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November 12, 2016

RE: September 2016 Ambient Air Monitoring Monthly Reports

Attached are the monthly continuous ambient air monitoring reports for the LICA Airshed Zone's Cold Lake South, Maskwa, St. Lina, and Portable Air Monitoring System (located in Bonnyville) stations. These reports also contain complete data tables, sample log sheets, and chain of custody documents for the integrated monitoring programs including volatile organic compounds, polycyclic aromatic hydrocarbons, Partisol sampler (particulate matter mass), and passive samplers.

Should you have any questions, please don't hesitate to contact me directly at (780) 266-7068.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga". The signature is written in a cursive, flowing style.

Michael Bisaga

Airshed Program Manager
Lakeland Industry and Community Association

cc (email): LICA Office



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

JOB #: 2833-2016-09-1-C

September 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **November 2, 2016**

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SUMMARY

In September 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake South Station, near Cold Lake, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

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

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

PM_{2.5}: Forty-one hours of data were recorded this month at concentrations less than 3 µg/m³, rendering the data invalid.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake South Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY		
SO ₂ (ppb)	172	48	0	0	0.2	1.1	8, 20	9, 10	1.8 4.6	WSW N	0.4	20, 26	100.0
TRS (ppb)	-	-	-	-	0.3	1.0	28	8	3.3	SW	0.4	VAR	100.0
THC (ppm)	-	-	-	-	2.12	3.10	5	5	0.3	ESE	2.49	5	100.0
NO ₂ (ppb)	159	-	0	-	2.7	16.4	29	19	1.0	ENE	6.3	29	100.0
NO (ppb)	-	-	-	-	1.0	48.2	22	7	1.2	ENE	4.7	22	100.0
NO _x (ppb)	-	-	-	-	3.7	60.4	22	7	1.2	ENE	8.7	29	100.0
O ₃ (ppb)	82	-	0	-	16.6	48.5	1	16	10.8	WSW	28.2	16	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	1.8	14.0	1	16	10.8	WSW	4.8	1	94.3
RELATIVE HUMIDITY (%)	-	-	-	-	72	100	7	VAR	VAR	VAR	87	3, 6	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	10.6	26.0	1	15	6.5	W	18.3	1	100.0
VECTOR WS (kph)	-	-	-	-	5.2	17.0	10	14	-	WNW	11.8	3	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24-Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 24-Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1-Hour Exceedances

No Exceedances Recorded During the Month

Passive Sampler Summary

	Sulphur Dioxide (ppb)
Mean	0.3
Minimum	<0.1
Maximum	1.0

Note: Access papers for stations #12 and #25 were not provided. As a result, data was not available for these stations. The sampler at station #36 was moved to station #38.

	Hydrogen Sulphide (ppb)
Mean	0.43
Minimum	0.06
Maximum	3.61

Note: Access papers for stations #12 and #25 were not provided. As a result, data was not available for these stations. The sampler at station #36 was moved to station #38.

	Nitrogen Dioxide (ppb)
Mean	1.4
Minimum	0.2
Maximum	4.5

Note: Access papers for station #12 was not provided. As a result, data was not available at this station. The sampler at station #36 was moved to station #38.

	Ozone (ppb)
Mean	16.6
Minimum	11.8
Maximum	25.7

Note: Access papers for station #12 was not provided. As a result, data was not available at this station. The sampler at station #36 was moved to station #38.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
September 3, 2016	1.8	ACETONE
September 9, 2016	5.9	ACETONE
September 15, 2016	3.2	ACETONE
September 21, 2016	1.8	ACETONE
September 27, 2016	2.0	ACETONE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
September 3, 2016	0.10	PHENANTHRENE
September 9, 2016	0.13	PHENANTHRENE
September 15, 2016	0.23	PHENANTHRENE
September 21, 2016	0.36	2-METHYLNAPHTHALENE
September 27, 2016	0.11	PHENANTHRENE

Note: NA

Partisol Sampler Summary

Sample Collection Date	Concentration (mg)
September 3, 2016	0.015
September 9, 2016	0.018
September 15, 2016	0.071
September 21, 2016	0.037
September 27, 2016	0.041

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 results for the non-continuous Partisol, VOCs, PAHs and Passive monitoring program 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 \(August 3, 2016\)](#). 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.

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%).

Trailer inspection was conducted on September 12. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on September 13. No operational issues were identified this month.

TOTAL REDUCED SULPHUR (TRS)

The routine monthly calibration was performed on September 13. No operational issues were identified this month.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on September 12. No operational issues were identified this month. One hour of maximum instantaneous data collected on September 13, at hour 07:00, was invalidated due to an interference from simultaneous calibration activities on other channels.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on September 13. No operational issues were identified this month.

OZONE (O₃)

The routine monthly calibration was performed on September 12. No operational issues were identified this month. One hour of maximum instantaneous data collected on September 13, at hour 07:00, was invalidated due to an interference from simultaneous calibration activities on other channels.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on September 12 and the other audit was performed on September 20. Both the inlet filter and the FDMS filter were replaced during the audits.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Forty-one hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

No operational issues were identified this month.

RELATIVE HUMIDITY (RH)

The humidity sensor performed well throughout the month. No operational issues were identified.

AMBIENT TEMPERATURE (AmbTPX)

The temperature sensor performed well throughout the month. No operational issues were identified.

VOC SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on September 3, 9, 15, 21 and 27. Analytical results are included in this report. VOC values are reported in ppb.

The routine audit for the VOC sampler was performed on September 2.

PAH SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on September 3, 9, 15, 21 and 27. Analytical results are included in this report. PAH values are reported in $\mu\text{g}/\text{puf}$.

The routine audit for the PAH sampler was performed on September 2.

PARTISOL SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule. Samples were collected on September 3, 9, 15, 21 and 27. Analytical results are included in this report. Partisol values are reported in mg.

PASSIVE SAMPLES

Samples were collected over the months of August and September, as scheduled. Samples were collected at all designated stations, except stations #12 and #25 as access documents were not provided by client. The sampler at station #36 (Elk Point) was moved to station #38 (Bonnyville). Analytical 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 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-00210: Ambient TRS Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ 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

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832
- Partisol - R&P 2000H Unit
- VOC - XONTECH 910A Gaseous Air Sampler
- PAH - TISCH PUF Plus Sampler Unit

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

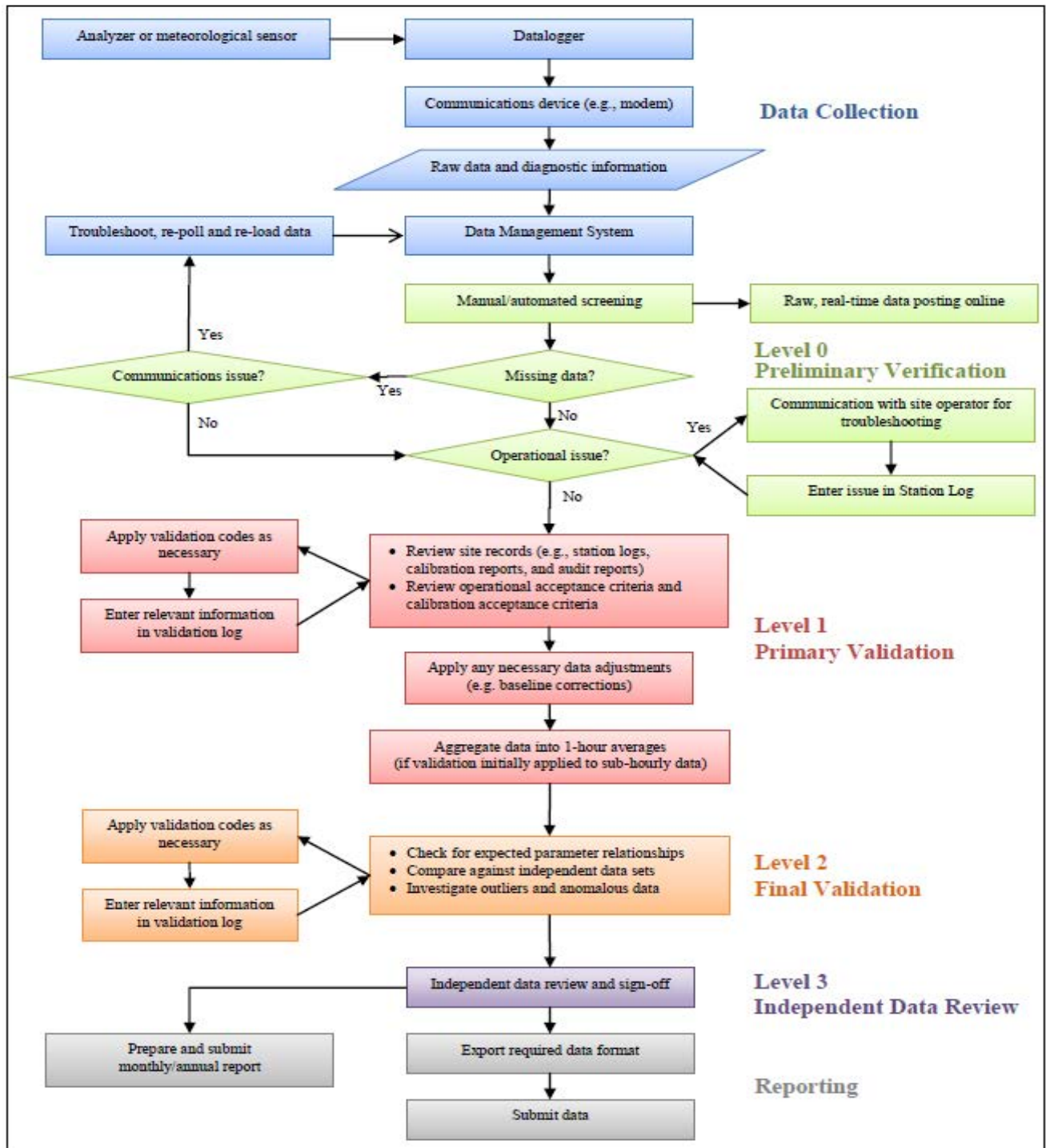
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (Aug 3, 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)

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.6	0.2	0.1	0.1	0.1	0.1	0.0	S	0.0	0.6	0.1	24	
2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	S	0.1	0.0	0.1	24	
3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.0	0.0	0.1	24	
4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.2	0.3	0.2	0.2	0.1	S	0.1	0.1	0.1	0.1	0.1	0.4	0.2	24
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24
6	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24
7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	S	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.1	24
8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.1	0.8	0.5	0.4	0.2	0.3	0.1	S	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.1	0.2	0.1	24
9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.6	0.4	0.4	0.3	0.2	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.6	0.2	24
10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.1	0.1	S	0.2	0.2	0.1	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.4	0.2	24
11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24
12	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.2	0.3	S	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	24
13	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	C	0.4	0.4	0.6	0.7	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.7	0.2	24
14	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	S	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	24	
15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	S	0.5	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.3	0.1	0.5	0.2	24	
16	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	S	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.5	0.3	0.1	24
17	0.1	0.1	0.1	0.2	0.1	0.1	0.1	S	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	24
18	0.1	0.1	0.1	0.1	0.0	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	24
19	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	24
20	0.1	0.1	0.1	0.1	S	0.1	0.2	0.1	0.1	0.4	1.1	0.7	0.5	0.5	0.6	0.9	0.8	0.9	0.4	0.2	0.1	0.1	0.1	0.1	0.0	1.1	0.4	0.1	24
21	0.2	0.1	0.1	S	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	24
22	0.1	0.1	S	0.2	0.1	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.4	0.2	0.1	24
23	0.1	S	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	24
24	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.2	0.1	24	
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	S	0.2	0.1	0.2	0.1	0.1	24
26	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	1.0	0.9	0.7	0.5	0.4	0.5	0.5	0.5	0.3	0.4	0.3	S	0.3	0.4	0.1	1.0	0.4	0.1	24
27	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.2	0.1	0.6	0.2	24
28	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	24
29	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	24
30	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24
HOURLY MAX	0.4	0.5	0.3	0.2	0.2	0.2	0.3	0.4	0.3	1.1	1.1	0.7	0.5	0.5	0.6	0.9	0.8	0.9	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	24
HOURLY AVG	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	24

STATUS FLAG CODES

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

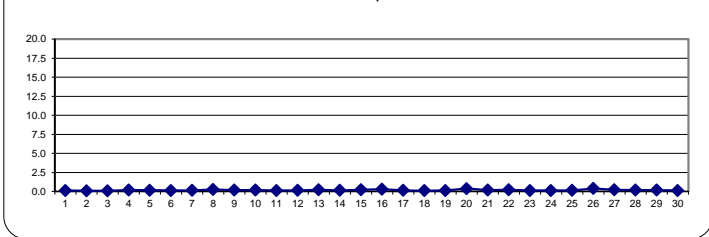
OBJECTIVE LIMIT:

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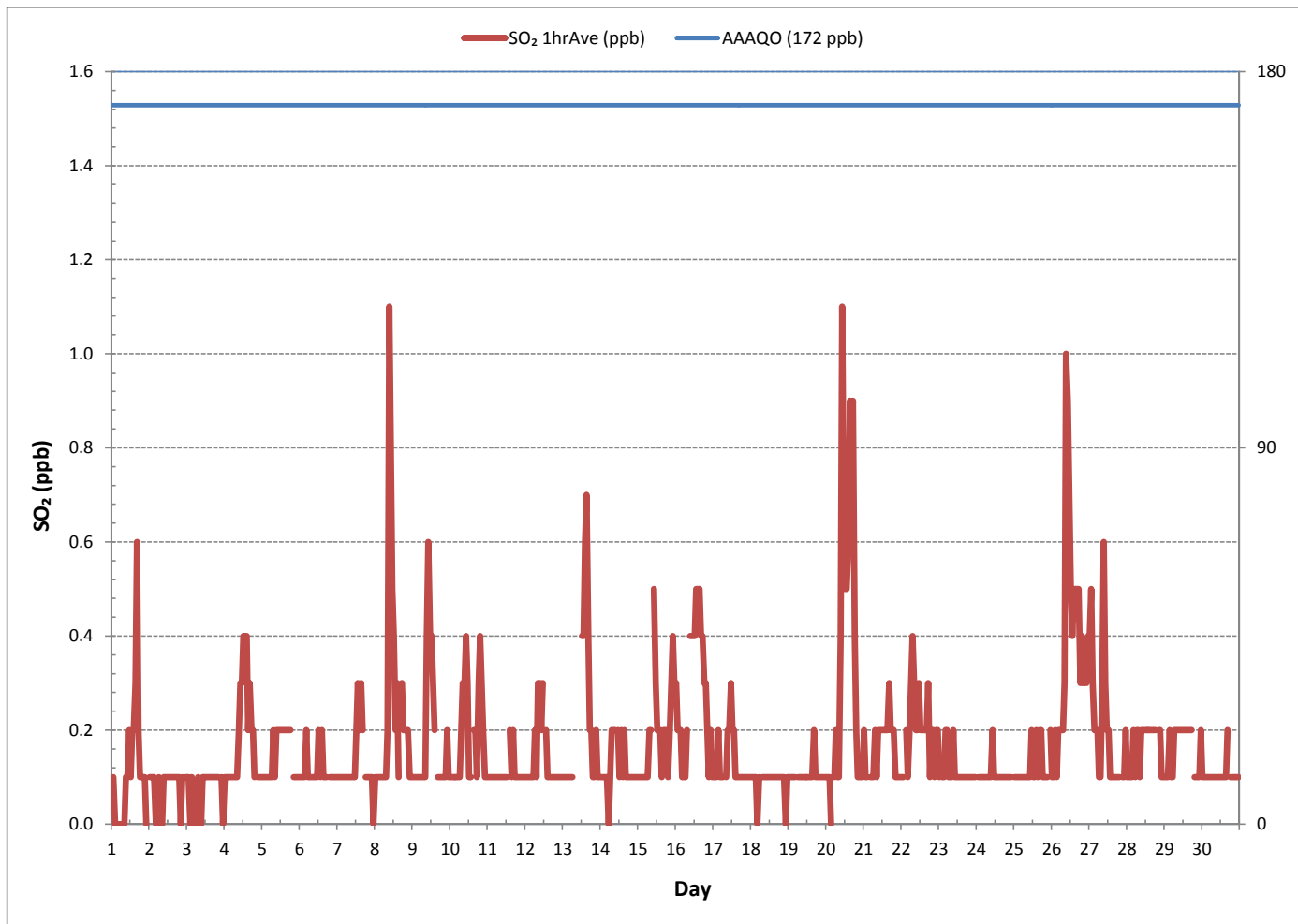
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	659					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	1.1	PPB	@ HOUR(S)	9, 10	ON DAY(S)	8, 20
MAXIMUM 24-HR AVERAGE:	0.4	PPB			ON DAY(S)	20, 26
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.14		MONTHLY AVERAGE:	0.2	PPB	

24 HOUR AVERAGES FOR September 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY	1	S	0.6	0.3	0.5	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.6	0.5	0.6	0.6	0.9	1.0	0.5	0.5	0.5	0.5	0.5	0.6	S	0.3	1.0	0.5	24	
2	0.4	0.4	0.4	0.4	0.3	0.4	0.6	0.5	0.5	0.4	0.4	0.6	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.6	0.4	0.4	S	0.4	0.4	0.3	0.6	0.4	24	
3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	S	0.4	0.4	0.3	0.6	0.4	24		
4	0.4	0.4	0.3	0.6	0.4	0.4	0.5	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.5	S	0.5	0.5	0.3	0.7	0.5	24		
5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7	S	0.5	0.5	0.5	0.5	0.4	0.7	0.5	24	
6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.6	0.5	0.6	0.5	0.6	0.5	S	0.5	0.4	0.5	0.3	0.6	0.3	0.6	0.5	24		
7	0.3	0.4	0.3	0.4	0.3	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.6	S	0.6	0.4	0.4	0.6	0.6	0.3	0.3	0.7	0.5	24		
8	0.5	0.4	0.6	0.3	0.4	0.5	0.4	0.6	0.6	1.8	1.5	1.0	1.0	0.5	0.7	0.5	S	0.6	0.6	0.6	0.5	0.6	0.4	0.4	0.3	1.8	0.7	24		
9	0.4	0.4	0.4	0.6	0.5	0.5	0.4	0.5	0.7	0.9	0.9	0.7	0.6	0.6	0.6	S	0.5	0.5	0.5	0.4	0.6	0.6	0.5	0.5	0.4	0.9	0.6	24		
10	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.6	0.5	S	0.6	0.5	0.6	0.9	0.7	0.6	0.6	0.6	0.4	0.4	0.9	0.6	24		
11	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	S	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.6	0.5	24		
12	0.4	0.5	0.5	0.5	0.6	0.5	0.4	0.5	0.8	0.7	0.6	0.6	S	0.6	0.4	0.4	0.4	0.6	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.8	0.5	24		
13	0.5	0.5	0.5	0.5	0.5	0.6	0.5	C	C	C	C	C	0.9	0.7	1.2	1.2	0.7	0.5	0.6	0.4	0.4	0.6	0.6	0.4	0.4	1.2	0.6	24		
14	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.6	0.7	0.6	S	0.6	0.5	0.6	0.5	0.6	0.4	0.6	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.7	0.5	24		
15	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	S	0.9	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.7	0.7	0.7	0.6	0.4	0.9	0.6	24		
16	0.6	0.6	0.5	0.5	0.4	0.6	0.6	0.6	S	0.7	0.7	0.6	0.8	0.9	0.9	0.9	0.7	0.7	0.6	0.7	0.6	0.7	0.6	0.4	0.5	0.6	0.4	0.9	0.6	24
17	0.4	0.4	0.5	0.5	0.4	0.5	0.5	S	0.5	0.7	0.7	0.7	0.6	0.6	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.5	24	
18	0.4	0.6	0.4	0.4	0.4	0.4	S	0.5	0.4	0.4	0.5	0.6	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.3	0.6	0.4	24	
19	0.4	0.4	0.5	0.4	0.4	S	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.6	0.5	24		
20	0.5	0.5	0.5	0.3	S	0.4	0.6	0.6	0.5	1.0	1.8	1.8	0.9	0.9	1.0	1.3	1.2	1.3	1.2	0.6	0.5	0.5	0.6	0.5	0.3	1.8	0.8	24		
21	0.6	0.4	0.6	S	0.5	0.5	0.5	0.7	0.3	0.6	0.7	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.5	0.4	0.6	0.5	0.5	0.5	0.3	0.7	0.5	24		
22	0.4	0.4	S	0.5	0.5	0.6	0.6	0.9	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.6	0.6	0.4	0.6	0.6	0.4	0.9	0.6	24	
23	0.6	S	0.4	0.4	0.6	0.4	0.4	0.6	0.4	0.6	0.4	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	24	
24	S	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	S	0.4	0.6	0.4	24	
25	0.5	0.5	0.4	0.4	0.4	0.6	0.3	0.6	0.4	0.4	0.4	0.6	0.4	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	S	0.4	0.3	0.6	0.4	24	
26	0.6	0.4	0.6	0.4	0.6	0.5	0.6	0.6	0.9	1.5	1.3	0.9	0.9	0.7	0.7	0.9	0.9	0.9	0.9	0.7	0.7	S	0.7	0.7	0.4	1.5	0.8	24		
27	0.7	0.9	0.6	0.6	0.4	0.4	0.4	0.4	0.7	1.3	0.7	0.7	0.5	0.5	0.4	0.6	0.4	0.6	0.6	0.4	0.6	0.4	S	0.4	0.3	0.6	0.3	1.3	0.6	24
28	0.4	0.4	0.5	0.6	0.5	0.5	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	S	0.5	0.6	0.6	0.4	0.4	0.7	0.5	24		
29	0.4	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.4	0.6	0.6	0.6	0.6	S	0.6	0.4	0.5	0.5	0.6	0.4	0.6	0.5	24	
30	0.4	0.6	0.4	0.4	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	S	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	24	
HOURLY MAX	0.7	0.9	0.6	0.6	0.6	0.6	0.7	0.9	0.9	1.8	1.8	1.8	1.0	0.9	1.2	1.3	1.2	1.3	1.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	24	
HOURLY AVG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	24	

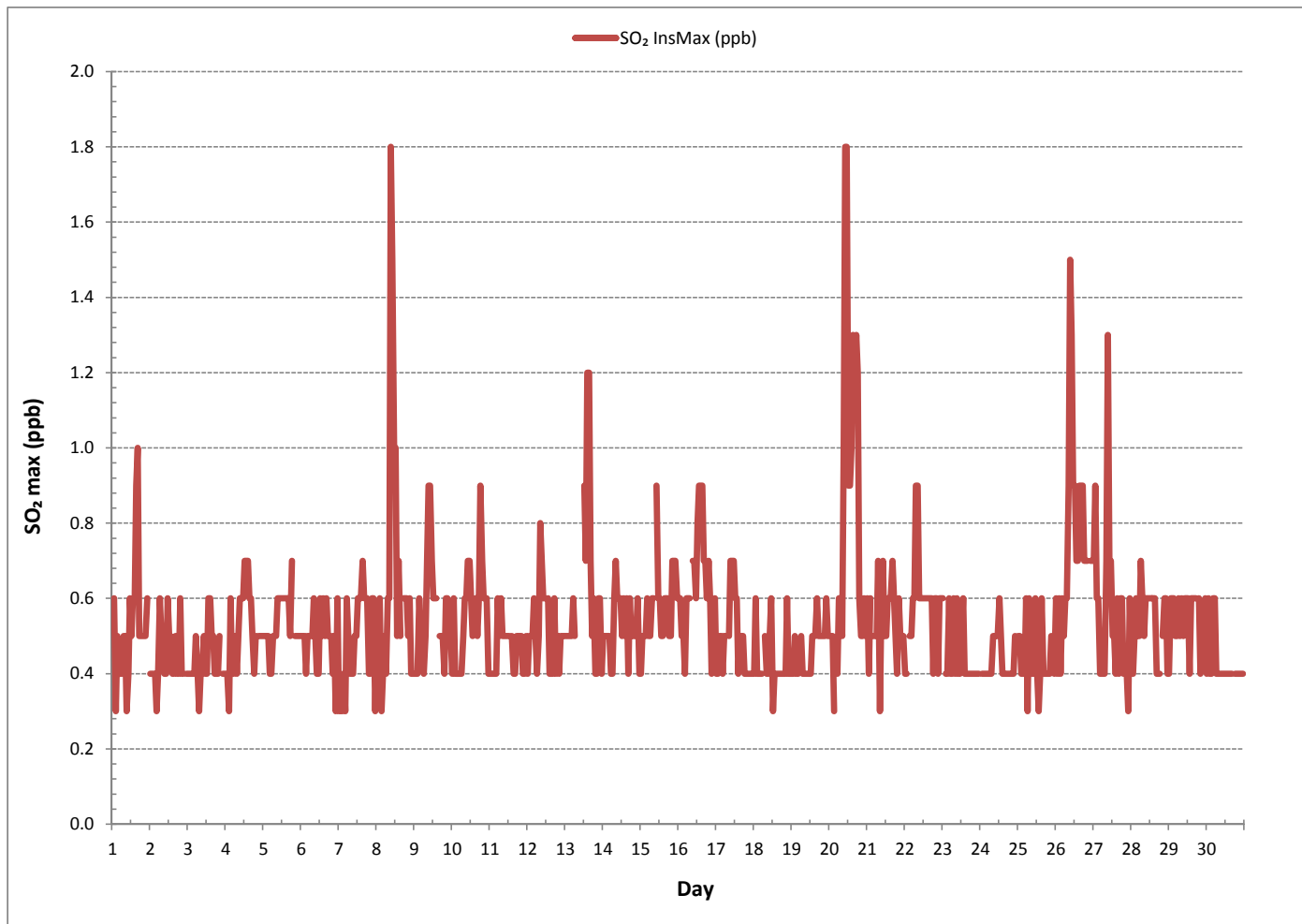
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	1.8 PPB @ HOUR(S) 9, VAR ON DAY(S) 8, 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.18
OPERATIONAL TIME:	720 HRS

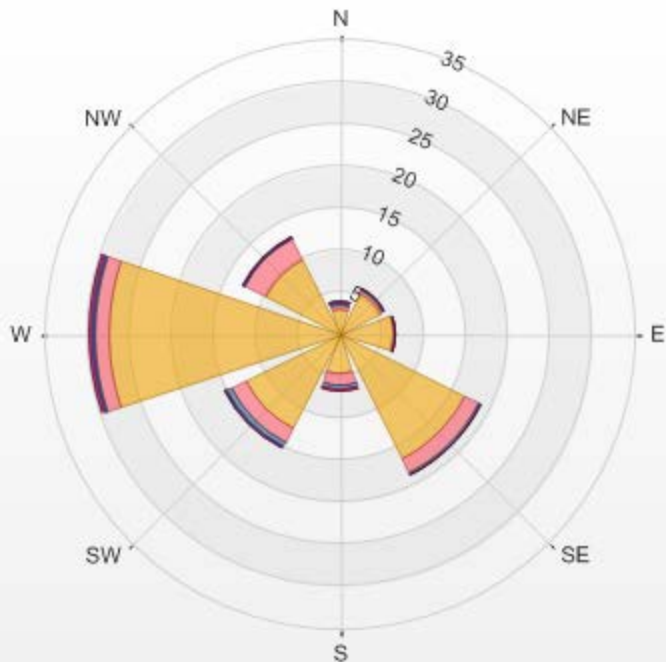
SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.00% Calm Avg: 0.00

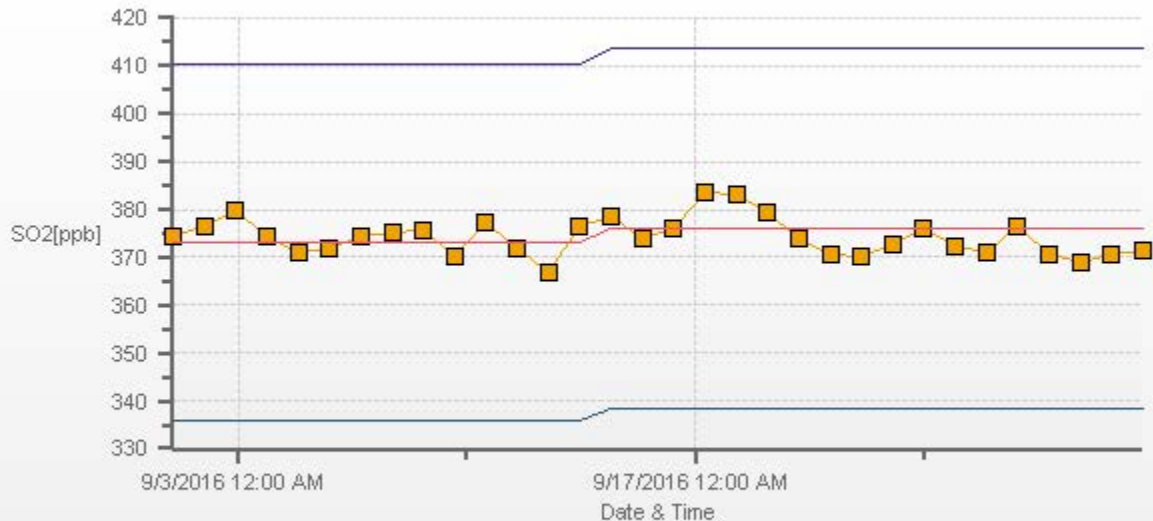
Direction	0.0-0.2	0.2-0.5	0.5-0.7	0.7-1.0	1.0-1.2	>1.2	Total
N	3.07	0.44	0.15	0.15	0.15	0	3.96
NE	5.41	0.29	0.29	0	0	0	5.99
E	6.43	0.15	0	0	0	0	6.58
SE	16.52	2.05	0.15	0	0	0	18.72
S	4.82	1.32	0.44	0.15	0.15	0	6.88
SW	12.57	1.9	0.58	0.15	0	0	15.2
W	27.49	1.61	0.29	0.15	0.15	0	29.69
NW	9.8	2.78	0.15	0.29	0	0	13.02
Summary	86.11	10.54	2.05	0.89	0.45	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2016/09/01 00:00 - 2016/09/30 23:00 Calm: 0.00%



% Icon	Classes (ppb)	86	11	2	1	0	0
	0.0-0.2						
	0.2-0.5						
	0.5-0.7						
	0.7-1.0						
	1.0-1.2						
	>1.2						

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR



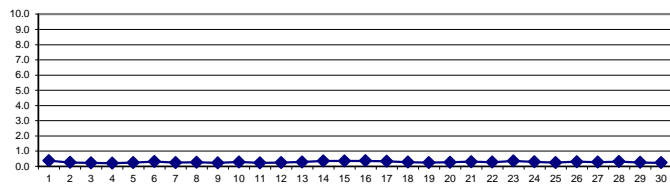
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR							
DAY	MIN.	MAX.	AVG.	RDGS.																															
1	S	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	S	0.3	0.5	0.4	24						
2	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	S	0.3	0.2	0.4	0.3	24					
3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	S	0.1	0.2	0.1	0.3	0.2	24					
4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	S	0.2	0.2	0.2	0.1	0.3	0.2	0.2	24					
5	0.2	0.2	0.2	0.5	0.4	0.4	0.4	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	S	0.2	0.4	0.3	0.3	0.1	0.5	0.3	0.2	24					
6	0.3	0.3	0.4	0.2	0.3	0.2	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	S	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.2	24				
7	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.3	0.2	24				
8	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8	0.5	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.2	S	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.8	0.3	0.2	24					
9	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.4	0.2	0.2	24				
10	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.2	S	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.5	0.3	0.2	24				
11	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	24				
12	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	24				
13	0.3	0.2	0.2	0.3	0.3	0.4	0.4	C	C	C	C	C	C	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.3	0.2	24				
14	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.7	0.8	0.7	S	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.2	0.8	0.4	0.2	24			
15	0.4	0.3	0.3	0.4	0.5	0.3	0.4	0.4	0.5	S	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.2	0.5	0.3	0.2	24			
16	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.6	S	0.4	0.4	0.4	0.3	0.3	0.2	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.2	0.6	0.4	0.2	24				
17	0.3	0.4	0.4	0.5	0.5	0.6	0.6	S	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.6	0.3	0.2	24			
18	0.3	0.3	0.5	0.3	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.5	0.3	0.2	24				
19	0.3	0.3	0.3	0.3	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	24			
20	0.3	0.2	0.3	0.3	S	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.2	24			
21	0.3	0.2	0.3	S	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.3	0.2	24				
22	0.3	0.2	S	0.2	0.2	0.3	0.3	0.5	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.6	0.3	0.2	24				
23	0.3	S	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.2	0.4	0.3	0.2	24		
24	S	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	S	0.2	0.5	0.3	0.2	0.3	0.2	24			
25	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	S	0.3	0.2	0.3	0.3	0.2	0.3	0.2	24		
26	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	S	0.2	0.3	0.2	0.4	0.3	0.2	0.3	0.2	24		
27	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	S	0.3	0.2	0.3	0.2	0.3	0.2	0.5	0.3	0.2	0.3	0.2	24	
28	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.0	0.7	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.3	0.3	0.3	0.3	0.2	1.0	0.3	0.2	0.3	0.2	0.3	0.2	24	
29	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	S	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	24
30	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	24	
HOURLY MAX	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.8	1.0	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
HOURLY AVG	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		

STATUS FLAG CODES

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

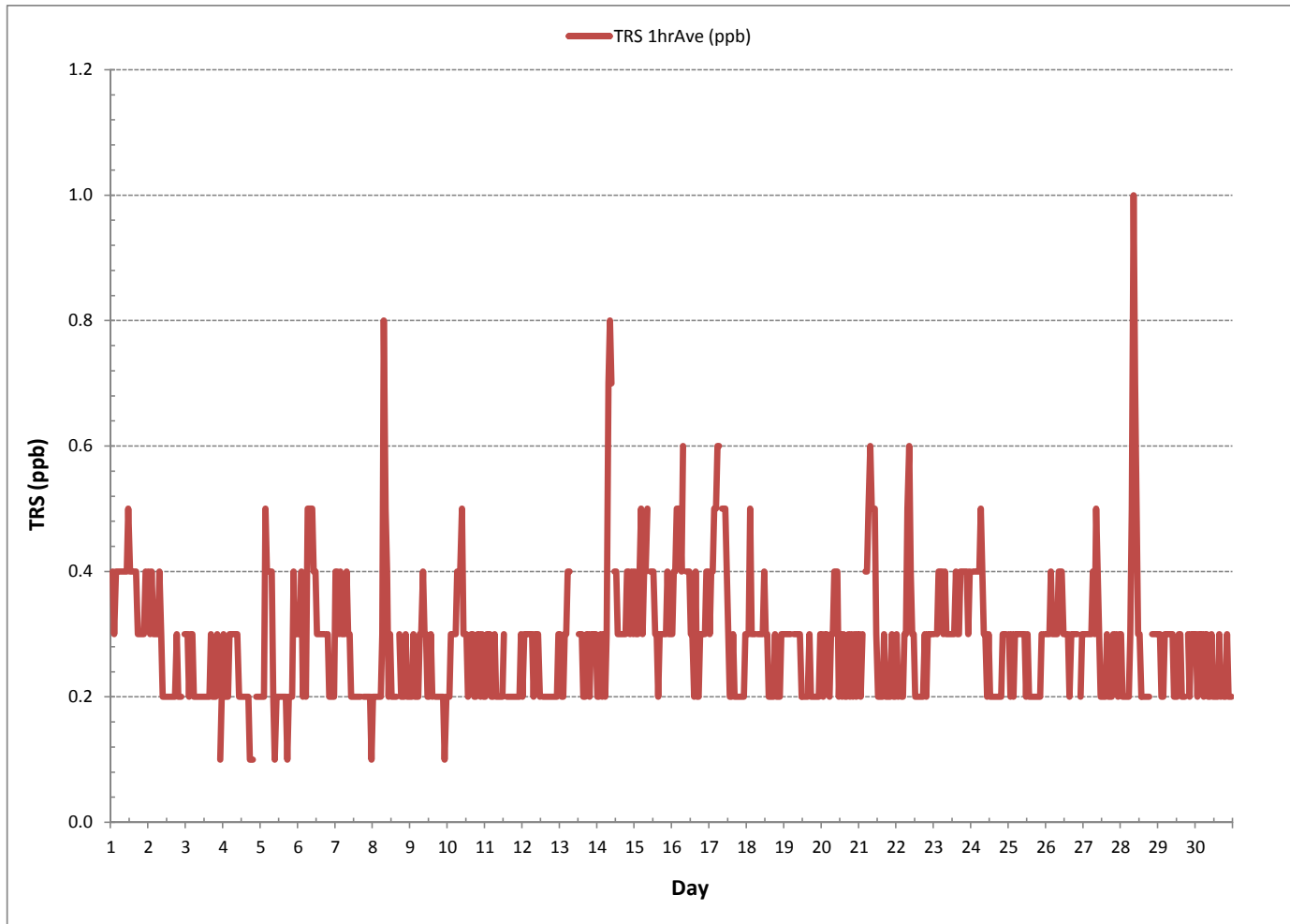
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684				
MINIMUM 1-HR AVERAGE:	0.1	PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	1.0	PPB @ HOUR(S)	8	ON DAY(S)	28
MAXIMUM 24-HR AVERAGE:	0.4	PPB		ON DAY(S)	VAR
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.10		MONTHLY AVERAGE:	0.3	PPB

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY	1	S	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.8	0.8	0.6	0.7	0.8	0.8	0.6	0.8	S	0.6	0.9	0.8	24	
2	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.8	0.6	0.6	0.7	0.5	0.7	0.6	0.8	0.6	0.6	0.6	0.6	0.7	0.5	0.6	0.6	S	0.8	0.5	0.8	0.7	24	
3	0.7	0.8	0.6	0.8	0.9	0.6	0.7	0.6	0.5	0.8	0.5	0.8	0.7	0.5	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	S	0.5	0.7	0.5	0.9	0.7	24	
4	0.7	0.7	0.6	0.8	0.7	0.7	0.9	0.7	0.8	0.8	0.6	0.7	0.6	0.5	0.5	0.7	0.5	0.6	0.6	0.6	0.6	S	0.8	0.7	0.6	0.5	0.9	0.7	24	
5	0.7	0.5	0.7	0.8	0.8	0.8	1.1	0.8	0.8	0.5	0.6	0.8	0.5	0.5	0.6	0.6	0.6	0.8	0.6	S	0.6	0.8	0.7	0.7	0.5	1.1	0.7	24		
6	0.7	0.8	0.9	0.7	0.7	0.7	1.6	1.1	0.8	0.9	0.9	0.9	0.9	0.7	0.8	0.9	0.6	0.7	0.9	S	0.8	0.7	0.7	0.5	0.7	0.5	1.6	0.8	24	
7	0.9	0.8	0.8	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.6	S	0.5	0.6	0.6	0.7	0.7	0.5	0.5	0.9	0.7	24	
8	0.6	0.6	0.5	0.6	0.8	0.6	0.8	1.3	1.1	0.8	0.8	0.7	0.6	0.7	0.5	0.8	S	0.7	0.7	0.7	0.8	0.5	0.8	0.6	0.6	0.5	1.3	0.7	24	
9	0.6	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	S	0.6	0.5	0.7	0.7	0.6	0.5	0.8	0.6	0.6	0.5	0.8	0.7	24	
10	0.6	0.6	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.7	S	0.7	0.6	0.7	0.6	0.9	0.7	0.7	0.6	0.5	0.5	0.9	0.7	24		
11	0.6	0.6	0.8	0.6	0.6	0.7	0.8	0.8	0.8	0.6	0.8	0.7	0.6	S	0.6	0.6	0.5	0.6	0.5	0.6	0.8	0.7	0.6	0.7	0.5	0.8	0.7	24		
12	0.6	0.7	0.7	0.8	0.9	0.6	0.8	0.7	0.6	0.8	0.7	0.6	S	0.7	0.7	0.6	0.7	0.6	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.9	0.7	24
13	0.7	0.5	0.5	0.7	0.8	0.8	0.8	C	C	C	C	C	C	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.8	0.8	0.5	0.8	0.7	24
14	0.7	0.6	0.6	0.6	0.7	0.5	0.7	1.4	1.4	1.1	S	0.8	0.9	0.7	0.8	0.8	0.9	0.7	0.7	0.8	0.7	0.6	0.8	0.6	0.5	1.4	0.8	24		
15	0.8	0.8	0.7	0.8	1.0	0.8	0.9	0.8	1.0	S	0.9	0.8	0.9	0.8	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.7	0.8	0.9	0.6	1.0	0.8	24		
16	1.0	0.9	0.9	0.9	1.0	0.8	0.9	1.1	S	0.9	1.0	0.8	0.7	0.7	0.8	0.8	0.6	0.6	0.6	0.8	0.6	0.8	0.6	0.8	0.7	0.8	0.6	1.1	0.8	24
17	0.7	0.9	0.9	1.0	1.0	1.0	1.1	S	1.0	1.0	1.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.6	0.7	0.8	0.5	1.1	0.8	24	
18	0.6	0.8	1.0	0.7	0.8	0.7	S	0.8	0.6	0.8	1.0	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.6	0.8	0.8	0.8	0.6	1.0	0.8	24	
19	0.7	0.7	0.8	0.6	0.6	S	0.8	0.7	0.6	0.7	0.7	0.7	0.8	0.6	0.6	0.8	0.6	0.8	0.8	0.5	0.7	0.7	0.6	0.7	0.5	0.8	0.7	24		
20	0.7	0.7	0.7	0.8	S	0.5	0.6	0.8	0.8	0.8	1.0	0.7	0.7	0.7	0.6	0.6	0.8	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.5	1.0	0.7	24		
21	0.6	0.8	0.7	S	0.9	0.9	1.0	1.1	1.0	0.8	1.0	0.8	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.6	0.7	0.5	1.1	0.7	24		
22	0.8	0.5	S	0.7	0.8	0.6	0.8	1.1	1.1	0.8	0.8	0.8	0.7	0.6	0.5	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.5	1.1	0.7	24	
23	0.8	S	0.8	0.9	0.7	0.9	0.9	0.8	0.7	0.8	0.5	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.7	0.7	0.8	0.8	0.9	0.5	0.9	0.8	24		
24	S	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.7	0.8	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.8	0.7	0.6	0.7	0.6	0.6	S	0.6	0.9	0.7	24		
25	0.7	0.7	0.7	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.5	0.6	0.7	S	0.8	0.5	0.8	0.7	24	
26	0.7	0.7	0.7	0.7	0.8	0.6	0.6	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.6	S	0.6	0.8	0.6	0.8	0.7	24	
27	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8	1.0	0.8	0.8	0.6	0.8	0.6	0.8	0.7	0.6	0.6	0.6	0.7	0.7	S	0.7	0.6	0.7	0.6	1.0	0.7	24	
28	0.8	0.5	0.6	0.6	0.8	0.5	0.8	1.0	1.5	1.1	0.8	0.7	0.7	0.7	0.6	0.6	0.7	0.8	0.8	S	0.8	0.8	0.7	0.7	0.5	1.5	0.8	24		
29	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.8	0.8	0.6	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	S	0.8	0.5	0.6	0.8	0.8	0.5	0.8	0.7	24	
30	0.7	0.5	0.9	0.6	0.6	0.6	0.9	0.7	0.7	0.7	0.7	0.7	0.8	0.6	0.8	0.7	0.6	S	0.6	0.6	0.6	0.7	0.8	0.6	0.5	0.9	0.7	24		
HOURLY MAX		1.0	0.9	1.0	1.0	1.0	1.0	1.6	1.4	1.5	1.1	1.0	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9				
HOURLY AVG		0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7				

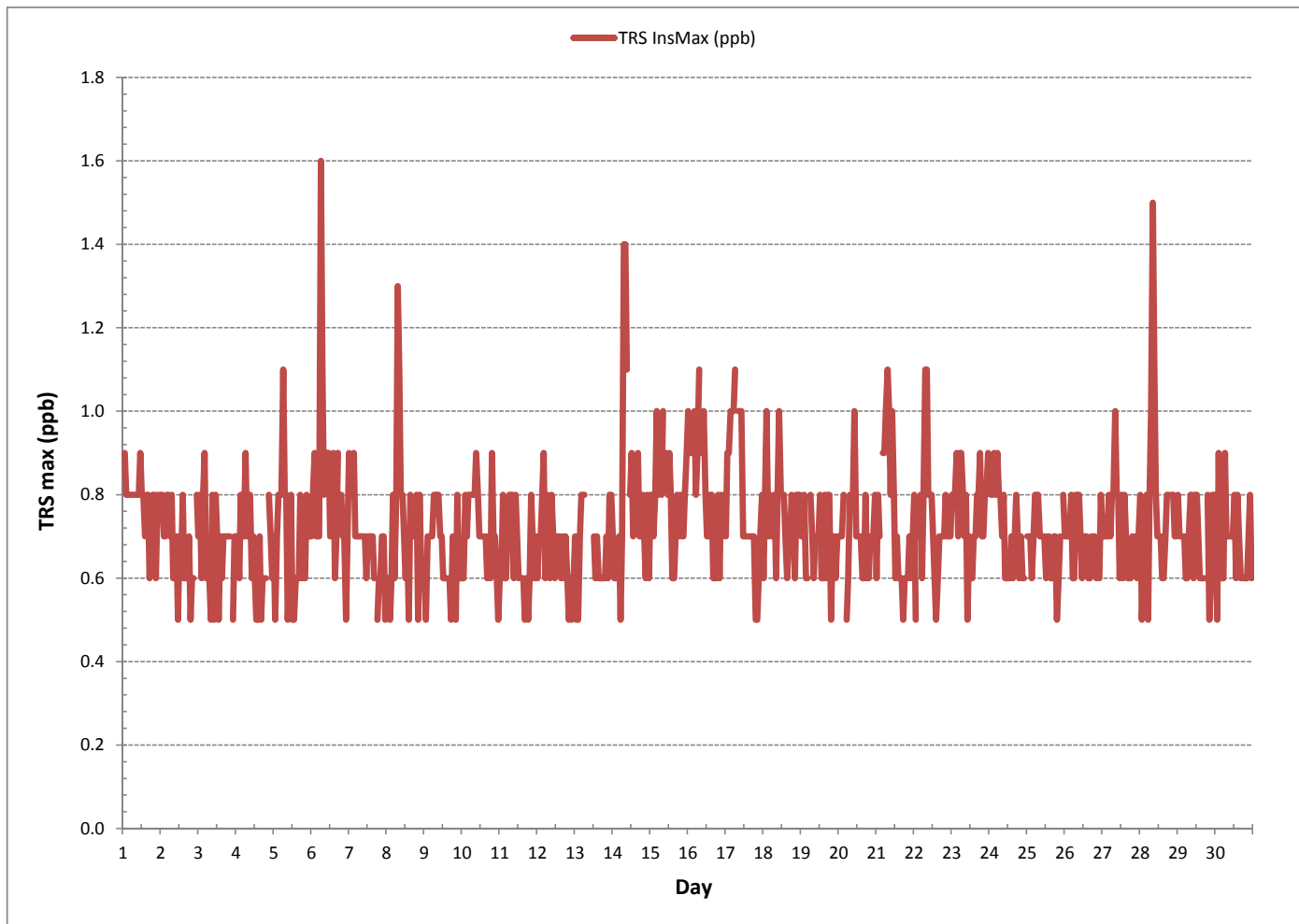
STATUS FLAG CODES

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:	684
MAXIMUM INSTANTANEOUS VALUE:	1.6 PPB @ HOUR(S) 6 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.14
OPERATIONAL TIME:	720 HRS

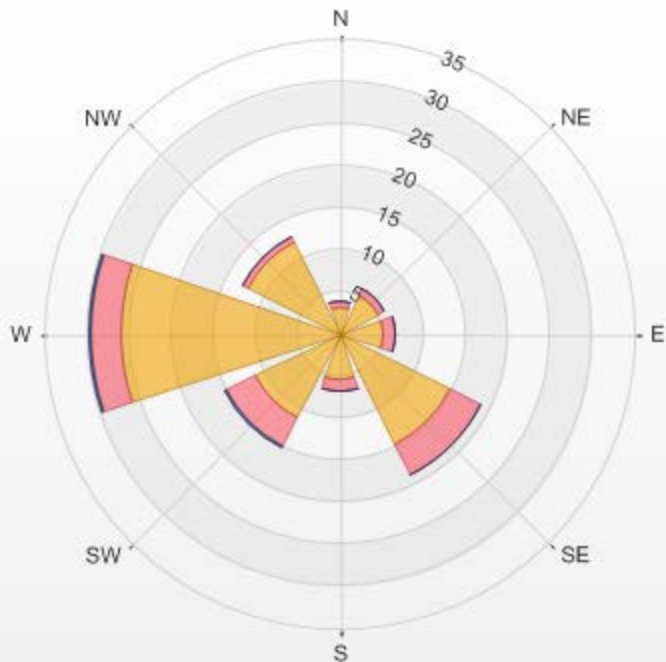
TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.00% Calm Avg: 0.00

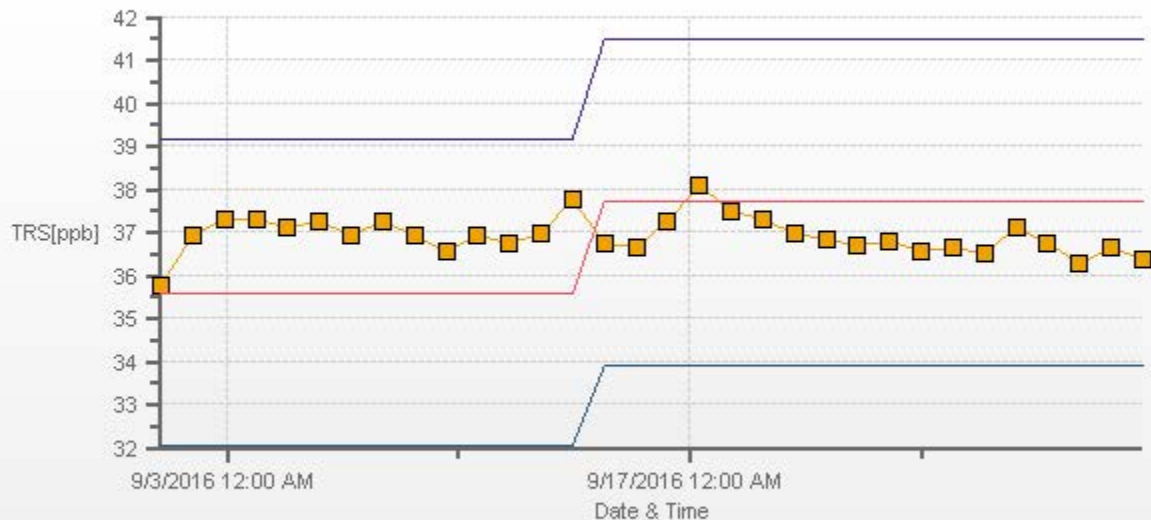
Direction	0.0-0.4	0.4-0.7	0.7-1.1	>1.1	Total
N	3.22	0.58	0.15	0	3.95
NE	5.12	0.88	0	0	6
E	5.12	1.46	0	0	6.58
SE	14.77	3.95	0	0	18.72
S	5.56	1.32	0	0	6.88
SW	11.26	3.8	0.15	0	15.21
W	25.88	3.65	0.15	0	29.68
NW	12.28	0.73	0	0	13.01
Summary	83.21	16.37	0.45	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2016/09/01 00:00 - 2016/09/30 23:00 Calm: 0.00%



% Icon Classes (ppb)	83	16	0	0
0.0-0.4	83	16	0	0
0.4-0.7		16	0	0
0.7-1.1			0	0
>1.1				0

TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 Type: Span



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

TOTAL HYDROCARBON



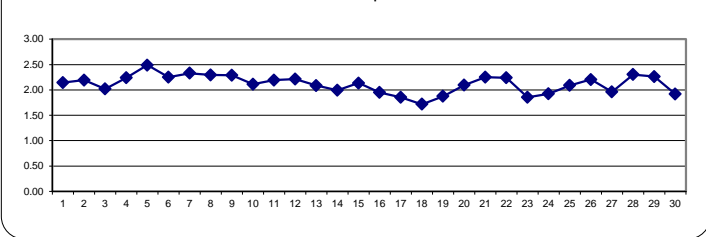
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	S	2.15	2.11	2.14	2.12	2.12	2.15	2.14	2.16	2.12	2.12	2.11	2.11	2.12	2.14	2.14	2.14	2.13	2.16	2.18	2.17	2.19	2.25	S	2.11	2.25	2.14	24		
2		2.37	2.39	2.41	2.47	2.60	2.60	2.52	2.45	2.07	2.07	2.09	2.08	2.08	2.06	2.05	2.03	2.03	2.02	2.02	2.01	2.01	2.03	S	1.99	1.99	2.60	2.19	24	
3		2.00	1.97	1.96	1.96	1.96	1.96	1.98	2.00	2.00	2.02	2.06	2.04	2.03	2.02	2.04	2.05	2.04	2.04	2.06	2.06	2.07	S	2.06	2.08	1.96	2.08	24		
4		2.16	2.23	2.26	2.20	2.17	2.20	2.25	2.23	2.27	2.32	2.25	2.22	2.22	2.19	2.17	2.18	2.16	2.14	2.18	2.34	S	2.36	2.41	2.42	2.14	2.42	2.24	24	
5		2.49	2.60	2.78	2.98	3.08	3.10	3.06	2.85	2.51	2.31	2.28	2.28	2.29	2.27	2.24	2.23	2.22	2.18	S	2.27	2.31	2.33	2.33	2.18	3.10	2.49	24		
6		2.35	2.28	2.31	2.30	2.29	2.32	2.30	2.24	2.20	2.16	2.10	2.11	2.18	2.24	2.24	2.17	2.15	2.16	S	2.13	2.33	2.30	2.35	2.10	2.55	2.25	24		
7		2.70	2.65	2.61	2.51	2.48	2.46	2.50	2.42	2.33	2.27	2.26	2.24	2.24	2.24	2.13	2.13	2.15	S	2.09	2.12	2.13	2.26	2.33	2.35	2.09	2.70	2.33	24	
8		2.51	2.43	2.45	2.52	2.54	2.61	2.68	2.66	2.67	2.36	2.19	2.16	2.09	2.05	2.07	2.10	S	2.10	2.08	2.12	2.11	2.13	2.10	2.09	2.05	2.68	2.30	24	
9		2.14	2.09	2.21	2.42	2.53	2.45	2.37	2.35	2.23	2.22	2.28	2.29	2.28	2.26	2.26	S	2.21	2.20	2.23	2.24	2.29	2.57	2.33	2.26	2.09	2.57	2.29	24	
10		2.10	2.17	2.15	2.18	2.23	2.28	2.27	2.30	2.26	2.13	2.07	2.03	2.03	2.05	S	2.05	2.06	2.05	2.03	2.09	2.06	2.04	1.99	1.97	1.97	2.30	2.11	24	
11		2.07	2.07	2.10	2.06	2.05	2.10	2.13	2.12	2.14	2.15	2.16	2.20	2.15	S	2.24	2.26	2.25	2.26	2.29	2.33	2.34	2.31	2.33	2.36	2.05	2.36	2.19	24	
12		2.35	2.39	2.42	2.39	2.42	2.43	2.40	2.48	2.37	C	C	C	C	C	1.97	1.94	1.94	1.96	1.94	1.97	2.13	2.14	2.21	2.23	2.15	1.94	2.48	2.21	24
13		2.20	2.30	2.37	2.49	2.53	2.48	2.46	2.31	2.15	2.22	2.20	S	1.97	1.86	1.83	1.83	1.79	1.77	1.79	1.86	1.88	1.82	1.92	1.95	1.77	2.53	2.09	24	
14		2.01	2.09	2.19	2.29	2.33	2.38	2.36	2.24	2.08	2.06	S	1.80	1.80	1.78	1.76	1.74	1.74	1.75	1.77	1.85	1.93	2.03	1.93	1.98	1.74	2.38	2.00	24	
15		2.18	2.22	2.26	2.42	2.60	2.59	2.70	2.65	2.45	S	2.04	1.95	1.90	1.88	1.86	1.88	1.87	1.84	1.85	1.95	1.99	2.02	2.02	2.00	1.84	2.70	2.14	24	
16		2.03	2.01	1.99	2.09	2.10	2.09	2.12	2.20	S	2.08	2.04	1.97	1.91	1.86	1.83	1.77	1.77	1.76	1.78	1.90	1.88	1.84	1.89	1.95	1.76	2.20	1.95	24	
17		2.03	2.04	2.07	2.14	2.19	1.95	1.85	S	1.92	1.98	2.03	1.80	1.62	1.60	1.57	1.59	1.59	1.62	1.70	1.68	1.81	1.81	2.05	2.00	1.57	2.19	1.85	24	
18		1.96	1.93	2.13	1.84	1.68	1.63	S	1.67	1.60	1.61	1.65	1.62	1.65	1.67	1.67	1.69	1.69	1.68	1.67	1.68	1.63	1.71	1.71	1.75	1.60	2.13	1.72	24	
19		1.77	1.84	1.83	1.82	1.82	S	1.83	1.81	1.81	1.81	1.79	1.79	1.81	1.80	1.81	1.82	1.82	1.83	1.94	2.01	2.13	2.13	2.02	2.12	1.77	2.13	1.88	24	
20		2.08	2.09	2.16	2.27	S	2.26	2.33	2.32	2.18	2.04	1.98	1.93	1.95	1.96	1.97	1.96	1.96	1.94	2.03	2.06	2.19	2.15	2.19	2.19	1.93	2.33	2.10	24	
21		2.25	2.29	2.53	S	2.71	2.76	2.79	2.67	2.60	2.46	2.14	1.99	2.00	2.00	2.00	1.99	1.98	2.00	1.96	1.94	2.05	2.26	2.22	2.15	1.94	2.79	2.25	24	
22		2.22	2.29	S	2.44	2.52	2.55	2.79	2.81	2.36	2.22	2.29	2.23	2.13	2.10	2.08	2.15	2.08	2.01	1.98	2.03	2.02	2.09	2.06	2.11	1.98	2.81	2.24	24	
23		2.16	S	2.11	2.01	1.98	1.96	1.88	1.94	1.83	1.84	1.86	1.82	1.86	1.86	1.81	1.75	1.77	1.78	1.78	1.77	1.74	1.69	1.76	1.72	1.69	2.16	1.86	24	
24		S	1.74	1.77	1.85	1.87	1.99	1.99	2.07	2.01	1.93	1.87	1.91	1.90	1.87	1.88	1.88	1.88	1.88	1.88	1.86	1.96	2.15	2.20	S	1.74	2.20	1.93	24	
25		2.15	2.16	2.15	2.17	2.18	2.22	2.23	2.09	2.11	2.06	2.07	2.06	2.01	1.99	1.98	2.00	1.98	1.98	1.95	1.97	2.09	2.25	S	2.18	1.95	2.25	2.09	24	
26		2.30	2.35	2.39	2.36	2.44	2.62	2.68	2.61	2.56	2.42	2.32	2.15	2.07	2.03	1.98	1.91	1.87	1.85	1.96	1.93	1.94	S	1.97	2.01	1.85	2.68	2.21	24	
27		1.99	1.98	2.02	1.99	1.96	1.97	2.09	2.09	2.23	1.95	1.85	1.84	1.84	1.85	1.89	1.85	1.86	1.89	1.89	1.90	S	2.02	2.08	2.14	1.84	2.23	1.96	24	
28		2.20	2.24	2.40	2.54	2.56	2.60	2.73	2.66	2.35	2.24	2.13	2.10	2.12	2.14	2.14	2.13	2.13	2.15	2.15	S	2.39	2.40	2.23	2.25	2.10	2.73	2.30	24	
29		2.28	2.34	2.48	2.50	2.60	2.57	2.63	2.63	2.52	2.06	1.98	2.02	2.03	2.02	2.01	2.00	1.98	2.02	S	2.14	2.18	2.31	2.43	2.36	1.98	2.63	2.26	24	
30		2.08	2.12	2.17	2.29	2.07	1.94	1.88	1.89	1.90	1.85	1.83	1.84	1.87	1.89	1.84	1.83	1.82	S	1.83	1.85	1.83	1.84	1.84	1.85	1.82	2.29	1.92	24	
HOURLY MAX		2.70	2.65	2.78	2.98	3.08	3.10	3.06	2.85	2.67	2.46	2.32	2.29	2.29	2.27	2.27	2.26	2.25	2.26	2.29	2.34	2.39	2.57	2.43	2.55					
HOURLY AVG		2.18	2.19	2.23	2.26	2.30	2.32	2.34	2.31	2.20	2.11	2.07	2.02	2.00	1.99	1.98	1.97	1.96	1.96	1.97	2.00	2.06	2.12	2.12	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

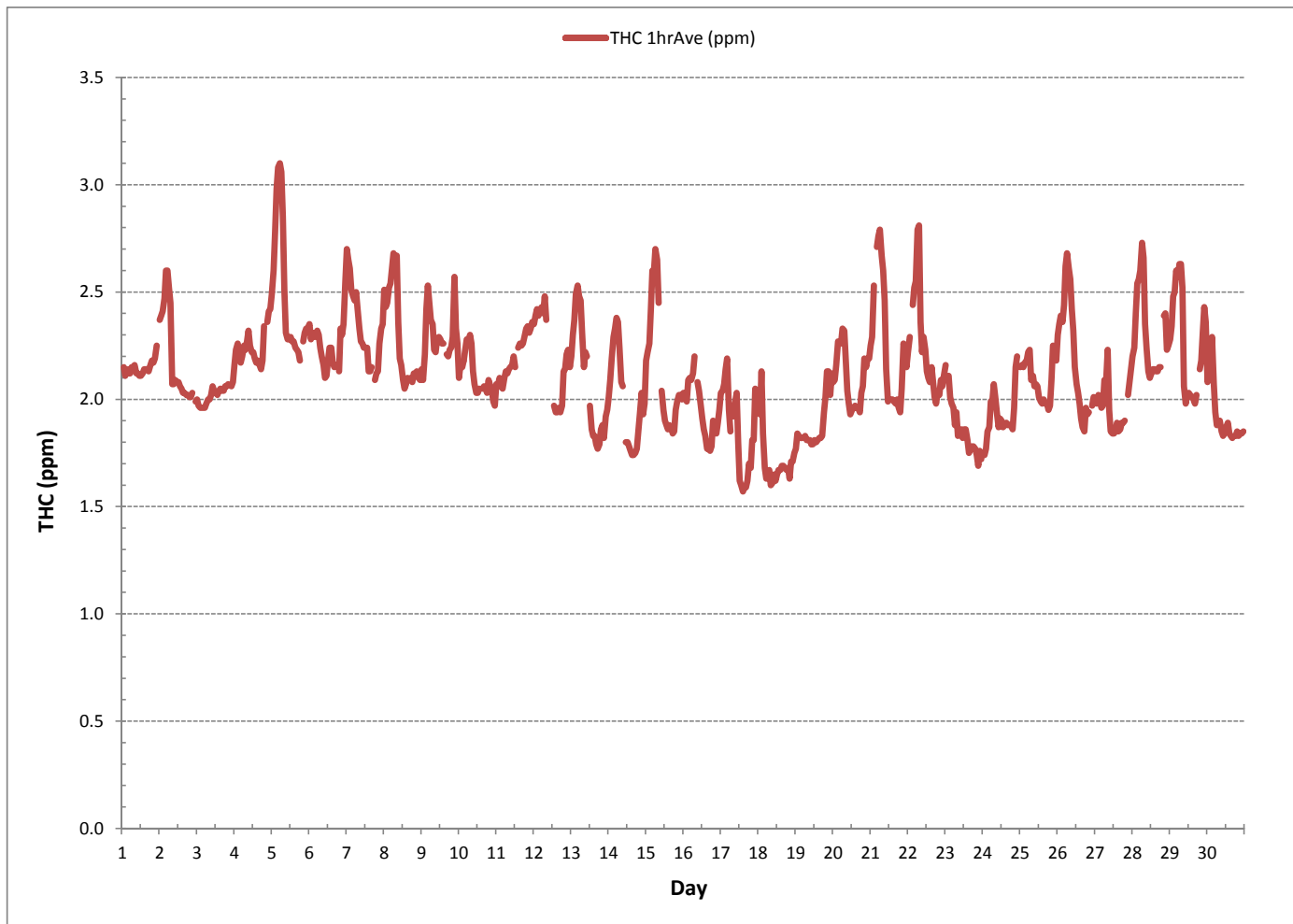
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	685		
MINIMUM 1-HR AVERAGE:	1.57 PPM	@ HOUR(S)	14 ON DAY(S) 17
MAXIMUM 1-HR AVERAGE:	3.10 PPM	@ HOUR(S)	5 ON DAY(S) 5
MAXIMUM 24-HR AVERAGE:	2.49 PPM		ON DAY(S) 5
			VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.25	MONTHLY AVERAGE:	2.12 PPM

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	S	2.24	2.23	2.26	2.24	2.26	2.29	2.26	2.24	2.23	2.20	2.20	2.20	2.20	2.35	2.42	2.26	2.23	2.20	2.24	2.27	2.30	2.33	2.51	S	2.20	2.51	2.27	24	
2		2.60	2.54	2.59	2.76	2.76	2.80	2.67	2.63	2.48	2.21	2.21	2.21	2.20	2.18	2.14	2.11	2.12	2.10	2.14	2.14	2.11	2.14	S	2.14	2.10	2.80	2.35	24	
3		2.15	2.10	2.11	2.11	2.10	2.10	2.14	2.14	2.13	2.17	2.17	2.16	2.15	2.14	2.26	2.20	2.18	2.17	2.20	2.23	2.16	S	2.14	2.20	2.10	2.26	2.16	24	
4		2.23	2.33	2.33	2.30	2.27	2.30	2.35	2.33	2.39	2.39	2.35	2.29	2.33	2.42	2.33	2.32	2.32	2.21	2.27	2.51	S	2.51	2.51	2.51	2.21	2.51	2.35	24	
5		2.61	2.72	2.89	3.24	3.29	3.28	3.19	3.16	2.76	2.45	2.44	2.45	2.45	2.45	2.39	2.38	2.38	2.38	2.33	S	2.39	2.41	2.42	2.42	2.33	3.29	2.65	24	
6		2.45	2.36	2.41	2.38	2.42	2.42	2.41	2.39	2.27	2.24	2.17	2.26	2.39	2.36	2.39	2.30	2.30	S	2.33	2.63	2.56	2.57	2.82	2.17	2.82	2.40	24		
7		2.80	2.80	2.69	2.65	2.57	2.54	2.57	2.54	2.42	2.44	2.42	2.39	2.38	2.36	2.33	2.27	2.33	S	2.32	2.42	2.29	2.43	2.54	2.54	2.27	2.80	2.48	24	
8		2.72	2.66	2.57	2.63	2.64	2.76	2.80	2.80	2.85	2.54	2.35	2.32	2.21	2.38	2.20	2.24	S	2.23	2.21	2.27	2.29	2.26	2.29	2.24	2.20	2.85	2.45	24	
9		2.32	2.20	2.36	2.57	2.64	2.64	2.45	2.48	2.35	2.39	2.44	2.47	2.41	2.41	2.39	S	2.35	2.44	2.42	2.50	2.53	2.72	2.71	2.36	2.20	2.72	2.46	24	
10		2.26	2.38	2.26	2.36	2.42	2.44	2.42	2.45	2.44	2.33	2.20	2.11	2.11	2.20	S	2.20	2.17	2.44	2.16	2.21	2.20	2.20	2.15	2.05	2.05	2.45	2.27	24	
11		2.48	2.14	2.17	2.14	2.11	2.18	2.20	2.18	2.20	2.21	2.24	2.26	2.21	S	2.36	2.35	2.35	2.36	2.39	2.42	2.47	2.39	2.42	2.45	2.11	2.48	2.29	24	
12		2.42	2.51	2.51	2.48	2.64	3.00	2.48	2.63	C	C	C	C	C	C	2.13	2.08	2.02	2.14	2.08	2.10	2.33	2.30	2.33	2.35	2.24	2.02	3.00	2.36	24
13		2.32	2.41	2.45	2.63	2.67	2.54	2.66	X	2.26	2.36	2.35	S	2.18	1.97	1.92	1.92	1.15	1.86	1.95	2.02	1.99	2.33	2.15	2.08	1.86	2.67	2.24	23	
14		2.17	2.35	2.54	2.50	2.53	2.48	2.54	2.48	2.21	2.23	S	1.92	2.07	1.97	1.88	1.92	1.83	1.83	1.98	2.14	2.32	2.44	2.17	2.21	1.83	2.54	2.20	24	
15		2.32	2.33	2.53	2.63	2.76	2.76	3.48	2.97	2.61	S	2.32	2.07	2.04	1.97	1.97	1.99	1.99	1.95	2.01	2.13	2.20	2.15	2.17	2.19	1.95	3.48	2.33	24	
16		2.17	2.14	2.20	2.21	2.27	2.17	2.47	2.42	S	2.21	2.17	2.10	2.07	1.95	1.94	1.86	1.85	1.85	1.97	2.06	2.02	2.02	2.08	2.14	1.85	2.47	2.10	24	
17		2.18	2.18	2.26	2.30	2.67	2.21	2.05	S	2.11	2.11	2.23	2.02	1.79	1.71	1.68	1.73	1.70	1.74	2.01	2.05	2.10	2.20	2.30	2.24	1.68	2.67	2.07	24	
18		2.23	2.20	2.36	2.04	1.86	1.80	S	1.80	1.74	1.77	1.80	1.77	1.80	1.80	1.80	1.82	1.85	1.83	1.83	1.85	1.80	1.91	1.82	1.83	1.74	2.36	1.88	24	
19		1.87	1.91	1.91	1.88	1.89	S	1.89	1.88	1.98	2.08	2.05	1.95	1.96	1.97	1.99	1.98	1.99	1.97	2.33	2.18	2.30	2.33	2.20	2.32	1.87	2.33	2.04	24	
20		2.18	2.20	2.30	2.48	S	2.57	2.45	2.47	2.33	2.17	2.13	2.08	2.10	2.11	2.13	2.13	2.13	2.14	2.23	2.41	2.36	2.29	2.51	2.33	2.08	2.57	2.27	24	
21		2.36	2.42	2.70	S	2.90	2.85	2.92	2.83	2.91	2.73	2.33	2.14	2.14	2.16	2.29	2.13	2.13	2.20	2.10	2.13	2.20	2.45	2.47	2.35	2.10	2.92	2.43	24	
22		2.42	2.44	S	2.60	2.69	2.72	2.98	3.06	2.67	2.45	2.44	2.44	2.30	2.32	2.25	2.29	2.24	2.17	2.14	2.19	2.24	2.20	2.15	2.33	2.14	3.06	2.42	24	
23		2.29	S	2.32	2.12	2.13	2.07	1.94	2.13	1.99	1.99	2.01	1.95	2.01	2.02	1.98	1.91	1.91	1.95	1.95	1.98	1.99	1.77	1.91	1.79	1.77	2.32	2.00	24	
24		S	1.83	1.99	1.96	2.05	2.14	2.05	2.32	2.18	2.08	2.04	2.05	2.04	2.02	2.02	2.05	2.02	2.02	2.02	1.94	2.27	2.29	2.30	S	1.83	2.32	2.08	24	
25		2.26	2.28	2.27	2.28	2.29	2.32	2.33	2.23	2.48	2.17	2.29	2.23	2.16	2.14	2.11	2.22	2.13	2.13	2.51	2.11	2.33	2.45	S	2.33	2.11	2.51	2.26	24	
26		2.48	2.48	2.50	2.48	2.63	2.87	2.82	2.82	2.63	2.57	2.53	2.33	2.38	2.14	2.11	2.02	1.97	2.02	2.17	2.16	2.13	S	2.14	2.18	1.97	2.87	2.37	24	
27		2.13	2.14	2.16	2.17	2.17	2.29	2.56	2.27	2.39	2.23	1.98	1.99	2.17	1.99	2.04	1.99	1.99	2.05	2.07	1.96	S	2.08	2.20	2.33	1.96	2.56	2.15	24	
28		2.33	2.38	2.54	2.70	2.67	2.75	3.96	2.81	2.63	2.42	2.29	2.24	2.25	2.28	2.54	2.26	2.33	2.30	2.35	S	2.57	2.82	2.44	2.53	2.24	3.96	2.54	24	
29		2.41	2.45	2.63	2.67	2.84	2.73	2.81	2.79	2.72	2.33	2.19	2.17	2.19	2.17	2.16	2.11	2.13	2.20	S	2.57	2.42	2.53	2.63	2.57	2.11	2.84	2.45	24	
30		2.33	2.48	2.57	2.63	2.33	2.08	2.08	2.02	2.10	1.96	2.02	1.99	2.04	2.04	1.99	1.99	2.02	S	1.92	1.99	1.91	1.96	2.02	1.93	1.91	2.63	2.10	24	
HOURLY MAX		2.80	2.80	2.89	3.24	3.29	3.28	3.96	3.16	2.91	2.73	2.53	2.47	2.45	2.45	2.54	2.38	2.38	2.44	2.51	2.57	2.63	2.82	2.71	2.82					
HOURLY AVG		2.34	2.33	2.39	2.42	2.46	2.49	2.55	2.47	2.37	2.27	2.23	2.16	2.16	2.14	2.14	2.10	2.11	2.11	2.15	2.20	2.24	2.30	2.30	2.27					

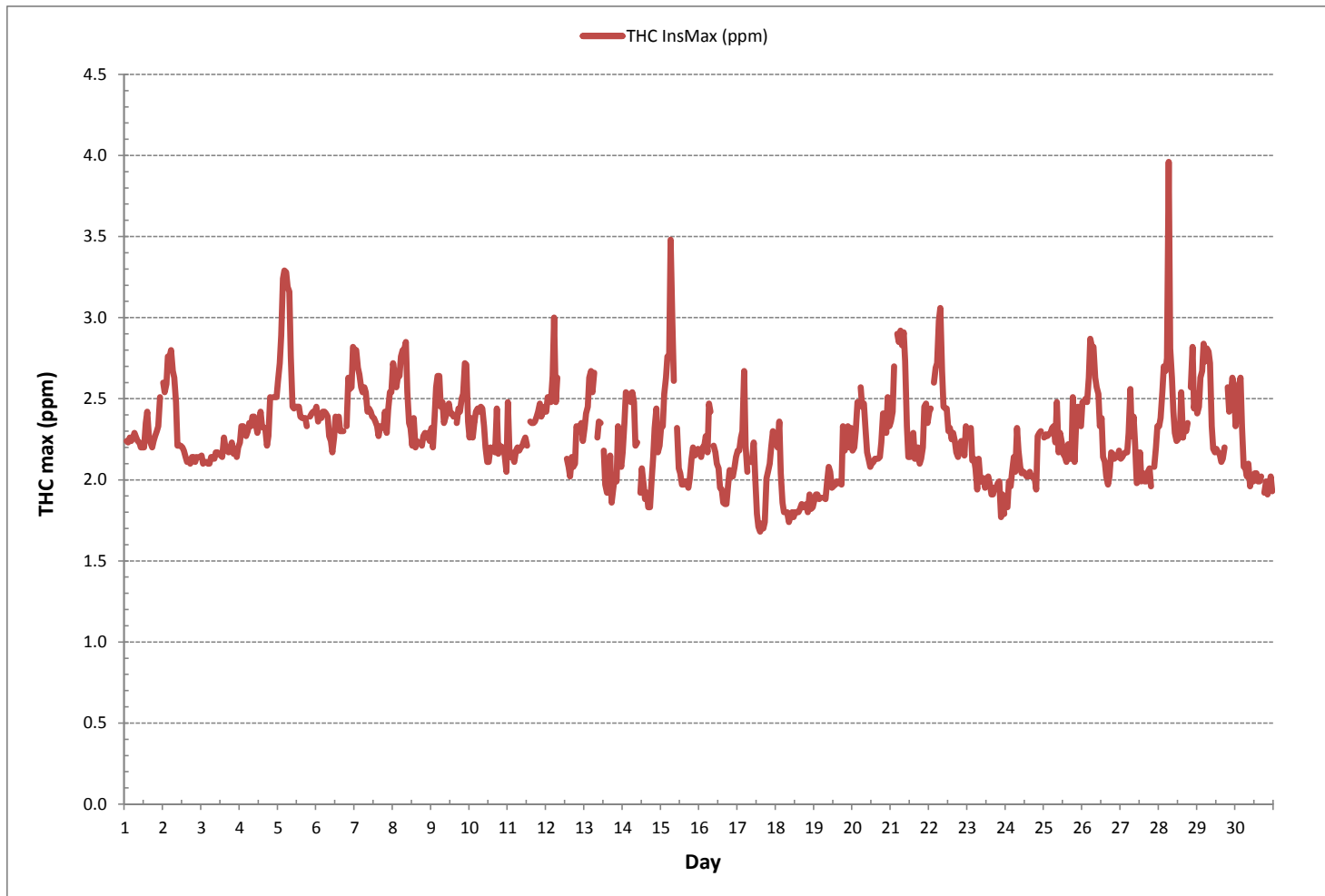
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	3.96 PPM @ HOUR(S) 6 ON DAY(S) 28
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.27
OPERATIONAL TIME:	719 HRS

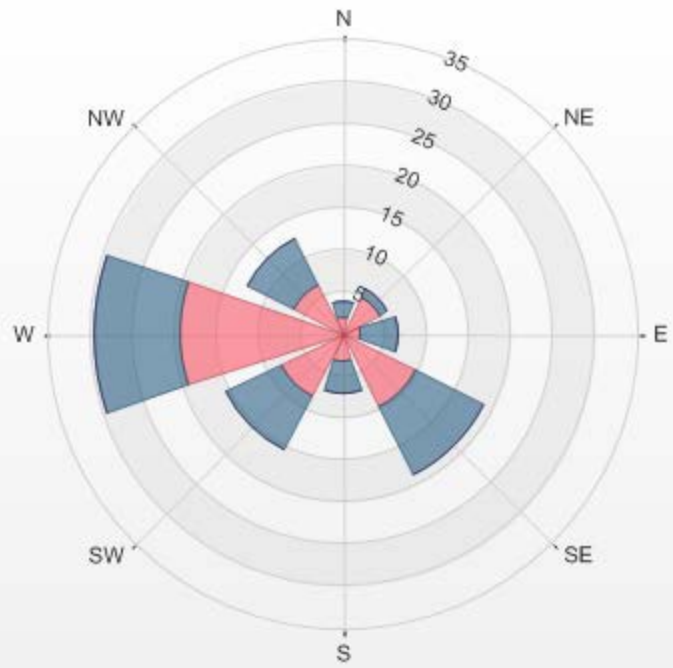
TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

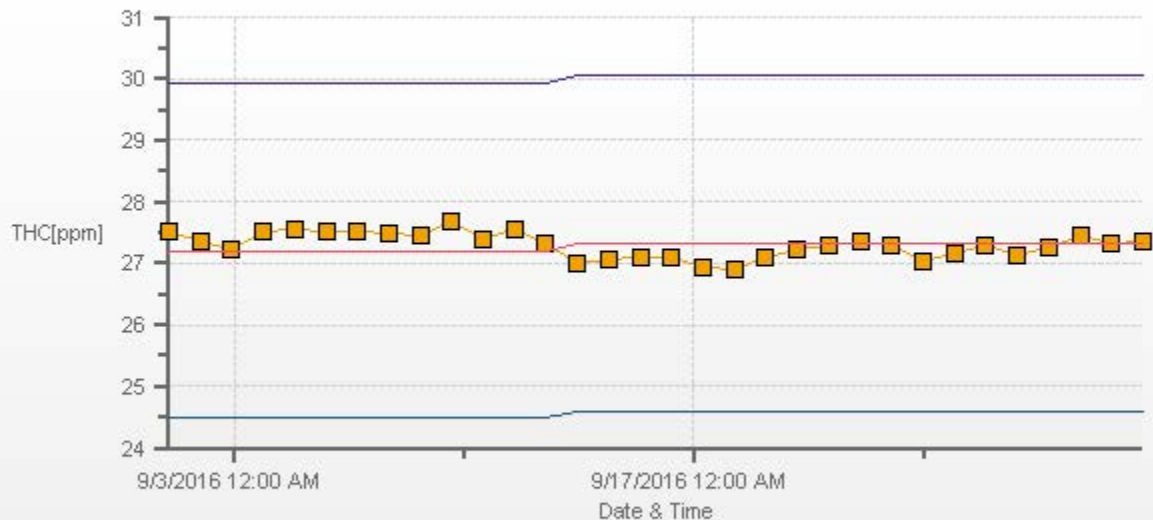
Direction	0.0-1.1	1.1-2.1	2.1-3.2	>3.2	Total
N	0	1.9	2.05	0	3.95
NE	0	4.98	1.02	0	6
E	0	2.2	4.39	0	6.59
SE	0	9.81	8.93	0	18.74
S	0	3.37	3.66	0	7.03
SW	0	8.2	7.32	0	15.52
W	0	19.33	10.25	0	29.58
NW	0	6.44	6.15	0	12.59
Summary	0	56.23	43.77	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2016/09/01 00:00 - 2016/09/30 23:00
 Calm: 0.00%



% Icon Classes (ppm)	
0	0.0-1.1
56	1.1-2.1
44	2.1-3.2
0	>3.2

THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 Type: Span



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

OXIDES OF NITROGEN



OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

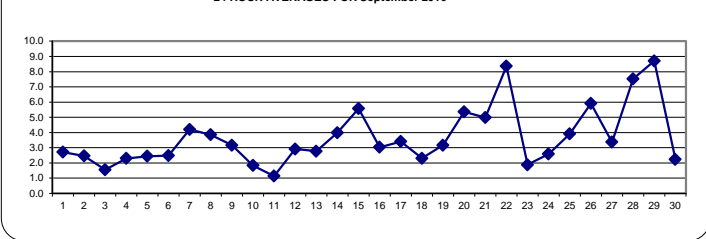
MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
1	S	2.5	1.6	1.5	1.8	2.5	3.6	3.8	2.2	3.4	1.9	1.7	2.6	9.4	4.7	2.0	3.2	2.1	1.6	1.7	1.9	1.8	2.2	S	1.5	9.4	2.7	24	
2	3.3	2.7	2.3	2.6	3.1	5.6	7.0	7.3	1.7	1.3	1.2	1.4	1.0	1.4	1.8	1.1	1.0	1.7	2.0	1.6	1.4	1.3	S	2.8	1.0	7.3	2.5	24	
3	2.7	1.8	1.8	1.8	2.1	1.9	1.3	1.8	1.4	1.3	1.2	1.0	0.8	1.0	1.0	1.0	1.0	1.2	1.3	1.5	1.7	S	3.1	2.1	0.8	3.1	1.6	24	
4	2.5	2.3	2.0	2.4	2.3	2.4	3.7	3.8	3.5	3.6	2.9	1.6	1.9	1.7	1.5	1.1	1.1	1.0	1.2	2.5	S	3.3	2.3	2.3	1.0	3.8	2.3	24	
5	2.2	1.9	1.6	1.4	5.0	5.4	6.0	6.4	2.2	1.7	1.7	1.2	1.3	1.2	1.5	1.2	1.1	1.3	1.7	S	3.9	2.9	1.9	1.6	1.1	6.4	2.4	24	
6	2.6	2.0	1.1	1.9	2.1	1.7	3.5	3.8	2.5	2.1	1.8	1.6	1.7	2.1	2.2	1.7	1.7	1.8	S	4.5	4.0	3.8	2.7	4.1	1.1	4.5	2.5	24	
7	6.9	7.6	8.6	6.2	5.2	4.1	4.3	4.8	8.6	6.3	2.3	2.7	1.8	2.1	1.7	1.7	1.9	S	4.7	3.3	3.3	2.2	4.0	2.2	1.7	8.6	4.2	24	
8	1.3	1.4	1.7	1.7	5.1	4.6	6.9	7.2	12.1	15.5	5.4	3.0	1.7	1.1	1.2	1.0	S	3.3	2.7	2.4	2.4	3.2	2.3	1.4	1.0	15.5	3.9	24	
9	2.2	1.9	2.8	3.6	3.8	4.8	5.9	8.2	3.8	6.4	3.2	1.5	1.2	1.5	0.7	S	1.6	0.9	1.7	4.5	6.2	3.7	1.8	0.9	0.7	8.2	3.2	24	
10	1.0	1.2	1.6	1.6	2.1	2.2	2.8	3.0	3.1	3.2	2.1	1.7	1.0	0.8	S	1.7	1.0	0.8	1.0	2.3	2.9	2.1	0.8	2.3	0.8	3.2	1.8	24	
11	1.5	2.0	1.8	1.5	0.8	0.8	1.2	0.8	1.1	1.1	1.5	2.1	1.8	S	1.5	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.7	1.7	0.5	2.1	1.1	24	
12	1.8	3.0	4.9	5.1	5.8	6.0	7.2	4.3	2.8	2.8	1.2	1.0	S	1.8	1.4	1.6	1.6	1.2	1.7	3.1	2.2	2.2	2.2	2.1	1.0	7.2	2.9	24	
13	2.6	2.5	2.3	3.2	3.5	4.1	4.2	C	C	C	C	C	C	C	C	3.5	3.4	1.8	1.5	1.6	2.1	2.1	2.4	3.0	3.4	1.5	4.2	2.8	24
14	2.4	1.8	2.7	4.3	4.6	4.4	6.3	9.1	14.4	7.4	S	3.9	3.7	1.9	2.0	1.6	1.6	1.0	1.5	4.6	3.6	3.6	2.9	2.4	1.0	14.4	4.0	24	
15	3.9	3.9	4.8	5.9	11.2	11.8	18.8	19.2	15.4	S	5.7	3.2	2.4	1.0	1.1	1.5	1.3	1.4	3.1	3.0	3.6	2.3	1.8	1.9	1.0	19.2	5.6	24	
16	2.2	2.1	2.3	2.8	3.6	6.3	6.8	7.7	S	4.5	3.4	2.9	2.7	2.1	1.8	1.5	1.4	1.4	2.2	2.7	2.4	1.8	2.3	2.9	1.4	7.7	3.0	24	
17	4.1	3.8	3.1	4.1	4.5	4.7	7.1	S	5.7	5.9	6.9	4.9	2.4	1.3	0.9	0.9	0.9	0.9	2.5	3.6	2.5	2.3	2.3	3.1	0.9	7.1	3.4	24	
18	3.5	2.1	6.3	4.8	2.9	2.3	S	3.8	2.9	2.8	2.3	1.8	1.9	1.2	0.8	0.9	0.7	0.7	1.1	0.8	0.7	2.2	3.1	3.4	0.7	6.3	2.3	24	
19	2.9	4.2	4.1	3.4	3.5	S	5.5	7.0	5.2	3.4	1.8	1.2	1.3	0.9	1.1	0.8	0.6	0.7	5.0	5.3	3.7	3.4	4.8	3.0	0.6	7.0	3.2	24	
20	2.6	3.3	5.2	5.0	S	6.0	14.3	14.7	12.0	7.8	6.5	3.4	3.1	2.1	2.0	2.2	1.9	2.5	5.7	4.6	5.4	3.2	5.2	4.7	1.9	14.7	5.4	24	
21	3.2	4.6	4.3	S	9.3	6.3	10.7	11.1	8.5	7.3	4.3	2.1	1.2	1.1	2.1	1.6	1.3	2.0	3.9	7.0	10.7	4.8	3.8	3.5	1.1	11.1	5.0	24	
22	2.7	3.7	S	8.5	10.0	12.2	24.0	60.4	32.3	4.6	2.7	2.2	1.2	1.1	1.0	1.1	1.7	1.3	4.6	4.6	3.6	3.4	2.6	2.7	1.0	60.4	8.4	24	
23	2.3	S	3.7	3.0	3.0	1.9	2.8	3.1	2.2	1.9	2.1	1.5	1.6	1.2	1.8	1.3	1.4	1.1	1.3	1.2	1.4	1.1	1.3	1.1	1.1	3.7	1.9	24	
24	S	2.1	1.5	2.1	1.9	4.1	4.8	5.9	4.2	2.2	2.3	5.4	1.0	0.7	0.5	0.5	0.5	0.5	0.8	4.1	4.3	2.5	5.1	S	0.5	5.9	2.6	24	
25	9.1	8.4	6.3	5.5	5.2	5.7	6.9	5.4	5.2	4.2	3.8	3.7	1.1	0.7	0.6	0.6	0.7	0.8	3.6	2.5	1.9	2.0	S	6.2	0.6	9.1	3.9	24	
26	6.1	7.4	7.3	5.1	8.1	10.5	19.1	20.2	12.4	8.0	5.4	3.6	2.5	2.4	2.7	1.9	1.4	1.4	2.7	1.8	1.3	S	2.5	2.2	1.3	20.2	5.9	24	
27	2.4	2.1	2.2	2.2	2.6	2.7	8.9	10.2	10.4	3.9	1.4	1.2	1.5	3.3	2.6	0.8	0.7	0.8	4.2	4.4	S	3.2	2.2	3.6	0.7	10.4	3.4	24	
28	3.7	4.7	5.0	5.7	6.2	9.1	20.1	34.0	11.7	7.9	5.6	1.7	2.5	1.4	1.6	1.6	1.9	2.6	5.8	S	17.1	12.8	3.9	6.6	1.4	34.0	7.5	24	
29	7.3	7.1	5.8	6.4	11.3	5.5	15.4	15.4	23.9	8.3	2.3	1.7	2.1	2.0	2.0	1.3	2.1	6.2	S	18.4	14.2	13.8	13.6	13.9	1.3	23.9	8.7	24	
30	7.4	4.8	3.0	2.8	2.5	3.8	2.1	3.2	1.8	2.6	2.2	1.1	1.0	1.3	1.4	1.2	1.3	S	1.7	1.6	1.4	1.1	1.4	0.8	0.8	7.4	2.2	24	
HOURLY MAX	9.1	8.4	8.6	8.5	11.3	12.2	24.0	60.4	32.3	15.5	6.9	5.4	3.7	9.4	4.7	3.4	3.2	6.2	5.8	18.4	17.1	13.8	13.6	13.9					
HOURLY AVG	3.4	3.4	3.5	3.7	4.6	4.9	8.0	10.2	7.6	4.7	3.0	2.3	1.8	1.8	1.7	1.4	1.3	1.5	2.6	3.6	3.9	3.3	3.1	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

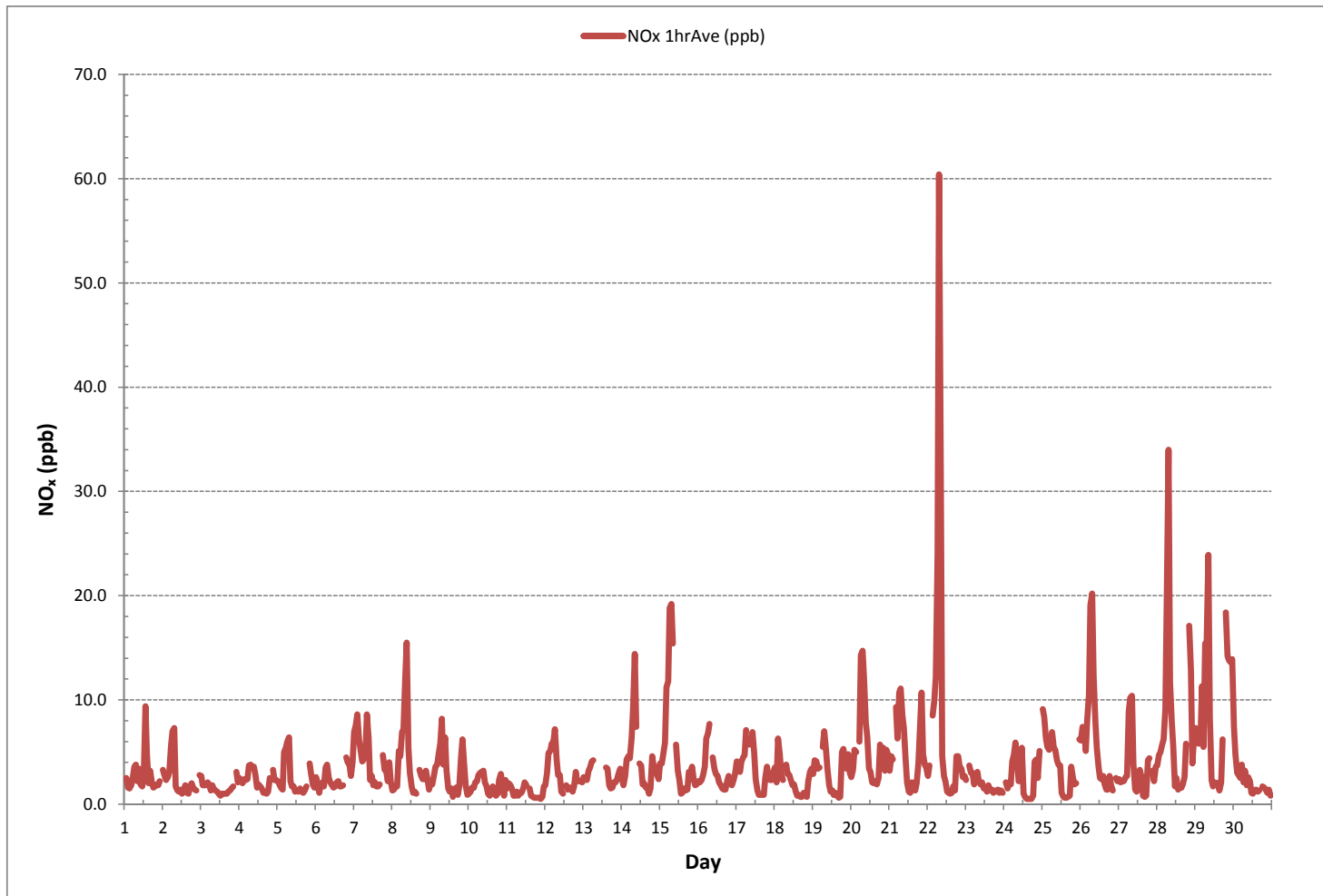
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682			
MINIMUM 1-HR AVERAGE:	0.5 PPB	@ HOUR(S)	21 , VAR	ON DAY(S) 11 , 24
MAXIMUM 1-HR AVERAGE:	60.4 PPB	@ HOUR(S)	7	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	8.7 PPB			ON DAY(S) 29
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	720 HRS	
MONTHLY CALIBRATION TIME:	7 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4.26	MONTHLY AVERAGE:	3.7 PPB	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		S	4.1	1.9	1.8	4.3	4.3	6.2	6.3	4.3	6.7	2.8	3.0	18.3	38.2	28.8	4.6	5.2	3.9	1.9	2.3	2.3	1.9	2.6	S	1.8	38.2	7.1	24	
2		5.2	3.2	2.6	3.3	4.5	8.5	8.9	9.2	7.4	5.0	1.6	1.9	1.6	5.0	3.4	3.3	1.5	3.6	3.9	2.9	2.6	2.0	S	4.4	1.5	9.2	4.2	24	
3		3.7	2.1	2.0	2.3	2.5	2.2	1.8	3.0	2.1	1.8	1.8	3.0	1.1	1.3	1.2	1.3	1.2	1.9	1.6	1.8	2.3	S	3.8	3.4	1.1	3.8	2.1	24	
4		3.0	3.6	2.6	3.4	2.9	4.2	4.5	4.5	4.0	4.0	3.4	2.2	2.3	2.4	2.8	1.5	1.3	1.3	1.5	8.0	S	4.6	2.7	3.6	1.3	8.0	3.2	24	
5		3.2	2.8	1.9	1.9	8.9	8.6	17.3	11.4	2.6	2.3	2.3	1.5	1.8	2.0	3.0	2.0	1.6	3.7	2.6	S	5.5	4.6	2.8	2.0	1.5	17.3	4.2	24	
6		6.8	3.0	1.9	3.8	5.1	3.2	7.3	8.1	5.4	7.3	2.8	5.8	5.2	4.4	3.4	2.8	4.1	4.7	S	6.5	5.4	4.7	3.3	5.6	1.9	8.1	4.8	24	
7		7.7	8.1	9.6	7.2	7.3	5.1	5.6	7.9	11.9	12.7	2.6	3.7	2.3	4.1	4.5	3.0	6.4	S	6.8	4.3	5.5	2.9	9.6	3.7	2.3	12.7	6.2	24	
8		1.8	2.5	3.3	2.4	8.4	5.8	11.3	10.5	14.8	20.4	10.9	6.3	2.9	1.6	4.3	1.8	S	5.1	3.3	3.6	2.9	4.0	3.2	1.8	1.6	20.4	5.8	24	
9		4.1	3.6	4.1	5.2	5.8	13.2	7.4	23.0	6.8	8.0	6.3	3.4	3.3	12.1	1.8	S	3.2	1.1	3.3	7.7	12.1	6.7	6.2	1.3	1.1	23.0	6.5	24	
10		1.2	1.6	2.2	1.9	2.8	3.2	3.3	3.4	3.4	5.4	2.5	2.4	1.5	1.1	S	3.0	1.1	0.9	2.0	2.5	3.4	2.8	1.0	3.8	0.9	5.4	2.5	24	
11		1.9	2.5	2.3	2.2	1.3	1.1	1.5	1.5	1.3	1.6	2.0	2.5	2.8	S	3.0	1.2	3.0	0.8	0.9	1.1	1.5	0.9	0.9	2.0	0.8	3.0	1.7	24	
12		2.0	4.3	5.2	6.3	6.3	20.4	8.9	7.0	5.0	3.4	2.0	1.6	S	3.0	1.9	2.3	5.8	1.3	3.7	7.7	4.8	3.1	2.8	2.4	1.3	20.4	4.8	24	
13		3.3	3.3	3.0	4.1	4.1	4.8	5.0	C	C	C	C	C	C	C	4.9	5.6	4.6	2.4	2.0	2.4	4.6	4.9	5.2	4.0	2.0	5.6	4.0	24	
14		3.3	2.3	4.2	7.4	7.7	7.7	10.0	13.6	20.0	11.6	S	6.2	19.6	3.3	5.9	3.3	2.9	1.3	4.6	22.2	5.4	5.4	3.6	2.9	1.3	22.2	7.6	24	
15		5.0	5.1	9.1	8.6	61.7	21.3	29.2	35.7	17.8	S	15.1	4.6	6.0	1.3	2.0	4.4	5.2	1.9	6.0	4.3	4.6	5.2	2.1	2.2	1.3	61.7	11.2	24	
16		2.3	2.3	2.7	3.0	4.8	44.4	19.1	15.5	S	5.9	4.0	8.0	9.5	9.1	3.3	2.4	2.5	2.0	6.7	3.3	4.0	2.3	2.9	3.6	2.0	44.4	7.1	24	
17		7.0	4.3	4.0	4.7	6.9	6.5	13.4	S	8.3	13.4	13.5	6.5	3.8	2.1	1.1	1.3	2.9	1.2	5.4	15.6	3.8	3.2	2.9	6.2	1.1	15.6	6.0	24	
18		5.5	4.5	7.1	6.0	3.6	3.0	S	5.8	3.6	3.4	2.9	2.1	2.3	1.8	0.9	1.2	0.8	0.8	4.0	1.0	1.2	2.8	4.8	4.7	0.8	7.1	3.2	24	
19		3.9	5.1	4.9	4.1	4.1	S	7.3	10.6	8.0	4.9	3.4	2.5	2.4	1.9	2.9	1.5	0.9	1.2	8.6	7.7	7.1	6.6	7.5	4.3	0.9	10.6	4.8	24	
20		3.4	5.1	6.5	7.2	S	16.8	25.2	23.8	16.0	15.5	7.7	6.4	6.2	3.0	3.4	3.0	2.3	2.9	11.4	7.4	8.3	5.1	12.8	6.8	2.3	25.2	9.0	24	
21		5.2	6.8	8.1	S	15.4	10.3	19.7	14.5	12.0	11.3	7.4	4.1	2.9	1.9	14.4	3.2	2.5	2.6	9.1	19.6	58.6	7.0	5.1	7.3	1.9	58.6	10.8	24	
22		3.8	6.4	S	12.7	24.0	21.5	31.0	142.2	82.7	7.0	4.1	11.2	2.4	3.0	1.6	1.6	19.2	2.3	9.7	26.3	7.1	5.0	3.7	3.4	1.6	142.2	18.8	24	
23		2.9	S	5.1	4.3	10.4	2.6	5.8	5.2	5.6	3.1	6.3	2.2	3.2	2.6	14.4	3.2	10.6	1.8	3.2	2.0	2.0	2.0	2.3	2.0	1.8	14.4	4.5	24	
24		S	3.4	2.3	3.3	3.7	5.8	6.2	6.6	5.6	3.3	8.4	24.9	1.3	1.5	0.9	0.6	0.7	0.7	1.3	7.0	7.4	3.7	5.8	S	0.6	24.9	4.7	24	
25		11.3	11.3	8.8	5.9	5.9	6.5	8.9	6.3	6.8	4.6	5.2	22.7	3.7	1.2	0.8	1.1	1.3	1.2	38.5	4.7	2.5	2.9	S	8.3	0.8	38.5	7.4	24	
26		9.9	16.4	13.0	10.7	20.1	18.3	49.1	29.3	24.8	10.4	6.9	16.3	2.9	2.9	14.8	15.5	4.4	4.8	6.4	3.3	2.7	S	3.6	2.4	2.4	49.1	12.6	24	
27		2.7	2.4	2.4	2.4	11.7	4.1	23.0	27.5	29.0	6.4	2.9	1.6	4.7	6.5	4.8	1.3	1.1	1.5	6.8	7.2	S	5.9	3.3	5.1	1.1	29.0	7.1	24	
28		4.8	7.5	6.4	14.2	19.6	15.7	29.1	55.7	23.2	13.6	8.5	3.7	18.4	3.2	3.7	3.6	6.4	5.0	11.6	S	21.7	17.1	6.4	22.3	3.2	55.7	14.0	24	
29		14.7	20.8	9.3	9.3	46.9	14.9	28.8	19.7	60.1	25.7	4.8	4.1	9.3	11.3	8.8	2.0	13.5	19.5	S	37.7	19.2	16.8	16.7	17.1	2.0	60.1	18.7	24	
30		12.6	7.3	6.2	6.1	6.5	6.7	2.9	14.8	3.4	5.0	6.3	2.2	1.9	2.9	4.8	2.3	4.7	S	3.2	6.5	2.2	2.1	2.9	1.9	1.9	14.8	5.0	24	
HOURLY MAX		14.7	20.8	13.0	14.2	61.7	44.4	49.1	142.2	82.7	25.7	15.1	24.9	19.6	38.2	28.8	15.5	19.2	19.5	38.5	37.7	58.6	17.1	16.7	22.3					
HOURLY AVG		5.1	5.4	4.9	5.4	10.9	10.0	13.7	18.7	14.1	8.0	5.3	5.7	5.1	4.8	5.2	2.9	4.2	2.9	6.1	8.1	7.5	4.9	4.7	4.9					

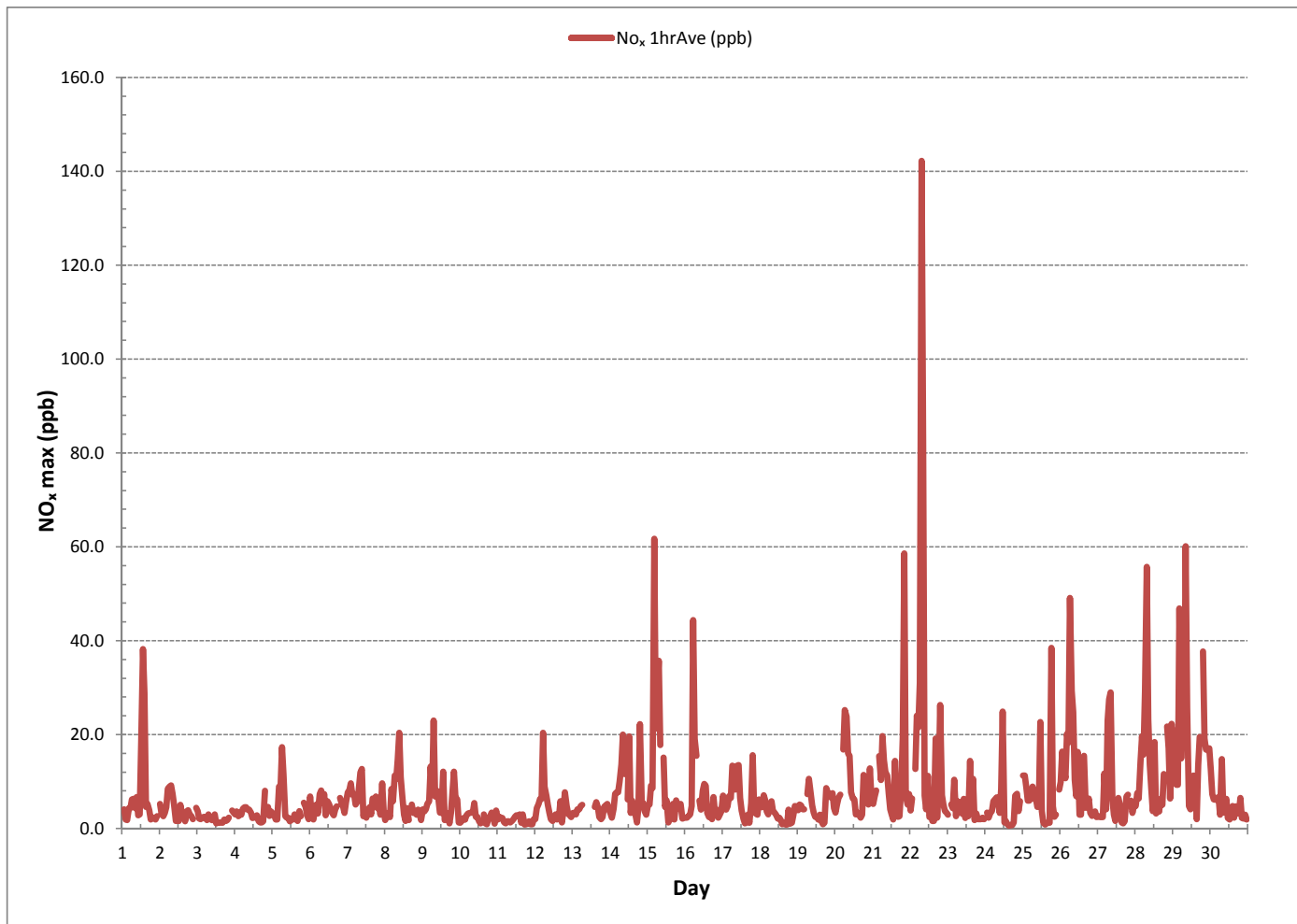
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	142.2 PPB @ HOUR(S) 7 ON DAY(S) 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	9.76
OPERATIONAL TIME:	720 HRS

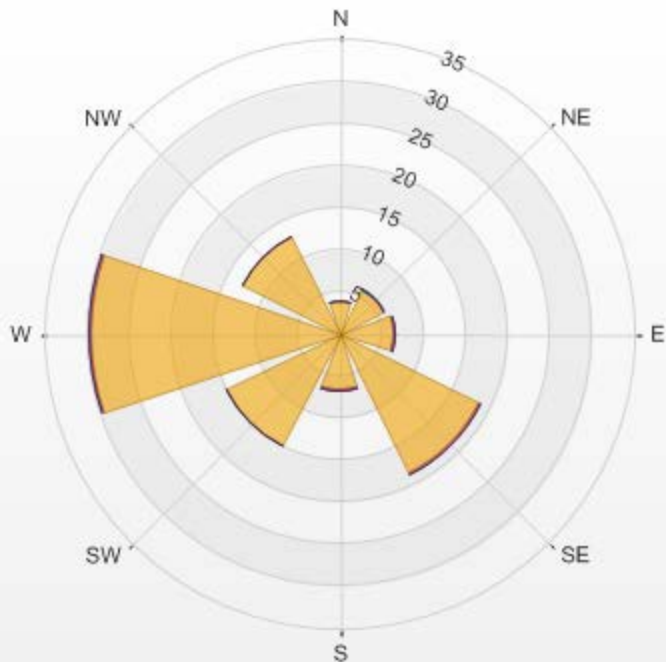
OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

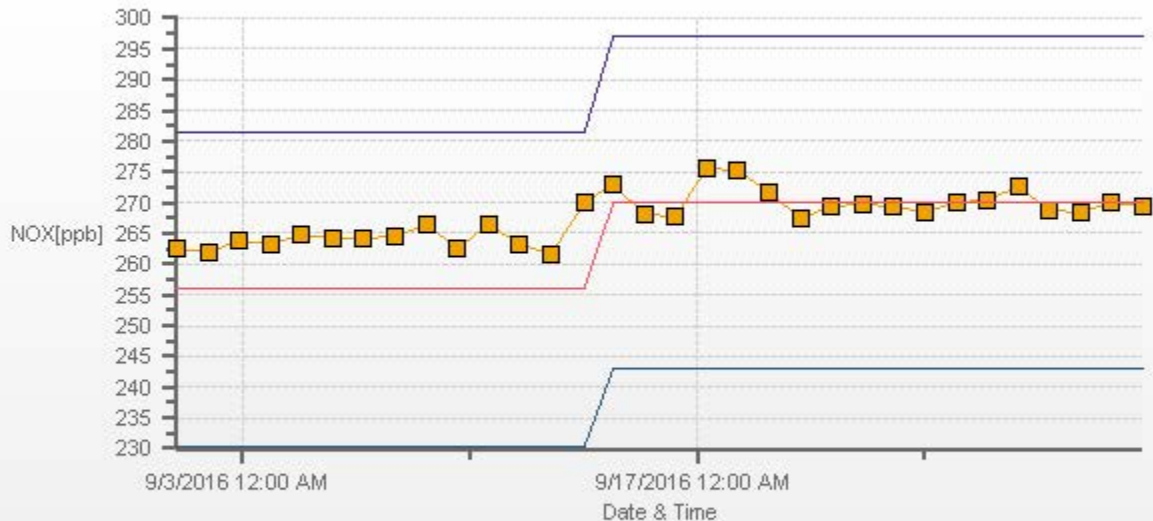
Direction	0.0-20.3	20.3-40.7	40.7-61.0	>61.0	Total
N	3.96	0	0	0	3.96
NE	5.87	0	0.15	0	6.02
E	6.45	0.15	0	0	6.6
SE	18.62	0.15	0	0	18.77
S	6.74	0.15	0	0	6.89
SW	14.96	0	0	0	14.96
W	29.62	0.15	0	0	29.77
NW	13.05	0	0	0	13.05
Summary	99.27	0.6	0.15	0	100

Calm: 0.00%



% Icon Classes (ppb)	99	1	0	0
0.0-20.3	20.3-40.7	40.7-61.0	>61.0	

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

NITRIC OXIDE Hourly Averages (NO ppb)

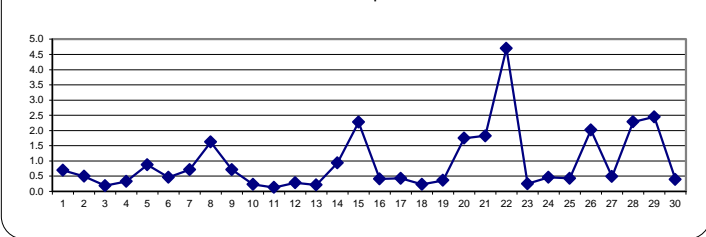
MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
1	S	0.1	0.1	0.1	0.2	0.3	0.5	0.7	0.5	0.9	0.4	0.3	0.8	6.5	2.7	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	6.5	0.7	24
2	0.1	0.2	0.2	0.3	0.7	1.2	3.0	2.7	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	S	0.1	0.1	3.0	0.5	24
3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	S	0.1	0.1	0.1	0.4	0.2	24
4	0.1	0.1	0.1	0.0	0.0	0.1	0.4	0.7	0.8	1.1	1.0	0.3	0.3	0.4	0.4	0.2	0.1	0.1	0.1	0.3	S	0.3	0.3	0.4	0.0	1.1	0.3	24	
5	0.4	0.3	0.3	0.3	3.0	3.5	4.3	4.2	0.7	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.1	S	0.4	0.2	0.2	0.2	0.2	0.1	4.3	0.9	24	
6	0.2	0.2	0.1	0.2	0.2	0.1	0.6	0.6	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.3	0.5	0.4	S	0.6	1.4	0.6	0.8	0.4	0.1	1.4	0.5	24	
7	0.4	0.4	0.4	0.2	0.2	0.2	0.8	1.7	4.2	2.7	0.7	0.7	0.4	0.3	0.3	0.3	0.3	S	0.2	0.1	0.2	0.2	1.1	0.4	0.1	4.2	0.7	24	
8	0.3	0.5	0.8	0.6	3.7	2.9	4.7	4.6	7.2	7.8	1.7	0.7	0.3	0.2	0.3	0.1	S	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.8	1.6	24
9	0.1	0.1	0.2	0.2	0.8	1.3	1.9	3.8	1.1	2.6	1.1	0.4	0.3	0.4	0.1	S	0.1	0.1	0.1	0.3	0.9	0.2	0.3	0.1	0.1	0.1	3.8	0.7	24
10	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.6	0.9	1.0	0.6	0.4	0.2	0.1	S	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	1.0	0.2	24	
11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	S	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.4	0.1	24	
12	0.0	0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.7	0.6	0.2	0.2	S	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	1.0	0.3	24	
13	0.1	0.1	0.1	0.1	0.1	0.2	0.5	C	C	C	C	C	C	C	C	0.5	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.6	0.2	24
14	0.1	0.1	0.2	0.2	0.4	0.4	2.3	3.8	6.0	2.7	S	0.7	1.2	0.4	0.4	0.5	0.2	0.1	0.1	0.6	0.2	0.3	0.3	0.3	0.1	6.0	0.9	24	
15	0.4	0.6	0.8	0.4	4.4	6.8	14.4	13.6	6.8	S	1.4	0.7	0.5	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	14.4	2.3	24	
16	0.1	0.1	0.1	0.1	0.1	1.5	1.0	2.0	S	0.9	0.6	0.6	0.6	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	2.0	0.4	24	
17	0.2	0.1	0.1	0.1	0.2	0.2	0.4	S	0.6	1.2	1.9	1.2	0.5	0.2	0.1	0.1	0.2	0.1	0.2	0.8	0.2	0.2	0.3	0.8	0.1	1.9	0.4	24	
18	0.9	0.4	0.2	0.1	0.1	0.1	S	0.2	0.3	0.5	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.2	24	
19	0.1	0.1	0.1	0.1	0.1	S	0.4	1.2	1.1	0.6	0.5	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.4	1.2	0.3	0.1	1.2	0.4	24	
20	0.3	0.3	0.3	0.2	S	2.1	10.0	7.8	4.6	3.7	3.0	1.0	1.1	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.2	1.6	0.8	0.2	10.0	1.7	24	
21	0.5	1.1	0.8	S	4.6	2.7	7.0	7.5	4.1	3.5	1.7	0.6	0.4	0.2	0.7	0.3	0.2	0.2	0.2	0.3	4.7	0.2	0.2	0.3	0.2	7.5	1.8	24	
22	0.2	0.6	S	2.7	4.6	6.7	18.6	48.2	21.4	1.4	0.7	0.5	0.2	0.2	0.2	0.1	0.3	0.1	0.2	0.5	0.2	0.2	0.2	0.1	0.1	48.2	4.7	24	
23	0.1	S	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.6	0.3	0.3	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.6	0.3	24	
24	S	0.1	0.2	0.1	0.2	0.4	0.5	1.0	1.5	0.7	1.2	3.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	3.1	0.5	24	
25	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.0	1.5	1.4	1.2	1.5	0.2	0.3	0.1	0.1	0.1	0.1	0.8	0.1	0.1	0.1	S	0.3	0.1	1.5	0.4	24	
26	0.5	1.6	0.8	0.5	1.8	3.2	11.5	12.7	5.3	2.8	1.7	1.0	0.6	0.5	0.6	0.4	0.2	0.2	0.2	0.1	0.1	S	0.1	0.1	0.1	12.7	2.0	24	
27	0.1	0.1	0.1	0.1	0.2	0.1	0.9	2.6	3.5	1.1	0.3	0.2	0.2	0.5	0.4	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	3.5	0.5	24	
28	0.1	0.3	0.2	0.6	1.0	1.8	8.9	23.4	4.7	2.8	1.8	0.4	0.8	0.3	0.3	0.3	0.3	0.2	0.2	S	2.0	1.0	0.3	0.8	0.1	23.4	2.3	24	
29	0.8	0.8	0.5	0.7	4.6	1.3	9.5	10.1	14.6	3.0	0.6	0.5	0.6	0.9	0.5	0.2	0.3	0.4	S	2.0	0.5	0.7	1.1	2.1	0.2	14.6	2.4	24	
30	0.7	0.3	0.3	0.3	0.4	0.5	0.2	1.1	0.5	0.6	0.5	0.3	0.2	0.4	0.7	0.2	0.3	S	0.2	0.4	0.3	0.2	0.4	0.1	0.1	1.1	0.4	24	
HOURLY MAX	0.9	1.6	0.8	2.7	4.6	6.8	18.6	48.2	21.4	7.8	3.0	3.1	1.2	6.5	2.7	0.6	0.5	0.4	0.8	2.0	4.7	1.0	1.6	2.1					
HOURLY AVG	0.3	0.3	0.3	0.3	1.1	1.4	3.6	5.6	3.4	1.6	0.9	0.6	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.4	0.3					

STATUS FLAG CODES

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

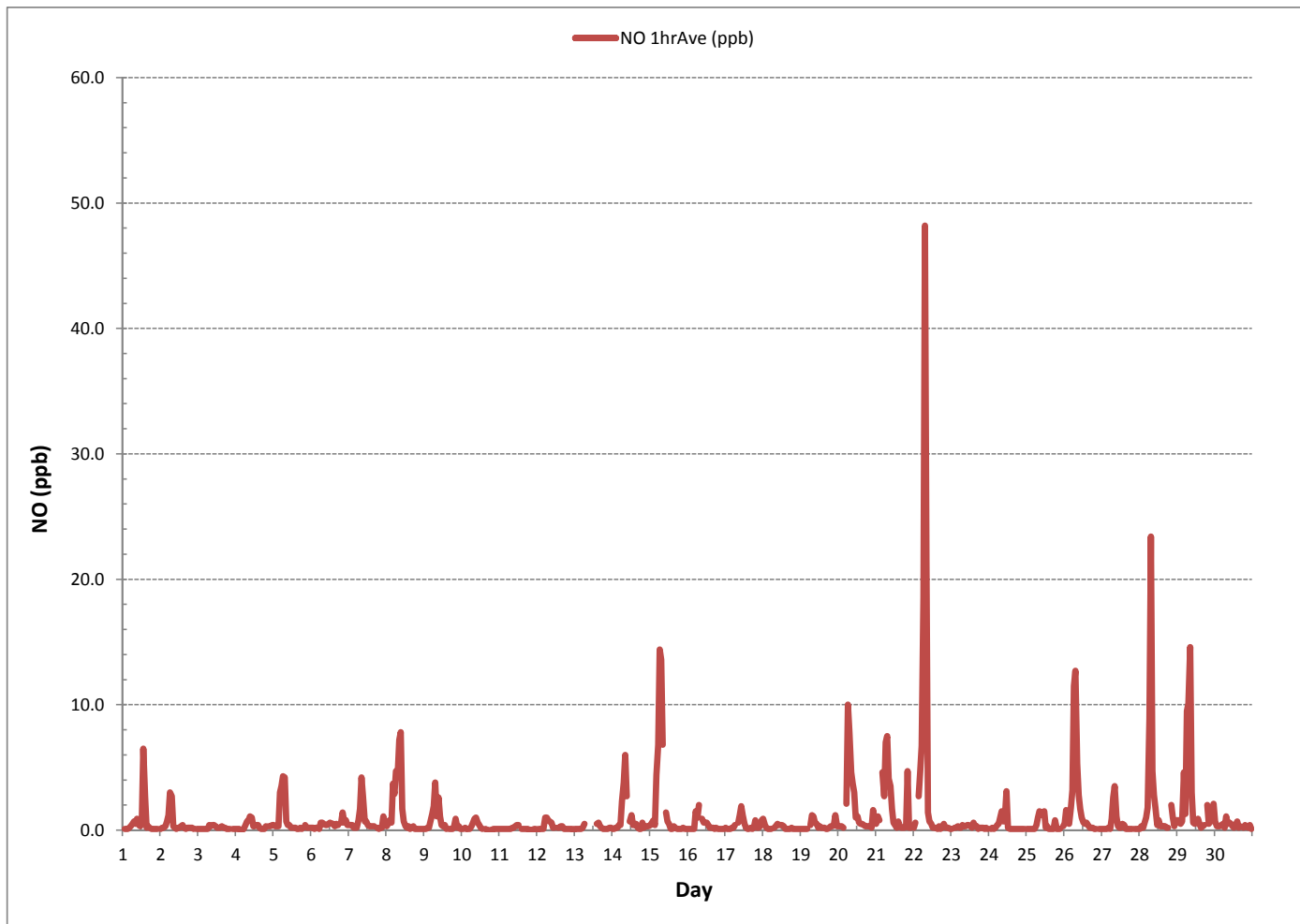
24 HOUR AVERAGES FOR September 2016



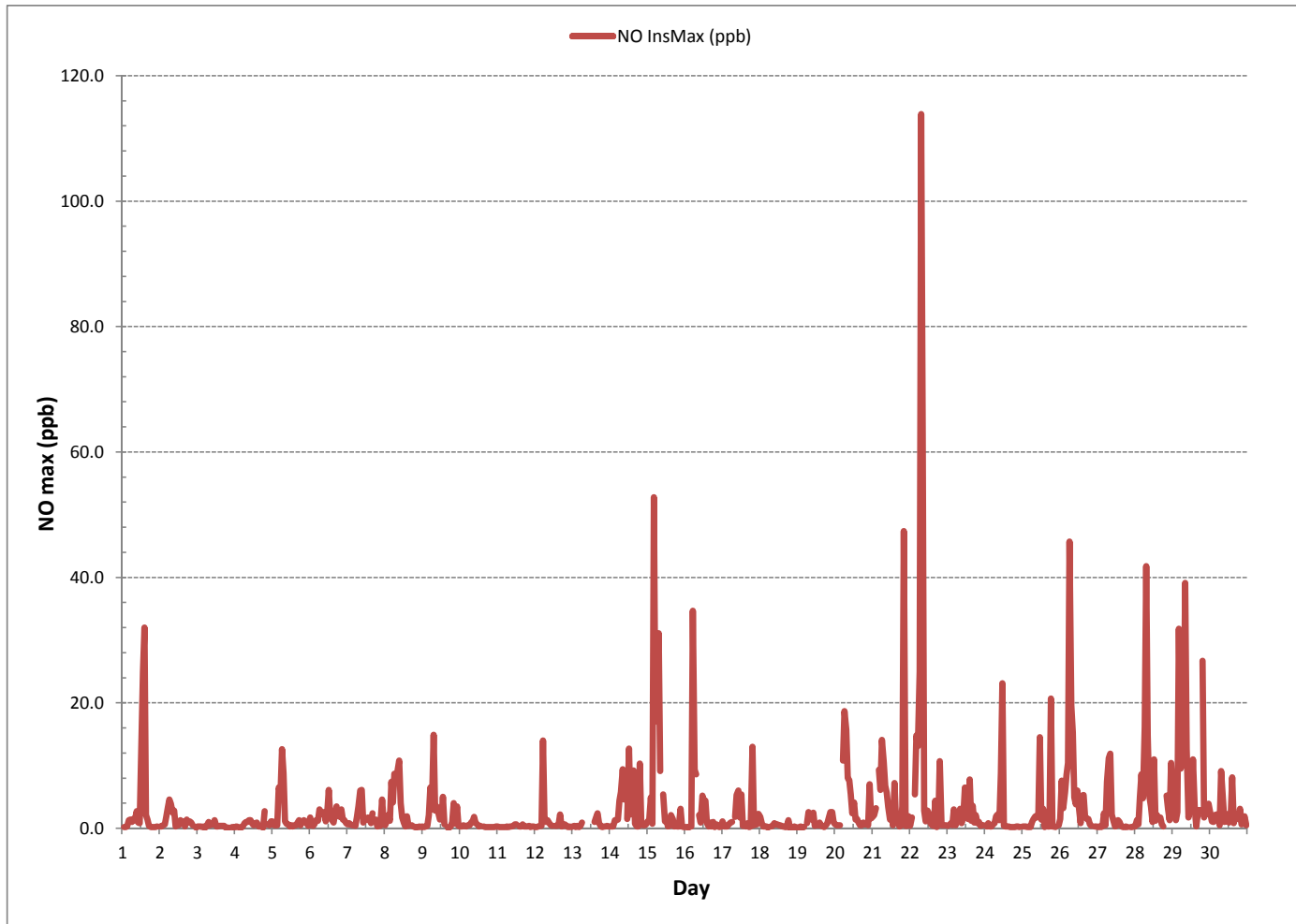
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	671				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	48.2	PPB @ HOUR(S)	7	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	4.7	PPB		ON DAY(S)	22
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	2.84		MONTHLY AVERAGE:	1.0	PPB

NITRIC OXIDE Hourly Averages (NO ppb)



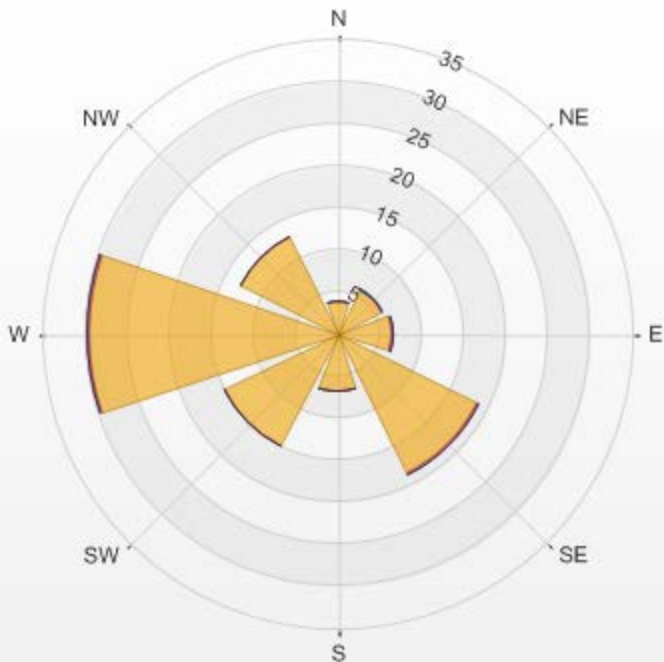
NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

Direction	0.0-16.3	16.3-32.7	32.7-49.0	>49.0	Total
N	3.96	0	0	0	3.96
NE	5.87	0	0.15	0	6.02
E	6.45	0.15	0	0	6.6
SE	18.62	0.15	0	0	18.77
S	6.89	0	0	0	6.89
SW	14.96	0	0	0	14.96
W	29.62	0.15	0	0	29.77
NW	13.05	0	0	0	13.05
Summary	99.42	0.45	0.15	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2016/09/01 00:00 - 2016/09/30 23:00 Calm: 0.00%



% Icon Classes (ppb)	99	0	0	0
0.0-16.3	16.3-32.7	32.7-49.0	>49.0	

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
1	S	2.4	1.5	1.4	1.6	2.2	3.1	3.0	1.7	2.5	1.4	1.4	1.8	2.9	2.1	1.8	2.9	1.9	1.5	1.6	1.8	1.7	2.0	S	1.4	3.1	2.0	24	
2	3.2	2.6	2.1	2.3	2.4	4.5	4.0	4.6	1.4	1.0	1.0	1.1	0.9	1.2	1.4	0.9	0.9	1.4	1.8	1.3	1.3	1.2	S	2.7	0.9	4.6	2.0	24	
3	2.6	1.7	1.7	1.7	2.0	1.7	1.1	1.3	1.1	0.9	0.8	0.7	0.6	0.8	0.7	0.7	0.8	1.0	1.2	1.4	1.6	S	3.1	2.0	0.6	3.1	1.4	24	
4	2.4	2.2	1.9	2.4	2.3	2.4	3.3	3.1	2.6	2.5	2.0	1.3	1.6	1.3	1.1	0.9	0.9	0.9	1.1	2.1	S	3.0	2.0	1.9	0.9	3.3	2.0	24	
5	1.8	1.6	1.3	1.1	2.0	1.9	1.7	2.2	1.5	1.3	1.3	1.0	1.1	1.1	1.3	1.1	1.0	1.1	1.5	S	3.6	2.6	1.7	1.4	1.0	3.6	1.6	24	
6	2.4	1.8	1.0	1.7	1.9	1.5	2.8	3.2	2.0	1.7	1.4	1.1	1.1	1.5	1.7	1.3	1.2	1.4	S	3.8	2.6	3.1	1.9	3.7	1.0	3.8	2.0	24	
7	6.4	7.2	8.2	5.9	5.0	3.9	3.5	3.0	4.5	3.6	1.6	2.0	1.4	1.8	1.4	1.4	1.6	S	4.5	3.2	3.1	2.0	2.9	1.8	1.4	8.2	3.5	24	
8	1.0	1.0	0.9	1.1	1.5	1.7	2.2	2.5	4.9	7.6	3.7	2.3	1.4	0.9	1.0	0.8	S	3.1	2.6	2.3	2.3	3.1	2.1	1.3	0.8	7.6	2.2	24	
9	2.0	1.8	2.6	3.4	3.0	3.5	4.0	4.4	2.7	3.7	2.1	1.1	0.9	1.1	0.6	S	1.5	0.9	1.6	4.2	5.3	3.4	1.4	0.8	0.6	5.3	2.4	24	
10	0.9	1.1	1.4	1.4	1.9	2.0	2.5	2.4	2.3	2.2	1.6	1.3	0.8	0.6	S	1.6	0.9	0.7	1.0	2.3	2.8	2.0	0.7	2.1	0.6	2.8	1.6	24	
11	1.4	1.9	1.7	1.4	0.8	0.8	1.1	0.6	0.9	0.9	1.2	1.7	1.4	S	1.4	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.7	1.6	0.5	1.9	1.0	24	
12	1.7	2.9	4.7	4.9	5.7	5.0	6.2	3.6	2.1	2.2	1.0	0.8	S	1.7	1.2	1.3	1.3	1.1	1.6	2.9	2.1	2.2	2.1	2.0	0.8	6.2	2.6	24	
13	2.5	2.3	2.2	3.1	3.4	3.9	3.7	C	C	C	C	C	C	C	C	3.0	2.8	1.6	1.3	1.4	2.0	2.0	2.2	2.9	3.3	1.3	3.9	2.6	24
14	2.3	1.7	2.5	4.1	4.3	4.0	4.0	5.4	8.3	4.7	S	3.2	2.5	1.6	1.6	1.0	1.4	0.9	1.4	3.9	3.4	3.4	2.6	2.1	0.9	8.3	3.1	24	
15	3.5	3.3	4.0	5.6	6.8	4.9	4.4	5.6	8.6	S	4.3	2.5	1.9	0.9	1.0	1.2	1.1	1.3	3.0	2.8	3.5	2.0	1.7	1.8	0.9	8.6	3.3	24	
16	2.0	2.0	2.2	2.7	3.5	4.8	5.8	5.7	S	3.6	2.8	2.3	2.1	1.8	1.6	1.4	1.2	1.2	2.0	2.6	2.3	1.7	2.1	2.8	1.2	5.8	2.6	24	
17	3.9	3.6	3.0	4.0	4.3	4.5	6.7	S	5.1	4.7	5.0	3.7	1.9	1.1	0.7	0.7	0.8	0.8	2.3	2.9	2.3	2.0	1.9	2.3	0.7	6.7	3.0	24	
18	2.6	1.7	6.2	4.7	2.8	2.2	S	3.6	2.6	2.3	1.9	1.5	1.5	0.9	0.7	0.7	0.6	0.6	0.9	0.7	0.7	2.1	3.0	3.3	0.6	6.2	2.1	24	
19	2.8	4.1	4.0	3.3	3.4	S	5.1	5.8	4.2	2.7	1.4	0.9	1.0	0.7	0.9	0.7	0.5	0.6	4.7	5.0	3.4	3.1	3.6	2.6	0.5	5.8	2.8	24	
20	2.3	3.0	4.9	4.8	S	3.9	4.2	6.9	7.4	4.2	3.5	2.5	2.1	1.5	1.6	1.8	1.5	2.2	5.3	4.3	5.0	2.9	3.5	3.9	1.5	7.4	3.6	24	
21	2.7	3.5	3.5	S	4.7	3.5	3.7	3.6	4.5	3.8	2.7	1.5	0.8	0.9	1.4	1.3	1.0	1.9	3.8	6.7	6.0	4.6	3.7	3.2	0.8	6.7	3.2	24	
22	2.5	3.2	S	5.8	5.4	5.4	5.5	12.2	11.0	3.2	2.0	1.7	0.9	0.9	0.9	0.9	1.4	1.2	4.5	4.1	3.5	3.2	2.4	2.5	0.9	12.2	3.7	24	
23	2.2	S	3.5	2.9	2.7	1.7	2.6	2.7	1.9	1.7	1.7	1.1	1.3	1.0	1.3	1.0	1.1	0.9	1.0	1.0	1.2	1.0	1.1	1.0	0.9	3.5	1.6	24	
24	S	1.9	1.3	2.0	1.8	3.7	4.3	4.9	2.7	1.6	1.0	2.4	0.7	0.6	0.5	0.4	0.5	0.5	0.7	4.0	4.2	2.4	4.9	S	0.4	4.9	2.1	24	
25	9.0	8.3	6.2	5.4	5.1	5.6	6.5	4.4	3.7	2.9	2.6	2.2	0.8	0.5	0.5	0.5	0.5	0.7	2.7	2.4	1.8	1.9	S	6.0	0.5	9.0	3.5	24	
26	5.6	5.8	6.6	4.6	6.3	7.3	7.6	7.5	7.2	5.2	3.7	2.6	1.9	1.9	2.0	1.5	1.2	1.2	2.5	1.6	1.2	S	2.4	2.1	1.2	7.6	3.9	24	
27	2.3	2.0	2.1	2.1	2.4	2.6	8.0	7.6	7.0	2.8	1.2	1.1	1.4	2.8	2.2	0.6	0.6	0.7	4.0	4.3	S	3.1	2.1	3.5	0.6	8.0	2.9	24	
28	3.6	4.4	4.8	5.1	5.2	7.4	11.2	10.7	7.0	5.1	3.7	1.3	1.7	1.2	1.3	1.3	1.6	2.4	5.6	S	15.1	11.8	3.6	5.9	1.2	15.1	5.3	24	
29	6.4	6.4	5.3	5.7	6.7	4.2	5.9	5.4	9.4	5.3	1.8	1.2	1.6	1.1	1.5	1.1	1.8	5.8	S	16.4	13.8	13.1	12.5	11.8	1.1	16.4	6.3	24	
30	6.7	4.5	2.7	2.5	2.1	3.3	1.8	2.0	1.2	2.0	1.6	0.8	0.7	0.9	0.7	0.9	1.0	S	1.5	1.3	1.1	0.9	1.0	0.7	0.7	6.7	1.8	24	
HOURLY MAX	9.0	8.3	8.2	5.9	6.8	7.4	11.2	12.2	11.0	7.6	5.0	3.7	2.5	2.9	3.0	2.8	2.9	5.8	5.6	16.4	15.1	13.1	12.5	11.8					
HOURLY AVG	3.2	3.1	3.2	3.3	3.5	3.6	4.4	4.6	4.3	3.1	2.1	1.7	1.4	1.3	1.3	1.1	1.1	1.4	2.4	3.3	3.5	3.1	2.7	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

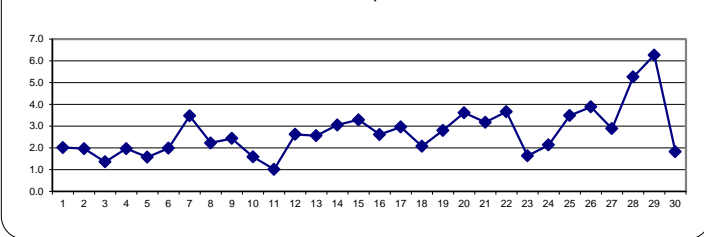
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

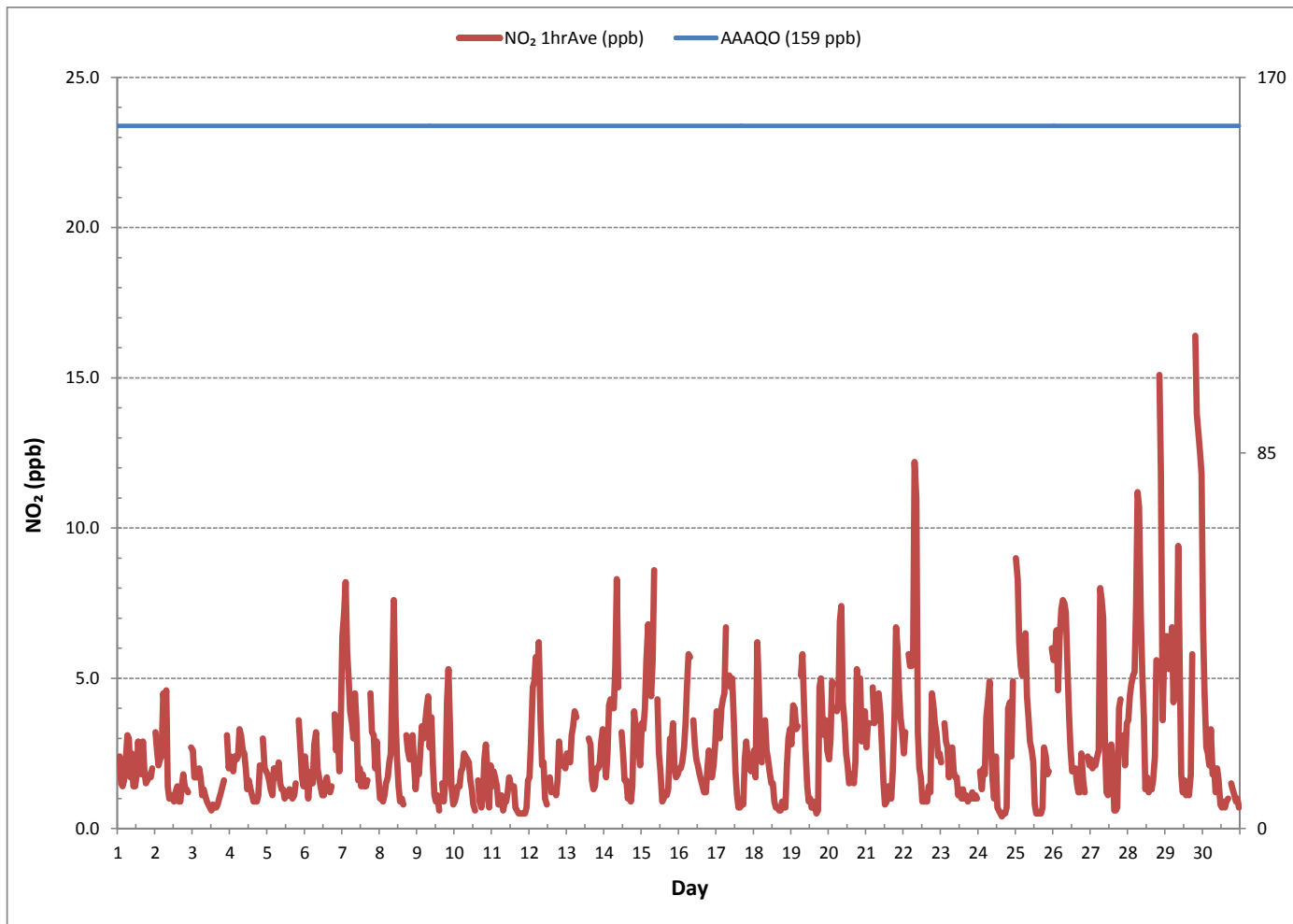
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	682					
MINIMUM 1-HR AVERAGE:	0.4	PPB	@ HOUR(S)	15	ON DAY(S)	24
MAXIMUM 1-HR AVERAGE:	16.4	PPB	@ HOUR(S)	19	ON DAY(S)	29
MAXIMUM 24-HR AVERAGE:	6.3	PPB			ON DAY(S)	29
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	2.13		MONTHLY AVERAGE:	2.7	PPB	

24 HOUR AVERAGES FOR September 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.
DAY	1	S	3.9	1.7	1.5	2.9	3.1	5.2	4.9	3.1	4.0	1.9	2.2	12.5	14.1	10.7	2.7	4.1	3.5	1.6	1.9	2.0	1.8	2.3	S	1.5	14.1	4.2	24
2	5.0	2.9	2.3	2.9	3.3	6.0	5.0	5.5	4.9	2.4	1.2	1.4	1.1	4.0	2.4	2.0	1.1	2.2	3.1	2.0	1.9	1.5	S	4.3	1.1	6.0	3.0	24	
3	3.5	1.8	1.8	2.0	2.2	1.9	1.4	2.0	1.5	1.1	1.0	1.6	0.9	1.0	1.0	0.9	1.0	1.4	1.4	1.5	2.0	S	3.6	3.2	0.9	3.6	1.7	24	
4	2.9	3.3	2.4	3.2	2.8	3.9	4.1	3.5	2.8	2.8	2.3	1.4	1.8	1.6	1.8	1.1	1.1	1.1	1.4	5.3	S	4.3	2.3	2.3	1.1	5.3	2.6	24	
5	2.2	2.3	1.4	1.2	2.8	2.9	5.2	3.2	1.5	1.5	1.5	1.2	1.2	1.5	2.4	1.6	1.1	2.4	2.4	S	4.6	3.6	2.2	1.6	1.1	5.2	2.2	24	
6	5.1	2.7	1.4	3.2	3.8	2.0	5.9	5.5	4.5	4.7	1.9	3.2	1.6	2.8	2.2	1.8	1.6	2.3	S	5.9	3.2	3.8	2.8	5.3	1.4	5.9	3.4	24	
7	7.2	7.7	9.0	7.1	6.8	4.8	3.9	4.3	6.0	6.5	1.7	2.5	1.8	2.4	2.9	2.2	3.9	S	6.1	4.1	5.1	2.7	5.1	2.4	1.7	9.0	4.6	24	
8	1.2	1.2	1.1	1.4	2.0	2.7	2.8	3.6	6.0	9.6	6.9	4.5	2.3	1.2	2.5	1.2	S	4.5	3.2	3.3	2.7	3.9	2.8	1.6	1.1	9.6	3.1	24	
9	3.9	3.5	3.8	4.9	3.9	7.2	4.7	8.2	3.9	4.4	3.8	1.9	1.6	7.0	1.0	S	3.0	0.9	3.1	6.7	8.9	5.9	2.9	1.0	0.9	8.9	4.2	24	
10	1.0	1.2	1.7	1.5	2.5	2.7	2.8	2.5	2.7	3.5	1.8	1.8	1.1	0.7	S	2.9	1.0	0.9	1.9	2.4	3.3	2.6	0.8	3.6	0.7	3.6	2.0	24	
11	1.7	2.4	2.0	1.9	1.1	1.0	1.1	1.1	1.1	1.2	1.5	1.9	2.2	S	2.9	0.9	2.3	0.6	0.6	0.7	1.0	0.7	0.7	1.8	0.6	2.9	1.4	24	
12	1.9	4.3	5.1	5.9	6.1	7.2	7.4	6.0	3.6	2.7	1.4	1.2	S	2.7	1.4	1.5	3.9	1.1	3.6	7.1	4.5	2.8	2.5	2.2	1.1	7.4	3.7	24	
13	3.1	2.9	2.8	3.9	3.9	4.4	4.4	C	C	C	C	C	C	C	3.5	3.8	3.2	2.0	1.8	2.2	4.3	4.7	4.9	3.6	1.8	4.9	3.5	24	
14	3.1	2.0	4.0	6.1	6.4	6.4	5.6	7.8	10.7	6.8	S	4.9	7.6	2.4	2.9	1.8	2.2	1.1	4.2	12.0	4.9	4.9	3.1	2.7	1.1	12.0	4.9	24	
15	4.8	4.4	4.5	8.5	11.7	6.5	5.5	9.4	11.0	S	10.1	3.3	4.5	1.1	1.5	2.5	3.7	1.7	5.7	4.1	4.4	2.5	1.8	2.1	1.1	11.7	5.0	24	
16	2.0	2.2	2.4	2.8	4.6	15.2	10.6	10.9	S	4.9	3.1	4.9	5.1	5.2	2.4	2.0	1.9	1.8	5.7	3.2	3.3	1.9	2.7	3.3	1.8	15.2	4.4	24	
17	5.9	4.1	3.6	4.6	6.3	5.7	12.5	S	6.7	8.4	8.0	5.5	3.3	1.6	0.9	1.0	2.0	1.0	5.1	5.3	3.3	2.4	2.3	3.8	0.9	12.5	4.5	24	
18	3.6	4.1	6.8	5.9	3.3	2.8	S	5.6	3.1	2.7	2.3	1.6	1.6	1.2	0.7	1.0	0.7	0.6	2.5	0.9	1.1	2.6	4.6	4.7	0.6	6.8	2.8	24	
19	3.9	5.1	4.8	3.9	4.0	S	6.7	8.1	6.0	4.0	1.5	2.0	1.8	1.5	1.9	1.1	0.6	1.0	8.4	7.5	5.6	4.1	5.2	3.6	0.6	8.4	4.0	24	
20	2.7	4.8	6.2	6.6	S	5.9	6.6	8.5	8.2	7.8	4.5	4.4	4.0	2.0	2.2	1.8	2.5	10.5	6.8	7.7	4.5	6.9	5.3	1.8	10.5	5.3	24		
21	4.4	4.7	4.8	S	6.4	4.4	6.0	5.9	5.5	5.3	4.1	2.7	1.6	1.4	7.4	2.3	1.5	2.4	8.9	16.1	16.5	6.9	4.9	5.5	1.4	16.5	5.6	24	
22	3.5	4.7	S	7.3	9.4	8.5	6.5	28.1	20.5	4.8	2.9	8.7	1.8	2.3	1.2	1.1	14.6	2.2	9.0	15.7	6.9	4.8	3.2	2.8	1.1	28.1	7.4	24	
23	2.7	S	4.9	3.9	7.7	2.2	4.4	4.4	2.9	2.4	4.0	1.6	1.9	1.4	6.9	2.4	7.2	1.4	1.5	1.4	1.8	1.4	1.7	1.4	1.4	7.7	3.1	24	
24	S	3.2	1.5	3.1	3.3	5.2	5.5	5.9	3.6	1.9	3.7	15.0	1.0	1.1	0.7	0.5	0.5	0.6	1.2	7.1	7.3	3.5	5.7	S	0.5	15.0	3.7	24	
25	11.2	11.2	8.6	5.7	5.7	6.5	8.0	5.5	4.8	3.1	3.5	13.3	2.2	0.9	0.6	0.8	1.0	1.0	18.2	4.5	2.2	2.7	S	8.0	0.6	18.2	5.6	24	
26	8.4	9.8	10.0	9.7	11.5	8.5	10.0	11.3	10.1	6.0	4.4	10.5	2.2	2.2	9.7	10.9	2.5	3.5	4.9	2.7	2.3	S	3.3	2.2	2.2	11.5	6.8	24	
27	2.4	2.2	2.2	2.2	9.2	3.6	16.1	16.2	17.0	4.3	1.5	1.4	4.4	5.3	3.8	0.9	0.9	1.2	6.6	7.1	S	5.7	3.2	4.9	0.9	17.0	5.3	24	
28	4.8	6.4	6.1	9.2	11.0	10.9	14.2	14.8	9.4	8.2	5.3	2.5	8.2	2.5	2.9	2.3	4.9	4.3	11.4	S	16.9	15.2	6.1	12.1	2.3	16.9	8.2	24	
29	9.9	13.5	8.6	8.2	15.7	8.5	7.4	6.6	20.5	12.9	3.5	2.2	5.9	6.4	5.9	1.6	11.1	16.6	S	19.2	17.2	15.4	15.0	13.5	1.6	20.5	10.7	24	
30	10.5	6.6	5.3	5.3	4.4	5.6	2.4	6.7	2.2	4.0	3.9	1.2	1.0	1.5	1.6	1.4	3.1	S	2.4	5.1	1.4	1.4	1.9	1.2	1.0	10.5	3.5	24	
HOURLY MAX	11.2	13.5	10.0	9.7	15.7	15.2	16.1	28.1	20.5	12.9	10.1	15.0	12.5	14.1	10.7	10.9	14.6	16.6	18.2	19.2	17.2	15.4	15.0	13.5					
HOURLY AVG	4.4	4.5	4.2	4.6	5.7	5.4	6.3	7.4	6.6	4.7	3.3	3.8	3.1	2.8	3.0	2.0	3.0	2.4	4.9	5.8	5.2	4.2	3.7	3.9					

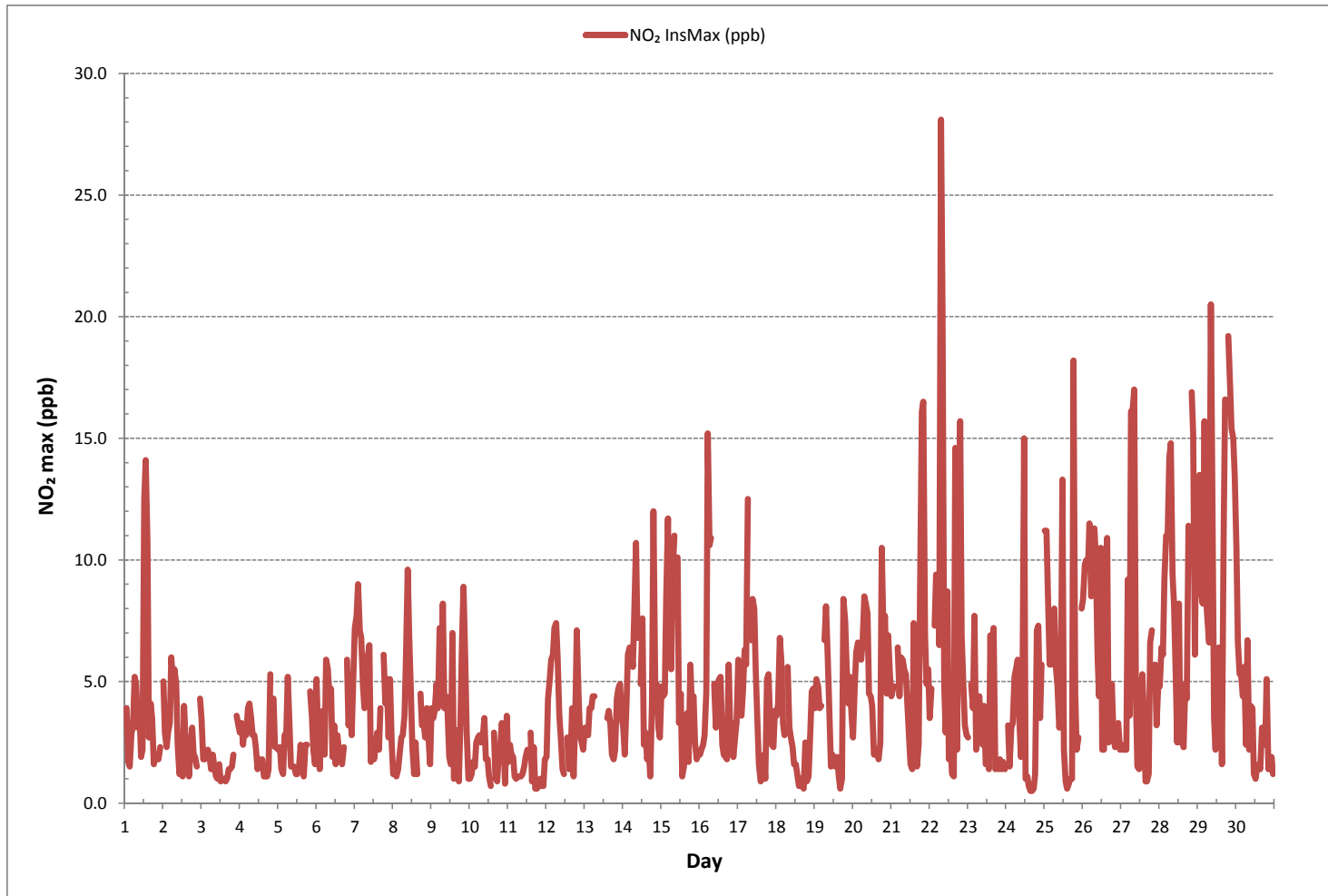
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	28.1 PPB @ HOUR(S) 7 ON DAY(S) 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	3.59
OPERATIONAL TIME:	720 HRS

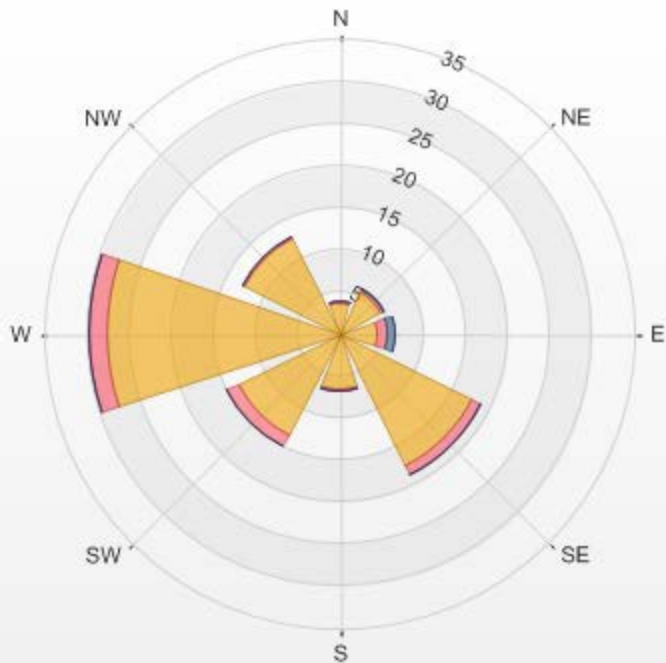
NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

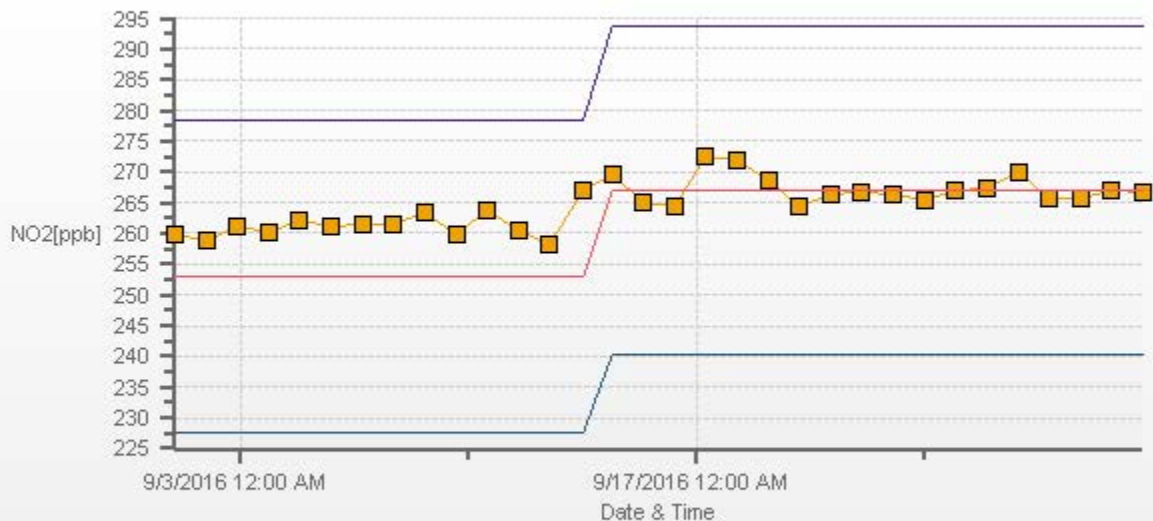
Direction	0.0-5.7	5.7-11.3	11.3-17.0	>17.0	Total
N	3.67	0.29	0	0	3.96
NE	5.57	0.29	0.15	0	6.01
E	4.4	1.32	0.88	0	6.6
SE	17.6	1.03	0.15	0	18.78
S	6.74	0.15	0	0	6.89
SW	13.49	1.47	0	0	14.96
W	27.57	2.2	0	0	29.77
NW	12.76	0.29	0	0	13.05
Summary	91.8	7.04	1.18	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2016/09/01 00:00 - 2016/09/30 23:00
 Calm: 0.00%



%	Icon	Classes (ppb)	Count	Icon	Classes (ppb)	Count	Icon	Classes (ppb)	Count	Icon	Classes (ppb)
92		0.0-5.7	7		5.7-11.3	1		11.3-17.0	0		>17.0

NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 Type: Span



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

OZONE

OZONE Hourly Averages (O₃ ppb)

MST

HOUR START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY 1	S	18.2	17.3	16.3	14.6	12.6	11.2	11.5	12.3	13.1	17.2	20.5	20.6	19.9	23.5	35.6	48.5	38.9	26.2	21.4	18.5	16.4	13.3	S	11.2	48.5	20.3	24	
2	7.9	6.3	2.2	0.9	0.5	1.0	1.4	3.9	16.8	17.0	16.5	17.3	18.9	18.6	19.2	20.5	19.0	17.3	15.1	13.8	13.3	12.5	S	17.5	0.5	20.5	12.1	24	
3	11.1	5.9	10.1	13.8	11.8	11.4	9.7	8.5	8.5	9.5	8.9	8.1	11.4	13.4	11.2	8.5	8.1	9.9	10.5	10.4	9.6	S	11.4	13.6	5.9	13.8	10.2	24	
4	13.1	12.8	13.1	13.4	14.7	13.4	10.5	10.6	12.0	13.2	15.8	20.8	20.6	21.5	23.3	24.3	24.0	22.1	20.7	9.9	S	2.6	1.0	1.0	1.0	24.3	14.5	24	
5	1.2	0.7	0.5	0.4	0.2	0.0	0.4	4.5	14.0	19.7	21.5	23.5	24.6	25.8	26.1	25.9	26.0	24.9	20.7	S	15.1	14.1	14.2	17.3	0.0	26.1	14.0	24	
6	15.6	11.8	18.2	18.5	16.7	13.0	9.6	12.0	14.6	12.8	11.9	13.0	12.9	13.7	14.7	14.5	15.9	16.8	S	1.7	0.5	0.6	0.4	1.3	0.4	18.5	11.3	24	
7	0.7	0.8	1.0	3.0	3.8	4.6	4.8	5.7	5.4	8.2	14.2	22.2	24.6	25.4	23.5	26.6	26.5	S	23.4	13.3	9.0	5.5	2.3	1.7	0.7	26.6	11.1	24	
8	0.7	0.4	0.2	0.3	0.0	0.0	0.7	2.5	5.9	10.6	20.8	23.8	25.3	23.9	26.3	28.3	S	22.1	22.0	20.7	17.4	14.8	14.6	12.4	0.0	28.3	12.8	24	
9	5.8	12.5	8.3	6.3	1.8	2.0	3.8	5.8	8.8	10.9	14.4	18.1	19.5	19.5	19.7	S	20.0	20.7	14.3	6.2	4.0	5.5	13.3	14.9	1.8	20.7	11.1	24	
10	16.1	15.3	12.7	13.5	10.6	11.3	12.7	12.8	14.0	15.1	19.3	24.9	29.9	31.4	S	32.4	34.1	32.9	30.8	27.4	23.2	22.3	22.1	17.2	10.6	34.1	21.0	24	
11	12.4	12.7	11.4	11.6	12.9	12.4	11.9	13.5	15.1	16.0	14.6	14.3	14.9	S	20.3	21.6	22.5	23.6	23.6	22.8	22.3	23.0	19.7	14.5	11.4	23.6	16.9	24	
12	11.6	8.1	5.7	6.1	5.6	4.2	4.2	9.7	14.2	C	C	C	C	26.6	26.6	28.8	30.9	29.9	22.4	12.2	10.6	12.7	13.6	14.0	4.2	30.9	14.9	24	
13	13.1	10.1	12.2	10.5	10.6	9.9	9.3	10.4	12.1	14.7	17.1	S	26.1	29.1	27.4	28.7	31.3	30.3	30.8	28.0	28.8	20.2	13.7	9.3	9.3	31.3	18.9	24	
14	8.3	8.3	6.5	4.9	3.7	2.5	1.6	7.7	11.5	14.9	S	19.8	21.5	22.8	24.2	24.9	25.9	24.7	21.1	12.3	8.1	5.0	3.7	2.8	1.6	25.9	12.5	24	
15	1.8	0.6	0.7	1.0	0.6	0.0	0.1	2.1	10.8	S	22.2	26.7	30.6	31.9	33.2	32.3	30.0	29.0	24.0	24.2	24.4	23.2	27.3	28.3	27.5	0.0	33.2	17.8	24
16	26.5	26.1	21.8	22.0	18.9	16.3	11.2	14.0	S	23.6	26.8	30.4	34.5	38.1	39.8	39.5	38.9	38.0	34.6	32.5	31.6	30.9	28.6	24.1	11.2	39.8	28.2	24	
17	13.1	13.4	12.2	11.6	9.6	15.7	15.4	S	13.5	14.5	15.0	16.4	21.8	23.2	24.3	25.4	25.6	25.3	17.4	9.8	7.3	4.8	2.4	1.5	1.5	25.6	14.7	24	
18	0.6	0.8	7.4	12.2	16.8	17.7	S	18.3	18.2	17.6	17.2	17.6	17.2	21.7	22.3	23.3	25.4	26.4	27.9	27.4	26.4	22.3	19.8	18.5	0.6	27.9	18.4	24	
19	19.1	16.7	17.0	17.1	15.6	S	11.9	10.4	12.1	14.3	16.9	19.7	20.6	22.1	20.9	24.7	25.9	25.0	15.1	9.2	5.5	3.5	1.5	1.5	1.5	25.9	15.1	24	
20	1.4	2.6	3.4	3.7	S	0.6	0.2	2.8	5.5	10.5	14.0	15.8	15.1	15.8	16.8	17.9	20.6	21.5	12.9	9.1	4.9	4.5	1.9	2.0	0.2	21.5	8.8	24	
21	1.8	0.6	0.4	S	0.0	0.0	0.0	1.7	9.0	11.7	18.1	23.7	27.8	29.1	30.7	31.1	30.9	27.9	19.9	11.9	9.5	8.1	7.9	5.9	0.0	31.1	13.4	24	
22	5.2	2.0	S	0.3	0.1	0.1	0.4	1.3	12.2	22.2	24.7	29.3	34.0	35.2	35.8	36.8	36.2	35.1	26.9	26.4	25.5	23.8	26.7	24.9	0.1	36.8	20.2	24	
23	22.6	S	16.3	19.5	21.2	22.4	21.6	21.7	22.8	22.5	22.0	22.3	23.9	26.8	26.4	25.9	25.1	23.6	21.7	20.3	19.6	17.9	15.5	13.7	13.7	26.8	21.5	24	
24	S	10.7	8.3	6.7	6.2	3.6	3.6	6.1	10.7	17.4	24.0	24.2	29.4	31.0	30.8	31.8	31.5	31.8	30.3	24.7	20.2	12.5	18.3	S	3.6	31.8	18.8	24	
25	16.9	16.1	16.8	16.4	15.7	15.6	14.7	17.2	19.9	22.0	23.6	26.2	31.1	31.9	31.8	32.5	32.4	31.5	24.6	18.2	14.8	11.9	S	5.6	5.6	32.5	21.2	24	
26	5.2	5.2	2.3	4.3	2.1	0.5	0.4	2.3	13.6	20.0	25.0	31.6	34.1	34.9	35.9	37.7	38.3	36.0	33.0	34.0	34.8	S	32.1	30.0	0.4	38.3	21.4	24	
27	27.9	27.6	27.0	26.3	25.1	23.7	11.9	9.9	16.8	24.2	29.4	32.5	34.4	29.5	31.2	32.0	31.8	31.8	26.3	24.9	S	26.1	26.6	18.1	9.9	34.4	25.9	24	
28	12.0	7.9	5.3	5.0	5.8	2.6	0.7	1.8	15.3	19.4	23.9	28.1	28.6	29.2	29.1	29.7	29.2	27.0	18.7	S	2.7	5.0	17.2	8.4	0.7	29.7	15.3	24	
29	6.1	3.6	3.1	2.6	0.8	1.4	0.4	1.6	5.0	20.0	28.0	31.9	32.0	34.3	35.6	36.8	35.6	35.6	S	5.2	7.2	4.3	2.2	3.1	0.4	36.8	14.3	24	
30	15.3	12.4	6.7	4.8	11.5	14.4	15.5	15.0	16.5	17.9	19.2	20.3	20.6	22.3	26.0	29.8	30.3	S	30.5	31.5	32.3	32.5	30.6	28.6	4.8	32.5	21.1	24	
HOURLY MAX	27.9	27.6	27.0	26.3	25.1	23.7	21.6	21.7	22.8	24.2	29.4	32.5	34.5	38.1	39.8	39.5	48.5	38.9	34.6	34.0	34.8	32.5	32.1	30.0					
HOURLY AVG	10.5	9.3	9.2	9.4	8.9	8.0	6.9	8.5	12.7	16.2	19.4	22.3	24.4	25.8	26.1	27.9	28.3	26.9	23.1	18.2	15.9	14.0	14.4	12.5					

