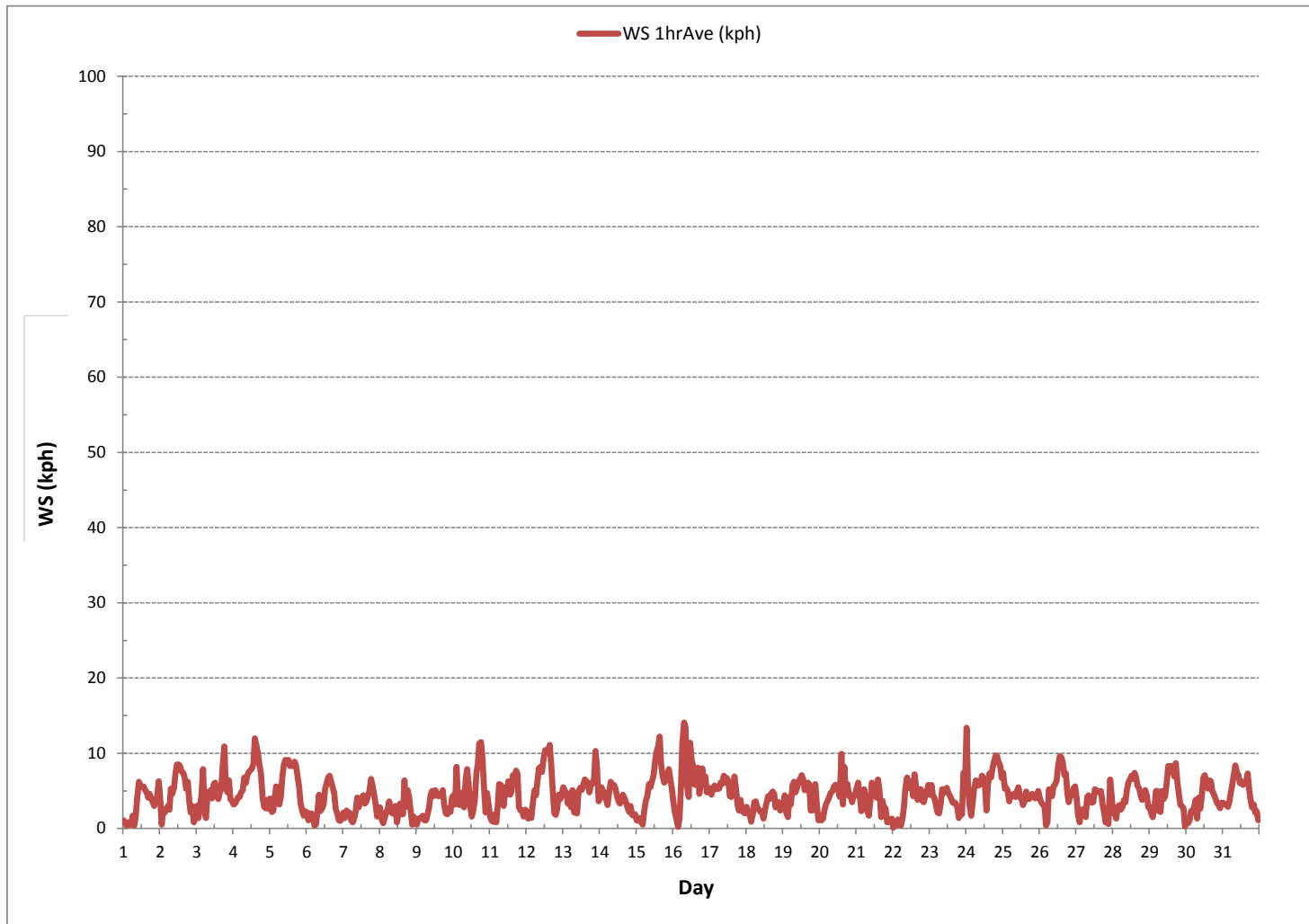
LAST CALIBRATION:	March 30, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 0 ON DAY 22
MAXIMUM 1-HR AVERAGE:	14.1 kph @ HOUR 7 ON DAY 16
MAXIMUM 24-HR AVERAGE:	5.7 kph ON DAY 4
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.4
MONTHLY AVERAGE:	1.3 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - July 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	4.3	3.2	2.3	3.4	3.6	2.6	4.1	6.5	11.5	15.2	19.0	20.9	15.7	18.8	18.8	13.9	14.6	16.3	14.4	11.5	8.7	10.0	13.1	21.6	2.3	21.6	11.4	24	
2	15.0	4.3	10.2	6.9	9.8	13.5	10.2	17.4	19.0	15.7	21.8	24.2	27.9	24.4	24.9	21.6	21.0	19.1	17.1	14.2	5.7	9.0	6.5	4.5	4.3	27.9	15.2	24	
3	5.6	13.1	15.5	22.9	25.5	35.8	16.6	19.9	24.2	16.8	24.7	P	23.6	21.4	18.8	27.7	22.7	43.0	42.6	24.4	19.6	27.1	16.8	15.0	5.6	43.0	22.8	23	
4	16.8	16.8	17.3	20.6	16.9	23.8	24.0	38.2	27.5	41.9	47.4	38.7	36.5	37.4	44.6	35.8	41.7	33.0	34.5	20.7	12.2	11.8	14.1	17.2	11.8	47.4	27.9	24	
5	23.6	6.5	9.6	10.0	13.7	15.7	16.1	19.2	29.5	40.9	38.7	38.0	44.6	35.4	35.4	40.0	39.3	36.3	30.4	21.1	12.9	8.6	5.1	10.7	5.1	44.6	24.2	24	
6	7.4	4.3	5.2	4.3	4.3	4.3	4.3	8.7	11.3	9.1	9.6	16.1	21.8	30.6	33.9	31.0	32.5	21.1	24.4	13.3	8.7	4.1	3.2	3.4	3.2	33.9	13.2	24	
7	5.8	3.9	5.0	4.5	5.0	3.9	5.0	6.7	12.6	19.0	17.0	19.9	20.4	30.0	23.6	19.1	18.4	17.5	16.7	12.8	8.5	8.0	13.1	5.0	3.9	30.0	12.6	24	
8	7.8	6.1	4.5	6.3	27.3	19.0	13.5	7.1	10.9	9.6	12.6	13.5	14.6	13.9	12.8	12.6	19.0	10.0	27.3	16.4	9.6	3.6	5.9	4.5	3.6	27.3	12.0	24	
9	4.5	5.9	3.9	4.1	4.8	4.5	4.8	12.2	14.0	14.5	16.9	21.9	19.1	17.8	21.0	21.0	20.9	19.0	17.2	6.1	6.5	10.2	10.9	41.5	3.9	41.5	13.5	24	
10	12.4	16.4	31.9	30.6	11.5	10.4	13.1	11.1	19.2	21.6	19.2	13.5	15.5	14.8	17.0	26.8	36.0	32.3	27.1	21.6	16.4	8.5	P	11.2	8.5	36.0	19.0	23	
11	6.1	5.0	4.7	8.3	3.9	11.3	12.4	18.5	11.5	11.1	24.0	24.9	28.8	26.0	22.9	28.6	20.9	22.5	22.7	14.4	11.5	8.9	5.4	5.9	3.9	28.8	15.0	24	
12	12.0	10.0	9.6	4.5	11.8	13.5	15.3	21.1	25.8	28.4	24.9	31.7	36.1	31.2	32.8	37.9	34.9	20.0	20.2	8.7	7.8	10.4	12.0	11.8	4.5	37.9	19.7	24	
13	17.9	16.6	12.6	9.6	11.3	9.1	18.8	9.1	10.9	12.0	20.1	24.9	21.8	23.3	27.7	27.7	23.5	19.2	21.8	31.0	56.8	43.3	31.5	15.9	9.1	56.8	21.5	24	
14	14.8	24.9	30.4	23.8	15.5	13.1	21.0	21.8	20.7	31.0	20.7	16.8	15.5	20.8	16.7	16.9	17.1	15.4	12.3	8.1	6.1	5.0	4.5	3.9	3.9	31.0	16.5	24	
15	3.0	2.8	3.9	4.3	3.9	7.1	8.5	18.5	18.3	25.5	31.7	27.0	33.8	34.3	36.0	40.0	32.5	34.3	22.0	24.4	20.5	21.1	22.0	17.9	2.8	40.0	20.6	24	
16	16.1	8.7	10.9	16.4	14.4	21.1	40.2	31.2	35.8	22.9	30.1	X	35.4	35.1	26.3	32.2	33.5	22.6	19.5	24.0	24.0	28.4	20.5	21.2	8.7	40.2	27.2	23	
17	28.0	21.6	27.1	24.9	25.3	22.1	21.8	27.1	29.3	31.7	29.3	24.2	34.1	22.3	25.5	26.6	31.0	23.8	20.7	9.1	9.0	7.5	9.6	11.8	7.5	34.1	22.6	24	
18	9.1	8.5	9.1	7.1	9.8	12.2	10.2	9.8	9.6	11.1	9.8	12.2	12.0	12.0	10.0	11.3	14.4	15.7	14.2	11.8	8.5	9.9	8.1	6.6	6.6	15.7	10.5	24	
19	7.6	9.1	8.3	8.5	9.1	10.0	14.2	18.6	18.1	18.8	19.2	P	26.4	22.5	22.0	22.5	22.0	22.9	17.7	10.7	17.7	28.2	10.0	4.4	4.4	28.2	16.0	23	
20	6.6	4.8	5.5	10.4	8.5	12.4	10.9	14.4	21.6	21.8	24.0	22.7	23.6	18.5	27.7	15.5	27.7	24.4	26.6	14.8	10.9	8.7	13.5	16.4	4.8	27.7	16.3	24	
21	P	27.1	17.2	15.5	14.6	31.0	16.8	14.2	8.5	13.8	39.4	18.9	21.5	17.7	16.8	13.5	8.3	12.0	15.7	8.5	3.2	4.3	3.6	5.4	3.2	39.4	15.1	23	
22	4.3	5.2	2.3	3.0	4.1	4.5	6.7	10.2	12.6	16.4	14.8	22.5	20.7	28.4	27.1	20.1	14.1	17.7	14.6	9.3	6.5	9.6	11.1	12.8	2.3	28.4	12.4	24	
23	10.4	14.6	18.3	17.5	17.1	7.9	8.1	13.8	18.4	22.8	19.7	23.7	18.8	23.6	15.0	14.6	11.5	13.1	13.1	5.8	5.6	8.9	29.5	31.3	5.6	31.3	16.0	24	
24	36.7	19.4	16.1	12.6	15.3	29.9	30.8	27.5	22.9	19.9	20.1	20.1	17.9	10.4	24.0	31.2	P	37.6	34.5	43.7	42.4	36.3	29.3	25.3	10.4	43.7	26.3	23	
25	27.9	21.8	17.7	19.7	12.9	23.4	13.7	16.4	15.5	17.4	19.4	19.0	16.1	15.5	17.0	15.9	15.7	15.2	12.8	10.0	6.5	7.1	6.5	P	6.5	27.9	15.8	23	
26	9.1	7.9	8.6	9.0	3.0	5.6	12.2	11.8	13.9	17.9	16.3	19.2	23.8	29.0	27.1	22.9	P	20.9	16.3	P	9.6	11.3	12.8	17.2	3.0	29.0	14.8	22	
27	13.1	8.5	3.9	6.9	7.1	7.8	9.0	17.6	16.4	P	15.7	19.0	20.1	20.5	22.0	23.5	21.8	15.5	P	4.3	3.9	5.0	64.5	24.9	3.9	64.5	16.0	22	
28	16.6	22.7	12.2	15.5	12.0	10.2	14.4	15.3	14.4	24.9	27.1	27.5	30.1	35.0	31.2	31.7	34.1	25.6	25.0	22.2	11.6	9.9	10.1	11.9	9.9	35.0	20.5	24	
29	5.3	6.3	4.3	6.9	18.1	15.7	8.0	12.8	14.6	17.7	22.7	21.4	28.6	21.1	23.3	20.5	20.1	22.2	19.6	13.9	6.5	7.6	6.3	2.8	2.8	28.6	14.4	24	
30	5.8	3.4	9.1	10.4	10.2	10.2	18.1	16.6	13.3	15.9	19.9	24.7	25.1	19.2	19.0	21.6	26.4	17.2	19.2	15.9	16.0	13.1	13.6	12.1	3.4	26.4	15.7	24	
31	12.9	10.9	12.6	12.8	12.9	21.0	23.1	28.4	30.1	28.4	40.0	25.3	29.5	32.3	28.1	26.8	31.7	24.4	18.3	26.4	19.0	8.5	8.5	8.3	8.3	40.0	21.7	24	
HOURLY MAX	36.7	27.1	31.9	30.6	27.3	35.8	40.2	38.2	35.8	41.9	47.4	38.7	44.6	37.4	44.6	40.0	41.7	43.0	42.6	43.7	56.8	43.3	64.5	41.5					
HOURLY AVG	12.2	11.0	11.3	11.7	11.7	14.0	14.4	16.8	18.1	20.5	23.1	22.6	24.5	24.0	24.2	24.2	24.4	22.3	21.3	16.0	13.3	12.7	14.1	13.4					

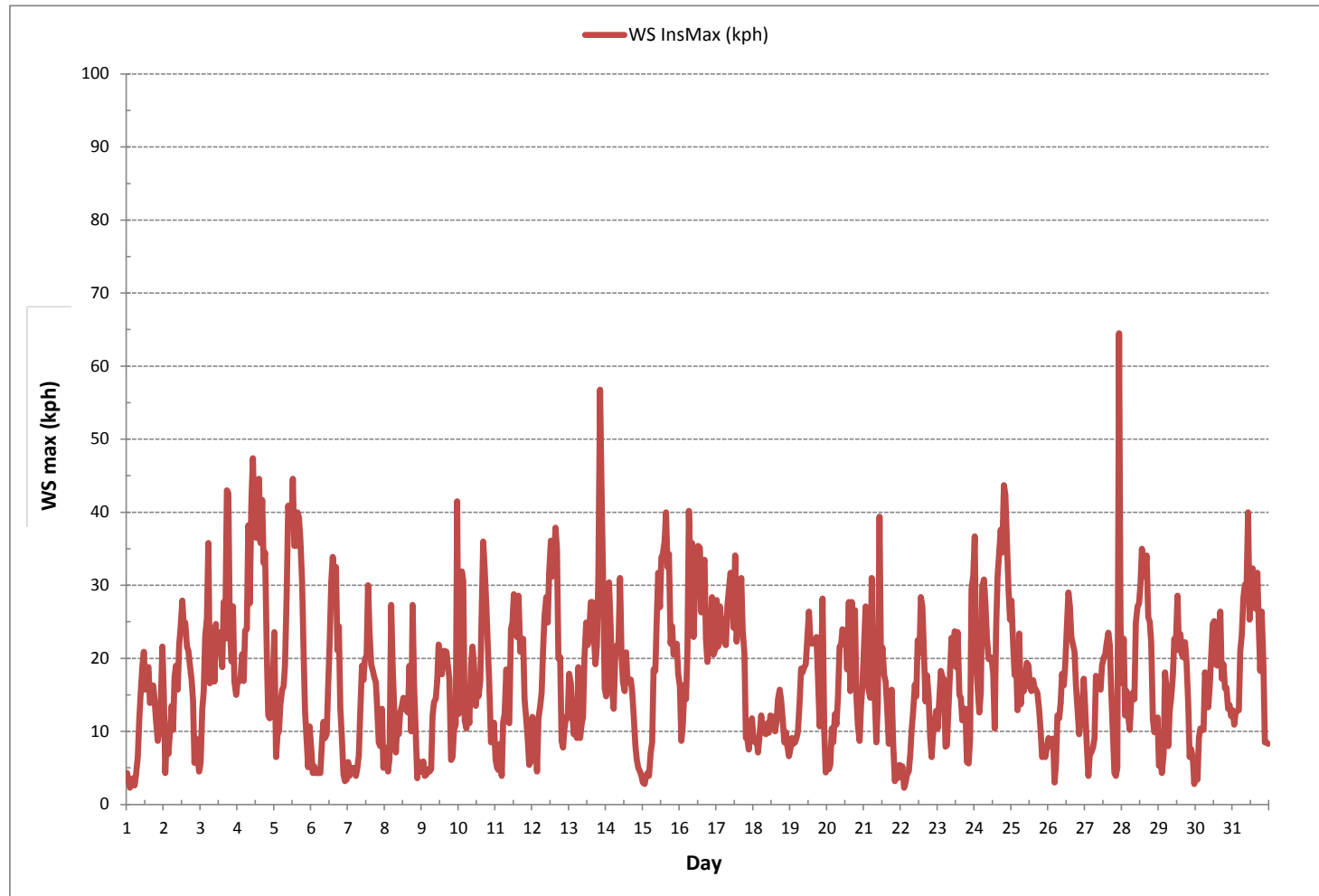
STATUS FLAG CODES

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:	64.5	kph	@ HOUR	22	ON DAY	27	
OPERATIONAL TIME:						733	hrs

WIND SPEED Instantaneous Maximum (WS kph)



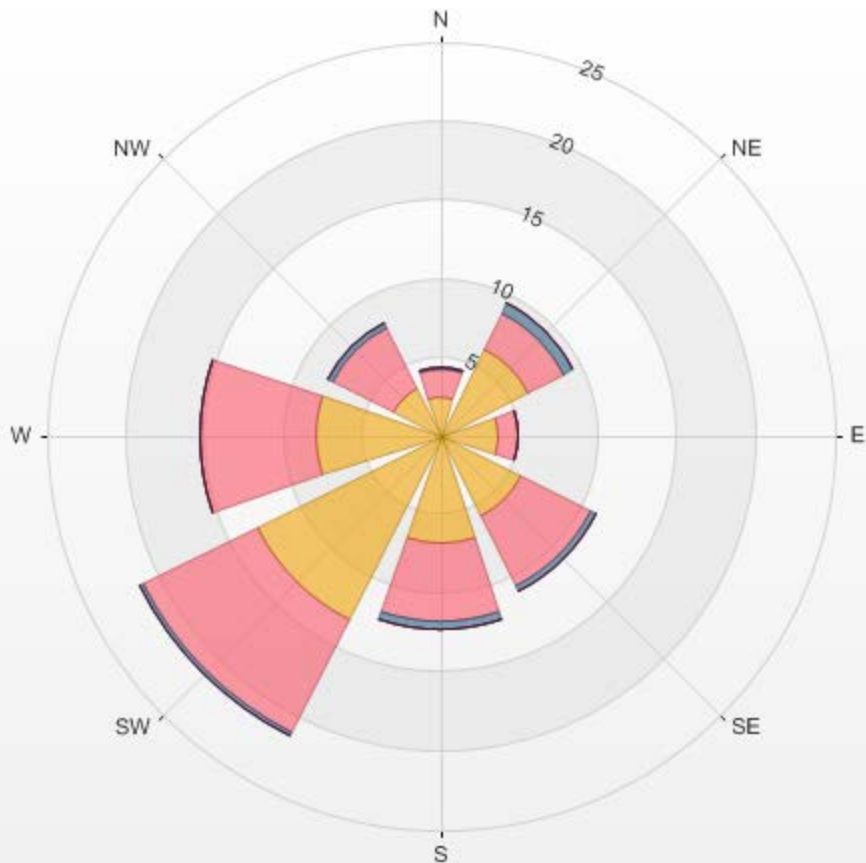
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 17/07
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 13.04%

Direction	1.8-5.0	5.0-9.9	9.9-14.9	14.9-19.8	19.8-24.8	>24.8	Total
N	2.4	1.9	0.1	0.0	0.0	0.0	4.4
NE	6.2	2.6	0.7	0.0	0.0	0.0	9.4
E	3.6	1.3	0.0	0.0	0.0	0.0	5.0
SE	5.7	5.0	0.4	0.0	0.0	0.0	11.0
S	6.9	5.0	0.5	0.0	0.0	0.0	12.4
SW	13.0	8.1	0.3	0.0	0.0	0.0	21.4
W	7.9	7.4	0.0	0.0	0.0	0.0	15.3
NW	3.4	4.3	0.4	0.0	0.0	0.0	8.1
Summary	49.1	35.5	2.4	0.0	0.0	0.0	86.9

%	Icon	Classes (kph)	49		1.8-5.0	35		5.0-9.9	2		9.9-14.9	0		14.9-19.8	0		19.8-24.8	0		>24.8
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LICA MASKWA 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 13.04% Calm Wind Avg Speed: 1.10(kph)



WIND DIRECTION



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

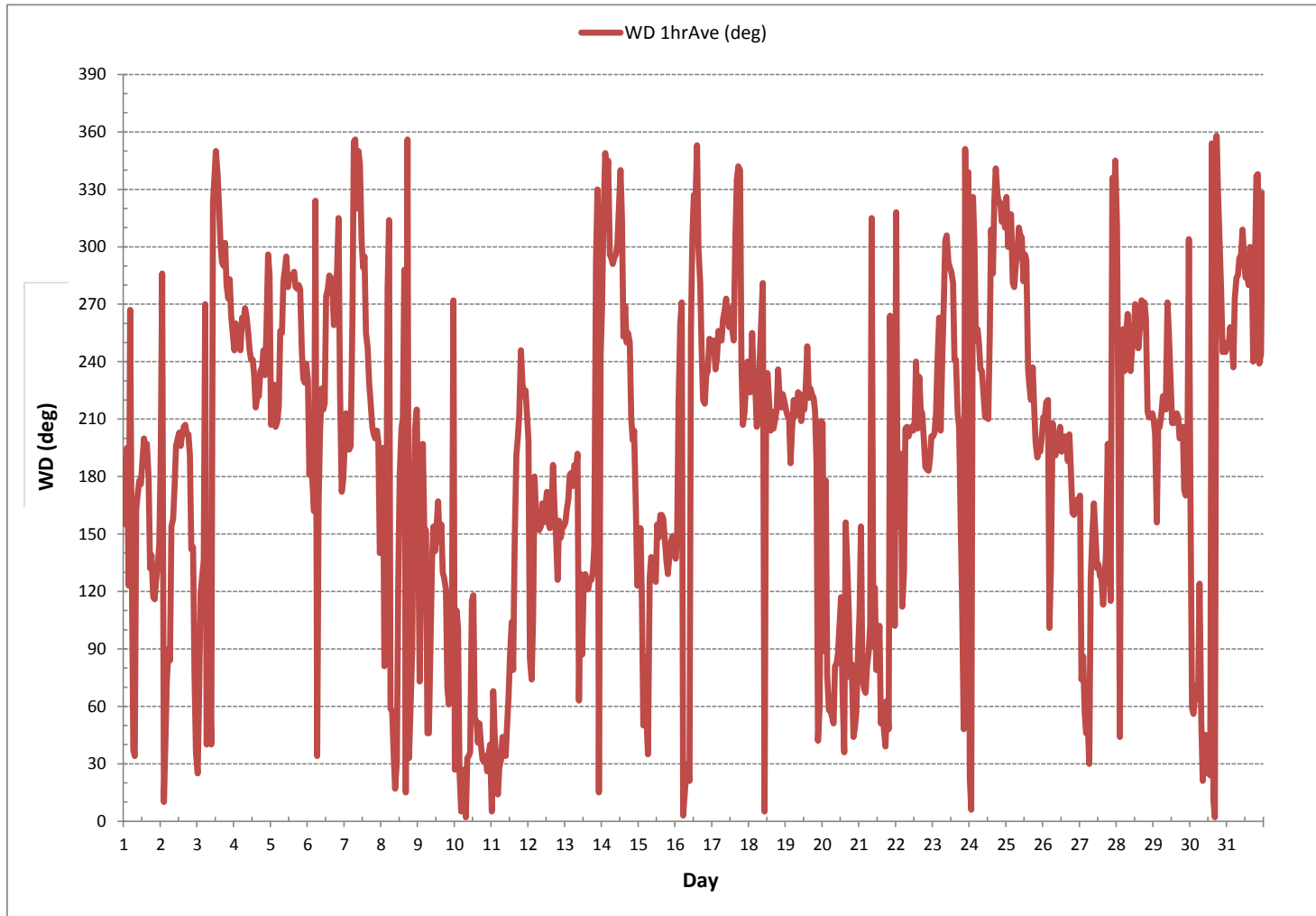
STATUS FLAG CODES

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	88		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	225 (SW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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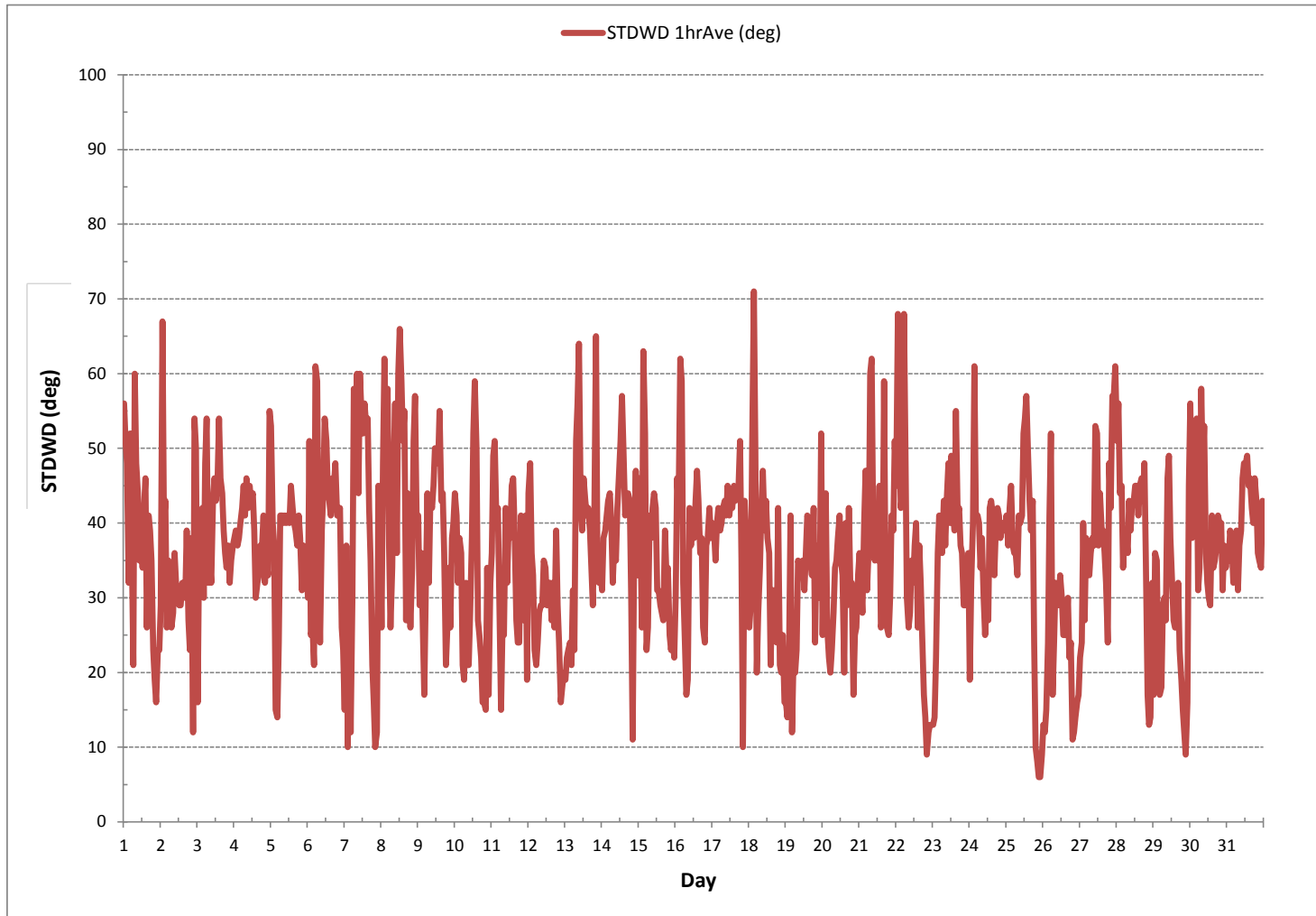
STATUS FLAG CODES

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: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

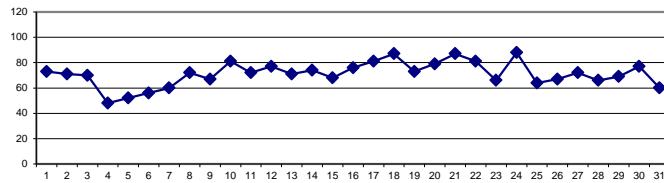
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

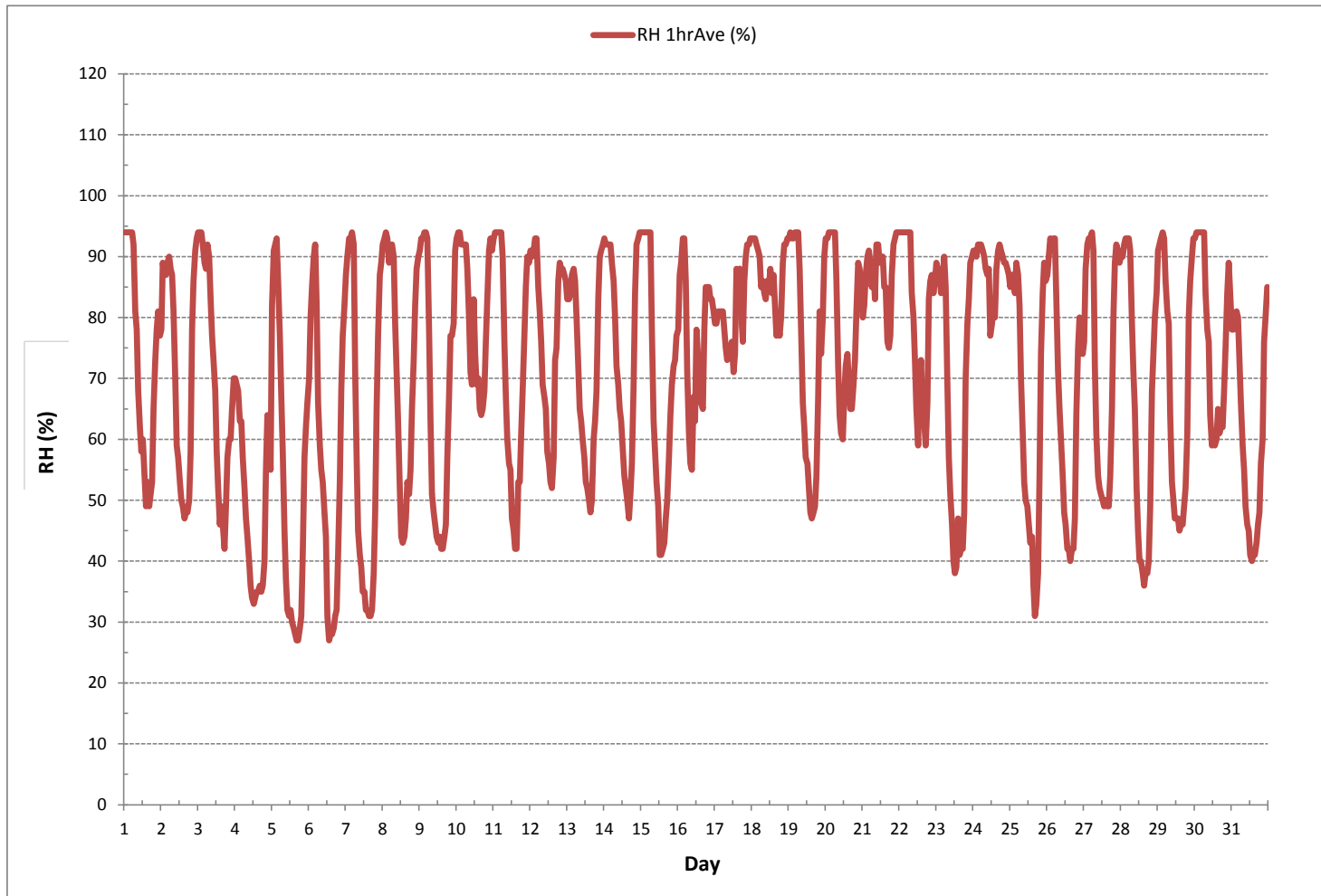
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27	%	@ HOUR	16	ON DAY	5
MAXIMUM 1-HR AVERAGE:	94	%	@ HOUR	0	ON DAY	1
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	24
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	19					MONTHLY AVERAGE: 71 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

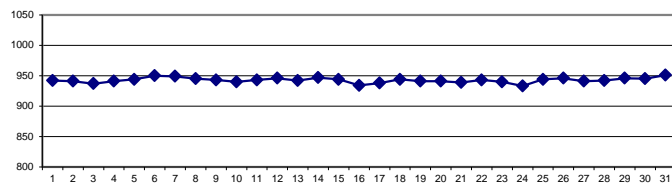
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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

STATUS FLAG CODES

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

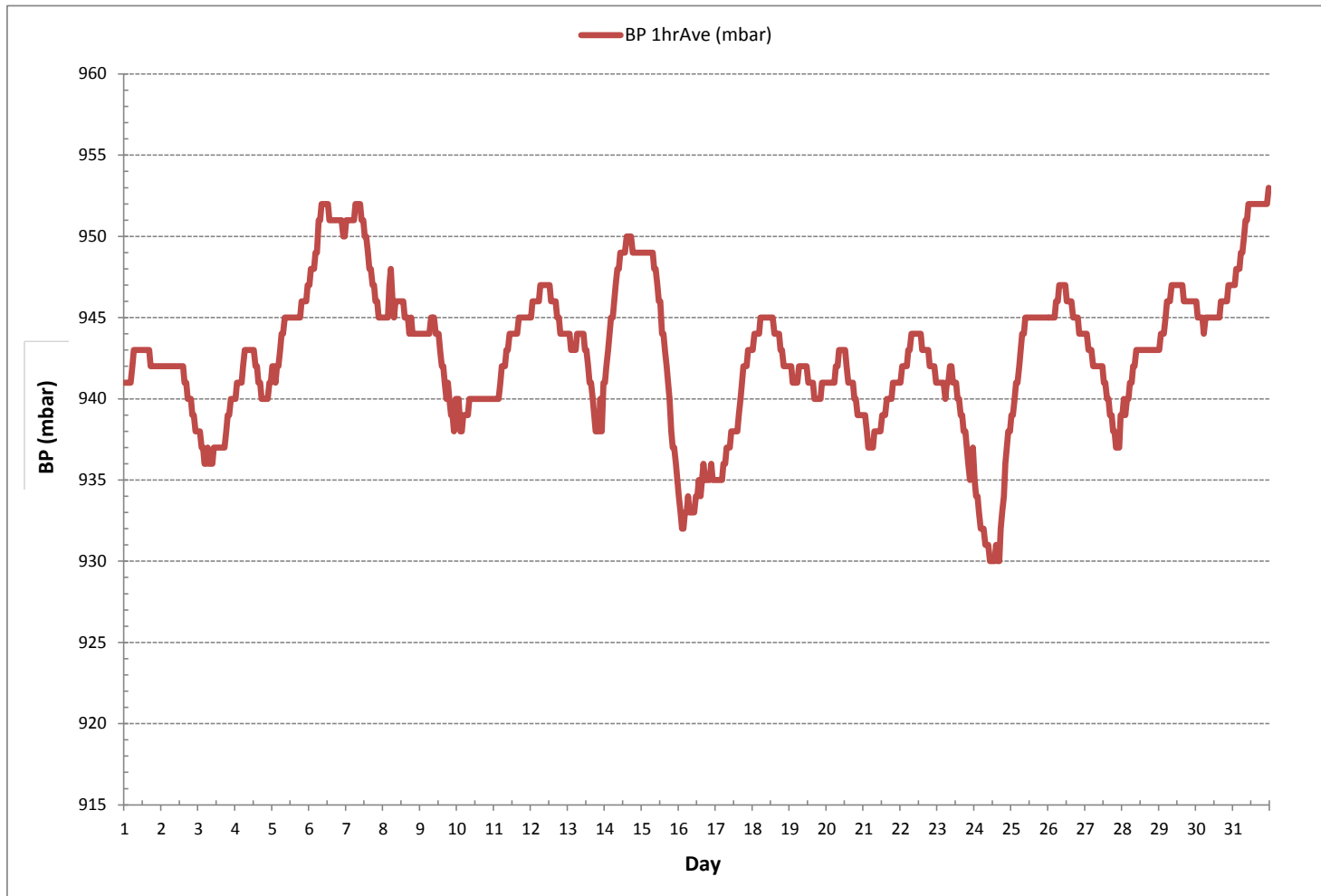
24 HR AVERAGES July 2017



MONTHLY SUMMARY

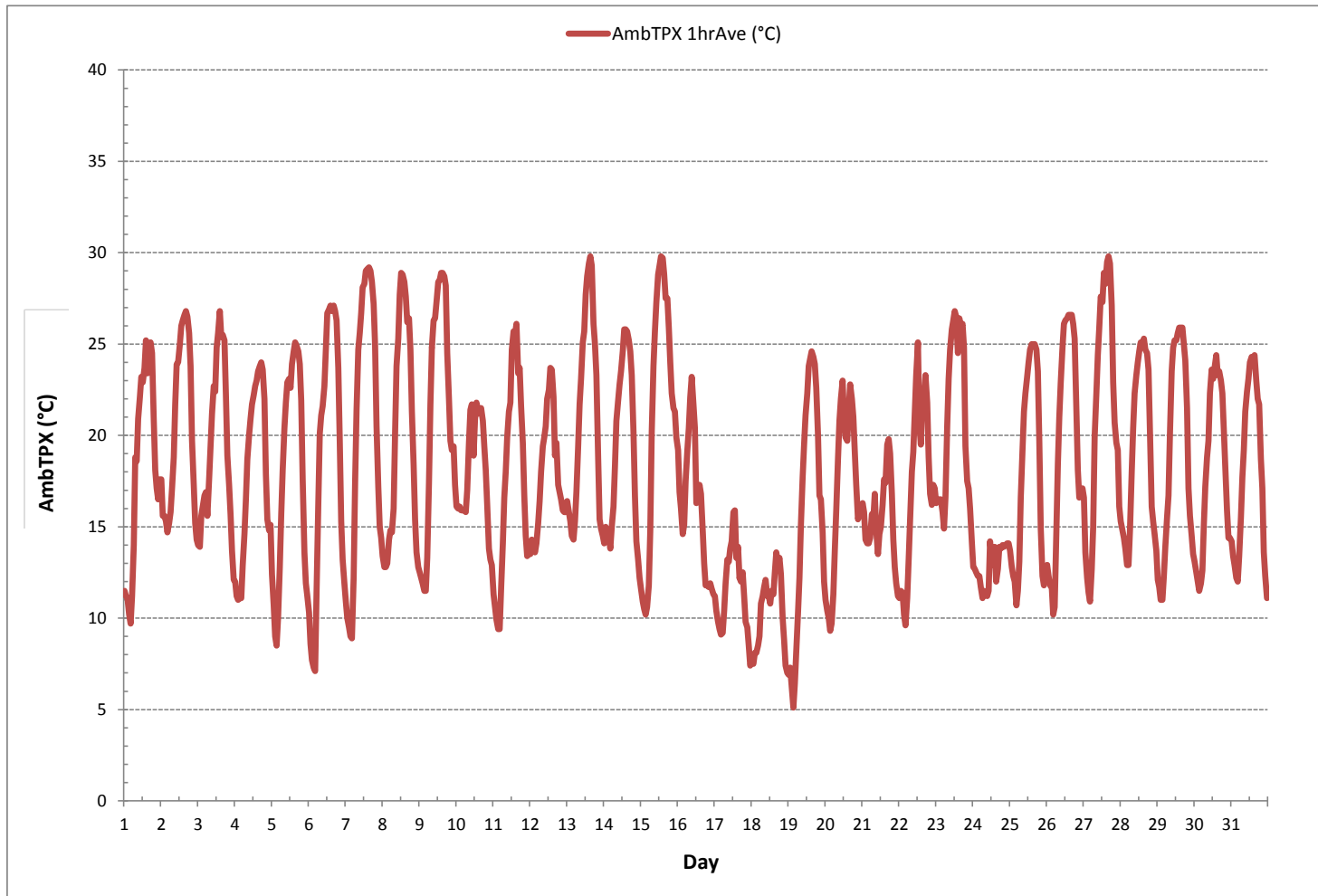
MINIMUM 1-HR AVERAGE:	930 mbar	@ HOUR	10	ON DAY	24
MAXIMUM 1-HR AVERAGE:	953 mbar	@ HOUR	23	ON DAY	31
MAXIMUM 24-HR AVERAGE:	951 mbar			ON DAY	31
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	4			MONTHLY AVERAGE:	943 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

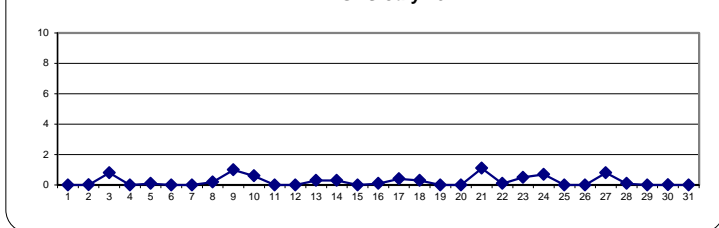
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0.0	0.0	0.1	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	0.1	0.0	24
2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
3	0.0	0.0	0.0	0.0	0.0	12.7	6.8	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	12.7	0.8	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	3.0	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	0.0	3.0	0.1	24		
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
8	0.0	0.0	0.0	0.0	2.6	2.4	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	2.6	0.2	24		
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	22.9	0.0	22.9	1.0	24			
10	2.6	6.7	3.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.6	24		
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
12	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	0.3	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	24		
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.1	2.9	0.0	0.0	0.0	0.0	0.0	4.1	0.3	24			
14	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	24		
15	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	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	2.6	4.2	3.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.4	24		
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.4	4.4	1.0	0.7	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	4.4	0.3	24		
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
21	0.0	1.3	0.2	0.0	0.0	0.0	0.7	0.1	3.1	12.9	7.3	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	1.1	24			
22	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.3	0.1	24			
23	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	4.5	6.3	0.0	0.0	6.3	0.5	24				
24	2.4	0.1	0.2	1.8	0.2	5.0	0.4	0.1	0.0	0.1	0.2	0.0	0.0	0.1	1.0	1.0	1.9	0.7	0.1	0.1	0.1	0.1	0.0	0.1	0.0	5.0	0.7	24				
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	16.5	2.7	0.0	16.5	0.8	24				
28	0.1	0.1	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	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	0.0	24		
30	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	0.0	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		
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
HOURLY MAX	3.0	6.7	3.4	1.8	2.6	12.7	6.8	0.1	3.1	12.9	7.3	4.4	1.0	2.6	4.2	3.1	1.0	1.9	0.7	0.2	4.1	2.9	16.5	22.9	0.0	0.0	0.0	0.0	24			
HOURLY AVG	0.3	0.3	0.2	0.1	0.1	0.7	0.3	0.0	0.1	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.7	1.0	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

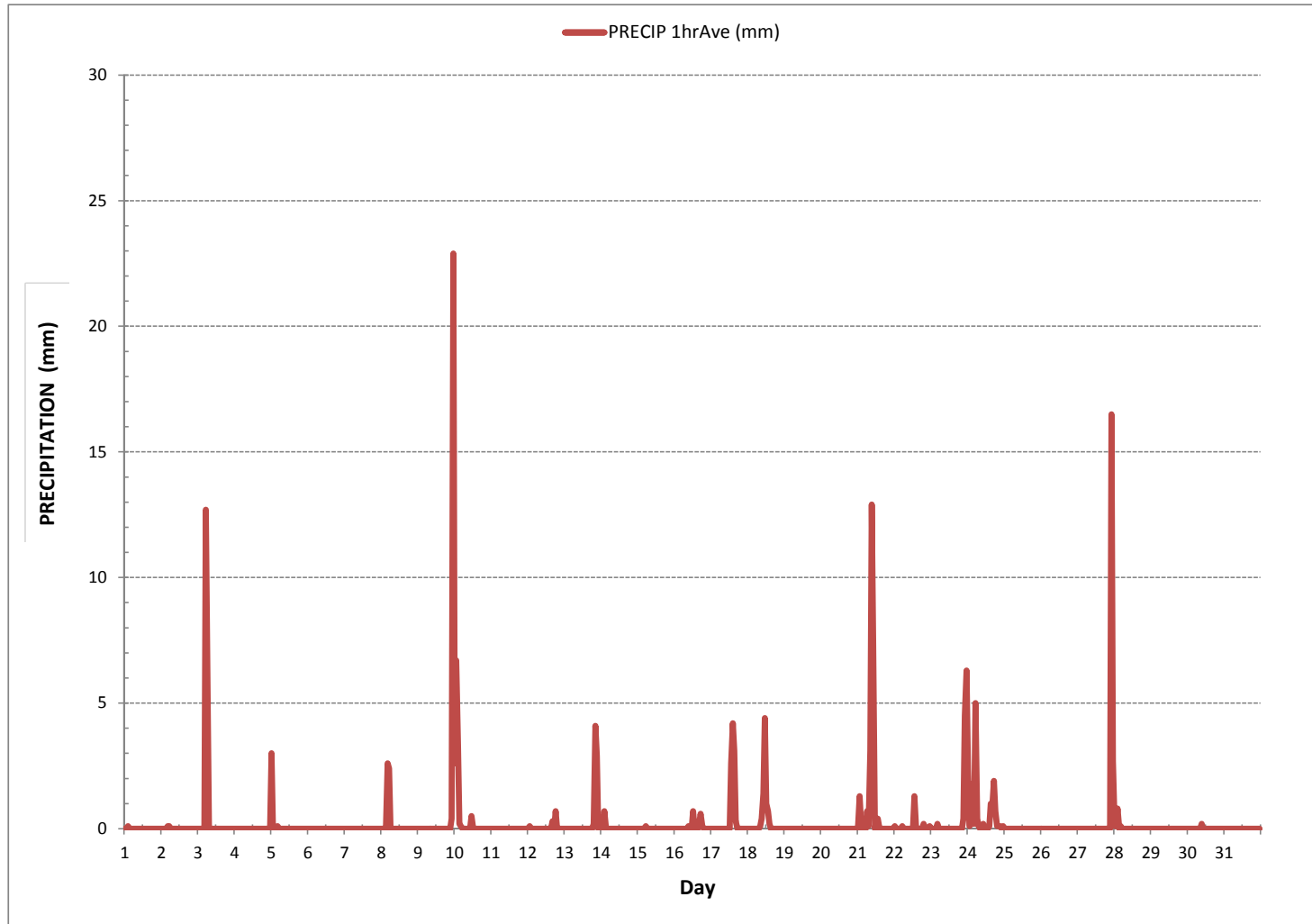
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	22.9	mm	@ HOUR	23	ON DAY	9
MAXIMUM 24-HR AVERAGE:	1.1	mm			ON DAY	21
MONTHLY TOTAL	169.5	mm				
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	1.4		MONTHLY AVERAGE:			0.2 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

Date: <u>July 6, 2017</u>	Barometer Data/B.P.: <u>Fisher Scientific, I.D. # 05544</u>	951 mb
Company/Airshed: <u>LICA</u>	Thermometer Data/Station Temp °C: <u>FLUKE 1551 A Ex STIK / I.D. # 4294</u>	22* C
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>	
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>	
Start Time 24 hr. (mst): <u>9:45</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Tom Bourque</u>
End Time 24 hr. (mst): <u>14:02</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>508</u>	Range ppb: <u>1000</u>
Last Calibration Date: <u>June 14, 2017</u>	As Found C.F.: <u>1.007</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>0.999</u>

Calibration Standards:		Standard Calibration Points for Ranges								
Low Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 152020 / Nov 21, 2016</u>		<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb									
High	780									
Mid	380									
Low	190									
High Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 148943 / Nov 21, 2016</u>										
Calibrator ID/Cert. Date: <u>API 700 / s.n. 627 / Jan 27, 2017</u>										
Cal Gas Cylinder I.D. #: <u>LL104222</u>										
Cal Gas Conc. (ppm): <u>50.6</u>										

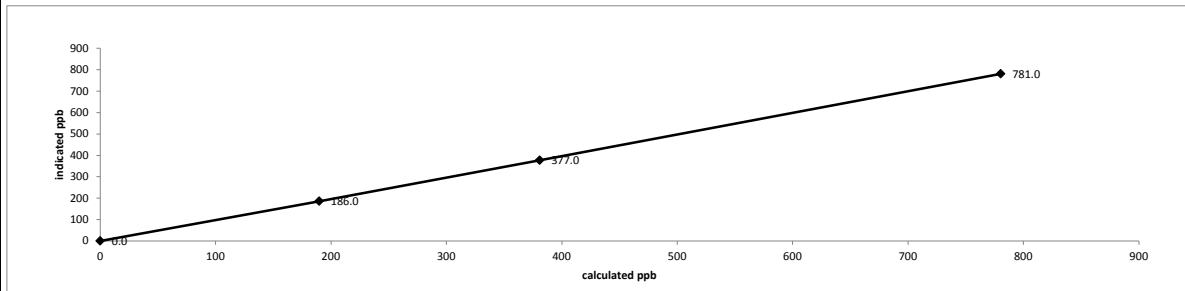
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	4900	0.00	4900	0.0	1.0	n/a
as found high	4955	77.61	5033	780.3	776.0	1.007
adjusted zero	4900	0.00	4900	0.0	0.0	n/a
adjusted high	4955	77.61	5033	780.3	781.0	0.999
mid	4982	37.78	5020	380.8	377.0	1.010
low	4996	18.81	5015	189.8	186.0	1.020
calibrator zero	4900	0.00	4900	0.0	0.0	n/a
Average C.F.=						1.010

Linear Regression/Calibration Results:

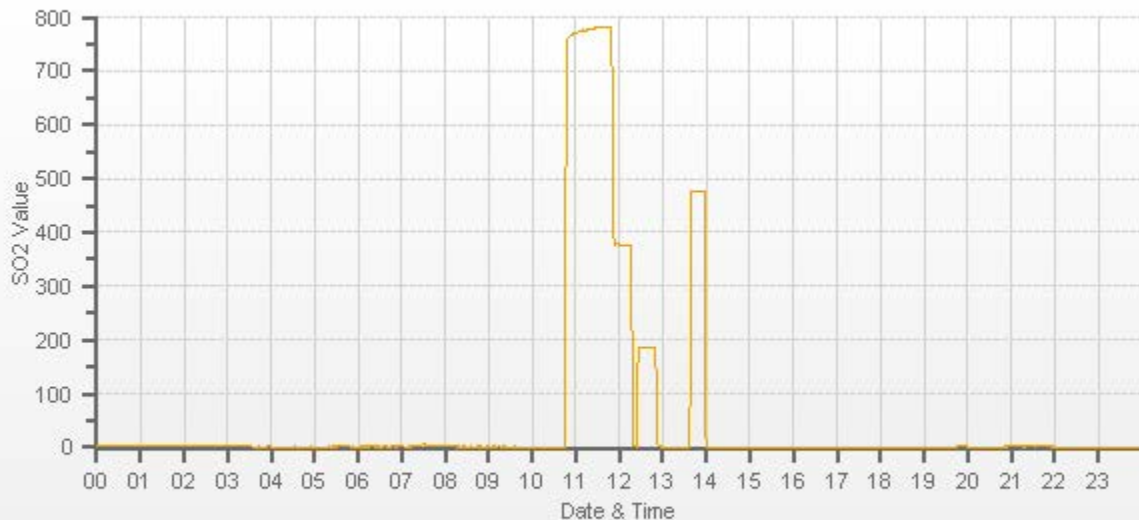
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.998</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.25%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.68%</u>	± 3% F.S.
	± 10%

API 100ESulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: <u>0.973</u> Offset: <u>136.3</u> Hvps: <u>483</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.2</u> Pmt Temp: <u>7.7</u> Izs Temp: <u>50.0</u> Pres: <u>25.0</u> Samp Fl: <u>589</u> Norm Pmt: <u>137.8</u> Uv Lamp: <u>2620.4</u> Lamp Ratio: <u>95.7</u> Str Lgt: <u>66.3</u> Drk Pmt: <u>10.1</u> Drk Lmp: <u>-0.5</u> Expected Value: <u>474.4</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.976</u> Offset: <u>137.6</u> Hvps: <u>483</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.5</u> Pmt Temp: <u>7.7</u> Izs Temp: <u>50.0</u> Pres: <u>25.0</u> Samp Fl: <u>589</u> Norm Pmt: <u>138.3</u> Uv Lamp: <u>2619.6</u> Lamp Ratio: <u>95.8</u> Str Lgt: <u>67.2</u> Drk Pmt: <u>10.5</u> Drk Lmp: <u>-0.5</u> Expected Value: <u>477.0</u>
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Comments:
The analyzer sample inlet filter was changed. Flow measurements after mid-point.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101A Hydrogen Sulphide Analyzer Calibration

Date:	July 1, 2017	Barometer Data/B.P.:	Fisher Scientific, I.D. # 05544	943 mb
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	FLUKE 1551 A Ex STIK / I.D. # 4294	23 °C
Location/Station Name:	Maskwa	Weather Conditions:	A few clouds	
Parameter:	Hydrogen Sulphide	Calibration Purpose:	as found	
Start Time 24 hr. (mst):	13:18	Performed By/Reviewer:	Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst):	15:21	Cal Gas Expiry Date:	June 14, 2019	
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a	

Analyzer:	
ID# or Serial Number:	324
Range ppb:	100
Last Calibration Date:	June 14, 2017
As Found C.F.:	1.009
Previous C.F.:	1.000
New C.F.:	n/a

Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: EnviroNics 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Standard Calibration Points for Ranges</th> </tr> <tr> <th style="text-align: center;">Point</th> <th style="text-align: center;">ppb</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">High</td> <td style="text-align: center;">78</td> </tr> <tr> <td style="text-align: center;">Mid</td> <td style="text-align: center;">38</td> </tr> <tr> <td style="text-align: center;">Low</td> <td style="text-align: center;">19</td> </tr> </tbody> </table>	Standard Calibration Points for Ranges		Point	ppb	High	78	Mid	38	Low	19
Standard Calibration Points for Ranges											
Point	ppb										
High	78										
Mid	38										
Low	19										

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

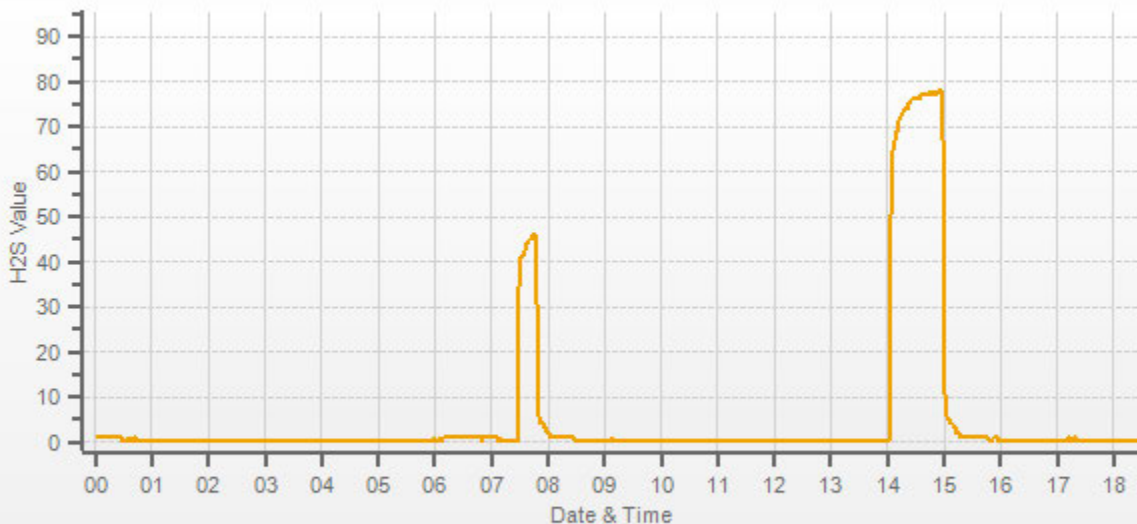
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7595	0.00	7595	0.0	-0.1	n/a
as found high	7519	58.29	7577	78.5	77.7	1.009
Average C.F. =						n/a

Linear Regression/Calibration Results:

Correlation Coefficient =	n/a	> or = 0.995	LIMITS
Slope =	n/a	.95-1.05	
b (Intercept as % of full scale) =	n/a	± 3% F.S.	
% change in C.F. from last cal =	-0.86%	± 10%	

As found:	As left:
Slope: 1.008	Slope: 1.008
Offset: 23.5	Offset: 23.5
Hvps: 676	Hvps: 676
Dcps: 2578	Dcps: 2578
Rcell Temp: 49.4	Rcell Temp: 51.5
Box Temp: 29.4	Box Temp: 31.3
Pmt Temp: 6.9	Pmt Temp: 6.7
IZS TEMP: 50.2	IZS TEMP: 50.4
Converter Temp: 325.8	Converter Temp: 325.4
Pres: 24.3	Pres: 24.3
Samp Fl: 512	Samp Fl: 515
Uv Lamp: 3861.4	Uv Lamp: 3875.0
Lamp Ratio: 109.5	Lamp Ratio: 110.7
Str Lgt: 11.8	Str Lgt: 11.8
Drk Pmt: 39.0	Drk Pmt: 39.0
Drk Lmp: -3.7	Drk Lmp: -3.7
Expected Value: 50.5	Expected Value: 50.5

Comments:
 The SO2 scrubber check was not performed.
 No high point adjustment was required/made.
 No zero adjustment was required/made.
 The analyzer perm tube was changed , the new expected value will be updated once the perm tube temperature has stabilized.



— H2S[ppb]



API 101A Hydrogen Sulphide Analyzer Calibration

Date: July 6, 2017	Barometer Data/B.P.: Fisher Scientific, I.D. # 05544	951 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551 A Ex STIK / I.D. # 4294	22* C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny	
Parameter: Hydrogen Sulphide	Calibration Purpose: shut down	
Start Time 24 hr. (mst): 9:45	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 12:48	Cal Gas Expiry Date: June 14, 2019	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
ID# or Serial Number: 324	Range ppb: 100
Last Calibration Date: June 14, 2017	As Found C.F.: 1.000
Previous C.F.: 1.000	New C.F.: n/a

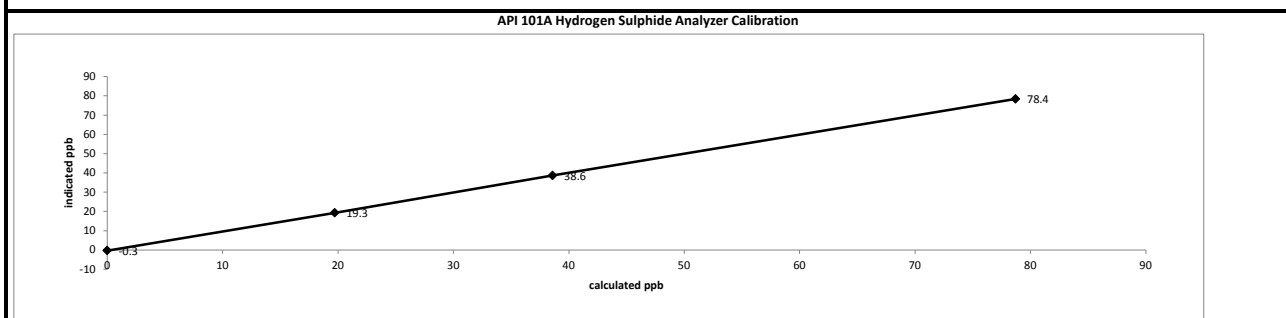
Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: Envionics 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	Standard Calibration 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)			Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):	
	Diluent	Cal Gas						
as found zero	7571	0.00		7571	0.0	-0.3	n/a	
as found high	7504	58.35		7562	78.7	78.4	1.000	
mid	7542	28.65		7571	38.6	38.6	0.992	
low	7560	14.64		7575	19.7	19.3	1.006	
Average C.F.=							0.999	

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.999	0.90-1.10
b (Intercept as % of full scale) = 0.28%	± 3% F.S.
% change in C.F. from last cal = -0.01%	± 10%



As found: Slope: 1.008 Offset: 23.5 Hvps: 677 Dcps: 2578 Rcell Temp: 49.7 Box Temp: 30.0 Pmt Temp: 6.9 IZS TEMP: 35.1 Converter Temp: 324.0 Pres: 24.6 Samp Fl: 519 Uv Lamp: 3875.6 Lamp Ratio: 110.4 Str Lgt: 11.8 Drk Pmt: 39.5 Drk Lmp: -3.2 Expected Value: 50.5	As left: Slope: n/a Offset: n/a Hvps: n/a Dcps: n/a Rcell Temp: n/a Box Temp: n/a Pmt Temp: n/a IZS TEMP: n/a Converter Temp: n/a Pres: n/a Samp Fl: n/a Uv Lamp: n/a Lamp Ratio: n/a Str Lgt: n/a Drk Pmt: n/a Drk Lmp: n/a Expected Value: n/a
--	--

Comments:

The SO2 scrubber check was not performed, see comments below.
 No high point adjustment was required/made.
 No zero adjustment was required/made.

Shutdown calibration was completed to renew SO2 scrubber material: reason - slow response on concentration changes during calibrations and daily ZS checks.



API 101A Hydrogen Sulphide Analyzer Calibration

Date: July 6, 2017	Barometer Data/B.P.: Fisher Scientific, I.D. # 05544	951 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551 A Ex STIK / I.D. # 4294	22 °C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny	
Parameter: Hydrogen Sulphide	Calibration Purpose: post repair	
Start Time 24 hr. (mst): 13:03	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 17:29	Cal Gas Expiry Date: June 14, 2019	
Calibration Metho: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:		
ID# or Serial Number: 324	Range ppb: 100	
Last Calibration Date: n/a	As Found C.F.: n/a	
Previous C.F.:	New C.F.: 1.000	

Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: EnviroNics 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	Standard Calibration Points for Ranges <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

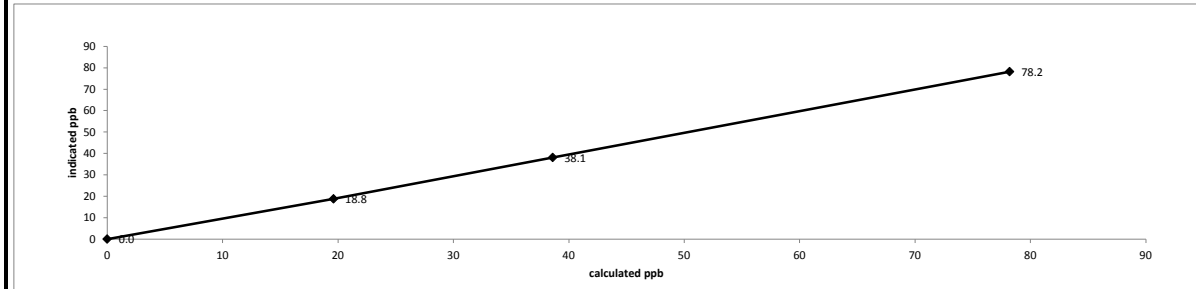
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7580	0.00	7580	0.0	0.0	n/a
adjusted high	7527	58.15	7585	78.2	78.2	1.000
mid	7552	28.69	7581	38.6	38.1	1.013
low	7563	14.57	7578	19.6	18.8	1.043
calibrator zero	7580	0.00	7580	0.0	0.0	n/a
Average C.F. =						1.019

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.997		.95-1.05
b (Intercept as % of full scale) =	0.43%		± 3% F.S.
% change in C.F. from last cal =	n/a		± 10%

API 101A Hydrogen Sulphide Analyzer Calibration

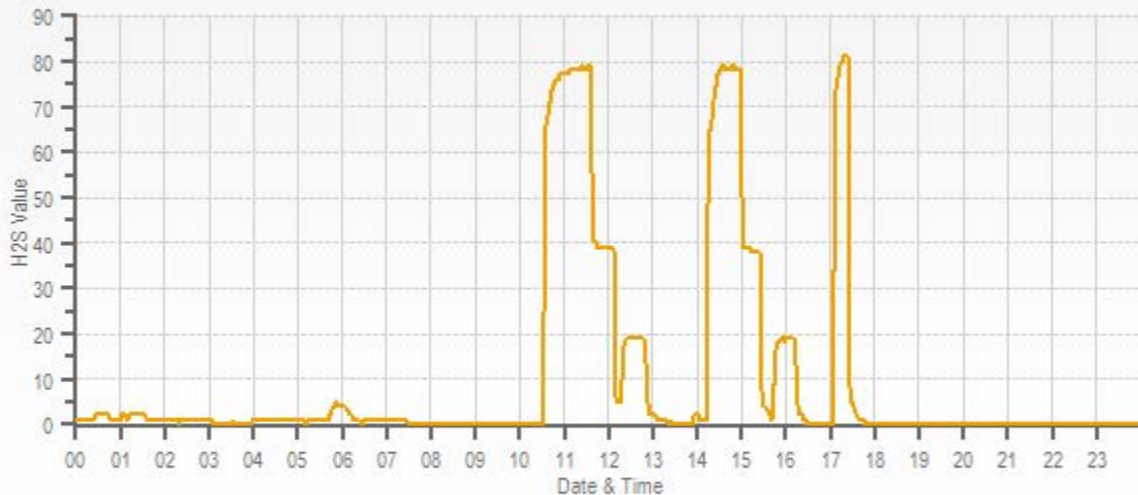


As found:	As left:
Slope: n/a	Slope: 0.986
Offset: n/a	Offset: 23.8
Hvps: n/a	Hvps: 677
Dcps: n/a	Dcps: 2579
Rcell Temp: n/a	Rcell Temp: 49.3
Box Temp: n/a	Box Temp: 30.2
Pmt Temp: n/a	Pmt Temp: 6.9
IZS TEMP: n/a	IZS TEMP: 35.3
Converter Temp: n/a	Converter Temp: 325.2
Pres: n/a	Pres: 24.5
Samp Fl: n/a	Samp Fl: 518
Uv Lamp: n/a	Uv Lamp: 3876.5
Lamp Ratio: n/a	Lamp Ratio: 111.2
Str Lgt: n/a	Str Lgt: 11.7
Drk Pmt: n/a	Drk Pmt: 39.4
Drk Lmp: n/a	Drk Lmp: -3.2
Expected Value: n/a	Expected Value: 81.1

Comments:
The analyzer sample inlet filter was changed.

Previous calibration date = "n/a". Post-repair calibration was completed after SO2 scrubber beads had been renewed.

H2S[ppb] Station: LICA MASKWA Daily: 17/07/06 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: July 13, 2017	Barometer Data/B.P.: Fisher Scientific / I.D. # 05544	9 44 bm
Company/Airshed: LUCA	Thermometer Data/Station Temp °C: FLUKE 1551 A Ex STIK / I.D. # 4294	22 °C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny	
Parameter: Hydrogen Sulphide	Calibration Purpose: installation	
Start Time 24 hr. (mst): 10:32	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 13:35	Cal Gas Expiry Date: June 14, 2019	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
ID# or Serial Number: 722	Range ppb: 100
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 0.998

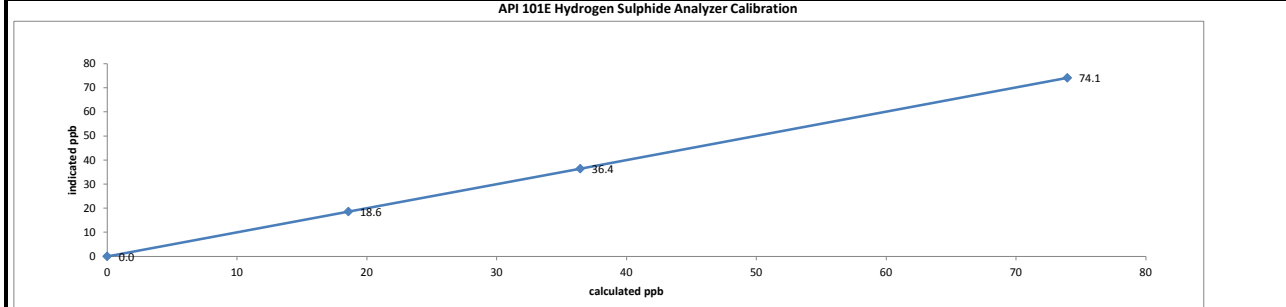
Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: Envirotronics 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	Standard 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:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	8096	0.00	8096	0.0	0.0	n/a
adjusted high	8012	58.52	8071	74.0	74.1	0.998
mid	8058	28.89	8087	36.4	36.4	1.001
low	8067	14.72	8082	18.6	18.6	0.999
calibrator zero	8096	0.00	8096	0.0	0.0	n/a
Average C.F. =						0.999

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.998	± 3% F.S.
b (Intercept as % of full scale) = 0.03%	± 10%
% change in C.F. from last cal = n/a	

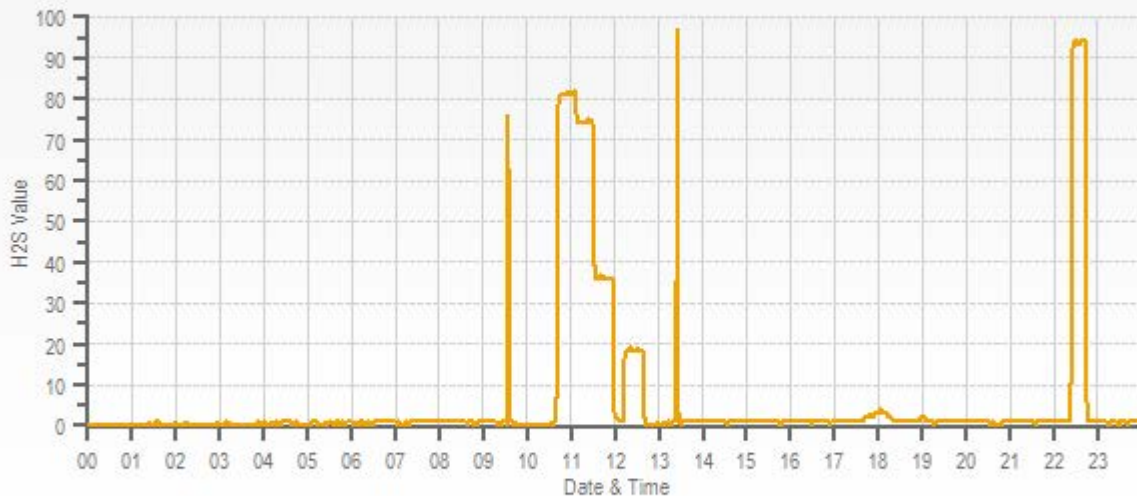


As found: Slope: n/a Offset: n/a Hvps: n/a Rcell Temp: n/a Box Temp: n/a Pmt Temp: n/a Izs Temp: n/a Converter Temp: n/a Pres: n/a Samp Fl: n/a Uv Lamp: n/a Lamp Ratio: n/a Str Lgt: n/a Drk Pmt: n/a Drk Lmp: n/a Expected Value: n/a	As left: Slope: 0.833 Offset: 97.5 Hvps: 583 Rcell Temp: 50.0 Box Temp: 30.4 Pmt Temp: 8.2 Izs Temp: 35 Converter Temp: 315.0 Pres: 23.3 Samp Fl: 620 Uv Lamp: 3223.0 Lamp Ratio: 98.5 Str Lgt: 40.6 Drk Pmt: 49.4 Drk Lmp: 3.8 Expected Value: n/a
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Comments:
The analyzer sample inlet filter was changed. Flow measurements after mid-point

Output voltage was calibrated prior to the installation calibration.

H2S[ppb] Station: LICA MASKWA Daily: 17/07/13 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	July 6, 2017	Barometer Data/B.P.:	Fisher Scientific, I.D. # 05544	951 mb
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	FLUKE 1551 A Ex STIK / I.D. # 4294	22 °C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny	
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly	
Start/End Time 24 hr. (mst):	15:57 / 19:06	Performed By/Reviewer:	Alex Yakupov	Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023	

Analyzer:	ID# or Serial Number: 436609738	Range ppm: 50
	Last Calibration Date: June 14, 2017	As Found C.F.: 1.006
	Previous Cal High Point C.F.: 1.000	New C.F.: 1.000

Calibration Standards:

Low Flow Meter ID/Cert. Date:	Defender 530 /s.n. 152020 / Nov 21, 2016
High Flow Meter ID/Cert. Date:	Defender 530 /s.n. 148943 / Nov 21, 2016
Calibrator ID/Cert. Date:	API 700 / s.n. 627 / Jan 27, 2017
Cal Gas Cylinder I.D. # :	LL165372
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 212.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0

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

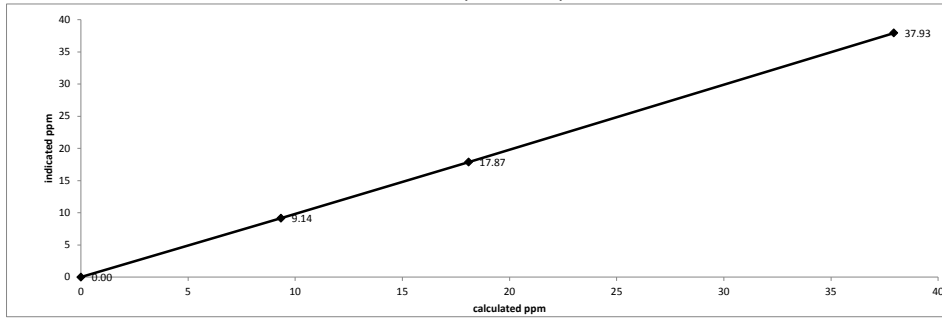
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2527	0.00	2527	0.0	0.00	n/a
as found high	2526	83.23	2609	37.93	37.71	1.006
adjusted zero	2527	0.00	2527	0.00	0.00	n/a
adjusted high	2526	83.23	2609	37.93	37.93	1.000
mid	2528	39.05	2567	18.09	17.87	1.012
low	2528	20.00	2548	9.33	9.14	1.021
calibrator zero	2527	0.00	2527	0.0	0.00	n/a
Average C.F.=						1.011

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	> or =	0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale)=	0.25%		± 3% F.S.
% change in C.F. from last cal=	-0.58%		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



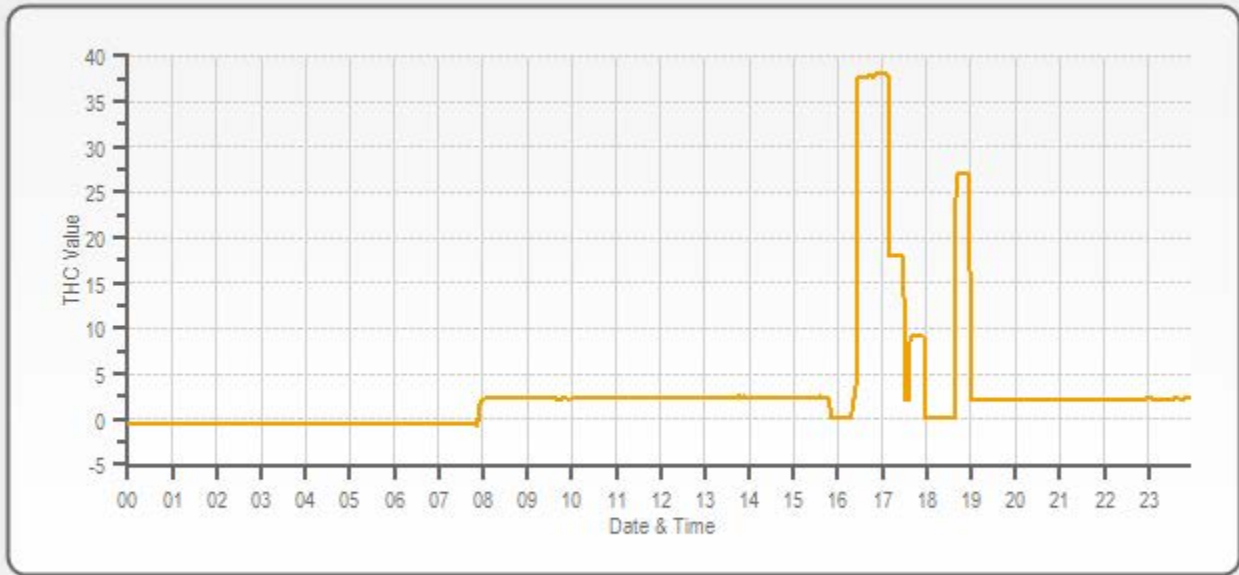
<p>As found:</p> <p>H2 cylinder (psi): 400</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 1300</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 39</p> <p>measurement alarms: Low Flow</p> <p>service alarms: None</p> <p>cnt: 1172</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 189.7</p> <p>det: 125.7</p> <p>Flame: 189</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 07.52</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: 0.864</p> <p>Expected Value: 27.38</p>	<p>As left:</p> <p>H2 cylinder (psi): 400</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 1300</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 39</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 1163</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 189.4</p> <p>det: 125.9</p> <p>Flame: 189</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 07.52</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: n/a</p> <p>Expected Value: 27.03</p>
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Comments: The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

The analyzer was reported in the daily report as "Flame Out". On arrival the analyzer was found with its pump seized. The pump was started manually - no issues. The analyzer is back online. A bearing of the pump has worn out and requires replacement.

THC[ppm] Station: LICA MASKWA Daily: 17/07/06 Type: AVG 1 Min. [1 Min.]



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	July 10, 2017	Barometer Data/B.P.:	Fisher Scientific / I.D. # 05544	940 mb
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	FLUKE 1551 A Ex STIK / I.D. # 4294	22 °C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny	
Parameter:	Total Hydrocarbon	Calibration Purpose:	shut down	
Start/End Time 24 hr. (mst):	9:46 / 11:43	Performed By/Reviewer:	Alex Yakupov	Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023	

Analyzer:	ID# or Serial Number:	436609738	Range ppm:	50
	Last Calibration Date:	July 6, 2017	As Found C.F.:	0.981
	Previous Cal High Point C.F.:	1.000	New C.F.:	n/a

Calibration Standards:

Low Flow Meter ID/Cert. Date:	Defender 530 / s.n. 152020 / Nov 21, 2016	Standard Calibration Points for a Range of: 50 ppm
High Flow Meter ID/Cert. Date:	Defender 530 / s.n. 148943 / Nov 21, 2016	
Calibrator ID/Cert. Date:	API 700 / s.n. 627 / Jan 27, 2017	
Cal Gas Cylinder I.D. # :	LL165372	
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 212.0	
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0	

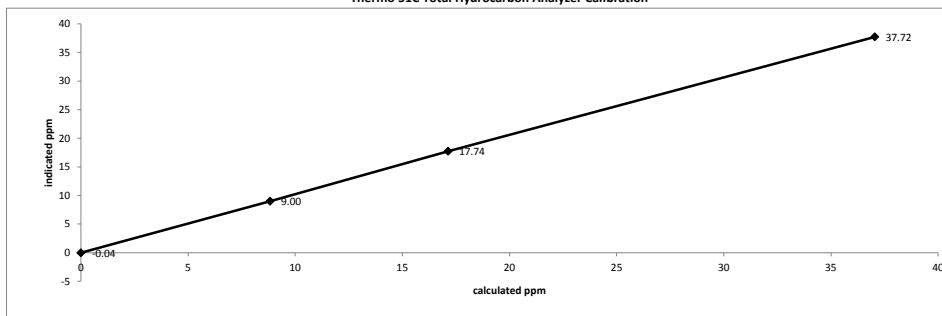
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
as found zero	2701	0.00	2701	0.0	-0.04	n/a
as found high	2617	84.14	2701	37.04	37.72	0.981
mid	2694	39.38	2733	17.13	17.74	0.964
low	2695	20.15	2715	8.82	9.00	0.976
Average C.F.=						0.974

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.981		0.90-1.00
b (Intercept as % of full scale) =	-0.09%		± 3% F.S.
% change in C.F. from last cal =	1.91%		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:	As left:
H2 cylinder (psi): 300	H2 cylinder (psi): n/a
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): n/a
Span Cylinder (psi): 1300	Span Cylinder (psi): n/a
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): n/a
Zero Air Gen Pressure: 38	Zero Air Gen Pressure: n/a
measurement alarms: None	measurement alarms: n/a
service alarms: None	service alarms: n/a
cnt: 1131	cnt: n/a
rng: 1	rng: n/a
try: 0	try: n/a
flm: 187.9	flm: n/a
det: 125.3	det: n/a
Flame: 187	Flame: n/a
Filter: 125	Filter: n/a
Base: 125	Base: n/a
Sample psi: 07.51	Sample psi: n/a
Internal Air Pressure: 20	Internal Air Pressure: n/a
Internal Fuel Pressure: 12	Internal Fuel Pressure: n/a
Measured Flow: 0.862	Measured Flow: n/a
Expected Value: 27.03	Expected Value: n/a

Comments:

No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

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

Shutdown calibration was complete to replace the sample pump, which requires replacement of the complete pump assembly.



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	July 10, 2017	Barometer Data/B.P.:	Fisher Scientific / I.D. # 05544	940 mb
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	FLUKE 1551 A Ex STIK / I.D. # 4294	22 °C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny	
Parameter:	Total Hydrocarbon	Calibration Purpose:	installation	
Start/End Time 24 hr. (mst):	12:33 / 16:02	Performed By/Reviewer:	Alex Yakupov	Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	June 14, 2019	

Analyzer:	ID# or Serial Number:	436609739	Range ppm:	50
	Last Calibration Date:	n/a	As Found C.F.:	n/a
	Previous Cal High Point C.F.:	n/a	New C.F.:	1.000

Calibration Standards:

Low Flow Meter ID/Cert. Date:	Defender 530 /s.n. 152020 / Nov 21, 2016
High Flow Meter ID/Cert. Date:	Defender 530 /s.n. 148943 / Nov 21, 2016
Calibrator ID/Cert. Date:	API 700 / s.n. 627 / Jan 27, 2017
Cal Gas Cylinder I.D. #:	LL165372
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 212.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0

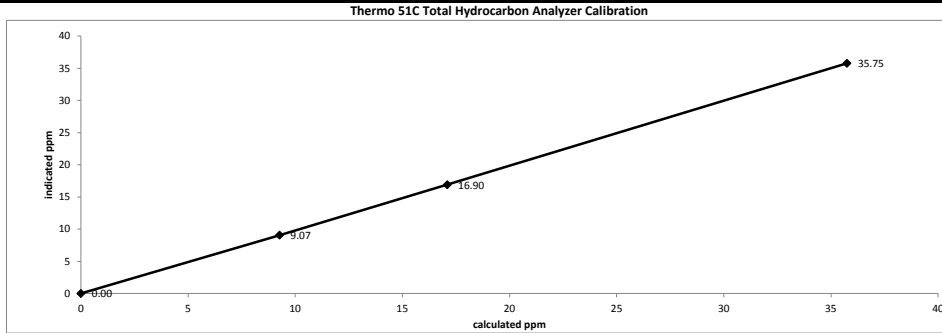
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

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			
adjusted zero	2695	0.00	2695	0.0	0.00	n/a
adjusted high	2694	83.49	2777	35.75	35.75	1.000
mid	2687	39.19	2726	17.09	16.90	1.011
low	2688	21.12	2709	9.27	9.07	1.022
calibrator zero	2695	0.00	2695	0.00	0.00	n/a
Average C.F. =						1.011

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		.95-1.05
b (Intercept as % of full scale) =	0.24%		± 3% F.S.
% change in C.F. from last cal =	n/a		± 10%



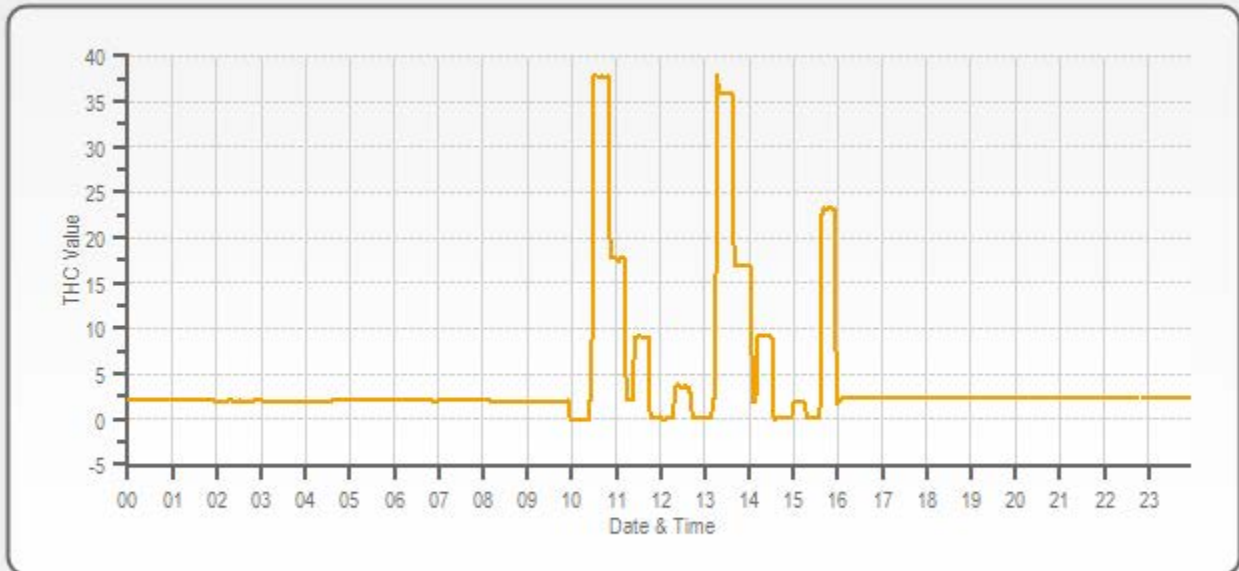
As found:	As left:
H2 cylinder (psi): n/a	H2 cylinder (psi): 300
H2 cylinder reg set (psi): n/a	H2 cylinder reg set (psi): 22
Span Cylinder (psi): n/a	Span Cylinder (psi): 1300
Span Cylinder Reg Set (psi): n/a	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: n/a	Zero Air Gen Pressure: 41
measurement alarms: n/a	measurement alarms: None
service alarms: n/a	service alarms: None
cnt: n/a	cnt: 2461
rng: n/a	rng: 1
try: n/a	try: 3
flm: n/a	flm: 211
det: n/a	det: 125.5
Flame: n/a	Flame: 211
Filter: n/a	Filter: 125
Base: n/a	Base: 125
Sample psi: n/a	Sample psi: 06.80
Internal Air Pressure: n/a	Internal Air: 22
Internal Fuel Pressure: n/a	Internal Fuel: 12
Measured Flow: n/a	Measured Flow: 1.018 lpm
Expected Value: n/a	Expected Value: 23.15

Comments: The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

Installation calibration was complete to replace the analyzer #436609738 because the sample pump required replacement.

THC[ppm] Station: LICA MASKWA Daily: 17/07/10 Type: AVG 1 Min. [1 Min.]

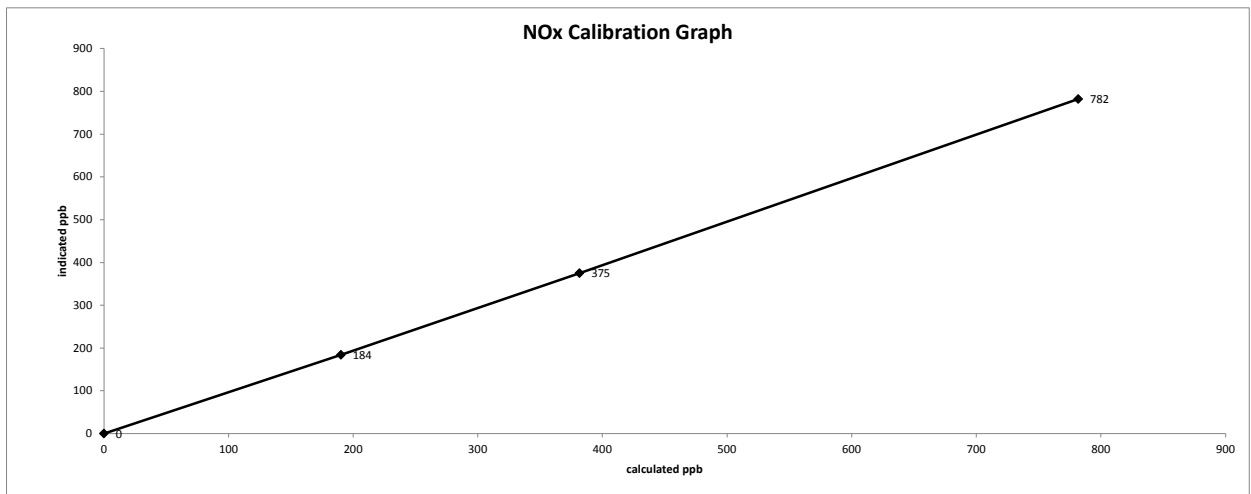
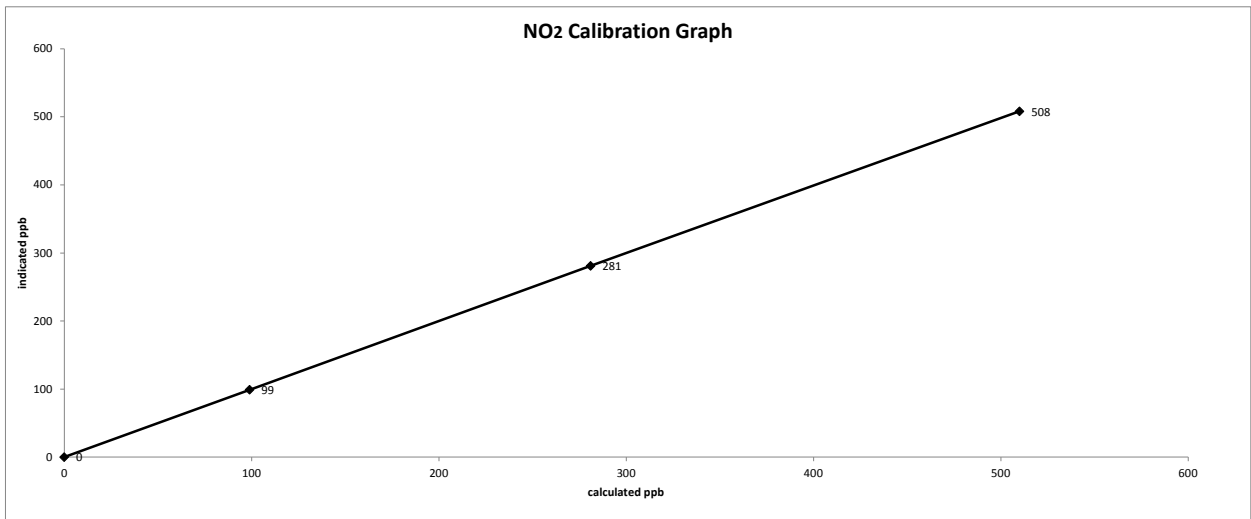
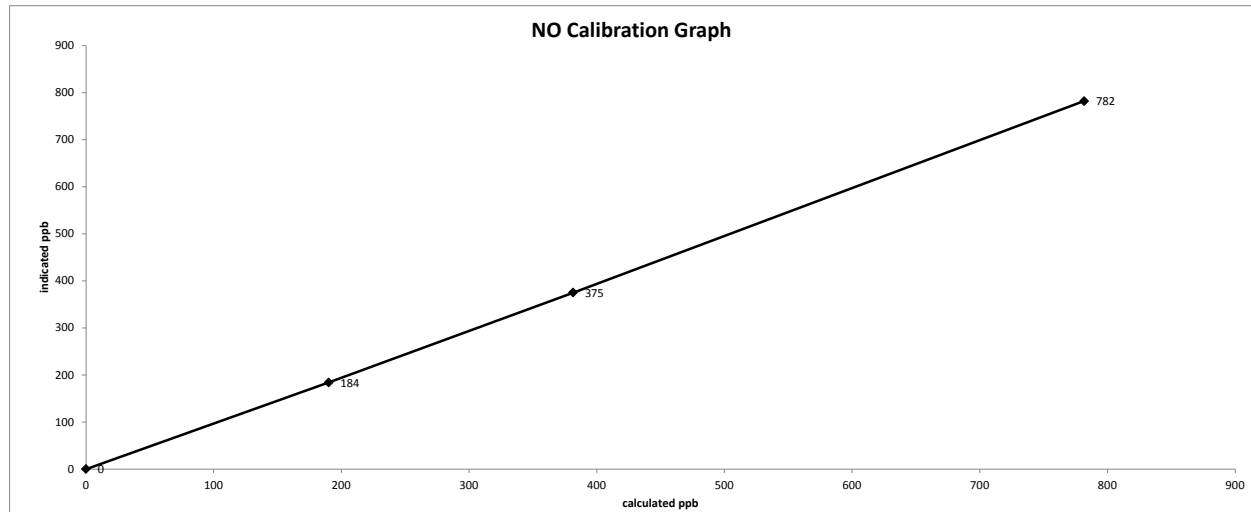


— THC[ppm]

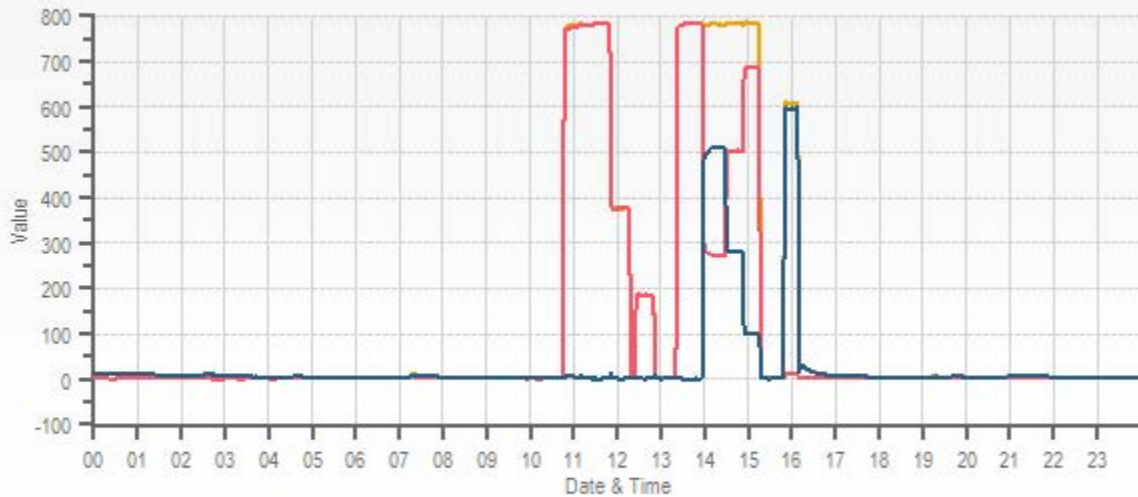
NITROGEN DIOXIDE

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

Start/End Time 24 hr. (mst): 9:45 / 16:13
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration



Station: LICA MASKWA Daily: 17/07/06 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

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 ₂ 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 _x		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: _____ Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Bios Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>Hi148944 Lo 152019</u>	
Last Verification Date	<u>February 3, 2016</u>		Temperature (°C)	<u>24.6</u>	
NO Cylinder S/N	<u>EY0000597</u>		Barometric Pressure	<u>701.4mmHg</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>4919</u>	Pt. #2	<u>4934</u>	Pt. #3	<u>4960</u>
Gas Flow (sccm)					
Pt. #1	<u>79.2</u>	Pt. #2	<u>38.3</u>	Pt. #3	<u>19.1</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4987	0.0	0.0000	0.0000	0.0000	0.0002	0.0002	Limit ± 10%	
4998	79.2	0.7765	0.7765	0.7801	-0.0003	0.7798	0%	0%
4977	38.3	0.3775	0.3775	0.3790	0.0000	0.3790	0%	0%
4979	19.1	0.1880	0.1880	0.1888	-0.0001	0.1887	0%	0%
Absolute Average Percent Difference							0%	0%

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)= 1.0046	0.90-1.10	m (Slope)= 1.0041
b (Intercept % of FS)= -0.0080	± 3% F.S.	b (Intercept % of FS)= 0.0057

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4998	0.000	0.0000	0.7799	-0.0008	0.7790	NO ₂	% Diff. Limit
4998	0.500	0.4949	0.2850	0.4909	0.7776	-1%	± 10%
4998	0.275	0.2765	0.5034	0.2742	0.7776	-1%	± 10%
4998	0.100	0.1003	0.6796	0.0989	0.7786	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9936	0.90-1.10
b (Intercept % of FS)= -0.0733	± 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>1868</u>
Serial/AMU Number <u>1809</u>	Last Calibration Date <u>February 13, 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 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] 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	0.000	0.000	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

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. 688mmHg

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	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
September 25, 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>2833-2017-07-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalib</u>	Date <u>August 23, 2017</u>
Level 1 Primary Validation	<u>Maram Ghalib</u>	Date <u>August 23, 2017</u>
Level 2 Final Validation	<u>Maram Ghalib</u>	Date <u>September 9, 2017</u>
Level 3 Independent Data Review	<u>Mike Bisaga</u>	Date <u>September 20, 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

September 28, 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 July 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

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

All data collected in July 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016), with the exception of PM2.5.

One 24-hr exceedance for Particulate Matter 2.5 was recorded for PM2.5 on July 20 at a concentration of 34 µg/m³. AEP reference number: 327342.

The Particulate Matter analyzer was upgraded to a SHARP unit from a Teom unit this month. The upgrade was performed between July 25 and July 26.

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
Technical Program Managers
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



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T2E 6P7

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Toll Free 800-386-7247
Fax 403-219-3673

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

JOB #: 2833-2017-07-31-C

July 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 St.
Bonnyville, Alberta
T9N 2J7

Attention: MIKE BISAGA

DATE: **September 25, 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 July 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, with the exception of PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.

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

Non-Conformance: One 24-hr exceedance was recorded for PM_{2.5} on July 20 at a concentration of 34 µg/m³. Details are recorded in the Exceedance Summary Report [Reference #327342].

PM_{2.5} Equipment Upgrade: The TEOM unit was upgraded to a SHARP unit this month. Twenty-three hours of downtime were recorded for PM_{2.5} between July 25 and July 26 due to this upgrade event. The O₃, BP and RH channels were placed in "maintenance" mode while this process was going on, one hour of downtime was recorded on July 26 as a result. One more hour of downtime was recorded for PM_{2.5} as the concentration was lower than -3 µg/m³, rendering the data invalid.

SO₂/H₂S/O₃: One hour of downtime was incurred due to an additional span check conducted on July 28 to address a sudden span drift.

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.

