



Alberta Environment and Parks (AEP)
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February 22, 2018

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

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of June 2017.

The air monitoring program consists of continuous air monitoring, passive sampling and intermittent sampling, including both VOC, PAH and Partisol sampling programs. All the air monitoring activities were conducted by contractors.

| Sampling Program | Monitoring Activities Conducted By | Sample Analysis Conducted By | Data/Report Review and Prepared By | Electronic Submission Conducted By |
|------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------------|
| Continuous ambient air | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics |
| Passive | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics |
| Intermittent | Maxxam Analytics | InnoTech Alberta Inc | InnoTech Alberta Inc | Not Applicable |

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

All data collected in June 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

A scheduled internal station audit was conducted by a contractor on June 6.

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

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

Respectfully,



Lakeland Industry & Community Association
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A handwritten signature in blue ink that reads 'Michael Bisaga'.

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

JOB #: 2833-2017-06-1-C

June 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

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Attention: MIKE BISAGA

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SUMMARY

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

All data collected this month 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.

A scheduled internal station audit was conducted by Maxxam on June 6. Audit report can be found in Appendix V.

All Parameters: A power failure resulted in two hours of downtime on June 19.

THC: Four hours of downtime were incurred while the analyzer was recovering from the power failure on June 19.

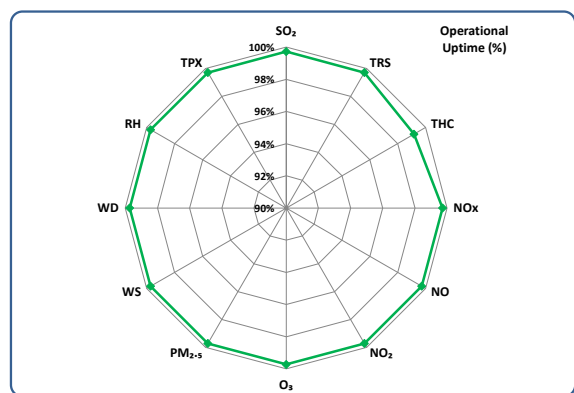
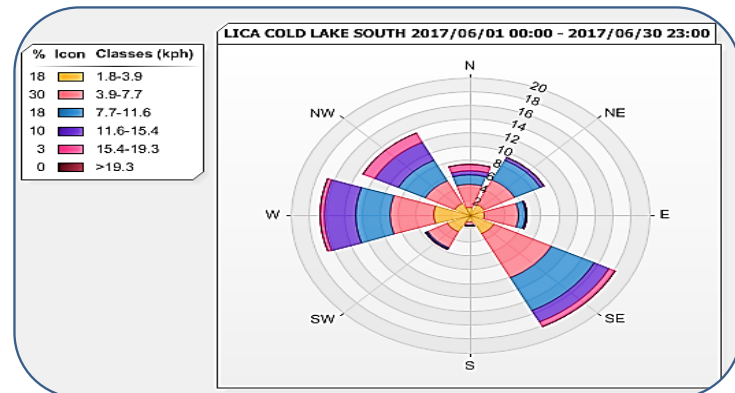
NO_x/NO/NO₂: NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded inaccurate values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

The summary of results is presented on the following pages.

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

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

| Name | Unit | Monthly Records | | 1-Hour Records | | | | | 24-Hour Records | | | | | |
|-------------------|-------------------|-----------------|-------|----------------|---------|---------|------|------|-----------------|---------------|---------|------|-----------------|--------------|
| | | | | Avg. Conc. | Uptime | Maximum | | | AAAQO Objective | Exceed. Hours | Maximum | | AAAQO Objective | Exceed. Days |
| | | | | | | Conc. | Date | Hour | | | Conc. | Date | | |
| SO ₂ | ppb | 0.0 | 99.7% | 1.0 | June 1 | 12 | 172 | 0 | 0.0 | June 1 | 48 | 0 | | |
| TRS | ppb | 0.1 | 99.7% | 2.0 | June 18 | 5 | - | - | 0.0 | June 1 | - | - | | |
| THC | ppm | 2.10 | 99.2% | 3.05 | June 23 | 6 | - | - | 2.29 | June 25 | - | - | | |
| NO _x | ppb | 2.1 | 99.7% | 16.6 | June 23 | 7 | - | - | 3.9 | June 23 | - | - | | |
| NO | ppb | 0.3 | 99.7% | 8.2 | June 23 | 23 | - | - | 1.3 | June 23 | - | - | | |
| NO ₂ | ppb | 1.8 | 99.7% | 8.6 | June 23 | 8 | 159 | 0 | 2.7 | June 1 | - | - | | |
| O ₃ | ppb | 27.3 | 99.7% | 58.7 | June 7 | 13 | 82 | 0 | 38.6 | June 26 | - | - | | |
| PM _{2.5} | µg/m ³ | 5.2 | 99.7% | 25.0 | June 2 | 5 | 80 | 0 | 11.0 | June 1 | 30 | 0 | | |
| WS | % | 0.9 | 99.7% | 19.2 | June 22 | 10 | - | - | 12.4 | June 21 | - | - | | |
| WD | degree | 318 (NW) | 99.7% | - | - | - | - | - | - | - | - | - | | |
| RH | mm | 68 | 99.7% | 100 | June 5 | 6 | - | - | 90 | June 14 | - | - | | |
| AmbTPX | °C | 15.1 | 99.7% | 26.6 | June 8 | 15 | - | - | 20.1 | June 8 | - | - | | |



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.
- * A scheduled internal station audit was conducted by Maxxam on June 6.

Operational Issues

- **All Parameters:** A power failure resulted in two hours of downtime on June 19.
- **THC:** Four hours of downtime were incurred while the analyzer was recovering from the power failure on June 19.

Monthly Continuous Data Summary

| Lakeland Industry & Community Association Cold Lake Continuous Monitoring Station | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|--|------------|-------|-------------|-------|--------------------|----------------|-----|--------|------------------------|-------------------------------|---------|-----|----------------------------|
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | READING | DAY | 1-HOUR | | | 24-HOUR | | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | | | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 0 | 1 | 1 | 12 | 3.2 | NNE | 0 | 1 | 99.7 |
| TRS (ppb) | - | - | - | - | 0 | 2 | 18 | 5 | 1.1 | WNW | 0 | 1 | 99.7 |
| THC (ppm) | - | - | - | - | 2.10 | 3.05 | 23 | 6 | 3.4 | WSW | 2.29 | 25 | 99.2 |
| NO ₂ (ppb) | 159 | - | 0 | - | 2 | 9 | 23 | 8 | 2.4 | WSW | 3 | 1 | 99.7 |
| NO (ppb) | - | - | - | - | 0 | 8 | 23 | 23 | 3.5 | WSW | 1 | 23 | 99.7 |
| NO _x (ppb) | - | - | - | - | 2 | 17 | 23 | 8 | 3.5 | WSW | 4 | 23 | 99.7 |
| O ₃ (ppb) | 82 | - | 0 | - | 27.3 | 58.7 | 7 | 13 | 6.3 | SE | 38.6 | 26 | 99.7 |
| PM _{2.5} (µg/m ³) | 80 | 30 | 0 | 0 | 5 | 25 | 2 | 5 | 0.4 | NE | 11 | 1 | 99.7 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 68 | 100 | 5 | 6 | 4.6 | NW | 90 | 14 | 99.7 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | 15.1 | 26.6 | 8 | 15 | 11.5 | SE | 20.1 | 8 | 99.7 |
| VECTOR WS (kph) | - | - | - | - | 0.9 | 19.2 | 22 | 10 | - | NNW | 12.4 | 21 | 99.7 |
| VECTOR WD (sec) | - | - | - | - | 318 (NW) | - | - | - | - | - | - | - | 99.7 |

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

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

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

Volatile Organics (VOCs) Data Summary

| Sample Collection Date | Maximum Reading (ppb) | Volatile Organic Compound |
|------------------------|-----------------------|---------------------------|
| June 6, 2017 | 4.2 | Acetone |
| June 12, 2017 | 5.7 | Acetone |
| June 18, 2017 | 3.6 | Acetone |
| June 24, 2017 | 5.9 | Acetone |
| June 30, 2017 | 5.4 | Acetone |

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

| Sample Collection Date | Maximum Reading (µg/puf) | Semi-Volatile Organic |
|------------------------|--------------------------|-----------------------|
| June 6, 2017 | 0.24 | 2-Methylnaphthalene |
| June 12, 2017 | 0.21 | 2-Methylnaphthalene |
| June 18, 2017 | 0.24 | Phenanthrene |
| June 24, 2017 | 0.18 | Phenanthrene |
| June 30, 2017 | 0.26 | Phenanthrene |

Note: NA

Partisol Sampler Summary

| Sample Collection Date | Concentration ($\mu\text{g}/\text{puf}$) |
|------------------------|--|
| June 6, 2017 | 0.036 |
| June 12, 2017 | 0.067 |
| June 18, 2017 | 0.057 |
| June 30, 2017 | 0.118 |

Note: No sampling on June 24 - Sampler did not recover after power failure.

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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, VOC and PAH monitoring programs are also included in this report.

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.
- A scheduled internal audit was conducted by Maxxam on June 6. Audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 20.
- Nine additional instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL REDUCED SULPHUR (TRS)

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.
- A scheduled internal audit was conducted by Maxxam on June 6. Audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 20. Extend time was taken for the calibration due to calibrator issues.
- Nine additional instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 99.2%, equivalent to six hours of downtime.
- A scheduled internal audit was conducted by Maxxam on June 6. Audit report can be found in Appendix V.
- A power failure resulted in two hours of downtime on June 19. The analyzer's functionality was back to normal after the zero/span check that day. Four more hours of downtime were incurred.
- The routine monthly calibration was performed on June 21.
- Ten additional instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.
- An internal audit was performed on June 6. The audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 20.
- Nine additional instances of maximum instantaneous data were discarded this month due to brief power outages.
- NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

OZONE (O₃)

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.
- A scheduled internal audit was conducted by Maxxam on June 6. Audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 21.
- Ten additional instances of maximum instantaneous data were discarded this month due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime.
- A scheduled internal audit was conducted by Maxxam on June 6. This also served as the routine monthly SHARP audit.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. No hourly data was invalidated as all measurements were above $-3 \mu\text{g}/\text{m}^3$ this month.

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

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.
- One hour of maximum instantaneous on June 29 was invalidated as it was considered an anomalous spike.
- Ten additional instances of maximum instantaneous data were discarded this month due to brief power outages.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. These were incurred as a result of a power failure that occurred on June 19.

VOC SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on June 6, 12, 18, 24, and 30. Analysis and results are provided by InnoTech Alberta.
- The routine quarterly audit for the VOC sampler was completed on June 21.

PAH SAMPLES

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

PARTISOL SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on June 6, 12, 18, and 30. Analysis and results are provided by InnoTech Alberta.
- A sample was not collected on June 24 as the sampler did not recover after a power failure event. The filter did not require analysis. The sampler was checked and no issues were found.

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-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- Maxxam PTC SOP-00151: Mass Determination of Particulate Matter (PM_{2.5} and PM₁₀)

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo 5030 SHARP Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832
- PAH - TISCH PUF Plus
- Partisol - R&P 2000H Unit
- VOC - XONTECH 910A Gaseous Air Sampler

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

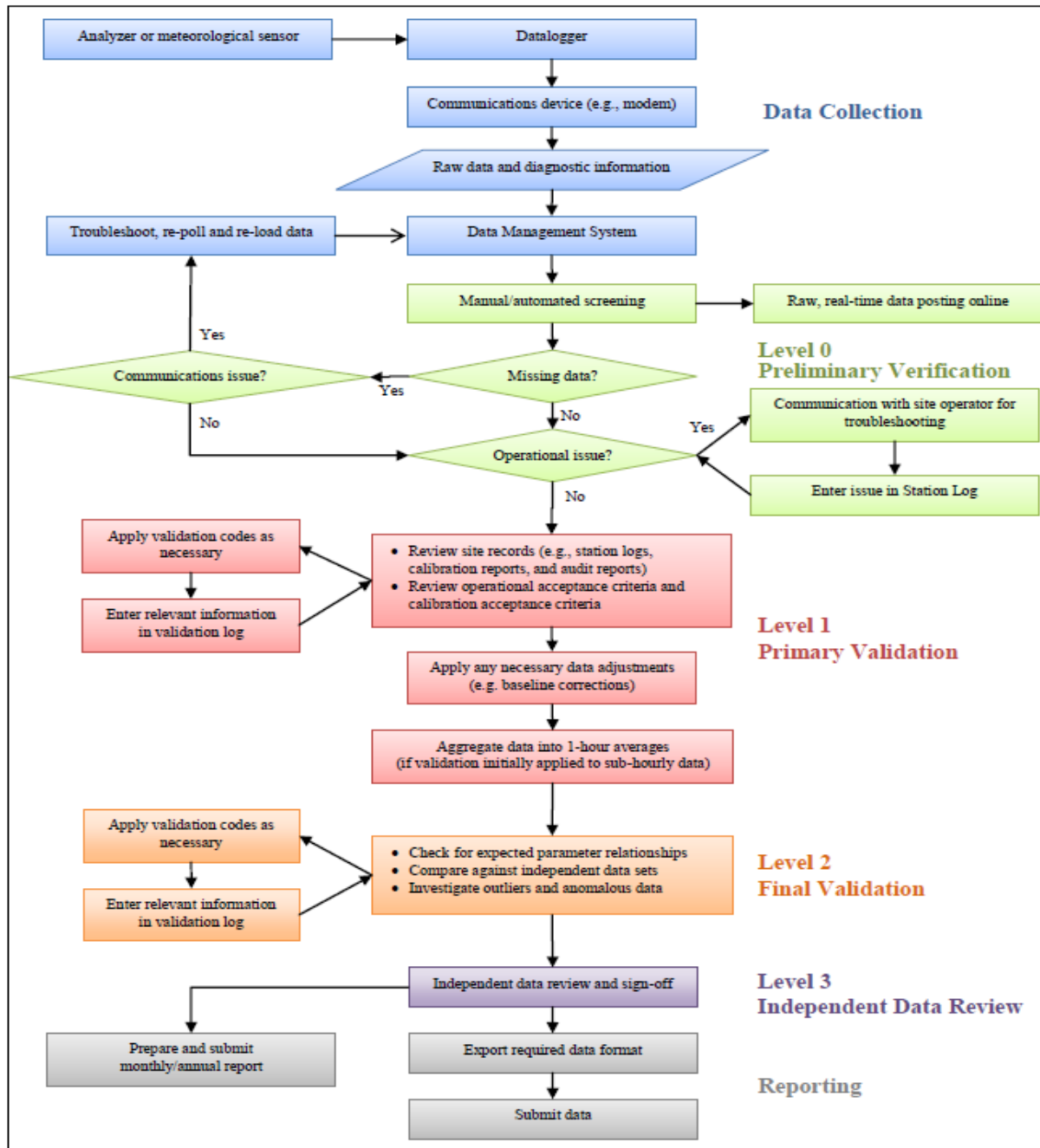
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

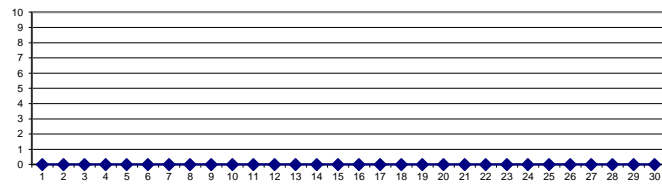
OBJECTIVE LIMIT:

| | | | | | | |
|-----------------------------|------|-----|-----|-------|----|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 172 | ppb | 24-HR | 48 | ppb |
|-----------------------------|------|-----|-----|-------|----|-----|

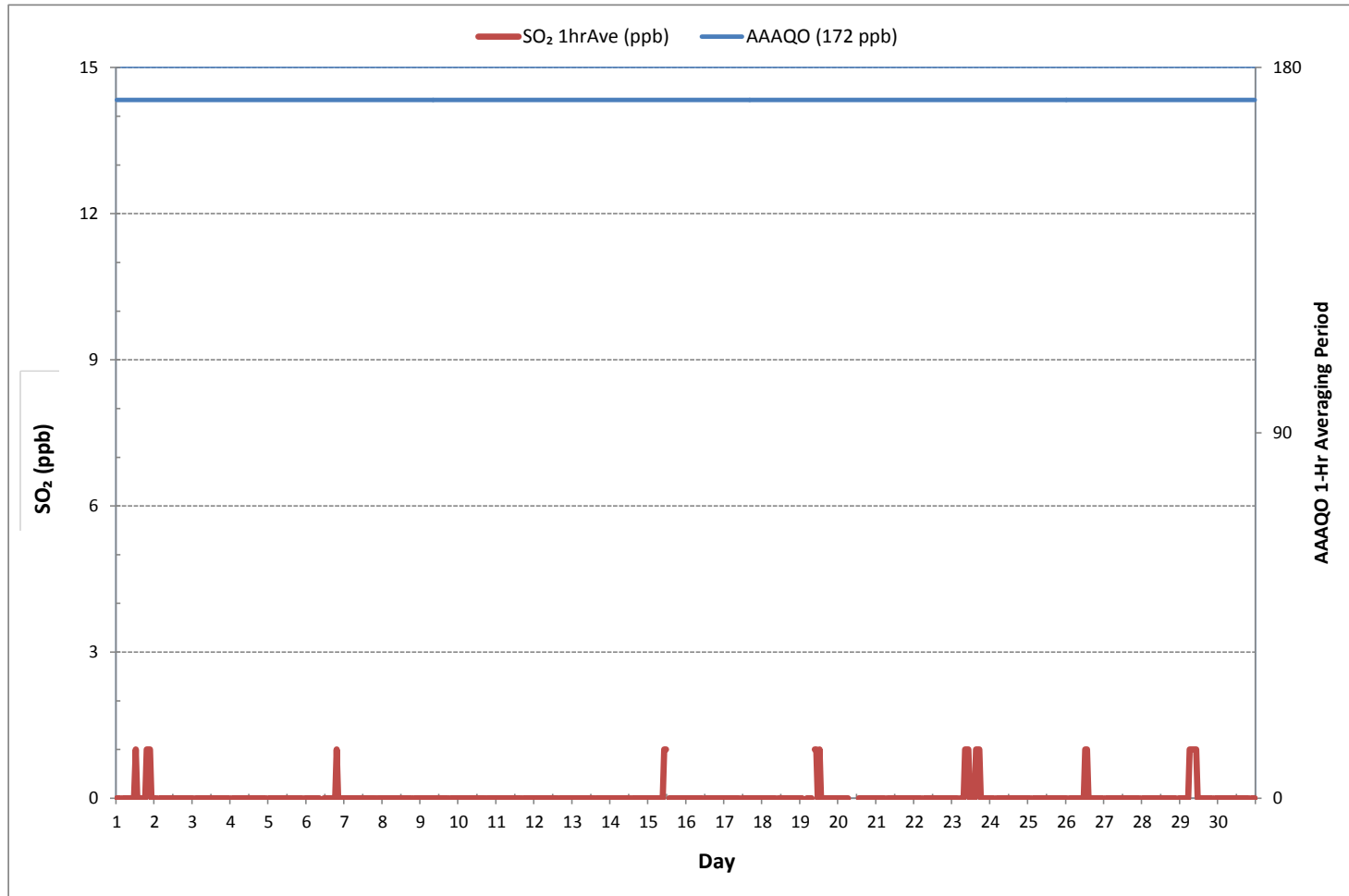
MONTHLY SUMMARY

| | | | | | | |
|------------------------------|----|-----|-----------------------|------|--------|---|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | | |
| NUMBER OF NON-ZERO READINGS: | 23 | | | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 1 | ppb | @ HOUR | 12 | ON DAY | 1 |
| MAXIMUM 24-HR AVERAGE: | 0 | ppb | | | ON DAY | 1 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 718 | hrs | |
| MONTHLY CALIBRATION TIME: | 5 | hrs | AMD OPERATION UPTIME: | 99.7 | % | |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 | ppb | |

24 HR AVERAGES June 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





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

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

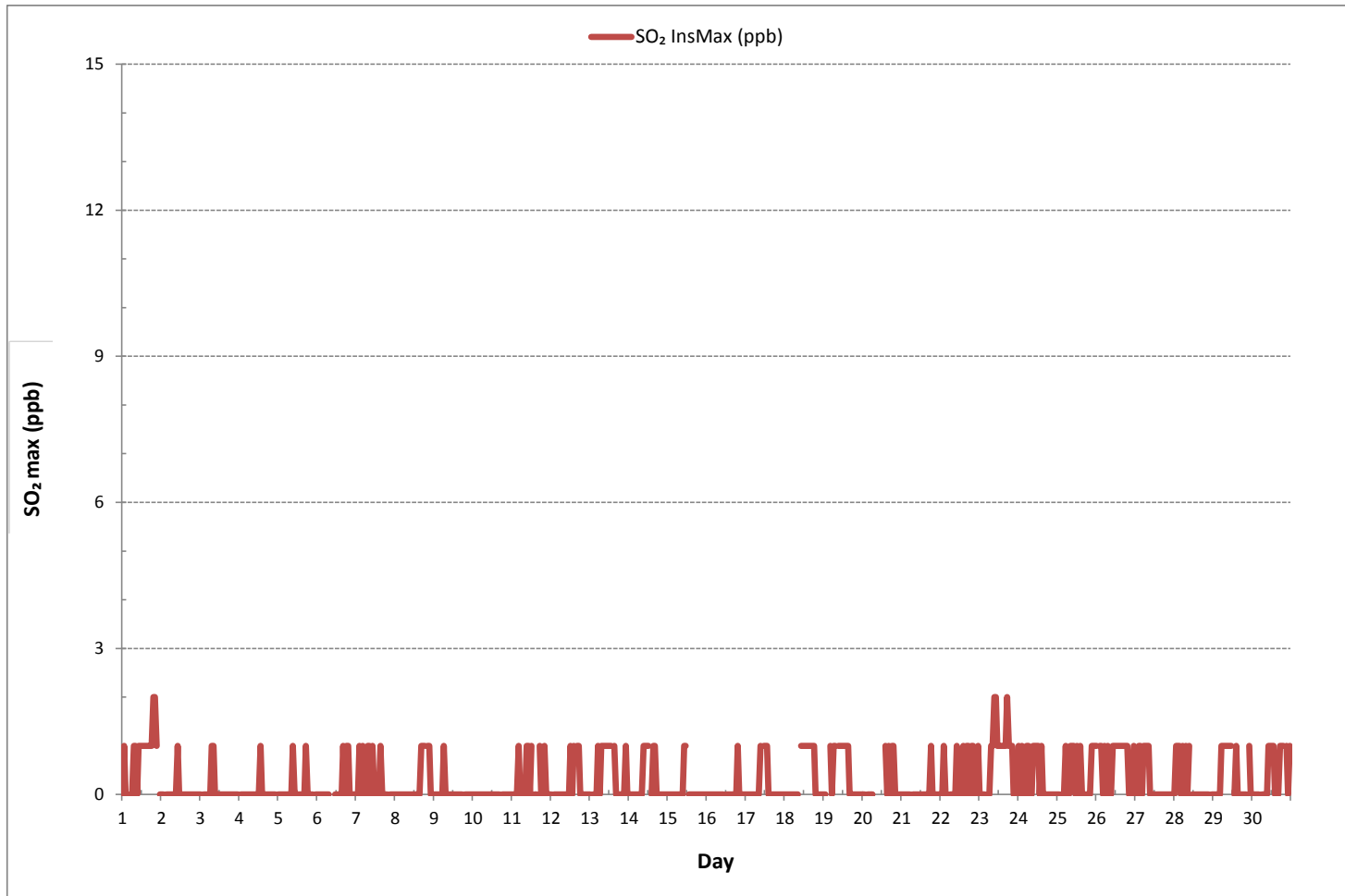
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 180 |
| MAXIMUM INSTANTANEOUS VALUE: | 2 ppb @ HOUR 19 ON DAY 1 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 0 |
| OPERATIONAL TIME: | 709 hrs |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

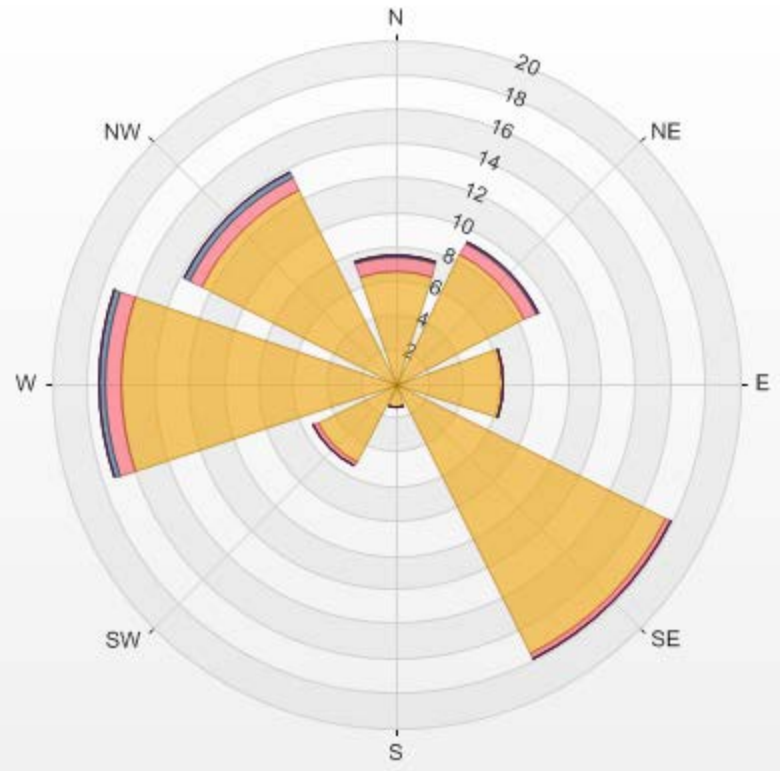
Calm: 21.26%

Calm Avg: 0.07 [ppb]

| Direction | 0.0-0.4 | 0.4-0.8 | 0.8-1.1 | 1.1-1.5 | 1.5-1.9 | >1.9 | Total |
|----------------|---------|---------|---------|---------|---------|------|-------|
| N | 6.6 | 0.8 | 0.2 | 0.0 | 0.0 | 0.0 | 7.5 |
| NE | 8.4 | 0.8 | 0.2 | 0.0 | 0.0 | 0.0 | 9.3 |
| E | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 |
| SE | 17.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 |
| S | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 |
| SW | 5.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 |
| W | 16.0 | 0.9 | 0.3 | 0.0 | 0.0 | 0.0 | 17.2 |
| NW | 12.6 | 0.9 | 0.3 | 0.0 | 0.0 | 0.0 | 13.8 |
| Summary | 73.8 | 4.1 | 0.9 | 0.0 | 0.0 | 0.0 | 78.8 |

| % Icon | Classes (ppb) | 74 | 4 | 1 | 0 | 0 | 0 |
|--------|---------------|----|---|---|---|---|---|
| | 0.0-0.4 | | | | | | |
| | 0.4-0.8 | | | | | | |
| | 0.8-1.1 | | | | | | |
| | 1.1-1.5 | | | | | | |
| | 1.5-1.9 | | | | | | |
| | >1.9 | | | | | | |

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.26% Calm Poll Avg: 0.07[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



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

TOTAL REDUCED SULPHUR

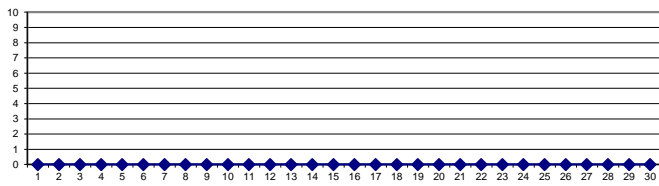
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

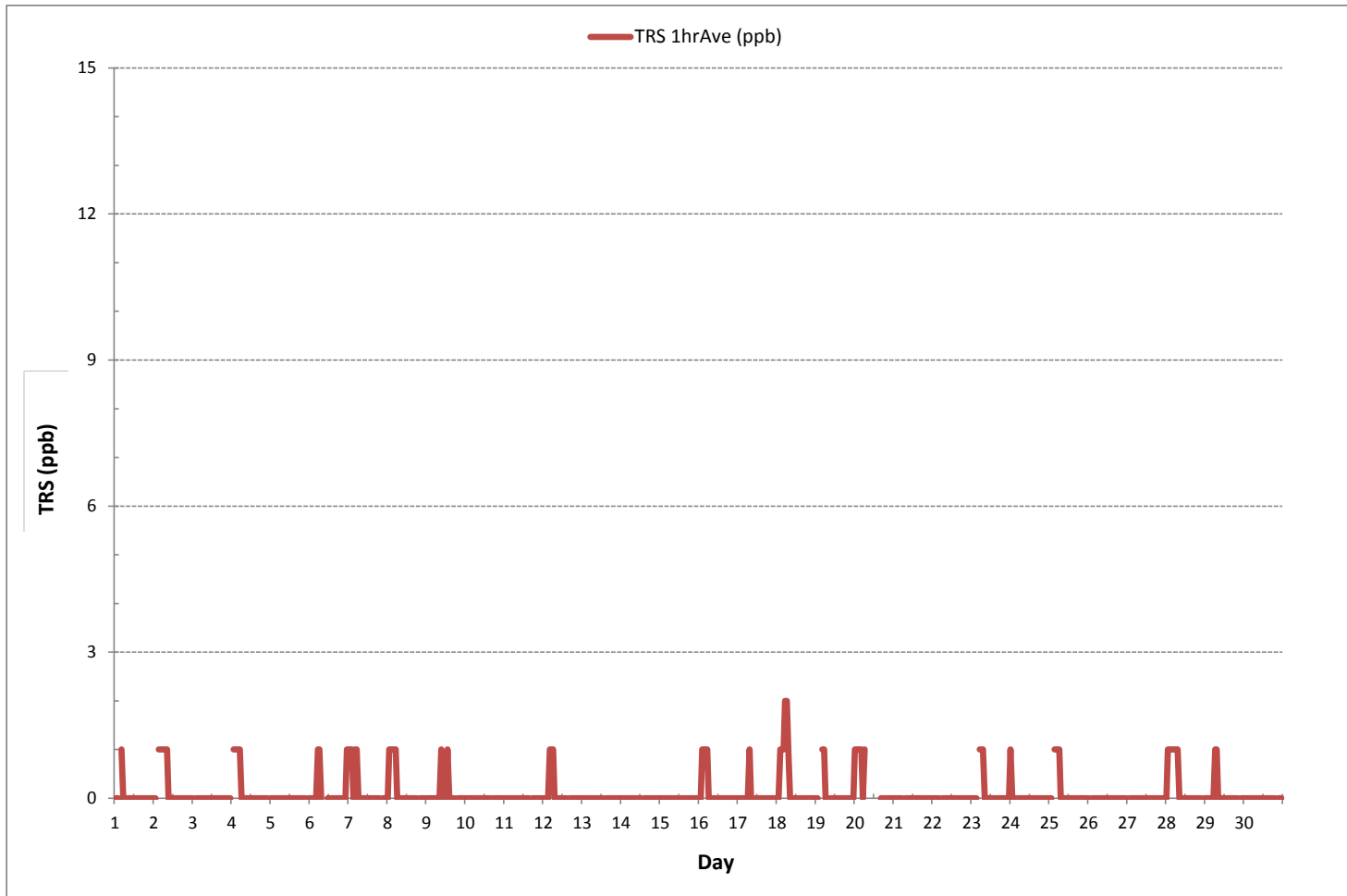
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | |
|------------------------------|----|------------|-----------------------|-----------|-----|
| NUMBER OF NON-ZERO READINGS: | 66 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 0 | ON DAY 1 | |
| MAXIMUM 1-HR AVERAGE: | 2 | ppb @ HOUR | 5 | ON DAY 18 | |
| MAXIMUM 24-HR AVERAGE: | 0 | ppb | | ON DAY 1 | |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 718 | hrs |
| MONTHLY CALIBRATION TIME: | 8 | hrs | AMD OPERATION UPTIME: | 99.7 | % |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 | ppb |

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





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

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

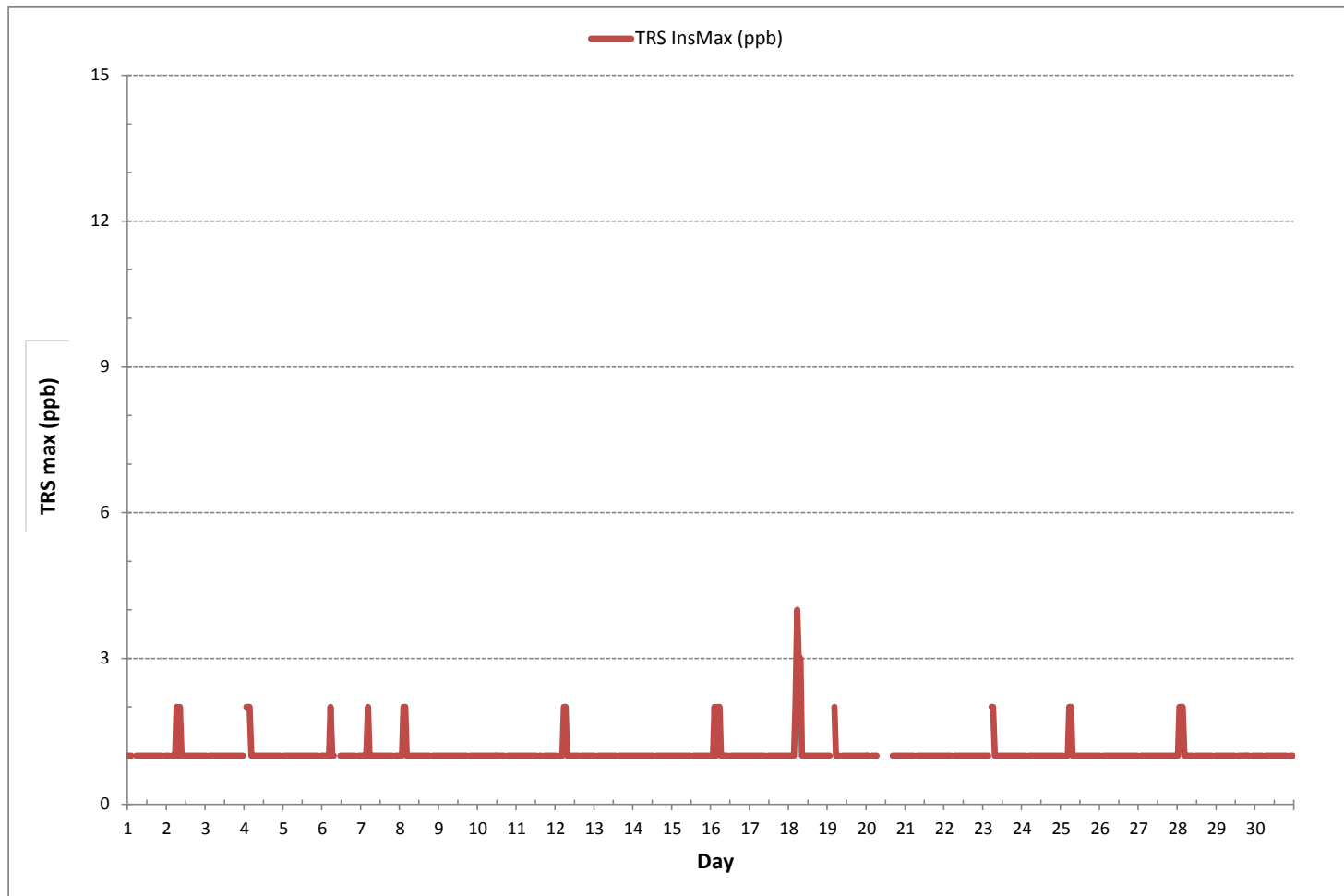
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|--------------------------|
| NUMBER OF NON-ZERO READINGS: | 666 |
| MAXIMUM INSTANTANEOUS VALUE: | 4 ppb @ HOUR 5 ON DAY 18 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| STANDARD DEVIATION: | 0 |
| OPERATIONAL TIME: | 709 hrs |

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



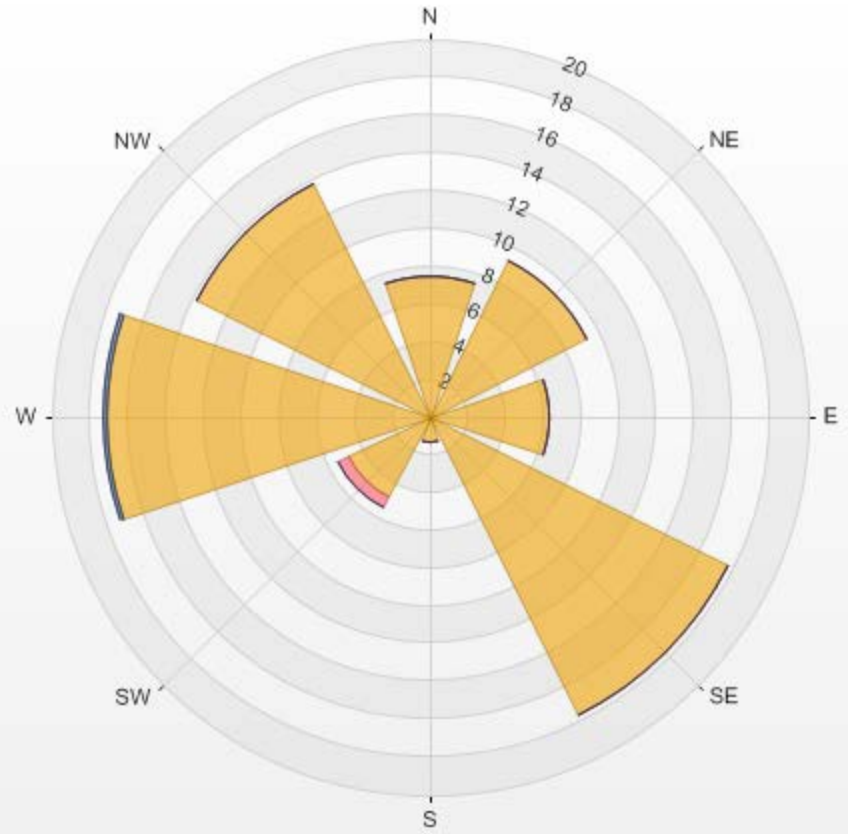
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.32% Calm Avg: 0.44 [ppb]

| Direction | 0.0-1.0 | 1.0-2.0 | 2.0-3.0 | >3.0 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 7.5 | 0.0 | 0.0 | 0.0 | 7.5 |
| NE | 9.3 | 0.0 | 0.0 | 0.0 | 9.3 |
| E | 6.3 | 0.0 | 0.0 | 0.0 | 6.3 |
| SE | 17.7 | 0.0 | 0.0 | 0.0 | 17.7 |
| S | 1.4 | 0.0 | 0.0 | 0.0 | 1.4 |
| SW | 4.8 | 0.6 | 0.0 | 0.0 | 5.4 |
| W | 17.1 | 0.0 | 0.2 | 0.0 | 17.3 |
| NW | 13.8 | 0.0 | 0.0 | 0.0 | 13.8 |
| Summary | 77.9 | 0.6 | 0.2 | 0.0 | 78.7 |

% Icon Classes (ppb) 78 0.0-1.0 1 1.0-2.0 0 2.0-3.0 0 >3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.32% Calm Poll Avg: 0.44[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



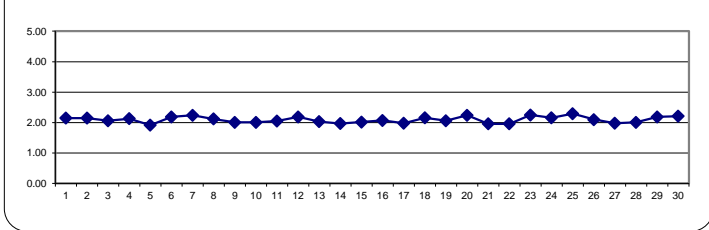
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 2.06 | 2.11 | 2.11 | S | 2.15 | 2.21 | 2.23 | 2.10 | 2.12 | 2.17 | 2.25 | 2.19 | 2.19 | 2.15 | 2.19 | 2.21 | 2.15 | 2.12 | 2.14 | 2.15 | 2.06 | 2.13 | 2.15 | 2.12 | 2.06 | 2.25 | 2.15 | 24 |
| 2 | 2.19 | 2.31 | S | 2.50 | 2.48 | 2.61 | 2.58 | 2.64 | 2.31 | 2.13 | 2.14 | 2.09 | 2.02 | 2.00 | 2.01 | 1.98 | 1.98 | 1.93 | 1.93 | 1.94 | 1.89 | 1.92 | 1.92 | 1.96 | 1.89 | 2.64 | 2.15 | 24 |
| 3 | 2.00 | S | 1.93 | 2.01 | 2.07 | 2.04 | 2.09 | 2.11 | 2.04 | 2.03 | 2.05 | 2.09 | 2.07 | 2.06 | 2.06 | 2.05 | 2.06 | 2.08 | 2.07 | 2.05 | 2.04 | 2.14 | 2.18 | 2.10 | 1.93 | 2.18 | 2.06 | 24 |
| 4 | S | 2.43 | 2.39 | 2.35 | 2.27 | 2.14 | 2.03 | 2.07 | 2.12 | 2.11 | 2.04 | 2.01 | 2.05 | 2.09 | 2.06 | 2.09 | 2.09 | 2.08 | 2.07 | 2.06 | 2.09 | 2.18 | 2.11 | S | 2.01 | 2.43 | 2.13 | 24 |
| 5 | 1.97 | 1.86 | 1.89 | 1.89 | 1.86 | 1.89 | 2.06 | 2.01 | 1.98 | 1.87 | 1.86 | 1.87 | 1.85 | 1.88 | 1.89 | 1.90 | 1.90 | 1.90 | 1.93 | 1.96 | 2.01 | S | 2.08 | 1.85 | 2.08 | 1.92 | 24 | |
| 6 | 2.13 | 2.21 | 2.24 | 2.30 | 2.39 | 2.38 | 2.21 | 2.18 | 2.11 | 2.14 | Q | Q | Q | Q | Q | 1.97 | 2.00 | 2.02 | 2.05 | 2.08 | 2.13 | S | 2.39 | 2.57 | 1.97 | 2.57 | 2.19 | 24 |
| 7 | 2.54 | 2.54 | 2.57 | 2.43 | 2.52 | 2.37 | 2.16 | 2.33 | 2.36 | 2.31 | 2.19 | 2.13 | 2.08 | 2.05 | 2.07 | 2.10 | 2.08 | 2.06 | 2.04 | 2.06 | S | 2.16 | 2.19 | 2.12 | 2.04 | 2.57 | 2.24 | 24 |
| 8 | 2.25 | 2.41 | 2.45 | 2.30 | 2.27 | 2.24 | 2.11 | 2.12 | 2.15 | 2.16 | 2.10 | 2.02 | 2.02 | 2.03 | 2.02 | 1.99 | 1.98 | 2.00 | 2.04 | S | 2.02 | 1.98 | 1.99 | 2.00 | 1.98 | 2.45 | 2.12 | 24 |
| 9 | 2.02 | 2.01 | 2.01 | 2.02 | 2.00 | 2.00 | 2.02 | 2.05 | 2.07 | 2.14 | 2.10 | 2.06 | 2.09 | 2.08 | 2.02 | 2.00 | 2.01 | 2.00 | S | 1.91 | 1.88 | 1.89 | 1.89 | 1.94 | 1.88 | 2.14 | 2.01 | 24 |
| 10 | 1.87 | 1.87 | 1.90 | 1.94 | 1.99 | 2.02 | 2.01 | 2.01 | 2.04 | 2.03 | 2.02 | 2.04 | 2.06 | 2.06 | 2.04 | 2.01 | 2.00 | S | 1.98 | 1.99 | 2.04 | 2.09 | 2.13 | 2.12 | 1.87 | 2.13 | 2.01 | 24 |
| 11 | 2.17 | 2.25 | 2.28 | 2.25 | 2.21 | 2.06 | 1.98 | 1.98 | 1.97 | 1.96 | 1.95 | 1.98 | 1.98 | 1.97 | 1.97 | 1.98 | S | 1.94 | 1.95 | 1.96 | 1.94 | 2.05 | 2.13 | 2.18 | 1.94 | 2.28 | 2.05 | 24 |
| 12 | 2.29 | 2.41 | 2.48 | 2.47 | 2.59 | 2.66 | 2.39 | 2.23 | 2.15 | 2.15 | 2.12 | 2.21 | 2.13 | 2.04 | 2.01 | S | 1.96 | 1.98 | 2.01 | 1.99 | 2.05 | 2.04 | 1.98 | 1.99 | 1.96 | 2.66 | 2.19 | 24 |
| 13 | 1.98 | 2.01 | 2.03 | 2.07 | 2.06 | 2.13 | 2.10 | 2.08 | 2.06 | 2.06 | 2.06 | 2.05 | 2.05 | 2.04 | S | 1.99 | 1.98 | 1.98 | 2.02 | 2.06 | 2.06 | 2.04 | 1.99 | 1.89 | 1.89 | 2.13 | 2.03 | 24 |
| 14 | 1.91 | 2.02 | 1.96 | 1.95 | 1.95 | 1.95 | 1.96 | 2.01 | 2.15 | 2.11 | 2.03 | 2.00 | 1.98 | S | 1.95 | 1.95 | 1.95 | 1.97 | 1.96 | 1.96 | 1.93 | 1.87 | 1.87 | 1.87 | 1.87 | 2.15 | 1.97 | 24 |
| 15 | 1.90 | 1.90 | 2.07 | 2.11 | 2.18 | 2.15 | 2.12 | 1.97 | 1.99 | 1.99 | 2.03 | 1.99 | S | 1.94 | 1.96 | 1.95 | 1.95 | 1.96 | 1.95 | 1.98 | 1.96 | 2.00 | 2.19 | 2.26 | 1.90 | 2.26 | 2.02 | 24 |
| 16 | 2.31 | 2.38 | 2.33 | 2.46 | 2.47 | 2.30 | 2.14 | 1.92 | 1.97 | 1.94 | 1.96 | S | 1.94 | 1.95 | 1.93 | 1.92 | 1.90 | 1.86 | 1.94 | 1.95 | 1.98 | 1.98 | 1.98 | 2.05 | 1.86 | 2.47 | 2.07 | 24 |
| 17 | 1.96 | 1.91 | 1.90 | 1.96 | 1.94 | 2.01 | 2.12 | 2.04 | 1.94 | 1.91 | S | 1.92 | 1.94 | 1.94 | 1.96 | 1.95 | 1.95 | 1.95 | 1.92 | 1.94 | 2.00 | 2.09 | 2.10 | 1.90 | 2.12 | 1.98 | 24 | |
| 18 | 2.26 | 2.36 | 2.41 | 2.38 | 2.57 | 2.58 | 2.34 | 2.23 | 2.04 | S | 2.02 | 2.02 | 2.00 | 2.00 | 2.01 | 1.97 | 2.00 | 2.02 | 2.07 | 2.07 | 2.08 | 2.17 | 2.12 | 1.97 | 2.58 | 2.16 | 24 | |
| 19 | 2.04 | 2.08 | P | P | X | X | X | X | S | 2.04 | 2.05 | 2.05 | 2.06 | 2.05 | 2.03 | 2.03 | 2.03 | 2.02 | 2.04 | 2.06 | 2.08 | 2.09 | 2.10 | 2.22 | 2.02 | 2.22 | 2.06 | 18 |
| 20 | 2.19 | 2.32 | 2.57 | 2.79 | 2.60 | 2.47 | 2.49 | S | 2.51 | 2.34 | 2.18 | 2.15 | 2.16 | 2.12 | 2.09 | 2.07 | 2.05 | 2.04 | 2.03 | 2.01 | 2.04 | 2.08 | 2.07 | 2.05 | 2.01 | 2.79 | 2.24 | 24 |
| 21 | 2.10 | 1.96 | 1.97 | 1.98 | 1.96 | 2.00 | S | 1.99 | C | C | C | C | C | 1.98 | 1.97 | 2.00 | 1.98 | 1.96 | 1.92 | 1.93 | 1.91 | 1.90 | 1.87 | 1.87 | 1.87 | 2.10 | 1.96 | 24 |
| 22 | 1.90 | 1.89 | 1.92 | 1.87 | 1.85 | S | 1.94 | 1.98 | 1.96 | 1.97 | 1.99 | 1.98 | 1.94 | 1.92 | 1.96 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.96 | 1.99 | 2.08 | 2.13 | 1.85 | 2.13 | 1.96 | 24 |
| 23 | 2.34 | 2.31 | 2.39 | 2.53 | S | 2.75 | 3.05 | 2.84 | 2.33 | 2.18 | 2.05 | 2.02 | 2.02 | 2.02 | 2.04 | 2.04 | 2.04 | 2.06 | 2.06 | 2.05 | 2.11 | 2.09 | 2.17 | 2.23 | 2.02 | 3.05 | 2.25 | 24 |
| 24 | 2.62 | 2.35 | 2.18 | S | 2.16 | 2.24 | 2.45 | 2.32 | 2.22 | 2.17 | 2.13 | 2.12 | 2.11 | 2.12 | 2.06 | 2.05 | 1.99 | 1.98 | 1.99 | 2.01 | 2.02 | 2.07 | 2.15 | 2.20 | 1.98 | 2.62 | 2.16 | 24 |
| 25 | 2.28 | 2.39 | S | 2.72 | 2.76 | 2.87 | 2.66 | 2.36 | 2.17 | 2.11 | 2.15 | 2.13 | 2.11 | 2.13 | 2.15 | 2.14 | 2.12 | 2.12 | 2.16 | 2.16 | 2.17 | 2.24 | 2.31 | 2.24 | 2.11 | 2.87 | 2.29 | 24 |
| 26 | 2.28 | S | 2.20 | 2.19 | 2.16 | 2.22 | 2.23 | 2.16 | 2.13 | 2.12 | 2.11 | 2.09 | 2.05 | 2.05 | 2.06 | 2.01 | 2.01 | 2.12 | 2.00 | 2.00 | 2.01 | 2.01 | 2.01 | 2.00 | 2.00 | 2.28 | 2.10 | 24 |
| 27 | S | 2.02 | 2.01 | 1.98 | 2.01 | 2.09 | 1.99 | 1.94 | 1.94 | 1.94 | 1.95 | 1.94 | 1.97 | 1.99 | 1.97 | 1.97 | 1.97 | 1.95 | 1.97 | 1.98 | 1.95 | 1.99 | 2.09 | S | 1.94 | 2.09 | 1.98 | 24 |
| 28 | 2.00 | 2.04 | 2.07 | 2.13 | 2.06 | 2.10 | 2.12 | 2.10 | 1.97 | 1.97 | 2.02 | 2.02 | 1.97 | 1.96 | 1.97 | 1.97 | 1.96 | 1.96 | 1.95 | 1.97 | 1.94 | 1.95 | S | 1.94 | 1.94 | 2.13 | 2.01 | 24 |
| 29 | 2.06 | 2.14 | 2.23 | 2.34 | 2.51 | 2.49 | 2.39 | 2.30 | 2.29 | 2.18 | 2.12 | 2.09 | 2.09 | 2.07 | 2.05 | 2.03 | 2.03 | 2.03 | 2.05 | 2.07 | 2.10 | S | 2.27 | 2.38 | 2.03 | 2.51 | 2.19 | 24 |
| 30 | 2.37 | 2.51 | 2.48 | 2.43 | 2.33 | 2.23 | 2.25 | 2.26 | 2.35 | 2.26 | 2.12 | 2.05 | 2.08 | 2.03 | 2.04 | 2.08 | 2.08 | 2.03 | 2.03 | 2.04 | S | 2.14 | 2.21 | 2.33 | 2.03 | 2.51 | 2.21 | 24 |
| HOURLY MAX | 2.62 | 2.54 | 2.57 | 2.79 | 2.76 | 2.87 | 3.05 | 2.84 | 2.51 | 2.34 | 2.25 | 2.21 | 2.19 | 2.15 | 2.19 | 2.21 | 2.15 | 2.12 | 2.16 | 2.16 | 2.17 | 2.24 | 2.39 | 2.57 | | | | |
| HOURLY AVG | 2.14 | 2.18 | 2.18 | 2.24 | 2.23 | 2.26 | 2.22 | 2.15 | 2.12 | 2.09 | 2.07 | 2.05 | 2.04 | 2.03 | 2.02 | 2.01 | 2.00 | 2.00 | 2.01 | 2.01 | 2.01 | 2.04 | 2.10 | 2.11 | | | | |

STATUS FLAG CODES

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

24 HR AVERAGES June 2017



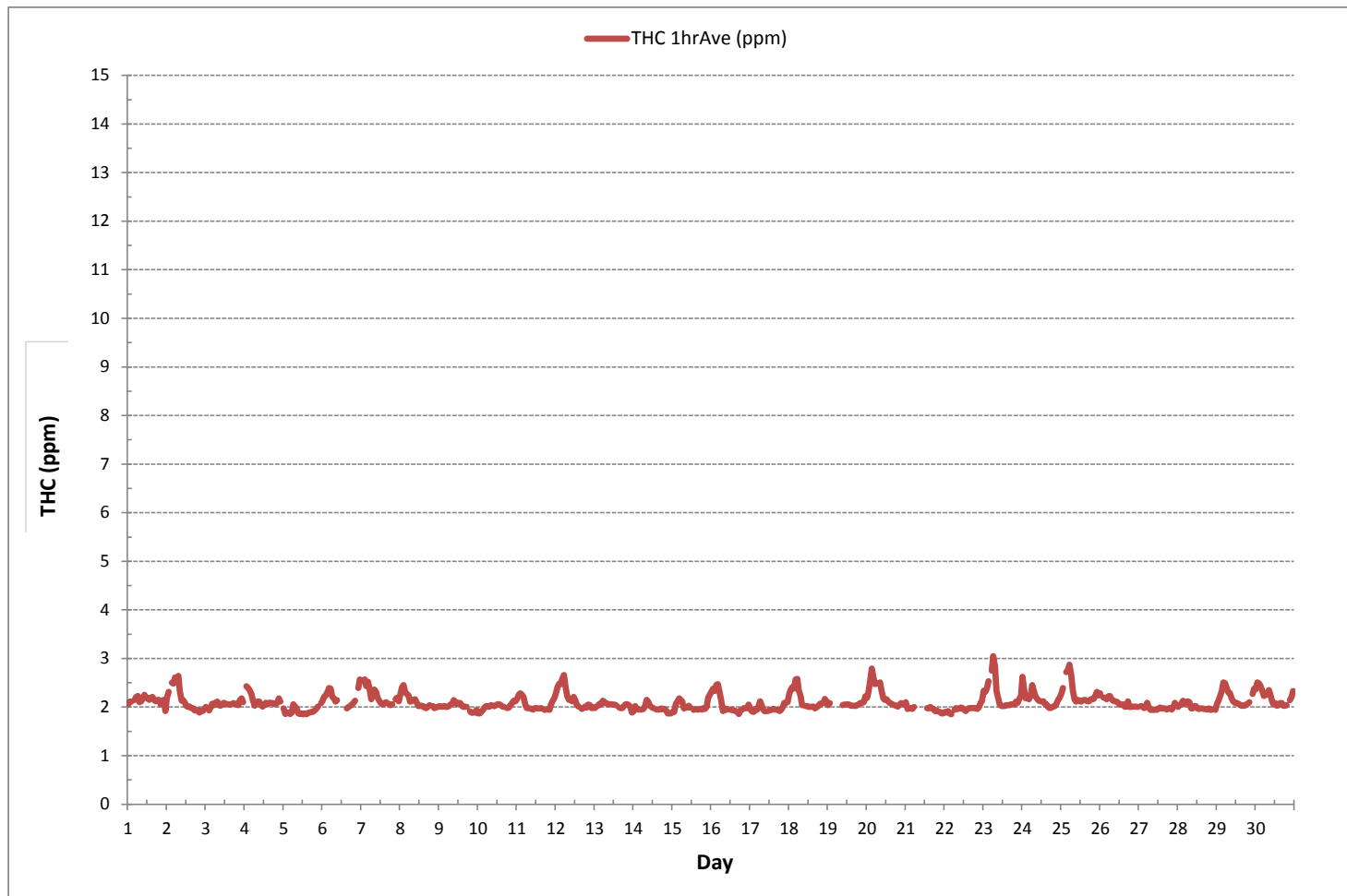
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|-----------|----------|
| NUMBER OF NON-ZERO READINGS: | 672 | | | |
| MINIMUM 1-HR AVERAGE: | 1.85 ppm | @ HOUR | 12 ON DAY | 5 |
| MAXIMUM 1-HR AVERAGE: | 3.05 ppm | @ HOUR | 6 ON DAY | 23 |
| MAXIMUM 24-HR AVERAGE: | 2.29 ppm | | ON DAY | 25 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | | 714 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | | 99.2 % |
| STANDARD DEVIATION: | 0.17 | MONTHLY AVERAGE: | | 2.10 ppm |

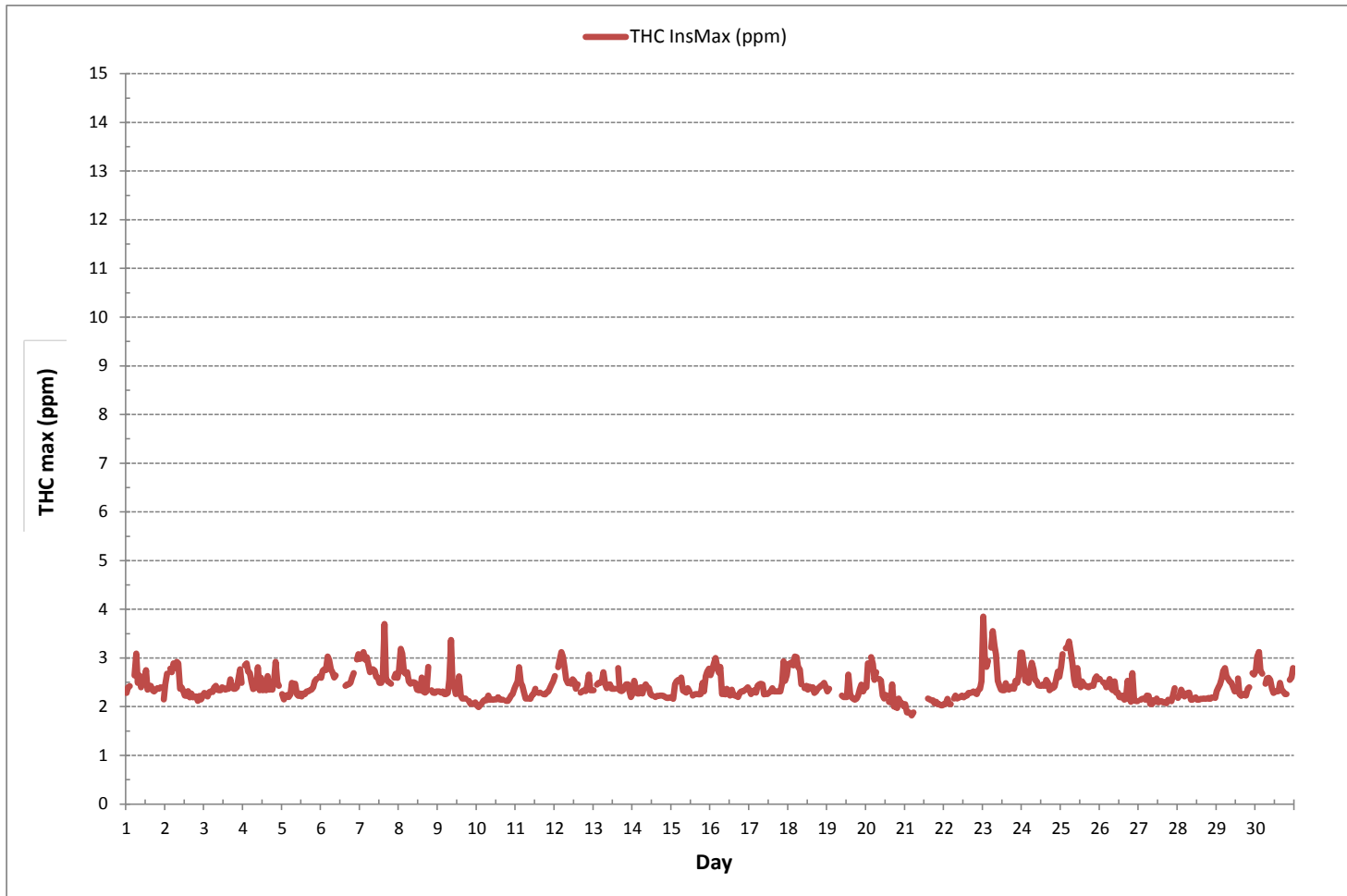


LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - June 2017

TOTAL HYDROCARBONS Hourly Averages (THC ppm)

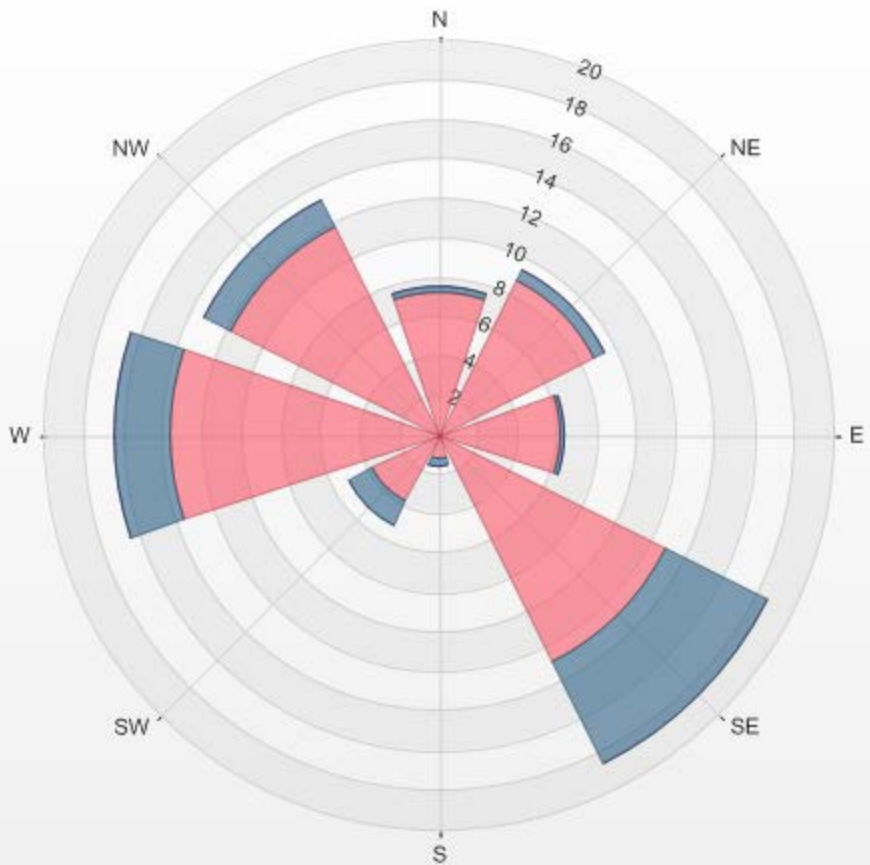


TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

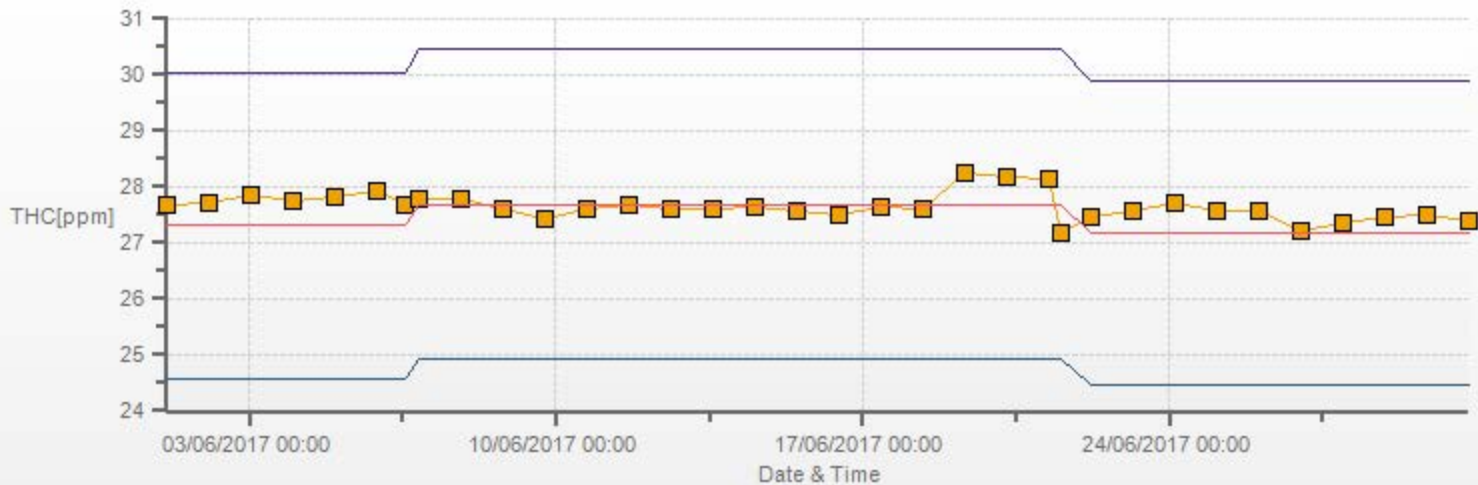


% Icon Classes (ppm) 0 0.0-1.1 66 1.1-2.1 13 2.1-3.2 0 >3.2

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.48% Calm Poll Avg: 2.26[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



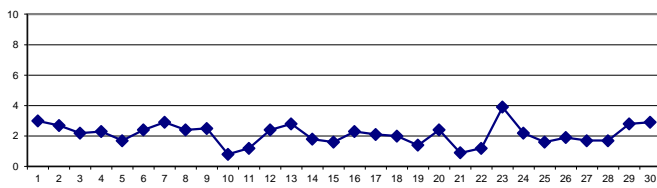
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

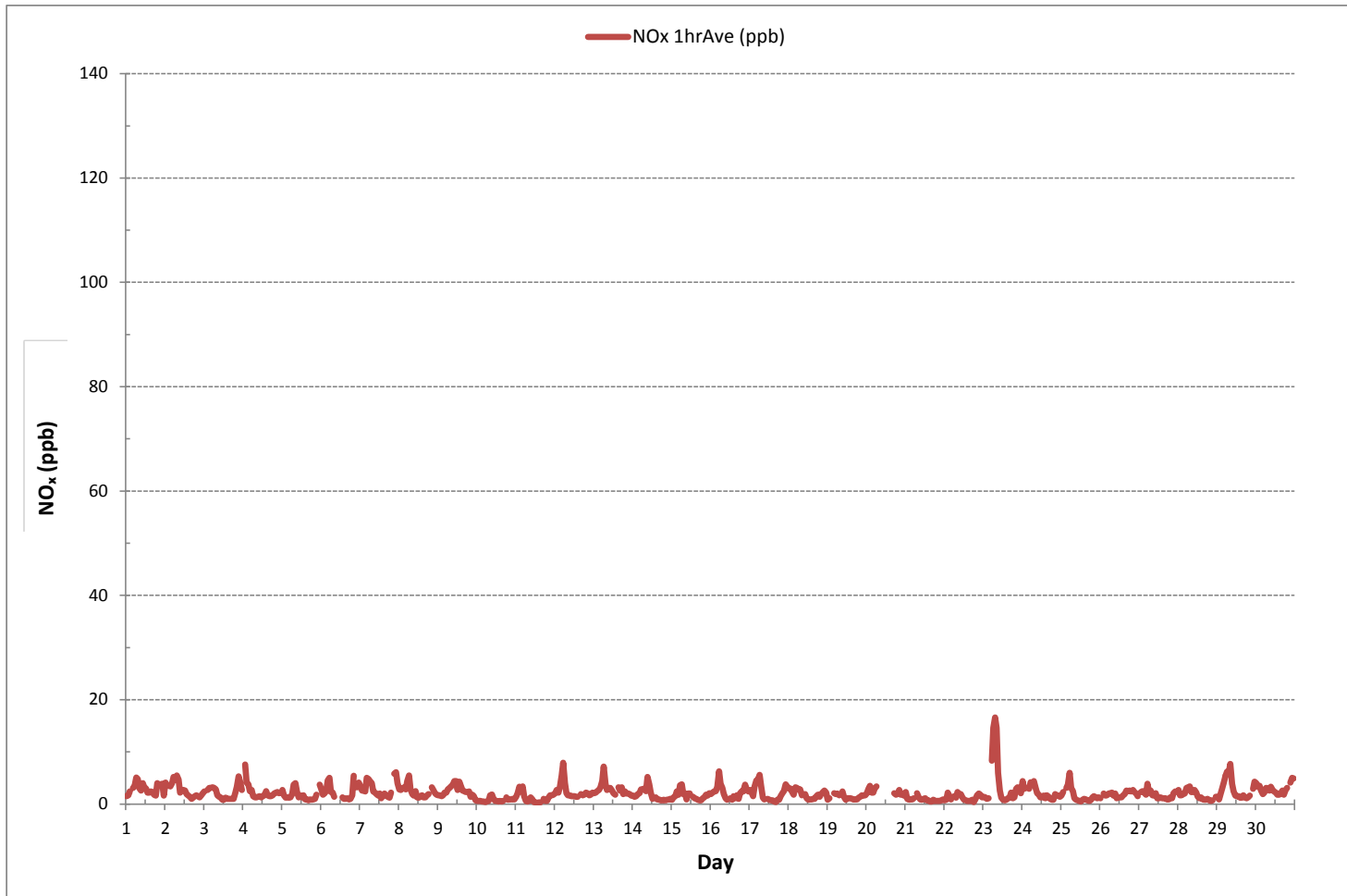
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | |
|------------------------------|--------|-----------------------|--------------|
| NUMBER OF NON-ZERO READINGS: | 673 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 13 ON DAY 11 |
| MAXIMUM 1-HR AVERAGE: | 17 ppb | @ HOUR | 7 ON DAY 23 |
| MAXIMUM 24-HR AVERAGE: | 4 ppb | | ON DAY 23 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 718 hrs |
| MONTHLY CALIBRATION TIME: | 9 hrs | AMD OPERATION UPTIME: | 99.7 % |
| STANDARD DEVIATION: | 2 | MONTHLY AVERAGE: | 2 ppb |

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

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

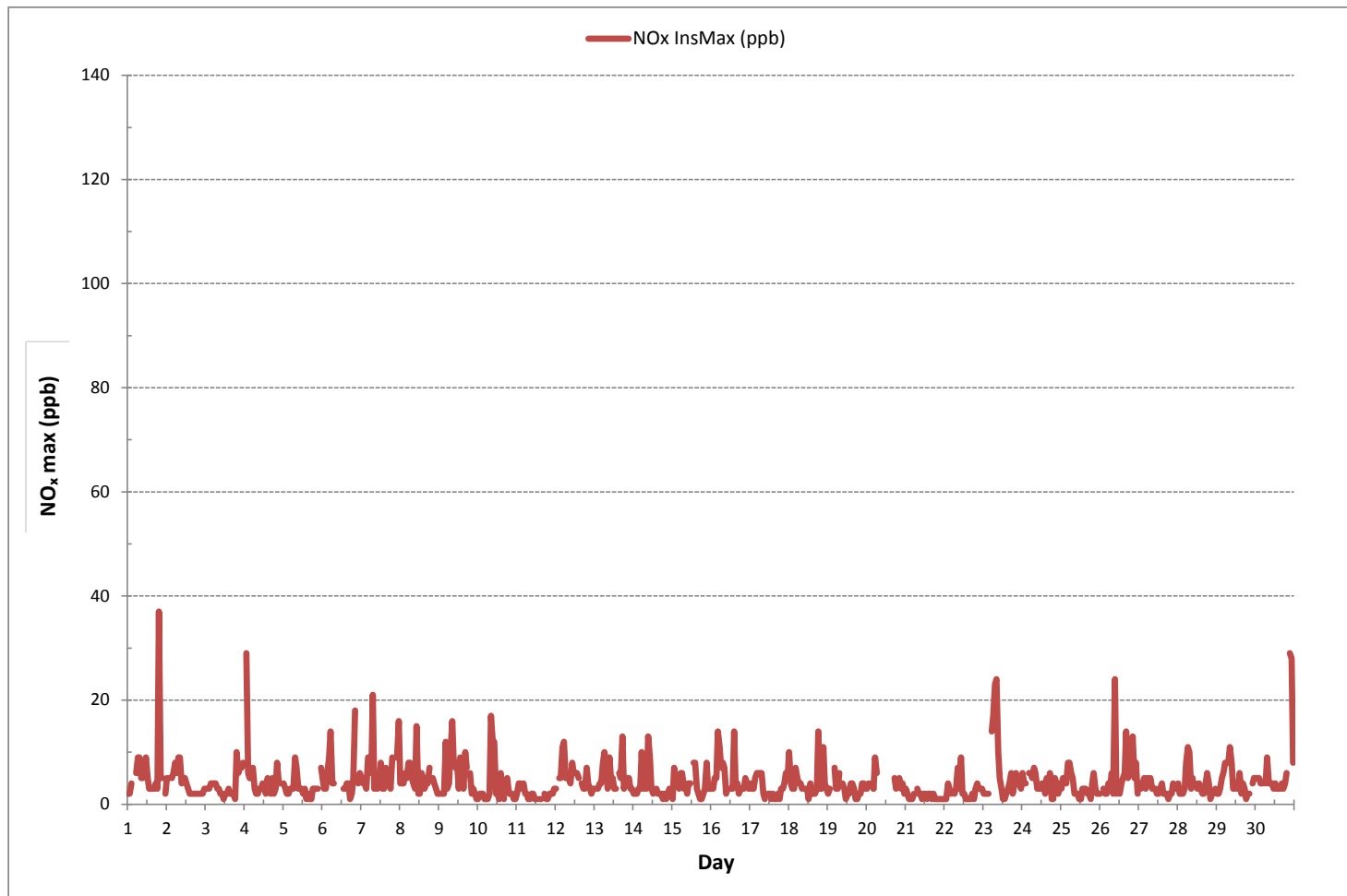
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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

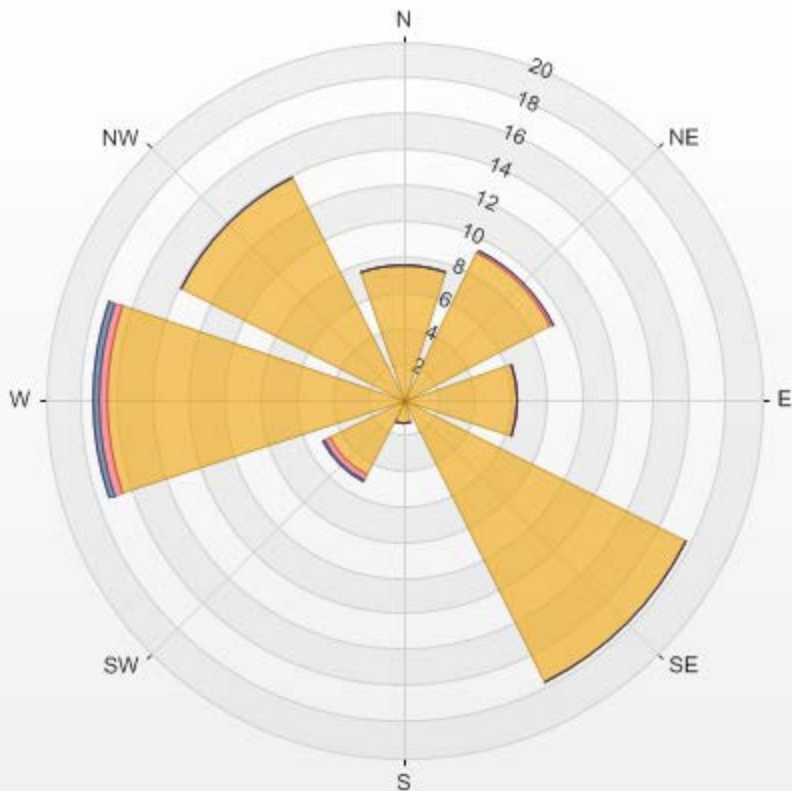
| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 663 |
| MAXIMUM INSTANTANEOUS VALUE: | 37 ppb @ HOUR 19 ON DAY 1 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 9 hrs |
| STANDARD DEVIATION: | 4 |
| OPERATIONAL TIME: | 709 hrs |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb) 77 0.0-5.6 1 5.6-11.1 0 11.1-16.7 0 >16.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.42% Calm Poll Avg: 2.89[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

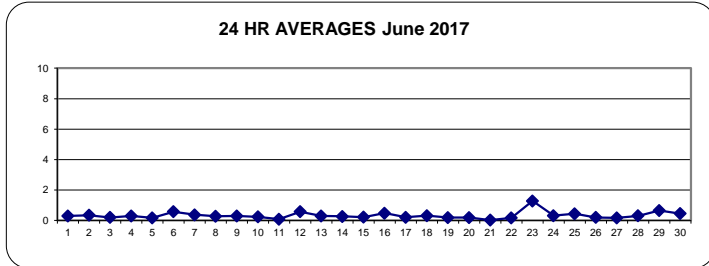
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

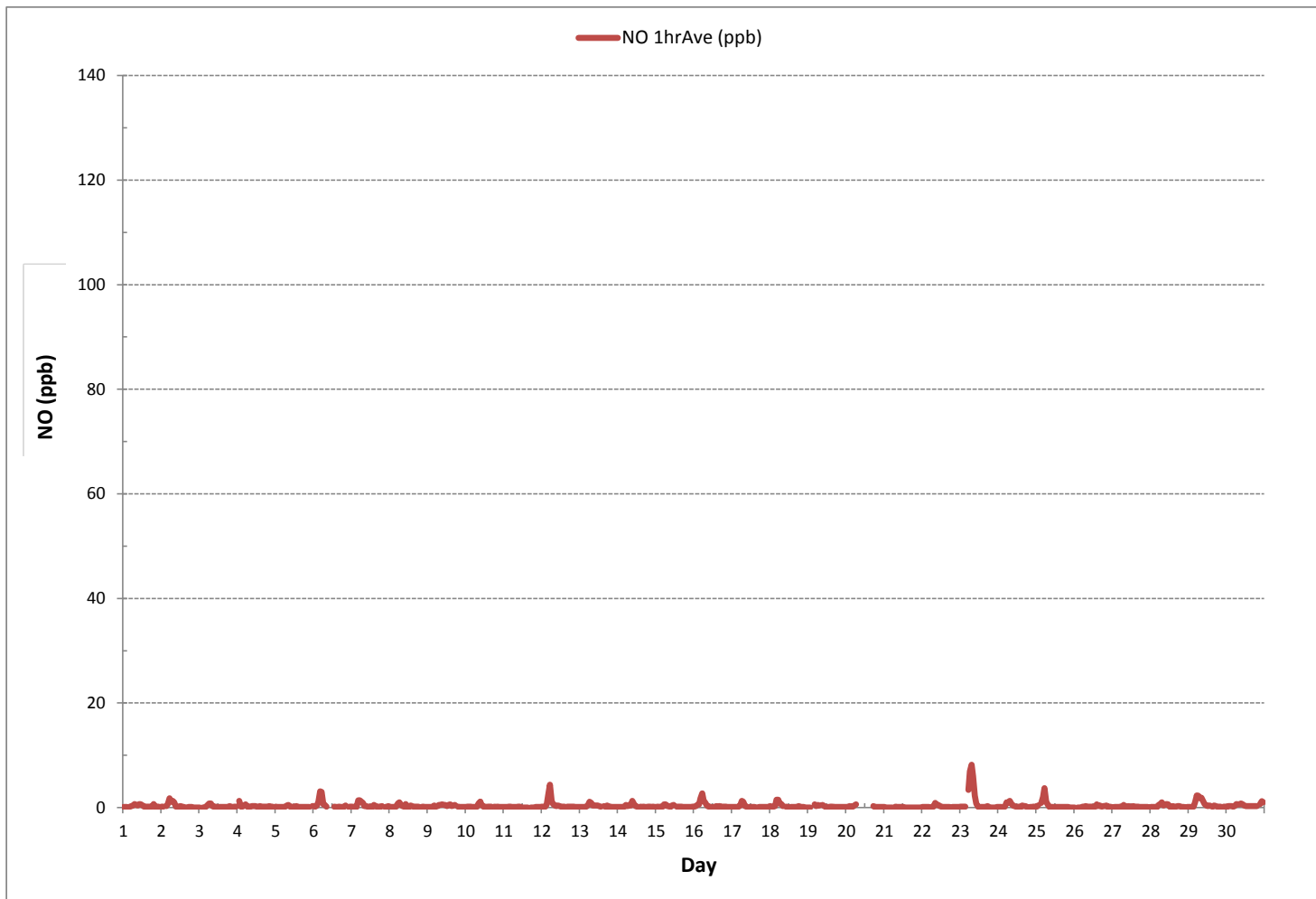
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF NON-ZERO READINGS: | 620 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 15 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 8 ppb | @ HOUR | 23 | ON DAY 23 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | | ON DAY 23 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 718 hrs | |
| MONTHLY CALIBRATION TIME: | 9 hrs | AMD OPERATION UPTIME: | 99.7 % | |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb | |

NITRIC OXIDE Hourly Averages (NO ppb)





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

NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

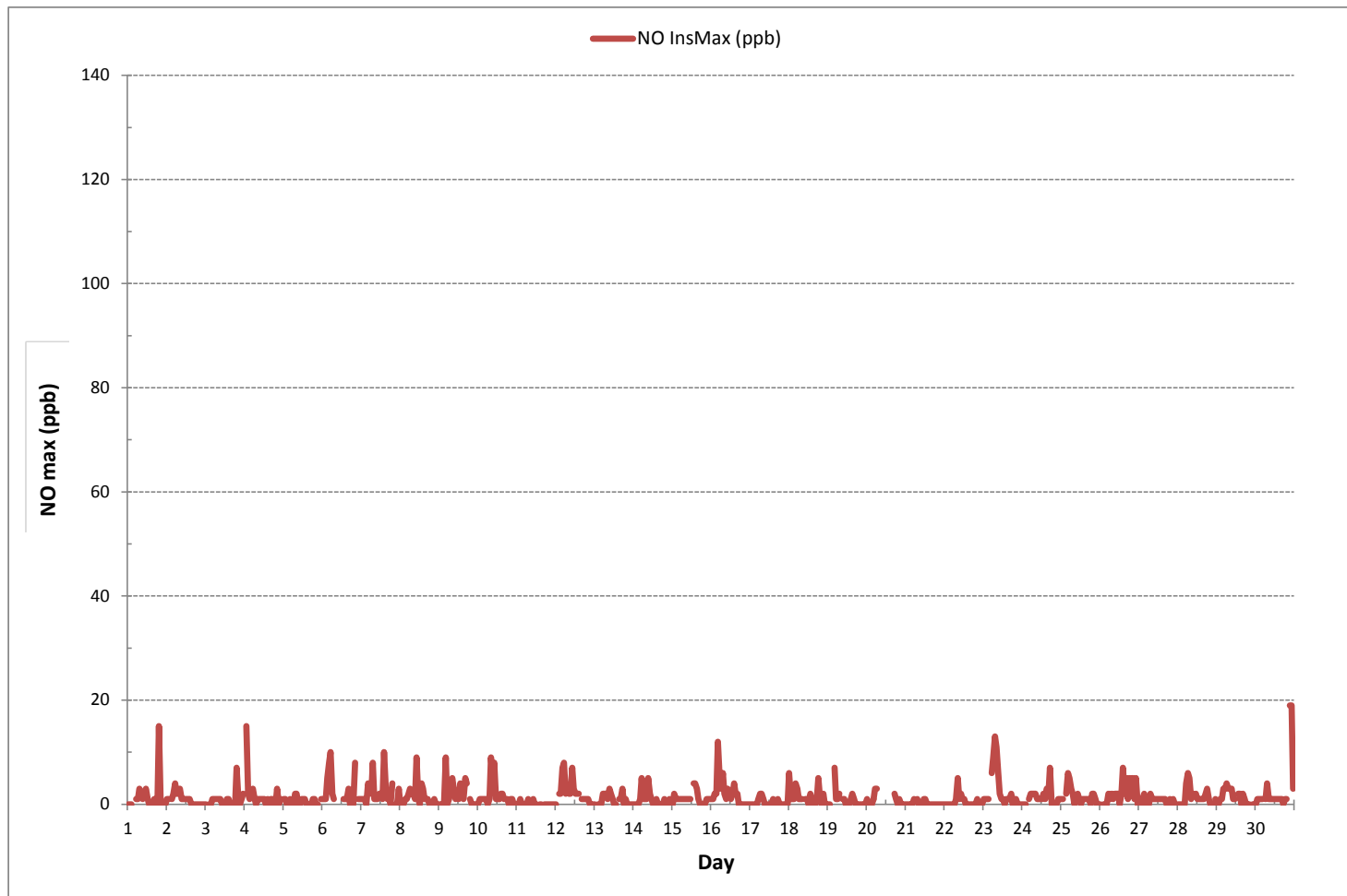
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|----------------------------|
| NUMBER OF NON-ZERO READINGS: | 404 |
| MAXIMUM INSTANTANEOUS VALUE: | 19 ppb @ HOUR 21 ON DAY 30 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 9 hrs |
| OPERATIONAL TIME: | 709 hrs |
| STANDARD DEVIATION: | 2 |

NITRIC OXIDE Instantaneous Maximum (NO ppb)



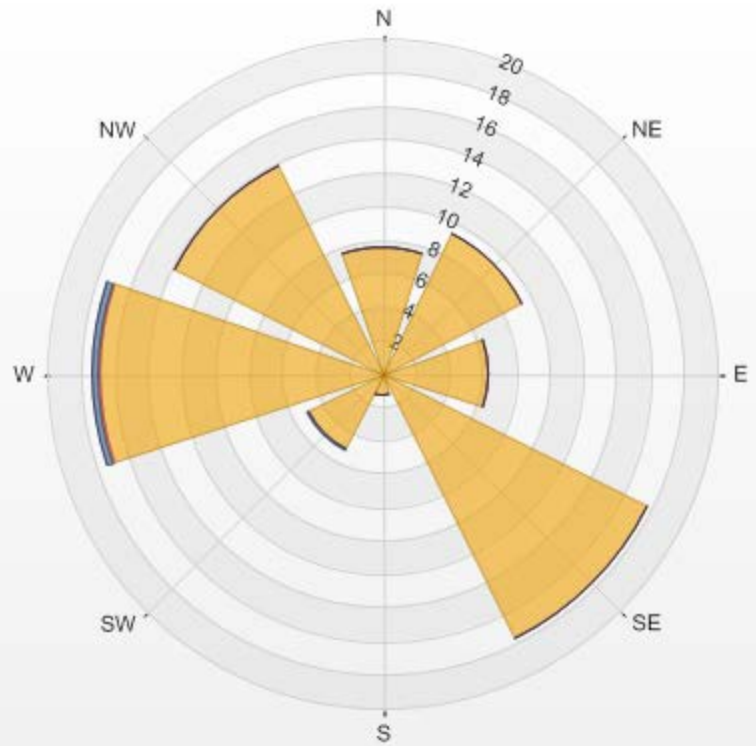
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.42% Calm Avg: 0.50 [ppb]

| Direction | 0.0-2.8 | 2.8-5.5 | 5.5-8.3 | >8.3 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 7.5 | 0.0 | 0.0 | 0.0 | 7.5 |
| NE | 9.4 | 0.0 | 0.0 | 0.0 | 9.4 |
| E | 6.3 | 0.0 | 0.0 | 0.0 | 6.3 |
| SE | 17.7 | 0.0 | 0.0 | 0.0 | 17.7 |
| S | 1.4 | 0.0 | 0.0 | 0.0 | 1.4 |
| SW | 5.0 | 0.0 | 0.2 | 0.0 | 5.1 |
| W | 16.9 | 0.2 | 0.3 | 0.0 | 17.3 |
| NW | 13.9 | 0.0 | 0.0 | 0.0 | 13.9 |
| Summary | 78.0 | 0.2 | 0.5 | 0.0 | 78.6 |

% Icon Classes (ppb) 78 0.0-2.8 0 2.8-5.5 0 5.5-8.3 0 >8.3

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.42% Calm Poll Avg: 0.50[ppb]



NITROGEN DIOXIDE



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

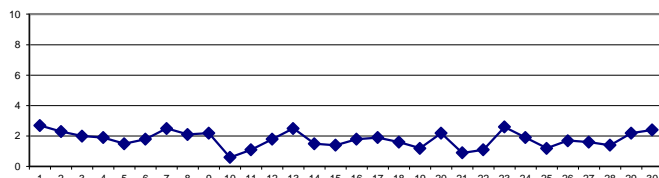
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

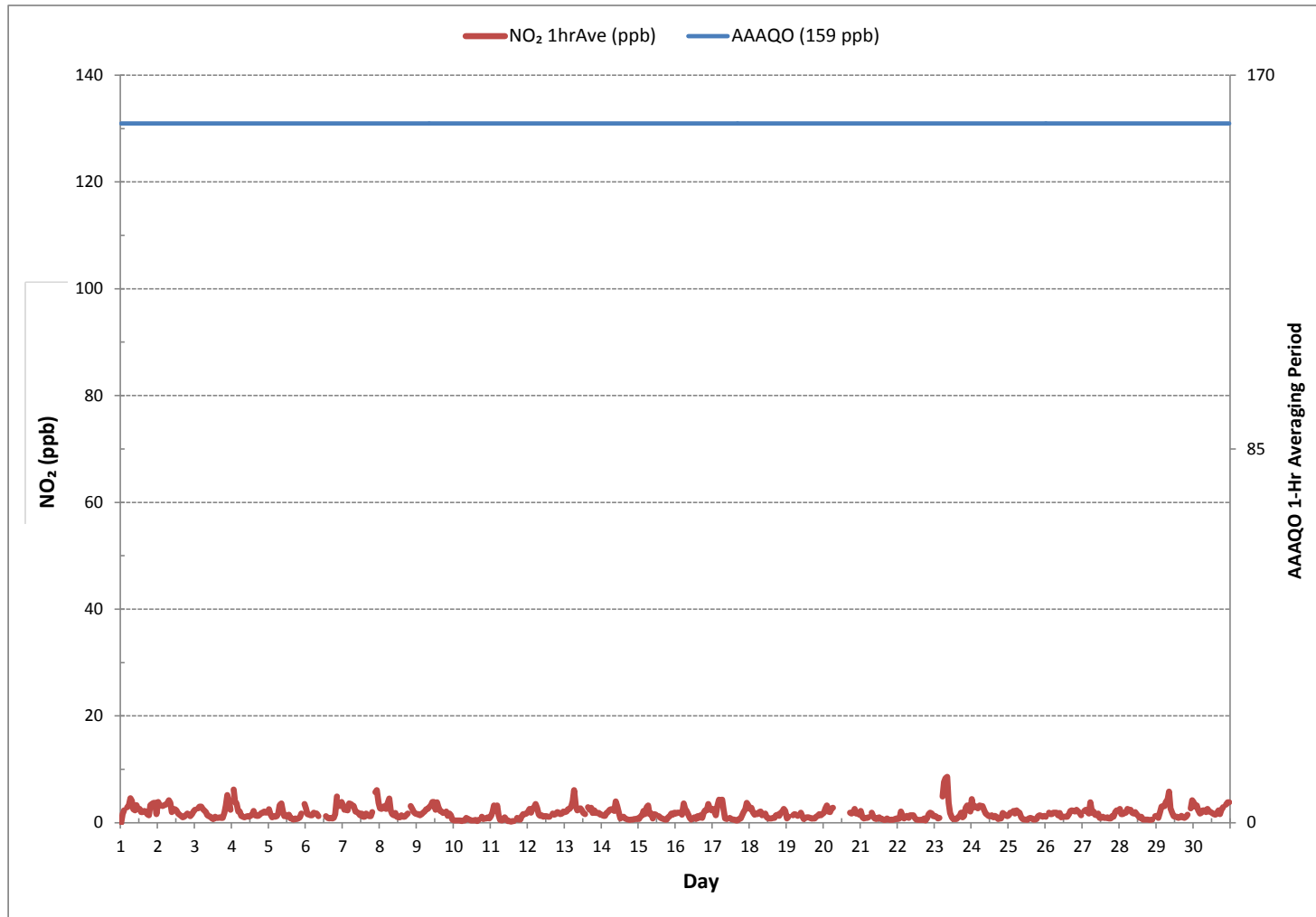
MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|--------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 673 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 13 | ON DAY |
| MAXIMUM 1-HR AVERAGE: | 9 ppb | @ HOUR | 8 | ON DAY |
| MAXIMUM 24-HR AVERAGE: | 3 ppb | | | ON DAY |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 718 hrs | |
| MONTHLY CALIBRATION TIME: | 9 hrs | AMD OPERATION UPTIME: | 99.7 % | |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 2 ppb | |

24 HR AVERAGES June 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

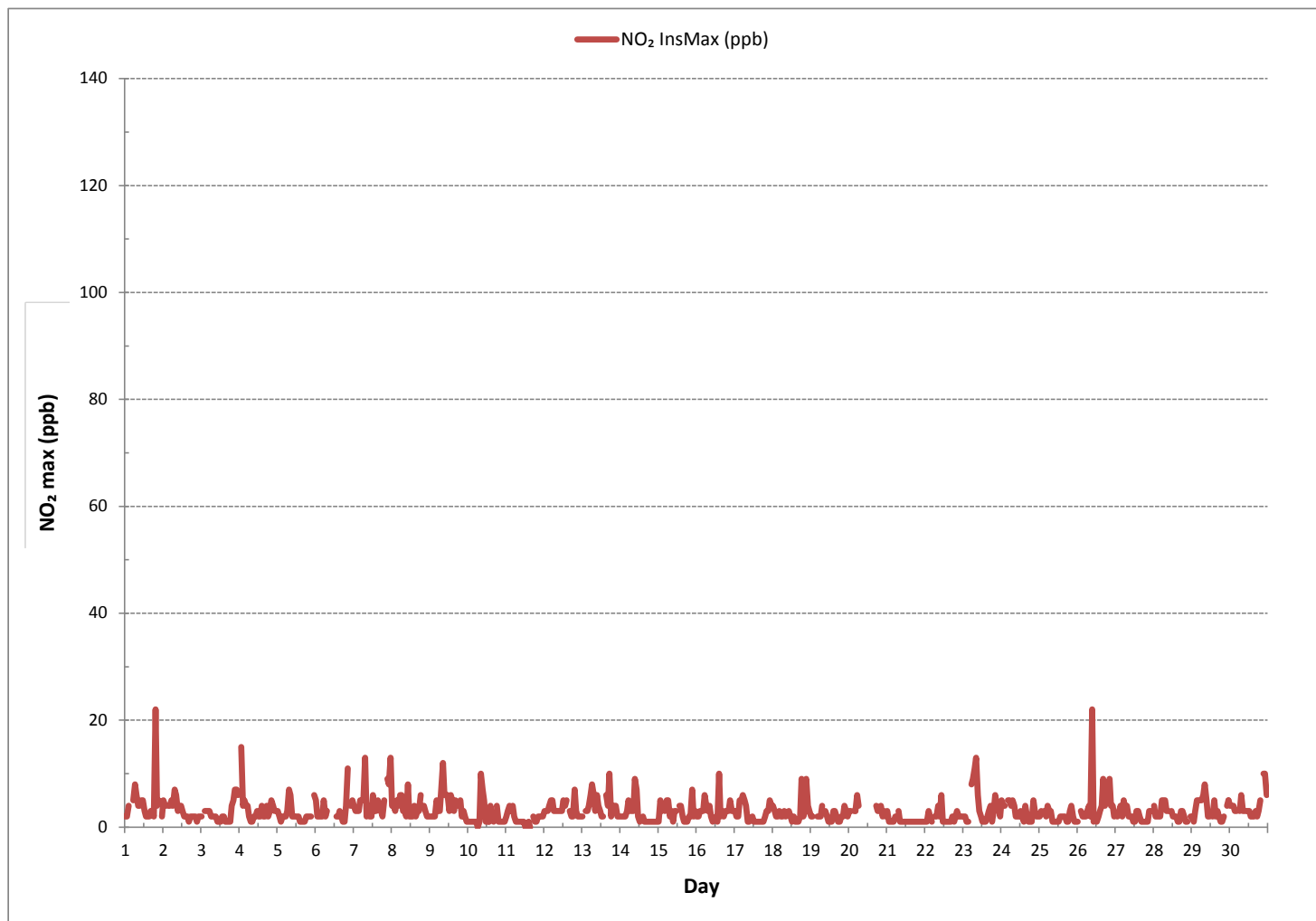
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 660 |
| MAXIMUM INSTANTANEOUS VALUE: | 22 ppb @ HOUR 19 ON DAY 1 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 9 hrs |
| STANDARD DEVIATION: | 2 |
| OPERATIONAL TIME: | 709 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



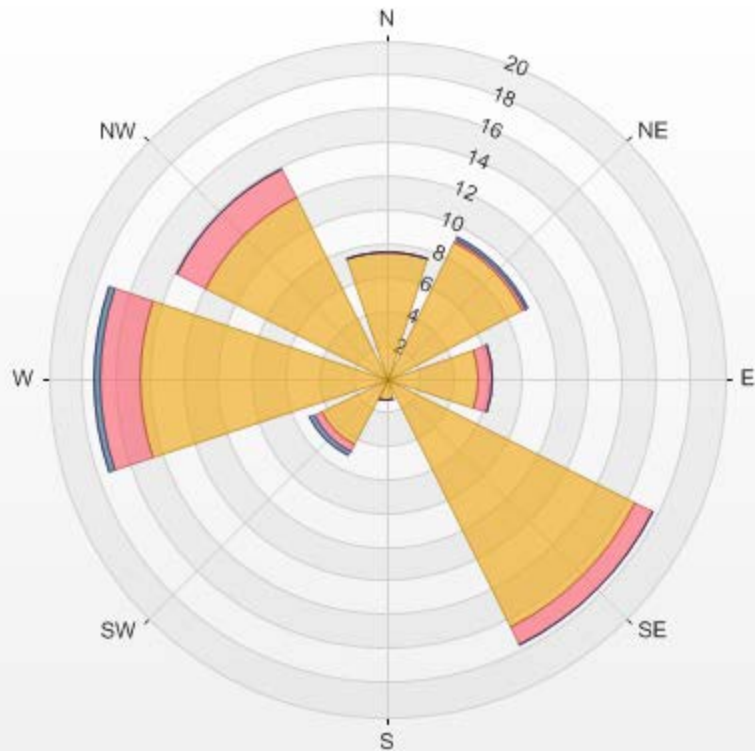
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.42% Calm Avg: 2.40 [ppb]

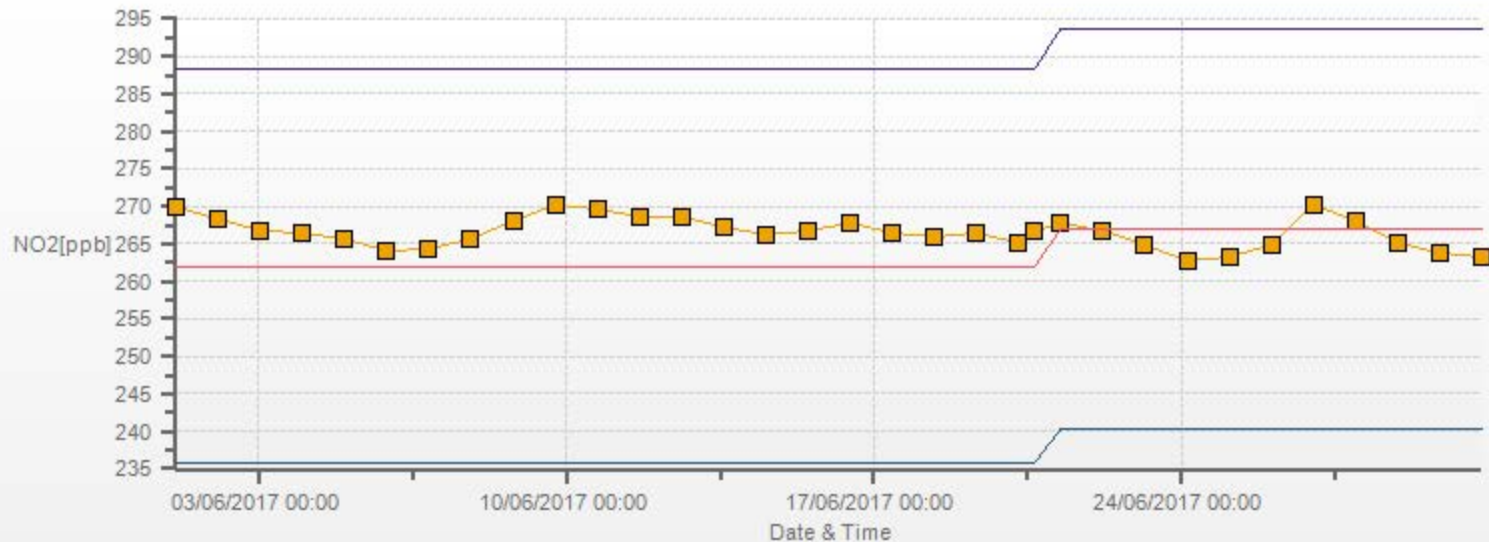
| Direction | 0.0-2.9 | 2.9-5.8 | 5.8-8.7 | >8.7 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 7.5 | 0.0 | 0.0 | 0.0 | 7.5 |
| NE | 9.1 | 0.2 | 0.2 | 0.0 | 9.4 |
| E | 5.4 | 0.9 | 0.0 | 0.0 | 6.3 |
| SE | 16.4 | 1.2 | 0.0 | 0.0 | 17.7 |
| S | 1.4 | 0.0 | 0.0 | 0.0 | 1.4 |
| SW | 4.4 | 0.5 | 0.3 | 0.0 | 5.1 |
| W | 14.6 | 2.4 | 0.3 | 0.0 | 17.3 |
| NW | 12.1 | 1.8 | 0.0 | 0.0 | 13.9 |
| Summary | 70.9 | 6.9 | 0.8 | 0.0 | 78.6 |

% Icon Classes (ppb) 71 0.0-2.9 7 2.9-5.8 1 5.8-8.7 0 >8.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.42% Calm Poll Avg: 2.40[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OZONE



OZONE Hourly Averages (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | |
| DAY 1 | 43.1 | 41.1 | 35.2 | S | 27.7 | 20.9 | 25.7 | 28.5 | 29.0 | 31.2 | 34.6 | 34.2 | 42.2 | 45.4 | 46.4 | 49.9 | 49.1 | 47.2 | 47.1 | 42.8 | 42.1 | 37.5 | 30.5 | 25.1 | 20.9 | 49.9 | 37.2 | 24 |
| 2 | 19.8 | 10.8 | S | 4.1 | 3.0 | 5.1 | 11.0 | 18.1 | 28.0 | 30.4 | 29.6 | 26.4 | 27.0 | 29.4 | 30.6 | 29.8 | 29.0 | 28.5 | 29.3 | 28.4 | 29.0 | 28.7 | 25.9 | 22.7 | 3.0 | 30.6 | 22.8 | 24 |
| 3 | 20.3 | S | 20.0 | 17.8 | 18.0 | 19.3 | 20.5 | 22.5 | 25.2 | 28.0 | 31.3 | 35.7 | 37.9 | 37.7 | 41.0 | 41.4 | 40.0 | 40.8 | 39.9 | 35.9 | 27.1 | 18.1 | 13.6 | 15.5 | 13.6 | 41.4 | 28.2 | 24 |
| 4 | S | 4.5 | 5.9 | 4.8 | 8.4 | 17.0 | 24.0 | 25.7 | 28.1 | 30.9 | 33.3 | 38.9 | 39.9 | 47.5 | 46.0 | 48.8 | 46.3 | 45.2 | 44.6 | 40.0 | 35.3 | 31.4 | 30.5 | S | 4.5 | 48.8 | 30.8 | 24 |
| 5 | 32.4 | 36.1 | 32.9 | 31.5 | 33.5 | 26.4 | 22.0 | 25.7 | 28.1 | 29.5 | 32.3 | 34.0 | 42.7 | 43.9 | 44.8 | 46.2 | 46.9 | 43.3 | 40.5 | 38.6 | 30.1 | 16.6 | S | 7.8 | 7.8 | 46.9 | 33.3 | 24 |
| 6 | 5.2 | 3.3 | 1.8 | 0.6 | 0.5 | 4.1 | 20.4 | 28.6 | 36.2 | 39.1 | 41.0 | 43.3 | Q | Q | 42.5 | 42.9 | 43.2 | 43.8 | 44.3 | 41.0 | 23.0 | S | 18.3 | 10.2 | 0.5 | 44.3 | 25.4 | 24 |
| 7 | 8.8 | 7.8 | 5.3 | 7.4 | 4.5 | 10.0 | 20.0 | 33.6 | 37.9 | 44.4 | 53.2 | 57.1 | 57.0 | 58.7 | 56.8 | 56.2 | 56.6 | 55.7 | 54.1 | 49.2 | S | 27.7 | 23.3 | 20.7 | 4.5 | 58.7 | 35.0 | 24 |
| 8 | 17.0 | 11.2 | 9.2 | 13.6 | 11.6 | 10.7 | 26.0 | 35.8 | 38.8 | 41.5 | 46.2 | 50.3 | 51.5 | 52.8 | 54.2 | 56.7 | 58.3 | 58.6 | 56.2 | S | 48.5 | 45.9 | 43.7 | 43.1 | 9.2 | 58.6 | 38.3 | 24 |
| 9 | 41.8 | 41.1 | 39.7 | 38.1 | 35.0 | 32.4 | 31.9 | 31.9 | 29.3 | 26.8 | 22.7 | 24.9 | 21.7 | 26.1 | 29.5 | 35.9 | 31.6 | 31.0 | S | 37.9 | 42.1 | 47.3 | 36.9 | 23.5 | 21.7 | 47.3 | 33.0 | 24 |
| 10 | 20.4 | 19.9 | 21.5 | 22.0 | 21.1 | 21.9 | 22.3 | 22.5 | 22.5 | 22.4 | 22.8 | 22.1 | 21.6 | 21.7 | 22.1 | 21.4 | 20.7 | S | 21.0 | 19.7 | 16.7 | 14.5 | 13.5 | 12.2 | 12.2 | 22.8 | 20.3 | 24 |
| 11 | 10.8 | 7.4 | 6.3 | 3.3 | 9.8 | 21.3 | 28.1 | 28.3 | 29.5 | 31.9 | 33.1 | 33.8 | 34.3 | 34.3 | 34.3 | S | 32.8 | 32.5 | 32.5 | 28.6 | 18.9 | 13.6 | 10.4 | 3.3 | 34.3 | 23.9 | 24 | |
| 12 | 6.7 | 5.6 | 3.9 | 2.0 | 1.8 | 3.6 | 12.2 | 17.0 | 22.8 | 28.6 | 30.8 | 31.5 | 32.0 | 31.5 | 32.7 | S | 37.1 | 38.3 | 40.1 | 40.4 | 38.2 | 37.5 | 36.6 | 35.9 | 1.8 | 40.4 | 24.6 | 24 |
| 13 | 35.7 | 35.2 | 31.1 | 27.0 | 24.8 | 20.3 | 18.6 | 29.2 | 33.7 | 34.9 | 34.5 | 36.4 | 41.0 | 42.9 | S | 38.5 | 39.7 | 30.9 | 31.0 | 31.0 | 32.8 | 31.0 | 30.6 | 33.5 | 18.6 | 42.9 | 32.4 | 24 |
| 14 | 27.8 | 16.0 | 19.0 | 19.2 | 20.4 | 20.8 | 20.2 | 20.0 | 23.2 | 21.2 | 27.2 | 26.0 | 24.7 | S | 28.2 | 25.8 | 22.9 | 20.3 | 18.9 | 18.5 | 18.1 | 16.7 | 14.6 | 12.0 | 12.0 | 28.2 | 20.9 | 24 |
| 15 | 28.8 | 30.8 | 18.2 | 12.2 | 9.2 | 11.4 | 21.3 | 29.5 | 31.7 | 35.2 | 34.3 | 33.5 | S | 27.4 | 27.0 | 28.6 | 26.8 | 28.7 | 30.7 | 28.6 | 27.2 | 19.6 | 11.5 | 8.1 | 8.1 | 35.2 | 24.4 | 24 |
| 16 | 5.3 | 3.3 | 1.9 | 1.3 | 1.7 | 3.6 | 10.5 | 21.2 | 27.2 | 32.7 | 36.2 | S | 33.8 | 35.7 | 36.0 | 34.5 | 35.2 | 36.1 | 29.4 | 25.0 | 18.2 | 17.9 | 18.7 | 18.7 | 1.3 | 36.2 | 21.0 | 24 |
| 17 | 18.4 | 19.6 | 20.0 | 17.3 | 15.7 | 14.7 | 15.0 | 16.9 | 19.2 | 21.8 | S | 25.6 | 25.8 | 26.9 | 27.9 | 31.1 | 34.7 | 32.3 | 30.8 | 29.1 | 25.9 | 18.0 | 16.0 | 11.3 | 11.3 | 34.7 | 22.3 | 24 |
| 18 | 8.5 | 4.6 | 2.8 | 2.4 | 1.8 | 5.4 | 17.2 | 24.2 | 30.4 | S | 36.3 | 40.1 | 41.4 | 43.2 | 43.7 | 42.9 | 40.0 | 39.6 | 38.5 | 34.2 | 32.8 | 28.5 | 26.4 | 29.3 | 1.8 | 43.7 | 26.7 | 24 |
| 19 | 33.7 | 29.9 | P | P | 23.7 | 21.4 | 22.0 | 24.0 | S | 26.7 | 30.8 | 34.3 | 35.5 | 37.0 | 33.6 | 33.9 | 32.9 | 34.0 | 35.0 | 33.1 | 26.2 | 20.2 | 18.8 | 17.2 | 17.2 | 37.0 | 28.8 | 22 |
| 20 | 15.4 | 14.3 | 9.3 | 7.2 | 12.4 | 20.3 | 21.6 | S | 23.5 | 27.4 | 32.6 | 33.6 | 32.5 | 33.0 | 34.3 | 33.7 | 35.4 | 35.1 | 37.8 | 35.8 | 31.9 | 28.5 | 25.9 | 25.5 | 7.2 | 37.8 | 26.4 | 24 |
| 21 | 25.4 | 34.6 | 32.5 | 33.7 | 32.2 | 29.0 | S | 23.0 | C | C | C | C | C | C | 25.8 | 30.1 | 30.3 | 29.7 | 30.0 | 30.0 | 28.5 | 26.7 | 25.8 | 23.6 | 23.0 | 34.6 | 28.9 | 24 |
| 22 | 20.8 | 17.7 | 17.3 | 23.3 | 20.5 | S | 20.9 | 23.4 | 21.4 | 19.8 | 20.5 | 22.9 | 25.3 | 25.8 | 29.5 | 31.4 | 32.3 | 32.2 | 32.2 | 34.6 | 32.3 | 22.0 | 15.3 | 9.3 | 9.3 | 34.6 | 23.9 | 24 |
| 23 | 5.2 | 3.7 | 1.9 | 1.3 | S | 3.7 | 6.2 | 13.0 | 21.1 | 24.8 | 30.1 | 31.6 | 33.8 | 35.8 | 37.8 | 40.2 | 40.1 | 41.6 | 41.5 | 42.0 | 37.5 | 25.2 | 18.4 | 15.6 | 1.3 | 42.0 | 24.0 | 24 |
| 24 | 20.2 | 16.6 | 17.1 | S | 14.0 | 10.2 | 17.4 | 22.6 | 27.0 | 30.7 | 34.2 | 35.8 | 36.1 | 38.0 | 34.2 | 31.8 | 30.9 | 31.4 | 32.0 | 30.4 | 23.1 | 14.7 | 8.4 | 5.7 | 5.7 | 38.0 | 24.5 | 24 |
| 25 | 3.8 | 2.8 | S | 0.6 | 0.8 | 2.8 | 11.6 | 24.3 | 32.7 | 33.8 | 33.9 | 35.3 | 37.0 | 38.2 | 38.6 | 39.5 | 38.9 | 39.7 | 40.3 | 38.5 | 36.4 | 35.8 | 34.4 | 35.0 | 0.6 | 40.3 | 27.6 | 24 |
| 26 | 34.3 | S | 34.4 | 34.2 | 34.1 | 32.5 | 33.7 | 34.9 | 36.1 | 40.1 | 42.1 | 43.2 | 43.7 | 44.2 | 43.0 | 42.5 | 42.0 | 39.8 | 41.4 | 41.1 | 37.1 | 36.2 | 38.2 | 39.5 | 32.5 | 44.2 | 38.6 | 24 |
| 27 | S | 37.1 | 35.1 | 35.0 | 33.8 | 26.4 | 27.2 | 33.5 | 32.0 | 32.8 | 32.0 | 37.6 | 42.0 | 36.5 | 37.0 | 35.9 | 36.4 | 41.0 | 41.4 | 39.5 | 37.8 | 28.1 | 25.0 | S | 25.0 | 42.0 | 34.7 | 24 |
| 28 | 22.2 | 20.0 | 15.9 | 13.4 | 12.8 | 11.5 | 10.0 | 14.0 | 20.8 | 21.9 | 22.0 | 25.2 | 32.0 | 27.9 | 27.3 | 29.1 | 22.5 | 21.7 | 21.8 | 26.5 | 30.1 | 28.7 | S | 28.3 | 10.0 | 32.0 | 22.0 | 24 |
| 29 | 19.7 | 13.6 | 8.2 | 4.7 | 3.0 | 6.3 | 11.7 | 17.2 | 18.6 | 25.1 | 27.6 | 30.0 | 30.7 | 30.9 | 31.3 | 30.4 | 28.0 | 30.4 | 28.8 | 26.6 | 23.2 | S | 15.1 | 15.0 | 3.0 | 31.3 | 20.7 | 24 |
| 30 | 12.3 | 6.5 | 4.6 | 5.7 | 16.2 | 15.3 | 12.8 | 13.3 | 14.3 | 17.8 | 25.7 | 29.8 | 31.2 | 32.6 | 32.0 | 34.4 | 31.9 | 26.7 | 27.6 | 27.4 | S | 11.1 | 5.0 | 1.9 | 1.9 | 34.4 | 19.0 | 24 |
| HOURLY MAX | 43.1 | 41.1 | 39.7 | 38.1 | 35.0 | 32.5 | 33.7 | 35.8 | 38.8 | 44.4 | 53.2 | 57.1 | 57.0 | 58.7 | 56.8 | 56.7 | 58.3 | 58.6 | 56.2 | 49.2 | 48.5 | 47.3 | 43.7 | 43.1 | | | | |
| HOURLY AVG | 20.1 | 17.7 | 16.7 | 14.2 | 15.6 | 15.5 | 19.4 | 24.2 | 27.4 | 29.7 | 32.5 | 34.0 | 35.3 | 36.5 | 36.1 | 37.1 | 36.5 | 36.4 | 35.8 | 33.7 | 30.7 | 26.2 | 22.7 | 19.9 | | | | |

STATUS FLAG CODES

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

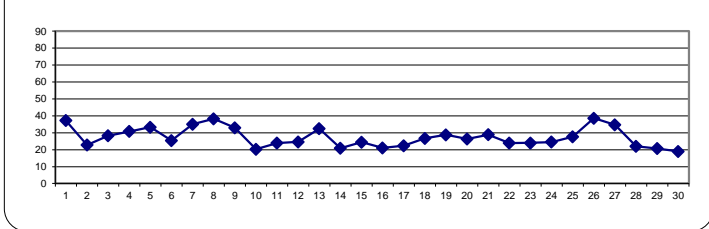
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

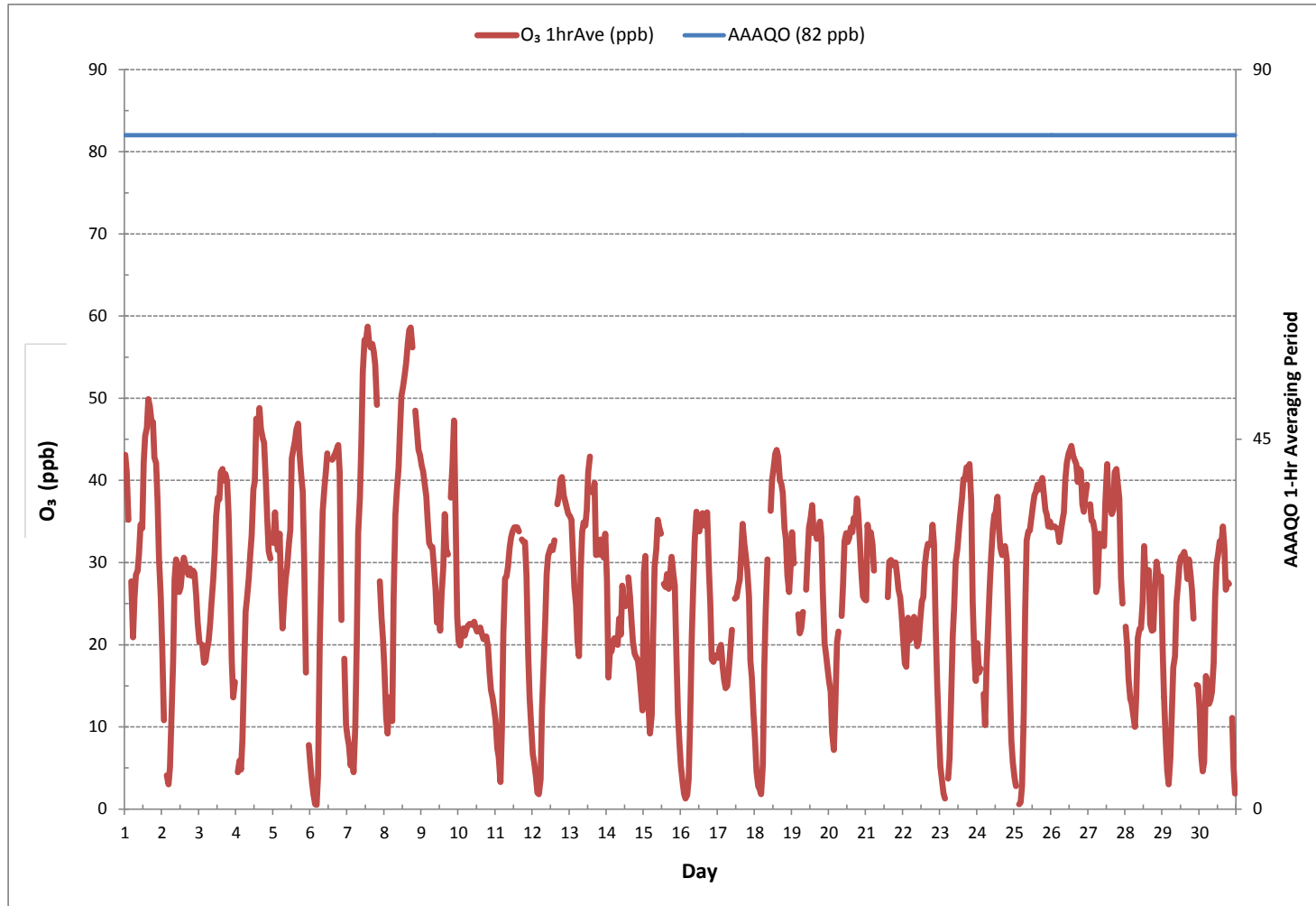
MONTHLY SUMMARY

| | | | | | |
|------------------------------|----------|-----------------------|----------|--------|----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 678 | | | | |
| MINIMUM 1-HR AVERAGE: | 0.5 ppb | @ HOUR | 4 | ON DAY | 6 |
| MAXIMUM 1-HR AVERAGE: | 58.7 ppb | @ HOUR | 13 | ON DAY | 7 |
| MAXIMUM 24-HR AVERAGE: | 38.6 ppb | | | ON DAY | 26 |
| I2S CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 718 hrs | | |
| MONTHLY CALIBRATION TIME: | 6 hrs | AMD OPERATION UPTIME: | 99.7 % | | |
| STANDARD DEVIATION: | 12.1 | MONTHLY AVERAGE: | 27.3 ppb | | |

24 HR AVERAGES June 2017



OZONE Hourly Averages (O₃ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 43.9 | 42.4 | 39.3 | S | P | 27.1 | 29.2 | 30.2 | 31.7 | 32.3 | 37.8 | 38.2 | 46.4 | 47.3 | 47.9 | 52.0 | 50.4 | 49.6 | 49.5 | 47.0 | 43.7 | 41.3 | P | 29.9 | 27.1 | 52.0 | 40.8 | 22 | |
| 2 | 24.9 | 16.4 | S | 6.9 | 3.6 | 9.7 | 12.2 | 20.9 | 31.9 | 32.0 | 30.5 | 28.5 | 27.8 | 30.6 | 31.4 | 30.5 | 29.3 | 28.6 | 29.8 | 29.2 | 29.7 | 29.4 | 27.7 | 25.0 | 3.6 | 32.0 | 24.6 | 24 | |
| 3 | 20.3 | S | 20.8 | 18.6 | 18.6 | 19.8 | 21.2 | 24.1 | 26.3 | 29.9 | 33.3 | 38.1 | 39.1 | 39.1 | 42.3 | 42.3 | 41.3 | 41.6 | 41.5 | 40.3 | 32.4 | 22.5 | 19.3 | 20.1 | 18.6 | 42.3 | 30.1 | 24 | |
| 4 | S | 7.0 | 6.8 | 6.0 | 13.3 | 22.7 | 26.0 | 26.0 | 30.2 | 32.7 | 34.2 | 41.1 | 43.1 | 51.6 | 48.5 | 50.7 | 48.4 | 46.1 | 46.4 | 44.6 | 42.5 | 34.8 | 32.5 | S | 6.0 | 51.6 | 33.4 | 24 | |
| 5 | 36.3 | 38.3 | 34.7 | 35.1 | 34.8 | 31.1 | 23.9 | 28.0 | 32.4 | 32.0 | 32.4 | 38.7 | 44.7 | 45.2 | 45.5 | 47.3 | 49.0 | 45.2 | 41.9 | 39.9 | 37.5 | 20.7 | S | 12.0 | 12.0 | 49.0 | 35.9 | 24 | |
| 6 | 7.0 | 5.8 | 3.9 | 0.9 | 0.5 | 10.1 | 25.7 | 33.7 | 38.1 | 41.1 | 42.8 | 45.7 | Q | Q | Q | 44.2 | 44.6 | 44.9 | 45.9 | 47.6 | 32.8 | S | 26.6 | 16.7 | 0.5 | 47.6 | 27.9 | 24 | |
| 7 | 11.1 | 10.5 | 6.8 | 8.3 | 6.7 | 14.7 | 29.3 | 37.4 | 41.2 | 48.1 | 56.8 | 58.4 | 58.5 | 60.0 | 59.7 | 59.1 | 58.1 | 57.0 | 56.3 | 52.0 | S | 34.0 | 27.7 | 24.4 | 6.7 | 60.0 | 38.1 | 24 | |
| 8 | 25.9 | 17.4 | 11.0 | 17.2 | 12.9 | 18.0 | 32.4 | 38.4 | 40.6 | 43.3 | 49.2 | 52.9 | 53.1 | 54.5 | 55.2 | 58.1 | 59.4 | 60.0 | 59.4 | S | 50.8 | 46.7 | 44.8 | 43.4 | 11.0 | 60.0 | 41.1 | 24 | |
| 9 | 42.8 | 41.5 | 40.9 | 39.1 | 36.3 | 33.7 | 33.1 | 32.8 | 31.3 | 30.9 | 25.8 | 26.9 | 24.2 | 29.9 | 37.2 | 38.0 | 34.8 | 36.0 | S | 42.4 | 51.6 | 52.2 | 43.6 | 27.1 | 24.2 | 52.2 | 36.2 | 24 | |
| 10 | 20.5 | 20.2 | 23.0 | 24.3 | 21.8 | 22.1 | 22.8 | 23.3 | 23.0 | 23.0 | 23.4 | 22.8 | 22.1 | 22.1 | 22.7 | 22.7 | 21.6 | S | 21.7 | 21.4 | 18.6 | 15.5 | 13.9 | 13.8 | 13.8 | 24.3 | 21.1 | 24 | |
| 11 | 12.9 | 10.1 | 7.4 | 5.2 | 17.2 | 27.4 | 29.0 | 29.8 | 32.1 | 33.1 | 34.4 | 35.4 | 36.3 | P | 35.7 | 35.1 | S | 33.9 | 33.4 | 33.4 | 32.0 | 23.2 | 15.7 | 13.8 | 5.2 | 36.3 | 25.8 | 23 | |
| 12 | 10.5 | P | 4.6 | 2.8 | 2.0 | 9.4 | 16.0 | 18.7 | 26.8 | 30.5 | 31.7 | 32.4 | 32.8 | 32.0 | 33.6 | S | 38.5 | 39.1 | 40.9 | 41.2 | 40.3 | 37.7 | 37.1 | 36.0 | 2.0 | 41.2 | 27.0 | 23 | |
| 13 | 36.0 | P | 33.6 | 28.7 | 28.2 | 23.3 | 22.1 | 33.3 | 35.4 | 37.7 | 38.8 | 38.9 | 42.7 | 44.8 | S | 42.7 | 48.8 | 36.8 | 33.6 | 37.2 | 37.7 | 33.6 | 35.5 | 34.6 | 22.1 | 48.8 | 35.6 | 23 | |
| 14 | 32.9 | 24.7 | 22.1 | 21.5 | 21.8 | 24.9 | 24.6 | 23.0 | 26.2 | 23.1 | 30.0 | 28.3 | 27.1 | S | 30.2 | 27.4 | 25.1 | 23.4 | 19.9 | 19.9 | 19.6 | 17.4 | 15.4 | 14.4 | 14.4 | 32.9 | 23.6 | 24 | |
| 15 | 35.7 | 32.7 | 27.9 | 16.1 | 12.8 | 14.8 | 29.1 | 32.3 | 33.0 | 37.1 | 36.2 | 35.4 | S | 29.2 | 27.8 | 32.2 | 29.6 | 31.1 | 32.0 | 31.8 | 29.8 | 25.0 | 14.2 | 10.8 | 10.8 | 37.1 | 27.7 | 24 | |
| 16 | 8.0 | 4.3 | 2.2 | 2.1 | 2.8 | 4.7 | 17.2 | 27.2 | 31.6 | 37.7 | 38.1 | S | 35.1 | 38.0 | 38.0 | 36.3 | 38.5 | 33.4 | 28.9 | 22.4 | 19.6 | 20.1 | 19.6 | 2.1 | 38.5 | 23.6 | 24 | | |
| 17 | 18.9 | 20.7 | 21.8 | 19.7 | 17.2 | 17.0 | 15.3 | 18.6 | 21.0 | 25.3 | S | 26.9 | 29.0 | 29.5 | 30.6 | 39.8 | 38.2 | 37.1 | 31.4 | 30.8 | 27.5 | 23.0 | 20.0 | 13.8 | 13.8 | 39.8 | 24.9 | 24 | |
| 18 | 12.2 | 5.5 | 4.0 | 3.6 | 2.3 | 10.3 | 21.0 | 26.9 | 32.7 | S | 38.0 | 43.3 | 42.7 | 44.6 | 45.4 | 44.0 | 41.1 | 41.2 | 40.0 | 36.9 | 35.4 | 33.6 | 28.4 | 32.0 | 2.3 | 45.4 | 28.9 | 24 | |
| 19 | 34.6 | 33.3 | P | P | 25.6 | 22.1 | 23.9 | 24.8 | S | 28.7 | 33.0 | 36.2 | 38.0 | 38.8 | 38.2 | 37.4 | 34.0 | 34.8 | 35.7 | 34.8 | 30.0 | 25.1 | 24.1 | 20.6 | 20.6 | 38.8 | 31.1 | 22 | |
| 20 | 17.4 | 18.3 | P | 9.6 | 18.4 | 21.8 | 22.2 | S | 24.8 | 32.4 | 35.4 | 36.0 | 34.4 | P | 35.9 | 36.0 | 36.9 | 36.5 | 38.9 | 37.5 | 35.5 | 35.1 | 29.3 | 29.2 | 9.6 | 38.9 | 29.6 | 22 | |
| 21 | 27.4 | 37.7 | 33.7 | 34.8 | 32.7 | 31.9 | S | 25.6 | C | C | C | C | C | C | 29.8 | 31.1 | 30.9 | 31.1 | 30.4 | 30.5 | 29.9 | 27.1 | 26.4 | 24.4 | 24.4 | 37.7 | 30.3 | 24 | |
| 22 | 22.6 | 19.2 | 21.1 | 24.3 | 23.2 | S | 22.5 | 24.8 | 23.3 | 20.9 | 22.2 | 24.5 | 27.5 | 30.8 | 30.6 | 33.6 | 33.4 | 33.9 | 33.4 | 36.5 | 35.5 | 29.9 | 18.7 | 13.0 | 13.0 | 36.5 | 26.3 | 24 | |
| 23 | 7.0 | 4.6 | 2.8 | 1.8 | S | 5.8 | 10.1 | 34.0 | 34.0 | 27.5 | 33.0 | 33.1 | 35.9 | 37.5 | 40.7 | 41.8 | 42.0 | 45.7 | 43.0 | 43.7 | 41.9 | 30.5 | 22.2 | 18.2 | 1.8 | 45.7 | 27.7 | 24 | |
| 24 | 23.0 | 20.3 | 21.8 | S | 19.8 | 16.7 | 19.2 | 26.0 | 31.1 | 33.3 | 36.6 | 37.8 | 39.1 | 39.8 | 38.2 | 33.6 | 32.7 | 33.1 | 33.6 | 33.3 | 27.4 | 19.1 | 12.8 | 7.9 | 7.9 | 39.8 | 27.7 | 24 | |
| 25 | 5.7 | 4.9 | S | 1.0 | 1.5 | 7.1 | 14.5 | 31.4 | 34.6 | 35.2 | 36.2 | 37.4 | 38.7 | 40.4 | 41.2 | 41.1 | 41.1 | 41.5 | 41.6 | 40.0 | 37.2 | 36.8 | 35.4 | 35.7 | 1.0 | 41.6 | 29.6 | 24 | |
| 26 | 35.5 | S | 34.8 | 34.5 | 34.7 | 33.9 | 36.5 | 36.6 | 39.4 | 41.7 | 43.3 | 44.6 | 44.9 | 45.5 | 44.2 | 43.7 | 43.3 | 41.5 | 42.7 | 42.2 | 40.9 | 37.4 | 39.4 | 40.0 | 33.9 | 45.5 | 40.1 | 24 | |
| 27 | S | 39.5 | 36.3 | 37.4 | 35.7 | 30.6 | 31.4 | 35.1 | 34.5 | 34.6 | 34.3 | 44.3 | 43.7 | 41.5 | 38.7 | 38.2 | 37.4 | 43.3 | 43.6 | 41.1 | 41.0 | 34.8 | 30.1 | S | 30.1 | 44.3 | 37.6 | 24 | |
| 28 | 23.6 | 21.1 | 18.3 | 15.9 | 13.8 | 12.4 | 11.3 | 21.6 | 21.9 | 25.4 | P | 28.9 | 34.0 | 32.5 | 30.6 | 31.8 | 24.2 | 22.8 | 23.0 | 29.0 | 30.8 | 29.5 | S | 29.1 | 11.3 | 34.0 | 24.2 | 23 | |
| 29 | 26.9 | 17.5 | 12.6 | 6.4 | 5.2 | 10.3 | 15.6 | 20.0 | 20.5 | 28.3 | 30.3 | 30.8 | P | 32.5 | 32.3 | 32.2 | 31.7 | 31.7 | 30.6 | 28.3 | 27.1 | S | 18.7 | 16.6 | 5.2 | 32.5 | 23.0 | 23 | |
| 30 | 15.3 | 11.6 | 6.4 | 9.9 | 18.3 | P | 14.4 | 16.2 | 16.0 | 22.4 | 29.4 | 33.4 | 33.7 | 35.2 | 34.8 | 36.3 | 34.9 | 29.2 | 29.5 | 29.5 | S | 16.3 | 9.2 | 4.2 | 4.2 | 36.3 | 22.1 | 23 | |
| HOURLY MAX | 43.9 | 42.4 | 40.9 | 39.1 | 36.3 | 33.9 | 36.5 | 38.4 | 41.2 | 48.1 | 56.8 | 58.4 | 58.5 | 60.0 | 59.7 | 59.1 | 59.4 | 60.0 | 59.4 | 52.0 | 51.6 | 52.2 | 44.8 | 43.4 | | | | | |
| HOURLY AVG | 22.8 | 20.2 | 19.2 | 16.0 | 17.2 | 19.1 | 22.5 | 27.6 | 30.2 | 32.2 | 35.1 | 36.4 | 37.5 | 38.9 | 38.1 | 39.3 | 38.5 | 38.5 | 37.3 | 36.2 | 34.3 | 29.7 | 25.5 | 22.4 | | | | | |

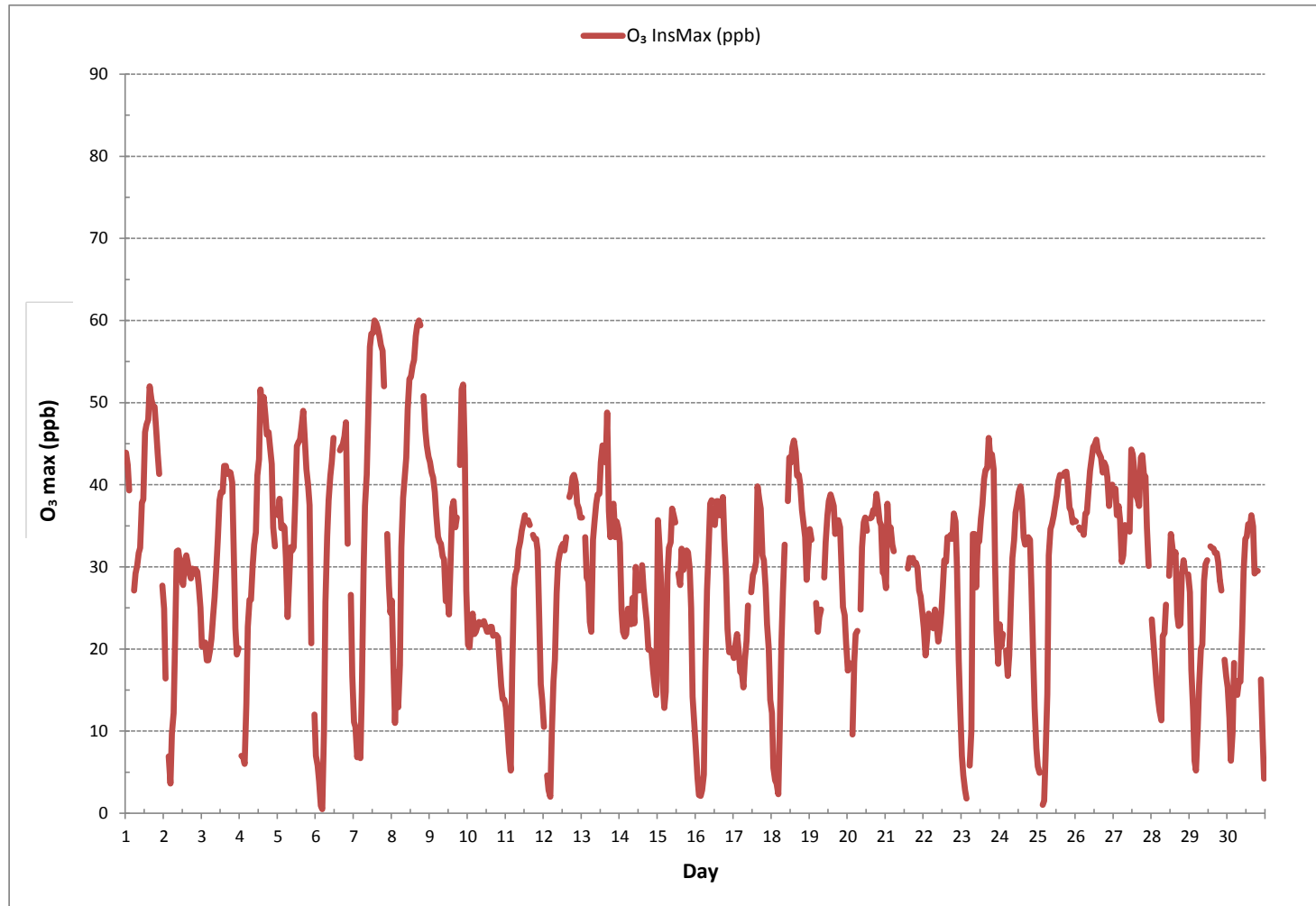
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 667 |
| MAXIMUM INSTANTANEOUS VALUE: | 60.0 ppb @ HOUR 13 ON DAY 7 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 12.0 |
| OPERATIONAL TIME: | 708 hrs |

OZONE Instantaneous Maximum (O₃ ppb)



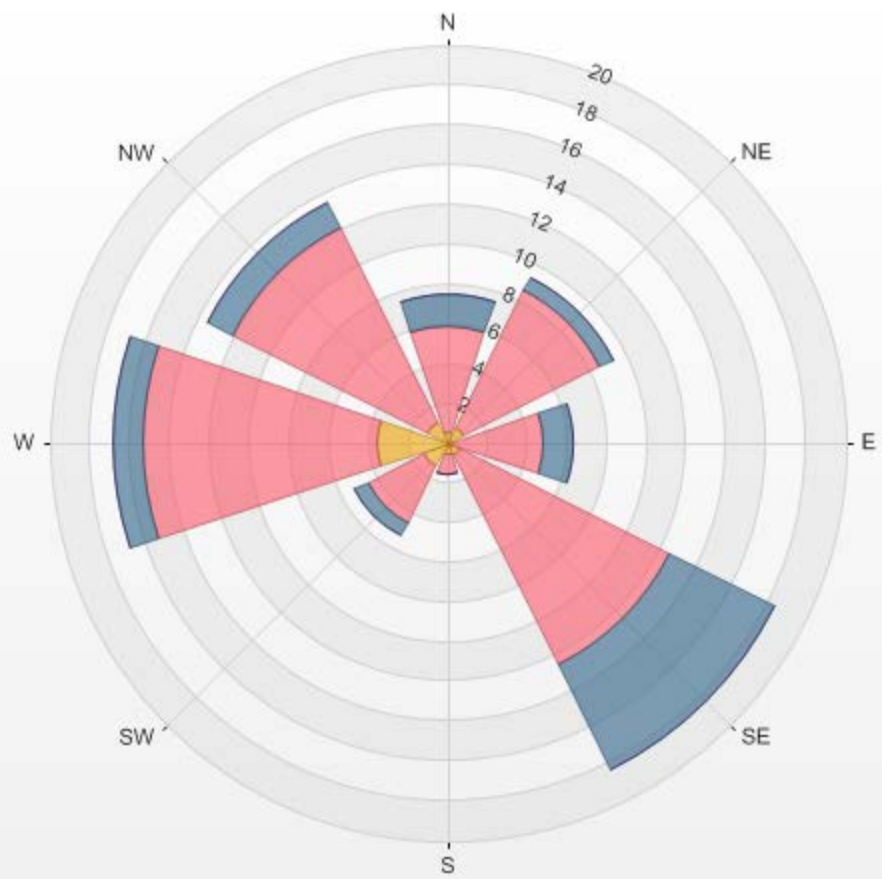
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O₃ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.29% Calm Avg: 12.96 [ppb]

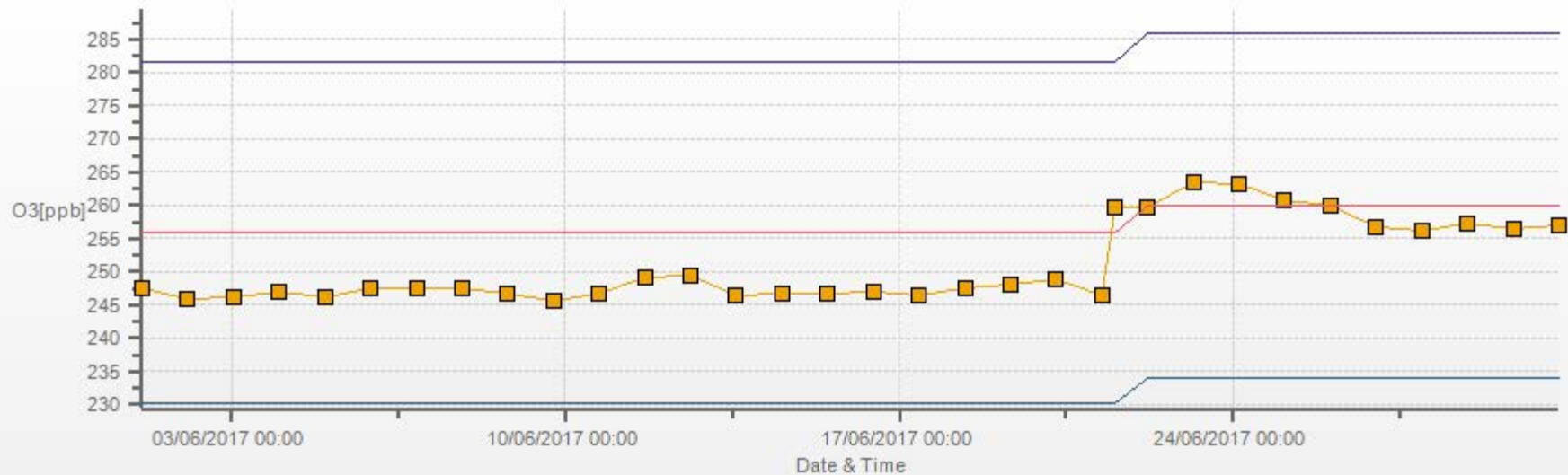
| Direction | 0.0-20.0 | 20.0-40.0 | 40.0-60.0 | >60.0 | Total |
|-----------|----------|-----------|-----------|-------|-------|
| N | 0.6 | 5.3 | 1.7 | 0.0 | 7.5 |
| NE | 0.9 | 7.7 | 0.8 | 0.0 | 9.3 |
| E | 0.0 | 4.8 | 1.5 | 0.0 | 6.3 |
| SE | 0.8 | 11.7 | 6.0 | 0.0 | 18.4 |
| S | 0.6 | 1.1 | 0.0 | 0.0 | 1.7 |
| SW | 1.4 | 3.2 | 0.8 | 0.0 | 5.3 |
| W | 3.6 | 11.7 | 1.5 | 0.0 | 16.8 |
| NW | 1.2 | 10.9 | 1.4 | 0.0 | 13.5 |
| Summary | 9.0 | 56.2 | 13.5 | 0.0 | 78.7 |

| | | | | | | | | | |
|--------|---------------|---|----------|----|-----------|----|-----------|---|-------|
| % Icon | Classes (ppb) | 9 | 0.0-20.0 | 56 | 20.0-40.0 | 14 | 40.0-60.0 | 0 | >60.0 |
|--------|---------------|---|----------|----|-----------|----|-----------|---|-------|

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.29% Calm Poll Avg: 12.96[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 17/06 Type: Span



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

PARTICULATE MATTER 2.5



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

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

STATUS FLAG CODES

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

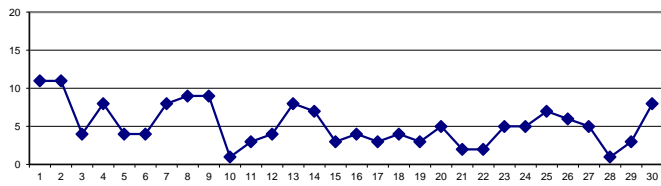
OBJECTIVE LIMIT:

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

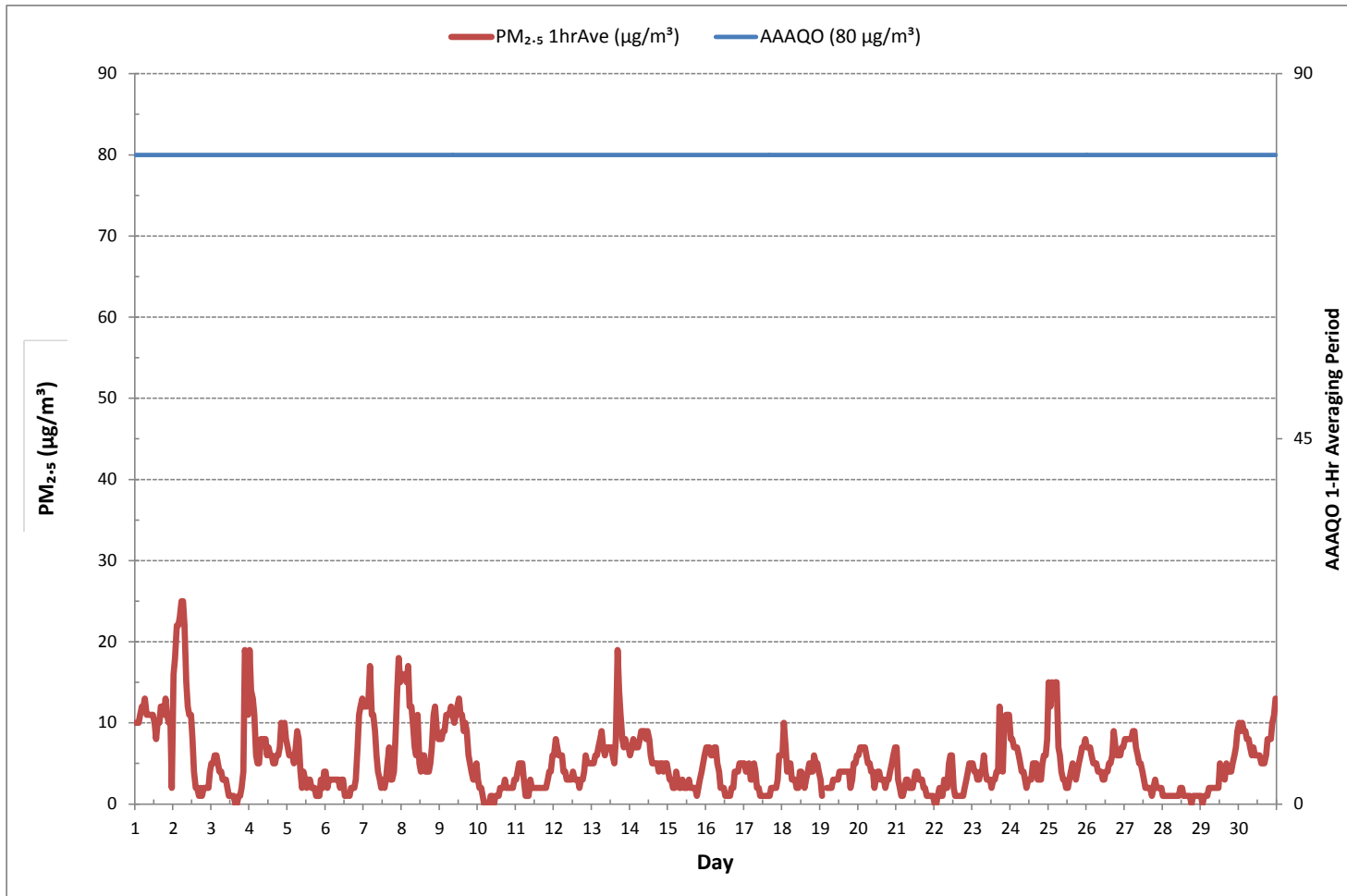
MONTHLY SUMMARY

| | | | |
|------------------------------|-----------------------------|-----------------------|---------------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 706 | | |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR | 15 ON DAY | 3 |
| MAXIMUM 1-HR AVERAGE: | 25 µg/m ³ @ HOUR | 5 ON DAY | 2 |
| MAXIMUM 24-HR AVERAGE: | 11 µg/m ³ | ON DAY | 1 |
| MONTHLY CALIBRATION TIME: | 0 hrs | OPERATIONAL TIME: | 718 hrs |
| STANDARD DEVIATION: | 4 | AMD OPERATION UPTIME: | 99.7 % |
| | | MONTHLY AVERAGE: | 5 µg/m ³ |

24 HR AVERAGES June 2017



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



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM_{2.5_2} [ug/m³(L)]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

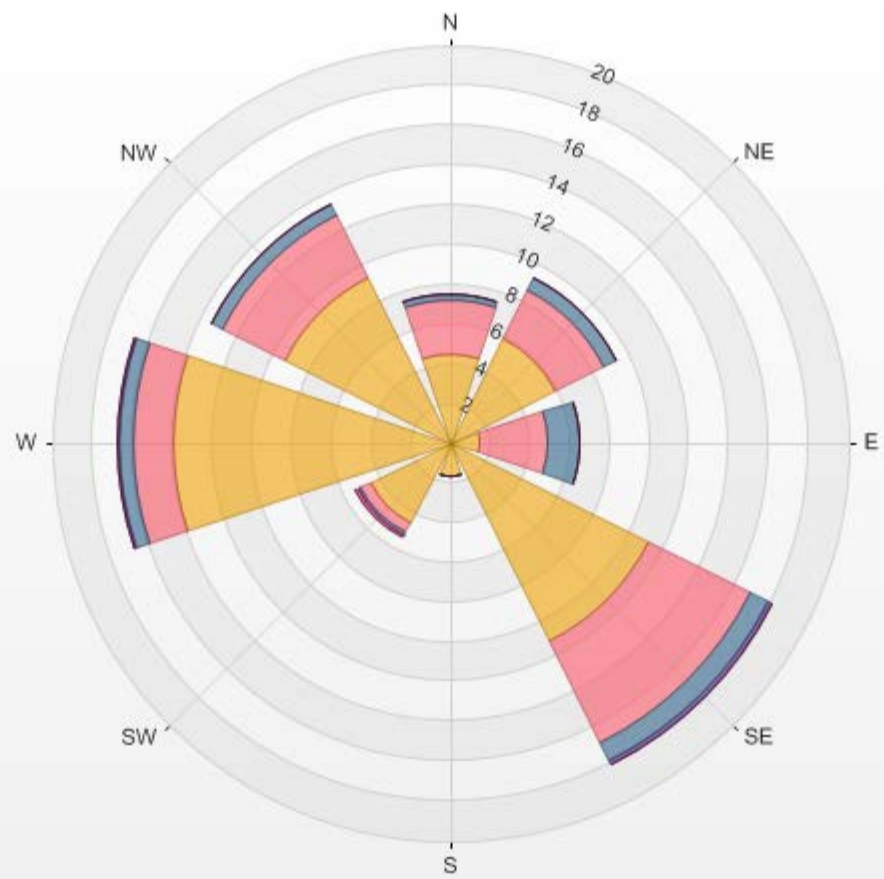
Calm: 21.44%

Calm Avg: 7.90 [ug/m³(L)]

| Direction | 0.0-5.2 | 5.2-10.4 | 10.4-15.6 | 15.6-20.8 | 20.8-26.0 | >26.0 | Total |
|----------------|---------|----------|-----------|-----------|-----------|-------|-------|
| N | 4.5 | 2.7 | 0.3 | 0.0 | 0.0 | 0.0 | 7.5 |
| NE | 5.9 | 2.7 | 0.7 | 0.0 | 0.0 | 0.0 | 9.3 |
| E | 1.6 | 3.4 | 1.6 | 0.0 | 0.0 | 0.0 | 6.5 |
| SE | 11.1 | 5.8 | 1.0 | 0.1 | 0.0 | 0.0 | 18.1 |
| S | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 |
| SW | 4.5 | 0.6 | 0.1 | 0.0 | 0.1 | 0.0 | 5.4 |
| W | 14.0 | 2.0 | 0.7 | 0.1 | 0.0 | 0.0 | 16.8 |
| NW | 9.3 | 3.5 | 0.6 | 0.0 | 0.0 | 0.0 | 13.4 |
| Summary | 52.6 | 20.6 | 4.9 | 0.3 | 0.1 | 0.0 | 78.5 |