STATUS FLAG CODES

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

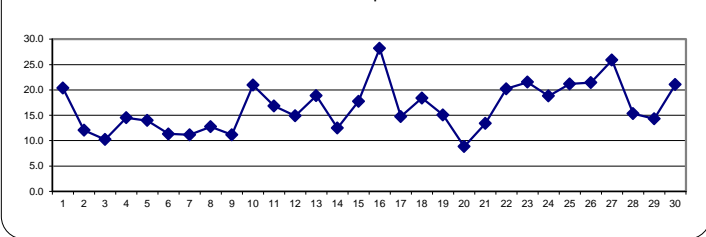
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

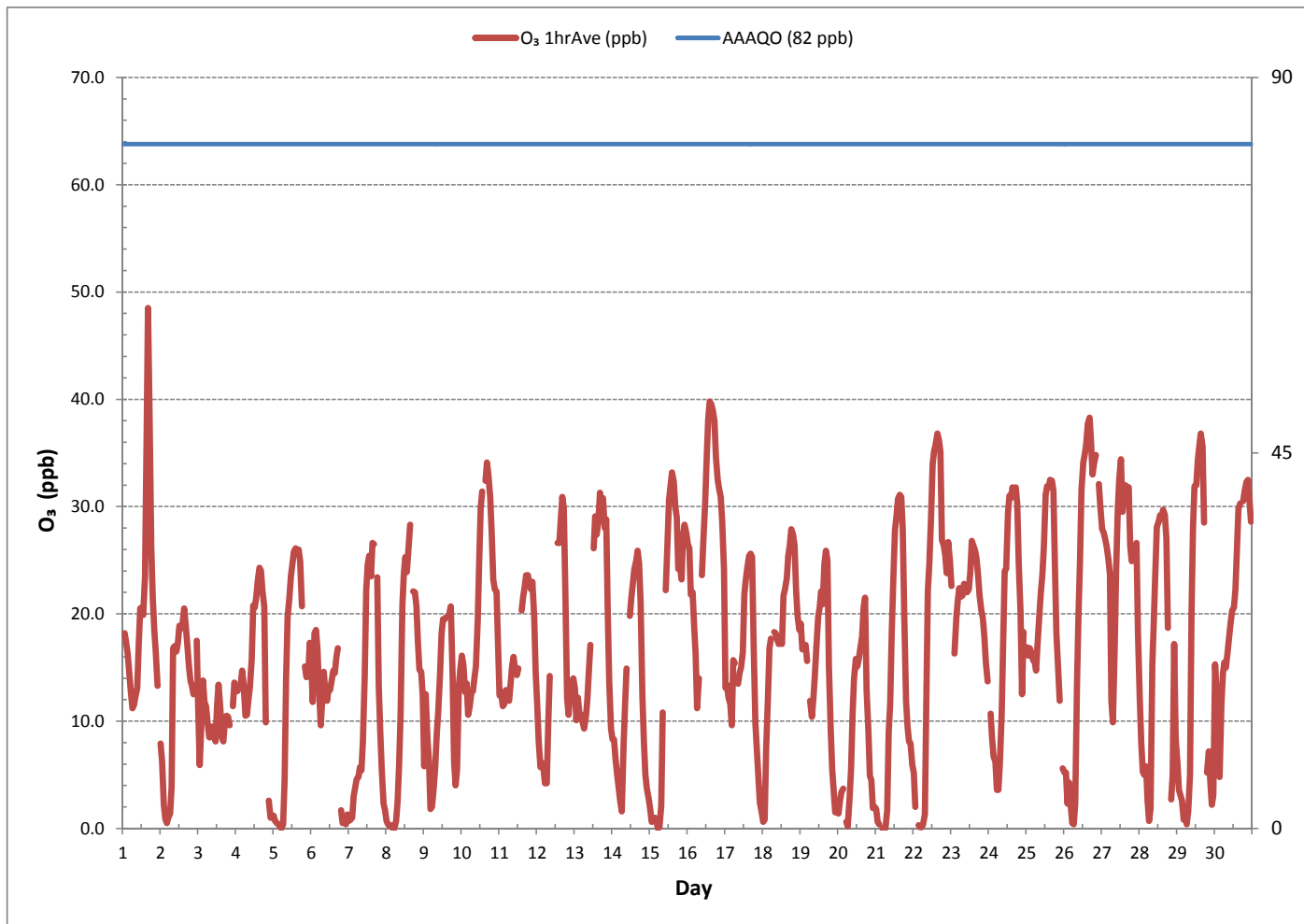
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	678					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	48.5	PPB	@ HOUR(S)	16	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	28.2	PPB			ON DAY(S)	16
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	10.13		MONTHLY AVERAGE:	16.6	PPB	

24 HOUR AVERAGES FOR September 2016



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

OZONE Instantaneous Maximum (O₃ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.
DAY	1	S	19.0	17.8	17.2	15.4	13.8	12.5	13.6	12.9	15.0	20.0	22.1	22.2	22.5	28.6	52.9	54.6	43.9	31.4	23.3	19.6	18.0	16.6	S	12.5	54.6	23.3	24
2	10.2	9.6	3.9	1.6	1.2	1.8	3.7	5.8	18.6	18.1	18.0	19.2	20.2	19.8	20.1	21.3	20.9	18.6	16.5	14.7	15.7	13.6	S	25.9	1.2	25.9	13.9	24	
3	24.9	6.7	14.5	15.1	12.5	12.2	10.8	9.4	9.1	10.1	9.4	8.5	13.1	14.2	13.6	10.4	10.1	12.2	11.7	11.0	10.2	S	13.1	16.0	6.7	24.9	12.1	24	
4	14.1	14.4	14.7	15.3	16.0	15.1	11.6	12.5	12.6	14.8	19.0	23.6	21.6	23.0	24.8	25.7	25.9	23.9	21.9	18.4	S	4.0	2.1	1.8	1.8	25.9	16.4	24	
5	2.1	1.5	0.9	0.7	0.6	0.2	0.9	8.2	19.0	21.6	23.7	24.5	26.0	27.2	27.0	26.8	26.8	26.0	24.1	S	18.6	16.6	15.7	18.1	0.2	27.2	15.5	24	
6	17.8	16.0	20.4	19.7	19.3	14.8	11.7	15.3	15.7	14.4	13.3	13.6	13.9	15.1	16.2	15.4	18.7	18.0	S	3.7	2.1	1.3	1.3	2.3	1.3	20.4	13.0	24	
7	1.3	1.2	1.5	4.9	5.2	6.0	6.1	6.8	6.6	10.8	17.8	24.1	27.2	27.8	25.9	29.2	28.0	S	27.7	19.8	14.7	11.3	5.2	2.6	1.2	29.2	13.6	24	
8	1.7	1.8	0.5	1.0	0.3	0.3	1.5	4.5	8.8	16.7	23.0	25.3	27.1	30.1	29.8	32.6	S	24.4	23.4	24.4	20.2	16.0	15.6	15.4	0.3	32.6	15.0	24	
9	10.4	14.7	10.4	9.1	4.7	3.7	4.9	9.0	10.1	13.1	16.9	19.3	20.3	20.8	20.9	S	21.1	22.1	20.4	9.3	6.0	9.8	15.4	15.4	3.7	22.1	13.4	24	
10	16.8	16.2	14.2	14.5	12.6	13.2	13.8	13.5	15.4	18.3	22.5	28.6	32.0	32.2	S	33.4	35.4	34.3	32.3	29.3	25.9	23.7	23.3	20.4	12.6	35.4	22.7	24	
11	16.2	14.1	12.0	12.5	13.3	13.3	12.3	14.7	16.7	16.9	15.4	15.3	17.8	S	22.8	23.0	23.6	24.8	24.4	23.6	24.9	27.5	22.4	17.1	12.0	27.5	18.5	24	
12	13.3	10.5	6.7	7.0	6.7	7.4	6.4	10.8	C	C	C	C	C	28.0	27.8	30.5	31.9	31.9	28.6	19.4	16.5	17.7	15.4	15.1	6.4	31.9	17.5	24	
13	14.5	13.1	13.6	13.1	11.6	10.8	10.4	X	14.1	15.4	20.0	S	29.0	30.3	30.5	32.4	32.6	30.9	31.9	30.5	30.3	25.3	17.2	17.1	10.4	32.6	21.6	23	
14	10.4	12.6	9.3	6.9	6.3	4.2	3.7	13.2	13.2	18.3	S	20.9	22.8	24.1	25.3	26.0	26.6	26.3	23.4	16.0	13.1	7.1	5.5	4.3	3.7	26.6	14.8	24	
15	3.6	1.3	1.5	2.1	1.7	0.2	0.8	7.7	18.1	S	26.2	28.4	32.3	33.4	34.5	34.5	31.4	30.5	28.6	27.8	26.6	28.7	29.0	28.3	0.2	34.5	19.9	24	
16	27.5	26.8	25.8	23.7	20.6	19.2	16.8	18.7	S	25.3	28.6	32.4	37.1	39.8	40.9	40.3	40.0	39.2	37.2	34.3	32.4	32.0	30.2	27.8	16.8	40.9	30.3	24	
17	19.7	15.7	14.2	14.8	12.0	19.0	20.4	S	16.0	16.2	16.6	20.4	23.7	24.5	25.6	26.3	26.8	26.2	25.1	13.3	10.8	8.4	4.5	2.9	2.9	26.8	17.5	24	
18	1.7	4.6	9.6	14.5	18.1	19.5	S	19.9	20.6	18.6	18.1	18.9	20.0	23.7	23.6	24.5	27.2	27.5	29.0	29.5	28.9	23.9	23.0	19.5	1.7	29.5	20.2	24	
19	20.4	17.8	18.1	18.1	16.5	S	13.8	12.2	14.5	16.3	18.6	21.0	22.7	23.3	22.8	26.8	26.8	25.9	23.1	11.6	7.4	5.3	3.7	2.9	2.9	26.8	16.9	24	
20	2.8	4.2	4.9	5.3	S	1.5	1.3	6.3	6.6	15.0	15.0	18.6	16.7	16.9	17.8	19.2	21.9	22.7	20.6	12.2	8.3	8.2	4.3	2.9	1.3	22.7	11.0	24	
21	3.2	1.3	0.9	S	0.2	0.4	0.5	4.9	13.6	14.5	21.8	27.5	29.3	30.3	31.9	32.2	31.7	30.6	27.2	16.5	15.1	12.3	13.6	10.1	0.2	32.2	16.1	24	
22	8.6	3.7	S	1.2	0.5	0.4	0.8	2.3	20.9	24.5	26.6	33.9	34.8	36.5	36.6	37.4	37.4	36.3	32.8	30.5	29.9	27.2	27.7	26.2	0.4	37.4	22.5	24	
23	23.4	S	19.3	22.2	23.0	23.3	23.1	23.5	23.6	23.4	22.7	23.1	26.9	27.5	27.4	26.6	26.2	24.2	22.7	20.8	20.6	19.2	16.8	14.5	14.5	27.5	22.8	24	
24	S	11.7	9.8	7.6	7.0	5.1	4.6	7.7	13.9	22.4	25.6	26.3	31.4	31.9	31.7	32.5	32.4	32.5	31.6	29.0	23.0	16.3	20.0	S	4.6	32.5	20.6	24	
25	19.0	17.4	18.0	18.0	16.7	16.7	15.9	18.3	21.8	23.4	24.5	29.3	32.4	32.5	32.3	33.1	33.3	32.5	30.6	22.7	18.0	14.8	S	7.6	7.6	33.3	23.0	24	
26	10.8	11.1	3.9	7.3	4.5	1.2	0.8	4.2	17.5	22.4	29.5	33.6	35.1	36.5	38.0	39.1	39.1	37.7	34.3	35.1	35.2	S	33.0	31.4	0.8	39.1	23.5	24	
27	28.4	28.0	27.5	26.8	26.5	25.0	22.1	12.6	19.5	29.8	30.9	36.5	38.1	32.2	32.5	32.8	32.5	32.4	30.9	26.5	S	27.5	28.0	26.5	12.6	38.1	28.4	24	
28	14.8	10.7	8.0	7.0	11.7	4.9	1.5	3.7	20.6	22.2	26.6	29.3	29.9	30.5	30.9	30.8	29.2	26.0	S	5.6	18.4	20.7	19.0	1.5	30.9	18.8	24		
29	9.4	9.1	5.6	5.0	1.6	2.4	0.9	3.9	9.6	27.1	31.9	34.2	33.1	36.2	36.9	37.8	37.3	34.8	S	14.1	11.1	7.6	4.6	10.8	0.9	37.8	17.6	24	
30	20.8	19.9	13.3	8.4	18.3	16.8	16.6	16.5	18.1	19.0	20.6	20.8	21.2	24.2	29.8	30.6	30.8	S	31.4	32.4	33.3	33.3	32.1	29.2	8.4	33.3	23.4	24	
HOURLY MAX	28.4	28.0	27.5	26.8	26.5	25.0	23.1	23.5	23.6	29.8	31.9	36.5	38.1	39.8	40.9	52.9	54.6	43.9	37.2	35.1	35.2	33.3	33.0	31.4					
HOURLY AVG	13.1	11.5	11.1	11.1	10.5	9.4	8.6	10.7	15.3	18.7	21.5	24.3	26.1	27.4	27.8	29.8	29.7	28.6	26.7	21.4	18.7	17.0	16.4	15.4					

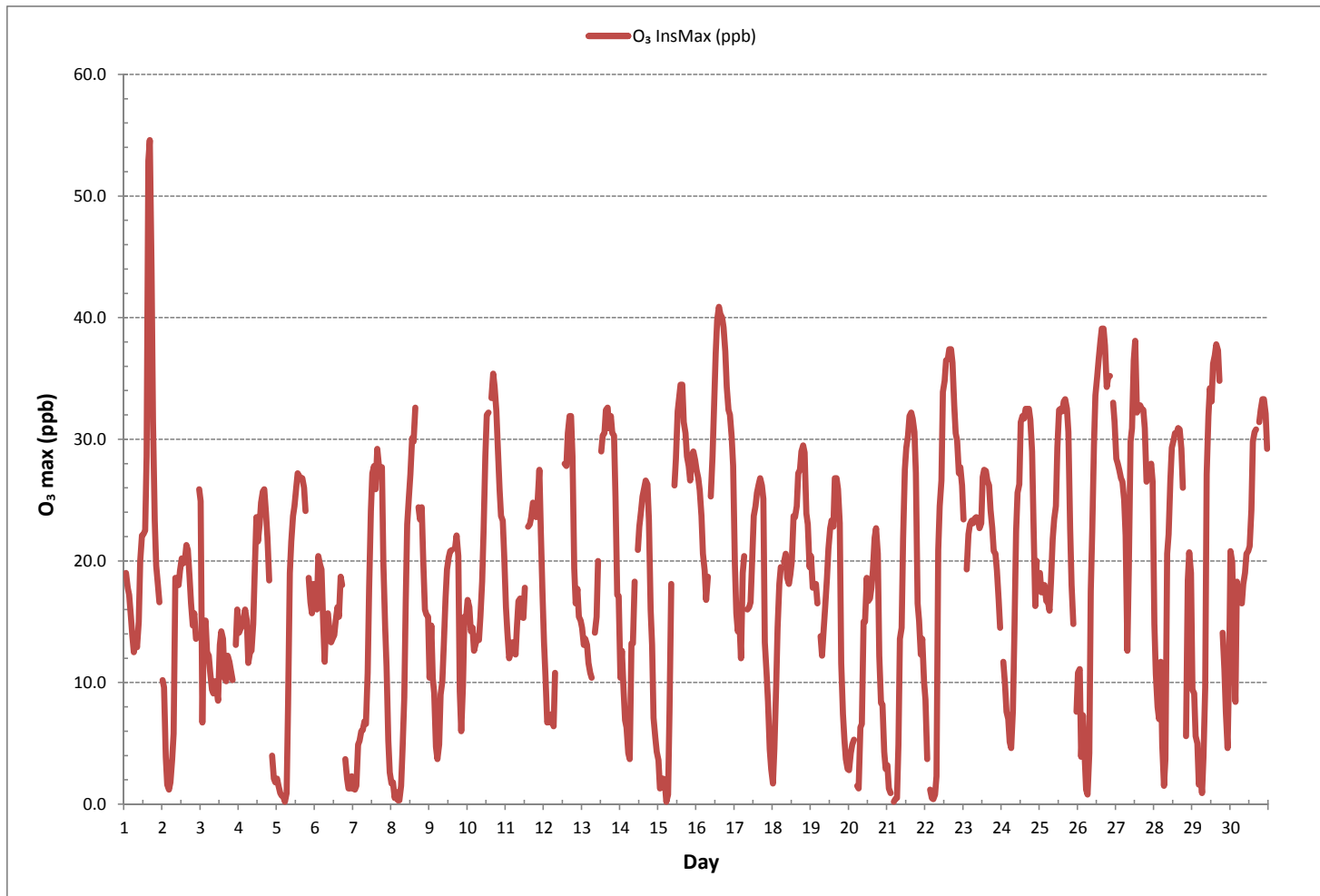
STATUS FLAG CODES

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:	683
MAXIMUM INSTANTANEOUS VALUE:	54.6 PPB @ HOUR(S) 16 ON DAY(S) 1
VAR-VARIOUS	
I2S CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	10.20
OPERATIONAL TIME:	719 HRS

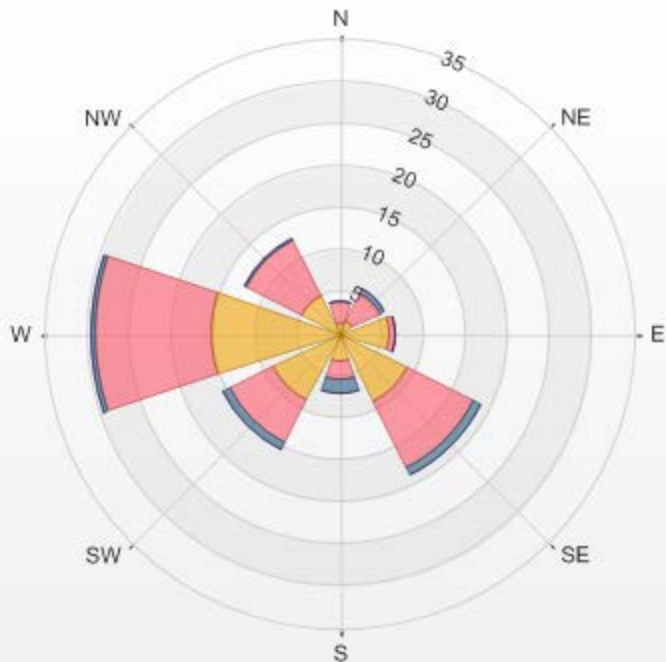
OZONE Instantaneous Maximum (O₃ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

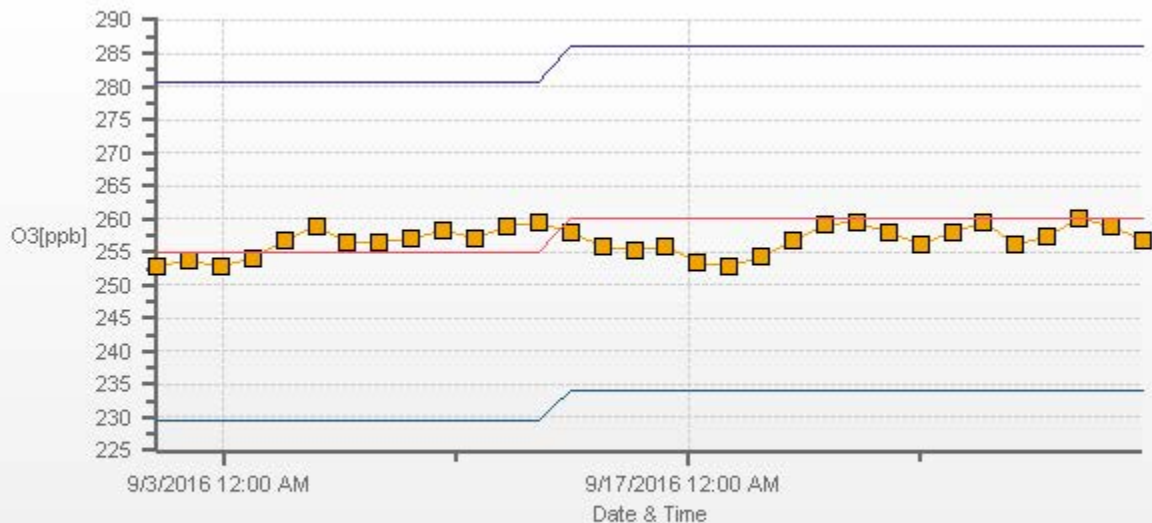
Direction	0.0-16.3	16.3-32.7	32.7-49.0	>49.0	Total
N	1.32	2.64	0	0	3.96
NE	1.76	3.66	0.59	0	6.01
E	6	0.59	0	0	6.59
SE	9.08	8.78	0.88	0	18.74
S	3.22	2.2	1.61	0	7.03
SW	8.78	5.71	1.02	0	15.51
W	15.23	13.76	0.59	0	29.58
NW	5.12	7.32	0.15	0	12.59
Summary	50.51	44.66	4.84	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-03[ppb] 2016/09/01 00:00 - 2016/09/30 23:00 Calm: 0.00%



% Icon Classes (ppb)	51	45	5	0
0.0-16.3	51	45	5	0
16.3-32.7		45		
32.7-49.0			5	
>49.0				0

O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 09/2016 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)

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
1	8.9	4.4	5.4	1.0	5.4	2.0	3.4	6.4	2.9	2.9	2.4	7.5	6.4	4.9	9.9	7.5	14.0	7.9	3.9	1.4	2.0	1.4	1.4	1.4	1.0	14.0	4.8	24
2	0.4	1.0	0.0	1.4	0.0	0.4	0.4	3.4	0.0	0.0	0.0	0.0	1.9	0.0	0.0	2.9	0.0	1.4	0.0	1.9	4.9	1.4	0.4	1.9	0.0	4.9	1.0	24
3	2.4	0.0	0.0	2.9	0.0	0.4	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	2.4	0.4	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.5	23
4	0.0	X	0.0	0.4	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.4	1.4	0.0	0.0	0.0	0.0	1.9	2.4	0.0	0.0	2.4	0.0	2.4	0.5	23
5	0.0	0.0	1.4	4.9	0.0	1.4	1.4	0.0	0.0	X	0.0	2.9	0.0	4.4	3.4	0.0	2.9	1.9	2.9	5.9	3.9	1.4	1.9	2.9	0.0	5.9	1.9	23
6	1.4	1.4	0.4	2.0	3.4	2.9	0.4	2.9	2.4	0.0	0.0	0.0	0.0	4.9	1.4	1.4	0.0	1.0	2.9	2.9	0.0	0.4	1.9	0.0	4.9	1.5	24	
7	0.0	1.4	1.4	0.0	0.0	1.4	0.0	2.4	0.0	0.0	0.0	0.0	X	4.9	0.0	1.9	0.0	0.0	0.0	1.9	1.4	0.0	0.4	1.4	0.0	4.9	0.8	23
8	2.9	1.4	0.0	2.4	1.0	1.9	0.4	2.9	2.4	0.0	X	X	1.9	2.4	0.0	1.9	2.9	0.0	0.4	0.0	0.0	1.9	0.4	0.0	0.0	2.9	1.2	22
9	0.0	0.0	2.4	0.0	0.0	0.0	0.4	1.0	0.0	3.4	3.4	1.4	2.4	0.4	3.9	0.0	0.0	0.0	1.9	0.0	1.4	X	0.4	0.0	0.0	3.9	1.0	23
10	0.0	1.9	0.0	0.0	2.9	1.4	X	3.4	0.4	2.4	0.0	0.0	2.9	X	0.0	1.9	0.4	2.4	1.9	1.4	0.0	1.9	0.0	X	0.0	3.4	1.2	21
11	0.0	0.0	0.0	X	0.4	0.0	0.0	0.0	X	0.0	0.0	X	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.4	1.0	0.0	0.0	1.4	0.2	21
12	4.9	0.0	2.9	0.0	1.4	X	X	3.9	0.0	0.0	3.4	7.5	C	0.4	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.4	1.0	1.4	0.0	7.5	1.4	22
13	1.9	1.3	0.4	1.5	0.0	2.7	2.9	1.9	1.0	0.4	0.0	0.0	2.8	1.8	0.5	4.6	4.8	1.4	2.8	4.3	0.7	1.9	2.3	1.1	0.0	4.8	1.8	24
14	0.0	1.3	2.2	3.9	2.3	4.5	2.3	0.8	1.7	1.3	4.9	0.4	2.4	2.2	1.8	1.6	3.7	2.6	4.9	4.7	0.0	1.9	2.7	3.0	0.0	4.9	2.4	24
15	1.7	3.0	3.4	0.6	4.3	1.1	2.9	2.6	5.7	8.2	2.1	0.0	0.0	3.3	0.7	3.9	4.9	2.7	0.9	8.5	5.0	4.2	5.7	4.4	0.0	8.5	3.3	24
16	3.0	1.2	6.2	5.4	2.9	4.8	0.4	1.9	0.1	0.7	3.2	0.4	2.9	4.9	3.4	5.7	5.6	7.3	3.8	4.3	6.1	2.4	4.6	0.1	0.1	7.3	3.4	24
17	1.6	4.4	2.4	4.9	4.3	4.3	0.0	6.8	3.7	4.6	5.8	0.0	0.0	1.9	0.0	0.0	0.0	4.8	0.0	0.0	1.3	1.0	0.0	0.0	0.0	6.8	2.2	24
18	2.3	3.4	0.0	0.0	0.4	0.0	X	0.2	0.0	0.4	0.4	0.0	X	0.0	0.0	X	X	0.0	0.4	1.5	0.9	0.0	1.4	0.0	0.0	3.4	0.6	20
19	0.0	0.0	1.0	0.0	0.0	X	0.0	0.0	0.0	0.0	0.0	X	0.0	X	0.0	0.0	X	0.4	0.0	1.9	0.4	1.9	2.9	1.4	0.0	2.9	0.5	20
20	0.0	X	X	0.0	1.9	1.4	1.4	0.0	C	C	C	0.4	0.4	X	X	1.4	0.4	2.9	5.9	3.9	1.9	3.9	1.9	2.4	0.0	5.9	1.8	20
21	2.4	1.4	1.4	2.9	2.4	4.4	2.4	2.4	2.9	3.9	X	0.0	0.0	X	X	X	0.0	1.9	4.4	5.4	1.9	0.4	4.4	4.9	0.0	5.4	2.5	20
22	1.0	1.4	1.0	3.9	3.4	3.9	3.9	2.9	4.9	1.4	0.0	4.9	3.9	10.9	4.4	0.0	0.0	3.4	3.9	5.4	4.4	5.4	4.4	3.4	0.0	10.9	3.4	24
23	3.4	1.9	0.4	1.9	1.9	1.0	3.4	0.4	1.0	1.9	3.9	1.9	3.9	3.4	1.0	2.9	3.4	1.0	1.0	0.0	0.0	0.0	0.0	3.4	0.0	3.9	1.8	24
24	0.0	1.0	0.0	0.0	0.0	1.0	0.0	3.4	7.5	5.4	0.0	X	0.4	0.0	1.4	0.0	1.0	3.4	0.0	1.9	0.4	0.0	0.0	0.0	0.0	7.5	1.2	23
25	0.0	0.4	0.0	0.4	0.4	0.0	2.9	2.9	1.4	1.4	0.0	0.0	X	0.0	X	X	1.0	3.9	0.0	3.9	1.9	0.0	0.0	1.9	0.0	3.9	1.1	21
26	3.4	2.9	2.4	2.4	1.9	1.9	2.9	4.9	4.4	3.4	1.4	X	0.0	1.0	0.4	1.4	0.0	1.0	2.9	0.0	1.4	2.4	4.9	4.9	0.0	4.9	2.3	23
27	1.4	1.4	0.0	3.9	1.9	1.4	1.0	2.4	2.9	0.0	X	0.0	X	2.4	X	0.0	1.9	0.4	2.4	0.4	0.0	1.0	0.0	3.4	0.0	3.9	1.3	21
28	3.4	0.0	3.4	4.9	2.4	1.9	1.0	6.9	6.4	2.4	1.4	0.0	0.0	1.4	1.0	1.9	X	4.4	3.4	0.0	6.4	5.4	0.4	3.4	0.0	6.9	2.7	23
29	1.4	2.9	4.4	2.4	4.4	4.9	3.4	0.4	2.4	2.9	5.9	0.0	1.0	2.4	1.9	X	0.0	4.9	6.4	10.4	5.9	6.4	6.4	4.4	0.0	10.4	3.7	23
30	5.4	1.9	0.4	0.0	1.9	2.4	0.0	1.4	2.4	1.4	0.0	2.4	0.0	8.9	2.4	0.0	0.0	0.0	4.4	1.4	2.9	0.0	1.4	0.0	8.9	1.7	24	
HOURLY MAX	8.9	4.4	6.2	5.4	5.4	4.9	3.9	6.9	7.5	8.2	5.9	7.5	6.4	10.9	9.9	7.5	14.0	7.9	6.4	10.4	6.4	6.4	6.4	4.9				
HOURLY AVG	1.8	1.5	1.5	1.9	1.7	1.9	1.4	2.3	2.0	1.7	1.5	1.2	1.4	2.5	1.7	1.6	1.8	1.9	2.0	2.7	1.9	1.8	1.7	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

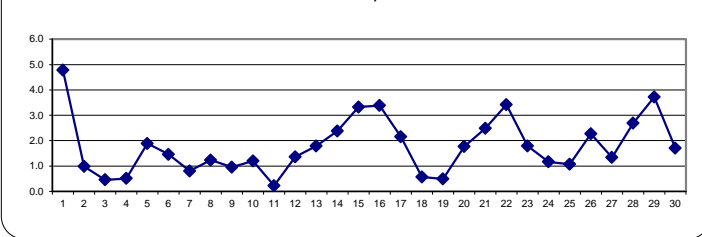
OBJECTIVE LIMIT:

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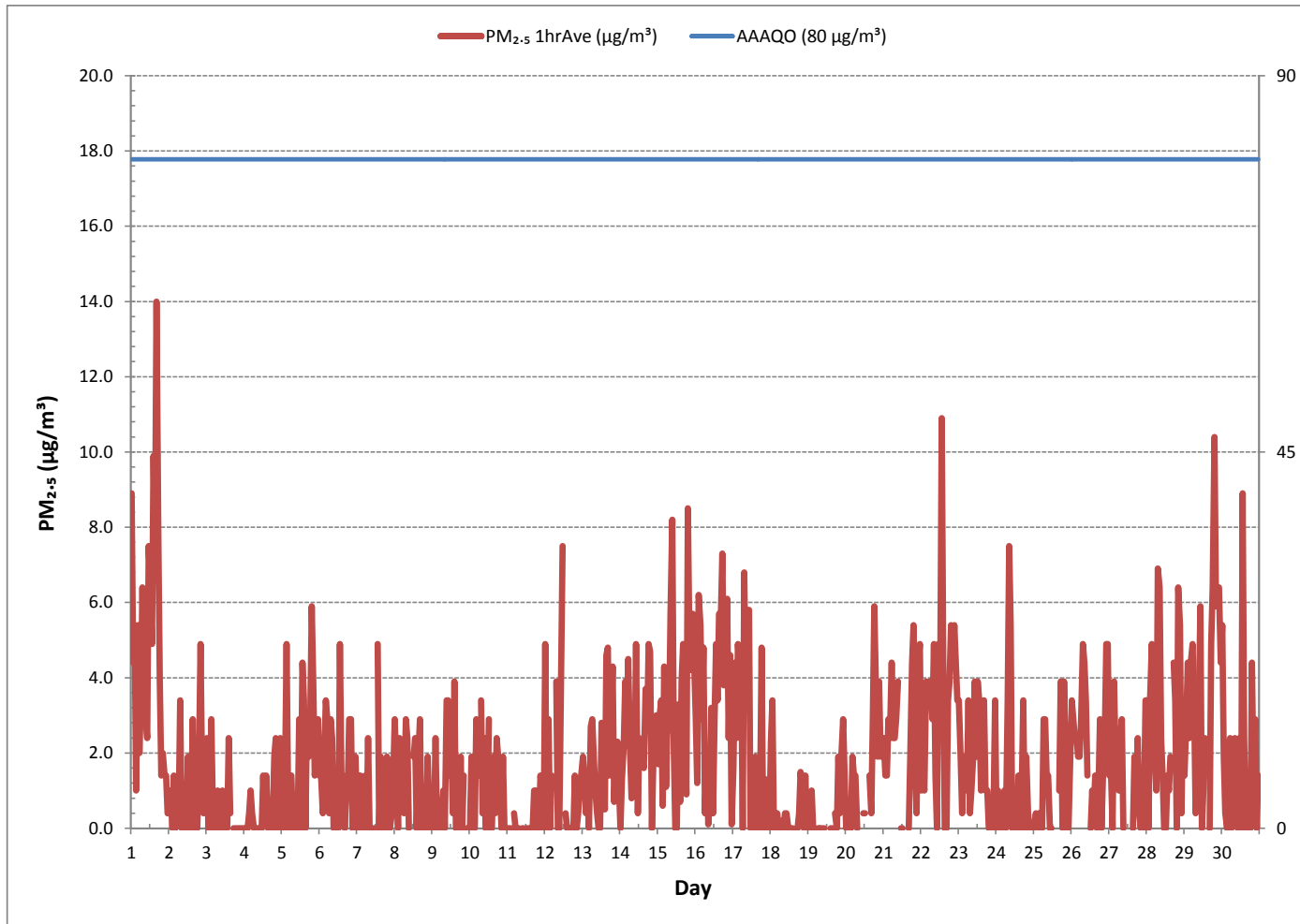
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	457					
MINIMUM 1-HR AVERAGE:	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	14.0	µg/m ³	@ HOUR(S)	16	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	4.8	µg/m ³			ON DAY(S)	1
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	4	HRS	OPERATIONAL TIME:	679	HRS	
STANDARD DEVIATION:	2.02		AMD OPERATION UPTIME:	94.3	%	
			MONTHLY AVERAGE:	1.8	µg/m ³	

24 HOUR AVERAGES FOR September 2016



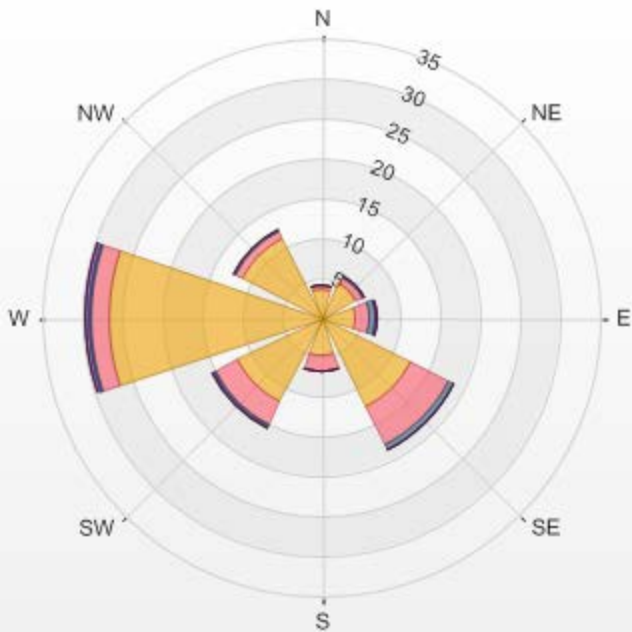
PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5[ug/m3(L)] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.61% Calm Avg: 0.00

Direction	0.0-3.0	3.0-6.0	6.0-9.0	9.0-12.0	12.0-15.0	>15.0	Total
N	3.71	0.15	0	0	0	0	3.86
NE	5.19	0.59	0.3	0	0	0	6.08
E	4.15	2.37	0.74	0.15	0	0	7.41
SE	13.2	5.64	0.74	0.15	0	0	19.73
S	4.9	1.93	0.15	0	0	0	6.98
SW	12.31	3.41	0.3	0	0.15	0	16.17
W	23.89	2.82	0.89	0	0	0	27.6
NW	10.68	1.34	0	0.15	0	0	12.17
Summary	78.03	18.25	3.12	0.45	0.15	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5[ug/m3(L)] 2016/09/01 00:00 - 2016/09/30 23:00 Calm: 0.00%



% Icon Classes (ug/m3(L))	17		3.0-6.0	3		6.0-9.0	1		9.0-12.0	0		12.0-15.0	0		>15.0
80		0.0-3.0													

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
HOURLY MAX	HOURLY AVG	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		5.2	5.7	6.7	6.8	6.6	5.8	6.1	6.0	8.0	5.9	7.2	7.7	4.5	7.2	4.8	6.5	10.8	12.5	9.9	6.6	4.4	3.4	2.9	2.9	2.9	2.9	12.5	6.4	24
2		2.8	1.8	0.5	0.1	2.7	1.1	1.3	1.3	6.0	3.7	3.9	6.4	8.2	6.6	8.6	9.5	6.0	5.9	7.7	4.9	4.5	7.4	6.2	8.6	0.1	9.5	4.8	24	
3		11.5	15.4	14.0	12.5	11.3	9.0	10.2	11.3	11.0	13.5	14.3	14.4	14.3	12.9	15.4	15.8	11.2	11.6	9.8	9.5	10.1	8.6	6.9	7.9	6.9	15.8	11.8	24	
4		5.8	5.1	6.7	7.8	8.0	7.0	5.0	7.6	7.2	7.4	7.2	6.7	5.7	5.4	2.5	4.0	3.5	3.2	4.1	0.4	1.3	0.3	0.9	0.5	0.3	8.0	4.7	24	
5		0.6	0.3	0.6	0.5	0.3	0.3	0.1	1.3	1.1	3.0	4.2	4.5	3.5	1.9	6.6	6.9	8.6	8.7	3.7	2.5	3.1	3.0	4.2	6.0	0.1	8.7	3.1	24	
6		3.1	3.5	6.3	5.1	3.8	4.9	5.9	5.3	8.3	8.4	8.8	9.7	6.0	2.0	3.4	5.6	5.4	4.7	1.7	0.6	1.7	0.3	2.1	2.8	0.3	9.7	4.6	24	
7		3.0	3.0	3.8	3.3	3.5	2.8	2.4	1.3	1.5	1.2	2.6	3.7	4.0	3.6	4.0	4.8	4.2	4.3	2.5	1.6	0.9	1.4	1.6	0.2	0.2	4.8	2.7	24	
8		1.0	0.2	0.3	0.4	0.4	0.9	0.4	1.7	1.8	1.8	3.4	4.9	6.9	3.5	7.9	4.3	5.1	7.1	9.2	5.4	5.5	3.4	4.2	2.7	0.2	9.2	3.4	24	
9		3.0	4.2	4.6	4.3	3.6	3.4	1.3	4.0	4.4	4.2	7.1	7.3	5.9	4.3	9.7	8.5	7.4	3.5	0.2	1.2	1.2	1.9	5.9	7.2	0.2	9.7	4.5	24	
10		9.3	6.7	5.3	7.2	3.5	2.7	4.4	5.6	7.3	8.6	10.6	12.6	16.2	16.1	17.0	15.3	14.8	12.1	13.5	7.1	3.7	4.5	5.1	4.8	2.7	17.0	8.9	24	
11		2.8	5.2	5.1	6.0	7.8	7.4	7.8	13.0	13.6	13.4	11.9	13.1	12.3	15.2	13.1	12.9	14.2	11.0	9.2	6.7	6.2	5.9	3.1	5.6	2.8	15.2	9.3	24	
12		5.4	3.7	3.4	4.1	2.8	1.7	3.0	6.8	5.8	6.5	6.7	5.7	4.5	4.3	4.3	2.1	3.9	3.9	2.0	1.3	1.4	2.3	2.2	1.9	1.3	6.8	3.7	24	
13		1.0	1.4	0.7	1.6	0.9	0.3	0.4	2.6	3.7	7.2	9.0	11.4	12.5	13.4	13.4	11.1	12.6	9.8	6.4	4.0	3.5	1.2	0.6	0.5	0.3	13.4	5.4	24	
14		0.8	1.0	0.3	0.2	1.5	0.4	0.2	1.9	2.6	3.6	4.9	7.6	8.6	9.8	9.8	8.4	8.2	8.8	3.9	1.6	1.5	1.6	0.9	1.2	0.2	9.8	3.7	24	
15		1.2	0.9	1.1	3.1	0.6	0.4	0.2	0.5	1.3	0.6	0.8	1.9	0.1	7.2	7.2	7.0	5.5	3.9	2.1	2.8	2.6	2.9	2.0	3.8	0.1	7.2	2.5	24	
16		3.7	4.7	2.9	4.8	2.4	1.4	0.9	2.1	4.9	5.9	3.6	4.2	6.2	5.6	7.0	8.0	6.3	4.7	3.9	4.2	5.3	3.2	3.0	0.5	0.5	8.0	4.1	24	
17		0.9	1.4	0.9	1.5	0.8	2.2	2.3	1.7	0.8	5.5	7.8	8.5	8.5	9.2	11.0	8.0	6.1	4.4	1.3	0.9	0.6	0.3	0.6	0.4	0.3	11.0	3.6	24	
18		0.3	1.4	4.7	6.8	8.1	7.4	7.5	9.4	6.9	10.5	11.9	13.0	11.1	13.8	13.1	12.7	13.5	9.0	7.6	8.1	6.2	7.5	8.8	7.6	0.3	13.8	8.6	24	
19		7.1	8.0	7.9	8.3	7.7	6.8	7.0	6.9	7.5	8.3	8.4	9.4	8.1	9.5	10.1	10.1	7.1	5.0	2.6	1.8	0.8	0.4	0.2	1.3	0.2	10.1	6.3	24	
20		0.4	2.3	2.8	2.3	1.5	0.8	1.0	1.9	2.6	3.3	4.6	4.9	5.5	4.0	4.6	6.0	4.8	4.6	2.0	1.3	0.5	0.4	0.4	2.3	0.4	6.0	2.7	24	
21		0.6	0.8	0.7	0.5	1.0	0.6	1.1	0.4	4.8	5.2	4.4	6.0	7.0	7.3	8.2	4.6	6.3	2.0	0.8	1.0	1.1	0.9	0.8	0.3	0.3	8.2	2.8	24	
22		0.1	0.6	0.4	0.6	0.6	0.5	0.9	1.2	2.9	1.7	3.4	5.6	6.1	7.2	6.7	6.4	5.4	4.2	3.2	3.3	2.5	3.6	5.3	4.5	0.1	7.2	3.2	24	
23		3.7	3.2	2.8	3.1	4.9	7.1	5.3	6.1	10.0	8.1	8.7	12.7	13.5	12.7	13.5	13.0	11.1	9.3	9.1	8.1	5.4	5.2	4.6	5.6	2.8	13.5	7.8	24	
24		3.7	3.5	0.8	2.0	2.6	3.6	4.9	5.9	6.8	9.6	10.7	10.9	12.2	16.0	14.8	14.6	12.8	11.9	6.3	5.2	4.3	3.7	6.7	7.1	0.8	16.0	7.5	24	
25		6.9	6.1	6.1	5.2	5.1	5.6	5.4	6.3	8.1	8.3	8.7	9.3	12.4	12.4	10.4	11.1	9.3	5.4	1.4	1.5	1.2	2.1	0.1	0.5	0.1	12.4	6.2	24	
26		0.6	0.6	0.2	0.9	0.6	0.3	0.2	1.7	1.7	4.6	6.2	6.8	7.7	5.5	6.9	6.2	4.2	6.0	8.0	9.1	9.7	10.0	11.0	0.2	11.0	4.5	24		
27		10.5	10.4	9.1	6.6	4.8	2.6	1.5	1.0	4.7	12.0	15.3	10.8	6.4	4.8	8.4	12.4	10.9	8.4	5.3	5.7	3.6	4.2	4.4	3.5	1.0	15.3	7.0	24	
28		1.6	0.4	0.4	0.8	2.8	0.2	0.5	0.6	3.3	4.2	3.6	4.2	4.6	4.9	5.0	4.8	3.0	1.8	1.2	0.8	1.5	1.5	3.4	1.3	0.2	5.0	2.4	24	
29		0.9	0.5	0.2	0.1	0.4	1.2	0.4	0.3	0.7	3.0	5.0	3.9	5.8	5.6	5.3	4.6	4.3	2.2	1.8	1.0	1.5	1.7	1.2	1.7	0.1	5.8	2.2	24	
30		3.3	1.0	0.2	1.1	1.9	3.9	4.1	5.9	7.1	8.4	10.9	13.3	11.4	11.4	10.9	13.5	12.8	12.3	13.0	11.2	11.5	11.3	12.1	10.7	0.2	13.5	8.5	24	
HOURLY MAX		11.5	15.4	14.0	12.5	11.3	9.0	10.2	13.0	13.6	13.5	15.3	14.4	16.2	16.1	17.0	15.8	14.8	12.5	13.5	11.2	11.5	11.3	12.1	11.0					
HOURLY AVG		3.4	3.4	3.3	3.6	3.4	3.1	3.1	4.0	5.2	6.2	7.1	8.0	8.0	8.2	8.7	8.6	8.0	6.7	5.0	3.9	3.6	3.5	3.7	3.8					

STATUS FLAG CODES

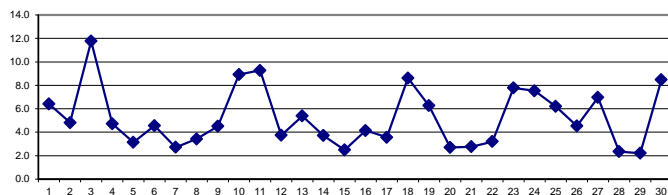
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

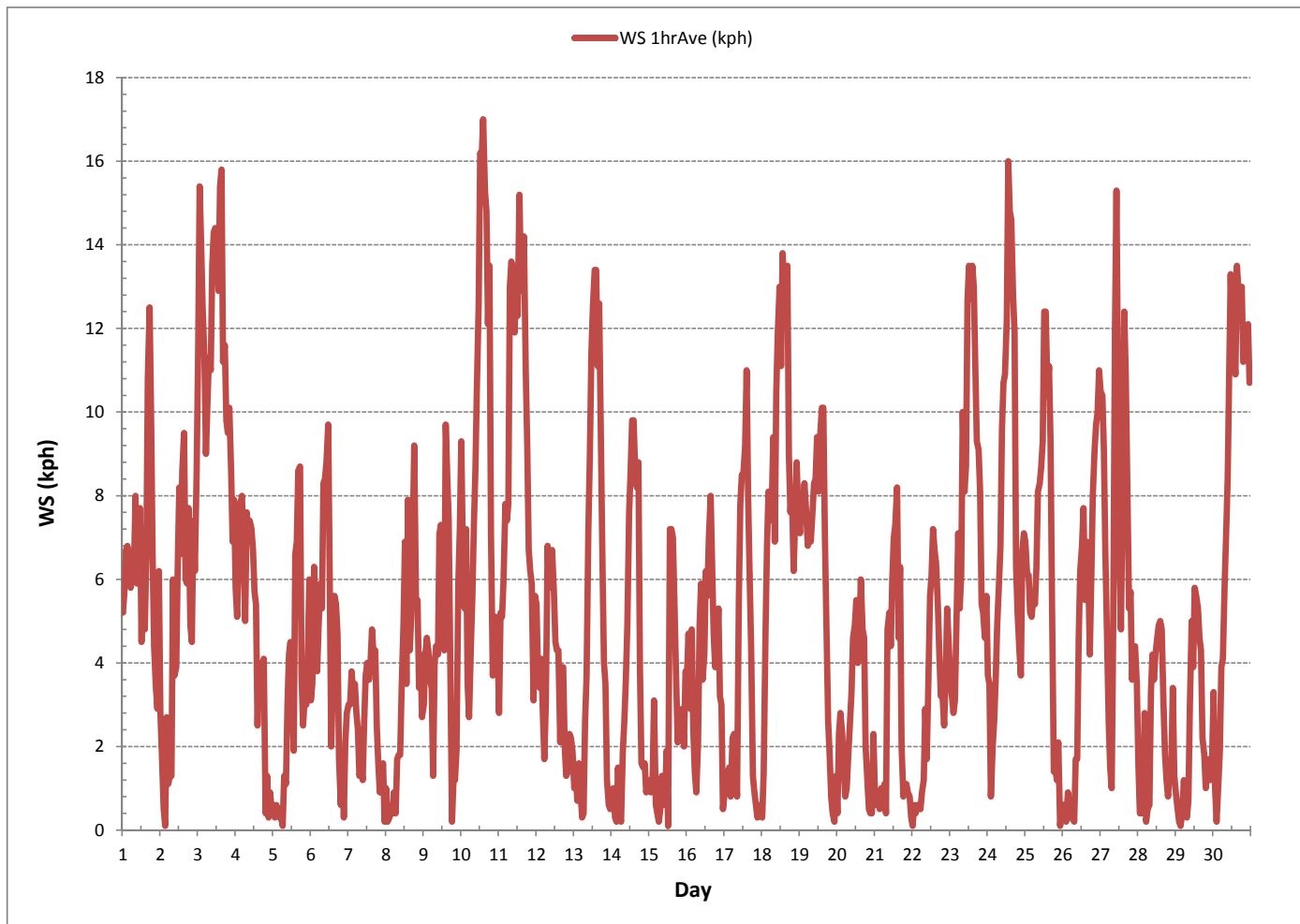
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR(S) VAR ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	17.0 kph @ HOUR(S) 14 ON DAY(S) 10
MAXIMUM 24-HR AVERAGE:	11.8 kph ON DAY(S) 3
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
	OPERATIONAL TIME: 720 HRS
	AMD OPERATION UPTIME: 100.0 %
STANDARD DEVIATION:	3.91
	MONTHLY AVERAGE: 5.2 kph

24 HOUR AVERAGES FOR September 2016



WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	9.5	10.2	10.0	11.0	9.3	10.6	9.1	14.4	17.7	10.7	14.1	17.4	9.9	14.2	10.4	14.0	17.7	19.8	16.8	11.1	7.4	5.5	4.7	4.6	4.6	19.8	11.7	24	
2	5.3	5.4	3.0	4.1	4.0	4.8	3.0	4.0	12.1	8.5	9.2	12.3	17.8	10.6	14.8	13.8	15.1	9.7	12.1	12.4	12.7	13.7	11.7	15.3	3.0	17.8	9.8	24	
3	20.8	22.8	22.3	21.3	17.6	14.2	15.0	17.7	16.6	20.1	23.7	21.4	21.6	20.6	26.6	23.0	19.6	20.4	14.4	14.3	14.4	15.0	12.8	15.8	12.8	26.6	18.8	24	
4	9.9	8.7	12.6	14.7	11.5	10.7	8.1	11.6	11.6	10.5	12.5	12.6	10.1	8.6	7.7	10.3	6.6	5.5	8.1	2.3	2.4	2.1	2.2	2.1	2.1	14.7	8.5	24	
5	2.2	1.4	2.1	1.8	2.7	2.0	2.5	5.2	4.5	9.0	10.6	8.6	10.9	8.6	13.3	11.8	12.6	14.9	6.5	5.3	5.8	5.0	5.9	8.6	1.4	14.9	6.7	24	
6	5.3	6.0	10.5	8.6	7.1	10.8	10.6	15.3	14.9	16.3	15.9	16.4	12.1	6.4	9.1	8.9	9.2	8.0	6.0	3.1	3.5	4.3	4.1	5.2	3.1	16.4	9.1	24	
7	4.6	5.3	7.2	6.1	6.7	5.7	4.8	13.0	5.1	4.6	6.3	8.4	9.6	8.8	11.6	9.1	10.3	13.6	5.6	3.2	3.2	5.2	3.4	2.6	2.6	13.6	6.8	24	
8	2.6	2.5	2.5	3.9	2.5	3.2	1.9	5.0	4.3	5.8	8.6	10.8	22.7	15.2	20.8	9.0	11.2	24.0	20.9	10.0	8.6	7.5	6.5	6.9	1.9	24.0	9.0	24	
9	6.5	6.6	6.2	6.9	4.5	4.7	3.5	9.4	9.1	8.6	14.9	12.8	13.5	11.1	17.5	15.9	14.1	11.2	3.3	2.3	2.2	5.5	8.6	12.4	2.2	17.5	8.8	24	
10	12.5	10.8	10.7	12.4	7.9	5.2	7.4	9.9	15.4	13.4	16.7	19.5	26.4	25.9	24.4	22.8	25.1	23.4	20.4	11.4	6.3	8.5	8.7	8.3	5.2	26.4	14.7	24	
11	9.2	7.2	8.7	8.8	17.7	15.3	11.9	20.2	21.7	21.5	21.2	21.6	17.4	22.6	20.4	21.5	21.9	18.6	15.1	10.9	12.0	15.8	5.5	8.6	5.5	22.6	15.6	24	
12	8.7	5.0	5.1	6.4	4.8	3.7	6.6	10.9	10.8	9.7	12.7	10.7	9.6	10.0	9.8	8.7	9.4	9.0	5.6	2.6	3.2	3.6	3.5	3.7	2.6	12.7	7.2	24	
13	3.9	3.1	3.8	4.3	2.8	3.0	3.6	S	8.4	13.6	15.6	17.9	18.2	21.1	21.8	19.1	17.8	18.0	11.2	7.4	5.9	3.4	2.0	2.4	2.0	21.8	9.9	24	
14	2.1	2.9	2.2	2.5	3.2	3.2	2.3	5.1	7.3	8.1	11.8	12.7	12.8	19.3	16.0	15.5	14.5	14.4	9.2	3.1	3.5	3.8	3.1	3.6	2.1	19.3	7.6	24	
15	4.6	3.7	4.8	5.4	1.7	3.2	2.9	2.6	6.3	4.3	7.3	8.0	9.7	15.0	12.9	14.4	14.0	11.2	3.8	4.7	4.4	5.9	5.4	8.0	1.7	15.0	6.8	24	
16	7.5	8.5	8.7	11.0	5.3	3.2	4.3	4.6	10.4	11.8	8.1	9.1	16.1	12.8	14.3	18.0	12.0	10.5	6.1	6.2	8.0	5.1	4.5	3.4	3.2	18.0	8.7	24	
17	2.8	2.9	2.8	3.2	4.3	6.1	7.3	8.2	7.9	9.7	13.4	15.3	14.8	16.1	16.9	15.1	12.4	7.9	3.0	1.9	2.7	2.6	2.5	2.1	1.9	16.9	7.6	24	
18	1.8	9.7	10.7	10.3	12.3	11.5	12.0	13.7	14.4	17.2	18.2	20.8	18.5	21.8	24.2	21.1	22.2	16.2	13.3	15.2	9.3	13.5	13.8	11.1	1.8	24.2	14.7	24	
19	10.1	11.4	11.2	11.7	10.9	9.8	11.5	10.7	11.9	13.0	13.3	14.9	13.6	16.7	16.7	18.2	13.1	9.8	4.2	3.2	4.9	3.8	3.3	2.5	2.5	18.2	10.4	24	
20	2.8	4.4	4.5	4.0	3.4	2.2	5.3	7.6	6.5	9.7	12.3	11.4	9.7	9.1	12.1	10.3	11.1	8.4	3.6	2.6	1.9	1.9	4.0	3.8	1.9	12.3	6.4	24	
21	2.4	2.3	3.4	3.7	2.5	3.4	6.1	2.6	9.5	10.6	12.3	10.5	12.1	13.8	15.6	9.5	12.1	6.9	2.3	1.8	2.4	3.8	3.2	1.4	1.4	15.6	6.4	24	
22	1.5	2.9	3.1	2.2	2.2	1.4	2.0	2.7	7.4	5.1	10.0	13.1	13.9	18.3	14.9	18.6	12.8	9.3	4.4	5.4	3.5	6.3	7.1	6.8	1.4	18.6	7.3	24	
23	6.8	6.3	5.1	7.1	9.2	8.8	9.1	12.2	14.7	13.3	16.8	18.8	23.3	22.4	19.5	18.7	15.2	13.6	15.9	11.7	8.3	7.3	6.5	9.3	5.1	23.3	12.5	24	
24	7.3	5.5	3.2	3.9	4.8	6.1	9.1	9.7	13.5	15.0	17.2	21.0	18.8	27.5	25.3	24.0	22.0	22.8	13.7	7.0	6.3	5.6	10.2	9.2	3.2	27.5	12.9	24	
25	9.8	8.2	8.1	7.6	6.8	7.6	7.7	9.1	13.0	14.7	14.2	14.6	21.2	22.0	18.9	18.5	15.8	11.5	3.5	4.4	3.9	3.4	2.4	1.7	1.7	22.0	10.4	24	
26	2.6	2.3	2.2	3.0	2.5	3.1	2.5	2.2	4.1	7.4	10.8	12.4	15.0	15.9	13.9	14.1	13.3	8.9	8.1	10.9	12.6	11.6	12.5	14.3	2.2	15.9	8.6	24	
27	14.8	14.9	11.8	9.3	7.1	9.8	3.5	3.2	8.6	21.4	24.4	19.8	17.5	9.0	17.2	19.6	17.5	16.9	7.1	8.5	5.5	6.7	6.1	5.5	3.2	24.4	11.9	24	
28	4.4	2.1	3.0	2.3	5.4	3.2	2.7	2.6	6.2	7.4	8.7	11.3	9.5	10.0	8.7	8.7	8.5	3.7	2.9	2.3	3.3	4.4	5.7	3.1	2.1	11.3	5.4	24	
29	2.8	1.8	2.3	1.8	1.9	2.8	1.8	1.9	3.9	6.8	11.2	10.0	10.9	10.6	8.7	9.1	7.2	4.9	3.2	1.9	2.5	2.6	2.4	2.8	1.8	11.2	4.8	24	
30	4.9	3.0	4.5	4.9	12.7	11.7	10.2	9.3	13.8	14.1	18.3	19.2	17.4	16.9	17.7	20.8	20.9	21.2	20.1	16.5	17.6	18.8	19.5	15.9	3.0	21.2	14.6	24	
HOURLY MAX	20.8	22.8	22.3	21.3	17.7	15.3	15.0	20.2	21.7	21.5	24.4	21.6	26.4	27.5	26.6	24.0	25.1	24.0	20.9	16.5	17.6	18.8	19.5	15.9					
HOURLY AVG	6.3	6.3	6.5	6.8	6.5	6.4	6.3	8.4	10.4	11.4	13.7	14.4	15.2	15.4	16.1	15.4	14.5	13.1	9.0	6.8	6.3	6.7	6.4	6.7					

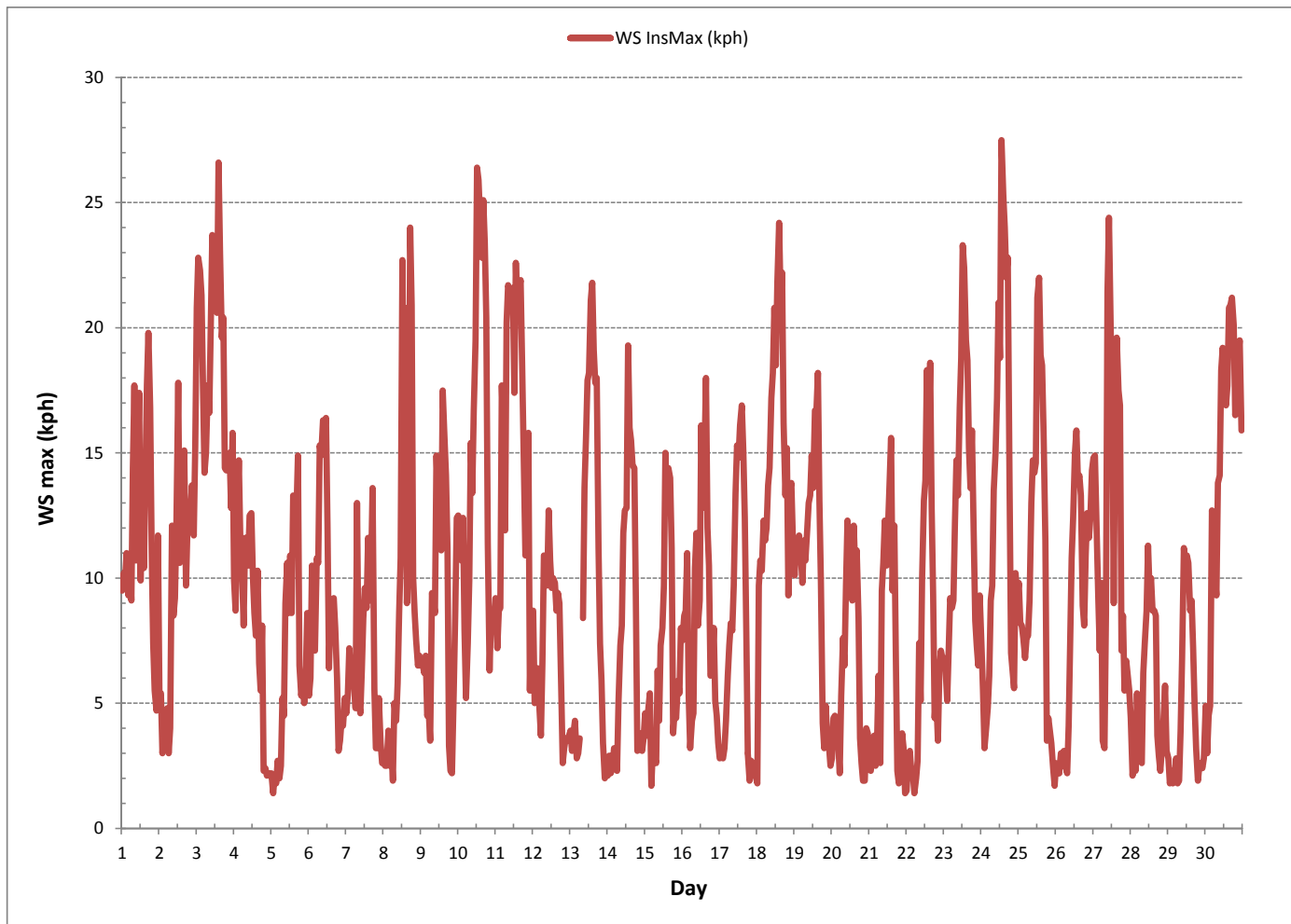
STATUS FLAG CODES

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

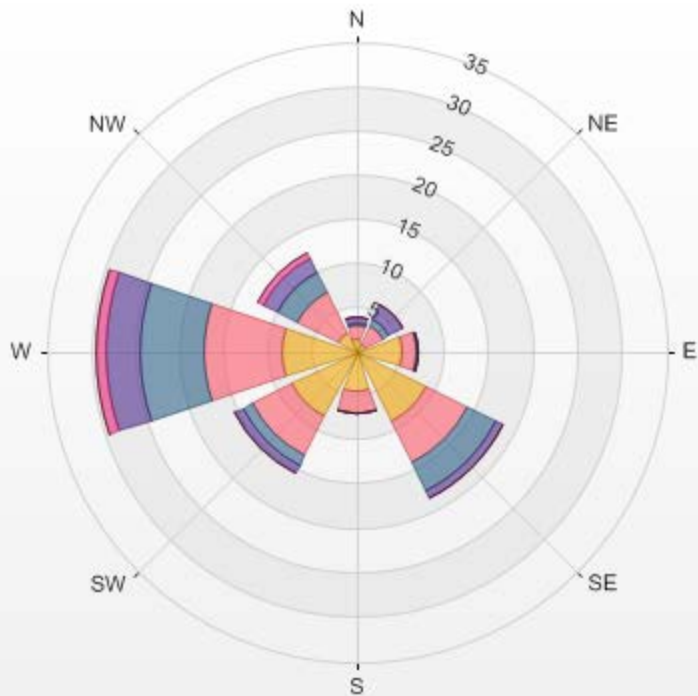
MAXIMUM INSTANTANEOUS VALUE:	27.5	kph	@ HOUR(S)	13	ON DAY(S)	24
					VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA COLD LAKE SOUTH Monitor: WSP [kph] Monthly: 2016/09 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-3.6	3.6-7.2	7.2-10.8	10.8-14.4	14.4-18.0	>18.0	Total
N	1.39	1.67	0.28	0.56	0.14	0	4.04
NE	1.11	2.22	0.83	1.81	0	0	5.97
E	5.28	1.53	0.14	0	0	0	6.95
SE	8.75	5.14	3.75	0.97	0	0	18.61
S	4.58	2.36	0	0	0	0	6.94
SW	8.19	5	1.25	0.97	0	0	15.41
W	8.47	8.89	7.22	3.75	1.25	0	29.58
NW	2.36	5.28	2.36	1.94	0.56	0	12.5
Summary	40.13	32.09	15.83	10	1.95	0	100



% Icon Classes (kph)	40	32	16	10	2	0
0.0-3.6	3.6-7.2	7.2-10.8	10.8-14.4	14.4-18.0	>18.0	

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

WIND DIRECTION Hourly Averages (WD)

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

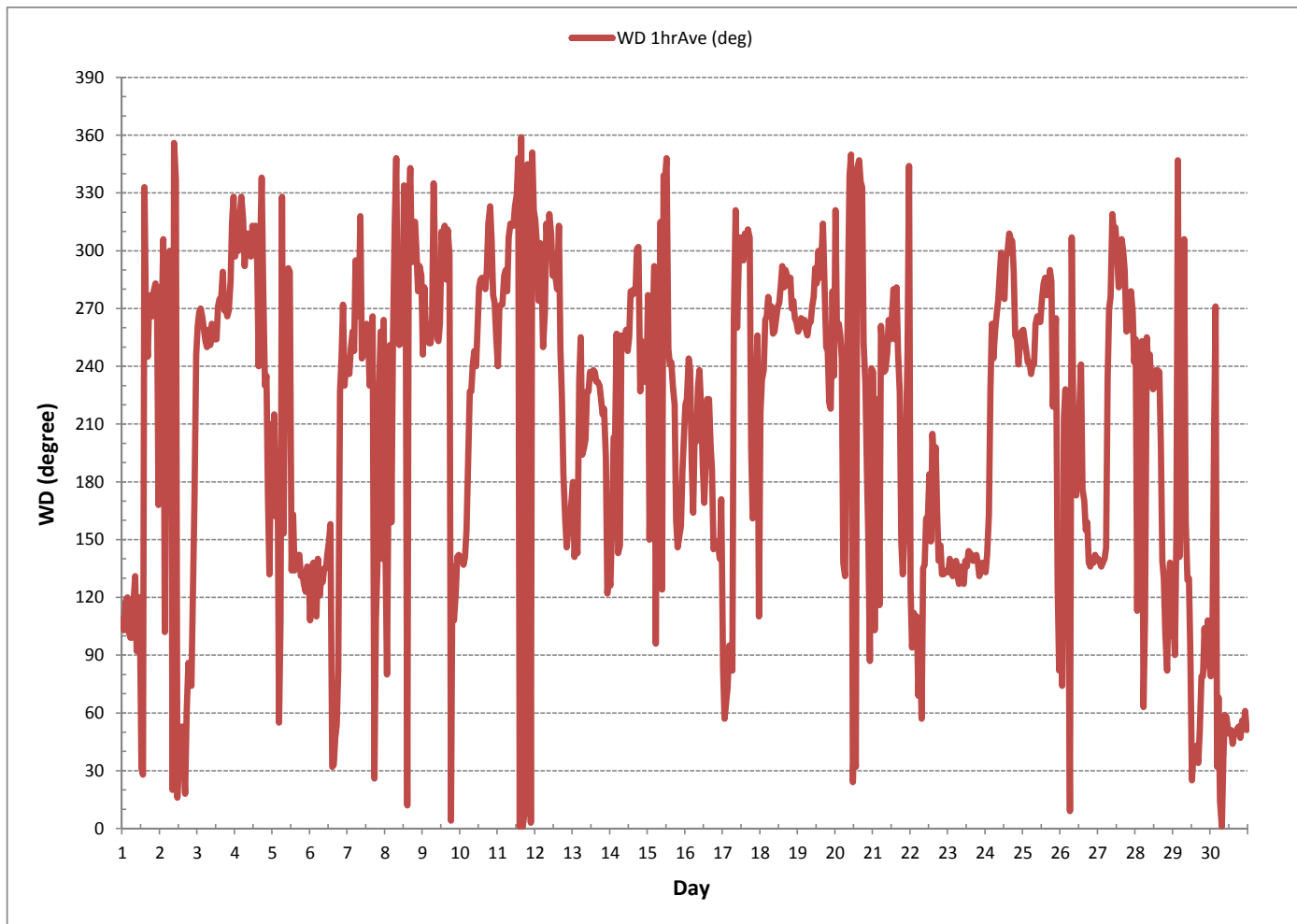
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	85.19		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - September 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		24	25	22	23	19	24	21	23	27	28	31	31	43	26	37	40	23	22	21	19	21	19	15	13	24	
2		16	64	67	60	18	35	39	63	24	36	42	32	24	23	22	25	23	22	21	51	53	22	29	25	24	
3		20	20	21	19	19	22	22	21	23	22	23	23	23	21	22	21	24	21	20	19	21	22	17	17	24	
4		18	17	19	15	15	14	19	19	20	20	26	26	23	25	56	47	27	21	21	25	14	54	33	38	24	
5		40	51	37	49	59	50	67	55	63	56	46	30	60	60	26	21	15	15	16	20	14	14	11	13	24	
6		19	11	12	23	24	21	20	36	22	20	18	16	20	64	46	26	22	27	27	55	34	66	21	18	24	
7		18	24	22	22	26	26	28	51	49	60	53	47	44	34	35	33	30	31	26	30	63	53	28	43	24	
8		49	57	61	73	37	44	62	22	46	55	50	41	38	33	28	29	26	20	17	26	18	24	18	30	24	
9		27	18	11	12	9	12	42	31	31	38	28	28	22	32	22	27	21	31	36	21	27	17	10	11	24	
10		11	30	27	19	29	42	29	25	28	25	25	26	23	24	24	24	22	22	19	12	15	20	23	21	24	
11		31	18	21	19	21	23	22	21	18	18	19	15	18	19	20	19	20	28	17	17	21	28	20	16	24	
12		13	15	17	17	18	34	27	17	23	23	22	28	42	48	36	54	50	37	21	29	34	26	30	45	24	
13		58	47	66	60	69	78	77	42	39	30	29	26	26	24	23	26	23	21	22	26	25	43	60	61	24	
14		51	28	63	71	45	72	55	47	40	43	32	26	24	28	26	28	24	18	20	23	45	45	36	48	24	
15		49	53	42	15	61	40	64	55	62	78	67	62	58	34	32	31	34	30	23	18	28	36	51	38	24	
16		29	29	41	37	39	37	57	38	28	31	48	43	40	45	36	32	40	40	20	19	21	25	23	60	24	
17		48	27	40	30	67	35	45	61	44	22	23	23	23	23	20	24	26	21	31	29	52	48	54	29	24	
18		56	37	17	19	19	21	19	19	22	20	19	20	21	23	24	24	22	21	22	22	18	19	18	17	24	
19		17	17	19	17	18	21	18	20	20	21	23	23	22	21	23	23	22	22	12	29	54	65	50	28	24	
20		56	32	21	18	37	34	60	50	35	37	41	25	24	43	31	21	34	16	12	23	53	68	67	11	24	
21		39	53	33	63	37	59	56	57	20	29	44	36	34	32	26	35	24	29	57	29	47	62	46	52	24	
22		50	44	42	49	51	39	25	24	35	51	54	32	42	37	39	42	43	31	12	20	16	13	12	15	24	
23		18	19	20	25	16	13	17	21	15	20	22	16	18	17	15	15	16	14	14	13	19	14	13	12	24	
24		25	17	43	29	21	19	17	20	24	24	23	25	24	21	23	20	21	18	19	14	12	13	13	15	24	
25		15	15	14	13	13	13	16	16	22	24	25	25	25	25	26	24	22	21	30	23	49	17	37	50	24	
26		43	41	61	45	58	58	68	56	45	66	36	40	34	33	45	37	33	33	13	11	12	11	12	11	24	
27		12	12	13	16	21	61	42	56	22	19	20	19	23	41	24	19	21	20	12	14	16	17	15	15	24	
28		47	55	63	49	31	49	54	39	30	29	40	41	28	27	23	26	34	22	20	34	19	47	14	24	24	
29		27	37	37	38	63	26	59	42	45	37	32	50	32	31	27	33	20	18	18	26	19	19	20	28	24	
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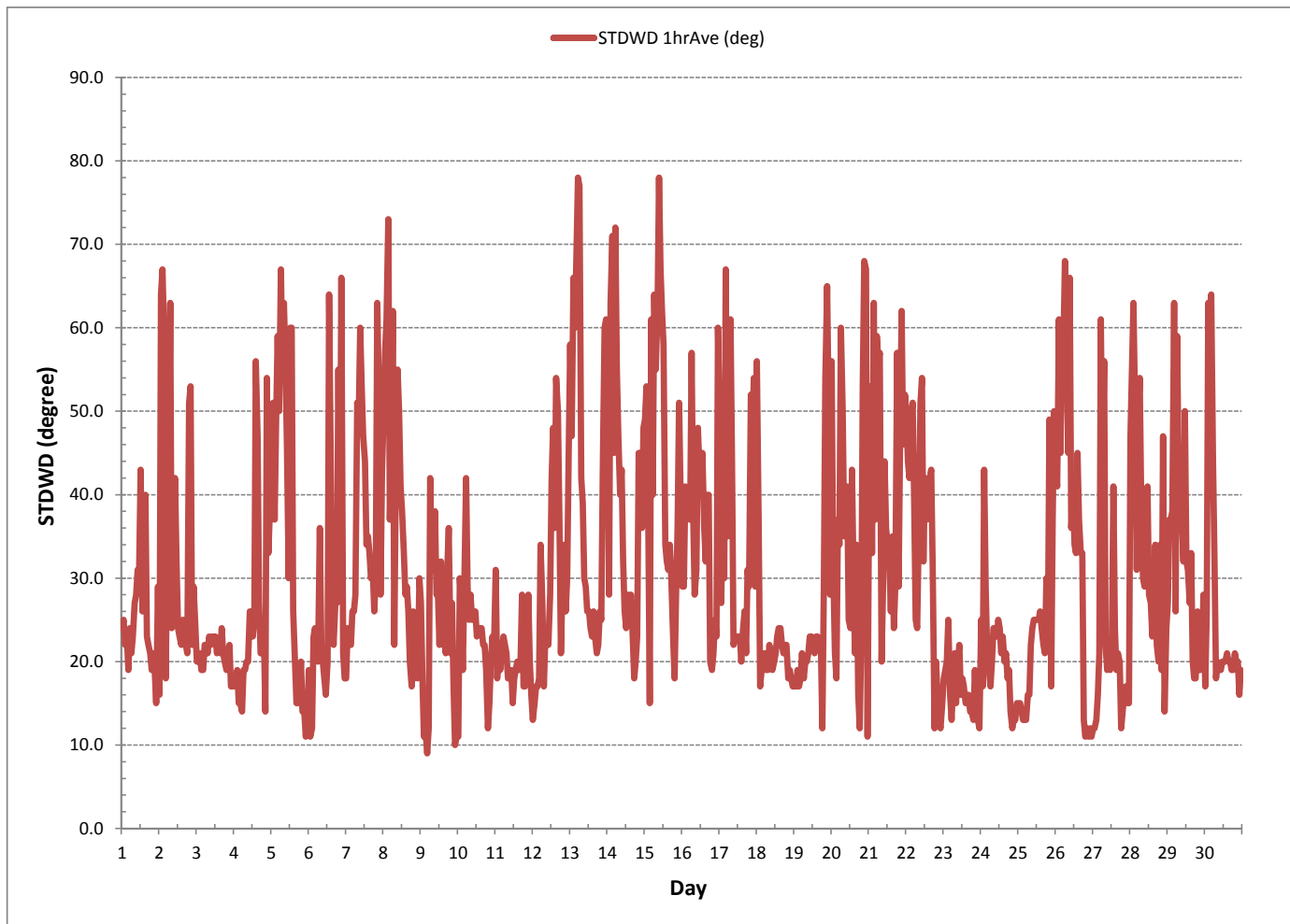
STATUS FLAG CODES

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

LAST CALIBRATION: April 1, 2015

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



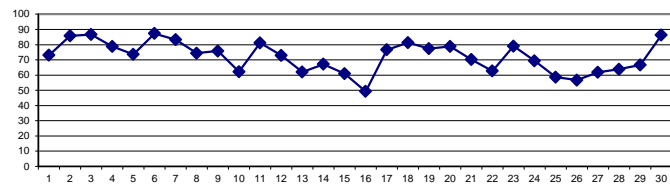
RELATIVE HUMIDITY Hourly Averages (RH %)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	74	77	80	83	86	88	89	87	85	82	72	64	63	61	56	50	51	48	59	67	74	80	85	92	48	92	73	24	
2	94	95	95	95	96	97	96	93	86	84	84	81	76	78	73	68	74	79	82	85	86	88	84	90	68	97	86	24	
3	97	96	94	93	94	94	91	87	84	76	69	70	67	70	73	78	89	92	93	94	95	95	94	67	97	87	24		
4	93	93	92	90	88	91	92	90	86	81	74	63	63	61	53	51	55	60	65	81	90	93	93	94	51	94	79	24	
5	94	94	95	95	95	94	94	86	70	59	56	55	52	49	51	52	53	55	63	76	79	82	85	81	49	95	74	24	
6	81	86	79	78	79	85	93	96	95	95	95	92	87	79	76	82	77	74	85	94	96	97	97	98	74	98	87	24	
7	98	98	99	99	100	100	100	100	100	100	98	69	59	59	58	48	46	53	65	81	87	92	94	94	46	100	83	24	
8	95	96	96	96	96	96	97	97	80	64	51	48	48	67	50	49	52	58	63	66	75	79	82	85	48	97	74	24	
9	91	87	92	94	94	95	95	92	90	79	70	65	64	60	52	46	47	45	62	79	84	86	77	74	45	95	76	24	
10	72	74	82	84	89	92	88	82	71	70	61	51	41	35	30	31	29	33	41	55	64	69	72	77	29	92	62	24	
11	85	85	86	82	79	79	79	78	80	83	84	86	90	87	85	76	69	67	68	72	85	89	88	67	90	81	24		
12	88	89	91	91	90	91	91	86	80	72	62	56	53	51	52	48	45	47	60	77	82	82	83	84	45	91	73	24	
13	86	89	89	89	89	89	88	81	71	57	49	42	37	34	34	34	33	35	41	49	51	66	76	81	33	89	62	24	
14	84	86	88	91	91	92	91	75	65	61	56	48	43	39	37	36	36	36	46	68	79	86	88	90	36	92	67	24	
15	92	92	93	94	94	94	94	81	69	61	47	42	36	31	30	32	34	38	46	51	55	52	52	53	30	94	61	24	
16	54	54	63	61	68	71	74	65	54	49	44	40	35	33	33	30	30	33	40	45	46	48	52	60	30	74	49	24	
17	71	73	74	75	77	71	69	74	77	76	76	77	79	78	70	65	63	62	76	85	90	92	93	95	62	95	77	24	
18	93	94	93	91	94	95	97	96	93	89	86	85	84	74	67	61	57	58	62	69	75	78	78	82	57	97	81	24	
19	84	85	85	86	87	89	90	89	82	78	72	67	65	63	63	56	51	53	70	82	88	90	91	93	51	93	77	24	
20	95	94	93	92	92	94	94	95	87	74	63	64	66	63	57	56	53	52	69	81	87	89	90	91	52	95	79	24	
21	93	92	92	93	94	95	95	89	78	70	59	51	44	38	36	36	37	42	57	69	75	80	84	88	36	95	70	24	
22	89	89	89	89	90	91	89	75	63	55	51	46	36	33	30	32	35	37	49	54	63	71	74	75	30	91	63	24	
23	78	80	82	78	80	80	79	77	75	73	69	71	73	73	74	78	79	78	81	82	85	87	91	93	69	93	79	24	
24	93	93	93	93	93	95	96	92	82	68	63	63	57	47	44	45	42	43	43	47	55	64	80	69	66	42	96	69	24
25	67	71	73	76	79	79	78	72	63	55	48	41	31	29	29	28	31	35	48	63	71	80	82	79	28	82	59	24	
26	81	85	85	90	89	89	88	79	59	49	44	38	34	31	32	32	32	34	40	44	47	50	53	56	31	90	57	24	
27	59	60	62	64	67	70	80	77	65	54	54	66	70	79	62	53	49	46	54	56	60	55	55	69	46	80	62	24	
28	80	81	87	87	87	86	88	85	69	58	48	40	40	39	39	36	38	41	52	62	71	74	68	76	36	88	64	24	
29	81	83	87	87	89	90	91	87	72	59	51	45	46	42	39	34	36	43	55	66	72	77	81	85	34	91	67	24	
30	87	87	92	92	94	95	97	97	95	88	86	83	82	80	79	76	75	76	80	83	87	86	87	87	75	97	86	24	
HOURLY MAX	98	98	99	99	100	100	100	100	100	100	98	92	90	87	87	85	89	92	93	94	96	97	97	98					
HOURLY AVG	84.3	85.3	86.7	86.9	88.0	88.9	89.4	85.3	77.5	70.6	64.7	60.1	57.0	55.3	52.2	50.2	50.2	51.8	60.6	69.6	75.0	79.0	80.0	82.3					

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

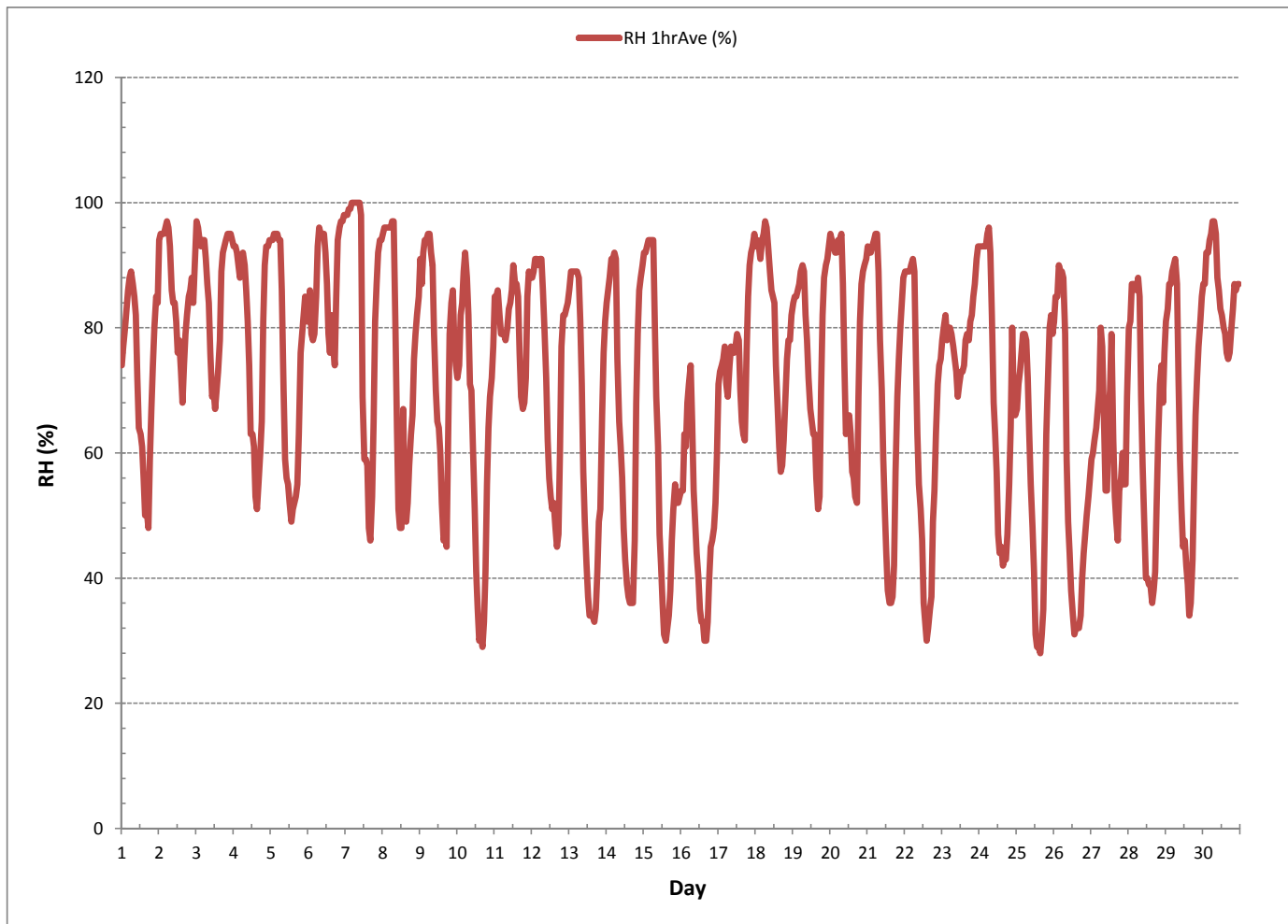
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	28	%	@ HOUR(S)	15	ON DAY(S)	25
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR(S)	VAR	ON DAY(S)	7
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY(S)	3, 6
					VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	19.20		MONTHLY AVERAGE:		72	%

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



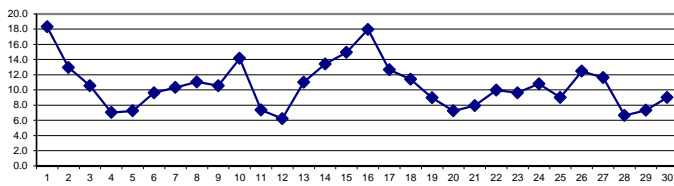
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.
1	1	17.6	16.9	16.1	15.5	14.8	14.3	14.4	14.9	15.6	16.6	19.5	21.9	22.3	23.1	24.7	26.0	24.5	23.5	21.0	18.6	16.8	15.3	13.6	11.5	11.5	26.0	18.3	24
2	2	10.9	10.2	8.7	8.0	7.4	8.2	9.2	11.7	13.3	13.4	13.5	14.3	15.4	15.1	16.4	17.5	16.7	16.2	15.6	15.2	15.0	14.4	12.6	11.6	7.4	17.5	12.9	24
3	3	11.3	10.8	10.7	10.3	10.1	10.0	10.0	10.4	11.0	12.0	13.2	13.1	13.3	12.8	12.2	11.4	9.9	9.1	8.7	8.7	8.8	8.8	8.6	8.1	8.1	13.3	10.6	24
4	4	7.3	6.7	6.4	6.2	5.7	4.7	4.7	5.8	6.7	7.5	8.7	9.3	9.1	9.7	11.3	11.9	10.7	10.3	9.3	6.6	4.1	2.9	2.0	1.1	1.1	11.9	7.0	24
5	5	0.2	-0.2	-0.6	-0.9	-1.1	-1.3	-0.4	4.1	9.1	11.6	12.2	12.2	13.1	13.5	13.5	13.1	13.0	12.9	11.3	8.9	8.0	7.4	6.7	7.7	-1.3	13.5	7.3	24
6	6	7.8	6.3	7.8	8.4	8.2	7.2	6.4	7.3	8.1	7.9	8.5	9.8	11.5	13.0	13.9	13.1	14.0	14.4	12.7	9.9	8.7	9.4	8.4	8.1	6.3	14.4	9.6	24
7	7	7.7	7.0	6.2	5.9	5.4	5.3	5.1	5.9	6.8	8.5	11.3	14.9	17.3	17.1	15.7	18.2	17.7	16.9	14.0	10.9	9.2	7.8	6.9	5.9	5.1	18.2	10.3	24
8	8	4.8	3.9	3.2	2.6	2.3	1.8	2.2	5.3	11.1	15.6	17.7	18.8	18.6	15.1	17.9	16.5	18.0	17.0	14.2	13.6	12.6	11.8	10.8	10.0	1.8	18.8	11.1	24
9	9	8.1	9.4	7.9	6.9	5.5	5.1	6.5	7.7	8.9	11.3	13.2	14.0	13.9	14.7	15.6	16.4	16.1	16.4	13.5	9.4	7.8	7.0	8.5	9.2	5.1	16.4	10.5	24
10	10	9.9	10.1	9.4	9.4	9.0	9.2	10.2	11.6	14.3	15.3	17.4	19.0	19.9	20.9	20.7	20.3	19.4	18.5	17.0	14.1	12.1	11.0	10.7	10.0	9.0	20.9	14.1	24
11	11	8.1	8.4	8.3	8.8	8.6	8.0	8.1	8.4	8.2	7.6	7.6	7.2	7.1	6.7	6.6	7.0	7.4	7.7	7.4	6.9	6.5	5.2	5.3	5.2	5.2	8.8	7.3	24
12	12	5.0	4.9	4.5	4.3	4.6	4.5	4.5	4.8	5.7	6.9	7.2	8.0	8.4	9.2	9.3	10.1	10.8	10.9	8.3	4.9	3.6	3.3	3.0	2.7	2.7	10.9	6.2	24
13	13	2.4	1.5	1.6	1.5	1.3	1.3	2.0	4.2	7.4	11.1	14.1	16.3	18.6	19.9	20.8	21.5	21.3	20.9	18.5	15.6	14.6	11.3	9.0	7.7	1.3	21.5	11.0	24
14	14	6.5	5.6	4.9	4.3	3.8	3.4	4.0	9.2	13.5	16.1	18.3	20.3	22.1	23.2	23.4	23.7	23.4	22.4	19.7	14.5	12.0	10.3	9.2	8.0	3.4	23.7	13.4	24
15	15	7.3	6.5	5.7	5.6	5.4	4.2	4.7	9.5	13.9	16.7	19.6	20.6	21.9	23.5	23.7	23.8	23.3	22.1	19.7	17.9	16.4	16.2	15.5	15.0	4.2	23.8	14.9	24
16	16	15.2	14.8	12.6	12.8	11.2	10.3	10.0	12.6	16.0	18.2	20.4	22.1	23.3	24.6	25.1	25.8	25.0	23.9	21.3	19.4	18.4	17.4	16.0	14.3	10.0	25.8	17.9	24
17	17	11.8	11.1	11.0	11.4	11.4	12.0	12.3	12.3	12.2	12.9	13.7	14.6	15.2	15.6	16.0	16.8	17.4	17.2	14.1	11.2	9.6	8.7	7.9	7.6	7.6	17.4	12.7	24
18	18	8.1	8.5	10.1	11.2	11.1	11.0	10.8	10.6	10.9	11.5	11.6	11.5	11.9	13.5	14.5	15.3	15.1	14.3	12.9	11.6	10.7	9.7	9.1	8.1	8.1	15.3	11.4	24
19	19	7.8	7.6	7.9	8.2	8.2	7.7	7.8	8.9	9.8	10.6	11.6	12.1	12.4	12.4	12.4	12.6	13.0	13.0	9.8	6.9	5.2	3.9	3.0	2.2	2.2	13.0	9.0	24
20	20	3.3	4.2	5.4	5.8	4.7	2.5	2.2	4.6	7.1	9.9	11.8	11.6	11.7	12.1	12.6	12.6	12.9	12.8	9.4	6.0	4.0	2.9	2.4	1.3	1.3	12.9	7.2	24
21	21	0.9	1.7	0.9	0.0	-0.1	0.6	0.7	3.8	7.3	10.3	13.2	14.7	15.1	16.3	16.9	17.1	16.5	15.6	11.8	8.2	6.3	5.3	4.3	3.2	-0.1	17.1	7.9	24
22	22	2.3	1.5	1.2	1.3	0.8	0.5	0.6	4.6	9.6	12.8	14.8	16.1	17.5	18.0	18.4	18.2	18.0	17.0	13.7	12.4	11.1	9.5	9.7	10.0	0.5	18.4	10.0	24
23	23	9.2	8.7	8.3	9.7	9.5	9.4	9.4	9.5	9.6	10.0	10.5	10.5	10.5	10.5	10.4	10.0	9.9	10.0	9.7	9.6	9.3	9.1	8.8	8.7	8.3	10.5	9.6	24
24	24	8.8	8.8	8.9	9.1	9.0	8.4	9.0	9.7	11.2	12.6	12.1	13.6	15.3	15.3	14.9	15.4	14.9	13.7	12.3	10.4	8.2	5.2	6.0	6.4	5.2	15.4	10.8	24
25	25	6.1	5.3	4.7	4.0	3.2	3.0	2.9	4.6	7.9	10.7	13.0	14.4	16.3	16.6	17.1	17.2	16.6	15.5	11.8	7.8	5.6	4.4	3.8	3.4	2.9	17.2	9.0	24
26	26	2.7	1.8	1.5	0.8	0.4	0.2	0.5	3.6	10.2	14.2	16.6	19.0	20.7	22.3	22.3	22.6	22.4	21.6	18.8	17.3	16.1	15.1	14.5	13.9	0.2	22.6	12.5	24
27	27	13.4	12.9	12.3	11.6	10.7	9.7	7.5	8.4	12.4	16.4	16.4	13.9	12.7	12.2	13.9	14.7	14.8	14.2	11.8	10.2	8.5	8.1	7.6	4.8	4.8	16.4	11.6	24
28	28	2.4	0.9	-0.1	-0.9	-0.6	-1.0	-1.3	0.7	5.0	8.3	11.8	13.7	13.7	14.1	13.7	14.1	13.6	12.9	10.5	8.0	6.3	5.3	5.1	3.2	-1.3	14.1	6.6	24
29	29	1.9	1.0	0.0	-0.7	-1.0	-1.2	-1.4	0.2	5.9	10.8	12.8	14.5	15.1	15.4	15.7	16.4	15.7	14.0	10.9	8.0	6.6	5.6	4.9	4.9	-1.4	16.4	7.3	24
30	30	6.8	6.4	5.1	5.2	7.1	8.2	8.8	9.1	9.5	10.0	10.4	10.8	10.9	11.2	11.1	10.8	10.4	9.9	9.4	9.0	8.8	8.9	9.0	9.0	5.1	11.2	9.0	24
HOURLY MAX		17.6	16.9	16.1	15.5	14.8	14.3	14.4	14.9	16.0	18.2	20.4	22.1	23.3	24.6	25.1	26.0	25.0	23.9	21.3	19.4	18.4	17.4	16.0	15.0				
HOURLY AVG		7.2	6.8	6.4	6.2	5.9	5.6	5.7	7.5	9.9	11.9	13.4	14.4	15.2	15.6	16.0	16.3	16.1	15.5	13.3	11.1	9.7	8.7	8.1	7.4				

STATUS FLAG CODES

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

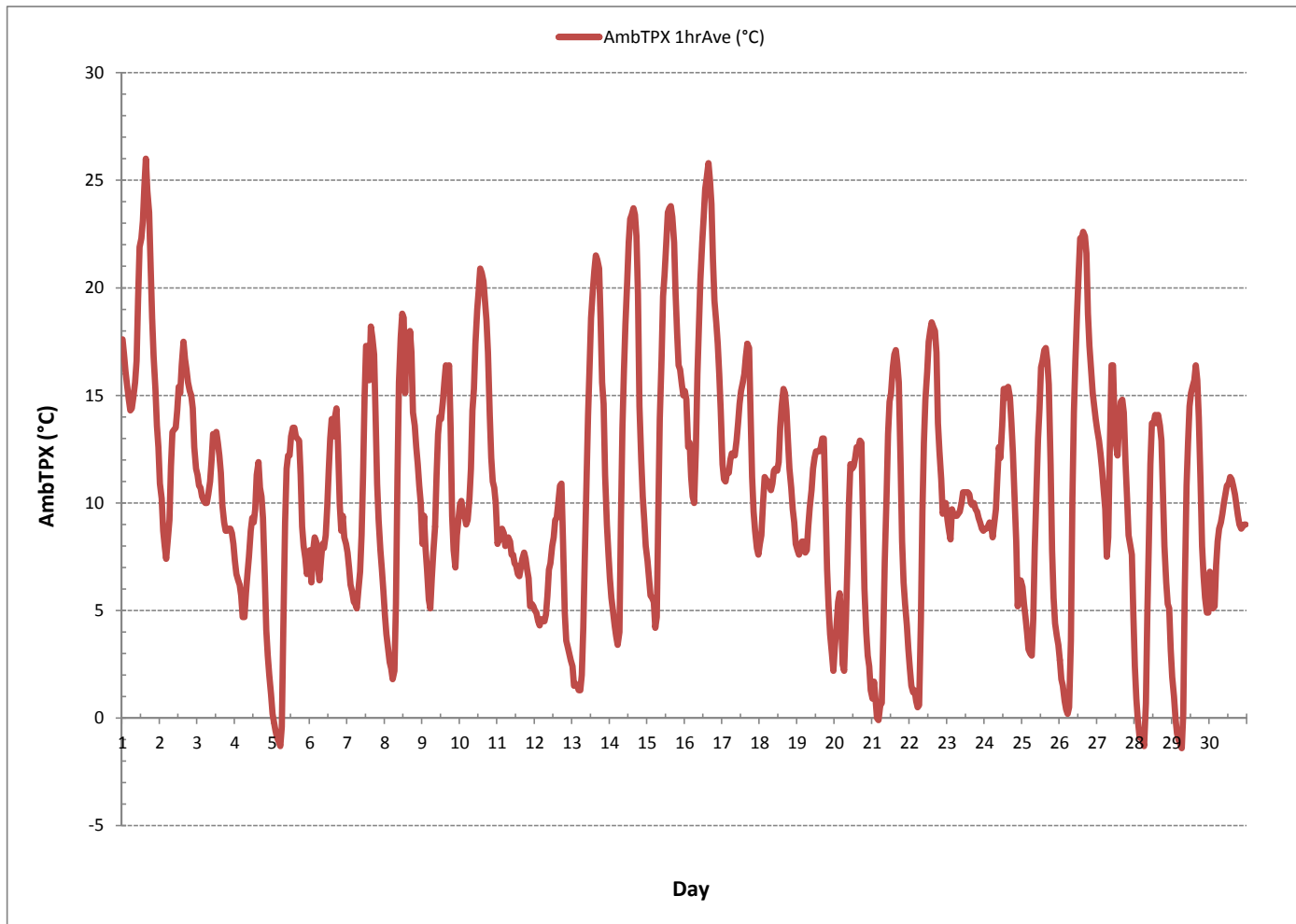
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-1.4 °C	@ HOUR(S)	6	ON DAY(S)	29
MAXIMUM 1-HR AVERAGE:	26.0 °C	@ HOUR(S)	15	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	18.3 °C			ON DAY(S)	1
				VAR-VARIOUS	
OPERATIONAL TIME:				720	HRS
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.61	MONTHLY AVERAGE:		10.6	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

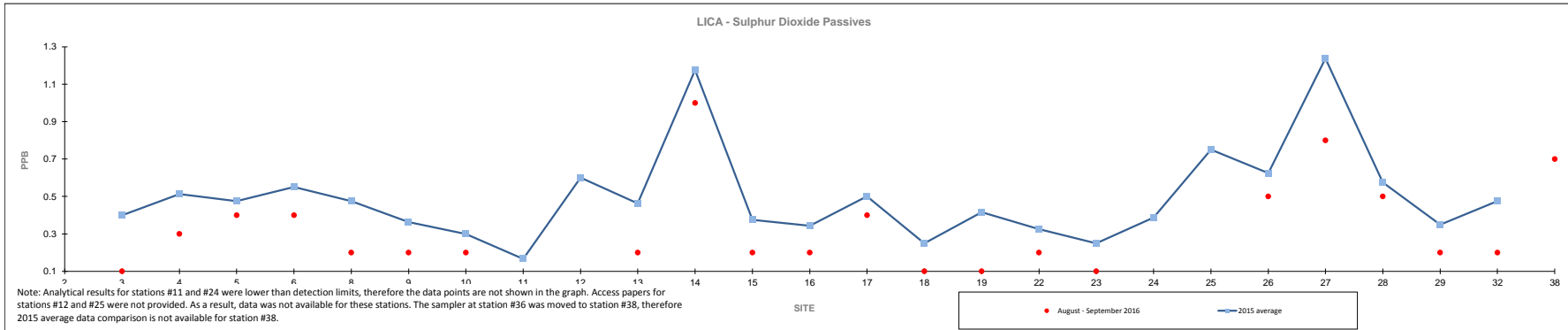


APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

PASSIVE RESULTS

Passive Summary Results for August - September 2016
Lakeland Industry & Community Association

	Sulphur Dioxide ppb																												August - September 2016	
	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	36	Reading	Site	
Mean	NA	0.4	0.5	0.5	0.6	0.5	0.4	0.3	0.2	0.6	0.5	1.2	0.4	0.3	0.5	0.3	0.4	0.3	0.3	0.4	0.8	0.6	1.2	0.6	0.4	0.5	0.4	0.3	-	
Minimum	NA	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.5	0.2	0.5	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.2	0.7	0.3	0.5	0.3	0.1	0.2	0.1	<0.1	#11, #24	
Maximum	NA	0.7	1.1	0.9	1.1	0.8	0.6	0.5	0.3	0.7	0.8	1.7	0.7	0.6	0.8	0.5	0.7	0.6	0.4	0.6	0.8	1.1	2.0	1.0	0.5	0.9	0.8	1.0	#14	



Lakeland Industry & Community Association SO₂ Passive Bubble Map

AUGUST - SEPTEMBER 2016

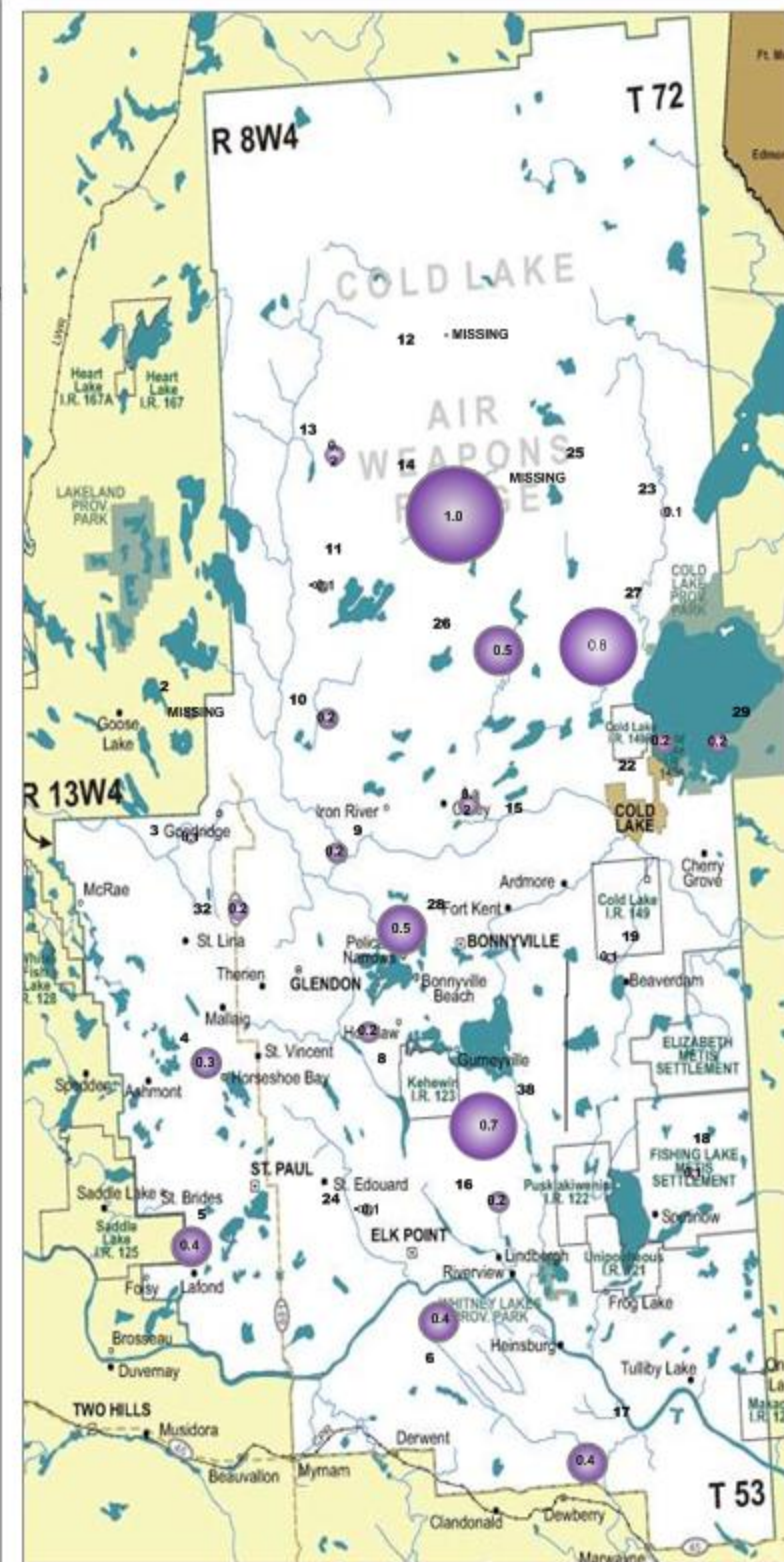
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	0.1 PPB	NA
4 – Flat Lake	0.3 PPB	NA
5 – Lake Eliza	0.4 PPB	0.4 PPB
6 – Telegraph Creek	0.4 PPB	0.3 PPB
8 – Muriel-Kehewin	0.2 PPB	0.2 PPB
9 – Dupre	0.2 PPB	NA
10 – La Corey	0.2 PPB	NA
11 – Wolf Lake	<0.1 PPB	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.2 PPB	NA
14 – Maskwa	1.0 PPB	NA
15 – Ardmore	0.2 PPB	NA
16 – Frog Lake	0.2 PPB	NA
17 – Clear Range	0.4 PPB	NA
18 – Fishing Lake	0.1 PPB	NA
19 – Beaverdam	0.1 PPB	NA
22 – Cold Lake South	0.2 PPB	NA
23 – Medley-Martineau	0.1 PPB	NA
24 – Fort George	<0.1 PPB	NA
25 – Burnt Lake	MISSING	NA
26 – Mahikan	0.5 PPB	NA
27 – Mahkeses	0.8 PPB	NA
28 – Town of Bonnyville	0.5 PPB	NA
29 – Cold Lake South 2	0.2 PPB	NA
32 – St. Lina	0.2 PPB	NA
38 – Bonnyville	0.7 PPB	NA



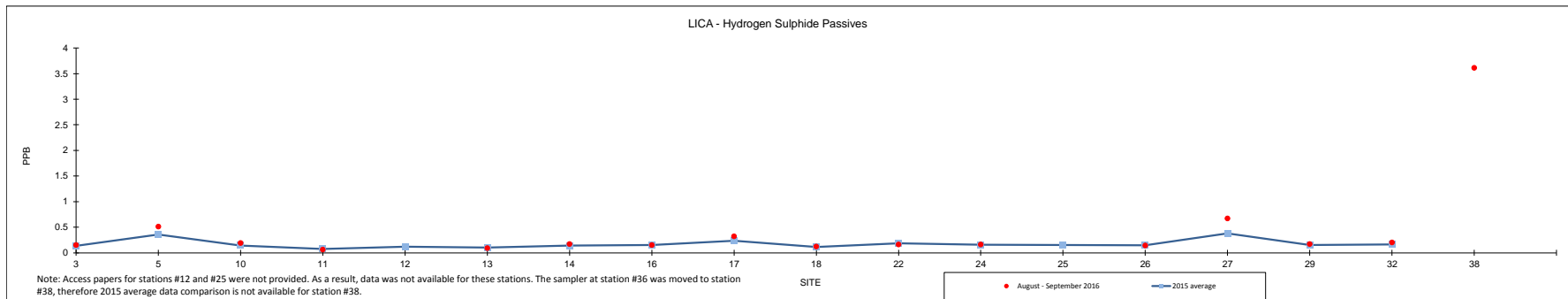
Summary

Minimum : <0.1 PPB – Wolf Lake and Fort George
 Maximum: 1.0 PPB – Maskwa
 Average: 0.3 PPB *Includes Duplicates



Passive Summary Results for August - September 2016
Lakeland Industry & Community Association

	Hydrogen Sulphide ppb																	August - September 2016		
	3	5	10	11	12	13	14	2015 16	17	18	22	24	25	26	27	29	32	36	Reading	Site
Mean	0.14	0.36	0.14	0.07	0.12	0.10	0.14	0.15	0.24	0.12	0.19	0.16	0.15	0.15	0.38	0.15	0.17	0.17	0.43	-
Minimum	0.09	0.13	0.10	0.05	0.09	0.07	0.11	0.10	0.15	0.08	0.10	0.11	0.12	0.08	0.15	0.09	0.08	0.11	0.06	#11
Maximum	0.22	0.86	0.20	0.10	0.15	0.14	0.19	0.22	0.46	0.15	0.43	0.25	0.18	0.24	0.87	0.27	0.30	0.28	3.61	#38

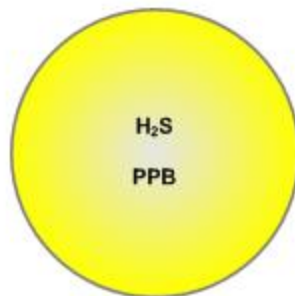


Lakeland Industry & Community Association H₂S Passive Bubble Map

AUGUST - SEPTEMBER 2016

PASSIVE STATIONS

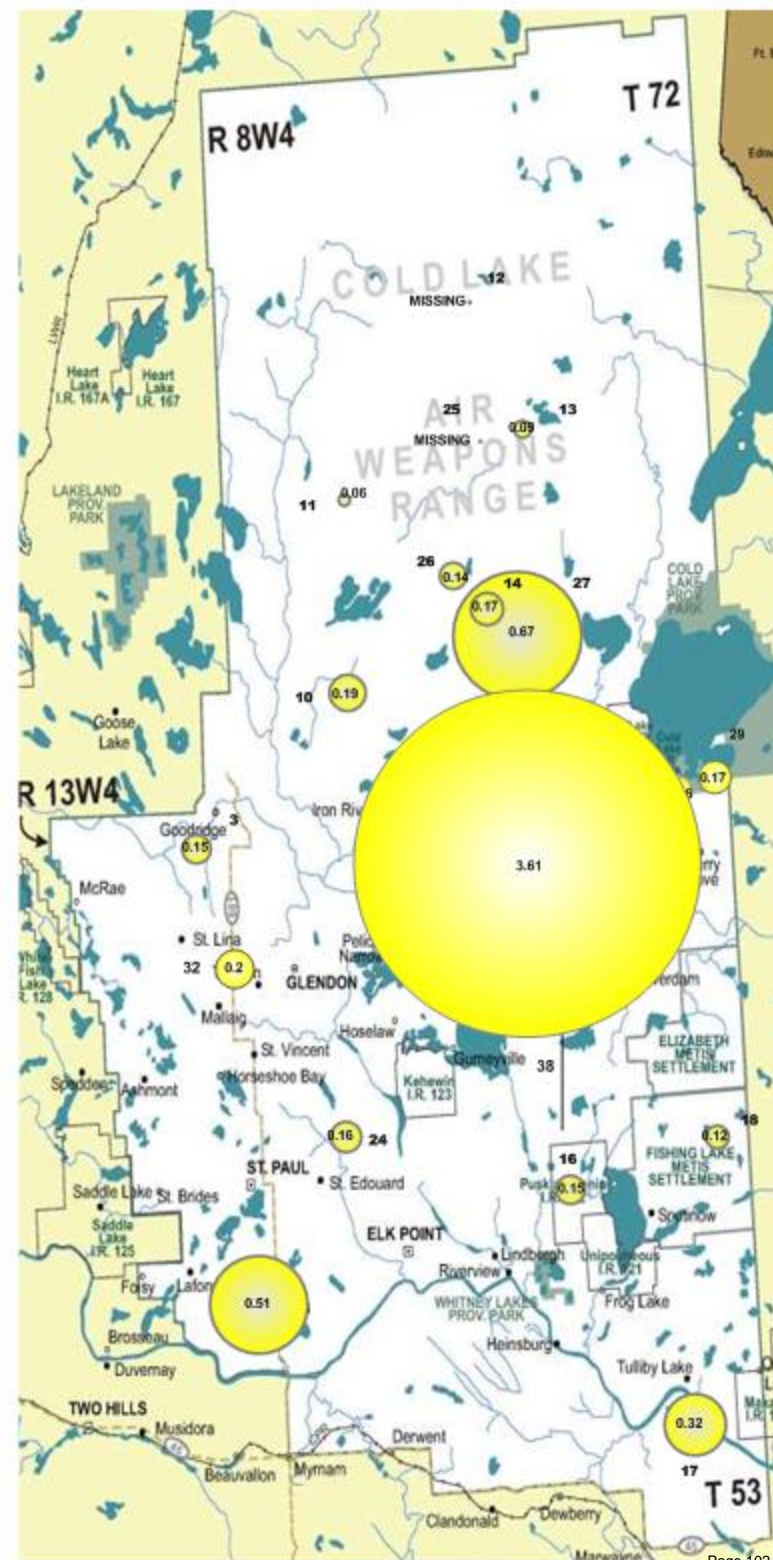
Station	Reading	DUPLICATE
3 - Therien	0.15 PPB	NA
5 - Lake Eliza	0.51 PPB	NA
10 - La Corey	0.19 PPB	NA
11 - Wolf Lake	0.06 PPB	0.06 PPB
12 - Foster Creek	MISSING	NA
13 - Primrose	0.09 PPB	0.08 PPB
14 - Maskwa	0.17 PPB	NA
16 - Frog Lake	0.15 PPB	NA
17 - Clear Range	0.32 PPB	NA
18 - Fishing Lake	0.12 PPB	NA
22 - Cold Lake South	0.16 PPB	NA
24 - Fort George	0.16 PPB	NA
25 - Burnt Lake	MISSING	NA
26 - Mahihkan	0.14 PPB	NA
27 - Mahkeses	0.67 PPB	NA
29 - Cold Lake South 2	0.17 PPB	NA
32 - St. Lina	0.20 PPB	NA
38 - Bonnyville	3.61 PPB	NA



Summary

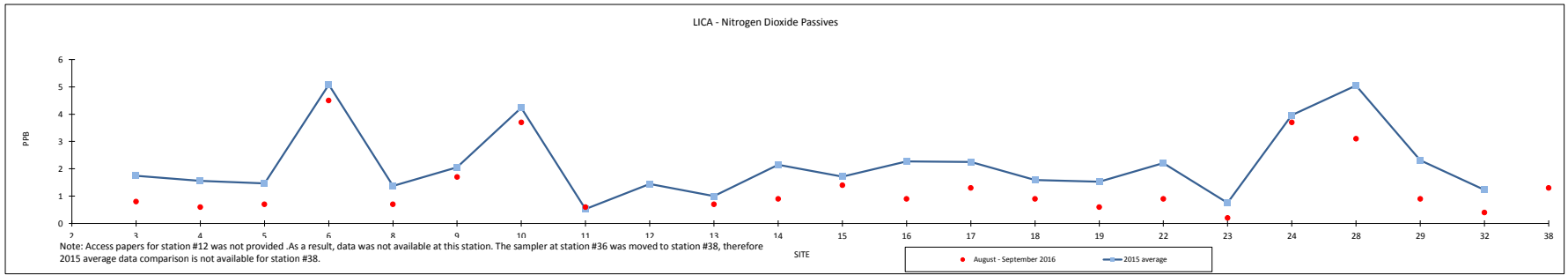
Minimum : 0.06 PPB - Wolf Lake
Maximum: 3.61 PPB - Bonnyville
Average: 0.43 PPB

Note: The scale for Bonnyville's (38) bubble graph was reduced by half due to the large size



Passive Summary Results for August - September 2016
Lakeland Industry & Community Association

	Nitrogen Dioxide ppb																				August - September 2016					
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	28	29	32	36	Reading	Site
Mean	NA	1.8	1.6	1.5	5.1	1.4	2.1	4.2	0.5	1.5	1.0	2.2	1.7	2.3	2.3	1.6	1.5	2.2	0.8	4.0	5.1	2.3	1.2	4.5	1.4	-
Minimum	NA	0.7	0.7	0.5	3.2	0.6	0.9	2.0	0.3	1.4	0.4	0.5	0.6	0.6	1.0	0.7	0.5	0.6	0.1	1.8	1.4	0.5	0.2	1.5	0.2	#23
Maximum	NA	4.5	3.5	3.8	8.8	4.0	4.8	9.0	0.8	1.5	2.1	5.1	3.5	4.8	3.4	3.7	3.8	7.0	1.9	7.3	10.7	6.0	4.0	11.2	4.5	#6

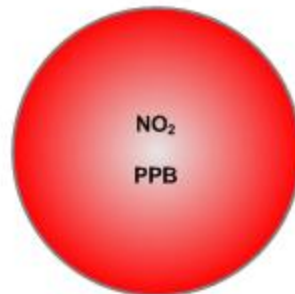


Lakeland Industry & Community Association NO₂ Passive Bubble Map

AUGUST - SEPTEMBER 2016

PASSIVE STATIONS

	PASSIVE STATIONS	DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	0.8 PPB	NA
4 – Flat Lake	0.6 PPB	NA
5 – Lake Eliza	0.7 PPB	NA
6 – Telegraph Creek	4.5 PPB	NA
8 – Muriel-Kehewin	0.7 PPB	NA
9 – Dupre	1.7 PPB	NA
10 – La Corey	3.7 PPB	NA
11 – Wolf Lake	0.6 PPB	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.7 PPB	NA
14 – Maskwa	0.9 PPB	NA
15 – Ardmore	1.4 PPB	NA
16 – Frog Lake	0.9 PPB	NA
17 – Clear Range	1.3 PPB	NA
18 – Fishing Lake	0.9 PPB	NA
19 – Beaverdam	0.6 PPB	NA
22 – Cold Lake South	0.9 PPB	NA
23 – Medley-Martineau	0.2 PPB	NA
24 – Fort George	3.7 PPB	NA
28 – Town of Bonnyville	3.1 PPB	NA
29 – Cold Lake South 2	0.9 PPB	0.9 PPB
32 – St. Lina	0.4 PPB	0.3 PPB
38 – Bonnyville	1.3 PPB	NA



Summary

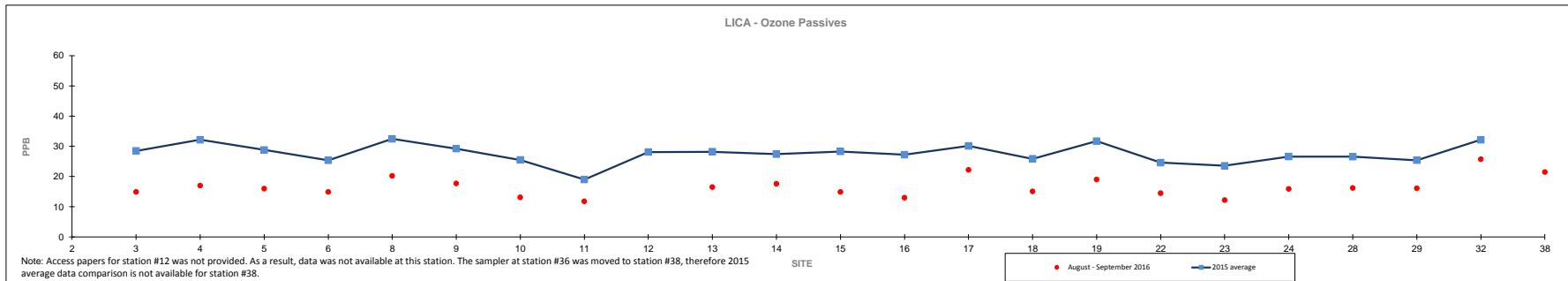
Minimum : 0.2 PPB – Medley-Martineau
Maximum: 4.5 PPB – Telegraph Creek

Average: 1.4 PPB *Includes Duplicates



Passive Summary Results for August - September 2016
Lakeland Industry & Community Association

	Ozone ppb																												August - September 2016	
	2	3	4	5	6	8	9	10	11	12	2015 13	14	15	16	17	18	19	22	23	24	28	29	32	36	Reading	Site				
Mean	NA	28.5	32.2	28.8	25.4	32.5	29.2	25.5	19.0	28.1	28.2	27.4	26.3	27.2	30.1	25.9	31.7	24.6	23.6	26.6	26.6	25.4	32.2	29.0	16.6	-				
Minimum	NA	21.1	24.8	20.5	17.3	25.5	18.4	16.6	14.5	28.1	20.4	20.3	18.2	19.2	20.6	16.3	24.6	18.7	15.0	17.6	17.7	19.0	24.4	18.6	11.8	#11				
Maximum	NA	36.5	39.1	36.3	35.3	42.3	40.1	35.6	22.9	28.1	37.2	33.5	39.3	42.4	42.2	36.9	36.8	29.5	31.9	34.0	40.5	33.0	42.2	37.6	25.7	#32				

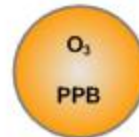


Lakeland Industry & Community Association O₃ Passive Bubble Map

AUGUST – SEPTEMBER 2016

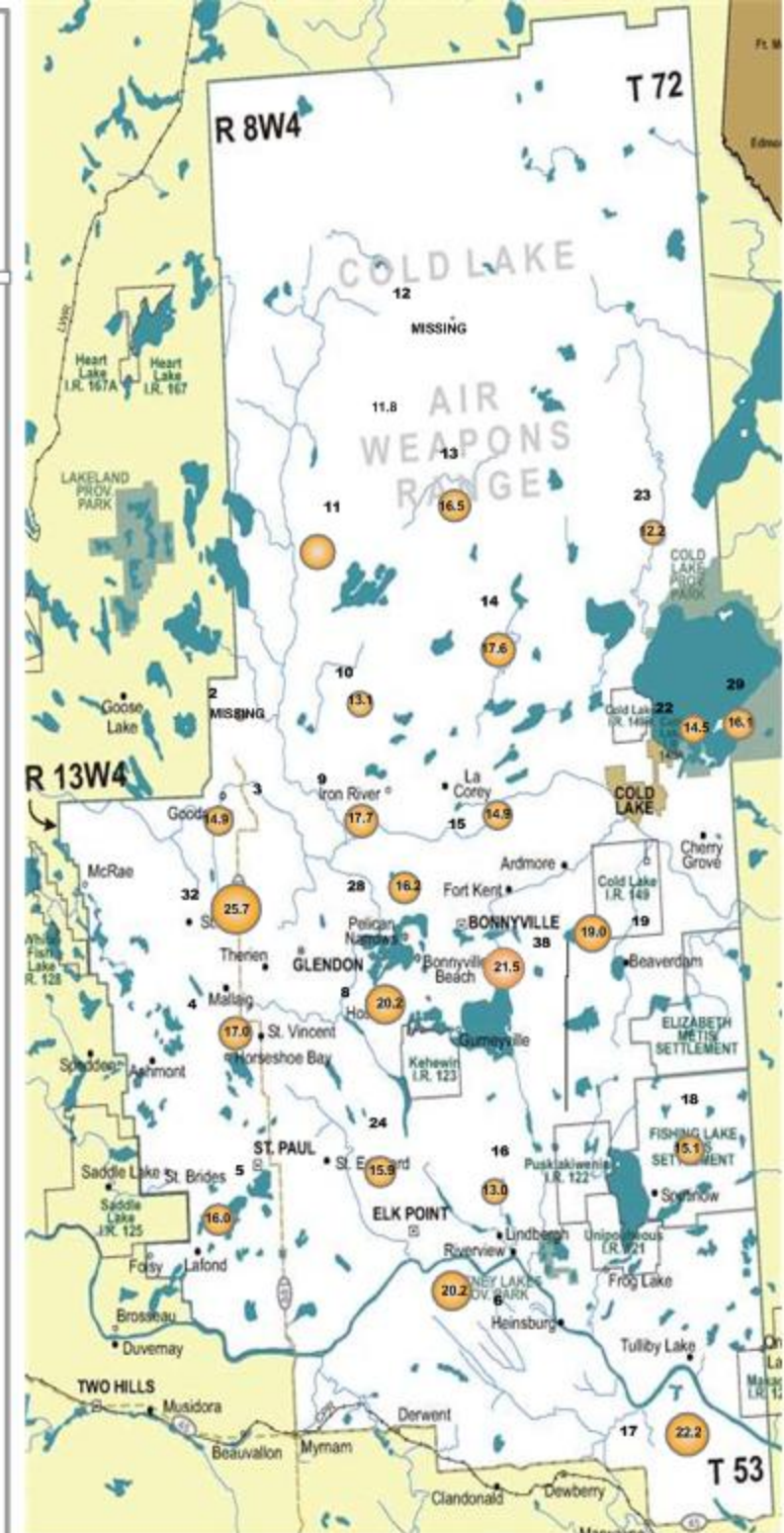
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	14.9 PPB	NA
4 – Flat Lake	17.0 PPB	NA
5 – Lake Eliza	16.0 PPB	NA
6 – Telegraph Creek	14.9 PPB	NA
8 – Muriel-Kehewin	20.2 PPB	NA
9 – Dupre	17.7 PPB	NA
10 – La Corey	13.1 PPB	NA
11 – Wolf Lake	11.8 ppb	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	16.5 PPB	NA
14 – Maskwa	17.6 PPB	NA
15 – Ardmore	14.9 PPB	NA
16 – Frog Lake	13.0 PPB	NA
17 – Clear Range	22.2 PPB	NA
18 – Fishing Lake	15.1 PPB	NA
19 – Beaverdam	19.0 PPB	NA
22 – Cold Lake South	14.5 PPB	NA
23 – Medley-Martineau	12.2 PPB	NA
24 – Fort George	15.9 PPB	NA
28 – Town of Bonnyville	16.2 PPB	NA
29 – Cold Lake South 2	17.7 PPB	14.4 PPB
32 – St. Lina	25.8 PPB	25.6 PPB
38 – Bonnyville	21.5 PPB	NA



Summary

Minimum : 11.8 PPB – Wolf Lake
 Maximum: 25.7 PPB – St. Lina
 Average: 16.6 PPB *Includes Duplicates



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: S5669
 Station ID: LICA 01 Installation Date/Time (mst): Aug 31, 2016 @ 08:44
 Sample ID: LICA/VOC/CLS/Sep 03, 2016 Removal Date/Time (mst): Sep 06, 2016 @ 08:50

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 03, 2016</u>	<u>00:00</u>	<u>00:00 Sep 04, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.5</u>	<u>+24.7</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = -27.5 @ 08:44 (Aug 31) mst
 Final leak check deployment vacuum (in. Hg) = -27.5 @ 08:09 (Sep 2) mst
 Total leak rate = 0.0 psi over 47 hours 35 minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sept 2, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

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

Comments: Date of last audit: Sept 2, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 06, 2016

Sample ID: 16090076-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Sep 03, 2016



Volatile Organics Data Results

Date: September 3, 2016
Canister ID: S5669

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	< 0.02
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	0.02
Acetone	1.8
Acrolein	< 0.3
Benzene	0.02
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.05
Carbon tetrachloride	0.09
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.19
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	0.5
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.28

Volatile Organics Data Results

Date: September 3, 2016
Canister ID: S5669

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.13
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.11
Isopentane	0.14
Isoprene	0.09
Isopropyl alcohol	0.8
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
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	0.21
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
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	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.10
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: 2664
 Station ID: LICA 01 Installation Date/Time (mst): Sep 06, 2016 @ 08:50
 Sample ID: LICA/VOC/CLS/Sep 09, 2016 Removal Date/Time (mst): Sep 14, 2016 @ 08:47

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
Sep 09, 2016	00:00	00:00 Sep 10, 2016	24.0

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
-27.3	+23.4

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
10.0	6:52	24

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: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 3, 2016 (due every 6 months)

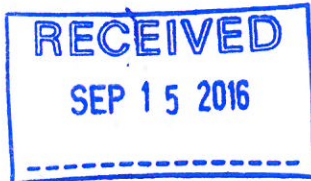
Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit : Sep 02, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 14, 2016

Sample ID: 16090151-003
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Sep 9, 2016



Volatile Organics Data Results

Date: September 9, 2016
Canister ID: 2664

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	0.04
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	0.16
1-Hexene	< 0.02
1-Pentene	0.03
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	0.02
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.06
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	5.9
Acrolein	0.4
Benzene	0.05
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	4.21
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.49
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	0.29

Volatile Organics Data Results

Date: September 9, 2016
Canister ID: 2664

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.47
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.59
Isopentane	0.52
Isoprene	0.14
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	1.3
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	0.20
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
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	0.02
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	0.02
trans-2-Pentene	0.02
Trichloroethylene	< 0.04
Vinyl acetate	1.1
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: S5611
 Station ID: LICA 01 Installation Date/Time (mst): Sep 14, 2016 @ 08:47
 Sample ID: LICA/VOC/CLS/ Sep 15, 2016 Removal Date/Time (mst): Sep 19, 2016 @ 09:04

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
Sep 15, 2016	00:00	00:00 Sep 16, 2016	24.0

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
-27.6	+25.0

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
10.0	6.52	24

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: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

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

Comments: Date of last audit : Sep 02, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 19, 2016

Sample ID: 16090250-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Sept 15, 2016



Volatile Organics Data Results

Date: September 15, 2016
Canister ID: S5611

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	0.03
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.15
1-Hexene	< 0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	< 0.01
2-Methylpentane	0.07
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.05
Acetone	3.2
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.09
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	2.1
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.31

Volatile Organics Data Results

Date: September 15, 2016
Canister ID: S5611

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.60
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.31
Isopentane	0.22
Isoprene	0.21
Isopropyl alcohol	1.7
Isopropylbenzene	< 0.01
m,p-Xylene	0.07
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	0.12
Methylcyclopentane	0.13
Methylene chloride	< 0.3
n-Butane	0.40
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.41
n-Nonane	< 0.01
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	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.14
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

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: S 5624
 Station ID: LICA 01 Installation Date/Time (mst): Sep 19, 2016 @ 09:04
 Sample ID: LICA/VOC/CLS/Sep 21, 2016 Removal Date/Time (mst): Sep 22, 2016 @ 08:04

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 21, 2016</u>	<u>00:00</u>	<u>00:00 Sep 22, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.9</u>	<u>+23.8</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</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: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

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

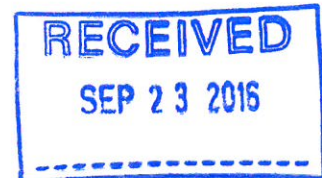
Comments: Date of last audit: Sep 02, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 22, 2016

Sample ID: 16090313-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Sep 21, 2016



Volatile Organics Data Results

Date: September 21, 2016
Canister ID: S5624

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	0.03
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	0.05
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.01
2-Methylheptane	0.01
2-Methylhexane	0.04
2-Methylpentane	0.06
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.04
Acetone	1.8
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.44
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.07
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.31

Volatile Organics Data Results

Date: September 21, 2016
Canister ID: S5624

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.62
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.33
Isopentane	0.23
Isoprene	0.06
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.07
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	0.11
Methylcyclopentane	0.09
Methylene chloride	< 0.3
n-Butane	0.34
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.11
n-Nonane	0.01
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	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.11
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: 14991
 Station ID: LICA 01 Installation Date/Time (mst): Sep 22, 2016 @ 08:04
 Sample ID: LICA/VOC/CLS/Sep 27, 2016 Removal Date/Time (mst): Sep 28, 2016 @ 08:36

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
Sep 27, 2016	00:00	00:00 Sep 28, 2016	24.0

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
- 27.3	+ 24.0

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
10.0	6.52	24

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: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

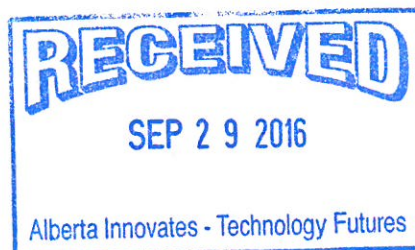
****Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required****

Comments: Date of last audit : Sep 02, 2016
The canister does not have a pressure gauge. Data was taken from a gauge on a sampler.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 28, 2016

Sample ID: 16090349-003
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Sep 27, 2016



Volatile Organics Data Results

Date: September 27, 2016
Canister ID: 14991

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	< 0.02
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	0.03
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.02
Acetone	2.0
Acrolein	< 0.3
Benzene	0.02
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.49
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	1.0
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.31

Volatile Organics Data Results

Date: September 27, 2016
Canister ID: 14991

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.65
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.33
Isopentane	0.21
Isoprene	0.01
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	0.04
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.36
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
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	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.03
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: 16090076-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Sep 03, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: 9702
 Location: Cold Lake South Motor S/N: 1138/ 100-1020
 Station ID: LICA 01 Installation Date/Time: Aug 31, 2016 / 08:52
 Field Sample ID: LICA/PUF/CLS/Sep 03, 2016 Removal Date/Time: Sep 06, 2016 / 09:16

Sample Data Collection Information

Sample Date: Sep 03, 2016 Average Pressure (mmHg) 705
 Start Time (mst): 00:00 Average Flow (Q_{std}) 229
 End Time (mst): 00:00 Sep 04, 2016 Average Temperature (°C) 11.4°
 Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.19

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
 Average temperature appears correct? YES NO
 Average pressure appears correct? YES NO
 Any error messages? (if yes list below) YES NO
 Sample duration 24 hours? YES NO

Date of last calibration/audit: September 2, 2016

Other observations? n/a



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Sep 06, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 3, 2016
PUF S/N: 9702

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.05
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
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	0.03
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	0.02
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.02
Perylene	< 0.01
Phenanthrene	0.10
Pyrene	< 0.01
Retene	< 0.01

Sample ID: 16090151-004

AIR FCD-01321/2

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Sep 9, 2016

Priority: Normal

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-09</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>Sep 06, 2016 / 09:16</u>
Field Sample ID:	<u>LICA/PUF/CLS/Sep 09, 2016</u>	Removal Date/Time:	<u>Sep 14, 2016 / 08:51</u>

Sample Data Collection Information

Sample Date:	<u>Sep 09, 2016</u>	Average Pressure (mmHg)	<u>713</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Sep 10, 2016</u>	Average Temperature (°C)	<u>12.1°</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	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>Sep 02, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Sep 14, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 9, 2016
PUF S/N: TE09

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
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	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
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	0.13
Pyrene	< 0.01
Retene	< 0.01

Sample ID: 16090250-002

AIF

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Sept 15, 2016



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: TE-06
Location: Cold Lake South Motor S/N: 1138/100-1020
Station ID: LICA 01 Installation Date/Time: Sep 14, 2016/08:51
Field Sample ID: LICA/PUF/CLS/Sept 15, 2016 Removal Date/Time: Sep 19, 2016/09:11

Sample Data Collection Information

Sample Date: Sep 15, 2016 Average Pressure (mmHg): 711
Start Time (mst): 00:00 Average Flow (Qstd): 229
End Time (mst): 00:00 Sep 16, 2016 Average Temperature (°C): 16.5°
Elapsed Time (Hours): 24.0 Volume (Vstd m³): 330.20

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
Average temperature appears correct? YES NO
Average pressure appears correct? YES NO
Any error messages? (if yes list below) YES NO
Sample duration 24 hours? YES NO
Date of last calibration/audit: Sep 02, 2016
Other observations? n/a

Deployed By: Alex Yakupov
Collected By: Alex Yakupov Date: Sep 19, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 15, 2016
PUF S/N: TE06

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
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	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.02
Fluorene	0.02
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.01
Perylene	< 0.01
Phenanthrene	0.23
Pyrene	< 0.01
Retene	< 0.01

Sample ID: 16090313-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Sep 21, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-11</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>118P/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Sep 19, 2016 / 09:11</u>
Field Sample ID:	<u>LICA/PUF/CLS/Sep 21, 2016</u>	Removal Date/Time:	<u>Sep 22, 2016 / 07:56</u>
Sample Data Collection Information			
Sample Date:	<u>Sep 21, 2016</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 Sep 22, 2016</u>	Average Temperature (°C)	<u>9.7°</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>Sep 02, 2016</u>		
Other observations?	<u>n/a</u>		
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	Date:	<u>Sep 22, 2016</u>

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SEP 23 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 21, 2016
PUF S/N: TE11

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.18
2-Methylnaphthalene	0.36
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	0.04
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	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.21
Perylene	< 0.01
Phenanthrene	0.16
Pyrene	0.03
Retene	< 0.01

Sample ID: 16090349-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Sep 27, 2016

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>Sep 22, 2016/07:56</u>
Field Sample ID:	<u>LICA/PUF/CLS/Sep 27, 2016</u>	Removal Date/Time:	<u>Sep 28, 2016/08:53</u>

Sample Data Collection Information

Sample Date:	<u>Sep 27, 2016</u>	Average Pressure (mmHg)	<u>711</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>22.9</u>
End Time (mst):	<u>00:00 Sep 28, 2016</u>	Average Temperature (°C)	<u>12.4°</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>Sep 02, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Sep 28, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 27, 2016
PUF S/N: TE05

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	0.04
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	< 0.01
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	0.04
Perylene	< 0.01
Phenanthrene	0.11
Pyrene	0.03
Retene	< 0.01

PARTISOL RESULTS

Partisol Sample Data Sheet

Sample ID: 16090075-001

Customer ID: LICA

Cust Samp ID: P 6028899

Priority: Normal

Date Sampled: Sep 03, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 602 88 99

Start Time 00:00 Sep 03, 2016

End Time 00:00 Sep 04, 2016

Status OK

Std Vol 23.570

Valid Time 24:00

Total Time 240



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016

Date of last calibration : July 8, 2016

Technician Signature:

Alex Yakupov

Date: Sep 06, 2016

Time: 09:18

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: 16090153-001

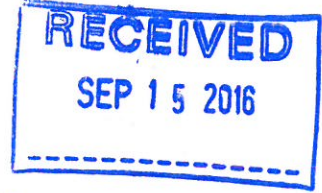
Customer ID: LICA

Cust Samp ID: LICA Fit # P6028900

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Sep 09, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 602 89 00

Start Time 00:00 Sep 09, 2016

End Time 00:00 Sep 10, 2016

Status OK

Std Vol 23.843

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature: Alex Yakepov
Date: Sep 14, 2016
Time: 09:02

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: 16090248-001

Customer ID: LICA

Cust Samp ID: LICA P6029636

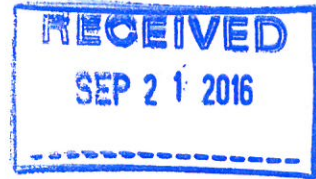
AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Sep 15, 2016
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P6029636

PM2.5



Start Time 00:00 Sep 15, 2016
 End Time 00:00 Sep 16, 2016
 Status OK
 Std Vol 23.383
 Valid Time 24:00
 Total Time 24.0

Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration : July 8, 2016

Technician Signature: Alex Yakupov
 Date: Sep 19, 2016
 Time: 09:15

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

Partisol Sample Data Sheet

Sample ID: 16090314-001

Customer ID: LICA

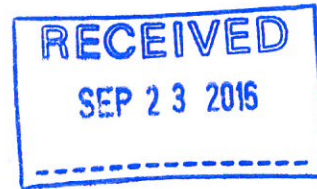
Cust Samp ID: LICA Fit # P6029637

Priority: Normal

Date Sampled: Sep 21, 2016
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P 602 96 37

PM2.5

Start Time 00:00 Sep 21, 2016
End Time 00:00 Sep 22, 2016
Status OK
Std Vol 24.182
Valid Time 24:00
Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration : July 8, 2016

Technician Signature: Alex Yankov
Date: Sep 22, 2016
Time: 08:19

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"

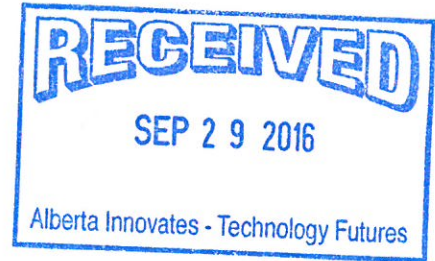
Note: Beginning & End Date should be same date

Partisol Sample Data Sheet

Date Sampled: Sep 27, 2016
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P 602 96 38

PM2.5

Start Time 00:00 Sep 27, 2016
 End Time 00:00 Sep 28, 2016
 Status OK
 Std Vol 23.682
 Valid Time 24:00
 Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 8, 2016
Date of last calibration: July 8, 2016

Technician Signature: Alex Yakupov
 Date: Sep 28, 2016
 Time: 09:11

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

Partisol Sampler Results

Date	Filter NO.	Concentration (mg)
September 3	P6028899	0.015
September 9	P6028900	0.018
September 15	P6029636	0.071
September 21	P6029637	0.037
September 27	P6029638	0.041

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: September 13, 2016 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 7:44 End Time 24 hr. (mst): 11:31 Calibration Method: Gas Dilution	Barometric Pressure: 0.940 atm Station Temperature °C: 22 Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Tom Bourque Cal Gas Expiry Date: December 2, 2023 Converter Model & s/n (if applicable): n/a
---	--

Analyzer: Serial Number: 806528242 Last Calibration Date: August 5, 2016 Previous C.F.: 0.997	Range ppb: 500 As Found C.F.: 1.015 New C.F.: 0.997
--	--

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 Cal Gas Conc. (ppm): 50.0	Standard Calibration Points for Ranges <table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> </tr> <tr> <td>Mid</td> <td>180</td> </tr> <tr> <td>Low</td> <td>90</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	380	Mid	180	Low	90
Point	Sulphur Dioxide Standard Calibration Points								
High	380								
Mid	180								
Low	90								

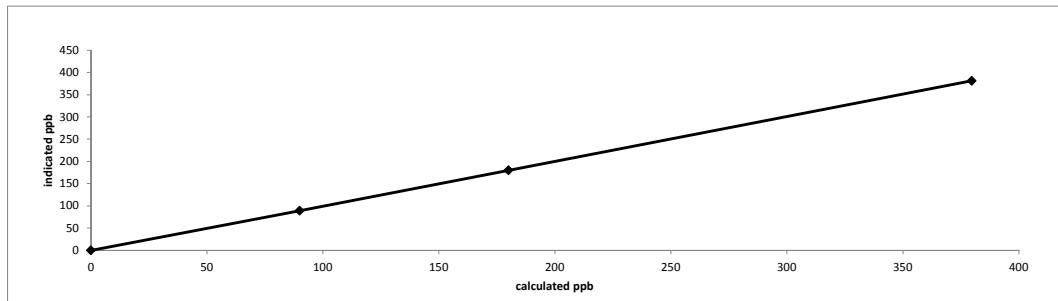
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	0.0	N/A
as found high	4966	38.00	5004	379.7	374.0	1.015
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4966	38.00	5004	379.7	381.0	0.997
mid	4982	18.00	5000	180.0	180.0	1.000
low	4992	9.00	5001	90.0	89.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 0.996 b (Intercept as % of full scale) = 0.13% % change in C.F. from last cal = -1.83%	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%
---	--

Thermo 43i Sulphur Dioxide Analyzer Calibration

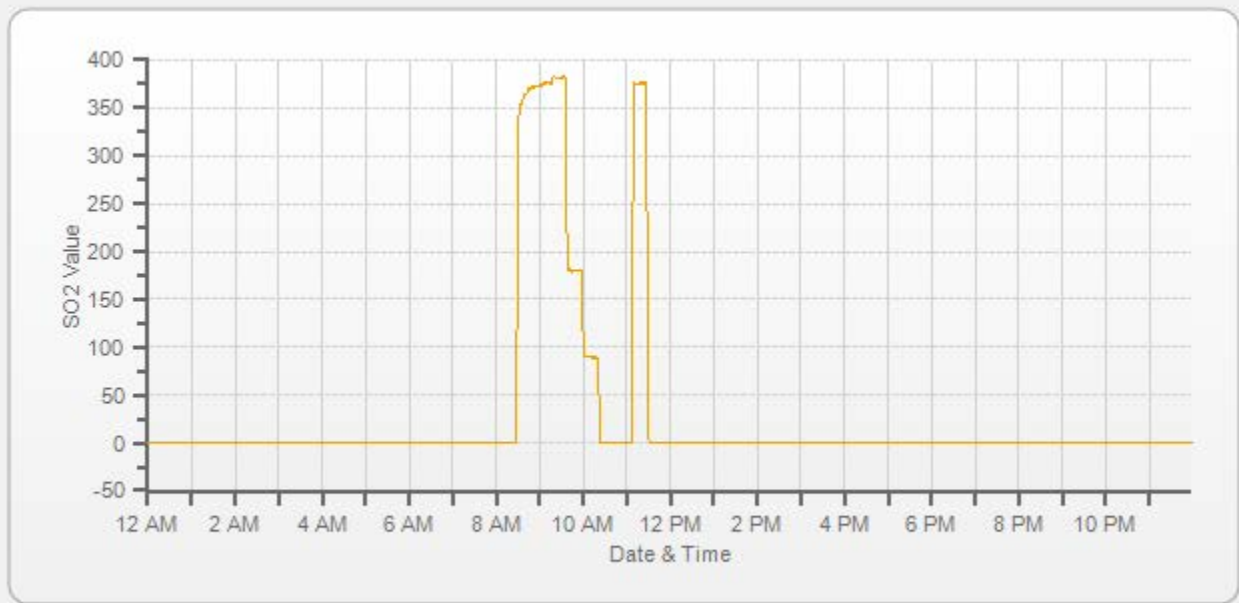


As found: BKG: 7.8 COEF: 0.964 PMT: -624.2 FLASH: 773 INTERNAL: 28.1 CHAMBER: 45.1 PERM OVEN GAS: 45.01 PERM OVEN HEATER: 44.20 PRESSURE: 679.8 SAMPLE FLOW: 0.474 LAMP INTENSITY: 96 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 373	As left: BKG: 7.9 COEF: 0.974 PMT: -624.2 FLASH: 772 INTERNAL: 27.7 CHAMBER: 44.9 PERM OVEN GAS: 45.00 PERM OVEN HEATER: 44.18 PRESSURE: 678.9 SAMPLE FLOW: 0.474 LAMP INTENSITY: 97 CONVERTER: n/a CONVERTER SET: n/a Internal Span: 376
---	--

Comments:

Sample inlet filter changed. No ZERO adjustment required/made.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 2016/09/13 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: September 13, 2016	Barometric Pressure: 0.940 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mix of sun and clouds
Parameter: Total Reduced Sulphur	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 7:44	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 11:32	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): CDNova CDN-101 #501

Analyzer:	
Serial Number: 812728560	Range ppb: 100
Last Calibration Date: August 5, 2016	As Found C.F.: 1.011
Previous C.F.: 0.996	New C.F.: 1.000

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Total Reduced Sulphur Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Total Reduced Sulphur Standard Calibration Points	High	78	Mid	38	Low	19
Point		Total Reduced Sulphur Standard Calibration Points							
High		78							
Mid		38							
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

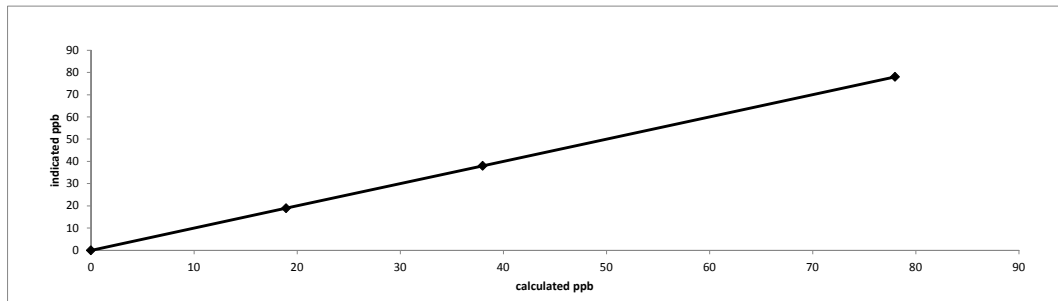
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	N/A
as found high	7443	58.50	7502	78.0	77.1	1.011
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	38.0	1.000
low	7486	14.20	7500	18.9	18.9	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = 0.02%	.95-1.05
% change in C.F. from last cal = -1.55%	± 3% F.S.
	± 10%

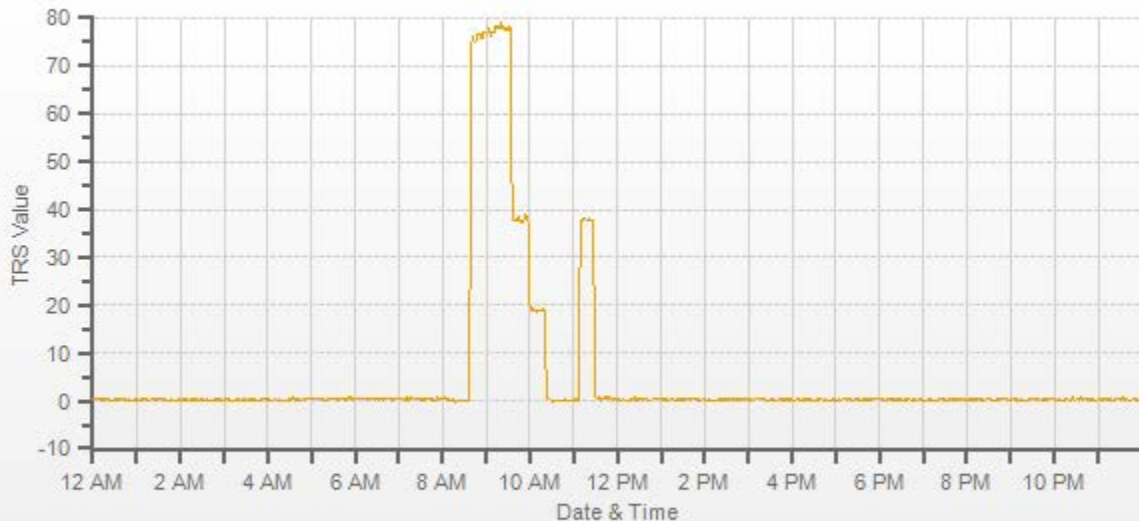
Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:	As left:
BKG: 13.8	BKG: 13.9
COEF: 0.936	COEF: 0.941
PMT: -651.2	PMT: -650.8
FLASH: 740	FLASH: 737
INTERNAL: 31.1	INTERNAL: 31.3
CHAMBER: 45.0	CHAMBER: 45.0
CONVERTER TEMP: 825	CONVERTER TEMP: 825
CONVERTER SET: 825	CONVERTER SET: 825
PERM OVEN GAS: 45.01	PERM OVEN GAS: 45.0
PERM OVEN HTR: 44.38	PERM OVEN HTR: 44.37
PRESSURE: 657.8	PRESSURE: 654.7
SAMPLE FLOW: 0.508	SAMPLE FLOW: 0.510
LAMP INTENSITY: 92	LAMP INTENSITY: 92
Internal Span: 35.6	Internal Span: 37.7

Comments:

Sample inlet filter changed. No ZERO adjustment required/made.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: September 12, 2016
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Parameter: Total Hydrocarbon
 Start/End Time 24 hr. (mst): 8:47 / 12:32
 Calibration Method: Gas Dilution
 Barometric Pressure: 0.949 atm
 Station Temperature °C: 22
 Weather Conditions: A few clouds
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Alex Yakupov / Tom Bourque
 Cal Gas Expiry Date: November 25, 2023

Analyzer:
 Serial Number: 427408718
 Last Calibration Date: August 22, 2016
 Previous Cal High Point C.F.: 1.000
 Range ppm: 50
 As Found C.F.: 0.993
 New C.F.: 1.000

Calibrator:
 Flow Meter ID's: n/a
 Make & Model: API 700
 Serial #: 627
 Cal Gas Cylinder I.D. #: LL165372
 CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 / 212.0
 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 / 1189.0
Standard Calibration Points for a Range of 50 ppm

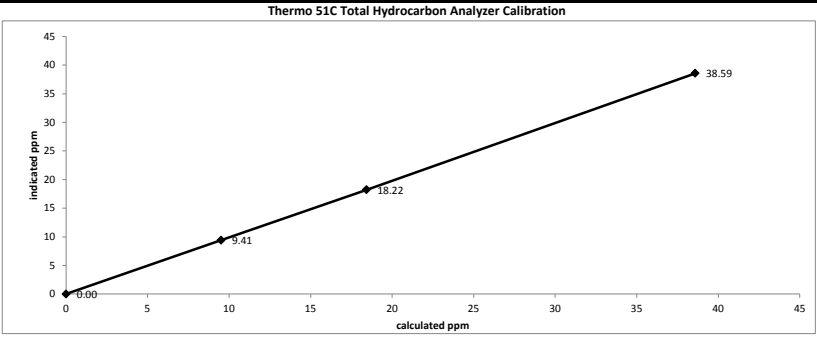
Point	Target ppm
High	38
Mid	18
Low	9

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	1999	0.00	1999	0.0	0.30	n/a
as found high	1937	65.00	2002	38.60	39.16	0.993
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.59	1.000
mid	1969	31.00	2000	18.43	18.22	1.011
low	1985	16.00	2001	9.51	9.41	1.010
calibrator zero	1999	0.00	1999	0.0	0.00	n/a

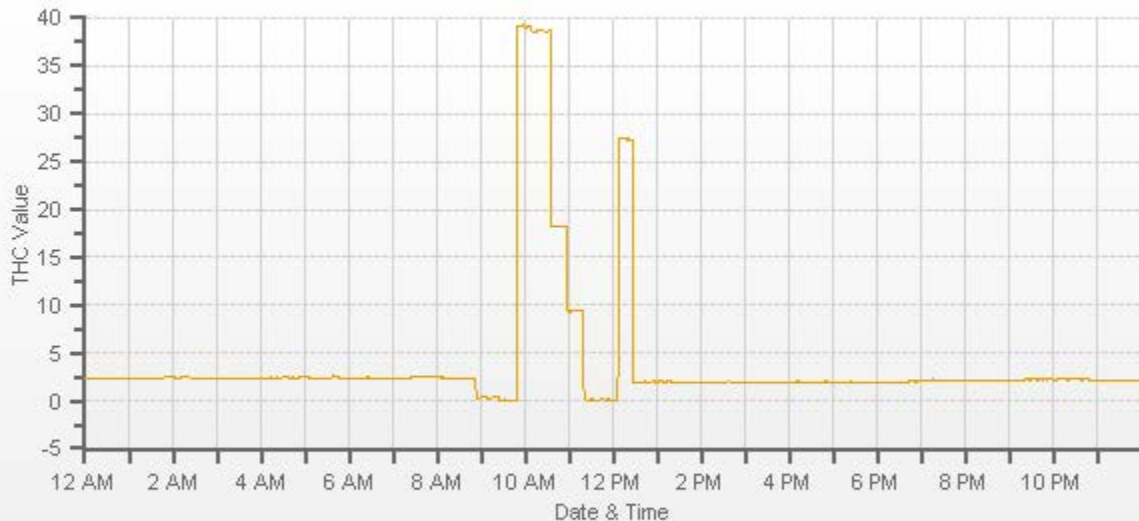
Average C.F.= 1.007

Linear Regression/Calibration Results:
 Correlation Coefficient = 1.000
 Slope = 0.999
 b (Intercept as % of full scale) = 0.17%
 % change in C.F. from last cal = 0.66%
LIMITS
 > or = 0.995
 .95-1.05
 ± 3% F.S.
 ± 10%



As found: H2 cylinder (psi): 700 H2 cylinder reg set (psi): 21 Span Cylinder (psi): 1400 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1675 rng: 1 try: 1 flm: 181.9 det: 125.8 Flame: 181 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 27.2	As left: H2 cylinder (psi): 700 H2 cylinder reg set (psi): 21 Span Cylinder (psi): 1400 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 34 measurement alarms: None service alarms: None cnt: 1692 rng: 1 try: 1 flm: 182.0 det: 125.4 Flame: 182 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Internal Pressure Gauge psi: 27 Internal Span: 27.33
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Comments:
 Sample inlet filter changed.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: September 13, 2016	Barometric Pressure: 0.940 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: Mix of sun and clouds
Start/End Time 24 hr. (mst): 7:44 / 13:29	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 1505664393 Last Calibration Date: August 10, 2016 Range ppb: 500	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.023</td> <td>0.999</td> </tr> <tr> <td>NO₂ =</td> <td>1.004</td> <td>1.008</td> <td>1.008</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.021</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.023	0.999	NO ₂ =	1.004	1.008	1.008	NOx =	0.999	1.021	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.023	0.999														
NO ₂ =	1.004	1.008	1.008														
NOx =	0.999	1.021	0.999														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	250	n/a																						
Mid	180	145	n/a																						
Low	90	50	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4966	38.00	5004	379.7	379.7	371.0	372.0	1.023	1.021
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999
mid	4982	18.00	5000	180.0	180.0	180.0	180.0	1.000	1.000
low	4992	9.00	5001	90.0	90.0	90.0	90.0	1.000	1.000
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	1.000

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	4966	38.00	5004	0.0	380.0	380.0	0.0	0.0	0.0	
as found high NO2	4839	38.00	4877	240.0	126.0	378.0	252.0	254.0	252.0	1.008
adjusted high NO2	4839	38.00	4877	240.0	126.0	378.0	252.0	254.0	252.0	1.008
gpt mid	4839	38.00	4877	140.0	234.0	380.0	146.0	146.0	146.0	1.000
gpt low	4839	38.00	4877	46.0	329.0	380.0	51.0	51.0	51.0	1.000
Average NO₂ C.F.=										1.003

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	1.008	.95-1.05
b (Intercept as % of full scale)=	-0.01%	-0.01%	0.07%	± 3% F.S.
% change in C.F. from last cal=	-2.45%	-2.17%	-0.39%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

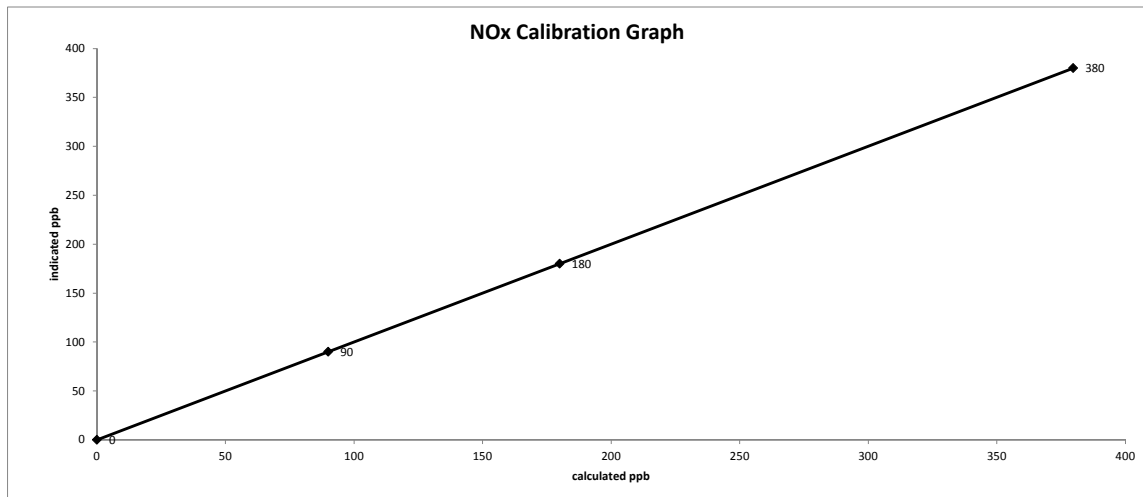
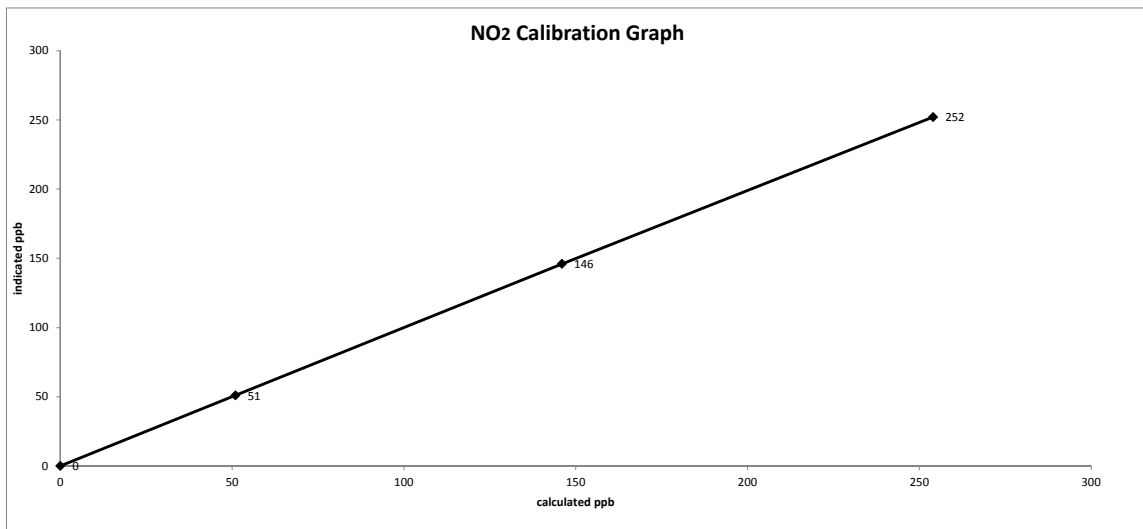
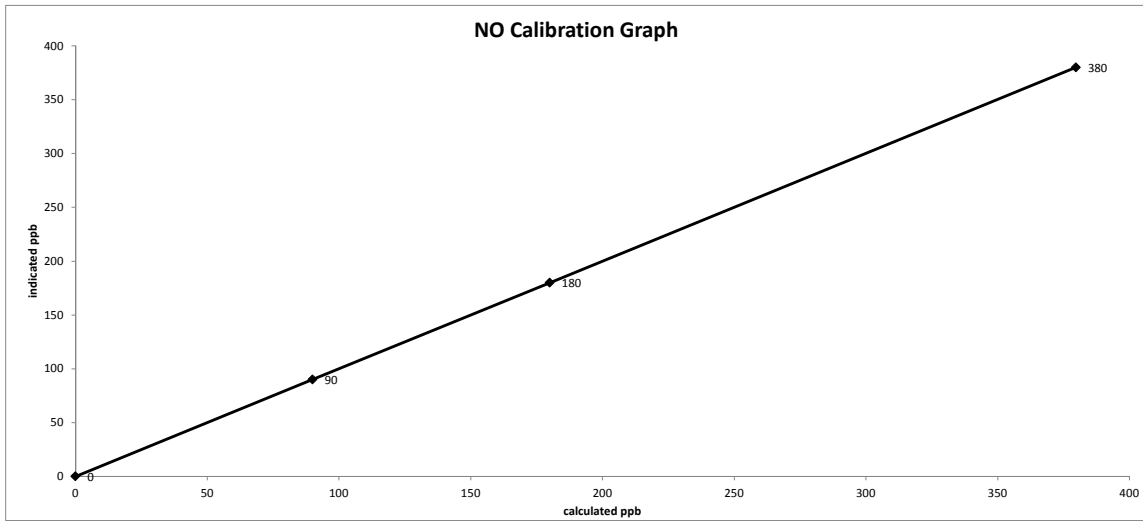
As found:	As left:
NO Bkg: 3.4	NO Bkg: 3.5
NOx Bkg: 3.5	NOx Bkg: 3.6
NO Coef: 0.994	NO Coef: 1.018
NO2 Coef: 1.000	NO2 Coef: 1.000
NOx Coef: 1.000	NOx Coef: 1.000
PMT: -854.3	PMT: -854.7
Internal: 25.2	Internal: 24.4
Chamber: 50.7	Chamber: 50.1
Cooler: -3.1	Cooler: -3.1
NO2 Converter: 325.0	NO2 Converter: 326.6
NO2 Converter Set: 325.0	NO2 Converter Set: 325.0
Pressure: 181.4	Pressure: 181.4
Flow: 0.773	Flow: 0.774
Ozonator Flow: OK	Ozonator Flow: OK
Internal Span NO: 2.4	Internal Span NO: 3.0
Internal Span NO2: 253	Internal Span NO2: 267
Internal Span NOx: 256	Internal Span NOx: 270

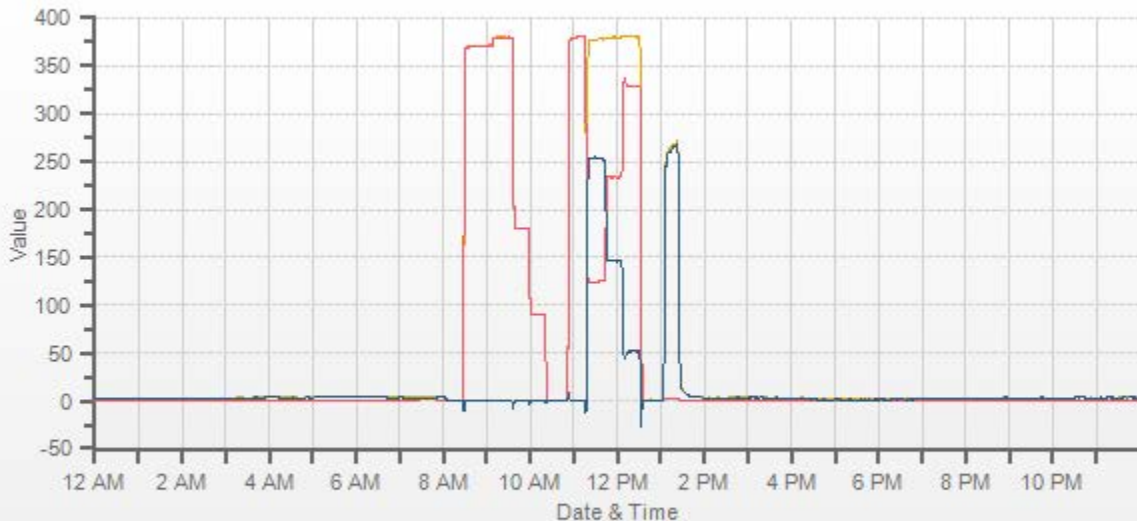
Comments:

Sample inlet filter changed. No ZERO adjustment required/made.