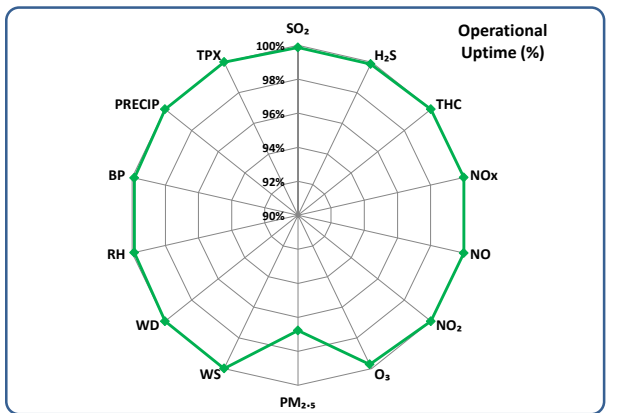
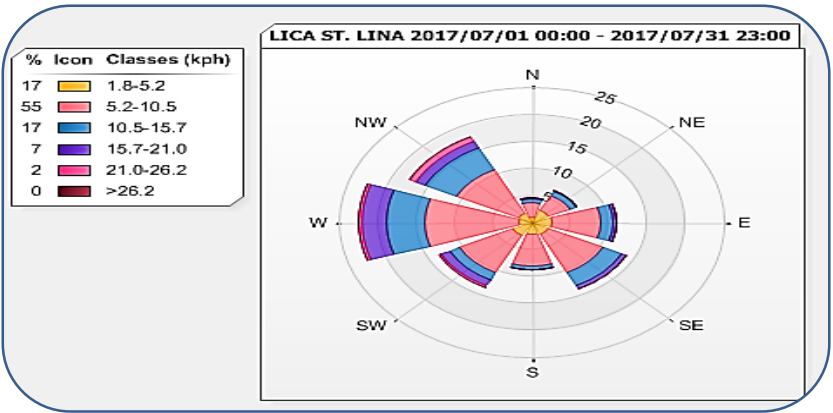
Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3678 or toll-free at 1-800-386-7247.

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	3	20	6	3.5	SE	1	20	99.9
H ₂ S (ppb)	10	3	0	0	0	3	17	4	17.2	WSW	1	13	99.9
THC (ppm)	-	-	-	-	2.08	2.90	30	9	2.9	NE	2.17	9	100.0
NO ₂ (ppb)	159	-	0	-	1	7	20	6	3.5	SE	3	20	100.0
NO (ppb)	-	-	-	-	0	1	23	23	6.7	ENE	0	20	100.0
NO _x (ppb)	-	-	-	-	1	8	20	6	3.5	SE	3	20	100.0
O ₃ (ppb)	82	-	0	-	28.7	54.3	13	19	5.5	WSW	39.6	15	99.7
PM _{2.5} (µg/m ³)	80	30	0	1	9	58	16	18	13.2	SW	34	20	96.8
RELATIVE HUMIDITY (%)	-	-	-	-	67	92	1	2	1.9	W	86	24	99.9
BAROMETRIC PRESSURE (millibar)	-	-	-	-	933	944	31	15	12.1	WNW	942	31	99.9
AMBIENT TEMPERATURE (°C)	-	-	-	-	17.8	28.8	26	10	7.8	SSW	21.7	7	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	15.6	20	23	11.6	ESE	1.1	24	100.0
VECTOR WS (kph)	-	-	-	-	2.6	26.1	24	16	-	NW	14.7	24	100.0
VECTOR WD (sec)	-	-	-	-	260 (WSW)	-	-	-	-	-	-	-	100.0

July 2017 Monthly Report Summary

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0	99.9%	3	July 20	6	172	0	1	July 20	48	0
H ₂ S	ppb	0	99.9%	3	July 17	4	10	0	1	July 13	3	0
THC	ppm	2.08	100.0%	2.90	July 30	9	-	-	2.17	July 9	-	-
NO _x	ppb	1	100.0%	8	July 20	6	-	-	3	July 20	-	-
NO	ppb	0	100.0%	1	July 23	23	-	-	0	July 20	-	-
NO ₂	ppb	1	100.0%	7	July 20	6	159	0	3	July 20	-	-
O ₃	ppb	28.7	99.7%	54.3	July 13	19	82	0	39.6	July 15	-	-
PM _{2.5}	µg/m ³	9	96.8%	58	July 16	18	80	0	34	July 20	30	1
WS	kph	2.6	100.0%	26.1	July 24	16	-	-	14.7	July 24	-	-
WD	degree	260 (WSW)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	67	99.9%	92	July 1	2	-	-	86	July 24	-	-
BP	mbar	933	99.9%	944	July 31	15	-	-	942	July 31	-	-
PRECIP	mm	0.1	100.0%	15.6	July 20	23	-	-	1.1	July 24	-	-
AmbTPX	°C	17.8	100.0%	28.8	July 26	10	-	-	21.7	July 7	-	-



Monthly Update

* All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
 * All data collected this month, with the exception of PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.
 * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

Non-Conformance: One 24-hr exceedance was recorded for PM_{2.5} on July 20. Details are recorded in the Exceedance Summary Report [Reference #327342].
PM_{2.5} Equipment Upgrade: The TEOM unit was upgraded to a SHARP unit this month. Twenty-three hours of downtime were recorded for PM_{2.5} between July 25 and July 26 due to this upgrade event. The O₃, BP and RH channels were placed in "maintenance" mode while this process was going on, one hour of downtime was recorded on July 26 as a result. One more hour of downtime was recorded for PM_{2.5} as the concentration was lower than -3 µg/m³, rendering the data invalid.
SO₂/H₂S/O₃: One hour of downtime was incurred due to an additional span check conducted on July 28 to address a sudden span drift.

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

DATE	READING (µg/m ³)	WS (kph)	WD (deg)	ESRD Reference #
July 20	34	6.8	E	327342

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 99.9%, equivalent to one hour of downtime.
- The routine monthly calibration was performed on July 18.
- The O₃ and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel, on July 19, during the monthly calibration of the Ozone analyzer.
- The scheduled daily zero/span check for July 21 was not executed, due to a brief power outage that occurred at that period. A successful zero/span check was manually completed afterwards.
- The span response drifted abruptly towards the upper acceptance limit on July 27, likely due to an elevated station temperature. A repeat zero/span check was conducted on July 28 and the response did not exhibit a drift. One hour of downtime was, however, recorded due to the additional zero/span check.
- Fifteen instances of maximum instantaneous data were discarded due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- The routine monthly calibration was performed on July 18.
- The scheduled daily zero/span check for July 21 was not executed, due to a brief power outage that occurred at that period. A successful zero/span check was manually completed afterwards.
- The span response drifted abruptly towards the upper acceptance limit on July 27, likely due to an elevated station temperature. A repeat zero/span check was conducted on July 28 and the response did not exhibit a drift. One hour of downtime was, however, recorded due to the additional zero/span check.
- Fifteen instances of maximum instantaneous data were discarded due to brief power outages.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on July 19.
- The scheduled daily zero/span check for July 21 was not executed, due to a brief power outage that occurred at that period. A successful zero/span check was manually completed afterwards.
- The station air conditioning system was experiencing intermittent problems towards the end of the month, causing elevated daily zero responses. The daily zero readings met AMD requirements and the analyzer was operating within manufacturer's temperature specifications. However, if applied, the daily zero would result in a non-historical data trend. The calibrator zero obtained from the calibration on July 19 was, therefore, applied for baseline correction on data collected from July 19 at hour 14:00 to the July 31 at hour 23:00. Maintenance and repairs for the air conditioning unit will be scheduled in August 2017, as required.
- Sixteen instances of maximum instantaneous data were discarded due to brief power outages.

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 July 18.
- The scheduled daily zero/span check for July 21 was not executed, due to a brief power outage that occurred at that period. A successful zero/span check was manually completed afterwards.
- One hour of maximum instantaneous data collected on July 20 at hour 18:00 was invalidated due to an anomalous spike. Review of the minute data, bracketing the spike, did not support the validity of the elevated concentration.
- An elevated maximum instantaneous concentration was recorded on July 17. During this time, farmer activities were noted and most likely contributed to this elevated measurement.
- Fifteen instances of maximum instantaneous data were discarded due to brief power outages.

OZONE (O₃)

- Operational time, for the monitoring period was 99.7% equivalent to two hours of downtime.
- The routine monthly calibration was performed on July 19.
- The ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the ozone channel, on July 18, during the monthly calibration of the SO₂ analyzer.
- The scheduled daily zero/span check for July 21 was not executed, due to a brief power outage that occurred at that period. A successful zero/span check was manually completed afterwards.
- The span response drifted abruptly towards the lower acceptance limit on July 27, likely due to an elevated station temperature. A repeat zero/span check was conducted on July 28 and the response did not exhibit a drift. One hour of downtime was recorded due to the additional zero/span check.
- The channel was placed in "maintenance" mode on July 26 at hour 10:00, while work was being done on the PM_{2.5} channel. One hour of downtime was incurred.
- Fifteen instances of maximum instantaneous data were discarded due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime.
- One routine TEOM audit was performed this month on July 14.
- There was one 24-Hr contravention for the parameter of PM_{2.5} recorded this month: concentration of 34 µg/m³ on July 20. Alberta Environment and Sustainable Resource Development (ESRD) Reference #327342.
- The PM_{2.5} monitoring equipment was upgraded this month. On July 25, a shutdown calibration was performed to remove the R & P 1405 [S/N: 1400A] TEOM unit and an installation calibration was performed on July 26 to install a Thermo 5030i SHARP Unit [S/N: CM17091001]. The channel was left offline for stabilization of the newly-installed unit. Twenty-three hours of downtime were recorded due to this upgrade event.
- 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. One hour of data was invalidated as the data was below -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%.
- Sixteen instances of maximum instantaneous data were discarded due to brief power outages.
- One hour of maximum instantaneous data collected on July 1 at hour 22:00 was invalidated due to an anomalous spike. Review of the minute data, bracketing the spike, did not support the validity of the elevated measurement.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime, which was incurred on July 26 at hour 10:00, while work was being done on the PM_{2.5} channel.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime, which was incurred on July 26 at hour 10:00, while work was being done on the PM_{2.5} channel.

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, with the exception of PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.

There was one 24-Hr contravention for the parameter of PM_{2.5} recorded this month: concentration of 34 µg/m³ on July 20. Alberta Environment and Sustainable Resource Development. AEP reference number: 327342.

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-00010: Thermo Model 5030 SHARP Monitor
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- 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-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 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM and Thermo 5030i SHARP Units
- 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

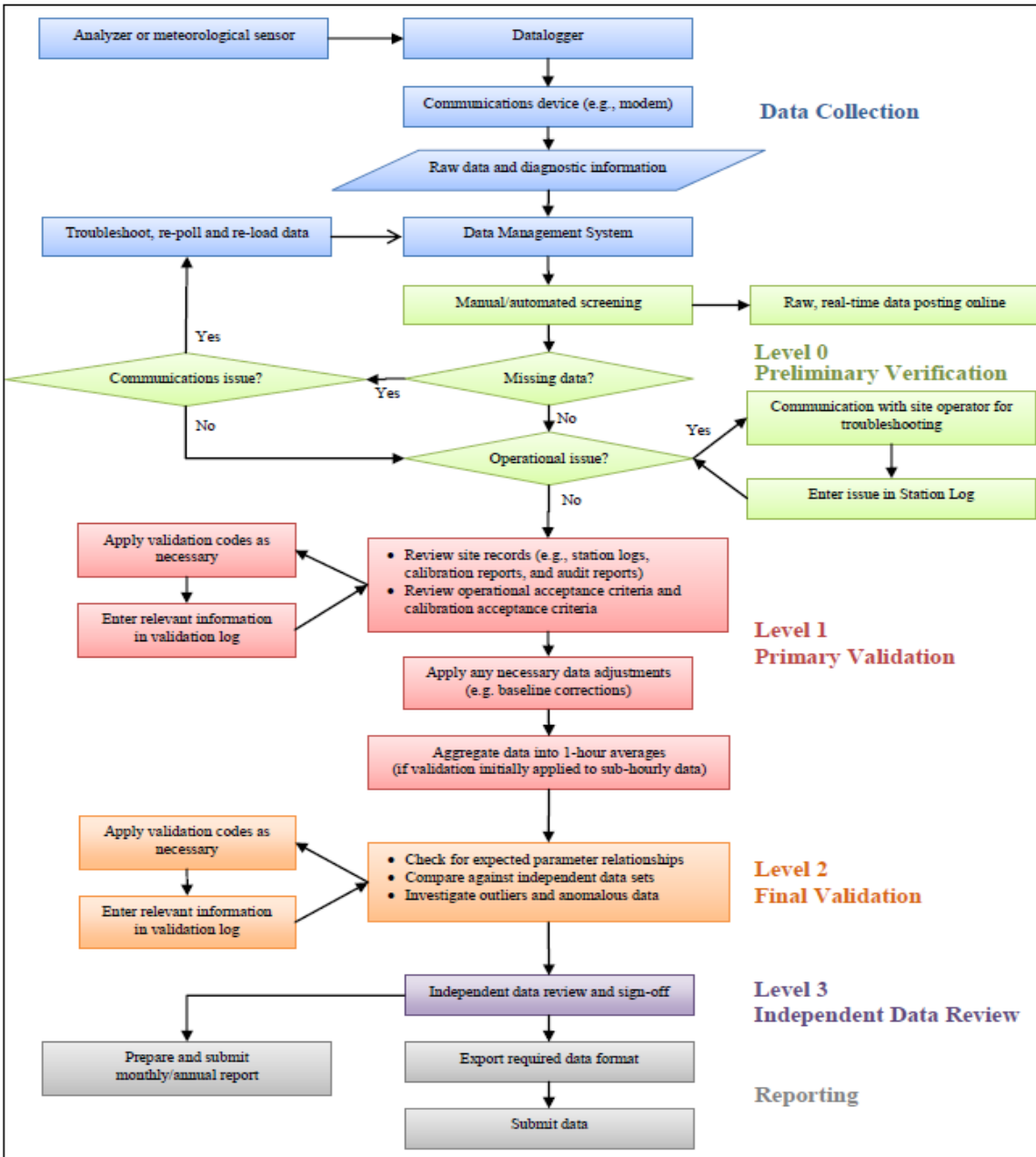
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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.

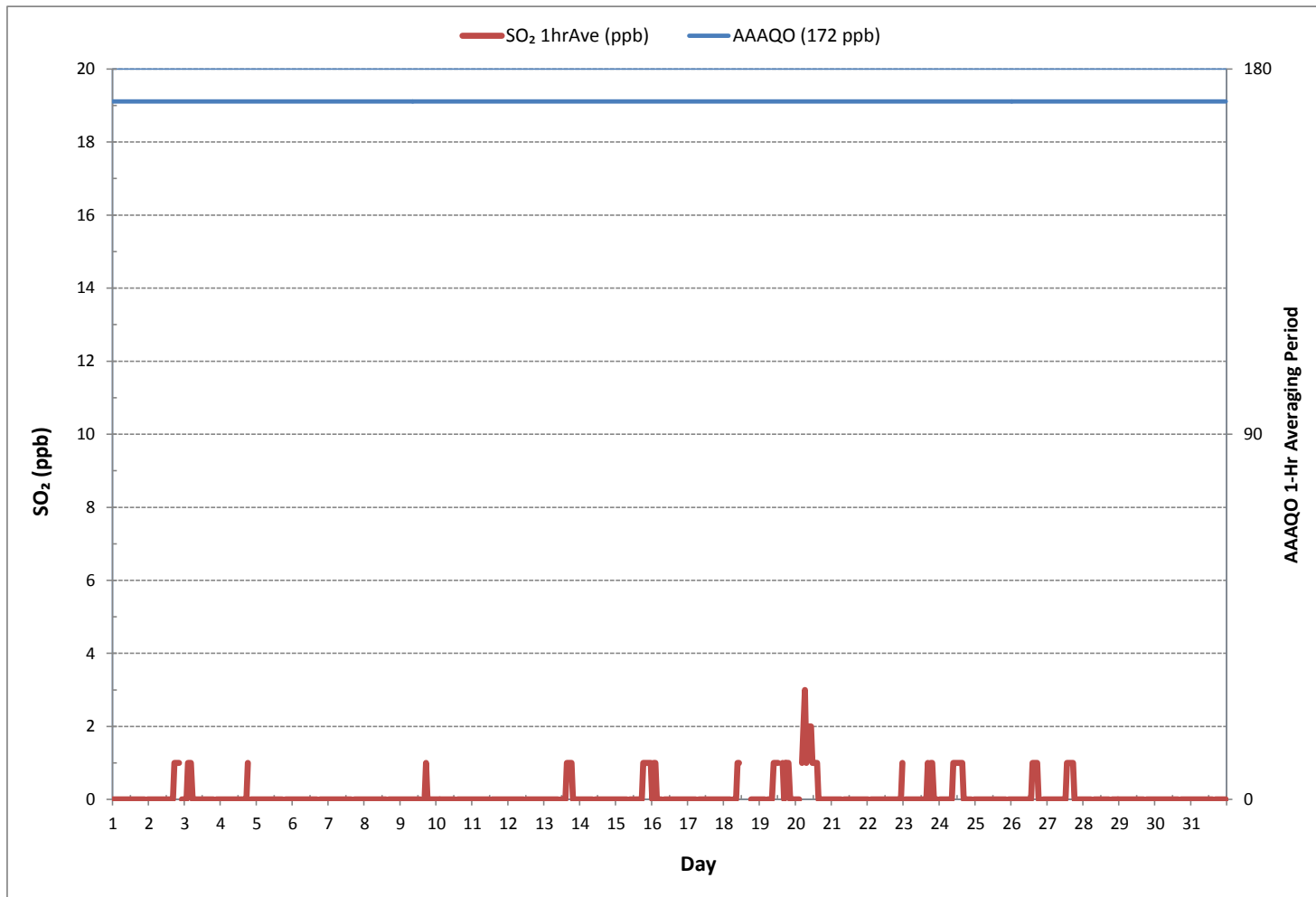


Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

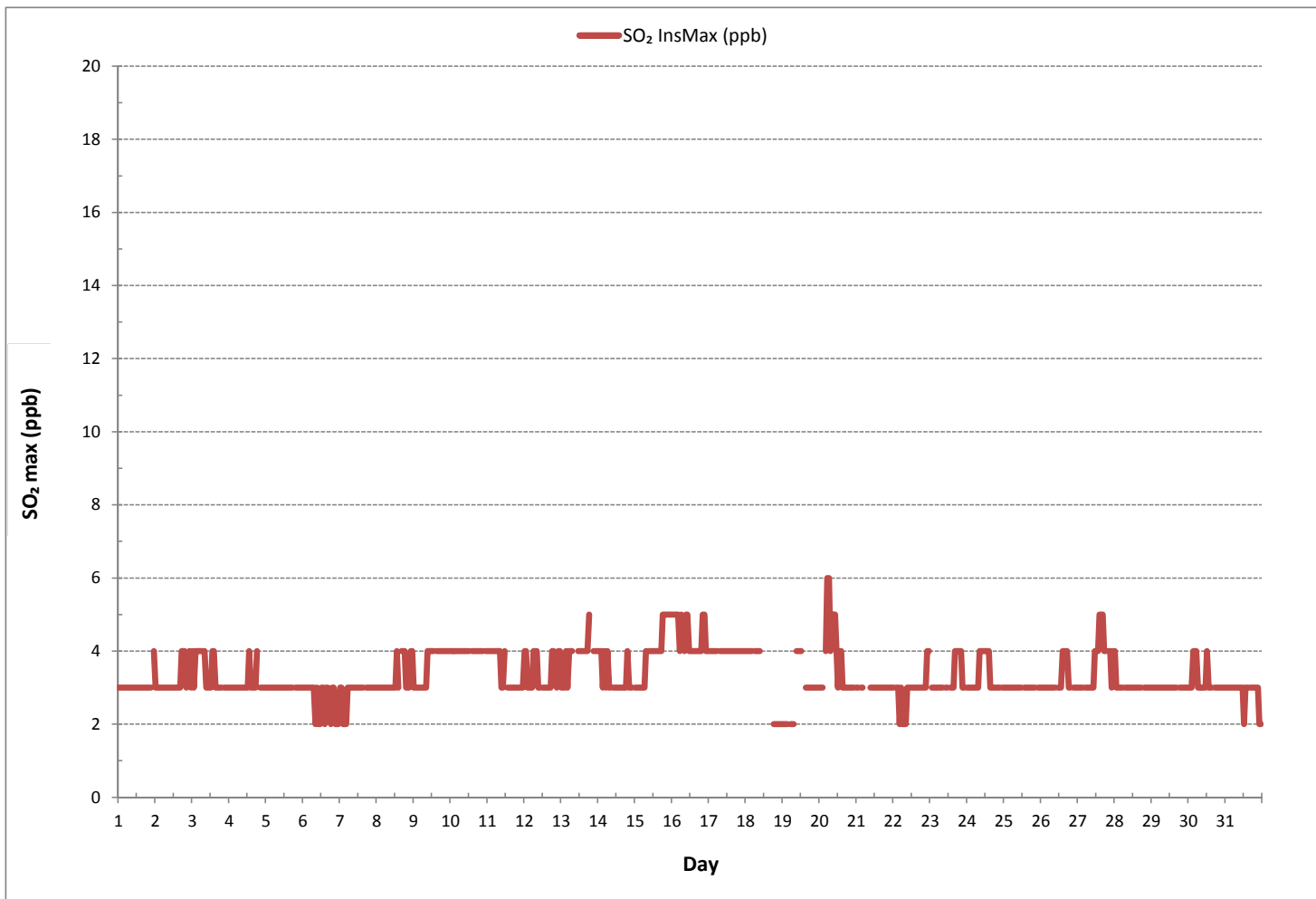
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	685
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 5 ON DAY 20
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	728 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

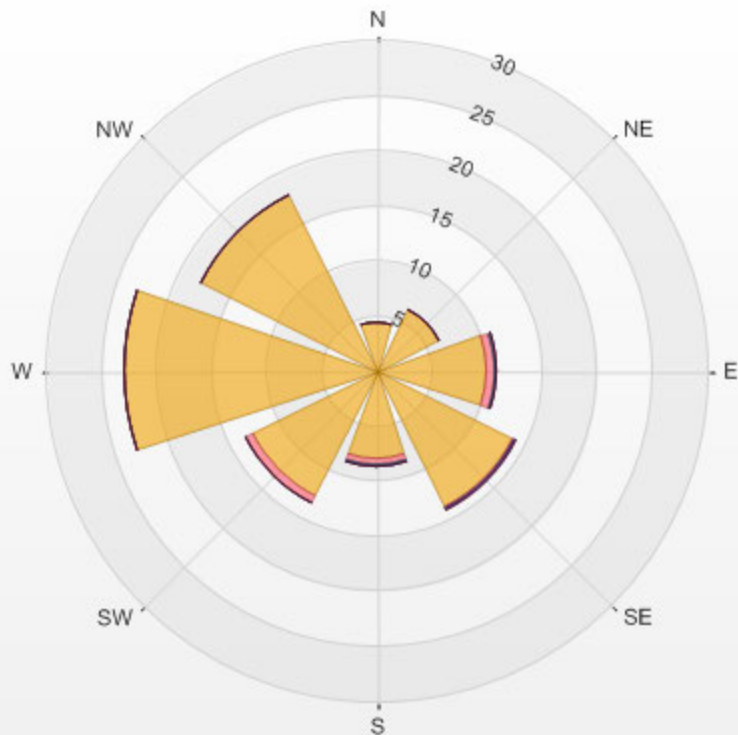
Calm: 1.46%

Calm Avg: 0.12 [ppb]

Direction	0.0-0.8	0.8-1.6	1.6-2.4	2.4-3.2	3.2-4.0	>4.0	Total
N	4.4	0.0	0.0	0.0	0.0	0.0	4.4
NE	6.3	0.0	0.0	0.0	0.0	0.0	6.3
E	10.1	0.6	0.3	0.0	0.0	0.0	10.9
SE	13.7	0.3	0.0	0.2	0.0	0.0	14.1
S	8.0	0.6	0.2	0.0	0.0	0.0	8.8
SW	12.7	0.7	0.0	0.0	0.0	0.0	13.4
W	22.9	0.0	0.0	0.0	0.0	0.0	22.9
NW	17.8	0.0	0.0	0.0	0.0	0.0	17.8
Summary	95.8	2.2	0.4	0.2	0.0	0.0	98.5

% Icon Classes (ppb) 96 0.0-0.8 2 0.8-1.6 0 1.6-2.4 0 2.4-3.2 0 3.2-4.0 0 >4.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.46% Calm Poll Avg: 0.12[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 17/07 Type: Span



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

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

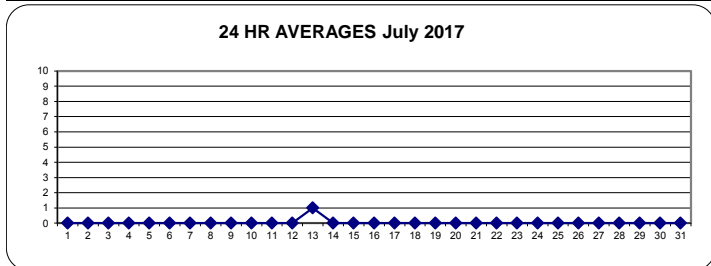
OBJECTIVE LIMIT:

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

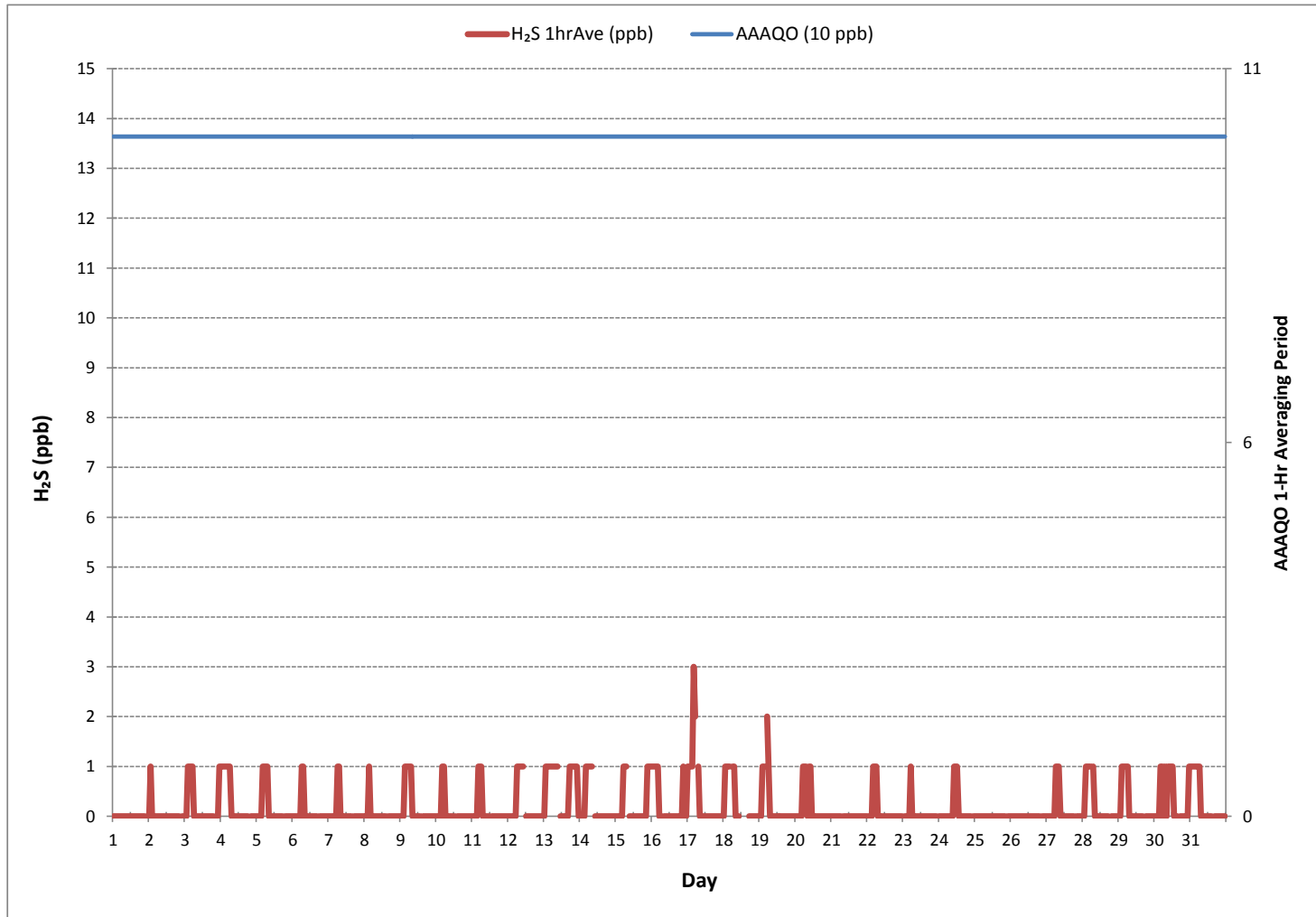
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	126
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR 4 ON DAY 17
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 13
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	743 hrs
AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

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

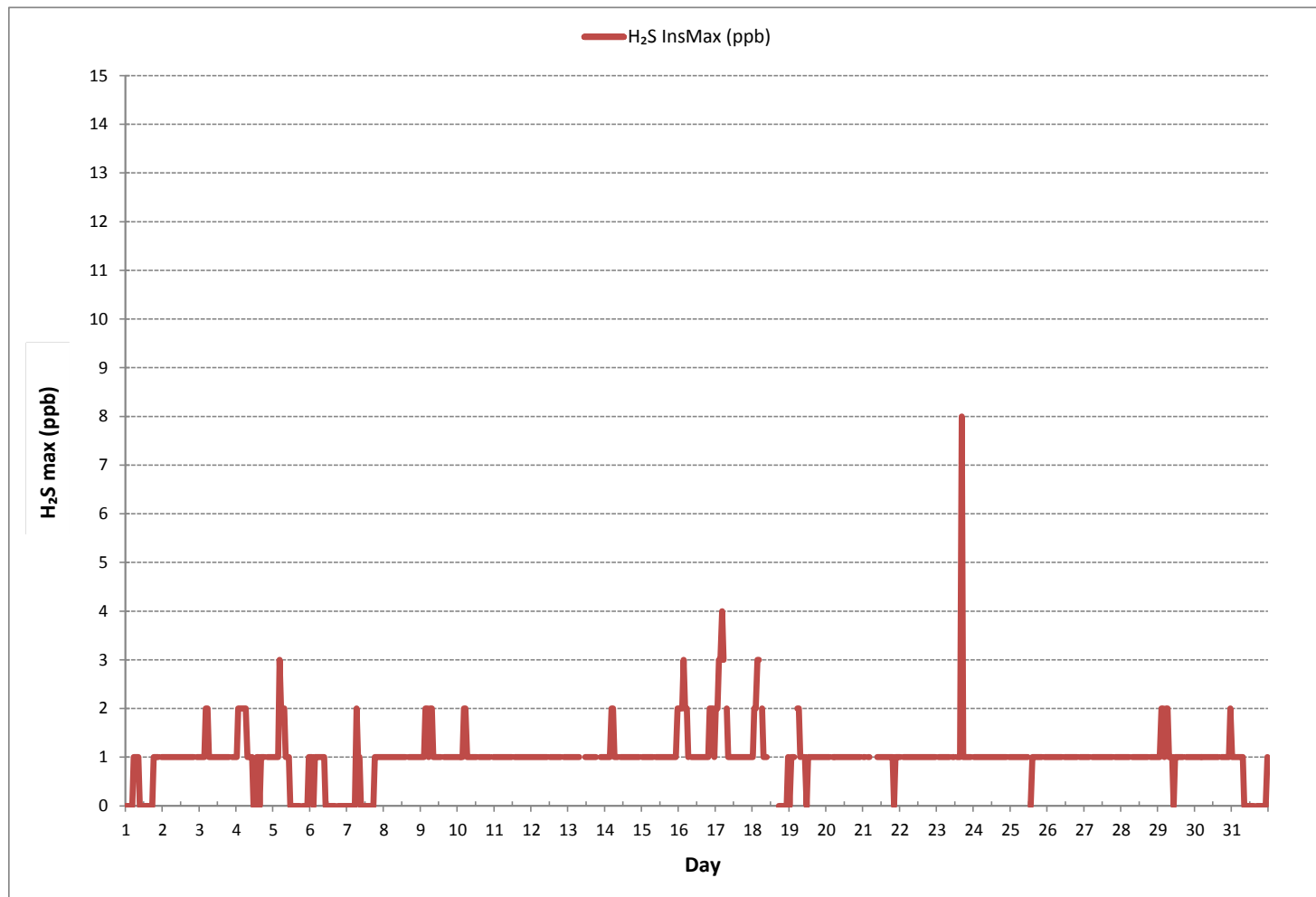
STATUS FLAG CODES

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:	607
MAXIMUM INSTANTANEOUS VALUE:	8 ppb @ HOUR 16 ON DAY 23
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	728 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



% Icon Classes (ppb)

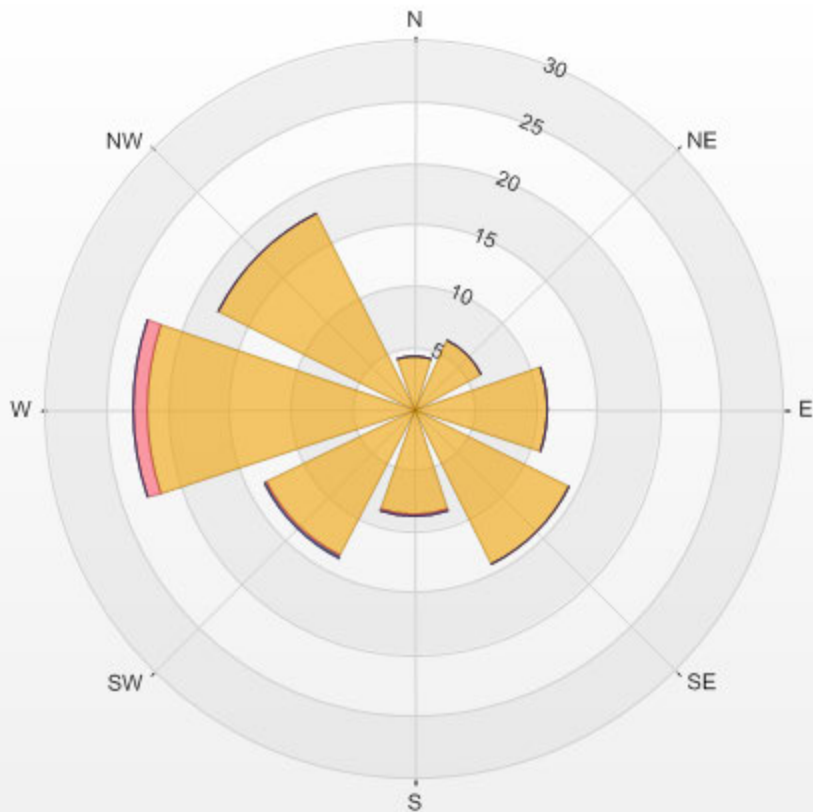
97 0.0-1.3

1 1.3-2.7

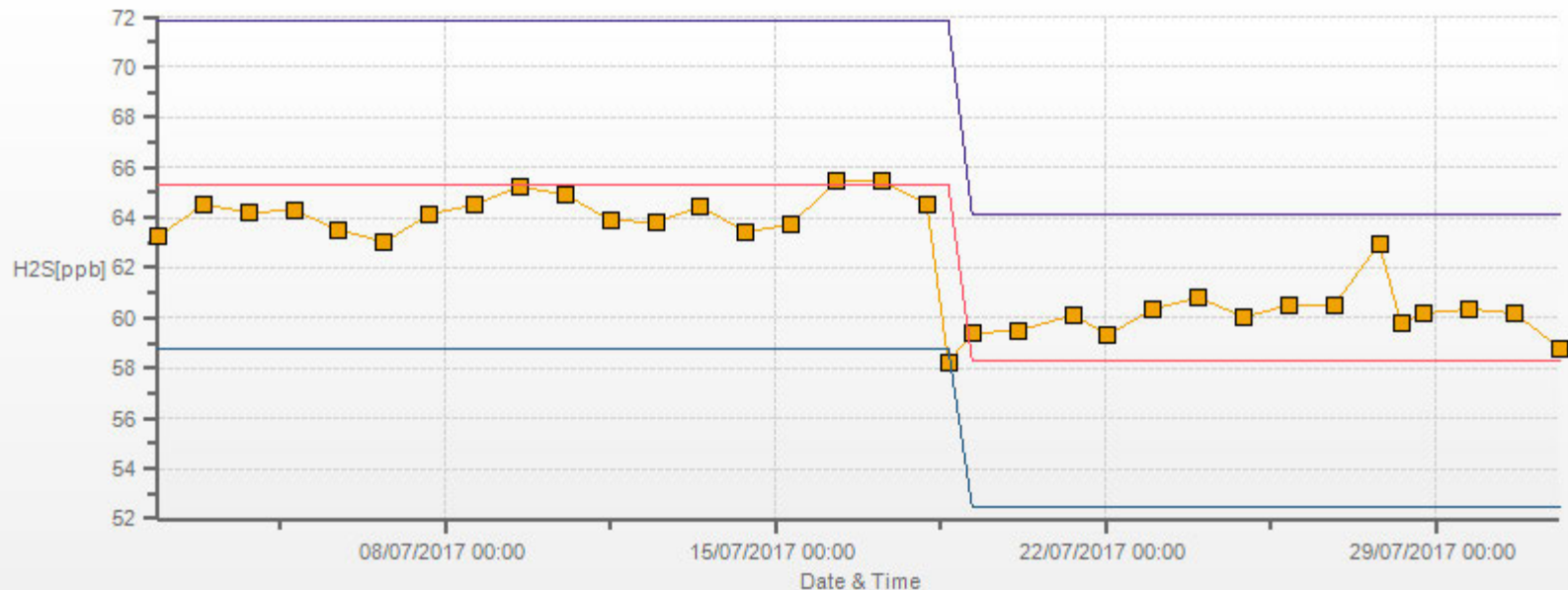
0 2.7-4.0

0 >4.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.45% Calm Poll Avg: 0.27[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 17/07 Type: Span



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

TOTAL HYDROCARBON

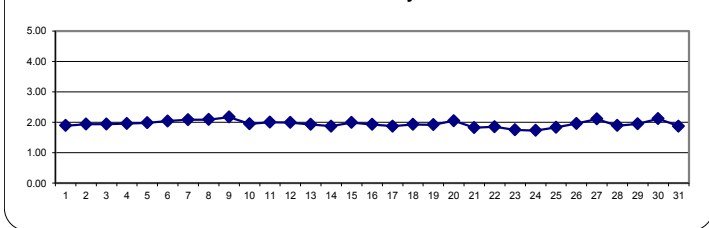
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.87	1.85	1.83	1.85	1.85	1.96	2.02	1.97	2.01	1.90	1.87	1.85	1.83	1.82	1.81	1.80	1.80	1.81	1.83	1.91	2.03	2.03	S	2.01	1.80	2.03	1.89	24	
2	2.02	2.09	2.04	2.10	2.10	2.08	2.10	1.96	1.89	1.89	1.88	1.87	1.84	1.84	1.83	1.82	1.81	1.80	1.82	1.88	1.97	S	2.00	2.00	1.80	2.10	1.94	24	
3	2.09	2.23	2.29	2.31	2.31	2.11	1.83	1.84	1.93	1.89	1.81	1.77	1.75	1.74	1.75	1.74	1.75	1.80	1.86	1.91	S	1.99	1.99	1.98	1.74	2.31	1.94	24	
4	2.01	2.03	1.98	1.96	1.97	1.98	1.99	2.00	2.01	1.97	1.95	1.95	1.95	1.94	1.93	1.92	1.90	1.90	1.91	S	1.97	1.99	1.99	1.96	1.90	2.03	1.96	24	
5	1.95	1.96	2.01	2.02	2.01	2.03	2.05	2.03	1.99	1.97	1.95	1.96	1.96	1.93	1.92	1.89	1.87	1.88	S	1.95	2.00	2.05	2.05	2.08	1.87	2.08	1.98	24	
6	2.08	2.08	2.08	2.05	2.08	2.10	2.19	2.13	2.05	2.05	2.03	2.07	2.03	1.98	1.95	1.90	1.88	S	1.90	1.94	1.99	2.04	2.11	2.13	1.88	2.19	2.04	24	
7	2.20	2.11	2.15	2.10	2.09	2.11	2.35	2.32	2.15	2.08	2.04	2.00	1.96	1.94	1.92	1.90	S	1.87	1.89	1.99	2.18	2.22	2.12	2.11	1.87	2.35	2.08	24	
8	2.23	2.25	2.21	2.37	2.21	2.06	2.09	2.04	2.05	2.07	2.09	2.13	2.12	2.10	2.07	S	1.98	1.91	1.91	1.91	1.95	2.07	2.13	2.21	1.91	2.37	2.09	24	
9	2.36	2.23	2.24	2.41	2.36	2.35	2.48	2.37	2.32	2.31	2.17	2.10	2.04	2.01	S	2.03	1.92	1.97	2.04	2.13	2.13	2.11	1.93	1.96	1.92	2.48	2.17	24	
10	1.95	1.95	1.99	1.99	2.05	2.05	2.01	1.99	1.99	2.01	2.00	1.96	1.92	S	1.86	1.85	1.86	1.83	1.87	1.89	1.93	1.99	1.99	2.00	1.83	2.05	1.95	24	
11	2.01	2.09	2.11	2.16	2.17	2.19	2.16	2.18	1.99	1.97	1.93	1.95	S	1.86	1.87	1.87	1.88	1.88	1.89	1.92	1.93	1.97	1.99	1.99	1.86	2.19	2.00	24	
12	2.03	2.07	2.16	2.06	2.03	2.11	2.11	2.12	2.07	1.91	1.87	S	1.86	1.89	1.91	1.89	1.91	1.91	1.89	1.92	2.00	1.98	2.01	2.05	1.86	2.16	1.99	24	
13	2.08	2.08	2.05	2.04	2.05	2.12	2.13	2.04	2.05	2.11	S	1.95	1.93	1.86	1.91	1.80	1.73	1.72	1.71	1.75	1.78	1.80	1.82	1.83	1.71	2.13	1.93	24	
14	1.82	1.82	1.82	1.83	1.84	1.82	1.87	1.89	1.87	1.85	S	1.85	1.85	1.84	1.82	1.80	1.78	1.80	1.80	1.81	1.87	1.94	2.12	2.11	1.98	1.78	2.12	1.87	24
15	2.08	2.12	2.17	2.12	2.16	2.26	2.24	2.16	S	2.10	1.99	1.93	1.88	1.84	1.80	1.80	1.80	1.77	1.78	1.83	1.86	1.96	1.99	2.06	1.77	2.26	1.99	24	
16	2.10	2.10	2.11	2.24	2.01	1.96	1.89	S	1.83	1.85	1.87	1.86	1.84	1.86	1.88	1.89	1.89	1.88	1.94	1.94	1.92	1.86	1.85	1.85	1.83	2.24	1.93	24	
17	1.87	1.88	1.91	1.91	1.89	1.87	S	1.84	1.81	1.87	1.88	1.86	1.87	1.84	1.84	1.88	1.88	1.87	1.89	1.88	1.91	1.88	1.87	1.87	1.81	1.91	1.87	24	
18	1.87	1.94	1.94	1.94	1.94	S	1.90	1.89	1.93	1.90	1.93	1.97	2.00	1.99	1.94	1.93	1.91	1.90	1.92	1.93	1.91	1.89	1.88	1.94	1.87	2.00	1.93	24	
19	1.87	1.99	2.13	2.18	S	2.16	2.15	2.04	1.92	1.91	C	C	C	C	1.95	1.95	1.93	1.93	1.99	2.00	2.05	2.14	2.19	2.22	1.87	2.22	1.92	24	
20	2.29	2.36	2.38	S	2.49	2.53	2.52	2.67	2.56	2.48	2.48	2.50	2.44	2.44	2.33	2.29	2.24	2.19	2.16	2.17	2.16	2.19	2.20	2.17	2.16	2.67	2.05	24	
21	2.11	2.16	2.14	2.18	2.16	2.14	2.11	S	2.05	2.06	2.08	2.08	2.10	2.10	2.09	2.06	2.06	2.05	2.07	2.10	2.13	2.23	2.28	2.29	2.05	2.29	1.82	24	
22	2.28	S	2.28	2.25	2.45	2.60	2.61	2.47	2.32	2.25	2.17	2.07	2.03	2.00	1.97	1.93	1.92	1.90	1.90	2.04	2.00	2.03	2.12	2.19	1.90	2.61	1.85	24	
23	S	2.24	2.26	2.07	2.10	2.18	2.14	2.12	2.08	2.01	1.98	1.96	1.96	1.92	1.91	1.87	1.87	1.86	1.90	2.00	1.97	1.97	1.99	S	1.86	2.26	1.75	24	
24	2.01	2.05	2.05	1.99	1.97	1.98	1.99	2.02	2.00	1.98	1.96	1.92	1.96	1.99	2.01	2.02	2.05	2.06	2.05	2.06	2.06	2.07	S	2.10	1.92	2.10	1.73	24	
25	2.13	2.14	2.17	2.19	2.21	2.23	2.24	2.24	2.29	2.30	2.17	2.14	2.12	2.12	2.10	2.05	2.10	2.10	2.09	2.16	2.24	S	2.31	2.43	2.05	2.43	1.83	24	
26	2.51	2.50	2.51	2.51	2.48	2.53	2.57	2.52	2.49	2.41	2.30	2.20	2.17	2.12	2.04	2.05	2.14	2.09	2.10	2.18	S	2.29	2.42	2.48	2.04	2.57	1.96	24	
27	2.54	2.55	2.52	2.61	2.68	2.72	2.70	2.66	2.60	2.55	2.42	2.34	2.30	2.26	2.25	2.14	2.07	1.96	2.08	S	2.21	2.15	2.04	2.08	1.96	2.72	2.11	24	
28	2.14	2.21	2.24	2.23	2.26	2.27	2.29	2.27	2.27	2.23	2.20	2.17	2.15	2.13	2.11	2.11	2.10	2.08	S	2.11	2.19	2.24	2.28	2.31	2.08	2.31	1.89	24	
29	2.32	2.36	2.46	2.49	2.43	2.45	2.51	2.46	2.38	2.30	2.25	2.19	2.17	2.16	2.12	2.11	2.08	S	2.07	2.17	2.26	2.26	2.42	2.54	2.07	2.54	1.95	24	
30	2.69	2.73	2.77	2.82	2.72	2.66	2.67	2.69	2.84	2.90	2.90	2.77	2.56	2.42	2.25	2.17	2.11	S	2.10	2.13	2.19	2.24	2.26	2.33	2.41	2.10	2.90	2.12	24
31	2.42	2.46	2.46	2.47	2.40	2.41	2.44	2.40	2.38	2.39	2.36	2.32	2.32	2.29	2.27	S	2.24	2.25	2.27	2.31	2.36	2.42	2.44	2.49	2.24	2.49	1.87	24	
HOURLY MAX	2.69	2.73	2.77	2.82	2.72	2.72	2.70	2.69	2.84	2.90	2.77	2.56	2.44	2.44	2.33	2.29	2.24	2.25	2.27	2.31	2.36	2.42	2.44	2.54					
HOURLY AVG	2.13	2.15	2.18	2.18	2.18	2.20	2.21	2.18	2.14	2.12	2.08	2.05	2.03	2.00	1.98	1.94	1.94	1.93	1.95	2.00	2.04	2.08	2.10	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

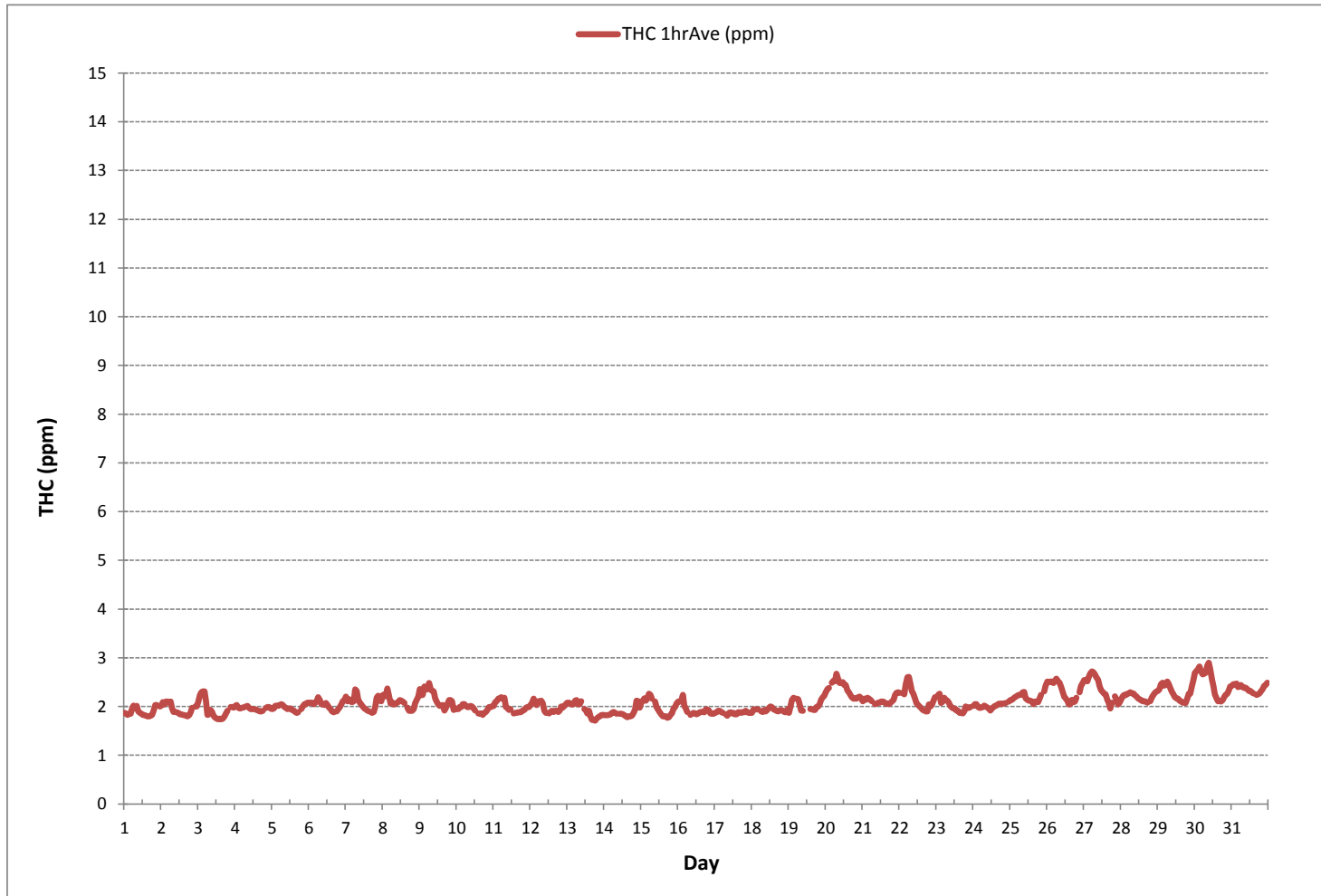
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708			
MINIMUM 1-HR AVERAGE:	1.71 ppm	@ HOUR	18	ON DAY 13
MAXIMUM 1-HR AVERAGE:	2.90 ppm	@ HOUR	9	ON DAY 30
MAXIMUM 24-HR AVERAGE:	2.17 ppm			ON DAY 9
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.21	MONTHLY AVERAGE:	2.08 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - July 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 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	2.05	2.04	2.08	2.05	2.11	2.75	2.51	2.23	2.27	2.13	2.07	2.05	2.04	2.03	2.01	2.00	2.01	2.01	2.04	2.14	2.31	2.27	S	2.20	2.00	2.75	2.19	24	
2	3.13	2.35	2.35	2.42	2.33	2.29	2.31	2.25	2.08	2.07	2.04	2.04	2.00	2.01	1.98	1.97	1.95	1.95	1.95	2.08	2.11	S	2.17	2.27	1.95	3.13	2.18	24	
3	2.33	2.41	2.49	2.49	2.51	3.00	1.98	2.01	2.11	2.23	1.98	1.94	1.95	1.91	1.95	1.95	2.04	2.00	2.11	2.21	S	2.41	2.41	2.14	1.91	3.00	2.20	24	
4	2.15	2.20	2.14	2.11	2.12	2.13	2.13	2.13	2.14	2.11	2.08	2.08	2.08	2.07	2.04	2.04	2.01	2.01	2.01	S	2.60	2.11	2.25	2.14	2.01	2.60	2.13	24	
5	2.13	2.23	2.29	2.29	2.17	2.20	2.20	2.26	2.17	2.15	2.14	2.15	2.14	2.17	2.17	2.11	2.13	2.14	S	2.39	2.39	2.84	2.54	2.29	2.11	2.84	2.25	24	
6	2.38	2.32	2.45	2.44	2.30	2.38	2.45	2.44	2.51	2.38	2.23	2.29	2.26	2.23	2.35	2.17	2.17	S	2.19	2.21	2.29	2.29	2.32	2.49	2.17	2.51	2.33	24	
7	2.70	2.32	2.51	2.32	2.50	2.41	2.60	2.54	2.48	2.26	2.17	2.14	2.10	2.06	2.05	2.01	S	2.01	2.01	2.41	2.51	2.56	2.28	2.29	2.01	2.70	2.31	24	
8	2.38	2.39	2.38	2.97	2.75	2.17	2.22	2.18	2.18	2.20	2.23	2.25	2.26	2.30	2.26	S	2.20	2.09	2.05	2.02	2.08	2.51	2.61	2.76	2.02	2.97	2.32	24	
9	2.75	2.54	2.41	2.70	2.57	2.62	2.66	2.54	2.47	2.44	2.30	2.23	2.16	2.11	S	2.17	2.04	2.14	2.17	2.29	2.29	2.29	2.11	2.11	2.04	2.75	2.35	24	
10	2.05	2.08	2.32	2.11	2.38	2.42	2.23	2.29	2.20	2.17	2.23	2.17	2.14	S	2.08	1.98	2.01	1.95	2.01	2.04	2.11	2.14	P	2.15	1.95	2.42	2.15	23	
11	2.18	2.29	2.28	2.35	2.38	2.36	2.38	2.39	2.20	2.17	2.13	2.14	S	2.05	2.07	2.08	2.08	2.08	2.08	2.11	2.11	2.17	2.18	2.22	2.75	2.05	2.75	2.22	24
12	2.38	2.44	2.54	2.30	2.29	2.35	2.35	2.38	2.39	2.20	2.11	S	2.11	2.14	2.14	2.13	2.14	2.14	2.14	2.11	2.20	P	2.20	2.25	2.27	2.11	2.54	2.25	23
13	2.30	2.29	2.26	2.25	2.26	2.32	2.35	2.28	P	2.34	S	2.17	2.14	2.08	2.14	2.05	1.95	1.92	1.98	P	P	2.25	2.09	2.11	1.92	2.35	2.17	21	
14	2.14	2.15	2.17	2.15	2.30	2.30	2.26	2.20	2.22	S	2.17	2.14	2.17	2.17	2.14	2.38	2.29	2.11	2.08	2.15	2.38	2.57	2.53	P	2.08	2.57	2.24	23	
15	2.53	2.39	2.44	2.41	2.49	2.54	2.60	2.42	S	2.38	2.35	2.18	2.11	2.07	2.01	2.01	2.01	1.98	1.98	2.01	2.04	2.17	2.14	2.26	1.98	2.60	2.24	24	
16	2.26	2.26	2.26	2.54	2.26	2.11	2.03	S	2.08	2.01	2.04	2.01	1.98	2.01	2.03	2.03	2.04	2.04	2.07	2.06	1.98	1.96	1.96	1.96	1.96	2.54	2.09	24	
17	1.98	2.00	2.03	2.03	2.01	1.98	S	1.95	1.97	2.03	2.01	2.01	2.26	2.06	2.03	2.11	2.08	2.08	2.17	2.14	2.27	2.11	2.23	2.30	1.95	2.30	2.08	24	
18	2.11	2.14	2.15	2.15	2.17	S	2.26	2.23	2.29	2.17	P	2.20	2.22	2.20	2.17	2.14	2.20	2.26	2.27	2.23	2.29	2.22	2.14	2.14	2.11	2.29	2.20	23	
19	2.14	2.26	2.33	2.39	S	2.36	2.35	2.26	P	2.11	C	C	C	C	C	2.03	1.95	1.96	2.04	2.02	2.13	2.17	2.23	2.27	1.95	2.39	2.18	23	
20	2.35	2.41	2.44	S	2.60	2.62	2.73	2.85	2.60	2.56	2.54	2.54	2.53	2.50	2.39	2.35	2.27	2.26	2.41	2.20	2.20	2.23	2.26	P	2.20	2.85	2.45	23	
21	2.17	2.20	P	2.23	2.23	P	2.17	S	S	2.13	2.23	2.23	2.14	2.14	2.11	2.11	2.18	2.23	2.20	2.29	2.45	2.79	2.49	2.48	2.11	2.79	2.26	22	
22	2.45	S	2.32	2.32	2.57	2.66	2.66	2.56	2.38	2.32	2.20	2.17	2.08	2.02	1.99	1.95	1.98	1.94	2.17	3.66	2.08	2.11	2.20	2.35	1.94	3.66	2.31	24	
23	S	2.44	3.59	2.11	2.38	2.44	2.18	2.17	2.24	P	2.04	2.04	P	2.05	2.01	1.96	2.91	1.89	2.01	2.94	2.07	2.04	2.05	S	1.89	3.59	2.28	22	
24	2.08	2.14	2.11	2.14	2.00	2.00	2.03	2.04	2.04	2.01	2.04	1.96	2.04	2.08	2.07	2.11	2.10	2.11	2.11	2.13	2.17	S	2.17	1.96	2.17	2.08	24		
25	2.20	2.20	2.20	2.23	2.25	2.26	2.29	2.29	2.38	2.41	2.29	2.19	P	2.33	2.29	2.11	5.54	7.67	4.41	2.27	2.35	S	2.41	2.48	2.11	7.67	2.78	23	
26	2.57	2.54	2.53	2.54	2.53	2.59	2.60	2.60	2.89	2.50	P	2.30	2.20	2.20	2.08	2.11	2.21	2.12	2.14	2.23	S	2.39	2.50	2.51	2.08	2.89	2.40	23	
27	2.59	2.60	2.56	2.69	P	2.79	2.73	2.73	2.66	2.63	2.53	2.38	2.35	2.29	2.30	2.20	2.15	2.01	5.63	S	2.32	2.32	2.14	2.17	2.01	5.63	2.58	23	
28	2.23	2.60	2.54	2.26	2.30	2.32	2.32	2.32	2.32	2.28	2.28	2.22	2.19	2.20	2.17	2.17	2.16	2.11	S	2.17	2.23	2.29	2.38	2.54	2.11	2.60	2.29	24	
29	2.38	2.51	2.60	2.60	2.69	2.54	2.54	2.53	2.42	2.38	2.30	2.23	2.20	2.19	2.17	2.14	2.11	S	2.11	2.28	2.35	2.36	2.48	2.67	2.11	2.69	2.38	24	
30	2.73	2.78	2.91	2.93	2.81	2.72	2.75	2.82	3.08	3.04	2.88	2.69	2.54	2.35	2.20	2.15	S	2.17	2.26	2.56	2.44	2.41	2.36	2.45	2.15	3.08	2.61	24	
31	2.47	2.50	2.50	2.57	2.44	2.44	2.56	2.45	2.42	2.45	2.47	2.38	2.44	2.33	2.35	S	2.30	2.32	2.36	2.38	2.45	2.53	2.60	2.72	2.30	2.72	2.45	24	
HOURLY MAX	3.13	2.78	3.59	2.97	2.81	3.00	2.75	2.85	3.08	3.04	2.88	2.69	2.54	2.50	2.39	2.38	5.54	7.67	5.63	3.66	2.60	2.84	2.61	2.76					
HOURLY AVG	2.34	2.33	2.41	2.37	2.37	2.42	2.38	2.36	2.34	2.28	2.23	2.19	2.18	2.15	2.13	2.09	2.25	2.27	2.31	2.28	2.26	2.31	2.30	2.34					

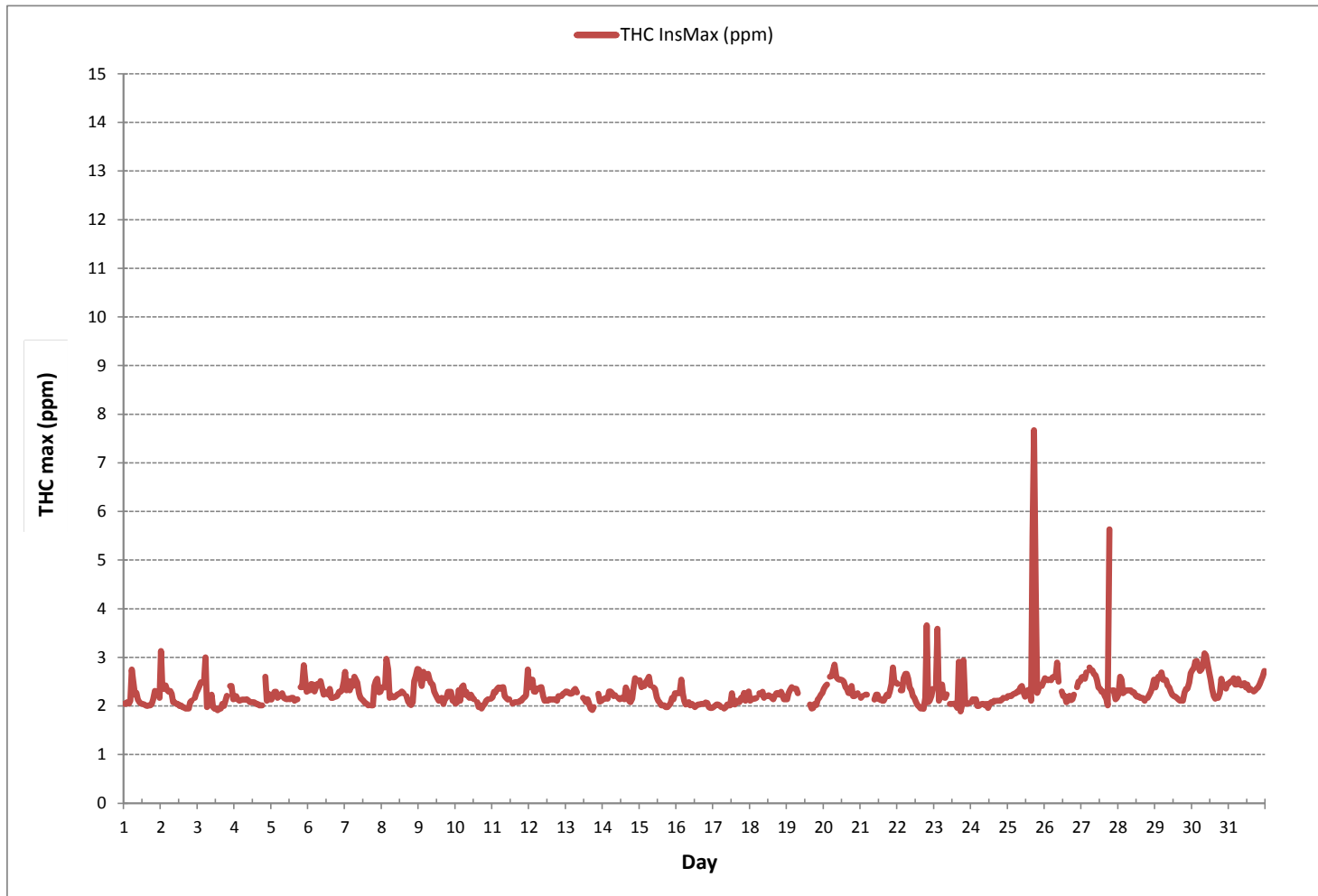
STATUS FLAG CODES

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

MONTHLY SUMMARY

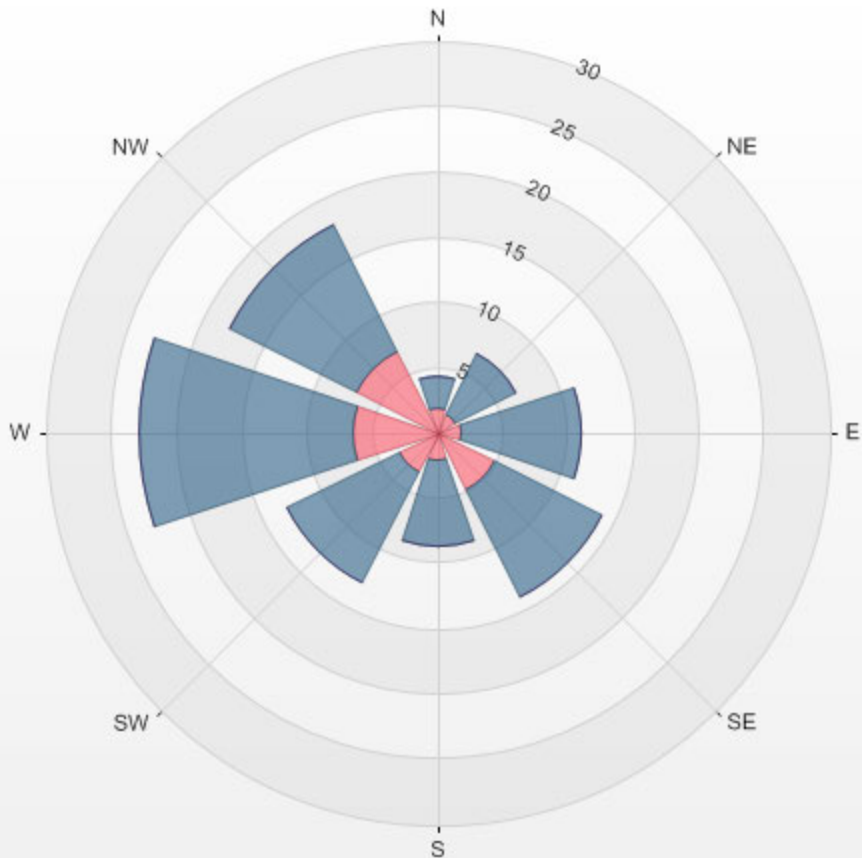
NUMBER OF NON-ZERO READINGS:	690
MAXIMUM INSTANTANEOUS VALUE:	7.67 ppm @ HOUR 17 ON DAY 25
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	728 hrs
STANDARD DEVIATION:	0.36

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



% Icon Classes (ppm) 0 0.0-1.0 29 1.0-1.9 69 1.9-2.9 0 >2.9

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.59% Calm Poll Avg: 2.02[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 17/07 Type: Span



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

OXIDES OF NITROGEN



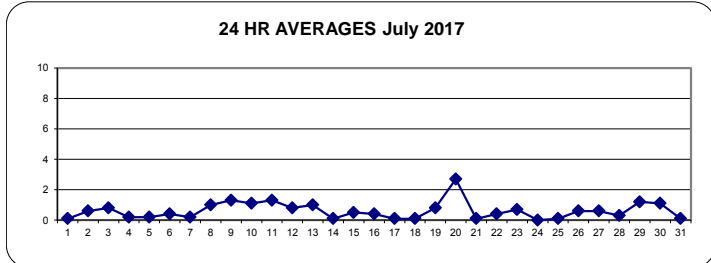
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

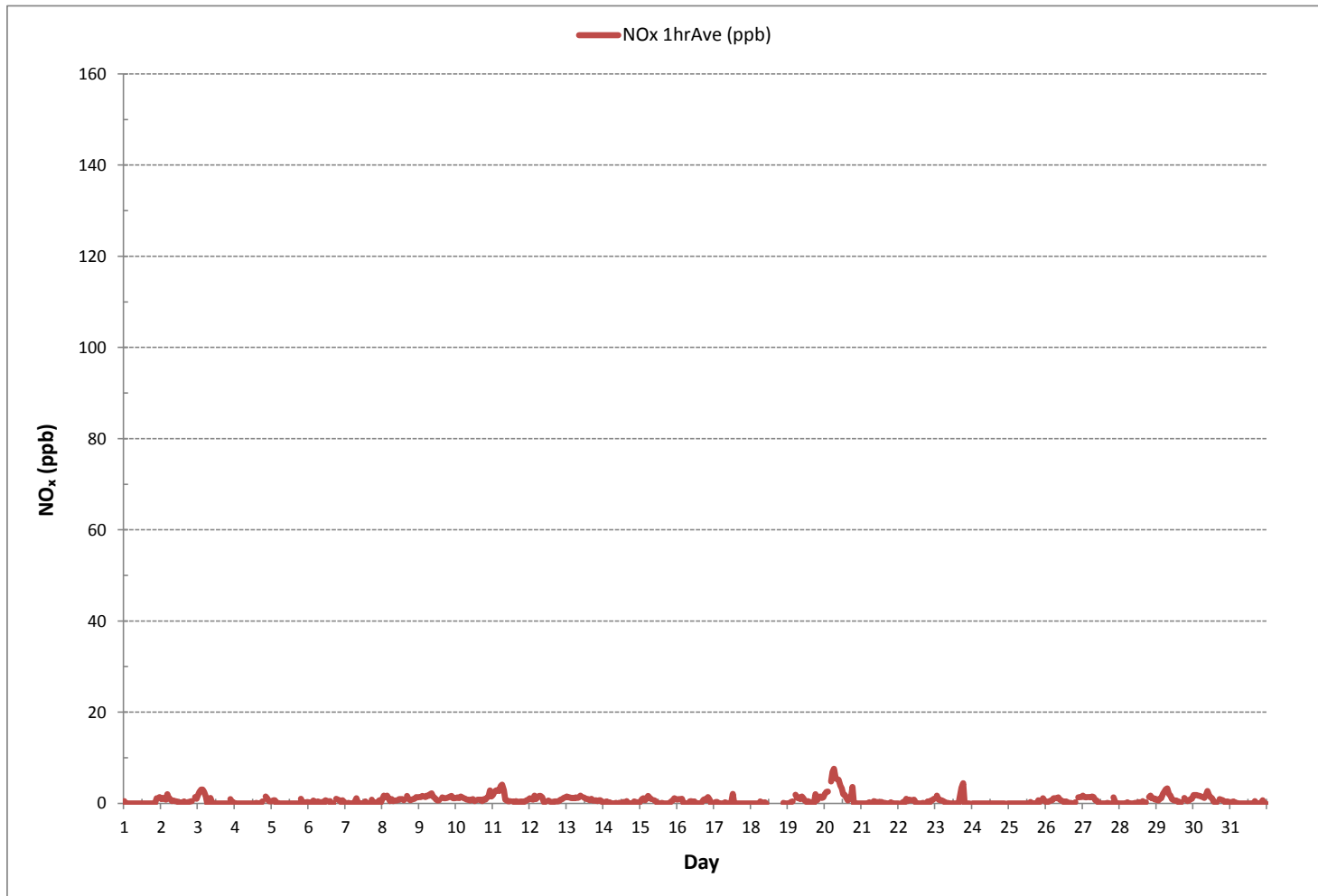
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	459			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY
MAXIMUM 1-HR AVERAGE:	8 ppb	@ HOUR	6	ON DAY
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	10 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - July 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	2	2	1	2	1	2	2	2	2	2	2	1	1	1	2	1	1	1	2	2	2	2	19	S	3	1	19	3	24
2	3	3	3	3	4	3	3	2	3	4	4	2	2	2	2	3	2	3	2	2	2	2	S	3	3	2	4	3	24
3	4	4	5	5	4	4	2	2	3	3	2	2	2	3	1	1	2	2	1	2	2	S	5	3	2	1	5	3	24
4	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	S	4	4	2	2	1	4	2	24
5	2	3	2	2	2	2	1	2	2	2	2	1	1	1	3	3	1	1	S	5	2	2	1	2	1	5	2	24	
6	2	2	2	2	2	2	4	2	2	2	2	4	4	4	2	4	2	2	S	3	5	4	5	5	2	2	5	3	24
7	2	2	2	2	2	2	2	4	2	3	3	3	2	5	2	1	S	4	2	2	2	2	2	3	2	1	5	2	24
8	3	4	3	3	3	2	2	2	2	2	2	2	2	3	2	S	3	2	2	2	2	3	2	3	2	2	4	2	24
9	3	3	3	3	3	3	3	3	3	3	3	2	2	3	S	3	2	2	3	3	3	3	3	3	2	2	3	3	24
10	2	3	2	3	2	2	2	2	2	2	2	22	2	S	2	2	2	2	2	2	2	2	3	P	3	2	22	3	23
11	3	4	4	4	4	5	6	5	2	2	2	2	S	2	2	2	2	2	2	3	2	2	2	3	2	6	3	24	
12	3	3	2	3	3	3	3	3	3	2	2	S	2	2	2	2	2	2	2	2	2	2	P	2	3	3	2	23	
13	3	3	3	2	3	3	3	3	P	3	S	3	3	2	2	2	5	2	2	P	P	2	3	2	2	5	3	21	
14	2	2	2	2	2	2	1	1	2	S	2	2	2	2	2	38	1	2	2	2	3	2	2	P	1	38	4	23	
15	2	3	3	3	3	4	3	3	S	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	4	2	24	
16	3	3	3	3	2	2	2	2	S	2	4	2	2	2	2	2	3	4	3	3	4	3	2	2	2	4	3	24	
17	2	2	2	2	2	2	S	3	10	2	2	2	124	8	2	1	1	1	1	1	1	2	2	1	1	124	8	24	
18	1	1	1	1	1	S	2	2	2	2	C	C	C	C	C	C	C	C	C	C	C	C	2	1	1	1	2	1	24
19	1	1	1	1	S	7	3	6	P	4	3	2	1	2	2	2	1	2	25	2	5	5	3	3	1	25	4	23	
20	4	4	5	S	7	9	10	7	7	7	6	5	4	3	3	2	20	9	X	1	1	1	2	1	P	1	20	13	22
21	2	1	P	1	1	P	2	S	S	2	3	2	2	2	3	3	1	1	4	4	2	1	2	1	2	1	4	2	22
22	1	S	1	2	2	5	2	3	4	2	3	2	2	1	1	3	2	2	1	4	1	2	2	2	1	5	2	24	
23	S	3	2	2	2	2	1	1	13	P	1	1	P	1	1	0	46	49	23	1	1	0	0	S	0	49	8	22	
24	1	1	1	1	0	1	1	1	1	0	1	2	1	1	1	0	1	1	0	0	0	0	S	1	0	2	1	24	
25	1	1	1	1	1	2	0	1	1	1	0	1	P	1	27	0	0	0	1	4	3	S	2	1	0	27	2	23	
26	1	1	1	1	1	2	2	2	4	2	P	1	1	1	1	1	1	0	1	1	S	2	2	2	0	4	1	23	
27	2	2	3	2	P	2	3	2	2	2	2	1	1	1	1	2	2	2	1	S	4	3	1	1	1	4	2	23	
28	1	1	1	3	1	2	1	1	1	1	9	1	3	1	1	3	1	1	S	3	3	1	1	1	1	9	2	24	
29	1	1	1	2	3	3	4	6	3	4	2	1	1	2	1	2	2	S	3	1	1	1	1	2	2	6	2	24	
30	2	3	3	2	2	2	2	2	4	4	3	2	2	2	1	1	S	2	2	2	1	1	1	1	1	4	2	24	
31	1	1	2	1	1	1	2	1	1	1	1	2	1	1	1	S	3	1	1	1	1	2	6	1	0	6	1	24	
HOURLY MAX	4	4	5	5	7	9	10	7	13	7	9	22	124	8	27	38	46	49	25	5	5	19	5	3					
HOURLY AVG	2	2	2	2	2	3	3	3	3	3	3	3	6	2	3	3	4	4	3	2	2	3	2	2					

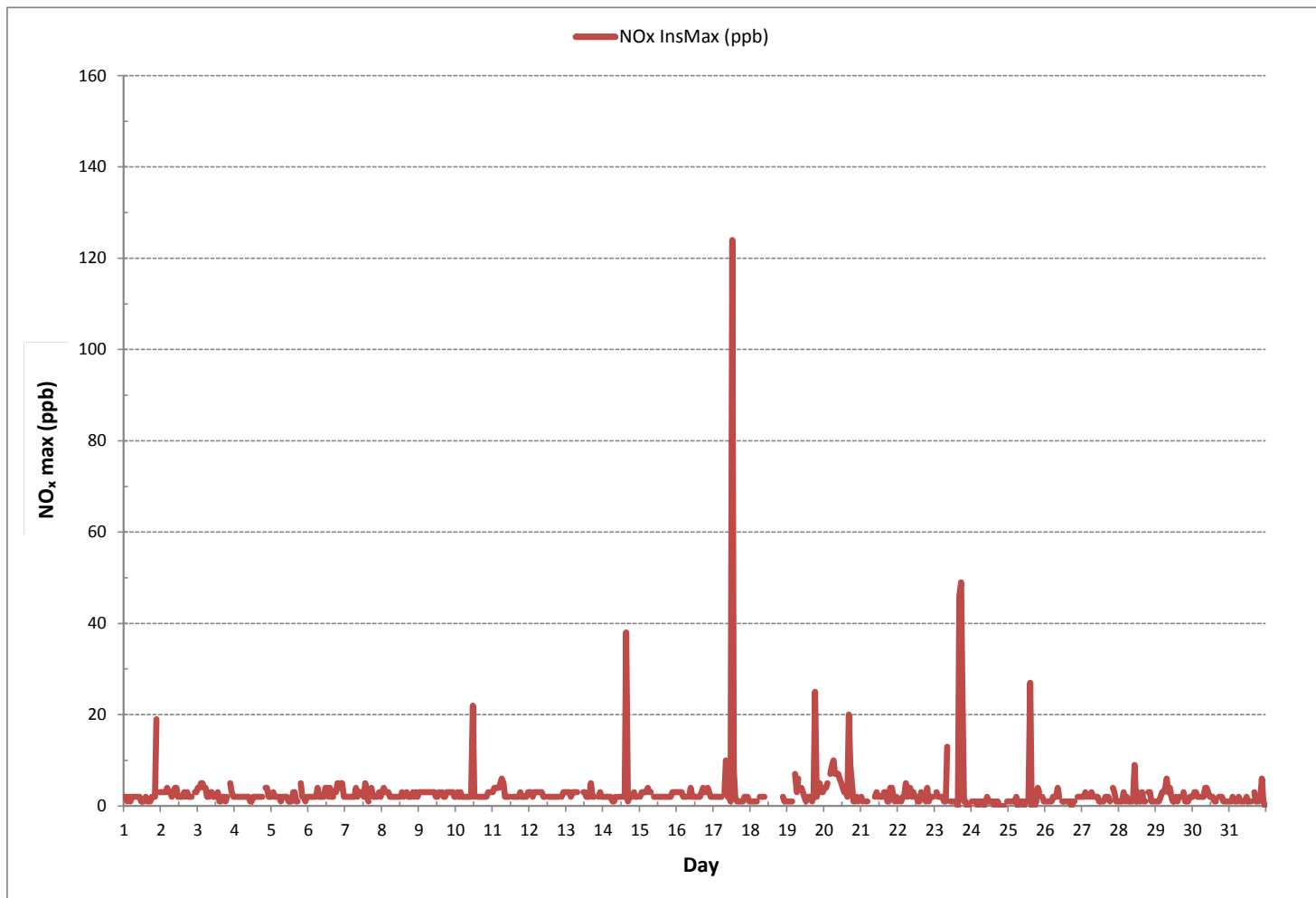
STATUS FLAG CODES

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:	667
MAXIMUM INSTANTANEOUS VALUE:	124 ppb @ HOUR 12 ON DAY 17
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	728 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

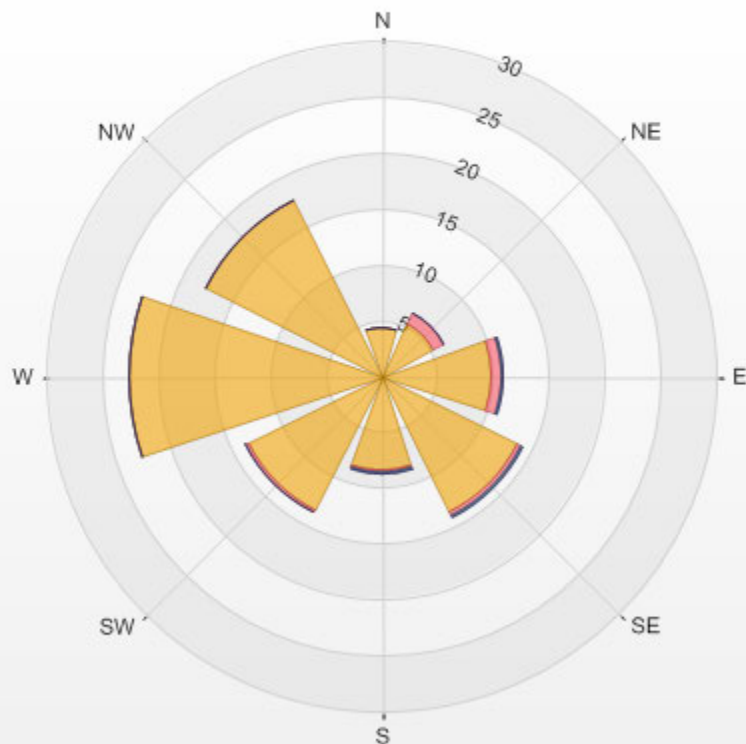
95 0.0-2.7

3 2.7-5.3

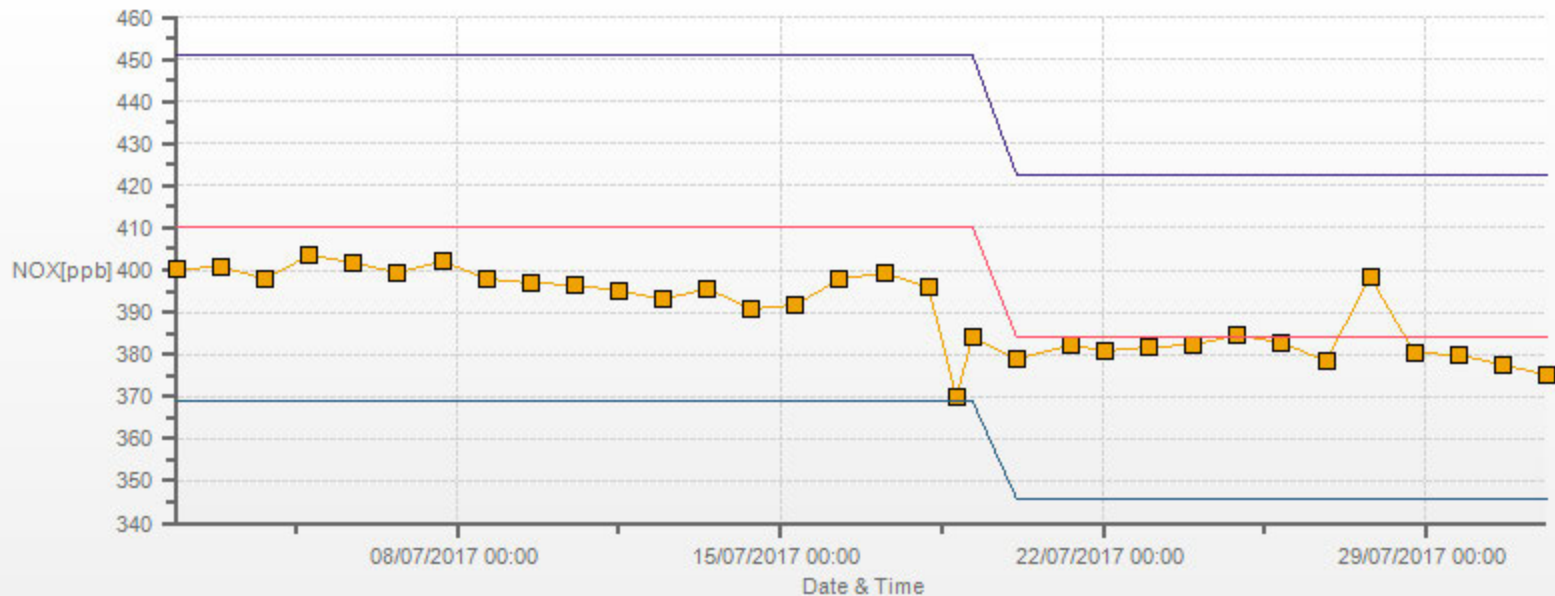
0 5.3-8.0

0 >8.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.46% Calm Poll Avg: 0.28[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 17/07 Type: Span



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

NITRIC OXIDES



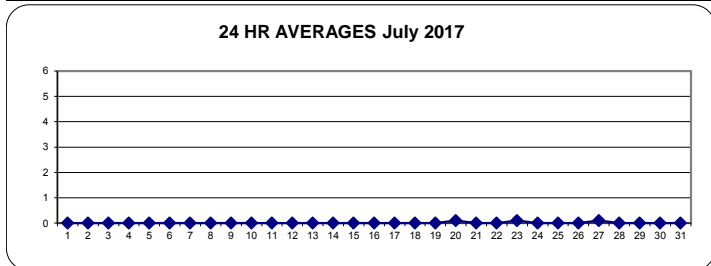
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

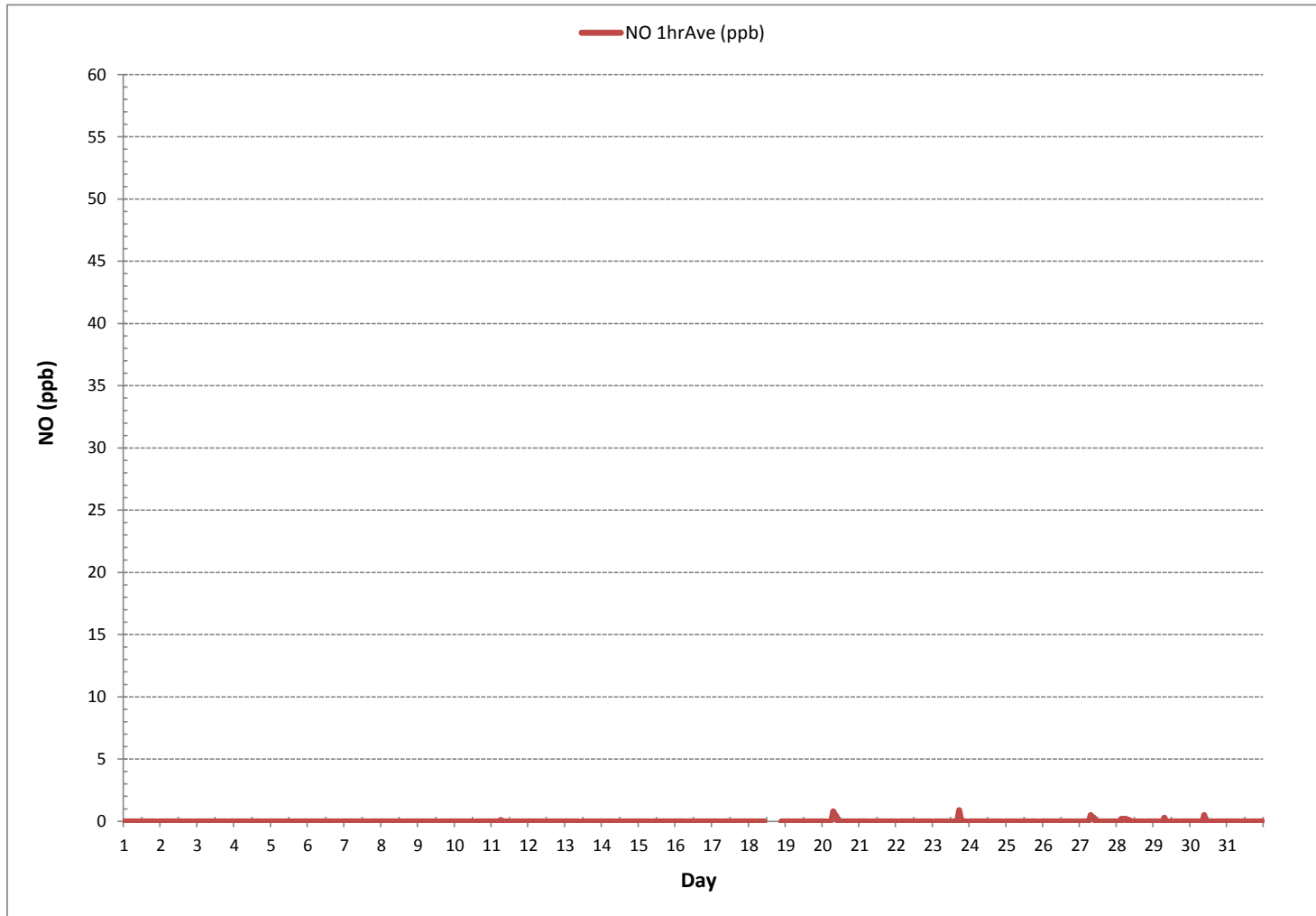
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	18			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	23	ON DAY 23
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 20
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0
				ppb

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

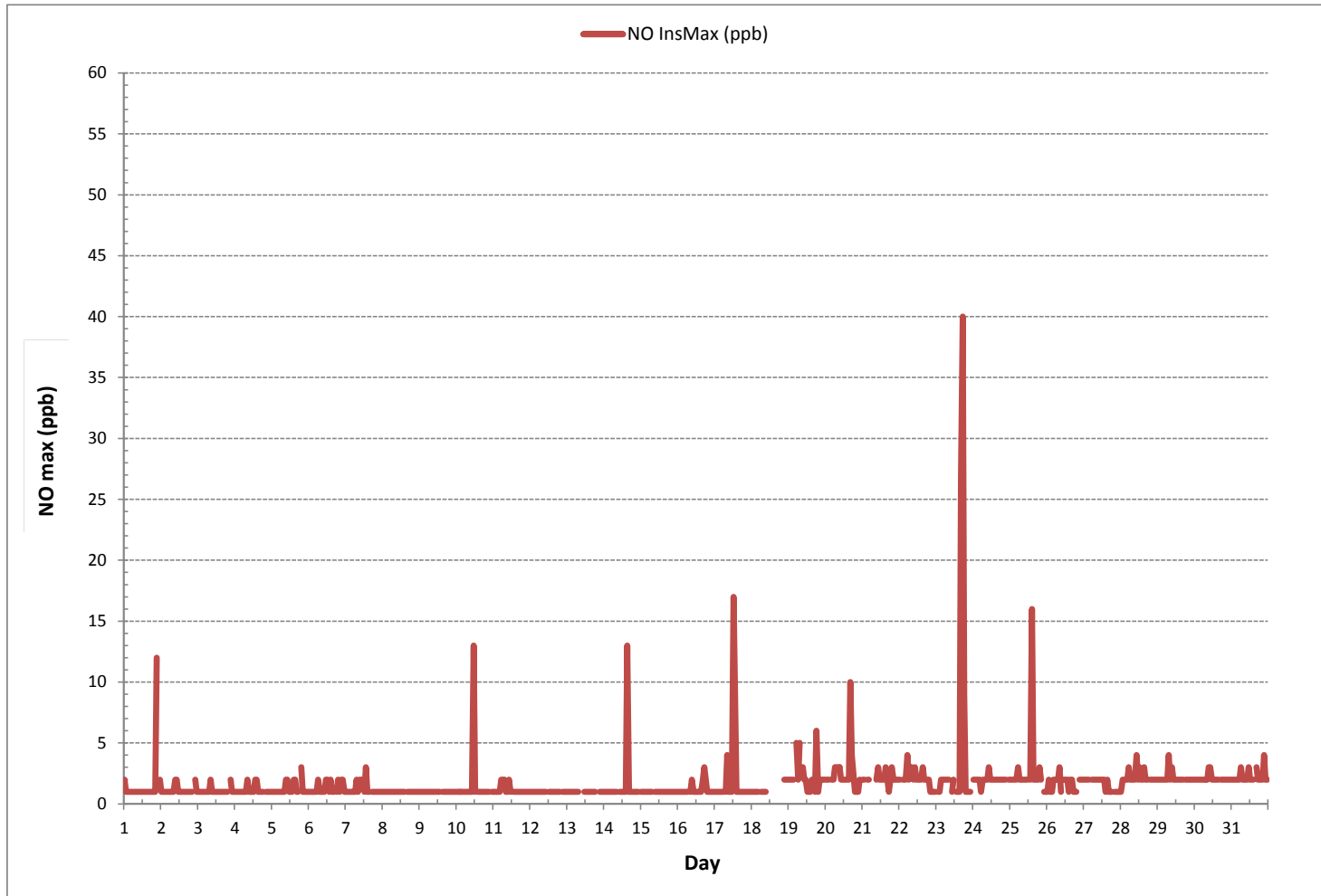
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	40 ppb @ HOUR 17 ON DAY 23
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	728 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 1.46% Calm Avg: 0.00 [ppb]

Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	4.4	0.0	0.0	0.0	4.4
NE	6.1	0.2	0.0	0.0	6.3
E	10.8	0.2	0.0	0.0	10.9
SE	14.1	0.0	0.0	0.0	14.1
S	8.8	0.0	0.0	0.0	8.8
SW	13.7	0.0	0.0	0.0	13.7
W	22.7	0.0	0.0	0.0	22.7
NW	17.6	0.0	0.0	0.0	17.6
Summary	98.3	0.3	0.0	0.0	98.6

% Icon Classes (ppb)

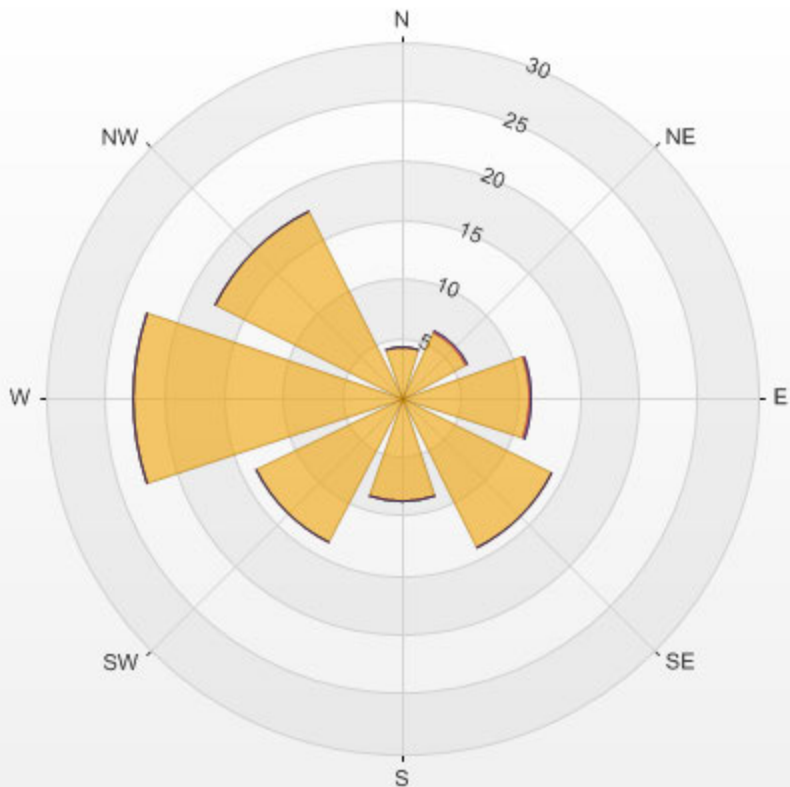
98 0.0-0.6

0 0.6-1.3

0 1.3-1.9

0 >1.9

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.46% Calm Poll Avg: 0.00[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

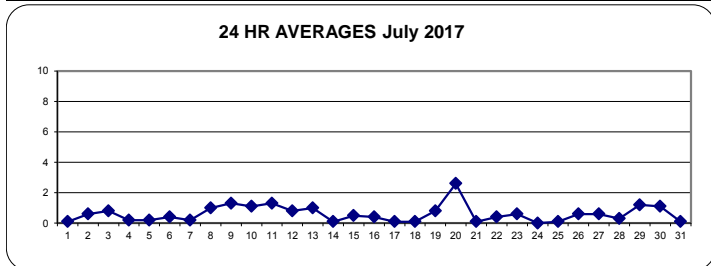
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

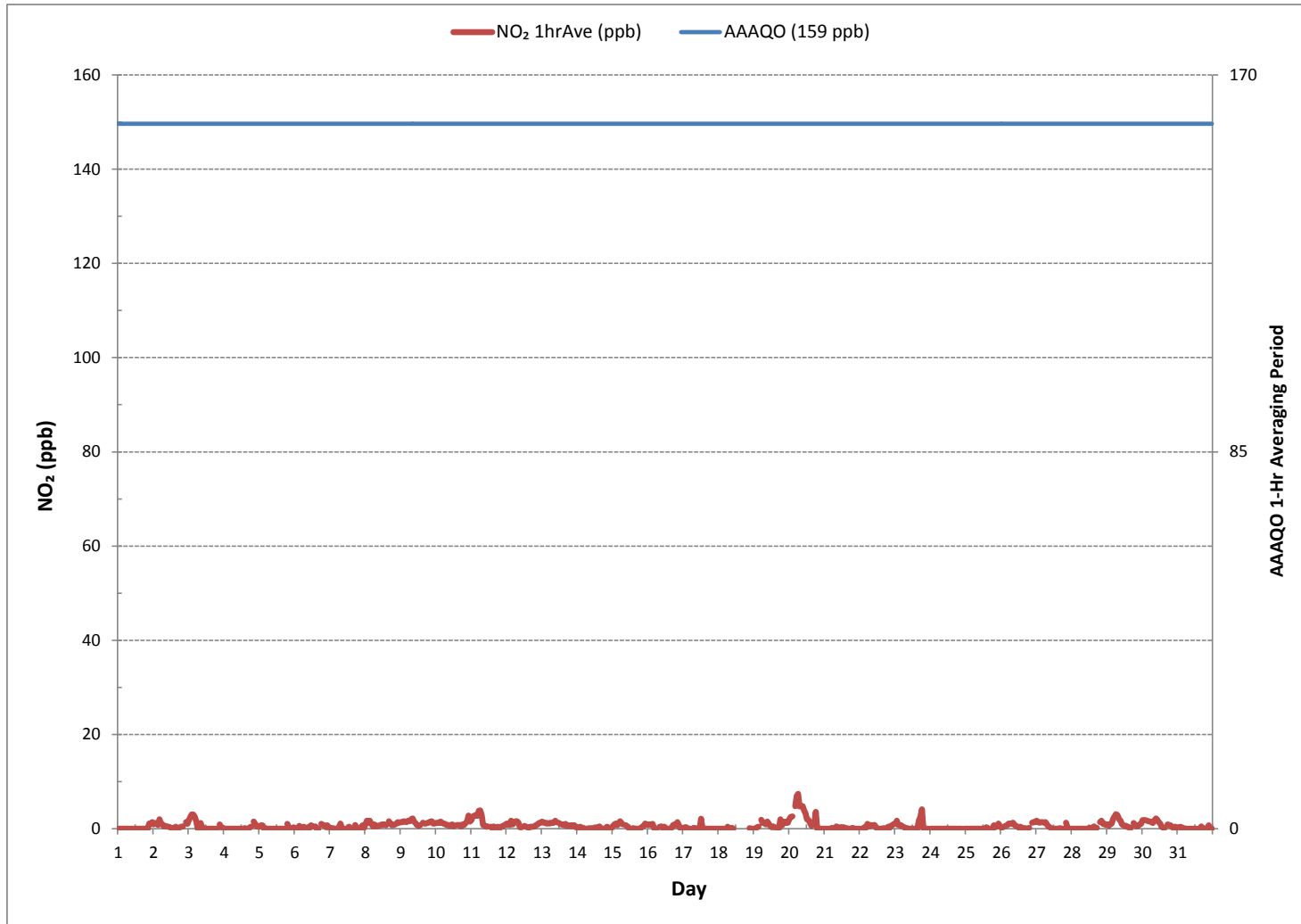
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	457				
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	1 ON DAY	1
MAXIMUM 1-HR AVERAGE:	7	ppb	@ HOUR	6 ON DAY	20
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY	20
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	1	ppb