% Icon Classes (ug/m3(L)) 53 0.0-5.2 21 5.2-10.4 5 10.4-15.6 0 15.6-20.8 0 20.8-26.0 0 >26.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.44% Calm Poll Avg: 7.90[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 10.3 | 7.7 | 2.1 | 2.9 | 2.1 | 0.2 | 4.3 | 4.6 | 1.9 | 0.8 | 5.9 | 6.0 | 3.2 | 4.2 | 2.9 | 1.7 | 5.4 | 6.7 | 5.0 | 7.1 | 5.2 | 2.3 | 4.6 | 2.4 | 0.2 | 10.3 | 1.2 | 24 |
| 2 | 1.8 | 0.9 | 0.5 | 0.7 | 0.1 | 0.4 | 1.0 | 3.8 | 7.2 | 8.0 | 7.1 | 11.2 | 12.4 | 13.3 | 12.7 | 12.5 | 10.6 | 9.3 | 12.2 | 12.5 | 11.9 | 10.5 | 12.7 | 10.7 | 0.1 | 13.3 | 7.5 | 24 |
| 3 | 10.0 | 9.5 | 10.7 | 9.8 | 9.9 | 9.2 | 11.8 | 12.3 | 11.1 | 11.7 | 11.9 | 12.4 | 11.1 | 9.6 | 10.4 | 8.4 | 5.5 | 2.7 | 1.7 | 2.5 | 2.4 | 1.3 | 0.9 | 0.7 | 0.7 | 12.4 | 7.1 | 24 |
| 4 | 0.6 | 0.8 | 0.6 | 0.1 | 1.0 | 3.2 | 6.0 | 6.5 | 8.2 | 11.6 | 12.1 | 12.7 | 10.1 | 15.7 | 9.0 | 13.6 | 12.1 | 7.4 | 8.0 | 5.3 | 0.6 | 2.4 | 3.2 | 3.6 | 0.1 | 15.7 | 5.4 | 24 |
| 5 | 4.6 | 5.2 | 4.7 | 6.6 | 4.9 | 1.4 | 4.6 | 6.6 | 10.9 | 12.3 | 17.1 | 11.8 | 9.6 | 14.9 | 16.1 | 14.5 | 16.2 | 11.8 | 10.9 | 6.5 | 1.4 | 0.8 | 1.1 | 1.4 | 0.8 | 17.1 | 7.5 | 24 |
| 6 | 1.5 | 0.4 | 0.3 | 0.3 | 0.6 | 1.4 | 3.1 | 5.1 | 6.9 | 6.2 | 4.5 | 3.6 | 4.4 | 4.5 | 4.1 | 3.9 | 3.1 | 4.0 | 2.2 | 0.6 | 1.2 | 1.4 | 0.9 | 0.4 | 0.3 | 6.9 | 2.2 | 24 |
| 7 | 0.2 | 0.2 | 0.4 | 0.7 | 1.1 | 1.5 | 1.9 | 3.6 | 4.3 | 3.4 | 3.9 | 3.9 | 4.7 | 6.3 | 5.8 | 3.6 | 4.6 | 6.9 | 6.9 | 3.5 | 1.2 | 1.1 | 1.2 | 0.7 | 0.2 | 6.9 | 2.8 | 24 |
| 8 | 0.1 | 0.5 | 1.3 | 1.5 | 1.0 | 1.3 | 3.3 | 6.8 | 7.8 | 8.4 | 10.3 | 9.6 | 11.4 | 11.1 | 11.5 | 11.5 | 11.4 | 10.1 | 6.4 | 4.6 | 7.0 | 7.3 | 5.0 | 5.8 | 0.1 | 11.5 | 6.2 | 24 |
| 9 | 6.7 | 6.7 | 8.1 | 8.3 | 7.8 | 10.7 | 7.6 | 6.4 | 6.7 | 3.8 | 2.6 | 4.5 | 3.4 | 4.1 | 8.2 | 6.9 | 7.2 | 6.7 | 4.8 | 7.5 | 4.9 | 1.9 | 5.5 | 12.9 | 1.9 | 12.9 | 5.6 | 24 |
| 10 | 11.1 | 9.1 | 10.9 | 8.7 | 7.9 | 9.2 | 9.3 | 10.6 | 11.2 | 12.0 | 10.6 | 8.6 | 7.3 | 7.7 | 6.9 | 3.7 | 2.9 | 5.7 | 6.3 | 2.7 | 2.6 | 2.3 | 2.3 | 1.4 | 1.4 | 12.0 | 5.7 | 24 |
| 11 | 1.7 | 1.4 | 0.6 | 1.4 | 4.0 | 6.2 | 8.7 | 7.4 | 8.8 | 11.3 | 10.1 | 12.3 | 11.0 | 12.6 | 12.1 | 10.9 | 8.9 | 6.9 | 6.7 | 6.2 | 3.2 | 1.8 | 1.6 | 1.0 | 0.6 | 12.6 | 5.8 | 24 |
| 12 | 0.5 | 0.5 | 0.6 | 0.2 | 0.5 | 0.6 | 3.1 | 7.0 | 8.4 | 9.3 | 12.7 | 7.9 | 11.1 | 10.5 | 10.9 | 9.5 | 9.8 | 11.2 | 10.7 | 8.1 | 5.5 | 7.5 | 7.5 | 7.8 | 0.2 | 12.7 | 6.7 | 24 |
| 13 | 6.6 | 6.8 | 1.4 | 2.1 | 1.6 | 1.5 | 2.1 | 9.1 | 10.3 | 3.9 | 3.6 | 5.3 | 7.2 | 8.9 | 9.1 | 6.6 | 4.9 | 1.3 | 4.9 | 0.9 | 4.5 | 3.9 | 4.1 | 3.7 | 0.9 | 10.3 | 2.3 | 24 |
| 14 | 2.3 | 0.7 | 1.7 | 2.0 | 2.0 | 1.7 | 3.3 | 2.9 | 3.8 | 6.1 | 9.0 | 7.6 | 8.5 | 7.8 | 9.5 | 9.7 | 7.5 | 6.8 | 7.2 | 6.9 | 7.5 | 5.5 | 5.0 | 4.4 | 0.7 | 9.7 | 4.8 | 24 |
| 15 | 6.9 | 2.8 | 1.1 | 0.4 | 1.3 | 2.2 | 3.4 | 4.8 | 5.0 | 5.6 | 4.5 | 8.0 | 6.6 | 4.9 | 6.7 | 4.1 | 3.9 | 5.0 | 2.7 | 1.3 | 3.7 | 0.2 | 0.3 | 1.1 | 0.2 | 8.0 | 1.2 | 24 |
| 16 | 0.8 | 0.7 | 0.8 | 0.5 | 0.5 | 1.1 | 2.5 | 3.0 | 3.9 | 4.3 | 3.8 | 2.4 | 3.8 | 4.0 | 3.5 | 6.3 | 6.1 | 10.1 | 5.4 | 2.8 | 1.6 | 3.0 | 2.7 | 3.5 | 0.5 | 10.1 | 0.4 | 24 |
| 17 | 2.8 | 3.0 | 2.9 | 5.1 | 5.3 | 5.2 | 6.6 | 8.2 | 8.9 | 8.6 | 11.3 | 12.9 | 11.8 | 12.6 | 11.2 | 12.6 | 14.1 | 7.6 | 8.3 | 6.6 | 4.3 | 2.3 | 0.9 | 0.9 | 0.9 | 14.1 | 6.7 | 24 |
| 18 | 1.3 | 0.3 | 0.5 | 0.5 | 0.4 | 1.1 | 3.7 | 5.8 | 4.2 | 4.2 | 6.8 | 12.0 | 3.7 | 6.6 | 8.5 | 12.8 | 10.5 | 5.8 | 3.7 | 0.9 | 3.1 | 1.6 | 3.7 | 4.8 | 0.3 | 12.8 | 2.5 | 24 |
| 19 | 9.0 | 3.2 | P | P | 6.6 | 7.3 | 9.0 | 9.3 | 7.9 | 6.9 | 8.9 | 8.7 | 5.1 | 4.2 | 3.8 | 2.3 | 3.9 | 4.7 | 5.3 | 3.5 | 1.9 | 1.5 | 0.9 | 0.7 | 0.7 | 9.3 | 4.2 | 22 |
| 20 | 1.5 | 1.5 | 0.9 | 0.4 | 1.4 | 5.5 | 6.4 | 7.6 | 6.9 | 4.3 | 5.6 | 9.4 | 8.9 | 11.1 | 11.7 | 11.0 | 11.7 | 12.2 | 10.5 | 6.8 | 2.1 | 0.6 | 2.7 | 1.9 | 0.4 | 12.2 | 5.4 | 24 |
| 21 | 5.4 | 10.5 | 8.0 | 12.3 | 7.5 | 5.7 | 10.1 | 11.9 | 12.3 | 15.3 | 14.5 | 15.1 | 15.7 | 15.6 | 16.0 | 16.4 | 15.5 | 15.5 | 13.6 | 13.7 | 11.1 | 13.5 | 13.7 | 12.8 | 5.4 | 16.4 | 12.4 | 24 |
| 22 | 10.8 | 8.3 | 9.6 | 12.6 | 14.7 | 16.0 | 15.7 | 18.2 | 18.5 | 18.1 | 19.2 | 15.9 | 16.9 | 16.4 | 14.7 | 15.7 | 16.8 | 14.3 | 12.7 | 7.0 | 3.4 | 0.8 | 1.3 | 0.9 | 0.8 | 19.2 | 11.8 | 24 |
| 23 | 0.7 | 0.4 | 0.5 | 0.4 | 0.8 | 1.9 | 3.4 | 3.5 | 2.4 | 0.9 | 6.6 | 6.1 | 6.6 | 6.3 | 8.2 | 6.4 | 4.6 | 6.9 | 6.7 | 4.5 | 2.0 | 1.0 | 0.3 | 1.6 | 0.3 | 8.2 | 2.1 | 24 |
| 24 | 3.4 | 1.8 | 2.1 | 1.5 | 0.4 | 1.2 | 1.5 | 3.9 | 3.8 | 4.6 | 2.8 | 5.1 | 4.8 | 8.5 | 8.9 | 9.6 | 4.8 | 3.5 | 3.5 | 2.8 | 1.2 | 1.1 | 0.7 | 0.4 | 0.4 | 9.6 | 1.3 | 24 |
| 25 | 0.9 | 0.6 | 0.3 | 0.1 | 0.2 | 0.5 | 1.1 | 3.7 | 5.6 | 5.2 | 6.8 | 4.9 | 3.4 | 4.9 | 2.0 | 6.1 | 5.8 | 6.2 | 6.9 | 6.2 | 5.9 | 5.8 | 5.6 | 5.6 | 0.1 | 6.9 | 3.8 | 24 |
| 26 | 5.5 | 5.6 | 9.1 | 9.2 | 9.1 | 7.8 | 10.5 | 12.2 | 14.0 | 16.2 | 17.6 | 18.9 | 17.6 | 14.6 | 12.6 | 11.8 | 8.1 | 6.7 | 7.4 | 7.4 | 7.6 | 6.6 | 6.1 | 6.6 | 5.5 | 18.9 | 10.0 | 24 |
| 27 | 7.0 | 3.6 | 6.1 | 3.0 | 5.6 | 6.8 | 11.8 | 14.2 | 8.9 | 10.9 | 11.0 | 10.5 | 8.1 | 11.7 | 14.7 | 12.7 | 13.7 | 12.0 | 12.8 | 10.0 | 5.5 | 0.7 | 3.5 | 3.9 | 0.7 | 14.7 | 7.0 | 24 |
| 28 | 4.2 | 3.2 | 2.3 | 1.7 | 1.6 | 1.1 | 1.3 | 1.2 | 3.7 | 1.3 | 3.3 | 4.1 | 4.2 | 6.8 | 6.5 | 11.1 | 12.7 | 10.9 | 10.0 | 9.5 | 9.9 | 5.3 | 7.7 | 4.6 | 1.1 | 12.7 | 3.7 | 24 |
| 29 | 1.3 | 1.3 | 1.4 | 1.6 | 0.6 | 2.4 | 4.4 | 3.5 | 4.7 | 5.0 | 6.3 | 8.1 | 7.4 | 5.5 | 5.4 | 7.2 | 6.1 | 5.6 | 6.2 | 3.3 | 1.6 | 1.4 | 2.8 | 3.0 | 0.6 | 8.1 | 3.9 | 24 |
| 30 | 1.9 | 0.2 | 1.1 | 1.9 | 2.9 | 1.9 | 2.5 | 0.9 | 4.1 | 3.5 | 3.9 | 2.9 | 3.0 | 4.0 | 6.1 | 5.3 | 4.2 | 1.7 | 2.7 | 1.9 | 0.8 | 1.6 | 0.5 | 0.4 | 0.2 | 6.1 | 1.1 | 24 |
| HOURLY MAX | 11.1 | 10.5 | 10.9 | 12.6 | 14.7 | 16.0 | 15.7 | 18.2 | 18.5 | 18.1 | 19.2 | 18.9 | 17.6 | 16.4 | 16.1 | 16.4 | 16.8 | 15.5 | 13.6 | 13.7 | 11.9 | 13.5 | 13.7 | 12.9 | | | | |
| HOURLY AVG | 0.2 | 0.3 | 0.4 | 0.6 | 0.8 | 0.9 | 1.4 | 1.0 | 1.3 | 1.9 | 1.9 | 1.7 | 1.6 | 1.8 | 1.9 | 1.8 | 1.6 | 0.9 | 0.9 | 0.9 | 0.6 | 0.3 | 0.3 | 0.3 | | | | |

STATUS FLAG CODES

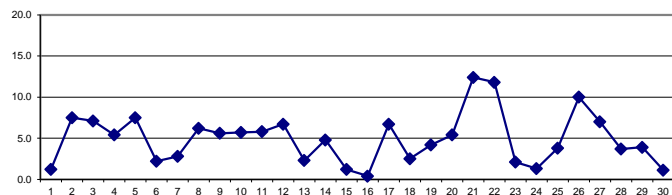
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

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

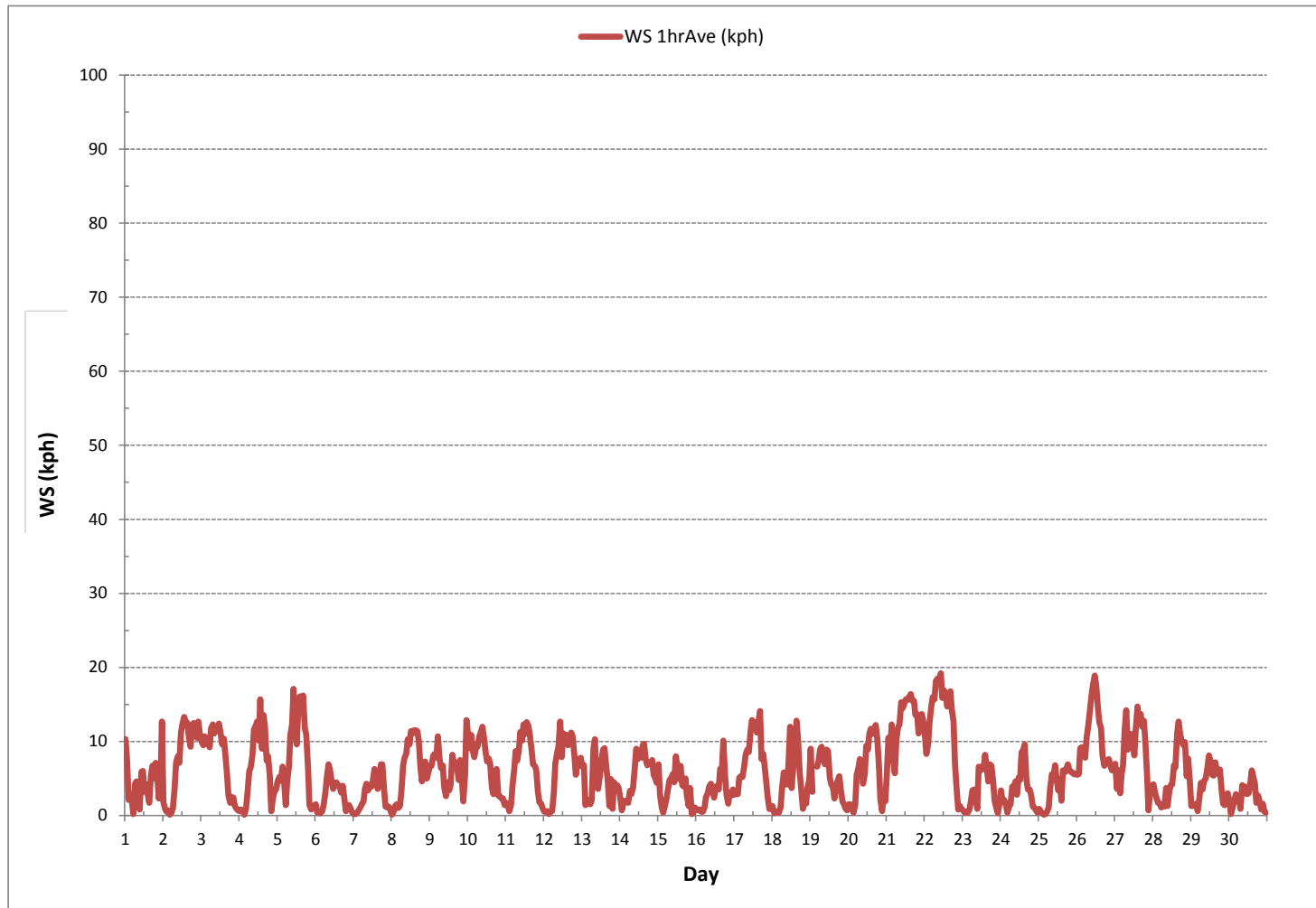
MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 718 |
| MINIMUM 1-HR AVERAGE | 0.1 kph @ HOUR 4 ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 19.2 kph @ HOUR 10 ON DAY 22 |
| MAXIMUM 24-HR AVERAGE: | 12.4 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 718 hrs |
| AMD OPERATION UPTIME: | 99.7 % |
| STANDARD DEVIATION: | 4.3 |
| MONTHLY AVERAGE: | 0.9 kph |

24 HR AVERAGES June 2017



WIND SPEED Hourly Averages (WS kph)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 14.5 | 13.7 | 6.3 | 6.2 | P | 3.1 | 7.9 | 9.4 | 8.6 | 8.0 | 10.6 | 12.5 | 8.9 | 8.7 | 6.7 | 7.1 | 10.7 | 11.2 | 9.7 | 12.9 | 13.9 | 6.6 | P | 5.3 | 3.1 | 14.5 | 9.2 | 22 |
| 2 | 4.6 | 3.8 | 3.3 | 3.9 | 1.7 | 2.1 | 4.3 | 7.4 | 13.5 | 14.2 | 14.0 | 20.1 | 18.3 | 24.6 | 21.3 | 18.5 | 16.0 | 15.1 | 18.5 | 18.4 | 16.8 | 16.1 | 18.8 | 16.1 | 1.7 | 24.6 | 13.0 | 24 |
| 3 | 14.9 | 14.0 | 15.5 | 13.3 | 13.5 | 12.8 | 18.7 | 18.8 | 16.6 | 17.7 | 20.4 | 19.5 | 18.5 | 15.2 | 17.3 | 15.9 | 11.4 | 10.5 | 5.1 | 5.9 | 4.2 | 2.5 | 2.1 | 2.1 | 2.1 | 20.4 | 12.8 | 24 |
| 4 | 1.8 | 2.1 | 2.0 | 3.2 | 3.0 | 7.2 | 10.7 | 12.2 | 13.2 | 17.4 | 19.6 | 20.1 | 30.6 | 28.3 | 16.8 | 19.7 | 19.1 | 15.7 | 14.3 | 17.8 | 9.5 | 7.7 | 5.7 | 7.7 | 1.8 | 30.6 | 12.7 | 24 |
| 5 | 10.0 | 9.3 | 10.4 | 17.5 | 9.9 | 5.3 | 11.2 | 12.0 | 21.4 | 19.3 | 24.2 | 22.3 | 18.8 | 23.5 | 23.1 | 22.0 | 26.9 | 17.8 | 18.4 | 12.0 | 7.7 | 2.4 | 3.1 | 3.7 | 2.4 | 26.9 | 14.7 | 24 |
| 6 | 3.9 | 1.9 | 2.3 | 2.5 | 2.7 | 3.8 | 7.5 | 9.5 | 13.5 | 12.2 | 10.1 | 9.5 | 11.7 | 14.4 | 11.2 | 12.2 | 9.0 | 10.1 | 5.9 | 4.3 | 2.3 | 2.2 | 2.5 | 1.2 | 1.2 | 14.4 | 6.9 | 24 |
| 7 | 1.8 | 1.6 | 2.0 | 1.4 | 3.0 | 3.5 | 4.0 | 8.7 | 8.0 | 9.3 | 11.6 | 10.3 | 16.3 | 13.0 | 15.7 | 10.8 | 9.3 | 11.1 | 10.4 | 7.6 | 2.5 | 2.0 | 2.5 | 1.6 | 1.4 | 16.3 | 7.0 | 24 |
| 8 | 2.4 | 1.6 | 1.9 | 3.0 | 1.6 | 3.4 | 6.6 | 14.6 | 13.2 | 14.2 | 22.1 | 17.2 | 22.0 | 19.2 | 20.8 | 17.8 | 17.1 | 16.1 | 11.1 | 8.6 | 10.5 | 12.1 | 8.2 | 9.5 | 1.6 | 22.1 | 11.5 | 24 |
| 9 | 9.7 | 9.4 | 12.4 | 13.2 | 13.9 | 14.8 | 13.2 | 11.9 | 13.0 | 7.9 | 7.0 | 8.0 | 7.1 | 8.4 | 14.9 | 12.0 | 11.0 | 10.1 | 9.5 | 15.7 | 14.4 | 10.4 | 15.9 | 23.2 | 7.0 | 23.2 | 12.0 | 24 |
| 10 | 18.4 | 14.2 | 18.2 | 18.1 | 12.3 | 13.6 | 14.1 | 16.9 | 18.5 | 18.9 | 18.4 | 12.6 | 12.0 | 12.0 | 13.7 | 9.9 | 7.9 | 10.3 | 12.4 | 6.2 | 4.4 | 5.3 | 4.3 | 3.5 | 3.5 | 18.9 | 12.3 | 24 |
| 11 | 5.1 | 3.7 | 3.7 | 3.6 | 6.6 | 16.5 | 14.3 | 12.8 | 17.5 | 18.0 | 20.2 | 21.3 | 17.2 | P | 20.6 | 17.0 | 16.5 | 11.9 | 11.9 | 13.1 | 5.9 | 3.1 | 2.7 | 2.7 | 2.7 | 21.3 | 11.6 | 23 |
| 12 | 1.4 | P | 3.6 | 1.9 | 2.4 | 3.1 | 6.7 | 11.4 | 15.5 | 15.2 | 19.6 | 17.7 | 21.8 | 18.1 | 19.9 | 19.8 | 17.5 | 19.3 | 22.5 | 13.5 | 8.5 | 10.1 | 9.6 | 10.5 | 1.4 | 22.5 | 12.6 | 23 |
| 13 | 11.5 | P | 9.2 | 7.7 | 5.6 | 5.4 | 5.8 | 15.8 | 15.2 | 10.4 | 8.2 | 9.1 | 12.6 | 14.1 | 13.6 | 12.9 | 18.7 | 5.8 | 10.1 | 8.5 | 10.4 | 10.5 | 10.0 | 7.4 | 5.4 | 18.7 | 10.4 | 23 |
| 14 | 6.2 | 2.9 | 4.8 | 3.9 | 3.5 | 4.4 | 6.1 | 6.5 | 8.1 | 10.6 | 12.6 | 11.5 | 14.9 | 14.6 | 13.4 | 15.0 | 13.5 | 10.8 | 11.8 | 11.0 | 12.0 | 10.0 | 8.0 | 11.0 | 2.9 | 15.0 | 9.5 | 24 |
| 15 | 12.1 | 5.3 | 2.8 | 1.7 | 2.6 | 4.2 | 6.0 | 8.2 | 8.3 | 9.3 | 9.9 | 14.8 | 11.9 | 11.5 | 13.8 | 10.7 | 10.3 | 9.5 | 6.8 | 9.4 | 7.5 | 3.0 | 2.9 | 3.1 | 1.7 | 14.8 | 7.7 | 24 |
| 16 | 2.8 | 2.2 | 3.0 | 2.2 | 3.2 | 3.0 | 4.8 | 5.3 | 8.0 | 10.1 | 10.5 | 10.0 | 11.5 | 14.2 | 10.3 | 11.0 | 10.3 | 22.4 | 8.7 | 7.9 | 3.9 | 6.0 | 4.8 | 5.6 | 2.2 | 22.4 | 7.6 | 24 |
| 17 | 5.5 | 5.1 | 6.2 | 8.4 | 7.4 | 8.1 | 11.4 | 14.3 | 15.4 | 15.2 | 20.1 | 20.4 | 18.8 | 19.6 | 20.4 | 20.3 | 28.0 | 15.2 | 15.3 | 10.5 | 7.8 | 3.9 | 10.8 | 3.0 | 3.0 | 28.0 | 13.0 | 24 |
| 18 | 3.6 | 1.7 | 2.1 | 3.2 | 2.1 | 3.3 | 9.7 | 11.4 | 8.8 | 11.4 | 12.5 | 24.3 | 10.6 | 13.3 | 15.9 | 29.3 | 19.2 | 12.3 | 7.1 | 4.1 | 8.8 | 4.7 | 8.9 | 14.6 | 1.7 | 29.3 | 10.1 | 24 |
| 19 | 18.0 | 10.8 | P | P | 9.7 | 11.4 | 13.2 | 13.4 | 12.3 | 13.5 | 15.8 | 15.2 | 14.9 | 11.0 | 8.7 | 9.9 | 9.4 | 9.2 | 9.5 | 7.6 | 3.7 | 2.9 | 2.9 | 2.5 | 2.5 | 18.0 | 10.3 | 22 |
| 20 | 2.6 | 2.7 | P | 1.4 | 4.3 | 8.7 | 8.5 | 11.5 | 11.7 | 9.0 | 11.3 | 14.6 | 16.6 | P | 21.3 | 23.2 | 22.7 | 21.4 | 12.2 | 8.2 | 7.5 | 6.7 | 8.4 | 1.4 | 23.2 | 11.5 | 22 | |
| 21 | 16.2 | 18.0 | 14.2 | 18.6 | 14.2 | 9.7 | 14.8 | 17.2 | 26.5 | 32.6 | 23.9 | 22.8 | 25.0 | 25.1 | 25.3 | 27.0 | 26.7 | 25.9 | 24.7 | 26.3 | 19.1 | 20.5 | 20.2 | 18.6 | 9.7 | 32.6 | 21.4 | 24 |
| 22 | 16.3 | 13.2 | 14.2 | 18.8 | 26.8 | 23.9 | 23.0 | 26.9 | 26.0 | 27.3 | 29.6 | 24.9 | 25.9 | 26.2 | 22.4 | 23.0 | 24.8 | 22.7 | 23.9 | 13.9 | 6.9 | 2.6 | 3.0 | 2.4 | 2.4 | 29.6 | 19.5 | 24 |
| 23 | 3.3 | 2.6 | 1.6 | 2.3 | 3.8 | 4.6 | 7.4 | 6.6 | 8.3 | 10.8 | 15.1 | 16.8 | 11.0 | 13.8 | 20.9 | 11.2 | 13.5 | 11.6 | 12.0 | 7.9 | 5.2 | 3.1 | 3.0 | 8.5 | 1.6 | 20.9 | 8.5 | 24 |
| 24 | 13.6 | 5.0 | 5.8 | 10.0 | 6.0 | 3.5 | 4.0 | 7.9 | 9.2 | 9.6 | 8.5 | 12.1 | 12.9 | 15.0 | 28.9 | 21.3 | 9.2 | 9.8 | 6.7 | 5.5 | 3.7 | 3.7 | 2.5 | 2.9 | 2.5 | 28.9 | 9.1 | 24 |
| 25 | 3.2 | 2.6 | 2.5 | 2.6 | 2.5 | 3.5 | 5.7 | 8.5 | 12.7 | 13.9 | 12.5 | 12.3 | 11.1 | 14.5 | 8.6 | 15.5 | 16.0 | 14.4 | 13.7 | 10.1 | 8.3 | 8.1 | 7.4 | 8.0 | 2.5 | 16.0 | 9.1 | 24 |
| 26 | 8.7 | 8.7 | 12.1 | 11.9 | 12.4 | 11.8 | 17.6 | 17.9 | 22.2 | 25.2 | 27.5 | 28.9 | 24.9 | 22.4 | 21.3 | 19.4 | 16.3 | 10.7 | 10.6 | 13.4 | 11.5 | 10.9 | 11.0 | 11.0 | 8.7 | 28.9 | 16.2 | 24 |
| 27 | 11.6 | 21.4 | 16.2 | 11.2 | 14.8 | 12.2 | 21.8 | 20.9 | 15.3 | 15.6 | 15.2 | 16.2 | 21.4 | 23.4 | 19.3 | 18.9 | 19.8 | 19.1 | 15.7 | 13.7 | 3.0 | 9.5 | 7.0 | 3.0 | 3.0 | 23.4 | 15.8 | 24 |
| 28 | 7.9 | 5.7 | 5.3 | 4.2 | 4.4 | 3.8 | 2.4 | 6.6 | 6.9 | 7.7 | P | 10.4 | 9.1 | 11.6 | 10.9 | 24.3 | 18.3 | 18.7 | 17.3 | 15.9 | 15.1 | 8.4 | 13.7 | 8.7 | 2.4 | 24.3 | 10.3 | 23 |
| 29 | 3.3 | 2.7 | 3.5 | 3.0 | 2.6 | 6.0 | 7.2 | 6.5 | 8.2 | 11.7 | 13.0 | 16.0 | P | 13.2 | 11.0 | 16.6 | 11.6 | 11.4 | X | 8.5 | 5.5 | 3.5 | 5.2 | 6.1 | 2.6 | 16.6 | 8.0 | 22 |
| 30 | 3.5 | 3.6 | 2.4 | 3.9 | 4.7 | P | 6.4 | 3.8 | 8.0 | 6.7 | 9.0 | 6.6 | 6.7 | 8.1 | 10.0 | 10.9 | 9.2 | 4.4 | 4.8 | 3.3 | 3.3 | 3.5 | 2.9 | 3.5 | 2.4 | 10.9 | 5.6 | 23 |
| HOURLY MAX | 18.4 | 21.4 | 18.2 | 18.8 | 26.8 | 23.9 | 23.0 | 26.9 | 26.5 | 32.6 | 29.6 | 28.9 | 30.6 | 28.3 | 28.9 | 29.3 | 28.0 | 25.9 | 24.7 | 26.3 | 19.1 | 20.5 | 20.2 | 23.2 | | | | |
| HOURLY AVG | 7.9 | 6.8 | 6.7 | 7.0 | 6.9 | 7.5 | 9.8 | 11.8 | 13.5 | 14.1 | 15.6 | 15.9 | 15.8 | 16.3 | 16.7 | 16.8 | 15.5 | 13.9 | 12.9 | 10.9 | 8.5 | 6.5 | 7.2 | 7.3 | | | | |

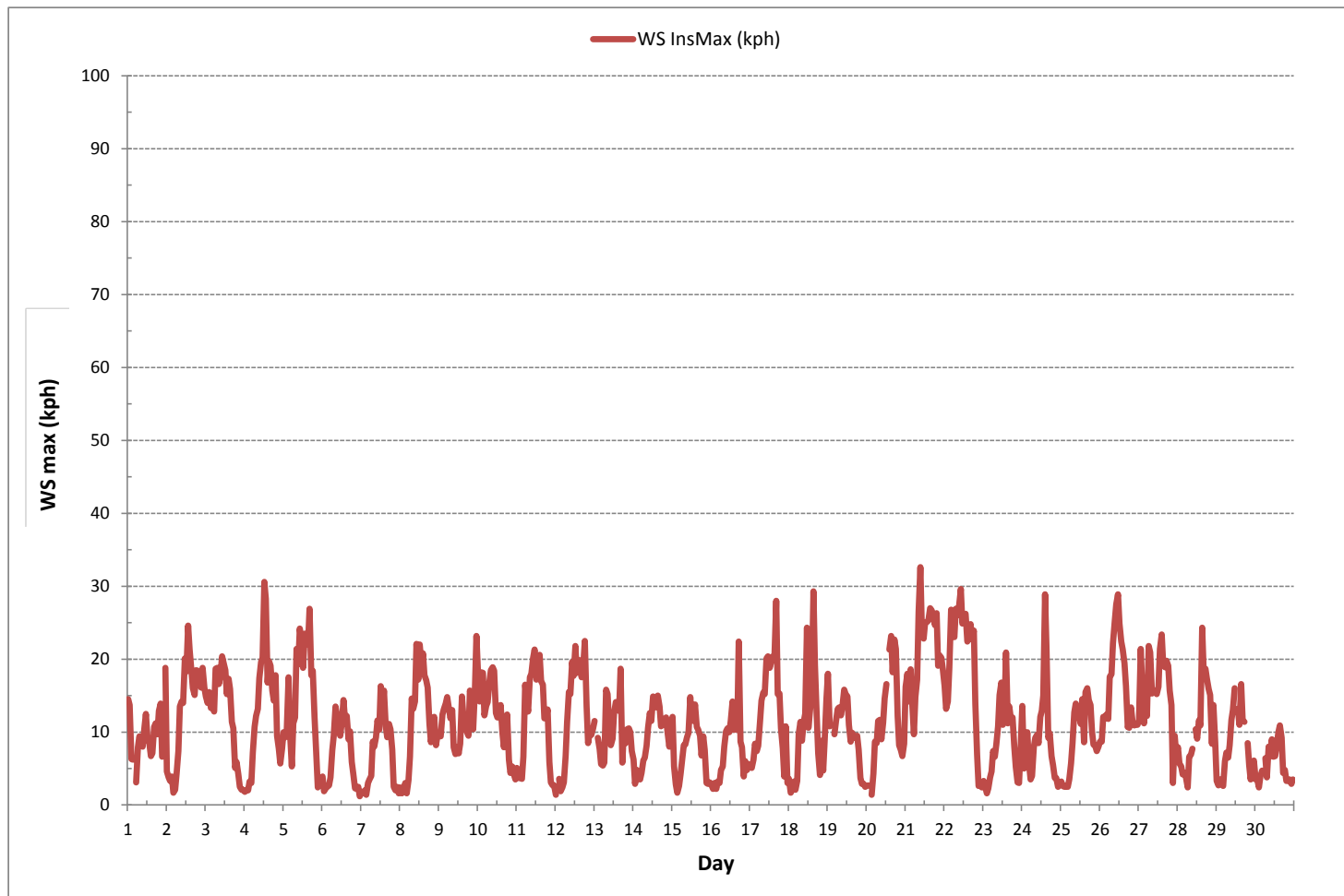
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | | | | | | | |
|------------------------------|------|-----|--------|---|--------|-----|-----|
| MAXIMUM INSTANTANEOUS VALUE: | 32.6 | kph | @ HOUR | 9 | ON DAY | 21 | |
| OPERATIONAL TIME: | | | | | | 707 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



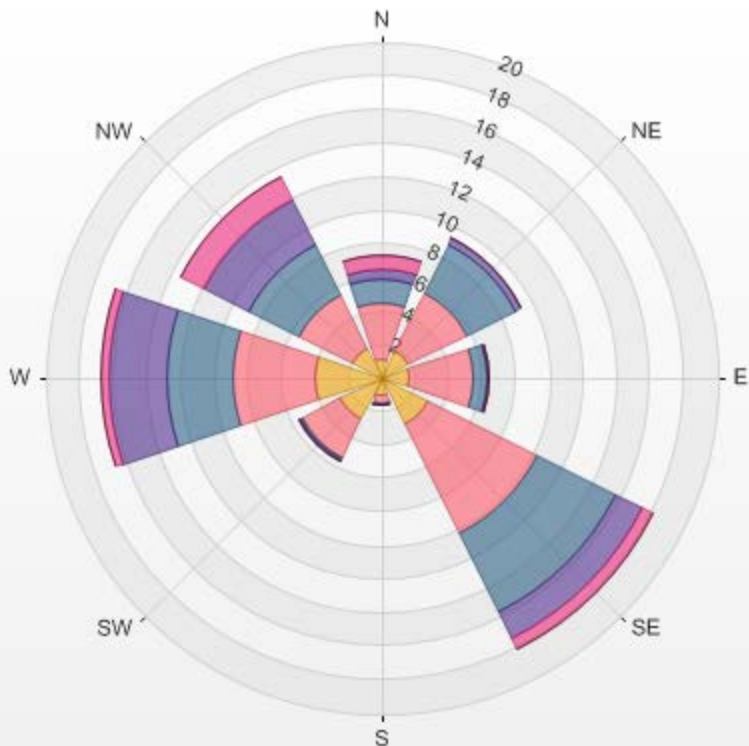
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 17/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.45%

| Direction | 1.8-3.9 | 3.9-7.7 | 7.7-11.6 | 11.6-15.4 | 15.4-19.3 | >19.3 | Total |
|----------------|---------|---------|----------|-----------|-----------|-------|-------|
| N | 1.1 | 3.3 | 1.4 | 0.7 | 0.8 | 0.0 | 7.4 |
| NE | 1.8 | 3.9 | 3.2 | 0.4 | 0.0 | 0.0 | 9.3 |
| E | 1.7 | 3.8 | 0.8 | 0.1 | 0.0 | 0.0 | 6.4 |
| SE | 3.1 | 7.2 | 5.3 | 1.8 | 0.7 | 0.0 | 18.1 |
| S | 1.1 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 1.7 |
| SW | 2.8 | 2.5 | 0.1 | 0.1 | 0.0 | 0.0 | 5.6 |
| W | 4.0 | 4.9 | 3.9 | 3.5 | 0.4 | 0.0 | 16.7 |
| NW | 2.0 | 3.6 | 3.3 | 2.9 | 1.5 | 0.0 | 13.4 |
| Summary | 17.5 | 29.7 | 18.2 | 9.6 | 3.5 | 0.0 | 78.5 |

% Icon Classes (kph) 18 1.8-3.9 30 3.9-7.7 18 7.7-11.6 10 11.6-15.4 3 15.4-19.3 0 >19.3

LICA COLD LAKE SOUTH 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 21.45% Calm Wind Avg Speed: 0.93(kph)



WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

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

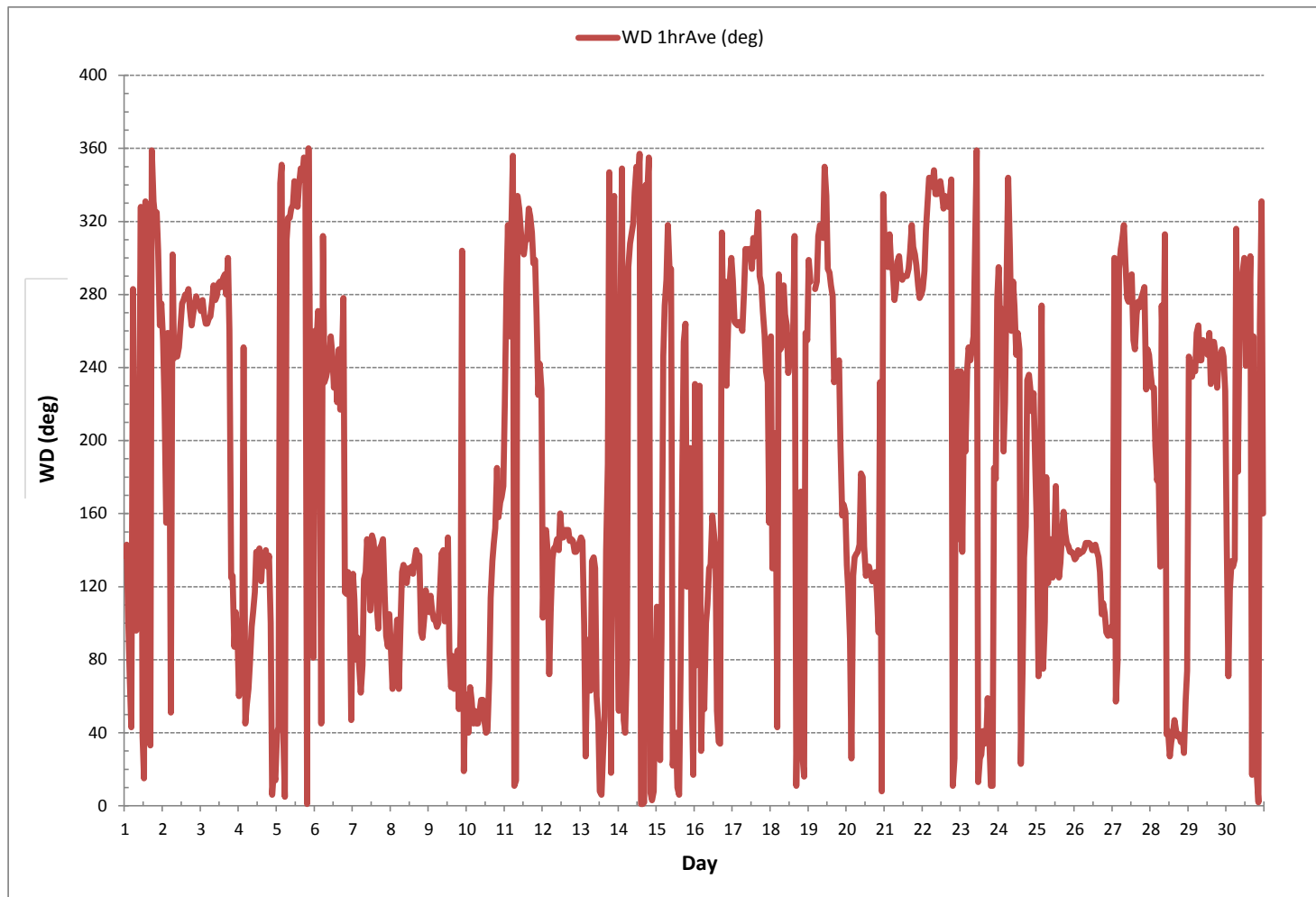
STATUS FLAG CODES

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

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

| | | | | | |
|---------------------------|-----|-----|-----------------------|------|------|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 718 | hrs |
| STANDARD DEVIATION: | 101 | | AMD OPERATION UPTIME: | 99.7 | % |
| | | | MONTHLY AVERAGE: | 318 | (NW) |

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | RDGS. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 12 | 18 | 31 | 27 | 32 | 68 | 25 | 32 | 64 | 57 | 23 | 25 | 60 | 35 | 47 | 71 | 31 | 25 | 23 | 16 | 25 | 24 | 13 | 18 | 24 | |
| 2 | 23 | 42 | 57 | 56 | 68 | 58 | 41 | 28 | 25 | 24 | 24 | 21 | 23 | 24 | 24 | 22 | 23 | 23 | 21 | 22 | 21 | 22 | 21 | 21 | 24 | |
| 3 | 21 | 21 | 19 | 19 | 18 | 20 | 22 | 21 | 24 | 25 | 24 | 25 | 24 | 26 | 28 | 28 | 32 | 61 | 57 | 23 | 22 | 24 | 32 | 36 | 24 | |
| 4 | 31 | 36 | 43 | 45 | 31 | 25 | 19 | 26 | 24 | 24 | 24 | 17 | 30 | 16 | 21 | 16 | 16 | 22 | 20 | 39 | 43 | 49 | 31 | 33 | 24 | |
| 5 | 25 | 21 | 20 | 28 | 33 | 55 | 35 | 15 | 15 | 16 | 16 | 31 | 20 | 18 | 18 | 20 | 19 | 20 | 19 | 20 | 51 | 55 | 45 | 28 | 24 | |
| 6 | 34 | 48 | 66 | 66 | 55 | 48 | 41 | 31 | 30 | 33 | 45 | 56 | 52 | 51 | 55 | 54 | 51 | 41 | 42 | 41 | 26 | 20 | 30 | 43 | 24 | |
| 7 | 74 | 61 | 50 | 41 | 29 | 40 | 37 | 38 | 30 | 50 | 61 | 54 | 50 | 38 | 49 | 53 | 37 | 20 | 13 | 13 | 15 | 23 | 26 | 34 | 24 | |
| 8 | 35 | 45 | 24 | 18 | 20 | 26 | 29 | 23 | 21 | 24 | 25 | 27 | 26 | 24 | 24 | 21 | 16 | 18 | 16 | 20 | 19 | 20 | 23 | 21 | 24 | |
| 9 | 20 | 22 | 22 | 23 | 24 | 21 | 31 | 28 | 18 | 31 | 37 | 21 | 31 | 30 | 23 | 24 | 20 | 23 | 26 | 21 | 30 | 65 | 18 | 18 | 24 | |
| 10 | 21 | 23 | 20 | 22 | 22 | 20 | 21 | 22 | 21 | 19 | 21 | 23 | 24 | 25 | 26 | 56 | 53 | 27 | 31 | 39 | 32 | 37 | 38 | 54 | 24 | |
| 11 | 49 | 43 | 58 | 29 | 15 | 17 | 18 | 22 | 22 | 23 | 32 | 26 | 25 | 23 | 22 | 21 | 26 | 24 | 24 | 21 | 17 | 17 | 21 | 47 | 24 | |
| 12 | 34 | 30 | 56 | 53 | 43 | 60 | 22 | 14 | 21 | 25 | 19 | 42 | 27 | 31 | 31 | 37 | 30 | 24 | 22 | 17 | 13 | 13 | 15 | 19 | 24 | |
| 13 | 24 | 23 | 26 | 64 | 51 | 54 | 41 | 17 | 15 | 52 | 49 | 23 | 19 | 24 | 23 | 24 | 41 | 57 | 26 | 59 | 21 | 31 | 26 | 24 | 24 | |
| 14 | 36 | 48 | 30 | 24 | 21 | 40 | 30 | 33 | 23 | 17 | 16 | 18 | 18 | 18 | 19 | 19 | 19 | 15 | 18 | 16 | 18 | 18 | 18 | 23 | 24 | |
| 15 | 22 | 22 | 29 | 40 | 18 | 21 | 23 | 19 | 26 | 26 | 34 | 28 | 25 | 43 | 33 | 37 | 37 | 30 | 50 | 48 | 23 | 48 | 35 | 35 | 24 | |
| 16 | 44 | 55 | 40 | 62 | 59 | 43 | 23 | 34 | 29 | 40 | 51 | 61 | 59 | 52 | 59 | 30 | 24 | 22 | 20 | 29 | 23 | 20 | 23 | 20 | 24 | |
| 17 | 20 | 17 | 22 | 17 | 18 | 19 | 20 | 25 | 24 | 24 | 24 | 24 | 21 | 23 | 21 | 20 | 26 | 23 | 19 | 16 | 20 | 63 | 56 | 24 | 24 | |
| 18 | 31 | 64 | 50 | 42 | 44 | 27 | 24 | 29 | 36 | 53 | 35 | 28 | 62 | 38 | 33 | 27 | 23 | 24 | 32 | 52 | 41 | 30 | 32 | 27 | 24 | |
| 19 | 21 | 30 | P | P | 21 | 21 | 20 | 19 | 23 | 33 | 35 | 31 | 38 | 46 | 47 | 52 | 45 | 37 | 29 | 24 | 31 | 19 | 45 | 65 | 22 | |
| 20 | 31 | 20 | 59 | 62 | 41 | 11 | 12 | 12 | 18 | 36 | 38 | 18 | 22 | 19 | 21 | 22 | 24 | 22 | 21 | 28 | 33 | 51 | 29 | 39 | 24 | |
| 21 | 20 | 20 | 22 | 19 | 23 | 21 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 23 | 24 | 22 | 21 | 18 | 20 | 20 | 21 | 23 | 22 | 22 | 24 | |
| 22 | 24 | 22 | 16 | 16 | 18 | 18 | 17 | 18 | 18 | 16 | 18 | 20 | 20 | 20 | 22 | 21 | 19 | 17 | 19 | 19 | 20 | 28 | 32 | 42 | 24 | |
| 23 | 65 | 51 | 49 | 63 | 45 | 39 | 26 | 31 | 59 | 71 | 44 | 43 | 33 | 32 | 30 | 31 | 33 | 23 | 26 | 23 | 39 | 33 | 55 | 64 | 24 | |
| 24 | 54 | 43 | 39 | 62 | 44 | 45 | 47 | 40 | 39 | 41 | 53 | 46 | 44 | 34 | 41 | 24 | 28 | 35 | 40 | 28 | 38 | 58 | 58 | 37 | 24 | |
| 25 | 34 | 38 | 40 | 64 | 58 | 71 | 55 | 28 | 30 | 43 | 35 | 49 | 60 | 46 | 63 | 42 | 37 | 30 | 27 | 14 | 12 | 12 | 13 | 13 | 24 | |
| 26 | 14 | 15 | 13 | 14 | 14 | 15 | 15 | 16 | 17 | 20 | 19 | 15 | 16 | 19 | 15 | 17 | 21 | 21 | 23 | 23 | 23 | 22 | 24 | 24 | 24 | |
| 27 | 21 | 48 | 53 | 62 | 34 | 21 | 18 | 17 | 22 | 21 | 24 | 23 | 32 | 28 | 25 | 26 | 23 | 25 | 23 | 24 | 21 | 46 | 31 | 25 | 24 | |
| 28 | 24 | 29 | 30 | 45 | 51 | 50 | 36 | 59 | 40 | 59 | 62 | 40 | 41 | 30 | 26 | 25 | 21 | 24 | 23 | 24 | 23 | 22 | 20 | 21 | 24 | |
| 29 | 43 | 41 | 33 | 19 | 53 | 52 | 23 | 35 | 27 | 34 | 33 | 29 | 36 | 37 | 44 | 30 | 29 | 31 | 26 | 29 | 49 | 48 | 23 | 31 | 24 | |
| 30 | 29 | 72 | 48 | 23 | 19 | 35 | 45 | 76 | 26 | 28 | 30 | 30 | 47 | 43 | 28 | 32 | 33 | 33 | 29 | 22 | 47 | 51 | 35 | 38 | 24 | |

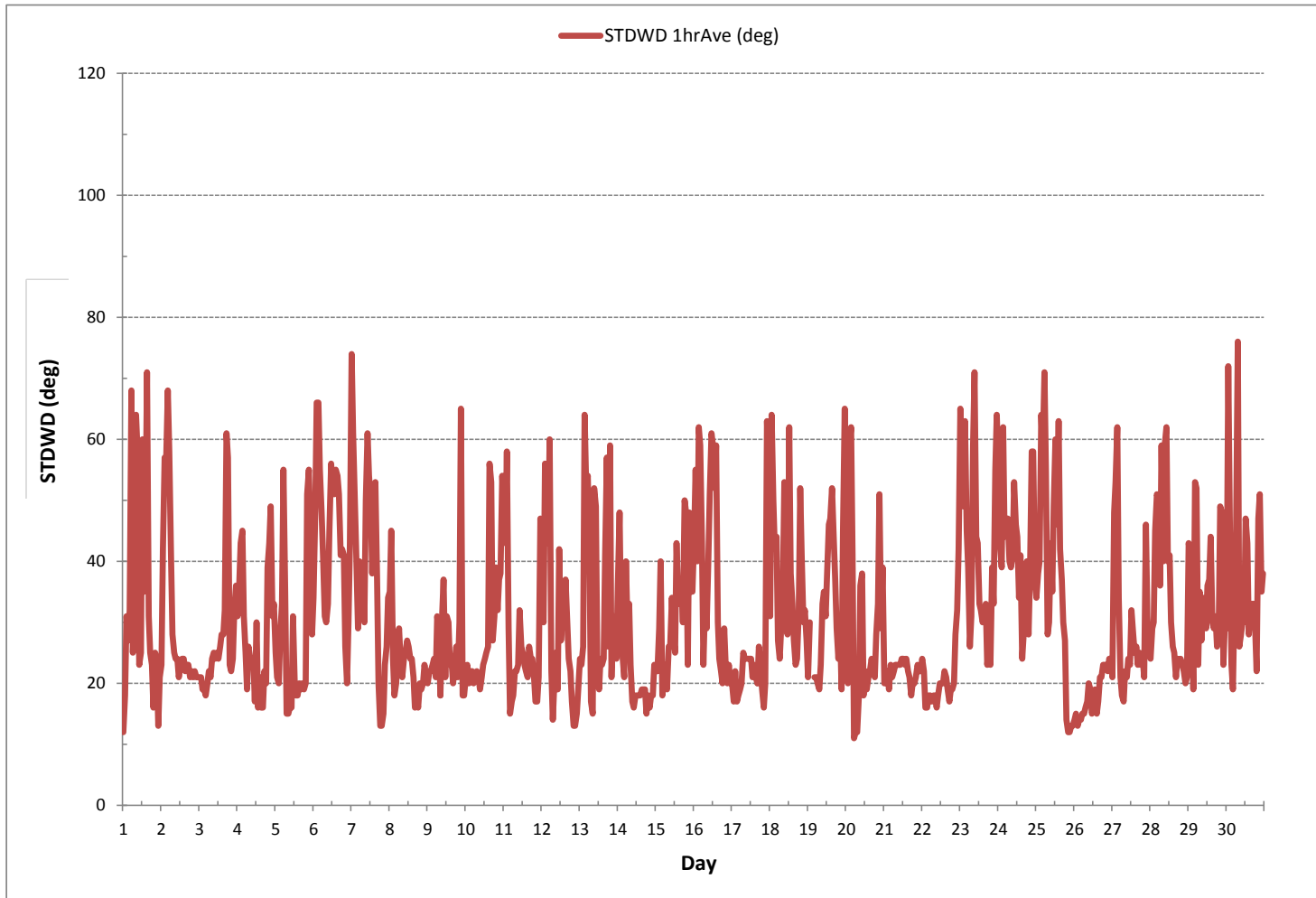
STATUS FLAG CODES

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

LAST CALIBRATION: April 1, 2015

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 718 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

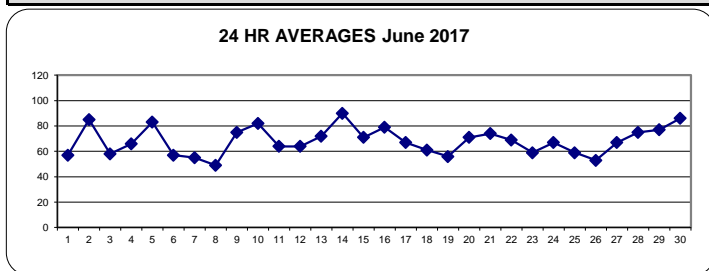


RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

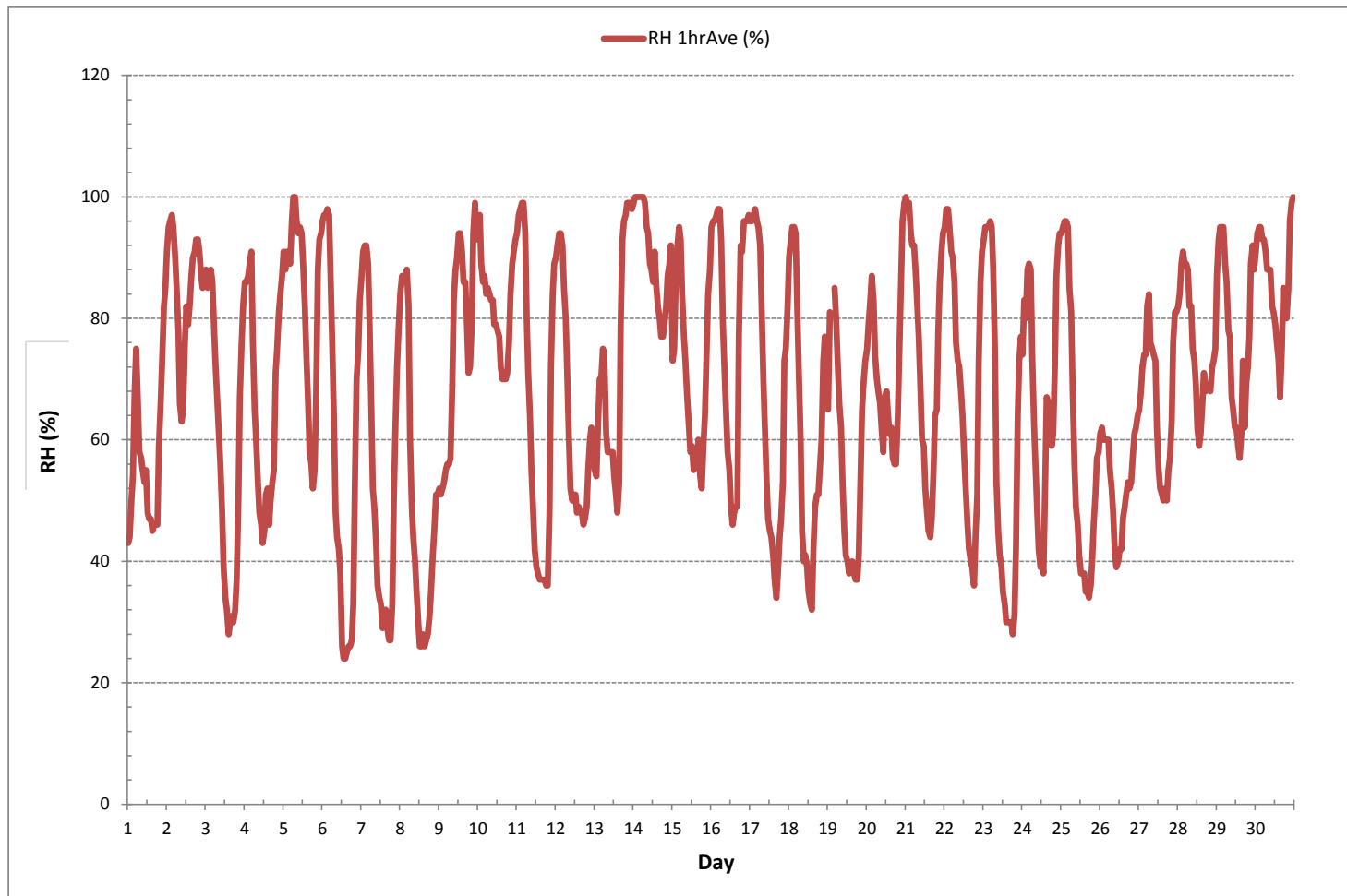
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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



MONTHLY SUMMARY

| | | | | | | |
|------------------------|-----|---|------------------|----|--------|---------|
| MINIMUM 1-HR AVERAGE: | 24 | % | @ HOUR | 13 | ON DAY | 6 |
| MAXIMUM 1-HR AVERAGE: | 100 | % | @ HOUR | 6 | ON DAY | 5 |
| MAXIMUM 24-HR AVERAGE: | 90 | % | | | ON DAY | 14 |
| OPERATIONAL TIME: | | | | | | 718 hrs |
| AMD OPERATION UPTIME: | | | | | | 99.7 % |
| STANDARD DEVIATION: | 21 | | MONTHLY AVERAGE: | | | 68 % |

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



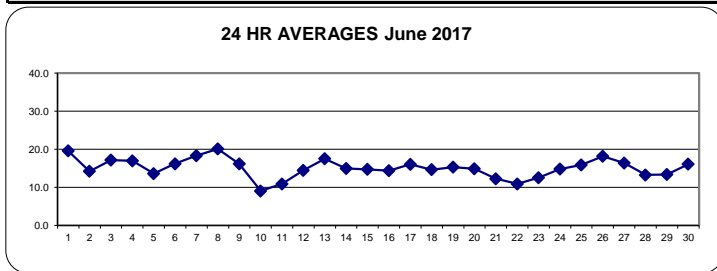
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 18.9 | 18.7 | 17.4 | 16.5 | 15.3 | 14.8 | 15.8 | 17.3 | 18.4 | 20.1 | 21.2 | 20.1 | 22.1 | 22.5 | 23.8 | 25.0 | 24.7 | 24.5 | 24.3 | 21.4 | 19.5 | 17.5 | 15.8 | 15.1 | 14.8 | 25.0 | 19.6 | 24 |
| 2 | 13.8 | 12.2 | 11.3 | 10.9 | 11.4 | 12.9 | 14.7 | 16.3 | 19.6 | 19.5 | 18.5 | 17.0 | 16.4 | 15.9 | 15.3 | 14.2 | 13.7 | 13.3 | 12.7 | 12.5 | 12.2 | 12.4 | 12.6 | 12.6 | 10.9 | 19.6 | 14.2 | 24 |
| 3 | 12.5 | 12.6 | 12.2 | 11.6 | 11.3 | 12.3 | 13.2 | 14.5 | 16.4 | 18.1 | 19.5 | 20.9 | 21.4 | 22.0 | 22.9 | 22.9 | 23.0 | 23.4 | 23.3 | 21.6 | 18.5 | 14.8 | 12.4 | 10.8 | 10.8 | 23.4 | 17.2 | 24 |
| 4 | 9.6 | 8.6 | 7.7 | 7.3 | 7.2 | 11.0 | 14.7 | 17.3 | 19.7 | 21.2 | 22.7 | 23.0 | 22.9 | 21.1 | 21.5 | 23.1 | 22.2 | 21.6 | 21.1 | 18.7 | 17.8 | 17.0 | 16.3 | 15.0 | 7.2 | 23.1 | 17.0 | 24 |
| 5 | 14.6 | 13.9 | 13.5 | 14.3 | 14.5 | 13.7 | 13.9 | 14.1 | 14.3 | 13.3 | 12.4 | 12.4 | 12.7 | 13.7 | 14.3 | 15.9 | 16.7 | 17.0 | 16.9 | 16.3 | 13.8 | 10.0 | 8.3 | 7.5 | 7.5 | 17.0 | 13.7 | 24 |
| 6 | 6.8 | 6.0 | 5.1 | 4.3 | 4.8 | 8.3 | 11.9 | 14.5 | 17.1 | 19.0 | 20.6 | 22.0 | 23.2 | 23.5 | 24.0 | 23.9 | 24.1 | 24.4 | 24.6 | 23.0 | 18.5 | 14.8 | 13.1 | 11.6 | 4.3 | 24.6 | 16.2 | 24 |
| 7 | 10.4 | 9.4 | 8.6 | 8.0 | 8.3 | 11.0 | 15.5 | 18.4 | 19.8 | 22.3 | 23.9 | 23.9 | 24.2 | 25.2 | 24.6 | 24.6 | 25.1 | 25.2 | 24.7 | 23.4 | 19.7 | 16.4 | 14.4 | 12.9 | 8.0 | 25.2 | 18.3 | 24 |
| 8 | 11.8 | 10.9 | 10.3 | 10.4 | 10.3 | 11.7 | 16.6 | 19.2 | 21.2 | 23.1 | 24.1 | 25.3 | 26.0 | 26.4 | 26.3 | 26.6 | 26.1 | 26.1 | 25.1 | 24.2 | 22.4 | 20.8 | 19.1 | 18.6 | 10.3 | 26.6 | 20.1 | 24 |
| 9 | 17.8 | 17.7 | 17.5 | 16.9 | 16.5 | 17.1 | 17.7 | 18.5 | 16.7 | 15.6 | 15.4 | 15.2 | 15.2 | 15.3 | 15.7 | 16.4 | 16.7 | 17.3 | 17.6 | 16.5 | 15.2 | 12.8 | 13.1 | 13.9 | 12.8 | 18.5 | 16.2 | 24 |
| 10 | 12.0 | 10.7 | 10.6 | 9.8 | 8.6 | 8.0 | 7.7 | 7.6 | 7.2 | 7.1 | 7.5 | 7.7 | 8.1 | 8.5 | 9.5 | 10.6 | 11.1 | 11.5 | 11.4 | 10.5 | 9.0 | 8.1 | 7.6 | 7.6 | 7.1 | 12.0 | 9.1 | 24 |
| 11 | 8.1 | 8.2 | 8.4 | 8.4 | 8.7 | 8.9 | 8.2 | 9.3 | 10.7 | 11.6 | 12.7 | 13.0 | 13.8 | 13.8 | 14.0 | 14.1 | 14.5 | 14.4 | 15.2 | 14.6 | 12.4 | 8.2 | 6.1 | 4.8 | 4.8 | 15.2 | 10.9 | 24 |
| 12 | 3.8 | 3.1 | 2.3 | 1.8 | 2.9 | 6.2 | 9.4 | 10.9 | 12.9 | 14.5 | 15.7 | 17.3 | 18.3 | 20.3 | 20.8 | 22.0 | 22.3 | 22.9 | 22.7 | 21.9 | 20.4 | 18.9 | 18.0 | 18.5 | 1.8 | 22.9 | 14.5 | 24 |
| 13 | 18.7 | 18.7 | 16.8 | 15.2 | 15.2 | 14.9 | 16.1 | 18.3 | 19.2 | 20.0 | 20.3 | 20.3 | 21.3 | 21.9 | 22.5 | 21.6 | 17.8 | 16.3 | 15.4 | 14.6 | 14.2 | 14.1 | 13.8 | 13.7 | 13.7 | 22.5 | 17.5 | 24 |
| 14 | 13.5 | 12.9 | 12.6 | 12.5 | 12.5 | 12.6 | 13.1 | 14.0 | 14.8 | 15.7 | 16.1 | 16.4 | 17.0 | 16.0 | 16.9 | 16.8 | 17.2 | 17.4 | 17.3 | 16.9 | 15.6 | 14.4 | 13.8 | 13.2 | 12.5 | 17.4 | 15.0 | 24 |
| 15 | 13.4 | 12.3 | 10.5 | 9.6 | 9.5 | 10.6 | 12.0 | 13.2 | 14.2 | 15.5 | 17.1 | 17.8 | 17.0 | 18.0 | 18.1 | 17.5 | 17.3 | 18.6 | 18.8 | 17.3 | 16.1 | 14.7 | 13.4 | 11.9 | 9.5 | 18.8 | 14.8 | 24 |
| 16 | 10.1 | 9.0 | 8.0 | 7.4 | 7.1 | 9.1 | 12.5 | 14.5 | 15.4 | 16.6 | 17.7 | 18.8 | 19.8 | 20.7 | 20.0 | 20.3 | 19.7 | 14.8 | 14.1 | 15.2 | 14.8 | 14.0 | 13.6 | 13.4 | 7.1 | 20.7 | 14.4 | 24 |
| 17 | 13.1 | 12.7 | 12.5 | 12.3 | 12.1 | 12.2 | 12.8 | 14.1 | 16.2 | 17.7 | 19.0 | 19.6 | 20.0 | 19.6 | 20.7 | 20.4 | 20.6 | 20.0 | 18.7 | 17.7 | 17.1 | 13.6 | 12.4 | 10.6 | 10.6 | 20.7 | 16.1 | 24 |
| 18 | 9.1 | 8.0 | 6.9 | 6.1 | 6.8 | 10.3 | 13.3 | 15.8 | 18.8 | 20.1 | 20.4 | 18.9 | 19.4 | 20.6 | 21.4 | 18.0 | 16.7 | 16.4 | 16.9 | 16.3 | 14.6 | 12.6 | 12.4 | 12.6 | 6.1 | 21.4 | 14.7 | 24 |
| 19 | 11.7 | 9.2 | P | P | 7.9 | 9.1 | 10.7 | 11.7 | 12.7 | 15.2 | 17.0 | 18.2 | 19.0 | 19.4 | 19.6 | 19.6 | 20.3 | 20.5 | 20.2 | 19.4 | 16.3 | 14.0 | 12.8 | 12.4 | 7.9 | 20.5 | 15.3 | 22 |
| 20 | 11.9 | 11.4 | 10.7 | 10.2 | 11.0 | 12.6 | 13.8 | 14.8 | 15.5 | 16.4 | 17.0 | 15.9 | 15.8 | 15.9 | 16.5 | 17.5 | 19.1 | 19.3 | 18.7 | 17.3 | 15.8 | 14.3 | 13.2 | 12.8 | 10.2 | 19.3 | 14.9 | 24 |
| 21 | 12.8 | 11.8 | 11.6 | 11.2 | 10.5 | 10.5 | 10.9 | 11.1 | 11.6 | 12.9 | 13.8 | 14.1 | 14.8 | 14.7 | 15.2 | 15.4 | 15.0 | 13.9 | 12.5 | 12.2 | 10.7 | 9.5 | 8.9 | 8.8 | 8.8 | 15.4 | 12.3 | 24 |
| 22 | 8.8 | 9.1 | 10.0 | 11.0 | 10.8 | 10.0 | 9.4 | 9.3 | 9.4 | 9.3 | 9.1 | 10.1 | 12.0 | 13.3 | 14.3 | 15.1 | 15.3 | 14.6 | 15.0 | 14.3 | 12.5 | 8.7 | 6.0 | 4.7 | 4.7 | 15.3 | 10.9 | 24 |
| 23 | 3.6 | 2.8 | 2.1 | 1.6 | 2.4 | 4.9 | 7.2 | 10.4 | 14.0 | 16.1 | 17.0 | 17.2 | 18.3 | 18.4 | 19.4 | 19.4 | 19.2 | 19.2 | 19.4 | 18.8 | 16.6 | 12.1 | 11.0 | 10.9 | 1.6 | 19.4 | 12.6 | 24 |
| 24 | 11.4 | 10.7 | 10.8 | 10.4 | 10.2 | 11.1 | 13.8 | 16.2 | 17.5 | 18.7 | 19.8 | 20.9 | 20.5 | 21.3 | 18.2 | 14.7 | 15.4 | 16.4 | 17.0 | 16.6 | 14.7 | 11.5 | 9.8 | 8.6 | 8.6 | 21.3 | 14.8 | 24 |
| 25 | 7.6 | 6.8 | 6.1 | 5.4 | 5.7 | 9.1 | 12.6 | 15.4 | 16.9 | 18.5 | 19.5 | 20.9 | 21.4 | 21.4 | 21.3 | 21.8 | 22.4 | 22.4 | 21.9 | 20.6 | 18.4 | 16.6 | 15.0 | 14.3 | 5.4 | 22.4 | 15.9 | 24 |
| 26 | 13.4 | 12.7 | 12.6 | 12.7 | 13.1 | 13.7 | 15.8 | 16.8 | 18.0 | 19.9 | 21.0 | 21.2 | 21.6 | 22.4 | 21.5 | 21.7 | 21.4 | 21.2 | 21.3 | 21.4 | 20.1 | 18.2 | 17.6 | 17.2 | 12.6 | 22.4 | 18.2 | 24 |
| 27 | 16.9 | 16.4 | 15.6 | 15.1 | 15.0 | 15.4 | 14.9 | 15.7 | 16.1 | 16.6 | 16.8 | 18.4 | 19.7 | 19.8 | 18.8 | 18.8 | 18.6 | 18.6 | 17.5 | 16.9 | 15.1 | 12.4 | 11.9 | 12.2 | 11.9 | 19.8 | 16.4 | 24 |
| 28 | 12.0 | 11.5 | 10.5 | 10.2 | 10.3 | 10.8 | 11.5 | 13.3 | 13.7 | 14.8 | 15.2 | 16.1 | 16.2 | 17.6 | 17.2 | 16.8 | 14.8 | 14.4 | 13.7 | 13.3 | 12.1 | 11.8 | 11.3 | 9.8 | 9.8 | 17.6 | 13.3 | 24 |
| 29 | 7.3 | 5.6 | 4.7 | 3.9 | 4.0 | 7.0 | 8.9 | 10.8 | 11.5 | 14.1 | 15.3 | 16.9 | 18.0 | 19.1 | 20.5 | 20.1 | 18.4 | 19.8 | 18.3 | 18.0 | 16.7 | 14.2 | 13.9 | 14.4 | 3.9 | 20.5 | 13.4 | 24 |
| 30 | 13.6 | 12.3 | 12.0 | 12.3 | 13.3 | 13.8 | 14.9 | 15.8 | 15.9 | 16.0 | 17.1 | 17.3 | 17.8 | 18.5 | 19.0 | 20.1 | 19.2 | 18.2 | 18.4 | 18.3 | 17.4 | 15.9 | 15.2 | 14.2 | 12.0 | 20.1 | 16.1 | 24 |
| HOURLY MAX | 18.9 | 18.7 | 17.5 | 16.9 | 16.5 | 17.1 | 17.7 | 19.2 | 21.2 | 23.1 | 24.1 | 25.3 | 26.0 | 26.4 | 26.3 | 26.6 | 26.1 | 26.1 | 25.1 | 24.2 | 22.4 | 20.8 | 19.1 | 18.6 | | | | |
| HOURLY AVG | 11.6 | 10.9 | 10.3 | 9.9 | 9.9 | 11.1 | 12.8 | 14.3 | 15.5 | 16.7 | 17.4 | 17.9 | 18.5 | 18.9 | 19.1 | 19.2 | 19.0 | 18.8 | 18.5 | 17.7 | 15.9 | 13.8 | 12.8 | 12.2 | | | | |

STATUS FLAG CODES

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

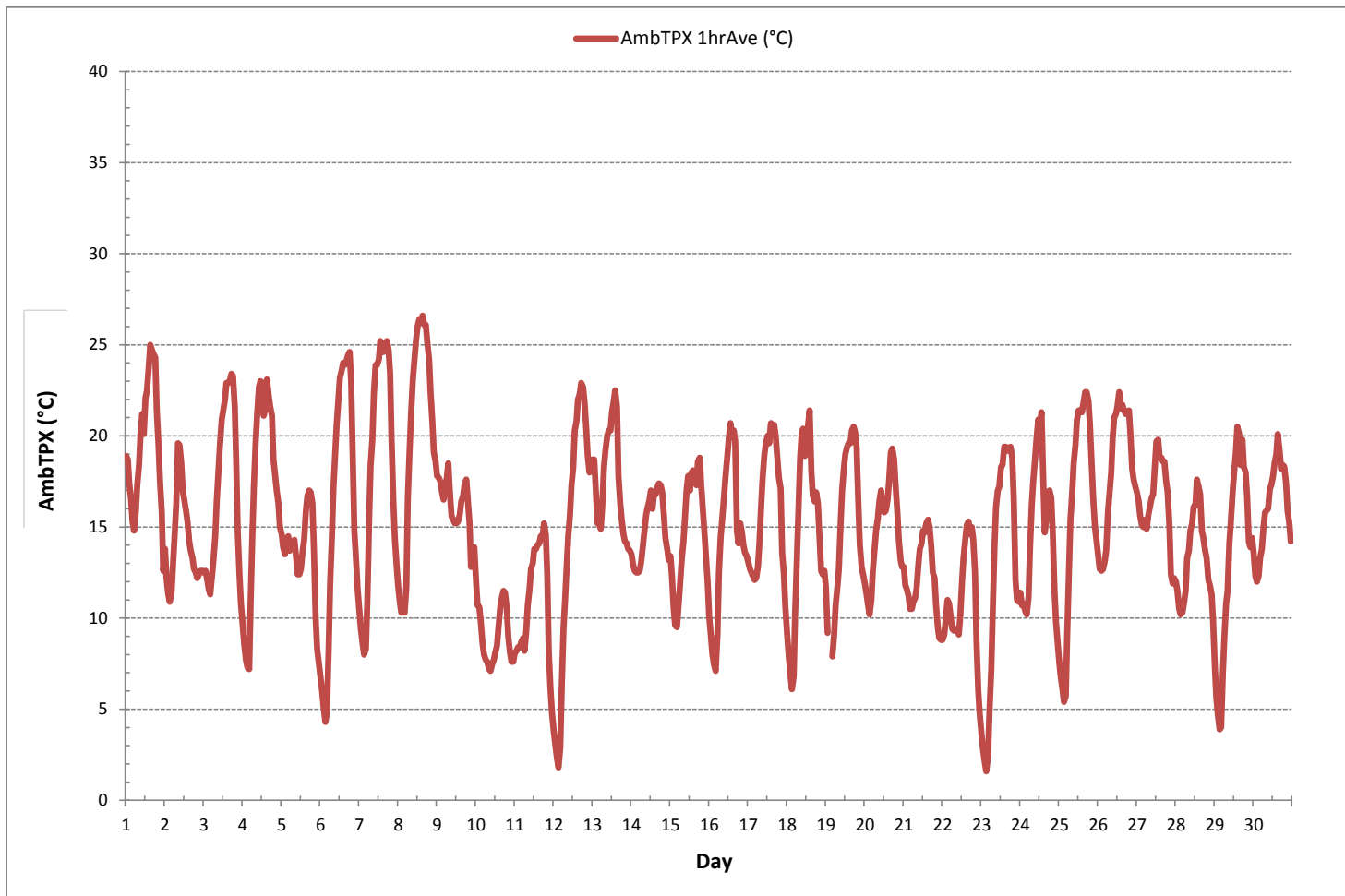
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | |
|------------------------------|---------|------------------|----|--------|---------|
| MINIMUM 1-HR AVERAGE: | 1.6 °C | @ HOUR | 3 | ON DAY | 23 |
| MAXIMUM 1-HR AVERAGE: | 26.6 °C | @ HOUR | 15 | ON DAY | 8 |
| MAXIMUM 24-HR AVERAGE: | 20.1 °C | | | ON DAY | 8 |
| OPERATIONAL TIME: 718 hrs | | | | | |
| AMD OPERATION UPTIME: 99.7 % | | | | | |
| STANDARD DEVIATION: | 4.9 | MONTHLY AVERAGE: | | | 15.1 °C |

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 17060102-001

Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/June 06, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167
Location: Cold Lake South Canister ID: H2798
Station ID: LICA 01 Installation Date/Time (mst): Jun 05, 2017 @ 21:45
Sample ID: LICA/VOC/CLS/June 06, 2017 Removal Date/Time (mst): Jun 09, 2017 @ 08:36

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.6</u> | <u>+25.9</u> |

| Flow Settings | | |
|---------------------|---------------|----------------|
| Flow Reading (sccm) | Pot Set Point | Pump Set (psi) |
| <u>10.0</u> | <u>0.52</u> | <u>24.0</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 09, 2017



Volatile Organics Data Results

Date: June 6, 2017
Canister ID: H2798

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.04 |
| 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 | 0.04 |
| 2,2-Dimethylbutane | < 0.01 |
| 2,3,4-Trimethylpentane | 0.01 |
| 2,3-Dimethylbutane | 0.03 |
| 2,3-Dimethylpentane | 0.04 |
| 2,4-Dimethylpentane | 0.02 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | 0.04 |
| 2-Methylpentane | 0.04 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.02 |
| 3-Methylpentane | 0.03 |
| Acetone | 4.2 |
| Acrolein | < 0.3 |
| Benzene | 0.05 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | 0.03 |
| Carbon disulfide | 0.09 |
| Carbon tetrachloride | 0.11 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | 0.04 |
| 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 | < 0.02 |
| Cyclopentane | 0.01 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.8 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.01 |
| Freon-11 | 0.38 |
| Freon-113 | 0.1 |

Volatile Organics Data Results

Date: June 6, 2017
Canister ID: H2798

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | 0.03 |
| Freon-12 | 0.5 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.33 |
| Isopentane | 0.32 |
| Isoprene | 0.54 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | 0.04 |
| m-Diethylbenzene | < 0.04 |
| m-Ethyltoluene | < 0.08 |
| Methyl butyl ketone | < 0.50 |
| Methyl ethyl ketone | 0.3 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 0.01 |
| Methylcyclopentane | 0.03 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.5 |
| 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 | 0.02 |
| 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: 6167
 Location: Cold Lake South Canister ID: S5630
 Station ID: LICA 01 Installation Date/Time (mst): Jun 09, 2017 @ 08:36
 Sample ID: LICA/VOC/CLS/Jun 12, 2017 Removal Date/Time (mst): Jun 16, 2017 @ 13:56

Date and Time Information

| Sample Date: | Start Time (mst) | End Time (mst) | Elapsed Time (hours) |
|---------------------|------------------|-------------------------------------|----------------------|
| <u>Jun 12, 2017</u> | <u>00:00</u> | <u>00:00</u> <u>Jun 13, 2017</u> | <u>24.0</u> |

Canister Pressure/Vacuum

| Initial Vacuum (in. Hg) | Final Pressure (psi) |
|-------------------------|----------------------|
| <u>-27.7</u> | <u>+23.1</u> |

Flow Settings

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

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: June 16, 2017

Sample ID: 17060234-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Jun 12, 2017



Volatile Organics Data Results

Date: June 12, 2017
Canister ID: S5630

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.04 |
| 1-Hexene | < 0.02 |
| 1-Pentene | < 0.01 |
| 2,2,4-Trimethylpentane | 0.02 |
| 2,2-Dimethylbutane | < 0.01 |
| 2,3,4-Trimethylpentane | < 0.01 |
| 2,3-Dimethylbutane | < 0.02 |
| 2,3-Dimethylpentane | 0.03 |
| 2,4-Dimethylpentane | 0.01 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | 0.08 |
| 2-Methylpentane | 0.04 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.03 |
| 3-Methylpentane | 0.03 |
| Acetone | 5.7 |
| Acrolein | < 0.3 |
| Benzene | 0.03 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.75 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | < 0.02 |
| Chloromethane | 0.4 |
| 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 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | < 0.01 |
| Freon-11 | 0.32 |
| Freon-113 | 0.08 |

Volatile Organics Data Results

Date: June 12, 2017
Canister ID: S5630

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.46 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.2 |
| Isopentane | 0.36 |
| Isoprene | 0.33 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | < 0.03 |
| m-Diethylbenzene | < 0.04 |
| m-Ethyltoluene | < 0.08 |
| Methyl butyl ketone | < 0.50 |
| Methyl ethyl ketone | 0.6 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 0.06 |
| Methylcyclopentane | 0.04 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.31 |
| 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 | < 0.01 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | < 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.05 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Jun 18, 2017

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: 1678
 Station ID: LICA 01 Installation Date/Time (mst): Jun 16, 2017 @ 13:56
 Sample ID: LICA/VOC/CLS/Jun 18, 2017 Removal Date/Time (mst): Jun 19, 2017 @ 13:12

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.2</u> | <u>+24.3</u> |

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

Deployment/Collection and Maintenance Checklist

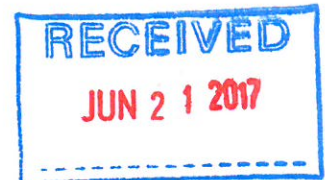
Initial leak check deployment vacuum (in. Hg) = — @ — mst
 Final leak check deployment vacuum (in. Hg) = — @ — mst
 Total leak rate = — psi over — minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 19, 2017



Volatile Organics Data Results

Date: June 18, 2017
Canister ID: 1678

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.01 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.03 |
| 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 | 0.02 |
| 2-Methylpentane | 0.03 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.02 |
| 3-Methylpentane | 0.02 |
| Acetone | 3.6 |
| Acrolein | < 0.3 |
| Benzene | 0.09 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.51 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | 0.02 |
| Chloromethane | 0.43 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | < 0.02 |
| Cyclopentane | 0.01 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.2 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | < 0.01 |
| Freon-11 | 0.35 |
| Freon-113 | 0.08 |

Volatile Organics Data Results

Date: June 18, 2017
Canister ID: 1678

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.5 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.17 |
| Isopentane | 0.27 |
| Isoprene | 0.32 |
| 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 | 0.04 |
| 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 | 0.12 |
| 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 |

Sample ID: 17060333-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/June 24, 2017

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 5653
 Station ID: LICA 01 Installation Date/Time (mst): Jun 19, 2017 @ 13:12
 Sample ID: LICA/VOC/CLS/June 24, 2017 Removal Date/Time (mst): Jun 26, 2017 @ 12:10

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.7</u> | <u>+26.5</u> |

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

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Mar 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 18, 2017 (due every 6 months)

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

Comments: NA

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 26, 2017



Volatile Organics Data Results

Date: June 24, 2017
Canister ID: S5653

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | 0.07 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.04 |
| 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 | 0.09 |
| 2,3-Dimethylpentane | 0.11 |
| 2,4-Dimethylpentane | 0.05 |
| 2-Methylheptane | 0.23 |
| 2-Methylhexane | 0.38 |
| 2-Methylpentane | 0.63 |
| 3-Methylheptane | 0.11 |
| 3-Methylhexane | 0.35 |
| 3-Methylpentane | 0.43 |
| Acetone | 5.9 |
| Acrolein | < 0.3 |
| Benzene | 0.28 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 1.22 |
| Carbon tetrachloride | 0.11 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | 0.03 |
| Chloromethane | 0.51 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | 0.47 |
| Cyclopentane | 0.15 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.2 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.11 |
| Freon-11 | 0.3 |
| Freon-113 | 0.09 |

Volatile Organics Data Results

Date: June 24, 2017
Canister ID: S5653

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | 0.02 |
| Freon-12 | 0.63 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.37 |
| Isopentane | 1.17 |
| Isoprene | 0.47 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | 0.03 |
| m,p-Xylene | 0.32 |
| m-Diethylbenzene | < 0.04 |
| m-Ethyltoluene | < 0.08 |
| Methyl butyl ketone | < 0.50 |
| Methyl ethyl ketone | 0.5 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 1 |
| Methylcyclopentane | 0.73 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.89 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.66 |
| n-Hexane | 0.99 |
| n-Nonane | 0.17 |
| n-Octane | 0.33 |
| n-Pentane | 1 |
| n-Propylbenzene | < 0.05 |
| n-Undecane | < 0.5 |
| Naphthalene | < 0.5 |
| o-Ethyltoluene | 0.03 |
| o-Xylene | 0.18 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | < 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.64 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | 0.03 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

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

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: S5629
 Station ID: LICA 01 Installation Date/Time (mst): Jun 26, 2017 @ 12:10
 Sample ID: LICA/VOC/CLS/ Jun 30, 2017 Removal Date/Time (mst): July 04, 2017 @ 09:12

Date and Time Information

| Sample Date: | Start Time (mst) | End Time (mst) | Elapsed Time (hours) |
|---------------------|------------------|--------------------------------------|----------------------|
| <u>Jun 30, 2017</u> | <u>00:00</u> | <u>00:00</u> <u>July 01, 2017</u> | <u>24.0</u> |

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.2</u> | <u>+23.5</u> |

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

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = -27.7 @ Jun 19, 2017/13:12 mst
 Final leak check deployment vacuum (in. Hg) = -27.7 @ Jun 21, 2017/12:21 mst
 Total leak rate = 0.0 psi over 47 hours 09 minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: June 21, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: June 21, 2017 (due every 6 months)

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

Comments: Leak test was completed on June 19 - Jun 21, 2017
No issues. The sampler is leak-free.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 04, 2017



Volatile Organics Data Results

Date: June 30, 2017
Canister ID: S5629

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | < 0.02 |
| 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 | 0.03 |
| 2,4-Dimethylpentane | < 0.01 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | < 0.01 |
| 2-Methylpentane | 0.06 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.02 |
| 3-Methylpentane | 0.03 |
| Acetone | 5.4 |
| Acrolein | 5.3 |
| Benzene | 0.06 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.2 |
| Carbon tetrachloride | 0.11 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | 0.03 |
| Chloromethane | 0.48 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | 0.05 |
| Cyclopentane | < 0.01 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.2 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.02 |
| Freon-11 | 0.31 |
| Freon-113 | 0.1 |

Volatile Organics Data Results

Date: June 30, 2017
Canister ID: S5629

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.62 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.17 |
| Isopentane | 0.37 |
| Isoprene | 0.42 |
| 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 | 0.06 |
| Methylcyclopentane | 0.06 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.27 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.03 |
| n-Hexane | 0.07 |
| 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 | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

PAH RESULTS

Sample ID: 17060102-002

Customer ID: LICA

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

RECEIVED
JUN 12 2017

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>1138/100-1020</u> |
| Station ID: | <u>LICA 01</u> | Installation Date/Time: | <u>Jun 05, 2017/21:37</u> |
| Field Sample ID: | <u>LICA/PUF/CLS/JUN 06, 2017</u> | Removal Date/Time: | <u>Jun 09, 2017/08:22</u> |

Sample Data Collection Information

| | | | |
|-----------------------|----------------------------|---|---------------------------------|
| Sample Date: | <u>June 06, 2017</u> | Average Pressure (mmHg) | <u>716</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 June 07, 2017</u> | Average Temperature (°C) | <u>18.1°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (V _{std} m ³) | <u>23.405 330.20</u> |

H.V.

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>Apr 05, 2017</u> | |
| Other observations? | <u>n/a</u> | |

| | | |
|---------------|---------------------|---------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | <u>Date: Jun 09, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 6, 2017
PUF S/N: TE-11

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.13 |
| 2-Methylnaphthalene | 0.24 |
| 3-Methylcholanthrene | < 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | < 0.01 |
| Acenaphthylene | 0.13 |
| Acridine | 0.02 |
| Anthracene | 0.01 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | < 0.01 |
| Benzo(b,j,k)fluoranthene | 0.02 |
| 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 | 0.05 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.08 |
| Perylene | < 0.01 |
| Phenanthrene | 0.21 |
| Pyrene | 0.03 |
| Retene | 0.02 |

Sample ID: 17060234-002

Customer ID: LICA

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

TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|-----------------------------------|-------------------------|---------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>TE-02</u> |
| Location: | <u>Cold Lake South</u> | Motor S/N: | <u>1138 / 100-1020</u> |
| Station ID: | <u>LICA 01</u> | Installation Date/Time: | <u>Jun 09, 2017/08:22</u> |
| Field Sample ID: | <u>LICA/PUF/CLS/June 12, 2017</u> | Removal Date/Time: | <u>Jun 16, 2017/13:47</u> |

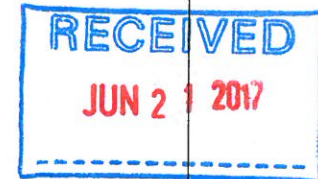
Sample Data Collection Information

| | | | |
|-----------------------|---------------------------|---|---------------|
| Sample Date: | <u>Jun 12, 2017</u> | Average Pressure (mmHg) | <u>707</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 Jun 13, 2017</u> | Average Temperature (°C) | <u>15.4°</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>Apr 05, 2017</u> | |
| Other observations? | <u>n/a</u> | |



| | | |
|---------------|---------------------|---------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | Date: <u>Jun 16, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 12, 2017
PUF S/N: TE-02

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.12 |
| 2-Methylnaphthalene | 0.21 |
| 3-Methylcholanthrene | 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | < 0.01 |
| Acenaphthylene | < 0.01 |
| Acridine | < 0.01 |
| Anthracene | < 0.01 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | 0.01 |
| Benzo(b,j,k)fluoranthene | 0.02 |
| 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 | 0.11 |
| Pyrene | 0.03 |
| Retene | 0.01 |

Sample ID: 17060234-004

Customer ID: LICA

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



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>Jun 16, 2017/13:47</u> |
| Field Sample ID: | <u>LICA/PUF/CLS/Jun 18, 2017</u> | Removal Date/Time: | <u>Jun 19, 2017/13:06</u> |

Sample Data Collection Information

| | | | |
|-----------------------|----------------------------|---|---------------|
| Sample Date: | <u>June 18, 2017</u> | Average Pressure (mmHg) | <u>709</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 June 19, 2017</u> | Average Temperature (°C) | <u>16.6°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (V _{std} m ³) | <u>330.22</u> |

Sample Recovery Checklist

(circle one)

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

| | | |
|---------------|---------------------|---------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | Date: <u>Jun 19, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 18, 2017
PUF S/N: TE-09

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.02 |
| 2-Methylnaphthalene | 0.07 |
| 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 | 0.03 |
| 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 | 0.04 |
| Fluorene | 0.05 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.01 |
| Perylene | < 0.01 |
| Phenanthrene | 0.24 |
| Pyrene | 0.04 |
| Retene | 0.02 |

Sample ID: 17060333-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/June 24, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: TE-08
Location: Cold Lake South Motor S/N: 1138/100-1020
Station ID: LICA 01 Installation Date/Time: June 19, 2017/13:06
Field Sample ID: LICA/PUF/CLS/Jun 24, 2017 Removal Date/Time: June 26, 2017/12:22

Sample Data Collection Information

Sample Date: June 24, 2017 Average Pressure (mmHg) 718
Start Time (mst): 00:00 Average Flow (Q_{std}) 229
End Time (mst): 00:00 June 25, 2017 Average Temperature (°C) 16.7°
Elapsed Time (Hours): 24.0 Volume (V_{std} 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: Apr 05, 2017
Other observations? n/a

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: June 26, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 24, 2017
PUF S/N: TE-08

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.07 |
| 2-Methylnaphthalene | 0.12 |
| 3-Methylcholanthrene | < 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | 0.05 |
| Acenaphthylene | < 0.01 |
| Acridine | < 0.01 |
| Anthracene | < 0.01 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | 0.01 |
| Benzo(b,j,k)fluoranthene | 0.02 |
| 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 | 0.04 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.03 |
| Perylene | < 0.01 |
| Phenanthrene | 0.18 |
| Pyrene | 0.02 |
| Retene | 0.02 |

Sample ID: 17070019-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/June 30, 2017



TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|----------------------------------|-------------------------|------------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>TE-04</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>Jun 26, 2017 / 12:22</u> |
| Field Sample ID: | <u>LICA/PUF/CLS/JUN 30, 2017</u> | Removal Date/Time: | <u>July 04, 2017 / 09:00</u> |

Sample Data Collection Information

| | | | |
|-----------------------|----------------------------|----------------------------------|---------------|
| Sample Date: | <u>Jun 30, 2017</u> | Average Pressure (mmHg) | <u>711</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 July 01, 2017</u> | Average Temperature (°C) | <u>17.8°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (Vstd m ³) | <u>330.20</u> |

Sample Recovery Checklist

(circle one)

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

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: July 04, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 30, 2017
PUF S/N: TE-04

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.05 |
| 2-Methylnaphthalene | 0.11 |
| 3-Methylcholanthrene | < 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | 0.21 |
| Acenaphthylene | 0.05 |
| Acridine | < 0.01 |
| Anthracene | 0.01 |
| Benzo(a)anthracene | 0.01 |
| Benzo(a)pyrene | < 0.01 |
| Benzo(b,j,k)fluoranthene | < 0.01 |
| Benzo(c)phenanthrene | < 0.01 |
| Benzo(e)pyrene | < 0.01 |
| Benzo(ghi)perylene | < 0.01 |
| Chrysene | < 0.01 |
| Dibenzo(a,h)pyrene | < 0.01 |
| Dibenzo(a,i)pyrene | 0.02 |
| Dibenzo(a,l)pyrene | < 0.01 |
| Dibenzo(ah)anthracene | < 0.01 |
| Fluoranthene | 0.04 |
| Fluorene | 0.07 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.05 |
| Perylene | < 0.01 |
| Phenanthrene | 0.26 |
| Pyrene | 0.04 |
| Retene | 0.02 |

PARTISOL RESULTS

Sample ID: 17060100-001

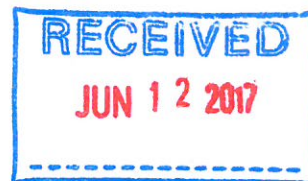
Customer ID: LICA

Cust Samp ID: P6193519

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: June 06, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6193519

Start Time 00:00 June 06, 2017

End Time 00:00 June 07, 2017

Status OK

Std Vol 23.405

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

Date of last audit: Apr 20, 2017

Technician Signature: Alex Yakupov
 Date: June 09, 2017
 Time: 08:14

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: 17060235-001

AIR FCD-01318/2

Customer ID: LICA

Cust Samp ID: LICA P6129435

artisol Sample Data Sheet

Priority: Normal

Date Sampled: June 12, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 612 94 35

Start Time 00:00 June 12, 2017

End Time 00:00 June 13, 2017

Status OK

Std Vol 23.274

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

n/a

Date of last audit : Apr 20, 2017

Technician Signature:

Alex Yakupov
Date: June 16, 2017
Time: 14:06

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: 17060235-002

Customer ID: LICA

Cust Samp ID: LICA P6194555

AIR FCD-01318/2

Priority: Normal

Partisol Sample Data Sheet

Date Sampled: June 18, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6194555

Start Time 00:00 June 18, 2017

End Time 00:00 June 19, 2017

Status OK

Std Vol 23.333

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

n/a

Date of last audit: Apr 20, 2017

Technician Signature:

Alex Yakupov
Date: June 19, 2017
Time: 13:27

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: 17070020-001

Customer ID: LICA

Cust Samp ID: P6194554

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: June 30, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6194554

Start Time 00:00 June 30, 2017

End Time 00:00 July 01, 2017

Status OK

Std Vol 23.244

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

Date of last audit: Apr 20, 2017

Technician Signature: Alex Yakupov
 Date: July 04, 2017
 Time: 09:26

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


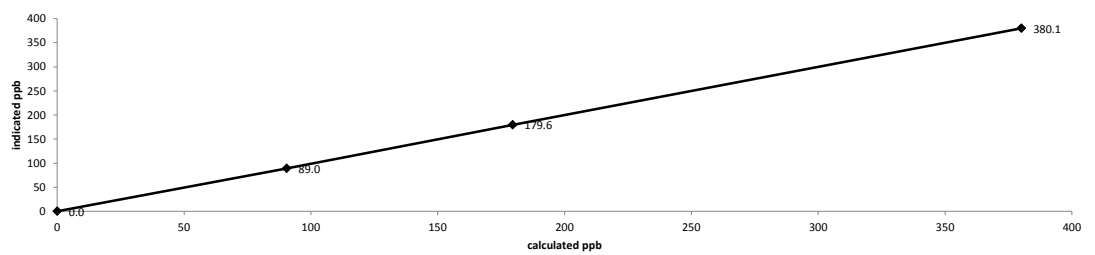
Partisol Sampler Results

| Date | Filter NO. | Concentration (mg) |
|---------|------------|--------------------|
| June 6 | P6193519 | 0.036 |
| June 12 | P6129435 | 0.067 |
| June 18 | P6194555 | 0.057 |
| June 30 | P6194554 | 0.118 |

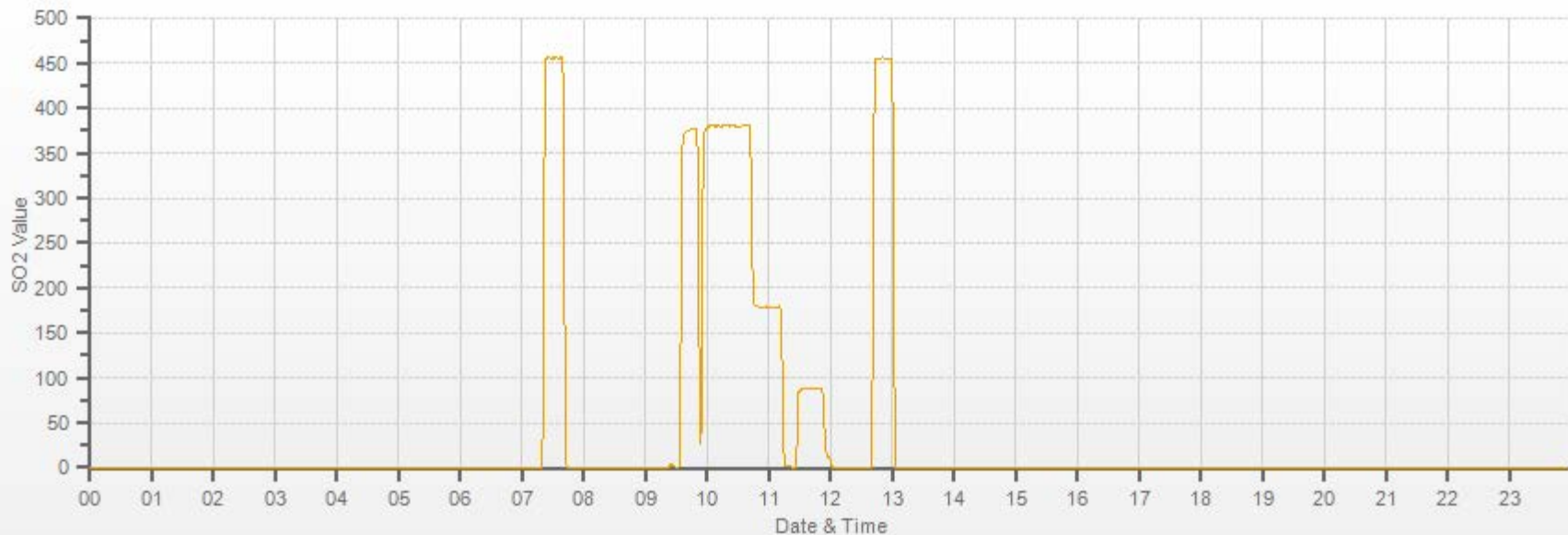
Note: No sampling on June 24 - Sampler did not recover after power failure.

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

|  | | Thermo 43iSulphur Dioxide Analyzer Calibration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|--|---------------------------------|--------------------------------|---------------------------------|--------------------------------|----------------------------|---------------|------|------|------|-----|-----|-----|---------------|------|-------|------|-------|-------|-------|---------------|------|------|------|-----|-----|-----|---------------|------|-------|------|-------|-------|-------|-----|------|-------|------|-------|-------|-------|-----|------|------|------|------|------|-------|-----------------|------|------|------|-----|-----|-----|---------------|--|--|--|--|--|-------|
| Date: June 20, 2017 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 8:34 End Time 24 hr. (mst): 13:05 Calibration Method: Gas Dilution | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 946 mb Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 22 °C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: July 18, 2019 Converter Model & s/n (if applicable): n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Analyzer: ID# or Serial Number: 806528242 Range ppb: 500 Last Calibration Date: May 9, 2017 As Found C.F.: 1.000 Previous C.F.: 1.001 New C.F.: 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibration Standards: Low Flow Meter ID/Cert. Date: Defender 2 Low ID# 152020 November 21, 2016 High Flow Meter ID/Cert. Date: Defender 2 High ID# 148943 November 21, 2016 Calibrator ID/Cert. Date: API 700 627, January 27, 2017 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard Calibration Points for Ranges | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table> | | Point | ppb | High | 380 | Mid | 180 | Low | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Point | ppb | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High | 380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>Calculated Concentration: (ppb)</th> <th>Indicated Concentration: (ppb)</th> <th>Correction Factors (C.F.):</th> </tr> </thead> <tbody> <tr><td>as found zero</td><td>4889</td><td>0.00</td><td>4889</td><td>0.0</td><td>0.0</td><td>n/a</td></tr> <tr><td>as found high</td><td>4980</td><td>37.70</td><td>5018</td><td>380.2</td><td>380.1</td><td>1.000</td></tr> <tr><td>adjusted zero</td><td>4889</td><td>0.00</td><td>4889</td><td>0.0</td><td>0.0</td><td>n/a</td></tr> <tr><td>adjusted high</td><td>4980</td><td>37.70</td><td>5018</td><td>380.2</td><td>380.1</td><td>1.000</td></tr> <tr><td>mid</td><td>5006</td><td>17.83</td><td>5024</td><td>179.6</td><td>179.6</td><td>1.000</td></tr> <tr><td>low</td><td>5014</td><td>8.98</td><td>5023</td><td>90.5</td><td>89.0</td><td>1.017</td></tr> <tr><td>calibrator zero</td><td>4889</td><td>0.00</td><td>4889</td><td>0.0</td><td>0.0</td><td>n/a</td></tr> <tr><td colspan="6" style="text-align: right;">Average C.F.=</td><td>1.006</td></tr> </tbody> </table> | | Point | Diluent | Cal Gas | Total | Calculated Concentration: (ppb) | Indicated Concentration: (ppb) | Correction Factors (C.F.): | as found zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | as found high | 4980 | 37.70 | 5018 | 380.2 | 380.1 | 1.000 | adjusted zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | adjusted high | 4980 | 37.70 | 5018 | 380.2 | 380.1 | 1.000 | mid | 5006 | 17.83 | 5024 | 179.6 | 179.6 | 1.000 | low | 5014 | 8.98 | 5023 | 90.5 | 89.0 | 1.017 | calibrator zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | Average C.F.= | | | | | | 1.006 |
| Point | Diluent | Cal Gas | Total | Calculated Concentration: (ppb) | Indicated Concentration: (ppb) | Correction Factors (C.F.): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| as found zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| as found high | 4980 | 37.70 | 5018 | 380.2 | 380.1 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| adjusted zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| adjusted high | 4980 | 37.70 | 5018 | 380.2 | 380.1 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| mid | 5006 | 17.83 | 5024 | 179.6 | 179.6 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| low | 5014 | 8.98 | 5023 | 90.5 | 89.0 | 1.017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| calibrator zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Average C.F.= | | | | | | 1.006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Linear Regression/Calibration Results: Correlation Coefficient = <u>1.000</u> LIMITS > or = 0.995 Slope = <u>0.999</u> .95-1.05 b (Intercept as % of full scale)= <u>0.12%</u> ± 3% F.S. % change in C.F. from last cal= <u>0.09%</u> ± 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermo 43iSulphur Dioxide Analyzer Calibration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table style="width:100%;"> <tr> <td style="width: 50%;"> As found: Bkg: 8.2 Coef: 0.967 Pmt: -624.2 Flash: 767 Internal: 28.0 Chamber: 45.1 Perm Oven Gas: 45.00 Perm Oven Heater: 44.19 Pressure: 678.0 Sample Flow: 0.473 Lamp Intensity: 95 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 457.0 </td> <td style="width: 50%;"> As left: Bkg: 8.1 Coef: 0.962 Pmt: -624.2 Flash: 767 Internal: 28.8 Chamber: 45.2 Perm Oven Gas: 45.00 Perm Oven Heater: 44.19 Pressure: 676.8 Sample Flow: 0.472 Lamp Intensity: 97 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 454.0 </td> </tr> </table> | | As found: Bkg: 8.2 Coef: 0.967 Pmt: -624.2 Flash: 767 Internal: 28.0 Chamber: 45.1 Perm Oven Gas: 45.00 Perm Oven Heater: 44.19 Pressure: 678.0 Sample Flow: 0.473 Lamp Intensity: 95 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 457.0 | As left: Bkg: 8.1 Coef: 0.962 Pmt: -624.2 Flash: 767 Internal: 28.8 Chamber: 45.2 Perm Oven Gas: 45.00 Perm Oven Heater: 44.19 Pressure: 676.8 Sample Flow: 0.472 Lamp Intensity: 97 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 454.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Comments: The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. No zero adjustment was required/made. The "as found" zero value was copied to the adjusted zero value field for linearity calculation purposes. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.06.20 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

| | | |
|---|--|----------------|
| Date: June 20, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 946 bm |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Cold Lake South | Weather Conditions: A few clouds | |
| Parameter: Total Reduced Sulphur | Calibration Purpose: routine monthly | |
| Start Time 24 hr. (mst): 8:34 | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): 15:38 | Cal Gas Expiry Date: June 14, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): CDNova CDN-101 #501 | |

| | | |
|------------------------------------|----------------------|--|
| Analyzer: | | |
| ID# or Serial Number: 812728560 | Range ppb: 100 | |
| Last Calibration Date: May 9, 2017 | As Found C.F.: 0.982 | |
| Previous C.F.: 1.001 | New C.F.: 1.002 | |

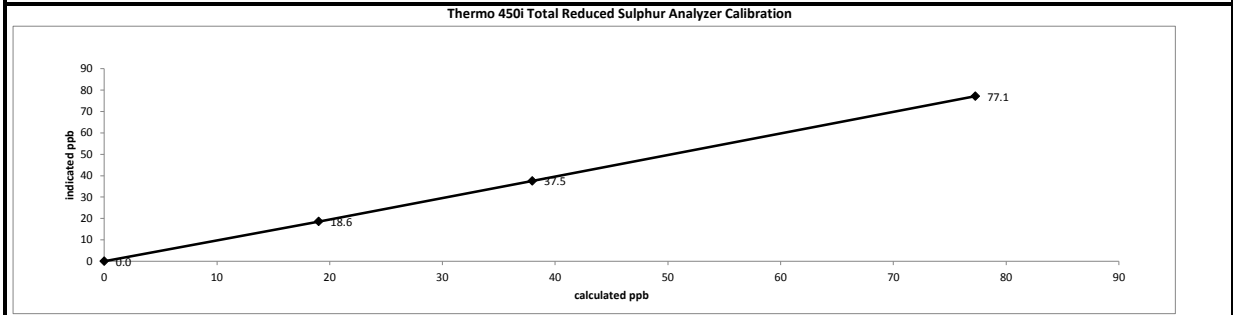
| Calibration Standards: Low Flow Meter ID/Cert. Date: <u>Defender 2 Low ID# 152020 November 21, 2016</u> High Flow Meter ID/Cert. Date: <u>Defender 2 High ID# 148943 November 21, 2016</u> Calibrator ID/Cert. Date: <u>Environics 6100 5212, February 14, 2017</u> Cal Gas Cylinder I.D. #: <u>EY0000654</u> Cal Gas Conc. (ppm): <u>10.2</u> | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
|--|--|-------|-----|------|----|-----|----|-----|----|
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|-----------------|--------------------------------|---------|-------|---------------------------|--------------------------|----------------------------|
| | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 7588 | 0.00 | 7588 | 0.0 | 0.0 | n/a |
| as found high | 7540 | 57.56 | 7598 | 77.3 | 78.7 | 0.982 |
| adjusted zero | 7588 | 0.00 | 7588 | 0.0 | 0.0 | n/a |
| adjusted high | 7540 | 57.57 | 7598 | 77.3 | 77.1 | 1.002 |
| mid | 7530 | 28.14 | 7558 | 38.0 | 37.5 | 1.013 |
| low | 7565 | 14.14 | 7579 | 19.0 | 18.6 | 1.023 |
| calibrator zero | 7588 | 0.00 | 7588 | 0.0 | 0.0 | n/a |
| Average C.F. = | | | | | | 1.013 |

Linear Regression/Calibration Results:

| | |
|---|---------------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS > or = 0.995 |
| Slope = <u>1.001</u> | .95-1.05 |
| b (Intercept as % of full scale) = <u>0.23%</u> | ± 3% F.S. |
| % change in C.F. from last cal = <u>1.91%</u> | ± 10% |



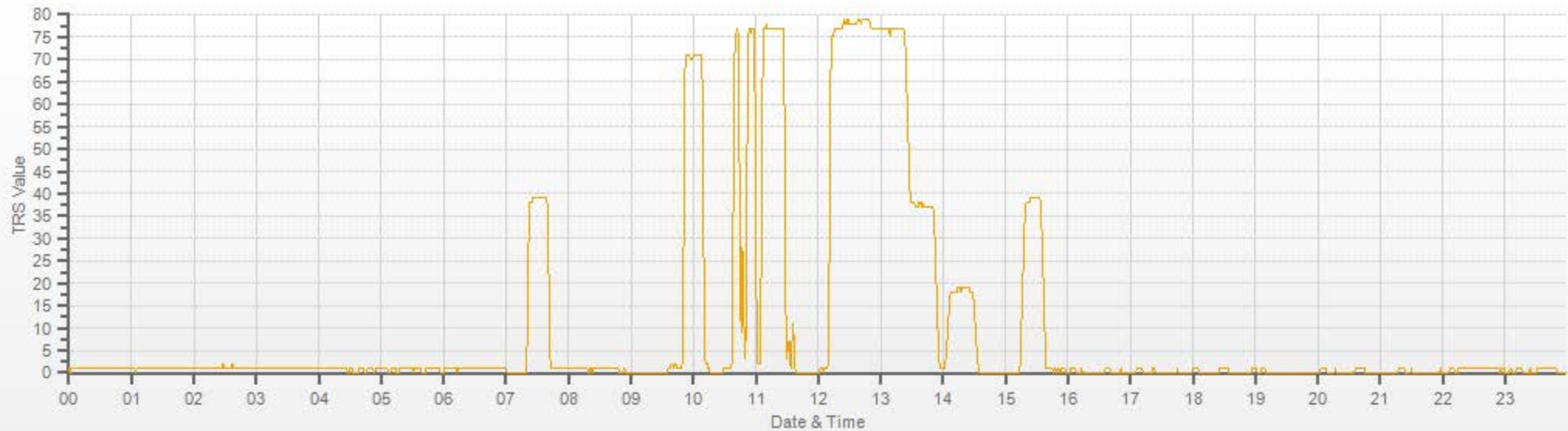
| | |
|---|--|
| As found: Bkg: 14.1 Coef: 0.909 Pmt: -651.2 Flash: 744 Internal: 30.3 Chamber: 45.1 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 44.99 Perm Oven Htr: 44.36 Pressure: 632.5 Sample Flow: 0.487 Lamp Intensity: 91 Averaging Time: 120 Expected Value: 38.5 | As left: Bkg: 13.9 Coef: 0.892 Pmt: -651.2 Flash: 740 Internal: 31.6 Chamber: 45.3 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 45.00 Perm Oven Htr: 44.37 Pressure: 630.1 Sample Flow: 0.483 Lamp Intensity: 91 Averaging Time: 120 Expected Value: 38.8 |
|---|--|

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

No zero adjustment was required/made. The "as found" zero value was copied to the adjusted zero value field for linearity calculation purposes.

No SO2 scrubber test was performed, because the scrubber was tested during internal audit this month.
 SABIO 2010 D was replaced with EnviroNics 6100 during calibration.

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.06.20 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | |
|--|--|
| Date: June 21, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 938 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 22 °C |
| Location/Station Name: Cold Lake South | Weather Conditions: A few clouds |
| Parameter: Total Hydrocarbon | Calibration Purpose: routine monthly |
| Start/End Time 24 hr. (mst): 8:40 / 13:11 | Performed By/Reviewer: Alex Yakupov Trina Whitsitt |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: November 25, 2023 |

| | | |
|------------------|--|-----------------------------|
| Analyzer: | ID# or Serial Number: 427408718 | Range ppm: 50 |
| | Last Calibration Date: May 24, 2017 | As Found C.F.: 0.981 |
| | Previous Cal High Point C.F.: 1.000 | New C.F.: 1.000 |

| | |
|---|---|
| Calibration Standards: | |
| Low Flow Meter ID/Cert. Date: Defender 2 Low ID# 152020 November 21, 2016 | Standard Calibration Points for a Range of: 50 ppm |
| High Flow Meter ID/Cert. Date: Defender 2 High ID# 148943 November 21, 2016 | |
| Calibrator ID/Cert. Date: EnviroNics 6100 5212, February 14, 2017 | |
| Cal Gas Cylinder I.D. #: LL165372 | |
| CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 212.0 | |
| CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0 | |

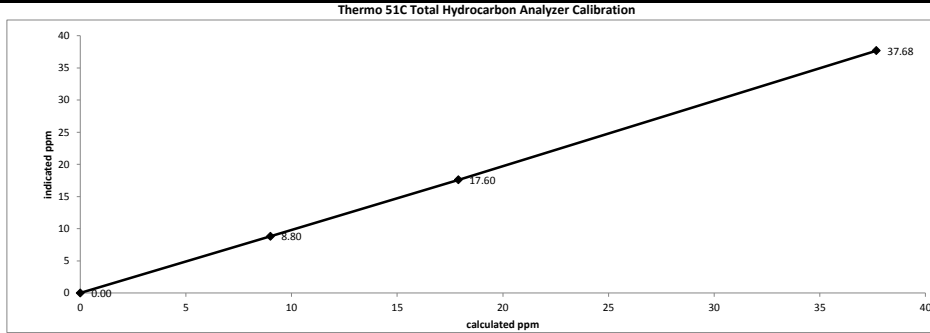
| Point | Target ppm |
|-------|------------|
| High | 38 |
| Mid | 18 |
| Low | 9 |

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 | 2025 | 0.00 | 2025 | 0.0 | 0.00 | n/a |
| as found high | 1964 | 64.26 | 2028 | 37.68 | 38.39 | 0.981 |
| adjusted zero | 2025 | 0.00 | 2025 | 0.00 | 0.00 | n/a |
| adjusted high | 1964 | 64.26 | 2028 | 37.68 | 37.68 | 1.000 |
| mid | 1994 | 30.46 | 2024 | 17.89 | 17.60 | 1.017 |
| low | 2010 | 15.33 | 2025 | 9.00 | 8.80 | 1.023 |
| calibrator zero | 2025 | 0.00 | 2025 | 0.0 | 0.00 | n/a |
| Average C.F. = | | | | | | 1.013 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|-------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 0.999 | | .95-1.05 |
| b (Intercept as % of full scale) = | 0.29% | | ± 3% F.S. |
| % change in C.F. from last cal = | 1.86% | | ± 10% |

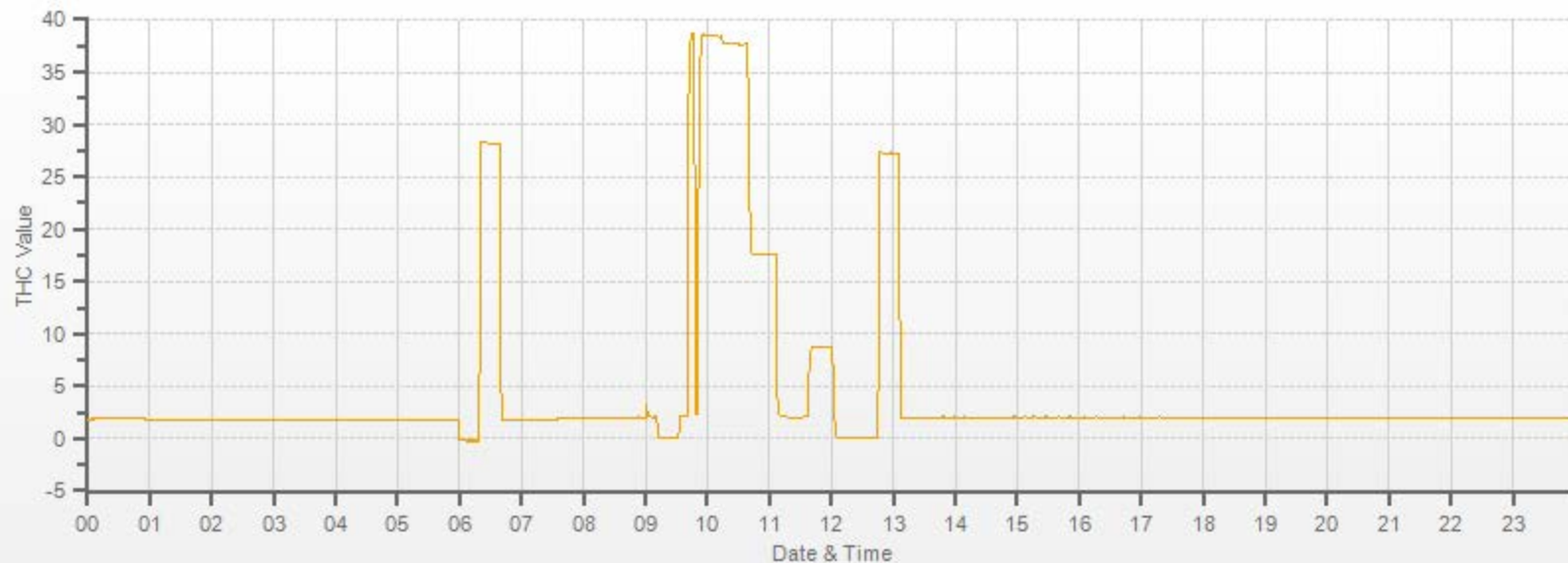


| | |
|--|---|
| <p>As found:</p> <p>H2 cylinder (psi): 1100</p> <p>H2 cylinder reg set (psi): 24</p> <p>Span Cylinder (psi): 1700</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 34</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 1198</p> <p>rng: 1</p> <p>try: 5</p> <p>flm: 176.8</p> <p>det: 125.4</p> <p>Flame: 176</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 06.51</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 13</p> <p>Measured Flow: 0.662</p> <p>Expected Value: 27.69</p> | <p>As left:</p> <p>H2 cylinder (psi): 1100</p> <p>H2 cylinder reg set (psi): 24</p> <p>Span Cylinder (psi): 1700</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 34</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 1185</p> <p>rng: 1</p> <p>try: 5</p> <p>flm: 176.7</p> <p>det: 125.4</p> <p>Flame: 176</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 06.51</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 13</p> <p>Measured Flow: n/a</p> <p>Expected Value: 27.19</p> |
|--|---|

Comments:
 The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

THC[ppm] Station: LICA COLD LAKE SOUTH Daily: 17.06.21 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | |
|--|---|----------------|
| Date: June 20, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 946 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Cold Lake South | Weather Conditions: A few clouds | |
| Start/End Time 24 hr. (mst): 8:34 / 16:24 | Calibration Purpose: routine monthly | |
| G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: July 18, 2019 | |

| | | | | |
|------------------------------------|--|-------------------------|----------------|-----------|
| Analyzer: | | Correction Factors: | | |
| ID# or Serial Number: 1505664393 | | Previous C.F.: | As Found C.F.: | New C.F.: |
| Last Calibration Date: May 9, 2017 | | NO = 1.000 | 1.010 | 0.999 |
| Range ppb: 500 | | NO ₂ = 1.000 | 1.000 | 1.000 |
| | | NOx = 1.000 | 1.007 | 0.999 |

| | | | |
|---|---|-----------------|------------------------------|
| Calibration Standards: | | | |
| Low Flow Meter ID/Cert. Date: Defender 2 Low ID# 152020 November 21, 2016 | Standard Calibration Points for a Range of: 500 ppb | | |
| High Flow Meter ID/Cert. Date: Defender 2 High ID# 148943 November 21, 2016 | Point | Target NO (ppb) | Target NO ₂ (ppb) |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | High | 380 | 330 |
| Cal Gas Cylinder I.D. #: LL104222 | Mid | 180 | 245 |
| Cal Gas Conc. (ppm): 50.7 50.7 | Low | 90 | 175 |
| | Extra Point #1 | n/a | 133 |
| | Extra Point #2 | n/a | 53 |
| | | | C _c Ozone ? |
| | | | <-high ozone |
| | | | n/a |
| | | | n/a |
| | | | <-mid ozone |
| | | | <-low ozone |

| ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015 | | | | | | | | | |
|---|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 4889 | 0.0 | 4889 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 4980 | 37.7 | 5018 | 380.7 | 380.7 | 377.0 | 378.0 | 1.010 | 1.007 |
| adjusted zero | 4889 | 0.00 | 4889 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4980 | 37.68 | 5018 | 380.7 | 380.7 | 381.0 | 381.0 | 0.999 | 0.999 |
| mid | 5006 | 17.83 | 5024 | 179.9 | 179.9 | 180.0 | 180.0 | 1.000 | 1.000 |
| low | 5014 | 8.98 | 5023 | 90.7 | 90.7 | 90.0 | 90.0 | 1.008 | 1.008 |
| calibrator zero | 4889 | 0.00 | 4889 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F. = | | | | | | | | 1.002 | 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 | 4980 | 37.68 | 5018 | 0.0 | 380.0 | 380.0 | 0.0 | 0.0 | 0.0 | |
| as found high NO2 | 4980 | 37.68 | 5018 | 240.0 | 132.0 | 380.0 | 248.0 | 248.0 | 248.0 | 1.000 |
| adjusted high NO2 | 4980 | 37.68 | 5018 | 240.0 | 132.0 | 380.0 | 248.0 | 248.0 | 248.0 | 1.000 |
| gpt mid | 4980 | 37.68 | 5018 | 137.0 | 239.0 | 380.0 | 141.0 | 141.0 | 141.0 | 1.000 |
| gpt low | 4980 | 37.68 | 5018 | 49.0 | 327.0 | 380.0 | 53.0 | 53.0 | 53.0 | 1.000 |
| Average NO ₂ C.F. = | | | | | | | | | 1.000 | |

| | | | | |
|--|--------|--------|-----------------|--------------|
| Linear Regression/Calibration Results: | | | | |
| | NO | NOx | NO ₂ | |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | LIMITS |
| Slope = | 0.999 | 0.999 | 1.000 | > or = 0.995 |
| b (Intercept as % of full scale) = | -0.06% | -0.06% | 0.00% | .95-1.05 |
| % change in C.F. from last cal = | -0.98% | -0.72% | 0.00% | ± 3% F.S. |
| NO ₂ converter efficiency | 1.00 | 1.00 | 1.00 | ± 10% |
| | | | | 0.96 to 1.04 |

| | | | |
|----------------------------------|--------|----------------------------------|--------|
| As found: | | As left: | |
| NO Bkg: | 3.7 | NO Bkg: | 3.7 |
| NOx Bkg: | 3.8 | NOx Bkg: | 3.8 |
| NO Coef: | 1.003 | NO Coef: | 1.011 |
| NO ₂ Coef: | 0.995 | NO ₂ Coef: | 0.995 |
| NOx Coef: | 0.999 | NOx Coef: | 0.998 |
| PMT: | -854.7 | PMT: | -854.7 |
| Internal: | 25.8 | Internal: | 26.5 |
| Chamber: | 50.4 | Chamber: | 50.6 |
| Cooler: | -2.9 | Cooler: | -3.1 |
| NO ₂ Converter: | 323.4 | NO ₂ Converter: | 325.3 |
| NO ₂ Converter Set: | 325.0 | NO ₂ Converter Set: | 325.0 |
| Pressure: | 177.2 | Pressure: | 176.6 |
| Flow: | 0.771 | Flow: | 0.769 |
| Ozonator Flow: | OK | Ozonator Flow: | OK |
| Expected Value NO: | 2.2 | Expected Value NO: | 2.5 |
| Expected Value NO ₂ : | 262.0 | Expected Value NO ₂ : | 267.0 |
| Expected Value NOx: | 265.0 | Expected Value NOx: | 270.0 |

Comments:

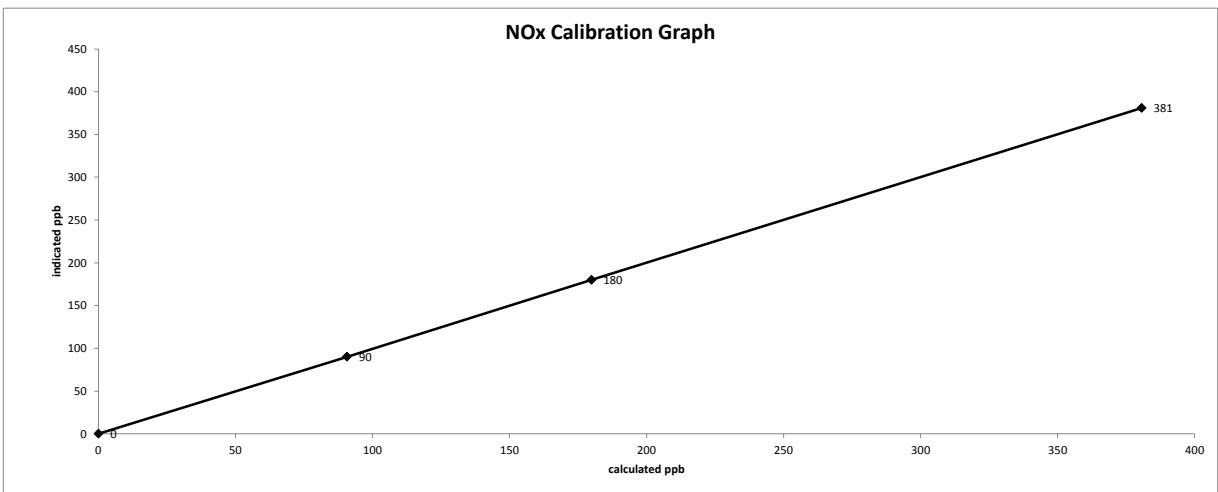
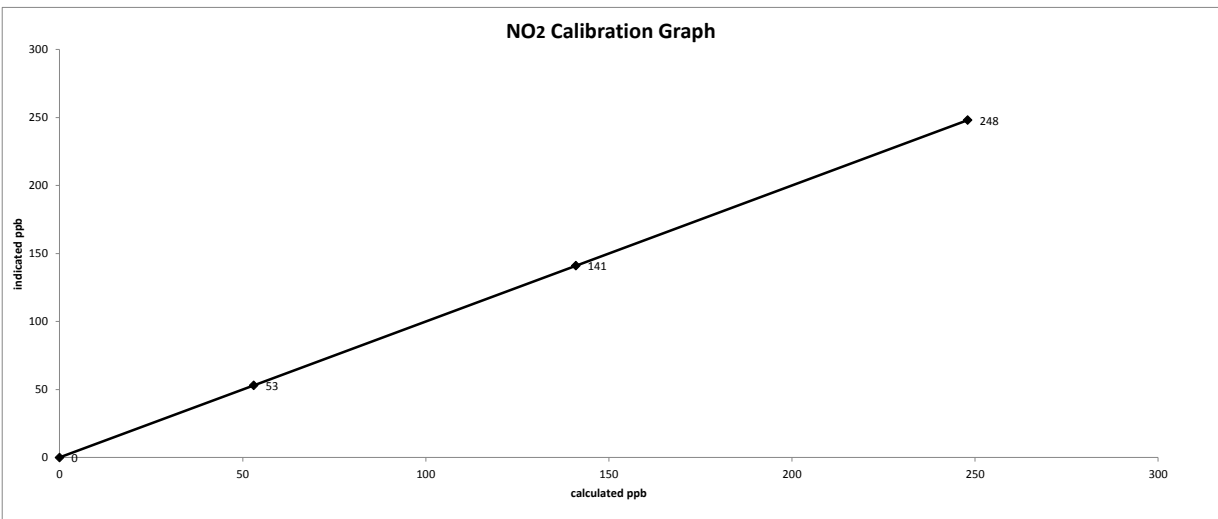
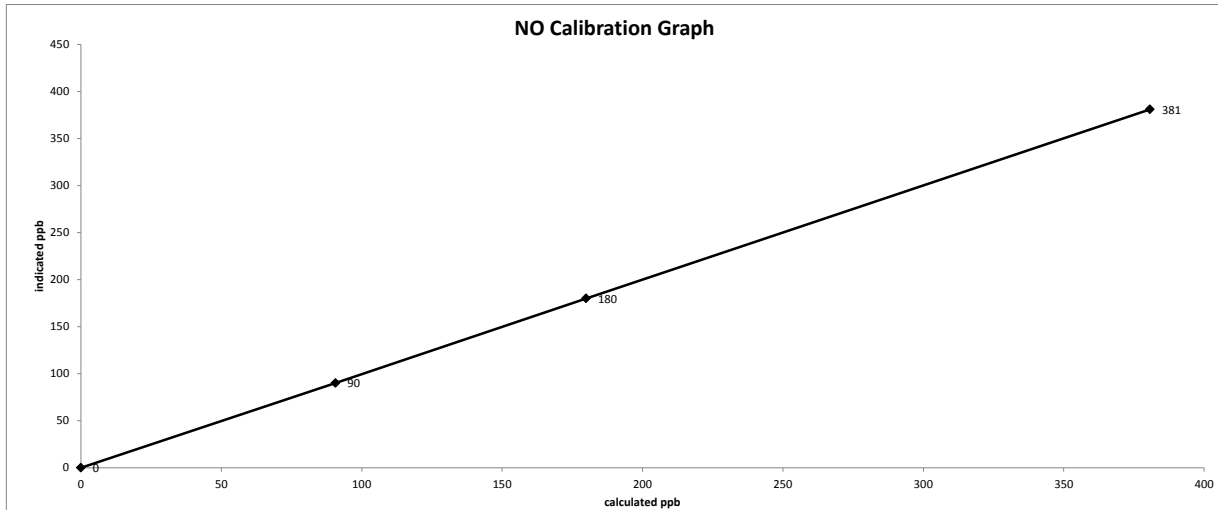
The analyzer sample inlet filter was changed. No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes. The analyzer cooling fan filter(s) were cleaned.

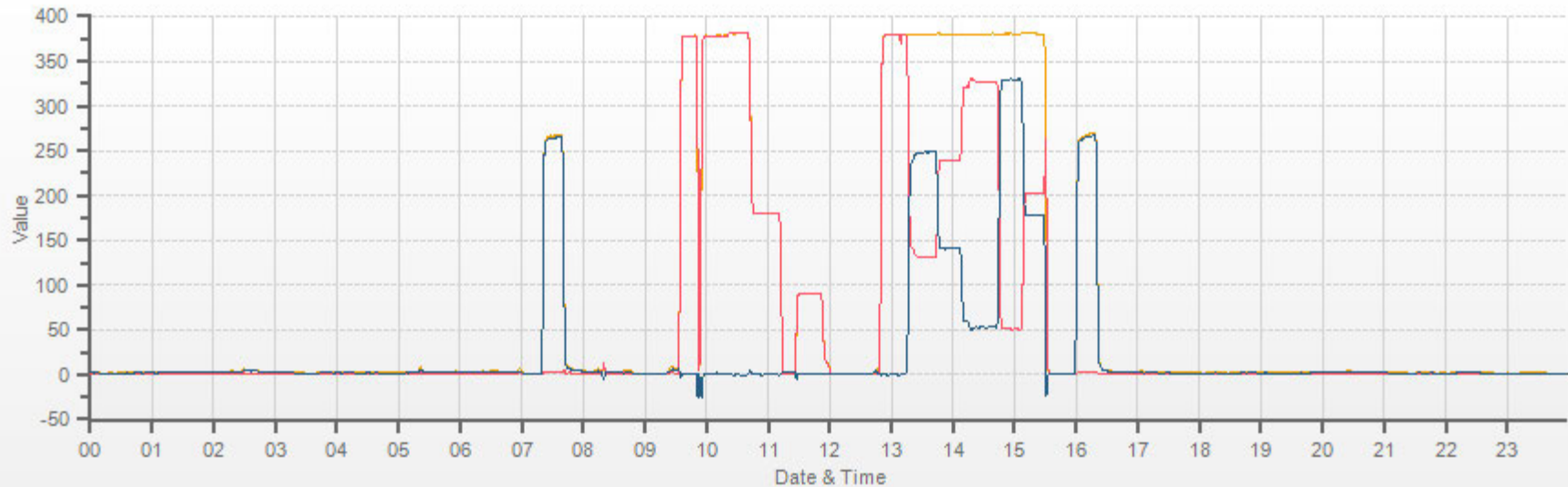
14:43 - two more GPT points were taken to use for O₃ High Point and Mid point O-Zone analyzer calibration: High Point O₃ setting = 320, NOx=380, NO=51, NO₂=329, NO drop = 329, NO₂ gain=329; Mid Point O₃ setting = 170, NOx=381, NO=203, NO₂=178, NO drop = 177, NO₂ gain = 178.

Date: June 20, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 8:34 / 16:24
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration



Station: LICA COLD LAKE SOUTH Daily: 17.06.20 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

| | | |
|--|--|----------------|
| Date: June 21, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 938 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Cold Lake South | Weather Conditions: A few clouds | |
| Start/End Time 24 hr. (mst): 8:40 / 13:28 | Calibration Purpose: routine monthly | |
| Ozone Calibration Method: Direct G.P.T. | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| G.P.T. Date: June 20, 2017 | Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power | |

| | |
|--|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 700419951 | Ozone Range ppb: 500 |
| Last Calibration Date: May 10, 2017 | As Found C.F.: 1.041 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: 1.000 |

| Calibration Standards: | | | | | | | | | |
|--|---|--|--|------|-------------|-----|-------------|-----|-----------|
| Low Flow Meter ID/Cert. Date: Defender 2 Low ID# 152020 November 21, 2016 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table> | Point | AMD Required Range of Ozone Calibration Points | High | 300-400 ppb | Mid | 150-200 ppb | Low | 50-75 ppb |
| Point | | AMD Required Range of Ozone Calibration Points | | | | | | | |
| High | | 300-400 ppb | | | | | | | |
| Mid | | 150-200 ppb | | | | | | | |
| Low | 50-75 ppb | | | | | | | | |
| High Flow Meter ID/Cert. Date: Defender 2 High ID# 148943 November 21, 2016 | | | | | | | | | |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: n/a | | | | | | | | | |

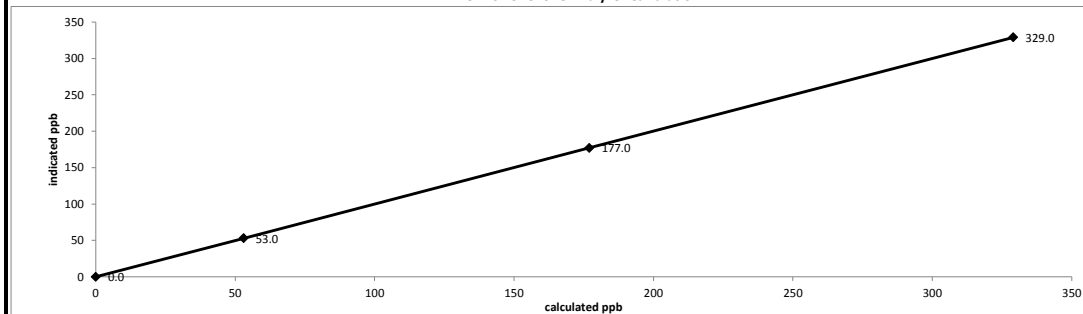
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rate (cc/min) | | Calculated Concentration: | Corrected Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|----------------------|-------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------|---------------------|
| | Total Flow @ Point Start | Total Flow @ Point Finish | (ppb) | (ppb) | (ppb) | |
| as found zero | 5016 | 5016 | 0.0 | n/a | 0.0 | n/a |
| as found high | 5016 | 5016 | 329.0 | 329.0 | 316.0 | 1.041 |
| adjusted zero | 5016 | 5016 | 0.0 | 0.0 | 0.0 | n/a |
| adjusted high | 5016 | 5016 | 329.0 | 329.0 | 329.0 | 1.000 |
| mid | 5016 | 5016 | 177.0 | 177.0 | 177.0 | 1.000 |
| low | 5016 | 5016 | 53.0 | 53.0 | 53.0 | 1.000 |
| calibrator zero | 5015 | 5016 | 0.0 | n/a | 0.0 | n/a |
| Average C.F.= | | | | | 1.000 | |

Linear Regression/Calibration Results:

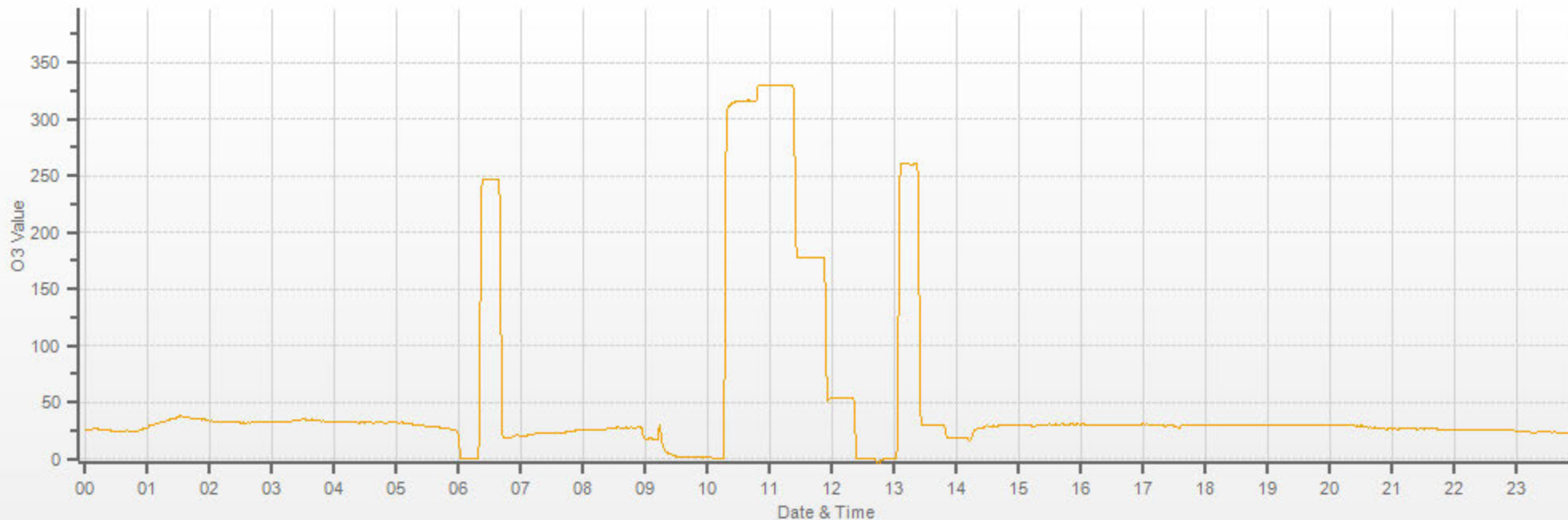
| | |
|--|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 1.000 | > or = 0.995 |
| b (Intercept as % of full scale)= 0.00% | .95-1.05 |
| % change in C.F. from last cal= -4.11% | ± 3% F.S. |
| | ± 10% |

Thermo 49i Ozone Analyzer Calibration



| | |
|--|---|
| As found: O3 Bkg: 0.3 O3 Coef: 0.993 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 28.4 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 700.5 Cell A lpm: 0.714 Cell B lpm: 0.753 O3 ppb: -0.2 Cell A ppb: 9.4 Cell B ppb: -9.8 Cell A int: 88121 Expected Value: 256.0 | As left: O3 Bkg: 0.0 O3 Coef: 1.033 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 28.4 Bench Lamp: 53.5 O3 Lamp: 67.4 Pressure: 700.8 Cell A lpm: 0.713 Cell B lpm: 0.753 O3 ppb: -0.3 Cell A ppb: 1.2 Cell B ppb: -1.7 Cell A int: 88118 Expected Value: 260.0 |
|--|---|

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



O3[ppb]

PARTICULATE MATTER

Thermo 5030 SHARP Monitor Monthly Audit

| | |
|---|---|
| Date: June 6, 2017 | Performed By/Reviewer: Alex Yakupov Trina Whitsitt |
| Company: LICA | Start Time (mst): 14:14 |
| Station Name/Location: Cold Lake South | End Time (mst): 14:59 |
| Previous Audit Date: May 18, 2017 | Calibration Purpose: routine monthly |
| Parameter: PM 2.5 | Weather Conditions: Mainly clear |

SHARP Information and Status:

| | |
|------------------------------------|-------------------------|
| Serial Number: CM-2209 | Status: 0.00 |
| Approx Tape remaining: 9/10 | Error Code: 0.00 |

Reference Standards:

| Air Flow | | | |
|---|----------------|-------------------|-------------------|
| Manometer | Orifice | Pressure: | Temperature: |
| Make: Dwyer | Chinnok Eng. | Fisher Scientific | FLUKE |
| Model: 475 Mk.III | FTS | FB1291 | 1551A Ex STIK |
| Serial Number: #3 | #2 | 055544 | 4295 |
| Calibration Date: January 31, 2017 | March 24, 2017 | December 5, 2016 | November 15, 2016 |

As found temperature and pressure:

| | |
|---------------------------|---------------------------------|
| Tolerance +/- 4°C | Tolerance +/- 13.33 hPa |
| SHARP T1 °C: 23.0 | SHARP P3 (hPa): 955.000 |
| Reference °C: 24.3 | Reference (hPa): 954.000 |
| Difference °C: 1.3 | Difference (hPa): 1.000 |

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

| | |
|---------------------------|---------------------------------|
| Tolerance +/- 4°C | Tolerance +/- 13.33 hPa |
| SHARP T1 °C: 23.0 | SHARP P3 (hPa): 955.000 |
| Reference °C: 24.3 | Reference (hPa): 954.000 |
| Difference °C: 1.3 | Difference : 1.000 |

As found flows:

| | |
|-------------------------------------|--|
| Targets: 1000 l/hr / <90% | Flow Tolerance 16.67 lpm +/- 0.67 lpm |
| SHARP AirFlow l/hr 1000.00 | SHARP Airflow (l/min) 16.67 |
| Pump Voltage (%) 43.20 | Reference AirFlow (l/min) 16.75 |
| | Difference (l/min) 0.08 |

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

| | |
|-------------------------------------|--|
| Targets: 1000 l/hr / <90% | Flow Tolerance 16.67 lpm +/- 0.67 lpm |
| SHARP AirFlow l/hr 1000.00 | SHARP Airflow (l/min) 16.67 |
| Pump Voltage (%) 41.40 | Reference AirFlow (l/min) 16.75 |
| | Difference (l/min) 0.08 |

Inlet Assembly:

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

Comments:

WIND SYSTEM



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

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

Sonic Wind Sensor Certificate of Calibration

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

Calibration Equipment

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

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

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

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

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

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

VOC SAMPLER

| Maxxam Analytics | |
|--|---|
| XONTECK FLOW RATE VERIFICATION/CALIBRATION | |
| Client: LICA | Date: June 21, 2017 |
| Location: Cold Lake South | Last Cal. Date: n/a |
| Station ID: LICA 01 | Start Time 24 hr. (mst): 12:54 |
| Sampler s/n: 6167 | End Time 24 hr. (mst): 13:42 |
| Purpose: Routine Quarterly | Performed By/Reviewer: Alex Yakupov not yet reviewed |
| Low Flow: Defender 2 Low ID# 152020 November 21, 2016 | |
| Digital Manometer: Dwyer ID#3, 475 Mark III January 1, 2017 | |
| Temperature: FLUKE 2329070, November 15, 2016 | |
| Pressure: fisher Scientific 05544, December 5, 2016 | |
| The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1. | |
| $F = \frac{(P_A \times V)}{(T \times 60)} = \frac{2.6272 \times 6000}{24 \times 60} = \boxed{10.95 \text{ cc/min}}$ <p>= target flow rate</p> | |
| where; | <p>F= flow rate in cc/min</p> <p>P_A= final canister in atmosphere absolute</p> <p>V= volume of canister in c.c.</p> <p>T= sampling period in hours</p> <p>BP= barometric pressure in atmospheres</p> <p>P_F= target final pressure</p> |
| enter: | <p>BP= 0.926 atm</p> <p>P_A= 2.627 atm</p> <p>V= 6000 cubic centimetres</p> <p>T= 24 hours</p> <p>P_F= 25.0 psi = 1.70115 atm</p> |
| XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION | |
| FLOW RATE VERIFICATION | |
| Volumetric Flow rate = 10.93 (cc/min) | As found pot setting = 6.52 |
| Target Flow Rate (cc/min) = 10.95 | |
| % Difference = -0.15% | Well within 2% tolerance, no flow calibration necessary. |
| FLOW RATE CALIBRATION | |
| Volumetric Flow rate = 10.93 (cc/min) | Adjusted pot setting = 6.52 |
| Target Flow Rate (cc/min) = 10.95 | |
| % Difference = -0.15% | Calibration meets requirements. |
| XONTECK MAINTENANCE | |
| Item: | Most Recent Date Completed: |
| 1. Replace sample line and fittings from sampler to canister every 6 months. | June 21, 2017 |
| 2. Purge line from manifold--> sampler with zero air every 6 months. | June 21, 2017 |
| 3. Sample system cleaning every 2 years. | |
| 4. Perform 12 hour leak check procedure every 6 months. | June 21, 2017 |
| COMMENTS: | |
| Last calibration date could not be entered: March 6, 2017; The date of last sample system cleaning is unknown. Leak check results: 0.0 psi over 47 hours and 09 minutes (June 19, 2017 / 13:12 -June 21, 2017/12:21) . | |

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

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

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

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

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

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

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

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

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

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

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

| | | | | | |
|------------------------|-------------------------|-----------|---------------------------------|---------------------------|--|
| Calibrator: | | | Flow Measurement Device: | | |
| Make/Model | <u>Envionics 6100</u> | | Make/Model | <u>Bios Defender 530</u> | |
| Serial Number | <u>5212</u> | | Serial Number | <u>Hi148944 Lo 152019</u> | |
| Last Verification Date | <u>February 3, 2016</u> | | Temperature (°C) | <u>24.6</u> | |
| NO Cylinder S/N | <u>EY0000597</u> | | Barometric Pressure | <u>701.4mmHg</u> | |
| NO [PPM] | <u>49.0</u> | NOx [PPM] | <u>49.0</u> | | |
| Expiry Date | <u>December 8, 2019</u> | | | | |

| | | | | | |
|-----------------------------|-------------|--------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | | | |
| Pt. #1 | <u>4919</u> | Pt. #2 | <u>4934</u> | Pt. #3 | <u>4960</u> |
| Gas Flow (sccm) | | | | | |
| Pt. #1 | <u>79.2</u> | Pt. #2 | <u>38.3</u> | Pt. #3 | <u>19.1</u> |

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

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

| | | | | | |
|------------------------|---------|------------------|--|------------------------|--------|
| NO | | LIMITS | | NOx | |
| Correlation= | 1.0000 | ≥ 0.990 | | Correlation= | 1.0000 |
| m (Slope)= | 1.0046 | 0.90-1.10 | | m (Slope)= | 1.0041 |
| b (Intercept % of FS)= | -0.0080 | ± 3% F.S. | | b (Intercept % of FS)= | 0.0057 |

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

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

| | | | |
|------------------------|---------|------------------|--|
| NO₂ | | LIMITS | |
| Correlation= | 1.0000 | ≥ 0.995 | |
| m (Slope)= | 0.9936 | 0.90-1.10 | |
| b (Intercept % of FS)= | -0.0733 | ± 3% F.S. | |

| | | | |
|-------------------------|--------------------|--------------------------------|--------------------------|
| AENV Standards | | NO_x Analyzer | |
| Audit Calibrator | | Make/Model <u>Thermo 42i</u> | |
| Make/Model | <u>Thermo 146i</u> | Serial/AMU Number | <u>1868</u> |
| Serial/AMU Number | <u>1809</u> | Last Calibration Date | <u>February 13, 2017</u> |
| SRM Gas Cylinder No. | <u>CAL018140</u> | Full Scale (ppm) | <u>1.0</u> |
| Cylinder Conc. (ppm) | <u>48.79</u> | Cylinder Gas Expiry Date | <u>March 28, 2019</u> |

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

| | | | |
|------------------------------|-------------------------|---------------------------------|---------------------------|
| Company <u>Maxxam</u> | | Operator: <u>Mike</u> | |
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>Sabio 2010</u> | Make/Model | <u>Bios Defender 530</u> |
| Serial Number | <u>42531101</u> | Serial Number | <u>HI148944 Lo 152019</u> |
| Last Verification Date | <u>February 4, 2016</u> | Temperature (°C) | <u>24.6</u> |
| NO Cylinder S/N | <u>EY0000597</u> | Barometric Pressure | <u>701.4mmHg</u> |
| NO [PPM] | <u>49.0</u> | NOx [PPM] | <u>49.0</u> |
| Expiry Date | <u>December 8, 2019</u> | | |

| | | | |
|-----------------------------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | |
| Pt. #1 | <u>4919</u> | Pt. #2 | <u>4939</u> |
| | | Pt. #3 | <u>4958</u> |
| Gas Flow (sccm) | | | |
| Pt. #1 | <u>79.7</u> | Pt. #2 | <u>38.5</u> |
| | | Pt. #3 | <u>19.0</u> |

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|--|------|-----------------------|--------|----------------------|-----------------|--------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5005 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0002 | Limit ± 10% | |
| 4999 | 79.7 | 0.7812 | 0.7812 | 0.7827 | -0.0004 | 0.7823 | 0% | 0% |
| 4977 | 38.5 | 0.3790 | 0.3790 | 0.3803 | -0.0004 | 0.3799 | 0% | 0% |
| 4977 | 19.0 | 0.1871 | 0.1871 | 0.1874 | 0.0001 | 0.1875 | 0% | 0% |
| Absolute Average Percent Difference | | | | | | | 0% | 0% |

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

| | | |
|-------------------------------|------------------|-------------------------------|
| NO | LIMITS | NOx |
| Correlation= 1.0000 | ≥ 0.990 | Correlation= 1.0000 |
| m (Slope)= 1.0020 | 0.90-1.10 | m (Slope)= 1.0012 |
| b (Intercept % of FS)= 0.0095 | ± 3% F.S. | b (Intercept % of FS)= 0.0248 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOx | % Diff. Vs Audit gas | |
|--|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 4999 | 0.000 | 0.0000 | 0.7868 | -0.0007 | 0.7861 | NO ₂ | % Diff. Limit |
| 4999 | 0.500 | 0.5116 | 0.2752 | 0.5118 | 0.7870 | 0% | ± 10% |
| 4999 | 0.250 | 0.2843 | 0.5025 | 0.2832 | 0.7857 | 0% | ± 10% |
| 4999 | 0.100 | 0.1034 | 0.6834 | 0.1031 | 0.7866 | 0% | ± 10% |
| Absolute Average Percent Difference | | | | | | 0% | ± 10% |

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

| | | |
|--------------------------------|------------------|--|
| NO₂ | LIMITS | |
| Correlation= 1.0000 | ≥ 0.995 | |
| m (Slope)= 1.0012 | 0.90-1.10 | |
| b (Intercept % of FS)= -0.0751 | ± 3% F.S. | |

| | |
|---------------------------------------|--|
| AENV Standards | NO_x Analyzer |
| Audit Calibrator | Make/Model <u>Thermo 42i</u> |
| Make/Model <u>Thermo 146i</u> | Serial/AMU Number <u>1868</u> |
| Serial/AMU Number <u>1809</u> | Last Calibration Date <u>February 13, 2017</u> |
| SRM Gas Cylinder No. <u>CAL018140</u> | Full Scale (ppm) <u>1.0</u> |
| Cylinder Conc. (ppm) <u>48.79</u> | Cylinder Gas Expiry Date <u>March 28, 2019</u> |

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company: Maxxam **Operator:** Mike

| Calibrator: | | Flow Measurement Device: | |
|--------------------------------|-------------------------|--------------------------|---------------------------|
| Make/Model | <u>API 700</u> | Make/Model | <u>Bios Defender 530+</u> |
| Serial Number | <u>831</u> | Serial Number | <u>Hi148944 Lo 152019</u> |
| Last Verification Date | <u>January 19, 2016</u> | Temperature (°C) | <u>24.6</u> |
| SO ₂ Cylinder Conc. | <u>50.5</u> | Barometric Pressure | <u>701.4mmHg</u> |
| SO ₂ Cylinder S/N | <u>EY0000769</u> | | |
| Expiry Date | <u>December 8, 2019</u> | | |

Flow Measurements

Pt. No. 1 77.3 **Pt. No. 2** 37.5 **Pt. No. 3** 18.8

| Calibrator Flow (sccm) | Calculated Concentration (ppm) | Indicated Concentration (ppm) | % Difference | |
|-------------------------------------|-----------------------------------|----------------------------------|--------------|---------------|
| | | | vs Audit Gas | % Diff. Limit |
| Zero Air | 0.0000 | 0.0001 | | |
| 4995 | 0.7815 | 0.7889 | 1% | ± 10% |
| 5003 | 0.3785 | 0.3840 | 1% | ± 10% |
| 5007 | 0.1896 | 0.1911 | 1% | ± 10% |
| Absolute Average Percent Difference | | | 1% | ± 10% |

LINEAR REGRESSION ANALYSIS

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

| SO ₂ | | LIMITS | |
|------------------------|--------|--------|------------------|
| Correlation= | 1.0000 | ≥ | 0.995 |
| m (Slope)= | 1.0097 | | 0.90-1.10 |
| b (Intercept % of FS)= | 0.0341 | ± | 3% F.S. |

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

COMMENTS: Analyzer verified prior to audit

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 14, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

| Reference Calibrator and Gas: | Flow Measurement Device: |
|---|--------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMY 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.5 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CA:016625</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:

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

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

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.0000 | 0.0000 | 0.000 |
| 4935 | 82.0 | 0.830 | 0.01662 | 60.183 | 50.0 |
| 4968 | 40.8 | 0.412 | 0.00821 | 121.765 | 50.2 |
| 4955 | 20.2 | 0.203 | 0.00408 | 245.297 | 49.8 |
| Average Cylinder Concentration: | | | | | 50.0 |

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

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

Auditor: Al Clark Date: October 19, 2016

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



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016

| | | | |
|-----------------|------------------|-------|--------------|
| Gas Type | <u>CH4</u> | Conc. | <u>999.2</u> |
| Cylinder Number | <u>D751932</u> | | |
| Gas Type | <u>C3H8</u> | Conc. | <u>246.5</u> |
| Cylinder Number | <u>XF0037998</u> | | |

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 688mmHg

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on CH4 only

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

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



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

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

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

Expiry Date: July 2019

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

Reference Analyzer:

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

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4935 | 82.0 | 0.838 | 0.837 | 0.017 | 60.183 | 50.4 | 50.4 |
| 4968 | 40.8 | 0.417 | 0.417 | 0.008 | 121.765 | 50.8 | 50.8 |
| 4955 | 20.2 | 0.207 | 0.207 | 0.004 | 245.297 | 50.8 | 50.8 |
| Average Cylinder Concentration: | | | | | | 50.7 | 50.6 |

| | | | |
|------------------------------------|-------------|-------------|------------|
| | <u>NO</u> | | <u>NOx</u> |
| Previous Stated Concentration PPM: | <u>50.7</u> | <u>50.9</u> | |
| Percent variance from Stated: | <u>0</u> | <u>1</u> | |

Cylinder gas tolerances based on NO only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.