Date: September 13, 2016
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 7:44 / 13:29
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOx[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	September 12, 2016	Barometric Pressure:	0.949 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds
Start/End Time 24 hr. (mst):	8:47 / 12:32	Calibration Purpose:	routine monthly
Ozone Calibration Method:	Varying UV Lamp Power	Performed By/Reviewer:	Alex Yakupov Tom Bourque
G.P.T. Date:	n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date:	n/a

Analyzer:	Serial Number:	700419951	Ozone Range ppb:	500
	Last Calibration Date:	August 5, 2016	As Found C.F.:	0.997
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Point	AMD Required Range of Ozone Calibration Points
	Make & Model:	SABIO 2010 D	High	300-400 ppb
	Serial #:	11900613	Mid	150-200 ppb
	Cal Gas Cylinder I.D. #:	n/a	Low	50-75 ppb

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

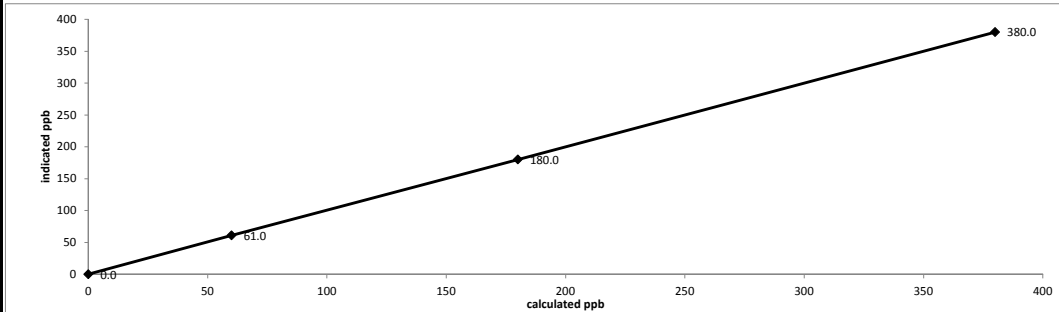
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	381.0	0.997
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	61.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a

Average C.F. = 0.995

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.001		.95-1.05
b (Intercept as % of full scale) =	-0.08%		± 3% F.S.
% change in C.F. from last cal =	0.26%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

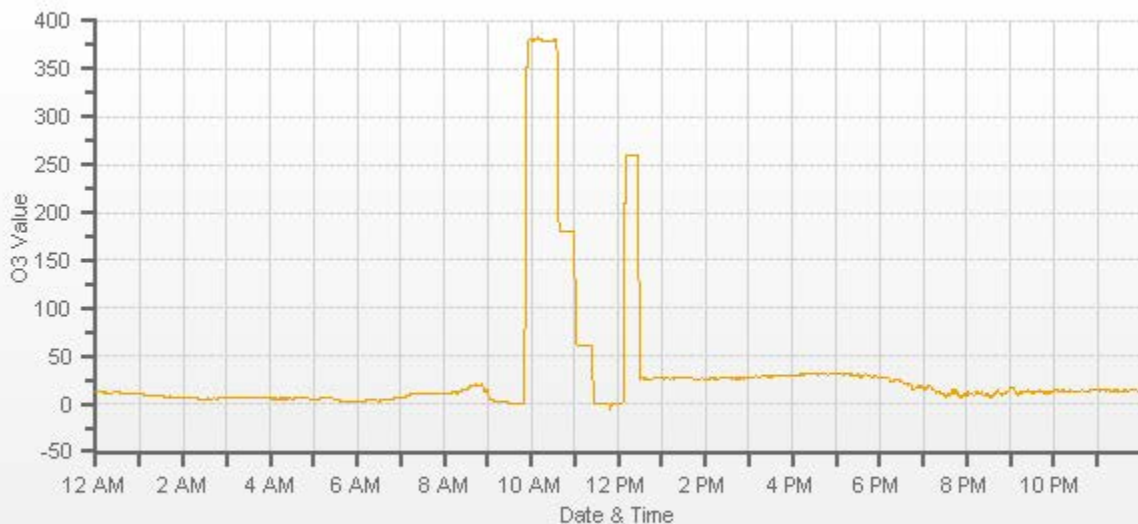
O3 Bkg:	0.2
O3 Coef:	1.007
Photo Lamp:	9.6
O3 Lamp:	9.0
Bench:	27.9
Bench Lamp:	53.5
O3 Lamp:	67.4
Pressure:	716.2
Cell A lpm:	0.720
Cell B lpm:	0.773
O3 ppb:	2.7
Cell A ppb:	3.4
Cell B ppb:	2.0
Cell A int:	90970
Cell B int:	91745
Internal Span:	255

As left:

O3 Bkg:	0.2
O3 Coef:	1.002
Photo Lamp:	9.6
O3 Lamp:	9.0
Bench:	27.9
Bench Lamp:	53.5
O3 Lamp:	67.4
Pressure:	716.2
Cell A lpm:	0.722
Cell B lpm:	0.762
O3 ppb:	0.0
Cell A ppb:	-2.0
Cell B ppb:	2.0
Cell A int:	90958
Cell B int:	91733
Internal Span:	260

Comments:

Sample inlet filter changed. No ZERO adjustment required/made.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 12, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: August 19, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 11:52
 End Time (mst): 12:50
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: A few clouds

1400A Information and Status:

Serial Number: 1405A201620804 As Found Filter Loading %: 23.28
 Ko Factor: 14578 As Left Filter Loading %: 16.75
 Ambient Temperature °C: 9.03 As Found Noise: 0.006
 Ambient Pressure atm: 0.947 As Left Noise: 0.003
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.11	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.11	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>9.0</u>	1405F pressure atm: <u>0.947</u>
reference temperature °C: <u>9.0</u>	reference pressure: <u>0.946</u>
difference °C: <u>0.0</u>	difference: <u>0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>9.0</u>	1405F pressure atm: <u>0.946</u>
reference temperature °C: <u>9.0</u>	reference pressure: <u>0.946</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.72</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>0.05</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.72</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.05</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

47 mm FDMS filter changed and TEOM sample filter changed. PM 2.5/10 sample inlet head cleaned. Flows audited and adjusted.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 20, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: September 12, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 8:09
 End Time (mst): 9:42
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly cloudy with sunny breaks

1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 24.59
 Ko Factor: 14578 As Left Filter Loading %: 18.40
 Ambient Temperature °C: 9.75 As Found Noise: 0.003
 Ambient Pressure atm: 0.944 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.32
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.11	0.02	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.19	0.00	0.19
	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	0.02	0.11	0.02	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.19	0.00	0.19
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm
1405F temperature °C: <u>9.8</u>		1405F pressure atm: <u>0.944</u>
reference temperature °C: <u>11.0</u>		reference pressure: <u>0.942</u>
difference °C: <u>1.2</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
1405F temperature °C: <u>11.0</u>		1405F pressure atm: <u>0.942</u>
reference temperature °C: <u>11.0</u>		reference pressure: <u>0.942</u>
difference °C: <u>0.0</u>		difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm		total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>		1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.99</u>		reference total/aux flow lpm: <u>16.66</u>
difference lpm: <u>-0.01</u>		difference lpm: <u>-0.01</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm		total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>		1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.99</u>		reference total/aux flow lpm: <u>16.66</u>
difference lpm: <u>-0.01</u>		difference lpm: <u>-0.01</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

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

Large amount of dew was found inside the sample inlet. This moisture can affect a sample filter and negative readings (within -3 mg/m3) were produced as a result. Because temperature fluctuates significantly this time of year (from 20 to 1 degrees during a day cycle), moisture accumulates in large amount on the surface of all metal parts of the sample inlet and adjacent tubing.

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

VOC SAMPLER

Maxxam Analytics

XONTECK FLOW RATE VERIFICATION/CALIBRATION

Client: <u>LICA</u>	Date: <u>September 2, 2016</u>
Location: <u>Cold Lake South</u>	Last Cal. Date: <u>June 1, 2016</u>
Station ID: <u>LICA 01</u>	Start Time 24 hr. (mst): <u>8:04</u>
Sampler s/n: <u>6167</u>	End Time 24 hr. (mst): <u>8:41</u>
Purpose: <u>Routine Quarterly</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Tom Bourque</u>

Pressure Standard:	Flow Standard:
Make/Model: <u>Fisher Scientific / FB 1291</u>	<u>DC-2/BIOS international</u>
S/N or ID#: <u>130168457</u>	<u>2293</u>
Certification Date: <u>February 7, 2016</u>	

The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1.

$$F = \frac{(P \times V)}{(T \times 60)} = \frac{1.61 \times 6000}{24 \times 60} = \boxed{6.71 \text{ cc/min}} = \text{target flow rate}$$

where;

F= flow rate in cc/min
P= final canister in atmosphere absolute
V= volume of canister in c.c.
T= sampling period in hours
bp= barometric pressure in atmospheres

enter:

bp 0.931 atm
P= 1.61146 (atm)+.68046
V= 6000 cubic centimetres
T= 24 hours

XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION

FLOW RATE VERIFICATION

Volumetric Flow rate =	10.00 (cc/min)	As found pot setting =	6.52
Target Flow Rate (cc/min) =	6.71		
% Difference =	n/a		n/a

FLOW RATE CALIBRATION

Volumetric Flow rate =	n/a (cc/min)	Adjusted pot setting =	n/a
Target Flow Rate (cc/min) =	6.71		
% Difference =	n/a		n/a

XONTECK MAINTENANCE

Item:	Most Recent Date Completed:
1. Replace sample line and fittings from sampler to canister every 6 months.	<u>June 1, 2016</u>
2. Purge line from manifold--> sampler with zero air every 6 months.	<u>June 1, 2016</u>
3. Sample system cleaning every 2 years.	
4. Perform 12 hour leak check procedure every 6 months.	<u>June 1, 2016</u>

COMMENTS:

No sample flow adjustments made. Leak check result: 0.0 psi over 47 hours 35 minutes.

PAH SAMPLER



TISCH PUF PLUS SAMPLER AUDIT

Date:	September 2, 2016	PUF PLUS Serial #:	100-1020
Company/Airshed:	LICA	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds
Reference Standards:	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher Scientific	FLUKE
Model:	475 Mark III	FB61291	1551A Ex
Serial Number:	#2	130168457	ID# 4295
Calibration Date:	January 15, 2016	February 7, 2016	November 2, 2015

TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT

AS FOUND Reference Barometric Pressure (mmHg):	707.31	AS FOUND Reference Temperature (°C):	13.7
AS FOUND PUF PLUS Barometric Pressure (mmHg):	707	AS FOUND PUF PLUS Temperature (°C):	14.4
% Difference (+/- 2% max.):	0.04%	% Difference (+/- 2 °C max.):	-0.7
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:

Calibrated Orifice Certification Date:	October 12, 2015
Enter Barometric Pressure from refrence (inHg)	27.85
Barometric Pressure (mmHg)	707.0
Enter Ambient Temperature from reference °C	14.4
Enter "m" variable from calibrated orifice	6.07570
Enter "b" variable from calibrated orifice	-0.03578
Enter Δp in. H ₂ O	1.95
Standardized Flow lpm=	231.56
Flow Set Point lpm=	230.00
% Difference (+/- 2% max.)=	-0.68%
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:
747.31	1.57	n/a	n/a	n/a
727.31	0.79	n/a	n/a	n/a
707.31	0.00	n/a	n/a	n/a
687.31	-0.79	n/a	n/a	n/a
667.31	-1.57	n/a	n/a	n/a
% Difference (+/- 2% max.)=				n/a

TISCH PUF PLUS TEMPERATURE CALIBRATION

Temperature Calibrator Certification Date:	n/a
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	n/a
-20	n/a	n/a	n/a
40	n/a	n/a	n/a
0	n/a	n/a	n/a
-30	n/a	n/a	n/a
% Difference (+/- 2 °C max.)			n/a

TISCH PUF PLUS FLOW CALIBRATION

Flow Calibration Calculations:

Calibrated Orifice Certification Date:	n/a
Enter Barometric Pressure from refrence (inHg)	n/a
Barometric Pressure (mmHg)	n/a
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. H ₂ O	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	14823.1796	-6613.4765	0.2879
A1	22.8942	0.1641	16.8673
R	0.0000	0.0000	0.0000

Notes:

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</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>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO2 - Flows Not Manually Measured

Auditor: Shea Beaton
 Operator Signature:

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas: Make/Model: <u>Thermo146i</u> Serial Number: <u>1809</u> Last Verification Date: <u>February 2, 2016</u> Gas Type: <u>SO2</u> Conc. <u>98.07</u> Cylinder Number: <u>CAL016625</u>	Flow Measurement Device: Make/Model: <u>Bios DC-2</u> Serial Number: <u>Bios D</u> Temp. °C: <u>24.5</u> B.P. <u>702mmHg</u>
--	---

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 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.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 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

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. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:

Make/Model	<u>Thermo 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.2</u>	Span:	<u>1.014</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>02-Feb-16</u>	C.F.	<u>1.000</u> Done By: <u>SB</u>

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

	NO	NOx
Previous Stated Concentration PPM:	<u>50.0</u>	<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

PASSIVE SAMPLES

Your Project #: 2016/07/28 - 2016/09/30
Site Location: LICA

Attention:MICHAEL BISAGA

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

Report Date: 2016/10/17
Report #: R2283066
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B688041

Received: 2016/10/06, 10:37

Sample Matrix: Air
Samples Received: 33

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
H2S Passive Analysis (1)	20	2016/10/13	2016/10/14	PTC SOP-00150	Tang.Passive H2S in
NO2 Passive Analysis (1)	19	2016/10/13	2016/10/14	PTC SOP-00148	Passive NO2 in ATM
NO2 Passive Analysis (1)	6	2016/10/14	2016/10/17	PTC SOP-00148	Passive NO2 in ATM
O3 Passive Analysis (1)	25	2016/10/11	2016/10/14	PTC SOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	29	2016/10/11	2016/10/14	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 #: B688041
Report Date: 2016/10/17

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/07/28 - 2016/09/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		PS0278	PS0279	PS0280	PS0281	PS0282	PS0283	PS0284		
Sampling Date		2016/07/28 14:40	2016/07/29 10:39	2016/07/29 11:24	2016/07/29 12:50	2016/07/29 09:34	2016/07/28 16:33	2016/07/28 13:35		
	UNITS	3	4	5	6	8	9	10	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.15		0.51				0.19	0.02	8432615
Calculated NO2	ppb	0.8	0.6	0.7	4.5	0.7	1.7	3.7	0.1	8431821
Calculated O3	ppb	14.9	17.0	16.0	14.9	20.2	17.7	13.1	0.1	8428871
Calculated SO2	ppb	0.1	0.3	0.4	0.4	0.2	0.2	0.2	0.1	8429214
RDL = Reportable Detection Limit										

Maxxam ID		PS0285	PS0286	PS0287	PS0288	PS0289	PS0290	PS0291		
Sampling Date		2016/07/28 12:54	2016/02/27 17:36	2016/07/28 11:24	2016/07/28 10:32	2016/07/28 17:56	2016/07/29 15:42	2016/07/29 13:43		
	UNITS	11	12	13	14	15	16	17	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.06	MISSING	0.09	0.17		0.15	0.32	0.02	8432615
Calculated NO2	ppb	0.6	MISSING	0.7	0.9	1.4	0.9	1.3	0.1	8431821
Calculated O3	ppb	11.8	MISSING	16.5	17.6	14.9	13.0	22.2	0.1	8428871
Calculated SO2	ppb	<0.1	MISSING	0.2	1.0	0.2	0.2	0.4	0.1	8429214
RDL = Reportable Detection Limit										

Maxxam ID		PS0292	PS0293		PS0294	PS0295	PS0296	PS0297		
Sampling Date		2016/07/29 14:52	2016/07/29 16:14		2016/07/28 18:35	2016/07/28 08:55	2016/07/28 12:08	2016/02/27 18:58		
	UNITS	18	19	QC Batch	22	23	24	25	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.12		8432615	0.16		0.16	MISSING	0.02	8432615
Calculated NO2	ppb	0.9	0.6	8431821	0.9	0.2	3.7		0.1	8431821
Calculated O3	ppb	15.1	19.0	8428881	14.5	12.2	15.9		0.1	8428881
Calculated SO2	ppb	0.1	0.1	8429214	0.2	0.1	<0.1	MISSING	0.1	8429229
RDL = Reportable Detection Limit										

Maxxam ID		PS0298	PS0299		PS0300	PS0301		PS0302		
Sampling Date		2016/07/28 10:51	2016/07/28 10:10		2016/07/28 16:51	2016/07/28 18:42		2016/07/28 18:23		
	UNITS	26	27	QC Batch	28	29	QC Batch	32	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.14	0.67	8432615		0.17	8432615	0.20	0.02	8432617
Calculated NO2	ppb			8431821	3.1	0.9	8432927	0.4	0.1	8432927
Calculated O3	ppb			8428881	16.2	17.7	8428881	25.8	0.1	8428881
Calculated SO2	ppb	0.5	0.8	8429229	0.5	0.2	8429229	0.2	0.1	8429229
RDL = Reportable Detection Limit										

Maxxam Job #: B688041
Report Date: 2016/10/17

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/07/28 - 2016/09/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		PS0303	PS0306	PS0307	PS0308	PS0309	PS0310	PS0311		
Sampling Date		2016/07/29 08:37	2016/07/28 18:42	2016/07/28 15:23	2016/07/29 11:24	2016/07/29 12:50	2016/07/29 09:34	2016/07/28 12:54		
	UNITS	38	29 DUP	32 DUP	5 DUP	6 DUP	8 DUP	11 DUP	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	3.61						0.06	0.02	8432617
Calculated NO2	ppb	1.3	0.9	0.3					0.1	8432927
Calculated O3	ppb	21.5	14.4	25.6					0.1	8428881
Calculated SO2	ppb	0.7			0.4	0.3	0.2		0.1	8429229
RDL = Reportable Detection Limit										

Maxxam ID		PS0312		
Sampling Date		2016/07/28 11:24		
	UNITS	13 DUP	RDL	QC Batch
Passive Monitoring				
Calculated H2S	ppb	0.08	0.02	8432617
RDL = Reportable Detection Limit				

Maxxam Job #: B688041
Report Date: 2016/10/17

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/07/28 - 2016/09/30
Site Location: LICA
Sampler Initials: AY

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B688041
Report Date: 2016/10/17

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/07/28 - 2016/09/30
Site Location: LICA
Sampler Initials: AY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8428871	SS6	Spiked Blank	Calculated O3	2016/10/11		97	%	90 - 110
8428871	SS6	Method Blank	Calculated O3	2016/10/11	<0.1		ppb	
8428881	SS6	Spiked Blank	Calculated O3	2016/10/11		103	%	90 - 110
8428881	SS6	Method Blank	Calculated O3	2016/10/11	<0.1		ppb	
8429214	OZ	Spiked Blank	Calculated SO2	2016/10/11		95	%	90 - 110
8429214	OZ	Method Blank	Calculated SO2	2016/10/11	<0.1		ppb	
8429229	OZ	Spiked Blank	Calculated SO2	2016/10/11		99	%	90 - 110
8429229	OZ	Method Blank	Calculated SO2	2016/10/11	<0.1		ppb	
8431821	SS6	Spiked Blank	Calculated NO2	2016/10/13		97	%	90 - 110
8431821	SS6	Method Blank	Calculated NO2	2016/10/13	<0.1		ppb	
8432615	LCH	Spiked Blank	Calculated H2S	2016/10/13		100	%	N/A
8432617	LCH	Spiked Blank	Calculated H2S	2016/10/13		100	%	N/A
8432927	SS6	Spiked Blank	Calculated NO2	2016/10/14		100	%	90 - 110
8432927	SS6	Method Blank	Calculated NO2	2016/10/14	<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 #: B688041
Report Date: 2016/10/17

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/07/28 - 2016/09/30
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).



Levi Manchak, Project Manager

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/Sep 03, 2016	S5669	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	11-Sep-16
16090076-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 03, 2016	S5669	Ambient Air	03-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	11-Sep-16
16090076-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Acetone		1.8	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-001	Benzene	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Carbon disulfide	I	0.05	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Carbon tetrachloride	I	0.09	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Chloroform	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Chloromethane	I	0.19	ppbv	0.02	AC-058	11-Sep-16
16090076-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 03, 2016	S5669	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-001	Cyclopentane	I	0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Ethanol		0.5	ppbv	0.3	AC-058	11-Sep-16
16090076-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Freon-11	I	0.28	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Freon-113	I	0.08	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Freon-114	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Freon-12	I	0.13	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	11-Sep-16
16090076-001	Isobutane	I	0.11	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Isopentane	I	0.14	ppbv	0.03	AC-058	11-Sep-16
16090076-001	Isoprene	I	0.09	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Isopropyl alcohol		0.8	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	m,p-Xylene	I	0.06	ppbv	0.03	AC-058	11-Sep-16
16090076-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	11-Sep-16
16090076-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	11-Sep-16
16090076-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-001	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-001	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 03, 2016	S5669	Ambient Air	03-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-001	n-Butane	I	0.21	ppbv	0.03	AC-058	11-Sep-16
16090076-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090076-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	n-Heptane	I	0.03	ppbv	0.01	AC-058	11-Sep-16
16090076-001	n-Hexane	I	0.06	ppbv	0.01	AC-058	11-Sep-16
16090076-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	n-Pentane	I	0.1	ppbv	0.1	AC-058	11-Sep-16
16090076-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	o-Xylene	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Toluene	I	0.10	ppbv	0.01	AC-058	11-Sep-16
16090076-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 03, 2016	S5669	Ambient Air	03-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 9, 2016	2664	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	18-Sep-16
16090151-003	1,2,4-Trimethylbenzene	I	0.04	ppbv	0.03	AC-058	18-Sep-16
16090151-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-003	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	18-Sep-16
16090151-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	1-Butene	I	0.16	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	1-Pentene	I	0.03	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2,2,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID LICA/VOC/CLS/Sep 9, 2016	CANISTER ID 2664	Matrix Ambient Air	DATE SAMPLED 09-Sep-16 0:00
DESCRIPTION: Cold Lake South			
REPORT NUMBER: 16090151	REPORT CREATED: 12-Oct-16		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-003	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	2-Methylpentane	I	0.06	ppbv	0.01	AC-058	18-Sep-16
16090151-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Acetone		5.9	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Acrolein		0.4	ppbv	0.3	AC-058	18-Sep-16
16090151-003	Benzene	I	0.05	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Carbon disulfide		4.21	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Chloroform	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Chloromethane		0.49	ppbv	0.02	AC-058	18-Sep-16
16090151-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 9, 2016	2664	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Ethanol		1.3	ppbv	0.3	AC-058	18-Sep-16
16090151-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Freon-11	I	0.29	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Freon-113	I	0.07	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Freon-12		0.47	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	18-Sep-16
16090151-003	Isobutane		0.59	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Isopentane		0.52	ppbv	0.03	AC-058	18-Sep-16
16090151-003	Isoprene	I	0.14	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	m,p-Xylene	I	0.06	ppbv	0.03	AC-058	18-Sep-16
16090151-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	18-Sep-16
16090151-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	18-Sep-16
16090151-003	Methyl ethyl ketone		1.3	ppbv	0.3	AC-058	18-Sep-16
16090151-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-003	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 9, 2016	2664	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	18-Sep-16
16090151-003	n-Butane	I	0.20	ppbv	0.03	AC-058	18-Sep-16
16090151-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	18-Sep-16
16090151-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	n-Heptane	I	0.03	ppbv	0.01	AC-058	18-Sep-16
16090151-003	n-Hexane	I	0.04	ppbv	0.01	AC-058	18-Sep-16
16090151-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	18-Sep-16
16090151-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	o-Xylene	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-003	Toluene	I	0.09	ppbv	0.01	AC-058	18-Sep-16
16090151-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-003	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-003	trans-2-Pentene	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 9, 2016	2664	Ambient Air	09-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090151-003	Vinyl acetate		1.1 ppbv	0.4	AC-058	18-Sep-16
16090151-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sept 15, 2016	S5611	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Sep-16
16090250-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Sep-16
16090250-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,3-Butadiene	I	0.03	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	1-Butene	I	0.15	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	1-Pentene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2,3,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	25-Sep-16
16090250-001	2,3-Dimethylpentane	I	0.05	ppbv	0.02	AC-058	25-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sept 15, 2016	S5611	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-001	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	2-Methylpentane	I	0.07	ppbv	0.01	AC-058	25-Sep-16
16090250-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	3-Methylhexane	I	0.05	ppbv	0.02	AC-058	25-Sep-16
16090250-001	3-Methylpentane	I	0.05	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Acetone		3.2	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-001	Benzene	I	0.07	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Chloromethane		0.47	ppbv	0.02	AC-058	25-Sep-16
16090250-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Cyclohexane	I	0.09	ppbv	0.02	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sept 15, 2016	S5611	Ambient Air	15-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-001	Cyclopentane	I	0.05	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Ethanol		2.1	ppbv	0.3	AC-058	25-Sep-16
16090250-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Freon-11		0.31	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Freon-113	I	0.08	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Freon-12		0.60	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Sep-16
16090250-001	Isobutane		0.31	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Isopentane	I	0.22	ppbv	0.03	AC-058	25-Sep-16
16090250-001	Isoprene	I	0.21	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Isopropyl alcohol		1.7	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	m,p-Xylene	I	0.07	ppbv	0.03	AC-058	25-Sep-16
16090250-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Sep-16
16090250-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Sep-16
16090250-001	Methyl ethyl ketone		0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Sep-16
16090250-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-001	Methylcyclohexane	I	0.12	ppbv	0.01	AC-058	25-Sep-16
16090250-001	Methylcyclopentane	I	0.13	ppbv	0.02	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sept 15, 2016	S5611	Ambient Air	15-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-001	n-Butane		0.40	ppbv	0.03	AC-058	25-Sep-16
16090250-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Sep-16
16090250-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	n-Heptane	I	0.04	ppbv	0.01	AC-058	25-Sep-16
16090250-001	n-Hexane		0.41	ppbv	0.01	AC-058	25-Sep-16
16090250-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	n-Pentane	I	0.2	ppbv	0.1	AC-058	25-Sep-16
16090250-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Sep-16
16090250-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Sep-16
16090250-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Sep-16
16090250-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	o-Xylene	I	0.03	ppbv	0.01	AC-058	25-Sep-16
16090250-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Sep-16
16090250-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-001	Toluene	I	0.14	ppbv	0.01	AC-058	25-Sep-16
16090250-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-001	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sept 15, 2016	S5611	Ambient Air	15-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Sep-16
16090250-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 21, 2016	S5624	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Sep-16
16090313-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	26-Sep-16
16090313-001	1,2,4-Trimethylbenzene	I	0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,3-Butadiene	I	0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	1-Butene	I	0.05	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	1-Pentene	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2,3-Dimethylbutane	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-001	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 21, 2016	S5624	Ambient Air	21-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-001	2,4-Dimethylpentane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2-Methylhexane	I	0.04	ppbv	0.01	AC-058	26-Sep-16
16090313-001	2-Methylpentane	I	0.06	ppbv	0.01	AC-058	26-Sep-16
16090313-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	3-Methylhexane	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-001	3-Methylpentane	I	0.04	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Acetone		1.8	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-001	Benzene	I	0.04	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Chloroform	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Chloromethane		0.44	ppbv	0.02	AC-058	26-Sep-16
16090313-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Cyclohexane	I	0.07	ppbv	0.02	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 21, 2016	S5624	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-001	Cyclopentane	I	0.04	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Ethanol		1.1	ppbv	0.3	AC-058	26-Sep-16
16090313-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Freon-11		0.31	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Freon-113	I	0.08	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Freon-114	I	0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Freon-12		0.62	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Sep-16
16090313-001	Isobutane		0.33	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Isopentane	I	0.23	ppbv	0.03	AC-058	26-Sep-16
16090313-001	Isoprene	I	0.06	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	m,p-Xylene	I	0.07	ppbv	0.03	AC-058	26-Sep-16
16090313-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Sep-16
16090313-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Sep-16
16090313-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-001	Methylcyclohexane	I	0.11	ppbv	0.01	AC-058	26-Sep-16
16090313-001	Methylcyclopentane	I	0.09	ppbv	0.02	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 21, 2016	S5624	Ambient Air	21-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-001	n-Butane		0.34	ppbv	0.03	AC-058	26-Sep-16
16090313-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	26-Sep-16
16090313-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	n-Heptane	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-001	n-Hexane	I	0.11	ppbv	0.01	AC-058	26-Sep-16
16090313-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	n-Pentane	I	0.2	ppbv	0.1	AC-058	26-Sep-16
16090313-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Sep-16
16090313-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Sep-16
16090313-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Sep-16
16090313-001	n-Nonane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	o-Xylene	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Sep-16
16090313-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-001	Toluene	I	0.11	ppbv	0.01	AC-058	26-Sep-16
16090313-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-001	trans-2-Butene	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 21, 2016	S5624	Ambient Air	21-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	26-Sep-16
16090313-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	26-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 27, 2016	14991	Ambient Air	27-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Oct-16
16090349-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Oct-16
16090349-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 27, 2016	14991	Ambient Air	27-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2-Methylhexane	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-003	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Acetone		2.0	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-003	Benzene	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Chloroform	I	0.03	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Chloromethane		0.49	ppbv	0.02	AC-058	03-Oct-16
16090349-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Cyclohexane	I	0.02	ppbv	0.02	AC-058	03-Oct-16

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		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 27, 2016	14991	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Ethanol		1.0	ppbv	0.3	AC-058	03-Oct-16
16090349-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Freon-11		0.31	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Freon-113	I	0.08	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Freon-12		0.65	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Oct-16
16090349-003	Isobutane		0.33	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Isopentane	I	0.21	ppbv	0.03	AC-058	03-Oct-16
16090349-003	Isoprene	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Oct-16
16090349-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Oct-16
16090349-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Oct-16
16090349-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-003	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	03-Oct-16
16090349-003	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Sep 27, 2016	14991	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-003	n-Butane		0.36	ppbv	0.03	AC-058	03-Oct-16
16090349-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Oct-16
16090349-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	n-Heptane	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-003	n-Hexane	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	03-Oct-16
16090349-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Oct-16
16090349-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Oct-16
16090349-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Oct-16
16090349-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Oct-16
16090349-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-003	Toluene	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Sep 27, 2016	14991	Ambient Air	27-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Oct-16
16090349-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 03, 2016	9702	Air Filter	03-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-002	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	2-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Anthracene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(c)phenanthrene		0.03	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Fluoranthene		0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Fluorene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Naphthalene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Phenanthrene		0.10	ug/puf	0.01	NA-017	28-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 03, 2016	9702	Air Filter	03-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-002	Pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-002	Retene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	October 12, 2016	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID LICA/PUF/CLS/Sep 9, 2016	CANISTER ID TE-09	Matrix Air Filter	DATE SAMPLED 09-Sep-16 0:00
DESCRIPTION: Cold Lake South			
REPORT NUMBER: 16090151	REPORT CREATED: 12-Oct-16		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-004	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	2-Methylnaphthalene		0.06	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Anthracene		0.03	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Fluorene		0.04	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Naphthalene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Phenanthrene		0.13	ug/puf	0.01	NA-017	28-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 9, 2016	TE-09	Air Filter	09-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-004	Pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-004	Retene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	October 12, 2016	Inquiries:	(780) 632 8455	E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sept 15, 2016	TE06	Air Filter	15-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-002	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	2-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Anthracene		0.03	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Fluoranthene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Fluorene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Naphthalene		0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Phenanthrene		0.23	ug/puf	0.01	NA-017	28-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sept 15, 2016	TE06	Air Filter	15-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-002	Pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-002	Retene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 21, 2016	TE-11	Air Filter	21-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-002	1-Methylnaphthalene		0.18	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	2-Methylnaphthalene		0.36	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Acenaphthene		0.04	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Acenaphthylene		0.03	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Anthracene		0.04	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Fluoranthene		0.03	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Fluorene		0.08	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Naphthalene		0.21	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Phenanthrene		0.16	ug/puf	0.01	NA-017	09-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 21, 2016	TE-11	Air Filter	21-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-002	Pyrene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090313-002	Retene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 27, 2016	TE05	Air Filter	27-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-004	1-Methylnaphthalene		0.03	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	2-Methylnaphthalene		0.06	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Acenaphthene		0.03	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Acenaphthylene		0.02	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Anthracene		0.04	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Fluoranthene		0.03	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Fluorene		0.06	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Naphthalene		0.04	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Phenanthrene		0.11	ug/puf	0.01	NA-017	09-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Sep 27, 2016	TE05	Air Filter	27-Sep-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-004	Pyrene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090349-004	Retene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

PARTISOL SAMPLES

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6028899</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 03-Sep-16 0:00 DATE RECEIVED: 08-Sep-16</p> <p>REPORT CREATED: 07-Oct-16 REPORT NUMBER: 16090075</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090075-001	Particulate Weight		0.015 mg	0.004	AC-029	09-Sep-16

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: October-07-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt # P6028900</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 09-Sep-16 0:00</p> <p>REPORT CREATED: 26-Oct-16</p> <p>DATE RECEIVED: 15-Sep-16</p> <p>REPORT NUMBER: 16090153</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090153-001	Particulate Weight		0.018 mg	0.004	AC-029	16-Sep-16

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

Date: Wednesday, October 26, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA P6029636</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 15-Sep-16 0:00</p> <p>REPORT CREATED: 26-Oct-16</p> <p>DATE RECEIVED: 21-Sep-16</p> <p>REPORT NUMBER: 16090248</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090248-001	Particulate Weight		0.071 mg	0.004	AC-029	27-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Wednesday, October 26, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt # P6029637</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 21-Sep-16 0:00</p> <p>REPORT CREATED: 26-Oct-16</p> <p>DATE RECEIVED: 23-Sep-16</p> <p>REPORT NUMBER: 16090314</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090314-001	Particulate Weight		0.037 mg	0.004	AC-029	27-Sep-16

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

Date: Wednesday, October 26, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt# P6029638</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 27-Sep-16 0:00</p> <p>REPORT CREATED: 26-Oct-16</p> <p>DATE RECEIVED: 29-Sep-16</p> <p>REPORT NUMBER: 16090347</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090347-001	Particulate Weight		0.041 mg	0.004	AC-029	04-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Wednesday, October 26, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.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 South Site
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	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.

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

03-11-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-09-1-C</u>
Site: <u>Cold Lake South Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>19-OCT-16</u>
Level 1 Primary Validation	<u></u>	Date <u>19-OCT-16</u>
Level 2 Final Validation	<u></u>	Date <u>03-NOV-16</u>
Level 3 Independent Data Review	<u></u>	Date <u>03-NOV-16</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.



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

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

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

JOB #: 2833-2016-09-30-C

September 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **November 1, 2016**

Prepared by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi".

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

Reviewed by:

A handwritten signature in blue ink, appearing to read "Cheri Sinclair".

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

SUMMARY

In September 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Station, near Cold Lake, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

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

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

SO₂: Five hours of downtime were recorded due to an additional calibration performed to address a zero drift occurrence.

H₂S: Seven hours of downtime were recorded due to additional quality checks performed to address a span drift occurrence.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Maskwa Site						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0.2	11.3	8	22	5.5	NW	1.5	8	99.3
H ₂ S (ppb)	10	3	0	0	0.0	2.1	1	1	3.8	ESE	0.5	1	99.0
THC (ppm)	-	-	-	-	2.12	2.61	26	7	2.3	SW	2.23	26	100.0
NO ₂ (ppb)	159	-	0	-	2.8	19.8	8	20	4.6	WNW	4.5	8	100.0
NO (ppb)	-	-	-	-	0.8	23.5	8	22	5.5	NW	4.1	8	100.0
NO _x (ppb)	-	-	-	-	3.7	38.9	8	22	5.5	NW	8.6	8	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	73	93	VAR	VAR	VAR	VAR	87	6	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	941	955	28	VAR	VAR	VAR	953	28	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	10.1	25.5	1	15	5.8	SW	17.5	1	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	13.3	2	23	6.2	WSW	1.2	2	100.0
VECTOR WS (kph)	-	-	-	-	5.0	14.1	30	15	-	NE	9.2	30	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 24-Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

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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 \(August 3, 2016\)](#). 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.

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%).

Trailer inspection was conducted on September 1. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on September 1. The permeation tube was replaced during the calibration. A repeat calibration was performed on September 19 to address a zero drift occurrence. As the calibration met AMD requirements, no data was discarded. Five hours of downtime were recorded due to the additional calibration.

HYDROGEN SULPHIDE (H₂S)

The analyzer was removed on September 1 for maintenance to address the zero drift occurrence encountered in August. Following a successful shut-down calibration, the API 101E (S/N: 511) was replaced with the API 101E (S/N: 722) and an installation calibration was completed afterwards. A repeat span check was initiated on September 11 to assess a suspect high daily span result, but no further action was required. On September 17, the analyzer spanned high once again. As a corrective action, the span check was repeated on September 18, followed by a repeat calibration on September 19. The calibration results met AMD requirements, therefore, no data was discarded. Seven hours of downtime were recorded due to the additional quality checks.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on September 1. No operational issues were identified this month.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on September 1. No operational issues were identified this month.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

No operational issues were identified this month.

RELATIVE HUMIDITY (RH)

The humidity sensor performed well throughout the month. No operational issues were identified.

BAROMETRIC PRESSURE (BP)

The pressure sensor performed well throughout the month. No operational issues were identified.

PRECIPITATION

Both the rain gauge system and heating system performed well throughout the month. No operational issues were identified.

AMBIENT TEMPERATURE (AmbTPX)

The temperature sensor performed well throughout the month. No operational issues were identified.

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 were above the 90% requirement.

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation /Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

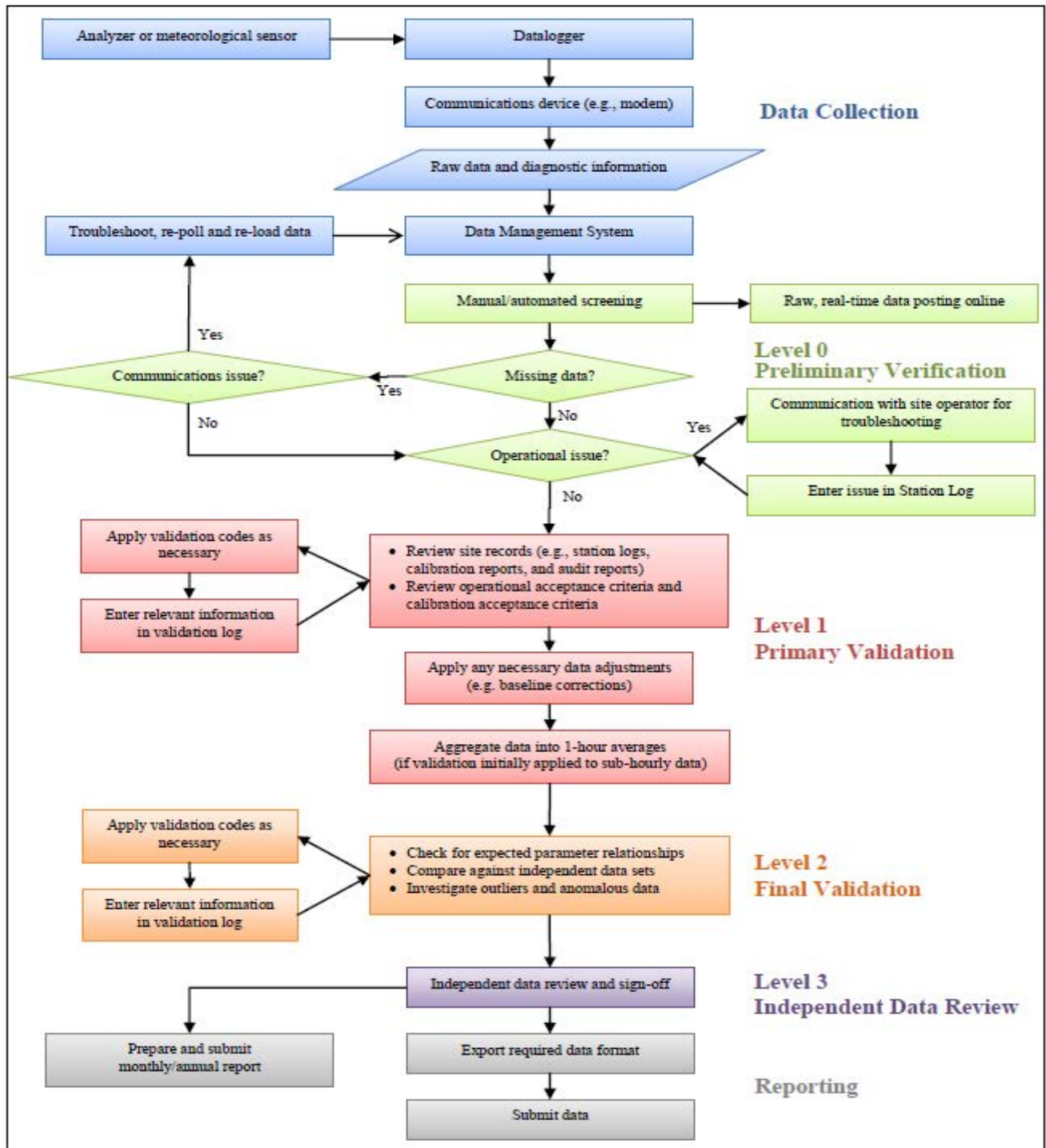
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (Aug 3, 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)

MST

DAY	HOURLY START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.	
	HOURLY END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
1	1.8	2.1	2.2	S	0.9	0.9	1.1	1.6	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.6	24
2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	1.2	0.0	1.2	0.1	24	
4	S	2.0	1.8	1.0	0.0	0.0	0.6	1.8	0.0	0.0	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	S	0.0	2.0	0.3	24		
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	1.1	0.1	24	
7	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.3	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.9	0.9	0.5	0.0	0.0	0.0	0.3	3.1	1.7	S	3.2	8.0	11.3	2.5	0.0	11.3	1.5	24		
9	1.6	3.2	0.0	0.0	0.8	0.0	0.0	0.0	1.4	0.7	0.4	0.2	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	3.2	0.4	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.7	1.7	2.8	0.9	0.4	0.0	0.0	0.0	2.8	0.3	24		
11	0.0	0.0	3.7	3.9	0.0	0.0	0.0	6.7	2.6	0.1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.7	24		
12	0.0	0.0	5.1	0.0	0.6	0.1	2.6	1.5	0.5	0.3	0.8	0.0	0.4	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.5	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	S	0.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	24		
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	24	
15	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	1.5	0.9	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.2	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	2.5	2.6	0.7	1.3	C1	C1	C1	C1	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.4	19	
20	0.0	0.0	0.0	0.0	0.0	0.2	0.1	S	2.6	0.4	0.0	0.0	0.0	0.2	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.2	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
23	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	0.0	2.1	1.1	1.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.3	24	
25	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
26	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	24		
27	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.6	6.3	4.7	0.3	0.0	0.0	0.7	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	6.3	1.0	24		
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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		
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	S	0.0	0.0	0.0	0.0	24		
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	1.8	3.2	5.1	3.9	0.9	0.9	2.6	6.7	4.5	2.5	6.3	4.7	1.3	1.6	2.1	1.1	4.5	3.1	1.7	1.7	3.2	8.0	11.3	2.5						
HOURLY AVG	0.2	0.3	0.5	0.2	0.1	0.1	0.2	0.4	0.5	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.3	0.5	0.1						

STATUS FLAG CODES

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

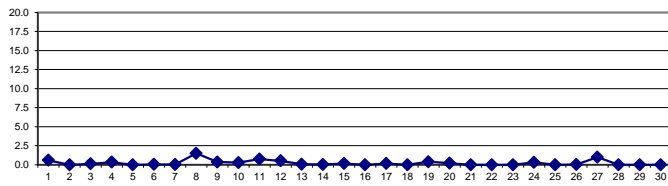
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	PPB	24-HR	48	PPB
-----------------------------	------	-----	-----	-------	----	-----

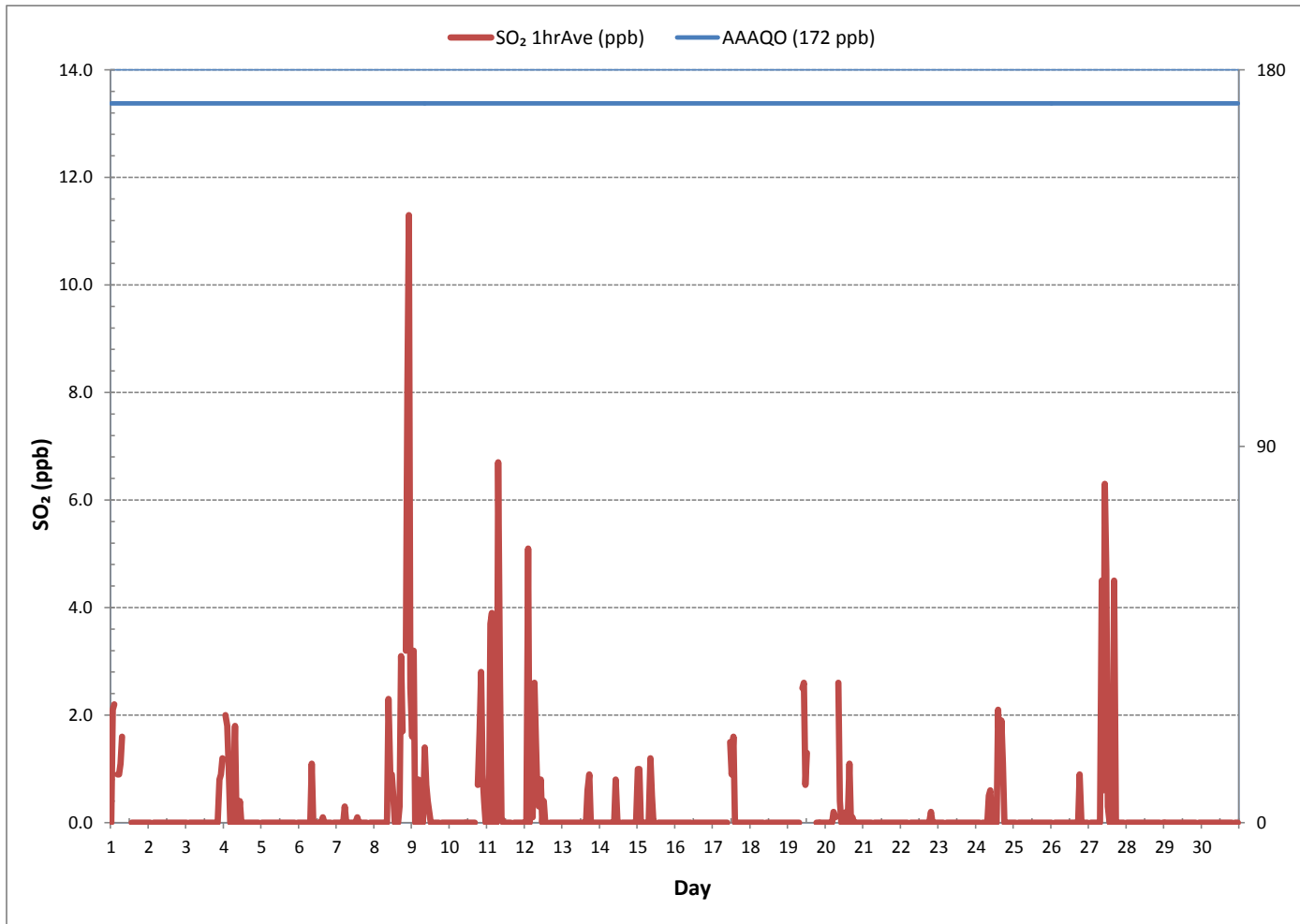
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	93					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	11.3	PPB	@ HOUR(S)	22	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	1.5	PPB			ON DAY(S)	8
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	715	HRS	
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	99.3	%	
STANDARD DEVIATION:	0.88		MONTHLY AVERAGE:	0.2	PPB	

24 HOUR AVERAGES FOR September 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		6.5	7.1	7.1	S	4.2	3.9	4.4	6.9	C	C	C	C	C	C	1.7	1.6	1.6	1.4	1.3	1.4	1.3	1.3	3.4	3.6	1.3	7.1	3.5	24	
2		2.1	1.8	S	1.2	1.2	1.4	1.5	1.6	1.6	2.1	2.4	1.6	1.7	1.8	1.5	1.8	2.8	2.0	1.8	1.9	1.9	2.1	2.1	2.0	1.2	2.8	1.8	24	
3		2.8	S	2.0	1.8	1.8	1.9	1.9	1.8	1.9	2.0	1.9	1.9	1.8	1.8	2.0	2.0	1.9	1.8	1.8	1.8	6.1	4.7	7.9	1.8	7.9	2.5	24		
4		S	6.9	6.8	4.7	2.8	1.4	4.5	7.4	2.6	2.2	5.9	4.9	1.7	2.8	1.7	1.5	1.8	1.6	1.5	1.3	1.4	1.2	1.3	S	1.2	7.4	3.1	24	
5		1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.3	1.5	1.5	1.5	1.6	1.8	2.1	2.0	3.5	2.0	2.2	1.8	1.8	1.6	1.7	S	1.7	1.2	3.5	1.7	24	
6		2.0	1.8	1.9	1.8	1.9	2.2	2.4	3.4	4.7	2.6	2.6	2.0	2.3	2.2	2.2	4.9	2.1	2.2	2.2	2.2	2.0	S	1.8	2.1	1.8	4.9	2.4	24	
7		2.1	2.0	2.1	2.4	2.4	4.4	2.8	2.2	2.3	3.1	3.6	2.4	3.3	3.2	2.9	2.8	2.6	3.6	2.7	2.4	S	2.1	2.4	2.4	2.0	4.4	2.7	24	
8		2.5	2.4	2.7	2.7	2.5	2.5	2.7	2.8	3.0	9.1	8.8	6.0	6.1	3.6	5.4	2.6	9.0	10.0	10.5	S	9.8	17.2	18.0	18.0	2.4	18.0	6.9	24	
9		8.0	14.9	2.9	2.4	6.0	3.4	2.6	3.8	6.8	5.5	4.1	5.1	4.0	2.4	2.2	5.3	2.2	2.3	S	2.1	2.3	2.4	2.4	2.4	2.1	14.9	4.2	24	
10		2.6	2.7	3.0	2.9	2.9	2.9	2.9	2.9	3.4	3.4	3.6	3.2	3.2	3.2	3.2	3.2	S	11.0	7.4	13.1	7.3	4.8	4.5	2.6	13.1	4.4	24		
11		2.9	3.8	12.4	11.5	3.9	3.0	7.7	13.7	12.0	3.9	3.3	2.9	2.7	2.7	2.5	2.4	S	2.1	2.2	2.3	2.4	2.3	2.7	2.4	2.1	13.7	4.7	24	
12		2.4	8.0	11.9	4.5	6.6	4.2	11.0	7.4	5.2	3.9	5.8	3.4	5.6	5.0	2.4	S	2.3	2.6	2.3	2.4	2.4	2.5	2.5	2.7	2.3	11.9	4.7	24	
13		2.8	2.6	2.7	2.8	2.7	2.6	2.8	2.9	3.2	3.3	3.6	3.6	3.3	3.3	S	3.9	5.0	5.2	4.1	3.6	3.5	3.4	3.4	3.6	2.6	5.2	3.4	24	
14		3.8	3.5	3.4	3.4	3.3	3.4	3.4	3.6	3.7	5.7	6.2	4.1	3.7	S	3.4	3.4	3.3	3.4	3.4	3.7	4.1	3.4	3.3	3.2	3.2	6.2	3.7	24	
15		8.2	6.8	4.2	3.5	3.2	3.1	3.1	3.6	6.7	5.3	3.4	3.2	S	3.1	3.2	3.4	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.1	8.2	3.9	24	
16		3.7	3.5	3.4	3.3	3.4	3.4	3.4	3.6	3.7	3.7	3.7	S	3.7	3.6	3.9	4.3	4.2	4.1	4.0	3.9	4.1	4.2	4.2	4.0	3.3	4.3	3.8	24	
17		4.3	4.2	4.5	4.3	4.4	4.3	4.5	4.5	4.7	4.8	S	9.9	8.8	11.4	6.0	6.0	5.2	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.2	11.4	5.5	24	
18		4.8	4.7	4.8	4.8	4.7	4.8	4.7	4.7	4.7	S	4.6	4.8	4.6	4.8	4.7	4.5	4.7	4.5	4.5	5.0	5.0	4.3	4.3	4.2	4.2	5.0	4.7	24	
19		4.2	4.1	4.2	4.1	4.3	4.2	4.2	5.7	S	11.0	13.0	4.7	5.5	C1	C1	C1	C1	C1	0.8	1.1	1.1	0.8	0.8	0.6	0.6	13.0	4.1	19	
20		0.8	0.7	1.4	1.1	1.6	2.6	1.6	S	8.8	1.9	1.5	4.1	0.7	4.1	1.7	13.7	7.1	2.6	1.5	0.8	0.6	0.5	0.4	0.4	0.4	13.7	2.6	24	
21		0.4	0.4	0.4	0.4	0.4	0.4	S	0.4	0.8	0.7	0.8	0.8	0.4	0.7	0.9	0.7	0.7	0.8	0.8	0.4	2.0	0.4	0.6	0.7	0.4	2.0	0.7	24	
22		0.5	0.6	0.5	0.5	0.5	S	0.5	0.8	0.7	0.7	0.7	0.7	0.4	0.7	0.7	0.8	1.0	1.0	1.7	2.1	1.3	0.9	1.1	1.3	0.4	2.1	0.9	24	
23		1.5	1.1	1.1	1.0	S	1.4	1.3	1.4	1.2	1.3	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.8	1.6	1.7	1.8	2.0	1.0	2.0	1.5	24	
24		2.0	2.0	1.8	S	1.6	1.6	1.6	1.5	5.8	5.0	1.8	1.7	4.7	1.6	12.7	10.7	12.3	6.0	2.6	1.3	1.4	1.3	1.2	1.3	1.2	12.7	3.6	24	
25		1.4	1.3	S	1.3	1.3	1.3	1.3	1.2	1.0	1.8	1.2	1.3	5.9	1.4	1.4	5.6	1.3	1.3	1.2	1.3	1.2	1.2	1.2	1.2	1.0	5.9	1.7	24	
26		1.3	S	1.3	1.4	1.4	1.6	1.5	1.6	1.8	2.1	2.3	1.9	1.9	1.9	1.8	2.2	2.1	2.2	4.7	2.2	2.2	2.3	3.1	3.2	1.3	4.7	2.1	24	
27		S	2.6	2.6	2.7	2.8	2.6	2.4	8.8	19.4	7.7	14.8	16.1	5.0	2.2	2.4	7.4	15.3	2.2	1.8	1.5	1.5	1.4	1.5	S	1.4	19.4	5.7	24	
28		1.3	1.3	1.4	1.6	1.9	1.3	1.2	1.3	1.7	1.4	2.1	1.4	1.4	1.4	1.4	1.3	1.2	1.4	1.3	1.3	1.3	1.3	S	1.3	1.2	2.1	1.4	24	
29		1.4	1.3	1.5	1.3	1.5	1.6	1.5	1.5	1.5	1.6	1.8	1.8	2.1	1.9	1.7	1.8	1.7	1.8	1.7	1.5	1.8	S	1.9	1.9	1.3	2.1	1.7	24	
30		2.0	1.9	1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.0	1.8	2.1	2.1	1.8	2.0	2.0	2.1	1.8	1.8	1.8	S	1.9	1.9	2.0	1.8	2.1	1.9	24	
HOURLY MAX		8.2	14.9	12.4	11.5	6.6	4.8	11.0	13.7	19.4	11.0	14.8	16.1	8.8	11.4	12.7	13.7	15.3	10.0	11.0	7.4	13.1	17.2	18.0	18.0					
HOURLY AVG		2.8	3.4	3.4	2.7	2.7	2.6	3.0	3.6	4.2	3.5	3.9	3.5	3.2	2.8	2.8	3.7	3.7	2.9	2.9	2.4	2.9	3.0	3.0	3.2					

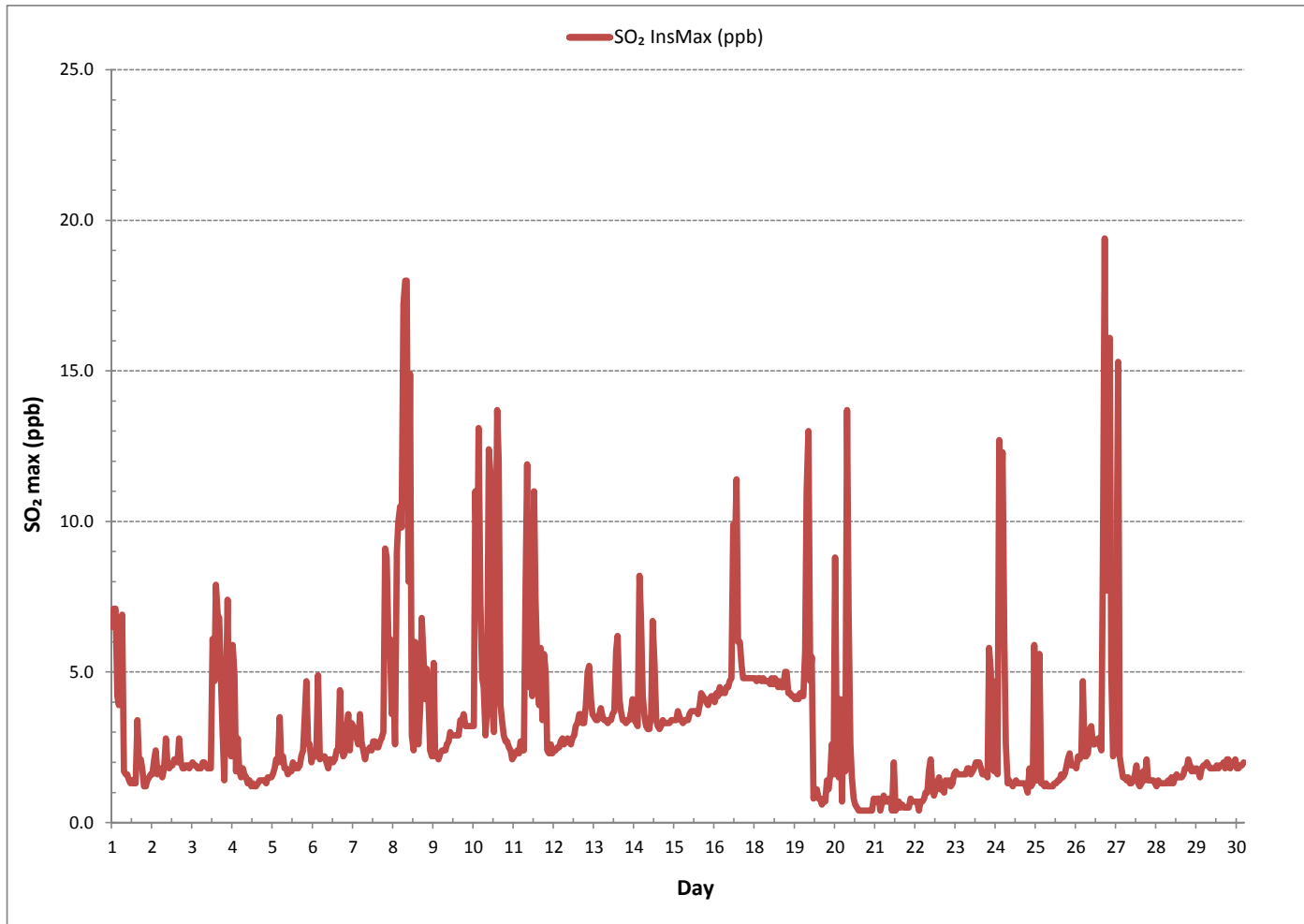
STATUS FLAG CODES

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

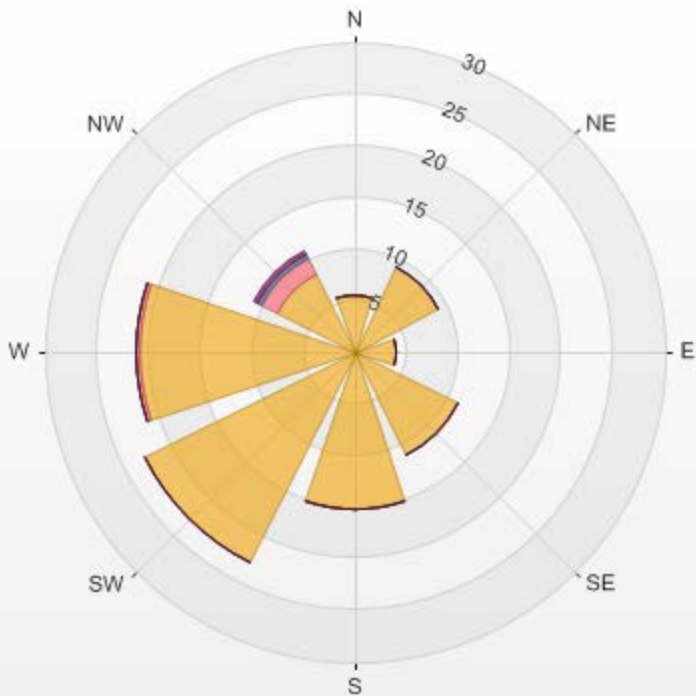
NUMBER OF NON-ZERO READINGS:	677
MAXIMUM INSTANTANEOUS VALUE:	19.4 PPB @ HOUR(S) 8 ON DAY(S) 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	2.67
OPERATIONAL TIME:	715 HRS

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



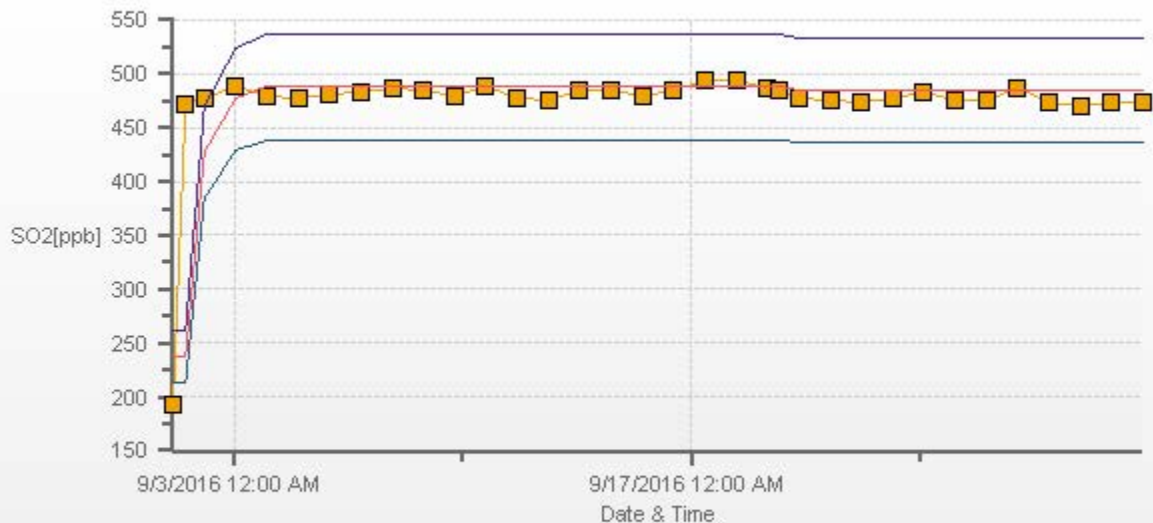
Wind: LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.03% Calm Avg: 0.00

Direction	0.0-2.4	2.4-4.8	4.8-7.2	7.2-9.6	9.6-12.0	>12.0	Total
N	5.47	0	0	0	0	0	5.47
NE	9.16	0	0	0	0	0	9.16
E	3.99	0	0	0	0	0	3.99
SE	11.23	0	0	0	0	0	11.23
S	15.21	0	0	0	0	0	15.21
SW	22.75	0	0	0	0	0	22.75
W	20.83	0.44	0	0	0	0	21.27
NW	8.42	1.77	0.44	0.15	0.15	0	10.93
Summary	97.06	2.21	0.44	0.15	0.15	0	100



% Icon Classes (ppb)	97	2	0	0	0	0
0.0-2.4						
2.4-4.8						
4.8-7.2						
7.2-9.6						
9.6-12.0						
>12.0						

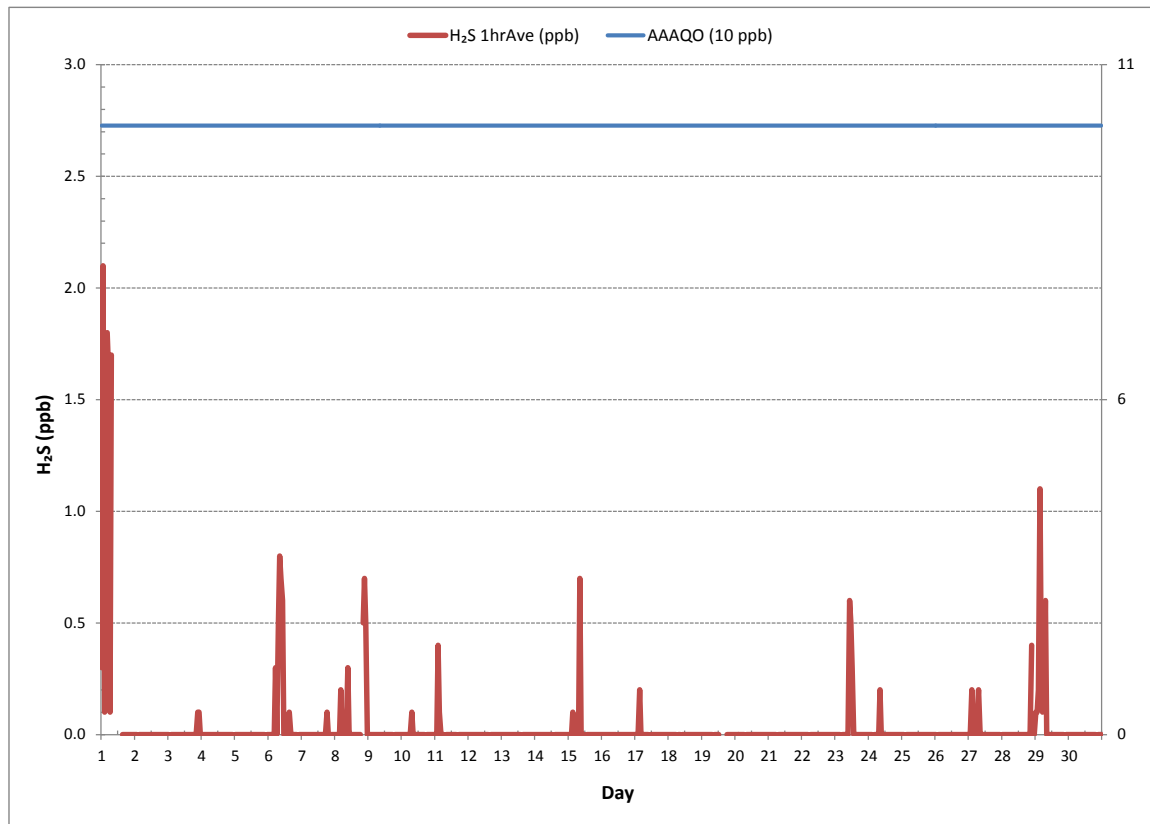
SO2[ppb] Calibration: LICA MASKWA Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY	1	4.6	7.3	5.0	S	4.5	3.3	3.2	4.4	C	C	C	C	C	C	C	C	0.6	0.5	0.6	0.4	0.2	0.2	1.1	1.2	0.2	7.3	2.5	24	
2	0.9	0.6	S	0.2	0.5	0.3	0.4	0.2	0.2	0.6	1.8	1.5	0.6	0.4	0.3	0.5	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.2	1.8	0.6	24	
3	1.3	S	0.4	0.4	0.5	0.6	0.7	0.5	0.4	0.6	0.7	0.6	0.6	0.5	0.5	0.8	0.5	0.9	0.4	0.4	0.4	1.5	1.3	1.5	0.4	0.4	1.5	0.7	24	
4	S	0.6	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.6	S	0.0	1.3	0.2	24	
5	0.0	0.4	0.5	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.3	0.3	0.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.2	0.0	0.7	0.2	24	
6	0.2	0.3	0.4	0.3	0.2	2.9	0.4	3.7	3.3	3.2	2.3	0.4	1.6	0.5	0.6	1.5	1.2	0.8	0.4	0.4	0.4	S	0.5	0.5	0.2	3.7	1.1	24		
7	0.5	0.4	0.7	0.9	0.6	1.0	0.9	0.7	0.8	0.4	1.1	0.5	0.5	0.6	0.5	0.5	0.5	0.4	2.0	0.8	S	0.5	0.4	0.6	0.4	2.0	0.7	24		
8	1.5	0.4	0.6	0.6	1.6	1.8	0.6	2.0	0.8	1.1	0.6	0.9	1.0	0.5	0.6	0.4	0.8	0.7	1.2	S	1.4	2.4	2.0	1.0	0.4	2.4	1.1	24		
9	1.2	3.3	0.2	0.0	0.5	0.0	0.1	0.1	0.2	0.2	0.1	0.3	0.6	0.2	0.7	0.3	0.1	0.4	S	0.1	0.1	0.3	0.4	0.2	0.0	3.3	0.4	24		
10	0.2	0.4	0.9	0.6	0.7	0.8	1.1	1.0	0.9	1.0	0.9	0.8	0.7	1.0	2.1	0.6	0.6	S	0.9	1.4	1.3	1.2	0.7	0.6	0.2	2.1	0.9	24		
11	0.4	0.6	3.4	2.3	0.5	0.7	S1	S1	1.0	0.3	0.2	0.4	0.2	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.5	22	
12	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	S	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24	
13	0.1	0.3	0.3	0.4	0.4	0.7	0.6	0.8	0.6	0.7	0.6	0.6	0.4	0.4	S	0.4	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.1	0.8	0.5	24		
14	0.6	0.5	0.6	0.7	0.6	0.7	0.9	0.9	0.6	0.6	1.0	0.8	0.6	S	0.4	0.5	0.4	1.0	1.0	0.6	0.7	0.6	0.4	0.3	0.3	1.0	0.7	24		
15	0.8	0.9	0.7	0.9	0.7	0.6	0.5	1.0	2.4	0.5	0.2	0.2	S	0.2	0.2	0.2	0.3	0.4	0.3	0.5	0.4	0.3	0.7	0.4	0.2	2.4	0.6	24		
16	0.5	0.5	0.6	0.8	0.8	1.0	0.9	0.7	0.9	1.1	0.9	S	2.5	0.8	0.5	0.7	0.6	0.7	2.4	1.6	0.7	1.3	0.7	0.9	0.5	2.5	1.0	24		
17	0.9	1.1	2.3	2.2	1.2	1.1	1.1	1.2	1.3	1.3	S	1.3	1.4	1.4	1.1	1.2	1.3	1.1	1.1	1.3	1.2	1.1	1.2	2.0	0.9	2.3	1.3	24		
18	1.2	1.2	1.3	1.2	1.3	1.3	S1	1.4	1.1	S	1.1	1.2	1.1	1.0	1.1	0.8	0.8	1.1	0.9	1.0	2.2	0.7	0.8	0.9	0.7	2.2	1.1	23		
19	0.8	1.4	0.8	0.8	0.7	0.8	0.8	1.1	S	2.4	0.9	0.5	0.5	C1	C1	C1	C1	C1	C1	2.3	0.1	0.4	0.1	0.2	0.1	2.4	0.9	18		
20	0.4	0.2	0.7	0.1	0.2	0.2	0.3	S	0.2	0.0	0.1	0.0	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	0.7	0.1	24		
21	0.0	0.0	0.0	0.0	1.4	0.0	S	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.1	24		
22	0.0	0.0	1.5	0.0	0.1	S	0.2	0.0	0.5	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	0.9	0.0	0.0	1.5	0.2	24		
23	0.1	0.3	0.2	0.2	S	0.3	0.3	0.8	0.4	0.1	2.1	2.3	2.2	0.6	0.2	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.5	0.6	0.1	2.3	0.7	24	
24	0.7	0.6	1.6	S	0.5	0.6	0.6	0.4	2.6	2.3	0.4	0.4	0.5	0.4	1.6	1.7	1.2	1.4	0.5	0.0	0.1	0.3	0.1	0.0	0.0	2.6	0.8	24		
25	0.1	0.0	S	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.7	0.3	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.1	24		
26	0.0	S	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.9	0.5	1.1	0.3	0.1	0.2	0.3	0.2	0.5	0.5	0.3	0.6	0.5	0.6	0.6	0.0	1.1	0.4	24		
27	S	0.8	1.8	0.8	0.6	0.9	1.3	1.7	1.8	0.8	1.1	1.2	0.4	0.3	0.3	0.4	0.6	0.3	0.2	0.0	0.0	1.0	0.0	S	0.0	1.8	0.7	24		
28	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.0	S	0.0	0.0	1.2	0.1	24		
29	0.4	0.2	0.2	2.7	0.9	0.8	0.6	1.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.2	1.0	0.0	0.2	0.1	S	0.2	0.0	0.0	2.7	0.4	24		
30	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.2	0.1	24	
HOURLY MAX	4.6	7.3	5.0	2.7	4.5	3.3	3.2	4.4	3.3	3.2	2.3	2.3	2.5	1.4	2.1	1.7	1.3	1.4	2.4	2.3	2.2	2.4	2.0	2.0						
HOURLY AVG	0.6	0.8	0.9	0.6	0.7	0.7	0.6	0.9	0.7	0.7	0.6	0.5	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.5					

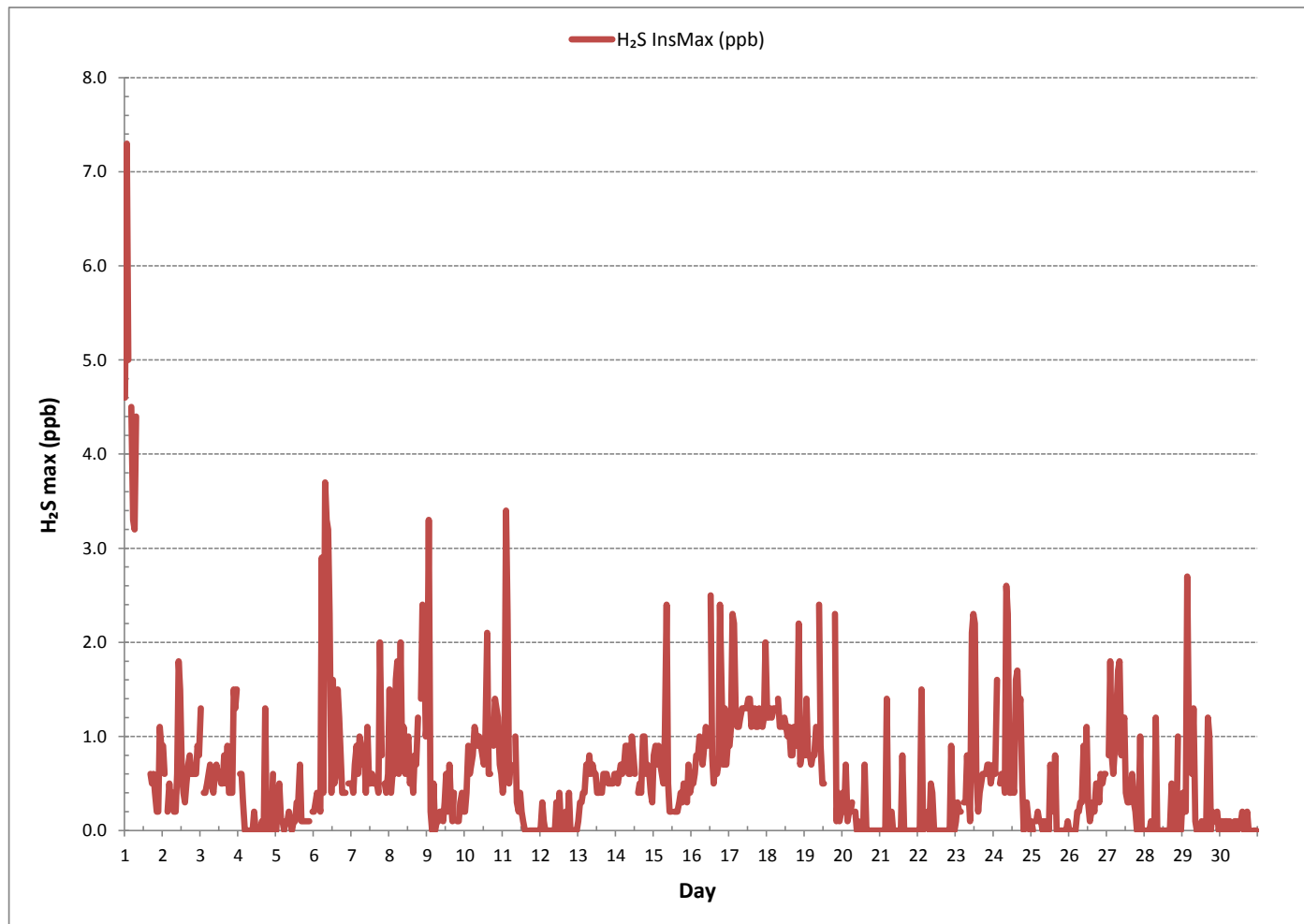
STATUS FLAG CODES

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

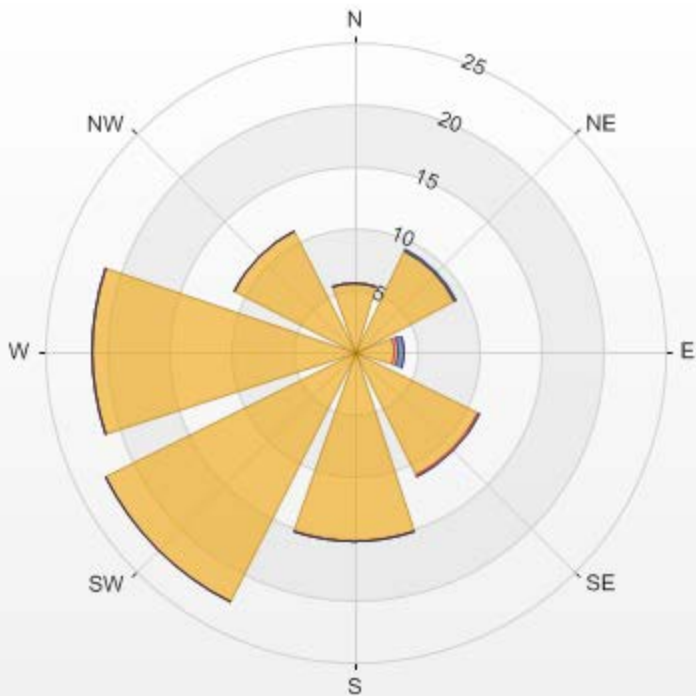
NUMBER OF NON-ZERO READINGS:	517
MAXIMUM INSTANTANEOUS VALUE:	7.3 PPB @ HOUR(S) 1 ON DAY(S) 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	0.73
OPERATIONAL TIME:	711 HRS

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.19% Calm Avg: 0.00

Direction	0.0-0.7	0.7-1.4	1.4-2.1	>2.1	Total
N	5.51	0	0	0	5.51
NE	9.09	0	0.15	0	9.24
E	3.28	0.3	0.45	0	4.03
SE	11.18	0.15	0	0	11.33
S	15.35	0	0	0	15.35
SW	22.5	0	0	0	22.5
W	21.16	0	0	0	21.16
NW	10.88	0	0	0	10.88
Summary	98.95	0.45	0.6	0	100



% Icon Classes (ppb)		99	0	1	0
0.0-0.7	0.7-1.4	1.4-2.1	>2.1		

TOTAL HYDROCARBON

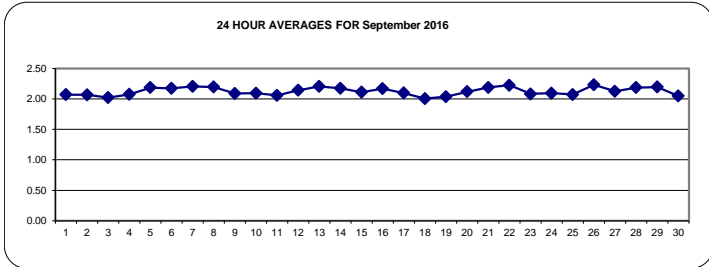


TOTAL HYDROCARBONS Hourly Averages (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	2.03	2.04	2.03	S	2.04	2.05	2.05	2.07	2.04	2.05	2.05	2.01	2.01	2.02	C	C	C	C	2.10	2.11	2.12	2.13	2.18	2.19	2.01	2.19	2.07	24		
2	2.20	2.15	S	2.12	2.14	2.19	2.20	2.15	2.07	2.06	2.06	2.03	2.02	2.01	2.00	2.00	2.01	2.00	2.01	2.00	2.01	2.02	2.04	2.02	2.01	2.05	2.00	2.20	2.07	24
3	2.04	S	2.00	1.99	2.00	2.00	2.01	2.02	2.02	2.02	2.02	2.00	1.99	2.00	2.01	2.02	2.02	2.01	2.01	2.01	2.02	2.11	2.11	2.07	1.99	2.11	2.07	24		
4	S	2.06	2.08	2.07	2.05	2.05	2.07	2.08	2.07	2.08	2.08	2.07	2.06	2.06	2.06	2.06	2.05	2.07	2.07	2.07	2.09	2.13	2.13	S	2.05	2.13	2.07	24		
5	2.14	2.19	2.24	2.31	2.36	2.41	2.44	2.59	2.23	2.10	2.07	2.07	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.11	2.12	2.11	S	2.18	2.07	2.59	2.19	24	
6	2.20	2.27	2.40	2.31	2.13	2.14	2.15	2.19	2.19	2.11	2.10	2.11	2.13	2.18	2.20	2.16	2.09	2.08	2.10	2.14	2.14	S	2.23	2.23	2.08	2.40	2.17	24		
7	2.24	2.30	2.35	2.34	2.34	2.33	2.33	2.34	2.33	2.29	2.21	2.15	2.14	2.13	2.05	2.08	2.06	2.05	2.06	2.06	S	2.20	2.16	2.20	2.05	2.35	2.21	24		
8	2.29	2.40	2.37	2.49	2.52	2.35	2.41	2.55	2.24	2.12	2.02	2.01	2.01	1.97	1.96	1.99	2.01	2.03	2.10	S	2.20	2.21	2.15	2.06	1.96	2.55	2.19	24		
9	2.13	2.10	2.06	2.07	2.15	2.10	2.10	2.14	2.12	2.10	2.08	2.06	2.06	2.06	2.03	2.04	2.02	2.05	S	2.06	2.13	2.15	2.14	2.08	2.02	2.15	2.09	24		
10	2.06	2.06	2.11	2.17	2.27	2.31	2.32	2.30	2.17	2.10	2.03	1.96	1.96	1.99	1.99	2.00	2.01	S	2.00	2.10	2.10	2.06	2.04	2.00	1.96	2.32	2.09	24		
11	2.00	2.02	2.14	2.09	2.04	2.03	2.06	2.08	2.03	2.04	2.04	2.03	2.03	2.03	S	S	2.05	2.06	2.06	2.09	2.11	2.11	2.11	2.00	2.14	2.06	24			
12	2.11	2.13	2.16	2.12	2.15	2.18	2.21	2.17	2.15	2.14	2.16	2.13	2.14	2.11	2.09	S	2.08	2.10	2.13	2.14	2.14	2.14	2.18	2.21	2.08	2.21	2.14	24		
13	2.24	2.32	2.51	2.48	2.43	2.41	2.38	2.35	2.33	2.29	2.20	2.14	2.09	2.06	S	2.03	2.01	2.01	2.00	2.06	2.07	2.06	2.08	2.11	2.00	2.51	2.20	24		
14	2.16	2.16	2.18	2.17	2.22	2.29	2.39	2.53	2.38	2.33	2.49	2.56	2.17	S	1.97	1.97	1.98	1.99	1.99	1.99	2.04	2.06	1.99	1.99	2.00	1.97	2.56	2.17	24	
15	2.17	2.21	2.15	2.18	2.12	2.14	2.17	2.23	2.41	2.14	2.01	2.03	S	2.01	2.01	2.01	2.00	1.98	1.99	1.99	2.01	2.03	2.11	2.21	2.26	1.98	2.41	2.11	24	
16	2.34	2.38	2.37	2.31	2.30	2.28	2.27	2.20	2.18	2.21	2.14	S	2.05	2.08	2.14	2.09	2.03	2.01	2.01	2.03	2.04	2.09	2.15	2.18	2.01	2.38	2.17	24		
17	2.18	2.20	2.26	2.28	2.30	2.32	2.27	2.28	2.30	2.26	S	1.97	1.94	1.97	1.93	1.92	1.90	1.90	1.92	1.96	1.99	2.02	2.04	2.11	1.90	2.32	2.10	24		
18	2.16	2.18	2.18	2.15	2.02	1.96	1.97	1.97	1.98	S	1.94	1.97	1.95	1.95	1.95	1.97	1.96	1.96	1.97	1.98	1.99	1.98	1.99	1.98	1.94	2.18	2.00	24		
19	1.99	2.01	2.02	2.01	1.99	1.99	2.00	2.04	S	2.06	2.02	2.01	2.03	2.01	2.03	2.04	2.05	2.01	2.02	2.06	2.06	2.09	2.13	2.13	1.99	2.13	2.03	24		
20	2.15	2.22	2.24	2.11	2.21	2.22	2.16	S	2.10	2.06	2.06	2.05	2.05	2.05	2.05	2.04	2.07	2.08	2.09	2.10	2.12	2.17	2.26	2.04	2.26	2.12	24			
21	2.24	2.24	2.25	2.32	2.32	2.33	S	2.33	2.34	2.33	2.26	2.25	2.10	2.09	2.05	2.03	2.05	2.05	2.08	2.11	2.13	2.14	2.15	2.18	2.03	2.34	2.19	24		
22	2.23	2.28	2.32	2.29	2.32	S	2.37	2.37	2.43	2.41	2.29	2.20	2.21	2.11	2.10	2.16	2.20	2.08	2.08	2.11	2.11	2.12	2.15	2.19	2.08	2.43	2.22	24		
23	2.19	2.21	2.25	2.24	S	2.19	2.13	2.11	2.08	2.04	2.05	2.04	2.04	2.02	2.02	2.02	2.01	2.01	2.02	2.03	2.04	2.03	2.03	2.07	2.01	2.25	2.08	24		
24	2.10	2.12	2.14	S	2.19	2.24	2.30	2.14	2.16	2.12	2.05	2.02	2.01	2.00	2.02	2.05	2.05	2.09	2.03	2.04	2.06	2.06	2.06	2.06	2.00	2.30	2.09	24		
25	2.06	2.06	S	2.06	2.06	2.07	2.08	2.08	2.07	2.09	2.06	2.05	2.08	2.06	2.03	2.05	2.04	2.05	2.08	2.08	2.10	2.11	2.13	2.12	2.03	2.13	2.07	24		
26	2.20	S	2.24	2.32	2.48	2.35	2.42	2.61	2.34	2.32	2.31	2.22	2.14	2.17	2.18	2.13	2.11	2.07	2.10	2.09	2.12	2.16	2.17	2.07	2.07	2.61	2.23	24		
27	S	2.25	2.32	2.29	2.28	2.28	2.40	2.44	2.22	2.01	2.01	2.00	1.97	1.98	1.99	2.03	2.06	2.01	2.02	2.05	2.05	2.05	S	1.97	2.44	2.13	24			
28	2.10	2.11	2.10	2.15	2.20	2.14	2.27	2.42	2.39	2.29	2.25	2.19	2.14	2.10	2.11	2.11	2.10	2.09	2.11	2.17	2.20	2.19	S	2.35	2.09	2.42	2.19	24		
29	2.26	2.29	2.46	2.45	2.35	2.32	2.43	2.45	2.34	2.21	2.16	2.08	2.05	2.03	2.04	2.03	2.02	2.04	2.06	2.09	2.10	S	2.11	2.12	2.02	2.46	2.20	24		
30	2.11	2.11	2.11	2.10	2.09	2.07	2.08	2.08	2.06	2.06	2.04	2.03	2.02	2.02	2.01	2.01	2.01	2.00	2.00	2.00	S	2.01	2.02	2.02	2.00	2.11	2.05	24		
HOURLY MAX	2.34	2.40	2.51	2.49	2.52	2.41	2.44	2.61	2.43	2.41	2.49	2.56	2.21	2.18	2.20	2.16	2.20	2.10	2.13	2.17	2.20	2.21	2.23	2.35						
HOURLY AVG	2.15	2.18	2.22	2.21	2.21	2.20	2.22	2.25	2.20	2.15	2.11	2.08	2.06	2.05	2.04	2.04	2.04	2.04	2.03	2.04	2.06	2.09	2.10	2.11	2.13					

STATUS FLAG CODES

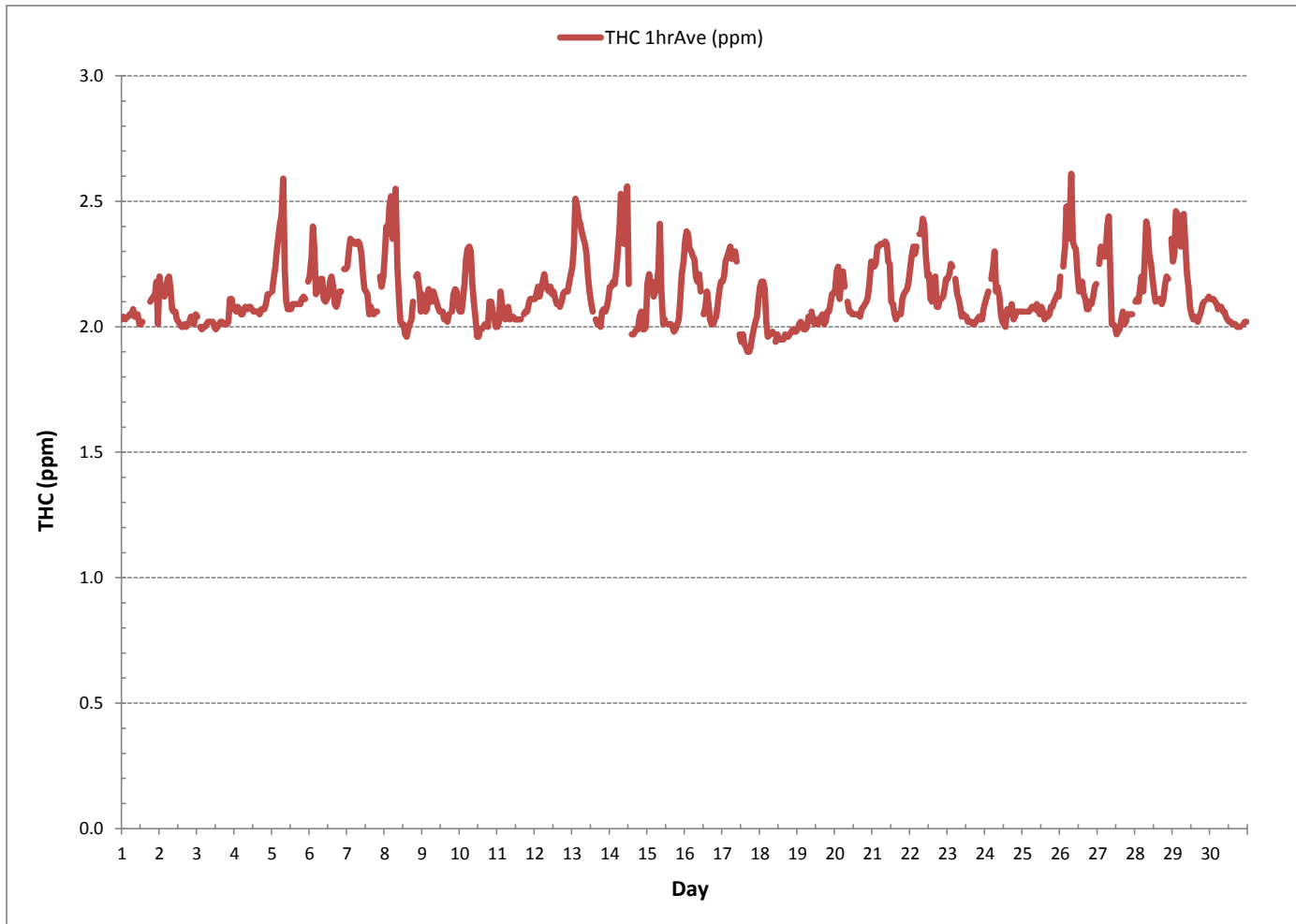
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684		
MINIMUM 1-HR AVERAGE:	1.90 PPM	@ HOUR(S)	16 , 17 ON DAY(S) 17 , 17
MAXIMUM 1-HR AVERAGE:	2.61 PPM	@ HOUR(S)	7 ON DAY(S) 26
MAXIMUM 24-HR AVERAGE:	2.23 PPM		ON DAY(S) 26
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.12	MONTHLY AVERAGE:	2.12 PPM

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.09	2.10	2.12	S	2.00	2.02	2.05	2.13	2.09	2.16	2.02	2.00	2.06	C	C	C	C	C	2.12	2.13	2.15	2.36	2.37	2.00	2.37	2.12	24		
2	2.37	2.28	S	2.13	2.19	2.32	2.24	2.24	2.09	2.06	2.09	2.05	2.03	2.03	2.00	2.00	2.03	2.00	2.03	2.03	2.06	2.03	2.08	2.12	2.00	2.37	2.11	24	
3	2.22	S	2.02	2.00	2.00	2.02	2.03	2.05	2.03	2.03	2.03	2.03	2.02	2.03	2.05	2.15	2.13	2.05	2.06	2.06	2.22	2.37	2.34	2.34	2.00	2.37	2.10	24	
4	S	2.18	2.24	2.16	2.09	2.09	2.16	2.17	2.15	2.14	2.18	2.15	2.12	2.13	2.12	2.12	2.13	2.14	2.14	2.19	2.19	2.21	S	2.09	2.24	2.15	24		
5	2.21	2.29	2.36	2.40	2.47	2.48	2.70	2.77	2.76	2.18	2.12	2.14	2.12	2.13	2.13	2.15	2.12	2.13	2.13	2.15	2.16	2.17	S	2.22	2.12	2.77	2.28	24	
6	2.26	2.52	2.76	2.61	2.17	2.24	2.27	2.30	2.31	2.15	2.15	2.16	2.18	2.24	2.24	2.34	2.13	2.12	2.19	2.19	2.19	S	2.29	2.30	2.12	2.76	2.27	24	
7	2.30	2.59	2.40	2.39	2.40	2.45	2.37	2.40	2.40	2.37	2.31	2.19	2.19	2.09	2.13	2.11	2.06	2.09	2.08	S	2.50	2.21	2.29	2.06	2.59	2.28	24		
8	2.37	2.50	2.46	2.83	2.94	2.43	2.88	2.80	2.40	2.30	2.10	2.09	2.12	2.02	2.03	2.02	2.12	2.18	2.31	S	2.40	2.55	2.61	2.19	2.02	2.94	2.38	24	
9	2.47	2.55	2.09	2.11	2.30	2.18	2.15	2.19	2.21	2.21	2.16	2.19	2.24	2.25	2.12	2.16	2.10	2.19	S	2.12	2.21	2.22	2.37	2.33	2.09	2.55	2.22	24	
10	2.11	2.11	2.17	2.26	2.32	2.35	2.35	2.33	2.27	2.22	2.09	2.00	1.97	2.21	2.03	2.02	2.05	S	2.15	2.34	2.24	2.22	2.13	2.06	1.97	2.35	2.17	24	
11	2.03	2.17	2.37	2.24	2.10	2.09	2.21	2.26	2.16	2.09	2.11	2.11	2.09	2.09	2.11	2.12	S	2.14	2.13	2.15	2.17	2.18	2.18	2.18	2.03	2.37	2.15	24	
12	2.18	2.22	2.30	2.19	2.27	2.30	2.33	2.26	2.22	2.22	2.29	2.19	2.27	2.24	2.14	S	2.13	2.15	2.17	2.18	2.18	2.19	2.22	2.26	2.13	2.33	2.22	24	
13	2.27	2.46	2.56	2.55	2.47	2.45	2.42	2.39	2.37	2.34	2.26	2.19	2.12	2.08	S	2.06	2.03	2.03	2.03	2.09	2.09	2.06	2.09	2.17	2.03	2.56	2.24	24	
14	2.19	2.18	2.20	2.19	2.26	2.36	2.53	2.61	2.52	2.53	2.68	2.65	2.46	S	1.99	2.00	2.06	2.02	2.02	2.15	2.19	2.03	2.05	1.99	2.02	2.68	2.26	24	
15	2.36	2.29	2.19	2.29	2.19	2.19	2.22	2.67	3.20	2.30	2.06	2.09	S	2.06	2.06	2.05	2.03	2.02	2.03	2.03	2.09	2.19	2.26	2.32	2.02	3.20	2.23	24	
16	2.37	2.40	2.40	2.34	2.34	2.32	2.31	2.22	2.21	2.22	2.19	S	2.09	2.12	2.18	2.15	2.05	2.03	2.03	2.03	2.06	2.12	2.17	2.18	2.03	2.40	2.20	24	
17	2.18	2.22	2.29	2.30	2.32	2.42	2.29	2.46	2.47	2.27	S	2.02	2.05	2.12	1.96	1.97	1.94	1.91	1.93	1.97	2.00	2.09	2.10	2.17	1.91	2.47	2.15	24	
18	2.18	2.22	2.22	2.18	2.10	1.97	1.99	1.97	1.97	S	1.96	2.00	1.97	1.96	2.00	1.97	2.03	1.97	1.97	2.00	2.00	2.00	2.02	2.00	1.96	2.22	2.03	24	
19	2.02	2.03	2.05	2.03	2.03	2.02	2.03	2.18	S	2.26	2.09	2.15	2.15	2.06	2.13	2.25	2.18	2.06	2.09	2.17	2.12	2.17	2.22	2.19	2.02	2.26	2.12	24	
20	2.29	2.43	2.46	2.29	2.48	2.35	2.29	S	2.27	2.15	2.12	2.12	2.12	2.12	2.21	2.16	2.12	2.21	2.19	2.18	2.21	2.30	2.35	2.12	2.48	2.24	24		
21	2.36	2.36	2.46	2.42	2.41	2.45	S	2.41	2.42	2.50	2.39	2.40	2.19	2.18	2.19	2.12	2.12	2.12	2.15	2.22	2.21	2.30	2.26	2.29	2.12	2.50	2.30	24	
22	2.33	2.41	2.49	2.41	2.45	S	2.57	2.47	2.59	2.61	2.44	2.29	2.32	2.21	2.18	2.29	2.30	2.18	2.17	2.20	2.19	2.20	2.26	2.26	2.17	2.61	2.34	24	
23	2.26	2.30	2.33	2.35	S	2.29	2.23	2.18	2.17	2.12	2.12	2.12	2.11	2.09	2.08	2.09	2.06	2.08	2.08	2.09	2.09	2.08	2.09	2.12	2.06	2.35	2.15	24	
24	2.15	2.18	2.18	S	2.26	2.32	2.38	2.27	2.43	2.40	2.18	2.12	2.15	2.14	2.29	2.22	2.42	2.62	2.26	2.12	2.12	2.15	2.15	2.12	2.12	2.62	2.24	24	
25	2.12	2.14	S	2.13	2.15	2.16	2.17	2.17	2.19	2.24	2.15	2.12	2.32	2.25	2.15	2.29	2.11	2.12	2.24	2.17	2.18	2.20	2.31	2.21	2.11	2.32	2.19	24	
26	2.36	S	2.35	2.45	2.59	2.53	2.85	3.49	2.40	2.41	2.41	2.30	2.20	2.21	2.26	2.24	2.17	2.11	2.11	2.12	2.12	2.17	2.18	2.19	2.11	3.49	2.36	24	
27	S	2.30	2.38	2.34	2.32	2.37	2.76	2.74	2.71	2.12	2.15	2.19	2.06	2.03	2.11	2.18	2.19	2.11	2.09	2.14	2.14	2.14	2.15	S	2.03	2.76	2.26	24	
28	2.20	2.20	2.20	2.33	2.33	2.29	2.43	2.57	2.57	2.45	2.48	2.31	2.29	2.20	2.20	2.22	2.21	2.20	2.26	2.29	2.34	2.32	S	2.64	2.20	2.64	2.33	24	
29	2.45	2.49	2.61	2.65	2.53	2.49	2.71	2.64	2.52	2.36	2.30	2.22	2.21	2.12	2.14	2.14	2.12	2.12	2.17	2.20	2.20	S	2.26	2.23	2.12	2.71	2.34	24	
30	2.21	2.22	2.22	2.23	2.22	2.17	2.26	2.18	2.17	2.17	2.14	2.12	2.12	2.12	2.11	2.12	2.11	2.11	2.11	2.11	S	2.11	2.12	2.12	2.11	2.26	2.16	24	
HOURLY MAX	2.47	2.59	2.76	2.83	2.94	2.53	2.88	3.49	3.20	2.61	2.68	2.65	2.46	2.25	2.29	2.34	2.42	2.62	2.31	2.34	2.40	2.55	2.61	2.64					
HOURLY AVG	2.25	2.30	2.32	2.31	2.30	2.28	2.35	2.40	2.35	2.26	2.20	2.16	2.15	2.13	2.12	2.13	2.12	2.11	2.12	2.13	2.16	2.19	2.21	2.22					

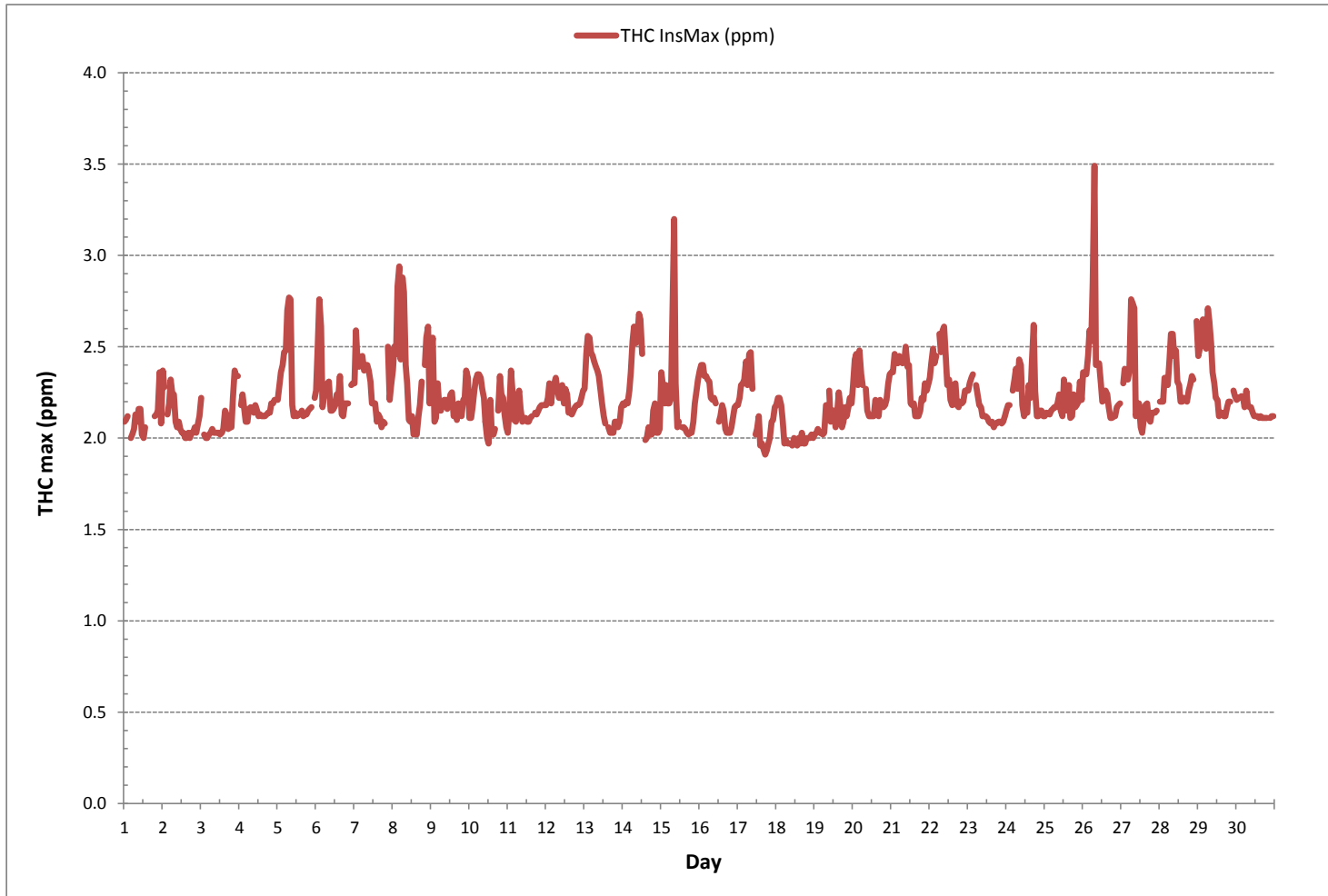
STATUS FLAG CODES

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

MONTHLY SUMMARY

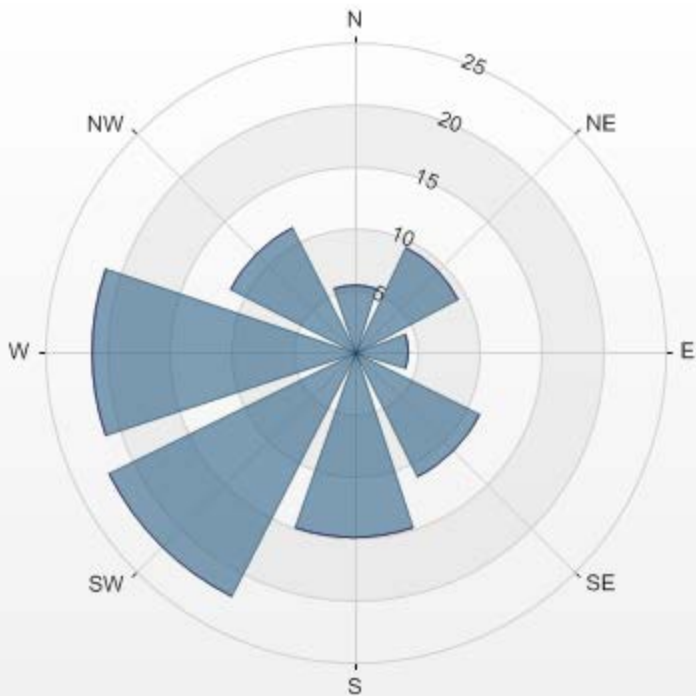
NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	3.49 PPM @ HOUR(S) 7 ON DAY(S) 26
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.18
OPERATIONAL TIME:	720 HRS

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA MASKWA Poll.: LICA MASKWA-THC[ppm] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0.0-0.9	0.9-1.8	1.8-2.7	>2.7	Total
N	0	0	5.42	0	5.42
NE	0	0	9.37	0	9.37
E	0	0	4.39	0	4.39
SE	0	0	11.27	0	11.27
S	0	0	15.08	0	15.08
SW	0	0	22.11	0	22.11
W	0	0	21.23	0	21.23
NW	0	0	11.13	0	11.13
Summary	0	0	100	0	100



OXIDES OF NITROGEN

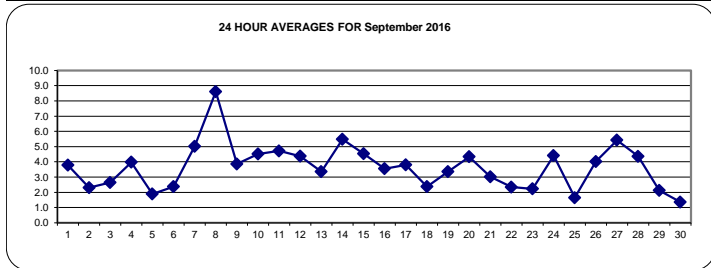


OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	1.8	4.0	3.2	S	7.8	4.6	3.4	3.2	C	C	C	C	C	C	C	C	4.4	2.3	1.4	1.0	0.8	0.9	8.5	9.4	0.8	9.4	3.8	24	
2	11.7	4.0	S	4.9	4.1	3.2	3.4	3.2	2.4	2.0	2.7	1.1	1.5	1.1	0.7	0.6	0.9	0.6	0.7	0.6	0.5	0.6	0.5	2.0	0.5	11.7	2.3	24	
3	4.0	S	3.3	3.1	2.3	2.1	2.0	1.6	1.3	1.0	0.8	0.6	0.7	0.6	0.7	1.3	3.1	0.7	0.9	0.4	1.5	8.5	8.4	11.9	0.4	11.9	2.6	24	
4	S	20.3	15.0	8.9	2.6	1.1	7.3	10.6	2.4	1.0	3.8	2.4	0.9	2.5	3.2	0.9	1.4	1.0	1.2	0.6	0.1	0.2	0.0	S	0.0	20.3	4.0	24	
5	7.7	3.1	1.9	1.4	1.2	1.9	1.3	1.9	2.3	1.4	1.0	0.6	0.8	1.3	1.0	1.4	1.0	1.1	0.7	0.4	0.4	0.2	S	9.4	0.2	9.4	1.9	24	
6	4.3	2.5	1.7	1.3	1.1	1.4	2.4	2.9	8.3	1.7	1.7	0.7	1.2	1.7	1.8	2.2	1.1	0.6	0.6	0.6	0.6	S	9.4	4.6	0.6	9.4	2.4	24	
7	3.5	2.6	4.1	12.9	7.8	21.2	9.9	5.1	6.5	6.0	4.2	1.8	2.4	2.6	2.1	1.5	1.2	1.2	0.9	0.4	S	10.1	4.3	3.2	0.4	21.2	5.0	24	
8	2.4	1.6	1.3	1.1	1.2	1.0	3.8	6.8	6.9	17.3	4.0	4.2	6.9	1.7	1.7	0.8	2.9	12.7	9.3	S	25.6	35.3	38.9	10.5	0.8	38.9	8.6	24	
9	8.5	13.8	1.7	1.0	9.1	4.2	2.8	3.7	7.3	5.2	3.9	4.0	2.5	0.2	0.0	1.0	0.1	0.0	S	9.9	3.8	2.7	1.9	1.4	0.0	13.8	3.9	24	
10	1.2	1.1	1.8	1.8	2.0	2.5	3.0	3.5	5.1	6.9	3.6	1.0	0.3	0.2	0.0	0.0	0.0	S	15.6	12.2	17.8	10.2	8.9	5.0	0.0	17.8	4.5	24	
11	0.6	1.4	16.5	13.4	1.0	0.3	5.9	22.1	9.1	2.7	2.0	2.2	4.8	1.6	0.0	0.0	S	9.1	3.0	1.9	3.5	2.4	2.8	2.2	0.0	22.1	4.7	24	
12	1.7	3.4	22.4	1.4	5.3	6.0	13.1	7.8	4.0	2.8	5.3	2.3	3.7	0.5	0.0	S	9.2	3.3	2.1	1.2	1.3	1.0	1.2	1.4	0.0	22.4	4.4	24	
13	1.6	2.1	3.7	3.0	2.7	2.6	3.0	3.3	3.9	4.0	3.3	1.9	1.0	0.5	S	12.8	6.6	5.3	3.2	2.7	2.9	2.3	2.2	2.6	0.5	12.8	3.4	24	
14	2.8	1.9	1.6	2.4	3.1	10.1	10.8	17.1	9.7	8.6	12.9	12.3	4.2	S	11.0	4.3	2.5	1.8	1.2	1.5	4.2	1.1	0.6	0.2	0.2	17.1	5.5	24	
15	8.3	16.0	8.8	7.2	3.0	3.6	4.0	3.7	7.5	5.9	0.3	0.1	S	10.9	4.2	2.8	2.5	2.3	1.8	1.7	1.8	2.6	2.6	2.8	0.1	16.0	4.5	24	
16	4.2	4.3	3.9	3.3	3.4	3.7	4.2	3.5	3.2	3.7	3.2	S	11.7	4.8	3.7	3.2	2.3	1.9	2.2	2.2	2.0	2.2	2.4	2.5	1.9	11.7	3.6	24	
17	2.9	2.6	3.9	3.8	2.1	1.7	1.9	3.4	3.3	4.4	S	15.3	9.9	10.2	5.0	3.3	2.2	1.5	1.3	1.2	1.5	1.5	1.4	3.2	1.2	15.3	3.8	24	
18	3.5	3.3	3.3	2.6	0.9	0.6	0.6	1.5	0.8	S	10.4	6.1	3.3	2.4	2.5	1.6	1.6	1.2	0.7	2.6	2.9	0.6	0.5	0.9	0.5	10.4	2.4	24	
19	0.6	1.0	0.9	0.6	0.5	0.3	2.4	4.9	S	19.4	10.0	2.9	4.2	1.8	6.9	4.4	4.5	1.8	1.0	2.3	2.1	1.5	1.2	2.0	0.3	19.4	3.4	24	
20	1.9	7.1	4.6	1.6	9.6	7.8	7.7	S	19.2	7.4	3.1	2.9	2.0	3.8	2.0	6.4	2.4	2.2	1.6	1.8	1.1	0.5	0.8	2.1	0.5	19.2	4.3	24	
21	1.2	0.8	0.8	1.0	0.5	3.2	S	15.7	11.8	8.1	5.8	5.8	2.0	3.4	1.3	1.0	1.0	1.3	0.9	0.7	0.7	0.2	0.6	1.7	0.2	15.7	3.0	24	
22	1.8	0.9	0.5	0.3	0.7	S	9.3	4.9	6.0	6.4	3.7	2.3	1.8	1.1	0.8	0.5	0.9	0.6	1.0	3.5	1.7	1.1	1.9	2.2	0.3	9.3	2.3	24	
23	2.4	1.8	1.8	1.7	S	12.4	4.7	3.0	2.1	2.1	3.4	2.6	1.8	1.3	1.3	1.0	1.1	0.8	0.7	0.7	1.1	0.7	0.8	1.9	0.7	12.4	2.2	24	
24	2.0	1.5	1.1	S	13.0	6.7	6.6	3.7	12.1	9.5	3.8	1.3	2.2	0.7	9.8	8.4	7.2	6.8	4.5	0.0	0.1	0.1	0.1	0.0	0.0	13.0	4.4	24	
25	0.0	0.4	S	10.4	3.6	3.2	3.4	2.4	1.9	3.6	0.7	0.8	2.2	0.5	0.2	1.7	0.1	0.2	0.5	0.5	0.3	0.6	0.3	0.4	0.0	10.4	1.6	24	
26	0.5	S	10.3	5.1	6.0	6.8	6.7	7.0	7.7	7.2	7.0	4.3	2.3	2.4	2.2	1.8	1.2	1.2	3.5	1.7	1.2	1.4	2.3	2.7	0.5	10.3	4.0	24	
27	S	12.9	6.2	4.0	3.7	3.3	3.6	20.1	13.5	3.1	15.1	11.2	3.6	1.4	0.8	5.0	11.3	0.3	0.0	0.1	0.1	0.0	0.0	S	0.0	20.1	5.4	24	
28	9.4	3.8	2.6	5.2	9.6	2.9	5.8	9.6	9.4	5.9	5.1	2.7	2.1	2.1	2.1	1.8	1.6	1.3	2.0	1.8	1.7	1.4	S	10.3	1.3	10.3	4.4	24	
29	4.6	3.2	2.9	2.6	1.6	2.5	2.5	3.5	1.9	1.1	1.7	1.2	1.5	1.1	0.6	0.8	0.5	0.4	0.4	1.0	0.4	S	9.3	3.5	0.4	9.3	2.1	24	
30	2.2	1.6	1.4	1.1	0.9	0.8	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.1	0.3	0.4	S	9.5	3.8	2.7	0.1	9.5	1.4	24		
HOURLY MAX	11.7	20.3	22.4	13.4	13.0	21.2	13.1	22.1	19.2	19.4	15.1	15.3	11.7	10.9	11.0	12.8	11.3	12.7	15.6	12.2	25.6	35.3	38.9	11.9					
HOURLY AVG	3.5	4.4	4.7	3.8	3.8	4.2	4.7	6.2	6.1	5.3	4.4	3.4	2.9	2.2	2.4	2.5	2.6	2.2	2.2	1.9	2.9	3.6	4.1	3.7					

STATUS FLAG CODES

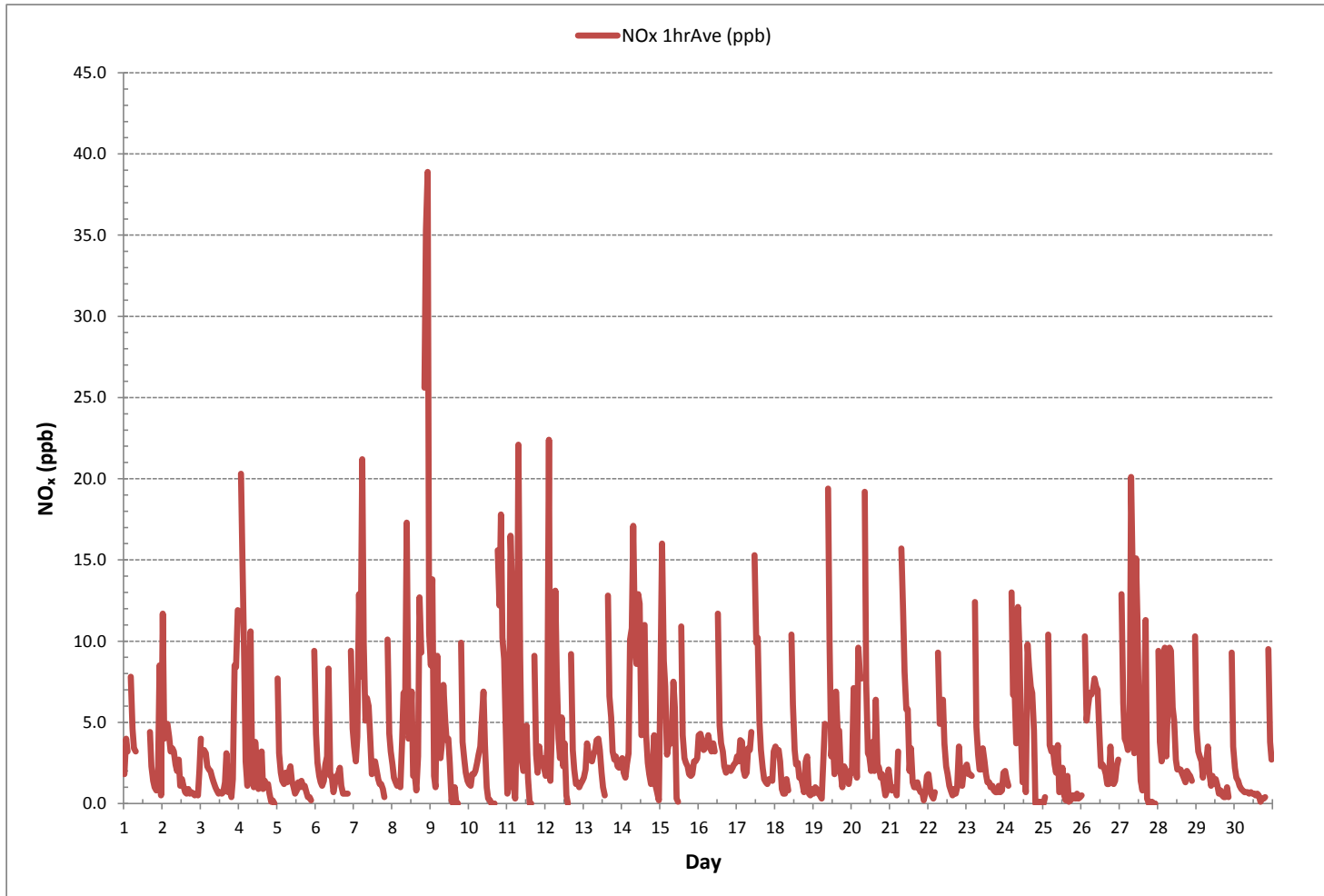
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	665				
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	38.9	PPB	@ HOUR(S)	22	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	8.6	PPB			ON DAY(S)
					VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	4.29		MONTHLY AVERAGE:	3.7	PPB

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		4.5	8.0	7.4	S	9.8	6.2	5.0	8.0	C	C	C	C	C	C	C	6.2	5.0	3.9	2.1	2.1	2.1	17.9	20.3	2.1	20.3	7.2	24		
2		17.9	12.1	S	5.6	5.0	4.4	3.9	3.9	3.3	3.3	3.3	2.7	2.1	2.1	0.9	0.9	2.1	0.9	0.9	1.0	0.9	1.0	1.6	3.9	0.9	17.9	3.6	24	
3		13.9	S	3.9	3.9	2.7	2.1	2.1	2.1	1.6	1.6	0.9	1.5	0.9	0.9	7.4	15.0	12.1	2.1	2.7	2.7	9.7	26.1	24.4	56.5	0.9	56.5	8.6	24	
4		S	43.1	30.8	21.5	8.0	2.1	17.3	26.1	6.8	5.0	13.8	12.1	3.3	5.6	5.0	2.7	4.4	2.7	2.7	1.6	0.9	0.9	0.9	S	0.9	43.1	9.9	24	
5		15.0	5.0	2.7	2.1	2.1	4.4	2.1	3.3	3.9	2.7	2.1	1.6	1.6	2.7	2.1	4.4	2.1	2.1	1.6	1.5	0.9	0.9	S	19.7	0.9	19.7	3.8	24	
6		6.2	3.3	2.7	2.1	1.5	3.3	3.9	6.8	13.9	4.4	3.9	1.5	2.1	2.1	2.7	5.6	1.6	1.5	0.9	1.5	0.9	S	13.9	6.8	0.9	13.9	4.0	24	
7		4.4	3.3	6.2	32.0	10.4	50.1	35.5	9.1	8.6	10.4	16.2	2.7	3.9	4.4	10.3	4.4	3.3	2.8	1.6	1.6	S	20.3	6.2	3.9	1.6	50.1	10.9	24	
8		3.9	2.7	2.1	2.1	2.1	1.5	12.1	12.7	10.9	22.0	18.5	10.4	16.2	8.0	10.9	1.6	25.0	26.1	30.2	S	39.5	55.4	57.7	57.7	1.5	57.7	18.7	24	
9		24.4	55.9	3.3	1.6	20.9	8.0	4.4	10.3	15.6	10.3	8.0	8.6	9.1	1.5	1.6	7.4	12.1	1.5	S	22.6	5.6	3.3	2.7	2.1	1.5	55.9	10.5	24	
10		2.1	2.1	2.7	2.7	2.7	3.3	6.2	5.6	7.4	10.3	6.8	2.7	2.1	1.5	1.5	0.4	0.9	S	31.4	19.1	36.7	23.2	15.0	13.9	0.4	36.7	8.7	24	
11		0.9	9.1	33.2	26.1	3.3	2.1	19.7	34.4	29.0	5.6	3.3	4.4	8.0	6.2	0.4	0.4	S	22.6	4.4	3.3	4.4	3.9	5.0	3.9	0.4	34.4	10.2	24	
12		3.3	22.6	40.7	8.6	17.3	10.9	28.5	17.9	10.4	6.8	26.1	6.8	9.7	9.8	1.5	S	22.6	6.2	3.3	2.1	2.7	2.1	2.7	2.7	1.5	40.7	11.5	24	
13		2.7	3.9	5.0	5.0	4.4	3.9	6.2	6.2	6.8	5.0	4.4	3.3	20.3	2.1	S	28.4	8.0	8.0	4.4	3.9	4.4	3.3	3.3	4.4	2.1	28.4	6.4	24	
14		5.0	2.7	2.7	3.3	4.5	37.2	20.9	74.6	13.9	32.6	17.3	14.4	9.2	S	25.6	6.2	3.3	2.7	2.1	3.9	8.0	2.1	0.9	0.9	0.9	74.6	12.8	24	
15		19.7	28.5	10.9	10.3	5.6	6.2	6.2	8.0	12.1	10.9	1.6	0.9	S	25.0	5.6	3.9	4.4	3.9	2.1	2.1	2.1	2.7	3.2	3.3	0.9	28.5	7.8	24	
16		4.4	4.5	4.4	3.3	3.3	3.9	5.0	3.9	3.9	3.9	S	26.1	6.2	4.4	3.9	2.7	2.1	2.1	2.1	2.1	2.1	2.1	2.7	2.7	2.1	26.1	4.5	24	
17		2.7	2.7	5.6	5.6	2.7	2.1	2.7	6.2	5.6	7.4	S	30.2	20.9	31.4	10.4	7.4	5.0	1.5	1.6	1.6	1.5	1.6	2.1	3.9	1.5	31.4	7.1	24	
18		3.9	3.3	3.9	2.7	1.5	0.4	0.9	25.6	0.9	S	16.7	10.3	3.3	2.7	3.3	1.6	2.7	1.5	0.9	49.5	8.6	0.4	0.9	4.4	0.4	49.5	6.5	24	
19		0.4	0.9	0.9	0.4	0.4	0.4	19.1	10.3	S	41.3	30.2	6.2	8.6	3.3	24.4	12.7	9.1	3.3	3.3	5.0	2.7	1.6	1.5	3.3	0.4	41.3	8.2	24	
20		2.1	46.0	8.6	7.9	18.5	14.4	10.9	S	36.7	9.1	5.6	9.8	2.7	9.1	3.9	38.3	20.3	5.0	2.7	2.1	1.5	0.4	1.5	2.1	0.4	46.0	11.3	24	
21		2.1	0.9	2.1	1.5	0.4	6.8	S	30.8	13.9	9.8	7.4	7.4	3.3	4.4	2.7	3.2	2.7	3.9	0.9	0.9	0.9	0.9	1.5	2.7	0.4	30.8	4.8	24	
22		3.3	1.5	0.9	0.9	2.7	S	21.5	6.2	11.5	10.9	4.4	3.3	2.1	2.1	1.5	0.9	0.9	0.9	3.3	4.4	2.1	1.5	2.7	2.1	0.9	21.5	4.0	24	
23		2.7	2.1	2.1	2.1	S	25.0	5.6	3.3	2.1	2.7	5.0	4.4	2.1	1.5	1.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	2.1	0.9	25.0	3.1	24	
24		2.7	2.1	0.9	S	23.2	8.0	9.7	5.0	46.6	31.4	6.2	2.1	10.3	0.9	32.0	24.4	30.2	12.1	13.9	0.0	0.4	0.4	0.4	0.0	0.0	46.6	11.4	24	
25		0.0	1.5	S	23.2	4.4	6.8	8.6	2.1	2.7	8.0	0.9	0.9	13.9	2.1	0.4	12.7	0.0	0.4	1.5	1.5	0.4	0.4	0.4	0.4	0.0	23.2	4.1	24	
26		0.4	S	23.2	6.2	7.4	8.0	9.1	60.6	8.0	7.4	8.0	5.0	2.1	2.1	2.1	2.1	0.9	1.5	4.4	1.5	1.5	1.5	2.7	2.7	0.4	60.6	7.3	24	
27		S	27.3	7.4	5.0	3.9	3.9	4.4	67.1	37.2	13.8	25.0	27.3	6.2	2.7	2.1	15.0	24.4	1.6	0.0	0.4	0.9	0.0	0.0	S	0.0	67.1	12.5	24	
28		20.9	4.4	2.7	8.6	13.3	5.0	8.6	12.7	10.3	6.7	7.4	2.7	2.1	2.7	1.6	2.1	1.5	0.9	2.1	1.5	0.9	0.9	S	22.0	0.9	22.0	6.2	24	
29		5.6	2.7	2.7	2.1	1.5	25.5	4.4	3.8	1.5	0.4	2.1	0.9	2.1	1.5	0.4	0.4	0.4	0.0	0.4	0.4	0.0	0.0	S	20.9	3.9	0.0	25.5	3.6	24
30		2.1	1.5	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	16.8	3.9	2.7	0.0	16.8	1.4	24	
HOURLY MAX		24.4	55.9	40.7	32.0	23.2	50.1	35.5	74.6	46.6	41.3	30.2	30.2	26.1	31.4	32.0	38.3	30.2	26.1	31.4	49.5	39.5	55.4	57.7	57.7					
HOURLY AVG		6.3	10.8	7.9	7.0	6.3	8.8	9.8	16.1	11.6	10.1	8.9	6.6	6.9	5.2	5.9	7.4	7.2	4.3	4.5	4.9	5.1	6.3	7.1	9.1					

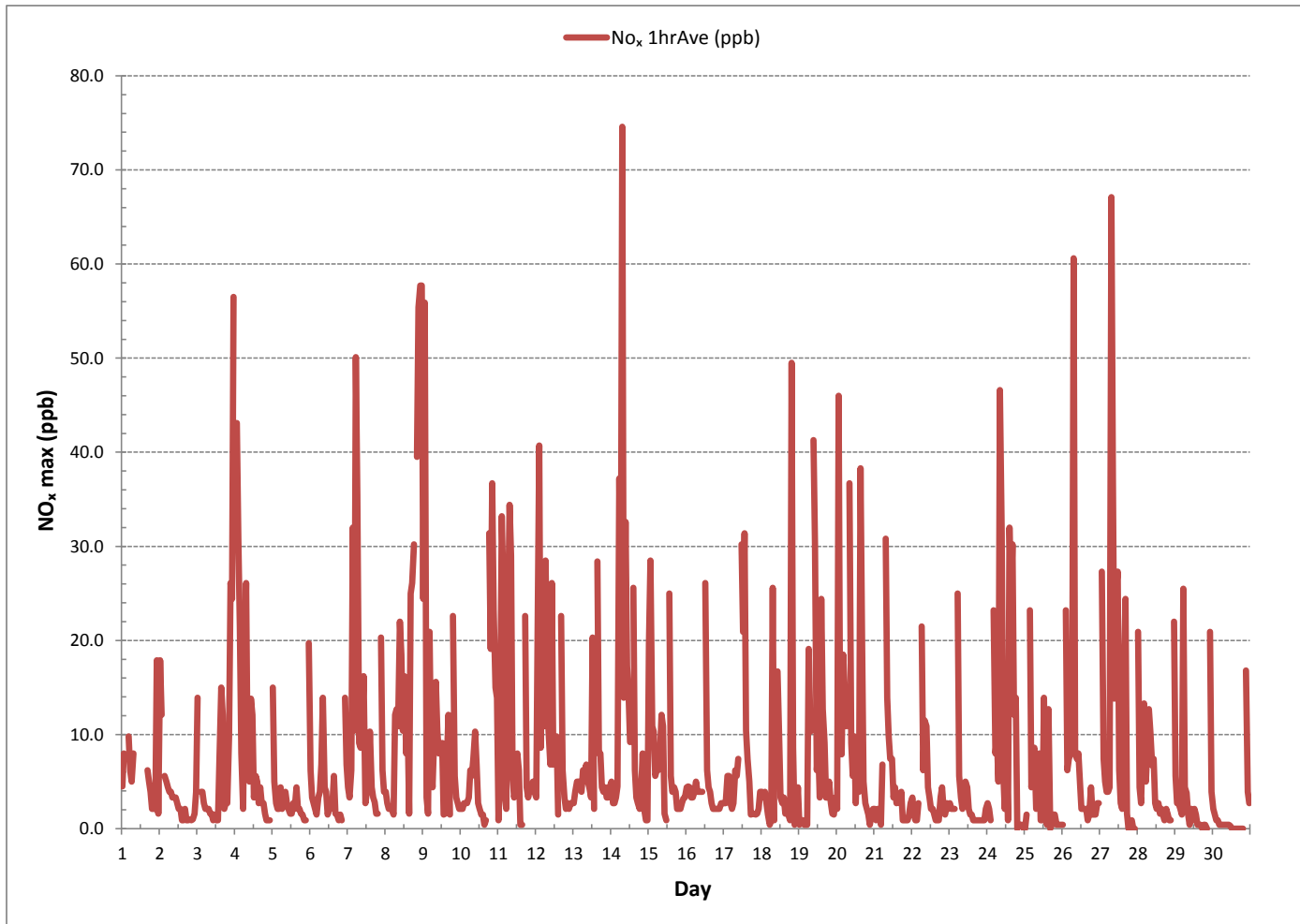
STATUS FLAG CODES

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

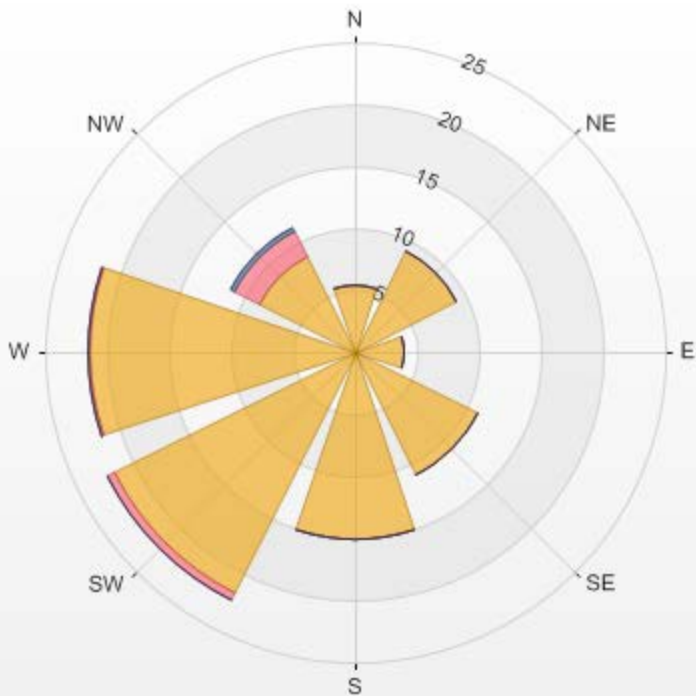
NUMBER OF NON-ZERO READINGS:	663
MAXIMUM INSTANTANEOUS VALUE:	74.6 PPB @ HOUR(S) 7 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	10.56
OPERATIONAL TIME:	720 HRS

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.44% Calm Avg: 0.00

Direction	0.0-13.3	13.3-26.7	26.7-40.0	>40.0	Total
N	5.44	0	0	0	5.44
NE	9.12	0	0	0	9.12
E	3.97	0	0	0	3.97
SE	11.18	0	0	0	11.18
S	15.15	0	0	0	15.15
SW	21.76	0.59	0	0	22.35
W	21.32	0.29	0	0	21.61
NW	8.68	2.21	0.29	0	11.18
Summary	96.62	3.09	0.29	0	100



% Icon Classes (ppb)	97	3	0	0
0.0-13.3	97	3	0	0
13.3-26.7		3	0	0
26.7-40.0			0	0
>40.0				0

NOX[ppb] Calibration: LICA MASKWA Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

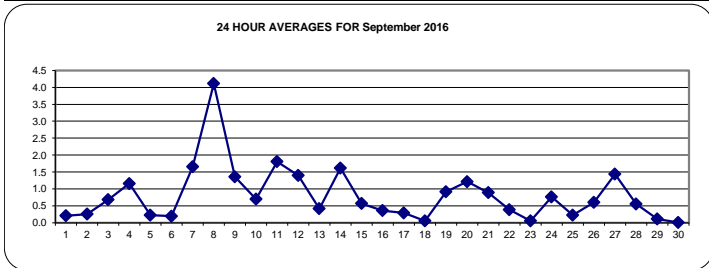
NITRIC OXIDES

NITRIC OXIDE Hourly Averages (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.0	0.2	0.1	S	0.0	0.0	0.1	0.5	C	C	C	C	C	C	C	C	0.1	0.0	0.2	0.1	0.0	0.0	0.7	1.1	0.0	1.1	0.2	24	
2	1.1	0.4	S	0.1	0.1	0.4	0.6	0.7	0.5	0.5	0.5	0.2	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1	0.3	24
3	0.3	S	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.0	0.0	0.0	0.0	0.0	3.8	3.6	6.5	0.0	6.5	0.7	24
4	S	6.2	4.8	2.3	0.0	0.0	2.3	4.6	0.7	0.0	1.6	0.8	0.1	0.6	0.7	0.3	0.2	0.2	0.0	0.0	0.0	0.1	0.0	S	0.0	6.2	1.2	24	
5	0.3	0.1	0.0	0.0	0.0	0.8	0.6	1.1	0.9	0.3	0.3	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	1.1	0.2	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8	0.1	0.1	0.0	0.2	0.6	0.6	0.6	0.0	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	1.8	0.2	24	
7	0.0	0.0	0.2	6.3	1.3	12.0	4.5	2.2	3.2	3.0	2.1	0.5	0.6	0.8	0.6	0.3	0.2	0.0	0.0	0.0	S	0.1	0.1	0.1	0.0	12.0	1.7	24	
8	0.0	0.2	0.2	0.2	0.2	0.3	3.0	4.8	4.0	9.3	1.9	2.2	2.6	0.9	1.0	0.6	1.4	5.2	3.0	S	5.8	18.9	23.5	5.3	0.0	23.5	4.1	24	
9	3.0	7.4	0.5	0.5	4.3	1.3	0.4	1.3	3.9	3.0	2.0	1.9	1.1	0.2	0.0	0.4	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	7.4	1.4	24	
10	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.8	2.1	3.4	1.8	0.4	0.3	0.2	0.0	0.0	0.0	S	1.2	0.9	2.3	0.8	0.6	0.4	0.0	3.4	0.7	24	
11	0.1	0.2	7.7	7.1	0.0	0.1	1.5	13.5	4.8	1.2	1.0	1.1	2.4	0.8	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	1.8	24	
12	0.0	0.8	13.0	0.0	1.0	0.4	6.1	3.6	1.7	1.0	1.7	0.9	1.5	0.4	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	1.4	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	2.1	2.1	1.7	0.7	0.4	0.0	S	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.4	24	
14	0.0	0.0	0.0	0.0	0.0	3.2	3.7	8.1	4.2	3.9	6.5	6.0	1.5	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	1.6	24
15	1.7	3.8	0.0	0.0	0.0	0.1	0.7	1.2	3.3	1.8	0.0	S	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	3.8	0.6	24	
16	0.3	0.1	0.0	0.0	0.0	0.4	0.5	1.0	1.3	1.6	1.2	S	0.6	0.3	0.4	0.3	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	1.6	0.4	24	
17	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	S	1.8	1.2	2.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.3	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.4	0.0	0.5	0.1	24	
19	0.0	0.1	0.3	0.0	0.2	0.2	0.8	1.6	S	5.0	3.5	0.4	1.0	0.4	2.4	1.4	1.2	0.5	0.6	0.4	0.3	0.3	0.2	0.2	0.0	5.0	0.9	24	
20	0.0	3.9	0.7	0.3	2.9	2.3	2.5	S	5.3	2.0	0.5	0.9	0.5	1.3	0.5	2.8	0.6	0.3	0.0	0.0	0.0	0.1	0.2	0.0	5.3	1.2	24		
21	0.1	0.0	0.4	0.5	0.3	2.5	S	2.5	4.6	3.2	2.1	1.6	0.4	0.8	0.5	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	4.6	0.9	24		
22	0.2	0.0	0.2	0.0	0.1	S	0.5	0.8	2.3	2.4	0.9	0.5	0.5	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.4	0.4	24		
23	0.1	0.0	0.0	0.0	S	0.4	0.1	0.1	0.0	0.0	0.3	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	0.4	0.1	24	
24	0.0	0.0	0.0	S	0.0	0.0	0.1	0.0	5.1	2.4	0.5	0.0	0.3	0.0	3.5	2.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.8	24	
25	0.0	0.0	S	0.5	0.1	0.4	0.2	0.3	0.5	1.1	0.0	0.3	0.8	0.2	0.1	0.5	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.1	0.2	24	
26	0.1	S	0.4	0.0	0.1	0.3	0.6	2.7	2.2	2.4	2.3	1.1	0.5	0.5	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.6	24	
27	S	0.4	0.0	0.0	0.0	0.0	0.1	10.8	6.8	0.8	4.7	2.8	0.3	0.1	0.1	1.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	10.8	1.4	24	
28	0.3	0.0	0.0	0.0	0.2	0.0	0.5	2.6	3.3	1.9	1.8	0.7	0.3	0.4	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	S	0.1	0.0	3.3	0.6	24	
29	0.0	0.0	0.0	0.0	0.0	0.5	0.3	1.0	0.4	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	1.0	0.1	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.1	0.0	24	
HOURLY MAX	3.0	7.4	13.0	7.1	4.3	12.0	6.1	13.5	6.8	9.3	6.5	6.0	2.6	2.4	3.5	2.8	3.4	5.2	3.0	0.9	5.8	18.9	23.5	6.5					
HOURLY AVG	0.3	0.9	1.0	0.6	0.4	0.9	1.0	2.3	2.3	1.9	1.4	0.9	0.6	0.4	0.4	0.5	0.4	0.3	0.2	0.1	0.3	0.9	1.0	0.5					

STATUS FLAG CODES

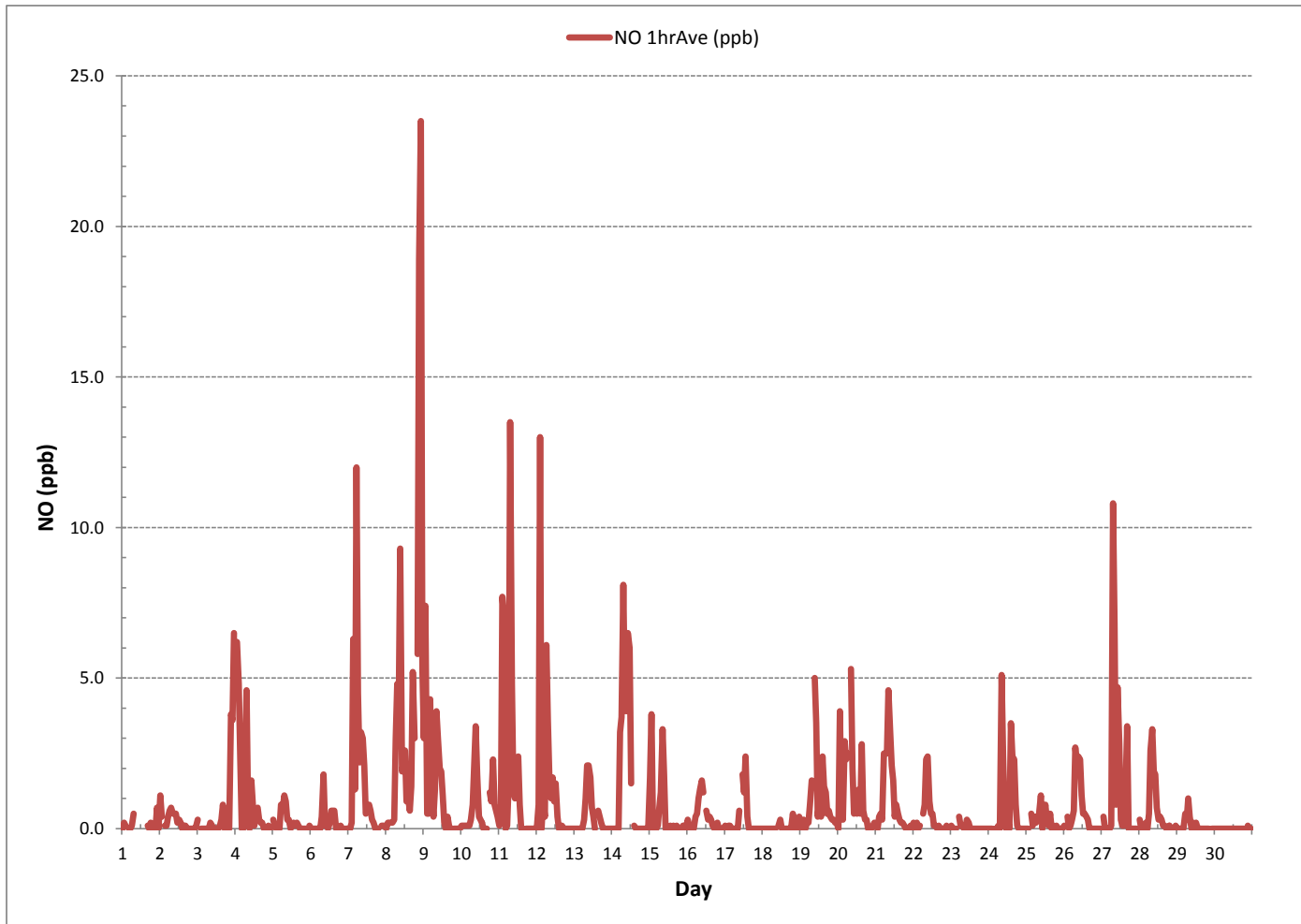
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	381				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	23.5	PPB @ HOUR(S)	22	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	4.1	PPB		ON DAY(S)	8
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1.96		MONTHLY AVERAGE:	0.8	PPB

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.7	0.8	0.8	S	0.8	0.8	0.8	2.5	C	C	C	C	C	C	C	C	0.8	0.7	1.9	0.7	0.8	0.2	4.2	4.8	0.2	4.8	1.4	24	
2	1.9	1.3	S	0.8	0.8	0.8	0.8	1.3	0.8	1.3	0.8	1.3	0.8	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	1.9	0.9	24
3	2.5	S	0.8	0.8	0.8	0.2	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	7.2	13.1	4.8	0.8	0.8	0.8	0.8	3.6	16.0	14.2	38.2	0.2	38.2	4.8	24
4	S	20.1	15.4	8.9	1.9	0.8	7.7	14.2	3.7	2.5	7.2	5.4	1.3	1.9	1.3	0.8	1.3	0.8	0.8	0.2	0.2	0.8	0.2	S	0.2	20.1	4.4	24	
5	0.8	0.8	0.7	0.7	0.8	3.1	1.3	1.9	1.9	0.8	0.8	0.2	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	S	0.8	0.2	3.1	0.9	24	
6	0.7	0.2	0.2	0.2	0.7	0.2	0.8	1.9	3.6	0.8	0.8	0.2	0.8	1.3	1.3	2.5	0.2	0.2	0.7	0.7	0.8	S	0.7	0.2	0.2	3.6	0.9	24	
7	0.7	0.8	0.8	20.7	2.5	36.5	23.0	4.2	4.2	4.8	12.5	0.8	1.3	1.3	4.2	1.9	1.3	0.2	0.2	0.2	S	0.2	0.2	0.2	0.2	36.5	5.3	24	
8	0.2	0.2	0.7	0.2	0.7	0.2	10.1	7.8	6.6	11.3	9.5	4.8	5.4	3.6	4.8	0.8	8.9	10.1	11.9	S	17.1	34.8	38.8	38.8	0.2	38.8	9.9	24	
9	10.1	37.1	0.8	0.8	10.1	3.1	0.8	4.8	8.4	6.0	3.6	4.8	6.5	0.7	0.8	3.1	7.7	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	37.1	4.8	24	
10	0.2	0.2	0.2	0.2	0.2	0.2	1.3	1.3	3.1	4.8	3.1	0.8	1.3	1.9	0.7	0.8	0.2	S	5.4	3.1	11.3	3.1	1.9	0.8	0.2	11.3	2.0	24	
11	0.2	1.9	20.1	14.8	0.2	1.3	10.7	22.4	16.6	3.1	1.9	2.5	4.2	3.1	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	22.4	4.6	24	
12	0.2	11.3	24.2	3.1	6.6	3.1	17.7	8.9	4.2	1.9	7.2	2.5	4.2	3.7	0.8	S	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	24.2	4.4	24	
13	0.2	0.2	0.2	0.2	0.2	0.2	1.9	1.9	4.2	2.5	2.5	1.3	13.1	0.8	S	1.3	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	13.1	1.5	24
14	0.2	0.2	0.2	0.2	0.2	26.0	10.1	44.7	6.6	23.0	8.9	7.2	4.2	S	1.3	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	44.7	5.9	24
15	6.0	11.3	0.7	0.8	0.2	1.3	1.3	7.2	3.7	0.2	0.2	S	0.2	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	11.3	1.7	24
16	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	1.9	1.3	1.3	S	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9	0.4	24
17	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	0.8	1.3	S	6.6	6.0	13.7	1.9	1.3	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	13.7	1.6	24
18	0.2	0.2	0.2	0.2	0.2	0.2	14.2	0.2	S	0.2	1.3	0.2	1.3	0.2	0.2	0.2	0.2	0.2	0.2	27.7	0.2	0.2	0.2	2.5	0.2	27.7	2.2	24	
19	0.2	0.2	0.2	0.2	0.2	0.2	8.9	4.2	S	18.3	15.4	1.3	1.9	0.2	10.7	4.2	1.9	1.3	1.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	18.3	3.1	24
20	0.2	34.2	1.9	1.9	7.2	4.8	4.2	S	13.6	1.9	0.8	3.7	0.8	3.6	0.7	18.9	8.3	0.8	0.2	0.0	0.0	0.1	0.2	0.2	0.0	34.2	4.7	24	
21	0.2	0.2	1.3	0.8	0.2	4.8	S	4.8	6.0	3.7	2.5	2.5	0.2	1.3	0.8	0.8	0.8	0.8	0.2	0.2	0.0	0.2	0.2	0.2	0.0	6.0	1.4	24	
22	0.2	0.2	0.2	0.2	0.2	S	0.2	0.8	5.4	5.4	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.0	0.0	5.4	0.7	24	
23	0.2	0.2	0.2	0.0	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	24
24	0.2	0.0	0.1	S	0.2	0.2	1.3	0.2	32.4	20.1	1.9	0.2	3.6	0.2	13.7	8.9	12.5	1.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	32.4	4.3	24	
25	0.0	0.2	S	0.2	0.2	0.8	0.2	0.2	0.2	2.5	0.0	0.2	5.4	0.7	0.2	4.2	0.0	0.2	0.0	0.2	0.2	0.2	0.0	0.0	0.0	5.4	0.7	24	
26	0.2	S	0.2	0.0	0.2	0.2	0.8	43.5	2.5	2.5	2.5	1.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	43.5	2.4	24	
27	S	0.2	0.0	0.0	0.2	0.2	0.2	48.3	21.9	4.2	8.9	7.2	0.8	0.2	0.2	4.2	8.4	0.0	0.0	0.0	0.0	0.0	0.2	S	0.0	48.3	4.8	24	
28	0.2	0.2	0.2	0.1	0.2	0.2	1.9	4.2	3.1	2.5	2.5	0.8	0.8	0.8	0.2	0.2	0.2	0.0	0.2	0.0	0.2	0.0	0.0	S	0.2	4.2	0.8	24	
29	0.0	0.0	0.0	0.0	0.0	14.2	0.2	0.8	0.2	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.2	0.0	14.2	0.7	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.0	0.0	0.0	0.2	0.0	24
HOURLY MAX	10.1	37.1	24.2	20.7	10.1	36.5	23.0	48.3	32.4	23.0	15.4	7.2	13.1	13.7	13.7	18.9	12.5	10.1	11.9	27.7	17.1	34.8	38.8	38.8					
HOURLY AVG	1.0	4.4	2.5	2.0	1.2	3.6	3.7	8.4	5.7	4.7	3.5	2.1	2.4	1.5	1.9	2.5	2.2	0.7	0.9	1.3	1.3	2.1	2.3	3.2					

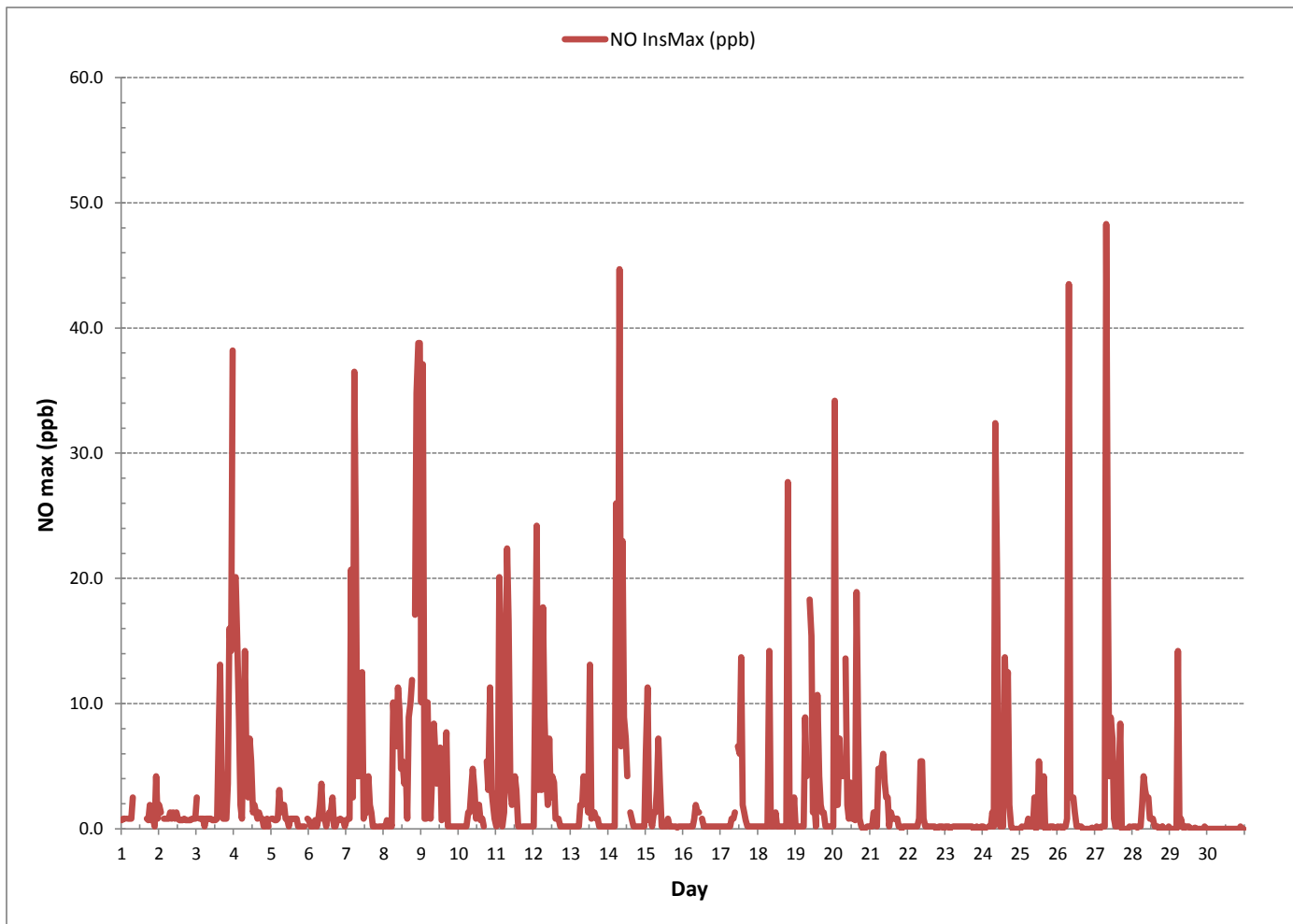
STATUS FLAG CODES

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

MONTHLY SUMMARY

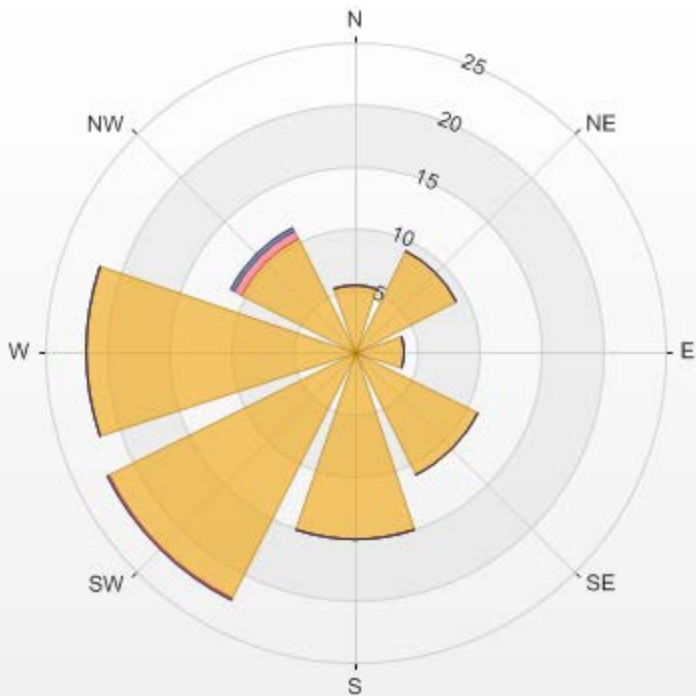
NUMBER OF NON-ZERO READINGS:	602				
MAXIMUM INSTANTANEOUS VALUE:	48.3	PPB	@ HOUR(S)	7	ON DAY(S) 27
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	8	HRS			
STANDARD DEVIATION:	6.25				

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-NO[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.44% Calm Avg: 0.00

Direction	0.0-8.3	8.3-16.7	16.7-25.0	>25.0	Total
N	5.44	0	0	0	5.44
NE	9.12	0	0	0	9.12
E	3.97	0	0	0	3.97
SE	11.18	0	0	0	11.18
S	15.15	0	0	0	15.15
SW	22.21	0.15	0	0	22.36
W	21.62	0	0	0	21.62
NW	10.29	0.59	0.29	0	11.17
Summary	98.98	0.74	0.29	0	100



% Icon Classes (ppb)											
99	■	0.0-8.3	1	■	8.3-16.7	0	■	16.7-25.0	0	■	>25.0

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	1.8	3.7	3.1	S	7.8	4.6	3.3	2.7	C	C	C	C	C	C	C	C	C	4.2	2.2	1.2	1.0	0.8	0.9	7.8	8.3	0.8	8.3	3.6	24
2	10.6	3.7	S	4.8	3.9	2.8	2.8	2.6	1.9	1.4	2.2	0.9	1.2	0.9	0.6	0.6	0.7	0.6	0.6	0.4	0.6	0.4	0.6	0.5	1.8	0.4	10.6	2.0	24
3	3.7	S	3.3	3.1	2.3	2.1	2.0	1.6	1.1	0.9	0.8	0.6	0.7	0.6	0.6	0.9	2.3	0.7	0.9	0.4	1.5	4.7	4.8	5.4	0.4	5.4	2.0	24	
4	S	14.1	10.2	6.7	2.6	1.1	5.0	6.0	1.7	1.0	2.2	1.6	0.8	1.9	2.5	0.7	1.2	0.9	1.2	0.6	0.1	0.1	0.0	S	0.0	14.1	2.8	24	
5	7.3	3.1	1.9	1.4	1.2	1.2	0.7	0.9	1.4	1.1	0.6	0.6	0.7	1.1	0.8	1.2	0.9	1.1	0.7	0.4	0.4	0.2	S	9.3	0.2	9.3	1.7	24	
6	4.3	2.5	1.7	1.3	1.1	1.4	2.3	2.5	6.4	1.7	1.5	0.7	1.0	1.1	1.2	1.6	1.1	0.6	0.6	0.5	0.5	S	9.4	4.6	0.5	9.4	2.2	24	
7	3.5	2.6	3.8	6.6	6.5	9.2	5.4	3.0	3.3	3.1	2.1	1.3	1.8	1.9	1.5	1.2	1.0	1.2	0.9	0.4	S	10.0	4.2	3.0	0.4	10.0	3.4	24	
8	2.3	1.5	1.1	0.9	1.0	0.8	0.8	2.0	2.9	8.1	2.0	2.0	4.2	0.8	0.7	0.1	1.5	7.5	6.3	S	19.8	16.3	15.3	5.2	0.1	19.8	4.5	24	
9	5.5	6.4	1.2	0.5	4.8	2.9	2.4	2.4	3.4	2.2	1.9	2.1	1.4	0.0	0.0	0.6	0.0	0.0	S	9.9	3.8	2.7	1.8	1.4	0.0	9.9	2.5	24	
10	1.1	1.1	1.7	1.7	2.0	2.4	2.6	2.8	3.0	3.5	1.8	0.6	0.1	0.0	0.0	0.0	0.0	S	14.4	11.3	15.5	9.4	8.3	4.7	0.0	15.5	3.8	24	
11	0.5	1.2	8.8	6.3	1.0	0.1	4.4	8.6	4.3	1.5	1.0	1.2	2.4	0.8	0.0	0.0	S	9.1	3.0	1.9	3.5	2.4	2.8	2.2	0.0	9.1	2.9	24	
12	1.7	2.7	9.3	1.4	4.2	5.6	7.0	4.2	2.3	1.9	3.7	1.4	2.2	0.1	0.0	S	9.1	3.3	2.1	1.2	1.3	1.0	1.2	1.4	0.0	9.3	3.0	24	
13	1.6	2.1	3.7	3.0	2.7	2.6	2.7	2.3	1.9	1.8	1.5	1.2	0.7	0.5	S	12.2	6.1	5.1	3.2	2.7	2.9	2.3	2.2	2.6	0.5	12.2	2.9	24	
14	2.8	1.9	1.6	2.4	3.1	6.8	7.1	9.0	5.5	4.7	6.5	6.3	2.7	S	10.8	4.3	2.5	1.8	1.2	1.5	4.2	1.1	0.6	0.2	0.2	10.8	3.9	24	
15	6.6	12.2	8.8	7.2	3.0	3.5	3.2	2.5	4.2	4.1	0.3	0.1	S	10.8	4.2	2.7	2.5	2.3	1.8	1.7	1.8	2.4	2.6	2.8	0.1	12.2	4.0	24	
16	3.8	4.1	3.9	3.3	3.4	3.3	3.7	2.5	1.9	2.1	2.0	S	11.2	4.5	3.4	3.0	2.2	1.9	2.1	1.9	2.0	2.2	2.4	2.5	1.9	11.2	3.2	24	
17	2.8	2.6	3.8	3.7	2.1	1.7	1.9	3.4	3.3	3.9	S	13.5	8.7	7.9	4.6	3.3	2.2	1.5	1.3	1.2	1.5	1.5	1.4	3.2	1.2	13.5	3.5	24	
18	3.5	3.3	3.3	2.6	0.9	0.6	0.6	1.5	0.8	S	10.3	5.8	3.3	2.4	2.5	1.6	1.6	1.2	0.7	2.1	2.9	0.6	0.5	0.5	0.5	10.3	2.3	24	
19	0.6	0.9	0.6	0.6	0.4	0.1	1.6	3.3	S	14.4	6.5	2.5	3.2	1.4	4.5	3.0	3.3	1.3	0.4	1.9	1.8	1.2	1.0	1.8	0.1	14.4	2.4	24	
20	1.8	3.2	3.8	1.2	6.7	5.4	5.2	S	13.9	5.3	2.7	2.1	1.5	2.5	1.5	3.7	1.7	1.9	1.4	1.8	1.1	0.5	0.7	1.8	0.5	13.9	3.1	24	
21	1.1	0.7	0.4	0.5	0.2	0.7	S	13.1	7.2	4.9	3.7	4.1	1.6	2.6	0.8	0.7	0.8	1.0	0.8	0.7	0.7	0.2	0.5	1.7	0.2	13.1	2.1	24	
22	1.5	0.9	0.3	0.3	0.6	S	8.8	4.1	3.8	4.0	2.7	1.8	1.4	0.9	0.7	0.5	0.9	0.6	1.0	3.5	1.7	1.1	1.9	2.2	0.3	8.8	2.0	24	
23	2.3	1.8	1.8	1.7	S	12.0	4.7	3.0	2.1	2.1	3.1	2.4	1.7	1.3	1.0	1.1	0.8	0.7	0.7	1.1	0.7	0.8	1.9	0.7	12.0	2.2	24		
24	2.0	1.5	1.1	S	13.0	6.7	6.5	3.7	7.1	7.0	3.3	1.3	1.9	0.7	6.3	6.0	4.9	6.0	4.4	0.0	0.1	0.1	0.1	0.0	0.0	13.0	3.6	24	
25	0.0	0.4	S	9.9	3.5	2.8	3.2	2.0	1.5	2.5	0.7	0.5	1.4	0.3	0.2	1.2	0.1	0.2	0.5	0.4	0.3	0.6	0.3	0.4	0.0	9.9	1.4	24	
26	0.4	S	9.9	5.1	5.9	6.5	6.1	4.3	5.4	4.8	4.7	3.2	1.8	1.9	1.8	1.4	1.2	1.2	3.5	1.7	1.2	1.4	2.3	2.7	0.4	9.9	3.4	24	
27	S	12.5	6.2	4.0	3.7	3.3	3.6	9.3	6.7	2.3	10.4	8.4	3.3	1.3	0.7	3.7	7.9	0.3	0.0	0.1	0.1	0.0	0.0	S	0.0	12.5	4.0	24	
28	9.1	3.7	2.6	5.2	9.4	2.9	5.3	7.0	6.2	4.0	3.2	2.0	1.7	1.7	1.8	1.7	1.5	1.3	2.0	1.7	1.7	1.4	S	10.2	1.3	10.2	3.8	24	
29	4.6	3.2	2.9	2.6	1.6	1.9	2.3	2.5	1.4	1.1	1.5	1.2	1.3	1.1	0.6	0.8	0.5	0.4	0.4	1.0	0.4	S	9.3	3.5	0.4	9.3	2.0	24	
30	2.2	1.6	1.4	1.1	0.9	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.1	0.3	0.4	S	9.3	3.8	2.6	0.1	9.3	1.3	24			
HOURLY MAX	10.6	14.1	10.2	9.9	13.0	12.0	8.8	13.1	13.9	14.4	10.4	13.5	11.2	10.8	10.8	12.2	9.1	9.1	14.4	11.3	19.8	16.3	15.3	10.2					
HOURLY AVG	3.2	3.5	3.7	3.2	3.4	3.3	3.7	3.9	3.8	3.4	3.0	2.5	2.3	1.8	1.9	2.1	2.2	1.9	2.0	1.8	2.6	2.7	3.1	3.1					