24 HR AVERAGES July 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.					
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.						
DAY																																	
1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	11	S	3	2	11	3	24					
2	4	4	4	4	4	4	4	3	3	3	3	3	2	2	3	2	3	2	2	2	3	S	3	3	2	4	3	24					
3	4	5	6	5	5	5	2	3	4	4	2	2	2	3	2	2	2	2	2	2	2	S	5	3	3	2	6	3	24				
4	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	S	5	5	3	3	2	5	3	24					
5	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	2	2	S	4	2	3	2	3	2	4	2	24						
6	2	2	2	3	2	2	3	2	3	2	2	4	3	2	3	2	2	S	3	4	4	5	5	3	2	5	3	24					
7	3	2	2	2	2	2	2	4	3	3	3	2	2	4	2	2	S	4	3	3	3	3	3	3	2	4	3	24					
8	3	4	3	4	4	3	3	2	2	2	3	3	3	4	3	S	3	3	3	3	3	3	3	3	2	4	3	24					
9	3	3	3	3	3	4	3	4	4	3	3	3	3	3	S	3	3	3	3	3	3	3	4	3	3	4	3	24					
10	3	3	3	3	3	3	3	2	2	2	2	12	2	S	3	2	2	2	3	3	3	3	P	4	2	12	3	23					
11	4	5	5	5	5	5	5	4	3	2	2	2	S	2	2	2	2	2	3	2	2	2	3	4	2	5	3	24					
12	3	3	3	4	3	3	3	4	3	2	2	S	2	2	2	2	2	2	2	2	2	P	3	3	2	4	3	23					
13	4	3	3	3	3	3	3	3	P	3	S	3	3	3	3	3	4	3	3	P	P	3	3	3	3	4	3	21					
14	3	3	3	2	2	2	2	2	S	2	2	2	2	2	2	28	2	3	2	2	3	3	3	P	2	28	4	23					
15	3	4	4	4	4	4	4	3	S	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2	4	3	24					
16	4	4	4	4	3	2	2	S	3	3	3	3	3	3	2	2	3	3	3	3	4	4	2	2	2	4	3	24					
17	3	3	3	2	2	2	S	3	8	2	2	2	109	5	2	2	2	2	2	2	2	2	2	2	2	109	7	24					
18	2	2	2	2	2	S	2	2	2	2	C	C	C	C	C	C	C	C	C	C	C	C	1	1	1	2	2	24					
19	1	1	1	1	S	3	2	3	P	3	2	2	1	2	2	2	1	1	22	2	5	5	3	3	1	22	3	23					
20	4	4	5	S	7	9	9	6	6	6	5	4	4	3	2	2	12	6	X	2	1	2	1	P	1	12	12	22					
21	2	1	P	1	1	P	2	S	S	2	2	2	2	2	2	1	2	2	1	1	3	4	2	1	2	1	4	2	22				
22	1	S	1	2	2	2	1	1	2	2	2	2	1	1	1	2	2	1	1	3	1	2	2	2	1	3	2	24					
23	S	3	2	2	2	2	1	1	13	P	1	1	P	0	1	0	33	12	16	1	1	1	1	S	0	33	5	22					
24	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	0	0	S	1	0	1	1	24					
25	1	1	1	1	1	1	1	1	1	1	0	0	P	1	12	0	0	1	1	3	3	S	2	2	0	12	2	23					
26	1	1	1	1	2	2	2	2	2	2	P	1	1	1	1	1	1	1	1	1	1	S	2	2	2	1	2	1	23				
27	3	2	3	3	P	2	3	2	2	2	1	2	1	1	2	2	2	2	1	S	4	3	1	1	1	4	2	23					
28	1	1	1	3	1	1	1	1	1	1	8	1	2	1	1	1	1	1	S	2	2	2	1	1	1	8	2	24					
29	1	1	1	2	3	3	3	4	2	3	1	1	1	2	1	2	2	S	2	1	1	1	2	3	1	4	2	24					
30	3	3	3	3	2	2	2	2	3	3	2	2	2	2	2	1	S	2	2	2	1	1	1	1	1	3	2	24					
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	2	1	1	1	1	2	3	1	1	0	3	1	24				
HOURLY MAX	4	5	6	5	7	9	9	6	13	6	8	12	109	5	12	28	33	12	22	4	5	11	5	4									
HOURLY AVG	3	3	3	3	3	3	3	2	3	2	2	2	6	2	2	3	3	3	3	2	3	3	2	2									

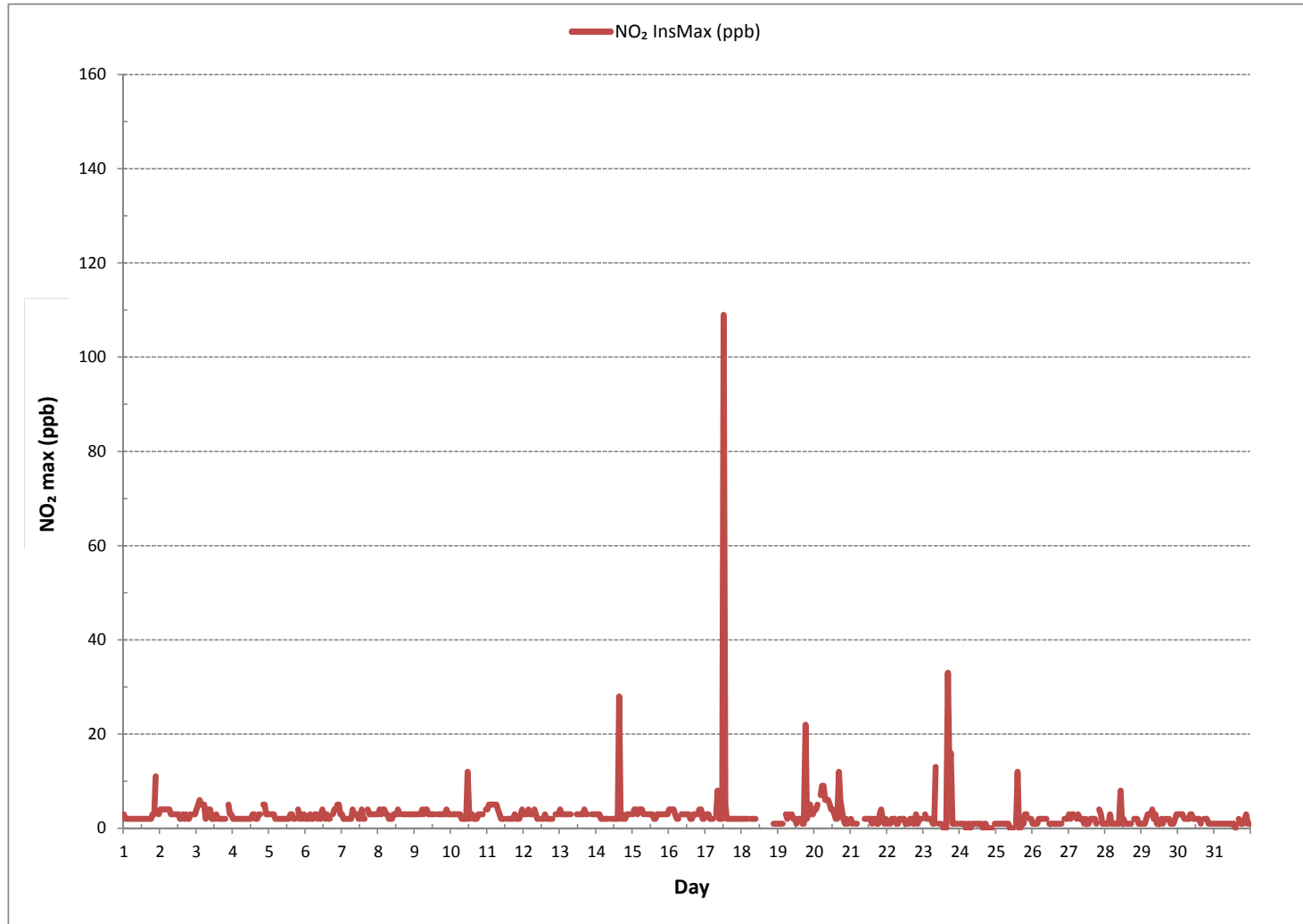
STATUS FLAG CODES

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:	669
MAXIMUM INSTANTANEOUS VALUE:	109 ppb @ HOUR 12 ON DAY 17
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	11 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	728 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 1.46% Calm Avg: 0.28 [ppb]

Direction	0.0-2.7	2.7-5.3	5.3-8.0	>8.0	Total
N	4.4	0.0	0.0	0.0	4.4
NE	5.5	0.7	0.0	0.0	6.3
E	9.9	1.0	0.0	0.0	10.9
SE	13.7	0.3	0.2	0.0	14.1
S	8.5	0.2	0.2	0.0	8.8
SW	13.4	0.3	0.0	0.0	13.7
W	22.7	0.0	0.0	0.0	22.7
NW	17.6	0.0	0.0	0.0	17.6
Summary	95.8	2.5	0.3	0.0	98.5

% Icon Classes (ppb)

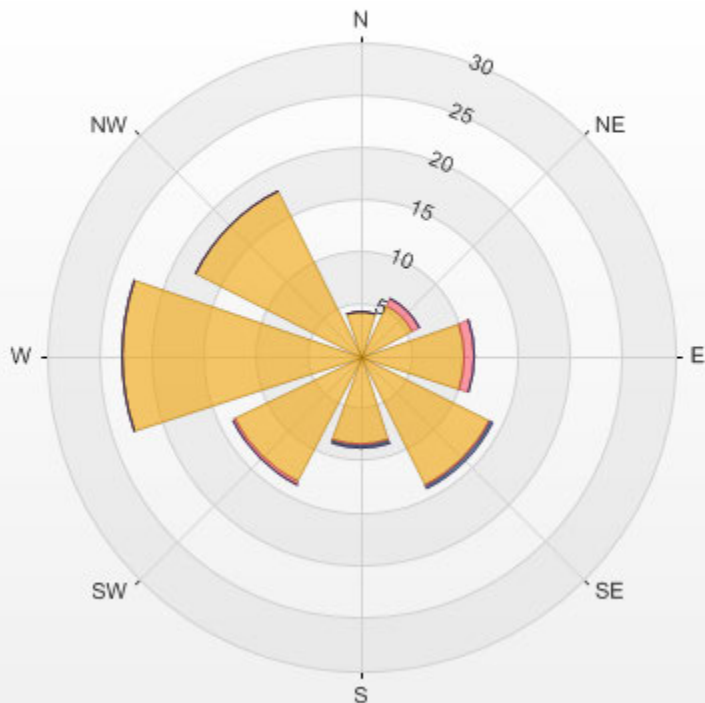
96 0.0-2.7

2 2.7-5.3

0 5.3-8.0

0 >8.0

LICA ST. LINA Poll.: LICA ST. LINA-NO₂[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.46% Calm Poll Avg: 0.28[ppb]



NO2[ppb] Calibration: LICA ST. LINA Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

OZONE

OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	24.0	23.8	23.0	24.0	22.7	18.0	17.8	19.7	22.5	28.0	30.1	29.3	29.5	29.8	30.0	29.9	30.9	31.1	29.8	28.5	28.1	24.4	S	47.0	17.8	47.0	26.0	24
2	25.2	20.7	19.6	17.0	18.5	19.6	21.2	31.0	37.8	38.5	42.1	44.4	46.0	47.0	46.2	45.2	47.2	49.3	52.8	49.0	47.2	S	47.2	44.1	17.0	52.8	37.3	24
3	41.1	35.9	30.5	27.2	23.7	25.2	31.4	30.1	29.8	33.8	36.6	38.9	42.0	40.9	41.0	41.0	38.7	33.1	32.4	31.9	S	32.4	29.5	27.8	23.7	42.0	33.7	24
4	26.8	26.1	24.7	25.7	24.7	23.1	24.1	26.7	28.4	30.5	32.3	33.5	37.7	38.9	38.6	38.4	40.5	44.2	46.1	S	46.0	44.0	35.5	32.8	23.1	46.1	33.4	24
5	31.3	28.8	26.8	26.4	23.3	24.4	22.4	24.3	26.0	27.1	29.8	29.8	30.3	31.1	31.4	30.9	31.2	31.2	S	29.6	29.3	29.2	28.8	23.6	22.4	31.4	28.1	24
6	24.9	26.0	29.9	30.5	29.5	27.1	22.7	21.5	30.1	34.5	36.1	31.2	33.0	35.4	36.2	38.4	37.9	S	38.1	34.8	34.1	33.9	32.0	29.9	21.5	38.4	31.6	24
7	26.1	26.7	26.1	26.2	25.2	24.5	17.6	20.8	26.2	28.0	29.1	30.6	32.8	34.4	36.0	36.7	S	38.2	37.9	34.2	31.6	31.8	34.0	36.2	17.6	38.2	30.0	24
8	39.9	38.3	37.8	33.1	28.6	28.9	28.9	28.4	30.6	31.4	35.7	39.1	42.1	44.6	41.1	S	41.8	34.3	29.4	31.3	29.2	27.8	26.2	31.8	26.2	44.6	33.9	24
9	32.0	34.4	33.4	30.4	32.5	28.6	26.0	29.4	31.7	33.5	35.9	40.3	42.2	45.9	S	48.4	44.7	37.8	35.4	34.1	33.0	29.5	42.3	40.0	26.0	48.4	35.7	24
10	40.3	38.8	33.6	30.0	27.1	23.6	22.2	24.0	24.5	25.2	25.0	28.1	30.5	S	32.2	33.8	33.3	33.9	34.4	32.5	32.8	31.9	29.2	28.0	22.2	40.3	30.2	24
11	25.7	22.1	20.6	19.1	17.6	13.8	14.4	19.5	28.1	29.8	33.5	33.9	S	31.5	32.5	29.6	26.9	26.5	26.3	23.5	20.0	19.7	17.5	20.9	13.8	33.9	24.0	24
12	20.6	18.2	16.3	15.5	18.3	18.3	20.6	20.9	23.4	26.0	28.5	S	29.3	27.6	25.6	25.7	24.0	23.8	25.2	22.8	18.8	21.8	22.7	25.2	15.5	29.3	22.6	24
13	25.2	24.3	23.1	22.3	21.4	19.7	20.2	23.5	25.0	23.8	S	36.2	38.3	43.3	46.4	48.0	46.1	46.5	48.2	54.3	49.3	41.2	38.1	36.8	19.7	54.3	34.8	24
14	35.0	33.9	36.5	35.3	31.6	27.7	26.6	27.0	27.7	S	32.7	34.1	35.6	31.8	30.9	31.6	33.6	33.6	32.1	28.2	27.0	24.3	26.4	31.0	24.3	36.5	31.1	24
15	32.9	36.6	36.3	37.8	37.9	34.4	32.1	35.9	S	41.8	45.2	47.2	47.6	47.8	47.9	46.9	45.2	42.7	39.9	39.1	38.1	35.4	32.1	30.5	30.5	47.9	39.6	24
16	28.2	26.7	24.3	21.0	23.3	23.0	30.0	S	37.4	35.5	33.9	31.2	28.9	25.2	24.0	21.0	22.3	19.1	19.5	20.5	20.4	21.6	23.2	23.6	19.1	37.4	25.4	24
17	20.7	18.3	16.5	15.5	15.1	15.4	S	15.1	16.5	19.4	22.2	21.9	23.7	22.0	22.4	20.5	20.8	20.8	20.4	19.5	21.8	20.7	21.4	22.1	15.1	23.7	19.7	24
18	16.5	13.9	14.7	12.2	15.0	S	18.7	18.4	18.0	20.2	20.2	23.3	20.1	20.3	19.5	22.9	22.5	Q	22.9	22.8	20.8	20.1	21.3	15.1	12.2	23.3	19.1	24
19	18.8	14.2	8.8	9.9	S	12.3	13.4	16.4	21.9	27.6	C	C	C	C	C	38.0	37.1	38.9	46.1	40.9	35.4	32.4	30.7	29.8	8.8	46.1	26.3	24
20	27.9	25.7	24.0	S	18.7	15.7	14.9	11.6	17.0	21.7	24.6	28.9	28.7	33.7	31.5	31.7	29.2	27.2	27.1	25.0	24.6	22.1	21.3	27.5	11.6	33.7	24.4	24
21	41.0	28.9	28.0	24.8	24.9	26.8	27.1	S	33.7	36.4	38.0	38.8	42.2	40.3	42.9	42.8	42.3	44.6	43.0	38.5	35.6	35.7	25.4	24.5	24.5	44.6	35.1	24
22	22.2	S	18.0	20.5	13.1	8.4	9.5	11.8	15.8	23.7	32.3	33.9	32.9	32.7	29.6	29.3	29.1	30.4	27.9	25.0	25.8	26.0	27.7	34.4	8.4	34.4	24.3	24
23	S	32.7	27.5	32.2	28.4	24.7	25.0	28.2	25.1	23.3	23.6	23.6	19.5	21.7	22.9	25.0	26.0	25.4	22.5	22.2	20.3	23.9	22.6	S	19.5	32.7	24.8	24
24	20.7	23.2	30.4	30.0	26.8	21.2	17.4	18.2	16.8	17.6	22.6	24.9	22.5	19.2	37.1	30.6	18.9	20.1	20.3	20.4	20.0	20.0	S	17.6	16.8	37.1	22.5	24
25	15.8	14.4	12.9	12.4	12.7	12.6	13.8	15.1	18.7	22.2	25.1	27.6	30.0	29.0	26.9	27.2	26.2	25.1	25.2	23.2	26.2	S	25.1	24.9	12.4	30.0	21.4	24
26	23.5	22.0	20.0	19.4	19.0	16.5	15.5	18.3	25.6	29.2	Y	37.0	39.6	43.9	45.9	46.0	46.5	44.8	42.5	38.7	S	40.2	38.7	35.8	15.5	46.5	32.2	23
27	33.1	33.3	32.3	28.3	24.7	24.2	24.0	23.3	26.1	27.0	31.2	34.8	38.8	39.2	41.8	48.7	48.5	41.3	39.3	S	37.1	31.3	37.5	34.9	23.3	48.7	33.9	24
28	32.1	27.8	26.2	25.1	22.7	21.0	S1	18.8	20.1	21.7	22.7	22.8	23.0	24.4	27.1	28.4	27.9	27.7	S	25.1	25.1	24.7	25.1	25.1	18.8	32.1	24.8	23
29	24.5	23.7	15.9	17.1	21.7	20.3	19.0	22.3	29.8	33.0	38.5	42.1	40.9	38.9	38.1	38.4	39.3	S	37.5	34.9	36.3	38.1	35.6	34.5	15.9	42.1	31.3	24
30	32.3	30.9	27.9	25.1	25.5	25.1	22.9	20.5	17.4	21.8	29.1	34.0	34.1	31.7	35.7	34.4	S	32.9	32.9	31.6	29.8	28.9	24.7	20.2	17.4	35.7	28.2	24
31	19.6	19.1	17.8	20.4	21.2	22.7	21.6	20.6	21.4	22.5	24.0	24.9	24.5	24.7	24.7	S	23.0	22.8	22.0	21.0	20.2	20.9	20.5	19.3	17.8	24.9	21.7	24
HOURLY MAX	41.1	38.8	37.8	37.8	37.9	34.4	32.1	35.9	37.8	41.8	45.2	47.2	47.6	47.8	47.9	48.7	48.5	49.3	52.8	54.3	49.3	44.0	47.2	47.0				
HOURLY AVG	27.6	26.3	24.6	23.8	23.2	21.6	21.4	22.1	25.1	27.8	30.7	32.6	33.3	33.7	34.0	34.8	33.8	33.1	33.0	30.5	29.8	28.8	29.0	29.2				

STATUS FLAG CODES

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

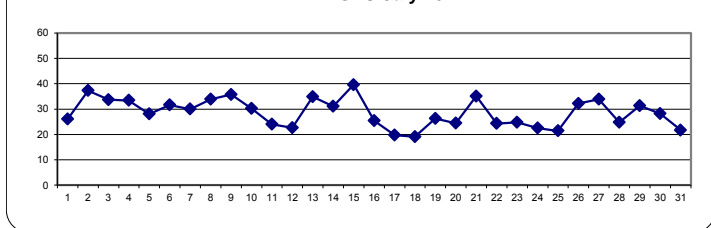
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

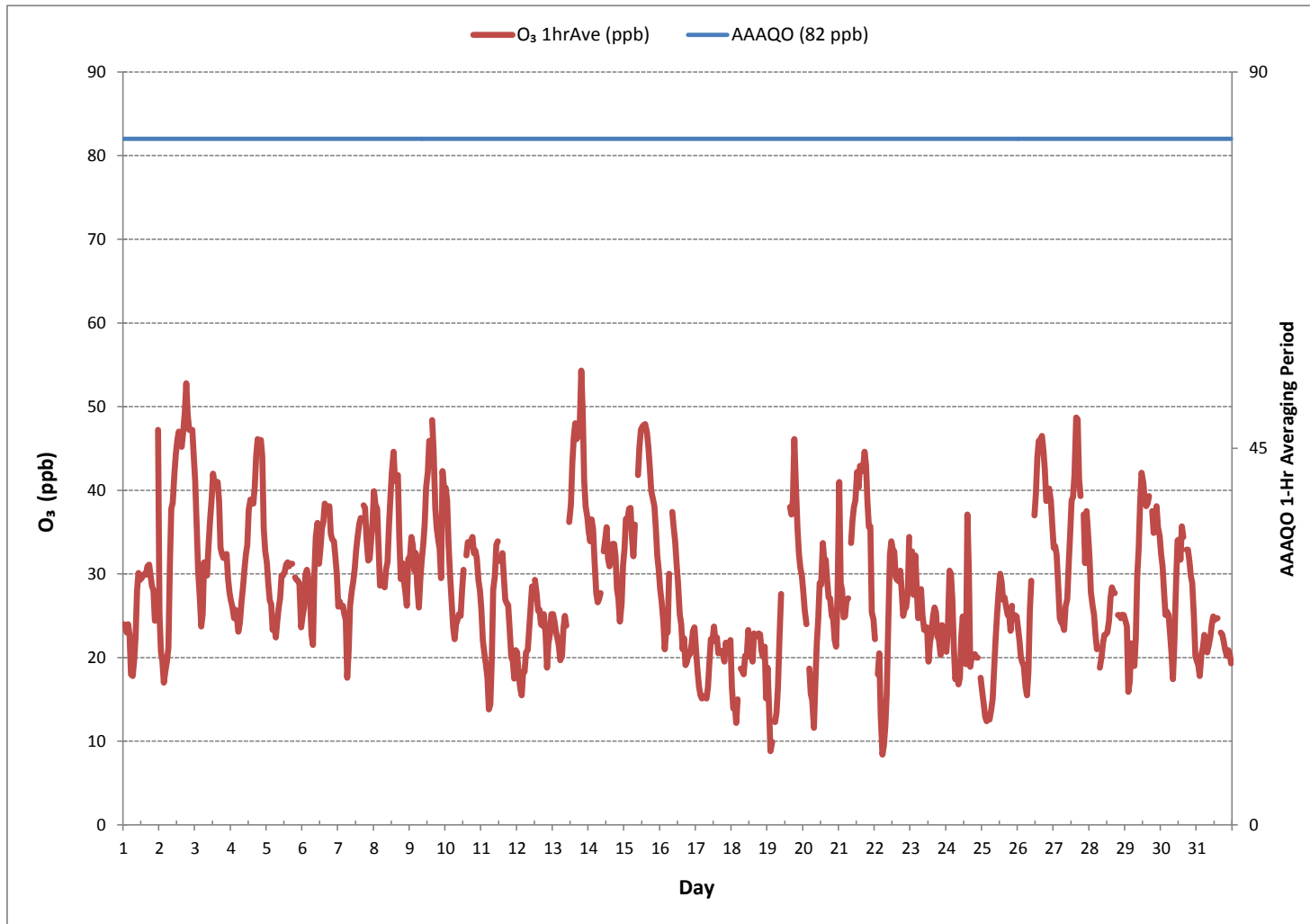
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	704			
MINIMUM 1-HR AVERAGE:	8.4 ppb	@ HOUR	5	ON DAY 22
MAXIMUM 1-HR AVERAGE:	54.3 ppb	@ HOUR	19	ON DAY 13
MAXIMUM 24-HR AVERAGE:	39.6 ppb			ON DAY 15
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	742 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.7 %	
STANDARD DEVIATION:	8.5	MONTHLY AVERAGE:	28.7 ppb	

24 HR AVERAGES July 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - July 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	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	24.6	24.2	23.9	24.6	23.7	23.3	20.8	22.9	25.2	30.1	31.5	30.1	30.3	30.4	31.2	31.3	31.6	32.4	31.5	29.6	28.4	27.9	S	49.0	20.8	49.0	27.6	24
2	28.8	26.3	20.9	19.0	19.2	21.0	23.9	36.4	39.7	39.8	45.1	46.3	47.5	48.4	47.2	47.1	48.8	51.6	55.1	53.0	47.6	S	48.7	46.5	19.0	55.1	39.5	24
3	42.5	38.3	34.2	28.5	25.1	31.9	32.2	31.9	32.8	35.1	40.4	40.6	44.3	43.4	43.0	42.5	41.7	35.0	33.5	32.7	S	33.5	31.9	28.7	25.1	44.3	35.8	24
4	27.3	27.6	25.8	26.4	25.8	23.9	25.9	28.1	30.0	31.9	33.5	35.2	39.2	41.1	40.1	40.2	42.9	46.0	49.2	S	46.7	45.7	39.7	33.8	23.9	49.2	35.0	24
5	32.5	30.3	27.9	27.2	25.4	25.1	24.3	25.9	27.1	28.4	31.3	31.3	31.2	32.6	32.4	32.1	31.8	31.8	S	30.8	29.8	30.0	30.3	26.0	24.3	32.6	29.4	24
6	26.1	29.1	30.6	31.6	30.9	31.3	24.8	24.3	35.9	38.7	38.0	37.2	35.2	37.5	38.7	39.8	39.2	S	39.3	37.2	34.8	35.1	32.5	32.1	24.3	39.8	33.9	24
7	27.2	27.2	26.9	26.4	25.6	25.6	23.8	23.1	31.5	29.1	30.1	31.7	34.0	35.9	37.0	38.0	S	39.8	39.6	35.8	33.0	33.0	34.3	40.2	23.1	40.2	31.7	24
8	40.5	38.9	38.7	35.7	30.7	29.6	29.8	29.1	32.7	32.5	38.6	41.4	43.9	46.3	44.9	S	45.6	40.2	29.8	32.2	30.8	28.2	27.7	33.7	27.7	46.3	35.7	24
9	34.2	35.6	33.9	32.6	33.9	31.7	27.9	30.9	32.5	35.6	37.3	44.2	44.2	47.6	S	50.4	46.8	43.4	36.4	35.7	33.9	32.6	52.0	43.5	27.9	52.0	38.1	24
10	41.3	40.1	36.0	31.9	28.7	25.1	25.0	26.8	27.3	26.6	27.7	30.0	33.2	S	33.8	37.3	36.0	36.5	36.5	36.8	33.2	32.2	P	29.1	25.0	41.3	32.3	23
11	26.2	24.7	21.7	20.1	19.1	15.0	16.8	26.9	30.4	32.4	35.4	35.6	S	34.4	33.9	31.9	28.4	27.6	27.7	24.8	21.7	20.6	18.3	24.1	15.0	35.6	26.0	24
12	23.1	20.1	17.1	17.4	18.7	19.0	21.4	21.5	27.0	29.7	30.5	S	31.6	30.3	27.2	27.6	25.8	25.5	26.4	25.4	P	23.0	23.5	26.0	17.1	31.6	24.4	23
13	25.6	24.7	23.4	22.3	21.9	20.6	21.5	25.4	P	27.6	S	37.9	41.5	45.9	49.0	49.5	48.1	48.9	55.0	P	P	44.7	39.9	37.9	20.6	55.0	36.6	21
14	36.3	35.3	37.5	36.1	33.6	29.1	27.3	28.6	29.2	S	34.7	38.4	38.4	33.4	31.9	33.8	35.0	35.3	34.2	30.1	28.5	26.0	30.5	P	26.0	38.4	32.9	23
15	35.0	37.8	37.2	38.7	38.8	36.2	35.0	37.8	S	43.5	47.4	48.3	49.0	49.0	49.0	48.8	47.4	43.6	42.2	39.8	39.2	37.9	32.9	32.1	32.1	49.0	41.2	24
16	29.5	27.3	26.5	24.2	25.4	26.9	33.4	S	38.9	38.4	38.0	32.8	31.5	26.4	26.2	22.7	25.8	21.0	20.6	21.5	20.8	22.9	24.9	24.7	20.6	38.9	27.4	24
17	22.0	19.4	17.3	16.7	15.7	16.0	S	16.1	17.7	21.8	23.0	24.1	24.9	23.8	27.2	23.7	21.9	21.8	21.5	21.3	22.9	22.1	23.4	23.7	15.7	27.2	21.2	24
18	20.4	15.0	16.0	14.3	16.0	S	22.1	21.8	21.7	23.5	P	26.2	22.6	23.0	21.7	24.7	24.7	Q	24.7	23.7	22.5	22.5	23.3	19.6	14.3	26.2	21.4	23
19	20.8	18.6	11.4	11.4	S	13.3	15.1	19.4	P	31.5	C	C	C	C	C	39.3	38.9	42.2	48.6	46.8	38.4	34.3	31.8	31.6	11.4	48.6	29.0	23
20	28.7	26.8	25.5	S	19.5	17.8	16.6	15.6	18.2	28.2	26.5	30.4	33.0	36.2	33.0	34.7	30.8	28.7	28.4	26.1	25.4	23.1	21.7	P	15.6	36.2	26.1	23
21	47.6	33.6	P	31.6	28.8	P	29.3	S	S	41.1	41.0	41.8	44.6	44.4	44.7	44.9	44.7	46.6	45.8	45.4	38.0	37.9	28.4	25.2	25.2	47.6	39.3	22
22	24.3	S	20.6	22.3	20.1	9.8	11.2	13.8	19.3	30.0	34.0	34.7	34.0	34.7	32.6	30.1	30.0	31.4	30.0	27.7	27.3	27.2	31.4	38.8	9.8	38.8	26.8	24
23	S	38.8	30.4	33.9	33.5	27.9	27.9	30.3	27.2	P	25.2	25.4	P	23.9	26.0	26.8	27.9	27.0	26.8	23.7	22.7	24.6	23.8	S	22.7	38.8	27.7	22
24	21.1	28.1	31.3	31.9	28.1	23.9	18.4	20.2	18.6	20.1	26.9	27.1	23.8	22.9	44.4	44.7	20.0	20.4	20.5	20.4	20.4	20.6	S	18.5	18.4	44.7	24.9	24
25	16.4	15.1	13.3	12.8	13.1	13.0	14.3	16.3	21.5	23.8	27.2	30.5	P	30.8	28.8	28.1	27.2	26.3	26.4	26.8	27.7	S	25.5	26.1	12.8	30.8	22.3	23
26	24.6	22.8	20.6	20.1	19.5	18.7	16.9	21.8	27.4	32.4	Y	39.2	43.1	46.4	47.8	47.5	48.2	46.0	44.7	40.8	S	40.9	39.6	37.6	16.9	48.2	33.9	23
27	34.0	33.5	32.8	31.2	P	25.0	25.1	24.6	28.4	28.6	32.5	38.1	40.5	39.6	43.5	53.6	51.7	42.7	42.4	S	38.0	36.8	38.8	37.9	24.6	53.6	36.3	23
28	35.1	31.5	27.0	26.2	23.3	22.9	S1	20.3	20.9	23.9	24.0	23.3	23.6	25.4	28.8	29.0	28.5	28.5	S	27.2	26.0	26.0	26.2	27.6	20.3	35.1	26.1	23
29	25.5	25.2	22.3	20.9	25.4	24.9	21.3	27.9	31.5	35.6	42.5	43.5	44.1	41.3	40.1	40.1	40.6	S	39.4	36.7	38.7	39.7	36.1	35.6	20.9	44.1	33.9	24
30	32.9	32.4	29.1	25.5	25.8	26.0	24.7	23.9	19.1	26.2	33.7	36.1	35.7	34.8	36.5	36.5	S	33.6	33.9	32.4	29.7	29.3	26.2	21.9	19.1	36.5	29.8	24
31	20.8	19.5	18.4	21.3	22.5	23.6	22.3	21.0	22.5	24.2	25.5	26.4	25.2	25.9	25.8	S	24.0	23.2	22.6	21.6	21.1	22.1	21.8	20.3	18.4	26.4	22.7	24
HOURLY MAX	47.6	40.1	38.7	38.7	38.8	36.2	35.0	37.8	39.7	43.5	47.4	48.3	49.0	49.0	49.0	53.6	51.7	51.6	55.1	53.0	47.6	45.7	52.0	49.0				
HOURLY AVG	29.2	28.3	25.9	25.4	24.8	23.4	23.4	24.6	27.2	30.7	33.4	34.8	35.9	35.7	36.1	37.1	35.7	34.9	34.9	31.6	30.6	30.4	30.9	31.1				

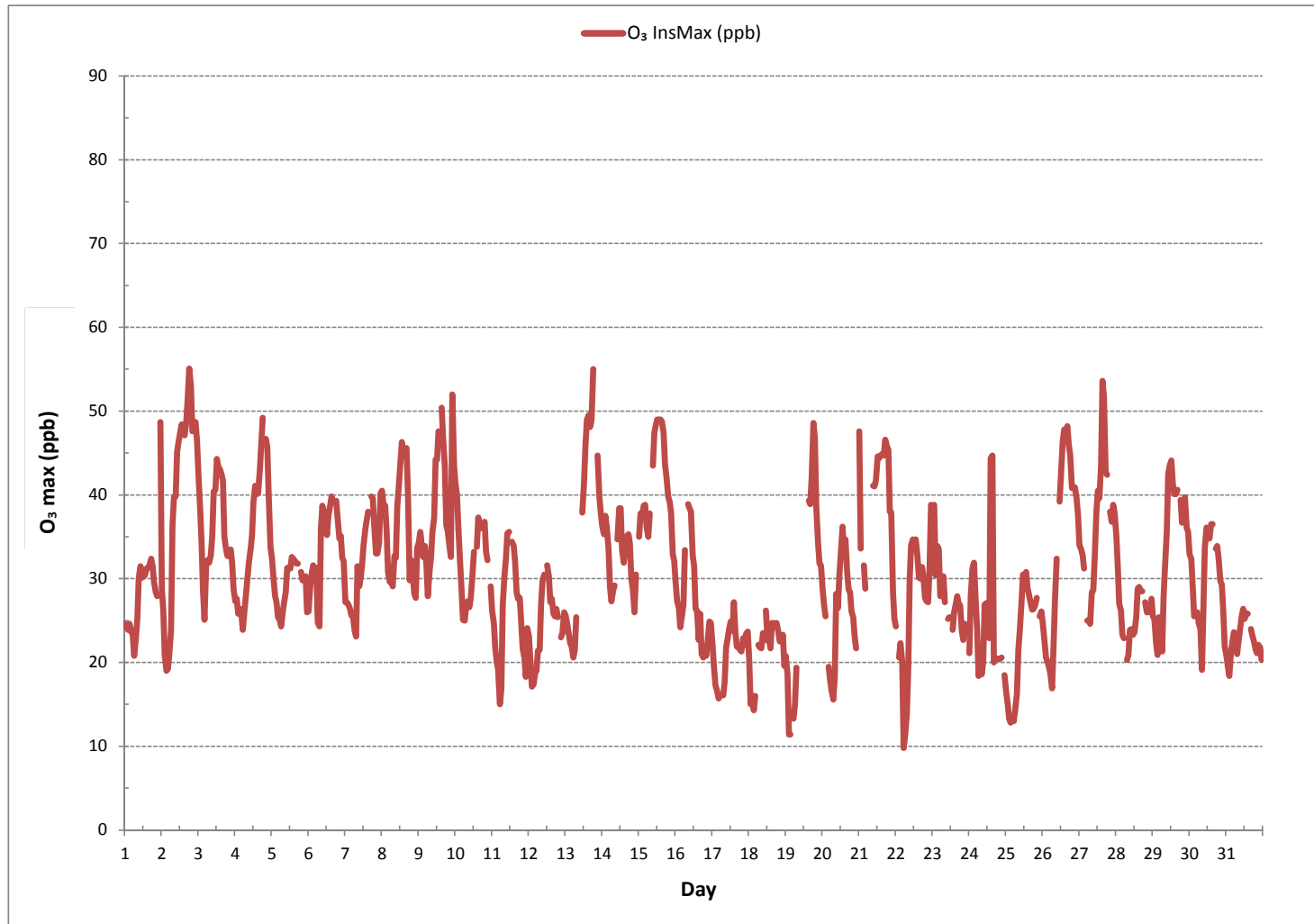
STATUS FLAG CODES

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

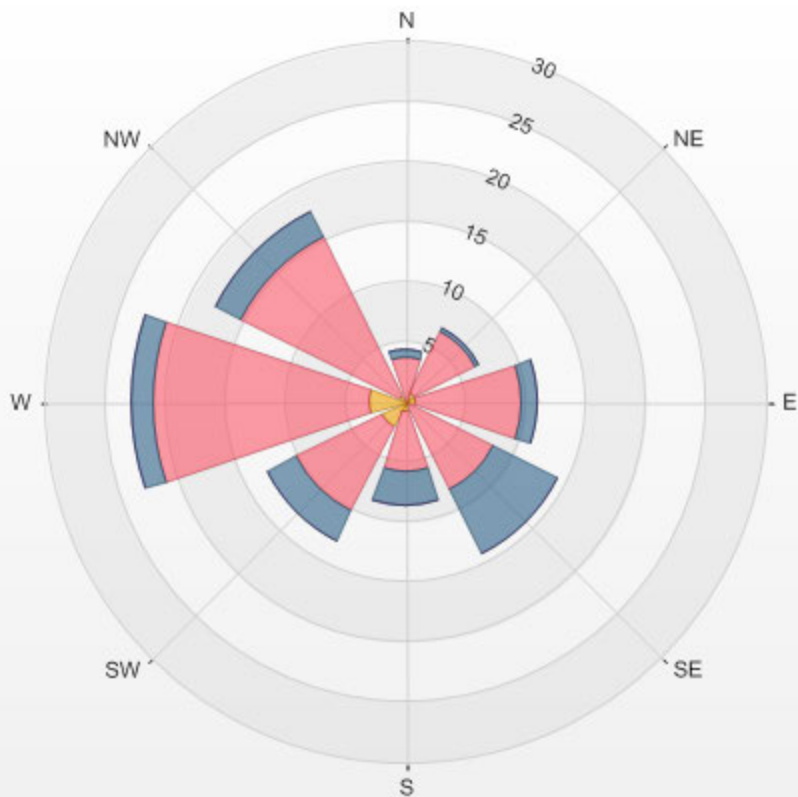
NUMBER OF NON-ZERO READINGS:	688
MAXIMUM INSTANTANEOUS VALUE:	55.1 ppb @ HOUR 18 ON DAY 2
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	727 hrs
STANDARD DEVIATION:	8.7

OZONE Instantaneous Maximum (O₃ ppb)

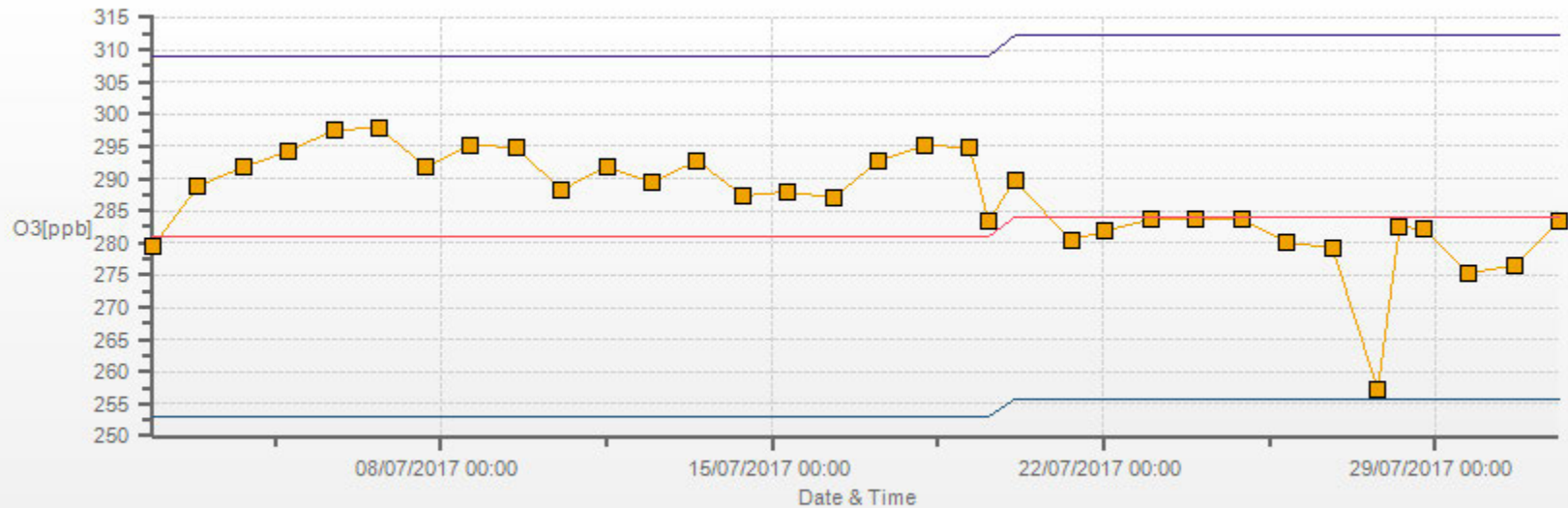


% Icon Classes (ppb) 9 0.0-18.3 72 18.3-36.7 18 36.7-55.0 0 >55.0

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.60% Calm Poll Avg: 27.80[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 17/07 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	6	7	4	3	5	6	7	9	8	8	6	1	4	6	1	7	3	6	4	2	3	7	9	4	1	9	5	24	
2	7	8	7	5	8	9	8	2	8	8	0	4	4	4	7	4	4	5	5	6	3	10	4	7	0	10	6	24	
3	5	2	1	10	0	5	5	6	5	5	3	7	1	2	9	6	3	8	2	2	1	4	4	5	0	10	4	24	
4	2	5	2	1	5	0	0	5	3	4	4	7	4	5	4	2	0	2	7	5	7	7	7	3	0	7	4	24	
5	0	6	2	2	2	7	5	0	2	3	6	2	5	1	2	5	5	3	6	4	3	5	4	6	0	7	4	24	
6	5	7	3	5	7	3	0	2	7	1	0	6	7	4	5	5	8	2	6	3	6	6	6	10	0	10	5	24	
7	5	7	4	6	5	8	5	9	2	4	1	6	4	7	9	10	6	8	6	6	10	8	5	3	1	10	6	24	
8	10	7	9	4	9	5	12	3	9	10	8	11	13	10	7	9	8	14	8	7	8	9	9	14	3	14	9	24	
9	15	16	16	15	16	13	15	13	13	17	15	11	11	10	11	12	15	12	13	12	16	10	12	3	3	17	13	24	
10	10	8	10	5	7	11	14	12	13	12	16	12	12	13	17	11	9	7	9	11	10	11	10	13	5	17	11	24	
11	12	14	5	9	12	10	6	5	6	6	3	5	2	1	2	2	3	4	1	4	0	6	5	7	0	14	5	24	
12	9	7	6	8	5	4	6	4	5	4	6	2	5	5	6	4	5	1	4	1	1	6	8	4	1	9	5	24	
13	6	6	6	3	6	7	4	4	4	8	4	7	10	6	9	7	3	5	11	0	16	5	6	7	0	16	6	24	
14	3	2	6	9	5	10	10	11	13	13	13	15	14	16	C	6	14	13	11	16	16	14	18	14	2	18	12	24	
15	14	16	13	13	10	8	9	12	10	9	10	8	9	13	11	12	13	7	9	7	8	5	12	9	5	16	10	24	
16	9	11	10	5	12	15	12	8	15	20	22	25	25	11	15	9	26	41	58	53	51	29	13	8	5	58	21	24	
17	9	14	15	11	7	2	3	4	3	4	5	4	1	0	0	0	0	0	0	1	1	2	2	2	0	15	4	24	
18	2	0	4	4	5	3	2	4	5	2	X	0	3	1	4	3	1	1	4	3	2	4	2	4	0	5	3	23	
19	5	3	4	5	5	7	5	7	0	0	9	8	13	17	13	14	14	16	23	19	20	25	34	0	34	12	24		
20	36	42	36	46	44	47	50	47	43	43	43	45	41	35	28	27	22	22	23	18	16	15	14	24	14	50	34	24	
21	7	11	18	18	12	6	8	14	16	10	7	6	8	12	10	10	14	11	10	4	7	8	10	10	4	18	10	24	
22	9	12	12	9	7	7	7	10	16	18	19	15	11	15	11	15	10	11	11	11	14	19	16	14	7	19	12	24	
23	17	16	13	9	8	9	11	4	5	5	3	2	4	3	2	7	1	8	9	4	8	6	7	3	1	17	7	24	
24	4	9	4	6	2	0	1	2	0	1	1	2	1	0	4	0	3	8	9	3	4	6	3	5	0	9	3	24	
25	2	5	4	3	3	7	6	5	10	15	10	C	X	X	X	X	X	X	X	X	X	X	X	X	2	15	6	12	
26	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	6	6	6	6	6	7	8	8	9	6	9	6	13	
27	7	14	19	18	17	17	16	15	14	13	13	13	13	13	13	14	15	14	13	13	14	15	20	19	7	20	15	24	
28	15	13	12	11	13	14	16	15	10	5	3	3	2	2	3	5	5	5	6	7	7	8	7	2	16	8	24		
29	7	7	8	8	9	10	10	10	10	9	9	9	9	8	8	8	9	10	10	10	10	10	8	8	7	10	9	24	
30	8	7	7	7	7	7	7	7	7	8	9	9	10	12	16	20	20	17	15	14	15	15	16	15	7	20	11	24	
31	15	16	16	12	10	6	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	16	5	24
HOURLY MAX	36	42	36	46	44	47	50	47	43	43	43	45	41	35	28	27	26	41	58	53	51	29	25	34					
HOURLY AVG	9	10	9	9	9	9	9	8	9	9	9	9	9	8	8	8	8	9	10	8	10	9	9	9					

STATUS FLAG CODES

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

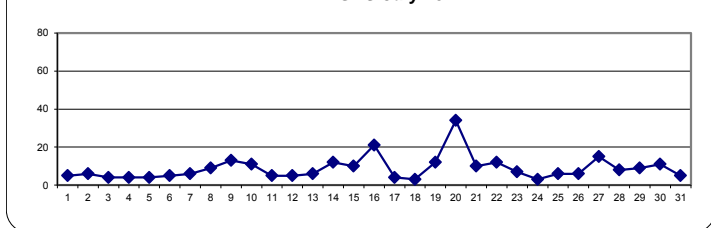
OBJECTIVE LIMIT:

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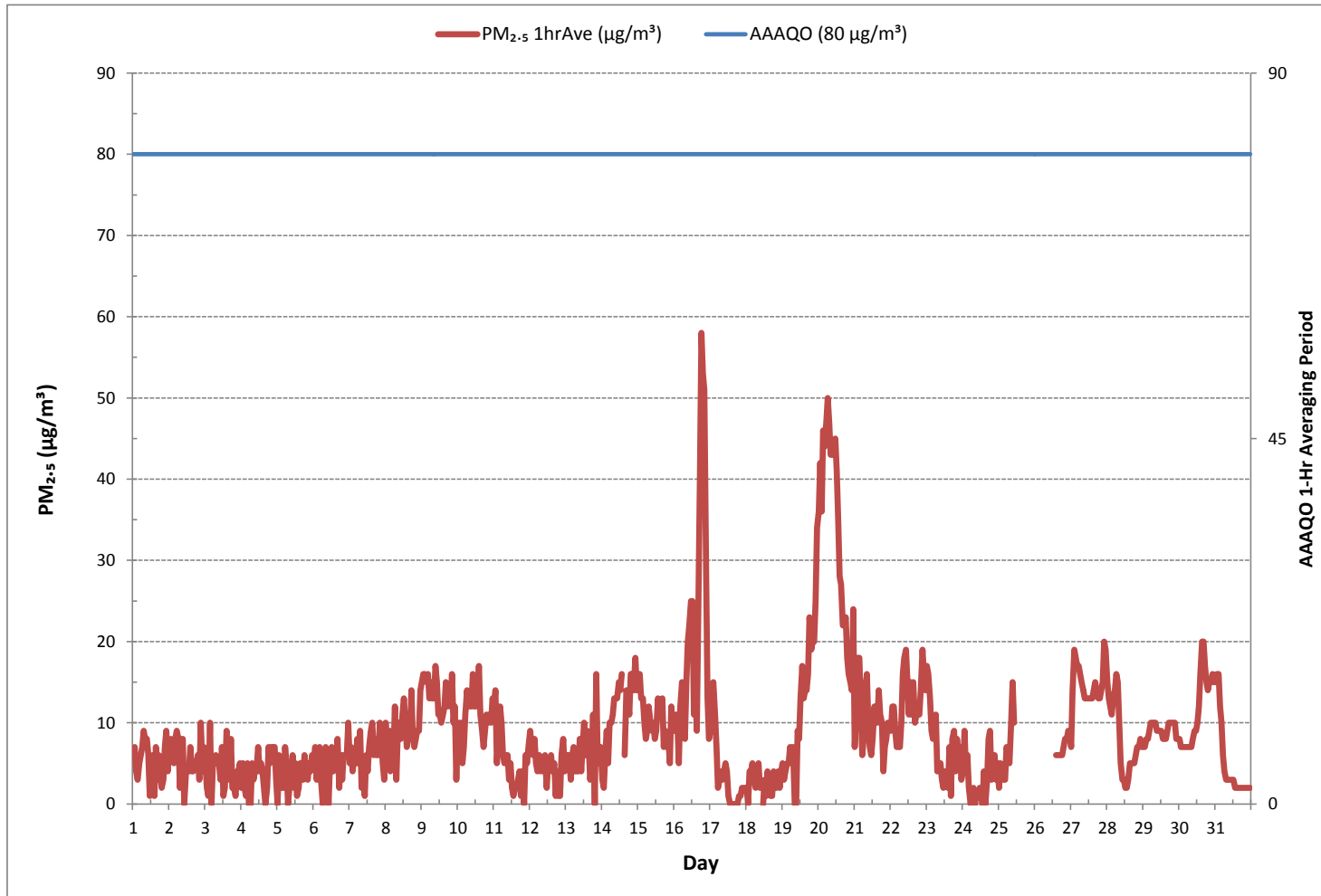
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	1			
NUMBER OF NON-ZERO READINGS:	690			
MINIMUM 1-HR AVERAGE	0 µg/m ³	@ HOUR	10	ON DAY
MAXIMUM 1-HR AVERAGE:	58 µg/m ³	@ HOUR	18	ON DAY
MAXIMUM 24-HR AVERAGE:	34 µg/m ³			ON DAY
MONTHLY CALIBRATION TIME:	5	hrs	OPERATIONAL TIME:	720
STANDARD DEVIATION:	8		AMD OPERATION UPTIME:	96.8
			MONTHLY AVERAGE:	9 µg/m ³

24 HR AVERAGES July 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: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

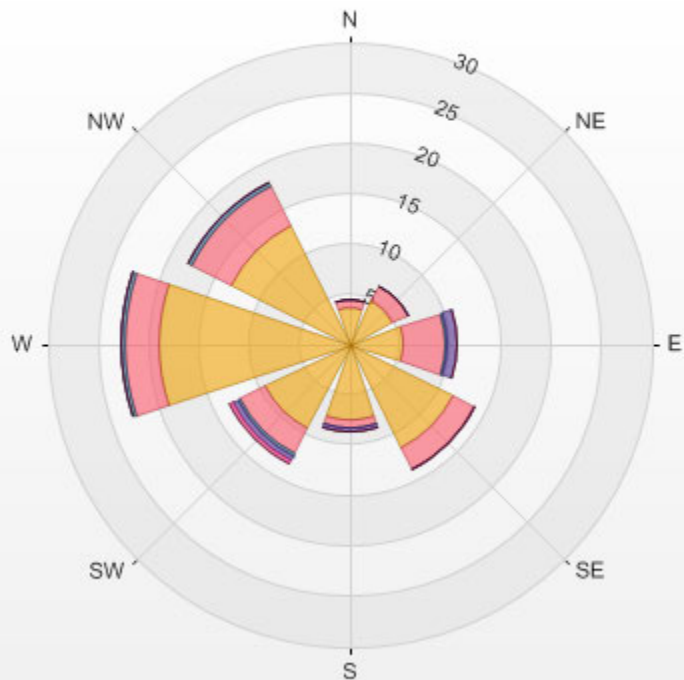
Calm: 1.52%

Calm Avg: 8.15 [ug/m3(L)]

Direction	0.0-11.8	11.8-23.6	23.6-35.4	35.4-47.2	47.2-59.0	>59.0	Total
N	3.7	0.8	0.0	0.0	0.0	0.0	4.6
NE	4.8	1.7	0.0	0.0	0.0	0.0	6.5
E	5.4	4.1	0.3	1.0	0.0	0.0	10.8
SE	11.6	2.2	0.0	0.0	0.1	0.0	14.0
S	7.5	0.8	0.0	0.4	0.0	0.0	8.7
SW	9.4	2.8	0.3	0.6	0.4	0.0	13.4
W	19.1	3.3	0.3	0.0	0.0	0.0	22.7
NW	13.3	4.4	0.3	0.0	0.0	0.0	18.0
Summary	74.7	20.2	1.1	1.9	0.6	0.0	98.5

% Icon	Classes (ug/m3(L))	75	20	1	2	1	0
	0.0-11.8	0.0-11.8	11.8-23.6	23.6-35.4	35.4-47.2	47.2-59.0	>59.0

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.52% Calm Poll Avg: 8.15[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

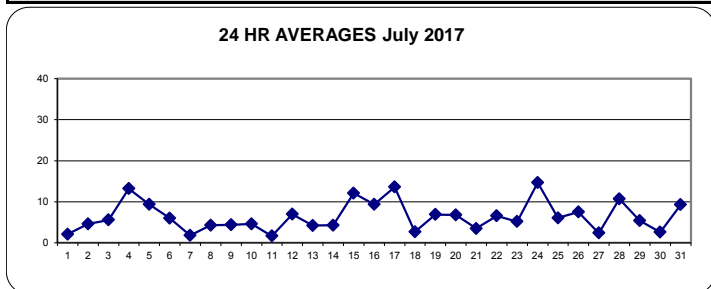
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.2	2.6	1.9	2.0	3.0	1.0	3.5	3.6	5.0	4.7	5.2	3.7	3.0	3.8	4.5	5.6	6.1	5.2	4.6	5.0	5.6	6.3	5.4	7.6	1.0	7.6	2.1	24
2	5.0	4.5	5.0	6.1	8.1	5.6	4.4	6.6	8.2	8.7	9.5	7.7	6.9	4.4	5.7	5.5	5.1	5.6	7.7	7.0	8.4	9.9	7.6	8.4	4.4	9.9	4.6	24
3	11.7	9.4	11.8	10.6	4.3	10.6	12.8	10.6	6.0	10.3	14.5	11.0	9.4	10.6	11.2	10.7	13.7	20.5	11.3	8.0	9.3	7.1	8.4	8.1	4.3	20.5	5.6	24
4	9.1	8.7	10.3	11.5	13.1	14.3	13.6	16.5	18.5	19.7	18.0	18.6	20.2	19.1	23.6	21.2	21.0	19.2	14.4	8.4	5.7	8.1	9.3	11.3	5.7	23.6	13.2	24
5	10.6	9.0	10.5	8.8	8.3	8.2	8.0	9.6	11.4	13.0	15.8	13.6	13.1	14.3	12.2	10.2	10.3	10.0	8.7	5.5	5.8	6.9	6.9	7.3	5.5	15.8	9.4	24
6	7.3	7.9	9.5	8.7	8.1	4.7	3.1	1.5	2.1	2.3	7.9	9.1	7.1	8.0	7.5	8.8	9.8	9.6	6.6	5.1	6.5	6.2	6.5	7.3	1.5	9.8	6.0	24
7	6.5	6.0	5.9	7.7	6.5	4.1	1.6	2.2	4.7	2.8	3.6	5.2	3.9	5.8	2.5	5.3	4.8	2.0	2.1	4.2	5.5	7.4	8.2	10.6	1.6	10.6	1.8	24
8	10.5	10.9	9.5	4.3	14.7	15.9	11.2	11.1	10.8	7.5	5.0	4.0	3.3	1.0	3.6	3.0	3.9	7.1	8.3	8.4	7.2	6.0	5.6	6.4	1.0	15.9	4.3	24
9	7.0	6.0	7.0	6.4	4.9	5.5	4.6	4.2	5.3	5.4	5.3	5.5	5.8	5.8	6.4	8.3	8.3	4.7	6.1	7.6	8.0	5.6	11.9	5.2	4.2	11.9	4.4	24
10	14.5	9.7	7.7	5.7	6.1	4.8	3.7	3.1	7.9	9.1	7.8	9.1	9.9	10.9	10.1	7.8	6.9	6.7	5.9	5.9	7.0	8.7	9.5	7.4	3.1	14.5	4.6	24
11	8.4	8.4	8.4	8.1	6.8	6.4	7.4	7.7	6.6	3.7	3.0	0.9	3.0	4.9	4.9	5.3	7.6	6.8	8.7	6.7	6.0	6.3	4.2	4.2	0.9	8.7	1.7	24
12	5.3	4.7	6.0	7.9	8.6	8.4	7.9	9.9	11.7	11.3	13.1	10.3	10.7	7.9	10.3	8.8	6.8	5.0	5.4	3.0	5.4	7.2	8.3	8.6	3.0	13.1	7.0	24
13	8.5	10.2	11.0	10.7	9.5	9.4	5.4	3.4	4.8	8.0	9.4	10.4	10.8	11.3	8.9	10.2	8.7	8.7	8.6	5.5	14.3	4.3	12.7	12.7	3.4	14.3	4.2	24
14	12.1	9.8	9.1	10.4	6.9	7.6	9.2	8.6	7.8	8.9	9.8	9.8	9.4	6.2	5.0	3.2	2.6	1.5	2.0	3.9	5.4	5.9	7.8	9.4	1.5	12.1	4.3	24
15	8.0	9.8	9.6	10.1	12.0	8.6	8.3	10.3	12.8	12.1	15.5	16.7	17.4	19.2	16.9	15.1	14.3	17.4	14.7	10.7	10.7	7.6	8.6	9.8	7.6	19.2	12.1	24
16	7.9	7.6	7.3	10.9	14.8	15.9	13.2	9.0	9.0	13.8	17.7	21.2	14.3	12.7	20.0	16.3	11.5	12.8	13.2	12.9	19.1	17.7	12.3	15.0	7.3	21.2	9.4	24
17	15.0	14.3	18.0	16.4	17.2	16.5	17.9	19.9	17.3	19.6	20.5	18.6	16.8	21.6	22.8	15.6	16.1	10.1	5.7	6.9	8.2	8.6	5.1	7.1	5.1	22.8	13.6	24
18	6.3	7.9	7.1	7.1	8.2	5.4	6.7	5.7	3.3	3.9	3.5	2.6	3.4	4.1	4.8	2.6	1.3	3.5	5.6	5.2	3.2	3.7	4.0	4.5	1.3	8.2	2.7	24
19	5.1	4.7	4.8	5.4	5.9	5.2	5.2	6.8	9.9	7.9	8.3	8.1	7.3	8.3	7.7	7.6	10.2	10.7	8.7	7.8	6.3	6.0	5.8	6.5	4.7	10.7	6.9	24
20	5.7	4.9	4.5	6.0	7.1	7.2	3.5	5.3	5.9	5.9	7.3	7.1	8.8	10.1	9.9	12.8	13.7	13.8	14.0	13.7	14.6	13.2	16.4	11.6	3.5	16.4	6.8	24
21	16.5	16.5	13.3	6.3	7.2	9.6	4.4	9.2	8.8	10.5	6.8	7.0	7.3	10.3	11.7	6.3	6.8	5.5	7.2	4.7	6.1	6.8	6.0	6.9	4.4	16.5	3.5	24
22	6.4	5.3	6.1	6.1	5.4	4.9	4.5	3.4	3.4	7.0	8.0	10.4	11.8	14.5	13.0	12.1	11.7	11.2	6.5	0.9	1.8	5.8	5.5	4.5	0.9	14.5	6.6	24
23	5.1	4.1	11.1	7.1	2.9	3.7	4.4	7.1	8.1	8.4	5.8	5.9	5.8	4.4	2.6	2.7	4.6	6.7	4.3	5.1	12.9	18.0	15.4	15.6	2.6	18.0	5.2	24
24	13.5	14.2	15.1	18.1	23.1	20.4	18.7	18.0	17.2	18.0	13.8	10.1	9.9	7.2	14.7	24.0	26.1	23.2	21.7	19.1	16.2	16.2	15.1	13.9	7.2	26.1	14.7	24
25	12.3	10.6	9.5	9.7	10.7	9.2	7.5	6.5	7.9	8.3	9.2	6.3	5.6	5.3	5.7	5.1	6.0	7.3	6.2	3.5	4.7	5.9	6.1	7.7	3.5	12.3	6.1	24
26	9.3	8.6	7.1	6.6	6.5	5.6	4.6	5.6	7.5	8.4	7.8	11.2	11.5	10.1	9.6	8.3	8.3	8.6	6.8	6.1	9.4	9.6	9.9	9.9	4.6	11.5	7.5	24
27	8.8	9.4	11.1	10.6	8.4	8.3	6.8	5.5	4.4	6.3	7.2	8.1	5.7	5.2	8.7	6.9	4.8	1.7	7.0	7.3	21.6	19.7	12.0	1.7	21.6	2.4	24	
28	9.7	3.0	7.8	5.3	10.4	8.7	11.4	10.2	11.8	13.5	17.0	15.9	16.5	16.0	16.1	14.6	12.3	11.6	12.8	8.3	9.3	8.7	9.4	5.9	3.0	17.0	10.7	24
29	6.5	6.0	8.1	8.5	6.9	7.4	8.2	7.3	10.4	7.8	5.8	7.3	8.8	7.6	6.8	6.7	7.7	5.6	4.1	5.0	6.2	9.3	10.1	10.6	4.1	10.6	5.4	24
30	9.9	9.5	7.6	9.9	10.8	10.1	3.4	3.0	3.8	2.9	3.6	7.1	7.8	13.2	11.9	11.7	10.3	9.6	10.1	7.6	7.4	7.0	7.3	7.6	2.9	13.2	2.6	24
31	7.4	8.0	8.2	10.5	8.7	10.5	8.9	9.2	11.1	10.2	10.9	11.5	11.9	10.3	12.2	12.1	12.6	11.1	9.6	6.3	7.1	6.2	7.5	7.6	6.2	12.6	9.3	24
HOURLY MAX	16.5	16.5	18.0	18.1	23.1	20.4	18.7	19.9	18.5	19.7	20.5	21.2	20.2	21.6	23.6	24.0	26.1	23.2	21.7	19.1	19.1	21.6	19.7	15.6				
HOURLY AVG	1.2	0.7	1.8	2.0	2.8	2.3	2.2	2.4	3.0	4.0	4.0	3.8	3.4	3.3	4.0	3.1	2.9	3.2	2.7	1.8	1.8	2.4	2.3	2.0				

STATUS FLAG CODES

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

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

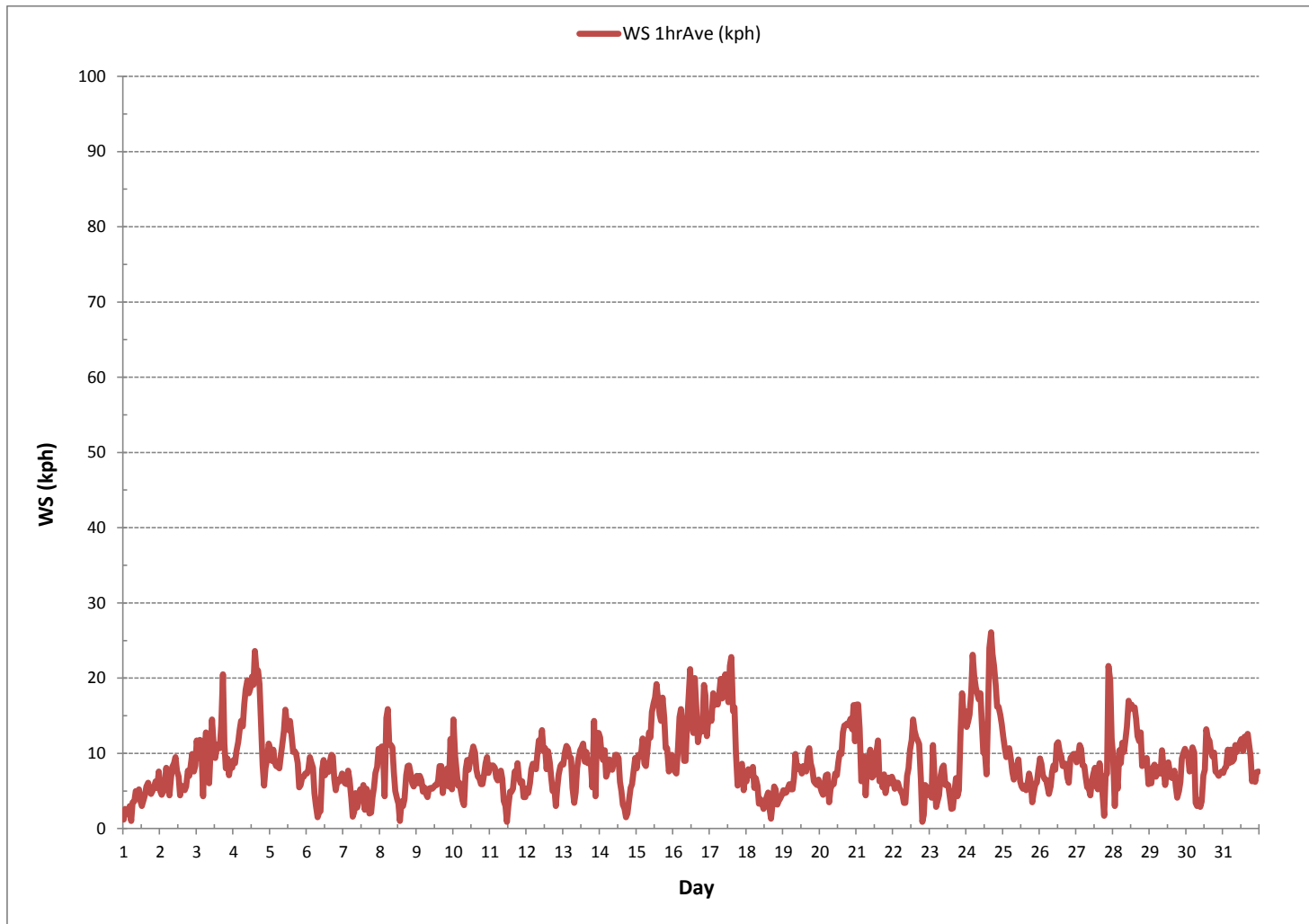
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.9 kph @ HOUR 11 ON DAY 11
MAXIMUM 1-HR AVERAGE:	26.1 kph @ HOUR 16 ON DAY 24
MAXIMUM 24-HR AVERAGE:	14.7 kph ON DAY 24
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.3
MONTHLY AVERAGE:	2.6 kph

WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	4.7	5.4	5.1	4.4	5.9	3.5	9.8	9.1	11.5	12.8	13.5	18.4	16.3	14.8	18.7	15.2	25.5	15.7	9.9	9.9	16.0	13.4	X	17.0	3.5	25.5	18.6	23
2	15.4	8.4	13.1	17.1	19.1	13.8	10.4	22.9	25.1	28.3	28.1	26.8	23.3	24.8	24.1	24.6	20.8	21.9	23.9	14.1	15.2	17.8	16.6	17.8	8.4	28.3	19.7	24
3	24.7	23.0	28.2	26.5	30.0	40.0	36.8	31.4	23.0	37.9	36.2	33.5	33.7	31.3	38.3	34.4	51.4	49.0	36.3	19.9	29.1	14.4	16.1	14.7	14.4	51.4	30.8	24
4	16.6	19.7	21.8	19.9	23.0	35.0	42.3	44.3	46.6	45.8	47.3	46.3	43.2	44.9	55.8	43.2	45.9	36.4	36.3	18.9	10.1	20.6	27.6	44.4	10.1	55.8	34.8	24
5	27.3	20.1	25.8	20.5	10.3	14.7	17.6	24.3	26.7	37.1	35.3	31.8	33.3	32.2	35.0	27.6	30.5	23.5	21.5	14.4	12.1	12.2	11.9	12.1	10.3	37.1	23.2	24
6	12.1	16.6	17.5	17.1	15.1	13.6	9.2	4.8	7.7	12.6	22.0	21.5	19.8	22.6	26.6	23.9	30.7	31.3	17.6	12.5	10.3	9.6	10.3	10.7	4.8	31.3	16.5	24
7	11.0	10.8	10.8	10.6	11.0	6.2	9.4	11.7	17.2	12.3	16.4	20.7	22.6	24.0	23.9	23.3	25.0	12.1	12.8	8.0	8.2	12.3	13.4	19.3	6.2	25.0	14.7	24
8	23.2	23.9	21.3	16.6	40.7	49.0	30.4	30.9	30.5	29.4	21.3	17.2	19.8	19.2	14.3	16.5	18.0	29.6	29.4	27.6	15.1	13.1	10.9	12.1	10.9	49.0	23.3	24
9	11.8	8.8	9.3	9.3	9.3	8.2	9.5	10.0	14.6	15.2	14.1	22.6	26.7	25.6	25.9	25.3	24.6	12.5	13.2	17.1	15.8	15.7	75.4	30.3	8.2	75.4	18.8	24
10	46.0	40.1	23.4	14.5	14.7	18.6	19.3	16.0	17.8	20.2	19.3	23.9	30.7	24.3	32.1	30.9	21.3	25.9	16.9	20.1	22.4	21.7	P	19.4	14.5	46.0	23.5	23
11	21.4	20.5	18.7	21.6	17.8	17.4	19.4	28.8	22.0	13.5	11.6	10.7	20.1	16.6	17.3	19.9	28.0	18.3	17.2	15.6	10.8	12.3	7.7	8.9	7.7	28.8	17.3	24
12	11.3	8.9	13.0	17.2	19.6	21.3	19.6	27.0	36.4	29.9	32.1	29.3	46.7	23.8	30.1	26.6	18.1	15.9	13.0	6.7	P	15.0	18.1	19.8	6.7	46.7	21.7	23
13	18.0	26.0	26.6	23.7	24.4	24.4	13.7	11.3	P	18.8	30.0	28.9	32.0	33.3	28.4	29.1	23.2	24.9	48.3	P	P	30.7	26.1	32.4	11.3	48.3	28.7	21
14	32.0	32.0	23.9	29.6	19.3	20.4	24.4	20.4	19.0	24.2	24.0	29.2	24.9	23.3	17.4	13.9	13.2	16.5	11.5	8.9	8.2	8.6	14.8	P	8.2	32.0	20.0	23
15	13.7	18.3	18.7	21.8	31.0	25.9	23.6	28.4	33.2	33.2	42.2	44.0	46.2	46.2	40.0	36.7	36.1	44.6	36.3	30.2	29.0	25.0	24.8	25.7	13.7	46.2	31.5	24
16	15.4	13.5	14.1	31.4	43.4	43.5	38.8	29.6	29.4	40.8	53.4	55.4	44.7	48.0	48.1	47.7	49.0	28.1	27.6	27.8	40.9	50.8	33.1	38.4	13.5	55.4	37.2	24
17	30.3	37.0	49.0	33.7	44.2	36.8	46.0	48.4	44.2	48.9	54.5	50.6	50.4	53.9	53.5	45.1	48.4	32.1	18.8	15.8	22.3	25.8	12.0	13.3	12.0	54.5	38.1	24
18	11.6	12.5	11.8	14.2	13.3	11.4	14.8	15.7	12.2	12.5	P	10.1	13.4	11.6	15.0	8.2	7.3	14.5	18.3	15.9	8.0	6.6	7.5	7.7	6.6	18.3	11.9	23
19	6.6	7.3	9.7	10.8	11.2	10.4	12.1	16.8	P	20.9	24.4	25.4	31.0	25.0	24.2	23.7	22.2	29.4	20.0	15.4	10.6	10.8	10.4	13.3	6.6	31.0	17.0	23
20	9.5	7.3	7.8	11.2	10.2	9.7	9.7	13.2	14.2	15.2	17.2	19.1	24.0	27.7	33.7	36.4	36.0	38.4	46.1	42.7	46.7	35.1	48.7	P	7.3	48.7	24.3	23
21	53.3	53.5	P	20.4	19.3	P	13.2	17.8	20.0	22.8	20.2	19.2	18.5	19.6	27.7	20.9	16.5	16.7	27.2	10.6	11.7	12.8	11.9	13.9	10.6	53.5	21.3	22
22	15.0	11.6	9.4	8.4	8.4	9.1	11.2	7.8	11.8	17.5	28.2	26.4	28.9	35.2	32.8	30.6	25.9	24.2	16.3	3.9	5.3	9.7	9.3	8.6	3.9	35.2	16.5	24
23	11.0	17.8	29.2	27.6	9.9	9.1	9.1	19.4	27.5	P	22.7	18.5	P	19.4	15.6	13.2	15.1	17.4	15.2	16.0	53.1	45.5	46.8	41.4	9.1	53.1	22.8	22
24	37.7	37.2	45.3	45.6	56.3	48.4	48.1	45.8	46.6	38.9	42.1	30.9	32.9	37.2	57.0	58.9	64.5	63.9	54.9	46.2	43.4	42.7	33.1	36.8	30.9	64.5	45.6	24
25	32.5	23.0	19.0	19.3	20.2	18.6	18.5	16.8	18.5	18.3	20.7	19.4	P	17.6	20.2	20.0	16.5	20.9	16.9	13.4	7.7	10.3	10.3	15.8	7.7	32.5	18.0	23
26	14.7	12.7	13.4	14.9	10.3	11.6	12.4	12.6	19.0	22.2	P	29.7	31.0	30.7	28.4	27.7	27.9	26.6	24.2	13.2	18.4	18.7	18.5	22.6	10.3	31.0	20.1	23
27	19.1	18.7	23.1	22.6	P	16.2	15.2	14.3	15.0	12.4	18.6	21.4	23.8	15.5	19.8	22.9	22.9	20.0	12.1	16.2	24.3	77.3	56.0	31.3	12.1	77.3	23.4	23
28	43.1	16.0	15.3	14.7	22.3	17.8	17.1	19.8	26.3	36.9	39.3	44.3	39.7	45.2	48.9	37.0	44.5	27.5	25.7	15.4	16.5	14.0	16.2	14.5	14.0	48.9	27.4	24
29	12.7	12.7	11.9	19.8	18.6	16.9	21.5	15.2	20.9	19.2	19.0	20.1	26.3	24.0	20.0	24.0	22.4	14.1	13.7	8.2	11.0	16.7	17.6	19.8	8.2	26.3	17.8	24
30	20.4	20.6	16.7	23.7	21.9	21.3	36.8	14.9	20.4	11.3	18.7	26.1	32.9	39.9	34.0	30.9	29.8	28.7	32.9	24.5	15.1	14.0	10.8	12.1	10.8	39.9	23.3	24
31	13.4	16.9	17.1	21.9	19.3	21.0	21.9	22.1	25.2	30.7	32.3	33.4	32.9	31.4	29.4	31.1	34.0	30.9	22.4	14.7	16.4	12.9	14.7	14.3	12.9	34.0	23.3	24
HOURLY MAX	53.3	53.5	49.0	45.6	56.3	49.0	48.1	48.4	46.6	48.9	54.5	55.4	50.4	53.9	57.0	58.9	64.5	63.9	54.9	46.2	53.1	77.3	75.4	44.4				
HOURLY AVG																												

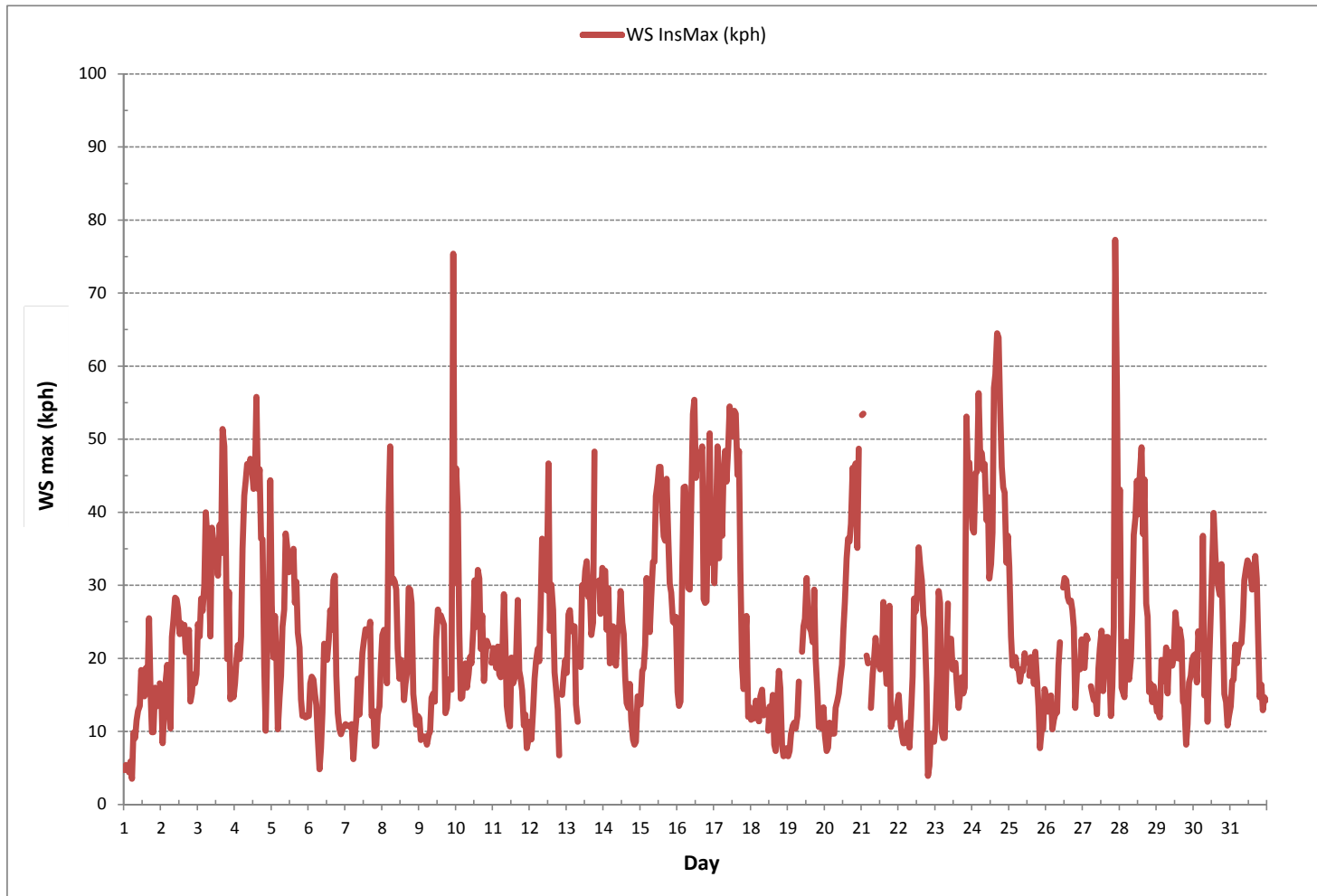
STATUS FLAG CODES

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C1	- REPEAT CALIBRATION	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:	77.3	kph	@ HOUR	21	ON DAY	27
OPERATIONAL TIME:	727 hrs					

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 17/07
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 1.48%

Direction	1.8-5.2	5.2-10.5	10.5-15.7	15.7-21.0	21.0-26.2	>26.2	Total
N	1.1	2.6	0.8	0.1	0.0	0.0	4.6
NE	2.6	3.1	0.8	0.1	0.0	0.0	6.6
E	2.8	6.2	1.6	0.4	0.0	0.0	11.0
SE	2.4	8.1	2.7	0.7	0.0	0.0	13.8
S	2.2	5.9	0.7	0.0	0.0	0.0	8.7
SW	2.8	7.7	1.5	1.2	0.4	0.0	13.6
W	1.6	12.4	4.8	3.2	0.4	0.0	22.5
NW	1.9	9.1	4.6	1.3	0.8	0.0	17.7
Summary	17.3	55.0	17.5	7.1	1.6	0.0	98.5

% Icon Classes (kph)

17



1.8-5.2

55



5.2-10.5

17



10.5-15.7

7



15.7-21.0

2



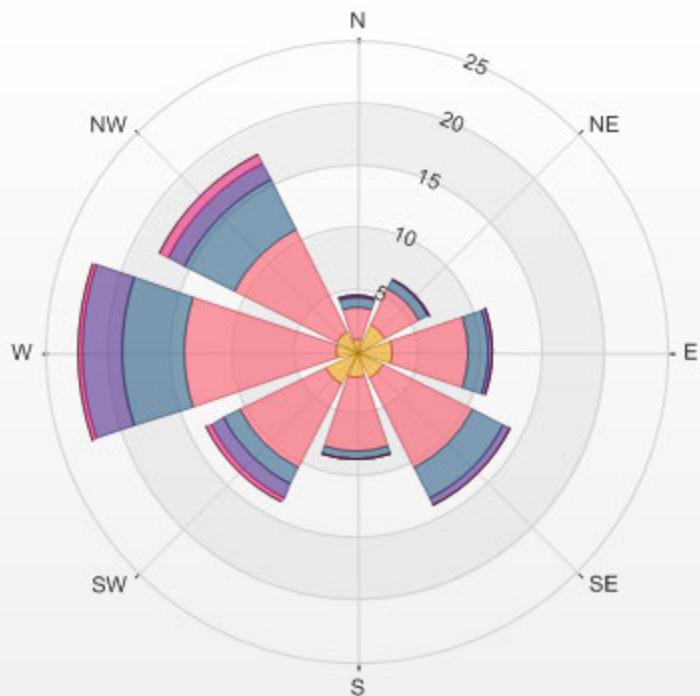
21.0-26.2

0



>26.2

LICA ST. LINA 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 1.48% Calm Wind Avg Speed: 1.32(kph)



WIND DIRECTION



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

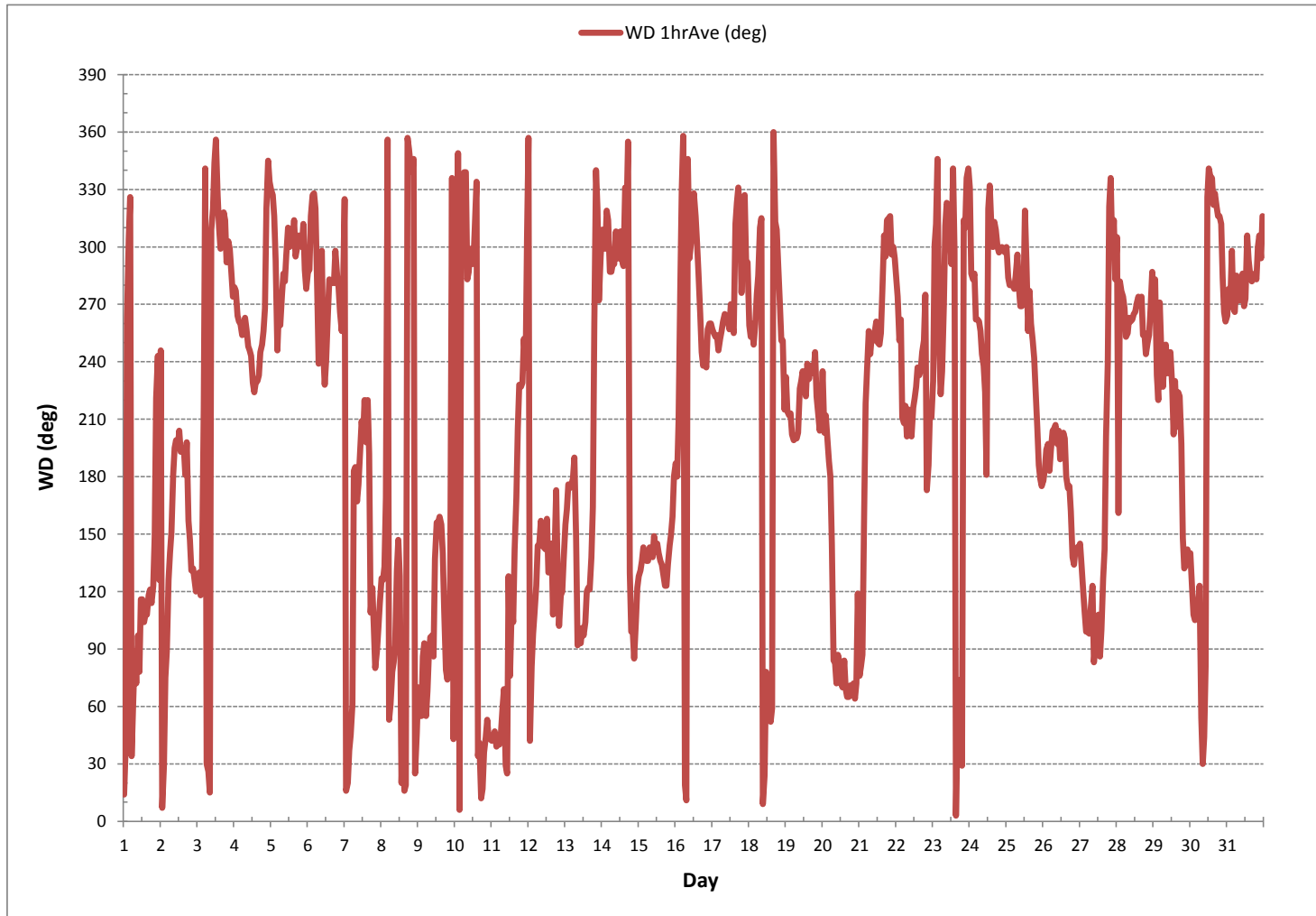
STATUS FLAG CODES

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

MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	92	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	260 (WSW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - July 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	34	17	18	31	8	27	19	29	22	34	30	48	59	49	45	28	30	21	15	7	16	14	11	9	24	
2	18	11	14	16	13	20	21	24	25	28	21	32	30	54	44	33	35	29	19	12	9	10	9	9	24	
3	11	14	13	16	44	19	14	21	27	31	20	24	24	23	24	23	19	16	18	17	14	11	12	10	24	
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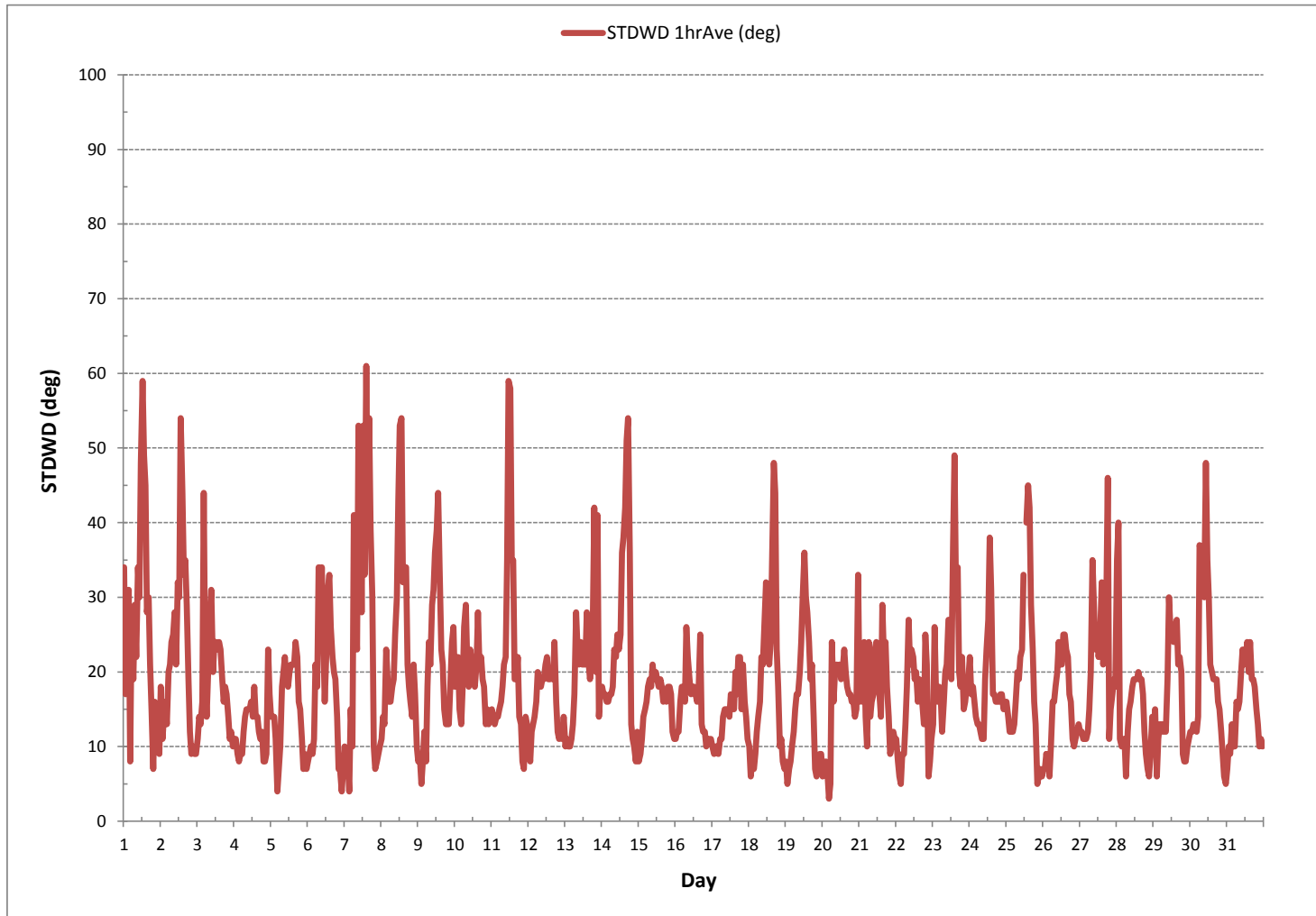
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C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

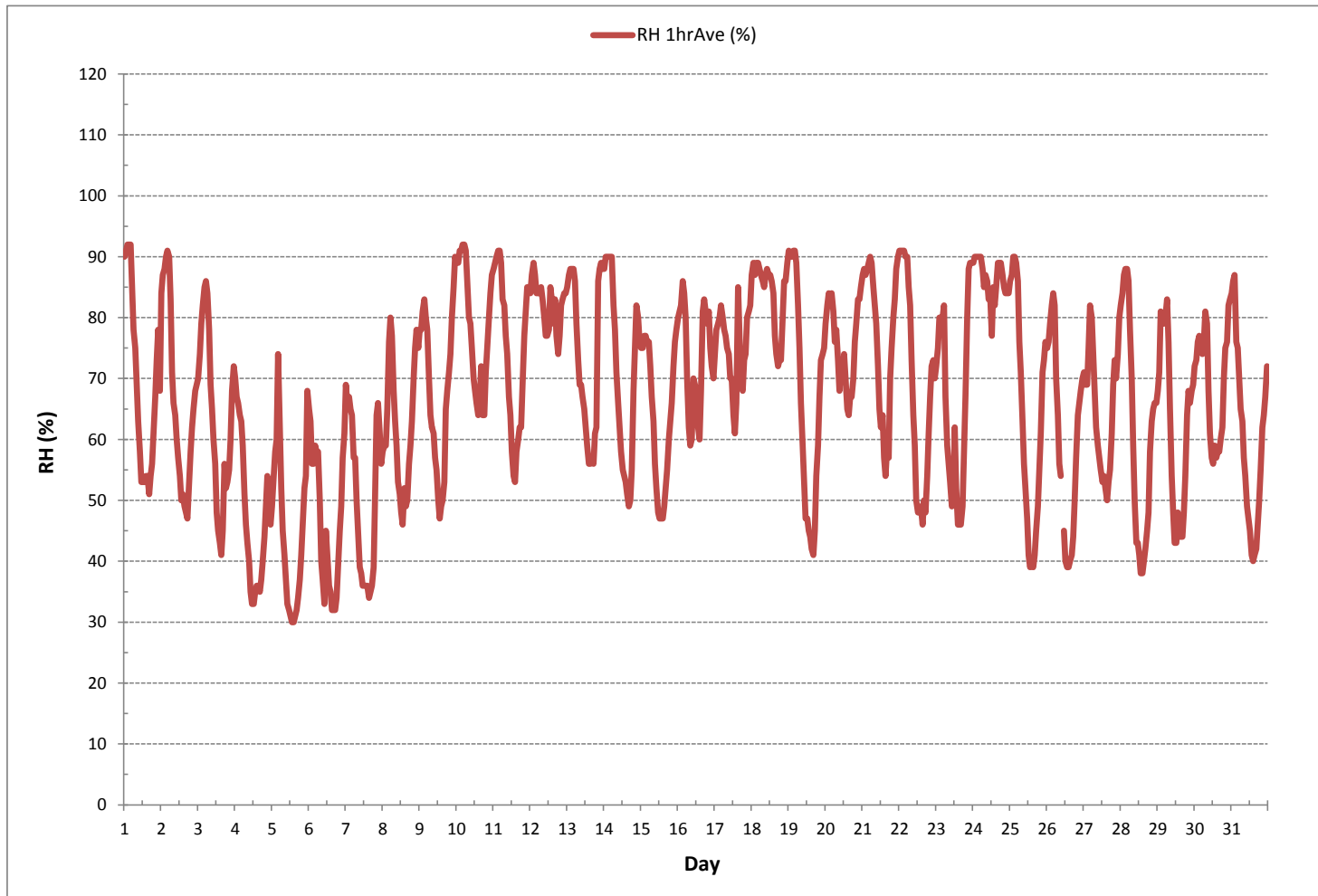
CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



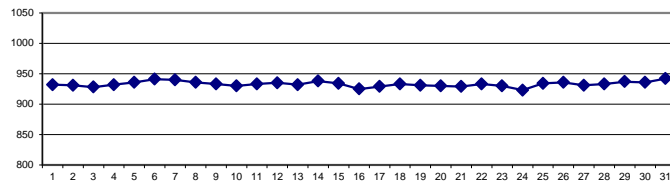
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	930	930	930	930	931	931	932	932	933	933	933	934	934	934	933	933	934	933	933	932	932	930	929	929	929	929	929	934	932	24
2	931	931	931	931	931	931	931	932	932	932	932	933	933	933	933	933	933	933	932	932	930	929	929	929	928	928	933	931	24	
3	927	927	926	925	925	926	926	926	926	928	928	928	929	929	929	930	930	930	930	930	930	930	930	930	930	930	925	930	928	24
4	930	931	931	931	931	931	932	933	934	934	934	934	934	933	933	933	933	933	932	932	932	932	931	931	931	930	934	932	24	
5	931	932	932	932	932	933	933	934	935	936	936	936	936	937	937	938	938	938	938	938	938	938	937	937	938	931	938	936	24	
6	938	938	938	938	938	939	940	941	942	942	943	943	943	943	943	943	943	943	943	943	942	941	941	941	941	938	943	941	24	
7	941	941	940	940	940	941	941	942	942	942	942	942	942	941	941	941	940	940	939	939	937	936	936	935	935	935	942	940	24	
8	935	935	935	936	937	935	935	935	936	936	937	937	937	937	937	937	937	936	936	936	935	934	934	934	934	934	937	936	24	
9	934	933	933	933	933	933	934	934	934	934	935	934	934	934	934	933	932	931	931	930	929	929	930	929	929	929	929	935	933	24
10	927	927	928	928	928	928	929	929	930	930	930	931	931	931	931	930	931	931	931	931	930	929	929	929	929	927	931	930	24	
11	929	929	929	929	929	930	931	932	932	933	934	934	935	935	935	935	936	936	936	935	935	935	935	935	935	929	936	933	24	
12	934	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	934	935	934	934	934	934	934	933	933	933	935	935	24	
13	933	933	932	932	932	932	932	932	933	933	933	933	933	932	932	932	931	930	929	929	930	929	930	931	929	929	933	932	24	
14	932	932	933	934	935	935	936	937	938	939	939	940	940	941	941	941	942	941	941	941	941	940	939	939	939	939	932	942	938	24
15	939	938	938	938	937	937	937	937	937	936	936	936	935	934	934	933	932	931	929	928	927	926	925	925	925	925	939	934	24	
16	924	923	922	923	923	923	924	924	924	925	925	925	926	925	926	926	926	926	926	925	925	926	925	925	925	922	926	925	24	
17	925	925	925	925	925	925	926	927	927	928	928	928	929	929	930	930	931	932	932	932	932	932	932	932	932	925	932	929	24	
18	933	933	933	933	933	933	933	934	934	934	934	933	933	933	933	933	934	934	933	933	932	931	931	931	931	931	934	933	24	
19	931	930	930	930	930	930	930	931	931	932	932	933	932	933	933	933	932	932	932	932	931	931	931	930	930	930	933	931	24	
20	930	930	930	930	930	930	931	931	931	932	932	932	931	931	931	931	930	930	929	928	928	927	927	927	927	927	932	930	24	
21	927	926	926	926	926	926	926	926	927	927	928	929	929	929	930	931	930	931	931	931	931	931	931	931	931	926	931	929	24	
22	931	931	931	931	932	932	933	934	934	935	935	935	935	935	935	935	935	934	934	934	934	933	932	932	932	931	935	933	24	
23	931	931	931	930	930	930	931	931	932	932	932	932	932	931	932	931	930	930	928	926	926	926	926	925	925	925	932	930	24	
24	925	925	924	923	923	923	922	921	921	919	918	918	919	920	921	922	923	924	926	926	927	928	928	929	918	929	923	24		
25	929	930	930	931	931	932	932	933	934	935	935	936	936	937	937	937	937	937	937	937	937	936	935	935	935	929	937	934	24	
26	935	935	935	934	934	935	935	936	937	937	Y	938	937	937	937	937	936	936	936	936	935	934	934	933	933	933	938	936	23	
27	933	933	932	932	931	931	931	931	931	932	932	932	932	932	931	931	931	930	929	928	930	929	929	928	928	933	931	24		
28	929	929	930	930	930	931	931	932	933	933	934	934	934	935	935	935	935	935	935	935	934	934	934	933	929	935	933	24		
29	934	934	934	935	935	935	936	936	937	937	938	938	938	938	938	939	939	939	938	937	936	936	936	936	934	939	937	24		
30	935	935	934	934	934	933	934	934	934	935	935	936	936	936	937	937	937	937	938	937	937	937	937	937	933	938	936	24		
31	938	938	938	938	938	938	939	940	941	942	942	943	943	943	943	944	944	944	944	944	944	943	943	943	938	944	942	24		
HOURLY MAX	941	941	940	940	940	941	941	942	942	942	943	943	943	943	944	944	944	944	944	944	944	943	943	943	943	943	943	943	943	
HOURLY AVG	932	932	931	932	932	932	932	933	933	933	934	934	934	934	934	934	934	934	934	933	933	932	932	932	932	932	932	932	932	