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

Auditor: Al Clark Date: October 19, 2016

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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-111CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119329 **Concentration PPM:** 50.1 **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 | | | | |
| 4960 | 0.0 | 0.000 | 0.0000 | 0.0000 | 0.000 |
| 4959 | 79.09 | 0.791 | 0.01595 | 62.701 | 49.6 |
| 4950 | 39.44 | 0.394 | 0.00797 | 125.507 | 49.4 |
| 4942 | 19.44 | 0.194 | 0.00393 | 254.218 | 49.3 |
| Average Cylinder Concentration: | | | | | 49.5 |

Previous Stated Concentration PPM: 50.1
 Percent variance from Stated: 1.3

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.3ppm NO
 <=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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-250CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL74267 **Concentration PPM:** 9.88 **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: AI Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.00755 | 132.442 | 9.68 |
| 5099 | 38.5 | 0.0731 | 0.00755 | 132.442 | 9.68 |
| 5092 | 18.0 | 0.0342 | 0.00353 | 282.889 | 9.67 |
| 5066 | 9.2 | 0.0173 | 0.00182 | 550.652 | 9.53 |
| Average Cylinder Concentration: | | | | | 9.63 |

Previous Stated Concentration PPM: 9.88

Percent variance from Stated: 2.6

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: AI Clark
 Operator Signature: *AI 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 Bios D
 Temp. °C 24.5
 B.P. 688mmHg

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on CH4 only

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

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



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-110CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119329 **Conc (PPM)** 50.3/50.3 **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:** 01-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 |
| 4960 | 0.0 | 0.000 | 0.000 | | | | |
| 4959 | 79.09 | 0.805 | 0.805 | 0.01595 | 62.701 | 50.5 | 50.5 |
| 4950 | 39.44 | 0.401 | 0.401 | 0.00797 | 125.507 | 50.3 | 50.3 |
| 4942 | 19.44 | 0.199 | 0.199 | 0.00393 | 254.218 | 50.6 | 50.6 |
| Average Cylinder Concentration: | | | | | | 50.5 | 50.5 |

| | | | |
|------------------------------------|-------------|--|-------------|
| | <u>NO</u> | | <u>NOx</u> |
| Previous Stated Concentration PPM: | <u>50.3</u> | | <u>50.3</u> |
| Percent variance from Stated: | <u>0.3</u> | | <u>0.3</u> |

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 50.1PPM 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 | |
| LICA/VOC/CLS/June 06, 2017 | H2798 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060102-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2-Dichloroethane | I | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1-Butene | | 0.05 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2,2,4-Trimethylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2,3,4-Trimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2,3-Dimethylbutane | | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2,3-Dimethylpentane | | 0.04 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 06, 2017 | H2798 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060102-001 | 2,4-Dimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2-Methylhexane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 2-Methylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 3-Methylhexane | | 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | 3-Methylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Acetone | | 4.2 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060102-001 | Benzene | | 0.05 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Bromomethane | I | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Carbon disulfide | I | 0.09 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Chloroform | I | 0.04 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Chloromethane | | 0.47 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 06, 2017 | H2798 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060102-001 | Cyclopentane | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Ethanol | | 1.8 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060102-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Ethylbenzene | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Freon-11 | | 0.38 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Freon-113 | I | 0.10 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Freon-114 | I | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Freon-12 | | 0.50 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 20-Jun-17 |
| 17060102-001 | Isobutane | | 0.33 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Isopentane | | 0.32 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060102-001 | Isoprene | | 0.54 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | m,p-Xylene | | 0.04 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060102-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methyl ethyl ketone | | 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methylcyclohexane | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | Methylcyclopentane | | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 06, 2017 | H2798 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060102-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Butane | | 0.50 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Heptane | | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Hexane | | 0.05 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Pentane | K, T, U | < 0.1 | ppbv | 0.1 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060102-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060102-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | o-Xylene | | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 20-Jun-17 |
| 17060102-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Toluene | | 0.08 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060102-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060102-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060102-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 06, 2017 | H2798 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------|-------|------|--------|---------------|
| 17060102-001 | Vinyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060102-001 | Vinyl chloride | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 12, 2017 | S5630 | Ambient Air | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | VERSION: | Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1-Butene | | 0.04 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2,2,4-Trimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2,3-Dimethylbutane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2,3-Dimethylpentane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

| | | | |
|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | | |
|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/Jun 12, 2017 | S5630 | Ambient Air | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | VERSION: | Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-001 | 2,4-Dimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2-Methylhexane | | 0.08 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 2-Methylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 3-Methylhexane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | 3-Methylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Acetone | | 5.7 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-001 | Benzene | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Carbon disulfide | | 0.75 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Chloroform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Chloromethane | | 0.40 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 12, 2017 | S5630 | Ambient Air | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | VERSION: | Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-001 | Cyclopentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Ethanol | | 1.0 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Ethylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Freon-11 | | 0.32 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Freon-113 | I | 0.08 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Freon-12 | | 0.46 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060234-001 | Isobutane | | 0.20 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Isopentane | | 0.36 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-001 | Isoprene | | 0.33 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | m,p-Xylene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methyl ethyl ketone | | 0.6 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methylcyclohexane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | Methylcyclopentane | | 0.04 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | | |
|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/Jun 12, 2017 | S5630 | Ambient Air | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | VERSION: | Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Butane | | 0.31 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Heptane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Hexane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Pentane | K, T, U | < 0.1 | ppbv | 0.1 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060234-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060234-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | o-Xylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060234-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Toluene | | 0.05 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 12, 2017 | S5630 | Ambient Air | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------|-------|------|--------|---------------|
| 17060234-001 | Vinyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-001 | Vinyl chloride | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/Jun 18, 2017 | 1678 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-003 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2-Dichloroethane | I | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1-Butene | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2,2,4-Trimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2,3-Dimethylbutane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2,3-Dimethylpentane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 18, 2017 | 1678 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-003 | 2,4-Dimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2-Methylhexane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 2-Methylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 3-Methylhexane | | 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | 3-Methylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Acetone | | 3.6 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-003 | Benzene | | 0.09 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Carbon disulfide | | 0.51 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Chloroform | I | 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Chloromethane | | 0.43 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 18, 2017 | 1678 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-003 | Cyclopentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Ethanol | | 1.2 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-003 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Ethylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Freon-11 | | 0.35 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Freon-113 | I | 0.08 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Freon-12 | | 0.50 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060234-003 | Isobutane | | 0.17 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Isopentane | | 0.27 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-003 | Isoprene | | 0.32 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | m,p-Xylene | | 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-003 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methyl ethyl ketone | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methylcyclohexane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | Methylcyclopentane | | 0.04 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

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|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/Jun 18, 2017 | 1678 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060234-003 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Butane | | 0.36 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Heptane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Hexane | | 0.05 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Pentane | | 0.1 | ppbv | 0.1 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060234-003 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060234-003 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | o-Xylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060234-003 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Toluene | | 0.12 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060234-003 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060234-003 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060234-003 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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 Vegreville, Alberta
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 (780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 18, 2017 | 1678 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------|-------|------|--------|---------------|
| 17060234-003 | Vinyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060234-003 | Vinyl chloride | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: August-01-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 24, 2017 | S5653 | Ambient Air | 24-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060333-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2,4-Trimethylbenzene | | 0.07 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,3,5-Trimethylbenzene | | 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1-Butene | | 0.04 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 1-Pentene | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2,2,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2,2-Dimethylbutane | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2,3,4-Trimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2,3-Dimethylbutane | | 0.09 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2,3-Dimethylpentane | | 0.11 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | |
|----------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/CLS/June 24, 2017 | S5653 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Cold Lake South | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060333-001 | 2,4-Dimethylpentane | | 0.05 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2-Methylheptane | | 0.23 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2-Methylhexane | | 0.38 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 2-Methylpentane | | 0.63 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | 3-Methylheptane | | 0.11 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 3-Methylhexane | | 0.35 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | 3-Methylpentane | | 0.43 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Acetone | | 5.9 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060333-001 | Benzene | | 0.28 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Carbon disulfide | | 1.22 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Chloroform | I | 0.03 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Chloromethane | | 0.51 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Cyclohexane | | 0.47 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

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|----------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/CLS/June 24, 2017 | S5653 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Cold Lake South | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060333-001 | Cyclopentane | | 0.15 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Ethanol | | 1.2 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060333-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Ethylbenzene | | 0.11 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Freon-11 | | 0.30 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Freon-113 | I | 0.09 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Freon-114 | I | 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Freon-12 | | 0.63 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 07-Jul-17 |
| 17060333-001 | Isobutane | | 0.37 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Isopentane | | 1.17 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060333-001 | Isoprene | | 0.47 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Isopropylbenzene | | 0.03 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | m,p-Xylene | | 0.32 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060333-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methyl ethyl ketone | | 0.5 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methylcyclohexane | | 1.00 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | Methylcyclopentane | | 0.73 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

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|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 24, 2017 | S5653 | Ambient Air | 24-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060333-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Butane | | 0.89 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Heptane | | 0.66 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Hexane | | 0.99 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Octane | | 0.33 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Pentane | | 1.0 | ppbv | 0.1 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060333-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060333-001 | n-Nonane | | 0.17 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | o-Ethyltoluene | I | 0.03 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | o-Xylene | | 0.18 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060333-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Toluene | | 0.64 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060333-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060333-001 | trans-2-Pentene | | 0.03 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060333-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 24, 2017 | S5653 | Ambient Air | 24-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17060333-001 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060333-001 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

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|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 30, 2017 | S5629 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17070019-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 1-Pentene | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2,2,4-Trimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2,2-Dimethylbutane | | 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2,3-Dimethylbutane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2,3-Dimethylpentane | | 0.03 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Friday, August 04, 2017

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|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 30, 2017 | S5629 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17070019-001 | 2,4-Dimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2-Methylhexane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 2-Methylpentane | | 0.06 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 3-Methylhexane | | 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | 3-Methylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Acetone | | 5.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Acrolein | | 5.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070019-001 | Benzene | | 0.06 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Carbon disulfide | I | 0.20 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Chloroform | I | 0.03 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Chloromethane | | 0.48 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Cyclohexane | | 0.05 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 30, 2017 | S5629 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17070019-001 | Cyclopentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Ethanol | | 1.2 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070019-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Ethylbenzene | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Freon-11 | | 0.31 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Freon-113 | I | 0.10 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Freon-12 | | 0.62 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 08-Jul-17 |
| 17070019-001 | Isobutane | | 0.17 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Isopentane | | 0.37 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070019-001 | Isoprene | | 0.42 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | m,p-Xylene | | 0.04 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070019-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methyl ethyl ketone | | 0.4 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methylcyclohexane | | 0.06 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | Methylcyclopentane | | 0.06 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

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| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 30, 2017 | S5629 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17070019-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Butane | | 0.27 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Heptane | | 0.03 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Hexane | | 0.07 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Pentane | | 0.1 | ppbv | 0.1 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 08-Jul-17 |
| 17070019-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 08-Jul-17 |
| 17070019-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | o-Xylene | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 08-Jul-17 |
| 17070019-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Toluene | | 0.09 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070019-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070019-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070019-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |

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| Report certified by: Rebecca Holgate, Account Coordinator | On behalf of: PJ Pretorius, Manager, Analysis and Testing Services |
| Date: Friday, August 04, 2017 | Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca |



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/CLS/June 30, 2017 | S5629 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17070019-001 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070019-001 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, August 04, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

PAHS SAMPLES

| | |
|--|--|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID LICA/PUF/CLS/June 06, 2017</p> <p>CANISTER ID TE-11</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 06-Jun-17 0:00</p> <p>REPORT CREATED: 22-Jun-17</p> <p>DATE RECEIVED: 12-Jun-17</p> <p>REPORT NUMBER: 17060102</p> <p>VERSION: Version 01</p> |
|--|--|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|------------------|------|--------|---------------|
| 17060102-002 | 1-Methylnaphthalene | | 0.13 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | 2-Methylnaphthalene | | 0.24 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | 3-Methylcholanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Acenaphthene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Acenaphthylene | | 0.13 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Acridine | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Anthracene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(a)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(b,j,k)fluoranthene | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(e)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Benzo(ghi)perylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Chrysene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Dibenzo(a,i)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

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|----------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/PUF/CLS/June 06, 2017 | TE-11 | Air Filter | 06-Jun-17 0:00 |
| DESCRIPTION: | Cold Lake South | | |
| REPORT NUMBER: | 17060102 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|------------------|------|--------|---------------|
| 17060102-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Fluoranthene | | 0.03 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Fluorene | | 0.05 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Naphthalene | | 0.08 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Perylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Phenanthrene | | 0.21 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Pyrene | | 0.03 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060102-002 | Retene | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

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|--|---|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID LICA/PUF/CLS/Jun 12, 2017</p> <p>CANISTER ID TE-02</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 12-Jun-17 0:00</p> <p>REPORT CREATED: 01-Aug-17</p> <p>REPORT REVISED: 01-Aug-17</p> <p>DATE RECEIVED: 21-Jun-17</p> <p>REPORT NUMBER: 17060234</p> <p>VERSION: Version 03</p> |
|--|---|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|------------------|------|--------|---------------|
| 17060234-002 | 1-Methylnaphthalene | | 0.12 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | 2-Methylnaphthalene | | 0.21 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | 3-Methylcholanthrene | | 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Acenaphthene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Acenaphthylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Acridine | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(a)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(b,j,k)fluoranthene | | 0.02 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(e)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Benzo(ghi)perylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Chrysene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/CLS/Jun 12, 2017 | TE-02 | Air Filter | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060234-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Fluoranthene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Fluorene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Naphthalene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Phenanthrene | | 0.11 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Pyrene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-002 | Retene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

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|-----------------------------|--------------------------------------|----------------------|--|---|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services | |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 | E-mail: EAS.Results@innotechalberta.ca |

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|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/CLS/Jun 18, 2017 | TE-09 | Air Filter | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | VERSION: | Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RD L | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060234-004 | 1-Methylnaphthalene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | 2-Methylnaphthalene | | 0.07 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | 3-Methylcholanthrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Acenaphthene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Acenaphthylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Acridine | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Anthracene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(a)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(b,j,k)fluoranthene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(e)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Chrysene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Fluoranthene | | 0.04 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Fluorene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Naphthalene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Phenanthrene | | 0.24 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|---------------------------|--------------------|------------------------|---------------------|----------------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/CLS/Jun 18, 2017 | TE-09 | Air Filter | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060234 | REPORT CREATED: | 01-Aug-17 | REPORT REVISED: 01-Aug-17 |
| | | | | VERSION: Version 03 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|--------|-----------|------|--------|---------------|
| 17060234-004 | Pyrene | | 0.04 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060234-004 | Retene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

| | | | | |
|-----------------------------|--------------------------------------|----------------------|--|---|
| Report certified by: | Krista Gegolick, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services | |
| Date: | August-01-17 | Inquiries: | (780) 632 8455 | E-mail: EAS.Results@innotechalberta.ca |

| | |
|--|--|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID LICA/PUF/CLS/June 24, 2017</p> <p>CANISTER ID TE-08</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 24-Jun-17 0:00</p> <p>REPORT CREATED: 01-Aug-17</p> <p>DATE RECEIVED: 28-Jun-17</p> <p>REPORT NUMBER: 17060333</p> <p>VERSION: Version 01</p> |
|--|--|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|------------------|------|--------|---------------|
| 17060333-002 | 1-Methylnaphthalene | | 0.07 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | 2-Methylnaphthalene | | 0.12 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | 3-Methylcholanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Acenaphthene | | 0.05 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Acenaphthylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Acridine | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(a)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(b,j,k)fluoranthene | | 0.02 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(e)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Benzo(ghi)perylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Chrysene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/CLS/June 24, 2017 | TE-08 | Air Filter | 24-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17060333 | REPORT CREATED: | 01-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060333-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Fluoranthene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Fluorene | | 0.04 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Naphthalene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Phenanthrene | | 0.18 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Pyrene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060333-002 | Retene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Krista Gegolick, Account Coordinator

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

Date: August-01-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|---|---|---------------------------------|--|---------------------------|
| RESULTS: Cheri Sinclair 403-819-9139 Lakeland Industry and Community Assn | CLIENT SAMPLE ID LICA/PUF/CLS/June 30, 2017 | CANISTER ID TE-04 | Matrix Air Filter | Priority Normal |
| DESCRIPTION: Cold Lake South | | | | |
| INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5 | DATE SAMPLED: 30-Jun-17 0:00 | DATE RECEIVED: 06-Jul-17 | REPORT NUMBER: 17070019 VERSION: Version 01 | |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|--------|------|--------|---------------|
| 17070019-002 | 1-Methylnaphthalene | | 0.05 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | 2-Methylnaphthalene | | 0.11 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | 3-Methylcholanthrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Acenaphthene | | 0.21 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Acenaphthylene | | 0.05 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Acridine | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Anthracene | | 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(a)anthracene | | 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(a)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(b,j,k)fluoranthene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(e)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Chrysene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Dibenzo(a,i)pyrene | | 0.02 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, August 04, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/CLS/June 30, 2017 | TE-04 | Air Filter | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Cold Lake South | | | |
| REPORT NUMBER: | 17070019 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|--------|------|--------|---------------|
| 17070019-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Fluoranthene | | 0.04 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Fluorene | | 0.07 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Naphthalene | | 0.05 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Perylene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Phenanthrene | | 0.26 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Pyrene | | 0.04 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070019-002 | Retene | | 0.02 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, August 04, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | |
|---|---|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID P6193519</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 06-Jun-17 0:00</p> <p>REPORT CREATED: 21-Jun-17</p> <p>DATE RECEIVED: 12-Jun-17</p> <p>REPORT NUMBER: 17060100</p> <p>VERSION: Version 01</p> |
|---|---|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------|-----------|--------------|-------|--------|---------------|
| 17060100-001 | Particulate Weight | | 0.036 mg | 0.004 | AC-029 | 16-Jun-17 |

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

Date: Wednesday, June 21, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | |
|---|--|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID LICA P6129435</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 12-Jun-17 0:00</p> <p>REPORT CREATED: 27-Jun-17</p> <p>DATE RECEIVED: 21-Jun-17</p> <p>REPORT NUMBER: 17060235</p> <p>VERSION: Version 01</p> |
|---|--|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------|-----------|--------------|-------|--------|---------------|
| 17060235-001 | Particulate Weight | | 0.067 mg | 0.004 | AC-029 | 23-Jun-17 |

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

Date: Tuesday, June 27, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|--|----------------------------------|-----------------------------|---------------------------------------|--|
| CLIENT SAMPLE ID LICA P6194555 | CANISTER ID | Matrix Air Filter | DATE SAMPLED 18-Jun-17 0:00 | |
| DESCRIPTION: Cold Lake South | | | | |
| REPORT NUMBER: 17060235 | REPORT CREATED: 27-Jun-17 | | VERSION: Version 01 | |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------|-----------|--------------|-------|--------|---------------|
| 17060235-002 | Particulate Weight | | 0.057 mg | 0.004 | AC-029 | 23-Jun-17 |

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, June 27, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | |
|---|--|
| <p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p> | <p>CLIENT SAMPLE ID P6194554</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 30-Jun-17 0:00</p> <p>REPORT CREATED: 13-Jul-17</p> <p>DATE RECEIVED: 06-Jul-17</p> <p>REPORT NUMBER: 17070020</p> <p>VERSION: Version 01</p> |
|---|--|

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------|-----------|--------------|-------|--------|---------------|
| 17070020-001 | Particulate Weight | | 0.118 mg | 0.004 | AC-029 | 07-Jul-17 |

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

Date: Thursday, July 13, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

APPENDIX V
INTERNAL AUDIT RESULTS

COMPANY: LICA STATION: Cold Lake South DATE: June 6, 2017

Station Location: X,Y Coordinates: 54.414, -110.232
Elevation (m): 529
Declination: 12°

| GENERAL | Yes | No | n/a | Comments: |
|--|-----|----|-----|---|
| Has site location changed from previous audit? | | X | | |
| Is site secure? | X | | | |
| Are station operating conditions adequate? | | X | | Only access to site is through a mud bog, street access cut off (construction). |
| Is the AC & heat working properly? | X | | | |
| Last twelve month's of calibrations available? | X | | | |
| All applicable SOP's available in station? | | X | | |
| Site documentation up to date? | | | X | working with Mike to verify and update |

| STATION COMPONENTS | Yes | No | n/a | Comments: |
|--|-----|----|-----|--|
| Are spare manifold ports capped? | X | | | |
| Is sampling manifold clean and free of chips and cracks? | X | | | |
| Is manifold pump properly installed and operative? | X | | | |
| Manifold cleaned all the way through? | X | | | |
| Manifold measured velocity / units | | | | anemometer doesn't fit port |
| Hot wire anemometer ID# | | | | anemometer doesn't fit port |
| Do sample lines extend halfway into manifold? | X | | | |
| Are monitor sampling lines connected to manifold? | X | | | |
| Are sampling lines clean? | X | | | |
| Are monitors properly mounted and secure? | X | | | |
| Are monitors properly exhausted from room or scrubbed (NOx pump inlet scrubbed and dated)? | | X | | O3 analyzer on exhaust scrubber, doesn't need to be, NOx scrubber needs to be replaced - dated. Still too much clutter in station, zero air/ozone analyzer need to be moved off back counter. Needs thorough cleaning. |
| Are zero and span systems operational? | X | | | |
| Modifications to any equipment? | | X | | |
| Black tape on anything? | | X | | |
| All scrubbers have dates? | | X | | AEP SCRUBBER - NO DATE - AND DISPOSABLE - ASK AEP |
| TEOM flow control set to active? | | | X | Sharp |
| All TEOM particulate intakes clean? | X | | | |
| Sharp tape advancement set to 8 hours? | X | | | |
| Modifications to any equipment? | | X | | |
| All pumps fastened down? | X | | | remove pumps not in use |
| Noisy pumps or zero air generator? | | X | | |
| TRS/H2S converter, single scrubber, no brass, no mods? | | X | | |
| Precip screen in/out? | | | X | |

| Meteorological | Yes | No | n/a | Comments: |
|-----------------------|------------|----|-----|-------------------|
| Head Type | ultrasonic | | | |
| Calibration date okay | | X | | February 10, 2015 |

| | Indicated Value: | Audit Value: | % Difference | Scalar Difference: |
|------------------------|------------------|--------------|--------------|--------------------|
| Station Temperature °C | 21.2 | 20.3 | -4.43 | -0.90 |
| Barometric Pressure | n/a | 958 | n/a | n/a |
| Wind Speed (kph) | 11.5 | n/a | n/a | n/a |
| Wind Direction (Deg) | 248 | n/a | n/a | n/a |
| Relative Humidity % | n/a | n/a | n/a | n/a |
| Ambient Temperature °C | 20.7 | 19.2 | -7.81 | -1.50 |

Recommendations: Station is still very cluttered, TEOM needs to be removed, counter on back has 2 zero air generators, station and rack area need to be dusted and cleaned. Access from street cut off from small city construction project, huge ruts, mud and standing water in the way. Contacted Mike B and sent photos. Chris to drive up quarterly for Sharp audit because he doesn't have an rh probe?
Talk to Alex about work flow and time killers.Landscaping needs to be done. See lab book for more items.....

AUDITOR: Tom Bourque



Thermo 43i Sulphur Dioxide Analyzer Calibration

| | | |
|--|--|------------------|
| Date: June 6, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 958 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 19.2 C |
| Location/Station Name: Cold Lake South | Weather Conditions: Mainly sunny | |
| Parameter: Sulphur Dioxide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 8:47 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 10:29 | Cal Gas Expiry Date: December 2, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | |

| | |
|------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 806528242 | Range ppb: 500 |
| Last Calibration Date: May 9, 2017 | As Found C.F.: 1.021 |
| Previous C.F.: 1.001 | New C.F.: n/a |

| | | | | | | | | | |
|---|---|-------|-----|------|-----|-----|-----|-----|----|
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.1 | Standard Calibration Points for Ranges <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table> | Point | ppb | High | 380 | Mid | 180 | Low | 90 |
| Point | ppb | | | | | | | | |
| High | 380 | | | | | | | | |
| Mid | 180 | | | | | | | | |
| Low | 90 | | | | | | | | |

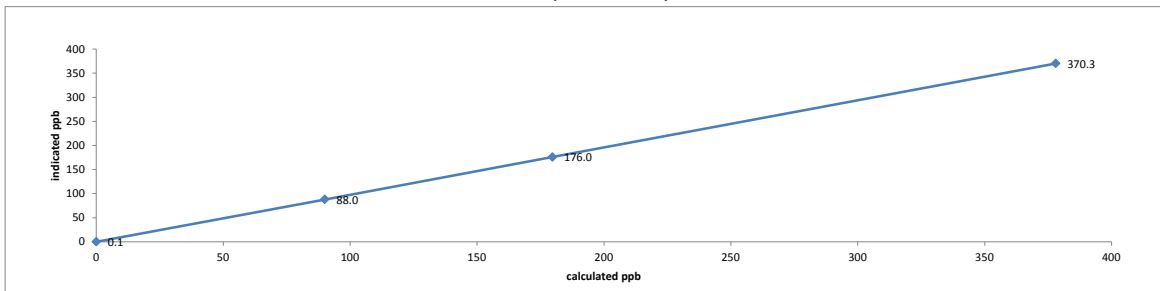
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 5000 | 0.00 | 5000 | 0.0 | 0.1 | n/a |
| as found high | 4998 | 38.00 | 5036 | 378.0 | 370.3 | 1.021 |
| mid | 4999 | 18.00 | 5017 | 179.7 | 176.0 | 1.022 |
| low | 4998 | 9.00 | 5007 | 90.1 | 88.0 | 1.025 |
| Average C.F.= | | | | | | 1.023 |

Linear Regression/Calibration Results:

| | | | |
|-----------------------------------|--------|--------------|---------------|
| Correlation Coefficient = | 1.000 | > or = 0.995 | LIMITS |
| Slope = | 1.021 | 0.90-1.10 | |
| b (Intercept as % of full scale)= | 0.01% | ± 3% F.S. | |
| % change in C.F. from last cal= | -2.02% | ± 10% | |

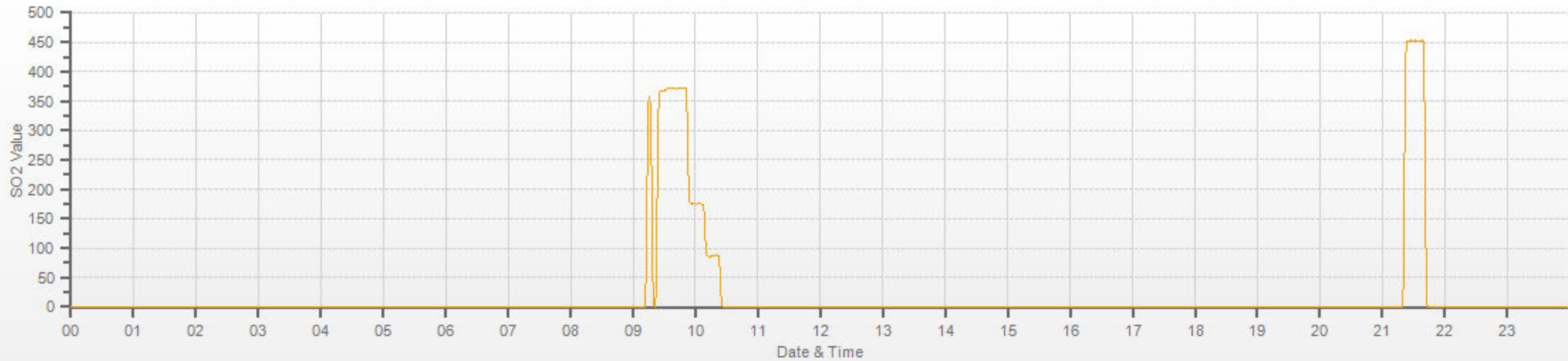
Thermo 43i Sulphur Dioxide Analyzer Calibration



| As found: | As left: |
|-------------------------|-------------------------|
| Bkg: 8.1 | Bkg: 8.1 |
| Coef: .967 | Coef: .967 |
| Pmt: -624.2 | Pmt: -624.2 |
| Flash: 766 | Flash: 766 |
| Internal: 28.8 | Internal: 28.8 |
| Chamber: 44.9 | Chamber: 44.9 |
| Perm Oven Gas: 45 | Perm Oven Gas: 45 |
| Perm Oven Heater: 44.19 | Perm Oven Heater: 44.19 |
| Pressure: 684 | Pressure: 684 |
| Sample Flow: .477 | Sample Flow: .477 |
| Lamp Intensity: 95% | Lamp Intensity: 95% |
| Converter: n/a | Converter: n/a |
| Converter Set: n/a | Converter Set: n/a |
| Averaging Time: 120 | Averaging Time: 120 |
| Expected Value: 457.0 | Expected Value: 457.0 |

Comments:

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.06.06 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



Thermo 450i Total Reduced Sulphur Analyzer Calibration

| | | | | |
|--------------------------|-----------------------|--|---|------------------|
| Date: | June 6, 2017 | Barometer ID #/Last Cert. Date/B.P.: | fisher Scientific 05544, December 5, 2016 | 958 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 19.2 C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Mainly sunny | |
| Parameter: | Total Reduced Sulphur | Calibration Purpose: | Internal Audit | |
| Start Time 24 hr. (mst): | 8:26 | Performed By/Reviewer: | Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): | 10:29 | Cal Gas Expiry Date: | July 15, 2017 | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | CDN 101 s/n 501 | |

| | | | | |
|------------------------|-------------|----------------|-------|--|
| Analyzer: | | | | |
| ID# or Serial Number: | 812728560 | Range ppb: | 100 | |
| Last Calibration Date: | May 9, 2017 | As Found C.F.: | 1.041 | |
| Previous C.F.: | 1.001 | New C.F.: | n/a | |

| | | | | | | | | | | |
|---|---|---|-----|------|----|-----|----|-----|----|------------------------------------|
| Calibration Standards: | Standard Calibration Points for Ranges | SO2 Scrubber Check (10 minutes): | | | | | | | | |
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 | Start/End Time 24 hr.: 08:30-08:40 |
| Point | | ppb | | | | | | | | |
| High | | 78 | | | | | | | | |
| Mid | | 38 | | | | | | | | |
| Low | 19 | | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | SO2 Analyzer Range: 500 | | | | | | | | | |
| Calibrator ID/Cert. Date: API 700 831, February 14, 2017 | Target Concentration (ppb): 380 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: LL74267 | As Found Zero: 0.2 | | | | | | | | | |
| Cal Gas Conc. (ppm): 9.88 | Analyzer Response: (ppb): 0.2 | | | | | | | | | |
| | Zero Corrected Result (ppb): 0.0 | | | | | | | | | |

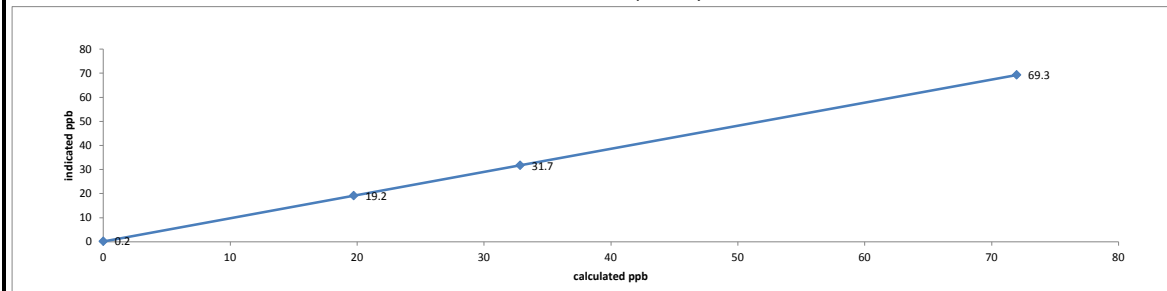
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| 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 | 7495 | 55.00 | 7550 | 72.0 | 69.3 | 1.041 |
| mid | 7494 | 25.00 | 7519 | 32.9 | 31.7 | 1.042 |
| low | 7495 | 15.00 | 7510 | 19.7 | 19.2 | 1.039 |
| Average C.F.= | | | | | | 1.041 |

Linear Regression/Calibration Results:

| | | |
|-----------------------------------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS |
| Slope = | 1.041 | > or = 0.995 |
| b (Intercept as % of full scale)= | -0.21% | 0.90-1.10 |
| % change in C.F. from last cal= | -4.02% | ± 3% F.S. |
| | | ± 10% |

Thermo 450i Total Reduced Sulphur Analyzer Calibration



| | |
|----------------------|----------------------|
| As found: | As left: |
| Bkg: 14.0 | Bkg: 14.0 |
| Coef: .909 | Coef: .909 |
| Pmt: -651.2 | Pmt: -651.2 |
| Flash: 740 | Flash: 740 |
| Internal: 31.3 | Internal: 31.3 |
| Chamber: 45 | Chamber: 45 |
| Converter Temp: 324 | Converter Temp: 324 |
| Converter Set: 325 | Converter Set: 325 |
| Perm Oven Gas: 45 | Perm Oven Gas: 45 |
| Perm Oven Htr: 44.37 | Perm Oven Htr: 44.37 |
| Pressure: 634.9 | Pressure: 634.9 |
| Sample Flow: .491 | Sample Flow: .491 |
| Lamp Intensity: 92% | Lamp Intensity: 92% |
| Averaging Time: 120 | Averaging Time: 120 |
| Expected Value: 38.5 | Expected Value: 38.5 |

Comments:

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.06.06 Type: AVG 1 Min. [1 Min.]



— TRS[ppb]



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | | |
|--|--|------------------|
| Date: June 6, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 958 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 19.2 C |
| Location/Station Name: Cold Lake South | Weather Conditions: Mainly sunny | |
| Parameter: Total Hydrocarbon | Calibration Purpose: Internal Audit | |
| Start/End Time 24 hr. (mst): 10:30-12:03 | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: November 25, 2023 | |

| | | |
|--|----------------------|--|
| Analyzer ID# or Serial Number: 427408718 | Range ppm: 50 | |
| Last Calibration Date: May 24, 2017 | As Found C.F.: 1.025 | |
| Previous Cal High Point C.F.: 1.000 | New C.F.: n/a | |

Calibration Standards:

| | | |
|---|--|---|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | | Standard Calibration Points for a Range of: 50 ppm |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | |
| Calibrator ID/Cert. Date: API 700 831, February 14, 2017 | | |
| Cal Gas Cylinder I.D. #: LL165372 | | |
| CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 606.0 212.0 | | |
| CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0 | | |

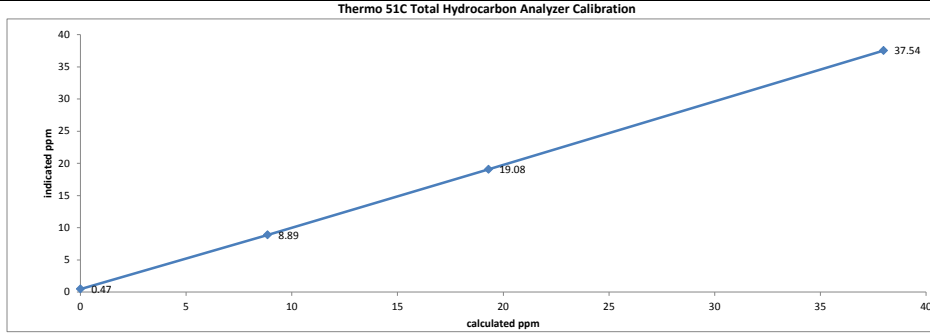
| Point | Target ppm |
|-------|------------|
| High | 38 |
| Mid | 18 |
| Low | 9 |

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 | 2000 | 0.00 | 2000 | 0.0 | 0.47 | n/a |
| as found high | 2000 | 66.00 | 2066 | 37.98 | 37.54 | 1.025 |
| mid | 2000 | 33.00 | 2033 | 19.30 | 19.08 | 1.037 |
| low | 2000 | 15.00 | 2015 | 8.85 | 8.89 | 1.052 |
| Average C.F. = | | | | | | 1.038 |

Linear Regression/Calibration Results:

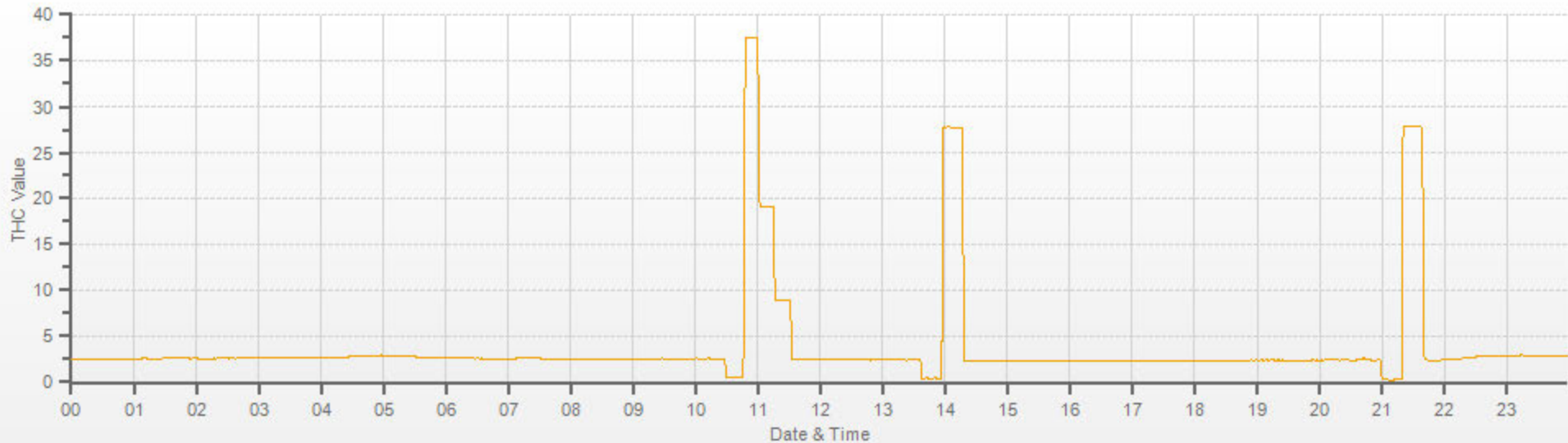
| | |
|--|---------------------|
| Correlation Coefficient = 1.000 | LIMITS > or = 0.995 |
| Slope = 1.023 | 0.90-1.00 |
| b (Intercept as % of full scale) = -0.69% | ± 3% F.S. |
| % change in C.F. from last cal = -2.47% | ± 10% |



| | |
|---|--|
| <p>As found:</p> <p>H2 cylinder (psi): 1500</p> <p>H2 cylinder reg set (psi): 25</p> <p>Span Cylinder (psi): 2050</p> <p>Span Cylinder Reg Set (psi): 24</p> <p>Zero Air Gen Pressure: 34</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 2256</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 180.7</p> <p>det: 125.2</p> <p>Flame: 180</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.51</p> <p>Internal Air Pressure: n/a</p> <p>Internal Fuel Pressure: n/a</p> <p>Measured Flow: n/a</p> <p>Expected Value: 27.32</p> | <p>As left:</p> <p>H2 cylinder (psi): 1500</p> <p>H2 cylinder reg set (psi): 25</p> <p>Span Cylinder (psi): 2050</p> <p>Span Cylinder Reg Set (psi): 24</p> <p>Zero Air Gen Pressure: 34</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 2256</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 180.7</p> <p>det: 125.2</p> <p>Flame: 180</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.51</p> <p>Internal Air Pressure: n/a</p> <p>Internal Fuel Pressure: n/a</p> <p>Measured Flow: n/a</p> <p>Expected Value: 27.32</p> |
|---|--|

Comments:

THC[ppm] Station: LICA COLD LAKE SOUTH Daily: 17.06.06 Type: AVG 1 Min. [1 Min.]



— THC[ppm]



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | | |
|------------------------------|------------------------------------|--|---|------------------|
| Date: | June 6, 2017 | Barometer ID #/Last Cert. Date/B.P.: | Fisher Scientific 10528, January 5, 2017 | 958 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 19.2 C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Mainly sunny | |
| Start/End Time 24 hr. (mst): | 08:47-12:31 | Calibration Purpose: | Internal Audit | |
| G.P.T. to be used for Ozone? | Yes with 500 ppb NOx full scale | Performed By/Reviewer: | Tom Bourque | not yet reviewed |
| Calibration Method: | Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: | December 2, 2019 | |

| Analyzer: ID# or Serial Number: 1505664393 Last Calibration Date: May 9, 2017 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>1.000</td> <td>1.023</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.998</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.024</td> <td>n/a</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 1.023 | n/a | NO ₂ = | 1.000 | 0.998 | n/a | NOx = | 1.000 | 1.024 | n/a |
|--|--|----------------|----------------|----------------|-----------|------|-------|-------|-----|-------------------|-------|-------|-----|-------|-------|-------|-----|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 1.023 | n/a | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 0.998 | n/a | | | | | | | | | | | | | | |
| NOx = | 1.000 | 1.024 | n/a | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.3 50.3 | Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>330</td> <td><--high ozone</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>245</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>175</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>133</td> <td><--mid ozone</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>53</td> <td><--low ozone</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 380 | 330 | <--high ozone | Mid | 180 | 245 | n/a | Low | 90 | 175 | n/a | Extra Point #1 | n/a | 133 | <--mid ozone | Extra Point #2 | n/a | 53 | <--low ozone |
|--|--|------------------------------|-----------------|------------------------------|------------|------|-----|-----|---------------|-----|-----|-----|-----|-----|----|-----|-----|----------------|-----|-----|--------------|----------------|-----|----|--------------|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 380 | 330 | <--high ozone | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 180 | 245 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 90 | 175 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | 133 | <--mid ozone | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | 53 | <--low ozone | | | | | | | | | | | | | | | | | | | | | | |

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

| Point | Diluent | Cal Gas | Total Flow | Calculated NO (ppb) | Calculated NOx (ppb) | Indicated NO (ppb) | Indicated NOx (ppb) | NO C.F. | NOx C.F. |
|----------------------|---------|---------|------------|---------------------|----------------------|--------------------|---------------------|---------|----------|
| as found zero | 5000 | 0.0 | 5000 | 0 | 0 | 0.1 | 0.2 | n/a | n/a |
| as found high | 4998 | 38.0 | 5036 | 379.5 | 379.5 | 371.0 | 371.0 | 1.023 | 1.024 |
| mid | 4999 | 18.00 | 5017 | 180.5 | 180.5 | 175.0 | 176.0 | 1.032 | 1.026 |
| low | 4998 | 9.00 | 5007 | 90.4 | 90.4 | 88.1 | 88.3 | 1.028 | 1.026 |
| Average C.F.= | | | | | | | | 1.028 | 1.025 |

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

| Point | Diluent | Cal Gas | Total Flow | Calibrator Setting (volts or ppb) | Indicated NO (ppb) | Indicated NOx (ppb) | Indicated NO ₂ (ppb) | NO drop (ppb) | NO ₂ gain (ppb) | NO ₂ C.F. (ppb) |
|-------------------------------------|---------|---------|------------|-----------------------------------|--------------------|---------------------|---------------------------------|---------------|----------------------------|----------------------------|
| NOx reference | 5000 | 38.00 | 5038 | 0.0 | 372.4 | 372.3 | 0.0 | 0.1 | 0.0 | |
| as found high NO2 | 5000 | 38.00 | 5038 | 1.15 | 28.1 | 373.0 | 345.0 | 344.3 | 345.0 | 0.998 |
| gpt mid | 5000 | 38.00 | 5038 | .55 | 207.7 | 373.8 | 166.4 | 164.7 | 166.4 | 0.990 |
| gpt low | 5000 | 38.00 | 5038 | 0.18 | 317.9 | 372.8 | 55.0 | 54.5 | 55.0 | 0.991 |
| Average NO₂ C.F.= | | | | | | | | | | 0.993 |

Linear Regression/Calibration Results:

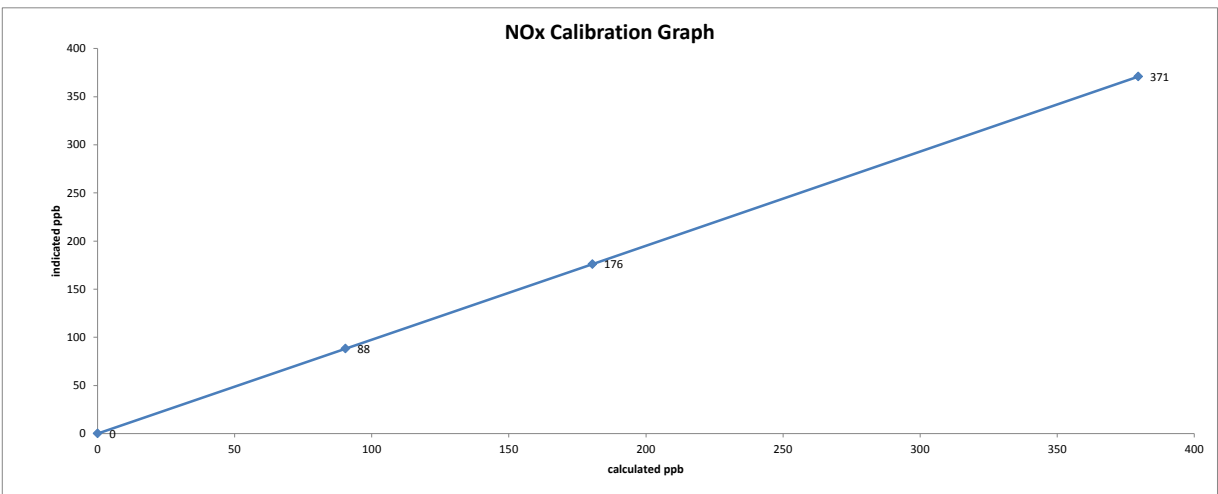
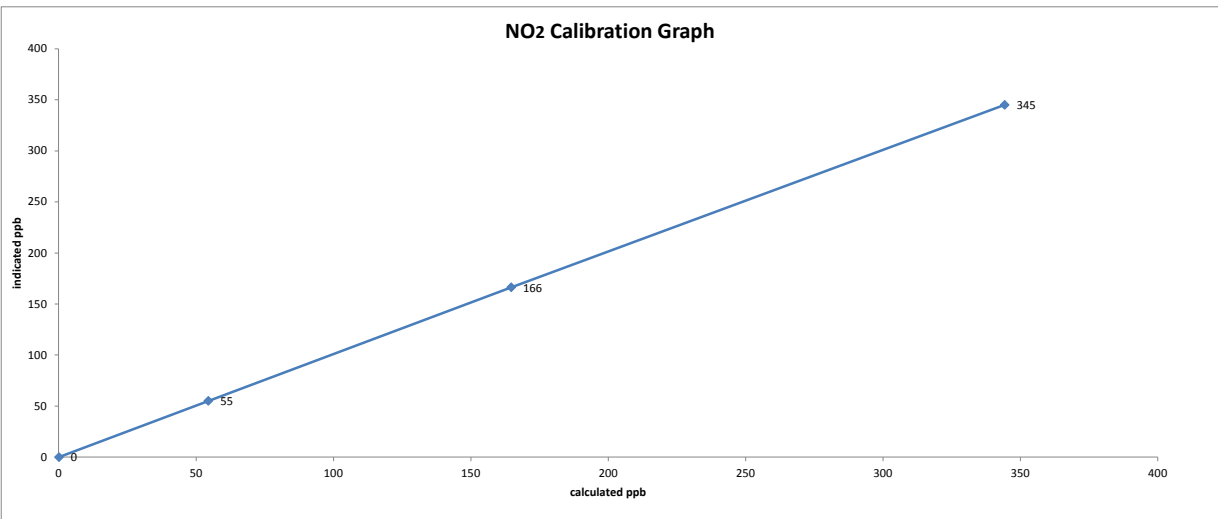
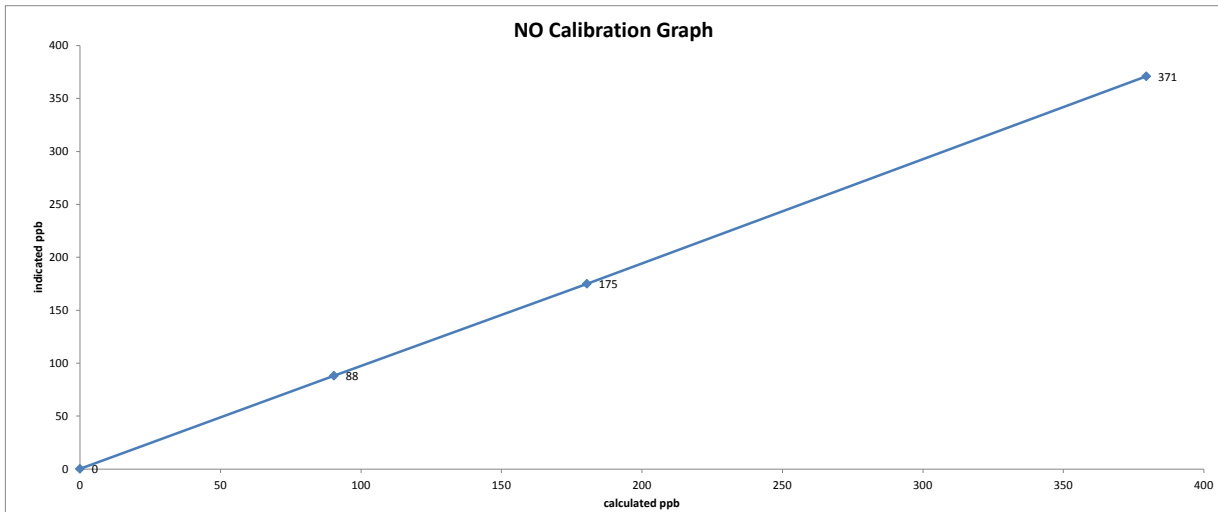
| | NO | NOx | NO ₂ | LIMITS |
|-----------------------------------|--------|-------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.023 | 1.023 | 0.998 | 0.90-1.10 |
| b (Intercept as % of full scale)= | -0.07% | 0.00% | 0.07% | ± 3% F.S. |
| % change in C.F. from last cal= | -2.34% | 0.20% | -2.35% | ± 10% |
| NO2 converter efficiency | | | 0.995 | 0.96 to 1.04 |

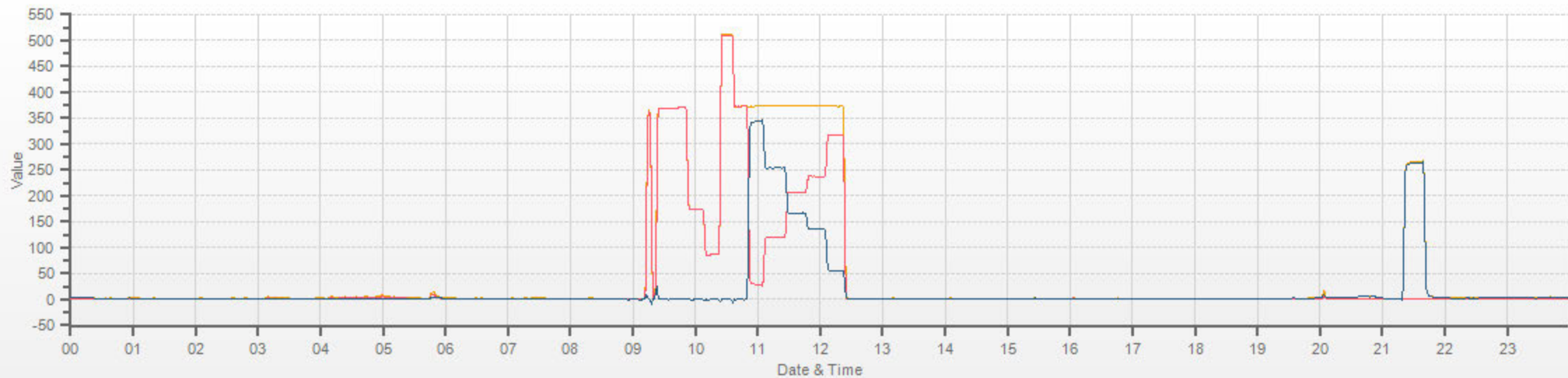
| | |
|---|--|
| As found: NO Bkg: 3.7 NOx Bkg: 3.8 NO Coef: 1.003 NO2 Coef: .995 NOx Coef: .999 PMT: -854.7 Internal: 25.1 Chamber: 50.0 Cooler: -3.0 NO2 Converter: 323.9 NO2 Converter Set: 325 Pressure: 178.1 Flow: .767 Ozonator Flow: ok Expected Value NO: 2.2 Expected Value NO2: 262.0 Expected Value NOx: 265.0 | As left: NO Bkg: 3.7 NOx Bkg: 3.8 NO Coef: 1.003 NO2 Coef: .995 NOx Coef: .999 PMT: -854.7 Internal: 25.1 Chamber: 50.0 Cooler: -3.0 NO2 Converter: 323.9 NO2 Converter Set: 325 Pressure: 178.1 Flow: .767 Ozonator Flow: ok Expected Value NO: 2.2 Expected Value NO2: 262.0 Expected Value NOx: 265.0 |
|---|--|

Comments:

Date: June 6, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 08:47-12:31
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 49i Ozone Analyzer Calibration

| | | |
|---|---|------------------|
| Date: June 6, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 958 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 19.2 C |
| Location/Station Name: Cold Lake South | Weather Conditions: Mainly sunny | |
| Start/End Time 24 hr. (mst): 12:21-14:07 | Calibration Purpose: Internal Audit | |
| Ozone Calibration Method: Direct G.P.T. | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| G.P.T. Date: June 6, 2017 | Cal Gas Expiry Date: December 2, 2019 | |

| | |
|--|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 700419951 | Ozone Range ppb: 500 |
| Last Calibration Date: May 10, 2017 | As Found C.F.: 1.027 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: n/a |

| Calibration Standards: | | | | | | | | | |
|--|---|--|--|------|-------------|-----|-------------|-----|-----------|
| Low Flow Meter ID/Cert. Date: Defender 1 Low ID# 152019 November 21, 2016 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table> | Point | AMD Required Range of Ozone Calibration Points | High | 300-400 ppb | Mid | 150-200 ppb | Low | 50-75 ppb |
| Point | | AMD Required Range of Ozone Calibration Points | | | | | | | |
| High | | 300-400 ppb | | | | | | | |
| Mid | | 150-200 ppb | | | | | | | |
| Low | 50-75 ppb | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | | | | | | | | |
| Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: LL119329 | | | | | | | | | |

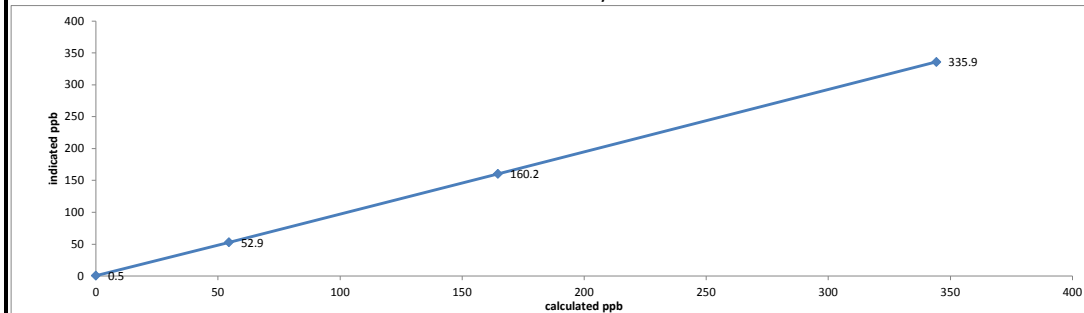
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| 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 | 5038 | 5038 | 0.0 | n/a | 0.5 | n/a |
| as found high | 5038 | 5038 | 344.3 | 344.3 | 335.9 | 1.027 |
| mid | 5038 | 5038 | 164.7 | 164.7 | 160.2 | 1.031 |
| low | 5038 | 5038 | 54.5 | 54.5 | 52.9 | 1.040 |
| Average C.F. = | | | | | | 1.033 |

Linear Regression/Calibration Results:

| | |
|--|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 1.026 | > or = 0.995 |
| b (Intercept as % of full scale) = -0.01% | 0.90-1.10 |
| % change in C.F. from last cal = -2.65% | ± 3% F.S. |
| | ± 10% |

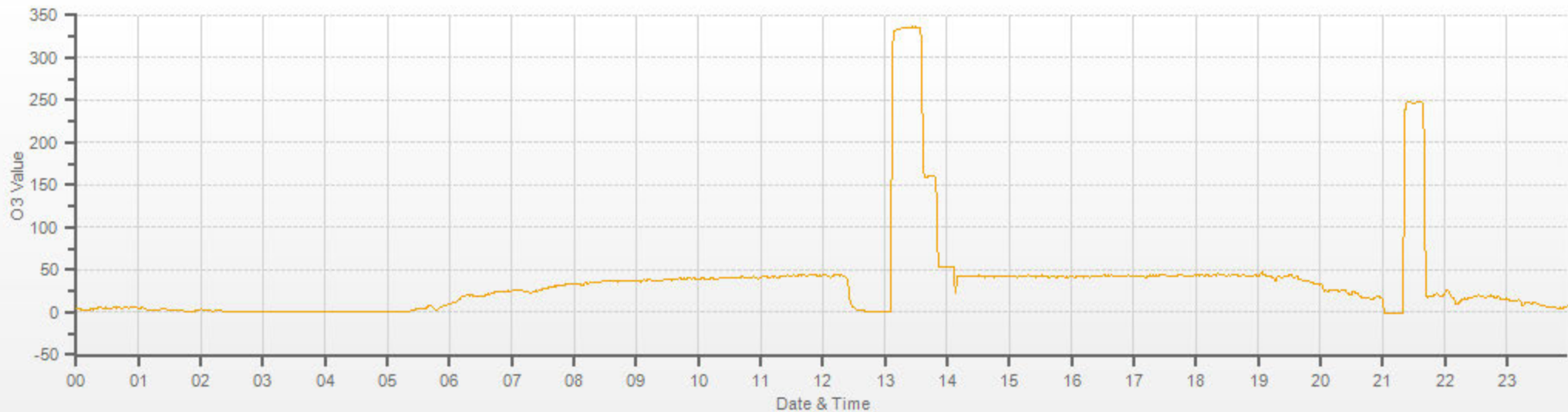
Thermo 49i Ozone Analyzer Calibration



| | |
|---|--|
| <p style="text-align: center;">As found:</p> <p>O3 Bkg: .2</p> <p>O3 Coef: .993</p> <p>Photo Lamp: 3.3</p> <p>O3 Lamp: 28.1</p> <p>Bench: 53.5</p> <p>Bench Lamp: 67.3</p> <p>O3 Lamp: 712</p> <p>Pressure: .720</p> <p>Cell A lpm: .761</p> <p>Cell B lpm: 2.1</p> <p>O3 ppb: -.2</p> <p>Cell A ppb: -.2</p> <p>Cell B ppb: 88637</p> <p>Cell A int: 88556</p> <p>Expected Value: 256.0</p> | <p style="text-align: center;">As left:</p> <p>O3 Bkg: .2</p> <p>O3 Coef: .993</p> <p>Photo Lamp: 3.3</p> <p>O3 Lamp: 28.1</p> <p>Bench: 53.5</p> <p>Bench Lamp: 67.3</p> <p>O3 Lamp: 712</p> <p>Pressure: .720</p> <p>Cell A lpm: .761</p> <p>Cell B lpm: 2.1</p> <p>O3 ppb: -.2</p> <p>Cell A ppb: -.2</p> <p>Cell B ppb: 88637</p> <p>Cell A int: 88556</p> <p>Expected Value: 256.0</p> |
|---|--|

Comments:

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 17.06.06 Type: AVG 1 Min. [1 Min.]



— O3[ppb]



Thermo 5030 SHARP Monitor Monthly Audit

| | | | |
|------------------------|--------------|------------------------|---------------------------------|
| Date: | June 6, 2017 | Performed By/Reviewer: | Alex Yakupov not yet reviewed |
| Company: | LICA | Start Time (mst): | 11:41 |
| Station Name/Location: | CLS | End Time (mst): | 15:01 |
| Previous Audit Date: | May 18, 2017 | Calibration Purpose: | Internal Audit |
| Parameter: | PM 2.5 | Weather Conditions: | Mainly clear |

SHARP Information and Status:

| | | | |
|------------------------|---------|-------------|------|
| Serial Number: | CM-2209 | Status: | 0.00 |
| Approx Tape remaining: | 9/10 | Error Code: | 0.00 |

Reference Standards:

| Air Flow | | | |
|-------------------|------------------|----------------|-------------------|
| Make: | Manometer | Orifice | Temperature: |
| | Dwyer | Chinnok Eng. | FLUKE |
| Model: | 475 Mk.III | FTS | 1551A Ex STIK |
| Serial Number: | #3 | #2 | 055544 |
| Calibration Date: | January 31, 2017 | March 24, 2017 | December 5, 2016 |
| | | | November 15, 2016 |

As found temperature and pressure:

| | | | |
|-------------------|------|-------------------------|---------|
| Tolerance +/- 4°C | | Tolerance +/- 13.33 hPa | |
| SHARP T1 °C: | 23.0 | SHARP P3 (hPa): | 955.000 |
| Reference °C: | 24.3 | Reference (hPa): | 954.000 |
| Difference °C: | 1.3 | Difference (hPa): | 1.000 |

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

| | | | |
|-------------------|------|-------------------------|---------|
| Tolerance +/- 4°C | | Tolerance +/- 13.33 hPa | |
| SHARP T1 °C: | 23.0 | SHARP P3 (hPa): | 955.000 |
| Reference °C: | 24.3 | Reference (hPa): | 954.000 |
| Difference °C: | 1.3 | Difference : | 1.000 |

As found flows:

| | |
|-----------------------------|---------------------------------------|
| Targets: 1000 l/hr / <90% | Flow Tolerance 16.67 lpm +/- 0.67 lpm |
| SHARP AirFlow l/hr: 1000.00 | SHARP Airflow (l/min): 16.67 |
| Pump Voltage (%): 43.20 | Reference AirFlow (l/min): 16.75 |
| | Difference (l/min): 0.08 |

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

| | |
|-----------------------------|---------------------------------------|
| Targets: 1000 l/hr / <90% | Flow Tolerance 16.67 lpm +/- 0.67 lpm |
| SHARP AirFlow l/hr: 1000.00 | SHARP Airflow (l/min): 16.67 |
| Pump Voltage (%): 41.40 | Reference AirFlow (l/min): 16.75 |
| | Difference (l/min): 0.08 |

Inlet Assembly:

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

Comments:

APPENDIX VI
REPORT CERTIFICATION FORM

Report Certification Form

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

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

Maram Ghaleb

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

Aug 15, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX VII
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|---|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2017-06-1-C</u> |
| Site: <u>Cold Lake Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|---------------------|---------------------------|
| Level 0 Preliminary Verification | <u>Maram Ghabeb</u> | Date <u>July 26, 2017</u> |
| Level 1 Primary Validation | <u>Maram Ghabeb</u> | Date <u>July 26, 2017</u> |
| Level 2 Final Validation | <u>Maram Ghabeb</u> | Date <u>Aug 4, 2017</u> |
| Level 3 Independent Data Review | <u>Mike Bisaga</u> | Date <u>Aug 15, 2017</u> |
| Post-Final Validation | <u>NA</u> | Date <u>NA</u> |

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



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

February 22, 2018

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of June 2017.

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

| Sampling Program | Monitoring Activities Conducted By | Sample Analysis Conducted By | Data/Report Review and Prepared By | Electronic Submission Conducted By |
|------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------------|
| Continuous ambient air | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics |

All data collected in June 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

A scheduled internal station audit was conducted by a contractor on June 8. Audit report can be found in this report.

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

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

Respectfully,



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

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

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

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

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



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T2E 6P7

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

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

JOB #: 2833-2017-06-30-C

June 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **August 17, 2017**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Wunmi Adekanmbi*

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

SUMMARY

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

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

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

A scheduled internal station audit was conducted by Maxxam on June 8. Audit report can be found in Appendix III.

H₂S: Two hours of downtime were incurred due to additional quality checks performed to address a biased low span response.

NO_x/NO₂/NO: Thirty-four hours of downtime were incurred this month.

- The analyzer was recording elevated readings in the hour following the zero/span cycle. These data were invalidated as they were not representative of ambient concentrations. Nineteen hours of downtime were therefore incurred.
- Fifteen hours of downtime were incurred due to maintenance activities and additional quality checks performed around an analyzer replacement event.
- NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

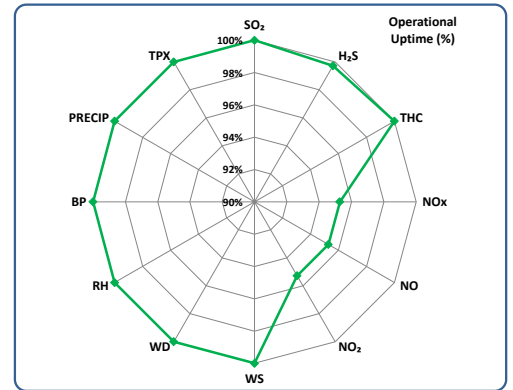
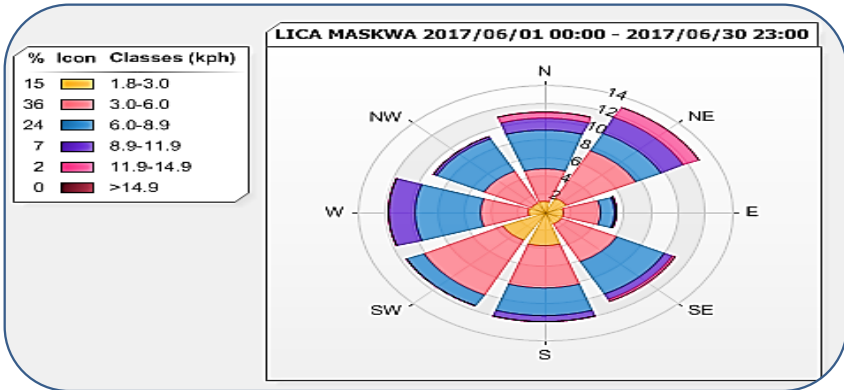
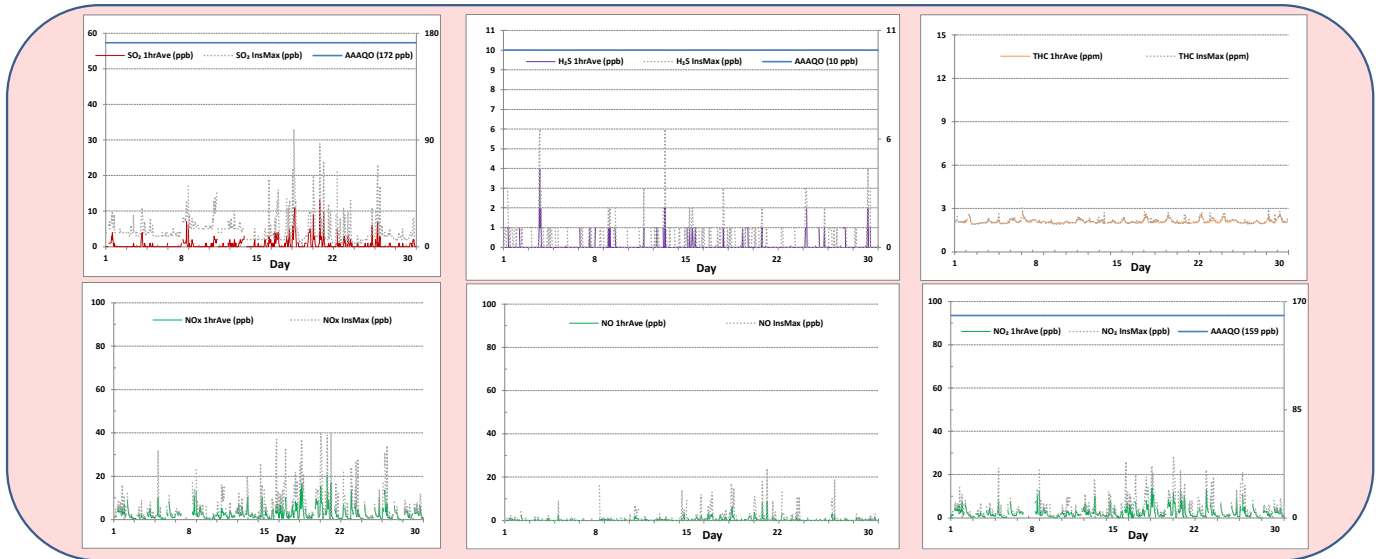
The summary of results is presented on the following pages.

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.

June 2017 Monthly Report Summary

| Pollutants | Unit | Monthly Records | | 1-Hour Records | | | | | 24-Hour Records | | | |
|------------------|--------|-----------------|--------|----------------|---------|------|-----------------|---------------|-----------------|---------|-----------------|--------------|
| | | | | Maximum | | | AAAQO Objective | Exceed. Hours | Maximum | | AAAQO Objective | Exceed. Days |
| | | | | Conc. | Date | Hour | | | Conc. | Date | | |
| SO ₂ | ppb | 0.6 | 100.0% | 13.0 | June 21 | 16 | 172 | 0 | 2.0 | June 19 | 48 | 0 |
| H ₂ S | ppb | 0.1 | 99.7% | 4.0 | June 3 | 21 | 10 | 0 | 0.3 | June 3 | 3 | 0 |
| THC | ppm | 2.09 | 100.0% | 2.81 | June 7 | 1 | - | - | 2.22 | June 7 | - | - |
| NO _x | ppb | 2.6 | 95.3% | 20.6 | June 21 | 16 | - | - | 5.7 | June 21 | - | - |
| NO | ppb | 0.4 | 95.3% | 8.9 | June 22 | 22 | - | - | 1.0 | June 21 | - | - |
| NO ₂ | ppb | 2.2 | 95.3% | 13.7 | June 19 | 2 | 159 | 0 | 4.6 | June 21 | - | - |
| WS | kph | 0.3 | 100.0% | 14.8 | June 28 | 18 | - | - | 8.7 | June 21 | - | - |
| WD | degree | 332 (NNW) | 100.0% | - | - | - | - | - | - | - | - | - |
| RH | % | 69 | 100.0% | 94 | June 1 | 21 | - | - | 88 | June 14 | - | - |
| BP | mbar | 938 | 100.0% | 954 | June 25 | 8 | - | - | 952 | June 24 | - | - |
| AmbTPX | °C | 14.6 | 100.0% | 28.0 | June 8 | 15 | - | - | 19.6 | June 8 | - | - |



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.
- * A scheduled internal station audit was conducted by Maxxam on June 8.

Operational Issues

- **NOX/NO2/NO:** Thirty-four hours of downtime were incurred this month as a result of replacing the malfunctioning analyzer.
- **H2S:** Two hours of downtime were incurred due to additional quality checks.

Monthly Continuous Data Summary

| Lakeland Industry & Community Association Maskwa Continuous Monitoring Station | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|--------------------|----------------|-----|------|------------------------|-------------------------------|---------|-----|----------------------------|
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | 1-HOUR | | | | | 24-HOUR | | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | READING | DAY | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 1 | 13 | 21 | 16 | 8.2 | NW | 2 | 19 | 100.0 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 0 | 4 | 3 | 21 | 3.7 | SE | 0 | 3 | 99.7 |
| THC (ppm) | - | - | - | - | 2.09 | 2.81 | 7 | 1 | 0.9 | NNE | 2.22 | 7 | 100.0 |
| NO ₂ (ppb) | 159 | - | 0 | - | 2 | 14 | 19 | 2 | 5.2 | W | 5 | 21 | 95.3 |
| NO (ppb) | - | - | - | - | 0 | 9 | 22 | 22 | 7.1 | NW | 1 | 21 | 95.3 |
| NO _x (ppb) | - | - | - | - | 3 | 21 | 21 | 16 | 8.2 | NW | 6 | 21 | 95.3 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 69 | 94 | 1 | 21 | 1.8 | WSW | 88 | 14 | 100.0 |
| BAROMETRIC PRESSURE (millibar) | - | - | - | - | 938 | 954 | 25 | 8 | 7.0 | S | 952 | 24 | 100.0 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | 14.6 | 28.0 | 8 | 15 | 7.4 | SE | 19.6 | 8 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 0.3 | 14.8 | 28 | 18 | - | NNE | 8.7 | 21 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 332 (NNW) | - | - | - | - | - | - | - | 100.0 |

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

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

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 100%.
- A scheduled internal audit was conducted by Maxxam on June 8. Audit report can be found in Appendix III.
- The routine monthly calibration was performed on June 14.
- Four instances of maximum instantaneous data were discarded due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period, was 99.7% equivalent to two hours of downtime.
- The analyzer spanned towards the lower acceptance limit on June 5. A repeat zero/span check was triggered and the response was within limits. No further action was required. The analyzer spanned towards the lower limit again on June 30. A repeat zero/span check was triggered and the response was outside limits. This prompted an immediate site visit on July 1, where a successful as-found response check was completed. Two hours of downtime were recorded due to the additional quality checks.
- A scheduled internal audit was conducted by Maxxam on June 8. Audit report can be found in Appendix III.
- The routine monthly calibration was performed on June 14.
- Four instances of maximum instantaneous data were discarded due to brief power outages.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period, was 100%.
- A scheduled internal audit was conducted by Maxxam on June 8. Audit report can be found in Appendix III.
- The routine monthly calibration was performed on June 14.
- Four instances of maximum instantaneous data were discarded due to brief power outages.

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

- Operational time, for the monitoring period, was 95.3% equivalent to thirty-four hours of downtime.
- On June 6, the analyzer spanned towards the lower acceptance limit. A repeat zero/span check was triggered and the response was within but very close to the limit. A prompt site visit was scheduled to replace the analyzer. Following a successful shut-down calibration on June 7, the resident analyzer (API 200A s/n: 1899) was removed and model API 200A (s/n: 2051) was installed June 8 as a replacement. Fifteen hours of downtime were incurred due to this event.
- It was observed that the analyzer was recording elevated readings in the hour following the zero/span cycle. These elevated readings were caused by a delay of the reaction cell purging with ambient air and re-stabilizing at ambient baseline levels; and were therefore invalidated. The analyzer (API 200A, s/n: 1899) was replaced on June 8 with another Maxxam analyzer (API 200A, s/n: 2051) but the issue reoccurred after some days. Arrangements are being made to temporarily replace the resident analyzer again. LICA's analyzer would be installed upon its return from the manufacturer, where it is currently being repaired. Nineteen hours of data were invalidated due to this issue.
- One instances of maximum instantaneous data were discarded due to brief power outages.
- NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

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

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

RELATIVE HUMIDITY (RH)

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

BAROMETRIC PRESSURE (BP)

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

PRECIPITATION (PRECIP)

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

AMBIENT TEMPERATURE (AmbTPX)

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

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

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

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

Maxxam AIR SOP-00209: Ambient Sulphur Monitoring

Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring

Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - API 100E UV Fluorescent Analyzer

Hydrogen Sulphide - API 101A UV Fluorescent Analyzer

Total Hydrocarbons - Thermo 51C FID Analyzer

Oxides of Nitrogen - API 200A Chemiluminescent Analyzer

Wind System - Met One Unit

Relative Humidity - Met One Unit

Barometric Pressure - Met One Unit

Ambient Temperature - Met One Unit

Precipitation - Met One Unit

Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

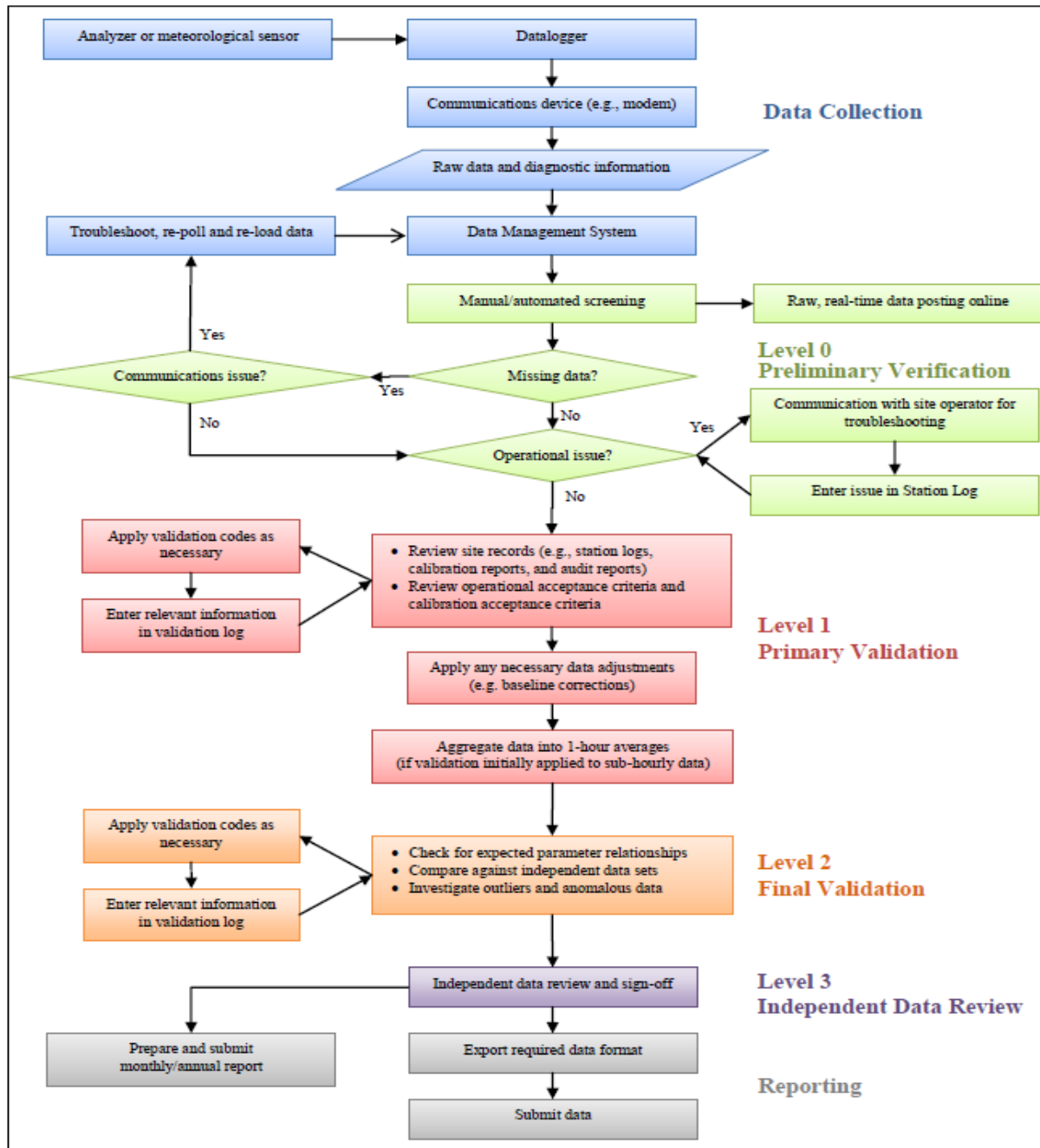
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

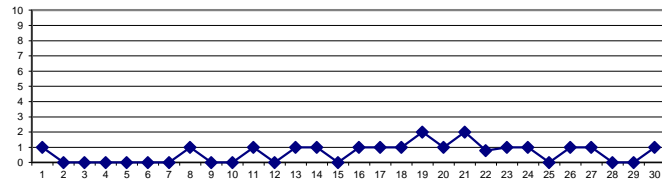
OBJECTIVE LIMIT:

| | | | | | | |
|-----------------------------|------|-----|-----|-------|----|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 172 | ppb | 24-HR | 48 | ppb |
|-----------------------------|------|-----|-----|-------|----|-----|

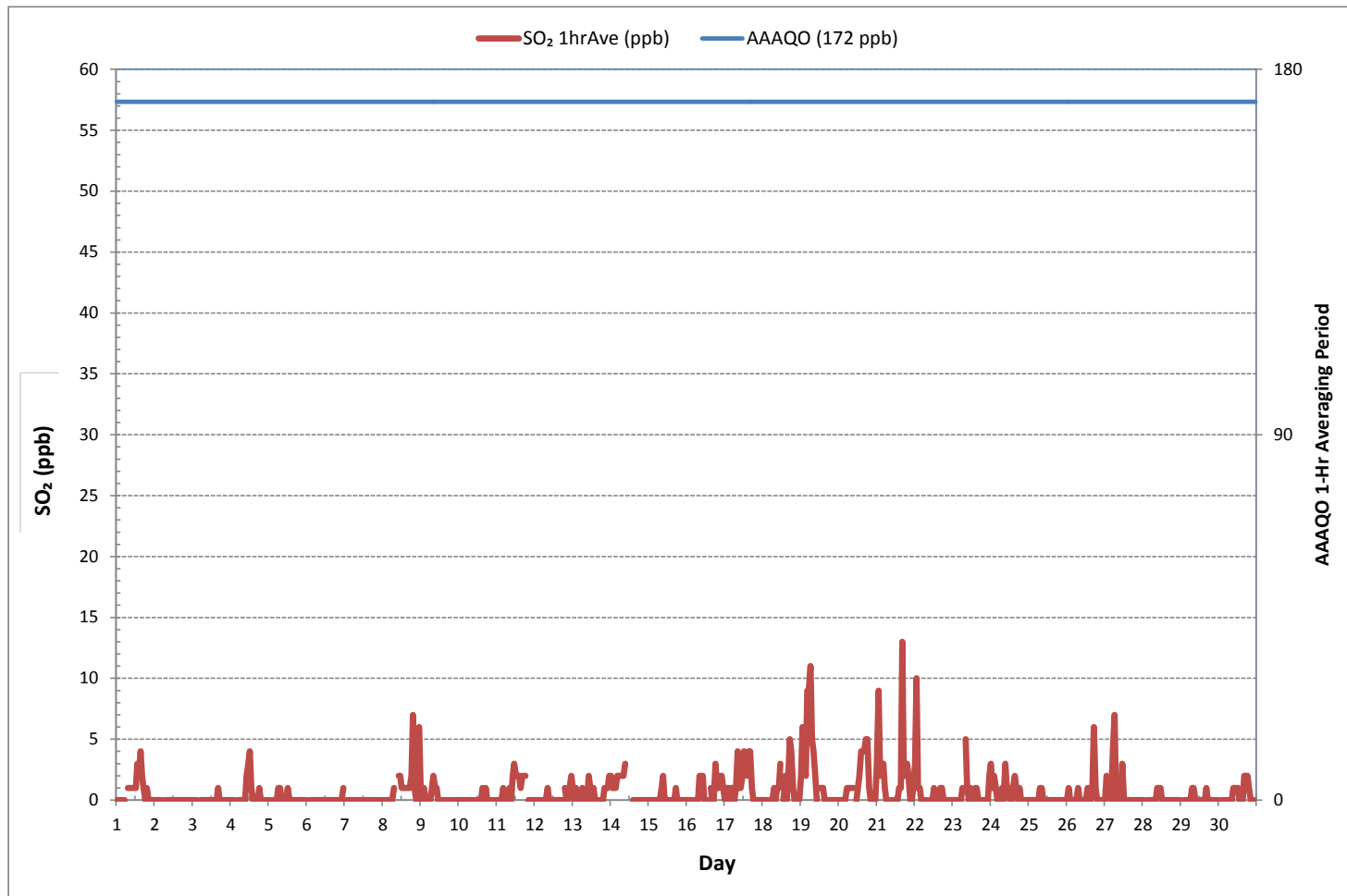
MONTHLY SUMMARY

| | | | |
|------------------------------|---------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 209 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 13 ppb @ HOUR | 16 ON DAY | 21 |
| MAXIMUM 24-HR AVERAGE: | 2 ppb | ON DAY | 19 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 720 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 1 ppb |

24 HR AVERAGES June 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





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

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

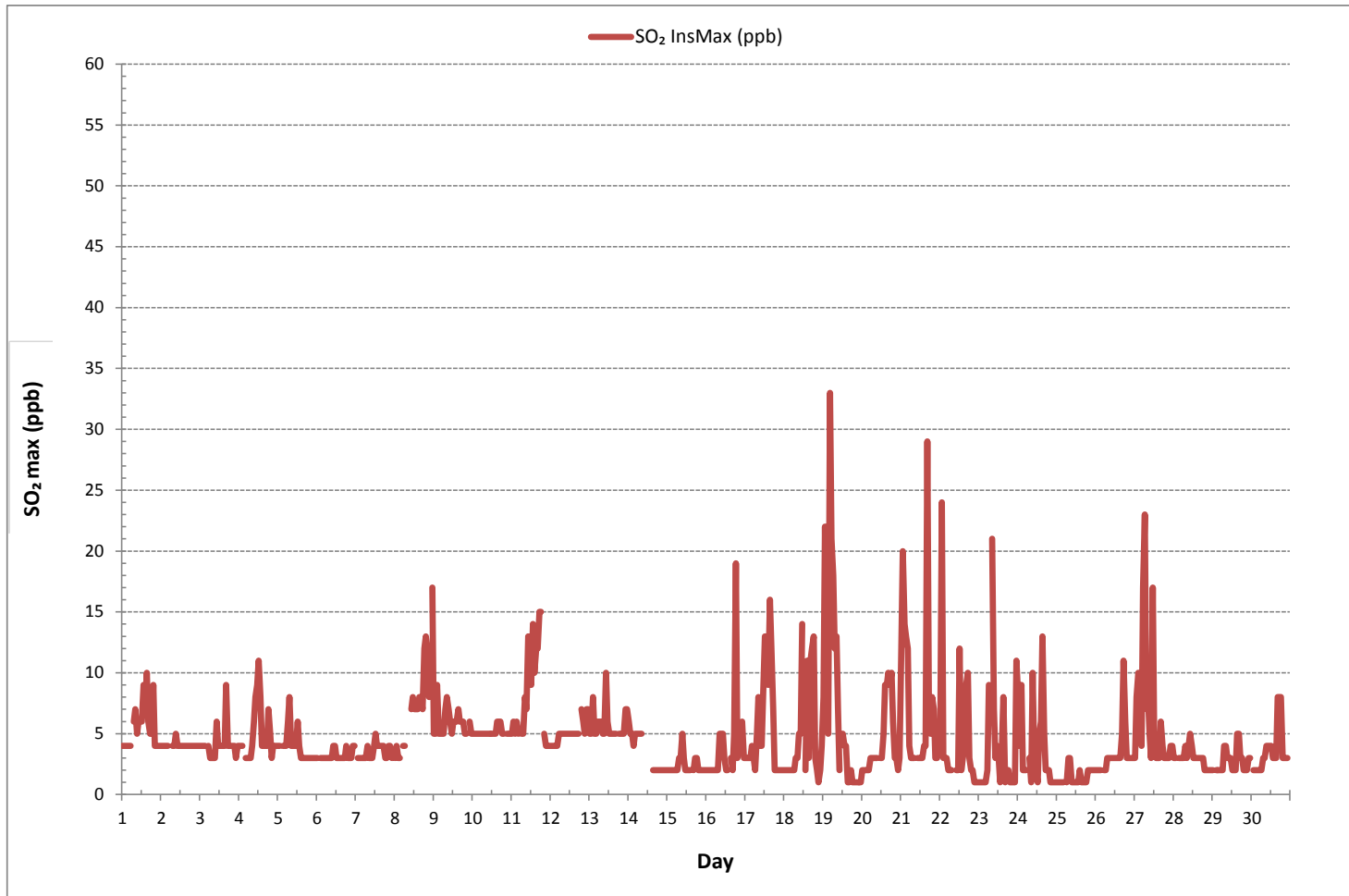
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 676 |
| MAXIMUM INSTANTANEOUS VALUE: | 33 ppb @ HOUR 4 ON DAY 19 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 4 |
| OPERATIONAL TIME: | 716 hrs |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

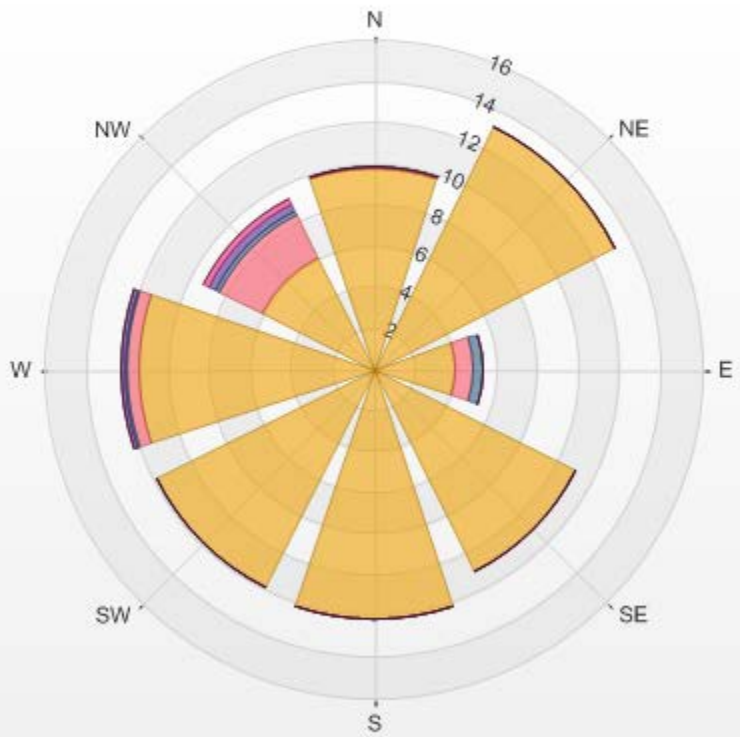
Calm: 15.09%

Calm Avg: 0.37 [ppb]

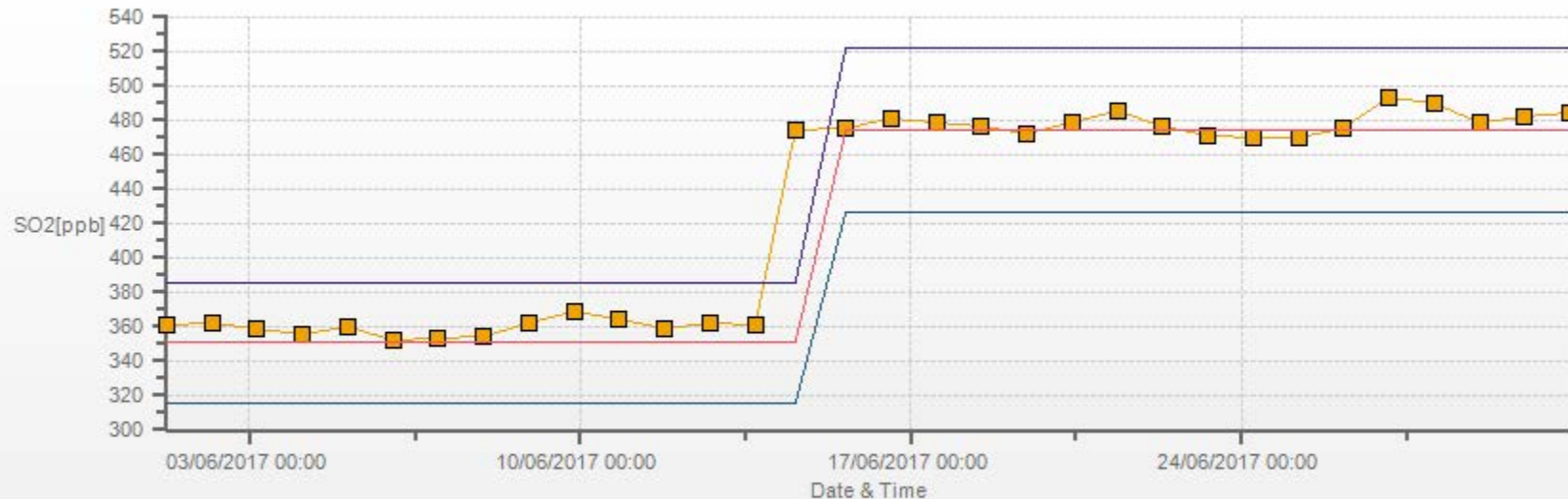
| Direction | 0.0-2.8 | 2.8-5.6 | 5.6-8.4 | 8.4-11.2 | 11.2-14.0 | >14.0 | Total |
|----------------|---------|---------|---------|----------|-----------|-------|-------|
| N | 9.8 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| NE | 13.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.2 |
| E | 4.0 | 0.9 | 0.4 | 0.0 | 0.0 | 0.0 | 5.3 |
| SE | 11.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 |
| S | 12.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.1 |
| SW | 11.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.8 |
| W | 11.4 | 0.6 | 0.2 | 0.2 | 0.0 | 0.0 | 12.3 |
| NW | 6.1 | 2.4 | 0.2 | 0.4 | 0.3 | 0.0 | 9.3 |
| Summary | 79.3 | 4.0 | 0.7 | 0.6 | 0.3 | 0.0 | 84.9 |

% Icon Classes (ppb) 79 0.0-2.8 4 2.8-5.6 1 5.6-8.4 1 8.4-11.2 0 11.2-14.0 0 >14.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.09% Calm Poll Avg: 0.37[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

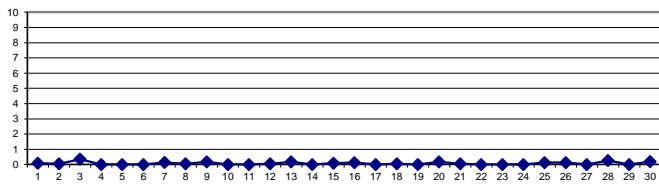
OBJECTIVE LIMIT:

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

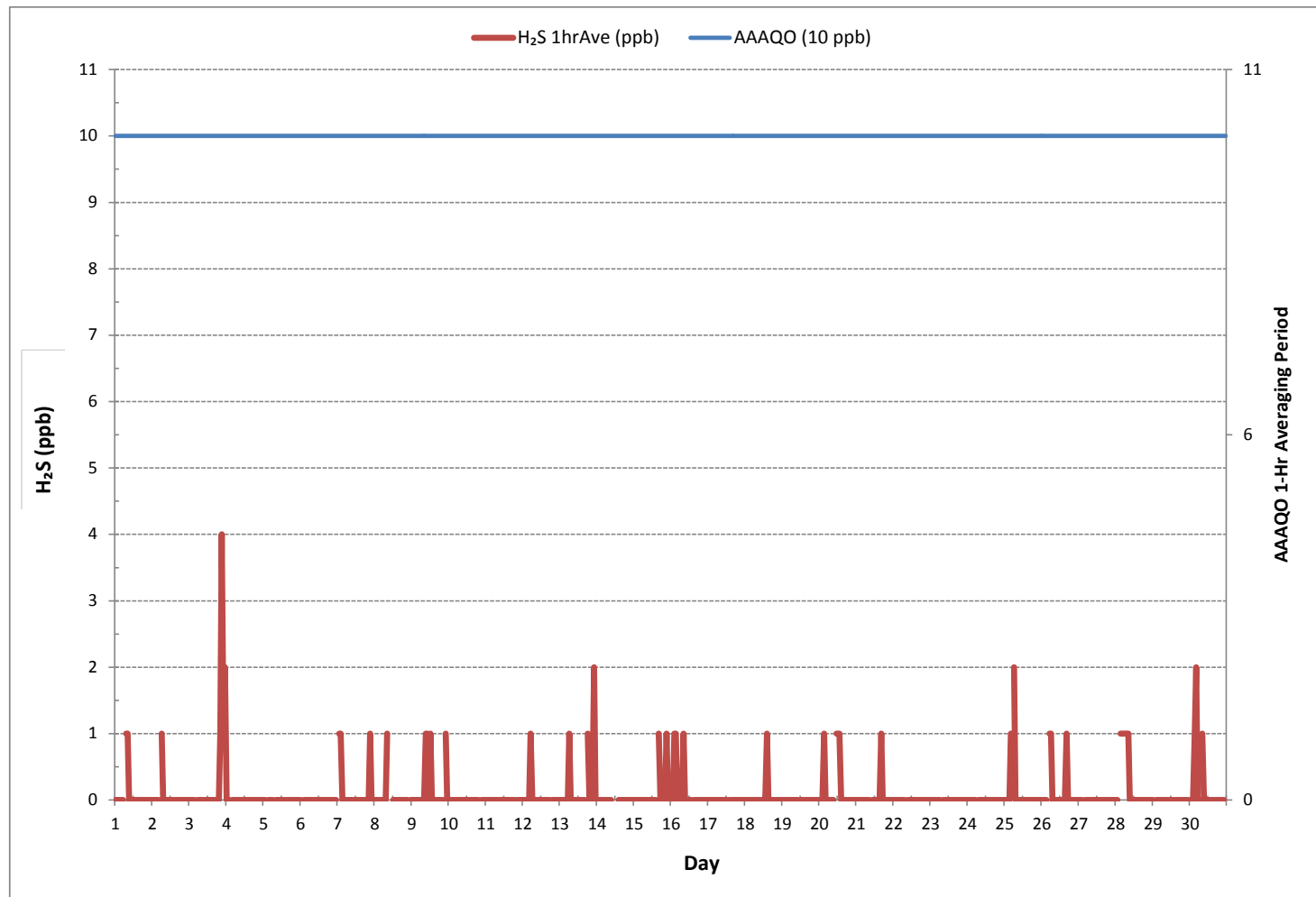
MONTHLY SUMMARY

| | | | | | |
|------------------------------|--------------|-----|-----------------------|------|-----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 44 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 | ON DAY | 1 | |
| MAXIMUM 1-HR AVERAGE: | 4 ppb @ HOUR | 21 | ON DAY | 3 | |
| MAXIMUM 24-HR AVERAGE: | 0 ppb | | ON DAY | 3 | |
| IZS CALIBRATION TIME: | 31 | hrs | OPERATIONAL TIME: | 718 | hrs |
| MONTHLY CALIBRATION TIME: | 4 | hrs | AMD OPERATION UPTIME: | 99.7 | % |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 | ppb |

24 HR AVERAGES June 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

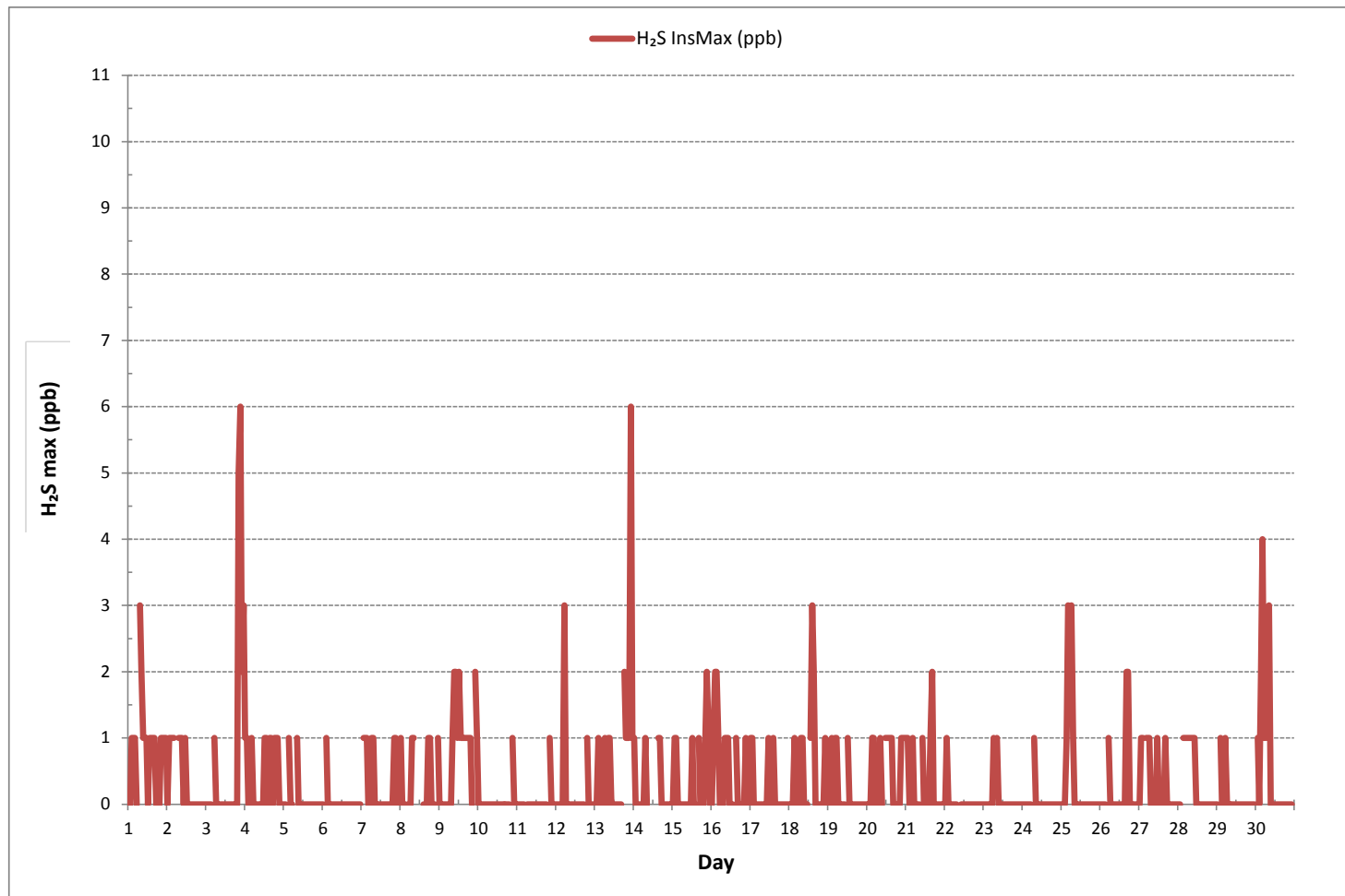
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 169 |
| MAXIMUM INSTANTANEOUS VALUE: | 6 ppb @ HOUR 21 ON DAY 3 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 1 |
| OPERATIONAL TIME: | 713 hrs |

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



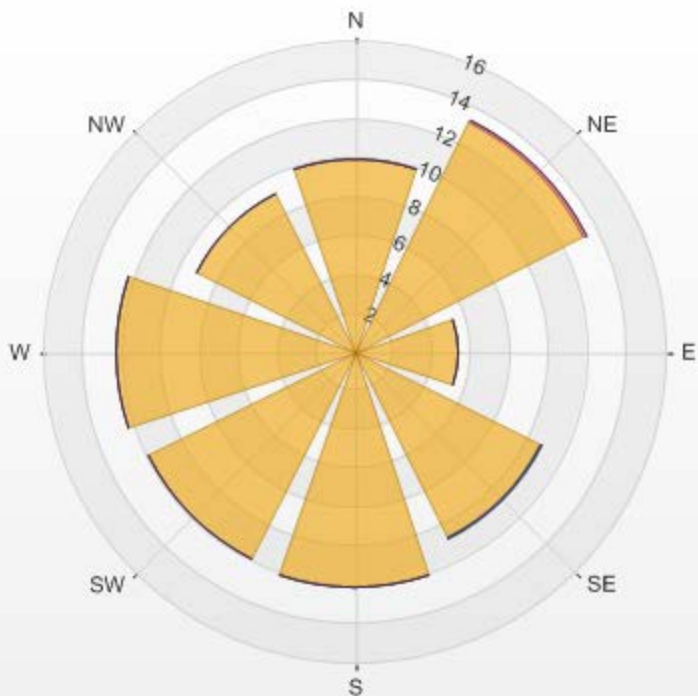
Wind: LICA MASKWA
 Poll.: LICA MASKWA-H₂S [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 15.01% Calm Avg: 0.26 [ppb]

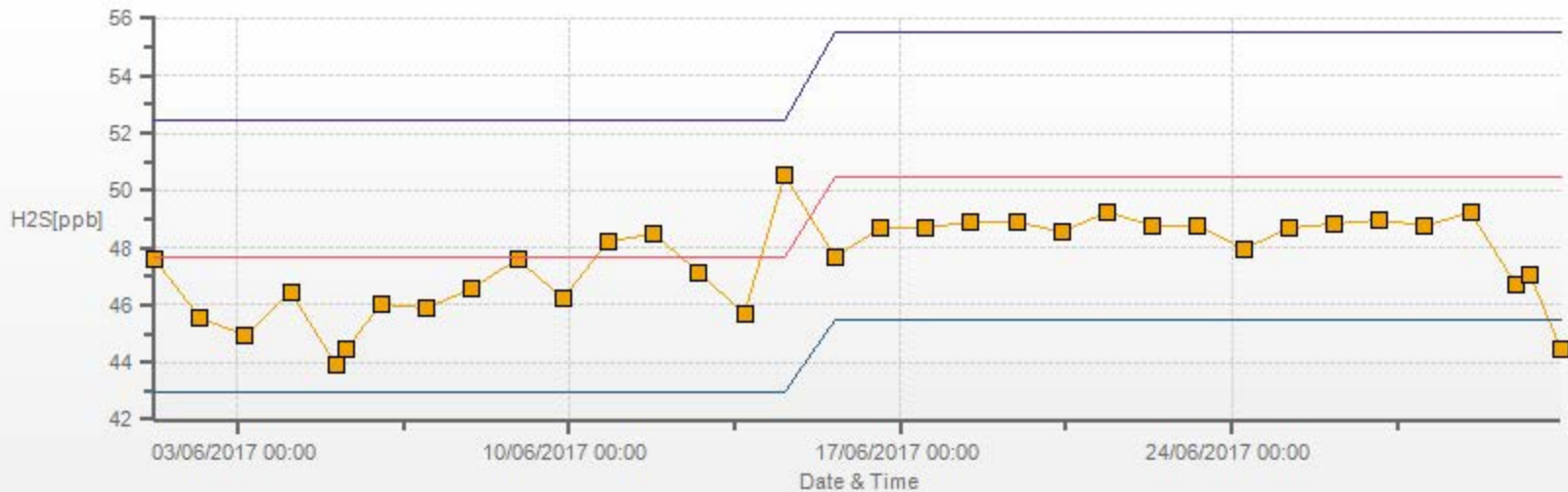
| Direction | 0.0-1.7 | 1.7-3.3 | 3.3-5.0 | >5.0 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 10.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| NE | 13.2 | 0.2 | 0.0 | 0.0 | 13.4 |
| E | 5.4 | 0.0 | 0.0 | 0.0 | 5.4 |
| SE | 10.7 | 0.0 | 0.2 | 0.0 | 10.9 |
| S | 12.2 | 0.0 | 0.0 | 0.0 | 12.2 |
| SW | 11.9 | 0.0 | 0.0 | 0.0 | 11.9 |
| W | 12.3 | 0.0 | 0.0 | 0.0 | 12.3 |
| NW | 9.1 | 0.0 | 0.0 | 0.0 | 9.1 |
| Summary | 84.7 | 0.2 | 0.2 | 0.0 | 85.0 |

% Icon Classes (ppb) 85 0.0-1.7 0 1.7-3.3 0 3.3-5.0 0 >5.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.01% Calm Poll Avg: 0.26[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

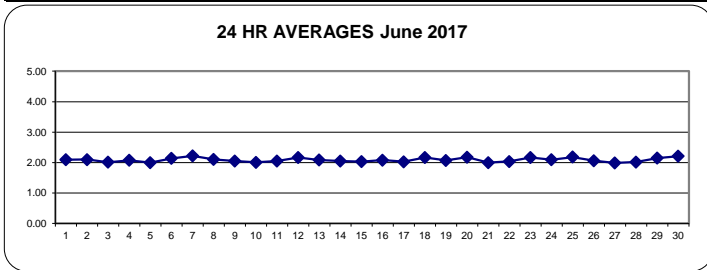


TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 2.07 | 2.08 | 2.10 | 2.18 | 2.19 | 2.23 | S | 2.07 | 2.08 | 2.09 | 2.11 | 2.09 | 2.08 | 2.10 | 2.07 | 2.10 | 2.07 | 2.08 | 2.07 | 2.01 | 2.02 | 2.10 | 2.10 | 2.05 | 2.01 | 2.23 | 2.09 | 24 | |
| 2 | 2.09 | 2.13 | 2.21 | 2.25 | 2.26 | S | 2.63 | 2.50 | 2.41 | 2.35 | 2.09 | 2.03 | 1.98 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.93 | 1.94 | 1.94 | 1.94 | 1.96 | 1.97 | 1.93 | 2.63 | 2.10 | 24 | |
| 3 | 1.97 | 1.96 | 1.97 | 1.98 | S | 2.00 | 2.00 | 2.00 | 2.00 | 2.01 | 2.01 | 2.01 | 2.01 | 2.03 | 2.02 | 2.02 | 2.03 | 2.01 | 2.01 | 2.02 | 2.07 | 2.05 | 2.05 | 2.11 | 1.96 | 2.11 | 2.01 | 24 | |
| 4 | 2.10 | 2.23 | 2.17 | S | 2.10 | 2.12 | 2.08 | 2.04 | 2.02 | 2.04 | 2.06 | 2.04 | 2.04 | 2.04 | 2.01 | 1.99 | 2.02 | 2.03 | 2.03 | 2.04 | 2.06 | 2.11 | 2.27 | 2.16 | 1.99 | 2.27 | 2.08 | 24 | |
| 5 | 2.04 | 1.98 | S | 1.96 | 1.93 | 1.96 | 1.96 | 1.96 | 1.97 | 1.99 | 2.00 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.98 | 1.98 | 2.00 | 2.04 | 2.03 | 2.02 | 2.11 | 2.19 | 1.93 | 2.19 | 2.00 | 24 | |
| 6 | 2.25 | S | 2.21 | 2.23 | 2.17 | 2.21 | 2.23 | 2.20 | 2.35 | 2.23 | 2.16 | 2.11 | 2.06 | 2.04 | 2.05 | 2.05 | 2.04 | 2.03 | 2.03 | 2.06 | 2.11 | 2.11 | 2.12 | 2.15 | 2.03 | 2.35 | 2.14 | 24 | |
| 7 | S | 2.81 | 2.59 | 2.50 | 2.33 | 2.31 | 2.34 | 2.31 | 2.23 | 2.20 | 2.18 | 2.07 | 2.11 | 2.15 | 2.11 | 2.08 | 2.08 | 2.07 | 2.06 | 2.05 | 2.07 | 2.09 | 2.10 | S | 2.05 | 2.81 | 2.22 | 24 | |
| 8 | 2.20 | 2.21 | 2.22 | 2.21 | 2.19 | 2.20 | 2.20 | 2.11 | Q | Q | 2.09 | 2.07 | 2.05 | 2.04 | 2.05 | 2.03 | 2.02 | 2.03 | 2.04 | 2.10 | 2.04 | 2.04 | S | 2.11 | 2.02 | 2.22 | 2.11 | 24 | |
| 9 | 2.09 | 2.09 | 2.09 | 2.05 | 2.05 | 2.05 | 2.05 | 2.06 | 2.07 | 2.08 | 2.08 | 2.07 | 2.08 | 2.10 | 2.11 | 2.06 | 2.03 | 2.01 | 2.01 | 1.99 | S | 1.97 | 1.96 | 1.96 | 2.11 | 2.05 | 2.05 | 24 | |
| 10 | 1.96 | 1.98 | 1.99 | 1.98 | 1.99 | 2.00 | 2.02 | 2.01 | 2.01 | 2.02 | 2.01 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 1.98 | 1.98 | 2.00 | S | 2.05 | 2.10 | 2.10 | 1.96 | 2.10 | 2.01 | 24 | |
| 11 | 2.13 | 2.13 | 2.13 | 2.06 | 2.02 | 2.01 | 2.02 | 2.01 | 2.02 | 2.02 | 2.04 | 2.03 | 2.03 | 2.02 | 2.04 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.03 | 2.09 | 2.16 | 2.14 | 2.01 | 2.16 | 2.05 | 24 | |
| 12 | 2.18 | 2.28 | 2.24 | 2.25 | 2.36 | 2.26 | 2.18 | 2.28 | 2.26 | 2.21 | 2.17 | 2.18 | 2.21 | 2.08 | 2.05 | 2.05 | 2.05 | 2.07 | S | 2.09 | 2.11 | 2.10 | 2.12 | 2.14 | 2.05 | 2.36 | 2.17 | 24 | |
| 13 | 2.17 | 2.15 | 2.24 | 2.18 | 2.06 | 2.05 | 2.10 | 2.08 | 2.08 | 2.09 | 2.12 | 2.11 | 2.08 | 2.07 | 2.05 | 2.03 | 2.02 | S | 2.00 | 2.02 | 2.06 | 2.02 | 2.16 | 2.07 | 2.00 | 2.24 | 2.09 | 24 | |
| 14 | 2.04 | 2.05 | 2.09 | 2.13 | 2.22 | 2.13 | 2.16 | 2.04 | 2.00 | 1.98 | 2.13 | 1.98 | 1.96 | C | C | C | C | 2.02 | 2.01 | 2.00 | 2.00 | 2.02 | 2.04 | 2.07 | 1.96 | 2.22 | 2.05 | 24 | |
| 15 | 2.03 | 2.00 | 2.04 | 2.09 | 2.12 | 2.18 | 2.09 | 2.06 | 2.05 | 2.09 | 1.99 | 1.97 | 2.00 | 1.99 | 1.98 | S | 1.99 | 1.99 | 1.98 | 1.99 | 1.98 | 1.99 | 2.00 | 2.05 | 2.07 | 1.97 | 2.18 | 2.03 | 24 |
| 16 | 2.12 | 2.16 | 2.23 | 2.22 | 2.29 | 2.33 | 2.21 | 2.10 | 2.04 | 2.00 | 1.99 | 1.99 | 1.99 | 1.99 | S | 1.99 | 1.96 | 2.00 | 2.03 | 2.02 | 2.05 | 2.06 | 2.09 | 2.04 | 1.96 | 2.33 | 2.08 | 24 | |
| 17 | 2.05 | 2.06 | 2.06 | 2.02 | 2.03 | 2.00 | 1.99 | 2.01 | 2.02 | 1.97 | 1.98 | 1.99 | 1.99 | S | 2.02 | 2.03 | 2.01 | 2.01 | 2.00 | 2.03 | 2.02 | 2.06 | 2.16 | 2.16 | 1.97 | 2.16 | 2.03 | 24 | |
| 18 | 2.20 | 2.37 | 2.30 | 2.41 | 2.48 | 2.41 | 2.36 | 2.41 | 2.22 | 2.08 | 2.04 | 2.05 | S | 2.02 | 2.07 | 2.00 | 2.02 | 2.03 | 2.06 | 2.02 | 2.01 | 2.09 | 2.11 | 2.07 | 2.00 | 2.48 | 2.17 | 24 | |
| 19 | 2.05 | 2.10 | 2.08 | 2.07 | 2.16 | 2.18 | 2.10 | 2.06 | 2.04 | 2.02 | 2.01 | S | 2.02 | 2.04 | 2.04 | 2.03 | 2.03 | 2.02 | 2.04 | 2.05 | 2.07 | 2.09 | 2.13 | 2.19 | 2.01 | 2.19 | 2.07 | 24 | |
| 20 | 2.16 | 2.26 | 2.33 | 2.44 | 2.58 | 2.37 | 2.32 | 2.34 | 2.36 | 2.34 | S | 2.14 | 2.07 | 2.09 | 2.07 | 2.06 | 2.04 | 2.02 | 2.03 | 2.00 | 2.01 | 2.02 | 2.00 | 2.08 | 2.00 | 2.58 | 2.18 | 24 | |
| 21 | 2.07 | 1.98 | 2.02 | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.98 | S | 1.98 | 1.96 | 1.97 | 1.98 | 2.00 | 2.05 | 2.05 | 2.08 | 2.02 | 2.04 | 2.00 | 1.97 | 1.96 | 1.97 | 1.96 | 2.08 | 2.00 | 24 | |
| 22 | 2.07 | 2.04 | 1.96 | 1.97 | 1.97 | 1.99 | 2.01 | 2.01 | S | 2.03 | 2.02 | 2.02 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.03 | 2.03 | 2.03 | 2.05 | 2.07 | 2.11 | 2.09 | 2.29 | 1.96 | 2.29 | 2.04 | 24 |
| 23 | 2.43 | 2.40 | 2.39 | 2.39 | 2.53 | 2.48 | S | 2.07 | 2.02 | 2.01 | 2.01 | 2.01 | 2.02 | 2.03 | 2.02 | 2.03 | 2.03 | 2.03 | 2.03 | 2.03 | 2.04 | 2.05 | 2.07 | 2.29 | 2.17 | 2.01 | 2.53 | 2.17 | 24 |
| 24 | 2.14 | 2.15 | 2.18 | 2.14 | 2.18 | 2.25 | S | 2.16 | 2.10 | 2.12 | 2.09 | 2.04 | 2.02 | 2.03 | 2.02 | 1.99 | 2.01 | 2.01 | 2.01 | 2.03 | 2.07 | 2.11 | 2.15 | 2.20 | 1.99 | 2.25 | 2.10 | 24 | |
| 25 | 2.27 | 2.33 | 2.40 | 2.46 | 2.43 | S | 2.47 | 2.13 | 2.08 | 2.12 | 2.09 | 2.07 | 2.07 | 2.05 | 2.07 | 2.08 | 2.08 | 2.09 | 2.08 | 2.11 | 2.16 | 2.20 | 2.19 | 2.19 | 2.05 | 2.47 | 2.18 | 24 | |
| 26 | 2.17 | 2.17 | 2.13 | 2.16 | S | 2.17 | 2.17 | 2.15 | 2.11 | 2.08 | 2.06 | 2.05 | 2.03 | 2.02 | 2.01 | 2.00 | 2.00 | 2.03 | 2.01 | 2.00 | 1.99 | 1.99 | 2.00 | 2.00 | 1.99 | 2.17 | 2.07 | 24 | |
| 27 | 2.01 | 2.08 | 2.03 | S | 2.04 | 2.09 | 2.00 | 1.94 | 1.95 | 1.96 | 1.94 | 1.98 | 1.95 | 1.96 | 1.96 | 1.96 | 1.96 | 1.95 | 1.95 | 1.96 | 1.98 | 2.01 | 2.06 | 2.07 | 1.94 | 2.09 | 1.99 | 24 | |
| 28 | 2.06 | 2.10 | S | 2.16 | 2.15 | 2.09 | 2.07 | 2.05 | 1.99 | 1.98 | 1.99 | 1.96 | 1.95 | 1.96 | 1.93 | 1.94 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 2.01 | 2.02 | 2.07 | 1.93 | 2.16 | 2.02 | 24 | |
| 29 | 2.15 | S | 2.20 | 2.21 | 2.32 | 2.46 | 2.14 | 2.09 | 2.14 | 2.16 | 2.22 | 2.14 | 2.06 | 2.05 | 2.05 | 2.03 | 2.00 | 2.01 | 2.14 | 2.06 | 2.15 | 2.20 | 2.25 | 2.25 | 2.00 | 2.46 | 2.15 | 24 | |
| 30 | S | 2.34 | 2.42 | 2.44 | 2.47 | 2.62 | 2.46 | 2.40 | 2.27 | 2.17 | 2.11 | 2.05 | 2.03 | 2.07 | 2.12 | 2.08 | 2.04 | 2.03 | 2.04 | 2.05 | 2.06 | 2.14 | 2.18 | S | 2.03 | 2.62 | 2.21 | 24 | |
| HOURLY MAX | 2.43 | 2.81 | 2.59 | 2.50 | 2.58 | 2.62 | 2.63 | 2.50 | 2.41 | 2.35 | 2.22 | 2.18 | 2.21 | 2.15 | 2.12 | 2.10 | 2.08 | 2.09 | 2.14 | 2.11 | 2.16 | 2.20 | 2.29 | 2.29 | | | | | |
| HOURLY AVG | 2.12 | 2.17 | 2.18 | 2.18 | 2.20 | 2.18 | 2.17 | 2.12 | 2.10 | 2.09 | 2.06 | 2.04 | 2.03 | 2.03 | 2.03 | 2.02 | 2.02 | 2.02 | 2.02 | 2.03 | 2.04 | 2.06 | 2.10 | 2.11 | | | | | |

STATUS FLAG CODES

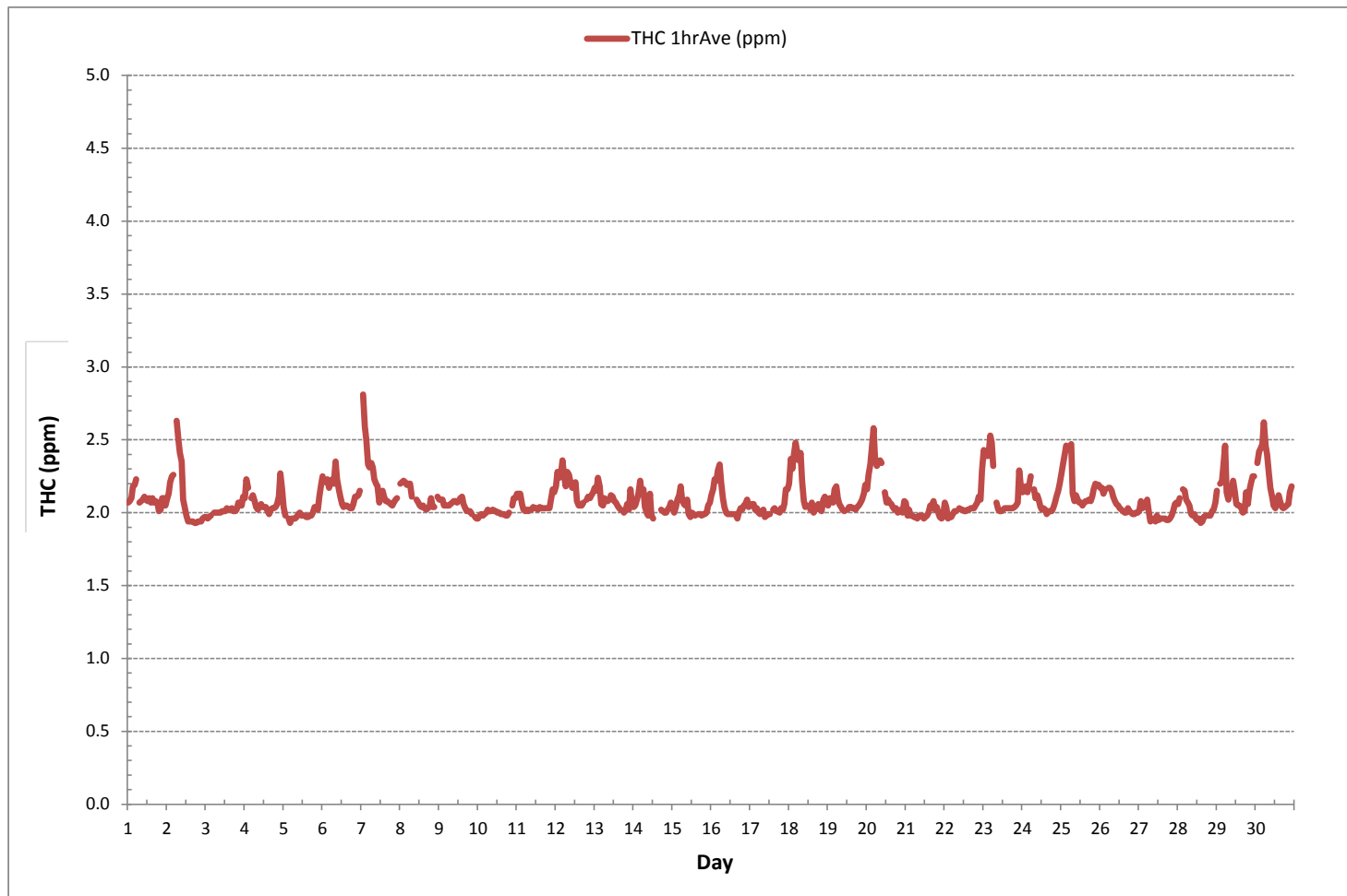
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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



MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|-------|----------|
| NUMBER OF NON-ZERO READINGS: | 683 | | | |
| MINIMUM 1-HR AVERAGE: | 1.93 ppm | @ HOUR | 17 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 2.81 ppm | @ HOUR | 1 | ON DAY 7 |
| MAXIMUM 24-HR AVERAGE: | 2.22 ppm | | | ON DAY 7 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 720 | hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 100.0 | % |
| STANDARD DEVIATION: | 0.12 | MONTHLY AVERAGE: | 2.09 | ppm |

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2.05 | 2.06 | 2.06 | 2.23 | 2.20 | 2.63 | S | 2.06 | 2.06 | 2.06 | 2.09 | 2.05 | 2.03 | 2.09 | 2.05 | 2.07 | 2.05 | 2.06 | 2.09 | 2.05 | 2.06 | 2.15 | 2.18 | 2.03 | 2.03 | 2.63 | 2.11 | 24 | |
| 2 | 2.09 | 2.17 | 2.20 | 2.26 | 2.27 | S | P | 2.57 | 2.43 | 2.45 | 2.14 | 2.00 | 1.94 | 1.91 | 1.90 | 1.88 | 1.91 | 1.88 | 1.88 | 1.91 | 1.91 | 1.91 | 1.91 | 1.94 | 1.88 | 2.57 | 2.07 | 23 | |
| 3 | 1.94 | 1.94 | 1.94 | 1.94 | S | 1.97 | 1.97 | 1.97 | 1.97 | 2.00 | 2.05 | 2.00 | 2.08 | 2.09 | 2.08 | 2.03 | 2.09 | 2.00 | 1.99 | 2.02 | 2.09 | 2.03 | 2.05 | 2.29 | 1.94 | 2.29 | 2.02 | 24 | |
| 4 | 2.15 | 2.32 | 2.20 | S | 2.09 | 2.15 | 2.12 | 2.03 | 2.00 | 2.06 | 2.06 | 2.09 | 2.03 | 2.02 | 2.00 | 1.99 | 2.00 | 2.00 | 2.09 | 2.03 | 2.06 | 2.18 | 2.62 | 2.62 | 1.99 | 2.62 | 2.13 | 24 | |
| 5 | 2.09 | 1.94 | S | 1.97 | 1.94 | 2.00 | 2.02 | 2.03 | 1.96 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.96 | 1.97 | 1.97 | 1.99 | 2.06 | 2.17 | 2.15 | 2.03 | 2.27 | 2.26 | 1.94 | 2.27 | 2.03 | 24 | |
| 6 | 2.38 | S | 2.32 | 2.36 | 2.22 | 2.35 | 2.26 | 2.26 | 2.41 | 2.37 | 2.18 | 2.17 | 2.08 | 2.06 | 2.06 | 2.06 | 2.07 | 2.06 | 2.06 | 2.09 | 2.21 | 2.14 | 2.18 | 2.43 | 2.06 | 2.43 | 2.21 | 24 | |
| 7 | S | 3.03 | 2.82 | 2.65 | 2.46 | 2.39 | 2.38 | 2.39 | 2.29 | 2.23 | 2.23 | 2.17 | 2.17 | 2.17 | 2.17 | 2.09 | 2.09 | 2.08 | 2.21 | 2.07 | 2.09 | 2.11 | 2.17 | S | 2.07 | 3.03 | 2.29 | 24 | |
| 8 | 2.24 | 2.23 | 2.29 | 2.26 | P | 2.20 | 2.23 | Q | Q | Q | 2.06 | 2.06 | 2.03 | 2.03 | 2.27 | 2.00 | 1.99 | 2.00 | 2.05 | 2.09 | 2.08 | 2.09 | S | 2.12 | 1.99 | 2.29 | 2.12 | 23 | |
| 9 | 2.09 | 2.09 | 2.09 | 2.00 | 1.97 | 1.99 | 1.97 | 2.00 | 2.02 | 2.00 | 2.02 | 2.00 | 2.02 | 2.03 | 2.09 | 2.00 | 2.26 | 1.94 | 1.94 | 1.97 | 1.93 | S | 1.93 | 1.87 | 1.87 | 2.26 | 2.01 | 24 | |
| 10 | 1.88 | 1.88 | 1.91 | 1.91 | 1.91 | 1.97 | 1.96 | 1.94 | 1.96 | 1.96 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.94 | 1.93 | 1.91 | 1.93 | 1.95 | S | 2.02 | 2.05 | 2.05 | 1.88 | 2.05 | 1.95 | 24 | |
| 11 | 2.08 | 2.12 | 2.09 | 2.05 | 1.97 | P | 1.98 | 1.97 | 1.97 | 2.00 | 2.03 | 2.03 | 2.03 | 2.02 | 2.03 | 2.03 | 2.00 | 2.02 | 2.00 | S | 2.00 | 2.12 | 2.20 | 2.18 | 1.97 | 2.20 | 2.04 | 23 | |
| 12 | 2.26 | 2.39 | 2.26 | 2.29 | 2.41 | 2.29 | 2.27 | 2.38 | 2.29 | 2.20 | 2.18 | 2.21 | 2.23 | 2.07 | 2.02 | 2.02 | 2.00 | 2.03 | S | 2.05 | 2.07 | 2.06 | 2.09 | 2.12 | 2.00 | 2.41 | 2.18 | 24 | |
| 13 | 2.12 | 2.27 | 2.35 | 2.24 | 2.08 | 2.14 | 2.12 | 2.06 | 2.06 | 2.06 | 2.11 | 2.09 | 2.06 | 2.05 | 2.03 | 2.00 | 2.00 | S | 1.99 | 2.00 | 2.24 | 2.34 | 2.43 | 2.12 | 1.99 | 2.43 | 2.13 | 24 | |
| 14 | 2.14 | 2.11 | 2.11 | 2.22 | 2.23 | 2.19 | 2.27 | 2.09 | 2.00 | 1.97 | 2.74 | 2.02 | 2.02 | C | C | C | C | C | 2.03 | 2.03 | 2.02 | 2.05 | 2.06 | 2.11 | 1.97 | 2.74 | 2.13 | 24 | |
| 15 | 2.06 | 2.05 | 2.12 | 2.15 | 2.21 | 2.26 | 2.24 | 2.14 | 2.11 | 2.18 | 2.02 | 2.00 | 2.05 | 2.00 | 2.02 | S | 2.00 | 2.02 | 2.00 | 2.00 | 2.00 | 2.00 | 2.12 | 2.09 | 2.00 | 2.26 | 2.08 | 24 | |
| 16 | 2.21 | 2.26 | 2.35 | 2.30 | 2.46 | 2.38 | 2.27 | 2.12 | 2.09 | 2.03 | 2.00 | 1.97 | 1.97 | 1.99 | S | 2.00 | 1.96 | 2.03 | 2.05 | 2.02 | 2.06 | 2.15 | 2.15 | 2.09 | 1.96 | 2.46 | 2.13 | 24 | |
| 17 | 2.06 | 2.11 | 2.09 | 2.05 | 2.06 | 2.05 | 2.00 | 2.09 | 2.15 | 1.99 | 2.03 | 2.05 | 2.08 | S | 2.09 | 2.15 | 2.03 | 2.05 | 2.03 | 2.05 | 2.03 | 2.21 | 2.22 | 2.20 | 1.99 | 2.22 | 2.08 | 24 | |
| 18 | 2.35 | 2.77 | 2.41 | 2.55 | 2.68 | 2.54 | 2.43 | 2.49 | 2.36 | 2.15 | 2.12 | 2.12 | S | 2.06 | 2.41 | 2.08 | 2.09 | 2.14 | 2.19 | 2.08 | 2.03 | 2.18 | 2.21 | 2.14 | 2.03 | 2.77 | 2.29 | 24 | |
| 19 | 2.17 | 2.32 | 2.24 | 2.20 | 2.29 | 2.29 | 2.20 | 2.15 | 2.09 | 2.12 | 2.05 | S | 2.06 | 2.15 | 2.11 | 2.06 | 2.06 | 2.06 | 2.08 | 2.09 | 2.09 | 2.12 | 2.18 | 2.27 | 2.05 | 2.32 | 2.15 | 24 | |
| 20 | 2.21 | 2.35 | 2.43 | 2.51 | 2.73 | 2.58 | 2.35 | 2.36 | 2.38 | 2.38 | S | 2.22 | 2.09 | 2.11 | 2.11 | 2.12 | 2.09 | 2.03 | 2.08 | 2.03 | 2.06 | 2.06 | 2.17 | 2.03 | 2.03 | 2.73 | 2.24 | 24 | |
| 21 | 2.14 | 2.12 | 2.12 | 2.06 | 2.06 | 1.99 | 1.97 | 1.97 | 2.05 | S | 2.06 | 1.97 | 1.97 | 1.97 | 2.09 | 2.52 | 2.29 | 2.57 | 2.37 | 2.13 | 2.09 | 2.00 | 1.99 | 2.02 | 1.97 | 2.57 | 2.11 | 24 | |
| 22 | 2.17 | 2.24 | 1.99 | 1.99 | 2.00 | 2.02 | 2.03 | 2.03 | S | P | 2.06 | 2.06 | 2.08 | 2.05 | 2.06 | 2.06 | 2.08 | 2.09 | 2.08 | 2.09 | 2.14 | 2.18 | 2.15 | 2.51 | 1.99 | 2.51 | 2.10 | 23 | |
| 23 | 2.59 | 2.52 | 2.46 | 2.51 | 2.75 | 2.73 | 2.49 | S | 2.26 | 2.12 | 2.08 | 2.09 | 2.09 | 2.09 | 2.15 | 2.11 | 2.11 | 2.11 | 2.12 | 2.12 | 2.12 | 2.12 | 2.15 | 2.71 | 2.46 | 2.08 | 2.75 | 2.30 | 24 |
| 24 | 2.29 | 2.29 | 2.35 | 2.26 | 2.32 | 2.54 | S | 2.30 | 2.18 | 2.23 | 2.20 | 2.15 | 2.11 | 2.15 | 2.12 | 2.09 | 2.09 | 2.09 | 2.09 | 2.12 | 2.17 | 2.20 | 2.26 | 2.38 | 2.09 | 2.54 | 2.22 | 24 | |
| 25 | 2.42 | 2.45 | 2.57 | 2.62 | 2.54 | S | 2.65 | 2.36 | 2.18 | 2.26 | 2.17 | 2.17 | 2.17 | 2.12 | 2.15 | 2.15 | 2.17 | 2.15 | 2.15 | 2.18 | 2.23 | 2.26 | 2.26 | 2.24 | 2.12 | 2.65 | 2.29 | 24 | |
| 26 | 2.23 | 2.22 | 2.20 | 2.20 | S | 2.20 | 2.21 | 2.21 | 2.17 | 2.14 | 2.08 | 2.08 | 2.05 | 2.03 | 2.03 | 2.02 | 2.00 | 2.05 | 2.03 | 2.00 | 2.00 | 1.99 | 2.00 | 1.99 | 1.99 | 2.23 | 2.09 | 24 | |
| 27 | 2.00 | 2.22 | 2.12 | S | 2.03 | 2.18 | 2.11 | 1.91 | 2.00 | 2.03 | 2.00 | 2.09 | 2.00 | 1.97 | 1.96 | 1.94 | 2.03 | 1.96 | 1.96 | 1.97 | 1.99 | 2.05 | 2.11 | 2.11 | 1.91 | 2.22 | 2.03 | 24 | |
| 28 | 2.08 | 2.12 | S | 2.18 | 2.18 | 2.11 | 2.11 | 2.09 | 2.03 | 2.02 | 2.05 | 2.00 | 1.99 | 2.00 | 1.97 | 1.99 | 2.00 | 2.00 | 2.00 | 2.02 | 2.03 | 2.08 | 2.09 | 2.18 | 1.97 | 2.18 | 2.06 | 24 | |
| 29 | 2.20 | S | 2.32 | 2.35 | 2.93 | 2.77 | 2.30 | 2.17 | 2.26 | 2.29 | 2.29 | 2.20 | 2.12 | 2.09 | 2.08 | 2.06 | 2.03 | 2.05 | 2.65 | 2.15 | 2.22 | 2.24 | 2.32 | 2.32 | 2.03 | 2.93 | 2.28 | 24 | |
| 30 | S | 2.42 | 2.53 | 2.49 | 2.77 | 2.77 | 2.52 | 2.46 | 2.45 | 2.20 | 2.26 | 2.09 | 2.06 | 2.12 | 2.17 | 2.12 | 2.06 | 2.06 | 2.09 | 2.11 | 2.16 | 2.26 | 2.29 | S | 2.06 | 2.77 | 2.29 | 24 | |
| HOURLY MAX | 2.59 | 3.03 | 2.82 | 2.65 | 2.93 | 2.77 | 2.65 | 2.57 | 2.45 | 2.45 | 2.74 | 2.22 | 2.23 | 2.17 | 2.41 | 2.52 | 2.29 | 2.57 | 2.65 | 2.18 | 2.24 | 2.34 | 2.71 | 2.62 | | | | | |
| HOURLY AVG | 2.17 | 2.25 | 2.25 | 2.24 | 2.29 | 2.28 | 2.20 | 2.16 | 2.15 | 2.13 | 2.11 | 2.07 | 2.05 | 2.05 | 2.08 | 2.06 | 2.05 | 2.05 | 2.08 | 2.05 | 2.08 | 2.12 | 2.18 | 2.19 | | | | | |

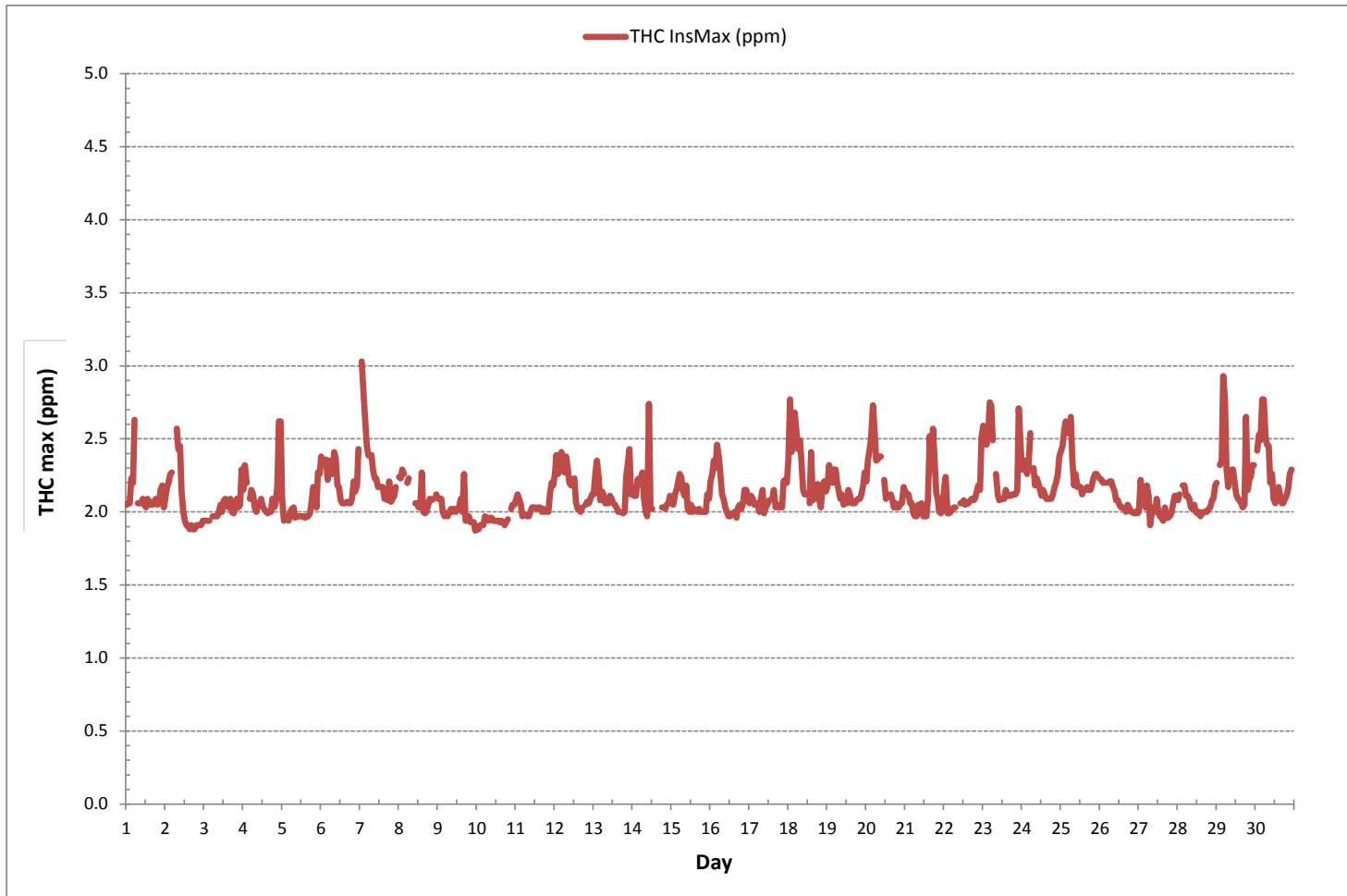
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|----------------------------|
| NUMBER OF NON-ZERO READINGS: | 677 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.03 ppm @ HOUR 1 ON DAY 7 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 716 hrs |
| STANDARD DEVIATION: | 0.17 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC [ppm]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 15.07% Calm Avg: 2.21 [ppm]

| Direction | 0.0-0.9 | 0.9-1.9 | 1.9-2.8 | >2.8 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 0.0 | 0.0 | 10.0 | 0.0 | 10.0 |
| NE | 0.0 | 0.0 | 13.2 | 0.0 | 13.2 |
| E | 0.0 | 0.0 | 5.3 | 0.0 | 5.3 |
| SE | 0.0 | 0.0 | 10.9 | 0.0 | 10.9 |
| S | 0.0 | 0.0 | 12.1 | 0.0 | 12.1 |
| SW | 0.0 | 0.0 | 11.8 | 0.0 | 11.8 |
| W | 0.0 | 0.0 | 12.3 | 0.0 | 12.3 |
| NW | 0.0 | 0.0 | 9.3 | 0.0 | 9.3 |
| Summary | 0.0 | 0.0 | 84.9 | 0.0 | 84.9 |

% Icon Classes (ppm)

0



0.0-0.9

0



0.9-1.9

85



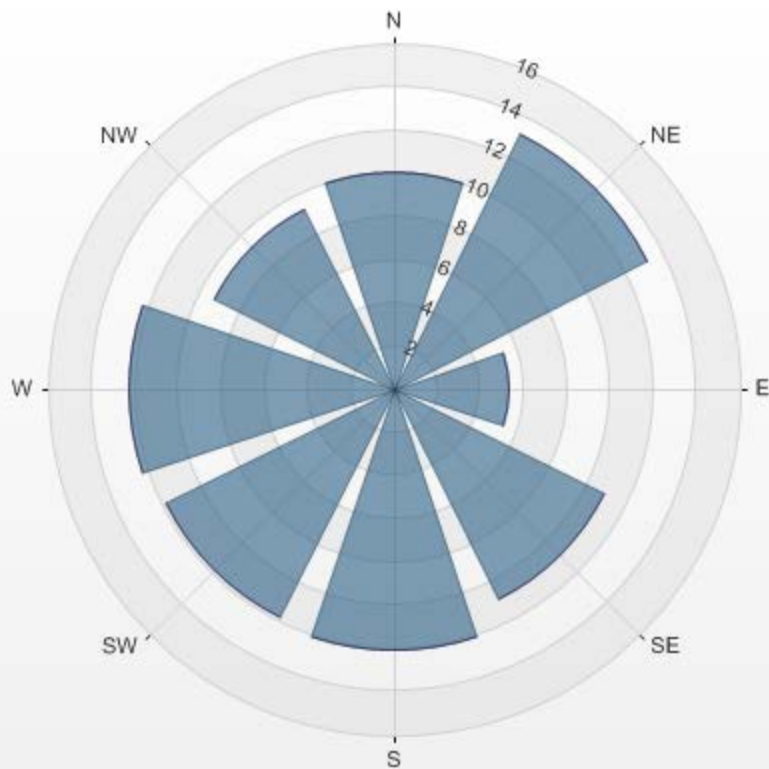
1.9-2.8

0

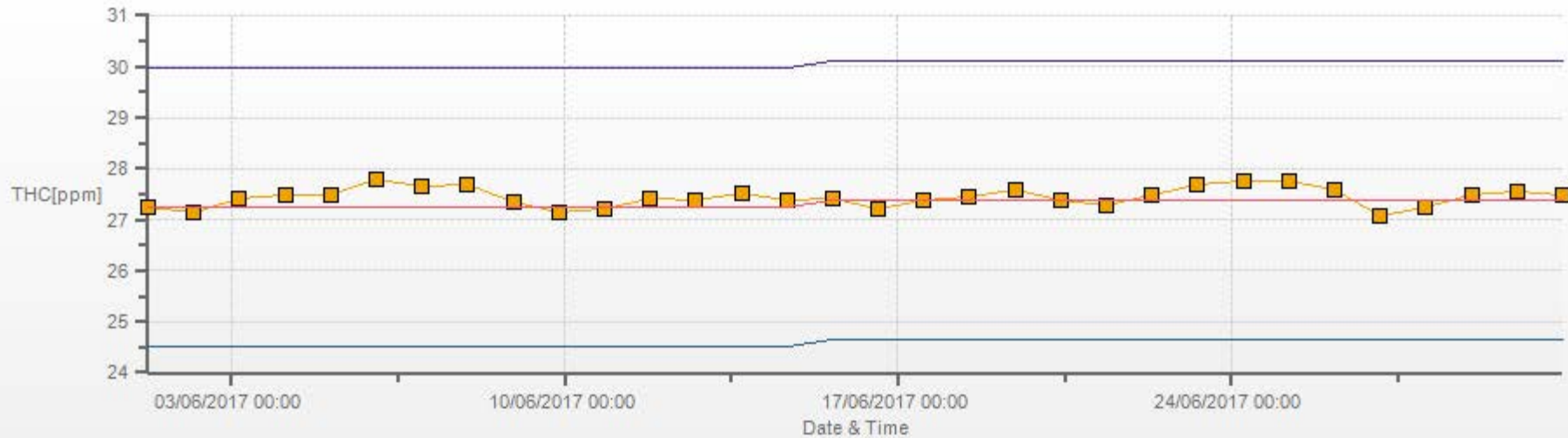


>2.8

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.07% Calm Poll Avg: 2.21[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