STATUS FLAG CODES

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

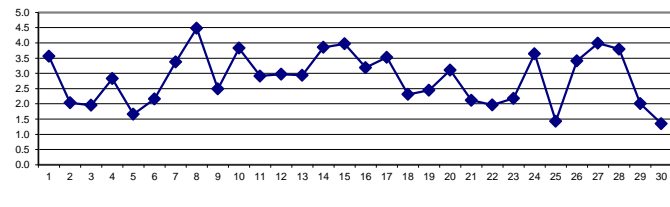
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

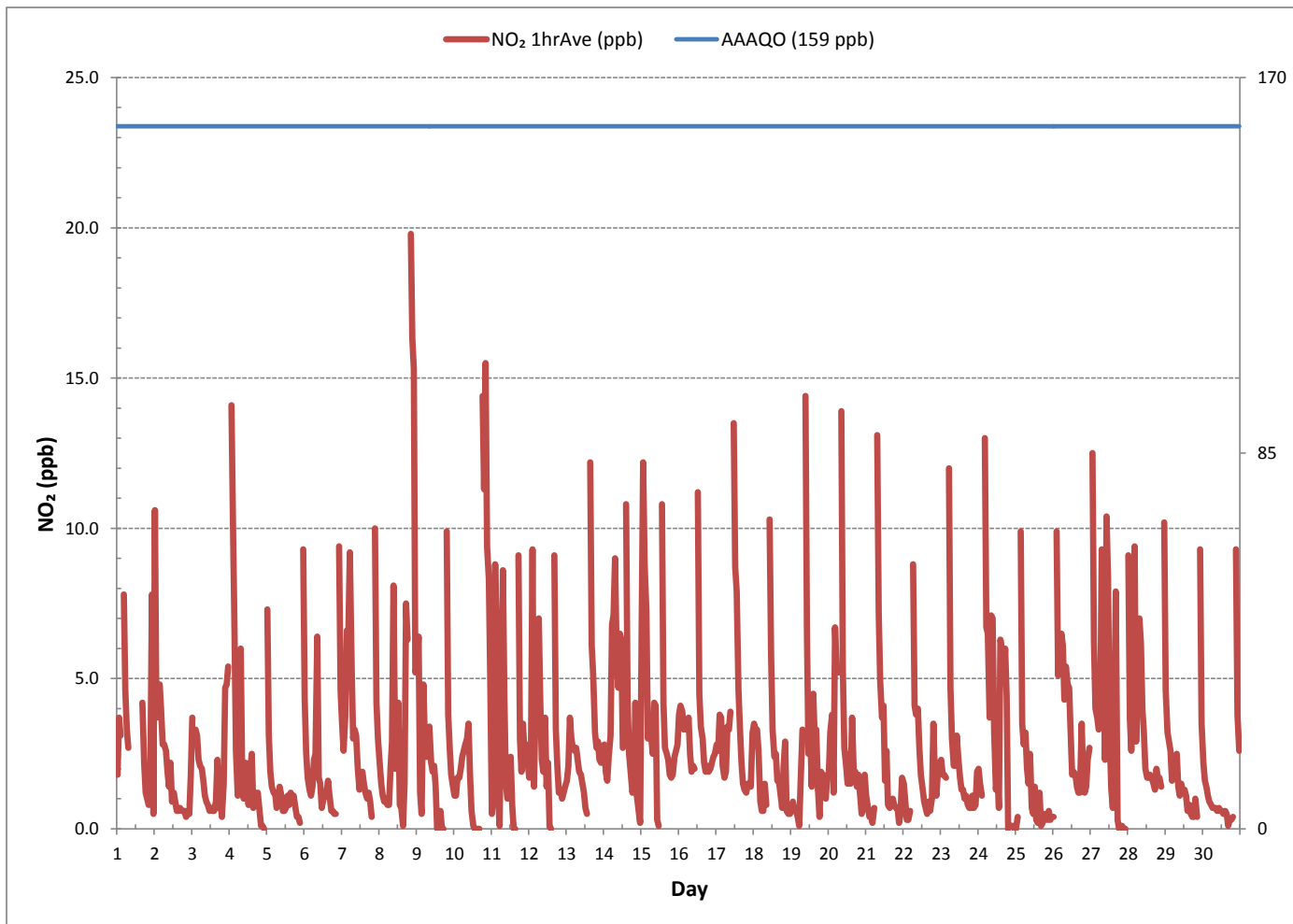
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	662					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	19.8	PPB	@ HOUR(S)	20	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	4.5	PPB			ON DAY(S)	8
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	2.90		MONTHLY AVERAGE:	2.8	PPB	

24 HOUR AVERAGES FOR September 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		4.3	7.8	6.7	S	9.6	6.1	4.3	5.5	C	C	C	C	C	C	C	6.1	4.9	3.1	2.0	2.0	2.0	13.7	15.5	2.0	15.5	6.2	24		
2		16.0	10.8	S	5.5	4.9	3.7	3.2	3.2	2.6	2.6	2.6	1.4	1.9	1.9	0.8	0.8	1.4	0.8	0.8	0.8	0.8	0.8	1.4	3.1	0.8	16.0	3.1	24	
3		11.9	S	3.7	3.2	2.6	2.0	2.0	2.0	1.4	0.8	0.8	0.8	0.8	0.8	0.8	4.3	7.3	1.9	2.0	2.6	6.0	10.2	10.2	20.2	0.8	20.2	4.3	24	
4		S	23.1	17.2	12.6	6.1	1.4	9.6	11.9	3.8	2.6	6.1	6.7	2.0	3.8	4.3	2.0	3.2	2.0	2.0	1.4	0.8	0.8	0.2	S	0.2	23.1	5.6	24	
5		14.3	4.3	2.6	2.0	2.0	2.0	1.4	2.0	2.0	2.0	1.4	1.4	1.4	2.0	2.0	3.7	1.4	2.0	1.4	1.4	0.8	0.8	S	19.6	0.8	19.6	3.2	24	
6		6.1	3.2	2.6	2.0	1.4	3.2	3.7	4.9	10.2	3.7	3.2	1.4	1.4	1.4	2.0	3.2	1.4	1.4	0.8	0.8	0.8	S	13.7	6.6	0.8	13.7	3.4	24	
7		4.3	3.2	5.5	11.4	7.8	13.7	12.6	4.3	4.3	5.5	5.5	2.0	3.2	3.1	8.4	3.1	2.0	2.6	2.0	1.4	S	20.2	6.1	3.7	1.4	20.2	5.9	24	
8		3.7	2.0	2.0	2.0	2.0	1.4	2.0	4.9	4.9	10.8	9.0	6.1	10.8	4.3	5.4	1.4	15.4	16.0	18.3	S	33.7	20.8	19.6	19.0	1.4	33.7	9.4	24	
9		14.3	19.5	2.6	1.4	10.8	5.5	3.7	5.4	7.3	4.3	4.3	4.3	5.4	1.4	0.8	3.7	6.6	0.8	S	22.5	5.5	3.7	2.6	2.0	0.8	22.5	6.0	24	
10		2.0	2.0	2.6	2.6	2.6	3.2	4.3	4.3	4.9	5.5	3.7	2.0	1.4	1.4	0.8	0.2	0.8	S	26.0	17.2	25.5	20.1	13.7	13.1	0.2	26.0	7.0	24	
11		1.4	7.3	13.2	11.4	3.2	1.4	8.4	12.5	12.0	3.2	2.0	2.6	4.3	3.2	0.2	0.2	S	21.9	4.3	3.2	4.3	4.3	4.9	3.7	0.2	21.9	5.8	24	
12		3.2	10.8	19.0	5.5	10.8	7.8	10.8	9.6	6.1	4.8	19.0	4.3	6.1	6.1	0.8	S	21.9	5.4	3.7	2.6	2.6	2.6	2.6	2.6	0.8	21.9	7.3	24	
13		2.6	4.3	4.9	4.8	4.3	3.7	4.3	4.3	3.2	3.2	3.1	2.0	9.6	2.0	S	27.7	7.3	7.3	4.3	4.3	4.3	3.2	3.2	4.3	2.0	27.7	5.3	24	
14		5.4	3.2	2.6	3.2	4.3	18.3	10.8	33.7	7.8	11.3	8.4	6.7	4.9	S	24.9	6.1	3.7	2.6	2.0	4.3	7.8	2.0	1.4	1.4	1.4	33.7	7.7	24	
15		14.3	17.2	10.8	10.2	5.5	4.9	4.9	4.9	6.1	7.3	1.4	0.8	S	25.5	6.0	3.7	4.3	3.7	2.6	2.6	2.6	3.1	3.2	3.7	0.8	25.5	6.5	24	
16		4.3	4.9	4.9	3.7	3.7	4.3	4.9	3.2	2.6	2.6	2.6	S	25.5	6.1	4.3	3.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.0	25.5	4.4	24
17		3.1	3.2	5.4	6.1	2.6	2.0	2.6	6.0	4.9	6.1	S	24.9	14.8	17.8	8.4	6.0	4.3	2.0	2.0	1.9	2.0	1.4	2.6	4.3	1.4	24.9	5.8	24	
18		4.3	3.7	4.3	3.1	1.9	0.8	1.4	12.5	0.8	S	16.6	8.4	3.7	2.6	3.2	2.0	2.6	2.0	0.8	21.4	9.0	0.8	0.8	2.5	0.8	21.4	4.7	24	
19		0.8	1.4	0.8	0.8	0.8	0.8	10.8	6.6	S	27.7	14.8	4.8	6.6	3.2	13.7	7.8	7.8	2.6	1.9	4.9	2.6	1.4	1.4	3.2	0.8	27.7	5.5	24	
20		2.6	13.7	6.6	6.0	11.4	9.0	7.2	S	25.5	7.3	4.3	5.4	2.5	5.4	3.7	20.1	11.9	4.3	3.2	2.6	2.0	0.8	1.9	2.6	0.8	25.5	7.0	24	
21		2.0	1.4	1.4	1.4	0.8	2.0	S	27.7	8.4	6.1	5.4	5.4	3.2	3.7	2.0	2.6	2.6	3.2	1.4	1.4	1.4	1.4	2.0	3.1	0.8	27.7	3.9	24	
22		3.2	1.9	1.4	1.4	2.6	S	21.3	5.4	6.1	6.1	3.7	2.6	2.6	2.0	1.4	1.4	1.4	1.4	3.7	4.8	2.6	2.0	3.2	2.6	1.4	21.3	3.7	24	
23		3.1	2.6	2.0	2.0	S	24.9	6.1	3.7	2.6	3.2	4.9	4.2	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.9	2.6	1.4	24.9	3.4	24	
24		2.6	2.0	1.4	S	22.5	7.8	7.8	4.9	14.8	14.3	4.9	2.0	7.2	0.8	18.3	15.4	18.3	10.2	13.7	0.2	0.8	0.8	0.8	0.2	0.2	22.5	7.5	24	
25		0.2	1.9	S	23.1	4.8	6.6	8.4	2.6	2.6	5.4	0.8	1.4	8.4	1.9	0.8	8.4	0.8	0.2	1.9	1.9	0.8	0.8	0.8	0.8	0.2	23.1	3.7	24	
26		0.8	S	23.1	6.6	7.8	8.4	8.4	19.5	6.1	5.4	6.1	3.7	2.6	2.6	2.6	2.6	1.4	1.9	4.9	2.0	1.9	2.5	3.2	3.2	0.8	23.1	5.5	24	
27		S	27.1	7.8	5.4	4.3	3.7	4.9	21.3	15.4	10.2	16.0	19.6	6.0	2.6	2.6	10.8	16.0	1.9	0.2	0.8	1.4	0.2	0.2	S	0.2	27.1	8.1	24	
28		21.3	4.8	3.2	9.0	13.7	5.4	6.6	8.4	7.3	4.8	4.8	2.6	2.0	2.0	2.0	2.0	1.9	1.4	2.6	1.9	1.4	1.4	S	21.9	1.4	21.9	5.8	24	
29		6.1	3.2	3.2	2.6	1.9	12.5	3.7	3.2	1.4	0.8	2.0	1.4	2.0	1.9	0.8	1.3	0.2	0.2	0.8	1.4	0.8	S	21.3	4.3	0.2	21.3	3.3	24	
30		2.6	2.0	1.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	16.6	4.8	3.1	0.2	16.6	1.7	24	
HOURLY MAX		21.3	27.1	23.1	23.1	22.5	24.9	21.3	33.7	25.5	27.7	19.0	24.9	25.5	25.5	24.9	27.7	21.9	21.9	26.0	22.5	33.7	20.8	21.3	21.9					
HOURLY AVG		5.7	6.9	5.8	5.4	5.4	5.8	6.2	8.2	6.3	6.0	5.7	4.6	5.1	4.0	4.4	5.2	5.4	3.8	4.0	4.0	4.6	4.6	5.1	6.3					

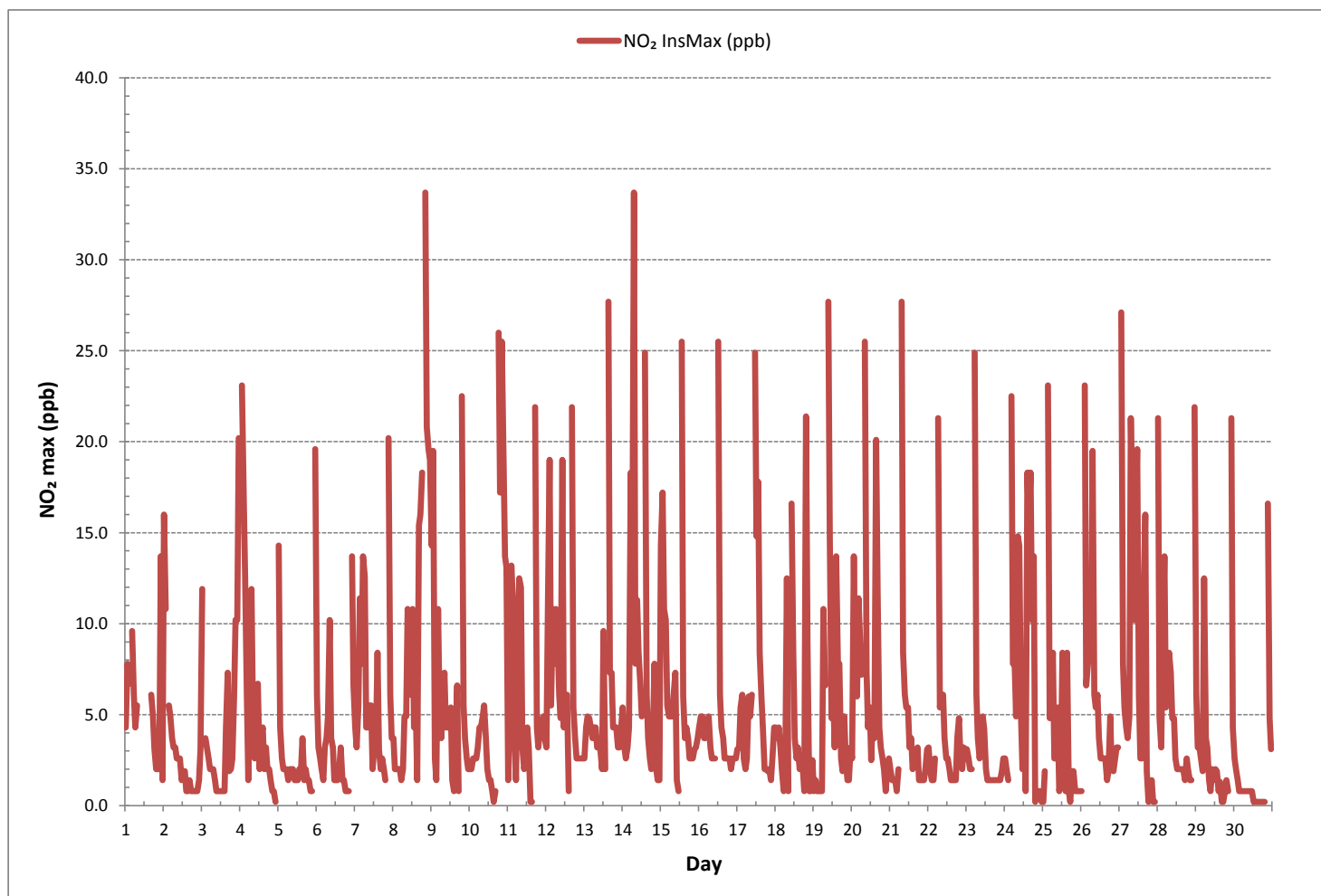
STATUS FLAG CODES

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

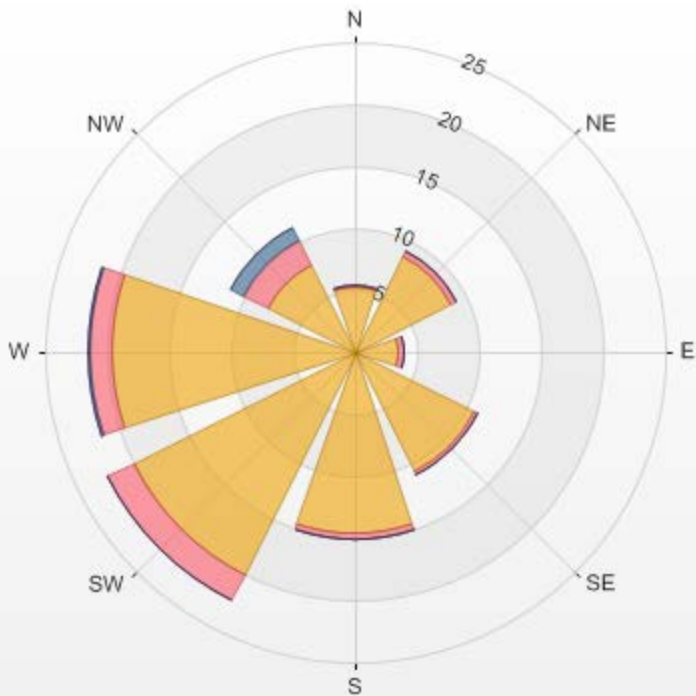
NUMBER OF NON-ZERO READINGS:	680
MAXIMUM INSTANTANEOUS VALUE:	33.7 PPB @ HOUR(S) 20, 7 ON DAY(S) 8, 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	5.82
OPERATIONAL TIME:	720 HRS

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.44% Calm Avg: 0.00

Direction	0.0-6.7	6.7-13.3	13.3-20.0	>20.0	Total
N	5.29	0.15	0	0	5.44
NE	8.68	0.44	0	0	9.12
E	3.53	0.44	0	0	3.97
SE	10.74	0.44	0	0	11.18
S	14.71	0.44	0	0	15.15
SW	20	2.35	0	0	22.35
W	19.56	1.76	0.29	0	21.61
NW	7.79	2.35	1.03	0	11.17
Summary	90.3	8.37	1.32	0	100



% Icon Classes (ppb) 90 0.0-6.7 8 6.7-13.3 1 13.3-20.0 0 >20.0

NO2[ppb] Calibration: LICA MASKWA Monthly: 09/2016 Type: Span



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

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
HOURLY START	HOURLY END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		5.0	3.8	3.6	3.1	4.0	3.9	3.9	4.4	6.2	7.6	5.5	7.1	7.5	4.4	6.9	5.8	7.0	7.2	5.5	4.5	3.5	3.3	3.0	3.2	3.0	3.0	7.6	5.0	24
2		2.6	2.8	2.3	1.0	0.5	1.1	1.3	3.7	4.6	2.2	1.9	5.1	8.3	8.3	9.6	9.6	2.9	5.2	4.9	7.2	5.4	6.2	5.1	6.2	0.5	9.6	4.5	24	
3		7.0	10.8	8.7	8.0	5.4	5.0	5.5	6.0	6.5	7.0	6.8	8.4	9.7	8.8	9.3	8.3	7.0	7.1	6.9	6.0	8.5	6.5	4.5	5.4	4.5	10.8	7.2	24	
4		5.7	5.5	5.1	5.8	5.1	4.4	4.2	5.1	5.5	4.0	4.8	4.6	3.4	2.2	2.9	1.9	3.4	3.6	2.3	1.4	2.1	2.1	1.5	2.1	1.4	5.8	3.7	24	
5		1.7	1.2	1.6	0.7	0.5	1.3	0.5	1.0	2.8	4.2	4.6	2.7	1.3	2.4	5.1	4.7	5.6	4.8	3.6	5.0	4.2	5.5	4.6	4.5	0.5	5.6	3.1	24	
6		3.5	2.6	1.0	2.9	3.7	3.4	2.6	2.9	5.2	7.1	5.8	4.6	4.7	5.2	2.7	2.8	5.7	2.8	1.8	0.5	0.7	1.3	2.3	1.8	0.5	7.1	3.2	24	
7		1.5	1.4	0.5	4.7	0.7	2.2	1.5	1.5	1.1	2.0	4.2	5.6	5.4	5.7	7.3	5.6	0.5	4.5	4.0	4.6	2.5	2.1	2.1	2.0	0.5	7.3	3.1	24	
8		0.4	1.8	1.3	0.7	1.2	0.8	1.2	2.0	2.4	3.0	4.2	5.7	3.8	3.2	4.1	4.6	5.0	8.6	4.5	4.1	4.6	4.7	5.5	5.3	0.4	8.6	3.4	24	
9		4.4	6.4	4.7	3.7	3.7	3.4	4.3	4.1	5.0	5.9	4.0	4.5	5.9	6.9	7.3	5.6	4.7	4.9	0.7	3.1	3.1	3.2	2.7	6.7	0.7	7.3	4.5	24	
10		8.0	2.5	3.8	5.4	7.0	7.5	7.3	8.2	7.8	6.4	8.1	8.6	10.6	10.4	11.4	10.4	11.2	10.9	6.2	5.1	4.9	5.9	7.7	5.1	2.5	11.4	7.5	24	
11		5.3	6.4	7.1	5.9	8.1	8.3	8.3	8.6	9.1	8.5	8.7	8.8	8.9	10.1	11.3	11.8	9.8	10.8	8.6	4.5	4.7	6.5	4.1	4.0	4.0	11.8	7.8	24	
12		4.0	4.0	4.6	4.1	3.5	3.0	3.3	3.1	3.5	3.7	3.7	2.4	4.7	4.2	4.0	4.8	3.6	4.1	4.1	4.5	4.4	5.4	6.2	6.0	2.4	6.2	4.1	24	
13		5.9	4.7	4.9	5.9	7.0	7.9	8.7	7.6	8.4	9.0	8.2	9.1	10.9	11.6	11.2	9.0	9.3	8.2	6.6	6.2	5.5	6.8	5.7	4.7	4.7	11.6	7.6	24	
14		4.7	4.5	3.9	4.6	1.4	2.0	1.8	1.7	1.3	3.6	6.3	7.9	6.5	7.2	6.9	7.5	7.2	6.4	2.8	1.1	2.7	2.0	2.5	3.2	1.1	7.9	4.2	24	
15		2.3	0.9	1.0	1.6	2.3	2.6	1.7	1.7	0.6	1.9	4.5	5.3	7.0	7.1	7.5	5.6	1.3	3.3	4.0	3.9	4.5	6.0	6.0	5.5	0.6	7.5	3.7	24	
16		7.2	7.3	7.2	9.3	8.4	7.0	5.7	7.1	6.4	6.5	6.8	7.1	8.3	9.6	9.9	9.4	9.1	6.7	4.7	5.3	6.1	5.8	6.0	5.4	4.7	9.9	7.2	24	
17		4.7	2.1	1.9	2.5	2.3	4.3	1.3	1.8	3.5	3.0	5.2	5.3	6.1	6.6	5.9	6.2	4.4	4.3	2.9	4.2	4.3	3.3	1.6	2.1	1.3	6.6	3.7	24	
18		1.5	1.3	3.4	3.4	4.9	5.4	3.2	4.0	4.1	5.7	7.9	8.9	9.0	10.9	10.5	11.9	9.8	9.0	6.0	7.3	5.1	6.8	7.0	4.7	1.3	11.9	6.3	24	
19		3.4	3.7	4.2	4.4	5.5	6.4	7.3	7.7	8.8	8.2	6.4	7.6	7.2	6.6	7.9	5.4	5.1	3.7	1.9	1.5	0.7	2.0	2.3	1.9	0.7	8.8	5.0	24	
20		0.7	1.5	2.1	2.3	1.4	1.9	0.9	3.4	3.5	4.7	5.2	5.4	5.9	4.0	5.2	4.5	2.0	3.0	0.9	2.3	2.6	2.2	1.3	2.5	0.7	5.9	2.9	24	
21		1.6	1.5	1.6	1.9	0.5	1.1	2.3	3.3	2.8	3.6	4.7	3.1	2.8	2.8	4.7	5.4	3.0	4.3	3.3	1.6	1.0	0.5	3.0	4.4	0.5	5.4	2.7	24	
22		2.5	1.9	0.8	0.2	0.6	0.4	1.8	1.5	0.7	2.9	7.4	8.8	8.6	8.4	9.1	8.8	7.8	6.9	4.7	5.9	5.4	5.0	5.9	6.3	0.2	9.1	4.7	24	
23		6.1	5.9	5.9	5.3	5.4	5.0	5.0	6.9	7.4	8.1	8.4	8.5	8.4	7.3	5.7	6.0	7.3	7.2	6.0	5.7	5.3	3.7	5.0	4.4	3.7	8.5	6.2	24	
24		2.8	3.2	2.7	3.1	2.0	2.2	3.1	3.0	6.9	7.4	7.7	8.8	10.2	12.2	11.9	9.0	9.5	8.1	4.4	3.0	3.0	3.0	4.0	3.6	2.0	12.2	5.6	24	
25		4.1	6.8	6.8	5.9	5.1	5.2	3.4	3.2	5.7	7.4	7.2	7.8	9.2	8.6	8.0	6.6	6.3	4.1	2.9	3.4	2.8	2.0	1.4	1.3	1.3	9.2	5.2	24	
26		1.1	1.0	1.1	1.4	3.0	5.8	1.5	2.3	5.0	5.0	7.2	10.2	9.9	9.8	9.2	9.4	6.7	6.4	6.1	7.3	9.0	8.0	7.6	7.3	1.0	10.2	5.9	24	
27		5.1	2.0	2.4	3.7	2.6	0.2	0.7	2.1	7.3	9.9	10.5	8.8	2.6	4.3	8.4	8.1	8.5	5.3	4.0	4.9	6.0	4.9	3.0	1.7	0.2	10.5	4.9	24	
28		1.8	2.5	2.2	1.8	2.2	2.4	2.0	3.8	2.7	2.7	7.1	6.6	8.5	6.0	5.1	5.7	4.3	3.1	2.8	1.9	3.5	3.5	4.2	1.3	1.3	8.5	3.7	24	
29		0.9	1.0	1.2	1.5	1.6	0.8	0.9	1.3	3.6	4.2	4.8	3.9	2.8	5.2	4.7	4.0	3.1	2.2	1.4	1.6	3.0	3.8	2.6	3.4	0.8	5.2	2.6	24	
30		3.1	2.1	3.1	4.7	5.6	6.5	5.2	5.1	5.8	7.3	9.3	11.7	12.4	13.4	12.9	14.1	13.3	12.4	12.5	13.6	12.3	10.9	11.3	13.3	2.1	14.1	9.2	24	
HOURLY MAX		8.0	10.8	8.7	9.3	8.4	8.3	8.7	8.6	9.1	9.9	10.5	11.7	12.4	13.4	12.9	14.1	13.3	12.4	12.5	13.6	12.3	10.9	11.3	13.3					
HOURLY AVG		3.6	3.4	3.4	3.7	3.5	3.7	3.3	3.9	4.8	5.4	6.2	6.8	7.0	7.1	7.6	7.1	6.1	6.0	4.4	4.4	4.4	4.4	4.3	4.3					

STATUS FLAG CODES

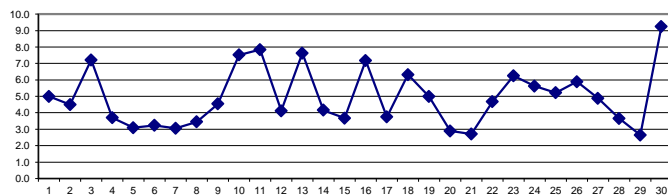
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

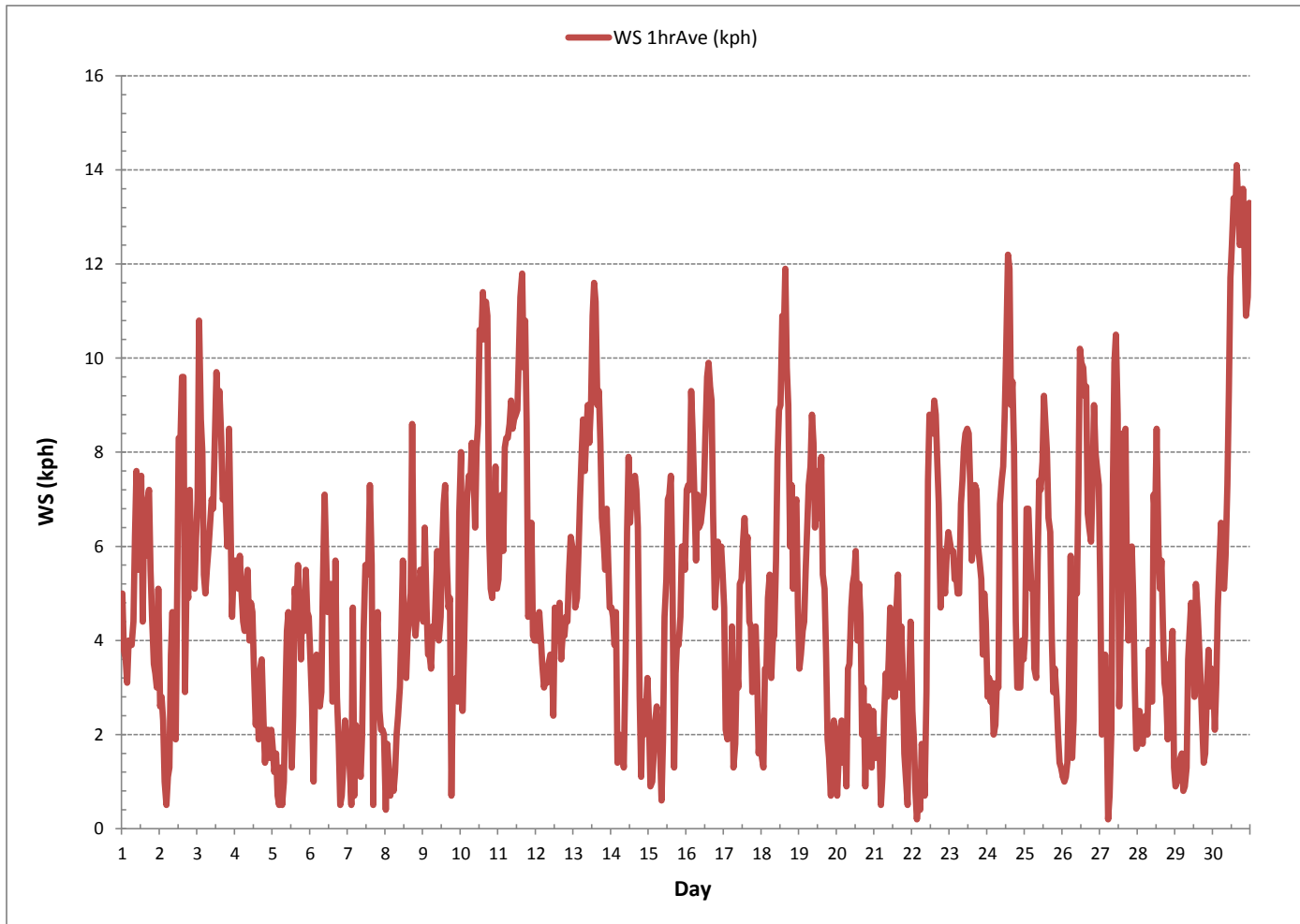
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.2 kph @ HOUR(S) 3 , 5 ON DAY(S) 22 , 27
MAXIMUM 1-HR AVERAGE:	14.1 kph @ HOUR(S) 15 ON DAY(S) 30
MAXIMUM 24-HR AVERAGE:	9.2 kph ON DAY(S) 30
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
OPERATIONAL TIME:	720 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.79
MONTHLY AVERAGE:	5.0 kph

24 HOUR AVERAGES FOR September 2016



WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	26.0	19.9	16.6	10.7	11.1	14.6	14.4	15.5	31.5	29.7	28.4	19.6	24.6	23.8	29.2	18.3	26.0	32.8	27.3	24.4	13.3	14.8	12.0	11.4	10.7	32.8	20.7	24	
2	10.5	13.8	10.5	5.8	3.2	7.6	4.5	11.5	13.1	10.4	14.1	17.2	18.3	25.1	24.4	25.5	15.5	16.8	18.8	22.0	17.7	14.8	32.8	41.7	3.2	41.7	16.5	24	
3	34.3	38.5	33.7	35.0	31.3	22.8	23.4	22.7	33.2	32.6	35.6	42.2	44.6	41.7	41.8	41.1	29.1	33.4	22.3	21.8	31.1	25.1	29.3	27.7	21.8	44.6	32.3	24	
4	21.4	37.9	29.1	21.0	24.3	17.0	17.2	20.3	19.9	15.3	17.7	16.4	17.4	12.2	9.8	11.3	12.8	13.5	9.6	5.6	4.8	4.6	3.7	3.4	3.4	37.9	15.3	24	
5	4.1	2.6	3.6	2.3	2.3	2.8	10.9	6.9	13.1	14.8	17.5	16.2	14.7	20.8	15.7	13.9	23.1	15.0	11.3	12.4	13.1	14.4	11.5	11.1	2.3	23.1	11.4	24	
6	12.0	11.1	5.0	16.6	14.4	12.9	12.0	8.3	17.5	23.5	21.5	17.5	17.5	16.1	13.5	15.7	14.1	10.0	5.4	8.0	3.4	6.1	5.2	4.5	3.4	23.5	12.2	24	
7	5.8	7.6	10.9	12.2	10.0	7.4	6.6	6.6	6.5	14.8	13.1	18.3	16.6	22.7	24.4	19.4	13.7	19.2	11.5	13.7	9.3	5.6	6.1	5.2	5.2	24.4	12.0	24	
8	3.6	4.8	5.6	4.3	4.3	2.6	4.6	7.4	7.4	12.2	25.5	24.6	31.0	15.2	32.6	18.3	23.1	39.1	23.1	18.1	16.8	21.4	25.5	19.7	2.6	39.1	16.3	24	
9	16.6	21.6	20.3	17.2	17.9	13.5	16.6	15.4	16.9	16.9	18.8	19.0	21.8	26.4	29.5	26.2	22.9	19.0	8.7	5.2	5.4	7.6	10.4	18.3	5.2	29.5	17.2	24	
10	23.1	16.4	11.5	16.8	23.1	19.0	18.6	17.4	24.2	20.6	29.4	43.6	47.7	46.2	41.4	44.5	43.5	54.4	32.8	19.6	21.6	21.8	27.1	20.5	11.5	54.4	28.5	24	
11	19.4	27.9	28.4	35.6	29.1	33.4	35.9	40.7	44.0	38.3	31.1	42.4	43.4	32.2	35.4	34.3	36.3	35.2	32.6	13.7	18.3	27.3	15.0	15.5	13.7	44.0	31.1	24	
12	14.8	15.3	19.9	16.2	13.3	14.5	15.1	11.8	13.1	13.9	14.6	15.5	15.5	21.6	18.1	17.7	22.0	29.1	12.6	9.8	10.4	12.2	13.1	13.8	9.8	29.1	15.6	24	
13	15.1	16.6	11.3	13.1	17.2	26.2	21.2	19.0	20.3	24.7	22.5	30.6	32.6	38.0	33.2	33.4	35.4	26.0	22.3	14.4	12.6	13.6	12.2	14.9	11.3	38.0	21.9	24	
14	11.2	9.6	10.7	13.7	6.1	9.1	6.1	6.7	7.6	11.5	17.4	20.1	26.0	31.0	30.6	27.9	34.5	31.4	14.4	7.4	15.5	13.9	10.7	11.3	6.1	34.5	16.0	24	
15	10.9	7.6	4.1	5.0	5.7	7.0	7.0	5.8	11.5	11.3	15.2	16.1	21.6	20.3	26.8	22.9	10.4	11.1	10.7	10.2	10.4	13.1	12.6	14.4	4.1	26.8	12.2	24	
16	17.7	17.4	19.0	23.1	18.3	16.8	14.6	19.0	18.3	14.6	19.0	20.5	24.4	25.3	27.5	28.4	25.5	21.6	13.1	13.9	16.6	12.3	14.9	16.9	12.3	28.4	19.1	24	
17	13.2	9.4	7.8	6.3	7.8	12.4	16.8	7.8	13.3	16.1	18.5	20.5	27.5	24.0	23.6	26.8	26.4	14.4	6.9	8.9	10.0	8.3	4.7	5.2	4.7	27.5	14.0	24	
18	5.0	5.0	10.4	12.5	19.1	27.0	12.9	16.8	15.0	27.1	31.9	28.6	29.3	39.4	48.1	40.0	40.9	33.7	29.7	29.5	21.8	23.1	24.2	27.9	5.0	48.1	25.0	24	
19	14.6	15.0	15.9	15.7	24.7	22.6	29.8	32.6	30.4	27.1	25.1	36.7	24.7	26.6	30.8	21.6	23.3	14.6	11.8	10.2	3.4	5.8	5.6	5.8	3.4	36.7	19.8	24	
20	5.9	5.9	10.1	14.5	6.7	9.3	8.0	15.7	12.4	17.9	17.7	18.6	22.0	15.0	17.4	16.8	11.5	13.3	8.7	5.4	5.8	5.0	4.3	9.9	4.3	22.0	11.6	24	
21	9.3	4.3	10.0	7.8	5.2	6.7	8.5	8.3	8.7	11.1	17.0	12.2	10.9	9.8	22.7	28.9	14.7	15.3	6.2	4.3	4.2	3.4	7.8	9.1	3.4	28.9	10.3	24	
22	9.1	8.0	5.2	1.9	2.3	2.3	11.3	5.0	3.5	11.6	18.9	23.6	26.2	31.0	31.4	26.0	23.3	22.3	10.7	14.8	15.5	13.7	14.8	17.0	1.9	31.4	14.6	24	
23	17.9	17.7	16.6	18.1	17.7	17.9	20.1	25.1	23.1	29.9	27.5	26.5	30.5	23.5	18.4	25.6	25.6	23.6	16.4	17.7	17.9	11.8	15.0	15.0	11.8	30.5	20.8	24	
24	12.4	8.7	9.3	10.0	10.7	9.8	17.7	14.2	29.1	30.3	28.3	32.6	32.8	38.5	39.1	35.2	37.6	30.6	27.5	11.1	11.8	10.9	15.3	13.1	8.7	39.1	21.5	24	
25	17.0	28.2	21.4	18.8	16.6	20.8	13.3	14.9	25.7	23.6	24.4	33.9	36.3	36.9	38.7	25.1	24.0	17.7	8.3	7.1	6.7	4.3	5.2	7.1	4.3	38.7	19.8	24	
26	3.9	6.5	4.1	5.0	9.3	12.7	13.6	12.6	12.0	12.0	20.5	29.3	26.6	22.9	25.1	23.8	25.5	17.0	14.4	19.4	26.4	21.4	21.0	23.1	3.9	29.3	17.0	24	
27	17.0	13.3	10.0	13.1	11.8	7.8	5.6	11.8	35.6	40.4	51.2	33.9	20.1	23.0	31.3	26.5	32.8	21.6	17.0	17.9	17.9	15.7	15.7	8.7	5.6	51.2	20.8	24	
28	8.5	10.0	8.5	7.4	8.3	5.6	6.1	9.2	8.1	8.0	18.1	18.3	24.2	16.4	15.0	16.8	11.8	10.0	8.3	9.8	10.9	8.9	12.4	6.1	5.6	24.2	11.1	24	
29	3.9	3.2	4.1	10.7	11.1	9.3	10.5	5.9	6.1	8.9	11.1	14.8	14.1	18.1	15.7	14.4	12.2	5.4	5.2	7.6	9.8	10.3	8.4	8.8	3.2	18.1	9.6	24	
30	9.8	8.0	9.1	12.9	16.8	22.5	19.2	15.7	17.9	19.2	25.6	29.5	29.3	34.6	36.5	33.9	31.5	32.5	37.7	39.9	30.8	27.3	33.7	31.7	8.0	39.9	25.2	24	
HOURLY MAX	34.3	38.5	33.7	35.6	31.3	33.4	35.9	40.7	44.0	40.4	51.2	43.6	47.7	46.2	48.1	44.5	43.5	54.4	37.7	39.9	31.1	27.3	33.7	41.7					
HOURLY AVG	13.1	13.7	12.8	13.4	13.3	13.8	14.1	14.4	18.0	19.6	22.6	24.6	25.7	25.9	27.6	25.3	24.3	22.7	16.2	14.1	13.8	13.3	14.3	14.6					

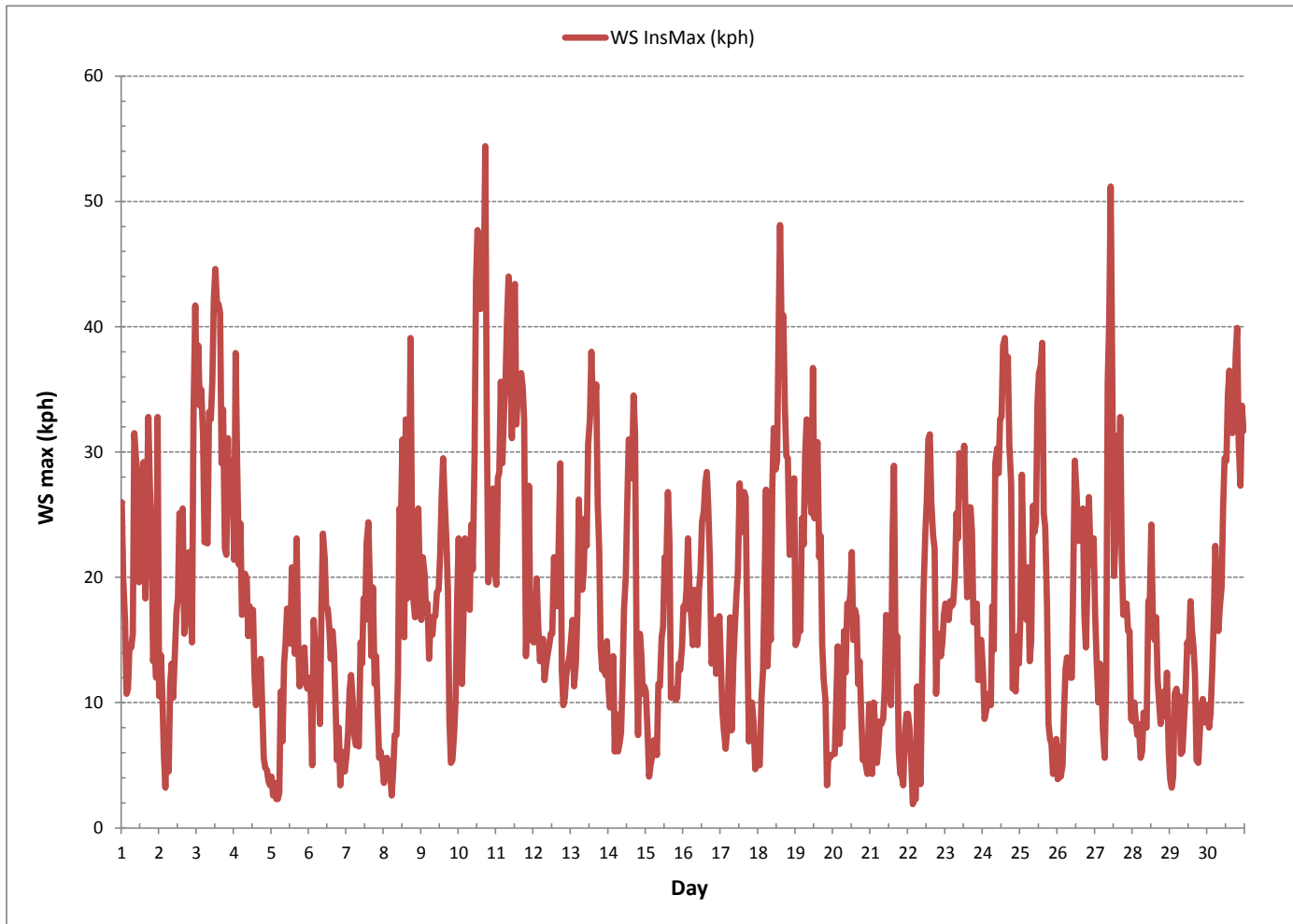
STATUS FLAG CODES

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

MONTHLY SUMMARY

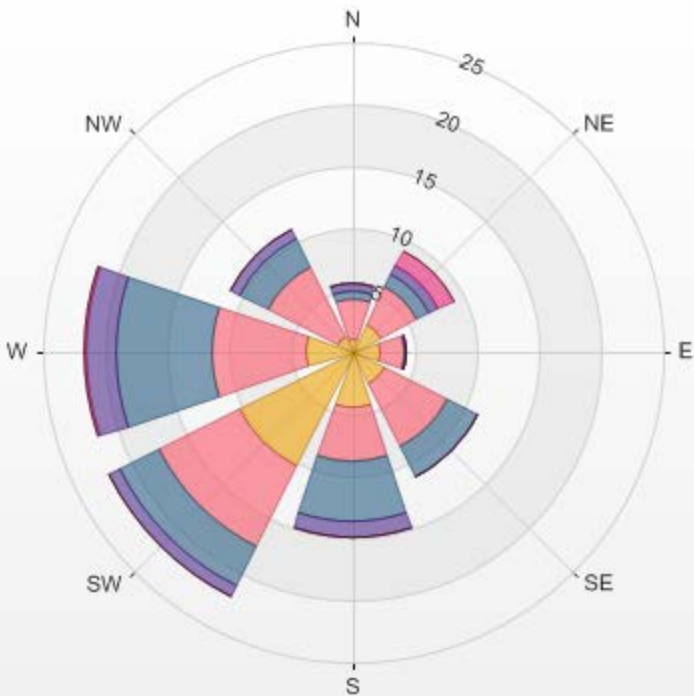
MAXIMUM INSTANTANEOUS VALUE:	54.4	kph	@ HOUR(S)	17	ON DAY(S)	10
					VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA MASKWA Monitor: WSP [kph] Monthly: 2016/09 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-3.0	3.0-6.0	6.0-9.0	9.0-12.0	12.0-15.0	>15.0	Total
N	1.11	3.19	0.56	0.69	0	0	5.55
NE	2.5	3.33	1.11	0.83	1.39	0	9.16
E	2.22	1.94	0.14	0	0	0	4.3
SE	2.92	5.56	2.78	0	0	0	11.26
S	4.44	4.44	4.86	1.25	0	0	14.99
SW	10.28	7.22	3.61	0.97	0	0	22.08
W	3.75	7.64	7.78	2.36	0.14	0	21.67
NW	1.39	6.25	2.64	0.69	0	0	10.97
Summary	28.61	39.57	23.48	6.79	1.53	0	100



% Icon Classes (kph)	29	40	23	7	2	0
	0.0-3.0	3.0-6.0	6.0-9.0	9.0-12.0	12.0-15.0	>15.0

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Site - September 2016

WIND DIRECTION Hourly Averages (WD)

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

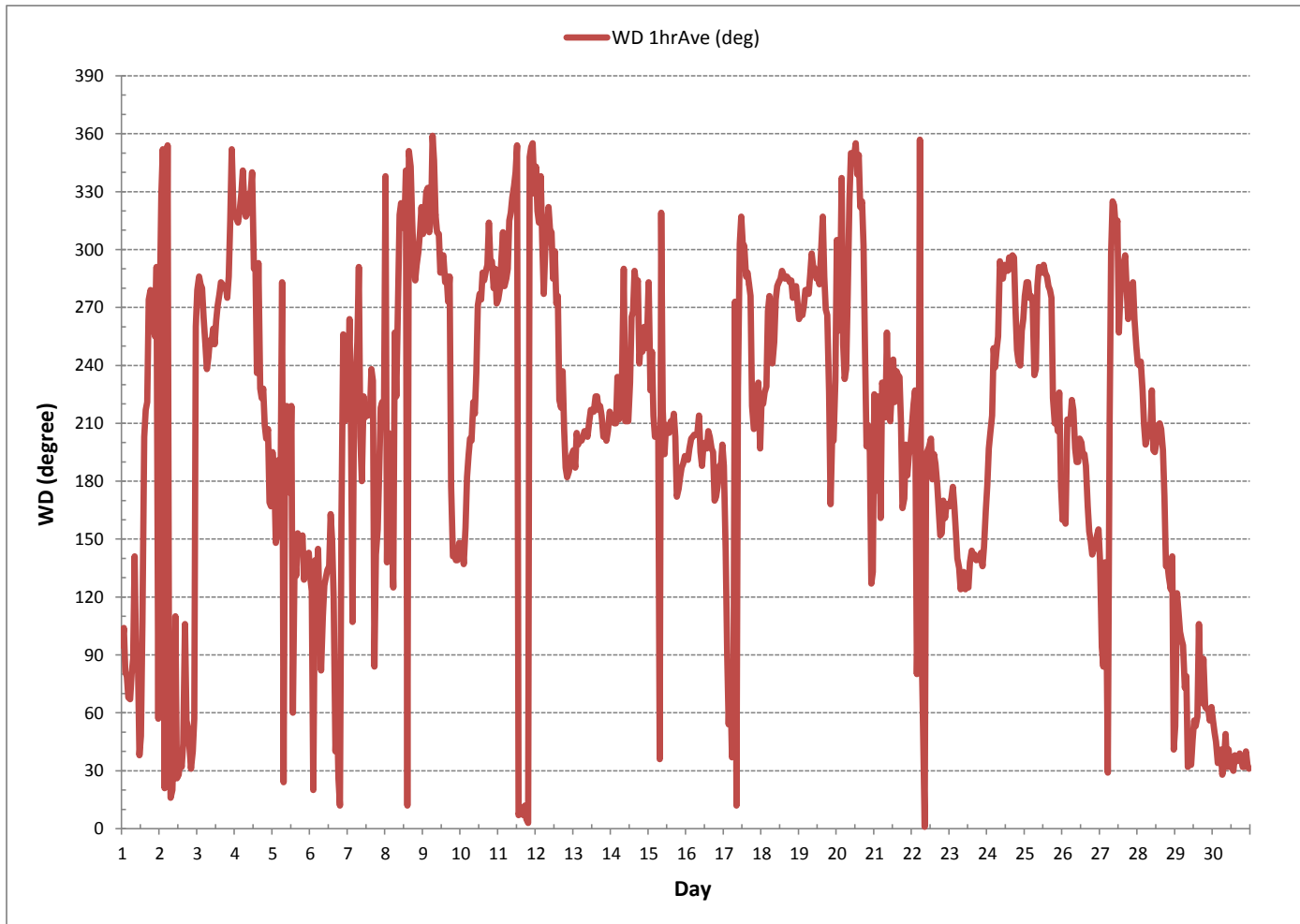
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	86.60		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.	
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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		31	33	31	30	24	23	29	29	33	32	41	24	32	43	34	34	33	37	38	31	27	31	38	34	24	
2		33	38	37	47	52	42	39	33	32	45	57	27	18	20	21	29	50	22	29	24	34	19	37	38	24	
3		33	35	33	34	41	38	37	38	42	43	41	42	41	39	36	37	32	31	30	32	32	40	57	40	24	
4		40	40	46	41	42	41	41	39	37	42	42	40	47	60	42	45	38	28	29	44	17	17	25	13	24	
5		23	16	39	37	35	25	51	57	46	34	37	57	74	55	46	35	35	33	18	16	18	18	19	17	24	
6		19	33	52	49	25	30	37	29	33	32	29	35	32	30	52	57	22	29	34	75	49	44	20	23	24	
7		26	33	57	54	56	40	51	44	61	51	35	33	39	42	33	34	58	34	17	16	34	23	19	22	24	
8		51	32	46	62	42	50	32	39	36	43	48	38	46	46	43	37	40	37	30	37	30	40	40	37	24	
9		36	35	41	44	37	40	39	36	37	33	48	42	45	41	38	41	42	35	59	14	11	15	24	22	24	
10		22	55	27	25	22	18	20	17	27	29	35	40	38	41	33	38	33	36	43	34	29	30	31	32	24	
11		33	32	34	38	30	33	32	38	41	40	40	40	40	27	25	24	28	22	27	25	37	33	37	41	24	
12		37	37	41	38	36	37	45	49	44	39	44	42	42	52	53	43	52	41	23	10	12	14	13	14	24	
13		15	16	18	17	17	17	16	18	22	22	26	28	30	27	31	35	27	27	20	15	14	13	15	17	24	
14		14	14	27	19	35	57	27	38	49	36	26	26	31	41	44	35	37	31	26	48	38	46	36	31	24	
15		47	69	48	27	23	36	42	39	77	47	42	39	36	35	36	26	45	24	12	13	13	15	14	13	24	
16		16	17	19	17	17	16	19	27	22	26	24	28	26	23	24	24	19	15	17	19	15	15	15	16	24	
17		18	39	27	21	29	17	62	52	40	38	35	41	37	39	36	39	35	29	19	10	15	16	25	15	24	
18		29	31	28	27	34	29	36	37	41	38	31	30	31	29	31	30	31	29	30	31	31	30	27	33	24	
19		35	35	37	35	33	30	30	32	33	33	39	33	33	36	38	41	36	38	49	34	46	22	37	27	24	
20		58	42	42	48	54	39	59	41	39	39	39	40	35	40	34	42	58	45	46	19	14	12	46	27	24	
21		25	32	45	37	50	43	33	20	37	41	41	47	33	27	44	44	42	24	7	41	52	29	13	12	24	
22		32	43	54	50	47	39	19	25	53	33	23	25	34	35	31	29	27	23	13	15	19	16	20	21	24	
23		21	22	21	22	23	28	27	27	30	28	30	31	30	30	26	27	28	28	24	25	26	24	25	29	24	
24		36	27	28	25	43	33	42	37	34	32	34	34	34	30	30	32	35	32	28	28	28	29	26	26	24	
25		28	25	26	28	26	27	25	33	33	31	30	31	36	37	33	41	35	31	21	16	20	22	34	54	24	
26		51	40	43	33	25	19	62	37	20	24	24	24	24	24	23	25	25	18	16	18	21	24	23	24	24	
27		28	45	43	34	57	52	63	35	38	40	37	38	43	36	34	33	34	31	26	27	23	26	34	46	24	
28		50	28	33	35	28	29	29	15	28	41	23	29	25	28	31	27	26	17	12	21	13	13	25	48	24	
29		42	37	29	28	35	48	58	45	12	18	20	48	69	40	35	37	27	13	23	20	21	19	22	23	24	
30		19	27	23	15	34	19	50	31	24	20	19	17	16	16	20	18	19	21	18	15	17	21	17	16	24	

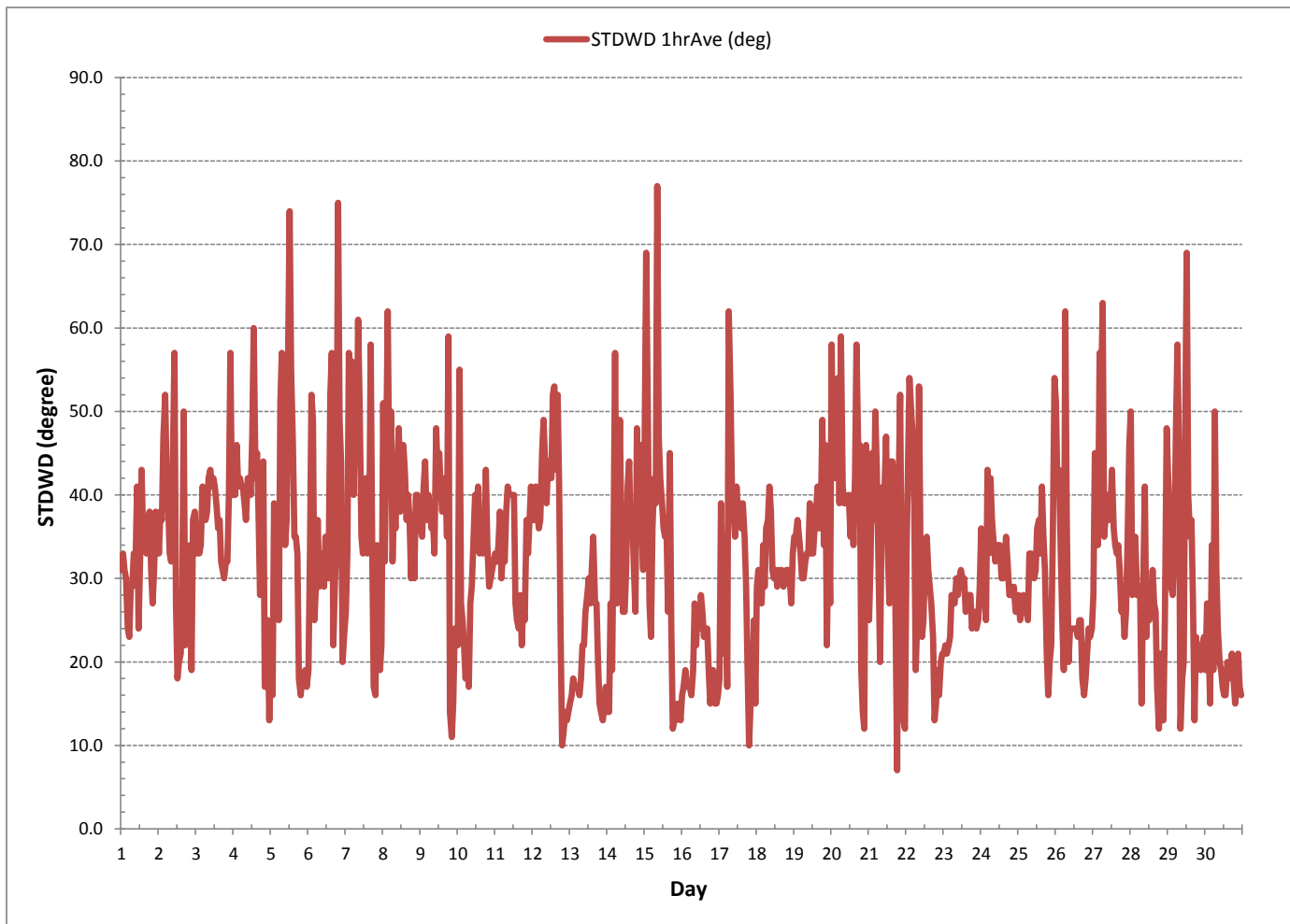
STATUS FLAG CODES

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

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

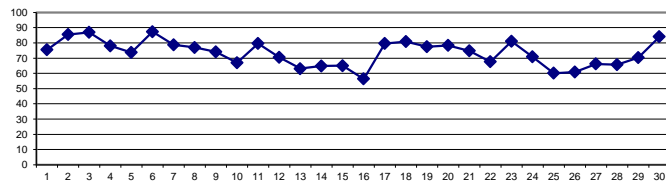
RELATIVE HUMIDITY Hourly Averages (RH %)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	78	81	82	84	87	90	89	86	80	79	73	77	66	58	55	53	53	60	67	74	82	83	86	88	53	90	75	24	
2	91	92	92	92	93	93	93	93	87	79	79	82	78	77	75	67	67	76	86	91	92	92	92	91	67	93	85	24	
3	92	92	92	91	91	91	91	90	86	82	78	73	74	80	80	85	88	90	90	91	91	89	90	89	73	92	87	24	
4	88	88	87	87	87	88	87	85	81	77	68	62	61	59	60	61	58	67	74	86	89	90	91	91	58	91	78	24	
5	91	91	91	91	91	91	91	92	76	60	56	52	47	49	56	57	54	57	69	76	81	83	84	85	47	92	74	24	
6	84	88	90	88	81	87	89	91	91	90	90	90	89	83	78	72	82	85	88	90	92	92	92	93	72	93	87	24	
7	93	93	93	93	93	93	93	93	93	91	75	66	58	55	51	49	49	57	71	76	80	90	91	92	49	93	79	24	
8	92	92	92	92	92	92	92	93	82	58	49	44	69	64	75	64	51	62	77	81	83	84	83	84	44	93	77	24	
9	84	84	85	87	89	91	91	90	82	75	68	64	55	52	48	47	47	50	69	83	88	88	88	74	47	91	74	24	
10	69	76	85	85	86	87	88	87	81	84	68	53	47	39	39	34	36	41	56	64	71	74	76	82	34	88	67	24	
11	84	83	78	77	79	80	83	79	80	77	79	85	86	87	86	81	74	68	69	75	78	77	80	84	68	87	80	24	
12	84	84	85	83	83	85	85	83	79	71	65	60	57	49	45	46	47	50	61	76	81	78	78	79	45	85	71	24	
13	82	86	85	85	83	84	84	81	74	67	61	52	44	40	40	38	38	39	45	53	60	62	64	67	38	86	63	24	
14	70	74	80	78	86	90	91	83	66	60	56	53	45	37	37	37	37	44	57	70	73	76	78	79	37	91	65	24	
15	82	88	91	92	92	92	93	92	71	60	44	40	37	36	35	41	45	48	58	67	66	61	63	67	35	93	65	24	
16	65	66	68	68	71	74	77	72	65	59	53	47	41	37	36	38	36	40	51	54	53	59	61	61	36	77	56	24	
17	65	69	75	76	77	79	83	85	85	86	85	85	84	78	73	66	65	67	80	87	87	91	91	92	65	92	80	24	
18	93	92	91	90	91	92	92	90	87	87	86	85	80	74	68	63	60	60	68	70	75	79	79	82	60	93	81	24	
19	85	85	85	85	84	84	84	82	76	74	73	69	69	65	61	56	56	62	75	85	90	91	92	92	56	92	78	24	
20	92	92	92	91	91	92	91	85	74	70	66	62	63	61	59	56	58	62	75	86	90	91	91	91	56	92	78	24	
21	92	92	92	92	92	92	93	86	68	59	59	58	59	43	38	42	50	68	78	83	87	90	91	38	93	75	24		
22	91	91	91	91	91	91	91	92	83	58	54	51	46	38	35	34	40	45	57	63	65	75	75	75	34	92	68	24	
23	75	78	80	79	80	81	82	79	75	73	71	73	74	82	89	87	85	84	83	84	86	87	89	90	71	90	81	24	
24	90	90	91	91	91	91	91	89	74	71	67	53	49	50	51	50	45	47	56	67	73	75	73	75	45	91	71	24	
25	73	71	70	72	76	78	82	76	64	53	44	40	32	31	31	31	36	45	57	68	74	78	80	80	31	82	60	24	
26	87	89	89	90	91	83	81	80	64	56	49	46	41	38	37	37	39	44	50	52	52	54	56	57	37	91	61	24	
27	62	71	75	75	78	83	88	84	66	57	58	60	74	72	60	54	47	53	62	60	58	57	63	72	47	88	66	24	
28	74	73	77	84	85	89	90	86	68	57	49	43	42	44	43	40	41	48	63	74	77	75	73	82	40	90	66	24	
29	87	89	90	90	90	91	90	90	85	72	61	51	43	41	38	35	41	55	67	78	79	71	77	78	35	91	70	24	
30	78	80	81	82	81	83	89	91	90	88	85	85	83	80	80	80	80	80	83	84	89	85	84	85	78	91	84	24	
HOURLY MAX	93	93	93	93	93	93	93	93	93	91	90	90	89	87	89	87	88	90	90	91	92	92	92	93					
HOURLY AVG	82.4	84.0	85.2	85.4	86.1	87.2	88.1	86.5	78.5	71.4	65.7	62.1	59.8	57.3	55.5	53.2	53.2	57.9	67.7	74.8	77.9	79.1	80.3	81.6					

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

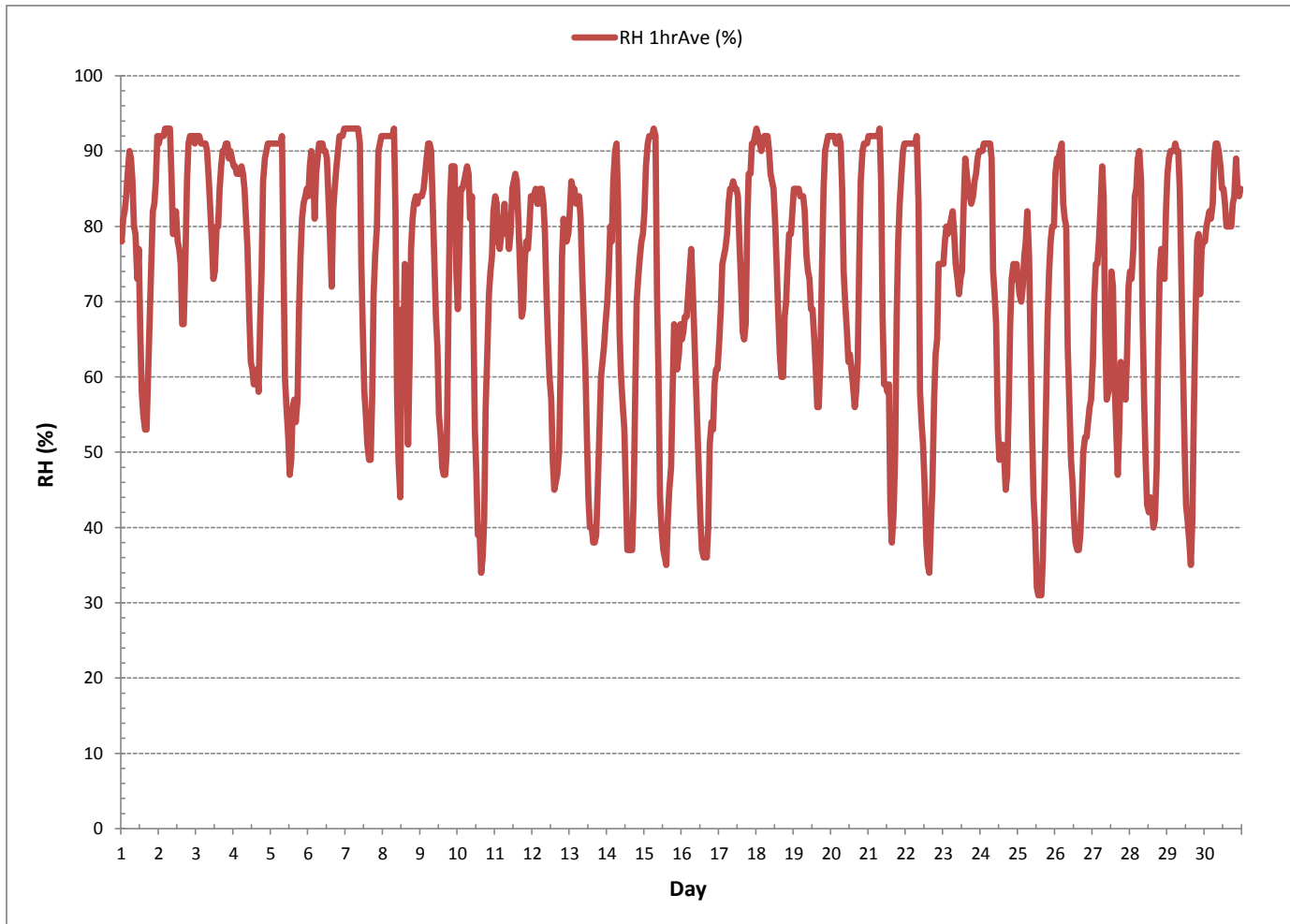
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	31	%	@ HOUR(S)	VAR	ON DAY(S)	25
MAXIMUM 1-HR AVERAGE:	93	%	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY(S)	6
					VAR-VARIOUS	
OPERATIONAL TIME:						720 HRS
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	16.66					MONTHLY AVERAGE: 73 %

RELATIVE HUMIDITY Hourly Averages (RH %)



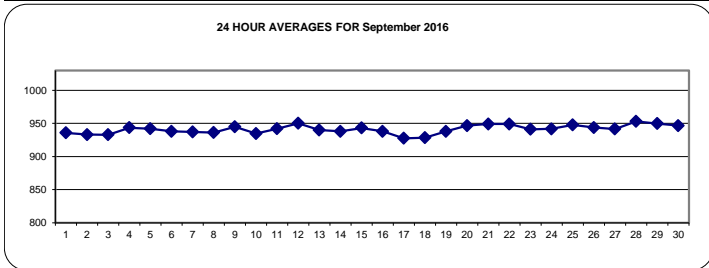
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	939	939	938	937	937	936	936	935	936	935	934	934	934	934	934	934	935	936	936	936	936	936	936	936	937	934	939	936	24	
2	937	937	936	935	935	935	935	935	935	935	936	934	934	933	933	932	932	932	932	931	930	930	928	928	928	928	928	937	933	24
3	928	929	930	930	930	931	931	931	932	932	932	933	933	933	933	934	934	935	936	937	938	939	939	939	939	939	939	933	24	
4	940	941	942	942	943	943	943	944	945	945	945	945	945	945	944	944	944	944	944	944	944	944	944	943	943	940	945	944	24	
5	943	943	943	943	943	942	942	943	944	944	943	943	943	942	942	942	941	940	940	940	940	940	940	940	940	940	940	942	24	
6	939	939	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	937	937	937	937	939	24	
7	937	937	937	938	938	938	938	938	938	938	939	939	939	939	938	938	937	937	937	936	936	935	935	934	934	934	939	937	24	
8	934	933	933	933	933	933	933	934	935	935	936	936	936	936	937	937	938	939	939	940	940	940	940	941	942	933	942	936	24	
9	942	943	943	944	944	945	946	946	947	947	948	947	947	947	947	946	945	945	943	943	942	941	940	940	940	940	940	948	24	
10	939	938	937	936	936	935	935	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	934	935	935	934	939	935	24	
11	935	935	936	936	936	936	937	937	938	939	939	939	940	941	942	943	945	946	947	948	949	949	950	950	950	950	950	950	24	
12	951	951	951	951	951	952	952	952	952	952	952	952	952	952	951	950	950	949	948	947	947	946	946	946	946	946	946	952	24	
13	945	945	944	943	943	942	941	941	941	941	941	941	941	940	940	939	938	938	937	937	937	936	936	937	936	936	945	940	24	
14	936	936	936	937	937	937	937	937	938	939	939	939	939	939	938	938	938	938	939	939	939	939	939	939	940	940	936	940	24	
15	941	941	941	942	942	943	943	944	945	945	946	945	945	945	945	944	944	943	943	943	942	942	942	942	942	941	946	943	24	
16	941	941	941	941	941	940	940	940	940	941	941	940	939	939	938	937	936	936	935	934	934	934	933	933	933	933	941	938	24	
17	932	931	931	930	929	929	928	928	927	927	928	928	927	927	928	927	927	927	926	925	925	925	925	925	925	925	932	928	24	
18	925	924	925	925	925	926	926	926	927	927	928	928	929	929	930	930	931	931	931	932	932	933	933	933	933	924	933	929	24	
19	933	934	934	935	935	935	936	936	937	937	938	938	939	939	940	940	940	940	940	941	941	942	942	942	942	942	942	938	24	
20	943	943	943	944	944	945	945	946	947	947	948	948	948	948	949	949	949	948	948	948	948	948	948	948	948	948	949	947	24	
21	948	949	948	948	948	948	949	949	950	950	951	951	951	950	950	950	950	949	948	948	948	948	948	948	948	948	948	951	24	
22	948	948	948	948	949	949	949	949	950	951	952	951	951	951	951	950	950	949	948	947	947	947	947	947	947	947	952	949	24	
23	946	946	946	946	945	945	944	943	943	942	942	941	940	940	939	938	938	938	938	937	937	937	937	937	937	937	946	941	24	
24	937	938	938	938	939	939	940	940	941	942	942	942	942	943	943	944	944	944	944	944	944	944	945	945	945	937	945	942	24	
25	946	946	947	946	946	947	947	947	948	949	949	949	949	949	949	948	948	948	947	947	947	947	947	947	947	946	949	948	24	
26	947	947	947	946	946	946	946	946	947	947	946	946	945	944	944	943	942	941	940	940	939	939	938	937	937	937	947	944	24	
27	937	936	936	935	935	935	936	936	938	939	941	941	942	943	944	945	946	946	947	948	949	949	949	950	950	950	950	950	24	
28	950	951	951	952	952	952	953	953	954	955	955	955	955	955	955	954	954	954	953	952	952	952	952	951	950	950	955	953	24	
29	951	951	951	950	950	950	950	950	951	951	952	952	951	951	950	950	950	949	948	948	948	948	947	947	947	947	952	950	24	
30	947	947	947	946	946	946	946	947	947	947	946	946	946	946	946	946	946	947	947	947	947	947	947	947	948	948	948	947	24	
HOURLY MAX	951	951	951	952	952	952	953	953	954	955	955	955	955	955	955	955	954	954	954	953	952	952	952	951	951	951	951	951	24	
HOURLY AVG	941	941	941	941	941	941	941	941	942	942	942	942	942	942	942	941	941	941	941	941	941	941	941	941	941	941	941	941	941	24

STATUS FLAG CODES

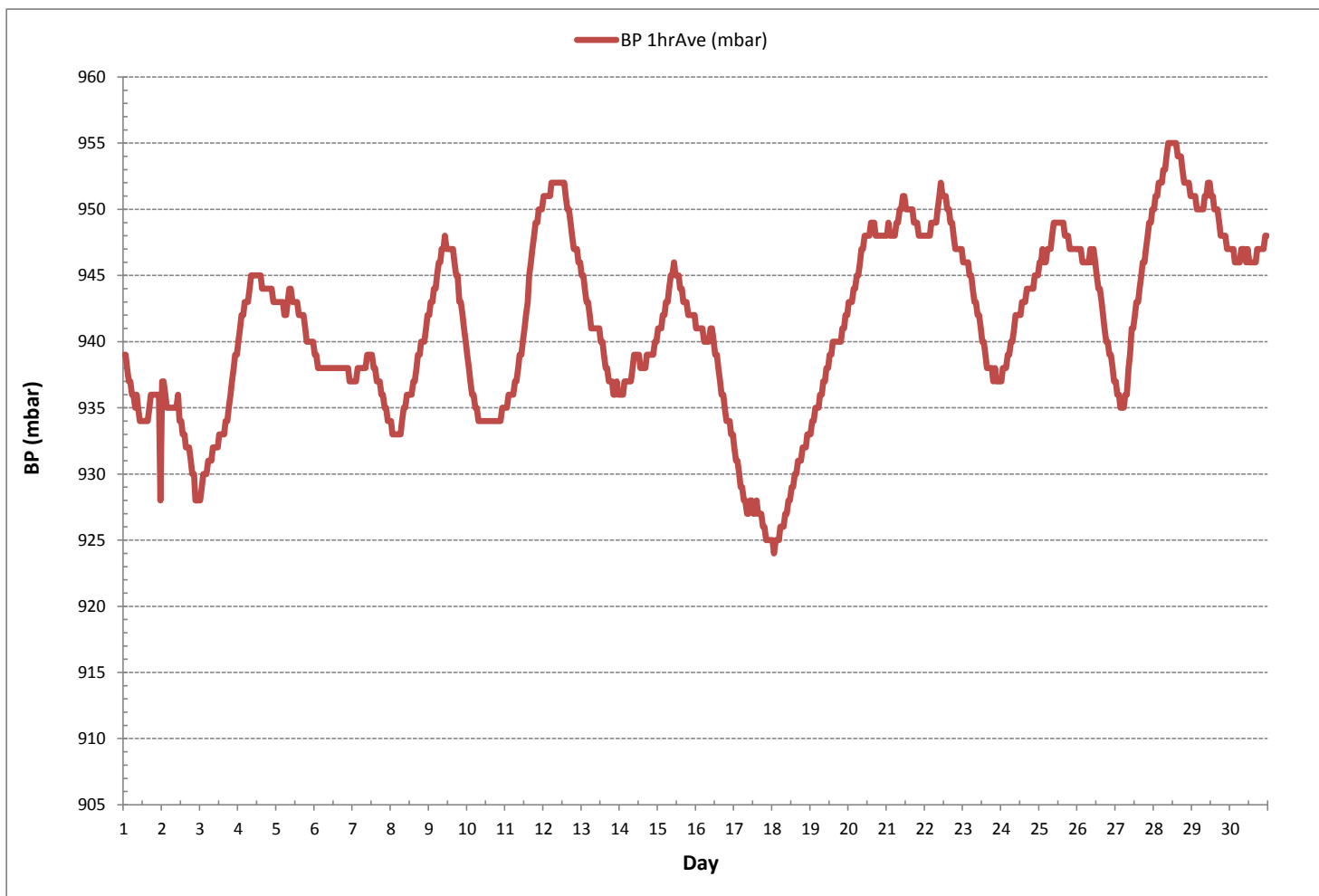
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	924	mbar	@ HOUR(S)	1	ON DAY(S)	18
MAXIMUM 1-HR AVERAGE:	955	mbar	@ HOUR(S)	VAR	ON DAY(S)	28
MAXIMUM 24-HR AVERAGE:	953	mbar			ON DAY(S)	28
					VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	6.71		MONTHLY AVERAGE:		941	mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



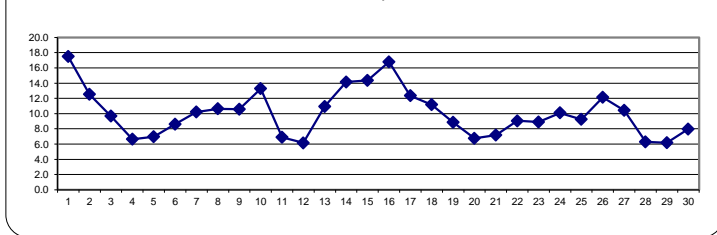
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.	
DAY	DAY	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.	RDGS.	
1	1	16.5	15.7	15.5	14.9	14.1	13.3	14.0	14.9	16.5	17.1	18.9	17.8	21.3	24.2	24.9	25.5	24.9	22.0	19.1	16.6	14.3	13.7	12.5	11.8	11.8	25.5	17.5	24	
2	2	10.7	10.7	10.1	8.0	7.5	7.3	8.5	10.3	11.8	13.9	13.8	13.6	14.7	14.9	15.7	17.5	18.0	16.2	14.6	13.0	12.8	12.7	12.9	11.2	7.3	18.0	12.5	24	
3	3	10.9	10.1	9.8	9.6	9.3	9.2	9.4	9.5	10.4	11.3	11.8	12.4	11.8	11.2	10.9	10.0	8.6	8.4	8.1	8.1	8.2	8.2	7.9	7.1	7.1	12.4	9.7	24	
4	4	6.9	6.3	5.7	5.2	4.8	4.5	4.9	5.6	6.5	7.8	9.3	9.3	9.8	10.5	9.8	9.9	10.1	8.9	7.8	4.6	4.1	3.6	2.3	1.4	1.4	10.5	6.7	24	
5	5	0.3	-0.5	-1.2	-1.5	-1.8	-1.9	-1.1	2.5	7.9	11.0	11.7	13.5	15.5	14.7	13.3	13.4	14.5	13.3	10.1	8.0	6.8	6.4	6.2	5.9	-1.9	15.5	7.0	24	
6	6	6.1	4.4	3.3	5.0	7.4	6.9	6.8	6.8	8.0	8.2	8.3	8.6	9.7	11.9	13.2	14.5	12.7	12.0	11.4	10.5	9.1	8.7	7.2	5.8	3.3	14.5	8.6	24	
7	7	5.2	4.9	5.8	5.1	5.2	4.7	4.3	5.3	7.3	9.7	13.5	15.4	17.2	18.5	18.6	18.6	18.9	16.6	12.5	10.1	9.4	7.1	5.9	4.9	4.3	18.9	10.2	24	
8	8	4.2	3.2	2.6	2.1	1.8	1.5	2.1	6.7	11.5	17.0	19.1	20.4	14.8	18.0	14.8	17.6	18.0	14.8	12.3	11.5	10.6	10.3	10.4	9.9	1.5	20.4	10.6	24	
9	9	9.6	9.2	8.7	7.9	7.2	6.5	6.6	7.6	9.7	11.7	13.1	14.0	16.2	16.7	16.8	16.7	16.4	14.8	12.8	10.1	7.1	6.3	6.1	5.7	9.1	5.7	16.8	10.6	24
10	10	10.2	9.7	9.0	9.1	9.0	8.8	9.0	10.0	12.0	12.9	16.7	19.4	20.0	20.8	19.0	20.1	19.0	17.4	14.3	12.4	10.8	10.4	10.0	8.8	8.8	20.8	13.3	24	
11	11	8.2	7.9	8.7	8.3	7.7	7.4	7.3	7.9	7.5	7.4	6.8	6.8	6.2	5.8	6.3	6.8	7.6	7.5	6.5	5.5	5.7	5.5	5.0	4.5	4.5	8.7	6.9	24	
12	12	4.7	4.6	4.4	4.2	4.1	3.7	3.8	4.4	5.3	6.8	6.8	7.7	8.8	10.7	11.1	11.2	11.2	10.0	7.3	3.7	2.8	3.4	3.7	3.3	2.8	11.2	6.2	24	
13	13	2.9	1.9	1.8	2.0	2.3	2.4	2.4	3.8	6.4	9.4	12.4	15.6	18.0	19.0	20.1	21.1	20.5	19.9	17.5	14.9	13.0	12.6	11.8	10.8	1.8	21.1	10.9	24	
14	14	9.8	8.7	7.3	7.6	5.5	4.4	4.4	8.5	14.3	17.2	18.6	19.9	22.4	23.7	23.7	23.7	23.0	20.7	17.0	13.9	12.7	11.4	10.6	10.3	4.4	23.7	14.1	24	
15	15	9.3	7.9	6.7	6.1	5.4	5.0	4.9	7.9	14.7	17.0	20.1	21.3	22.0	22.7	23.4	21.6	21.5	20.2	17.0	14.0	13.8	15.0	14.1	12.6	4.9	23.4	14.3	24	
16	16	13.1	12.4	12.0	12.2	11.5	10.7	9.8	11.5	14.1	16.5	18.8	21.4	23.1	23.8	23.7	24.3	24.3	22.2	18.6	17.2	17.3	15.5	14.6	14.5	9.8	24.3	16.8	24	
17	17	13.2	12.2	11.4	11.1	11.1	11.0	10.8	11.0	11.3	11.5	13.0	13.8	14.2	14.6	15.9	17.3	16.8	15.9	12.5	10.6	10.2	9.3	9.1	8.8	8.8	17.3	12.4	24	
18	18	9.0	9.3	9.9	10.4	10.6	10.4	10.1	10.1	10.9	11.8	11.4	11.3	12.6	13.5	14.9	15.5	15.1	13.5	11.3	10.9	9.8	8.7	8.5	8.3	8.3	15.5	11.2	24	
19	19	7.5	7.9	8.2	8.4	8.7	8.5	8.7	9.1	10.3	10.7	11.2	11.6	11.5	12.3	12.0	12.8	12.8	11.6	8.5	6.0	4.1	3.2	3.0	4.0	3.0	12.8	8.9	24	
20	20	3.7	3.3	3.5	4.0	2.8	3.1	4.3	6.2	9.3	10.5	11.5	12.2	11.9	12.2	12.1	12.4	11.8	10.4	7.1	4.1	2.9	1.9	0.6	0.1	0.1	12.4	6.7	24	
21	21	0.0	0.0	-0.4	0.4	0.4	1.5	2.1	4.3	7.5	11.3	13.8	12.9	12.0	12.7	16.0	16.6	15.4	13.4	9.1	7.0	6.1	4.3	2.9	3.2	-0.4	16.6	7.2	24	
22	22	2.6	1.5	0.6	-0.3	-0.9	-1.2	-1.0	1.6	7.3	12.9	14.5	15.8	16.9	17.9	17.8	17.6	17.0	15.1	11.7	10.3	10.8	9.3	9.7	9.6	-1.2	17.9	9.0	24	
23	23	9.5	8.9	8.6	9.0	8.8	8.7	8.5	8.7	9.3	9.4	9.7	9.8	9.9	9.1	8.5	8.8	8.8	8.8	8.7	8.6	8.5	8.4	8.2	8.1	8.1	9.9	8.9	24	
24	24	8.2	8.3	8.4	8.5	8.6	8.3	8.3	8.9	11.8	11.2	11.4	14.9	15.2	14.8	13.9	14.1	14.8	13.0	10.2	7.5	6.0	5.3	5.6	5.0	5.0	15.2	10.1	24	
25	25	5.2	6.1	5.9	5.3	4.1	4.0	3.3	5.5	9.5	12.4	14.9	15.8	16.9	17.0	17.2	17.2	15.9	13.0	9.4	6.6	4.9	4.0	3.8	3.8	3.3	17.2	9.2	24	
26	26	2.3	2.0	1.6	0.9	0.9	3.9	3.5	4.7	9.6	12.8	15.8	17.8	19.7	20.9	21.6	21.9	21.3	19.3	16.5	15.9	15.4	14.6	14.1	14.0	0.9	21.9	12.1	24	
27	27	12.6	10.3	9.3	9.3	8.4	6.7	5.5	7.3	13.5	16.1	15.0	13.6	11.7	12.2	13.9	14.9	15.2	12.5	9.8	8.7	8.0	7.3	5.4	3.1	3.1	16.1	10.4	24	
28	28	2.7	3.1	2.2	0.6	0.4	-1.0	-1.3	1.3	6.4	10.0	11.4	13.0	13.4	13.3	12.9	13.4	12.9	11.1	8.0	5.0	3.9	3.6	3.7	1.0	-1.3	13.4	6.3	24	
29	29	0.0	-0.6	-1.6	-2.2	-2.0	-2.0	-2.4	-0.9	3.1	8.6	12.2	14.5	15.6	15.8	15.5	16.3	15.3	11.5	7.9	5.4	4.4	5.2	3.9	4.4	-2.4	16.3	6.2	24	
30	30	5.7	6.2	6.7	6.4	7.2	7.6	7.3	7.3	8.1	8.8	9.3	10.4	10.2	9.7	9.4	8.9	8.5	8.3	7.9	7.6	7.1	7.4	7.7	7.7	5.7	10.4	8.0	24	
HOURLY MAX		16.5	15.7	15.5	14.9	14.1	13.3	14.0	14.9	16.5	17.2	20.1	21.4	23.1	24.2	24.9	25.5	24.9	22.2	19.1	17.2	17.3	15.5	14.6	14.5					
HOURLY AVG		7.0	6.5	6.2	5.9	5.7	5.5	5.5	6.9	9.7	11.8	13.2	14.2	14.8	15.4	15.6	16.0	15.7	14.1	11.4	9.5	8.7	8.1	7.6	7.1					

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

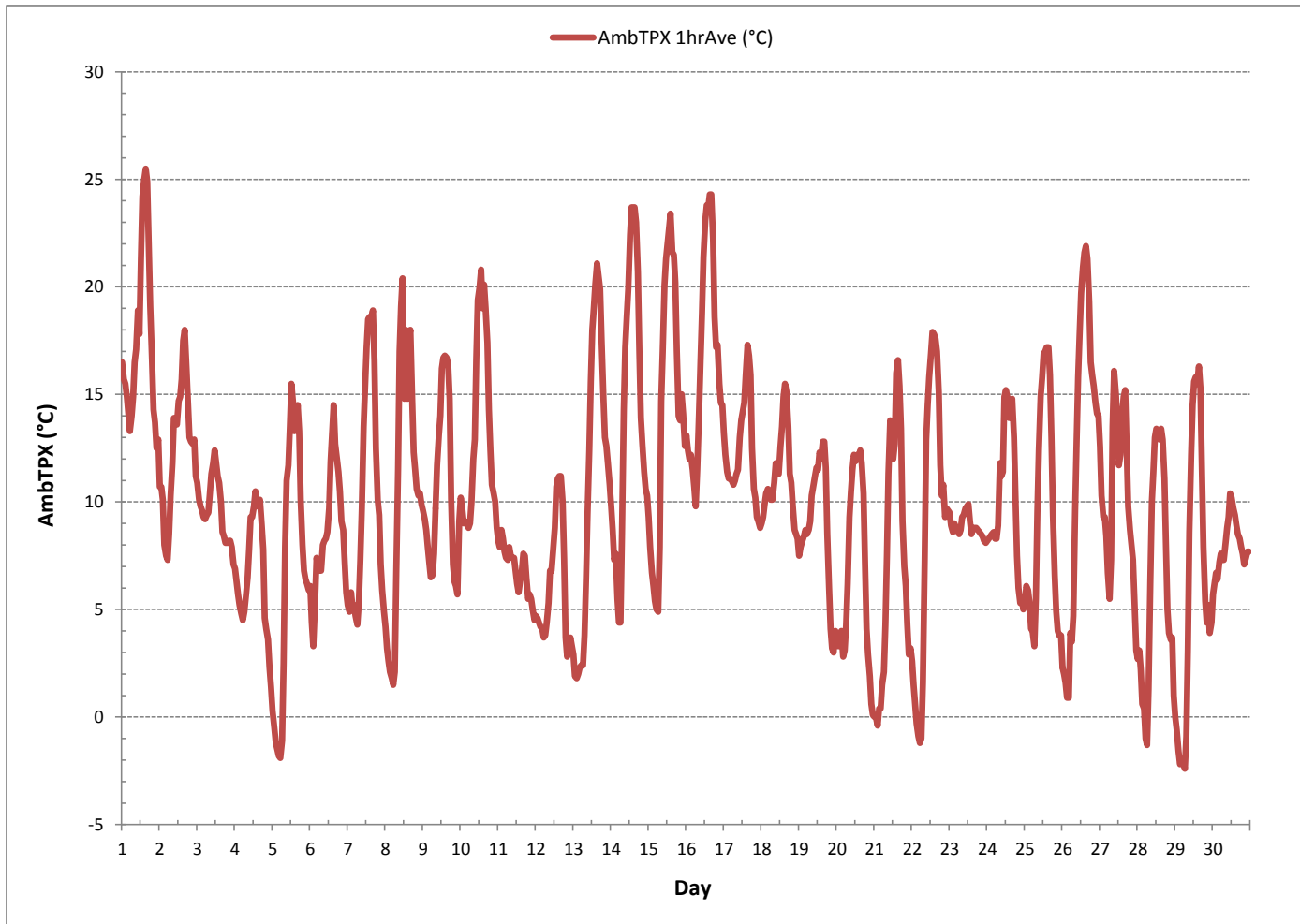
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-2.4 °C	@ HOUR(S)	6	ON DAY(S)	29
MAXIMUM 1-HR AVERAGE:	25.5 °C	@ HOUR(S)	15	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	17.5 °C			ON DAY(S)	1
				VAR-VARIOUS	
OPERATIONAL TIME:				720	HRS
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.50	MONTHLY AVERAGE:		10.1	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

PRECIPITATION Hourly Averages (mm)

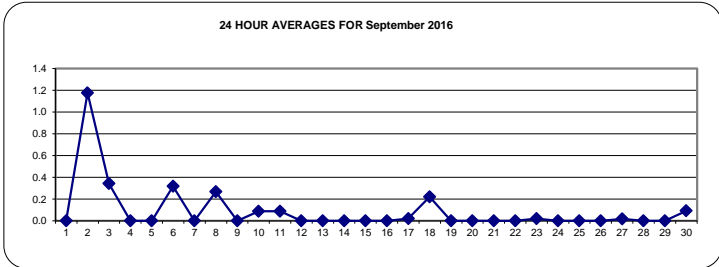
MST

DAY	HOURLY START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.	
	HOURLY END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	11.9	0.3	0.1	0.7	13.3	0.0	13.3	1.2	24	
3	1.0	0.3	0.2	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	1.3	1.6	0.4	0.3	0.2	0.1	0.5	0.0	0.0	0.0	1.6	0.3	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.1	0.4	1.7	1.8	1.6	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.8	0.3	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.3	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
10	0.0	0.1	0.2	0.3	0.2	0.0	0.0	0.1	0.7	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	0.7	0.1	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	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	0.7	0.1	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	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	0.2	0.0	24	
18	0.0	0.0	0.0	0.0	0.9	2.7	0.5	1.0	0.1	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	2.7	0.2	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.2	1.6	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.1	24	
HOURLY MAX	1.0	0.3	0.2	0.5	0.9	2.7	1.7	1.8	1.6	1.7	0.2	0.4	4.2	0.7	2.2	1.2	1.3	1.6	1.7	11.9	0.3	0.1	0.7	13.3						
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.4	0.0	0.0	0.0	0.4						

STATUS FLAG CODES

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

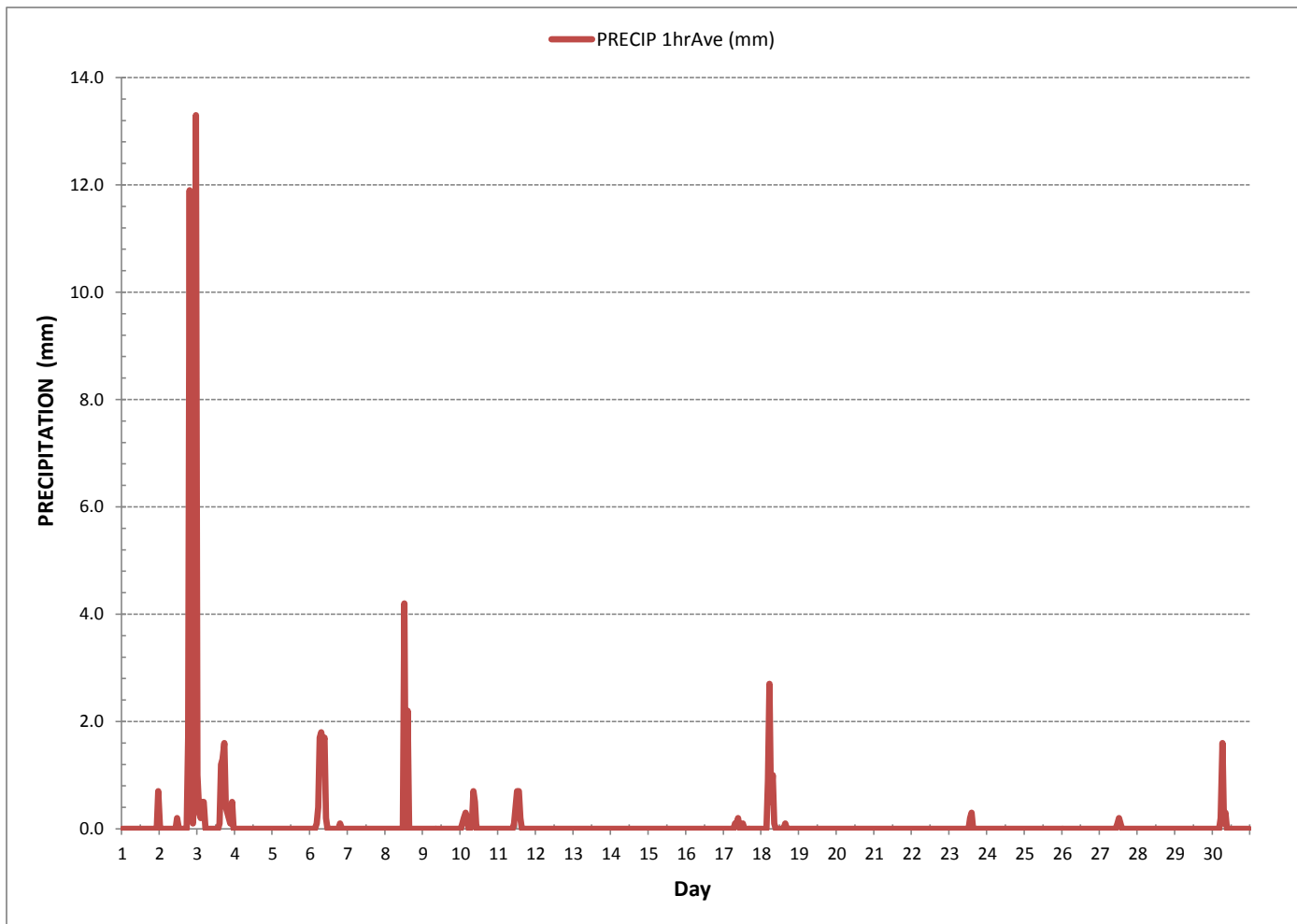
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	13.3	mm	@ HOUR(S)	23	ON DAY(S)	2
MAXIMUM 24-HR AVERAGE:	1.2	mm			ON DAY(S)	2
MONTHLY TOTAL	63.5	mm			VAR-VARIOUS	
STANDARD DEVIATION:	0.72					
OPERATIONAL TIME:					720	HRS
AMD OPERATION UPTIME:					100.0	%
MONTHLY AVERAGE:					0.1	mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: September 1, 2016	Barometric Pressure: 0.922 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 8:40	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 13:00	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
Serial Number: 508	Range ppb: 1000
Last Calibration Date: August 29, 2016	As Found C.F.: 0.999
Previous C.F.: 1.003	New C.F.: 1.000

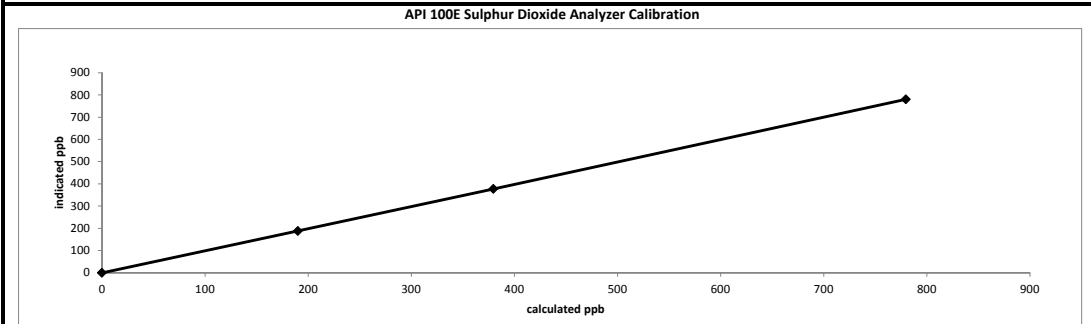
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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	5000	0.00	5000	0.0	2.8	N/A
as found high	4924	78.00	5002	779.7	783.0	0.999
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	377.0	1.007
low	4981	19.00	5000	190.0	188.0	1.011
calibrator zero	5000	0.00	5000	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>0.14%</u>	.95-1.05
% change in C.F. from last cal = <u>0.36%</u>	± 3% F.S.
	± 10%

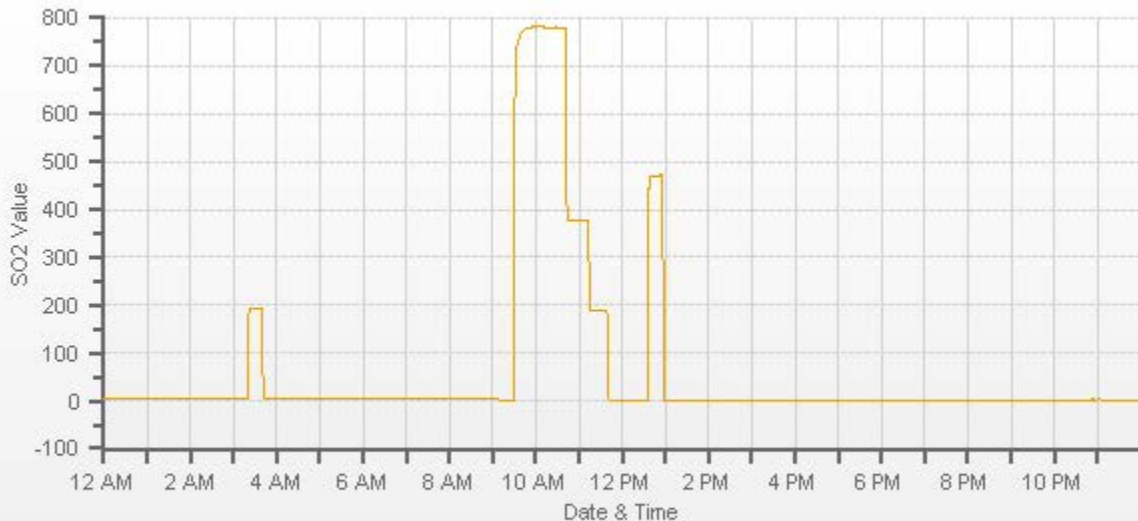


<p style="text-align: center;">As found:</p> <p>SLOPE: <u>1.003</u></p> <p>OFFSET: <u>93.7</u></p> <p>HVPS: <u>467</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>31.1</u></p> <p>PMT TEMP: <u>7.7</u></p> <p>IZS TEMP: <u>45.0</u></p> <p>PRES: <u>24.4</u></p> <p>SAMP FL: <u>618</u></p> <p>NORM PMT: <u>98.9</u></p> <p>UV LAMP: <u>3348.1</u></p> <p>LAMP RATIO: <u>92.0</u></p> <p>STR. LGT: <u>47.0</u></p> <p>DRK PMT: <u>10.0</u></p> <p>DRK LMP: <u>-0.2</u></p> <p>Internal Span: <u>237</u></p>	<p style="text-align: center;">As left:</p> <p>SLOPE: <u>1.001</u></p> <p>OFFSET: <u>99.1</u></p> <p>HVPS: <u>467</u></p> <p>RCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>32.0</u></p> <p>PMT TEMP: <u>7.7</u></p> <p>IZS TEMP: <u>45.0</u></p> <p>PRES: <u>24.3</u></p> <p>SAMP FL: <u>618</u></p> <p>NORM PMT: <u>99.0</u></p> <p>UV LAMP: <u>3344.5</u></p> <p>LAMP RATIO: <u>91.8</u></p> <p>STR. LGT: <u>49.6</u></p> <p>DRK PMT: <u>10.6</u></p> <p>DRK LMP: <u>-0.3</u></p> <p>Internal Span: <u>472</u></p>
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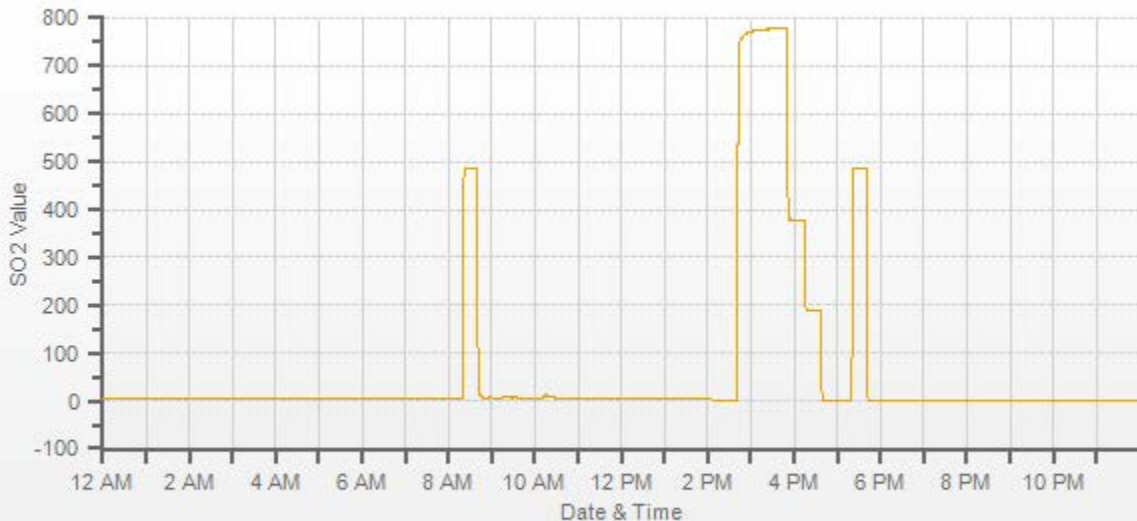
Comments:

Sample inlet filter changed. A new permeation device installed. It will require 48 hours for a new permeation tube to get stabilized. The EV will be re-adjusted after stabilizing.

SO2[ppb] Station: LICA MASKWA Daily: 2016/09/01 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>September 1, 2016</u>	Barometric Pressure: <u>0.922 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>8:40</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Tom Bourque</u>
End Time 24 hr. (mst): <u>10:34</u>	Cal Gas Expiry Date: <u>July 15, 2017</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:	
Serial Number: <u>511</u>	Range ppb: <u>100</u>
Last Calibration Date: <u>August 26, 2016</u>	As Found C.F.: <u>0.986</u>
Previous C.F.: <u>1.006</u>	New C.F.: <u>n/a</u>

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>LL36837</u> Cal Gas Conc. (ppm): <u>10.0</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">19</td> </tr> </tbody> </table>	Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point	Hydrogen Sulphide Standard Calibration Points								
High	78								
Mid	38								
Low	19								

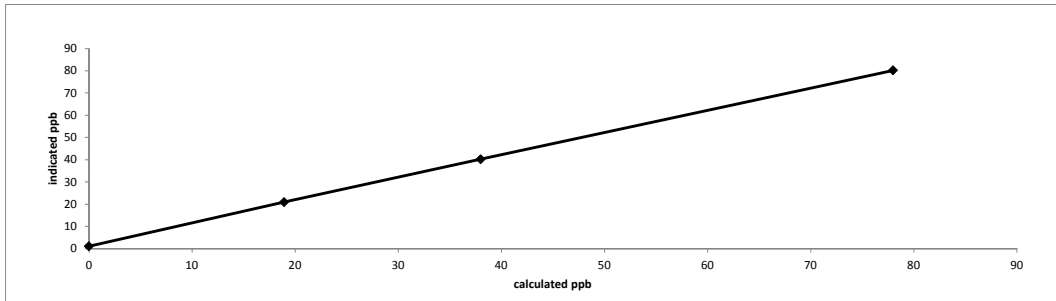
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	1.1	N/A
as found high	7442	58.50	7501	78.0	80.2	0.986
mid	7471	28.50	7500	38.0	40.2	0.972
low	7485	14.20	7499	18.9	20.9	0.956
Average C.F. =						0.971

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS
Slope =	<u>0.988</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>-1.43%</u>	0.90-1.10
% change in C.F. from last cal =	<u>1.99%</u>	± 3% F.S.
		± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found: SLOPE: <u>0.847</u> OFFSET: <u>52.9</u> HVPS: <u>600</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>31.6</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>314.8</u> PRES: <u>21.7</u> SAMP FL: <u>571</u> UV LAMP: <u>2846.4</u> LAMP RATIO: <u>84.5</u> STR. LGT: <u>22.4</u> DRK PMT: <u>38.7</u> DRK LMP: <u>6.8</u> Internal Span: <u>48.5</u>	As left: SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> Converter Temp: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> STR. LGT: <u>n/a</u> DRK PMT: <u>n/a</u> DRK LMP: <u>n/a</u> Internal Span: <u>n/a</u>
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Comments:
 Shutdown calibration completed because of unstable ZERO readings during ZS check. The analyzer requires repair/maintenance and is being removed.



API 101E Hydrogen Sulphide Analyzer Calibration

Date: September 1, 2016	Barometric Pressure: 0.922 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: installation
Start Time 24 hr. (mst): 11:15	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 15:03	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
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.: 1.003

Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0	<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;">Hydrogen Sulphide Standard Calibration Points</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	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Standard Calibration Points for Ranges											
Point	Hydrogen Sulphide Standard Calibration Points										
High	78										
Mid	38										
Low	19										

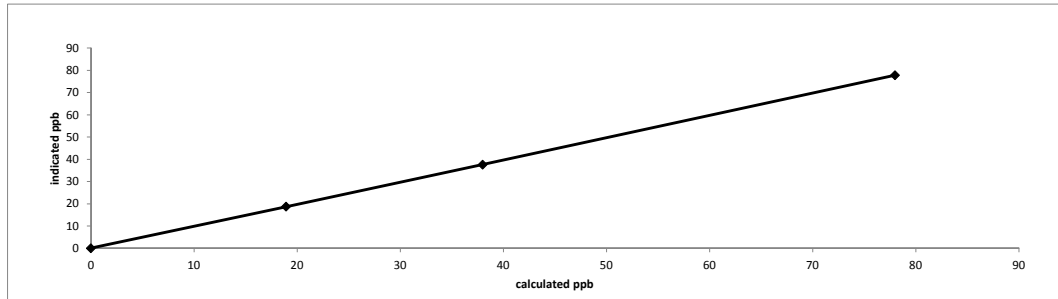
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7500	0.00	7500	0.0	0.0	N/A
adjusted high	7442	58.50	7501	78.0	77.8	1.003
mid	7471	28.50	7500	38.0	37.6	1.011
low	7485	14.20	7499	18.9	18.7	1.013
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.009

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 1.002	.95-1.05
b (Intercept as % of full scale) = 0.14%	± 3% F.S.
% change in C.F. from last cal = n/a	± 10%

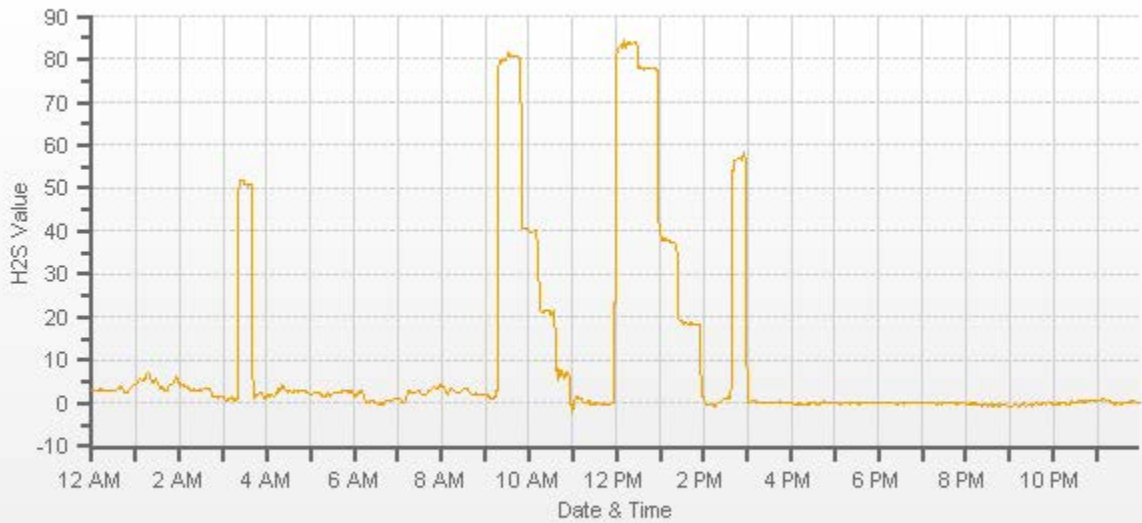
API 101E Hydrogen Sulphide Analyzer Calibration



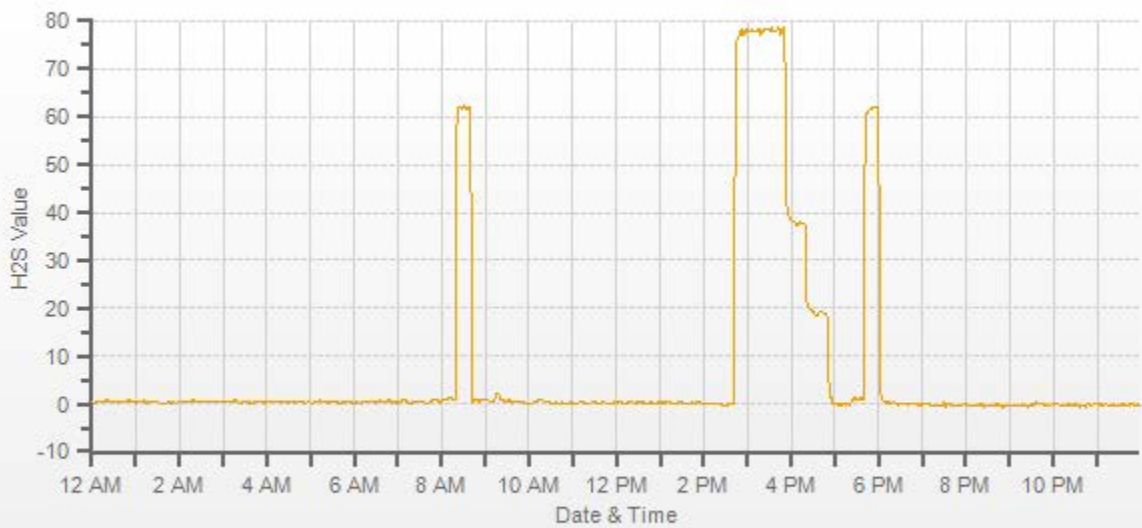
As found: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Internal Span: n/a	As left: SLOPE: 0.839 OFFSET: 90.9 HVPS: 590 RCELL TEMP: 50.0 BOX TEMP: 32.1 PMT TEMP: 8.2 IZS TEMP: 48.0 Converter Temp: 314.9 PRES: 23.0 SAMP FL: 615 UV LAMP: 3232.5 LAMP RATIO: 101.7 STR. LGT: 38.1 DRK PMT: 61.2 DRK LMP: 3.6 Internal Span: 57.6
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Comments:

Installation calibration completed to replace the analyzer #511 for repair/maintenance in shop. Sample inlet filter changed.



— H2S[ppb]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	September 1, 2016	Barometric Pressure:	0.922 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	14:39 / 18:13	Performed By/Reviewer:	Alex Yakupov Tom Bourque
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	Serial Number:	436609738	Range ppm:	50
	Last Calibration Date:	August 17, 2016	As Found C.F.:	1.001
	Previous Cal High Point C.F.:	0.998	New C.F.:	1.001

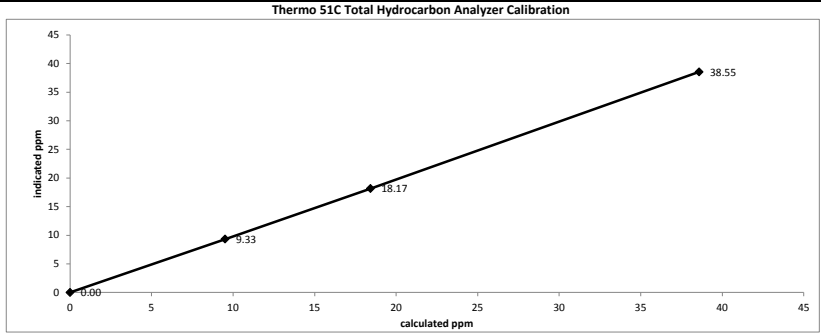
Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of 50 ppm								
	Make & Model:	API 700									
	Serial #:	627									
	Cal Gas Cylinder I.D. #:	LL165372									
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0 212.0	<table border="1"> <tr><th>Point</th><th>Target ppm</th></tr> <tr><td>High</td><td>38</td></tr> <tr><td>Mid</td><td>18</td></tr> <tr><td>Low</td><td>9</td></tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm										
High	38										
Mid	18										
Low	9										
	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	1999	0.00	1999	0.0	-0.06	n/a
as found high	1938	65.00	2003	38.58	38.47	1.001
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.55	1.001
mid	1969	31.00	2000	18.43	18.17	1.014
low	1984	16.00	2000	9.51	9.33	1.020
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.012

Linear Regression/Calibration Results:

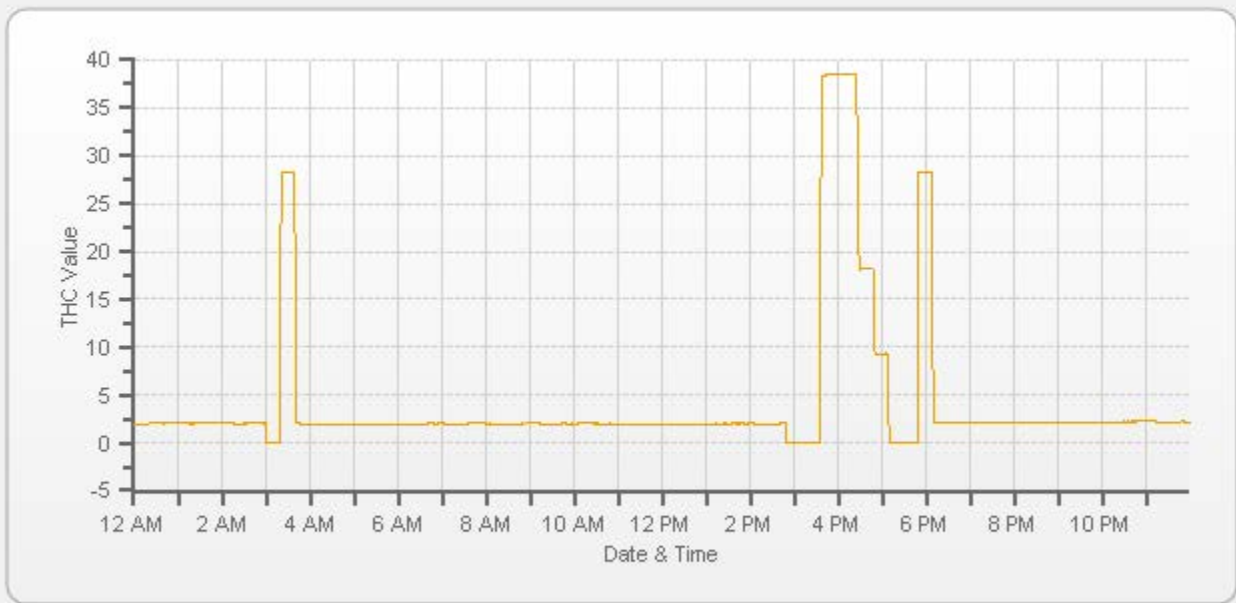
Correlation Coefficient =	1.000	> or = 0.995
Slope =	1.000	.95-1.05
b (Intercept as % of full scale) =	0.24%	± 3% F.S.
% change in C.F. from last cal =	-0.34%	± 10%



As found:	As left:
H2 cylinder (psi): 1700	H2 cylinder (psi): 1700
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 700	Span Cylinder (psi): 700
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 35	Zero Air Gen Pressure: 35
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1056	cnt: 1065
rng: 1	rng: 1
try: 5	try: 5
flm: 185.7	flm: 185.6
det: 125.4	det: 125.4
Flame: 185	Flame: 185
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 07.52	Sample psi: 07.52
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 12	Internal Fuel Pressure: 12
Intenal Pressure Gauge psi: 28	Intenal Pressure Gauge psi: 28
Internal Span: 28.5	Internal Span: 28.31

Comments:

Sample inlet filter changed.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: <u>September 1, 2016</u>	Barometric Pressure: <u>0.922 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>
Start/End Time 24 hr. (mst): <u>8:40 / 15:23</u>	Calibration Purpose: <u>routine monthly</u>
G.P.T. to be used for Ozone? <u>No</u>	Performed By/Reviewer: <u>Alex Yakupov Tom Bourque</u>
Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>

Analyzer: Serial Number: <u>2051</u> Last Calibration Date: <u>August 15, 2016</u> Range ppb: <u>1000</u>	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>Previous C.F.:</td> <td>As Found C.F.:</td> <td>New C.F.:</td> </tr> <tr> <td>NO =</td> <td>1.000</td> <td>1.011</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.004</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.012</td> <td>1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.011	1.000	NO ₂ =	1.004	1.000	1.000	NOx =	1.000	1.012	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.011	1.000														
NO ₂ =	1.004	1.000	1.000														
NOx =	1.000	1.012	1.000														

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API 700</u> Serial #: <u>627</u> Cal Gas Cylinder I.D. #: <u>LL119346</u> NO/NOx Gas Conc. (ppm): <u>50.0 50.0</u>	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.3	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	771.0	771.0	1.011	1.012
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	374.0	374.0	1.015	1.015
low	4981	19.00	5000	190.0	190.0	185.0	185.0	1.027	1.027
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.014	1.014

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

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	4924	78.00	5002	0.0	782.0	782.0	0.0	0.0	0.0	
as found high NO2	4799	78.00	4877	490.0	284.0	782.0	498.0	498.0	498.0	1.000
adjusted high NO2	4799	78.00	4877	490.0	284.0	782.0	498.0	498.0	498.0	1.000
gpt mid	4799	78.00	4877	265.0	512.0	782.0	270.0	270.0	270.0	1.000
gpt low	4799	78.00	4877	100.0	684.0	782.0	98.0	98.0	98.0	1.000
Average NO₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.000	.95-1.05
b (Intercept as % of full scale) =	-0.32%	-0.32%	0.00%	± 3% F.S.
% change in C.F. from last cal =	-1.13%	-1.17%	0.40%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

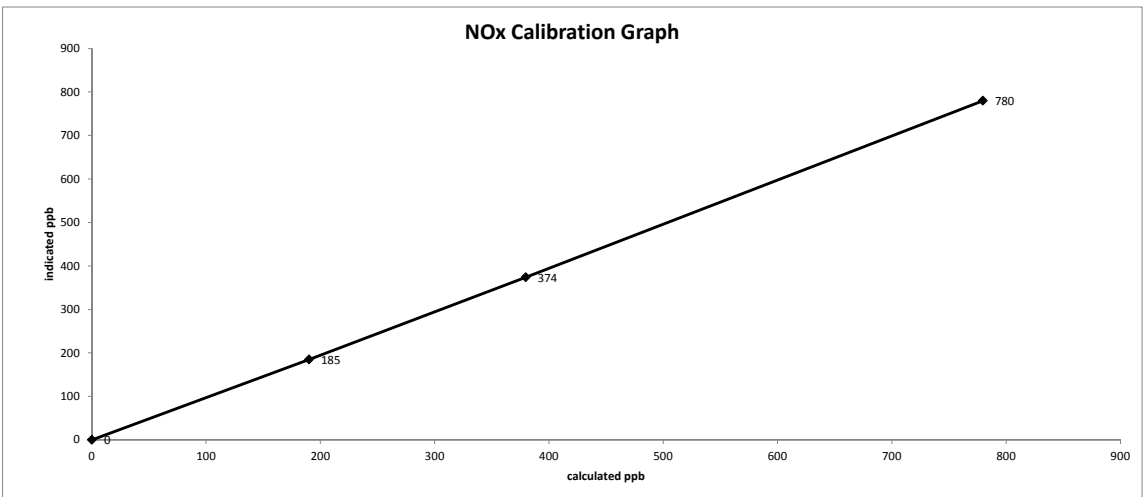
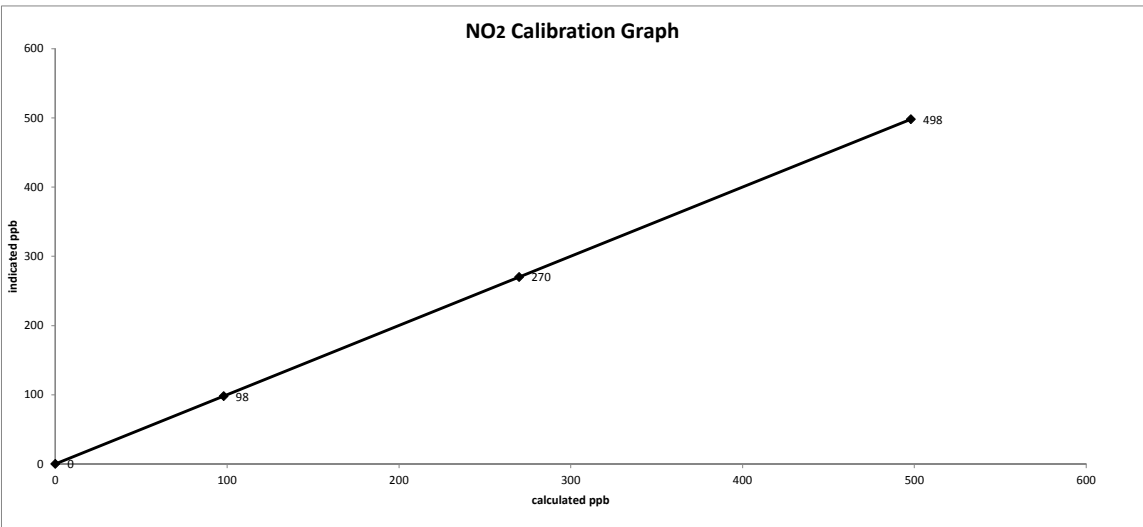
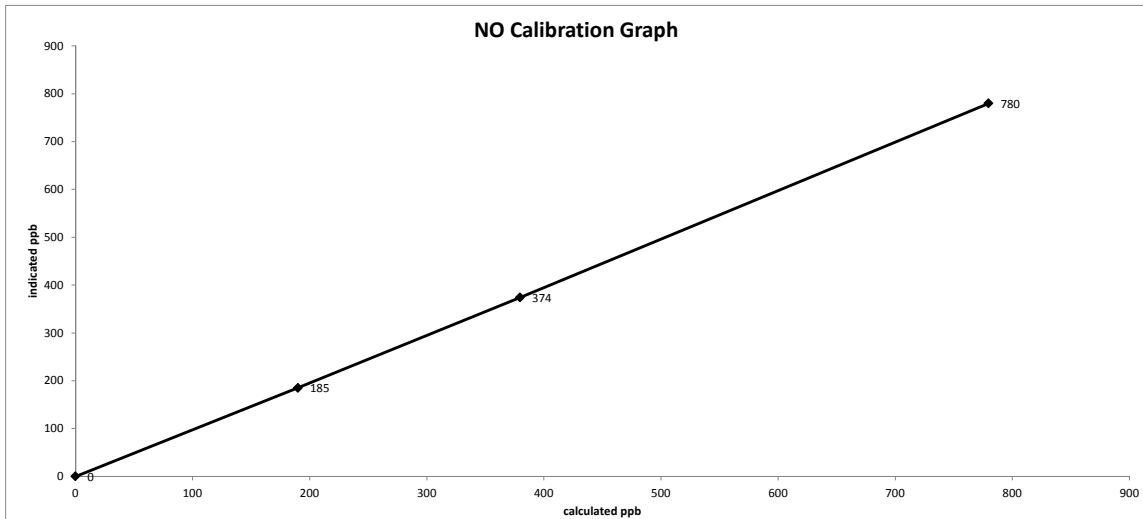
As found: NOx SLOPE: <u>1.178</u> NOx OFFS: <u>-0.5</u> NO SLOPE: <u>1.179</u> NO OFFS: <u>-1.9</u> SAMP FLW: <u>496</u> OZONE FL: <u>80</u> NORM PMT: <u>1.5</u> AZERO: <u>47.5</u> HVPS: <u>707</u> DCPS: <u>2570</u> RCELL: <u>49.9</u> BOX TEMP: <u>31.4</u> IZS TEMP: <u>45.4</u> MOLY TEMP: <u>316.7</u> RCEL: <u>5.0</u> SAMP: <u>26.9</u> Internal Span NO: <u>9.5</u> Internal Span NO ₂ : <u>414</u> Internal Span NOx: <u>424</u>	As left: NOx SLOPE: <u>1.192</u> NOx OFFS: <u>-0.6</u> NO SLOPE: <u>1.194</u> NO OFFS: <u>-2.1</u> SAMP FLW: <u>495</u> OZONE FL: <u>80</u> NORM PMT: <u>-0.8</u> AZERO: <u>47.2</u> HVPS: <u>707</u> DCPS: <u>2569</u> RCELL: <u>50.1</u> BOX TEMP: <u>30.9</u> IZS TEMP: <u>45.0</u> MOLY TEMP: <u>314.3</u> RCEL: <u>5.0</u> SAMP: <u>26.6</u> Internal Span NO: <u>9.5</u> Internal Span NO ₂ : <u>422</u> Internal Span NOx: <u>432</u>
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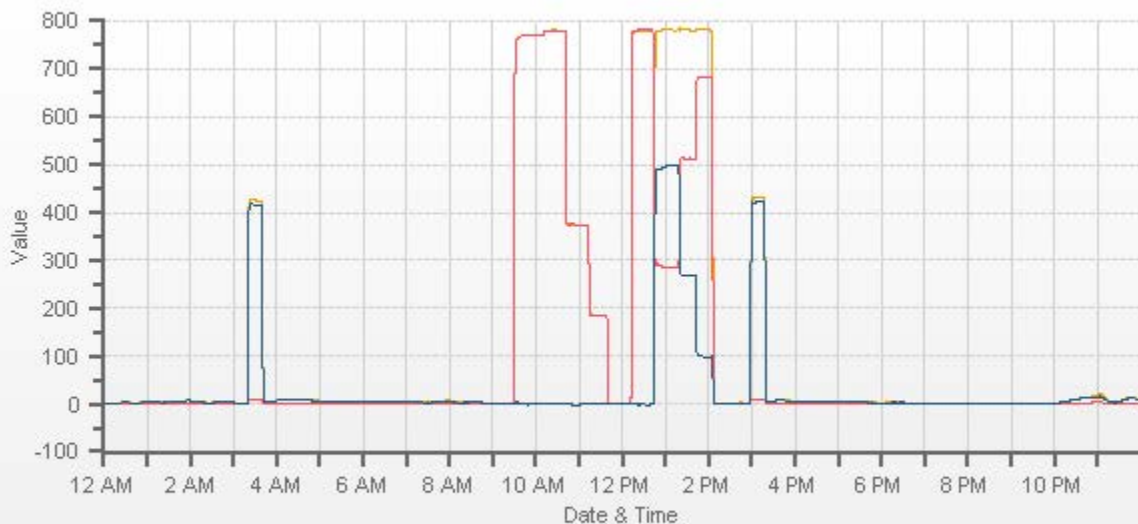
Comments:

Sample inlet filter changed. No NO2 high point adjustment required/made.

Date: September 1, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 8:40 / 15:23
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</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>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO2 - Flows Not Manually Measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.00000	0.00000	0.000
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 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.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 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

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. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:

Make/Model	<u>Thermo 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.2</u>	Span:	<u>1.014</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>02-Feb-16</u>	C.F.	<u>1.000</u> Done By: <u>SB</u>

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000	X	X	X	X
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NOx
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] 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 Site
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	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.

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

01-11-2016

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-09-30-C</u>
Site: <u>Maskwa Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>19-OCT-16</u>
Level 1 Primary Validation	<u></u>	Date <u>19-OCT-16</u>
Level 2 Final Validation	<u></u>	Date <u>01-NOV-16</u>
Level 3 Independent Data Review	<u></u>	Date <u>01-NOV-16</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.



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
ST. LINA CONTINUOUS MONITORING STATION

JOB #: 2833-2016-09-31-C

September 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **October 31, 2016**

Prepared by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi".

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

Reviewed by:

A handwritten signature in blue ink, appearing to read "Cheri Sinclair".

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

SUMMARY

In September 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Station, near the Community of St. Lina, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry and Community Association..

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

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

PM_{2.5}: Twenty-five hours of data were recorded this month at concentrations less than 3 µg/m³, rendering the data invalid.

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 Site.

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association St. Lina Site						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	0.0	2.2	13	15	23.6	WSW	0.4	6	100.0
H ₂ S (ppb)	10	3	0	0	0.0	0.6	1	6	10.2	E	0.1	6	100.0
THC (ppm)	-	-	-	-	1.81	2.34	6	19	5.1	NW	2.00	29	100.0
NO ₂ (ppb)	159	-	0	-	1.0	6.2	28, 30	19, 3	11.2 10.6	ESE ENE	3.0	30	100.0
NO (ppb)	-	-	-	-	0.1	1.7	21	7	4.7	W	0.3	13	100.0
NO _x (ppb)	-	-	-	-	1.1	6.3	28, 30	19, 8	11.2 10.8	ESE ENE	3.1	30	100.0
O ₃ (ppb)	82	-	0	-	22.5	41.5	16	15	12.9	SSW	30.6	27	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	2.7	21.9	1	13	25	WSW	5.9	1	96.5
RELATIVE HUMIDITY (%)	-	-	-	-	67	91	7, 7	0, 6	6.6 6.5	W SSW	82	VAR	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	930	943	28	VAR	VAR	VAR	941	28	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	11.2	25.3	16	14	12	SW	17.5	1	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	12.8	18	0	15.5	W	1.0	18	100.0
VECTOR WS (kph)	-	-	-	-	10.0	26.9	3	11	-	W	17.5	3	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 24-Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 24-Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1-Hour Exceedances

No Exceedances Recorded During the Month

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1.0 Discussion

This monthly report consists of continuous monitoring data 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 (August 3, 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.

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%).

Trailer inspection was conducted on September 6. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on September 6. The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel on September 7 during monthly calibration of the Ozone analyzer. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

HYDROGEN SULPHIDE (H₂S)

The routine monthly calibration was performed on September 6. No operational issues were identified this month. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on September 7. No operational issues were identified this month. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on September 6. No operational issues were identified this month. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

OZONE (O₃)

The routine monthly calibration was performed on September 7. No operational issues were identified this month. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine audits were performed this month: one was completed on September 7 and the other audit was performed on September 20.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. Twenty-five 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)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

No operational issues were identified this month. Maximum instantaneous data collected on September 2, at hour 18:00, was discarded due to a brief power failure.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

BAROMETRIC PRESSURE (BP)

No operational issues were identified this month.

PRECIPITATION

No operational issues were identified this month.

AMBIENT TEMPERATURE (AmbTPX)

The temperature sensor was audited on September 6 using thermometer Fluke-1551A Ex (S/N: 4295), as a reference. No operational issues were identified this month.

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 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 Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ 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 Unit
- Wind System - RM Young Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

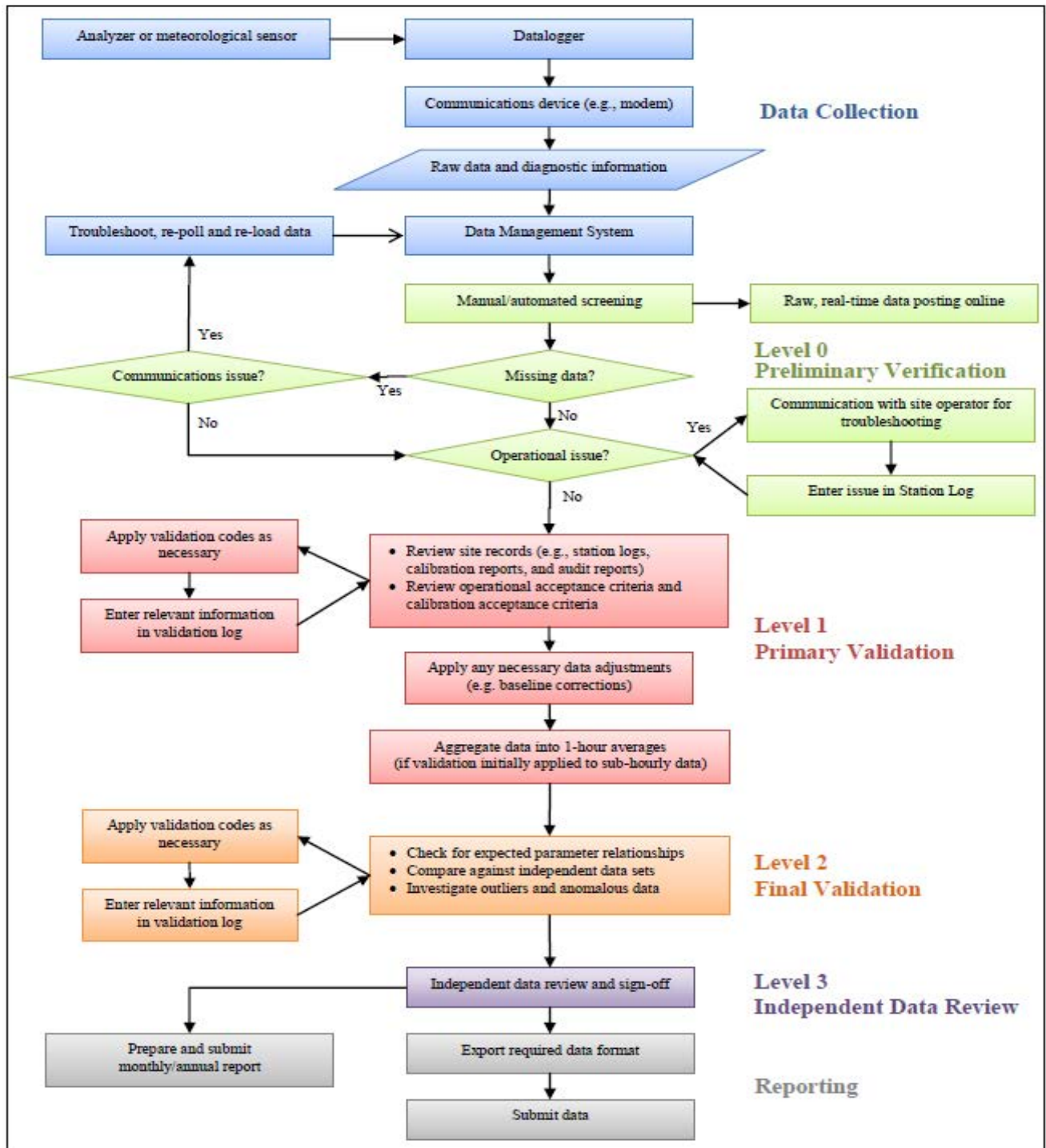
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



Source: Air Monitoring Directive (Aug 3, 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)

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
1	0.6	0.5	0.4	S	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	0.6	0.1	24
2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24	
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	S	0.0	0.0	0.0	0.0	24	
6	0.2	0.0	0.2	0.2	0.3	0.6	0.5	0.8	0.8	1.0	1.1	1.2	1.3	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.4	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	Q	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.4	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.7	S	2.2	1.3	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
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	S	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	S	0.0	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24
17	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	S	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	0.1	0.0	24
22	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	S	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.1	1.2	1.7	0.6	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.2	24
27	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.6	0.5	0.4	0.2	0.3	0.6	0.5	0.8	0.8	1.0	1.1	1.2	1.7	0.7	0.3	2.2	1.3	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	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	24

STATUS FLAG CODES

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

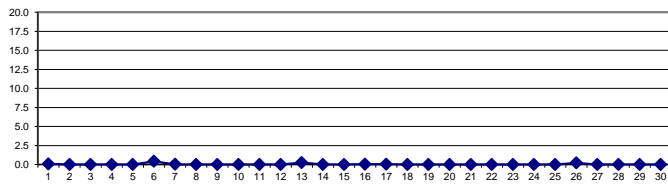
OBJECTIVE LIMIT:

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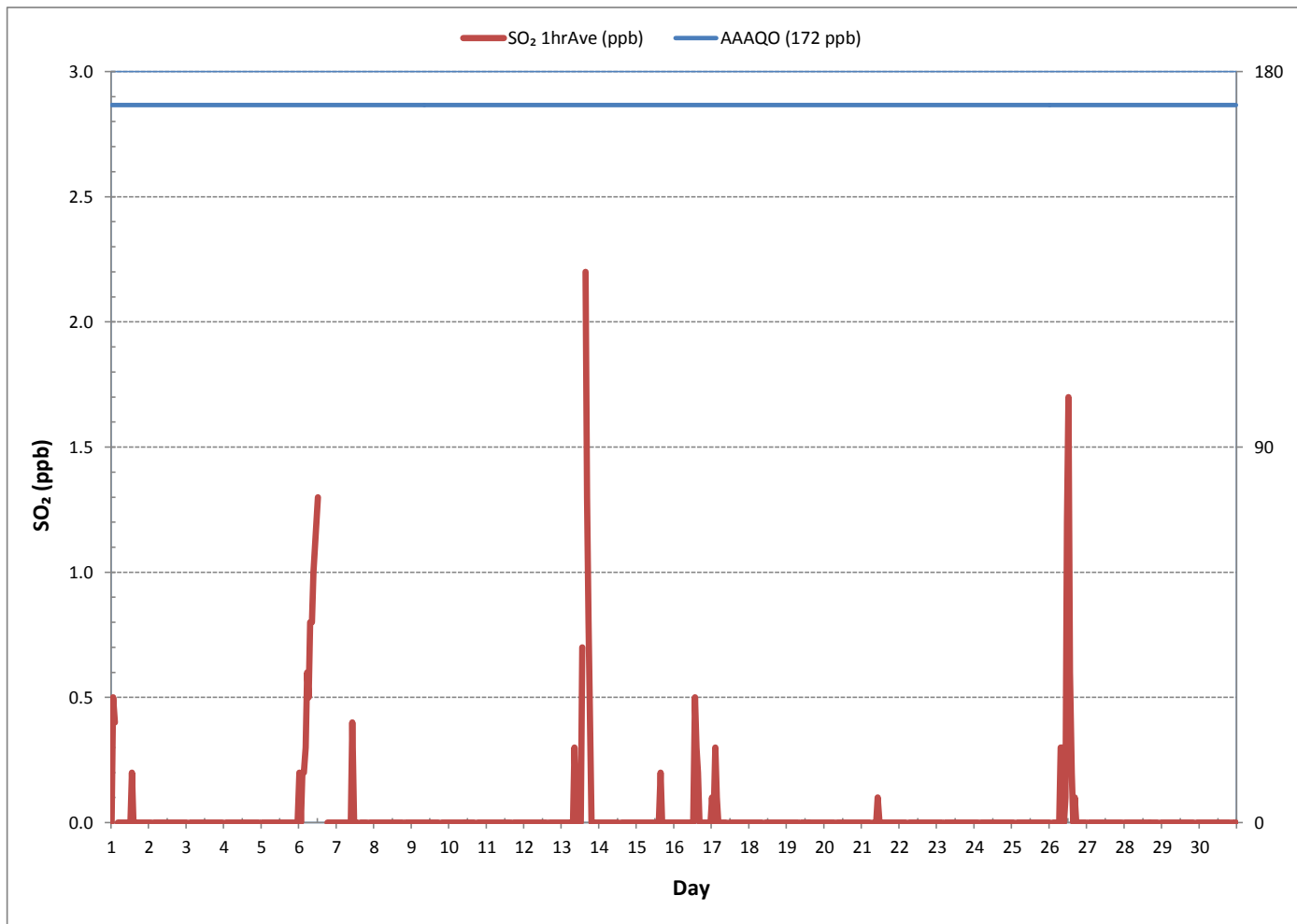
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	40			
MINIMUM 1-HR AVERAGE:	0.0 PPB @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	2.2 PPB @ HOUR(S)	15	ON DAY(S)	13
MAXIMUM 24-HR AVERAGE:	0.4 PPB		ON DAY(S)	6
			VAR-VARIOUS	
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	720 HRS	
MONTHLY CALIBRATION TIME:	5 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.18	MONTHLY AVERAGE:	0.0 PPB	

24 HOUR AVERAGES FOR September 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		3.9	4.1	3.8	S	3.9	3.9	3.8	3.9	4.0	4.1	4.1	3.9	4.0	5.1	4.0	3.7	3.5	3.4	3.6	3.5	3.5	3.5	3.5	3.5	3.4	5.1	3.8	24	
2		3.2	3.5	S	3.5	3.6	3.7	3.6	3.7	3.5	3.7	3.6	3.9	3.9	3.9	4.1	3.9	4.1	4.1	P	4.1	4.2	4.2	4.2	4.3	3.2	4.3	3.8	23	
3		4.1	S	3.8	4.1	3.9	4.0	3.9	3.8	3.9	3.9	3.9	3.9	4.0	3.9	3.9	3.6	3.7	3.7	3.6	3.6	3.4	3.4	3.4	3.3	3.3	4.1	3.8	24	
4		S	3.2	3.4	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.0	3.1	3.1	3.1	3.2	3.3	3.0	3.1	3.0	3.1	3.1	S	3.0	3.4	3.1	24	
5		3.1	3.1	3.2	3.3	3.3	3.1	3.0	3.2	3.3	3.7	3.5	3.6	3.5	3.6	3.4	3.5	3.6	3.5	3.7	3.8	3.5	3.6	S	4.3	3.0	4.3	3.5	24	
6		4.1	3.6	3.7	3.6	3.5	3.8	3.6	3.7	3.6	3.7	3.7	3.7	3.6	C	C	C	C	C	C	1.5	1.6	1.3	1.1	1.3	1.1	4.1	3.0	24	
7		1.4	1.4	1.2	1.2	1.4	1.3	1.2	1.3	1.4	1.6	2.6	2.3	1.7	1.6	Q	Q	Q	1.3	1.3	1.5	1.3	S	1.5	1.6	1.7	1.2	2.6	1.5	24
8		1.5	1.3	1.7	1.7	1.6	1.6	1.9	1.6	1.7	1.7	1.7	1.6	1.5	1.6	1.3	1.5	1.4	1.2	1.2	S	1.0	1.0	0.8	1.1	0.8	1.9	1.4	24	
9		1.1	0.8	0.8	0.9	0.8	0.7	0.8	0.7	0.9	0.8	0.8	0.8	0.8	0.6	0.8	1.0	1.0	0.8	S	0.8	1.1	1.1	1.2	1.2	0.6	1.2	0.9	24	
10		1.4	1.4	1.5	1.6	1.7	1.5	1.8	1.8	2.1	2.1	2.0	1.9	1.9	1.6	1.7	1.6	1.9	S	1.7	1.7	1.7	1.7	1.6	1.4	1.4	2.1	1.7	24	
11		1.4	1.5	1.5	1.4	1.5	1.5	1.3	1.4	1.4	1.2	1.2	1.2	0.9	0.8	0.8	0.8	S	0.6	0.5	0.5	0.2	0.5	0.5	0.2	0.2	1.5	1.0	24	
12		0.3	0.1	0.5	0.4	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.6	0.6	0.8	S	0.4	0.6	0.6	0.8	0.6	0.8	0.7	0.7	0.1	0.8	0.5	24	
13		0.9	1.0	1.0	1.1	0.9	1.3	1.2	1.3	1.9	1.8	1.7	1.6	1.6	2.8	S	5.7	3.1	2.8	2.2	1.9	1.6	1.5	1.7	1.6	0.9	5.7	1.8	24	
14		1.5	1.5	1.6	1.7	1.7	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.6	S	1.7	1.7	1.7	1.5	1.7	1.5	1.5	1.2	1.2	1.4	1.2	1.7	1.5	24	
15		1.2	1.5	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.0	S	1.2	2.3	2.1	1.6	1.5	1.5	1.4	1.1	1.1	1.3	1.2	1.0	2.3	1.3	24	
16		1.4	1.4	1.3	1.4	1.5	1.5	1.4	1.4	1.4	1.7	1.5	S	2.0	2.5	2.4	2.5	2.2	2.3	2.1	2.3	2.1	2.4	2.3	1.3	2.5	1.9	24		
17		2.9	2.8	3.1	2.8	2.5	2.3	2.5	2.4	2.3	2.3	S	2.3	2.4	2.3	2.3	2.5	2.5	2.5	2.2	2.5	2.8	2.4	2.3	2.6	2.2	3.1	2.5	24	
18		2.5	2.6	2.5	2.5	2.3	2.5	2.6	2.2	2.3	S	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.0	1.8	1.8	2.6	2.2	24	
19		2.0	1.9	1.8	1.8	1.8	1.8	1.7	1.7	S	1.7	1.7	1.7	1.5	1.5	1.7	1.6	1.6	1.4	1.4	1.4	1.2	1.3	1.3	1.2	1.2	2.0	1.6	24	
20		1.2	1.1	1.2	1.1	1.1	1.2	1.1	S	1.0	1.1	0.9	0.8	0.9	0.9	1.1	0.9	0.9	0.8	0.9	0.9	0.9	1.0	0.9	1.0	0.8	1.2	1.0	24	
21		1.0	0.9	0.9	1.1	1.0	1.0	S	1.2	1.0	1.5	2.2	1.4	1.9	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.4	1.6	1.3	0.9	2.2	1.3	24	
22		1.2	1.0	1.1	1.0	1.2	S	1.0	1.0	1.1	1.3	1.0	1.0	1.2	1.2	1.3	1.2	1.5	1.3	1.4	1.5	1.4	1.2	1.2	1.5	1.0	1.5	1.2	24	
23		1.3	1.4	1.3	1.4	S	1.3	1.7	1.5	1.8	1.7	1.9	1.9	1.8	1.8	1.9	2.1	2.2	2.2	2.0	2.1	2.3	2.0	1.9	2.0	1.3	2.3	1.8	24	
24		1.9	1.9	2.0	S	1.8	1.9	1.7	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.3	1.3	1.4	1.3	1.5	1.3	1.4	1.2	1.2	2.0	1.6	24	
25		1.1	1.2	S	1.0	1.3	1.4	1.2	1.2	1.0	1.2	1.2	1.3	1.4	1.2	1.2	1.1	1.4	1.2	1.2	1.3	1.2	1.1	1.2	1.1	1.0	1.4	1.2	24	
26		1.7	S	1.7	1.9	1.7	1.7	1.9	2.6	2.5	1.9	3.6	3.9	4.1	3.8	2.7	2.6	2.5	2.2	2.3	2.1	2.3	2.2	2.5	2.8	1.7	4.1	2.5	24	
27		S	2.3	2.3	2.2	2.2	2.3	2.1	2.1	1.9	1.9	1.8	1.9	1.7	1.6	1.6	1.3	1.5	1.5	1.4	1.5	1.3	1.0	1.2	S	1.0	2.3	1.8	24	
28		0.9	1.2	1.0	1.0	1.1	0.9	1.0	0.9	0.9	0.9	0.8	0.7	1.0	0.8	1.1	1.2	1.1	1.1	1.1	1.1	1.0	1.1	1.4	S	1.0	0.7	1.4	1.0	24
29		1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.3	1.2	1.4	1.2	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	S	1.4	1.5	1.1	1.5	1.3	24
30		1.6	1.6	1.6	1.9	1.8	1.7	1.8	1.6	1.6	1.8	1.7	1.4	1.7	1.7	1.9	1.8	1.7	1.7	1.6	1.7	S	1.4	1.4	1.6	1.4	1.9	1.7	24	
HOURLY MAX		4.1	4.1	3.8	4.1	3.9	4.0	3.9	3.9	4.0	4.1	4.1	3.9	4.1	5.1	4.1	5.7	4.1	4.1	3.7	4.1	4.2	4.2	4.2	4.3					
HOURLY AVG		1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.8	1.9	1.8	1.8	1.7	1.8					

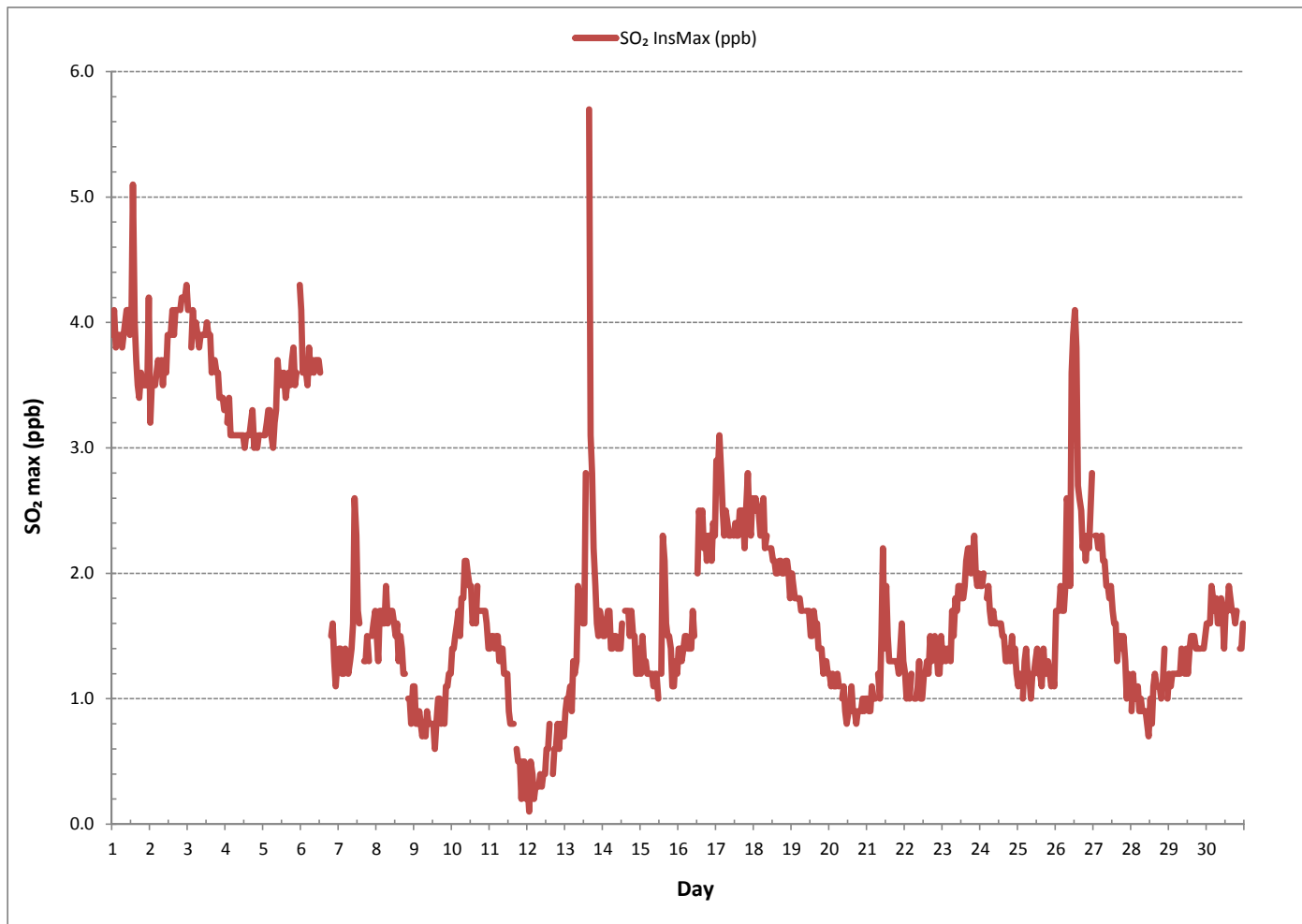
STATUS FLAG CODES

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

MONTHLY SUMMARY

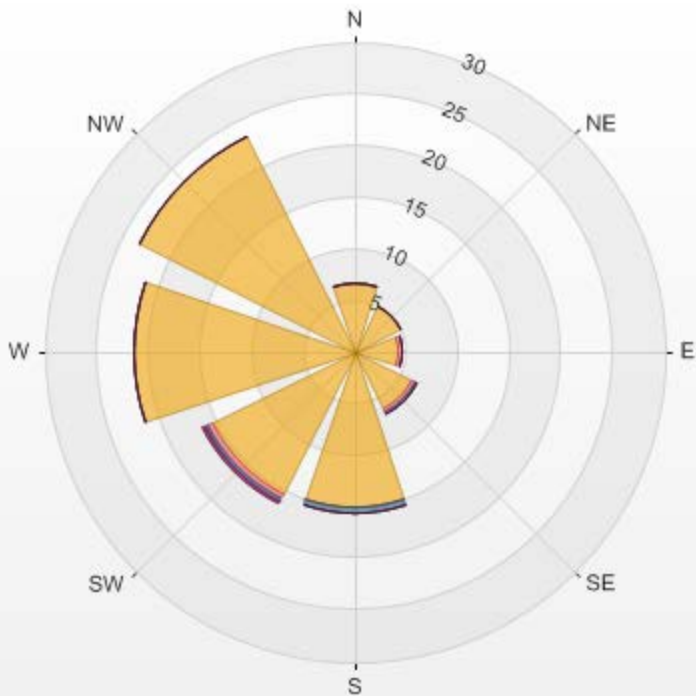
NUMBER OF NON-ZERO READINGS:	680
MAXIMUM INSTANTANEOUS VALUE:	5.7 PPB @ HOUR(S) 15 ON DAY(S) 13
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	0.99
OPERATIONAL TIME:	719 HRS

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



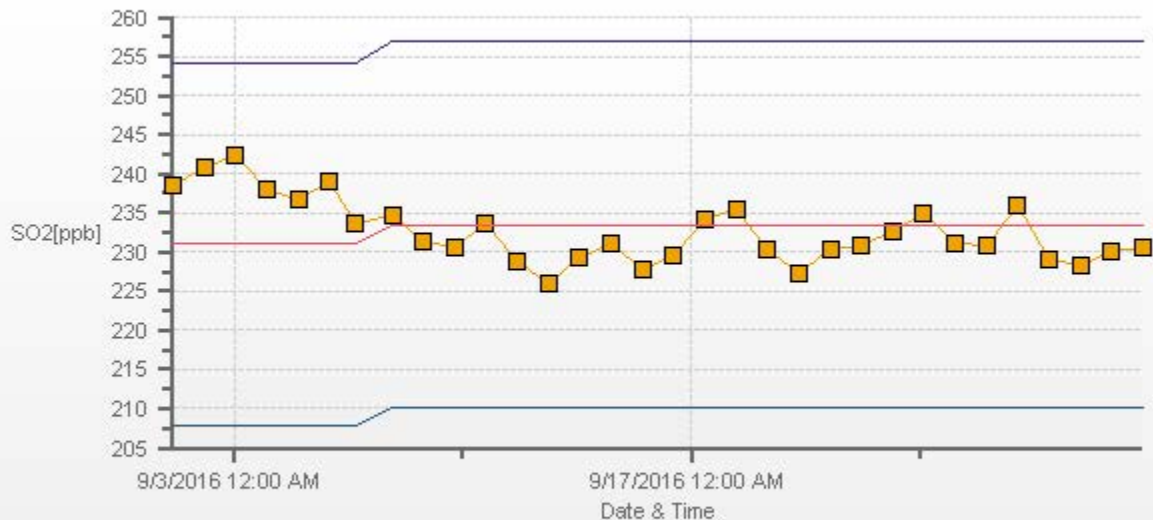
Wind: LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.44% Calm Avg: 0.00

Direction	0.0-0.5	0.5-0.9	0.9-1.4	1.4-1.8	1.8-2.3	>2.3	Total
N	6.76	0	0	0	0	0	6.76
NE	5	0	0	0	0	0	5
E	4.26	0.44	0	0	0	0	4.7
SE	6.18	0.44	0.15	0	0	0	6.77
S	15	0.15	0.44	0	0	0	15.59
SW	15.44	0.44	0.29	0.15	0.15	0	16.47
W	21.47	0	0	0	0	0	21.47
NW	23.24	0	0	0	0	0	23.24
Summary	97.35	1.47	0.88	0.15	0.15	0	100



% Icon Classes (ppb)	97	0.0-0.5	1	0.5-0.9	1	0.9-1.4	0	1.4-1.8	0	1.8-2.3	0	>2.3

SO2[ppb] Calibration: LICA ST. LINA Monthly: 09/2016 Type: Span



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

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	0.2	0.3	0.2	S	0.0	0.2	0.6	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	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	0.0	0.0	0.0	0.0	0.0	0.0	24
4	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	24	
6	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.5	0.4	0.4	0.3	0.2	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24
7	0.0	0.1	0.0	0.0	0.5	0.5	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	S	0.1	0.0	0.0	0.0	0.5	0.1	24	
8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.3	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.1	24
15	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
16	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	24	
17	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	24		
18	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.1	0.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
21	0.0	0.2	0.2	0.2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
25	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
27	S	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.3	0.0	24	
28	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	0.0	0.0	0.0	S	0.0	0.2	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.2	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	S	0.0	0.0	0.2	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.2	0.3	0.3	0.2	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.2						
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

STATUS FLAG CODES

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

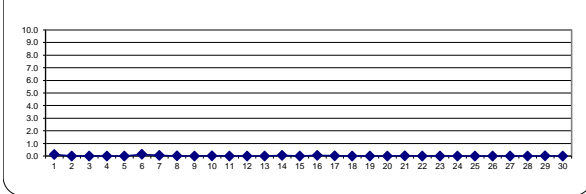
OBJECTIVE LIMIT:

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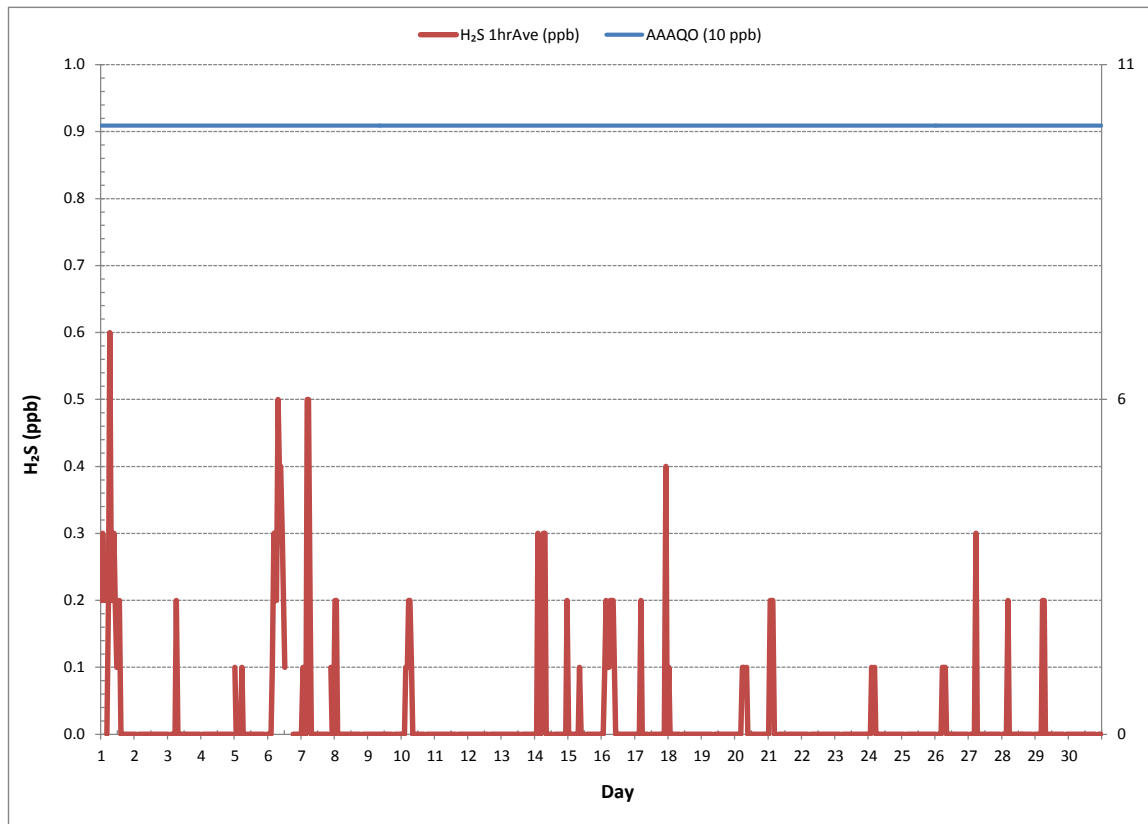
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	69					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.6	PPB	@ HOUR(S)	6	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	0.1	PPB			ON DAY(S)	6
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.07		MONTHLY AVERAGE:	0.0	PPB	