STATUS FLAG CODES

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

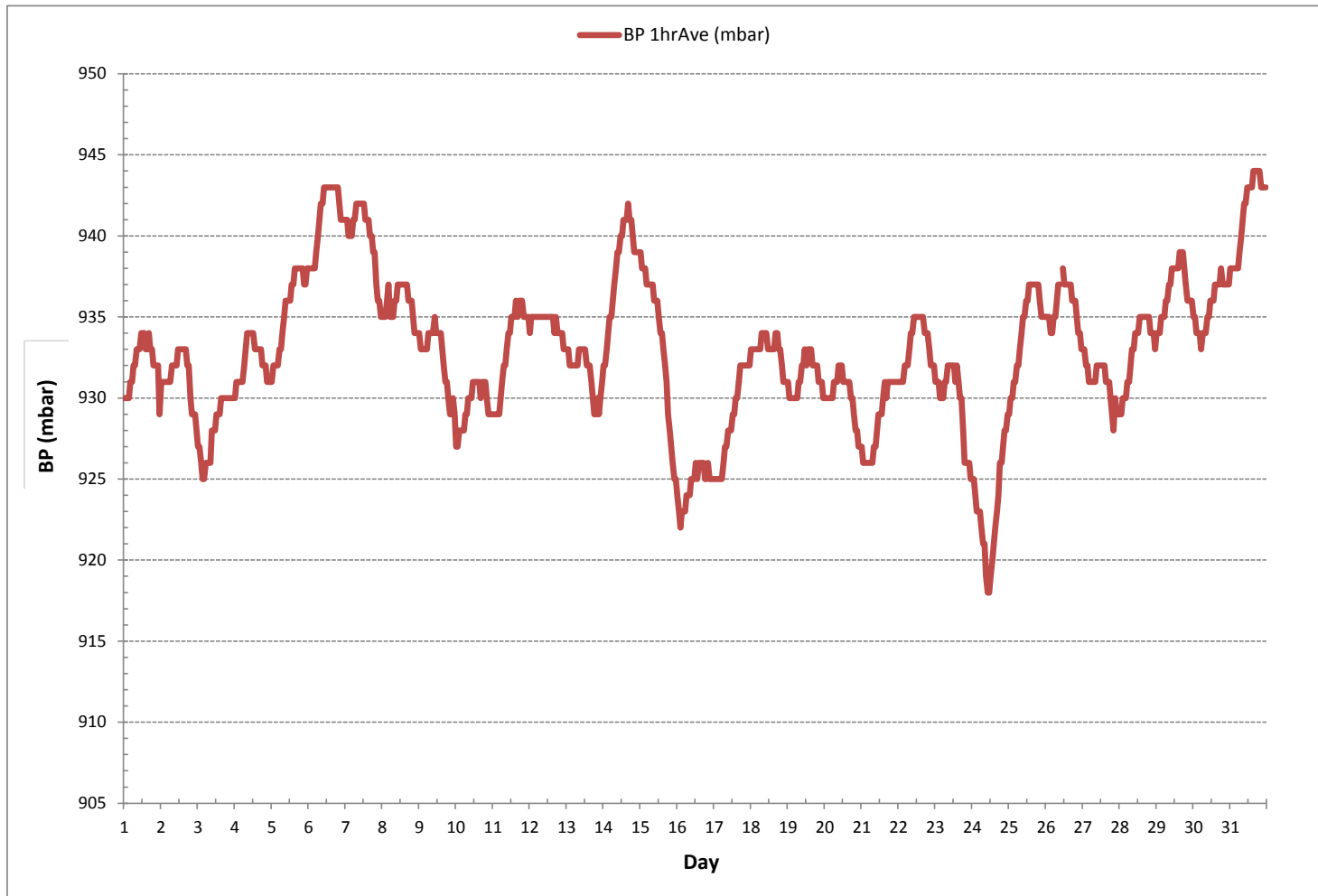
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	918 mbar	@ HOUR	10	ON DAY	24
MAXIMUM 1-HR AVERAGE:	944 mbar	@ HOUR	15	ON DAY	31
MAXIMUM 24-HR AVERAGE:	942 mbar			ON DAY	31
OPERATIONAL TIME:					743 hrs
AMD OPERATION UPTIME:					99.9 %
STANDARD DEVIATION:	5			MONTHLY AVERAGE:	933 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



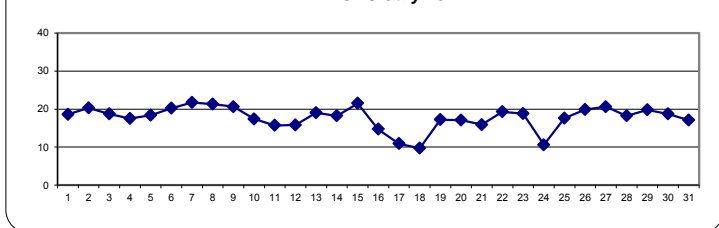
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	12.6	12.5	12.3	12.2	12.5	14.9	17.2	18.1	19.3	20.4	21.5	22.9	22.6	22.8	22.3	22.4	23.3	22.3	21.7	20.3	19.3	18.6	17.3	19.0	12.2	23.3	18.6	24
2	16.1	15.5	15.1	14.6	14.2	15.0	17.0	19.4	20.3	21.2	22.2	23.4	24.2	25.4	24.8	25.7	25.1	25.1	23.6	21.9	20.6	19.7	19.1	18.5	14.2	25.7	20.3	24
3	18.2	18.1	17.3	16.6	16.2	15.4	14.8	16.6	19.9	21.0	21.6	22.5	23.7	24.3	24.4	24.6	23.4	18.9	17.9	17.8	15.9	13.9	13.2	12.2	12.2	24.6	18.7	24
4	11.5	11.1	9.8	9.3	9.2	11.0	14.0	15.7	17.1	18.5	20.1	21.1	21.8	22.4	23.2	23.6	23.8	23.3	22.6	21.5	19.5	17.6	16.4	15.4	9.2	23.8	17.5	24
5	14.0	13.3	12.8	12.2	10.3	12.3	16.5	18.5	19.6	20.8	21.2	21.4	22.1	22.6	23.2	23.7	23.6	22.9	21.9	20.9	18.9	17.0	16.5	15.1	10.3	23.7	18.4	24
6	14.6	14.0	14.1	13.2	12.7	13.8	16.2	20.8	22.9	23.1	24.6	23.5	24.6	25.9	25.2	25.4	25.4	24.7	23.9	22.9	20.5	19.0	17.4	16.7	12.7	25.9	20.2	24
7	15.5	15.2	14.4	14.4	14.1	16.6	19.3	22.2	22.9	25.1	25.7	26.7	26.9	27.7	27.3	27.8	27.2	26.5	25.2	23.0	20.3	19.1	18.8	18.8	14.1	27.8	21.7	24
8	19.0	19.0	18.6	17.9	16.3	15.7	16.5	19.4	21.6	23.1	24.7	25.3	26.6	26.6	26.1	26.7	26.7	25.1	23.8	21.8	19.7	18.4	17.3	16.3	15.7	26.7	21.3	24
9	15.4	14.7	13.9	13.9	14.1	15.0	18.0	20.3	21.9	23.6	25.2	25.7	26.6	27.2	26.6	26.4	25.9	23.7	23.2	22.1	21.0	20.0	16.0	14.1	13.9	27.2	20.6	24
10	14.1	14.0	13.9	13.7	13.6	13.7	14.8	16.6	18.2	18.0	19.4	20.8	21.1	21.0	22.0	21.4	20.1	20.9	20.4	19.0	17.1	15.5	14.0	13.1	13.1	22.0	17.4	24
11	12.6	12.1	11.3	10.6	10.2	11.7	13.9	14.3	15.2	15.8	17.4	18.2	20.1	20.8	21.1	19.7	18.9	18.9	18.8	17.5	15.6	14.7	14.0	14.0	10.2	21.1	15.7	24
12	14.2	13.6	13.6	13.7	14.0	14.0	14.5	14.6	15.4	16.0	16.8	17.0	16.9	15.9	16.4	17.5	17.0	18.6	18.1	17.7	16.8	16.6	15.8	15.3	13.6	18.6	15.8	24
13	14.7	14.2	13.9	13.6	13.4	13.6	15.7	18.1	20.6	21.6	22.7	23.5	24.8	25.6	26.6	26.4	26.0	26.3	23.1	19.3	13.4	13.1	13.1	13.7	13.1	26.6	19.0	24
14	13.6	13.1	12.9	12.9	12.3	12.7	14.9	16.0	18.3	20.1	20.5	21.2	22.0	23.0	23.5	23.9	23.8	23.4	22.0	19.8	17.8	16.4	16.0	16.3	12.3	23.9	18.2	24
15	15.9	15.9	15.5	15.5	15.9	16.3	18.1	20.0	21.6	23.5	24.5	25.7	25.9	26.7	27.2	26.6	25.9	25.5	24.4	23.8	22.4	20.8	19.6	18.9	15.5	27.2	21.5	24
16	18.2	17.4	16.4	15.8	16.5	16.9	17.7	19.6	19.5	19.8	17.0	17.3	15.2	15.5	14.6	12.7	10.7	10.8	11.1	10.8	10.2	10.2	9.7	9.9	9.7	19.8	14.7	24
17	9.1	8.4	8.0	7.4	6.7	7.5	8.9	10.1	11.3	11.9	12.9	13.1	15.0	16.4	15.6	11.4	12.3	13.5	13.1	11.9	10.9	9.7	9.1	8.5	6.7	16.4	10.9	24
18	7.6	7.0	7.6	7.7	8.0	8.4	8.8	9.2	9.5	8.6	8.6	8.9	9.7	10.2	10.9	12.1	13.3	13.8	13.1	12.2	10.3	8.8	9.0	8.5	7.0	13.8	9.7	24
19	8.4	8.5	7.7	7.6	7.9	9.3	12.0	14.5	16.6	19.7	21.8	22.9	23.1	23.8	24.3	24.8	24.9	23.8	22.2	20.6	18.3	16.9	16.6	15.5	7.6	24.9	17.2	24
20	14.5	13.8	13.3	13.0	12.6	12.8	14.7	15.5	17.2	19.4	18.5	19.2	19.0	19.7	21.7	22.2	21.3	20.7	19.5	18.2	17.0	16.0	15.8	15.0	12.6	22.2	17.1	24
21	13.1	14.3	14.0	13.5	13.3	12.8	13.0	13.7	13.9	14.5	16.2	18.4	18.8	18.6	19.9	21.0	19.3	20.2	17.3	16.9	15.7	15.1	14.3	14.1	12.8	21.0	15.9	24
22	13.8	13.2	12.6	12.6	11.6	11.5	13.9	15.8	19.2	22.0	22.7	24.6	25.4	25.7	24.9	25.9	24.4	24.5	23.0	21.5	19.5	18.7	18.2	18.3	11.5	25.9	19.3	24
23	17.4	16.7	15.5	14.8	14.9	14.9	19.4	21.3	22.0	22.4	22.9	22.7	20.6	22.8	24.1	23.4	23.7	22.4	20.4	18.4	15.4	12.1	11.5	11.2	11.2	24.1	18.8	24
24	11.3	10.4	9.3	9.1	8.9	8.8	9.1	9.5	9.6	9.7	11.0	10.4	12.4	10.6	11.3	11.1	10.8	10.9	11.1	11.7	11.9	11.9	11.5	11.3	8.8	12.4	10.6	24
25	11.0	10.4	9.7	9.3	9.5	10.0	12.9	15.5	17.7	19.7	20.5	22.1	22.6	23.5	24.2	24.1	24.4	23.7	22.6	21.5	19.2	17.5	16.5	15.2	9.3	24.4	17.6	24
26	14.6	14.0	13.2	12.4	12.2	12.4	16.3	18.8	21.0	21.6	28.8	23.8	24.3	25.5	25.6	25.1	24.9	24.2	23.2	22.0	19.7	18.4	17.6	17.1	12.2	28.8	19.9	24
27	16.4	16.1	15.6	14.4	13.2	13.4	15.4	18.0	20.3	22.6	23.8	24.9	25.6	26.1	27.6	27.0	27.2	26.9	25.6	23.6	21.6	20.1	14.7	14.1	13.2	27.6	20.6	24
28	13.9	13.6	13.0	12.4	11.7	12.2	14.3	16.8	19.0	21.1	22.0	22.3	22.9	23.1	23.6	23.0	22.8	22.7	21.9	19.9	17.2	16.3	15.6	15.9	11.7	23.6	18.2	24
29	15.6	15.4	13.4	14.1	14.4	14.5	14.4	16.6	19.7	22.5	24.1	25.3	25.4	23.4	25.7	24.9	25.5	24.8	22.9	20.8	18.6	18.6	17.7	17.3	13.4	25.7	19.8	24
30	16.7	16.4	15.7	15.1	15.2	15.4	15.8	16.0	16.7	19.9	22.3	23.7	24.6	23.9	23.3	23.1	22.3	21.7	20.2	18.2	16.7	16.2	15.2	14.4	14.4	24.6	18.7	24
31	14.0	13.9	13.4	12.9	11.9	11.7	12.7	14.1	16.6	18.7	20.2	21.2	21.6	21.8	21.6	22.1	21.7	21.0	19.9	18.8	16.2	15.0	14.7	13.6	11.7	22.1	17.1	24
HOURLY MAX	19.0	19.0	18.6	17.9	16.5	16.9	19.4	22.2	22.9	25.1	28.8	26.7	26.9	27.7	27.6	27.8	27.2	26.9	25.6	23.8	22.4	20.8	19.6	19.0				
HOURLY AVG	14.1	13.7	13.2	12.8	12.5	13.0	14.9	16.6	18.2	19.5	20.7	21.3	21.8	22.2	22.5	22.4	22.1	21.7	20.6	19.2	17.3	16.2	15.2	14.8				

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

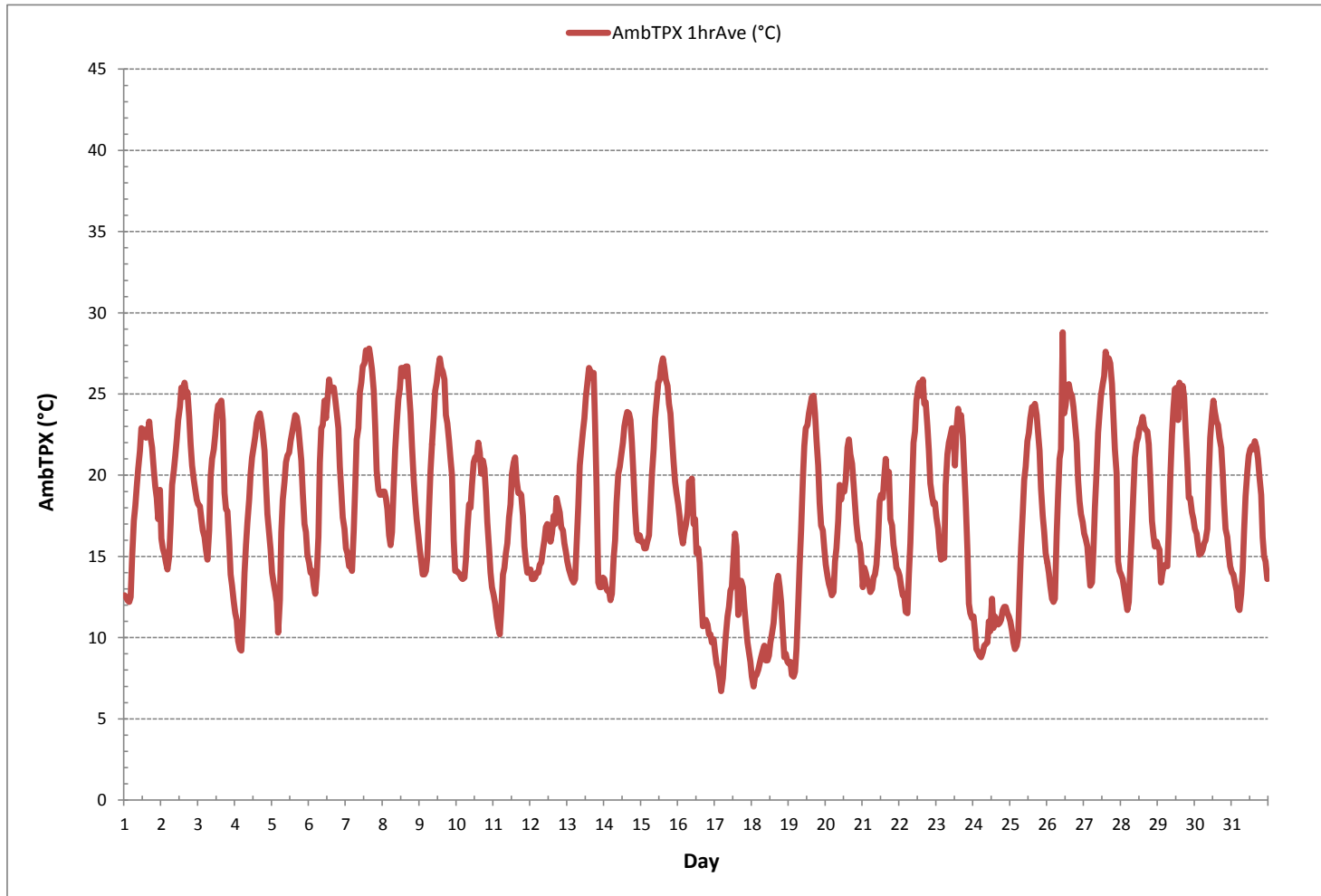
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	6.7 °C	@ HOUR	4	ON DAY	17
MAXIMUM 1-HR AVERAGE:	28.8 °C	@ HOUR	10	ON DAY	26
MAXIMUM 24-HR AVERAGE:	21.7 °C			ON DAY	7
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.0			MONTHLY AVERAGE:	17.8 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



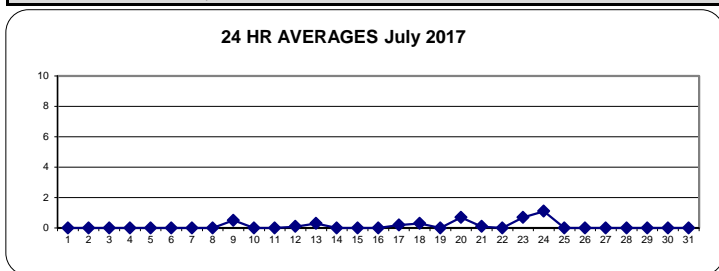
PRECIPITATION Hourly Averages (mm)

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	0.1	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	0.1	0.0	24
2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
3	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.1	0.0	0.0	0.0	1.0	4.0	6.7	0.0	0.0	6.7	0.5	24			
10	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	24		
11	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			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.1	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.1	24		
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	3.9	0.1	0.0	0.0	0.0	0.0	3.9	0.3	24			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24		
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	1.0	2.3	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	2.3	0.2	24			
18	0.0	0.0	0.1	0.1	0.3	0.5	0.2	0.1	0.7	1.4	2.0	1.8	0.9	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.3	24			
19	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			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0	15.6	0.7	24			
21	1.8	0.2	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	1.8	0.1	24			
22	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24			
23	0.0	0.1	0.2	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	0.1	4.9	6.0	4.1	0.1	0.0	6.0	0.7	24				
24	0.0	4.3	5.1	3.1	1.3	1.4	0.0	0.0	0.7	0.4	0.4	0.0	0.0	1.6	0.2	2.9	2.6	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	5.1	1.1	24				
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.1	0.0	0.1	0.0	0.0	0.0	24		
28	0.5	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	0.5	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	0.0	0.0	24	
30	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	0.0	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			
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	1.8	4.3	5.1	3.1	1.3	1.4	0.2	0.2	0.7	1.4	2.0	1.8	1.8	1.6	1.0	2.9	2.6	1.8	0.5	2.3	4.9	6.0	4.1	15.6	0.0	0.0	0.0	0.0	0.0	24		
HOURLY AVG	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.3	0.2	0.3	0.7	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

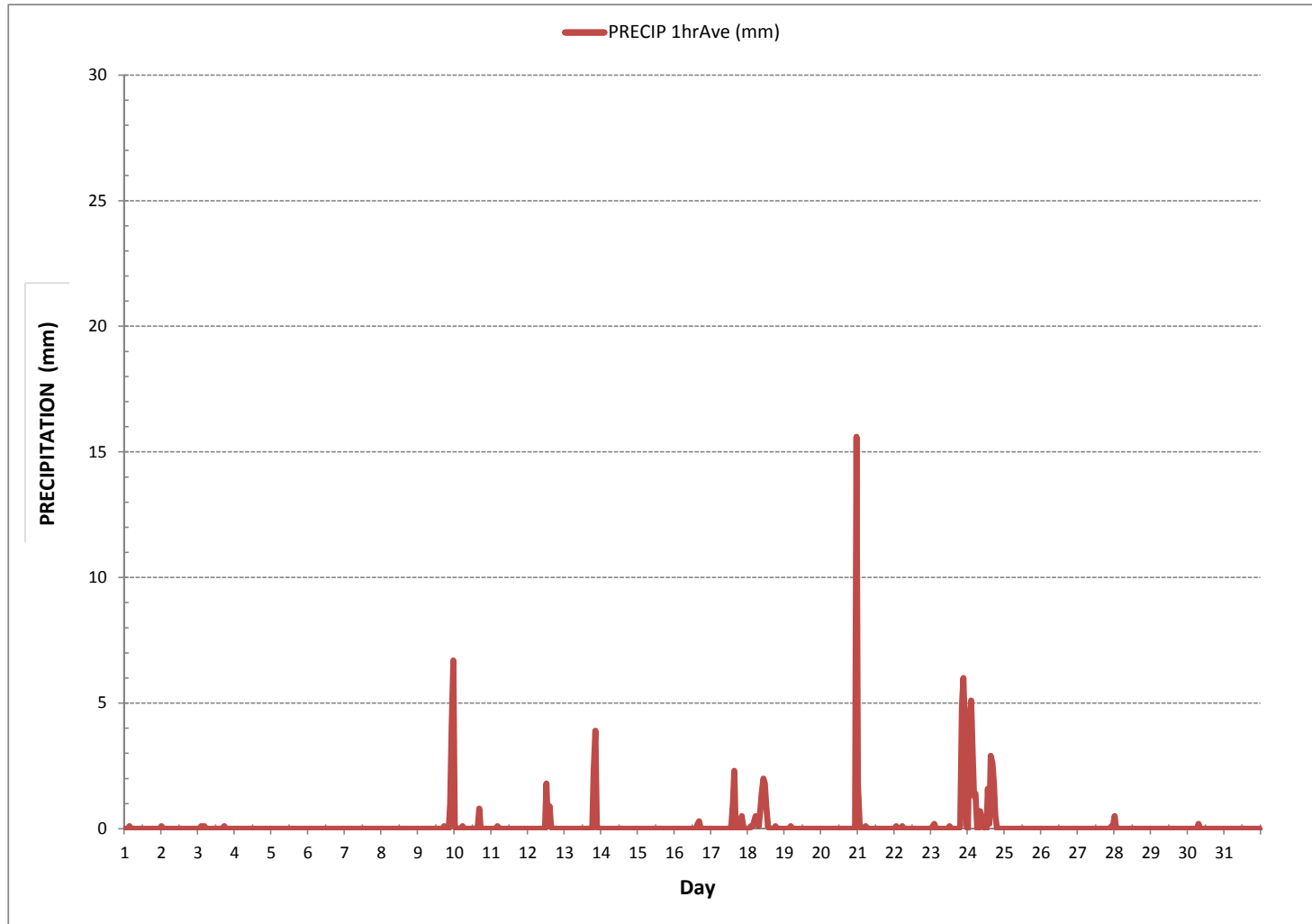
24 HR AVERAGES July 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	15.6	mm	@ HOUR	23	ON DAY	20
MAXIMUM 24-HR AVERAGE:	1.1	mm			ON DAY	24
MONTHLY TOTAL	96.1	mm				
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.8		MONTHLY AVERAGE:			0.1 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

Date: July 18, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	934 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: St. Lina	Weather Conditions: Rain fall heavy at times	
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly	
Start Time 24 hr. (mst): 11:37	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 17:46	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: June 12, 2017	As Found C.F.: 0.939
Previous C.F.: 1.000	New C.F.: 1.000

Calibration Standards:		Standard Calibration Points for Ranges								
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016		<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb									
High	780									
Mid	380									
Low	190									
High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016										
Calibrator ID/Cert. Date: API 700 / s.n. 627 / Jan 27, 2017										
Cal Gas Cylinder I.D. #: LL104222										
Cal Gas Conc. (ppm): 50.6										

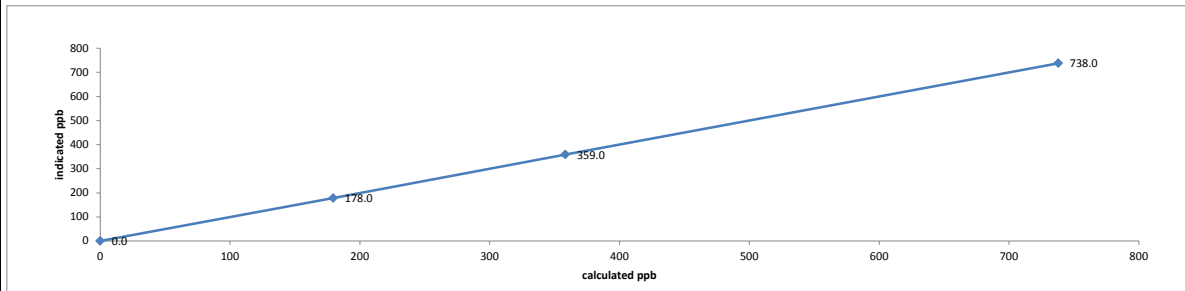
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5203	0.00	5203	0.0	2.0	n/a
as found high	5248	77.67	5326	737.9	788.0	0.939
adjusted zero	5203	0.00	5203	0.0	0.0	n/a
adjusted high	5248	77.67	5326	737.9	738.0	1.000
mid	5301	37.80	5339	358.2	359.0	0.998
low	5294	18.84	5313	179.4	178.0	1.008
calibrator zero	5203	0.00	5203	0.0	0.0	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale) =	0.04%	.95-1.05
% change in C.F. from last cal =	6.12%	± 3% F.S.
		± 10%

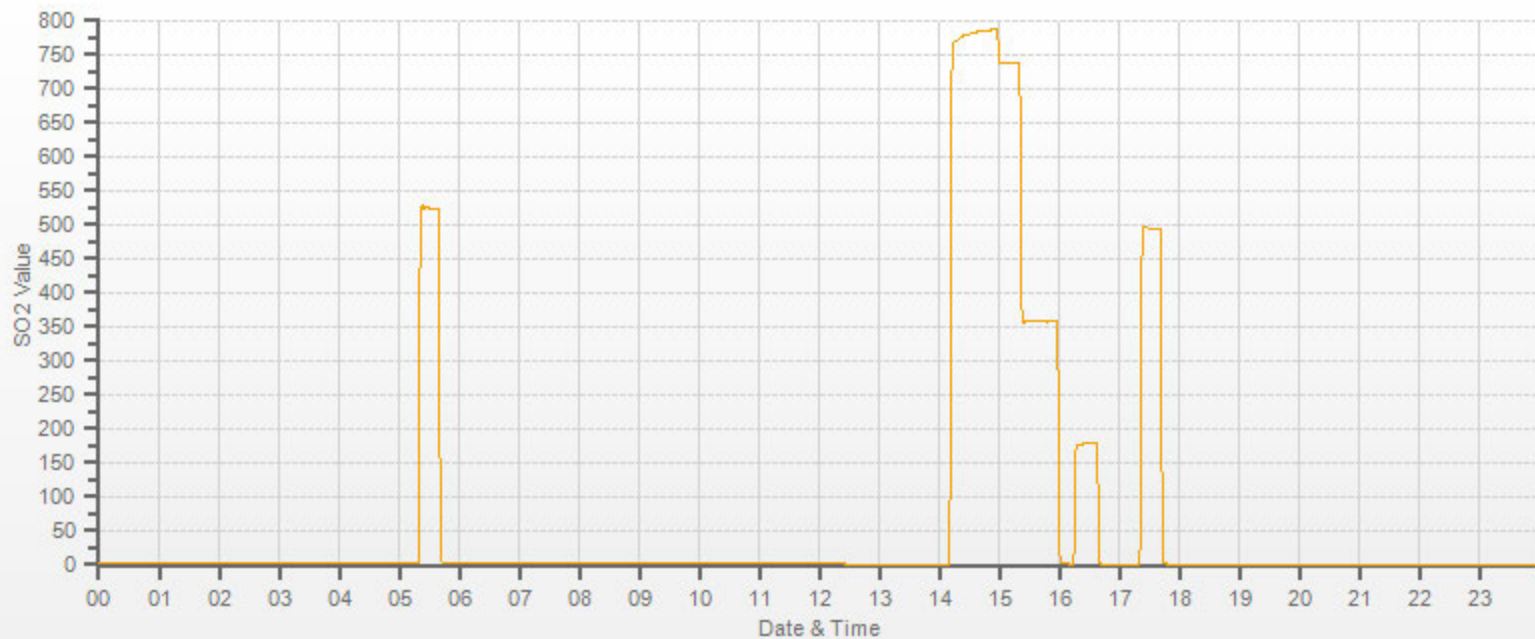
API 100ESulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: 1.006 Offset: 124.5 Hvps: 651 Rcell Temp: 50.0 Box Temp: 28.6 Pmt Temp: 7.9 Izs Temp: 45.0 Pres: 24.1 Samp Fl: 612 Norm Pmt: 127.5 Uv Lamp: 3026.3 Lamp Ratio: 96.1 Str Lgt: 62.6 Drk Pmt: 5.4 Drk Lmp: 6.5 Expected Value: 544.0	<p style="text-align: center;">As left:</p> Slope: 0.945 Offset: 127.8 Hvps: 651 Rcell Temp: 50.0 Box Temp: 30.5 Pmt Temp: 7.9 Izs Temp: 45.0 Pres: 24.1 Samp Fl: 610 Norm Pmt: 127.7 Uv Lamp: 3027.2 Lamp Ratio: 96.1 Str Lgt: 60.4 Drk Pmt: 5.6 Drk Lmp: 6.4 Expected Value: 494.0
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Comments:
The analyzer sample inlet filter was changed.

SO2[ppb] Station: LICA ST. LINA Daily: 17.07.18 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: July 18, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	934 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: St. Lina	Weather Conditions: Rain fall heavy at times	
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly	
Start Time 24 hr. (mst): 11:37	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 16:34	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: June 12, 2017	As Found C.F.: 0.925
Previous C.F.: 1.000	New C.F.: 1.000

Calibration Standards:		Standard Calibration Points for Ranges	
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016		Point	ppb
High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016		High	78
Calibrator ID/Cert. Date: EnviroNics 6100, #5212 / Feb 14, 2017		Mid	38
Cal Gas Cylinder I.D. #: EY 0000654		Low	19
Cal Gas Conc. (ppm): 10.2			

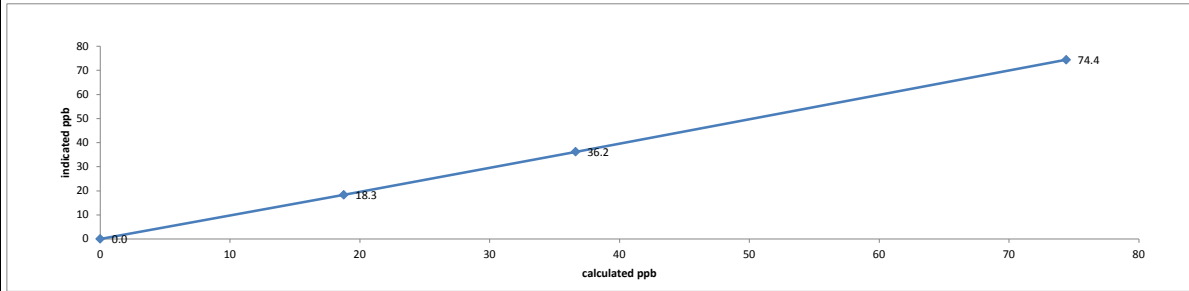
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	8045	0.00	8045	0.0	0.3	n/a
as found high	7966	58.54	8025	74.4	80.7	0.925
adjusted zero	8045	0.00	8045	0.0	0.0	n/a
adjusted high	7966	58.54	8025	74.4	74.4	1.000
mid	8014	28.88	8043	36.6	36.2	1.012
low	8029	14.80	8044	18.8	18.3	1.026
calibrator zero	8045	0.00	8045	0.0	0.0	n/a
Average C.F.=						1.012

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.998	> or = 0.995
b (Intercept as % of full scale) =	0.27%	.95-1.05
% change in C.F. from last cal =	7.46%	± 3% F.S.
		± 10%

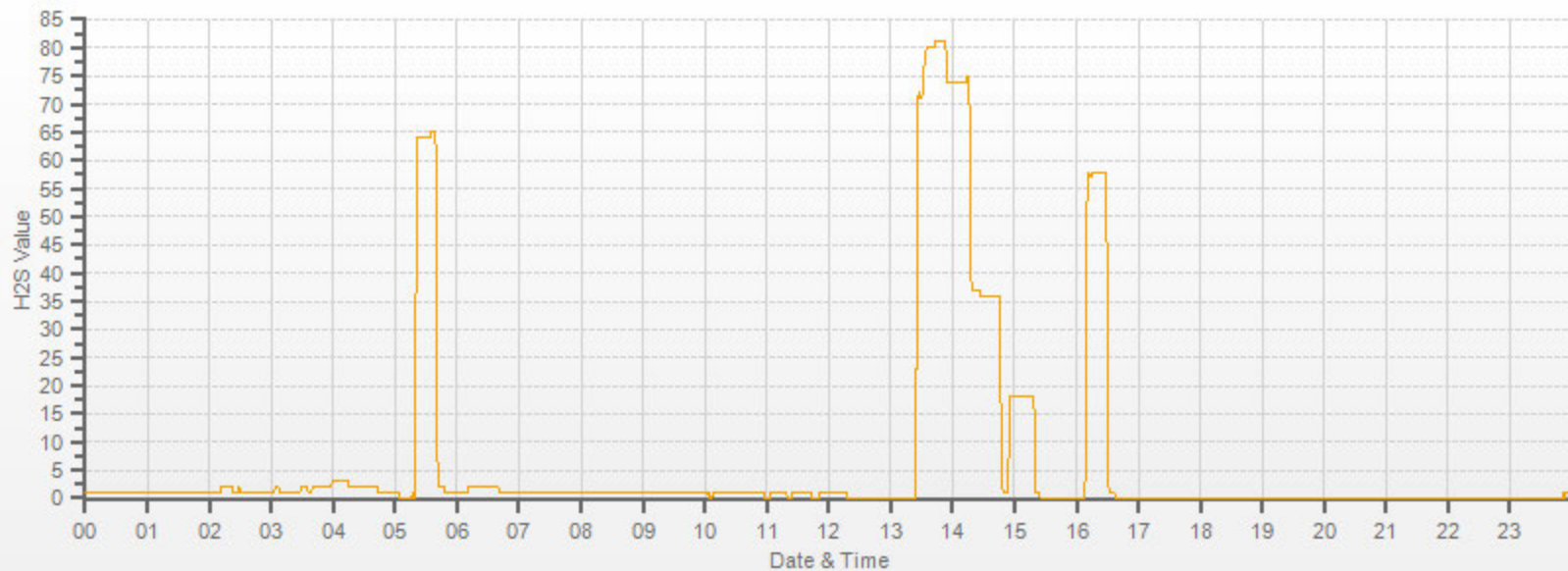
API 101E Hydrogen Sulphide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: 0.945 Offset: 61.6 Hvps: 671 Rcell Temp: 50.0 Box Temp: 28.7 Pmt Temp: 8.0 Izs Temp: 48.0 Converter Temp: 315.2 Pres: 20.6 Samp Fl: 534 Uv Lamp: 3362.9 Lamp Ratio: 100.3 Str Lgt: 29.1 Drk Pmt: 0.4 Drk Lmp: 0.5 Expected Value: 65.3	<p style="text-align: center;">As left:</p> Slope: 0.873 Offset: 62.6 Hvps: 671 Rcell Temp: 50.0 Box Temp: 30.5 Pmt Temp: 8.0 Izs Temp: 48.0 Converter Temp: 314.6 Pres: 20.6 Samp Fl: 531 Uv Lamp: 3359.5 Lamp Ratio: 100.2 Str Lgt: 27.3 Drk Pmt: 0.6 Drk Lmp: 0.2 Expected Value: 58.3
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Comments:
The analyzer sample inlet filter was changed.

H2S[ppb] Station: LICA ST. LINA Daily: 17.07.18 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: July 19, 2017 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 10:15 / 14:07 Calibration Method: Gas Dilution	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016 932 mb Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016 21 °C Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: November 25, 2023
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Analyzer: ID# or Serial Number: 51CLT-77021-384 Last Calibration Date: June 13, 2017 Previous Cal High Point C.F.: 0.999	Range ppm: 50 As Found C.F.: 0.966 New C.F.: 0.999
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Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 ID# 152020 November 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 ID# 148943 November 21, 2016 Calibrator ID/Cert. Date: EnviroNics 6100 5212 February 14, 2017 Cal Gas Cylinder I.D. # : LL165372 CH₄/C₂H₆ Cylinder Conc. (ppm): <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">606.0</td> <td style="width: 50%;">212.0</td> </tr> <tr> <td>CH₄ as propane/total CH₄ equivalents (ppm):</td> <td>583.0 1189.0</td> </tr> </table>	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>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>	Point	Target ppm	High	38	Mid	18	Low	9
606.0	212.0												
CH₄ as propane/total CH₄ equivalents (ppm):	583.0 1189.0												
Point	Target ppm												
High	38												
Mid	18												
Low	9												

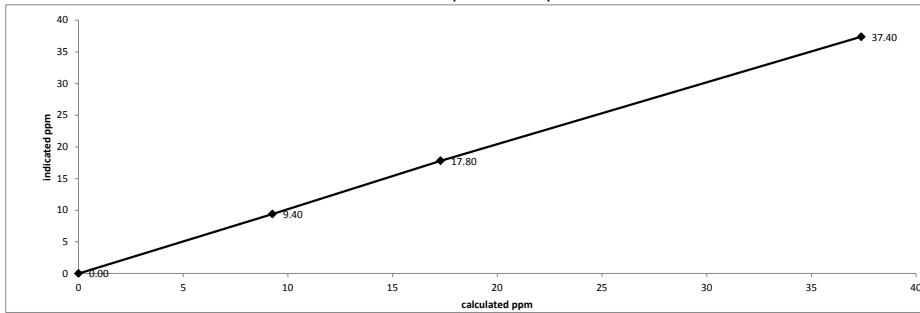
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2689	0.00	2689	0.0	0.00	n/a
as found high	2603	84.47	2687	37.38	38.70	0.966
adjusted zero	2689	0.00	2689	0.00	0.00	n/a
adjusted high	2603	84.47	2687	37.38	37.40	0.999
mid	2653	39.15	2692	17.29	17.80	0.971
low	2670	20.96	2691	9.26	9.40	0.985
calibrator zero	2689	0.00	2689	0.0	0.00	n/a
Average C.F. =						0.985

Linear Regression/Calibration Results:

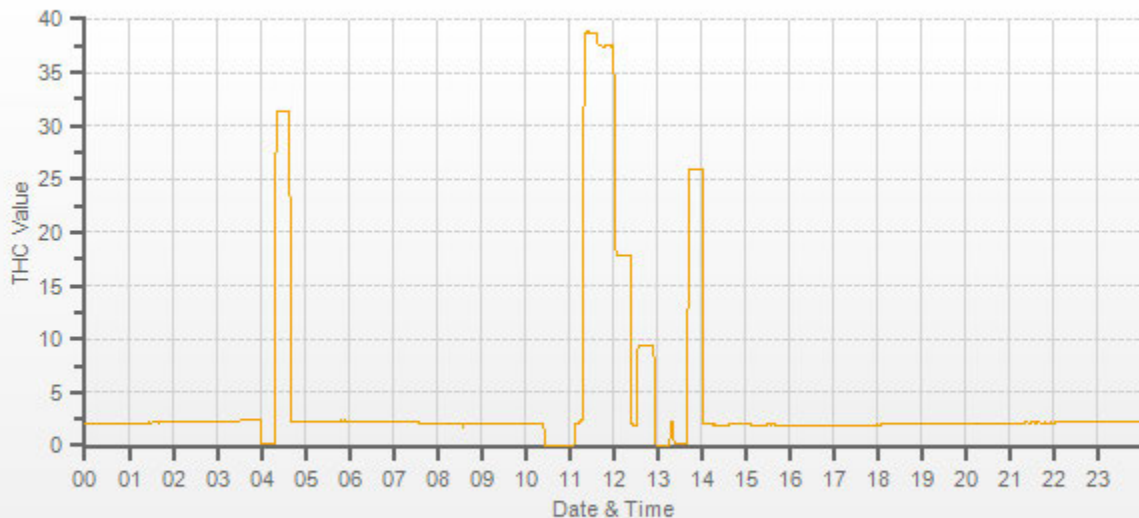
Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = -0.32%	.95-1.05
% change in C.F. from last cal = 3.32%	± 3% F.S.
	± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 50 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 45 measurement alarms: None service alarms: None cnt: 1863 rng: 1 try: 1 flm: 190.6 det: 125.4 Flame: 190 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: n/a Expected Value: 31.10	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: 45 measurement alarms: None service alarms: None cnt: 1813 rng: 1 try: 1 flm: 189.7 det: 125.7 Flame: 189 Filter: 125 Base: 125 Sample psi: 06.92 Internal Air Pressure: 20 Internal Fuel Pressure: 13 Measured Flow: 1.036 lpm Expected Value: 25.90
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Comments:
 The analyzer sample inlet filter was changed.
 A new span gas cylinder was installed.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: July 18, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016 934 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016 22 °C
Location/Station Name: St. Lina	Weather Conditions: Rain fall heavy at times
Start/End Time 24 hr. (mst): 11:37 / 20:20	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov Trina Whatsitt
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.: As Found C.F.: New C.F.:
Last Calibration Date: June 12, 2017	NO = 0.998 0.966 0.998
Range ppb: 1000	NO ₂ = 0.976 0.978 0.978
	NOx = 1.000 0.965 0.999

Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 ID# 152020 November 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 ID# 148943 November 21, 2016 Calibrator ID/Cert. Date: API 700 627 January 27, 2017 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: 10px;"> <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	5203	0.0	5203	0	0	0.0	2.0	n/a	n/a
as found high	5248	77.7	5326	739.4	739.4	765.0	768.0	0.966	0.965
adjusted zero	5203	0.00	5203	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5248	77.67	5326	739.4	739.4	741.0	740.0	0.998	0.999
mid	5301	37.80	5339	359.0	359.0	361.0	361.0	0.994	0.994
low	5294	18.84	5313	179.8	179.8	180.0	180.0	0.999	0.999
calibrator zero	5203	0.00	5203	0	0	0.0	0.0	n/a	n/a
Average C.F. =								0.997	0.997

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	5248	77.67	5326	0.0	743.0	744.0	3.0	0.0	3.0	
as found high NO2	5248	77.67	5326	470.0	296.0	754.0	460.0	447.0	457.0	0.978
adjusted high NO2	5248	77.67	5326	470.0	296.0	754.0	460.0	447.0	457.0	0.978
gpt mid	5248	77.67	5326	265.0	489.0	750.0	262.0	254.0	259.0	0.981
gpt low	5248	77.67	5326	90.0	658.0	745.0	88.0	85.0	85.0	1.000
Average NO ₂ C.F. =										0.986

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.999	0.981	.95-1.05
b (Intercept as % of full scale) =	0.02%	0.04%	0.08%	± 3% F.S.
% change in C.F. from last cal =	3.16%	3.48%	-0.22%	± 10%
NO2 converter efficiency			0.97	0.96 to 1.04

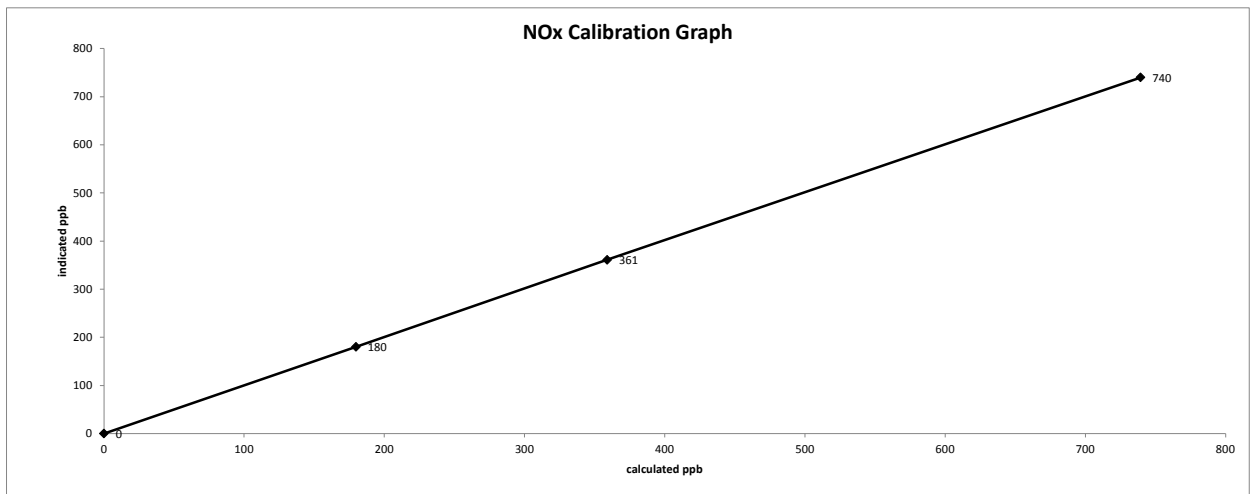
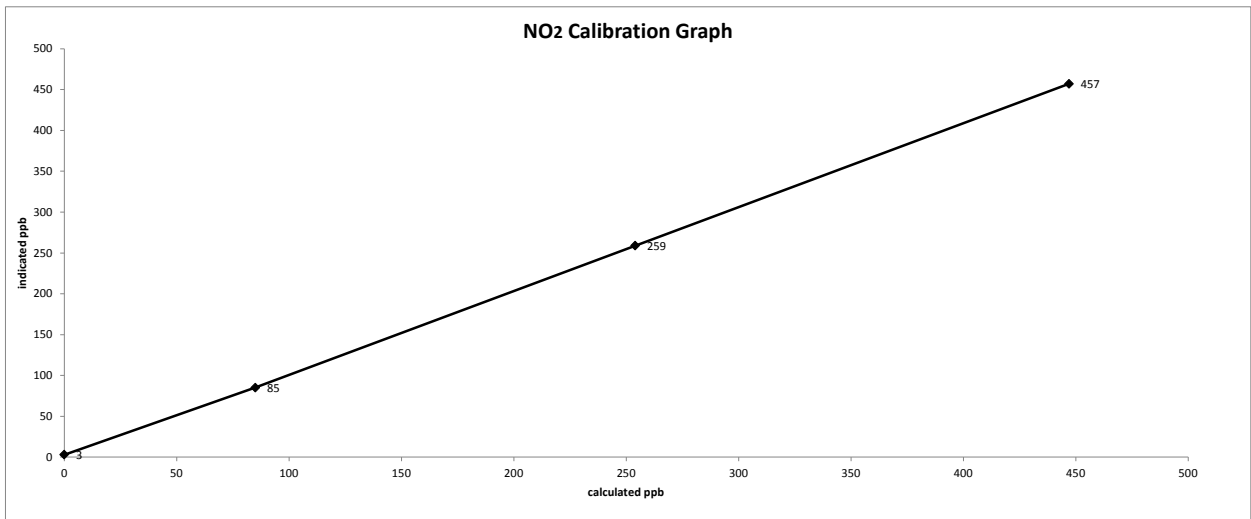
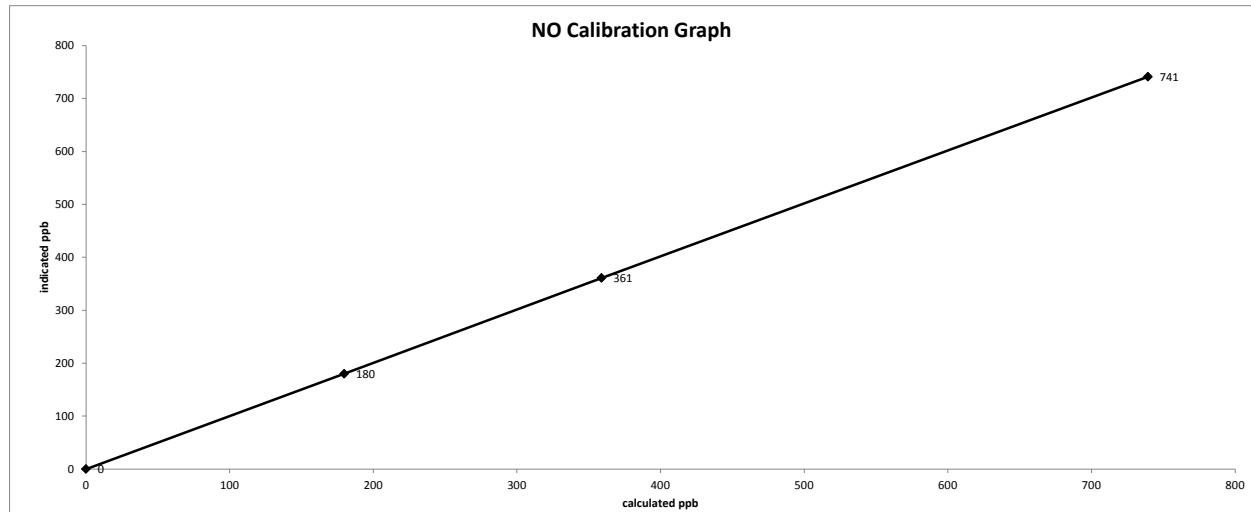
As found: NOx SLOPE: 0.968 NOx OFFS: 2.3 NO SLOPE: 0.965 NO OFFS: 1.4 SAMP FLW: 483 OZONE FL: 78 PMT: 15.7 NORM PMT: 9.1 AZERO: 16.2 HVPS: 767 RCELL TEMP: 50.0 BOX TEMP: 30.7 PMT TEMP: 6.7 IZS TEMP: 40.0 MOLY TEMP: 314.9 RCEL: 5.6 SAMP: 26.6 Expected Value NO: 6.7 Expected Value NO ₂ : 405.0 Expected Value NOx: 410.0	As left: NOx SLOPE: 0.937 NOx OFFS: 3.7 NO SLOPE: 0.934 NO OFFS: 0.2 SAMP FLW: 483 OZONE FL: 78 PMT: 15.5 NORM PMT: 0.1 AZERO: 17.0 HVPS: 767 RCELL TEMP: 50.0 BOX TEMP: 32.1 PMT TEMP: 6.7 IZS TEMP: 40.2 MOLY TEMP: 315.5 RCEL: 5.6 SAMP: 26.6 Expected Value NO: 7.2 Expected Value NO ₂ : 379.0 Expected Value NOx: 384.0
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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.

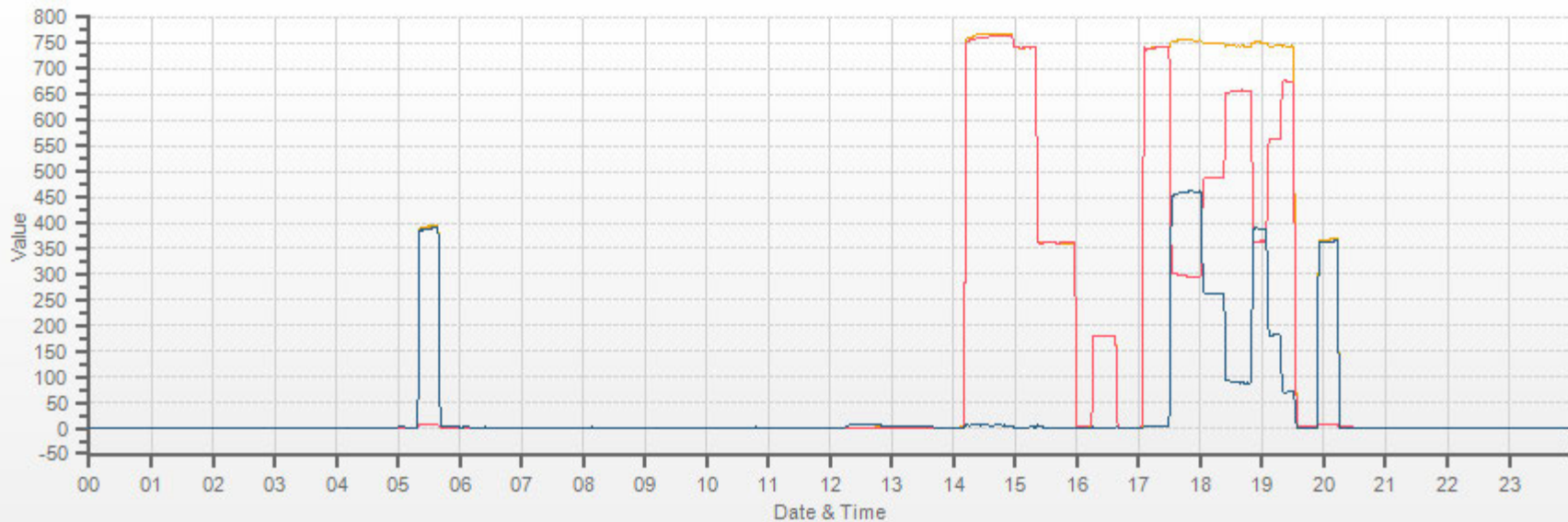
Three additional GPT points were taken for O3 calibration: O3 set High = 395 / NO drop = 379; O3 set Mid = 185/ NO drop = 180; O3 set Low = 70 / NO drop = 66.

Date: July 18, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:37 / 20:20
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration



Station: LICA ST. LINA Daily: 17.07.18 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: July 19, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	932 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	21 °C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny	
Start/End Time 24 hr. (mst): 10:15 / 14:24	Calibration Purpose: routine monthly	
Ozone Calibration Method: Direct G.P.T.	Performed By/Reviewer: Alex Yakupov / Trina Whitsitt	
G.P.T. Date: July 18, 2017	Cal Gas Expiry Date:	

Analyzer:	
ID# or Serial Number: 1002240371	Ozone Range ppb: 500
Last Calibration Date: June 13, 2017	As Found C.F.: 0.990
Previous Cal High Point C.F.: 1.000	New C.F.: 1.000

Calibration Standards:									
Low Flow Meter ID/Cert. Date: Defender 530 ID# 152020 November 21, 2016	<table border="1" style="margin: auto;"> <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>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point		AMD Required Range of Ozone Calibration Points							
High		300-400 ppb							
Mid		150-200 ppb							
Low	50-75 ppb								
High Flow Meter ID/Cert. Date: Defender 530 ID# 148943 November 21, 2016									
Calibrator ID/Cert. Date: API 700 627 January 27, 2017									
Cal Gas Cylinder I.D. #: n/a									

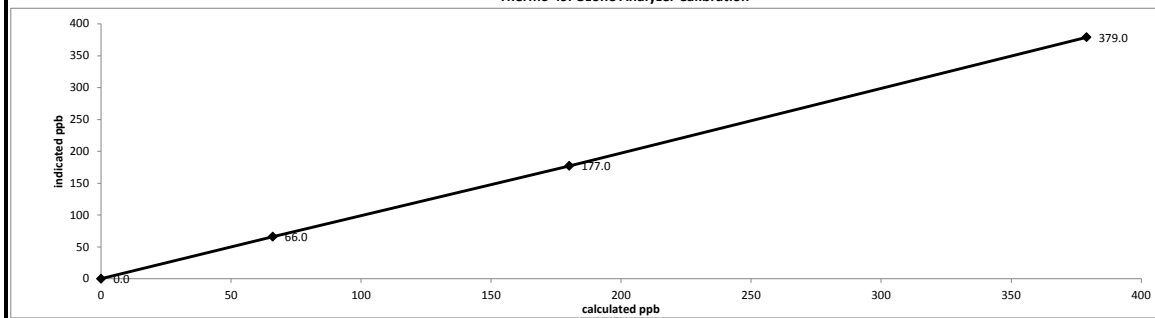
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	379.0	379.0	383.0	0.990
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	379.0	379.0	379.0	1.000
mid	5000	5000	180.0	180.0	177.0	1.017
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. =						1.006

Linear Regression/Calibration Results:

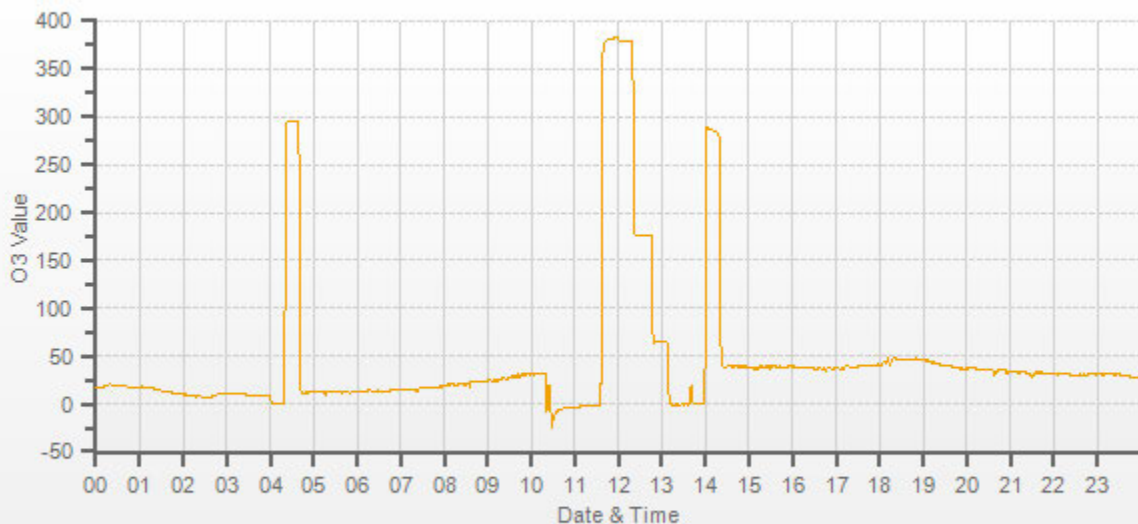
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.001		.95-1.05
b (Intercept as % of full scale) =	0.13%		± 3% F.S.
% change in C.F. from last cal =	1.04%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:	As left:
O3 Bkg: -0.1	O3 Bkg: -0.1
O3 Coef: 0.962	O3 Coef: 0.952
Photo Lamp: 10.7	Photo Lamp: 10.7
O3 Lamp: 8.2	O3 Lamp: 8.2
Bench: 30.4	Bench: 33.0
Bench Lamp: 53.6	Bench Lamp: 53.8
O3 Lamp: 67.9	O3 Lamp: 67.9
Pressure: 680.3	Pressure: 680.0
Cell A lpm: 0.730	Cell A lpm: 0.730
Cell B lpm: 0.781	Cell B lpm: 0.783
O3 ppb: -5.4	O3 ppb: -0.6
Cell A ppb: -5.5	Cell A ppb: -3.1
Cell B ppb: -5.4	Cell B ppb: 2.1
Cell A int: 83215	Cell A int: 83105
Expected Value: 281.0	Expected Value: 284.0

Comments: The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.



O3[ppb]

PARTICULATE MATTER

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

Date: July 14, 2017
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: June 27, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 13:55
 End Time (mst): 15:11
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 33%
 Ko Factor: 13125 As Left Filter Loading %: 18%
 Ambient Temperature °C: 24.24 As Found Noise: 0.004
 Ambient Pressure atm: 0.924 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./Cert. Date:

Low Flow: Chinook Eng. / sn 091099, #3 / March 24, 2017
 High Flow: Chinook Eng. / sn 091001, #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / #3 / January 1, 2017
 Temperature: FLUKE 1551A Ex STIK / # 4295 / November 15, 2016
 Pressure: Fisher Scientific / # 05544 / December 05, 2016

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.06	0.00	0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.19	-0.95	0.10	-0.95
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.06	0.00	0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.19	-0.95	0.10	-0.95
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C
 1405F temperature °C: 24.2
 reference temperature °C: 25.1
 difference °C: 0.8
 tolerance +/- 0.01 atm
 1405F pressure atm: 0.924
 reference pressure: 0.925
 difference: -0.001

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

tolerance +/- 2.0°C
 1405F temperature °C: 25.1
 reference temperature °C: 25.1
 difference °C: 0.0
 tolerance +/- 0.01 atm
 1405F pressure atm: 0.925
 reference pressure: 0.925
 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: 2.91
 difference lpm: -0.09
 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: 16.41
 difference lpm: -0.26

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: 2.91
 difference lpm: -0.09
 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: 16.41
 difference lpm: -0.26

K_o Audit:

Last K_o audit date: June 13, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13175.2000
 % difference: 0.38

Comments:

The TEOM sample filter was changed.

The 47 mm FDMS filter was changed.

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



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

Date: July 25, 2017
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: July 14, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 11:40
 End Time (mst): 12:06
 Calibration Purpose: shut down
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 25%
 Ko Factor: 13125 As Left Filter Loading %: n/a
 Ambient Temperature °C: 22.91 As Found Noise: 0.004
 Ambient Pressure atm: 0.920 As Left Noise: n/a
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.28
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. / sn 091099, #3 / March 24, 2017
 High Flow: Chinook Eng. / sn 091001, #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / #3 / January 1, 2017
 Temperature: FLUKE 1551A Ex STIK / # 4295 / November 15, 2016
 Pressure: Fisher Scientific / # 05544 / December 05, 2016

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.10	0.06	0.00	0.06
	limit	0.15	0.06	0.15	0.06
Bypass Flow	actual	0.34	-0.95	0.31	-0.95
	limit	0.60	-0.95	0.60	-0.95

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	n/a	n/a	n/a	n/a
	limit	0.15	0.06	0.15	0.06
Bypass Flow	actual	n/a	n/a	n/a	n/a
	limit	0.60	-0.95	0.60	-0.95

As found temperature and pressure:

tolerance +/- 2.0°C tolerance +/- 0.01 atm
 1405F temperature °C: 22.9 1405F pressure atm: 0.920
 reference temperature °C: 22.7 reference pressure: 0.920
 difference °C: -0.3 difference: 0.000

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

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

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
 1405F main flow lpm: 3.00 1400A total/aux flow lpm: 16.67
 reference main flow lpm: 2.87 reference total/aux flow lpm: 16.34
 difference lpm: -0.13 difference lpm: -0.33

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: 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!

K_o Audit:

Last K_o audit date: June 13, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13175.2000
 % difference: 0.38

Comments:

Shutdown audit completed to replace the instrument with the SHARP.

Thermo 5030i SHARP Monitor Quarterly Audit/Calibration

Date: July 26, 2017	Performed By/Reviewer: Chris Wesson Trina Whitsitt
Company: LICA	Start Time (mst): 10:54
Station Name/Location: St. Lina	End Time (mst): 14:15
Previous Audit Date: n/a	Calibration Purpose: installation
Parameter: PM 2.5	Weather Conditions: Mainly sunny

SHARP 5030i Information and Status:		
Serial Number: CM17091001	Filter Tape Counter	1

Reference Standards: Air Flow				
Make:	Manometer Dwyer	Orifice Chinook	Pressure: Brunton	Temp / RH: Fisher Scientific
Model:	475 Mk.III	CHN0901	ADC Pro	11-661-7A, 11745843
Serial Number:	#3	#2	05535	160459244
Calibration Date:	January 1, 2017	March 24, 2017	December 5, 2016	May 18, 2016

Ambient Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	24.60	26.2	-1.6	23.19	23.7	-0.5
#2	24.70	26.3	-1.6	23.26	23.6	-0.3
#3	24.40	26.3	-1.9	23.30	23.5	-0.2
Average	24.6	26.3	-1.7	23.3	23.6	-0.3
Temp Limit: ± 2°C						

Ambient Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)
#1	51.33	42.9	8.4	48.44	49.3	-0.9
#2	51.66	44.4	7.3	50.75	49.2	1.6
#3	50.85	43.5	7.4	48.76	48.4	0.4
Average	51.3	43.6	7.7	49.3	49.0	0.3
RH Limit: ± 2 %RH						

Flow Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	24.62	24.6	0.0	24.59	24.6	0.0
#2	24.57	24.8	-0.2	24.60	24.6	0.0
#3	24.57	24.7	-0.1	24.53	24.7	-0.2
Average	24.6	24.7	-0.1	24.6	24.6	-0.1
Temp Limit: ± 2°C						

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	702.8	704.5	-1.7	702.8	702.8	0.0
BP Limit: ± 2 mmHg						

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	46.25	43.1	3.2	46.61	46.7	-0.1
RH Limit: ± 2 %RH						

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	25.59	24.6	1.0	25.64	25.7	-0.1
Temp Limit: ± 2°C						

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

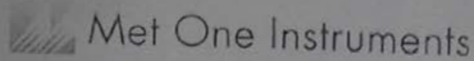
Detector Calibration (Auto)						
Detector Auto Calibration Completed:			As Left:			
YES			Variable	Value		
			HIGH VOLT	1380		
			BETA REF TH	310		
			ALPHA TH	770		
			DIFF HV	4		

Mass Coefficient (Auto)						
Zero			Span			
	Variable	Value		Variable	Value	
	MASS COEF	7016.8		MASS COEF	7016.8	
	FOIL VALUE	1045		FOIL VALUE	1045	
	Beta Avg	8778		Beta Avg	n/a	
	difference	n/a		difference	0.0	
Foil Set: 4804						

Flow Calibration (L/min)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	17.09	16.62	0.47	16.67	16.65	0.02
#2	17.09	16.66	0.43	16.67	16.67	0.00
#3	17.09	16.64	0.45	16.67	16.66	0.01
Average	17.09	16.64	0.45	16.67	16.66	0.01
Flow Limit: 16.67 ± 0.33 L/min						

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.67	16.67	0.00	16.59	16.61	-0.02
Leak Limit: 0.08 L/min LEAK RATE: -0.02						

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)*

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: _____ Location: McIntyre Center Edmonton

Company Maxxam **Operator:** Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Envionics 6100</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>5212</u>	Serial Number	<u>Hi148944 Lo 152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>24.6</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>701.4mmHg</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>4919</u>	Pt. #3 <u>4960</u>
Pt. #2	<u>4934</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.2</u>	Pt. #3 <u>19.1</u>
Pt. #2	<u>38.3</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4987	0.0	0.0000	0.0000	0.0000	0.0002	0.0002	Limit ± 10%	
4998	79.2	0.7765	0.7765	0.7801	-0.0003	0.7798	0%	0%
4977	38.3	0.3775	0.3775	0.3790	0.0000	0.3790	0%	0%
4979	19.1	0.1880	0.1880	0.1888	-0.0001	0.1887	0%	0%
Absolute Average Percent Difference							0%	0%

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)= 1.0046	0.90-1.10	m (Slope)= 1.0041
b (Intercept % of FS)= -0.0080	± 3% F.S.	b (Intercept % of FS)= 0.0057

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4998	0.000	0.0000	0.7799	-0.0008	0.7790	NO ₂	% Diff. Limit
4998	0.500	0.4949	0.2850	0.4909	0.7776	-1%	± 10%
4998	0.275	0.2765	0.5034	0.2742	0.7776	-1%	± 10%
4998	0.100	0.1003	0.6796	0.0989	0.7786	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9936	0.90-1.10
b (Intercept % of FS)= -0.0733	± 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>1868</u>
Serial/AMU Number <u>1809</u>	Last Calibration Date <u>February 13, 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 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] 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

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. 688mmHg

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 IV
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
Name of the Representative of the Person Responsible (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

September 25, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-07-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram ghabeb</u>	Date <u>August 22, 2017</u>
Level 1 Primary Validation	<u>Maram ghabeb</u>	Date <u>August 22, 2017</u>
Level 2 Final Validation	<u>Maram ghabeb</u>	Date <u>September 08, 2017</u>
Level 3 Independent Data Review	<u>crashmka</u>	Date <u>September 20, 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

September 28, 2017

Subject: Monthly Report Submission for the LICA Portable (Bonnyville) station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Portable (Bonnyville) AQM Station in the month of July 2017.

The air monitoring program consists of continuous air monitoring, 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
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 systems.

All data collected in July 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016), with the exception of H2S.

One 1-hr exceedance for H2S was recorded on July 19. AEP reference number: 326699.

The Air Quality Monitoring program at Bonnyville was decommissioned at the end of July for trailer relocation purpose.

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, with the exception of electronic submission for the results of 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



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

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 Managers
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
BONNYVILLE CONTINUOUS MONITORING STATION

JOB #: 2833-2017-07-35-C

July 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 St.

Bonnyville, Alberta

T9N 2J7

Attention: MIKE BISAGA

DATE: **September 25, 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 July 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville 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 H₂S, was compliant with the requirements outlined in the AMD, 2016.

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

Non-Conformance: One 1-hr exceedance was recorded for H₂S on July 19. Details are recorded in the Exceedance Summary Report. AEP reference number: 326699.

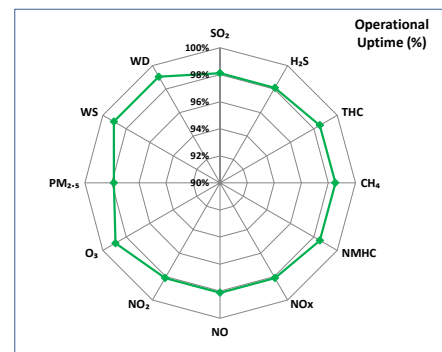
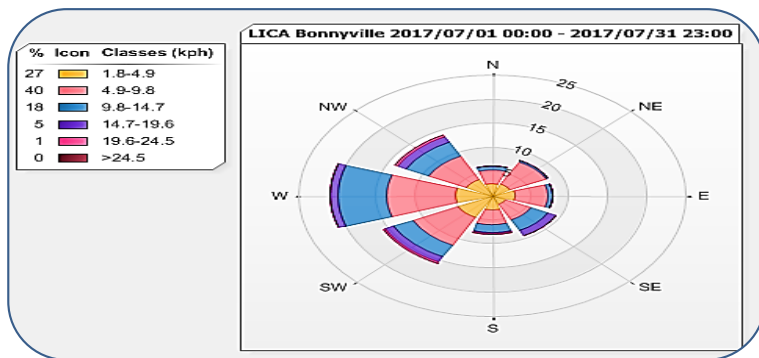
Trailer Removal: The Air Quality Monitoring program at Bonnyville was decommissioned at the end of July, as per LICA's request. Removal calibrations were performed on the analyzers and wind system on July 31. Downtime ranging from 7 to 14 hours were incurred on July 31, on respective parameters as a result of the trailer removal.

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, Bonnyville Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3678 or toll-free at 1-800-386-7247.

Pollutants	Unit	Monthly Records		1-Hour Records					24-Hour Records			
		Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0	98.1%	1	July 3	3	172	0	1	July 13	0	0
H ₂ S	ppb	1	98.1%	17	July 9	4	10	1	3	July 9	3	0
THC	ppm	2.17	98.5%	3.37	July 8	4	-	-	2.43	July 27	-	-
CH ₄	ppm	2.16	98.5%	3.30	July 8	4	-	-	2.39	July 27	-	-
NMHC	ppm	0.01	98.5%	0.31	July 8	1	-	-	0.04	July 27	-	-
NO _x	ppb	3	98.1%	21	July 7	5	-	-	6	July 7	-	-
NO	ppb	0	98.1%	9	July 7	7	-	-	1	July 7	-	-
NO ₂	ppb	3	98.1%	14	July 14	21	159	0	4	July 7	-	-
O ₃	ppb	28.5	98.9%	57.8	July 13	20	82	0	39.4	July 15	-	-
PM _{2.5}	µg/m ³	7	97.8%	51	July 16	20	80	0	19	July 16	30	0
WS	kph	2.1	99.1%	24.4	July 4	16	-	-	11.9	July 24	-	-
WD	degree	256 (WSW)	99.1%	-	-	-	-	-	-	-	-	-



Monthly Update

- All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- All data collected this month, with the exception of H₂S, was compliant with the requirements outlined in the AMD, 2016.
- The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

- Non-Conformance:** One 1-hr exceedance was recorded for H₂S on July 19. Details are recorded in the Exceedance Summary Report. AEP reference number: 326699.
- Trailer Removal:** The Air Quality Monitoring program at Bonnyville was decommissioned at the end of July, as per LICA's request. Removal calibrations were performed on the analyzers and wind system on July 31. Downtime ranging from 7 to 14 hours were incurred on July 31, on respective parameters as a result of the trailer removal.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Bonnyville 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	1	3	3	7.7	ESE	1	13	98.1
H ₂ S (ppb)	10	3	1	0	1	17	9	4	4.3	NNE	3	9	98.1
THC (ppm)	-	-	-	-	2.17	3.37	8	4	6	NNW	2.43	27	98.5
CH ₄ (ppm)	-	-	-	-	2.16	3.30	8	4	6	NNW	2.39	27	98.5
NMHC (ppm)	-	-	-	-	0.01	0.31	8	1	1.2	NE	0.04	27	98.5
NO ₂ (ppb)	159	-	0	-	3	14	14	21	0.8	N	4	7	98.1
NO (ppb)	-	-	-	-	0	9	7	7	1.5	W	1	7	98.1
NO _x (ppb)	-	-	-	-	3	21	7	5	1.2	NNW	6	7	98.1
O ₃ (ppb)	82	-	0	-	28.5	57.8	13	20	16.1	WNV	39.4	15	98.9
PM _{2.5} (µg/m ³)	80	30	0	0	7	51	16	20	15.8	SW	19	16	97.8
VECTOR WS (kph)	-	-	-	-	2.1	24.4	4	16	-	SW	11.9	24	99.1
VECTOR WD (sec)	-	-	-	-	256 (WSW)	-	-	-	-	-	-	-	99.1

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

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (deg)	ESRD Reference #
July 9	4	17	4.3	NNE	326699

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.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
July 6, 2017	6.1	Acetone
July 12, 2017	9.9	Acetone
July 18, 2017	1.9	Acetone
July 24, 2017	5.34	Carbon disulfide
July 30, 2017	4.3	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
July 6, 2017	0.35	Phenanthrene
July 12, 2017	0.36	Phenanthrene
July 18, 2017	0.35	Benzo(c)phenanthrene
July 24, 2017	1.4	Benzo(ghi)perylene
July 30, 2017	0.43	Phenanthrene

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
July 1, 2017	3.8	Acetone
July 7, 2017	8.7	Ethanol
July 20, 2017	67.9	Acetone
July 27, 2017	16.3	n-Butane

Note: NA

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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), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The results for non-continuous VOC, PAH and NMHC canister monitoring are also included in this report.

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 98.1%, equivalent to fourteen hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- The routine monthly calibration was performed on July 4.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 98.1%, equivalent to fourteen hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- The routine monthly calibration was performed on July 4.
- One 1-hr exceedance was recorded on July 19 at hour 04:00, at a concentration of 17 ppb. This event was reported to AEP under reference number 326699.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time, for the monitoring period was 98.5%, equivalent to eleven hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- The routine monthly calibration was performed on July 5.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 98.1%, equivalent to fourteen hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- The permeation tube was replaced on June 30 and allowed time to stabilize. The expected span value was updated on July 4, following the routine monthly calibration.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.

OZONE (O₃)

- Operational time, for the monitoring period was 98.9%, equivalent to eight hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- The routine monthly calibration was performed on July 5.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 97.8%, equivalent to sixteen hours of downtime.
- Two routine TEOM audits were performed this month. The first was completed on July 5, and the second on July 24.
- Seven hours of downtime were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- 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. Nine hours of data were invalidated as the data was below -3 µg/m³ this month.

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

- Operational time, for the monitoring period was 99.1%, equivalent to seven hours of downtime. These were incurred on July 31, due to a removal calibration and the subsequent trailer removal, as the monitoring program came to an end as per LICA's request.
- Eight instances of maximum instantaneous data were discarded this month due to brief power outages.
- 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.

VOC SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on July 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.
- The VOC sampler quarterly audit was conducted on July 5.

PAH SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on July 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.
- The PAH sampler quarterly audit was conducted on July 5.

NMHC CANISTER SAMPLES

- The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered.
- Four canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows:
 - July 1 at 00:00 - 0.31 ppm
 - July 7 at 20:20 - 0.45 ppm
 - July 20 at 07:55 - 0.64 ppm
 - July 27 at 06:35 - 1.93 ppm

Other five-minute averages recorded at concentrations above 0.30 ppm are not considered sample-collection events as they occurred between events, before the canisters were replaced. Analysis was provided by InnoTech Alberta, results are included in this report.

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, with the exception of H₂S, was compliant with the requirements outlined in the AMD, 2016.

Non-Conformance: One 1-hr exceedance was recorded for H₂S on July 19 at hour 04:00, at a concentration of 17 ppb. Details are recorded in the Exceedance Summary Report. AEP reference number: 326699.

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-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- 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-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

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
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1400A TEOM Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832
- VOC - XONTECH 910A Gaseous Air Sampler

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

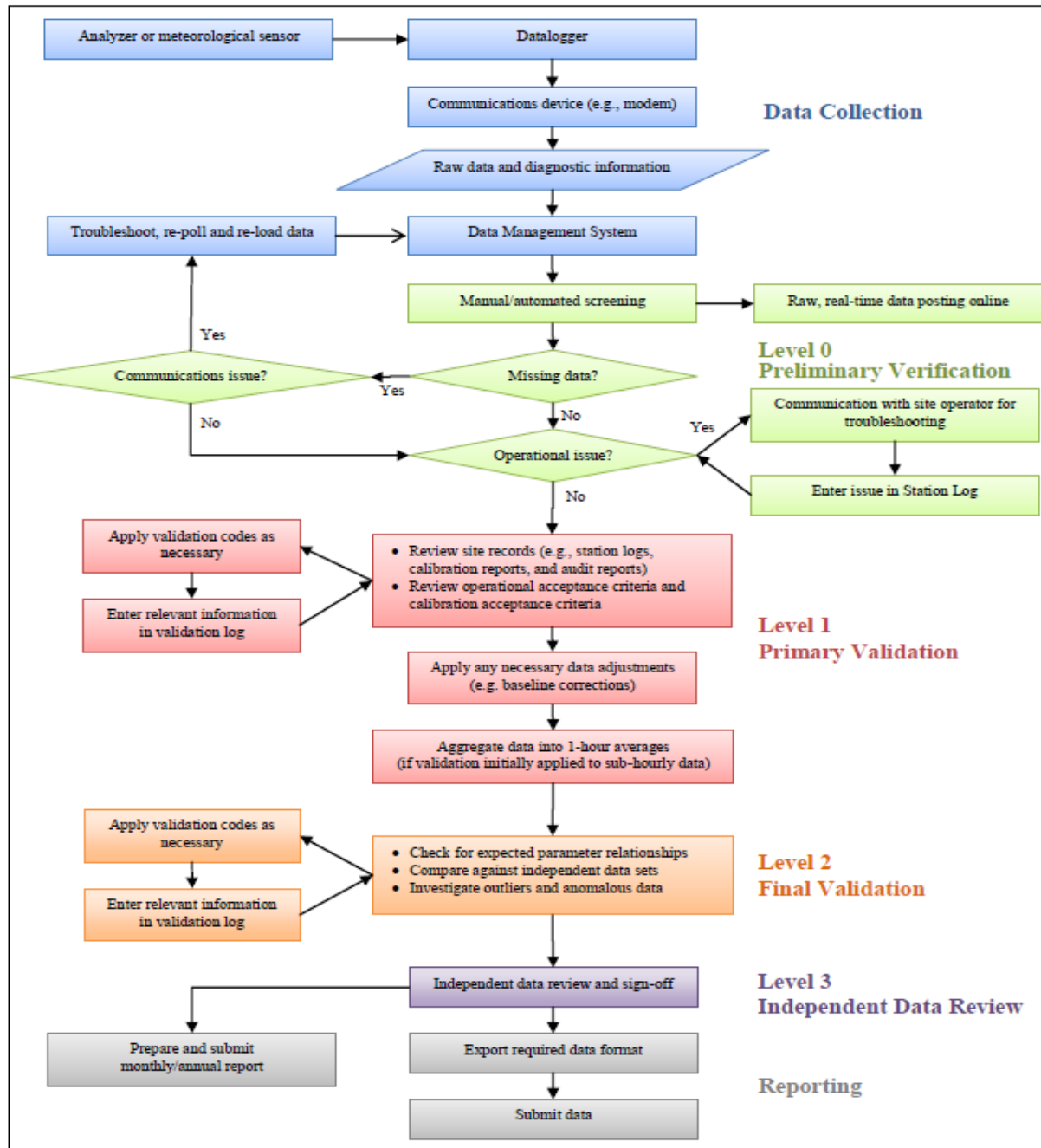
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

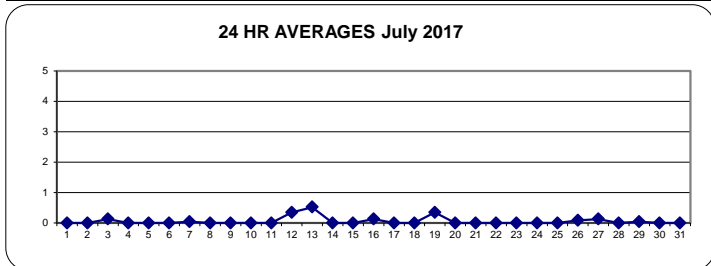
OBJECTIVE LIMIT:

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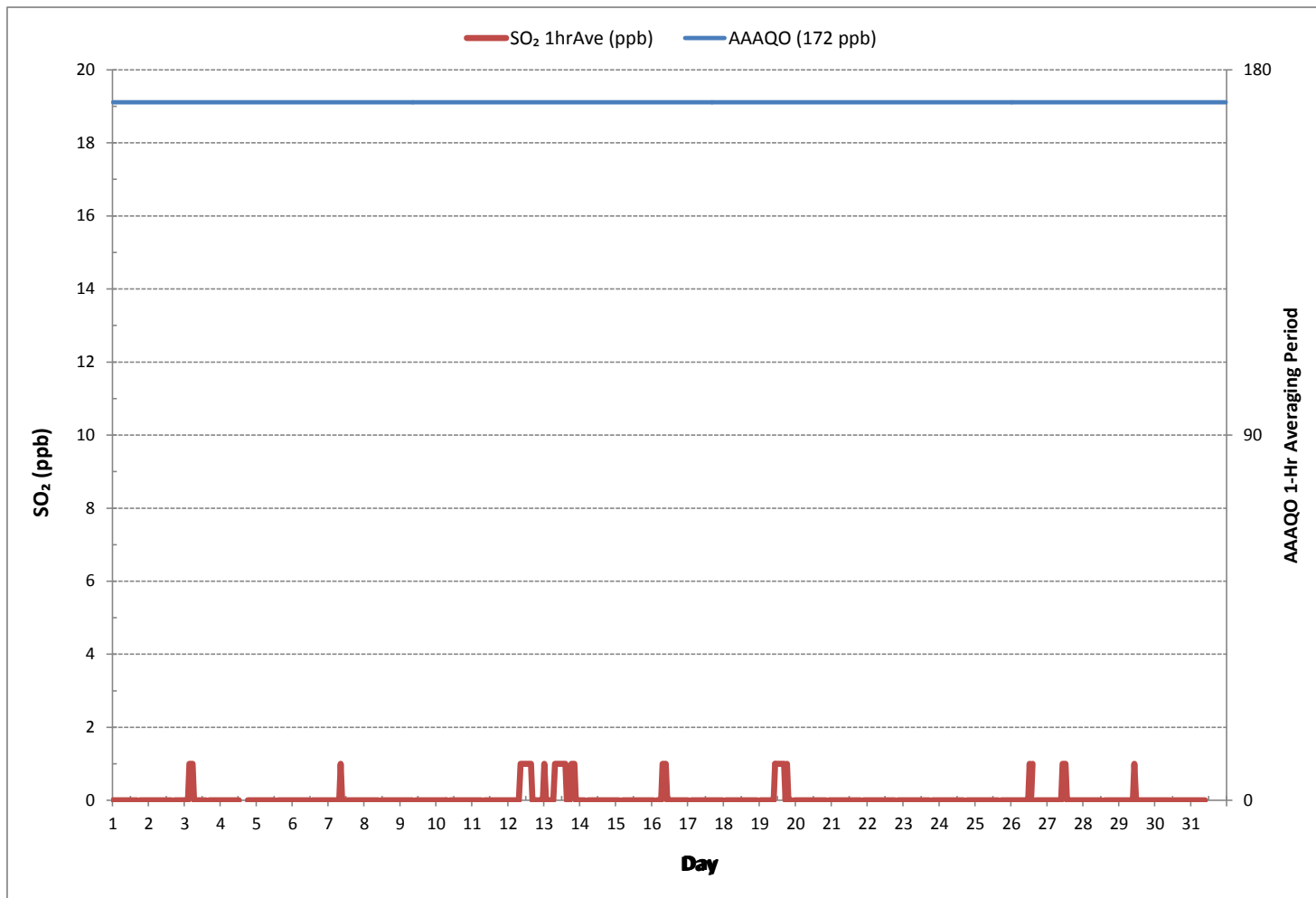
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	41
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR ON DAY 3
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 13
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	730 hrs
AMD OPERATION UPTIME:	98.1 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES July 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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	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	1	1	1	1	1	1	1	1	2	1	1	2	2	2	1	1	S	2	2	1	1	2	1	1	1	2	1	24
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	24
3	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	S	2	2	1	2	2	2	2	2	1	1	3	2	24
4	2	1	2	1	1	1	1	1	1	1	1	1	2	C	C	C	C	C	C	2	2	2	2	2	2	1	2	1	24
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17	2	S	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	3	2	24
18	S	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	2	S	1	2	1	2	24
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20	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	3	2	24
21	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	24
22	2	2	2	2	2	2	2	P	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	23
23	2	2	2	2	2	2	P	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	22
24	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	24
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HOURLY MAX	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
HOURLY AVG	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	2	2	

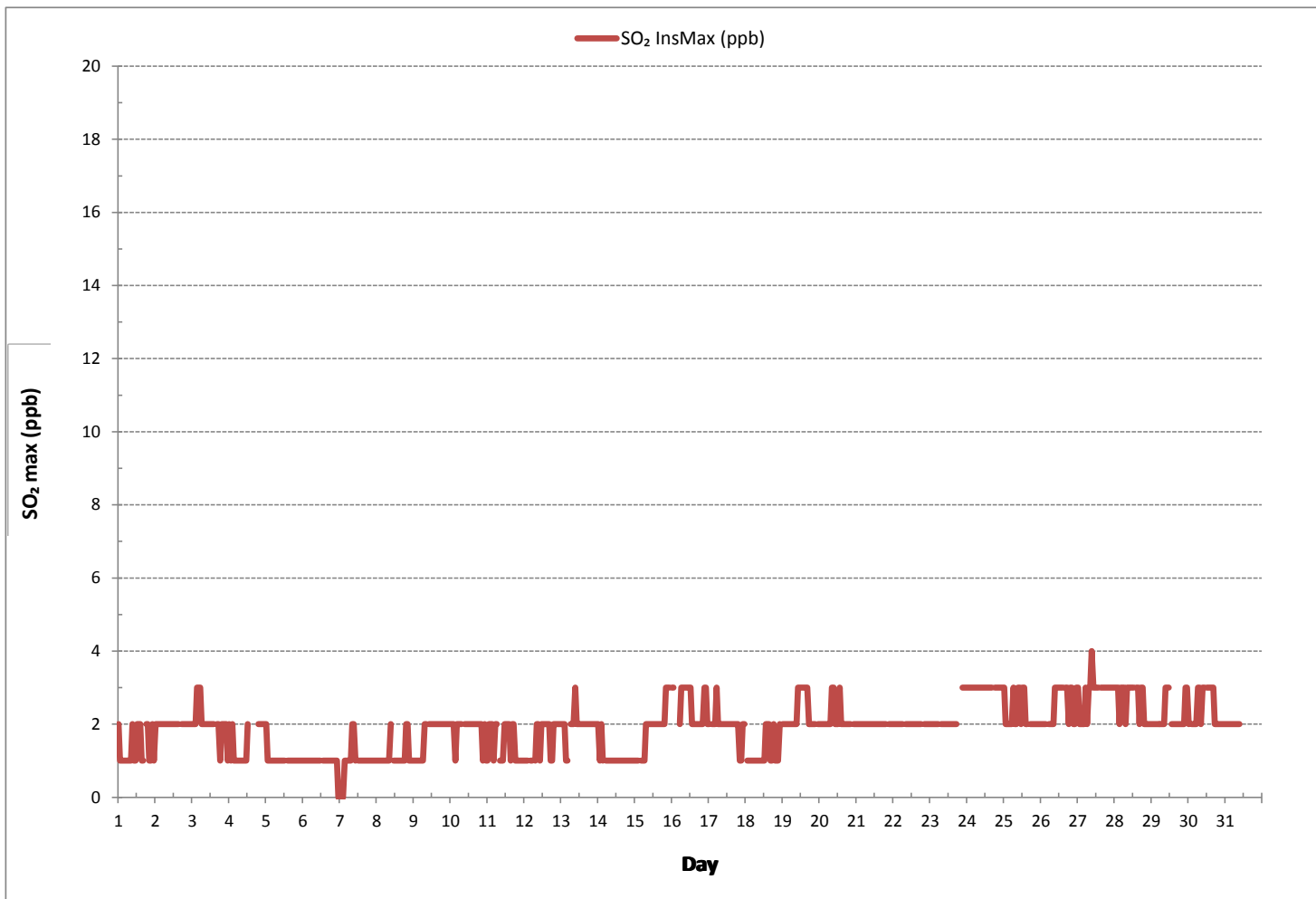
STATUS FLAG CODES

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:	682
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 9 ON DAY 27
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	722 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-SO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

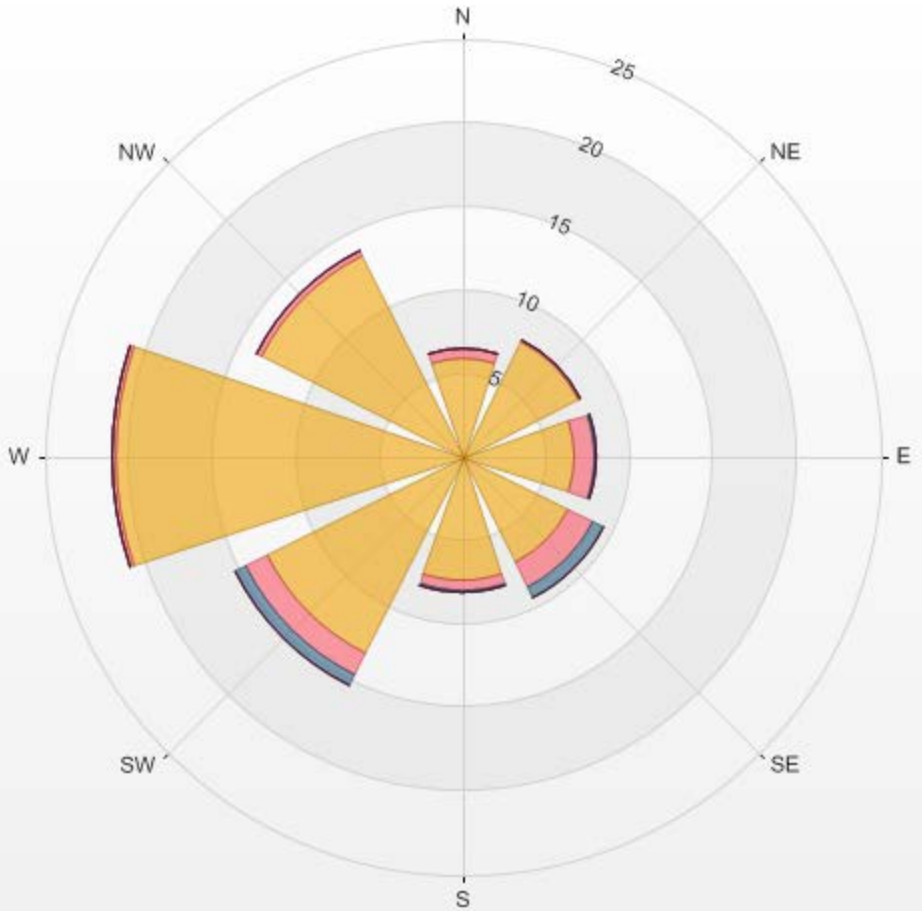
Calm: 9.77%

Calm Avg: 0.03 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	6.0	0.6	0.0	0.0	0.0	0.0	6.6
NE	7.7	0.2	0.0	0.0	0.0	0.0	7.9
E	6.7	1.2	0.2	0.0	0.0	0.0	8.0
SE	7.0	1.8	0.7	0.0	0.0	0.0	9.5
S	7.4	0.6	0.2	0.0	0.0	0.0	8.2
SW	13.1	1.5	0.7	0.0	0.0	0.0	15.3
W	20.7	0.3	0.0	0.0	0.0	0.0	21.0
NW	13.4	0.4	0.0	0.0	0.0	0.0	13.9
Summary	82.1	6.4	1.8	0.0	0.0	0.0	90.3

% Icon Classes (ppb) 82 0.0-0.4 6 0.4-0.8 2 0.8-1.2 0 1.2-1.6 0 1.6-2.0 0 >2.0

LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.77% Calm Poll Avg: 0.03[ppb]



SO2[ppb] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
h2s	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

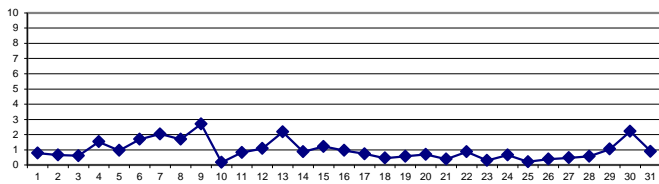
OBJECTIVE LIMIT:

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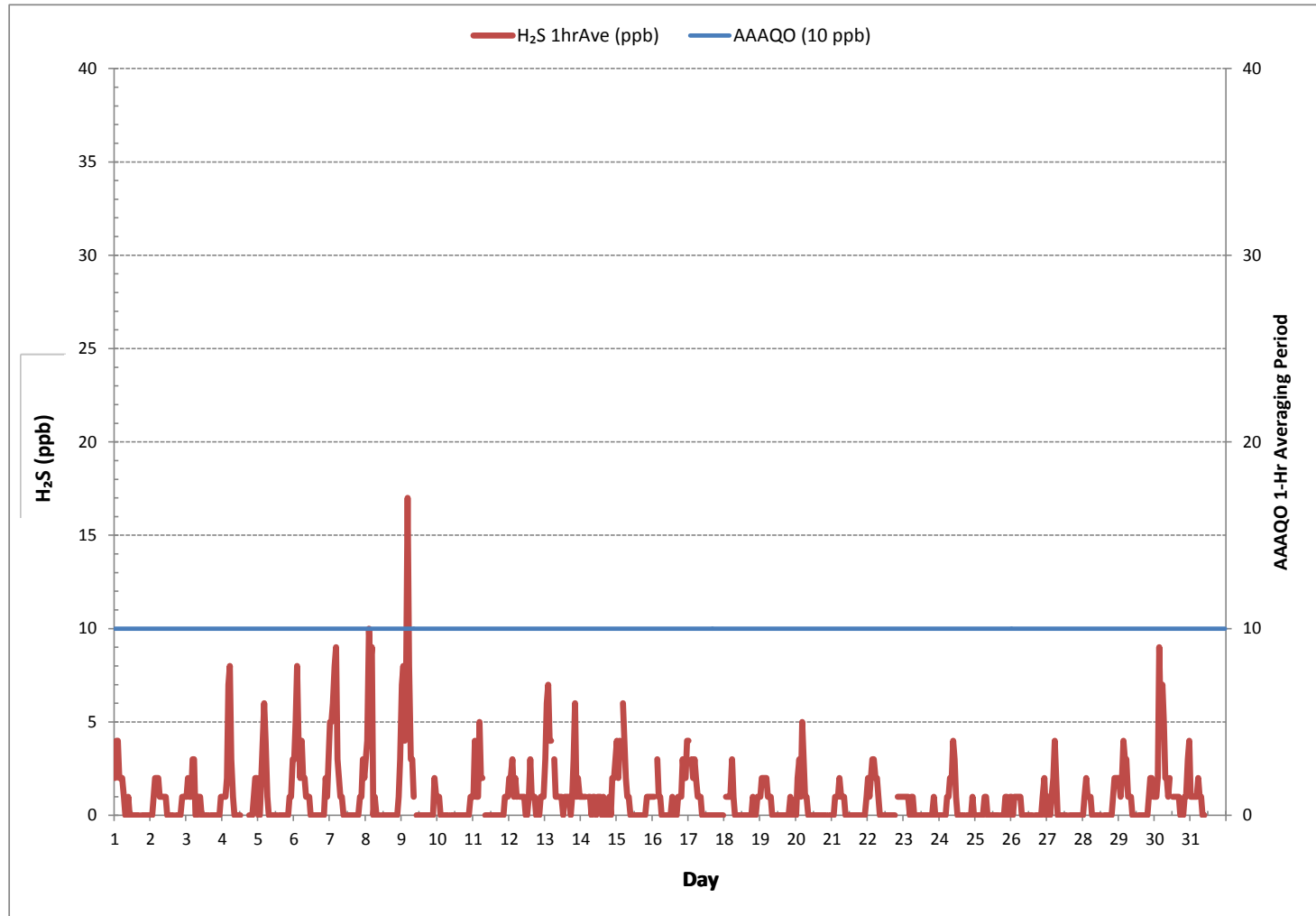
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	1			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	324			
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	7	ON DAY	1
MAXIMUM 1-HR AVERAGE:	17 ppb @ HOUR	4	ON DAY	9
MAXIMUM 24-HR AVERAGE:	3 ppb		ON DAY	9
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	730 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	98.1 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	1 ppb	