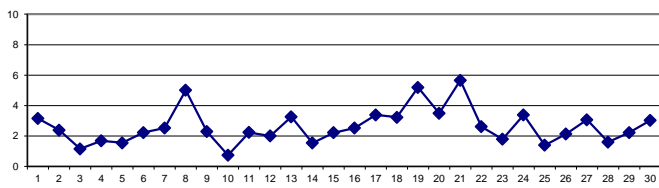
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

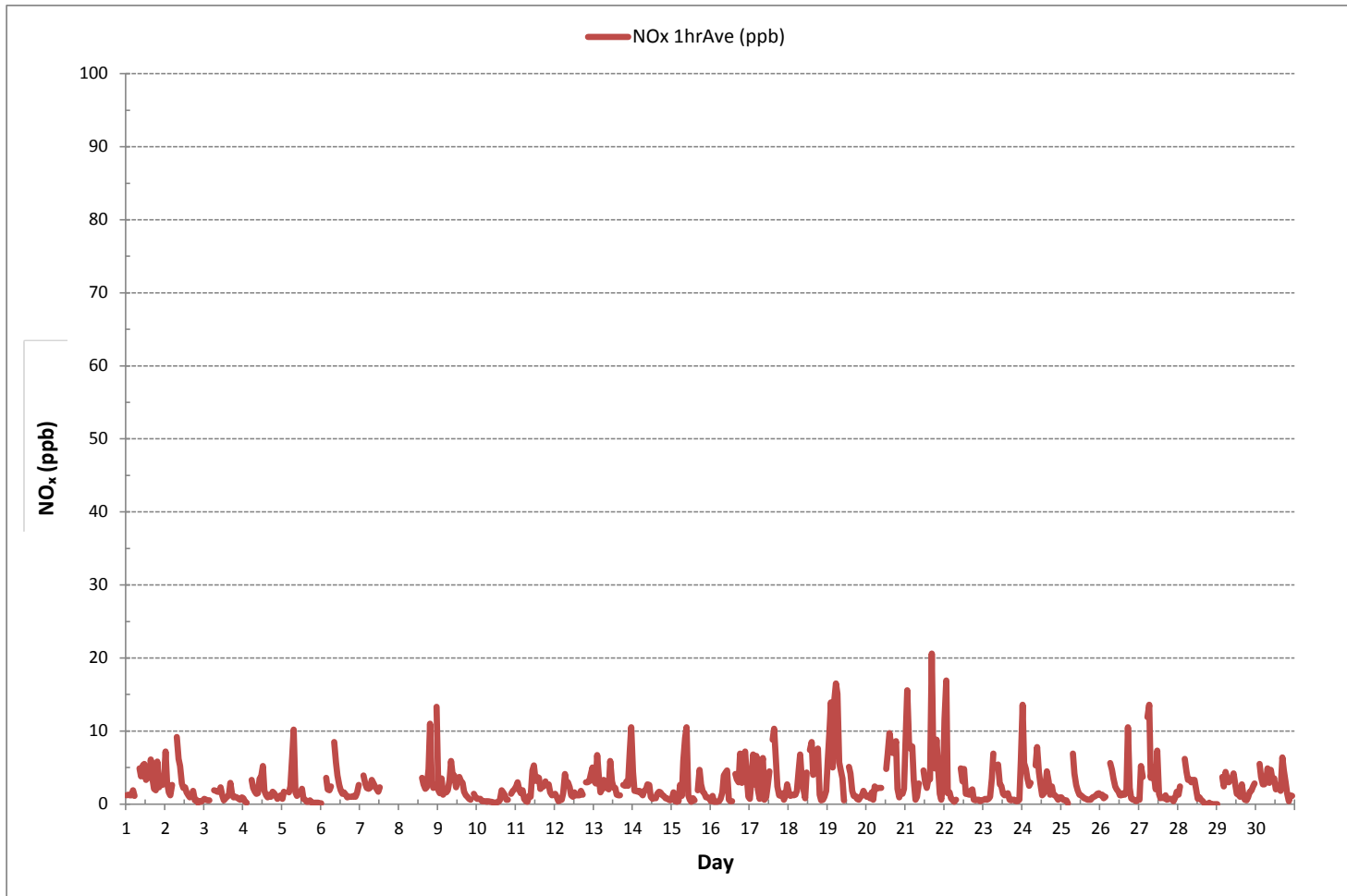
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF NON-ZERO READINGS: | 637 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 17 | ON DAY 28 |
| MAXIMUM 1-HR AVERAGE: | 21 ppb | @ HOUR | 16 | ON DAY 21 |
| MAXIMUM 24-HR AVERAGE: | 6 ppb | | | ON DAY 21 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 686 hrs | |
| MONTHLY CALIBRATION TIME: | 11 hrs | AMD OPERATION UPTIME: | 95.3 % | |
| STANDARD DEVIATION: | 3 | MONTHLY AVERAGE: | 3 | ppb |

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 1 | 2 | 1 | 1 | 5 | 2 | S | X | 6 | 4 | 9 | 8 | 4 | 6 | 4 | 8 | 6 | 2 | 2 | 16 | 5 | 5 | 4 | 8 | 1 | 16 | 5 | 23 | |
| 2 | 11 | 4 | 1 | 1 | 6 | S | X | 12 | 7 | 6 | 4 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | 3 | 23 |
| 3 | 1 | 1 | 1 | 1 | S | X | 2 | 2 | 2 | 2 | 6 | 4 | 1 | 1 | 1 | 4 | 9 | 3 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 9 | 2 | 23 | |
| 4 | 1 | 1 | 1 | S | X | 5 | 3 | 2 | 2 | 4 | 5 | 6 | 8 | 8 | 2 | 2 | 2 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 3 | 23 |
| 5 | 1 | 2 | S | X | 2 | 4 | 21 | 32 | 2 | 2 | 2 | 2 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 32 | 4 | 23 |
| 6 | 1 | S | X | 6 | 4 | 4 | S1 | S1 | 11 | 9 | 5 | 4 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 1 | 11 | 4 | 21 | |
| 7 | S | X | 5 | 4 | 3 | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 3 | C | C | C | C | C | Y | Y | Y | Y | Y | Y | 2 | 5 | 3 | 17 | |
| 8 | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | C | C | 17 | 9 | 7 | 7 | 13 | 14 | 13 | 8 | S | 23 | 7 | 23 | 12 | 16 | |
| 9 | 2 | 4 | 9 | 2 | 2 | 2 | 2 | 5 | 7 | 6 | 6 | 3 | 6 | 6 | 6 | 7 | 3 | 1 | 1 | 1 | 0 | S | 6 | 1 | 0 | 9 | 4 | 24 | |
| 10 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | S | 2 | 3 | 3 | 0 | 3 | 1 | 24 | |
| 11 | 3 | 8 | 4 | 4 | 3 | P | 2 | 2 | 5 | 6 | 16 | 15 | 9 | 15 | 8 | 11 | 10 | 15 | 15 | S | 5 | 2 | 2 | 2 | 2 | 16 | 7 | 23 | |
| 12 | 2 | 2 | 1 | 1 | 2 | 6 | 8 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | S | 4 | 3 | 3 | 5 | 6 | 1 | 8 | 3 | 24 | |
| 13 | 3 | 4 | 12 | 4 | 2 | 7 | 6 | 4 | 3 | 3 | 10 | 5 | 2 | 3 | 2 | 1 | 3 | S | 4 | 3 | 4 | 3 | 20 | 16 | 1 | 20 | 5 | 24 | |
| 14 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | S | S | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 12 | 2 | 24 | |
| 15 | 4 | 4 | 1 | 0 | 0 | 26 | 2 | 13 | 14 | 16 | 2 | 2 | 0 | 1 | 14 | S | 4 | 7 | 6 | 3 | 4 | 2 | 1 | 0 | 26 | 6 | 24 | | |
| 16 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 3 | 10 | 7 | 8 | 2 | 1 | 2 | S | 6 | 4 | 28 | 37 | 4 | 9 | 12 | 13 | 3 | 0 | 37 | 7 | 24 | |
| 17 | 3 | 9 | 12 | 7 | 11 | 10 | 3 | 11 | 14 | 4 | 5 | 11 | 18 | S | 16 | 33 | 15 | 9 | 2 | 2 | 4 | 2 | 3 | 4 | 2 | 33 | 9 | 24 | |
| 18 | 3 | 2 | 2 | 2 | 2 | 3 | 6 | 9 | 6 | 7 | 6 | 17 | S | 12 | 22 | 10 | 13 | 15 | 18 | 7 | 1 | 1 | 2 | 9 | 1 | 22 | 8 | 24 | |
| 19 | 17 | 26 | 24 | 15 | 37 | 34 | 24 | 15 | 13 | 21 | 2 | S | X | 9 | 9 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 37 | 12 | 23 | |
| 20 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 3 | 3 | 3 | S | X | 6 | 9 | 14 | 14 | 13 | 12 | 14 | 6 | 1 | 3 | 2 | 3 | 1 | 14 | 6 | 23 | |
| 21 | 28 | 40 | 33 | 28 | 18 | 7 | 1 | 1 | 6 | S | X | 13 | 3 | 3 | 6 | 6 | 39 | 13 | 11 | 13 | 10 | 6 | 0 | 9 | 0 | 40 | 13 | 23 | |
| 22 | 14 | 40 | 2 | 2 | 1 | 1 | 0 | 1 | S | P | 6 | 4 | 17 | 3 | 3 | 4 | 10 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 6 | 23 | |
| 23 | 0 | 1 | 1 | 1 | 2 | 7 | 22 | S | X | 11 | 4 | 4 | 3 | 2 | 4 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 4 | 23 | |
| 24 | 24 | 13 | 16 | 5 | 4 | 3 | S | X | 7 | 15 | 6 | 27 | 2 | 7 | 9 | 28 | 7 | 3 | 3 | 2 | 1 | 1 | 0 | 1 | 0 | 28 | 8 | 23 | |
| 25 | 1 | 0 | 0 | 0 | 0 | S | X | 8 | 6 | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 8 | 2 | 23 | |
| 26 | 1 | 2 | 1 | 1 | S | X | 7 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 14 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 14 | 3 | 23 | |
| 27 | 0 | 13 | 17 | S | X | 25 | 31 | 8 | 9 | 7 | 11 | 34 | 2 | 1 | 1 | 2 | 4 | 4 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 34 | 8 | 23 | |
| 28 | 1 | 3 | S | X | 8 | 4 | 3 | 4 | 3 | 4 | 6 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 2 | 23 | |
| 29 | 0 | S | X | 5 | 2 | 9 | 8 | 3 | 5 | 5 | 6 | 3 | 2 | 3 | 2 | 7 | 7 | 1 | 0 | 2 | 2 | 2 | 3 | 3 | 0 | 9 | 4 | 23 | |
| 30 | S | X | 7 | 4 | 3 | 3 | 4 | 7 | 3 | 8 | 4 | 5 | 3 | 4 | 4 | 2 | 12 | 11 | 8 | 2 | 0 | 1 | 1 | S | 0 | 12 | 5 | 23 | |
| HOURLY MAX | 28 | 40 | 33 | 28 | 37 | 34 | 31 | 32 | 14 | 21 | 16 | 34 | 18 | 15 | 22 | 33 | 39 | 28 | 37 | 16 | 13 | 12 | 20 | 24 | | | | | |
| HOURLY AVG | 5 | 8 | 6 | 4 | 5 | 7 | 7 | 6 | 6 | 6 | 5 | 7 | 4 | 4 | 6 | 6 | 7 | 6 | 6 | 3 | 3 | 2 | 3 | 5 | | | | | |

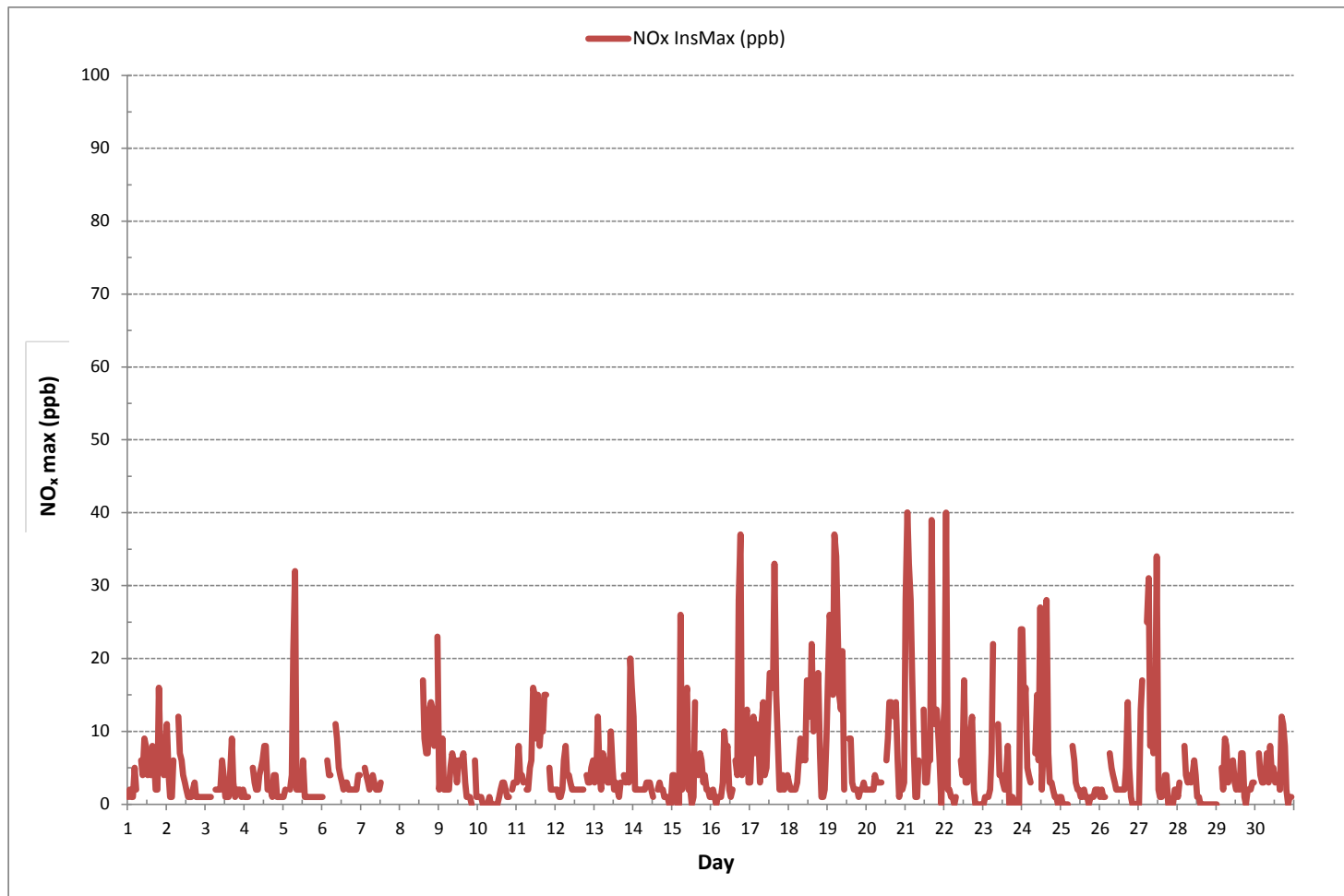
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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 |

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 583 |
| MAXIMUM INSTANTANEOUS VALUE: | 40 ppb @ HOUR 1 ON DAY 21 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 11 hrs |
| STANDARD DEVIATION: | 7 |
| OPERATIONAL TIME: | 684 hrs |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



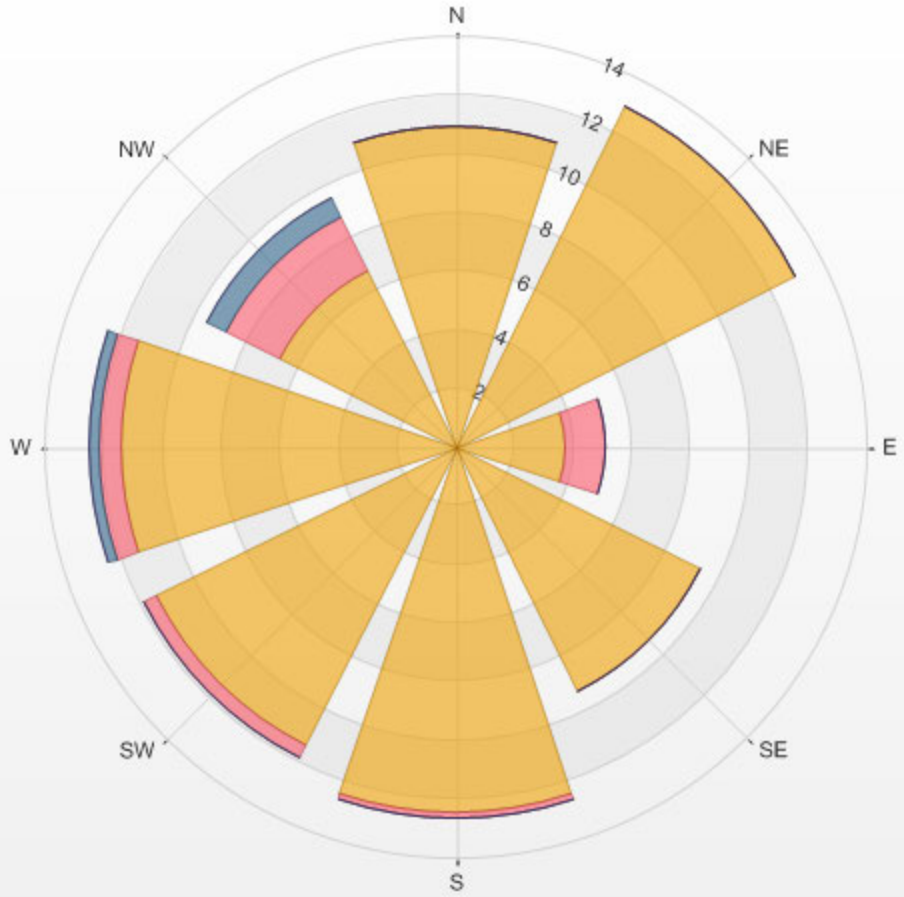
Wind: LICA MASKWA
Poll.: LICA MASKWA-NOX[ppb]
Monthly: 17/06
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 15.13% Calm Avg: 2.22 [ppb]

| Direction | 0.0-6.9 | 6.9-13.8 | 13.8-20.7 | >20.7 | Total |
|-----------|---------|----------|-----------|-------|-------|
| N | 10.9 | 0.0 | 0.0 | 0.0 | 10.9 |
| NE | 13.0 | 0.0 | 0.0 | 0.0 | 13.0 |
| E | 3.7 | 1.4 | 0.0 | 0.0 | 5.1 |
| SE | 9.4 | 0.0 | 0.0 | 0.0 | 9.4 |
| S | 12.5 | 0.2 | 0.0 | 0.0 | 12.6 |
| SW | 11.4 | 0.5 | 0.0 | 0.0 | 11.9 |
| W | 11.4 | 0.8 | 0.3 | 0.0 | 12.5 |
| NW | 6.7 | 2.0 | 0.8 | 0.0 | 9.5 |
| Summary | 78.9 | 4.8 | 1.1 | 0.0 | 84.9 |

% Icon Classes (ppb) 79 0.0-6.9 5 6.9-13.8 1 13.8-20.7 0 >20.7

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.13% Calm Poll Avg: 2.22[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

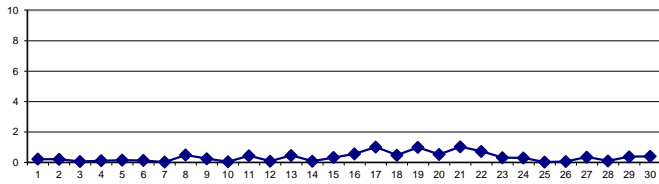
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

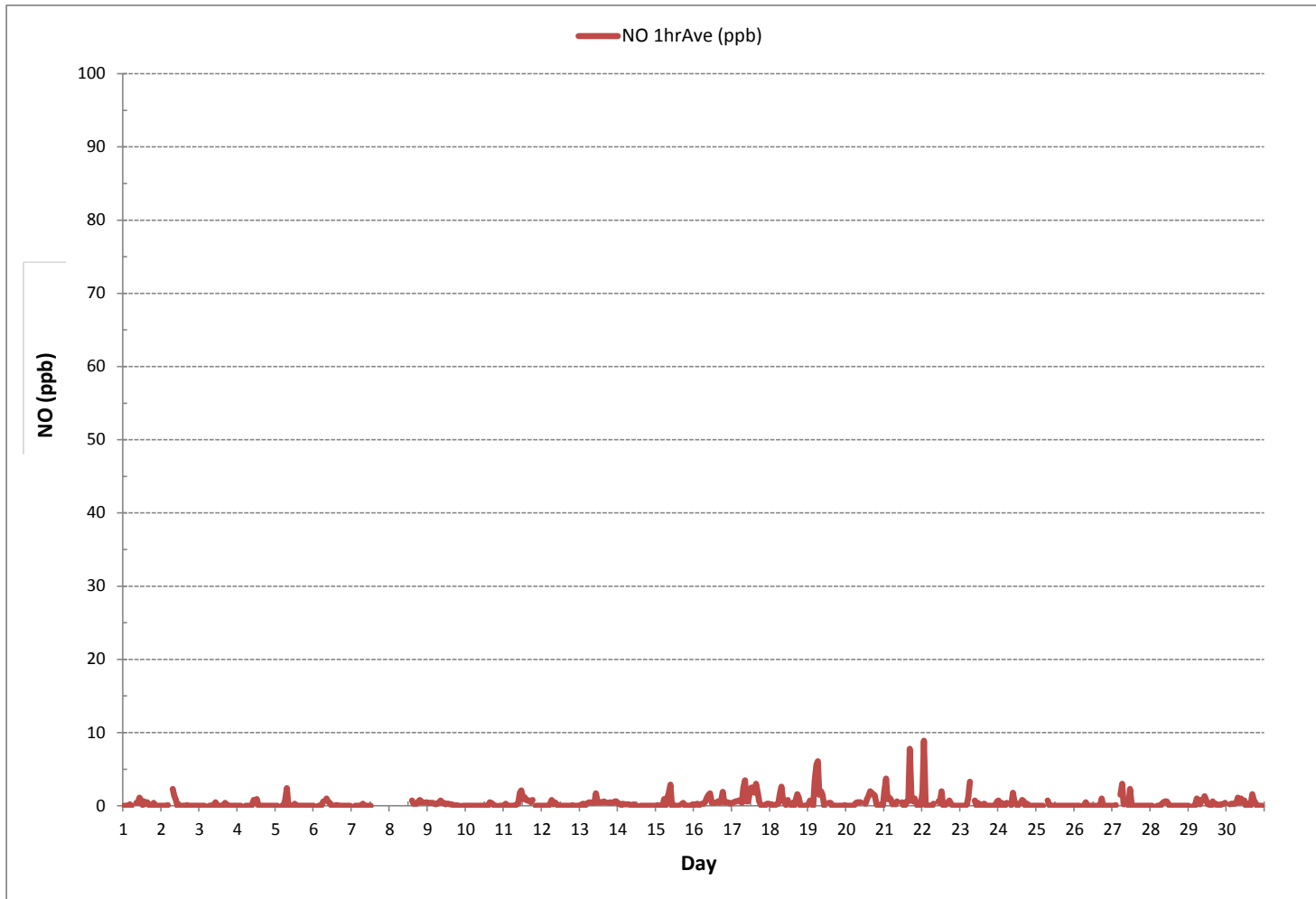
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF NON-ZERO READINGS: | 324 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 9 ppb | @ HOUR | 22 | ON DAY 22 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | | ON DAY 21 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 686 hrs | |
| MONTHLY CALIBRATION TIME: | 11 hrs | AMD OPERATION UPTIME: | 95.3 % | |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb | |

NITRIC OXIDE Hourly Averages (NO ppb)





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

NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

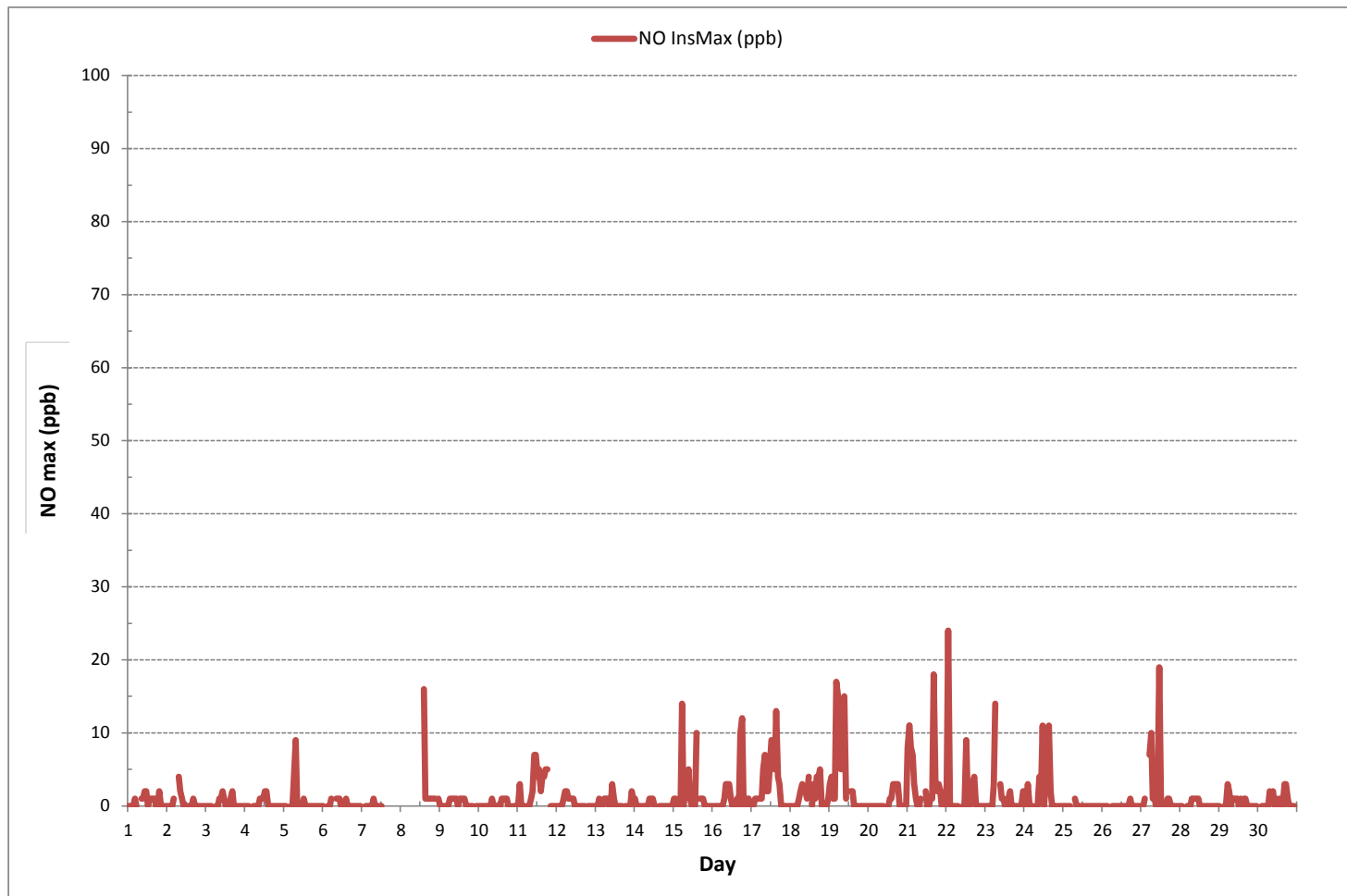
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 230 |
| MAXIMUM INSTANTANEOUS VALUE: | 24 ppb @ HOUR 1 ON DAY 22 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 11 hrs |
| OPERATIONAL TIME: | 683 hrs |
| STANDARD DEVIATION: | 3 |

NITRIC OXIDE Instantaneous Maximum (NO ppb)



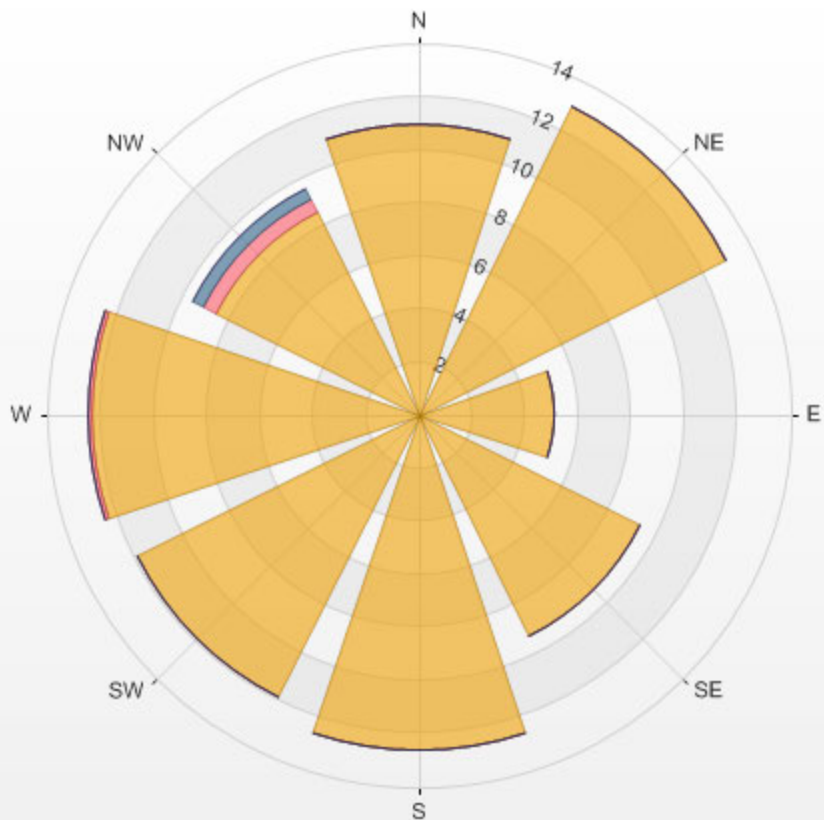
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 15.13% Calm Avg: 0.25 [ppb]

| Direction | 0.0-3.0 | 3.0-6.0 | 6.0-9.0 | >9.0 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 10.9 | 0.0 | 0.0 | 0.0 | 10.9 |
| NE | 13.0 | 0.0 | 0.0 | 0.0 | 13.0 |
| E | 5.2 | 0.0 | 0.0 | 0.0 | 5.2 |
| SE | 9.4 | 0.0 | 0.0 | 0.0 | 9.4 |
| S | 12.6 | 0.0 | 0.0 | 0.0 | 12.6 |
| SW | 11.9 | 0.0 | 0.0 | 0.0 | 11.9 |
| W | 12.3 | 0.2 | 0.0 | 0.0 | 12.5 |
| NW | 8.6 | 0.5 | 0.5 | 0.0 | 9.5 |
| Summary | 83.8 | 0.6 | 0.5 | 0.0 | 84.9 |

| % Icon | Classes (ppb) | 84 | 0.0-3.0 | 1 | 3.0-6.0 | 0 | 6.0-9.0 | 0 | >9.0 |
|--------|---------------|----|---------|---|---------|---|---------|---|------|
|--------|---------------|----|---------|---|---------|---|---------|---|------|

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.13% Calm Poll Avg: 0.25[ppb]



NITROGEN DIOXIDE



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

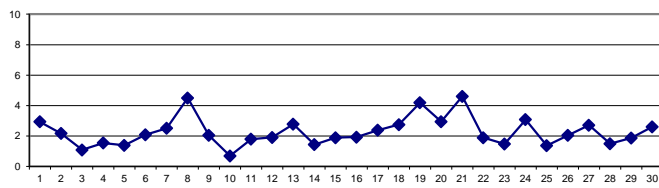
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

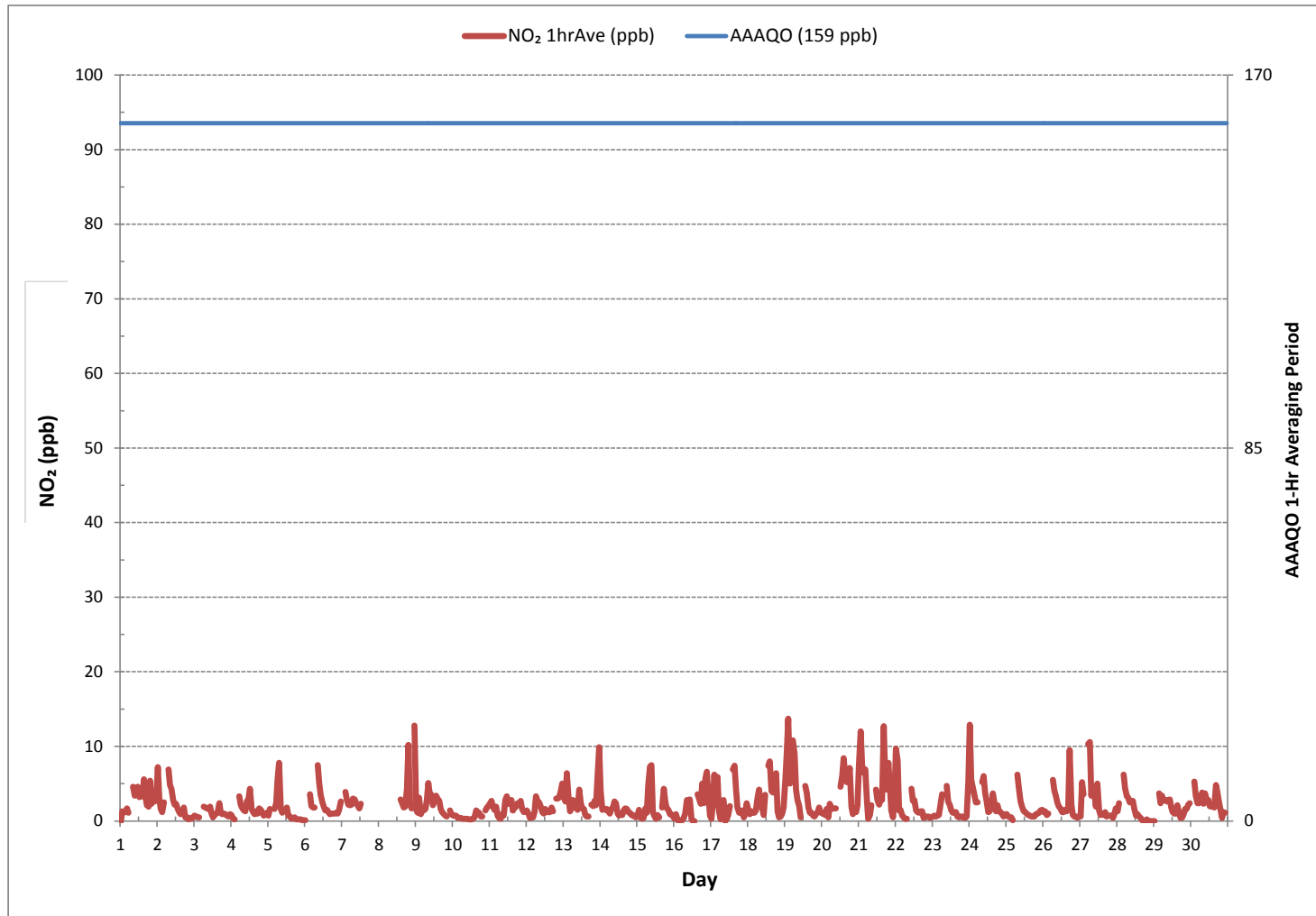
MONTHLY SUMMARY

| | | | | |
|------------------------------|-----|------------|-----------------------|--------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 633 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 4 | ON DAY |
| MAXIMUM 1-HR AVERAGE: | 14 | ppb @ HOUR | 2 | ON DAY |
| MAXIMUM 24-HR AVERAGE: | 5 | ppb | | ON DAY |
| I2S CALIBRATION TIME: | 31 | hrs | OPERATIONAL TIME: | 686 |
| MONTHLY CALIBRATION TIME: | 11 | hrs | AMD OPERATION UPTIME: | 95.3 |
| STANDARD DEVIATION: | 2 | | MONTHLY AVERAGE: | 2 |
| | | | | ppb |

24 HR AVERAGES June 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

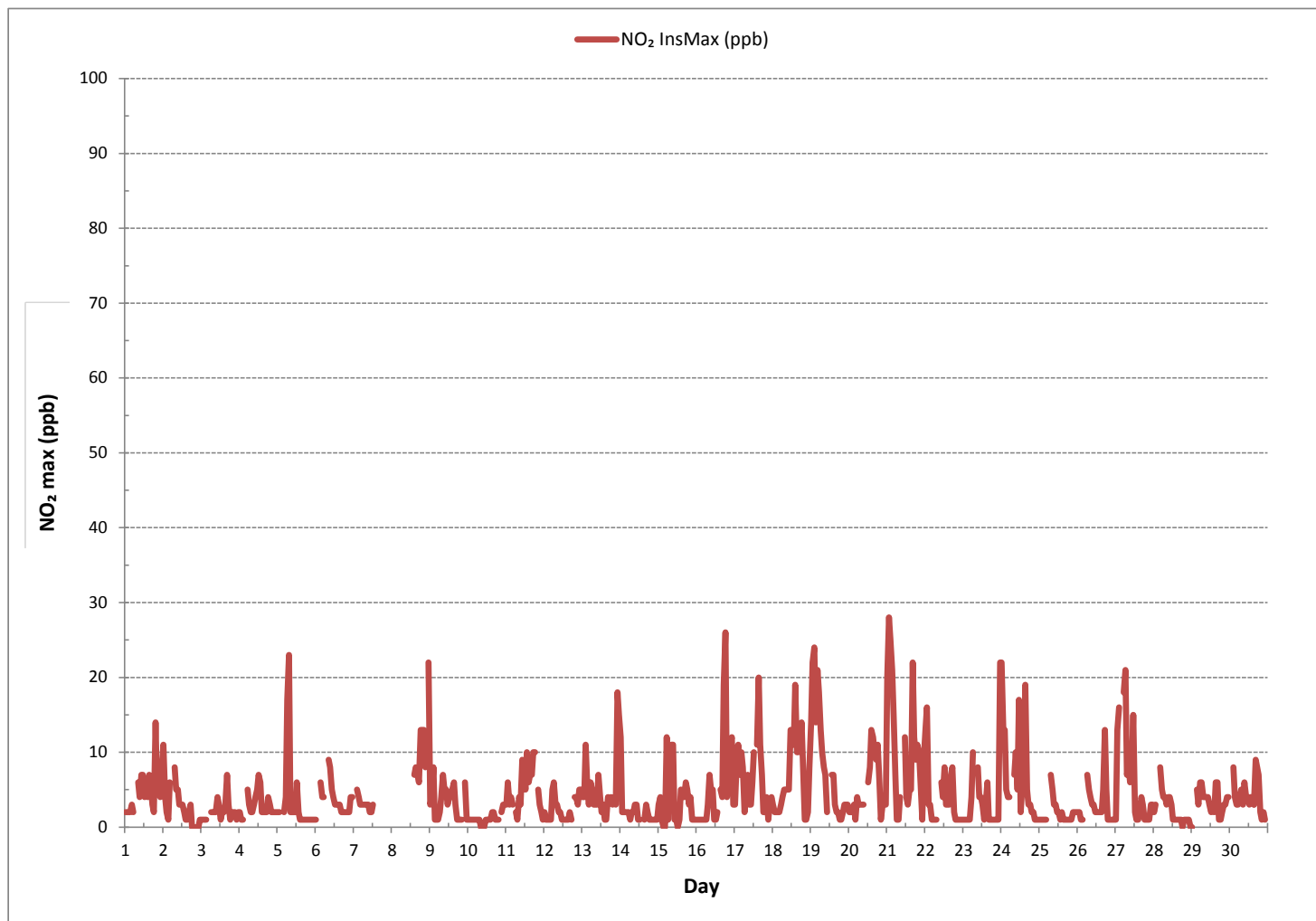
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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 |

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 627 |
| MAXIMUM INSTANTANEOUS VALUE: | 28 ppb @ HOUR 1 ON DAY 21 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 11 hrs |
| STANDARD DEVIATION: | 5 |
| OPERATIONAL TIME: | 683 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



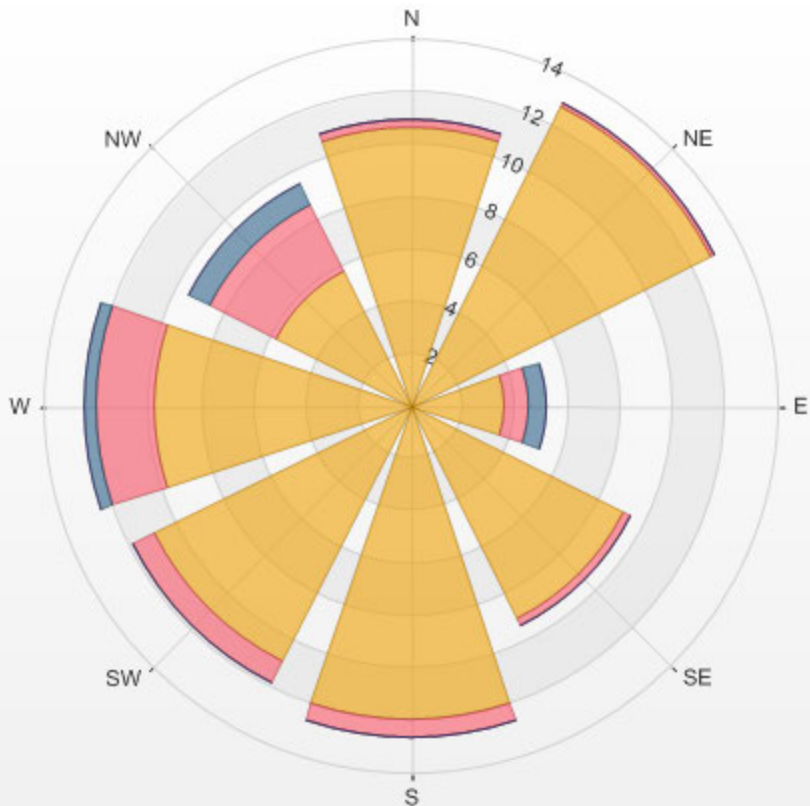
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO2[ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 15.13% Calm Avg: 1.98 [ppb]

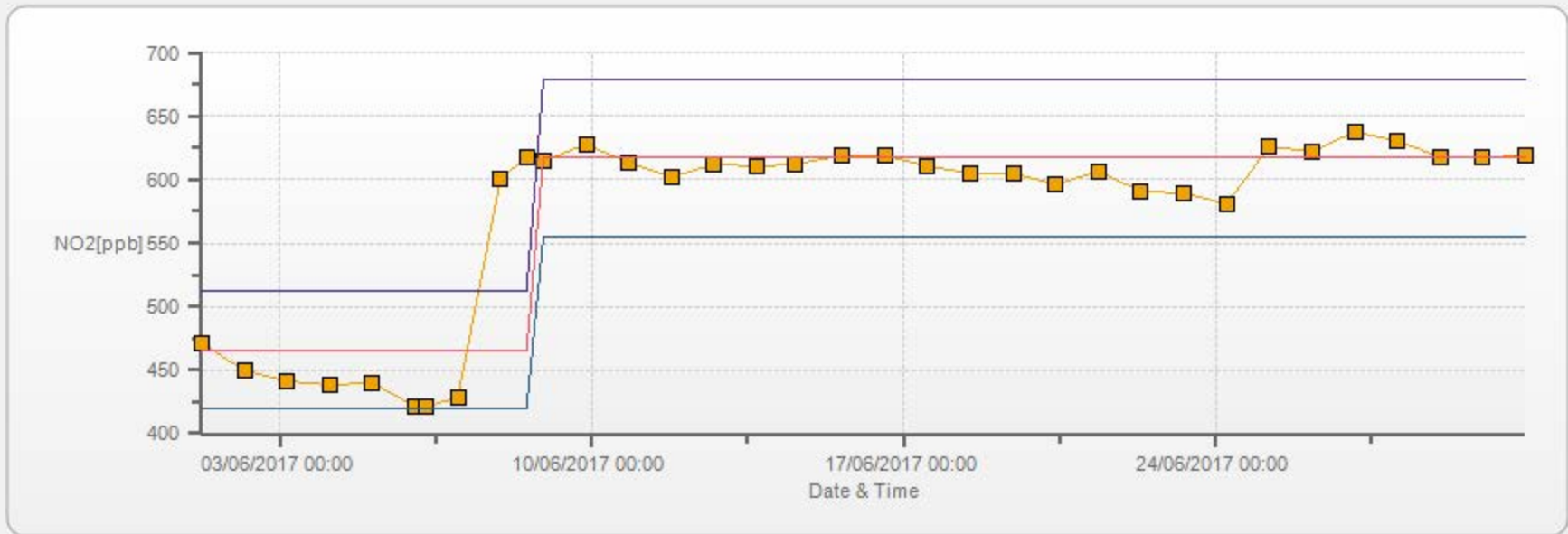
| Direction | 0.0-4.6 | 4.6-9.2 | 9.2-13.8 | >13.8 | Total |
|----------------|---------|---------|----------|-------|-------|
| N | 10.6 | 0.3 | 0.0 | 0.0 | 10.9 |
| NE | 12.8 | 0.2 | 0.0 | 0.0 | 13.0 |
| E | 3.6 | 0.9 | 0.6 | 0.0 | 5.2 |
| SE | 9.1 | 0.3 | 0.0 | 0.0 | 9.4 |
| S | 12.0 | 0.6 | 0.0 | 0.0 | 12.6 |
| SW | 10.9 | 0.9 | 0.0 | 0.0 | 11.9 |
| W | 9.8 | 2.2 | 0.5 | 0.0 | 12.5 |
| NW | 5.8 | 2.8 | 0.9 | 0.0 | 9.5 |
| Summary | 74.6 | 8.3 | 2.0 | 0.0 | 84.9 |

% Icon Classes (ppb) 75 0.0-4.6 8 4.6-9.2 2 9.2-13.8 0 >13.8

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.13% Calm Poll Avg: 1.98[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

WIND SPEED



WIND SPEED Hourly Averages (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 5.6 | 2.3 | 3.7 | 3.3 | 2.8 | 1.8 | 3.0 | 4.3 | 1.6 | 1.5 | 5.8 | 4.5 | 1.9 | 2.8 | 3.1 | 3.3 | 1.0 | 1.2 | 2.8 | 5.9 | 2.0 | 1.8 | 2.5 | 2.3 | 1.0 | 5.9 | 0.9 | 24 |
| 2 | 1.9 | 1.7 | 2.3 | 2.7 | 2.4 | 2.4 | 2.2 | 4.4 | 5.5 | 5.3 | 5.2 | 6.3 | 6.7 | 9.9 | 10.2 | 9.5 | 7.6 | 6.5 | 6.0 | 7.8 | 7.6 | 7.4 | 8.3 | 7.0 | 1.7 | 10.2 | 4.8 | 24 |
| 3 | 6.8 | 7.4 | 7.3 | 6.4 | 4.7 | 6.1 | 6.2 | 7.7 | 8.4 | 8.2 | 8.5 | 8.2 | 7.6 | 7.1 | 6.0 | 5.0 | 3.1 | 3.5 | 3.2 | 2.7 | 3.7 | 3.7 | 2.1 | 2.6 | 2.1 | 8.5 | 4.5 | 24 |
| 4 | 1.9 | 2.6 | 3.4 | 4.2 | 4.3 | 4.1 | 5.0 | 7.0 | 7.6 | 7.0 | 9.1 | 6.8 | 5.1 | 5.5 | 6.3 | 7.4 | 8.0 | 7.7 | 3.0 | 1.1 | 1.6 | 1.3 | 1.3 | 1.8 | 1.1 | 9.1 | 3.5 | 24 |
| 5 | 4.6 | 1.8 | 3.6 | 5.3 | 4.7 | 2.3 | 4.0 | 5.2 | 7.2 | 7.2 | 8.5 | 12.2 | 5.7 | 8.8 | 12.4 | 10.2 | 8.1 | 8.0 | 8.6 | 6.3 | 1.0 | 2.2 | 2.3 | 1.2 | 1.0 | 12.4 | 5.2 | 24 |
| 6 | 1.0 | 0.7 | 1.3 | 1.6 | 0.3 | 4.0 | 5.9 | 6.5 | 6.7 | 5.6 | 5.5 | 6.3 | 5.8 | 6.1 | 5.6 | 6.8 | 6.8 | 7.8 | 5.3 | 2.9 | 3.8 | 4.2 | 2.7 | 0.8 | 0.3 | 7.8 | 4.1 | 24 |
| 7 | 0.3 | 0.9 | 0.8 | 0.7 | 1.4 | 1.8 | 2.7 | 2.3 | 3.9 | 3.7 | 2.0 | 4.4 | 3.5 | 6.9 | 4.7 | 4.4 | 4.7 | 4.8 | 4.8 | 3.4 | 3.5 | 3.3 | 3.7 | 2.2 | 0.3 | 6.9 | 2.4 | 24 |
| 8 | 1.9 | 3.0 | 2.7 | 4.0 | 3.8 | 3.7 | 4.1 | 4.1 | 5.0 | 6.1 | 7.9 | 8.4 | 7.4 | 8.5 | 7.6 | 7.4 | 7.2 | 5.1 | 5.7 | 3.7 | 3.2 | 4.2 | 3.6 | 3.2 | 1.9 | 8.5 | 4.4 | 24 |
| 9 | 4.2 | 3.8 | 4.5 | 5.8 | 6.0 | 5.8 | 6.1 | 4.5 | 4.5 | 3.4 | 2.6 | 3.8 | 3.2 | 3.2 | 6.2 | 4.5 | 5.1 | 4.6 | 5.3 | 6.5 | 13.2 | 8.8 | 10.2 | 12.0 | 2.6 | 13.2 | 5.2 | 24 |
| 10 | 13.7 | 12.1 | 11.7 | 9.3 | 9.1 | 9.4 | 8.9 | 12.0 | 10.6 | 10.3 | 9.4 | 9.0 | 9.2 | 5.3 | 4.1 | 2.3 | 4.5 | 5.7 | 6.6 | 5.0 | 4.6 | 5.2 | 5.3 | 3.2 | 2.3 | 13.7 | 4.6 | 24 |
| 11 | 3.4 | 2.0 | 1.8 | 2.7 | 3.0 | 8.6 | 6.3 | 7.5 | 6.4 | 7.1 | 7.2 | 7.1 | 6.7 | 6.5 | 5.9 | 5.8 | 5.0 | 4.8 | 5.3 | 3.3 | 2.8 | 3.7 | 3.0 | 3.3 | 1.8 | 8.6 | 3.5 | 24 |
| 12 | 2.3 | 1.7 | 1.4 | 0.9 | 1.0 | 0.9 | 5.0 | 6.4 | 6.2 | 8.1 | 9.3 | 9.1 | 10.0 | 10.5 | 9.1 | 6.2 | 8.3 | 8.7 | 8.7 | 5.9 | 5.5 | 6.0 | 7.3 | 7.1 | 0.9 | 10.5 | 6.0 | 24 |
| 13 | 6.6 | 1.5 | 1.0 | 3.3 | 6.0 | 3.6 | 2.5 | 3.7 | 1.4 | 3.7 | 2.7 | 3.7 | 4.0 | 4.3 | 8.2 | 11.8 | 8.4 | 3.9 | 3.2 | 2.3 | 2.1 | 1.3 | 1.5 | 4.5 | 1.0 | 11.8 | 2.1 | 24 |
| 14 | 2.6 | 0.8 | 1.1 | 1.2 | 1.0 | 0.7 | 2.1 | 2.3 | 3.4 | 3.9 | 4.3 | 5.3 | 5.4 | 4.9 | 7.9 | 7.0 | 5.3 | 5.0 | 5.7 | 5.5 | 6.1 | 4.6 | 2.7 | 1.3 | 0.7 | 7.9 | 3.5 | 24 |
| 15 | 3.1 | 2.2 | 1.2 | 0.8 | 1.1 | 1.6 | 2.8 | 3.4 | 3.4 | 4.0 | 4.9 | 7.8 | 2.8 | 3.8 | 5.5 | 5.2 | 1.3 | 1.6 | 2.7 | 3.1 | 3.1 | 2.2 | 1.2 | 1.7 | 0.8 | 7.8 | 1.4 | 24 |
| 16 | 2.0 | 1.4 | 1.1 | 0.3 | 1.3 | 1.7 | 3.4 | 1.6 | 1.6 | 2.3 | 2.8 | 3.7 | 3.0 | 4.4 | 2.2 | 0.9 | 2.9 | 3.4 | 5.3 | 3.9 | 3.2 | 1.7 | 2.6 | 3.3 | 0.3 | 5.3 | 0.3 | 24 |
| 17 | 2.7 | 3.1 | 2.6 | 3.3 | 3.1 | 3.1 | 3.8 | 6.4 | 6.7 | 6.2 | 6.1 | 7.5 | 8.8 | 7.9 | 8.1 | 6.9 | 6.1 | 6.0 | 4.9 | 3.6 | 2.9 | 1.8 | 0.6 | 1.2 | 0.6 | 8.8 | 4.0 | 24 |
| 18 | 1.6 | 1.4 | 2.1 | 1.2 | 0.6 | 2.3 | 3.4 | 3.5 | 1.9 | 3.0 | 5.2 | 2.5 | 5.5 | 7.0 | 6.2 | 6.9 | 5.1 | 5.4 | 6.2 | 4.3 | 2.3 | 1.2 | 3.7 | 6.2 | 0.6 | 7.0 | 1.9 | 24 |
| 19 | 5.7 | 4.5 | 5.2 | 5.5 | 5.8 | 5.5 | 5.6 | 4.6 | 5.3 | 5.9 | 5.7 | 5.0 | 3.7 | 2.6 | 2.9 | 4.2 | 3.0 | 7.2 | 6.5 | 5.9 | 3.8 | 3.6 | 2.6 | 3.4 | 2.6 | 7.2 | 3.0 | 24 |
| 20 | 1.9 | 1.8 | 1.0 | 0.8 | 1.5 | 4.6 | 4.3 | 5.9 | 5.5 | 5.9 | 6.4 | 5.9 | 6.4 | 6.0 | 5.5 | 5.1 | 8.7 | 7.3 | 6.7 | 3.8 | 1.7 | 5.1 | 2.3 | 2.1 | 0.8 | 8.7 | 3.6 | 24 |
| 21 | 7.2 | 8.1 | 8.0 | 7.2 | 4.6 | 5.1 | 9.4 | 9.4 | 10.2 | 10.5 | 9.9 | 9.0 | 9.6 | 10.0 | 11.3 | 11.9 | 8.2 | 7.7 | 7.2 | 8.7 | 9.3 | 10.2 | 9.7 | 8.6 | 4.6 | 11.9 | 8.7 | 24 |
| 22 | 7.5 | 7.1 | 6.5 | 8.8 | 11.9 | 11.9 | 12.5 | 9.8 | 10.5 | 10.3 | 11.8 | 8.8 | 10.0 | 9.7 | 8.2 | 8.5 | 8.1 | 8.7 | 7.4 | 7.5 | 4.1 | 0.4 | 2.1 | 2.6 | 0.4 | 12.5 | 7.5 | 24 |
| 23 | 3.2 | 2.5 | 2.3 | 2.1 | 1.9 | 1.5 | 1.0 | 1.8 | 4.3 | 4.7 | 7.0 | 6.4 | 6.8 | 7.5 | 7.2 | 7.2 | 9.1 | 8.2 | 7.5 | 8.9 | 2.1 | 2.1 | 1.8 | 2.4 | 1.0 | 9.1 | 3.0 | 24 |
| 24 | 1.3 | 1.9 | 2.5 | 1.6 | 2.2 | 1.2 | 1.5 | 3.6 | 4.1 | 1.3 | 4.0 | 3.0 | 4.2 | 4.8 | 10.0 | 2.8 | 1.4 | 1.2 | 6.3 | 4.6 | 4.1 | 3.4 | 2.4 | 1.5 | 1.2 | 10.0 | 1.7 | 24 |
| 25 | 1.2 | 2.2 | 0.8 | 0.9 | 1.1 | 1.2 | 0.4 | 3.3 | 7.0 | 6.6 | 5.4 | 6.4 | 6.5 | 6.6 | 6.0 | 7.7 | 5.8 | 5.4 | 5.2 | 5.0 | 5.5 | 6.6 | 7.6 | 7.5 | 0.4 | 7.7 | 4.4 | 24 |
| 26 | 7.4 | 7.7 | 7.8 | 7.3 | 6.6 | 5.9 | 6.4 | 6.8 | 8.7 | 11.5 | 13.1 | 10.9 | 12.3 | 10.6 | 10.6 | 11.3 | 7.5 | 6.0 | 5.7 | 5.6 | 5.6 | 5.6 | 4.9 | 5.5 | 4.9 | 13.1 | 6.8 | 24 |
| 27 | 4.3 | 3.6 | 6.2 | 0.6 | 4.6 | 5.7 | 6.4 | 5.2 | 5.1 | 5.6 | 7.3 | 6.5 | 4.2 | 7.3 | 7.8 | 7.3 | 8.3 | 7.7 | 6.6 | 5.1 | 2.8 | 2.9 | 4.0 | 2.8 | 0.6 | 8.3 | 4.2 | 24 |
| 28 | 5.7 | 5.6 | 4.9 | 4.9 | 3.9 | 4.6 | 1.2 | 1.9 | 2.0 | 4.5 | 2.9 | 4.8 | 6.8 | 3.2 | 6.7 | 12.5 | 12.4 | 12.9 | 14.8 | 11.6 | 10.0 | 3.6 | 2.3 | 0.7 | 0.7 | 14.8 | 3.4 | 24 |
| 29 | 0.4 | 1.8 | 1.3 | 1.8 | 1.0 | 2.1 | 2.8 | 2.8 | 4.6 | 4.9 | 6.9 | 6.1 | 5.8 | 5.2 | 5.9 | 4.7 | 4.5 | 4.4 | 3.5 | 4.1 | 4.5 | 4.6 | 4.0 | 3.9 | 0.4 | 6.9 | 3.5 | 24 |
| 30 | 2.9 | 1.2 | 0.9 | 1.1 | 0.4 | 0.8 | 0.8 | 1.4 | 3.2 | 2.9 | 2.9 | 2.2 | 5.2 | 4.7 | 2.0 | 4.1 | 0.9 | 2.3 | 2.0 | 1.5 | 1.0 | 1.6 | 1.1 | 1.5 | 0.4 | 5.2 | 1.1 | 24 |
| HOURLY MAX | 13.7 | 12.1 | 11.7 | 9.3 | 11.9 | 11.9 | 12.5 | 12.0 | 10.6 | 11.5 | 13.1 | 12.2 | 12.3 | 10.6 | 12.4 | 12.5 | 12.4 | 12.9 | 14.8 | 11.6 | 13.2 | 10.2 | 10.2 | 12.0 | | | | |
| HOURLY AVG | 0.3 | 0.3 | 0.5 | 0.7 | 0.9 | 0.6 | 1.0 | 0.8 | 0.9 | 0.9 | 0.6 | 0.6 | 0.4 | 1.0 | 0.9 | 1.2 | 0.9 | 0.3 | 0.3 | 0.9 | 0.3 | 1.1 | 1.0 | 0.4 | | | | |

STATUS FLAG CODES

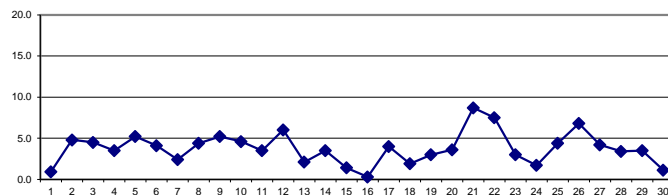
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

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

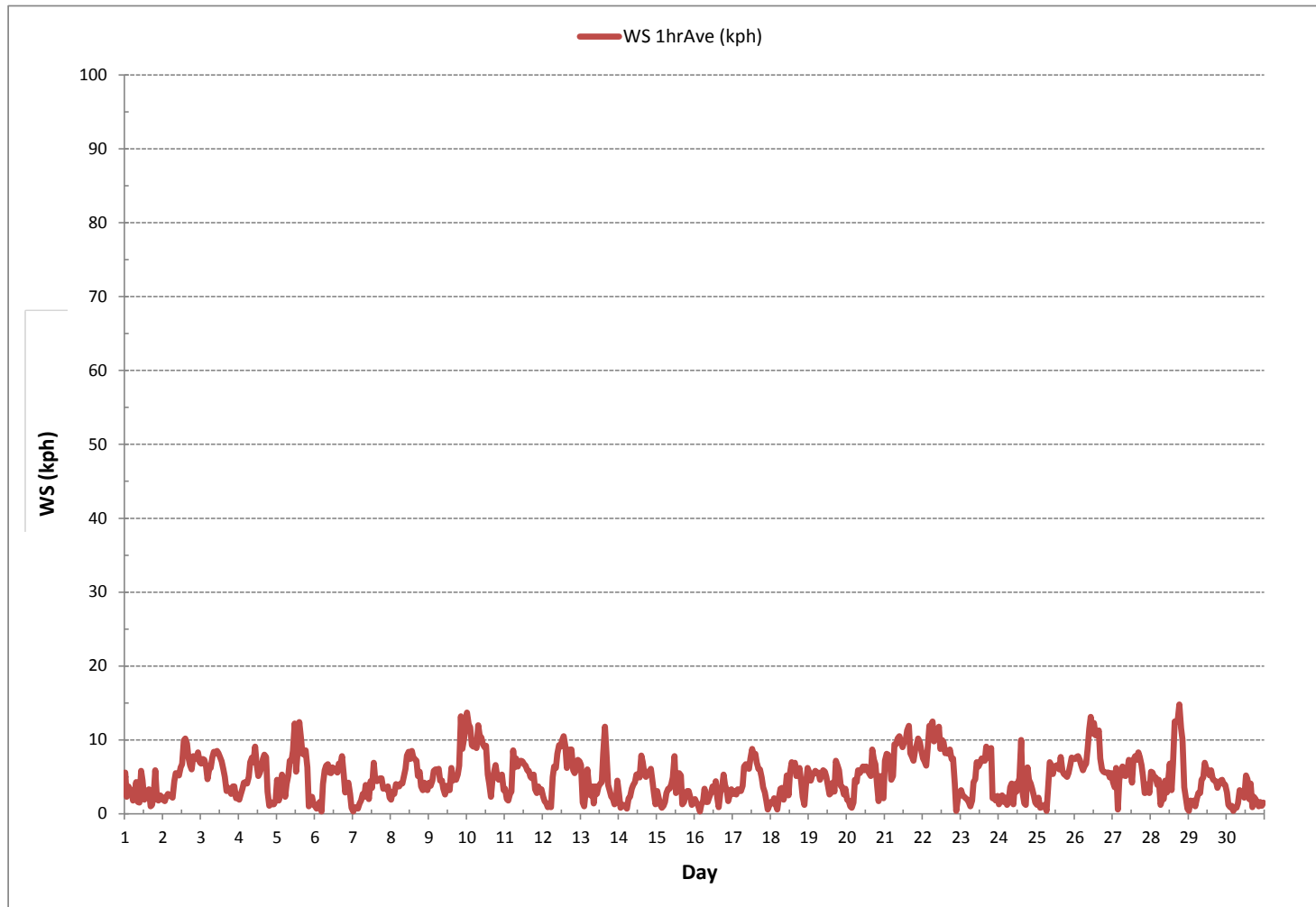
MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 720 |
| MINIMUM 1-HR AVERAGE | 0.3 kph @ HOUR 4 ON DAY 6 |
| MAXIMUM 1-HR AVERAGE: | 14.8 kph @ HOUR 18 ON DAY 28 |
| MAXIMUM 24-HR AVERAGE: | 8.7 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 720 hrs |
| AMSD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 2.9 |
| MONTHLY AVERAGE: | 0.3 kph |

24 HR AVERAGES June 2017



WIND SPEED Hourly Averages (WS kph)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 24.0 | 7.1 | 7.6 | 7.8 | 8.9 | 7.7 | 10.8 | 18.2 | 11.9 | 11.6 | 17.9 | 17.7 | 13.9 | 15.2 | 16.6 | 15.5 | 13.7 | 7.6 | 14.4 | 28.8 | 13.7 | 8.5 | 7.6 | 7.8 | 7.1 | 28.8 | 13.1 | 24 | |
| 2 | 4.3 | 3.6 | 4.7 | 5.4 | 6.1 | 7.6 | P | 17.2 | 17.9 | 19.7 | 18.8 | 21.7 | 27.4 | 42.5 | 43.6 | 38.7 | 32.8 | 25.3 | 33.0 | 29.7 | 35.4 | 27.7 | 32.1 | 23.4 | 3.6 | 43.6 | 22.5 | 23 | |
| 3 | 28.2 | 36.9 | 27.7 | 29.5 | 19.0 | 22.0 | 27.1 | 33.4 | 35.6 | 29.0 | 31.2 | 36.7 | 34.3 | 31.0 | 30.4 | 23.5 | 15.5 | 16.1 | 11.3 | 8.0 | 10.9 | 9.6 | 8.3 | 5.0 | 5.0 | 36.9 | 23.3 | 24 | |
| 4 | 8.8 | 8.3 | 7.4 | 12.6 | 12.4 | 9.1 | 18.1 | 22.9 | 29.7 | 31.9 | 36.0 | 29.9 | 24.4 | 25.1 | 26.8 | 30.6 | 33.4 | 25.7 | 12.4 | 8.9 | 10.2 | 6.5 | 10.7 | 10.0 | 6.5 | 36.0 | 18.8 | 24 | |
| 5 | 15.5 | 12.0 | 13.5 | 15.9 | 20.3 | 15.9 | 17.4 | 28.4 | 30.4 | 32.1 | 33.0 | 40.2 | 27.4 | 39.9 | 41.4 | 38.1 | 29.7 | 30.6 | 23.6 | 18.1 | 4.5 | 4.3 | 6.5 | 5.2 | 4.3 | 41.4 | 22.7 | 24 | |
| 6 | 5.4 | 3.6 | 5.8 | 8.0 | 3.2 | 14.6 | 16.4 | 20.1 | 21.2 | 20.7 | 16.1 | 17.7 | 25.5 | 21.1 | 22.9 | 25.1 | 25.3 | 24.2 | 18.8 | 8.2 | 7.2 | 8.0 | 8.1 | 4.2 | 3.2 | 25.5 | 14.6 | 24 | |
| 7 | 4.6 | 4.6 | 4.8 | 4.1 | 5.8 | 7.6 | 5.8 | 8.7 | 12.4 | 13.3 | 16.6 | 19.4 | 22.0 | 17.9 | 20.3 | 18.8 | 19.2 | 21.4 | 15.7 | 11.5 | 6.5 | 6.7 | 7.8 | 8.0 | 4.1 | 22.0 | 11.8 | 24 | |
| 8 | 6.9 | 8.5 | 7.8 | 9.1 | P | 8.5 | 8.9 | 13.1 | 22.9 | 28.4 | 29.5 | 33.9 | 39.7 | 31.6 | 31.6 | 26.4 | 26.6 | 19.4 | 24.6 | 12.2 | 15.3 | 16.6 | 13.7 | 11.8 | 6.9 | 39.7 | 19.4 | 23 | |
| 9 | 10.2 | 10.9 | 17.9 | 19.2 | 23.6 | 15.9 | 25.1 | 15.7 | 23.8 | 14.8 | 15.3 | 14.6 | 13.9 | 12.2 | 17.9 | 27.7 | 22.0 | 17.4 | 15.9 | 16.4 | 38.3 | 40.7 | 35.7 | 44.0 | 10.2 | 44.0 | 21.2 | 24 | |
| 10 | 44.9 | 35.7 | 38.0 | 32.8 | 35.4 | 31.9 | 25.6 | 33.7 | 34.1 | 27.3 | 28.4 | 24.7 | 21.0 | 18.6 | 23.6 | 15.5 | 16.4 | 16.6 | 19.2 | 13.7 | 11.8 | 13.1 | 15.3 | 13.1 | 11.8 | 44.9 | 24.6 | 24 | |
| 11 | 9.7 | 10.7 | 8.3 | 12.0 | 13.9 | P | 22.5 | 25.6 | 33.7 | 30.8 | 27.7 | 29.5 | 32.1 | 30.8 | 26.6 | 27.1 | 22.7 | 24.0 | 22.0 | 19.5 | 12.1 | 8.4 | 8.3 | 10.0 | 8.3 | 33.7 | 20.3 | 23 | |
| 12 | 5.6 | 4.8 | 3.4 | 4.5 | 2.8 | 10.4 | 15.5 | 17.0 | 28.4 | 26.2 | 27.3 | 27.9 | 30.4 | 32.8 | 36.7 | 19.2 | 27.3 | 30.1 | 30.3 | 20.3 | 15.5 | 19.4 | 23.0 | 21.2 | 2.8 | 36.7 | 20.0 | 24 | |
| 13 | 22.6 | 15.6 | 14.9 | 12.9 | 15.5 | 14.1 | 10.4 | 9.3 | 11.1 | 10.9 | 12.0 | 13.3 | 15.9 | 18.1 | 26.2 | 27.7 | 26.2 | 31.2 | 12.0 | 11.1 | 8.0 | 9.3 | 20.3 | 16.1 | 8.0 | 31.2 | 16.0 | 24 | |
| 14 | 13.7 | 4.5 | 4.8 | 3.0 | 3.4 | 5.0 | 7.6 | 11.8 | 16.1 | 15.3 | 16.6 | 15.7 | 16.4 | 27.7 | 24.3 | 23.1 | 21.7 | 16.0 | 16.2 | 21.0 | 16.0 | 11.1 | 8.9 | 10.0 | 3.0 | 27.7 | 13.7 | 24 | |
| 15 | 10.7 | 9.1 | 4.1 | 4.1 | 3.0 | 5.6 | 11.3 | 11.8 | 12.8 | 14.2 | 22.3 | 22.7 | 14.4 | 13.3 | 22.5 | 15.5 | 10.2 | 8.9 | 10.7 | 13.1 | 12.4 | 7.6 | 5.0 | 6.1 | 3.0 | 22.7 | 11.3 | 24 | |
| 16 | 6.3 | 5.0 | 4.6 | 5.3 | 5.3 | 5.6 | 11.8 | 6.3 | 8.9 | 8.7 | 14.1 | 16.8 | 13.7 | 18.5 | 14.4 | 29.0 | 13.1 | 23.1 | 22.7 | 11.1 | 8.5 | 13.3 | 17.4 | 12.8 | 4.6 | 29.0 | 12.3 | 24 | |
| 17 | 14.1 | 13.5 | 11.8 | 13.3 | 12.4 | 11.5 | 18.3 | 24.7 | 25.5 | 23.6 | 25.5 | 36.3 | 33.4 | 32.7 | 37.9 | 34.6 | 25.9 | 25.9 | 21.5 | 14.7 | 16.0 | 7.4 | 8.9 | 6.3 | 6.3 | 37.9 | 20.7 | 24 | |
| 18 | 6.3 | 17.2 | 13.9 | 6.9 | 3.9 | 8.9 | 10.2 | 16.1 | 11.1 | 27.9 | 17.9 | 33.4 | 22.7 | 24.9 | 35.2 | 29.1 | 22.3 | 32.1 | 28.4 | 32.3 | 14.1 | 7.1 | 12.0 | 32.6 | 3.9 | 35.2 | 19.4 | 24 | |
| 19 | 25.0 | 21.7 | 22.1 | 21.4 | 19.9 | 20.8 | 23.1 | 15.5 | 18.8 | 26.9 | 23.1 | 17.4 | 18.8 | 19.4 | 16.6 | 19.6 | 14.8 | 20.1 | 22.5 | 16.1 | 9.8 | 8.3 | 6.1 | 6.1 | 6.1 | 26.9 | 18.1 | 24 | |
| 20 | 6.3 | 7.1 | 4.1 | 3.7 | 7.1 | 12.4 | 13.9 | 19.7 | 16.4 | 17.1 | 19.5 | 19.3 | 27.8 | 25.8 | 26.9 | 21.4 | 35.4 | 35.0 | 36.7 | 17.4 | 11.8 | 12.6 | 19.0 | 12.6 | 3.7 | 36.7 | 17.9 | 24 | |
| 21 | 35.0 | 29.3 | 34.1 | 35.8 | 17.9 | 23.1 | 39.4 | 48.6 | 42.4 | 39.1 | 40.4 | 39.6 | 45.7 | 49.2 | 45.3 | 67.8 | 46.6 | 34.0 | 36.8 | 37.5 | 41.2 | 55.8 | 39.8 | 38.0 | 17.9 | 67.8 | 40.1 | 24 | |
| 22 | 29.9 | 26.2 | 26.9 | 39.4 | 45.1 | 55.3 | 48.4 | 39.8 | 50.3 | P | 56.7 | 44.3 | 52.4 | 35.1 | 42.7 | 39.1 | 33.0 | 36.9 | 50.5 | 24.4 | 12.4 | 6.9 | 4.8 | 5.0 | 4.8 | 56.7 | 35.0 | 23 | |
| 23 | 5.2 | 5.6 | 5.2 | 4.3 | 4.1 | 5.0 | 6.1 | 7.4 | 17.1 | 22.4 | 27.6 | 23.0 | 30.7 | 29.4 | 30.7 | 32.1 | 30.6 | 31.4 | 26.0 | 22.7 | 13.3 | 6.3 | 5.6 | 35.0 | 4.1 | 35.0 | 17.8 | 24 | |
| 24 | 10.2 | 8.5 | 8.7 | 9.8 | 5.6 | 4.5 | 8.5 | 14.8 | 15.0 | 13.3 | 17.0 | 21.8 | 20.3 | 26.0 | 47.2 | 18.6 | 16.6 | 15.7 | 14.8 | 14.8 | 9.1 | 7.6 | 7.0 | 4.9 | 4.5 | 47.2 | 14.2 | 24 | |
| 25 | 4.2 | 4.6 | 4.1 | 4.8 | 4.8 | 4.8 | 5.6 | 14.1 | 19.2 | 18.3 | 18.3 | 22.5 | 21.4 | 24.0 | 19.2 | 25.1 | 22.7 | 19.4 | 17.4 | 16.6 | 13.7 | 16.4 | 21.6 | 21.0 | 4.1 | 25.1 | 15.2 | 24 | |
| 26 | 20.5 | 22.3 | 25.8 | 22.7 | 20.3 | 19.9 | 23.8 | 29.1 | 38.5 | 43.8 | 39.0 | 43.8 | 49.1 | 35.9 | 37.9 | 34.8 | 32.7 | 22.3 | 26.8 | 22.7 | 15.5 | 19.0 | 16.6 | 21.0 | 15.5 | 49.1 | 28.5 | 24 | |
| 27 | 13.5 | 27.3 | 29.7 | 15.5 | 19.2 | 27.3 | 28.2 | 22.7 | 21.4 | 20.7 | 27.5 | 33.2 | 18.3 | 35.6 | 34.1 | 36.7 | 35.6 | 34.3 | 32.6 | 24.0 | 12.8 | 8.7 | 10.9 | 11.5 | 8.7 | 36.7 | 24.2 | 24 | |
| 28 | 18.1 | 15.0 | 10.9 | 11.1 | 13.8 | 14.5 | 5.3 | 10.4 | 16.4 | 13.1 | 12.4 | 19.4 | 18.8 | 10.7 | 29.3 | 32.1 | 36.3 | 32.1 | 33.4 | 34.5 | 26.0 | 14.2 | 7.8 | 4.1 | 4.1 | 36.3 | 18.3 | 24 | |
| 29 | 3.2 | 6.5 | 5.6 | 5.6 | 5.0 | 9.0 | 9.0 | 8.0 | 14.4 | 14.1 | 27.3 | 22.5 | 23.1 | 18.5 | 18.3 | 19.4 | 16.6 | 13.9 | 11.1 | 8.7 | 8.5 | 9.6 | 12.8 | 8.5 | 3.2 | 27.3 | 12.5 | 24 | |
| 30 | 7.6 | 4.8 | 3.0 | 4.1 | 3.0 | 8.3 | 7.8 | 8.3 | 9.8 | 10.2 | 10.0 | 10.4 | 13.3 | 13.9 | 17.9 | 10.4 | 5.4 | 13.3 | 10.3 | 5.9 | 4.6 | 4.4 | 5.5 | 4.1 | 3.0 | 17.9 | 8.2 | 24 | |
| HOURLY MAX | 44.9 | 36.9 | 38.0 | 39.4 | 45.1 | 55.3 | 48.4 | 48.6 | 50.3 | 43.8 | 56.7 | 44.3 | 52.4 | 49.2 | 47.2 | 67.8 | 46.6 | 36.9 | 50.5 | 37.5 | 41.2 | 55.8 | 39.8 | 44.0 | | | | | |
| HOURLY AVG | 14.0 | 13.0 | 12.7 | 12.8 | 12.4 | 14.0 | 16.6 | 19.1 | 22.2 | 21.6 | 24.2 | 25.6 | 25.6 | 25.9 | 28.8 | 27.4 | 24.3 | 23.5 | 22.4 | 18.1 | 14.5 | 13.2 | 13.6 | 14.0 | | | | | |

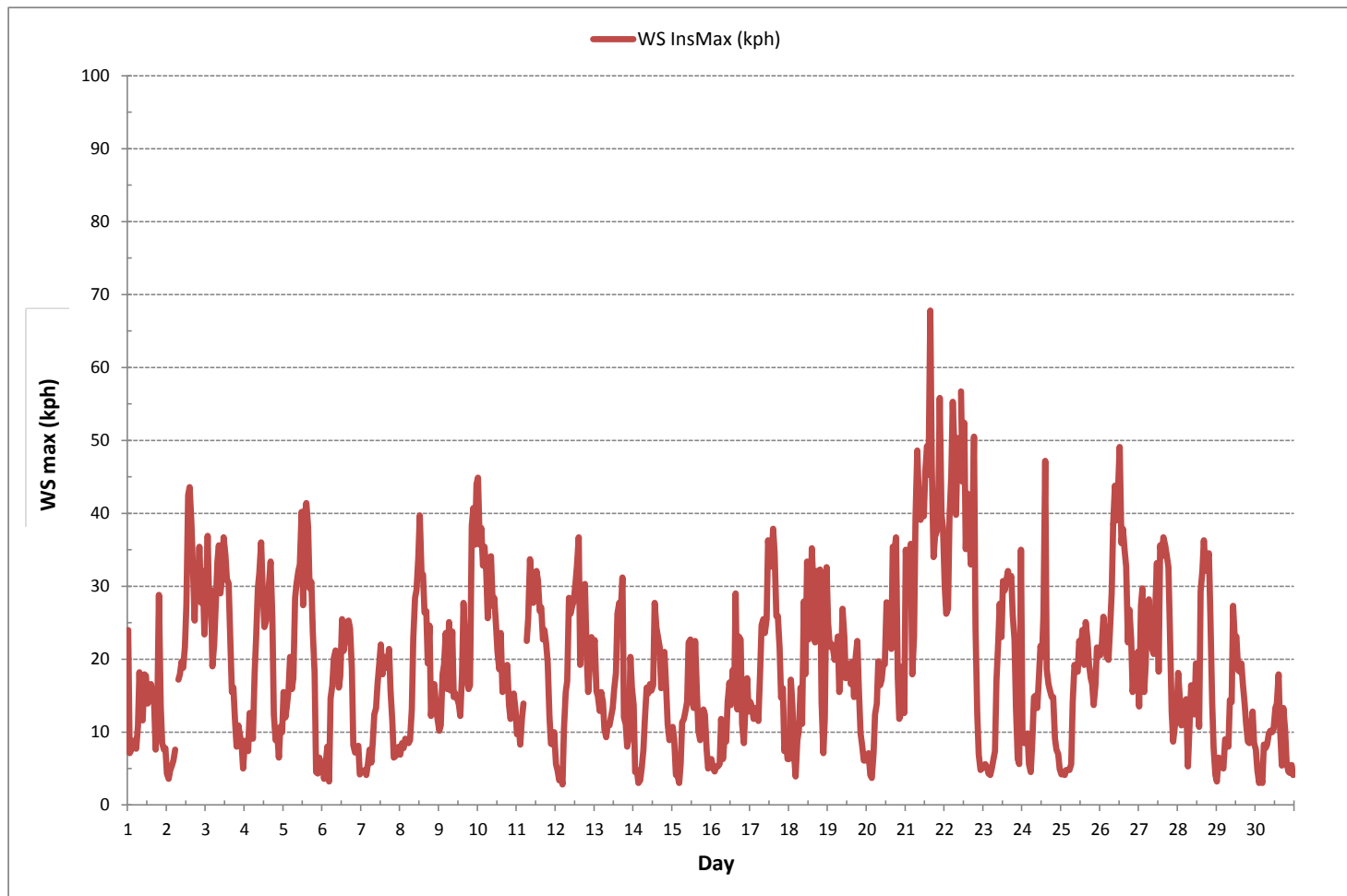
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 67.8 | kph | @ HOUR | 15 | ON DAY | 21 | |
| OPERATIONAL TIME: | | | | | | 716 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



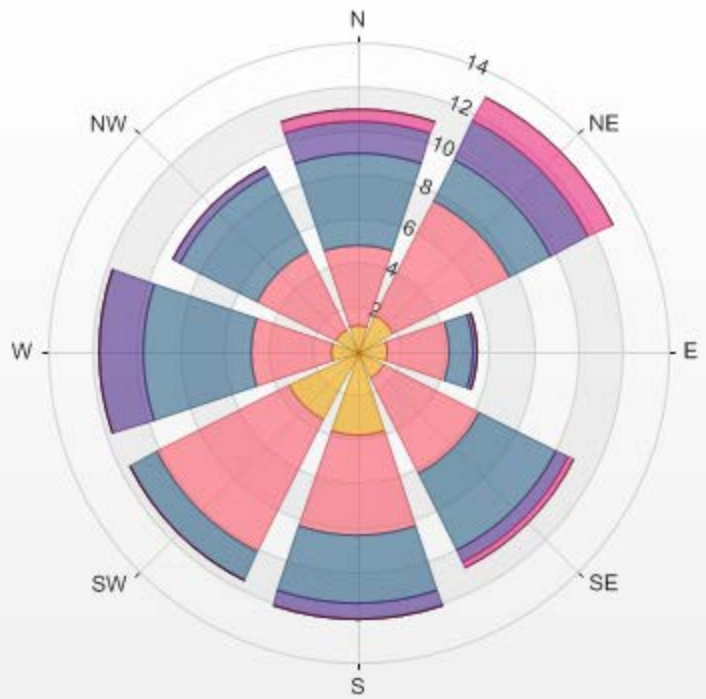
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 17/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 15.14%

| Direction | 1.8-3.0 | 3.0-6.0 | 6.0-8.9 | 8.9-11.9 | 11.9-14.9 | >14.9 | Total |
|----------------|---------|---------|---------|----------|-----------|-------|-------|
| N | 1.3 | 3.6 | 4.2 | 1.4 | 0.6 | 0.0 | 11.0 |
| NE | 1.8 | 5.8 | 2.1 | 1.9 | 1.3 | 0.0 | 12.9 |
| E | 1.4 | 2.8 | 1.1 | 0.1 | 0.0 | 0.0 | 5.4 |
| SE | 1.4 | 4.7 | 3.9 | 0.7 | 0.3 | 0.0 | 11.0 |
| S | 3.8 | 4.6 | 3.1 | 0.7 | 0.0 | 0.0 | 12.1 |
| SW | 3.5 | 6.7 | 1.4 | 0.0 | 0.0 | 0.0 | 11.5 |
| W | 1.3 | 3.6 | 4.9 | 1.9 | 0.0 | 0.0 | 11.7 |
| NW | 1.1 | 4.0 | 3.9 | 0.3 | 0.0 | 0.0 | 9.3 |
| Summary | 15.4 | 35.8 | 24.5 | 7.1 | 2.1 | 0.0 | 84.9 |

% Icon Classes (kph) 15 1.8-3.0 36 3.0-6.0 24 6.0-8.9 7 8.9-11.9 2 11.9-14.9 0 >14.9

LICA MASKWA 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 15.14% Calm Wind Avg Speed: 1.18(kph)



WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

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

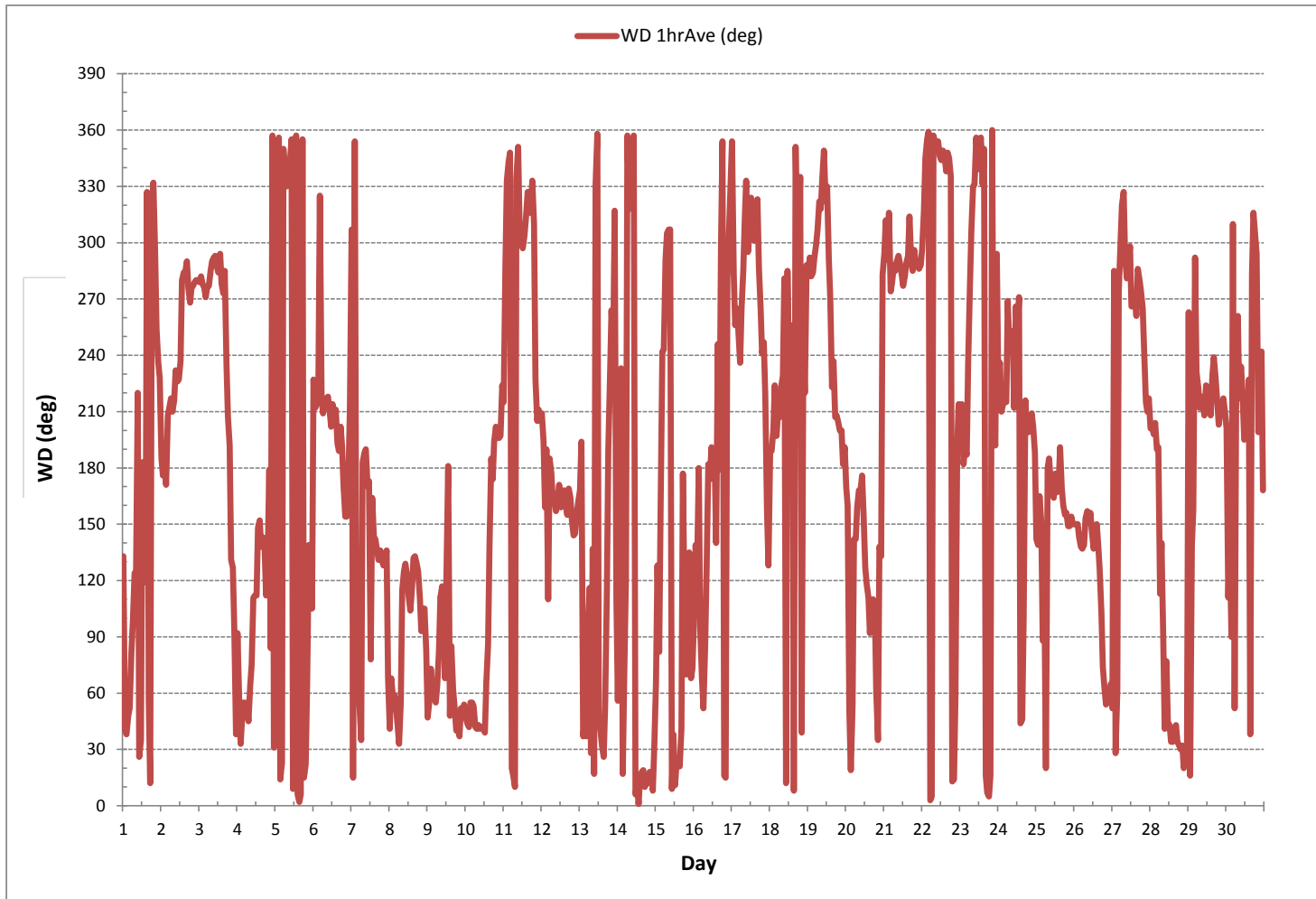
STATUS FLAG CODES

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

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

| | | | | | |
|---------------------------|-----|-----|-----------------------|-----------|-----|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 720 | hrs |
| STANDARD DEVIATION: | 102 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 332 (NNW) | |

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | RDGS. |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 32 | 28 | 16 | 24 | 24 | 33 | 39 | 38 | 53 | 54 | 44 | 38 | 50 | 40 | 57 | 52 | 59 | 54 | 44 | 33 | 34 | 32 | 33 | 31 | 24 |
| 2 | 19 | 20 | 13 | 14 | 24 | 24 | 36 | 40 | 32 | 38 | 32 | 30 | 31 | 36 | 37 | 38 | 38 | 34 | 39 | 36 | 35 | 34 | 34 | 33 | 24 |
| 3 | 34 | 35 | 33 | 32 | 39 | 35 | 39 | 35 | 36 | 37 | 38 | 39 | 45 | 38 | 45 | 43 | 53 | 48 | 28 | 18 | 10 | 13 | 24 | 17 | 24 |
| 4 | 24 | 19 | 20 | 17 | 18 | 18 | 26 | 25 | 31 | 40 | 40 | 46 | 41 | 33 | 35 | 36 | 31 | 30 | 42 | 56 | 52 | 57 | 60 | 63 | 24 |
| 5 | 33 | 42 | 30 | 23 | 45 | 43 | 44 | 42 | 41 | 40 | 34 | 33 | 50 | 36 | 30 | 34 | 35 | 39 | 26 | 18 | 48 | 21 | 33 | 40 | 24 |
| 6 | 51 | 51 | 55 | 45 | 69 | 22 | 25 | 27 | 29 | 34 | 41 | 35 | 47 | 48 | 48 | 36 | 35 | 22 | 22 | 16 | 9 | 12 | 22 | 33 | 24 |
| 7 | 65 | 31 | 42 | 50 | 44 | 32 | 19 | 38 | 33 | 48 | 65 | 53 | 52 | 35 | 49 | 42 | 45 | 45 | 30 | 18 | 10 | 11 | 11 | 17 | 24 |
| 8 | 18 | 24 | 17 | 16 | 16 | 16 | 12 | 34 | 41 | 44 | 38 | 41 | 43 | 39 | 41 | 37 | 36 | 38 | 34 | 28 | 34 | 37 | 37 | 29 | 24 |
| 9 | 16 | 22 | 27 | 21 | 24 | 27 | 30 | 37 | 43 | 37 | 36 | 31 | 33 | 32 | 26 | 37 | 31 | 27 | 24 | 18 | 19 | 34 | 27 | 24 | 24 |
| 10 | 22 | 22 | 23 | 27 | 25 | 24 | 23 | 22 | 22 | 22 | 23 | 24 | 19 | 36 | 57 | 65 | 42 | 32 | 26 | 22 | 20 | 20 | 33 | 50 | 24 |
| 11 | 31 | 53 | 39 | 40 | 41 | 22 | 22 | 31 | 44 | 42 | 46 | 44 | 45 | 46 | 42 | 46 | 45 | 46 | 46 | 51 | 25 | 13 | 21 | 14 | 24 |
| 12 | 32 | 46 | 39 | 36 | 43 | 61 | 26 | 26 | 32 | 30 | 33 | 28 | 32 | 32 | 32 | 33 | 31 | 31 | 29 | 24 | 19 | 20 | 21 | 23 | 24 |
| 13 | 22 | 46 | 43 | 52 | 20 | 27 | 52 | 31 | 62 | 26 | 45 | 40 | 50 | 50 | 28 | 21 | 28 | 58 | 55 | 38 | 29 | 56 | 39 | 35 | 24 |
| 14 | 27 | 62 | 37 | 23 | 37 | 38 | 22 | 52 | 50 | 41 | 36 | 32 | 29 | 34 | 25 | 25 | 37 | 31 | 25 | 29 | 19 | 14 | 20 | 43 | 24 |
| 15 | 36 | 31 | 27 | 35 | 37 | 27 | 34 | 35 | 44 | 38 | 40 | 28 | 39 | 35 | 39 | 32 | 59 | 63 | 43 | 30 | 29 | 20 | 37 | 37 | 24 |
| 16 | 42 | 41 | 54 | 34 | 43 | 38 | 23 | 45 | 50 | 53 | 57 | 57 | 60 | 46 | 54 | 73 | 29 | 41 | 33 | 25 | 24 | 47 | 46 | 38 | 24 |
| 17 | 38 | 36 | 39 | 36 | 37 | 27 | 38 | 37 | 44 | 43 | 44 | 41 | 42 | 44 | 42 | 43 | 40 | 48 | 41 | 39 | 36 | 45 | 37 | 58 | 24 |
| 18 | 38 | 44 | 30 | 50 | 70 | 34 | 23 | 45 | 66 | 47 | 40 | 75 | 46 | 42 | 44 | 50 | 35 | 48 | 40 | 35 | 49 | 54 | 27 | 36 | 24 |
| 19 | 39 | 39 | 37 | 36 | 36 | 38 | 39 | 37 | 40 | 39 | 43 | 46 | 53 | 56 | 55 | 55 | 42 | 26 | 22 | 17 | 13 | 12 | 11 | 11 | 24 |
| 20 | 35 | 46 | 39 | 36 | 44 | 17 | 28 | 28 | 30 | 25 | 28 | 31 | 32 | 39 | 41 | 38 | 38 | 40 | 37 | 30 | 42 | 25 | 54 | 52 | 24 |
| 21 | 34 | 36 | 34 | 42 | 38 | 36 | 32 | 36 | 36 | 37 | 42 | 38 | 41 | 38 | 37 | 36 | 46 | 34 | 37 | 40 | 37 | 31 | 33 | 37 | 24 |
| 22 | 37 | 40 | 41 | 35 | 31 | 32 | 29 | 35 | 36 | 40 | 38 | 52 | 41 | 41 | 42 | 43 | 39 | 40 | 40 | 25 | 21 | 56 | 18 | 13 | 24 |
| 23 | 7 | 18 | 16 | 15 | 21 | 34 | 68 | 53 | 40 | 53 | 43 | 41 | 42 | 40 | 44 | 41 | 28 | 35 | 35 | 22 | 35 | 16 | 34 | 47 | 24 |
| 24 | 61 | 42 | 41 | 66 | 38 | 45 | 50 | 41 | 45 | 72 | 52 | 53 | 45 | 43 | 33 | 51 | 59 | 39 | 22 | 21 | 13 | 13 | 16 | 25 | 24 |
| 25 | 52 | 42 | 65 | 57 | 61 | 54 | 72 | 44 | 31 | 32 | 41 | 39 | 43 | 38 | 42 | 37 | 45 | 37 | 30 | 20 | 15 | 18 | 20 | 21 | 24 |
| 26 | 25 | 24 | 23 | 27 | 26 | 30 | 31 | 34 | 33 | 29 | 30 | 32 | 34 | 31 | 33 | 34 | 40 | 36 | 32 | 27 | 22 | 25 | 20 | 25 | 24 |
| 27 | 29 | 54 | 42 | 51 | 37 | 39 | 44 | 46 | 41 | 37 | 39 | 40 | 45 | 43 | 44 | 42 | 42 | 42 | 41 | 41 | 31 | 19 | 20 | 22 | 24 |
| 28 | 13 | 15 | 16 | 18 | 17 | 20 | 40 | 33 | 42 | 27 | 45 | 38 | 24 | 28 | 30 | 22 | 23 | 19 | 18 | 17 | 16 | 26 | 31 | 60 | 24 |
| 29 | 65 | 32 | 29 | 28 | 61 | 39 | 35 | 32 | 32 | 30 | 30 | 45 | 43 | 39 | 33 | 37 | 39 | 37 | 26 | 22 | 12 | 12 | 16 | 18 | 24 |
| 30 | 15 | 38 | 53 | 35 | 47 | 68 | 50 | 31 | 26 | 36 | 39 | 51 | 27 | 32 | 43 | 35 | 56 | 42 | 47 | 37 | 34 | 48 | 39 | 27 | 24 |

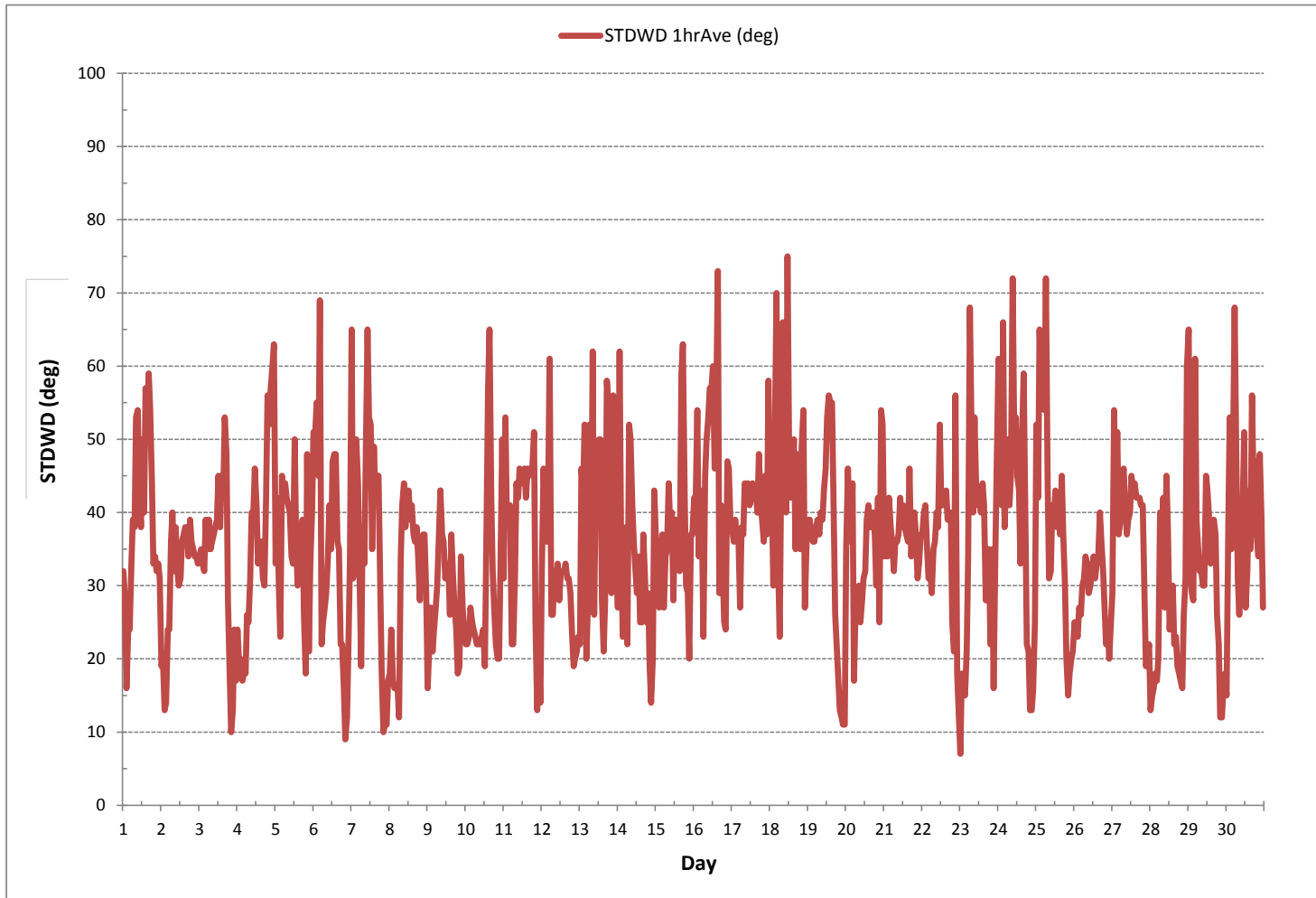
STATUS FLAG CODES

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

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



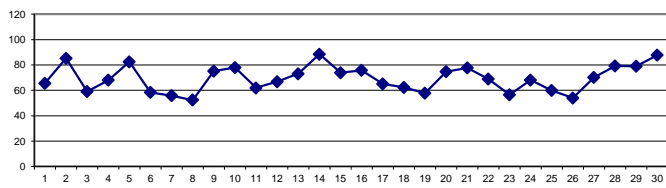
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

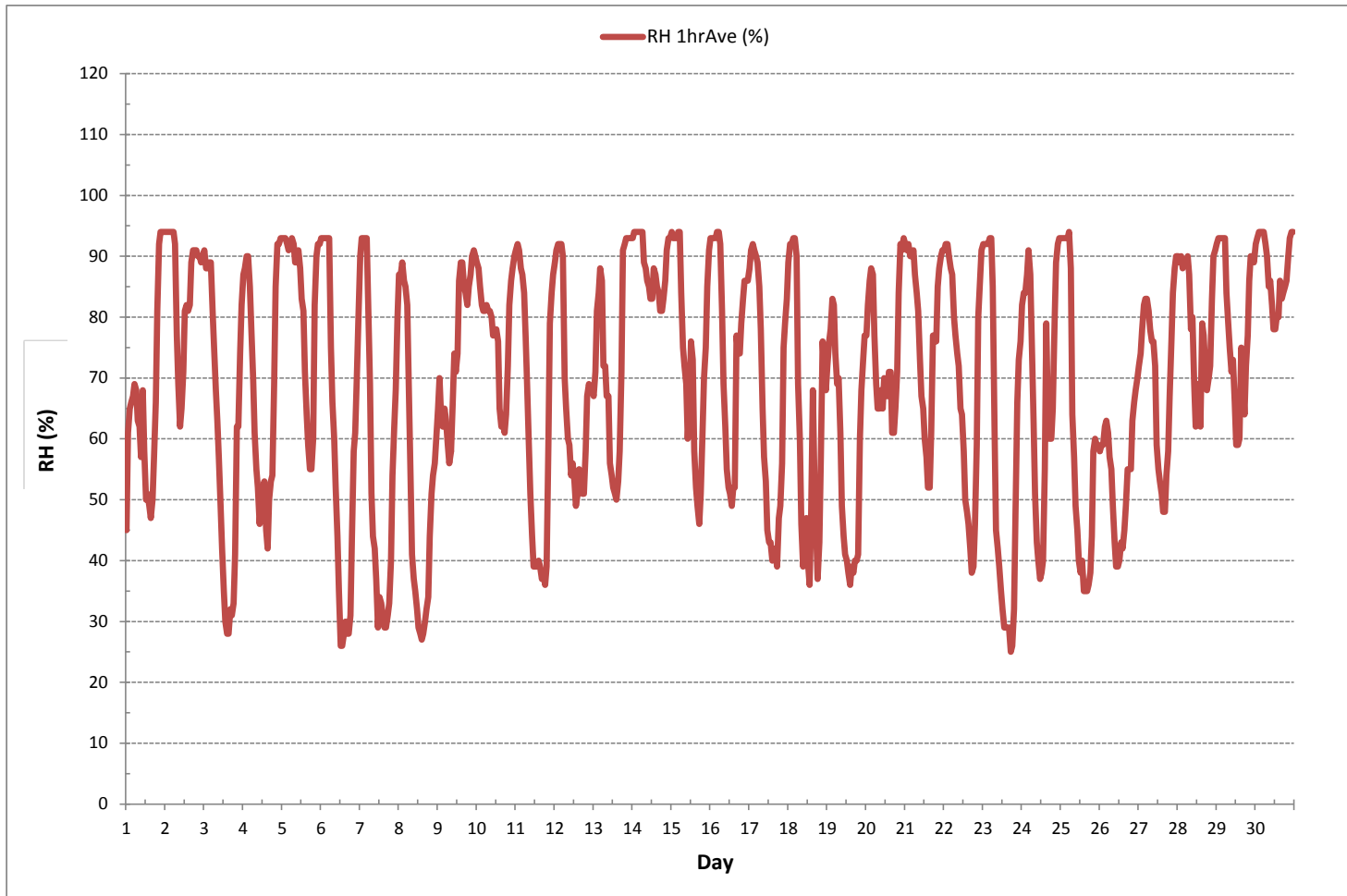
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | | |
|------------------------|----|---|------------------|----|--------|---------|
| MINIMUM 1-HR AVERAGE: | 25 | % | @ HOUR | 17 | ON DAY | 23 |
| MAXIMUM 1-HR AVERAGE: | 94 | % | @ HOUR | 21 | ON DAY | 1 |
| MAXIMUM 24-HR AVERAGE: | 88 | % | | | ON DAY | 14 |
| OPERATIONAL TIME: | | | | | | 720 hrs |
| AMD OPERATION UPTIME: | | | | | | 100.0 % |
| STANDARD DEVIATION: | 20 | | MONTHLY AVERAGE: | | | 69 % |

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



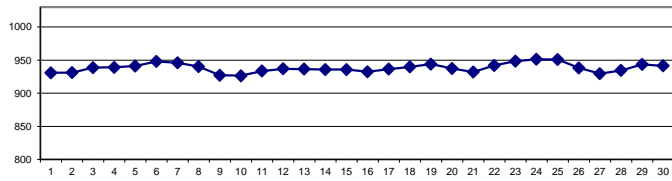
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 932 | 932 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 932 | 931 | 931 | 931 | 931 | 932 | 931 | 931 | 931 | 931 | 931 | 930 | 930 | 931 | 931 | 930 | 932 | 931 | 24 | |
| 2 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 931 | 932 | 932 | 933 | 933 | 933 | 934 | 934 | 930 | 934 | 24 | |
| 3 | 935 | 935 | 936 | 936 | 937 | 938 | 938 | 939 | 940 | 940 | 941 | 941 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 939 | 939 | 939 | 938 | 935 | 941 | 24 | |
| 4 | 938 | 938 | 938 | 938 | 939 | 939 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 938 | 940 | 24 | |
| 5 | 938 | 938 | 938 | 937 | 936 | 938 | 938 | 938 | 938 | 939 | 939 | 939 | 941 | 942 | 943 | 944 | 944 | 945 | 945 | 946 | 946 | 946 | 946 | 946 | 936 | 946 | 941 | 24 | |
| 6 | 947 | 947 | 947 | 948 | 948 | 949 | 950 | 950 | 950 | 951 | 950 | 950 | 950 | 949 | 949 | 948 | 948 | 947 | 947 | 947 | 946 | 946 | 946 | 946 | 946 | 951 | 948 | 24 | |
| 7 | 946 | 946 | 946 | 945 | 946 | 946 | 947 | 947 | 948 | 948 | 948 | 948 | 947 | 947 | 947 | 946 | 946 | 946 | 946 | 946 | 946 | 945 | 945 | 944 | 944 | 944 | 948 | 24 | |
| 8 | 944 | 944 | 943 | 943 | 943 | 943 | 944 | 944 | 944 | 943 | 943 | 942 | 941 | 941 | 940 | 939 | 938 | 938 | 937 | 936 | 935 | 934 | 934 | 934 | 934 | 934 | 940 | 24 | |
| 9 | 933 | 932 | 932 | 931 | 929 | 929 | 929 | 929 | 929 | 928 | 928 | 928 | 927 | 927 | 926 | 925 | 925 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 933 | 24 | |
| 10 | 925 | 924 | 924 | 925 | 925 | 925 | 925 | 926 | 926 | 926 | 926 | 927 | 927 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 927 | 24 | |
| 11 | 928 | 928 | 929 | 929 | 930 | 931 | 932 | 933 | 933 | 934 | 934 | 935 | 935 | 935 | 935 | 936 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 937 | 937 | 928 | 937 | 24 | |
| 12 | 937 | 937 | 937 | 937 | 938 | 938 | 939 | 940 | 940 | 939 | 939 | 939 | 938 | 938 | 937 | 937 | 936 | 935 | 935 | 934 | 934 | 935 | 935 | 935 | 934 | 940 | 937 | 24 | |
| 13 | 935 | 935 | 935 | 935 | 936 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 936 | 937 | 938 | 938 | 939 | 938 | 937 | 936 | 936 | 935 | 939 | 937 | 24 | |
| 14 | 937 | 937 | 937 | 937 | 937 | 937 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 936 | 935 | 935 | 935 | 935 | 937 | 24 | |
| 15 | 935 | 936 | 935 | 935 | 936 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 936 | 936 | 936 | 936 | 935 | 935 | 935 | 934 | 934 | 937 | 936 | 24 | |
| 16 | 934 | 933 | 933 | 932 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 932 | 932 | 932 | 931 | 932 | 932 | 932 | 932 | 932 | 932 | 932 | 933 | 931 | 934 | 24 | |
| 17 | 933 | 933 | 933 | 934 | 934 | 934 | 935 | 935 | 936 | 937 | 937 | 937 | 938 | 938 | 938 | 938 | 938 | 939 | 939 | 939 | 939 | 938 | 938 | 938 | 933 | 939 | 937 | 24 | |
| 18 | 938 | 938 | 938 | 938 | 939 | 939 | 940 | 940 | 941 | 941 | 940 | 940 | 940 | 940 | 940 | 940 | 940 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 942 | 938 | 942 | 24 | |
| 19 | 942 | 942 | 942 | 943 | 943 | 944 | 945 | 945 | 945 | 946 | 946 | 946 | 946 | 946 | 945 | 945 | 945 | 945 | 944 | 944 | 944 | 943 | 943 | 942 | 942 | 946 | 944 | 24 | |
| 20 | 942 | 941 | 941 | 941 | 940 | 940 | 940 | 940 | 940 | 939 | 939 | 938 | 937 | 937 | 936 | 935 | 934 | 934 | 933 | 933 | 933 | 933 | 932 | 932 | 932 | 932 | 942 | 937 | 24 |
| 21 | 932 | 932 | 931 | 932 | 932 | 931 | 931 | 931 | 932 | 932 | 932 | 932 | 932 | 932 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 932 | 932 | 932 | 931 | 933 | 24 | |
| 22 | 932 | 932 | 933 | 934 | 936 | 937 | 939 | 940 | 941 | 942 | 943 | 944 | 944 | 945 | 945 | 946 | 946 | 947 | 947 | 947 | 948 | 947 | 947 | 947 | 932 | 948 | 942 | 24 | |
| 23 | 947 | 947 | 947 | 947 | 947 | 948 | 948 | 949 | 949 | 949 | 949 | 949 | 949 | 949 | 949 | 949 | 949 | 949 | 950 | 950 | 950 | 949 | 949 | 950 | 947 | 950 | 24 | | |
| 24 | 950 | 950 | 950 | 950 | 950 | 951 | 951 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 950 | 953 | 24 | | |
| 25 | 952 | 951 | 951 | 951 | 951 | 952 | 953 | 953 | 954 | 954 | 954 | 953 | 953 | 952 | 952 | 951 | 951 | 950 | 950 | 949 | 948 | 948 | 947 | 947 | 947 | 954 | 951 | 24 | |
| 26 | 947 | 946 | 945 | 944 | 944 | 944 | 943 | 943 | 942 | 941 | 940 | 939 | 938 | 937 | 937 | 936 | 935 | 934 | 933 | 932 | 931 | 930 | 929 | 928 | 928 | 947 | 938 | 24 | |
| 27 | 928 | 929 | 927 | 926 | 928 | 929 | 930 | 930 | 929 | 929 | 930 | 930 | 930 | 931 | 930 | 931 | 931 | 931 | 932 | 932 | 932 | 931 | 931 | 931 | 931 | 926 | 932 | 24 | |
| 28 | 931 | 931 | 930 | 930 | 930 | 930 | 931 | 931 | 932 | 932 | 933 | 933 | 934 | 934 | 935 | 936 | 937 | 938 | 939 | 940 | 940 | 941 | 941 | 941 | 930 | 941 | 935 | 24 | |
| 29 | 942 | 942 | 942 | 942 | 943 | 943 | 944 | 944 | 945 | 945 | 945 | 945 | 945 | 945 | 944 | 944 | 943 | 944 | 944 | 944 | 943 | 943 | 943 | 943 | 942 | 945 | 944 | 24 | |
| 30 | 942 | 942 | 942 | 941 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 942 | 941 | 24 |
| HOURLY MAX | 952 | 951 | 951 | 951 | 951 | 952 | 953 | 953 | 954 | 954 | 954 | 953 | 953 | 952 | 952 | 952 | 952 | 953 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 952 | 24 | |
| HOURLY AVG | 938 | 938 | 937 | 937 | 938 | 938 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 938 | 938 | 938 | 938 | 938 | 938 | 24 | |

STATUS FLAG CODES

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

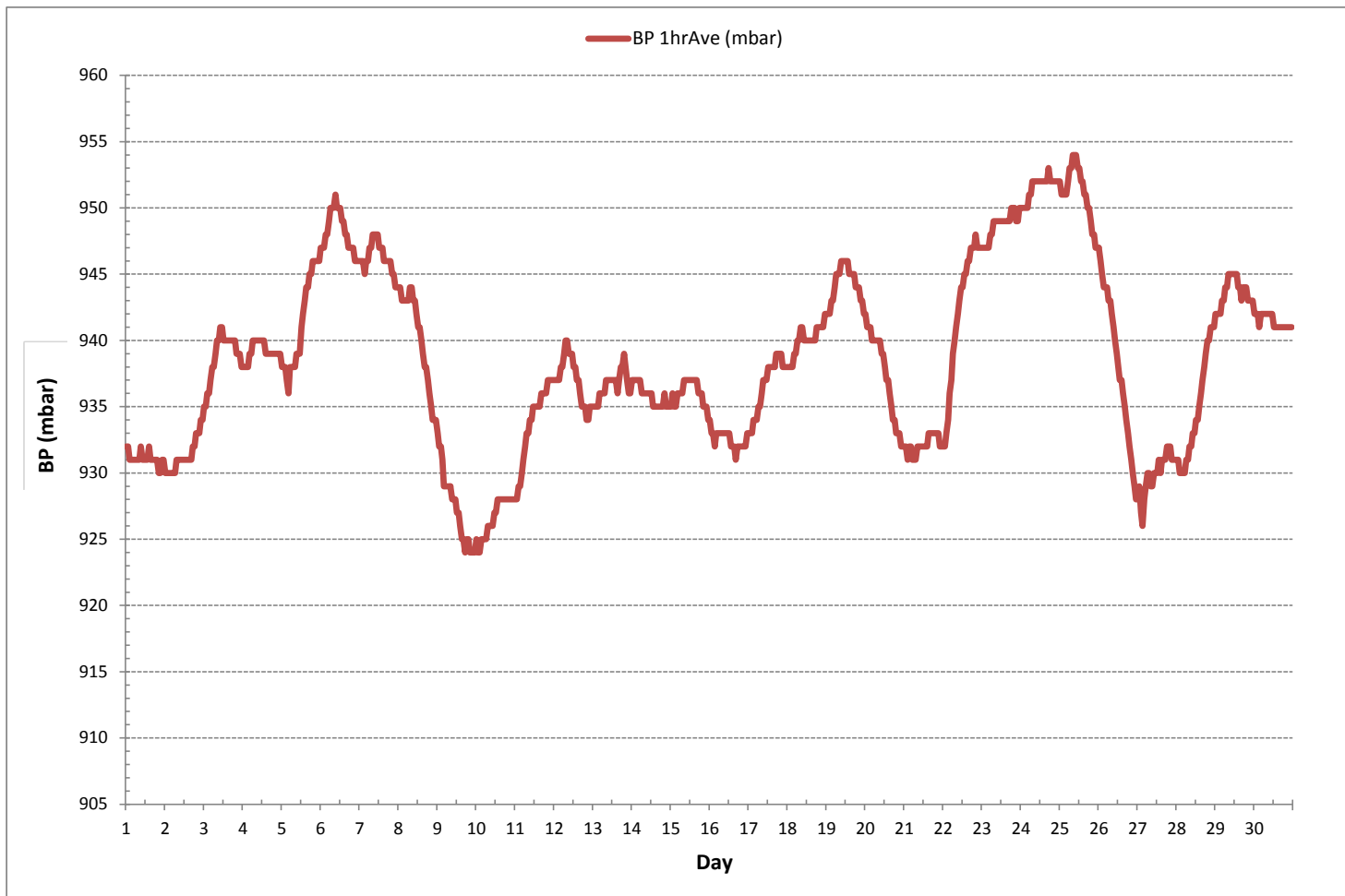
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | | |
|------------------------|-----|------|--------|----|--------|----------|
| MINIMUM 1-HR AVERAGE: | 924 | mbar | @ HOUR | 17 | ON DAY | 9 |
| MAXIMUM 1-HR AVERAGE: | 954 | mbar | @ HOUR | 8 | ON DAY | 25 |
| MAXIMUM 24-HR AVERAGE: | 952 | mbar | | | ON DAY | 24 |
| OPERATIONAL TIME: | | | | | | 720 hrs |
| AMD OPERATION UPTIME: | | | | | | 100.0 % |
| STANDARD DEVIATION: | 7 | | | | | |
| MONTHLY AVERAGE: | | | | | | 938 mbar |

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



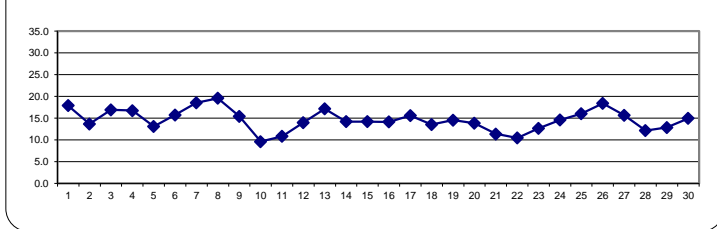
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 18.2 | 14.2 | 13.1 | 12.9 | 13.6 | 13.4 | 14.8 | 16.0 | 17.7 | 19.0 | 18.1 | 20.9 | 24.0 | 24.1 | 25.2 | 25.5 | 24.5 | 22.7 | 20.5 | 17.2 | 15.0 | 13.9 | 13.3 | 12.1 | 12.1 | 25.5 | 17.9 | 24 |
| 2 | 10.6 | 10.0 | 9.8 | 9.9 | 10.3 | 11.8 | 13.8 | 17.1 | 19.3 | 21.1 | 19.7 | 18.0 | 16.3 | 15.7 | 15.3 | 14.4 | 13.0 | 12.6 | 12.3 | 12.0 | 11.4 | 11.2 | 11.3 | 11.2 | 9.8 | 21.1 | 13.7 | 24 |
| 3 | 11.5 | 11.7 | 11.2 | 10.7 | 10.6 | 12.7 | 14.1 | 15.5 | 17.3 | 19.1 | 20.9 | 22.0 | 22.4 | 22.9 | 23.6 | 23.5 | 23.1 | 23.4 | 22.6 | 20.8 | 15.3 | 12.7 | 10.0 | 8.2 | 8.2 | 23.6 | 16.9 | 24 |
| 4 | 7.5 | 7.3 | 6.2 | 6.2 | 7.4 | 9.5 | 13.2 | 16.9 | 20.0 | 21.6 | 23.9 | 23.3 | 23.0 | 22.9 | 23.1 | 24.1 | 22.7 | 22.4 | 22.1 | 18.6 | 16.1 | 15.1 | 14.8 | 14.3 | 6.2 | 24.1 | 16.8 | 24 |
| 5 | 13.9 | 13.6 | 13.7 | 13.6 | 13.5 | 13.3 | 13.4 | 13.8 | 13.2 | 12.6 | 11.9 | 11.8 | 12.8 | 13.3 | 14.6 | 16.2 | 17.2 | 17.6 | 16.7 | 15.2 | 10.7 | 8.5 | 7.2 | 6.1 | 6.1 | 17.6 | 13.1 | 24 |
| 6 | 5.3 | 4.8 | 4.3 | 4.5 | 4.6 | 8.1 | 12.1 | 14.4 | 16.8 | 19.6 | 21.7 | 23.1 | 24.1 | 24.5 | 24.7 | 24.5 | 24.5 | 23.6 | 22.6 | 19.8 | 15.6 | 13.5 | 11.7 | 9.8 | 4.3 | 24.7 | 15.8 | 24 |
| 7 | 8.9 | 8.0 | 7.4 | 6.8 | 6.8 | 10.8 | 15.2 | 19.6 | 22.0 | 23.7 | 25.5 | 26.5 | 25.3 | 26.8 | 27.2 | 27.1 | 26.9 | 26.4 | 25.0 | 22.1 | 17.9 | 15.2 | 13.6 | 11.0 | 6.8 | 27.2 | 18.6 | 24 |
| 8 | 9.5 | 9.4 | 8.5 | 8.9 | 9.2 | 10.6 | 15.3 | 19.4 | 23.0 | 25.0 | 25.9 | 26.7 | 27.3 | 27.6 | 27.7 | 28.0 | 27.0 | 26.5 | 24.9 | 21.4 | 18.7 | 17.6 | 16.8 | 15.6 | 8.5 | 28.0 | 19.6 | 24 |
| 9 | 14.0 | 12.6 | 14.1 | 14.5 | 14.2 | 15.1 | 17.3 | 19.0 | 18.9 | 17.2 | 16.4 | 17.0 | 16.8 | 15.4 | 15.0 | 15.4 | 15.9 | 16.2 | 16.0 | 14.6 | 14.6 | 14.1 | 13.7 | 13.0 | 12.6 | 19.0 | 15.5 | 24 |
| 10 | 11.5 | 10.6 | 10.0 | 8.4 | 7.9 | 7.6 | 7.6 | 7.3 | 7.2 | 7.4 | 7.9 | 8.3 | 8.0 | 9.2 | 12.7 | 13.5 | 13.5 | 14.2 | 13.1 | 11.3 | 9.4 | 8.3 | 7.9 | 8.3 | 7.2 | 14.2 | 9.6 | 24 |
| 11 | 8.4 | 8.6 | 8.6 | 8.4 | 8.4 | 7.8 | 7.9 | 9.7 | 11.8 | 12.7 | 14.0 | 14.8 | 14.3 | 14.3 | 13.6 | 14.5 | 15.1 | 14.9 | 14.9 | 13.7 | 9.6 | 5.9 | 4.7 | 4.2 | 4.2 | 15.1 | 10.9 | 24 |
| 12 | 3.2 | 2.2 | 1.4 | 0.6 | 0.6 | 5.8 | 10.8 | 11.6 | 13.0 | 14.0 | 15.9 | 16.5 | 19.6 | 21.9 | 21.4 | 20.8 | 21.9 | 23.1 | 22.8 | 20.7 | 18.0 | 16.9 | 16.9 | 16.9 | 0.6 | 23.1 | 14.0 | 24 |
| 13 | 16.6 | 16.1 | 14.3 | 13.2 | 12.6 | 13.3 | 16.7 | 17.3 | 18.5 | 18.1 | 21.3 | 21.6 | 22.4 | 23.8 | 23.9 | 23.1 | 21.2 | 17.1 | 14.4 | 14.3 | 13.9 | 13.3 | 13.0 | 12.6 | 12.6 | 23.9 | 17.2 | 24 |
| 14 | 12.6 | 12.3 | 12.3 | 11.8 | 11.7 | 12.0 | 13.3 | 14.8 | 15.4 | 15.8 | 16.2 | 16.7 | 16.6 | 15.5 | 15.8 | 16.0 | 16.1 | 16.6 | 16.4 | 15.4 | 13.9 | 12.4 | 11.7 | 10.4 | 10.4 | 16.7 | 14.2 | 24 |
| 15 | 11.1 | 10.8 | 9.1 | 8.4 | 8.9 | 10.4 | 12.3 | 14.0 | 15.2 | 16.4 | 18.5 | 16.2 | 15.4 | 16.2 | 17.9 | 18.4 | 19.1 | 20.0 | 18.7 | 16.4 | 14.5 | 13.3 | 11.3 | 9.4 | 8.4 | 20.0 | 14.2 | 24 |
| 16 | 8.2 | 7.7 | 6.5 | 6.3 | 7.2 | 9.1 | 11.0 | 13.7 | 16.5 | 17.9 | 19.6 | 20.0 | 19.9 | 21.1 | 20.3 | 20.2 | 15.7 | 16.1 | 15.5 | 14.5 | 13.8 | 13.1 | 13.0 | 12.9 | 6.3 | 21.1 | 14.2 | 24 |
| 17 | 12.3 | 12.0 | 11.8 | 11.4 | 11.3 | 11.5 | 12.8 | 13.6 | 16.8 | 19.0 | 20.2 | 21.0 | 20.2 | 20.0 | 21.6 | 19.9 | 20.1 | 20.8 | 18.6 | 17.8 | 15.1 | 10.3 | 9.2 | 8.0 | 8.0 | 21.6 | 15.6 | 24 |
| 18 | 6.6 | 5.7 | 5.0 | 4.7 | 4.9 | 8.9 | 13.9 | 16.0 | 19.6 | 19.5 | 18.0 | 17.8 | 21.0 | 21.4 | 17.9 | 13.6 | 16.4 | 18.6 | 17.4 | 16.2 | 12.1 | 9.1 | 10.3 | 10.6 | 4.7 | 21.4 | 13.6 | 24 |
| 19 | 9.9 | 8.8 | 8.1 | 7.3 | 7.3 | 9.5 | 10.6 | 10.8 | 13.7 | 17.1 | 18.1 | 19.4 | 19.7 | 20.2 | 21.5 | 20.2 | 21.2 | 20.4 | 19.5 | 18.4 | 14.1 | 12.3 | 11.1 | 10.6 | 7.3 | 21.5 | 14.6 | 24 |
| 20 | 9.7 | 9.1 | 8.4 | 7.9 | 8.8 | 11.7 | 13.8 | 15.3 | 15.8 | 15.6 | 16.3 | 16.3 | 16.1 | 16.2 | 15.0 | 16.2 | 18.2 | 18.5 | 17.4 | 15.7 | 13.5 | 12.3 | 12.3 | 12.1 | 7.9 | 18.5 | 13.8 | 24 |
| 21 | 12.2 | 11.4 | 11.1 | 10.4 | 9.7 | 9.7 | 10.0 | 10.3 | 10.9 | 12.4 | 13.4 | 13.6 | 14.4 | 14.2 | 14.8 | 14.5 | 13.4 | 10.9 | 11.1 | 10.7 | 9.3 | 8.6 | 8.2 | 8.3 | 8.2 | 14.8 | 11.4 | 24 |
| 22 | 8.4 | 9.2 | 10.1 | 10.4 | 9.9 | 9.0 | 8.4 | 8.5 | 8.5 | 8.5 | 10.0 | 11.0 | 12.9 | 14.2 | 14.3 | 14.7 | 15.3 | 15.8 | 14.8 | 13.2 | 10.4 | 6.0 | 4.3 | 3.3 | 3.3 | 15.8 | 10.5 | 24 |
| 23 | 2.8 | 1.9 | 1.3 | 0.9 | 1.6 | 4.8 | 7.5 | 12.5 | 16.4 | 17.8 | 18.1 | 19.2 | 19.8 | 20.3 | 20.6 | 20.7 | 19.5 | 19.7 | 19.4 | 17.7 | 13.5 | 9.3 | 8.8 | 9.8 | 0.9 | 20.7 | 12.7 | 24 |
| 24 | 10.1 | 9.6 | 9.7 | 9.1 | 8.2 | 10.2 | 13.3 | 16.3 | 18.8 | 20.7 | 21.8 | 21.6 | 21.3 | 21.2 | 17.0 | 13.6 | 17.5 | 16.9 | 17.6 | 16.0 | 13.1 | 10.6 | 8.8 | 7.8 | 7.8 | 21.8 | 14.6 | 24 |
| 25 | 6.6 | 5.8 | 4.9 | 4.4 | 4.2 | 7.5 | 12.9 | 17.0 | 17.7 | 19.6 | 21.2 | 22.5 | 23.3 | 22.0 | 24.1 | 23.6 | 23.6 | 23.1 | 22.4 | 20.0 | 16.0 | 14.9 | 14.4 | 13.9 | 4.2 | 24.1 | 16.1 | 24 |
| 26 | 13.5 | 13.0 | 12.8 | 12.2 | 12.2 | 13.9 | 15.9 | 17.5 | 19.1 | 21.2 | 22.1 | 23.3 | 23.6 | 23.4 | 24.4 | 24.3 | 23.1 | 20.8 | 20.3 | 20.7 | 17.8 | 16.4 | 15.7 | 15.2 | 12.2 | 24.4 | 18.4 | 24 |
| 27 | 15.0 | 15.1 | 14.9 | 13.9 | 14.3 | 14.5 | 14.4 | 15.0 | 15.6 | 15.7 | 16.6 | 19.3 | 20.6 | 20.3 | 19.8 | 20.2 | 19.9 | 18.7 | 17.1 | 14.6 | 12.4 | 10.1 | 9.4 | 9.3 | 9.3 | 20.6 | 15.7 | 24 |
| 28 | 10.1 | 10.5 | 9.8 | 10.1 | 10.1 | 10.5 | 11.1 | 12.1 | 14.2 | 13.3 | 16.2 | 17.3 | 15.8 | 16.2 | 17.5 | 14.1 | 13.8 | 13.7 | 13.3 | 12.4 | 10.9 | 7.9 | 6.2 | 4.5 | 4.5 | 17.5 | 12.2 | 24 |
| 29 | 3.6 | 3.1 | 2.5 | 2.3 | 3.0 | 6.5 | 9.7 | 10.8 | 12.2 | 13.9 | 14.9 | 17.6 | 20.3 | 20.1 | 20.5 | 17.6 | 19.1 | 20.1 | 17.9 | 17.4 | 15.2 | 13.9 | 13.6 | 13.4 | 2.3 | 20.5 | 12.9 | 24 |
| 30 | 12.4 | 10.9 | 10.6 | 10.2 | 10.6 | 11.9 | 13.4 | 14.8 | 15.9 | 15.8 | 16.8 | 18.0 | 18.0 | 17.9 | 18.0 | 17.2 | 18.1 | 17.8 | 17.4 | 17.2 | 16.0 | 14.2 | 13.9 | 12.8 | 10.2 | 18.1 | 15.0 | 24 |
| HOURLY MAX | 18.2 | 16.1 | 14.9 | 14.5 | 14.3 | 15.1 | 17.3 | 19.6 | 23.0 | 25.0 | 25.9 | 26.7 | 27.3 | 27.6 | 27.7 | 28.0 | 27.0 | 26.5 | 25.0 | 22.1 | 18.7 | 17.6 | 16.9 | 16.9 | | | | |
| HOURLY AVG | 10.1 | 9.5 | 9.1 | 8.7 | 8.8 | 10.4 | 12.6 | 14.4 | 16.0 | 17.0 | 18.0 | 18.7 | 19.2 | 19.4 | 19.6 | 19.2 | 19.2 | 19.0 | 18.1 | 16.5 | 13.9 | 12.0 | 11.2 | 10.5 | | | | |

STATUS FLAG CODES

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

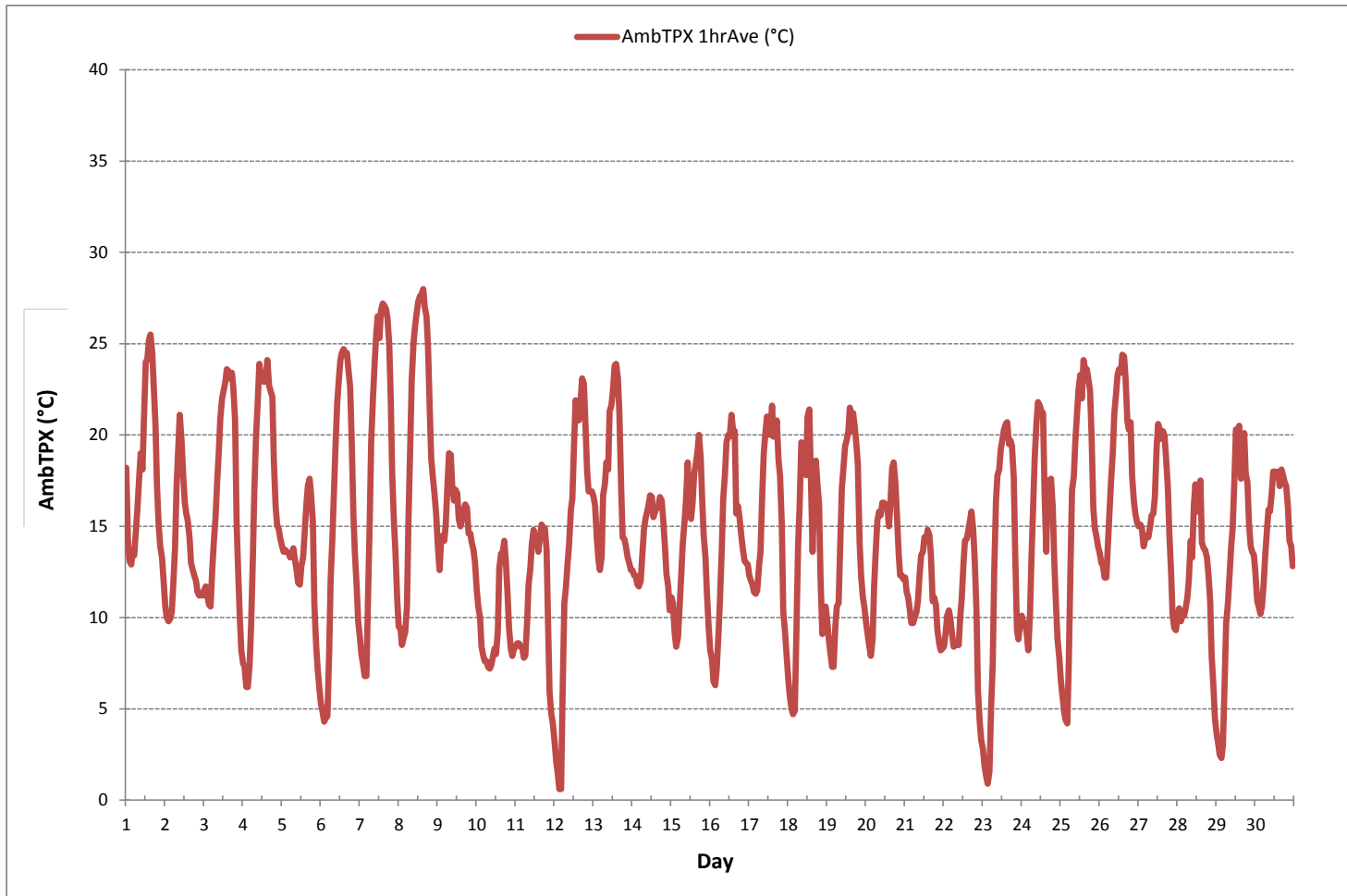
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | |
|------------------------|---------|--------|----|--------|--------------------------|
| MINIMUM 1-HR AVERAGE: | 0.6 °C | @ HOUR | 3 | ON DAY | 12 |
| MAXIMUM 1-HR AVERAGE: | 28.0 °C | @ HOUR | 15 | ON DAY | 8 |
| MAXIMUM 24-HR AVERAGE: | 19.6 °C | | | ON DAY | 8 |
| OPERATIONAL TIME: | | | | | 720 hrs |
| AMD OPERATION UPTIME: | | | | | 100.0 % |
| STANDARD DEVIATION: | 5.4 | | | | MONTHLY AVERAGE: 14.6 °C |

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



PRECIPITATION Hourly Averages (mm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 3.3 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 3.3 | 0.2 | 24 | |
| 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.9 | 1.3 | 0.5 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 2.5 | 0.3 | 24 |
| 3 | 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 |
| 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 | 0.4 | 0.7 | 2.0 | 0.6 | 0.0 | 2.0 | 0.2 | 24 |
| 5 | 0.1 | 0.3 | 0.3 | 0.4 | 0.6 | 1.6 | 1.5 | 0.1 | 0.0 | 0.7 | 2.6 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.6 | 0.4 | 24 |
| 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 1.0 | 2.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 1.2 | 0.6 | 0.0 | 0.0 | 2.0 | 0.2 | 24 |
| 10 | 0.8 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.8 | 0.1 | 24 |
| 11 | 0.0 | 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 | 0.0 | 0.0 | 0.2 | 0.0 | 24 |
| 12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 2.2 | 6.8 | 1.9 | 1.2 | 0.4 | 0.1 | 0.0 | 0.0 | 6.8 | 0.5 | 24 |
| 14 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.3 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.9 | 0.2 | 24 |
| 15 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 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 | 0.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 24 |
| 17 | 0.3 | 0.5 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 24 |
| 18 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 24 |
| 19 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.1 | 7.5 | 5.4 | 0.1 | 0.0 | 7.5 | 0.8 | 24 |
| 21 | 1.9 | 2.8 | 3.2 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | 0.1 | 0.4 | 0.9 | 0.6 | 0.8 | 0.4 | 0.0 | 0.0 | 3.2 | 0.6 | 24 |
| 22 | 0.6 | 0.5 | 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 | 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 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 24 |
| 24 | 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 | 0.4 | 0.0 | 0.1 | 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 | 24 |
| 26 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 27 | 0.0 | 0.0 | 0.2 | 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 | 0.2 | 0.0 | 24 |
| 28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 24 |
| 29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 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 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 1.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 | 1.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 | 0.2 | 24 |
| HOURLY MAX | 1.9 | 2.8 | 3.2 | 2.0 | 0.6 | 1.6 | 1.5 | 0.1 | 0.1 | 1.0 | 2.6 | 0.7 | 1.0 | 3.9 | 2.0 | 1.6 | 2.5 | 2.2 | 6.8 | 3.3 | 5.1 | 7.5 | 5.4 | 0.6 | | | | |
| HOURLY AVG | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 | 0.2 | 0.3 | 0.4 | 0.3 | 0.1 | | | | |

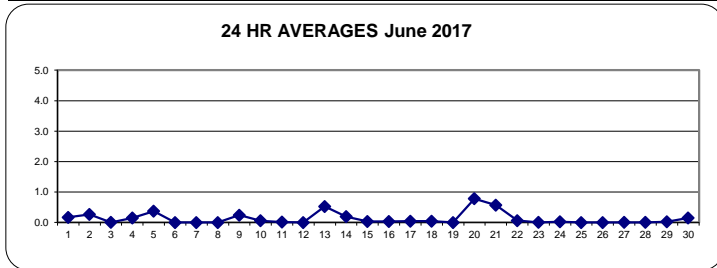
STATUS FLAG CODES

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

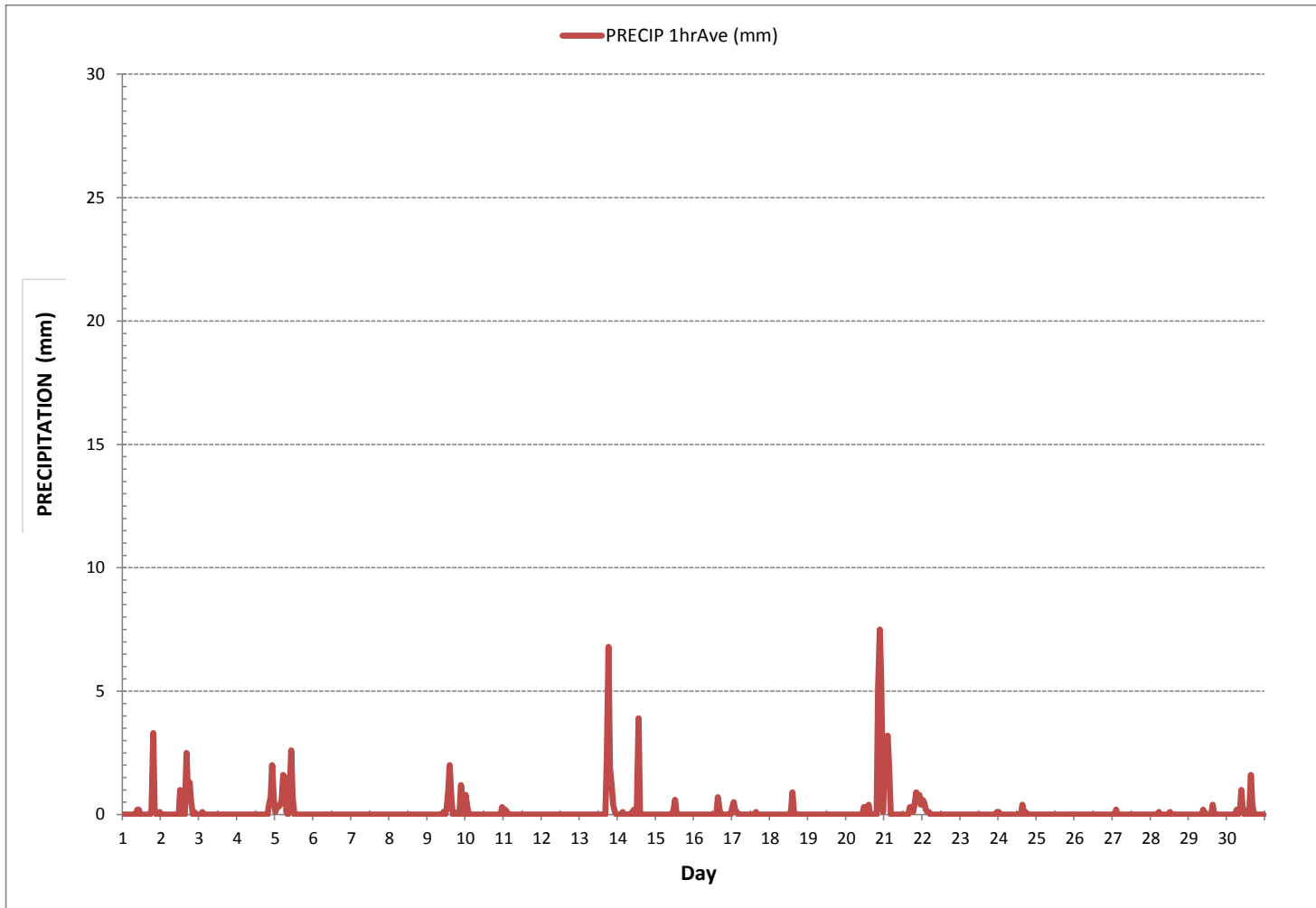
MONTHLY SUMMARY

| | | | | | | |
|------------------------|------|----|--------|----|------------------|--------|
| MINIMUM 1-HR AVERAGE: | 0.0 | mm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 7.5 | mm | @ HOUR | 21 | ON DAY | 20 |
| MAXIMUM 24-HR AVERAGE: | 0.8 | mm | | | ON DAY | 20 |
| MONTHLY TOTAL | 91.0 | mm | | | | |
| OPERATIONAL TIME: | | | | | 720 | hrs |
| AMD OPERATION UPTIME: | | | | | 100.0 | % |
| STANDARD DEVIATION: | 0.6 | | | | MONTHLY AVERAGE: | 0.1 mm |

24 HR AVERAGES June 2017



PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

| | | |
|----------------------------------|---|----------------|
| Date: June 14, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 935 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: Maskwa | Weather Conditions: A few clouds | |
| Parameter: Sulphur Dioxide | Calibration Purpose: routine monthly | |
| Start Time 24 hr. (mst): 9:46 | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): 14:09 | Cal Gas Expiry Date: July 18, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 508 | Range ppb: 1000 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 0.995 |
| Previous C.F.: 0.999 | New C.F.: 1.000 |

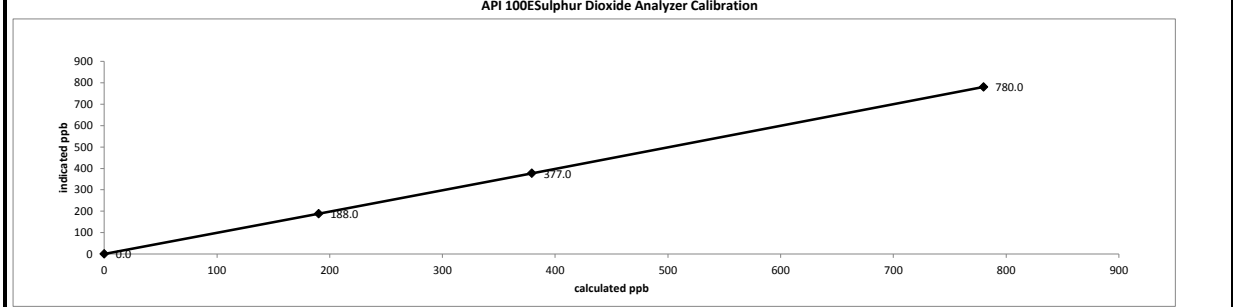
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 627, January 27, 2017 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|--|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

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 | 3.0 | n/a |
| as found high | 4924 | 77.10 | 5001 | 780.1 | 787.0 | 0.995 |
| adjusted zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| adjusted high | 4924 | 77.10 | 5001 | 780.1 | 780.0 | 1.000 |
| mid | 4964 | 37.50 | 5001 | 379.4 | 377.0 | 1.006 |
| low | 4981 | 18.80 | 5000 | 190.3 | 188.0 | 1.012 |
| calibrator zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.006 |

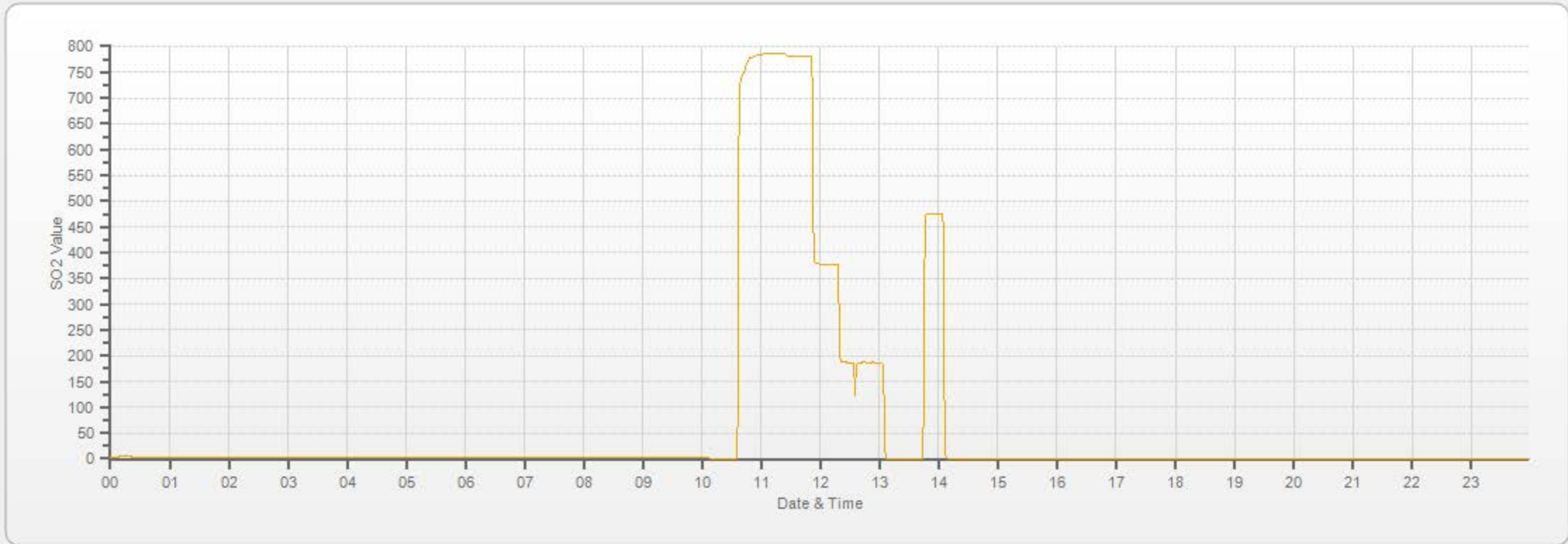
Linear Regression/Calibration Results:

| | |
|---|---------------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS > or = 0.995 |
| Slope = <u>0.999</u> | .95-1.05 |
| b (Intercept as % of full scale) = <u>0.14%</u> | ± 3% F.S. |
| % change in C.F. from last cal = <u>0.40%</u> | ± 10% |



| | |
|---|--|
| As found: Slope: <u>0.977</u> Offset: <u>129.8</u> Hvps: <u>483</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.2</u> Pmt Temp: <u>7.7</u> Izs Temp: <u>45.0</u> Pres: <u>24.6</u> Samp Fl: <u>581</u> Norm Pmt: <u>136.0</u> Uv Lamp: <u>2655.0</u> Lamp Ratio: <u>96.9</u> Str Lgt: <u>63.4</u> Drk Pmt: <u>10.3</u> Drk Lmp: <u>-0.5</u> Expected Value: <u>351.0</u> | As left: Slope: <u>0.973</u> Offset: <u>136.3</u> Hvps: <u>483</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.7</u> Pmt Temp: <u>7.7</u> Izs Temp: <u>50.0</u> Pres: <u>24.6</u> Samp Fl: <u>582</u> Norm Pmt: <u>135.9</u> Uv Lamp: <u>2653.2</u> Lamp Ratio: <u>96.8</u> Str Lgt: <u>66.3</u> Drk Pmt: <u>10.7</u> Drk Lmp: <u>-0.5</u> Expected Value: <u>474.4</u> |
|---|--|

Comments:
 The analyzer sample inlet filter was changed.
 IZS TEMP was adjusted to 50.0 degrees to increase SPAN check value of the permeation device. Low Point starts at 12:40.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101A Hydrogen Sulphide Analyzer Calibration

| | |
|---|---|
| Date: June 14, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 9:46 End Time 24 hr. (mst): 14:08 Calibration Method: Gas Dilution | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 935 mb Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 23° C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Not yet reviewed Cal Gas Expiry Date: June 14, 2019 Converter Model & s/n (if applicable): n/a |
|---|---|

| | |
|---|--|
| Analyzer: ID# or Serial Number: 324 Last Calibration Date: May 11, 2017 Previous C.F.: 0.999 | Range ppb: 100 As Found C.F.: 1.038 New C.F.: 1.000 |
|---|--|

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010D 11900613, March 16, 2017 Cal Gas Cylinder I.D. #: EY0000654 Cal Gas Conc. (ppm): 10.2 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
|--|---|-------|-----|------|----|-----|----|-----|----|
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |

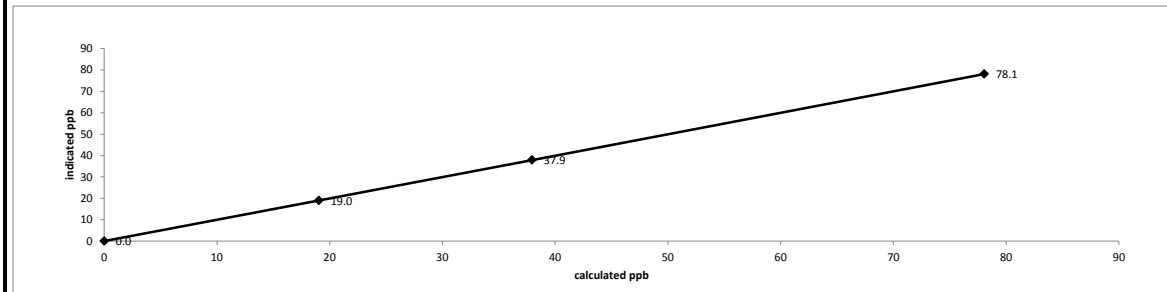
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|----------------------|--------------------------------|---------|-------|---------------------------|--------------------------|----------------------------|
| | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| as found high | 7443 | 57.40 | 7500 | 78.1 | 75.2 | 1.038 |
| adjusted zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| adjusted high | 7443 | 57.40 | 7500 | 78.1 | 78.1 | 1.000 |
| mid | 7471 | 27.90 | 7499 | 37.9 | 37.9 | 1.001 |
| low | 7485 | 14.00 | 7499 | 19.0 | 19.0 | 1.002 |
| calibrator zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.001 |

Linear Regression/Calibration Results:

| | |
|---|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 0.999 | > or = 0.995 |
| b (Intercept as % of full scale) = 0.03% | .95-1.05 |
| % change in C.F. from last cal = -3.91% | ± 3% F.S. |
| | ± 10% |

API 101A Hydrogen Sulphide Analyzer Calibration

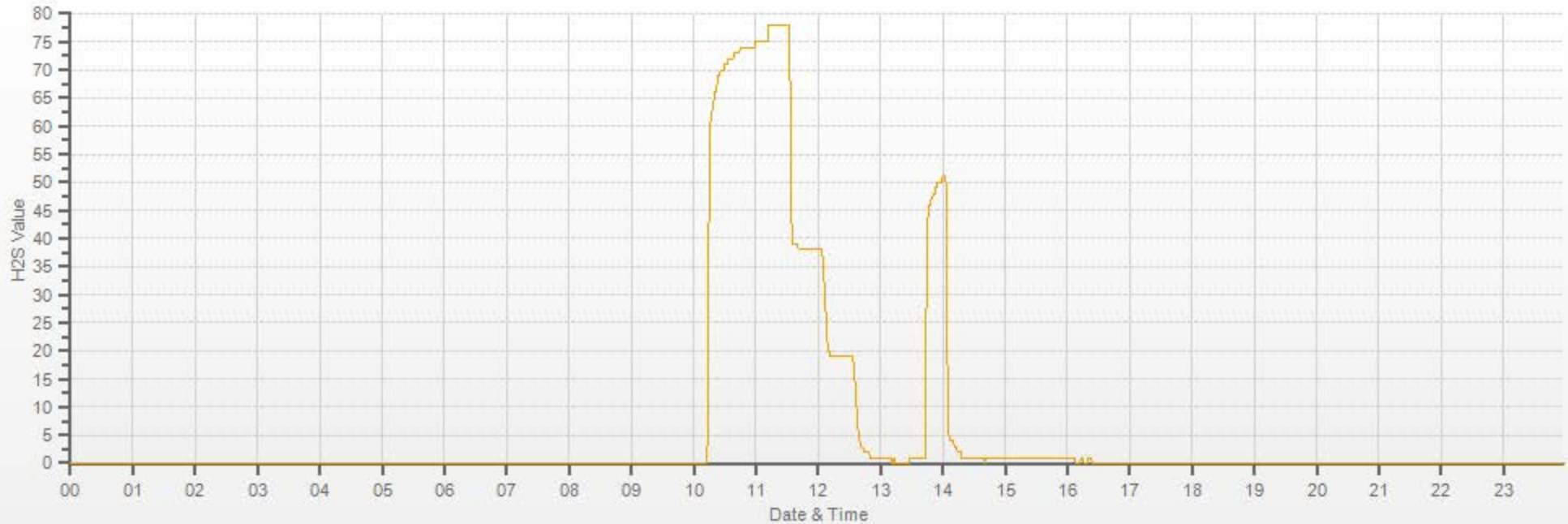


| | |
|--|---|
| As found: Slope: 0.978 Offset: 23.5 Hvps: 676 Dcps: 2578 Rcell Temp: 50.2 Box Temp: 29.9 Pmt Temp: 6.8 IZS TEMP: 50.2 Converter Temp: 324.0 Pres: 24.0 Samp Fl: 523 Uv Lamp: 3935.3 Lamp Ratio: 111.5 Str Lgt: 11.5 Drk Pmt: 38.4 Drk Lmp: -3.7 Expected Value: 47.7 | As left: Slope: 1.008 Offset: 23.5 Hvps: 676 Dcps: 2578 Rcell Temp: 51.0 Box Temp: 30.2 Pmt Temp: 6.8 IZS TEMP: 50.3 Converter Temp: 325.2 Pres: 24.0 Samp Fl: 523 Uv Lamp: 3922.5 Lamp Ratio: 112.0 Str Lgt: 11.8 Drk Pmt: 38.3 Drk Lmp: -3.8 Expected Value: 50.5 |
|--|---|

Comments:

The analyzer sample inlet filter was changed.
 No zero adjustment was required/made. The "as found" zero value was copied to the adjusted zero value field for linearity calculation purposes.
 No SO2 scrubber test was performed because it was conducted during internal audit this month.