24 HOUR AVERAGES FOR September 2016



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY	1	1.5	1.6	1.6	S	1.6	2.1	2.4	2.1	1.9	1.9	1.9	1.7	1.9	1.9	1.6	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.3	1.3	2.4	1.6	24	
2	1.4	1.4	S	1.4	1.5	1.5	1.6	1.6	1.5	1.4	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.6	P	1.6	1.6	1.7	1.7	1.6	1.3	1.7	1.5	23		
3	1.6	S	1.5	1.5	1.5	1.5	2.1	1.7	1.5	1.4	1.4	1.5	1.4	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.3	1.2	1.2	1.2	1.2	2.1	1.5	24		
4	S	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.0	1.1	1.1	1.1	1.0	1.1	1.2	1.3	S	1.0	1.3	1.1	24	
5	1.8	1.2	1.6	1.2	1.2	1.6	1.3	1.3	1.5	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	S	1.4	1.1	1.8	1.3	24	
6	1.2	1.4	1.5	1.5	2.5	1.7	1.6	1.8	1.6	1.7	1.6	1.5	1.4	C	C	C	C	C	C	0.8	0.8	0.8	1.0	0.8	1.2	0.8	2.5	1.4	24	
7	1.1	1.6	1.1	1.2	1.7	1.7	1.6	1.2	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	S	1.2	1.2	1.2	0.7	1.7	1.1	24		
8	1.3	1.4	1.3	1.0	1.3	1.2	0.9	1.0	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.6	S	0.6	0.6	0.7	0.7	0.6	1.4	0.9	24		
9	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.6	0.4	S	0.6	0.6	0.6	0.7	0.9	0.4	0.9	0.6	24		
10	0.9	1.0	1.1	1.1	1.1	1.4	1.5	1.2	1.2	1.1	1.0	0.9	1.0	0.9	0.9	0.8	0.9	S	0.9	0.8	0.7	0.8	0.8	1.4	0.7	1.5	1.0	24		
11	0.9	0.8	0.9	0.8	0.9	0.8	0.7	0.8	0.8	0.6	0.6	0.5	0.6	0.6	0.4	0.4	S	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.9	0.6	24	
12	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	S	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.2	0.6	0.3	24	
13	0.5	0.6	0.7	0.7	0.8	0.7	0.8	0.9	0.9	0.9	0.9	0.8	0.7	0.7	S	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.5	0.9	0.8	24	
14	0.9	1.3	1.4	1.0	1.1	1.4	1.4	1.4	1.1	0.8	0.7	0.7	0.7	S	0.6	0.7	0.8	0.8	0.6	0.7	0.7	0.7	0.7	1.8	0.6	1.8	1.0	24		
15	0.9	0.6	0.6	0.5	0.7	0.7	0.7	0.7	1.1	1.0	0.8	0.6	S	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.9	0.8	0.5	1.1	0.7	24	
16	0.9	0.9	1.0	1.1	1.0	1.0	1.0	1.1	1.0	1.0	0.8	S	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	1.0	1.1	1.2	0.8	1.2	0.9	24	
17	1.2	1.2	1.2	1.2	1.5	1.5	1.2	1.1	1.1	1.0	S	1.0	1.0	1.1	1.1	1.1	1.2	1.1	1.1	1.3	1.1	1.3	1.1	1.3	1.7	1.4	1.0	1.7	1.2	24
18	1.7	1.2	1.6	1.2	1.2	1.2	1.1	1.3	1.0	S	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8	1.7	1.1	24
19	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.8	S	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.9	0.7	24	
20	0.6	0.7	0.8	0.8	0.7	0.8	0.8	S	0.7	0.5	0.6	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.8	0.5	0.3	0.8	0.6	24	
21	0.9	1.1	1.1	1.2	0.9	0.7	S	0.8	0.9	0.7	0.5	0.5	0.5	0.4	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.4	1.2	0.7	24	
22	0.7	0.7	0.8	0.6	0.5	S	0.9	0.9	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.5	0.9	0.6	24	
23	0.8	0.8	0.7	0.9	S	0.8	0.8	0.8	0.9	1.1	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.1	1.2	1.2	1.2	0.7	1.2	1.0	24	
24	1.2	1.1	1.4	S	1.3	1.1	1.1	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.5	1.4	0.8	24		
25	0.5	0.5	S	0.5	0.6	1.0	0.9	0.9	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.9	0.5	1.0	0.6	24
26	0.9	S	0.9	0.9	1.0	1.2	1.2	1.2	1.0	1.0	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.9	0.8	0.9	1.1	1.1	1.1	1.0	0.7	1.2	0.9	24	
27	S	1.3	1.3	1.3	1.4	1.6	1.5	1.2	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	S	0.5	1.6	0.9	24	
28	0.4	0.6	0.5	1.0	1.1	1.0	0.6	0.8	0.8	0.7	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	S	0.6	0.4	1.1	0.6	24	
29	0.7	0.7	0.6	0.7	0.7	0.9	1.0	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	S	0.6	0.6	0.5	1.0	0.7	24
30	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	S	0.6	0.7	0.6	0.6	0.8	0.7	24	
HOURLY MAX		1.8	1.6	1.6	1.5	2.5	2.1	2.4	2.1	1.9	1.9	1.9	1.7	1.9	1.9	1.6	1.5	1.5	1.6	1.4	1.6	1.6	1.7	1.7	1.8					
HOURLY AVG		1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0					

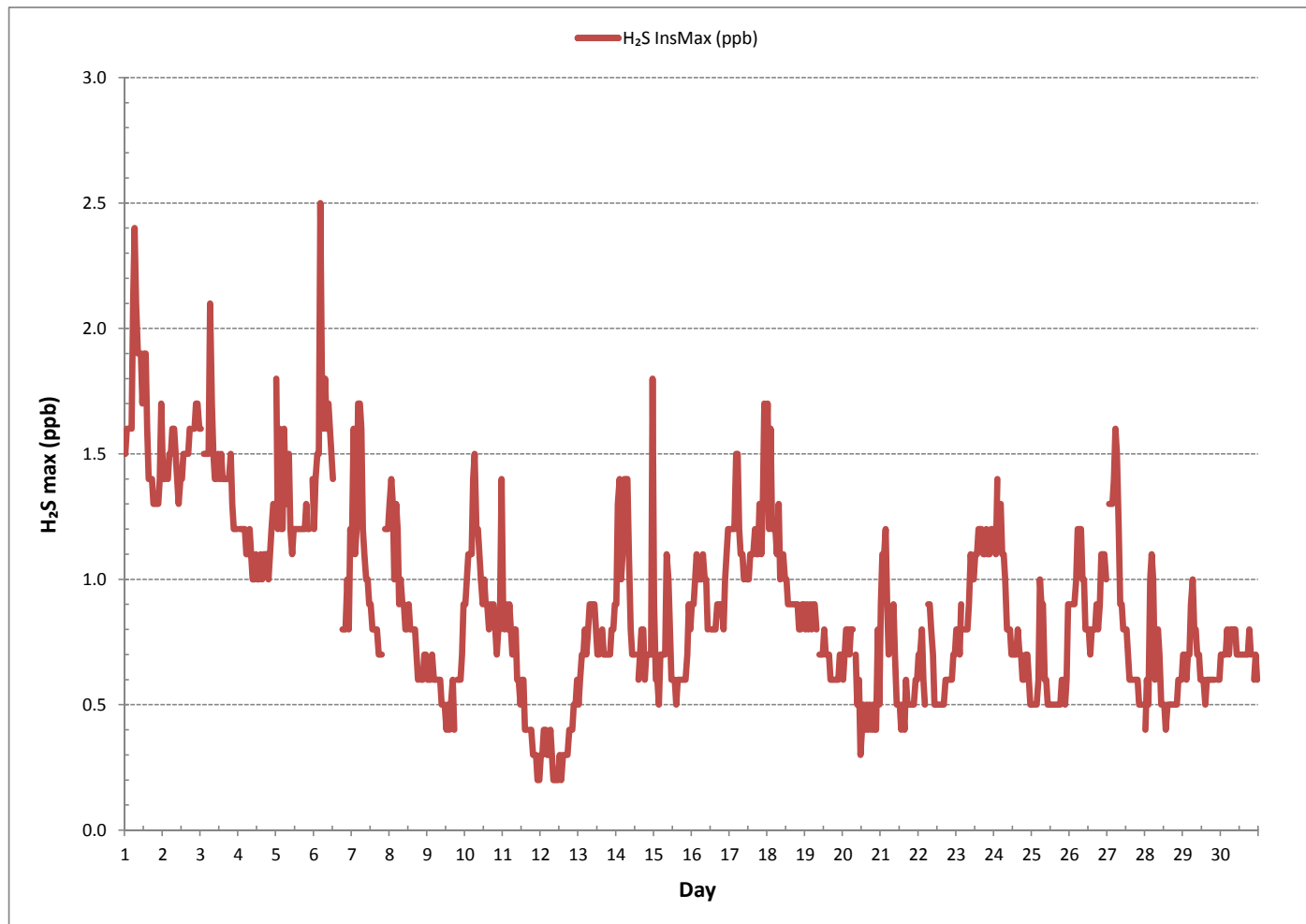
STATUS FLAG CODES

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

MONTHLY SUMMARY

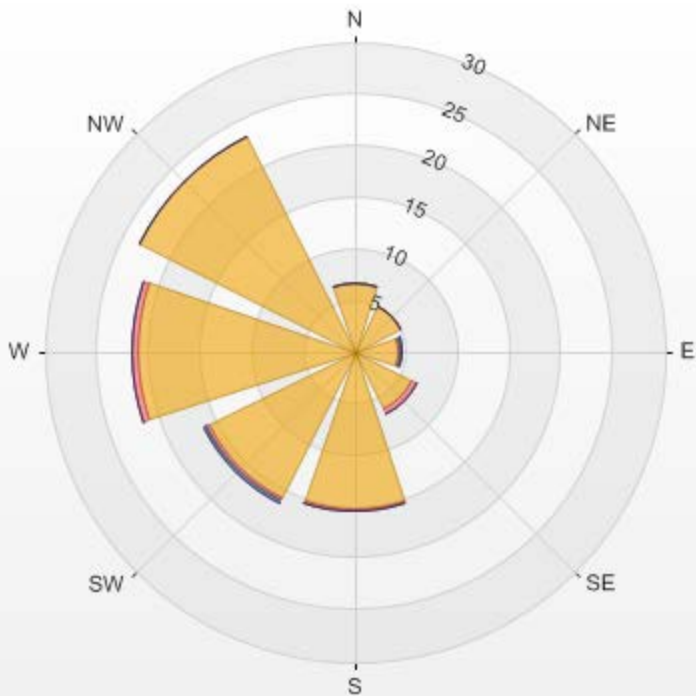
NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	2.5 PPB @ HOUR(S) 4 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.37
OPERATIONAL TIME:	719 HRS

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0-0.233	0.233-0.467	0.467-0.7	>0.7	Total
N	6.73	0	0	0	6.73
NE	4.98	0	0	0	4.98
E	4.25	0.15	0.29	0	4.69
SE	6	0.73	0	0	6.73
S	15.23	0.29	0	0	15.52
SW	15.81	0.29	0.29	0	16.39
W	20.94	0.73	0	0	21.67
NW	23.28	0	0	0	23.28
Summary	97.22	2.19	0.58	0	100



% Icon Classes (ppb)		97	2	1	0
0-0.233	0.233-0.467	0.467-0.7	>0.7		

H2S[ppb] Calibration: LICA ST. LINA Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



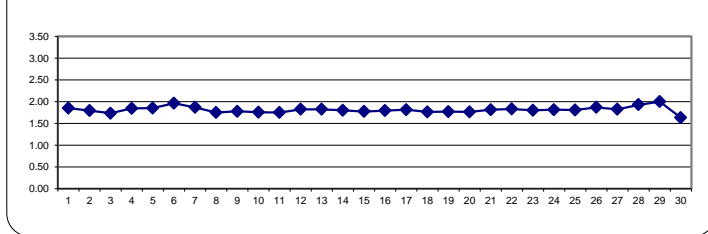
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	1.78	1.78	1.78	S	1.84	1.87	1.86	1.91	1.95	1.95	1.95	1.95	1.82	1.90	1.80	1.77	1.78	1.81	1.89	1.92	1.87	1.82	1.82	1.82	1.77	1.95	1.85	24					
2	1.83	1.75	S	1.74	1.76	1.77	1.76	1.74	1.75	1.82	1.82	1.79	1.80	1.78	1.84	1.83	1.83	1.84	1.79	1.85	1.83	1.78	1.73	1.73	1.73	1.85	1.79	24					
3	1.73	S	1.72	1.73	1.73	1.74	1.75	1.76	1.70	1.78	1.75	1.68	1.64	1.65	1.69	1.69	1.73	1.78	1.78	1.78	1.79	1.79	1.78	1.64	1.79	1.73	24						
4	S	1.75	1.79	1.78	1.80	1.77	1.89	1.83	1.81	1.79	1.78	1.79	1.77	1.78	1.77	1.79	1.79	1.85	2.33	2.30	1.77	1.80	1.81	S	1.75	2.33	1.84	24					
5	1.80	1.75	1.91	1.87	1.87	1.83	1.81	1.89	1.91	1.85	1.84	1.81	1.83	1.82	1.80	1.81	1.84	1.85	1.88	1.89	1.86	1.87	S	1.99	1.75	1.99	1.85	24					
6	1.96	2.00	2.05	2.10	2.07	2.20	2.16	2.08	2.12	2.03	1.96	1.88	1.82	1.75	1.70	1.83	1.81	S	2.06	2.34	1.84	1.85	1.76	1.83	1.70	2.34	1.97	24					
7	1.79	1.90	1.86	1.87	2.08	2.07	2.01	1.96	1.90	1.89	C	C	C	C	1.79	1.81	1.80	1.82	1.88	1.82	S	1.77	1.74	1.74	1.74	2.08	1.87	24					
8	1.78	1.84	1.79	1.74	1.80	1.74	1.75	1.77	1.69	1.74	1.76	1.74	1.76	1.73	1.72	1.71	1.73	1.75	1.74	S	1.72	1.75	1.75	1.76	1.69	1.84	1.75	24					
9	1.73	1.72	1.75	1.78	1.77	1.78	1.81	1.85	1.82	1.81	1.82	1.80	1.79	1.79	1.77	1.81	1.76	1.77	S	1.71	1.71	1.72	1.74	1.82	1.71	1.85	1.78	24					
10	1.88	1.87	1.78	1.72	1.73	1.71	1.73	1.70	1.67	1.64	1.70	1.71	1.74	1.75	1.76	1.77	1.76	S	1.79	1.88	1.88	1.79	1.77	1.70	1.64	1.88	1.76	24					
11	1.74	1.72	1.70	1.75	1.77	1.76	1.76	1.75	1.74	1.73	1.75	1.74	1.73	1.71	1.72	1.74	S	1.75	1.76	1.80	1.78	1.77	1.78	1.87	1.70	1.87	1.75	24					
12	1.88	1.81	1.86	1.85	1.85	1.87	1.80	1.85	1.83	1.77	1.82	1.85	1.85	1.84	1.81	S	1.80	1.78	1.76	1.77	1.80	1.83	1.82	1.83	1.76	1.88	1.82	24					
13	1.81	1.82	1.82	1.84	1.84	1.85	1.85	1.87	1.88	1.92	1.92	1.89	1.86	1.79	S	1.76	1.76	1.76	1.76	1.77	1.77	1.79	1.79	1.81	1.76	1.92	1.82	24					
14	1.81	1.82	1.85	1.84	1.82	1.88	1.85	1.91	1.92	1.84	1.82	1.76	1.71	S	1.67	1.66	1.68	1.74	1.75	1.83	1.82	1.82	1.83	1.83	1.66	1.92	1.80	24					
15	1.78	1.80	1.88	1.76	1.74	1.73	1.74	1.78	2.01	1.92	1.81	1.77	S	1.69	1.67	1.66	1.68	1.71	1.75	1.78	1.78	1.79	1.76	1.81	1.66	2.01	1.77	24					
16	1.80	1.78	1.83	1.77	1.79	1.81	1.84	1.87	1.90	1.89	1.86	S	1.75	1.72	1.68	1.68	1.68	1.69	1.74	1.79	1.83	1.84	1.86	1.82	1.68	1.90	1.79	24					
17	1.85	1.87	1.84	1.92	1.99	2.11	1.84	1.82	1.80	1.75	S	1.71	1.72	1.74	1.73	1.72	1.78	1.85	1.79	1.73	1.72	1.74	1.84	1.84	1.71	2.11	1.81	24					
18	1.82	1.76	1.76	1.79	1.78	1.77	1.74	1.71	1.73	S	1.68	1.69	1.79	1.81	1.80	1.81	1.81	1.79	1.79	1.78	1.75	1.73	1.73	1.68	1.82	1.76	24						
19	1.73	1.72	1.71	1.72	1.72	1.73	1.72	1.73	S	1.75	1.76	1.76	1.77	1.77	1.78	1.77	1.77	1.85	1.85	1.84	1.86	1.74	1.79	1.84	1.71	1.86	1.77	24					
20	1.79	1.82	1.85	1.87	1.80	1.81	1.89	S	1.85	1.76	1.81	1.79	1.69	1.68	1.72	1.72	1.72	1.72	1.71	1.71	1.70	1.71	1.74	1.72	1.68	1.89	1.76	24					
21	1.79	1.83	1.84	1.88	1.84	1.84	S	1.84	1.88	1.85	1.79	1.77	1.77	1.78	1.77	1.78	1.79	1.81	1.81	1.79	1.79	1.81	1.82	1.81	1.77	1.88	1.81	24					
22	1.81	1.82	1.82	1.81	1.82	S	1.86	1.92	1.89	1.86	1.86	1.86	1.90	1.90	1.82	1.81	1.79	1.79	1.78	1.78	1.81	1.81	1.82	1.84	1.78	1.92	1.83	24					
23	1.81	1.77	1.76	1.77	S	1.78	1.81	1.86	1.89	1.91	1.86	1.83	1.80	1.78	1.78	1.75	1.75	1.79	1.78	1.78	1.79	1.83	1.82	1.75	1.91	1.80	24						
24	1.82	1.84	1.88	S	1.87	1.84	1.84	1.83	1.79	1.78	1.78	1.81	1.82	1.81	1.81	1.82	1.83	1.84	1.86	1.77	1.76	1.77	1.78	1.78	1.76	1.88	1.81	24					
25	1.79	1.79	S	1.76	1.79	1.81	1.81	1.83	1.83	1.83	1.83	1.82	1.82	1.80	1.80	1.82	1.82	1.84	1.82	1.79	1.77	1.80	1.80	1.81	1.76	1.84	1.81	24					
26	1.83	S	1.89	1.92	1.95	1.99	1.97	1.98	1.95	1.93	1.86	1.85	1.83	1.81	1.79	1.80	1.80	1.80	1.80	1.83	1.83	1.84	1.88	1.82	1.80	1.79	1.99	1.87	24				
27	S	1.84	1.89	1.93	1.93	1.93	1.88	1.79	1.78	1.79	1.80	1.80	1.78	1.78	1.80	1.80	1.82	1.85	1.80	1.78	1.79	1.78	1.78	S	1.78	1.93	1.82	24					
28	1.79	1.81	1.80	1.84	1.91	1.92	1.89	1.96	1.95	1.91	1.90	1.89	1.85	1.84	1.83	1.80	1.81	1.84	2.20	2.26	2.19	2.17	S	2.02	1.79	2.26	1.93	24					
29	2.06	2.16	2.14	2.24	2.21	2.22	2.22	2.20	2.21	2.01	1.95	1.93	1.90	1.85	1.84	1.83	1.83	1.86	1.85	1.87	S	1.88	1.92	1.83	2.24	2.00	24						
30	1.97	1.71	1.70	1.78	1.71	1.63	1.63	1.73	1.78	1.75	1.66	1.64	1.63	1.58	1.54	1.50	1.50	1.51	1.53	1.53	S	1.51	1.53	1.54	1.50	1.97	1.63	24					
HOURLY MAX	2.06	2.16	2.14	2.24	2.21	2.22	2.22	2.20	2.21	2.03	1.96	1.95	1.90	1.90	1.84	1.83	1.84	1.85	2.33	2.34	2.19	2.17	1.88	2.02									
HOURLY AVG	1.82	1.82	1.83	1.83	1.85	1.85	1.84	1.85	1.86	1.84	1.82	1.80	1.78	1.77	1.76	1.76	1.77	1.78	1.83	1.84	1.81	1.80	1.78	1.81									

STATUS FLAG CODES

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

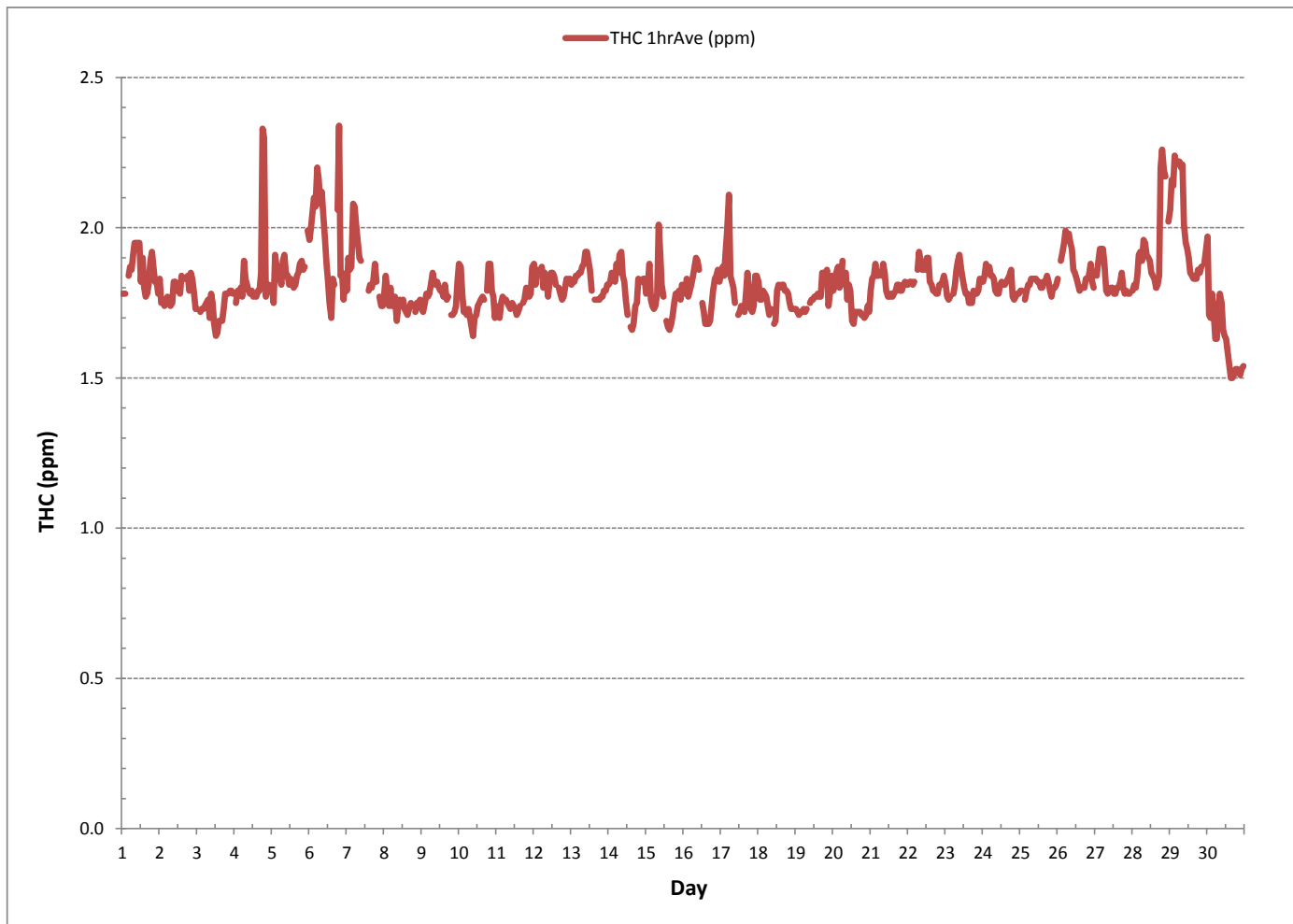
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684			
MINIMUM 1-HR AVERAGE:	1.50	PPM @ HOUR(S)	15 , 16	ON DAY(S) 30 , 30
MAXIMUM 1-HR AVERAGE:	2.34	PPM @ HOUR(S)	19	ON DAY(S) 6
MAXIMUM 24-HR AVERAGE:	2.00	PPM		ON DAY(S) 29
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	0.10		MONTHLY AVERAGE:	1.81
				PPM

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.14	2.14	2.14	S	2.15	2.15	2.14	2.21	2.21	2.22	2.61	2.09	2.21	2.11	2.04	2.26	2.24	2.48	3.03	2.75	2.03	2.02	2.08	2.02	3.03	2.25	24		
2	2.05	2.00	S	1.94	1.95	1.96	1.95	1.95	2.17	2.01	2.01	1.98	1.98	2.01	2.02	2.04	2.01	2.01	P	2.24	2.26	2.15	2.03	2.11	1.94	2.26	2.04	23	
3	2.00	S	1.91	2.01	1.92	1.93	1.95	1.98	1.95	2.02	2.01	1.93	1.88	1.94	2.02	2.09	2.05	2.11	2.23	2.18	2.27	2.24	2.27	2.33	1.88	2.33	2.05	24	
4	S	2.32	2.30	2.45	2.48	2.18	2.56	2.54	2.29	2.35	2.20	2.41	2.14	2.26	2.27	2.26	2.29	2.65	8.27	7.21	2.72	2.50	2.57	S	2.14	8.27	2.87	24	
5	2.15	2.06	2.47	2.67	2.38	2.17	2.12	2.24	2.26	2.14	2.14	2.11	2.12	2.11	2.11	2.11	2.11	2.17	2.18	2.18	2.15	2.17	S	2.32	2.06	2.67	2.20	24	
6	2.26	2.29	2.39	2.41	2.53	2.54	2.57	2.39	2.42	2.39	2.27	2.20	2.14	2.09	2.03	2.48	2.40	S	S	11.04	2.77	2.98	2.03	2.14	2.03	11.04	2.76	24	
7	2.23	2.26	2.18	2.35	2.41	2.30	2.30	2.25	2.14	2.14	C	C	C	C	2.35	2.08	2.23	2.35	2.41	2.54	S	1.97	1.93	1.95	1.93	2.54	2.23	24	
8	2.06	2.26	2.38	1.97	2.12	2.09	2.48	2.04	1.97	2.11	2.23	2.20	2.41	2.21	2.20	2.04	2.17	2.15	2.23	S	2.01	2.26	2.27	2.26	1.97	2.48	2.18	24	
9	2.27	2.20	2.23	2.33	2.41	2.29	2.50	2.44	2.67	2.41	2.26	2.26	2.26	2.27	2.23	2.35	2.33	2.67	S	2.04	2.02	2.04	2.05	2.14	2.02	2.67	2.29	24	
10	2.20	2.18	2.11	1.99	2.01	2.01	1.99	1.98	1.92	1.91	1.95	2.04	2.12	2.12	2.04	2.17	2.03	S	2.35	2.69	2.82	2.48	2.32	2.06	1.91	2.82	2.15	24	
11	2.35	2.27	2.04	2.26	2.20	2.26	2.15	2.20	2.32	2.17	2.20	2.14	2.14	2.06	2.08	2.11	S	2.11	2.15	2.38	2.26	2.26	2.27	2.83	2.04	2.83	2.23	24	
12	2.63	2.54	2.53	2.51	2.77	2.88	2.50	2.57	2.98	2.33	2.36	2.36	2.51	2.38	2.35	S	2.33	2.41	2.20	2.18	2.21	2.25	2.23	2.21	2.18	2.98	2.44	24	
13	2.20	2.20	2.20	2.20	2.20	2.21	2.20	2.23	2.26	2.27	2.27	2.25	2.18	2.14	S	2.08	2.06	2.08	2.07	2.20	2.08	2.09	2.11	2.11	2.06	2.27	2.17	24	
14	2.11	2.11	2.17	2.14	2.14	2.21	2.15	2.23	2.25	2.14	2.11	2.08	2.00	S	2.05	2.11	2.14	2.41	2.75	2.44	2.51	2.41	2.70	2.29	2.00	2.75	2.25	24	
15	2.14	2.29	2.54	2.17	2.09	2.08	2.11	2.22	2.45	2.39	2.18	2.15	S	2.04	2.03	2.01	2.04	2.06	2.11	2.14	2.12	2.12	2.14	2.15	2.01	2.54	2.16	24	
16	2.15	2.14	2.81	2.10	2.11	2.12	2.15	2.22	2.23	2.20	2.18	S	2.06	2.01	1.95	1.95	1.95	1.95	2.01	2.06	2.08	2.10	2.11	2.08	1.95	2.81	2.12	24	
17	4.22	2.69	2.10	2.56	2.33	2.64	2.20	2.56	2.18	2.05	S	2.03	2.56	2.14	2.04	2.04	2.36	2.66	2.38	1.94	1.91	1.95	2.04	2.62	1.91	4.22	2.36	24	
18	2.25	2.12	2.01	2.26	2.08	1.94	1.92	1.89	1.89	S	1.86	2.02	2.08	2.14	2.14	2.18	2.11	2.08	2.17	2.20	2.05	1.98	2.08	2.15	1.86	2.26	2.07	24	
19	2.01	2.01	2.00	2.04	2.05	2.04	2.04	2.08	S	2.20	2.32	2.20	2.32	2.23	2.23	2.26	2.35	2.57	2.60	2.50	2.69	2.20	2.36	2.58	2.00	2.69	2.26	24	
20	2.54	2.72	2.69	2.83	2.54	2.54	2.89	S	2.77	2.39	2.27	2.26	2.26	2.14	2.26	2.29	2.11	2.11	2.08	2.08	2.08	2.89	2.14	2.09	2.08	2.89	2.39	24	
21	2.18	2.18	2.26	2.26	2.20	2.20	S	2.21	2.23	2.21	2.14	2.11	2.11	2.12	2.12	2.12	2.14	2.15	2.42	2.14	2.12	2.15	2.15	2.14	2.11	2.42	2.18	24	
22	2.14	2.15	2.14	2.14	2.15	S	2.20	2.24	2.23	2.18	2.17	2.17	2.32	2.30	2.14	2.11	2.09	2.08	2.08	2.06	2.09	2.08	2.08	2.11	2.06	2.32	2.15	24	
23	2.08	2.04	2.01	2.04	S	2.03	2.11	2.12	2.14	2.14	2.11	2.08	2.05	2.01	2.01	1.98	1.98	1.98	2.02	1.99	1.99	2.01	2.04	2.04	1.98	2.14	2.04	24	
24	2.03	2.05	2.11	S	2.09	2.06	2.08	2.06	2.04	2.08	2.12	2.11	2.15	2.14	2.27	2.15	2.23	2.38	2.36	2.26	2.04	2.08	2.09	2.08	2.03	2.38	2.13	24	
25	2.09	2.11	S	2.08	2.08	2.11	2.11	2.14	2.12	2.21	2.23	2.15	2.29	2.26	2.23	2.23	2.26	2.32	2.14	2.14	2.08	2.11	2.11	2.11	2.08	2.32	2.16	24	
26	2.14	S	2.18	2.23	2.23	2.26	2.25	2.25	2.23	2.18	2.12	2.08	2.06	2.04	2.01	2.01	1.98	2.01	2.02	2.03	2.03	2.04	2.00	1.95	1.95	2.26	2.10	24	
27	S	2.02	2.08	2.11	2.11	2.14	2.23	2.11	2.17	2.08	2.21	2.20	2.23	2.14	2.24	2.23	2.23	2.60	2.36	2.54	2.36	2.27	2.20	S	2.02	2.60	2.22	24	
28	2.14	2.14	2.14	2.21	2.26	2.26	2.26	3.41	2.42	2.29	2.26	2.24	2.23	2.20	2.20	2.19	2.23	2.85	2.82	2.80	2.54	S	2.42	2.14	3.41	2.38	24		
29	2.47	2.57	2.54	2.63	2.73	2.60	2.60	2.56	2.57	2.48	2.32	2.29	2.26	2.18	2.15	2.14	2.14	2.14	2.18	2.17	2.15	S	2.17	2.22	2.14	2.73	2.36	24	
30	2.29	2.29	2.30	2.38	2.32	2.20	2.20	2.32	2.33	2.29	2.26	2.18	2.17	2.14	2.09	2.02	2.04	2.05	2.07	2.08	S	2.04	2.04	2.08	2.02	2.38	2.18	24	
HOURLY MAX	4.22	2.72	2.81	2.83	2.77	2.88	2.89	3.41	2.98	2.48	2.36	2.61	2.56	2.38	2.35	2.48	2.40	2.67	8.27	11.04	2.82	2.98	2.70	2.83					
HOURLY AVG	2.27	2.23	2.25	2.26	2.24	2.22	2.24	2.26	2.27	2.21	2.18	2.17	2.18	2.14	2.14	2.13	2.16	2.24	2.49	2.74	2.27	2.22	2.16	2.20					

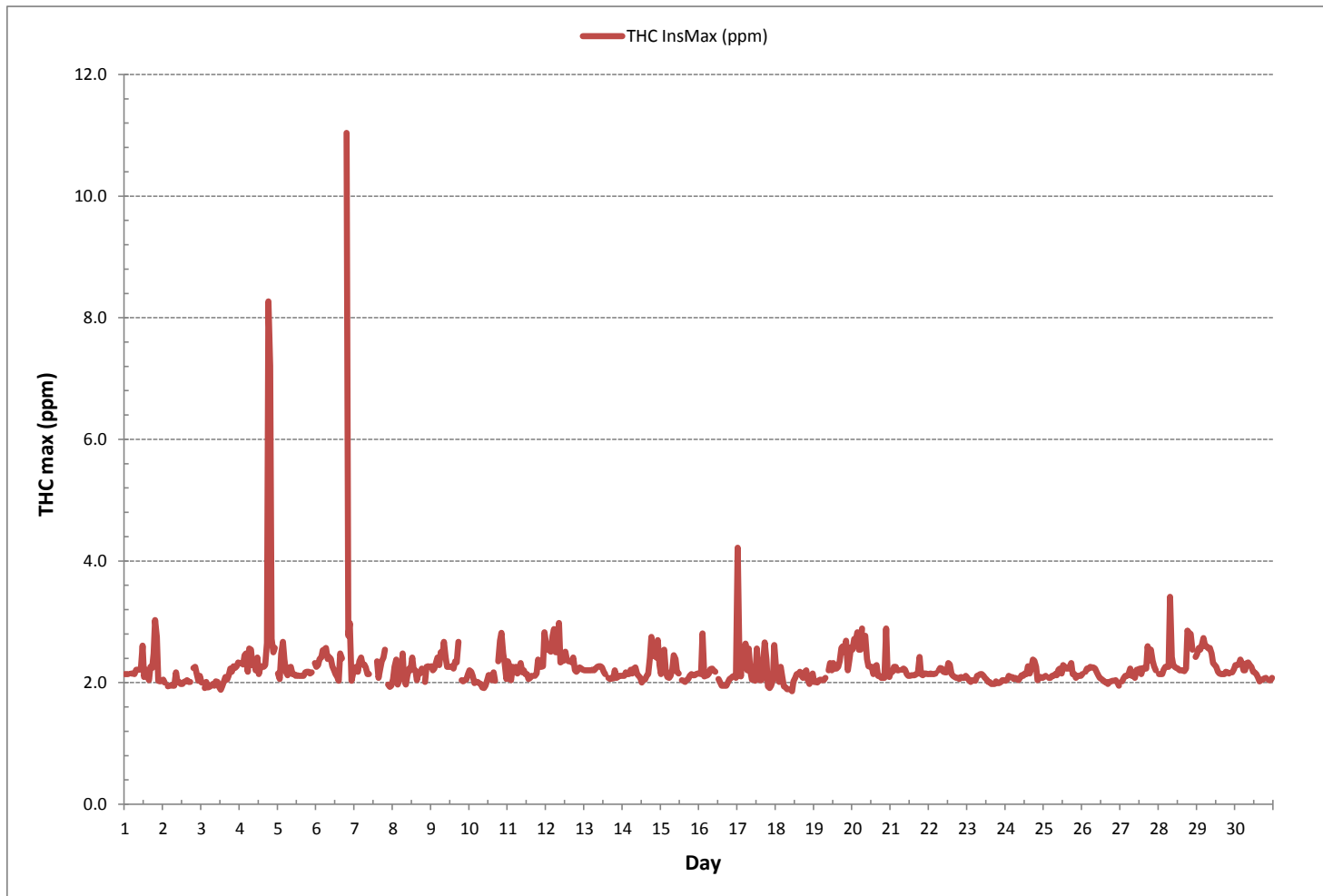
STATUS FLAG CODES

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

MONTHLY SUMMARY

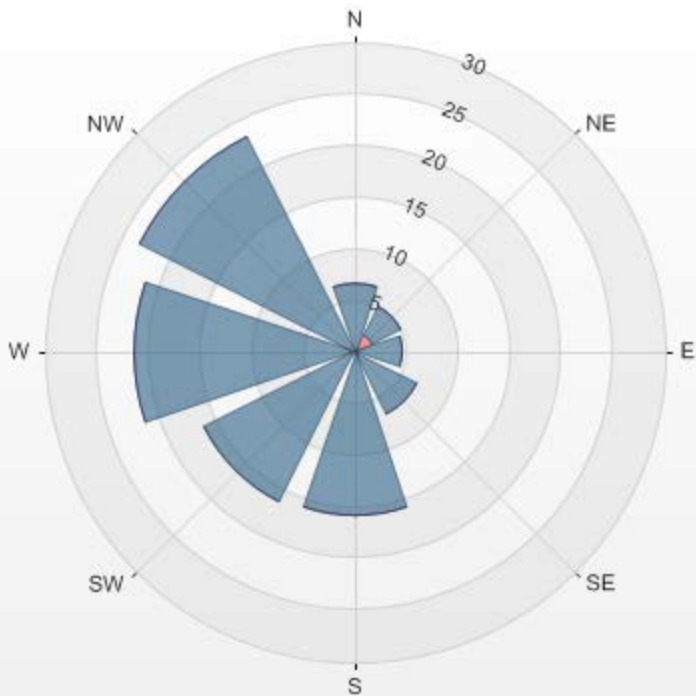
NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	11.04 PPM @ HOUR(S) 19 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.50
OPERATIONAL TIME:	719 HRS

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

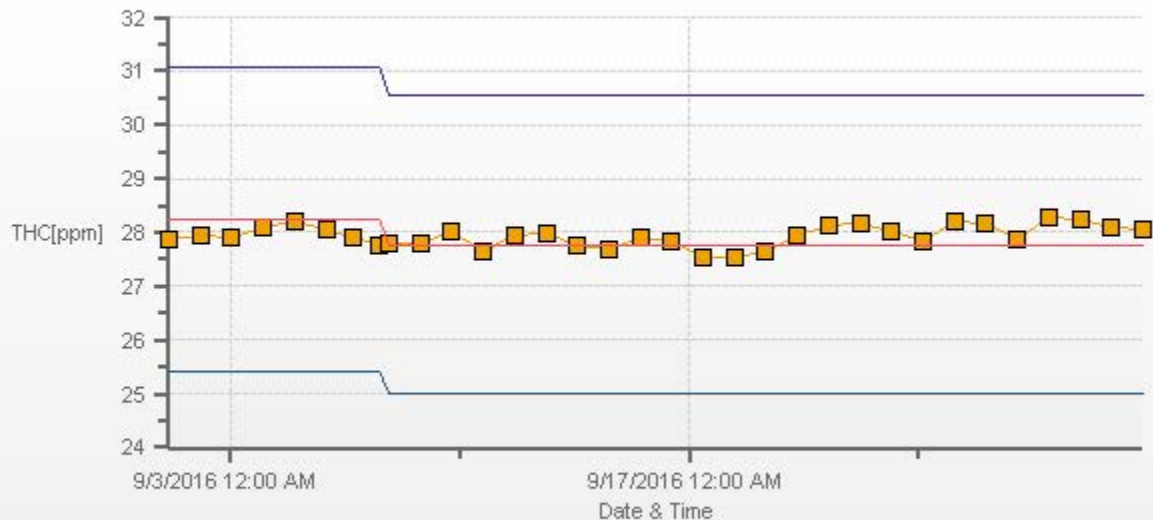


Wind: LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

Direction	0.0-0.8	0.8-1.7	1.7-2.5	>2.5	Total
N	0	0	6.74	0	6.74
NE	0	1.91	3.08	0	4.99
E	0	0.29	4.4	0	4.69
SE	0	0	6.74	0	6.74
S	0	0	15.84	0	15.84
SW	0	0.44	15.84	0	16.28
W	0	0.44	20.97	0	21.41
NW	0	0	23.31	0	23.31
Summary	0	3.08	96.92	0	100



THC[ppm] Calibration: LICA ST. LINA Monthly: 09/2016 Type: Span



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

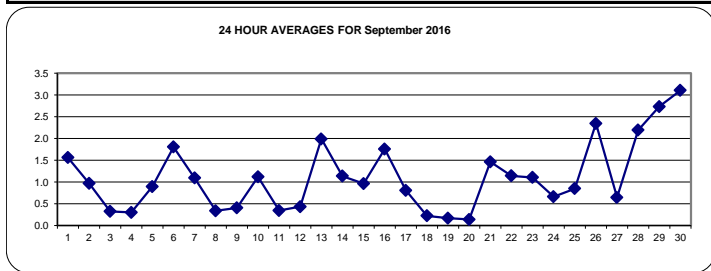
OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

MST	HOUR START																								DAILY MIN.	DAILY MAX.	24-HOUR AVG.	RDGS.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
	HOUR END																											
	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.1	2.1	2.0	S	1.6	1.6	1.6	1.9	2.5	2.7	2.5	2.0	1.5	5.0	1.3	0.4	0.5	0.4	0.6	1.1	0.3	0.6	1.0	0.6	0.3	5.0	1.6	24
2	0.5	0.4	S	0.7	0.7	0.9	0.9	0.7	0.4	0.4	0.6	0.4	0.4	1.8	2.1	2.2	2.3	2.3	1.3	1.1	0.7	0.5	0.6	0.4	2.3	1.0	24	
3	0.4	S	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.3	0.5	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.6	0.3	24	
4	S	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.1	0.3	0.2	0.3	0.2	0.0	0.3	0.3	0.4	0.8	0.5	0.6	0.2	0.6	0.4	S	0.0	0.8	0.3	24
5	0.8	0.4	0.5	0.4	0.5	0.8	0.6	1.0	1.4	1.1	0.9	0.5	0.9	0.6	0.5	0.3	0.5	0.6	1.6	1.7	1.3	1.5	S	2.2	0.3	2.2	0.9	24
6	2.2	2.4	2.5	2.6	2.5	2.1	2.3	2.3	2.8	2.4	2.2	1.5	1.1	C	C	C	C	C	C	C	1.0	0.2	0.2	0.4	0.2	2.8	1.8	24
7	0.4	0.8	0.8	1.1	0.8	1.3	2.4	1.2	2.1	1.6	3.3	3.3	1.5	0.5	0.3	0.6	0.0	0.2	0.4	0.4	S	0.9	0.7	0.5	0.0	3.3	1.1	24
8	1.0	0.8	0.4	0.3	0.7	0.7	1.1	1.0	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.4	0.2	0.1	0.2	0.0	1.1	0.3	24
9	0.3	0.2	0.3	0.2	0.2	0.2	1.8	0.4	0.5	0.2	0.3	0.0	0.2	0.0	0.1	0.3	0.0	0.3	S	0.4	0.4	0.8	0.7	1.5	0.0	1.8	0.4	24
10	1.5	1.5	1.2	1.1	1.1	1.5	1.9	3.7	2.6	2.7	1.4	0.4	0.1	0.2	0.2	0.3	0.6	S	0.7	0.6	1.1	0.8	0.6	0.0	0.0	3.7	1.1	24
11	0.6	0.2	0.2	0.0	0.1	0.2	0.3	0.2	0.3	0.3	0.6	0.3	0.4	0.7	0.4	0.6	S	0.7	0.7	0.6	0.2	0.3	0.0	0.0	0.0	0.7	0.3	24
12	0.1	0.1	0.0	0.1	0.3	0.2	0.1	0.3	0.2	0.0	0.1	0.3	0.1	0.0	0.2	S	0.4	0.5	2.8	0.3	0.4	1.0	1.2	1.2	0.0	2.8	0.4	24
13	1.3	1.4	1.2	1.1	1.2	2.0	2.0	2.5	3.2	2.9	3.0	1.9	1.7	2.3	S	4.3	2.6	2.2	2.2	1.5	1.1	0.9	1.1	2.2	0.9	4.3	2.0	24
14	1.6	1.5	1.8	2.8	2.1	2.0	2.7	2.9	2.0	0.9	0.7	0.4	0.4	S	0.6	0.3	0.1	0.6	0.1	1.2	0.4	0.4	0.2	0.4	0.1	2.9	1.1	24
15	0.2	0.3	0.4	0.5	0.4	0.5	0.3	0.3	1.1	1.7	0.9	0.8	S	0.3	0.5	1.0	1.7	1.1	1.8	1.0	1.7	2.1	1.9	1.6	0.2	2.1	1.0	24
16	1.7	1.8	2.2	2.1	2.3	2.1	1.8	2.3	3.0	3.3	1.7	S	0.8	0.8	0.7	0.7	0.6	1.2	1.7	1.3	1.7	2.4	2.2	2.0	0.6	3.3	1.8	24
17	1.7	1.6	1.4	1.5	1.6	5.5	1.3	0.3	0.3	0.2	S	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.6	0.1	0.2	0.4	0.8	0.0	5.5	0.8	24
18	0.9	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.3	S	0.4	0.1	0.3	0.1	0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.9	0.2	24
19	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	S	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.4	0.1	0.4	0.0	0.1	0.1	0.0	0.0	0.4	0.2	24
20	0.1	0.1	0.3	0.2	0.3	0.3	0.4	S	0.5	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24
21	0.2	0.3	0.5	0.5	0.5	0.7	S	5.3	2.2	2.1	1.3	0.8	1.0	0.7	0.8	0.7	1.4	1.7	1.1	1.9	2.4	2.7	2.6	2.2	0.2	5.3	1.5	24
22	2.3	2.1	2.0	1.4	1.0	S	1.7	2.2	1.9	1.3	0.8	0.6	0.6	0.7	0.4	0.4	0.3	0.6	0.6	1.0	1.0	1.0	1.2	1.2	0.3	2.3	1.1	24
23	1.0	0.6	0.4	0.4	S	0.7	1.0	1.7	1.9	1.8	1.9	1.8	1.5	1.0	1.0	0.6	0.7	0.9	1.0	0.9	1.0	1.1	1.3	1.2	0.4	1.9	1.1	24
24	1.0	1.1	1.1	S	1.1	1.2	1.2	1.6	1.3	1.2	0.8	0.4	0.3	0.0	0.0	0.1	0.1	0.2	0.2	0.7	0.4	0.4	0.4	0.4	0.0	1.6	0.7	24
25	0.4	0.2	S	0.6	0.3	0.7	0.7	0.8	1.0	0.7	0.7	1.1	0.1	0.6	0.5	0.8	0.5	0.4	0.8	2.8	1.3	1.0	1.7	1.8	0.1	2.8	0.8	24
26	2.1	S	3.5	3.6	3.8	4.2	4.9	6.1	4.8	3.2	2.1	2.2	1.5	0.8	0.5	0.5	0.5	0.8	0.9	1.3	1.5	1.7	1.7	1.8	0.5	6.1	2.3	24
27	S	2.0	1.8	1.9	1.9	2.0	2.1	1.4	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.2	S	0.0	2.1	0.6	24
28	0.4	0.3	0.3	0.5	1.1	1.9	2.1	2.5	3.0	2.8	2.0	3.5	1.0	1.5	0.7	0.6	0.7	1.4	5.6	6.3	4.5	4.3	S	3.5	0.3	6.3	2.2	24
29	3.9	5.0	4.3	4.8	4.4	3.4	3.4	3.9	4.2	2.8	2.0	1.7	1.3	0.8	0.8	0.5	0.7	0.6	1.6	2.3	3.3	S	3.4	3.8	0.5	5.0	2.7	24
30	4.0	4.8	4.6	6.2	5.0	3.5	4.1	6.0	6.3	5.5	3.9	2.4	2.2	1.5	1.3	1.3	1.4	1.4	1.3	1.3	S	1.3	1.0	1.2	1.0	6.3	3.1	24
HOURLY MAX	4.0	5.0	4.6	6.2	5.0	5.5	4.9	6.1	6.3	5.5	3.9	3.5	2.2	5.0	1.8	4.3	2.6	2.3	5.6	6.3	4.5	4.3	3.4	3.8				
HOURLY AVG	1.2	1.2	1.2	1.3	1.3	1.4	1.5	1.9	1.8	1.5	1.2	0.9	0.7	0.7	0.5	0.6	0.6	0.7	1.1	1.1	1.0	0.9	0.9	1.1				

STATUS FLAG CODES

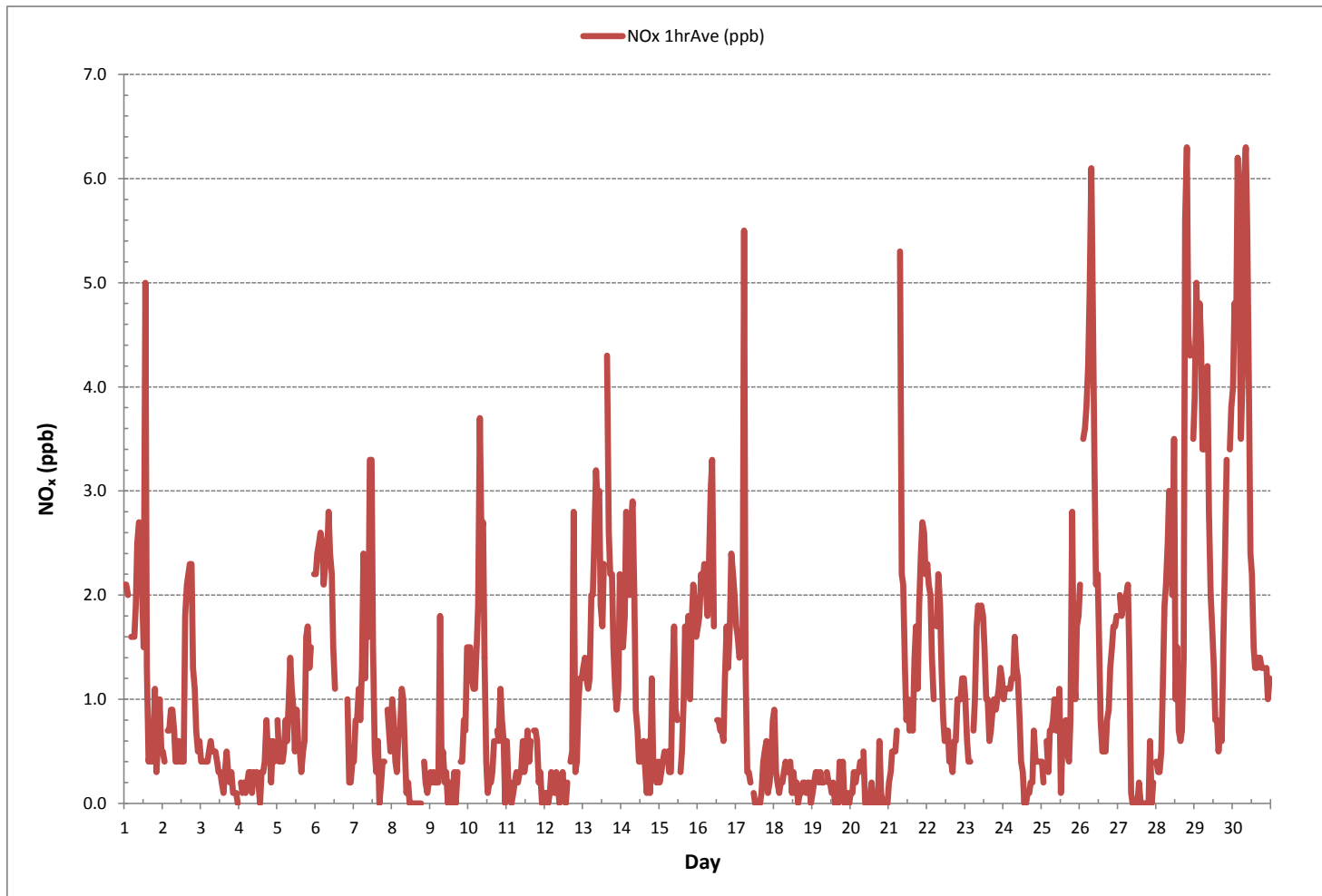
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	626				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	6.3	PPB @ HOUR(S)	19 , 8	ON DAY(S)	28 , 30
MAXIMUM 24-HR AVERAGE:	3.1	PPB		ON DAY(S)	30
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1.17		MONTHLY AVERAGE:	1.1	PPB

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		2.6	2.4	2.4	S	2.1	2.2	2.3	3.0	3.0	3.2	3.5	3.1	3.3	8.3	4.0	1.0	1.1	0.9	1.8	3.1	0.9	1.2	2.0	1.0	0.9	8.3	2.5	24	
2		1.0	0.9	S	1.2	1.1	1.4	1.2	1.2	0.8	0.8	0.9	1.2	1.5	1.7	2.4	2.6	2.9	2.6	P	1.8	1.9	1.3	0.7	0.9	0.7	2.9	1.5	23	
3		0.7	S	0.9	0.7	0.6	0.9	1.2	0.9	1.1	0.9	0.7	0.7	0.7	0.6	0.7	0.9	1.2	0.8	2.2	1.2	0.9	0.7	0.7	0.6	0.6	2.2	0.9	24	
4		S	0.9	0.6	0.7	0.7	0.7	0.7	1.8	1.9	1.6	0.8	0.8	0.7	0.6	0.7	1.4	1.7	4.8	2.6	2.2	0.4	2.8	0.7	S	0.4	4.8	1.4	24	
5		1.4	1.5	1.1	0.6	0.8	1.1	1.3	1.5	2.1	1.8	2.1	1.7	3.9	1.0	1.1	0.7	0.8	1.5	2.1	2.1	2.1	2.3	S	2.7	0.6	3.9	1.6	24	
6		2.8	3.0	3.0	2.9	3.8	2.7	2.8	2.7	3.0	3.0	2.4	2.1	1.3	C	C	C	C	C	C	C	C	1.9	0.3	0.2	0.6	0.2	3.8	2.3	24
7		0.4	0.9	0.9	1.1	0.6	3.4	6.5	2.9	3.6	2.0	4.4	3.6	2.0	0.4	0.3	3.6	0.0	0.1	1.7	0.6	S	0.6	0.7	0.4	0.0	6.5	1.8	24	
8		0.7	0.7	0.2	0.2	0.7	1.3	1.2	0.7	0.5	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.0	S	0.4	0.4	0.1	0.2	0.0	1.3	0.4	24	
9		0.4	0.1	0.2	0.2	0.1	0.2	36.6	0.7	0.7	0.2	1.3	0.0	0.2	0.2	0.2	0.5	0.0	1.2	S	0.3	0.3	0.7	0.6	1.3	0.0	36.6	2.0	24	
10		1.2	1.2	1.0	0.7	0.7	1.6	1.8	38.3	4.2	5.9	1.7	0.4	0.7	0.7	0.1	5.7	12.5	S	2.1	3.9	4.6	2.0	2.4	0.0	0.0	38.3	4.1	24	
11		3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.1	0.0	0.3	0.3	0.5	0.4	S	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.3	24	
12		0.0	0.0	0.0	0.0	1.3	1.5	0.5	2.1	1.5	0.0	0.5	2.1	0.9	0.1	9.5	S	2.0	2.0	42.1	0.5	0.6	1.4	1.5	1.7	0.0	42.1	3.1	24	
13		1.4	1.5	1.5	1.2	1.4	4.6	2.4	3.0	6.4	3.6	5.7	2.7	2.2	8.3	S	6.8	3.0	3.3	3.7	2.1	3.9	1.3	1.3	8.9	1.2	8.9	3.5	24	
14		1.7	1.4	2.2	2.8	2.3	2.3	25.2	32.0	3.2	0.9	0.7	0.4	0.4	S	1.6	1.0	0.3	2.7	0.0	6.6	0.8	0.6	0.1	0.6	0.0	32.0	3.9	24	
15		0.1	0.3	0.4	0.3	0.3	0.4	0.2	0.7	1.4	4.1	1.5	1.6	S	0.2	1.1	2.0	14.3	2.0	5.2	1.2	1.7	2.5	2.2	1.5	0.1	14.3	2.0	24	
16		1.5	1.7	2.0	2.0	3.7	4.1	2.5	3.0	4.5	4.1	2.5	S	1.1	0.8	0.7	1.0	1.0	2.0	7.1	1.4	1.9	2.5	2.2	2.2	0.7	7.1	2.4	24	
17		1.7	1.7	1.4	1.9	1.7	8.9	3.0	0.4	0.6	0.6	S	0.4	0.0	0.1	0.1	0.0	0.3	1.5	2.6	5.1	0.0	0.2	0.4	1.2	0.0	8.9	1.5	24	
18		0.9	0.3	0.3	0.0	0.1	0.0	0.3	0.2	0.0	S	0.7	0.2	0.4	0.3	0.0	0.0	0.3	0.3	0.0	0.0	0.3	0.1	0.6	0.1	0.0	0.9	0.2	24	
19		0.6	0.0	0.1	0.1	0.0	0.3	0.1	0.9	S	0.7	0.6	1.2	0.1	0.6	0.1	0.0	0.0	3.0	1.3	2.2	0.6	0.0	0.2	0.0	0.0	3.0	0.6	24	
20		0.0	0.3	0.3	0.3	0.3	0.6	0.8	S	1.4	0.0	0.0	0.1	0.2	1.0	0.8	1.3	0.0	0.0	2.8	0.2	0.0	0.0	0.0	0.0	0.0	2.8	0.5	24	
21		0.1	0.4	0.5	0.6	0.4	1.0	S	10.6	4.2	2.7	1.3	0.9	1.6	1.0	0.6	1.1	1.6	1.8	1.1	3.7	2.4	2.6	2.4	2.3	0.1	10.6	2.0	24	
22		2.1	1.9	1.9	1.5	1.0	S	1.8	2.3	2.2	1.2	0.7	0.2	1.0	1.0	0.2	0.2	0.0	0.3	0.5	0.8	0.7	0.8	1.0	1.0	0.0	2.3	1.1	24	
23		0.7	0.4	0.2	0.2	S	0.4	0.9	1.5	1.6	1.5	1.8	1.5	1.5	0.9	0.8	0.6	0.7	0.6	1.0	0.7	0.7	0.7	1.0	1.0	0.2	1.8	0.9	24	
24		0.7	0.9	0.9	S	0.9	1.2	1.2	18.7	3.1	2.4	2.5	1.3	0.7	0.2	0.2	0.1	0.0	0.4	0.8	4.4	0.7	0.2	0.2	0.2	0.0	18.7	1.8	24	
25		0.6	0.0	S	0.4	0.0	1.6	1.8	15.8	17.1	1.5	1.5	31.9	0.0	16.1	9.4	26.7	0.7	0.4	0.7	45.8	1.7	0.6	1.6	1.5	0.0	45.8	7.7	24	
26		2.0	S	3.0	3.2	4.1	4.5	5.1	7.8	5.2	3.1	3.9	1.8	1.5	0.5	0.2	0.2	0.2	0.4	0.6	1.2	1.3	1.5	1.6	1.5	0.2	7.8	2.4	24	
27		S	1.8	1.6	1.7	1.7	2.4	2.4	17.9	0.2	0.5	0.3	0.2	0.1	0.5	0.1	0.9	0.4	0.5	0.5	0.2	2.9	0.2	1.2	S	0.1	17.9	1.7	24	
28		0.5	0.5	0.5	0.6	1.3	4.0	2.4	3.3	5.1	4.1	2.1	8.4	2.0	32.1	2.9	1.5	0.7	1.5	9.3	9.0	4.5	4.5	S	3.9	0.5	32.1	4.6	24	
29		4.6	5.4	4.8	4.9	4.7	3.8	3.3	3.8	4.3	3.2	2.2	1.8	1.6	0.7	1.0	0.6	0.5	0.6	2.1	3.2	3.2	S	3.2	4.5	0.5	5.4	3.0	24	
30		4.7	4.8	4.7	6.9	6.5	3.3	4.6	6.7	6.2	5.4	4.6	2.2	1.9	1.4	1.1	1.1	1.1	1.1	1.0	1.2	S	1.1	0.9	1.1	0.9	6.9	3.2	24	
HOURLY MAX		4.7	5.4	4.8	6.9	6.5	8.9	36.6	38.3	17.1	5.9	5.7	31.9	3.9	32.1	9.5	26.7	14.3	4.8	42.1	45.8	4.6	4.5	3.2	8.9					
HOURLY AVG		1.4	1.2	1.3	1.3	1.5	2.1	3.9	6.4	3.1	2.0	1.8	2.5	1.1	2.8	1.4	2.2	1.7	1.3	3.5	3.7	1.5	1.1	1.1	1.5					

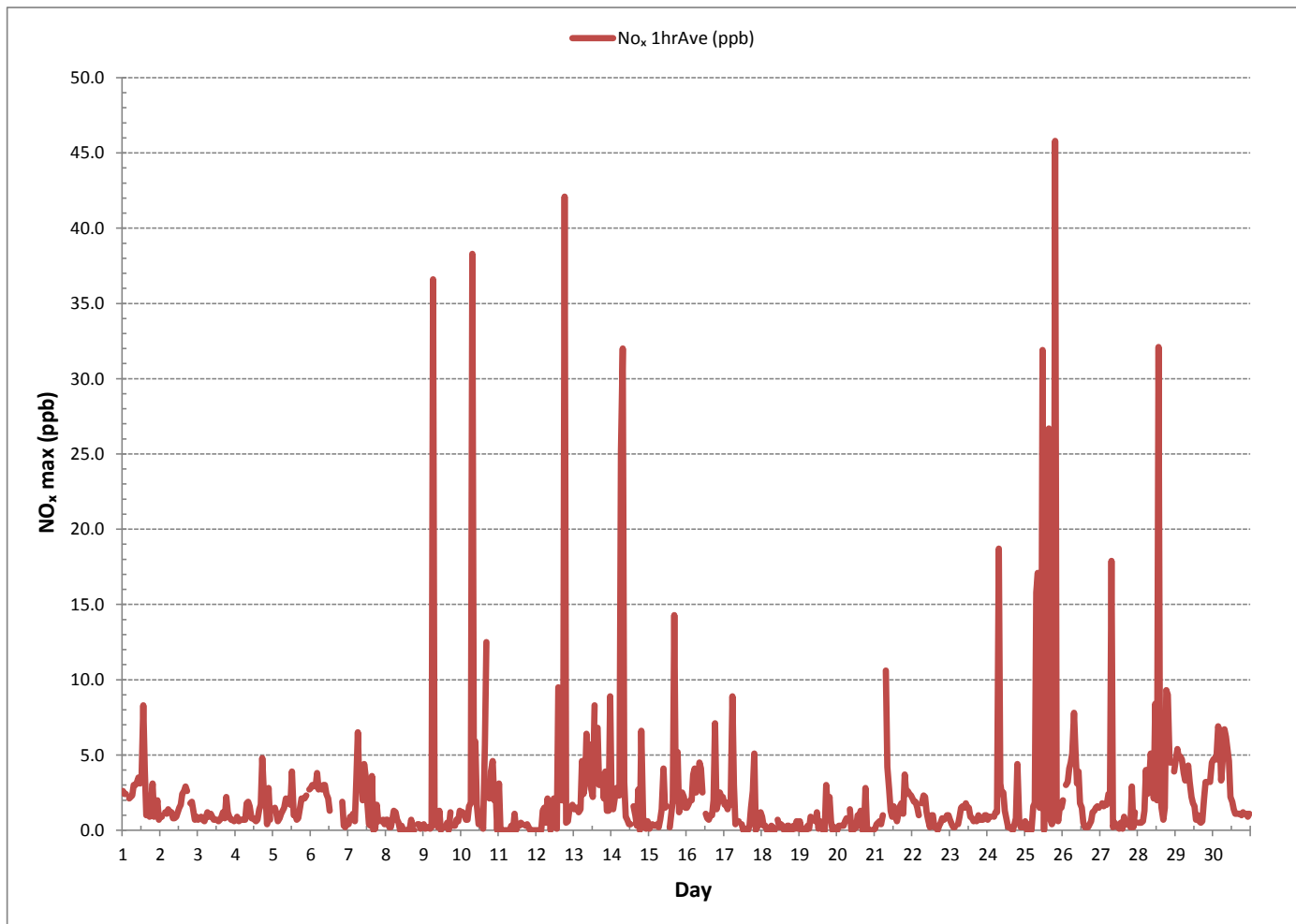
STATUS FLAG CODES

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

MONTHLY SUMMARY

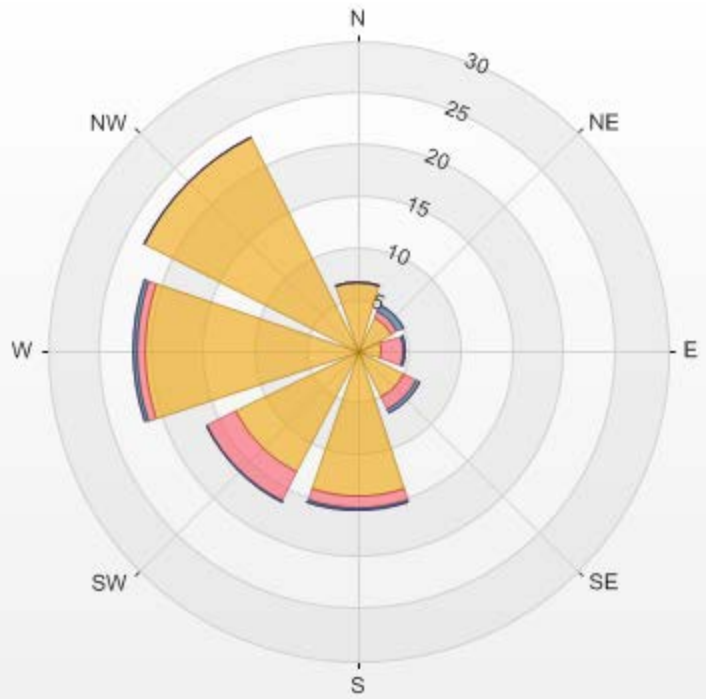
NUMBER OF NON-ZERO READINGS:	621
MAXIMUM INSTANTANEOUS VALUE:	45.8 PPB @ HOUR(S) 19 ON DAY(S) 25
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	4.42
OPERATIONAL TIME:	719 HRS

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.58% Calm Avg: 0.00

Direction	0.0-2.3	2.3-4.7	4.7-7.0	>7.0	Total
N	6.61	0	0.15	0	6.76
NE	3.67	0.59	0.73	0	4.99
E	2.35	2.06	0.29	0	4.7
SE	4.99	1.32	0.44	0	6.75
S	14.1	1.17	0.29	0	15.56
SW	13.22	3.08	0.15	0	16.45
W	20.7	0.73	0.29	0	21.72
NW	23.05	0	0	0	23.05
Summary	88.69	8.95	2.34	0	100



% Icon Classes (ppb)	89	9	2	0
0.0-2.3	89	9	2	0
2.3-4.7		9	2	0
4.7-7.0			2	0
>7.0				0

NOX[ppb] Calibration: LICA ST. LINA Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

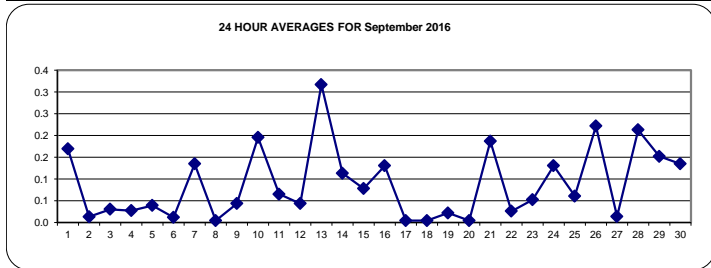
NITRIC OXIDES

NITRIC OXIDE Hourly Averages (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
DAY	MIN.	MAX.	AVG.	RDGS.																										
1	0.0	0.0	0.0	S	0.1	0.0	0.0	0.2	0.3	0.8	0.6	0.2	0.3	1.3	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	1.3	0.2	24
2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	24	
3	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	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	0.2	0.0	24
4	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	24
5	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.1	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.6	0.4	1.0	0.6	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	0.0	1.0	0.1	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.7	1.1	0.3	0.0	0.0	0.0	0.1	0.0	0.0	S	0.3	0.0	0.3	0.2	0.2	0.0	0.0	0.0	1.3	0.2	24	
11	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.0	0.1	S	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.2	1.2	0.5	0.2	0.6	S	1.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.3	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	0.6	0.0	0.0	0.0	0.0	S	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	1.0	0.1	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.1	0.1	S	0.1	0.0	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
16	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.4	0.9	1.0	0.3	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	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	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.2	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	0.2	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	S	1.7	0.9	0.6	0.4	0.0	0.2	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.2	24	
22	0.0	0.0	0.0	0.0	0.0	S	0.0	0.2	0.3	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	0.3	0.0	24	
23	0.0	0.0	0.0	S	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.1	0.0	24	
24	0.1	0.1	0.1	S	0.2	0.3	0.0	0.4	0.5	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
25	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
26	0.0	S	0.1	0.1	0.1	0.1	0.2	1.1	1.3	0.8	0.6	0.4	0.2	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	1.3	0.2	24	
27	S	0.1	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	S	0.0	0.2	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.0	0.4	1.0	0.0	0.5	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	S	0.1	0.0	1.0	0.2	24	
29	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.3	0.9	0.8	0.5	0.3	0.2	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	0.9	0.2	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.5	0.2	0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.0	S	0.2	0.0	0.0	0.0	0.0	0.5	0.1	24	
HOURLY MAX	0.2	0.1	0.1	0.1	0.2	0.3	0.8	1.7	1.3	1.2	1.2	1.0	0.3	1.3	0.2	1.2	0.5	0.2	0.8	0.6	0.3	0.2	0.2	0.1						
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0						

STATUS FLAG CODES

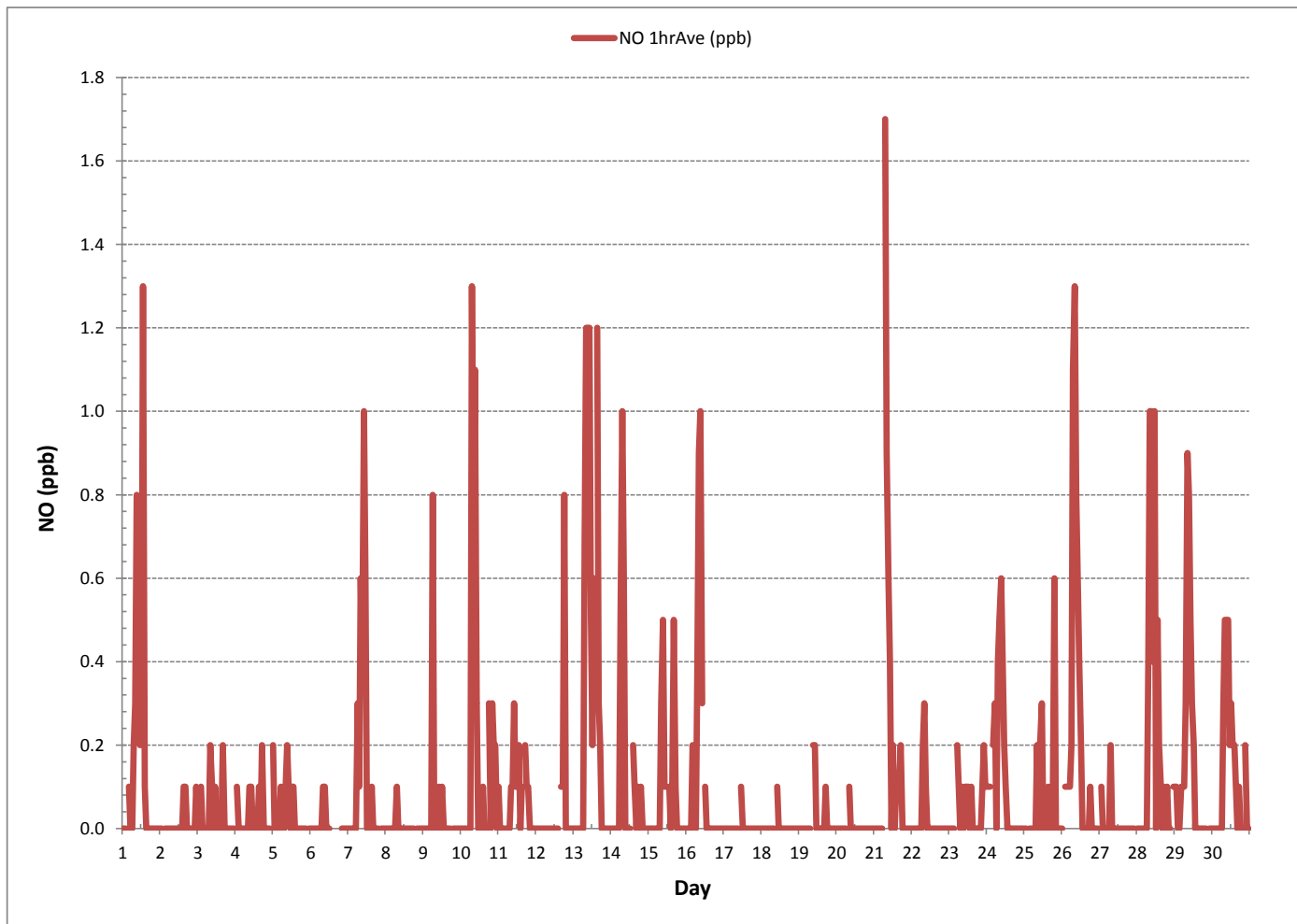
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	188				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S) ALL	
MAXIMUM 1-HR AVERAGE:	1.7	PPB @ HOUR(S)	7	ON DAY(S) 21	
MAXIMUM 24-HR AVERAGE:	0.3	PPB		ON DAY(S) 13	
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.22		MONTHLY AVERAGE:	0.1	PPB

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	1.1	0.9	0.9	S	1.3	1.1	1.1	1.3	1.7	1.8	2.1	1.3	2.3	2.9	2.1	0.8	1.3	0.9	1.3	1.5	0.8	0.7	0.6	0.8	0.6	2.9	1.3	24				
2	0.8	1.1	S	1.1	0.8	0.8	0.8	0.9	0.9	1.1	1.0	0.9	0.9	0.8	1.0	1.3	1.3	1.1	P	1.1	1.3	1.2	0.9	1.2	0.8	1.3	1.0	23				
3	0.9	S	1.3	0.9	0.8	0.8	1.1	1.1	1.6	1.3	1.3	1.4	1.1	1.1	0.9	1.1	1.6	1.3	2.0	1.7	1.4	0.9	0.9	0.9	0.8	2.0	1.2	24				
4	S	1.5	1.0	1.1	0.9	1.2	1.3	1.9	1.9	1.8	1.3	1.2	1.2	0.7	0.9	1.4	1.6	3.3	1.1	1.0	0.8	0.8	0.8	S	0.7	3.3	1.3	24				
5	1.5	1.1	1.1	0.9	0.9	1.2	0.9	0.9	1.1	1.5	1.4	1.5	2.4	1.2	1.3	1.0	1.0	1.0	1.0	1.0	0.9	0.9	S	1.3	0.9	2.4	1.2	24				
6	0.9	1.1	1.0	0.9	1.4	0.9	0.9	1.2	1.7	1.5	1.5	1.4	1.3	C	C	C	C	C	C	C	1.1	0.7	0.7	0.6	0.6	1.7	1.1	24				
7	0.7	0.7	0.9	0.7	0.7	2.8	3.9	1.7	2.9	1.7	2.6	2.1	1.4	0.8	0.6	3.0	0.7	1.0	1.2	0.9	S	1.4	0.6	0.9	0.6	3.9	1.5	24				
8	0.8	0.7	0.6	0.7	0.6	0.7	0.9	0.9	1.1	0.7	1.0	0.7	0.7	0.7	0.7	1.2	0.7	0.7	S	0.9	0.8	0.9	0.6	0.6	1.2	0.8	24					
9	0.6	0.9	0.7	0.7	0.6	0.7	25.4	1.3	0.9	0.9	1.7	0.8	1.1	0.9	0.8	0.9	0.9	1.2	S	1.0	0.6	0.6	0.6	0.6	0.6	25.4	1.9	24				
10	0.6	0.6	0.6	0.7	0.9	0.9	1.0	33.0	3.4	5.2	1.5	1.0	1.3	1.3	1.6	4.6	5.9	S	2.3	2.0	2.6	1.8	2.4	0.6	0.6	33.0	3.3	24				
11	2.8	0.9	0.7	0.6	0.6	0.9	1.0	0.9	1.1	1.1	1.6	0.9	1.1	1.1	1.3	1.1	S	1.2	0.9	0.9	1.1	1.0	0.7	0.7	0.6	2.8	1.1	24				
12	0.7	0.8	0.7	0.8	1.5	1.7	0.7	2.5	1.9	0.7	1.3	2.0	1.3	1.1	8.3	S	2.0	2.2	31.0	0.9	0.9	0.9	0.9	0.9	0.7	31.0	2.9	24				
13	0.9	1.0	1.0	0.9	0.9	2.4	1.6	2.2	4.5	2.9	3.8	2.1	1.8	6.1	S	3.4	1.6	2.1	2.0	1.3	1.9	0.8	0.8	3.2	0.8	6.1	2.1	24				
14	0.8	0.8	0.8	0.9	0.9	1.1	18.1	27.0	2.8	1.1	1.1	0.9	1.2	S	1.9	1.9	1.2	2.4	0.8	3.2	0.9	0.8	0.8	0.8	0.8	27.0	3.1	24				
15	0.7	0.9	0.8	0.9	0.9	0.8	0.8	1.1	1.2	2.6	1.5	1.7	S	1.3	1.1	1.3	8.3	1.4	1.1	0.9	0.9	0.9	1.0	0.9	0.7	8.3	1.4	24				
16	0.9	0.9	1.1	1.2	1.9	1.7	1.4	1.8	3.0	2.4	1.4	S	1.3	1.1	0.8	1.0	0.8	1.0	1.8	0.8	0.8	0.8	0.8	0.8	0.8	3.0	1.3	24				
17	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.9	1.0	1.2	S	1.5	0.9	0.9	0.9	1.1	1.1	1.1	1.7	1.4	0.9	0.9	0.9	0.9	0.8	1.7	1.0	24				
18	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	0.9	S	1.5	1.2	1.1	0.8	0.8	0.8	1.1	1.3	0.9	0.9	1.0	0.9	1.1	0.9	0.8	1.5	1.0	24			
19	1.1	0.9	0.9	0.9	0.9	1.1	0.9	1.7	S	1.4	1.3	2.0	1.1	1.1	0.9	0.9	0.9	2.7	1.1	1.6	1.0	0.9	1.0	0.9	0.9	2.7	1.2	24				
20	0.8	0.9	0.8	0.9	0.9	0.8	1.3	S	1.9	1.1	0.9	1.4	1.1	1.6	1.3	1.5	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	1.9	1.0	24				
21	0.9	0.7	0.8	0.7	0.7	0.6	S	7.3	3.0	1.7	1.2	0.9	1.2	0.9	0.9	1.3	1.1	1.1	0.8	1.1	0.7	0.6	0.7	0.7	0.6	7.3	1.3	24				
22	0.7	0.7	0.7	0.7	0.7	S	0.8	1.3	1.3	1.2	0.9	0.7	1.0	1.0	0.9	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.9	0.7	0.7	1.3	0.8	24				
23	0.7	0.6	0.7	0.7	S	1.1	0.8	0.8	0.9	0.6	0.8	0.9	0.8	0.7	0.9	0.7	0.9	0.7	0.7	0.5	0.6	0.8	0.7	0.7	0.5	1.1	0.8	24				
24	0.7	0.7	0.8	S	0.8	1.1	0.8	14.3	2.4	2.4	2.6	2.0	1.2	1.0	0.9	0.8	0.9	0.9	0.9	2.8	0.7	0.7	0.8	0.7	0.7	14.3	1.8	24				
25	1.1	0.7	S	0.9	0.7	1.7	2.2	9.3	14.6	1.5	2.5	18.8	0.7	15.2	7.2	18.2	1.1	0.7	0.9	34.9	0.9	0.7	0.9	0.8	0.7	34.9	5.9	24				
26	0.7	S	0.9	0.9	1.2	1.1	1.0	2.8	2.2	1.8	2.6	1.1	0.9	0.9	0.7	0.9	0.7	0.7	1.0	0.7	0.7	0.6	0.6	0.6	0.6	2.8	1.1	24				
27	S	0.9	0.7	0.7	0.7	1.4	1.5	9.0	0.7	0.9	1.0	1.0	0.7	0.9	1.0	1.5	1.1	0.9	1.0	0.9	1.8	0.6	0.9	S	0.6	9.0	1.4	24				
28	0.9	0.6	0.9	0.7	0.7	1.8	0.7	1.7	3.0	2.3	1.5	4.5	0.9	23.6	2.2	0.9	0.9	0.9	0.6	0.7	0.8	0.8	S	0.9	0.6	23.6	2.3	24				
29	0.9	0.8	0.6	0.7	1.0	0.9	0.9	1.2	1.7	1.7	1.5	1.1	1.3	1.0	1.2	0.7	1.0	0.8	0.6	0.6	0.6	S	0.8	0.6	0.6	1.7	1.0	24				
30	0.7	0.6	0.7	0.9	0.7	0.9	1.0	1.3	1.5	1.5	1.3	1.0	1.1	1.1	1.1	0.7	0.8	1.0	0.7	0.6	S	1.0	0.6	0.6	0.6	1.5	0.9	24				
HOURLY MAX	2.8	1.5	1.3	1.2	1.9	2.8	25.4	33.0	14.6	5.2	3.8	18.8	2.4	23.6	8.3	18.2	8.3	3.3	31.0	34.9	2.6	1.8	2.4	3.2								
HOURLY AVG	0.9	0.8	0.8	0.8	0.9	1.2	2.6	4.6	2.3	1.6	1.6	2.0	1.2	2.6	1.6	1.9	1.5	1.3	2.2	2.4	1.0	0.9	0.9	0.9								

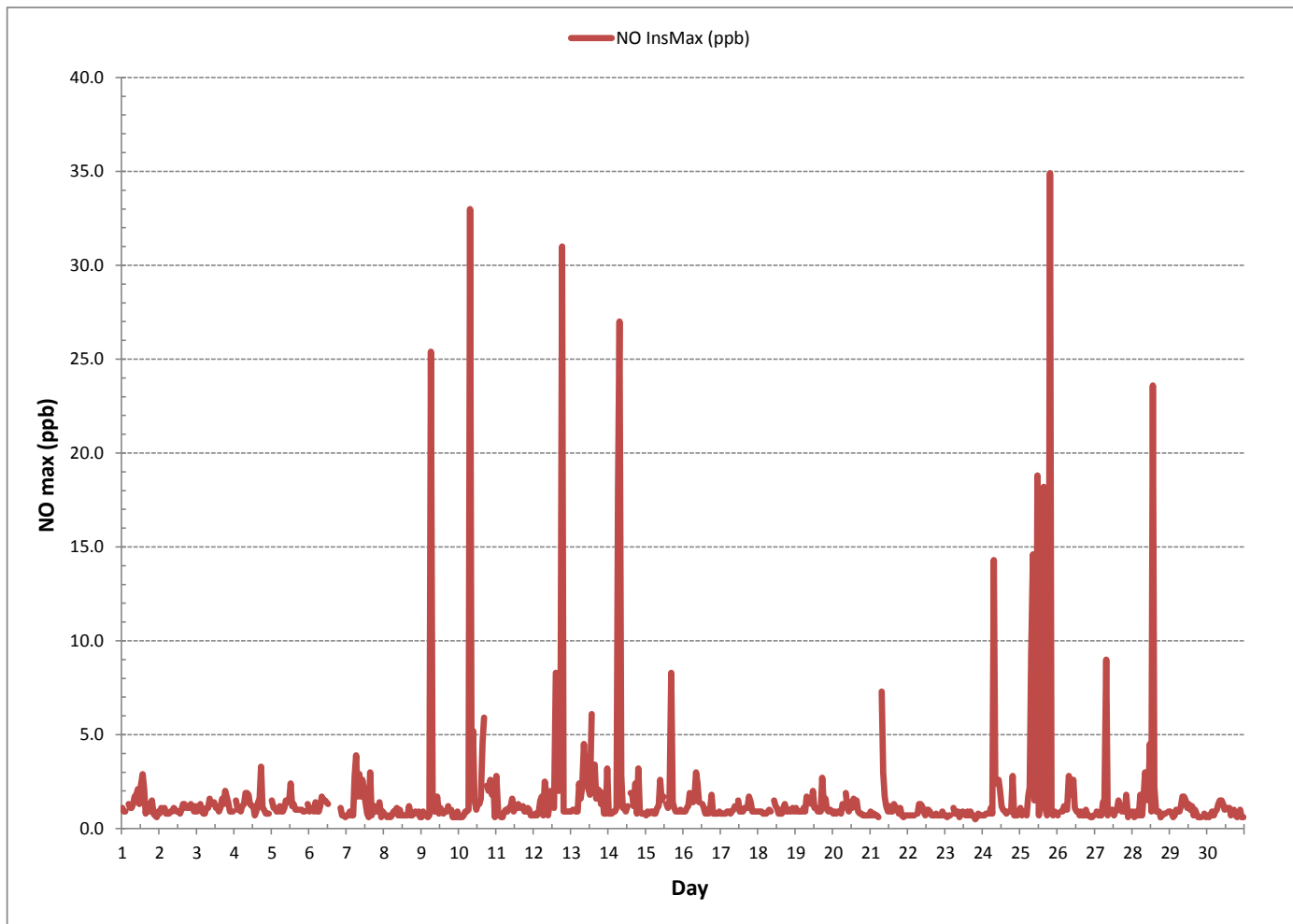
STATUS FLAG CODES

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

MONTHLY SUMMARY

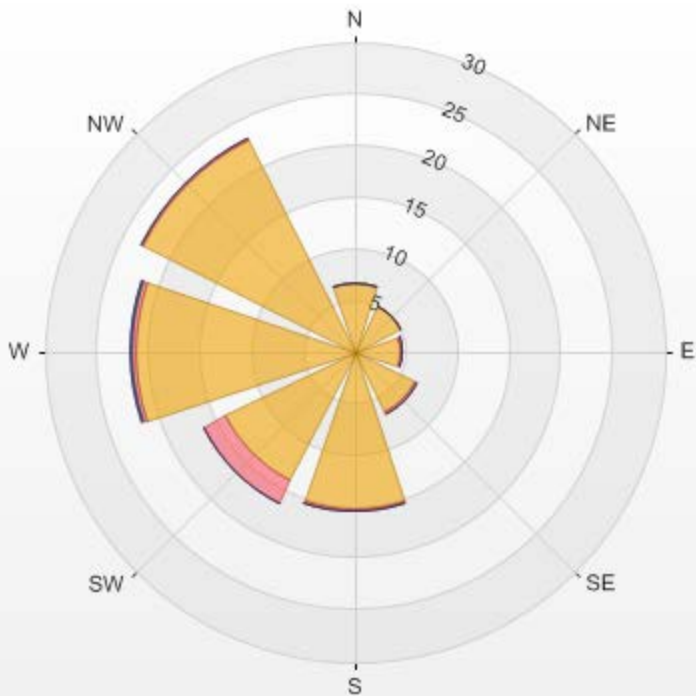
NUMBER OF NON-ZERO READINGS:	681					
MAXIMUM INSTANTANEOUS VALUE:	34.9	PPB	@ HOUR(S)	19	ON DAY(S)	25
				VAR-VARIOUS		
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	719	HRS	
MONTHLY CALIBRATION TIME:	7	HRS				
STANDARD DEVIATION:	3.14					

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.58% Calm Avg: 0.00

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	6.75	0	0	0	6.75
NE	4.99	0	0	0	4.99
E	4.41	0.29	0	0	4.7
SE	6.61	0.15	0	0	6.76
S	15.27	0.29	0	0	15.56
SW	13.95	2.5	0	0	16.45
W	21.29	0.29	0.15	0	21.73
NW	22.91	0.15	0	0	23.06
Summary	96.18	3.67	0.15	0	100



% Icon Classes (ppb)	96	0.0-0.7	4	0.7-1.3	0	1.3-2.0	0	>2.0
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NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR				
DAY	MIN.	MAX.	AVG.	RDGS.																												
1	2.1	2.1	2.0	S	1.5	1.6	1.6	1.7	2.2	1.9	1.9	1.8	1.3	3.7	1.2	0.4	0.5	0.4	0.6	1.1	0.3	0.6	1.0	0.6	0.3	3.7	1.4	24				
2	0.5	0.4	S	0.6	0.7	0.9	0.9	0.7	0.4	0.4	0.6	0.4	0.4	0.4	1.7	2.1	2.0	2.3	2.3	1.2	1.1	0.6	0.5	0.5	0.4	2.3	0.9	24				
3	0.4	S	0.3	0.4	0.4	0.5	0.6	0.5	0.3	0.4	0.3	0.2	0.3	0.2	0.1	0.3	0.4	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.6	0.3	24				
4	S	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.1	0.3	0.2	0.3	0.2	0.0	0.3	0.2	0.4	0.6	0.5	0.6	0.2	0.6	0.4	S	0.0	0.6	0.3	24				
5	0.6	0.4	0.5	0.4	0.5	0.7	0.6	1.0	1.3	0.9	0.8	0.5	0.8	0.4	0.5	0.3	0.5	0.6	1.6	1.7	1.3	1.5	S	2.2	0.3	2.2	0.9	24				
6	2.2	2.4	2.5	2.6	2.5	2.1	2.3	2.3	2.7	2.3	2.2	1.5	1.1	C	C	C	C	C	C	C	1.0	0.2	0.2	0.4	0.2	2.7	1.8	24				
7	0.4	0.8	0.8	1.1	0.8	1.3	2.0	1.1	1.4	1.3	2.3	2.8	1.5	0.5	0.3	0.6	0.0	0.2	0.4	0.4	S	0.9	0.7	0.5	0.0	2.8	1.0	24				
8	1.0	0.8	0.4	0.3	0.7	0.7	1.1	0.9	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.4	0.2	0.1	0.2	0.0	1.1	0.3	24				
9	0.3	0.2	0.3	0.2	0.2	0.2	1.1	0.4	0.5	0.2	0.3	0.0	0.1	0.0	0.1	0.3	0.0	0.3	S	0.4	0.4	0.8	0.7	1.5	0.0	1.5	0.4	24				
10	1.5	1.5	1.2	1.1	1.1	1.5	1.9	2.4	1.9	1.6	1.1	0.4	0.1	0.2	0.1	0.3	0.5	S	0.4	0.5	0.8	0.7	0.4	0.0	0.0	2.4	0.9	24				
11	0.5	0.2	0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.5	0.4	0.5	S	0.5	0.6	0.5	0.2	0.3	0.0	0.0	0.0	0.6	0.3	24				
12	0.1	0.1	0.0	0.1	0.3	0.2	0.1	0.3	0.2	0.0	0.1	0.3	0.1	0.0	0.2	S	0.4	0.5	2.0	0.3	0.4	1.0	1.2	1.2	0.0	2.0	0.4	24				
13	1.3	1.4	1.2	1.1	1.2	2.0	2.0	1.8	2.1	1.7	1.9	1.4	1.4	1.7	S	3.1	2.3	2.0	2.2	1.5	1.1	0.9	1.1	2.2	0.9	3.1	1.7	24				
14	1.6	1.5	1.8	2.8	2.1	2.0	2.2	1.9	1.3	0.9	0.7	0.4	0.4	S	0.3	0.2	0.1	0.6	0.1	1.1	0.4	0.4	0.2	0.4	0.1	2.8	1.0	24				
15	0.2	0.3	0.4	0.5	0.4	0.5	0.3	0.9	1.2	0.9	0.6	S	0.2	0.5	0.9	1.2	1.0	1.8	1.0	1.7	2.1	1.9	1.6	0.2	2.1	0.9	24					
16	1.7	1.8	2.1	2.1	2.1	2.0	1.7	1.9	2.1	2.3	1.4	S	0.7	0.8	0.7	0.7	0.6	1.2	1.7	1.3	1.7	2.4	2.2	2.0	0.6	2.4	1.6	24				
17	1.7	1.6	1.4	1.5	1.6	5.5	1.3	0.3	0.3	0.2	S	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.6	0.1	0.2	0.4	0.8	0.0	5.5	0.8	24					
18	0.9	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.3	S	0.3	0.1	0.3	0.1	0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.9	0.2	24				
19	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	S	0.0	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.3	0.1	0.4	0.0	0.1	0.1	0.0	0.0	0.4	0.1	24				
20	0.1	0.1	0.3	0.2	0.3	0.3	0.4	S	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24				
21	0.2	0.3	0.5	0.5	0.7	S	3.6	1.3	1.5	0.9	0.8	0.8	0.7	0.7	0.6	1.3	1.5	1.1	1.9	2.4	2.7	2.6	2.2	0.2	3.6	1.3	24					
22	2.3	2.1	2.0	1.4	1.0	S	1.7	2.0	1.6	1.1	0.7	0.6	0.6	0.7	0.4	0.4	0.3	0.6	0.6	1.0	1.0	1.0	1.2	1.2	0.3	2.3	1.1	24				
23	1.0	0.6	0.4	0.4	S	0.5	0.9	1.7	1.8	1.8	1.8	1.6	1.4	1.0	0.8	0.6	0.7	0.9	1.0	0.9	1.0	1.0	1.1	1.1	0.4	1.8	1.0	24				
24	0.9	1.0	0.9	S	0.9	0.9	1.2	1.1	0.8	0.6	0.4	0.3	0.2	0.0	0.0	0.1	0.1	0.2	0.2	0.7	0.4	0.4	0.4	0.0	1.2	0.5	24					
25	0.4	0.2	S	0.6	0.3	0.7	0.7	0.8	0.7	0.7	0.5	0.8	0.1	0.6	0.5	0.6	0.5	0.4	0.8	2.2	1.3	1.0	1.7	1.8	0.1	2.2	0.8	24				
26	2.1	S	3.4	3.5	3.8	4.1	4.7	5.0	3.6	2.3	1.6	1.8	1.3	0.8	0.5	0.4	0.5	0.8	0.8	1.3	1.5	1.7	1.7	1.8	0.4	5.0	2.1	24				
27	S	1.8	1.8	1.9	1.9	2.0	2.1	1.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.2	S	0.0	2.1	0.6	24				
28	0.4	0.3	0.3	0.5	1.1	1.9	2.1	2.1	2.0	1.8	1.5	2.5	1.0	0.9	0.5	0.5	0.7	1.3	5.6	6.2	4.5	4.3	S	3.3	0.3	6.2	2.0	24				
29	3.8	4.9	4.3	4.8	4.3	3.4	3.3	3.6	3.2	2.0	1.5	1.4	1.1	0.7	0.8	0.5	0.7	0.6	1.6	2.3	3.3	S	3.4	3.8	0.5	4.9	2.6	24				
30	4.0	4.8	4.6	6.2	5.0	3.5	4.1	5.7	5.7	5.0	3.4	2.2	1.9	1.3	1.1	1.3	1.3	1.3	1.2	1.3	S	1.1	1.0	1.2	1.0	6.2	3.0	24				
HOURLY MAX	4.0	4.9	4.6	6.2	5.0	5.5	4.7	5.7	5.7	5.0	3.4	2.8	1.9	3.7	1.7	3.1	2.3	2.3	5.6	6.2	4.5	4.3	3.4	3.8								
HOURLY AVG	1.2	1.2	1.2	1.3	1.2	1.4	1.4	1.6	1.4	1.1	1.0	0.8	0.6	0.6	0.4	0.5	0.5	0.7	1.0	1.1	1.0	0.9	0.9	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

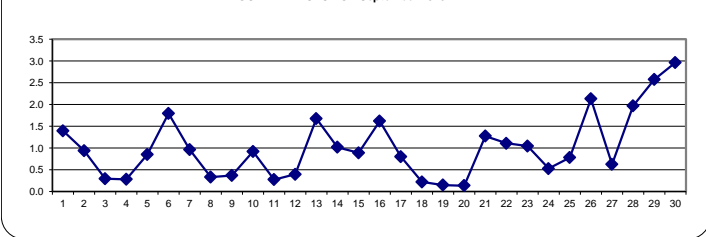
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

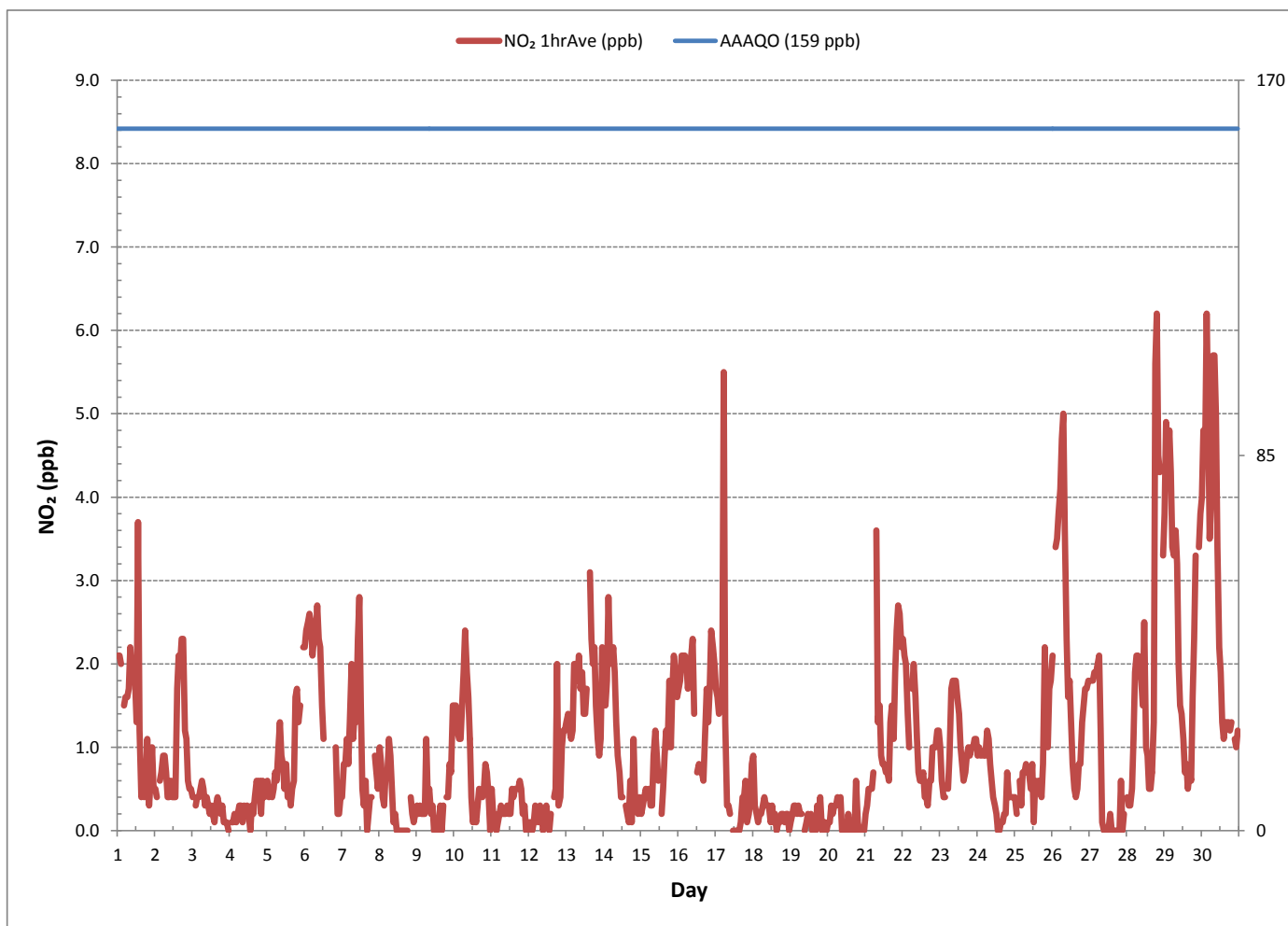
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	624					
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	6.2	PPB	@ HOUR(S)	19 , 3	ON DAY(S)	28 , 30
MAXIMUM 24-HR AVERAGE:	3.0	PPB			ON DAY(S)	30
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	1.07		MONTHLY AVERAGE:	1.0	PPB	

24 HOUR AVERAGES FOR September 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.
DAY																													
1		2.1	2.0	2.0	S	1.7	1.6	1.7	2.0	2.3	1.7	2.0	2.2	1.9	5.4	1.9	0.5	0.5	0.6	1.1	1.7	0.6	0.7	1.9	0.6	0.5	5.4	1.7	24
2		0.6	0.4	S	0.4	0.8	0.7	0.7	0.4	0.2	0.3	0.5	0.6	0.6	1.1	1.9	1.9	2.2	1.9	P	1.2	1.5	0.6	0.4	0.5	0.2	2.2	0.9	23
3		0.3	S	0.2	0.2	0.2	0.5	0.3	0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.2	0.5	0.2	0.2	0.1	0.2	0.0	0.0	0.5	0.2	24
4		S	0.0	0.1	0.0	0.0	0.4	0.1	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.4	0.5	1.8	1.6	1.4	0.4	2.4	0.3	S	0.0	2.4	0.5	24
5		0.4	0.8	0.3	0.3	0.4	0.5	0.7	1.0	1.2	0.9	0.8	0.6	1.8	0.5	0.4	0.5	0.4	0.9	1.9	1.8	1.5	1.8	S	2.0	0.3	2.0	0.9	24
6		2.2	2.2	2.3	2.5	2.8	2.5	2.4	2.0	2.2	1.8	1.5	1.2	1.0	C	C	C	C	C	C	C	1.0	0.1	0.2	0.2	0.1	2.8	1.7	24
7		0.2	0.6	0.6	1.1	0.7	0.8	3.0	1.4	1.2	0.6	1.9	2.9	1.0	0.0	0.0	0.8	0.0	0.0	1.1	0.3	S	0.2	0.2	0.2	0.0	3.0	0.8	24
8		0.6	0.5	0.2	0.0	0.8	1.1	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	1.1	0.2	24
9		0.1	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	S	0.0	0.1	0.5	0.6	1.1	0.0	11.7	0.6	24
10		1.1	1.1	0.8	0.6	0.6	1.3	1.4	8.3	1.4	1.1	0.5	0.0	0.0	0.0	0.0	1.5	8.1	S	0.1	2.2	2.5	0.9	0.6	0.0	0.0	8.3	1.5	24
11		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	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	24
12		0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.8	0.1	0.0	1.8	S	0.5	0.6	14.8	0.2	0.3	1.3	1.5	1.3	0.0	14.8	1.0	24
13		1.3	1.3	1.3	1.0	1.0	2.6	1.9	1.5	2.4	1.8	2.6	1.0	1.2	3.9	S	4.0	2.1	1.9	2.5	1.5	2.6	1.1	1.1	6.2	1.0	6.2	2.1	24
14		1.3	1.3	2.1	2.6	2.3	1.9	9.1	7.9	1.1	0.4	0.5	0.0	0.0	S	0.3	0.0	0.0	1.0	0.0	4.0	0.7	0.3	0.0	0.4	0.0	9.1	1.6	24
15		0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.7	1.8	0.7	0.5	S	0.0	0.6	1.3	10.0	0.9	4.5	1.0	1.4	2.1	1.8	1.5	0.0	10.0	1.3	24
16		1.4	1.4	1.9	1.9	2.4	2.9	1.9	1.7	2.1	2.1	1.6	S	0.5	0.6	0.4	0.6	0.6	1.5	5.8	1.3	1.8	2.6	2.4	2.1	0.4	5.8	1.8	24
17		1.6	1.3	1.3	1.6	1.3	8.8	2.7	0.5	0.3	0.1	S	0.0	0.0	0.0	0.0	0.0	0.3	1.1	1.3	4.4	0.0	0.2	0.3	1.1	0.0	8.8	1.2	24
18		1.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24
19		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	1.0	0.8	1.3	0.2	0.0	0.0	0.0	1.3	0.2	24
20		0.0	0.2	0.2	0.0	0.2	0.2	0.7	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	2.4	0.1	0.0	0.0	0.0	0.2	0.0	2.4	0.2	24
21		0.1	0.0	0.1	0.5	0.3	0.6	S	6.0	1.7	1.1	0.5	0.3	0.9	0.4	0.4	0.3	1.2	1.3	1.1	2.8	2.2	2.6	2.2	1.9	0.0	6.0	1.2	24
22		1.9	1.8	1.5	1.4	0.9	S	1.3	1.4	0.9	0.6	0.3	0.1	0.5	0.5	0.1	0.0	0.0	0.1	0.4	0.7	1.0	0.7	0.9	0.7	0.0	1.9	0.8	24
23		0.6	0.3	0.0	0.1	S	0.0	0.6	1.2	1.3	1.2	1.3	1.1	1.1	0.6	0.3	0.3	0.4	0.3	0.6	0.7	0.6	0.6	0.7	0.8	0.0	1.3	0.6	24
24		0.6	0.6	0.6	S	0.6	0.7	0.8	7.1	0.9	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.4	0.2	0.1	0.0	0.0	7.1	0.7	24
25		0.1	0.0	S	0.0	0.0	0.3	0.1	7.4	8.8	0.5	0.1	13.8	0.0	2.7	2.5	13.1	0.1	0.0	0.3	11.0	0.9	0.3	1.1	1.4	0.0	13.8	2.8	24
26		1.9	S	2.8	2.8	3.4	3.9	4.5	5.3	3.4	1.9	1.5	1.3	0.8	0.2	0.0	0.0	0.0	0.2	0.3	1.1	1.2	1.4	1.4	1.4	0.0	5.3	1.8	24
27		S	1.5	1.4	2.0	1.5	1.5	1.7	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.6	S	0.0	10.7	1.0	24
28		0.1	0.1	0.1	0.6	0.9	2.5	2.0	2.2	2.3	1.8	1.5	4.6	1.4	11.2	1.1	0.9	0.5	1.4	9.1	8.6	4.4	4.3	S	3.3	0.1	11.2	2.8	24
29		4.4	4.9	4.6	4.7	4.4	3.5	3.0	3.4	3.0	2.0	1.2	1.1	0.9	0.4	0.7	0.4	0.4	0.6	2.0	3.1	3.2	S	3.0	4.3	0.4	4.9	2.6	24
30		4.4	4.7	4.6	6.6	6.3	3.1	4.1	6.3	5.6	4.5	3.6	2.0	1.5	1.0	0.7	0.9	0.9	0.9	0.9	0.9	S	0.6	0.6	0.8	0.6	6.6	2.8	24
HOURLY MAX		4.4	4.9	4.6	6.6	6.3	8.8	11.7	10.7	8.8	4.5	3.6	13.8	1.9	11.2	2.5	13.1	10.0	1.9	14.8	11.0	4.4	4.3	3.0	6.2				
HOURLY AVG		1.1	1.0	1.0	1.1	1.2	1.5	2.0	2.7	1.5	0.9	0.8	1.2	0.5	1.0	0.5	1.0	1.0	0.7	2.0	1.9	1.1	0.9	0.8	1.1				

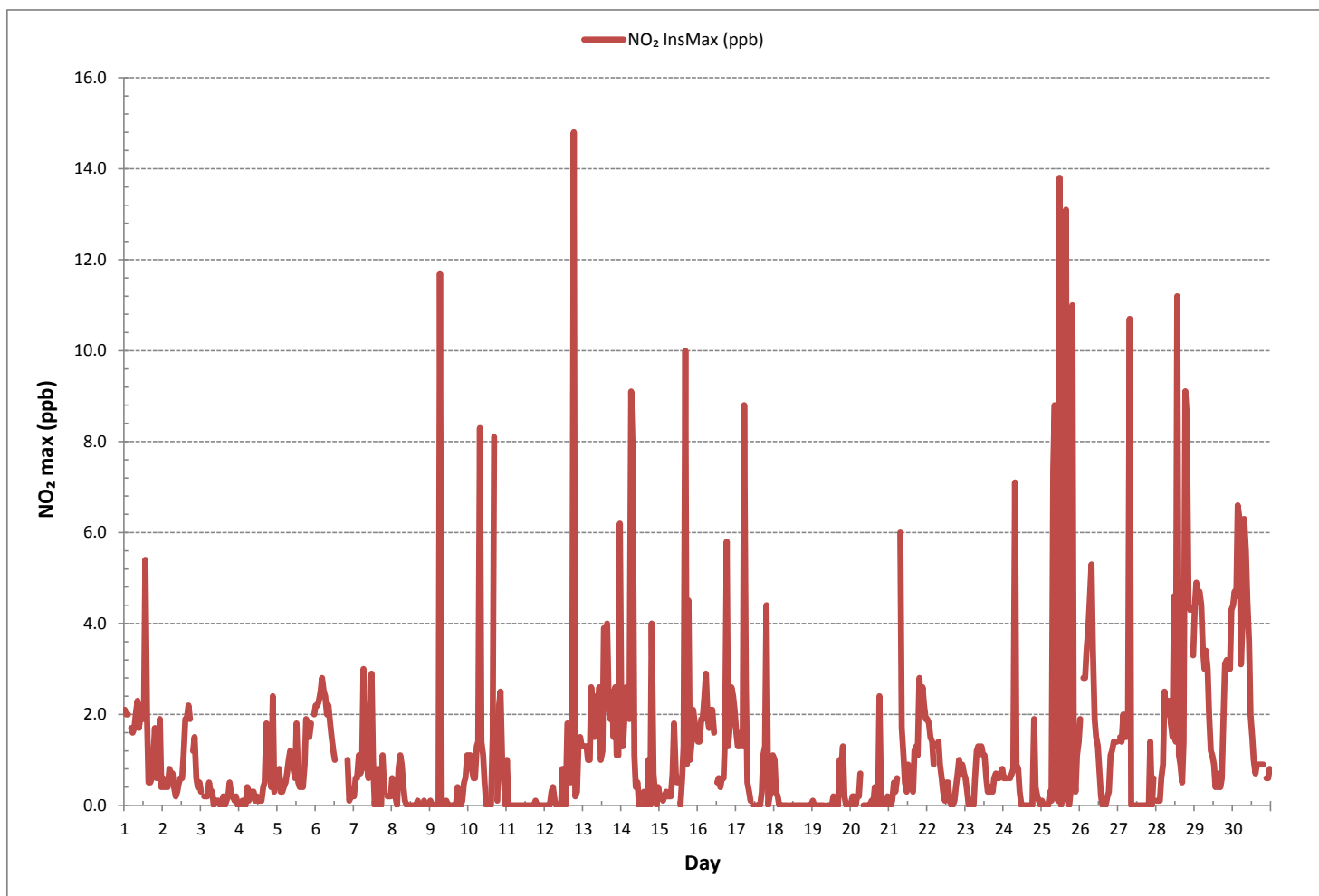
STATUS FLAG CODES

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

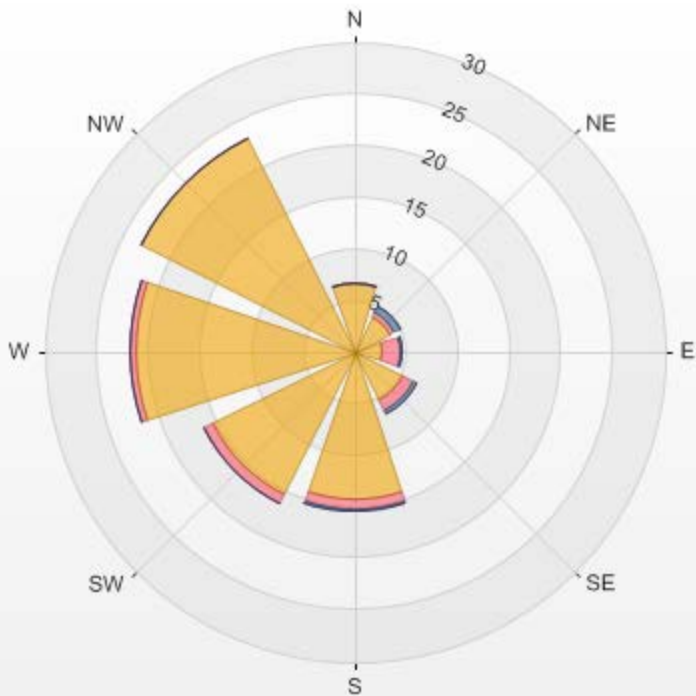
NUMBER OF NON-ZERO READINGS:	508
MAXIMUM INSTANTANEOUS VALUE:	14.8 PPB @ HOUR(S) 18 ON DAY(S) 12
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	1.90
OPERATIONAL TIME:	719 HRS

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.58% Calm Avg: 0.00

Direction	0.0-2.3	2.3-4.7	4.7-7.0	>7.0	Total
N	6.61	0	0.15	0	6.76
NE	3.82	0.44	0.73	0	4.99
E	2.79	1.62	0.29	0	4.7
SE	5.14	1.17	0.44	0	6.75
S	14.24	1.03	0.29	0	15.56
SW	15.42	1.03	0	0	16.45
W	21.15	0.59	0	0	21.74
NW	23.05	0	0	0	23.05
Summary	92.22	5.88	1.9	0	100



% Icon Classes (ppb)	92	0.0-2.3	6	2.3-4.7	2	4.7-7.0	0	>7.0
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NO2[ppb] Calibration: LICA ST. LINA Monthly: 09/2016 Type: Span



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

OZONE

OZONE Hourly Averages (O₃ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	21.9	20.4	19.4	S	16.3	15.1	13.3	13.7	13.4	15.1	16.2	18.9	25.8	27.4	30.4	33.0	31.8	29.3	24.9	25.8	26.0	25.5	25.8	22.7	13.3	33.0	22.3	24					
2	20.6	22.8	S	17.8	15.5	14.4	13.4	12.9	16.5	18.5	17.4	17.6	17.0	17.4	18.6	17.5	18.4	17.3	15.3	15.6	11.0	6.2	9.0	17.9	6.2	22.8	16.0	24					
3	19.9	S	18.9	16.4	13.4	11.5	10.5	9.5	9.4	8.6	7.9	12.7	18.0	14.6	11.7	9.8	9.1	8.7	12.3	13.1	12.7	12.7	12.5	12.9	7.9	19.9	12.5	24					
4	S	13.5	13.2	15.5	15.4	14.8	14.2	13.6	15.3	21.5	23.5	25.2	24.6	24.6	23.7	24.5	23.9	23.8	22.5	23.7	25.2	22.9	22.2	S	13.2	25.2	20.3	24					
5	17.1	25.1	19.5	19.6	16.8	16.4	16.6	17.7	17.6	21.8	24.3	23.8	24.0	24.3	24.4	24.0	23.9	22.3	22.0	20.9	21.3	22.1	S	22.6	16.4	25.1	21.2	24					
6	22.0	20.4	18.1	16.2	14.2	9.3	10.9	11.8	11.2	12.6	14.0	17.2	17.9	20.0	22.0	20.8	20.6	S	18.2	18.3	19.7	20.3	19.7	15.6	9.3	22.0	17.0	24					
7	18.4	11.9	14.3	14.1	7.6	7.8	10.0	12.3	14.2	15.3	C	C	C	C	C	26.1	26.0	25.2	25.6	26.8	S	20.8	23.6	24.8	7.6	26.8	18.0	24					
8	18.8	17.8	19.4	23.0	18.8	22.1	23.7	15.0	20.2	24.2	24.6	24.7	25.5	26.2	26.8	26.5	26.7	27.6	25.0	S	20.4	20.3	20.2	18.1	15.0	27.6	22.4	24					
9	18.5	17.8	16.3	14.6	12.8	11.6	10.8	10.7	12.6	14.1	16.0	18.5	20.5	22.5	24.0	24.0	23.8	23.1	S	22.5	22.4	21.9	21.2	19.6	10.7	24.0	18.3	24					
10	19.6	19.7	20.4	18.3	15.7	12.8	11.4	11.1	10.1	12.5	21.6	29.1	31.5	31.8	32.7	34.4	34.5	S	30.8	28.5	26.6	25.0	22.7	21.4	10.1	34.5	22.7	24					
11	20.2	18.4	15.4	13.3	13.7	13.9	14.2	15.3	16.6	16.0	15.7	15.9	19.2	23.4	20.7	S	20.4	19.6	17.3	15.7	15.7	16.5	14.8	13.3	23.4	16.9	24						
12	15.2	14.3	13.5	13.7	14.3	14.0	13.7	14.8	18.9	28.2	28.5	27.5	26.7	26.6	26.5	S	26.9	26.4	23.9	25.3	23.6	21.1	19.7	19.0	13.5	28.5	21.0	24					
13	19.2	18.0	17.8	16.1	14.7	12.4	11.2	11.2	12.7	13.5	14.6	19.2	23.8	26.1	S	28.4	30.3	30.7	28.4	27.5	26.7	26.7	26.5	25.3	11.2	30.7	20.9	24					
14	23.6	21.6	18.7	18.0	16.4	14.5	13.0	10.3	11.2	14.5	16.6	18.5	20.9	S	25.9	26.4	26.2	24.6	24.7	23.9	22.2	22.5	23.0	18.1	10.3	26.4	19.8	24					
15	21.3	22.0	22.1	21.5	20.6	21.5	22.2	20.0	13.3	15.3	18.1	24.3	S	29.1	33.4	36.4	33.9	33.6	32.3	31.8	28.3	26.1	26.2	25.2	13.3	36.4	25.2	24					
16	23.0	21.2	18.8	18.8	18.6	19.5	18.8	17.0	16.9	20.1	28.2	S	34.7	39.5	40.4	41.5	41.1	38.6	35.8	36.7	34.1	31.8	31.0	30.6	16.9	41.5	28.6	24					
17	30.8	29.6	29.7	26.4	20.1	13.3	18.8	21.5	20.7	23.2	S	25.3	30.1	29.1	30.0	30.7	30.8	29.6	30.6	30.5	31.4	29.4	23.7	28.0	13.3	31.4	26.7	24					
18	21.3	26.6	25.9	27.3	26.4	27.0	23.3	23.2	21.4	S	18.9	19.7	22.9	23.9	25.3	27.3	29.5	30.3	28.9	31.1	28.6	25.6	25.8	30.0	18.9	31.1	25.7	24					
19	28.7	24.9	22.6	20.3	18.3	16.8	17.7	17.9	S	21.5	22.9	24.6	25.0	23.2	25.1	26.0	28.1	27.2	24.8	24.4	24.4	22.2	21.0	21.3	16.8	28.7	23.0	24					
20	21.1	19.8	18.0	16.6	15.6	13.3	11.3	S	10.3	16.4	21.6	24.3	24.6	25.0	26.1	25.5	21.4	21.3	20.2	21.1	22.6	24.0	21.1	21.4	10.3	26.1	20.1	24					
21	16.1	13.4	12.8	12.9	12.9	14.9	S	14.2	13.7	18.3	25.5	27.3	29.5	31.2	31.0	32.3	32.6	31.3	31.2	30.8	29.9	28.2	26.6	25.9	12.8	32.6	23.6	24					
22	25.0	24.6	24.0	24.5	24.2	S	23.1	22.4	22.7	24.3	28.0	32.9	34.8	36.3	38.0	38.4	38.9	38.9	36.9	34.7	32.5	30.5	28.0	25.3	22.4	38.9	30.0	24					
23	24.8	27.0	28.4	29.1	S	27.6	26.0	23.1	21.1	20.9	21.6	21.4	22.3	19.1	17.3	17.3	16.7	15.7	13.6	12.7	12.4	11.2	10.3	10.1	10.1	29.1	19.6	24					
24	10.4	10.0	8.5	S	8.4	9.5	8.3	12.2	19.0	20.6	27.1	30.4	32.1	33.0	34.0	34.6	34.4	34.2	32.8	31.6	30.5	29.3	29.0	29.4	8.3	34.6	23.9	24					
25	29.4	29.4	S	28.1	26.9	24.7	24.6	21.7	23.3	25.3	27.3	29.5	31.5	32.3	34.4	35.4	36.0	35.5	33.7	31.9	33.2	32.5	30.8	30.2	21.7	36.0	29.9	24					
26	27.5	S	21.2	20.5	18.7	17.0	16.3	15.1	17.9	24.1	30.9	31.3	34.9	35.1	34.0	34.4	33.2	31.2	30.3	28.6	27.7	26.2	24.5	23.7	15.1	35.1	26.3	24					
27	S	21.8	20.4	19.0	18.3	16.9	18.9	25.7	36.0	39.4	41.0	37.5	36.5	35.1	35.0	35.2	35.6	34.7	34.1	33.5	33.3	32.7	31.9	S	16.9	41.0	30.6	24					
28	30.4	29.5	28.7	25.8	19.8	18.1	19.5	16.5	16.8	18.3	19.0	18.7	23.0	26.2	30.2	30.8	29.4	27.9	19.0	17.6	19.3	20.3	S	22.8	16.5	30.8	22.9	24					
29	21.5	18.7	21.6	18.7	18.4	18.8	17.6	18.8	19.3	25.0	28.8	31.1	32.4	33.8	34.4	35.3	35.7	34.9	32.8	31.5	30.4	S	30.0	27.3	17.6	35.7	26.8	24					
30	26.3	25.3	25.1	21.5	20.5	20.2	18.3	14.2	12.5	11.5	13.6	15.8	17.8	20.0	23.9	29.2	31.7	31.2	30.4	29.8	S	28.1	28.6	28.7	11.5	31.7	22.8	24					
HOURLY MAX	30.8	29.6	29.7	29.1	26.9	27.6	26.0	25.7	36.0	39.4	41.0	37.5	36.5	39.5	40.4	41.5	41.1	38.9	36.9	36.7	34.1	32.7	31.9	30.6									
HOURLY AVG	21.9	20.9	19.7	19.6	17.0	16.2	16.3	16.0	16.7	19.3	21.9	23.7	25.9	26.9	28.0	28.5	28.7	27.7	26.2	25.8	24.7	23.5	23.3	22.6									

STATUS FLAG CODES

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

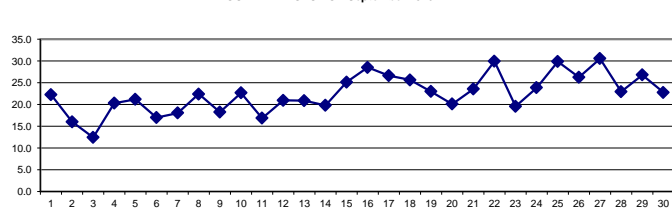
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

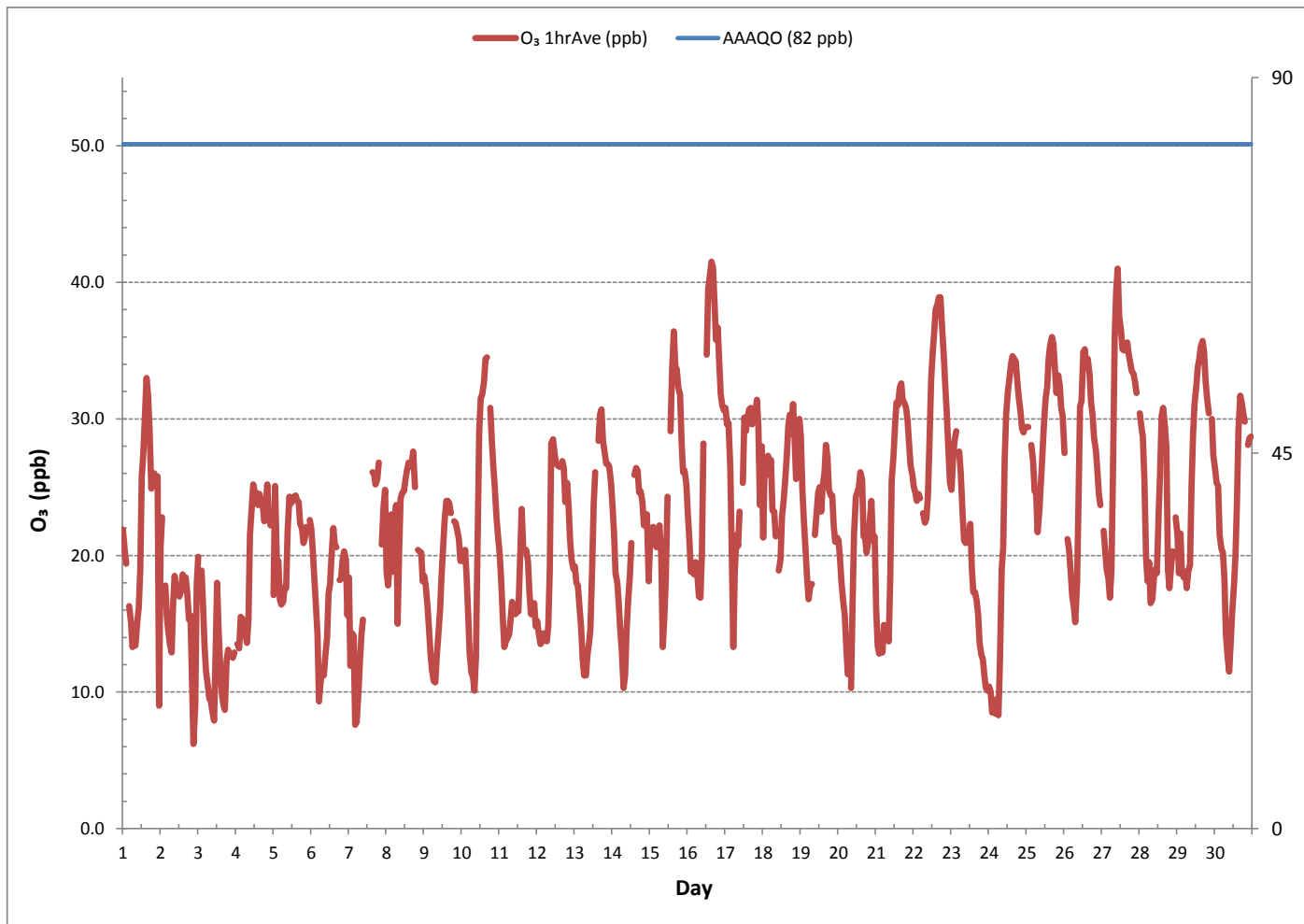
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	683					
MINIMUM 1-HR AVERAGE:	6.2	PPB	@ HOUR(S)	21	ON DAY(S)	2
MAXIMUM 1-HR AVERAGE:	41.5	PPB	@ HOUR(S)	15	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	30.6	PPB			ON DAY(S)	27
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	7.15		MONTHLY AVERAGE:	22.5	PPB	

24 HOUR AVERAGES FOR September 2016



OZONE Hourly Averages (O₃ ppb)





OZONE Instantaneous Maximum (O₃ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY 1		24.3	21.7	20.9	S	18.1	16.6	15.5	16.0	15.3	17.2	17.8	24.2	30.5	33.9	33.7	36.2	35.6	31.7	27.6	27.6	27.7	27.6	25.4	15.3	36.2	24.9	24	
2		22.1	24.6	S	19.6	17.4	16.2	15.2	14.7	19.1	20.0	19.1	18.8	18.3	19.4	20.2	19.2	20.2	19.6	P	17.0	16.4	7.2	13.8	23.4	7.2	24.6	18.3	23
3		22.6	S	20.2	18.8	15.3	13.3	11.7	10.7	10.5	9.8	9.1	19.0	19.6	17.4	13.9	11.1	10.6	11.5	13.7	14.8	13.7	13.6	13.4	14.0	9.1	22.6	14.3	24
4		S	15.2	14.7	19.9	16.9	16.0	15.9	15.0	19.2	24.0	25.6	26.8	26.2	26.2	25.1	26.2	25.7	26.0	25.0	25.7	26.2	26.1	25.4	S	14.7	26.8	22.4	24
5		24.2	26.7	26.7	22.9	19.5	18.0	18.7	19.0	20.1	24.8	25.9	25.5	25.4	26.0	25.9	25.5	25.6	24.3	24.2	22.3	22.5	25.0	S	23.6	18.0	26.7	23.6	24
6		23.3	22.2	20.1	17.5	17.9	13.3	13.4	13.1	12.7	16.1	17.1	20.9	19.9	23.9	24.3	24.4	22.8	S	S	20.6	22.5	22.2	22.5	21.3	12.7	24.4	19.6	24
7		21.4	19.2	19.2	16.4	13.2	9.7	15.6	16.8	17.9	18.1	C	C	C	C	C	C	27.9	26.5	27.3	27.9	S	21.9	27.8	28.1	9.7	28.1	20.9	24
8		24.0	20.2	25.1	25.2	25.9	27.7	26.7	18.8	22.7	26.9	26.8	26.7	27.2	27.4	28.5	28.4	30.2	30.3	26.5	S	22.1	21.4	21.9	19.0	18.8	30.3	25.2	24
9		19.5	18.6	17.7	16.0	14.1	12.9	11.8	13.1	14.1	16.2	17.3	20.2	22.5	24.4	25.3	25.5	25.0	24.9	S	23.6	23.6	23.1	23.0	20.6	11.8	25.5	19.7	24
10		20.7	20.9	21.3	20.5	17.7	14.3	12.5	13.2	11.6	17.5	26.4	32.1	32.9	33.2	34.5	36.5	36.3	S	33.2	30.1	28.9	26.6	24.6	22.5	11.6	36.5	24.7	24
11		21.9	20.2	17.4	15.6	15.1	14.8	15.1	16.8	17.8	17.3	16.6	16.8	16.9	23.8	26.1	23.5	S	22.5	21.1	19.5	16.9	17.0	17.8	16.9	14.8	26.1	18.6	24
12		16.5	15.3	14.6	15.3	16.0	16.1	15.2	17.2	21.5	30.6	30.9	28.8	28.1	28.0	28.5	S	28.9	28.6	26.9	27.2	25.1	22.7	20.5	20.1	14.6	30.9	22.7	24
13		20.4	19.5	18.7	17.8	16.1	14.3	12.1	12.7	13.8	14.9	17.3	22.5	26.0	27.6	S	31.1	31.9	32.0	30.1	28.4	27.7	27.8	27.6	26.9	12.1	32.0	22.5	24
14		25.8	23.5	20.6	19.7	17.5	16.3	15.0	12.0	13.8	16.2	18.3	19.9	23.3	S	26.9	27.4	27.3	26.0	25.8	25.5	23.4	23.7	24.2	24.4	12.0	27.4	21.6	24
15		22.9	23.1	23.0	22.6	21.8	22.6	23.5	22.7	17.1	17.5	21.7	27.6	S	31.3	38.5	38.3	36.2	36.2	34.6	33.9	30.4	27.6	27.0	26.4	17.1	38.5	27.2	24
16		24.6	22.7	20.4	20.3	20.0	21.7	20.6	18.6	18.5	24.1	30.7	S	38.0	41.8	42.0	43.9	43.5	41.1	38.0	38.0	36.0	33.6	32.6	31.5	18.5	43.9	30.5	24
17		31.8	32.0	32.2	29.3	26.5	16.5	21.0	23.2	22.3	25.0	S	29.3	31.5	30.5	31.4	32.4	32.2	32.0	32.0	32.1	32.5	31.6	26.9	29.3	16.5	32.5	28.8	24
18		25.8	28.7	28.0	28.9	28.6	29.1	25.1	24.4	23.0	S	20.1	22.2	25.0	25.3	26.8	30.9	31.8	32.6	30.8	32.8	31.1	27.4	29.6	31.3	20.1	32.8	27.8	24
19		30.9	27.1	24.4	21.9	20.0	18.3	18.7	19.2	S	23.0	24.7	27.1	27.1	25.1	27.2	27.7	29.5	29.1	27.2	25.5	25.6	24.2	22.2	22.3	18.3	30.9	24.7	24
20		22.2	21.8	19.4	18.2	18.3	17.8	13.3	S	13.0	20.3	25.4	26.4	26.2	26.9	28.1	27.2	24.6	23.4	21.5	22.2	24.4	25.6	24.9	23.0	13.0	28.1	22.4	24
21		21.3	15.6	15.3	15.0	14.6	17.3	S	18.2	15.8	25.5	27.7	28.9	31.5	32.5	32.6	34.6	34.3	33.5	32.5	32.2	31.9	30.0	28.4	26.9	14.6	34.6	25.9	24
22		26.2	25.6	25.0	25.7	25.1	S	25.0	23.5	23.9	28.2	30.9	36.0	36.1	38.0	39.4	39.6	41.1	40.5	38.6	36.6	33.9	32.5	29.6	27.0	23.5	41.1	31.7	24
23		26.5	28.4	30.4	30.1	S	28.8	27.6	24.6	22.2	21.6	23.5	23.4	24.2	21.3	18.8	18.3	17.8	17.1	14.9	14.6	13.8	12.7	11.7	11.3	11.3	30.4	21.0	24
24		12.1	11.4	10.7	S	11.0	10.7	9.9	17.8	21.3	24.7	29.4	32.6	33.4	34.3	35.8	36.0	35.6	35.7	33.9	33.2	32.4	30.4	29.8	30.3	9.9	36.0	25.8	24
25		30.4	30.4	S	29.6	28.4	26.5	26.2	23.9	25.4	27.2	29.1	32.2	32.9	35.1	36.1	36.7	37.1	37.1	35.7	33.8	34.4	33.6	33.1	31.7	23.9	37.1	31.6	24
26		29.7	S	22.3	22.1	20.3	18.6	18.3	16.3	21.8	27.8	32.9	34.0	36.5	36.6	36.0	36.1	34.6	32.7	31.5	30.5	29.1	27.7	25.9	24.7	16.3	36.6	28.1	24
27		S	23.1	21.7	20.2	19.5	18.2	20.3	32.5	38.7	41.8	43.1	39.8	38.0	36.6	36.1	36.3	37.0	36.2	35.4	35.1	34.8	34.0	33.4	S	18.2	43.1	32.4	24
28		31.9	31.2	30.1	28.5	25.6	20.1	23.1	23.0	26.1	23.2	23.5	21.3	25.0	29.6	32.5	32.4	31.4	29.7	27.2	20.4	21.4	22.2	S	25.0	20.1	32.5	26.3	24
29		24.6	21.5	23.3	21.0	19.6	20.4	18.8	20.7	22.2	29.1	31.8	33.0	35.7	35.4	35.7	36.9	37.0	36.7	34.4	33.8	31.8	S	31.3	30.0	18.8	37.0	28.9	24
30		27.8	26.6	26.8	24.6	22.6	21.9	21.1	17.1	14.2	13.4	16.5	17.3	20.2	22.6	27.8	31.7	33.5	33.4	32.2	31.3	S	30.1	30.9	31.2	13.4	33.5	25.0	24
HOURLY MAX		31.9	32.0	32.2	30.1	28.6	29.1	27.6	32.5	38.7	41.8	43.1	39.8	38.0	41.8	42.0	43.9	43.5	41.1	38.6	38.0	36.0	34.0	33.4	31.7				
HOURLY AVG		24.1	22.8	21.8	21.5	19.4	18.2	18.2	18.4	19.2	22.1	24.3	26.2	27.8	29.1	29.9	30.5	30.5	29.7	29.0	27.5	26.4	25.1	25.3	24.6				

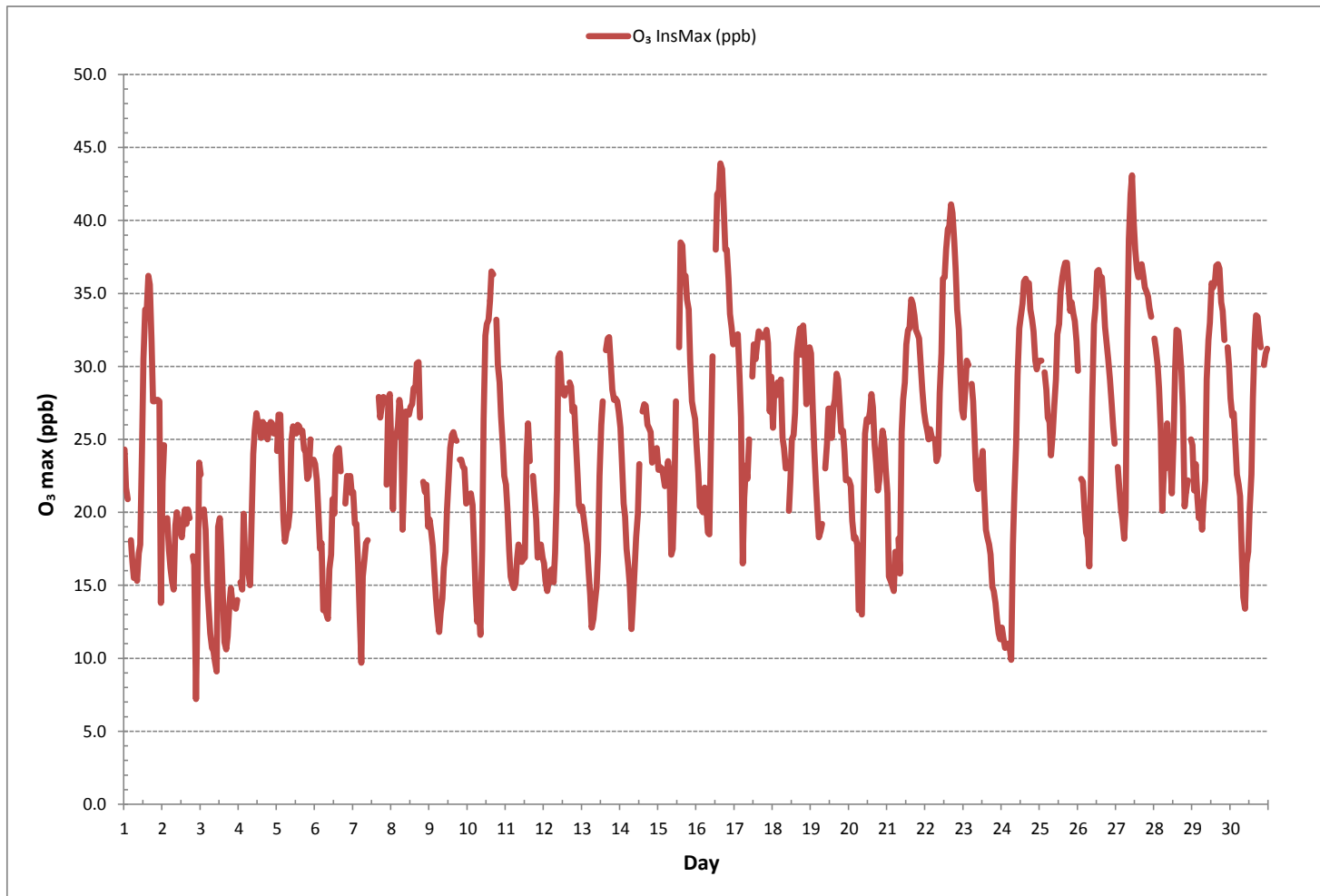
STATUS FLAG CODES

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

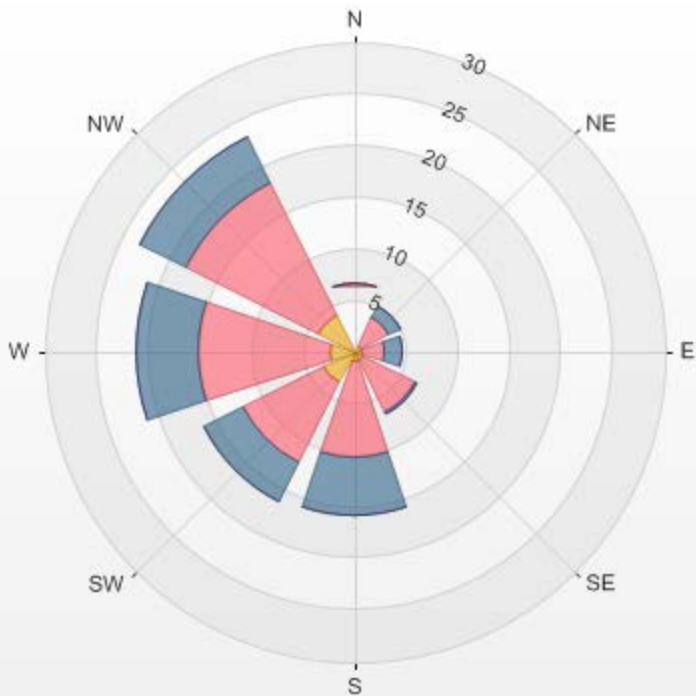
NUMBER OF NON-ZERO READINGS:	680
MAXIMUM INSTANTANEOUS VALUE:	43.9 PPB @ HOUR(S) 15 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	7.09
OPERATIONAL TIME:	719 HRS

OZONE Instantaneous Maximum (O₃ ppb)



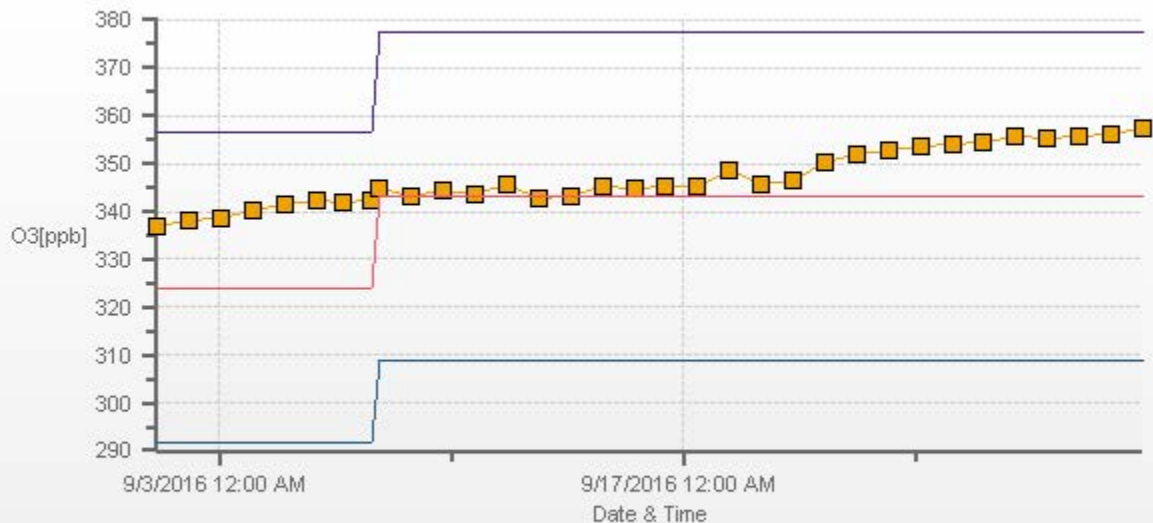
Wind: LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.44% Calm Avg: 0.00

Direction	0.0-14.0	14.0-28.0	28.0-42.0	>42.0	Total
N	0.15	6.47	0.15	0	6.77
NE	0.74	2.94	1.32	0	5
E	0.74	2.21	1.76	0	4.71
SE	0.88	5.74	0.15	0	6.77
S	0.88	9.41	5.59	0	15.88
SW	3.38	8.68	4.26	0	16.32
W	2.5	12.65	6.03	0	21.18
NW	3.97	14.26	5.15	0	23.38
Summary	13.24	62.36	24.41	0	100



% Icon Classes (ppb)	13	0.0-14.0	62	14.0-28.0	24	28.0-42.0	0	>42.0
								

O3[ppb] Calibration: LICA ST. LINA Monthly: 09/2016 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)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
1	9.0	6.4	7.9	7.9	9.0	4.0	6.9	5.0	5.9	5.4	5.0	7.5	4.5	21.9	5.4	4.0	5.9	2.9	1.4	2.4	3.5	5.9	4.0	0.4	0.4	21.9	5.9	24			
2	0.0	1.9	3.4	0.4	0.9	0.4	0.4	3.4	0.9	0.9	0.9	2.4	2.4	0.0	4.0	0.9	5.9	1.9	0.0	0.0	1.9	0.0	0.9	0.4	0.0	5.9	1.4	24			
3	1.9	0.9	1.9	4.4	1.4	0.0	2.9	5.0	0.4	1.4	3.4	1.9	X	1.9	0.9	0.0	0.0	0.0	0.0	0.9	0.0	1.4	0.0	1.4	0.0	5.0	1.4	23			
4	0.9	0.4	0.0	1.9	1.4	2.9	0.4	0.9	1.4	0.4	2.9	1.4	3.4	0.0	0.0	2.4	0.4	0.9	1.4	0.9	0.0	3.4	3.4	2.4	0.0	3.4	1.4	24			
5	3.4	0.9	0.0	0.9	0.0	0.4	0.4	0.9	0.9	3.9	5.4	0.9	6.9	2.4	3.4	1.9	2.4	4.5	7.5	5.0	5.4	2.9	5.4	3.9	0.0	7.5	2.9	24			
6	2.9	6.4	4.4	5.0	5.0	4.4	1.9	3.4	5.0	6.4	5.0	3.4	4.4	3.9	0.9	4.4	5.0	3.4	7.5	8.4	2.4	0.9	2.9	0.0	8.4	4.1	24				
7	0.0	1.4	1.9	0.9	2.4	0.9	1.4	1.9	2.4	4.4	0.4	C	C	C	5.0	2.9	0.0	0.0	0.9	2.4	1.4	2.4	1.4	1.4	0.0	5.0	1.7	24			
8	1.4	5.0	2.4	0.9	0.0	4.4	3.9	2.9	1.9	1.9	1.4	0.9	0.0	1.4	1.4	X	0.4	0.0	0.0	0.0	0.0	0.0	0.4	3.4	0.0	5.0	1.5	23			
9	1.9	2.4	1.4	2.4	2.9	3.4	1.9	0.9	0.9	0.0	0.4	X	0.0	X	0.0	0.0	0.0	0.0	1.4	1.9	0.4	1.9	5.4	4.4	0.0	5.4	1.5	22			
10	5.9	4.4	1.4	3.4	1.4	2.4	2.9	0.4	4.0	0.0	1.9	0.0	0.0	0.0	0.0	0.4	0.0	X	0.0	1.4	1.9	0.0	0.0	2.4	0.0	5.9	1.5	23			
11	1.4	1.4	1.9	X	1.9	1.9	0.0	2.9	0.4	1.4	0.0	0.0	0.0	1.4	0.4	1.9	1.4	3.4	1.4	1.4	0.0	0.0	0.4	0.0	0.0	3.4	1.1	23			
12	0.0	1.4	2.4	0.0	0.9	0.0	0.4	4.5	0.4	X	0.9	0.4	0.0	0.4	X	0.9	5.9	X	0.0	5.0	0.0	3.4	2.9	0.4	0.0	5.9	1.4	21			
13	1.9	5.9	4.5	2.9	0.9	4.0	2.4	4.0	5.4	2.4	5.4	5.0	0.4	6.9	X	3.4	0.0	0.0	7.9	0.0	2.9	4.5	5.9	0.9	0.0	7.9	3.4	23			
14	5.4	5.4	3.5	5.4	4.0	3.4	1.4	3.4	0.0	4.5	1.9	7.5	7.5	3.9	1.9	0.0	2.4	2.9	3.5	1.9	2.4	2.4	2.9	X	0.0	7.5	3.4	23			
15	0.9	2.4	0.0	0.9	2.9	3.0	0.9	1.9	0.0	5.0	0.0	X	1.9	0.0	6.9	2.4	0.0	5.4	3.0	0.0	5.4	5.0	2.4	0.9	0.0	6.9	2.2	23			
16	5.9	9.0	4.0	6.4	6.4	1.5	2.4	2.4	4.0	5.4	7.9	6.4	7.5	4.0	5.0	8.0	3.4	9.0	5.0	4.5	7.9	2.9	5.4	3.5	1.5	9.0	5.3	24			
17	5.0	7.0	6.9	1.9	X	3.4	0.0	0.0	2.4	0.5	3.9	6.4	1.5	1.9	1.9	0.0	2.4	0.0	X	0.0	0.0	0.0	0.0	0.0	0.0	7.0	2.1	22			
18	0.0	X	0.0	X	0.0	0.5	0.0	2.3	3.0	2.0	0.0	0.9	1.4	0.9	0.4	0.0	2.8	1.2	0.4	0.4	0.9	0.4	1.5	1.0	0.0	3.0	0.9	22			
19	5.3	3.3	1.5	2.4	1.9	1.9	0.9	3.5	1.8	0.0	0.0	5.4	X	0.9	X	X	X	X	0.0	2.5	0.0	0.0	0.8	2.4	0.0	5.4	1.8	19			
20	3.3	2.3	1.9	3.1	1.2	4.6	6.2	2.7	5.3	1.0	0.0	X	C	C	0.0	0.4	X	1.1	2.6	1.1	3.1	5.0	1.9	3.8	0.0	6.2	2.5	22			
21	2.9	2.4	3.4	0.0	1.3	1.8	3.9	7.9	1.6	0.1	1.9	3.0	4.1	0.1	0.9	0.9	5.0	7.9	8.2	4.2	4.0	6.3	2.9	3.1	0.0	8.2	3.2	24			
22	7.5	5.4	5.6	4.4	2.9	4.2	5.1	2.7	0.4	3.6	1.9	2.8	1.5	4.7	4.7	3.1	3.4	1.4	3.9	2.2	2.4	6.3	5.2	2.2	0.4	7.5	3.6	24			
23	3.4	1.7	6.1	1.7	3.9	0.7	3.4	4.7	6.2	1.7	2.7	5.0	3.4	5.6	5.4	4.7	3.1	3.7	5.9	0.0	1.9	2.4	1.0	2.2	0.0	6.2	3.4	24			
24	3.2	7.5	4.9	4.4	0.7	5.9	4.2	0.8	2.7	2.9	6.6	5.2	2.4	1.7	0.0	2.2	0.0	1.4	0.0	1.9	2.8	6.4	3.9	3.7	0.0	7.5	3.1	24			
25	1.7	3.6	0.0	1.2	5.4	4.3	1.8	1.1	3.8	1.6	2.9	1.7	1.6	1.3	0.7	1.8	0.7	0.1	0.8	3.8	3.7	3.4	4.1	4.3	0.0	5.4	2.3	24			
26	1.3	4.2	5.6	5.1	7.9	4.6	5.3	3.4	5.8	1.8	1.2	6.8	2.3	3.6	1.4	0.0	X	2.7	1.4	4.3	0.0	2.4	6.0	4.0	0.0	7.9	3.5	23			
27	2.3	2.7	4.3	4.4	5.9	2.9	4.4	0.4	0.0	3.3	1.6	5.5	5.3	5.0	2.4	4.5	1.9	0.3	0.0	2.4	2.9	1.5	1.8	2.8	0.0	5.9	2.9	24			
28	1.0	1.4	1.5	3.7	3.5	5.9	6.4	1.9	3.5	7.5	4.9	5.5	4.9	7.0	0.9	7.5	4.5	1.9	6.4	4.4	3.9	5.5	4.4	2.9	0.9	7.5	4.2	24			
29	4.9	5.0	3.4	5.4	5.4	3.9	4.4	2.4	5.0	3.9	2.4	4.4	2.4	1.9	5.4	1.5	4.4	3.5	0.9	3.4	4.4	4.0	2.9	4.4	0.9	5.4	3.7	24			
30	4.4	2.4	2.9	7.9	4.0	9.0	X	5.0	1.4	2.4	0.4	5.9	3.4	4.5	2.9	2.4	3.5	5.4	5.0	5.0	0.9	5.0	2.4	3.4	0.4	9.0	3.9	23			
HOURLY MAX	9.0	9.0	7.9	7.9	9.0	9.0	6.9	7.9	6.2	7.5	7.9	7.5	7.5	21.9	6.9	8.0	5.9	9.0	8.2	8.4	7.9	6.4	6.0	4.4							
HOURLY AVG	3.0	3.6	3.0	3.2	2.9	3.0	2.6	2.8	2.6	2.6	2.4	3.7	2.8	3.2	2.3	2.2	2.4	2.4	2.6	2.4	2.2	2.9	2.8	2.3							

STATUS FLAG CODES

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

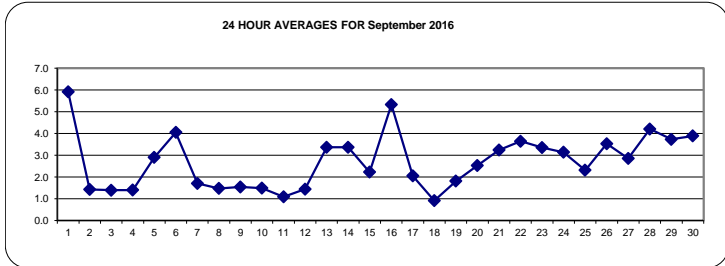
OBJECTIVE LIMIT:

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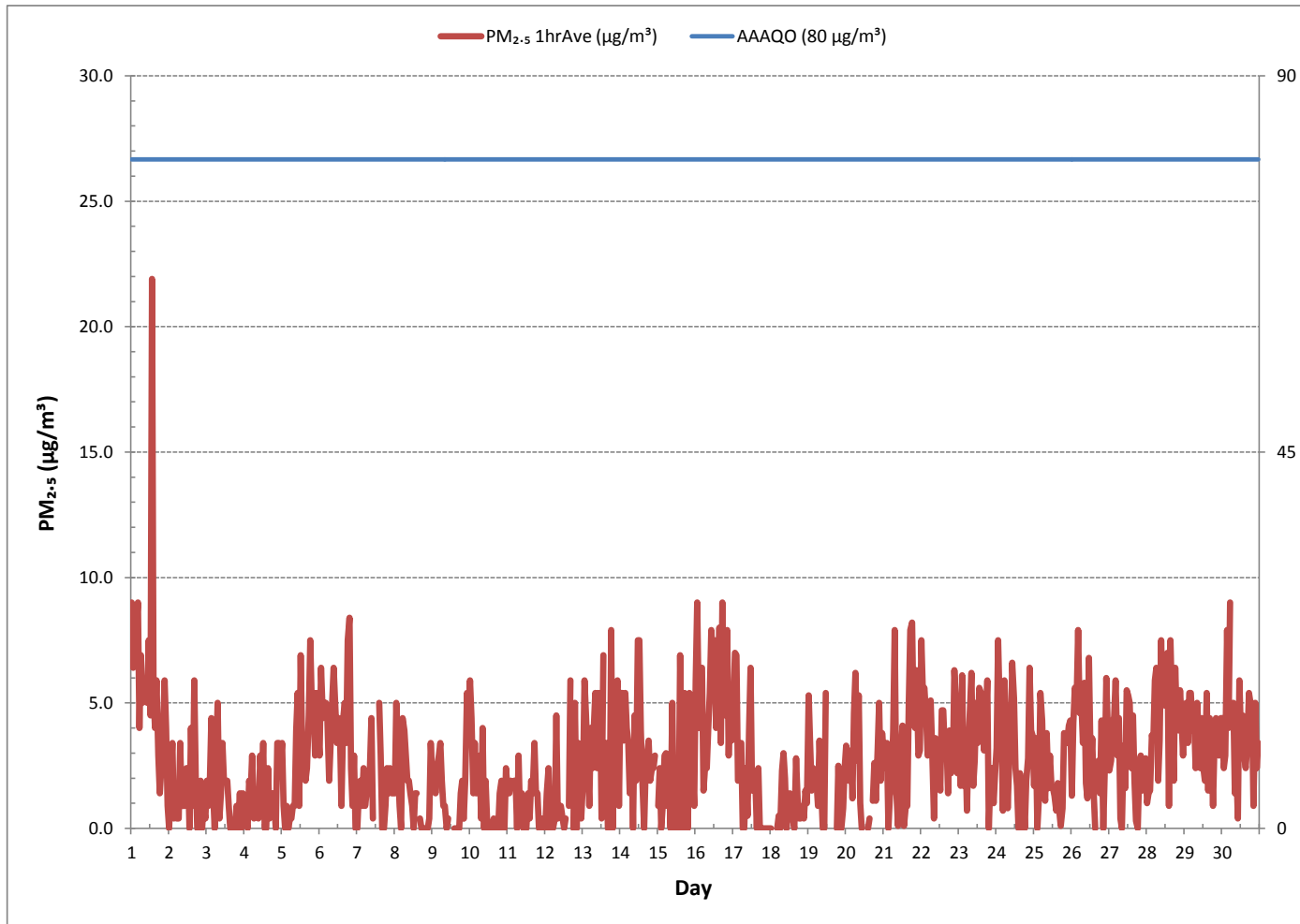
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	590					
MINIMUM 1-HR AVERAGE:	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	21.9	µg/m ³	@ HOUR(S)	13	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	5.9	µg/m ³			ON DAY(S)	1
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	5	HRS	OPERATIONAL TIME:	695	HRS	
STANDARD DEVIATION:	2.28		AMD OPERATION UPTIME:	96.5	%	
			MONTHLY AVERAGE:	2.7	µg/m ³	

24 HOUR AVERAGES FOR September 2016

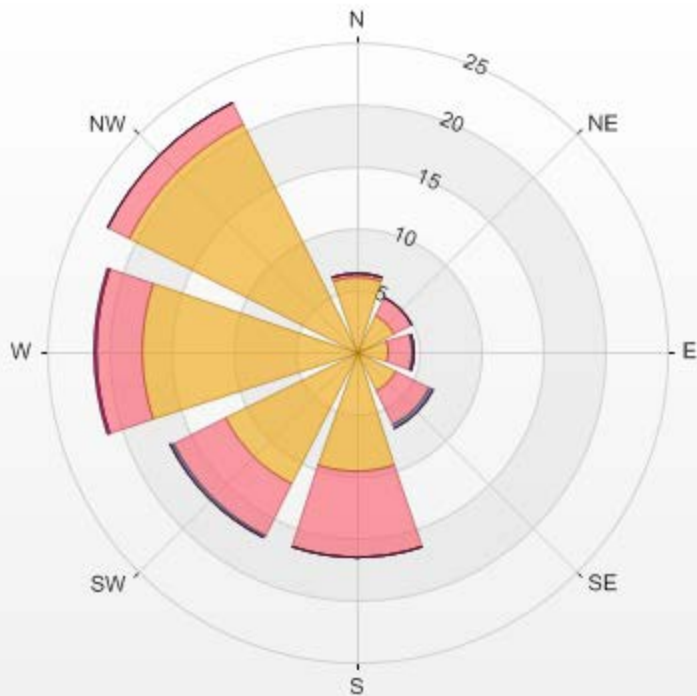


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-PM2.5[ug/m3(L)] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.69% Calm Avg: 0.00

Direction	0.0-4.4	4.4-8.8	8.8-13.2	13.2-17.6	17.6-22.0	>22.0	Total
N	6.1	0.29	0	0	0	0	6.39
NE	3.34	1.6	0	0	0	0	4.94
E	2.61	1.89	0.15	0	0	0	4.65
SE	3.48	3.19	0.29	0	0	0	6.96
S	9.72	6.82	0	0	0	0	16.54
SW	11.9	4.64	0.29	0	0	0	16.83
W	17.27	3.77	0	0	0.15	0	21.19
NW	20.61	1.89	0	0	0	0	22.5
Summary	75.03	24.09	0.73	0	0.15	0	100



% Icon Classes (ug/m3(L)) 75 0.0-4.4 24 4.4-8.8 1 8.8-13.2 0 13.2-17.6 0 17.6-22.0 0 >22.0

WIND SPEED



WIND SPEED Hourly Averages (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
1		11.0	12.9	12.7	12.5	11.2	9.8	10.2	11.3	7.4	8.7	5.8	9.5	18.3	25.0	19.4	19.8	14.6	12.3	8.0	6.0	5.6	7.8	8.3	8.5	5.6	25.0	11.5	24
2		10.6	10.5	7.9	7.5	9.3	9.3	8.4	6.4	5.5	6.8	5.5	9.8	9.7	10.5	9.1	7.0	7.1	7.2	8.2	10.9	14.1	16.1	18.7	17.5	5.5	18.7	9.7	24
3		17.9	17.3	15.7	15.7	15.8	16.4	17.2	19.0	22.6	21.6	26.1	26.9	23.2	22.3	18.1	15.5	16.9	15.0	12.2	12.8	14.4	14.1	11.0	12.0	11.0	26.9	17.5	24
4		11.3	11.0	9.4	7.4	8.5	9.8	7.0	6.5	6.6	7.3	7.7	6.4	5.9	4.4	4.9	5.2	3.8	3.9	2.9	1.6	1.4	3.4	4.5	5.9	1.4	11.3	6.1	24
5		4.1	1.2	5.2	6.9	5.9	9.4	7.6	6.8	7.8	10.4	9.2	8.1	7.4	5.5	7.4	7.1	7.2	8.5	9.6	11.0	13.7	14.2	14.7	12.0	1.2	14.7	8.4	24
6		11.3	8.4	7.5	6.1	1.2	5.7	8.1	6.9	6.9	5.7	3.1	5.9	6.0	8.1	8.7	5.1	7.2	5.3	3.3	5.1	4.9	4.9	4.7	5.2	1.2	11.3	6.1	24
7		6.6	5.8	6.7	6.6	6.1	5.8	6.5	5.5	5.1	6.3	9.0	14.0	11.8	10.8	8.6	10.9	12.2	9.4	7.4	5.8	5.5	6.4	5.8	5.2	5.1	14.0	7.7	24
8		6.1	7.0	5.0	4.8	5.0	4.9	7.8	0.7	3.8	3.8	5.2	7.6	8.4	10.7	11.7	14.3	12.1	11.2	8.4	8.1	8.8	10.1	9.6	11.8	0.7	14.3	7.8	24
9		12.7	10.7	12.3	11.5	10.7	8.6	8.5	7.2	7.6	8.0	8.2	6.9	8.9	8.9	7.7	6.4	6.0	3.5	3.3	8.0	9.9	9.0	9.2	8.7	3.3	12.7	8.4	24
10		8.5	9.8	10.3	7.6	8.2	6.0	7.5	6.4	5.2	8.7	19.5	24.2	23.0	21.4	21.6	22.9	18.7	14.2	11.2	7.4	7.8	10.0	8.3	7.6	5.2	24.2	12.3	24
11		8.1	9.4	10.7	11.1	16.0	14.3	16.5	16.6	18.1	16.1	17.0	17.0	18.6	19.9	15.6	15.0	14.8	12.4	9.5	11.3	11.5	10.5	6.4	6.4	6.4	19.9	14.0	24
12		8.0	8.2	7.7	6.7	4.9	5.0	6.3	7.3	5.2	7.1	7.8	8.4	7.4	7.4	8.6	5.6	9.9	4.9	4.5	7.5	8.7	9.3	10.3	10.2	4.5	10.3	7.4	24
13		10.0	11.2	10.6	7.9	8.6	9.2	9.2	8.0	10.4	10.7	8.7	11.6	19.6	22.9	21.1	23.6	21.3	16.3	13.8	10.3	9.7	8.8	8.3	8.3	7.9	23.6	12.5	24
14		8.4	10.3	11.2	13.0	12.3	10.2	10.0	6.5	7.4	10.0	8.7	11.1	18.5	15.6	14.7	13.4	10.1	6.5	5.6	7.4	7.4	7.5	8.3	8.0	5.6	18.5	10.1	24
15		10.9	10.2	9.1	9.4	9.2	8.1	7.2	5.0	7.2	7.4	7.5	7.8	8.6	9.5	11.5	8.5	8.7	8.1	5.3	8.8	8.9	9.5	10.4	11.3	5.0	11.5	8.7	24
16		12.4	10.5	6.9	9.0	9.0	7.7	8.0	6.7	6.5	5.3	8.1	7.2	10.4	11.5	12.0	12.9	11.1	7.8	5.2	8.1	6.4	8.5	9.2	10.2	5.2	12.9	8.8	24
17		7.7	2.5	4.2	2.5	3.9	8.0	9.2	8.0	11.0	9.9	9.9	12.4	14.4	13.9	10.3	8.3	4.4	4.5	4.7	2.7	4.8	5.6	5.4	4.8	2.5	14.4	7.2	24
18		15.5	8.9	10.3	8.5	9.5	10.7	10.8	16.2	17.1	17.1	16.1	14.0	16.7	17.2	13.8	13.0	14.4	15.8	14.3	11.5	10.9	9.6	12.4	9.9	8.5	17.2	13.1	24
19		9.1	11.0	12.6	13.8	11.1	9.5	10.7	9.9	12.8	13.8	13.9	14.3	12.7	12.6	11.7	10.9	12.4	6.9	5.8	7.9	7.7	7.6	8.8	8.4	5.8	14.3	10.7	24
20		8.8	7.7	5.7	6.7	5.8	5.2	3.3	3.7	1.8	3.2	4.2	3.2	6.5	6.2	8.0	8.4	9.8	5.8	6.3	6.3	5.6	4.2	4.6	5.2	1.8	9.8	5.7	24
21		4.9	5.4	5.9	6.4	6.8	5.5	6.2	4.7	5.2	6.8	9.6	9.0	10.4	13.1	10.0	9.2	11.8	9.6	7.0	6.1	6.6	7.5	7.7	9.2	4.7	13.1	7.7	24
22		9.2	8.8	9.4	10.3	10.6	10.9	10.6	7.6	7.1	8.9	9.0	12.8	14.2	13.4	14.0	15.8	12.7	11.8	11.9	10.1	11.0	11.4	12.6	13.3	7.1	15.8	11.1	24
23		13.8	14.3	16.4	15.1	13.5	13.0	11.7	13.7	14.7	14.2	14.0	14.7	16.5	14.3	13.0	13.6	10.6	7.8	5.8	5.8	5.0	5.6	5.9	6.7	5.0	16.5	11.7	24
24		5.0	3.2	3.8	3.4	8.2	9.9	9.1	10.2	10.6	11.2	13.2	16.2	19.5	17.6	17.5	18.3	16.7	14.5	9.0	8.6	8.5	9.7	9.2	10.2	3.2	19.5	11.0	24
25		10.4	9.8	11.6	13.2	13.2	14.2	11.4	11.5	12.9	10.7	11.8	16.8	18.0	14.0	14.8	13.9	10.9	7.8	8.5	7.8	6.8	5.6	5.1	6.7	5.1	18.0	11.1	24
26		7.5	7.7	7.9	7.8	7.4	9.0	8.7	9.6	9.6	11.9	15.2	13.7	11.1	12.0	14.4	14.5	11.3	9.3	11.1	11.0	10.9	11.4	14.3	14.4	7.4	15.2	10.9	24
27		14.7	14.4	13.7	11.3	9.5	11.5	13.0	17.8	19.0	18.8	20.2	11.9	12.6	16.6	16.9	17.2	15.6	10.3	7.3	8.0	7.3	8.5	7.7	8.7	7.3	20.2	13.0	24
28		9.0	9.7	10.9	10.0	8.8	9.4	8.0	6.4	4.5	1.6	2.1	2.4	3.9	3.4	6.4	9.2	8.4	7.4	10.8	11.2	11.2	11.5	8.8	8.4	1.6	11.5	7.6	24
29		10.0	10.5	10.3	9.4	9.0	9.4	9.5	8.4	6.0	7.2	4.9	7.2	8.7	8.3	9.2	9.9	8.7	7.7	8.9	9.7	10.6	11.8	13.7	9.7	4.9	13.7	9.1	24
30		9.5	10.3	11.0	10.6	11.7	8.5	11.1	10.3	10.8	8.9	12.4	12.9	14.1	15.9	17.9	21.8	17.1	16.9	16.4	15.9	14.5	12.5	14.3	14.5	8.5	21.8	13.3	24
HOURLY MAX		17.9	17.3	16.4	15.7	16.0	16.4	17.2	19.0	22.6	21.6	26.1	26.9	23.2	25.0	21.6	23.6	21.3	16.9	16.4	15.9	14.5	16.1	18.7	17.5				
HOURLY AVG		9.8	9.3	9.4	9.1	9.0	9.2	9.3	8.8	9.3	9.7	10.4	11.5	12.8	13.1	12.8	12.6	11.6	9.5	8.3	8.4	8.7	9.1	9.4	9.3				