24 HR AVERAGES July 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 2017

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

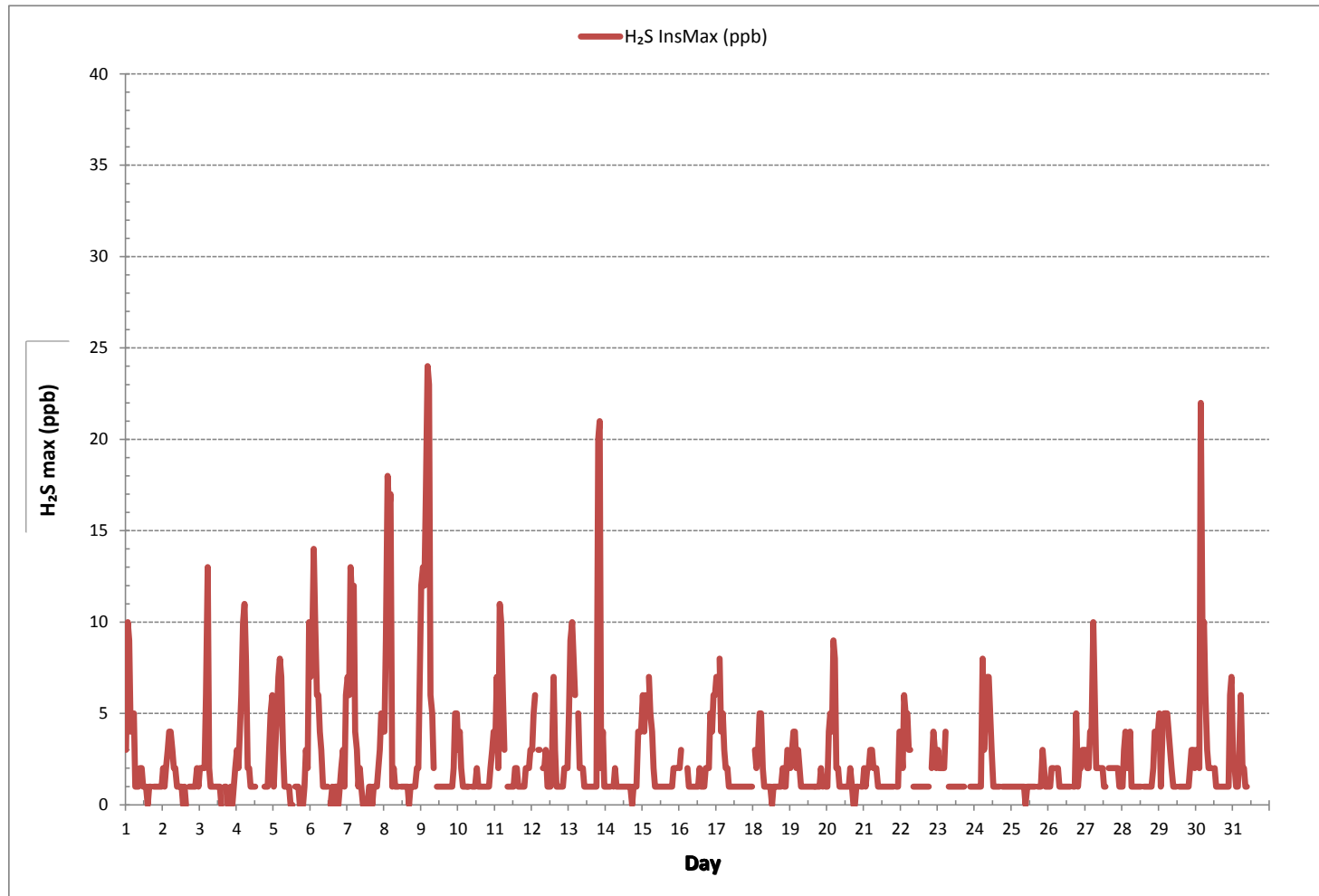
STATUS FLAG CODES

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

MONTHLY SUMMARY

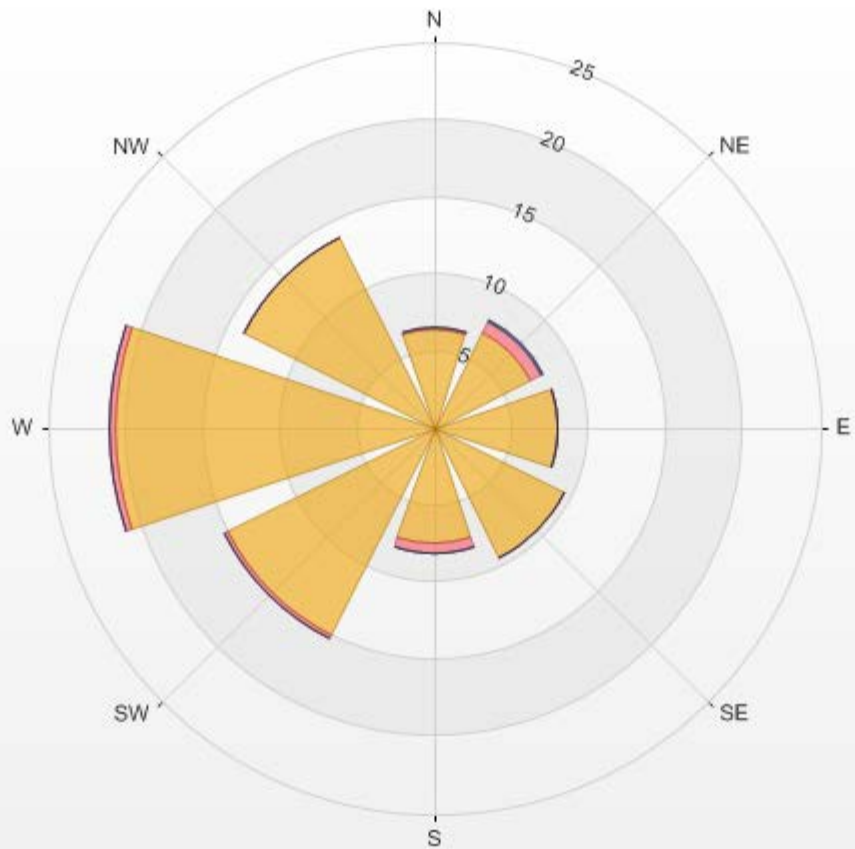
NUMBER OF NON-ZERO READINGS:	662
MAXIMUM INSTANTANEOUS VALUE:	24 ppb @ HOUR 4 ON DAY 9
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	722 hrs
STANDARD DEVIATION:	3

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

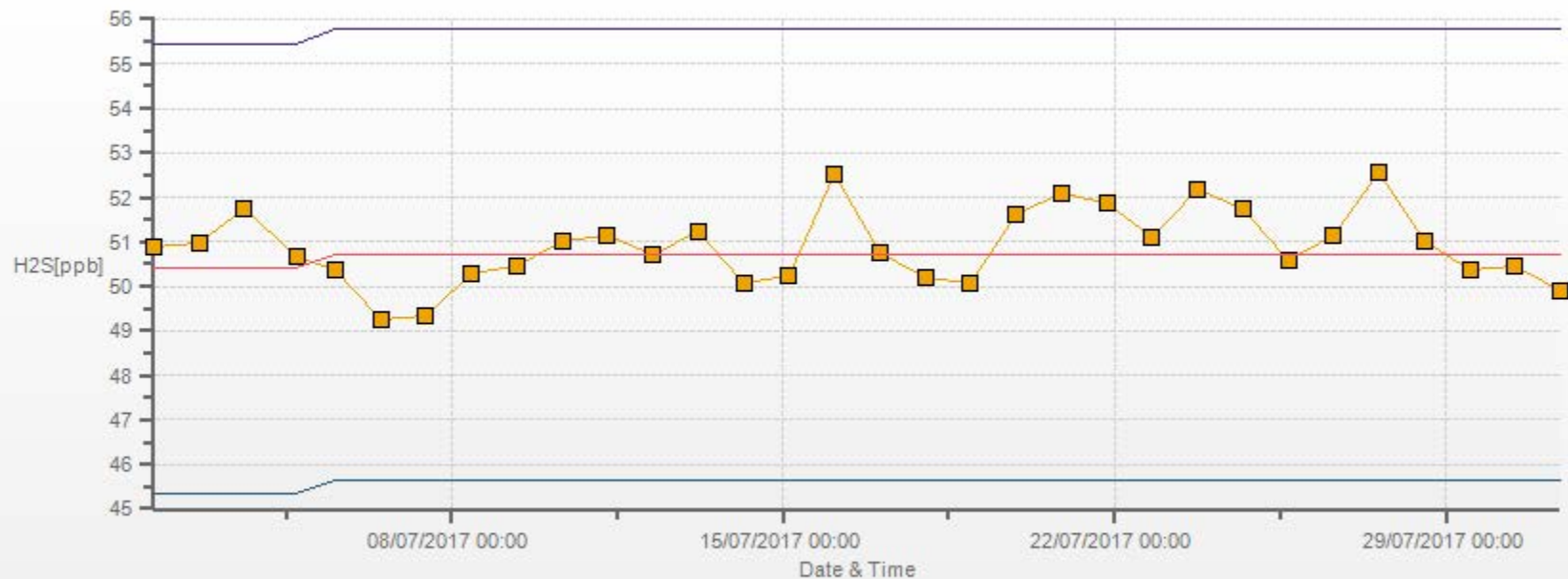


% Icon Classes (ppb) 88 0.0-6.0 2 6.0-12.0 0 12.0-18.0 0 >18.0

LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.75% Calm Poll Avg: 1.88[ppb]



H2S[ppb] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

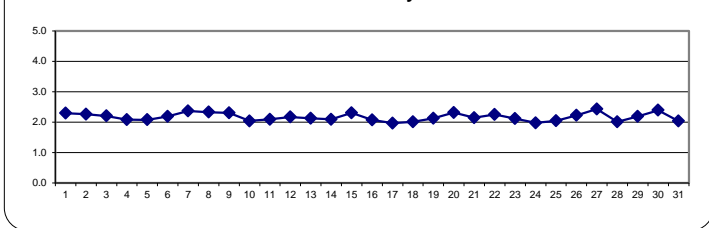
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.58	2.74	2.57	2.53	2.54	2.51	2.46	2.38	2.33	2.30	2.23	2.14	2.07	2.05	2.02	2.02	2.01	S	2.08	2.14	2.23	2.29	2.26	2.29	2.01	2.74	2.29	24
2	2.31	2.26	2.40	2.50	2.55	2.63	2.54	2.63	2.24	2.06	2.05	2.07	2.05	2.04	2.02	2.00	S	1.99	2.00	2.03	2.13	2.45	2.56	2.56	1.99	2.63	2.26	24
3	2.70	2.60	2.48	2.47	2.40	2.35	2.42	2.42	2.37	2.31	2.25	2.04	1.98	1.96	1.96	S	1.96	1.96	1.97	1.99	1.99	2.00	2.02	2.05	1.96	2.70	2.20	24
4	2.05	2.04	2.04	2.07	2.12	2.12	2.08	2.02	2.00	2.00	1.99	1.99	1.98	2.00	S	2.08	2.04	2.00	2.00	2.03	2.10	2.39	2.34	2.39	1.98	2.39	2.08	24
5	2.12	2.18	2.27	2.34	2.31	2.22	2.11	2.03	2.00	C	C	C	C	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.98	2.11	2.08	2.24	1.94	2.34	2.08	24
6	2.25	2.37	2.46	2.37	2.44	2.49	2.38	2.24	2.16	2.10	2.10	2.04	S	1.97	1.99	2.01	1.96	1.95	1.95	2.01	2.18	2.25	2.15	2.52	1.95	2.52	2.19	24
7	2.77	2.73	2.77	2.89	3.00	2.79	2.82	2.80	2.54	2.09	1.99	S	1.99	1.99	1.99	1.98	1.98	2.00	2.01	2.02	2.22	2.29	2.47	2.38	1.98	3.00	2.37	24
8	2.32	2.92	3.03	3.17	3.37	2.34	2.17	2.20	2.27	2.18	S	2.13	2.09	2.12	2.12	2.12	2.06	2.08	2.12	2.31	2.06	2.08	2.09	2.18	2.06	3.37	2.33	24
9	2.27	2.18	2.27	2.62	2.99	2.62	2.41	2.30	2.18	S	2.11	2.07	2.17	2.09	2.08	2.10	2.12	2.17	2.22	2.35	2.52	2.61	2.46	2.05	2.05	2.99	2.30	24
10	2.09	2.11	2.04	2.06	2.13	2.11	2.15	2.07	S	1.96	1.96	1.96	1.98	1.96	1.96	1.98	2.00	1.99	1.99	2.01	2.06	2.06	2.15	2.10	1.96	2.15	2.04	24
11	2.14	2.13	2.03	2.07	2.27	2.22	2.14	S	2.05	2.00	2.01	2.01	2.02	2.00	2.00	2.03	2.09	2.01	2.04	2.08	2.08	2.17	2.27	2.23	2.00	2.27	2.09	24
12	2.25	2.33	2.39	2.35	2.41	2.29	S	2.30	2.17	2.14	2.03	2.05	2.02	2.04	2.09	2.05	2.07	2.08	2.11	2.11	2.16	2.14	2.16	2.14	2.02	2.41	2.17	24
13	2.17	2.16	2.13	2.12	2.14	S	2.39	2.22	2.27	2.24	2.20	2.12	2.10	2.09	2.10	2.04	2.00	2.04	2.01	2.48	1.99	1.96	2.01	1.98	1.96	2.48	2.13	24
14	1.98	2.05	2.04	2.07	S	2.13	2.06	2.01	2.00	1.98	1.97	1.96	1.97	1.96	1.96	1.96	1.97	1.98	1.99	2.04	2.09	2.57	2.68	2.70	1.96	2.70	2.09	24
15	2.90	2.58	2.71	S	3.07	2.87	2.76	2.51	2.34	2.18	2.17	2.20	2.11	2.03	2.06	2.00	2.00	2.01	2.02	2.03	2.06	2.06	2.10	2.14	2.00	3.07	2.30	24
16	2.18	2.24	S	2.32	2.35	2.60	2.28	2.01	1.97	1.97	1.96	1.96	1.95	1.97	1.96	1.94	1.94	1.96	1.99	2.01	2.04	2.01	1.99	2.01	1.94	2.60	2.07	24
17	2.00	S	2.00	1.98	1.98	1.98	1.96	1.96	1.95	1.94	1.94	1.95	1.94	1.94	1.95	1.94	1.96	1.97	1.96	1.96	1.97	1.98	1.96	1.99	1.94	2.00	1.97	24
18	S	2.02	2.02	2.05	2.05	2.10	2.04	2.02	2.00	1.98	1.99	1.97	1.96	1.97	2.00	1.99	1.97	1.97	1.97	1.98	1.98	2.00	2.15	S	1.96	2.15	2.01	24
19	2.26	2.26	2.33	2.31	2.29	2.20	2.17	2.17	2.15	2.04	2.04	1.97	1.95	1.96	1.98	2.01	2.01	2.02	2.07	2.17	2.21	2.26	S	2.13	1.95	2.33	2.13	24
20	2.17	2.40	2.48	2.46	2.90	2.59	2.42	2.42	2.41	2.23	2.22	2.27	2.30	2.29	2.30	2.24	2.15	2.13	2.15	2.14	2.16	S	2.18	2.19	2.13	2.90	2.31	24
21	2.15	2.17	2.23	2.16	2.20	2.25	2.27	2.24	2.31	2.12	2.05	2.06	1.97	1.96	1.96	1.98	2.03	2.01	2.04	2.10	S	2.24	2.38	2.44	1.96	2.44	2.14	24
22	2.49	2.56	2.76	2.63	2.64	2.44	2.43	2.32	2.18	2.15	2.07	2.00	1.99	1.97	1.96	1.96	1.97	2.00	2.09	S	2.25	2.31	2.35	2.35	1.96	2.76	2.26	24
23	2.45	2.66	2.75	2.36	2.10	2.11	2.29	2.13	1.96	1.99	2.03	1.97	1.94	1.94	1.93	1.94	1.95	1.96	S	2.17	2.01	2.05	2.09	1.97	1.93	2.75	2.12	24
24	1.97	1.98	2.00	1.94	1.93	1.97	1.96	1.96	1.96	1.99	1.99	1.97	1.94	1.94	1.98	1.97	1.97	S	1.98	1.98	1.99	1.99	2.02	2.05	1.93	2.05	1.98	24
25	2.01	2.00	2.00	2.01	2.00	2.05	2.02	2.01	1.97	1.95	1.93	1.92	1.93	1.96	1.96	1.96	S	1.99	2.02	2.10	2.38	2.28	2.23	2.29	1.92	2.38	2.04	24
26	2.23	2.37	2.47	2.46	2.65	2.43	2.42	2.39	2.20	2.04	2.01	2.02	1.99	1.99	1.99	S	2.00	2.03	2.15	2.19	2.15	2.29	2.32	2.30	1.99	2.65	2.22	24
27	2.33	2.28	2.26	2.50	3.21	3.01	3.11	2.74	2.52	2.29	2.23	2.20	2.16	2.17	S	2.21	2.21	2.28	2.29	2.47	2.62	2.74	2.16	1.95	1.95	3.21	2.43	24
28	1.99	2.02	2.09	2.02	2.02	2.02	2.02	2.02	1.95	1.93	1.93	1.92	1.91	S	1.93	1.92	1.93	1.93	1.96	2.03	2.17	2.23	2.14	2.11	1.91	2.23	2.01	24
29	2.24	2.12	2.26	2.27	2.33	2.36	2.22	2.17	2.12	2.06	2.02	1.98	S	1.96	1.96	1.97	1.99	1.97	2.00	2.11	2.35	3.05	2.42	2.39	1.96	3.05	2.19	24
30	2.41	2.51	2.66	3.10	3.00	3.07	2.80	2.38	2.72	2.64	2.52	S	2.27	2.19	2.11	2.04	2.03	2.03	2.00	2.01	2.06	2.09	2.16	2.23	2.00	3.10	2.39	24
31	2.13	2.12	2.11	2.05	2.05	2.07	2.04	2.02	1.97	1.96	S	1.94	1.94	C1	C1	C1	C1	C1	C1	C1					1.94	2.13	2.03	13
HOURLY MAX	2.90	2.92	3.03	3.17	3.37	3.07	3.11	2.80	2.72	2.64	2.52	2.27	2.30	2.29	2.30	2.24	2.21	2.28	2.29	2.48	2.62	3.05	2.68	2.70				
HOURLY AVG	2.26	2.30	2.34	2.34	2.45	2.36	2.31	2.24	2.18	2.10	2.07	2.03	2.02	2.02	2.01	2.01	2.01	2.02	2.04	2.10	2.14	2.24	2.22	2.22				

STATUS FLAG CODES

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

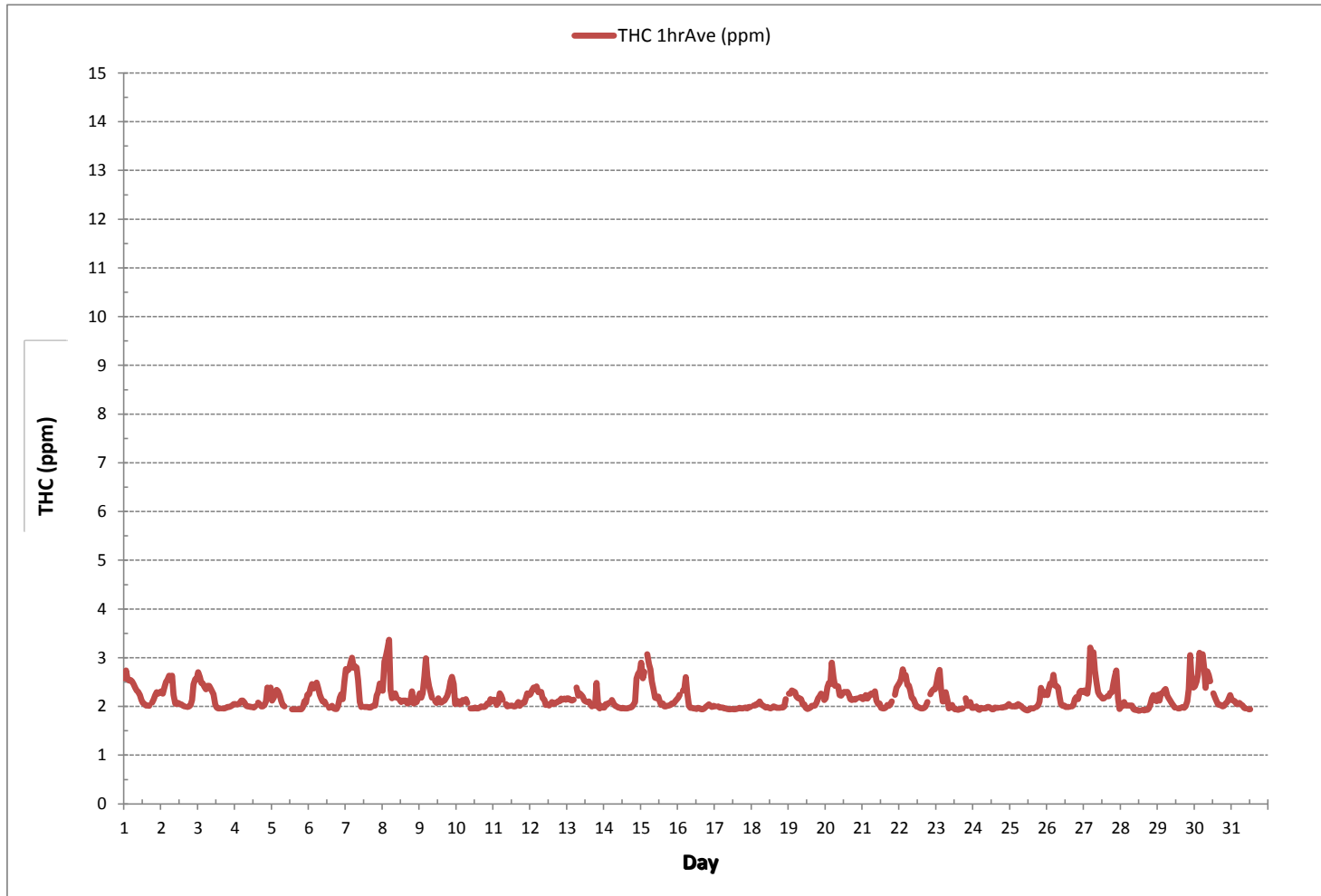
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698			
MINIMUM 1-HR AVERAGE:	1.91 ppm	@ HOUR	12	ON DAY 28
MAXIMUM 1-HR AVERAGE:	3.37 ppm	@ HOUR	4	ON DAY 8
MAXIMUM 24-HR AVERAGE:	2.43 ppm			ON DAY 27
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	733 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.5 %	
STANDARD DEVIATION:	0.24	MONTHLY AVERAGE:	2.17 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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 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	3.01	4.09	2.79	2.65	2.62	2.63	2.59	2.85	3.17	2.41	2.39	2.25	2.10	2.38	2.24	2.05	2.16	S	2.40	2.34	2.28	2.63	2.84	2.34	2.05	4.09	2.57	24
2	2.39	2.39	3.07	3.01	2.61	2.93	2.79	2.74	2.42	2.20	2.09	2.09	2.08	2.07	2.15	2.08	S	2.11	2.06	2.12	2.59	2.97	2.96	2.88	2.06	3.07	2.47	24
3	3.01	3.17	2.81	3.06	2.87	2.46	2.67	2.60	2.68	2.99	2.51	2.19	2.19	1.98	2.14	S	2.19	1.99	1.99	2.01	2.01	2.02	2.04	2.15	1.98	3.17	2.42	24
4	2.07	2.07	2.09	2.10	2.18	2.14	2.14	2.04	2.02	2.02	2.03	2.04	2.01	2.09	S	2.29	2.09	2.04	2.03	2.11	2.24	2.74	2.65	2.68	2.01	2.74	2.17	24
5	2.21	2.30	2.41	2.41	2.35	2.31	2.20	2.05	C	C	C	C	C	1.95	1.99	2.02	2.03	1.95	1.95	1.96	2.09	2.28	2.26	2.51	1.95	2.51	2.17	24
6	2.46	2.47	2.57	2.74	2.95	2.61	2.52	2.29	2.20	2.25	2.14	2.11	S	2.05	2.06	2.16	1.97	1.97	2.02	2.15	2.42	2.53	2.50	2.90	1.97	2.95	2.35	24
7	2.98	2.92	3.07	3.11	3.24	2.93	3.01	2.96	2.72	2.39	2.02	S	2.02	2.06	2.36	2.22	2.10	2.23	2.18	2.60	3.77	2.84	3.04	2.74	2.02	3.77	2.67	24
8	2.46	6.92	3.45	3.42	3.76	3.30	2.32	2.33	2.60	2.40	S	2.27	2.17	2.15	2.19	2.16	2.14	2.09	2.21	2.43	2.44	2.22	2.33	2.42	2.09	6.92	2.70	24
9	2.51	2.47	2.39	2.97	3.18	3.17	2.66	2.55	2.33	S	2.26	2.13	2.39	2.14	2.24	2.24	2.23	2.40	3.00	2.69	2.85	3.03	2.97	2.08	2.08	3.18	2.56	24
10	2.30	2.28	2.07	2.24	2.32	2.29	2.30	2.12	S	1.98	1.98	2.18	2.18	2.18	2.05	1.99	2.02	2.09	2.02	2.04	2.30	2.11	2.28	2.17	1.98	2.32	2.15	24
11	2.16	2.18	2.08	2.20	2.32	2.34	2.23	S	2.24	2.03	2.02	2.26	2.08	2.06	2.06	2.40	2.37	2.05	2.09	2.11	2.13	2.35	2.36	2.30	2.02	2.40	2.19	24
12	2.36	2.78	2.84	P	3.04	2.56	S	2.59	2.23	2.26	2.07	2.12	2.44	2.49	2.18	2.10	2.16	2.23	3.00	3.00	2.94	2.31	2.42	2.35	2.07	3.04	2.48	23
13	2.22	2.28	2.19	2.15	2.23	S	2.66	2.28	2.41	2.35	2.35	2.42	2.31	2.17	3.08	2.12	2.16	2.24	2.19	6.67	2.32	1.99	2.05	2.01	1.99	6.67	2.48	24
14	2.08	2.26	2.08	2.10	S	2.15	2.14	2.04	2.02	2.14	2.05	1.98	1.98	1.99	1.99	2.02	2.01	2.04	2.03	2.12	2.18	2.98	3.12	3.03	1.98	3.12	2.20	24
15	3.52	3.07	2.89	S	3.66	3.01	2.94	2.80	2.44	2.36	2.25	2.31	2.19	2.13	2.24	2.07	2.22	2.15	2.08	2.06	2.25	2.12	2.17	P	2.06	3.66	2.50	23
16	2.28	2.35	S	2.42	P	2.89	2.79	2.05	1.99	2.00	1.99	1.98	1.97	2.20	1.98	1.97	1.96	2.00	2.04	2.03	2.16	2.05	2.03	2.06	1.96	2.89	2.15	23
17	2.05	S	2.03	2.02	2.00	2.00	1.98	2.14	1.97	1.96	1.96	1.97	1.96	1.96	2.00	2.10	2.46	1.99	1.99	1.99	2.00	1.99	2.01	2.01	1.96	2.46	2.02	24
18	S	2.07	2.04	2.06	2.10	2.47	2.05	2.05	2.07	2.05	2.29	1.98	1.98	2.00	2.03	2.13	1.99	1.98	1.99	2.02	2.00	2.02	2.23	S	1.98	2.47	2.07	24
19	2.30	2.33	2.43	2.47	2.32	2.27	2.22	2.23	2.23	2.08	2.10	2.01	1.98	1.99	2.04	2.31	2.05	2.09	2.23	2.25	2.29	2.34	S	2.31	1.98	2.47	2.21	24
20	2.34	2.59	2.66	2.97	3.10	3.07	2.54	3.34	3.89	2.69	2.60	2.49	2.45	2.38	2.50	2.28	2.29	2.30	2.38	2.35	2.30	S	2.30	2.36	2.28	3.89	2.62	24
21	2.17	2.37	3.08	2.49	2.61	2.44	2.43	2.35	2.56	2.14	2.10	2.19	2.02	2.02	2.11	2.03	2.15	2.04	2.18	2.12	S	2.38	2.59	2.63	2.02	3.08	2.31	24
22	2.69	2.79	3.34	2.76	2.78	2.55	2.51	P	2.30	2.23	2.18	2.12	2.02	2.01	1.99	1.97	2.09	2.07	2.25	S	2.60	2.48	2.46	2.51	1.97	3.34	2.40	23
23	2.67	2.77	3.00	2.86	2.13	2.25	P	2.33	2.01	2.08	2.16	3.19	1.96	2.12	1.95	1.95	1.97	1.98	S	2.53	P	2.40	2.21	2.00	1.95	3.19	2.31	22
24	2.00	2.00	2.03	1.99	1.95	2.14	1.98	1.99	2.01	2.03	2.06	2.13	1.98	1.96	2.25	2.06	2.08	S	1.99	2.00	2.01	2.01	2.05	2.06	1.95	2.25	2.03	24
25	2.05	2.02	2.02	2.03	2.03	2.17	2.14	2.02	2.03	2.06	2.01	1.94	1.96	1.99	1.99	2.00	S	2.02	2.15	2.25	2.57	2.37	2.35	2.39	1.94	2.57	2.11	24
26	2.28	2.47	2.51	2.54	P	2.51	2.49	2.41	2.38	2.10	2.04	2.06	2.06	2.10	2.03	S	2.06	2.19	2.31	2.47	2.43	2.63	2.71	2.64	2.03	2.71	2.34	23
27	2.57	2.39	2.34	2.76	3.55	3.19	5.72	3.87	2.71	2.52	2.43	2.48	2.34	2.40	S	2.42	2.49	2.72	2.63	3.19	2.84	2.96	2.85	2.08	2.08	5.72	2.85	24
28	2.10	2.11	2.19	2.06	2.06	2.20	2.04	2.00	1.97	1.97	1.95	1.94	S	2.11	2.09	1.94	1.97	1.99	2.34	2.32	2.28	2.22	2.31	1.94	2.34	2.10	24	
29	2.39	2.14	2.43	2.36	2.50	2.50	2.36	2.39	2.23	2.09	2.05	2.04	S	2.01	1.99	2.02	2.03	2.03	2.06	2.50	3.03	3.68	2.77	2.57	1.99	3.68	2.36	24
30	2.69	P	2.98	3.55	3.22	3.52	3.30	2.72	3.16	2.79	2.83	S	2.34	2.24	1.17	2.21	2.14	2.25	2.08	2.15	2.19	2.11	2.41	2.33	2.08	3.55	2.61	23
31	2.32	2.32	2.26	2.07	2.09	2.12	2.06	2.27	2.01	1.98	S	1.96	1.95	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	1.95	2.32	2.12	13
HOURLY MAX	3.52	6.92	3.45	3.55	3.76	3.52	5.72	3.87	3.89	2.99	2.83	3.19	2.45	2.49	3.07	2.42	2.49	2.72	3.00	6.67	3.77	3.68	3.12	3.03				
HOURLY AVG	2.42	2.63	2.54	2.54	2.63	2.57	2.55	2.43	2.38	2.23	2.18	2.17	2.11	2.11	2.15	2.13	2.13	2.11	2.19	2.43	2.41	2.44	2.45	2.39				

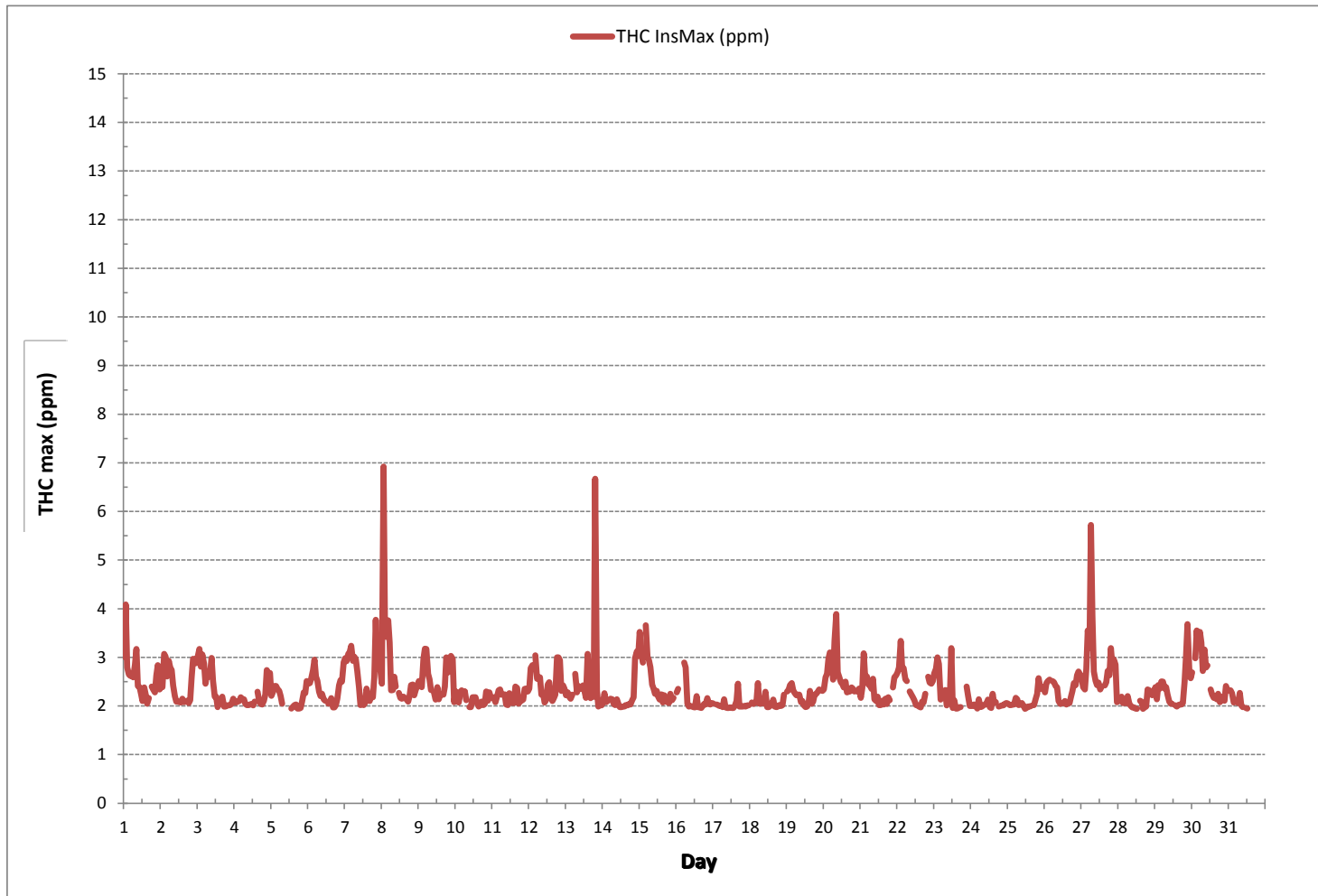
STATUS FLAG CODES

- MONTHLY CALIBRATION	Q - QUALI' AQ1Z
C1 - REPEAT CALIBRATION	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

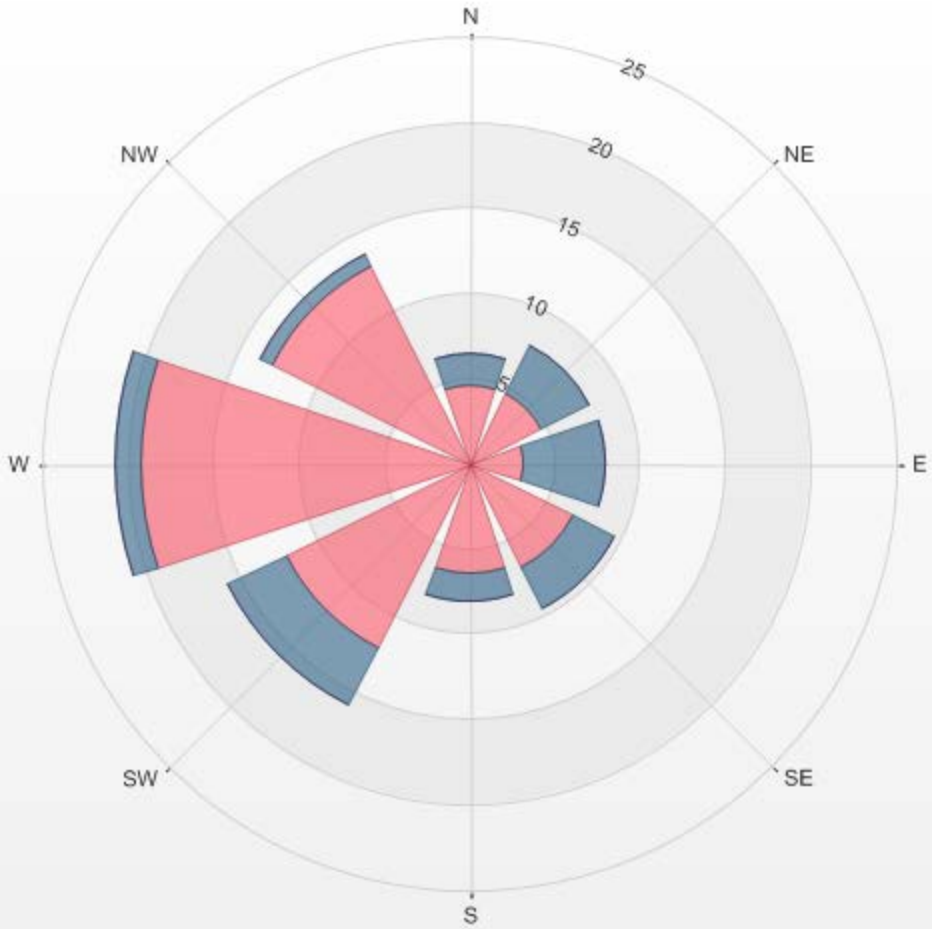
NUMBER OF NON-ZERO READINGS:	689
MAXIMUM INSTANTANEOUS VALUE:	6.92 ppm @ HOUR 1 ON DAY 8
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	725 hrs
STANDARD DEVIATION:	0.46

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

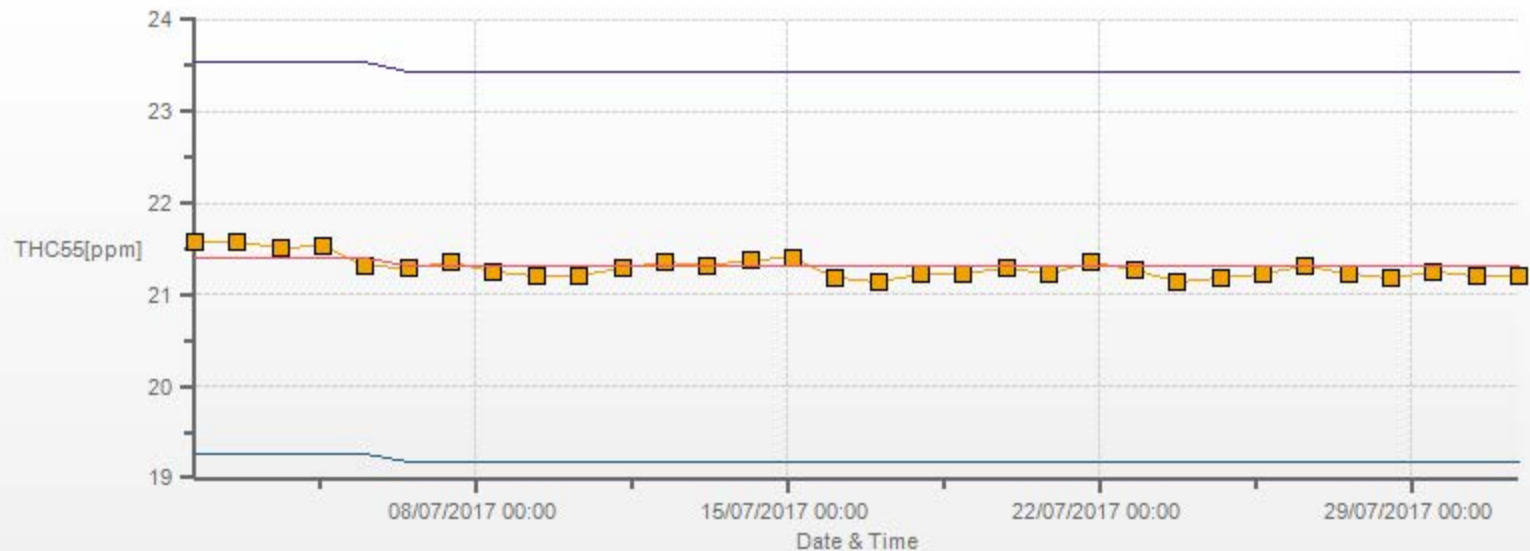


%	Icon	Classes (ppm)
0		0.0-1.1
70		1.1-2.3
20		2.3-3.4
0		>3.4

LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.72% Calm Poll Avg: 2.41[ppm]



THC55[ppm] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

METHANE



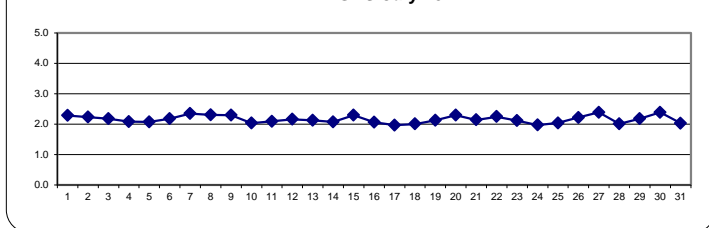
METHANE Hourly Averages (CH₄ ppm)

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	2.49	2.71	2.57	2.53	2.54	2.51	2.45	2.37	2.31	2.29	2.23	2.14	2.07	2.05	2.02	2.02	2.01	S	2.06	2.14	2.23	2.26	2.25	2.29	2.01	2.71	2.28	24	
2	2.31	2.26	2.38	2.47	2.55	2.61	2.53	2.63	2.24	2.06	2.05	2.07	2.05	2.04	2.02	2.00	S	1.99	2.00	2.03	2.11	2.30	2.34	2.41	1.99	2.63	2.24	24	
3	2.55	2.52	2.46	2.44	2.39	2.35	2.40	2.42	2.35	2.29	2.22	2.04	1.97	1.96	1.96	S	1.94	1.96	1.97	1.99	1.99	2.00	2.02	2.04	1.94	2.55	2.18	24	
4	2.05	2.04	2.04	2.07	2.12	2.12	2.08	2.02	2.00	2.00	1.99	1.99	1.98	2.00	S	2.07	2.04	2.00	2.00	2.03	2.10	2.39	2.34	2.38	1.98	2.39	2.08	24	
5	2.12	2.17	2.27	2.34	2.31	2.22	2.10	2.03	2.00	C	C	C	C	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.98	2.11	2.07	2.23	1.94	2.34	2.08	24	
6	2.25	2.37	2.46	2.35	2.40	2.49	2.38	2.24	2.16	2.10	2.10	2.04	S	1.97	1.99	2.00	1.96	1.95	1.95	2.01	2.17	2.25	2.12	2.47	1.95	2.49	2.18	24	
7	2.75	2.73	2.72	2.87	3.00	2.73	2.77	2.78	2.54	2.09	1.99	S	1.99	1.99	1.98	1.98	1.98	1.99	2.00	2.01	2.12	2.22	2.39	2.35	1.98	3.00	2.35	24	
8	2.31	2.61	2.99	3.14	3.30	2.33	2.16	2.20	2.27	2.18	S	2.12	2.08	2.12	2.12	2.12	2.05	2.08	2.12	2.26	2.06	2.08	2.09	2.17	2.05	3.30	2.30	24	
9	2.26	2.18	2.27	2.61	2.98	2.62	2.41	2.30	2.18	S	2.11	2.07	2.16	2.09	2.08	2.10	2.12	2.16	2.19	2.32	2.50	2.58	2.45	2.05	2.05	2.98	2.30	24	
10	2.09	2.10	2.04	2.05	2.12	2.10	2.15	2.07	S	1.96	1.96	1.96	1.98	1.96	1.96	1.98	2.00	1.99	1.99	2.01	2.05	2.06	2.14	2.10	1.96	2.15	2.04	24	
11	2.14	2.13	2.03	2.07	2.27	2.22	2.14	S	2.04	2.00	2.01	2.01	2.02	2.00	2.00	2.03	2.09	2.01	2.04	2.08	2.08	2.17	2.27	2.23	2.00	2.27	2.09	24	
12	2.25	2.33	2.38	2.35	2.41	2.28	S	2.29	2.17	2.14	2.03	2.05	2.01	2.03	2.09	2.05	2.07	2.08	2.09	2.10	2.15	2.13	2.15	2.13	2.01	2.41	2.16	24	
13	2.17	2.16	2.13	2.12	2.14	S	2.38	2.22	2.26	2.23	2.19	2.12	2.09	2.09	2.07	2.02	1.99	2.02	2.01	2.47	1.99	1.96	2.01	1.98	1.96	2.47	2.12	24	
14	1.98	2.04	2.04	2.07	S	2.13	2.06	2.01	2.00	1.98	1.97	1.96	1.97	1.96	1.96	1.96	1.97	1.98	1.99	2.04	2.08	2.41	2.54	2.63	1.96	2.63	2.08	24	
15	2.81	2.54	2.71	S	3.04	2.87	2.75	2.50	2.34	2.18	2.17	2.20	2.11	2.03	2.05	2.00	2.00	2.00	2.02	2.03	2.06	2.06	2.10	2.14	2.00	3.04	2.29	24	
16	2.18	2.24	S	2.31	2.34	2.57	2.27	2.01	1.97	1.97	1.96	1.96	1.95	1.96	1.96	1.94	1.94	1.96	1.99	2.01	2.04	2.01	1.99	2.01	1.94	2.57	2.07	24	
17	2.00	S	2.00	1.98	1.98	1.98	1.96	1.96	1.95	1.94	1.94	1.95	1.94	1.94	1.95	1.95	1.96	1.96	1.96	1.97	1.98	1.96	1.96	1.99	1.94	2.00	1.96	24	
18	S	2.02	2.02	2.05	2.05	2.09	2.04	2.02	2.00	1.98	1.96	1.97	1.96	1.97	2.00	1.98	1.97	1.97	1.97	1.98	1.98	2.00	2.15	S	1.96	2.15	2.01	24	
19	2.26	2.26	2.33	2.31	2.29	2.20	2.17	2.17	2.15	2.04	2.04	1.97	1.95	1.96	1.98	2.01	2.01	2.02	2.07	2.17	2.21	2.26	S	2.13	1.95	2.33	2.13	24	
20	2.17	2.40	2.47	2.45	2.90	2.59	2.42	2.36	2.26	2.19	2.22	2.26	2.28	2.28	2.30	2.24	2.15	2.13	2.14	2.13	2.15	S	2.18	2.18	2.13	2.90	2.30	24	
21	2.15	2.17	2.22	2.15	2.20	2.25	2.27	2.23	2.30	2.12	2.05	2.06	1.97	1.96	1.96	1.98	2.02	2.01	2.04	2.10	S	2.23	2.37	2.40	1.96	2.40	2.14	24	
22	2.48	2.50	2.68	2.63	2.64	2.44	2.43	2.32	2.18	2.15	2.07	2.00	1.99	1.97	1.96	1.96	1.97	2.00	2.08	S	2.24	2.31	2.35	2.34	1.96	2.68	2.25	24	
23	2.45	2.65	2.74	2.35	2.10	2.11	2.29	2.13	1.96	1.99	2.03	1.95	1.94	1.94	1.93	1.94	1.95	1.96	S	2.17	2.01	2.05	2.08	1.97	1.93	2.74	2.12	24	
24	1.97	1.98	2.00	1.94	1.93	1.96	1.96	1.96	1.96	1.99	1.99	1.96	1.94	1.94	1.96	1.96	1.96	S	1.98	1.98	1.99	1.99	2.02	2.05	1.93	2.05	1.97	24	
25	2.01	2.00	2.00	2.01	2.00	2.01	2.01	1.97	1.94	1.93	1.92	1.93	1.92	1.93	1.96	1.96	1.96	S	1.99	2.02	2.10	2.37	2.27	2.23	2.28	1.92	2.37	2.04	24
26	2.23	2.37	2.47	2.46	2.64	2.43	2.42	2.39	2.20	2.04	2.01	2.02	1.99	1.99	1.99	S	2.00	2.03	2.15	2.19	2.14	2.27	2.30	2.26	1.99	2.64	2.22	24	
27	2.32	2.28	2.26	2.49	3.19	3.00	2.81	2.64	2.52	2.29	2.22	2.19	2.15	2.16	S	2.19	2.17	2.25	2.26	2.38	2.52	2.60	2.13	1.94	1.94	3.19	2.39	24	
28	1.99	2.02	2.09	2.02	2.02	2.02	2.02	2.02	1.95	1.93	1.93	1.92	1.91	S	1.91	1.92	1.93	1.93	1.96	2.03	2.17	2.23	2.14	2.11	1.91	2.23	2.01	24	
29	2.23	2.12	2.26	2.26	2.33	2.35	2.22	2.17	2.12	2.06	2.02	1.98	S	1.96	1.96	1.97	1.99	1.97	2.00	2.11	2.34	3.03	2.40	2.37	1.96	3.03	2.18	24	
30	2.39	2.50	2.65	3.09	2.99	3.05	2.78	2.38	2.70	2.63	2.51	S	2.27	2.19	2.11	2.04	2.02	2.02	2.00	2.01	2.06	2.09	2.15	2.22	2.00	3.09	2.38	24	
31	2.13	2.12	2.10	2.05	2.05	2.07	2.04	2.01	1.97	1.96	S	1.94	1.94	C1	C1	C1	C1	C1	C1						1.94	2.13	2.03	13	
HOURLY MAX	2.81	2.73	2.99	3.14	3.30	3.05	2.81	2.78	2.70	2.63	2.51	2.26	2.28	2.28	2.30	2.24	2.17	2.25	2.26	2.47	2.52	3.03	2.54	2.63					
HOURLY AVG	2.25	2.28	2.33	2.33	2.44	2.36	2.30	2.23	2.17	2.09	2.07	2.03	2.02	2.01	2.01	2.01	2.01	2.01	2.03	2.10	2.13	2.22	2.20	2.20					

STATUS FLAG CODES

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

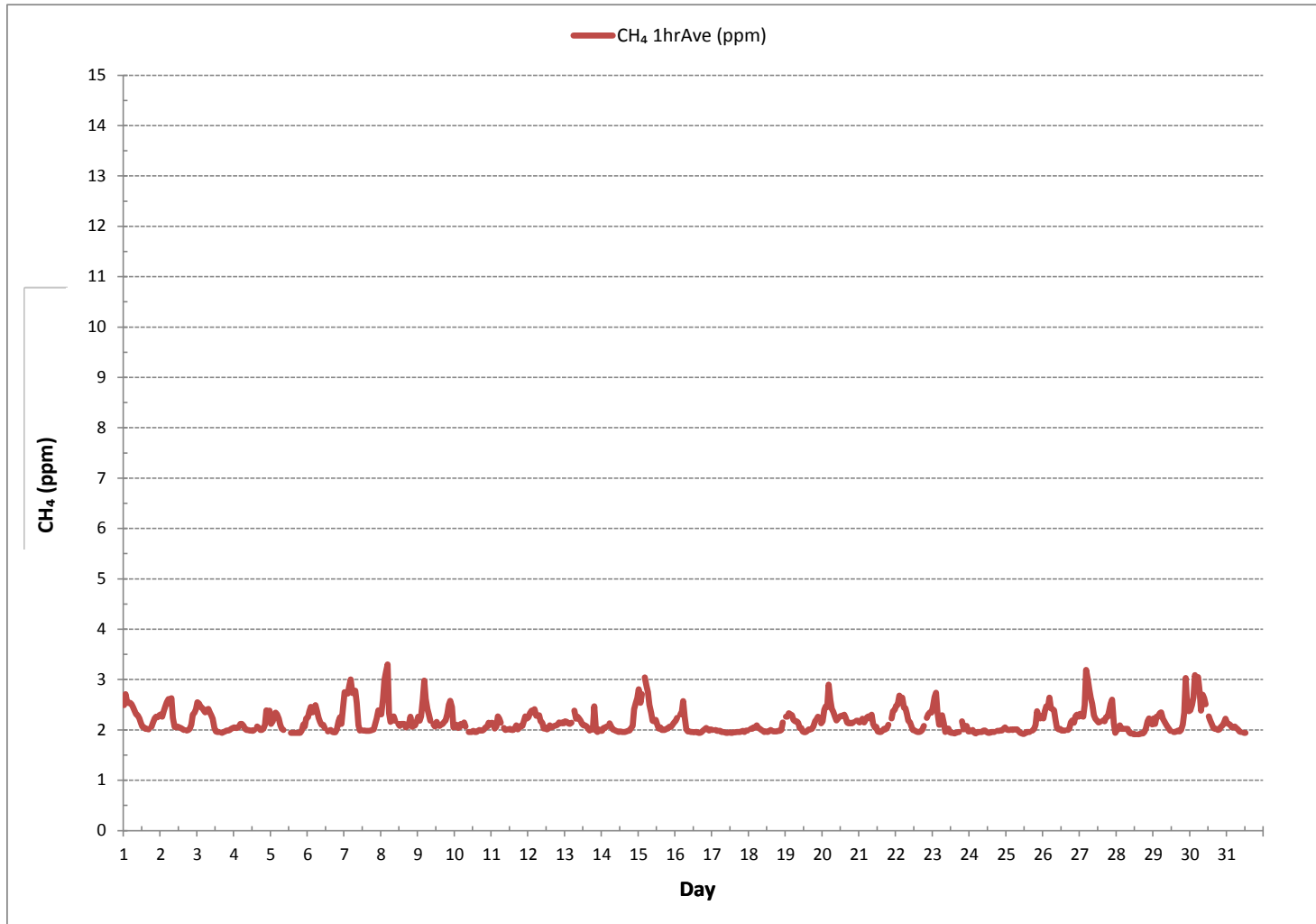
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698			
MINIMUM 1-HR AVERAGE:	1.91 ppm	@ HOUR	12	ON DAY 28
MAXIMUM 1-HR AVERAGE:	3.30 ppm	@ HOUR	4	ON DAY 8
MAXIMUM 24-HR AVERAGE:	2.39 ppm			ON DAY 27
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	733 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.5 %	
STANDARD DEVIATION:	0.23	MONTHLY AVERAGE:	2.16 ppm	

METHANE Hourly Averages (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 2017

METHANE MAX Instantaneous Maximum (CH₄ 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	2.74	3.82	2.79	2.65	2.62	2.63	2.53	2.71	2.39	2.37	2.40	2.25	2.11	2.09	2.04	2.05	2.04	S	2.23	2.21	2.28	2.43	2.59	2.35	2.04	3.82	2.45	24
2	2.39	2.39	2.96	2.81	2.61	2.83	2.67	2.73	2.42	2.21	2.10	2.10	2.09	2.08	2.16	2.02	S	2.05	2.06	2.10	2.31	2.75	2.68	2.62	2.02	2.96	2.40	24
3	2.82	3.02	2.75	2.98	2.87	2.45	2.43	2.48	2.57	2.51	2.28	2.20	2.00	1.98	1.98	S	1.98	1.99	1.99	2.01	2.01	2.02	2.04	2.10	1.98	3.02	2.32	24
4	2.08	2.07	2.10	2.10	2.19	2.14	2.14	2.04	2.02	2.02	2.03	2.04	2.01	2.09	S	2.20	2.09	2.04	2.03	2.11	2.24	2.75	2.65	2.68	2.01	2.75	2.17	24
5	2.21	2.22	2.41	2.41	2.35	2.31	2.18	2.05	C	C	C	C	C	1.94	1.94	1.95	1.98	1.94	1.94	1.95	2.09	2.28	2.26	2.51	1.94	2.51	2.15	24
6	2.45	2.47	2.57	2.48	2.73	2.61	2.53	2.29	2.20	2.13	2.15	2.11	S	2.02	2.06	2.05	1.97	1.97	1.97	2.16	2.32	2.52	2.15	2.75	1.97	2.75	2.29	24
7	2.86	2.93	3.06	3.09	3.24	2.78	2.89	2.86	2.72	2.39	2.02	S	2.02	2.04	2.02	2.01	2.04	2.06	2.10	2.29	2.36	2.65	2.84	2.63	2.01	3.24	2.52	24
8	2.45	3.00	3.36	3.37	3.64	3.13	2.28	2.33	2.60	2.40	S	2.19	2.13	2.16	2.20	2.17	2.09	2.10	2.19	2.33	2.35	2.21	2.22	2.38	2.09	3.64	2.49	24
9	2.45	2.27	2.39	2.97	3.18	3.04	2.56	2.54	2.33	S	2.24	2.13	2.24	2.14	2.20	2.24	2.24	2.24	2.36	2.56	2.71	2.89	2.98	2.09	2.09	3.18	2.48	24
10	2.30	2.28	2.08	2.13	2.18	2.16	2.19	2.13	S	1.98	1.98	1.98	2.03	2.19	2.06	2.00	2.03	2.02	2.03	2.04	2.10	2.12	2.21	2.17	1.98	2.30	2.10	24
11	2.17	2.18	2.08	2.20	2.32	2.34	2.22	S	2.08	2.03	2.02	2.06	2.09	2.07	2.06	2.41	2.37	2.06	2.10	2.12	2.13	2.27	2.36	2.30	2.02	2.41	2.18	24
12	2.36	2.70	2.78	P	2.93	2.50	S	2.50	2.22	2.26	2.07	2.13	2.15	2.11	2.18	2.11	2.11	2.22	2.25	2.25	2.67	2.25	2.30	2.29	2.07	2.93	2.33	23
13	2.22	2.21	2.19	2.15	2.19	S	2.56	2.28	2.41	2.35	2.33	2.34	2.31	2.15	2.15	2.12	2.09	2.18	2.07	6.68	2.32	1.99	2.05	2.01	1.99	6.68	2.41	24
14	2.00	2.09	2.08	2.10	S	2.16	2.14	2.05	2.02	1.99	1.98	1.98	1.98	1.99	1.99	2.00	2.01	2.04	2.03	2.11	2.17	2.78	2.93	2.83	1.98	2.93	2.15	24
15	3.34	2.92	2.89	S	3.51	3.01	2.94	2.74	2.42	2.36	2.25	2.25	2.20	2.13	2.25	2.07	2.13	2.16	2.08	2.06	2.10	2.08	2.17	P	2.06	3.51	2.46	23
16	2.22	2.35	S	2.39	P	2.79	2.75	2.05	1.98	2.00	1.99	1.98	1.97	1.98	1.98	1.97	1.95	2.00	2.04	2.04	2.16	2.05	2.03	2.06	1.95	2.79	2.12	23
17	2.05	S	2.04	2.02	2.00	2.00	1.98	1.97	1.96	1.95	1.95	1.96	1.96	1.96	2.00	1.99	2.02	1.99	1.99	1.99	2.00	1.98	2.02	2.01	1.95	2.05	1.99	24
18	S	2.07	2.04	2.06	2.11	2.14	2.05	2.05	2.03	2.00	1.98	1.98	1.98	2.00	2.03	2.11	1.99	1.98	1.99	2.02	2.00	2.03	2.24	S	1.98	2.24	2.04	24
19	2.30	2.33	2.43	2.40	2.32	2.27	2.21	2.23	2.23	2.08	2.11	2.02	1.99	1.99	2.04	2.04	2.05	2.09	2.11	2.25	2.29	2.34	S	2.31	1.99	2.43	2.19	24
20	2.34	2.59	2.61	2.81	3.10	2.97	2.50	2.63	2.39	2.33	2.50	2.41	2.38	2.31	2.42	2.28	2.19	2.30	2.38	2.19	2.19	S	2.20	2.26	2.19	3.10	2.45	24
21	2.17	2.21	3.00	2.38	2.58	2.36	2.31	2.30	2.56	2.15	2.11	2.18	2.03	1.98	1.97	2.03	2.04	2.04	2.06	2.13	S	2.32	2.42	2.54	1.97	3.00	2.26	24
22	2.60	2.65	3.10	2.72	2.77	2.55	2.51	P	2.24	2.21	2.13	2.04	2.02	2.01	1.99	1.97	2.03	2.07	2.18	S	2.60	2.47	2.46	2.41	1.97	3.10	2.35	23
23	2.67	2.71	2.92	2.86	2.14	2.25	P	2.33	2.01	2.04	2.09	1.98	1.96	2.00	1.94	1.95	1.97	1.98	S	2.53	P	2.26	2.21	2.00	1.94	2.92	2.23	22
24	2.00	2.01	2.03	1.99	1.94	2.15	1.98	1.99	2.01	2.04	2.06	1.99	1.98	1.97	1.99	1.99	2.00	S	2.00	2.00	2.01	2.02	2.05	2.06	1.94	2.15	2.01	24
25	2.05	2.02	2.02	2.03	2.03	2.03	2.02	2.02	2.00	1.98	1.95	1.94	1.96	1.99	1.98	2.00	S	2.02	2.12	2.25	2.57	2.37	2.33	2.34	1.94	2.57	2.09	24
26	2.29	2.46	2.51	2.53	P	2.50	2.49	2.41	2.38	2.10	2.05	2.07	2.06	2.11	2.03	S	2.06	2.20	2.32	2.47	2.43	2.54	2.61	2.55	2.03	2.61	2.33	23
27	2.51	2.39	2.29	2.76	3.44	3.16	3.01	2.87	2.71	2.51	2.43	2.38	2.26	2.27	S	2.38	2.33	2.46	2.63	3.03	2.64	2.79	2.71	1.96	1.96	3.44	2.61	24
28	2.04	2.12	2.19	2.06	2.06	2.06	2.03	2.04	2.00	1.96	1.96	1.94	1.93	S	1.94	1.94	1.94	1.96	1.99	2.17	2.21	2.29	2.22	2.31	1.93	2.31	2.06	24
29	2.39	2.15	2.44	2.33	2.38	2.40	2.36	2.20	2.18	2.10	2.05	2.04	S	2.01	1.99	2.02	2.03	2.03	2.06	2.27	3.04	3.55	2.63	2.43	1.99	3.55	2.31	24
30	2.58	P	2.81	3.55	3.17	3.39	3.18	2.58	3.09	2.69	2.66	S	2.34	2.24	2.18	2.07	2.04	2.03	2.04	2.04	2.10	2.11	2.27	2.30	2.03	3.55	2.52	23
31	2.18	2.16	2.14	2.07	2.10	2.12	2.06	2.04	2.01	1.98	S	1.95	1.94	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	1.94	2.18	2.06	13
HOURLY MAX	3.34	3.82	3.36	3.55	3.64	3.39	3.18	2.87	3.09	2.69	2.66	2.41	2.38	2.31	2.42	2.41	2.37	2.46	2.63	6.68	3.04	3.55	2.98	2.83				
HOURLY AVG	2.37	2.44	2.50	2.50	2.60	2.51	2.40	2.33	2.28	2.18	2.14	2.09	2.08	2.07	2.06	2.08	2.06	2.08	2.12	2.36	2.30	2.38	2.37	2.33				

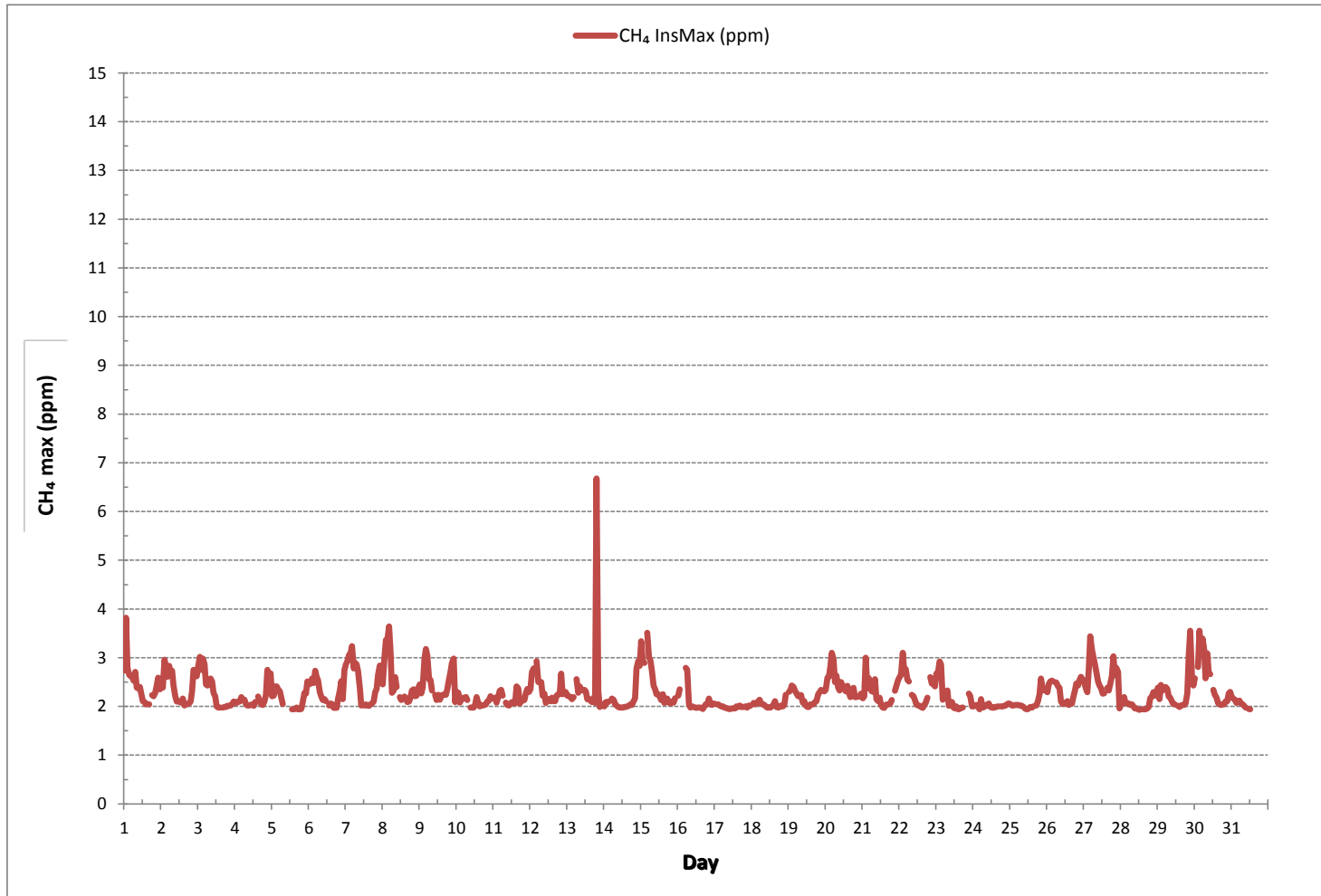
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	689
MAXIMUM INSTANTANEOUS VALUE:	6.68 ppm @ HOUR 19 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	725 hrs
STANDARD DEVIATION:	0.36

METHANE MAX Instantaneous Maximum (CH₄ ppm)



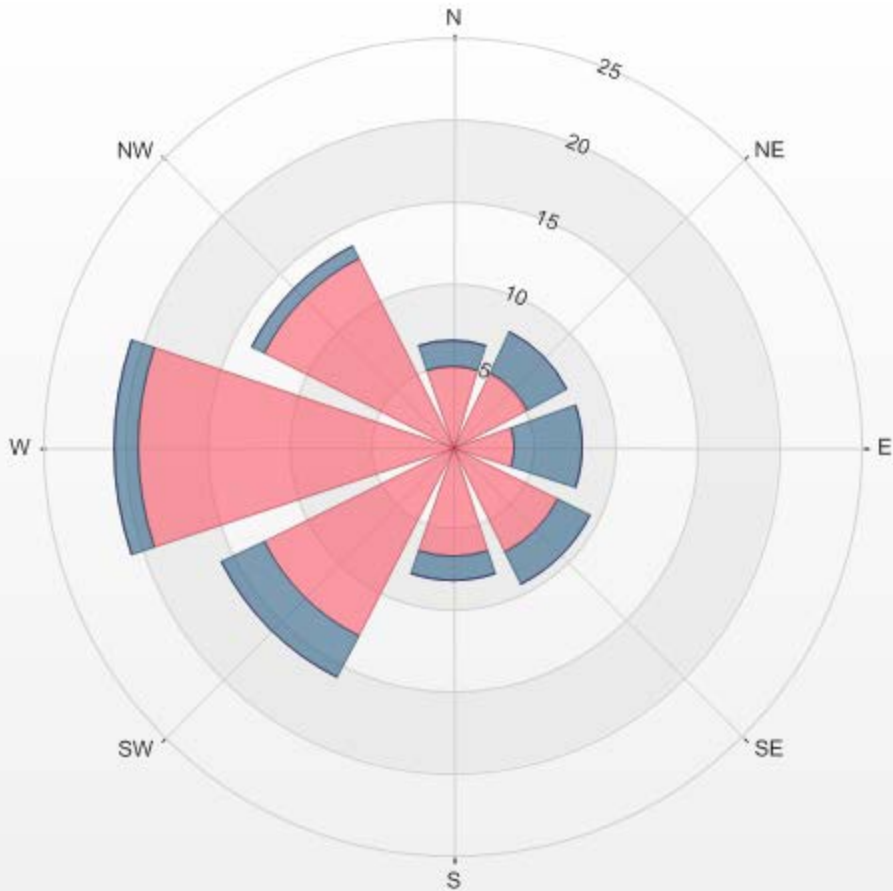
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-CH4[ppm]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.72% Calm Avg: 2.39 [ppm]

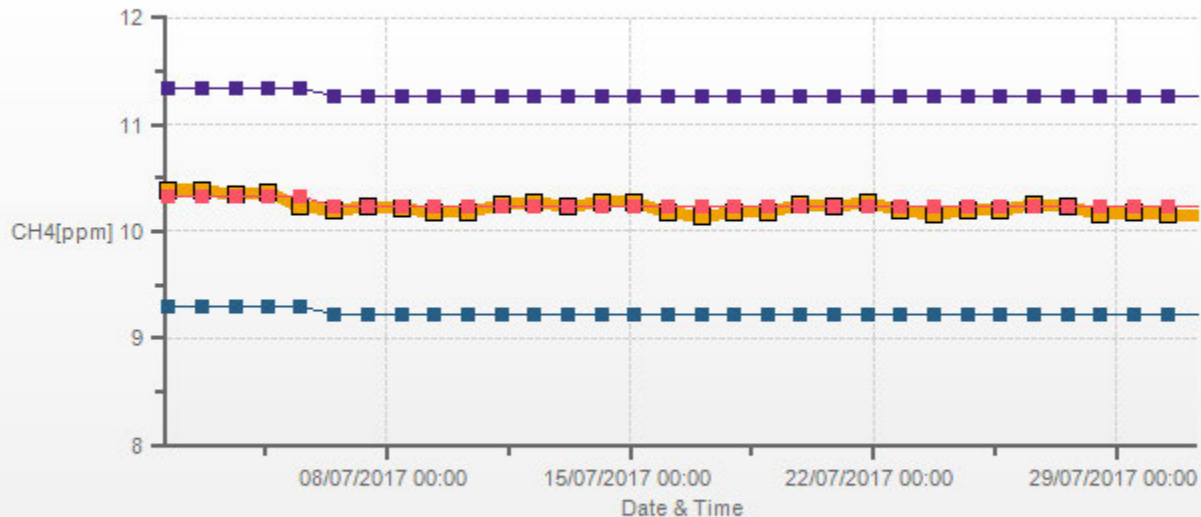
Direction	0.0-1.1	1.1-2.3	2.3-3.4	>3.4	Total
N	0.0	4.9	1.6	0.0	6.5
NE	0.0	5.1	2.8	0.0	7.8
E	0.0	3.8	4.2	0.0	8.0
SE	0.0	7.3	2.2	0.0	9.4
S	0.0	6.7	1.5	0.0	8.1
SW	0.0	12.9	2.9	0.0	15.8
W	0.0	19.3	1.5	0.0	20.8
NW	0.0	12.9	0.9	0.0	13.8
Summary	0.0	72.9	17.4	0.0	90.3

% Icon Classes (ppm) 0 0.0-1.1 73 1.1-2.3 17 2.3-3.4 0 >3.4

LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.72% Calm Poll Avg: 2.39[ppm]



CH4[ppm] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

NON-METHANE HYDROCARBON



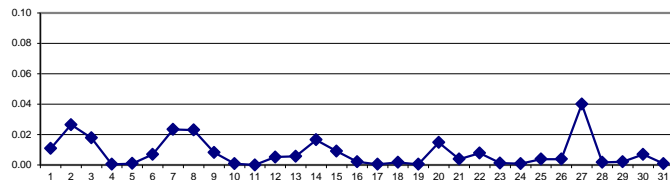
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	0.10	0.03	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	S	0.02	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.10	0.01	24
2	0.00	0.00	0.01	0.03	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.15	0.23	0.15	0.00	0.00	0.23	0.03	24
3	0.15	0.08	0.02	0.03	0.00	0.00	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.00	0.00	S	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.02	24
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	24
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	24
6	0.00	0.00	0.00	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.04	0.00	0.05	0.01	24
7	0.02	0.00	0.05	0.02	0.00	0.06	0.05	0.02	0.00	0.00	0.00	S	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.10	0.08	0.07	0.03	0.00	0.10	0.02	24	
8	0.00	0.31	0.04	0.03	0.07	0.01	0.00	0.00	0.00	0.00	S	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.31	0.02	24
9	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.03	0.01	0.00	0.00	0.00	0.03	0.01	24
10	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
12	0.00	0.01	0.00	0.00	0.01	0.00	S	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.01	24
13	0.00	0.00	0.00	0.00	0.00	S	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.04	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.04	0.01	24
14	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.14	0.08	0.00	0.16	0.02	24	
15	0.09	0.04	0.01	S	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.09	0.01	24
16	0.00	0.00	S	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24
17	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
18	S	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.03	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	24
20	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.15	0.04	0.01	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	S	0.00	0.00	0.00	0.00	0.15	0.01	24
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	S	0.01	0.02	0.03	0.00	0.03	0.00	24	
22	0.02	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S	0.00	0.01	0.00	0.01	0.00	0.08	0.01	24
23	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24	
25	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.04	0.00	24	
26	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.00	0.03	0.00	24	
27	0.01	0.00	0.00	0.00	0.02	0.00	0.30	0.10	0.00	0.01	0.00	0.01	0.01	0.01	S	0.02	0.03	0.03	0.03	0.08	0.09	0.14	0.03	0.00	0.00	0.30	0.04	24	
28	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	24
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.02	0.00	24
30	0.02	0.01	0.01	0.00	0.01	0.02	0.02	0.01	0.02	0.01	0.01	S	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01	24
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	C1	C1	C1	C1	C1								0.00	0.01	0.00	13
HOURLY MAX	0.15	0.31	0.08	0.03	0.07	0.06	0.30	0.10	0.15	0.04	0.03	0.02	0.02	0.01	0.04	0.02	0.03	0.03	0.03	0.08	0.10	0.16	0.23	0.15					
HOURLY AVG	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.01					

STATUS FLAG CODES

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

24 HR AVERAGES July 2017



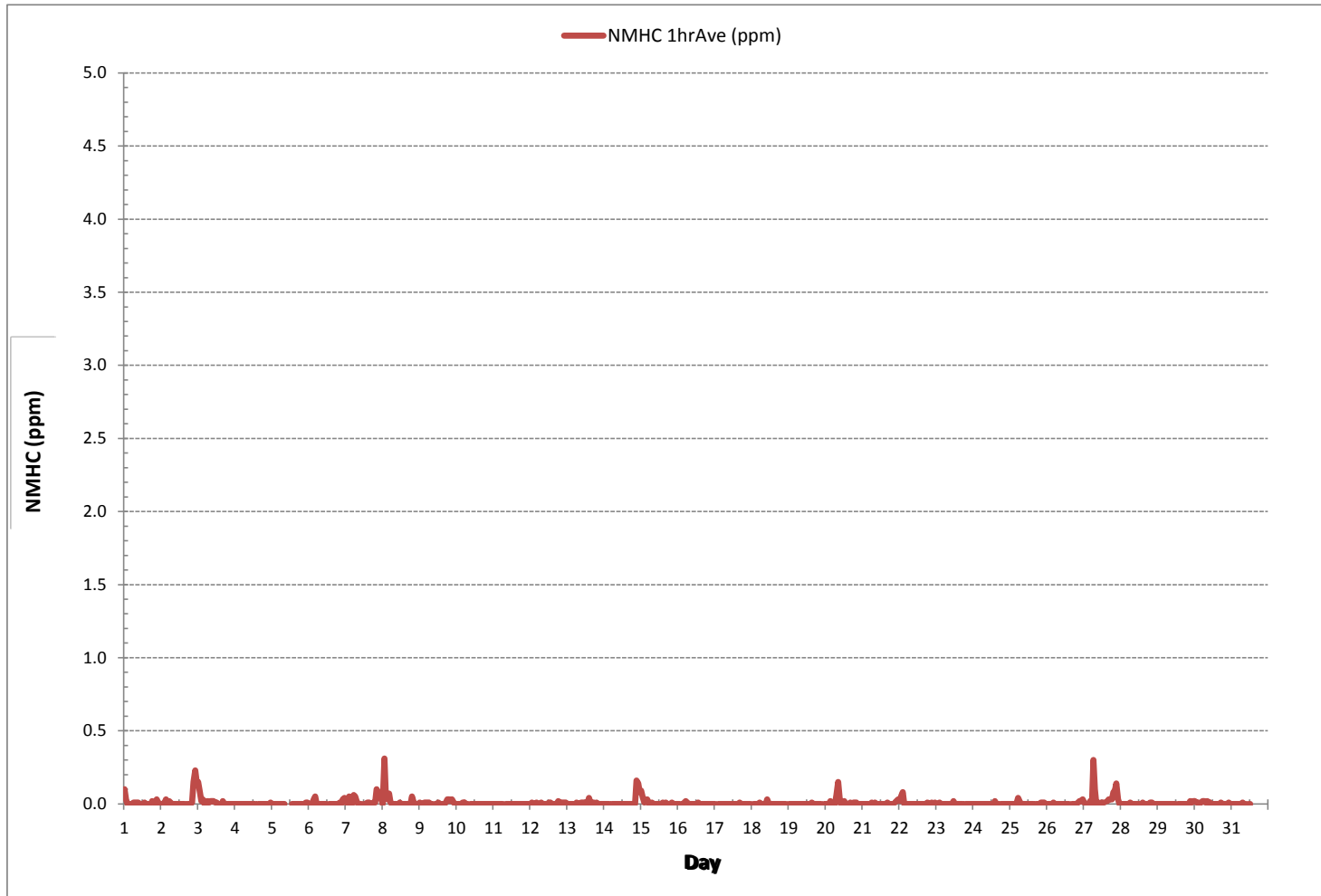
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	186			
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	2	ON DAY 1
MAXIMUM 1-HR AVERAGE:	0.31	ppm @ HOUR	1	ON DAY 8
MAXIMUM 24-HR AVERAGE:	0.04	ppm		ON DAY 27
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	733 hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	98.5 %
STANDARD DEVIATION:	0.03		MONTHLY AVERAGE:	0.01 ppm



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 2017

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 2017

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC 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	0.34	0.27	0.00	0.00	0.00	0.00	0.16	0.15	0.79	0.15	0.08	0.00	0.00	0.33	0.21	0.00	0.16	S	0.31	0.17	0.00	0.21	0.26	0.00	0.00	0.79	0.16	24
2	0.00	0.00	0.21	0.25	0.04	0.18	0.15	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.09	S	0.14	0.00	0.08	0.32	0.39	0.42	0.36	0.00	0.42	0.12	24
3	0.27	0.20	0.16	0.22	0.22	0.09	0.25	0.15	0.14	0.62	0.24	0.18	0.24	0.00	0.19	S	0.25	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.62	0.15	24
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.13	0.00	0.00	0.00	0.00	0.00	0.12	0.03	0.22	0.00	0.22	0.02	24
5	0.00	0.16	0.00	0.00	0.00	0.00	0.14	0.00	C	C	C	C	C	0.00	0.06	0.08	0.09	0.00	0.00	0.00	0.00	0.13	0.26	0.18	0.00	0.26	0.06	24
6	0.00	0.10	0.00	0.37	0.38	0.00	0.00	0.00	0.00	0.17	0.00	0.00	S	0.07	0.09	0.16	0.00	0.00	0.07	0.00	0.28	0.14	0.36	0.32	0.00	0.38	0.11	24
7	0.23	0.08	0.34	0.34	0.00	0.21	0.17	0.12	0.10	0.00	0.00	S	0.00	0.07	0.39	0.24	0.13	0.26	0.17	0.32	1.49	0.24	0.25	0.23	0.00	1.49	0.23	24
8	0.09	4.04	0.28	0.16	0.18	0.30	0.17	0.00	0.00	0.02	S	0.16	0.09	0.00	0.00	0.00	0.11	0.00	0.12	0.17	0.14	0.15	0.11	0.15	0.00	4.04	0.28	24
9	0.21	0.20	0.08	0.21	0.13	0.14	0.13	0.00	0.00	S	0.18	0.00	0.18	0.00	0.09	0.07	0.15	0.26	0.71	0.21	0.17	0.16	0.15	0.00	0.00	0.71	0.15	24
10	0.18	0.05	0.00	0.14	0.21	0.20	0.15	0.00	S	0.00	0.00	0.23	0.23	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.25	0.00	0.16	0.00	0.00	0.25	0.08	24
11	0.00	0.00	0.00	0.00	0.00	0.00	S	0.20	0.00	0.00	0.00	0.24	0.00	0.09	0.00	0.00	0.18	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.24	0.03	24
12	0.00	0.13	0.07	P	0.14	0.20	S	0.20	0.00	0.15	0.00	0.00	0.44	0.42	0.00	0.00	0.09	0.16	0.77	0.77	0.28	0.18	0.14	0.23	0.00	0.77	0.20	23
13	0.00	0.07	0.00	0.00	0.06	S	0.16	0.00	0.09	0.12	0.17	0.16	0.21	0.11	0.95	0.26	0.19	0.21	0.17	0.30	0.00	0.00	0.00	0.00	0.00	0.95	0.14	24
14	0.10	0.21	0.05	0.00	S	0.00	0.00	0.00	0.00	0.17	0.10	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.04	0.12	0.36	0.26	0.25	0.00	0.36	0.07	24	
15	0.22	0.16	0.12	S	0.15	0.11	0.07	0.12	0.06	0.00	0.00	0.11	0.00	0.09	0.19	0.00	0.20	0.14	0.09	0.00	0.20	0.07	0.00	P	0.00	0.22	0.10	23
16	0.13	0.00	S	0.08	P	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.04	23
17	0.00	S	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.03	24
18	S	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.08	0.08	0.33	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.34	0.04	24
19	0.00	0.00	0.08	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.19	0.00	0.09	0.11	S	0.06	0.00	0.29	0.04	24	
20	0.00	0.00	0.09	0.18	0.10	0.10	0.09	1.07	1.50	0.37	0.10	0.15	0.16	0.10	0.10	0.00	0.12	0.12	0.22	0.23	0.13	S	0.12	0.18	0.00	1.50	0.23	24
21	0.00	0.23	0.15	0.11	0.13	0.10	0.15	0.10	0.15	0.00	0.00	0.10	0.00	0.07	0.15	0.00	0.13	0.00	0.14	0.00	S	0.13	0.20	0.26	0.00	0.26	0.10	24
22	0.18	0.17	0.29	0.10	0.00	0.00	0.00	P	0.11	0.09	0.16	0.11	0.00	0.00	0.00	0.11	0.00	0.12	S	0.14	0.15	0.00	0.21	0.00	0.29	0.09	0.23	23
23	0.10	0.10	0.13	0.12	0.00	0.00	P	0.09	0.00	0.07	0.16	1.23	0.00	0.19	0.00	0.00	0.00	S	0.11	P	0.16	0.15	0.00	0.00	0.00	1.23	0.12	22
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.28	0.10	0.13	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.03	24
25	0.00	0.00	0.00	0.00	0.00	0.16	0.14	0.00	0.06	0.12	0.09	0.00	0.00	0.00	0.00	S	0.00	0.05	0.00	0.22	0.14	0.13	0.12	0.00	0.22	0.05	24	
26	0.00	0.00	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.14	0.18	0.18	0.38	0.00	0.38	0.04	23	
27	0.13	0.00	0.10	0.18	0.14	0.18	2.99	1.20	0.00	0.15	0.14	0.18	0.18	0.16	S	0.22	0.27	0.29	0.21	0.26	0.25	0.28	0.30	0.15	0.00	2.99	0.35	24
28	0.12	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	S	0.21	0.18	0.00	0.05	0.00	0.22	0.13	0.00	0.00	0.00	0.00	0.22	0.05	24
29	0.07	0.00	0.00	0.15	0.14	0.14	0.11	0.22	0.08	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.09	0.20	0.17	0.21	0.00	0.25	0.08	24
30	0.12	P	0.23	0.23	0.12	0.21	0.21	0.19	0.25	0.14	0.22	S	0.00	0.00	0.00	0.15	0.14	0.23	0.07	0.14	0.12	0.00	0.22	0.11	0.00	0.25	0.14	23
31	0.18	0.19	0.14	0.00	0.00	0.00	0.00	0.24	0.00	0.00	S	0.00	0.00	C1	C1	C1	C1	C1	C1						0.00	0.24	0.06	13
HOURLY MAX	0.34	4.04	0.34	0.37	0.38	0.34	2.99	1.20	1.50	0.62	0.33	1.23	0.44	0.42	0.95	0.29	0.44	0.29	0.77	0.77	1.49	0.39	0.42	0.38				
HOURLY AVG	0.09	0.22	0.08	0.10	0.08	0.10	0.19	0.14	0.12	0.09	0.07	0.11	0.06	0.07	0.10	0.08	0.10	0.07	0.12	0.11	0.16	0.13	0.13					

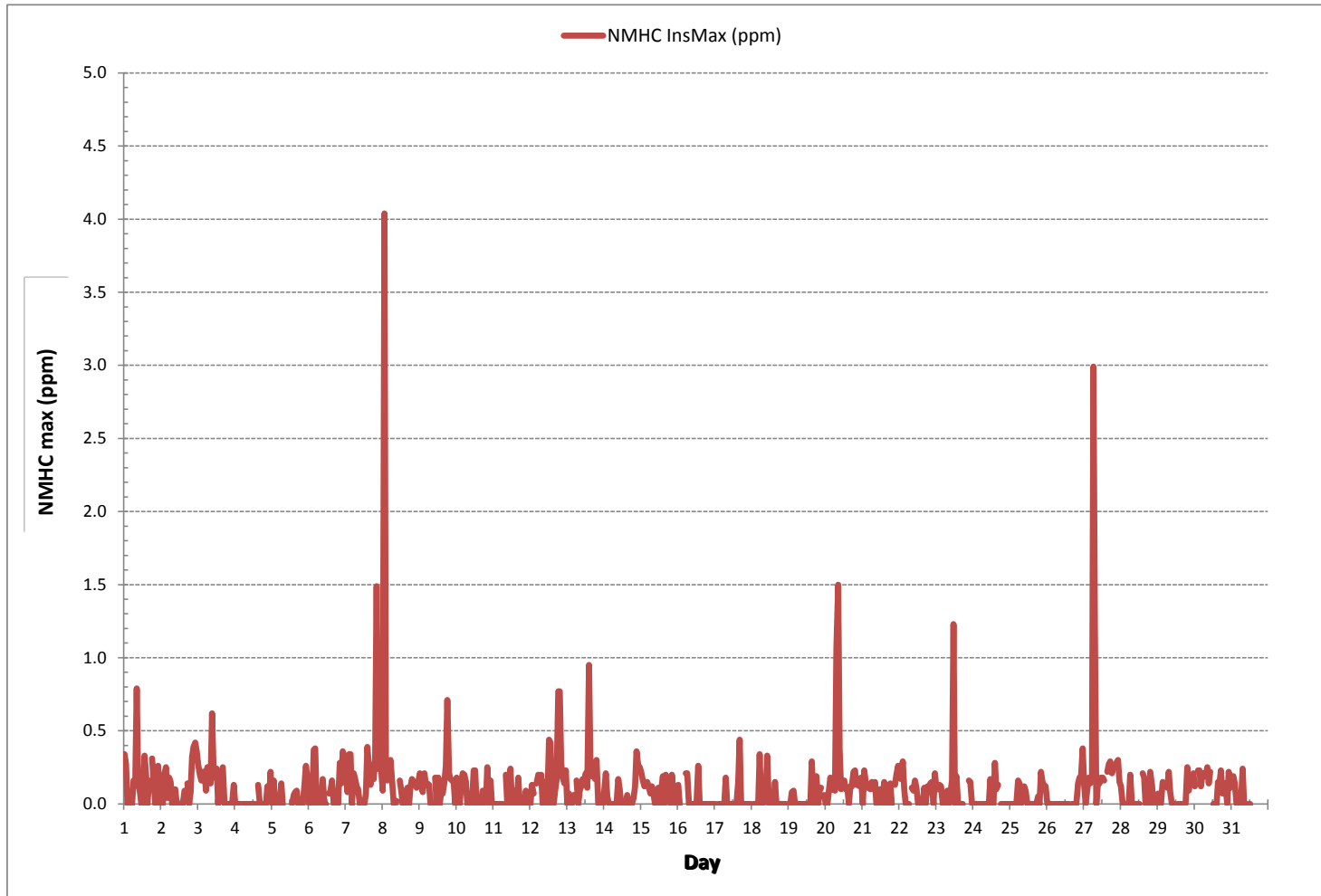
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	356
MAXIMUM INSTANTANEOUS VALUE:	4.04 ppm @ HOUR 1 ON DAY 8
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.24
OPERATIONAL TIME:	725 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



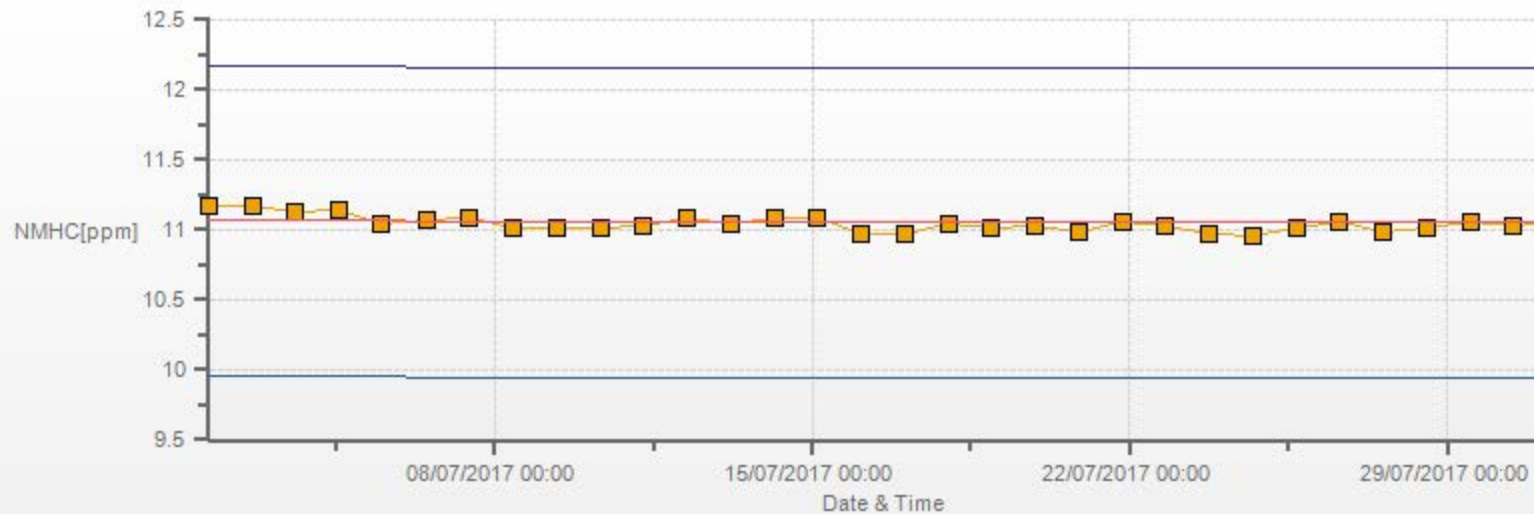
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NMHC[ppm]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.72%

Calm Avg: 0.03 [ppm]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	7.8	0.0	0.0	0.0	7.8
E	8.0	0.0	0.0	0.0	8.0
SE	9.4	0.0	0.0	0.0	9.4
S	8.1	0.0	0.0	0.0	8.1
SW	15.8	0.0	0.0	0.0	15.8
W	20.8	0.0	0.0	0.0	20.8
NW	13.8	0.0	0.0	0.0	13.8
Summary	90.3	0.0	0.0	0.0	90.3

NMHC[ppm] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



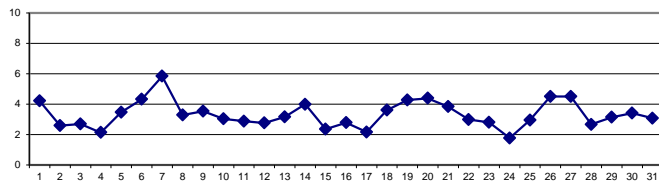
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

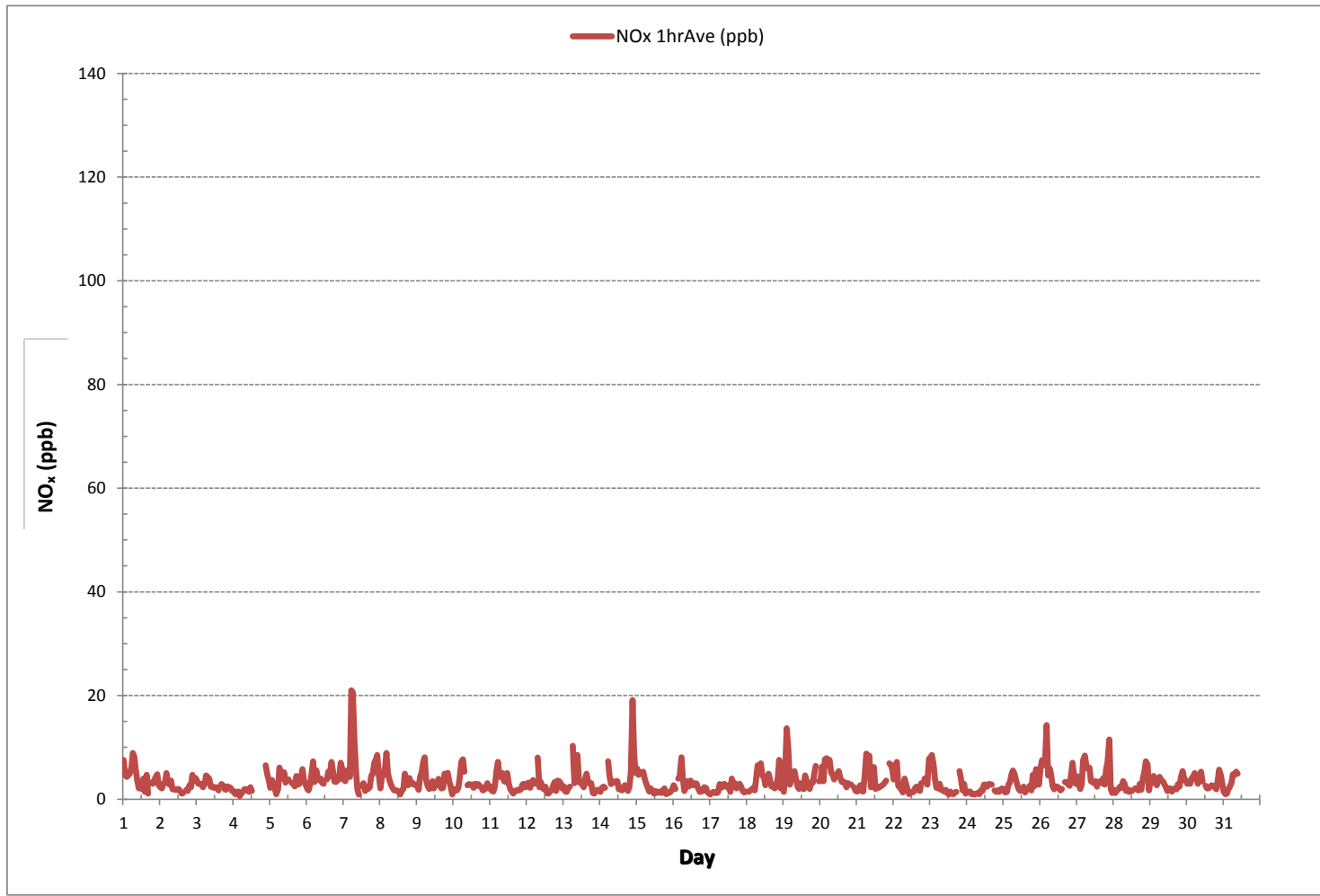
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	692			
MINIMUM 1-HR AVERAGE:	1 ppb	@ HOUR	4	ON DAY
MAXIMUM 1-HR AVERAGE:	21 ppb	@ HOUR	5	ON DAY
MAXIMUM 24-HR AVERAGE:	6 ppb			ON DAY
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	730 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	98.1 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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	14	6	5	7	8	11	11	12	8	5	5	30	42	27	9	23	7	S	30	17	34	16	12	15	5	42	15	24					
2	4	4	5	7	8	5	14	15	4	14	16	14	11	4	3	3	S	4	4	6	17	29	8	10	3	29	9	24					
3	6	5	4	4	4	6	11	9	7	5	5	5	5	7	4	S	5	4	4	4	4	4	5	3	3	11	5	24					
4	3	3	3	3	2	4	16	17	4	20	6	7	7	C	C	C	C	C	C	C	C	C	12	12	7	2	20	8	24				
5	4	6	4	4	2	5	24	7	7	14	6	5	6	S	5	6	4	11	4	4	6	106	5	4	2	106	11	24					
6	2	2	5	9	9	5	8	23	15	15	4	6	S	6	41	31	13	11	5	6	9	6	9	8	2	41	11	24					
7	5	4	6	8	8	30	28	44	7	4	2	S	20	19	3	4	20	8	32	78	16	28	51	9	2	78	19	24					
8	3	6	6	7	11	11	4	4	4	16	S	19	2	1	2	17	10	7	3	6	5	5	4	3	1	19	7	24					
9	4	3	10	8	10	11	5	3	2	S	17	10	28	17	20	6	3	4	44	7	6	4	4	1	1	44	10	24					
10	2	2	2	3	8	12	12	7	S	3	4	4	4	4	11	3	4	3	3	2	3	3	9	3	2	12	5	24					
11	4	3	2	5	11	25	6	S	8	5	6	9	13	32	17	3	19	5	4	3	4	7	5	4	2	32	9	24					
12	3	5	2	P	5	4	S	20	5	19	8	10	11	2	2	4	4	4	18	3	39	28	6	3	2	39	9	23					
13	3	3	2	3	3	S	16	14	9	74	15	5	28	9	23	30	13	11	25	3	2	2	3	2	2	74	13	24					
14	1	3	3	3	S	9	7	5	5	6	5	13	3	4	3	4	21	23	3	7	12	49	15	11	1	49	9	24					
15	8	7	6	S	9	4	4	3	3	18	4	2	5	2	16	3	3	11	16	2	10	2	3	P	2	18	6	23					
16	6	2	S	6	P	18	9	3	3	7	5	9	8	6	6	5	4	3	4	4	24	2	2	2	2	2	24	6	23				
17	1	S	2	1	2	2	4	3	21	22	3	3	6	3	13	6	5	3	3	4	4	3	3	2	1	22	5	24					
18	S	2	2	2	3	3	7	18	9	9	8	7	25	6	6	22	4	4	4	8	10	6	S	2	2	25	8	24					
19	2	18	21	24	5	11	17	8	14	5	4	7	26	3	12	37	23	5	39	45	47	18	S	6	2	47	17	24					
20	5	17	11	12	10	8	17	25	13	28	7	9	8	7	18	5	5	3	25	4	4	S	3	3	3	28	11	24					
21	3	3	6	2	2	7	14	11	12	4	5	10	3	4	3	3	4	5	5	S	11	8	10	2	14	6	24						
22	7	9	10	5	3	4	2	P	5	11	11	4	2	11	6	6	3	9	6	S	7	8	4	15	2	15	7	23					
23	14	13	16	9	3	3	P	3	28	29	3	2	2	2	2	1	2	2	S	7	P	4	5	2	1	29	7	22					
24	2	2	2	1	1	1	2	1	1	3	10	14	26	3	4	5	4	S	2	2	2	2	2	2	1	26	4	24					
25	2	2	2	5	6	7	7	8	6	4	4	3	4	4	2	7	S	17	3	36	7	40	17	6	2	40	9	24					
26	8	15	8	36	P	7	31	19	5	21	32	16	12	14	9	S	19	17	4	6	39	30	6	9	4	39	17	23					
27	9	7	3	4	11	11	12	6	20	6	18	29	7	3	S	27	24	9	8	10	10	18	6	2	2	29	11	24					
28	3	2	3	3	3	4	4	4	2	16	12	3	3	S	4	3	2	6	3	22	22	13	11	2	2	22	7	24					
29	4	4	7	11	7	6	7	5	4	3	3	3	S	9	2	5	3	3	9	7	32	9	5	7	2	32	7	24					
30	6	P	3	6	6	8	5	6	6	7	5	S	4	3	3	3	3	3	3	3	5	7	6	7	3	8	5	23					
31	2	1	1	3	4	9	8	7	10	19	C1	C1	C1	C1	C1	C1	C1	C1	C1							1	19	6	10				
HOURLY MAX	14	18	21	36	11	30	31	44	28	74	32	30	42	32	41	37	24	23	44	78	47	106	51	15									
HOURLY AVG	5	5	5	7	6	8	11	11	8	14	8	9	11	8	9	10	9	7	11	11	14	16	8	6									