H2S[ppb] Station: LICA MASKWA Daily: 17.06.14 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | |
|---|--|
| Date: June 14, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 13:25 / 17:11 Calibration Method: Gas Dilution | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 935 mb Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 23 °C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: November 25, 2023 |
|---|--|

| | |
|--|---|
| Analyzer: ID# or Serial Number: 436609738 Last Calibration Date: May 26, 2017 Previous Cal High Point C.F.: 1.000 | Range ppm: 50 As Found C.F.: 0.996 New C.F.: 1.000 |
|--|---|

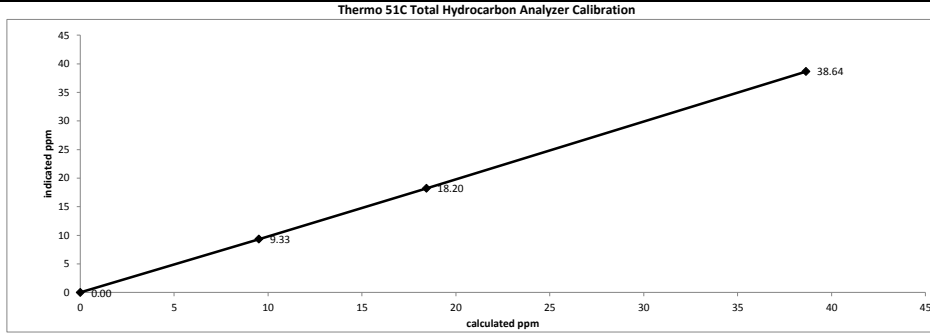
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 627, January 27, 2017 Cal Gas Cylinder I.D. #: LL165372 CH₄/C₃H₈ Cylinder Conc. (ppm): 606.0 212.0 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0 | | Standard Calibration Points for a Range of: 50 ppm <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table> | Point | Target ppm | High | 38 | Mid | 18 | Low | 9 |
|--|------------|--|-------|------------|------|----|-----|----|-----|---|
| Point | Target ppm | | | | | | | | | |
| High | 38 | | | | | | | | | |
| Mid | 18 | | | | | | | | | |
| Low | 9 | | | | | | | | | |

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 | -0.04 | n/a |
| as found high | 1935 | 65.00 | 2000 | 38.64 | 38.76 | 0.996 |
| adjusted zero | 2000 | 0.00 | 2000 | 0.00 | 0.00 | n/a |
| adjusted high | 1935 | 65.00 | 2000 | 38.64 | 38.64 | 1.000 |
| mid | 1969 | 31.00 | 2000 | 18.43 | 18.20 | 1.013 |
| low | 1984 | 16.00 | 2000 | 9.51 | 9.33 | 1.020 |
| calibrator zero | 2000 | 0.00 | 2000 | 0.0 | 0.00 | n/a |
| Average C.F. = | | | | | | 1.011 |

Linear Regression/Calibration Results:

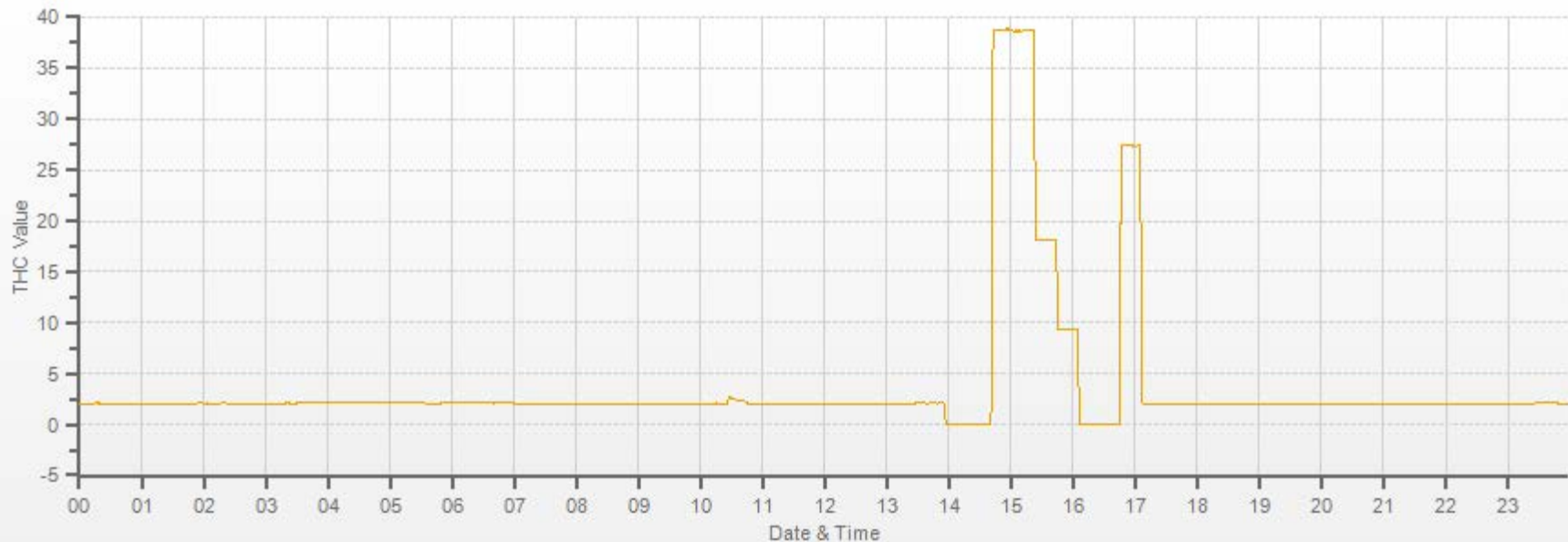
| | |
|--|---|
| Correlation Coefficient = 1.000 Slope = 0.999 b (Intercept as % of full scale) = 0.24% % change in C.F. from last cal = 0.41% | LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10% |
|--|---|



| | |
|--|---|
| As found: H2 cylinder (psi): 600 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 1500 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 39 measurement alarms: None service alarms: None cnt: 1017 rng: 1 try: 0 flm: 183.6 det: 125.2 Flame: 183 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 12 Measured Flow: n/a Expected Value: 27.25 | As left: H2 cylinder (psi): 600 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 1500 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 38 measurement alarms: None service alarms: None cnt: 1025 rng: 1 try: 0 flm: 183.6 det: 125.3 Flame: 183 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 12 Measured Flow: n/a Expected Value: 27.38 |
|--|---|

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

THC[ppm] Station: LICA MASKWA Daily: 17.06.14 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

| | | |
|---|---|----------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: fisher Scientific 05544, December 5, 2016 | 955 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Maskwa | Weather Conditions: Mainly sunny | |
| Start/End Time 24 hr. (mst): 13:19 / 17:33 | Calibration Purpose: shut down | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: July 18, 2019 | |

| | | | | | | | | | | |
|--|--|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Analyzer: | Correction Factors: | | | | | | | | | |
| ID# or Serial Number: 1899 | Previous C.F.: As Found C.F.: New C.F.: | | | | | | | | | |
| Last Calibration Date: May 11, 2017 | NO = <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>1.000</td><td>1.018</td><td>n/a</td></tr><tr><td>1.000</td><td>1.000</td><td>n/a</td></tr><tr><td>1.000</td><td>1.018</td><td>n/a</td></tr></table> | 1.000 | 1.018 | n/a | 1.000 | 1.000 | n/a | 1.000 | 1.018 | n/a |
| 1.000 | 1.018 | n/a | | | | | | | | |
| 1.000 | 1.000 | n/a | | | | | | | | |
| 1.000 | 1.018 | n/a | | | | | | | | |
| Range ppb: 1000 | NO ₂ = | | | | | | | | | |
| | NO _x = | | | | | | | | | |

| Calibration Standards: | Standard Calibration Points for a Range of: 1000 ppb | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-----------------|------------------------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr><td>High</td><td>780</td><td>500</td><td>n/a</td></tr> <tr><td>Mid</td><td>380</td><td>275</td><td>n/a</td></tr> <tr><td>Low</td><td>190</td><td>100</td><td>n/a</td></tr> <tr><td>Extra Point #1</td><td>n/a</td><td>n/a</td><td>n/a</td></tr> <tr><td>Extra Point #2</td><td>n/a</td><td>n/a</td><td>n/a</td></tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
| Point | | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | |
| High | | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Mid | | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Low | | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cal Gas Cylinder I.D. #: LL104222 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cal Gas Conc. (ppm): 50.7 50.7 | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NO _x | Indicated NO | Indicated NO _x | NO C.F. | NO _x 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 | 4923 | 76.9 | 5000 | 779.8 | 779.8 | 766.0 | 766.0 | 1.018 | 1.018 |
| mid | 4965 | 37.50 | 5002 | 380.1 | 380.1 | 367.0 | 367.0 | 1.036 | 1.036 |
| low | 4980 | 18.70 | 4999 | 189.7 | 189.7 | 179.0 | 179.0 | 1.060 | 1.060 |
| Average C.F.= | | | | | | | | 1.038 | 1.038 |

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

| Calibrator Flow Rates (cc/min) | | | | Calibrator Setting | Indicated NO | Indicated NO _x | 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) |
| NO _x reference | 4923 | 76.90 | 5000 | 0.0 | 768.0 | 768.0 | 0.0 | 0.0 | 0.0 | |
| as found high NO ₂ | 4923 | 76.90 | 5000 | 485.0 | 272.0 | 272.0 | 496.0 | 496.0 | 496.0 | 1.000 |
| gpt mid | 4923 | 76.90 | 5000 | 260.0 | 491.0 | 768.0 | 277.0 | 277.0 | 277.0 | 1.000 |
| gpt low | 4923 | 76.90 | 5000 | 93.0 | 671.0 | 768.0 | 97.0 | 97.0 | 97.0 | 1.000 |
| Average NO₂ C.F.= | | | | | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | NO | NO _x | NO ₂ | LIMITS |
|--------------------------------------|--------|-----------------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.015 | 1.015 | 1.000 | 0.90-1.10 |
| b (Intercept as % of full scale)= | -0.42% | -0.42% | 0.00% | ± 3% F.S. |
| % change in C.F. from last cal= | -1.80% | 0.00% | -1.80% | ± 10% |
| NO ₂ converter efficiency | | | 0.99 | 0.96 to 1.04 |

| As found: | As left: |
|--|--------------------------------------|
| NO _x SLOPE: 0.870 | NO _x SLOPE: n/a |
| NO _x OFFS: 0.3 | NO _x OFFS: n/a |
| NO SLOPE: 0.884 | NO SLOPE: n/a |
| NO OFFS: -1.1 | NO OFFS: n/a |
| SAMP FLW: 553 | SAMP FLW: n/a |
| OZONE FL: 78 | OZONE FL: n/a |
| NORM PMT: 0.6 | NORM PMT: n/a |
| AZERO: 21.9 | AZERO: n/a |
| HVPS: 686 | HVPS: n/a |
| DCPS: 2582 | DCPS: n/a |
| RCELL: 50.0 | RCELL: n/a |
| BOX TEMP: 29.4 | BOX TEMP: n/a |
| IZS TEMP: 48.1 | IZS TEMP: n/a |
| MOLY TEMP: 315.1 | MOLY TEMP: n/a |
| RCEL: 5.8 | RCEL: n/a |
| SAMP: 27.1 | SAMP: n/a |
| Expected Value NO: 5.1 | Expected Value NO: n/a |
| Expected Value NO ₂ : 466.0 | Expected Value NO ₂ : n/a |
| Expected Value NO _x : 471.0 | Expected Value NO _x : n/a |

Comments:

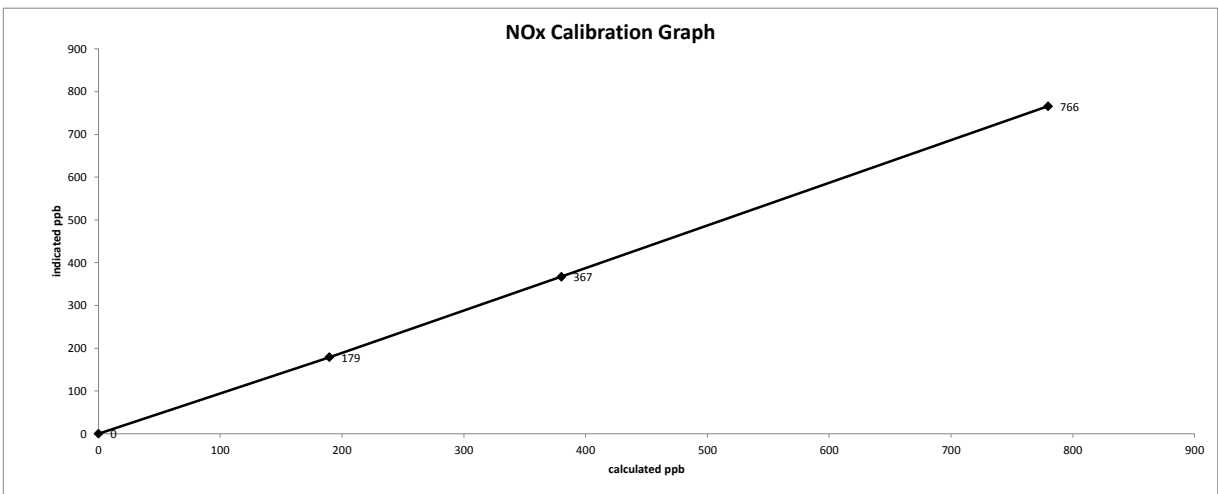
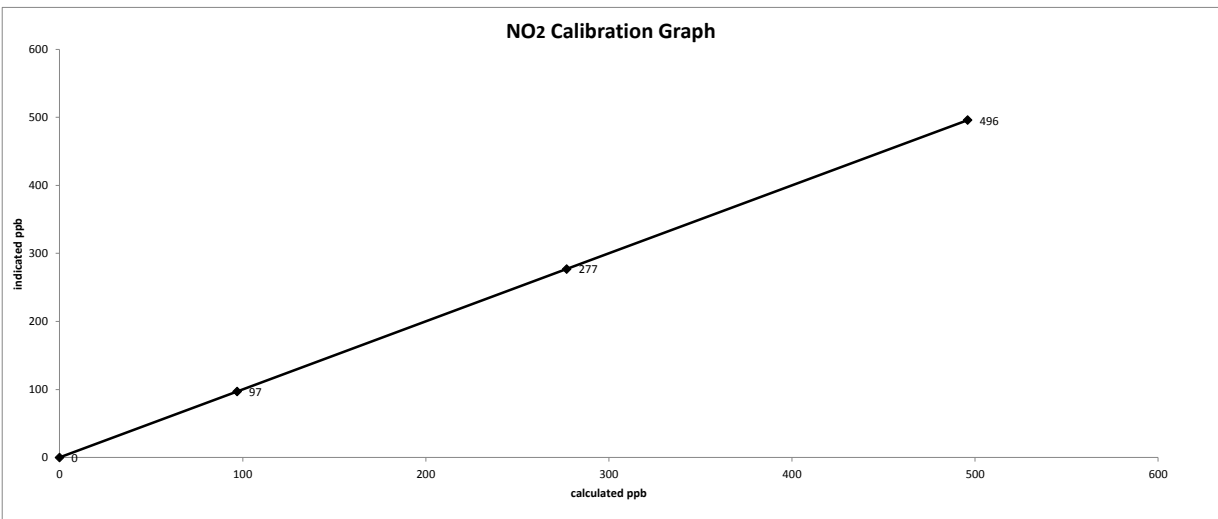
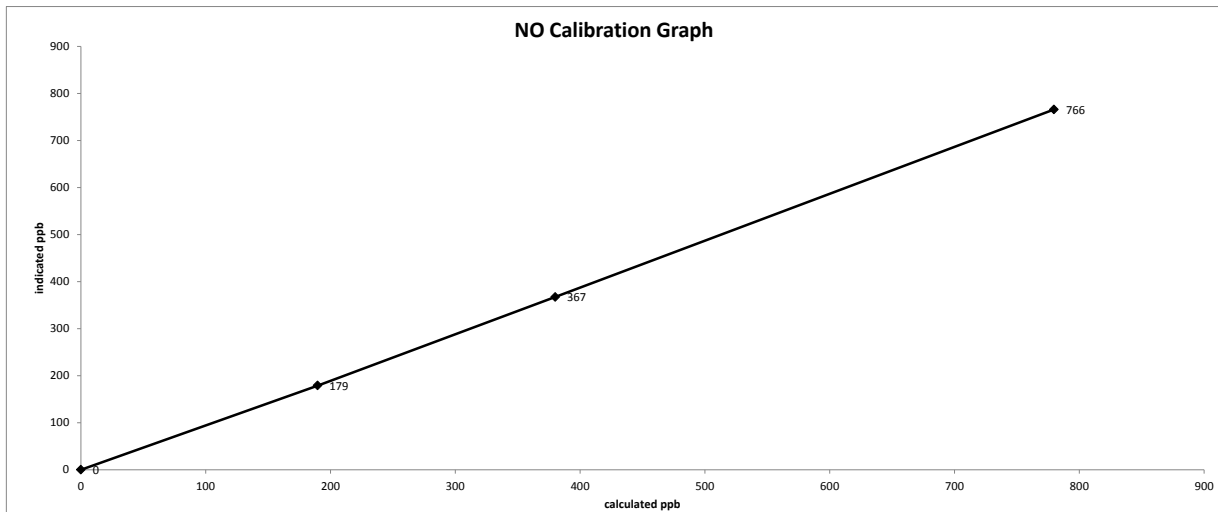
No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

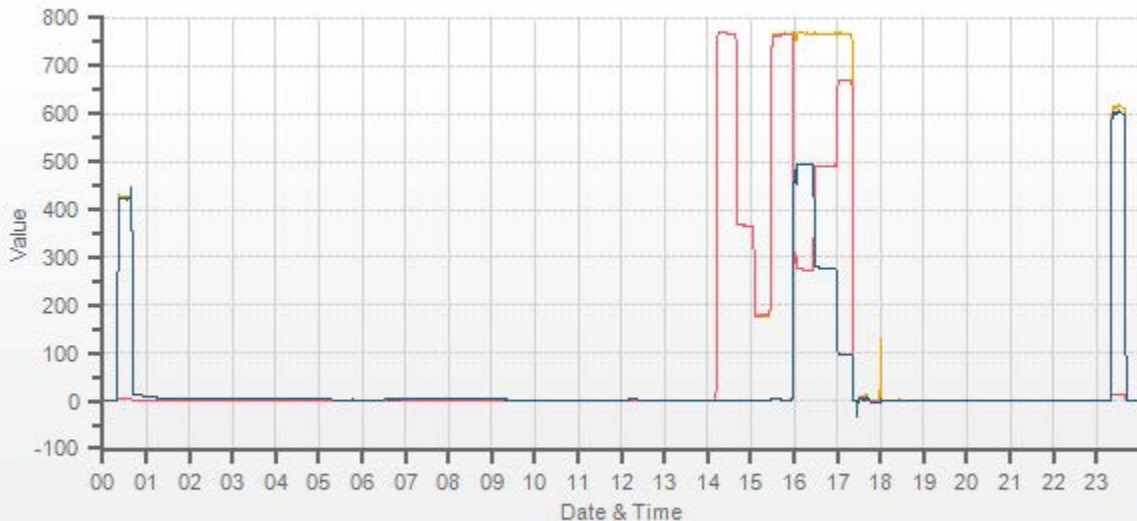
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

No High Point adjustment made. The Shutdown calibration was completed to replace with another spare analyzer, because it indicated higher readings after each ZS check.

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

Start/End Time 24 hr. (mst): 13:19 / 17:33
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





— NOx[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

| | | |
|--|--|--------|
| Date: June 8, 2017 | Barometer ID #/Last Cert. Date/B.P.: fisher Scientific 05544, December 5, 2016 | 940 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Maskwa | Weather Conditions: Mainly sunny | |
| Start/End Time 24 hr. (mst): 8:14 / 13:45 | Calibration Purpose: installation | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov Trina Whitsitt | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: June 18, 2017 | |

| Analyzer: ID# or Serial Number: 2051 Last Calibration Date: n/a 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>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.002</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | n/a | n/a | 1.000 | NO ₂ = | n/a | n/a | 1.002 | NOx = | n/a | n/a | 1.000 |
|---|--|----------------|----------------|----------------|-----------|------|-----|-----|-------|-------------------|-----|-----|-------|-------|-----|-----|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | n/a | n/a | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | n/a | n/a | 1.002 | | | | | | | | | | | | | | |
| NOx = | n/a | n/a | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 627, January 27, 2017 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.7 50.7 | 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

| Point | Diluent | Cal Gas | Total Flow | Calculated NO (ppb) | Calculated NOx (ppb) | Indicated NO (ppb) | Indicated NOx (ppb) | NO C.F. | NOx C.F. |
|----------------------|---------|---------|------------|---------------------|----------------------|--------------------|---------------------|---------|----------|
| adjusted zero | 5000 | 0.0 | 5000 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4923 | 76.9 | 5000 | 779.8 | 779.8 | 780.0 | 780.0 | 1.000 | 1.000 |
| mid | 4965 | 37.50 | 5002 | 380.1 | 380.1 | 374.0 | 374.0 | 1.016 | 1.016 |
| low | 4980 | 18.70 | 4999 | 189.7 | 189.7 | 184.0 | 184.0 | 1.031 | 1.031 |
| calibrator zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.016 | 1.016 |

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

| Point | Diluent | Cal Gas | Total Flow | Calibrator Setting (volts or ppb) | Indicated NO (ppb) | Indicated NOx (ppb) | Indicated NO ₂ (ppb) | NO drop (ppb) | NO ₂ gain (ppb) | NO ₂ C.F. (ppb) |
|-------------------------------------|---------|---------|------------|-----------------------------------|--------------------|---------------------|---------------------------------|---------------|----------------------------|----------------------------|
| NOx reference | 4923 | 76.90 | 5000 | 0.0 | 782.0 | 783.0 | 0.0 | 0.0 | 0.0 | |
| adjusted high NO2 | 4923 | 76.90 | 5000 | 500.0 | 274.0 | 782.0 | 507.0 | 508.0 | 507.0 | 1.002 |
| gpt mid | 4923 | 76.90 | 5000 | 275.0 | 501.0 | 782.0 | 281.0 | 281.0 | 281.0 | 1.000 |
| gpt low | 4923 | 76.90 | 5000 | 100.0 | 685.0 | 782.0 | 97.0 | 97.0 | 97.0 | 1.000 |
| Average NO₂ C.F.= | | | | | | | | | 1.001 | |

Linear Regression/Calibration Results:

| | NO | NOx | NO ₂ | LIMITS |
|-----------------------------------|--------|--------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.998 | 0.998 | 1.002 | .95-1.05 |
| b (Intercept as % of full scale)= | -0.36% | -0.36% | 0.02% | ± 3% F.S. |
| % change in C.F. from last cal= | n/a | n/a | n/a | ± 10% |
| NO2 converter efficiency | | | 1.00 | 0.96 to 1.04 |

As found:

NOx SLOPE: n/a
 NOx OFFS: n/a
 NO SLOPE: n/a
 NO OFFS: n/a
 SAMP FLW: n/a
 OZONE FL: n/a
 NORM PMT: n/a
 AZERO: n/a
 HVPS: n/a
 DCPS: n/a
 RCELL: n/a
 BOX TEMP: n/a
 IZS TEMP: n/a
 MOLY TEMP: n/a
 RCEL: n/a
 SAMP: n/a
 Expected Value NO: n/a
 Expected Value NO₂: n/a
 Expected Value NOx: n/a

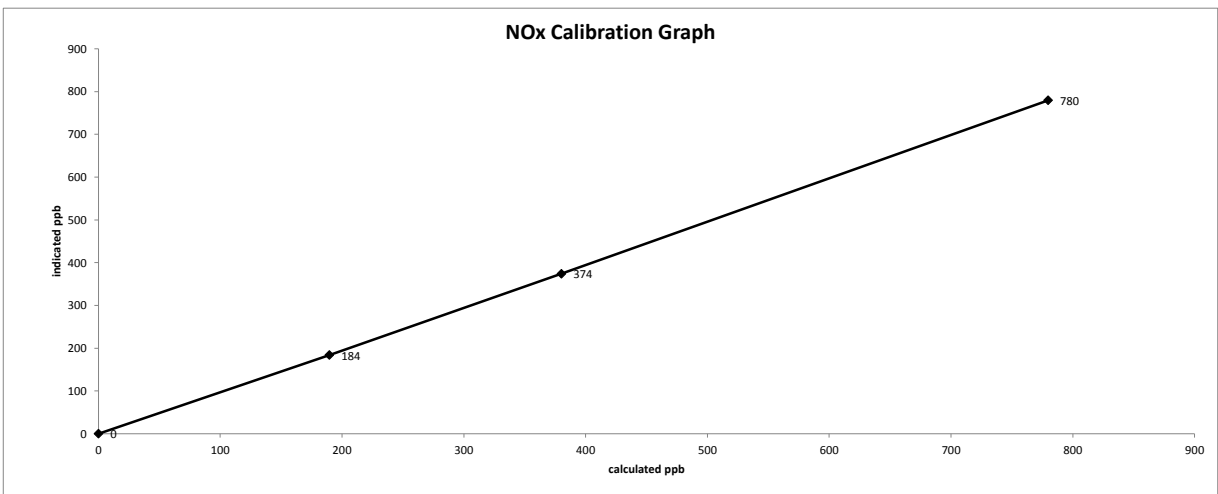
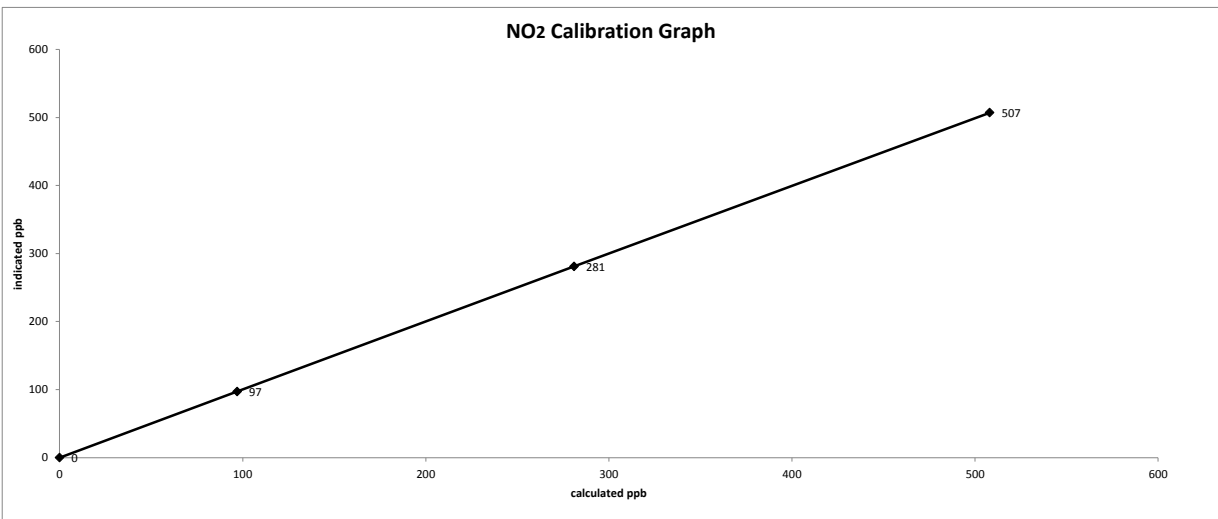
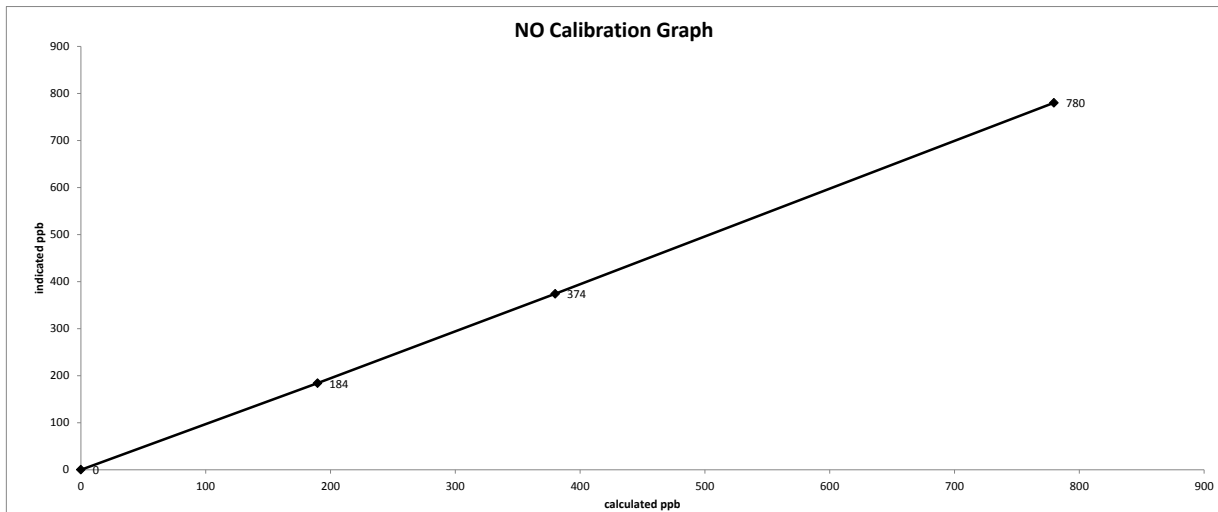
As left:

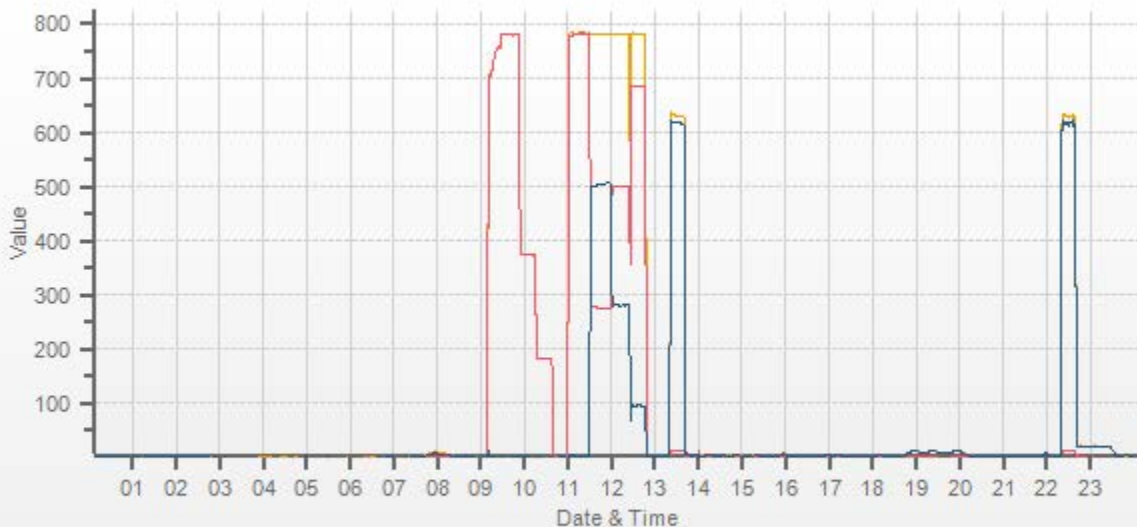
NOx SLOPE: 1.051
 NOx OFFS: -0.1
 NO SLOPE: 1.050
 NO OFFS: -1.7
 SAMP FLW: 502
 OZONE FL: 81
 NORM PMT: -2.2
 AZERO: 50.8
 HVPS: 707
 DCPS: 2576
 RCELL: 50.5
 BOX TEMP: 29.9
 IZS TEMP: 50.0
 MOLY TEMP: 316.2
 RCEL: 6.4
 SAMP: 29.8
 Expected Value NO: 11.9
 Expected Value NO₂: 617.0
 Expected Value NOx: 629.0

Comments:
 The analyzer sample inlet filter was changed.
 No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.
 Installation calibration of the analyzer #2051 (Maxxam) was completed to replace the analyzer #1899 (Maxxam), because of higher readings issue after daily ZS checks. The LICA's NOx analyzer is still at a manufacturer facility for major repair.

Date: June 8, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 8:14 / 13:45
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration





— NOx[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM



Met One Instruments

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
Sensor Output Swing 0V - 1.0V
Customer: Maxxam Analytics
Tested per PO: 35-62828
Calibrated by: David Frith D7

Sensor Serial No.: H10703
Sensor Output Range: 0 - 50.0 MPS
Sales Order No.: 115035
Calibration Date: 03/30/2016

QC Inspection Byron Dawson

Instrument Condition Within Tolerance: As Found As Left X
Corrective Action: No Adjustment Adjust X Repair
Preventative Maintenance

As Found Test Date: N/A As Left Test Date 03/30/2016

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
All Work Performed per Customer Purchase Order Requirements.
Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

| Description | Manufacturer | Model No. | Serial No. | Cal Date | Cal Due | Voltage Accuracy | Time Base Accuracy |
|------------------|---------------------|-----------|------------|-----------|-----------|------------------------------|--------------------|
| Data Acquisition | Campbell Scientific | CR1000 | 6569 | 4/06/2015 | 4/06/2018 | +/- 3mV | < 6 ppm |
| NIST Cupset | Met One Instruments | 170-41 | 3309 | 4/24/2012 | 4/24/2017 | Accuracy < 0.15 mph or 1% WS | |

Environmental Data: Temperature 65 to 80 Deg F Vibration none
Humidity 20 to 70% Radiation none

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

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

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

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

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

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

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

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

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

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

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

| | | | |
|------------------------|-------------------------|---------------------------------|---------------------------|
| Company <u>Maxxam</u> | | Operator: <u>Mike</u> | |
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>Sabio 2010</u> | Make/Model | <u>Bios Defender 530</u> |
| Serial Number | <u>42531101</u> | Serial Number | <u>HI148944 Lo 152019</u> |
| Last Verification Date | <u>February 4, 2016</u> | Temperature (°C) | <u>24.6</u> |
| NO Cylinder S/N | <u>EY0000597</u> | Barometric Pressure | <u>701.4mmHg</u> |
| NO [PPM] | <u>49.0</u> | NOx [PPM] | <u>49.0</u> |
| Expiry Date | <u>December 8, 2019</u> | | |

| | | | |
|----------------------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | |
| Pt. #1 | <u>4919</u> | Pt. #2 | <u>4939</u> |
| | | Pt. #3 | <u>4958</u> |
| Gas Flow (sccm) | | | |
| Pt. #1 | <u>79.7</u> | Pt. #2 | <u>38.5</u> |
| | | Pt. #3 | <u>19.0</u> |

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|-------------------------------------|------|-----------------------|--------|----------------------|-----------------|--------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5005 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0002 | Limit ± 10% | |
| 4999 | 79.7 | 0.7812 | 0.7812 | 0.7827 | -0.0004 | 0.7823 | 0% | 0% |
| 4977 | 38.5 | 0.3790 | 0.3790 | 0.3803 | -0.0004 | 0.3799 | 0% | 0% |
| 4977 | 19.0 | 0.1871 | 0.1871 | 0.1874 | 0.0001 | 0.1875 | 0% | 0% |
| Absolute Average Percent Difference | | | | | | | 0% | 0% |

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

| <u>NO</u> | | <u>LIMITS</u> | | <u>NOx</u> | |
|------------------------|--------|------------------|--|------------------------|--------|
| Correlation= | 1.0000 | ≥ 0.990 | | Correlation= | 1.0000 |
| m (Slope)= | 1.0020 | 0.90-1.10 | | m (Slope)= | 1.0012 |
| b (Intercept % of FS)= | 0.0095 | ± 3% F.S. | | b (Intercept % of FS)= | 0.0248 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOx | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 4999 | 0.000 | 0.0000 | 0.7868 | -0.0007 | 0.7861 | NO ₂ | % Diff. Limit |
| 4999 | 0.500 | 0.5116 | 0.2752 | 0.5118 | 0.7870 | 0% | ± 10% |
| 4999 | 0.250 | 0.2843 | 0.5025 | 0.2832 | 0.7857 | 0% | ± 10% |
| 4999 | 0.100 | 0.1034 | 0.6834 | 0.1031 | 0.7866 | 0% | ± 10% |
| Absolute Average Percent Difference | | | | | | 0% | ± 10% |

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

| <u>NO₂</u> | | <u>LIMITS</u> | |
|------------------------|---------|------------------|--|
| Correlation= | 1.0000 | ≥ 0.995 | |
| m (Slope)= | 1.0012 | 0.90-1.10 | |
| b (Intercept % of FS)= | -0.0751 | ± 3% F.S. | |

| | | | |
|-------------------------|--------------------|--------------------------------|--------------------------|
| AENV Standards | | NO_x Analyzer | |
| Audit Calibrator | | Make/Model <u>Thermo 42i</u> | |
| Make/Model | <u>Thermo 146i</u> | Serial/AMU Number | <u>1868</u> |
| Serial/AMU Number | <u>1809</u> | Last Calibration Date | <u>February 13, 2017</u> |
| SRM Gas Cylinder No. | <u>CAL018140</u> | Full Scale (ppm) | <u>1.0</u> |
| Cylinder Conc. (ppm) | <u>48.79</u> | Cylinder Gas Expiry Date | <u>March 28, 2019</u> |

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

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

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

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

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

| | | |
|--------------------------------|------------------|--------------------------------|
| NO | LIMITS | NOx |
| Correlation= 1.0000 | ≥ 0.990 | Correlation= 1.0000 |
| m (Slope)= 1.0301 | 0.90-1.10 | m (Slope)= 1.0291 |
| b (Intercept % of FS)= -0.0919 | ± 3% F.S. | b (Intercept % of FS)= -0.0881 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|--|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 4954 | 0.000 | 0.0000 | 0.7949 | 0.0005 | 0.7954 | NO ₂ | % Diff. Limit |
| 4954 | 0.510 | 0.5104 | 0.2845 | 0.5072 | 0.7917 | -1% | ± 10% |
| 4954 | 0.250 | 0.2516 | 0.5433 | 0.2514 | 0.7944 | 0% | ± 10% |
| 4954 | 0.100 | 0.1085 | 0.6864 | 0.1087 | 0.7951 | 0% | ± 10% |
| Absolute Average Percent Difference | | | | | | 0% | ± 10% |

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

Company: Maxxam **Operator:** Mike

| Calibrator: | | Flow Measurement Device: | |
|--------------------------------|-------------------------|--------------------------|---------------------------|
| Make/Model | <u>API 700</u> | Make/Model | <u>Bios Defender 530+</u> |
| Serial Number | <u>831</u> | Serial Number | <u>Hi148944 Lo 152019</u> |
| Last Verification Date | <u>January 19, 2016</u> | Temperature (°C) | <u>24.6</u> |
| SO ₂ Cylinder Conc. | <u>50.5</u> | Barometric Pressure | <u>701.4mmHg</u> |
| SO ₂ Cylinder S/N | <u>EY0000769</u> | | |
| Expiry Date | <u>December 8, 2019</u> | | |

Flow Measurements

Pt. No. 1 77.3 **Pt. No. 2** 37.5 **Pt. No. 3** 18.8

| Calibrator Flow (sccm) | Calculated Concentration (ppm) | Indicated Concentration (ppm) | % Difference | |
|-------------------------------------|-----------------------------------|----------------------------------|--------------|---------------|
| | | | vs Audit Gas | % Diff. Limit |
| Zero Air | 0.0000 | 0.0001 | | |
| 4995 | 0.7815 | 0.7889 | 1% | ± 10% |
| 5003 | 0.3785 | 0.3840 | 1% | ± 10% |
| 5007 | 0.1896 | 0.1911 | 1% | ± 10% |
| Absolute Average Percent Difference | | | 1% | ± 10% |

LINEAR REGRESSION ANALYSIS

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

| SO₂ | | LIMITS |
|------------------------|--------|---------------|
| Correlation= | 1.0000 | ≥ 0.995 |
| m (Slope)= | 1.0097 | 0.90-1.10 |
| b (Intercept % of FS)= | 0.0341 | ± 3% F.S. |

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

COMMENTS: Analyzer verified prior to audit

Auditor: Shea Beaton
Operator Signature: 

Date: February 14, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

| Reference Calibrator and Gas: | Flow Measurement Device: |
|---|--------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMY 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.5 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CA:016625</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:

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

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

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.01662 | 60.183 | 50.0 |
| 4935 | 82.0 | 0.830 | 0.01662 | 60.183 | 50.0 |
| 4968 | 40.8 | 0.412 | 0.00821 | 121.765 | 50.2 |
| 4955 | 20.2 | 0.203 | 0.00408 | 245.297 | 49.8 |
| Average Cylinder Concentration: | | | | | 50.0 |

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

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

Auditor: Al Clark

Operator Signature: *Al Clark*

Date: October 19, 2016

Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-111CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119329 **Concentration PPM:** 50.1 **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 | | | | |
| 4960 | 0.0 | 0.000 | | | |
| 4959 | 79.09 | 0.791 | 0.01595 | 62.701 | 49.6 |
| 4950 | 39.44 | 0.394 | 0.00797 | 125.507 | 49.4 |
| 4942 | 19.44 | 0.194 | 0.00393 | 254.218 | 49.3 |
| Average Cylinder Concentration: | | | | | 49.5 |

Previous Stated Concentration PPM: 50.1

Percent variance from Stated: 1.3

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.3ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature:

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

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

| Reference Calibrator and Gas: | Flow Measurement Device: |
|--|---------------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMU 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.0 C</u> |
| Gas Type: <u>H2S</u> Conc. <u>20.43</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CAL015584</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:
Make/Model: Teco 450i **Serial/AMU Number:** 1980
Instrument Settings: **Zero:** 16.6 **Span:** 1.231 **Range:** 0.1
Last Calibration: **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|--|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.00752 | 132.895 | 10.2 |
| 5050 | 38.0 | 0.0764 | 0.00752 | 132.895 | 10.2 |
| 5050 | 17.8 | 0.0355 | 0.00352 | 283.708 | 10.1 |
| 5023 | 9.1 | 0.0182 | 0.00181 | 551.978 | 10.0 |
| Average Cylinder Concentration: | | | | | 10.1 |

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

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

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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-250CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL74267 Concentration PPM: 9.88 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: AI Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.00755 | 132.442 | 9.68 |
| 5099 | 38.5 | 0.0731 | 0.00755 | 132.442 | 9.68 |
| 5092 | 18.0 | 0.0342 | 0.00353 | 282.889 | 9.67 |
| 5066 | 9.2 | 0.0173 | 0.00182 | 550.652 | 9.53 |
| Average Cylinder Concentration: | | | | | 9.63 |

Previous Stated Concentration PPM: 9.88

Percent variance from Stated: 2.6

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: AI Clark Date: December 16, 2014
 Operator Signature: *AI Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 688mmHg

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on CH4 only

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

Auditor: Shea Beaton
Operator Signature: _____

Date: January 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

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

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

Reference Analyzer:
Make/Model Teco 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.4 **Span:** 1.080 **Range:** 1.0
Last Calibration: **Date:** Oct 18/16 **C.F.** 1.000 **Done By:** Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4935 | 82.0 | 0.838 | 0.837 | 0.017 | 60.183 | 50.4 | 50.4 |
| 4968 | 40.8 | 0.417 | 0.417 | 0.008 | 121.765 | 50.8 | 50.8 |
| 4955 | 20.2 | 0.207 | 0.207 | 0.004 | 245.297 | 50.8 | 50.8 |
| Average Cylinder Concentration: | | | | | | 50.7 | 50.6 |

| | | |
|------------------------------------|-------------|-------------|
| | <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: | <u>50.7</u> | <u>50.9</u> |
| Percent variance from Stated: | <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

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

APPENDIX III
INTERNAL AUDIT RESULTS

COMPANY: LICA STATION: Maskwa DATE: June 8, 2017

Station Location: X,Y Coordinates: 54.605, -110.452
 Elevation (m): 607
 Declination: 12°

| GENERAL | Yes | No | n/a | Comments: |
|--|-----|----|-----|--|
| Has site location changed from previous audit? | | X | | |
| Is site secure? | X | | | |
| Are station operating conditions adequate? | X | | | |
| Is the AC & heat working properly? | X | | | |
| Last twelve month's of calibrations available? | X | | | |
| All applicable SOP's available in station? | | X | | |
| Site documentation up to date? | | | X | working with Mike to verify and update |

| STATION COMPONENTS | Yes | No | n/a | Comments: |
|--|-----|----|-----|-----------------------------------|
| Are spare manifold ports capped? | X | | | |
| Is sampling manifold clean and free of chips and cracks? | X | | | |
| Is manifold pump properly installed and operative? | X | | | |
| Manifold cleaned all the way through? | X | | | |
| Manifold measured velocity / units | | | | anemometer doesn't fit port |
| Hot wire anemometer ID# | | | | anemometer doesn't fit port |
| Do sample lines extend halfway into manifold? | X | | | |
| Are monitor sampling lines connected to manifold? | X | | | |
| Are sampling lines clean? | X | | | |
| Are monitors properly mounted and secure? | X | | | |
| Are monitors properly exhausted from room or scrubbed | X | | | |
| Are zero and span systems operational? | X | | | |
| Modifications to any equipment? | | X | | |
| Black tape on anything? | | X | | |
| All scrubbers have dates? | | | X | Moved inside analyzer except NOx. |
| TEOM flow control set to active? | | | X | |
| All TEOM particulate intakes clean? | | | X | |
| Sharp tape advancement set to 8 hours? | | | X | |
| Modifications to any equipment? | | X | | |
| All pumps fastened down? | | X | | On shelf with lip in pump closet. |
| Noisy pumps or zero air generator? | | X | | |
| TRS/H2S converter, single scrubber, no brass, no mods? | X | | | |
| Precip screen in/out? | | | | OUT |

| Meteorological | Yes | No | n/a | Comments: |
|-----------------------|-----|----|-----|----------------|
| Head Type | | | | ultrasonic |
| Calibration date okay | X | | | March 30, 2016 |

| | Indicated Value: | Audit Value: | % Difference | Scalar Difference: |
|-----------------------------------|------------------|--------------|--------------|--------------------|
| Station Temperature °C | 23 | 21.3 | -7.98 | -1.70 |
| Barometric Pressure | 942 | 940 | -0.21 | -2.00 |
| Wind Speed (kph) | 2.99 | n/a | n/a | n/a |
| Wind Direction (Deg) | 24 | n/a | n/a | n/a |
| Relative Humidity % | 41.6 | n/a | n/a | n/a |
| Ambient Temperature °C | 23.1 | 22.9 | -0.87 | -0.20 |
| Solar Radiation kW/m ² | n/a | n/a | n/a | n/a |
| Precipitation (Tipping Bucket mm) | 20 | 20 | 0.00 | 0.00 |

Recommendations: Keep on top of landscaping.

AUDITOR: Tom Bourque



API 100E Sulphur Dioxide Analyzer Calibration

| | | |
|----------------------------------|--|------------------|
| Date: June 8, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 940 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 21 C |
| Location/Station Name: Maskwa | Weather Conditions: Mainly sunny | |
| Parameter: Sulphur Dioxide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 7:57 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 9:52 | Cal Gas Expiry Date: December 2, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 508 | Range ppb: 1000 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 1.016 |
| Previous C.F.: 0.999 | New C.F.: n/a |

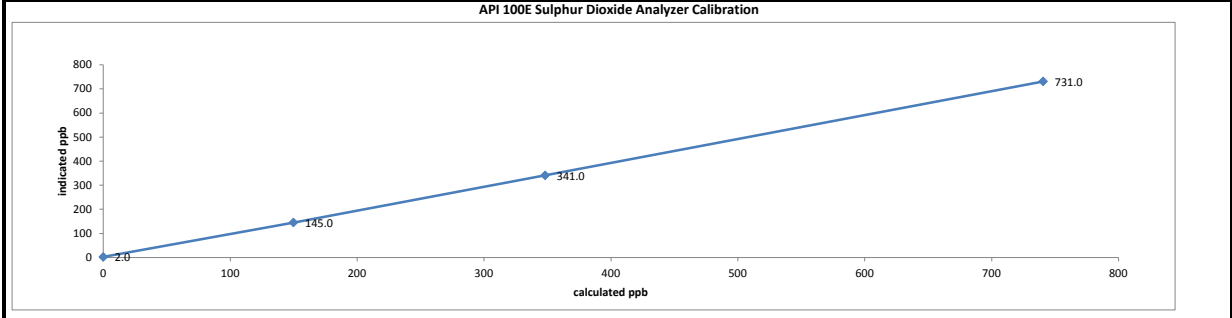
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.1 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|--|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

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 | 4998 | 75.00 | 5073 | 740.7 | 731.0 | 1.016 |
| mid | 5000 | 35.00 | 5035 | 348.3 | 341.0 | 1.027 |
| low | 5000 | 15.00 | 5015 | 149.9 | 145.0 | 1.048 |
| Average C.F.= | | | | | | 1.030 |

Linear Regression/Calibration Results:

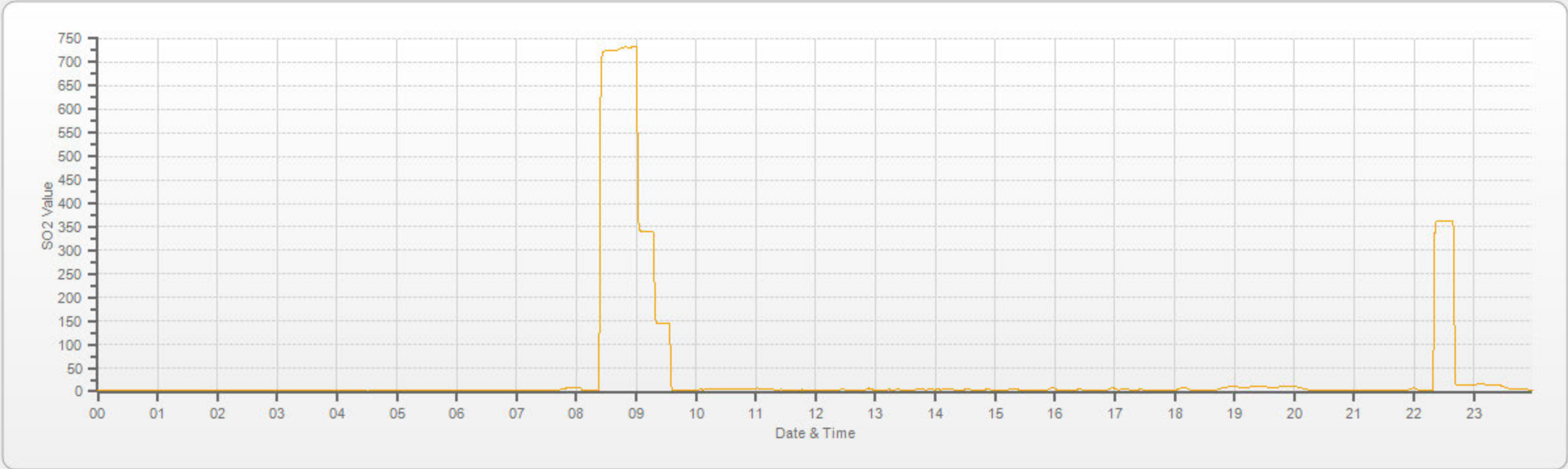
| | |
|---|---------------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS > or = 0.995 |
| Slope = <u>1.014</u> | 0.90-1.10 |
| b (Intercept as % of full scale) = <u>0.07%</u> | ± 3% F.S. |
| % change in C.F. from last cal = <u>-1.70%</u> | ± 10% |



| | |
|--|---|
| As found: Slope: .977 Offset: 129.8 Hvps: 483 Rcell Temp: 50.0 Box Temp: 30.8 Pmt Temp: 7.7 Izs Temp: 45.0 Pres: 24.8 Samp Fl: 584 Norm Pmt: 1613 Uv Lamp: 2658 Lamp Ratio: 97.1% Str Lgt: 63.4 Drk Pmt: 10.3 Drk Lmp: -0.6 Expected Value: 351.0 | As left: Slope: .977 Offset: 129.8 Hvps: 483 Rcell Temp: 50.0 Box Temp: 30.8 Pmt Temp: 7.7 Izs Temp: 45.0 Pres: 24.8 Samp Fl: 584 Norm Pmt: 1613 Uv Lamp: 2658 Lamp Ratio: 97.1% Str Lgt: 63.4 Drk Pmt: 10.3 Drk Lmp: -0.6 Expected Value: 351.0 |
|--|---|

Comments:

SO2[ppb] Station: LICA MASKWA Daily: 17.06.08 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 101A Hydrogen Sulphide Analyzer Calibration

| | | |
|----------------------------------|--|------------------|
| Date: June 8, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 940 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 21 C |
| Location/Station Name: Maskwa | Weather Conditions: Mainly clear | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 9:14 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 11:50 | Cal Gas Expiry Date: July 15, 2017 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a internal |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 324 | Range ppb: 100 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 1.033 |
| Previous C.F.: 0.999 | New C.F.: n/a |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 831, February 14, 2017 Cal Gas Cylinder I.D. #: LL74267 Cal Gas Conc. (ppm): 9.88 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 | SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 9:20-9:30 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.1 Analyzer Response (ppb): 0.6 Zero Corrected Result (ppb): 0.5 |
|--|--|-------|-----|------|----|-----|----|-----|----|--|
| Point | ppb | | | | | | | | | |
| High | 78 | | | | | | | | | |
| Mid | 38 | | | | | | | | | |
| Low | 19 | | | | | | | | | |

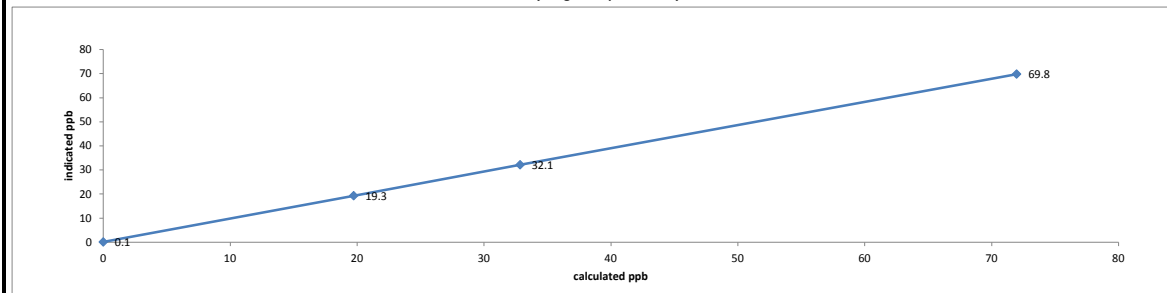
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|---------------|--------------------------------|---------|-------|---------------------------|--------------------------|----------------------------|
| | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 7500 | 0.00 | 7500 | 0.0 | 0.1 | n/a |
| as found high | 7494 | 55.00 | 7549 | 72.0 | 69.8 | 1.033 |
| mid | 7495 | 25.00 | 7520 | 32.8 | 32.1 | 1.026 |
| low | 7496 | 15.00 | 7511 | 19.7 | 19.3 | 1.028 |
| Average C.F.= | | | | | | 1.029 |

Linear Regression/Calibration Results:

| | | |
|-----------------------------------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS |
| Slope = | 1.033 | > or = 0.995 |
| b (Intercept as % of full scale)= | -0.19% | 0.90-1.10 |
| % change in C.F. from last cal= | -3.38% | ± 3% F.S. |
| | | ± 10% |

API 101A Hydrogen Sulphide Analyzer Calibration

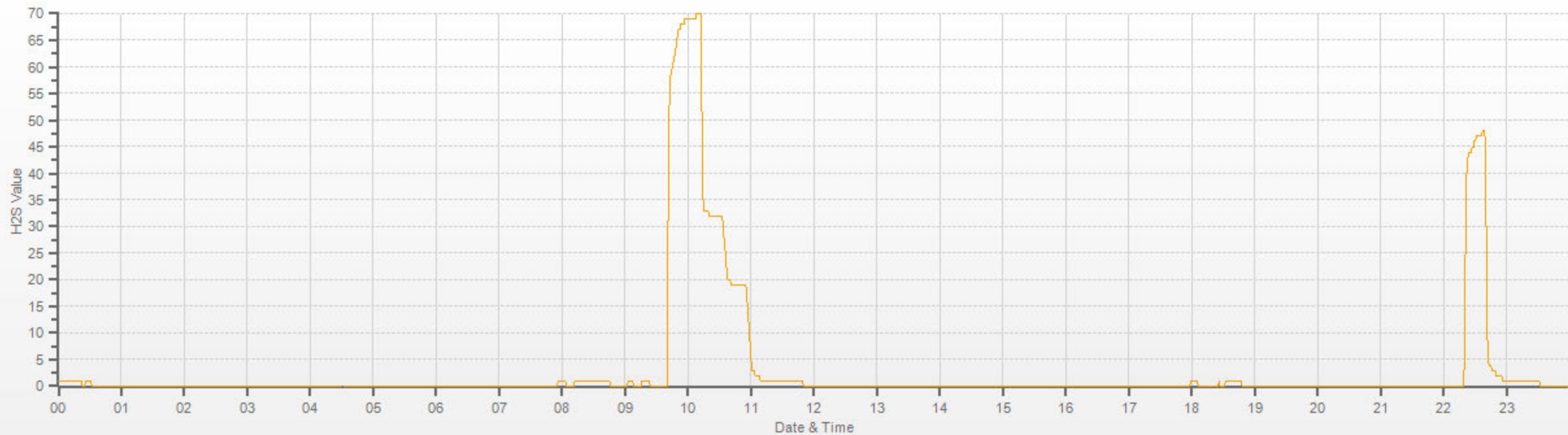


| | |
|--|---|
| As found: Slope: .978 Offset: 23.5 Hvps: 676 Dcps: 2578 Rcell Temp: 50.2 Box Temp: 30.3 Pmt Temp: 6.8 IZS TEMP: 50.2 Converter Temp: 321.6 Pres: 24.1 Samp Fl: 529 Uv Lamp: 3904 Lamp Ratio: 111.2% Str Lgt: 11.5 Drk Pmt: 38.4 Drk Lmp: -3.9 Expected Value: 47.7 | As left: Slope: .978 Offset: 23.5 Hvps: 676 Dcps: 2578 Rcell Temp: 50.2 Box Temp: 30.3 Pmt Temp: 6.8 IZS TEMP: 50.2 Converter Temp: 321.6 Pres: 24.1 Samp Fl: 529 Uv Lamp: 3904 Lamp Ratio: 111.2% Str Lgt: 11.5 Drk Pmt: 38.4 Drk Lmp: -3.9 Expected Value: 47.7 |
|--|---|

Comments:

Analyzer response slow but does pass.

H2S[ppb] Station: LICA MASKWA Daily: 17.06.08 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | | |
|--|--|------------------|
| Date: June 8, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 940 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 21 C |
| Location/Station Name: Maskwa | Weather Conditions: Mainly sunny | |
| Parameter: Total Hydrocarbon | Calibration Purpose: Internal Audit | |
| Start/End Time 24 hr. (mst): 07:57-09:19 | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: November 25, 2023 | |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 436609738 | Range ppm: 50 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 1.022 |
| Previous Cal High Point C.F.: 0.999 | New C.F.: n/a |

| | |
|---|---|
| Calibration Standards: | |
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | Standard Calibration Points for a Range of: 50 ppm |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | |
| Calibrator ID/Cert. Date: API 700 831, February 14, 2017 | |
| Cal Gas Cylinder I.D. #: LL165372 | |
| CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 606.0 212.0 | |
| CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0 | |

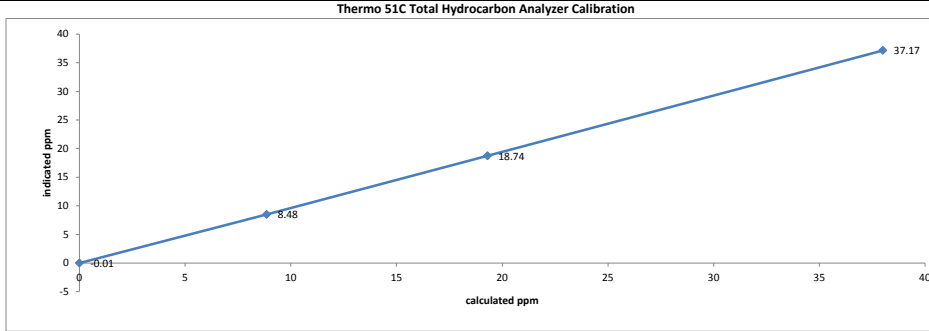
| Point | Target ppm |
|-------|------------|
| High | 38 |
| Mid | 18 |
| Low | 9 |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|---------------------|
| Point | Diluent | Cal Gas | Total | (ppm) | (ppm) | |
| as found zero | 2000 | 0.00 | 2000 | 0.0 | -0.01 | n/a |
| as found high | 1999 | 66.00 | 2065 | 38.00 | 37.17 | 1.022 |
| mid | 2000 | 33.00 | 2033 | 19.30 | 18.74 | 1.029 |
| low | 1999 | 15.00 | 2014 | 8.86 | 8.48 | 1.043 |
| Average C.F. = | | | | | | 1.031 |

Linear Regression/Calibration Results:

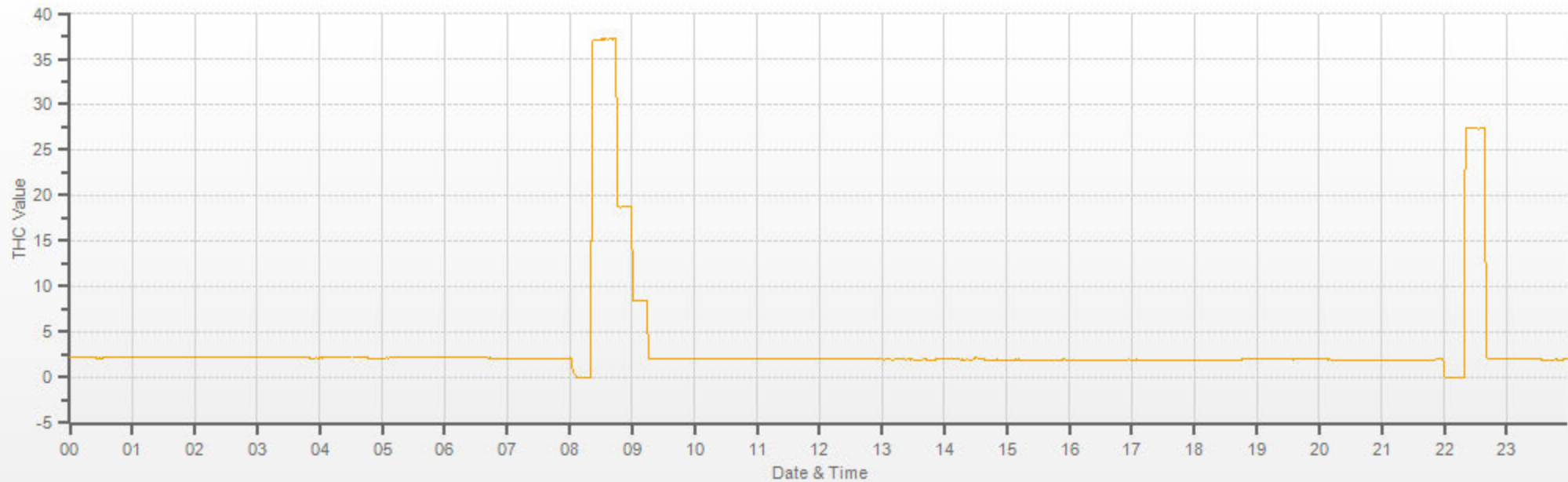
| | | |
|------------------------------------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS |
| Slope = | 1.021 | > or = 0.995 |
| b (Intercept as % of full scale) = | 0.22% | 0.90-1.00 |
| % change in C.F. from last cal = | -2.31% | ± 3% F.S. |
| | | ± 10% |



| | |
|--|--|
| <p style="text-align: center;">As found:</p> <p>H2 cylinder (psi): 800</p> <p>H2 cylinder reg set (psi): 25</p> <p>Span Cylinder (psi): 1500</p> <p>Span Cylinder Reg Set (psi): 25</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 28076</p> <p>rng: 1</p> <p>try: 0</p> <p>flm: 185.0</p> <p>det: 125.3</p> <p>Flame: 185</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 7.46</p> <p>Expected Value: 27.40</p> | <p style="text-align: center;">As left:</p> <p>H2 cylinder (psi): 800</p> <p>H2 cylinder reg set (psi): 25</p> <p>Span Cylinder (psi): 1500</p> <p>Span Cylinder Reg Set (psi): 25</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 28076</p> <p>rng: 1</p> <p>try: 0</p> <p>flm: 185.0</p> <p>det: 125.3</p> <p>Flame: 185</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 7.46</p> <p>Expected Value: 27.4</p> |
|--|--|

Comments:

THC[ppm] Station: LICA MASKWA Daily: 17.06.08 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

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

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

Maram Ghaleb

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

August 16, 2017

Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2017-06-30-C</u> |
| Site: <u>Maskwa Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|---------------------|-----------------------------|
| Level 0 Preliminary Verification | <u>Maram Ghaleb</u> | Date <u>July 28, 2017</u> |
| Level 1 Primary Validation | <u>Maram Ghaleb</u> | Date <u>July 28, 2017</u> |
| Level 2 Final Validation | <u>Maram Ghaleb</u> | Date <u>August 11, 2017</u> |
| Level 3 Independent Data Review | <u>CSA-LMBQ</u> | Date <u>August 16, 2017</u> |
| Post-Final Validation | <u>NA</u> | Date <u>NA</u> |

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



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

February 22, 2018

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

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of June 2017.

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

| Sampling Program | Monitoring Activities Conducted By | Sample Analysis Conducted By | Data/Report Review and Prepared By | Electronic Submission Conducted By |
|------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------------|
| Continuous ambient air | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics |

All data collected in June 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

A scheduled internal station audit was performed by a contractor on June 7. The audit report can be found in this report.

Wind System: The Maxxam-supplied RM Young wind unit, s/n: 56778, was removed on June 27 in order to reinstate the LICA- owned MET One wind system, s/n: H12635.

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

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

Respectfully,



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

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

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

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

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



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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 #: 2833-2017-06-31-C

June 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

402 - 19 ST NW
CALGARY, ALBERTA
T2N 2J1

Attention: MIKE BISAGA

DATE: **August 16, 2017**

Prepared by: *Maram Ghaleb*

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

Reviewed by: *Wunmi Adekanmbi*

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

SUMMARY

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

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

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

A scheduled internal station audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.

All Parameters: A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 05:00.

SO₂: The analyzer started spanning low towards the end of May due to a depleted permeation tube. The permeation tube was replaced on June 2, following a successful as-found response check, incurring two hours of downtime.

THC: An additional hour of downtime was recorded on June 22, at hour 06:00 as the analyzer was in recovery mode following the power failure.

NO_x/NO/NO₂: An additional hour of downtime was recorded on June 22, at hour 06:00 as the analyzer was in recovery mode following the power failure. NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

O₃: A brief power failure occurred on June 12 which interrupted the zero-span check. An additional span verification was initiated, but it did not execute properly, resulting in one hour of downtime.

PM_{2.5}: Following the power failure, data at hours 6:00 to 08:00 on June 22 were invalidated as the instrument was slow to recover. Two additional hours of data were invalidated due to brief power outages on June 27. Two hours of data were recorded at concentrations below $-3 \mu\text{g}/\text{m}^3$ rendering the data invalid.

Wind System: The Maxxam owned RM Young wind unit (s/n: 56778) was removed on June 27 in order to reinstate the LICA owned MET One Unit (s/n: H12635), resulting in two hours of downtime.

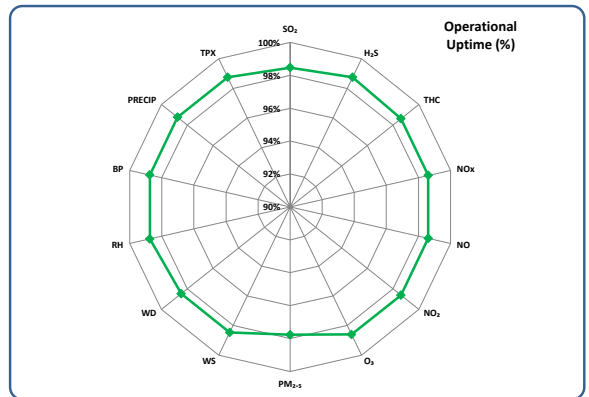
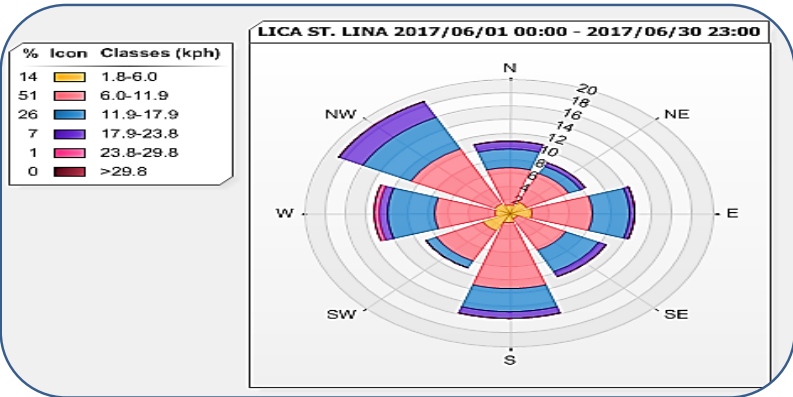
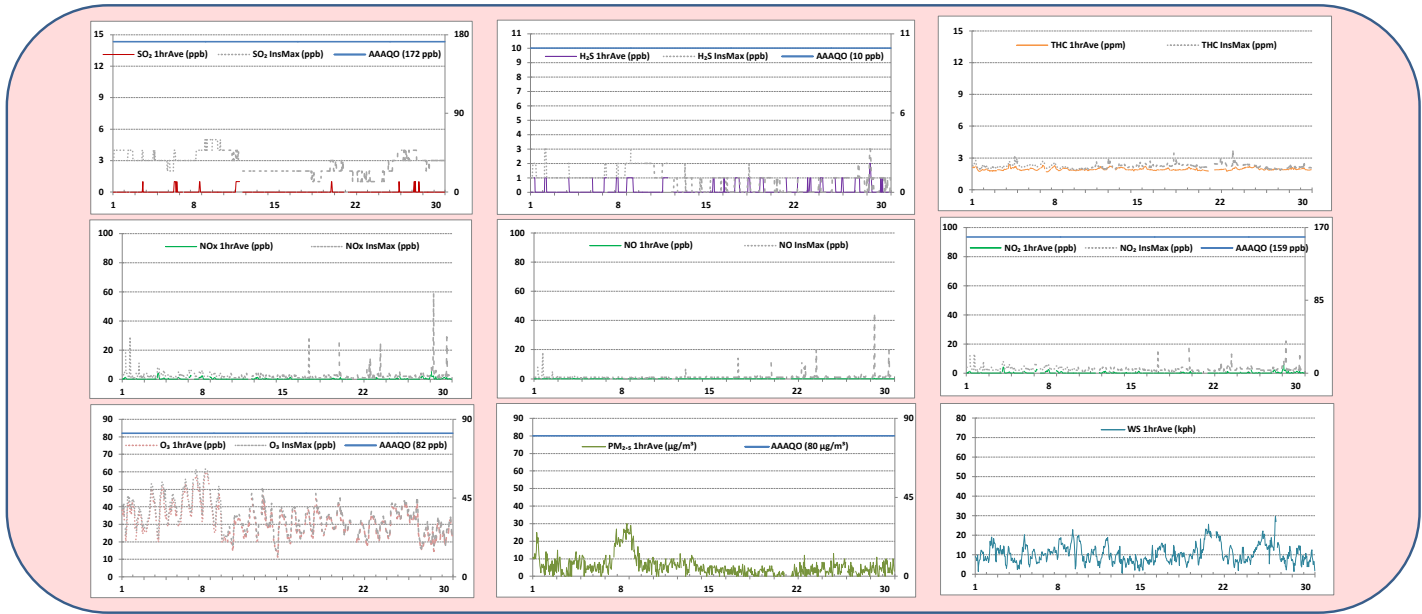
The summary of results is presented on the following pages.

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

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

June 2017 Monthly Report Summary

| Pollutants | | Monthly Records | | 1-Hour Records | | | | | 24-Hour Records | | | |
|-------------------|-------------------|-----------------|--------|----------------|---------|------|-----------------|---------------|-----------------|---------|-----------------|--------------|
| Name | Unit | Avg. Conc. | Uptime | Maximum | | | AAAQO Objective | Exceed. Hours | Maximum | | AAAQO Objective | Exceed. Days |
| | | | | Conc. | Date | Hour | | | Conc. | Date | | |
| SO ₂ | ppb | 0 | 98.5% | 1 | June 3 | 16 | 172 | 0 | 1 | June 12 | 48 | 0 |
| H ₂ S | ppb | 0 | 98.8% | 2 | June 29 | 5 | 10 | 0 | 1 | June 9 | 3 | 0 |
| THC | ppm | 1.94 | 98.6% | 2.39 | June 4 | 5 | - | - | 2.12 | June 25 | - | - |
| NO _x | ppb | 0 | 98.6% | 6 | June 29 | 2 | - | - | 1 | June 29 | - | - |
| NO | ppb | 0 | 98.6% | 1 | June 29 | 29 | - | - | 0 | June 1 | - | - |
| NO ₂ | ppb | 0 | 98.6% | 6 | June 29 | 2 | 159 | 0 | 1 | June 29 | - | - |
| O ₃ | ppb | 32.1 | 98.6% | 59.7 | June 8 | 15 | 82 | 0 | 49.9 | June 8 | - | - |
| PM _{2.5} | µg/m ³ | 6 | 97.8% | 30 | June 8 | 19 | 80 | 0 | 23 | June 8 | 30 | 0 |
| WS | kph | 1.1 | 98.5% | 29.7 | June 27 | 12 | - | - | 19.0 | June 21 | - | - |
| WD | degree | 287 (WNW) | 98.5% | - | - | - | - | - | - | - | - | - |
| RH | % | 64 | 98.8% | 92 | June 9 | 11 | - | - | 87 | June 14 | - | - |
| BP | mbar | 928 | 98.8% | 943 | June 24 | 11 | - | - | 941 | June 24 | - | - |
| PRECIP | mm | 0 | 98.8% | 15 | June 13 | 18 | - | - | 1 | June 13 | - | - |
| AmbTPX | °C | 15 | 98.8% | 26 | June 8 | 14 | - | - | 20 | June 8 | - | - |



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.
- * A scheduled internal station audit was conducted by Maxxam on June 7.

Operational Issues

• **All Parameters:** A power failure resulted in 9 hrs of downtime from Jun 21 at 21:00 to Jun 22 at 05:00.
 • **SO₂:** The analyzer started spanning low towards the end of May due to a depleted permeation tube. The permeation tube was replaced on Jun 2, following a successful as-found response check, incurring 2 hrs of downtime. • **THC:** An additional hr of downtime was recorded on Jun 22, at hr 06:00 as the analyzer was in recovery mode following the power failure. • **NO_x/NO/NO₂:** An additional hr of downtime was recorded on Jun 22, at hr 06:00 as the analyzer was in recovery mode following the power failure. • **O₃:** A brief power failure occurred on Jun 12 which interrupted the zero-span check. An additional span verification was initiated, but it did not execute properly, resulting in 1 hr of downtime. • **PM_{2.5}:** Following the power failure, data at hrs 6:00 to 08:00 on Jun 22 were invalidated as the instrument was slow to recover. 2 additional hrs of data were invalidated due to brief power outages on Jun 27. 2 hrs of data were recorded at concentrations below -3 µg/m³ rendering the data invalid. • **Wind System:** The Maxxam owned RM Young wind unit (s/n: 56778) was removed on Jun 27 in order to reinstate the LICA owned MET One Unit (s/n: H12635), resulting in 2 hrs of downtime.

Monthly Continuous Data Summary

| Lakeland Industry & Community Association | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| St. Lina Continuous Monitoring Station | | | | | | 1-HOUR | | | | | 24-HOUR | | |
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | READING | DAY | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | | | | | | | | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 0 | 1 | 3 | 16 | 4.8 | SW | 1 | 12 | 98.5 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 0 | 2 | 29 | 5 | 4.6 | SW | 1 | 9 | 98.8 |
| THC (ppm) | - | - | - | - | 1.94 | 2.39 | 4 | 5 | 8.4 | NE | 2.12 | 25 | 98.6 |
| NO ₂ (ppb) | 159 | - | 0 | - | 0 | 6 | 29 | 2 | 5.0 | NE | 1 | 29 | 98.6 |
| NO (ppb) | - | - | - | - | 0 | 1 | 29 | 29 | 8.9 | SW | 0 | 1 | 98.6 |
| NO _x (ppb) | - | - | - | - | 0 | 6 | 29 | 2 | 5.0 | NE | 1 | 29 | 98.6 |
| O ₃ (ppb) | 82 | - | 0 | - | 32.1 | 59.7 | 8 | 15 | 15.6 | SE | 49.9 | 8 | 98.6 |
| PM _{2.5} (µg/m ³) | 80 | 30 | 0 | 0 | 6 | 30 | 8 | 19 | 13.0 | E | 23 | 8 | 97.8 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 64 | 92 | 9 | 11 | 16.1 | ENE | 87 | 14 | 98.8 |
| BAROMETRIC PRESSURE (millibar) | - | - | - | - | 928 | 943 | 24 | 11 | 5.5 | N | 941 | 24 | 98.8 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | 14.5 | 25.8 | 8 | 14 | 15.3 | SE | 19.9 | 8 | 98.8 |
| PRECIPITATION (mm) | - | - | - | - | 0.2 | 14.9 | 13 | 18 | 14.4 | SW | 1.5 | 13 | 98.8 |
| VECTOR WS (kph) | - | - | - | - | 1.1 | 29.7 | 27 | 12 | - | W | 19.0 | 21 | 98.5 |
| VECTOR WD (sec) | - | - | - | - | 287 (WNNW) | - | - | - | - | - | - | - | 98.5 |

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

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

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

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

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 98.5%, equivalent to eleven hours of downtime.
- The analyzer started spanning low towards the end of May due to a depleted permeation tube. The permeation tube was replaced on June 2, following a successful as-found response check. The IZS oven temperature appeared to be unstable after the installation of the permeation tube as demonstrated by the biased high span responses. The new permeation device was, therefore, allowed ample stabilization period. During the routine monthly calibration on June 12, the IZS oven temperature was adjusted and the expected span value was subsequently updated. As both the as-found response check and the routine monthly calibration met AMD requirements, no data was discarded due to this event. However, two hours of downtime were recorded due to the additional quality checks.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 05:00.
- One instance of maximum instantaneous data was invalidated on June 27 at 14:00 as the data was considered an anomalous spike. This is likely due to an interference from activities surrounding a station visit on that day.
- Eleven additional instances of maximum instantaneous data were discarded this month due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime. These were incurred due to a power failure that occurred from June 21 at 21:00 to June 22 at 05:00.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 12.
- One instance of maximum instantaneous data was invalidated on June 27 at 14:00 as the data was considered an anomalous spike. This is likely due to an interference from activities surrounding a station visit on that day.
- Eleven additional instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL HYDROCARBONS (THC)

- Operational time, for the monitoring period was 98.6%, equivalent to ten hours of downtime.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 13.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 5:00. One hour of data following the power failure (June 22 at 6:00) was invalidated as the analyzer was recovering from the power failure.
- Eleven instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 98.6%, equivalent to ten hours of downtime.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- The routine monthly calibration was performed on June 12.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 05:00. One hour of data following the power failure (June 22 at 6:00) was invalidated as the analyzer was recovering from the power failure.
- One instance of maximum instantaneous data was invalidated on June 27 at 14:00 as the data was considered an anomalous spike. This is likely due to an interference from activities surrounding a station visit on that day.
- Eleven additional instances of maximum instantaneous data were discarded this month due to brief power outages.
- NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

OZONE (O₃)

- Operational time, for the monitoring period was 98.6%, equivalent to ten hours of downtime.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- A brief power failure occurred on June 12 at 15:57 and 15:58 which interrupted the zero-span check. The technician was on site for station calibrations and adjusted the zero-span schedule to run at hour 15:00, rather than the scheduled hour 18:00. This span did not execute properly and was initiated again at hour 16:00. One hour of downtime was incurred due to the additional quality check.
- The routine monthly calibration was performed on June 13.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 05:00.
- Eleven instances of maximum instantaneous data were discarded due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 97.8%, equivalent to sixteen hours of downtime.
- A scheduled internal audit was performed by Maxxam on June 7. The audit report can be found in Appendix V.
- Two routine TEOM audits were performed this month. The first was completed on June 13, and the second on June 27.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 05:00. Following the power failure, data at hours 6:00 to 08:00 were invalidated as the instrument was slow to recover.
- Two hours of data were invalidated on June 27 at hours 00:00 to 01:00, due to brief power outages.
- 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. Two hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime.
- A power failure resulted in nine hours of downtime from June 21 at 21:00 to June 22 at 5:00.
- The Maxxam owned RM Young wind unit (s/n: 56778) was removed on June 27 in order to reinstate the LICA owned MET One Unit (s/n: H12635). The latter unit was the resident wind system that was removed on April 25, 2017 for off-site repairs.
- Twenty instances of maximum instantaneous data were discarded due to brief power outages.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime. These were incurred due to power failure events that occurred on June 12 at from June 21 at 21:00 to June 22 at 05:00.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime. These were incurred due to power failure events that occurred on June 12 at from June 21 at 21:00 to June 22 at 05:00.

PRECIPITATION (PRECIP)

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime. These were incurred due to power failure events that occurred on June 12 at from June 21 at 21:00 to June 22 at 05:00.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period was 98.8%, equivalent to nine hours of downtime. These were incurred due to power failure events that occurred on June 12 at from June 21 at 21:00 to June 22 at 05:00.

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 Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - RM Young & Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

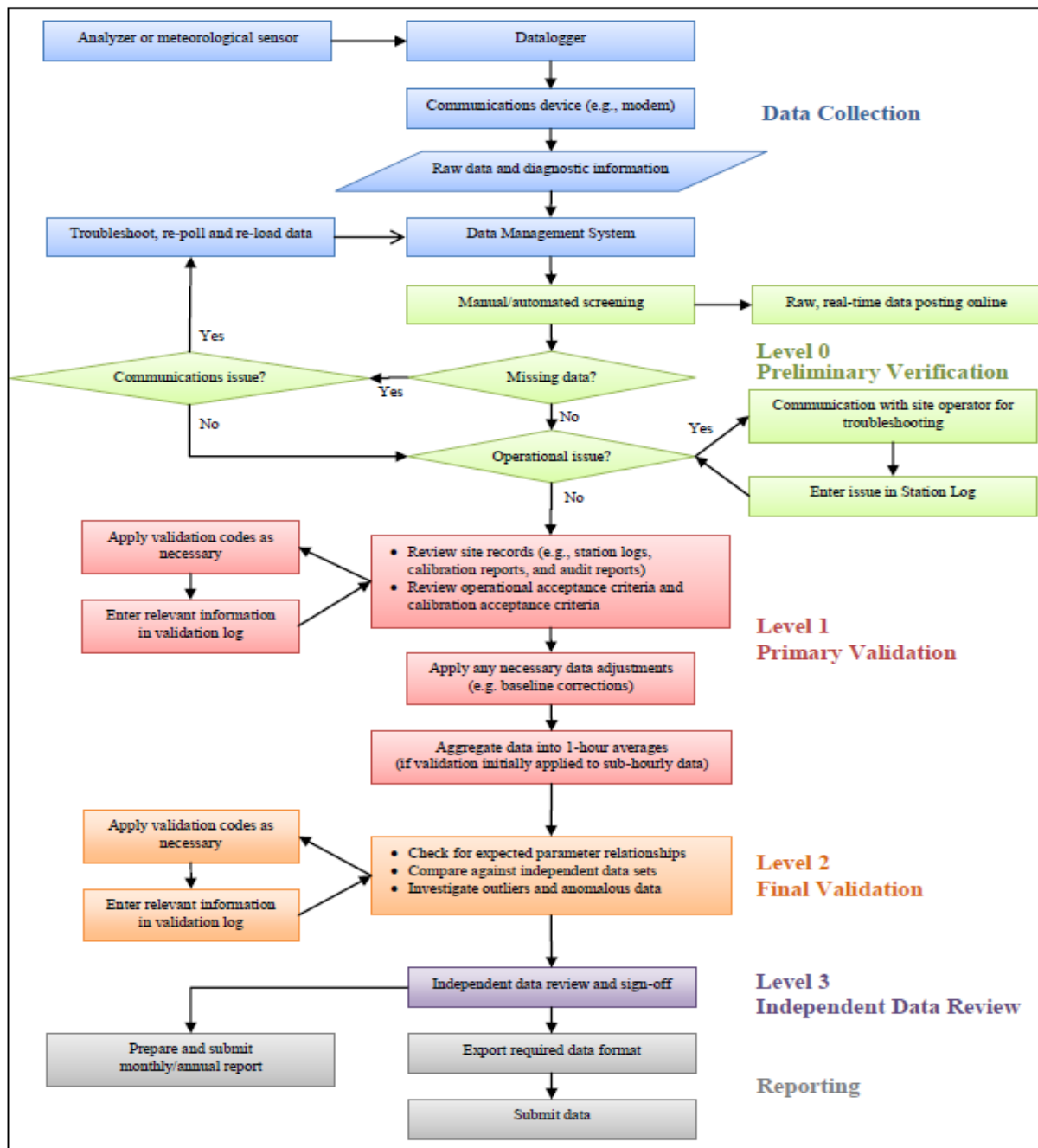
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

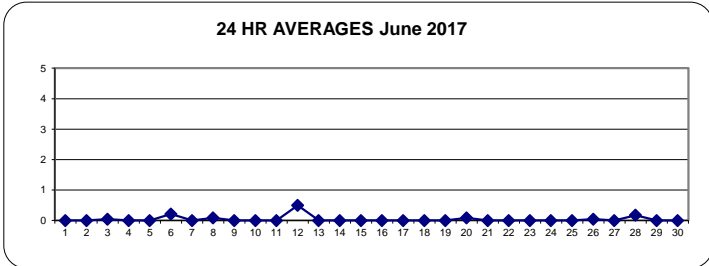
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

| | | | | | | |
|-----------------------------|------|-----|-----|-------|----|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 172 | ppb | 24-HR | 48 | ppb |
|-----------------------------|------|-----|-----|-------|----|-----|

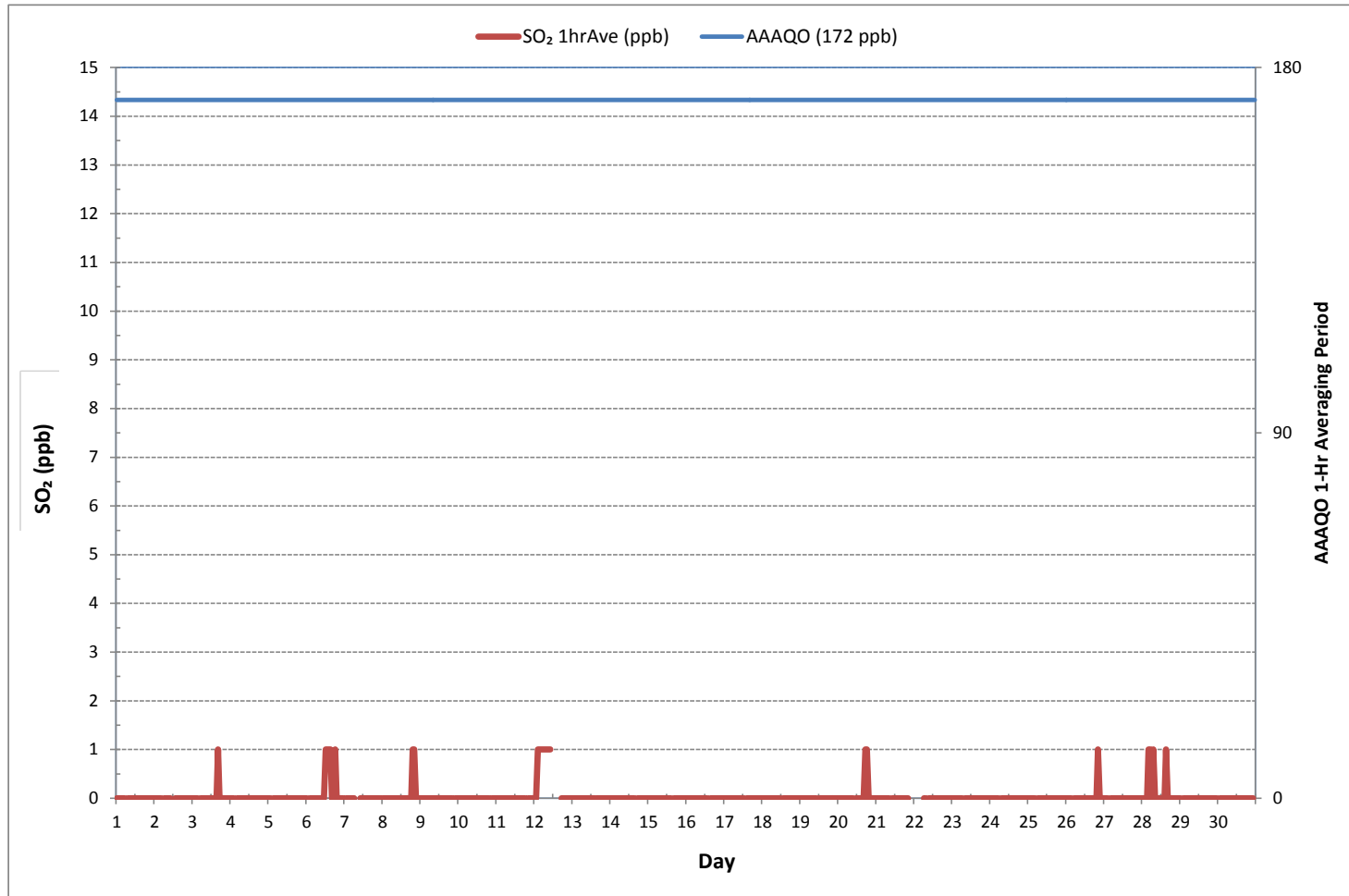
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | |
|------------------------------|----|-----|-----------------------|-------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 24 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb | @ HOUR | 0 ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 1 | ppb | @ HOUR | 16 ON DAY 3 |
| MAXIMUM 24-HR AVERAGE: | 1 | ppb | | ON DAY 12 |
| IZS CALIBRATION TIME: | 31 | hrs | OPERATIONAL TIME: | 709 hrs |
| MONTHLY CALIBRATION TIME: | 6 | hrs | AMD OPERATION UPTIME: | 98.5 % |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 ppb |

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





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

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

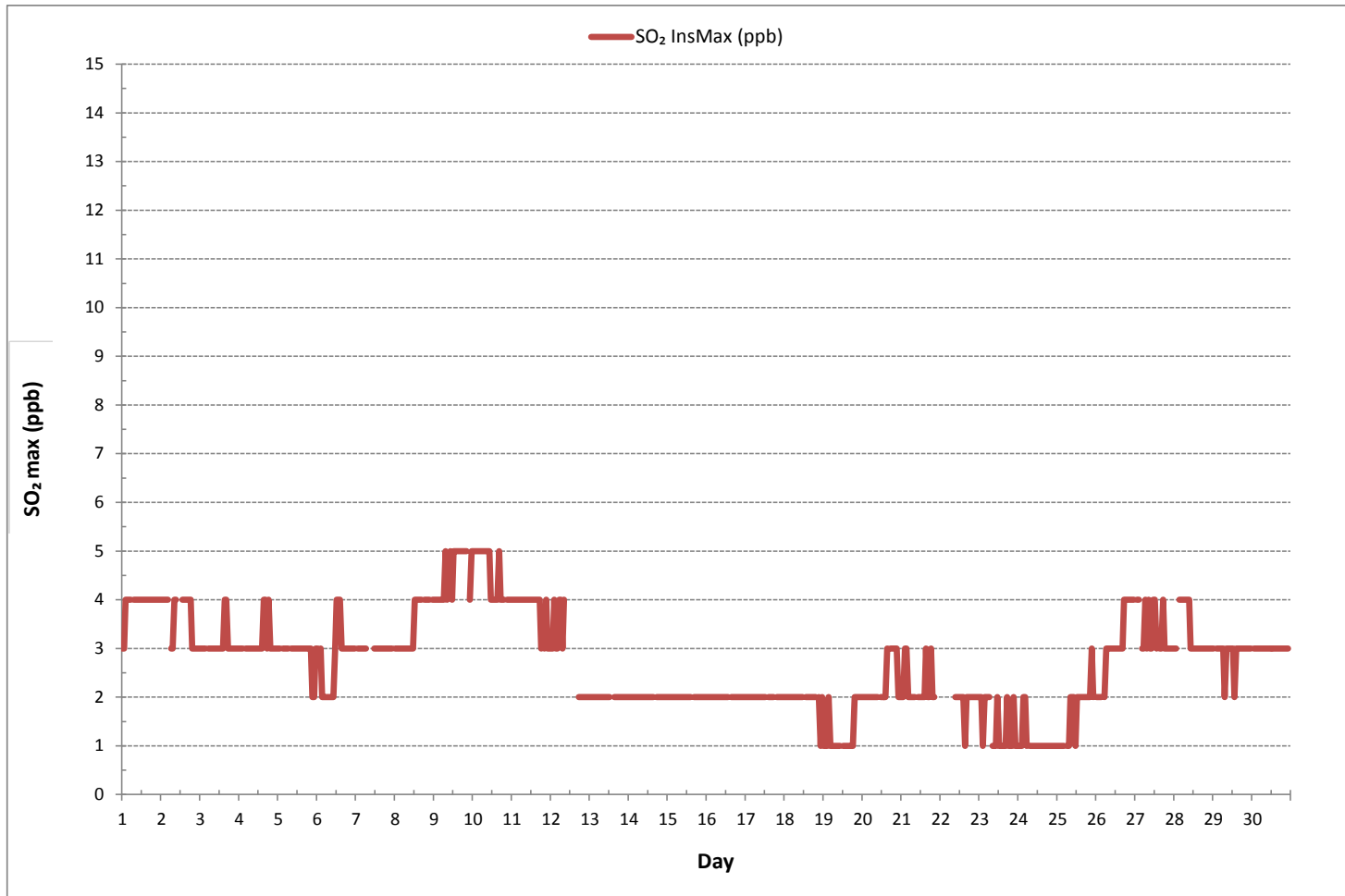
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-------------------------|
| NUMBER OF NON-ZERO READINGS: | 654 |
| MAXIMUM INSTANTANEOUS VALUE: | 5 ppb @ HOUR 7 ON DAY 9 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 1 |
| OPERATIONAL TIME: | 696 hrs |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

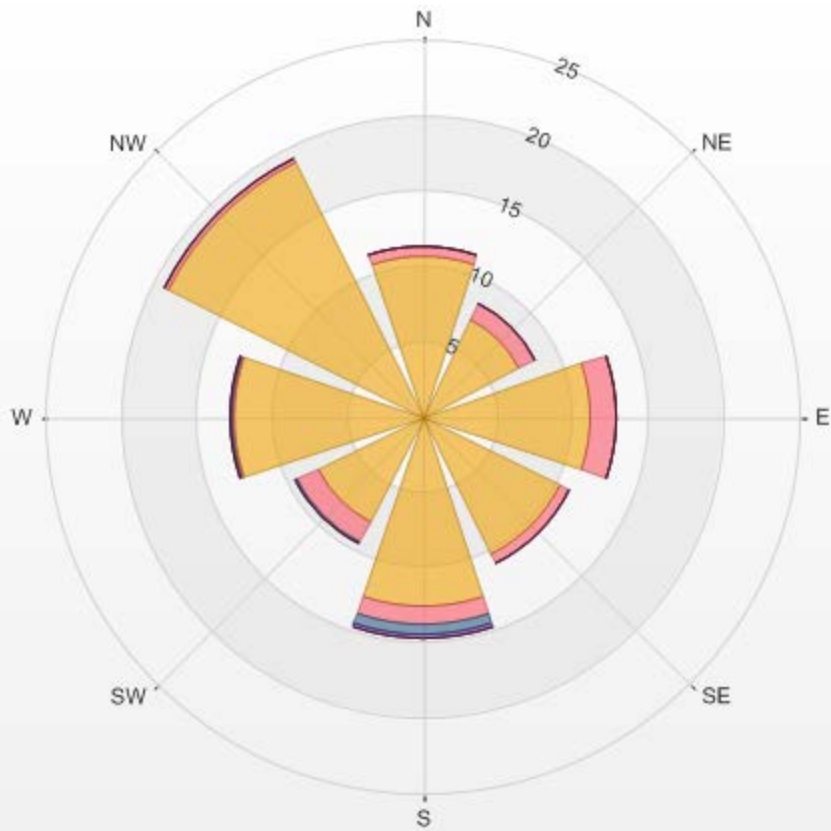
Calm: 0.46%

Calm Avg: 0.16 [ppb]

| Direction | 0.0-0.4 | 0.4-0.8 | 0.8-1.1 | 1.1-1.5 | 1.5-1.9 | >1.9 | Total |
|----------------|---------|---------|---------|---------|---------|------|-------|
| N | 10.7 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 11.3 |
| NE | 7.2 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 8.4 |
| E | 11.2 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 12.8 |
| SE | 10.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 10.9 |
| S | 12.5 | 1.2 | 0.8 | 0.2 | 0.0 | 0.0 | 14.7 |
| SW | 7.8 | 1.5 | 0.2 | 0.0 | 0.0 | 0.0 | 9.5 |
| W | 12.5 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 12.8 |
| NW | 19.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 19.1 |
| Summary | 91.1 | 7.2 | 1.1 | 0.2 | 0.0 | 0.0 | 100.0 |

| | | | | | | | | | | | | | |
|--------|---------------|----|---------|---|---------|---|---------|---|---------|---|---------|---|------|
| % Icon | Classes (ppb) | 91 | 0.0-0.4 | 7 | 0.4-0.8 | 1 | 0.8-1.1 | 0 | 1.1-1.5 | 0 | 1.5-1.9 | 0 | >1.9 |
|--------|---------------|----|---------|---|---------|---|---------|---|---------|---|---------|---|------|

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 0.16[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



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

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

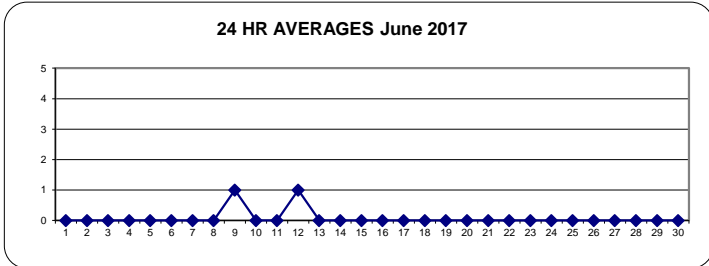
OBJECTIVE LIMIT:

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

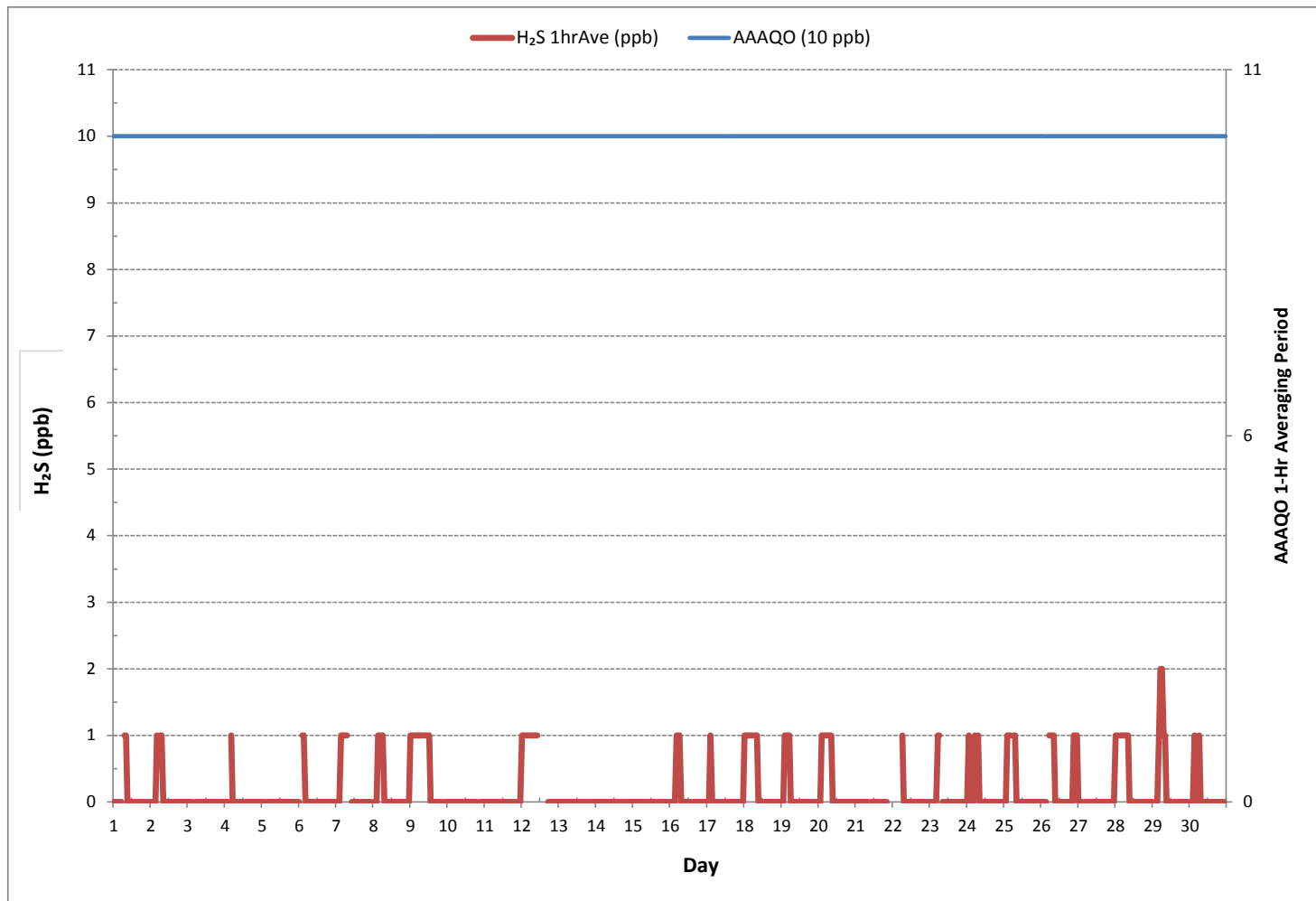
MONTHLY SUMMARY

| | | | |
|------------------------------|--------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 98 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 2 ppb @ HOUR | 5 ON DAY | 29 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | ON DAY | 9 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 711 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs | AMD OPERATION UPTIME: | 98.8 % |
| STANDARD DEVIATION: | 0 | MONTHLY AVERAGE: | 0 ppb |

24 HR AVERAGES June 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

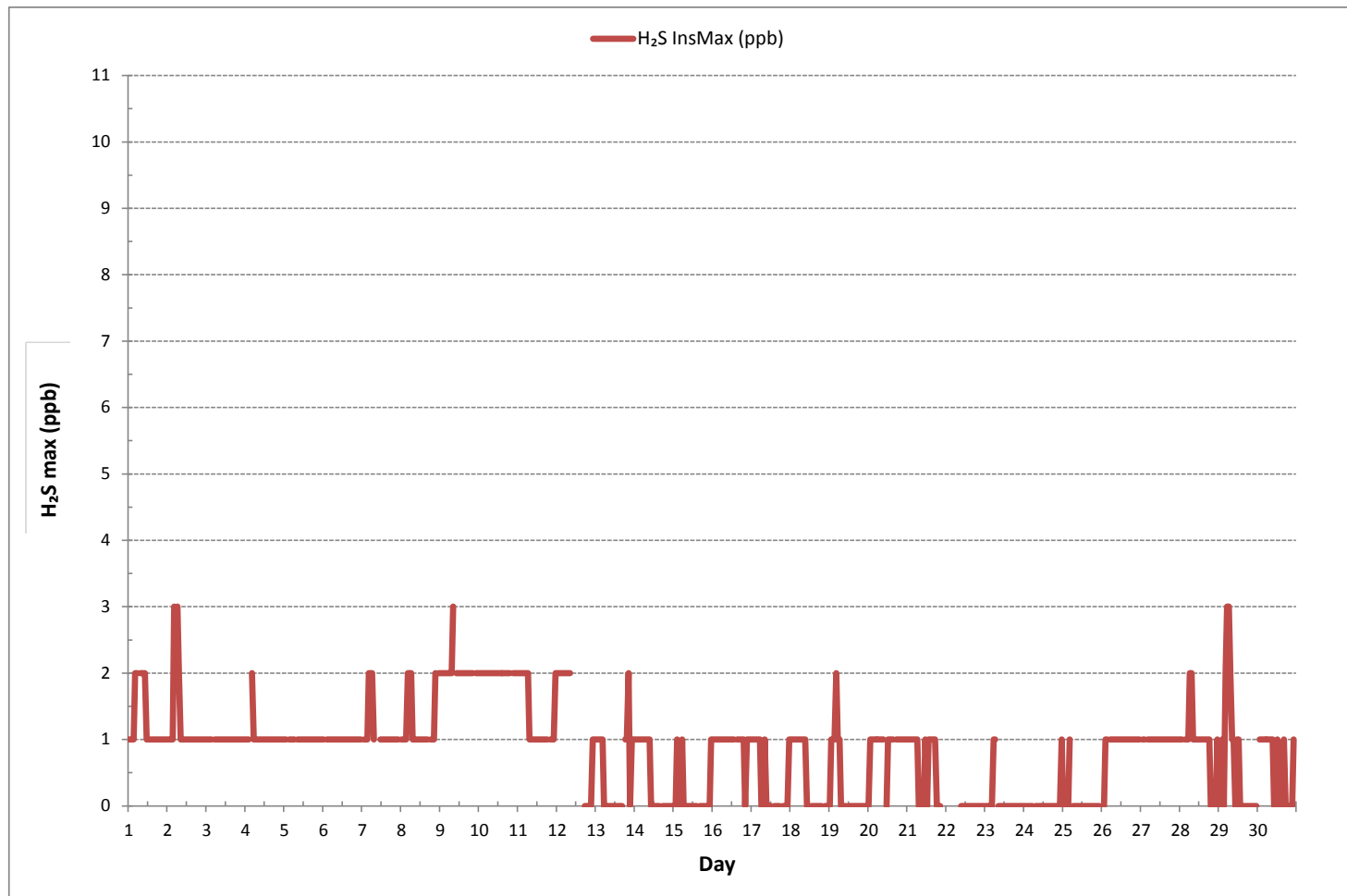
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-------------------------|
| NUMBER OF NON-ZERO READINGS: | 446 |
| MAXIMUM INSTANTANEOUS VALUE: | 3 ppb @ HOUR 4 ON DAY 2 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| STANDARD DEVIATION: | 1 |
| OPERATIONAL TIME: | 699 hrs |

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-H₂S [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.46% Calm Avg: 0.19 [ppb]

| Direction | 0.0-1.0 | 1.0-2.0 | 2.0-3.0 | >3.0 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 11.2 | 0.0 | 0.0 | 0.0 | 11.2 |
| NE | 8.7 | 0.0 | 0.0 | 0.0 | 8.7 |
| E | 12.8 | 0.0 | 0.0 | 0.0 | 12.8 |
| SE | 10.8 | 0.0 | 0.0 | 0.0 | 10.8 |
| S | 14.1 | 0.5 | 0.0 | 0.0 | 14.6 |
| SW | 9.0 | 0.2 | 0.3 | 0.0 | 9.4 |
| W | 13.2 | 0.0 | 0.0 | 0.0 | 13.2 |
| NW | 18.7 | 0.3 | 0.0 | 0.0 | 19.0 |
| Summary | 98.3 | 0.9 | 0.3 | 0.0 | 100.0 |

% Icon Classes (ppb)

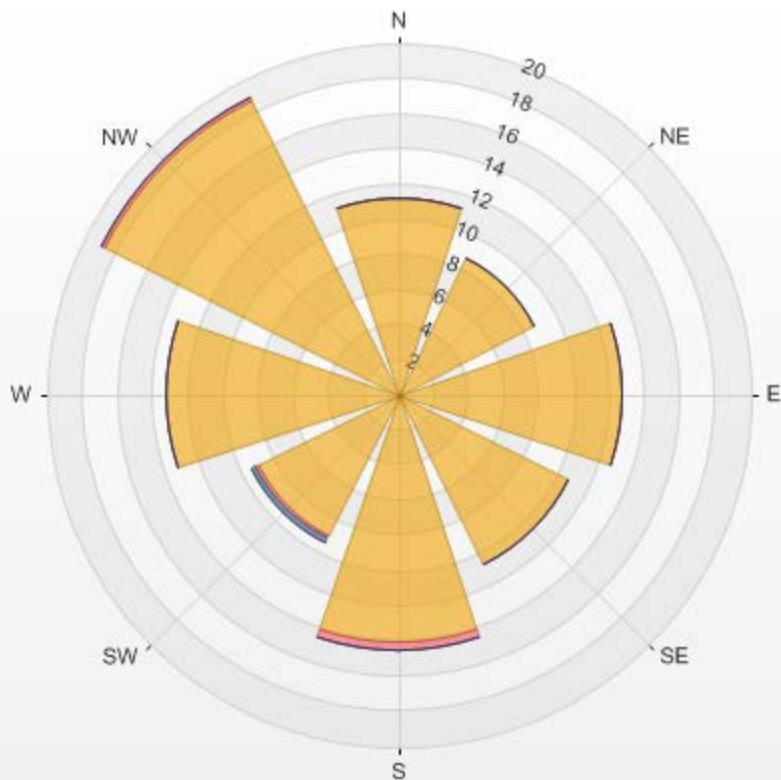
98 0.0-1.0

1 1.0-2.0

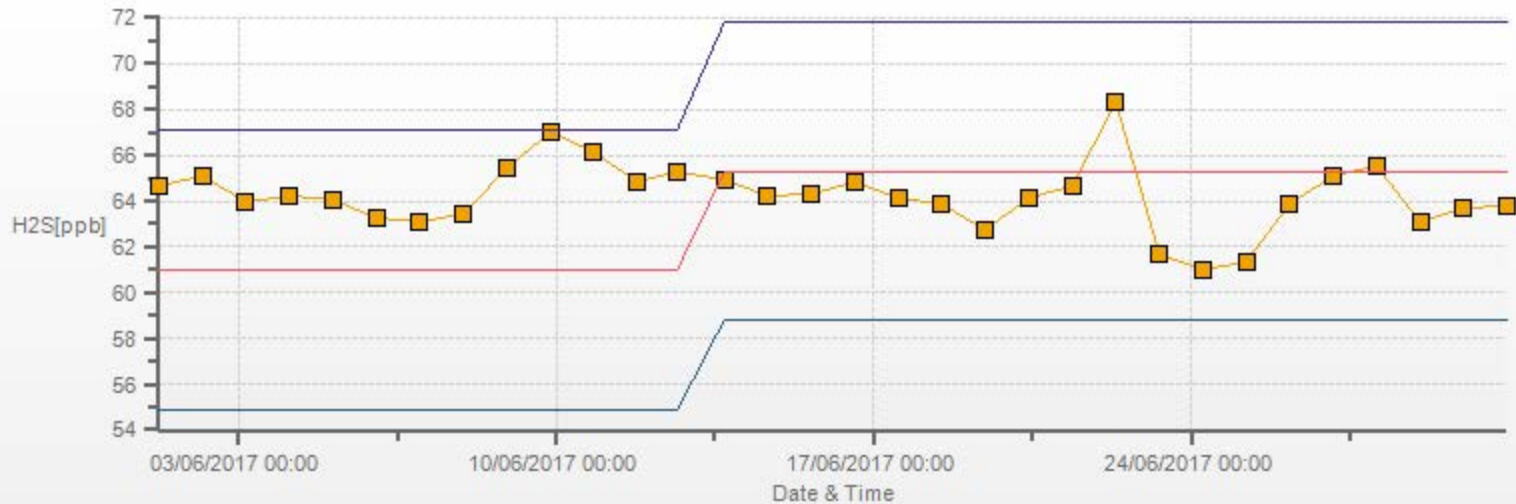
0 2.0-3.0

0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 0.19[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



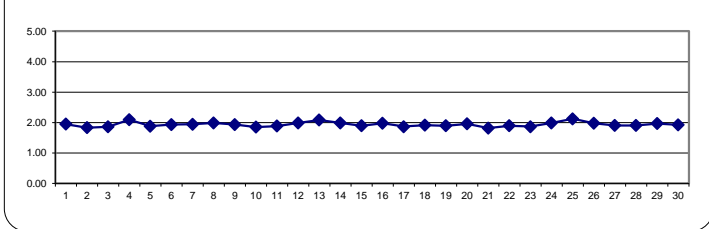
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 2.10 | 2.10 | 2.15 | 2.08 | 2.11 | 2.17 | S | 2.25 | 2.19 | 2.04 | 2.00 | 1.90 | 1.82 | 1.79 | 1.75 | 1.74 | 1.75 | 1.76 | 1.81 | 1.84 | 1.85 | 1.92 | 1.90 | 1.85 | 1.74 | 2.25 | 1.95 | 2.4 |
| 2 | 1.87 | 1.88 | 1.86 | 1.86 | 1.95 | S | 1.98 | 1.91 | 1.86 | 1.83 | 1.85 | 1.84 | 1.82 | 1.75 | 1.81 | 1.80 | 1.81 | 1.80 | 1.74 | 1.79 | 1.84 | 1.78 | 1.79 | 1.81 | 1.74 | 1.98 | 1.84 | 24 |
| 3 | 1.76 | 1.84 | 1.78 | 1.81 | S | 1.89 | 1.89 | 1.90 | 1.89 | 1.90 | 1.88 | 1.85 | 1.86 | 1.85 | 1.83 | 1.82 | 1.83 | 1.80 | 1.84 | 1.91 | 1.94 | 1.93 | 1.91 | 1.92 | 1.76 | 1.94 | 1.86 | 24 |
| 4 | 1.94 | 1.97 | 1.98 | S | 2.00 | 2.36 | 2.39 | 2.36 | 2.19 | 2.00 | 1.99 | 2.03 | 2.06 | 2.09 | 2.09 | 2.04 | 2.07 | 2.10 | 2.19 | 2.14 | 2.23 | 2.07 | 2.00 | 1.95 | 1.94 | 2.39 | 2.10 | 24 |
| 5 | 1.91 | 1.96 | S | 1.92 | 1.87 | 1.86 | 1.84 | 1.85 | 1.79 | 1.82 | 1.86 | 1.87 | 1.87 | 1.88 | 1.86 | 1.89 | 1.90 | 1.91 | 1.92 | 1.91 | 1.92 | 1.94 | 1.91 | 1.87 | 1.79 | 1.96 | 1.88 | 24 |
| 6 | 1.89 | S | 1.99 | 2.05 | 2.06 | 2.02 | 2.01 | 2.01 | 2.00 | 1.98 | 1.96 | 1.93 | 1.89 | 1.87 | 1.86 | 1.84 | 1.83 | 1.83 | 1.86 | 1.89 | 1.91 | 1.96 | 1.98 | 1.99 | 1.83 | 2.06 | 1.94 | 24 |
| 7 | S | 2.04 | 2.10 | 2.14 | 2.14 | 2.30 | 2.29 | 2.26 | 2.18 | 1.97 | Q | Q | 1.71 | 1.70 | 1.68 | 1.70 | 1.72 | 1.74 | 1.78 | 1.81 | 1.85 | 1.90 | 1.96 | S | 1.68 | 2.30 | 1.95 | 24 |
| 8 | 2.02 | 2.06 | 2.14 | 2.12 | 2.16 | 2.23 | 2.29 | 2.25 | 2.13 | 1.99 | 1.95 | 1.92 | 1.92 | 1.88 | 1.83 | 1.81 | 1.80 | 1.82 | 1.82 | 1.86 | 1.89 | 1.92 | S | 1.99 | 1.80 | 2.29 | 1.99 | 24 |
| 9 | 2.02 | 2.07 | 2.06 | 2.02 | 2.01 | 2.02 | 2.03 | 2.04 | 2.02 | 2.02 | 1.97 | 1.95 | 1.90 | 1.83 | 1.83 | 1.85 | 1.85 | 1.85 | 1.87 | 1.83 | 1.86 | S | 1.84 | 1.87 | 1.83 | 2.07 | 1.94 | 24 |
| 10 | 1.84 | 1.82 | 1.81 | 1.80 | 1.80 | 1.84 | 1.86 | 1.85 | 1.83 | 1.84 | 1.84 | 1.92 | 1.93 | 1.87 | 1.86 | 1.92 | 1.91 | 1.89 | 1.88 | 1.90 | S | 1.82 | 1.83 | 1.87 | 1.80 | 1.93 | 1.86 | 24 |
| 11 | 1.92 | 1.91 | 1.92 | 1.86 | 1.84 | 1.81 | 1.82 | 1.82 | 1.89 | 1.91 | 1.90 | 1.89 | 1.89 | 1.88 | 1.90 | 1.89 | 1.90 | 1.91 | 1.92 | S | 1.91 | 1.89 | 1.93 | 1.92 | 1.81 | 1.93 | 1.89 | 24 |
| 12 | 1.94 | 1.99 | 2.01 | 2.06 | 2.01 | 2.05 | 2.05 | 2.18 | 2.13 | 2.06 | 2.03 | 2.00 | 2.00 | 1.93 | 1.89 | 1.91 | 1.89 | 1.87 | S | 1.88 | 1.90 | 1.95 | 2.00 | 2.08 | 1.87 | 2.18 | 1.99 | 24 |
| 13 | 2.12 | 2.11 | 2.17 | 2.24 | 2.22 | 2.19 | 2.18 | 2.20 | 2.13 | 2.07 | C | C | C | C | C | 1.88 | 1.89 | 1.92 | 1.99 | 2.05 | 2.08 | 2.08 | 2.07 | 2.09 | 1.88 | 2.24 | 2.09 | 24 |
| 14 | 2.04 | 2.10 | 2.12 | 2.11 | 2.11 | 2.12 | 2.08 | 2.08 | 2.06 | 2.08 | 2.05 | 2.02 | 1.93 | 1.89 | 1.88 | 1.89 | S | 1.88 | 1.87 | 1.88 | 1.88 | 1.90 | 1.88 | 1.89 | 1.87 | 2.12 | 1.99 | 24 |
| 15 | 1.87 | 1.87 | 1.88 | 1.86 | 1.88 | 1.82 | 1.78 | 1.86 | 1.92 | 1.89 | 1.90 | 1.88 | 1.88 | 1.89 | 1.87 | S | 1.88 | 1.88 | 1.95 | 2.00 | 2.02 | 1.93 | 1.92 | 1.97 | 1.78 | 2.02 | 1.90 | 24 |
| 16 | 1.99 | 1.95 | 1.94 | 2.11 | 2.12 | 2.17 | 2.22 | 2.18 | 2.13 | 2.05 | 1.96 | 1.93 | 1.93 | 1.96 | S | 1.89 | 1.89 | 1.91 | 1.85 | 1.88 | 1.90 | 1.89 | 1.86 | 1.83 | 1.83 | 2.22 | 1.98 | 24 |
| 17 | 1.82 | 1.83 | 1.85 | 1.84 | 1.83 | 1.79 | 1.87 | 1.90 | 1.89 | 1.88 | 1.88 | 1.86 | 1.87 | S | 1.88 | 1.88 | 1.89 | 1.90 | 1.87 | 1.88 | 1.88 | 1.89 | 1.90 | 1.90 | 1.79 | 1.90 | 1.87 | 24 |
| 18 | 1.93 | 1.95 | 1.98 | 1.94 | 1.94 | 2.03 | 2.01 | 2.06 | 2.01 | 1.95 | 1.87 | 1.87 | S | 1.84 | 1.85 | 1.85 | 1.85 | 1.89 | 1.91 | 1.88 | 1.87 | 1.87 | 1.89 | 1.83 | 1.83 | 2.06 | 1.92 | 24 |
| 19 | 1.87 | 1.85 | 1.87 | 1.88 | 1.87 | 1.87 | 1.91 | 1.91 | 1.89 | 1.88 | 1.87 | S | 1.87 | 1.88 | 1.90 | 1.90 | 1.91 | 1.89 | 1.89 | 1.89 | 1.93 | 1.97 | 1.95 | 1.97 | 1.85 | 1.97 | 1.90 | 24 |
| 20 | 1.95 | 2.05 | 2.12 | 2.11 | 2.09 | 2.04 | 1.96 | 1.97 | 2.00 | 1.97 | S | 1.96 | 1.94 | 1.94 | 1.92 | 1.90 | 1.88 | 1.87 | 1.92 | 2.07 | 2.00 | 1.81 | 1.82 | 1.84 | 1.81 | 2.12 | 1.96 | 24 |
| 21 | 1.83 | 1.85 | 1.83 | 1.79 | 1.81 | 1.82 | 1.83 | 1.88 | 1.90 | S | 1.86 | 1.84 | 1.83 | 1.83 | 1.81 | 1.81 | 1.79 | 1.78 | 1.79 | 1.76 | 1.76 | P | P | P | 1.76 | 1.90 | 1.82 | 21 |
| 22 | P | P | P | P | P | P | R | 1.91 | S | 1.89 | 1.87 | 1.90 | 1.89 | 1.89 | 1.89 | 1.88 | 1.89 | 1.89 | 1.88 | 1.93 | 1.89 | 1.93 | 1.95 | 1.87 | 1.95 | 1.90 | 1.90 | 17 |
| 23 | 1.88 | 1.91 | 1.92 | 1.93 | 1.91 | 1.95 | 1.96 | S | 1.98 | 1.94 | 1.84 | 1.74 | 1.78 | 1.79 | 1.81 | 1.82 | 1.82 | 1.83 | 1.84 | 1.83 | 1.86 | 1.86 | 1.87 | 1.91 | 1.74 | 1.98 | 1.87 | 24 |
| 24 | 2.00 | 2.02 | 2.04 | 2.05 | 2.01 | 2.17 | S | 2.09 | 2.03 | 1.96 | 1.94 | 1.93 | 1.91 | 1.89 | 1.89 | 1.93 | 1.95 | 1.96 | 1.95 | 1.96 | 1.99 | 2.04 | 2.02 | 2.05 | 1.89 | 2.17 | 1.99 | 24 |
| 25 | 2.10 | 2.05 | 2.07 | 2.12 | 2.10 | S | 2.16 | 2.14 | 2.11 | 2.12 | 2.18 | 2.13 | 2.15 | 2.12 | 2.09 | 2.09 | 2.08 | 2.07 | 2.10 | 2.11 | 2.13 | 2.16 | 2.23 | 2.20 | 2.05 | 2.23 | 2.12 | 24 |
| 26 | 2.20 | 2.19 | 2.10 | 2.08 | S | 2.05 | 2.03 | 1.96 | 1.89 | 1.89 | 1.96 | 1.98 | 1.97 | 1.99 | 1.95 | 1.94 | 1.92 | 1.86 | 1.85 | 1.85 | 1.90 | 1.98 | 1.98 | 2.00 | 1.85 | 2.20 | 1.98 | 24 |
| 27 | 1.98 | 1.91 | 1.89 | S | 1.84 | 1.87 | 1.85 | 1.87 | 1.88 | 1.88 | 1.87 | 1.87 | 1.89 | 1.94 | 1.85 | 1.95 | 1.96 | 1.93 | 1.92 | 1.93 | 1.94 | 1.96 | 1.94 | 1.92 | 1.84 | 1.98 | 1.91 | 24 |
| 28 | 1.97 | 1.98 | S | 1.95 | 1.85 | 1.84 | 1.92 | 1.93 | 1.92 | 1.90 | 1.89 | 1.89 | 1.89 | 1.89 | 1.93 | 1.90 | 1.88 | 1.89 | 1.91 | 1.91 | 1.91 | 1.90 | 1.90 | 1.94 | 1.84 | 1.98 | 1.91 | 24 |
| 29 | 2.01 | S | 2.05 | 1.93 | 2.02 | 2.01 | 2.09 | 2.03 | 1.93 | 1.96 | 1.97 | 2.02 | 2.00 | 1.93 | 1.92 | 1.90 | 1.92 | 1.91 | 1.93 | 1.95 | 2.02 | 1.96 | 1.95 | 1.96 | 1.90 | 2.09 | 1.97 | 24 |
| 30 | S | 1.99 | 1.97 | 2.00 | 2.02 | 1.99 | 2.06 | 2.06 | 1.99 | 1.92 | 1.89 | 1.88 | 1.88 | 1.89 | 1.86 | 1.86 | 1.86 | 1.85 | 1.87 | 1.86 | 1.88 | 1.89 | 1.90 | S | 1.85 | 2.06 | 1.93 | 24 |
| HOURLY MAX | 2.20 | 2.19 | 2.17 | 2.24 | 2.22 | 2.36 | 2.39 | 2.36 | 2.19 | 2.12 | 2.18 | 2.13 | 2.15 | 2.12 | 2.09 | 2.09 | 2.08 | 2.10 | 2.19 | 2.14 | 2.23 | 2.16 | 2.23 | 2.20 | | | | |
| HOURLY AVG | 1.95 | 1.97 | 1.99 | 1.99 | 1.98 | 2.01 | 2.01 | 2.02 | 1.99 | 1.95 | 1.93 | 1.92 | 1.90 | 1.89 | 1.87 | 1.88 | 1.88 | 1.88 | 1.89 | 1.91 | 1.93 | 1.93 | 1.93 | 1.94 | | | | |

STATUS FLAG CODES

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

24 HR AVERAGES June 2017



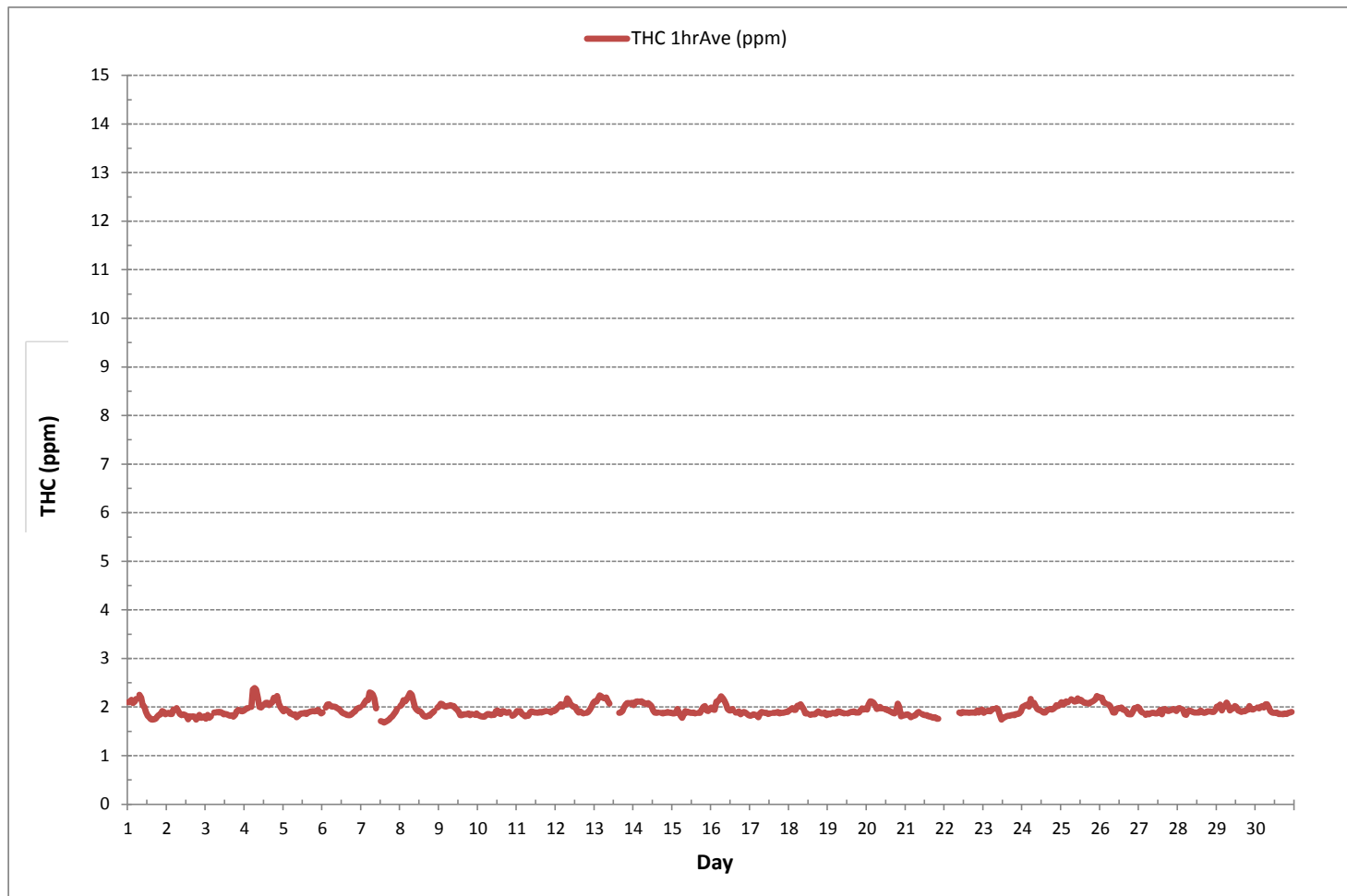
MONTHLY SUMMARY

| | | | |
|------------------------------|----------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 672 | | |
| MINIMUM 1-HR AVERAGE: | 1.68 ppm | @ HOUR | 14 ON DAY |
| MAXIMUM 1-HR AVERAGE: | 2.39 ppm | @ HOUR | 6 ON DAY |
| MAXIMUM 24-HR AVERAGE: | 2.12 ppm | | 25 ON DAY |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 710 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 98.6 % |
| STANDARD DEVIATION: | 0.11 | MONTHLY AVERAGE: | 1.94 ppm |



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

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2.29 | 2.29 | 2.32 | 2.29 | 2.51 | 2.38 | S | 2.75 | 2.49 | 2.28 | 2.20 | 2.08 | 2.00 | 1.95 | 1.92 | 1.97 | 2.14 | 1.98 | 2.08 | 2.20 | 2.04 | 2.29 | 2.26 | 2.35 | 1.92 | 2.75 | 2.22 | 24 | |
| 2 | 2.21 | 2.25 | 2.17 | 2.04 | 2.29 | S | 2.23 | 2.11 | 2.14 | 2.01 | 2.04 | 2.04 | 2.08 | 2.01 | 2.04 | 2.04 | 2.04 | 2.04 | 1.99 | 2.29 | 2.23 | 2.05 | 2.08 | 2.08 | 1.99 | 2.29 | 2.11 | 24 | |
| 3 | 2.04 | 2.10 | 2.04 | 2.09 | S | 2.14 | 2.16 | 2.26 | 2.23 | 2.19 | 2.17 | 2.19 | 2.11 | 2.14 | 2.14 | 2.08 | 2.14 | 2.05 | 2.17 | 2.22 | 2.20 | 2.20 | 2.17 | 2.17 | 2.04 | 2.26 | 2.15 | 24 | |
| 4 | 2.20 | 2.22 | 2.25 | S | 2.44 | 2.66 | 2.63 | 2.63 | 2.56 | 2.26 | 2.26 | 2.29 | 2.32 | 2.32 | 2.33 | 2.29 | 2.34 | 2.35 | 3.21 | 2.60 | 2.64 | 2.54 | 2.93 | 2.42 | 2.20 | 3.21 | 2.46 | 24 | |
| 5 | 2.78 | 2.76 | S | 2.29 | 2.20 | 2.25 | 2.25 | P | 2.15 | 2.13 | 2.17 | 2.20 | 2.17 | 2.17 | 2.16 | 2.19 | 2.20 | 2.25 | 2.26 | 2.26 | 2.25 | 2.33 | 2.26 | 2.20 | 2.13 | 2.78 | 2.27 | 23 | |
| 6 | 2.23 | S | 2.35 | 2.41 | 2.44 | 2.41 | 2.36 | 2.35 | 2.32 | 2.32 | 2.30 | 2.27 | 2.23 | 2.32 | 2.20 | 2.17 | 2.17 | 2.17 | 2.20 | 2.23 | 2.27 | 2.29 | 2.35 | 2.35 | 2.17 | 2.44 | 2.29 | 24 | |
| 7 | S | 2.41 | 2.45 | 2.49 | 2.51 | 2.69 | 2.66 | 2.60 | 2.57 | 2.42 | Q | Q | Q | 2.04 | 2.02 | 2.02 | 2.04 | 2.08 | 2.11 | 2.13 | 2.17 | 2.23 | 2.29 | S | 2.02 | 2.69 | 2.31 | 24 | |
| 8 | 2.32 | 2.41 | 2.47 | 2.44 | 2.44 | 2.51 | 2.58 | 2.54 | 2.42 | 2.29 | 2.20 | 2.14 | 2.15 | 2.14 | 2.04 | 2.02 | 1.99 | P | 2.02 | 2.07 | 2.07 | 2.08 | S | 2.15 | 1.99 | 2.58 | 2.25 | 23 | |
| 9 | 2.19 | 2.23 | 2.22 | 2.17 | 2.14 | 2.15 | 2.15 | 2.15 | 2.14 | P | 2.11 | 2.05 | 2.01 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.95 | 1.89 | 2.23 | S | 1.92 | 1.95 | 1.89 | 2.23 | 2.06 | 23 | |
| 10 | 1.91 | 1.89 | 1.91 | 1.89 | 1.89 | 1.92 | 1.95 | 1.95 | 1.92 | 1.92 | 1.95 | 2.01 | 2.01 | 2.01 | 2.01 | 2.01 | 2.01 | 1.98 | 1.98 | 2.01 | S | 1.95 | 1.94 | 2.01 | 1.89 | 2.01 | 1.96 | 24 | |
| 11 | 2.04 | 2.05 | 2.21 | 2.04 | 2.01 | 1.94 | 1.95 | 1.99 | 2.05 | 2.13 | 2.15 | 2.08 | 2.08 | 2.08 | 2.14 | 2.11 | 2.25 | 2.22 | 2.22 | S | 2.20 | 2.24 | 2.55 | 2.70 | 1.94 | 2.70 | 2.15 | 24 | |
| 12 | 2.17 | 2.23 | 2.22 | 2.25 | 2.17 | 2.20 | 2.25 | 2.34 | 2.32 | P | 2.16 | 2.11 | 2.23 | 2.32 | 1.99 | P | 1.98 | 1.95 | S | 1.98 | 1.98 | 2.04 | 2.11 | 2.19 | 1.95 | 2.34 | 2.15 | 22 | |
| 13 | 2.97 | 2.41 | 2.38 | 2.87 | 2.36 | 2.29 | 2.29 | 2.32 | 2.29 | 2.20 | C | C | C | C | C | 1.99 | 2.01 | 2.07 | 2.11 | 2.28 | 2.23 | 2.25 | 2.25 | 2.54 | 1.99 | 2.97 | 2.32 | 24 | |
| 14 | 2.56 | 2.35 | 2.29 | 2.28 | 2.30 | 2.31 | 2.28 | 2.27 | 2.26 | 2.41 | 2.45 | 2.28 | 2.32 | 2.20 | 2.11 | 2.14 | S | 2.11 | 2.11 | 2.13 | 2.16 | 2.15 | 2.13 | 2.15 | 2.11 | 2.56 | 2.25 | 24 | |
| 15 | 2.16 | 2.13 | 2.17 | 2.25 | 2.20 | 2.10 | 2.06 | 2.20 | 2.20 | 2.17 | 2.19 | 2.17 | 2.35 | 2.20 | 2.22 | S | 2.17 | 2.23 | 2.60 | 2.50 | 2.59 | 2.23 | 2.20 | 2.25 | 2.06 | 2.60 | 2.24 | 24 | |
| 16 | 2.28 | 2.20 | 2.20 | 2.42 | 2.39 | 2.47 | 2.50 | 2.47 | 2.39 | 2.35 | 2.23 | 2.17 | 2.17 | 2.20 | S | 2.11 | 2.35 | 2.69 | 2.11 | 2.25 | 2.30 | 2.25 | 2.15 | 2.38 | 2.11 | 2.69 | 2.31 | 24 | |
| 17 | 2.17 | 2.11 | 2.14 | 2.14 | 2.17 | 2.13 | 2.30 | 2.32 | 2.25 | 2.23 | 2.20 | 2.23 | 2.22 | S | 2.23 | 2.25 | 2.26 | 2.26 | P | 2.20 | 2.20 | 2.23 | 2.23 | 2.23 | 2.11 | 2.32 | 2.21 | 23 | |
| 18 | 2.29 | 2.29 | 2.38 | 2.29 | 2.33 | 2.39 | 2.59 | 2.47 | 2.35 | 2.35 | 2.23 | 2.23 | S | 2.22 | 2.23 | 2.26 | 2.30 | 2.38 | 2.49 | 3.54 | P | 2.39 | 2.45 | 2.32 | 2.22 | 3.54 | 2.40 | 23 | |
| 19 | 2.97 | 2.44 | 2.34 | 2.35 | 2.32 | 2.35 | 2.49 | 2.36 | 2.38 | 2.35 | 2.35 | S | 2.32 | 2.32 | 2.36 | 2.36 | 2.32 | 2.29 | 2.29 | 2.28 | 2.32 | 2.36 | 2.32 | 2.32 | 2.28 | 2.97 | 2.37 | 24 | |
| 20 | 2.33 | 2.42 | 2.47 | 2.45 | 2.42 | 2.41 | 2.35 | 2.32 | 2.32 | 2.28 | S | 2.27 | 2.26 | 2.23 | 2.22 | 2.19 | P | 2.17 | 2.26 | 2.35 | 2.32 | 2.11 | 2.28 | 2.22 | 2.11 | 2.47 | 2.30 | 23 | |
| 21 | 2.14 | 2.17 | 2.14 | 2.07 | 2.08 | 2.11 | 2.13 | 2.16 | 2.15 | S | 2.14 | 2.17 | 2.14 | 2.14 | 2.17 | 2.17 | 2.14 | 2.15 | 2.17 | 2.20 | 2.22 | P | P | P | 2.07 | 2.22 | 2.15 | 21 | |
| 22 | P | P | P | P | P | P | P | P | S | 2.45 | 2.44 | 2.44 | 2.47 | 2.44 | 2.42 | 2.44 | 2.42 | 2.42 | 2.44 | 2.41 | 2.69 | 2.61 | 2.95 | 2.72 | 2.41 | 2.95 | 2.52 | 16 | |
| 23 | 2.39 | 2.64 | 2.51 | 2.41 | 2.41 | 2.44 | 2.45 | S | 2.53 | 2.44 | 2.35 | 2.20 | 2.23 | 2.28 | 2.25 | 2.23 | 2.26 | 2.25 | 2.23 | 2.25 | 2.26 | 2.23 | 2.25 | 2.32 | 2.20 | 2.64 | 2.34 | 24 | |
| 24 | 3.82 | 2.60 | 2.66 | 2.44 | 2.82 | 2.57 | S | 2.54 | 2.49 | 2.35 | 2.33 | 2.29 | 2.26 | 2.23 | 2.25 | 2.29 | 2.26 | 2.26 | 2.25 | 2.26 | 2.29 | 2.33 | 2.32 | 2.36 | 2.23 | 3.82 | 2.45 | 24 | |
| 25 | 2.38 | 2.33 | 2.36 | 2.38 | 2.38 | S | 2.41 | 2.41 | 2.35 | 2.38 | 2.41 | 2.35 | 2.33 | 2.33 | 2.26 | 2.25 | 2.23 | 2.20 | 2.23 | 2.23 | 2.25 | 2.32 | 2.32 | P | 2.20 | 2.41 | 2.32 | 23 | |
| 26 | 2.28 | 2.29 | 2.17 | 2.11 | S | 2.09 | 2.08 | 2.14 | 2.16 | 2.15 | 2.25 | 2.26 | 2.09 | 2.08 | 2.03 | 2.08 | 2.00 | 2.00 | 1.97 | 1.97 | 2.02 | 2.05 | 2.02 | 2.48 | 1.97 | 2.48 | 2.12 | 24 | |
| 27 | P | 2.14 | 2.01 | S | 1.95 | 1.97 | 1.94 | 1.95 | 1.95 | 1.95 | 1.92 | 1.89 | 1.91 | 2.00 | 1.95 | 1.98 | 2.14 | 1.97 | 1.94 | 1.91 | 1.92 | 1.98 | 1.92 | 1.89 | 1.89 | 2.14 | 1.96 | 23 | |
| 28 | 1.92 | 1.95 | S | 1.94 | 1.86 | 1.89 | 1.94 | 1.95 | 1.95 | 1.92 | 1.95 | 1.95 | 1.95 | 2.03 | 2.04 | 2.01 | 2.01 | 2.01 | 2.04 | 2.05 | 2.05 | 2.08 | 2.08 | 2.16 | 1.86 | 2.16 | 1.99 | 24 | |
| 29 | 2.25 | S | 2.30 | 2.11 | 2.32 | 2.26 | 2.29 | 2.28 | 2.11 | 2.14 | 2.14 | 2.20 | 2.18 | 2.08 | 2.08 | 2.08 | 2.08 | 2.06 | 2.08 | 2.26 | 2.32 | 2.12 | 2.14 | 2.14 | 2.06 | 2.32 | 2.17 | 24 | |
| 30 | S | 2.15 | 2.14 | 2.17 | 2.20 | 2.16 | 2.29 | 2.47 | 2.28 | 2.29 | 2.14 | 2.04 | 2.11 | 2.11 | 2.08 | 2.13 | 2.08 | 2.08 | 2.10 | 2.11 | 2.10 | 2.08 | 2.08 | S | 2.04 | 2.47 | 2.15 | 24 | |
| HOURLY MAX | 3.82 | 2.76 | 2.66 | 2.87 | 2.82 | 2.69 | 2.66 | 2.75 | 2.57 | 2.45 | 2.44 | 2.44 | 2.47 | 2.44 | 2.42 | 2.44 | 2.42 | 2.42 | 2.44 | 2.41 | 2.69 | 3.21 | 3.54 | 2.69 | 2.61 | 2.95 | 2.72 | | |
| HOURLY AVG | 2.36 | 2.28 | 2.27 | 2.26 | 2.28 | 2.27 | 2.28 | 2.31 | 2.27 | 2.24 | 2.20 | 2.17 | 2.17 | 2.16 | 2.14 | 2.14 | 2.15 | 2.16 | 2.20 | 2.24 | 2.23 | 2.21 | 2.25 | 2.27 | | | | | |

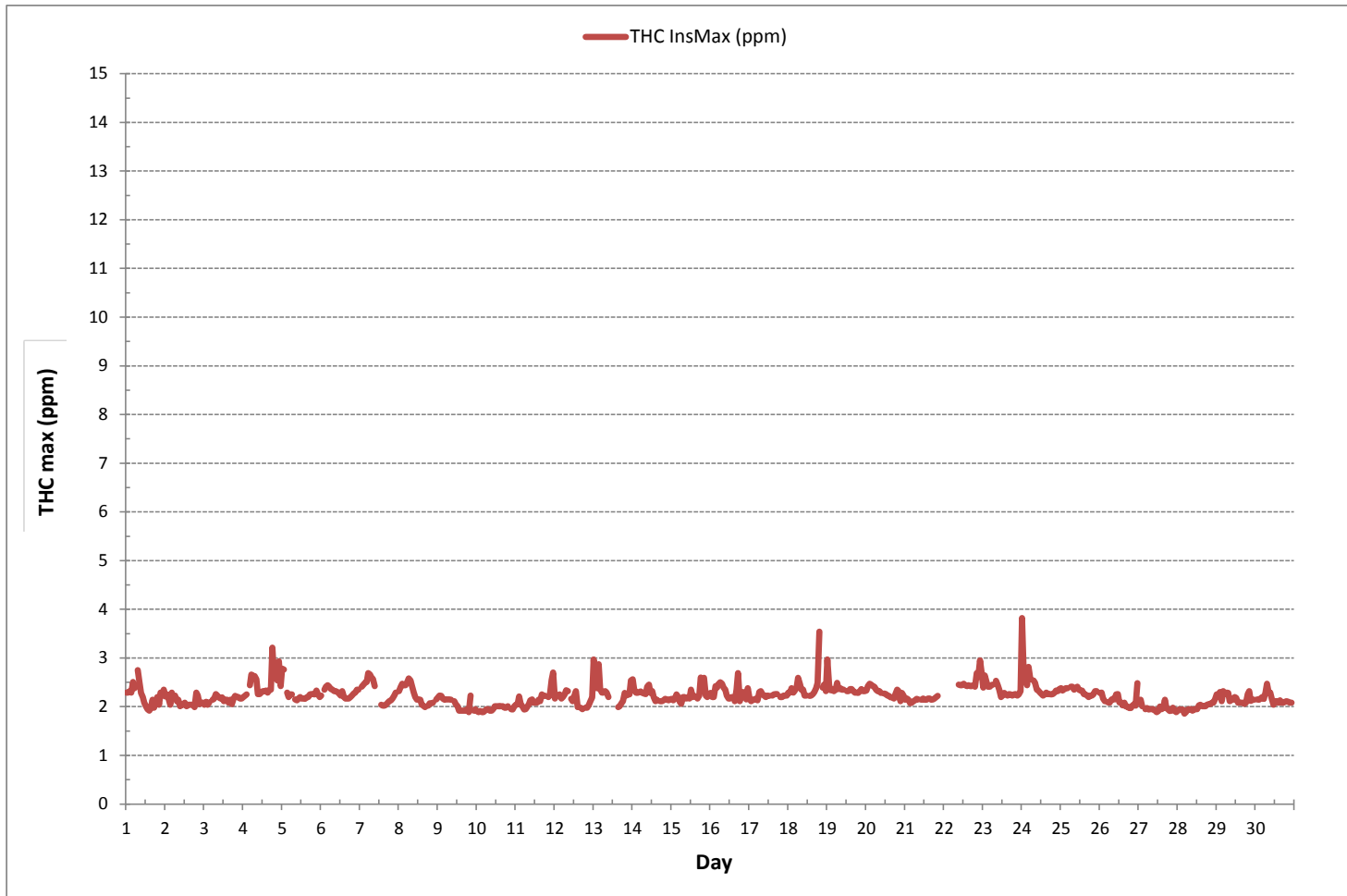
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 660 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.82 ppm @ HOUR 0 ON DAY 24 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 699 hrs |
| STANDARD DEVIATION: | 0.20 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