STATUS FLAG CODES

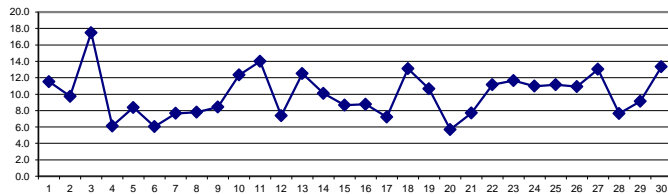
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	July 7, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

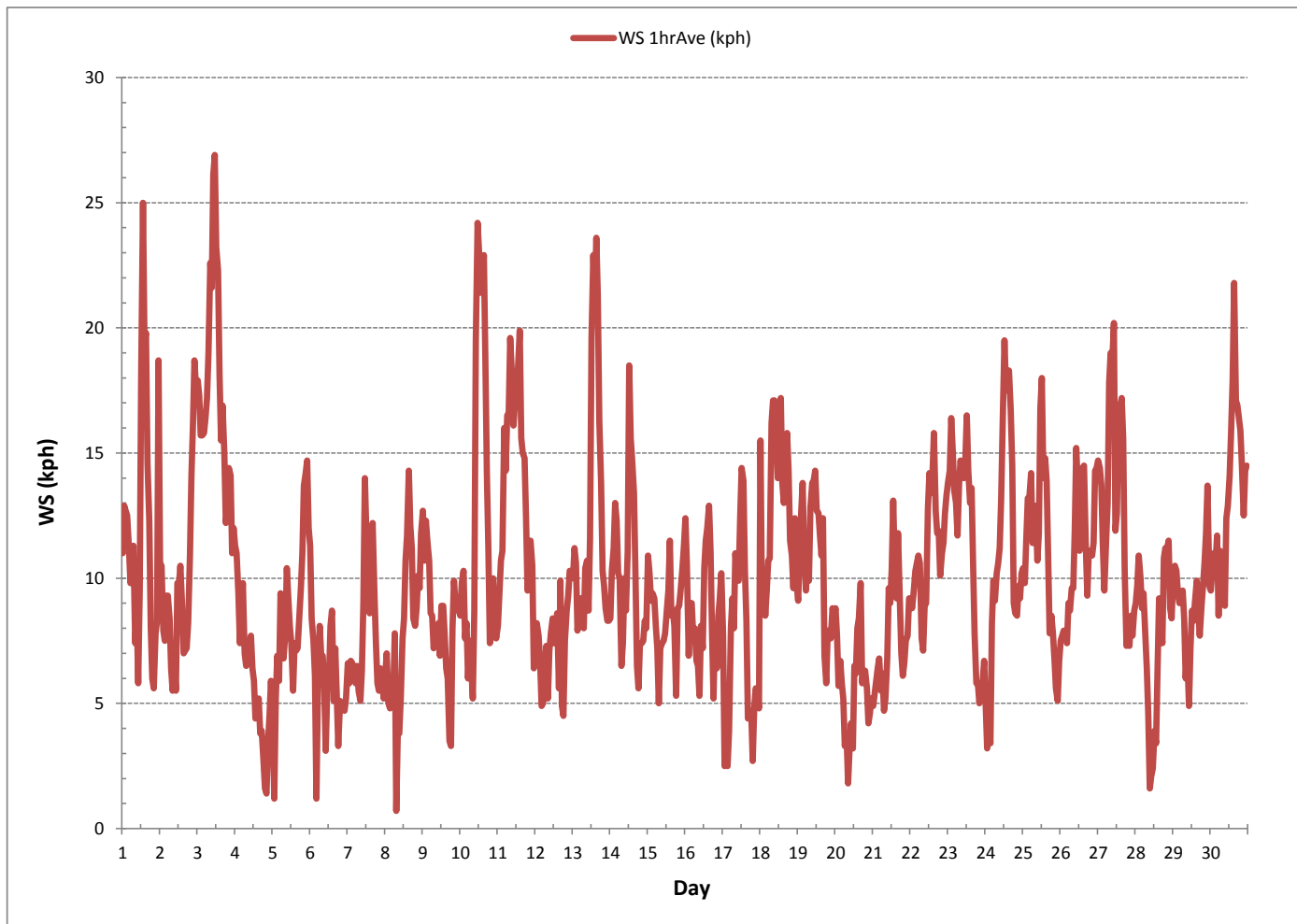
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.7 kph @ HOUR(S) 7 ON DAY(S) 8
MAXIMUM 1-HR AVERAGE:	26.9 kph @ HOUR(S) 11 ON DAY(S) 3
MAXIMUM 24-HR AVERAGE:	17.5 kph ON DAY(S) 3
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 HRS
OPERATIONAL TIME:	720 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.26
MONTHLY AVERAGE:	10.0 kph

24 HOUR AVERAGES FOR September 2016



WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	25.8	25.5	23.9	26.6	24.4	20.9	24.9	32.1	24.1	23.6	16.8	28.5	42.4	44.7	41.9	38.7	33.6	28.1	22.9	12.9	11.5	18.4	17.4	16.7	11.5	44.7	26.1	24	
2	22.1	24.1	18.1	16.0	21.6	20.5	21.0	17.8	21.6	18.5	19.1	27.6	27.0	26.7	26.1	18.7	18.3	19.6	P	36.2	34.7	38.6	45.5	40.5	16.0	45.5	25.2	23	
3	33.2	37.9	32.6	30.4	31.5	27.9	33.2	36.4	44.1	41.5	47.8	51.5	47.2	53.3	43.3	42.8	40.4	35.4	36.7	31.4	33.4	36.6	28.7	30.3	27.9	53.3	37.8	24	
4	33.2	31.8	24.7	19.9	21.7	23.3	19.2	16.3	16.8	19.8	20.1	19.5	15.4	15.5	14.5	13.6	12.7	10.5	6.2	3.7	3.7	7.6	7.3	9.9	3.7	33.2	16.1	24	
5	7.5	4.6	10.0	13.7	15.1	16.0	14.0	12.1	16.6	24.4	22.8	19.2	19.1	20.3	18.5	19.9	22.3	23.8	20.9	27.7	34.5	33.3	26.0	4.6	34.5	19.4	24		
6	25.3	18.3	15.6	14.5	5.6	12.4	19.6	17.7	14.0	13.0	10.4	14.0	14.3	18.7	21.0	15.2	16.7	13.0	9.7	8.4	7.6	8.6	7.5	10.0	5.6	25.3	13.8	24	
7	9.6	9.0	10.6	9.4	11.2	10.5	11.5	14.7	13.3	16.3	20.6	27.5	27.8	29.4	25.7	31.0	28.3	26.0	27.3	10.2	9.2	8.3	8.1	7.2	7.2	31.0	16.8	24	
8	10.4	10.1	7.7	8.4	12.4	10.5	15.4	9.0	13.2	10.7	17.2	23.6	24.1	27.3	40.4	40.6	38.7	34.5	21.6	14.9	17.1	23.9	21.4	27.5	7.7	40.6	20.0	24	
9	26.9	20.6	28.2	24.1	21.7	20.5	19.0	17.6	15.6	17.8	24.7	20.6	22.3	25.5	22.5	19.2	16.1	10.3	8.2	12.3	17.2	16.8	17.3	17.8	8.2	28.2	19.3	24	
10	16.8	19.3	20.8	18.2	16.3	14.4	19.0	30.6	15.0	28.0	39.7	50.2	50.7	52.7	47.5	60.4	42.5	36.5	35.1	19.1	22.6	29.7	23.0	19.1	14.4	60.4	30.3	24	
11	15.5	20.3	25.8	29.2	40.4	39.2	38.0	41.1	50.3	49.8	42.6	42.0	39.5	44.9	49.8	48.9	41.4	39.2	34.8	23.0	29.2	26.9	24.7	16.0	15.5	50.3	35.5	24	
12	17.5	19.9	16.6	16.3	13.6	10.4	15.5	16.2	13.5	20.6	22.4	22.4	18.0	21.7	21.8	23.9	25.0	12.6	12.0	11.2	12.9	15.2	14.5	21.8	10.4	25.0	17.3	24	
13	23.8	21.6	24.0	18.1	20.2	19.8	20.8	21.1	27.0	24.8	25.0	30.9	40.9	43.3	44.8	50.1	43.8	35.4	29.2	21.4	20.3	20.1	15.7	15.2	15.2	50.1	27.4	24	
14	12.8	13.6	19.4	18.4	16.9	14.8	13.1	11.2	14.1	15.7	18.1	23.9	35.0	32.6	35.6	29.2	25.0	24.6	11.8	13.4	15.4	13.9	17.5	19.0	11.2	35.6	19.4	24	
15	17.4	19.4	16.6	15.4	16.8	12.4	9.3	11.0	14.8	17.3	19.6	20.0	23.9	29.5	29.1	26.0	24.1	20.7	9.9	12.9	13.5	16.0	18.0	17.7	9.3	29.5	18.0	24	
16	20.9	21.6	20.7	20.9	21.2	15.2	14.0	14.4	15.2	13.3	16.0	18.7	31.5	34.1	33.1	35.2	31.1	24.6	11.6	12.2	10.2	13.0	14.5	16.3	10.2	35.2	20.0	24	
17	14.3	13.7	10.2	10.5	13.1	21.1	25.3	17.7	26.2	22.2	20.6	31.4	31.1	33.5	26.4	21.1	10.6	11.6	9.5	6.2	6.9	8.1	7.9	13.3	6.2	33.5	17.2	24	
18	38.4	18.9	19.7	18.2	17.8	20.7	22.3	30.1	29.6	33.2	27.6	31.4	42.3	37.1	33.3	45.6	37.6	35.7	37.7	28.7	28.2	20.2	27.0	20.4	17.8	45.6	29.2	24	
19	18.0	19.5	21.2	26.4	23.2	19.5	22.3	23.5	27.9	31.7	31.0	34.8	31.9	30.1	29.2	32.3	30.7	17.5	18.3	14.7	12.4	12.6	19.4	18.8	12.4	34.8	23.6	24	
20	15.7	14.5	12.1	16.4	13.2	13.6	8.8	10.3	8.5	10.9	14.9	18.1	16.2	26.5	23.9	24.5	26.1	16.6	12.3	11.9	7.8	6.9	7.1	7.3	6.9	26.5	14.3	24	
21	8.0	8.2	11.2	9.4	10.1	9.4	8.6	9.8	10.3	17.0	21.7	22.8	30.1	28.8	30.3	23.6	26.1	20.8	13.4	8.9	10.3	10.8	13.2	16.0	8.0	30.3	15.8	24	
22	15.3	13.3	15.9	17.4	14.5	15.8	18.5	13.3	14.3	19.6	26.0	33.1	33.0	30.9	35.0	37.9	33.1	27.6	28.4	19.1	22.2	21.2	25.3	29.4	13.3	37.9	23.3	24	
23	30.0	33.1	33.5	36.3	35.5	28.3	25.0	32.0	31.8	31.4	29.4	34.9	36.5	34.4	29.8	29.2	27.4	17.6	12.4	12.9	10.8	12.1	12.9	14.9	10.8	36.5	26.3	24	
24	15.4	9.2	10.9	9.9	19.7	21.6	15.2	19.0	21.4	28.0	32.6	39.2	44.0	42.6	41.1	45.4	45.1	42.2	18.4	15.0	15.9	17.7	18.1	19.4	9.2	45.4	25.3	24	
25	20.5	19.7	20.1	22.2	22.1	19.3	17.1	18.0	21.6	21.8	23.9	38.5	42.7	36.7	33.1	34.9	26.3	21.8	14.1	11.8	11.3	7.7	8.3	10.4	7.7	42.7	21.8	24	
26	13.4	13.2	12.8	11.6	9.4	13.1	12.8	16.8	19.9	25.8	30.9	29.3	27.9	26.0	32.1	29.9	27.3	18.8	23.7	22.0	20.5	19.1	24.4	26.3	9.4	32.1	21.1	24	
27	26.3	24.3	22.7	20.9	19.2	19.4	27.8	42.6	45.0	55.0	48.3	38.9	35.3	39.2	37.4	39.8	34.8	34.4	16.0	13.3	12.5	13.7	11.6	13.0	11.6	55.0	28.8	24	
28	13.5	13.0	14.6	13.2	10.6	10.6	11.0	9.9	12.8	6.8	8.8	7.2	9.4	11.4	18.8	20.1	19.7	15.6	20.1	20.5	20.9	23.2	18.8	13.3	6.8	23.2	14.3	24	
29	14.1	15.4	16.5	15.3	13.0	14.6	13.3	12.5	11.9	14.9	13.9	16.8	20.3	19.9	19.6	22.0	18.2	17.7	15.3	18.1	17.5	20.3	27.3	17.1	11.9	27.3	16.9	24	
30	15.5	19.1	19.9	23.4	25.4	24.5	24.0	22.8	23.2	21.3	30.8	30.0	34.0	39.6	41.2	46.7	39.1	39.5	40.7	37.4	33.1	30.2	32.4	33.0	15.5	46.7	30.3	24	
HOURLY MAX	38.4	37.9	33.5	36.3	40.4	39.2	38.0	42.6	50.3	55.0	48.3	51.5	50.7	53.3	49.8	60.4	45.1	42.2	40.7	37.4	34.7	38.6	45.5	40.5					
HOURLY AVG	19.2	18.4	18.6	18.4	18.6	18.0	18.7	19.9	21.1	23.2	24.8	28.3	30.5	31.9	31.6	32.2	28.7	24.4	20.0	16.8	17.2	18.4	18.9	18.8					

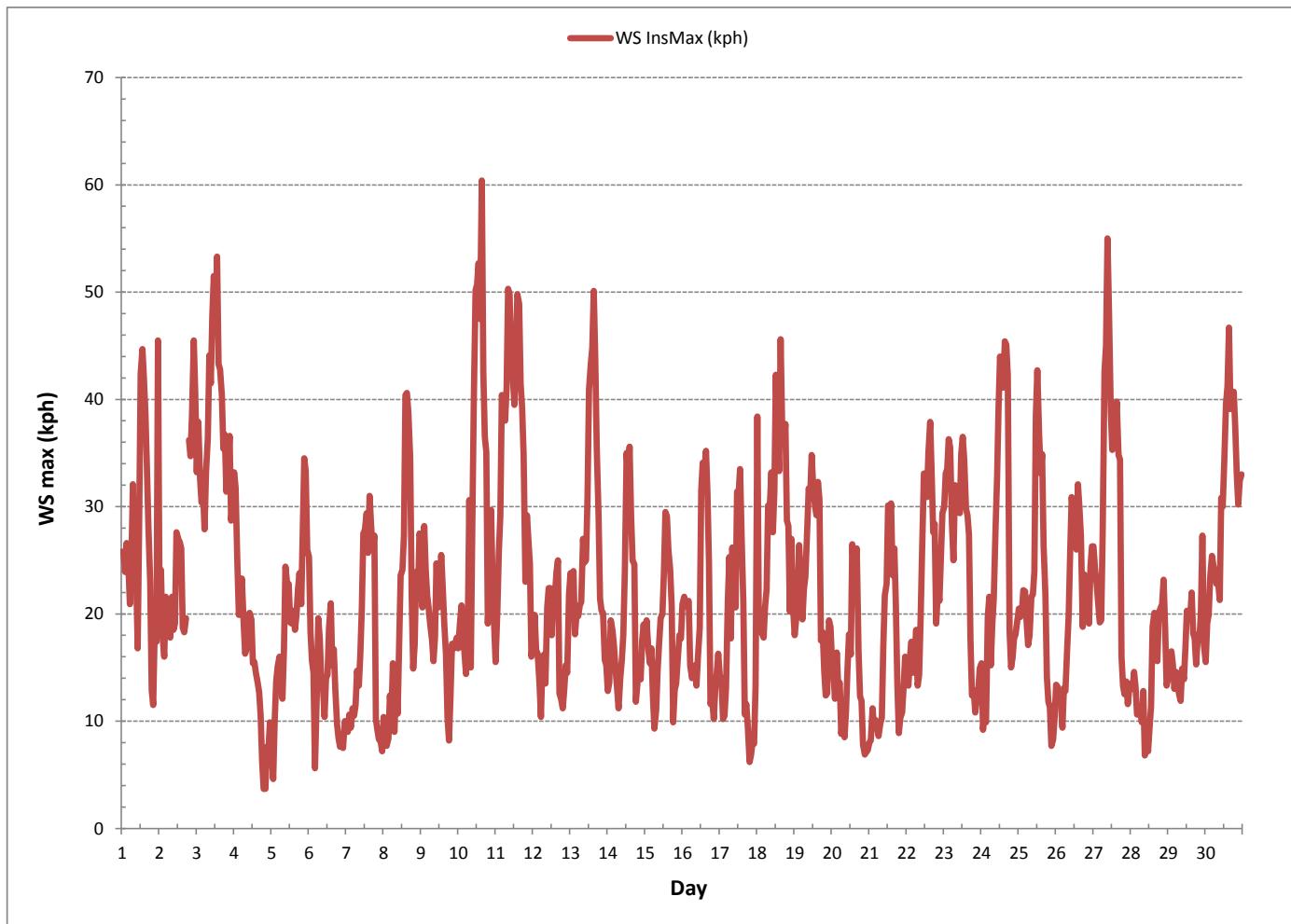
STATUS FLAG CODES

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

MONTHLY SUMMARY

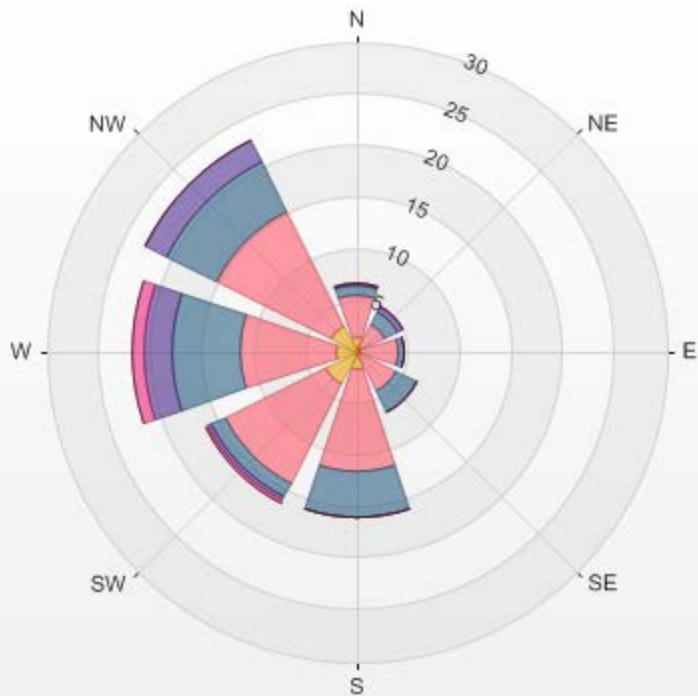
MAXIMUM INSTANTANEOUS VALUE:	60.4	kph	@ HOUR(S)	15	ON DAY(S)	10
					VAR-VARIOUS	
OPERATIONAL TIME:					719	HRS

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA Monitor: WSP [kph] Monthly: 09/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0	Total
N	1.53	3.89	0.97	0.28	0	0	6.67
NE	0.42	2.64	1.39	0.56	0	0	5.01
E	0.42	3.61	0.56	0	0	0	4.59
SE	0.28	3.89	2.5	0	0	0	6.67
S	1.67	9.86	4.44	0	0	0	15.97
SW	3.47	10.83	1.39	0.42	0.28	0	16.39
W	2.08	9.17	6.67	2.78	1.11	0	21.81
NW	2.78	12.36	5.56	2.22	0	0	22.92
Summary	12.65	56.25	23.48	6.26	1.39	0	100



% Icon Classes (kph)	13	56	23	6	1	0
0.0-5.6	0.0-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0

WIND DIRECTION



WIND DIRECTION Hourly Averages (WD)

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

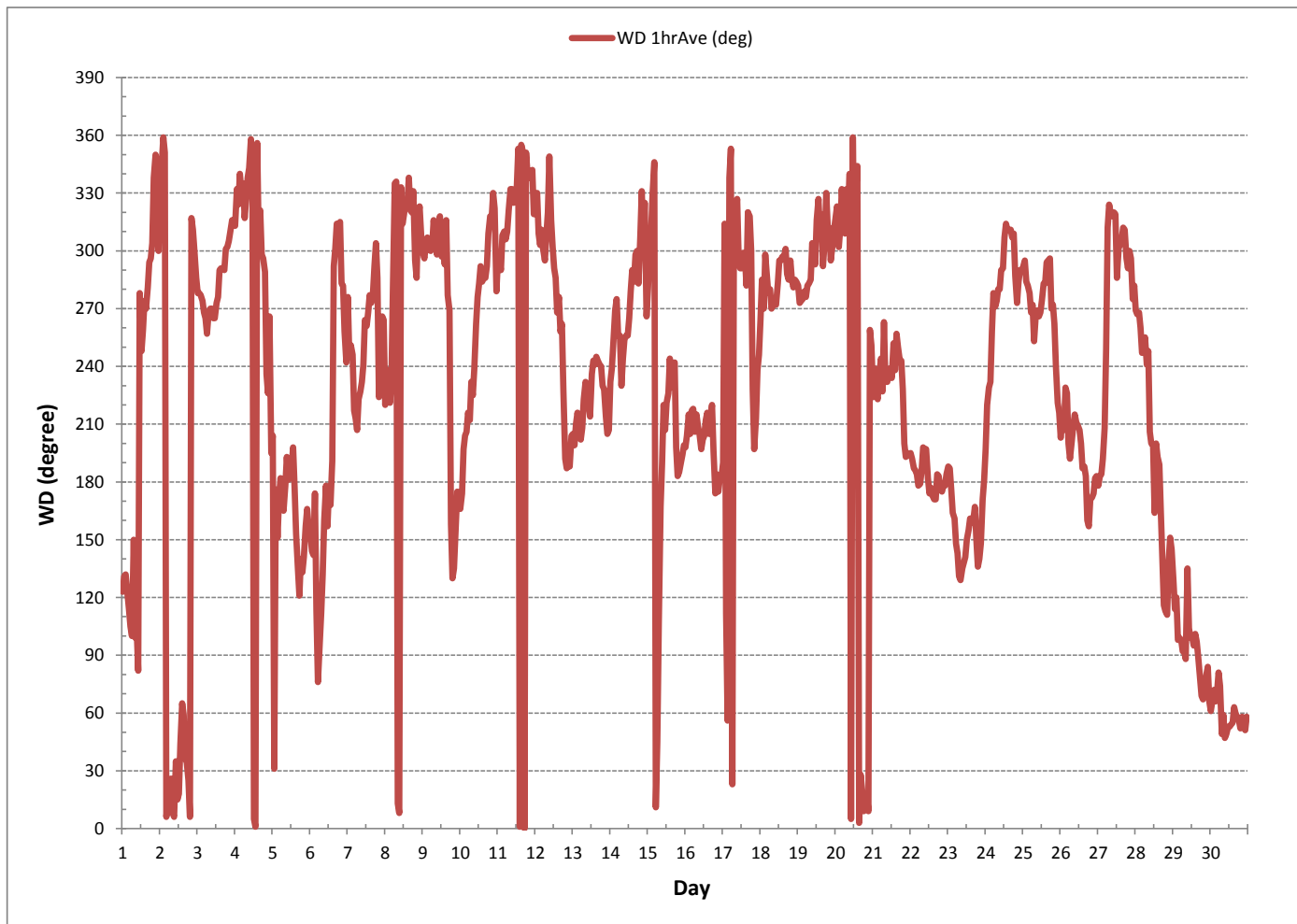
STATUS FLAG CODES

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

LAST CALIBRATION:	July 7, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	86.28		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.		
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59			
DAY																												
1		18	16	12	15	18	19	20	20	25	29	39	22	20	13	17	16	18	18	19	14	13	15	16	15	24		
2		15	18	19	17	17	17	19	20	30	24	26	22	21	25	25	22	24	22	21	24	18	20	19	18	24		
3		16	16	16	14	12	12	12	14	14	14	14	14	15	16	18	19	17	19	18	20	18	18	20	19	24		
4		19	20	19	21	19	19	18	21	23	22	26	29	26	31	26	28	34	21	11	3	13	13	10	9	24		
5		14	36	31	13	26	11	13	14	18	20	28	32	25	33	30	29	19	17	15	13	16	17	17	18	24		
6		18	16	14	12	38	15	18	22	20	20	28	29	21	22	22	24	19	20	16	9	9	8	5	7	24		
7		11	11	9	11	13	9	12	18	24	24	23	18	24	24	25	22	20	18	16	13	9	5	5	11	24		
8		10	8	13	11	16	16	15	44	28	37	35	33	26	22	28	24	20	19	17	16	12	17	18	17	24		
9		16	16	18	16	17	16	16	20	21	23	27	35	37	30	29	26	25	27	14	6	9	14	13	14	24		
10		14	15	14	18	16	22	21	28	25	22	15	18	19	20	20	20	19	19	18	14	16	18	18	13	24		
11		15	16	17	20	19	19	20	21	21	20	20	20	21	22	22	22	23	21	20	20	21	18	19	17	24		
12		17	19	17	18	17	14	17	18	24	31	35	32	32	33	25	45	17	22	14	7	6	8	7	15	24		
13		17	11	21	20	20	17	21	24	21	22	26	23	18	16	17	14	14	15	12	17	17	17	15	13	24		
14		9	6	8	6	7	7	5	13	14	12	17	17	16	19	21	21	23	18	14	12	14	13	14	20	24		
15		10	13	14	12	12	10	6	15	16	18	23	28	30	27	24	25	19	15	11	6	8	9	9	11	24		
16		12	16	18	14	14	15	14	19	21	27	21	29	26	25	25	23	24	22	13	7	10	11	8	8	24		
17		26	19	34	28	48	22	30	18	19	21	20	22	19	21	23	29	26	21	14	12	5	8	7	7	24		
18		16	18	12	16	15	13	15	12	12	13	13	17	19	18	19	22	19	18	18	17	15	13	16	15	24		
19		13	10	11	13	15	14	16	16	18	20	22	21	23	21	22	23	21	17	17	12	12	11	14	14	24		
20		13	12	18	15	15	24	27	19	40	37	37	60	31	43	28	26	21	18	14	9	7	9	15	7	24		
21		10	8	10	7	8	7	7	20	16	20	23	21	22	21	25	22	18	14	6	7	10	8	9	10	24		
22		10	9	7	9	7	7	9	14	19	20	28	23	25	23	22	21	23	15	14	13	14	14	14	16	24		
23		15	16	16	19	19	18	17	16	16	17	17	18	19	19	19	17	18	18	17	18	18	13	16	14	24		
24		26	22	20	20	13	14	12	12	14	16	19	22	22	20	20	18	19	19	16	11	9	11	14	12	24		
25		13	13	10	11	9	5	8	6	10	17	19	17	20	25	21	21	21	18	9	7	9	8	12	9	24		
26		12	11	11	6	6	9	10	13	17	18	18	19	22	23	20	19	18	15	14	14	12	12	10	11	24		
27		12	11	12	13	15	7	16	17	17	19	18	21	17	20	19	20	18	17	13	15	11	11	8	8	24		
28		7	6	4	3	6	4	7	18	15	42	35	25	27	40	28	22	18	14	11	10	9	13	12	8	24		
29		7	6	9	9	9	9	8	10	14	20	30	26	26	27	24	17	15	11	8	9	9	11	12	12	24		
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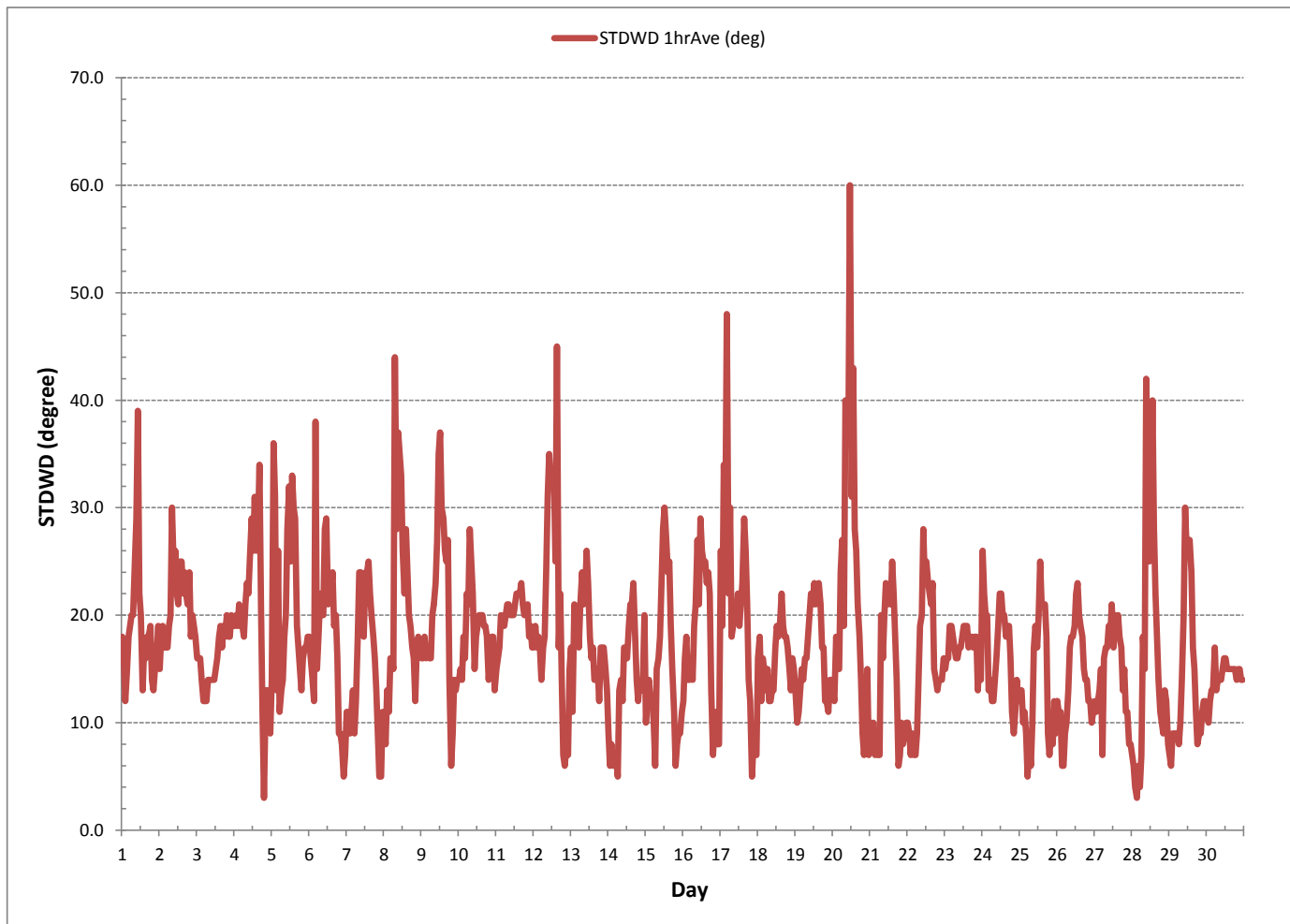
STATUS FLAG CODES

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

LAST CALIBRATION: July 7, 2016

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

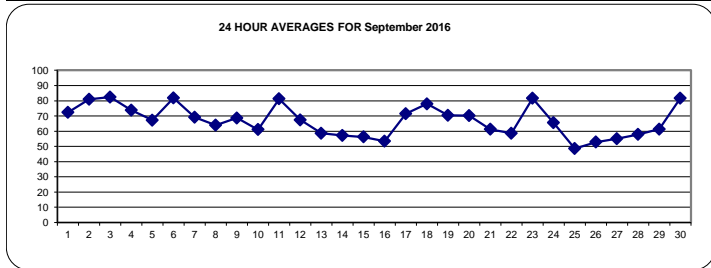


RELATIVE HUMIDITY Hourly Averages (RH %)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	75	77	79	82	84	86	87	86	85	74	73	74	61	64	57	47	51	55	62	67	72	76	79	83	47	87	72	24	
2	84	81	83	87	89	89	88	86	75	75	74	71	71	69	72	75	72	77	82	88	89	89	89	89	69	89	81	24	
3	89	88	87	87	87	88	87	83	77	76	73	68	67	69	73	80	84	87	87	87	88	89	89	67	89	82	24		
4	88	89	88	89	88	88	87	86	81	71	66	60	61	59	60	58	60	61	67	69	67	70	76	82	58	89	74	24	
5	85	72	78	79	79	81	80	77	76	67	57	53	53	52	50	53	57	61	64	68	68	67	67	70	50	85	67	24	
6	69	71	76	81	86	88	89	90	89	86	83	78	79	75	71	74	76	78	80	87	88	89	90	90	69	90	82	24	
7	91	90	90	90	90	90	91	89	81	69	58	52	48	43	45	46	42	46	56	60	70	77	74	70	42	91	69	24	
8	81	83	82	73	78	77	66	64	57	49	47	46	45	44	40	47	56	54	62	70	76	78	79	82	40	83	64	24	
9	81	85	86	88	89	89	89	87	85	79	67	56	50	47	43	45	45	49	58	65	63	66	67	70	43	89	69	24	
10	71	70	70	79	81	83	84	82	81	77	60	47	40	37	34	29	31	35	43	53	61	68	71	78	29	84	61	24	
11	78	81	82	85	81	80	81	81	80	82	83	84	85	84	83	82	79	75	74	79	82	83	82	84	74	85	81	24	
12	86	86	87	87	87	87	87	84	75	51	49	49	49	50	49	45	49	51	59	64	68	70	74	76	45	87	67	24	
13	75	77	78	81	82	84	83	71	65	59	56	50	43	36	33	32	32	36	46	52	56	58	61	62	32	84	59	24	
14	68	74	78	74	75	78	76	65	58	55	50	45	41	37	33	34	36	40	47	54	59	61	62	73	33	78	57	24	
15	72	67	68	71	74	73	71	60	67	65	60	47	40	39	36	34	38	40	46	50	54	57	59	61	34	74	56	24	
16	64	67	72	72	73	73	74	67	61	54	46	41	36	36	32	32	31	36	42	47	51	55	58	61	31	74	53	24	
17	63	67	66	72	77	81	82	82	83	76	81	75	61	58	57	56	58	64	72	74	74	77	81	77	56	83	71	24	
18	85	89	90	90	90	88	88	88	88	87	86	82	75	70	66	64	59	54	63	65	72	78	77	76	54	90	78	24	
19	79	83	84	85	85	86	85	74	72	69	63	59	58	61	55	51	47	52	63	68	69	77	81	83	47	86	70	24	
20	85	87	88	88	87	87	88	87	83	65	60	53	52	47	47	46	52	59	66	70	70	68	77	75	46	88	70	24	
21	79	81	83	86	87	87	88	70	63	56	49	48	45	42	41	36	35	41	51	56	57	59	63	67	35	88	61	24	
22	68	68	70	69	70	70	70	65	62	59	51	45	39	36	35	39	43	52	59	65	69	68	68	67	35	70	59	24	
23	71	73	73	76	77	74	74	78	77	77	84	84	83	84	83	81	83	88	89	90	90	90	90	90	71	90	82	24	
24	90	90	90	90	90	90	90	88	80	61	49	45	44	44	40	38	38	46	52	56	58	57	56	38	90	66	24		
25	56	57	58	61	65	70	68	63	56	50	44	40	36	35	32	29	29	33	42	45	46	49	50	53	29	70	49	24	
26	58	64	66	68	72	73	72	69	62	51	43	40	35	34	34	33	34	39	43	47	53	57	60	61	33	73	53	24	
27	63	65	69	73	74	78	73	65	55	52	53	58	56	50	45	38	33	37	43	45	47	48	50	52	33	78	55	24	
28	54	56	58	63	74	77	73	69	65	54	57	57	56	44	38	40	41	45	56	61	63	61	63	63	38	77	58	24	
29	68	74	72	76	77	81	85	80	73	63	53	49	47	43	46	46	51	56	59	58	55	54	60	43	85	61	24		
30	64	67	68	71	80	85	87	88	89	90	89	87	85	83	80	75	73	80	82	82	87	90	90	90	64	90	82	24	
HOURLY MAX	91	90	90	90	90	90	91	90	89	90	89	87	85	84	83	82	84	88	89	90	90	90	90	90					
HOURLY AVG	74.7	76.0	77.3	79.1	80.9	82.0	81.4	77.5	73.6	67.3	62.5	58.2	54.7	52.4	50.5	49.6	50.3	53.8	60.2	64.6	67.4	69.6	71.3	73.0					

STATUS FLAG CODES

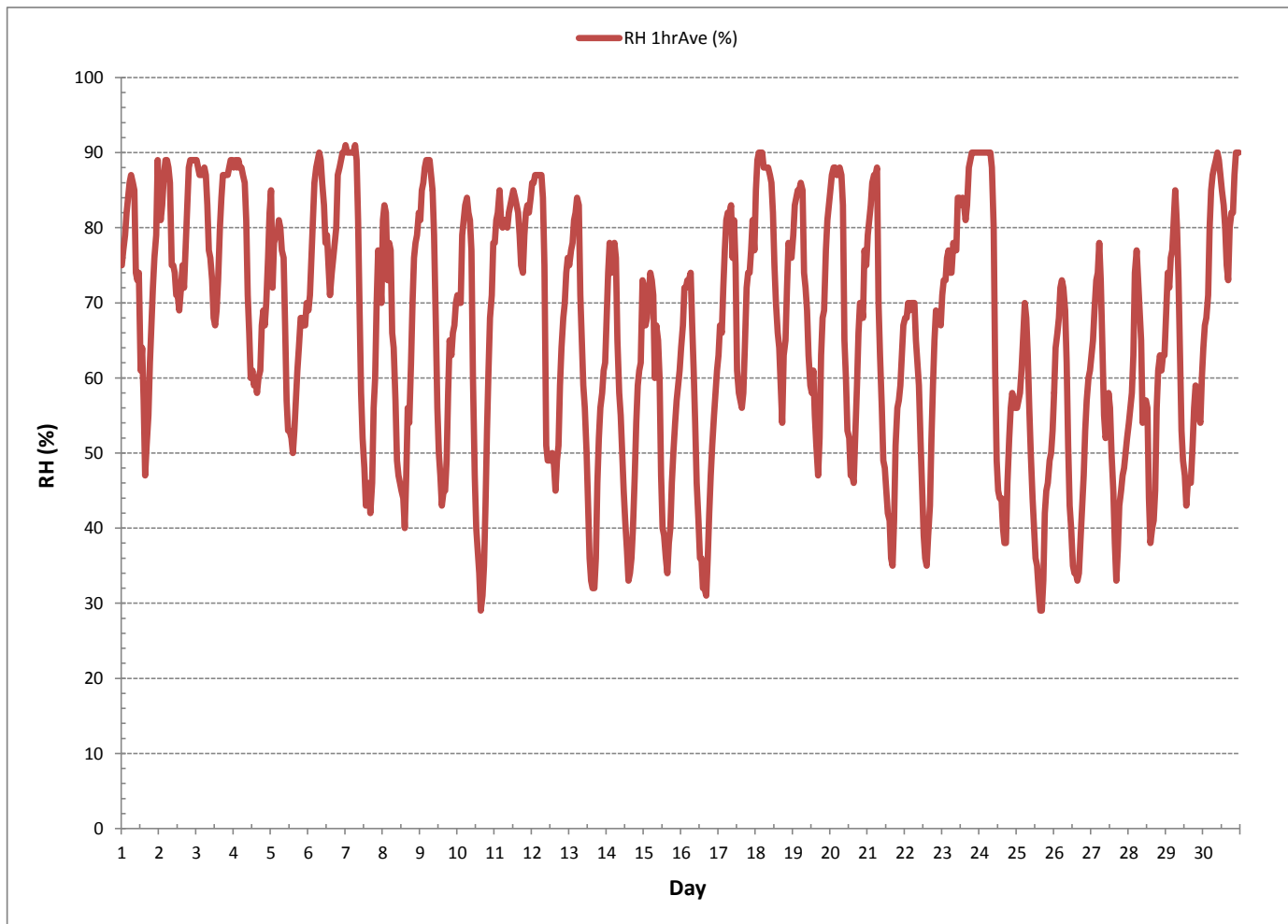
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	29	%	@ HOUR(S)	15 , VAR	ON DAY(S)	10 , 25
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR(S)	0 , 6	ON DAY(S)	7 , 7
MAXIMUM 24-HR AVERAGE:	82	%			ON DAY(S)	VAR
					VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	16.45				MONTHLY AVERAGE:	67 %

RELATIVE HUMIDITY Hourly Averages (RH %)



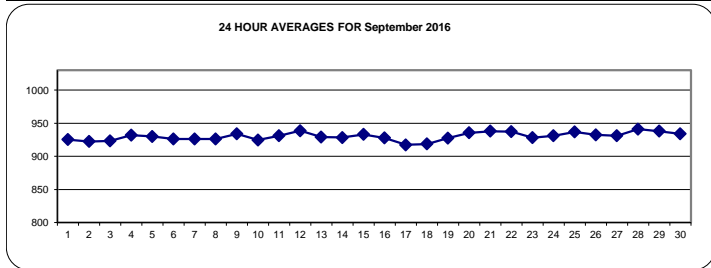
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	928	927	926	925	925	924	924	924	923	923	923	923	924	925	925	926	927	927	927	927	927	926	926	926	926	923	928	925	24
2	926	925	925	925	924	924	923	924	925	925	924	923	923	922	922	922	921	920	919	918	918	918	919	920	918	926	922	24	
3	920	920	920	921	921	921	921	921	922	922	922	922	923	923	923	924	924	924	925	926	927	928	928	929	920	929	923	24	
4	930	930	930	931	931	931	932	932	933	933	933	934	934	934	933	933	933	933	933	933	932	932	932	931	931	930	934	932	24
5	931	931	930	930	931	931	930	930	931	931	931	931	931	931	931	931	930	930	929	928	928	928	928	927	927	931	930	24	
6	927	927	926	926	926	925	925	926	926	926	926	927	926	926	926	926	926	926	927	927	926	926	926	926	925	925	927	926	24
7	926	925	925	925	925	925	925	926	927	928	928	928	928	928	928	928	927	927	927	926	925	925	924	923	923	923	928	926	24
8	923	922	922	922	922	922	922	923	924	925	926	927	927	927	927	928	928	929	929	929	930	930	931	931	922	931	926	24	
9	932	932	932	933	933	934	934	934	935	936	936	937	937	937	937	937	936	936	935	932	931	930	929	928	928	937	934	24	
10	927	926	925	925	924	924	924	924	924	924	924	924	924	925	925	925	925	925	925	924	924	924	925	925	924	927	925	24	
11	925	925	925	925	926	926	926	926	927	928	929	929	930	931	931	932	934	935	936	936	937	938	938	939	925	939	931	24	
12	939	939	939	939	940	940	940	940	941	941	941	941	941	941	940	940	939	939	938	936	935	934	933	933	941	939	24		
13	933	932	931	931	930	930	929	929	930	930	930	930	930	930	930	930	929	929	928	927	926	926	926	926	926	933	929	24	
14	925	925	925	926	926	926	926	927	928	929	929	930	930	929	930	930	930	930	930	930	930	930	930	931	925	931	928	24	
15	931	931	931	932	932	932	933	934	934	935	935	935	935	935	935	934	934	933	932	932	931	931	931	931	931	935	933	24	
16	930	930	930	929	929	929	929	929	929	930	930	930	930	929	929	928	927	927	926	925	924	923	922	922	922	930	928	24	
17	921	920	919	918	918	918	917	917	918	918	918	918	918	918	918	918	918	917	916	915	915	914	914	914	914	921	917	24	
18	915	915	915	915	915	915	916	916	917	917	918	918	918	919	920	920	921	921	922	922	922	922	922	922	915	923	919	24	
19	923	923	923	924	924	925	925	926	927	927	928	928	929	929	929	930	930	930	930	930	930	930	931	931	923	931	928	24	
20	931	931	932	932	933	933	934	934	935	936	937	937	937	938	938	938	938	938	938	937	937	937	937	937	937	931	938	936	24
21	937	937	937	937	936	936	936	937	938	939	940	940	940	940	940	940	939	939	938	937	937	937	937	937	936	940	938	24	
22	937	937	937	937	937	937	937	937	938	939	940	940	940	939	939	938	938	937	936	936	935	935	934	934	940	937	24		
23	934	934	933	933	932	931	930	929	929	928	928	927	927	926	926	926	925	925	925	925	925	925	925	925	925	934	928	24	
24	925	926	926	927	927	928	928	929	930	930	931	932	932	932	933	934	935	934	934	934	934	935	935	935	925	935	931	24	
25	936	936	936	936	935	936	935	936	937	938	938	938	938	938	938	938	938	938	937	937	937	937	937	936	935	938	937	24	
26	936	935	935	934	934	934	934	934	934	935	935	935	935	934	934	933	933	932	931	929	929	928	927	926	925	936	932	24	
27	925	924	924	924	924	924	925	927	928	930	931	931	932	933	934	935	935	936	936	937	937	938	939	939	924	939	931	24	
28	939	940	940	940	940	941	941	942	943	943	943	943	943	943	943	943	942	942	941	940	940	940	939	939	943	941	24		
29	939	938	938	938	938	938	938	938	938	939	940	940	940	939	939	939	938	938	937	936	936	936	936	935	935	940	938	24	
30	935	934	934	934	933	934	934	934	934	934	934	934	934	934	934	933	933	934	934	934	935	935	935	935	933	935	934	24	
HOURLY MAX	939	940	940	940	940	941	941	942	943	943	943	943	943	943	943	943	942	942	941	940	940	940	939	939					
HOURLY AVG	930	929	929	929	929	929	929	930	930	931	931	931	931	931	931	931	931	931	931	931	930	930	930	930					

STATUS FLAG CODES

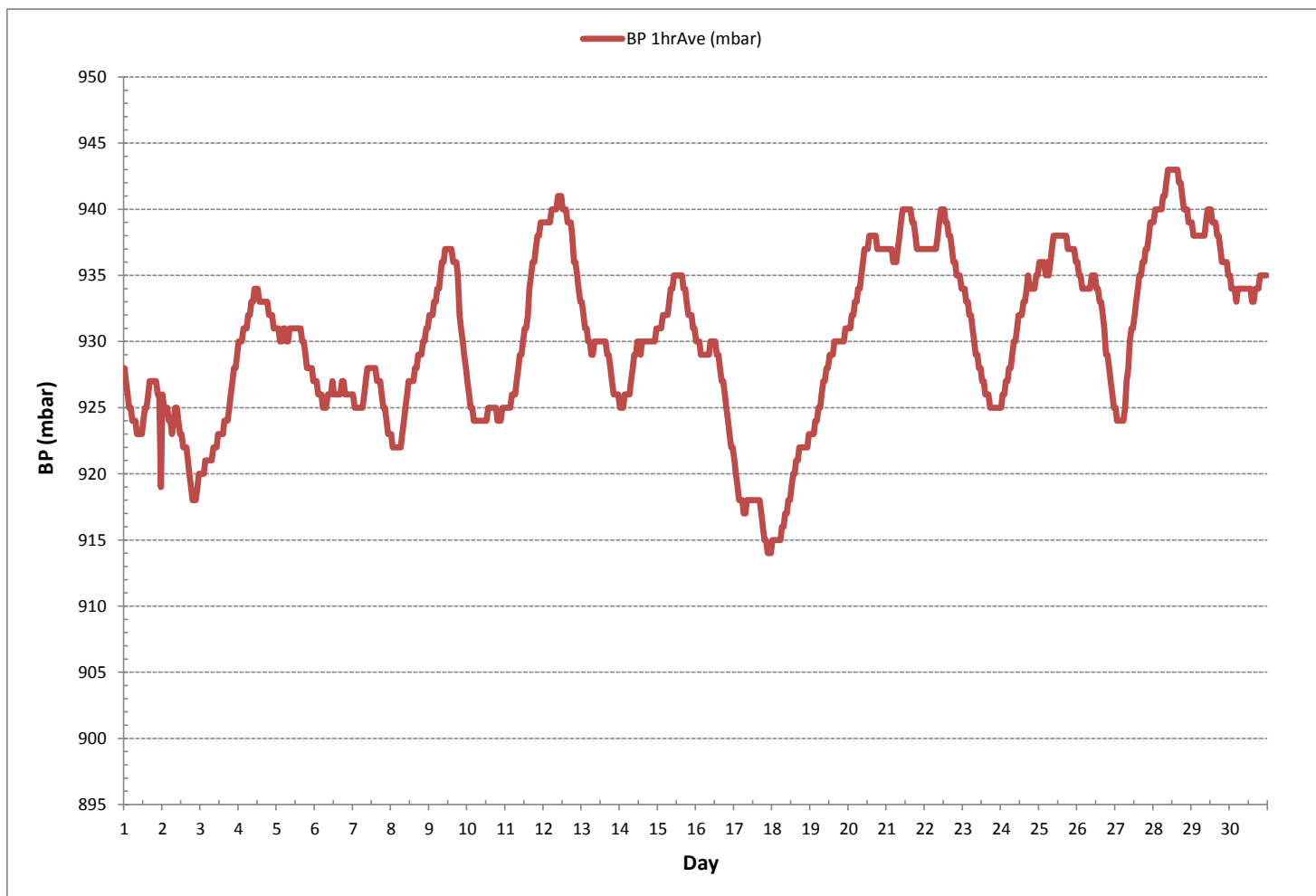
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	914	mbar	@ HOUR(S)	VAR	ON DAY(S)	17
MAXIMUM 1-HR AVERAGE:	943	mbar	@ HOUR(S)	VAR	ON DAY(S)	28
MAXIMUM 24-HR AVERAGE:	941	mbar			ON DAY(S)	28
					VAR-VARIOUS	
OPERATIONAL TIME:						720 HRS
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	6.32				MONTHLY AVERAGE:	930 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



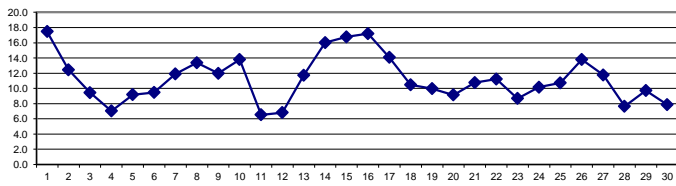
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.
DAY	MIN.	MAX.	AVG.																										
1	17.5	16.8	16.1	15.3	14.7	14.2	13.9	14.6	15.5	18.5	19.2	19.6	23.4	21.9	22.1	23.2	21.9	20.5	18.5	16.6	15.3	14.4	13.3	12.1	12.1	23.4	17.5	24	
2	11.7	11.4	10.8	10.1	9.9	9.9	10.4	11.2	14.2	13.2	13.9	14.4	14.5	15.7	15.5	14.9	16.1	14.9	13.5	12.1	11.2	10.3	9.7	9.3	9.3	16.1	12.5	24	
3	9.1	9.1	9.0	8.9	8.9	8.7	9.2	9.9	10.9	10.7	11.7	12.4	12.4	12.2	11.1	10.1	9.1	8.6	7.8	7.6	7.5	7.3	7.1	7.1	12.4	9.5	24		
4	6.8	6.4	6.3	5.8	5.2	5.0	4.8	5.6	6.8	7.4	8.1	9.2	8.7	9.1	9.5	9.7	9.3	8.9	7.5	6.3	6.5	6.1	5.0	4.9	4.8	9.7	7.0	24	
5	5.0	5.3	4.3	3.9	4.5	4.5	4.9	5.6	6.5	9.1	12.2	13.6	13.5	14.3	14.9	14.3	13.4	12.7	11.5	9.9	9.3	9.2	8.5	3.9	14.9	9.2	24		
6	8.7	8.4	7.8	7.5	7.3	6.9	6.6	7.2	8.0	9.3	10.2	11.7	11.2	12.4	12.8	13.0	12.6	12.5	11.4	9.4	8.7	8.5	7.9	7.3	6.6	13.0	9.5	24	
7	7.5	5.4	5.6	4.8	3.2	3.0	4.3	8.7	12.3	15.2	18.0	18.4	19.2	19.3	18.8	18.2	18.9	17.4	14.4	12.7	11.0	9.8	9.6	9.9	3.0	19.3	11.9	24	
8	8.4	7.9	7.9	9.2	8.1	8.5	10.6	13.3	16.1	18.4	19.4	19.5	19.3	18.6	19.9	18.6	16.2	15.3	13.1	11.7	11.0	10.3	10.2	9.5	7.9	19.9	13.4	24	
9	9.5	8.6	8.3	7.7	7.1	6.7	7.3	8.1	9.1	10.9	13.8	16.0	17.2	17.0	17.8	16.8	17.7	16.6	13.9	11.7	11.8	11.3	11.4	11.2	6.7	17.8	12.0	24	
10	11.0	10.9	10.9	10.0	9.7	9.6	9.7	11.1	12.4	14.3	18.1	19.0	19.5	19.8	19.9	19.8	18.2	17.7	15.6	13.0	11.6	10.8	10.2	8.6	8.6	19.9	13.8	24	
11	8.1	7.8	7.8	7.4	6.7	6.3	6.5	6.7	6.7	6.5	6.4	6.2	6.3	6.7	6.4	6.6	6.7	6.8	6.6	6.1	5.9	5.5	5.2	4.7	4.7	8.1	6.5	24	
12	4.3	3.7	3.3	3.5	3.4	3.3	3.5	3.9	5.2	8.8	9.7	9.8	10.3	10.5	11.0	12.7	11.5	11.0	8.3	7.1	5.9	5.1	4.2	3.6	3.3	12.7	6.8	24	
13	3.7	2.7	2.8	2.2	2.1	1.6	2.5	6.7	9.3	11.8	13.9	16.2	19.0	20.9	22.0	21.9	21.7	20.2	16.8	14.7	13.5	12.8	11.8	10.9	1.6	22.0	11.7	24	
14	9.2	8.0	7.5	9.2	9.3	8.5	8.8	12.8	16.1	17.8	20.0	22.4	22.8	23.2	23.6	23.6	23.5	22.3	19.9	17.7	15.9	15.3	15.0	12.3	7.5	23.6	16.0	24	
15	11.9	12.8	12.3	11.6	10.7	10.8	11.4	15.6	14.4	15.5	18.2	21.1	22.7	23.3	24.0	24.3	23.7	21.6	19.3	17.8	16.5	15.3	14.5	14.0	10.7	24.3	16.8	24	
16	13.0	12.1	10.6	10.7	10.3	9.9	9.8	12.2	14.8	17.8	19.9	22.4	23.3	24.3	25.3	24.7	25.2	23.8	20.6	18.8	17.5	16.1	15.2	14.5	9.8	25.3	17.2	24	
17	14.4	13.4	13.6	12.7	11.9	11.1	11.8	12.2	12.7	14.9	13.9	15.5	17.5	17.6	17.8	18.0	17.2	15.8	13.8	13.3	13.0	12.4	11.7	12.0	11.1	18.0	14.1	24	
18	11.2	10.5	10.3	10.1	9.9	9.8	9.5	9.2	9.2	9.0	9.2	10.6	11.9	12.4	13.2	13.8	13.5	14.1	11.7	10.0	8.7	7.7	7.9	8.2	7.7	14.1	10.5	24	
19	7.5	6.7	6.4	6.5	6.9	6.7	7.3	9.9	11.0	11.6	12.9	12.9	12.9	12.3	13.6	14.4	14.8	13.0	11.0	9.8	9.3	8.0	7.2	6.7	6.4	14.8	10.0	24	
20	6.0	5.4	5.4	5.4	6.0	5.6	5.6	6.4	8.5	12.2	12.3	13.8	13.4	15.3	14.3	14.2	13.6	11.3	9.2	7.9	7.3	7.4	6.1	6.6	5.4	15.3	9.1	24	
21	6.3	6.1	5.2	4.3	3.6	3.5	3.1	8.8	11.1	14.2	15.5	15.6	16.7	17.1	17.6	18.0	17.5	15.4	12.0	10.5	10.1	9.6	8.7	8.0	3.1	18.0	10.8	24	
22	7.5	6.9	6.2	5.9	5.3	5.1	5.2	7.3	9.7	11.9	14.7	15.8	16.4	17.1	17.5	17.5	17.4	15.0	13.4	11.8	10.8	10.6	10.3	10.4	5.1	17.5	11.2	24	
23	9.8	9.4	9.5	8.8	8.5	8.6	8.4	7.9	8.1	8.3	8.0	8.3	8.6	8.6	9.0	9.3	9.2	8.6	8.5	8.5	8.6	8.7	8.6	8.6	7.9	9.8	8.7	24	
24	8.6	8.7	8.6	8.0	7.6	6.9	6.5	7.3	8.1	9.5	11.5	13.8	14.5	14.8	14.2	14.2	14.4	13.9	11.5	9.8	8.7	8.0	7.5	7.2	6.5	14.8	10.2	24	
25	7.0	6.8	6.5	6.1	5.2	3.6	4.0	5.6	9.3	12.1	14.3	14.7	15.8	16.6	17.3	17.2	17.2	15.5	12.4	11.0	10.5	9.7	9.8	8.8	3.6	17.3	10.7	24	
26	7.7	6.3	5.8	5.2	4.6	4.3	4.8	6.4	9.7	14.2	17.3	19.2	21.6	22.6	22.6	22.7	20.8	18.8	17.1	15.4	14.3	13.6	13.5	4.3	22.7	13.8	24		
27	13.0	12.4	11.5	10.4	9.9	8.8	10.0	12.7	14.5	14.3	13.3	12.6	12.8	13.8	13.9	15.3	15.3	13.9	11.3	10.0	9.4	8.7	7.9	6.8	6.8	15.3	11.8	24	
28	6.1	5.2	4.5	3.3	2.0	1.2	1.3	3.4	5.3	10.5	9.9	9.8	9.5	12.9	14.1	13.3	13.0	12.0	9.5	7.9	7.1	7.6	7.0	7.0	1.2	14.1	7.6	24	
29	6.1	4.6	5.2	4.7	4.5	4.1	3.6	5.2	7.5	10.4	13.6	14.0	14.8	16.2	15.8	15.8	14.7	13.1	11.1	10.0	9.5	10.0	10.1	8.4	3.6	16.2	9.7	24	
30	7.5	7.1	7.2	7.2	6.9	7.0	6.9	7.0	7.2	7.9	8.7	9.5	9.7	9.8	9.7	9.8	9.3	8.2	7.7	7.5	6.8	6.7	6.6	6.6	6.6	9.8	7.9	24	
HOURLY MAX	17.5	16.8	16.1	15.3	14.7	14.2	13.9	15.6	16.1	18.5	20.0	22.4	23.4	24.3	25.3	24.7	25.2	23.8	20.6	18.8	17.5	16.1	15.2	14.5					
HOURLY AVG	8.8	8.2	7.9	7.5	7.1	6.8	7.1	8.8	10.3	12.2	13.6	14.6	15.3	15.9	16.2	16.2	15.8	14.7	12.7	11.3	10.5	9.9	9.4	8.9					

STATUS FLAG CODES

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

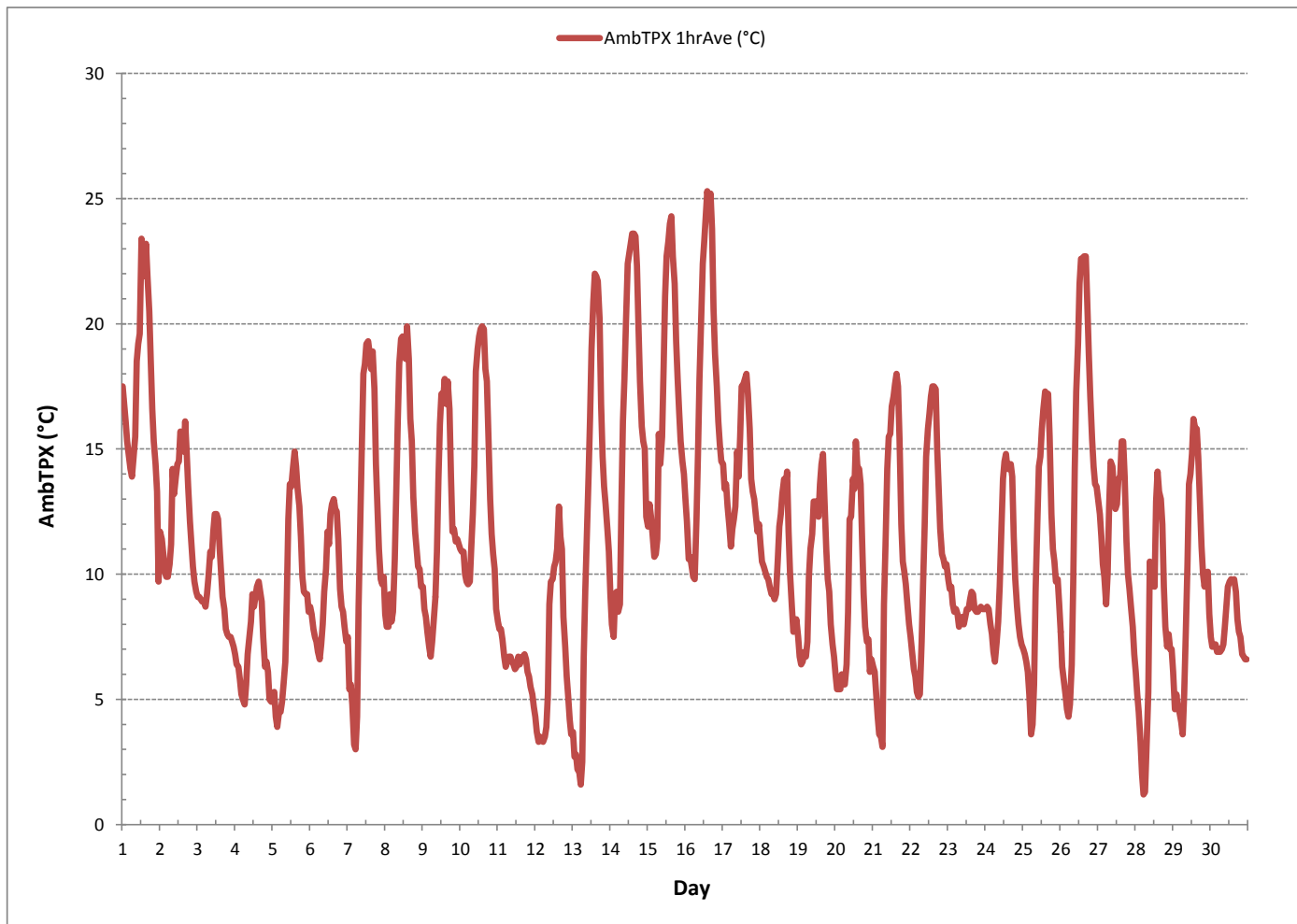
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	1.2 °C	@ HOUR(S)	5	ON DAY(S)	28
MAXIMUM 1-HR AVERAGE:	25.3 °C	@ HOUR(S)	14	ON DAY(S)	16
MAXIMUM 24-HR AVERAGE:	17.5 °C			ON DAY(S)	1
				VAR-VARIOUS	
		OPERATIONAL TIME:		720	HRS
		AMD OPERATION UPTIME:		100.0	%
STANDARD DEVIATION:	4.88	MONTHLY AVERAGE:		11.2	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

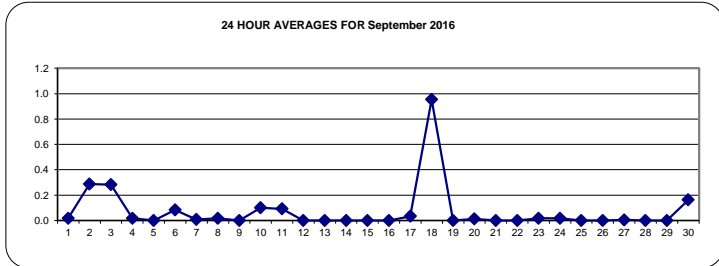
PRECIPITATION Hourly Averages (mm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.		
DAY	MIN.	MAX.	AVG.																									MIN.	MAX.	AVG.	RDGS.
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	0.4	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	0.4	0.0	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.0	1.7	0.7	0.2	0.4	0.0	3.0	0.3	24		
3	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	0.1	0.2	0.9	2.7	1.3	0.3	0.3	0.6	0.3	0.0	0.0	2.7	0.3	24		
4	0.2	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	0.2	0.0	24		
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
6	0.0	0.0	0.0	0.1	0.7	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24		
7	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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		
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	0.4	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		
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
10	0.0	0.0	0.2	0.2	0.1	0.2	0.1	0.9	0.5	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	0.9	0.1	24		
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.7	0.5	0.4	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		
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	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	0.8	0.0	24		
18	12.8	5.5	2.6	0.4	0.1	0.0	0.4	0.8	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	0.1	0.0	0.0	0.0	0.0	12.8	1.0	24		
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24		
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24		
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	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		
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	0.1	0.0	24		
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
30	0.0	0.0	0.0	0.1	0.3	1.6	1.5	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	0.1	0.1	0.1	0.0	1.6	0.2	24		
HOURLY MAX	12.8	5.5	2.6	0.4	0.7	1.6	1.5	0.9	0.5	0.2	0.8	0.4	0.3	0.7	0.5	0.4	0.9	2.7	1.3	3.0	1.7	0.7	0.3	0.4							
HOURLY AVG	0.4	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0							

STATUS FLAG CODES

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

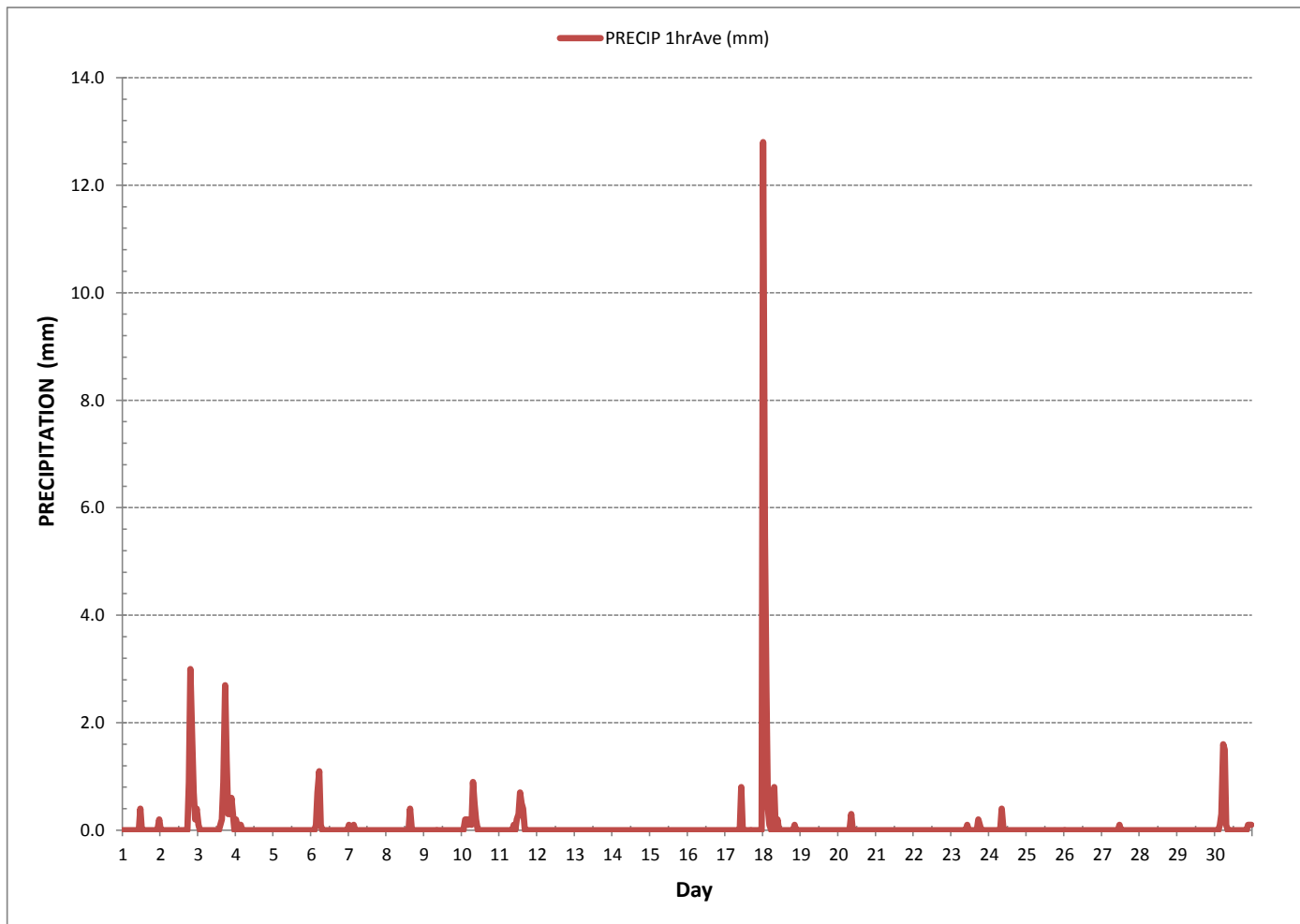
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	12.8	mm	@ HOUR(S)	0	ON DAY(S)	18
MAXIMUM 24-HR AVERAGE:	1.0	mm			ON DAY(S)	18
MONTHLY TOTAL	50.5	mm			VAR-VARIOUS	
OPERATIONAL TIME:					720	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.57				MONTHLY AVERAGE:	0.1 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: September 6, 2016	Barometric Pressure: 0.918 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Light rain/scattered showers
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 13:16	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 18:04	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000
Serial Number: 468	As Found C.F.: 0.993
Last Calibration Date: August 18, 2016	New C.F.: 1.000
Previous C.F.: 1.001	

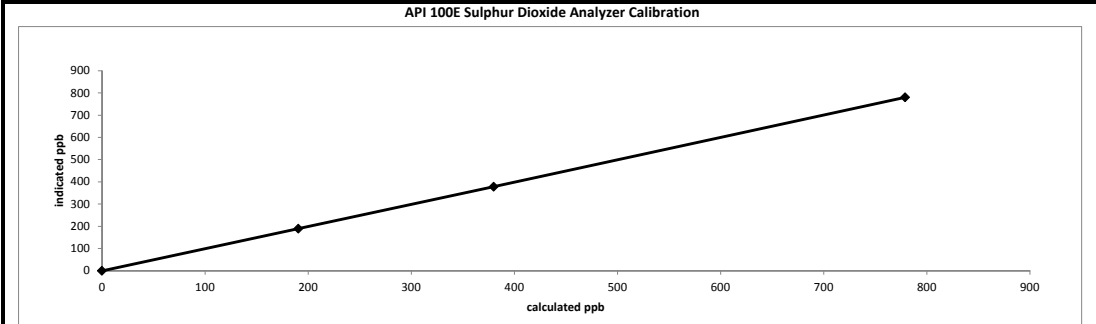
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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	5000	0.00	5000	0.0	2.0	N/A
as found high	4924	78.00	5002	779.7	787.0	0.993
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	378.0	1.004
low	4981	19.00	5000	190.0	189.0	1.005
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale) = 0.08%	.95-1.05
% change in C.F. from last cal = 0.78%	± 3% F.S.
	± 10%

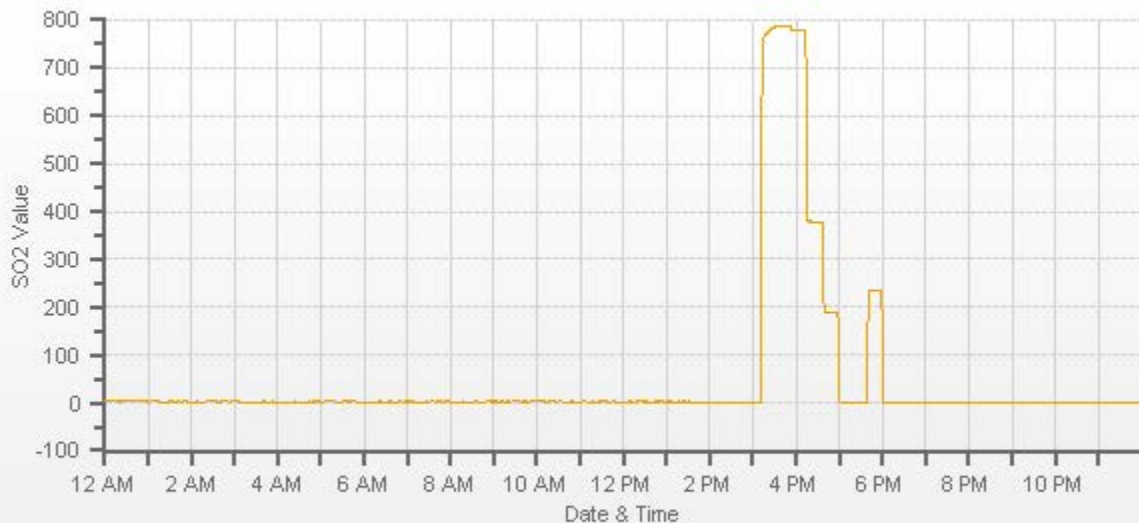


As found:	As left:
SLOPE: 1.026	SLOPE: 1.017
OFFSET: 106.2	OFFSET: 110.7
HVPS: 651	HVPS: 651
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.8	BOX TEMP: 28.2
PMT TEMP: 7.9	PMT TEMP: 7.8
IZS TEMP: 40.0	IZS TEMP: 40.0
PRES: 23.9	PRES: 24.0
SAMP FL: 619	SAMP FL: 622
NORM PMT: 110.2	NORM PMT: 110.0
UV LAMP: 3257.6	UV LAMP: 3259.7
LAMP RATIO: 100.0	LAMP RATIO: 99.9
STR. LGT 54.4	STR. LGT 56.3
DRK PMT: 5.2	DRK PMT: 6.1
DRK LMP: 6.6	DRK LMP: 6.8
Internal Span: 231	Internal Span: 233.5

Comments:

Sample inlet filter changed.

SO2[ppb] Station: LICA ST. LINA Daily: 2016/09/06 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: September 6, 2016	Barometric Pressure: 0.918 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Light rain/scattered showers
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 13:16	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 17:31	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

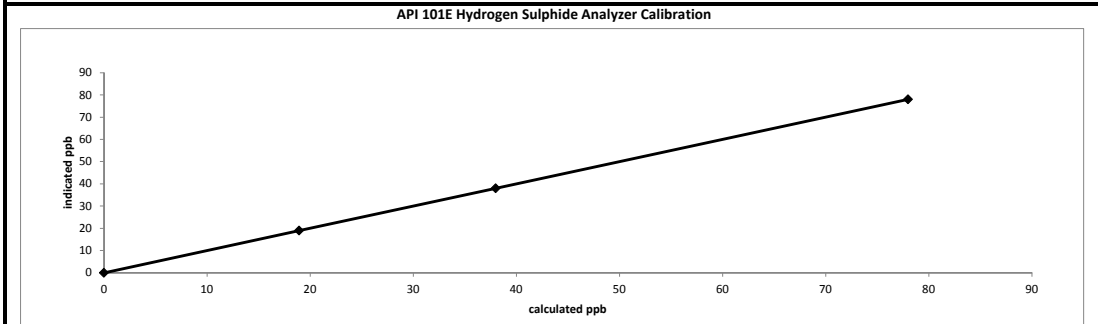
Analyzer: Serial Number: 509	Range ppb: 100
Last Calibration Date: August 16, 2016	As Found C.F.: 1.002
Previous C.F.: 1.000	New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a	Standard Calibration Points for Ranges								
Make & Model: SABIO 2010 D	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point		Hydrogen Sulphide Standard Calibration Points							
High		78							
Mid		38							
Low	19								
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

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	7500	0.00	7500	0.0	0.7	N/A
as found high	7443	58.50	7502	78.0	78.5	1.002
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	38.0	1.000
low	7487	14.20	7501	18.9	19.0	0.996
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						0.999

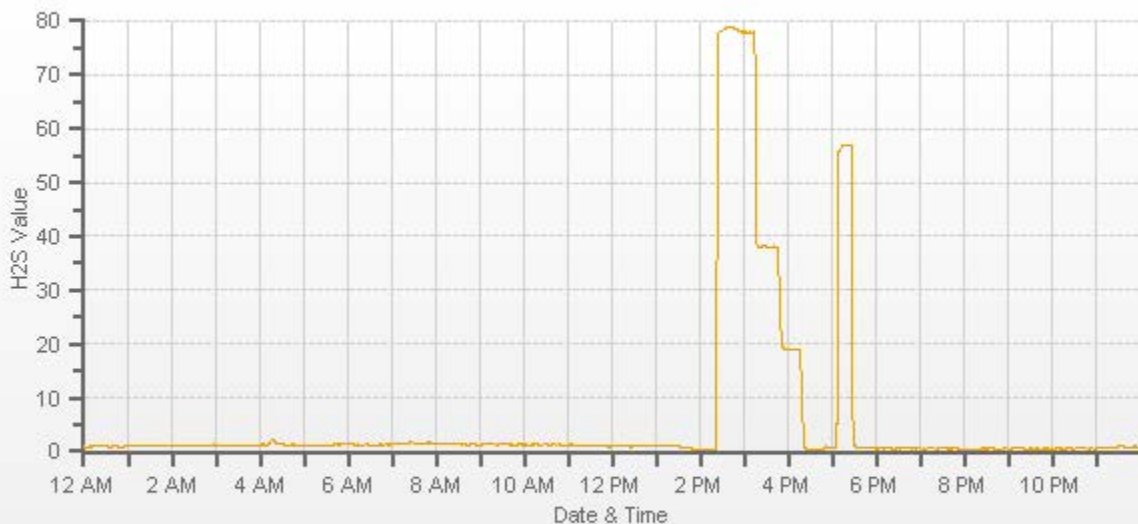
Linear Regression/Calibration Results:		
Correlation Coefficient = <u>1.000</u>		LIMITS
Slope = <u>1.000</u>		> or = 0.995
b (Intercept as % of full scale) = <u>-0.03%</u>		.95-1.05
% change in C.F. from last cal = <u>-0.24%</u>		± 3% F.S.
		± 10%



As found: SLOPE: <u>0.941</u> OFFSET: <u>49.6</u> HVPS: <u>675</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>32.8</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>48.0</u> Converter Temp: <u>315.8</u> PRES: <u>20.4</u> SAMP FL: <u>555</u> UV LAMP: <u>3745.0</u> LAMP RATIO: <u>100.2</u> STR. LGT: <u>23.4</u> DRK PMT: <u>0.3</u> DRK LMP: <u>0.6</u> Internal Span: <u>58.5</u>	As left: SLOPE: <u>0.941</u> OFFSET: <u>50.7</u> HVPS: <u>675</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>31.4</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>48.0</u> Converter Temp: <u>315.7</u> PRES: <u>20.4</u> SAMP FL: <u>556</u> UV LAMP: <u>3748.2</u> LAMP RATIO: <u>100.4</u> STR. LGT: <u>23.8</u> DRK PMT: <u>0.4</u> DRK LMP: <u>0.6</u> Internal Span: <u>56.9</u>
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Comments:

Sample inlet filter changed.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: September 7, 2016 Barometric Pressure: 0.917 atm
 Company/Airshed: LICA Station Temperature °C: 23
 Location/Station Name: St. Lina Weather Conditions: Mainly sunny
 Parameter: Total Hydrocarbon Calibration Purpose: routine monthly
 Start/End Time 24 hr. (mst): 10:22 / 13:58 Performed By/Reviewer: Alex Yakupov Tom Bourque
 Calibration Method: Gas Dilution Cal Gas Expiry Date: November 25, 2023

Analyzer: Serial Number: 51CLT-77021-384 Range ppm: 50
 Last Calibration Date: August 16, 2016 As Found C.F.: 1.001
 Previous Cal High Point C.F.: 0.999 New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a
 Make & Model: API 700
 Serial #: 627
 Cal Gas Cylinder I.D. #: LL165372
 CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 212.0
 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0

Point	Target ppm
High	38
Mid	18
Low	9

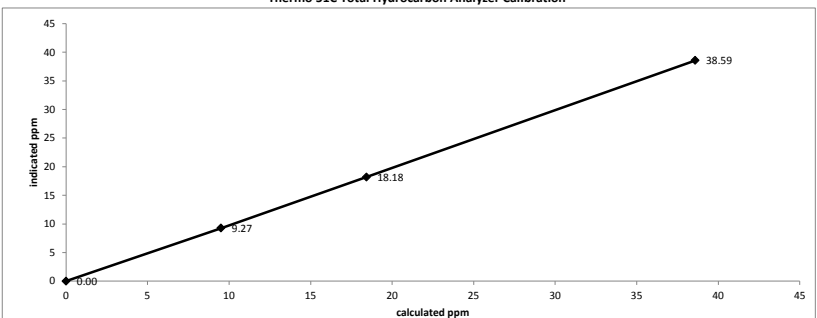
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	0.10	n/a
as found high	1938	65.00	2003	38.58	38.64	1.001
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.59	1.000
mid	1969	31.00	2000	18.43	18.18	1.014
low	1986	16.00	2002	9.50	9.27	1.025
calibrator zero	2000	0.00	2000	0.0	0.00	n/a

Average C.F.= 1.013

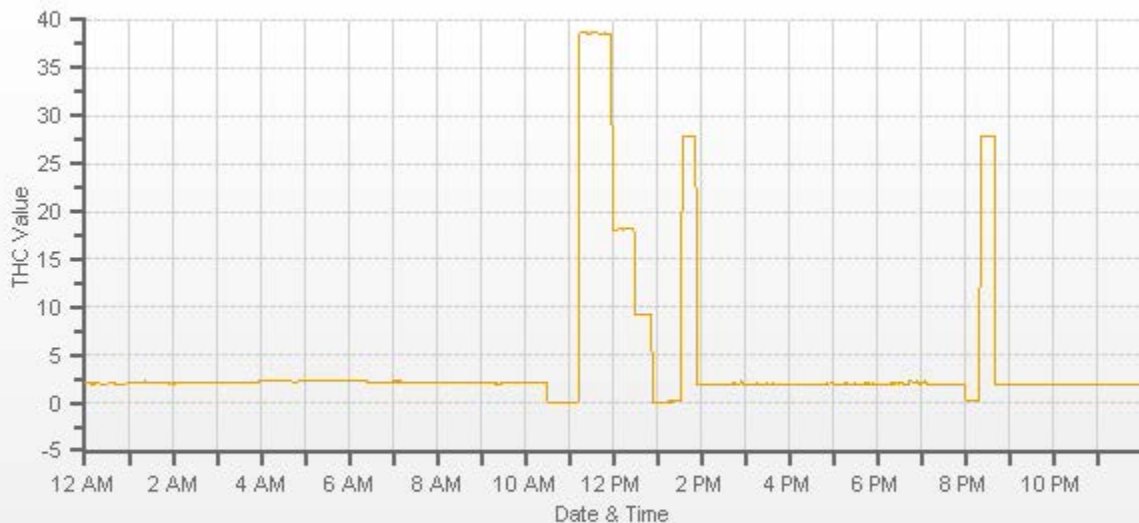
Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 > or = 0.995
 Slope = 0.998 .95-1.05
 b (Intercept as % of full scale) = 0.29% ± 3% F.S.
 % change in C.F. from last cal = -0.22% ± 10%



As found:	As left:
H2 cylinder (psi): 1600	H2 cylinder (psi): 1600
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 1500	Span Cylinder (psi): 1500
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 45	Zero Air Gen Pressure: 45
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1590	cnt: 1540
rng: 1	rng: 1
try: 0	try: 0
flm: 184.1	flm: 183.2
det: 125.5	det: 125.7
Flame: 184	Flame: 183
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.90	Sample psi: 06.91
Internal Air Pressure: 18	Internal Air Pressure: 18
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Intenal Pressure Gauge psi: 27	Intenal Pressure Gauge psi: 27
Internal Span: 28.25	Internal Span: 27.77

Comments: Sample inlet filter changed.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: September 6, 2016	Barometric Pressure: 0.918 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Light rain/scattered showers
Start/End Time 24 hr. (mst): 13:16 / 19:37	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 594 Last Calibration Date: August 18, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>0.996</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.997</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	0.996	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	0.997	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	0.996	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	0.997	1.000														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	783.0	783.0	0.996	0.997
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	378.0	378.0	1.004	1.004
low	4981	19.00	5000	190.0	190.0	189.0	189.0	1.005	1.005
calibrator zero	5000	0.00	5000	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	4924	78.00	5002	0.0	778.0	778.0	0.0	0.0	0.0	
as found high NO2	7498	78.00	7576	485.0	284.0	778.0	494.0	494.0	494.0	1.000
adjusted high NO2	7498	78.00	7576	485.0	284.0	778.0	494.0	494.0	494.0	1.000
gpt mid	7498	78.00	7576	270.0	502.0	778.0	276.0	276.0	276.0	1.000
gpt low	7498	78.00	7576	95.0	683.0	778.0	95.0	95.0	95.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.000	.95-1.05
b (Intercept as % of full scale) =	-0.08%	-0.08%	0.00%	± 3% F.S.
% change in C.F. from last cal =	0.42%	0.30%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

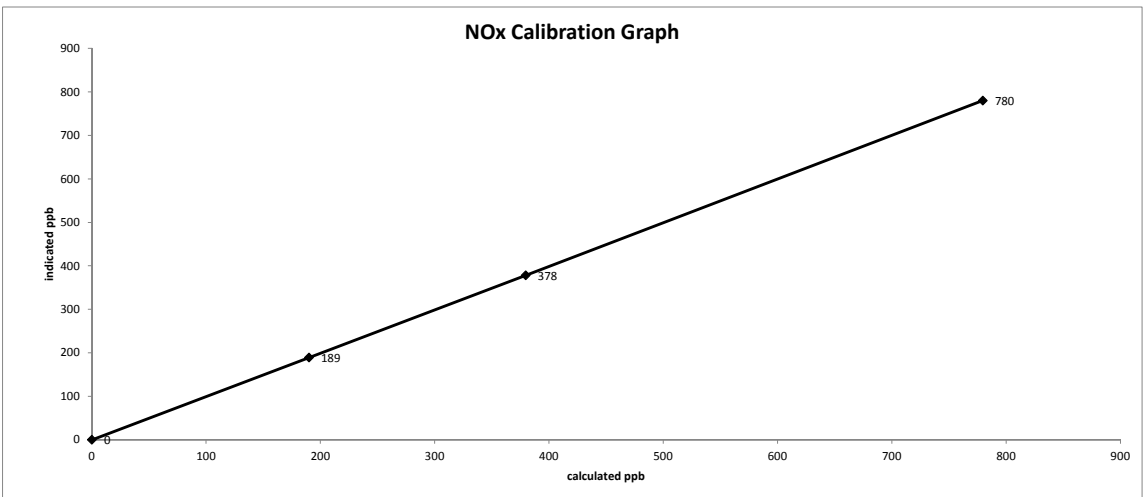
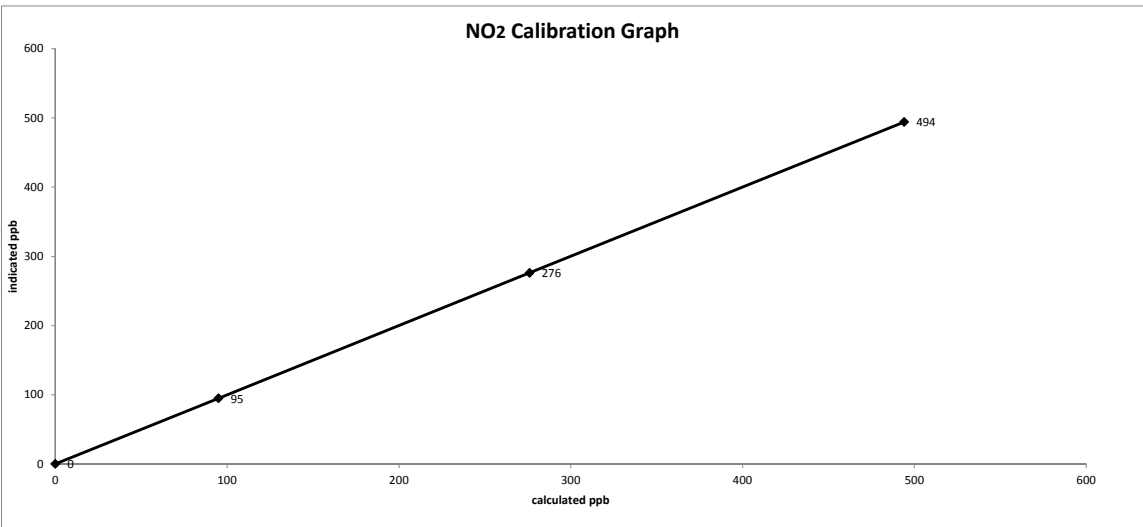
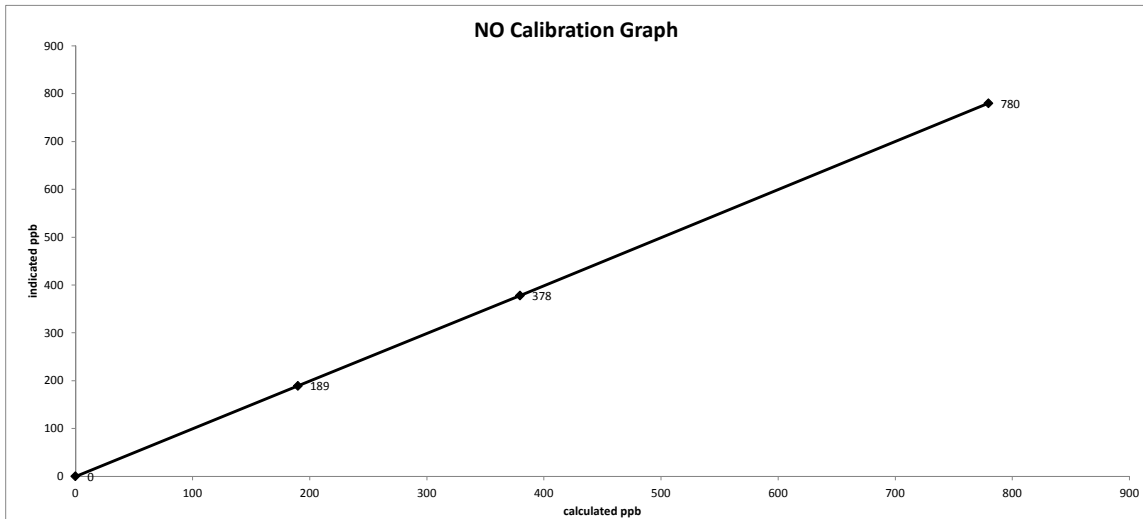
As found:	As left:
NOx SLOPE: 0.977	NOx SLOPE: 0.974
NOx OFFS: 0.5	NOx OFFS: 2.0
NO SLOPE: 0.980	NO SLOPE: 0.977
NO OFFS: -0.8	NO OFFS: -0.2
SAMP FLW: 481	SAMP FLW: 481
OZONE FL: 78	OZONE FL: 78
PMT: 21.5	PMT: 20.3
NORM PMT: 0.7	NORM PMT: 0.8
AZERO: 16.8	AZERO: 16.5
HVPS: 767	HVPS: 767
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 32.1	BOX TEMP: 30.0
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 45.0	IZS TEMP: 45.1
MOLY TEMP: 316.3	MOLY TEMP: 315.9
RCEL: 5.1	RCEL: 5.0
SAMP: 26.0	SAMP: 26.0
Internal Span NO: 8.5	Internal Span NO: 7.9
Internal Span NO2: 494	Internal Span NO2: 495
Internal Span NOx: 502	Internal Span NOx: 502

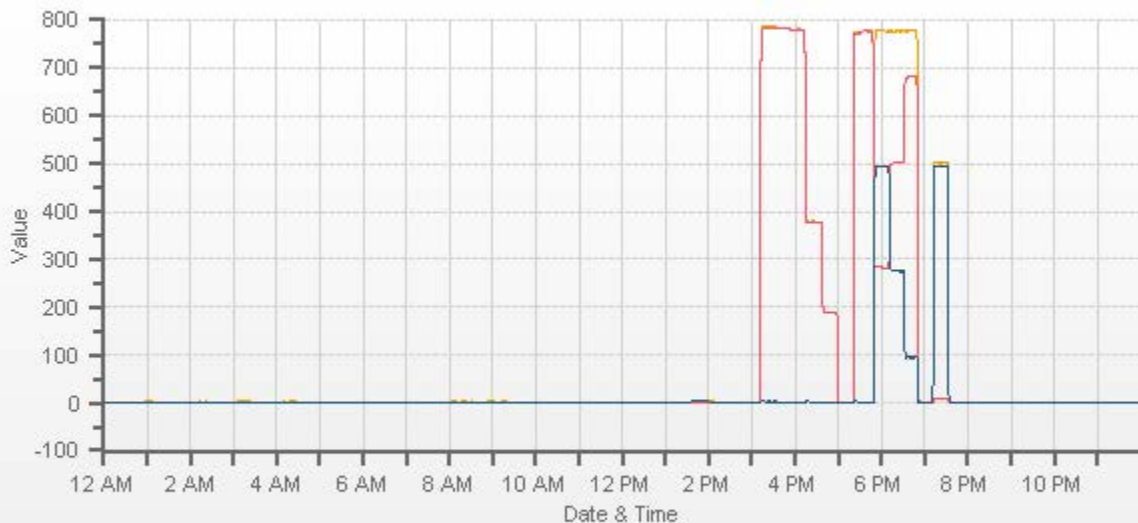
Comments:

Sample inlet filter changed. No NO2 adjustment required/made.

Date: September 6, 2016
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 13:16 / 19:37
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	September 7, 2016	Barometric Pressure:	0.917 atm
Company/Airshed:	LICA	Station Temperature °C:	23
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst):	10:22 / 15:03	Calibration Purpose:	routine monthly
Ozone Calibration Method:	Varying UV Lamp Power	Performed By/Reviewer:	Alex Yakupov Tom Bourque
G.P.T. Date:	n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date:	n/a

Analyzer:	Serial Number:	1002240371	Ozone Range ppb:	500
	Last Calibration Date:	August 18, 2016	As Found C.F.:	0.998
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Point	AMD Required Range of Ozone Calibration Points
	Make & Model:	SABIO 2010 D	High	300-400 ppb
	Serial #:	11900613	Mid	150-200 ppb
	Cal Gas Cylinder I.D. #:	n/a	Low	50-75 ppb

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

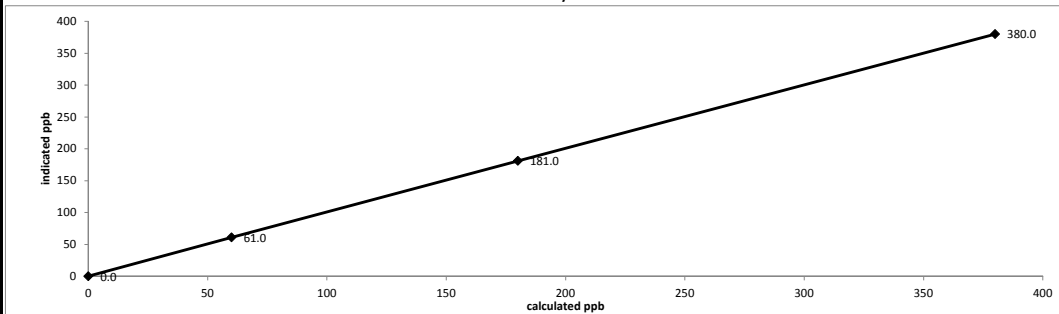
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	-0.7	n/a
as found high	5000	5000	380.0	380.0	380.0	0.998
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	181.0	0.994
low	5000	5000	60.0	60.0	61.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a

Average C.F. = 0.993

Linear Regression/Calibration Results:

Correlation Coefficient =	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 =	0.18%		± 10%

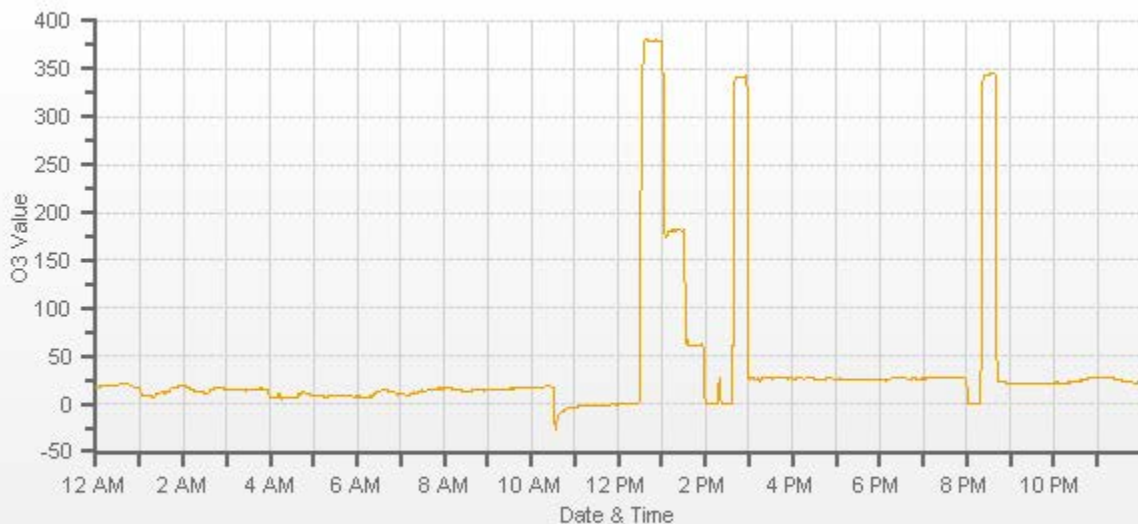
Thermo 49i Ozone Analyzer Calibration



As found:	O3 Bkg:	-0.7	As left:	O3 Bkg:	-0.5
	O3 Coef:	0.966		O3 Coef:	0.966
	Photo Lamp:	9.4		Photo Lamp:	9.4
	O3 Lamp:	7.8		O3 Lamp:	7.8
	Bench:	27.3		Bench:	28.3
	Bench Lamp:	53.6		Bench Lamp:	53.6
	O3 Lamp:	67.8		O3 Lamp:	67.8
	Pressure:	676.4		Pressure:	676.4
	Cell A lpm:	0.725		Cell A lpm:	0.725
	Cell B lpm:	0.720		Cell B lpm:	0.720
	O3 ppb:	-8.7		O3 ppb:	0.5
	Cell A ppb:	-1.0		Cell A ppb:	-0.1
	Cell B ppb:	-14.5		Cell B ppb:	0.5
	Cell A int:	57330		Cell A int:	53780
	Cell B int:	72295		Cell B int:	72350
	Internal Span:	324		Internal Span:	343

Comments:

Sample inlet filter changed. No High Point adjustment required/made.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 7, 2016
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: August 22, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 11:42
 End Time (mst): 13:17
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number: 1405A208301003 As Found Filter Loading %: 22.67
 Ko Factor: 13125.0 As Left Filter Loading %: 21.63
 Ambient Temperature °C: 17.01 As Found Noise: 0.003
 Ambient Pressure atm: 0.918 As Left Noise: 0.002
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.27
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 17, 2016</u>	<u>November 2, 2015</u>

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	0.00	-0.94	0.00	-0.94
	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	0.00	-0.94	0.00	-0.94
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>17.0</u>	1405F pressure atm: <u>0.918</u>
reference temperature °C: <u>17.6</u>	reference pressure: <u>0.917</u>
difference °C: <u>0.6</u>	difference: <u>0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>17.6</u>	1405F pressure atm: <u>0.917</u>
reference temperature °C: <u>17.6</u>	reference pressure: <u>0.917</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.93</u>	reference total/aux flow lpm: <u>16.65</u>
difference lpm: <u>-0.07</u>	difference lpm: <u>-0.02</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.67</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>0.00</u>

K_o Audit:

Last K_o audit date: August 16, 2016
 1405F K_o factor: 13125.0
 Measured K_o factor: 13230.7000
 % difference: 0.81

Comments:

PM 2.5/10 sample inlet head was cleaned. 47 mm FDMS filter was changed. Flows were audited and adjusted.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 20, 2016
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: September 7, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 12:33
 End Time (mst): 13:22
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly cloudy with sunny breaks

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 29.36
 Ko Factor: 13125 As Left Filter Loading %: 18.82
 Ambient Temperature °C: 12.81 As Found Noise: 0.005
 Ambient Pressure atm: 0.924 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.27
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

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	0.00	-0.93	0.00	-0.93
	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	0.00	-0.93	0.00	-0.93
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>12.8</u>	1405F pressure atm: <u>0.924</u>
reference temperature °C: <u>13.1</u>	reference pressure: <u>0.926</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
1405F temperature °C: <u>13.1</u>	1405F pressure atm: <u>0.926</u>
reference temperature °C: <u>13.1</u>	reference pressure: <u>0.926</u>
difference °C: <u>0.0</u>	difference : <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.96</u>	reference total/aux flow lpm: <u>16.68</u>
difference lpm: <u>-0.04</u>	difference lpm: <u>0.01</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.68</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.01</u>

K_o Audit:

Last K_o audit date: August 16, 2016
 1405F K_o factor: 13125
 Measured K_o factor: 13230.7000
 % difference: 0.81

Comments:

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

Flows were audited and the Main Flow was adjusted.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Abid/Limin Li</u>
Location:	<u>St Lina</u>	Reason:	<u>Install</u>
Audit Date:	<u>July 7, 2016</u>	Calibrator Make/Model:	<u>RM Young/18802</u>
Previous Audit Date:	<u>n/a</u>	Calibrator Cert. Date:	<u>Mar 17, 2014</u>

Wind Speed

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>124638</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA03309</u>
Voltage range:	<u>0-1V</u>	Output signal range:	<u>0-200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.4	0.4	-
1000	17.6	17.9	17.9	0.98
2000	35.28	35.64	35.62	0.99
3000	52.92	53.4	53.4	0.99
4000	70.56	71.22	71.22	0.99
5000	88.2	89.05	89.06	0.99
6000	105.84	106.9	106.9	0.99
7000	123.48	124.8	124.8	0.99
8000	141.12	142.6	142.6	0.99
9000	158.76	160.6	160.6	0.99
10000	176.4	178.5	178.6	0.99
Average Correction Factor:				0.99

Wind Direction

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>124638</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA03309</u>
Voltage range:	<u>0-1V</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.6	n/a
45	45.2	1.00
90	92.4	0.97
135	136.3	0.99
180	181.2	0.99
225	226.8	0.99
270	271.0	1.00
315	315.7	1.00
355	355.1	1.00
Average Correction Factor:		0.99

Remarks: _____

Audit Performed by: Abid Ashraf

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</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>77.5</u>	Pt. #2	<u>37.8</u>	Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO₂ - Flows Not Manually Measured

Auditor: Shea Beaton
 Operator Signature:

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0

Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 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.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 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

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
Operator Signature: _____

Date: January 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:

Make/Model	<u>Thermo 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.2</u>	Span:	<u>1.014</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>02-Feb-16</u>	C.F.	<u>1.000</u> Done By: <u>SB</u>

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

	NO	NOx
Previous Stated Concentration PPM:	<u>50.0</u>	<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

APPENDIX III
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Site
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	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.

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

01-11-2016

Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-09-0-C</u>
Site: <u>St. Lina Site</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>19-SEP-16</u>
Level 1 Primary Validation	<u></u>	Date <u>19-SEP-16</u>
Level 2 Final Validation	<u></u>	Date <u>01-NOV-16</u>
Level 3 Independent Data Review	<u></u>	Date <u>01-NOV-16</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.



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

JOB #: 2833-2016-09-37-C

September 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **November 3, 2016**

Prepared by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi".

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

Reviewed by:

A handwritten signature in black ink, appearing to read "Cheri Sinclair".

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

SUMMARY

In September 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville 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 (LICA).

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.

PM_{2.5}: A total of 45 hours of data was discarded this month. Twenty-one hours of data were invalidated as the recorded concentrations were below $-3 \mu\text{g}/\text{m}^3$. Twenty-four hours of data, collected on September 30, were discarded due to equipment malfunction.

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.

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Bonnyville						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	0.0	0.6	1	14	13.5	SW	0.1	1	100.0
H ₂ S (ppb)	10	3	0	0	0.6	8.4	26	4	1.7	SSW	1.4	14	100.0
THC (ppm)	-	-	-	-	2.09	3.05	22	6	1.0	N	2.36	29	100.0
CH ₄ (ppm)	-	-	-	-	2.09	3.03	22	6	1.0	N	2.35	29	100.0
NMHC (ppm)	-	-	-	-	0.00	0.22	20	7	2.9	WNW	0.01	VAR	100.0
NO ₂ (ppb)	159	-	0	-	3.9	21.2	29	7	1.5	N	10.0	29	100.0
NO (ppb)	-	-	-	-	1.4	46.5	22	7	1.1	NNW	6.8	22	100.0
NO _x (ppb)	-	-	-	-	5.3	65.4	22	7	1.1	NNW	14.0	29	100.0
O ₃ (ppb)	82	-	0	-	19.2	45.4	1	14	13.5	SW	27.7	16	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	4.3	30.1	24	4	3.6	WNW	8.3	23	93.8
VECTOR WS (kph)	-	-	-	-	7.6	24.2	13	12	-	SSW	14.3	13	100.0
VECTOR WD (sec)	-	-	-	-	-	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

SO₂ 24-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 1-Hour Exceedances

No Exceedances Recorded During the Month

H₂S 24-Hour Exceedances

No Exceedances Recorded During the Month

NO₂ 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 1-Hour Exceedances

No Exceedances Recorded During the Month

PM_{2.5} 24-Hour Exceedances

No Exceedances Recorded During the Month

O₃ 1-Hour Exceedances

No Exceedances Recorded During the Month

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
September 3, 2016	1.6	ACETONE
September 9, 2016	2.6	ACETONE
September 15, 2016	3.9	ACETONE
September 21, 2016	1.9	ACETONE
September 27, 2016	2.2	ACETONE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
September 3, 2016	0.09	PHENANTHRENE
September 9, 2016	0.41	PHENANTHRENE
September 15, 2016	0.28	PHENANTHRENE
September 21, 2016	0.20	PHENANTHRENE
September 27, 2016	0.22	PHENANTHRENE

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
September 2, 2016	6.1	ETHANOL
September 13, 2016	3.9	ACETONE
September 17, 2016	3.0	ACETONE
September 20, 2016	42.0	ETHANOL
September 27, 2016	4.1	ETHANOL

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 the non-continuous VOCs, PAHs 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 (August 3, 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.

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%).

Trailer inspection was conducted on September 8. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on September 8. No operational issues were identified this month.

HYDROGEN SULPHIDE (H₂S)

The routine monthly calibration was performed on September 8. No operational issues were identified this month.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

The routine monthly calibration was performed on September 9. No operational issues were identified this month. Maximum instantaneous data collected on September 8, at hours 10:00 and 11:00, were invalidated due to intermittent power outages that occurred while maintenance was performed on other channels.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on September 8. No operational issues were identified this month.

OZONE (O₃)

The routine monthly calibration was performed on September 9. No operational issues were identified this month. Maximum instantaneous data collected on September 8, at hours 10:00 and 11:00, were invalidated due to intermittent power outages that occurred while maintenance was performed on other channels.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on September 9 and the other audit was performed on September 22. Both the inlet filter and the FDMS filter were replaced during the audits. The TEOM unit recorded intermittent negative readings in the days following the September 22 audit. As a corrective action, the filter was exchanged and reset on September 26 which resolved the issue. The TEOM malfunctioned on September 30 which resulted in twenty-four hours of discarded data. The equipment was restarted on October 1 and after stabilization, the unit resumed normal operations.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Twenty-one hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

The wind system performed well throughout the month. No operational issues were identified. Maximum instantaneous data collected on September 8, at hours 10:00 and 11:00, were invalidated due to intermittent power outages that occurred while maintenance was performed on other channels.

VOC SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on September 3, 9, 15, 21 and 27. Analytical results are included in this report. VOC values are reported in ppb.

PAH SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on September 3, 9, 15, 21 and 27. Analytical results are included in this report. PAH values are reported in μg .

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.

Five canister events were recorded this month between September 2 and September 27. The date, time and initial 5-min average concentration measurements are as follows:

- September 2 at hour 15:50 - 0.31 ppm
- September 13 at hour 15:40 - 0.44 ppm
- September 17 at hour 07:15 - 0.84 ppm
- September 20 at hour 07:05 - 0.34 ppm
- September 27 at hour 05:45 - 0.35 ppm

There were two five-minute averages recorded on September 1, at hours 06:55 and 07:00, that were greater than 0.30 ppm. However, these measurements occurred prior to the scheduled replacement of the canister, following a late afternoon collection event on August 31. Analytical results are included in this report. The values for the NMHC canister samples are reported in ppb.

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 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-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ 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 1405F TEOM Unit
- Wind System - RM Young 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

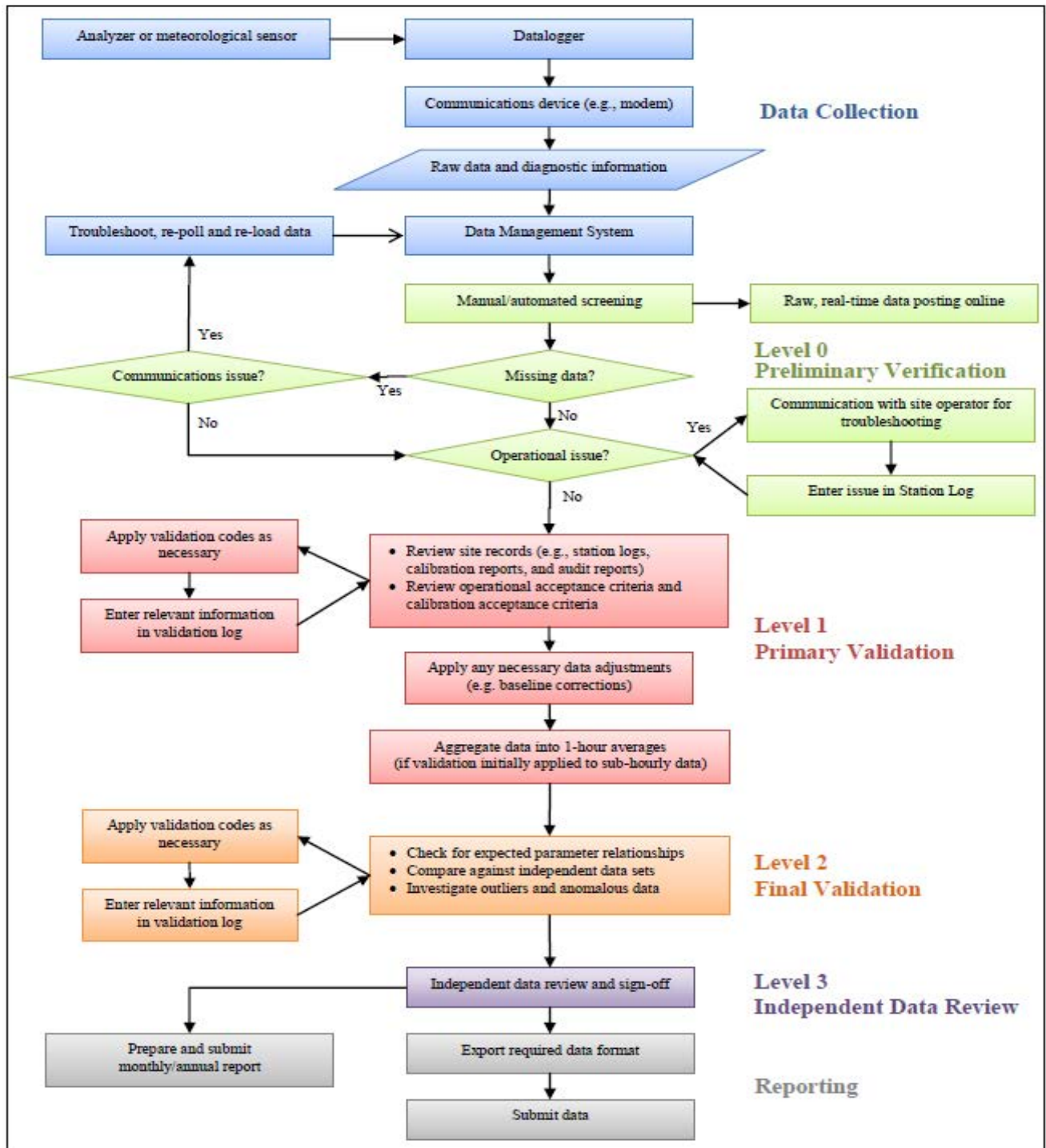
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (Aug 3, 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)

MST

DAY	HOURLY START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	RDGS.	
	HOURLY END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.2	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.6	0.1	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	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	0.1	0.3	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.2	0.4	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
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.2	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.3	0.3	0.4	0.5	0.2	0.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24

STATUS FLAG CODES

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

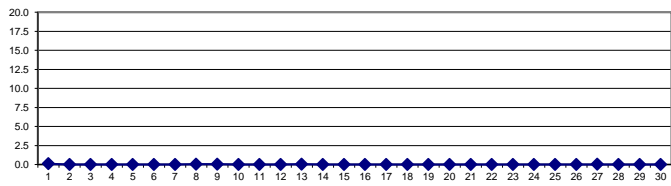
OBJECTIVE LIMIT:

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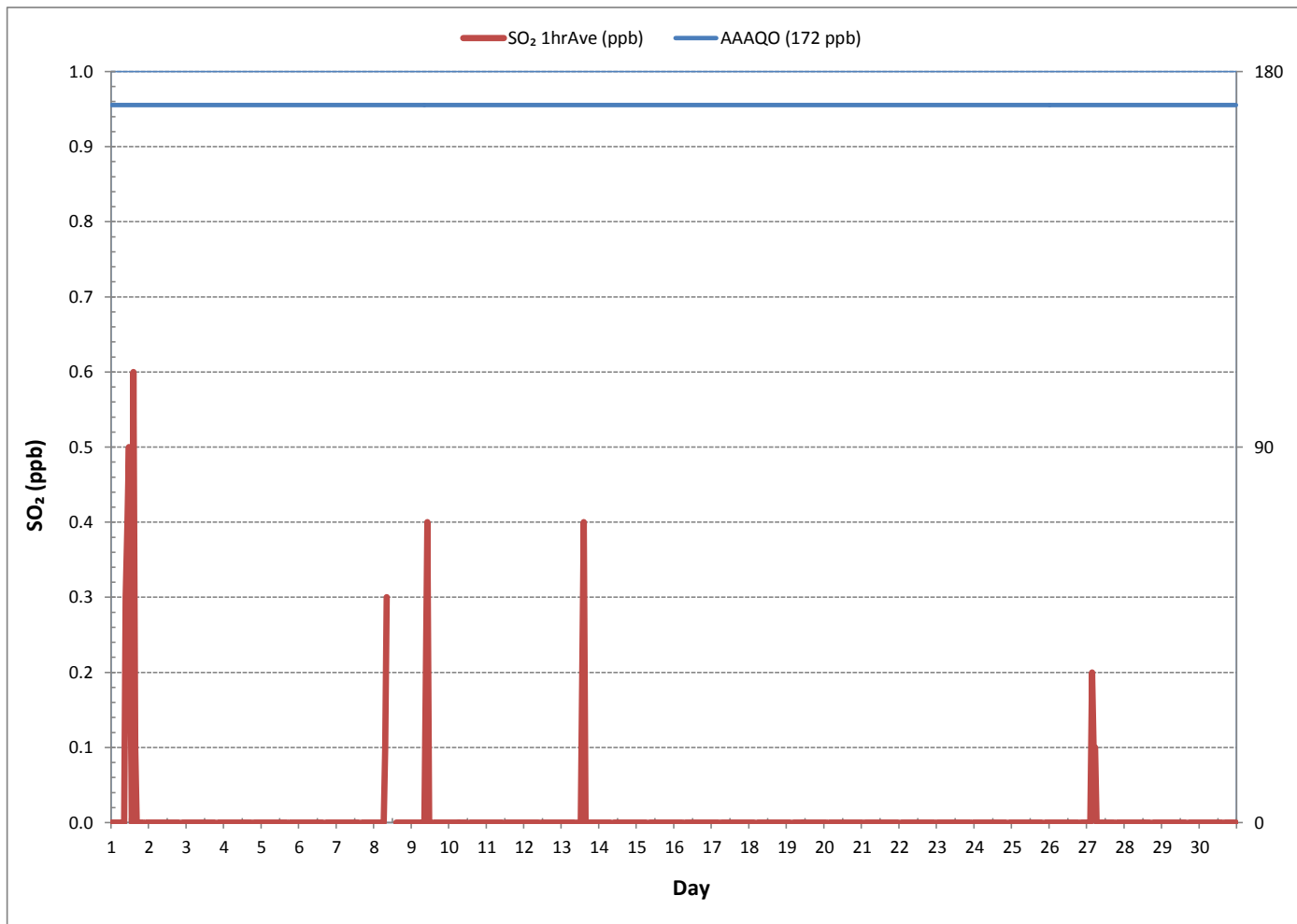
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	15				
MINIMUM 1-HR AVERAGE:	0.0	PPB	@ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	0.6	PPB	@ HOUR(S)	14	ON DAY(S) 1
MAXIMUM 24-HR AVERAGE:	0.1	PPB			ON DAY(S) 1
					VAR-VARIOUS
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.05		MONTHLY AVERAGE:	0.0	PPB

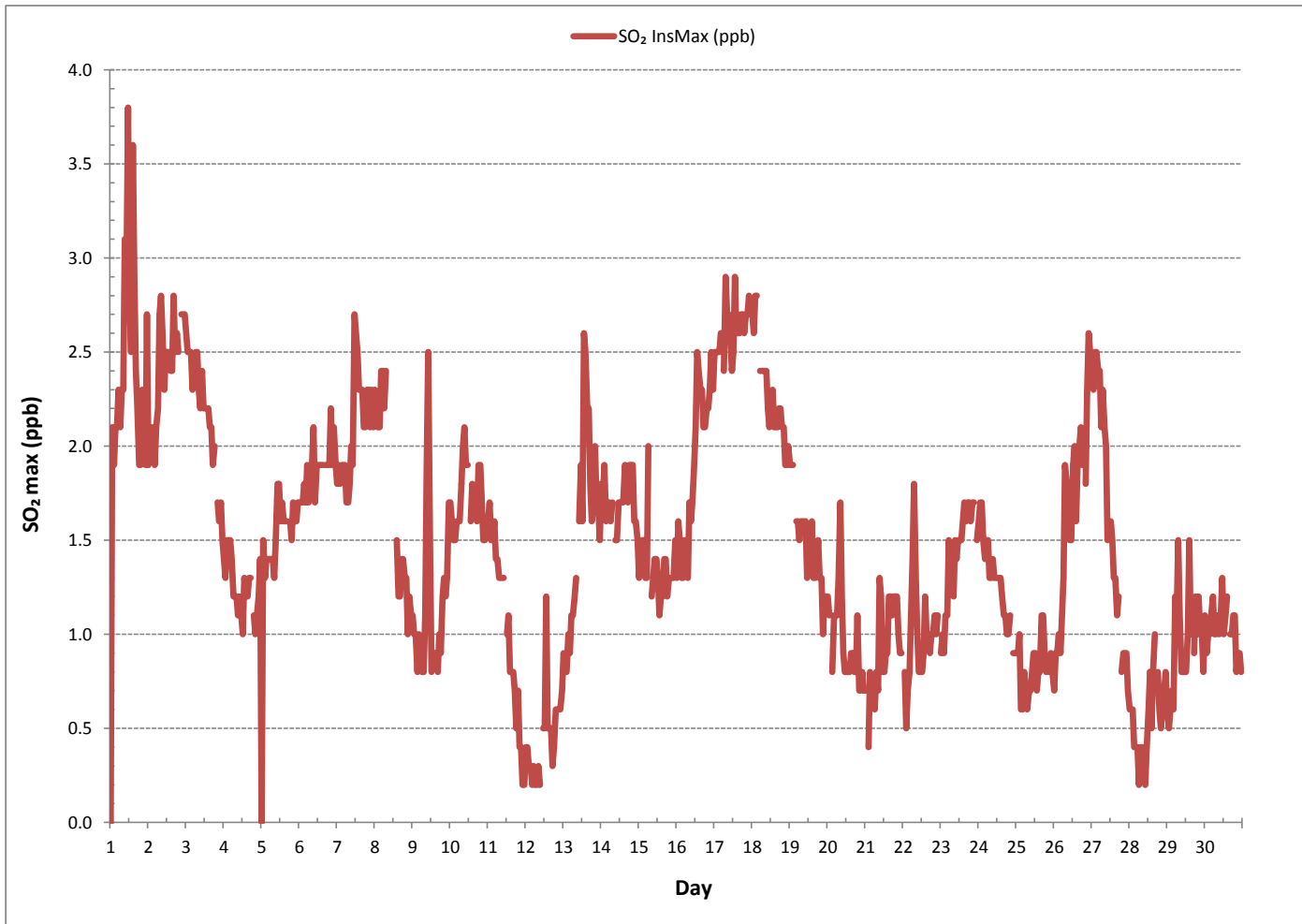
24 HOUR AVERAGES FOR September 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

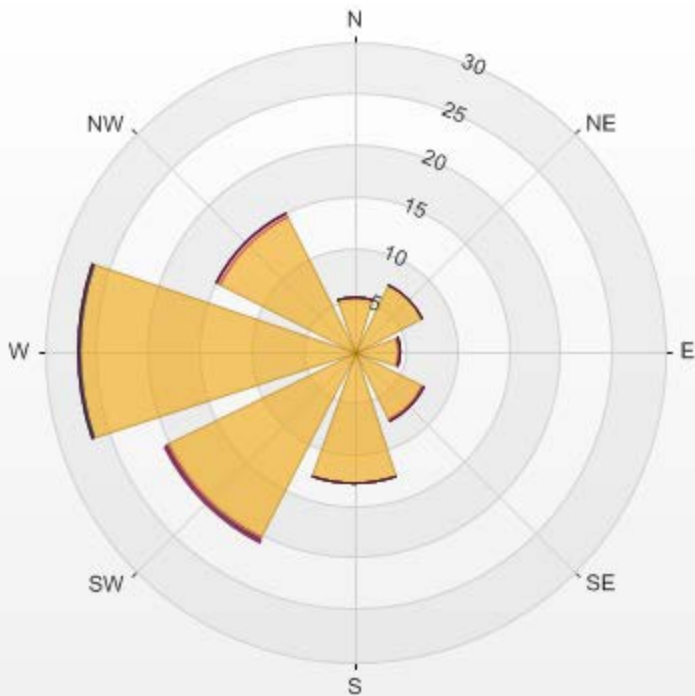


SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



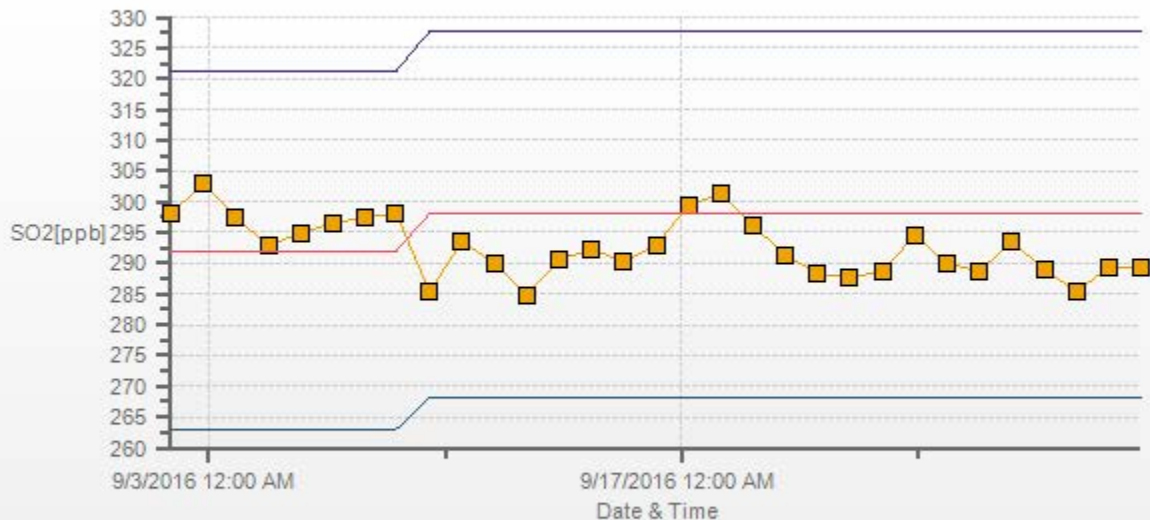
Wind: LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.00% Calm Avg: 0.00

Direction	0-0.14	0.14-0.28	0.28-0.42	0.42-0.56	0.56-0.7	>0.7	Total
N	5.41	0	0	0	0	0	5.41
NE	7.31	0	0	0	0	0	7.31
E	4.24	0.15	0.15	0	0	0	4.54
SE	7.31	0.15	0	0	0	0	7.46
S	12.87	0	0	0	0	0	12.87
SW	20.18	0.15	0.15	0	0.15	0	20.63
W	26.61	0	0.15	0	0	0	26.76
NW	14.62	0.29	0	0.15	0	0	15.06
Summary	98.55	0.74	0.45	0.15	0.15	0	100



% Icon Classes (ppb)	99	1	0	0	0	0
	0-0.14	0.14-0.28	0.28-0.42	0.42-0.56	0.56-0.7	>0.7

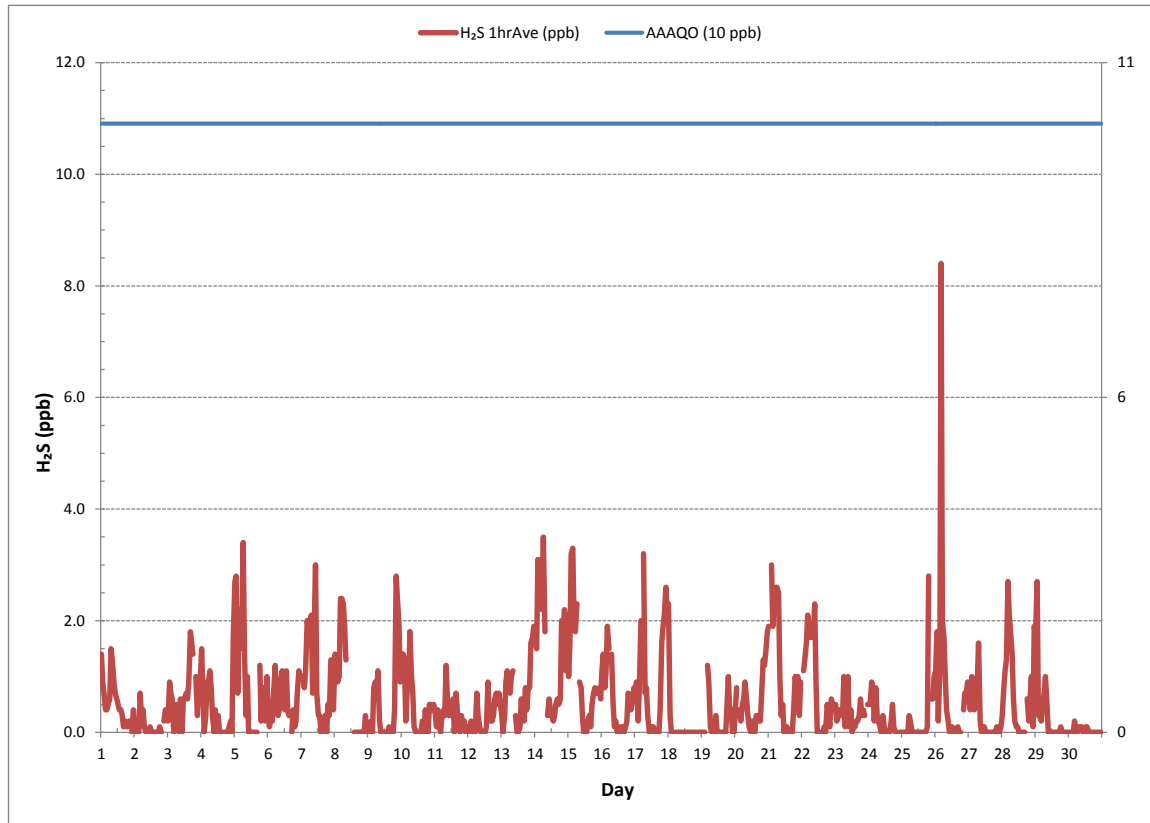
SO2[ppb] Calibration: LICA Bonnyville Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
1	1	3.3	2.6	2.5	1.0	1.0	1.0	1.0	5.1	4.5	1.7	1.1	1.0	0.9	0.8	0.9	0.8	0.6	0.5	0.5	0.5	0.9	S	1.2	1.2	0.5	5.1	1.5	24
2	2	0.6	0.6	0.6	0.8	5.9	1.0	1.1	0.8	0.6	0.8	0.6	0.8	0.6	0.7	0.6	0.7	0.7	0.7	1.0	0.8	S	1.3	1.2	0.8	0.6	5.9	1.0	24
3	3	0.7	3.2	3.0	1.5	0.6	1.0	1.7	0.9	1.0	1.0	0.5	1.2	1.3	0.9	0.8	1.5	2.3	2.3	1.6	S	1.1	0.8	1.3	1.2	0.5	3.2	1.4	24
4	4	1.8	1.8	0.3	1.6	1.3	1.3	1.9	1.3	1.0	0.5	2.7	0.6	1.5	0.6	0.6	0.6	0.7	0.7	S	0.0	1.4	1.2	1.1	3.1	0.0	3.1	1.2	24
5	5	4.7	4.1	2.1	3.6	4.0	7.6	7.7	2.7	1.6	2.3	1.0	1.0	0.4	0.5	0.9	0.5	1.1	S	3.3	2.9	4.2	1.8	1.6	3.8	0.4	7.7	2.8	24
6	6	2.9	0.8	1.1	1.2	1.7	2.3	1.5	0.9	1.1	1.5	1.9	1.6	0.6	1.7	1.3	0.6	S	0.5	0.6	0.7	0.5	1.2	1.5	1.6	0.5	2.9	1.3	24
7	7	1.4	1.8	1.2	2.7	3.0	2.6	2.6	2.9	1.8	3.6	4.0	2.4	1.0	0.9	0.6	S	0.6	1.1	0.8	1.9	1.0	3.4	3.1	2.0	0.6	4.0	2.0	24
8	8	4.8	2.5	2.1	1.9	6.8	5.6	4.5	4.0	C	C	C	C	C	C	C	0.7	0.3	0.8	1.1	0.4	0.6	0.7	0.7	0.3	0.3	6.8	2.2	24
9	9	0.5	0.5	0.7	0.8	1.5	1.4	1.1	1.5	0.9	0.1	0.2	0.5	0.1	S	0.0	0.7	0.2	0.6	0.7	1.3	7.5	6.2	3.5	2.3	0.0	7.5	1.4	24
10	10	2.5	2.7	2.7	0.8	1.7	2.5	3.2	2.0	1.7	1.0	0.6	0.5	S	0.9	1.0	0.8	0.9	1.4	1.1	0.5	1.6	1.4	0.9	0.9	0.5	3.2	1.4	24
11	11	0.8	0.7	0.7	0.4	0.2	1.0	0.9	1.6	1.5	0.7	0.5	S	0.5	0.8	0.0	1.3	1.2	0.4	0.4	0.4	0.4	0.3	0.2	0.0	0.0	1.6	0.6	24
12	12	0.3	0.1	0.2	0.4	0.3	0.3	1.1	0.7	0.2	0.2	S	0.1	0.1	0.6	1.1	0.7	0.6	0.5	0.8	1.0	1.0	0.8	1.1	0.9	0.1	1.1	0.6	24
13	13	1.1	0.0	0.9	1.5	1.4	1.3	0.9	1.6	1.8	S	0.6	0.5	0.2	0.5	1.0	0.7	0.9	1.3	0.9	1.5	1.5	2.1	2.9	2.5	0.0	2.9	1.2	24
14	14	2.4	2.8	4.0	4.0	3.7	4.5	4.3	2.4	S	0.4	0.6	0.6	0.4	0.3	0.4	0.6	0.7	0.5	1.6	5.6	3.2	4.2	3.3	6.2	0.3	6.2	2.5	24
15	15	2.4	4.7	5.7	7.5	4.2	3.2	6.2	S	2.0	1.5	1.1	0.7	0.8	0.3	0.6	0.9	0.7	1.2	1.7	1.6	1.5	1.2	1.7	1.3	0.3	7.5	2.3	24
16	16	2.4	2.4	2.2	2.4	3.4	3.0	S	3.1	1.6	0.7	0.7	0.6	0.7	0.6	0.8	0.7	0.6	0.7	1.1	1.7	1.3	1.4	1.4	2.2	0.6	3.4	1.6	24
17	17	3.2	2.6	1.0	2.2	3.1	S	6.9	2.2	2.5	1.3	0.9	0.9	0.9	1.0	1.0	0.8	0.8	0.5	2.0	3.7	4.7	3.9	5.2	5.6	0.5	6.9	2.5	24
18	18	5.5	2.7	0.8	1.0	S	0.8	0.7	0.8	0.6	0.8	0.8	0.8	0.8	0.9	0.6	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.5	5.5	1.0	24
19	19	1.0	0.6	0.7	S	3.4	3.3	2.3	0.5	0.6	1.6	1.8	1.3	0.0	0.2	0.2	0.9	0.3	0.7	2.1	3.2	1.1	1.1	0.7	0.8	0.0	3.4	1.2	24
20	20	1.6	2.6	S	1.1	0.5	1.3	0.9	1.2	1.2	0.4	0.2	0.1	0.3	0.3	0.6	0.5	0.5	0.4	0.3	1.8	3.1	3.9	3.0	3.3	0.1	3.9	1.3	24
21	21	3.3	S	5.3	2.9	5.0	4.0	3.7	3.0	1.7	0.7	0.8	0.3	0.3	0.4	0.1	0.2	0.2	0.1	1.2	1.7	1.4	2.7	0.9	2.6	0.1	5.3	1.8	24
22	22	S	2.2	2.5	2.4	2.7	2.5	2.4	2.7	2.8	4.4	1.5	1.0	0.1	0.3	0.1	0.6	0.6	0.6	1.0	0.9	0.7	1.2	1.3	S	0.1	4.4	1.6	24
23	23	1.4	0.6	1.1	1.1	0.9	0.9	2.9	1.2	1.7	1.7	1.3	1.7	0.6	0.7	0.7	1.2	1.5	1.0	1.3	1.1	1.4	0.9	S	1.8	0.6	2.9	1.2	24
24	24	1.1	1.3	1.8	1.6	1.2	1.5	1.2	0.8	0.8	0.6	0.8	0.7	0.7	0.4	0.3	0.4	1.2	1.3	0.7	0.3	0.4	S	0.4	0.4	0.3	1.8	0.9	24
25	25	0.6	0.4	0.3	0.8	0.3	1.4	0.6	0.5	0.3	0.3	0.1	0.1	0.3	0.3	0.2	0.2	0.3	0.3	2.3	5.3	S	1.9	1.5	3.1	0.1	5.3	0.9	24
26	26	2.4	3.9	1.0	2.2	15.5	5.1	3.2	3.0	1.0	0.7	0.5	0.4	0.7	0.5	0.5	0.6	0.5	0.5	0.4	S	1.1	1.4	1.3	1.5	0.4	15.5	2.1	24
27	27	1.4	1.5	3.0	2.3	1.0	2.6	1.7	3.1	1.0	0.4	0.5	0.6	0.4	0.5	0.4	0.5	0.3	0.4	S	0.4	0.9	0.7	0.6	1.1	0.3	3.1	1.1	24
28	28	1.7	2.5	3.2	2.6	4.0	2.9	2.4	2.3	1.0	0.6	0.4	0.4	0.6	0.4	0.2	0.1	0.2	S	1.6	0.6	2.2	2.3	0.4	4.4	0.1	4.4	1.6	24
29	29	4.6	6.0	1.4	0.7	0.7	1.1	1.2	1.6	1.2	0.7	0.3	0.2	0.4	0.4	0.3	0.4	S	0.5	0.6	0.5	0.4	0.4	0.3	0.5	0.2	6.0	1.1	24
30	30	0.5	0.5	0.4	0.4	1.5	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.5	0.5	0.4	S	0.4	0.2	0.3	0.3	0.1	0.3	0.2	0.1	0.1	1.5	0.4	24
HOURLY MAX		5.5	6.0	5.7	7.5	15.5	7.6	7.7	5.1	4.5	4.4	4.0	2.4	1.5	1.7	1.3	1.5	2.3	2.3	3.3	5.6	7.5	6.2	5.2	6.2				
HOURLY AVG		2.1	2.0	1.8	1.8	2.8	2.3	2.4	1.9	1.4	1.1	0.9	0.8	0.6	0.6	0.6	0.7	0.7	0.7	1.1	1.5	1.6	1.8	1.5	1.9				

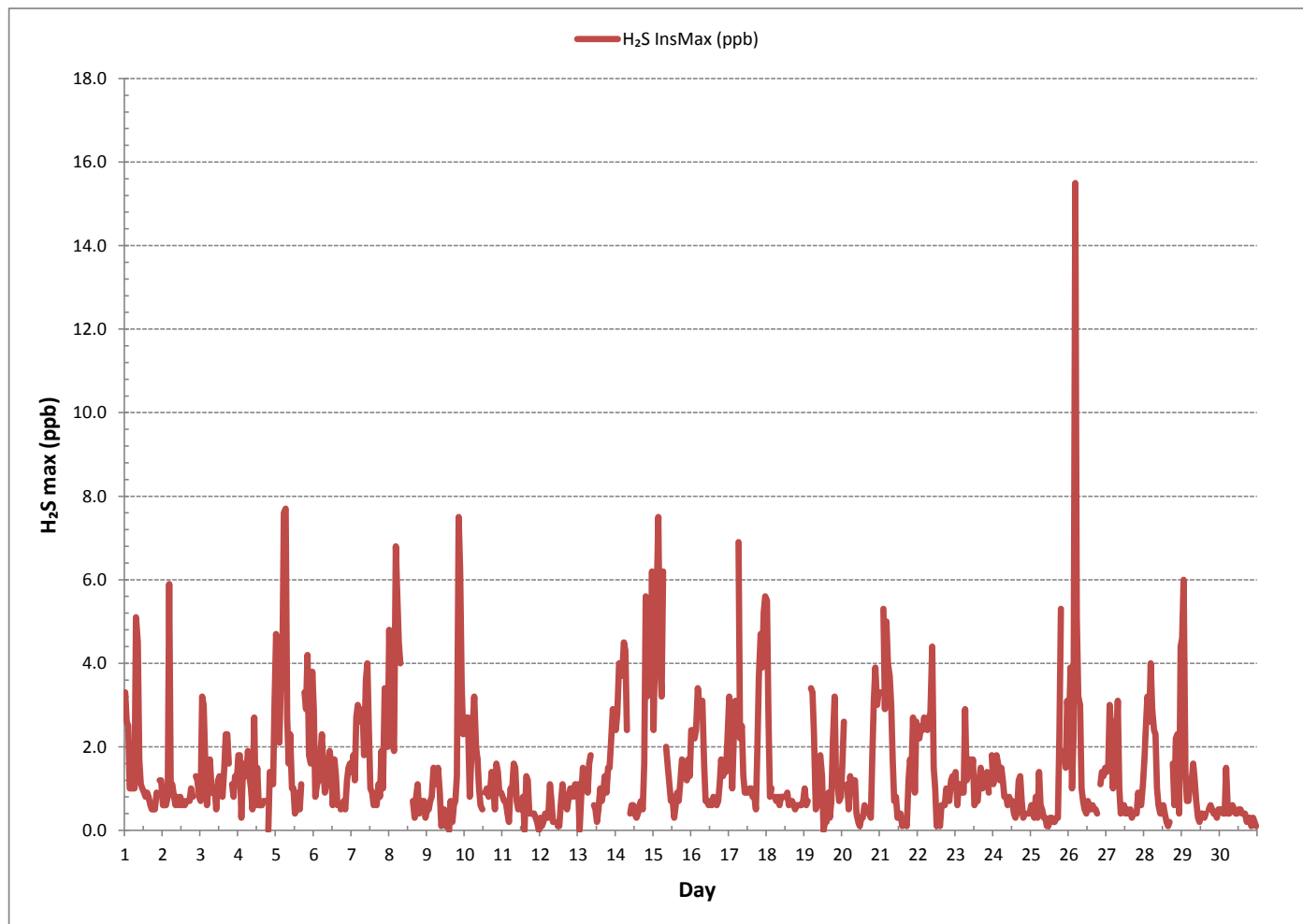
STATUS FLAG CODES

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

MONTHLY SUMMARY

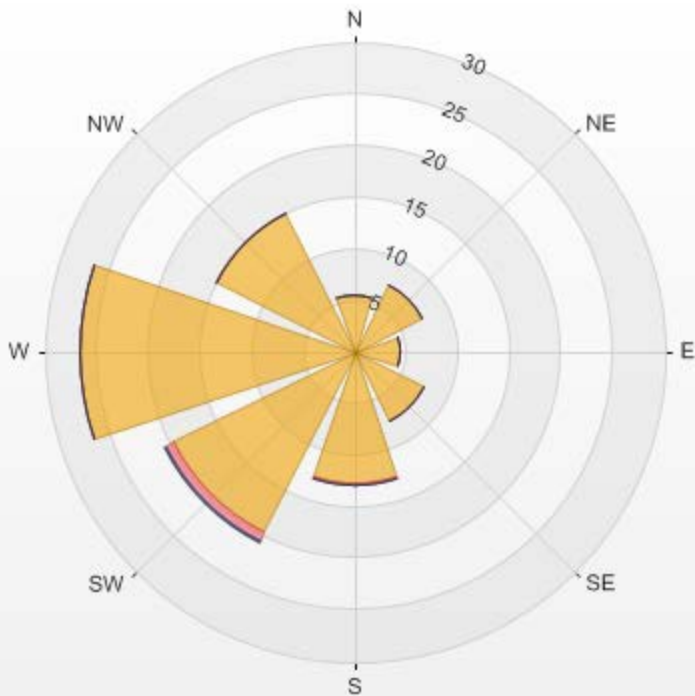
NUMBER OF NON-ZERO READINGS:	677
MAXIMUM INSTANTANEOUS VALUE:	15.5 PPB @ HOUR(S) 4 ON DAY(S) 26
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	7 HRS
STANDARD DEVIATION:	1.43
OPERATIONAL TIME:	720 HRS

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



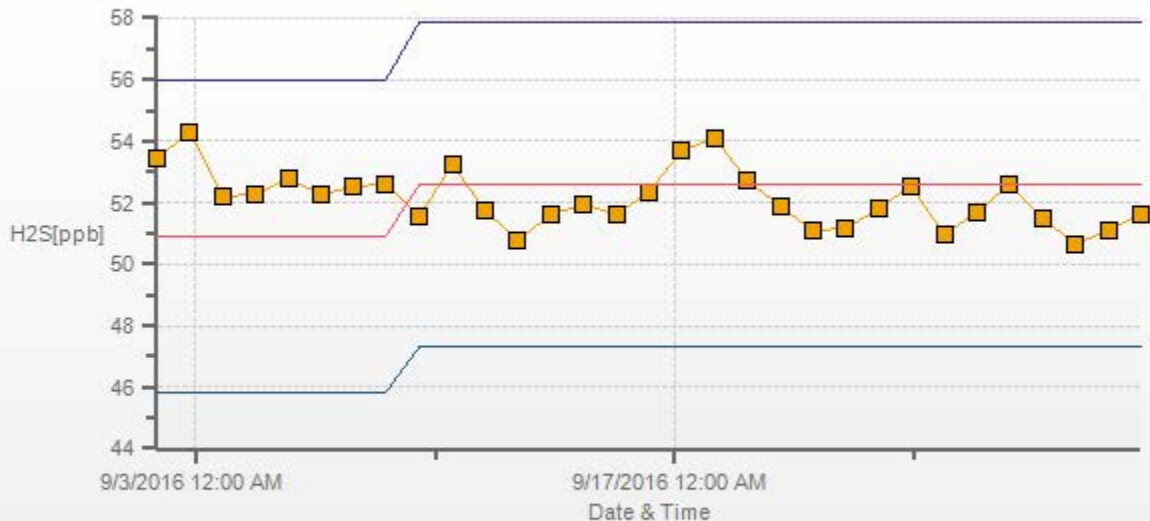
Wind: LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0.0-2.8	2.8-5.7	5.7-8.5	>8.5	Total
N	5.42	0	0	0	5.42
NE	7.32	0	0	0	7.32
E	4.39	0.15	0	0	4.54
SE	7.47	0	0	0	7.47
S	12.74	0.15	0	0	12.89
SW	19.62	0.88	0.15	0	20.65
W	26.65	0	0	0	26.65
NW	14.93	0.15	0	0	15.08
Summary	98.54	1.33	0.15	0	100



% Icon Classes (ppb)	99	0.0-2.8	1	2.8-5.7	0	5.7-8.5	0	>8.5
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H2S[ppb] Calibration: LICA Bonnyville Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



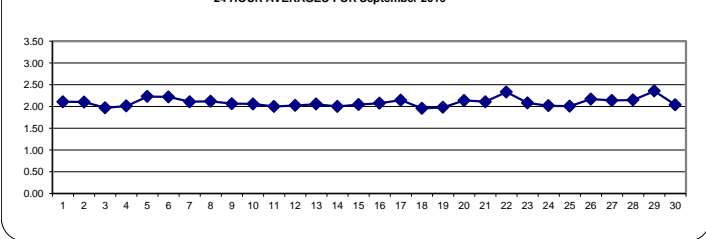
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.13	2.15	2.15	2.14	2.12	2.13	2.17	2.26	2.20	2.19	2.18	2.14	2.12	2.10	2.05	2.05	1.98	1.98	2.00	2.00	2.02	S	2.12	2.12	1.98	2.26	2.11	24	
2	2.17	2.28	2.37	2.28	2.20	2.23	2.22	2.15	2.08	2.06	2.02	2.05	2.03	2.01	1.99	2.03	2.03	2.00	2.02	2.03	S	2.05	2.05	2.01	1.99	2.37	2.10	24	
3	1.98	1.94	1.94	1.94	1.95	1.96	1.97	1.97	1.97	1.98	1.97	1.97	1.96	1.95	1.98	1.98	1.97	1.97	1.98	S	1.98	1.98	2.00	2.00	1.94	2.00	1.97	24	
4	2.03	1.98	1.98	1.99	2.03	2.03	2.04	2.04	2.02	2.00	1.99	1.98	1.97	1.97	1.97	1.97	1.98	1.99	S	2.02	2.02	2.06	2.08	2.12	1.97	2.12	2.01	24	
5	2.19	2.30	2.29	2.37	2.50	2.36	2.66	2.56	2.36	2.13	2.10	2.08	2.01	2.00	2.05	2.08	2.07	S	2.16	2.21	2.18	2.14	2.23	2.30	2.00	2.66	2.23	24	
6	2.40	2.49	2.39	2.40	2.34	2.30	2.19	2.18	2.21	2.24	2.18	2.21	2.18	2.11	2.01	1.97	S	1.99	2.01	2.20	2.29	2.31	2.27	2.24	1.97	2.49	2.22	24	
7	2.26	2.22	2.16	2.14	2.19	2.16	2.17	2.17	2.13	2.12	2.11	2.05	1.97	1.97	1.98	S	1.96	1.97	2.11	2.07	2.12	2.17	2.19	2.15	1.96	2.26	2.11	24	
8	2.17	2.22	2.23	2.33	2.35	2.35	2.42	2.29	2.20	2.16	2.03	2.00	2.06	1.94	S	1.93	1.94	1.94	1.95	1.97	2.01	2.07	2.12	2.06	1.93	2.42	2.12	24	
9	2.04	2.03	2.04	2.08	2.10	2.05	2.04	2.02	C	C	C	C	1.96	1.97	1.97	1.97	1.97	1.97	2.00	2.13	2.23	2.27	2.22	2.18	1.96	2.27	2.07	24	
10	2.25	2.33	2.29	2.30	2.25	2.18	2.24	2.16	2.01	1.98	1.96	1.94	S	1.93	1.93	1.93	1.93	1.94	1.94	1.96	1.97	1.97	1.96	1.99	1.93	2.33	2.06	24	
11	1.97	1.96	1.98	2.02	2.00	1.99	1.99	2.00	1.99	1.98	1.99	S	1.99	1.98	1.99	1.98	1.99	1.98	1.99	2.00	2.02	2.03	2.04	2.04	2.06	1.96	2.06	2.00	24
12	2.05	2.04	2.03	2.04	2.05	2.10	2.10	2.02	2.02	S	2.00	1.99	1.99	1.99	1.98	1.98	1.99	1.98	1.99	2.04	2.03	2.01	2.04	2.06	1.98	2.10	2.02	24	
13	2.11	2.16	2.22	2.16	2.17	2.16	2.11	2.15	2.15	S	2.05	2.02	1.98	1.99	1.97	1.99	1.94	1.96	1.97	2.00	1.99	2.00	2.00	2.01	1.94	2.22	2.05	24	
14	2.01	2.02	2.03	2.06	2.06	2.09	2.07	2.05	S	1.99	1.98	1.94	1.92	1.91	1.91	1.91	1.90	1.90	1.91	2.01	2.08	2.04	2.11	2.05	2.05	1.90	2.11	2.00	24
15	2.03	2.04	2.06	2.05	2.08	2.10	2.13	S	2.18	2.03	1.96	1.95	1.98	1.99	1.92	1.92	1.93	1.94	1.99	1.98	1.99	2.10	2.21	2.49	1.92	2.49	2.05	24	
16	2.27	2.21	2.19	2.13	2.08	2.06	S	2.04	2.04	2.07	2.06	2.02	2.12	2.02	1.95	1.93	1.93	1.95	1.98	2.02	2.08	2.17	2.17	2.33	1.93	2.33	2.08	24	
17	2.32	2.20	2.25	2.35	2.32	S	2.34	2.45	2.55	2.67	2.04	1.95	1.92	1.94	1.92	1.93	1.92	1.93	1.98	2.04	2.09	2.09	2.06	2.09	1.92	2.67	2.15	24	
18	2.12	2.03	1.97	1.94	S	1.96	1.94	1.93	1.94	1.94	1.94	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.96	1.93	2.12	1.96	24	
19	1.95	1.95	1.95	S	1.97	1.96	1.97	1.97	1.96	1.97	1.97	1.96	1.96	1.96	1.98	1.98	1.96	1.97	1.98	2.00	2.01	2.01	2.05	2.15	1.95	2.15	1.98	24	
20	2.26	2.26	S	2.23	2.28	2.26	2.33	2.66	2.30	2.12	2.04	2.02	1.99	2.00	1.98	1.99	1.98	1.99	2.01	2.07	2.08	2.10	2.12	2.16	1.98	2.66	2.14	24	
21	2.20	S	2.29	2.76	2.33	2.23	2.16	2.11	2.07	2.02	1.99	1.97	1.96	1.97	1.97	1.97	1.97	1.97	1.97	2.02	2.17	2.19	2.07	2.04	2.08	1.96	2.76	2.11	24
22	S	2.19	2.29	2.53	2.86	2.96	3.05	3.01	2.86	2.49	2.28	2.10	2.05	2.14	2.08	2.01	2.00	1.99	2.00	2.04	2.05	2.12	2.20	S	1.99	3.05	2.33	24	
23	2.23	2.21	2.11	2.01	2.05	2.08	2.12	2.14	2.15	2.05	2.07	2.06	2.02	2.01	2.02	2.05	2.06	2.03	2.05	2.07	2.06	2.11	S	2.12	2.01	2.23	2.08	24	
24	2.12	2.13	2.16	2.19	2.07	2.05	2.05	2.04	2.02	2.00	1.98	1.97	1.95	1.95	1.95	1.95	1.96	1.97	1.97	1.99	1.99	S	2.00	2.00	1.95	2.19	2.02	24	
25	2.00	2.00	2.00	2.00	2.00	2.00	2.01	2.01	2.00	2.00	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.99	2.03	2.10	S	2.05	2.09	2.07	1.97	2.10	2.01	24
26	2.06	2.08	2.12	2.49	2.41	2.15	2.23	2.30	2.34	2.34	2.21	2.18	2.15	1.99	1.98	1.99	2.01	2.01	2.12	S	2.10	2.16	2.25	2.27	1.98	2.49	2.17	24	
27	2.28	2.33	2.36	2.38	2.48	2.64	2.38	2.32	2.33	2.00	1.94	1.94	1.95	1.95	1.95	1.96	1.96	1.96	S	1.99	2.03	2.03	2.02	2.02	1.94	2.64	2.14	24	
28	2.04	2.04	2.06	2.07	2.06	2.05	2.09	2.11	2.10	2.05	2.03	2.02	2.04	2.03	2.01	2.02	2.15	S	2.27	2.30	2.43	2.45	2.49	2.60	2.01	2.60	2.15	24	
29	2.67	2.82	2.77	2.72	2.79	2.81	2.65	2.69	2.54	2.33	2.14	2.05	2.07	2.00	1.99	1.98	S	2.02	2.09	2.18	2.16	2.16	2.30	2.30	1.98	2.82	2.36	24	
30	2.15	2.14	2.16	2.13	2.09	2.19	2.13	2.12	2.04	2.04	2.03	2.01	2.00	1.99	1.98	S	1.98	1.97	1.97	1.96	1.96	1.96	1.97	1.97	1.96	2.19	2.04	24	
HOURLY MAX	2.67	2.82	2.77	2.76	2.86	2.96	3.05	3.01	2.86	2.67	2.28	2.21	2.18	2.14	2.08	2.08	2.15	2.03	2.27	2.30	2.43	2.45	2.49	2.60					
HOURLY AVG	2.15	2.16	2.17	2.21	2.21	2.19	2.21	2.20	2.17	2.11	2.04	2.02	2.01	1.99	1.98	1.98	1.98	1.98	1.97	2.02	2.06	2.07	2.10	2.11	2.14				

STATUS FLAG CODES

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

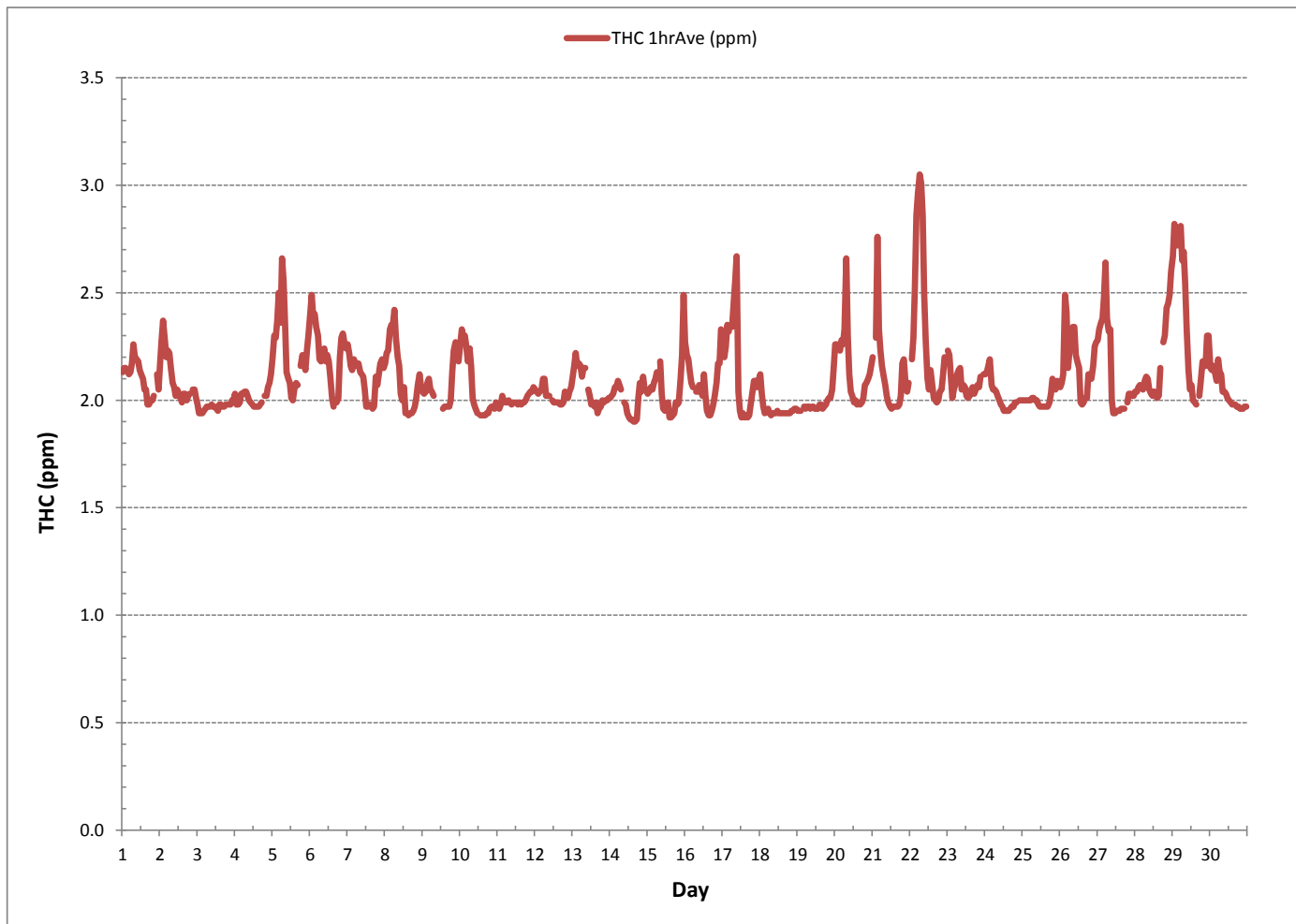
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	685			
MINIMUM 1-HR AVERAGE:	1.90	PPM @ HOUR(S)	15, 16	ON DAY(S) 14, 14
MAXIMUM 1-HR AVERAGE:	3.05	PPM @ HOUR(S)	6	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	2.36	PPM		ON DAY(S) 29
				VAR-VARIOUS
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	0.17		MONTHLY AVERAGE:	2.09
				PPM

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.29	2.63	2.24	2.18	2.15	2.50	3.39	3.53	2.40	2.40	2.42	2.23	2.26	2.15	2.12	2.12	2.20	2.20	2.01	2.01	2.05	S	2.26	2.16	2.01	3.53	2.34	24	
2	2.20	2.53	2.42	2.41	2.33	2.27	2.25	2.23	2.25	2.10	2.03	2.15	2.06	2.04	2.00	2.72	2.38	2.02	2.04	2.25	S	2.18	2.16	2.03	2.00	2.72	2.22	24	
3	2.00	1.96	1.95	1.95	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.98	1.97	1.96	2.15	2.23	1.98	1.98	1.99	S	1.99	1.99	2.02	2.01	1.95	2.23	2.00	24	
4	2.04	2.03	2.00	2.03	2.04	2.04	2.33	2.06	2.04	2.02	2.01	1.99	2.01	1.98	1.98	1.98	1.99	2.01	S	2.22	2.07	2.09	2.26	2.20	1.98	2.33	2.06	24	
5	2.25	2.54	2.72	3.32	3.45	2.61	2.95	2.81	2.46	2.21	2.25	2.25	2.09	2.01	2.17	2.19	2.24	S	2.29	2.57	2.37	2.31	2.41	2.57	2.01	3.45	2.48	24	
6	2.54	2.61	2.45	2.45	2.50	2.35	2.29	2.19	2.28	2.34	2.38	2.27	2.38	2.20	2.19	2.18	S	2.02	2.07	2.70	2.48	2.42	2.38	2.30	2.02	2.70	2.35	24	
7	2.28	2.28	2.29	2.24	2.20	2.29	2.20	2.31	2.15	2.23	2.25	2.20	2.02	2.07	2.02	S	1.98	2.00	2.72	2.42	2.99	3.90	2.29	2.22	1.98	3.90	2.33	24	
8	2.30	2.26	2.27	2.59	2.55	2.48	2.57	2.43	2.45	2.35	P	P	2.13	1.97	S	1.94	1.95	1.96	1.96	1.99	2.08	2.08	2.17	2.09	1.94	2.59	2.22	22	
9	2.07	2.04	2.06	2.10	2.32	2.20	2.14	2.04	C	C	C	C	C	1.97	1.99	1.98	1.99	1.98	2.05	2.42	2.59	3.25	2.48	2.42	1.97	3.25	2.22	24	
10	2.40	2.40	2.32	2.54	2.30	2.24	2.28	2.21	2.15	2.00	1.97	1.97	S	1.95	1.94	1.94	1.94	1.95	1.96	1.97	2.01	1.99	1.98	2.01	1.94	2.54	2.11	24	
11	2.01	2.00	2.00	2.03	2.01	2.00	2.00	2.02	2.00	2.00	2.00	S	2.00	2.00	2.12	2.02	2.04	2.08	2.03	2.16	2.12	2.07	2.16	2.07	2.00	2.16	2.04	24	
12	2.19	2.11	2.16	2.16	2.09	2.15	2.54	2.10	2.11	2.04	S	2.04	2.00	2.01	2.03	2.64	2.04	1.99	2.01	2.10	2.05	2.04	2.08	2.14	1.99	2.64	2.12	24	
13	2.16	2.22	2.25	2.18	2.17	2.19	2.14	2.18	2.17	S	2.09	2.20	2.01	2.00	1.99	4.02	1.95	1.97	2.02	2.06	2.04	2.02	2.02	2.02	1.95	4.02	2.18	24	
14	2.03	2.04	2.06	2.15	2.09	2.12	2.11	2.09	S	2.07	2.16	1.96	1.93	1.92	1.91	1.91	1.91	1.92	2.33	2.18	2.38	2.26	2.19	1.91	2.39	2.09	24		
15	2.07	2.20	2.10	2.10	2.10	2.15	2.42	S	2.47	2.11	2.03	1.97	2.01	2.03	1.96	2.10	1.94	1.99	2.08	2.02	2.03	2.15	2.24	3.95	1.94	3.95	2.18	24	
16	2.30	2.30	2.21	2.19	2.11	2.08	S	2.05	2.05	2.09	2.08	2.04	2.27	2.09	1.99	1.94	1.95	1.99	2.02	2.20	2.13	2.26	2.19	4.27	1.94	4.27	2.21	24	
17	3.13	3.07	2.33	2.60	2.52	S	2.73	3.57	2.94	2.94	2.29	2.06	2.10	2.58	1.93	2.15	1.94	1.95	2.09	2.35	2.55	2.33	2.13	2.10	1.93	3.57	2.45	24	
18	2.21	2.13	1.99	1.97	S	1.97	1.95	1.95	1.96	1.95	2.06	1.96	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.95	1.96	1.96	1.96	1.97	1.95	2.21	1.98	24	
19	1.96	1.95	1.98	S	1.98	1.97	1.98	1.97	1.97	1.98	1.98	1.97	2.00	1.97	2.13	2.18	1.97	1.99	2.01	2.02	2.02	2.03	2.16	2.26	1.95	2.26	2.02	24	
20	2.32	2.33	S	2.35	2.36	2.37	2.50	3.77	2.55	2.20	2.26	2.06	2.01	2.25	2.00	2.17	2.00	2.06	2.10	2.12	2.22	2.58	2.26	2.00	3.77	2.30	24		
21	2.28	S	2.81	3.86	2.77	2.33	2.22	2.15	2.10	2.04	2.14	2.14	1.98	1.98	1.98	2.07	1.99	2.16	2.21	2.73	2.58	2.09	2.07	2.20	1.98	3.86	2.30	24	
22	S	2.22	2.54	2.85	3.01	3.15	3.23	3.23	3.09	2.65	2.40	2.16	2.14	2.22	2.16	2.04	2.02	2.02	2.17	2.17	2.07	2.15	2.29	S	2.02	3.23	2.45	24	
23	2.27	2.24	2.18	2.14	2.14	2.14	2.42	2.36	2.38	2.18	2.24	2.20	2.09	2.09	2.11	2.19	2.25	2.11	2.23	2.44	2.19	2.34	S	2.29	2.09	2.44	2.23	24	
24	2.13	2.15	2.19	2.22	2.16	2.12	2.07	2.17	2.04	2.02	2.00	1.98	1.96	1.96	1.96	1.96	1.97	1.98	1.98	2.00	2.14	S	2.01	2.01	1.96	2.22	2.05	24	
25	2.01	2.01	2.01	2.01	2.02	2.03	2.12	2.01	2.10	2.00	1.99	1.98	1.98	1.98	1.98	1.98	1.98	2.01	2.15	2.15	S	2.10	2.22	2.08	1.98	2.22	2.04	24	
26	2.09	2.15	2.17	4.62	4.11	2.20	2.31	2.33	2.41	2.40	2.25	2.22	2.23	2.08	2.01	2.12	2.15	2.14	2.55	S	2.12	2.23	2.28	2.30	2.01	4.62	2.41	24	
27	2.31	2.48	3.12	2.83	3.13	3.18	3.25	2.45	2.57	2.17	1.95	1.95	1.97	1.96	1.96	2.06	1.97	1.98	S	2.02	2.04	2.05	2.05	2.03	1.95	3.25	2.33	24	
28	2.08	2.06	2.09	2.09	2.08	2.07	2.10	2.20	2.13	2.08	2.05	2.07	2.06	2.07	2.03	2.07	2.35	S	2.54	2.73	2.63	2.89	3.10	2.98	2.03	3.10	2.28	24	
29	2.95	3.04	3.10	2.83	2.96	2.94	3.03	3.08	2.68	2.50	2.36	2.28	2.67	2.33	2.09	2.03	S	2.03	2.16	2.25	2.47	2.54	2.45	2.39	2.03	3.10	2.57	24	
30	2.27	2.19	2.40	2.18	2.40	2.31	2.37	2.15	2.13	2.05	2.07	2.05	2.04	2.02	2.00	S	2.01	2.00	2.00	1.98	1.98	1.98	1.99	2.00	1.98	2.40	2.11	24	
HOURLY MAX	3.13	3.07	3.12	4.62	4.11	3.18	3.39	3.77	3.09	2.94	2.42	2.28	2.67	2.58	2.19	4.02	2.38	2.20	2.72	2.73	2.99	3.90	3.10	4.27					
HOURLY AVG	2.25	2.28	2.29	2.45	2.41	2.29	2.41	2.40	2.28	2.19	2.14	2.09	2.08	2.06	2.03	2.17	2.04	2.01	2.13	2.23	2.22	2.29	2.23	2.33					