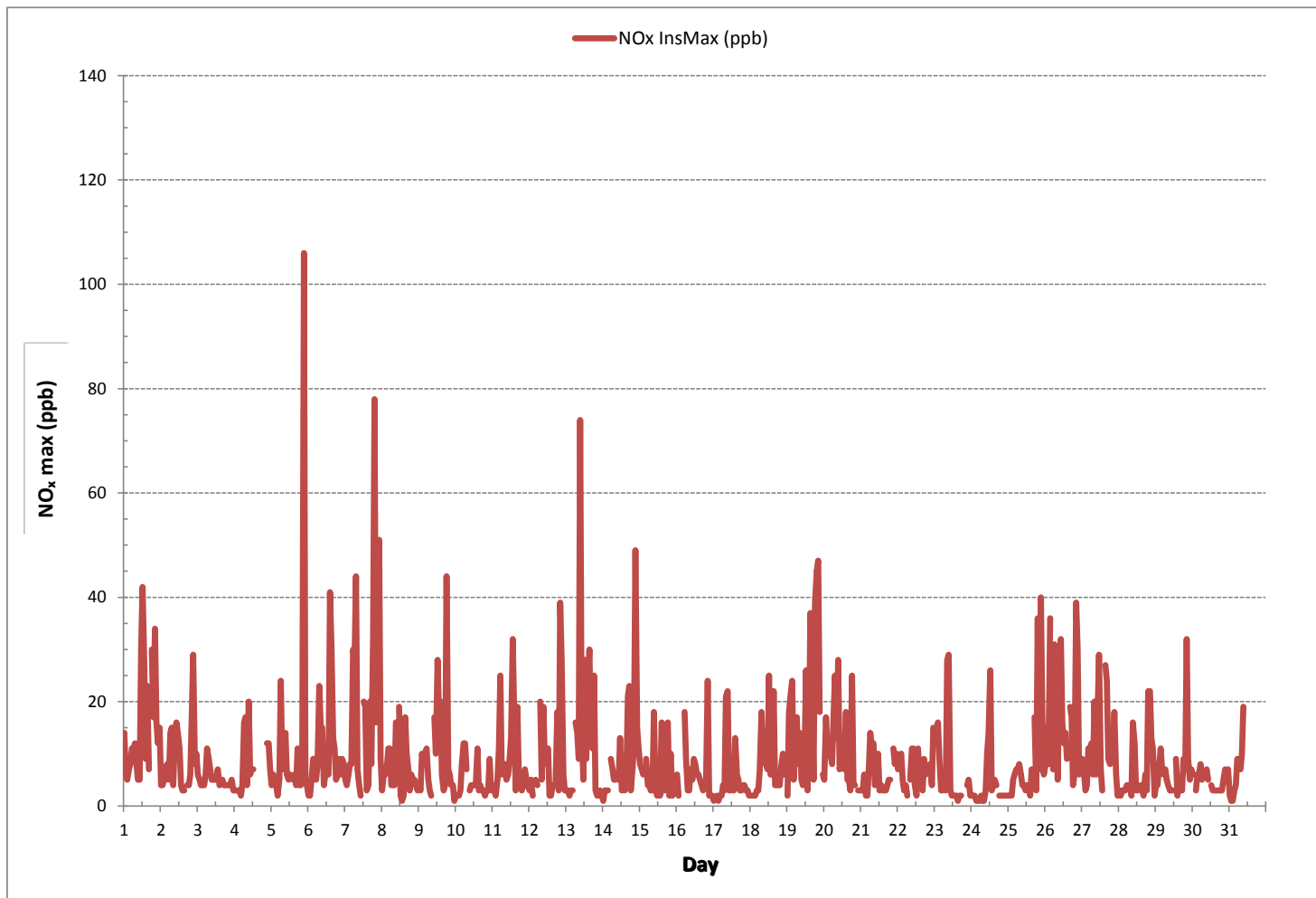
STATUS FLAG CODES

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

MONTHLY SUMMARY

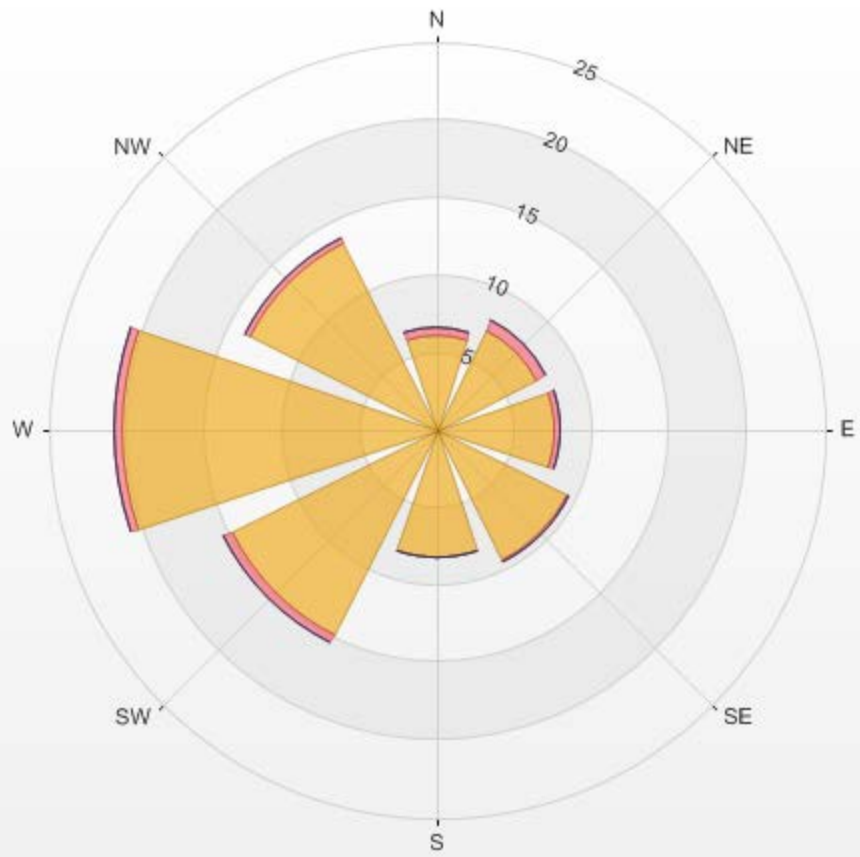
NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	106 ppb @ HOUR 21 ON DAY 5
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	722 hrs
STANDARD DEVIATION:	10

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb) 87 0.0-7.3 3 7.3-14.7 0 14.7-22.0 0 >22.0

LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.80% Calm Poll Avg: 5.55[ppb]



NOX[ppb] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



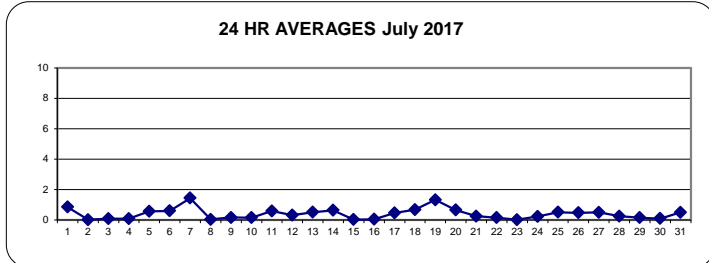
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.1	0.0	0.0	0.2	0.3	1.6	3.6	3.4	2.0	0.7	0.1	0.3	0.4	1.9	0.2	2.3	0.2	S	0.5	0.3	0.4	0.3	0.9	0.0	0.0	3.6	0.9	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.2	0.1	0.0	0.2	0.2	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.1	0.5	0.1	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.5	0.1	24
5	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0	0.9	1.8	0.9	1.1	1.2	S	0.8	0.9	0.4	0.9	0.3	0.2	0.0	1.2	0.0	0.0	0.0	1.8	0.6	24
6	0.0	0.0	0.0	0.0	0.0	0.1	1.2	1.3	0.8	0.8	0.2	0.5	S	1.1	2.1	1.3	2.3	1.3	0.3	0.2	0.3	0.0	0.0	0.0	0.0	2.3	0.6	24
7	0.0	0.0	0.0	0.0	0.0	8.4	9.0	4.8	1.3	0.3	0.0	S	0.8	1.2	0.3	0.5	0.4	0.4	1.4	1.5	0.8	0.8	1.3	0.0	0.0	9.0	1.4	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.0	0.0	0.0	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24
9	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	S	0.9	0.3	0.7	0.3	0.7	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	24
10	0.0	0.0	0.0	0.0	0.0	0.6	1.0	0.6	S	0.2	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	1.0	0.2	24
11	0.1	0.0	0.0	0.1	0.8	2.3	1.2	S	1.2	0.7	0.5	1.1	1.0	0.5	0.6	0.5	0.7	1.0	0.4	0.3	0.2	0.5	0.0	0.0	0.0	2.3	0.6	24
12	0.0	0.0	0.0	0.0	0.1	0.0	S	2.7	0.0	0.7	0.3	0.3	0.8	0.0	0.0	0.3	0.2	0.2	0.6	0.2	0.6	0.3	0.0	0.0	0.0	2.7	0.3	24
13	0.0	0.0	0.0	0.0	0.0	S	2.7	0.4	0.7	3.4	0.7	0.5	0.6	0.2	0.9	1.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.5	24
14	0.0	0.0	0.0	0.0	S	0.7	0.5	0.5	0.7	1.1	0.8	1.3	0.2	0.4	0.1	0.4	0.8	0.5	0.3	0.5	0.1	5.0	0.8	0.0	0.0	5.0	0.6	24
15	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.4	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	0.4	0.0	24
16	0.0	0.0	S	0.0	0.0	0.8	0.0	0.0	0.0	0.0	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	0.8	0.1	24
17	0.0	S	0.0	0.0	0.0	0.0	0.9	0.6	0.7	1.1	0.3	0.4	1.0	0.1	2.0	0.6	0.9	0.5	0.6	0.6	0.3	0.0	0.1	0.0	0.0	2.0	0.5	24
18	S	0.2	0.1	0.0	0.2	0.4	1.1	1.9	1.6	1.8	1.1	0.9	0.7	0.8	1.2	1.1	0.6	0.4	0.1	0.1	0.0	0.5	0.0	S	0.0	1.9	0.7	24
19	0.1	1.2	4.8	2.8	0.1	1.5	1.8	2.3	1.9	1.1	0.6	1.4	1.1	0.6	1.9	1.1	0.9	0.6	1.3	1.1	1.1	0.8	S	0.3	0.1	4.8	1.3	24
20	0.1	0.3	0.0	0.0	0.8	1.1	2.3	1.2	1.7	0.8	0.8	1.5	1.2	0.9	0.5	0.5	0.2	0.5	0.1	0.0	S	0.0	0.0	0.0	0.0	2.3	0.7	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	1.6	0.0	0.1	1.1	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.0	S	0.7	0.0	0.0	0.0	1.6	0.2	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.6	0.2	0.0	0.3	0.1	0.3	0.4	0.4	0.0	0.0	0.2	S	0.1	0.0	0.0	0.0	0.0	1.0	0.2	24
23	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	0.0	0.0	0.0	0.0	0.0	S	0.3	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	0.1	0.1	0.7	0.6	1.3	0.8	0.4	0.5	0.4	0.2	S	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	24
25	0.0	0.0	0.0	0.0	0.3	0.9	1.9	1.7	1.1	0.6	0.3	0.1	0.2	0.3	0.0	0.4	S	0.8	0.1	1.1	0.0	1.3	0.6	0.0	0.0	1.9	0.5	24
26	0.0	0.0	0.0	0.1	2.1	0.2	1.5	1.2	0.4	0.2	0.7	0.7	0.5	0.2	0.2	S	0.8	0.5	0.4	0.2	0.3	0.8	0.0	0.0	0.0	2.1	0.5	24
27	0.0	0.0	0.0	0.0	0.4	1.6	1.5	1.5	2.1	0.9	0.7	0.6	0.4	0.1	S	0.8	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.5	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.3	0.3	0.5	0.3	S	0.6	0.4	0.2	0.4	0.2	0.7	0.5	0.7	0.1	0.0	0.0	0.7	0.2	24
29	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	S	0.5	0.3	0.3	0.3	0.2	0.3	0.2	0.6	0.5	0.0	0.0	0.0	0.6	0.2	24
30	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.7	0.7	0.4	S	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	0.7	0.1	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.9	1.6	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	0.0	1.9	0.5	10
HOURLY MAX	0.1	1.2	4.8	2.8	2.1	8.4	9.0	4.8	2.1	3.4	1.1	1.5	1.2	1.9	2.1	2.3	2.3	1.3	1.4	1.5	1.1	5.0	1.3	0.3				
HOURLY AVG	0.0	0.1	0.2	0.1	0.2	0.7	1.1	1.0	0.8	0.7	0.4	0.6	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.5	0.1	0.0				

STATUS FLAG CODES

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

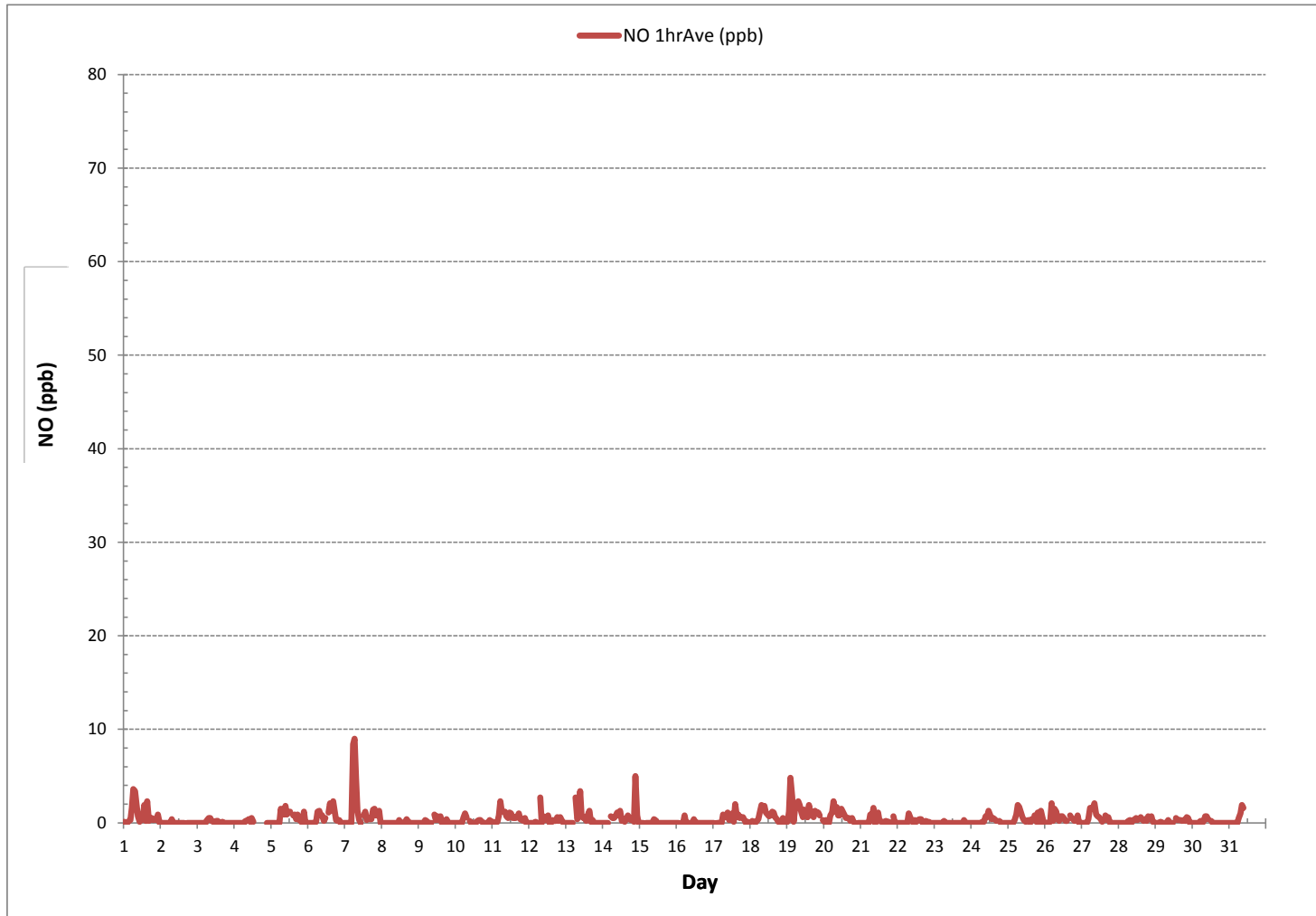
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	363			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR	1	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9.0 ppb	@ HOUR	7	ON DAY 7
MAXIMUM 24-HR AVERAGE:	1.4 ppb			ON DAY 7
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	730 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	98.1 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0.4 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	3	1	1	2	2	4	6	6	6	2	2	11	24	21	5	14	7	S	14	7	21	9	6	6	1	24	8	24	
2	1	1	1	1	1	1	10	10	2	8	9	10	7	2	2	2	S	2	2	2	6	11	2	2	1	11	4	24	
3	1	2	1	1	1	1	3	3	3	2	2	2	2	3	2	S	2	1	2	1	1	2	2	1	1	3	2	24	
4	1	1	1	1	1	3	15	15	2	16	4	4	8	C	C	C	C	C	C	C	C	C	4	3	1	1	16	5	24
5	1	2	1	1	1	2	13	4	4	8	3	3	3	S	3	3	2	3	2	1	2	69	1	1	1	69	6	24	
6	1	1	2	3	2	2	3	15	13	9	5	2	S	3	23	7	6	4	2	3	3	1	1	0	0	23	5	24	
7	0	1	1	1	2	16	14	35	3	2	1	S	9	8	2	2	14	3	18	41	5	17	26	3	0	41	10	24	
8	1	1	1	0	2	1	1	1	1	10	S	15	1	1	1	19	3	2	1	1	1	1	1	1	0	19	3	24	
9	1	1	0	0	2	1	1	1	1	S	7	4	20	6	13	3	1	1	23	1	1	0	0	0	0	23	4	24	
10	1	0	0	1	2	3	3	3	S	2	1	1	2	2	2	2	2	1	1	1	1	1	3	2	0	3	2	24	
11	2	1	1	2	4	15	3	S	3	3	2	3	13	7	17	3	15	4	3	2	2	3	2	1	1	17	5	24	
12	1	1	1	P	2	2	S	15	2	11	3	8	8	2	5	3	3	2	12	2	18	13	3	1	1	18	5	23	
13	1	1	1	1	1	S	6	12	4	58	10	2	18	3	20	19	3	4	7	1	1	1	1	1	1	58	8	24	
14	0	1	1	1	S	2	2	2	3	3	2	8	2	2	1	2	8	9	2	3	1	28	3	3	0	28	4	24	
15	1	1	1	S	2	1	1	1	1	12	2	2	1	1	6	2	1	4	6	1	7	1	1	P	1	12	3	23	
16	2	1	S	1	P	6	3	1	1	3	2	4	3	2	3	2	2	1	2	2	14	1	1	1	1	14	3	23	
17	1	S	2	1	1	2	3	3	14	14	2	2	5	3	12	3	3	2	2	2	2	2	2	2	1	14	4	24	
18	S	2	1	1	2	2	3	10	4	4	3	3	15	3	3	15	3	2	2	2	2	2	1	S	1	15	4	24	
19	2	6	11	12	3	5	13	5	10	3	4	5	16	2	7	9	16	3	29	27	23	4	S	2	2	29	9	24	
20	1	3	1	2	3	3	14	9	10	11	3	7	5	3	11	2	2	2	14	1	1	S	1	1	1	14	5	24	
21	1	1	2	2	1	1	3	3	5	1	1	3	2	2	1	1	1	1	2	1	S	3	2	3	1	5	2	24	
22	1	1	2	1	2	1	1	P	2	5	6	4	2	5	2	3	1	5	2	S	2	2	2	1	2	6	2	23	
23	2	2	3	1	1	1	P	1	2	2	1	2	1	1	1	1	1	1	S	2	P	1	1	1	1	3	1	22	
24	1	1	1	1	1	1	1	2	2	3	5	8	9	2	2	2	2	S	2	1	1	1	1	1	1	9	2	24	
25	1	1	1	2	2	3	4	4	3	3	2	3	2	3	4	S	11	3	26	2	22	8	2	1	26	5	24		
26	1	3	1	25	P	3	18	8	3	14	23	13	6	10	5	S	6	8	3	3	16	24	1	3	1	25	9	23	
27	3	2	0	1	3	4	5	3	13	6	10	19	3	1	S	17	16	7	3	2	1	1	1	1	0	19	5	24	
28	1	0	1	1	1	1	2	2	1	11	12	2	2	S	2	2	2	3	2	12	17	3	2	1	0	17	4	24	
29	1	2	3	3	1	2	2	1	2	1	2	1	S	7	3	4	2	3	3	3	24	3	1	2	1	24	3	24	
30	2	P	1	2	1	2	2	3	3	3	2	S	2	1	1	1	1	1	1	1	1	1	1	2	1	3	2	23	
31	0	1	1	1	1	3	3	3	5	14	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	0	14	3	10	
HOURLY MAX	3	6	11	25	4	16	18	35	14	58	23	19	24	21	23	19	16	11	29	41	24	69	26	6					
HOURLY AVG	1	1	2	2	2	3	5	6	4	8	5	5	7	4	6	5	5	3	6	5	7	8	3	2					

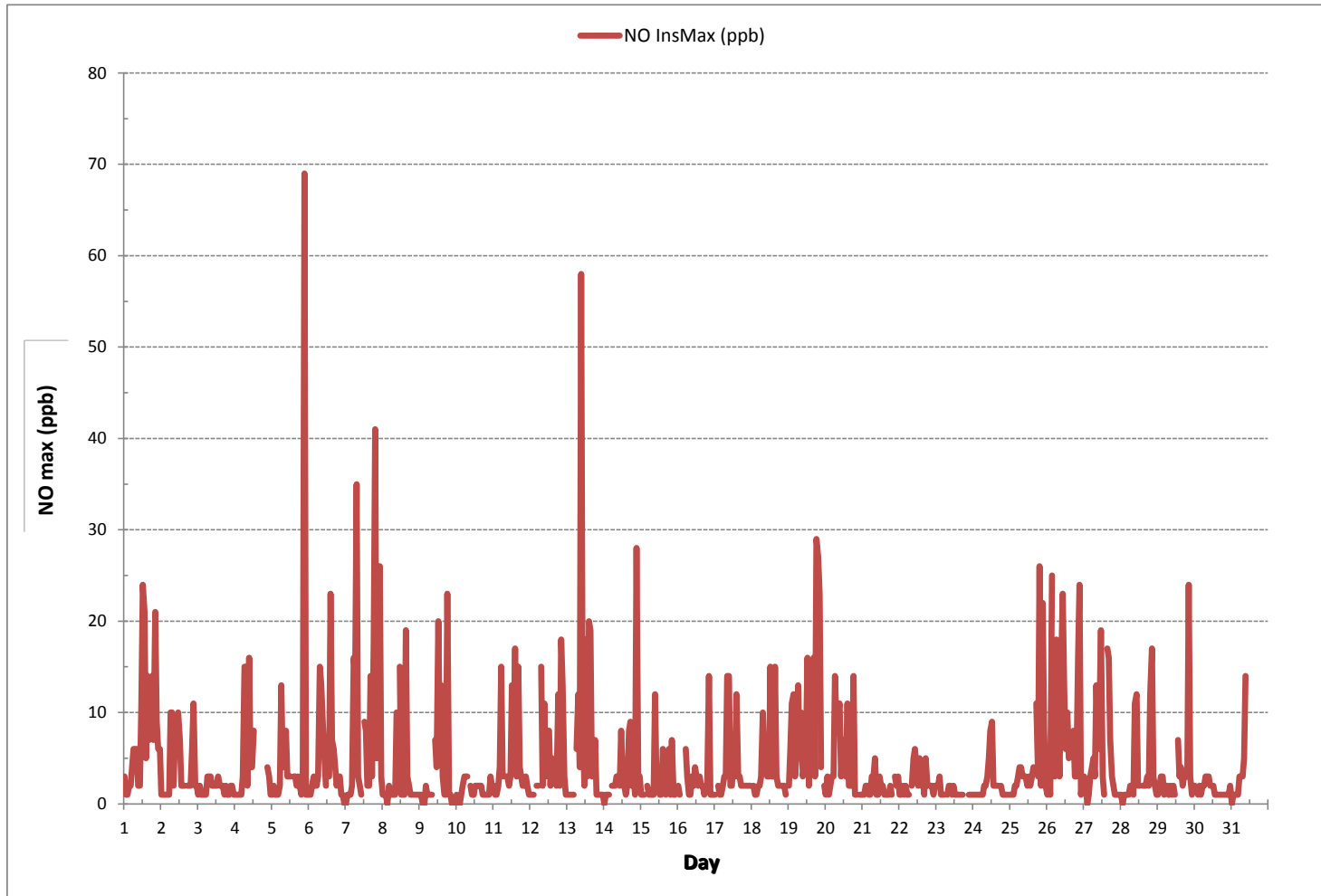
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	670
MAXIMUM INSTANTANEOUS VALUE:	69 ppb @ HOUR 21 ON DAY 5
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	722 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



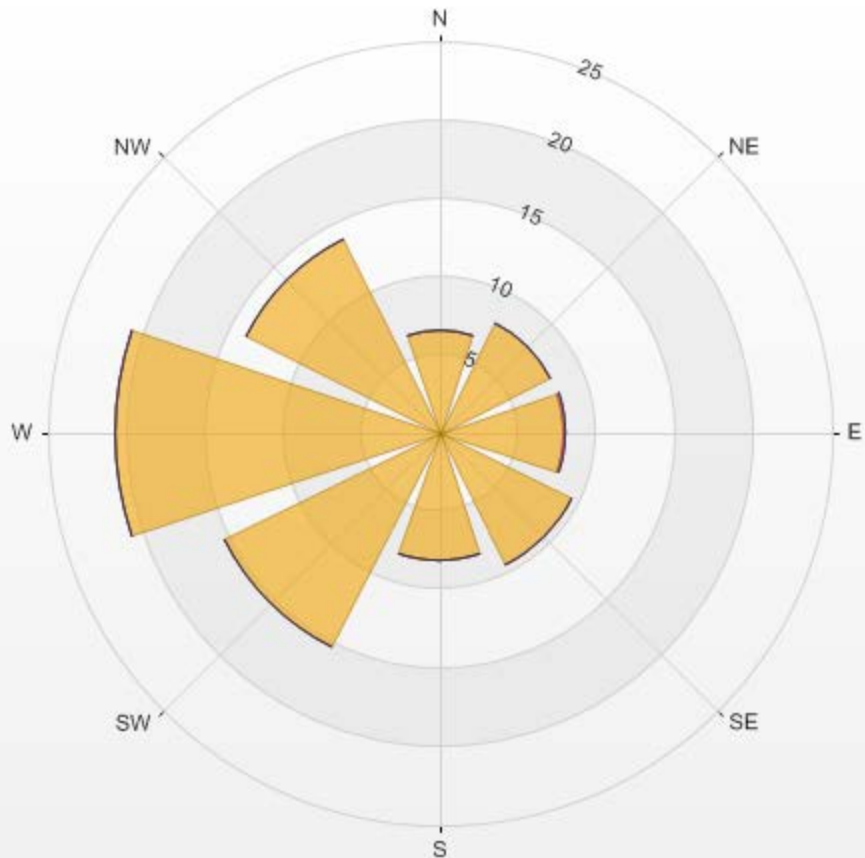
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NO[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.80% Calm Avg: 0.88 [ppb]

Direction	0.0-3.3	3.3-6.7	6.7-10.0	>10.0	Total
N	6.6	0.0	0.0	0.0	6.6
NE	7.9	0.0	0.0	0.0	7.9
E	7.9	0.2	0.0	0.0	8.0
SE	9.5	0.0	0.0	0.0	9.5
S	8.2	0.0	0.0	0.0	8.2
SW	15.4	0.0	0.0	0.0	15.4
W	20.8	0.0	0.0	0.0	20.8
NW	13.9	0.0	0.0	0.0	13.9
Summary	90.1	0.2	0.0	0.0	90.2

% Icon Classes (ppb) 90 0.0-3.3 0 3.3-6.7 0 6.7-10.0 0 >10.0

LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.80% Calm Poll Avg: 0.88[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	7.5	4.7	4.2	4.4	4.6	4.5	5.3	4.7	3.3	2.7	1.9	2.0	1.6	2.1	1.2	2.5	0.9	S	2.7	2.7	3.2	4.0	3.9	2.7	0.9	7.5	3.4	24	
2	2.3	2.1	3.0	3.2	5.0	3.3	2.8	3.2	1.9	2.0	1.8	1.8	2.0	1.6	1.1	1.2	S	1.8	1.6	2.7	2.3	4.7	3.5	4.1	1.1	5.0	2.6	24	
3	3.6	3.0	2.9	2.9	2.3	3.0	4.3	3.7	3.4	2.3	2.4	2.2	2.1	2.1	1.7	S	2.8	2.7	2.0	1.8	2.5	2.3	2.2	1.6	1.6	4.3	2.6	24	
4	1.6	1.0	1.2	1.5	0.6	1.1	1.4	1.7	1.6	1.4	1.3	1.8	1.5	C	C	C	C	C	C	C	C	6.5	4.7	3.7	0.6	6.5	2.0	24	
5	2.2	3.7	2.9	2.0	1.0	1.9	4.6	3.5	3.0	3.3	2.3	2.5	2.7	S	2.4	2.3	2.1	3.5	2.5	2.8	4.1	4.6	3.7	3.0	1.0	4.6	2.9	24	
6	2.1	1.7	2.7	5.0	7.3	3.2	4.4	2.9	2.8	3.2	3.0	2.5	S	2.7	3.2	3.2	4.9	4.0	3.0	3.1	3.7	3.8	7.0	5.9	1.7	7.3	3.7	24	
7	3.8	3.5	5.0	5.7	4.3	12.6	11.6	6.3	4.3	1.6	0.9	S	1.7	2.0	1.3	1.9	1.6	1.9	3.1	3.3	6.2	6.9	7.2	4.5	0.9	12.6	4.4	24	
8	2.1	4.2	4.7	5.9	8.9	5.0	3.6	2.8	2.2	1.7	S	1.4	1.3	0.9	1.6	2.0	4.5	3.3	2.7	4.1	3.0	3.2	2.8	2.8	0.9	8.9	3.2	24	
9	2.8	1.8	4.3	5.1	6.8	7.8	3.7	2.5	2.0	S	2.6	1.8	2.2	2.3	3.2	2.5	2.1	2.2	4.5	4.7	5.1	3.6	2.5	0.9	0.9	7.8	3.3	24	
10	2.0	1.8	1.7	2.2	4.2	6.7	6.7	4.7	S	2.6	2.9	2.8	2.8	2.2	2.8	2.3	2.6	2.5	2.3	1.7	1.8	2.3	2.9	2.0	1.7	6.7	2.9	24	
11	2.4	1.6	1.5	2.3	4.8	5.0	3.1	S	3.7	2.8	2.8	3.9	2.1	1.4	0.9	0.6	0.9	0.7	1.4	1.4	1.7	2.4	2.9	2.3	0.6	5.0	2.3	24	
12	2.8	3.2	2.2	3.2	3.6	3.0	S	5.3	2.3	2.6	1.9	1.6	1.6	1.2	1.1	1.3	1.5	2.3	2.8	1.4	3.0	3.1	3.1	2.1	1.1	5.3	2.4	24	
13	2.5	1.5	1.4	2.2	2.4	S	7.5	2.6	3.1	5.0	2.6	2.7	2.4	2.2	3.1	3.6	3.1	2.7	3.1	1.2	1.1	1.6	1.8	1.6	1.1	7.5	2.7	24	
14	1.4	2.2	2.4	2.2	S	6.6	4.0	2.5	2.5	2.4	2.5	2.2	1.7	1.9	1.6	1.6	1.9	1.6	1.3	2.0	5.1	14.1	8.5	5.1	1.3	14.1	3.4	24	
15	5.9	4.7	5.2	S	5.3	4.0	2.9	2.2	1.5	1.8	1.4	1.1	1.6	1.2	1.4	1.5	1.2	1.7	2.1	1.0	1.3	1.2	1.5	1.9	1.0	5.9	2.3	24	
16	2.7	2.0	S	4.0	4.4	7.3	3.9	1.6	2.3	3.5	2.5	3.1	2.8	2.7	3.0	3.0	2.1	1.4	1.5	1.6	2.3	2.2	1.5	1.1	1.1	7.3	2.7	24	
17	0.9	S	1.4	1.2	1.2	1.3	2.0	1.6	1.7	1.8	2.3	1.9	1.8	1.3	2.0	3.0	2.2	1.5	1.7	2.4	2.3	1.7	1.3	1.5	0.9	2.4	1.7	24	
18	S	1.2	1.6	1.7	2.0	1.3	3.0	4.6	3.9	5.0	3.5	3.3	2.0	3.3	3.7	2.6	2.0	2.0	2.0	2.2	4.1	7.1	2.1	S	1.2	7.1	2.9	24	
19	1.4	4.5	9.0	6.5	2.7	3.7	3.0	3.1	2.1	1.4	1.4	1.7	1.6	1.4	2.6	2.4	1.7	1.5	1.9	2.2	3.7	5.6	S	3.1	1.4	9.0	3.0	24	
20	3.4	6.0	3.5	7.7	7.1	5.8	5.3	3.7	3.1	3.0	3.6	3.4	4.2	3.4	2.8	2.9	2.8	2.1	2.6	2.9	2.8	S	2.3	1.6	1.6	7.7	3.7	24	
21	1.5	2.1	2.7	1.6	1.5	4.3	7.9	5.4	6.7	2.3	2.4	5.1	1.7	2.4	2.1	2.3	2.4	2.7	3.1	3.6	S	6.2	6.7	5.8	1.5	7.9	3.6	24	
22	3.8	6.2	7.2	2.6	2.2	1.8	1.3	3.0	2.4	1.7	1.0	1.1	1.2	1.1	1.8	2.0	1.8	1.6	3.0	S	3.7	4.1	2.8	7.8	1.0	7.8	2.8	24	
23	8.1	8.5	6.6	3.7	2.2	2.1	2.8	1.8	1.8	1.5	1.8	1.2	0.9	1.5	1.1	1.0	1.3	1.4	S	5.1	3.9	1.7	2.9	1.1	0.9	8.5	2.8	24	
24	1.3	1.5	1.5	1.0	1.0	0.9	1.1	1.1	1.0	1.0	1.0	1.5	2.0	2.0	2.3	2.6	2.6	S	1.5	1.4	1.7	1.4	1.9	2.1	0.9	2.6	1.5	24	
25	1.6	1.3	1.4	2.8	2.9	3.9	3.6	3.2	2.5	2.1	1.4	1.4	1.6	2.1	1.3	1.5	S	1.8	1.6	3.5	2.5	4.5	4.6	2.8	1.3	4.6	2.4	24	
26	6.0	7.5	6.6	7.8	12.2	4.4	4.4	3.4	2.1	1.6	1.8	1.7	1.7	1.6	1.8	S	2.4	2.9	2.5	2.3	4.4	6.2	4.2	3.0	1.6	12.2	4.0	24	
27	4.4	2.9	2.0	2.9	7.1	6.8	5.0	4.4	4.0	2.6	2.5	2.5	3.1	2.4	S	2.7	2.8	3.5	2.8	5.8	7.2	11.5	2.0	1.2	1.2	11.5	4.0	24	
28	1.8	1.2	1.7	1.9	2.4	2.2	3.2	2.7	1.6	1.6	1.2	1.3	1.3	S	1.5	1.5	1.5	1.5	2.4	1.6	3.4	4.8	6.6	6.6	1.7	1.2	6.6	2.4	24
29	3.4	3.2	4.5	4.1	2.7	3.6	4.2	3.6	3.2	2.9	2.4	1.6	S	1.5	1.2	1.6	1.8	1.7	2.6	2.3	3.8	5.0	4.1	3.7	1.2	5.0	3.0	24	
30	3.0	3.3	3.0	4.1	4.4	4.8	4.0	2.9	3.8	4.6	3.0	S	2.4	2.1	2.1	2.4	2.7	2.5	2.5	1.9	3.6	5.7	4.6	3.0	1.9	5.7	3.3	24	
31	1.4	1.0	1.1	1.9	2.5	3.2	4.2	3.7	3.5	3.3	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	1.0	4.2	2.6	10	
HOURLY MAX	8.1	8.5	9.0	7.8	12.2	12.6	11.6	6.3	6.7	5.0	3.6	5.1	4.2	3.4	3.7	3.6	4.9	4.0	4.5	5.8	7.2	14.1	8.5	7.8					
HOURLY AVG	3.0	3.1	3.3	3.4	4.0	4.2	4.2	3.3	2.8	2.5	2.1	2.2	2.0	1.9	2.0	2.1	2.2	2.2	2.4	2.7	3.4	4.6	3.6	2.9					

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

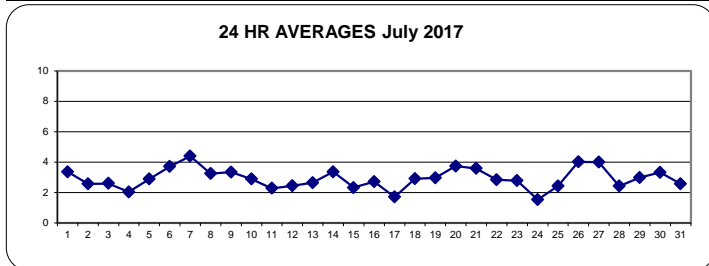
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

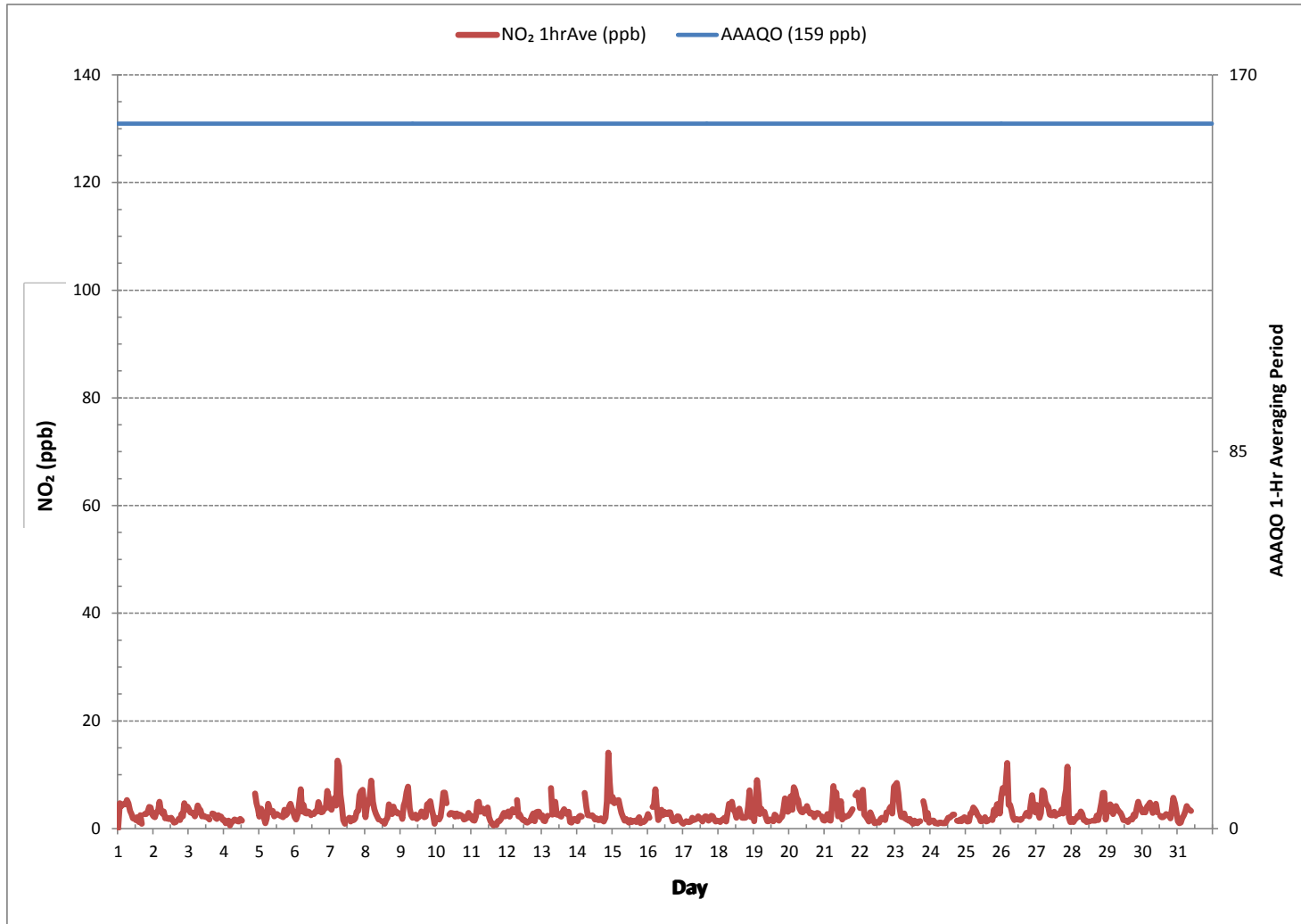
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	692					
MINIMUM 1-HR AVERAGE:	0.6	ppb	@ HOUR	4	ON DAY	4
MAXIMUM 1-HR AVERAGE:	14.1	ppb	@ HOUR	21	ON DAY	14
MAXIMUM 24-HR AVERAGE:	4.4	ppb			ON DAY	7
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	730	hrs	
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	98.1	%	
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	2.9	ppb	

24 HR AVERAGES July 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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	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	6	5	6	6	8	6	7	5	4	4	19	20	7	8	12	4	S	21	10	15	11	7	9	4	21	9	24	
2	4	4	5	6	8	5	5	8	3	10	10	9	5	3	2	2	S	3	3	5	12	24	7	9	2	24	7	24	
3	5	5	4	4	4	6	8	7	5	4	4	4	4	5	3	S	4	3	3	4	4	4	4	3	3	8	4	24	
4	3	2	3	3	2	2	2	6	2	7	3	4	5	C	C	C	C	C	C	C	C	C	11	9	7	2	11	4	24
5	4	5	4	5	2	3	13	4	4	7	3	3	4	S	4	4	3	9	3	4	5	39	5	4	2	39	6	24	
6	3	2	4	8	8	4	6	10	5	9	4	5	S	4	23	25	8	7	5	4	7	6	9	8	2	25	8	24	
7	5	4	6	8	7	15	15	11	5	3	2	S	13	12	3	3	8	6	16	39	12	17	26	7	2	39	11	24	
8	3	6	6	7	11	10	4	3	3	9	S	9	2	1	2	3	8	6	3	6	5	5	4	3	1	11	5	24	
9	4	3	10	8	9	11	5	3	2	S	12	7	14	11	10	4	3	3	22	7	6	5	5	2	2	22	7	24	
10	3	2	2	3	6	11	10	6	S	3	3	4	4	3	10	3	4	3	3	2	2	3	6	3	2	11	4	24	
11	3	2	2	4	9	14	4	S	5	4	5	7	6	29	6	1	11	5	3	2	3	5	5	4	1	29	6	24	
12	3	4	2	2	P	4	3	S	7	3	8	5	6	7	2	2	2	3	3	15	2	23	15	5	3	2	23	6	23
13	3	2	2	3	3	S	10	4	8	50	10	4	15	8	6	17	11	10	19	2	2	2	3	2	2	50	9	24	
14	2	3	3	3	S	8	6	4	4	3	4	8	2	3	2	3	17	15	2	4	12	27	14	9	2	27	7	24	
15	7	7	6	S	8	5	4	3	3	7	3	2	5	2	11	3	3	8	15	1	7	3	4	P	1	15	5	23	
16	5	3	S	6	P	12	7	3	3	6	4	7	6	5	4	4	3	3	3	3	10	3	2	2	2	12	5	23	
17	1	S	2	2	1	1	2	2	7	9	2	2	2	2	4	4	3	2	2	3	3	2	1	2	1	9	3	24	
18	S	1	2	2	3	2	5	9	6	6	6	5	11	5	4	12	2	2	3	3	7	9	5	S	1	12	5	24	
19	2	12	12	12	4	7	9	5	5	3	3	4	10	2	7	33	8	3	28	19	24	17	S	4	2	33	10	24	
20	5	16	11	11	8	7	10	17	8	23	6	5	6	6	8	4	4	3	12	3	3	S	3	2	2	23	8	24	
21	2	3	4	3	2	6	12	9	9	3	4	8	3	3	3	3	4	5	4	S	9	8	8	2	2	12	5	24	
22	6	9	9	4	3	4	2	P	3	7	6	2	2	8	5	4	2	6	5	S	7	7	4	14	2	14	5	23	
23	13	12	14	8	3	3	P	3	27	28	3	2	2	2	1	2	2	S	6	P	4	4	2	1	28	7	22		
24	2	2	2	1	1	1	1	1	1	1	6	8	18	2	2	4	4	S	1	1	2	2	3	2	1	18	3	24	
25	2	2	2	4	5	5	4	4	3	3	3	2	2	3	1	3	S	12	2	11	6	20	9	5	1	20	5	24	
26	7	13	8	17	P	6	14	12	3	8	14	11	8	5	8	S	14	12	3	4	25	8	6	7	3	25	10	23	
27	7	6	3	4	9	8	7	5	12	4	11	13	5	3	S	13	12	7	6	9	10	17	7	2	2	17	8	24	
28	3	3	3	4	3	4	4	3	2	8	3	2	2	S	2	2	2	4	2	13	8	12	10	3	2	13	4	24	
29	4	3	6	9	7	5	6	5	4	3	3	3	S	6	2	2	2	2	7	4	14	8	4	5	2	14	5	24	
30	4	P	3	5	6	7	5	4	5	5	5	S	3	3	3	3	3	3	3	3	5	7	6	6	3	7	4	23	
31	2	1	1	3	4	7	6	4	6	8	C1	C1	C1	C1	C1	C1	C1	C1	C1						1	8	4	10	
HOURLY MAX	13	16	14	17	11	15	15	17	27	50	14	19	20	29	23	33	17	15	28	39	25	39	26	14					
HOURLY AVG	4	5	5	6	5	6	7	6	5	8	5	6	7	5	5	6	6	5	8	6	9	10	6	5					

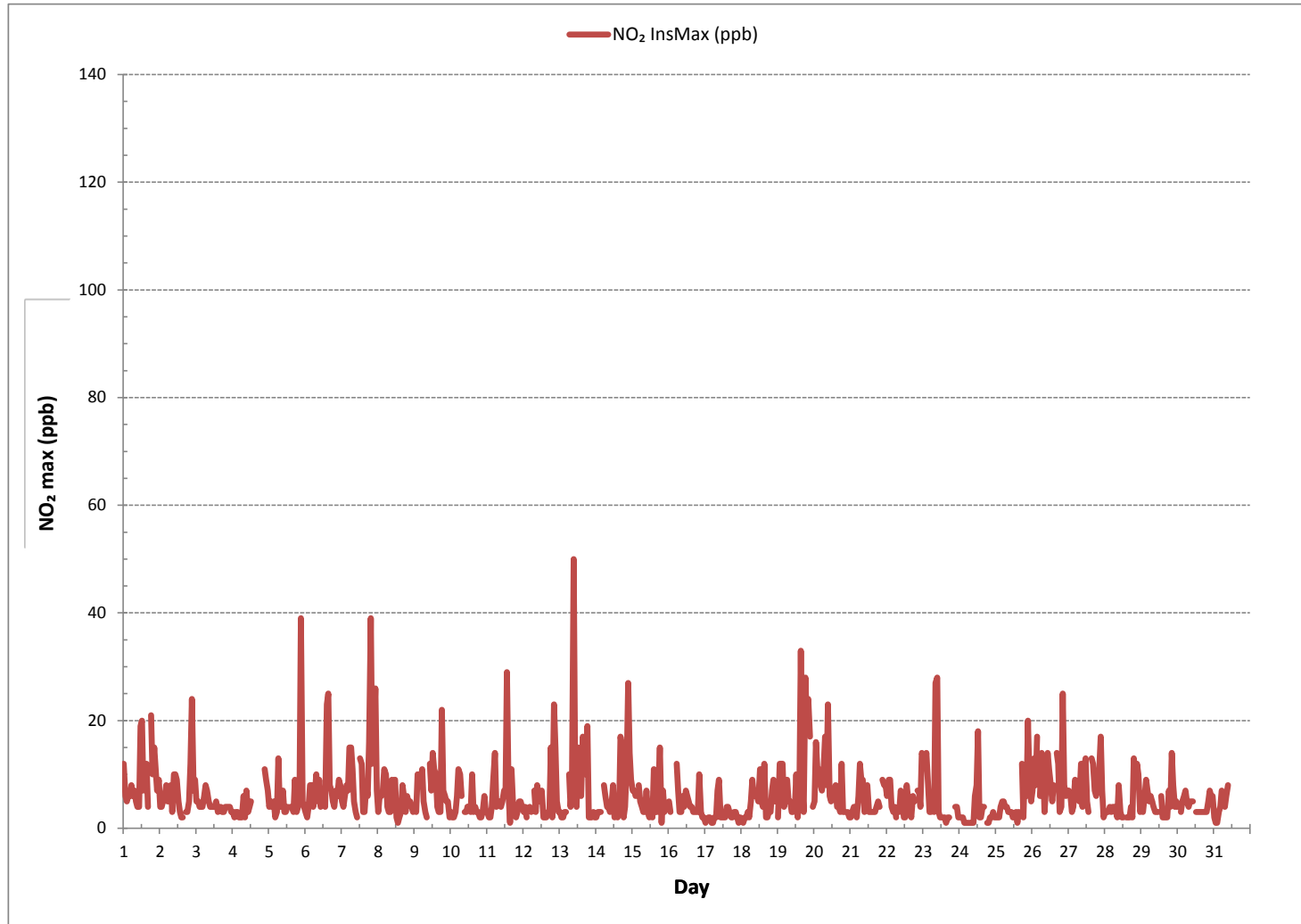
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	50 ppb @ HOUR 9 ON DAY 13
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	722 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



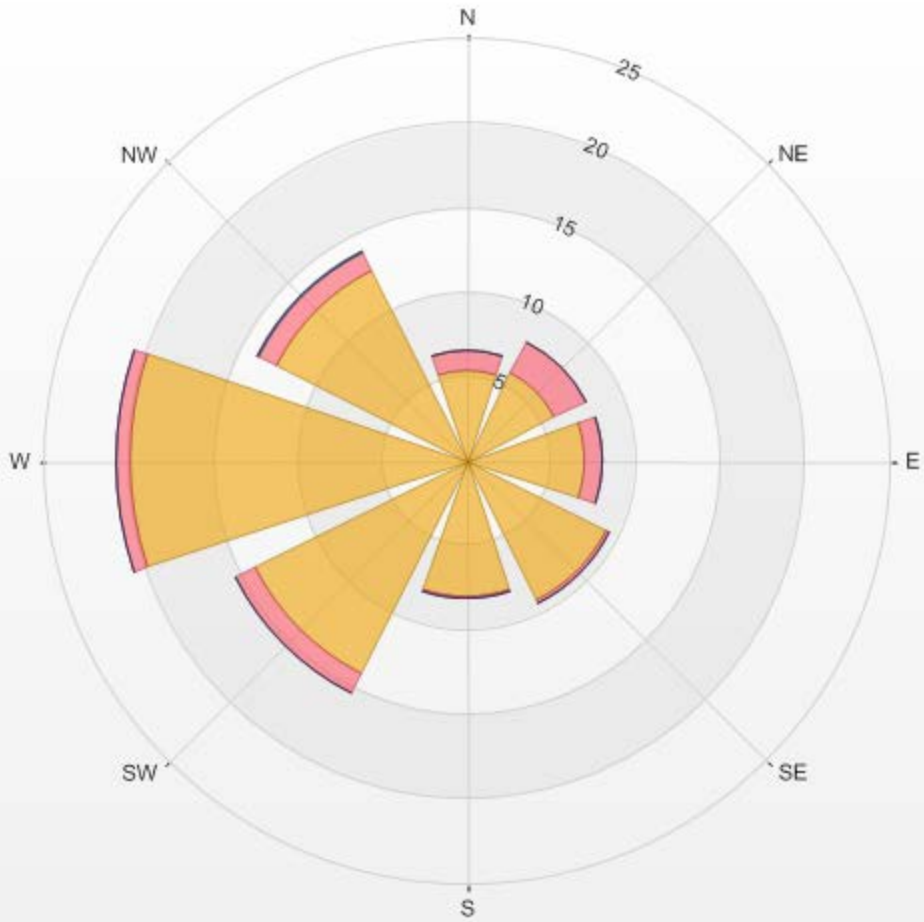
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NO2[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.80% Calm Avg: 4.67 [ppb]

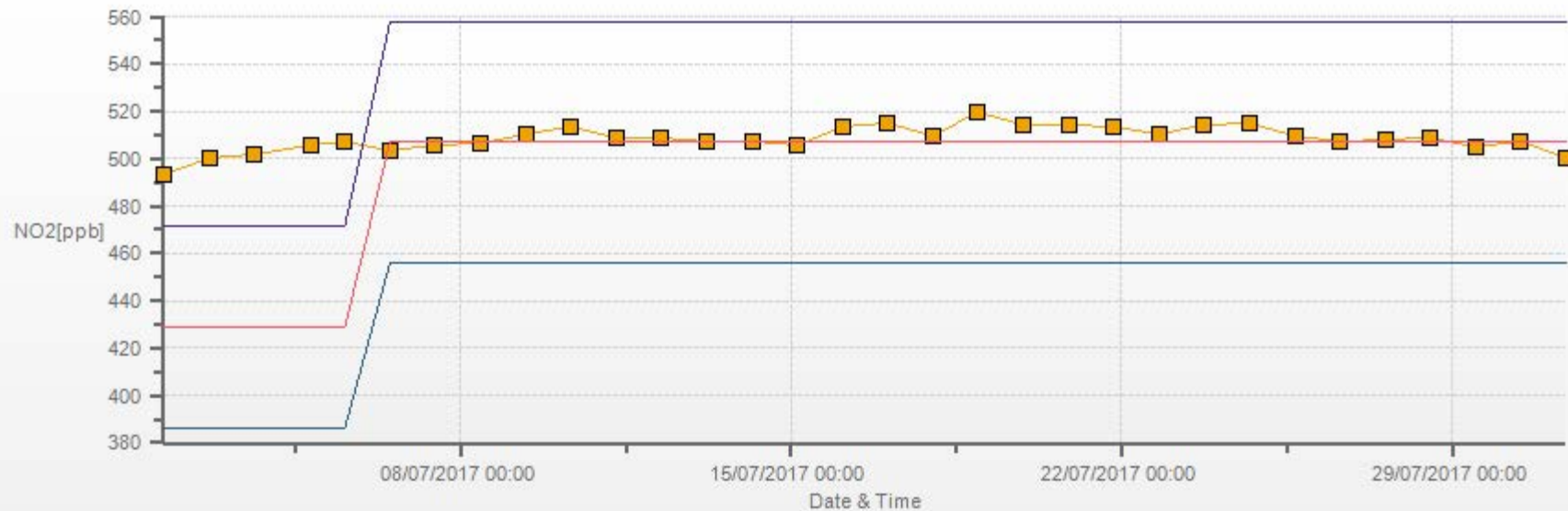
Direction	0.0-4.7	4.7-9.5	9.5-14.2	>14.2	Total
N	5.4	1.2	0.0	0.0	6.6
NE	5.9	2.1	0.0	0.0	7.9
E	7.0	1.0	0.0	0.0	8.0
SE	9.2	0.3	0.0	0.0	9.5
S	8.0	0.2	0.0	0.0	8.2
SW	14.0	1.3	0.0	0.0	15.4
W	19.9	0.9	0.0	0.0	20.8
NW	12.6	1.2	0.2	0.0	13.9
Summary	82.0	8.1	0.2	0.0	90.2

% Icon Classes (ppb) 82 0.0-4.7 8 4.7-9.5 0 9.5-14.2 0 >14.2

LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.80% Calm Poll Avg: 4.67[ppb]



NO2[ppb] Calibration: LICA Bonnyville Monthly: 17/07 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	9.7	9.2	7.9	6.7	7.2	6.8	6.5	9.3	13.0	20.9	29.9	32.8	33.5	33.2	32.0	30.4	31.3	S	33.7	34.8	33.5	29.9	27.8	28.1	6.5	34.8	22.1	24
2	26.6	24.0	21.1	23.3	18.0	17.4	17.5	16.3	35.9	44.1	46.8	47.2	47.6	50.1	51.7	52.4	S	51.6	50.9	49.8	47.1	38.6	36.3	31.7	16.3	52.4	36.8	24
3	28.2	26.9	26.5	25.4	25.0	24.2	21.7	24.7	28.1	33.9	35.1	36.5	37.2	38.6	41.7	S	42.4	39.6	34.0	36.3	33.5	30.9	29.2	27.4	21.7	42.4	31.6	24
4	26.5	26.1	25.0	24.0	23.1	23.2	24.1	26.3	27.8	28.9	30.8	33.2	34.2	37.5	S	34.2	39.4	42.4	41.7	41.1	37.6	28.1	27.1	26.8	23.1	42.4	30.8	24
5	29.5	24.9	23.3	21.6	21.1	19.3	19.6	23.5	25.7	C	C	C	C	30.3	30.2	31.7	31.7	30.5	31.2	30.2	26.6	23.7	22.2	21.1	19.3	32.0	26.0	24
6	21.5	20.7	18.7	16.8	16.2	19.0	18.4	24.5	27.7	32.1	34.8	36.9	S	39.3	38.9	39.0	37.3	37.6	37.4	35.5	30.1	26.7	21.1	16.7	16.2	39.3	28.1	24
7	16.3	15.8	11.4	8.6	10.2	6.0	10.4	15.7	23.6	32.0	34.2	S	34.7	35.2	36.7	37.9	38.5	38.1	37.8	37.9	30.7	27.1	26.2	27.8	6.0	38.5	25.8	24
8	30.6	23.7	18.5	15.4	10.7	24.1	23.9	25.0	30.5	33.4	S	33.6	36.4	39.4	41.0	41.9	41.2	43.8	40.7	30.7	35.4	37.7	39.2	39.0	10.7	43.8	32.0	24
9	39.1	41.3	35.1	27.8	23.0	25.5	33.6	37.7	41.8	S	37.5	37.5	41.3	44.6	44.7	47.2	49.3	49.8	44.5	35.4	30.7	26.5	26.1	42.0	23.0	49.8	37.5	24
10	38.8	37.7	40.0	35.4	28.7	28.4	28.2	35.7	S	45.0	46.1	46.2	40.9	44.7	44.4	41.0	37.0	35.1	35.8	37.2	33.9	28.7	25.2	26.0	25.2	46.2	36.5	24
11	22.5	26.3	28.9	26.2	17.6	13.8	17.7	S	24.0	30.8	30.2	30.1	32.5	29.6	26.9	26.3	25.5	27.3	25.4	24.2	23.5	21.6	19.3	20.1	13.8	32.5	24.8	24
12	18.6	16.2	16.6	16.0	16.1	19.4	S	19.5	30.0	31.7	37.8	36.5	36.7	38.0	33.5	33.6	30.8	28.5	26.6	27.3	27.1	29.2	29.4	32.9	16.0	38.0	27.5	24
13	32.3	31.8	30.6	28.3	27.2	S	17.1	25.8	25.8	30.5	35.9	42.1	44.8	48.5	47.3	48.0	48.7	48.7	46.6	49.1	57.8	50.9	44.4	40.3	17.1	57.8	39.2	24
14	35.1	32.8	33.5	30.4	S	24.1	28.6	27.8	30.7	29.9	31.6	33.8	37.7	40.1	42.2	40.4	38.7	38.2	36.8	35.6	29.9	14.2	16.4	16.3	14.2	42.2	31.5	24
15	15.8	19.8	19.0	S	18.3	22.2	26.5	34.4	41.3	46.3	51.2	52.5	51.7	50.9	51.6	50.9	48.6	46.9	45.6	46.7	44.7	42.8	39.9	37.5	15.8	52.5	39.4	24
16	35.1	33.8	S	27.1	22.4	15.9	22.8	33.6	39.6	39.1	40.2	35.7	32.7	30.2	28.7	22.8	21.0	24.3	23.2	22.0	21.7	22.5	22.1	22.0	15.9	40.2	27.8	24
17	22.5	S	19.4	18.1	17.4	16.6	15.5	16.0	17.0	19.0	20.5	21.8	23.3	25.6	25.0	23.5	19.4	20.5	21.1	19.3	20.0	24.4	24.0	20.1	15.5	25.6	20.4	24
18	S	19.1	18.6	15.9	15.0	13.8	16.2	15.5	18.3	19.1	25.0	23.1	27.0	25.0	22.7	25.6	28.6	29.3	28.9	26.1	21.6	14.9	16.5	S	13.8	29.3	21.2	24
19	14.1	10.0	4.4	8.2	10.5	10.3	13.9	16.7	22.2	27.9	30.9	33.1	36.4	41.2	42.9	42.6	41.5	41.1	40.1	35.9	30.6	29.1	S	25.4	4.4	42.9	26.5	24
20	23.1	18.8	24.6	17.8	10.9	10.8	12.7	18.0	21.4	25.3	23.3	22.9	22.9	21.5	23.4	24.7	28.2	28.6	26.7	23.1	21.8	S	19.5	21.0	10.8	28.6	21.3	24
21	23.6	22.0	25.1	24.5	22.5	16.7	10.3	14.4	12.0	24.4	32.0	28.0	45.6	46.8	46.9	44.5	43.5	42.2	41.7	36.2	S	28.5	22.7	18.9	10.3	46.9	29.3	24
22	18.0	13.5	10.5	15.8	14.7	15.1	15.0	17.8	24.7	27.5	32.1	35.3	36.9	40.3	36.2	34.2	36.1	37.3	30.0	S	29.2	23.3	25.5	19.3	10.5	40.3	25.6	24
23	19.0	17.0	17.8	21.9	25.8	28.1	22.5	27.8	32.8	34.2	35.0	31.0	30.4	29.6	29.0	31.7	32.8	33.7	S	25.6	23.3	25.6	18.4	23.1	17.0	35.0	26.8	24
24	22.4	21.2	18.5	25.0	28.7	26.3	21.6	19.9	20.7	19.1	20.0	22.1	24.9	23.6	22.4	33.6	31.9	S	18.0	17.2	16.1	15.6	14.9	14.9	14.9	33.6	21.7	24
25	14.7	14.6	14.5	12.2	11.2	9.8	10.9	14.2	18.4	24.4	26.3	28.8	32.3	36.7	38.5	37.8	S	36.1	33.0	26.8	22.1	18.7	17.7	19.6	9.8	38.5	22.6	24
26	15.2	14.7	17.0	16.0	7.8	21.4	20.7	21.4	28.2	36.5	39.9	40.6	45.4	47.8	49.4	S	47.9	47.3	46.6	43.4	40.3	34.1	36.2	37.7	7.8	49.4	32.8	24
27	31.8	30.9	31.0	27.7	15.3	12.1	13.5	19.0	24.1	32.8	38.6	40.4	40.3	40.2	S	45.6	46.5	45.1	43.6	35.4	28.1	22.1	27.8	31.2	12.1	46.5	31.4	24
28	26.9	29.2	25.7	24.2	22.8	21.7	20.4	20.4	23.2	25.2	25.2	25.6	24.8	S	25.8	27.1	27.9	27.4	26.6	23.6	19.5	16.2	17.3	21.5	16.2	29.2	23.8	24
29	19.3	19.4	16.0	15.5	16.3	19.1	21.6	22.1	27.8	34.2	40.0	41.7	S	42.2	44.1	44.0	42.5	43.1	40.6	40.3	37.0	32.9	31.0	31.7	15.5	44.1	31.4	24
30	30.8	28.7	26.5	21.9	17.9	16.2	18.5	24.5	14.7	16.4	23.4	S	39.8	43.2	40.8	36.6	34.2	30.7	28.7	30.2	28.5	25.1	24.7	22.3	14.7	43.2	27.1	24
31	19.9	18.4	18.3	18.9	19.1	19.4	19.4	20.6	23.3	26.4	S	30.3	29.7	27.3	26.7	26.0	C1	C1	C1						18.3	30.3	22.9	16
HOURLY MAX	39.1	41.3	40.0	35.4	28.7	28.4	33.6	37.7	41.8	46.3	51.2	52.5	51.7	50.9	51.7	52.4	49.3	51.6	50.9	49.8	57.8	50.9	44.4	42.0				
HOURLY AVG	24.3	23.0	21.5	20.6	18.0	18.2	19.0	22.3	25.8	30.0	33.4	34.3	35.8	37.4	36.8	36.4	36.5	37.3	35.1	33.0	30.4	27.2	25.8	26.3				

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

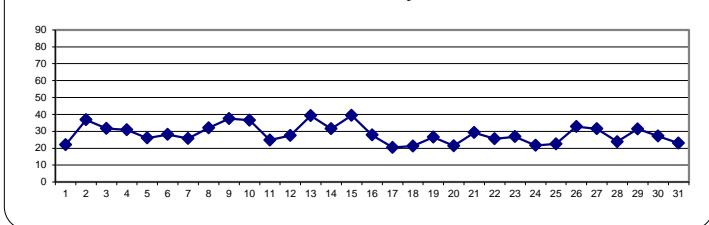
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

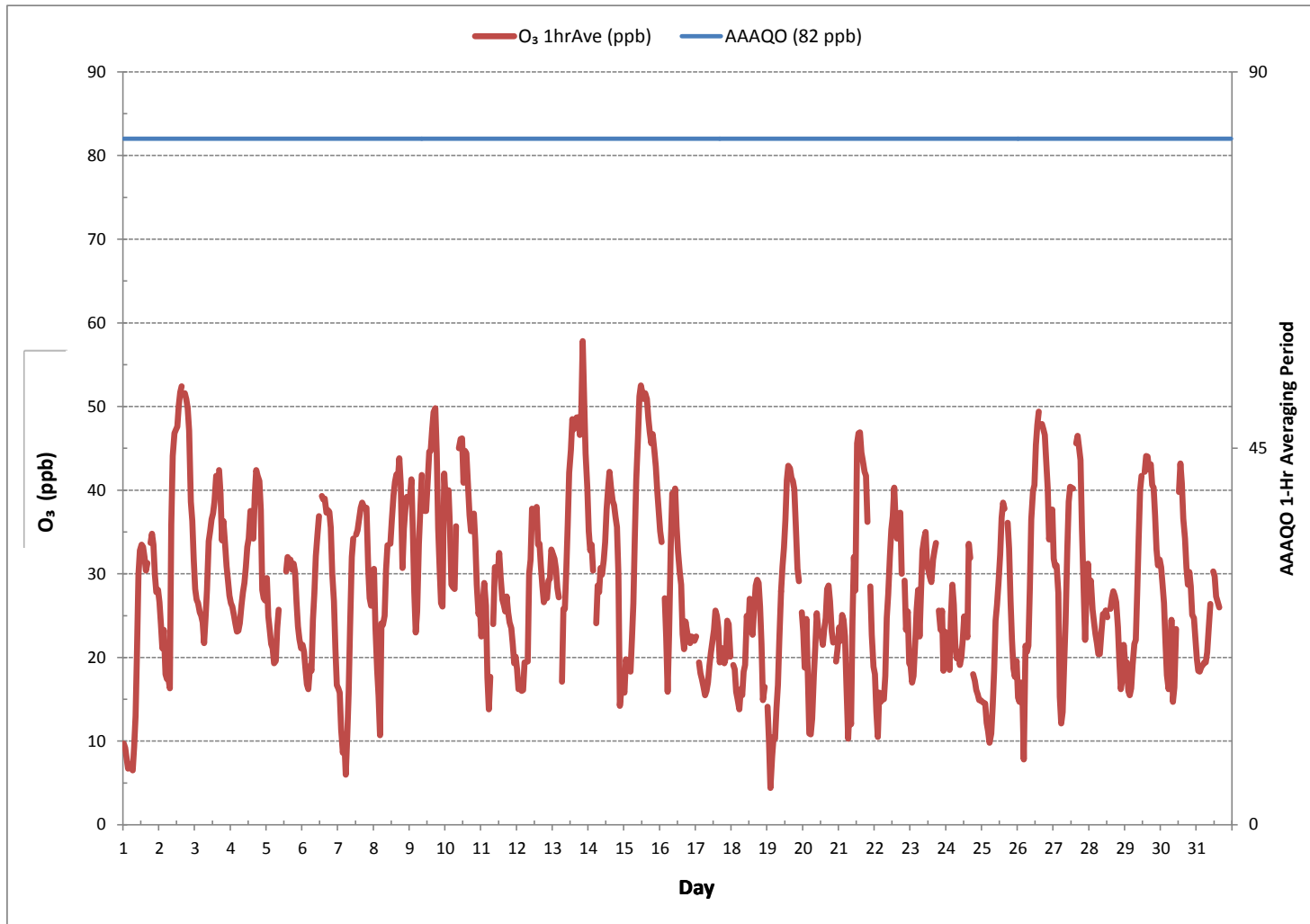
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	701			
MINIMUM 1-HR AVERAGE:	4.40 ppb	@ HOUR	2	ON DAY 19
MAXIMUM 1-HR AVERAGE:	57.8 ppb	@ HOUR	20	ON DAY 13
MAXIMUM 24-HR AVERAGE:	39.4 ppb			ON DAY 15
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	736 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.9 %	
STANDARD DEVIATION:	10.2	MONTHLY AVERAGE:	28.5 ppb	

24 HR AVERAGES July 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	11.2	10.1	8.4	7.2	8.7	7.2	7.6	11.1	18.5	23.1	33.7	33.5	33.9	34.3	32.6	31.7	31.5	S	34.9	35.7	35.0	31.7	29.4	29.1	7.2	35.7	23.5	24
2	29.0	28.1	23.4	24.9	18.9	18.6	18.8	24.0	40.2	45.7	47.9	48.2	49.1	50.9	52.4	52.5	S	51.6	51.2	50.7	49.2	40.8	37.9	33.8	18.6	52.5	38.6	24
3	28.4	26.7	26.4	26.1	25.3	27.8	22.6	26.3	29.7	35.3	37.2	38.3	38.0	40.0	42.3	S	43.8	40.8	36.9	36.8	35.1	32.3	30.2	28.8	22.6	43.8	32.8	24
4	27.0	26.4	25.8	24.8	24.0	24.0	25.4	27.6	28.8	29.9	33.1	34.2	35.3	39.0	S	41.0	41.7	43.6	42.9	43.0	40.5	33.1	30.6	31.2	24.0	43.6	32.7	24
5	31.8	26.3	25.7	23.1	22.3	20.7	23.3	25.2	C	C	C	C	C	31.9	33.2	33.1	32.9	32.0	32.1	32.3	29.8	26.1	24.3	22.8	20.7	33.2	27.8	24
6	23.1	22.2	19.9	20.1	19.7	21.0	24.3	27.8	30.0	34.5	36.5	41.2	S	41.2	42.6	41.5	40.2	39.6	38.6	37.5	33.2	29.1	24.0	18.5	18.5	42.6	30.7	24
7	17.3	17.3	15.6	10.6	12.3	8.1	14.4	19.5	28.2	33.5	36.9	S	35.6	36.6	37.8	39.3	39.2	38.8	39.4	40.5	35.6	30.3	31.4	30.4	8.1	40.5	28.2	24
8	31.8	30.7	23.3	16.5	12.6	28.0	25.8	26.0	34.1	34.1	S	35.0	38.0	40.2	42.6	43.4	44.8	45.9	46.7	33.7	37.2	39.7	40.5	40.2	12.6	46.7	34.4	24
9	41.7	42.9	40.9	35.3	25.6	28.8	36.6	41.8	45.4	S	39.3	39.6	43.6	47.1	47.0	48.9	50.7	51.0	50.0	38.6	32.6	27.9	44.8	44.4	25.6	51.0	41.1	24
10	40.3	41.6	41.0	39.7	32.0	32.3	34.5	38.5	S	46.7	48.3	48.6	47.1	47.7	46.8	43.5	40.3	36.8	37.2	38.4	38.1	30.1	27.6	29.1	27.6	48.6	39.4	24
11	25.1	29.1	30.3	29.1	22.3	16.0	20.7	S	29.2	32.5	32.6	32.6	34.0	33.9	28.2	27.8	26.9	28.7	28.7	25.8	25.6	24.0	20.8	22.1	16.0	34.0	27.2	24
12	21.2	17.7	18.3	P	18.3	20.4	S	24.1	32.5	35.1	39.5	38.7	37.6	39.1	38.6	35.3	34.4	30.4	29.5	29.5	29.1	31.0	31.7	33.8	17.7	39.5	30.3	23
13	33.7	32.1	31.3	30.0	28.2	S	25.8	28.0	28.7	35.0	37.8	45.6	49.7	50.0	48.7	50.0	51.2	51.3	49.5	69.2	68.6	53.2	49.2	43.0	25.8	69.2	43.0	24
14	36.9	33.7	34.6	32.0	S	27.5	31.3	29.0	32.1	32.1	32.9	35.6	40.5	43.5	44.2	41.7	40.7	39.9	37.9	37.6	34.9	22.8	21.9	21.3	21.3	44.2	34.1	24
15	18.9	22.6	21.4	S	22.5	23.5	29.9	39.1	43.8	49.8	52.8	54.6	53.0	52.4	53.4	52.5	50.9	48.6	47.0	47.7	45.6	43.6	41.7	P	18.9	54.6	41.6	23
16	35.9	34.4	S	31.2	P	19.9	28.5	38.7	41.1	42.5	43.6	39.4	40.0	32.5	30.9	28.1	23.5	25.8	26.6	23.1	22.9	23.4	22.8	24.1	19.9	43.6	30.9	23
17	24.4	S	20.5	19.4	18.6	17.3	16.7	16.7	18.9	20.2	22.5	23.8	24.3	27.0	27.3	27.0	22.2	21.9	22.5	20.4	24.0	26.6	26.0	22.9	16.7	27.3	22.2	24
18	S	20.3	19.7	17.5	16.4	17.0	18.0	18.4	21.6	24.0	29.1	25.1	30.6	28.4	25.1	29.4	30.2	30.7	30.7	28.7	28.4	17.7	18.3	S	16.4	30.7	23.9	24
19	14.9	14.7	10.9	13.7	11.4	14.0	16.0	18.5	25.1	29.5	32.5	35.1	39.6	44.4	44.4	44.6	42.5	42.8	42.0	40.5	33.8	34.4	S	26.4	10.9	44.6	29.2	24
20	25.3	24.1	27.3	24.3	12.0	12.1	15.0	20.4	24.5	28.2	25.9	25.6	25.9	22.9	24.8	27.0	29.4	29.6	28.4	24.4	22.5	S	20.8	22.3	12.0	29.6	23.6	24
21	25.8	24.4	30.4	29.6	22.9	20.1	13.4	20.1	21.8	29.6	35.7	42.0	49.4	48.6	48.2	48.5	44.8	43.6	44.4	43.5	S	31.6	25.5	23.5	13.4	49.4	33.4	24
22	19.9	19.4	14.3	17.7	15.4	16.5	16.0	P	29.0	28.7	35.1	37.1	39.6	41.6	39.1	35.4	38.3	38.7	35.3	S	32.6	28.5	27.0	26.1	14.3	41.6	28.7	23
23	22.9	21.5	21.3	26.3	28.8	32.3	P	31.8	34.1	36.2	36.5	33.2	31.5	32.0	32.1	32.9	34.3	34.4	S	31.2	P	30.7	21.6	23.7	21.3	36.5	30.0	22
24	23.3	21.7	19.4	30.4	30.4	28.2	23.5	21.0	22.2	21.4	21.9	24.8	27.3	25.2	27.3	38.3	38.8	S	18.6	18.4	16.7	16.4	15.4	15.6	15.4	38.8	23.7	24
25	15.3	15.1	14.9	14.0	12.0	11.1	13.5	16.4	22.5	27.0	28.1	31.2	35.3	39.5	40.2	39.7	S	39.6	34.9	31.0	26.3	20.6	20.4	22.5	11.1	40.2	24.8	24
26	19.5	18.9	18.1	18.0	P	23.3	23.1	22.6	34.1	39.8	41.5	44.6	47.6	49.1	51.2	S	50.0	49.5	48.9	45.5	45.5	37.2	39.6	39.9	18.0	51.2	36.7	23
27	35.1	32.3	32.0	30.7	25.3	14.1	16.2	22.8	26.3	38.1	40.5	42.9	42.3	41.3	S	48.5	48.9	47.8	46.2	44.6	31.8	27.8	32.5	33.1	14.1	48.9	34.8	24
28	29.1	32.2	29.0	27.3	24.3	23.3	21.8	21.8	24.8	26.7	26.4	26.6	26.0	S	26.6	28.8	28.8	28.8	28.0	27.7	25.0	19.4	21.0	23.7	19.4	32.2	26.0	24
29	21.2	21.0	19.4	17.7	17.7	20.8	22.9	23.5	32.0	39.3	41.9	43.8	S	43.8	45.7	45.3	43.6	44.8	43.6	42.1	40.5	36.5	31.9	34.3	17.7	45.7	33.6	24
30	34.9	P	28.4	26.9	20.5	20.2	31.7	31.9	18.5	19.2	28.8	S	43.8	44.8	45.5	38.4	35.9	33.7	31.0	31.3	30.7	27.2	24.7	18.5	45.5	30.7	23	
31	21.2	19.5	19.4	20.1	20.4	21.1	21.1	22.9	25.3	29.2	S	31.5	30.7	29.7	27.7	27.0	C1	C1	C1						19.4	31.5	24.5	16
HOURLY MAX	41.7	42.9	41.0	39.7	32.0	32.3	36.6	41.8	45.4	49.8	52.8	54.6	53.0	52.4	53.4	52.5	51.2	51.6	51.2	69.2	68.6	53.2	49.2	44.4				
HOURLY AVG	26.2	25.1	23.7	23.6	20.3	20.5	22.0	25.4	29.1	32.7	35.7	36.9	38.2	39.3	38.8	38.7	38.6	39.0	37.4	36.2	34.0	30.1	28.8	28.3				

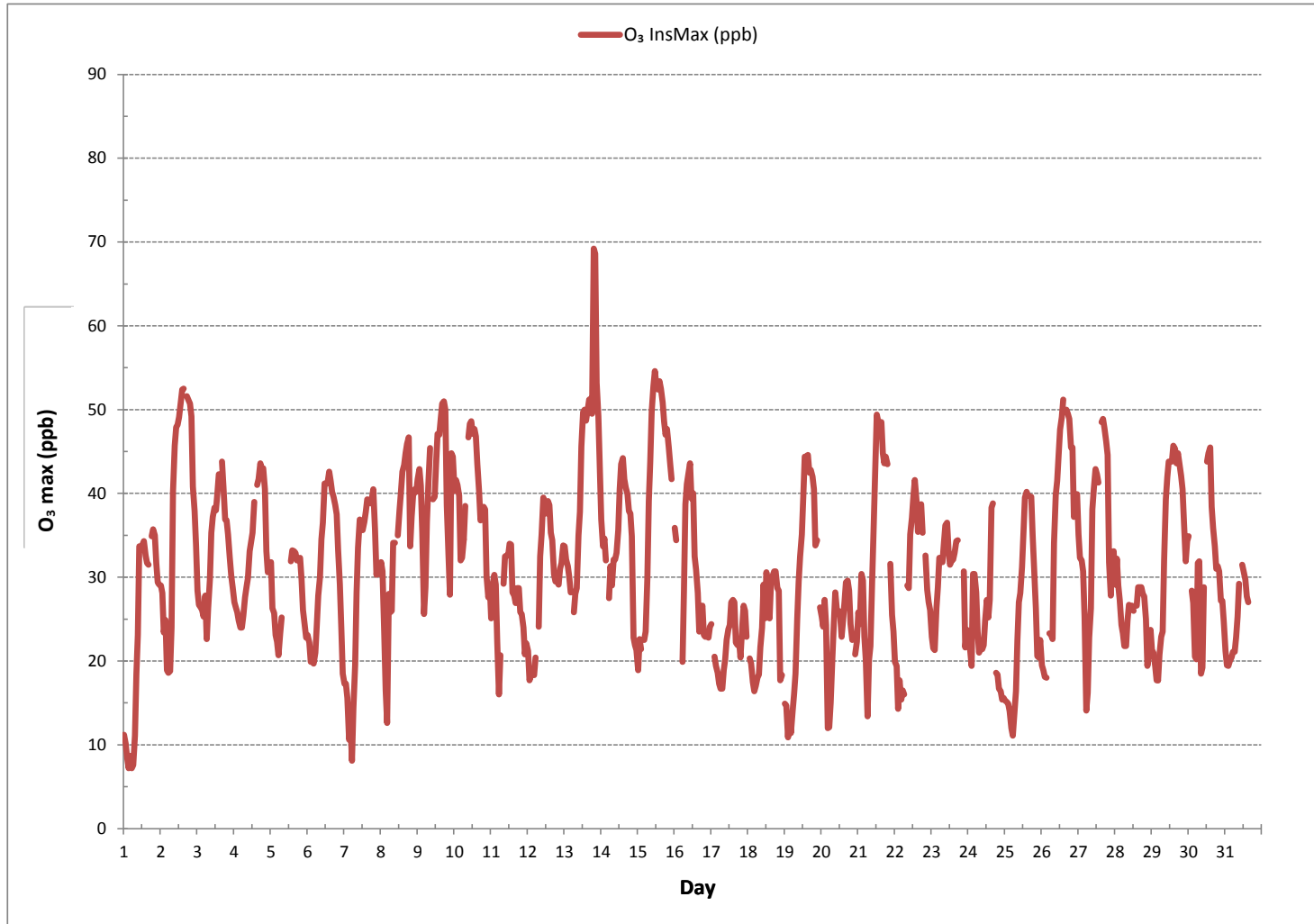
STATUS FLAG CODES

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:	692
MAXIMUM INSTANTANEOUS VALUE:	69.2 ppb @ HOUR 19 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	728 hrs
STANDARD DEVIATION:	10.2

OZONE Instantaneous Maximum (O₃ ppb)



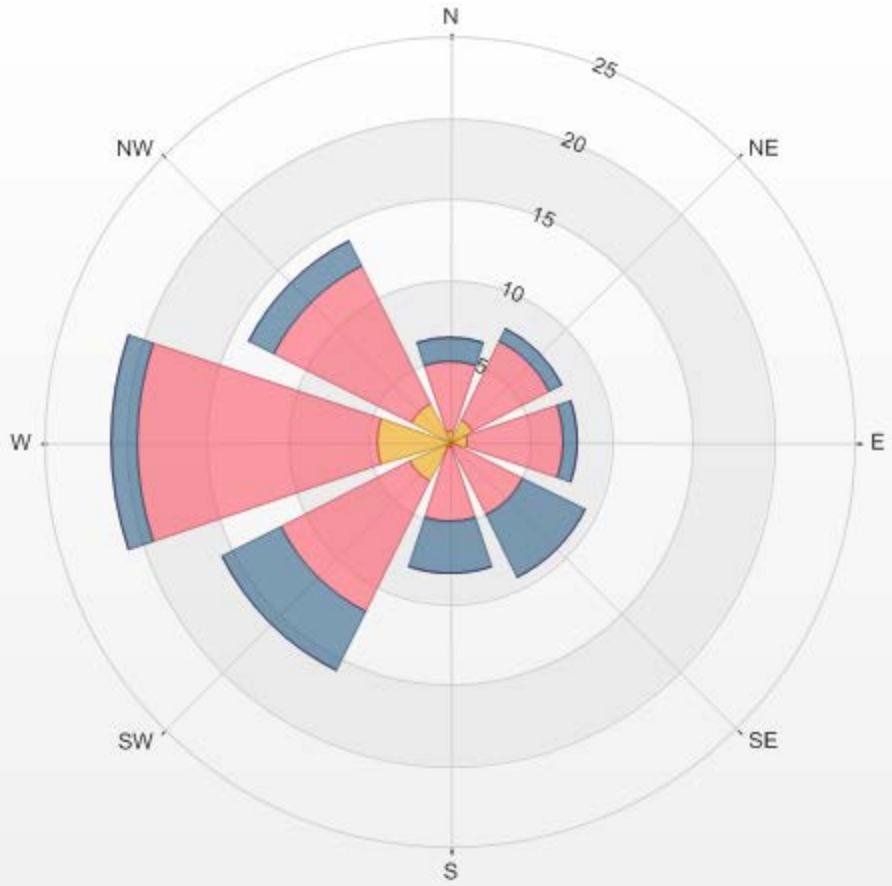
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-O3[ppb]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.68% Calm Avg: 19.37 [ppb]

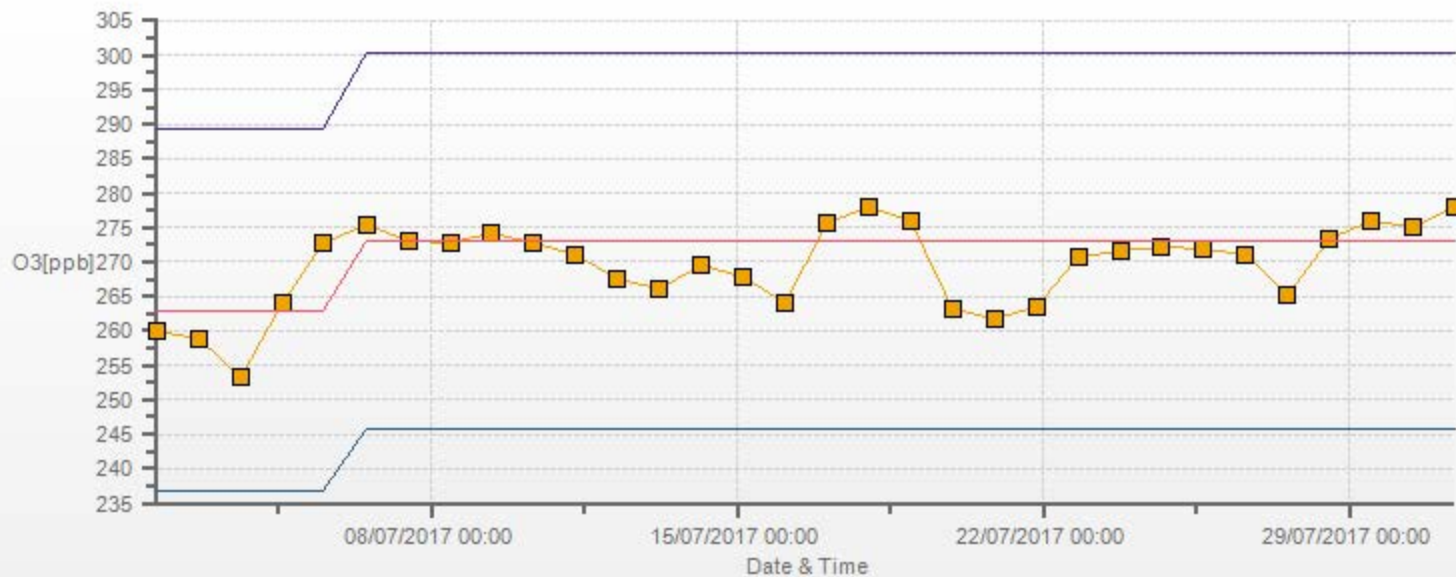
Direction	0.0-19.3	19.3-38.6	38.6-57.9	>57.9	Total
N	0.7	4.3	1.5	0.0	6.5
NE	1.6	5.4	0.9	0.0	7.8
E	1.2	5.9	0.9	0.0	8.0
SE	0.3	4.8	4.3	0.0	9.4
S	0.4	4.5	3.2	0.0	8.1
SW	2.8	9.0	4.1	0.0	15.8
W	4.5	14.9	1.6	0.0	21.0
NW	2.6	9.5	1.7	0.0	13.9
Summary	14.0	58.2	18.1	0.0	90.3

% Icon Classes (ppb) 14 0.0-19.3 58 19.3-38.6 18 38.6-57.9 0 >57.9

LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.68% Calm Poll Avg: 19.37[ppb]



O3[ppb] Calibration: LICA Bonnyville Monthly: 17/07 Type: Span



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

PARTICULATE MATTER 2.5

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

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	3	2	3	3	3	3	4	6	5	7	4	3	3	3	2	3	1	2	4	8	6	6	6	6	6	1	8	4	24
2	7	8	7	5	6	7	6	7	0	0	0	1	2	2	1	1	1	1	3	3	5	6	7	6	0	8	4	24	
3	6	4	4	4	4	7	5	7	5	7	8	2	1	1	0	0	0	3	2	0	2	3	3	3	0	8	3	24	
4	1	0	0	1	0	1	0	0	0	0	0	0	0	1	3	4	3	3	3	8	12	8	6	6	0	12	3	24	
5	0	0	3	3	2	3	2	2	1	1	1	2	2	2	2	4	C	5	5	5	8	7	8	0	8	3	8	3	24
6	6	5	4	2	5	5	6	6	8	6	8	3	0	2	2	4	2	4	6	8	9	10	9	12	0	12	6	24	
7	8	6	6	6	6	6	8	9	9	X	1	2	2	3	3	3	3	4	4	10	10	9	8	8	1	10	6	23	
8	6	5	8	6	9	6	5	8	7	6	4	2	2	5	4	7	6	6	12	11	7	12	13	16	2	16	7	24	
9	16	15	17	16	16	17	19	17	17	16	10	8	11	9	10	10	9	11	18	14	8	13	14	X	8	19	14	23	
10	1	0	3	7	5	6	9	8	6	6	6	11	11	3	4	7	10	9	7	9	11	9	8	6	0	11	7	24	
11	6	3	3	4	6	4	5	4	2	2	5	5	6	1	3	6	1	0	7	7	4	5	3	2	0	7	4	24	
12	4	4	4	3	3	2	4	4	0	2	1	7	4	5	7	0	6	5	3	4	6	2	3	1	0	7	4	24	
13	3	2	2	2	2	4	7	3	5	10	6	5	7	7	7	9	8	6	6	7	6	0	6	3	0	10	5	24	
14	5	6	7	7	7	7	9	11	10	12	12	14	11	10	14	9	19	12	17	15	17	40	29	22	5	40	13	24	
15	21	13	17	13	12	11	13	9	10	4	5	15	12	10	10	6	10	7	8	8	7	7	8	5	4	21	10	24	
16	6	7	2	3	7	11	8	5	9	15	18	24	34	26	21	14	0	28	40	47	51	43	23	11	0	51	19	24	
17	6	6	5	4	2	1	0	1	1	2	2	4	1	1	3	8	0	X	0	0	0	2	1	0	0	8	2	23	
18	1	0	1	2	2	1	1	1	0	1	1	0	0	2	1	0	0	0	2	2	3	2	2	2	0	3	1	24	
19	0	0	10	13	6	5	3	4	0	2	6	5	7	8	13	8	10	13	21	28	26	21	25	4	0	28	10	24	
20	4	15	22	24	16	6	7	11	12	17	16	19	21	11	14	11	12	14	15	12	6	7	6	11	4	24	13	24	
21	10	6	6	15	9	12	11	11	9	7	7	11	3	8	8	16	5	2	3	6	6	6	8	10	2	16	8	24	
22	7	4	6	3	4	8	13	6	8	14	9	11	7	1	10	12	5	12	19	9	19	12	10	6	1	19	9	24	
23	13	11	16	0	2	1	7	3	0	0	1	0	0	0	0	0	0	2	0	8	1	11	3	X	0	16	3	23	
24	0	0	1	X	X	X	0	X	X	0	0	C	C	5	5	4	2	9	9	8	8	7	5	5	0	9	4	19	
25	5	5	5	6	5	5	4	6	10	10	8	5	2	2	1	1	1	2	5	7	5	5	5	3	1	10	5	24	
26	2	3	3	3	7	4	4	7	5	3	3	3	3	3	4	5	4	5	6	6	7	7	7	6	2	7	5	24	
27	6	5	4	5	5	6	6	6	8	5	5	6	7	8	6	9	11	10	8	15	12	16	3	2	2	16	7	24	
28	4	6	11	8	10	10	11	14	14	8	1	0	0	1	0	2	4	6	6	9	13	8	8	5	0	14	7	24	
29	9	7	9	8	7	8	7	8	8	10	8	5	2	4	5	5	6	4	8	11	9	11	8	6	2	11	7	24	
30	6	6	6	7	6	7	10	9	10	8	8	8	5	9	11	10	13	15	13	14	15	16	18	17	5	18	10	24	
31	12	11	10	7	7	5	4	2	5	3	1	0	1	1	3	1	1	C1	19	28	40	47	51	43	29	22	0	12	4
HOURLY MAX	21	15	22	24	16	17	19	17	17	17	18	24	34	26	21	16	19	28	40	47	51	43	29	22					
HOURLY AVG	6	5	7	6	6	6	6	7	6	6	5	6	6	5	6	6	5	7	9	10	10	10	9	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

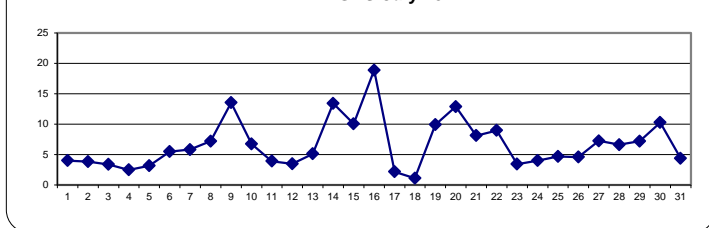
OBJECTIVE LIMIT:

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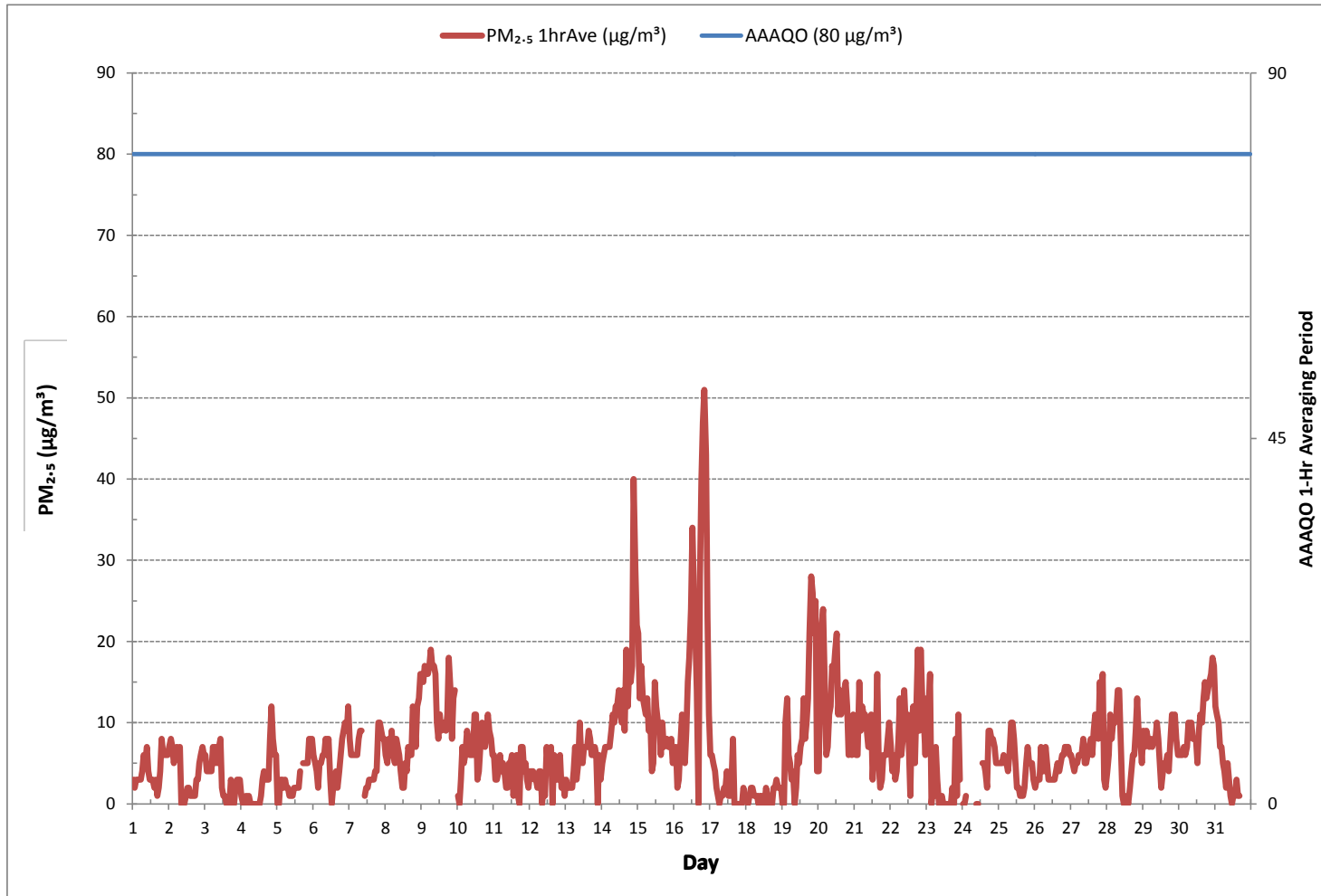
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	664			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	8	ON DAY	2
MAXIMUM 1-HR AVERAGE:	51 µg/m ³ @ HOUR	20	ON DAY	16
MAXIMUM 24-HR AVERAGE:	19 µg/m ³		ON DAY	16
MONTHLY CALIBRATION TIME:	3 hrs	OPERATIONAL TIME:	728 hrs	
STANDARD DEVIATION:	6	AMD OPERATION UPTIME:	97.8 %	
		MONTHLY AVERAGE:	7 µg/m ³	