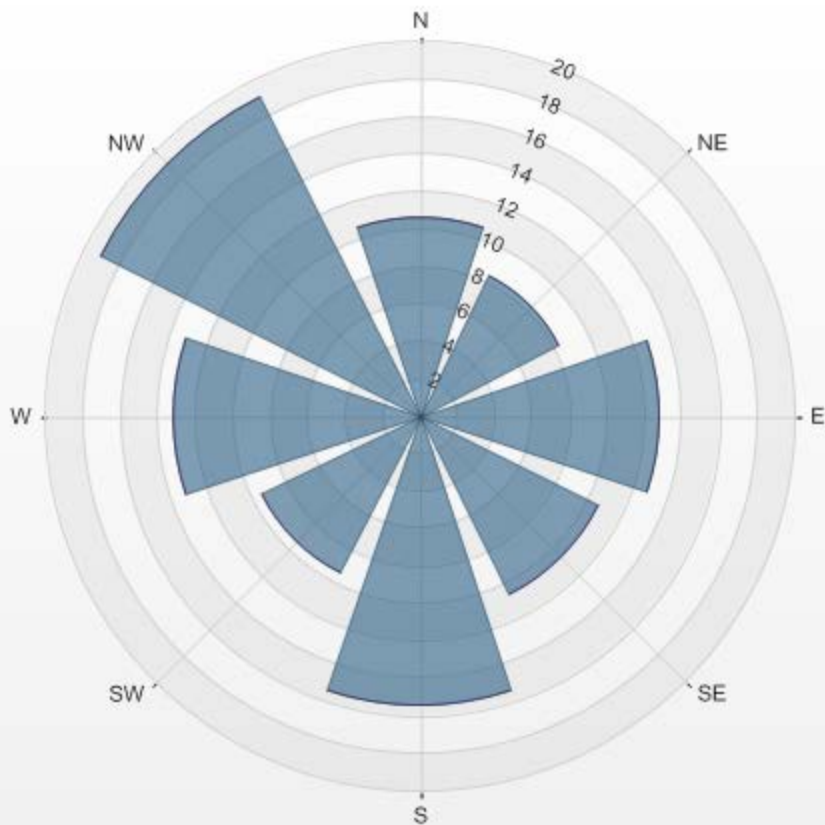
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-THC [ppm]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.46% Calm Avg: 1.97 [ppm]

| Direction | 0.0-0.8 | 0.8-1.7 | 1.7-2.5 | >2.5 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 0.0 | 0.0 | 10.6 | 0.0 | 10.6 |
| NE | 0.0 | 0.0 | 8.4 | 0.0 | 8.4 |
| E | 0.0 | 0.0 | 12.8 | 0.0 | 12.8 |
| SE | 0.0 | 0.0 | 10.6 | 0.0 | 10.6 |
| S | 0.0 | 0.0 | 15.5 | 0.0 | 15.5 |
| SW | 0.0 | 0.0 | 9.4 | 0.0 | 9.4 |
| W | 0.0 | 0.0 | 13.2 | 0.0 | 13.2 |
| NW | 0.0 | 0.0 | 19.0 | 0.0 | 19.0 |
| Summary | 0.0 | 0.0 | 100.0 | 0.0 | 100.0 |

% Icon Classes (ppm) 0 0.0-0.8 0.8-1.7 1.7-2.5 >2.5

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 1.97[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



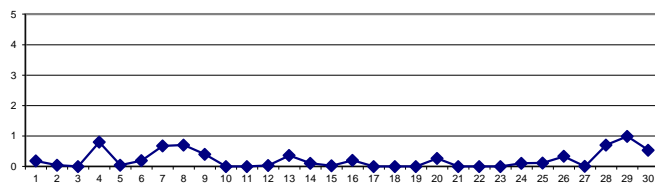
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

STATUS FLAG CODES

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

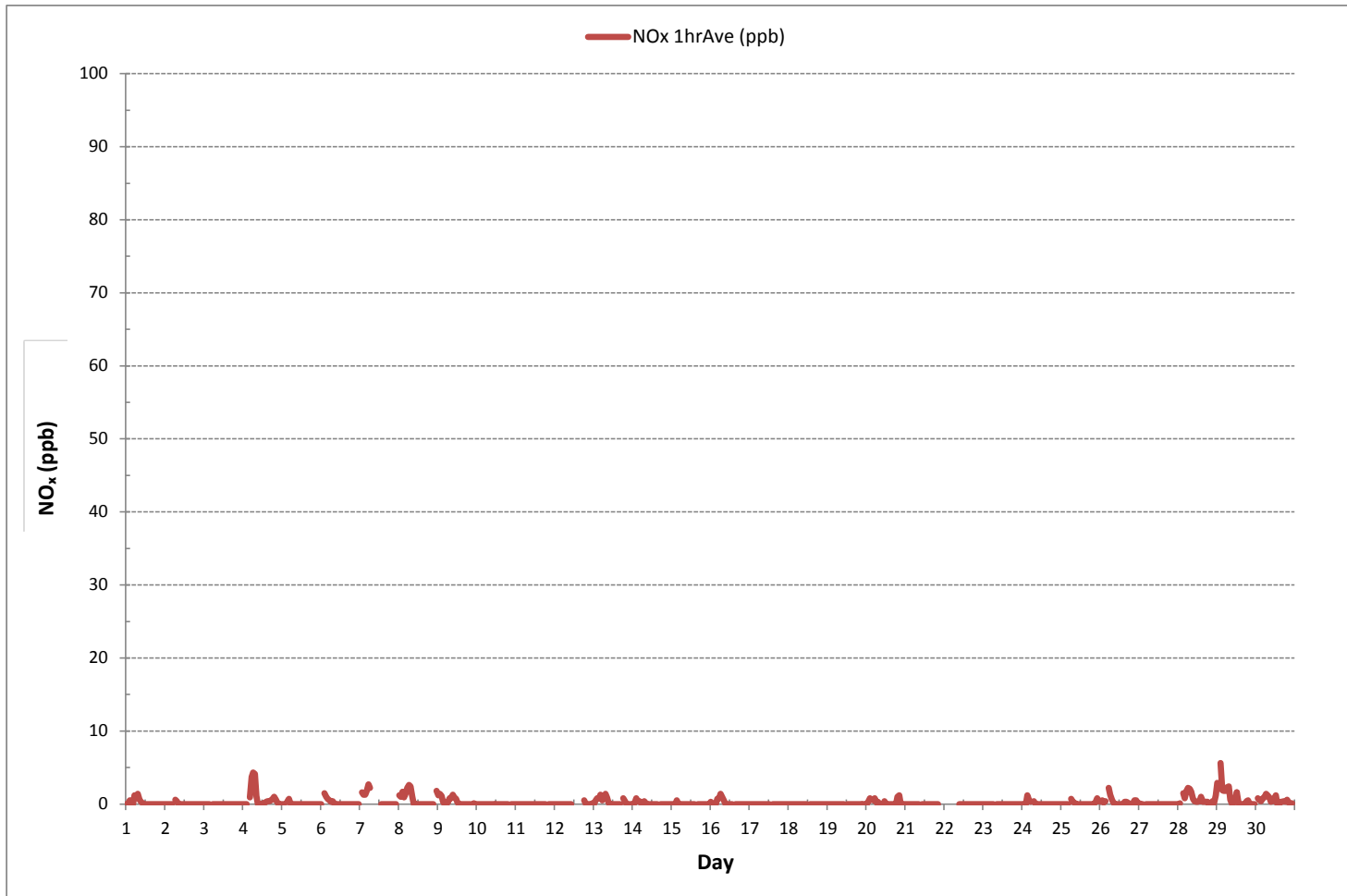
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | |
|------------------------------|--------|-----------------------|-------------|
| NUMBER OF NON-ZERO READINGS: | 181 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 6 ppb | @ HOUR | 2 ON DAY 29 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | ON DAY 29 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 710 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 98.6 % |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb |

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

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

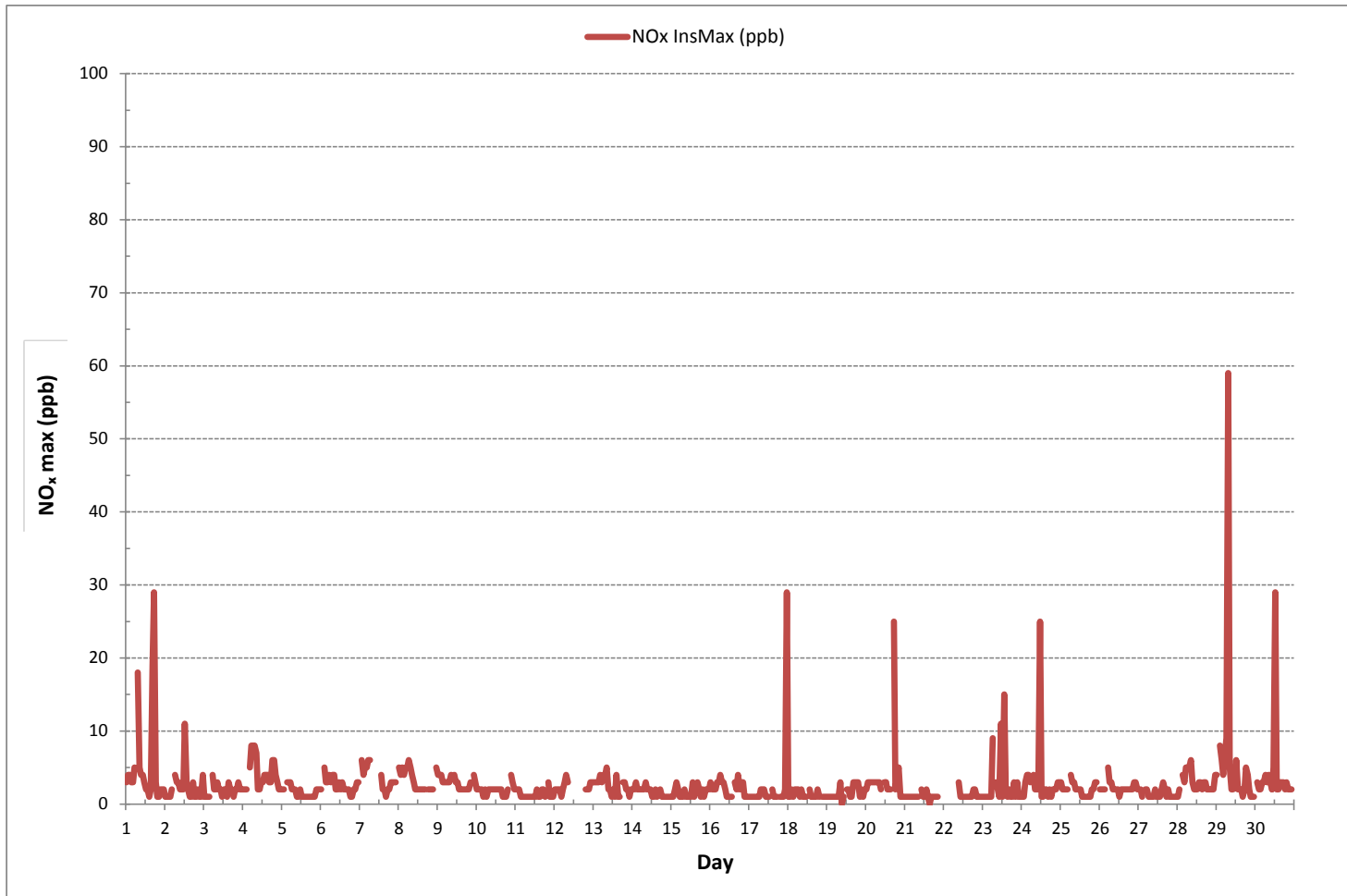
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 652 |
| MAXIMUM INSTANTANEOUS VALUE: | 59 ppb @ HOUR 7 ON DAY 29 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 4 |
| OPERATIONAL TIME: | 699 hrs |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

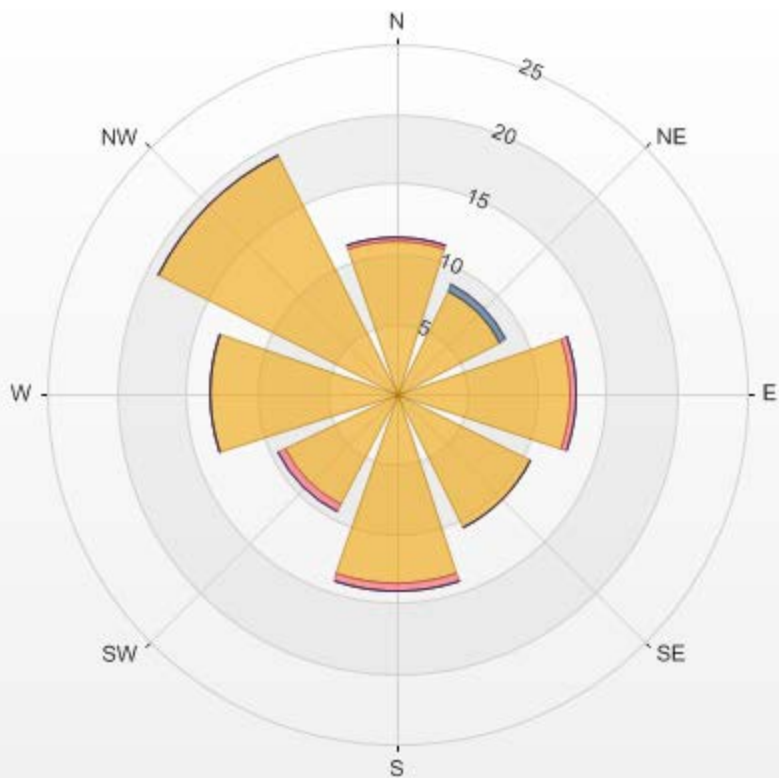
97 0.0-1.9

2 1.9-3.8

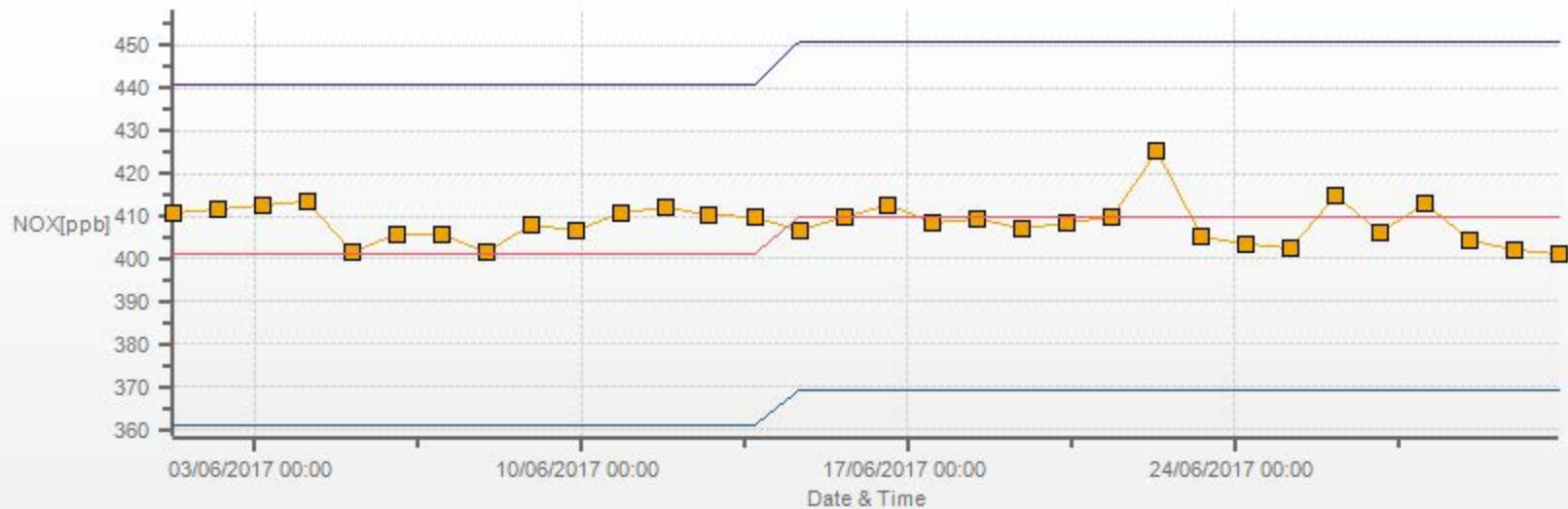
0 3.8-5.7

0 >5.7

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 0.62[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



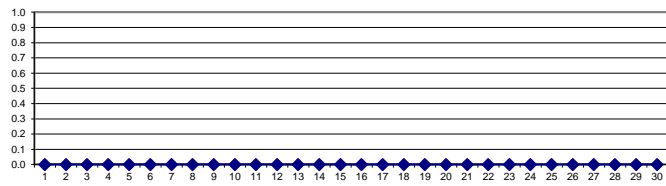
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

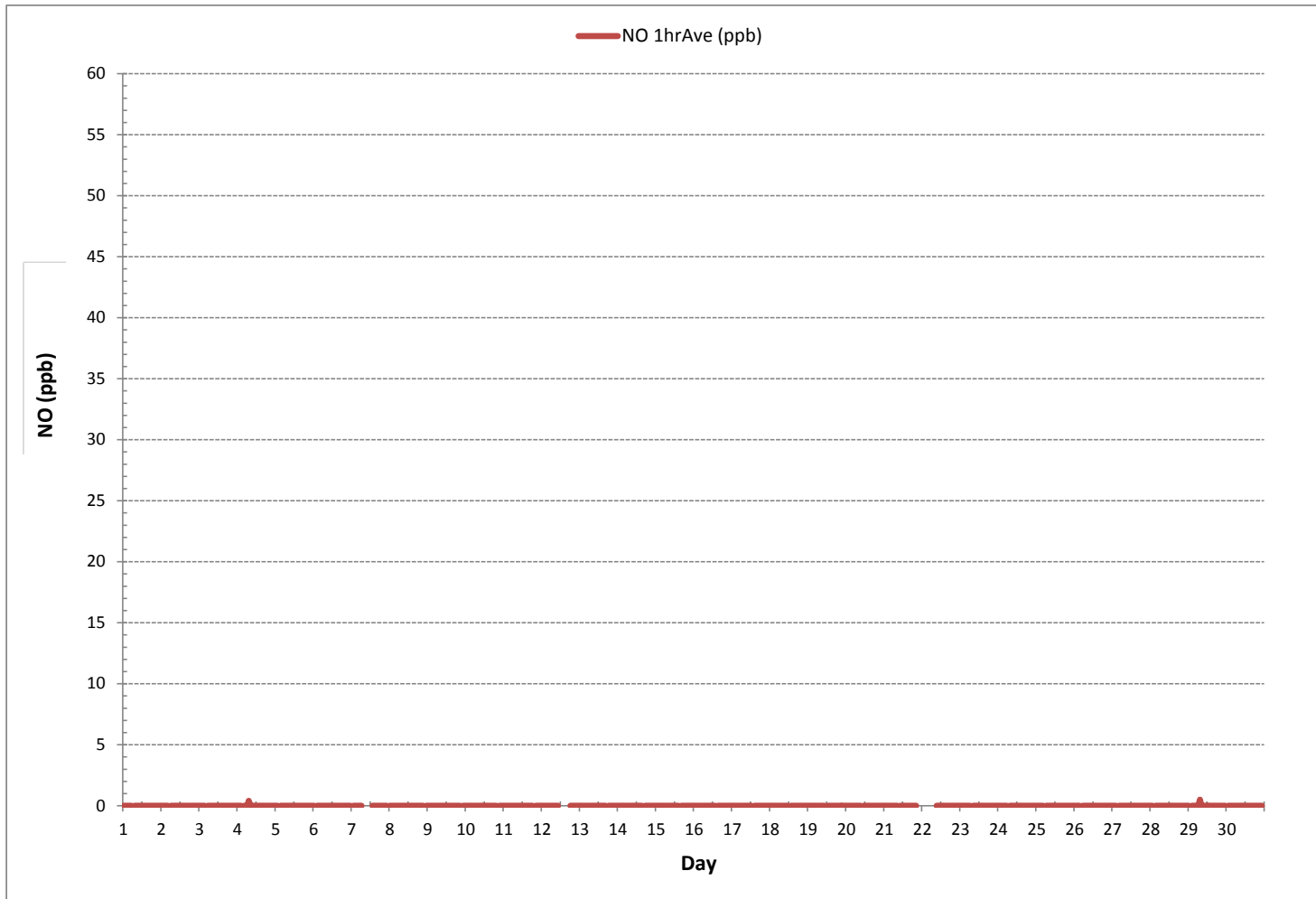
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 2 |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 1 ppb @ HOUR 29 ON DAY 29 |
| MAXIMUM 24-HR AVERAGE: | 0 ppb ON DAY 1 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 710 hrs |
| AMD OPERATION UPTIME: | 98.6 % |
| STANDARD DEVIATION: | 0 |
| MONTHLY AVERAGE: | 0 ppb |

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 | S | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 7 | 18 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 18 | 2 | 24 | |
| 2 | 1 | 1 | 1 | 1 | 0 | S | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 5 | 1 | 24 | |
| 3 | 1 | 1 | 1 | 0 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 24 | |
| 4 | 1 | 1 | 1 | S | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 24 | |
| 5 | 0 | 1 | S | 1 | 0 | 1 | 1 | P | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 23 | |
| 6 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 24 | |
| 7 | S | 1 | 1 | 0 | 1 | 1 | 1 | Q | Q | Q | Q | Q | Q | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 0 | 1 | 0 | 24 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | P | 0 | 0 | 0 | 0 | 0 | S | 1 | 0 | 1 | 1 | 23 | |
| 9 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | S | 1 | 1 | 0 | 1 | 1 | 23 | |
| 10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 11 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 24 | |
| 12 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | P | 1 | C | C | C | C | C | C | C | S | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 23 | |
| 13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 0 | S | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 7 | 1 | 24 | |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 | |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 24 | |
| 16 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 24 | |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 14 | 1 | 14 | 2 | 23 | |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 1 | 1 | 1 | 1 | 1 | 23 | |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | S | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 24 | |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | P | 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 1 | 23 | |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | P | P | 1 | 1 | 1 | 21 | |
| 22 | P | P | P | P | P | P | P | S | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 16 | |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | S | 1 | 1 | 1 | 8 | 1 | 9 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 2 | 24 | |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | S | 2 | 1 | 2 | 1 | 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 20 | 2 | 24 | |
| 25 | 1 | 1 | 1 | 1 | 1 | S | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | P | 1 | 2 | 1 | 23 | |
| 26 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 | |
| 27 | P | 1 | 1 | S | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | X | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 22 | |
| 28 | 1 | 1 | S | 1 | 1 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 | |
| 29 | 1 | S | 1 | 1 | 1 | 4 | 6 | 45 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 45 | 4 | 24 | |
| 30 | S | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 3 | 20 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | S | 1 | 2 | 24 | |
| HOURLY MAX | 1 | 1 | 1 | 1 | 1 | 4 | 11 | 45 | 3 | 2 | 2 | 20 | 20 | 9 | 7 | 2 | 7 | 18 | 2 | 2 | 2 | 1 | 1 | 14 | | | | | |
| HOURLY AVG | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |

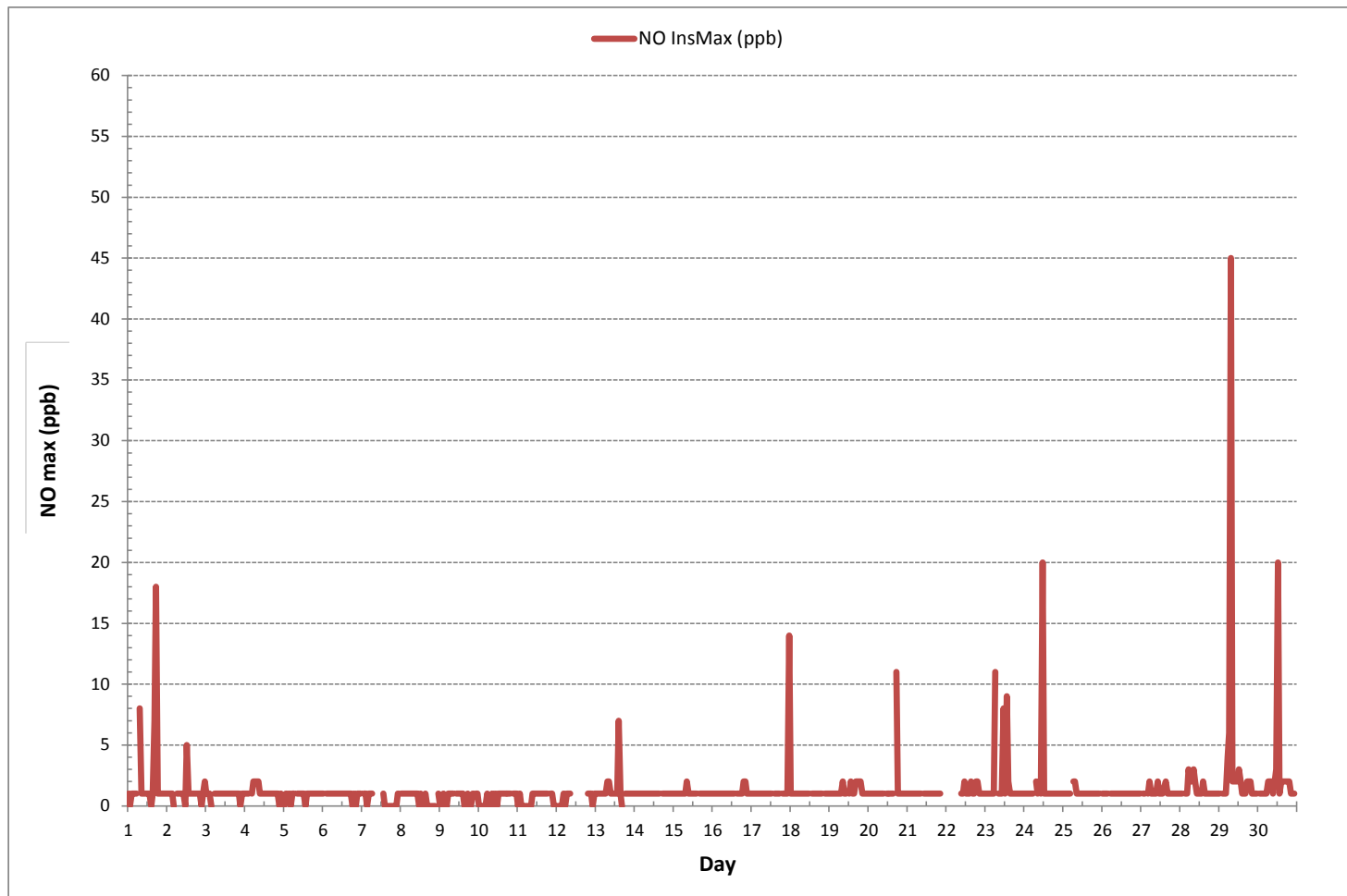
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 589 |
| MAXIMUM INSTANTANEOUS VALUE: | 45 ppb @ HOUR 7 ON DAY 29 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 699 hrs |
| STANDARD DEVIATION: | 2 |

NITRIC OXIDE Instantaneous Maximum (NO ppb)



% Icon Classes (ppb)

100

0.0-0.6

0

0.6-1.3

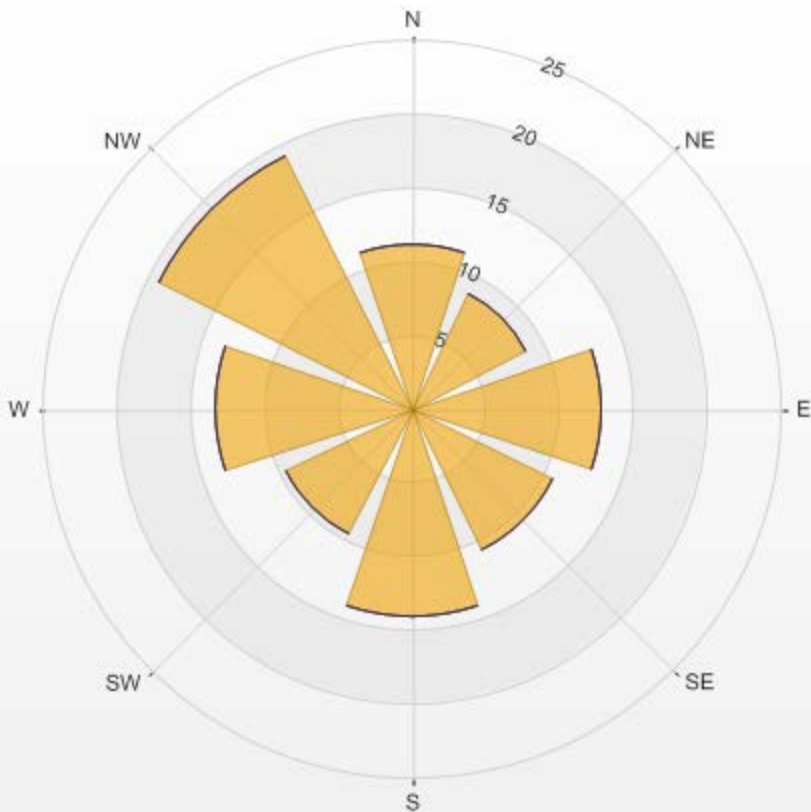
0

1.3-1.9

0

>1.9

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 0.00[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

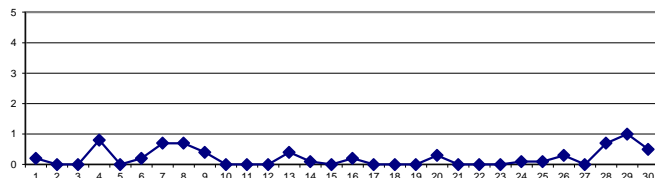
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

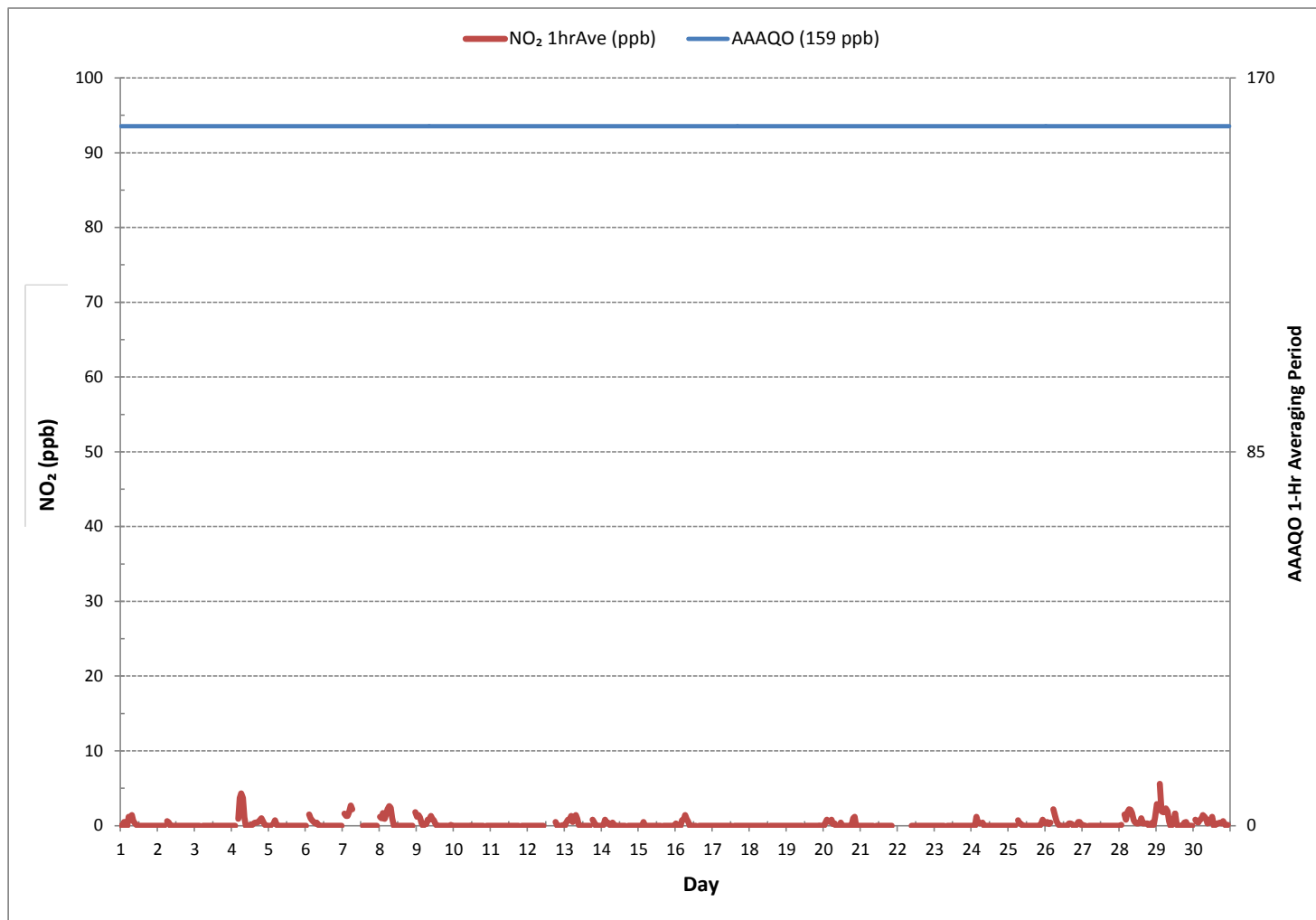
MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|--------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 181 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 | ON DAY |
| MAXIMUM 1-HR AVERAGE: | 6 ppb | @ HOUR | 2 | ON DAY |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | | ON DAY |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 710 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 98.6 % | |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb | |

24 HR AVERAGES June 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

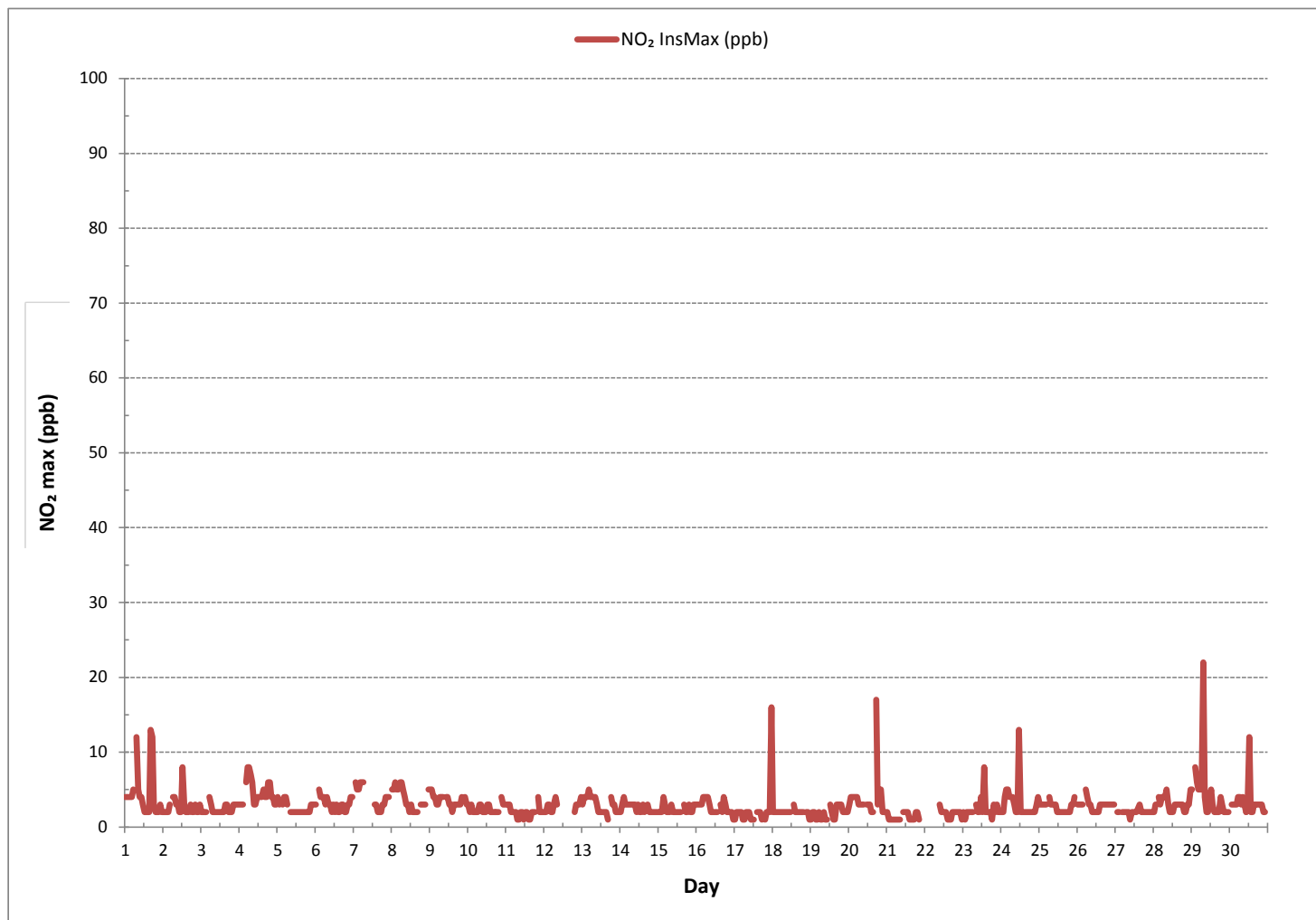
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 654 |
| MAXIMUM INSTANTANEOUS VALUE: | 22 ppb @ HOUR 7 ON DAY 29 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 2 |
| OPERATIONAL TIME: | 699 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)








Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

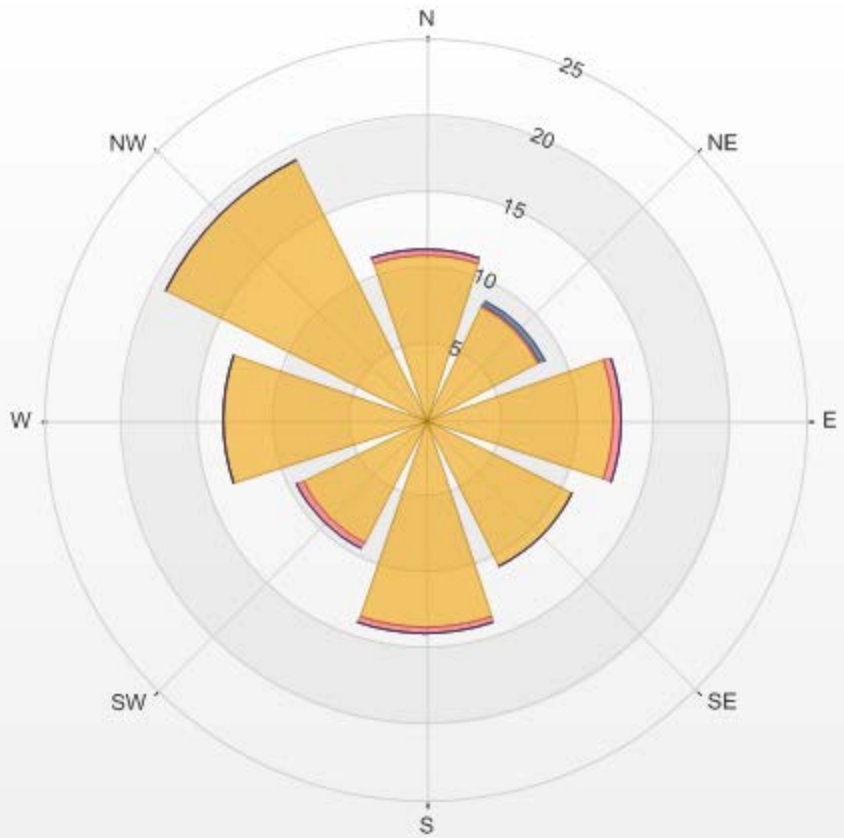
Calm: 0.46%

Calm Avg: 0.62 [ppb]

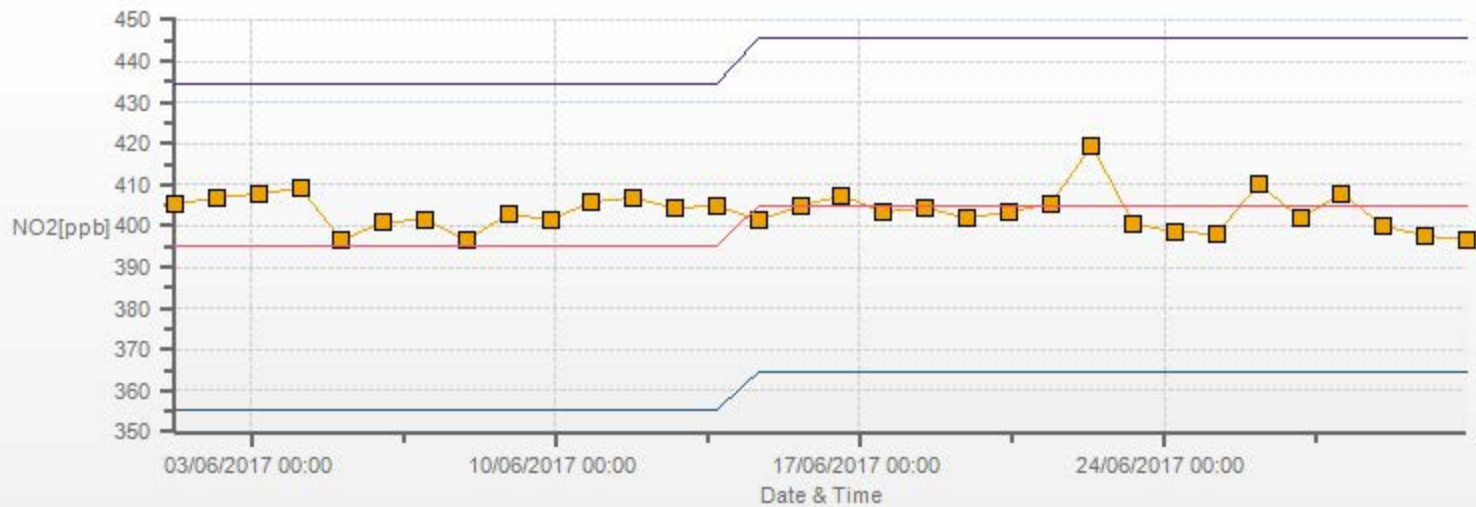
| Direction | 0.0-1.9 | 1.9-3.8 | 3.8-5.7 | >5.7 | Total |
|----------------|---------|---------|---------|------|-------|
| N | 10.9 | 0.3 | 0.0 | 0.0 | 11.2 |
| NE | 8.3 | 0.2 | 0.3 | 0.0 | 8.7 |
| E | 12.4 | 0.5 | 0.0 | 0.0 | 12.9 |
| SE | 10.7 | 0.0 | 0.0 | 0.0 | 10.7 |
| S | 13.6 | 0.5 | 0.0 | 0.0 | 14.1 |
| SW | 9.0 | 0.5 | 0.0 | 0.0 | 9.5 |
| W | 13.3 | 0.0 | 0.0 | 0.0 | 13.3 |
| NW | 19.1 | 0.0 | 0.0 | 0.0 | 19.1 |
| Summary | 97.4 | 1.8 | 0.3 | 0.0 | 100.0 |

| % Icon | Classes (ppb) | 97 | 2 | 0 | 0 |
|---|---------------|---|---|---|---|
|  | 0.0-1.9 |  |  |  |  |

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.46% Calm Poll Avg: 0.62[ppb]



NO2[ppb] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



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

OZONE



OZONE Hourly Averages (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 38.1 | 35.9 | 34.9 | 39.1 | 36.8 | 32.1 | S | 23.8 | 20.4 | 23.8 | 29.0 | 36.0 | 41.5 | 41.9 | 42.5 | 40.6 | 41.8 | 37.3 | 38.7 | 38.7 | 35.4 | 38.0 | 42.9 | 41.5 | 20.4 | 42.9 | 36.1 | 24 | |
| 2 | 40.5 | 40.2 | 38.8 | 35.9 | 27.4 | S | 21.3 | 24.4 | 28.5 | 29.9 | 31.3 | 33.4 | 34.5 | 36.9 | 37.0 | 34.3 | 34.5 | 34.5 | 32.2 | 28.9 | 25.1 | 24.6 | 28.2 | 27.1 | 21.3 | 40.5 | 31.7 | 24 | |
| 3 | 27.4 | 25.4 | 24.9 | 25.2 | S | 25.9 | 27.1 | 29.0 | 30.4 | 32.2 | 32.4 | 33.1 | 34.8 | 40.7 | 43.2 | 48.5 | 50.3 | 49.9 | 47.7 | 46.2 | 42.3 | 42.2 | 43.4 | 40.1 | 24.9 | 50.3 | 36.6 | 24 | |
| 4 | 37.0 | 34.4 | 31.0 | S | 25.8 | 20.9 | 21.1 | 20.0 | 24.4 | 31.4 | 35.9 | 42.9 | 45.2 | 46.7 | 50.1 | 51.4 | 50.8 | 49.7 | 46.1 | 42.5 | 38.4 | 38.7 | 33.5 | 33.3 | 20.0 | 51.4 | 37.0 | 24 | |
| 5 | 35.4 | 31.7 | S | 29.3 | 29.0 | 32.4 | 35.9 | 38.4 | 39.7 | 37.5 | 35.6 | 36.3 | 38.1 | 44.1 | 45.0 | 43.8 | 42.7 | 41.2 | 40.8 | 41.4 | 36.7 | 34.5 | 38.2 | 34.3 | 29.0 | 45.0 | 37.5 | 24 | |
| 6 | 34.7 | S | 29.4 | 28.9 | 28.8 | 30.2 | 30.9 | 30.9 | 32.2 | 36.5 | 40.5 | 43.0 | 45.7 | 47.8 | 48.9 | 48.7 | 47.7 | 50.6 | 53.2 | 50.7 | 50.0 | 49.7 | 45.8 | 44.2 | 28.8 | 53.2 | 41.3 | 24 | |
| 7 | S | 41.0 | 38.1 | 37.4 | 36.9 | 34.3 | 34.2 | 35.2 | 39.2 | 44.7 | 50.0 | 54.1 | Q | Q | Q | 56.4 | 57.6 | 57.3 | 57.4 | 54.3 | 53.1 | 50.3 | 49.0 | S | 34.2 | 57.6 | 46.3 | 24 | |
| 8 | 50.9 | 47.5 | 42.2 | 43.5 | 40.7 | 35.8 | 31.6 | 32.6 | 40.8 | 50.1 | 54.0 | 56.5 | 57.9 | 59.5 | 59.5 | 59.7 | 59.3 | 58.4 | 57.5 | 55.1 | 53.6 | 52.9 | S | 47.2 | 31.6 | 59.7 | 49.9 | 24 | |
| 9 | 44.9 | 42.4 | 40.9 | 39.9 | 37.4 | 35.3 | 32.5 | 29.6 | 27.0 | 25.4 | 26.5 | 26.4 | 31.3 | 38.7 | 41.3 | 40.0 | 39.1 | 40.3 | 38.7 | 47.9 | 44.6 | S | 35.9 | 33.3 | 25.4 | 47.9 | 36.5 | 24 | |
| 10 | 26.5 | 19.8 | 19.6 | 20.0 | 20.7 | 22.0 | 22.7 | 21.8 | 21.9 | 20.9 | 21.5 | 21.1 | 20.7 | 19.8 | 22.1 | 24.4 | 25.9 | 26.5 | 25.5 | 22.8 | S | 19.6 | 18.9 | 18.6 | 18.6 | 26.5 | 21.9 | 24 | |
| 11 | 15.6 | 14.6 | 19.2 | 26.2 | 32.9 | 30.4 | 28.9 | 32.7 | 32.6 | 32.4 | 32.5 | 32.3 | 32.6 | 33.7 | 34.5 | 33.6 | 32.6 | 31.9 | 31.3 | S | 28.7 | 27.9 | 28.6 | 27.6 | 14.6 | 34.5 | 29.3 | 24 | |
| 12 | 22.9 | 21.8 | 24.2 | 23.1 | 23.8 | 22.4 | 23.8 | 23.5 | 25.8 | 25.7 | 28.0 | 31.3 | 28.3 | 32.1 | 37.7 | S1 | S | 44.6 | 44.8 | 43.5 | 40.8 | 38.9 | 36.9 | 35.0 | 21.8 | 44.8 | 30.9 | 23 | |
| 13 | 33.3 | 32.5 | 32.6 | 29.1 | 21.5 | 20.2 | 20.8 | 21.2 | 22.7 | 27.0 | C | C | C | C | C | 36.8 | 34.5 | 40.3 | 46.6 | 43.9 | 38.5 | 43.0 | 40.3 | 32.4 | 20.2 | 46.6 | 32.5 | 24 | |
| 14 | 35.7 | 29.3 | 31.0 | 29.6 | 28.9 | 27.5 | 26.9 | 29.1 | 28.4 | 27.3 | 29.4 | 31.3 | 36.7 | 37.9 | 34.4 | 28.4 | S | 33.5 | 21.7 | 20.1 | 19.2 | 16.9 | 15.6 | 15.0 | 15.4 | 15.0 | 37.9 | 26.8 | 24 |
| 15 | 14.4 | 13.0 | 11.2 | 12.1 | 25.7 | 28.8 | 27.9 | 33.2 | 36.4 | 36.4 | 38.4 | 37.2 | 34.4 | 36.0 | 34.1 | S | 33.5 | 31.3 | 30.0 | 29.5 | 28.8 | 27.1 | 25.8 | 23.3 | 11.2 | 38.4 | 28.2 | 24 | |
| 16 | 21.6 | 23.3 | 23.0 | 21.6 | 20.0 | 19.3 | 19.0 | 23.4 | 28.0 | 33.4 | 37.1 | 39.1 | 38.2 | 38.6 | S | 37.9 | 37.5 | 36.3 | 27.6 | 24.3 | 26.7 | 25.3 | 27.5 | 28.9 | 19.0 | 39.1 | 28.6 | 24 | |
| 17 | 30.1 | 29.9 | 23.9 | 22.1 | 21.4 | 21.8 | 24.1 | 24.5 | 23.7 | 24.2 | 24.6 | 25.3 | 26.4 | S | 30.0 | 31.5 | 36.0 | 36.2 | 35.4 | 38.1 | 38.7 | 38.0 | 36.5 | 33.9 | 21.4 | 38.7 | 29.4 | 24 | |
| 18 | 31.1 | 29.7 | 27.3 | 25.6 | 22.9 | 24.4 | 25.7 | 22.1 | 24.0 | 31.4 | 39.9 | 40.3 | S | 44.8 | 43.8 | 38.6 | 35.6 | 38.5 | 36.8 | 36.0 | 36.6 | 35.0 | 34.4 | 33.0 | 22.1 | 44.8 | 32.9 | 24 | |
| 19 | 32.5 | 30.8 | 26.4 | 25.3 | 24.2 | 24.0 | 23.5 | 24.1 | 25.0 | 26.4 | 27.4 | S | 28.9 | 31.4 | 33.6 | 32.4 | 32.9 | 34.6 | 34.2 | 31.7 | 33.1 | 32.8 | 33.6 | 32.2 | 23.5 | 34.6 | 29.6 | 24 | |
| 20 | 31.0 | 28.6 | 27.6 | 27.8 | 27.5 | 26.7 | 27.3 | 26.2 | 27.9 | 29.0 | S | 35.0 | 36.7 | 38.8 | 41.2 | 41.3 | 41.0 | 42.1 | 40.3 | 33.7 | 32.1 | 36.8 | 34.6 | 33.7 | 26.2 | 42.1 | 33.3 | 24 | |
| 21 | 32.8 | 30.3 | 25.8 | 23.5 | 24.2 | 26.7 | 27.7 | 29.8 | 30.3 | S | 26.4 | 27.2 | 28.4 | 30.2 | 31.7 | 30.9 | 31.2 | 30.5 | 30.3 | 30.6 | 30.4 | P | P | P | 23.5 | 32.8 | 28.9 | 21 | |
| 22 | P | P | P | P | P | P | 19.9 | 24.1 | S | 22.5 | 21.3 | 21.3 | 24.0 | 25.8 | 28.3 | 30.2 | 30.9 | 30.9 | 29.5 | 29.0 | 28.5 | 27.5 | 26.8 | 26.0 | 19.9 | 30.9 | 26.3 | 18 | |
| 23 | 23.1 | 22.0 | 21.8 | 19.2 | 20.7 | 18.0 | 19.0 | S | 22.1 | 27.2 | 31.1 | 31.1 | 31.7 | 33.4 | 36.1 | 35.3 | 34.0 | 34.1 | 34.0 | 32.7 | 32.9 | 33.9 | 31.9 | 29.7 | 18.0 | 36.1 | 28.5 | 24 | |
| 24 | 27.4 | 24.2 | 24.4 | 25.5 | 24.1 | 20.7 | S | 20.7 | 22.9 | 28.2 | 28.9 | 28.4 | 29.9 | 29.7 | 31.7 | 31.7 | 30.4 | 29.6 | 32.0 | 30.4 | 29.9 | 27.9 | 25.9 | 23.9 | 20.7 | 32.0 | 27.3 | 24 | |
| 25 | 24.5 | 24.3 | 22.8 | 21.8 | 22.9 | S | 23.8 | 27.0 | 33.8 | 39.3 | 39.9 | 40.0 | 39.6 | 39.5 | 38.8 | 39.3 | 39.2 | 39.7 | 40.9 | 40.1 | 37.8 | 34.6 | 33.2 | 34.8 | 21.8 | 40.9 | 33.8 | 24 | |
| 26 | 36.5 | 36.8 | 35.9 | 34.3 | S | 33.0 | 33.4 | 34.8 | 37.1 | 40.7 | 41.2 | 41.2 | 42.1 | 42.4 | 42.4 | 40.3 | 38.9 | 40.4 | 41.5 | 40.0 | 38.4 | 35.1 | 34.9 | 35.7 | 33.0 | 42.4 | 38.1 | 24 | |
| 27 | 34.7 | 32.3 | 30.5 | S | 34.7 | 32.3 | 31.6 | 33.1 | 32.5 | 33.1 | 34.1 | 36.5 | 32.9 | 31.3 | 31.1 | 32.9 | 38.1 | 42.5 | 41.2 | 33.2 | 25.5 | 23.0 | 22.7 | 20.5 | 20.5 | 42.5 | 32.2 | 24 | |
| 28 | 18.4 | 15.4 | S | 15.6 | 18.7 | 17.1 | 17.2 | 17.8 | 19.1 | 23.4 | 23.0 | 24.7 | 24.8 | 26.5 | 26.4 | 26.1 | 28.7 | 26.9 | 20.2 | 21.5 | 23.0 | 23.2 | 21.5 | 20.0 | 15.4 | 28.7 | 21.7 | 24 | |
| 29 | 18.2 | S | 18.9 | 25.7 | 20.5 | 15.4 | 14.5 | 18.3 | 19.6 | 23.3 | 22.1 | 20.8 | 25.1 | 29.1 | 29.6 | 31.5 | 30.9 | 27.8 | 25.4 | 21.1 | 22.0 | 30.6 | 29.2 | 28.3 | 14.5 | 31.5 | 23.8 | 24 | |
| 30 | S | 23.2 | 23.7 | 25.8 | 23.4 | 20.9 | 19.8 | 17.0 | 20.0 | 22.7 | 23.9 | 25.9 | 25.9 | 24.9 | 26.9 | 28.4 | 31.8 | 32.4 | 32.7 | 28.8 | 25.1 | 24.5 | 23.6 | S | 17.0 | 32.7 | 25.1 | 24 | |
| HOURLY MAX | 50.9 | 47.5 | 42.2 | 43.5 | 40.7 | 35.8 | 35.9 | 38.4 | 40.8 | 50.1 | 54.0 | 56.5 | 57.9 | 59.5 | 59.5 | 59.7 | 59.3 | 58.4 | 57.5 | 55.1 | 53.6 | 52.9 | 49.0 | 47.2 | | | | | |
| HOURLY AVG | 30.3 | 28.9 | 27.8 | 27.2 | 26.7 | 25.9 | 25.4 | 26.5 | 28.2 | 30.6 | 32.4 | 34.0 | 33.9 | 36.4 | 37.1 | 37.7 | 38.1 | 37.9 | 37.1 | 35.7 | 34.3 | 33.3 | 32.1 | 30.9 | | | | | |

STATUS FLAG CODES

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

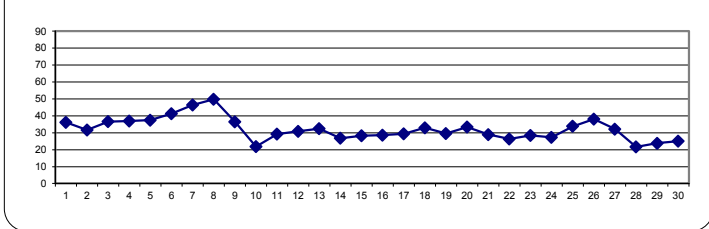
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

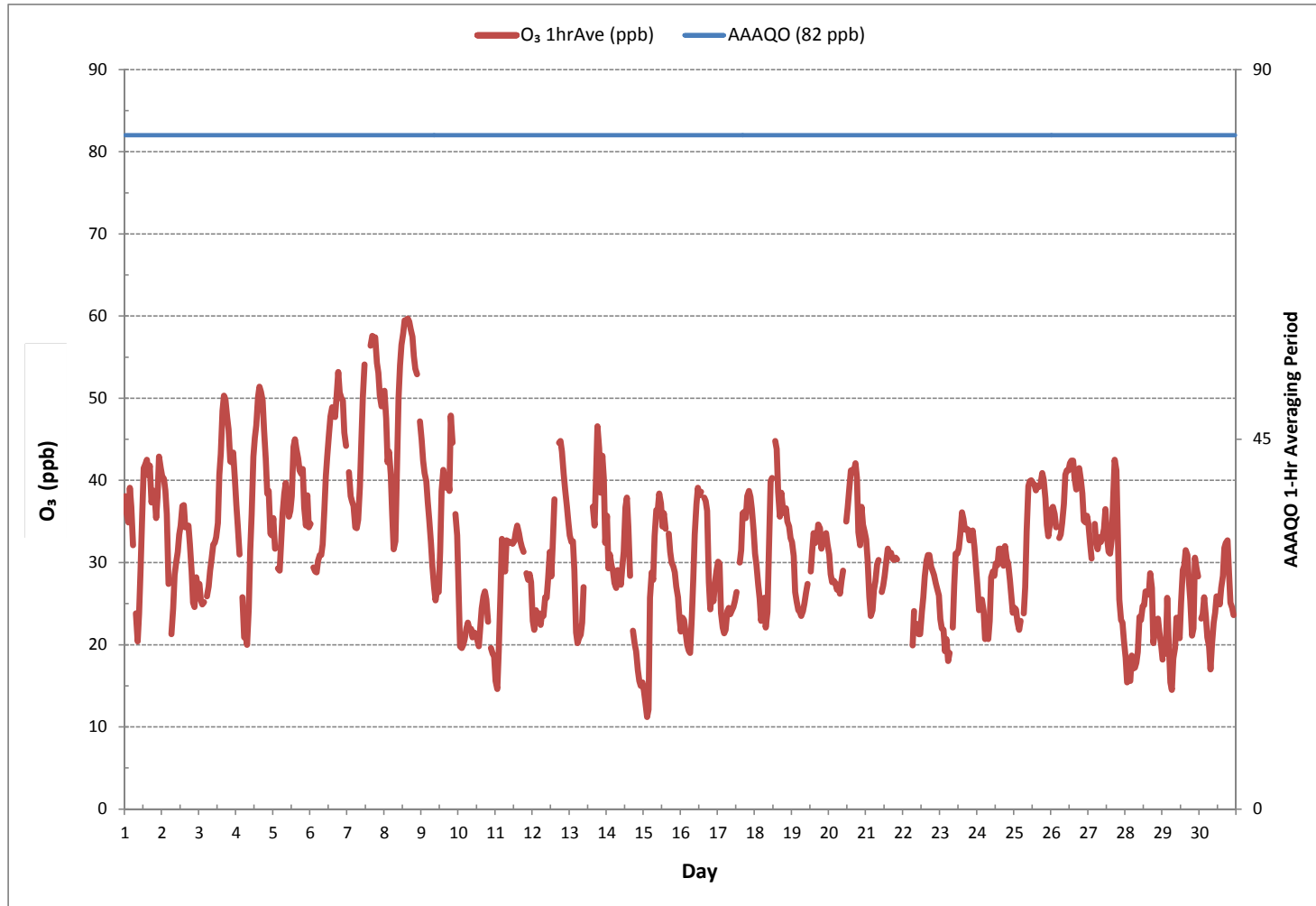
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 671 | | | |
| MINIMUM 1-HR AVERAGE: | 11.2 ppb | @ HOUR | 2 | ON DAY 15 |
| MAXIMUM 1-HR AVERAGE: | 59.7 ppb | @ HOUR | 15 | ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 49.9 ppb | | | ON DAY 8 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 710 hrs | |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 98.6 % | |
| STANDARD DEVIATION: | 8.9 | MONTHLY AVERAGE: | 32.1 ppb | |

24 HR AVERAGES June 2017



OZONE Hourly Averages (O₃ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | |
| DAY 1 | 40.9 | 37.9 | 38.8 | 42.1 | 41.0 | 34.4 | S | 27.3 | 23.7 | 27.2 | 35.1 | 38.7 | 45.6 | 44.6 | 46.2 | 43.0 | 45.1 | 41.5 | 41.0 | 40.5 | 38.4 | 41.4 | 44.6 | 44.3 | 23.7 | 46.2 | 39.3 | 24 |
| 2 | 43.4 | 44.0 | 41.0 | 38.5 | 35.1 | S | 28.4 | 26.4 | 32.5 | 32.1 | 33.9 | 36.5 | 36.6 | 39.8 | 38.9 | 37.1 | 37.5 | 36.2 | 35.0 | 32.9 | 28.1 | 28.8 | 30.1 | 29.1 | 26.4 | 44.0 | 34.9 | 24 |
| 3 | 29.3 | 27.8 | 26.8 | 26.8 | S | 27.6 | 29.2 | 31.5 | 32.2 | 34.2 | 35.1 | 35.6 | 37.9 | 44.2 | 46.4 | 53.0 | 53.1 | 52.8 | 52.5 | 48.7 | 47.0 | 44.9 | 45.1 | 43.8 | 26.8 | 53.1 | 39.4 | 24 |
| 4 | 39.3 | 37.3 | 33.8 | S | 29.7 | 23.4 | 23.3 | 22.3 | 30.3 | 36.3 | 41.3 | 46.7 | 47.3 | 49.8 | 52.9 | 54.2 | 53.7 | 52.8 | 50.6 | 46.4 | 44.1 | 50.0 | 50.3 | 38.4 | 22.3 | 54.2 | 41.5 | 24 |
| 5 | 38.5 | 34.9 | S | 30.6 | 30.6 | 35.1 | 37.6 | P | 42.6 | 39.2 | 37.6 | 38.3 | 41.0 | 47.1 | 47.6 | 46.7 | 44.7 | 43.8 | 43.5 | 44.0 | 41.0 | 39.1 | 40.5 | 36.8 | 30.6 | 47.6 | 40.0 | 23 |
| 6 | 36.3 | S | 31.7 | 30.6 | 31.5 | 31.8 | 33.2 | 33.2 | 36.2 | 40.1 | 44.1 | 46.7 | 49.0 | 51.7 | 51.5 | 51.6 | 50.6 | 54.7 | 55.8 | 54.0 | 51.6 | 51.6 | 49.7 | 45.9 | 30.6 | 55.8 | 44.0 | 24 |
| 7 | S | 43.1 | 40.9 | 39.6 | 39.3 | 36.7 | 36.7 | 37.6 | 43.8 | 48.5 | 53.3 | 57.1 | Q | Q | Q | 58.9 | 60.0 | 61.3 | 61.1 | 56.9 | 56.4 | 51.7 | 50.6 | S | 36.7 | 61.3 | 49.1 | 24 |
| 8 | 53.1 | 51.3 | 44.6 | 45.1 | 43.1 | 39.0 | 35.3 | 37.6 | 47.5 | 54.4 | 57.1 | 59.1 | 60.3 | 61.6 | 61.5 | 61.7 | 61.5 | P | 60.4 | 57.0 | 56.4 | 54.9 | S | 49.4 | 35.3 | 61.7 | 52.4 | 23 |
| 9 | 47.6 | 44.2 | 42.3 | 42.2 | 39.2 | 37.6 | 35.6 | 32.4 | 30.8 | P | 29.4 | 29.4 | 35.8 | 44.3 | 44.4 | 44.9 | 43.5 | 43.9 | 51.9 | 51.2 | 48.6 | S | 43.4 | 36.3 | 29.4 | 51.9 | 40.9 | 23 |
| 10 | 36.3 | 20.9 | 21.4 | 21.9 | 22.7 | 24.0 | 24.3 | 23.9 | 23.9 | 23.2 | 24.0 | 23.9 | 22.6 | 22.6 | 25.1 | 26.7 | 28.2 | 28.7 | 28.1 | 26.1 | S | 21.8 | 20.9 | 21.3 | 20.9 | 36.3 | 24.5 | 24 |
| 11 | 18.6 | 16.9 | 25.4 | 29.8 | 35.8 | 34.2 | 34.2 | 35.6 | 34.7 | 34.3 | 34.6 | 34.7 | 35.1 | 36.3 | 36.2 | 35.2 | 34.7 | 33.9 | 33.5 | S | 30.5 | 29.6 | 30.8 | 31.2 | 16.9 | 36.3 | 32.0 | 24 |
| 12 | 29.2 | 28.5 | 28.4 | 25.4 | 26.1 | 24.0 | 25.7 | 25.5 | 28.1 | P | 31.0 | 33.4 | 34.2 | 38.1 | 40.6 | P | S | 46.8 | 47.6 | 45.4 | 43.5 | 40.3 | 39.2 | 36.3 | 24.0 | 47.6 | 34.2 | 22 |
| 13 | 35.5 | 35.1 | 33.8 | 33.1 | 23.9 | 22.3 | 22.6 | 23.2 | 25.1 | 31.0 | C | C | C | C | C | 39.9 | 35.6 | 51.3 | 49.0 | 46.8 | 42.9 | 45.2 | 44.7 | 37.5 | 22.3 | 51.3 | 35.7 | 24 |
| 14 | 38.4 | 34.2 | 31.7 | 29.6 | 29.7 | 28.5 | 28.2 | 31.7 | 30.8 | 28.9 | 31.2 | 36.0 | 40.2 | 41.9 | 36.2 | 30.9 | S | 26.9 | 20.9 | 20.4 | 18.3 | 16.3 | 15.3 | 15.2 | 15.2 | 41.9 | 28.8 | 24 |
| 15 | 14.8 | 14.6 | 12.7 | 14.7 | 30.1 | 29.7 | 30.4 | 38.0 | 38.3 | 37.9 | 39.9 | 38.9 | 36.6 | 37.3 | 37.6 | S | 35.5 | 33.1 | 33.5 | 34.4 | 32.9 | 27.7 | 26.8 | 23.8 | 12.7 | 39.9 | 30.4 | 24 |
| 16 | 22.1 | 24.1 | 23.6 | 22.7 | 20.4 | 20.9 | 21.3 | 25.9 | 30.0 | 35.6 | 38.4 | 40.5 | 40.1 | 39.6 | S | 39.3 | 39.7 | 39.0 | 33.1 | 28.4 | 28.9 | 26.2 | 30.1 | 29.3 | 20.4 | 40.5 | 30.4 | 24 |
| 17 | 32.5 | 31.9 | 28.2 | 23.0 | 21.7 | 22.9 | 25.4 | 25.2 | 24.3 | 24.7 | 25.4 | 25.9 | 27.7 | S | 31.5 | 35.4 | 37.6 | 37.2 | P | 39.1 | 39.7 | 38.5 | 37.5 | 35.9 | 21.7 | 39.7 | 30.5 | 23 |
| 18 | 32.2 | 30.5 | 29.1 | 28.4 | 26.0 | 26.0 | 28.2 | 23.9 | 25.6 | 39.3 | 41.1 | 42.3 | S | 47.6 | 45.4 | 43.5 | 37.8 | 40.7 | 38.9 | 39.8 | P | 37.3 | 35.6 | 34.7 | 23.9 | 47.6 | 35.2 | 23 |
| 19 | 34.7 | 34.9 | 27.7 | 25.9 | 25.2 | 24.4 | 24.2 | 25.2 | 26.1 | 27.8 | 28.0 | S | 30.1 | 34.2 | 34.6 | 33.6 | 34.4 | 35.6 | 35.6 | 33.5 | 33.9 | 33.5 | 34.0 | 33.2 | 24.2 | 35.6 | 30.9 | 24 |
| 20 | 31.6 | 30.1 | 28.9 | 29.2 | 28.2 | 27.1 | 28.4 | 27.3 | 28.9 | 30.3 | S | 36.0 | 38.3 | 40.7 | 42.3 | 42.1 | S | 44.9 | 45.1 | 35.2 | 37.0 | 39.0 | 36.0 | 35.4 | 27.1 | 45.1 | 34.6 | 24 |
| 21 | 33.8 | 31.5 | 28.5 | 24.1 | 25.7 | 27.4 | 29.2 | 30.4 | 31.0 | S | 27.0 | 27.9 | 29.7 | 31.3 | 32.3 | 32.1 | 32.2 | 31.0 | 31.1 | 31.2 | 30.8 | P | P | P | 24.1 | 33.8 | 29.9 | 21 |
| 22 | P | P | P | P | P | P | P | P | S | 24.3 | 21.9 | 23.5 | 25.5 | 27.4 | 29.3 | 32.2 | 31.7 | 31.6 | 30.4 | 29.7 | 29.3 | 28.1 | 27.3 | 26.8 | 21.9 | 32.2 | 27.9 | 16 |
| 23 | 24.3 | 22.7 | 23.7 | 20.5 | 21.7 | 21.0 | 21.7 | S | 25.0 | 30.9 | 33.0 | 33.0 | 33.4 | 35.2 | 37.8 | 37.0 | 35.2 | 35.3 | 35.0 | 34.0 | 34.0 | 35.6 | 33.6 | 30.9 | 20.5 | 37.8 | 30.2 | 24 |
| 24 | 30.1 | 28.1 | 25.5 | 27.7 | 25.4 | 23.1 | S | 21.9 | 25.1 | 30.4 | 30.8 | 29.7 | 31.2 | 30.4 | 33.1 | 33.7 | 34.7 | 32.9 | 33.8 | 31.8 | 31.9 | 28.9 | 27.8 | 25.7 | 21.9 | 34.7 | 29.3 | 24 |
| 25 | 25.4 | 25.2 | 23.9 | 22.2 | 23.5 | S | 24.7 | 28.8 | 38.5 | 41.0 | 41.4 | 42.2 | 40.9 | 40.8 | 39.4 | 40.1 | 40.0 | 40.6 | 41.7 | 41.4 | 39.0 | 36.8 | 33.5 | P | 22.2 | 42.2 | 35.0 | 23 |
| 26 | 36.8 | 37.1 | 36.9 | 35.0 | S | 33.2 | 33.6 | 36.0 | 39.4 | 42.4 | 42.3 | 42.3 | 42.7 | 43.4 | 43.5 | 40.9 | 39.8 | 42.1 | 42.3 | 40.8 | 39.0 | 36.3 | 35.2 | 38.5 | 33.2 | 43.5 | 39.1 | 24 |
| 27 | P | 35.1 | 31.5 | S | 35.3 | 34.0 | 32.9 | 33.6 | 33.4 | 33.5 | 37.0 | 37.5 | 35.4 | 33.3 | 32.9 | 34.6 | 39.3 | 45.9 | 45.9 | 37.2 | 28.5 | 23.8 | 23.7 | 21.4 | 21.4 | 45.9 | 33.9 | 23 |
| 28 | 20.4 | 16.6 | S | 16.1 | 20.6 | 19.0 | 19.4 | 19.5 | 21.4 | 25.9 | 25.2 | 27.1 | 26.8 | 29.1 | 28.8 | 28.1 | 32.1 | 29.1 | 24.7 | 23.3 | 24.2 | 24.4 | 22.3 | 21.5 | 16.1 | 32.1 | 23.7 | 24 |
| 29 | 19.6 | S | 21.4 | 28.4 | 26.0 | 18.7 | 17.7 | 19.9 | 22.6 | 25.4 | 24.2 | 22.3 | 28.8 | 30.5 | 30.6 | 34.7 | 34.4 | 29.8 | 28.6 | 24.7 | 25.9 | 32.4 | 30.8 | 29.5 | 17.7 | 34.7 | 26.4 | 24 |
| 30 | S | 24.6 | 26.1 | 26.3 | 24.4 | 21.7 | 21.7 | 17.7 | 22.2 | 23.1 | 27.2 | 27.4 | 27.2 | 25.5 | 28.0 | 29.5 | 34.0 | 33.1 | 34.2 | 30.8 | 26.4 | 25.1 | 24.2 | S | 17.7 | 34.2 | 26.4 | 24 |
| HOURLY MAX | 53.1 | 51.3 | 44.6 | 45.1 | 43.1 | 39.0 | 37.6 | 38.0 | 47.5 | 54.4 | 57.1 | 59.1 | 60.3 | 61.6 | 61.5 | 61.7 | 61.5 | 61.3 | 61.1 | 57.0 | 56.4 | 54.9 | 50.6 | 49.4 | | | | |
| HOURLY AVG | 32.5 | 31.2 | 29.9 | 28.9 | 29.0 | 27.7 | 27.9 | 28.2 | 30.8 | 33.4 | 34.7 | 36.2 | 36.3 | 38.8 | 39.1 | 40.0 | 40.2 | 39.9 | 40.2 | 38.1 | 36.7 | 35.3 | 34.4 | 32.8 | | | | |

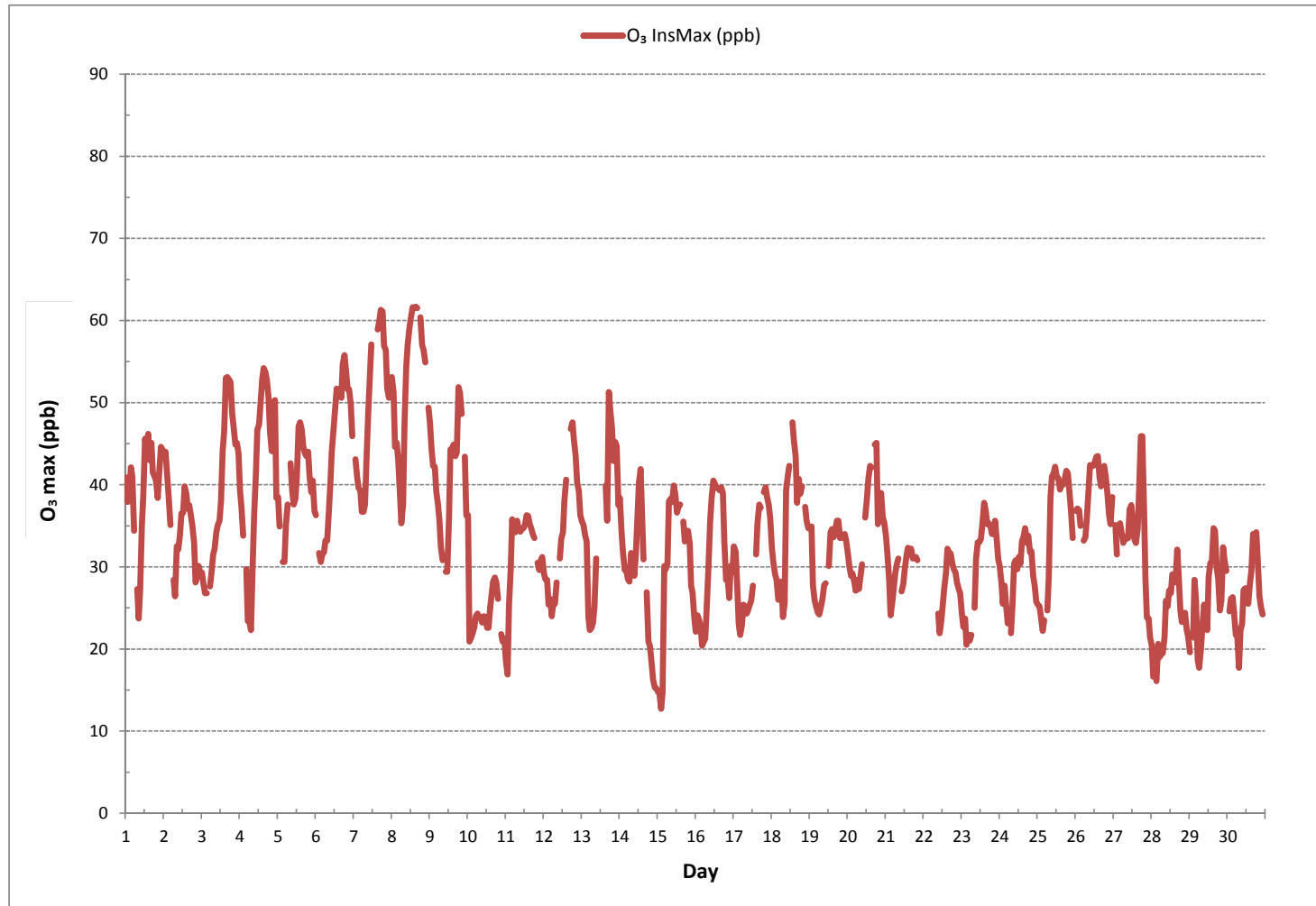
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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

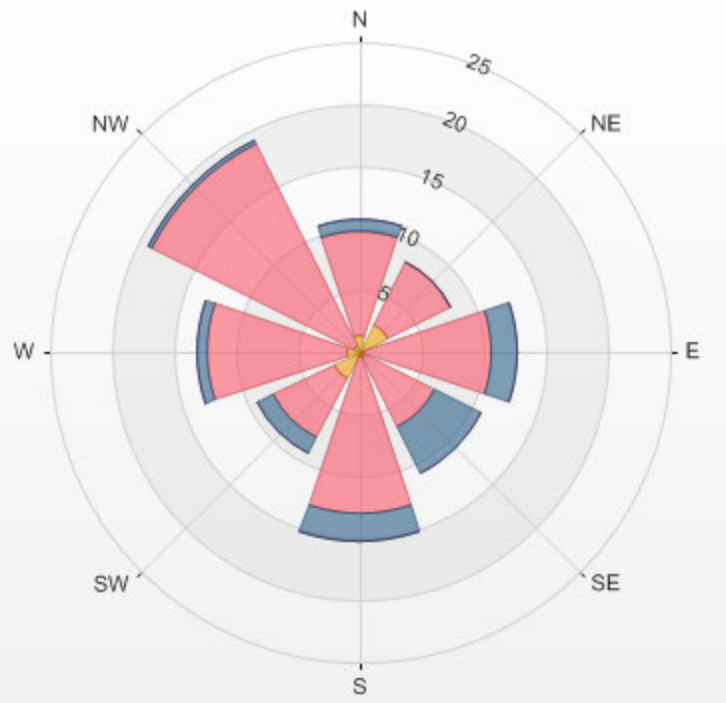
| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 660 |
| MAXIMUM INSTANTANEOUS VALUE: | 61.7 ppb @ HOUR 15 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 9.3 |
| OPERATIONAL TIME: | 700 hrs |

OZONE Instantaneous Maximum (O₃ ppb)



| % Icon | Classes (ppb) | 9 | 0.0-21.0 | 78 | 21.0-42.0 | 12 | 42.0-63.0 | 0 | >63.0 |
|--------|---------------|---|----------|----|-----------|----|-----------|---|-------|
|--------|---------------|---|----------|----|-----------|----|-----------|---|-------|

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.45% Calm Poll Avg: 30.85[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5



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

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

STATUS FLAG CODES

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

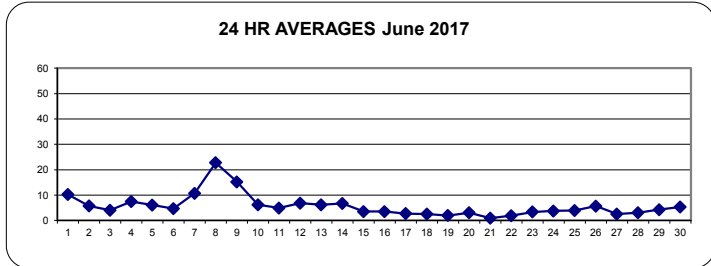
OBJECTIVE LIMIT:

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

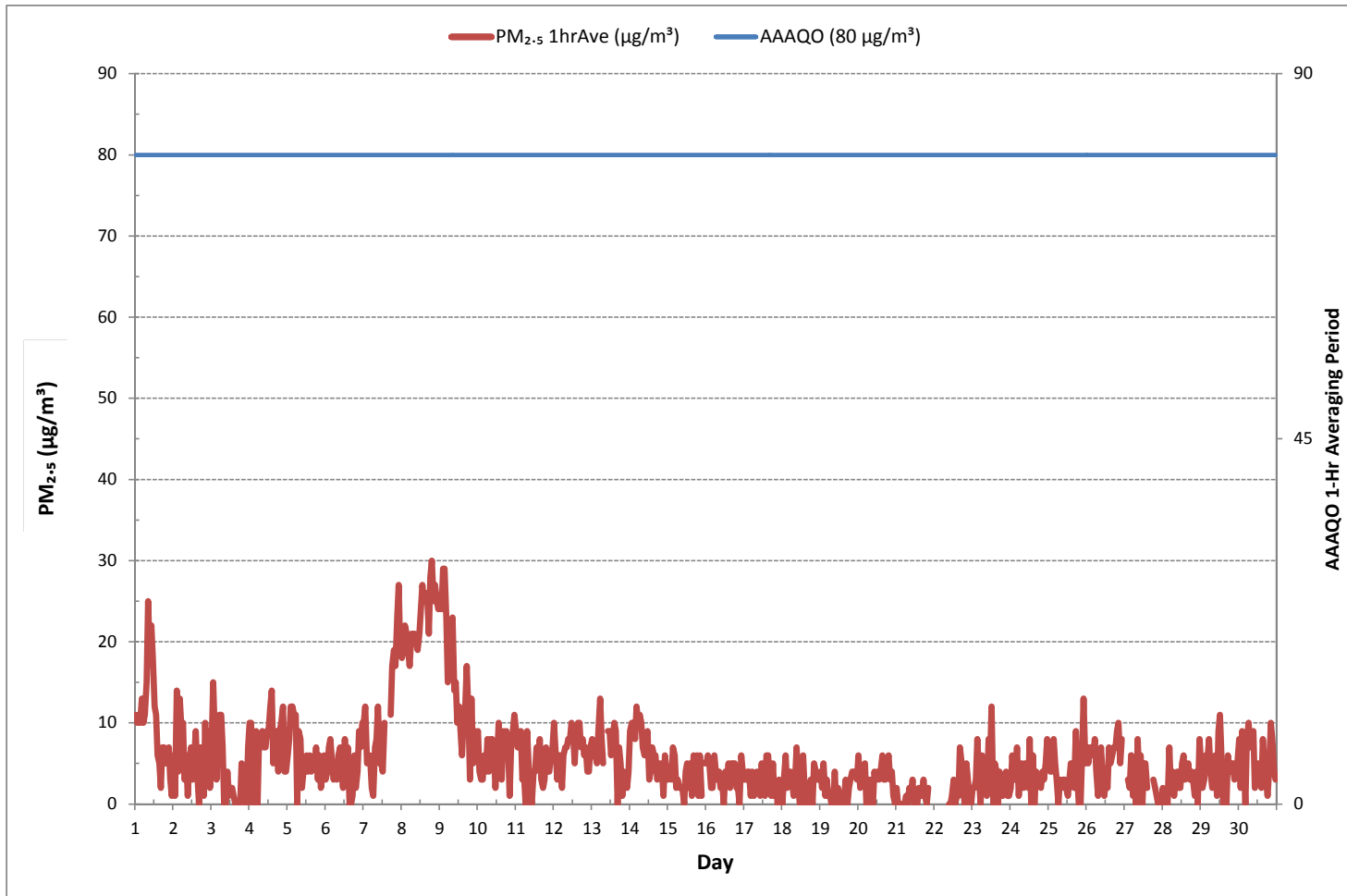
MONTHLY SUMMARY

| | | | | |
|------------------------------|-----------------------------|-----------------------|---------------------|---|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 626 | | | |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR | 16 | ON DAY | 2 |
| MAXIMUM 1-HR AVERAGE: | 30 µg/m ³ @ HOUR | 19 | ON DAY | 8 |
| MAXIMUM 24-HR AVERAGE: | 23 µg/m ³ | | ON DAY | 8 |
| MONTHLY CALIBRATION TIME: | 4 hrs | OPERATIONAL TIME: | 704 hrs | |
| STANDARD DEVIATION: | 5 | AMD OPERATION UPTIME: | 97.8 % | |
| | | MONTHLY AVERAGE: | 6 µg/m ³ | |

24 HR AVERAGES June 2017



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









Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m³(L)]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

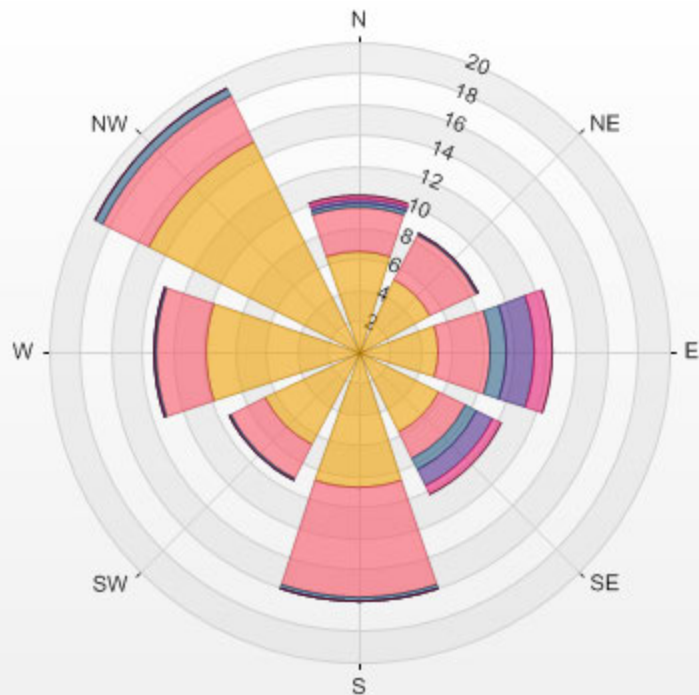
Calm: 0.72%

Calm Avg: 5.94 [ug/m³(L)]

| 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 | 6.5 | 2.9 | 0.3 | 0.3 | 0.1 | 0.0 | 10.1 |
| NE | 5.2 | 3.3 | 0.1 | 0.0 | 0.0 | 0.0 | 8.6 |
| E | 5.2 | 3.3 | 1.0 | 1.9 | 1.2 | 0.0 | 12.5 |
| SE | 5.8 | 2.0 | 0.7 | 1.2 | 0.7 | 0.0 | 10.4 |
| S | 8.8 | 7.1 | 0.3 | 0.0 | 0.0 | 0.0 | 16.1 |
| SW | 6.8 | 2.5 | 0.1 | 0.0 | 0.0 | 0.0 | 9.4 |
| W | 9.9 | 3.2 | 0.1 | 0.0 | 0.0 | 0.0 | 13.2 |
| NW | 15.1 | 3.5 | 0.4 | 0.0 | 0.0 | 0.0 | 19.0 |
| Summary | 63.2 | 27.6 | 3.2 | 3.3 | 2.0 | 0.0 | 99.3 |

| | | | | | | | | | | | | | |
|--------|--------------------|----|---|----|--|---|---|---|---|---|---|---|---|
| % Icon | Classes (ug/m3(L)) | 63 |  0.0-6.2 | 28 |  6.2-12.4 | 3 |  12.4-18.6 | 3 |  18.6-24.8 | 2 |  24.8-31.0 | 0 |  >31.0 |
|--------|--------------------|----|---|----|--|---|---|---|---|---|---|---|---|

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.72% Calm Poll Avg: 5.94[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 9.2 | 8.7 | 8.4 | 7.0 | 8.4 | 10.0 | 1.5 | 4.6 | 6.9 | 7.4 | 7.6 | 10.8 | 12.4 | 12.0 | 12.0 | 10.6 | 10.6 | 11.4 | 6.9 | 7.5 | 7.3 | 9.2 | 8.0 | 7.0 | 1.5 | 12.4 | 3.8 | 24 |
| 2 | 7.7 | 8.5 | 9.2 | 7.9 | 6.1 | 7.5 | 10.1 | 17.0 | 14.9 | 15.1 | 18.5 | 19.1 | 14.4 | 13.5 | 14.5 | 18.3 | 15.9 | 16.1 | 15.6 | 7.3 | 6.4 | 12.2 | 13.6 | 12.5 | 6.1 | 19.1 | 12.1 | 24 |
| 3 | 13.5 | 12.0 | 10.6 | 12.4 | 12.6 | 14.8 | 12.1 | 10.4 | 11.7 | 12.7 | 10.4 | 10.8 | 14.5 | 14.0 | 9.4 | 9.3 | 4.8 | 4.6 | 3.1 | 5.4 | 9.2 | 11.7 | 14.4 | 13.4 | 3.1 | 14.8 | 5.7 | 24 |
| 4 | 10.9 | 10.7 | 10.7 | 10.9 | 7.1 | 8.2 | 8.4 | 7.9 | 6.1 | 7.2 | 6.6 | 8.3 | 6.0 | 6.1 | 6.3 | 7.1 | 5.3 | 2.4 | 3.4 | 4.7 | 3.8 | 2.7 | 6.5 | 7.3 | 2.4 | 10.9 | 3.8 | 24 |
| 5 | 7.3 | 5.3 | 7.7 | 11.2 | 13.9 | 11.6 | 15.0 | 18.2 | 20.3 | 16.0 | 13.0 | 15.3 | 15.2 | 14.6 | 14.9 | 11.7 | 10.1 | 5.2 | 4.9 | 3.7 | 5.6 | 9.2 | 8.5 | 8.1 | 3.7 | 20.3 | 7.1 | 24 |
| 6 | 8.0 | 11.6 | 11.8 | 12.3 | 12.9 | 12.3 | 10.9 | 9.4 | 7.8 | 6.6 | 5.4 | 6.3 | 6.1 | 5.8 | 6.2 | 5.9 | 9.0 | 8.0 | 7.6 | 7.3 | 9.4 | 11.6 | 10.6 | 10.3 | 5.4 | 12.9 | 7.7 | 24 |
| 7 | 9.7 | 9.6 | 10.4 | 10.5 | 10.7 | 10.7 | 9.0 | 6.3 | 7.8 | 9.1 | 13.1 | 12.7 | 11.9 | 12.8 | 10.8 | 10.1 | 11.7 | 11.2 | 11.5 | 10.8 | 10.8 | 12.1 | 12.8 | 14.0 | 6.3 | 14.0 | 10.0 | 24 |
| 8 | 13.6 | 11.2 | 11.7 | 12.3 | 11.4 | 9.7 | 7.6 | 8.9 | 12.6 | 17.3 | 18.3 | 18.1 | 18.0 | 18.8 | 15.3 | 15.6 | 16.1 | 15.6 | 14.7 | 13.0 | 13.6 | 15.2 | 13.4 | 12.7 | 7.6 | 18.8 | 13.3 | 24 |
| 9 | 11.4 | 13.7 | 13.5 | 13.6 | 14.3 | 11.2 | 9.3 | 10.1 | 12.7 | 13.1 | 15.8 | 16.1 | 17.6 | 19.1 | 22.9 | 20.4 | 19.0 | 17.5 | 15.6 | 8.1 | 2.8 | 4.6 | 9.4 | 14.5 | 2.8 | 22.9 | 13.0 | 24 |
| 10 | 18.8 | 19.7 | 19.1 | 20.0 | 17.7 | 16.9 | 17.2 | 15.7 | 15.3 | 10.7 | 9.9 | 9.1 | 6.7 | 8.6 | 9.1 | 5.1 | 4.0 | 3.2 | 6.7 | 6.0 | 8.7 | 10.1 | 9.8 | 10.8 | 3.2 | 20.0 | 7.5 | 24 |
| 11 | 7.3 | 6.6 | 6.1 | 6.6 | 8.6 | 10.1 | 12.9 | 12.1 | 11.4 | 11.0 | 10.0 | 12.8 | 12.5 | 13.0 | 14.6 | 13.7 | 9.1 | 9.4 | 7.7 | 5.9 | 4.4 | 5.5 | 6.8 | 3.4 | 3.4 | 14.6 | 7.7 | 24 |
| 12 | 5.2 | 6.1 | 7.7 | 8.2 | 8.7 | 9.8 | 11.3 | 10.7 | 14.4 | 13.6 | 14.0 | 14.4 | 17.6 | 17.7 | 18.3 | 17.4 | 19.0 | 16.3 | 14.0 | 9.1 | 7.5 | 9.0 | 10.0 | 10.9 | 5.2 | 19.0 | 12.0 | 24 |
| 13 | 9.6 | 8.1 | 4.8 | 4.0 | 6.7 | 6.5 | 6.4 | 5.4 | 6.7 | 9.5 | 10.2 | 10.2 | 10.4 | 11.5 | 10.8 | 12.5 | 10.9 | 6.3 | 14.4 | 6.0 | 5.6 | 7.6 | 7.4 | 0.7 | 0.7 | 14.4 | 4.0 | 24 |
| 14 | 5.9 | 8.0 | 9.1 | 7.4 | 8.0 | 7.2 | 4.2 | 3.6 | 5.0 | 5.7 | 6.3 | 8.2 | 6.7 | 5.1 | 6.6 | 9.2 | 9.5 | 6.9 | 8.1 | 6.2 | 5.6 | 5.5 | 6.9 | 6.1 | 3.6 | 9.5 | 4.5 | 24 |
| 15 | 5.5 | 4.0 | 2.1 | 10.2 | 9.5 | 8.0 | 6.8 | 6.9 | 3.3 | 4.7 | 3.9 | 1.8 | 1.8 | 5.0 | 4.1 | 8.0 | 7.4 | 3.8 | 3.2 | 2.1 | 6.2 | 8.0 | 8.2 | 8.3 | 1.8 | 10.2 | 3.7 | 24 |
| 16 | 9.0 | 7.7 | 8.2 | 7.0 | 7.2 | 5.7 | 7.3 | 6.2 | 5.1 | 5.9 | 7.6 | 6.3 | 6.6 | 6.4 | 10.4 | 14.9 | 10.4 | 6.1 | 4.8 | 6.1 | 7.0 | 6.4 | 12.5 | 8.6 | 4.8 | 14.9 | 0.6 | 24 |
| 17 | 10.0 | 8.7 | 12.1 | 13.6 | 12.4 | 13.4 | 14.4 | 13.5 | 12.5 | 14.3 | 15.5 | 16.1 | 15.7 | 13.9 | 14.9 | 14.8 | 11.5 | 11.8 | 15.6 | 9.4 | 8.5 | 8.0 | 7.0 | 6.8 | 6.8 | 16.1 | 11.2 | 24 |
| 18 | 6.8 | 6.2 | 6.6 | 5.3 | 5.8 | 7.8 | 8.0 | 6.0 | 4.9 | 9.9 | 9.4 | 9.5 | 14.9 | 13.9 | 7.1 | 12.0 | 7.9 | 6.4 | 6.6 | 8.5 | 9.4 | 10.2 | 10.7 | 10.0 | 4.9 | 14.9 | 6.0 | 24 |
| 19 | 4.5 | 10.1 | 11.1 | 11.0 | 11.3 | 11.3 | 8.9 | 10.8 | 9.1 | 10.1 | 11.2 | 9.3 | 8.7 | 6.7 | 6.3 | 4.9 | 3.6 | 4.8 | 6.5 | 5.9 | 6.6 | 9.2 | 9.5 | 10.4 | 3.6 | 11.3 | 5.2 | 24 |
| 20 | 9.6 | 9.4 | 9.3 | 7.8 | 9.4 | 10.3 | 12.5 | 12.7 | 11.8 | 10.9 | 13.2 | 17.0 | 15.4 | 13.7 | 13.5 | 11.0 | 5.1 | 4.7 | 6.8 | 8.8 | 8.4 | 18.1 | 8.1 | 9.9 | 4.7 | 18.1 | 5.9 | 24 |
| 21 | 12.5 | 11.1 | 12.7 | 12.5 | 14.7 | 18.5 | 17.9 | 21.0 | 23.3 | 22.7 | 23.1 | 20.6 | 21.8 | 21.6 | 25.7 | 21.2 | 20.7 | 22.1 | 19.5 | 21.4 | 18.6 | P | P | P | 11.1 | 25.7 | 19.0 | 21 |
| 22 | P | P | P | P | P | P | 22.0 | 18.6 | 21.8 | 20.1 | 20.4 | 18.9 | 19.4 | 17.1 | 19.6 | 19.5 | 17.4 | 16.2 | 13.1 | 11.5 | 8.5 | 7.3 | 7.1 | 8.8 | 7.1 | 22.0 | 15.8 | 18 |
| 23 | 9.0 | 9.2 | 9.3 | 9.6 | 8.9 | 9.5 | 8.0 | 5.2 | 6.6 | 8.1 | 11.2 | 13.3 | 14.5 | 14.9 | 13.7 | 13.3 | 13.0 | 11.6 | 10.0 | 6.2 | 3.8 | 3.5 | 6.1 | 7.6 | 3.5 | 14.9 | 8.1 | 24 |
| 24 | 7.0 | 6.3 | 7.4 | 7.5 | 5.6 | 2.0 | 6.0 | 6.4 | 7.4 | 9.8 | 8.6 | 5.5 | 6.1 | 8.1 | 13.9 | 11.4 | 13.9 | 5.8 | 5.8 | 6.6 | 5.8 | 7.8 | 7.5 | 7.0 | 2.0 | 13.9 | 1.4 | 24 |
| 25 | 6.3 | 8.3 | 9.3 | 8.6 | 8.4 | 7.5 | 6.8 | 5.1 | 8.0 | 9.9 | 9.5 | 8.7 | 9.4 | 9.0 | 11.9 | 11.0 | 12.7 | 11.8 | 13.7 | 12.8 | 12.7 | 14.4 | 15.1 | 14.7 | 5.1 | 15.1 | 9.6 | 24 |
| 26 | 17.0 | 16.8 | 16.1 | 15.0 | 16.2 | 16.7 | 17.2 | 18.3 | 20.9 | 22.3 | 18.4 | 20.5 | 20.6 | 18.3 | 14.9 | 14.9 | 14.8 | 15.6 | 12.9 | 12.8 | 13.9 | 13.1 | 14.8 | 5.4 | 5.4 | 22.3 | 13.7 | 24 |
| 27 | 14.4 | 17.5 | 13.9 | 18.8 | 15.4 | 14.7 | 13.9 | 13.9 | 12.2 | 14.3 | 21.1 | 27.4 | 29.7 | 27.0 | Y | Y | 13.8 | 16.3 | 15.2 | 15.2 | 13.7 | 9.9 | 7.6 | 7.3 | 7.3 | 29.7 | 14.0 | 22 |
| 28 | 6.6 | 8.2 | 7.4 | 7.3 | 9.5 | 7.8 | 8.5 | 5.7 | 7.3 | 4.2 | 3.5 | 2.2 | 5.6 | 9.0 | 10.2 | 8.1 | 11.3 | 9.4 | 14.4 | 12.8 | 11.7 | 8.5 | 7.1 | 7.7 | 2.2 | 14.4 | 2.1 | 24 |
| 29 | 7.0 | 6.5 | 5.0 | 1.4 | 5.7 | 4.6 | 5.6 | 8.9 | 9.1 | 13.4 | 12.1 | 10.4 | 12.9 | 14.7 | 14.6 | 12.4 | 14.6 | 9.5 | 4.7 | 3.7 | 6.6 | 7.3 | 9.7 | 5.1 | 1.4 | 14.7 | 4.5 | 24 |
| 30 | 7.0 | 7.5 | 8.7 | 7.8 | 10.8 | 8.8 | 9.3 | 3.9 | 4.6 | 6.3 | 3.9 | 6.5 | 7.4 | 6.3 | 8.7 | 9.1 | 11.4 | 12.6 | 8.7 | 7.2 | 5.0 | 6.7 | 5.8 | 1.7 | 1.7 | 12.6 | 4.5 | 24 |
| HOURLY MAX | 18.8 | 19.7 | 19.1 | 20.0 | 17.7 | 18.5 | 22.0 | 21.0 | 23.3 | 22.7 | 23.1 | 27.4 | 29.7 | 27.0 | 25.7 | 21.2 | 20.7 | 22.1 | 19.5 | 21.4 | 18.6 | 18.1 | 15.1 | 14.7 | | | | |
| HOURLY AVG | 1.7 | 1.1 | 1.6 | 1.3 | 1.4 | 1.5 | 2.2 | 2.5 | 2.4 | 2.6 | 2.2 | 2.8 | 3.2 | 2.8 | 2.4 | 3.2 | 2.4 | 1.6 | 1.0 | 0.8 | 1.1 | 1.2 | 1.2 | 1.2 | | | | |

STATUS FLAG CODES

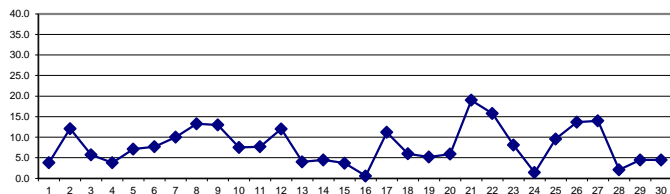
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

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

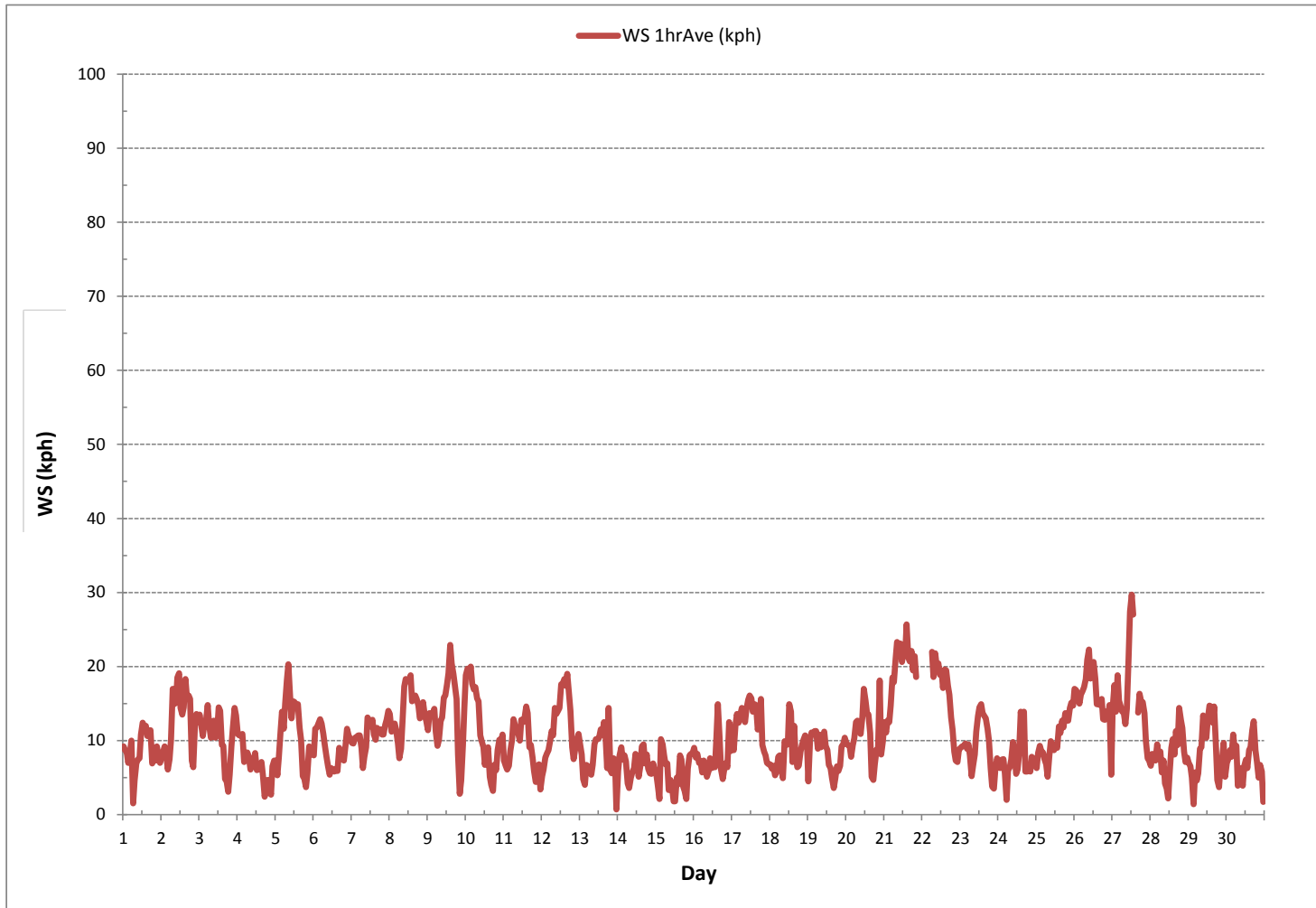
MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 709 |
| MINIMUM 1-HR AVERAGE | 0.7 kph @ HOUR 23 ON DAY 13 |
| MAXIMUM 1-HR AVERAGE: | 29.7 kph @ HOUR 12 ON DAY 27 |
| MAXIMUM 24-HR AVERAGE: | 19.0 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 709 hrs |
| AMD OPERATION UPTIME: | 98.5 % |
| STANDARD DEVIATION: | 4.6 |
| MONTHLY AVERAGE: | 1.1 kph |

24 HR AVERAGES June 2017



WIND SPEED Hourly Averages (WS kph)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 16.9 | 16.8 | 14.1 | 10.8 | 20.7 | 22.0 | 13.3 | 12.3 | 20.8 | 20.9 | 22.4 | 29.9 | 33.4 | 29.2 | 31.2 | 30.1 | 27.7 | 28.3 | 18.2 | 16.1 | 14.8 | 16.7 | 13.8 | 12.9 | 10.8 | 33.4 | 20.6 | 24 |
| 2 | 13.5 | 14.7 | 17.0 | 12.3 | 9.6 | 15.1 | 33.1 | 32.5 | 32.2 | 35.2 | 39.2 | 40.3 | 37.2 | 28.8 | 39.4 | 44.6 | 39.7 | 39.6 | 41.0 | 23.9 | 11.2 | 23.4 | 24.5 | 24.4 | 9.6 | 44.6 | 28.0 | 24 |
| 3 | 24.4 | 21.5 | 18.6 | 20.7 | 24.0 | 26.3 | 23.8 | 22.8 | 28.9 | 26.5 | 25.5 | 25.4 | 28.5 | 29.8 | 20.7 | 22.5 | 15.3 | 13.5 | 7.7 | 8.6 | 17.4 | 20.3 | 26.6 | 24.6 | 7.7 | 29.8 | 21.8 | 24 |
| 4 | 19.6 | 18.6 | 20.3 | 19.8 | 21.9 | 19.2 | 20.8 | 19.4 | 17.5 | 19.9 | 16.9 | 18.7 | 15.9 | 15.6 | 21.8 | 17.4 | 16.9 | 12.7 | 6.7 | 12.9 | 11.9 | 9.6 | 14.8 | 18.6 | 6.7 | 21.9 | 17.0 | 24 |
| 5 | 15.0 | 13.2 | 22.0 | 27.4 | 36.2 | 33.2 | 35.5 | P | 49.1 | 44.5 | 31.1 | 39.3 | 39.4 | 40.3 | 38.5 | 36.1 | 33.3 | 19.3 | 15.6 | 8.4 | 9.8 | 17.5 | 14.5 | 12.5 | 8.4 | 49.1 | 27.5 | 23 |
| 6 | 14.4 | 20.0 | 18.3 | 20.6 | 22.6 | 21.9 | 24.9 | 22.5 | 19.3 | 14.2 | 18.0 | 18.8 | 24.0 | 19.3 | 19.3 | 21.3 | 22.7 | 22.2 | 17.5 | 12.8 | 15.5 | 21.9 | 18.5 | 19.5 | 12.8 | 24.9 | 19.6 | 24 |
| 7 | 17.1 | 16.0 | 15.4 | 18.1 | 16.7 | 18.5 | 16.0 | 12.6 | 17.2 | 23.1 | 34.9 | 33.1 | 35.0 | 30.7 | 27.3 | 23.2 | 26.9 | 27.7 | 25.0 | 22.8 | 22.5 | 20.9 | 21.2 | 27.0 | 12.6 | 35.0 | 22.9 | 24 |
| 8 | 28.1 | 21.1 | 18.9 | 21.3 | 20.0 | 18.7 | 19.6 | 20.2 | 25.6 | 36.5 | 39.8 | 41.6 | 42.7 | 39.4 | 37.1 | 38.6 | 37.9 | P | 40.0 | 27.0 | 27.8 | 28.9 | 26.3 | 23.3 | 18.7 | 42.7 | 29.6 | 23 |
| 9 | 22.3 | 27.1 | 25.1 | 29.4 | 30.0 | 27.8 | 20.6 | 20.2 | 31.6 | P | 34.4 | 34.6 | 42.8 | 43.0 | 59.3 | 50.7 | 40.3 | 39.8 | 38.2 | 19.7 | 23.1 | 16.1 | 31.0 | 38.5 | 16.1 | 59.3 | 32.4 | 23 |
| 10 | 48.2 | 45.8 | 46.4 | 44.9 | 42.3 | 37.0 | 38.8 | 38.7 | 40.8 | 30.2 | 23.8 | 25.4 | 15.7 | 21.8 | 22.2 | 18.5 | 15.2 | 13.8 | 16.5 | 14.9 | 21.7 | 21.9 | 19.9 | 25.8 | 13.8 | 48.2 | 28.8 | 24 |
| 11 | 13.2 | 11.3 | 16.8 | 17.6 | 23.5 | 28.5 | 34.5 | 30.1 | 30.1 | 26.8 | 31.1 | 34.4 | 35.3 | 37.8 | 36.5 | 33.4 | 24.1 | 23.5 | 18.7 | 16.1 | 8.5 | 9.3 | 9.4 | 7.8 | 7.8 | 37.8 | 23.3 | 24 |
| 12 | 10.2 | 9.4 | 10.7 | 11.9 | 14.3 | 19.1 | 23.6 | 24.9 | 30.4 | P | 31.1 | 32.6 | 39.4 | 41.6 | 37.5 | P | 40.1 | 34.9 | 31.7 | 22.6 | 15.2 | 13.8 | 15.6 | 17.1 | 9.4 | 41.6 | 24.0 | 22 |
| 13 | 18.6 | 21.3 | 10.8 | 11.5 | 14.3 | 17.2 | 16.3 | 14.3 | 16.4 | 23.5 | 28.1 | 23.5 | 26.3 | 28.3 | 24.4 | 31.1 | 28.5 | 49.2 | 35.7 | 20.6 | 11.5 | 14.3 | 11.2 | 12.9 | 10.8 | 49.2 | 21.2 | 24 |
| 14 | 11.4 | 19.8 | 23.5 | 13.9 | 16.3 | 14.1 | 9.8 | 8.7 | 9.7 | 15.8 | 14.2 | 19.2 | 16.6 | 14.6 | 16.1 | 29.6 | 25.9 | 17.5 | 18.6 | 19.0 | 13.2 | 13.4 | 16.6 | 13.5 | 8.7 | 29.6 | 16.3 | 24 |
| 15 | 12.4 | 9.2 | 16.5 | 21.3 | 17.6 | 14.4 | 13.9 | 14.8 | 12.4 | 13.0 | 14.9 | 12.6 | 8.7 | 12.0 | 16.9 | 17.4 | 15.8 | 8.7 | 8.0 | 6.1 | 10.8 | 13.2 | 12.3 | 14.9 | 6.1 | 21.3 | 13.2 | 24 |
| 16 | 15.7 | 14.5 | 13.1 | 12.7 | 13.5 | 11.7 | 13.7 | 12.5 | 12.2 | 17.3 | 19.2 | 19.6 | 17.0 | 19.3 | 39.2 | 29.1 | 18.6 | 16.4 | 10.1 | 14.8 | 15.4 | 14.3 | 39.7 | 22.0 | 10.1 | 39.7 | 18.0 | 24 |
| 17 | 25.5 | 17.9 | 20.1 | 23.1 | 27.2 | 28.5 | 35.1 | 32.6 | 28.2 | 29.7 | 35.5 | 41.1 | 40.1 | 32.7 | 38.6 | 46.6 | 30.4 | 29.5 | P | 17.8 | 13.7 | 10.4 | 9.9 | 9.4 | 9.4 | 46.6 | 27.1 | 23 |
| 18 | 11.0 | 9.3 | 10.5 | 8.1 | 8.7 | 12.8 | 22.1 | 21.3 | 20.1 | 31.2 | 21.6 | 27.6 | 32.2 | 59.7 | 21.9 | 50.6 | 32.9 | 20.8 | 19.8 | 25.6 | P | 28.5 | 46.8 | 23.6 | 8.1 | 59.7 | 24.6 | 23 |
| 19 | 11.2 | 19.2 | 20.8 | 21.3 | 24.1 | 26.0 | 27.1 | 23.9 | 23.0 | 24.2 | 25.8 | 25.2 | 27.8 | 22.1 | 18.1 | 16.7 | 15.7 | 19.9 | 19.7 | 12.4 | 11.1 | 16.1 | 16.3 | 17.0 | 11.1 | 27.8 | 20.2 | 24 |
| 20 | 17.3 | 15.9 | 18.5 | 15.3 | 18.2 | 19.3 | 26.4 | 25.7 | 24.6 | 23.9 | 28.8 | 33.7 | 36.6 | 31.2 | 27.7 | 25.2 | P | 18.7 | 19.0 | 19.2 | 49.5 | 46.8 | 25.0 | 21.6 | 15.3 | 49.5 | 25.6 | 23 |
| 21 | 33.4 | 25.8 | 30.4 | 25.4 | 34.8 | 38.7 | 40.2 | 50.7 | 52.7 | 50.8 | 51.7 | 48.6 | 56.9 | 55.2 | 62.2 | 53.6 | 49.7 | 52.6 | 51.6 | 61.9 | 50.2 | P | P | P | 25.4 | 62.2 | 46.5 | 21 |
| 22 | P | P | P | P | P | P | 53.5 | P | 54.2 | 51.0 | 50.8 | 51.8 | 49.9 | 41.7 | 46.1 | 45.8 | 40.6 | 39.7 | 36.3 | 28.3 | 22.7 | 13.3 | 13.3 | 14.8 | 13.3 | 54.2 | 38.5 | 17 |
| 23 | 13.4 | 15.5 | 16.0 | 16.1 | 15.5 | 14.9 | 15.6 | 14.1 | 17.4 | 25.1 | 32.7 | 41.8 | 39.6 | 37.9 | 36.6 | 33.8 | 34.4 | 31.4 | 29.3 | 21.1 | 7.5 | 7.0 | 8.1 | 15.8 | 7.0 | 41.8 | 22.5 | 24 |
| 24 | 18.0 | 13.6 | 12.0 | 15.0 | 9.3 | 10.0 | 14.7 | 13.9 | 14.8 | 21.4 | 24.4 | 18.1 | 20.0 | 23.3 | 34.0 | 25.7 | 45.3 | 29.1 | 15.9 | 14.4 | 9.8 | 10.6 | 12.1 | 11.5 | 9.3 | 45.3 | 18.2 | 24 |
| 25 | 10.1 | 13.9 | 13.7 | 13.5 | 12.8 | 12.9 | 12.5 | 11.2 | 24.0 | 25.0 | 25.8 | 22.1 | 25.2 | 25.9 | 33.4 | 27.9 | 35.3 | 27.3 | 32.1 | 27.2 | 26.6 | 27.5 | 30.2 | P | 10.1 | 35.3 | 22.4 | 23 |
| 26 | 35.6 | 38.2 | 34.4 | 33.3 | 34.5 | 38.4 | 39.1 | 39.1 | 54.8 | 52.0 | 43.1 | 50.6 | 48.7 | 39.7 | 36.2 | 33.0 | 34.5 | 30.7 | 29.7 | 26.7 | 29.3 | 23.6 | 28.7 | 43.3 | 23.6 | 54.8 | 37.4 | 24 |
| 27 | P | 47.2 | 38.1 | 46.1 | 43.9 | 32.0 | 28.5 | 32.4 | 29.3 | 37.0 | 40.4 | 45.4 | 53.8 | 46.1 | Y | Y | 37.6 | 42.9 | 42.7 | 29.3 | 25.8 | 20.7 | 14.2 | 13.4 | 13.4 | 53.8 | 35.6 | 21 |
| 28 | 12.9 | 17.7 | 19.7 | 17.9 | 22.7 | 21.7 | 20.3 | 18.6 | 16.4 | 14.2 | 9.7 | 8.8 | 14.7 | 25.2 | 26.7 | 23.2 | 44.8 | 25.9 | 37.7 | 32.6 | 29.7 | 28.3 | 15.7 | 19.0 | 8.8 | 44.8 | 21.8 | 24 |
| 29 | 14.6 | 11.5 | 9.8 | 4.4 | 11.1 | 9.8 | 17.7 | 18.1 | 19.2 | 27.9 | 25.3 | 24.3 | 30.2 | 31.3 | 32.5 | 57.3 | 35.1 | 22.3 | 11.0 | 11.0 | 23.0 | 23.2 | 24.5 | 21.0 | 4.4 | 57.3 | 21.5 | 24 |
| 30 | 14.0 | 13.9 | 15.5 | 16.2 | 16.8 | 16.2 | 18.6 | 15.2 | 16.1 | 19.5 | 15.4 | 16.7 | 22.4 | 19.1 | 28.7 | 27.1 | 37.9 | 35.8 | 25.5 | 17.4 | 16.7 | 15.8 | 14.3 | 7.1 | 7.1 | 37.9 | 19.2 | 24 |
| HOURLY MAX | 48.2 | 47.2 | 46.4 | 46.1 | 43.9 | 38.7 | 53.5 | 50.7 | 54.8 | 52.0 | 51.7 | 51.8 | 56.9 | 59.7 | 62.2 | 57.3 | 49.7 | 52.6 | 51.6 | 61.9 | 50.2 | 46.8 | 46.8 | 43.3 | | | | |
| HOURLY AVG | 18.5 | 19.3 | 19.6 | 19.7 | 21.5 | 21.6 | 24.3 | 22.3 | 26.3 | 27.9 | 28.5 | 30.2 | 31.9 | 31.4 | 32.1 | 32.5 | 31.1 | 27.4 | 24.8 | 20.4 | 19.5 | 18.9 | 19.8 | 19.0 | | | | |

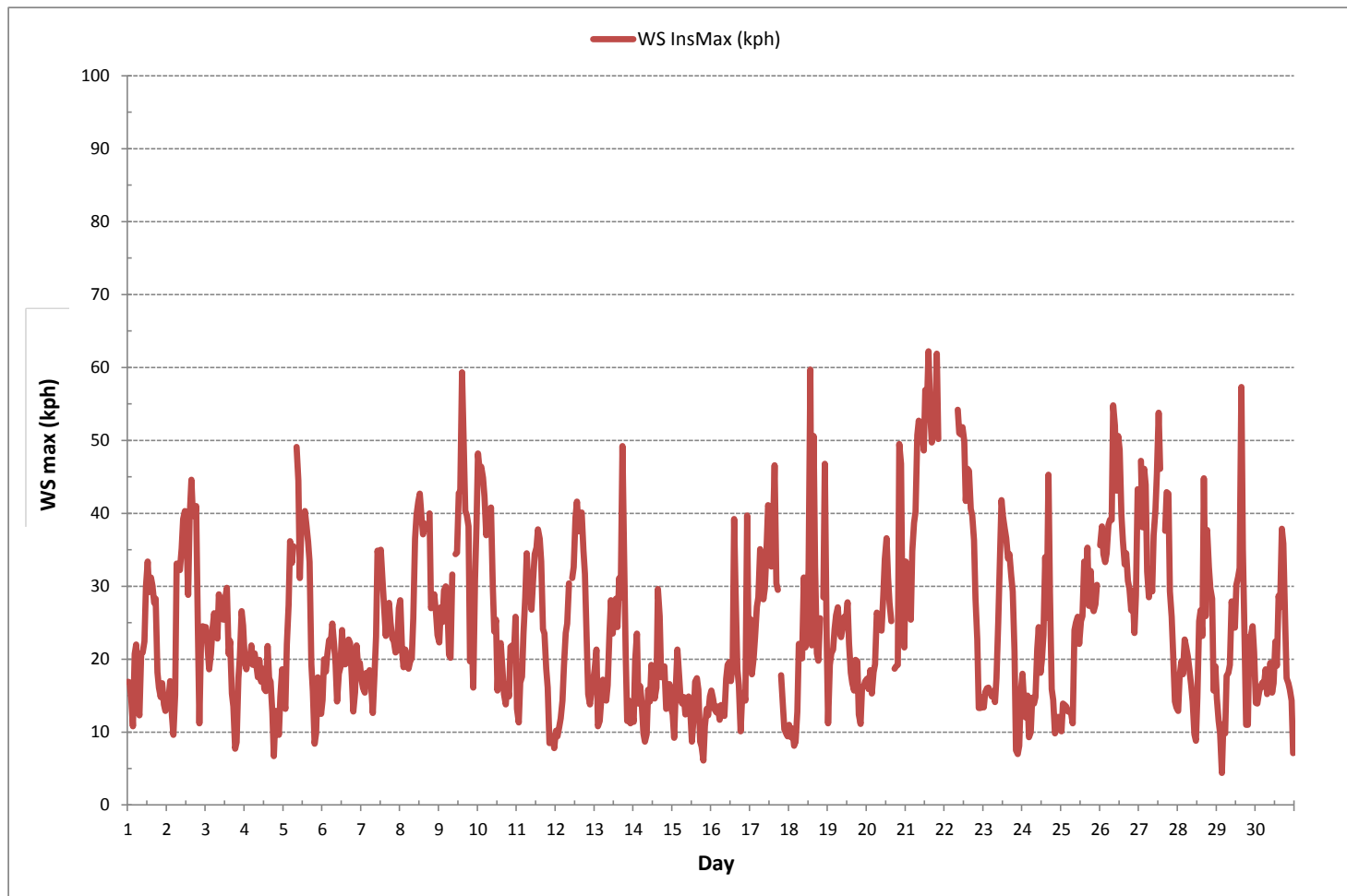
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 62.2 kph | @ HOUR | 14 | ON DAY | 21 |
| OPERATIONAL TIME: | | | | 698 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



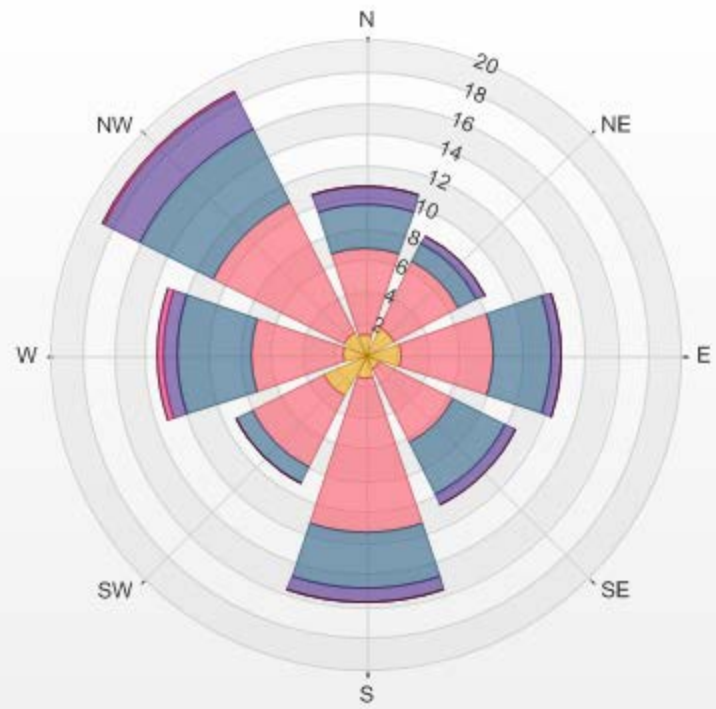
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 17/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.71%

| Direction | 1.8-6.0 | 6.0-11.9 | 11.9-17.9 | 17.9-23.8 | 23.8-29.8 | >29.8 | Total |
|----------------|---------|----------|-----------|-----------|-----------|-------|-------|
| N | 1.3 | 5.5 | 2.8 | 1.1 | 0.0 | 0.0 | 10.7 |
| NE | 2.0 | 4.7 | 1.3 | 0.6 | 0.0 | 0.0 | 8.5 |
| E | 2.3 | 5.9 | 3.7 | 0.6 | 0.0 | 0.0 | 12.4 |
| SE | 1.0 | 5.2 | 3.7 | 0.9 | 0.0 | 0.0 | 10.7 |
| S | 1.6 | 9.7 | 3.5 | 1.0 | 0.0 | 0.0 | 15.8 |
| SW | 3.0 | 5.1 | 1.1 | 0.0 | 0.0 | 0.0 | 9.2 |
| W | 1.4 | 5.9 | 4.7 | 0.9 | 0.4 | 0.0 | 13.3 |
| NW | 1.6 | 9.3 | 5.2 | 2.5 | 0.1 | 0.0 | 18.8 |
| Summary | 14.0 | 51.3 | 26.0 | 7.5 | 0.6 | 0.0 | 99.3 |

% Icon Classes (kph) 14 1.8-6.0 51 6.0-11.9 26 11.9-17.9 7 17.9-23.8 1 23.8-29.8 0 >29.8

LICA ST. LINA 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 0.71% Calm Wind Avg Speed: 1.41(kph)



WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

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

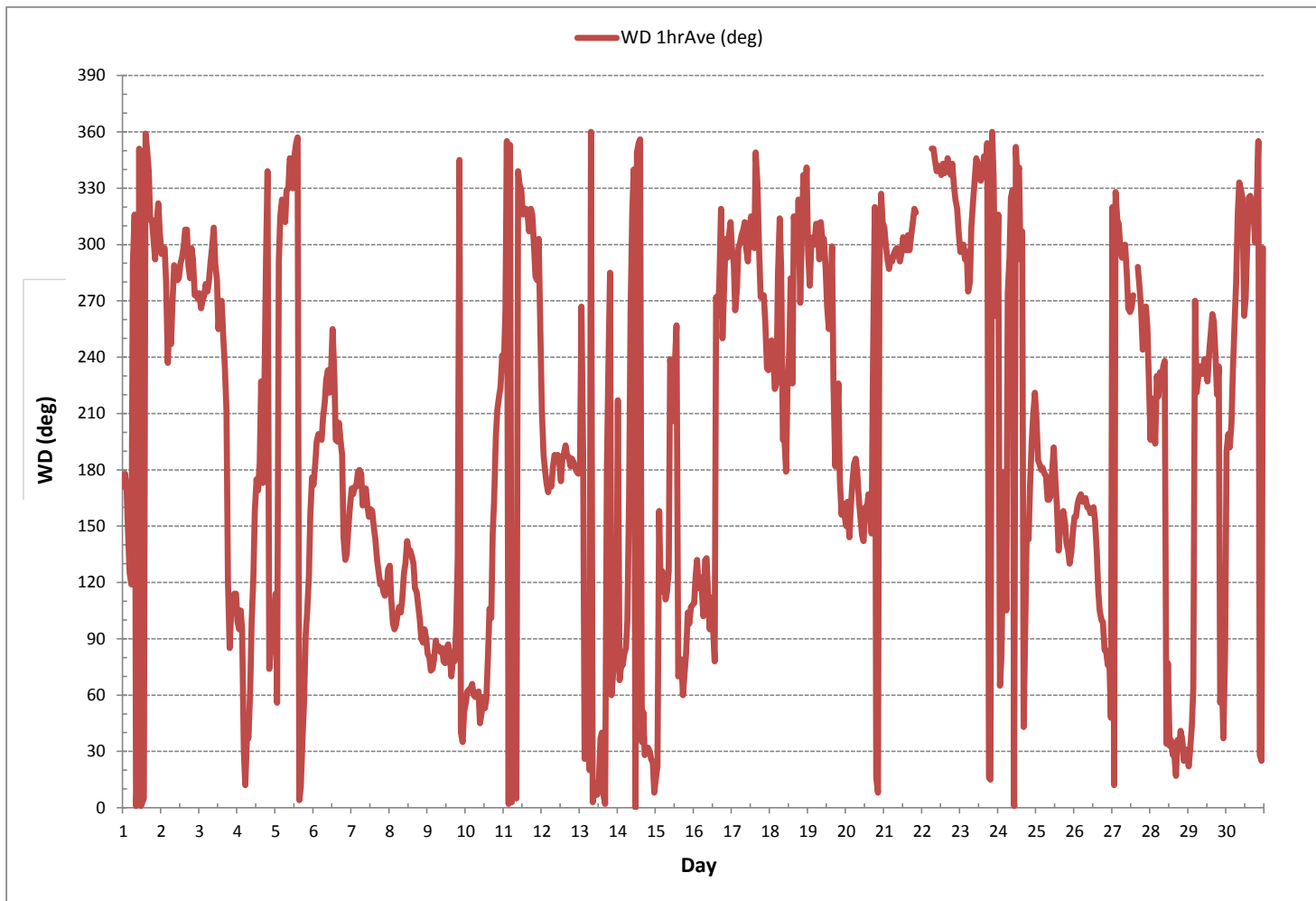
STATUS FLAG CODES

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

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

| | | | | | |
|---------------------------|-----|-----|-----------------------|-----------|-----|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 709 | hrs |
| STANDARD DEVIATION: | 102 | | AMD OPERATION UPTIME: | 98.5 | % |
| | | | MONTHLY AVERAGE: | 287 (WNW) | |

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 12 | 11 | 11 | 10 | 12 | 16 | 39 | 24 | 27 | 25 | 26 | 24 | 24 | 24 | 27 | 25 | 24 | 20 | 19 | 16 | 11 | 12 | 11 | 15 | 24 |
| 2 | 10 | 11 | 11 | 9 | 14 | 13 | 12 | 14 | 17 | 17 | 15 | 15 | 17 | 18 | 18 | 18 | 19 | 17 | 16 | 19 | 13 | 10 | 13 | 10 | 24 |
| 3 | 11 | 9 | 8 | 9 | 11 | 10 | 14 | 18 | 20 | 18 | 23 | 26 | 17 | 20 | 24 | 22 | 30 | 35 | 21 | 10 | 10 | 11 | 11 | 11 | 24 |
| 4 | 12 | 12 | 13 | 12 | 19 | 17 | 19 | 19 | 24 | 23 | 23 | 23 | 26 | 38 | 23 | 24 | 23 | 16 | 15 | 19 | 18 | 20 | 18 | 24 | 24 |
| 5 | 19 | 22 | 15 | 16 | 17 | 19 | 17 | 18 | 19 | 22 | 20 | 20 | 22 | 24 | 22 | 27 | 25 | 30 | 23 | 14 | 8 | 11 | 10 | 7 | 24 |
| 6 | 11 | 9 | 9 | 10 | 11 | 13 | 18 | 19 | 22 | 21 | 37 | 37 | 41 | 39 | 40 | 41 | 26 | 24 | 18 | 10 | 8 | 9 | 12 | 13 | 24 |
| 7 | 11 | 9 | 8 | 9 | 8 | 11 | 11 | 16 | 20 | 23 | 22 | 24 | 26 | 24 | 26 | 28 | 23 | 15 | 13 | 12 | 10 | 10 | 10 | 13 | 24 |
| 8 | 12 | 11 | 10 | 10 | 12 | 14 | 15 | 17 | 16 | 17 | 18 | 19 | 20 | 22 | 20 | 22 | 20 | 16 | 14 | 14 | 14 | 13 | 12 | 13 | 24 |
| 9 | 12 | 12 | 13 | 14 | 14 | 15 | 18 | 14 | 13 | 15 | 16 | 15 | 16 | 15 | 16 | 16 | 15 | 15 | 17 | 18 | 30 | 35 | 15 | 15 | 24 |
| 10 | 17 | 17 | 16 | 16 | 16 | 15 | 15 | 15 | 17 | 19 | 20 | 19 | 22 | 17 | 23 | 45 | 39 | 56 | 23 | 17 | 17 | 17 | 15 | 11 | 24 |
| 11 | 11 | 14 | 17 | 19 | 18 | 20 | 19 | 21 | 22 | 22 | 28 | 23 | 28 | 28 | 23 | 22 | 21 | 19 | 21 | 16 | 11 | 6 | 6 | 15 | 24 |
| 12 | 11 | 7 | 5 | 8 | 11 | 13 | 16 | 16 | 16 | 18 | 20 | 20 | 18 | 19 | 19 | 21 | 18 | 17 | 16 | 16 | 12 | 9 | 6 | 8 | 24 |
| 13 | 33 | 21 | 12 | 38 | 19 | 18 | 18 | 19 | 22 | 20 | 20 | 22 | 24 | 21 | 22 | 21 | 19 | 25 | 15 | 20 | 14 | 12 | 11 | 39 | 24 |
| 14 | 12 | 17 | 13 | 13 | 13 | 13 | 19 | 21 | 17 | 19 | 20 | 20 | 22 | 23 | 18 | 20 | 18 | 19 | 16 | 15 | 15 | 14 | 14 | 16 | 24 |
| 15 | 14 | 16 | 41 | 13 | 12 | 11 | 14 | 19 | 31 | 23 | 42 | 41 | 29 | 29 | 37 | 16 | 15 | 15 | 12 | 13 | 8 | 10 | 8 | 10 | 24 |
| 16 | 11 | 17 | 11 | 10 | 11 | 14 | 14 | 17 | 26 | 33 | 23 | 41 | 25 | 27 | 50 | 12 | 14 | 20 | 13 | 12 | 14 | 12 | 16 | 15 | 24 |
| 17 | 16 | 11 | 9 | 10 | 15 | 15 | 17 | 18 | 21 | 19 | 19 | 22 | 22 | 24 | 23 | 26 | 21 | 20 | 13 | 11 | 8 | 5 | 6 | 4 | 24 |
| 18 | 3 | 3 | 3 | 9 | 9 | 11 | 24 | 45 | 31 | 20 | 23 | 25 | 18 | 31 | 25 | 29 | 32 | 30 | 18 | 17 | 17 | 17 | 20 | 17 | 24 |
| 19 | 22 | 9 | 13 | 13 | 15 | 16 | 18 | 18 | 23 | 23 | 25 | 30 | 40 | 33 | 43 | 47 | 56 | 48 | 28 | 11 | 8 | 10 | 10 | 11 | 24 |
| 20 | 11 | 12 | 12 | 14 | 11 | 11 | 14 | 14 | 16 | 18 | 18 | 17 | 18 | 19 | 18 | 20 | 44 | 32 | 19 | 16 | 24 | 16 | 17 | 16 | 24 |
| 21 | 18 | 17 | 16 | 15 | 16 | 16 | 17 | 18 | 18 | 18 | 18 | 20 | 19 | 19 | 19 | 19 | 18 | 18 | 19 | 18 | 18 | P | P | P | 21 |
| 22 | P | P | P | P | P | P | 20 | 20 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 21 | 21 | 21 | 18 | 19 | 15 | 11 | 10 | 10 | 18 |
| 23 | 7 | 10 | 11 | 10 | 10 | 9 | 14 | 26 | 21 | 30 | 27 | 24 | 21 | 21 | 22 | 22 | 21 | 23 | 19 | 17 | 9 | 12 | 4 | 8 | 24 |
| 24 | 22 | 8 | 10 | 11 | 33 | 25 | 15 | 20 | 18 | 21 | 27 | 45 | 38 | 28 | 23 | 16 | 28 | 23 | 22 | 16 | 15 | 7 | 8 | 8 | 24 |
| 25 | 8 | 12 | 7 | 8 | 8 | 13 | 14 | 21 | 22 | 24 | 24 | 32 | 28 | 31 | 22 | 27 | 22 | 21 | 18 | 16 | 14 | 13 | 14 | 16 | 24 |
| 26 | 16 | 17 | 17 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 19 | 19 | 19 | 18 | 15 | 14 | 15 | 15 | 14 | 13 | 12 | 12 | 49 | 24 |
| 27 | 37 | 21 | 19 | 16 | 19 | 17 | 17 | 16 | 19 | 20 | 18 | 12 | 13 | 14 | Y | Y | 21 | 19 | 15 | 11 | 10 | 14 | 12 | 9 | 22 |
| 28 | 11 | 11 | 13 | 15 | 13 | 16 | 13 | 20 | 15 | 37 | 22 | 37 | 24 | 20 | 18 | 18 | 20 | 15 | 14 | 15 | 15 | 12 | 11 | 14 | 24 |
| 29 | 10 | 10 | 8 | 19 | 9 | 19 | 12 | 11 | 12 | 14 | 14 | 16 | 18 | 15 | 15 | 17 | 13 | 14 | 12 | 37 | 15 | 16 | 16 | 19 | 24 |
| 30 | 11 | 12 | 9 | 9 | 7 | 9 | 13 | 26 | 26 | 25 | 30 | 29 | 26 | 26 | 31 | 19 | 19 | 19 | 17 | 17 | 17 | 12 | 11 | 19 | 24 |

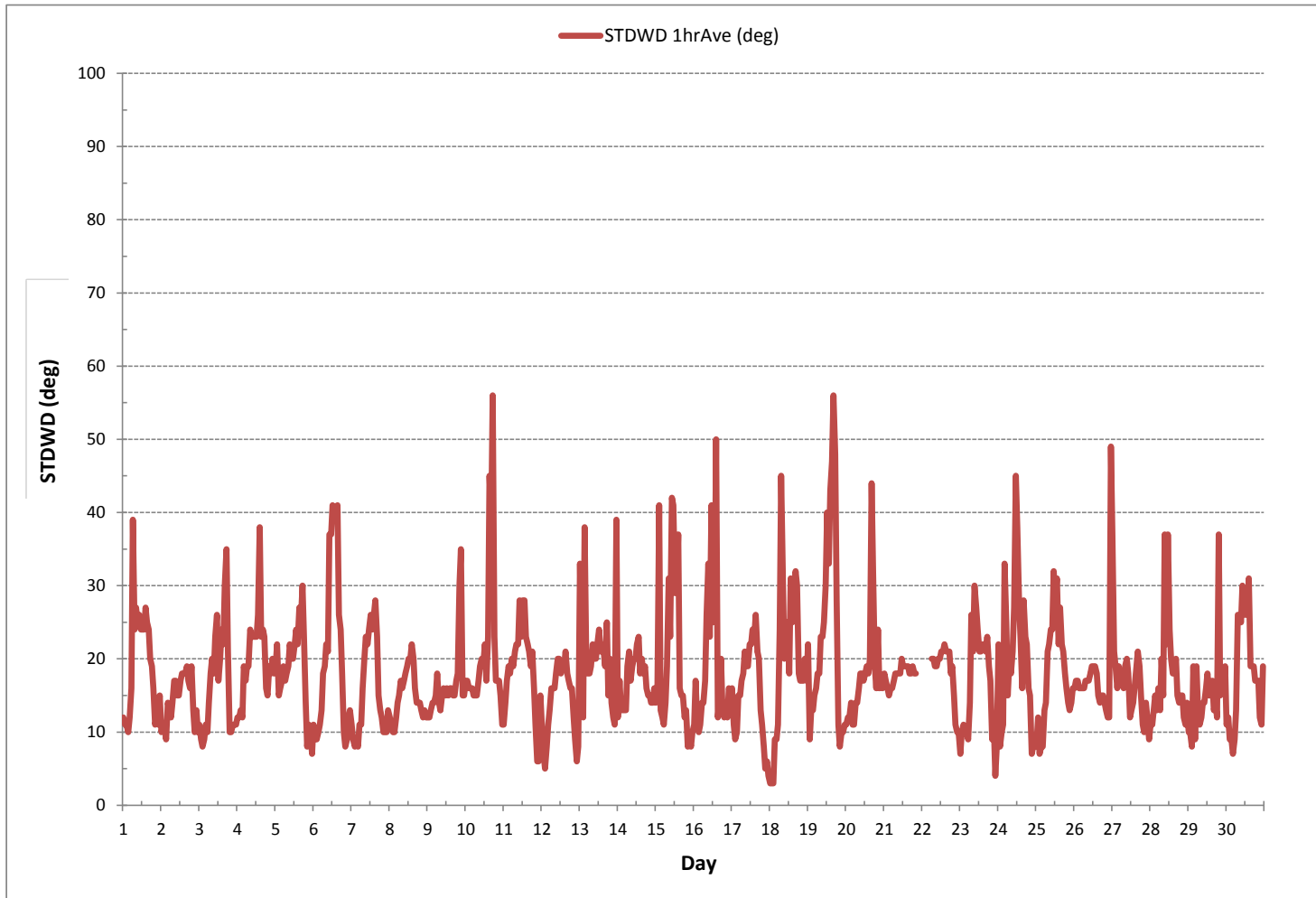
STATUS FLAG CODES

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

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 709 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



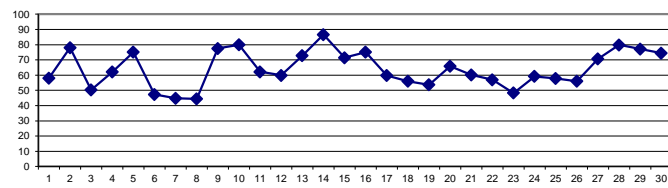
RELATIVE HUMIDITY Hourly Averages (RH %)

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

STATUS FLAG CODES

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

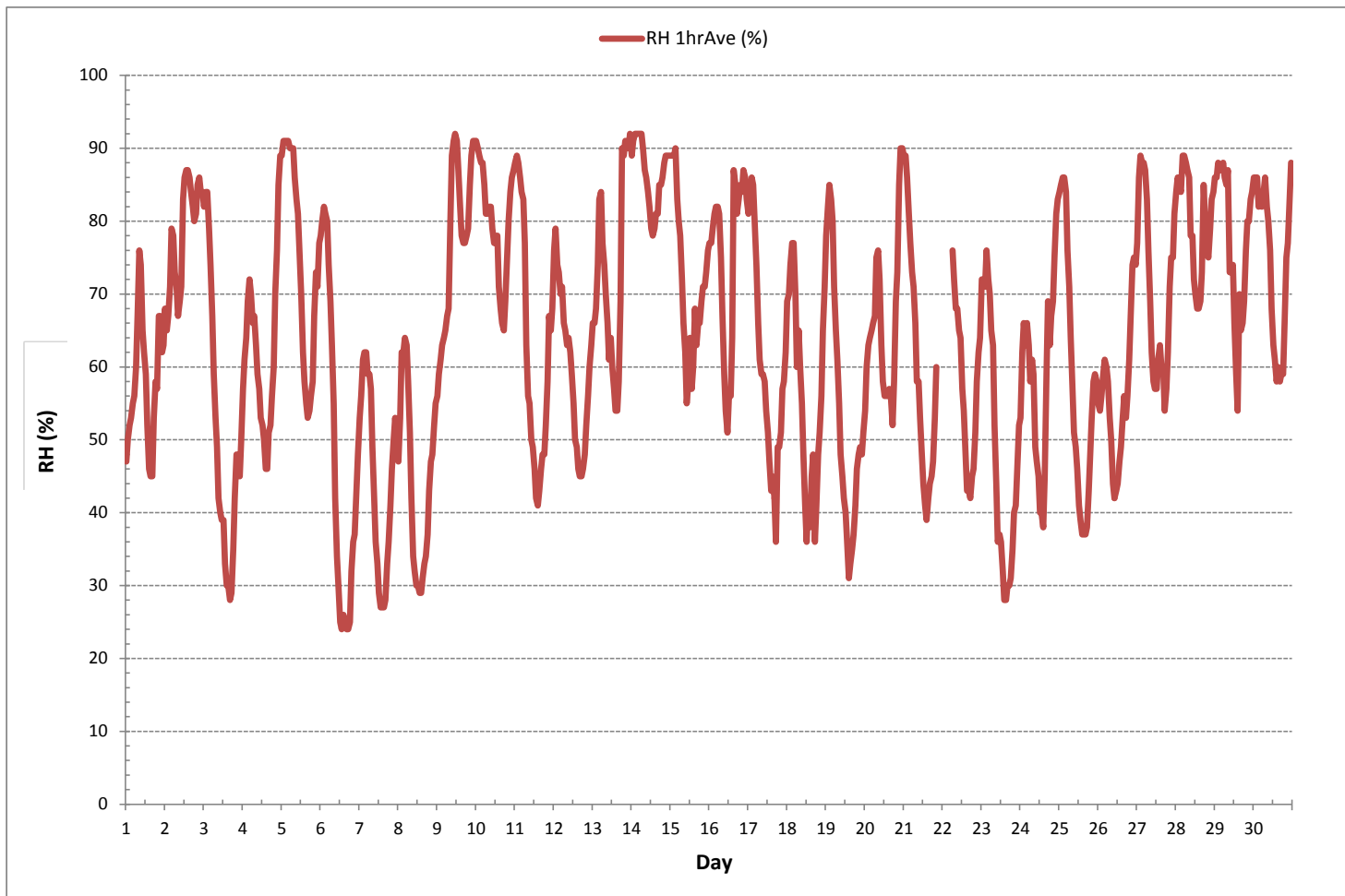
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | | |
|------------------------|----|---|------------------|----|--------|---------|
| MINIMUM 1-HR AVERAGE: | 24 | % | @ HOUR | 13 | ON DAY | 6 |
| MAXIMUM 1-HR AVERAGE: | 92 | % | @ HOUR | 11 | ON DAY | 9 |
| MAXIMUM 24-HR AVERAGE: | 87 | % | | | ON DAY | 14 |
| OPERATIONAL TIME: | | | | | | 711 hrs |
| AMD OPERATION UPTIME: | | | | | | 98.8 % |
| STANDARD DEVIATION: | 17 | | MONTHLY AVERAGE: | | | 64 % |

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



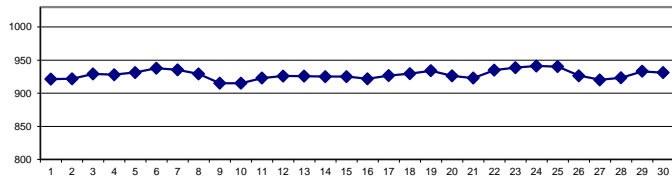
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 921 | 921 | 921 | 920 | 920 | 920 | 920 | 921 | 920 | 921 | 922 | 922 | 922 | 923 | 923 | 923 | 923 | 923 | 922 | 922 | 922 | 921 | 921 | 921 | 920 | 920 | 923 | 921 | 24 |
| 2 | 920 | 920 | 920 | 920 | 920 | 920 | 921 | 921 | 921 | 921 | 922 | 921 | 921 | 922 | 922 | 922 | 922 | 923 | 924 | 924 | 924 | 924 | 925 | 925 | 920 | 920 | 925 | 922 | 24 |
| 3 | 926 | 926 | 926 | 926 | 927 | 928 | 928 | 929 | 930 | 931 | 931 | 931 | 932 | 932 | 932 | 931 | 931 | 931 | 931 | 931 | 930 | 929 | 928 | 928 | 926 | 926 | 932 | 929 | 24 |
| 4 | 927 | 927 | 927 | 927 | 927 | 927 | 928 | 928 | 928 | 929 | 929 | 929 | 929 | 929 | 930 | 930 | 929 | 929 | 929 | 928 | 928 | 928 | 928 | 927 | 927 | 927 | 930 | 928 | 24 |
| 5 | 927 | 927 | 927 | 927 | 926 | 927 | 928 | 928 | 928 | 929 | 930 | 931 | 932 | 933 | 933 | 934 | 935 | 936 | 937 | 937 | 937 | 936 | 936 | 936 | 926 | 926 | 937 | 932 | 24 |
| 6 | 936 | 936 | 936 | 937 | 937 | 938 | 938 | 939 | 940 | 940 | 940 | 940 | 940 | 940 | 939 | 939 | 939 | 938 | 938 | 937 | 936 | 936 | 936 | 935 | 935 | 940 | 938 | 24 | |
| 7 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 936 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 937 | 936 | 936 | 935 | 934 | 934 | 934 | 933 | 933 | 937 | 936 | 24 | |
| 8 | 933 | 933 | 932 | 932 | 932 | 931 | 931 | 932 | 932 | 932 | 932 | 931 | 931 | 931 | 930 | 929 | 928 | 928 | 927 | 926 | 924 | 923 | 923 | 922 | 922 | 922 | 933 | 929 | 24 |
| 9 | 921 | 921 | 919 | 918 | 917 | 917 | 917 | 916 | 915 | 915 | 915 | 915 | 915 | 915 | 914 | 914 | 913 | 913 | 914 | 913 | 913 | 913 | 912 | 912 | 912 | 912 | 921 | 915 | 24 |
| 10 | 912 | 912 | 912 | 912 | 913 | 913 | 913 | 913 | 914 | 914 | 915 | 915 | 916 | 916 | 917 | 918 | 918 | 919 | 918 | 918 | 917 | 917 | 916 | 917 | 912 | 912 | 919 | 915 | 24 |
| 11 | 917 | 917 | 918 | 918 | 919 | 920 | 921 | 922 | 923 | 924 | 924 | 924 | 925 | 925 | 925 | 925 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 926 | 917 | 926 | 923 | 24 | |
| 12 | 926 | 926 | 926 | 926 | 927 | 927 | 927 | 927 | 928 | 927 | 928 | 927 | 927 | 927 | 927 | 926 | 926 | 926 | 926 | 925 | 925 | 925 | 924 | 924 | 924 | 924 | 928 | 926 | 24 |
| 13 | 924 | 924 | 924 | 924 | 924 | 924 | 925 | 925 | 926 | 927 | 927 | 927 | 928 | 928 | 928 | 928 | 927 | 927 | 927 | 927 | 927 | 927 | 926 | 925 | 925 | 924 | 928 | 926 | 24 |
| 14 | 925 | 926 | 926 | 926 | 926 | 926 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 925 | 924 | 924 | 926 | 925 | 24 | |
| 15 | 924 | 924 | 924 | 924 | 924 | 924 | 925 | 925 | 926 | 927 | 927 | 927 | 927 | 927 | 927 | 926 | 926 | 926 | 925 | 925 | 924 | 924 | 923 | 923 | 923 | 923 | 927 | 925 | 24 |
| 16 | 923 | 922 | 922 | 921 | 921 | 921 | 921 | 922 | 922 | 923 | 923 | 923 | 922 | 922 | 922 | 921 | 921 | 920 | 921 | 922 | 922 | 922 | 922 | 922 | 920 | 923 | 922 | 24 | |
| 17 | 922 | 922 | 923 | 923 | 923 | 924 | 925 | 925 | 926 | 927 | 928 | 928 | 929 | 929 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 928 | 928 | 928 | 922 | 930 | 927 | 24 |
| 18 | 928 | 928 | 928 | 928 | 928 | 928 | 929 | 930 | 930 | 930 | 930 | 931 | 930 | 931 | 930 | 932 | 932 | 931 | 931 | 931 | 931 | 931 | 931 | 928 | 928 | 932 | 930 | 24 | |
| 19 | 931 | 931 | 931 | 932 | 932 | 933 | 934 | 935 | 935 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 936 | 935 | 934 | 933 | 932 | 932 | 931 | 931 | 931 | 937 | 934 | 24 | |
| 20 | 931 | 930 | 930 | 929 | 929 | 929 | 929 | 928 | 928 | 927 | 927 | 927 | 926 | 925 | 924 | 924 | 924 | 924 | 924 | 923 | 922 | 922 | 922 | 922 | 922 | 931 | 926 | 24 | |
| 21 | 922 | 922 | 922 | 922 | 922 | 922 | 922 | 922 | 923 | 923 | 923 | 923 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | P | P | P | 922 | 924 | 923 | 21 | |
| 22 | P | P | P | P | P | P | 928 | 930 | 931 | 932 | 933 | 934 | 934 | 935 | 936 | 937 | 937 | 937 | 937 | 937 | 938 | 938 | 937 | 937 | 937 | 928 | 938 | 935 | 18 |
| 23 | 937 | 936 | 936 | 936 | 936 | 937 | 937 | 938 | 938 | 939 | 939 | 939 | 939 | 940 | 940 | 940 | 941 | 941 | 941 | 942 | 941 | 940 | 939 | 939 | 936 | 942 | 939 | 24 | |
| 24 | 940 | 939 | 939 | 939 | 939 | 939 | 940 | 941 | 941 | 942 | 942 | 943 | 943 | 943 | 943 | 942 | 943 | 942 | 942 | 942 | 942 | 941 | 941 | 939 | 939 | 943 | 941 | 24 | |
| 25 | 940 | 940 | 940 | 940 | 940 | 940 | 941 | 942 | 942 | 942 | 943 | 943 | 942 | 942 | 942 | 941 | 940 | 940 | 939 | 938 | 936 | 936 | 935 | 935 | 935 | 943 | 940 | 24 | |
| 26 | 935 | 934 | 933 | 932 | 932 | 931 | 930 | 930 | 929 | 928 | 928 | 927 | 927 | 926 | 926 | 925 | 924 | 924 | 923 | 922 | 920 | 918 | 917 | 917 | 917 | 935 | 927 | 24 | |
| 27 | 919 | 916 | 917 | 917 | 918 | 920 | 919 | 919 | 920 | 920 | 921 | 921 | 921 | 921 | 922 | 922 | 923 | 923 | 923 | 923 | 921 | 921 | 921 | 920 | 916 | 923 | 920 | 24 | |
| 28 | 919 | 919 | 918 | 918 | 918 | 919 | 919 | 920 | 920 | 921 | 922 | 922 | 923 | 924 | 925 | 926 | 927 | 927 | 928 | 929 | 929 | 930 | 930 | 930 | 918 | 930 | 923 | 24 | |
| 29 | 930 | 931 | 931 | 931 | 932 | 932 | 933 | 933 | 933 | 934 | 935 | 935 | 935 | 935 | 935 | 935 | 934 | 934 | 934 | 934 | 933 | 933 | 933 | 932 | 930 | 935 | 933 | 24 | |
| 30 | 932 | 931 | 931 | 930 | 930 | 930 | 931 | 931 | 931 | 931 | 931 | 932 | 932 | 932 | 932 | 931 | 932 | 932 | 931 | 931 | 931 | 931 | 931 | 930 | 930 | 932 | 931 | 24 | |
| HOURLY MAX | 940 | 940 | 940 | 940 | 940 | 940 | 941 | 942 | 942 | 942 | 943 | 943 | 943 | 943 | 943 | 942 | 943 | 942 | 942 | 942 | 942 | 941 | 941 | 941 | | | | | |
| HOURLY AVG | 927 | 927 | 927 | 927 | 927 | 927 | 927 | 928 | 928 | 928 | 929 | 929 | 929 | 929 | 929 | 929 | 929 | 929 | 929 | 929 | 928 | 928 | 928 | 927 | | | | | |