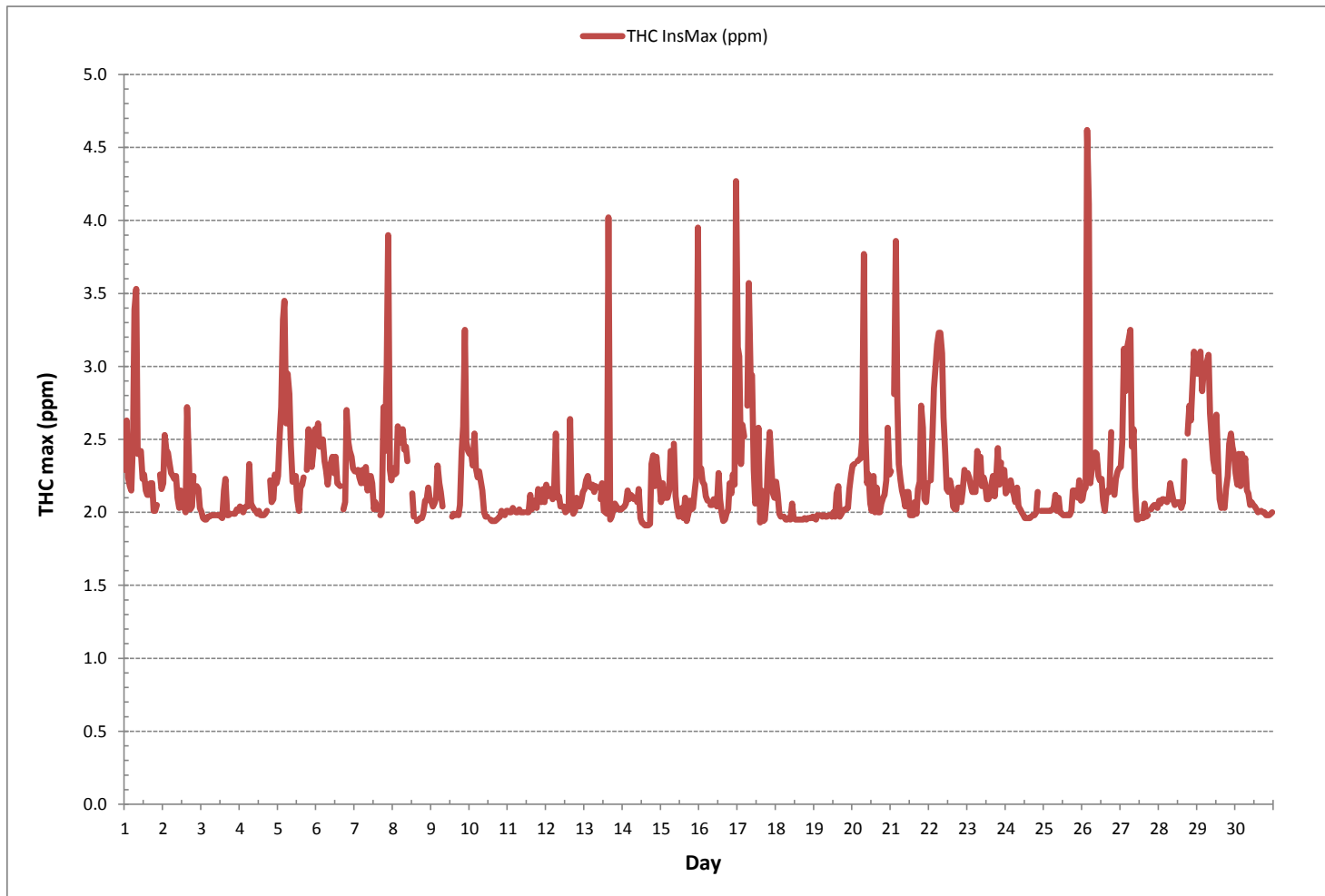
STATUS FLAG CODES

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:	683
MAXIMUM INSTANTANEOUS VALUE:	4.62 PPM @ HOUR(S) 3 ON DAY(S) 26
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.34
OPERATIONAL TIME:	718 HRS

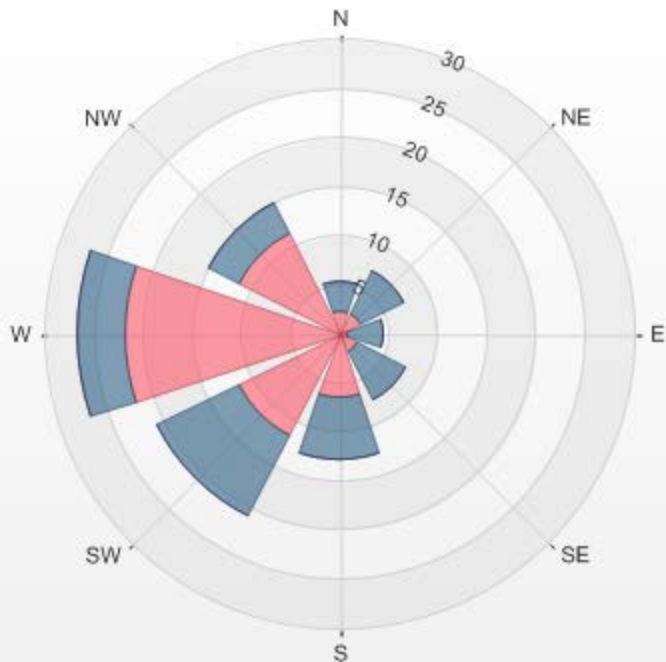
TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

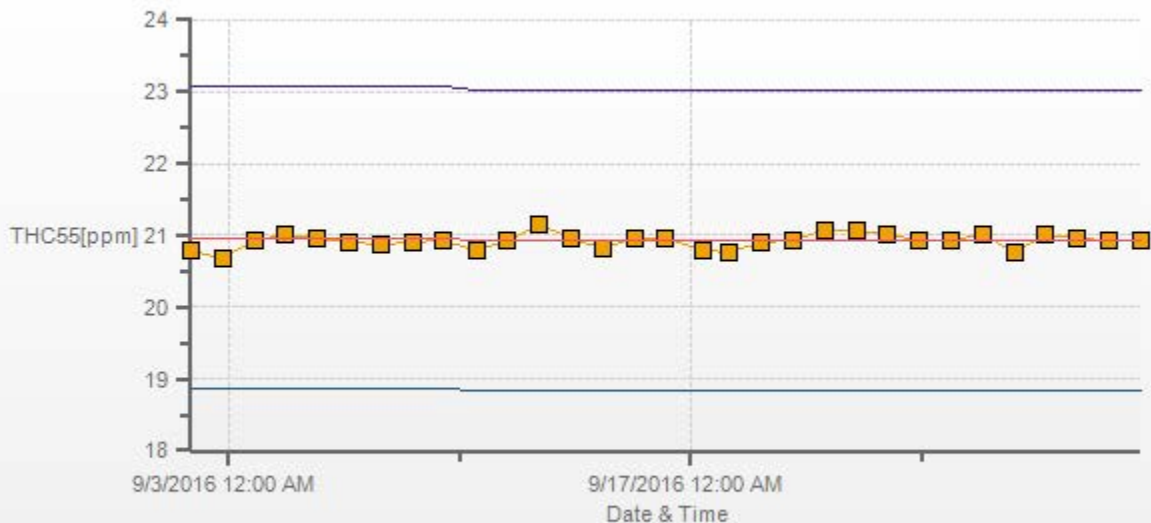
Direction	0.0-1.0	1.0-2.1	2.1-3.1	>3.1	Total
N	0	2.34	3.07	0	5.41
NE	0	2.34	4.98	0	7.32
E	0	0.73	3.81	0	4.54
SE	0	2.05	5.42	0	7.47
S	0	6.59	6.3	0	12.89
SW	0	11.57	9.22	0	20.79
W	0	21.96	4.69	0	26.65
NW	0	11.57	3.37	0	14.94
Summary	0	59.15	40.86	0	100

LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2016/09/01 12:00 AM - 2016/09/30 11:00 PM Calm: 0.00%



% Icon Classes (ppm) 0 0.0-1.0 59 1.0-2.1 41 2.1-3.1 0 >3.1

THC55[ppm] Calibration: LICA Bonnyville Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

METHANE



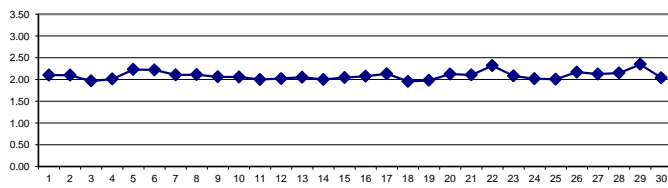
METHANE Hourly Averages (CH₄ ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
DAY 1		2.13	2.15	2.15	2.14	2.12	2.12	2.13	2.16	2.20	2.19	2.17	2.14	2.12	2.10	2.05	2.05	1.98	1.97	2.00	2.00	2.02	S	2.12	2.12	1.97	2.20	2.10	24	
2		2.17	2.28	2.37	2.27	2.20	2.23	2.22	2.15	2.08	2.06	2.02	2.05	2.03	2.01	1.99	2.00	2.00	2.00	2.02	2.03	S	2.05	2.05	2.01	1.99	2.37	2.10	24	
3		1.98	1.94	1.94	1.94	1.95	1.96	1.97	1.97	1.97	1.98	1.97	1.97	1.96	1.95	1.96	1.97	1.97	1.97	1.98	S	1.98	1.98	2.00	2.00	1.94	2.00	1.97	24	
4		2.03	1.98	1.98	1.99	2.03	2.03	2.03	2.04	2.02	2.00	1.99	1.98	1.97	1.97	1.97	1.97	1.98	1.99	S	2.02	2.02	2.06	2.08	2.12	1.97	2.12	2.01	24	
5		2.19	2.30	2.29	2.36	2.50	2.36	2.65	2.56	2.36	2.13	2.10	2.08	2.01	2.00	2.05	2.08	2.07	S	2.16	2.21	2.18	2.14	2.23	2.30	2.00	2.65	2.23	24	
6		2.40	2.49	2.39	2.40	2.34	2.30	2.19	2.18	2.21	2.24	2.18	2.21	2.18	2.11	2.01	1.97	S	1.99	2.01	2.18	2.27	2.30	2.27	2.24	1.97	2.49	2.22	24	
7		2.26	2.22	2.16	2.14	2.19	2.16	2.17	2.16	2.13	2.11	2.11	2.05	1.97	1.97	1.98	S	1.96	1.97	2.10	2.06	2.12	2.16	2.19	2.15	1.96	2.26	2.11	24	
8		2.17	2.22	2.23	2.33	2.34	2.35	2.41	2.27	2.16	2.07	2.02	2.00	2.06	1.94	S	1.93	1.94	1.94	1.95	1.97	2.01	2.07	2.12	2.06	1.93	2.41	2.11	24	
9		2.04	2.03	2.04	2.08	2.08	2.05	2.03	2.02	C	C	C	C	C	1.96	1.97	1.97	1.97	2.00	2.13	2.22	2.26	2.22	2.18	1.96	2.26	2.06	24		
10		2.25	2.33	2.29	2.29	2.25	2.18	2.24	2.16	2.01	1.98	1.96	1.94	S	1.93	1.93	1.93	1.93	1.94	1.94	1.96	1.97	1.97	1.96	1.99	1.93	2.33	2.06	24	
11		1.97	1.96	1.98	2.02	2.00	1.99	1.99	2.00	1.99	1.98	1.99	S	1.99	1.98	1.99	1.98	1.99	1.99	2.00	2.02	2.03	2.04	2.04	2.06	1.96	2.06	2.00	24	
12		2.05	2.04	2.03	2.04	2.05	2.10	2.06	2.02	2.01	2.02	S	2.00	1.99	1.99	1.99	1.98	1.98	1.98	1.99	2.00	2.04	2.03	2.01	2.04	2.06	1.98	2.10	2.02	24
13		2.11	2.16	2.22	2.16	2.17	2.16	2.11	2.15	2.15	S	2.05	2.02	1.98	1.99	1.97	1.95	1.94	1.96	1.97	2.00	1.99	2.00	2.00	2.01	1.94	2.22	2.05	24	
14		2.01	2.02	2.03	2.05	2.06	2.09	2.07	2.05	S	1.99	1.97	1.94	1.92	1.91	1.91	1.91	1.90	1.90	1.91	1.95	2.07	2.04	2.10	2.05	2.05	1.90	2.10	2.00	24
15		2.03	2.04	2.06	2.05	2.08	2.10	2.11	S	2.18	2.03	1.96	1.95	1.98	1.99	1.92	1.92	1.93	1.94	1.99	1.98	1.99	2.10	2.21	2.47	1.92	2.47	2.04	24	
16		2.27	2.21	2.19	2.13	2.08	2.06	S	2.04	2.04	2.07	2.06	2.02	2.12	2.02	1.95	1.93	1.93	1.95	1.98	2.02	2.08	2.17	2.17	2.32	1.93	2.32	2.08	24	
17		2.31	2.19	2.25	2.34	2.31	S	2.34	2.34	2.54	2.66	2.04	1.95	1.92	1.92	1.92	1.92	1.92	1.93	1.98	2.02	2.07	2.07	2.06	2.09	1.92	2.66	2.13	24	
18		2.12	2.03	1.97	1.94	S	1.96	1.94	1.93	1.94	1.94	1.94	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.96	1.93	2.12	1.96	24
19		1.95	1.95	1.95	S	1.97	1.96	1.97	1.97	1.96	1.97	1.97	1.96	1.96	1.96	1.97	1.96	1.96	1.96	1.97	1.98	2.00	2.01	2.01	2.04	2.15	1.95	2.15	1.98	24
20		2.26	2.26	S	2.23	2.28	2.26	2.33	2.44	2.28	2.12	2.04	2.02	1.99	1.98	1.99	1.98	1.99	1.98	1.99	2.01	2.07	2.08	2.10	2.12	2.16	1.98	2.44	2.13	24
21		2.20	S	2.28	2.73	2.32	2.23	2.16	2.11	2.07	2.02	1.99	1.97	1.96	1.97	1.97	1.97	1.97	1.97	1.98	2.02	2.17	2.19	2.07	2.04	2.08	1.96	2.73	2.11	24
22		S	2.19	2.29	2.49	2.81	2.95	3.03	2.94	2.77	2.48	2.28	2.10	2.05	2.14	2.08	2.01	2.00	1.99	2.00	2.03	2.05	2.12	2.20	S	1.99	3.03	2.32	24	
23		2.23	2.21	2.11	2.01	2.05	2.08	2.12	2.14	2.15	2.05	2.07	2.06	2.02	2.01	2.02	2.05	2.06	2.03	2.05	2.07	2.06	2.11	S	2.12	2.01	2.23	2.08	24	
24		2.12	2.13	2.16	2.19	2.07	2.05	2.05	2.03	2.02	2.00	1.98	1.97	1.95	1.95	1.95	1.95	1.96	1.97	1.97	1.99	1.99	S	2.00	2.00	1.95	2.19	2.02	24	
25		2.00	2.00	2.00	2.00	2.00	2.00	2.01	2.01	2.00	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.99	2.03	2.10	S	2.05	2.09	2.07	1.97	2.10	2.01	24
26		2.06	2.08	2.12	2.46	2.39	2.15	2.23	2.30	2.34	2.34	2.21	2.18	2.15	1.99	1.98	1.99	2.00	2.01	2.12	S	2.10	2.16	2.25	2.27	1.98	2.46	2.17	24	
27		2.28	2.33	2.35	2.37	2.46	2.52	2.32	2.31	2.33	2.00	1.94	1.94	1.95	1.95	1.95	1.95	1.96	1.96	S	1.99	2.03	2.03	2.02	2.02	1.94	2.52	2.13	24	
28		2.04	2.04	2.06	2.07	2.06	2.05	2.09	2.11	2.10	2.05	2.03	2.02	2.04	2.03	2.01	2.02	2.15	S	2.27	2.30	2.43	2.45	2.48	2.57	2.01	2.57	2.15	24	
29		2.66	2.80	2.77	2.71	2.79	2.79	2.65	2.68	2.53	2.33	2.14	2.04	2.01	1.99	1.99	1.98	S	2.02	2.09	2.18	2.16	2.16	2.30	2.30	1.98	2.80	2.35	24	
30		2.15	2.14	2.16	2.13	2.09	2.19	2.13	2.12	2.04	2.04	2.03	2.01	2.00	1.99	1.98	S	1.98	1.97	1.97	1.96	1.96	1.96	1.97	1.97	1.96	2.19	2.04	24	
HOURLY MAX		2.66	2.80	2.77	2.73	2.81	2.95	3.03	2.94	2.77	2.66	2.28	2.21	2.18	2.14	2.08	2.08	2.15	2.03	2.27	2.30	2.43	2.45	2.48	2.57					
HOURLY AVG		2.15	2.16	2.17	2.21	2.21	2.19	2.20	2.18	2.16	2.10	2.04	2.02	2.01	1.99	1.98	1.97	1.98	1.97	2.02	2.05	2.07	2.09	2.11	2.13					

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

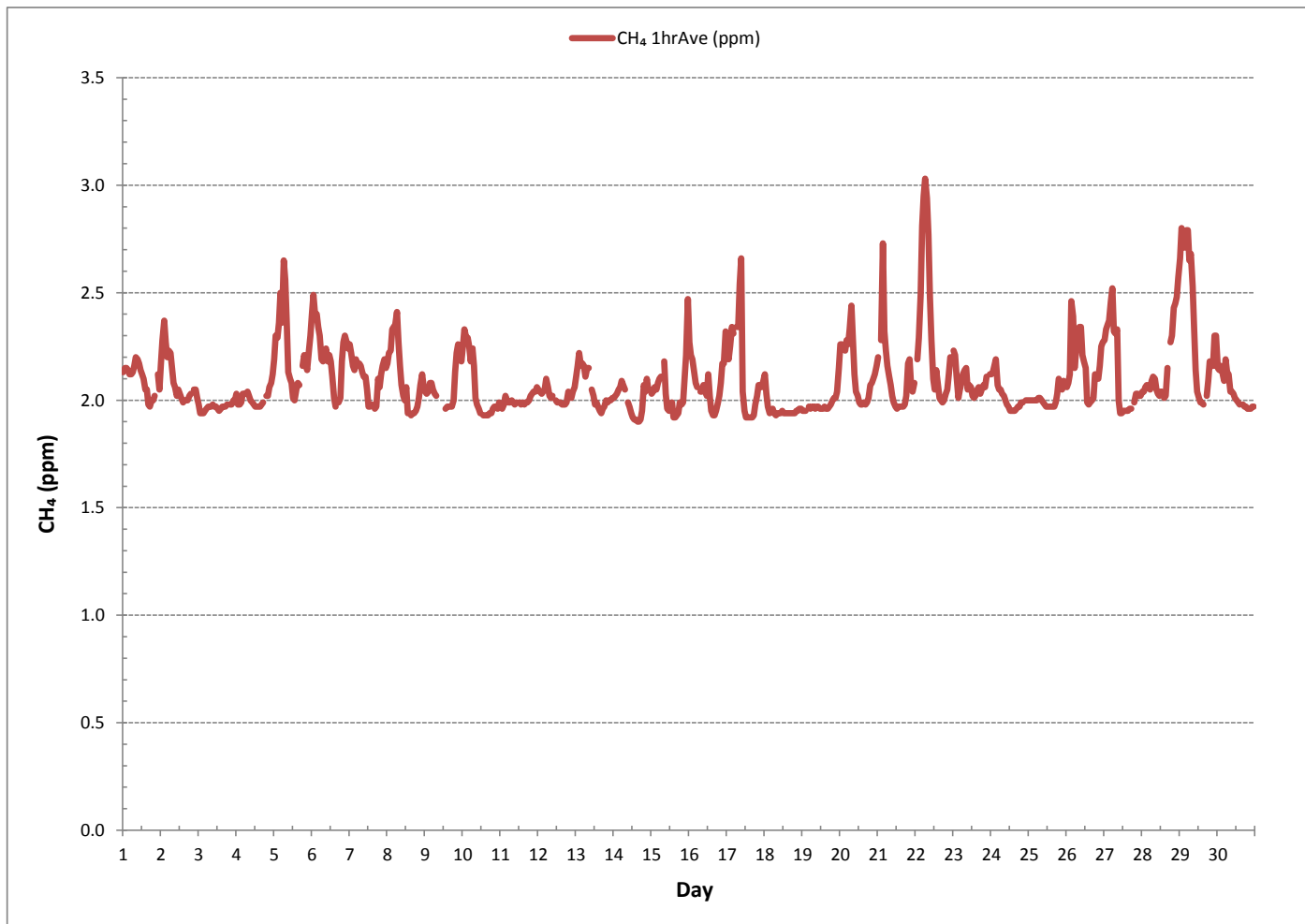
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	685			
MINIMUM 1-HR AVERAGE:	1.90 PPM	@ HOUR(S)	15 , 16	ON DAY(S) 14 , 14
MAXIMUM 1-HR AVERAGE:	3.03 PPM	@ HOUR(S)	6	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	2.35 PPM			ON DAY(S) 29
				VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:	720 HRS	
MONTHLY CALIBRATION TIME:	5 HRS	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.09 PPM	

METHANE Hourly Averages (CH₄ ppm)





METHANE MAX Instantaneous Maximum (CH₄ ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		2.29	2.50	2.24	2.19	2.15	2.32	2.18	2.23	2.40	2.40	2.39	2.22	2.13	2.16	2.08	2.09	2.03	1.99	2.01	2.01	2.05	S	2.13	2.17	1.99	2.50	2.19	24	
2		2.21	2.36	2.42	2.32	2.24	2.27	2.26	2.24	2.10	2.10	2.03	2.09	2.06	2.04	2.00	2.02	2.01	2.02	2.04	2.08	S	2.19	2.17	2.03	2.00	2.42	2.14	24	
3		2.00	1.96	1.95	1.95	1.97	1.98	1.98	1.98	1.98	1.98	1.99	1.97	1.96	1.97	1.98	1.98	1.99	1.99	S	1.99	1.99	2.02	2.01	1.95	2.02	1.98	24		
4		2.04	2.03	2.00	2.03	2.04	2.04	2.05	2.06	2.04	2.02	2.01	1.99	2.01	1.98	1.98	1.98	1.99	2.01	S	2.09	2.08	2.09	2.26	2.20	1.98	2.26	2.04	24	
5		2.25	2.54	2.60	3.23	3.34	2.62	2.85	2.81	2.45	2.22	2.26	2.26	2.09	2.02	2.18	2.20	2.24	S	2.30	2.46	2.37	2.31	2.41	2.57	2.02	3.34	2.46	24	
6		2.53	2.61	2.45	2.45	2.51	2.36	2.29	2.20	2.28	2.34	2.30	2.27	2.21	2.17	2.04	2.00	S	2.02	2.08	2.25	2.30	2.43	2.38	2.30	2.00	2.61	2.29	24	
7		2.28	2.28	2.20	2.24	2.21	2.20	2.21	2.18	2.15	2.23	2.25	2.08	2.02	1.98	2.02	S	1.98	1.98	2.66	2.36	2.82	3.63	2.29	2.22	1.98	3.63	2.28	24	
8		2.31	2.26	2.27	2.59	2.55	2.48	2.49	2.43	2.26	2.12	P	P	2.13	1.97	S	1.94	1.95	1.95	1.96	1.99	2.09	2.09	2.17	2.10	1.94	2.59	2.20	22	
9		2.08	2.04	2.06	2.10	2.10	2.07	2.05	2.05	C	C	C	C	C	1.97	1.99	1.99	1.99	1.98	2.05	2.42	2.47	3.13	2.48	2.42	1.97	3.13	2.18	24	
10		2.32	2.40	2.32	2.38	2.30	2.24	2.28	2.21	2.04	2.00	1.97	1.96	S	1.95	1.93	1.94	1.94	1.94	1.95	1.96	2.01	1.99	1.98	2.01	1.93	2.40	2.09	24	
11		2.01	2.00	2.00	2.03	2.01	2.01	2.00	2.02	2.00	2.00	2.00	S	2.01	2.00	2.13	2.02	2.04	2.09	2.03	2.17	2.12	2.07	2.16	2.08	2.00	2.17	2.04	24	
12		2.10	2.12	2.16	2.16	2.09	2.16	2.08	2.11	2.05	2.04	S	2.04	2.00	2.01	2.03	2.04	2.04	1.99	2.01	2.11	2.05	2.04	2.09	2.15	1.99	2.16	2.07	24	
13		2.17	2.22	2.26	2.19	2.18	2.19	2.14	2.19	2.18	S	2.09	2.04	2.01	2.00	1.93	1.96	1.95	1.97	2.02	2.06	2.04	2.03	2.03	2.03	1.95	2.26	2.08	24	
14		2.03	2.04	2.06	2.15	2.10	2.13	2.12	2.09	S	2.00	1.99	1.96	1.93	1.92	1.92	1.91	1.91	1.92	2.16	2.40	2.19	2.17	2.12	2.12	1.91	2.40	2.06	24	
15		2.07	2.06	2.10	2.10	2.11	2.16	2.20	S	2.39	2.11	2.03	1.96	2.01	2.03	1.96	1.93	1.94	1.99	2.08	2.02	2.03	2.16	2.25	3.73	1.93	3.73	2.15	24	
16		2.30	2.30	2.21	2.19	2.12	2.08	S	2.05	2.10	2.09	2.04	2.19	2.09	2.00	1.93	1.94	1.99	2.02	2.05	2.14	2.21	2.20	4.02	1.93	4.02	2.19	24		
17		3.06	2.90	2.33	2.50	2.45	S	2.70	2.36	2.82	2.85	2.29	1.98	1.94	1.94	1.93	1.92	1.93	1.95	2.10	2.12	2.17	2.14	2.11	2.10	1.92	3.06	2.29	24	
18		2.20	2.14	1.99	1.95	S	1.96	1.95	1.94	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.96	1.97	1.94	2.20	1.97	24		
19		1.96	1.95	1.98	S	1.98	1.97	1.98	1.97	1.98	1.98	1.98	1.97	2.00	1.97	1.98	1.97	1.97	1.98	2.01	2.02	2.02	2.03	2.08	2.26	1.95	2.26	2.00	24	
20		2.32	2.33	S	2.36	2.36	2.37	2.50	2.54	2.41	2.21	2.15	2.06	2.01	2.00	2.00	2.02	2.00	2.00	2.07	2.11	2.12	2.22	2.54	2.26	2.00	2.54	2.22	24	
21		2.28	S	2.67	3.71	2.66	2.33	2.22	2.16	2.11	2.04	2.01	1.98	1.97	1.98	1.98	1.99	1.99	2.00	2.11	2.73	2.54	2.10	2.07	2.20	1.97	3.71	2.25	24	
22		S	2.21	2.54	2.68	2.91	3.05	3.11	3.03	2.93	2.65	2.40	2.17	2.11	2.22	2.17	2.04	2.02	2.02	2.08	2.07	2.16	2.29	S	2.02	3.11	2.40	24		
23		2.27	2.24	2.18	2.04	2.14	2.14	2.42	2.36	2.38	2.19	2.25	2.20	2.09	2.10	2.12	2.20	2.25	2.12	2.14	2.44	2.20	2.35	S	2.29	2.04	2.44	2.22	24	
24		2.14	2.16	2.20	2.21	2.17	2.12	2.07	2.04	2.04	2.02	2.00	1.98	1.96	1.96	1.96	1.97	1.98	1.98	2.01	2.01	S	2.01	2.01	1.96	2.21	2.04	24		
25		2.01	2.01	2.01	2.01	2.01	2.03	2.03	2.02	2.01	2.01	2.00	1.98	1.98	1.98	1.98	1.98	1.98	2.01	2.14	2.15	S	2.10	2.15	2.09	1.98	2.15	2.03	24	
26		2.09	2.16	2.17	4.37	3.92	2.21	2.31	2.33	2.41	2.40	2.25	2.22	2.22	2.09	2.01	2.01	2.02	2.08	2.45	S	2.13	2.23	2.28	2.30	2.01	4.37	2.38	24	
27		2.31	2.48	3.05	2.73	3.02	3.00	2.36	2.35	2.43	2.18	1.95	1.95	1.96	1.96	1.95	1.97	1.97	1.98	S	2.02	2.04	2.05	2.05	2.03	1.95	3.05	2.25	24	
28		2.08	2.06	2.09	2.10	2.08	2.08	2.11	2.20	2.14	2.08	2.05	2.08	2.06	2.07	2.03	2.08	2.35	S	2.54	2.71	2.63	2.86	3.07	2.76	2.03	3.07	2.27	24	
29		2.87	2.91	3.02	2.77	2.90	2.88	3.04	2.83	2.67	2.50	2.36	2.28	2.19	2.05	2.09	2.03	S	2.03	2.17	2.25	2.46	2.54	2.45	2.40	2.03	3.04	2.51	24	
30		2.27	2.20	2.40	2.19	2.40	2.25	2.37	2.16	2.13	2.05	2.08	2.05	2.04	2.03	2.00	S	2.01	2.00	2.00	1.98	1.98	1.98	1.99	2.00	1.98	2.40	2.11	24	
HOURLY MAX		3.06	2.91	3.05	4.37	3.92	3.05	3.11	3.03	2.93	2.85	2.40	2.28	2.22	2.22	2.18	2.20	2.35	2.12	2.66	2.73	2.82	3.63	3.07	4.02					
HOURLY AVG		2.24	2.26	2.27	2.41	2.38	2.27	2.29	2.25	2.24	2.17	2.12	2.06	2.04	2.02	2.01	2.00	2.01	2.00	2.11	2.18	2.18	2.26	2.21	2.30					

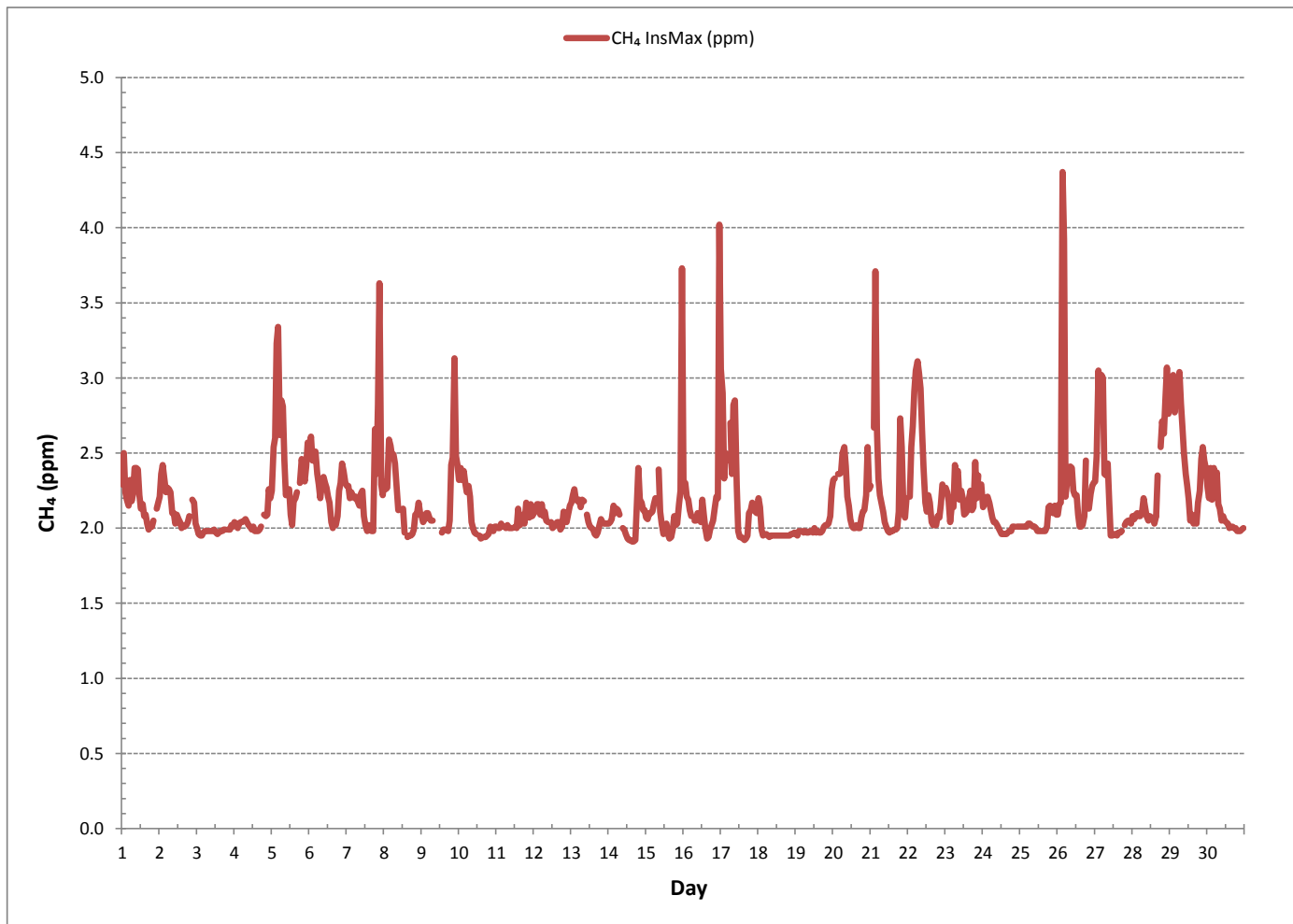
STATUS FLAG CODES

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

MONTHLY SUMMARY

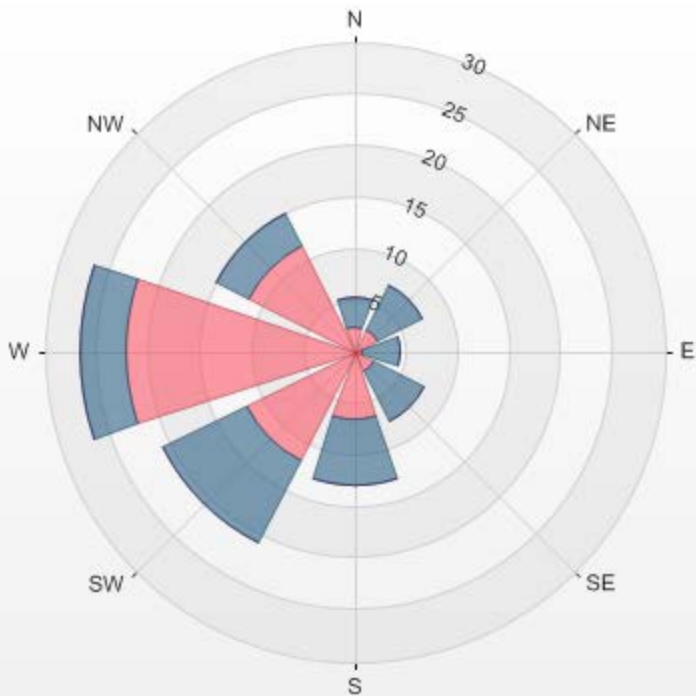
NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	4.37 PPM @ HOUR(S) 3 ON DAY(S) 26
	VAR-VARIOUS
IJS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.29
OPERATIONAL TIME:	718 HRS

METHANE MAX Instantaneous Maximum (CH₄ ppm)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0.0-1.0	1.0-2.1	2.1-3.1	>3.1	Total
N	0	2.34	3.07	0	5.41
NE	0	2.49	4.83	0	7.32
E	0	0.73	3.81	0	4.54
SE	0	2.2	5.27	0	7.47
S	0	6.59	6.3	0	12.89
SW	0	11.71	9.08	0	20.79
W	0	22.11	4.54	0	26.65
NW	0	11.57	3.37	0	14.94
Summary	0	59.74	40.27	0	100



% Icon Classes (ppm) 0 0.0-1.0 60 1.0-2.1 40 2.1-3.1 0 >3.1

NON-METHANE HYDROCARBON



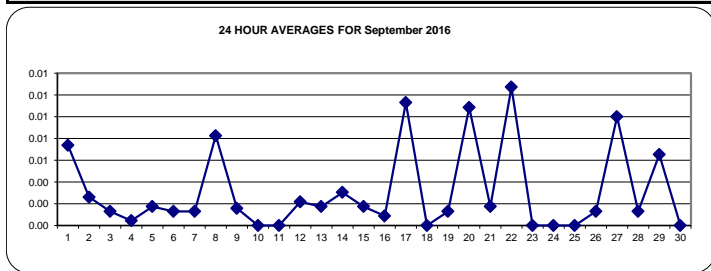
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	S	0.00	0.00	0.00	0.11	0.01	24		
2	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	0.03	0.03	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24	
3	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	0.02	0.01	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24	
4	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	S	0.00	0.00	0.00	0.00	0.00	0.00	24		
5	0.00	0.00	0.01	0.01	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.00	24		
6	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	S	0.00	0.02	0.01	0.00	0.00	0.00	24		
7	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	S	0.00	0.01	0.01	0.01	0.00	0.00	24		
8	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.04	0.10	0.01	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	24		
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	C	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		
10	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	0.00	0.00	0.00	0.00	24		
11	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	0.00	0.00	0.00	0.00	24		
12	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	S	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	24		
13	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	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
14	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	0.05	0.01	0.00	0.01	0.00	0.00	0.00	24		
15	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	0.02	0.00	24		
16	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	0.02	0.00	24		
17	0.01	0.01	0.00	0.01	0.01	S	0.00	0.11	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	24		
18	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	0.00	0.00	24		
19	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	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
20	0.00	0.00	S	0.00	0.00	0.00	0.00	0.22	0.02	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	24		
21	0.00	S	0.00	0.03	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
22	S	0.00	0.00	0.04	0.05	0.01	0.02	0.07	0.09	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	S	0.00	24		
23	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	0.00	0.00	0.00	0.00	S	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	24		
25	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	0.00	0.00	0.00	0.00	S	0.00	0.00	24		
26	0.00	0.00	0.00	0.02	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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24		
27	0.00	0.00	0.00	0.00	0.02	0.13	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24		
28	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	S	0.00	0.00	0.00	0.00	0.03	0.00	24		
29	0.01	0.02	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.06	0.01	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
30	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
HOURLY MAX	0.01	0.02	0.01	0.04	0.05	0.13	0.06	0.22	0.09	0.10	0.01	0.01	0.06	0.02	0.02	0.04	0.03	0.01	0.05	0.02	0.02	0.02	0.00	0.03					
HOURLY AVG	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	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	0.00	0.00	0.00	0.00	0.00			

STATUS FLAG CODES

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

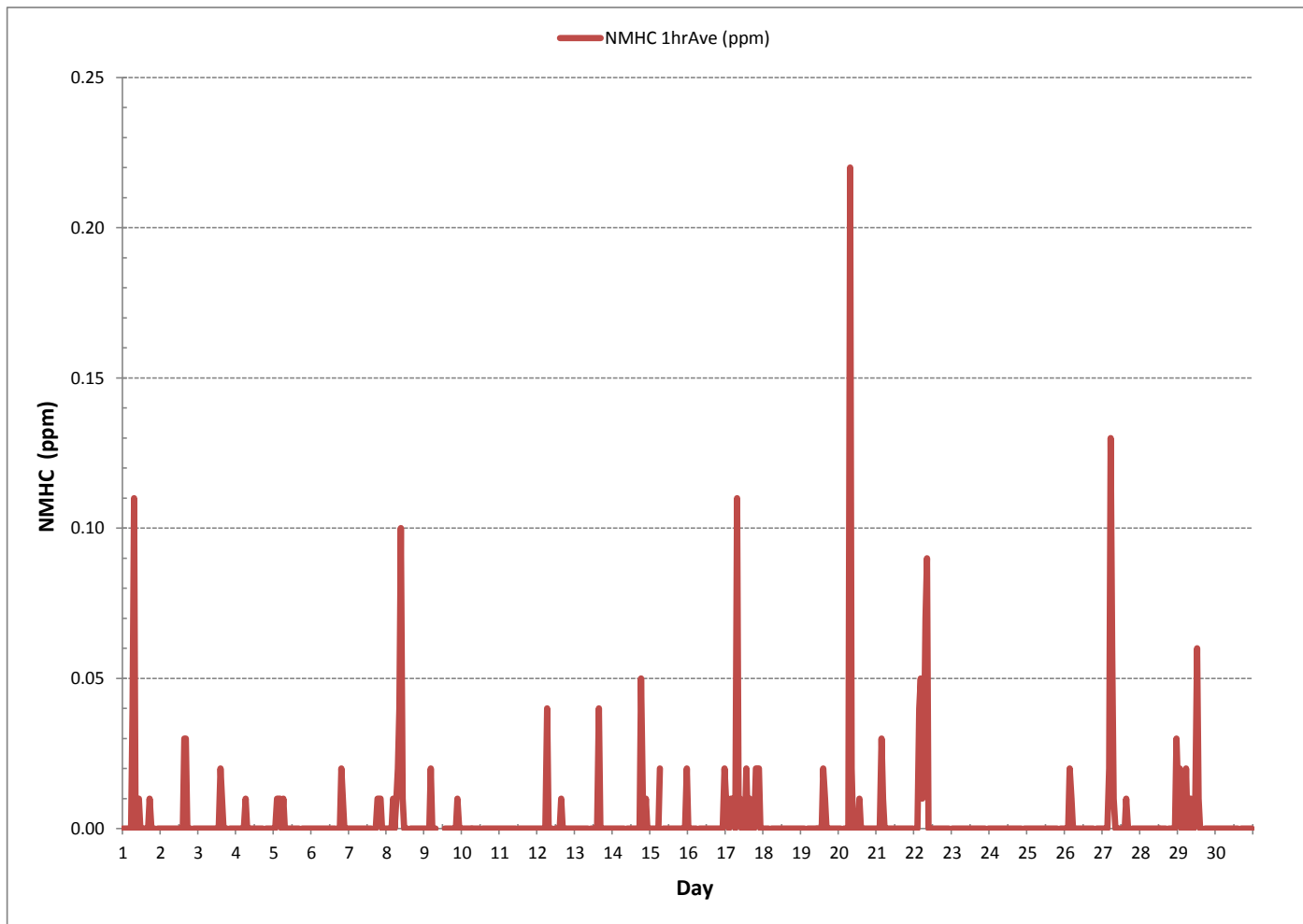
24 HOUR AVERAGES FOR September 2016



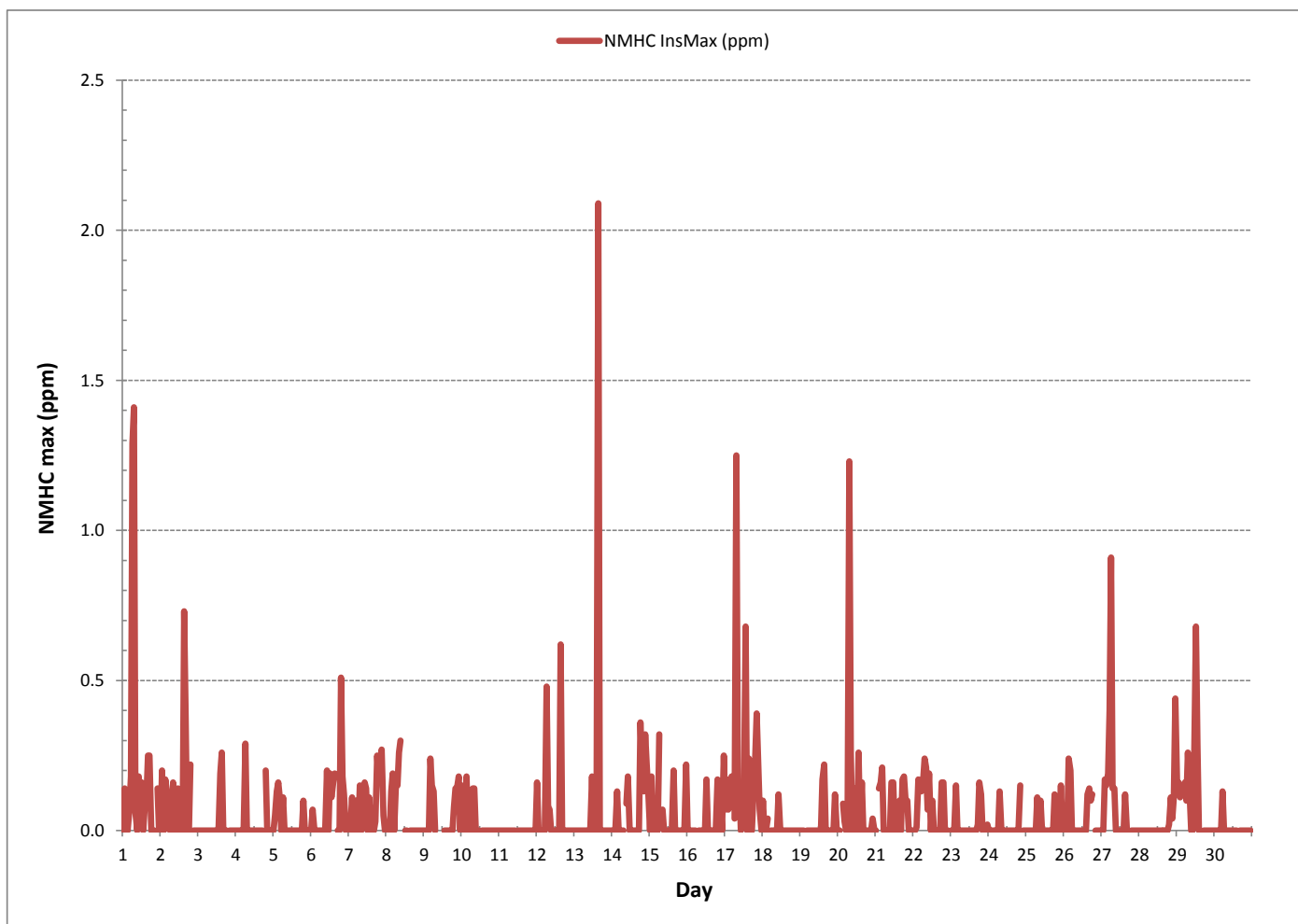
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	76				
MINIMUM 1-HR AVERAGE:	0.00	PPM @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.22	PPM @ HOUR(S)	7	ON DAY(S)	20
MAXIMUM 24-HR AVERAGE:	0.01	PPM		ON DAY(S)	VAR
				VAR-VARIOUS	
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.01		MONTHLY AVERAGE:	0.00	PPM

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

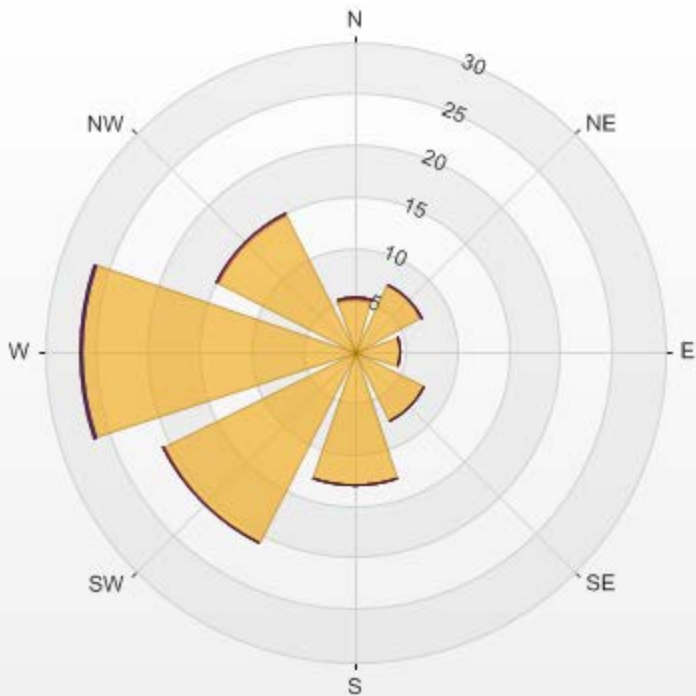


NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] Monthly: 2016/09 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0-0.06	0.06-0.12	0.12-0.18	0.18-0.24	0.24-0.3	>0.3	Total
N	5.12	0.29	0	0	0	0	5.41
NE	7.17	0.15	0	0	0	0	7.32
E	4.39	0.15	0	0	0	0	4.54
SE	7.47	0	0	0	0	0	7.47
S	12.88	0	0	0	0	0	12.88
SW	20.64	0.15	0	0	0	0	20.79
W	26.35	0	0.15	0.15	0	0	26.65
NW	14.79	0.15	0	0	0	0	14.94
Summary	98.81	0.89	0.15	0.15	0	0	100



% Icon Classes (ppm)	99	1	0	0	0	0
0-0.06	0.06-0.12	0.12-0.18	0.18-0.24	0.24-0.3	>0.3	

OXIDES OF NITROGEN



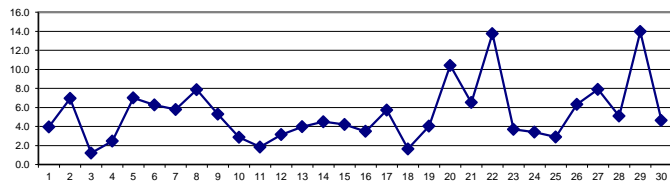
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

MST	DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.	
	DAY	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
1	1	2.3	2.8	2.6	2.9	2.9	3.9	4.9	6.5	4.1	4.6	4.3	5.5	4.0	3.7	5.2	3.7	2.8	2.5	3.0	4.7	4.4	S	4.7	5.0	2.3	6.5	4.0	24	
2	2	4.8	7.0	8.1	9.5	8.4	11.6	15.8	11.5	8.0	5.5	5.8	7.2	7.4	5.8	5.7	7.7	5.8	8.2	4.4	3.7	S	3.4	2.9	1.4	1.4	15.8	6.9	24	
3	3	0.9	0.8	0.9	0.7	1.1	0.8	1.1	0.9	0.8	0.9	1.0	0.9	1.0	1.3	1.2	1.3	1.7	1.5	1.8	S	2.2	1.5	1.7	1.6	0.7	2.2	1.2	24	
4	4	2.2	1.1	1.1	1.8	2.5	2.7	2.9	2.4	2.0	2.2	1.6	1.7	1.9	1.4	0.7	1.6	1.7	1.8	S	7.3	3.5	3.2	4.1	5.1	0.7	7.3	2.5	24	
5	5	11.3	22.7	8.8	10.0	10.4	11.1	13.7	11.8	7.7	3.6	3.5	3.0	1.8	1.9	2.4	3.6	3.1	S	6.8	5.9	5.0	3.9	4.4	4.8	1.8	22.7	7.0	24	
6	6	4.5	5.5	5.6	6.1	5.7	7.6	6.2	9.5	7.1	9.3	4.9	5.8	2.8	6.5	3.6	1.5	S	4.5	5.5	8.3	12.3	8.6	9.0	3.9	1.5	12.3	6.3	24	
7	7	3.7	2.9	2.4	2.4	5.1	8.2	3.8	9.0	9.6	4.8	7.3	3.8	2.8	3.6	8.2	S	4.5	5.8	11.8	6.0	4.7	5.9	8.5	8.3	2.4	11.8	5.8	24	
8	8	6.8	5.4	3.3	7.3	13.5	8.6	10.2	19.4	26.5	C	C	C	C	C	C	C	5.4	7.2	4.0	2.8	3.5	3.8	3.7	2.4	2.4	26.5	7.9	24	
9	9	2.2	1.8	2.2	3.7	6.7	8.2	9.8	5.6	6.7	5.2	5.3	3.4	1.9	S	4.2	3.5	4.1	6.1	5.9	9.3	8.8	7.3	5.5	4.3	1.8	9.8	5.3	24	
10	10	4.0	3.6	3.2	3.1	3.4	3.5	6.8	4.8	2.3	2.7	1.8	1.5	S	1.4	1.2	2.0	2.3	2.8	2.1	2.4	5.5	1.9	1.4	1.8	1.2	6.8	2.8	24	
11	11	1.3	0.9	0.9	1.5	1.2	1.0	1.0	1.1	0.8	4.0	3.5	S	2.3	1.5	1.7	1.8	2.0	1.9	1.6	3.1	2.5	2.2	2.2	2.2	0.8	4.0	1.8	24	
12	12	1.5	1.6	1.7	2.1	3.2	7.2	7.4	6.7	4.8	4.2	S	4.4	3.3	2.7	5.5	1.4	0.9	1.1	1.9	4.8	1.8	1.0	1.2	1.6	0.9	7.4	3.1	24	
13	13	1.8	2.4	3.2	3.2	3.2	2.9	4.0	7.7	5.7	S	4.5	4.3	1.9	3.5	3.7	2.1	1.6	1.4	12.4	8.3	7.4	1.8	3.1	1.3	1.3	12.4	4.0	24	
14	14	3.3	1.7	2.9	2.5	3.2	3.7	4.3	6.1	S	3.6	2.7	2.3	1.4	2.3	1.9	2.2	2.3	5.2	13.7	11.3	10.9	8.1	3.8	4.0	1.4	13.7	4.5	24	
15	15	3.8	3.3	2.0	1.6	2.9	6.6	20.5	S	7.8	7.0	3.5	2.4	2.5	1.5	1.7	1.4	4.0	3.2	1.9	3.2	2.1	2.8	4.7	6.1	1.4	20.5	4.2	24	
16	16	6.3	5.2	7.3	3.3	2.1	2.5	S	4.8	3.3	4.2	3.3	2.7	4.2	2.3	2.5	1.4	2.9	1.9	2.3	2.2	2.7	3.5	3.4	5.7	1.4	7.3	3.5	24	
17	17	4.6	4.4	5.9	7.2	5.2	S	4.7	9.8	10.5	14.7	6.1	3.6	2.4	4.3	2.3	2.1	1.7	2.3	6.9	6.1	11.3	7.9	3.4	3.8	1.7	14.7	5.7	24	
18	18	3.9	1.5	0.7	0.7	S	2.4	1.4	1.6	1.0	0.9	1.5	1.5	1.4	2.5	1.6	1.6	1.8	1.9	2.7	2.3	1.9	0.8	1.2	0.9	0.7	3.9	1.6	24	
19	19	0.6	0.7	0.8	S	3.1	2.2	2.0	4.7	3.5	3.0	4.3	2.6	2.8	2.8	3.5	3.9	4.9	6.8	7.7	10.0	5.8	4.3	4.8	7.8	0.6	10.0	4.0	24	
20	20	9.7	5.3	S	10.7	14.1	15.0	28.1	35.1	18.3	7.2	3.6	3.3	2.8	3.5	4.0	5.3	5.2	4.6	8.0	22.3	6.8	8.2	11.2	7.3	2.8	35.1	10.4	24	
21	21	5.7	S	9.2	18.8	10.3	6.8	5.5	8.6	3.4	2.7	2.9	2.3	1.0	1.5	1.6	4.9	6.7	4.0	10.2	10.1	5.8	12.0	9.0	6.6	1.0	18.8	6.5	24	
22	22	S	12.7	11.3	17.5	20.0	31.8	49.5	65.4	47.7	10.1	5.5	3.6	1.8	1.7	2.3	2.0	2.2	1.4	2.8	2.3	4.5	3.4	3.3	S	1.4	65.4	13.8	24	
23	23	3.8	3.5	2.4	1.1	1.1	1.8	6.8	9.2	4.6	3.9	4.0	3.4	3.3	2.6	2.9	5.7	4.7	3.8	4.0	3.7	2.9	3.2	S	2.6	1.1	9.2	3.7	24	
24	24	2.3	2.6	2.3	2.7	4.7	4.2	3.5	2.8	5.9	5.4	2.5	4.2	2.6	2.6	2.5	3.6	4.1	6.0	2.7	5.3	2.3	S	2.0	1.7	1.7	6.0	3.4	24	
25	25	1.4	1.2	1.2	3.3	4.8	1.1	1.2	1.4	1.5	1.7	2.0	1.2	1.0	1.4	2.4	2.5	3.0	4.5	9.1	5.4	S	3.5	4.0	7.4	1.0	9.1	2.9	24	
26	26	4.0	4.9	4.4	9.2	9.1	6.1	9.0	14.7	12.5	10.5	6.9	5.0	12.3	2.0	3.2	2.5	2.9	5.2	5.8	S	2.9	3.4	4.7	4.4	2.0	14.7	6.3	24	
27	27	4.0	3.7	3.5	4.3	10.2	27.4	15.7	15.2	12.4	4.8	4.3	6.3	10.0	4.6	3.9	6.8	4.2	5.2	S	6.2	16.0	7.6	3.2	2.2	2.2	27.4	7.9	24	
28	28	2.3	1.1	1.2	1.2	1.9	3.1	3.5	6.2	4.4	3.2	3.4	4.8	4.6	5.3	3.1	2.2	8.2	S	9.3	13.1	9.7	7.3	7.0	10.8	1.1	13.1	5.1	24	
29	29	12.4	12.5	11.1	11.8	15.8	24.9	33.5	51.8	28.1	12.5	5.7	4.6	3.3	3.1	5.3	3.3	S	11.7	13.6	12.6	12.7	11.7	10.3	9.1	3.1	51.8	14.0	24	
30	30	5.8	5.2	4.7	5.0	3.5	5.6	9.9	10.2	7.9	4.8	5.9	4.9	4.7	4.4	4.4	S	4.5	3.4	2.2	2.5	2.2	1.5	2.1	1.4	1.4	10.2	4.6	24	
HOURLY MAX		12.4	22.7	11.3	18.8	20.0	31.8	49.5	65.4	47.7	14.7	7.3	7.2	12.3	6.5	8.2	7.7	8.2	11.7	13.7	22.3	16.0	12.0	11.2	10.8					
HOURLY AVG		4.2	4.4	4.0	5.4	6.2	7.7	9.9	11.9	8.9	5.3	4.0	3.6	3.3	2.9	3.2	3.0	3.5	4.1	5.9	6.6	5.8	4.8	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

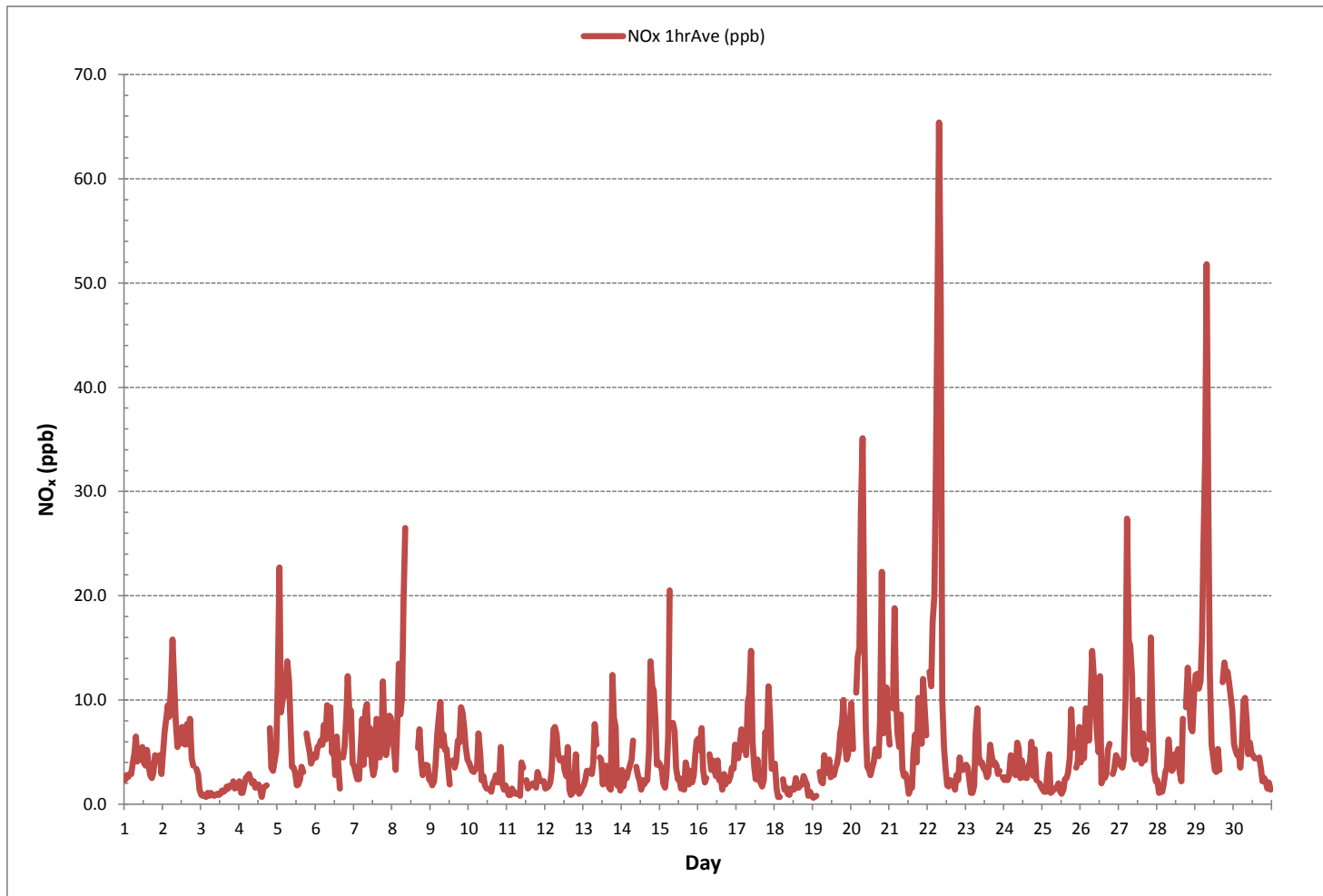
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683				
MINIMUM 1-HR AVERAGE:	0.6	PPB @ HOUR(S)	0	ON DAY(S) 19	
MAXIMUM 1-HR AVERAGE:	65.4	PPB @ HOUR(S)	7	ON DAY(S) 22	
MAXIMUM 24-HR AVERAGE:	14.0	PPB		ON DAY(S) 29	
				VAR-VARIOUS	
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	5.81		MONTHLY AVERAGE:	5.3	PPB

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		2.2	2.7	2.4	3.4	3.5	4.3	5.4	20.6	4.8	15.6	6.6	8.4	5.0	25.9	6.8	4.9	11.5	2.3	3.1	6.2	5.3	S	5.0	5.6	2.2	25.9	7.0	24	
2		5.5	9.2	8.6	14.0	13.3	12.7	23.5	17.5	9.7	7.8	9.9	12.7	11.4	8.0	7.8	11.1	8.4	11.7	5.9	4.6	S	5.5	3.2	1.3	1.3	23.5	9.7	24	
3		0.8	0.6	0.6	0.5	1.2	0.8	1.1	0.8	1.0	1.0	1.1	8.7	2.3	1.2	1.9	2.4	1.4	2.7	S	2.9	1.5	1.7	1.7	0.5	8.7	1.7	24		
4		2.5	1.9	1.1	2.3	2.5	3.7	4.4	3.3	2.6	2.3	2.2	2.2	2.7	1.9	0.6	17.6	2.3	2.5	S	8.9	8.9	5.3	6.0	21.5	0.6	21.5	4.7	24	
5		52.0	48.4	21.7	14.4	16.4	17.6	18.4	16.7	13.1	16.1	47.2	21.9	16.7	10.6	4.0	25.7	22.0	S	12.4	7.3	25.5	7.8	6.0	5.8	4.0	52.0	19.5	24	
6		5.1	6.2	6.9	6.8	8.5	8.8	11.8	11.8	9.0	81.1	15.5	41.8	16.8	32.8	29.6	3.0	S	22.5	6.5	11.9	46.0	11.2	82.3	7.5	3.0	82.3	21.0	24	
7		3.8	4.8	4.6	4.1	6.8	13.6	6.1	40.5	17.4	7.1	12.9	35.2	32.2	17.4	15.4	S	28.9	10.2	17.1	12.5	10.8	14.5	36.2	21.5	3.8	40.5	16.2	24	
8		19.3	14.9	4.7	13.7	44.6	27.7	36.1	62.7	C	C	C	C	C	C	C	C	9.8	10.6	10.0	5.4	6.5	7.2	5.8	4.2	4.2	62.7	17.7	24	
9		3.9	3.3	4.3	5.5	13.1	11.6	14.9	9.1	9.8	8.2	7.6	5.5	4.3	S	5.7	6.5	6.6	10.4	10.7	13.1	18.3	11.7	22.8	6.8	3.3	22.8	9.3	24	
10		6.7	4.4	3.9	4.3	6.4	10.3	12.0	9.8	13.7	14.3	3.0	2.7	S	2.5	2.9	3.4	4.1	5.3	5.2	4.0	11.3	5.0	2.8	2.5	2.5	14.3	6.1	24	
11		3.3	1.9	1.8	3.1	2.7	2.0	1.9	1.9	2.1	7.6	6.0	S	3.8	2.7	3.0	3.1	4.6	2.9	3.5	7.2	4.7	4.5	3.4	3.3	1.8	7.6	3.5	24	
12		2.7	2.6	3.0	3.9	4.5	13.2	10.1	11.5	7.1	5.7	S	8.2	5.6	12.9	35.9	2.6	6.8	4.3	4.6	44.5	5.2	2.6	3.1	2.7	2.6	44.5	8.8	24	
13		3.0	3.8	4.0	7.7	15.3	4.1	38.3	55.7	8.0	S	8.0	12.3	5.6	13.4	12.3	12.5	3.3	2.7	44.2	20.8	27.7	3.1	65.2	2.5	2.5	65.2	16.2	24	
14		85.7	2.3	9.2	3.6	5.0	5.3	8.8	11.8	S	5.6	4.7	13.6	3.5	4.8	3.4	3.4	3.4	9.0	26.3	68.2	19.2	27.9	23.0	52.2	2.3	85.7	17.4	24	
15		6.6	4.8	3.5	3.4	4.9	28.2	121.7	S	14.1	13.1	31.7	6.8	5.7	3.4	12.9	10.8	28.4	42.3	13.8	37.8	6.1	4.3	6.5	7.9	3.4	121.7	18.2	24	
16		9.4	9.0	10.7	6.1	14.5	4.5	S	49.0	5.4	19.8	11.8	5.1	17.2	15.4	26.3	5.5	21.6	17.4	4.8	15.8	7.2	5.2	6.1	10.6	4.5	49.0	13.0	24	
17		7.8	34.4	8.0	38.1	9.5	S	16.4	16.1	16.1	18.0	10.0	7.9	4.8	8.4	3.9	4.4	3.0	6.0	22.6	22.6	29.2	23.6	7.8	5.7	3.0	38.1	14.1	24	
18		34.2	2.4	1.5	1.7	S	3.5	2.1	2.4	1.7	1.7	2.8	2.8	2.3	4.0	3.7	2.6	2.6	3.1	4.5	4.2	3.4	1.5	2.2	1.6	1.5	34.2	4.0	24	
19		1.2	1.3	1.8	S	4.0	3.1	3.6	6.6	6.0	4.2	8.0	4.5	4.1	4.3	7.0	6.3	10.8	11.2	13.9	15.6	7.1	6.3	8.2	14.7	1.2	15.6	6.7	24	
20		15.6	7.1	S	13.5	19.9	23.4	38.6	48.3	22.8	10.2	5.7	7.1	5.0	6.6	7.0	8.2	10.4	10.9	14.1	32.1	15.8	14.8	46.1	13.9	5.0	48.3	17.3	24	
21		15.3	S	14.7	25.1	19.5	20.4	13.3	38.4	6.3	4.0	4.0	28.2	2.9	3.1	4.8	29.9	38.7	30.0	32.3	73.8	11.1	22.8	15.3	11.7	2.9	73.8	20.2	24	
22		S	25.8	15.4	21.6	24.9	44.8	66.5	102.3	74.8	28.8	34.8	16.1	16.9	10.8	4.7	12.0	7.6	4.9	29.5	15.3	50.7	18.2	5.2	S	4.7	102.3	28.7	24	
23		4.4	4.3	3.6	1.9	1.8	4.8	16.6	23.5	13.1	14.3	12.5	8.6	27.1	20.0	14.5	23.3	13.3	37.3	18.4	27.7	6.4	7.0	S	4.0	1.8	37.3	13.4	24	
24		3.1	6.6	3.3	3.9	9.2	7.4	4.8	5.1	9.2	15.8	4.7	8.4	4.7	4.5	5.3	6.8	8.2	15.2	5.0	36.1	5.4	S	3.2	2.6	2.6	36.1	7.8	24	
25		2.3	2.1	2.0	12.8	12.5	2.2	2.0	2.3	2.9	2.8	6.4	2.9	2.3	3.2	4.5	5.4	5.0	7.6	14.1	10.0	S	7.2	5.7	16.2	2.0	16.2	5.8	24	
26		8.8	9.3	10.2	12.3	42.1	10.1	14.3	32.5	44.0	24.3	24.3	20.0	47.3	10.9	19.7	41.3	5.5	23.0	30.2	S	5.6	4.5	6.0	5.6	4.5	47.3	19.6	24	
27		4.8	5.2	4.9	7.3	48.7	50.7	30.5	43.3	16.3	11.2	9.2	12.7	16.0	9.7	5.7	16.1	7.8	12.1	S	10.4	60.9	16.2	4.5	4.2	4.2	60.9	17.8	24	
28		4.9	2.2	3.3	4.8	23.3	6.6	5.2	42.9	22.9	7.4	29.5	38.3	26.1	59.7	20.1	4.6	35.3	S	15.6	16.9	12.7	9.9	11.5	15.0	2.2	59.7	18.2	24	
29		15.5	14.7	14.3	14.4	20.8	37.6	46.1	70.9	47.7	20.0	24.3	17.1	6.8	6.5	30.3	6.0	S	16.8	21.5	15.0	17.3	17.3	13.2	12.3	6.0	70.9	22.0	24	
30		9.2	7.3	7.5	9.0	5.7	10.6	14.6	13.5	13.3	7.1	9.2	9.3	19.2	7.8	7.2	S	6.9	6.1	4.1	5.3	4.4	3.7	3.9	3.1	3.1	19.2	8.2	24	
HOURLY MAX		85.7	48.4	21.7	38.1	48.7	50.7	121.7	102.3	74.8	81.1	47.2	41.8	47.3	59.7	35.9	41.3	38.7	42.3	44.2	73.8	60.9	27.9	82.3	52.2					
HOURLY AVG		11.7	8.4	6.3	9.1	14.0	13.6	20.3	26.6	14.8	13.4	12.6	12.9	11.6	11.2	10.6	10.3	11.4	12.1	14.2	19.8	15.6	9.7	14.2	9.2					

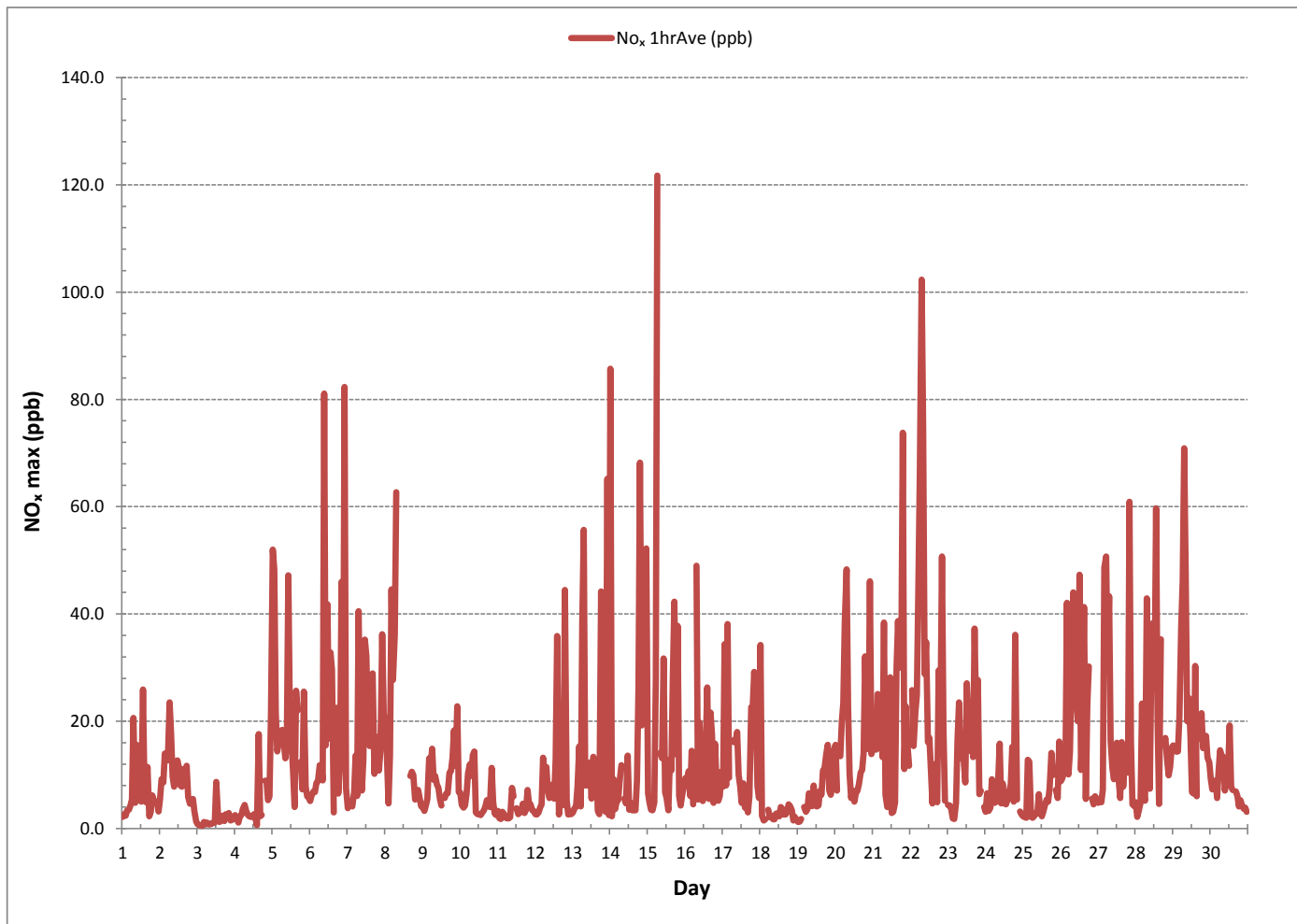
STATUS FLAG CODES

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

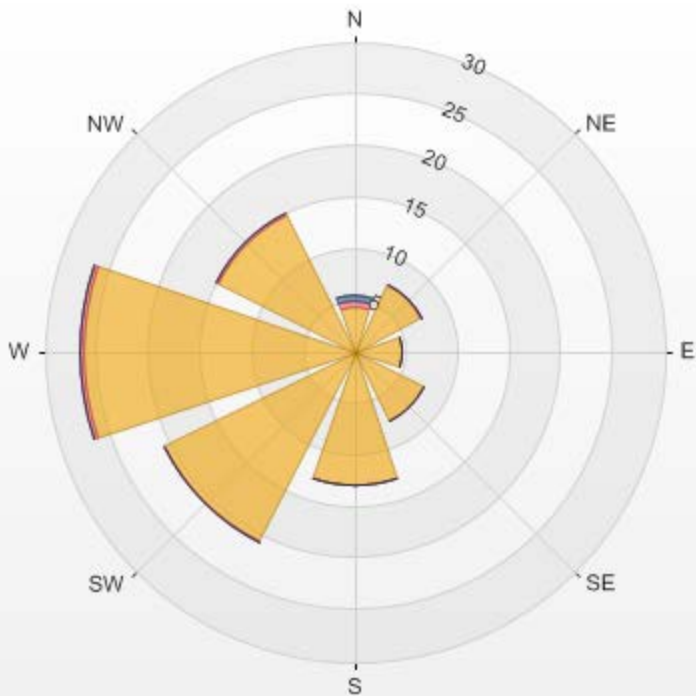
NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	121.7 PPB @ HOUR(S) 6 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	14.45
OPERATIONAL TIME:	720 HRS

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



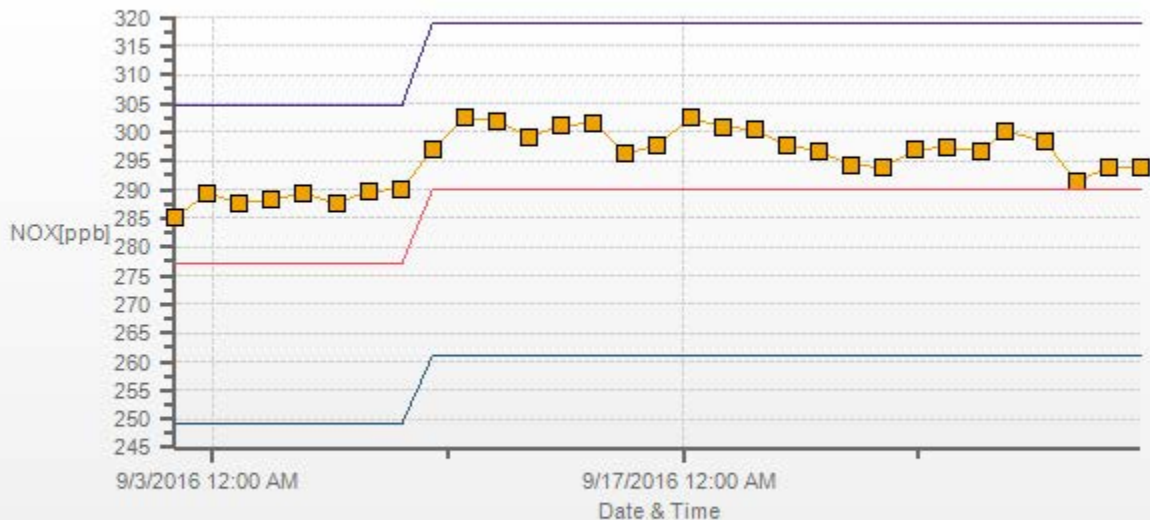
Wind: LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

Direction	0.0-22.0	22.0-44.0	44.0-66.0	>66.0	Total
N	4.4	0.44	0.59	0	5.43
NE	7.18	0.15	0	0	7.33
E	4.55	0	0	0	4.55
SE	7.48	0	0	0	7.48
S	12.9	0	0	0	12.9
SW	20.53	0.15	0	0	20.68
W	26.25	0.44	0	0	26.69
NW	14.81	0.15	0	0	14.96
Summary	98.1	1.33	0.59	0	100



% Icon Classes (ppb)	
98	0.0-22.0
1	22.0-44.0
1	44.0-66.0
0	>66.0

NOX[ppb] Calibration: LICA Bonnyville Monthly: 09/2016 Type: Span



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

NITRIC OXIDES

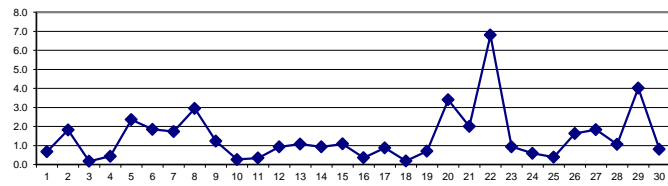
NITRIC OXIDE Hourly Averages (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.1	0.1	0.0	0.1	0.2	0.9	1.1	3.1	1.1	1.6	1.4	1.4	1.2	0.7	1.0	0.1	0.3	0.1	0.1	0.4	0.1	S	0.2	0.0	0.0	3.1	0.7	24	
2	0.0	0.1	0.0	0.8	0.7	1.7	6.3	5.4	3.1	1.4	2.0	2.9	1.9	2.1	2.9	1.9	2.6	0.9	0.8	S	0.9	0.2	0.1	0.0	6.3	1.8	24		
3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.3	0.3	0.2	0.3	0.1	0.3	0.6	0.4	0.3	S	0.5	0.1	0.0	0.0	0.6	0.2	24		
4	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.5	0.5	0.7	0.4	0.6	0.7	0.4	0.0	0.5	0.4	0.3	S	0.9	0.8	0.3	0.4	1.6	0.0	1.6	0.4	24	
5	3.5	10.0	2.3	2.3	3.1	2.8	6.4	5.7	3.3	1.2	1.4	1.5	0.6	0.7	0.9	1.1	1.0	S	2.2	0.9	1.1	0.8	0.7	0.6	0.6	10.0	2.4	24	
6	0.5	0.6	0.6	1.0	1.2	2.1	1.7	3.1	2.3	4.5	2.4	3.3	1.3	3.6	1.8	1.0	S	1.8	0.9	1.1	2.8	1.2	3.4	0.2	4.5	1.8	24		
7	0.1	0.3	0.0	0.0	0.7	1.7	1.3	4.8	5.3	2.5	4.1	1.6	1.2	1.5	3.0	S	1.5	1.4	2.2	0.8	0.4	0.7	3.0	1.8	0.0	5.3	1.7	24	
8	1.9	1.3	0.0	0.8	5.2	2.9	4.6	13.3	18.0	C	C	C	C	C	C	C	C	0.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	18.0	2.9	24	
9	0.0	0.0	0.0	0.0	0.2	1.5	3.3	2.2	3.2	2.1	2.1	1.2	0.8	S	1.7	1.1	1.2	1.6	0.4	1.2	2.5	1.1	0.8	0.2	0.0	3.3	1.2	24	
10	0.1	0.0	0.0	0.0	0.0	0.0	1.1	1.3	0.5	0.8	0.6	0.5	S	0.1	0.0	0.2	0.2	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.3	0.3	24	
11	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	1.9	1.5	S	0.8	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.0	1.9	0.3	24	
12	0.0	0.0	0.0	0.1	0.4	1.5	1.7	2.2	2.0	2.1	S	1.6	1.3	1.1	3.1	0.6	0.4	0.3	0.5	2.0	0.3	0.1	0.0	0.0	0.0	3.1	0.9	24	
13	0.0	0.0	0.0	0.0	0.1	0.0	0.8	3.5	2.8	S	2.0	2.1	0.6	1.6	1.6	0.8	0.3	0.4	3.4	1.3	1.9	0.0	1.5	0.0	0.0	3.5	1.1	24	
14	0.6	0.0	0.5	0.2	0.2	0.4	1.1	2.9	S	1.8	1.1	0.9	0.4	0.8	0.5	0.5	0.2	0.6	2.2	2.9	1.7	1.1	0.1	0.7	0.0	2.9	0.9	24	
15	0.0	0.0	0.0	0.0	0.0	1.3	11.6	S	3.2	2.8	1.1	0.9	1.0	0.3	0.4	0.0	1.1	0.2	0.0	0.8	0.2	0.0	0.0	0.0	0.0	11.6	1.1	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	S	1.4	0.8	1.2	0.9	0.6	1.1	0.3	0.5	0.0	0.9	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	1.4	0.4	24	
17	0.1	0.0	0.0	0.4	0.0	S	0.4	1.3	2.5	5.7	1.8	0.7	0.4	1.0	0.4	0.1	0.1	0.1	1.0	0.9	1.7	1.2	0.3	0.0	0.0	5.7	0.9	24	
18	0.5	0.0	0.0	0.0	S	0.3	0.0	0.1	0.1	0.0	0.2	0.3	0.3	0.6	0.4	0.3	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.2	24	
19	0.0	0.0	0.0	S	0.7	0.3	0.3	1.5	1.3	0.9	1.6	0.9	0.7	0.8	1.1	1.2	1.3	1.7	0.6	0.3	0.1	0.1	0.2	0.5	0.0	1.7	0.7	24	
20	0.6	0.0	S	1.2	2.2	3.6	14.6	19.4	8.8	3.5	1.6	1.2	0.7	0.8	1.5	2.8	2.6	1.4	1.1	4.9	1.1	1.5	2.6	0.4	0.0	19.4	3.4	24	
21	0.2	S	2.0	8.9	3.6	1.9	1.6	4.8	1.8	1.2	1.2	1.0	0.3	0.6	0.7	2.2	2.9	1.9	3.6	3.2	0.5	1.6	0.3	0.1	0.1	8.9	2.0	24	
22	S	1.6	0.6	3.9	6.8	13.6	30.0	46.5	31.2	5.0	2.5	1.9	0.6	0.5	1.0	0.8	0.7	0.2	0.7	0.3	1.3	0.0	0.0	S	0.0	46.5	6.8	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	1.3	1.2	1.4	1.1	1.1	0.7	1.0	2.7	1.8	1.4	1.5	1.1	0.6	0.8	S	0.2	0.0	2.7	0.9	24	
24	0.0	0.0	0.0	0.0	0.6	0.6	0.4	0.5	2.5	1.6	0.3	1.4	0.8	0.8	0.7	1.0	0.9	0.8	0.0	0.5	0.1	S	0.0	0.0	0.0	2.5	0.6	24	
25	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.5	0.6	0.9	0.5	0.4	0.5	0.8	0.8	0.7	0.6	0.9	0.6	S	0.2	0.2	0.3	0.0	0.9	0.4	24	
26	0.1	0.0	0.1	0.5	1.4	0.5	1.3	5.5	5.2	4.2	2.8	1.8	6.2	0.9	1.6	0.9	1.0	1.7	1.9	S	0.0	0.0	0.0	0.0	0.0	6.2	1.6	24	
27	0.0	0.0	0.0	0.0	0.8	10.3	3.9	6.5	5.1	1.7	0.9	1.5	1.4	0.7	1.0	2.2	1.1	0.6	S	0.3	3.9	0.2	0.0	0.0	0.0	10.3	1.8	24	
28	0.0	0.0	0.0	0.0	0.1	0.3	0.4	2.7	1.9	1.4	1.5	1.9	1.9	2.5	1.0	0.6	2.8	S	1.1	1.8	0.7	0.5	0.5	0.8	0.0	2.8	1.1	24	
29	1.0	1.1	0.8	1.4	2.3	7.3	14.6	30.5	15.0	5.9	2.1	1.9	0.8	0.7	1.6	0.7	S	1.7	1.3	0.7	0.6	0.3	0.1	0.0	0.0	30.5	4.0	24	
30	0.0	0.0	0.0	0.1	0.1	0.3	1.9	2.2	2.2	1.4	2.3	2.2	2.1	1.5	1.5	S	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.8	24	
HOURLY MAX	3.5	10.0	2.3	8.9	6.8	13.6	30.0	46.5	31.2	5.9	4.1	3.3	6.2	3.6	3.1	2.9	2.9	2.6	3.6	4.9	3.9	1.6	3.4	1.8					
HOURLY AVG	0.3	0.5	0.2	0.8	1.1	1.9	3.9	6.0	4.3	2.1	1.5	1.3	1.1	0.9	1.1	1.0	1.0	0.9	1.0	1.0	0.8	0.5	0.5	0.3					

STATUS FLAG CODES

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

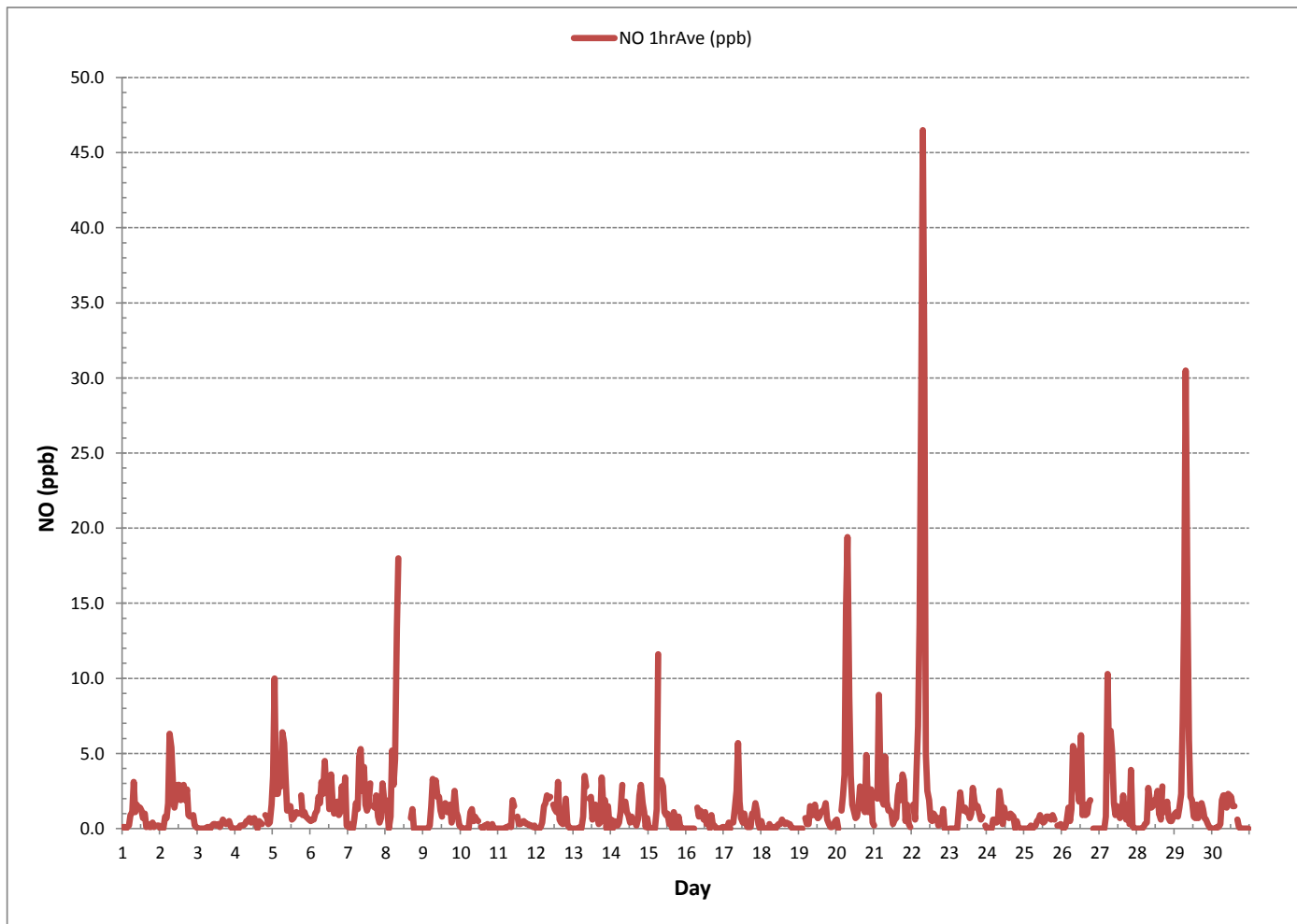
24 HOUR AVERAGES FOR September 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	541				
MINIMUM 1-HR AVERAGE:	0.0	PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	46.5	PPB @ HOUR(S)	7	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	6.8	PPB		ON DAY(S)	22
				VAR-VARIOUS	
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	3.31		MONTHLY AVERAGE:	1.4	PPB

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	0.8	0.5	0.5	0.7	0.9	1.9	2.4	14.4	2.7	6.1	3.3	3.4	2.6	7.1	2.9	1.3	7.2	0.6	0.6	1.5	1.0	S	1.4	0.7	0.5	14.4	2.8	24	
2	0.8	1.0	1.0	2.6	2.3	3.1	13.1	9.0	5.2	3.1	4.9	7.1	6.0	3.3	4.2	6.0	3.4	5.1	2.1	1.8	S	3.0	0.7	0.7	13.1	3.9	24		
3	0.6	0.4	0.4	0.4	0.5	0.6	1.1	0.7	0.9	1.2	1.1	1.4	2.9	1.5	0.9	1.5	1.9	1.9	1.3	S	2.1	1.0	0.8	0.9	0.4	2.9	1.1	24	
4	0.6	0.6	0.6	0.9	0.8	0.9	1.1	1.3	1.5	1.5	1.1	1.3	1.8	1.3	0.5	10.7	1.1	1.2	S	2.3	3.7	3.3	1.3	9.9	0.5	10.7	2.1	24	
5	31.1	29.8	10.9	5.6	7.2	7.6	10.7	10.3	6.9	5.3	25.1	16.0	12.8	6.5	2.7	13.0	8.8	S	5.9	2.3	8.5	3.1	1.9	1.5	1.5	31.1	10.2	24	
6	2.1	1.3	1.6	2.2	2.7	3.3	4.3	5.0	4.1	44.8	9.3	29.2	11.7	20.8	17.2	6.5	S	8.2	2.1	2.3	30.9	3.2	71.9	1.6	1.3	71.9	12.4	24	
7	0.6	2.0	0.9	0.6	3.1	4.9	3.8	21.3	10.8	4.6	7.2	28.8	17.2	14.1	6.5	S	19.5	2.8	4.7	3.6	3.0	5.1	21.1	9.6	0.6	28.8	8.5	24	
8	10.0	6.8	1.0	4.3	30.9	16.6	27.3	58.1	C	C	C	C	C	C	C	C	C	3.3	3.6	3.2	0.0	0.0	0.0	0.0	0.0	0.0	58.1	10.3	24
9	0.0	0.0	0.0	0.0	2.7	3.3	6.5	3.7	4.8	3.8	2.9	1.9	1.7	S	2.4	2.1	1.8	2.9	2.1	2.3	7.8	2.6	17.1	0.9	0.0	17.1	3.2	24	
10	0.7	0.0	0.0	0.1	0.0	1.1	1.9	3.7	6.3	6.5	0.9	0.8	S	0.0	0.0	0.1	0.3	0.3	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	6.5	1.1	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	3.1	2.7	S	1.2	0.4	0.4	0.7	1.2	0.3	0.8	0.7	0.6	0.4	0.0	0.0	0.0	0.0	0.0	3.1	0.6	24
12	0.0	0.0	0.0	0.0	0.3	2.9	2.3	3.2	3.3	2.5	S	2.8	1.9	7.9	22.2	0.6	9.4	1.4	0.9	20.1	1.1	0.3	0.0	0.0	0.0	0.0	22.2	3.6	24
13	0.0	0.0	0.0	0.0	4.9	0.2	24.6	33.4	3.8	S	4.4	8.0	2.9	12.1	4.6	4.7	1.2	2.4	17.0	5.1	15.9	0.0	54.1	0.0	0.0	54.1	8.7	24	
14	39.3	0.0	3.2	0.6	0.6	1.1	4.7	6.0	S	2.5	1.9	3.6	1.0	1.7	0.6	1.2	0.3	1.0	7.4	39.8	4.1	20.3	14.4	41.2	0.0	41.2	8.5	24	
15	0.0	0.0	0.0	0.3	0.0	13.5	99.5	S	5.5	5.1	14.8	4.3	3.0	1.2	15.3	4.0	17.3	17.6	8.9	26.9	2.7	0.1	0.7	0.1	0.0	99.5	10.5	24	
16	0.0	0.0	0.1	0.0	6.3	0.3	S	28.6	1.9	14.1	6.5	2.3	7.1	11.8	14.3	1.8	11.4	10.0	1.3	10.1	1.2	0.4	1.2	2.3	0.0	28.6	5.8	24	
17	2.0	14.5	0.3	19.8	0.5	S	6.6	2.7	5.6	6.7	3.4	2.1	0.8	2.0	0.8	0.3	0.4	0.6	5.8	9.1	8.6	7.0	2.4	0.2	0.2	19.8	4.4	24	
18	28.4	0.0	0.0	0.0	S	0.6	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.9	0.9	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.4	1.4	24
19	0.0	0.0	0.0	S	0.6	0.1	0.2	2.1	2.0	0.9	2.5	1.2	0.7	0.7	2.3	1.9	2.5	3.0	0.7	0.5	0.0	0.0	0.7	2.6	0.0	3.0	1.1	24	
20	2.9	0.0	S	1.8	4.8	6.2	23.1	28.3	10.7	4.9	1.9	2.2	1.2	1.6	2.1	3.7	5.2	4.0	1.4	10.2	3.5	3.6	32.2	1.6	0.0	32.2	6.8	24	
21	2.1	S	4.9	14.1	8.9	8.7	5.9	27.1	4.1	1.3	1.1	12.1	0.6	1.2	2.7	18.0	23.5	26.3	14.0	53.3	1.4	8.4	0.6	0.0	0.0	53.3	10.4	24	
22	S	5.5	0.9	5.8	10.6	21.9	43.4	80.8	54.1	15.6	23.5	13.3	2.9	3.8	5.2	7.5	5.8	1.6	14.2	4.8	22.3	5.0	0.4	S	0.4	80.8	15.9	24	
23	0.0	0.0	0.0	0.1	0.0	0.0	4.1	7.5	8.8	13.6	3.1	1.3	8.7	9.2	4.0	11.1	10.4	25.2	13.7	18.0	2.7	2.1	S	0.5	0.0	25.2	6.3	24	
24	0.0	0.1	0.0	0.0	2.1	1.9	0.3	2.0	3.9	5.6	0.3	2.9	1.1	1.3	1.6	1.9	1.9	2.2	0.1	21.8	1.3	S	0.0	0.0	0.0	21.8	2.3	24	
25	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.1	0.8	1.1	3.0	0.7	0.7	1.0	0.9	1.1	0.6	0.5	1.8	1.1	S	0.0	0.0	0.6	0.0	3.0	0.7	24	
26	0.3	0.0	0.3	1.9	19.2	2.1	3.1	18.9	34.8	7.9	13.5	9.7	28.0	7.4	8.5	20.1	2.3	14.0	20.4	S	0.3	0.2	0.0	0.0	0.0	34.8	9.3	24	
27	0.0	0.0	0.0	0.0	18.5	26.8	11.2	26.8	6.4	4.2	2.6	2.9	2.8	1.6	1.1	8.0	2.0	1.0	S	0.5	35.7	3.3	0.0	0.7	0.0	35.7	6.8	24	
28	0.0	0.0	0.2	1.2	9.7	1.7	1.0	20.6	19.8	3.6	15.6	18.2	15.8	45.1	13.0	1.4	22.6	S	3.2	3.7	1.4	1.2	1.9	1.9	0.0	45.1	8.8	24	
29	2.1	1.8	1.6	1.9	4.0	17.2	24.8	45.1	28.7	9.4	13.1	9.6	1.1	1.5	16.4	1.0	S	2.7	2.6	1.3	1.3	0.3	0.5	0.3	0.5	45.1	8.2	24	
30	0.7	0.2	0.0	0.8	0.0	1.0	3.5	3.0	3.8	2.2	3.6	4.6	13.4	3.1	2.5	S	1.6	1.4	0.5	0.8	0.6	0.2	0.5	0.4	0.0	13.4	2.1	24	
HOURLY MAX	39.3	29.8	10.9	19.8	30.9	26.8	99.5	80.8	54.1	44.8	25.1	29.2	28.0	45.1	22.2	20.1	23.5	26.3	20.4	53.3	35.7	20.3	71.9	41.2					
HOURLY AVG	4.3	2.2	1.0	2.3	4.9	5.2	11.4	16.0	8.6	6.5	6.2	6.9	5.4	6.1	5.4	4.8	6.0	5.1	4.9	8.7	5.9	2.7	7.8	2.7					

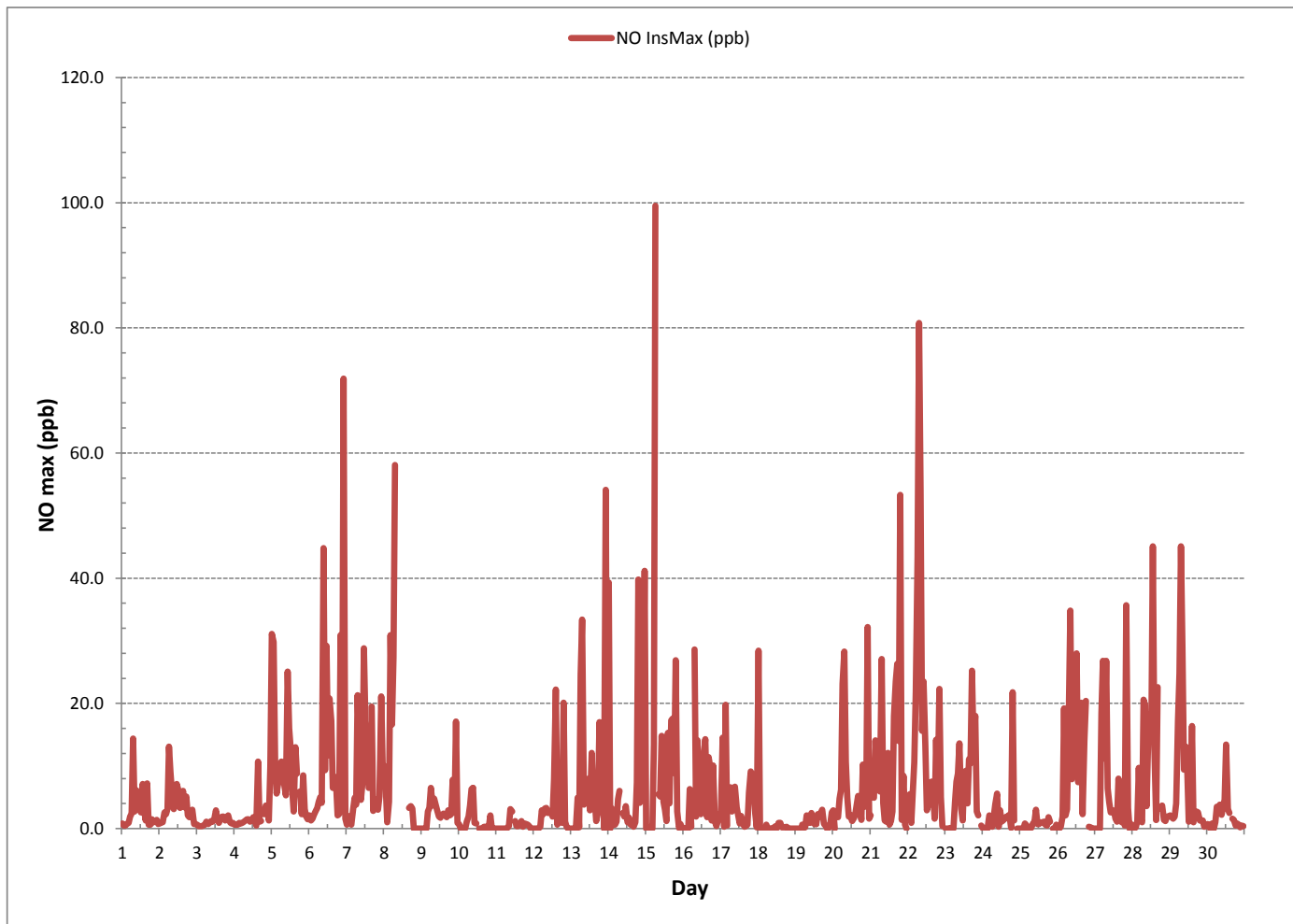
STATUS FLAG CODES

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

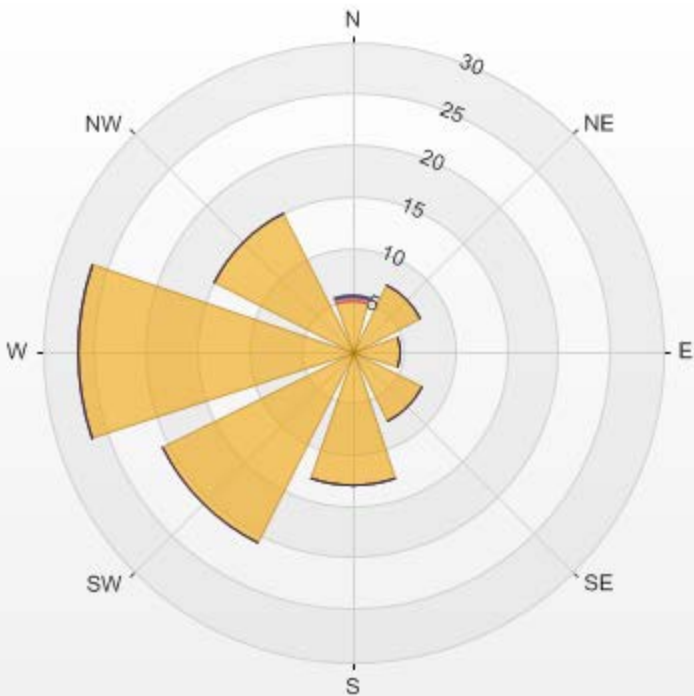
NUMBER OF NON-ZERO READINGS:	586
MAXIMUM INSTANTANEOUS VALUE:	99.5 PPB @ HOUR(S) 6 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	8 HRS
OPERATIONAL TIME:	720 HRS
STANDARD DEVIATION:	10.21

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

Direction	0.0-15.7	15.7-31.3	31.3-47.0	>47.0	Total
N	4.84	0.44	0.15	0	5.43
NE	7.33	0	0	0	7.33
E	4.55	0	0	0	4.55
SE	7.48	0	0	0	7.48
S	12.9	0	0	0	12.9
SW	20.67	0	0	0	20.67
W	26.54	0.15	0	0	26.69
NW	14.96	0	0	0	14.96
Summary	99.27	0.59	0.15	0	100



% Icon Classes (ppb)		99	1	0	0
0.0-15.7	15.7-31.3	31.3-47.0	>47.0		

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	2.2	2.7	2.6	2.8	2.8	3.0	3.7	3.5	3.0	3.0	2.9	4.0	2.8	3.0	4.2	3.6	2.5	2.4	2.9	4.3	4.3	S	4.5	5.0	2.2	5.0	3.3	24	
2	4.8	6.9	8.1	8.6	7.7	9.8	9.5	6.1	5.0	4.1	3.8	4.3	4.5	3.9	3.6	4.8	3.9	5.6	3.5	2.9	S	2.5	2.7	1.3	1.3	9.8	5.1	24	
3	0.9	0.8	0.9	0.7	1.1	0.8	1.0	0.8	0.8	0.7	0.7	0.6	0.8	1.0	1.0	1.1	1.1	1.5	S	1.7	1.4	1.7	1.6	0.6	1.7	1.0	24		
4	2.2	1.1	1.1	1.7	2.3	2.5	2.6	2.0	1.5	1.5	1.2	1.1	1.3	1.0	0.7	1.1	1.3	1.5	S	6.4	2.7	2.9	3.7	3.5	0.7	6.4	2.0	24	
5	7.7	12.7	6.5	7.8	7.2	8.2	7.3	6.0	4.4	2.4	2.2	1.5	1.2	1.2	1.4	2.4	2.1	S	4.6	5.1	3.9	3.1	3.6	4.1	1.2	12.7	4.6	24	
6	4.0	4.9	5.1	5.0	4.5	5.5	4.4	6.4	4.8	4.8	2.4	2.6	1.6	2.9	1.8	0.6	S	2.7	4.5	7.1	9.5	7.4	5.6	3.7	0.6	9.5	4.4	24	
7	3.6	2.6	2.3	2.4	4.4	6.5	2.5	4.1	4.3	2.3	3.3	2.1	1.6	2.2	5.2	S	3.0	4.4	9.6	5.3	4.4	5.2	5.5	6.5	1.6	9.6	4.1	24	
8	4.9	4.1	3.3	6.5	8.3	5.6	5.6	6.0	8.5	C	C	C	C	C	C	C	C	4.6	5.9	4.0	2.8	3.5	3.8	3.7	2.4	2.4	8.5	4.9	24
9	2.2	1.8	2.2	3.7	6.5	6.7	6.4	3.4	3.4	3.1	3.2	2.3	1.1	S	2.6	2.4	2.9	4.6	5.5	8.1	6.3	6.1	4.7	4.1	1.1	8.1	4.1	24	
10	3.9	3.6	3.2	3.1	3.4	3.5	5.7	3.5	1.9	1.9	1.3	1.0	S	1.3	1.2	1.8	2.1	2.6	2.1	2.4	5.2	1.9	1.4	1.8	1.0	5.7	2.6	24	
11	1.3	0.9	0.9	1.5	1.2	0.9	0.9	1.0	0.7	2.1	2.0	S	1.6	1.2	1.4	1.3	1.5	1.5	1.3	2.8	2.3	2.0	2.1	2.0	0.7	2.8	1.5	24	
12	1.5	1.6	1.7	1.9	2.7	5.8	5.7	4.5	2.8	2.1	S	2.9	2.0	1.6	2.4	0.8	0.5	0.7	1.4	2.9	1.6	0.9	1.2	1.6	0.5	5.8	2.2	24	
13	1.8	2.4	3.2	3.2	3.1	2.9	3.1	4.2	3.0	S	2.5	2.2	1.3	1.8	2.1	1.3	1.3	1.0	9.0	7.0	5.5	1.7	1.6	1.3	1.0	9.0	2.9	24	
14	2.7	1.7	2.4	2.3	3.0	3.3	3.2	3.2	S	1.9	1.6	1.4	1.0	1.5	1.4	1.6	2.1	4.6	11.6	8.4	9.2	7.0	3.7	3.3	1.0	11.6	3.6	24	
15	3.8	3.3	2.0	1.6	2.9	5.3	8.9	S	4.7	4.2	2.4	1.6	1.5	1.3	1.3	1.4	3.0	3.0	1.9	2.3	1.9	2.8	4.7	6.1	1.3	8.9	3.1	24	
16	6.3	5.2	7.3	3.3	2.1	2.5	S	3.4	2.6	3.0	2.3	2.1	3.1	2.0	2.1	1.4	2.0	1.7	2.1	2.2	2.7	3.5	3.4	5.6	1.4	7.3	3.1	24	
17	4.6	4.4	5.9	6.9	5.2	S	4.4	8.5	8.0	9.1	4.2	2.9	2.0	3.3	1.9	2.0	1.6	2.2	5.9	5.2	9.6	6.6	3.1	3.8	1.6	9.6	4.8	24	
18	3.4	1.5	0.7	0.7	S	2.1	1.4	1.5	0.9	0.9	1.3	1.2	1.1	1.9	1.2	1.3	1.4	1.6	2.4	2.2	1.9	0.8	1.2	0.9	0.7	3.4	1.5	24	
19	0.6	0.7	0.8	S	2.4	1.9	1.8	3.2	2.2	2.2	2.7	1.7	2.1	2.1	2.4	2.6	3.6	5.1	7.0	9.7	5.7	4.2	4.6	7.3	0.6	9.7	3.3	24	
20	9.1	5.3	S	9.4	12.0	11.4	13.4	15.7	9.5	3.7	2.0	2.1	2.1	2.7	2.5	2.5	2.6	3.2	6.9	17.4	5.8	6.7	8.7	6.9	2.0	17.4	7.0	24	
21	5.5	S	7.1	9.9	6.7	4.9	3.9	3.8	1.5	1.5	1.7	1.3	0.6	0.9	0.9	2.8	3.8	2.1	6.6	6.9	5.3	10.4	8.7	6.5	0.6	10.4	4.5	24	
22	S	11.1	10.7	13.6	13.2	18.2	19.5	18.9	16.5	5.2	3.0	1.7	1.2	1.3	1.4	1.2	1.4	1.2	2.1	2.0	3.2	3.3	3.3	S	1.2	19.5	7.0	24	
23	3.8	3.5	2.4	1.1	1.1	1.8	5.6	6.7	3.3	2.7	2.5	2.4	2.2	1.9	1.9	3.1	2.9	2.4	2.5	2.6	2.2	2.4	S	2.4	1.1	6.7	2.8	24	
24	2.3	2.6	2.3	2.7	4.1	3.6	3.1	2.2	3.3	3.8	2.2	2.9	1.8	1.8	1.7	2.6	3.2	5.2	2.7	4.8	2.2	S	2.0	1.7	1.7	5.2	2.8	24	
25	1.4	1.2	1.2	3.3	4.7	1.1	1.1	1.2	1.0	1.1	1.0	0.7	0.6	0.8	1.6	1.7	2.3	3.9	8.3	4.9	S	3.4	3.8	7.1	0.6	8.3	2.5	24	
26	3.9	4.9	4.3	8.8	7.7	5.6	7.7	9.1	7.3	6.3	4.0	3.1	6.1	1.1	1.6	1.6	1.9	3.5	3.9	S	2.9	3.4	4.7	4.4	1.1	9.1	4.7	24	
27	4.0	3.7	3.5	4.3	9.4	17.2	11.8	8.7	7.4	3.1	3.4	4.8	8.6	3.9	2.9	4.5	3.1	4.7	S	5.9	12.2	7.4	3.2	2.2	2.2	17.2	6.1	24	
28	2.3	1.1	1.2	1.2	1.8	2.8	3.1	3.5	2.5	1.8	1.9	2.9	2.7	2.8	2.1	1.6	5.5	S	8.2	11.3	9.0	6.8	6.5	10.0	1.1	11.3	4.0	24	
29	11.4	11.4	10.2	10.5	13.4	17.6	18.9	21.2	13.1	6.6	3.5	2.8	2.5	2.4	3.8	2.6	S	10.0	12.3	11.8	12.2	11.4	10.2	9.1	2.4	21.2	10.0	24	
30	5.8	5.2	4.7	4.9	3.5	5.3	8.0	8.1	5.8	3.4	3.7	2.7	2.7	2.9	2.8	S	4.0	3.3	2.2	2.5	2.2	1.5	2.1	1.4	1.4	8.1	3.9	24	
HOURLY MAX	11.4	12.7	10.7	13.6	13.4	18.2	19.5	21.2	16.5	9.1	4.2	4.8	8.6	3.9	5.2	4.8	5.5	10.0	12.3	17.4	12.2	11.4	10.2	10.0					
HOURLY AVG	3.9	3.9	3.7	4.6	5.1	5.7	6.0	5.9	4.6	3.2	2.5	2.2	2.2	2.0	2.1	2.1	2.5	3.3	4.9	5.6	5.0	4.3	4.0	4.1					

STATUS FLAG CODES

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

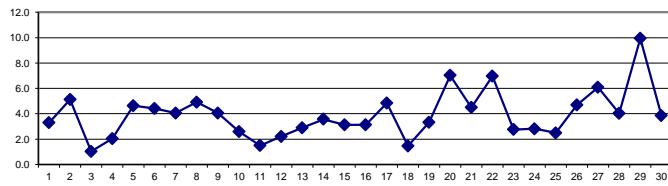
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

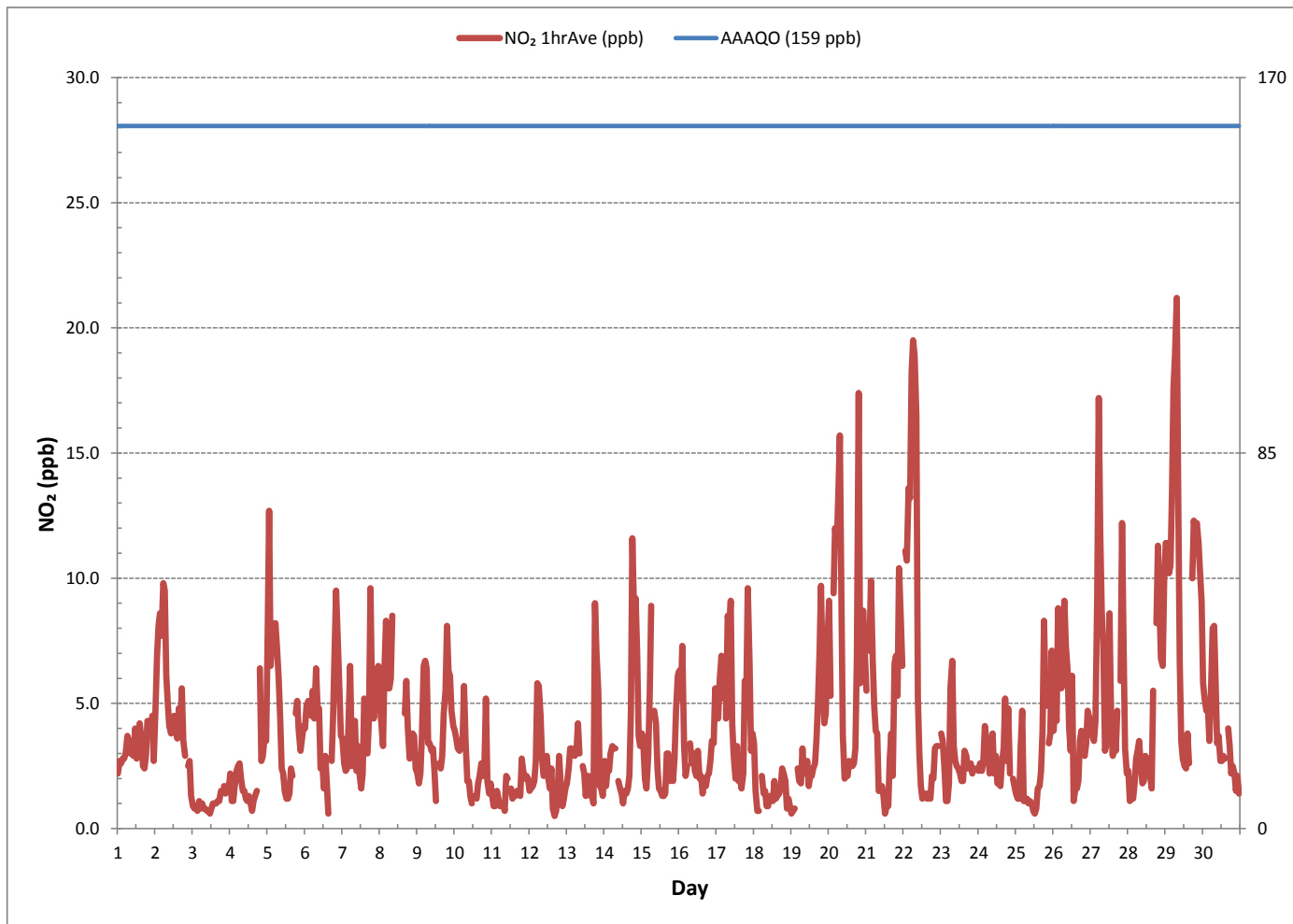
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	683					
MINIMUM 1-HR AVERAGE:	0.5	PPB	@ HOUR(S)	16	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	21.2	PPB	@ HOUR(S)	7	ON DAY(S)	29
MAXIMUM 24-HR AVERAGE:	10.0	PPB			ON DAY(S)	29
					VAR-VARIOUS	
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	3.16		MONTHLY AVERAGE:	3.9	PPB	

24 HOUR AVERAGES FOR September 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR		
		0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	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.	RDGS.	
DAY																														
1		2.3	3.0	2.8	3.3	3.2	3.4	4.1	6.8	3.5	9.9	3.9	5.6	3.3	19.2	5.1	3.9	4.4	2.3	3.3	5.5	5.3	S	5.1	5.4	2.3	19.2	5.0	24	
2		5.3	9.0	8.8	11.7	11.8	10.4	10.9	8.6	5.8	5.4	5.3	6.2	6.1	5.4	4.3	6.2	5.5	7.4	4.5	3.6	S	3.2	3.3	1.5	1.5	11.8	6.5	24	
3		0.9	0.9	0.9	0.8	1.2	0.9	1.0	0.9	0.8	0.6	0.6	0.7	6.7	1.5	0.9	1.2	1.2	1.2	2.0	S	1.9	1.2	1.9	1.7	0.6	6.7	1.4	24	
4		2.6	2.1	1.2	2.2	2.6	3.7	4.1	2.6	1.7	1.6	1.8	1.5	1.9	1.6	0.7	7.5	1.9	2.3	S	7.4	7.1	3.9	5.8	12.1	0.7	12.1	3.5	24	
5		25.1	19.3	11.6	9.5	10.0	10.5	10.2	7.3	6.6	11.3	23.0	9.2	9.3	9.0	2.2	17.2	14.9	S	7.4	6.1	17.0	5.2	5.4	5.1	2.2	25.1	11.0	24	
6		4.5	5.5	6.3	5.8	6.4	6.5	8.8	7.3	5.6	36.4	6.5	12.9	5.8	15.1	16.4	1.3	S	14.9	5.3	10.4	17.7	9.1	12.3	6.6	1.3	36.4	9.9	24	
7		4.1	3.6	4.4	4.2	5.3	9.4	4.7	22.2	10.0	3.3	9.5	13.0	15.1	9.6	9.7	S	12.5	8.0	13.4	9.9	8.5	10.4	16.0	12.5	3.3	22.2	9.5	24	
8		9.8	8.6	4.5	10.2	16.2	11.8	11.7	24.1	C	C	C	C	C	C	C	C	C	6.9	8.2	7.4	6.4	7.2	7.9	6.9	5.4	4.5	24.1	9.6	24
9		5.1	4.4	5.3	6.4	11.0	9.3	9.2	6.2	5.6	5.2	5.8	4.8	3.3	S	4.5	5.3	5.6	8.8	10.5	12.8	11.1	9.9	10.7	6.8	3.3	12.8	7.3	24	
10		6.6	5.7	5.2	5.2	7.1	9.6	10.7	7.6	7.9	9.8	2.8	3.0	S	2.9	3.3	3.7	4.8	5.6	5.9	5.2	9.8	6.2	3.8	3.7	2.8	10.7	5.9	24	
11		4.6	3.2	3.1	3.9	3.7	2.9	2.6	2.8	2.5	5.3	4.3	S	3.4	3.2	3.4	3.2	4.2	3.5	3.7	7.1	4.7	4.8	4.4	4.0	2.5	7.1	3.8	24	
12		3.7	3.4	3.9	4.8	5.1	11.3	8.5	8.9	5.6	4.1	S	6.9	4.8	7.1	18.9	3.0	3.7	3.6	4.5	28.2	4.8	3.3	4.1	4.0	3.0	28.2	6.8	24	
13		4.1	5.1	5.2	8.3	11.0	4.7	18.0	24.1	5.6	S	5.4	9.4	3.6	4.9	8.5	8.8	3.7	3.5	28.2	18.9	20.3	4.1	11.9	3.5	3.5	28.2	9.6	24	
14		50.5	3.7	6.8	4.3	5.4	5.6	5.4	6.9	S	4.1	3.7	11.5	3.3	4.0	3.7	3.6	4.1	9.0	19.4	30.3	15.7	22.3	9.3	12.5	3.3	50.5	10.7	24	
15		7.6	6.0	4.9	3.7	5.8	14.7	26.4	S	9.5	8.9	17.6	5.0	3.7	3.5	3.9	9.6	11.9	24.5	8.7	11.5	4.4	5.3	7.6	8.6	3.5	26.4	9.3	24	
16		10.5	9.8	11.3	6.9	10.8	4.9	S	23.4	4.4	11.3	7.3	4.0	13.7	8.2	14.2	5.3	10.6	8.9	4.7	10.3	7.6	5.6	9.1	4.0	23.4	9.1	24		
17		8.1	20.5	8.5	19.6	9.5	S	11.3	14.1	12.2	12.3	7.4	6.6	4.7	7.1	3.9	4.8	3.7	5.9	17.6	15.5	21.3	17.1	6.2	6.8	3.7	21.3	10.6	24	
18		7.2	3.5	2.5	2.7	S	3.7	3.2	3.2	2.7	2.7	3.5	3.3	2.9	4.1	3.4	3.2	3.2	3.6	5.0	5.1	4.5	2.6	3.3	2.7	2.5	7.2	3.6	24	
19		2.5	2.4	2.9	S	4.3	3.8	4.3	5.6	4.8	4.1	6.3	4.1	4.0	4.2	5.6	5.4	9.3	9.8	14.3	15.9	8.0	7.2	8.6	12.6	2.4	15.9	6.5	24	
20		13.5	8.0	S	12.5	16.8	18.0	15.9	20.5	12.7	6.8	4.4	5.7	4.8	5.8	5.8	5.6	6.4	7.4	13.4	22.5	12.7	12.4	20.0	13.2	4.4	22.5	11.5	24	
21		13.9	S	11.7	12.7	11.3	13.1	8.4	12.9	3.8	3.7	3.8	17.2	2.9	3.1	3.9	17.1	19.0	17.7	24.3	28.4	10.5	15.9	15.5	12.4	2.9	28.4	12.3	24	
22		S	20.8	15.5	16.9	17.6	23.5	23.5	25.1	21.0	13.5	12.9	15.0	14.5	7.9	4.1	8.8	5.6	3.9	16.1	12.6	28.9	14.2	5.6	S	3.9	28.9	14.9	24	
23		5.4	5.7	4.9	3.1	2.8	5.2	13.0	16.8	6.1	8.5	10.6	8.2	19.0	12.7	11.2	13.3	9.5	12.5	6.5	13.7	4.5	5.8	S	4.4	2.8	19.0	8.8	24	
24		4.1	7.4	4.7	4.8	8.2	6.3	5.3	5.2	6.0	10.9	5.2	6.4	4.5	4.1	4.9	5.8	7.2	13.9	6.2	17.8	5.2	S	3.9	3.4	3.4	17.8	6.6	24	
25		3.2	3.3	3.3	12.7	12.5	3.3	3.0	3.1	3.3	3.1	4.4	2.9	3.0	3.3	4.3	5.0	5.2	8.4	14.9	10.9	S	7.8	6.3	16.5	2.9	16.5	6.2	24	
26		9.5	10.5	10.5	12.6	23.7	9.2	12.1	17.2	16.1	16.9	13.1	11.6	27.2	5.5	12.3	21.6	4.8	13.1	13.6	S	5.9	5.6	6.9	6.7	4.8	27.2	12.4	24	
27		6.3	6.1	6.0	7.9	35.0	36.6	20.1	19.4	10.5	7.7	7.6	10.6	14.5	8.9	5.5	9.1	6.7	11.9	S	11.0	34.3	13.2	5.7	4.6	4.6	36.6	13.0	24	
28		5.9	3.3	3.6	4.6	14.1	5.8	5.2	22.7	7.0	4.7	16.7	21.9	11.1	16.0	13.5	4.1	13.3	S	13.5	14.6	12.1	9.8	10.2	14.4	3.3	22.7	10.8	24	
29		14.5	14.5	13.3	13.3	17.3	20.5	22.9	26.3	19.6	11.5	12.9	8.4	6.4	6.1	15.9	5.8	S	15.1	19.7	14.5	16.5	16.6	13.6	12.7	5.8	26.3	14.7	24	
30		9.2	7.8	8.2	8.8	6.4	10.4	11.8	11.3	10.1	5.9	6.4	6.1	12.1	5.5	5.7	S	6.1	5.6	4.3	5.0	4.5	4.1	4.4	3.5	3.5	12.1	7.1	24	
HOURLY MAX		50.5	20.8	15.5	19.6	35.0	36.6	26.4	26.3	21.0	36.4	23.0	21.9	27.2	19.2	18.9	21.6	19.0	24.5	28.2	30.3	34.3	22.3	20.0	16.5					
HOURLY AVG		8.6	7.1	6.3	7.7	10.2	9.6	10.2	12.5	7.5	8.2	7.6	7.9	7.7	6.8	6.9	7.0	7.0	8.6	10.7	12.9	11.1	8.4	7.7	7.5					

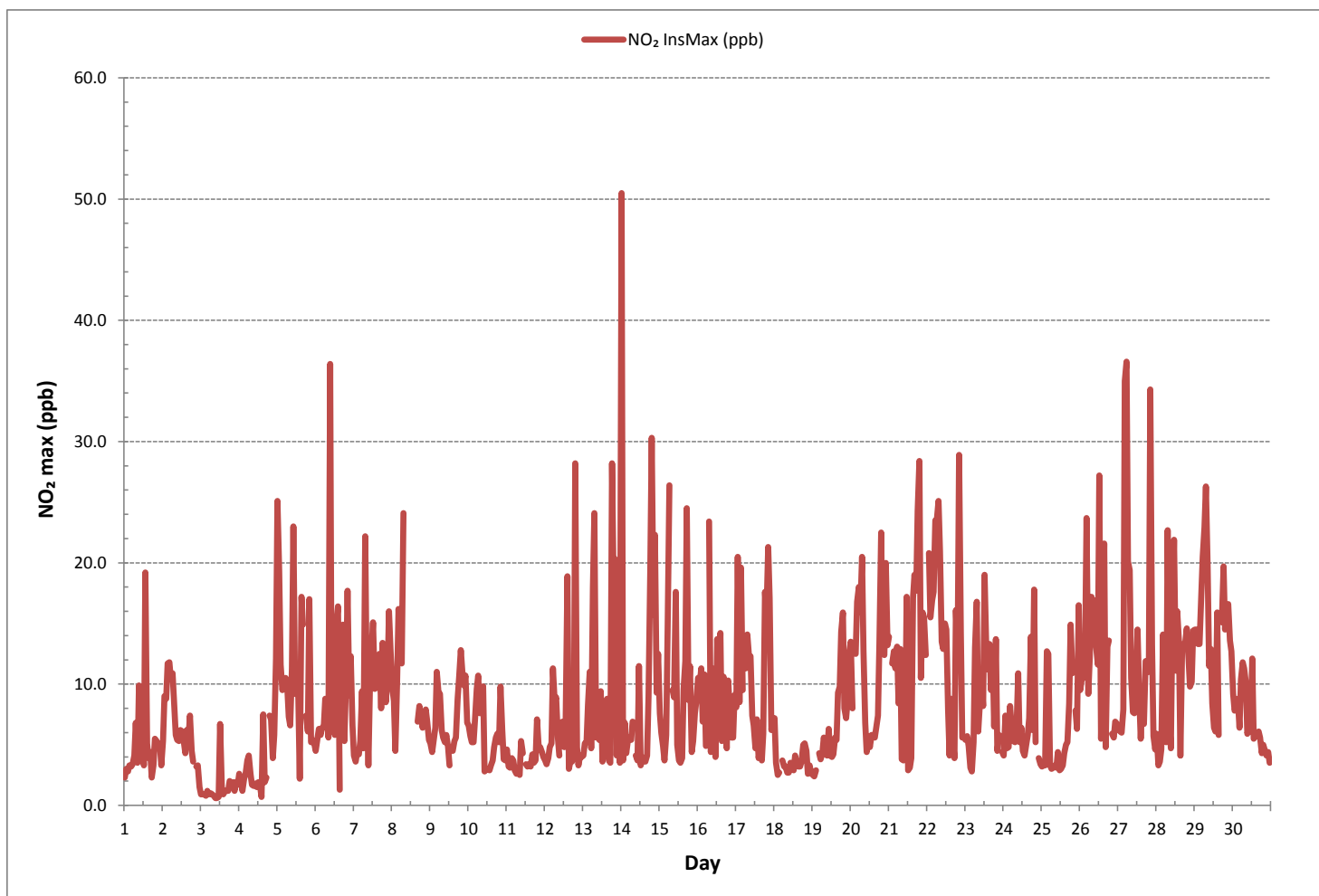
STATUS FLAG CODES

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

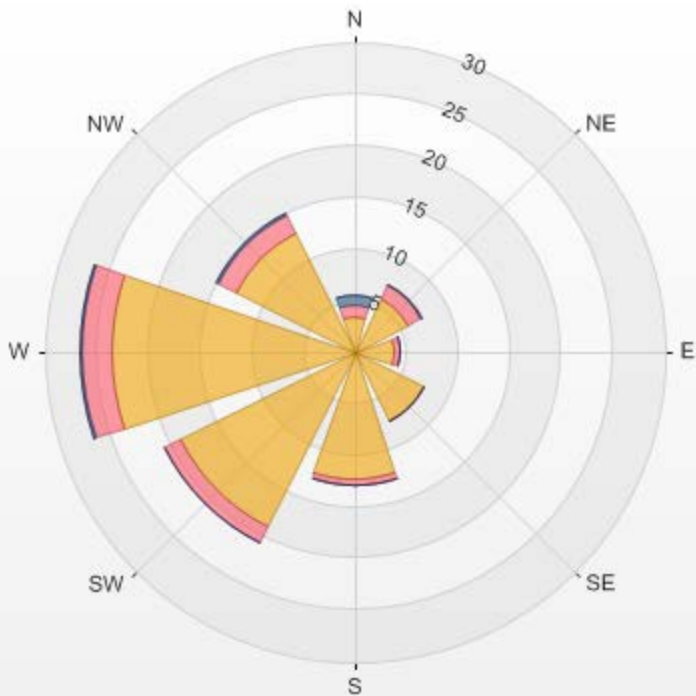
NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	50.5 PPB @ HOUR(S) 0 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	6.22
OPERATIONAL TIME:	720 HRS

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



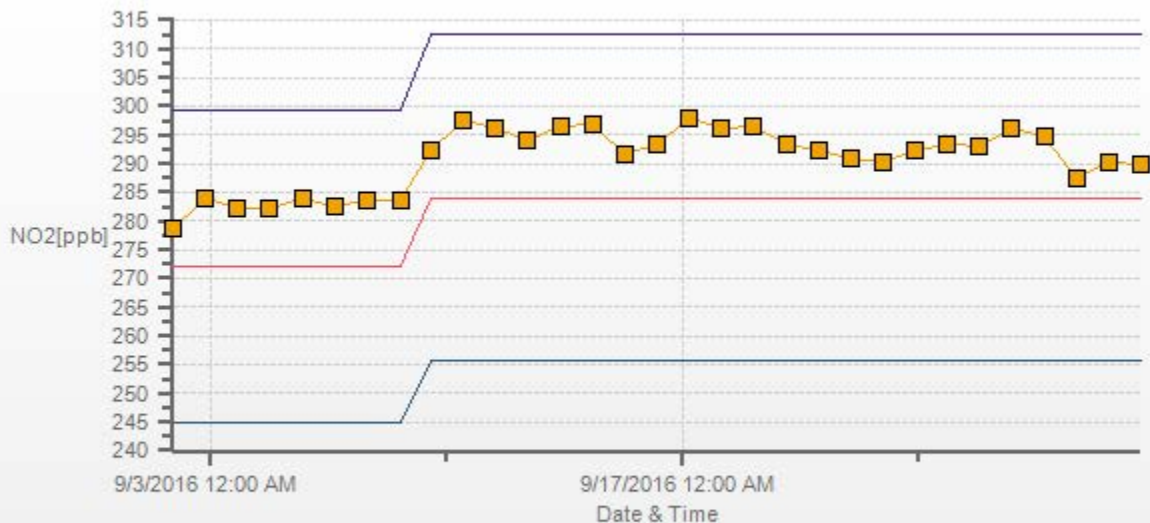
Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.72% Calm Avg: 0.00

Direction	0.0-7.3	7.3-14.7	14.7-22.0	>22.0	Total
N	3.37	1.17	0.88	0	5.42
NE	5.72	1.47	0.15	0	7.34
E	3.81	0.73	0	0	4.54
SE	7.48	0	0	0	7.48
S	12.46	0.44	0	0	12.9
SW	18.91	1.76	0	0	20.67
W	23.61	2.79	0.29	0	26.69
NW	12.9	1.91	0.15	0	14.96
Summary	88.26	10.27	1.47	0	100



% Icon	Classes (ppb)	88	10	1	0
	0.0-7.3				
	7.3-14.7				
	14.7-22.0				
	>22.0				

NO2[ppb] Calibration: LICA Bonnyville Monthly: 09/2016 Type: Span



Span Meas Span Ref Span Low Span High

OZONE



OZONE Hourly Averages (O₃ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY 1		22.2	18.4	15.6	14.7	11.4	11.3	10.0	10.1	16.1	18.1	17.6	19.0	23.5	31.0	45.4	42.7	37.3	31.8	26.1	21.5	19.2	S	19.6	18.9	10.0	45.4	21.8	24
2		18.4	14.2	11.0	7.4	7.3	3.4	4.1	8.1	12.1	12.4	13.5	14.2	16.4	17.2	17.8	17.4	18.2	15.6	14.3	13.1	S	11.4	18.2	6.3	3.4	18.4	12.7	24
3		10.0	18.9	17.6	18.7	17.2	13.9	11.4	11.1	10.3	10.0	9.4	9.6	15.0	17.3	14.6	9.8	9.0	10.6	11.7	S	12.0	11.5	11.5	13.4	9.0	18.9	12.8	24
4		11.6	15.6	14.5	12.9	10.9	12.4	13.1	13.6	14.6	16.9	19.8	22.2	23.7	24.7	25.3	25.2	24.7	23.5	S	15.8	18.2	14.9	12.3	12.4	10.9	25.3	17.3	24
5		7.7	1.6	6.6	3.5	3.8	5.1	3.6	5.9	9.9	18.5	22.2	22.3	23.8	25.5	25.5	25.6	25.1	S	21.1	17.7	18.7	18.6	17.0	15.4	1.6	25.6	15.0	24
6		11.9	8.6	10.1	6.6	6.3	5.6	8.2	8.0	8.0	8.2	12.1	12.5	14.6	17.9	23.7	25.4	S	22.1	16.8	8.8	3.1	3.7	3.5	6.1	3.1	25.4	10.9	24
7		6.7	7.9	9.7	9.8	5.7	5.0	8.2	7.0	10.3	14.6	15.4	23.8	28.1	26.5	21.8	S	26.4	24.5	16.0	18.4	17.9	14.0	9.4	8.3	5.0	28.1	14.6	24
8		7.0	8.8	8.8	5.2	1.5	5.0	3.9	4.5	6.6	15.9	20.1	23.3	25.2	23.9	S	26.2	24.3	21.9	21.3	20.2	18.4	16.9	15.3	16.4	1.5	26.2	14.8	24
9		15.5	13.9	12.4	9.7	7.2	5.4	5.1	7.7	C	C	C	C	20.3	20.9	20.9	21.6	21.7	20.1	18.3	13.5	13.3	13.0	13.2	15.0	5.1	21.7	14.4	24
10		17.7	17.5	19.3	18.4	16.6	14.8	10.7	11.9	13.6	16.7	21.6	26.8	S	32.0	33.0	33.0	33.0	31.7	29.8	27.2	22.6	24.3	22.1	18.3	10.7	33.0	22.3	24
11		17.9	17.4	15.7	13.8	13.9	13.7	13.6	13.8	16.8	16.0	15.3	S	17.3	20.5	20.4	21.4	21.2	20.3	21.2	17.9	18.1	19.3	17.6	13.8	13.6	21.4	17.3	24
12		12.3	13.2	14.4	13.3	12.3	9.2	8.9	14.5	16.2	16.0	S	25.6	27.8	29.0	29.4	29.5	28.8	28.0	25.3	21.6	22.0	22.8	21.8	20.8	8.9	29.5	20.1	24
13		20.1	18.8	18.0	16.7	15.5	14.5	14.1	12.0	12.9	S	16.1	21.4	28.1	25.5	28.1	31.2	31.5	31.9	22.4	21.6	25.5	28.6	28.5	30.1	12.0	31.9	22.3	24
14		29.5	28.1	25.0	22.5	18.5	14.8	13.0	11.5	S	16.0	18.1	19.6	20.4	20.8	22.3	24.2	24.2	21.0	12.0	9.2	6.8	8.4	12.2	11.9	6.8	29.5	17.8	24
15		12.4	12.6	12.7	12.8	10.4	7.0	4.7	S	11.7	16.7	26.5	29.3	31.7	32.1	28.8	30.4	29.8	27.4	25.2	24.5	24.3	23.4	20.8	18.7	4.7	32.1	20.6	24
16		18.6	19.4	17.6	20.1	20.1	18.5	S	19.4	21.2	22.3	26.2	31.2	34.1	39.6	39.5	39.3	38.9	37.0	32.5	31.5	31.0	28.6	26.8	22.6	17.6	39.6	27.7	24
17		24.3	24.5	16.9	15.9	18.9	S	19.3	11.2	9.5	10.5	19.9	24.3	25.9	27.4	27.8	27.2	27.9	27.9	20.2	17.5	12.6	16.1	17.8	15.9	9.5	27.9	20.0	24
18		15.1	19.5	25.2	29.0	S	24.4	25.2	24.2	23.9	21.9	20.7	20.2	20.4	22.5	23.7	25.1	26.6	29.0	27.9	26.5	25.6	26.3	25.1	24.0	15.1	29.0	24.0	24
19		25.5	26.1	24.5	S	19.3	17.7	15.8	13.7	16.7	18.8	19.7	23.4	22.5	23.0	22.1	24.5	23.3	21.6	17.5	14.1	17.3	17.7	15.7	10.9	10.9	26.1	19.6	24
20		8.1	9.9	S	7.3	4.5	3.3	1.4	3.6	7.9	14.7	20.9	22.9	23.3	22.9	21.2	17.7	19.2	19.2	14.7	3.9	9.5	7.7	6.1	7.3	1.4	23.3	12.1	24
21		8.2	S	5.7	0.8	5.4	7.7	7.2	9.0	13.5	18.8	23.2	26.9	29.5	29.9	31.2	29.9	30.7	29.2	20.4	19.3	18.2	13.5	16.8	17.6	0.8	31.2	18.0	24
22		S	13.4	11.2	3.9	1.9	1.5	1.1	2.4	5.9	17.0	23.3	30.5	34.3	35.1	36.9	37.4	36.5	36.2	34.2	32.0	29.7	27.9	24.1	S	1.1	37.4	21.7	24
23		21.3	20.3	23.7	26.8	25.9	24.6	20.4	19.8	23.7	24.2	23.7	24.5	26.4	23.4	20.2	17.5	17.0	17.1	15.9	15.2	14.6	12.9	S	10.6	10.6	26.8	20.4	24
24		10.4	9.0	7.7	7.4	10.6	11.1	9.9	10.5	14.9	18.7	21.9	25.3	29.7	30.9	31.5	31.1	30.9	28.1	28.4	24.7	26.1	S	25.8	26.7	7.4	31.5	20.5	24
25		26.5	26.0	25.7	23.3	22.3	23.7	22.5	23.0	23.7	25.0	27.0	29.4	30.4	30.8	31.2	31.8	32.0	29.1	22.1	16.5	S	21.0	20.4	17.0	16.5	32.0	25.2	24
26		20.5	19.8	19.8	12.8	11.1	17.2	16.9	16.9	18.8	21.4	26.1	30.2	30.5	35.7	36.3	36.6	36.0	32.6	29.8	S	31.1	28.5	25.2	23.9	11.1	36.6	25.1	24
27		23.0	22.7	22.2	20.6	14.5	5.7	9.7	11.0	14.6	29.6	34.2	35.6	29.9	32.7	32.3	31.0	31.9	29.9	S	27.6	19.9	22.6	24.8	24.1	5.7	35.6	23.9	24
28		22.4	22.0	21.7	21.7	20.2	18.5	17.2	17.4	19.0	22.0	24.6	25.5	25.1	26.4	28.1	28.9	24.2	S	19.6	16.4	17.0	19.0	18.6	12.3	12.3	28.9	21.2	24
29		10.3	8.1	9.9	9.9	6.0	2.3	2.9	3.3	9.0	16.9	25.1	30.7	34.7	35.1	33.8	34.4	S	25.9	21.9	22.1	21.0	20.2	20.3	20.0	2.3	35.1	18.4	24
30		22.2	21.5	21.9	20.1	20.0	16.4	10.7	11.0	13.2	14.8	16.4	20.3	21.6	22.4	25.2	S	29.2	29.5	29.9	30.2	29.8	29.7	29.2	27.8	10.7	30.2	22.3	24
HOURLY MAX		29.5	28.1	25.7	29.0	25.9	24.6	25.2	24.2	23.9	29.6	34.2	35.6	34.7	39.6	45.4	42.7	38.9	37.0	34.2	32.0	31.1	29.7	29.2	30.1				
HOURLY AVG		16.5	16.5	16.0	14.0	12.4	11.5	10.8	11.6	14.1	17.6	20.7	23.9	25.3	26.8	27.5	27.7	27.1	25.8	22.0	19.6	19.4	18.7	18.6	16.8				

STATUS FLAG CODES

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

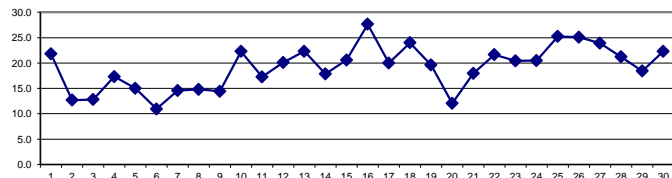
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

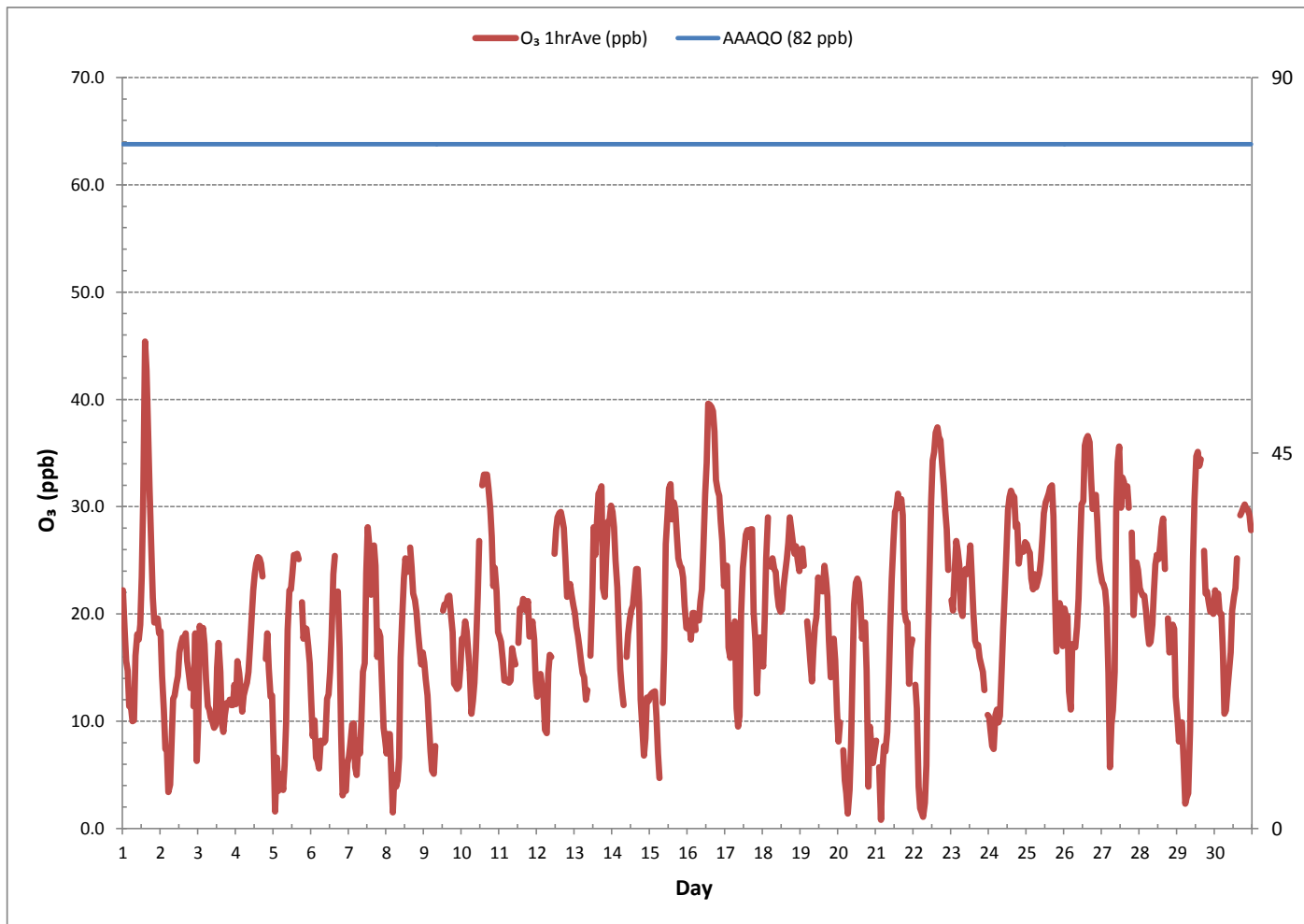
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	686					
MINIMUM 1-HR AVERAGE:	0.8	PPB	@ HOUR(S)	3	ON DAY(S)	21
MAXIMUM 1-HR AVERAGE:	45.4	PPB	@ HOUR(S)	14	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	27.7	PPB			ON DAY(S)	16
					VAR-VARIOUS	
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	4	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	8.26		MONTHLY AVERAGE:	19.2	PPB	

24 HOUR AVERAGES FOR September 2016



OZONE Hourly Averages (O₃ ppb)





OZONE Instantaneous Maximum (O₃ ppb)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR AVG.	RDGS.
DAY																													
1		22.8	21.7	17.2	16.0	13.3	12.0	11.2	11.7	17.5	19.4	19.9	22.5	29.4	33.9	53.0	48.4	39.0	35.3	29.0	24.2	20.8	S	20.5	20.4	11.2	53.0	24.3	24
2		19.5	17.0	11.7	11.7	10.4	5.6	5.7	11.2	13.2	14.7	15.2	15.7	18.3	19.4	20.7	20.2	19.8	19.0	16.3	14.4	S	12.9	34.7	7.3	5.6	34.7	15.4	24
3		13.8	21.7	19.1	19.4	18.6	15.7	12.6	11.7	10.9	10.7	10.0	13.2	17.8	18.6	17.1	11.3	10.0	13.3	13.5	S	12.6	12.3	12.6	14.3	10.0	21.7	14.4	24
4		13.5	18.1	16.8	16.4	13.0	13.5	14.9	14.9	16.8	18.0	21.7	24.5	25.1	25.8	26.4	26.4	26.3	25.2	S	19.8	21.6	18.0	15.3	15.9	13.0	26.4	19.5	24
5		14.5	11.7	10.8	5.2	6.4	8.1	7.5	7.6	16.5	22.9	23.8	24.0	25.5	26.9	27.2	27.5	26.7	S	24.9	20.5	20.2	20.2	18.2	18.6	5.2	27.5	18.1	24
6		17.1	10.8	12.4	8.2	9.0	8.1	9.9	9.7	10.0	11.8	13.8	15.2	16.0	22.2	26.1	26.4	S	25.2	22.5	13.5	5.1	6.8	5.6	8.4	5.1	26.4	13.6	24
7		7.6	9.7	12.1	13.3	7.8	8.9	10.0	8.6	13.5	17.5	22.2	26.4	29.8	28.5	27.3	S	28.7	27.0	20.8	22.8	23.4	17.4	14.0	12.3	7.6	29.8	17.8	24
8		11.8	10.9	10.6	9.1	6.7	9.1	7.0	6.9	10.9	25.8	P	P	26.7	26.6	S	28.5	28.4	24.5	23.8	23.4	21.3	18.3	17.1	17.9	6.7	28.5	17.4	22
9		16.5	14.9	13.7	11.2	9.3	8.5	7.0	8.7	C	C	C	C	C	21.9	22.1	22.8	23.3	22.8	22.2	16.5	15.3	14.3	14.2	16.5	7.0	23.3	15.9	24
10		18.5	19.1	20.7	19.8	19.2	16.5	12.9	15.0	15.6	20.7	24.9	29.7	S	32.9	34.1	34.7	34.7	33.7	31.9	29.9	24.3	26.9	24.0	20.8	12.9	34.7	24.4	24
11		19.2	18.6	16.8	14.5	14.9	14.3	14.4	16.0	18.0	17.8	16.7	S	20.7	23.2	21.9	22.5	22.6	21.6	22.5	20.8	19.7	21.4	20.5	14.9	14.3	23.2	18.8	24
12		13.2	15.4	15.9	15.6	13.3	12.1	12.0	19.5	19.1	18.8	S	28.2	29.7	30.6	30.9	30.6	30.2	29.3	28.5	26.6	23.4	23.8	23.4	21.4	12.0	30.9	22.2	24
13		21.5	20.5	18.8	19.1	16.8	15.3	15.2	14.4	13.8	S	18.2	25.6	29.8	29.2	31.5	32.5	33.1	33.7	30.7	28.1	29.5	29.5	29.9	30.9	13.8	33.7	24.7	24
14		30.9	30.4	27.3	25.6	20.7	16.0	14.3	12.3	S	17.0	19.7	20.5	21.4	21.6	24.1	25.7	25.4	23.8	17.1	13.5	10.8	13.5	13.5	13.5	10.8	30.9	19.9	24
15		13.3	14.7	14.0	14.1	12.7	10.1	9.4	S	15.4	21.0	29.1	31.7	33.8	34.0	31.3	32.3	32.6	30.3	27.5	26.6	25.6	25.1	22.9	21.0	9.4	34.0	23.0	24
16		21.3	21.0	21.0	21.6	21.3	19.2	S	21.0	22.5	24.1	29.8	33.5	37.2	42.6	42.3	40.5	41.0	39.9	34.7	33.1	33.1	30.3	28.0	26.9	19.2	42.6	29.8	24
17		26.6	26.7	20.5	20.7	22.6	S	21.1	17.4	11.8	13.9	24.0	26.3	30.7	30.2	29.1	29.4	29.0	30.0	25.3	21.5	20.1	22.8	19.8	18.9	11.8	30.7	23.4	24
18		16.2	22.5	28.4	30.7	S	25.8	26.6	25.0	24.8	22.9	21.6	20.8	23.3	23.5	24.6	26.3	28.4	30.7	29.5	28.2	27.7	26.9	26.3	25.0	16.2	30.7	25.5	24
19		26.6	27.0	25.7	S	20.5	19.1	17.3	15.6	19.4	20.4	22.3	24.8	24.3	24.3	24.6	26.6	26.6	24.9	21.6	18.3	18.6	19.2	18.0	13.0	13.0	27.0	21.7	24
20		11.8	11.8	S	9.7	7.5	6.5	2.0	6.5	11.8	19.9	25.1	25.3	25.1	24.8	23.5	20.1	21.8	21.6	19.1	9.6	13.3	11.5	11.5	10.3	2.0	25.3	15.2	24
21		11.5	S	10.1	5.3	11.1	10.4	8.9	12.1	16.7	21.9	26.4	28.8	31.3	31.3	32.4	32.5	33.5	32.1	27.3	23.5	22.3	17.3	21.4	23.7	5.3	33.5	21.4	24
22		S	19.5	18.8	9.3	4.5	2.9	2.3	3.9	10.1	21.1	28.0	34.4	35.7	36.3	38.8	38.7	37.6	37.5	36.2	33.7	31.3	30.0	26.7	S	2.3	38.8	24.4	24
23		22.8	22.2	26.1	28.1	27.4	25.8	24.4	24.0	26.1	25.8	25.1	28.5	28.7	25.4	22.1	19.4	18.8	18.2	17.0	16.0	15.7	14.2	S	11.2	11.2	28.7	22.3	24
24		10.9	10.5	9.3	9.0	13.5	12.4	11.2	11.5	19.1	21.1	23.8	29.3	31.8	32.3	32.9	33.4	32.9	32.3	30.7	26.4	27.2	S	26.9	27.5	9.0	33.4	22.4	24
25		27.7	26.6	26.4	26.1	25.4	25.4	23.4	24.1	25.1	26.6	29.4	30.7	31.3	32.0	32.8	33.5	33.4	32.6	29.4	18.6	S	22.6	22.9	21.4	18.6	33.5	27.3	24
26		22.2	22.3	22.3	19.4	16.0	21.8	18.9	20.5	20.5	24.8	29.2	31.8	34.6	37.4	38.8	38.6	37.2	36.3	31.8	S	32.3	30.4	27.0	25.4	16.0	38.8	27.8	24
27		24.1	23.4	23.3	21.8	18.9	15.4	17.0	14.7	21.1	36.3	38.3	38.6	35.7	35.1	34.7	32.8	34.0	32.9	S	30.6	24.3	24.7	25.7	25.7	14.7	38.6	27.4	24
28		24.3	24.3	23.1	22.8	22.1	19.7	18.2	18.8	20.5	23.8	27.7	27.3	27.0	28.4	30.9	30.9	27.5	S	22.3	19.2	18.5	21.4	20.8	17.9	17.9	30.9	23.4	24
29		14.7	10.9	11.7	12.0	8.5	4.0	6.2	5.2	14.8	22.3	31.3	34.0	38.7	38.7	36.8	36.1	S	30.0	26.6	24.5	23.8	22.8	22.1	24.6	4.0	38.7	21.8	24
30		25.0	22.8	24.1	22.5	22.8	19.5	12.6	13.5	15.3	16.2	18.9	22.3	23.1	24.0	27.3	S	30.9	30.7	31.0	31.5	30.9	30.9	30.6	29.7	12.6	31.5	24.2	24
HOURLY MAX		30.9	30.4	28.4	30.7	27.4	25.8	26.6	25.0	26.1	36.3	38.3	38.6	38.7	42.6	53.0	48.4	41.0	39.9	36.2	33.7	33.1	30.9	34.7	30.9				
HOURLY AVG		18.6	18.9	18.2	16.5	15.0	13.9	12.9	13.9	16.8	20.6	23.6	26.4	27.9	28.7	29.8	29.6	29.1	28.4	25.5	22.7	21.9	20.9	21.2	19.1				

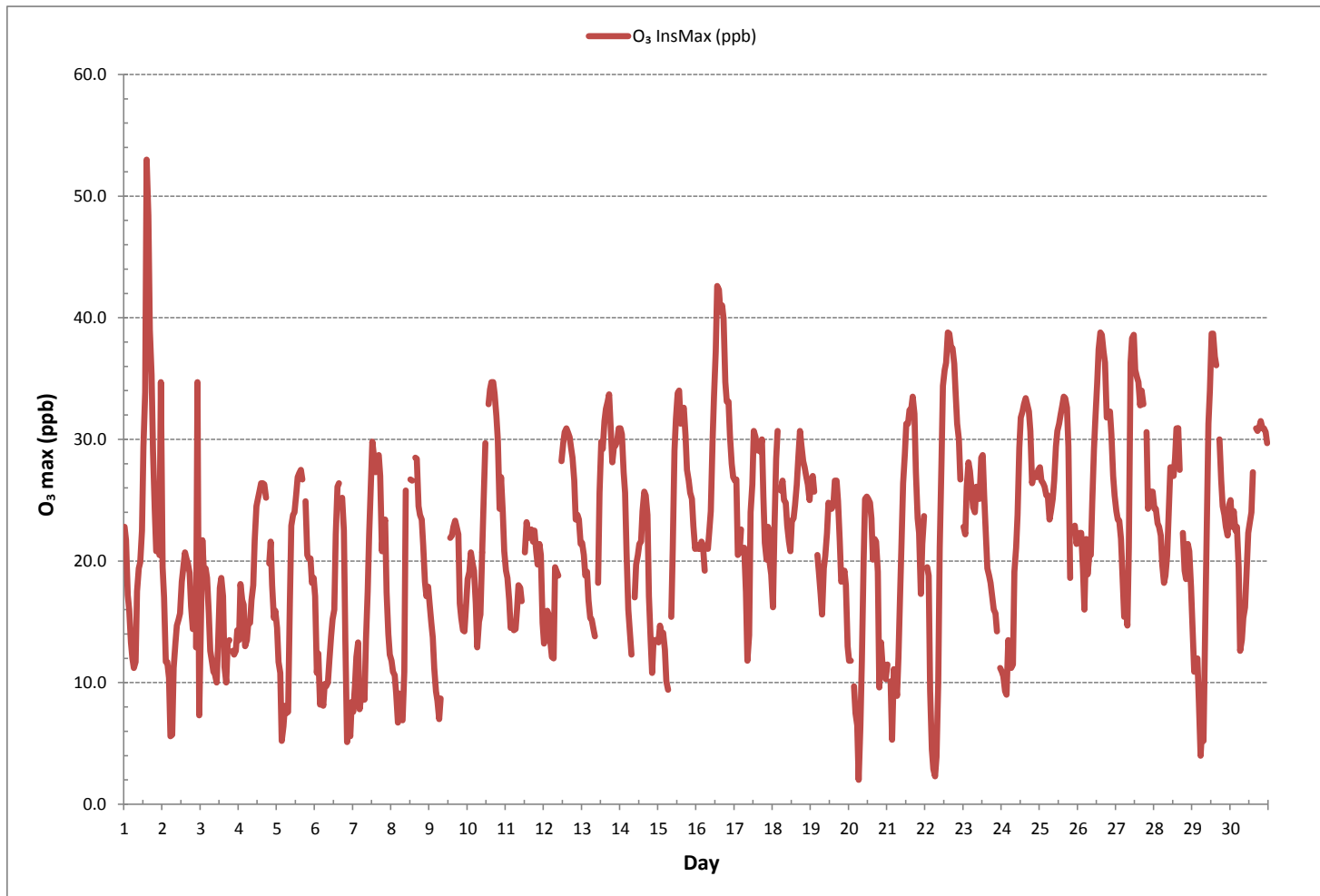
STATUS FLAG CODES

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

MONTHLY SUMMARY

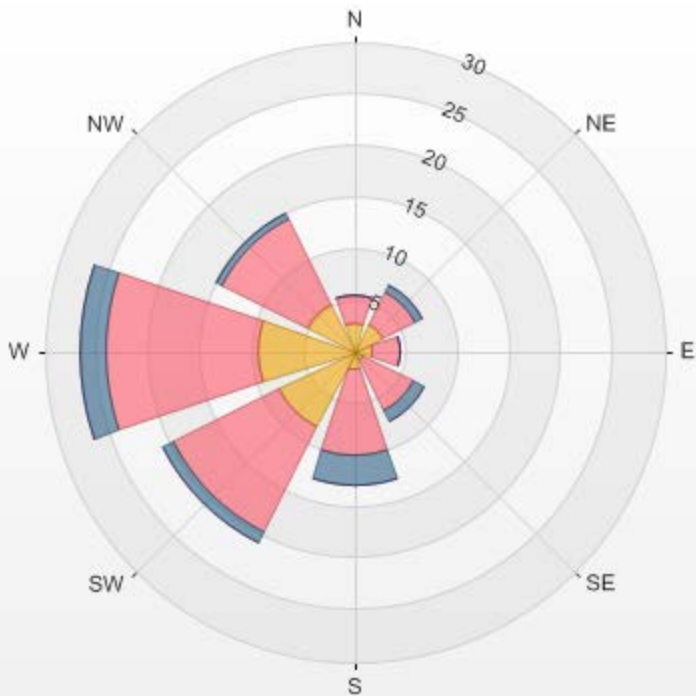
NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	53.0 PPB @ HOUR(S) 14 ON DAY(S) 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	8.18
OPERATIONAL TIME:	718 HRS

OZONE Instantaneous Maximum (O₃ ppb)



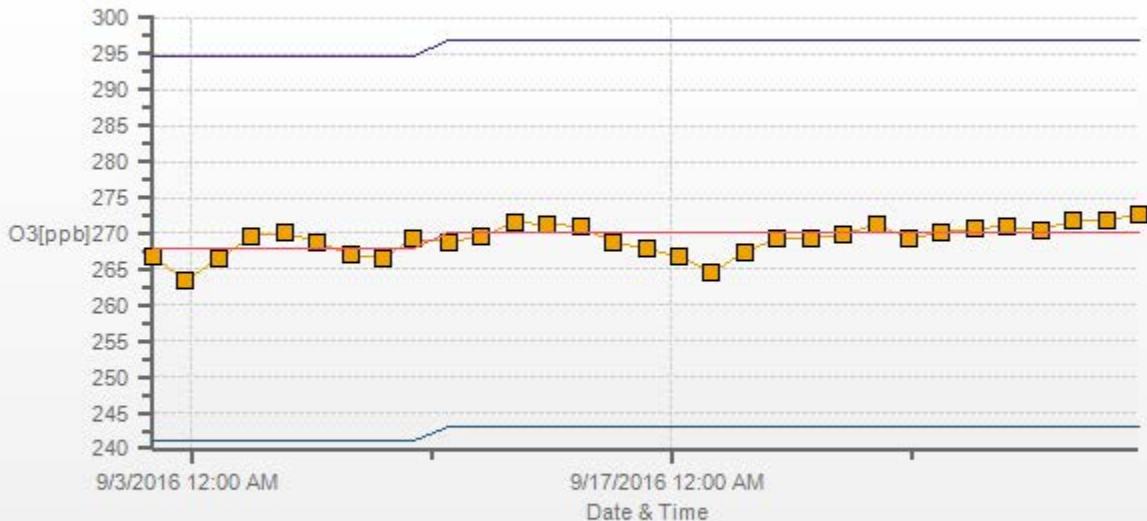
Wind: LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00