24 HR AVERAGES July 2017



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



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-PM25[ug/m³(L)]
 Monthly: 17/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

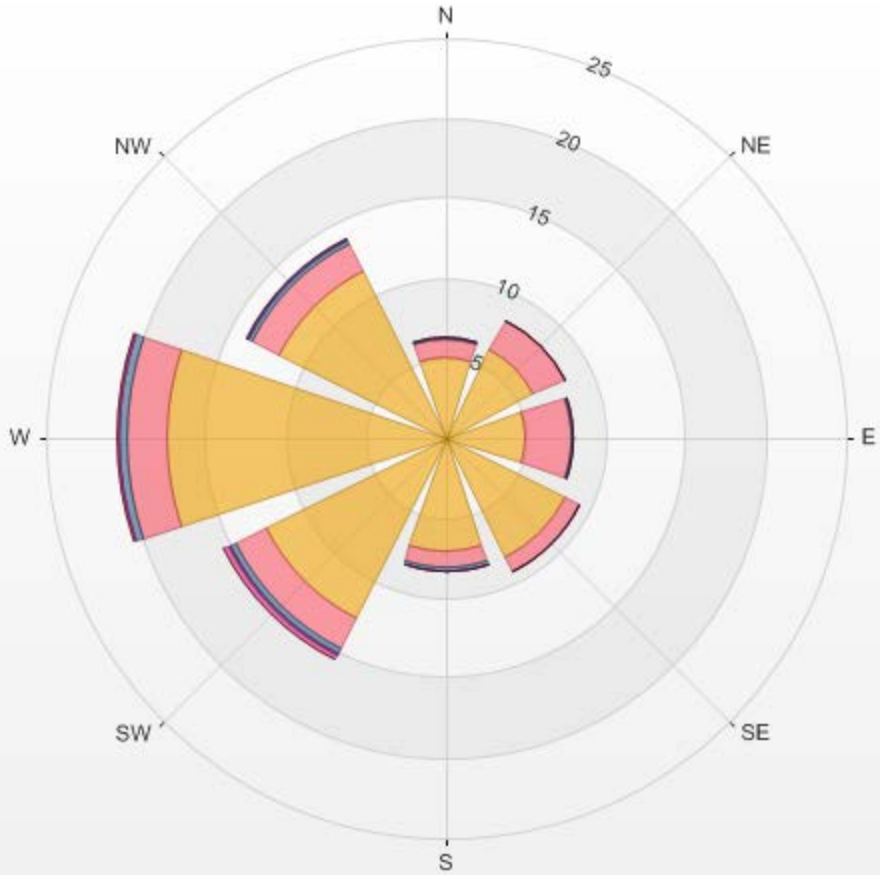
Calm: 9.79%

Calm Avg: 7.65 [ug/m³]

Direction	0.0-10.4	10.4-20.8	20.8-31.2	31.2-41.6	41.6-52.0	>52.0	Total
N	5.0	1.1	0.1	0.0	0.0	0.0	6.3
NE	6.2	2.1	0.0	0.0	0.0	0.0	8.3
E	5.0	2.8	0.1	0.0	0.0	0.0	8.0
SE	8.4	1.0	0.0	0.0	0.0	0.0	9.4
S	7.1	1.0	0.1	0.0	0.0	0.0	8.3
SW	12.6	2.1	0.4	0.1	0.3	0.0	15.5
W	17.5	2.5	0.4	0.0	0.1	0.0	20.6
NW	11.8	1.8	0.3	0.1	0.0	0.0	14.0
Summary	73.6	14.4	1.5	0.3	0.4	0.0	90.2

% Icon Classes (ug/m3(L)) 74 0.0-10.4 14 10.4-20.8 2 20.8-31.2 0 31.2-41.6 0 41.6-52.0 0 >52.0

LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.79% Calm Poll Avg: 7.65[ug/m3(L)]



WIND SPEED



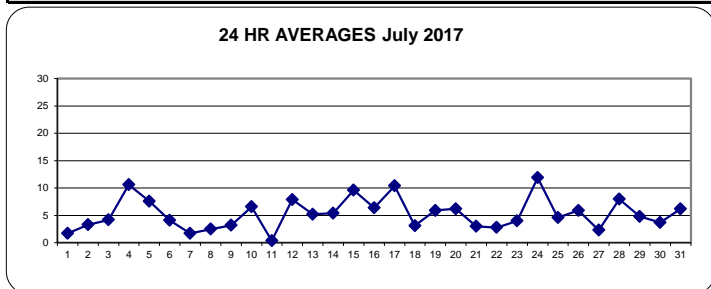
WIND SPEED Hourly Averages (WS kph)

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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	1.1	0.3	0.1	0.0	0.1	1.1	0.4	0.9	1.1	0.9	2.1	4.5	1.5	3.4	2.6	4.0	3.3	1.5	3.2	7.5	7.4	7.1	6.8	5.0	0.0	7.5	1.7	24	
2	1.6	2.8	3.2	3.1	3.7	4.6	6.3	6.8	11.9	14.3	10.5	9.9	6.5	3.7	3.2	2.0	1.9	2.0	4.3	3.7	4.3	3.8	4.9	2.7	1.6	14.3	3.3	24	
3	5.8	7.6	5.5	7.7	15.9	3.9	4.1	3.6	1.9	2.1	9.9	12.4	11.5	9.5	9.3	10.2	11.3	13.3	15.6	11.0	6.7	7.8	7.7	3.3	1.9	15.9	4.2	24	
4	5.6	5.4	5.3	7.5	8.3	10.2	11.2	12.0	13.2	15.4	14.5	15.4	14.0	19.1	18.1	21.2	24.4	16.5	11.4	5.8	2.6	2.5	2.0	2.7	2.0	24.4	10.6	24	
5	6.7	2.8	3.9	6.6	7.3	5.8	5.4	8.8	10.0	11.1	12.4	13.0	11.8	11.8	13.0	11.8	11.2	11.2	9.5	7.1	3.2	2.6	2.1	2.5	2.1	13.0	7.6	24	
6	3.7	2.2	2.0	0.9	0.8	2.4	4.4	4.2	3.1	2.6	3.8	6.2	9.1	7.6	8.3	9.5	6.8	7.7	8.2	6.2	4.1	2.8	2.0	0.2	0.2	9.5	4.1	24	
7	0.1	0.3	0.2	0.0	0.2	1.2	1.5	1.1	2.5	1.4	3.9	4.1	2.5	2.7	5.2	6.4	5.1	4.2	2.1	1.3	2.4	2.4	2.7	2.8	0.0	6.4	1.7	24	
8	5.2	1.2	3.5	1.7	6.1	10.2	7.6	5.9	5.7	4.6	3.8	3.9	2.7	2.1	0.3	2.6	4.7	4.5	6.0	5.4	7.9	5.7	5.6	4.1	0.3	10.2	2.5	24	
9	6.6	6.2	3.0	2.4	4.3	3.4	4.4	6.6	5.7	6.7	7.2	6.4	6.8	6.8	5.6	7.5	7.6	7.0	1.6	3.7	5.3	4.5	4.2	8.0	1.6	8.0	3.2	24	
10	2.9	11.0	13.1	6.3	4.3	5.1	6.2	8.1	8.4	6.4	7.3	6.0	9.7	8.9	6.6	8.2	7.7	7.4	7.8	9.1	6.6	7.1	6.7	5.8	2.9	13.1	6.6	24	
11	6.7	6.8	6.2	5.4	4.5	6.2	5.9	5.8	5.9	5.7	4.3	1.1	6.1	4.5	5.9	9.9	11.6	9.1	5.0	6.5	6.6	3.1	1.1	0.8	0.8	11.6	0.4	24	
12	0.3	1.7	2.5	4.4	5.2	4.7	5.6	6.7	12.2	12.3	13.3	15.0	15.0	17.2	17.7	14.0	9.2	3.5	3.6	7.2	8.2	7.5	5.9	12.7	0.3	17.7	7.9	24	
13	14.6	15.5	11.6	7.2	4.1	0.9	1.1	0.2	3.6	4.7	7.6	6.9	7.3	10.9	12.4	12.6	12.3	12.2	10.6	21.1	16.1	11.6	8.9	9.5	0.2	21.1	5.2	24	
14	10.7	10.2	8.5	7.9	5.3	3.2	6.4	6.5	8.4	7.8	7.7	7.3	7.1	7.3	9.3	8.1	7.3	6.5	4.7	1.7	0.8	0.8	0.2	0.3	0.2	10.7	5.4	24	
15	0.1	1.5	4.0	2.8	4.5	3.8	7.6	8.7	9.4	12.1	14.0	13.8	14.2	15.9	17.7	16.2	13.4	12.0	12.9	17.2	16.4	12.8	8.6	7.0	0.1	17.7	9.6	24	
16	8.3	8.9	7.0	3.3	3.4	7.4	10.0	10.6	8.9	8.0	14.8	16.4	14.5	8.3	11.7	13.7	13.1	9.3	11.0	10.9	15.8	13.0	10.2	11.0	3.3	16.4	6.4	24	
17	10.4	11.4	10.9	13.3	13.0	16.0	11.2	13.6	12.1	12.3	12.9	12.0	15.6	17.2	16.9	14.8	15.8	12.8	8.4	4.7	5.6	6.6	5.0	2.9	2.9	17.2	10.4	24	
18	3.0	4.9	4.4	3.6	3.3	4.5	6.9	6.0	6.6	5.2	4.2	2.6	0.4	1.1	3.4	1.8	1.3	1.7	5.1	4.3	2.4	2.7	2.6	2.9	0.4	6.9	3.1	24	
19	2.8	1.8	1.1	2.6	3.3	5.1	6.5	8.4	11.2	10.3	8.0	8.6	8.2	8.8	9.3	10.7	9.8	9.4	8.9	9.1	4.3	2.1	2.2	5.6	1.1	11.2	5.9	24	
20	1.3	2.6	3.6	1.9	4.0	5.1	5.4	7.4	5.8	4.4	4.5	7.2	7.1	10.0	8.1	11.2	12.4	13.1	8.9	7.1	8.0	8.2	9.6	10.6	1.3	13.1	6.2	24	
21	5.9	6.4	3.3	5.4	6.5	1.8	2.3	1.5	1.7	4.9	3.4	5.3	8.8	6.8	8.8	8.4	8.9	7.0	4.8	5.4	3.6	4.5	1.3	0.9	0.9	8.9	3.0	24	
22	1.2	0.7	0.9	1.8	4.4	2.1	0.4	2.2	2.5	4.1	7.5	7.6	9.9	11.6	6.9	9.1	2.0	1.6	1.8	0.4	3.5	3.7	5.5	2.5	0.4	11.6	2.8	24	
23	2.7	2.9	3.4	5.3	2.1	3.5	3.1	2.4	4.5	8.1	6.9	5.8	5.6	6.2	5.1	3.9	3.3	4.5	4.6	4.3	5.3	9.5	11.7	17.4	2.1	17.4	4.0	24	
24	11.1	8.8	7.8	11.9	13.6	14.9	13.1	13.6	14.8	18.9	18.9	12.9	5.9	8.6	10.8	13.2	16.3	23.5	22.3	21.3	19.1	15.0	12.6	10.8	5.9	23.5	11.9	24	
25	9.7	8.2	9.6	6.7	5.7	6.0	6.2	7.4	5.2	5.7	6.1	5.9	5.5	3.3	5.0	8.8	9.9	7.4	5.1	2.1	1.1	2.7	0.8	2.3	0.8	9.9	4.6	24	
26	4.3	4.6	3.4	1.6	1.3	6.2	6.3	5.3	8.2	10.2	7.9	8.7	11.1	11.4	10.8	11.6	10.5	8.5	7.4	6.7	4.9	3.3	3.0	4.8	1.3	11.6	5.9	24	
27	2.5	4.0	4.8	6.6	5.1	5.8	5.6	6.0	6.0	5.4	5.2	6.1	6.0	6.5	7.2	9.8	10.1	9.3	0.6	2.3	4.7	4.8	18.1	13.0	0.6	18.1	2.3	24	
28	4.7	5.6	3.6	6.2	5.2	5.5	7.4	7.3	8.0	10.6	12.7	12.6	13.2	14.3	13.3	13.0	11.5	9.8	9.4	6.2	6.8	5.3	5.8	3.3	3.3	14.3	8.0	24	
29	1.6	2.2	4.2	8.9	6.0	3.6	4.6	4.0	5.4	4.1	7.5	7.0	8.4	9.9	9.7	8.6	6.8	5.3	4.4	9.1	4.6	4.1	5.2	6.1	1.6	9.9	4.8	24	
30	2.9	3.3	5.1	4.8	6.4	4.8	6.5	2.2	4.1	4.4	4.1	1.6	7.7	7.3	12.0	12.0	10.8	9.5	7.3	9.5	4.7	1.9	3.1	5.1	1.6	12.0	3.7	24	
31	5.4	5.2	5.9	6.2	5.6	7.5	8.0	9.0	11.5	9.7	10.8	11.9	11.5	9.6	10.9	12.3	10.5												17
HOURLY MAX	14.6	15.5	13.1	13.3	15.9	16.0	13.1	13.6	14.8	18.9	18.9	16.4	15.6	19.1	18.1	21.2	24.4	23.5	22.3	21.3	19.1	15.0	18.1	17.4					
HOURLY AVG	1.2	0.7	0.8	1.9	1.4	2.0	1.8	1.7	2.2	3.2	3.7	3.3	3.4	3.5	4.1	4.2	3.4	2.5	2.4	2.0	1.3	1.0	1.4	1.0					

STATUS FLAG CODES

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

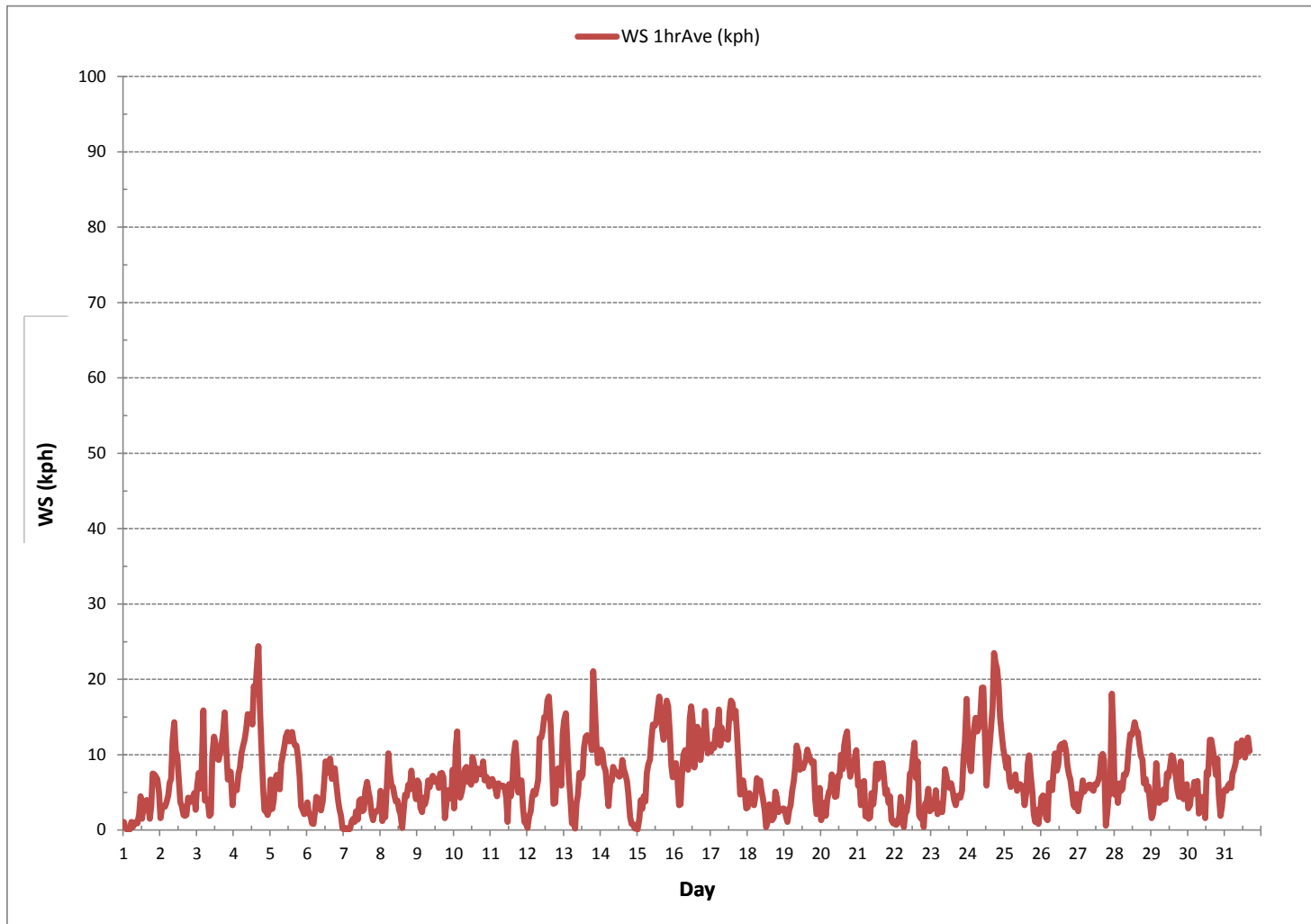
LAST CALIBRATION:	March 3, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	735
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR 3 ON DAY 1
MAXIMUM 1-HR AVERAGE:	24.4 kph @ HOUR 16 ON DAY 4
MAXIMUM 24-HR AVERAGE:	11.9 kph ON DAY 24
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	737 hrs
AMD OPERATION UPTIME:	99.1 %
STANDARD DEVIATION:	4.3
MONTHLY AVERAGE:	2.1 kph

WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	9.0	3.0	1.8	1.1	2.1	7.3	4.7	5.6	8.2	10.8	12.2	15.6	12.9	8.2	9.9	11.3	10.1	7.4	16.6	16.3	14.7	14.9	14.2	16.2	1.1	16.6	9.8	24				
2	14.6	8.8	8.3	12.2	10.5	15.7	14.0	15.2	25.8	26.3	23.4	21.5	16.7	11.2	10.9	11.4	10.1	11.8	11.0	9.6	9.1	10.7	9.0	9.1	8.3	26.3	13.6	24				
3	13.3	15.9	14.8	24.8	37.8	38.0	16.4	10.1	12.7	16.1	28.3	28.4	28.8	23.2	22.3	25.9	31.1	38.3	37.0	27.5	21.5	18.7	18.8	10.6	10.1	38.3	23.3	24				
4	18.4	16.8	13.8	20.4	18.7	22.1	25.9	35.6	29.8	34.5	32.8	29.7	30.9	37.3	41.4	42.6	44.4	36.1	28.3	21.6	8.3	6.6	10.4	26.6	6.6	44.4	26.4	24				
5	26.9	12.7	11.8	12.4	11.4	14.2	16.4	21.5	26.0	33.2	34.9	36.7	33.3	31.4	36.2	34.2	30.1	34.9	28.2	23.5	11.6	8.8	7.7	8.3	7.7	36.7	22.8	24				
6	8.4	6.4	6.7	6.2	7.4	7.1	11.9	10.0	7.8	7.8	10.5	15.6	18.4	20.4	37.3	22.9	23.8	19.9	20.6	20.2	10.4	8.3	6.8	3.9	3.9	37.3	13.3	24				
7	2.4	4.3	5.3	0.0	4.0	4.9	12.9	7.0	7.1	6.7	9.5	9.5	10.9	13.0	13.5	17.2	11.9	12.0	7.4	7.3	9.0	8.3	10.4	11.3	0.0	17.2	8.6	24				
8	14.7	9.6	9.3	8.3	21.4	28.1	22.5	18.9	13.8	13.7	13.3	12.6	9.9	8.8	9.8	11.4	14.1	10.0	15.6	14.9	26.7	16.3	15.1	10.3	8.3	28.1	14.5	24				
9	13.2	12.3	8.3	9.5	11.3	8.6	12.8	15.0	13.7	15.6	17.7	17.7	18.5	15.0	16.7	19.1	21.4	16.0	6.9	9.8	14.3	12.2	30.4	39.6	6.9	39.6	15.7	24				
10	19.2	41.6	40.4	14.9	9.5	11.4	14.4	18.7	20.3	16.9	21.4	18.2	24.9	24.1	20.1	19.9	21.5	21.3	21.8	23.5	18.8	17.1	19.7	19.5	9.5	41.6	20.8	24				
11	17.8	15.9	16.2	17.7	10.1	13.3	14.3	11.7	12.5	12.1	12.6	7.1	12.0	14.1	17.2	21.8	20.4	18.8	13.7	17.3	15.6	10.3	6.8	9.8	6.8	21.8	14.1	24				
12	7.0	8.8	10.5	P	14.1	17.1	13.4	18.2	28.1	28.4	27.9	32.5	33.7	35.5	39.5	28.8	24.6	10.5	15.7	14.9	16.9	17.1	14.5	26.6	7.0	39.5	21.1	23				
13	31.5	30.7	27.9	18.4	10.7	7.6	7.1	5.6	14.0	14.3	17.3	20.3	20.7	21.4	25.5	28.4	27.6	27.3	23.9	62.7	76.2	47.3	24.2	29.5	5.6	76.2	25.8	24				
14	26.7	23.6	22.3	16.7	14.7	9.6	18.4	18.3	22.9	19.8	20.0	19.4	20.0	21.8	27.1	21.7	18.8	15.7	11.6	8.3	2.9	3.2	3.5	7.0	2.9	27.1	16.4	24				
15	2.2	11.3	10.7	9.4	12.9	12.0	16.6	18.2	20.9	26.8	31.9	31.3	32.8	41.6	46.5	41.3	34.7	25.6	31.4	36.1	32.9	28.0	20.7	P	2.2	46.5	25.0	23				
16	19.3	21.7	16.7	16.0	P	21.2	28.7	26.7	22.7	19.8	50.2	44.5	49.2	27.6	34.3	37.6	36.3	39.7	28.5	29.1	34.5	35.5	31.4	27.4	16.0	50.2	30.4	23				
17	28.1	28.4	28.8	34.7	34.9	40.9	30.9	39.1	33.7	31.7	34.1	34.3	39.2	42.8	36.7	59.2	40.5	38.9	20.2	13.8	22.8	20.4	15.3	9.9	9.9	59.2	31.6	24				
18	13.5	14.3	13.4	10.9	10.1	13.2	15.7	16.3	14.7	15.8	12.5	7.2	3.5	6.1	9.9	8.0	8.3	11.4	16.0	12.8	12.5	7.1	7.4	10.9	3.5	16.3	11.3	24				
19	10.5	8.4	6.8	8.1	9.5	11.1	13.0	17.3	20.3	19.9	19.4	19.8	20.1	19.0	21.7	22.5	20.1	19.2	17.6	14.2	11.2	8.6	20.3	13.1	6.8	22.5	15.5	24				
20	8.9	7.8	7.9	7.5	10.7	13.4	16.2	20.2	13.9	12.7	12.9	16.2	17.3	27.4	21.8	25.2	29.8	31.2	23.7	18.0	21.3	21.0	23.3	24.7	7.5	31.2	18.0	24				
21	25.7	17.9	11.1	19.1	15.7	12.2	7.2	10.6	14.1	16.1	10.5	22.3	23.6	18.8	22.3	21.9	20.2	16.9	13.3	11.3	8.5	9.8	6.2	5.2	5.2	25.7	15.0	24				
22	9.2	4.9	6.5	7.1	9.3	8.1	6.0	P	9.9	12.4	14.9	17.3	22.2	22.1	34.6	25.5	11.9	8.1	15.2	7.4	8.4	11.8	13.0	8.5	4.9	34.6	12.8	23				
23	8.5	11.7	11.5	18.5	10.6	9.6	P	9.1	16.8	18.5	16.8	15.1	15.6	17.3	13.4	12.6	11.3	13.0	12.6	13.6	P	22.6	30.6	40.1	8.5	40.1	15.9	22				
24	29.1	20.3	20.5	33.5	39.9	40.6	35.5	34.7	40.8	35.9	35.3	26.9	19.4	20.2	34.3	38.9	46.4	55.3	50.8	54.9	45.5	37.4	30.9	31.9	19.4	55.3	35.8	24				
25	24.1	21.9	21.0	15.8	16.1	15.1	17.3	17.3	12.0	17.8	21.8	17.2	17.8	16.8	15.2	19.2	21.3	14.8	12.8	6.9	7.0	7.3	4.9	8.3	4.9	24.1	15.4	24				
26	10.8	12.6	11.2	8.0	P	12.0	11.9	10.5	16.5	18.2	17.7	19.4	22.8	23.8	23.5	22.3	18.7	12.9	14.8	14.3	8.4	9.1	12.3	8.0	8.0	23.8	15.5	23				
27	7.1	8.3	9.8	13.2	13.6	13.4	13.9	14.4	15.2	14.0	14.0	14.9	18.9	17.9	20.0	21.4	21.3	16.8	8.3	8.2	11.5	18.2	59.3	46.8	7.1	59.3	17.5	24				
28	19.4	29.4	17.0	20.5	15.0	14.9	21.8	18.4	19.7	24.0	32.1	33.5	33.8	36.6	32.4	32.2	27.7	24.6	23.0	17.6	12.5	12.5	12.6	10.7	10.7	36.6	22.6	24				
29	8.6	8.1	13.1	17.9	13.4	10.1	15.2	10.5	15.4	18.4	15.6	16.2	19.3	21.6	19.1	16.7	14.6	15.8	11.0	13.6	12.1	10.7	12.8	12.9	8.1	21.6	14.3	24				
30	10.8	P	12.0	10.7	19.1	13.2	28.6	35.6	15.2	11.3	11.6	12.4	19.9	19.5	32.4	27.6	24.9	20.0	17.4	21.7	15.2	9.6	7.7	11.3	7.7	35.6	17.7	23				
31	13.4	16.9	17.0	16.5	17.4	21.2	24.0	24.3	31.3	23.3	26.1	30.2	32.9	26.6	29.6	30.2													16			
HOURLY MAX	31.5	41.6	40.4	34.7	39.9	40.9	35.5	39.1	40.8	35.9	50.2	44.5	49.2	42.8	46.5	59.2	46.4	55.3	50.8	62.7	76.2	47.3	59.3	46.8								
HOURLY AVG	15.2	15.1	13.9	14.3	14.9	15.7	16.9	17.8	18.6	19.1	21.3	21.4	22.6	22.3	25.0	25.2	23.4	21.7	19.1	19.0	18.1	15.6	16.6	17.3								

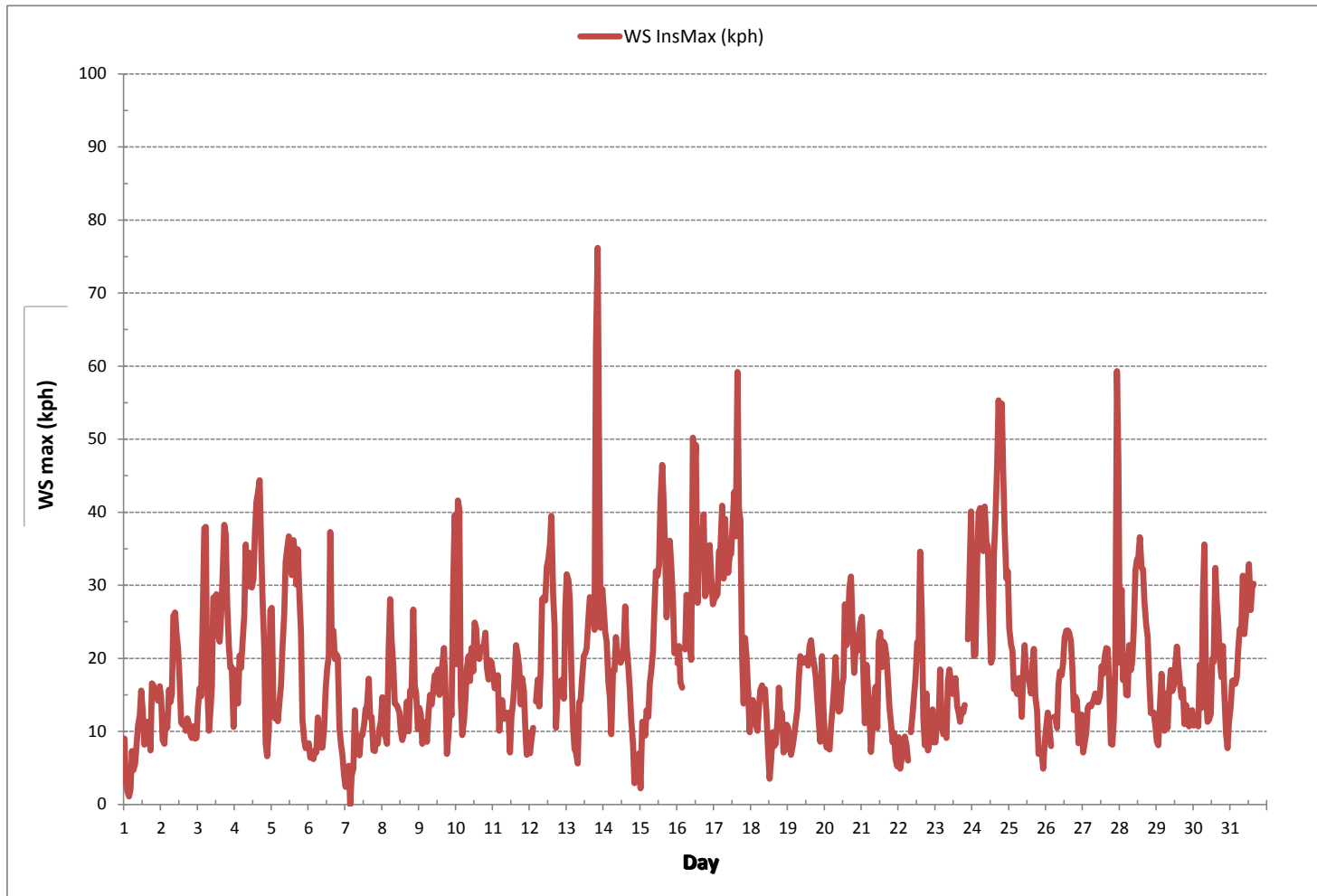
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	76.2	kph	@ HOUR	20	ON DAY	13	
OPERATIONAL TIME:						728	hrs

WIND SPEED Instantaneous Maximum (WS kph)



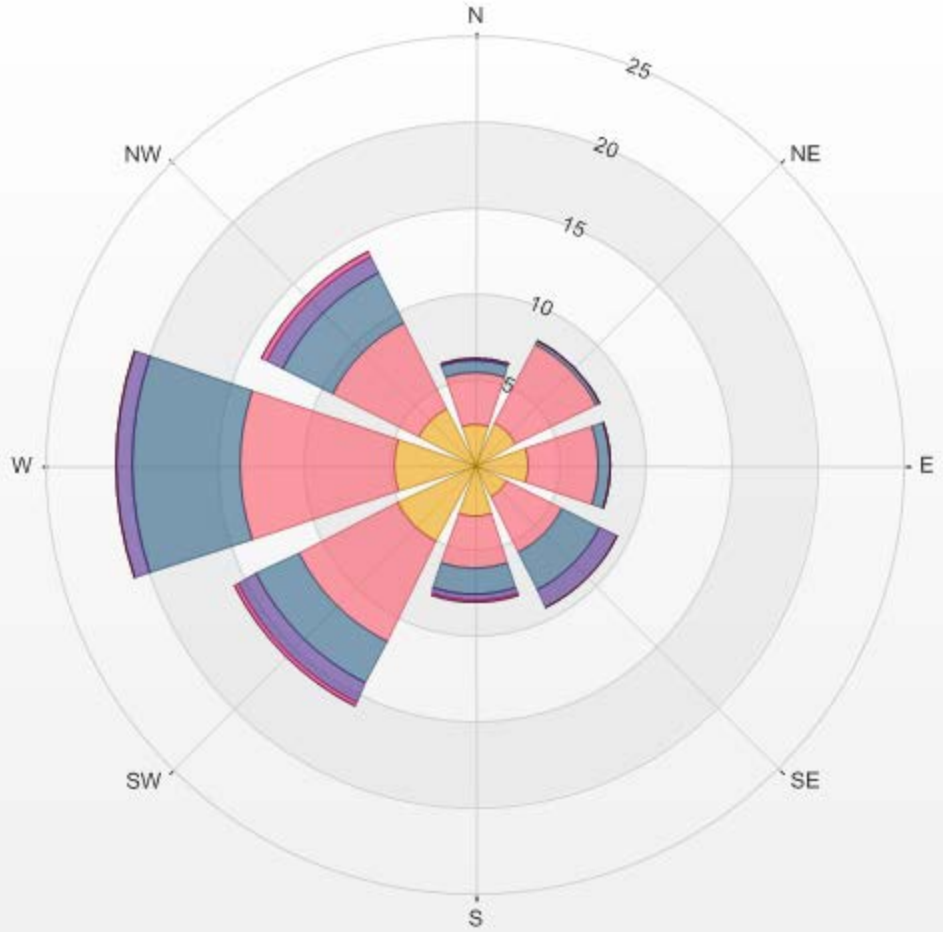
Wind: LICA Bonnyville
 Monitor: WSP [kph]
 Monthly: 17/07
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 9.77%

Direction	1.8-4.9	4.9-9.8	9.8-14.7	14.7-19.6	19.6-24.5	>24.5	Total
N	2.4	3.0	0.7	0.1	0.0	0.0	6.3
NE	2.7	5.2	0.3	0.0	0.0	0.0	8.1
E	3.1	4.1	0.7	0.0	0.0	0.0	7.9
SE	2.0	3.7	2.4	1.2	0.0	0.0	9.4
S	3.0	3.1	1.5	0.3	0.1	0.0	8.0
SW	5.0	6.5	2.7	1.2	0.3	0.0	15.7
W	4.8	9.0	6.2	1.0	0.0	0.0	20.9
NW	3.7	5.6	3.3	1.1	0.4	0.0	14.0
Summary	26.7	40.0	17.8	4.9	0.8	0.0	90.2

%	Icon	Classes (kph)
27		1.8-4.9
40		4.9-9.8
18		9.8-14.7
5		14.7-19.6
1		19.6-24.5
0		>24.5

LICA Bonnyville 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 9.77% Calm Wind Avg Speed: 0.98(kph)



WIND DIRECTION



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

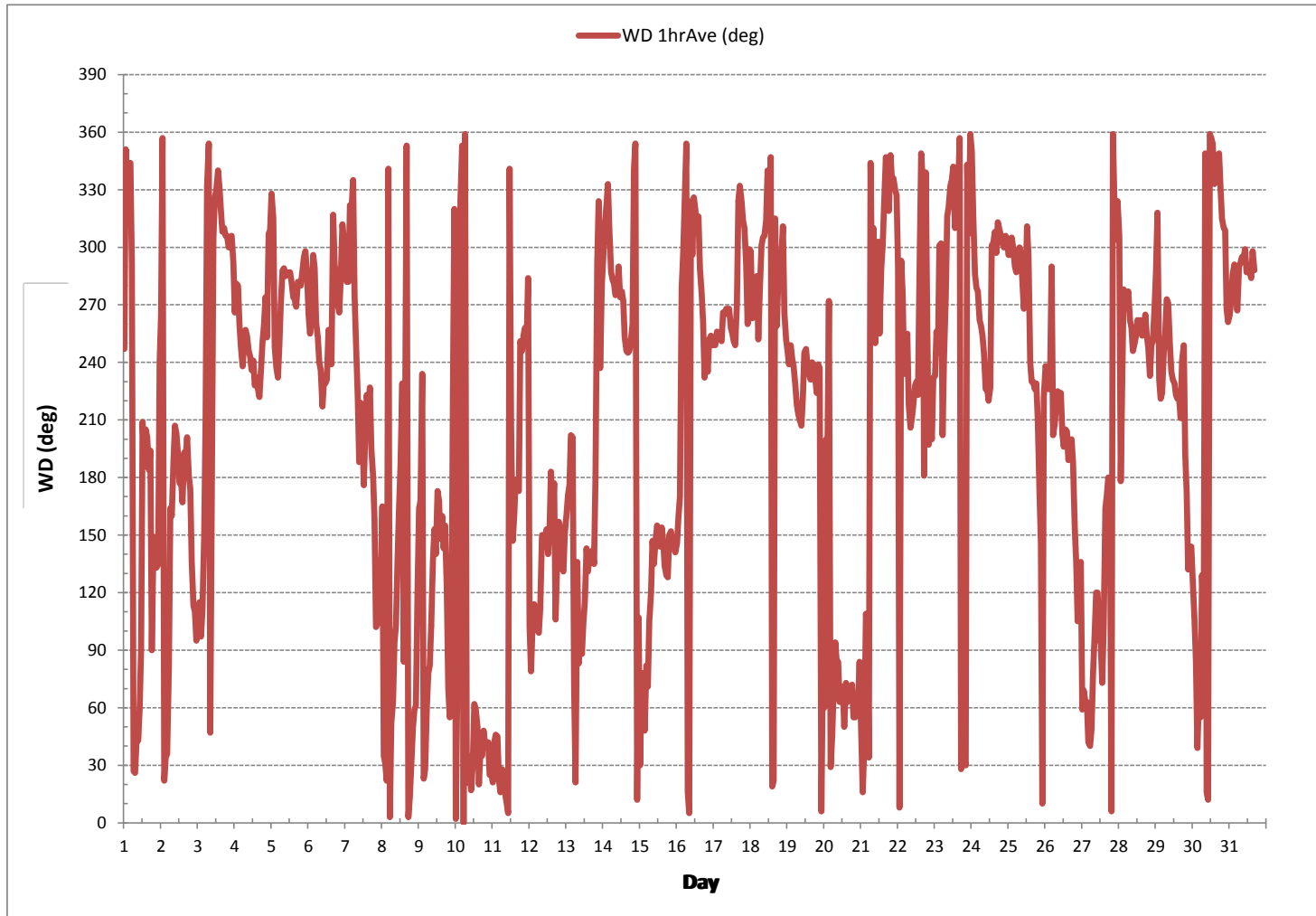
STATUS FLAG CODES

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

LAST CALIBRATION:	March 3, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	737	hrs
STANDARD DEVIATION:	97		AMD OPERATION UPTIME:	99.1	%
			MONTHLY AVERAGE:	256	(WSW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - July 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	26	18	11	8	10	18	13	15	35	44	41	42	63	47	55	48	59	72	32	20	17	17	20	33	24
2	28	14	27	20	16	22	29	20	16	14	17	20	38	59	70	59	72	79	46	31	24	23	17	27	24
3	16	13	21	19	16	43	17	18	29	37	24	21	22	21	21	22	20	20	18	17	19	16	14	18	24
4	22	20	21	19	16	15	19	21	20	18	19	18	20	16	15	15	13	16	17	18	17	22	12	14	24
5	17	12	20	12	11	18	23	20	22	23	23	23	23	24	22	24	23	22	21	20	17	15	13	17	24
6	18	19	19	19	14	19	18	22	28	44	40	19	20	28	31	26	27	24	21	18	17	17	11	10	24
7	14	9	13	5	8	7	24	31	36	55	29	29	60	69	36	29	24	41	56	59	35	30	54	37	24
8	28	50	17	16	18	22	23	24	27	40	54	54	59	40	58	55	20	18	18	18	24	23	20	24	24
9	18	23	38	32	14	20	25	21	26	30	31	39	29	37	38	21	31	18	50	23	23	24	32	51	24
10	48	23	22	19	12	10	16	18	22	22	23	23	21	24	22	22	22	20	20	19	17	16	15	14	24
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12	46	29	29	18	18	19	22	20	17	16	18	17	20	16	16	17	24	28	33	19	16	17	22	15	24
13	16	15	17	22	39	56	30	56	42	35	24	28	29	20	21	19	19	16	16	18	25	21	22	20	24
14	19	17	15	16	15	19	22	22	23	25	26	27	27	30	25	25	22	22	27	15	2	23	13	38	24
15	15	23	24	21	20	25	17	16	19	18	17	16	18	18	16	17	17	16	16	15	15	16	16	20	24
16	16	16	17	30	24	19	21	20	20	17	21	21	21	22	19	19	22	26	17	18	14	20	18	17	24
17	17	18	19	19	19	18	22	21	22	22	21	19	20	19	18	21	20	19	16	15	17	19	20	16	24
18	15	20	24	20	18	24	19	18	15	17	17	10	25	14	21	27	40	31	24	21	13	10	17	14	24
19	19	22	22	31	28	21	18	14	13	16	21	25	26	21	21	18	17	15	12	8	19	26	22	23	24
20	26	42	41	18	13	22	24	20	25	38	26	24	24	23	24	21	23	22	22	22	24	22	20	22	24
21	24	14	20	28	20	28	15	36	24	25	27	22	23	27	21	18	17	16	18	11	9	10	9	11	24
22	19	7	16	19	20	24	24	50	55	41	18	21	18	20	22	17	47	57	48	35	52	32	25	35	24
23	29	28	27	17	24	23	26	24	23	21	23	23	17	21	22	28	20	22	29	19	23	17	19	20	24
24	19	19	20	22	21	21	21	19	18	13	13	15	26	18	19	19	20	19	18	19	17	18	17	18	24
25	18	19	16	18	19	19	21	17	20	28	32	35	30	41	38	19	14	16	22	36	58	57	29	38	24
26	18	24	22	31	12	18	20	19	14	12	20	19	17	18	16	16	18	17	17	21	28	33	39	26	24
27	20	20	18	16	17	17	19	21	24	39	37	31	34	32	31	21	18	23	46	14	11	15	23	19	24
28	24	46	58	22	21	21	21	22	24	18	19	23	23	21	21	21	19	20	18	16	13	16	16	20	24
29	21	13	22	13	18	28	22	19	23	30	19	21	20	19	16	15	19	20	19	10	48	28	22	15	24
30	26	28	21	18	21	25	52	39	38	23	18	44	20	24	20	19	17	15	15	16	14	13	18	19	24
31	19	21	19	20	21	21	21	21	20	22	23	23	23	23	24	22	22								17

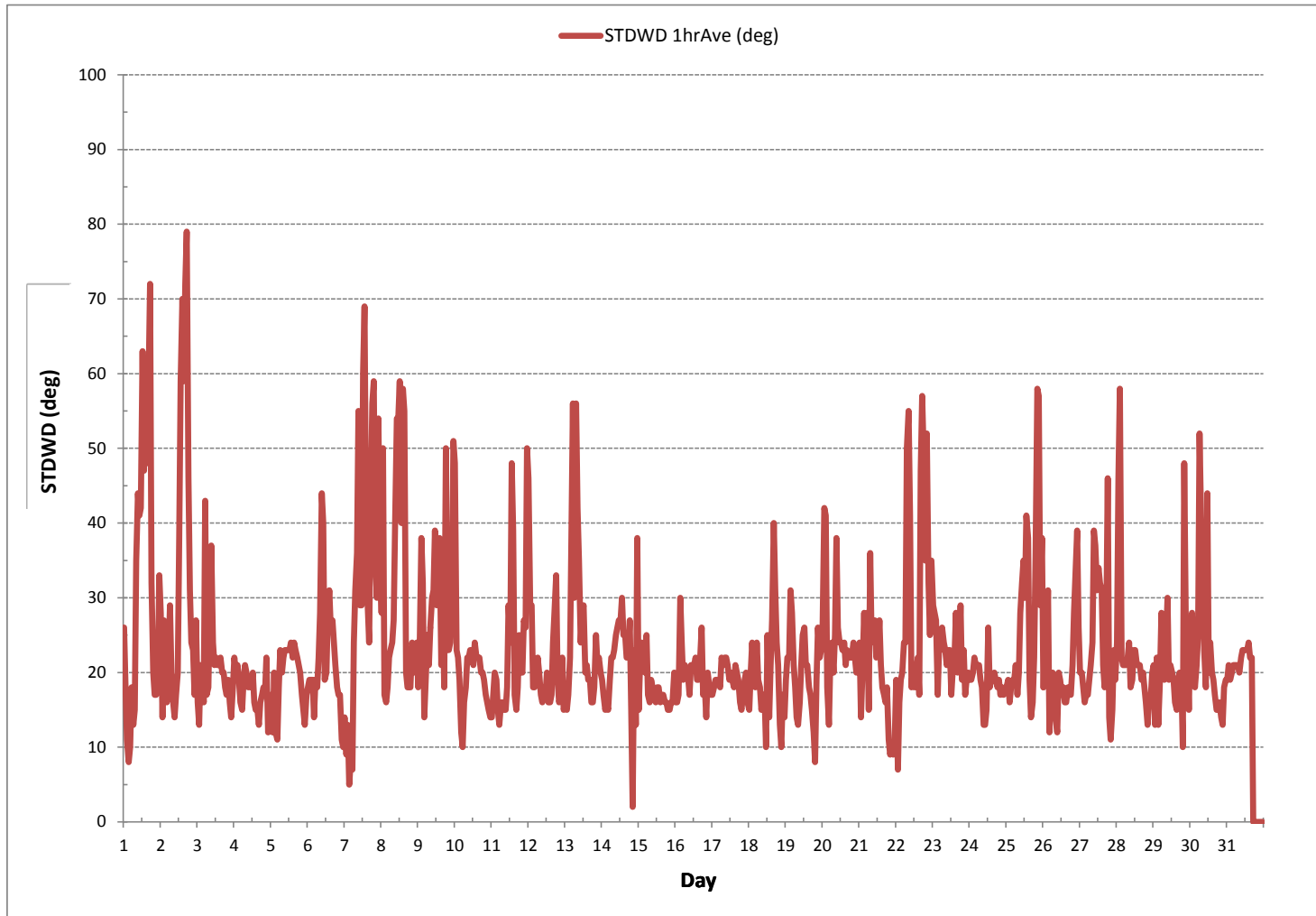
STATUS FLAG CODES

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

LAST CALIBRATION: March 3, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 737 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/July 06, 2017

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: S5635
 Station ID: LICA -37 Installation Date/Time (mst): July 05, 2017 @ 14:35
 Sample ID: LICA/VOC/Bonnyville/July 06, 2017 Removal Date/Time (mst): July 10, 2017 @ 18:15

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 06, 2017</u>	<u>00:00</u>	<u>00:00 July 07, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.5</u>	<u>+19.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 05, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: April 05, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov
 Collection Technician Signature: Alex Yakupov Date: July 10, 2017



Volatile Organics Data Results

Date: July 6, 2017
Canister ID: S5635

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.12
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.1
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.07
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.05
Acetone	6.1
Acrolein	< 0.3
Benzene	0.06
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.04
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	2.6
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.31
Freon-113	0.1

Volatile Organics Data Results

Date: July 6, 2017
Canister ID: S5635

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.67
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.24
Isopentane	0.43
Isoprene	0.65
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.05
Methylene chloride	< 0.3
n-Butane	0.53
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.05
n-Hexane	0.06
n-Nonane	0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.13
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville -AER Canister ID: 14985
 Station ID: LICA-37 Installation Date/Time (mst): July 10, 2017 @ 18:15
 Sample ID: LICA/VOC/Bonnyville/July 12, 2017 Removal Date/Time (mst): July 17, 2017 @ 18:24

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 12, 2017</u>	<u>00:00</u>	<u>00:00 July 13, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.5</u>	<u>+18.3</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 05, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

The canister is not equipped with a pressure gauge

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 17, 2017

Sample ID: 17070168-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/July 12, 2017



Volatile Organics Data Results

Date: July 12, 2017
Canister ID: 14985

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.07
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.05
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.05
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	0.03
2-Methylheptane	0.09
2-Methylhexane	< 0.01
2-Methylpentane	0.24
3-Methylheptane	0.05
3-Methylhexane	0.16
3-Methylpentane	0.19
Acetone	9.9
Acrolein	< 0.3
Benzene	0.31
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.19
Cyclopentane	0.09
Dibromochloromethane	< 0.01
Ethanol	2
Ethyl acetate	< 0.4
Ethylbenzene	0.11
Freon-11	0.27
Freon-113	0.09

Volatile Organics Data Results

Date: July 12, 2017
Canister ID: 14985

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.61
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.34
Isopentane	0.79
Isoprene	0.23
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.01
m,p-Xylene	0.32
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	2.1
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.31
Methylcyclopentane	0.34
Methylene chloride	< 0.3
n-Butane	1.6
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.34
n-Hexane	0.5
n-Nonane	0.04
n-Octane	0.14
n-Pentane	0.9
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.15
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.86
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 23786
 Station ID: LICA-37 Installation Date/Time (mst): July 17, 2017 @ 18:24
 Sample ID: LICA/VOC/Bonnyville/July 18, 2017 Removal Date/Time (mst): July 21, 2017 @ 13:36

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 18, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>July 19, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</u>	<u>+19.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 05, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 21, 2017

Sample ID: 17070221-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/July 18, 2017



Volatile Organics Data Results

Date: July 18, 2017
Canister ID: 23786

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.02
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	1.9
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.32
Freon-113	0.09

Volatile Organics Data Results

Date: July 18, 2017
Canister ID: 23786

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.69
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.07
Isopentane	0.2
Isoprene	0.07
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.01
Methylcyclopentane	< 0.02
Methylene chloride	< 0.3
n-Butane	0.17
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01
n-Hexane	0.03
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.08
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/July 24, 2017

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 2262
 Station ID: LICA-37 Installation Date/Time (mst): July 24, 2017 @ 13:36
 Sample ID: LICA/VOC/Bonnyville/July 24, 2017 Removal Date/Time (mst): July 28, 2017 @ 11:26

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>July 24, 2017</u>	<u>00:00</u>	<u>00:00 July 25, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</u>	<u>+18.4</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 05, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

The canister is not equipped with a pressure gauge

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 28, 2017



Volatile Organics Data Results

Date: July 24, 2017
Canister ID: 2262

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.12
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.01
Acetone	3.6
Acrolein	< 0.3
Benzene	0.05
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	5.34
Carbon tetrachloride	0.08
Chlorobenzene	< 0.02
Chloroethane	0.02
Chloroform	< 0.02
Chloromethane	0.67
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.28
Freon-113	0.08

Volatile Organics Data Results

Date: July 24, 2017
Canister ID: 2262

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.61
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.32
Isopentane	0.28
Isoprene	0.33
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.23
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.03
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.06
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.02
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	0.6
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: S 5670
 Station ID: LICA-37 Installation Date/Time (mst): July 28, 2017 @ 11:26
 Sample ID: LICA/VOC/Bonnyville/July 30, 2017 Removal Date/Time (mst): July 31, 2017 @ 17:56

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
July 30, 2017	00:00	00:00 July 31, 2017	24.0

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
-27.4	+19.0

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
10.0	4.94	27.5

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: July 05, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 31, 2017

Sample ID: 17080051-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/July 30, 2017



Volatile Organics Data Results

Date: July 30, 2017
Canister ID: S5670

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	< 0.01
2-Methylpentane	0.07
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.04
Acetone	4.3
Acrolein	< 0.3
Benzene	0.16
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.38
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.06
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.6
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.31
Freon-113	0.08

Volatile Organics Data Results

Date: July 30, 2017
Canister ID: S5670

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.27
Isopentane	0.44
Isoprene	0.44
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.1
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.7
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.09
Methylcyclopentane	0.08
Methylene chloride	< 0.3
n-Butane	0.55
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.07
n-Hexane	0.12
n-Nonane	0.02
n-Octane	0.03
n-Pentane	0.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.04
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.31
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.02
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 17070097-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/July 06, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-03</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>July 05, 2017/15:23</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/July 06, 2017</u>	Removal Date/Time:	<u>July 10, 2017/18:26</u>

Sample Data Collection Information

Sample Date:	<u>July 06, 2017</u>	Average Pressure (mmHg)	<u>708</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>July 07, 2017/00:00</u>	Average Temperature (°C)	<u>20.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>July 05, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: July 10, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 6, 2017
PUF S/N: TE-03

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.08
2-Methylnaphthalene	0.15
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.19
Acenaphthylene	0.1
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	0.02
Dibenzo(a,l)pyrene	0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.05
Perylene	< 0.01
Phenanthrene	0.35
Pyrene	0.07
Retene	0.07

Sample ID: 17070168-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/July 12, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puff S/N:	<u>TE-11</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA-37</u>	Installation Date/Time:	<u>July 10, 2017/18:26</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jul 12, 2017</u>	Removal Date/Time:	<u>July 17, 2017/18:10</u>

Sample Data Collection Information

Sample Date:	<u>July 12, 2017</u>	Average Pressure (mmHg)	<u>704</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 / July 13, 2017</u>	Average Temperature (°C)	<u>18.9°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>July 05, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov

Date: July 17, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 12, 2017
PUF S/N: TE-11

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.03
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	0.02
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.08
Fluorene	0.03
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	< 0.01
Perylene	< 0.01
Phenanthrene	0.36
Pyrene	0.1
Retene	0.04

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 18, 2017
PUF S/N: 9801

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	0.35
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.02
Fluoranthene	0.03
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.14
Pyrene	0.03
Retene	0.04

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 24, 2017
PUF S/N: TE-09

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.16
2-Methylnaphthalene	0.33
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.09
Benzo(b,j,k)fluoranthene	0.09
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	1.4
Chrysene	0.01
Dibenzo(a,h)pyrene	0.09
Dibenzo(a,i)pyrene	0.1
Dibenzo(a,l)pyrene	0.09
Dibenzo(ah)anthracene	0.97
Fluoranthene	< 0.01
Fluorene	0.02
Indeno(1,2,3-cd)pyrene	0.86
Naphthalene	0.18
Perylene	< 0.01
Phenanthrene	0.06
Pyrene	0.01
Retene	0.02

Sample ID: 17080051-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/July 30, 2017

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ISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>P13-01</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>July 28, 2017 / 11:12</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/July 30, 2017</u>	Removal Date/Time:	<u>July 31, 2017 / 17:41</u>

Sample Data Collection Information

Sample Date:	<u>July 30, 2017</u>	Average Pressure (mmHg)	<u>705</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 July 31, 2017</u>	Average Temperature (°C)	<u>19.7</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.18</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<u>YES</u>	NO
Average temperature appears correct?	<u>YES</u>	NO
Average pressure appears correct?	<u>YES</u>	NO
Any error messages? (if yes list below)	YES	<u>NO</u>
Sample duration 24 hours?	<u>YES</u>	NO
Date of last calibration/audit:	<u>July 05, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>July 31, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: July 30, 2017
PUF S/N: P13-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.01
2-Methylnaphthalene	0.03
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.01
Benzo(c)phenanthrene	0.1
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.03
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.09
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.43
Pyrene	0.07
Retene	0.08

NMHC CANISTER RESULTS

Sample ID: 17070018-003
Sample ID: 17070018-003

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/July 01,
2017



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA-37
Field Sample ID: LICA/NMHC VOC/Bonnyville/
July 01, 2017

Sampler S/N: n/a
Canister ID: S 5680
Canister Installation Date/Time: June 27, 2017 / 12:37 11:37 A.M.
Canister Removal Date/Time: July 05, 2017 / 12:28

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>July 01, 2017</u>	<u>00:00</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.2</u>	<u>-1.5</u>

Canister valve open prior to sampling?: YES / NO
Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yampov Date: July 05, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: July 1, 2017
Canister ID: S5680

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.9
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	0.05
2,2,4-Trimethylpentane	0.13
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.14
2,3-Dimethylpentane	0.13
2,4-Dimethylpentane	0.04
2-Methylheptane	0.02
2-Methylhexane	0.09
2-Methylpentane	0.28
3-Methylheptane	< 0.02
3-Methylhexane	0.09
3-Methylpentane	0.17
Acetone	3.8
Acrolein	< 0.3
Benzene	0.15
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.26
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	< 0.02
cis-2-Pentene	0.05
Cyclohexane	0.13
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	3.6
Ethyl acetate	< 0.5
Ethylbenzene	0.09
Freon-11	0.31
Freon-113	0.1

Volatile Organics Data Results (NMHC Canister System)

Date: July 1, 2017
Canister ID: S5680

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.56
Isobutane	0.56
Isopentane	1.66
Isoprene	0.34
Isopropyl alcohol	1
Isopropylbenzene	< 0.01
m,p-Xylene	0.19
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.09
Methyl butyl ketone	< 0.56
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.16
Methylcyclopentane	0.22
Methylene chloride	< 0.3
n-Butane	2.9
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.09
n-Hexane	0.23
n-Nonane	0.02
n-Octane	0.03
n-Pentane	0.8
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.02
o-Xylene	0.09
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.08
Styrene	< 0.05
Tetrachloroethylene	0.05
Tetrahydrofuran	< 0.5
Toluene	0.49
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.02
trans-2-Pentene	0.08
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17070097-003

Customer ID: LICA

Cust Samp ID: LICA/NMHC
VOC/Bonnyville/July 07,
2017

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC VOC/Bonnyville /
July 07, 2017

Sampler S/N: n/a
Canister ID: 23790
Canister Installation Date/Time: July 05, 2017 / 12:42
Canister Removal Date/Time: July 10, 2017 / 18:06

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>July 07, 2017</u>	<u>20:25</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.1</u>	<u>-2.1</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yakupov

Date: July 10, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: July 7, 2017
Canister ID: 23790

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.9
1,2,4-Trimethylbenzene	0.18
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.04
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.13
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.6
2,2-Dimethylbutane	0.06
2,3,4-Trimethylpentane	0.1
2,3-Dimethylbutane	0.15
2,3-Dimethylpentane	0.25
2,4-Dimethylpentane	0.08
2-Methylheptane	0.03
2-Methylhexane	< 0.01
2-Methylpentane	0.47
3-Methylheptane	0.04
3-Methylhexane	0.14
3-Methylpentane	0.31
Acetone	7.5
Acrolein	< 0.3
Benzene	0.16
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.23
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.53
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.1
Cyclopentane	0.15
Dibromochloromethane	< 0.01
Ethanol	8.7
Ethyl acetate	< 0.4
Ethylbenzene	0.11
Freon-11	0.3
Freon-113	0.09

Volatile Organics Data Results (NMHC Canister System)

Date: July 7, 2017
Canister ID: 23790

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.55
Isobutane	1.95
Isopentane	2.47
Isoprene	1.2
Isopropyl alcohol	0.7
Isopropylbenzene	0.01
m,p-Xylene	0.41
m-Diethylbenzene	< 0.04
m-Ethyltoluene	0.1
Methyl butyl ketone	< 0.55
Methyl ethyl ketone	0.8
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.11
Methylcyclopentane	0.31
Methylene chloride	< 0.3
n-Butane	5.14
n-Decane	< 0.07
n-Dodecane	< 0.4
n-Heptane	0.12
n-Hexane	0.56
n-Nonane	0.02
n-Octane	0.04
n-Pentane	1.8
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.04
o-Xylene	0.2
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.08
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.54
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.04
trans-2-Pentene	0.05
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 17070221-003

Customer ID: LICA

AIR FCD-01320/2

Cust Samp ID: LICA/NMHC
VOC/Bonnyville/July 20,
2017

Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: U2821
 Station ID: LICA 37 Canister Installation Date/Time: July 10, 2017 / 18:06
 Field Sample ID: LICA/NMHC VOC/Bonnyville/July 20, 2017 Canister Removal Date/Time: July 21, 2017 / 13:16

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>July 20, 2017</u>	<u>07:55</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>- 27.2</u>	<u>- 1.9</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister

Technician Signature: Alex Vampor

Date: July 21, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: July 20, 2017
Canister ID: H2821

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	0.07
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.1
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.08
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	67.9
Acrolein	< 0.4
Benzene	0.12
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.65
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.46
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.4
Ethyl acetate	< 0.5
Ethylbenzene	1.25
Freon-11	0.28
Freon-113	0.08

Volatile Organics Data Results (NMHC Canister System)

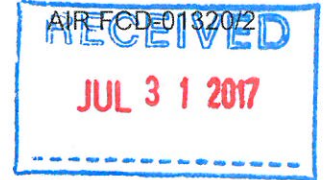
Date: July 20, 2017
Canister ID: H2821

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.60
Isobutane	0.16
Isopentane	0.46
Isoprene	0.37
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.02
m,p-Xylene	5.88
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.60
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.03
Methylcyclopentane	0.04
Methylene chloride	< 0.4
n-Butane	0.31
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	< 0.01
n-Hexane	0.09
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.1
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.01
o-Xylene	1.85
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.08
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	2.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17070336-003

Customer ID: LICA

Cust Samp ID: LICA/NMHC
VOC/Bonnyville/July 27,
2017



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 2655
 Station ID: LICA 37 Canister Installation Date/Time: July 21, 2017 / 13:16
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: July 28, 2017 / 12:26
July 27, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
July 27, 2017	06:40	n/a	n/a

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
-27.3	0.0

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yakupov

Date: July 28, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: July 27, 2017
Canister ID: 2655

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	0.11
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.04
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.22
1-Hexene	< 0.03
1-Pentene	0.05
2,2,4-Trimethylpentane	0.76
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.1
2,3-Dimethylbutane	0.41
2,3-Dimethylpentane	0.93
2,4-Dimethylpentane	0.41
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.35
3-Methylheptane	< 0.03
3-Methylhexane	0.09
3-Methylpentane	0.14
Acetone	5.2
Acrolein	< 0.4
Benzene	0.12
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.31
Carbon tetrachloride	0.09
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.04
Chloromethane	0.66
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.03
cis-2-Pentene	0.06
Cyclohexane	0.09
Cyclopentane	0.07
Dibromochloromethane	< 0.01
Ethanol	9.7
Ethyl acetate	< 0.5
Ethylbenzene	0.04
Freon-11	0.28
Freon-113	0.08

Volatile Organics Data Results (NMHC Canister System)

Date: July 27, 2017
Canister ID: 2655

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.6
Hexachloro-1,3-butadiene	< 0.66
Isobutane	2.14
Isopentane	7.37
Isoprene	0.48
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.15
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.66
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.11
Methylcyclopentane	0.14
Methylene chloride	< 0.4
n-Butane	16.3
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.06
n-Hexane	0.15
n-Nonane	0.01
n-Octane	< 0.03
n-Pentane	0.5
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.02
o-Xylene	0.08
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.11
Tetrahydrofuran	< 0.5
Toluene	0.42
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.03
trans-2-Pentene	0.11
Trichloroethylene	< 0.05
Vinyl acetate	0.6
Vinyl chloride	< 0.03

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

Date: <u>July 4, 2017</u>	Barometer Data/B.P.: <u>Fisher Scientific, I.D. # 05544</u>	946 mb
Company/Airshed: <u>LICA</u>	Thermometer Data/Station Temp °C: <u>FLUKE 1551 A Ex STIK / I.D. # 4294</u>	22 °C
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>Mainly sunny</u>	
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>	
Start Time 24 hr. (mst): <u>13:34</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>18:03</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>467</u>	Range ppb: <u>1000</u>
Last Calibration Date: <u>June 1, 2017</u>	As Found C.F.: <u>1.026</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>

Calibration Standards:		Standard Calibration Points for Ranges								
Low Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 152020 / Nov 21, 2016</u>		<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb									
High	780									
Mid	380									
Low	190									
High Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 148943 / Nov 21, 2016</u>										
Calibrator ID/Cert. Date: <u>API 700 / s.n. 627 / Jan 27, 2017</u>										
Cal Gas Cylinder I.D. #: <u>LL104222</u>										
Cal Gas Conc. (ppm): <u>50.6</u>										

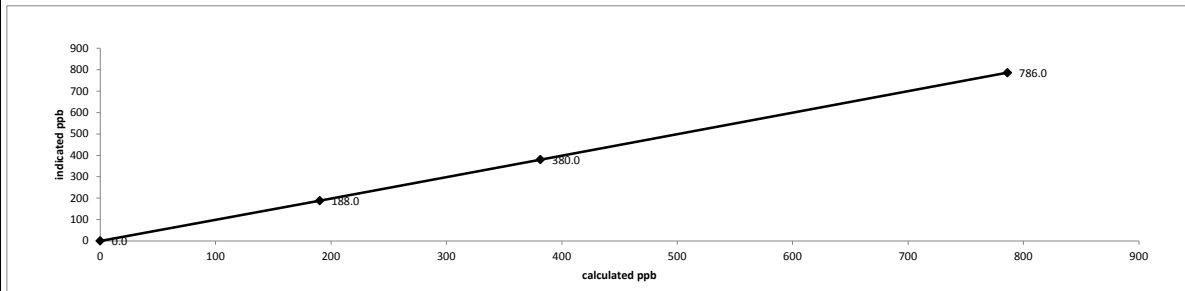
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5008	0.00	5008	0.0	0.0	n/a
as found high	4931	77.83	5009	786.2	766.0	1.026
adjusted zero	5008	0.00	5008	0.0	0.0	n/a
adjusted high	4931	77.83	5009	786.2	786.0	1.000
mid	4966	37.73	5004	381.5	380.0	1.004
low	4987	18.83	5006	190.3	188.0	1.012
calibrator zero	5008	0.00	5008	0.0	0.0	n/a
Average C.F.=						1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS
Slope =	<u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>0.12%</u>	.95-1.05
% change in C.F. from last cal =	<u>-2.64%</u>	± 3% F.S.
		± 10%

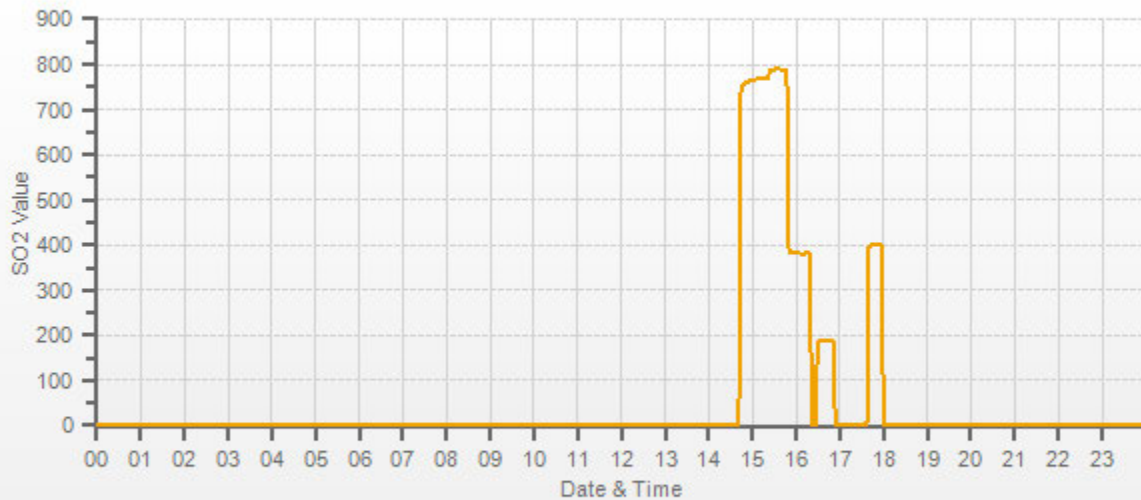
API 100ESulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: <u>1.048</u> Offset: <u>120.2</u> Hvps: <u>488</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.4</u> Pmt Temp: <u>8.1</u> Izs Temp: <u>50.0</u> Pres: <u>25.2</u> Samp Fl: <u>594</u> Norm Pmt: <u>121.1</u> Uv Lamp: <u>3704.4</u> Lamp Ratio: <u>85.6</u> Str Lgt: <u>63.0</u> Drk Pmt: <u>16.0</u> Drk Lmp: <u>2.8</u> Expected Value: <u>404.0</u>	<p style="text-align: center;">As left:</p> Slope: <u>1.073</u> Offset: <u>120.7</u> Hvps: <u>488</u> Rcell Temp: <u>50.0</u> Box Temp: <u>32.7</u> Pmt Temp: <u>8.1</u> Izs Temp: <u>50.0</u> Pres: <u>25.2</u> Samp Fl: <u>593</u> Norm Pmt: <u>124.4</u> Uv Lamp: <u>3704.6</u> Lamp Ratio: <u>85.5</u> Str Lgt: <u>64.7</u> Drk Pmt: <u>16.7</u> Drk Lmp: <u>2.9</u> Expected Value: <u>398.0</u>
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Comments:
The analyzer sample inlet filter was changed.
Flow measurements after mid-point.

SO2[ppb] Station: LICA Bonnyville Daily: 17/07/04 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 100ESulphur Dioxide Analyzer Calibration

Date: July 31, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	955 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny	
Parameter: Sulphur Dioxide	Calibration Purpose: shut down	
Start Time 24 hr. (mst): 10:29	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 13:19	Cal Gas Expiry Date: July 18, 2019	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	Range ppb: 1000
ID# or Serial Number: 467	As Found C.F.: 0.954
Last Calibration Date: July 7, 2017	New C.F.: n/a
Previous C.F.: 1.000	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016	<table border="1" style="margin-left: auto; margin-right: 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/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016									
Calibrator ID/Cert. Date: API 700 / s.n. 627 / Jan 27, 2017									
Cal Gas Cylinder I.D. #: LL104222									
Cal Gas Conc. (ppm): 50.6									

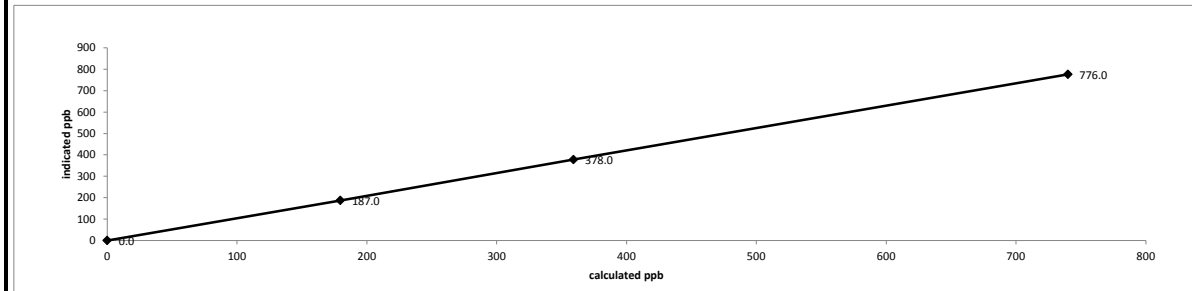
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5345	0.00	5345	0.0	0.0	n/a
as found high	5264	78.12	5342	740.0	776.0	0.954
mid	5304	37.92	5342	359.2	378.0	0.950
low	5324	18.96	5343	179.6	187.0	0.960
Average C.F. =						0.955

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.953	> or = 0.995
b (Intercept as % of full scale) =	0.02%	0.90-1.10
% change in C.F. from last cal =	4.64%	± 3% F.S.
		± 10%

API 100ESulphur Dioxide Analyzer Calibration



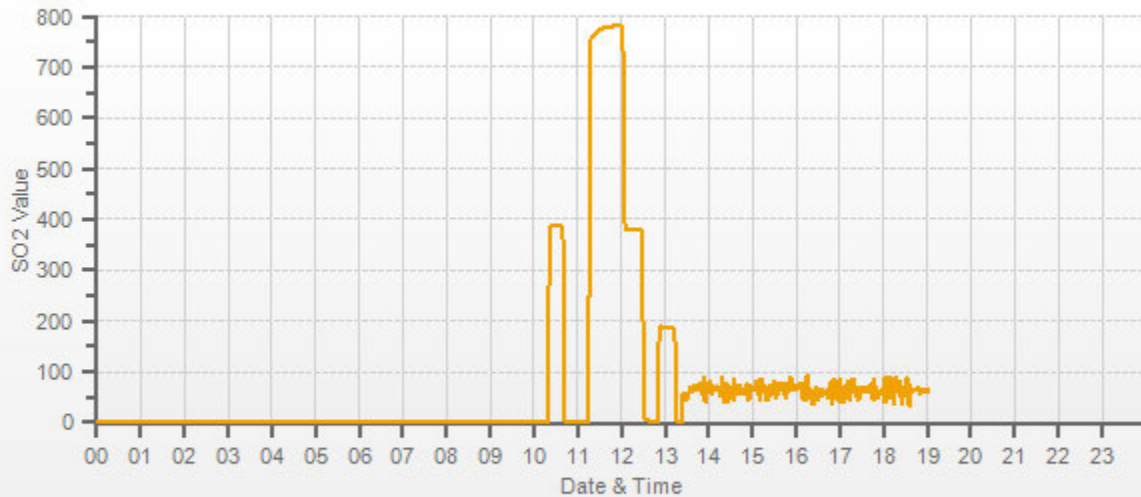
<p style="text-align: center;">As found:</p> Slope: 1.073 Offset: 120.7 Hvps: 488 Rcell Temp: 50.0 Box Temp: 30.3 Pmt Temp: 8.1 Izs Temp: 50.0 Pres: 25.5 Samp Fl: 608 Norm Pmt: 121.5 Uv Lamp: 3590.6 Lamp Ratio: 82.8 Str Lgt: 64.7 Drk Pmt: 15.5 Drk Lmp: 2.8 Expected Value: 398.0	<p style="text-align: center;">As left:</p> Slope: n/a Offset: n/a Hvps: n/a Rcell Temp: n/a Box Temp: n/a Pmt Temp: n/a Izs Temp: n/a Pres: n/a Samp Fl: n/a Norm Pmt: n/a Uv Lamp: n/a Lamp Ratio: n/a Str Lgt: n/a Drk Pmt: n/a Drk Lmp: n/a Expected Value: n/a
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Comments:

No high point adjustment was required/made.
No zero adjustment was required/made.

Flow measurements after mid-point.
Shutdown calibration was completed for relocation of the station.

SO2[ppb] Station: LICA Bonnyville Daily: 17/07/31 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>July 4, 2017</u>	Barometer Data/B.P.: <u>Fisher Scientific, I.D. # 05544</u>	946 mb
Company/Airshed: <u>LICA</u>	Thermometer Data/Station Temp °C: <u>FLUKE 1551 A Ex STIK / I.D. # 4294</u>	22 °C
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>Mainly sunny</u>	
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>	
Start Time 24 hr. (mst): <u>13:34</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>17:57</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>	
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>	

Analyzer:	
ID# or Serial Number: <u>510</u>	Range ppb: <u>100</u>
Last Calibration Date: <u>June 1, 2017</u>	As Found C.F.: <u>1.005</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>0.999</u>

Calibration Standards:		Standard Calibration Points for Ranges								
Low Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 152020 / Nov 21, 2016</u>		<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb									
High	78									
Mid	38									
Low	19									
High Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 148943 / Nov 21, 2016</u>										
Calibrator ID/Cert. Date: <u>Enviroconics 6100, #5212 / Feb 14, 2017</u>										
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>										
Cal Gas Conc. (ppm): <u>10.2</u>										

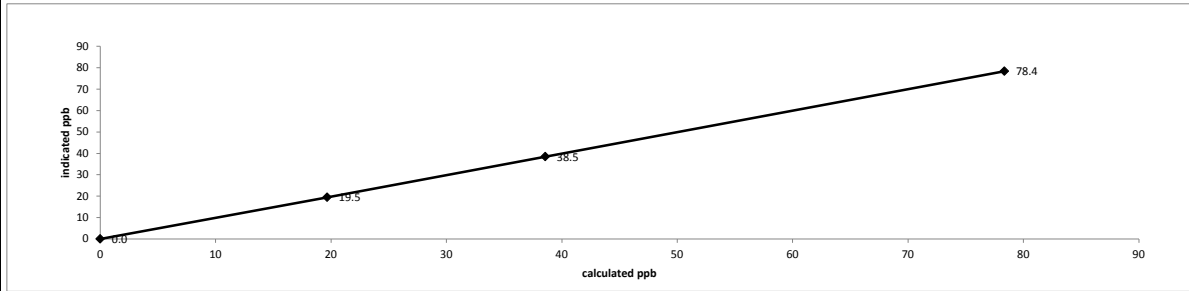
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7573	0.00	7573	0.0	0.0	n/a
as found high	7512	58.15	7570	78.4	78.0	1.005
adjusted zero	7573	0.00	7573	0.0	0.0	n/a
adjusted high	7512	58.15	7570	78.4	78.4	0.999
mid	7543	28.63	7572	38.6	38.5	1.002
low	7555	14.60	7570	19.7	19.5	1.009
calibrator zero	7573	0.00	7573	0.0	0.0	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.09%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.45%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: <u>1.052</u> Offset: <u>30.6</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.9</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>315.1</u> Pres: <u>20.6</u> Samp Fl: <u>537</u> Uv Lamp: <u>3211.0</u> Lamp Ratio: <u>95.7</u> Str Lgt: <u>16.1</u> Drk Pmt: <u>35.1</u> Drk Lmp: <u>-1.7</u> Expected Value: <u>50.4</u>	<p style="text-align: center;">As left:</p> Slope: <u>1.046</u> Offset: <u>30.5</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.6</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.5</u> Pres: <u>20.6</u> Samp Fl: <u>534</u> Uv Lamp: <u>3193.2</u> Lamp Ratio: <u>95.1</u> Str Lgt: <u>15.9</u> Drk Pmt: <u>34.8</u> Drk Lmp: <u>-1.7</u> Expected Value: <u>50.7</u>
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Comments:
The analyzer sample inlet filter was changed.
Flow measurements after mid-point.

H2S[ppb] Station: LICA Bonnyville Daily: 17/07/04 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: July 31, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	955 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny	
Parameter: Hydrogen Sulphide	Calibration Purpose: shut down	
Start Time 24 hr. (mst): 10:29	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
End Time 24 hr. (mst): 13:19	Cal Gas Expiry Date: June 14, 2019	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
ID# or Serial Number: 510	Range ppb: 100
Last Calibration Date: July 4, 2017	As Found C.F.: 0.980
Previous C.F.: 0.999	New C.F.: n/a

Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: Envionics 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. #: EY 0000654 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								

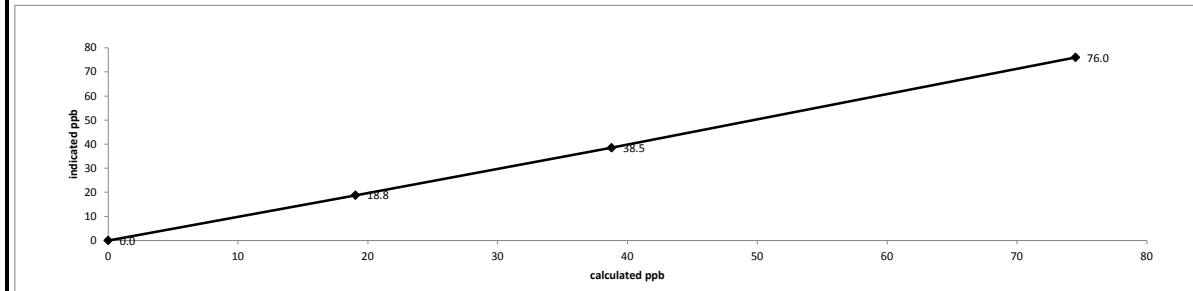
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	8061	0.00	8061	0.0	0.0	n/a
as found high	8003	58.89	8062	74.5	76.0	0.980
mid	8019	30.60	8050	38.8	38.5	1.007
low	8037	15.04	8052	19.1	18.8	1.013
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.979		0.90-1.10
b (Intercept as % of full scale) =	0.45%		± 3% F.S.
% change in C.F. from last cal =	1.87%		± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

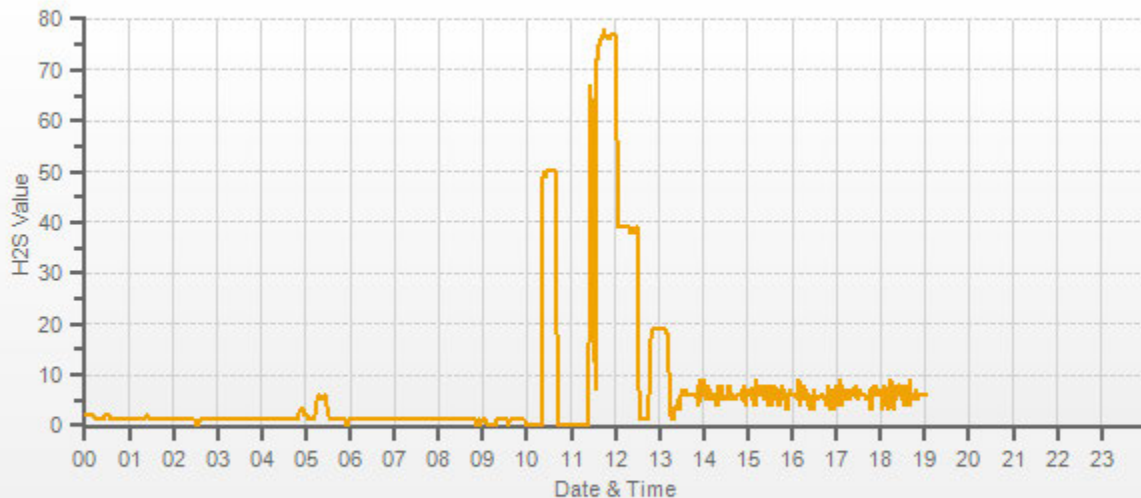


As found: Slope: 1.046 Offset: 30.5 Hvps: 530 Rcell Temp: 50.0 Box Temp: 32.3 Pmt Temp: 8.4 Izs Temp: 45.0 Converter Temp: 314.6 Pres: 20.8 Samp Fl: 541 Uv Lamp: 3155.1 Lamp Ratio: 94.0 Str Lgt: 15.9 Drk Pmt: 35.5 Drk Lmp: -1.7 Expected Value: 50.7	As left: Slope: n/a Offset: n/a Hvps: n/a Rcell Temp: n/a Box Temp: n/a Pmt Temp: n/a Izs Temp: n/a Converter Temp: n/a Pres: n/a Samp Fl: n/a Uv Lamp: n/a Lamp Ratio: n/a Str Lgt: n/a Drk Pmt: n/a Drk Lmp: n/a Expected Value: n/a
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Comments:
 The SO2 scrubber check was not performed, see comments below.
 No high point adjustment was required/made.
 No zero adjustment was required/made.

Flow measurements after mid-point.
 Shutdown calibration was completed for relocation of the station.

H2S[ppb] Station: LICA Bonnyville Daily: 17/07/31 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	July 5, 2017	Barometer Data/B.P.:	Fisher Scientific, I.D. # 05544	948 mb
Company/Airshed:	LICA	Thermometer Data/Station Temp °C:	FLUKE 1551 A Ex STIK / I.D. # 4294	21 °C
Location/Station Name:	Bonnyville - AER	Weather Conditions:	Mainly sunny	
Parameter:	CH ₄ / NMHC / THC	Calibration Purpose:	routine monthly	
Start/End Time 24 hr. (mst):	8:57 / 12:51	Performed By/Reviewer:	Alex Yakupov	Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023	

Analyzer:		Correction Factors:			
ID# or Serial Number:	1236656107	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.095 lpm	CH ₄ =	1.000	0.984	0.999
Last Calibration Date:	June 2, 2017	NMHC =	1.000	0.985	1.000
Range ppm:	20 CH ₄ /20 NMHC/40 THC	THC =	1.000	0.983	0.999

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Low Flow Meter ID/Cert. Date:	Defender 530 /s.n. 152020 / Nov 21, 2016	Point	CH ₄	NMHC	THC
High Flow Meter ID/Cert. Date:	Defender 530 /s.n. 148943 / Nov 21, 2016	High	13.00	13.00	26.00
Calibrator ID/Cert. Date:	Enviroincs 6100, #5212 / Feb 14, 2017	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. # :	LL165372	Low	3.00	3.00	6.00
CH ₄ Cylinder Conc. =	606.0 212.0 =C ₂ H ₆ Cylinder Conc.				
CH ₄ as C ₂ H ₆ =	583.0 1189.0 =total CH ₄ equivalent				

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015										Correction Factors:		
Calibrator Flow Rates (cc/min)				Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC
Point	Diluent	Cal Gas	Total Flow									
as found zero	3031	0.00	3031	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2964	66.46	3030	13.29	12.79	26.08	13.51	12.98	26.52	0.984	0.985	0.983
adjusted zero	3031	0.00	3031	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2964	66.46	3030	13.29	12.79	26.08	13.30	12.79	26.11	0.999	1.000	0.999
mid	2996	36.03	3032	7.20	6.93	14.13	7.24	6.94	14.18	0.995	0.998	0.996
low	3015	15.76	3031	3.15	3.03	6.18	3.17	3.06	6.22	0.994	0.991	0.994
calibrator zero	3031	0.00	3031	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
										Average C.F. =		
										0.996	0.996	0.996

Linear Regression/Calibration Results:				
	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.000	1.001	.95-1.05
b (Intercept as % of full scale) =	0.07%	0.07%	0.05%	± 3% F.S.
% change in C.F. from last cal =	1.61%	1.48%	1.66%	± 10%

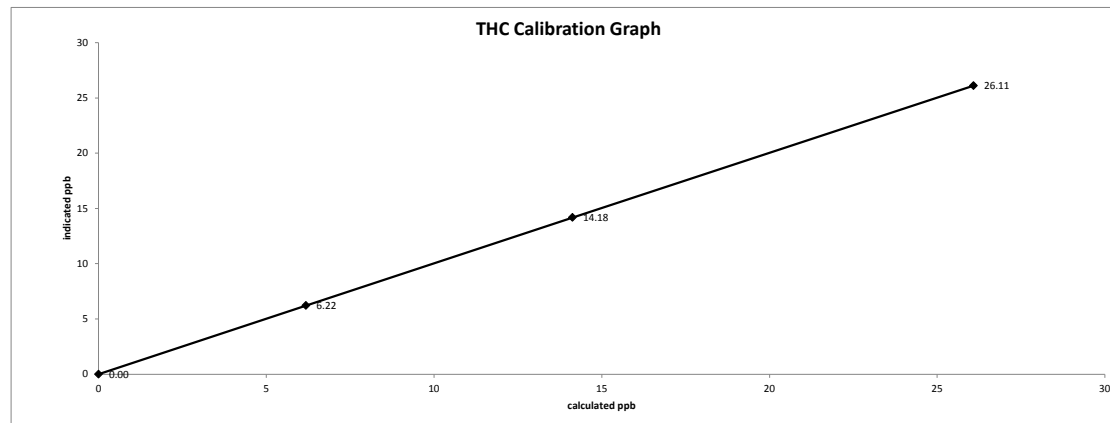
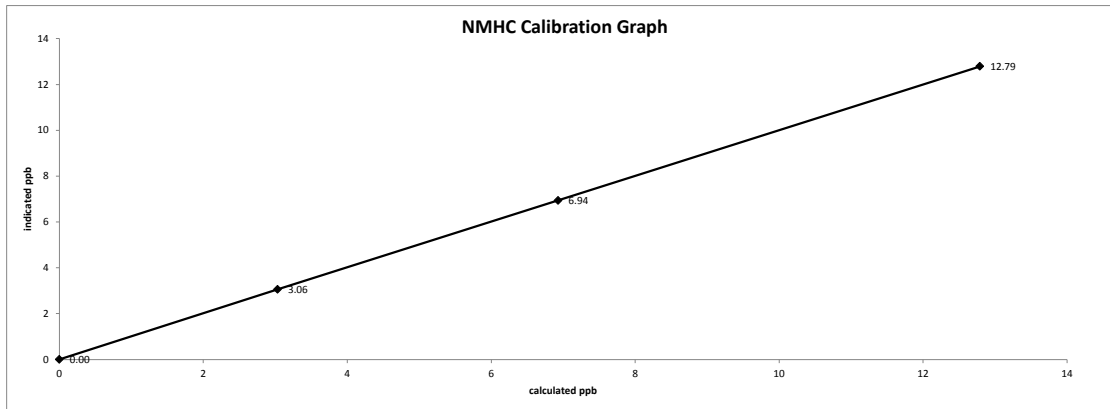
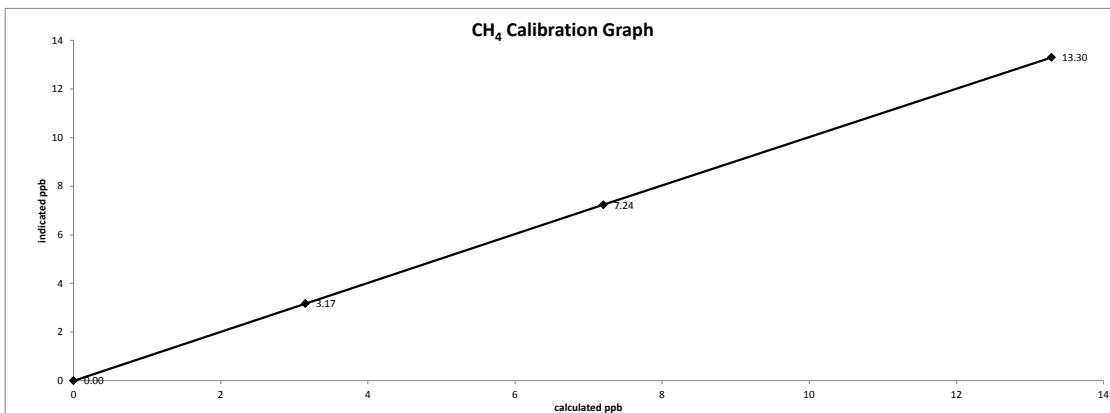
Interface Board Voltages:	Bias Supply:	-292.7	Calibration History cnt'd:	NM Peak Area:	86378
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	n/a
	Filter:	175.1		Methane End:	n/a
	Column Oven:	75.2		Backflush:	n/a
	Internal:	31.2		NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1300 50	Run History>1:	NMHC End:	n/a
	Fuel:	2000 50		Date:	Jul 05, 2017
	Span Gas:	1200 22		Time:	11:35
	Zero Air Generator:	55		CH ₄ PK HT:	0
Internal Pressures:	Carrier:	31.1		CH ₄ RT:	8.0
	Fuel:	40.3		CH ₄ Baseline:	2515
	Air:	32.0		CH ₄ LOD:	63
FID Status:	Status:	LIT		CH ₄ SD:	21
	Counts:	28730		CH ₄ CONC:	0.00
	Flame:	371.1	Expected Values:	NM PK HT:	0
	Det Base:	175.1		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	Aug 3, 2016 / 10:48		NM CONC:	0.00
	Flameouts:	3		NM Base Start:	2470
	Det Oven at Start:	169.0		NM Base End:	2497
	Col Oven at Start:	74.5		NM LOD:	4
Calibration History:	Time:	Jun 02, 2017 / 16:56		NM Start IDX:	14
	Type:	SPAN		NM End IDX:	93
	Status:	GOOD		NM Max Slope:	1.1e+0.0
	Check/Adjust:	ADJUST		NM Min Slope:	-2.8e-0.1
	CH ₄ Span Conc:	13.62		NM PT Count:	0
	CH ₄ SP Ratio:	0.000766		Previous CH ₄ :	10.32
	CH ₄ RT:	13.4		Previous NMHC:	11.07
	CH ₄ PK IDX:	27		Previous THC:	21.41
	CH ₄ PK HT:	17792		New CH ₄ :	10.24
	NM Span Conc:	13.11		New NMHC:	11.05
	NM SP Ratio:	0.000152		New THC:	21.31

Comments:
 The analyzer sample inlet filter was changed.
 A new hydrogen cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

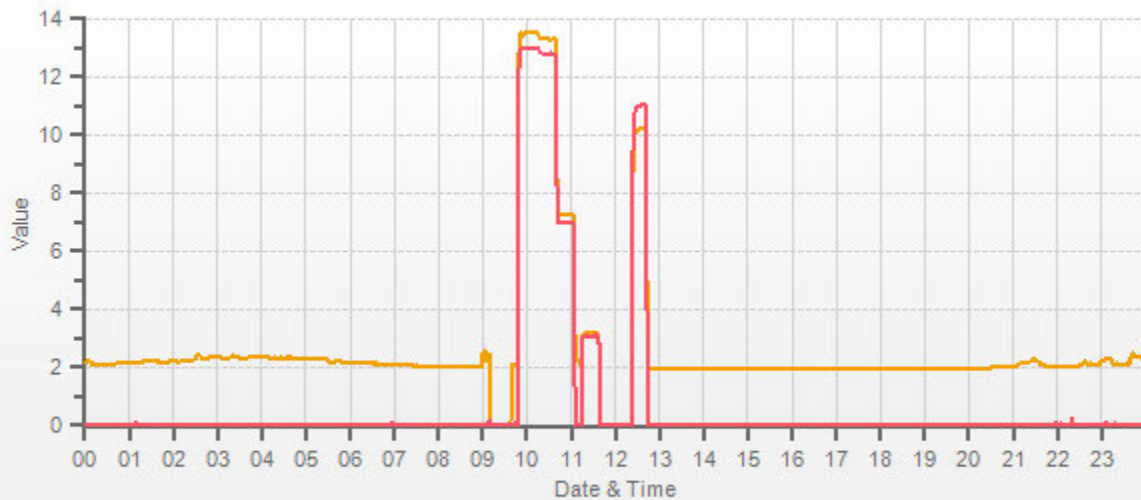
Flow measurements after mid-point.

Date: July 5, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 8:57 / 12:51
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



Station: LICA Bonnyville Daily: 17/07/05 Type: AVG 1 Min. [1 Min.]



— CH4[ppm]

— NMHC[ppm]



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: July 31, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	955 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny	
Parameter: CH ₄ / NMHC / THC	Calibration Purpose: shut down	
Start/End Time 24 hr. (mst): 13:22 / 15:50	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
Calibration Method: Gas Dilution	Cal Gas Expiry Date: November 25, 2023	

Analyzer: ID# or Serial Number: 1236656107 Measured Flow: 1.097 lpm Last Calibration Date: July 5, 2017 Range ppm: 20 CH ₄ /20 NMHC/40 THC	Correction Factors: <table border="1" style="margin-left: auto; margin-right: auto;"> <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>CH₄ =</td> <td>0.999</td> <td>0.945</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.938</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>0.999</td> <td>0.940</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	0.999	0.945	n/a	NMHC =	1.000	0.938	n/a	THC =	0.999	0.940	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	0.999	0.945	n/a														
NMHC =	1.000	0.938	n/a														
THC =	0.999	0.940	n/a														

Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: Enviroincs 6100, #5212 / Feb 14, 2017 Cal Gas Cylinder I.D. # : LL165372 CH ₄ Cylinder Conc.: 606.0 212.0 =C ₂ H ₆ Cylinder Conc. CH ₄ as C ₂ H ₆ : 583.0 1189.0 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH ₄	NMHC	THC														
High	13.00	13.00	26.00														
Mid	7.00	7.00	14.00														
Low	3.00	3.00	6.00														

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

Calibrator Flow Rates (cc/min)				Calculated						Correction Factors:		
Point	Diluent	Cal Gas	Total Flow	CH ₄ (ppm)	NMHC (ppm)	THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC
as found zero	3226	0.00	3226	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	3156	67.12	3223	12.62	12.14	24.76	13.36	12.95	26.34	0.945	0.938	0.940
mid	3188	36.65	3225	6.89	6.63	13.51	7.30	7.10	14.40	0.943	0.933	0.938
low	3210	16.18	3226	3.04	2.92	5.96	3.24	3.15	6.38	0.942	0.933	0.935
Average C.F.=										0.942	0.933	0.938

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.058	1.066	1.063	0.90-1.10
b (Intercept as % of full scale)=	0.05%	0.09%	0.05%	± 3% F.S.
% change in C.F. from last cal=	5.44%	6.25%	5.90%	± 10%

As found: Interface Board Voltages: Bias Supply: -292.9 Temperatures: Detector Oven: 175.0 Filter: 175.0 Column Oven: 75.0 Internal: 32.0 Cylinder Pressures/reg.: Carrier: 1000 50 Fuel: 150 50 Span Gas: 77 22 Zero Air Generator: 55 Internal Pressures: Carrier: 31.1 Fuel: 40.3 Air: 32.0 FID Status: Status: LIT Counts: 29290 Flame: 370.8 Det Base: 175.0 Flame and Power Stats: Last Power On: Jul 23, 2017 / 20:24 Flameouts: 1 Det Oven at Start: 170.0 Col Oven at Start: 74.6 Calibration History: Time: Jan 01, 1970 Type: n/a Status: n/a Check/Adjust: n/a CH ₄ Span Conc: n/a CH ₄ SP Ratio: n/a CH ₄ RT: n/a CH ₄ PK IDX: n/a CH ₄ PK HT: n/s NM Span Conc: n/a NM SP Ratio: n/a	As left: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: n/a Time: n/a CH ₄ PK HT: n/a CH ₄ RT: n/a CH ₄ Baseline: n/a CH ₄ LOD: n/a CH ₄ SD: n/a CH ₄ CONC: n/a NM PK HT: n/a NM Peak Area: n/a NM CONC: n/a NM Base Start: n/a NM Base End: n/a NM LOD: n/a NM Start IDX: n/a NM End IDX: n/a NM Max Slope: n/a NM Min Slope: n/a NM PT Count: n/a Expected Values: Previous CH ₄ : 10.24 Previous NMHC: 11.05 Previous THC: 21.31 New CH ₄ : n/a New NMHC: n/a New THC: n/a
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Comments:

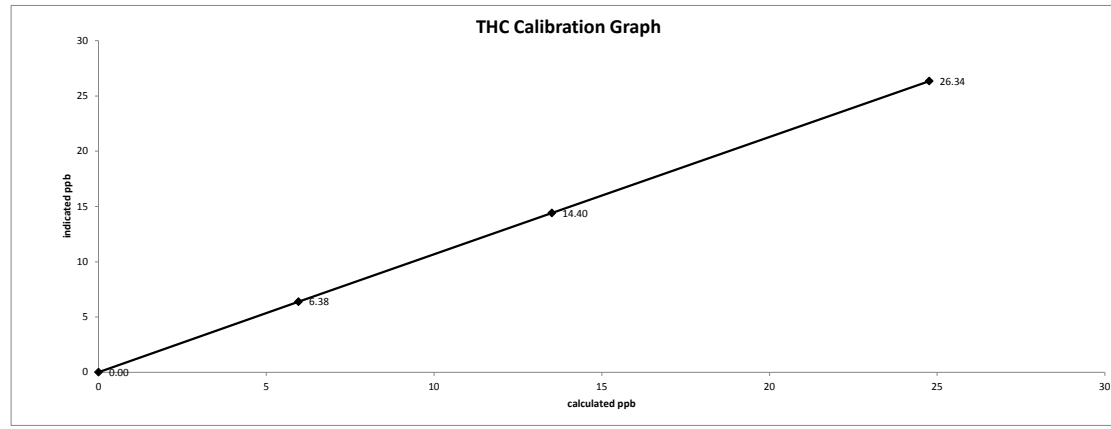
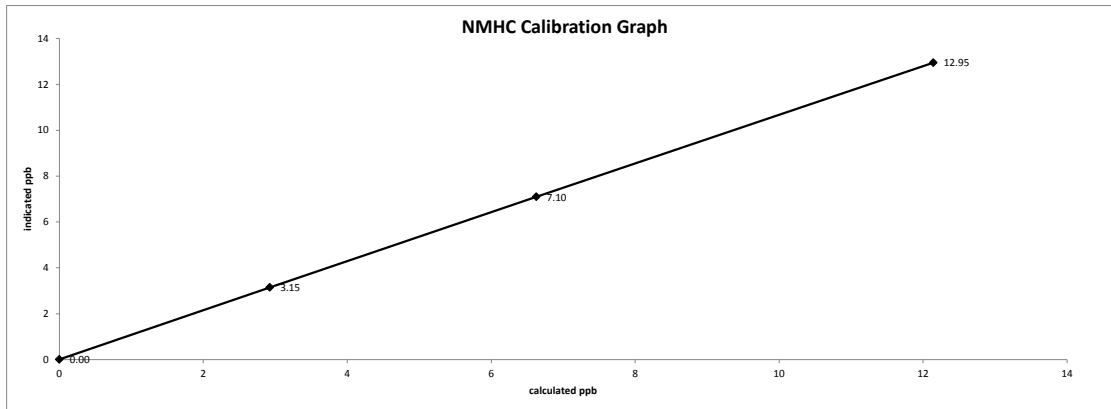
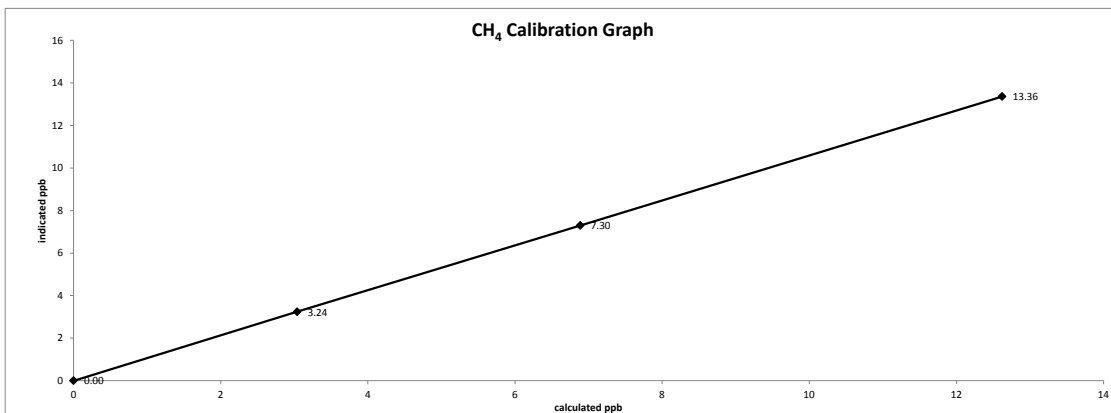
No zero adjustment was required/made.