STATUS FLAG CODES

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

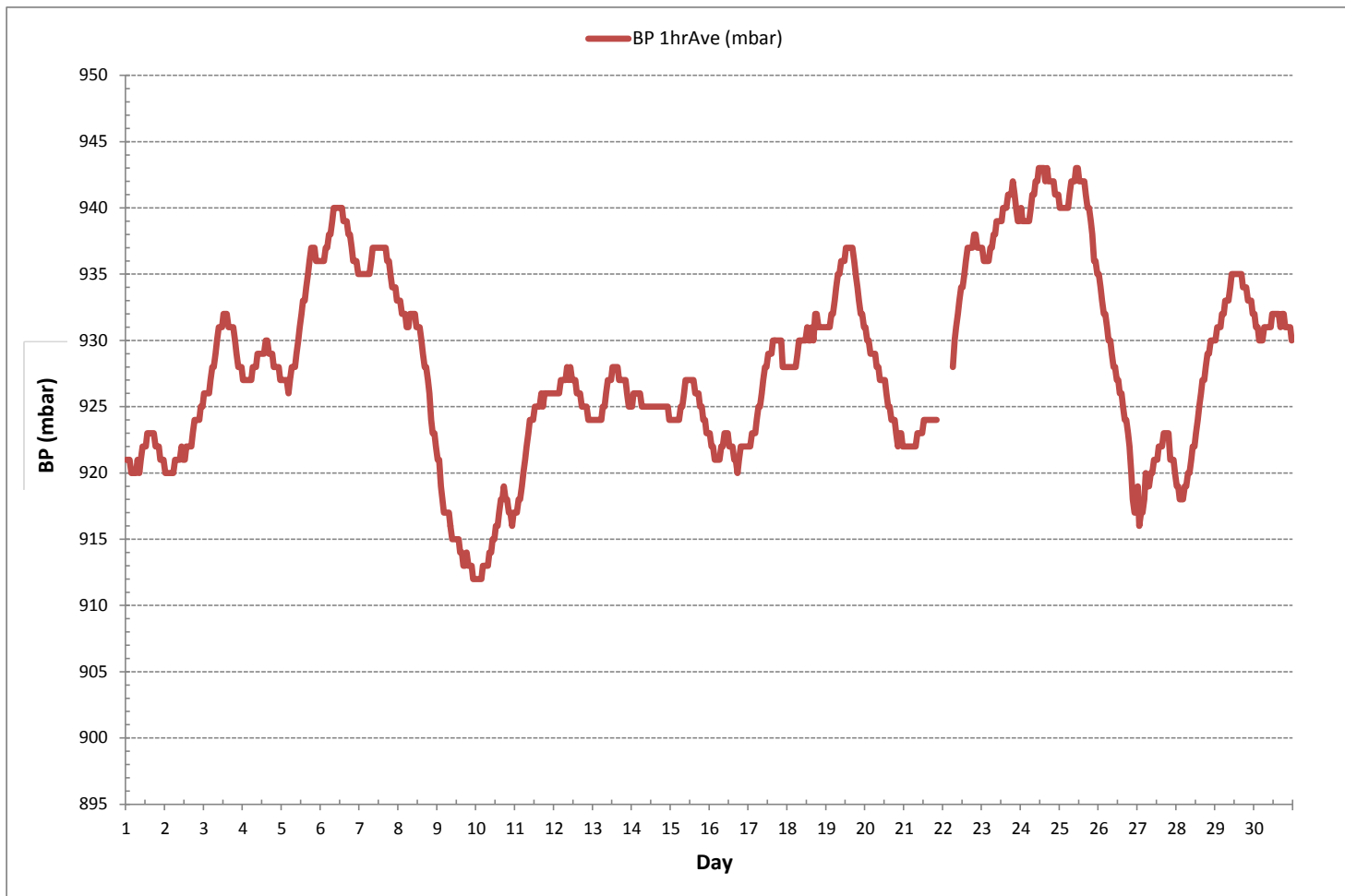
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | | |
|------------------------|-----|------|--------|----|--------|---------|
| MINIMUM 1-HR AVERAGE: | 912 | mbar | @ HOUR | 22 | ON DAY | 9 |
| MAXIMUM 1-HR AVERAGE: | 943 | mbar | @ HOUR | 11 | ON DAY | 24 |
| MAXIMUM 24-HR AVERAGE: | 941 | mbar | | | ON DAY | 24 |
| OPERATIONAL TIME: | | | | | | 711 hrs |
| AMD OPERATION UPTIME: | | | | | | 98.8 % |
| STANDARD DEVIATION: | 7 | | | | | |
| MONTHLY AVERAGE: | 928 | mbar | | | | |

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



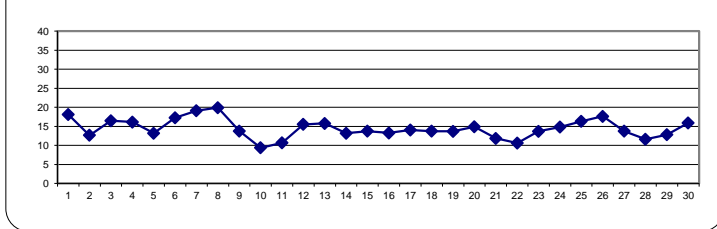
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 17.8 | 17.0 | 16.5 | 16.5 | 16.3 | 15.9 | 16.2 | 15.9 | 15.3 | 16.1 | 18.8 | 19.9 | 20.8 | 22.0 | 23.1 | 23.0 | 22.7 | 21.0 | 18.6 | 18.8 | 16.4 | 15.8 | 15.9 | 15.3 | 15.3 | 23.1 | 18.2 | 24 |
| 2 | 14.4 | 14.7 | 14.2 | 13.2 | 11.7 | 12.9 | 14.7 | 14.9 | 16.3 | 15.6 | 14.6 | 12.6 | 12.2 | 11.7 | 11.6 | 11.7 | 11.5 | 11.3 | 11.6 | 11.3 | 10.8 | 10.3 | 10.3 | 10.0 | 10.0 | 16.3 | 12.7 | 24 |
| 3 | 10.2 | 9.4 | 8.6 | 8.5 | 8.6 | 10.2 | 13.0 | 15.4 | 17.2 | 18.5 | 20.1 | 20.9 | 21.2 | 22.3 | 22.8 | 22.6 | 23.0 | 22.4 | 20.7 | 19.1 | 16.7 | 15.4 | 14.9 | 14.2 | 8.5 | 23.0 | 16.5 | 24 |
| 4 | 12.9 | 11.9 | 11.4 | 10.7 | 9.9 | 11.1 | 12.7 | 13.6 | 16.2 | 17.3 | 18.2 | 18.8 | 19.2 | 19.9 | 21.7 | 22.1 | 20.5 | 20.3 | 19.9 | 18.7 | 16.8 | 15.7 | 14.2 | 13.4 | 9.9 | 22.1 | 16.1 | 24 |
| 5 | 13.2 | 12.8 | 12.7 | 11.7 | 10.6 | 10.2 | 9.6 | 9.7 | 10.0 | 10.6 | 11.7 | 13.1 | 14.3 | 15.9 | 16.4 | 17.5 | 17.9 | 17.9 | 16.9 | 16.0 | 14.0 | 12.3 | 11.8 | 10.6 | 9.6 | 17.9 | 13.2 | 24 |
| 6 | 9.9 | 9.8 | 9.0 | 8.6 | 8.5 | 10.1 | 12.6 | 15.4 | 18.4 | 21.3 | 21.9 | 22.3 | 23.3 | 23.3 | 23.1 | 23.3 | 22.9 | 22.2 | 21.4 | 20.0 | 18.4 | 17.4 | 16.4 | 15.7 | 8.5 | 23.3 | 17.3 | 24 |
| 7 | 14.7 | 13.9 | 13.0 | 12.5 | 12.4 | 13.7 | 14.9 | 16.7 | 19.6 | 21.6 | 22.7 | 23.6 | 24.4 | 24.4 | 25.0 | 25.1 | 25.1 | 23.0 | 22.4 | 20.7 | 18.9 | 17.4 | 16.6 | 16.6 | 12.4 | 25.1 | 19.1 | 24 |
| 8 | 16.6 | 15.1 | 13.3 | 12.9 | 12.9 | 13.7 | 15.8 | 19.3 | 21.8 | 23.3 | 24.0 | 24.7 | 25.1 | 25.4 | 25.8 | 25.2 | 24.6 | 23.7 | 22.9 | 21.0 | 19.6 | 18.3 | 17.2 | 16.5 | 12.9 | 25.8 | 19.9 | 24 |
| 9 | 16.1 | 15.4 | 14.4 | 13.9 | 13.5 | 13.7 | 13.6 | 14.1 | 12.6 | 11.5 | 11.6 | 12.1 | 13.4 | 15.0 | 16.3 | 16.8 | 16.3 | 16.1 | 15.3 | 13.0 | 11.9 | 11.3 | 11.5 | 11.9 | 11.3 | 16.8 | 13.8 | 24 |
| 10 | 11.7 | 10.7 | 9.8 | 9.1 | 8.3 | 7.3 | 6.7 | 7.0 | 7.7 | 7.3 | 8.0 | 8.7 | 9.0 | 9.0 | 11.3 | 11.6 | 12.4 | 12.8 | 11.9 | 10.5 | 9.6 | 8.5 | 8.2 | 8.5 | 6.7 | 12.8 | 9.4 | 24 |
| 11 | 8.5 | 8.2 | 8.5 | 8.2 | 7.8 | 7.9 | 8.0 | 10.0 | 11.7 | 11.3 | 12.6 | 12.7 | 13.4 | 15.0 | 14.3 | 13.7 | 13.0 | 12.2 | 12.5 | 11.7 | 10.5 | 8.5 | 8.9 | 8.2 | 7.8 | 15.0 | 10.7 | 24 |
| 12 | 7.9 | 7.1 | 7.4 | 7.8 | 8.4 | 8.7 | 9.9 | 11.3 | 13.1 | 14.0 | 15.9 | 17.6 | 19.4 | 20.9 | 21.1 | 22.2 | 22.4 | 22.7 | 22.3 | 21.7 | 20.1 | 18.1 | 16.8 | 16.0 | 7.1 | 22.7 | 15.5 | 24 |
| 13 | 15.3 | 15.0 | 14.2 | 13.1 | 11.5 | 11.6 | 13.9 | 15.2 | 16.8 | 18.1 | 19.8 | 19.4 | 20.6 | 22.0 | 22.3 | 21.5 | 20.0 | 16.8 | 12.7 | 12.9 | 12.3 | 11.6 | 11.5 | 11.3 | 11.3 | 22.3 | 15.8 | 24 |
| 14 | 11.8 | 11.3 | 11.6 | 11.6 | 11.6 | 11.6 | 11.9 | 12.7 | 13.6 | 14.0 | 14.5 | 14.8 | 15.2 | 15.4 | 15.6 | 15.3 | 14.8 | 14.2 | 14.2 | 13.6 | 12.7 | 12.3 | 11.8 | 11.2 | 11.2 | 15.6 | 13.2 | 24 |
| 15 | 11.2 | 11.4 | 11.5 | 11.0 | 10.5 | 10.6 | 11.4 | 12.6 | 14.1 | 15.7 | 17.4 | 16.5 | 15.6 | 17.3 | 16.6 | 15.3 | 15.6 | 15.5 | 15.2 | 14.2 | 13.5 | 12.8 | 12.5 | 12.1 | 10.5 | 17.4 | 13.8 | 24 |
| 16 | 11.7 | 11.3 | 10.6 | 10.5 | 10.3 | 10.5 | 11.4 | 12.9 | 15.4 | 18.0 | 18.6 | 19.4 | 18.1 | 18.9 | 16.3 | 10.8 | 11.2 | 12.4 | 13.2 | 13.1 | 12.0 | 11.4 | 10.7 | 10.0 | 10.0 | 19.4 | 13.3 | 24 |
| 17 | 10.1 | 10.1 | 9.6 | 9.4 | 9.3 | 9.8 | 11.2 | 12.7 | 14.4 | 15.4 | 16.1 | 17.1 | 17.9 | 18.6 | 19.5 | 18.0 | 17.6 | 18.6 | 15.4 | 15.8 | 14.3 | 12.5 | 12.2 | 11.3 | 9.3 | 19.5 | 14.0 | 24 |
| 18 | 10.5 | 9.9 | 9.5 | 8.9 | 9.2 | 10.8 | 13.4 | 12.2 | 13.7 | 14.8 | 15.9 | 19.0 | 20.6 | 16.2 | 18.9 | 16.4 | 16.6 | 18.4 | 16.7 | 14.6 | 13.3 | 12.0 | 10.2 | 8.6 | 8.6 | 20.6 | 13.8 | 24 |
| 19 | 6.5 | 5.8 | 5.7 | 5.4 | 5.4 | 7.6 | 10.1 | 12.0 | 14.0 | 15.8 | 16.3 | 17.7 | 19.0 | 19.5 | 20.0 | 20.0 | 19.8 | 18.6 | 17.4 | 16.4 | 14.9 | 13.9 | 13.8 | 13.5 | 5.4 | 20.0 | 13.7 | 24 |
| 20 | 13.1 | 12.4 | 12.2 | 12.2 | 12.1 | 12.1 | 12.3 | 11.6 | 12.1 | 13.6 | 16.4 | 17.4 | 17.6 | 18.4 | 19.0 | 19.5 | 20.5 | 21.6 | 19.7 | 16.9 | 15.2 | 11.2 | 10.2 | 10.2 | 10.2 | 21.6 | 14.9 | 24 |
| 21 | 10.0 | 9.7 | 9.1 | 8.4 | 7.8 | 8.1 | 8.9 | 10.0 | 12.0 | 11.9 | 12.7 | 14.3 | 15.2 | 15.5 | 15.6 | 15.2 | 14.6 | 14.3 | 13.2 | 12.0 | 10.6 | P | P | P | 7.8 | 15.6 | 11.9 | 21 |
| 22 | P | P | P | P | P | P | 7.7 | 8.4 | 8.1 | 8.5 | 9.3 | 9.7 | 11.1 | 12.3 | 13.7 | 14.2 | 13.5 | 13.5 | 12.5 | 12.4 | 11.0 | 9.1 | 8.2 | 8.2 | 7.7 | 14.2 | 10.6 | 18 |
| 23 | 7.0 | 6.7 | 6.7 | 5.7 | 6.4 | 7.7 | 9.9 | 11.3 | 15.3 | 17.1 | 17.7 | 17.7 | 17.9 | 18.8 | 19.2 | 19.1 | 19.2 | 18.5 | 17.6 | 16.6 | 14.8 | 13.6 | 12.7 | 11.8 | 5.7 | 19.2 | 13.7 | 24 |
| 24 | 12.3 | 10.8 | 9.8 | 9.8 | 9.6 | 11.2 | 13.8 | 13.8 | 15.5 | 18.6 | 20.1 | 20.6 | 21.4 | 21.1 | 21.4 | 19.7 | 16.1 | 14.3 | 14.7 | 13.9 | 13.0 | 12.1 | 11.3 | 10.7 | 9.6 | 21.4 | 14.8 | 24 |
| 25 | 10.1 | 9.6 | 9.0 | 8.6 | 8.9 | 10.9 | 13.0 | 16.1 | 17.7 | 18.6 | 19.7 | 20.4 | 21.1 | 21.6 | 22.0 | 22.1 | 21.8 | 21.3 | 20.4 | 19.0 | 17.2 | 15.4 | 14.4 | 14.1 | 8.6 | 22.1 | 16.4 | 24 |
| 26 | 14.1 | 13.7 | 13.2 | 12.6 | 12.5 | 12.8 | 13.4 | 15.2 | 16.5 | 18.4 | 19.8 | 20.8 | 21.2 | 21.5 | 22.2 | 21.7 | 21.6 | 23.4 | 22.3 | 20.5 | 18.6 | 16.5 | 15.7 | 15.8 | 12.5 | 23.4 | 17.7 | 24 |
| 27 | 15.8 | 13.9 | 12.8 | 11.5 | 11.3 | 11.8 | 12.2 | 12.7 | 14.0 | 16.5 | 17.2 | 16.7 | 16.0 | 14.7 | 14.1 | 15.1 | 15.3 | 15.9 | 14.9 | 14.4 | 12.2 | 11.2 | 10.7 | 9.0 | 9.0 | 17.2 | 13.7 | 24 |
| 28 | 8.5 | 8.3 | 9.0 | 9.6 | 9.5 | 9.9 | 10.4 | 11.0 | 11.4 | 13.4 | 13.3 | 14.2 | 15.3 | 16.2 | 16.1 | 15.5 | 14.6 | 13.0 | 12.6 | 11.9 | 11.1 | 9.0 | 7.8 | 7.4 | 7.4 | 16.2 | 11.6 | 24 |
| 29 | 6.4 | 6.0 | 5.6 | 6.2 | 6.1 | 6.8 | 7.9 | 8.6 | 10.2 | 14.6 | 14.9 | 15.3 | 18.9 | 20.5 | 21.6 | 17.2 | 17.4 | 17.4 | 17.4 | 16.1 | 14.7 | 13.2 | 12.4 | 12.2 | 5.6 | 21.6 | 12.8 | 24 |
| 30 | 11.5 | 11.4 | 11.2 | 11.5 | 11.5 | 12.4 | 12.6 | 13.3 | 15.3 | 15.7 | 16.9 | 19.2 | 20.5 | 21.2 | 21.4 | 20.2 | 20.1 | 20.3 | 19.1 | 17.9 | 16.6 | 15.4 | 14.2 | 12.9 | 11.2 | 21.4 | 15.9 | 24 |
| HOURLY MAX | 17.8 | 17.0 | 16.5 | 16.5 | 16.3 | 15.9 | 16.2 | 19.3 | 21.8 | 23.3 | 24.0 | 24.7 | 25.1 | 25.4 | 25.8 | 25.2 | 25.1 | 23.7 | 22.9 | 21.7 | 20.1 | 18.3 | 17.2 | 16.6 | | | | |
| HOURLY AVG | 11.7 | 11.1 | 10.7 | 10.3 | 10.1 | 10.7 | 11.8 | 12.9 | 14.3 | 15.6 | 16.6 | 17.2 | 18.0 | 18.5 | 18.9 | 18.4 | 18.1 | 17.8 | 16.9 | 15.8 | 14.4 | 13.2 | 12.5 | 12.0 | | | | |

STATUS FLAG CODES

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

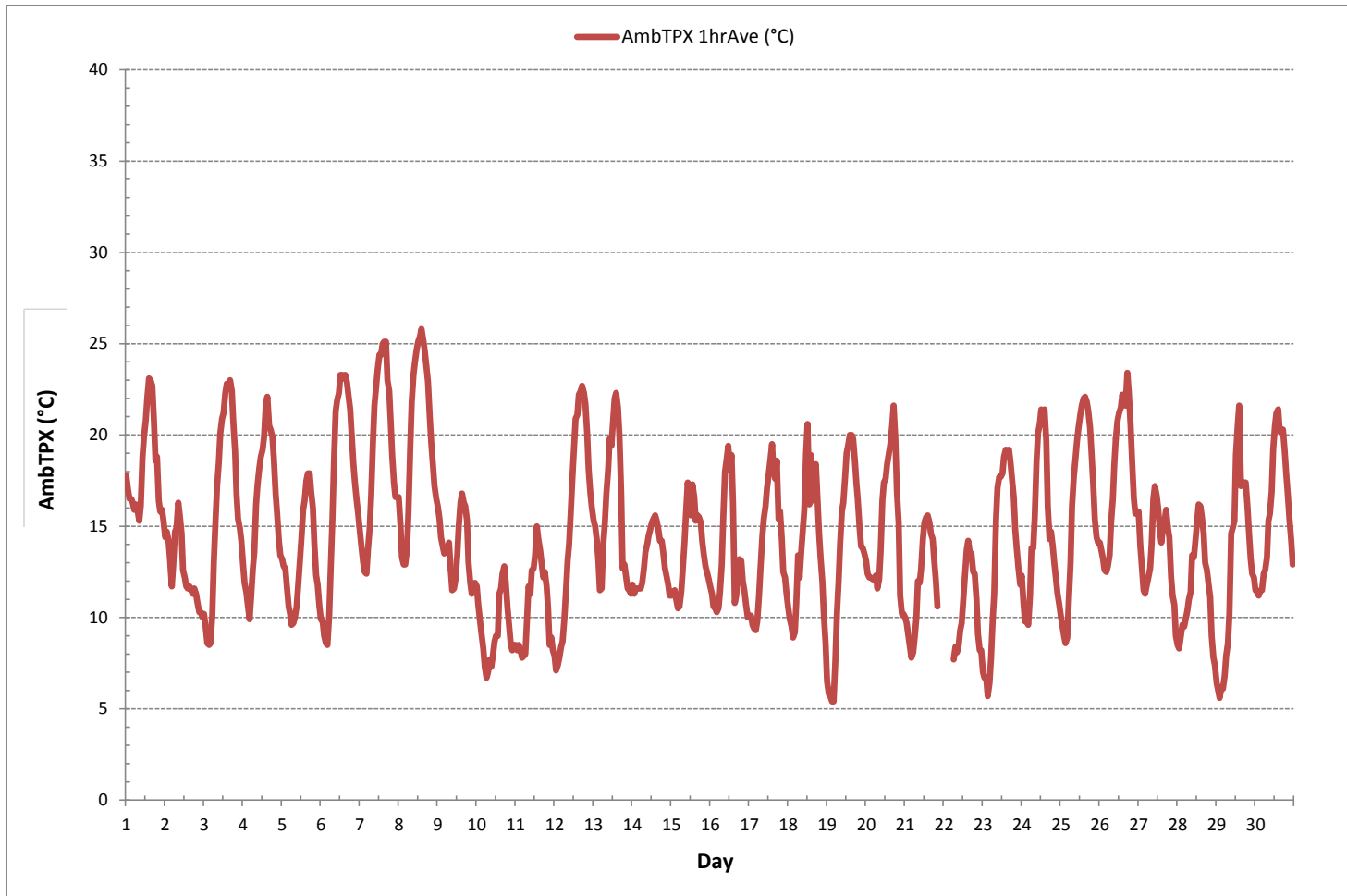
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | | |
|------------------------|------|----|--------|----|--------|--------------------------|
| MINIMUM 1-HR AVERAGE: | 5.4 | °C | @ HOUR | 3 | ON DAY | 19 |
| MAXIMUM 1-HR AVERAGE: | 25.8 | °C | @ HOUR | 14 | ON DAY | 8 |
| MAXIMUM 24-HR AVERAGE: | 19.9 | °C | | | ON DAY | 8 |
| OPERATIONAL TIME: | | | | | | 711 hrs |
| AMD OPERATION UPTIME: | | | | | | 98.8 % |
| STANDARD DEVIATION: | 4.4 | | | | | MONTHLY AVERAGE: 14.5 °C |

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



PRECIPITATION Hourly Averages (mm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 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 | 0.1 | 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 | 1.9 | 1.6 | 2.0 | 1.6 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.3 | 24 |
| 3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.6 | 0.0 | 0.6 | 0.0 | 24 |
| 5 | 3.0 | 0.1 | 1.5 | 2.5 | 0.7 | 0.3 | 0.7 | 1.4 | 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 | 0.0 | 3.0 | 0.4 | 24 |
| 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 | 4.4 | 2.8 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 6.6 | 0.7 | 3.2 | 0.0 | 6.6 | 0.9 | 24 |
| 10 | 2.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 2.5 | 0.1 | 24 |
| 11 | 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 | 0.0 | 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 |
| 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 | 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 | 14.5 | 14.9 | 3.0 | 2.3 | 0.3 | 0.0 | 0.0 | 0.0 | 14.9 | 1.5 | 24 |
| 14 | 0.0 | 0.1 | 0.4 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.1 | 24 |
| 15 | 0.0 | 0.1 | 0.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 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 | 0.5 | 8.2 | 3.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 8.2 | 0.5 | 24 |
| 17 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 24 |
| 18 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.4 | 0.0 | 24 |
| 19 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 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 | 8.8 | 0.6 | 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 | P | P | P | 0.0 | 0.0 | 0.0 | 21 |
| 22 | P | P | P | P | P | P | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| 23 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 24 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 25 | 0.0 | 0.0 | 0.1 | 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 |
| 26 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 27 | 0.6 | 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 24 |
| 28 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.6 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 | 0.2 | 24 |
| 29 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 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 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 24 |
| HOURLY MAX | 3.0 | 0.5 | 1.5 | 2.5 | 0.7 | 0.6 | 0.7 | 2.5 | 1.5 | 4.4 | 2.8 | 2.4 | 1.6 | 2.0 | 1.6 | 8.2 | 4.6 | 14.5 | 14.9 | 3.0 | 2.3 | 6.6 | 8.8 | 3.2 | | | | |
| HOURLY AVG | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.4 | 0.3 | 0.5 | 0.5 | 0.1 | 0.1 | 0.4 | 0.3 | 0.1 | | | | |

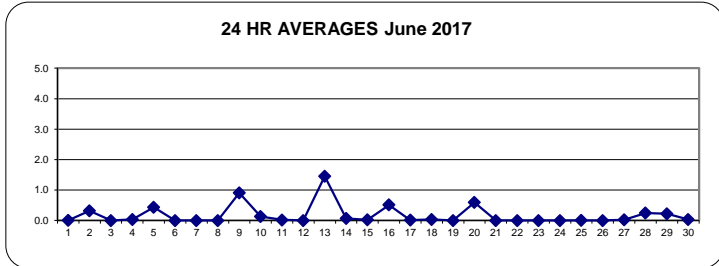
STATUS FLAG CODES

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

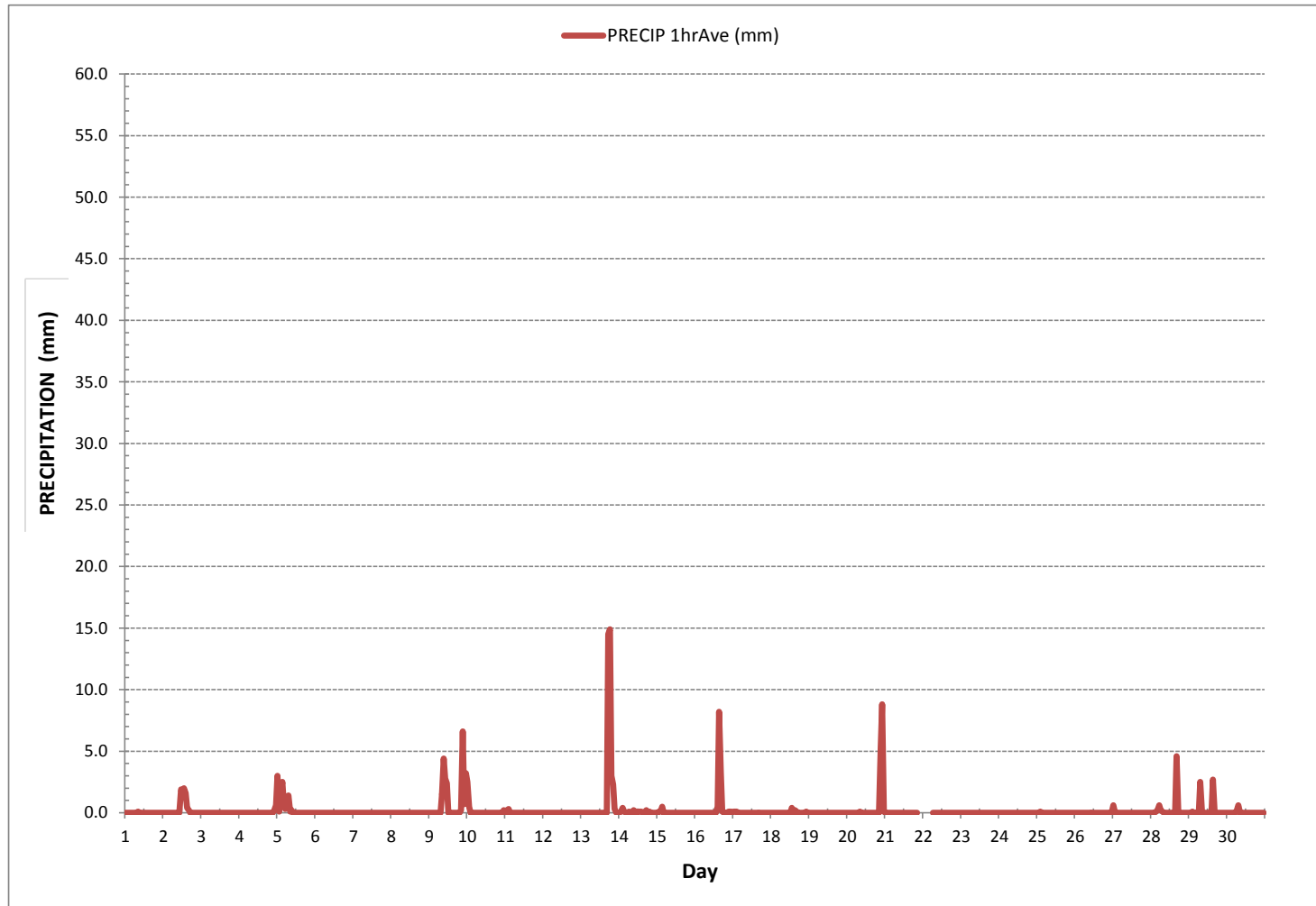
MONTHLY SUMMARY

| | | | | | | |
|------------------------|-------|----|--------|----|--------|-------------------------|
| MINIMUM 1-HR AVERAGE: | 0.0 | mm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 14.9 | mm | @ HOUR | 18 | ON DAY | 13 |
| MAXIMUM 24-HR AVERAGE: | 1.5 | mm | | | ON DAY | 13 |
| MONTHLY TOTAL | 122.5 | mm | | | | |
| OPERATIONAL TIME: | | | | | | 711 hrs |
| AMD OPERATION UPTIME: | | | | | | 98.8 % |
| STANDARD DEVIATION: | 1.0 | | | | | MONTHLY AVERAGE: 0.2 mm |

24 HR AVERAGES June 2017



PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

| | | |
|----------------------------------|--|----------------|
| Date: June 2, 2017 | Barometer ID #/Last Cert. Date/B.P.: fisher Scientific 05544, December 5, 2016 | 921 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: St. Lina | Weather Conditions: A few clouds | |
| Parameter: Sulphur Dioxide | Calibration Purpose: as found | |
| Start Time 24 hr. (mst): 10:59 | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): 12:36 | Cal Gas Expiry Date: July 8, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 468 | Range ppb: 1000 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 0.979 |
| Previous C.F.: 0.997 | New C.F.: n/a |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 627, January 27, 2017 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|---|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

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 | 77.10 | 5001 | 780.1 | 799.0 | 0.979 |
| Average C.F.= | | | | | | n/a |

Linear Regression/Calibration Results:

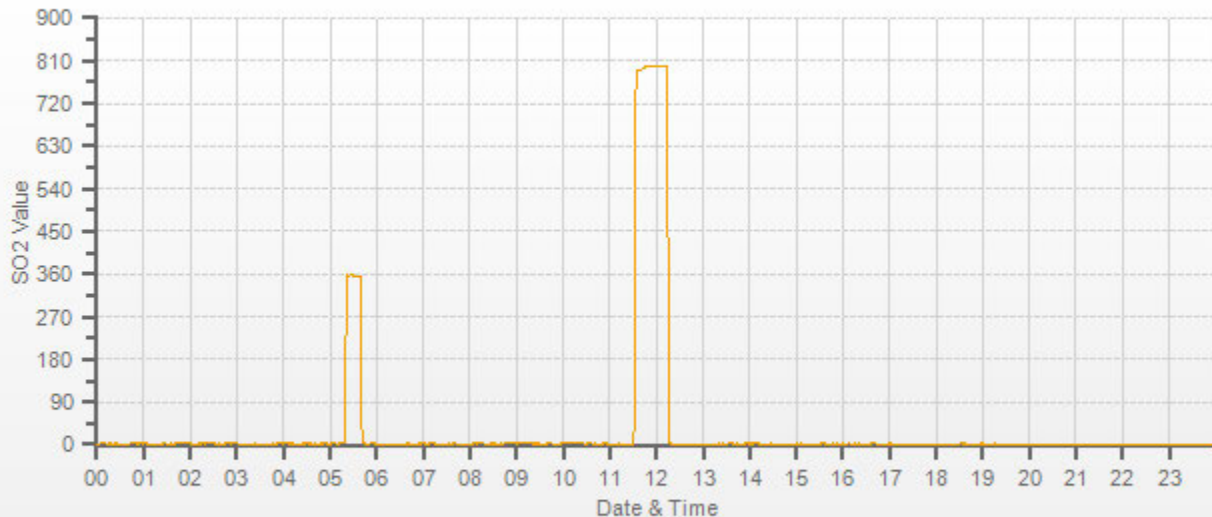
| | |
|--|-------------------------------|
| Correlation Coefficient = n/a | LIMITS > or = 0.995 |
| Slope = n/a | .95-1.05 |
| b (Intercept as % of full scale) = n/a | ± 3% F.S. |
| % change in C.F. from last cal = 1.83% | ± 10% |

| | |
|---|--|
| As found: Slope: 1.026 Offset: 120.8 Hvps: 651 Rcell Temp: 50.0 Box Temp: 30.1 Pmt Temp: 7.9 Izs Temp: 53.0 Pres: 23.8 Samp Fl: 588 Norm Pmt: 124.2 Uv Lamp: 3069.8 Lamp Ratio: 97.5 Str Lgt: 62.0 Drk Pmt: 5.9 Drk Lmp: 6.6 Expected Value: 456.8 | As left: Slope: 1.026 Offset: 120.8 Hvps: 651 Rcell Temp: 50.0 Box Temp: 30.4 Pmt Temp: 7.9 Izs Temp: 53.0 Pres: 23.8 Samp Fl: 588 Norm Pmt: 124.3 Uv Lamp: 3072.6 Lamp Ratio: 97.5 Str Lgt: 62.0 Drk Pmt: 6.6 Drk Lmp: 6.6 Expected Value: 456.8 |
|---|--|

Comments:

No high point adjustment was required/made.
 No zero adjustment was required/made.
 The analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.

"As Found" calibration had been completed to check the analyzer before a new permeation tube was installed as the previous permeation tube was depleted.



— SO2[ppb]



API 100ESulphur Dioxide Analyzer Calibration

| | | |
|---|--|----------------|
| Date: June 12, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 927 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Parameter: Sulphur Dioxide | Calibration Purpose: routine monthly | |
| Start Time 24 hr. (mst): 11:40 | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): 16:50 | Cal Gas Expiry Date: July 18, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|---|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 468 | Range ppb: 1000 |
| Last Calibration Date: May 2, 2017 | As Found C.F.: 0.985 |
| Previous C.F.: 1.000 | New C.F.: 1.000 |

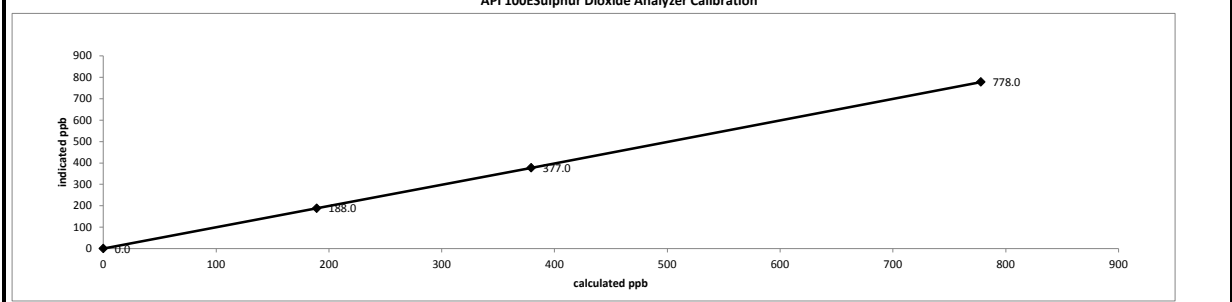
| Calibration Standards: | Standard Calibration Points for Ranges | | | | | | | | |
|--|--|-------|-----|------|-----|-----|-----|-----|-----|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
| Point | | ppb | | | | | | | |
| High | | 780 | | | | | | | |
| Mid | | 380 | | | | | | | |
| Low | 190 | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | | | | | | | | |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | | | | | | | | | |
| Cal Gas Cylinder I.D. # : LL104222 | | | | | | | | | |
| Cal Gas Conc. (ppm): 50.6 | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 5000 | 0.00 | 5000 | 0.0 | 2.0 | n/a |
| as found high | 4924 | 76.90 | 5001 | 778.1 | 792.0 | 0.985 |
| adjusted zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| adjusted high | 4924 | 76.90 | 5001 | 778.1 | 778.0 | 1.000 |
| mid | 4965 | 37.50 | 5002 | 379.3 | 377.0 | 1.006 |
| low | 4980 | 18.70 | 4999 | 189.3 | 188.0 | 1.007 |
| calibrator zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.004 |

Linear Regression/Calibration Results:

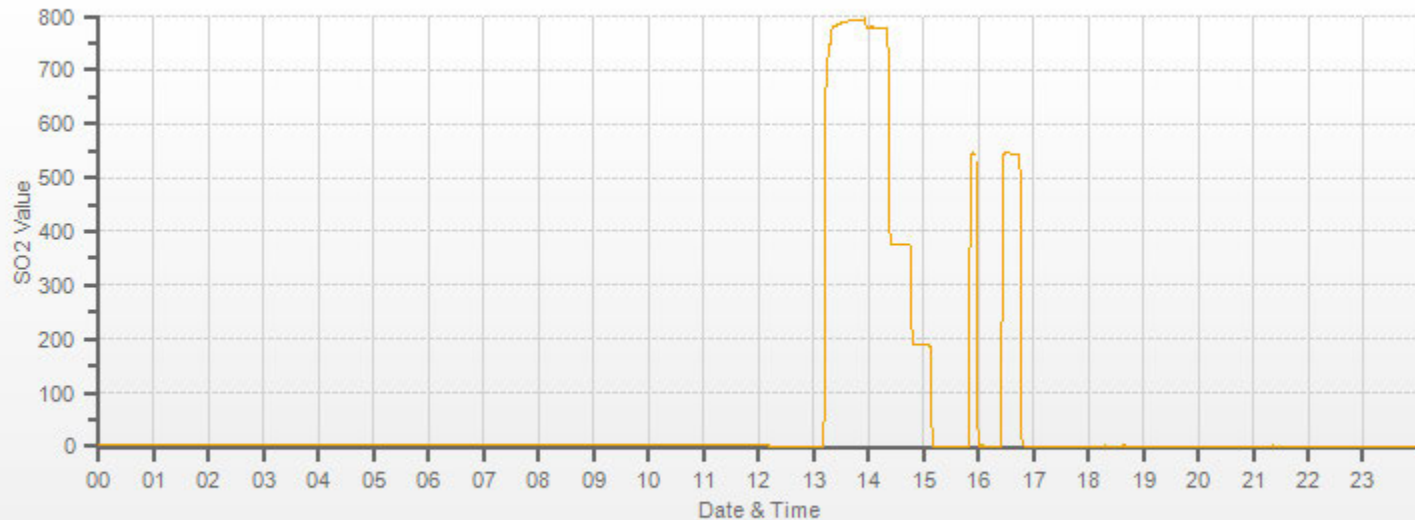
| | |
|--|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 1.000 | > or = 0.995 |
| b (Intercept as % of full scale)= 0.10% | .95-1.05 |
| % change in C.F. from last cal= 1.51% | ± 3% F.S. |
| | ± 10% |



| | |
|-----------------------|-----------------------|
| As found: | As left: |
| Slope: 1.026 | Slope: 1.006 |
| Offset: 120.8 | Offset: 124.5 |
| Hvps: 651 | Hvps: 651 |
| Rcell Temp: 50.0 | Rcell Temp: 50.0 |
| Box Temp: 30.2 | Box Temp: 33.0 |
| Pmt Temp: 7.9 | Pmt Temp: 7.9 |
| Izs Temp: 53.0 | Izs Temp: 45.0 |
| Pres: 24.0 | Pres: 23.9 |
| Samp Fl: 590 | Samp Fl: 586 |
| Norm Pmt: 123.9 | Norm Pmt: 124.4 |
| Uv Lamp: 3066.4 | Uv Lamp: 3069.4 |
| Lamp Ratio: 97.5 | Lamp Ratio: 97.5 |
| Str Lgt: 62.0 | Str Lgt: 62.6 |
| Drk Pmt: 5.9 | Drk Pmt: 6.2 |
| Drk Lmp: 6.7 | Drk Lmp: 6.8 |
| Expected Value: 456.8 | Expected Value: 544.0 |

Comments:
The analyzer sample inlet filter was changed.

The ZS TEMP was adjusted from 53°C to 45°C to keep SPAN value lower than 80% of the scale. 15:57-15:58 power failure to the station. ZS check was starter from the beginning.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

| | | |
|---|--|----------------|
| Date: June 12, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 927 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: routine monthly | |
| Start Time 24 hr. (mst): 11:40 | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): 16:50 | Cal Gas Expiry Date: June 14, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | |

| | | |
|------------------------------------|----------------------|--|
| Analyzer: | | |
| ID# or Serial Number: 509 | Range ppb: 100 | |
| Last Calibration Date: May 2, 2017 | As Found C.F.: 1.005 | |
| Previous C.F.: 1.000 | New C.F.: 1.000 | |

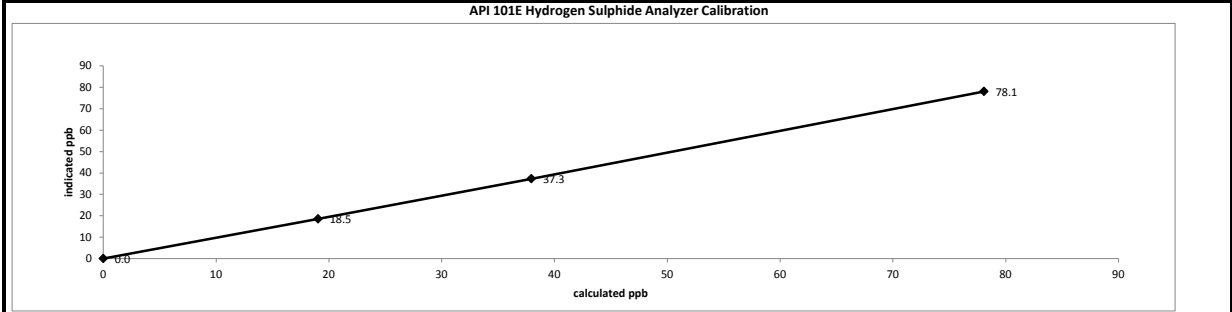
| Calibration Standards: | Standard Calibration Points for Ranges | | | | | | | | |
|---|---|-------|-----|------|----|-----|----|-----|----|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
| Point | | ppb | | | | | | | |
| High | | 78 | | | | | | | |
| Mid | | 38 | | | | | | | |
| Low | 19 | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | | | | | | | | |
| Calibrator ID/Cert. Date: Sabio 2010D 11900613, March 16, 2017 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: EY0000654 | | | | | | | | | |
| Cal Gas Conc. (ppm): 10.2 | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 7500 | 0.00 | 7500 | 0.0 | 1.0 | n/a |
| as found high | 7442 | 57.40 | 7499 | 78.1 | 78.7 | 1.005 |
| adjusted zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| adjusted high | 7442 | 57.40 | 7499 | 78.1 | 78.1 | 1.000 |
| mid | 7471 | 27.90 | 7499 | 37.9 | 37.3 | 1.017 |
| low | 7486 | 14.00 | 7500 | 19.0 | 18.5 | 1.029 |
| calibrator zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.015 |

Linear Regression/Calibration Results:

| | |
|---|---------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS |
| Slope = <u>0.998</u> | > or = 0.995 |
| b (Intercept as % of full scale) = <u>0.36%</u> | .95-1.05 |
| % change in C.F. from last cal = <u>-0.48%</u> | ± 3% F.S. |
| | ± 10% |



| | |
|--|---|
| <p style="text-align: center;">As found:</p> Slope: <u>0.944</u> Offset: <u>59.4</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>29.2</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>313.9</u> Pres: <u>20.4</u> Samp Fl: <u>519</u> Uv Lamp: <u>3360.9</u> Lamp Ratio: <u>100.2</u> Str Lgt: <u>28.0</u> Drk Pmt: <u>0.5</u> Drk Lmp: <u>0.5</u> Expected Value: <u>61.0</u> | <p style="text-align: center;">As left:</p> Slope: <u>0.945</u> Offset: <u>61.6</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>32.8</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>314.9</u> Pres: <u>20.3</u> Samp Fl: <u>517</u> Uv Lamp: <u>3357.1</u> Lamp Ratio: <u>100.1</u> Str Lgt: <u>29.1</u> Drk Pmt: <u>0.6</u> Drk Lmp: <u>0.4</u> Expected Value: <u>65.3</u> |
|--|---|

Comments:
The analyzer sample inlet filter was changed.

Scrubber check was skipped because it was checked during internal audit last week. 15:57-15:58 power failure to the station. ZS check was started from the beginning.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | | | | |
|------------------------------|-------------------|--------------------------------|---|----------------|
| Date: | June 13, 2017 | Barometer Data/B.P.: | fisher Scientific 05544, December 5, 2016 | 925 mb |
| Company/Airshed: | LICA | Thermometer Data/Station Temp: | FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: | St. Lina | Weather Conditions: | Mix of sun and clouds | |
| Parameter: | Total Hydrocarbon | Calibration Purpose: | routine monthly | |
| Start/End Time 24 hr. (mst): | 10:26 / 14:33 | Performed By/Reviewer: | Alex Yakupov | Trina Whitsitt |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | November 25, 2023 | |

| | | | | |
|-----------|-------------------------------|-----------------|----------------|-------|
| Analyzer: | ID# or Serial Number: | 51CLT-77021-384 | Range ppm: | 50 |
| | Last Calibration Date: | May 3, 2017 | As Found C.F.: | 1.015 |
| | Previous Cal High Point C.F.: | 1.000 | New C.F.: | 0.999 |

| | | |
|--|--|---|
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 | Standard Calibration Points for a Range of: 50 ppm |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 | |
| Calibrator ID/Cert. Date: | API 700 627, January 27, 2017 | |
| Cal Gas Cylinder I.D. #: | LL165372 | |
| CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): | 606.0 212.0 | |
| CH ₄ as propane/total CH ₄ equivalents (ppm): | 583.0 1189.0 | |

| 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 | 2000 | 0.00 | 2000 | 0.0 | 0.10 | n/a |
| as found high | 1935 | 65.00 | 2000 | 38.64 | 38.18 | 1.015 |
| adjusted zero | 2000 | 0.00 | 2000 | 0.00 | 0.00 | n/a |
| adjusted high | 1935 | 65.00 | 2000 | 38.64 | 38.68 | 0.999 |
| mid | 1969 | 31.00 | 2000 | 18.43 | 18.26 | 1.009 |
| low | 1984 | 16.00 | 2000 | 9.51 | 9.33 | 1.020 |
| calibrator zero | 2000 | 0.00 | 2000 | 0.0 | 0.00 | n/a |
| Average C.F. = | | | | | | 1.009 |

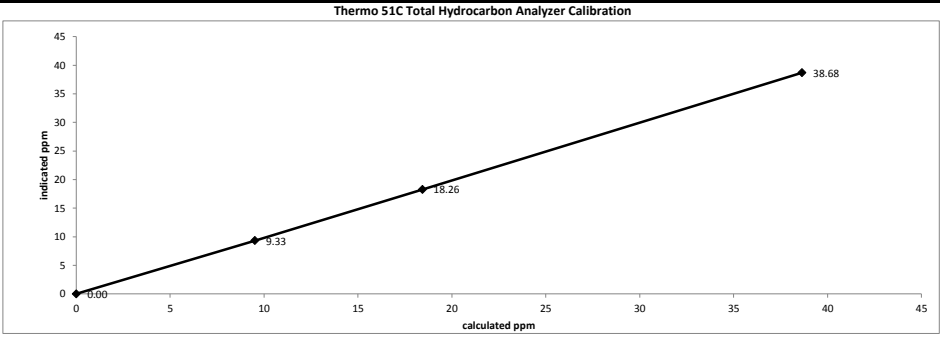
Linear Regression/Calibration Results:

Correlation Coefficient = **1.000** > or = 0.995

Slope = **0.998** .95-1.05

b (Intercept as % of full scale) = **0.23%** ± 3% F.S.

% change in C.F. from last cal = **-1.48%** ± 10%



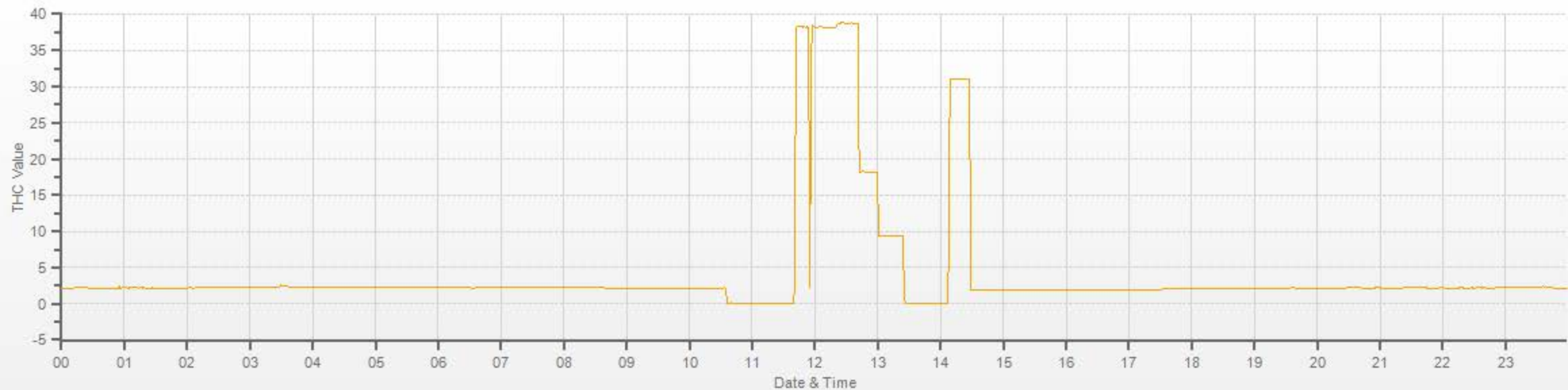
| | |
|---------------------------------|---------------------------------|
| As found: | As left: |
| H2 cylinder (psi): 450 | H2 cylinder (psi): 450 |
| H2 cylinder reg set (psi): 24 | H2 cylinder reg set (psi): 24 |
| Span Cylinder (psi): 700 | Span Cylinder (psi): 700 |
| Span Cylinder Reg Set (psi): 22 | Span Cylinder Reg Set (psi): 22 |
| Zero Air Gen Pressure: 44 | Zero Air Gen Pressure: 44 |
| measurement alarms: None | measurement alarms: None |
| service alarms: None | service alarms: None |
| cnt: 1931 | cnt: 1860 |
| rng: 1 | rng: 1 |
| try: 1 | try: 1 |
| flm: 191.5 | flm: 190.2 |
| det: 125.3 | det: 125.6 |
| Flame: 191 | Flame: 190 |
| Filter: 125 | Filter: 125 |
| Base: 125 | Base: 125 |
| Sample psi: 06.91 | Sample psi: 06.91 |
| Internal Air Pressure: 20.0 | Internal Air Pressure: 20.0 |
| Internal Fuel Pressure: 13.0 | Internal Fuel Pressure: 13.0 |
| Measured Flow: n/a | Measured Flow: n/a |
| Expected Value: 30.95 | Expected Value: 31.10 |

Comments: The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

High Point starts at 11:57.

THC[ppm] Station: LICA ST. LINA Daily: 17.06.13 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

| | | |
|--|---|----------------|
| Date: June 12, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 927 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Start/End Time 24 hr. (mst): 11:40 / 18:09 | Calibration Purpose: routine monthly | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: July 18, 2019 | |

| | | | | |
|------------------------------------|--|-------------------------|----------------|-----------|
| Analyzer: | | Correction Factors: | | |
| ID# or Serial Number: 594 | | Previous C.F.: | As Found C.F.: | New C.F.: |
| Last Calibration Date: May 2, 2017 | | NO = 0.998 | 1.019 | 0.998 |
| Range ppb: 1000 | | NO ₂ = 0.979 | 0.976 | 0.976 |
| | | NOx = 0.998 | 1.026 | 1.000 |

| | | | | | |
|---|------|--|-----------------|------------------------------|------------|
| Calibration Standards: | | Standard Calibration Points for a Range of: 1000 ppb | | | |
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | High | 780 | 500 | n/a |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | | Mid | 380 | 275 | n/a |
| Cal Gas Cylinder I.D. #: LL104222 | | Low | 190 | 100 | n/a |
| Cal Gas Conc. (ppm): 50.7 | 50.7 | 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 | 3.0 | n/a | n/a |
| as found high | 4924 | 76.9 | 5001 | 779.6 | 779.6 | 765.0 | 763.0 | 1.019 | 1.026 |
| adjusted zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4924 | 76.90 | 5001 | 779.6 | 779.6 | 781.0 | 780.0 | 0.998 | 1.000 |
| mid | 4965 | 37.50 | 5002 | 380.1 | 380.1 | 379.0 | 379.0 | 1.003 | 1.003 |
| low | 4980 | 18.70 | 4999 | 189.7 | 189.7 | 189.0 | 189.0 | 1.003 | 1.003 |
| calibrator zero | 5000 | 0.00 | 5000 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.002 | 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 | 76.90 | 5001 | 0.0 | 783.0 | 784.0 | 4.0 | 0.0 | 4.0 | |
| as found high NO2 | 4924 | 76.90 | 5001 | 490.0 | 296.0 | 799.0 | 503.0 | 487.0 | 499.0 | 0.976 |
| adjusted high NO2 | 4924 | 76.90 | 5001 | 490.0 | 296.0 | 799.0 | 503.0 | 487.0 | 499.0 | 0.976 |
| gpt mid | 4924 | 76.90 | 5001 | 275.0 | 508.0 | 793.0 | 286.0 | 275.0 | 282.0 | 0.975 |
| gpt low | 4924 | 76.90 | 5001 | 90.0 | 693.0 | 787.0 | 96.0 | 90.0 | 92.0 | 0.978 |
| Average NO ₂ C.F.= | | | | | | | | | 0.976 | |

| | | | | |
|--|--------|--------|-----------------|--------------|
| Linear Regression/Calibration Results: | | | | |
| | NO | NOx | NO ₂ | |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | LIMITS |
| Slope = | 0.998 | 0.999 | 0.981 | > or = 0.995 |
| b (Intercept as % of full scale)= | -0.08% | -0.06% | 0.22% | .95-1.05 |
| % change in C.F. from last cal= | -2.11% | -2.79% | 0.31% | ± 3% F.S. |
| NO2 converter efficiency | 0.97 | | | ± 10% |
| | | | | 0.96 to 1.04 |

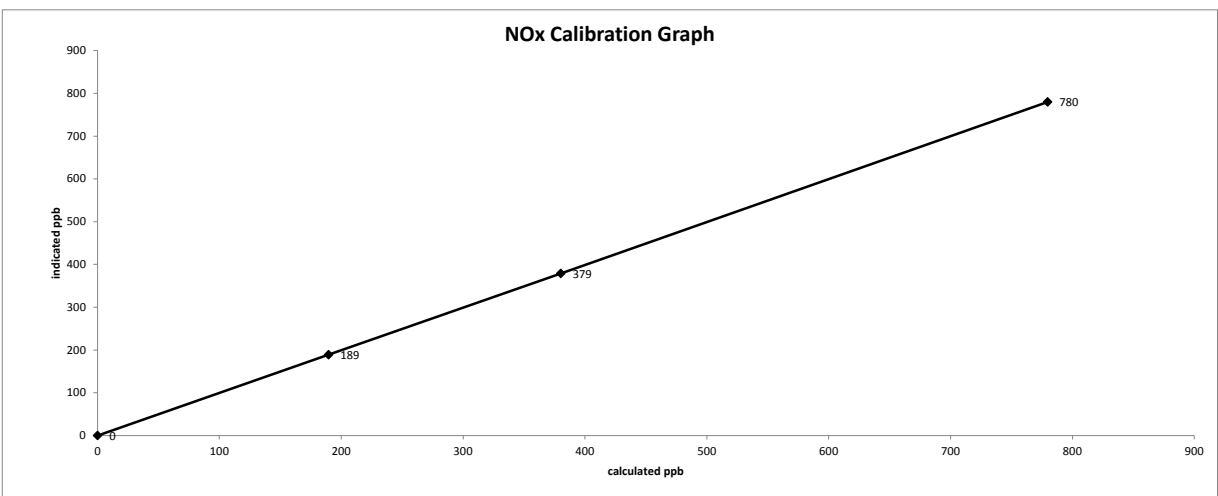
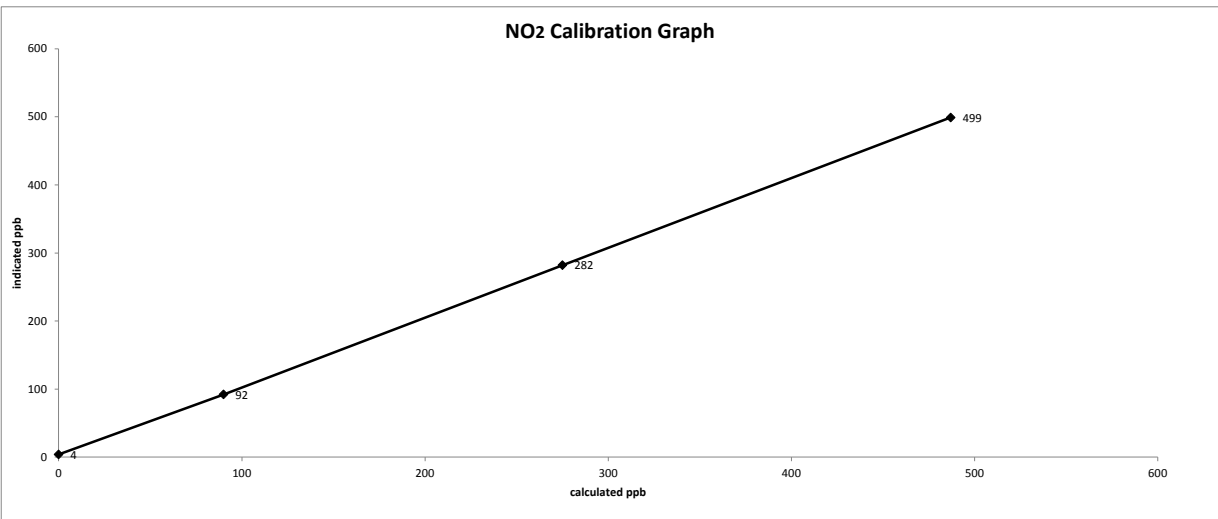
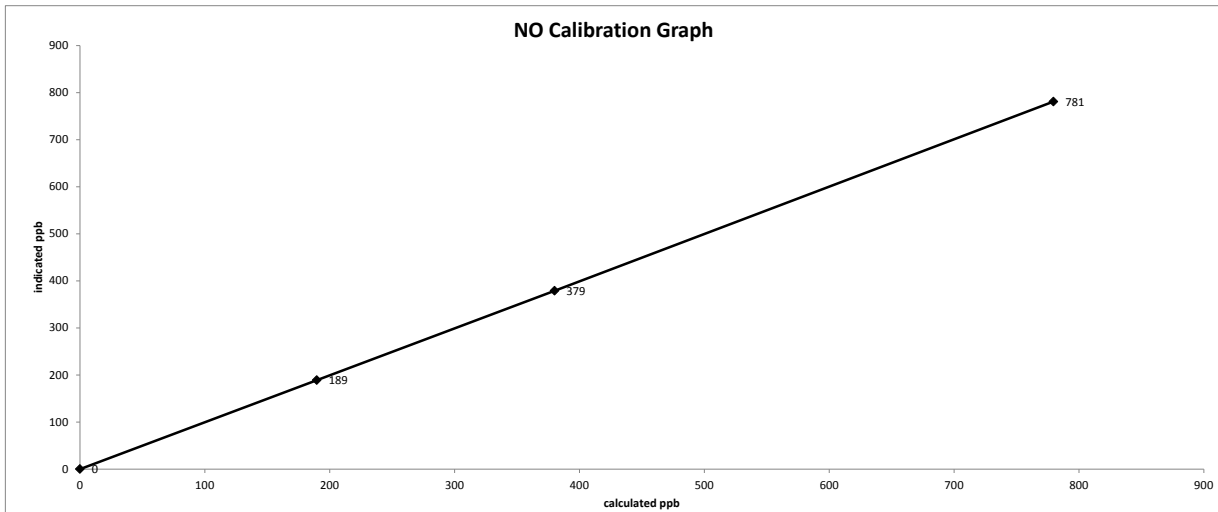
| | | | |
|---------------------|-------|---------------------|-------|
| As found: | | As left: | |
| NOx SLOPE: | 0.945 | NOx SLOPE: | 0.968 |
| NOx OFFS: | 2.1 | NOx OFFS: | 2.3 |
| NO SLOPE: | 0.950 | NO SLOPE: | 0.965 |
| NO OFFS: | 1.8 | NO OFFS: | 1.4 |
| SAMP FLW: | 480 | SAMP FLW: | 480 |
| OZONE FL: | 78 | OZONE FL: | 77 |
| PMT: | 27.7 | PMT: | 13.4 |
| NORM PMT: | 0.6 | NORM PMT: | 1.1 |
| AZERO: | 16.6 | AZERO: | 17.1 |
| HVPS: | 767 | HVPS: | 767 |
| RCELL TEMP: | 50.0 | RCELL TEMP: | 50.0 |
| BOX TEMP: | 32.5 | BOX TEMP: | 34.2 |
| PMT TEMP: | 6.7 | PMT TEMP: | 6.7 |
| IZS TEMP: | 40.1 | IZS TEMP: | 40.0 |
| MOLY TEMP: | 315.2 | MOLY TEMP: | 314.8 |
| RCEL: | 5.6 | RCEL: | 5.6 |
| SAMP: | 26.0 | SAMP: | 26.5 |
| Expected Value NO: | 7.1 | Expected Value NO: | 7.1 |
| Expected Value NO2: | 395.0 | Expected Value NO2: | 395.0 |
| Expected Value NOx: | 400.9 | Expected Value NOx: | 400.9 |

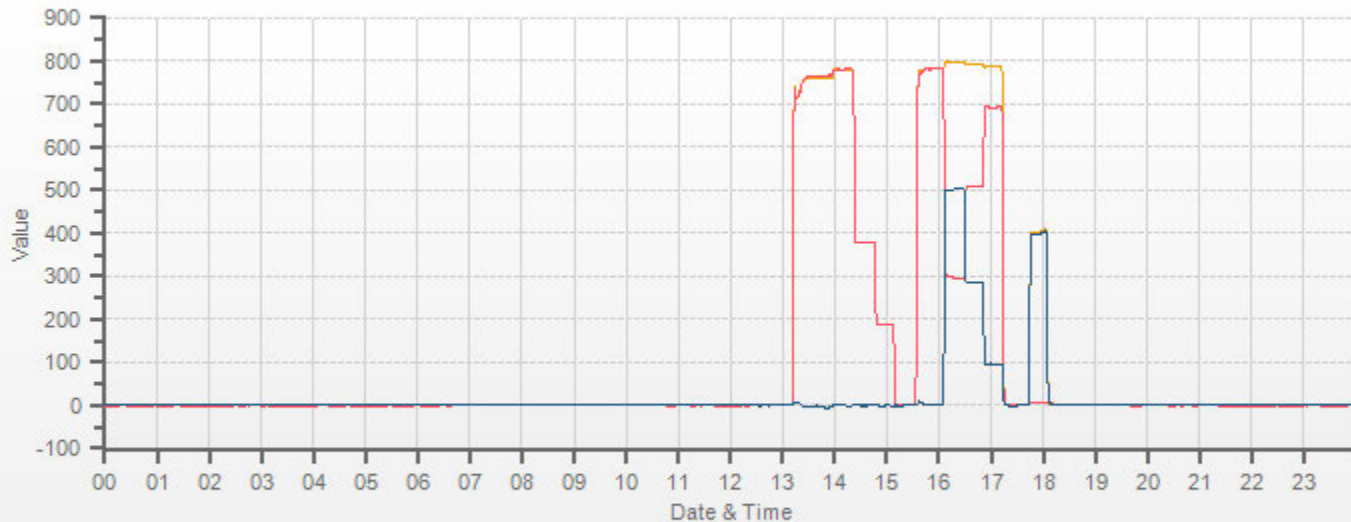
Comments:
 The analyzer sample inlet filter was changed. No high point NO2 adjustment was required/made.

15:57-15:58 power failure to the station. The EV has not been adjusted after the post-calibration ZS check. It will be adjusted after the first scheduled SZ check for more accurate EV results.

Date: June 12, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:40 / 18:09
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

| | | |
|--|--|----------------|
| Date: June 13, 2017 | Barometer Data/B.P.: fisher Scientific 05544, December 5, 2016 | 925 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp: FLUKE 2329070, November 15, 2016 | 23 °C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Start/End Time 24 hr. (mst): 10:26 / 14:33 | Calibration Purpose: routine monthly | |
| Ozone Calibration Method: Varying UV Lamp Power | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| G.P.T. Date: n/a-done by Varying UV Lamp Power | Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power | |

| | |
|--|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 1002240371 | Ozone Range ppb: 500 |
| Last Calibration Date: May 3, 2017 | As Found C.F.: 0.992 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: 1.000 |

| Calibration Standards: | | | | | | | | | |
|--|---|--|--|------|-------------|-----|-------------|-----|-----------|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table> | Point | AMD Required Range of Ozone Calibration Points | High | 300-400 ppb | Mid | 150-200 ppb | Low | 50-75 ppb |
| Point | | AMD Required Range of Ozone Calibration Points | | | | | | | |
| High | | 300-400 ppb | | | | | | | |
| Mid | | 150-200 ppb | | | | | | | |
| Low | 50-75 ppb | | | | | | | | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | | | | | | | | |
| Calibrator ID/Cert. Date: Sabio 2010D 11900613, March 16, 2017 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: n/a | | | | | | | | | |

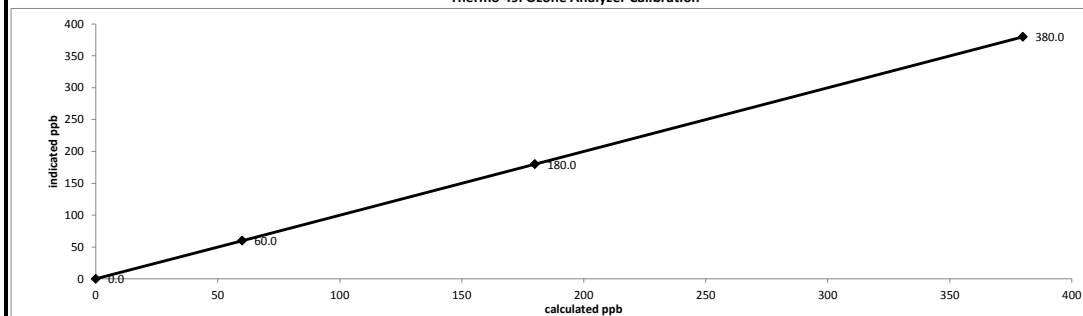
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rate (cc/min) | | Calculated Concentration: | Corrected Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|----------------------|-------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------|---------------------|
| | Total Flow @ Point Start | Total Flow @ Point Finish | (ppb) | (ppb) | (ppb) | |
| as found zero | 5000 | 5000 | 0.0 | n/a | 1.0 | n/a |
| as found high | 5000 | 5000 | 380.0 | 380.0 | 384.0 | 0.992 |
| 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 | 60.0 | 1.000 |
| calibrator zero | 5000 | 5000 | 0.0 | n/a | 0.0 | n/a |
| Average C.F.= | | | | | 1.000 | |

Linear Regression/Calibration Results:

| | |
|---|---------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS |
| Slope = <u>1.000</u> | > or = 0.995 |
| b (Intercept as % of full scale) = <u>0.00%</u> | .95-1.05 |
| % change in C.F. from last cal = <u>0.78%</u> | ± 3% F.S. |
| | ± 10% |

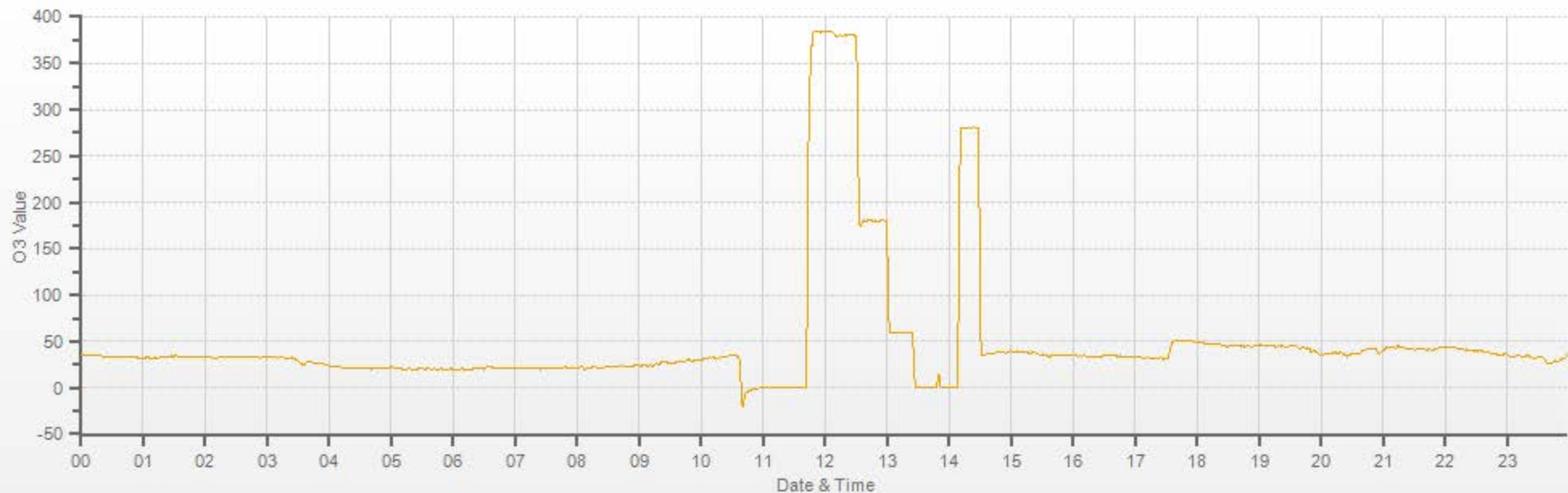
Thermo 49i Ozone Analyzer Calibration



| | |
|---|---|
| <p style="text-align: center;">As found:</p> <p>O3 Bkg: <u>-1.2</u></p> <p>O3 Coef: <u>0.970</u></p> <p>Photo Lamp: <u>10.7</u></p> <p>O3 Lamp: <u>8.2</u></p> <p>Bench: <u>31.0</u></p> <p>Bench Lamp: <u>53.7</u></p> <p>O3 Lamp: <u>67.9</u></p> <p>Pressure: <u>677.3</u></p> <p>Cell A lpm: <u>0.728</u></p> <p>Cell B lpm: <u>0.782</u></p> <p>O3 ppb: <u>0.7</u></p> <p>Cell A ppb: <u>-0.6</u></p> <p>Cell B ppb: <u>7.4</u></p> <p>Cell A int: <u>84066</u></p> <p>Expected Value: <u>278.0</u></p> | <p style="text-align: center;">As left:</p> <p>O3 Bkg: <u>-0.1</u></p> <p>O3 Coef: <u>0.962</u></p> <p>Photo Lamp: <u>10.7</u></p> <p>O3 Lamp: <u>8.2</u></p> <p>Bench: <u>33.4</u></p> <p>Bench Lamp: <u>53.7</u></p> <p>O3 Lamp: <u>67.9</u></p> <p>Pressure: <u>677.6</u></p> <p>Cell A lpm: <u>0.728</u></p> <p>Cell B lpm: <u>0.781</u></p> <p>O3 ppb: <u>0.4</u></p> <p>Cell A ppb: <u>0.5</u></p> <p>Cell B ppb: <u>0.4</u></p> <p>Cell A int: <u>83942</u></p> <p>Expected Value: <u>281.0</u></p> |
|---|---|

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

O3[ppb] Station: LICA ST. LINA Daily: 17.06.13 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER

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

Date: June 27, 2017
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: June 13, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | not yet reviewed
 Start Time (mst): 15:46
 End Time (mst): 17:17
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 49%
 Ko Factor: 13125 As Left Filter Loading %: 20%
 Ambient Temperature °C: 15.58 As Found Noise: 0.004
 Ambient Pressure atm: 0.908 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.28
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. /sn 091099, #3/March 24, 2017
 High Flow: Chinook Eng. /sn 091001, #2/March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / #3 / January 1, 2017
 Temperature: FLUKE 1551A Ex STIK / # 4295 / November 15, 2016
 Pressure: Fisher Scientific / # 05544 / December 05, 2016

As found leak check:

| | | Base | Zero | Reference | Zero |
|-------------|--------|------|-----------------|-----------|-----------------|
| PM 2.5 Flow | actual | 0.00 | -0.07 | 0.00 | -0.07 |
| | limit | 0.15 | 0.15 | 0.15 | 0.15 |
| Bypass Flow | actual | 0.00 | -1.35 | 0.00 | -1.35 |
| | 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 | -0.07 | 0.00 | -0.07 |
| | limit | 0.15 | 0.15 | 0.15 | 0.15 |
| Bypass Flow | actual | 0.00 | -1.35 | 0.00 | -1.35 |
| | limit | 0.60 | 0.60 | 0.60 | 0.60 |

As found temperature and pressure:

1405F temperature °C: 15.6 tolerance +/- 2.0°C
 reference temperature °C: 15.9
 difference °C: 0.4
 1405F pressure atm: 0.909 tolerance +/- 0.01 atm
 reference pressure: 0.908
 difference: 0.001

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

1405F temperature °C: 15.9 tolerance +/- 2.0°C
 reference temperature °C: 15.9
 difference °C: 0.0
 1405F pressure atm: 0.909 tolerance +/- 0.01 atm
 reference pressure: 0.909
 difference: 0.000

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.01
 difference lpm: 0.01
 total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.73
 difference lpm: 0.06

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

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.01
 difference lpm: 0.01
 total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.73
 difference lpm: 0.06

K_o Audit:

Last K_o audit date: June 13, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13175.2000
 % difference: 0.38

Comments:

The TEOM sample filter was changed.

The 47 mm FDMS filter was changed.

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

WIND SYSTEM

Meteorological Sensor Audit/Calibration

Location Information

| | |
|--------------------------------------|---|
| Company: <u>LICA (St Lina)</u> | Performed By: <u>Chris Wesson</u> |
| Audit Location: <u>Edmonton Shop</u> | Reviewed By: <u>Trina Whitsitt</u> |
| Audit Date: <u>April 27, 2017</u> | Start /EndTime (mst): <u>7:40 / 08:05</u> |

Wind Sensor Information

| Sensor ID Data: | Sensor Outputs: |
|---|---|
| Sensor Make: <u>RM Young</u> | Velocity Voltage Output Range: <u>0-1 V</u> |
| Sensor Model: <u>05305VK</u> | Velocity Unit Output Range: <u>0-200 km/h</u> |
| Serial #: <u>56778</u> | Direction Voltage Output Range: <u>0-1 V</u> |
| Previous Cal/Audit Date: <u>February 28, 2017</u> | Direction Unit Output Range: <u>0-360°</u> |

Wind Calibrator Information

| | |
|---|--|
| Calibrator Make/ Model: <u>RM Young</u> | Serial #: <u>CA 4309</u> |
| Maxxam Unit ID #: <u>n/a</u> | Certification Date: <u>February 24, 2017</u> |

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

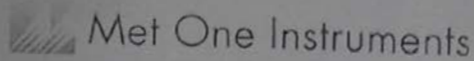
| RPM | Wind Speed Generated kph | Clockwise Wind Speed kph | Counter Clockwise Wind Speed kph | Correction Factor |
|-----------------------------------|--------------------------|--------------------------|----------------------------------|-------------------|
| 0 | 0 | 0.2 | 0.2 | - |
| 1000 | 18.4 | 18.4 | 18.5 | 1.000 |
| 2000 | 36.9 | 36.9 | 36.8 | 1.001 |
| 3000 | 55.3 | 55.3 | 55.2 | 1.001 |
| 4000 | 73.7 | 73.7 | 73.7 | 1.000 |
| 5000 | 92.2 | 92.1 | 92.1 | 1.001 |
| 6000 | 110.6 | 110.5 | 110.5 | 1.001 |
| 7000 | 129.0 | 128.9 | 128.9 | 1.001 |
| 8000 | 147.4 | 147.3 | 147.3 | 1.001 |
| 9000 | 165.9 | 165.7 | 165.8 | 1.001 |
| 10000 | 184.3 | 184.2 | 184.2 | 1.001 |
| The audit meets AMD requirements. | | | Average Correction Factor= | 1.001 |

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

| Generated Wind Direction 0-360 (Up) | Generated Wind Direction 360-0 (Down) | Indicated Wind Direction 0-360 (Up) | Indicated Wind Direction 360-0 (Down) | Degrees Difference 0-360 (Up) | Degrees Difference 360-0 (Down) | Average Absolute Degrees Difference |
|-------------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|---------------------------------|-------------------------------------|
| 0 | 355 | 1 | 355 | 0.6 | 0.1 | 0.3 |
| 30 | 330 | 30 | 331 | 0.2 | -0.6 | 0.4 |
| 60 | 300 | 62 | 302 | -1.5 | -1.6 | 1.6 |
| 90 | 270 | 92 | 272 | -2.3 | -2.2 | 2.2 |
| 120 | 240 | 122 | 242 | -2.2 | -1.9 | 2.1 |
| 150 | 210 | 152 | 212 | -2.0 | -1.6 | 1.8 |
| 180 | 180 | 182 | 181 | -1.6 | -1.4 | 1.5 |
| 210 | 150 | 211 | 151 | -1.2 | -1.2 | 1.2 |
| 240 | 120 | 241 | 122 | -0.9 | -1.6 | 1.3 |
| 270 | 90 | 271 | 91 | -0.5 | -1.3 | 0.9 |
| 300 | 60 | 300 | 62 | -0.3 | -2.0 | 1.1 |
| 330 | 30 | 330 | 32 | 0.2 | -1.8 | 1.0 |
| 355 | 0 | 355 | 2 | 0.5 | 2.1 | 1.3 |
| The audit meets AMD requirements. | | | | Average Absolute Degrees Difference= | | 1.3 |

Comments:

Audited at Edmonton shop prior to install at St Lina
 Previous calibration = Campbell.



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

| Description | Manufacturer | Model No. | Serial No. | Cal Date | Cal Due | Voltage Accuracy | Time Base Accuracy |
|------------------|---------------------|-----------|------------|-----------|-----------|------------------------------|--------------------|
| Data Acquisition | Campbell Scientific | CR1000 | 6569 | 4/06/2015 | 4/06/2018 | +/- 3mV | < 6 ppm |
| NIST Cupset | Met One Instruments | 170-41 | 3309 | 1/26/2017 | 1/26/2022 | Accuracy < 0.15 mph or 1% WS | |

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company Maxxam/SIA Operator: Chris

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

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

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

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

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

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

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

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

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

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017

Operator Signature: _____ Location: McIntyre Center Edmonton

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

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

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

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

| | | | | | |
|------------------------|---------|------------------|--|------------------------|---------|
| NO | | LIMITS | | NOx | |
| Correlation= | 1.0000 | ≥ 0.990 | | Correlation= | 1.0000 |
| m (Slope)= | 1.0301 | 0.90-1.10 | | m (Slope)= | 1.0291 |
| b (Intercept % of FS)= | -0.0919 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0881 |

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

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton

Operator Signature:

Date: March 16, 2017

Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

| Reference Calibrator and Gas: | Flow Measurement Device: |
|--|---------------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMY 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.5 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CA:016625</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:

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

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

Last Calibration: **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|--|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.0000 | 0.0000 | 0.000 |
| 4935 | 82.0 | 0.830 | 0.01662 | 60.183 | 50.0 |
| 4968 | 40.8 | 0.412 | 0.00821 | 121.765 | 50.2 |
| 4955 | 20.2 | 0.203 | 0.00408 | 245.297 | 49.8 |
| Average Cylinder Concentration: | | | | | 50.0 |

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

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

Auditor: Al Clark **Date:** October 19, 2016

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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

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

| Reference Calibrator and Gas: | Flow Measurement Device: |
|---|--------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMU 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.0 C</u> |
| Gas Type: <u>H2S</u> Conc. <u>20.43</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CAL015584</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1
 Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (scm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5050 | 38.0 | 0.0764 | 0.00752 | 132.895 | 10.2 |
| 5050 | 17.8 | 0.0355 | 0.00352 | 283.708 | 10.1 |
| 5023 | 9.1 | 0.0182 | 0.00181 | 551.978 | 10.0 |
| Average Cylinder Concentration: | | | | | 10.1 |

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

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

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: October 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

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

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

Expiry Date: July 2019

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

Reference Analyzer:

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

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4935 | 82.0 | 0.838 | 0.837 | 0.017 | 60.183 | 50.4 | 50.4 |
| 4968 | 40.8 | 0.417 | 0.417 | 0.008 | 121.765 | 50.8 | 50.8 |
| 4955 | 20.2 | 0.207 | 0.207 | 0.004 | 245.297 | 50.8 | 50.8 |
| Average Cylinder Concentration: | | | | | | 50.7 | 50.6 |

| | |
|--|-------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>50.7</u> | <u>50.9</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.

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

Auditor: Al Clark Date: October 19, 2016

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

APPENDIX III
INTERNAL AUDIT RESULTS

| COMPANY: <u>LICA</u> | | STATION: <u>St. Lina</u> | | DATE: <u>June 7, 2017</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|-------------------------------------|--|--|--|------------------|--------------|--------------|--------------------|------------------------|-------|------|-------|-------|---------------------|-----|-----|------|------|------------------|----|-----|-----|-----|----------------------|-----|-----|-----|-----|---------------------|-------|-----|-----|-----|------------------------|-------|------|------|------|-----------------------------------|-----|-----|-----|-----|-----------------------------------|-----|-----|-----|-----|
| Station Location: | | X,Y Coordinates: <u>54.216,-111.502</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Elevation (m): <u>679</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Declination: <u>13°</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Yes | No | n/a | Comments: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Has site location changed from previous audit? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Is site secure? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are station operating conditions adequate? | <input checked="" type="checkbox"/> | | | insect infestation, insect fecies covering instruments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Is the AC & heat working properly? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Last twelve month's of calibrations available? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All applicable SOP's available in station? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Site documentation up to date? | | | <input checked="" type="checkbox"/> | working with Mike to verify and update | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STATION COMPONENTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Yes | No | n/a | Comments: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are spare manifold ports capped? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Is sampling manifold clean and free of chips and cracks? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Is manifold pump properly installed and operative? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manifold cleaned all the way through? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manifold measured velocity / units | | | | anemometer doesn't fit port | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hot wire anemometer ID# | | | | anemometer doesn't fit port | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Do sample lines extend halfway into manifold? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are monitor sampling lines connected to manifold? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are sampling lines clean? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are monitors properly mounted and secure? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are monitors properly exhausted from room or scrubbed (NOx) | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Are zero and span systems operational? | <input checked="" type="checkbox"/> | | | No scrubbers on back, they are internal now. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modifications to any equipment? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Black tape on anything? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All scrubbers have dates? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TEOM flow control set to active? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All TEOM particulate intakes clean? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sharp tape advancement set to 8 hours? | | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modifications to any equipment? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All pumps fastened down? | | <input checked="" type="checkbox"/> | | Lip on shelf, ok. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Noisy pumps or zero air generator? | | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TRS/H2S converter, single scrubber, no brass, no mods? | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Precip screen in/out? | | | <input checked="" type="checkbox"/> | out | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Meteorological | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Yes | No | n/a | Comments: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Head Type | | | | ULTRASONIC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibration date okay | <input checked="" type="checkbox"/> | | | April 27, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1" style="width:100%; border-collapse: collapse; text-align:center;"> <thead> <tr> <th></th> <th>Indicated Value:</th> <th>Audit Value:</th> <th>% Difference</th> <th>Scalar Difference:</th> </tr> </thead> <tbody> <tr> <td>Station Temperature °C</td> <td>28.34</td> <td>27.7</td> <td>-2.31</td> <td>-0.64</td> </tr> <tr> <td>Barometric Pressure</td> <td>937</td> <td>937</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Wind Speed (kph)</td> <td>16</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Wind Direction (Deg)</td> <td>175</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Relative Humidity %</td> <td>28.99</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Ambient Temperature °C</td> <td>25.27</td> <td>27.8</td> <td>9.10</td> <td>2.53</td> </tr> <tr> <td>Solar Radiation kW/m²</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Precipitation (Tipping Bucket mm)</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | | | | | | Indicated Value: | Audit Value: | % Difference | Scalar Difference: | Station Temperature °C | 28.34 | 27.7 | -2.31 | -0.64 | Barometric Pressure | 937 | 937 | 0.00 | 0.00 | Wind Speed (kph) | 16 | n/a | n/a | n/a | Wind Direction (Deg) | 175 | n/a | n/a | n/a | Relative Humidity % | 28.99 | n/a | n/a | n/a | Ambient Temperature °C | 25.27 | 27.8 | 9.10 | 2.53 | Solar Radiation kW/m ² | n/a | n/a | n/a | n/a | Precipitation (Tipping Bucket mm) | n/a | n/a | n/a | n/a |
| | Indicated Value: | Audit Value: | % Difference | Scalar Difference: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Temperature °C | 28.34 | 27.7 | -2.31 | -0.64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Barometric Pressure | 937 | 937 | 0.00 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wind Speed (kph) | 16 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wind Direction (Deg) | 175 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relative Humidity % | 28.99 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ambient Temperature °C | 25.27 | 27.8 | 9.10 | 2.53 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Solar Radiation kW/m ² | n/a | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Precipitation (Tipping Bucket mm) | n/a | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Recommendations: Station needs grass cut, and floor cleaned, also some substance (insect fecies) on analyzer face plates, also suggest fly paper as flies are bad. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spare analyzer & converter on counter taking up work space, should be removed to.....? | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Covers are missing from fluorescent lights (3). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STATION CLEANLINESS AND FLY ISSUE NEEDS SERIOUS ATTENTION!! Alex cut grass while I was here. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AUDITOR: <u>Tom Bourque</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



API 100ESulphur Dioxide Analyzer Calibration

| | | |
|----------------------------------|--|------------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 937 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.4 C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Parameter: Sulphur Dioxide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 7:43 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 10:12 | Cal Gas Expiry Date: December 2, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 468 | Range ppb: 1000 |
| Last Calibration Date: May 11, 2017 | As Found C.F.: 0.996 |
| Previous C.F.: 0.997 | New C.F.: n/a |

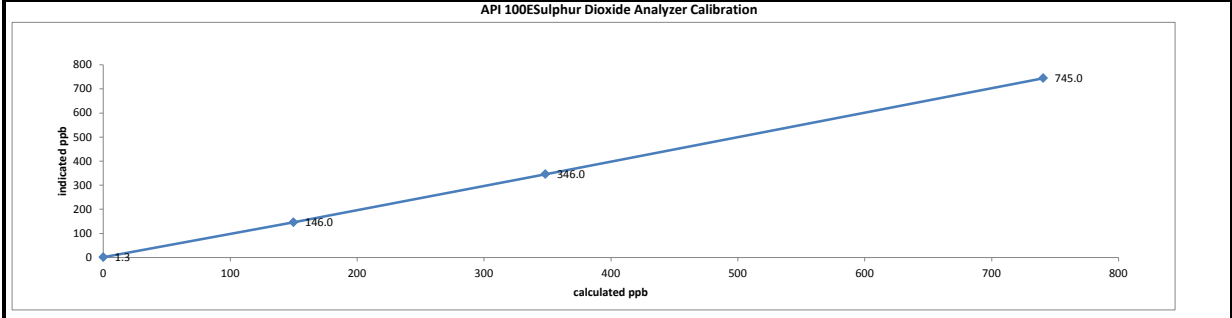
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.1 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|--|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

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 | 1.3 | n/a |
| as found high | 4998 | 75.00 | 5073 | 740.7 | 745.0 | 0.996 |
| mid | 4998 | 35.00 | 5033 | 348.4 | 346.0 | 1.011 |
| low | 4998 | 15.00 | 5013 | 149.9 | 146.0 | 1.036 |
| Average C.F.= | | | | | | 1.014 |

Linear Regression/Calibration Results:

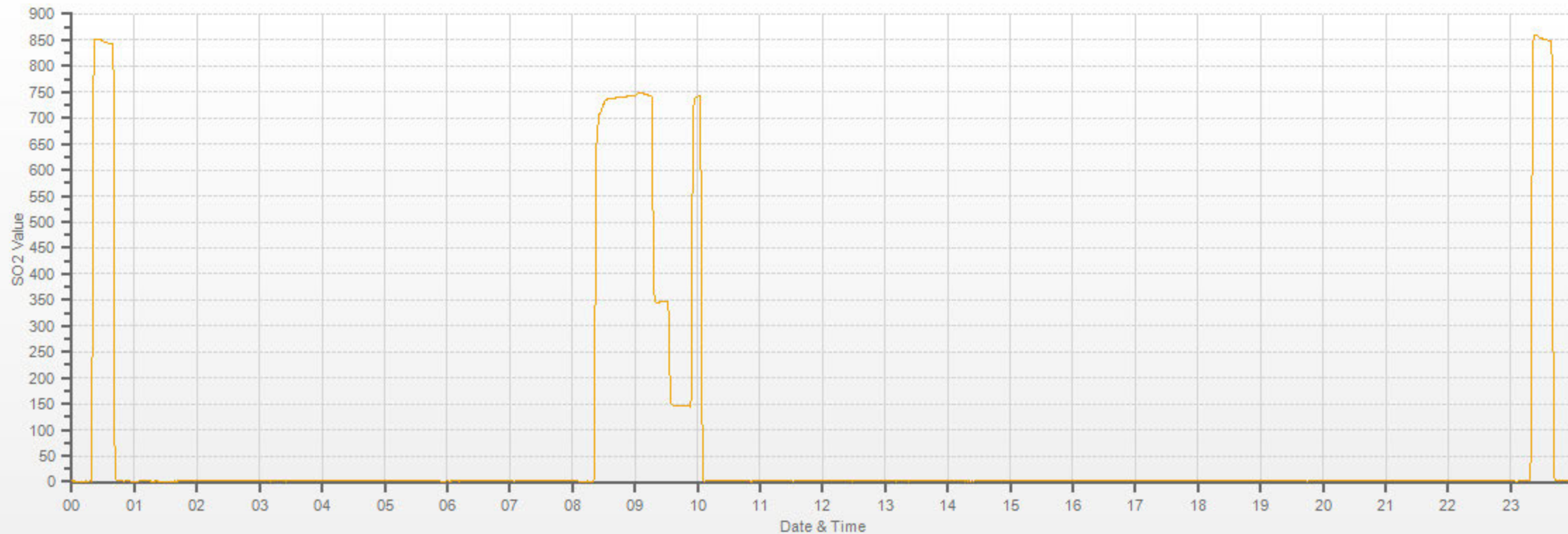
| | |
|---|---------------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS > or = 0.995 |
| Slope = <u>0.994</u> | 0.90-1.10 |
| b (Intercept as % of full scale) = <u>0.22%</u> | ± 3% F.S. |
| % change in C.F. from last cal = <u>0.11%</u> | ± 10% |



| | |
|---|--|
| As found: Slope: <u>1.026</u> Offset: <u>120.8</u> Hvps: <u>651</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.7</u> Pmt Temp: <u>7.9</u> Izs Temp: <u>53.0</u> Pres: <u>24.2</u> Samp Fl: <u>598</u> Norm Pmt: <u>1568</u> Uv Lamp: <u>3062</u> Lamp Ratio: <u>97.2%</u> Str Lgt: <u>62.0</u> Drk Pmt: <u>6.2</u> Drk Lmp: <u>6.5</u> Expected Value: <u>456.8</u> | As left: Slope: <u>1.026</u> Offset: <u>120.8</u> Hvps: <u>651</u> Rcell Temp: <u>50.0</u> Box Temp: <u>31.7</u> Pmt Temp: <u>7.9</u> Izs Temp: <u>53.0</u> Pres: <u>24.2</u> Samp Fl: <u>598</u> Norm Pmt: <u>1568</u> Uv Lamp: <u>3062</u> Lamp Ratio: <u>97.2%</u> Str Lgt: <u>62.0</u> Drk Pmt: <u>6.2</u> Drk Lmp: <u>6.5</u> Expected Value: <u>456.8</u> |
|---|--|

Comments:

SO2[ppb] Station: LICA ST. LINA Daily: 17.06.07 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

| | | |
|----------------------------------|--|------------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 937 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.4 C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 8:19 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 10:13 | Cal Gas Expiry Date: July 15, 2017 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a - internal |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 509 | Range ppb: 100 |
| Last Calibration Date: May 25, 2017 | As Found C.F.: 0.986 |
| Previous C.F.: 1.000 | New C.F.: n/a |

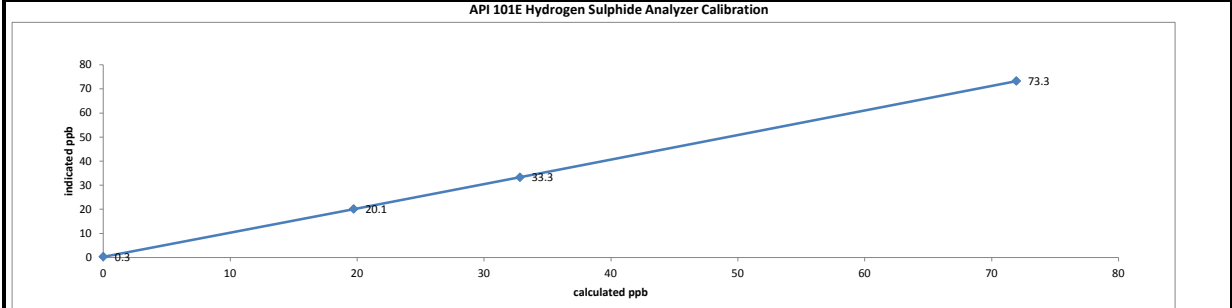
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 831, February 14, 2017 Cal Gas Cylinder I.D. #: LL74267 Cal Gas Conc. (ppm): 9.88 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Standard Calibration Points for Ranges</th> </tr> <tr> <th style="text-align: center;">Point</th> <th style="text-align: center;">ppb</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">High</td> <td style="text-align: center;">78</td> </tr> <tr> <td style="text-align: center;">Mid</td> <td style="text-align: center;">38</td> </tr> <tr> <td style="text-align: center;">Low</td> <td style="text-align: center;">19</td> </tr> </tbody> </table> | Standard Calibration Points for Ranges | | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
|---|--|--|--|-------|-----|------|----|-----|----|-----|----|
| Standard Calibration Points for Ranges | | | | | | | | | | | |
| Point | ppb | | | | | | | | | | |
| High | 78 | | | | | | | | | | |
| Mid | 38 | | | | | | | | | | |
| Low | 19 | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 7495 | 0.00 | 7495 | 0.0 | 0.3 | n/a |
| as found high | 7497 | 55.00 | 7552 | 72.0 | 73.3 | 0.986 |
| mid | 7497 | 25.00 | 7522 | 32.8 | 33.3 | 0.995 |
| low | 7496 | 15.00 | 7511 | 19.7 | 20.1 | 0.997 |
| Average C.F.= | | | | | | 0.992 |

Linear Regression/Calibration Results:

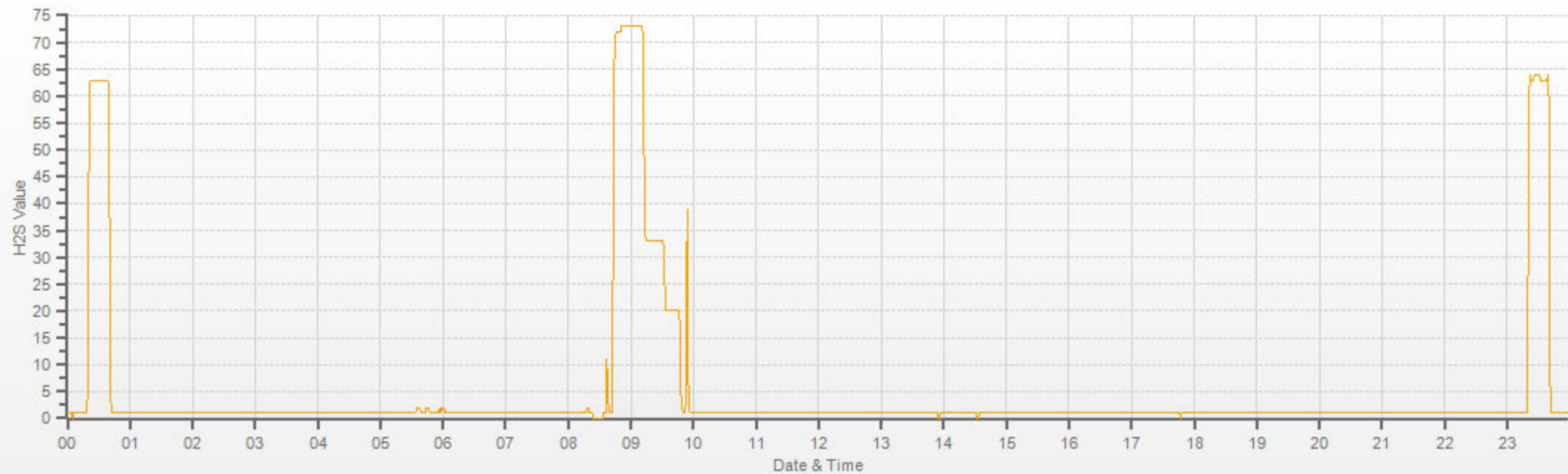
| | | |
|-----------------------------------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS |
| Slope = | 0.985 | > or = 0.995 |
| b (Intercept as % of full scale)= | -0.14% | 0.90-1.10 |
| % change in C.F. from last cal= | 1.43% | ± 3% F.S. |
| | | ± 10% |



| | |
|---|--|
| As found: Slope: .944 Offset: 59.4 Hvps: 671 Rcell Temp: 50.0 Box Temp: 30.7 Pmt Temp: 8.0 Izs Temp: 48.0 Converter Temp: 314.6 Pres: 20.7 Samp Fl: 527 Uv Lamp: 3327 Lamp Ratio: 99.2% Str Lgt: 28.0 Drk Pmt: .5 Drk Lmp: .4 Expected Value: 61.0 | As left: Slope: .944 Offset: 59.4 Hvps: 671 Rcell Temp: 50.0 Box Temp: 30.7 Pmt Temp: 8.0 Izs Temp: 48.0 Converter Temp: 314.6 Pres: 20.7 Samp Fl: 527 Uv Lamp: 3327 Lamp Ratio: 99.2% Str Lgt: 28.0 Drk Pmt: .5 Drk Lmp: .4 Expected Value: 61.0 |
|---|--|

Comments:

H2S[ppb] Station: LICA ST. LINA Daily: 17.06.07 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



Thermo 51C Total Hydrocarbon Analyzer Calibration

| | | |
|--|--|------------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 937 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.4 C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Parameter: Total Hydrocarbon | Calibration Purpose: Internal Audit | |
| Start/End Time 24 hr. (mst): 10:14-12:11 | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: November 25, 2023 | |

| | |
|---|----------------------|
| Analyzer: ID# or Serial Number: 51-CLT-77021-384 | Range ppm: 50 |
| Last Calibration Date: May 3, 2017 | As Found C.F.: 1.044 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: n/a |

Calibration Standards:

| | |
|---|--|
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | Standard Calibration Points for a Range of: 50 ppm |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | |
| Calibrator ID/Cert. Date: API 700 831, February 14, 2017 | |
| Cal Gas Cylinder I.D. #: LL165372 | |
| CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 606.0 212.0 | |
| CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 1189.0 | |

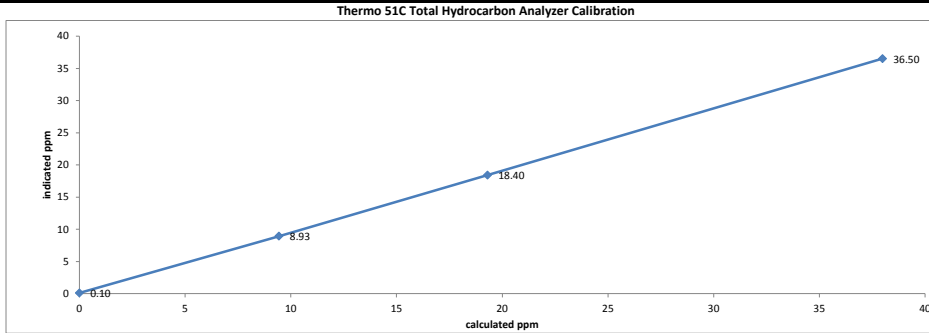
| Point | Target ppm |
|-------|------------|
| High | 38 |
| Mid | 18 |
| Low | 9 |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|---------------------|
| Point | Diluent | Cal Gas | Total | (ppm) | (ppm) | |
| as found zero | 2000 | 0.00 | 2000 | 0.0 | 0.10 | n/a |
| as found high | 2000 | 66.00 | 2066 | 37.98 | 36.50 | 1.044 |
| mid | 2000 | 33.00 | 2033 | 19.30 | 18.40 | 1.055 |
| low | 2000 | 16.00 | 2016 | 9.44 | 8.93 | 1.069 |
| Average C.F. = | | | | | | 1.056 |

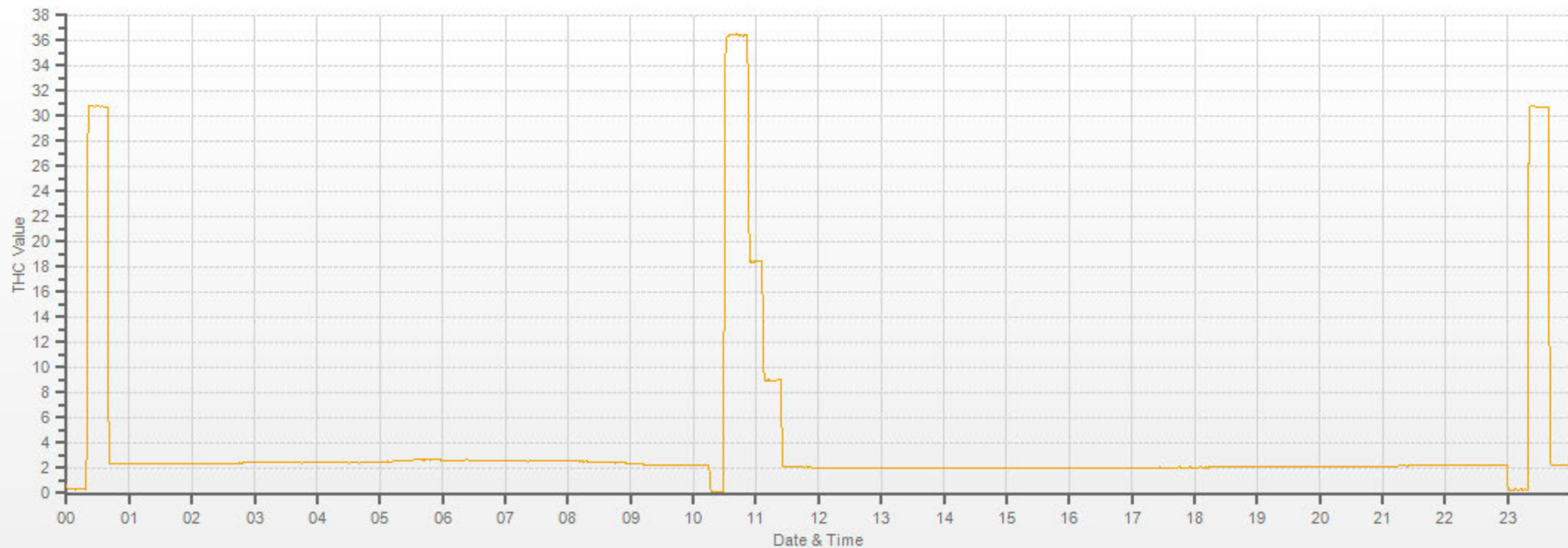
Linear Regression/Calibration Results:

| | |
|--|---------------------|
| Correlation Coefficient = 1.000 | LIMITS > or = 0.995 |
| Slope = 1.042 | 0.90-1.00 |
| b (Intercept as % of full scale) = 0.05% | ± 3% F.S. |
| % change in C.F. from last cal = -4.35% | ± 10% |



| | |
|--|---|
| <p style="text-align: center;">As found:</p> <p>H2 cylinder (psi): 600</p> <p>H2 cylinder reg set (psi): 24</p> <p>Span Cylinder (psi): 700</p> <p>Span Cylinder Reg Set (psi): 20</p> <p>Zero Air Gen Pressure: 45</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 7316</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 191.7</p> <p>det: 125.5</p> <p>Flame: 191</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.92</p> <p>Expected Value: 28.33</p> | <p style="text-align: center;">As left:</p> <p>H2 cylinder (psi): 600</p> <p>H2 cylinder reg set (psi): 24</p> <p>Span Cylinder (psi): 700</p> <p>Span Cylinder Reg Set (psi): 20</p> <p>Zero Air Gen Pressure: 45</p> <p>measurement alarms: none</p> <p>service alarms: none</p> <p>cnt: 7316</p> <p>rng: 1</p> <p>try: 1</p> <p>flm: 191.7</p> <p>det: 125.5</p> <p>Flame: 191</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 6.92</p> <p>Expected Value: 28.33</p> |
|--|---|

Comments:



— THC[ppm]



API 200E NO-NO2-NOx Analyzer Calibration

| | | |
|---|--|------------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 937 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.4 C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Start/End Time 24 hr. (mst): 07:43-12:43 | Calibration Purpose: Internal Audit | |
| G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: December 2, 2019 | |

| Analyzer: ID# or Serial Number: 594 Last Calibration Date: May 25, 2017 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.007</td> <td>1.023</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>0.980</td> <td>0.969</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.007</td> <td>1.032</td> <td>n/a</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.007 | 1.023 | n/a | NO ₂ = | 0.980 | 0.969 | n/a | NOx = | 1.007 | 1.032 | n/a |
|---|--|----------------|----------------|----------------|-----------|------|-------|-------|-----|-------------------|-------|-------|-----|-------|-------|-------|-----|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.007 | 1.023 | n/a | | | | | | | | | | | | | | |
| NO ₂ = | 0.980 | 0.969 | n/a | | | | | | | | | | | | | | |
| NOx = | 1.007 | 1.032 | n/a | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.3 50.3 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>610</td> <td>375</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>190</td> <td><-mid ozone</td> </tr> <tr> <td>Low</td> <td>190</td> <td>70</td> <td><-low ozone</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 610 | 375 | <-high ozone | Mid | 380 | 190 | <-mid ozone | Low | 190 | 70 | <-low ozone | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|---|------------------------------|-----------------|------------------------------|------------|------|-----|-----|--------------|-----|-----|-----|-------------|-----|-----|----|-------------|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 610 | 375 | <-high ozone | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 190 | <-mid ozone | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 70 | <-low ozone | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5000 | 0.0 | 5000 | 0 | 0 | 0.3 | 7.6 | n/a | n/a |
| as found high | 4998 | 75.00 | 5073 | 743.6 | 743.6 | 727.0 | 728.0 | 1.023 | 1.032 |
| mid | 4998 | 35.00 | 5033 | 349.8 | 349.8 | 340.0 | 340.0 | 1.030 | 1.052 |
| low | 4998 | 15.00 | 5013 | 150.5 | 150.5 | 145.0 | 145.0 | 1.040 | 1.095 |
| Average C.F.= | | | | | | | | 1.031 | 1.060 |

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 | 4998 | 75.00 | 5073 | 0.0 | 733.0 | 731.0 | -1.0 | 0.3 | -1.0 | |
| as found high NO2 | 4998 | 75.00 | 5073 | 1.27 | 359.0 | 744.0 | 385.0 | 374.0 | 386.0 | 0.969 |
| gpt mid | 4998 | 75.00 | 5073 | 0.62 | 553.0 | 738.0 | 185.0 | 180.0 | 186.0 | 0.968 |
| gpt low | 4998 | 75.00 | 5073 | 0.21 | 676.0 | 736.0 | 62.0 | 57.0 | 63.0 | 0.905 |
| Average NO₂ C.F.= | | | | | | | | | 0.947 | |

Linear Regression/Calibration Results:

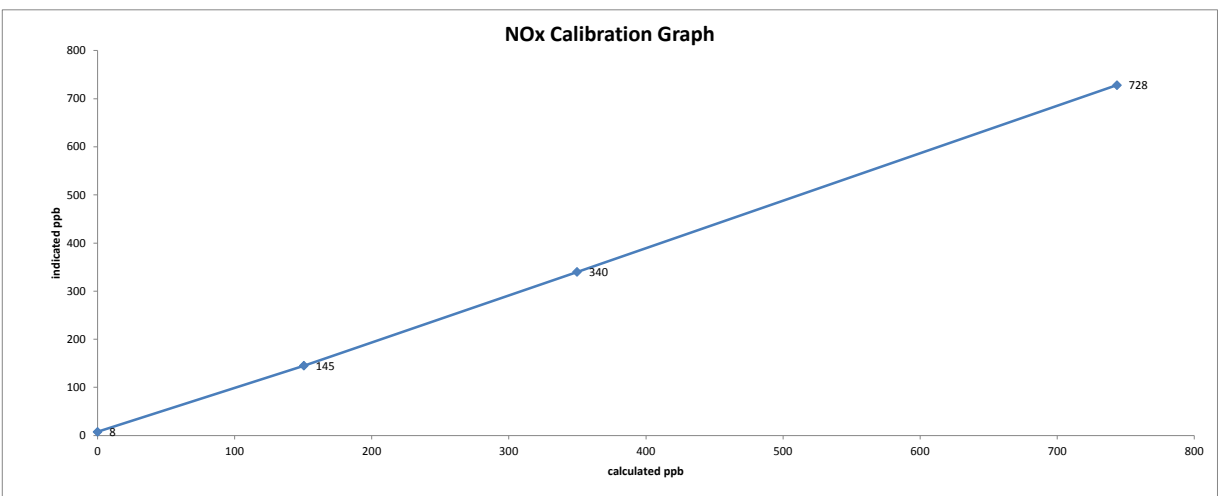
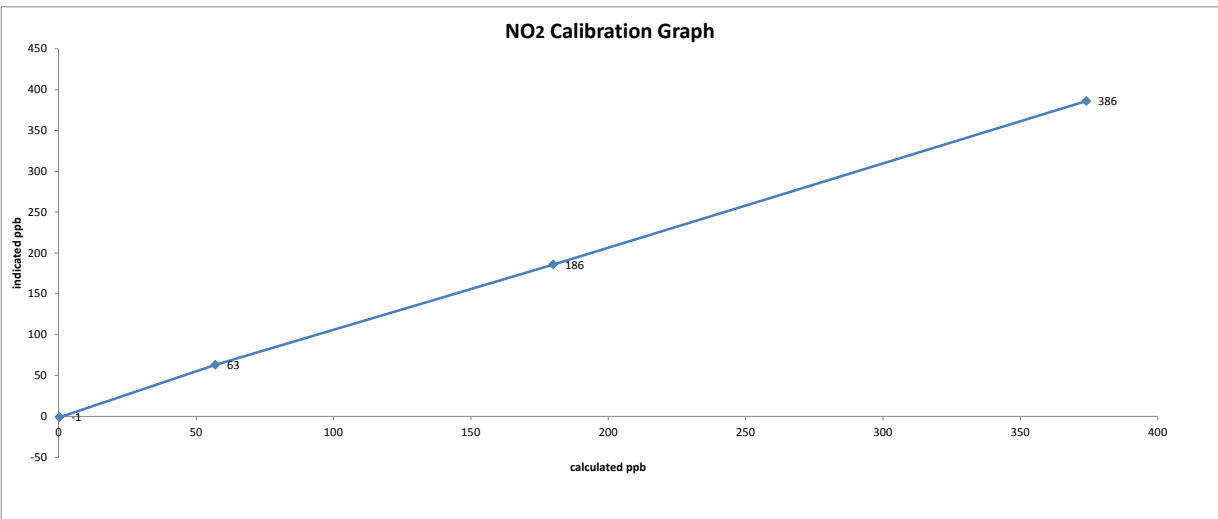
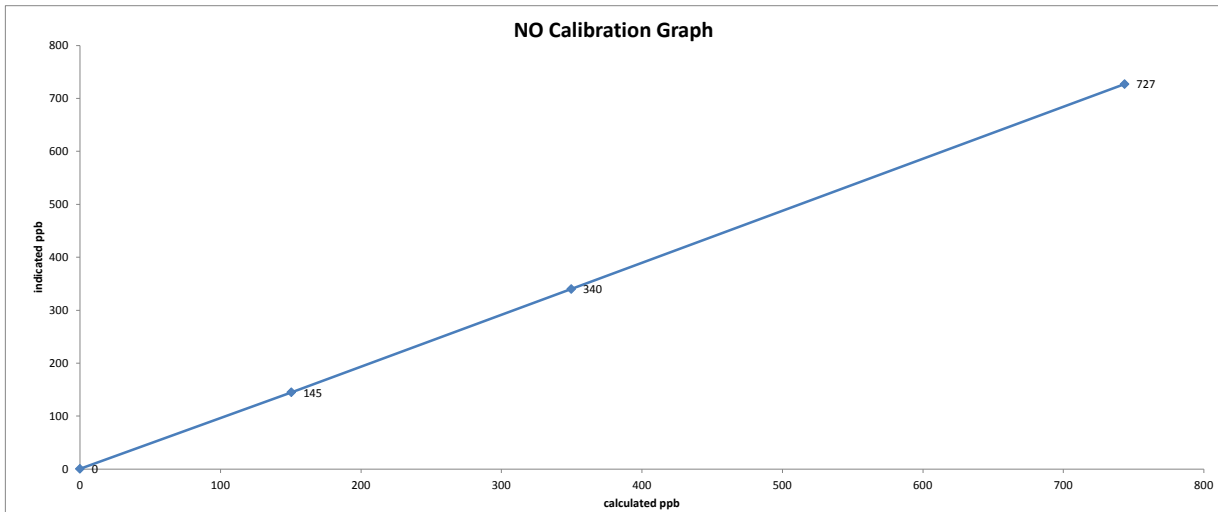
| | NO | NOx | NO ₂ | LIMITS |
|-----------------------------------|--------|-------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.022 | 1.028 | 0.971 | 0.90-1.10 |
| b (Intercept as % of full scale)= | -0.11% | 0.28% | 0.11% | ± 3% F.S. |
| % change in C.F. from last cal= | -1.62% | 1.13% | -2.51% | ± 10% |
| NO2 converter efficiency | | | 0.97 | 0.96 to 1.04 |

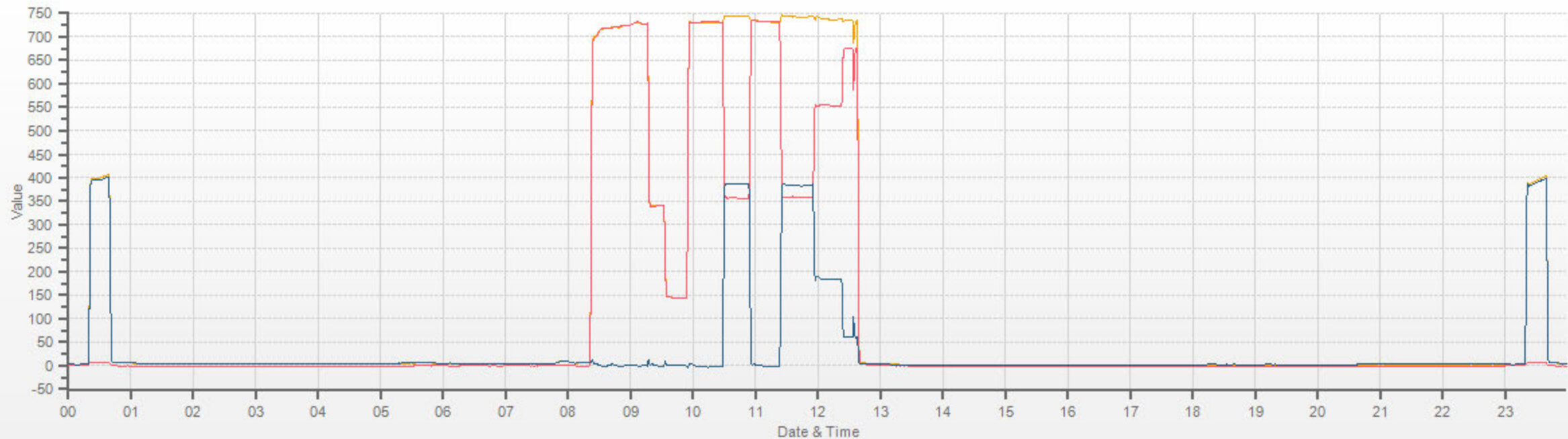
| As found: | As left: |
|---------------------------|---------------------------|
| NOx SLOPE: .945 | NOx SLOPE: .945 |
| NOx OFFS: 2.1 | NOx OFFS: 2.1 |
| NO SLOPE: .95 | NO SLOPE: .95 |
| NO OFFS: 1.8 | NO OFFS: 1.8 |
| SAMP FLW: 485 | SAMP FLW: 485 |
| OZONE FL: 78 | OZONE FL: 78 |
| PMT: 1168.2 | PMT: 1168.2 |
| NORM PMT: 1520 | NORM PMT: 1520 |
| AZERO: 16.7 | AZERO: 16.7 |
| HVPS: 767 | HVPS: 767 |
| RCELL TEMP: 50.0 | RCELL TEMP: 50.0 |
| BOX TEMP: 31.3 | BOX TEMP: 31.3 |
| PMT TEMP: 6.7 | PMT TEMP: 6.7 |
| IZS TEMP: 40.3 | IZS TEMP: 40.3 |
| MOLY TEMP: 315.9 | MOLY TEMP: 315.9 |
| RCEL: 5.7 | RCEL: 5.7 |
| SAMP: 26.7 | SAMP: 26.7 |
| Expected Value NO: 7.1 | Expected Value NO: 7.1 |
| Expected Value NO2: 395.0 | Expected Value NO2: 395 |
| Expected Value NOx: 400.9 | Expected Value NOx: 400.9 |

Comments:

Date: June 7, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 07:43-12:43
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





— NOx[ppb] — NO[ppb] — NO2[ppb]



Thermo 49i Ozone Analyzer Calibration

| | | |
|---|---|------------------|
| Date: June 7, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 937 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.4 C |
| Location/Station Name: St. Lina | Weather Conditions: Mix of sun and clouds | |
| Start/End Time 24 hr. (mst): 12:37-14:43 | Calibration Purpose: Internal Audit | |
| Ozone Calibration Method: Direct G.P.T. | Performed By/Reviewer: Tom Bourque | not yet reviewed |
| G.P.T. Date: June 7, 2017 | Cal Gas Expiry Date: December 2, 2019 | |

| | |
|--|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 1002240371 | Ozone Range ppb: 500 |
| Last Calibration Date: May 3, 2017 | As Found C.F.: 1.012 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: n/a |

| | |
|--|--|
| Calibration Standards: | |
| Low Flow Meter ID/Cert. Date: Defender 1 Low ID# 152019 November 21, 2016 | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | |
| Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 | |
| Cal Gas Cylinder I.D. #: LL119329 | |

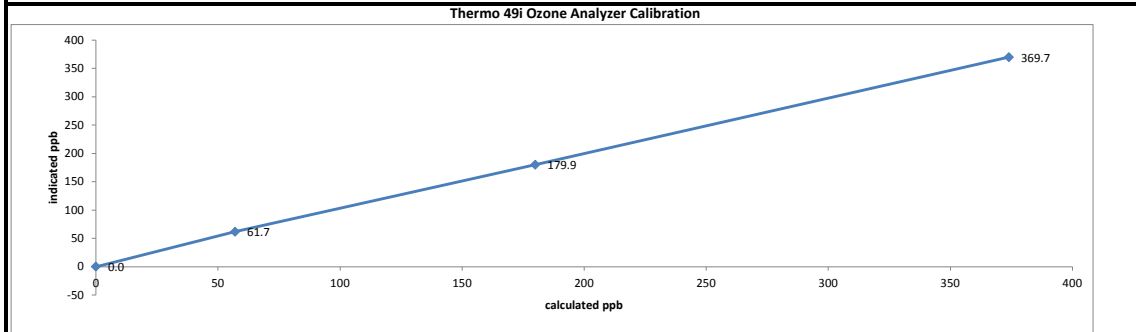
| Point | AMD Required Range of Ozone Calibration Points |
|-------|--|
| High | 300-400 ppb |
| Mid | 150-200 ppb |
| Low | 50-75 ppb |

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

| Point | Calibrator Flow Rate (cc/min) | | Calculated Concentration: | Corrected Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|---------------|-------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------|---------------------|
| | Total Flow @ Point Start | Total Flow @ Point Finish | (ppb) | (ppb) | (ppb) | |
| as found zero | 5073 | 5073 | 0.0 | n/a | 0.0 | n/a |
| as found high | 5073 | 5073 | 374.0 | 374.0 | 369.7 | 1.012 |
| mid | 5073 | 5073 | 180.0 | 180.0 | 179.9 | 1.000 |
| low | 5073 | 5073 | 57.0 | 57.0 | 61.7 | 0.924 |
| | | | | | Average C.F.= | 0.979 |

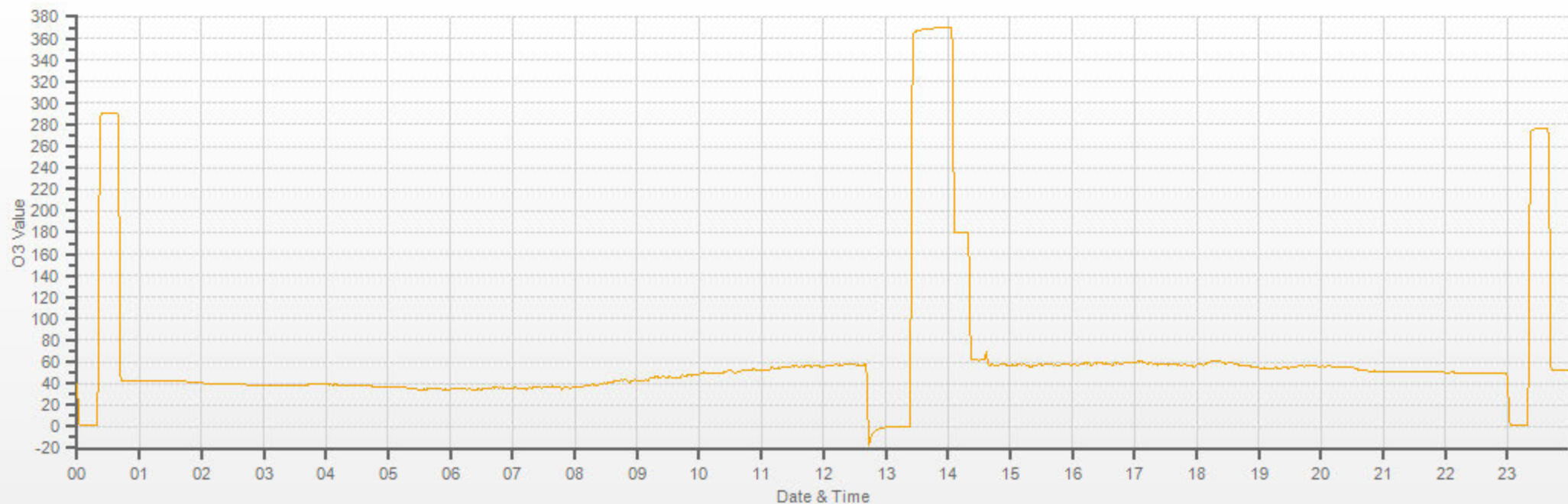
Linear Regression/Calibration Results:

| | |
|--|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 1.017 | > or = 0.995 |
| b (Intercept as % of full scale) = -0.54% | 0.90-1.10 |
| % change in C.F. from last cal = -1.16% | ± 3% F.S. |
| | ± 10% |



Comments:

O3[ppb] Station: LICA ST. LINA Daily: 17.06.07 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

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

Date: June 7, 2017
Company: LICA
Station Name/Location: St. Lina
Previous Audit Date: May 3, 2017
Parameter: PM 2.5
Performed By/Reviewer: Tom Bourque | not yet reviewed
Start Time (mst): 14:11
End Time (mst): 15:01
Calibration Purpose: Internal Audit
Weather Conditions: Mix of sun and clouds

1400A Information and Status:

ID# or Serial Number: 1405A208301003
Ko Factor: 13125
Ambient Temperature °C: 25
Ambient Pressure atm: .920
Main Flow Reading lpm: 3.00
Aux Flow Reading lpm: 13.67
As Found Filter Loading %: 27%
As Left Filter Loading %: 23%
As Found Noise: 0.003
As Left Noise: n/a
Pump Vacuum: 0.30 atm
Warnings: none

Reference Standards/I.D./Cert. Date:

Low Flow: Airmetrics/Chinook, ID# Low CHN0910 (Maxxam ID #2) March 24, 2017
High Flow: Airmetrics/Chinook, High FRM1210 (Maxxam ID #3) March 24, 2017
Digital Manometer: Dwyer ID#3, 475 Mark III January 1, 2017
Temperature: Fisher Scientific 10528, February 8, 2016
Pressure: Fisher Scientific 10528, January 5, 2017

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 | 0.04 | -1.32 | 0.03 | -1.32 |
| | 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 | 0.04 | -1.32 | 0.03 | -1.32 |
| | limit | 0.60 | 0.60 | 0.60 | 0.60 |

As found temperature and pressure:

1405F temperature °C: 25.9
reference temperature °C: 25.2
difference °C: -0.6
1405F pressure atm: 0.924
reference pressure: 0.920
difference : 0.004

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

1405F temperature °C: 25.9
reference temperature °C: 25.2
difference °C: -0.6
1405F pressure atm: 0.924
reference pressure: 0.920
difference : -0.004

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm
1405F main flow lpm: 2.99
reference main flow lpm: 3.10
difference lpm: 0.11
total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1400A total/aux flow lpm: 16.65
reference total/aux flow lpm: 16.15
difference lpm: -0.50

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

main flow tolerance 3.00 lpm +/- 0.20 lpm
1405F main flow lpm: 2.99
reference main flow lpm: 3.10
difference lpm: 0.11
total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1400A total/aux flow lpm: 16.65
reference total/aux flow lpm: 16.15
difference lpm: -0.50

K_o Audit:

Last K_o audit date: June 13, 2017
1405F K_o factor: 13125
Measured K_o factor: 13175.2000
% difference: 0.38

Comments:

Ambient emp found with short, reading -272.99, inspected and re-connected connection, ok. NO Ko audit filter available. Head appears to have been cleaned regularly. Slight coating of dust inside.

APPENDIX IV
REPORT CERTIFICATION FORM

Report Certification Form

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

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

Maram Ghaleb

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

August 16, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2017-06-31-C</u> |
| Site: <u>St. Lina Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|---------------------|-----------------------------|
| Level 0 Preliminary Verification | <u>Maram Ghaleb</u> | Date <u>July 28, 2017</u> |
| Level 1 Primary Validation | <u>Maram Ghaleb</u> | Date <u>July 28, 2017</u> |
| Level 2 Final Validation | <u>Maram Ghaleb</u> | Date <u>August 11, 2017</u> |
| Level 3 Independent Data Review | <u>CSA/mba</u> | Date <u>August 16, 2017</u> |
| Post-Final Validation | <u>NA</u> | Date <u>NA</u> |

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



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

February 22, 2018

Subject: Monthly Report Submission for the LICA Portable (Bonnyville) station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Portable (Bonnyville) AQM Station in the month of June 2017.

The air monitoring program consists of continuous air monitoring, intermittent sampling, including both VOC and PAH sampling program, and VOC canister sampling program. All the air monitoring activities were conducted by contractors.

| Sampling Program | Monitoring Activities Conducted By | Sample Analysis Conducted By | Data/Report Review and Prepared By | Electronic Submission Conducted By |
|------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------------|
| Continuous ambient air | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics | Maxxam Analytics |
| Intermittent | Maxxam Analytics | InnoTech Alberta Inc | InnoTech Alberta Inc | Not Applicable |
| VOC Canister | Maxxam Analytics | InnoTech Alberta Inc | InnoTech Alberta Inc | Not Applicable |

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

All data collected in June 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

A scheduled internal station audit was conducted by a contractor on June 5. Audit report can be found in this report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta’s Ambient Air Quality Data Warehouse have been submitted by the time of this report submission, with the exception of electronic submission for the results of intermittent samples and VOC canister samples. The results for both intermittent samples and VOC canister samples is scheduled to be submitted by the end of June 2018.

Should you have any questions, please don’t hesitate to contact me.



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

Respectfully,

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

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

JOB #: 2833-2017-06-35-C

June 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

402 - 19 ST NW
CALGARY, ALBERTA
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Attention: MIKE BISAGA

DATE: **August 16, 2017**

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SUMMARY

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

All data collected this month 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.

A scheduled internal station audit was conducted by Maxxam on June 5. Audit report can be found in Appendix V.

NO_x/NO/NO₂: Four hours of downtime were incurred due to an as-found response check performed on June 30, to address a biased low span response.

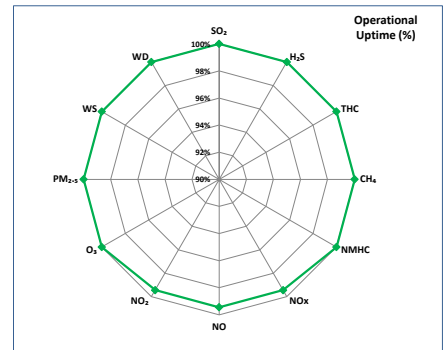
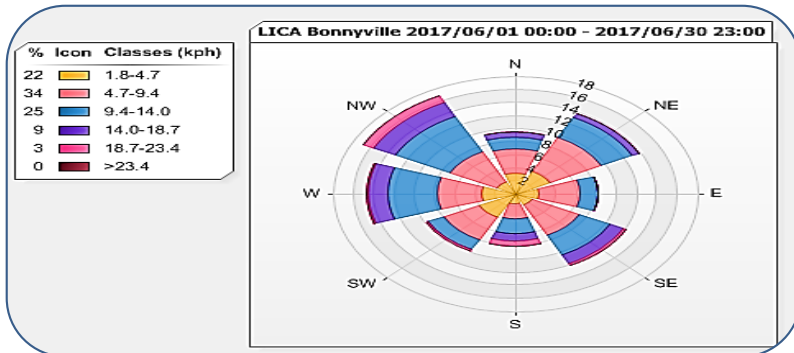
The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

The summary of results is presented on the following pages.

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

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

| Pollutants | | Monthly Records | | 1-Hour Records | | | | | 24-Hour Records | | | |
|-------------------|-------------------|-----------------|--------|----------------|---------|------|-----------------|---------------|-----------------|---------|-----------------|--------------|
| Name | Unit | Avg. Conc. | Uptime | Maximum | | | AAAQO Objective | Exceed. Hours | Maximum | | AAAQO Objective | Exceed. Days |
| | | | | Conc. | Date | Hour | | | Conc. | Date | | |
| SO ₂ | ppb | 0 | 100.0% | 2 | June 1 | 9 | 172 | 0 | 1 | June 1 | 48 | 0 |
| H ₂ S | ppb | 1 | 100.0% | 8 | June 18 | 4 | 10 | 0 | 1 | June 1 | 3 | 0 |
| THC | ppm | 2.10 | 100.0% | 2.89 | June 25 | 3 | - | - | 2.27 | June 25 | - | - |
| CH ₄ | ppm | 2.10 | 100.0% | 2.84 | June 25 | 3 | - | - | 2.26 | June 25 | - | - |
| NMHC | ppm | 0.00 | 100.0% | 0.14 | June 3 | 21 | - | - | 0.01 | June 1 | - | - |
| NO _x | ppb | 4 | 99.4% | 14 | June 15 | 4 | - | - | 6 | June 13 | - | - |
| NO | ppb | 1 | 99.4% | 5 | June 23 | 23 | - | - | 2 | June 22 | - | - |
| NO ₂ | ppb | 3 | 99.4% | 12 | June 30 | 21 | 159 | 0 | 5 | June 30 | - | - |
| O ₃ | ppb | 29.5 | 100.0% | 57.9 | June 7 | 15 | 82 | 0 | 45.8 | June 7 | - | - |
| PM _{2.5} | µg/m ³ | 4 | 100.0% | 31 | June 5 | 12 | 80 | 0 | 9 | June 1 | 30 | 0 |
| WS | kph | 1.1 | 100.0% | 23.3 | June 26 | 2 | - | - | 15.4 | June 21 | - | - |
| WD | degree | 299 (WNW) | 100.0% | - | - | - | - | - | - | - | - | - |



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.
- * A scheduled internal station audit was conducted by Maxxam on June 5.

Operational Issues

NO_x/NO/NO₂: Four hours of downtime were incurred due to an as-found response check performed on June 30, to address a biased low span response.

Monthly Continuous Data Summary

| Lakeland Industry & Community Association | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| Bonnyville Continuous Monitoring Station | | | | | | 1-HOUR | | | | 24-HOUR | | | |
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | READING | DAY | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | | | | | | | | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 0 | 2 | 1 | 9 | 1.4 | NNW | 1 | 1 | 100.0 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 1 | 8 | 18 | 4 | 2.1 | SSE | 1 | 1 | 100.0 |
| THC (ppm) | - | - | - | - | 2.10 | 2.89 | 25 | 3 | 0.2 | NNE | 2.27 | 25 | 100.0 |
| CH ₄ (ppm) | - | - | - | - | 2.10 | 2.84 | 25 | 3 | 0.2 | NNE | 2.26 | 25 | 100.0 |
| NMHC (ppm) | - | - | - | - | 0.00 | 0.14 | 3 | 21 | 4.6 | E | 0.01 | 1 | 100.0 |
| NO ₂ (ppb) | 159 | - | 0 | - | 3 | 12 | 30 | 21 | 0.6 | N | 5 | 30 | 99.4 |
| NO (ppb) | - | - | - | - | 1 | 5 | 23 | 23 | 2.6 | W | 2 | 22 | 99.4 |
| NO _x (ppb) | - | - | - | - | 4 | 14 | 15 | 4 | 1.6 | NNE | 6 | 13 | 99.4 |
| O ₃ (ppb) | 82 | - | 0 | - | 29.5 | 58.0 | 7 | 11 | 9.9 | S | 45.9 | 7 | 100.0 |
| PM _{2.5} (µg/m ³) | 80 | 30 | 0 | 0 | 4 | 31 | 5 | 12 | 15.1 | NW | 9 | 1 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 1.1 | 23.3 | 26 | 2 | - | SSE | 15.4 | 21 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 299 (WNW) | - | - | - | - | - | - | - | 100.0 |

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

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

O₃ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

Volatile Organics (VOCs) Data Summary

| Sample Collection Date | Maximum Reading (ppb) | Volatile Organic Compound |
|------------------------|-----------------------|---------------------------|
| June 6, 2017 | 4.6 | Acetone |
| June 12, 2017 | 4.6 | Acetone |
| June 18, 2017 | 6.0 | Acetone |
| June 24, 2017 | 6.4 | Acetone |
| June 30, 2017 | 4.4 | Acetone |

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

| Sample Collection Date | Maximum Reading ($\mu\text{g}/\text{puf}$) | Semi-Volatile Organic |
|------------------------|--|-----------------------|
| June 6, 2017 | 0.45 | Phenanthrene |
| June 12, 2017 | 0.30 | Phenanthrene |
| June 18, 2017 | 0.42 | Phenanthrene |
| June 24, 2017 | 0.42 | Phenanthrene |
| June 30, 2017 | 0.31 | Phenanthrene |

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

| Sample Collection Date | Maximum Reading (ppb) | Volatile Organic Compound |
|------------------------|-----------------------|---------------------------|
| June 8, 2017 | 4.9 | Acetone |
| June 9, 2017 | 18.1 | n-Butane |
| June 26, 2017 | 6.7 | Acetone |

Note: NA

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The results for non-continuous VOC, PAH and NMHC canister monitoring are also included in this report.

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on June 1.
- A scheduled internal audit was performed on June 5. The audit report can be found in Appendix V.
- Four instances of maximum instantaneous data were discarded this month due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on June 1.
- A scheduled internal audit was performed on June 5. The audit report can be found in Appendix V.
- Four instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on June 2.
- A scheduled internal audit was performed on June 5. The audit report can be found in Appendix V.
- Four instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 99.4 %, equivalent to four hours of downtime.
- The routine monthly calibration was performed on June 1.
- A scheduled internal audit was performed on June 5. The audit report can be found in Appendix V.
- The daily span response exceeded the lower acceptance limit on June 29, as the permeation tube was depleted. A repeat internal zero span check performed on June 30 at 6:00 confirmed the drift. This prompted an immediate site visit where the permeation tube was replaced, following a successful as-found response check. The new permeation tube was allowed time to stabilize and the expected span value was updated on July 4. Four hours of downtime were accrued due to the additional quality checks.
- Four instances of maximum instantaneous data were discarded this month due to brief power outages.
- The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

OZONE (O₃)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on June 2.
- A scheduled internal audit was performed on June 5. The audit report can be found in Appendix V.
- Four instances of maximum instantaneous data were discarded this month due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 100%.
- A scheduled internal audit was performed on June 5. This also served as one of the routine bi-monthly audits. The other routine audit was completed on June 28.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. No hourly data was invalidated as all measurements were above -3 µg/m³ this month.