Direction	0.0-15.3	15.3-30.7	30.7-46.0	>46.0	Total
N	2.78	2.64	0	0	5.42
NE	3.07	3.51	0.73	0	7.31
E	1.76	2.78	0	0	4.54
SE	0.88	5.56	1.02	0	7.46
S	1.76	8.35	2.78	0	12.89
SW	8.2	11.42	1.17	0	20.79
W	9.37	14.64	2.64	0	26.65
NW	5.12	9.37	0.44	0	14.93
Summary	32.94	58.27	8.78	0	100



% Icon Classes (ppb)	33	58	9	0
0.0-15.3	33	58	9	0
15.3-30.7	33	58	9	0
30.7-46.0	33	58	9	0
>46.0	33	58	9	0

O3[ppb] Calibration: LICA Bonnyville Monthly: 09/2016 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)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR					
DAY	MIN.	MAX.	AVG.	RDGS.																													
1	2.7	7.2	6.7	5.1	1.7	6.7	5.2	5.1	14.7	15.2	12.2	6.2	7.2	13.7	19.7	21.7	9.7	4.7	3.2	6.2	2.7	2.7	3.2	0.7	0.7	21.7	7.7	24					
2	5.1	5.1	1.6	1.1	0.2	0.0	0.7	3.7	4.1	0.2	0.0	X	4.1	5.7	5.6	7.2	0.7	2.7	2.2	4.7	3.2	3.2	1.1	1.7	0.0	7.2	2.8	23					
3	0.0	3.2	0.0	0.0	2.7	5.6	1.2	1.2	4.1	2.7	2.7	9.2	3.2	0.2	0.0	3.7	0.0	3.7	0.0	3.2	2.2	1.6	5.7	0.0	0.0	9.2	2.3	24					
4	0.0	0.0	0.0	1.6	1.1	0.7	0.7	0.2	0.7	1.6	1.7	2.7	0.2	1.1	0.7	0.1	0.0	0.0	0.7	1.6	2.7	2.2	2.7	3.7	0.0	3.7	1.1	24					
5	1.1	0.2	6.2	6.2	1.7	1.7	0.0	0.0	1.1	0.0	3.7	1.2	2.7	6.2	3.2	3.7	3.2	5.1	5.6	6.6	5.1	2.2	3.7	2.7	0.0	6.6	3.0	24					
6	3.7	6.2	1.1	2.2	1.2	6.2	4.7	5.1	4.2	2.7	6.2	8.2	2.7	4.7	2.7	5.1	6.6	4.1	6.2	6.2	3.2	10.6	0.0	0.0	0.0	10.6	4.3	24					
7	5.1	1.6	3.2	1.6	3.2	0.0	4.1	2.7	3.7	10.1	5.6	8.2	4.1	3.7	3.2	0.2	2.7	6.7	3.7	9.2	4.2	3.7	0.7	2.7	0.0	10.1	3.9	24					
8	2.7	1.2	3.2	5.1	2.2	1.6	5.1	4.7	6.2	5.7	5.1	1.7	0.0	0.0	0.7	4.2	4.7	1.7	6.7	2.2	1.2	1.7	0.7	3.2	0.0	6.7	3.0	24					
9	1.2	2.7	4.1	1.2	0.0	1.1	3.2	1.1	3.2	1.1	4.7	C	C	3.2	0.2	3.2	4.7	0.2	8.7	5.2	8.7	9.6	8.2	1.1	0.0	9.6	3.5	24					
10	0.0	0.7	0.7	4.1	3.7	0.0	3.2	7.2	7.7	2.7	9.2	6.7	0.7	2.2	3.2	4.7	1.6	X	1.6	5.1	5.6	0.1	5.1	0.0	0.0	9.2	3.3	23					
11	0.0	0.7	0.2	0.0	6.2	2.2	0.7	0.0	1.6	X	0.0	3.2	0.0	2.7	4.7	1.1	0.0	2.7	4.7	0.7	2.2	4.7	3.2	1.6	0.0	6.2	1.9	23					
12	1.1	3.2	1.1	1.7	2.2	4.1	3.7	0.2	4.7	1.2	0.0	3.7	0.0	0.7	4.7	1.6	1.2	0.0	0.1	2.2	5.1	5.2	4.7	1.7	0.0	5.2	2.3	24					
13	2.2	6.2	3.7	1.2	2.2	0.0	2.7	4.6	0.2	2.5	5.7	1.5	5.1	1.6	6.6	6.6	0.6	3.7	9.1	7.5	5.0	1.3	0.6	4.2	0.0	9.1	3.5	24					
14	7.7	5.0	7.6	6.3	6.6	5.3	8.6	6.7	7.3	0.5	X	0.0	6.0	4.0	8.8	3.8	4.2	8.7	13.5	10.7	8.8	5.3	5.6	2.3	0.0	13.5	6.2	23					
15	0.0	0.6	0.9	2.4	4.7	1.7	5.5	14.0	3.3	7.7	2.0	5.8	6.7	5.8	3.5	1.2	5.7	4.4	2.9	3.4	8.6	6.4	3.0	6.9	0.0	14.0	4.5	24					
16	6.3	8.0	6.8	6.2	3.3	6.2	2.0	6.3	4.3	0.2	6.0	4.3	6.6	12.0	5.7	7.7	7.9	6.9	5.9	9.0	7.9	9.1	4.3	2.5	0.2	12.0	6.1	24					
17	9.9	2.6	8.5	6.9	1.6	12.1	10.1	8.2	6.2	5.9	7.7	2.4	0.0	0.3	X	0.2	0.0	2.4	1.1	5.7	5.1	3.9	0.0	3.0	0.0	12.1	4.5	23					
18	2.4	3.6	5.4	0.9	4.3	2.9	2.5	0.0	3.5	0.9	0.5	0.7	0.0	2.2	3.2	4.5	3.2	6.7	4.3	2.2	6.0	0.0	0.2	6.7	0.0	6.7	2.8	24					
19	3.7	3.7	0.2	2.4	4.0	3.5	1.6	0.6	0.0	1.9	0.0	0.0	2.7	X	0.0	3.3	8.2	2.1	4.0	7.3	2.4	2.2	1.6	4.8	0.0	8.2	2.6	23					
20	4.4	4.8	0.5	2.2	2.7	0.6	2.4	5.3	0.9	7.8	4.6	3.0	0.9	3.4	5.8	0.7	2.6	0.0	4.3	4.6	4.1	3.1	3.2	0.0	7.8	3.1	24						
21	0.1	0.0	1.1	3.2	0.7	2.8	0.0	2.2	1.3	0.2	6.6	1.2	5.1	4.1	2.7	3.2	5.0	8.2	10.3	10.6	6.7	7.2	7.1	5.7	0.0	10.6	4.0	24					
22	3.6	3.2	1.7	6.2	8.6	10.1	7.7	10.1	10.1	7.2	C	C	0.0	11.2	0.0	X	1.1	1.6	12.7	15.7	5.1	23.1	8.2	2.7	0.0	23.1	7.1	23					
23	10.6	12.7	X	7.7	8.2	6.7	3.7	0.0	5.6	8.2	15.7	0.0	22.1	12.1	X	28.2	X	0.0	0.0	11.2	X	4.1	6.7	1.7	0.0	28.2	8.3	20					
24	8.7	3.7	X	X	30.1	0.0	19.2	7.7	4.7	12.7	2.2	7.2	11.7	4.7	0.0	2.7	4.1	5.1	1.1	4.1	0.0	18.6	7.7	10.1	0.0	30.1	7.6	22					
25	X	4.7	11.7	15.2	7.7	0.2	0.7	10.6	6.7	0.7	X	X	X	4.1	0.0	X	4.7	4.7	14.7	29.1	11.7	0.7	X	X	0.0	29.1	7.5	17					
26	18.2	14.7	12.1	0.0	0.0	17.1	25.1	15.7	0.0	0.0	0.1	3.2	5.1	1.6	5.1	1.6	5.6	6.6	2.2	11.7	4.7	3.2	4.7	6.7	0.0	25.1	6.9	24					
27	3.7	8.2	3.2	3.7	5.7	1.2	7.7	5.2	0.2	X	4.1	8.2	1.7	0.2	2.7	5.2	0.2	3.7	4.2	2.2	0.0	4.1	4.2	4.2	0.0	8.2	3.6	23					
28	5.1	4.2	2.2	3.2	2.7	4.7	1.7	4.1	7.7	8.2	2.7	1.6	10.1	5.6	4.2	4.1	4.7	7.2	3.2	4.7	7.2	3.7	3.7	5.6	1.6	10.1	4.7	24					
29	3.7	5.1	0.0	0.0	6.2	7.7	5.1	5.1	5.1	0.0	0.7	6.2	9.7	15.2	1.1	7.2	4.7	5.1	4.7	4.7	6.2	8.7	7.2	0.0	15.2	5.2	24						
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	0					
HOURLY MAX	18.2	14.7	12.1	15.2	30.1	17.1	25.1	15.7	14.7	15.2	15.7	8.2	22.1	15.2	19.7	28.2	9.7	8.7	14.7	29.1	11.7	23.1	8.7	10.1									
HOURLY AVG	4.0	4.2	3.5	3.5	4.3	3.9	4.8	4.7	4.3	3.8	4.3	3.7	4.7	4.7	3.5	5.1	3.6	3.8	4.8	6.8	4.8	5.3	3.7	3.5									

STATUS FLAG CODES

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

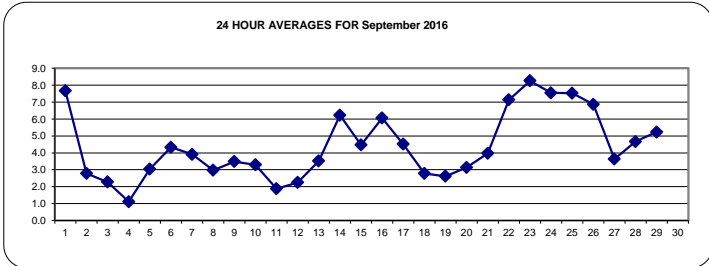
OBJECTIVE LIMIT:

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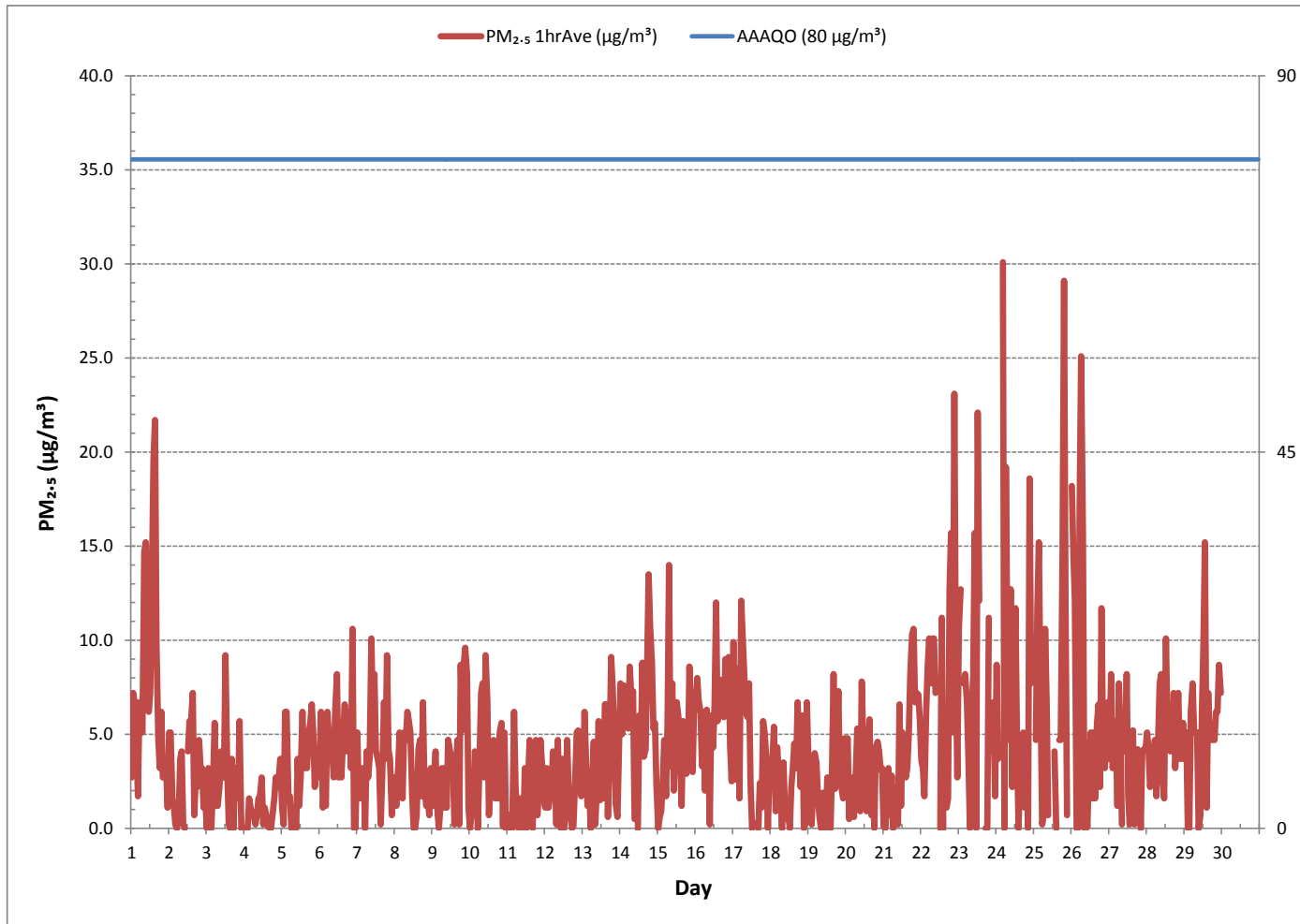
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	602					
MINIMUM 1-HR AVERAGE:	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	30.1	µg/m ³	@ HOUR(S)	4	ON DAY(S)	24
MAXIMUM 24-HR AVERAGE:	8.3	µg/m ³			ON DAY(S)	23
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	4	HRS	OPERATIONAL TIME:	675	HRS	
STANDARD DEVIATION:	4.12		AMD OPERATION UPTIME:	93.8	%	
			MONTHLY AVERAGE:	4.3	µg/m ³	

24 HOUR AVERAGES FOR September 2016

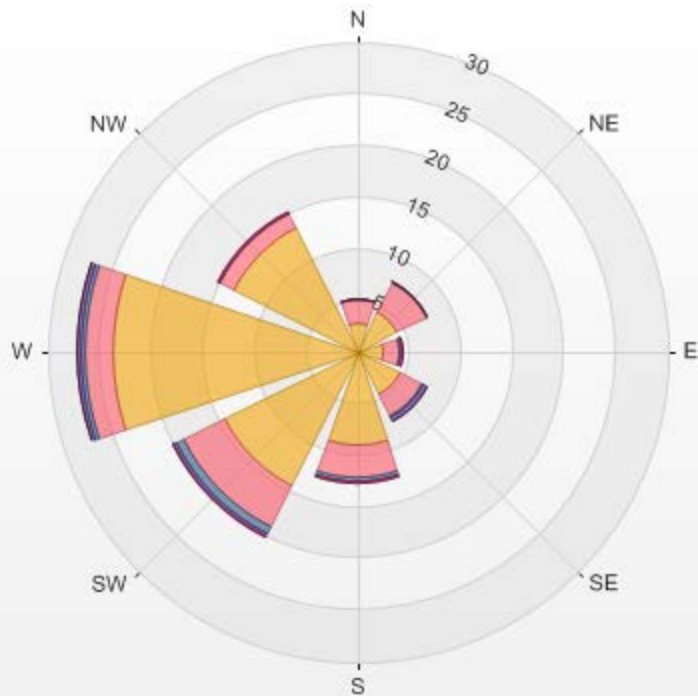


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] Monthly: 09/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 96.67% Calm Avg: 0.00

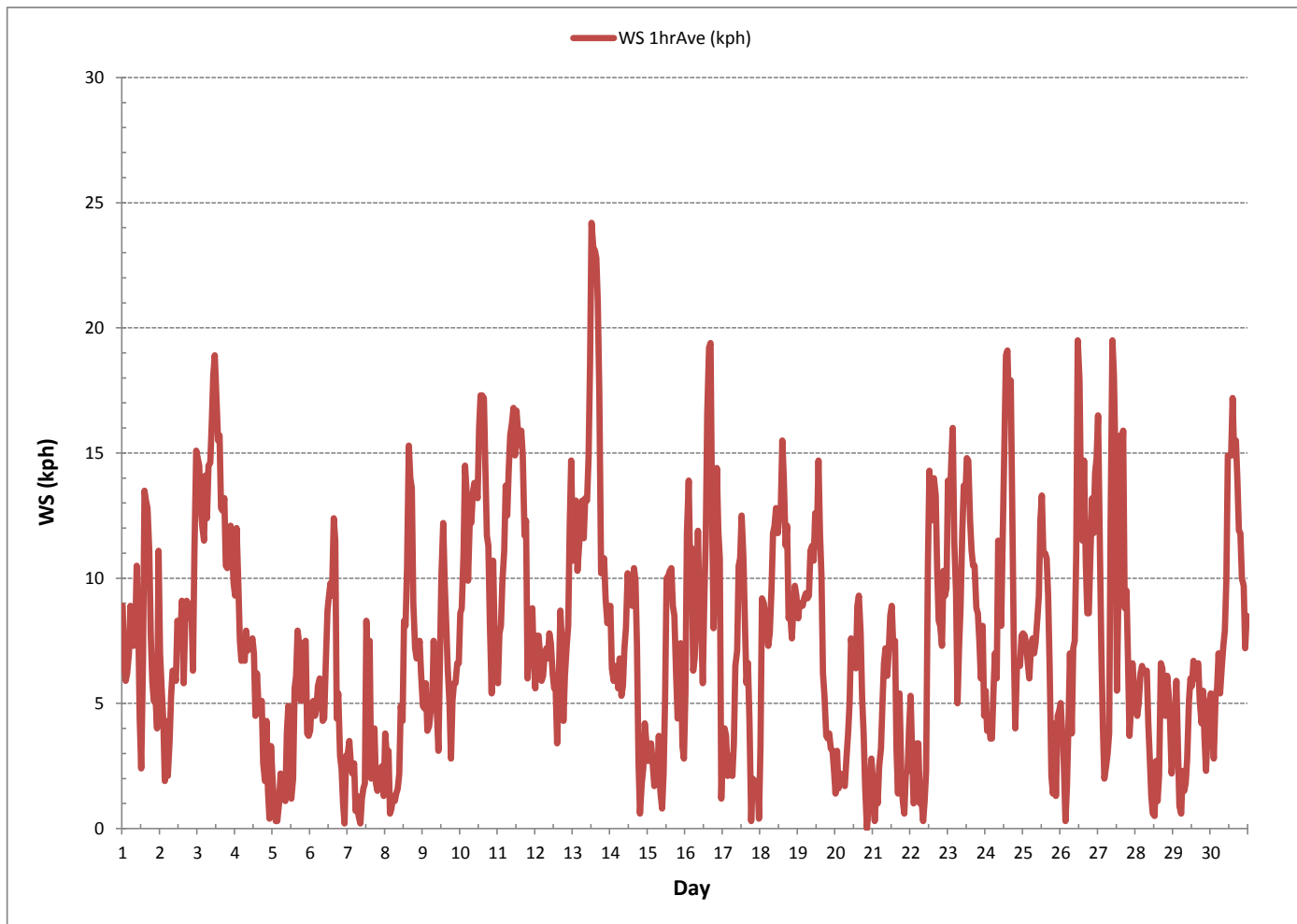
Direction	0.0-6.2	6.2-12.4	12.4-18.6	18.6-24.8	24.8-31.0	>31.0	Total
N	2.87	2.3	0	0	0	0	5.17
NE	4.31	3.16	0.14	0	0	0	7.61
E	2.44	1.58	0.29	0	0.14	0	4.45
SE	4.74	2.16	0.29	0.29	0	0	7.48
S	9.05	3.16	0.43	0	0.14	0	12.78
SW	14.51	4.45	0.72	0.29	0.14	0	20.11
W	23.71	2.73	0.43	0.29	0	0	27.16
NW	13.51	1.44	0.14	0	0.14	0	15.23
Summary	75.14	20.98	2.44	0.87	0.56	0	100



% Icon Classes (ug/m3(L))	75	0.0-6.2	21	6.2-12.4	2	12.4-18.6	1	18.6-24.8	1	24.8-31.0	0	>31.0

WIND SPEED

WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	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-HOUR	
DAY	MIN.	MAX.	AVG.	RDGS.																									
1	24.6	16.5	15.2	14.0	15.9	19.9	19.0	19.1	20.8	27.6	26.2	16.8	14.1	23.8	33.1	29.0	32.3	30.5	23.0	17.0	12.5	15.1	11.5	16.8	11.5	33.1	20.6	24	
2	15.3	12.7	9.8	7.4	9.2	6.0	9.3	14.0	16.5	13.8	13.7	20.5	19.6	22.6	23.0	16.0	20.8	23.6	21.3	24.7	28.7	18.7	35.4	46.3	6.0	46.3	18.7	24	
3	41.4	37.9	32.8	35.5	33.1	32.6	28.7	38.9	35.2	37.6	45.0	44.5	43.0	45.0	45.1	35.2	42.2	40.4	29.9	31.7	31.4	30.4	25.7	24.8	24.8	45.1	36.2	24	
4	21.9	27.1	26.2	17.6	16.6	17.7	14.5	15.6	15.8	17.3	18.1	20.3	17.0	14.9	16.3	13.3	12.9	12.1	5.8	5.3	8.9	6.1	2.7	6.2	2.7	27.1	14.6	24	
5	6.0	5.7	6.2	5.3	6.3	7.6	11.3	6.1	6.9	11.9	18.6	13.6	11.5	9.7	15.1	12.1	17.7	16.4	12.4	10.5	17.0	17.9	12.8	10.4	5.3	18.6	11.2	24	
6	7.8	11.4	11.0	9.2	10.5	15.0	13.8	15.8	10.4	12.7	17.1	18.9	22.0	20.8	19.2	23.8	22.4	10.4	13.7	8.2	7.3	6.9	4.6	7.8	4.6	23.8	13.4	24	
7	7.6	10.0	8.6	8.1	9.6	5.3	6.4	4.8	3.6	8.4	8.1	11.9	21.9	21.4	28.6	11.0	13.1	11.2	8.9	7.4	8.3	7.2	7.9	5.0	3.6	28.6	10.2	24	
8	10.2	8.2	9.7	5.4	7.5	6.7	6.8	5.8	6.1	8.1	X	X	24.8	36.0	26.0	37.6	33.9	36.7	28.5	18.9	15.0	16.9	17.9	16.6	5.4	37.6	17.4	22	
9	12.6	14.7	15.9	12.1	10.3	12.2	14.9	17.4	14.4	13.5	13.1	19.9	25.2	36.0	27.9	21.1	17.6	13.0	8.5	10.7	13.2	11.3	14.3	15.7	8.5	36.0	16.1	24	
10	20.6	16.5	25.0	24.6	23.3	19.7	19.8	28.0	25.3	27.9	33.8	37.2	48.0	46.3	50.0	51.9	40.7	34.2	30.4	26.2	14.8	41.4	23.6	18.6	14.8	51.9	30.3	24	
11	20.0	17.2	24.4	23.2	30.3	37.9	29.5	38.8	47.5	43.8	39.6	36.7	41.2	39.3	34.7	36.4	37.2	29.2	31.8	14.4	19.1	17.7	19.3	18.5	14.4	47.5	30.3	24	
12	13.4	17.9	17.9	15.0	12.2	14.1	16.7	15.6	17.7	17.0	18.3	20.2	18.8	18.7	18.0	20.1	19.6	17.2	10.4	10.3	12.4	14.3	20.0	23.3	10.3	23.3	16.6	24	
13	18.1	28.3	26.3	19.3	20.9	20.6	21.5	21.0	21.4	22.7	25.7	31.6	39.3	39.8	40.8	40.1	37.0	26.6	18.0	17.3	21.1	14.5	15.9	15.1	14.5	40.8	25.1	24	
14	17.1	14.7	9.7	11.5	11.2	11.5	14.2	9.0	16.3	15.8	18.5	20.3	21.7	26.7	24.7	28.1	26.8	20.5	12.3	4.8	7.3	5.5	8.3	7.7	4.8	28.1	15.2	24	
15	8.6	10.3	7.8	6.0	6.2	8.7	7.8	9.1	8.9	6.8	7.0	15.8	22.3	22.9	27.6	23.4	18.6	14.3	10.5	9.3	11.6	13.4	11.2	11.3	6.0	27.6	12.5	24	
16	12.1	18.5	23.6	24.6	18.2	10.5	13.8	17.0	18.6	17.0	14.6	11.5	17.4	26.5	31.6	33.7	29.7	26.3	14.6	20.1	21.9	17.8	17.2	10.9	10.5	33.7	19.5	24	
17	17.3	10.8	10.4	6.9	10.5	10.4	10.9	14.0	17.6	20.9	24.0	25.0	30.2	25.6	20.4	17.0	17.6	11.7	4.8	5.5	6.6	7.7	9.0	2.9	2.9	30.2	14.1	24	
18	14.3	25.0	25.6	24.5	22.2	22.3	21.7	26.6	27.5	32.2	33.9	31.1	37.5	34.4	41.3	35.8	29.1	36.6	21.9	25.5	23.6	23.1	23.5	23.2	14.3	41.3	27.6	24	
19	21.0	23.7	22.2	20.9	20.9	24.9	23.2	23.2	26.2	25.5	29.0	27.9	26.4	33.1	27.1	25.2	16.5	18.2	10.7	8.7	8.9	9.0	7.0	8.8	7.0	33.1	20.3	24	
20	5.2	7.2	5.4	7.6	6.9	5.2	6.3	6.7	7.8	13.9	18.2	23.1	16.8	17.1	25.6	23.4	21.3	12.5	7.2	4.0	0.0	5.0	6.5	7.5	0.0	25.6	10.9	24	
21	5.6	3.7	5.8	5.5	7.3	7.0	9.3	12.6	13.4	13.0	14.7	18.9	18.3	17.4	18.1	10.3	8.6	15.4	7.5	5.9	6.0	5.4	4.8	9.6	3.7	18.9	10.2	24	
22	10.8	9.4	6.6	3.9	7.3	6.9	4.0	4.4	5.1	5.5	7.0	25.5	32.2	28.7	25.6	27.8	25.9	23.7	15.5	14.1	13.6	18.1	21.0	22.3	3.9	32.2	15.2	24	
23	26.8	23.4	29.4	30.1	25.4	23.5	11.5	17.7	23.3	25.4	34.5	34.7	35.6	35.9	28.4	22.9	20.4	23.4	18.1	20.4	16.2	10.7	15.0	13.7	10.7	35.9	23.6	24	
24	11.0	9.0	8.9	8.0	10.7	16.6	17.6	17.4	30.9	25.9	21.5	27.3	43.2	44.6	45.4	37.2	43.2	31.7	20.1	9.6	15.5	15.4	15.0	19.1	8.0	45.4	22.7	24	
25	19.4	18.1	18.2	15.4	13.8	14.4	16.3	16.9	18.0	23.8	23.0	30.2	29.5	27.4	26.0	28.0	22.3	15.4	6.9	5.3	8.3	6.3	10.3	8.0	5.3	30.2	17.6	24	
26	7.9	6.4	7.4	4.0	6.7	9.3	11.3	12.0	12.3	15.0	22.2	34.7	30.1	26.4	26.2	28.1	22.5	19.1	14.2	22.0	22.8	23.3	26.4	26.1	4.0	34.7	18.2	24	
27	29.3	29.1	17.6	13.8	7.4	8.2	9.6	16.0	32.1	43.4	42.2	42.0	16.6	22.1	44.3	36.1	37.3	26.9	22.4	14.1	7.8	10.9	11.8	11.1	7.4	44.3	23.0	24	
28	11.4	9.9	8.8	10.0	10.1	10.4	10.2	11.6	8.3	7.2	5.7	5.7	4.5	9.1	8.2	12.0	13.0	13.4	9.9	9.3	11.0	11.4	8.1	8.3	4.5	13.4	9.5	24	
29	7.1	9.5	12.0	11.0	5.3	6.7	6.9	5.2	5.9	10.6	15.8	15.8	18.1	19.3	17.6	17.4	15.8	12.5	9.5	11.7	9.5	6.6	9.4	14.0	5.2	19.3	11.4	24	
30	17.8	10.7	11.1	18.9	22.0	19.9	11.3	19.8	21.1	20.6	27.1	34.9	35.1	35.8	41.7	37.3	39.6	35.0	31.2	30.2	27.5	24.6	16.8	20.5	10.7	41.7	25.4	24	
HOURLY MAX	41.4	37.9	32.8	35.5	33.1	37.9	29.5	38.9	47.5	43.8	45.0	44.5	48.0	46.3	50.0	51.9	43.2	40.4	31.8	31.7	31.4	41.4	35.4	46.3					
HOURLY AVG	15.4	15.5	15.3	14.0	13.9	14.4	13.9	16.0	17.8	19.5	21.9	24.7	26.1	27.6	28.6	26.4	25.2	21.9	16.0	14.1	14.3	14.4	14.4	15.0					

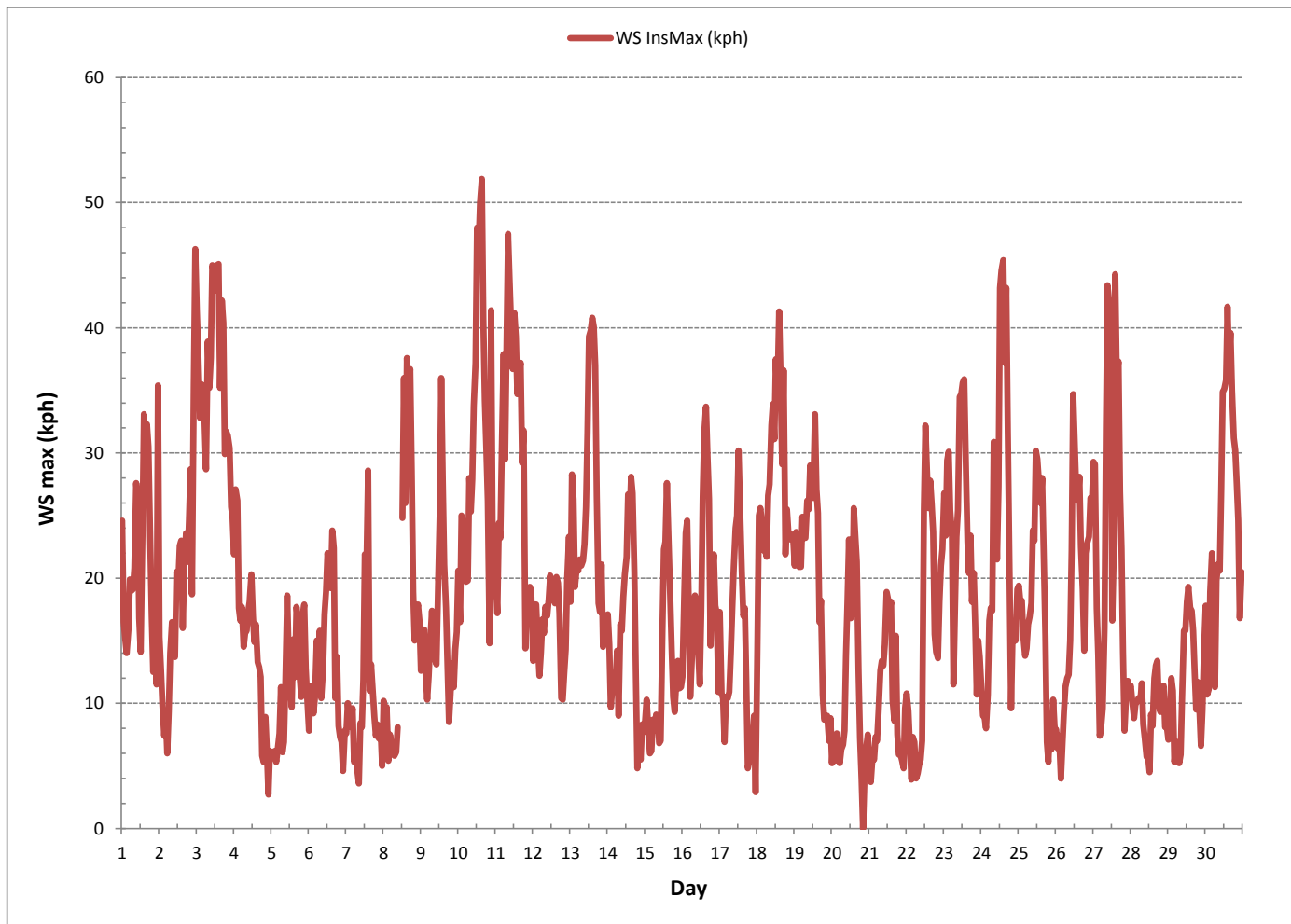
STATUS FLAG CODES

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

MONTHLY SUMMARY

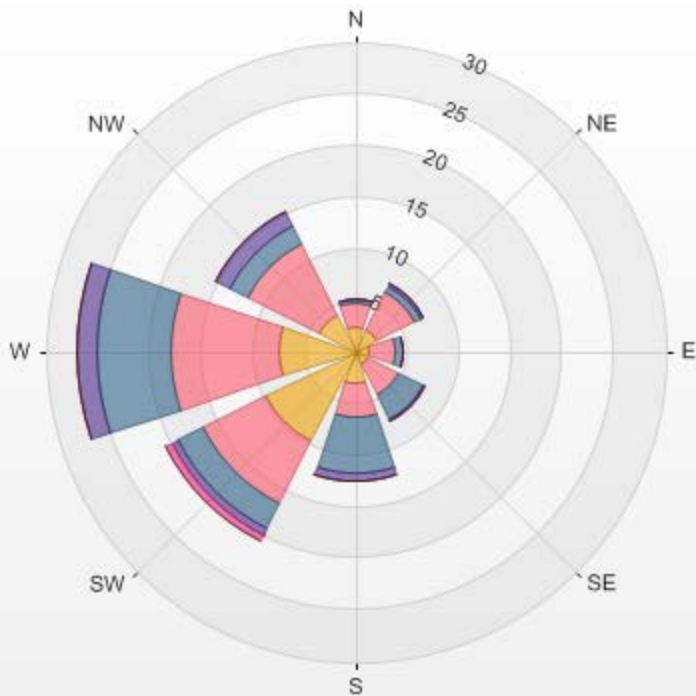
MAXIMUM INSTANTANEOUS VALUE:	51.9	kph	@ HOUR(S)	15	ON DAY(S)	10
					VAR-VARIOUS	
OPERATIONAL TIME:					718	HRS

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA Bonnyville Monitor: WSP [kph] Monthly: 2016/09 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-5.0	5.0-10.0	10.0-15.0	15.0-20.0	20.0-25.0	>25.0	Total
N	2.36	2.36	0.42	0	0	0	5.14
NE	2.36	4.03	0.69	0.28	0	0	7.36
E	1.39	2.5	0.69	0	0	0	4.58
SE	1.39	3.19	2.78	0.28	0	0	7.64
S	3.19	3.19	5.42	0.83	0	0	12.63
SW	9.72	6.81	2.64	0.69	0.69	0	20.55
W	7.36	10.56	7.08	1.94	0	0	26.94
NW	3.89	7.78	1.94	1.53	0	0	15.14
Summary	31.66	40.42	21.66	5.55	0.69	0	100



% Icon Classes (kph) 32 0.0-5.0 40 5.0-10.0 22 10.0-15.0 6 15.0-20.0 1 20.0-25.0 0 >25.0

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville - September 2016

WIND DIRECTION Hourly Averages (WD)

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

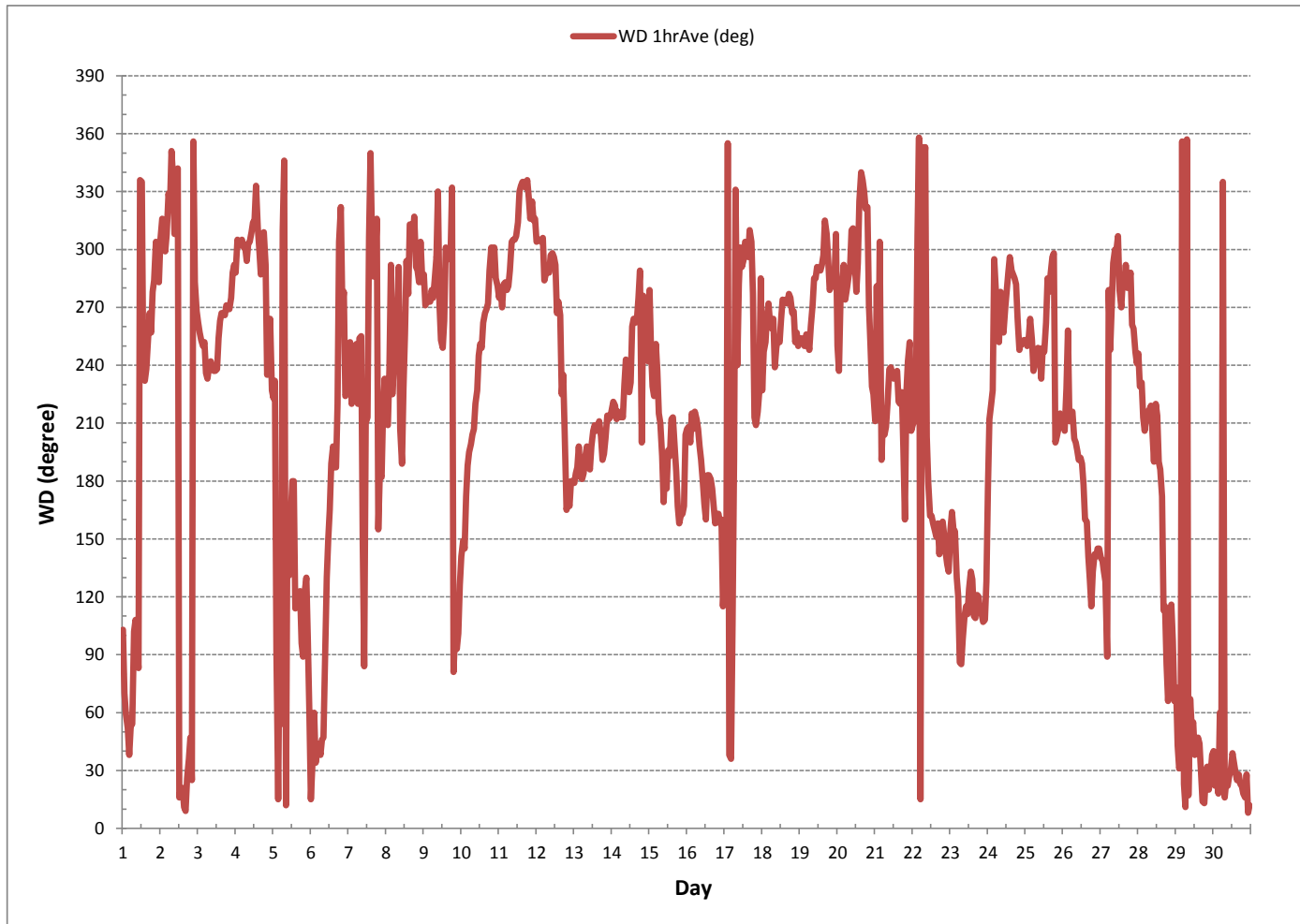
STATUS FLAG CODES

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

LAST CALIBRATION:	January 26, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	86.81		AMD OPERATION UPTIME:	100.0	%

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville - September 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

MST		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	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.			
HOUR START	HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY																													
1		18	23	22	19	18	17	18	19	26	28	37	32	36	25	18	19	21	21	20	16	15	13	11	13	24			
2		14	11	8	7	11	7	8	17	18	16	17	17	21	24	22	25	19	19	22	35	20	38	32	21	24			
3		21	21	20	20	20	17	17	18	19	18	18	18	19	21	22	23	22	20	20	20	20	19	16	14	24			
4		15	16	16	14	13	13	14	13	17	17	20	18	17	31	24	21	15	9	6	12	11	8	13	24				
5		18	11	42	51	53	28	23	14	45	41	38	34	62	45	32	26	17	21	24	15	16	16	45	29	24			
6		18	15	19	20	22	23	22	24	26	27	25	17	15	15	14	10	18	18	9	11	6	12	19	24				
7		15	16	18	18	17	15	22	17	26	69	69	45	26	31	22	25	25	19	23	59	31	36	23	16	24			
8		12	15	15	9	31	17	20	19	19	32	17	32	30	22	21	20	18	17	16	15	15	15	15	14	24			
9		15	14	17	15	13	14	15	17	17	20	33	27	25	24	27	26	22	18	15	18	17	16	16	19	24			
10		16	15	14	11	11	11	10	11	9	14	17	22	23	23	22	21	20	18	14	12	17	16	16	24				
11		18	16	17	18	17	19	19	18	19	18	18	18	18	17	17	16	17	16	15	14	14	14	15	15	24			
12		13	14	15	14	14	15	15	16	18	19	19	23	33	35	50	27	25	16	16	13	13	10	10	9	24			
13		12	12	12	11	11	11	11	12	11	11	12	12	11	12	11	12	11	8	11	11	9	9	9	7	24			
14		9	12	10	10	9	11	11	11	16	18	19	15	18	24	25	22	21	16	12	13	7	10	10	13	24			
15		10	15	14	17	15	17	17	18	52	44	31	19	13	17	18	14	13	8	15	18	15	12	34	23	24			
16		18	8	10	15	7	11	12	8	9	12	11	15	14	14	13	12	10	9	10	8	9	11	11	33	24			
17		35	47	18	28	31	60	43	39	33	19	16	18	18	18	21	19	18	16	32	19	25	24	18	5	24			
18		13	18	18	18	18	19	19	18	17	19	21	20	21	20	20	20	20	19	17	18	19	17	18	17	24			
19		18	18	18	17	18	18	18	20	20	18	17	17	17	18	19	17	14	12	10	10	10	11	10	11	24			
20		9	13	16	8	10	7	6	10	12	19	20	29	21	20	18	20	19	14	9	10	2	10	20	12	24			
21		22	6	17	17	18	22	10	9	11	18	19	22	20	26	23	13	36	16	29	63	48	12	11	26	24			
22		14	22	19	11	11	16	11	11	40	35	36	18	18	18	18	13	14	12	10	11	11	14	14	24				
23		12	11	14	15	16	15	20	18	16	15	16	17	17	15	17	15	14	16	16	13	14	12	14	24				
24		13	17	12	22	15	15	19	19	20	19	19	20	21	19	17	17	17	15	14	12	14	14	15	17	24			
25		16	15	16	15	16	14	14	17	20	21	18	20	21	22	19	21	17	12	8	20	12	15	14	8	24			
26		8	11	14	13	26	17	8	23	10	12	11	10	12	14	15	13	13	12	11	12	11	11	12	12	24			
27		12	15	14	50	40	33	18	23	16	17	16	16	17	17	19	18	16	17	14	11	9	9	10	10	24			
28		15	11	10	7	7	7	8	10	15	25	42	27	29	20	33	42	16	15	16	18	14	14	17	27	24			
29		25	18	14	17	15	18	19	14	21	46	31	29	32	31	30	26	22	19	18	18	20	20	21	20	24			
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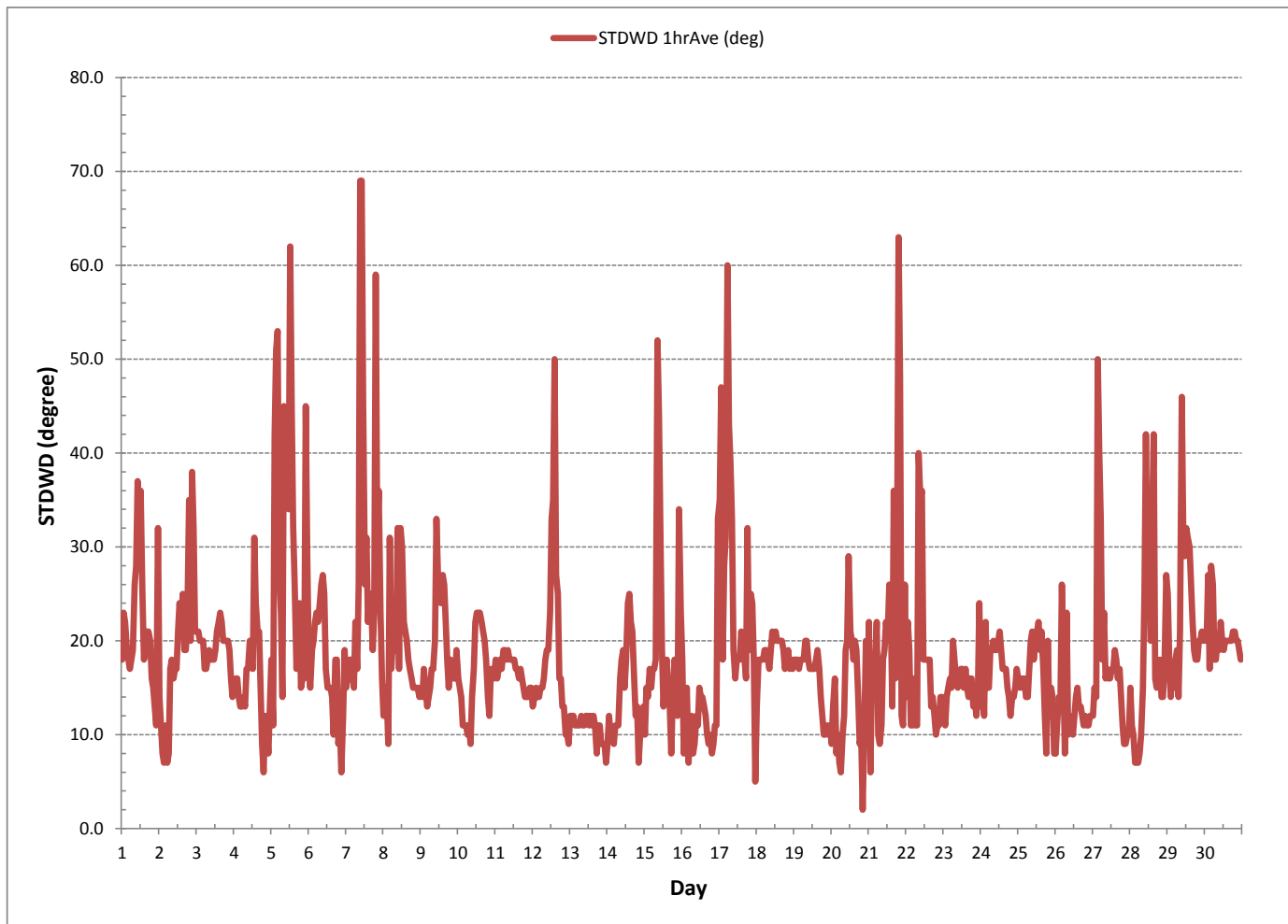
STATUS FLAG CODES

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

LAST CALIBRATION: January 26, 2016

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

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: S5602
 Station ID: LICA 37 Installation Date/Time (mst): Aug 31, 2016 @ 10:56
 Sample ID: LICA/VOC/Bonnyville/Sep 03, 2016 Removal Date/Time (mst): Sep 06, 2016 @ 10:54

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 03, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Sep 04, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.4</u>	<u>+ 19.1</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</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 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

Comments: Date of last audit: July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 06, 2016

Sample ID: 16090076-003

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Sep 03, 2016



Volatile Organics Data Results

Date: September 3, 2016
Canister ID: S5602

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	< 0.02
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	0.02
Acetone	1.6
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.12
Chloromethane	0.17
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	0.9
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.30

Volatile Organics Data Results

Date: September 3, 2016
Canister ID: S5602

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.09
Freon-114	0.02
Freon-12	0.02
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.13
Isopentane	0.20
Isoprene	0.09
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	0.34
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	0.03
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: 14719
 Station ID: LICA 37 Installation Date/Time (mst): Sep 06, 2016 @ 10:54
 Sample ID: LICA/VOC/Bonnyville/Sep 09, 2016 Removal Date/Time (mst): Sep 14, 2016 @ 11:43

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 09, 2016</u>	<u>00:00</u>	<u>00:00 Sep 10, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.8</u>	<u>+19.8</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</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 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

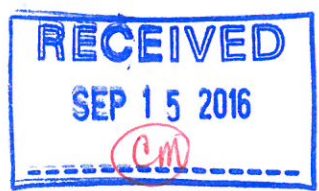
Comments: Date of last audit: July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 14, 2016

Sample ID: 16090151-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Sep 9, 2016



Volatile Organics Data Results

Date: September 9, 2016
Canister ID: 14719

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	< 0.03
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	0.03
1-Pentene	0.01
2,2,4-Trimethylpentane	0.08
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.01
2-Methylheptane	0.03
2-Methylhexane	< 0.01
2-Methylpentane	0.11
3-Methylheptane	< 0.02
3-Methylhexane	0.13
3-Methylpentane	0.07
Acetone	2.6
Acrolein	< 0.3
Benzene	0.07
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	0.49
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	0.03
Dibromochloromethane	< 0.01
Ethanol	2.0
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.29

Volatile Organics Data Results

Date: September 9, 2016
Canister ID: 14719

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.49
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.42
Isopentane	0.50
Isoprene	0.05
Isopropyl alcohol	0.7
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.17
Methylcyclopentane	0.11
Methylene chloride	1.0
n-Butane	0.53
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.24
n-Hexane	2.21
n-Nonane	0.01
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	0.02
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

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: 2529
 Station ID: LICA 37 Installation Date/Time (mst): Sep 14, 2016 @ 11:43
 Sample ID: LICA/VOC/Bonnyville/Sep 15, 2016 Removal Date/Time (mst): Sep 19, 2016 @ 11:48

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 15, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Sep 16, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</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>26</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 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

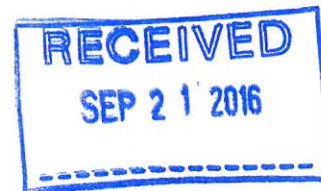
Comments: Date of last audit: July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 19, 2016

Sample ID: 16090250-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Sept 15, 2016



Volatile Organics Data Results

Date: September 15, 2016
Canister ID: 2529

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	0.10
1-Hexene	< 0.02
1-Pentene	0.02
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	< 0.01
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	3.9
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.49
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	3.1
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.31

Volatile Organics Data Results

Date: September 15, 2016
Canister ID: 2529

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.70
Isopentane	0.15
Isoprene	0.15
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	0.4
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	0.27
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
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	< 0.4
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: 17121
 Station ID: LICA 37 Installation Date/Time (mst): Sep 19, 2016 @ 11:48
 Sample ID: LICA/VOC/Bonnyville/Sep 21, 2016 Removal Date/Time (mst): Sep 22, 2016 @ 10:02

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 21, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Sep 22, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+18.7</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</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 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

Comments: Date of last audit : July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 22, 2016

Sample ID: 16090313-003
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Sep 21, 2016



Volatile Organics Data Results

Date: September 21, 2016
Canister ID: 17121

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	0.03
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	0.03
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	0.03
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.03
Acetone	1.9
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.18
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.40
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	1.5
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.32

Volatile Organics Data Results

Date: September 21, 2016
Canister ID: 17121

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.61
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.23
Isopentane	0.24
Isoprene	0.03
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	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.04
Methylcyclopentane	0.05
Methylene chloride	< 0.3
n-Butane	0.38
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
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	0.02
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

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 5683
 Station ID: LICA 37 Installation Date/Time (mst): Sep 22, 2016 @ 10:02
 Sample ID: LICA/VOC/Bonnyville/Sep 27, 2016 Removal Date/Time (mst): Sep 28, 2016 @ 12:22

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Sep 27, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Sep 28, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.3</u>	<u>+ 18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</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/no)
 Date of last flow calibration: July 4, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 5, 2016 (due every 6 months)

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

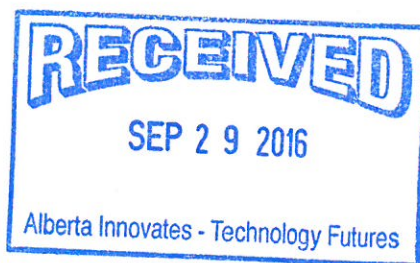
Comments: Date of last audit : July 4, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Sep 28, 2016

Sample ID: 16090349-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Sep 27, 2016



Volatile Organics Data Results

Date: September 27, 2016
Canister ID: S5683

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-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	< 0.03
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	0.05
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	0.04
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.02
2-Methylheptane	0.01
2-Methylhexane	0.06
2-Methylpentane	0.11
3-Methylheptane	< 0.02
3-Methylhexane	0.06
3-Methylpentane	0.07
Acetone	2.2
Acrolein	< 0.3
Benzene	0.06
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.05
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.45
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.05
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.6
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.31

Volatile Organics Data Results

Date: September 27, 2016
Canister ID: S5683

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.58
Isopentane	0.47
Isoprene	0.01
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	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.07
Methylcyclopentane	0.08
Methylene chloride	< 0.3
n-Butane	0.92
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.05
n-Hexane	0.10
n-Nonane	0.01
n-Octane	< 0.02
n-Pentane	0.3
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	0.10
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

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Sep 03, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>P13-02</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Aug 31, 2016/ 11:16</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Sep 03, 2016</u>	Removal Date/Time:	<u>Sep 06, 2016/ 11:08</u>

Sample Data Collection Information

Sample Date:	<u>Sep 03, 2016</u>	Average Pressure (mmHg)	<u>701</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Sep 04, 2016</u>	Average Temperature (°C)	<u>10.3°</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>July 4, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Sep 06, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 3, 2016
PUF S/N: P1302

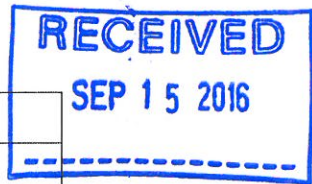
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
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	0.02
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.01
Perylene	< 0.01
Phenanthrene	0.09
Pyrene	< 0.01
Retene	< 0.01

Sample ID: 16090151-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Sep 9, 2016

AIR FCD-01321/2



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: 9801
Location: Bonnyville - AER Motor S/N: 1139/100-1015
Station ID: LICA 37 Installation Date/Time: Sep 6, 2016 / 11:08
Field Sample ID: LICA/PUF/Bonnyville/Sep 09, 2016 Removal Date/Time: Sep 14, 2016 / 11:34

Sample Data Collection Information

Sample Date: Sep 09, 2016 Average Pressure (mmHg) 705
Start Time (mst): 00:00 Average Flow (Qstd) 229
End Time (mst): 00:00 Sep 10, 2016 Average Temperature (°C) 12.0°
Elapsed Time (Hours): 24.0 Volume (Vstd m³) 330.19

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
Average temperature appears correct? YES NO
Average pressure appears correct? YES NO
Any error messages? (if yes list below) YES NO
Sample duration 24 hours? YES NO
Date of last calibration/audit: July 4, 2016
Other observations? n/a

Deployed By: Alex Yakupov
Collected By: Alex Yakupov Date: Sep 14, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 9, 2016
PUF S/N: 9801

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.09
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	0.16
Acridine	< 0.01
Anthracene	0.08
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	0.06
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	0.08
Fluorene	0.10
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.06
Perylene	< 0.01
Phenanthrene	0.41
Pyrene	0.05
Retene	0.02

Sample ID: 16090250-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Sept 15, 2016



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	TE-07
Location:	Bonnyville - AER	Motor S/N:	1139/100-1015
Station ID:	LICA 37	Installation Date/Time:	Sep 14, 2016/11:34
Field Sample ID:	LICA/PUF/Bonnyville/Sep 15, 2016	Removal Date/Time:	Sep 19, 2016/11:41

Sample Data Collection Information

Sample Date:	Sep 15, 2016	Average Pressure (mmHg)	702
Start Time (mst):	00:00	Average Flow (Q _{std})	22.9
End Time (mst):	00:00 Sep 16, 2016	Average Temperature (°C)	15.6 °
Elapsed Time (Hours):	24.0	Volume (V _{std} m ³)	330.18

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:	July 4, 2016	
Other observations?	n/a	

Deployed By:	Alex Yakupov	
Collected By:	Alex Yakupov	Date: Sep 19, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 15, 2016
PUF S/N: TE07

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.01
2-Methylnaphthalene	0.08
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	0.04
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	< 0.01
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	0.02
Perylene	0.01
Phenanthrene	0.28
Pyrene	0.01
Retene	0.05

Sample ID: 16090313-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Sep 21, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-08</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Sep 19, 2016/11:41</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Sep 21, 2016</u>	Removal Date/Time:	<u>Sep 22, 2016/10:13</u>

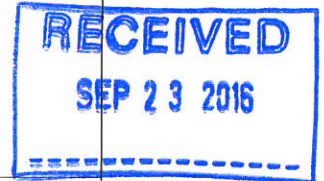
Sample Data Collection Information

Sample Date:	<u>Sep 21, 2016</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>00:00 Sep 22, 2016</u>	Average Temperature (°C)	<u>9.5°</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 4, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Sep 22, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 21, 2016
PUF S/N: TE08

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.04
2-Methylnaphthalene	0.09
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.05
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	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.20
Pyrene	0.05
Retene	0.05

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>Sep 22, 2016 / 10:13</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Sep 27, 2016</u>	Removal Date/Time:	<u>Sep 28, 2016 / 12:29</u>
Sample Data Collection Information			
Sample Date:	<u>Sep 27, 2016</u>	Average Pressure (mmHg)	<u>703</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Sep 28, 2016</u>	Average Temperature (°C)	<u>11.5°</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)	<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>July 04, 2016</u>		
Other observations?	<u>n/a</u>		
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	<u>Date: Sep 28, 2016</u>	



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: September 27, 2016
PUF S/N: TE03

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.07
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	0.06
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	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.22
Pyrene	0.07
Retene	0.07

NMHC CANISTER RESULTS

Sample ID: 16090076-005

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Sep 02,
2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/

Sampler S/N: n/a
Canister ID: 2522
Canister Installation Date/Time: September 02, 2016 / 11:44
Canister Removal Date/Time: September 06, 2016 / 11:09

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Sept 02, 2016</u>	<u>15:55</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>-27.6</u>	<u>-2.0</u>

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SEP 08 2016

Canister valve open prior to sampling?: YES / NO
Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yakupov Date: Sep 06, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: September 2, 2016
Canister ID: 2522

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.07
1,2,3-Trimethylbenzene	< 0.09
1,2,4-Trichlorobenzene	< 1.4
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.05
1,2-Dichloroethane	0.08
1,2-Dichloropropane	< 0.02
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.07
1,3-Dichlorobenzene	< 0.5
1,4-Dichlorobenzene	< 0.7
1,4-Dioxane	1.6
1-Butene	0.19
1-Hexene	< 0.03
1-Pentene	0.06
2,2,4-Trimethylpentane	0.06
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	< 0.02
2,3-Dimethylbutane	0.06
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.03
2-Methylheptane	< 0.02
2-Methylhexane	< 0.02
2-Methylpentane	0.20
3-Methylheptane	< 0.03
3-Methylhexane	0.07
3-Methylpentane	0.14
Acetone	5.5
Acrolein	< 0.5
Benzene	0.09
Benzyl chloride	< 0.7
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.02
Carbon disulfide	0.14
Carbon tetrachloride	0.09
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.54
cis-1,2-Dichloroethene	< 0.02
cis-1,3-Dichloropropene	< 0.07
cis-2-Butene	0.04
cis-2-Pentene	< 0.03
Cyclohexane	< 0.03
Cyclopentane	0.04
Dibromochloromethane	< 0.02
Ethanol	6.1
Ethyl acetate	< 0.7
Ethylbenzene	0.05
Freon-11	0.28

Volatile Organics Data Results (NMHC Canister System)

Date: September 2, 2016
Canister ID: 2522

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.03
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.86
Isobutane	0.78
Isopentane	1.39
Isoprene	0.25
Isopropyl alcohol	1.9
Isopropylbenzene	< 0.02
m,p-Xylene	0.16
m-Diethylbenzene	< 0.07
m-Ethyltoluene	< 0.14
Methyl butyl ketone	< 0.86
Methyl ethyl ketone	< 0.5
Methyl isobutyl ketone	< 0.7
Methyl methacrylate	< 0.12
Methyl tert butyl ether	< 0.05
Methylcyclohexane	0.06
Methylcyclopentane	0.10
Methylene chloride	0.6
n-Butane	1.68
n-Decane	0.14
n-Dodecane	< 0.7
n-Heptane	0.07
n-Hexane	0.16
n-Nonane	0.02
n-Octane	0.05
n-Pentane	0.6
n-Propylbenzene	< 0.09
n-Undecane	< 0.9
Naphthalene	< 0.9
o-Ethyltoluene	< 0.02
o-Xylene	0.05
p-Diethylbenzene	< 0.07
p-Ethyltoluene	< 0.12
Styrene	< 0.07
Tetrachloroethylene	0.08
Tetrahydrofuran	< 0.7
Toluene	0.31
trans-1,2-Dichloroethylene	< 0.02
trans-1,3-Dichloropropylene	< 0.07
trans-2-Butene	0.03
trans-2-Pentene	0.05
Trichloroethylene	< 0.07
Vinyl acetate	< 0.7
Vinyl chloride	< 0.03

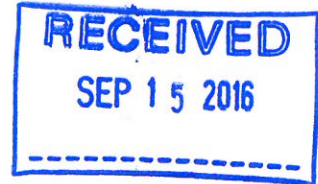
Sample ID: 16090151-005

AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Sept 13,
2016

Maxxam



VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville AER Canister ID: 85598
 Station ID: LICA 37 Canister Installation Date/Time: September 06, 2016 / 11:09
 Field Sample ID: LICA/NMHC - VOC/Bonnyville/ Canister Removal Date/Time: September 14, 2016 / 12:04
Sep 13, 2016

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Sep 13, 2016</u>	<u>15:45</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>-27.3</u>	<u>-4.4</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: Sep 14, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: September 13, 2016
Canister ID: S5598

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.07
1,2,3-Trimethylbenzene	< 0.08
1,2,4-Trichlorobenzene	< 1.3
1,2,4-Trimethylbenzene	< 0.05
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.05
1,2-Dichloroethane	< 0.02
1,2-Dichloropropane	< 0.02
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.06
1,3-Dichlorobenzene	< 0.5
1,4-Dichlorobenzene	< 0.7
1,4-Dioxane	< 0.7
1-Butene	0.21
1-Hexene	< 0.03
1-Pentene	0.06
2,2,4-Trimethylpentane	< 0.02
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.02
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	< 0.03
2,4-Dimethylpentane	< 0.02
2-Methylheptane	0.02
2-Methylhexane	< 0.02
2-Methylpentane	0.05
3-Methylheptane	< 0.03
3-Methylhexane	< 0.03
3-Methylpentane	0.04
Acetone	3.9
Acrolein	< 0.5
Benzene	0.14
Benzyl chloride	< 0.7
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.02
Carbon disulfide	0.06
Carbon tetrachloride	0.10
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.59
cis-1,2-Dichloroethene	< 0.02
cis-1,3-Dichloropropene	< 0.07
cis-2-Butene	< 0.03
cis-2-Pentene	< 0.03
Cyclohexane	< 0.03
Cyclopentane	< 0.02
Dibromochloromethane	< 0.02
Ethanol	1.3
Ethyl acetate	< 0.7
Ethylbenzene	< 0.02
Freon-11	0.27

Volatile Organics Data Results (NMHC Canister System)

Date: September 13, 2016
Canister ID: S5598

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.06
Freon-114	< 0.03
Freon-12	0.50
Hexachloro-1,3-butadiene	< 0.83
Isobutane	0.24
Isopentane	0.25
Isoprene	0.07
Isopropyl alcohol	< 0.7
Isopropylbenzene	< 0.02
m,p-Xylene	0.05
m-Diethylbenzene	< 0.07
m-Ethyltoluene	< 0.13
Methyl butyl ketone	< 0.83
Methyl ethyl ketone	< 0.5
Methyl isobutyl ketone	< 0.7
Methyl methacrylate	< 0.12
Methyl tert butyl ether	< 0.05
Methylcyclohexane	< 0.02
Methylcyclopentane	< 0.03
Methylene chloride	< 0.5
n-Butane	0.22
n-Decane	< 0.10
n-Dodecane	< 0.7
n-Heptane	0.02
n-Hexane	0.07
n-Nonane	< 0.02
n-Octane	< 0.03
n-Pentane	< 0.2
n-Propylbenzene	< 0.08
n-Undecane	< 0.8
Naphthalene	< 0.8
o-Ethyltoluene	< 0.02
o-Xylene	< 0.02
p-Diethylbenzene	< 0.07
p-Ethyltoluene	< 0.12
Styrene	< 0.07
Tetrachloroethylene	< 0.07
Tetrahydrofuran	< 0.7
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.02
trans-1,3-Dichloropropylene	< 0.07
trans-2-Butene	< 0.02
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.07
Vinyl acetate	< 0.7
Vinyl chloride	< 0.03

Sample ID: 16090250-005

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Sept 17,
2016

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VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Sep 17, 2016

Sampler S/N: n/a
Canister ID: H 3286
Canister Installation Date/Time: September 14, 2016 / 12:04
Canister Removal Date/Time: September 19, 2016 / 11:25

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Sep 17, 2016</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>-27.3</u>	<u>-4.0</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: September 19, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: September 17, 2016
Canister ID: H3286

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.04
1,1,2-Tetrachloroethane	< 0.04
1,1,2-Trichloroethane	< 0.04
1,1-Dichloroethane	< 0.04
1,1-Dichloroethylene	< 0.08
1,2,3-Trimethylbenzene	< 0.10
1,2,4-Trichlorobenzene	< 1.6
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.04
1,2-Dichlorobenzene	< 0.06
1,2-Dichloroethane	< 0.02
1,2-Dichloropropane	< 0.02
1,3,5-Trimethylbenzene	< 0.04
1,3-Butadiene	< 0.04
1,3-Dichlorobenzene	< 0.6
1,4-Dichlorobenzene	< 0.8
1,4-Dioxane	< 0.8
1-Butene	0.14
1-Hexene	< 0.04
1-Pentene	0.04
2,2,4-Trimethylpentane	< 0.02
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	< 0.02
2,3-Dimethylbutane	0.08
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	0.03
2-Methylheptane	0.03
2-Methylhexane	0.09
2-Methylpentane	0.24
3-Methylheptane	< 0.04
3-Methylhexane	0.07
3-Methylpentane	0.14
Acetone	3.0
Acrolein	< 0.6
Benzene	0.05
Benzyl chloride	< 0.8
Bromodichloromethane	< 0.04
Bromoform	< 0.04
Bromomethane	< 0.02
Carbon disulfide	0.45
Carbon tetrachloride	0.11
Chlorobenzene	< 0.04
Chloroethane	< 0.04
Chloroform	< 0.04
Chloromethane	0.44
cis-1,2-Dichloroethene	< 0.02
cis-1,3-Dichloropropene	< 0.08
cis-2-Butene	< 0.04
cis-2-Pentene	< 0.04
Cyclohexane	0.12
Cyclopentane	0.07
Dibromochloromethane	< 0.02
Ethanol	2.3
Ethyl acetate	< 0.8
Ethylbenzene	0.02
Freon-11	0.30

Volatile Organics Data Results (NMHC Canister System)

Date: September 17, 2016
Canister ID: H3286

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.06
Freon-114	< 0.04
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.98
Isobutane	1.32
Isopentane	1.04
Isoprene	< 0.02
Isopropyl alcohol	< 0.8
Isopropylbenzene	< 0.02
m,p-Xylene	0.07
m-Diethylbenzene	< 0.08
m-Ethyltoluene	< 0.16
Methyl butyl ketone	< 0.98
Methyl ethyl ketone	< 0.6
Methyl isobutyl ketone	< 0.8
Methyl methacrylate	< 0.14
Methyl tert butyl ether	< 0.06
Methylcyclohexane	0.19
Methylcyclopentane	0.18
Methylene chloride	< 0.6
n-Butane	2.02
n-Decane	< 0.12
n-Dodecane	< 0.8
n-Heptane	0.08
n-Hexane	0.22
n-Nonane	< 0.02
n-Octane	< 0.04
n-Pentane	0.7
n-Propylbenzene	< 0.10
n-Undecane	< 1.0
Naphthalene	< 1.0
o-Ethyltoluene	< 0.02
o-Xylene	0.03
p-Diethylbenzene	< 0.08
p-Ethyltoluene	< 0.14
Styrene	< 0.08
Tetrachloroethylene	< 0.08
Tetrahydrofuran	< 0.8
Toluene	0.11
trans-1,2-Dichloroethylene	< 0.02
trans-1,3-Dichloropropylene	< 0.08
trans-2-Butene	0.05
trans-2-Pentene	< 0.04
Trichloroethylene	< 0.08
Vinyl acetate	< 0.8
Vinyl chloride	< 0.04

Sample ID: 16090313-005

AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Sep 20,
2016

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Sep 20, 2016

Sampler S/N: n/a
Canister ID: H 3284
Canister Installation Date/Time: September 19, 2016 / 11:25
Canister Removal Date/Time: September 22, 2016 / 09:47

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Sep 20, 2016</u>	<u>07:10</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>- 3.5</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: Sep 22, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: September 20, 2016
Canister ID: H3284

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.08
1,1,2-Tetrachloroethane	< 0.08
1,1,2-Trichloroethane	< 0.08
1,1-Dichloroethane	< 0.08
1,1-Dichloroethylene	< 0.15
1,2,3-Trimethylbenzene	< 0.19
1,2,4-Trichlorobenzene	< 3.1
1,2,4-Trimethylbenzene	< 0.11
1,2-Dibromoethane	< 0.08
1,2-Dichlorobenzene	< 0.11
1,2-Dichloroethane	< 0.04
1,2-Dichloropropane	< 0.04
1,3,5-Trimethylbenzene	< 0.08
1,3-Butadiene	0.15
1,3-Dichlorobenzene	< 1.1
1,4-Dichlorobenzene	< 1.5
1,4-Dioxane	< 1.5
1-Butene	0.63
1-Hexene	< 0.08
1-Pentene	0.20
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	< 0.04
2,3-Dimethylbutane	0.24
2,3-Dimethylpentane	0.20
2,4-Dimethylpentane	0.10
2-Methylheptane	0.06
2-Methylhexane	0.23
2-Methylpentane	0.71
3-Methylheptane	< 0.08
3-Methylhexane	0.22
3-Methylpentane	0.42
Acetone	4.2
Acrolein	1.5
Benzene	0.29
Benzyl chloride	< 1.5
Bromodichloromethane	< 0.08
Bromoform	< 0.08
Bromomethane	< 0.04
Carbon disulfide	0.25
Carbon tetrachloride	0.11
Chlorobenzene	< 0.08
Chloroethane	< 0.08
Chloroform	< 0.08
Chloromethane	0.42
cis-1,2-Dichloroethene	< 0.04
cis-1,3-Dichloropropene	< 0.15
cis-2-Butene	0.24
cis-2-Pentene	0.20
Cyclohexane	0.22
Cyclopentane	0.18
Dibromochloromethane	< 0.04
Ethanol	42.0
Ethyl acetate	< 1.5
Ethylbenzene	0.07
Freon-11	0.30

Volatile Organics Data Results (NMHC Canister System)

Date: September 20, 2016
Canister ID: H3284

PARAMETERS	CONCENTRATION (PPB)
Freon-113	< 0.04
Freon-114	< 0.08
Freon-12	0.62
Hexachloro-1,3-butadiene	< 1.91
Isobutane	3.83
Isopentane	4.99
Isoprene	0.08
Isopropyl alcohol	< 1.5
Isopropylbenzene	< 0.04
m,p-Xylene	0.20
m-Diethylbenzene	< 0.15
m-Ethyltoluene	< 0.31
Methyl butyl ketone	< 1.91
Methyl ethyl ketone	< 1.1
Methyl isobutyl ketone	< 1.5
Methyl methacrylate	< 0.27
Methyl tert butyl ether	< 0.11
Methylcyclohexane	0.27
Methylcyclopentane	0.54
Methylene chloride	< 1.1
n-Butane	13.5
n-Decane	< 0.23
n-Dodecane	< 1.5
n-Heptane	0.18
n-Hexane	0.45
n-Nonane	< 0.04
n-Octane	< 0.08
n-Pentane	2.0
n-Propylbenzene	< 0.19
n-Undecane	< 1.9
Naphthalene	< 1.9
o-Ethyltoluene	< 0.04
o-Xylene	0.07
p-Diethylbenzene	< 0.15
p-Ethyltoluene	< 0.27
Styrene	< 0.15
Tetrachloroethylene	< 0.15
Tetrahydrofuran	< 1.5
Toluene	0.41
trans-1,2-Dichloroethylene	< 0.04
trans-1,3-Dichloropropylene	< 0.15
trans-2-Butene	0.43
trans-2-Pentene	0.38
Trichloroethylene	< 0.15
Vinyl acetate	< 1.5
Vinyl chloride	< 0.08

Sample ID: 16090349-005

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
 VOC/Bonnyville/Sep 27,
 2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Sep 27, 2016

Sampler S/N: n/a
Canister ID: 35672
Canister Installation Date/Time: September 22, 2016 / 09:47
Canister Removal Date/Time: September 28, 2016 / 12:00

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Sep 27, 2016	05:50	n/a	n/a

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
-27.2	-5.0

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister



Technician Signature: Alex Yakupov

Date: September 28, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: September 27, 2016
Canister ID: S5672

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	0.14
1,1,2-Tetrachloroethane	0.05
1,1,2-Trichloroethane	0.04
1,1-Dichloroethane	0.05
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	0.48
1,2,4-Trichlorobenzene	< 1.2
1,2,4-Trimethylbenzene	1.71
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	0.07
1,2-Dichloroethane	0.07
1,2-Dichloropropane	0.06
1,3,5-Trimethylbenzene	0.66
1,3-Butadiene	0.19
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.6
1,4-Dioxane	< 0.6
1-Butene	0.36
1-Hexene	0.07
1-Pentene	0.08
2,2,4-Trimethylpentane	0.23
2,2-Dimethylbutane	0.08
2,3,4-Trimethylpentane	0.10
2,3-Dimethylbutane	0.17
2,3-Dimethylpentane	0.23
2,4-Dimethylpentane	0.12
2-Methylheptane	0.25
2-Methylhexane	0.37
2-Methylpentane	0.51
3-Methylheptane	0.20
3-Methylhexane	0.25
3-Methylpentane	0.33
Acetone	2.9
Acrolein	< 0.4
Benzene	0.40
Benzyl chloride	< 0.6
Bromodichloromethane	0.07
Bromoform	0.03
Bromomethane	0.05
Carbon disulfide	0.19
Carbon tetrachloride	0.16
Chlorobenzene	0.04
Chloroethane	0.04
Chloroform	0.08
Chloromethane	0.46
cis-1,2-Dichloroethene	0.05
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.09
cis-2-Pentene	0.08
Cyclohexane	0.20
Cyclopentane	0.12
Dibromochloromethane	0.04
Ethanol	4.1
Ethyl acetate	< 0.6
Ethylbenzene	0.33
Freon-11	0.34

Volatile Organics Data Results (NMHC Canister System)

Date: September 27, 2016
Canister ID: S5672

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	0.07
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.73
Isobutane	1.72
Isopentane	1.48
Isoprene	0.08
Isopropyl alcohol	< 0.6
Isopropylbenzene	0.09
m,p-Xylene	1.29
m-Diethylbenzene	0.36
m-Ethyltoluene	0.71
Methyl butyl ketone	< 0.73
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	0.05
Methylcyclohexane	0.24
Methylcyclopentane	0.34
Methylene chloride	< 0.4
n-Butane	2.93
n-Decane	2.37
n-Dodecane	< 0.6
n-Heptane	0.32
n-Hexane	0.64
n-Nonane	2.26
n-Octane	0.46
n-Pentane	1.0
n-Propylbenzene	0.20
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.38
o-Xylene	0.66
p-Diethylbenzene	0.68
p-Ethyltoluene	0.41
Styrene	0.13
Tetrachloroethylene	0.37
Tetrahydrofuran	< 0.6
Toluene	1.18
trans-1,2-Dichloroethylene	0.04
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	0.11
trans-2-Pentene	0.11
Trichloroethylene	0.07
Vinyl acetate	< 0.6
Vinyl chloride	0.05

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: September 8, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 8:50	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 13:45	Cal Gas Expiry Date: December 2, 2023
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000
Serial Number: 467	As Found C.F.: 0.999
Last Calibration Date: August 3, 2016	New C.F.: 1.000
Previous C.F.: 1.000	

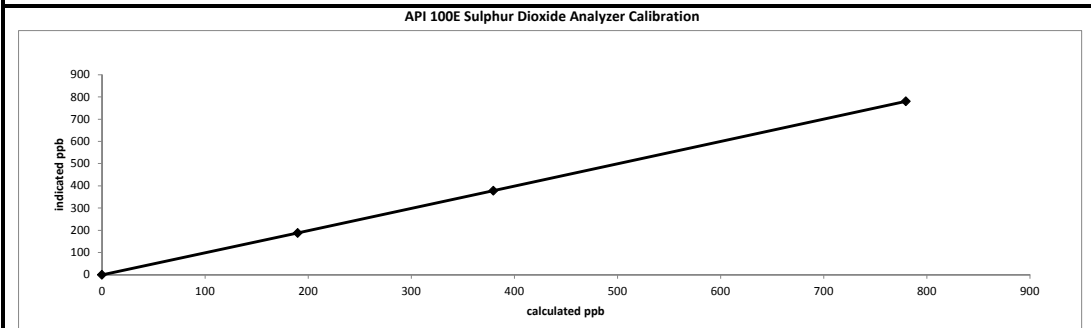
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>	Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point		Sulphur Dioxide Standard Calibration Points							
High		780							
Mid		380							
Low		190							
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL119346									
Cal Gas Conc. (ppm): 50.0									

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	5000	0.00	5000	0.0	0.8	N/A		
as found high	4924	78.00	5002	779.7	781.0	0.999		
adjusted zero	5000	0.00	5000	0.0	0.0	n/a		
adjusted high	4924	78.00	5002	779.7	780.0	1.000		
mid	4966	38.00	5004	379.7	378.0	1.004		
low	4982	19.00	5001	190.0	188.0	1.010		
calibrator zero	5000	0.00	5000	0.0	0.0	n/a		
Average C.F.=						1.005		

Linear Regression/Calibration Results:

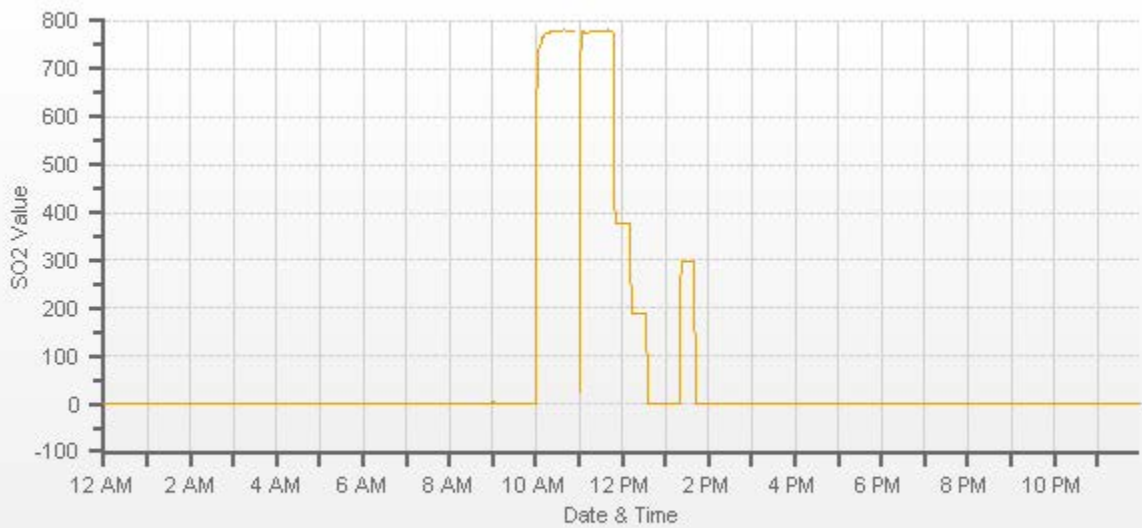
Correlation Coefficient = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale) = 0.12%	.95-1.05
% change in C.F. from last cal = 0.07%	± 3% F.S.
	± 10%



As found:	As left:
SLOPE: 0.984	SLOPE: 0.983
OFFSET: 123.5	OFFSET: 124.7
HVPS: 524	HVPS: 524
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 31.8	BOX TEMP: 33.8
PMT TEMP: 8.1	PMT TEMP: 8.1
IZS TEMP: 45.0	IZS TEMP: 45.0
PRES: 24.7	PRES: 24.7
SAMP FL: 619	SAMP FL: 619
NORM PMT: 124.7	NORM PMT: 124.4
UV LAMP: 2801.5	UV LAMP: 2759.8
LAMP RATIO: 100.8	LAMP RATIO: 99.5
STR. LGT 60.8	STR. LGT 61.3
DRK PMT: 15.0	DRK PMT: 15.8
DRK LMP: 2.6	DRK LMP: 2.7
Internal Span: 292	Internal Span: 298

Comments:

Sample inlet filter changed. 10:55 - power issue. Adjusted High Point started again at 11:15.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: September 8, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 8:50	Performed By/Reviewer: Alex Yakupov Tom Bourque
End Time 24 hr. (mst): 14:01	Cal Gas Expiry Date: July 15, 2017
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 100
Serial Number: 510	As Found C.F.: 0.995
Last Calibration Date: August 4, 2016	New C.F.: 1.000
Previous C.F.: 1.000	

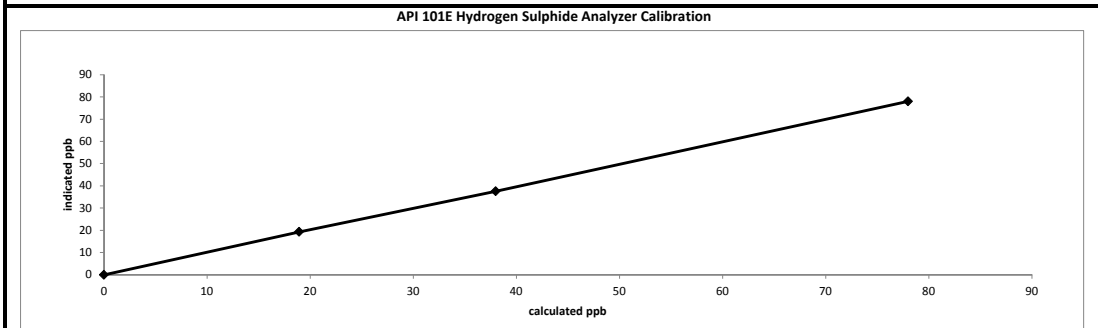
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point		Hydrogen Sulphide Standard Calibration Points							
High		78							
Mid		38							
Low		19							
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: LL36837									
Cal Gas Conc. (ppm): 10.0									

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	7500	0.00	7500	0.0	0.2	N/A
as found high	7443	58.50	7502	78.0	78.6	0.995
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	37.6	1.011
low	7486	14.20	7500	18.9	19.3	0.981
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						0.997

Linear Regression/Calibration Results:

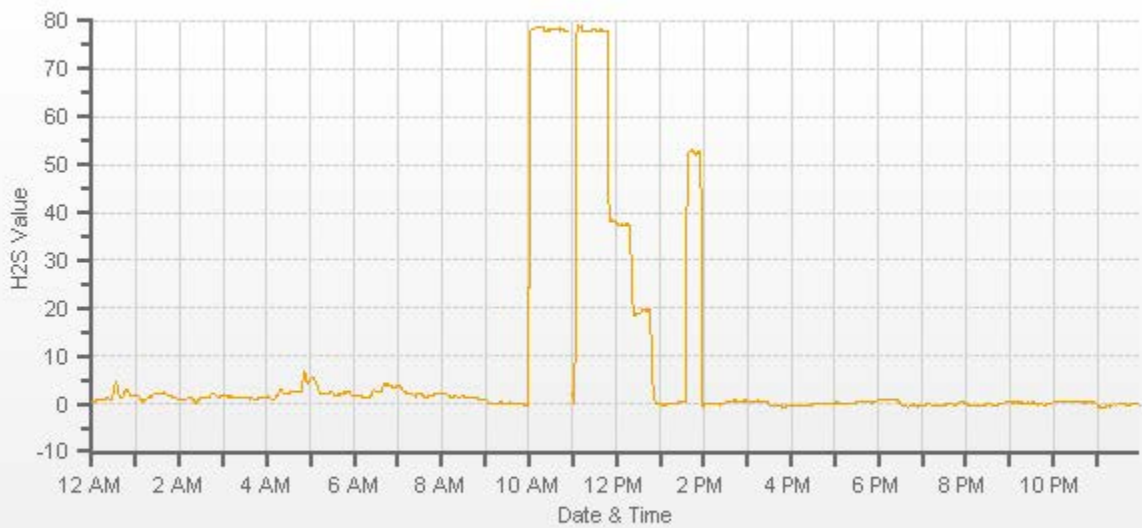
Correlation Coefficient = 1.000	LIMITS
Slope = 1.002	> or = 0.995
b (Intercept as % of full scale) = -0.06%	.95-1.05
% change in C.F. from last cal = 0.53%	± 3% F.S.
	± 10%



As found:	As left:
SLOPE: 0.987	SLOPE: 0.978
OFFSET: 30.6	OFFSET: 30.9
HVPS: 530	HVPS: 530
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 33.4	BOX TEMP: 35.6
PMT TEMP: 8.4	PMT TEMP: 8.4
IZS TEMP: 45.0	IZS TEMP: 45.0
Converter Temp: 314.6	Converter Temp: 315.2
PRES: 21.1	PRES: 21.1
SAMP FL: 550	SAMP FL: 549
UV LAMP: 3773.9	UV LAMP: 3753.6
LAMP RATIO: 99.4	LAMP RATIO: 98.5
STR. LGT: 15.1	STR. LGT: 15.1
DRK PMT: 37.5	DRK PMT: 38.8
DRK LMP: -1.7	DRK LMP: -1.6
Internal Span: 50.9	Internal Span: 52.6

Comments:

Sample inlet filter changed. 10:55 - power issue. Adjusted High Point started again at 11:15.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: September 9, 2016	Barometric Pressure: 0.941 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Parameter: CH ₄ / NMHC / THC	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 8:38 / 12:11	Performed By/Reviewer: Alex Yakupov / Tom Bourque
Calibration Method: Gas Dilution	Cal Gas Expiry Date: November 25, 2023

Analyzer:	Correction Factors:
Serial Number: 1236656107	Previous C.F.: CH ₄ = 1.005, NMHC = 1.006, THC = 1.000
Last Calibration Date: August 3, 2016	As Found C.F.: CH ₄ = 1.006, NMHC = 0.999, THC = 1.000
Range ppm: 20 CH ₄ /20 NMHC/40 THC	New C.F.: CH ₄ = 1.005, NMHC = 1.002, THC = 0.999

Calibrator:	Standard Calibration Points for Analyzer Range of 20/20/40 ppm																
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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													
Make & Model: API 700																	
Serial #: 627																	
Cal Gas Cylinder I.D. #: LL165372																	
CH₄ Cylinder Conc.: 606.0 212.0 = C ₃ H ₈ Cylinder Conc.																	
CH₄ as C₃H₈: 583.0 1189.0 = total CH ₄ equivalent																	

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

Point	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)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2000	46.00	2046	13.62	13.11	26.73	13.54	13.12	26.68	1.006	0.999	1.002
adjusted zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2000	46.00	2046	13.62	13.11	26.73	13.63	13.11	26.76	1.000	1.000	0.999
mid	2000	24.00	2024	7.19	6.91	14.10	7.18	6.90	14.07	1.001	1.002	1.002
low	2000	11.00	2011	3.31	3.19	6.50	3.32	3.20	6.51	0.998	0.997	0.999
calibrator zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a

Average C.F. = CH₄: 1.000, NMHC: 0.999, THC: 1.000

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	1.001	.95-1.05
b (Intercept as % of full scale) =	0.00%	0.01%	-0.02%	± 3% F.S.
% change in C.F. from last cal =	-0.12%	0.69%	0.30%	± 10%

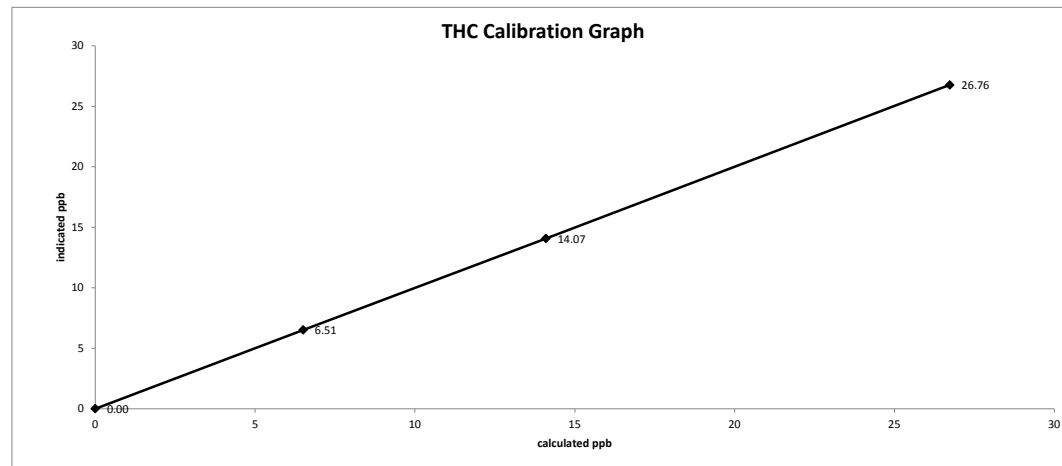
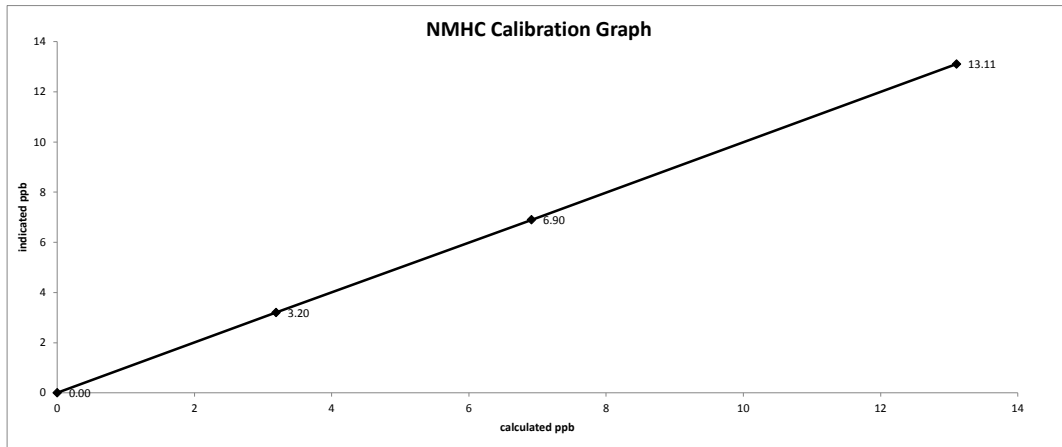
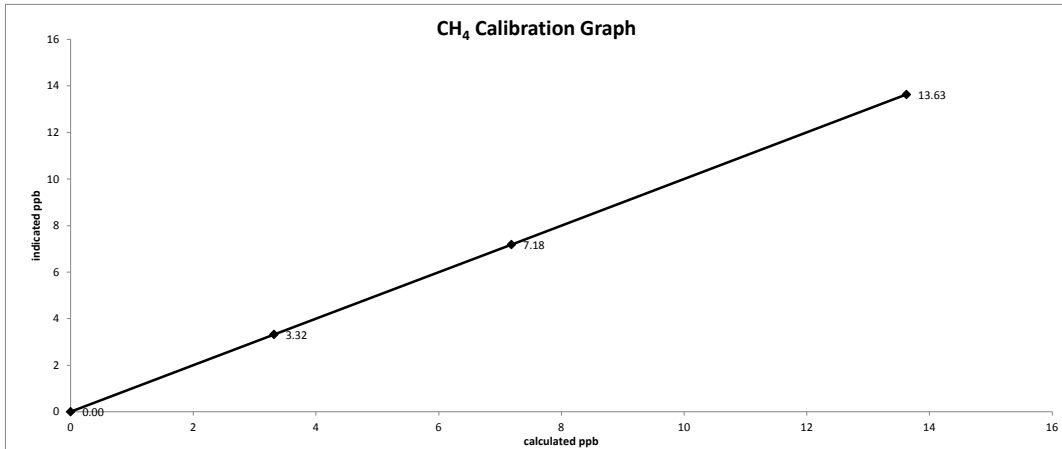
Interface Board Voltages:	Bias Supply: -292.9	Calibration History cnt'd:	NM Peak Area: n/a
Temperatures:	Detector Oven: 175.0	Crucial Settings:	Methane Start: n/a
	Filter: 175.0		Methane End: n/a
	Column Oven: 75.0		Backflush: n/a
	Internal: 32.2		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 2300 60	Run History>1:	NMHC End: n/a
	Fuel: 170 50	Date: Septemeber 9, 2016	
	Span Gas: 1300 22	Time: 09:02	
	Zero Air Generator: 47	CH₄ PK HT: 0	
Internal Pressures:	Carrier: 31.1	CH₄ RT: 8.0	
	Fuel: 40.3	CH₄ Baseline: 2294	
	Air: 32.4	CH₄ LOD: 70	
FID Status:	Status: LIT	CH₄ SD: 23	
	Counts: 26946	CH₄ CONC: 0.00	
	Flame: 378.6	NM PK HT: 0	
	Det Base: 175.0	NM Peak Area: 0	
Flame and Power Stats:	Last Power On: August 3, 2016	NM CONC: 0.00	
	Flameouts: 2	NM Base Start: 2286	
	Det Oven at Start: 169.0	NM Base End: 2306	
	Col Oven at Start: 74.5	NM LOD: 8	
Calibration History:	Time: n/a (Jan 01, 1970)	NM Start IDX: 4	
	Type: n/a	NM End IDX: 69	
	Status: n/a	NM Max Slope: 9.4e-01	
	Check/Adjust: n/a	NM Min Slope: -7.7e-01	
	CH₄ Span Conc: n/a	NM PT Count: 0	
	CH₄ SP Ratio: n/a	Daily Zero/Span Values:	Previous CH₄: 9.63
	CH₄ RT: n/a		Previous NMHC: 11.33
	CH₄ PK IDX: n/a		Previous THC: 20.97
	CH₄ PK HT: n/a		New CH₄: 9.76
	NM Span Conc: n/a		New NMHC: 11.25
	NM SP Ratio: n/a		New THC: 20.94

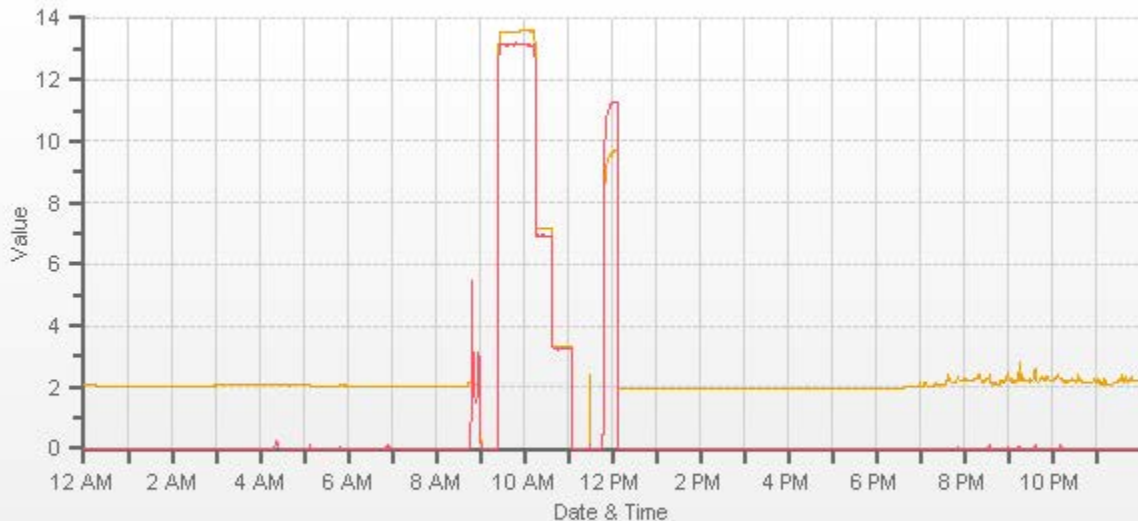
Comments:

No ZERO required/adjustment made. Sample flow measured = 1.198 l/p. Sample inlet filter changed.

Date: September 9, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 8:38 / 12:11
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution





CH4[ppm] NMHC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: September 8, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 8:50 / 15:49	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Tom Bourque
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: Serial Number: 593 Last Calibration Date: August 9, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>1.027</td> <td>1.001</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.002</td> <td>1.002</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>1.027</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	1.027	1.001	NO ₂ =	1.000	1.002	1.002	NOx =	1.001	1.027	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	1.027	1.001														
NO ₂ =	1.000	1.002	1.002														
NOx =	1.001	1.027	1.000														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.1	0.1	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	759.0	759.0	1.027	1.027
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	779.0	780.0	1.001	1.000
mid	4966	38.00	5004	379.7	379.7	379.0	379.0	1.002	1.002
low	4982	19.00	5001	190.0	190.0	189.0	189.0	1.005	1.005
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.002

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	4924	78.00	5002	0.0	780.0	781.0	1.0	0.0	1.0	
as found high NO2	4799	78.00	4877	490.0	289.0	780.0	491.0	491.0	490.0	1.002
adjusted high NO2	4799	78.00	4877	490.0	289.0	780.0	491.0	491.0	490.0	1.002
gpt mid	4799	78.00	4877	275.0	508.0	785.0	277.0	272.0	276.0	0.986
gpt low	4799	78.00	4877	100.0	686.0	785.0	99.0	94.0	98.0	0.959
Average NO ₂ C.F.=										0.982

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	0.999	1.005	.95-1.05
b (Intercept as % of full scale) =	-0.04%	-0.06%	0.31%	± 3% F.S.
% change in C.F. from last cal =	-2.64%	-2.64%	-0.20%	± 10%
NO2 converter efficiency			0.98	0.96 to 1.04

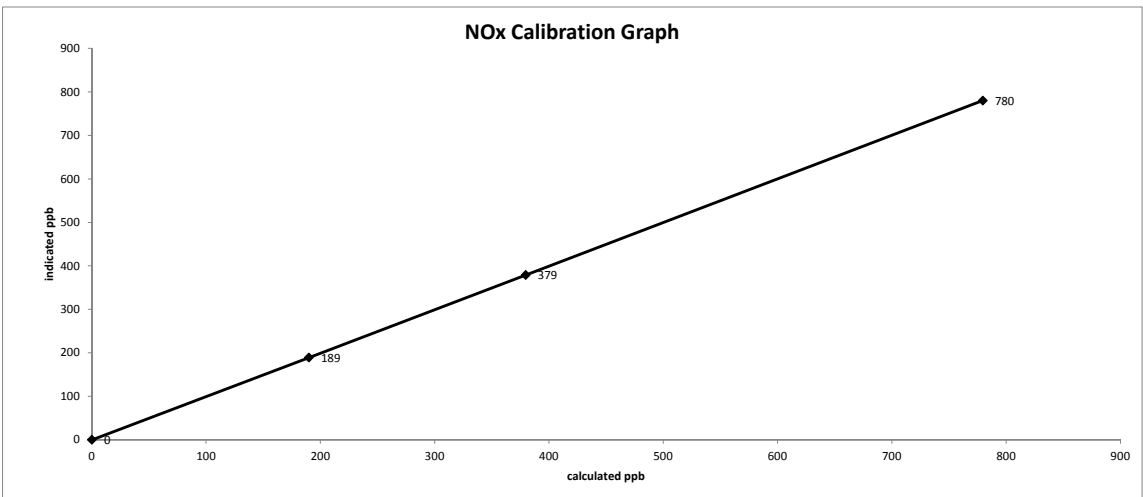
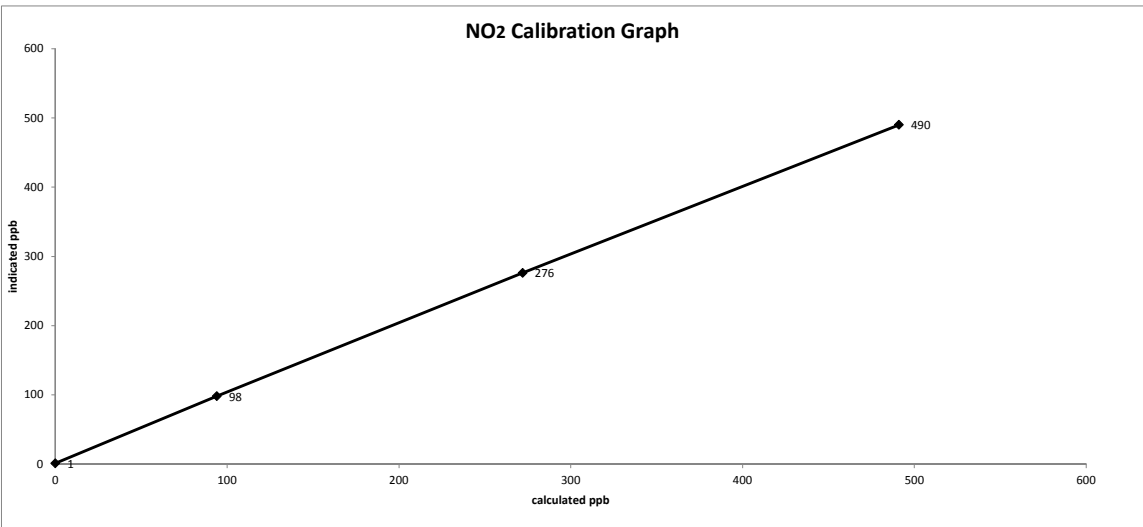
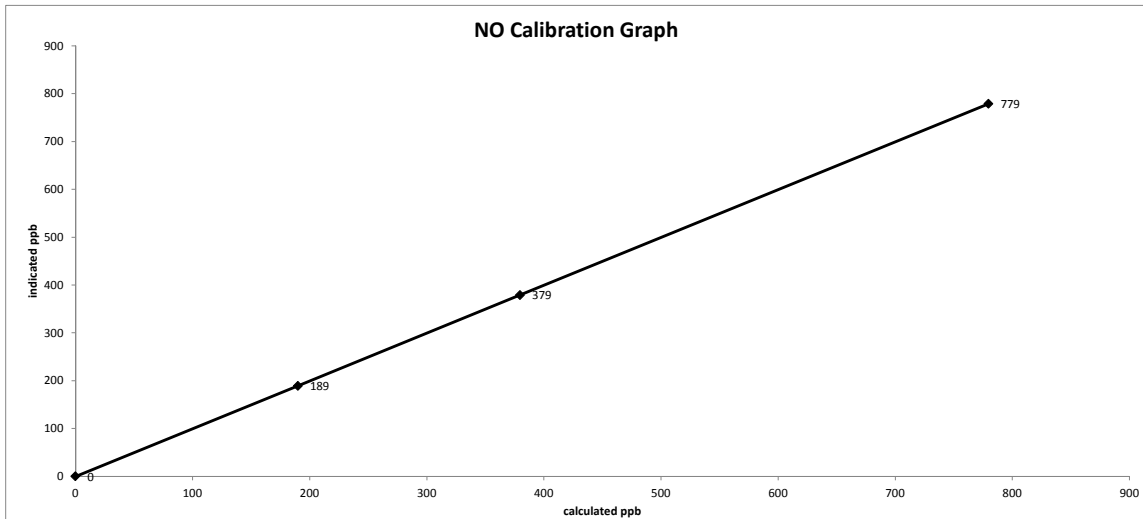
As found:	As left:
NOx SLOPE: 1.034	NOx SLOPE: 1.061
NOx OFFS: 1.9	NOx OFFS: 0.7
NO SLOPE: 1.035	NO SLOPE: 1.060
NO OFFS: -0.4	NO OFFS: 1.3
SAMP FLW: 475	SAMP FLW: 475
OZONE FL: 62	OZONE FL: 62
PMT: 6.6	PMT: 8.5
NORM PMT: 0.2	NORM PMT: 1.8
AZERO: 7.6	AZERO: 7.8
HVPS: 658	HVPS: 658
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.6	BOX TEMP: 32.5
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 40.1	IZS TEMP: 40.3
MOLY TEMP: 316.1	MOLY TEMP: 315.1
RCEL: 5.4	RCEL: 5.4
SAMP: 26.3	SAMP: 27.1
Internal Span NO: 6	Internal Span NO: 6.1
Internal Span NO2: 272	Internal Span NO2: 284
Internal Span NOx: 277	Internal Span NOx: 290

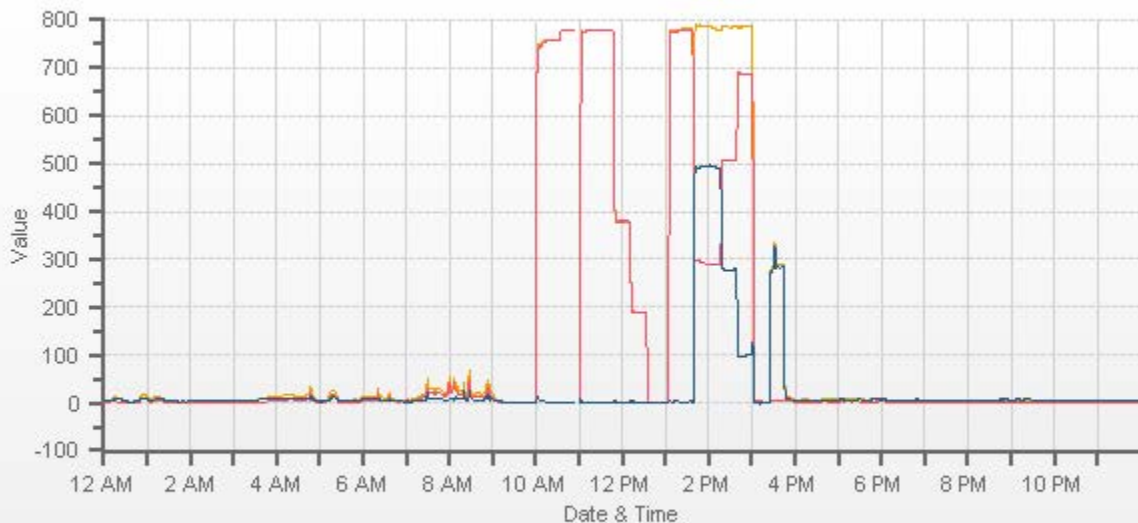
Comments:

Sample inlet filter changed. No NO2 adjustment made. 10:55 - power issue. Adjusted High Point started again at 11:15.

Date: September 8, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 8:50 / 15:49
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	September 9, 2016	Barometric Pressure:	0.941 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Bonnyville - AER	Weather Conditions:	Mainly sunny
Start/End Time 24 hr. (mst):	8:38 / 12:11	Calibration Purpose:	routine monthly
Ozone Calibration Method:	Varying UV Lamp Power	Performed By/Reviewer:	Alex Yakupov Tom Bourque
G.P.T. Date:	n/a-done by Varying UV Lamp Power	Cal Gas Expiry Date:	n/a

Analyzer:	Serial Number:	1002240372	Ozone Range ppb:	500
	Last Calibration Date:	August 3, 2016	As Found C.F.:	1.000
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Point	AMD Required Range of Ozone Calibration Points
	Make & Model:	SABIO 2010 D	High	300-400 ppb
	Serial #:	11900613	Mid	150-200 ppb
	Cal Gas Cylinder I.D. #:	n/a	Low	50-75 ppb

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

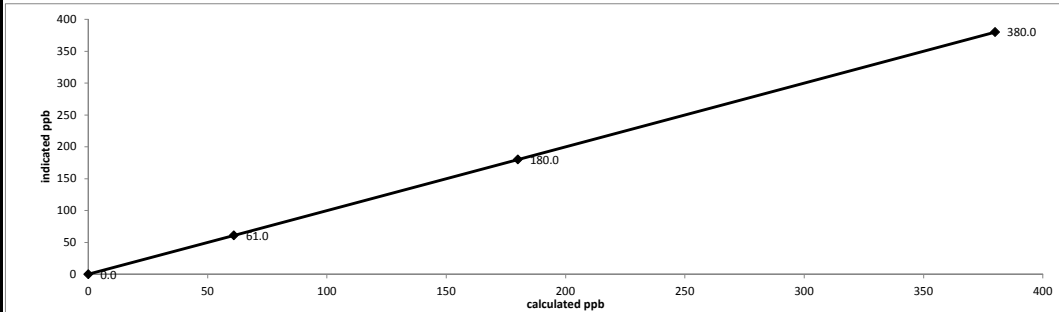
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	380.0	1.000
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	61.0	61.0	61.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a

Average C.F. = 1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale) =	0.00%		± 3% F.S.
% change in C.F. from last cal =	0.00%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

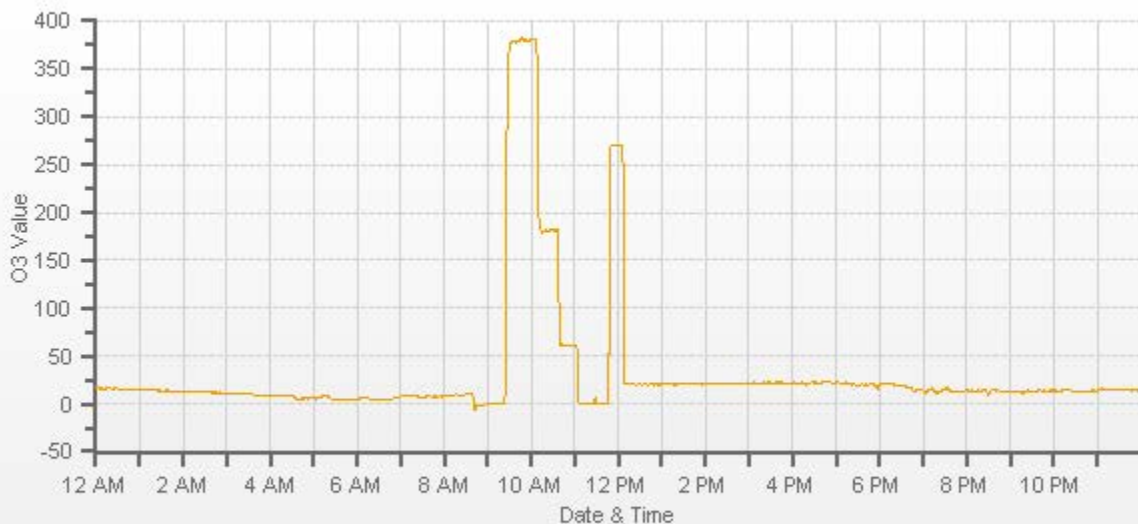
- O3 Bkg: -0.3
- O3 Coef: 0.990
- Photo Lamp: 14.2
- O3 Lamp: 5.8
- Bench: 29.1
- Bench Lamp: 54.0
- O3 Lamp: 68.1
- Pressure: 703.9
- Cell A lpm: 0.752
- Cell B lpm: 0.764
- O3 ppb: -0.1
- Cell A ppb: -0.1
- Cell B ppb: -0.1
- Cell A int: 85814
- Cell B int: 83508
- Internal Span: 268

As left:

- O3 Bkg: -0.3
- O3 Coef: 0.990
- Photo Lamp: 14.2
- O3 Lamp: 5.8
- Bench: 28.7
- Bench Lamp: 54.1
- O3 Lamp: 68.1
- Pressure: 703.6
- Cell A lpm: 0.753
- Cell B lpm: 0.764
- O3 ppb: 0.1
- Cell A ppb: 1.1
- Cell B ppb: -0.9
- Cell A int: 85850
- Cell B int: 83551
- Internal Span: 270

Comments:

Sample inlet filter changed. No ZERO adjustment required/made. No High Point adjustment required/made.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 9, 2016
 Company: LICA
 Station Name/Location: Bonnyville
 Previous Audit Date: August 23, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 11:32
 End Time (mst): 12:33
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 46.71
 Ko Factor: 15635 As Left Filter Loading %: 17.56
 Ambient Temperature °C: 15.35 As Found Noise: 0.005
 Ambient Pressure atm: 0.941 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.35
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 2, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.42	0.00	-0.42
	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	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.42	0.00	-0.42
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>15.4</u>	1405F pressure atm: <u>0.941</u>
reference temperature °C: <u>15.7</u>	reference pressure: <u>0.941</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
1405F temperature °C: <u>15.7</u>	1405F pressure atm: <u>0.941</u>
reference temperature °C: <u>15.7</u>	reference pressure: <u>0.941</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>16.75</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.08</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>16.75</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.08</u>

K_o Audit:

Last K_o audit date: August 4, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

TEOM Sample filter and 47 mm FDMS filter changed. Sample inlet head PM 2.5/10 cleaned. Flows audited.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: September 22, 2016
 Company: LICA
 Station Name/Location: Bonnyville AER
 Previous Audit Date: September 9, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Tom Bourque
 Start Time (mst): 10:44
 End Time (mst): 11:47
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 22.67
 Ko Factor: 15635 As Left Filter Loading %: 17.77
 Ambient Temperature °C: 16.72 As Found Noise: 0.002
 Ambient Pressure atm: 0.942 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.33
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 2, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.42	0.00	-0.42
	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	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.42	0.00	-0.42
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>16.7</u>	1405F pressure atm: <u>0.942</u>
reference temperature °C: <u>16.7</u>	reference pressure: <u>0.943</u>
difference °C: <u>0.0</u>	difference: <u>-0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>16.7</u>	1405F pressure atm: <u>0.943</u>
reference temperature °C: <u>16.7</u>	reference pressure: <u>0.943</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.78</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>0.11</u>

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.76</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.09</u>

K_o Audit:

Last K_o audit date: August 4, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

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

Flows were audited and adjusted.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Limin Li</u>
Location:	<u>Bonnyville (in Calgary shop)</u>	Reason:	<u>Annual maintenance</u>
Audit Date:	<u>26-Jan-16</u>	Start Time (mst):	<u>11:00</u>
Previous Audit Date:	<u>NA</u>	End Time (mst):	<u>15:00</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.032	0.032	-
1000	17.6	17.66	17.64	1.00
2000	35.28	35.3	35.29	1.00
3000	52.92	52.99	52.99	1.00
4000	70.56	70.66	70.65	1.00
5000	88.2	88.35	88.33	1.00
6000	105.84	106	106	1.00
7000	123.48	123.7	123.7	1.00
8000	141.12	141.4	141.3	1.00
9000	158.76	159.1	159.1	1.00
10000	176.4	176.7	176.7	1.00
Average Correction Factor:				1.00

Wind Direction

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.5	NA
45	44.9	1.00
90	92.0	0.98
135	136.5	0.99
180	180.6	1.00
225	224.4	1.00
270	270.3	1.00
315	312.2	1.01
359	355.0	1.01
Average Correction Factor:		1.00

Remarks: Annual maintenance. Changed 05163PG, 05124VG bearings. 05131D, 05133B & 05135D

Audit Performed by: Limin Li

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</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>77.5</u>	Pt. #2	<u>37.8</u>	Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NO _x	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO2 - Flows Not Manually Measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas: Make/Model: <u>Thermo146i</u> Serial Number: <u>1809</u> Last Verification Date: <u>February 2, 2016</u> Gas Type: <u>SO2</u> Conc. <u>98.07</u> Cylinder Number: <u>CAL016625</u>	Flow Measurement Device: Make/Model: <u>Bios DC-2</u> Serial Number: <u>Bios D</u> Temp. °C: <u>24.5</u> B.P. <u>702mmHg</u>
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Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 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.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

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: December 16, 2014
 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

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
Operator Signature: _____

Date: January 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
Make/Model Thermo 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.014 **Range:** 1.0
Last Calibration: **Date:** 02-Feb-16 **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
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NO_x
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton **Date:** February 2, 2016
Operator Signature: [Signature] **Location:** McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sep 03, 2016	S5602	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	11-Sep-16
16090076-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-003	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	1-Pentene	I	0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2,2,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sep 03, 2016	S5602	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	11-Sep-16
16090076-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Acetone		1.6	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-003	Benzene	I	0.04	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Chloroform	I	0.12	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Chloromethane	I	0.17	ppbv	0.02	AC-058	11-Sep-16
16090076-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sep 03, 2016	S5602	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Ethanol		0.9	ppbv	0.3	AC-058	11-Sep-16
16090076-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Freon-11	I	0.30	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Freon-113	I	0.09	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Freon-114	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Freon-12	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	11-Sep-16
16090076-003	Isobutane	I	0.13	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Isopentane	I	0.20	ppbv	0.03	AC-058	11-Sep-16
16090076-003	Isoprene	I	0.09	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	11-Sep-16
16090076-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	11-Sep-16
16090076-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-003	Methylcyclohexane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sep 03, 2016	S5602	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	11-Sep-16
16090076-003	n-Butane		0.34	ppbv	0.03	AC-058	11-Sep-16
16090076-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	11-Sep-16
16090076-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	n-Heptane	I	0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	n-Hexane	I	0.03	ppbv	0.01	AC-058	11-Sep-16
16090076-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	11-Sep-16
16090076-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	o-Xylene	I	0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	11-Sep-16
16090076-003	Toluene	I	0.03	ppbv	0.01	AC-058	11-Sep-16
16090076-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16
16090076-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	11-Sep-16
16090076-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sep 03, 2016	S5602	Ambient Air	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090076-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	11-Sep-16
16090076-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Sep 9, 2016	14719	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	18-Sep-16
16090151-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	18-Sep-16
16090151-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	1-Butene	I	0.06	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1-Hexene	I	0.03	ppbv	0.02	AC-058	18-Sep-16
16090151-001	1-Pentene	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2,2,4-Trimethylpentane	I	0.08	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	18-Sep-16
16090151-001	2,3-Dimethylpentane	I	0.05	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 9, 2016	14719	Ambient Air	09-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-001	2,4-Dimethylpentane	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2-Methylheptane	I	0.03	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	2-Methylpentane	I	0.11	ppbv	0.01	AC-058	18-Sep-16
16090151-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	3-Methylhexane	I	0.13	ppbv	0.02	AC-058	18-Sep-16
16090151-001	3-Methylpentane	I	0.07	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Acetone		2.6	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	18-Sep-16
16090151-001	Benzene	I	0.07	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Chloroform	I	0.03	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Chloromethane		0.49	ppbv	0.02	AC-058	18-Sep-16
16090151-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Cyclohexane	I	0.04	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 9, 2016	14719	Ambient Air	09-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-001	Cyclopentane	I	0.03	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Ethanol		2.0	ppbv	0.3	AC-058	18-Sep-16
16090151-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Freon-11	I	0.29	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Freon-113	I	0.08	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Freon-114	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Freon-12		0.49	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	18-Sep-16
16090151-001	Isobutane		0.42	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Isopentane		0.50	ppbv	0.03	AC-058	18-Sep-16
16090151-001	Isoprene	I	0.05	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Isopropyl alcohol		0.7	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	m,p-Xylene	I	0.06	ppbv	0.03	AC-058	18-Sep-16
16090151-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	18-Sep-16
16090151-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	18-Sep-16
16090151-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	18-Sep-16
16090151-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-001	Methylcyclohexane	I	0.17	ppbv	0.01	AC-058	18-Sep-16
16090151-001	Methylcyclopentane	I	0.11	ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Sep 9, 2016	14719	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-001	Methylene chloride		1.0	ppbv	0.3	AC-058	18-Sep-16
16090151-001	n-Butane		0.53	ppbv	0.03	AC-058	18-Sep-16
16090151-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	18-Sep-16
16090151-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	n-Heptane	I	0.24	ppbv	0.01	AC-058	18-Sep-16
16090151-001	n-Hexane		2.21	ppbv	0.01	AC-058	18-Sep-16
16090151-001	n-Octane	I	0.03	ppbv	0.02	AC-058	18-Sep-16
16090151-001	n-Pentane	I	0.3	ppbv	0.1	AC-058	18-Sep-16
16090151-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-001	n-Nonane	I	0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	o-Xylene	I	0.02	ppbv	0.01	AC-058	18-Sep-16
16090151-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Sep-16
16090151-001	Toluene	I	0.12	ppbv	0.01	AC-058	18-Sep-16
16090151-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16
16090151-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Sep-16
16090151-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Sep 9, 2016	14719	Ambient Air	09-Sep-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090151-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	18-Sep-16
16090151-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sept 15, 2011	2529	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Sep-16
16090250-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Sep-16
16090250-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-003	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	1-Butene	I	0.10	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	1-Pentene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	2,3-Dimethylpentane	I	0.02	ppbv	0.02	AC-058	25-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sept 15, 2011	2529	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	2-Methylpentane	I	0.04	ppbv	0.01	AC-058	25-Sep-16
16090250-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Acetone		3.9	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-003	Benzene	I	0.04	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Chloromethane		0.49	ppbv	0.02	AC-058	25-Sep-16
16090250-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Cyclohexane	I	0.02	ppbv	0.02	AC-058	25-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sept 15, 2011	2529	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Ethanol		3.1	ppbv	0.3	AC-058	25-Sep-16
16090250-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Freon-11		0.31	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Freon-113	I	0.07	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Freon-114	I	0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Freon-12		0.59	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Sep-16
16090250-003	Isobutane		0.70	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Isopentane	I	0.15	ppbv	0.03	AC-058	25-Sep-16
16090250-003	Isoprene	I	0.15	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	25-Sep-16
16090250-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Sep-16
16090250-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Sep-16
16090250-003	Methyl ethyl ketone		0.4	ppbv	0.3	AC-058	25-Sep-16
16090250-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Sep-16
16090250-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Sep-16
16090250-003	Methylcyclohexane	I	0.03	ppbv	0.01	AC-058	25-Sep-16
16090250-003	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	25-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sept 15, 2011	2529	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Sep-16
16090250-003	n-Butane	I	0.27	ppbv	0.03	AC-058	25-Sep-16
16090250-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Sep-16
16090250-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	n-Heptane	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	n-Hexane	I	0.03	ppbv	0.01	AC-058	25-Sep-16
16090250-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	25-Sep-16
16090250-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Sep-16
16090250-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Sep-16
16090250-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Sep-16
16090250-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	o-Xylene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Sep-16
16090250-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Sep-16
16090250-003	Toluene	I	0.06	ppbv	0.01	AC-058	25-Sep-16
16090250-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Sep-16
16090250-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-003	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	25-Sep-16
16090250-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16

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

Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Sept 15, 2011	2529	Ambient Air	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Sep-16
16090250-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16

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

Date: October-14-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 21, 2016	17121	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Sep-16
16090313-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	26-Sep-16
16090313-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	1-Butene	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	1-Pentene	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2,2,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2,3-Dimethylbutane	I	0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	26-Sep-16

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Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 21, 2016	17121	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-003	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2-Methylhexane	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-003	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	26-Sep-16
16090313-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	3-Methylhexane	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-003	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Acetone		1.9	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-003	Benzene	I	0.07	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Carbon disulfide	I	0.18	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Chloroform	I	0.03	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Chloromethane		0.40	ppbv	0.02	AC-058	26-Sep-16
16090313-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Cyclohexane	I	0.04	ppbv	0.02	AC-058	26-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 21, 2016	17121	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Ethanol		1.5	ppbv	0.3	AC-058	26-Sep-16
16090313-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Freon-11		0.32	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Freon-113	I	0.08	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Freon-12		0.61	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Sep-16
16090313-003	Isobutane	I	0.23	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Isopentane	I	0.24	ppbv	0.03	AC-058	26-Sep-16
16090313-003	Isoprene	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	m,p-Xylene	I	0.06	ppbv	0.03	AC-058	26-Sep-16
16090313-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	26-Sep-16
16090313-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Sep-16
16090313-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	26-Sep-16
16090313-003	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	26-Sep-16
16090313-003	Methylcyclopentane	I	0.05	ppbv	0.02	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 21, 2016	17121	Ambient Air	21-Sep-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	26-Sep-16
16090313-003	n-Butane		0.38	ppbv	0.03	AC-058	26-Sep-16
16090313-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	26-Sep-16
16090313-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	n-Heptane	I	0.03	ppbv	0.01	AC-058	26-Sep-16
16090313-003	n-Hexane	I	0.05	ppbv	0.01	AC-058	26-Sep-16
16090313-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	n-Pentane	I	0.1	ppbv	0.1	AC-058	26-Sep-16
16090313-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	26-Sep-16
16090313-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Sep-16
16090313-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	26-Sep-16
16090313-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	o-Xylene	I	0.02	ppbv	0.01	AC-058	26-Sep-16
16090313-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	26-Sep-16
16090313-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	26-Sep-16
16090313-003	Toluene	I	0.08	ppbv	0.01	AC-058	26-Sep-16
16090313-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-003	trans-2-Butene	I	0.01	ppbv	0.01	AC-058	26-Sep-16
16090313-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	26-Sep-16
16090313-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Sep 21, 2016	17121	Ambient Air	21-Sep-16	0:00
DESCRIPTION:	Bonnyville-AER			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	26-Sep-16
16090313-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	26-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 27, 2016	S5683	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Oct-16
16090349-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Oct-16
16090349-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	1-Butene	I	0.05	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	1-Pentene	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2,2,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	03-Oct-16
16090349-001	2,3-Dimethylpentane	I	0.05	ppbv	0.02	AC-058	03-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 27, 2016	S5683	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-001	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2-Methylhexane	I	0.06	ppbv	0.01	AC-058	03-Oct-16
16090349-001	2-Methylpentane	I	0.11	ppbv	0.01	AC-058	03-Oct-16
16090349-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	3-Methylhexane	I	0.06	ppbv	0.02	AC-058	03-Oct-16
16090349-001	3-Methylpentane	I	0.07	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Acetone		2.2	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-001	Benzene	I	0.06	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Bromomethane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Carbon disulfide	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Chloroform	I	0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Chloromethane		0.45	ppbv	0.02	AC-058	03-Oct-16
16090349-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Cyclohexane	I	0.05	ppbv	0.02	AC-058	03-Oct-16

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Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 27, 2016	S5683	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-001	Cyclopentane	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Ethanol		1.6	ppbv	0.3	AC-058	03-Oct-16
16090349-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Freon-11		0.31	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Freon-113	I	0.08	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Freon-12		0.63	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Oct-16
16090349-001	Isobutane		0.58	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Isopentane		0.47	ppbv	0.03	AC-058	03-Oct-16
16090349-001	Isoprene	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	m,p-Xylene	I	0.06	ppbv	0.03	AC-058	03-Oct-16
16090349-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Oct-16
16090349-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Oct-16
16090349-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Oct-16
16090349-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-001	Methylcyclohexane	I	0.07	ppbv	0.01	AC-058	03-Oct-16
16090349-001	Methylcyclopentane	I	0.08	ppbv	0.02	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 27, 2016	S5683	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Oct-16
16090349-001	n-Butane		0.92	ppbv	0.03	AC-058	03-Oct-16
16090349-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Oct-16
16090349-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	n-Heptane	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-001	n-Hexane	I	0.10	ppbv	0.01	AC-058	03-Oct-16
16090349-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	n-Pentane	I	0.3	ppbv	0.1	AC-058	03-Oct-16
16090349-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Oct-16
16090349-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Oct-16
16090349-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Oct-16
16090349-001	n-Nonane	I	0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	o-Xylene	I	0.03	ppbv	0.01	AC-058	03-Oct-16
16090349-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Oct-16
16090349-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-001	Toluene	I	0.10	ppbv	0.01	AC-058	03-Oct-16
16090349-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16
16090349-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Oct-16
16090349-001	trans-2-Pentene	I	0.02	ppbv	0.02	AC-058	03-Oct-16
16090349-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Sep 27, 2016	S5683	Ambient Air	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Oct-16
16090349-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	October-14-16	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@albertainnovates.ca

PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 03, 2016	P13-02	Air Filter	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-004	1-Methylnaphthalene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	2-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Acenaphthylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Anthracene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Fluorene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Naphthalene		0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Phenanthrene		0.09	ug/puf	0.01	NA-017	28-Sep-16

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

Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 03, 2016	P13-02	Air Filter	03-Sep-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090076-004	Pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090076-004	Retene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16

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Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 9, 2016	9801	Air Filter	09-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-002	1-Methylnaphthalene		0.02	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	2-Methylnaphthalene		0.09	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Acenaphthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Acenaphthylene		0.16	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Anthracene		0.08	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(c)phenanthrene		0.06	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Chrysene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Fluoranthene		0.08	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Fluorene		0.10	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Naphthalene		0.06	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Phenanthrene		0.41	ug/puf	0.01	NA-017	28-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 9, 2016	9801	Air Filter	09-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090151-002	Pyrene		0.05 ug/puf	0.01	NA-017	28-Sep-16
16090151-002	Retene		0.02 ug/puf	0.01	NA-017	28-Sep-16

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

Date: October 12, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/Sept 15, 2016	TE07	Air Filter	15-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-004	1-Methylnaphthalene		0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	2-Methylnaphthalene		0.08 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Acenaphthene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Acenaphthylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Acridine	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Anthracene		0.04 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(a)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(e)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Benzo(ghi)perylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Chrysene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Fluoranthene		0.03 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Fluorene		0.03 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Naphthalene		0.02 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Perylene		0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Phenanthrene		0.28 ug/puf	0.01	NA-017	28-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/PUF/Bonnyville/Sept 15, 2016	TE07	Air Filter	15-Sep-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-004	Pyrene		0.01 ug/puf	0.01	NA-017	28-Sep-16
16090250-004	Retene		0.05 ug/puf	0.01	NA-017	28-Sep-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 21, 2016	TE-08	Air Filter	21-Sep-16 0:00
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-004	1-Methylnaphthalene		0.04 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	2-Methylnaphthalene		0.09 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Acenaphthene		0.02 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Acenaphthylene		0.04 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Acridine	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Anthracene		0.05 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(a)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(e)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Benzo(ghi)perylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Chrysene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Fluoranthene		0.05 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Fluorene		0.07 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Naphthalene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Perylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Phenanthrene		0.20 ug/puf	0.01	NA-017	09-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Sep 21, 2016	TE-08	Air Filter	21-Sep-16	0:00
DESCRIPTION:	Bonnyville-AER			
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-004	Pyrene		0.05 ug/puf	0.01	NA-017	09-Oct-16
16090313-004	Retene		0.05 ug/puf	0.01	NA-017	09-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Sep 27, 2016	TE03	Air Filter	27-Sep-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-002	1-Methylnaphthalene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	2-Methylnaphthalene		0.07 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Acenaphthene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Acenaphthylene		0.05 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Acridine	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Anthracene		0.06 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Chrysene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Fluoranthene		0.07 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Fluorene		0.09 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Naphthalene		0.03 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Perylene	K, T, U	< 0.01 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Phenanthrene		0.22 ug/puf	0.01	NA-017	09-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Sep 27, 2016	TE03	Air Filter	27-Sep-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-002	Pyrene		0.07 ug/puf	0.01	NA-017	09-Oct-16
16090349-002	Retene		0.07 ug/puf	0.01	NA-017	09-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services		
Date:	October-14-16	Inquiries:	(780) 632 8455	E-mail:	EAS.Results@albertainnovates.ca

NMHC CANISTER SAMPLES

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID NMHC-VOC/Bonnyville/Sep 02, CANISTER ID 2522 Matrix Ambient Air Priority Normal</p> <p>DESCRIPTION: Bonnyville AER</p> <p>DATE SAMPLED: 02-Sep-16 15:55 DATE RECEIVED: 08-Sep-16</p> <p>REPORT CREATED: 12-Oct-16 REPORT NUMBER: 16090076 VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-005	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,1-Dichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	1,2,3-Trimethylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	11-Sep-16
16090076-005	1,2,4-Trichlorobenzene	K, T, U	< 1.4	ppbv	1.4	AC-058	11-Sep-16
16090076-005	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-005	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,2-Dichlorobenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-005	1,2-Dichloroethane	I	0.08	ppbv	0.02	AC-058	11-Sep-16
16090076-005	1,2-Dichloropropane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,3-Butadiene	I	0.07	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1,3-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-005	1,4-Dichlorobenzene	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	1,4-Dioxane		1.6	ppbv	0.7	AC-058	11-Sep-16
16090076-005	1-Butene	I	0.19	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sep 02, 2	2522	Ambient Air	02-Sep-16	15:55
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-005	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	1-Pentene	I	0.06	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2,2,4-Trimethylpentane	I	0.06	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2,2-Dimethylbutane	I	0.03	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2,3,4-Trimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2,3-Dimethylbutane	I	0.06	ppbv	0.03	AC-058	11-Sep-16
16090076-005	2,3-Dimethylpentane	I	0.05	ppbv	0.03	AC-058	11-Sep-16
16090076-005	2,4-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	2-Methylpentane	I	0.20	ppbv	0.02	AC-058	11-Sep-16
16090076-005	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	3-Methylhexane	I	0.07	ppbv	0.03	AC-058	11-Sep-16
16090076-005	3-Methylpentane	I	0.14	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Acetone		5.5	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Acrolein	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-005	Benzene	I	0.09	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Benzyl chloride	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Carbon disulfide	I	0.14	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Carbon tetrachloride	I	0.09	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sep 02, 2	2522	Ambient Air	02-Sep-16	15:55
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-005	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Chloromethane		0.54	ppbv	0.03	AC-058	11-Sep-16
16090076-005	cis-1,2-Dichloroethene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	cis-1,3-Dichloropropene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	cis-2-Butene	I	0.04	ppbv	0.03	AC-058	11-Sep-16
16090076-005	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Cyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Cyclopentane	I	0.04	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Dibromochloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Ethanol		6.1	ppbv	0.5	AC-058	11-Sep-16
16090076-005	Ethyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Ethylbenzene	I	0.05	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Freon-11	I	0.28	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Freon-113	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Freon-12		0.58	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Hexachloro-1,3-butadiene	K, T, U	< 0.86	ppbv	0.86	AC-058	11-Sep-16
16090076-005	Isobutane		0.78	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Isopentane		1.39	ppbv	0.05	AC-058	11-Sep-16
16090076-005	Isoprene	I	0.25	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Isopropyl alcohol		1.9	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Isopropylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	m,p-Xylene	I	0.16	ppbv	0.05	AC-058	11-Sep-16
16090076-005	m-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	m-Ethyltoluene	K, T, U	< 0.14	ppbv	0.14	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sep 02, 2	2522	Ambient Air	02-Sep-16	15:55
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-005	Methyl butyl ketone	K, T, U	< 0.86	ppbv	0.86	AC-058	11-Sep-16
16090076-005	Methyl ethyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	11-Sep-16
16090076-005	Methyl isobutyl ketone	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Methyl methacrylate	K, T, U	< 0.12	ppbv	0.12	AC-058	11-Sep-16
16090076-005	Methyl tert butyl ether	K, T, U	< 0.05	ppbv	0.05	AC-058	11-Sep-16
16090076-005	Methylcyclohexane	I	0.06	ppbv	0.02	AC-058	11-Sep-16
16090076-005	Methylcyclopentane	I	0.10	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Methylene chloride		0.6	ppbv	0.5	AC-058	11-Sep-16
16090076-005	n-Butane		1.68	ppbv	0.05	AC-058	11-Sep-16
16090076-005	n-Decane	I	0.14	ppbv	0.10	AC-058	11-Sep-16
16090076-005	n-Dodecane	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	n-Heptane	I	0.07	ppbv	0.02	AC-058	11-Sep-16
16090076-005	n-Hexane	I	0.16	ppbv	0.02	AC-058	11-Sep-16
16090076-005	n-Octane	I	0.05	ppbv	0.03	AC-058	11-Sep-16
16090076-005	n-Pentane		0.6	ppbv	0.2	AC-058	11-Sep-16
16090076-005	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	11-Sep-16
16090076-005	n-Undecane	K, T, U	< 0.9	ppbv	0.9	AC-058	11-Sep-16
16090076-005	Naphthalene	K, T, U	< 0.9	ppbv	0.9	AC-058	11-Sep-16
16090076-005	n-Nonane	I	0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	o-Ethyltoluene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	o-Xylene	I	0.05	ppbv	0.02	AC-058	11-Sep-16
16090076-005	p-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	p-Ethyltoluene	K, T, U	< 0.12	ppbv	0.12	AC-058	11-Sep-16
16090076-005	Styrene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	Tetrachloroethylene	I	0.08	ppbv	0.07	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sep 02, 2	2522	Ambient Air	02-Sep-16	15:55
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16090076	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090076-005	Tetrahydrofuran	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Toluene	I	0.31	ppbv	0.02	AC-058	11-Sep-16
16090076-005	trans-1,2-Dichloroethylene	K, T, U	< 0.02	ppbv	0.02	AC-058	11-Sep-16
16090076-005	trans-1,3-Dichloropropylene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	trans-2-Butene	I	0.03	ppbv	0.02	AC-058	11-Sep-16
16090076-005	trans-2-Pentene	I	0.05	ppbv	0.03	AC-058	11-Sep-16
16090076-005	Trichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	11-Sep-16
16090076-005	Vinyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	11-Sep-16
16090076-005	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	11-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID MHC-VOC/Bonnyville/Sept 13,	CANISTER ID S5598	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville- AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 13-Sep-16 15:45	DATE RECEIVED: 15-Sep-16		
	REPORT CREATED: 12-Oct-16	REPORT NUMBER: 16090151		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-005	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,1-Dichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	18-Sep-16
16090151-005	1,2,4-Trichlorobenzene	K, T, U	< 1.3	ppbv	1.3	AC-058	18-Sep-16
16090151-005	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-005	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,2-Dichlorobenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-005	1,2-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	1,2-Dichloropropane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,3-Butadiene	I	0.06	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1,3-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-005	1,4-Dichlorobenzene	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	1,4-Dioxane	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	1-Butene	I	0.21	ppbv	0.03	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sept 13, 2	S5598	Ambient Air	13-Sep-16	15:45
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-005	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	1-Pentene	I	0.06	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2,2,4-Trimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2,2-Dimethylbutane	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2,3,4-Trimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	2,4-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2-Methylheptane	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	2-Methylpentane	I	0.05	ppbv	0.02	AC-058	18-Sep-16
16090151-005	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	3-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	3-Methylpentane	I	0.04	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Acetone		3.9	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Acrolein	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-005	Benzene	I	0.14	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Benzyl chloride	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Carbon disulfide	I	0.06	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Carbon tetrachloride	I	0.10	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sept 13, 2	S5598	Ambient Air	13-Sep-16	15:45
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-005	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Chloromethane		0.59	ppbv	0.03	AC-058	18-Sep-16
16090151-005	cis-1,2-Dichloroethene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	cis-1,3-Dichloropropene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	cis-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Cyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Cyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Dibromochloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Ethanol		1.3	ppbv	0.5	AC-058	18-Sep-16
16090151-005	Ethyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Ethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Freon-11	I	0.27	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Freon-113	I	0.06	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Freon-12		0.50	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Hexachloro-1,3-butadiene	K, T, U	< 0.83	ppbv	0.83	AC-058	18-Sep-16
16090151-005	Isobutane	I	0.24	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Isopentane	I	0.25	ppbv	0.05	AC-058	18-Sep-16
16090151-005	Isoprene	I	0.07	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Isopropyl alcohol	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Isopropylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	m,p-Xylene	I	0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-005	m-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	m-Ethyltoluene	K, T, U	< 0.13	ppbv	0.13	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead

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

Date: October 12, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sept 13, 2	S5598	Ambient Air	13-Sep-16	15:45
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-005	Methyl butyl ketone	K, T, U	< 0.83	ppbv	0.83	AC-058	18-Sep-16
16090151-005	Methyl ethyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-005	Methyl isobutyl ketone	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Methyl methacrylate	K, T, U	< 0.12	ppbv	0.12	AC-058	18-Sep-16
16090151-005	Methyl tert butyl ether	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Sep-16
16090151-005	Methylcyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	Methylcyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Methylene chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Sep-16
16090151-005	n-Butane	I	0.22	ppbv	0.05	AC-058	18-Sep-16
16090151-005	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	18-Sep-16
16090151-005	n-Dodecane	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	n-Heptane	I	0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	n-Hexane	I	0.07	ppbv	0.02	AC-058	18-Sep-16
16090151-005	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	n-Pentane	K, T, U	< 0.2	ppbv	0.2	AC-058	18-Sep-16
16090151-005	n-Propylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	18-Sep-16
16090151-005	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	18-Sep-16
16090151-005	Naphthalene	K, T, U	< 0.8	ppbv	0.8	AC-058	18-Sep-16
16090151-005	n-Nonane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	o-Ethyltoluene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	o-Xylene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	p-Diethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	p-Ethyltoluene	K, T, U	< 0.12	ppbv	0.12	AC-058	18-Sep-16
16090151-005	Styrene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	Tetrachloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Sept 13, 2	S5598	Ambient Air	13-Sep-16	15:45
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16090151	REPORT CREATED:	12-Oct-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090151-005	Tetrahydrofuran	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Toluene	I	0.04	ppbv	0.02	AC-058	18-Sep-16
16090151-005	trans-1,2-Dichloroethylene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	trans-1,3-Dichloropropylene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	trans-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Sep-16
16090151-005	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16
16090151-005	Trichloroethylene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Sep-16
16090151-005	Vinyl acetate	K, T, U	< 0.7	ppbv	0.7	AC-058	18-Sep-16
16090151-005	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Sep-16

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: October 12, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID NMHC-VOC/Bonnyville/Sept 17	CANISTER ID H3286	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville- AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 17-Sep-16 0:00	DATE RECEIVED: 21-Sep-16		
	REPORT CREATED: 14-Oct-16	REPORT NUMBER: 16090250		
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-005	1,1,1-Trichloroethane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,1,2-Trichloroethane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,1-Dichloroethane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,1-Dichloroethylene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16
16090250-005	1,2,3-Trimethylbenzene	K, T, U	< 0.10 ppbv	0.10	AC-058	25-Sep-16
16090250-005	1,2,4-Trichlorobenzene	K, T, U	< 1.6 ppbv	1.6	AC-058	25-Sep-16
16090250-005	1,2,4-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	25-Sep-16
16090250-005	1,2-Dibromoethane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,2-Dichlorobenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	25-Sep-16
16090250-005	1,2-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16
16090250-005	1,2-Dichloropropane	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16
16090250-005	1,3,5-Trimethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,3-Butadiene	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	1,3-Dichlorobenzene	K, T, U	< 0.6 ppbv	0.6	AC-058	25-Sep-16
16090250-005	1,4-Dichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	1,4-Dioxane	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	1-Butene	I	0.14 ppbv	0.04	AC-058	25-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Sept 17, :	H3286	Ambient Air	17-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-005	1-Hexene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	1-Pentene	I	0.04	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2,2,4-Trimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2,2-Dimethylbutane	I	0.05	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2,3,4-Trimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2,3-Dimethylbutane	I	0.08	ppbv	0.04	AC-058	25-Sep-16
16090250-005	2,3-Dimethylpentane	I	0.06	ppbv	0.04	AC-058	25-Sep-16
16090250-005	2,4-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2-Methylheptane	I	0.03	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2-Methylhexane	I	0.09	ppbv	0.02	AC-058	25-Sep-16
16090250-005	2-Methylpentane	I	0.24	ppbv	0.02	AC-058	25-Sep-16
16090250-005	3-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	3-Methylhexane	I	0.07	ppbv	0.04	AC-058	25-Sep-16
16090250-005	3-Methylpentane	I	0.14	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Acetone		3.0	ppbv	0.8	AC-058	25-Sep-16
16090250-005	Acrolein	K, T, U	< 0.6	ppbv	0.6	AC-058	25-Sep-16
16090250-005	Benzene	I	0.05	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Benzyl chloride	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Sep-16
16090250-005	Bromodichloromethane	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Bromoform	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Bromomethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Carbon disulfide	I	0.45	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Carbon tetrachloride	I	0.11	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Chlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Chloroethane	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Sept 17, :	H3286	Ambient Air	17-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090250-005	Chloroform	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Chloromethane	I	0.44	ppbv	0.04	AC-058	25-Sep-16
16090250-005	cis-1,2-Dichloroethene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	cis-1,3-Dichloropropene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Sep-16
16090250-005	cis-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	cis-2-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Cyclohexane	I	0.12	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Cyclopentane	I	0.07	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Dibromochloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Ethanol		2.3	ppbv	0.6	AC-058	25-Sep-16
16090250-005	Ethyl acetate	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Sep-16
16090250-005	Ethylbenzene	I	0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Freon-11	I	0.30	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Freon-113	I	0.06	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Freon-114	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Freon-12		0.64	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Hexachloro-1,3-butadiene	K, T, U	< 0.98	ppbv	0.98	AC-058	25-Sep-16
16090250-005	Isobutane		1.32	ppbv	0.04	AC-058	25-Sep-16
16090250-005	Isopentane		1.04	ppbv	0.06	AC-058	25-Sep-16
16090250-005	Isoprene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	Isopropyl alcohol	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Sep-16
16090250-005	Isopropylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Sep-16
16090250-005	m,p-Xylene	I	0.07	ppbv	0.06	AC-058	25-Sep-16
16090250-005	m-Diethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Sep-16
16090250-005	m-Ethyltoluene	K, T, U	< 0.16	ppbv	0.16	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Sept 17, :	H3286	Ambient Air	17-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-005	Methyl butyl ketone	K, T, U	< 0.98 ppbv	0.98	AC-058	25-Sep-16
16090250-005	Methyl ethyl ketone	K, T, U	< 0.6 ppbv	0.6	AC-058	25-Sep-16
16090250-005	Methyl isobutyl ketone	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	Methyl methacrylate	K, T, U	< 0.14 ppbv	0.14	AC-058	25-Sep-16
16090250-005	Methyl tert butyl ether	K, T, U	< 0.06 ppbv	0.06	AC-058	25-Sep-16
16090250-005	Methylcyclohexane	I	0.19 ppbv	0.02	AC-058	25-Sep-16
16090250-005	Methylcyclopentane	I	0.18 ppbv	0.04	AC-058	25-Sep-16
16090250-005	Methylene chloride	K, T, U	< 0.6 ppbv	0.6	AC-058	25-Sep-16
16090250-005	n-Butane		2.02 ppbv	0.06	AC-058	25-Sep-16
16090250-005	n-Decane	K, T, U	< 0.12 ppbv	0.12	AC-058	25-Sep-16
16090250-005	n-Dodecane	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	n-Heptane	I	0.08 ppbv	0.02	AC-058	25-Sep-16
16090250-005	n-Hexane	I	0.22 ppbv	0.02	AC-058	25-Sep-16
16090250-005	n-Octane	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	n-Pentane		0.7 ppbv	0.2	AC-058	25-Sep-16
16090250-005	n-Propylbenzene	K, T, U	< 0.10 ppbv	0.10	AC-058	25-Sep-16
16090250-005	n-Undecane	K, T, U	< 1.0 ppbv	1.0	AC-058	25-Sep-16
16090250-005	Naphthalene	K, T, U	< 1.0 ppbv	1.0	AC-058	25-Sep-16
16090250-005	n-Nonane	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16
16090250-005	o-Ethyltoluene	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16
16090250-005	o-Xylene	I	0.03 ppbv	0.02	AC-058	25-Sep-16
16090250-005	p-Diethylbenzene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16
16090250-005	p-Ethyltoluene	K, T, U	< 0.14 ppbv	0.14	AC-058	25-Sep-16
16090250-005	Styrene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16
16090250-005	Tetrachloroethylene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC-VOC/Bonnyville/Sept 17, :	H3286	Ambient Air	17-Sep-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16090250	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090250-005	Tetrahydrofuran	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	Toluene	I	0.11 ppbv	0.02	AC-058	25-Sep-16
16090250-005	trans-1,2-Dichloroethylene	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Sep-16
16090250-005	trans-1,3-Dichloropropylene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16
16090250-005	trans-2-Butene	I	0.05 ppbv	0.02	AC-058	25-Sep-16
16090250-005	trans-2-Pentene	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16
16090250-005	Trichloroethylene	K, T, U	< 0.08 ppbv	0.08	AC-058	25-Sep-16
16090250-005	Vinyl acetate	K, T, U	< 0.8 ppbv	0.8	AC-058	25-Sep-16
16090250-005	Vinyl chloride	K, T, U	< 0.04 ppbv	0.04	AC-058	25-Sep-16

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

Date: October-14-16

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RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	NMHC-VOC/Bonnyville/Sep 20,	H3284	Ambient Air	Normal
INVOICE:	Charmaine Code	780 812-2182	DESCRIPTION: Bonnyville-AER		DATE SAMPLED: 20-Sep-16 7:10	DATE RECEIVED: 23-Sep-16
	PO Box 8237 5107W-50 St Bonnyville AB	T9N 2J5	REPORT CREATED: 14-Oct-16		REPORT NUMBER: 16090313	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-005	1,1,1-Trichloroethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,1,2-Trichloroethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,1-Dichloroethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,1-Dichloroethylene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16
16090313-005	1,2,3-Trimethylbenzene	K, T, U	< 0.19	ppbv	0.19	AC-058	26-Sep-16
16090313-005	1,2,4-Trichlorobenzene	K, T, U	< 3.1	ppbv	3.1	AC-058	26-Sep-16
16090313-005	1,2,4-Trimethylbenzene	K, T, U	< 0.11	ppbv	0.11	AC-058	26-Sep-16
16090313-005	1,2-Dibromoethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,2-Dichlorobenzene	K, T, U	< 0.11	ppbv	0.11	AC-058	26-Sep-16
16090313-005	1,2-Dichloroethane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	1,2-Dichloropropane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	1,3,5-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,3-Butadiene	I	0.15	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1,3-Dichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	26-Sep-16
16090313-005	1,4-Dichlorobenzene	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	1,4-Dioxane	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	1-Butene	I	0.63	ppbv	0.08	AC-058	26-Sep-16

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Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 20, 2	H3284	Ambient Air	20-Sep-16 7:10
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-005	1-Hexene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	1-Pentene	I	0.20	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2,2,4-Trimethylpentane	I	0.11	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2,2-Dimethylbutane	I	0.05	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2,3,4-Trimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2,3-Dimethylbutane	I	0.24	ppbv	0.08	AC-058	26-Sep-16
16090313-005	2,3-Dimethylpentane	I	0.20	ppbv	0.08	AC-058	26-Sep-16
16090313-005	2,4-Dimethylpentane	I	0.10	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2-Methylheptane	I	0.06	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2-Methylhexane	I	0.23	ppbv	0.04	AC-058	26-Sep-16
16090313-005	2-Methylpentane	I	0.71	ppbv	0.04	AC-058	26-Sep-16
16090313-005	3-Methylheptane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	3-Methylhexane	I	0.22	ppbv	0.08	AC-058	26-Sep-16
16090313-005	3-Methylpentane	I	0.42	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Acetone		4.2	ppbv	1.5	AC-058	26-Sep-16
16090313-005	Acrolein		1.5	ppbv	1.1	AC-058	26-Sep-16
16090313-005	Benzene	I	0.29	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Benzyl chloride	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	Bromodichloromethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Bromoform	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Bromomethane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Carbon disulfide	I	0.25	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Carbon tetrachloride	I	0.11	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Chlorobenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Chloroethane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 20, 2	H3284	Ambient Air	20-Sep-16 7:10
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-005	Chloroform	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Chloromethane	I	0.42	ppbv	0.08	AC-058	26-Sep-16
16090313-005	cis-1,2-Dichloroethene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	cis-1,3-Dichloropropene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16
16090313-005	cis-2-Butene	I	0.24	ppbv	0.08	AC-058	26-Sep-16
16090313-005	cis-2-Pentene	I	0.20	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Cyclohexane	I	0.22	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Cyclopentane	I	0.18	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Dibromochloromethane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Ethanol		42.0	ppbv	1.1	AC-058	26-Sep-16
16090313-005	Ethyl acetate	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	Ethylbenzene	I	0.07	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Freon-11	I	0.30	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Freon-113	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Freon-114	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Freon-12	I	0.62	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Hexachloro-1,3-butadiene	K, T, U	< 1.91	ppbv	1.91	AC-058	26-Sep-16
16090313-005	Isobutane		3.83	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Isopentane		4.99	ppbv	0.11	AC-058	26-Sep-16
16090313-005	Isoprene	I	0.08	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Isopropyl alcohol	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	Isopropylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	m,p-Xylene	I	0.20	ppbv	0.11	AC-058	26-Sep-16
16090313-005	m-Diethylbenzene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16
16090313-005	m-Ethyltoluene	K, T, U	< 0.31	ppbv	0.31	AC-058	26-Sep-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 20, 2	H3284	Ambient Air	20-Sep-16 7:10
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090313-005	Methyl butyl ketone	K, T, U	< 1.91	ppbv	1.91	AC-058	26-Sep-16
16090313-005	Methyl ethyl ketone	K, T, U	< 1.1	ppbv	1.1	AC-058	26-Sep-16
16090313-005	Methyl isobutyl ketone	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	Methyl methacrylate	K, T, U	< 0.27	ppbv	0.27	AC-058	26-Sep-16
16090313-005	Methyl tert butyl ether	K, T, U	< 0.11	ppbv	0.11	AC-058	26-Sep-16
16090313-005	Methylcyclohexane	I	0.27	ppbv	0.04	AC-058	26-Sep-16
16090313-005	Methylcyclopentane	I	0.54	ppbv	0.08	AC-058	26-Sep-16
16090313-005	Methylene chloride	K, T, U	< 1.1	ppbv	1.1	AC-058	26-Sep-16
16090313-005	n-Butane		13.5	ppbv	0.11	AC-058	26-Sep-16
16090313-005	n-Decane	K, T, U	< 0.23	ppbv	0.23	AC-058	26-Sep-16
16090313-005	n-Dodecane	K, T, U	< 1.5	ppbv	1.5	AC-058	26-Sep-16
16090313-005	n-Heptane	I	0.18	ppbv	0.04	AC-058	26-Sep-16
16090313-005	n-Hexane	I	0.45	ppbv	0.04	AC-058	26-Sep-16
16090313-005	n-Octane	K, T, U	< 0.08	ppbv	0.08	AC-058	26-Sep-16
16090313-005	n-Pentane		2.0	ppbv	0.4	AC-058	26-Sep-16
16090313-005	n-Propylbenzene	K, T, U	< 0.19	ppbv	0.19	AC-058	26-Sep-16
16090313-005	n-Undecane	K, T, U	< 1.9	ppbv	1.9	AC-058	26-Sep-16
16090313-005	Naphthalene	K, T, U	< 1.9	ppbv	1.9	AC-058	26-Sep-16
16090313-005	n-Nonane	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	o-Ethyltoluene	K, T, U	< 0.04	ppbv	0.04	AC-058	26-Sep-16
16090313-005	o-Xylene	I	0.07	ppbv	0.04	AC-058	26-Sep-16
16090313-005	p-Diethylbenzene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16
16090313-005	p-Ethyltoluene	K, T, U	< 0.27	ppbv	0.27	AC-058	26-Sep-16
16090313-005	Styrene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16
16090313-005	Tetrachloroethylene	K, T, U	< 0.15	ppbv	0.15	AC-058	26-Sep-16

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: October-14-16

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 20, 2	H3284	Ambient Air	20-Sep-16 7:10
DESCRIPTION:	Bonnyville-AER		
REPORT NUMBER:	16090313	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090313-005	Tetrahydrofuran	K, T, U	< 1.5 ppbv	1.5	AC-058	26-Sep-16
16090313-005	Toluene	I	0.41 ppbv	0.04	AC-058	26-Sep-16
16090313-005	trans-1,2-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	26-Sep-16
16090313-005	trans-1,3-Dichloropropylene	K, T, U	< 0.15 ppbv	0.15	AC-058	26-Sep-16
16090313-005	trans-2-Butene	I	0.43 ppbv	0.04	AC-058	26-Sep-16
16090313-005	trans-2-Pentene	I	0.38 ppbv	0.08	AC-058	26-Sep-16
16090313-005	Trichloroethylene	K, T, U	< 0.15 ppbv	0.15	AC-058	26-Sep-16
16090313-005	Vinyl acetate	K, T, U	< 1.5 ppbv	1.5	AC-058	26-Sep-16
16090313-005	Vinyl chloride	K, T, U	< 0.08 ppbv	0.08	AC-058	26-Sep-16

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RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	NMHC-VOC/Bonnyville/Sep 27,	S5672	Ambient Air	Normal
INVOICE:	Charmaine Code	780 812-2182	DESCRIPTION: Bonnyville - AER		DATE SAMPLED: 27-Sep-16 5:50	DATE RECEIVED: 29-Sep-16
	PO Box 8237 5107W-50 St Bonnyville AB	T9N 2J5	REPORT CREATED: 14-Oct-16		REPORT NUMBER: 16090349	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-005	1,1,1-Trichloroethane	I	0.14 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,1,2,2-Tetrachloroethane	I	0.05 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,1,2-Trichloroethane	I	0.04 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,1-Dichloroethane	I	0.05 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,1-Dichloroethylene	K, T, U	< 0.06 ppbv	0.06	AC-058	03-Oct-16
16090349-005	1,2,3-Trimethylbenzene		0.48 ppbv	0.07	AC-058	03-Oct-16
16090349-005	1,2,4-Trichlorobenzene	K, T, U	< 1.2 ppbv	1.2	AC-058	03-Oct-16
16090349-005	1,2,4-Trimethylbenzene		1.71 ppbv	0.04	AC-058	03-Oct-16
16090349-005	1,2-Dibromoethane	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,2-Dichlorobenzene	I	0.07 ppbv	0.04	AC-058	03-Oct-16
16090349-005	1,2-Dichloroethane	I	0.07 ppbv	0.01	AC-058	03-Oct-16
16090349-005	1,2-Dichloropropane	I	0.06 ppbv	0.01	AC-058	03-Oct-16
16090349-005	1,3,5-Trimethylbenzene		0.66 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,3-Butadiene	I	0.19 ppbv	0.03	AC-058	03-Oct-16
16090349-005	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Oct-16
16090349-005	1,4-Dichlorobenzene	K, T, U	< 0.6 ppbv	0.6	AC-058	03-Oct-16
16090349-005	1,4-Dioxane	K, T, U	< 0.6 ppbv	0.6	AC-058	03-Oct-16
16090349-005	1-Butene	I	0.36 ppbv	0.03	AC-058	03-Oct-16

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

Date: October-14-16

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E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 27, 2	S5672	Ambient Air	27-Sep-16 5:50
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-005	1-Hexene	I	0.07	ppbv	0.03	AC-058	03-Oct-16
16090349-005	1-Pentene	I	0.08	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2,2,4-Trimethylpentane	I	0.23	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2,2-Dimethylbutane	I	0.08	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2,3,4-Trimethylpentane	I	0.10	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2,3-Dimethylbutane	I	0.17	ppbv	0.03	AC-058	03-Oct-16
16090349-005	2,3-Dimethylpentane	I	0.23	ppbv	0.03	AC-058	03-Oct-16
16090349-005	2,4-Dimethylpentane	I	0.12	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2-Methylheptane	I	0.25	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2-Methylhexane	I	0.37	ppbv	0.01	AC-058	03-Oct-16
16090349-005	2-Methylpentane	I	0.51	ppbv	0.01	AC-058	03-Oct-16
16090349-005	3-Methylheptane	I	0.20	ppbv	0.03	AC-058	03-Oct-16
16090349-005	3-Methylhexane	I	0.25	ppbv	0.03	AC-058	03-Oct-16
16090349-005	3-Methylpentane	I	0.33	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Acetone	I	2.9	ppbv	0.6	AC-058	03-Oct-16
16090349-005	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-005	Benzene	I	0.40	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Oct-16
16090349-005	Bromodichloromethane	I	0.07	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Bromoform	I	0.03	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Bromomethane	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Carbon disulfide	I	0.19	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Carbon tetrachloride	I	0.16	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Chlorobenzene	I	0.04	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Chloroethane	I	0.04	ppbv	0.03	AC-058	03-Oct-16

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Date: October-14-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 27, 2	S5672	Ambient Air	27-Sep-16 5:50
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-005	Chloroform	I	0.08	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Chloromethane		0.46	ppbv	0.03	AC-058	03-Oct-16
16090349-005	cis-1,2-Dichloroethene	I	0.05	ppbv	0.01	AC-058	03-Oct-16
16090349-005	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Oct-16
16090349-005	cis-2-Butene	I	0.09	ppbv	0.03	AC-058	03-Oct-16
16090349-005	cis-2-Pentene	I	0.08	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Cyclohexane	I	0.20	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Cyclopentane	I	0.12	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Dibromochloromethane	I	0.04	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Ethanol		4.1	ppbv	0.4	AC-058	03-Oct-16
16090349-005	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Oct-16
16090349-005	Ethylbenzene	I	0.33	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Freon-11	I	0.34	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Freon-113	I	0.12	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Freon-114	I	0.07	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Freon-12		0.64	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Hexachloro-1,3-butadiene	K, T, U	< 0.73	ppbv	0.73	AC-058	03-Oct-16
16090349-005	Isobutane		1.72	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Isopentane		1.48	ppbv	0.04	AC-058	03-Oct-16
16090349-005	Isoprene	I	0.08	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Oct-16
16090349-005	Isopropylbenzene	I	0.09	ppbv	0.01	AC-058	03-Oct-16
16090349-005	m,p-Xylene		1.29	ppbv	0.04	AC-058	03-Oct-16
16090349-005	m-Diethylbenzene	I	0.36	ppbv	0.06	AC-058	03-Oct-16
16090349-005	m-Ethyltoluene		0.71	ppbv	0.12	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 27, 2	S5672	Ambient Air	27-Sep-16 5:50
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16090349-005	Methyl butyl ketone	K, T, U	< 0.73	ppbv	0.73	AC-058	03-Oct-16
16090349-005	Methyl ethyl ketone		0.5	ppbv	0.4	AC-058	03-Oct-16
16090349-005	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Oct-16
16090349-005	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Oct-16
16090349-005	Methyl tert butyl ether	I	0.05	ppbv	0.04	AC-058	03-Oct-16
16090349-005	Methylcyclohexane	I	0.24	ppbv	0.01	AC-058	03-Oct-16
16090349-005	Methylcyclopentane	I	0.34	ppbv	0.03	AC-058	03-Oct-16
16090349-005	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Oct-16
16090349-005	n-Butane		2.93	ppbv	0.04	AC-058	03-Oct-16
16090349-005	n-Decane		2.37	ppbv	0.09	AC-058	03-Oct-16
16090349-005	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Oct-16
16090349-005	n-Heptane	I	0.32	ppbv	0.01	AC-058	03-Oct-16
16090349-005	n-Hexane		0.64	ppbv	0.01	AC-058	03-Oct-16
16090349-005	n-Octane		0.46	ppbv	0.03	AC-058	03-Oct-16
16090349-005	n-Pentane		1.0	ppbv	0.1	AC-058	03-Oct-16
16090349-005	n-Propylbenzene	I	0.20	ppbv	0.07	AC-058	03-Oct-16
16090349-005	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Oct-16
16090349-005	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Oct-16
16090349-005	n-Nonane		2.26	ppbv	0.01	AC-058	03-Oct-16
16090349-005	o-Ethyltoluene	I	0.38	ppbv	0.01	AC-058	03-Oct-16
16090349-005	o-Xylene		0.66	ppbv	0.01	AC-058	03-Oct-16
16090349-005	p-Diethylbenzene		0.68	ppbv	0.06	AC-058	03-Oct-16
16090349-005	p-Ethyltoluene	I	0.41	ppbv	0.10	AC-058	03-Oct-16
16090349-005	Styrene	I	0.13	ppbv	0.06	AC-058	03-Oct-16
16090349-005	Tetrachloroethylene	I	0.37	ppbv	0.06	AC-058	03-Oct-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC-VOC/Bonnyville/Sep 27, 2	S5672	Ambient Air	27-Sep-16 5:50
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16090349	REPORT CREATED:	14-Oct-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16090349-005	Tetrahydrofuran	K, T, U	< 0.6 ppbv	0.6	AC-058	03-Oct-16
16090349-005	Toluene		1.18 ppbv	0.01	AC-058	03-Oct-16
16090349-005	trans-1,2-Dichloroethylene	I	0.04 ppbv	0.01	AC-058	03-Oct-16
16090349-005	trans-1,3-Dichloropropylene	K, T, U	< 0.06 ppbv	0.06	AC-058	03-Oct-16
16090349-005	trans-2-Butene	I	0.11 ppbv	0.01	AC-058	03-Oct-16
16090349-005	trans-2-Pentene	I	0.11 ppbv	0.03	AC-058	03-Oct-16
16090349-005	Trichloroethylene	I	0.07 ppbv	0.06	AC-058	03-Oct-16
16090349-005	Vinyl acetate	K, T, U	< 0.6 ppbv	0.6	AC-058	03-Oct-16
16090349-005	Vinyl chloride	I	0.05 ppbv	0.03	AC-058	03-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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Date: October-14-16

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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	Bonnyville
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	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.

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

03-11-2016

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-09-37-C</u>
Site: <u>Bonnyville</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>24-OCT-16</u>
Level 1 Primary Validation	<u></u>	Date <u>31-OCT-31</u>
Level 2 Final Validation	<u></u>	Date <u>03-NOV-16</u>
Level 3 Independent Data Review	<u></u>	Date <u>03-NOV-16</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.