Flow measurements after mid-point.

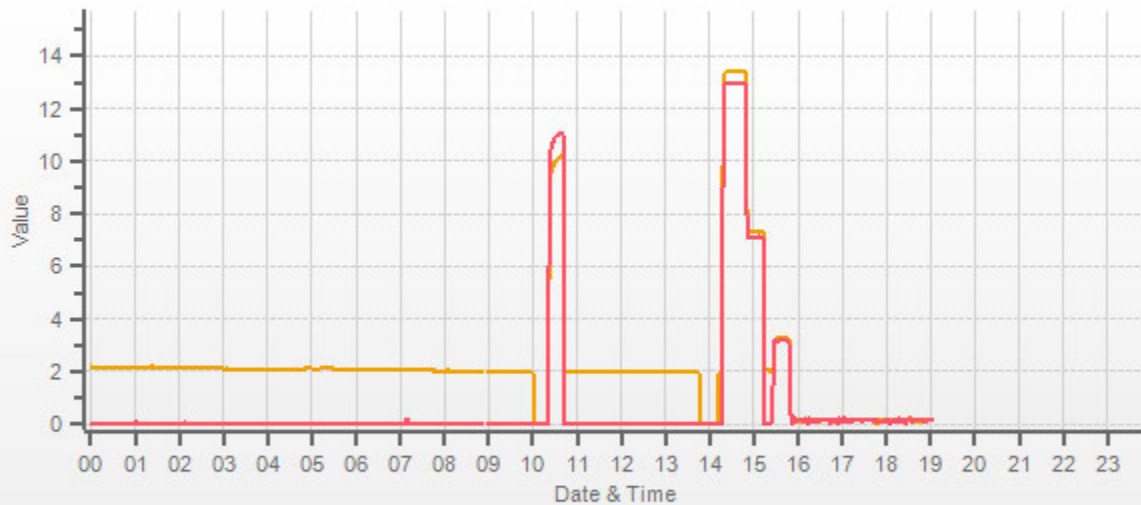
Shutdown calibration was completed for relocation of the station.

Date: July 31, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 13:22 / 15:50
Calibration Purpose: shut down
Calibration Method: Gas Dilution



Station: LICA Bonnyville Daily: 17/07/31 Type: AVG 1 Min. [1 Min.]



— CH4[ppm]

— NMHC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: <u>July 4, 2017</u>	Barometer Data/B.P.: <u>Fisher Scientific, I.D. # 05544</u>	946 mb
Company/Airshed: <u>LICA</u>	Thermometer Data/Station Temp °C: <u>FLUKE 1551 A Ex STIK / I.D. # 4294</u>	22 °C
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>Mainly sunny</u>	
Start/End Time 24 hr. (mst): <u>13:34 / 20:51</u>	Calibration Purpose: <u>routine monthly</u>	
G.P.T. to be used for Ozone? <u>Yes with 1000 ppb NOx full scale</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Trina Whitsitt</u>
Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Cal Gas Expiry Date: <u>July 18, 2019</u>	

Analyzer:	Correction Factors:			
ID# or Serial Number: <u>593</u>	Previous C.F.: <u>As Found C.F.:</u> <u>New C.F.:</u>			
Last Calibration Date: <u>June 1, 2017</u>	NO = <table border="1" style="display: inline-table;"><tr><td>1.000</td><td>1.020</td><td>1.000</td></tr></table>	1.000	1.020	1.000
1.000	1.020	1.000		
Range ppb: <u>1000</u>	NO ₂ = <table border="1" style="display: inline-table;"><tr><td>1.000</td><td>1.006</td><td>1.006</td></tr></table>	1.000	1.006	1.006
1.000	1.006	1.006		
	NOx = <table border="1" style="display: inline-table;"><tr><td>1.000</td><td>1.015</td><td>1.000</td></tr></table>	1.000	1.015	1.000
1.000	1.015	1.000		

Calibration Standards:	Standard Calibration Points for a Range of: 1000 ppb																								
Low Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 152020 / Nov 21, 2016</u>	<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																						
High Flow Meter ID/Cert. Date: <u>Defender 530 /s.n. 148943 / Nov 21, 2016</u>																									
Calibrator ID/Cert. Date: <u>API 700 / s.n. 627 / Jan 27, 2017</u>																									
Cal Gas Cylinder I.D. #: <u>LL104222</u>																									
Cal Gas Conc. (ppm): <u>50.7</u> <u>50.9</u>																									

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	5008	0.0	5008	0	0	1.0	1.0	n/a	n/a
as found high	4931	77.8	5009	787.8	787.8	773.0	777.0	1.020	1.015
adjusted zero	5008	0.00	5008	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4931	77.83	5009	787.8	787.8	788.0	788.0	1.000	1.000
mid	4966	37.73	5004	382.3	382.3	382.0	382.0	1.001	1.001
low	4987	18.83	5006	190.7	190.7	189.0	189.0	1.009	1.009
calibrator zero	5008	0.00	5008	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.003

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

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	4931	77.83	5009	0.0	790.0	788.0	-1.0	0.0	-1.0	
as found high NO2	4931	77.83	5009	510.0	270.0	786.0	516.0	520.0	517.0	1.006
adjusted high NO2	4931	77.83	5009	510.0	270.0	786.0	516.0	520.0	517.0	1.006
gpt mid	4931	77.83	5009	276.0	507.0	787.0	280.0	283.0	281.0	1.007
gpt low	4931	77.83	5009	96.0	692.0	788.0	96.0	98.0	97.0	1.010
Average NO ₂ C.F.=									1.008	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.004	.95-1.05
b (Intercept as % of full scale)=	-0.08%	-0.08%	-0.08%	± 3% F.S.
% change in C.F. from last cal=	-2.04%	-1.52%	-0.58%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

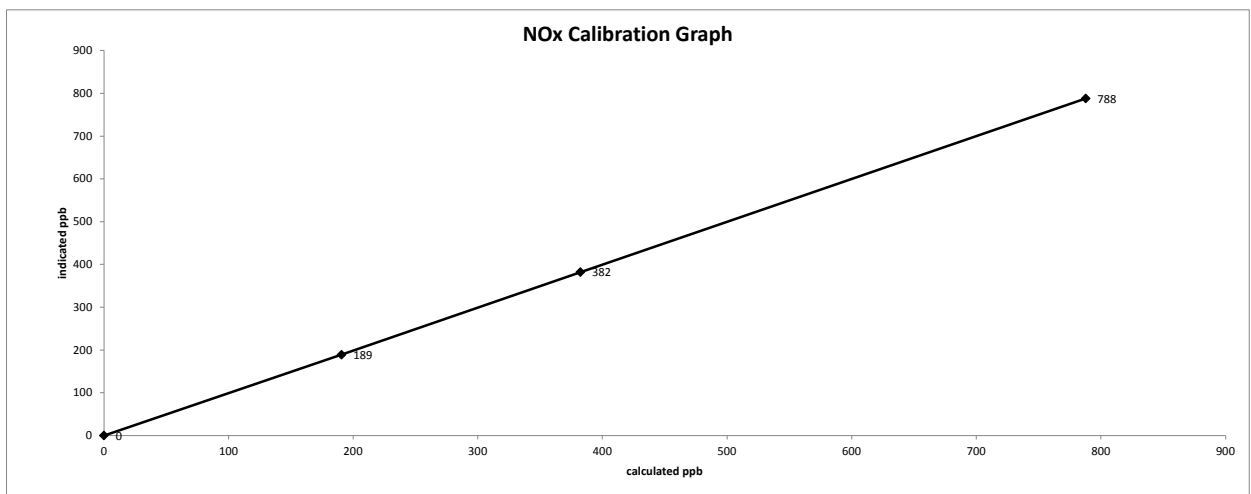
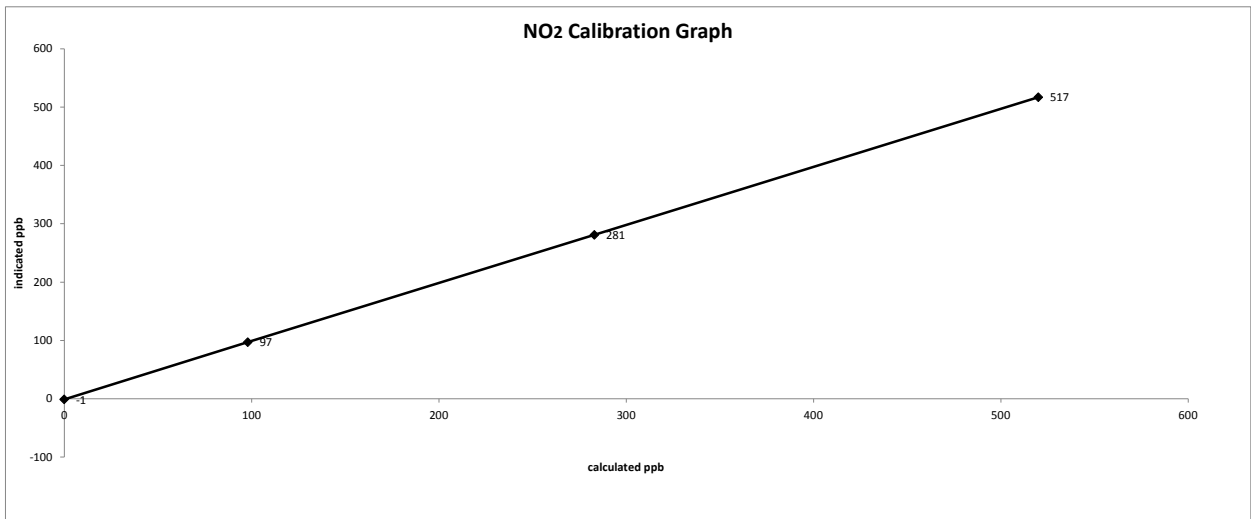
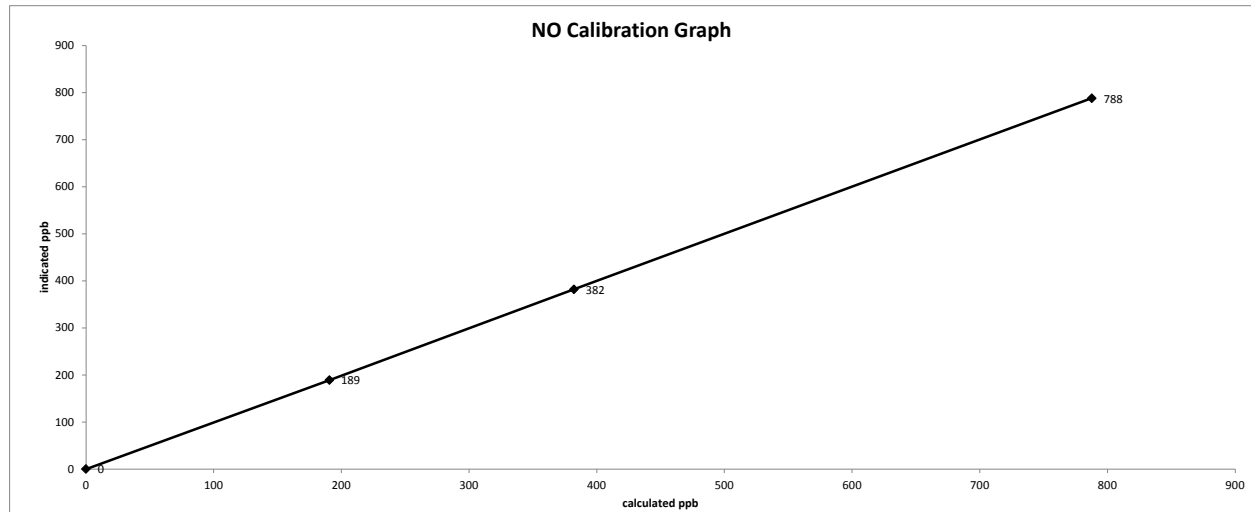
<p style="text-align: center;">As found:</p> <p>NOx SLOPE: <u>0.903</u></p> <p>NOx OFFS: <u>-1.8</u></p> <p>NO SLOPE: <u>0.904</u></p> <p>NO OFFS: <u>-2.7</u></p> <p>SAMP FLW: <u>477</u></p> <p>OZONE FL: <u>77</u></p> <p>PMT: <u>9.8</u></p> <p>NORM PMT: <u>-0.6</u></p> <p>AZERO: <u>10.1</u></p> <p>HVPS: <u>670</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>29.0</u></p> <p>PMT TEMP: <u>6.7</u></p> <p>IZS TEMP: <u>45.3</u></p> <p>MOLY TEMP: <u>315.0</u></p> <p>RCEL: <u>5.6</u></p> <p>SAMP: <u>27.0</u></p> <p>Expected Value NO: <u>439.0</u></p> <p>Expected Value NO₂: <u>5.6</u></p> <p>Expected Value NOx: <u>435.0</u></p>	<p style="text-align: center;">As left:</p> <p>NOx SLOPE: <u>0.914</u></p> <p>NOx OFFS: <u>0.4</u></p> <p>NO SLOPE: <u>0.920</u></p> <p>NO OFFS: <u>-1.9</u></p> <p>SAMP FLW: <u>476</u></p> <p>OZONE FL: <u>77</u></p> <p>PMT: <u>11.4</u></p> <p>NORM PMT: <u>-0.3</u></p> <p>AZERO: <u>10.9</u></p> <p>HVPS: <u>670</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>32.2</u></p> <p>PMT TEMP: <u>6.7</u></p> <p>IZS TEMP: <u>45.0</u></p> <p>MOLY TEMP: <u>316.1</u></p> <p>RCEL: <u>5.6</u></p> <p>SAMP: <u>26.9</u></p> <p>Expected Value NO: <u>439.0</u></p> <p>Expected Value NO₂: <u>5.6</u></p> <p>Expected Value NOx: <u>435.0</u></p>
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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.
 Flow measurements after mid-point.

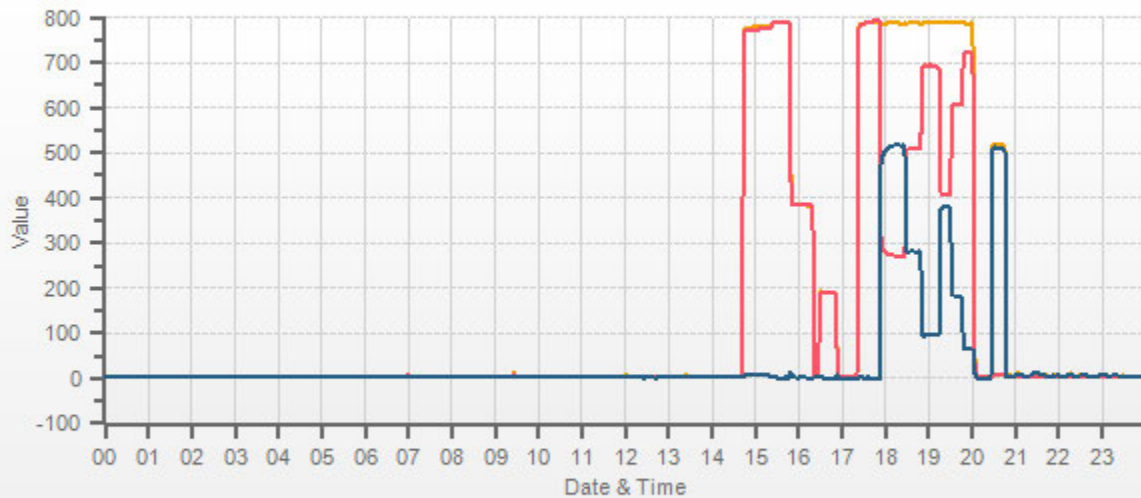
Three additional GPT points were taken for O3 calibration: O3 High/NO/NOx/NO2/No drop/NO2 gain = 372/406/786/380/384/381; O3 Mid/NO/NOx/NO2/NO drop/NO2 gain = 175/607/785/178/183/179; O3 Low/NO/NOx/NO2/NO drop/NO2 gain = 60/722/785/63/68/64. The EV will be adjusted only after the first scheduled ZS check.

Date: July 4, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 13:34 / 20:51
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration



Station: LICA Bonnyville Daily: 17/07/04 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: July 31, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016	955 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016	22 °C
Location/Station Name: Bonnyville - AER	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst): 10:29 / 16:26	Calibration Purpose:	shut down
G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date:	July 18, 2019

Analyzer:	Correction Factors:												
ID# or Serial Number: 593	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Previous C.F.:</th> <th style="width: 33%;">As Found C.F.:</th> <th style="width: 33%;">New C.F.:</th> </tr> <tr> <td>NO = 1.000</td> <td>0.959</td> <td>n/a</td> </tr> <tr> <td>NO₂ = 1.006</td> <td>1.008</td> <td>n/a</td> </tr> <tr> <td>NOx = 1.000</td> <td>0.959</td> <td>n/a</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO = 1.000	0.959	n/a	NO ₂ = 1.006	1.008	n/a	NOx = 1.000	0.959	n/a
Previous C.F.:	As Found C.F.:	New C.F.:											
NO = 1.000	0.959	n/a											
NO ₂ = 1.006	1.008	n/a											
NOx = 1.000	0.959	n/a											
Last Calibration Date: July 7, 2017													
Range ppb: 1000													

Calibration Standards:	Standard Calibration Points for a Range of: 1000 ppb																								
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016	<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																						
High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016																									
Calibrator ID/Cert. Date: API 700 /s.n. 627 / Jan 27, 2017																									
Cal Gas Cylinder I.D. #: LL104222																									
Cal Gas Conc. (ppm): 50.7 / 50.9																									

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

Point	Calibrator Flow Rates (cc/min)			Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
as found zero	5345	0.0	5345	0	0	0.0	0.0	n/a	n/a
as found high	5264	78.12	5342	741.4	741.4	773.0	773.0	0.959	0.959
mid	5304	37.92	5342	359.9	359.9	377.0	377.0	0.955	0.955
low	5324	18.96	5343	179.9	179.9	188.0	188.0	0.957	0.957
Average C.F.=								0.957	0.957

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

Point	Calibrator Flow Rates (cc/min)			Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5264	78.12	5342	0.0	781.0	781.0	0.0	0.0	0.0	
as found high NO ₂	5264	78.12	5342	500.0	280.0	777.0	497.0	501.0	497.0	1.008
gpt mid	5264	78.12	5342	275.0	505.0	778.0	273.0	276.0	273.0	1.011
gpt low	5264	78.12	5342	100.0	685.0	778.0	93.0	96.0	93.0	1.032
Average NO₂ C.F.=										1.017

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.959	0.959	1.006	0.90-1.10
b (Intercept as % of full scale)=	0.05%	0.05%	-0.11%	± 3% F.S.
% change in C.F. from last cal=	4.08%	-0.20%	4.08%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

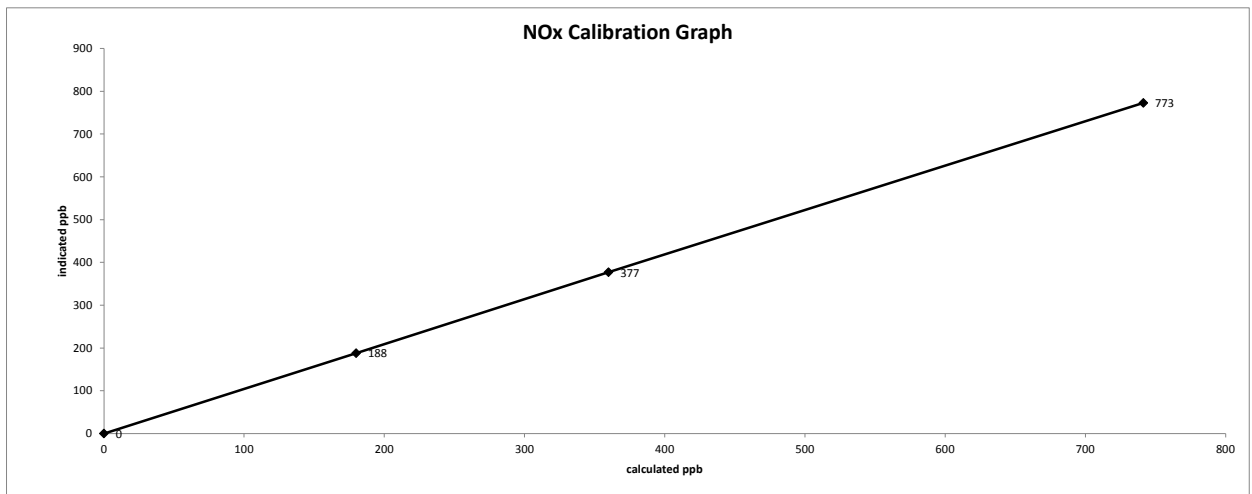
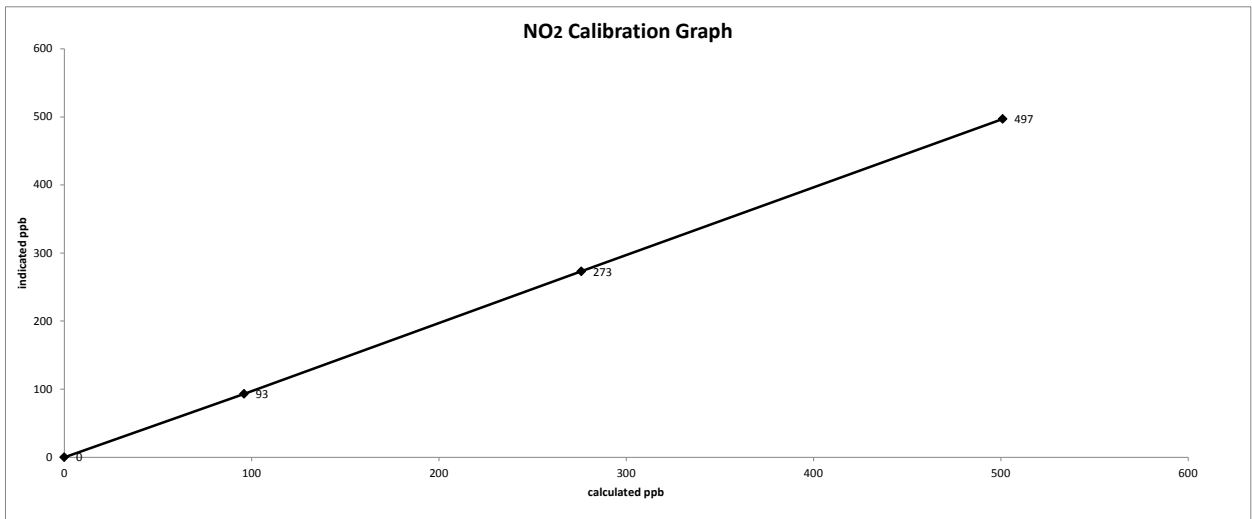
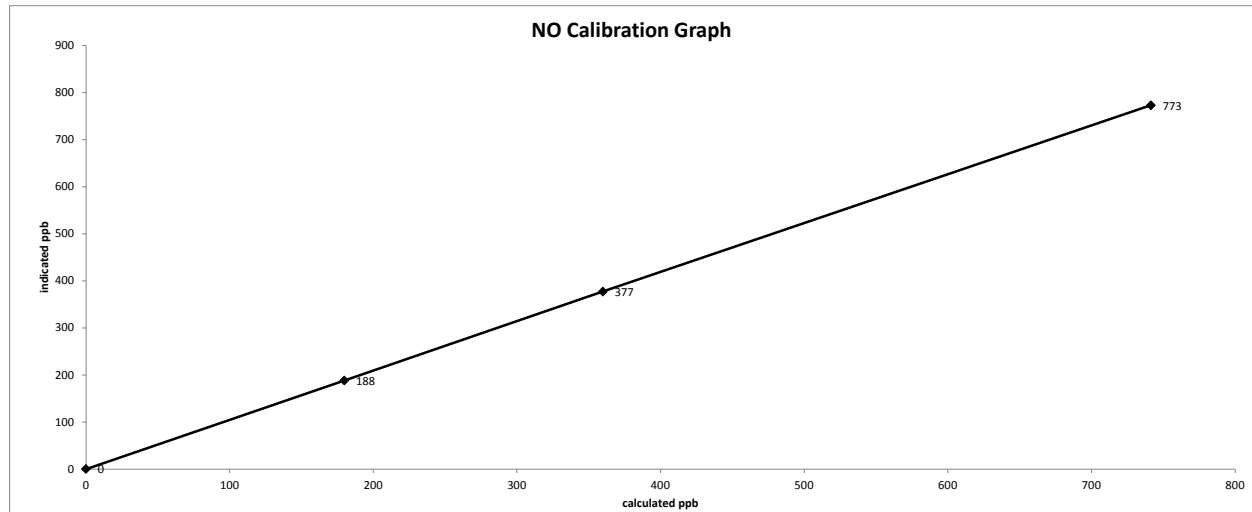
As found:	As left:
NOx SLOPE: 0.914	NOx SLOPE: n/a
NOx OFFS: 0.4	NOx OFFS: n/a
NO SLOPE: 0.920	NO SLOPE: n/a
NO OFFS: -1.9	NO OFFS: n/a
SAMP FLW: 482	SAMP FLW: n/a
OZONE FL: 78	OZONE FL: n/a
PMT: 12.9	PMT: n/a
NORM PMT: 0.3	NORM PMT: n/a
AZERO: 10.5	AZERO: n/a
HVPS: 670	HVPS: n/a
RCELL TEMP: 50.0	RCELL TEMP: n/a
BOX TEMP: 29.5	BOX TEMP: n/a
PMT TEMP: 6.7	PMT TEMP: n/a
IZS TEMP: 45.1	IZS TEMP: n/a
MOLY TEMP: 315.5	MOLY TEMP: n/a
RCEL: 5.8	RCEL: n/a
SAMP: 27.2	SAMP: n/a
Expected Value NO: 7.6	Expected Value NO: n/a
Expected Value NO ₂ : 507.0	Expected Value NO ₂ : n/a
Expected Value NOx: 515.0	Expected Value NOx: n/a

Comments:
 No zero adjustment was required/made.
 No high point NO₂ adjustment was required/made.

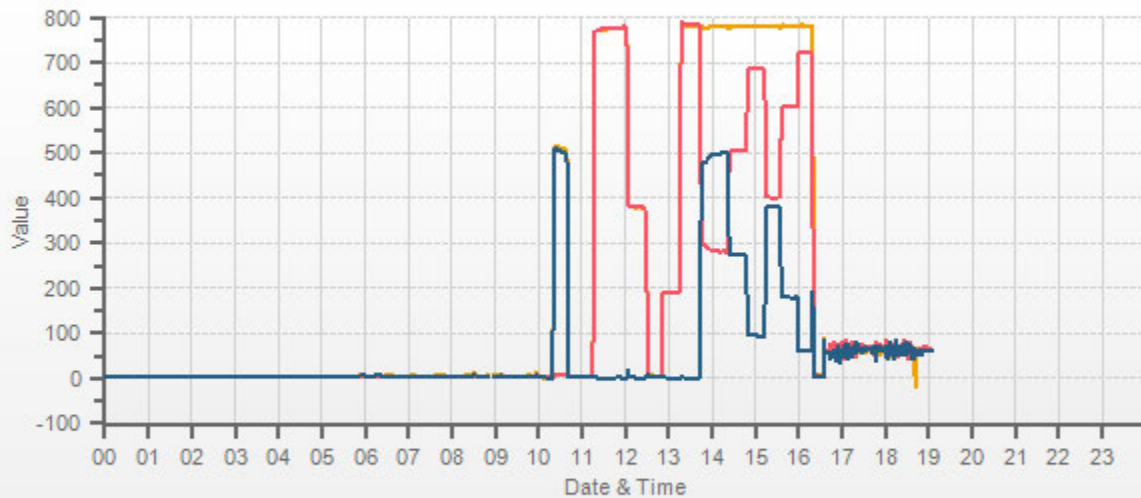
Flow measurements after mid-point.
 Shutdown calibration was completed for relocation of the station. Additional points for O3 analyzer shutdown calibration: High O3=380 , High NO drop=382 ; Mid O3= 180, Mid NO drop= 180; Low O3=60 , Low NO drop=58 .

Date: July 31, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 10:29 / 16:26
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration



Station: LICA Bonnyville Daily: 17/07/31 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: July 5, 2017	Barometer Data/B.P.: Fisher Scientific, I.D. # 05544	948 mb
Company/Airshed: LICA	Thermometer Data/Station Temp °C: FLUKE 1551 A Ex STIK / I.D. # 4294	21 °C
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny	
Start/End Time 24 hr. (mst): 8:57 / 12:54	Calibration Purpose: routine monthly	
Ozone Calibration Method: Direct G.P.T.	Performed By/Reviewer: Alex Yakupov	Trina Whitsitt
G.P.T. Date: July 4, 2017	Cal Gas Expiry Date:	

Analyzer:	
ID# or Serial Number: 1002240372	Ozone Range ppb: 500
Last Calibration Date: June 2, 2017	As Found C.F.: 1.035
Previous Cal High Point C.F.: 1.000	New C.F.: 1.000

Calibration Standards:									
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016	<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>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point		AMD Required Range of Ozone Calibration Points							
High		300-400 ppb							
Mid		150-200 ppb							
Low	50-75 ppb								
High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016									
Calibrator ID/Cert. Date: API 700 / s.n. 627 / Jan 27, 2017									
Cal Gas Cylinder I.D. #: n/a									

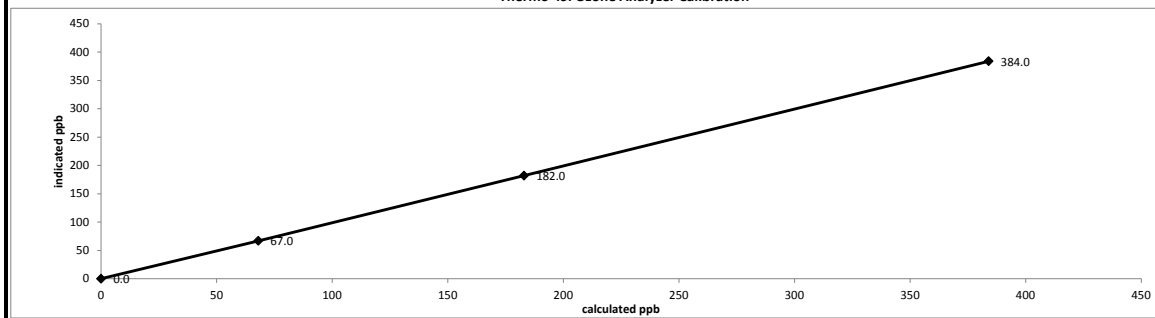
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	384.0	384.0	371.0	1.035
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	384.0	384.0	384.0	1.000
mid	5000	5000	183.0	183.0	182.0	1.005
low	5000	5000	68.0	68.0	67.0	1.015
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =					1.007	

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale) =	0.13%	.95-1.05
% change in C.F. from last cal =	-3.50%	± 3% F.S.
		± 10%

Thermo 49i Ozone Analyzer Calibration



<p style="text-align: center;">As found:</p> <p>O3 Bkg: -0.2</p> <p>O3 Coef: 0.982</p> <p>Photo Lamp: 14.2</p> <p>O3 Lamp: 5.8</p> <p>Bench: 28.9</p> <p>Bench Lamp: 54.1</p> <p>O3 Lamp: 68.1</p> <p>Pressure: 705.4</p> <p>Cell A lpm: 0.757</p> <p>Cell B lpm: 0.771</p> <p>O3 ppb: -1.1</p> <p>Cell A ppb: -1.1</p> <p>Cell B ppb: -1.1</p> <p>Cell A int: 78186</p> <p>Expected Value: 263.0</p>	<p style="text-align: center;">As left:</p> <p>O3 Bkg: -0.2</p> <p>O3 Coef: 1.016</p> <p>Photo Lamp: 14.2</p> <p>O3 Lamp: 5.8</p> <p>Bench: 29.4</p> <p>Bench Lamp: 54.1</p> <p>O3 Lamp: 68.1</p> <p>Pressure: 705.7</p> <p>Cell A lpm: 0.757</p> <p>Cell B lpm: 0.769</p> <p>O3 ppb: 0.0</p> <p>Cell A ppb: -0.7</p> <p>Cell B ppb: 0.7</p> <p>Cell A int: 78178</p> <p>Expected Value: 273.0</p>
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Comments: The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

Cal gas expiry date: n/a

O3[ppb] Station: LICA Bonnyville Daily: 17/07/05 Type: AVG 1 Min. [1 Min.]



— O3[ppb]



Thermo 49i Ozone Analyzer Calibration

Date: July 31, 2017 Company/Airshed: LICA Location/Station Name: Bonnyville - AER Start/End Time 24 hr. (mst): 16:11 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: July 31, 2017	Barometer Data/B.P.: Fisher Scientific / ID# 05544 / Dec 05, 2016 955 mb Thermometer Data/Station Temp °C: FLUKE 1551A / ID # 4295 / Nov 15, 2016 22 °C Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date:
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Analyzer: ID# or Serial Number: 1002240372 Last Calibration Date: July 5, 2017 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 0.992 New C.F.: n/a
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Calibration Standards:									
Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 Calibrator ID/Cert. Date: API 700 / s.n. 627 / Jan 27, 2017 Cal Gas Cylinder I.D. # : n/a	<table border="1" style="margin: auto;"> <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>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

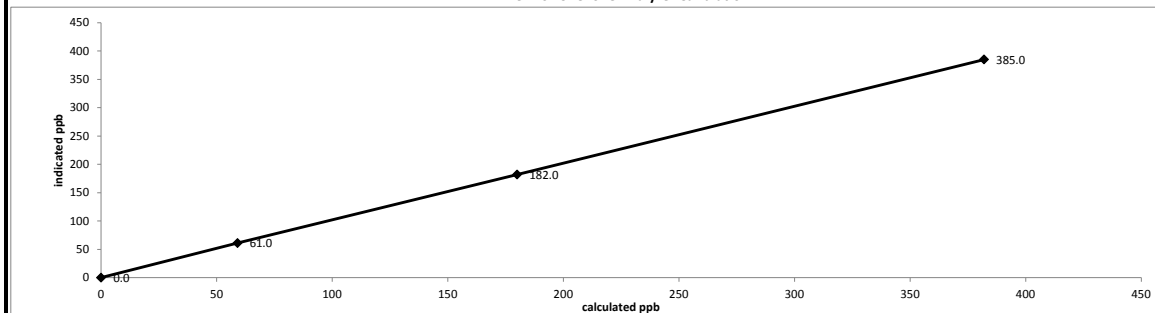
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	382.0	382.0	385.0	0.992
mid	5000	5000	180.0	180.0	182.0	0.989
low	5000	5000	59.0	59.0	61.0	0.967
Average C.F.=						0.983

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.994	> or = 0.995
b (Intercept as % of full scale)= -0.15%	0.90-1.10
% change in C.F. from last cal= 0.78%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration

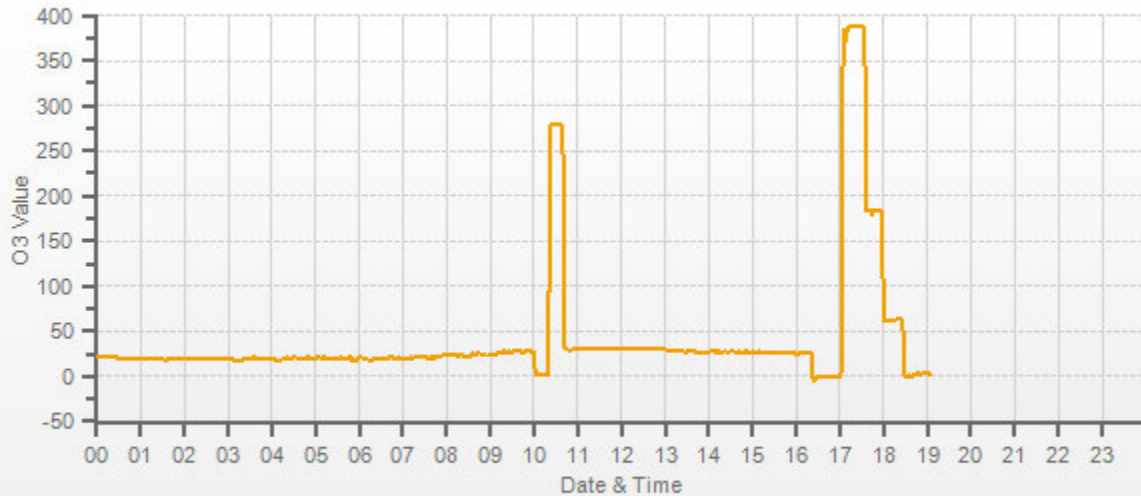


As found: O3 Bkg: -0.2 O3 Coef: 1.016 Photo Lamp: 14.2 O3 Lamp: 5.8 Bench: 29.5 Bench Lamp: 54.0 O3 Lamp: 68.1 Pressure: 710.1 Cell A lpm: 0.760 Cell B lpm: 0.772 O3 ppb: 0.2 Cell A ppb: -2.0 Cell B ppb: 0.2 Cell A int: 76761 Expected Value: 273.0	As left: O3 Bkg: n/a O3 Coef: n/a Photo Lamp: n/a O3 Lamp: n/a Bench: n/a Bench Lamp: n/a O3 Lamp: n/a Pressure: n/a Cell A lpm: n/a Cell B lpm: n/a O3 ppb: n/a Cell A ppb: n/a Cell B ppb: n/a Cell A int: n/a Expected Value: n/a
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Comments:
 No zero adjustment was required/made.
 No high point adjustment was required/made.

Shutdown calibration was completed for relocation of the station.

O3[ppb] Station: LICA Bonnyville Daily: 17/07/31 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER

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

Date: July 5, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: June 28, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 15:45
 End Time (mst): 16:38
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number:	<u>140AB229030002</u>	As Found Filter Loading %:	<u>21%</u>
K _o Factor:	<u>13319</u>	As Left Filter Loading %:	<u>21%</u>
Ambient Temperature °C:	<u>24.5</u>	As Found Noise:	<u>0.046</u>
Ambient Pressure atm:	<u>0.938</u>	As Left Noise:	<u>0.027</u>
Main Flow Reading lpm:	<u>2.99</u>	Pump Vacuum:	<u>n/a</u>
Aux Flow Reading lpm:	<u>13.63</u>	Warnings:	<u>None</u>

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. / sn # 091099, I.D.#3 / March 24, 2017
 High Flow: Chinook Eng. / sn # 091001, I.D. #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / I.D. #3 / January 01, 2017
 Temperature: FLUKE 1551A Ex STIK / I.D. #4295 / November 15, 2016
 Pressure: Fisher Scientific / I.D. #05544 / December 05, 2016

As Found Pump Off Test and Leak Check :

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>0.09</u>	<u>0.10</u>	
seconds to reach full flow (max. 60s)	<u>51</u>	<u>54</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>0.11</u>	<u>0.09</u>	
0 corrected leak rate (lpm)	<u>0.02</u>	<u>-0.01</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

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

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>0.09</u>	<u>0.10</u>	
seconds to reach full flow (max. 60s)	<u>51</u>	<u>54</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>0.11</u>	<u>0.09</u>	
0 corrected leak rate (lpm)	<u>0.02</u>	<u>-0.01</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>24.5</u>	1400A pressure atm:	<u>0.938</u>
reference temperature °C:	<u>24.8</u>	reference pressure:	<u>0.936</u>
difference °C:	<u>0.3</u>	difference:	<u>-0.002</u>

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>24.5</u>	1400A pressure atm:	<u>0.938</u>
reference temperature °C:	<u>24.8</u>	reference pressure:	<u>0.936</u>
difference °C:	<u>0.3</u>	difference:	<u>-0.002</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%	
1400A main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.67</u>
reference main flow lpm:	<u>3.08</u>	reference total/aux flow lpm:	<u>16.85</u>
difference lpm:	<u>0.08</u>	difference lpm:	<u>0.18</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%	
1400A main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.67</u>
reference main flow lpm:	<u>3.08</u>	reference total/aux flow lpm:	<u>16.85</u>
difference lpm:	<u>0.08</u>	difference lpm:	<u>0.18</u>

K_o Audit:

Last K_o audit date: June 5, 2017
 1400A K_o factor: 13319
 Measured K_o factor: 13564
 % difference: 1.84%

Instrument Operating Parameters:

Pump Vacuum: n/a
 Main F_{adj}: 1.000
 Aux F_{adj}: 1.000

Comments:

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

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

Date: July 24, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: July 5, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 11:25
 End Time (mst): 12:56
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Light rain/scattered showers

1400A Information and Status:

ID# or Serial Number:	<u>140AB229030002</u>	As Found Filter Loading %:	<u>53%</u>
K ₀ Factor:	<u>13319</u>	As Left Filter Loading %:	<u>22%</u>
Ambient Temperature °C:	<u>12.0</u>	As Found Noise:	<u>0.062</u>
Ambient Pressure atm:	<u>0.922</u>	As Left Noise:	<u>0.052</u>
Main Flow Reading lpm:	<u>2.99</u>	Pump Vacuum:	<u>n/a</u>
Aux Flow Reading lpm:	<u>13.63</u>	Warnings:	<u>None</u>

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. / sn # 091099, I.D.#3 / March 24, 2017
 High Flow: Chinook Eng. / sn # 091001, I.D. #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / I.D. #3 / January 01, 2017
 Temperature: FLUKE 1551A Ex STIK / I.D. #4295 / November 15, 2016
 Pressure: Fisher Scientific / I.D. #05544 / December 05, 2016

As Found Pump Off Test and Leak Check :

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>0.09</u>	<u>0.09</u>	
seconds to reach full flow (max. 60s)	<u>50</u>	<u>56</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>0.11</u>	<u>0.09</u>	
0 corrected leak rate (lpm)	<u>0.02</u>	<u>0.00</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

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

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>0.09</u>	<u>0.09</u>	
seconds to reach full flow (max. 60s)	<u>50</u>	<u>56</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>0.11</u>	<u>0.09</u>	
0 corrected leak rate (lpm)	<u>0.02</u>	<u>0.00</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>12.0</u>	1400A pressure atm:	<u>0.922</u>
reference temperature °C:	<u>13.3</u>	reference pressure:	<u>0.922</u>
difference °C:	<u>1.3</u>	difference :	<u>0.000</u>

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>12.0</u>	1400A pressure atm:	<u>0.922</u>
reference temperature °C:	<u>13.3</u>	reference pressure:	<u>0.922</u>
difference °C:	<u>1.3</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%	
1400A main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.67</u>
reference main flow lpm:	<u>3.10</u>	reference total/aux flow lpm:	<u>16.96</u>
difference lpm:	<u>0.10</u>	difference lpm:	<u>0.29</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%	
1400A main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.67</u>
reference main flow lpm:	<u>3.10</u>	reference total/aux flow lpm:	<u>16.96</u>
difference lpm:	<u>0.10</u>	difference lpm:	<u>0.29</u>

K₀ Audit:

Last K₀ audit date: June 5, 2017
 1400A K₀ factor: 13319
 Measured K₀ factor: 13564
 % difference: 1.84%

Instrument Operating Parameters:

Pump Vacuum: n/a
 Main F_{adj}: 1.000
 Aux F_{adj}: 1.000

Comments:

The TEOM sample filter was changed.

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

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

Date: July 31, 2017 Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Company: LICA Start Time (mst): 16:11
 Station Name/Location: Bonnyville - AER End Time (mst): 16:57
 Previous Audit Date: July 24, 2017 Calibration Purpose: shut down
 Parameter: PM 2.5 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number:	<u>140AB229030002</u>	As Found Filter Loading %:	<u>29%</u>
K _o Factor:	<u>13319</u>	As Left Filter Loading %:	<u>n/a</u>
Ambient Temperature °C:	<u>25.0</u>	As Found Noise:	<u>0.039</u>
Ambient Pressure atm:	<u>0.944</u>	As Left Noise:	<u>n/a</u>
Main Flow Reading lpm:	<u>2.99</u>	Pump Vacuum:	<u>n/a</u>
Aux Flow Reading lpm:	<u>13.63</u>	Warnings:	<u>None</u>

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. / sn # 091099, I.D.#3 / March 24, 2017
 High Flow: Chinook Eng. / sn # 091001, I.D. #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / I.D. #3 / January 01, 2017
 Temperature: FLUKE 1551A Ex STIK / I.D. #4295 / November 15, 2016
 Pressure: Fisher Scientific / I.D. #05544 / December 05, 2016

As Found Pump Off Test and Leak Check :

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>0.09</u>	<u>0.09</u>	
seconds to reach full flow (max. 60s)	<u>52</u>	<u>55</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>0.10</u>	<u>0.09</u>	
0 corrected leak rate (lpm)	<u>0.01</u>	<u>0.00</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

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

	main flow	auxiliary flow	
pump unplugged zero (lpm)	<u>n/a</u>	<u>n/a</u>	
seconds to reach full flow (max. 60s)	<u>n/a</u>	<u>n/a</u>	(maintenance required if either > 60 seconds)
leak rate (lpm)	<u>n/a</u>	<u>n/a</u>	
0 corrected leak rate (lpm)	<u>#VALUE!</u>	<u>#VALUE!</u>	
limit (lpm)	<u>0.15</u>	<u>.15 or (.60 with FDMS unit)</u>	

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>25.0</u>	1400A pressure atm:	<u>0.944</u>
reference temperature °C:	<u>25.4</u>	reference pressure:	<u>0.944</u>
difference °C:	<u>0.4</u>	difference:	<u>0.000</u>

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1400A temperature °C:	<u>n/a</u>	1400A pressure atm:	<u>n/a</u>
reference temperature °C:	<u>n/a</u>	reference pressure:	<u>n/a</u>
difference °C:	<u>#VALUE!</u>	difference:	<u>#VALUE!</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%	
1400A main flow lpm:	<u>3.00</u>	1400A total/aux flow lpm:	<u>16.67</u>
reference main flow lpm:	<u>3.09</u>	reference total/aux flow lpm:	<u>16.93</u>
difference lpm:	<u>0.09</u>	difference lpm:	<u>0.26</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%	
1400A main flow lpm:	<u>n/a</u>	1400A total/aux flow lpm:	<u>n/a</u>
reference main flow lpm:	<u>n/a</u>	reference total/aux flow lpm:	<u>n/a</u>
difference lpm:	<u>#VALUE!</u>	difference lpm:	<u>#VALUE!</u>

K_o Audit:

Last K_o audit date: n/a
 1400A K_o factor: 13319
 Measured K_o factor: n/a
 % difference: n/a

Instrument Operating Parameters:

Pump Vacuum: n/a
 Main F_{adj}: 1.000
 Aux F_{adj}: 1.000

Comments:

Shut down calibration was completed for relocation of the station.

WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Bonnyville - AER	Reviewed By:	Trina Whitsitt
Audit Date:	March 3, 2017	Start /EndTime (mst):	10:11 / 13:14

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	R.M. Young	Velocity Voltage Output Range:	0-1
Sensor Model:	5103 VK	Velocity Unit Output Range:	0-200
Serial #:	56589	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	January 26, 2016	Direction Unit Output Range:	0-360

Wind Calibrator Information

Calibrator Make/ Model:	RM Young / Model 18802	Serial #:	CA 03309
Maxxam Unit ID #:	13-3357	Certification Date:	October 6, 2016

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

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	17.6	17.7	17.6	0.998
2000	35.3	35.3	35.3	0.999
3000	52.9	53.0	53.0	0.999
4000	70.6	70.6	70.7	0.999
5000	88.2	88.3	88.4	0.998
6000	105.8	106.0	106.0	0.998
7000	123.5	123.6	123.7	0.999
8000	141.1	141.3	141.4	0.998
9000	158.8	159.0	159.1	0.998
10000	176.4	176.7	176.7	0.998
The audit meets AMD requirements.			Average Correction Factor=	0.998

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	354	0.2	1.3	0.8
30	330	30	329	-0.4	0.9	0.6
60	300	60	300	-0.4	0.3	0.4
90	270	91	271	-0.8	-0.6	0.7
120	240	120	240	0.3	0.4	0.4
150	210	149	210	0.7	-0.3	0.5
180	180	180	181	0.5	-0.9	0.7
210	150	209	150	1.1	-0.2	0.6
240	120	239	121	1.4	-0.5	1.0
270	90	269	90	1.5	-0.2	0.9
300	60	296	60	3.6	0.0	1.8
330	30	325	30	4.7	0.0	2.4
355	0	352	0	3.2	0.2	1.7
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.0

Comments:

VOC SAMPLER

Maxxam Analytics

XONTECK FLOW RATE VERIFICATION/CALIBRATION

Client: <u>LICA</u>	Date: <u>July 5, 2017</u>
Location: <u>Bonnyville - AER</u>	Last Cal. Date: <u>n/a</u>
Station ID: <u>LICA 37</u>	Start Time 24 hr. (mst): <u>13:45</u>
Sampler s/n: <u>6200</u>	End Time 24 hr. (mst): <u>14:34</u>
Purpose: <u>Routine Quarterly</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
Low Flow: <u>Defender 530 /s.n. 152020 / November 21, 2016</u>	
Digital Manometer: <u>Dwyer ID#3, 475 Mark III / January 1, 2017</u>	
Temperature: <u>FLUKE 1551 A Ex STIK / I.D. # 4295 / November 15, 2016</u>	
Pressure: <u>Fisher Scientific, I.D. # 05544 / December 5, 2017</u>	

The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1.

$$F = \frac{(P_A \times V)}{(T \times 60)} = \frac{2.2959 \times 6000}{24 \times 60} = \boxed{9.57 \text{ cc/min}} = \text{target flow rate}$$

where;

- F= flow rate in cc/min
- P_A= final canister in atmosphere absolute
- V= volume of canister in c.c.
- T= sampling period in hours
- BP= barometric pressure in atmospheres
- P_f= target final pressure

enter:

- BP= 0.935 atm
- P_A= 2.296 atm
- V= 6000 cubic centimetres
- T= 24 hours
- P_f= 20.0 psi= =1.36092 atm

XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION

FLOW RATE VERIFICATION

Volumetric Flow rate =	9.68 (cc/min)	As found pot setting =	4.94
Target Flow Rate (cc/min) =	9.57	Well within 2% tolerance, no flow calibration necessary.	
% Difference =	1.17%		

FLOW RATE CALIBRATION

Volumetric Flow rate =	9.68 (cc/min)	Adjusted pot setting =	4.94
Target Flow Rate (cc/min) =	9.57	Calibration meets requirements.	
% Difference =	1.17%		

XONTECK MAINTENANCE

Item:	Most Recent Date Completed:
1. Replace sample line and fittings from sampler to canister every 6 months.	_____
2. Purge line from manifold--> sampler with zero air every 6 months.	_____
3. Sample system cleaning every 2 years.	_____
4. Perform 12 hour leak check procedure every 6 months.	April 6, 2017

COMMENTS:

Last cal date and Xonteck Maintenance Item 1 and 2 - The date of "April 6, 2017" is not in the drop down list, and cannot be entered.

PAH SAMPLER



TISCH PUF PLUS SAMPLER AUDIT

Date: July 5, 2017 **PUF PLUS Serial #:** 100-1015
Company/Airshed: LICA/Bonnyville **Performed By/Reviewer:** Alex Yakupov | Trina Whitsitt
Location/Station Name: Bonnyville - AER / LICA 37 **Weather Conditions:** Mainly sunny

Reference Standards/I.D./Cert. Date:
Orifice Plate Kit: TE-5040, s.n. 1626 / Cal. Date: October 20, 2016
Digital Manometer: Dwyer ID#3, 475 Mark III January 1, 2017
Temperature: FLUKE 1551 A Ex STIK / I.D. # 4295 / November 15, 2016
Pressure: Fisher Scientific, I.D. # 05544 / December 5, 2016

TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT

AS FOUND Reference Barometric Pressure (mmHg):	711	AS FOUND Reference Temperature (°C):	25.2
AS FOUND PUF PLUS Barometric Pressure (mmHg):	706	AS FOUND PUF PLUS Temperature (°C):	24.6
% Difference (+/- 2% max.):	0.70%	% Difference (+/- 2 °C max.):	0.6
IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED		**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**	

TISCH PUF PLUS FLOW AUDIT

Flow Audit Calculations:

Enter Barometric Pressure from refrence (inHg) 27.99
 Barometric Pressure (mmHg) 710.9
 Enter Ambient Temperature from reference °C 25.2
 Enter "m" variable from calibrated orifice 6.08663
 Enter "b" variable from calibrated orifice -0.04218
 Enter Δp in. H₂O 1.97
 Standardized Flow lpm= 229.85
 Flow Set Point lpm= 230.00
 % Difference (+/- 2% max.)= 0.07%

IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED

TISCH PUF PLUS PRESSURE CALIBRATION

Reference Barometric Pressure AFTER CALIBRATION (mmHg): n/a
PUF Barometric Pressure AFTER CALIBRATION(mmHg): n/a
% Difference: #VALUE! Max 2.0%

Calibration Point (mmHg):	Δp (in. H ₂ O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):	% Difference vs. Calibration Target:
751	1.57	n/a	n/a	#VALUE!
731	0.79	n/a	n/a	#VALUE!
711	0.00	n/a	n/a	#VALUE!
691	-0.79	n/a	n/a	#VALUE!
671	-1.57	n/a	n/a	#VALUE!
% Difference (+/- 2% max.)=				#VALUE!

TISCH PUF PLUS TEMPERATURE CALIBRATION

Reference Temperature AFTER CALIBRATION (°C): n/a
TISCH PUF PLUS Temperature AFTER CALIBRATION(°C): n/a
Difference (°C): #VALUE! Max 2.0 °C

Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)
20	n/a	n/a	#VALUE!
-20	n/a	n/a	#VALUE!
40	n/a	n/a	#VALUE!
0	n/a	n/a	#VALUE!
-30	n/a	n/a	#VALUE!
% Difference (+/- 2 °C max.)			#VALUE!

TISCH PUF PLUS FLOW CALIBRATION

Flow Calibration Calculations:

Enter Barometric Pressure from refrence (inHg) n/a
 Barometric Pressure (mmHg) #VALUE!
 Enter Ambient Temperature from reference °C n/a
 Enter "m" variable from calibrated orifice n/a
 Enter "b" variable from calibrated orifice n/a
 Enter Δp in. H₂O n/a
 Standardized Flow lpm= #VALUE!
 Flow Set Point lpm= 230.00
 % Difference (+/- 2% max.)= #VALUE!

IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED

R, A1 and A0 Factors:

	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:
A0	15312.7500	-11845.5546	-0.2483
A1	22.5779	0.2990	17.6252
R	0.0000	0.0000	0.0000

Notes:

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
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

Calibrator:			Flow Measurement Device:		
Make/Model	Environics 6100		Make/Model	Bios Defender 530	
Serial Number	5212		Serial Number	Hi148944 Lo 152019	
Last Verification Date	February 3, 2016		Temperature (°C)	24.6	
NO Cylinder S/N	EY0000597		Barometric Pressure	701.4mmHg	
NO [PPM]	49.0	NOx [PPM]	49.0		
Expiry Date	December 8, 2019				

Dilution Flow (sccm)					
Pt. #1	<u>4919</u>	Pt. #2	<u>4934</u>	Pt. #3	<u>4960</u>
Gas Flow (sccm)					
Pt. #1	<u>79.2</u>	Pt. #2	<u>38.3</u>	Pt. #3	<u>19.1</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4987	0.0	0.0000	0.0000	0.0000	0.0002	0.0002	Limit ± 10%	
4998	79.2	0.7765	0.7765	0.7801	-0.0003	0.7798	0%	0%
4977	38.3	0.3775	0.3775	0.3790	0.0000	0.3790	0%	0%
4979	19.1	0.1880	0.1880	0.1888	-0.0001	0.1887	0%	0%
Absolute Average Percent Difference							0%	0%

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)=	1.0046	0.90-1.10		m (Slope)=	1.0041
b (Intercept % of FS)=	-0.0080	± 3% F.S.		b (Intercept % of FS)=	0.0057

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4998	0.000	0.0000	0.7799	-0.0008	0.7790	NO ₂	% Diff. Limit
4998	0.500	0.4949	0.2850	0.4909	0.7776	-1%	± 10%
4998	0.275	0.2765	0.5034	0.2742	0.7776	-1%	± 10%
4998	0.100	0.1003	0.6796	0.0989	0.7786	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9936	0.90-1.10	
b (Intercept % of FS)=	-0.0733	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	Thermo 146i	Make/Model	Thermo 42i
Serial/AMU Number	1809	Serial/AMU Number	1868
SRM Gas Cylinder No.	CAL018140	Last Calibration Date	February 13, 2017
Cylinder Conc. (ppm)	48.79	Full Scale (ppm)	1.0
		Cylinder Gas Expiry Date	March 28, 2019

COMMENTS: Gas has ~50ppm SO₂

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 14, 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

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

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 IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 06, 2017	S5635	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jul-17
17070097-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	20-Jul-17
17070097-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jul-17
17070097-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jul-17
17070097-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	20-Jul-17
17070097-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070097-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	1-Butene		0.12	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2,2,4-Trimethylpentane		0.10	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2,3,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	2,3-Dimethylpentane		0.05	ppbv	0.02	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/July 06, 2017	S5635	Ambient Air	06-Jul-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2-Methylheptane		0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	2-Methylpentane		0.07	ppbv	0.01	AC-058	20-Jul-17
17070097-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	3-Methylhexane		0.04	ppbv	0.02	AC-058	20-Jul-17
17070097-001	3-Methylpentane		0.05	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Acetone		6.1	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070097-001	Benzene		0.06	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Chloroform	I	0.03	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Chloromethane		0.51	ppbv	0.02	AC-058	20-Jul-17
17070097-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 06, 2017	S5635	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Ethanol		2.6	ppbv	0.3	AC-058	20-Jul-17
17070097-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Freon-11		0.31	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Freon-113	I	0.10	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Freon-114	I	0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Freon-12		0.67	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jul-17
17070097-001	Isobutane		0.24	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Isopentane		0.43	ppbv	0.03	AC-058	20-Jul-17
17070097-001	Isoprene		0.65	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	m,p-Xylene		0.06	ppbv	0.03	AC-058	20-Jul-17
17070097-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jul-17
17070097-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jul-17
17070097-001	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	20-Jul-17
17070097-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jul-17
17070097-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jul-17
17070097-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	20-Jul-17
17070097-001	Methylcyclopentane		0.05	ppbv	0.02	AC-058	20-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 06, 2017	S5635	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070097-001	n-Butane		0.53	ppbv	0.03	AC-058	20-Jul-17
17070097-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	20-Jul-17
17070097-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	n-Heptane		0.05	ppbv	0.01	AC-058	20-Jul-17
17070097-001	n-Hexane		0.06	ppbv	0.01	AC-058	20-Jul-17
17070097-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	n-Pentane		0.1	ppbv	0.1	AC-058	20-Jul-17
17070097-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jul-17
17070097-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jul-17
17070097-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jul-17
17070097-001	n-Nonane		0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	o-Xylene		0.03	ppbv	0.01	AC-058	20-Jul-17
17070097-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jul-17
17070097-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-001	Toluene		0.13	ppbv	0.01	AC-058	20-Jul-17
17070097-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 06, 2017	S5635	Ambient Air	06-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070097-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070097-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17

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Date: August-09-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/July 12, 2017	14985	Ambient Air	12-Jul-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070168-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	21-Jul-17
17070168-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	21-Jul-17
17070168-001	1,2,4-Trimethylbenzene		0.07	ppbv	0.05	AC-058	21-Jul-17
17070168-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	21-Jul-17
17070168-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	21-Jul-17
17070168-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070168-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	1-Butene		0.05	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2,3,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2,3-Dimethylbutane		0.05	ppbv	0.02	AC-058	21-Jul-17
17070168-001	2,3-Dimethylpentane		0.06	ppbv	0.02	AC-058	21-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 12, 2017	14985	Ambient Air	12-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070168-001	2,4-Dimethylpentane		0.03	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2-Methylheptane		0.09	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	2-Methylpentane		0.24	ppbv	0.01	AC-058	21-Jul-17
17070168-001	3-Methylheptane		0.05	ppbv	0.02	AC-058	21-Jul-17
17070168-001	3-Methylhexane		0.16	ppbv	0.02	AC-058	21-Jul-17
17070168-001	3-Methylpentane		0.19	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Acetone		9.9	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070168-001	Benzene		0.31	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Chloroform	I	0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Chloromethane		0.56	ppbv	0.02	AC-058	21-Jul-17
17070168-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Cyclohexane		0.19	ppbv	0.02	AC-058	21-Jul-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/July 12, 2017	14985	Ambient Air	12-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070168-001	Cyclopentane		0.09	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Ethanol		2.0	ppbv	0.3	AC-058	21-Jul-17
17070168-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Ethylbenzene		0.11	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Freon-11	I	0.27	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Freon-113	I	0.09	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Freon-12		0.61	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	21-Jul-17
17070168-001	Isobutane		0.34	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Isopentane		0.79	ppbv	0.03	AC-058	21-Jul-17
17070168-001	Isoprene		0.23	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Isopropylbenzene		0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	m,p-Xylene		0.32	ppbv	0.03	AC-058	21-Jul-17
17070168-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	21-Jul-17
17070168-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	21-Jul-17
17070168-001	Methyl ethyl ketone		2.1	ppbv	0.3	AC-058	21-Jul-17
17070168-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	21-Jul-17
17070168-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	21-Jul-17
17070168-001	Methylcyclohexane		0.31	ppbv	0.01	AC-058	21-Jul-17
17070168-001	Methylcyclopentane		0.34	ppbv	0.02	AC-058	21-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/July 12, 2017	14985	Ambient Air	12-Jul-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070168-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	21-Jul-17
17070168-001	n-Butane		1.60	ppbv	0.03	AC-058	21-Jul-17
17070168-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	21-Jul-17
17070168-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	n-Heptane		0.34	ppbv	0.01	AC-058	21-Jul-17
17070168-001	n-Hexane		0.50	ppbv	0.01	AC-058	21-Jul-17
17070168-001	n-Octane		0.14	ppbv	0.02	AC-058	21-Jul-17
17070168-001	n-Pentane		0.9	ppbv	0.1	AC-058	21-Jul-17
17070168-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	21-Jul-17
17070168-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	21-Jul-17
17070168-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	21-Jul-17
17070168-001	n-Nonane		0.04	ppbv	0.01	AC-058	21-Jul-17
17070168-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	21-Jul-17
17070168-001	o-Xylene		0.15	ppbv	0.01	AC-058	21-Jul-17
17070168-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	21-Jul-17
17070168-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	21-Jul-17
17070168-001	Toluene		0.86	ppbv	0.01	AC-058	21-Jul-17
17070168-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	21-Jul-17
17070168-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17
17070168-001	trans-2-Butene		0.03	ppbv	0.01	AC-058	21-Jul-17
17070168-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	21-Jul-17
17070168-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	21-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/July 12, 2017	14985	Ambient Air	12-Jul-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070168-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	21-Jul-17
17070168-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	21-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 18, 2017	23786	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070221-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Aug-17
17070221-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070221-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070221-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	1-Butene		0.07	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2,3-Dimethylbutane		0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 18, 2017	23786	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2-Methylhexane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	02-Aug-17
17070221-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	3-Methylpentane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Acetone		1.9	ppbv	0.4	AC-058	02-Aug-17
17070221-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070221-001	Benzene		0.04	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Chloroform	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Chloromethane		0.51	ppbv	0.02	AC-058	02-Aug-17
17070221-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070221-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 18, 2017	23786	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Ethanol		0.8	ppbv	0.3	AC-058	02-Aug-17
17070221-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Freon-11		0.32	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Freon-113	I	0.09	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Freon-114	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Freon-12		0.69	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070221-001	Isobutane		0.07	ppbv	0.02	AC-058	02-Aug-17
17070221-001	Isopentane		0.20	ppbv	0.03	AC-058	02-Aug-17
17070221-001	Isoprene		0.07	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	m,p-Xylene		0.03	ppbv	0.03	AC-058	02-Aug-17
17070221-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070221-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070221-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070221-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070221-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070221-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070221-001	Methylcyclohexane		0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-001	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 18, 2017	23786	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070221-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	02-Aug-17
17070221-001	n-Butane		0.17 ppbv	0.03	AC-058	02-Aug-17
17070221-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	02-Aug-17
17070221-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Aug-17
17070221-001	n-Heptane	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-001	n-Hexane		0.03 ppbv	0.01	AC-058	02-Aug-17
17070221-001	n-Octane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17
17070221-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	02-Aug-17
17070221-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Aug-17
17070221-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Aug-17
17070221-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Aug-17
17070221-001	n-Nonane	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-001	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-001	o-Xylene		0.02 ppbv	0.01	AC-058	02-Aug-17
17070221-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Aug-17
17070221-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	02-Aug-17
17070221-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Aug-17
17070221-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Aug-17
17070221-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Aug-17
17070221-001	Toluene		0.08 ppbv	0.01	AC-058	02-Aug-17
17070221-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Aug-17
17070221-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17
17070221-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 18, 2017	23786	Ambient Air	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070221-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Aug-17
17070221-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 24, 2017	2262	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070336-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Aug-17
17070336-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070336-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070336-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070336-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	1-Butene		0.12	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 24, 2017	2262	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070336-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	3-Methylpentane		0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Acetone		3.6	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070336-001	Benzene		0.05	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Carbon disulfide		5.34	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Chloroethane	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Chloromethane		0.67	ppbv	0.02	AC-058	02-Aug-17
17070336-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Cyclohexane		0.02	ppbv	0.02	AC-058	02-Aug-17

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 24, 2017	2262	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Ethanol		1.1	ppbv	0.3	AC-058	02-Aug-17
17070336-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Freon-11	I	0.28	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Freon-113	I	0.08	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Freon-114	I	0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Freon-12		0.61	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070336-001	Isobutane		0.32	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Isopentane		0.28	ppbv	0.03	AC-058	02-Aug-17
17070336-001	Isoprene		0.33	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070336-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070336-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Aug-17
17070336-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070336-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070336-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Aug-17
17070336-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070336-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	02-Aug-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 24, 2017	2262	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Aug-17
17070336-001	n-Butane		0.23	ppbv	0.03	AC-058	02-Aug-17
17070336-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Aug-17
17070336-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	n-Heptane		0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	n-Hexane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070336-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	02-Aug-17
17070336-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070336-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070336-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070336-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	o-Xylene		0.02	ppbv	0.01	AC-058	02-Aug-17
17070336-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070336-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070336-001	Toluene		0.06	ppbv	0.01	AC-058	02-Aug-17
17070336-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070336-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070336-001	trans-2-Butene		0.02	ppbv	0.01	AC-058	02-Aug-17
17070336-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070336-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 24, 2017	2262	Ambient Air	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070336-001	Vinyl acetate		0.6 ppbv	0.4	AC-058	02-Aug-17
17070336-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/July 30, 2017	S5670	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080051-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080051-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Aug-17
17080051-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080051-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Aug-17
17080051-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080051-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	1-Butene		0.06	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	1-Pentene		0.02	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2,2-Dimethylbutane		0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	16-Aug-17
17080051-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 30, 2017	S5670	Ambient Air	30-Jul-17 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080051-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	2-Methylpentane		0.07	ppbv	0.01	AC-058	16-Aug-17
17080051-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	16-Aug-17
17080051-001	3-Methylpentane		0.04	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Acetone		4.3	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080051-001	Benzene		0.16	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Chloroform	I	0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Chloromethane		0.38	ppbv	0.02	AC-058	16-Aug-17
17080051-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Cyclohexane		0.06	ppbv	0.02	AC-058	16-Aug-17

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 30, 2017	S5670	Ambient Air	30-Jul-17 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080051-001	Cyclopentane		0.03	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Ethanol		1.6	ppbv	0.3	AC-058	16-Aug-17
17080051-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Ethylbenzene		0.04	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Freon-11		0.31	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Freon-113	I	0.08	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Freon-12		0.63	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Aug-17
17080051-001	Isobutane		0.27	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Isopentane		0.44	ppbv	0.03	AC-058	16-Aug-17
17080051-001	Isoprene		0.44	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	m,p-Xylene		0.10	ppbv	0.03	AC-058	16-Aug-17
17080051-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Aug-17
17080051-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Aug-17
17080051-001	Methyl ethyl ketone		0.7	ppbv	0.3	AC-058	16-Aug-17
17080051-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Aug-17
17080051-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Aug-17
17080051-001	Methylcyclohexane		0.09	ppbv	0.01	AC-058	16-Aug-17
17080051-001	Methylcyclopentane		0.08	ppbv	0.02	AC-058	16-Aug-17

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Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/July 30, 2017	S5670	Ambient Air	30-Jul-17 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080051-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Aug-17
17080051-001	n-Butane		0.55	ppbv	0.03	AC-058	16-Aug-17
17080051-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Aug-17
17080051-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	n-Heptane		0.07	ppbv	0.01	AC-058	16-Aug-17
17080051-001	n-Hexane		0.12	ppbv	0.01	AC-058	16-Aug-17
17080051-001	n-Octane		0.03	ppbv	0.02	AC-058	16-Aug-17
17080051-001	n-Pentane		0.3	ppbv	0.1	AC-058	16-Aug-17
17080051-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Aug-17
17080051-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Aug-17
17080051-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Aug-17
17080051-001	n-Nonane		0.02	ppbv	0.01	AC-058	16-Aug-17
17080051-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	o-Xylene		0.04	ppbv	0.01	AC-058	16-Aug-17
17080051-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Aug-17
17080051-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Aug-17
17080051-001	Toluene		0.31	ppbv	0.01	AC-058	16-Aug-17
17080051-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Aug-17
17080051-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17
17080051-001	trans-2-Butene		0.02	ppbv	0.01	AC-058	16-Aug-17
17080051-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Aug-17
17080051-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/July 30, 2017	S5670	Ambient Air	30-Jul-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17080051-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Aug-17
17080051-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 06, 2017	TE-03	Air Filter	06-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070097-002	1-Methylnaphthalene		0.08 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	2-Methylnaphthalene		0.15 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Acenaphthene		0.19 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Acenaphthylene		0.10 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Anthracene		0.02 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(a)anthracene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(b,j,k)fluoranthene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(e)pyrene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Chrysene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Dibenzo(a,i)pyrene		0.02 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Dibenzo(a,l)pyrene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Fluoranthene		0.07 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Fluorene		0.08 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Naphthalene		0.05 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Phenanthrene		0.35 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/July 06, 2017	TE-03	Air Filter	06-Jul-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-002	Pyrene		0.07	ug/PUF	0.01	NA-017	27-Jul-17
17070097-002	Retene		0.07	ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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RESULTS: Cheri Sinclair Lakeland Industry and Community Assn	403-819-9139	CLIENT SAMPLE ID .ICA/PUF/Bonnyville/July 12, 201	CANISTER ID TE-11	Matrix Air Filter	Priority Normal
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB	780 812 2182 T9N 2J5	DESCRIPTION: Bonnyville - AER	DATE SAMPLED: 12-Jul-17 0:00	DATE RECEIVED: 19-Jul-17	REPORT NUMBER: 17070168 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070168-002	1-Methylnaphthalene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	2-Methylnaphthalene		0.03 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Acenaphthene		0.04 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Acenaphthylene		0.05 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Chrysene		0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Dibenzo(a,i)pyrene		0.02 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 12, 2017	TE-11	Air Filter	12-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070168	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070168-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Fluoranthene		0.08 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Fluorene		0.03 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Naphthalene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Phenanthrene		0.36 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Pyrene		0.10 ug/PUF	0.01	NA-017	27-Jul-17
17070168-002	Retene		0.04 ug/PUF	0.01	NA-017	27-Jul-17

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 18, 2017	9801	Air Filter	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-002	1-Methylnaphthalene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	2-Methylnaphthalene		0.04	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Acenaphthene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Acenaphthylene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Anthracene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(c)phenanthrene		0.35	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Benzo(ghi)perylene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Chrysene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Dibenzo(ah)anthracene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Fluoranthene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Fluorene		0.04	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Indeno(1,2,3-cd)pyrene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Naphthalene		0.02	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Phenanthrene		0.14	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 18, 2017	9801	Air Filter	18-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070221-002	Pyrene		0.03 ug/Filter	0.01	NA-017	16-Aug-17
17070221-002	Retene		0.04 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 24, 2017	TE-09	Air Filter	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070336-002	1-Methylnaphthalene		0.16 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	2-Methylnaphthalene		0.33 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Acenaphthene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Acenaphthylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(a)pyrene		0.09 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(b,j,k)fluoranthene		0.09 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Benzo(ghi)perylene		1.40 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Chrysene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Dibenzo(a,h)pyrene		0.09 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Dibenzo(a,i)pyrene		0.10 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Dibenzo(a,l)pyrene		0.09 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Dibenzo(ah)anthracene		0.97 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Fluorene		0.02 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Indeno(1,2,3-cd)pyrene		0.86 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Naphthalene		0.18 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Phenanthrene		0.06 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 24, 2017	TE-09	Air Filter	24-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070336-002	Pyrene		0.01 ug/Filter	0.01	NA-017	16-Aug-17
17070336-002	Retene		0.02 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID Matrix Priority</p> <p>ICA/PUF/Bonnyville/July 30, 2017 P13-01 Air Filter Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Bonnyville- AER</p> <p>DATE SAMPLED: 30-Jul-17 0:00 DATE RECEIVED: 04-Aug-17</p> <p>REPORT CREATED: 22-Aug-17 REPORT NUMBER: 17080051</p> <p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17080051-002	1-Methylnaphthalene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	2-Methylnaphthalene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Acenaphthene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Acenaphthylene		0.04	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Anthracene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(a)anthracene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(b,j,k)fluoranthene		0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(c)phenanthrene		0.10	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Chrysene		0.03	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/July 30, 2017	P13-01	Air Filter	30-Jul-17 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	17080051	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17080051-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Fluoranthene		0.09 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Fluorene		0.07 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Naphthalene		0.02 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Phenanthrene		0.43 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Pyrene		0.07 ug/Filter	0.01	NA-017	16-Aug-17
17080051-002	Retene		0.08 ug/Filter	0.01	NA-017	16-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

NMHC CANISTER SAMPLES

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID Matrix Priority</p> <p>/ NMHC VOC/Bonnyville/July 01, S5680 Ambient Air Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Bonnyville - AER</p> <p>DATE SAMPLED: 01-Jul-17 0:00 DATE RECEIVED: 06-Jul-17</p> <p>REPORT CREATED: 04-Aug-17 REPORT NUMBER: 17070018</p> <p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070018-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-Jul-17
17070018-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	08-Jul-17
17070018-003	1,2,4-Trichlorobenzene	K, T, U	< 0.9	ppbv	0.9	AC-058	08-Jul-17
17070018-003	1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	08-Jul-17
17070018-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Jul-17
17070018-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	08-Jul-17
17070018-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-Jul-17
17070018-003	1,3,5-Trimethylbenzene		0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	08-Jul-17
17070018-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	1-Butene		0.07	ppbv	0.02	AC-058	08-Jul-17

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, August 04, 2017	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/ NMHC VOC/Bonnyville/July 01, 2	S5680	Ambient Air	01-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070018	REPORT CREATED:	04-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070018-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	1-Pentene		0.05	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2,2,4-Trimethylpentane		0.13	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2,2-Dimethylbutane		0.04	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2,3,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2,3-Dimethylbutane		0.14	ppbv	0.02	AC-058	08-Jul-17
17070018-003	2,3-Dimethylpentane		0.13	ppbv	0.02	AC-058	08-Jul-17
17070018-003	2,4-Dimethylpentane		0.04	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2-Methylheptane		0.02	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2-Methylhexane		0.09	ppbv	0.01	AC-058	08-Jul-17
17070018-003	2-Methylpentane		0.28	ppbv	0.01	AC-058	08-Jul-17
17070018-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	3-Methylhexane		0.09	ppbv	0.02	AC-058	08-Jul-17
17070018-003	3-Methylpentane		0.17	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Acetone		3.8	ppbv	0.5	AC-058	08-Jul-17
17070018-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	08-Jul-17
17070018-003	Benzene		0.15	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Carbon disulfide	I	0.26	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/ NMHC VOC/Bonnyville/July 01, 2	S5680	Ambient Air	01-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070018	REPORT CREATED:	04-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070018-003	Chloroform	I	0.03	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Chloromethane		0.48	ppbv	0.02	AC-058	08-Jul-17
17070018-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-Jul-17
17070018-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-Jul-17
17070018-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	cis-2-Pentene		0.05	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Cyclohexane		0.13	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Cyclopentane		0.08	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Ethanol		3.6	ppbv	0.3	AC-058	08-Jul-17
17070018-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	Ethylbenzene		0.09	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Freon-11	I	0.31	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Freon-113	I	0.10	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Freon-12		0.63	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Hexachloro-1,3-butadiene	K, T, U	< 0.56	ppbv	0.56	AC-058	08-Jul-17
17070018-003	Isobutane		0.56	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Isopentane		1.66	ppbv	0.03	AC-058	08-Jul-17
17070018-003	Isoprene		0.34	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Isopropyl alcohol		1.0	ppbv	0.5	AC-058	08-Jul-17
17070018-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	08-Jul-17
17070018-003	m,p-Xylene		0.19	ppbv	0.03	AC-058	08-Jul-17
17070018-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-Jul-17
17070018-003	m-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	08-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/ NMHC VOC/Bonnyville/July 01, 2	S5680	Ambient Air	01-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070018	REPORT CREATED:	04-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070018-003	Methyl butyl ketone	K, T, U	< 0.56	ppbv	0.56	AC-058	08-Jul-17
17070018-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	08-Jul-17
17070018-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	Methyl methacrylate	K, T, U	< 0.08	ppbv	0.08	AC-058	08-Jul-17
17070018-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Jul-17
17070018-003	Methylcyclohexane		0.16	ppbv	0.01	AC-058	08-Jul-17
17070018-003	Methylcyclopentane		0.22	ppbv	0.02	AC-058	08-Jul-17
17070018-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	08-Jul-17
17070018-003	n-Butane		2.90	ppbv	0.03	AC-058	08-Jul-17
17070018-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	08-Jul-17
17070018-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	08-Jul-17
17070018-003	n-Heptane		0.09	ppbv	0.01	AC-058	08-Jul-17
17070018-003	n-Hexane		0.23	ppbv	0.01	AC-058	08-Jul-17
17070018-003	n-Octane		0.03	ppbv	0.02	AC-058	08-Jul-17
17070018-003	n-Pentane		0.8	ppbv	0.1	AC-058	08-Jul-17
17070018-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	08-Jul-17
17070018-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	08-Jul-17
17070018-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	08-Jul-17
17070018-003	n-Nonane		0.02	ppbv	0.01	AC-058	08-Jul-17
17070018-003	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	08-Jul-17
17070018-003	o-Xylene		0.09	ppbv	0.01	AC-058	08-Jul-17
17070018-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-Jul-17
17070018-003	p-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	08-Jul-17
17070018-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	08-Jul-17
17070018-003	Tetrachloroethylene	I	0.05	ppbv	0.05	AC-058	08-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/ NMHC VOC/Bonnyville/July 01, 2	S5680	Ambient Air	01-Jul-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070018	REPORT CREATED:	04-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070018-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	08-Jul-17
17070018-003	Toluene		0.49 ppbv	0.01	AC-058	08-Jul-17
17070018-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	08-Jul-17
17070018-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	08-Jul-17
17070018-003	trans-2-Butene		0.02 ppbv	0.01	AC-058	08-Jul-17
17070018-003	trans-2-Pentene		0.08 ppbv	0.02	AC-058	08-Jul-17
17070018-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	08-Jul-17
17070018-003	Vinyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	08-Jul-17
17070018-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	08-Jul-17

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS: Cheri Sinclair Lakeland Industry and Community Assn	403-819-9139	CLIENT SAMPLE ID /NMHC VOC/Bonnyville/July 07, :	CANISTER ID 23790	Matrix Ambient Air	Priority Normal
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB	780 812 2182 T9N 2J5	DESCRIPTION: Bonnyville - AER	DATE SAMPLED: 07-Jul-17 20:25	DATE RECEIVED: 13-Jul-17	REPORT NUMBER: 17070097 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070097-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070097-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	20-Jul-17
17070097-003	1,2,4-Trichlorobenzene	K, T, U	< 0.9 ppbv	0.9	AC-058	20-Jul-17
17070097-003	1,2,4-Trimethylbenzene		0.18 ppbv	0.06	AC-058	20-Jul-17
17070097-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jul-17
17070097-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	20-Jul-17
17070097-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	20-Jul-17
17070097-003	1,3,5-Trimethylbenzene		0.04 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17
17070097-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	20-Jul-17
17070097-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070097-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070097-003	1-Butene		0.13 ppbv	0.02	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/July 07, 2	23790	Ambient Air	07-Jul-17 20:25
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2,2,4-Trimethylpentane		0.60	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2,2-Dimethylbutane		0.06	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2,3,4-Trimethylpentane		0.10	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2,3-Dimethylbutane		0.15	ppbv	0.02	AC-058	20-Jul-17
17070097-003	2,3-Dimethylpentane		0.25	ppbv	0.02	AC-058	20-Jul-17
17070097-003	2,4-Dimethylpentane		0.08	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2-Methylheptane		0.03	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	2-Methylpentane		0.47	ppbv	0.01	AC-058	20-Jul-17
17070097-003	3-Methylheptane		0.04	ppbv	0.02	AC-058	20-Jul-17
17070097-003	3-Methylhexane		0.14	ppbv	0.02	AC-058	20-Jul-17
17070097-003	3-Methylpentane		0.31	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Acetone		7.5	ppbv	0.4	AC-058	20-Jul-17
17070097-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070097-003	Benzene		0.16	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Carbon disulfide	I	0.23	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/July 07, 2	23790	Ambient Air	07-Jul-17 20:25
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-003	Chloroform	I	0.03	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Chloromethane		0.53	ppbv	0.02	AC-058	20-Jul-17
17070097-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-003	cis-2-Butene		0.03	ppbv	0.02	AC-058	20-Jul-17
17070097-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Cyclohexane		0.10	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Cyclopentane		0.15	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Ethanol		8.7	ppbv	0.3	AC-058	20-Jul-17
17070097-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-003	Ethylbenzene		0.11	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Freon-11	I	0.30	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Freon-113	I	0.09	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Freon-114	I	0.02	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Freon-12		0.63	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Hexachloro-1,3-butadiene	K, T, U	< 0.55	ppbv	0.55	AC-058	20-Jul-17
17070097-003	Isobutane		1.95	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Isopentane		2.47	ppbv	0.03	AC-058	20-Jul-17
17070097-003	Isoprene		1.20	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Isopropyl alcohol		0.7	ppbv	0.4	AC-058	20-Jul-17
17070097-003	Isopropylbenzene		0.01	ppbv	0.01	AC-058	20-Jul-17
17070097-003	m,p-Xylene		0.41	ppbv	0.03	AC-058	20-Jul-17
17070097-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-003	m-Ethyltoluene	I	0.10	ppbv	0.09	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/July 07, 2	23790	Ambient Air	07-Jul-17 20:25
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070097-003	Methyl butyl ketone	K, T, U	< 0.55	ppbv	0.55	AC-058	20-Jul-17
17070097-003	Methyl ethyl ketone		0.8	ppbv	0.3	AC-058	20-Jul-17
17070097-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-003	Methyl methacrylate	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jul-17
17070097-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jul-17
17070097-003	Methylcyclohexane		0.11	ppbv	0.01	AC-058	20-Jul-17
17070097-003	Methylcyclopentane		0.31	ppbv	0.02	AC-058	20-Jul-17
17070097-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jul-17
17070097-003	n-Butane		5.14	ppbv	0.03	AC-058	20-Jul-17
17070097-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jul-17
17070097-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jul-17
17070097-003	n-Heptane		0.12	ppbv	0.01	AC-058	20-Jul-17
17070097-003	n-Hexane		0.56	ppbv	0.01	AC-058	20-Jul-17
17070097-003	n-Octane		0.04	ppbv	0.02	AC-058	20-Jul-17
17070097-003	n-Pentane		1.8	ppbv	0.1	AC-058	20-Jul-17
17070097-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	20-Jul-17
17070097-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	20-Jul-17
17070097-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	20-Jul-17
17070097-003	n-Nonane		0.02	ppbv	0.01	AC-058	20-Jul-17
17070097-003	o-Ethyltoluene	I	0.04	ppbv	0.01	AC-058	20-Jul-17
17070097-003	o-Xylene		0.20	ppbv	0.01	AC-058	20-Jul-17
17070097-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-003	p-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jul-17
17070097-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17
17070097-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/July 07, 2	23790	Ambient Air	07-Jul-17 20:25
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070097	REPORT CREATED:	09-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070097-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070097-003	Toluene		0.54 ppbv	0.01	AC-058	20-Jul-17
17070097-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	20-Jul-17
17070097-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070097-003	trans-2-Butene		0.04 ppbv	0.01	AC-058	20-Jul-17
17070097-003	trans-2-Pentene		0.05 ppbv	0.02	AC-058	20-Jul-17
17070097-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jul-17
17070097-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jul-17
17070097-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jul-17

Report certified by: Krista Gegolick, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-09-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">CLIENT SAMPLE ID</td> <td style="width: 33%;">CANISTER ID</td> <td style="width: 33%;">Matrix</td> <td style="width: 15%;">Priority</td> </tr> <tr> <td>/NMHC VOC/Bonnyville/July 20, 2017</td> <td>H2821</td> <td>Ambient Air</td> <td>Normal</td> </tr> <tr> <td colspan="4"> DESCRIPTION: Bonnyville - AER</td> </tr> <tr> <td>DATE SAMPLED: 20-Jul-17</td> <td>7:55</td> <td>DATE RECEIVED: 24-Jul-17</td> <td></td> </tr> <tr> <td>REPORT CREATED: 22-Aug-17</td> <td></td> <td>REPORT NUMBER: 17070221</td> <td></td> </tr> <tr> <td></td> <td></td> <td>VERSION: Version 01</td> <td></td> </tr> </table>	CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority	/NMHC VOC/Bonnyville/July 20, 2017	H2821	Ambient Air	Normal	 DESCRIPTION: Bonnyville - AER				DATE SAMPLED: 20-Jul-17	7:55	DATE RECEIVED: 24-Jul-17		REPORT CREATED: 22-Aug-17		REPORT NUMBER: 17070221				VERSION: Version 01	
CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority																						
/NMHC VOC/Bonnyville/July 20, 2017	H2821	Ambient Air	Normal																						
 DESCRIPTION: Bonnyville - AER																									
DATE SAMPLED: 20-Jul-17	7:55	DATE RECEIVED: 24-Jul-17																							
REPORT CREATED: 22-Aug-17		REPORT NUMBER: 17070221																							
		VERSION: Version 01																							
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>																									

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Aug-17
17070221-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	02-Aug-17
17070221-003	1,2,4-Trimethylbenzene		0.07	ppbv	0.06	AC-058	02-Aug-17
17070221-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070221-003	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	1-Butene		0.10	ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 20, 2	H2821	Ambient Air	20-Jul-17 7:55
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2,3,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	02-Aug-17
17070221-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	2-Methylpentane		0.08	ppbv	0.01	AC-058	02-Aug-17
17070221-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	3-Methylpentane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Acetone		67.9	ppbv	2.9	AC-058	02-Aug-17
17070221-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-003	Benzene		0.12	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Carbon disulfide		0.65	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 20, 2	H2821	Ambient Air	20-Jul-17 7:55
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-003	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Chloromethane		0.46	ppbv	0.02	AC-058	02-Aug-17
17070221-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Ethanol		1.4	ppbv	0.4	AC-058	02-Aug-17
17070221-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	Ethylbenzene		1.25	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Freon-11	I	0.28	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Freon-113	I	0.08	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Freon-12		0.59	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Hexachloro-1,3-butadiene	K, T, U	< 0.60	ppbv	0.60	AC-058	02-Aug-17
17070221-003	Isobutane		0.16	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Isopentane		0.46	ppbv	0.04	AC-058	02-Aug-17
17070221-003	Isoprene		0.37	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	Isopropylbenzene		0.02	ppbv	0.01	AC-058	02-Aug-17
17070221-003	m,p-Xylene		5.88	ppbv	0.04	AC-058	02-Aug-17
17070221-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 20, 2	H2821	Ambient Air	20-Jul-17 7:55
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070221-003	Methyl butyl ketone	K, T, U	< 0.60	ppbv	0.60	AC-058	02-Aug-17
17070221-003	Methyl ethyl ketone		0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	Methyl methacrylate	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070221-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Aug-17
17070221-003	Methylcyclohexane		0.03	ppbv	0.01	AC-058	02-Aug-17
17070221-003	Methylcyclopentane		0.04	ppbv	0.02	AC-058	02-Aug-17
17070221-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Aug-17
17070221-003	n-Butane		0.31	ppbv	0.04	AC-058	02-Aug-17
17070221-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Aug-17
17070221-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Aug-17
17070221-003	n-Heptane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	n-Hexane		0.09	ppbv	0.01	AC-058	02-Aug-17
17070221-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Aug-17
17070221-003	n-Pentane		0.1	ppbv	0.1	AC-058	02-Aug-17
17070221-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Aug-17
17070221-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Aug-17
17070221-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Aug-17
17070221-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	02-Aug-17
17070221-003	o-Xylene		1.85	ppbv	0.01	AC-058	02-Aug-17
17070221-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-003	p-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Aug-17
17070221-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17
17070221-003	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 20, 2	H2821	Ambient Air	20-Jul-17 7:55
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070221	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070221-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Aug-17
17070221-003	Toluene		2.11 ppbv	0.01	AC-058	02-Aug-17
17070221-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Aug-17
17070221-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Aug-17
17070221-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17
17070221-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Aug-17
17070221-003	Vinyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Aug-17
17070221-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<p>RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn</p>	<p>CLIENT SAMPLE ID CANISTER ID Matrix Priority</p> <p>/NMHC VOC/Bonnyville/July 27, 2017 2655 Ambient Air Normal</p>
<p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>DESCRIPTION: Bonnyville - AER</p> <p>DATE SAMPLED: 27-Jul-17 6:40 DATE RECEIVED: 31-Jul-17</p> <p>REPORT CREATED: 22-Aug-17 REPORT NUMBER: 17070336</p> <p>VERSION: Version 01</p>

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070336-003	1,1,1-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,1,2-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,1-Dichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Aug-17
17070336-003	1,2,3-Trimethylbenzene	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Aug-17
17070336-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0 ppbv	1.0	AC-058	03-Aug-17
17070336-003	1,2,4-Trimethylbenzene		0.11 ppbv	0.07	AC-058	03-Aug-17
17070336-003	1,2-Dibromoethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Aug-17
17070336-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	03-Aug-17
17070336-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Aug-17
17070336-003	1,3,5-Trimethylbenzene		0.04 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,3-Butadiene	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17
17070336-003	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Aug-17
17070336-003	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Aug-17
17070336-003	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Aug-17
17070336-003	1-Butene		0.22 ppbv	0.03	AC-058	03-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 27, 2	2655	Ambient Air	27-Jul-17 6:40
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-003	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	1-Pentene		0.05	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2,2,4-Trimethylpentane		0.76	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2,3,4-Trimethylpentane		0.10	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2,3-Dimethylbutane		0.41	ppbv	0.03	AC-058	03-Aug-17
17070336-003	2,3-Dimethylpentane		0.93	ppbv	0.03	AC-058	03-Aug-17
17070336-003	2,4-Dimethylpentane		0.41	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	2-Methylpentane		0.35	ppbv	0.01	AC-058	03-Aug-17
17070336-003	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	3-Methylhexane		0.09	ppbv	0.03	AC-058	03-Aug-17
17070336-003	3-Methylpentane		0.14	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Acetone		5.2	ppbv	0.5	AC-058	03-Aug-17
17070336-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Aug-17
17070336-003	Benzene		0.12	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Aug-17
17070336-003	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Carbon disulfide	I	0.31	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 27, 2	2655	Ambient Air	27-Jul-17 6:40
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-003	Chloroform	I	0.04	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Chloromethane		0.66	ppbv	0.03	AC-058	03-Aug-17
17070336-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Aug-17
17070336-003	cis-2-Butene		0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	cis-2-Pentene		0.06	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Cyclohexane		0.09	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Cyclopentane		0.07	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Ethanol		9.7	ppbv	0.4	AC-058	03-Aug-17
17070336-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Aug-17
17070336-003	Ethylbenzene		0.04	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Freon-11	I	0.28	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Freon-113	I	0.08	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Freon-12		0.60	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	03-Aug-17
17070336-003	Isobutane		2.14	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Isopentane		7.37	ppbv	0.04	AC-058	03-Aug-17
17070336-003	Isoprene		0.48	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Aug-17
17070336-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	m,p-Xylene		0.15	ppbv	0.04	AC-058	03-Aug-17
17070336-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Aug-17
17070336-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Aug-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 27, 2	2655	Ambient Air	27-Jul-17 6:40
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17070336-003	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	03-Aug-17
17070336-003	Methyl ethyl ketone		0.4	ppbv	0.4	AC-058	03-Aug-17
17070336-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Aug-17
17070336-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	03-Aug-17
17070336-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Aug-17
17070336-003	Methylcyclohexane		0.11	ppbv	0.01	AC-058	03-Aug-17
17070336-003	Methylcyclopentane		0.14	ppbv	0.03	AC-058	03-Aug-17
17070336-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Aug-17
17070336-003	n-Butane		16.3	ppbv	0.12	AC-058	03-Aug-17
17070336-003	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Aug-17
17070336-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Aug-17
17070336-003	n-Heptane		0.06	ppbv	0.01	AC-058	03-Aug-17
17070336-003	n-Hexane		0.15	ppbv	0.01	AC-058	03-Aug-17
17070336-003	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Aug-17
17070336-003	n-Pentane		0.5	ppbv	0.1	AC-058	03-Aug-17
17070336-003	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Aug-17
17070336-003	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Aug-17
17070336-003	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Aug-17
17070336-003	n-Nonane		0.01	ppbv	0.01	AC-058	03-Aug-17
17070336-003	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	03-Aug-17
17070336-003	o-Xylene		0.08	ppbv	0.01	AC-058	03-Aug-17
17070336-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Aug-17
17070336-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	03-Aug-17
17070336-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Aug-17
17070336-003	Tetrachloroethylene	I	0.11	ppbv	0.05	AC-058	03-Aug-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/July 27, 2	2655	Ambient Air	27-Jul-17 6:40
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17070336	REPORT CREATED:	22-Aug-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17070336-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Aug-17
17070336-003	Toluene		0.42 ppbv	0.01	AC-058	03-Aug-17
17070336-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Aug-17
17070336-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Aug-17
17070336-003	trans-2-Butene		0.03 ppbv	0.01	AC-058	03-Aug-17
17070336-003	trans-2-Pentene		0.11 ppbv	0.03	AC-058	03-Aug-17
17070336-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Aug-17
17070336-003	Vinyl acetate		0.6 ppbv	0.5	AC-058	03-Aug-17
17070336-003	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Aug-17

Report certified by: Colleen McGerrigle, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: August-22-17

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APPENDIX VI
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	Bonnyville 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
September 25, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX VII
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-07-35-C</u>
Site: <u>Bonnyville Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>August 23, 2017</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>August 23, 2017</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>September 12, 2017</u>
Level 3 Independent Data Review	<u>Chris Smith</u>	Date <u>September 20, 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.