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

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

VOC SAMPLES

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

PAH SAMPLES

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

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.
- Three canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows:
 - June 8 at 20:30 - 0.61 ppm
 - June 9 at 21:15 - 0.37 ppm
 - June 26 at 15:40 - 0.36 ppm

Other five-minute averages recorded at concentrations above 0.30 ppm are not considered sample-collection events as they occurred between events, before the canisters were replaced. Analysis was provided by InnoTech Alberta, results are included in this report. Analysis was provided by InnoTech Alberta, results are included in this report.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

All data collected this month 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 Wind Monitor Calibration
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O₃ Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
Maxxam AIR SOP-00215: TEOM Operation
Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
Maxxam AIR SOP-00007: TISCH PUF Sampler Operating, Calibration and Maintenance
Procedures

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 - O FID Analyzer
Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter (PM_{2.5}) - R&P 1400A TEOM Unit
Wind System - RM Young Unit
Datalogger - ESC 8832
VOC - XONTECH 910A Gaseous Air Sampler
PAH - TISCH PUF Plus

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

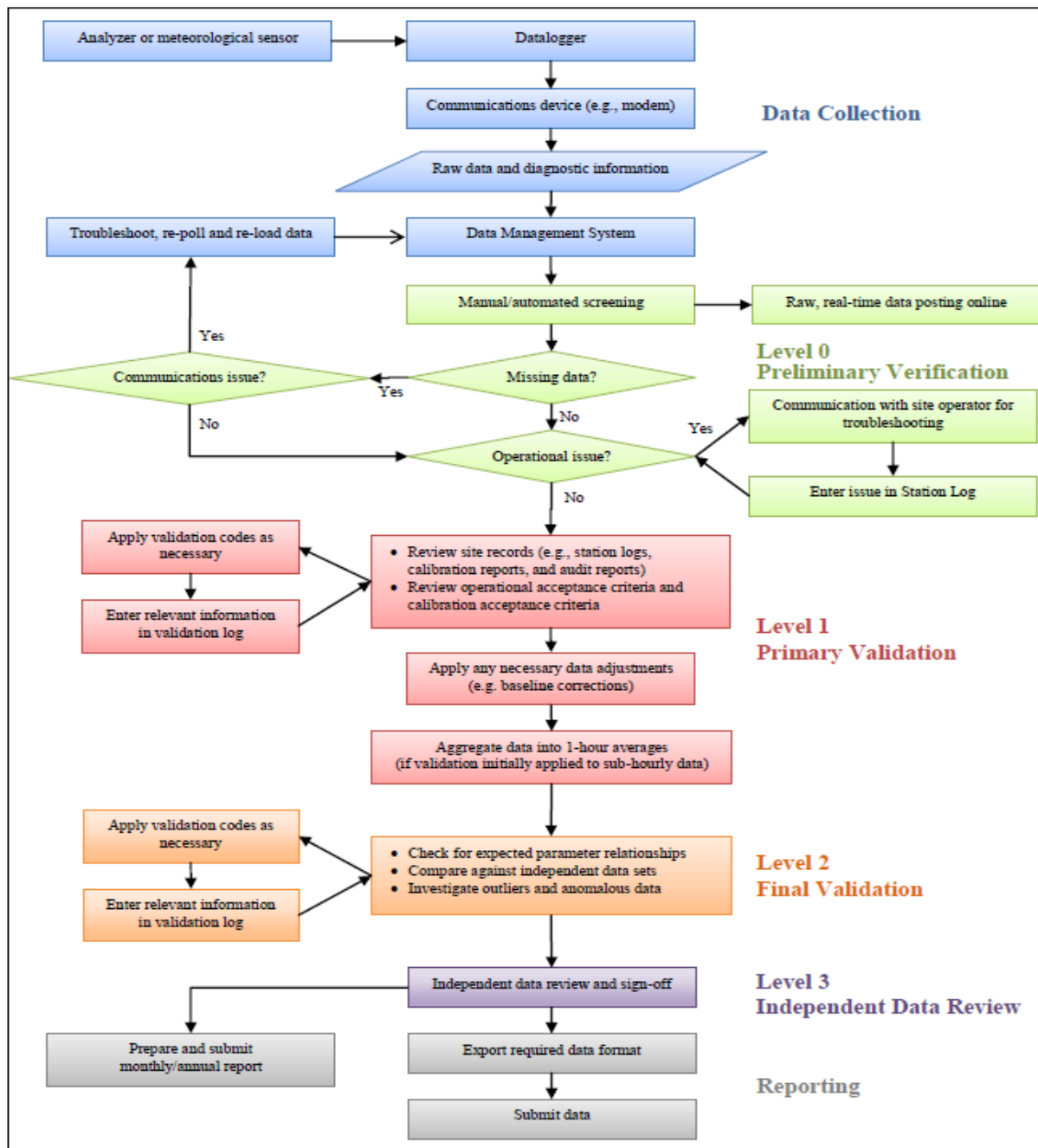
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

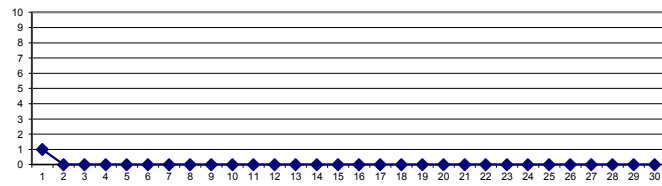
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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 |
|-----------------------------|------|-----|-----|-------|----|-----|

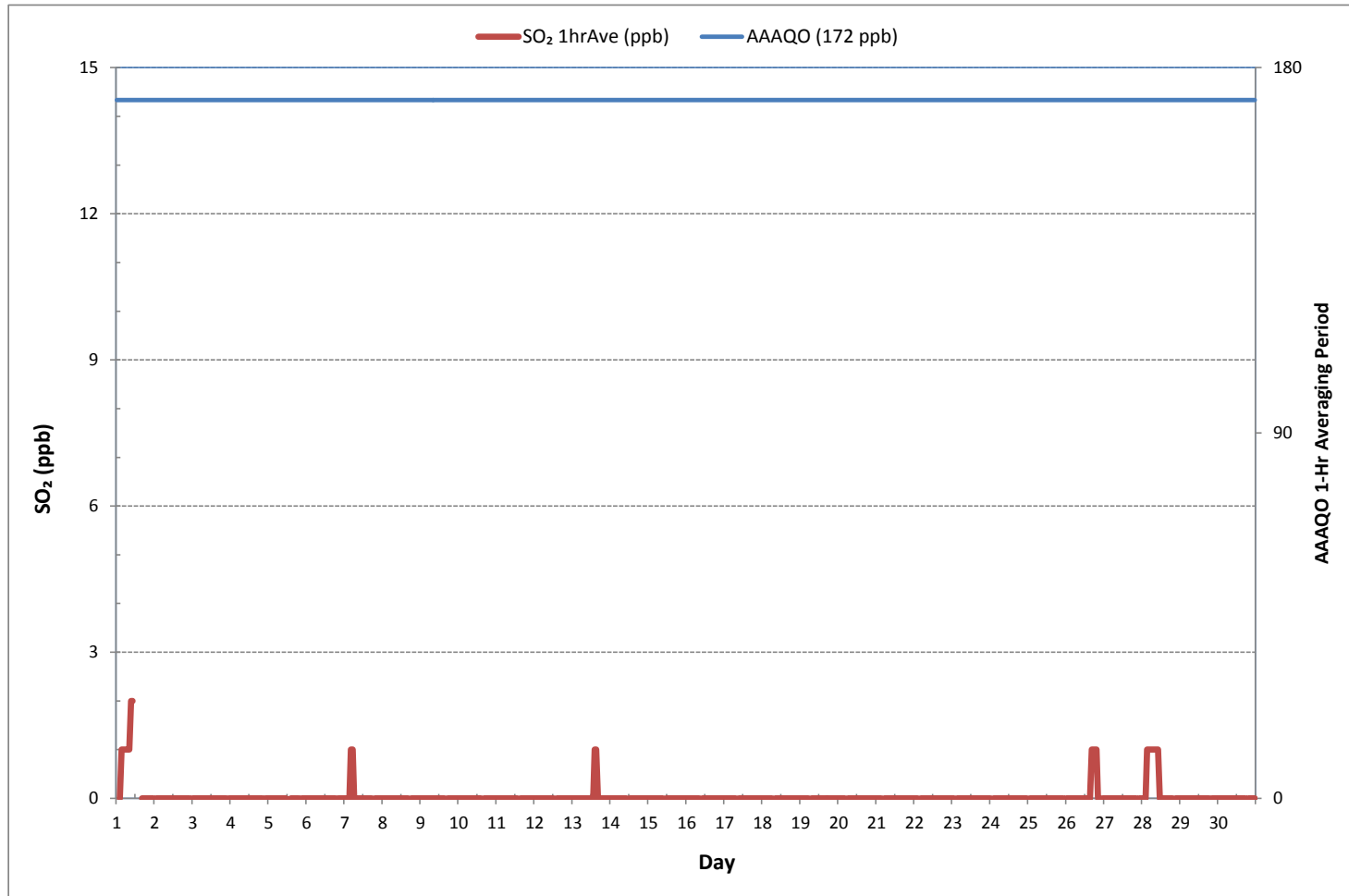
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | |
|------------------------------|-------------------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 |
| NUMBER OF 24-HR EXCEEDANCES: | 0 |
| NUMBER OF NON-ZERO READINGS: | 24 |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR 0 ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 2 ppb @ HOUR 9 ON DAY 1 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb ON DAY 1 |
| IZS CALIBRATION TIME: | 32 hrs |
| OPERATIONAL TIME: | 720 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 0 |
| MONTHLY AVERAGE: | 0 ppb |

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

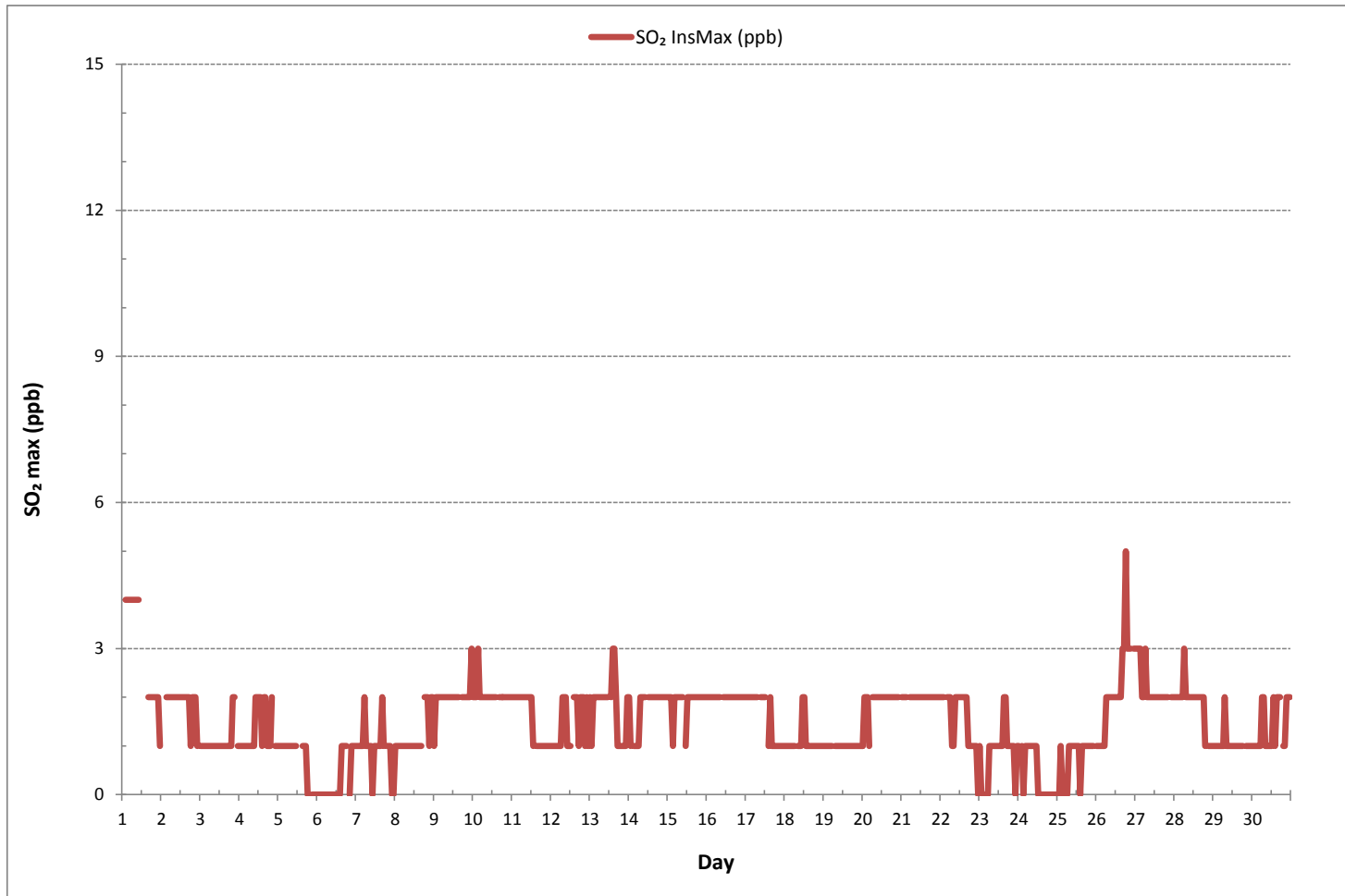
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 627 |
| MAXIMUM INSTANTANEOUS VALUE: | 5 ppb @ HOUR 18 ON DAY 26 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 1 |
| OPERATIONAL TIME: | 716 hrs |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-SO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.80%

Calm Avg: 0.10 [ppb]

| Direction | 0.0-0.6 | 0.6-1.2 | 1.2-1.8 | 1.8-2.4 | 2.4-3.0 | >3.0 | Total |
|----------------|---------|---------|---------|---------|---------|------|-------|
| N | 7.8 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 8.3 |
| NE | 13.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 13.8 |
| E | 7.5 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 8.3 |
| SE | 12.1 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 12.6 |
| S | 8.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.4 |
| SW | 9.2 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| W | 15.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.1 |
| NW | 16.7 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 16.9 |
| Summary | 90.4 | 2.4 | 0.5 | 0.0 | 0.0 | 0.0 | 93.2 |

% Icon Classes (ppb)

90

0.0-0.6

2

0.6-1.2

0

1.2-1.8

0

1.8-2.4

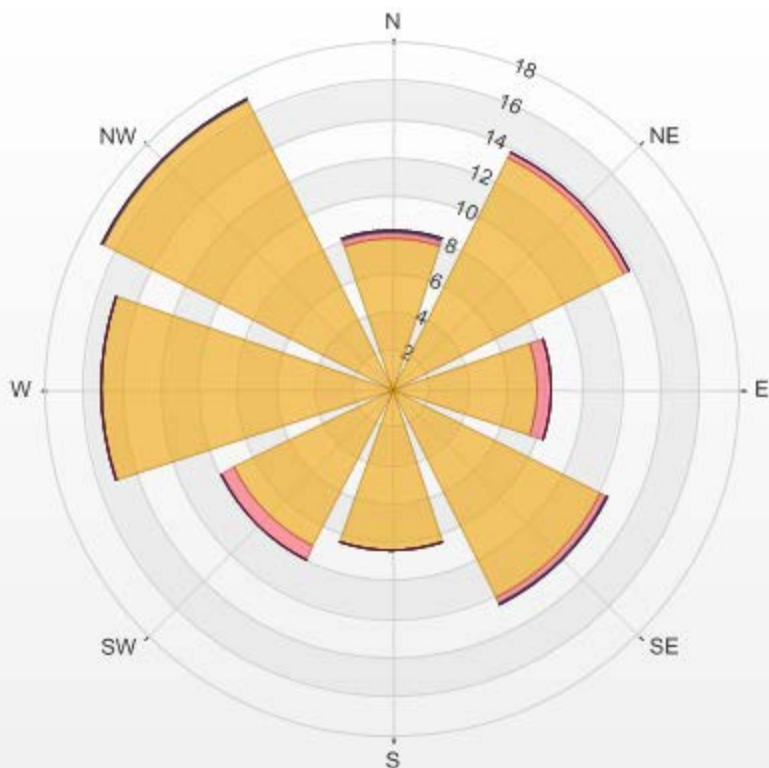
0

2.4-3.0

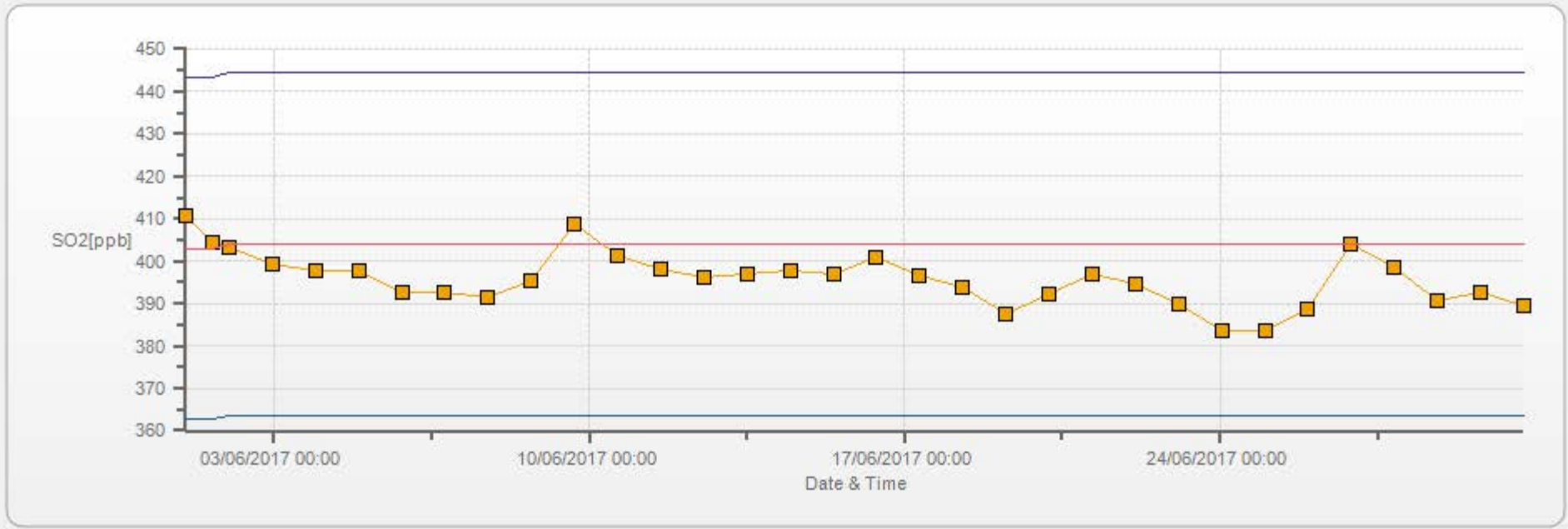
0

>3.0

LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.80% Calm Poll Avg: 0.10[ppb]



SO2[ppb] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

STATUS FLAG CODES

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

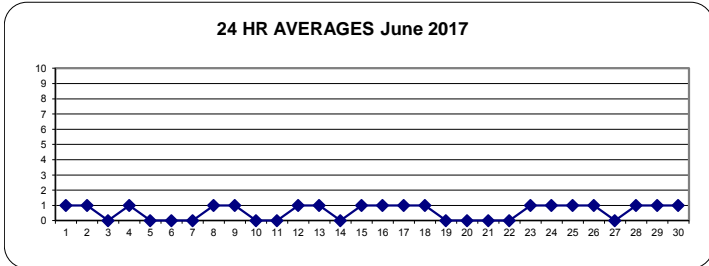
OBJECTIVE LIMIT:

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

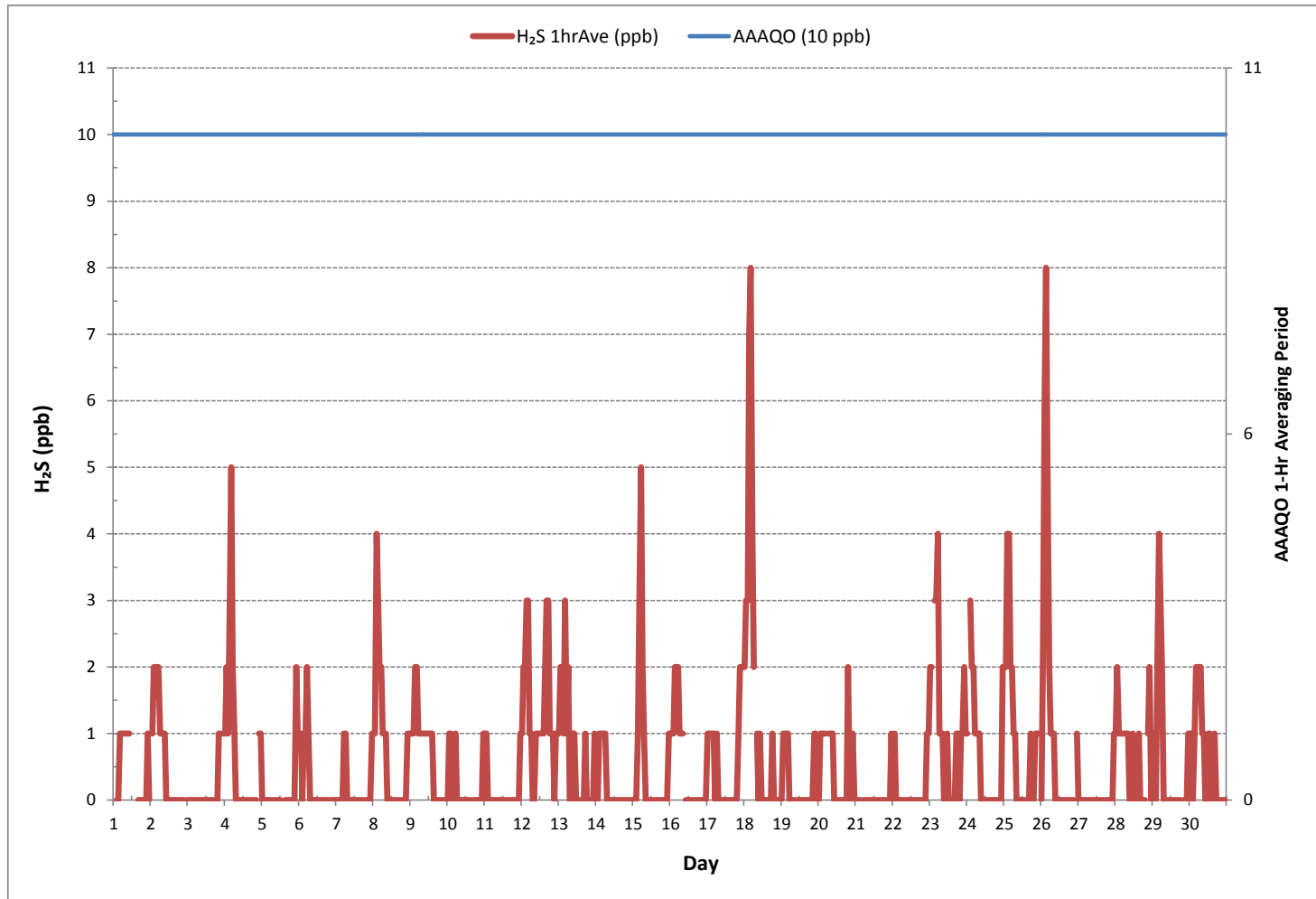
MONTHLY SUMMARY

| | | | |
|------------------------------|--------------------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 242 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR 2 ON DAY 1 | | |
| MAXIMUM 1-HR AVERAGE: | 8 ppb @ HOUR 4 ON DAY 18 | | |
| MAXIMUM 24-HR AVERAGE: | 1 ppb ON DAY 1 | | |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 720 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 1 ppb |

24 HR AVERAGES June 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

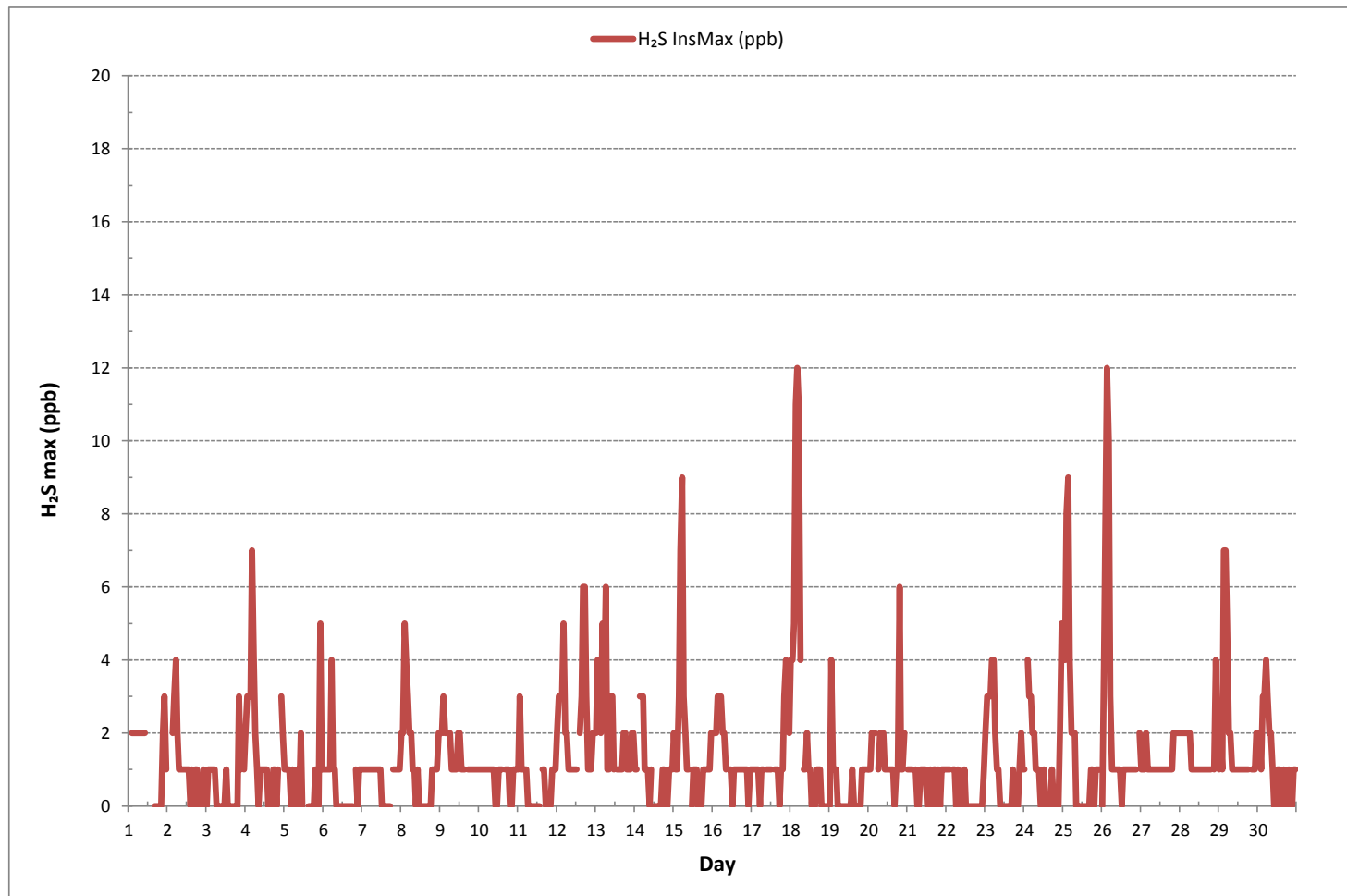
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 494 |
| MAXIMUM INSTANTANEOUS VALUE: | 12 ppb @ HOUR 4 ON DAY 18 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 2 |
| OPERATIONAL TIME: | 716 hrs |

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



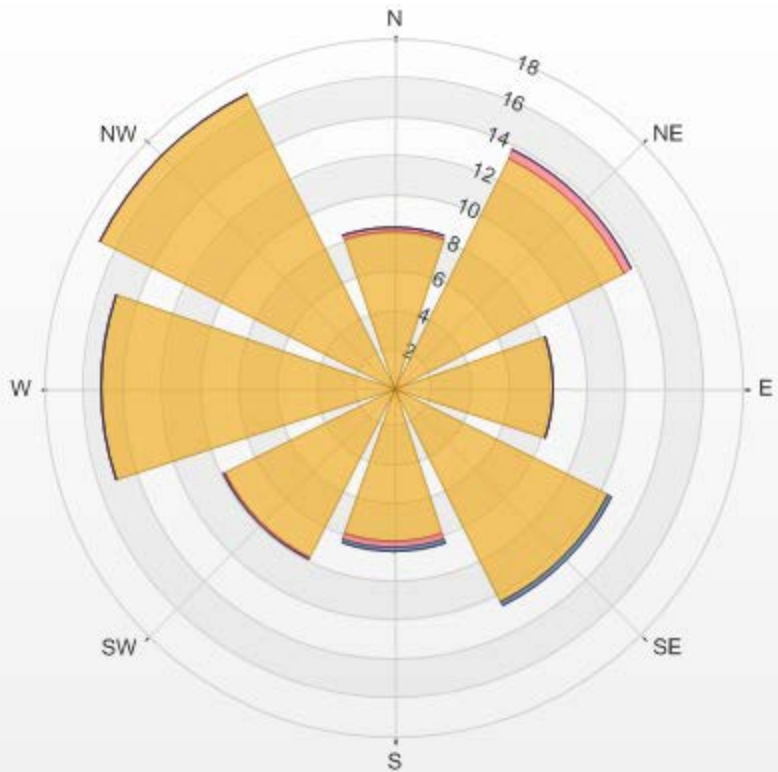
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-H₂S [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.79% Calm Avg: 1.55 [ppb]

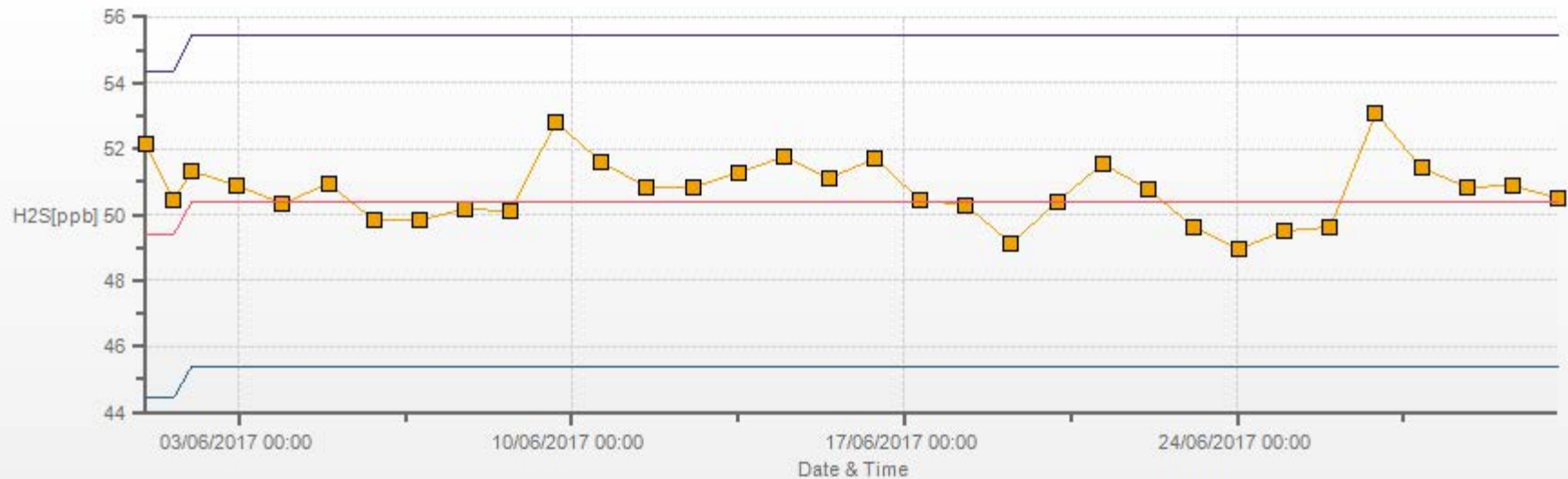
| Direction | 0.0-3.0 | 3.0-6.0 | 6.0-9.0 | >9.0 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 8.1 | 0.2 | 0.0 | 0.0 | 8.3 |
| NE | 13.3 | 0.4 | 0.0 | 0.0 | 13.7 |
| E | 8.3 | 0.0 | 0.0 | 0.0 | 8.3 |
| SE | 12.4 | 0.0 | 0.2 | 0.0 | 12.6 |
| S | 8.0 | 0.3 | 0.2 | 0.0 | 8.4 |
| SW | 9.8 | 0.2 | 0.0 | 0.0 | 9.9 |
| W | 15.1 | 0.0 | 0.0 | 0.0 | 15.1 |
| NW | 17.0 | 0.0 | 0.0 | 0.0 | 17.0 |
| Summary | 91.9 | 1.0 | 0.3 | 0.0 | 93.2 |

% Icon Classes (ppb) 92 0.0-3.0 1 3.0-6.0 0 6.0-9.0 0 >9.0

LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.79% Calm Poll Avg: 1.55[ppb]



H2S[ppb] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



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

TOTAL HYDROCARBON



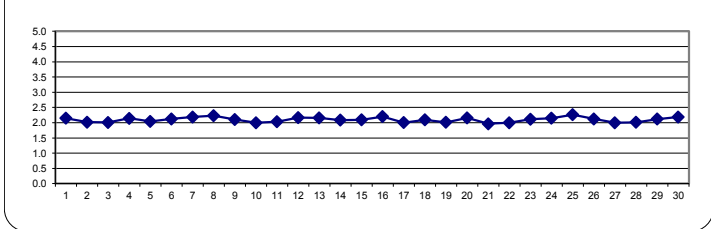
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 2.10 | S | 2.28 | 2.19 | 2.23 | 2.30 | 2.37 | 2.32 | 2.29 | 2.29 | 2.24 | 2.23 | 2.14 | 2.24 | 2.12 | 2.07 | 2.02 | 1.97 | 1.96 | 1.94 | 1.97 | 2.01 | 2.08 | 2.01 | 1.94 | 2.37 | 2.15 | 24 | |
| 2 | S | 2.09 | 2.13 | 2.14 | 2.16 | 2.15 | 2.11 | 2.05 | 2.07 | 2.02 | 1.99 | 1.95 | 1.93 | 1.92 | 1.92 | C | C | C | C | 1.93 | 1.94 | 1.95 | S | 1.92 | 2.16 | 2.02 | 24 | | |
| 3 | 1.95 | 1.96 | 1.97 | 1.98 | 1.99 | 1.98 | 1.96 | 1.96 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.95 | 1.95 | 2.08 | 2.25 | 2.41 | S | 2.30 | 1.94 | 2.41 | 2.01 | 24 | | | |
| 4 | 2.13 | 2.25 | 2.38 | 2.62 | 2.55 | 2.36 | 2.22 | 2.18 | 2.12 | 2.05 | 2.01 | 2.03 | 2.02 | 2.07 | 2.00 | 1.99 | 2.01 | 2.01 | 2.03 | 2.08 | 2.10 | S | 2.08 | 1.99 | 1.99 | 2.62 | 2.14 | 24 | |
| 5 | 2.00 | 2.02 | 2.16 | 2.15 | 2.14 | 2.09 | 2.03 | 2.02 | 1.98 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | Q | Q | Q | 1.96 | 1.96 | 2.00 | S | 2.05 | 2.22 | 2.22 | 1.96 | 2.22 | 2.04 | 24 | |
| 6 | 2.24 | 2.08 | 2.05 | 2.18 | 2.39 | 2.17 | 2.18 | 2.07 | 2.21 | 2.24 | 2.11 | 2.01 | 1.98 | 1.98 | 1.98 | 1.99 | 2.01 | 1.98 | 1.98 | S | 2.14 | 2.34 | 2.25 | 2.34 | 1.98 | 2.39 | 2.13 | 24 | |
| 7 | 2.36 | 2.32 | 2.46 | 2.37 | 2.33 | 2.37 | 2.30 | 2.21 | 2.15 | 2.13 | 2.05 | 2.01 | 2.03 | 2.02 | 2.03 | 2.04 | 2.05 | 2.07 | S | 2.15 | 2.21 | 2.26 | 2.24 | 2.22 | 2.01 | 2.46 | 2.19 | 24 | |
| 8 | 2.28 | 2.35 | 2.66 | 2.82 | 2.59 | 2.50 | 2.41 | 2.35 | 2.28 | 2.13 | 2.03 | 2.00 | 2.01 | 2.01 | 1.99 | 1.98 | 2.02 | S | 2.06 | 2.08 | 2.23 | 2.14 | 2.20 | 2.16 | 1.98 | 2.82 | 2.23 | 24 | |
| 9 | 2.16 | 2.18 | 2.21 | 2.19 | 2.16 | 2.14 | 2.15 | 2.15 | 2.16 | 2.16 | 2.17 | 2.12 | 2.10 | 2.05 | 2.02 | 2.04 | S | 2.04 | 2.12 | 2.09 | 1.96 | 2.10 | 2.03 | 1.99 | 1.96 | 2.21 | 2.11 | 24 | |
| 10 | 1.98 | 1.97 | 1.98 | 1.98 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | S | 1.98 | 1.99 | 1.98 | 1.99 | 2.00 | 2.06 | 2.10 | 2.10 | 1.97 | 2.10 | 2.00 | 24 | |
| 11 | 2.08 | 2.07 | 2.05 | 2.15 | 2.18 | 2.12 | 2.02 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | S | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 2.04 | 2.15 | 2.18 | 1.97 | 2.18 | 2.03 | 24 | |
| 12 | 2.16 | 2.16 | 2.26 | 2.16 | 2.45 | 2.44 | 2.29 | 2.36 | 2.36 | 2.26 | 2.23 | 2.04 | 2.03 | S | 2.03 | 2.08 | 2.09 | 2.03 | 2.02 | 2.01 | 2.02 | 2.14 | 2.16 | 2.16 | 2.01 | 2.45 | 2.17 | 24 | |
| 13 | 2.14 | 2.17 | 2.15 | 2.26 | 2.38 | 2.41 | 2.35 | 2.30 | 2.23 | 2.21 | 2.23 | 2.19 | S | 2.09 | 2.08 | 2.03 | 2.03 | 2.03 | 2.03 | 2.05 | 2.01 | 2.02 | 2.07 | 2.12 | 2.11 | 2.01 | 2.41 | 2.16 | 24 |
| 14 | 2.14 | 2.09 | 2.15 | 2.21 | 2.18 | 2.16 | 2.25 | 2.17 | 2.08 | 2.11 | 2.15 | S | 2.00 | 2.01 | 2.02 | 2.00 | 1.98 | 1.98 | 2.00 | 2.02 | 2.06 | 2.07 | 2.05 | 2.12 | 1.98 | 2.25 | 2.09 | 24 | |
| 15 | 2.16 | 2.13 | 2.12 | 2.08 | 2.23 | 2.30 | 2.18 | 2.08 | 2.02 | 2.00 | S | 2.05 | 2.00 | 1.97 | 1.99 | 1.98 | 2.00 | 2.05 | 2.08 | 2.13 | 2.24 | 2.22 | 2.18 | 1.97 | 2.30 | 2.09 | 24 | | |
| 16 | 2.35 | 2.25 | 2.45 | 2.46 | 2.49 | 2.46 | 2.43 | 2.44 | 2.58 | S | 2.30 | 2.07 | 2.04 | 2.03 | 2.01 | 2.02 | 2.04 | 2.00 | 2.03 | 2.06 | 2.08 | 2.06 | 2.03 | 2.02 | 2.00 | 2.58 | 2.20 | 24 | |
| 17 | 2.04 | 2.06 | 2.01 | 2.02 | 2.01 | 2.00 | 2.00 | 2.01 | S | 1.98 | 1.97 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 2.00 | 2.02 | 2.04 | 2.12 | 2.15 | 1.96 | 2.15 | 2.00 | 24 | |
| 18 | 2.27 | 2.28 | 2.35 | 2.51 | 2.32 | 2.25 | 2.21 | S | 2.09 | 2.08 | 2.08 | 1.97 | 1.97 | 1.97 | 1.98 | 1.96 | 1.98 | 1.98 | 1.97 | 1.97 | 2.03 | 2.06 | 1.98 | 1.99 | 1.96 | 2.51 | 2.10 | 24 | |
| 19 | 1.98 | 2.01 | 2.02 | 2.03 | 2.02 | 2.04 | S | 2.04 | 2.00 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 2.00 | 2.05 | 2.12 | 2.09 | 2.18 | 1.97 | 2.18 | 2.02 | 24 | |
| 20 | 2.25 | 2.28 | 2.28 | 2.28 | 2.23 | S | 2.30 | 2.21 | 2.28 | 2.25 | 2.10 | 2.12 | 2.16 | 2.15 | 2.12 | 2.10 | 2.08 | 2.06 | 2.11 | 2.09 | 2.07 | 2.10 | 2.05 | 1.99 | 1.99 | 2.30 | 2.16 | 24 | |
| 21 | 2.00 | 1.99 | 1.96 | 1.97 | S | 1.97 | 1.97 | 1.96 | 1.95 | 1.95 | 1.96 | 1.97 | 1.97 | 1.95 | 1.96 | 1.96 | 1.97 | 1.96 | 1.97 | 1.97 | 1.96 | 1.95 | 1.95 | 1.95 | 1.95 | 2.00 | 1.96 | 24 | |
| 22 | 1.96 | 1.97 | 1.99 | S | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.99 | 2.01 | 2.06 | 2.13 | 2.21 | 1.96 | 2.21 | 2.00 | 24 | |
| 23 | 2.26 | 2.32 | S | 2.26 | 2.28 | 2.30 | 2.21 | 2.11 | 2.05 | 2.11 | 2.04 | 1.97 | 1.97 | 1.98 | 1.97 | 1.98 | 1.98 | 1.98 | 1.97 | 2.00 | 2.05 | 2.13 | 2.44 | 2.31 | 1.97 | 2.44 | 2.12 | 24 | |
| 24 | 2.16 | S | 2.35 | 2.35 | 2.43 | 2.36 | 2.27 | 2.18 | 2.16 | 2.10 | 2.08 | 2.10 | 2.04 | 2.01 | 1.98 | 1.99 | 2.00 | 2.04 | 2.03 | 2.02 | 2.06 | 2.12 | 2.13 | 2.44 | 1.98 | 2.44 | 2.15 | 24 | |
| 25 | S | 2.56 | 2.67 | 2.89 | 2.79 | 2.70 | 2.52 | 2.38 | 2.17 | 2.06 | 2.05 | 2.06 | 2.06 | 2.03 | 2.03 | 2.08 | 2.07 | 2.06 | 2.08 | 2.05 | 2.12 | 2.21 | 2.24 | S | 2.03 | 2.89 | 2.27 | 24 | |
| 26 | 2.09 | 2.23 | 2.23 | 2.21 | 2.19 | 2.17 | 2.14 | 2.12 | 2.12 | 2.09 | 2.07 | 2.05 | 2.02 | 2.04 | 2.03 | 2.12 | 2.21 | 2.11 | 2.23 | 2.12 | 2.09 | 2.11 | S | 2.14 | 2.02 | 2.23 | 2.13 | 24 | |
| 27 | 2.16 | 2.12 | 2.21 | 2.14 | 2.08 | 2.00 | 1.97 | 1.97 | 1.95 | 1.96 | 1.96 | 1.94 | 1.95 | 1.95 | 1.94 | 1.94 | 1.93 | 1.94 | 1.97 | S | 1.96 | 2.04 | 1.93 | 2.21 | 2.00 | 2.00 | 24 | | |
| 28 | 2.08 | 2.06 | 2.06 | 2.04 | 2.02 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.99 | 1.99 | 2.00 | 2.00 | 1.98 | 2.00 | 1.99 | 2.00 | S | 2.02 | 2.04 | 2.11 | 1.98 | 2.11 | 2.01 | 24 | |
| 29 | 2.21 | 2.29 | 2.27 | 2.41 | 2.40 | 2.33 | 2.26 | 2.08 | 2.01 | 2.04 | 2.03 | 2.02 | 2.02 | 2.03 | 2.03 | 2.02 | 2.02 | 2.04 | S | 2.15 | 2.09 | 1.98 | 2.02 | 1.98 | 2.41 | 2.12 | 24 | | |
| 30 | 2.07 | 2.10 | 2.14 | 2.23 | 2.33 | 2.43 | 2.41 | 2.38 | 2.30 | 2.16 | 2.10 | 2.10 | 2.10 | 2.07 | 2.06 | 2.02 | 2.05 | 2.03 | S | 2.02 | 2.01 | 2.24 | 2.26 | 2.63 | 2.01 | 2.63 | 2.18 | 24 | |
| HOURLY MAX | 2.36 | 2.56 | 2.67 | 2.89 | 2.79 | 2.70 | 2.52 | 2.44 | 2.58 | 2.29 | 2.30 | 2.23 | 2.16 | 2.24 | 2.12 | 2.12 | 2.21 | 2.11 | 2.23 | 2.15 | 2.25 | 2.41 | 2.44 | 2.63 | | | | | |
| HOURLY AVG | 2.13 | 2.16 | 2.21 | 2.25 | 2.26 | 2.22 | 2.19 | 2.14 | 2.12 | 2.08 | 2.06 | 2.03 | 2.01 | 2.01 | 2.00 | 2.01 | 2.01 | 2.00 | 2.01 | 2.03 | 2.06 | 2.11 | 2.12 | 2.15 | | | | | |

STATUS FLAG CODES

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

24 HR AVERAGES June 2017



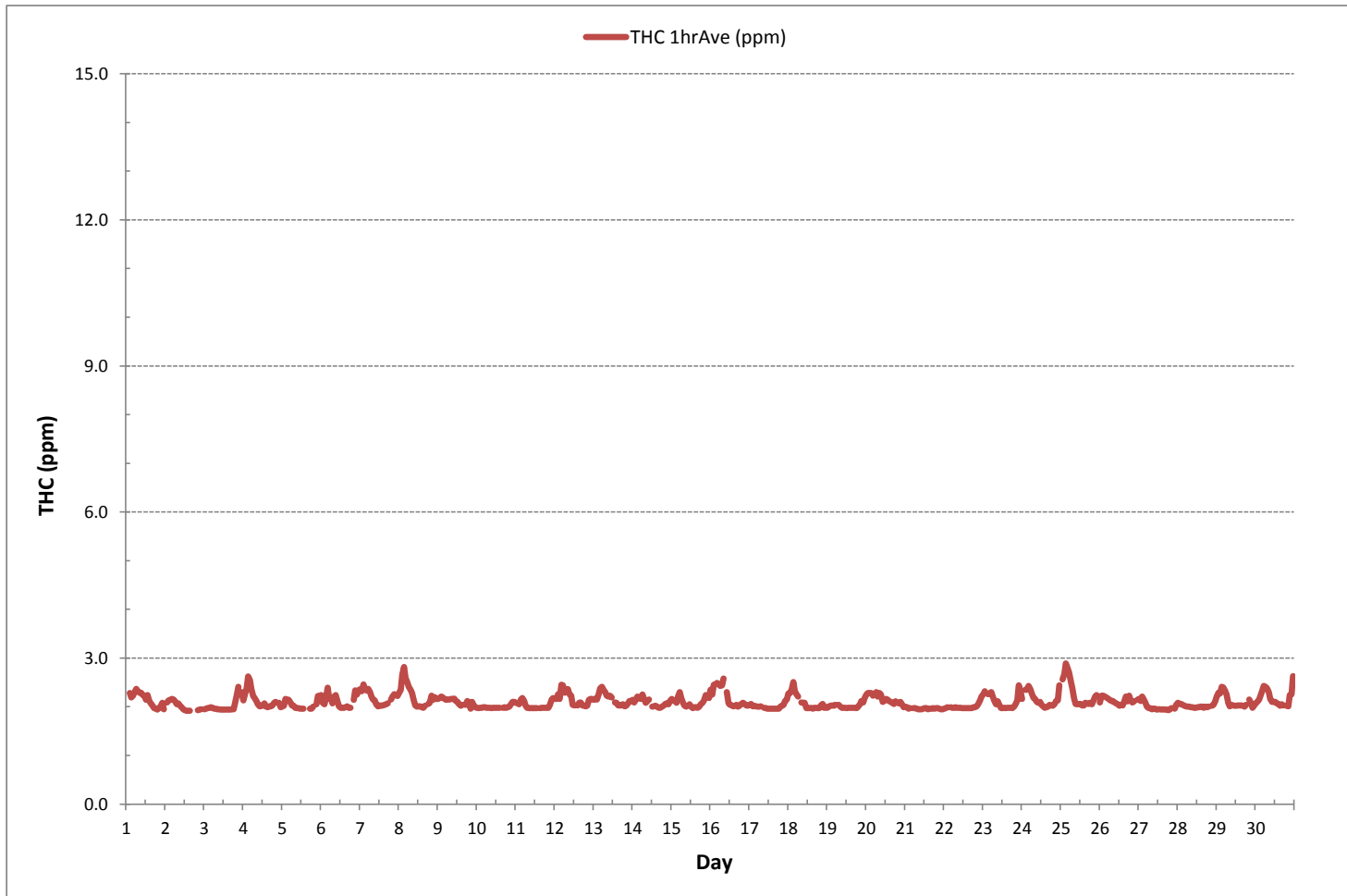
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 681 | | | |
| MINIMUM 1-HR AVERAGE: | 1.92 ppm | @ HOUR | 13 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 2.89 ppm | @ HOUR | 3 | ON DAY 25 |
| MAXIMUM 24-HR AVERAGE: | 2.27 ppm | | | ON DAY 25 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 720 hrs | |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.15 | MONTHLY AVERAGE: | 2.10 ppm | |



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | | | | | | | | | | | | | | | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | | | | | | | | | | | | | | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2.13 | S | 2.91 | 2.33 | 2.53 | 2.64 | 2.61 | 3.68 | 2.72 | 2.39 | 2.39 | 2.72 | 2.24 | 2.78 | 2.48 | 2.48 | 2.23 | 2.05 | 1.98 | 1.96 | 2.00 | 2.12 | 2.11 | 2.07 | 1.96 | 3.68 | 2.42 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | S | 2.49 | P | 2.19 | 2.22 | 2.19 | 2.15 | 2.08 | 2.13 | 2.05 | 2.10 | 1.99 | 1.94 | 1.95 | 2.13 | C | C | C | C | C | 1.96 | 1.95 | 1.98 | S | 1.94 | 2.49 | 2.09 | 23 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 2.01 | 1.99 | 1.98 | 2.01 | 2.00 | 2.11 | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.95 | 2.01 | 1.96 | 1.97 | 1.96 | 1.98 | 2.15 | 2.10 | 2.56 | 2.57 | 2.70 | S | 2.83 | 1.95 | 2.83 | 2.12 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 2.44 | 2.41 | 2.62 | 2.81 | 2.81 | 2.47 | 2.29 | 2.28 | 2.66 | 2.66 | 2.12 | 2.07 | 2.08 | 2.20 | 2.05 | 2.04 | 2.04 | 2.18 | 2.28 | 2.32 | 2.37 | S | 2.58 | 2.06 | 2.04 | 2.81 | 2.34 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 2.18 | 2.09 | 2.23 | 2.26 | 2.26 | 2.14 | 2.21 | 2.11 | 2.01 | 2.03 | 2.00 | 2.10 | 1.99 | 1.98 | Q | Q | Q | 1.98 | 1.99 | 2.03 | S | 2.27 | 2.75 | 2.67 | 1.98 | 2.75 | 2.16 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 3.29 | 2.14 | 2.18 | 3.86 | 3.55 | 2.19 | 2.20 | 2.15 | 2.30 | 2.30 | 2.18 | 2.06 | 2.00 | 2.35 | 2.35 | 2.01 | 2.03 | 2.01 | 2.01 | S | 2.70 | 2.69 | 2.64 | 2.82 | 2.00 | 3.86 | 2.44 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 3.15 | 2.65 | 2.84 | 2.98 | 2.98 | 3.43 | 2.34 | 2.25 | 2.18 | 2.16 | 2.10 | 2.13 | 2.15 | 2.11 | 2.20 | 2.37 | 2.32 | 2.41 | S | 2.83 | 2.54 | 2.52 | 2.71 | 2.50 | 2.10 | 3.43 | 2.52 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 2.41 | 2.47 | 2.91 | 3.08 | 2.74 | 2.63 | 2.48 | 2.53 | 2.44 | 2.44 | 2.14 | 2.08 | 2.18 | 2.09 | 2.06 | 2.04 | 2.13 | S | 2.37 | 2.25 | 4.54 | 2.24 | 2.28 | 2.24 | 2.04 | 4.54 | 2.47 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 2.34 | 2.30 | 2.24 | 2.28 | 2.22 | 2.19 | 2.29 | 2.19 | 2.23 | 2.22 | 2.26 | 2.29 | 2.13 | 2.08 | 2.05 | 2.05 | S | 2.17 | 2.71 | 2.50 | 2.12 | 2.50 | 2.08 | 2.01 | 2.01 | 2.71 | 2.24 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 2.00 | 1.99 | 2.00 | 2.00 | 2.00 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 2.12 | 2.00 | 1.99 | 2.00 | 2.01 | S | 2.06 | 2.01 | 2.03 | 2.02 | 2.02 | 2.09 | 2.13 | 2.12 | 1.99 | 2.13 | 2.03 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 2.12 | 2.20 | 2.07 | 2.20 | 2.23 | 2.14 | 2.08 | 2.00 | 2.00 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | S | 1.99 | 2.06 | 1.99 | 1.98 | 2.00 | 2.12 | 2.19 | 2.26 | 1.98 | 2.26 | 2.07 | 24 | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 2.22 | 2.29 | 2.67 | 2.22 | 3.19 | 3.14 | 2.44 | 2.52 | 2.48 | 2.31 | 2.35 | 2.08 | 2.08 | S | 2.07 | 2.19 | 4.20 | 2.07 | 2.05 | 2.04 | 2.22 | 2.18 | 2.22 | 2.32 | 2.04 | 4.20 | 2.42 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 2.28 | 2.20 | 2.35 | 3.02 | 3.01 | 2.88 | 2.74 | 2.44 | 2.37 | 2.37 | 2.33 | 2.33 | S | 2.11 | 2.36 | 2.08 | 2.13 | 2.07 | 2.23 | 2.07 | 2.05 | 2.15 | 2.53 | 2.24 | 2.05 | 3.02 | 2.36 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 2.24 | 2.21 | P | 3.30 | 2.27 | 2.36 | 2.49 | 2.38 | 2.10 | 2.23 | 2.24 | S | 2.01 | 2.12 | 2.04 | 2.21 | 1.99 | 2.00 | 2.01 | 2.04 | 2.11 | 2.11 | 2.08 | 2.17 | 1.99 | 2.49 | 2.17 | 23 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 2.26 | 2.81 | 2.49 | 2.33 | 2.39 | 2.40 | 2.24 | 2.18 | 2.04 | 2.02 | S | 2.11 | 2.05 | 1.99 | 2.01 | 2.08 | 2.00 | 2.15 | 2.30 | 2.38 | 2.44 | 2.57 | 2.74 | 2.34 | 1.99 | 2.81 | 2.27 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 2.47 | 2.45 | 2.55 | 2.58 | 2.61 | 2.66 | 2.55 | 2.65 | 2.88 | S | 3.99 | 2.40 | 2.25 | 2.09 | 2.03 | 2.04 | 2.15 | 2.03 | 2.05 | 2.12 | 2.10 | 2.04 | 2.03 | 2.03 | 3.99 | 2.38 | 24 | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 2.07 | 2.10 | 2.02 | 2.04 | 2.04 | 2.01 | 2.02 | 2.20 | S | 2.00 | 2.00 | 1.97 | 1.97 | P | 2.10 | 1.97 | 1.97 | 1.98 | 1.99 | 2.21 | 2.22 | 2.08 | 2.20 | 2.18 | 1.97 | 2.22 | 2.06 | 23 | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 2.36 | 2.54 | 2.70 | 3.09 | 2.79 | 2.47 | 2.27 | S | 2.14 | 2.10 | 2.52 | 2.00 | 1.98 | 2.00 | 2.03 | 1.99 | 1.99 | 2.00 | 2.00 | 2.06 | 2.14 | 2.00 | 2.02 | 1.98 | 3.09 | 2.23 | 24 | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | 2.02 | 2.08 | 2.04 | 2.05 | 2.03 | 2.06 | S | 2.07 | 2.02 | 2.00 | 1.99 | 2.12 | 1.99 | 2.02 | 2.01 | 2.00 | 2.06 | 2.01 | 2.01 | 2.41 | 2.41 | 2.41 | 2.16 | 2.28 | 1.99 | 2.41 | 2.10 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 2.30 | 2.47 | 2.36 | 2.35 | 2.32 | S | 2.50 | 2.27 | 2.37 | 2.37 | 2.20 | 2.48 | 2.34 | 3.26 | 2.31 | 2.20 | 2.25 | 2.38 | 2.48 | 2.31 | 2.31 | 2.23 | 2.29 | P | 2.20 | 3.26 | 2.38 | 23 | | | | | | | | | | | | | | | | | | | | | | |
| 21 | 2.03 | 2.04 | 1.97 | 1.98 | S | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.96 | 2.07 | 2.16 | 2.12 | 1.96 | 1.97 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.98 | 1.96 | 1.96 | 1.96 | 2.19 | 2.01 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 1.97 | 2.00 | 2.01 | S | 2.01 | 2.00 | 2.04 | 2.07 | 2.14 | 2.11 | 2.10 | 2.10 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 2.00 | 2.17 | 2.02 | 2.04 | 2.13 | 2.18 | 2.47 | 1.97 | 2.47 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 23 | 2.42 | 2.36 | S | 2.28 | 2.41 | 2.34 | 2.27 | 2.26 | 2.15 | 2.29 | 2.16 | 1.99 | 1.98 | 2.25 | 1.98 | 1.99 | 1.99 | 2.00 | 1.99 | 2.02 | 2.12 | 2.39 | 2.61 | 2.40 | 1.98 | 2.61 | 2.20 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 2.57 | S | 2.53 | 2.51 | 2.62 | 2.46 | 2.33 | 2.25 | 2.18 | 2.16 | 2.11 | 2.11 | 2.10 | 2.14 | 2.01 | 2.01 | 2.15 | 2.20 | 2.11 | 2.14 | 2.16 | 2.32 | 2.18 | 3.05 | 2.01 | 3.05 | 2.28 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | S | 3.12 | 3.18 | 3.70 | 3.38 | 3.34 | 3.29 | 2.58 | 2.34 | 2.08 | 2.13 | 2.11 | 2.10 | 2.28 | 2.11 | 2.98 | 2.16 | 2.20 | 2.39 | 2.11 | 2.53 | 2.49 | 2.44 | S | 2.08 | 3.70 | 2.59 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 26 | 2.15 | 2.33 | 2.32 | 2.24 | 2.22 | 2.20 | 2.29 | 2.13 | 2.24 | 2.11 | 2.16 | 2.33 | 2.05 | 2.10 | 2.11 | 2.91 | 2.63 | 2.34 | 2.97 | 2.36 | 2.31 | 2.23 | S | 2.15 | 2.05 | 2.97 | 2.30 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 27 | 2.37 | 2.14 | 3.17 | 2.37 | 2.13 | 2.18 | 1.99 | 2.25 | 1.98 | 1.98 | 1.98 | 1.96 | 1.99 | 1.99 | 1.96 | 2.08 | 1.95 | 2.04 | 1.95 | 1.96 | 2.03 | S | 1.99 | 2.11 | 1.95 | 3.17 | 2.11 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | 2.10 | 2.10 | 2.10 | 2.08 | 2.04 | 2.04 | 2.05 | 2.05 | 2.02 | 2.02 | 2.32 | 2.01 | 2.11 | 2.06 | 2.06 | 2.04 | 2.10 | 2.10 | 2.00 | 2.01 | S | 2.06 | 2.08 | 2.28 | 2.00 | 2.32 | 2.08 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 29 | 2.34 | 2.39 | 2.38 | 2.54 | 2.54 | 2.42 | 2.32 | 2.22 | 2.03 | 2.08 | 2.08 | 2.07 | 2.06 | 2.07 | 2.05 | 2.06 | 2.04 | 2.03 | 2.23 | S | 2.37 | 2.27 | 2.00 | 2.10 | 2.00 | 2.54 | 2.20 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 2.19 | 2.15 | 2.21 | 2.39 | 2.43 | 2.56 | 2.57 | 2.44 | 2.64 | 2.32 | 2.12 | 2.13 | 2.13 | 2.09 | 2.11 | 2.14 | 2.11 | 2.05 | S | 2.03 | 2.08 | 3.12 | 2.42 | 4.70 | 2.03 | 4.70 | 2.40 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| HOURLY MAX | 3.29 | 3.12 | 3.18 | 3.86 | 3.55 | 3.43 | 3.29 | 3.68 | 2.88 | 2.66 | 3.99 | 2.72 | 2.34 | 3.26 | 2.48 | 2.98 | 4.20 | 2.41 | 2.97 | 2.83 | 4.54 | 3.12 | 2.75 | 4.70 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOURLY AVG | 2.30 | 2.30 | 2.41 | 2.49 | 2.48 | 2.40 | 2.31 | 2.28 | 2.23 | 2.16 | 2.21 | 2.13 | 2.07 | 2.15 | 2.09 | 2.14 | 2.17 | 2.10 | 2.16 | 2.17 | 2.30 | 2.29 | 2.27 | 2.38 | | | | | | | | | | | | | | | | | | | | | | | | | | |

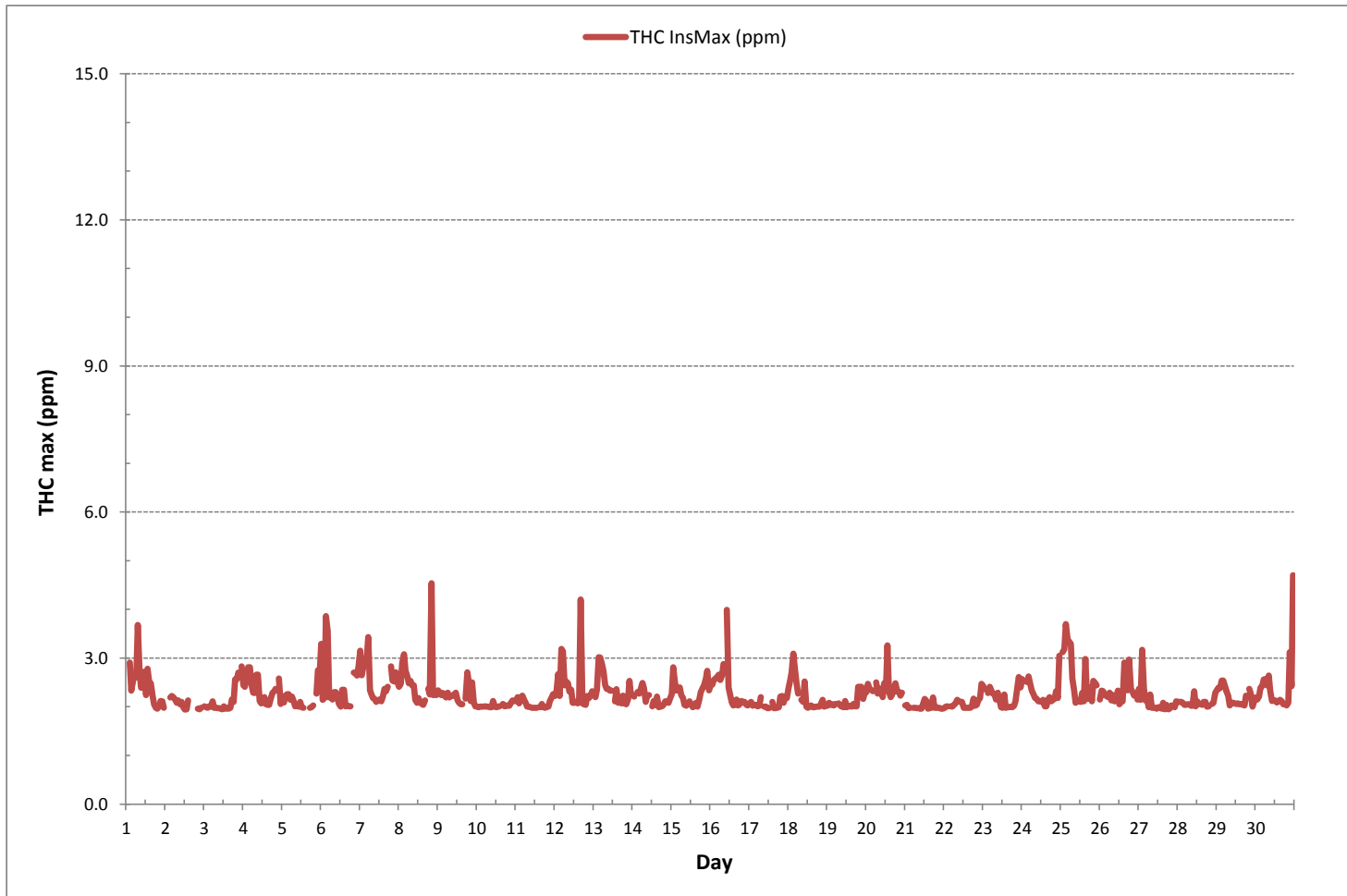
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 676 |
| MAXIMUM INSTANTANEOUS VALUE: | 4.70 ppm @ HOUR 23 ON DAY 30 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 716 hrs |
| STANDARD DEVIATION: | 0.34 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-THC55 [ppm]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.80% Calm Avg: 2.30 [ppm]

| Direction | 0.0-1.0 | 1.0-1.9 | 1.9-2.9 | >2.9 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 0.0 | 0.0 | 8.9 | 0.0 | 8.9 |
| NE | 0.0 | 0.0 | 13.8 | 0.0 | 13.8 |
| E | 0.0 | 0.0 | 8.3 | 0.0 | 8.3 |
| SE | 0.0 | 0.0 | 12.6 | 0.0 | 12.6 |
| S | 0.0 | 0.0 | 8.4 | 0.0 | 8.4 |
| SW | 0.0 | 0.0 | 9.9 | 0.0 | 9.9 |
| W | 0.0 | 0.4 | 13.9 | 0.0 | 14.4 |
| NW | 0.0 | 0.0 | 17.0 | 0.0 | 17.0 |
| Summary | 0.0 | 0.4 | 92.8 | 0.0 | 93.2 |

% Icon Classes (ppm)

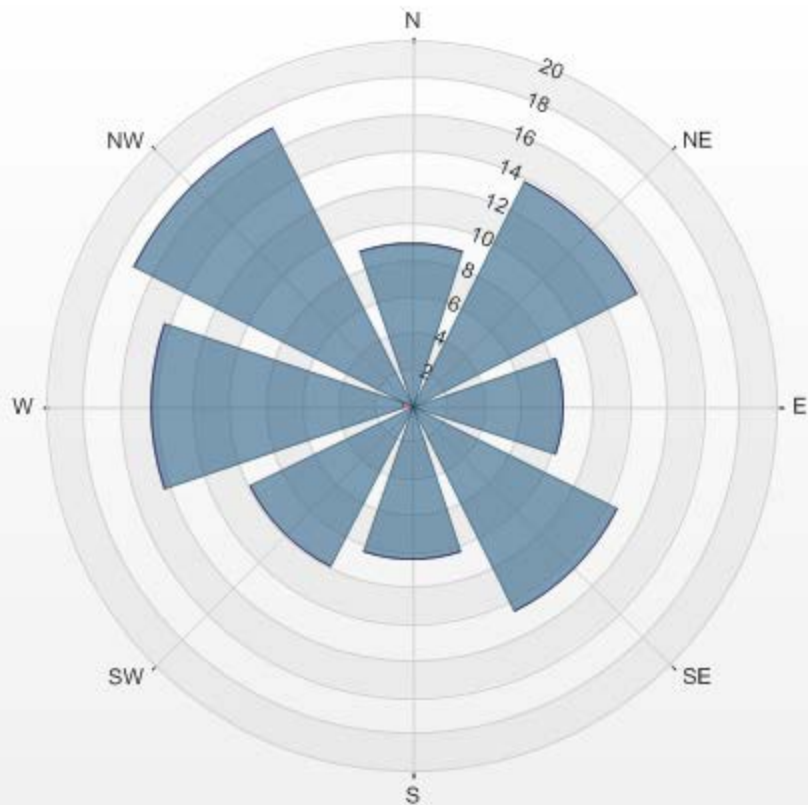
0 0.0-1.0

0 1.0-1.9

93 1.9-2.9

0 >2.9

LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.80% Calm Poll Avg: 2.30[ppm]



THC55[ppm] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

METHANE



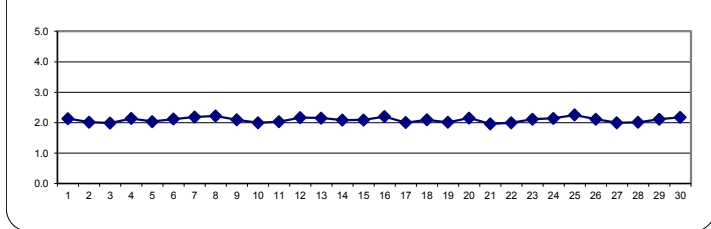
METHANE Hourly Averages (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 2.10 | S | 2.24 | 2.18 | 2.22 | 2.28 | 2.34 | 2.28 | 2.27 | 2.29 | 2.23 | 2.22 | 2.14 | 2.20 | 2.09 | 2.07 | 2.01 | 1.97 | 1.96 | 1.94 | 1.97 | 2.01 | 2.08 | 2.01 | 1.94 | 2.34 | 2.13 | 24 | |
| 2 | S | 2.07 | 2.13 | 2.14 | 2.16 | 2.15 | 2.11 | 2.05 | 2.07 | 2.02 | 1.99 | 1.95 | 1.93 | 1.92 | 1.92 | C | C | C | C | 1.93 | 1.94 | 1.95 | S | 1.92 | 2.16 | 2.02 | 24 | | |
| 3 | 1.95 | 1.96 | 1.97 | 1.98 | 1.99 | 1.98 | 1.96 | 1.96 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.95 | 1.95 | 2.03 | 2.16 | 2.26 | S | 2.24 | 1.94 | 2.26 | 1.99 | 24 | | | |
| 4 | 2.12 | 2.25 | 2.37 | 2.61 | 2.55 | 2.36 | 2.22 | 2.17 | 2.12 | 2.04 | 2.01 | 2.03 | 2.02 | 2.06 | 2.00 | 1.99 | 2.01 | 2.00 | 2.02 | 2.06 | 2.09 | S | 2.07 | 1.99 | 1.99 | 2.61 | 2.14 | 24 | |
| 5 | 1.99 | 2.02 | 2.16 | 2.14 | 2.14 | 2.09 | 2.01 | 2.01 | 1.98 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | Q | Q | Q | 1.96 | 1.96 | 2.00 | S | 2.05 | 2.22 | 2.21 | 1.96 | 2.22 | 2.04 | 24 | |
| 6 | 2.22 | 2.08 | 2.05 | 2.17 | 2.36 | 2.17 | 2.18 | 2.07 | 2.21 | 2.24 | 2.11 | 2.01 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | S | 2.12 | 2.30 | 2.25 | 2.33 | 1.98 | 2.36 | 2.12 | 24 | | |
| 7 | 2.36 | 2.32 | 2.44 | 2.36 | 2.32 | 2.37 | 2.30 | 2.21 | 2.15 | 2.13 | 2.05 | 2.01 | 2.03 | 2.02 | 2.03 | 2.04 | 2.05 | 2.06 | S | 2.13 | 2.21 | 2.25 | 2.24 | 2.22 | 2.01 | 2.44 | 2.19 | 24 | |
| 8 | 2.27 | 2.35 | 2.65 | 2.81 | 2.58 | 2.49 | 2.41 | 2.35 | 2.28 | 2.13 | 2.03 | 2.00 | 2.01 | 2.01 | 1.99 | 1.98 | 2.01 | S | 2.06 | 2.08 | 2.17 | 2.14 | 2.20 | 2.16 | 1.98 | 2.81 | 2.22 | 24 | |
| 9 | 2.16 | 2.18 | 2.21 | 2.19 | 2.16 | 2.14 | 2.15 | 2.15 | 2.16 | 2.16 | 2.17 | 2.11 | 2.10 | 2.05 | 2.02 | 2.03 | S | 2.04 | 2.05 | 1.96 | 1.98 | 2.03 | 1.99 | 1.96 | 2.21 | 2.10 | 24 | | |
| 10 | 1.98 | 1.97 | 1.98 | 1.98 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | S | 1.98 | 1.99 | 1.98 | 1.99 | 2.00 | 2.06 | 2.10 | 2.10 | 1.97 | 2.10 | 2.00 | 24 | |
| 11 | 2.08 | 2.06 | 2.05 | 2.15 | 2.18 | 2.12 | 2.02 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | S | 1.97 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 2.04 | 2.15 | 2.18 | 1.97 | 2.18 | 2.03 | 24 | | |
| 12 | 2.16 | 2.16 | 2.26 | 2.16 | 2.44 | 2.44 | 2.29 | 2.36 | 2.36 | 2.26 | 2.23 | 2.04 | 2.03 | S | 2.03 | 2.08 | 2.06 | 2.03 | 2.02 | 2.01 | 2.02 | 2.14 | 2.16 | 2.16 | 2.01 | 2.44 | 2.17 | 24 | |
| 13 | 2.14 | 2.17 | 2.15 | 2.25 | 2.36 | 2.40 | 2.35 | 2.30 | 2.22 | 2.21 | 2.23 | 2.19 | S | 2.09 | 2.06 | 2.03 | 2.02 | 2.03 | 2.01 | 2.01 | 2.02 | 2.07 | 2.12 | 2.11 | 2.01 | 2.40 | 2.15 | 24 | |
| 14 | 2.14 | 2.09 | 2.15 | 2.21 | 2.18 | 2.16 | 2.25 | 2.17 | 2.08 | 2.11 | 2.15 | S | 2.00 | 2.01 | 2.02 | 1.99 | 1.98 | 1.98 | 2.00 | 2.02 | 2.06 | 2.07 | 2.05 | 2.12 | 1.98 | 2.25 | 2.09 | 24 | |
| 15 | 2.15 | 2.13 | 2.10 | 2.20 | 2.23 | 2.30 | 2.18 | 2.08 | 2.02 | 2.00 | S | 2.05 | 2.00 | 1.97 | 1.99 | 1.99 | 1.98 | 2.00 | 2.04 | 2.07 | 2.12 | 2.22 | 2.21 | 2.18 | 1.97 | 2.30 | 2.09 | 24 | |
| 16 | 2.35 | 2.25 | 2.45 | 2.46 | 2.49 | 2.46 | 2.43 | 2.43 | 2.57 | S | 2.27 | 2.07 | 2.03 | 2.03 | 2.01 | 2.02 | 2.04 | 2.00 | 2.03 | 2.06 | 2.08 | 2.06 | 2.03 | 2.02 | 2.00 | 2.57 | 2.20 | 24 | |
| 17 | 2.04 | 2.06 | 2.01 | 2.02 | 2.01 | 2.00 | 2.00 | 2.00 | S | 1.98 | 1.97 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 2.00 | 2.02 | 2.04 | 2.12 | 2.15 | 1.96 | 2.15 | 2.00 | 24 | |
| 18 | 2.27 | 2.28 | 2.33 | 2.49 | 2.31 | 2.25 | 2.21 | S | 2.09 | 2.08 | 2.08 | 1.97 | 1.97 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 2.03 | 2.06 | 1.98 | 1.99 | 1.96 | 2.49 | 2.10 | 24 | |
| 19 | 1.98 | 2.01 | 2.02 | 2.03 | 2.02 | 2.04 | S | 2.04 | 2.00 | 1.98 | 1.98 | 1.97 | 1.97 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 2.05 | 2.12 | 2.09 | 2.18 | 1.97 | 2.18 | 2.01 | 24 |
| 20 | 2.25 | 2.28 | 2.28 | 2.28 | 2.23 | S | 2.30 | 2.21 | 2.28 | 2.25 | 2.10 | 2.12 | 2.15 | 2.13 | 2.12 | 2.10 | 2.08 | 2.04 | 2.07 | 2.07 | 2.06 | 2.10 | 2.05 | 1.99 | 1.99 | 2.30 | 2.15 | 24 | |
| 21 | 2.00 | 1.99 | 1.96 | 1.97 | S | 1.97 | 1.97 | 1.96 | 1.95 | 1.95 | 1.95 | 1.96 | 1.96 | 1.95 | 1.95 | 1.96 | 1.96 | 1.96 | 1.97 | 1.97 | 1.96 | 1.95 | 1.95 | 1.95 | 1.95 | 2.00 | 1.96 | 24 | |
| 22 | 1.96 | 1.97 | 1.99 | S | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.99 | 2.01 | 2.06 | 2.13 | 2.21 | 1.96 | 2.21 | 2.00 | 24 | |
| 23 | 2.25 | 2.32 | S | 2.26 | 2.28 | 2.30 | 2.21 | 2.11 | 2.05 | 2.10 | 2.04 | 1.97 | 1.97 | 1.97 | 1.97 | 1.98 | 1.98 | 1.98 | 1.97 | 2.00 | 2.05 | 2.12 | 2.44 | 2.31 | 1.97 | 2.44 | 2.11 | 24 | |
| 24 | 2.16 | S | 2.35 | 2.35 | 2.43 | 2.36 | 2.27 | 2.18 | 2.16 | 2.10 | 2.08 | 2.10 | 2.04 | 2.01 | 1.98 | 1.99 | 2.00 | 2.04 | 2.03 | 2.02 | 2.06 | 2.11 | 2.13 | 2.40 | 1.98 | 2.43 | 2.15 | 24 | |
| 25 | S | 2.54 | 2.65 | 2.84 | 2.74 | 2.68 | 2.51 | 2.38 | 2.17 | 2.06 | 2.05 | 2.06 | 2.06 | 2.03 | 2.03 | 2.07 | 2.06 | 2.06 | 2.08 | 2.05 | 2.11 | 2.16 | 2.23 | S | 2.03 | 2.84 | 2.26 | 24 | |
| 26 | 2.09 | 2.23 | 2.23 | 2.21 | 2.19 | 2.17 | 2.13 | 2.12 | 2.12 | 2.09 | 2.07 | 2.05 | 2.02 | 2.04 | 2.03 | 2.07 | 2.12 | 2.09 | 2.12 | 2.11 | 2.08 | 2.10 | S | 2.14 | 2.02 | 2.23 | 2.11 | 24 | |
| 27 | 2.16 | 2.12 | 2.19 | 2.14 | 2.08 | 2.00 | 1.97 | 1.96 | 1.95 | 1.96 | 1.96 | 1.94 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.93 | 1.94 | 1.97 | S | 1.96 | 2.04 | 1.93 | 2.19 | 2.00 | 24 | | |
| 28 | 2.08 | 2.06 | 2.06 | 2.04 | 2.02 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.99 | 1.99 | 2.00 | 2.00 | 1.98 | 1.99 | 1.99 | 2.00 | S | 2.02 | 2.04 | 2.11 | 1.98 | 2.11 | 2.01 | 24 | |
| 29 | 2.21 | 2.29 | 2.27 | 2.41 | 2.40 | 2.32 | 2.26 | 2.08 | 2.01 | 2.04 | 2.03 | 2.01 | 2.02 | 2.03 | 2.03 | 2.03 | 2.02 | 2.00 | 2.03 | S | 2.14 | 2.09 | 1.98 | 2.02 | 1.98 | 2.41 | 2.12 | 24 | |
| 30 | 2.07 | 2.10 | 2.14 | 2.23 | 2.33 | 2.43 | 2.40 | 2.38 | 2.29 | 2.16 | 2.10 | 2.10 | 2.10 | 2.07 | 2.06 | 2.02 | 2.05 | 2.03 | S | 2.02 | 2.01 | 2.16 | 2.21 | 2.55 | 2.01 | 2.55 | 2.17 | 24 | |
| HOURLY MAX | 2.36 | 2.54 | 2.65 | 2.84 | 2.74 | 2.68 | 2.51 | 2.43 | 2.57 | 2.29 | 2.27 | 2.22 | 2.15 | 2.20 | 2.12 | 2.10 | 2.12 | 2.09 | 2.12 | 2.13 | 2.21 | 2.30 | 2.44 | 2.55 | | | | | |
| HOURLY AVG | 2.13 | 2.15 | 2.20 | 2.25 | 2.25 | 2.22 | 2.19 | 2.14 | 2.12 | 2.07 | 2.06 | 2.02 | 2.01 | 2.01 | 2.00 | 2.01 | 2.00 | 2.01 | 2.00 | 2.02 | 2.05 | 2.10 | 2.11 | 2.15 | | | | | |

STATUS FLAG CODES

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

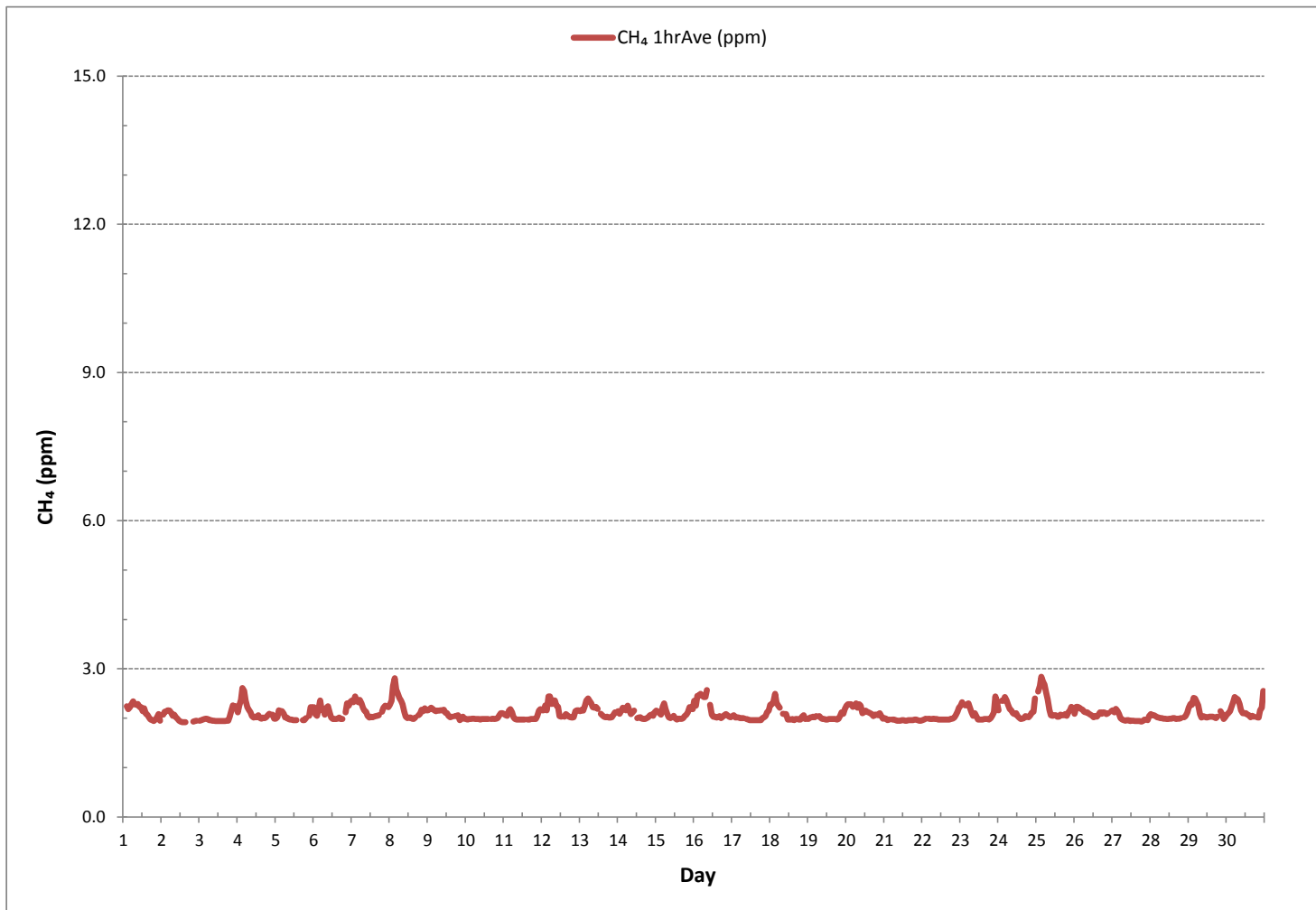
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 681 | | | |
| MINIMUM 1-HR AVERAGE: | 1.92 ppm | @ HOUR | 13 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 2.84 ppm | @ HOUR | 3 | ON DAY 25 |
| MAXIMUM 24-HR AVERAGE: | 2.26 ppm | | | ON DAY 25 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 720 hrs | |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.15 | MONTHLY AVERAGE: | 2.10 ppm | |

METHANE Hourly Averages (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

METHANE MAX Instantaneous Maximum (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 2.13 | S | 2.74 | 2.21 | 2.30 | 2.37 | 2.45 | 2.39 | 2.47 | 2.31 | 2.28 | 2.30 | 2.17 | 2.55 | 2.12 | 2.09 | 2.06 | 2.00 | 1.98 | 1.96 | 2.00 | 2.07 | 2.12 | 2.07 | 1.96 | 2.74 | 2.22 | 24 | |
| 2 | S | 2.17 | P | 2.20 | 2.22 | 2.20 | 2.16 | 2.09 | 2.14 | 2.05 | 2.03 | 1.99 | 1.94 | 1.94 | 1.93 | C | C | C | C | C | 1.96 | 1.94 | 1.98 | S | 1.93 | 2.22 | 2.06 | 23 | |
| 3 | 1.96 | 1.99 | 1.98 | 2.02 | 2.00 | 2.00 | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.95 | 1.96 | 1.96 | 1.97 | 1.96 | 1.98 | 1.96 | 1.98 | 1.98 | 2.33 | 2.38 | 2.46 | S | 2.67 | 1.95 | 2.67 | 2.06 | 24 |
| 4 | 2.26 | 2.35 | 2.63 | 2.73 | 2.74 | 2.46 | 2.29 | 2.22 | 2.24 | 2.26 | 2.12 | 2.08 | 2.09 | 2.18 | 2.05 | 2.04 | 2.04 | 2.04 | 2.16 | 2.16 | 2.25 | S | 2.42 | 2.05 | 2.04 | 2.74 | 2.25 | 24 | |
| 5 | 2.04 | 2.10 | 2.23 | 2.20 | 2.19 | 2.15 | 2.04 | 2.08 | 2.01 | 1.98 | 2.01 | 1.98 | 1.99 | 1.98 | Q | Q | Q | 1.98 | 1.99 | 2.03 | S | 2.27 | 2.69 | 2.54 | 1.98 | 2.69 | 2.12 | 24 | |
| 6 | 3.14 | 2.15 | 2.18 | 3.62 | 3.33 | 2.20 | 2.20 | 2.16 | 2.30 | 2.30 | 2.19 | 2.06 | 2.01 | 2.00 | 2.00 | 2.01 | 2.03 | 2.01 | 2.01 | S | 2.51 | 2.61 | 2.59 | 2.75 | 2.00 | 3.62 | 2.36 | 24 | |
| 7 | 3.04 | 2.52 | 2.77 | 2.90 | 2.91 | 3.29 | 2.34 | 2.25 | 2.19 | 2.16 | 2.11 | 2.05 | 2.08 | 2.12 | 2.21 | 2.38 | 2.25 | 2.36 | S | 2.30 | 2.53 | 2.46 | 2.65 | 2.51 | 2.05 | 3.29 | 2.45 | 24 | |
| 8 | 2.35 | 2.38 | 2.77 | 2.98 | 2.73 | 2.53 | 2.49 | 2.52 | 2.44 | 2.44 | 2.15 | 2.09 | 2.18 | 2.10 | 2.06 | 2.04 | 2.14 | S | 2.37 | 2.25 | 2.35 | 2.25 | 2.26 | 2.22 | 2.04 | 2.98 | 2.35 | 24 | |
| 9 | 2.25 | 2.30 | 2.24 | 2.28 | 2.22 | 2.19 | 2.29 | 2.20 | 2.23 | 2.22 | 2.26 | 2.20 | 2.14 | 2.09 | 2.05 | 2.05 | S | 2.06 | 2.17 | 2.30 | 2.02 | 2.14 | 2.09 | 2.01 | 2.01 | 2.30 | 2.17 | 24 | |
| 10 | 2.00 | 1.98 | 2.00 | 2.00 | 2.00 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 2.00 | 1.99 | 2.00 | 2.02 | S | 2.06 | 2.01 | 2.03 | 2.02 | 2.03 | 2.10 | 2.13 | 2.13 | 1.98 | 2.13 | 2.02 | 24 | |
| 11 | 2.12 | 2.09 | 2.08 | 2.21 | 2.23 | 2.15 | 2.09 | 2.00 | 2.00 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | S | 1.99 | 2.00 | 1.99 | 1.99 | 2.00 | 2.00 | 2.12 | 2.20 | 2.27 | 1.98 | 2.27 | 2.06 | 24 | |
| 12 | 2.22 | 2.29 | 2.63 | 2.22 | 3.04 | 3.06 | 2.44 | 2.51 | 2.48 | 2.31 | 2.35 | 2.09 | 2.09 | S | 2.07 | 2.20 | 2.36 | 2.08 | 2.05 | 2.04 | 2.09 | 2.18 | 2.22 | 2.18 | 2.04 | 3.06 | 2.31 | 24 | |
| 13 | 2.17 | 2.21 | 2.23 | 2.93 | 2.93 | 2.73 | 2.65 | 2.44 | 2.37 | 2.25 | 2.25 | 2.21 | S | 2.12 | 2.09 | 2.08 | 2.07 | 2.08 | 2.03 | 2.03 | 2.05 | 2.09 | 2.45 | 2.24 | 2.03 | 2.93 | 2.29 | 24 | |
| 14 | 2.25 | 2.22 | P | 2.30 | 2.28 | 2.34 | 2.49 | 2.27 | 2.11 | 2.22 | 2.21 | S | 2.01 | 2.02 | 2.04 | 2.02 | 1.99 | 2.00 | 2.01 | 2.05 | 2.12 | 2.12 | 2.09 | 2.18 | 1.99 | 2.49 | 2.15 | 23 | |
| 15 | 2.26 | 2.75 | 2.37 | 2.23 | 2.40 | 2.40 | 2.24 | 2.18 | 2.04 | 2.02 | S | 2.07 | 2.05 | 1.99 | 2.01 | 2.09 | 2.00 | 2.15 | 2.28 | 2.22 | 2.39 | 2.39 | 2.47 | 2.34 | 1.99 | 2.75 | 2.23 | 24 | |
| 16 | 2.48 | 2.46 | 2.54 | 2.58 | 2.61 | 2.67 | 2.55 | 2.65 | 2.73 | S | 2.59 | 2.36 | 2.17 | 2.09 | 2.03 | 2.04 | 2.15 | 2.03 | 2.05 | 2.12 | 2.11 | 2.10 | 2.05 | 2.04 | 2.03 | 2.73 | 2.31 | 24 | |
| 17 | 2.07 | 2.10 | 2.03 | 2.04 | 2.05 | 2.01 | 2.02 | 2.02 | S | 2.00 | 2.00 | 1.97 | 1.98 | P | 1.97 | 1.97 | 1.97 | 1.98 | 1.99 | 2.10 | 2.09 | 2.08 | 2.21 | 2.19 | 1.97 | 2.21 | 2.04 | 23 | |
| 18 | 2.37 | 2.54 | 2.66 | 3.00 | 2.74 | 2.46 | 2.27 | S | 2.14 | 2.11 | 2.52 | 2.00 | 1.98 | 2.00 | 2.03 | 1.99 | 1.99 | 2.01 | 2.00 | 2.00 | 2.06 | 2.14 | 2.00 | 2.02 | 1.98 | 3.00 | 2.22 | 24 | |
| 19 | 2.02 | 2.08 | 2.04 | 2.06 | 2.04 | 2.07 | S | 2.07 | 2.02 | 2.00 | 1.98 | 2.00 | 1.99 | 2.02 | 2.01 | 2.00 | 2.02 | 2.02 | 2.02 | 2.03 | 2.25 | 2.23 | 2.16 | 2.29 | 1.98 | 2.29 | 2.06 | 24 | |
| 20 | 2.30 | 2.47 | 2.36 | 2.35 | 2.32 | S | 2.49 | 2.28 | 2.37 | 2.37 | 2.21 | 2.29 | 2.27 | 2.39 | 2.19 | 2.21 | 2.26 | 2.13 | 2.40 | 2.18 | 2.23 | 2.23 | 2.18 | P | 2.13 | 2.49 | 2.29 | 23 | |
| 21 | 2.03 | 2.05 | 1.97 | 1.98 | S | 1.99 | 1.98 | 1.97 | 1.96 | 1.95 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.96 | 1.96 | 1.95 | 2.05 | 1.98 | 24 | |
| 22 | 1.96 | 2.00 | 2.01 | S | 2.01 | 2.00 | 2.04 | 2.01 | 1.99 | 2.01 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 2.00 | 2.17 | 2.02 | 2.04 | 2.13 | 2.16 | 2.46 | 1.96 | 2.46 | 2.04 | 24 | |
| 23 | 2.32 | 2.36 | S | 2.28 | 2.32 | 2.34 | 2.27 | 2.17 | 2.08 | 2.15 | 2.16 | 1.99 | 1.98 | 1.99 | 1.99 | 1.99 | 1.98 | 2.00 | 1.99 | 2.02 | 2.12 | 2.39 | 2.61 | 2.40 | 1.98 | 2.61 | 2.17 | 24 | |
| 24 | 2.52 | S | 2.53 | 2.50 | 2.62 | 2.45 | 2.33 | 2.25 | 2.19 | 2.16 | 2.11 | 2.12 | 2.11 | 2.15 | 2.01 | 2.01 | 2.13 | 2.21 | 2.11 | 2.15 | 2.13 | 2.27 | 2.19 | 2.96 | 2.01 | 2.96 | 2.27 | 24 | |
| 25 | S | 2.96 | 3.06 | 3.52 | 3.27 | 3.24 | 3.19 | 2.58 | 2.34 | 2.09 | 2.14 | 2.12 | 2.10 | 2.28 | 2.11 | 2.20 | 2.14 | 2.10 | 2.30 | 2.11 | 2.27 | 2.36 | 2.36 | S | 2.09 | 3.52 | 2.49 | 24 | |
| 26 | 2.16 | 2.33 | 2.32 | 2.24 | 2.22 | 2.21 | 2.17 | 2.14 | 2.24 | 2.11 | 2.13 | 2.16 | 2.05 | 2.11 | 2.12 | 2.36 | 2.33 | 2.29 | 2.26 | 2.24 | 2.31 | 2.13 | S | 2.16 | 2.05 | 2.36 | 2.21 | 24 | |
| 27 | 2.20 | 2.15 | 3.07 | 2.26 | 2.14 | 2.06 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.96 | 1.99 | 1.99 | 1.96 | 1.95 | 1.95 | 1.95 | 1.95 | 1.95 | 2.03 | S | 1.99 | 2.12 | 1.95 | 3.07 | 2.07 | 24 | |
| 28 | 2.11 | 2.11 | 2.11 | 2.08 | 2.04 | 2.04 | 2.05 | 2.05 | 2.03 | 2.03 | 2.32 | 2.01 | 2.12 | 2.06 | 2.06 | 2.04 | 2.00 | 2.01 | 2.00 | 2.01 | S | 2.06 | 2.08 | 2.28 | 2.00 | 2.32 | 2.07 | 24 | |
| 29 | 2.35 | 2.39 | 2.38 | 2.53 | 2.53 | 2.40 | 2.32 | 2.22 | 2.03 | 2.09 | 2.08 | 2.07 | 2.07 | 2.07 | 2.05 | 2.06 | 2.05 | 2.03 | 2.06 | S | 2.25 | 2.27 | 2.00 | 2.11 | 2.00 | 2.53 | 2.19 | 24 | |
| 30 | 2.20 | 2.15 | 2.20 | 2.39 | 2.44 | 2.55 | 2.57 | 2.45 | 2.42 | 2.20 | 2.13 | 2.14 | 2.13 | 2.09 | 2.11 | 2.12 | 2.11 | 2.12 | 2.11 | 2.05 | S | 2.04 | 2.04 | 2.70 | 2.33 | 4.39 | 2.04 | 4.39 | 24 |
| HOURLY MAX | 3.14 | 2.96 | 3.07 | 3.62 | 3.33 | 3.29 | 3.19 | 2.65 | 2.73 | 2.44 | 2.59 | 2.36 | 2.27 | 2.55 | 2.21 | 2.38 | 2.36 | 2.36 | 2.40 | 2.33 | 2.53 | 2.70 | 2.69 | 4.39 | | | | | |
| HOURLY AVG | 2.26 | 2.27 | 2.38 | 2.44 | 2.44 | 2.36 | 2.29 | 2.21 | 2.19 | 2.13 | 2.14 | 2.08 | 2.05 | 2.08 | 2.04 | 2.07 | 2.07 | 2.05 | 2.09 | 2.10 | 2.16 | 2.22 | 2.24 | 2.35 | | | | | |

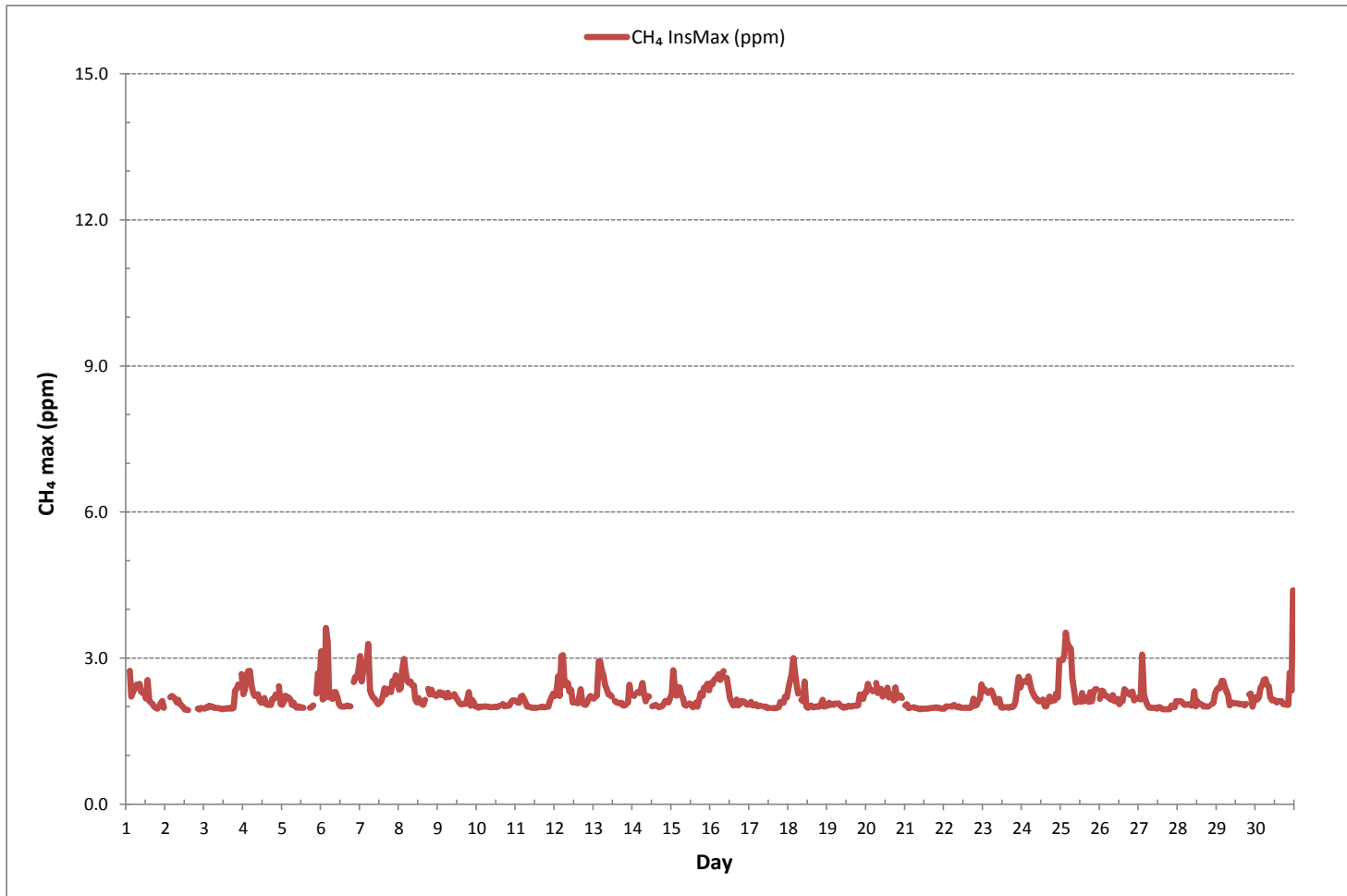
STATUS FLAG CODES

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

MONTHLY SUMMARY

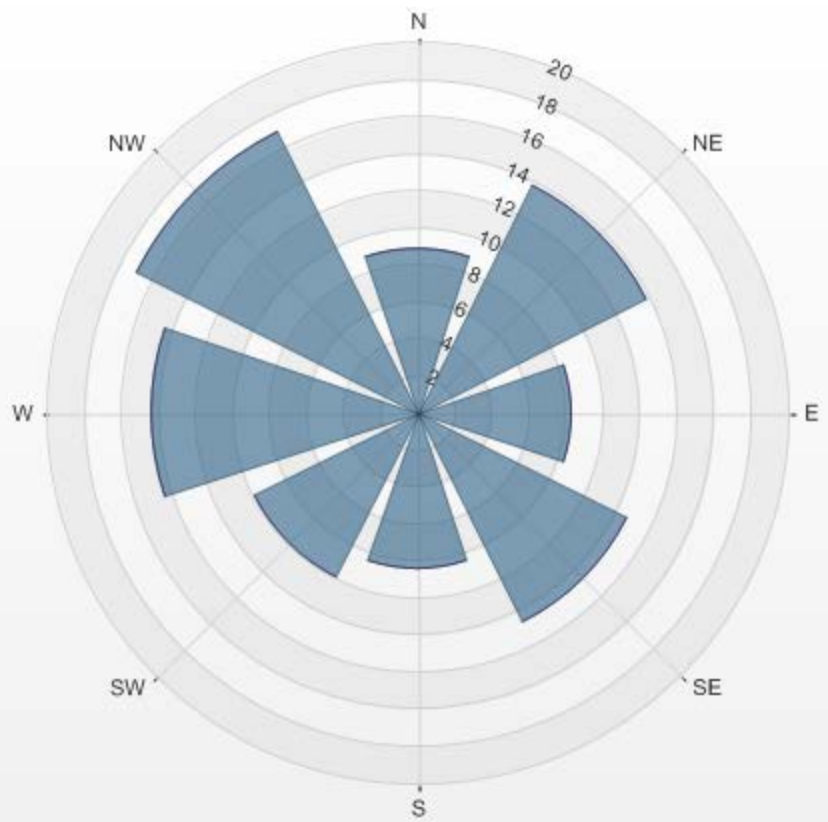
| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 676 |
| MAXIMUM INSTANTANEOUS VALUE: | 4.39 ppm @ HOUR 23 ON DAY 30 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 0.26 |
| OPERATIONAL TIME: | 716 hrs |

METHANE MAX Instantaneous Maximum (CH₄ ppm)



% Icon Classes (ppm) 0 0.0-0.9 0 0.9-1.9 93 1.9-2.8 0 >2.9

LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.80% Calm Poll Avg: 2.29[ppm]



CH4[ppm] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



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

NON-METHANE HYDROCARBON



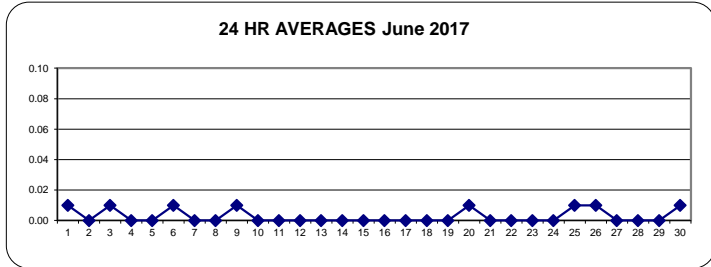
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.00 | S | 0.04 | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 0.03 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 24 |
| 2 | S | 0.02 | 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 | C | C | C | C | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.02 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.10 | 0.14 | S | 0.06 | 0.00 | 0.14 | 0.01 | 24 |
| 4 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | S | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 24 |
| 5 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | Q | Q | Q | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 24 |
| 6 | 0.01 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.02 | 0.04 | 0.00 | 0.01 | 0.00 | 0.04 | 0.01 | 24 |
| 7 | 0.00 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | S | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 |
| 8 | 0.00 | 0.00 | 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 | S | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 24 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.01 | 0.06 | 0.03 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.12 | 0.01 | 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 | 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 | 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 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 | 24 |
| 13 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | S | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 24 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| 15 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | S | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 24 |
| 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 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 | 0.01 | 0.00 | 24 |
| 18 | 0.00 | 0.00 | 0.02 | 0.02 | 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 | 0.02 | 0.00 | 24 |
| 19 | 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 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 24 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 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 |
| 22 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| 23 | 0.01 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 |
| 24 | 0.00 | S | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.04 | 0.00 | 24 |
| 25 | S | 0.02 | 0.02 | 0.05 | 0.04 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.05 | 0.00 | S | 0.00 | 0.00 | 0.05 | 0.01 | 24 |
| 26 | 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 | 0.05 | 0.08 | 0.02 | 0.11 | 0.01 | 0.01 | 0.00 | S | 0.00 | 0.00 | 0.11 | 0.01 | 24 |
| 27 | 0.00 | 0.00 | 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 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 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 | 0.00 | 0.00 | 0.00 | 24 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| 30 | 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 | S | 0.00 | 0.00 | 0.08 | 0.05 | 0.08 | 0.00 | 0.00 | 0.08 | 0.01 | 24 |
| HOURLY MAX | 0.02 | 0.02 | 0.04 | 0.05 | 0.04 | 0.02 | 0.03 | 0.04 | 0.02 | 0.01 | 0.03 | 0.01 | 0.01 | 0.03 | 0.03 | 0.05 | 0.08 | 0.02 | 0.11 | 0.04 | 0.10 | 0.14 | 0.05 | 0.08 | | | | |
| HOURLY AVG | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | | | | |

STATUS FLAG CODES

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

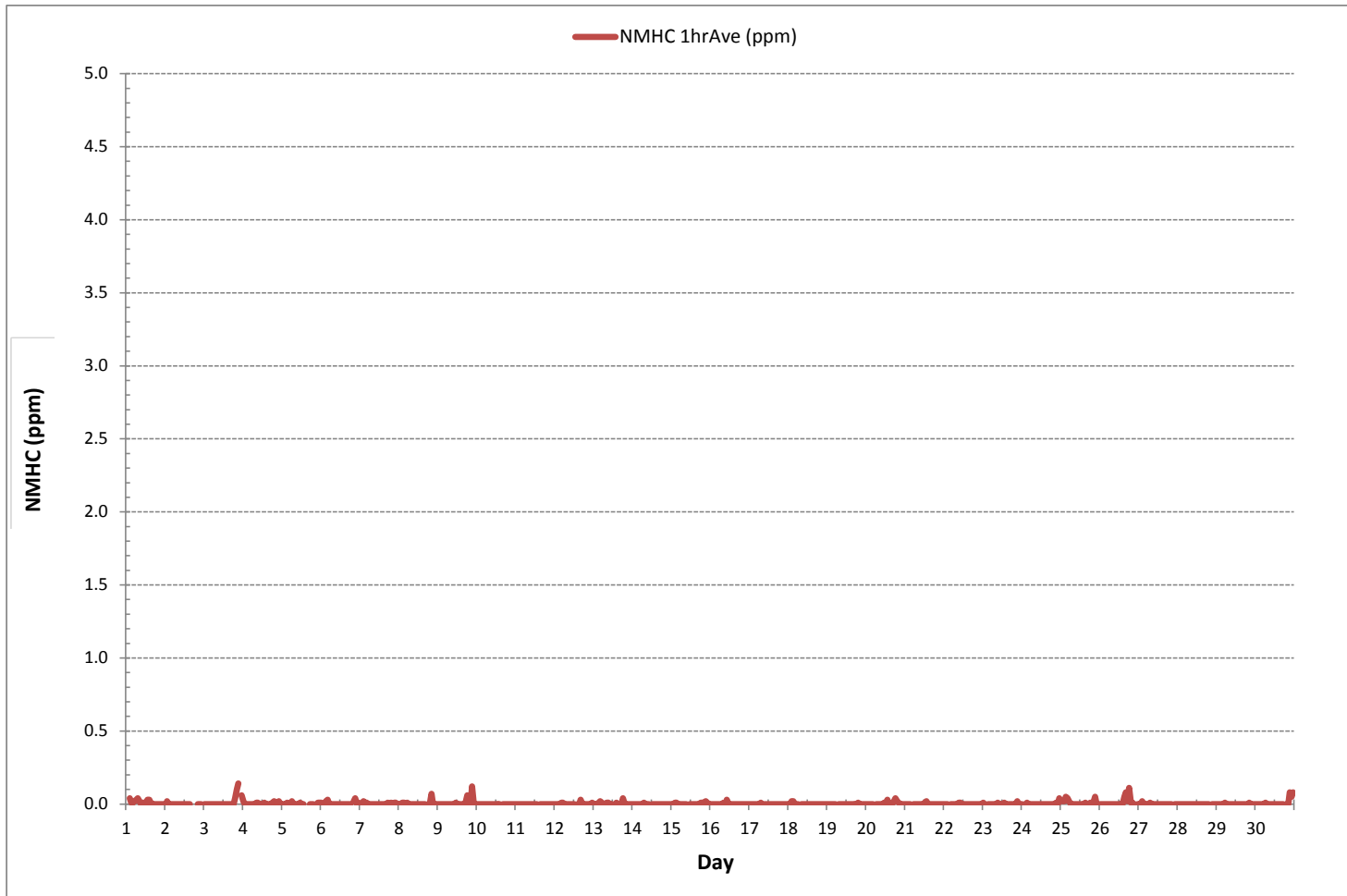
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | |
|------------------------------|----------|-----------------------|----------|--------|---|
| NUMBER OF NON-ZERO READINGS: | 117 | | | | |
| MINIMUM 1-HR AVERAGE: | 0.00 ppm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 0.14 ppm | @ HOUR | 21 | ON DAY | 3 |
| MAXIMUM 24-HR AVERAGE: | 0.01 ppm | | | ON DAY | 1 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 720 hrs | | |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 100.0 % | | |
| STANDARD DEVIATION: | 0.01 | MONTHLY AVERAGE: | 0.00 ppm | | |

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | |
| DAY 1 | 0.00 | S | 0.53 | 0.16 | 0.32 | 0.36 | 0.28 | 1.29 | 0.37 | 0.10 | 0.17 | 0.43 | 0.11 | 0.27 | 0.39 | 0.39 | 0.23 | 0.09 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 1.29 | 0.24 | 24 |
| 2 | S | 0.44 | P | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.22 | C | C | C | C | C | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.44 | 0.05 | 23 | |
| 3 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.15 | 0.31 | 0.33 | 0.45 | S | 0.26 | 0.00 | 0.45 | 0.09 | 24 | |
| 4 | 0.31 | 0.09 | 0.10 | 0.09 | 0.09 | 0.00 | 0.00 | 0.09 | 0.54 | 0.54 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.18 | 0.23 | 0.18 | 0.16 | S | 0.21 | 0.10 | 0.00 | 0.54 | 0.13 | 24 | |
| 5 | 0.15 | 0.00 | 0.00 | 0.14 | 0.08 | 0.00 | 0.21 | 0.14 | 0.00 | 0.07 | 0.00 | 0.15 | 0.00 | 0.00 | Q | Q | Q | 0.00 | 0.00 | 0.00 | S | 0.13 | 0.11 | 0.13 | 0.00 | 0.21 | 0.07 | 24 | |
| 6 | 0.15 | 0.00 | 0.00 | 0.24 | 0.22 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.33 | 0.18 | 0.10 | 0.11 | 0.00 | 0.36 | 0.09 | 24 | |
| 7 | 0.12 | 0.13 | 0.16 | 0.10 | 0.08 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.14 | 0.00 | 0.08 | 0.10 | 0.17 | 0.23 | S | 0.58 | 0.03 | 0.13 | 0.16 | 0.00 | 0.00 | 0.58 | 0.11 | 24 | |
| 8 | 0.09 | 0.14 | 0.24 | 0.14 | 0.10 | 0.14 | 0.00 | 0.08 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | S | 0.00 | 0.00 | 2.29 | 0.00 | 0.08 | 0.09 | 0.00 | 2.29 | 0.16 | 24 | | |
| 9 | 0.21 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | S | 0.15 | 0.68 | 0.43 | 0.11 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.68 | 0.10 | 24 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 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 | 0.16 | 0.01 | 24 | |
| 11 | 0.00 | 0.14 | 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 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.14 | 0.01 | 24 | |
| 12 | 0.00 | 0.00 | 0.13 | 0.00 | 0.16 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.07 | 1.84 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.17 | 0.00 | 1.84 | 0.12 | 24 | |
| 13 | 0.15 | 0.00 | 0.12 | 0.15 | 0.23 | 0.15 | 0.11 | 0.06 | 0.11 | 0.15 | 0.12 | 0.14 | S | 0.00 | 0.30 | 0.00 | 0.12 | 0.00 | 0.23 | 0.08 | 0.00 | 0.09 | 0.13 | 0.00 | 0.00 | 0.30 | 0.11 | 24 | |
| 14 | 0.00 | 0.00 | P | 0.00 | 0.00 | 0.06 | 0.12 | 0.20 | 0.00 | 0.00 | 0.11 | S | 0.00 | 0.12 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.04 | 23 | |
| 15 | 0.08 | 0.12 | 0.19 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.22 | 0.27 | 0.29 | 0.47 | 0.00 | 0.00 | 0.47 | 0.09 | 24 | |
| 16 | 0.04 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.21 | S | 1.40 | 0.12 | 0.20 | 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 | 1.40 | 0.10 | 24 |
| 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | S | 0.00 | 0.00 | 0.00 | 0.00 | P | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.03 | 23 | |
| 18 | 0.00 | 0.00 | 0.14 | 0.19 | 0.05 | 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 | 0.19 | 0.02 | 24 | |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.43 | 0.18 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 0.04 | 24 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.17 | 0.89 | 0.12 | 0.06 | 0.07 | 0.34 | 0.23 | 0.23 | 0.12 | 0.00 | 0.17 | P | 0.00 | 0.89 | 0.12 | 23 | |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.22 | 0.17 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.03 | 24 | |
| 22 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.09 | 0.16 | 0.14 | 0.14 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.10 | 0.00 | 0.00 | 0.16 | 0.04 | 24 | |
| 23 | 0.14 | 0.04 | S | 0.00 | 0.12 | 0.00 | 0.00 | 0.16 | 0.10 | 0.19 | 0.00 | 0.00 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.27 | 0.05 | 24 | |
| 24 | 0.15 | S | 0.07 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.08 | 0.00 | 0.00 | 0.13 | 0.12 | 0.00 | 0.34 | 0.00 | 0.34 | 0.05 | 24 | |
| 25 | S | 0.18 | 0.21 | 0.21 | 0.16 | 0.12 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 | 0.13 | 0.14 | 0.24 | 0.00 | 0.26 | 0.28 | 0.12 | S | 0.00 | 0.79 | 0.13 | 24 | |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.09 | 0.18 | 0.00 | 0.01 | 0.06 | 0.85 | 0.51 | 0.24 | 0.89 | 0.16 | 0.15 | 0.12 | S | 0.00 | 0.00 | 0.89 | 0.15 | 24 | |
| 27 | 0.22 | 0.00 | 0.17 | 0.12 | 0.07 | 0.14 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.10 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.05 | 24 | |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.14 | 0.11 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.02 | 24 | |
| 29 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | S | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.03 | 24 | |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.12 | 0.00 | 0.22 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | S | 0.00 | 0.09 | 0.43 | 0.22 | 0.42 | 0.00 | 0.43 | 0.08 | 24 | |
| HOURLY MAX | 0.31 | 0.44 | 0.53 | 0.24 | 0.32 | 0.36 | 0.28 | 1.29 | 0.54 | 0.54 | 1.40 | 0.43 | 0.22 | 0.89 | 0.39 | 0.85 | 1.84 | 0.34 | 0.89 | 0.58 | 2.29 | 0.50 | 0.47 | 0.42 | | | | | |
| HOURLY AVG | 0.07 | 0.05 | 0.08 | 0.06 | 0.06 | 0.06 | 0.04 | 0.10 | 0.06 | 0.05 | 0.08 | 0.07 | 0.04 | 0.08 | 0.06 | 0.10 | 0.13 | 0.08 | 0.12 | 0.10 | 0.18 | 0.12 | 0.07 | 0.06 | | | | | |

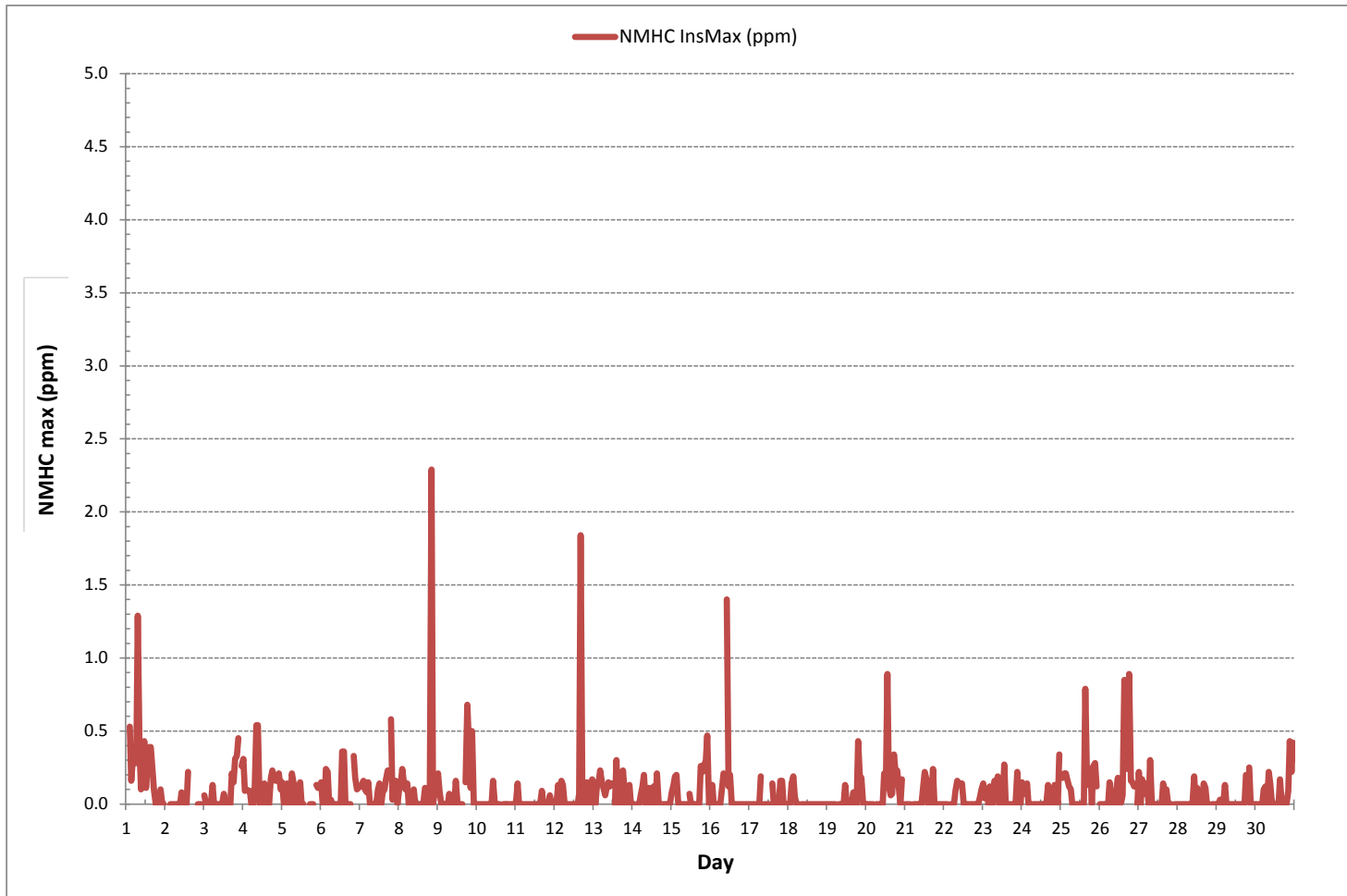
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 252 |
| MAXIMUM INSTANTANEOUS VALUE: | 2.29 ppm @ HOUR 20 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 0.18 |
| OPERATIONAL TIME: | 716 hrs |

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NMHC [ppm]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

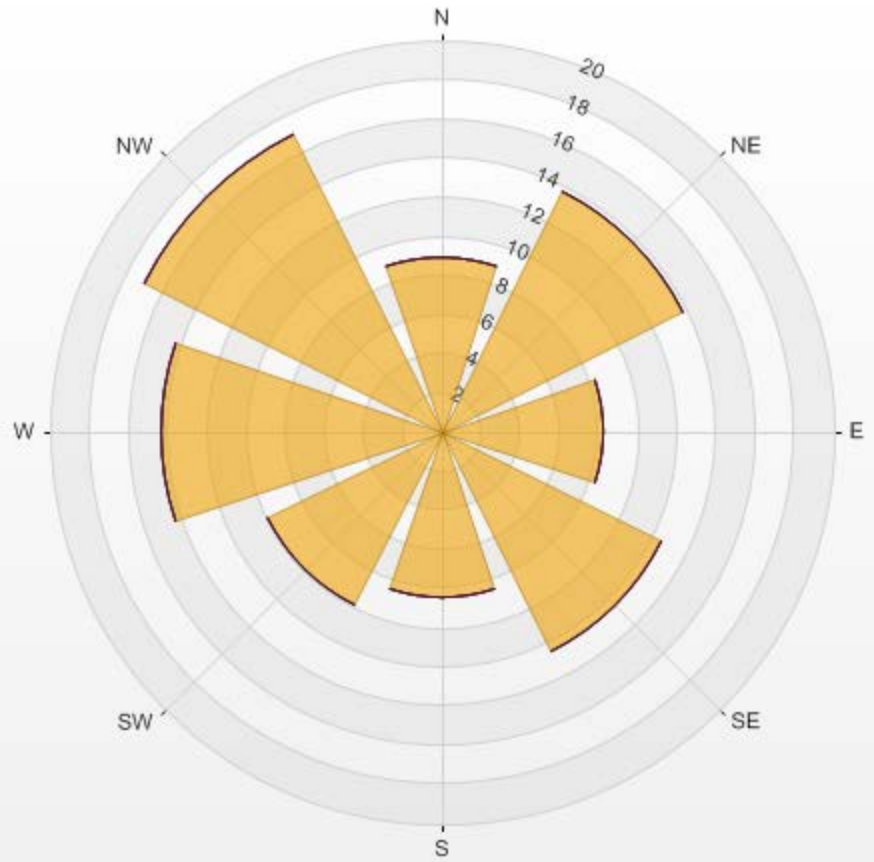
Calm: 6.80%

Calm Avg: 0.01 [ppm]

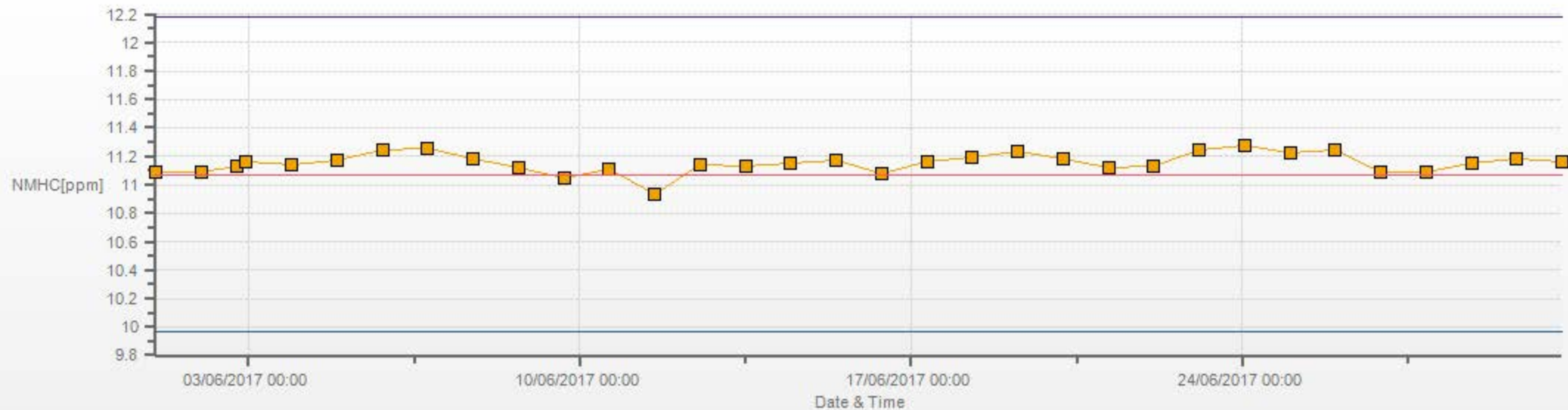
| Direction | 0.0-0.4 | 0.4-0.8 | 0.8-1.1 | 1.1-1.5 | 1.5-1.9 | >1.9 | Total |
|----------------|---------|---------|---------|---------|---------|------|-------|
| N | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 |
| NE | 13.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.8 |
| E | 8.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.3 |
| SE | 12.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.6 |
| S | 8.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.4 |
| SW | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| W | 14.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.4 |
| NW | 17.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 |
| Summary | 93.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 93.2 |

% Icon Classes (ppm) 93 0.0-0.4 0 0.4-0.8 0 0.8-1.1 0 1.1-1.5 0 1.5-1.9 0 >1.9

LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.80% Calm Poll Avg: 0.01[ppm]



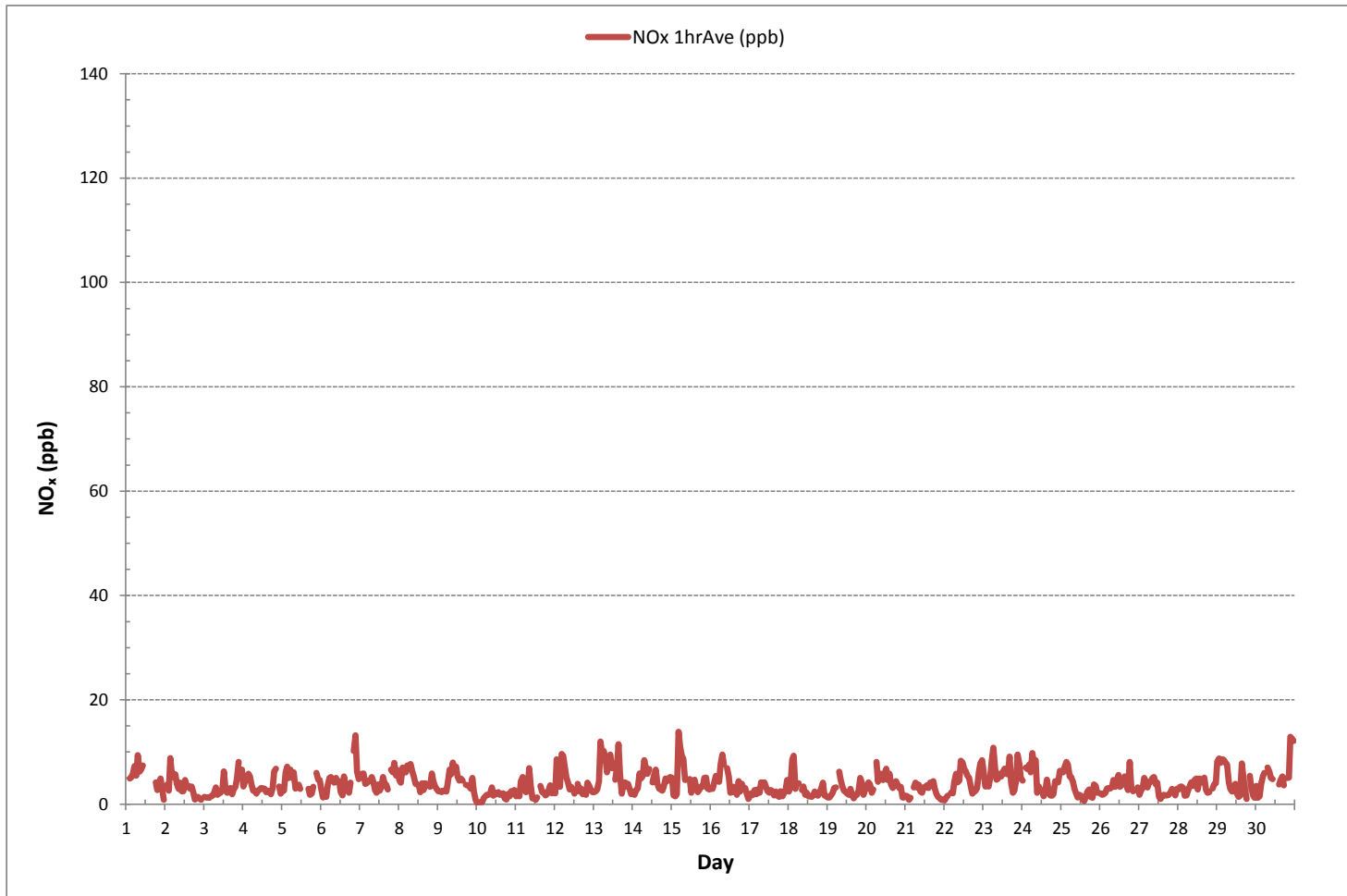
NMHC[ppm] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 4 | S | 8 | 6 | 12 | 13 | 15 | 31 | 31 | 10 | 10 | C | C | C | C | C | C | C | 7 | 4 | 6 | 7 | 4 | 4 | 4 | 31 | 11 | 24 | |
| 2 | S | 5 | P | 16 | 14 | 15 | 14 | 6 | 10 | 13 | 6 | 6 | 7 | 5 | 6 | 4 | 5 | 4 | 2 | 2 | 2 | 2 | 2 | S | 2 | 16 | 7 | 23 | |
| 3 | 2 | 2 | 2 | 3 | 3 | 2 | 4 | 5 | 2 | 3 | 3 | 7 | 63 | 5 | 4 | 6 | 60 | 5 | 17 | 7 | 7 | 13 | S | 8 | 2 | 63 | 10 | 24 | |
| 4 | 6 | 6 | 9 | 8 | 8 | 5 | 4 | 5 | 12 | 5 | 6 | 21 | 13 | 5 | 11 | 11 | 11 | 5 | 11 | 17 | 16 | S | 5 | 3 | 3 | 21 | 9 | 24 | |
| 5 | 4 | 6 | 9 | 10 | 6 | 11 | 8 | 10 | 4 | 5 | 6 | 4 | Q | Q | Q | Q | Q | 3 | 4 | 7 | S | 11 | 8 | 8 | 3 | 11 | 7 | 24 | |
| 6 | 5 | 3 | 3 | 3 | 7 | 19 | 27 | 25 | 21 | 14 | 23 | 34 | 15 | 12 | 29 | 31 | 7 | 21 | 27 | S | 30 | 73 | 9 | 6 | 3 | 73 | 19 | 24 | |
| 7 | 7 | 7 | 10 | 7 | 6 | 6 | 18 | 10 | 7 | 21 | 3 | 20 | 6 | 6 | 31 | 13 | 7 | 6 | S | 26 | 9 | 16 | 8 | 10 | 3 | 31 | 11 | 24 | |
| 8 | 7 | 5 | 9 | 8 | 12 | 12 | 8 | 20 | 24 | 18 | 13 | 14 | 11 | 4 | 21 | 6 | 22 | S | 6 | 5 | 14 | 6 | 5 | 4 | 4 | 24 | 11 | 24 | |
| 9 | 4 | 4 | 3 | 5 | 5 | 3 | 8 | 10 | 9 | 11 | 10 | 11 | 8 | 7 | 7 | 7 | S | 6 | 9 | 10 | 36 | 10 | 4 | 3 | 3 | 36 | 8 | 24 | |
| 10 | 2 | 1 | 2 | 2 | 3 | 5 | 5 | 4 | 4 | 8 | 3 | 13 | 4 | 5 | 5 | S | 5 | 3 | 3 | 23 | 24 | 23 | 4 | 7 | 1 | 24 | 7 | 24 | |
| 11 | 4 | 5 | 4 | 7 | 9 | 7 | 5 | 5 | 14 | 11 | 3 | 3 | 3 | 4 | S | 12 | 5 | 5 | 4 | 5 | 5 | 11 | 4 | 6 | 3 | 14 | 6 | 24 | |
| 12 | 8 | 18 | 16 | 13 | 18 | 36 | 27 | 25 | 8 | 6 | 19 | 9 | 10 | S | 19 | 14 | 26 | 7 | 6 | 4 | 17 | 32 | 4 | 3 | 3 | 36 | 15 | 24 | |
| 13 | 3 | 4 | 5 | 6 | 61 | 18 | 55 | 20 | 26 | 14 | 17 | 12 | S | 7 | 17 | 20 | 13 | 4 | 9 | 9 | 6 | 6 | 5 | 4 | 3 | 61 | 15 | 24 | |
| 14 | 4 | 4 | P | 5 | 11 | 28 | 9 | 16 | 11 | 10 | 9 | S | 6 | 10 | 11 | 6 | 5 | 5 | 4 | 6 | 8 | 6 | 8 | 8 | 4 | 28 | 9 | 23 | |
| 15 | 8 | 4 | 4 | 6 | 38 | 18 | 17 | 16 | 8 | 9 | S | 12 | 4 | 6 | 7 | 5 | 4 | 7 | 16 | 6 | 7 | 8 | 5 | 5 | 4 | 38 | 10 | 24 | |
| 16 | 4 | 4 | 5 | 8 | 7 | 6 | 13 | 16 | 13 | S | 36 | 27 | 5 | 7 | 29 | 24 | 4 | 8 | 7 | 6 | 6 | 5 | 4 | 3 | 3 | 36 | 11 | 24 | |
| 17 | 3 | 4 | 4 | 8 | 5 | 6 | 5 | 7 | S | 8 | 5 | 4 | 4 | P | 6 | 3 | 4 | 4 | 3 | 37 | 7 | 4 | 28 | 37 | 3 | 37 | 9 | 23 | |
| 18 | 4 | 6 | 11 | 36 | 6 | 9 | 22 | S | 4 | 8 | 12 | 14 | 16 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 7 | 5 | 3 | 3 | 36 | 8 | 24 | |
| 19 | 3 | 3 | 3 | 5 | 6 | 5 | S | 11 | 8 | 5 | 5 | 4 | 4 | 5 | 8 | 18 | 12 | 13 | 27 | 33 | 23 | 39 | 4 | 5 | 3 | 39 | 11 | 24 | |
| 20 | 4 | 7 | 7 | 4 | 5 | S | 42 | 25 | 23 | 22 | 24 | 21 | 24 | 23 | 26 | 8 | 5 | 40 | 24 | 21 | 6 | 17 | 2 | P | 2 | 42 | 17 | 23 | |
| 21 | 3 | 3 | 2 | 3 | S | 6 | 6 | 6 | 6 | 5 | 4 | 5 | 5 | 7 | 4 | 25 | 8 | 7 | 6 | 3 | 3 | 2 | 2 | 2 | 2 | 25 | 5 | 24 | |
| 22 | 2 | 3 | 3 | S | 4 | 4 | 4 | 7 | 8 | 7 | 10 | 13 | 12 | 11 | 11 | 9 | 10 | 8 | 4 | 4 | 5 | 6 | 10 | 11 | 15 | 2 | 15 | 8 | 24 |
| 23 | 12 | 8 | S | 5 | 9 | 15 | 18 | 13 | 12 | 8 | 12 | 13 | 12 | 15 | 12 | 11 | 16 | 12 | 4 | 4 | 7 | 14 | 17 | 10 | 4 | 18 | 11 | 24 | |
| 24 | 6 | S | 9 | 9 | 15 | 13 | 17 | 17 | 17 | 5 | 7 | 4 | 26 | 17 | 10 | 15 | 5 | 4 | 4 | 11 | 23 | 37 | 7 | 10 | 4 | 37 | 13 | 24 | |
| 25 | S | 9 | 10 | 11 | 11 | 7 | 8 | 7 | 22 | 12 | 5 | 4 | 24 | 3 | 3 | 6 | 20 | 16 | 13 | 3 | 8 | 6 | 4 | S | 3 | 24 | 10 | 24 | |
| 26 | 4 | 3 | 3 | 3 | 5 | 5 | 7 | 6 | 19 | 8 | 17 | 37 | 7 | 16 | 24 | 15 | 10 | 5 | 37 | 8 | 4 | 5 | S | 6 | 3 | 37 | 11 | 24 | |
| 27 | 4 | 4 | 5 | 11 | 8 | 5 | 6 | 7 | 8 | 8 | 7 | 11 | 4 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 6 | S | 4 | 12 | 2 | 12 | 6 | 24 | |
| 28 | 8 | 10 | 11 | 11 | 3 | 3 | 6 | 5 | 11 | 6 | 18 | 29 | 5 | 11 | 26 | 8 | 12 | 5 | 4 | 4 | S | 7 | 8 | 7 | 3 | 29 | 9 | 24 | |
| 29 | 18 | 13 | 10 | 12 | 13 | 13 | 11 | 10 | 5 | 6 | 22 | 15 | 6 | 4 | 4 | 54 | 22 | 18 | 3 | S | 30 | 6 | 3 | 3 | 3 | 54 | 13 | 24 | |
| 30 | 17 | 7 | 3 | 7 | 8 | 9 | S1 | S1 | 10 | 7 | 8 | C1 | C1 | C1 | 11 | 8 | 9 | 6 | S | 6 | 8 | 21 | 22 | 16 | 3 | 22 | 10 | 19 | |
| HOURLY MAX | 18 | 18 | 16 | 36 | 61 | 36 | 55 | 31 | 31 | 22 | 36 | 37 | 63 | 23 | 31 | 54 | 60 | 40 | 37 | 37 | 36 | 73 | 28 | 37 | | | | | |
| HOURLY AVG | 6 | 6 | 6 | 8 | 11 | 10 | 14 | 12 | 12 | 10 | 11 | 14 | 12 | 8 | 13 | 13 | 12 | 8 | 10 | 10 | 12 | 14 | 7 | 8 | | | | | |

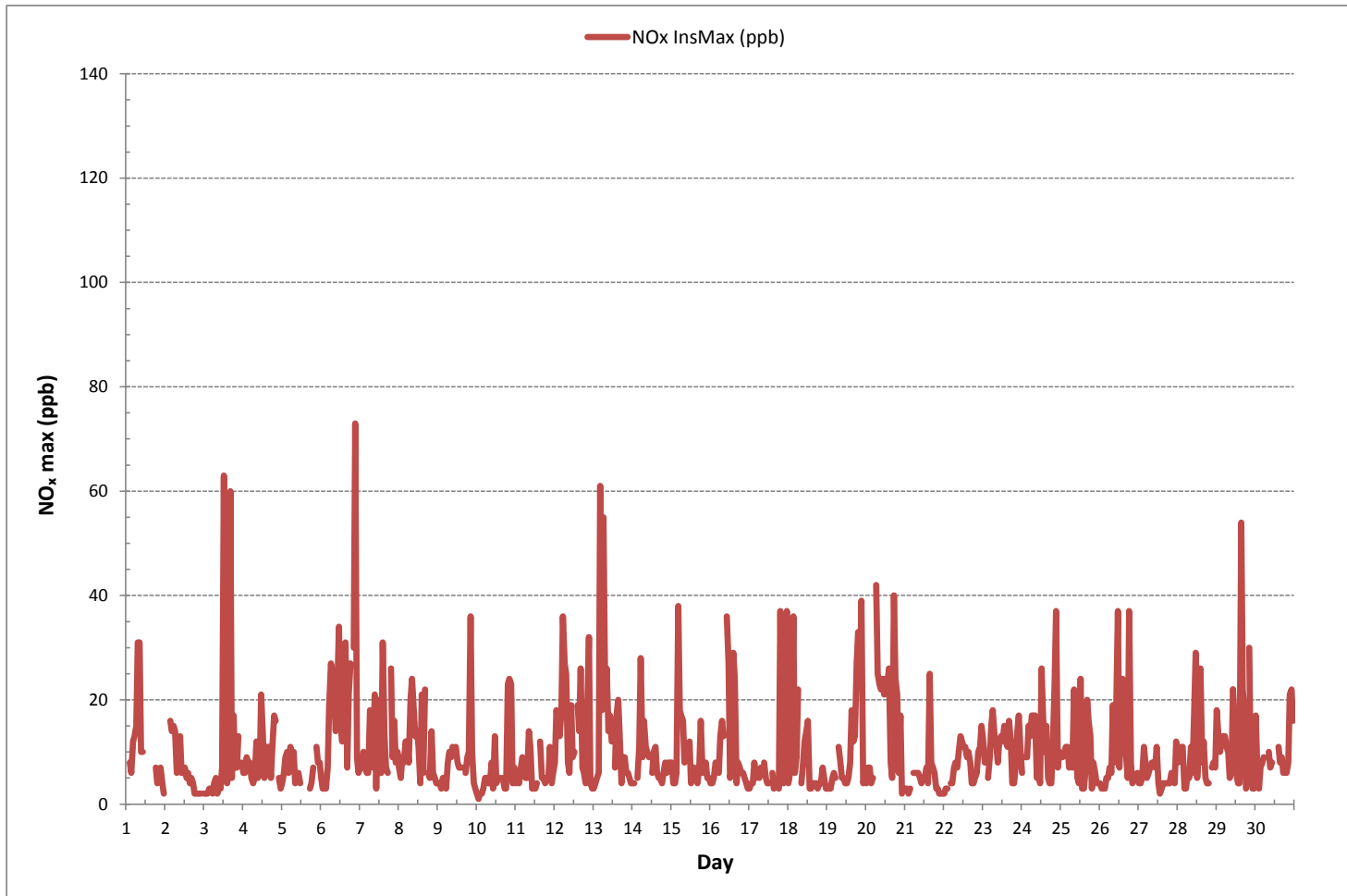
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 667 |
| MAXIMUM INSTANTANEOUS VALUE: | 73 ppb @ HOUR 21 ON DAY 6 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 9 |
| OPERATIONAL TIME: | 711 hrs |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

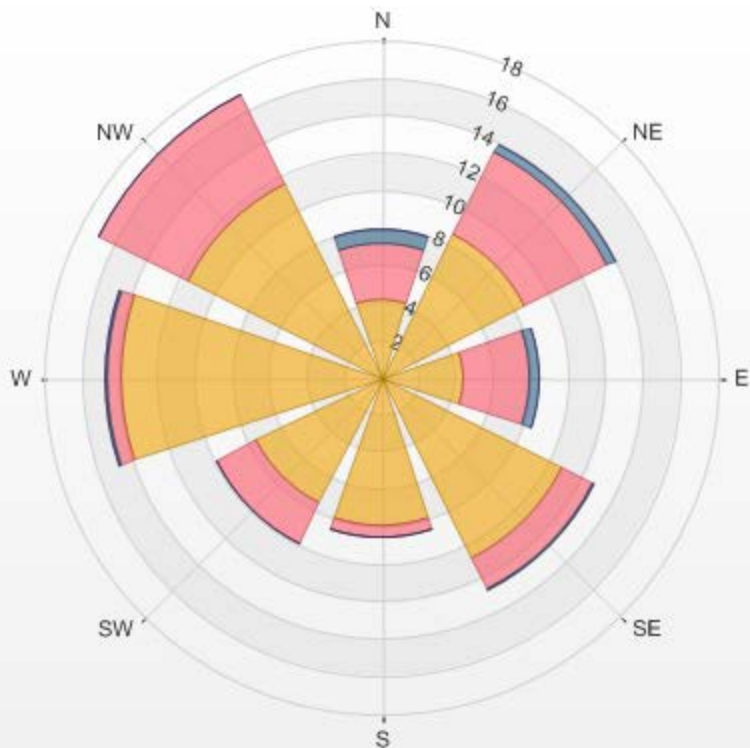
69 0.0-4.7

23 4.7-9.3

2 9.3-14.0

0 >14.0

LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.75% Calm Poll Avg: 6.61[ppb]



NITRIC OXIDES



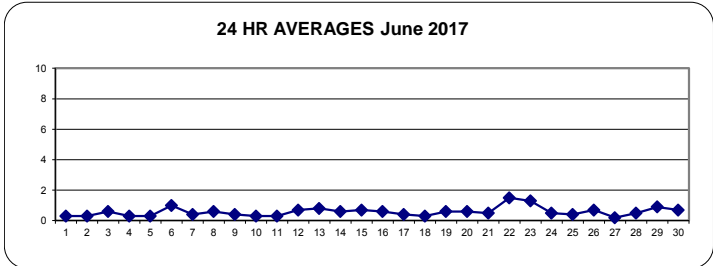
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

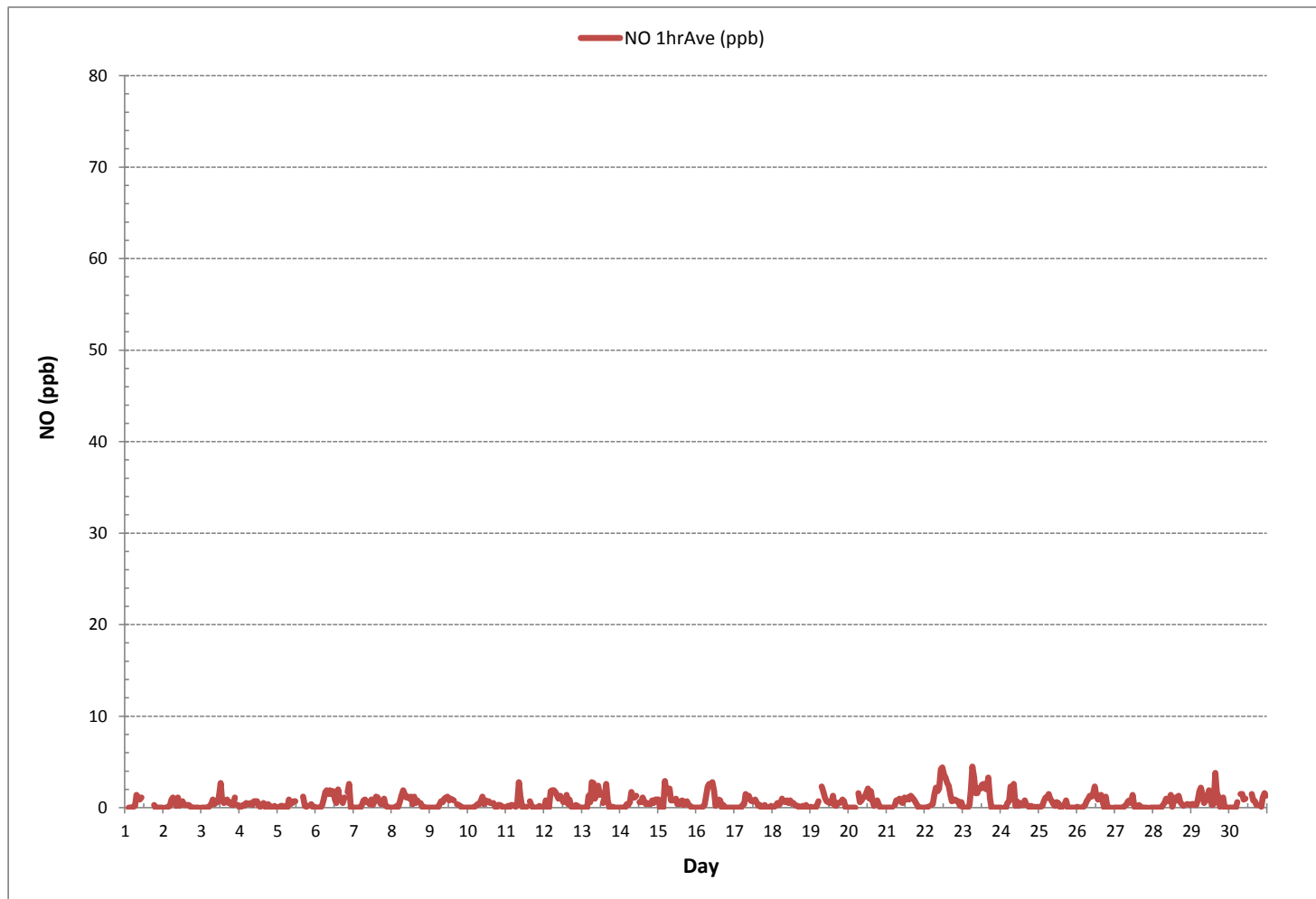
24 HR AVERAGES June 2017



MONTHLY SUMMARY

| | | | | | |
|------------------------------|-----|------------|-----------------------|--------|-----|
| NUMBER OF NON-ZERO READINGS: | 470 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 5 | ppb @ HOUR | 23 | ON DAY | 23 |
| MAXIMUM 24-HR AVERAGE: | 2 | ppb | | ON DAY | 22 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 716 | hrs |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 99.4 | % |
| STANDARD DEVIATION: | 1 | | MONTHLY AVERAGE: | 1 | ppb |

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - June 2017

NITRIC OXIDE Instantaneous Maximum (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 2 | S | 2 | 2 | 2 | 2 | 4 | 8 | 17 | 3 | 4 | C | C | C | C | C | C | C | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 17 | 3 | 24 |
| 2 | S | 1 | P | 2 | 3 | 4 | 5 | 3 | 5 | 7 | 6 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | S | 1 | 7 | 3 | 23 | |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 4 | 31 | 2 | 2 | 2 | 23 | 3 | 13 | 2 | 2 | 4 | S | 2 | 1 | 31 | 5 | 24 | |
| 4 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 2 | 5 | 3 | 2 | 10 | 5 | 2 | 3 | 6 | 1 | 2 | 5 | 8 | 2 | S | 2 | 1 | 1 | 10 | 3 | 24 | |
| 5 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | Q | Q | Q | Q | Q | 1 | 1 | 1 | S | 2 | 2 | 2 | 1 | 2 | 2 | 24 | |
| 6 | 1 | 1 | 1 | 1 | 2 | 7 | 19 | 16 | 11 | 7 | 12 | 17 | 11 | 6 | 19 | 20 | 3 | 7 | 11 | S | 10 | 43 | 2 | 1 | 1 | 43 | 10 | 24 | |
| 7 | 1 | 1 | 2 | 1 | 2 | 2 | 10 | 3 | 2 | 10 | 2 | 10 | 3 | 3 | 8 | 4 | 3 | 2 | S | 7 | 2 | 3 | 1 | 1 | 1 | 10 | 4 | 24 | |
| 8 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 6 | 10 | 5 | 7 | 5 | 8 | 2 | 8 | 2 | 10 | S | 2 | 2 | 10 | 1 | 1 | 1 | 1 | 10 | 4 | 24 | |
| 9 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | S | 2 | 4 | 3 | 12 | 3 | 1 | 2 | 1 | 12 | 2 | 24 | |
| 10 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 6 | 3 | 3 | 3 | S | 3 | 3 | 2 | 5 | 15 | 10 | 2 | 2 | 1 | 15 | 3 | 24 | |
| 11 | 2 | 4 | 2 | 3 | 3 | 3 | 2 | 3 | 7 | 6 | 2 | 2 | 2 | S | 5 | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 1 | 2 | 1 | 7 | 3 | 24 | |
| 12 | 1 | 5 | 3 | 2 | 5 | 21 | 17 | 14 | 5 | 3 | 16 | 5 | 10 | S | 15 | 9 | 16 | 2 | 7 | 2 | 8 | 25 | 1 | 1 | 1 | 25 | 8 | 24 | |
| 13 | 1 | 1 | 1 | 1 | 32 | 3 | 16 | 13 | 16 | 5 | 6 | 4 | S | 3 | 5 | 8 | 5 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 32 | 6 | 24 | |
| 14 | 1 | 2 | P | 1 | 4 | 14 | 3 | 5 | 3 | 3 | 3 | S | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 4 | 2 | 3 | 3 | 1 | 14 | 3 | 23 | |
| 15 | 4 | 2 | 1 | 1 | 14 | 4 | 4 | 5 | 3 | 3 | S | 4 | 2 | 2 | 2 | 3 | 2 | 4 | 13 | 2 | 2 | 2 | 2 | 1 | 1 | 14 | 4 | 24 | |
| 16 | 1 | 1 | 1 | 1 | 3 | 2 | 4 | 6 | 7 | S | 24 | 17 | 2 | 8 | 14 | 8 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 24 | 5 | 24 | |
| 17 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | S | 3 | 2 | 2 | 2 | P | 3 | 2 | 2 | 2 | 1 | 24 | 3 | 1 | 10 | 10 | 1 | 24 | 4 | 23 | |
| 18 | 1 | 1 | 2 | 23 | 3 | 3 | 12 | S | 2 | 3 | 9 | 7 | 8 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 1 | 1 | 23 | 4 | 24 | |
| 19 | 2 | 1 | 1 | 1 | 2 | 2 | S | 5 | 4 | 3 | 2 | 3 | 3 | 3 | 5 | 8 | 5 | 6 | 14 | 13 | 17 | 21 | 2 | 1 | 1 | 21 | 5 | 24 | |
| 20 | 1 | 1 | 2 | 1 | 2 | S | 25 | 12 | 8 | 12 | 14 | 15 | 16 | 10 | 16 | 4 | 3 | 15 | 13 | 13 | 7 | 10 | 1 | P | 1 | 25 | 9 | 23 | |
| 21 | 1 | 1 | 1 | 1 | S | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 20 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 20 | 3 | 24 | |
| 22 | 1 | 2 | 2 | S | 2 | 2 | 4 | 4 | 4 | 6 | 8 | 8 | 7 | 7 | 5 | 6 | 4 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 8 | 4 | 24 | |
| 23 | 2 | 2 | S | 2 | 3 | 6 | 8 | 10 | 6 | 4 | 6 | 6 | 6 | 8 | 6 | 5 | 8 | 6 | 2 | 1 | 2 | 2 | 2 | 3 | 1 | 10 | 5 | 24 | |
| 24 | 2 | S | 2 | 1 | 4 | 4 | 6 | 6 | 6 | 2 | 3 | 2 | 15 | 9 | 3 | 5 | 3 | 2 | 2 | 4 | 9 | 20 | 2 | 3 | 1 | 20 | 5 | 24 | |
| 25 | S | 2 | 3 | 3 | 4 | 3 | 4 | 4 | 14 | 5 | 3 | 3 | 17 | 2 | 2 | 3 | 5 | 13 | 8 | 2 | 3 | 2 | 1 | S | 1 | 17 | 5 | 24 | |
| 26 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 5 | 6 | 12 | 25 | 5 | 8 | 17 | 9 | 5 | 2 | 12 | 2 | 1 | 1 | S | 1 | 1 | 25 | 5 | 24 | |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 7 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | S | 2 | 4 | 1 | 7 | 2 | 24 | |
| 28 | 5 | 3 | 3 | 3 | 2 | 1 | 3 | 3 | 9 | 3 | 15 | 24 | 3 | 4 | 18 | 3 | 6 | 3 | 3 | 2 | S | 3 | 3 | 3 | 1 | 24 | 5 | 24 | |
| 29 | 6 | 3 | 2 | 3 | 4 | 5 | 5 | 3 | 4 | 16 | 11 | 4 | 2 | 2 | 33 | 12 | 12 | 2 | S | 18 | 2 | 1 | 1 | 1 | 1 | 33 | 7 | 24 | |
| 30 | 2 | 1 | 1 | 2 | 2 | 3 | S1 | S1 | 4 | 3 | 3 | C1 | C1 | C1 | 6 | 2 | 3 | 2 | S | 1 | 1 | 5 | 5 | 4 | 1 | 6 | 3 | 19 | |
| HOURLY MAX | 6 | 5 | 3 | 23 | 32 | 21 | 25 | 16 | 17 | 12 | 24 | 25 | 31 | 10 | 19 | 33 | 23 | 15 | 14 | 24 | 18 | 43 | 10 | 10 | | | | | |
| HOURLY AVG | 2 | 2 | 2 | 2 | 4 | 4 | 6 | 6 | 6 | 4 | 7 | 8 | 7 | 4 | 7 | 7 | 5 | 4 | 5 | 4 | 5 | 6 | 2 | 2 | | | | | |

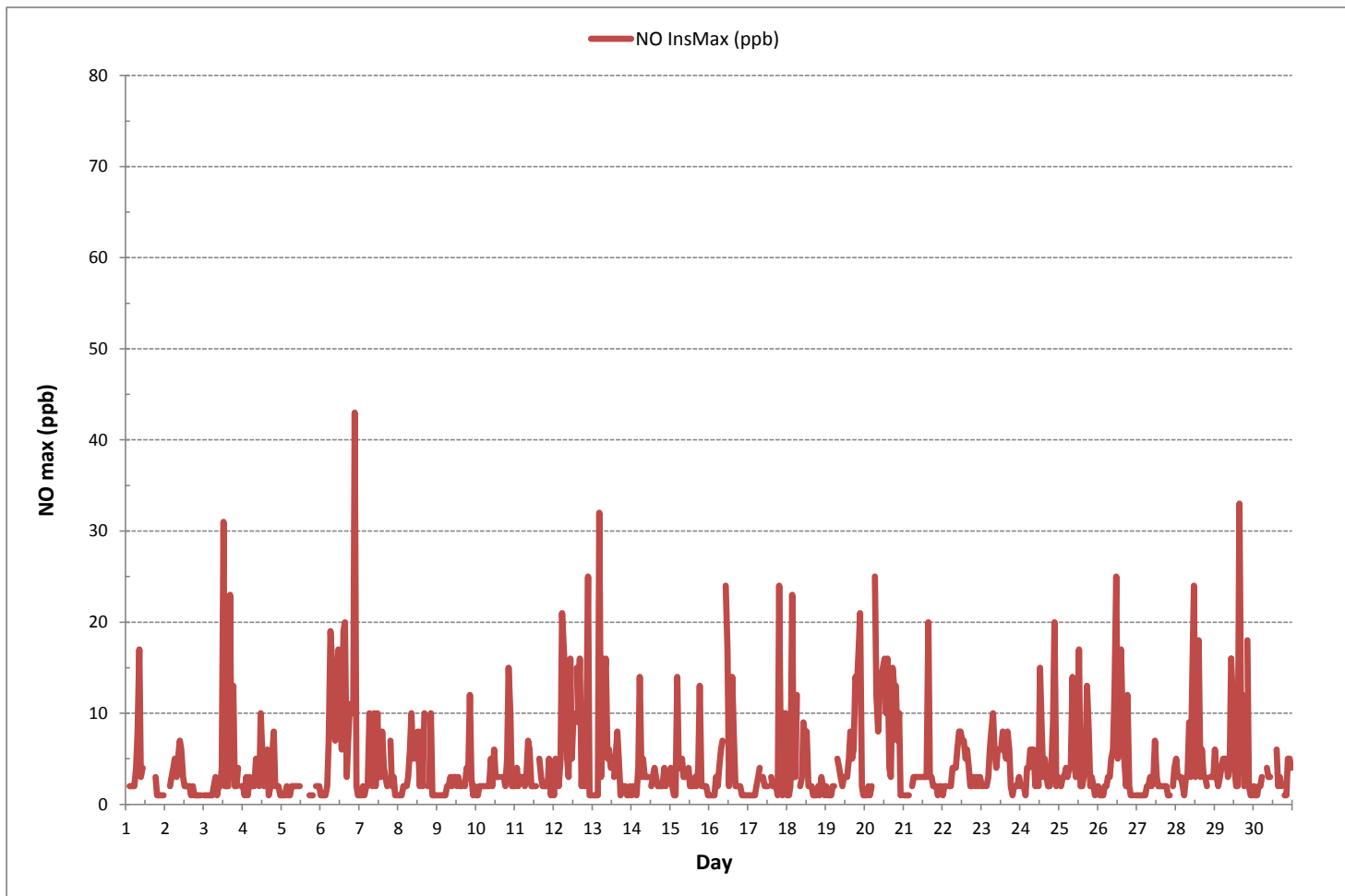
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 667 |
| MAXIMUM INSTANTANEOUS VALUE: | 43 ppb @ HOUR 21 ON DAY 6 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 711 hrs |
| STANDARD DEVIATION: | 5 |

NITRIC OXIDE Instantaneous Maximum (NO ppb)



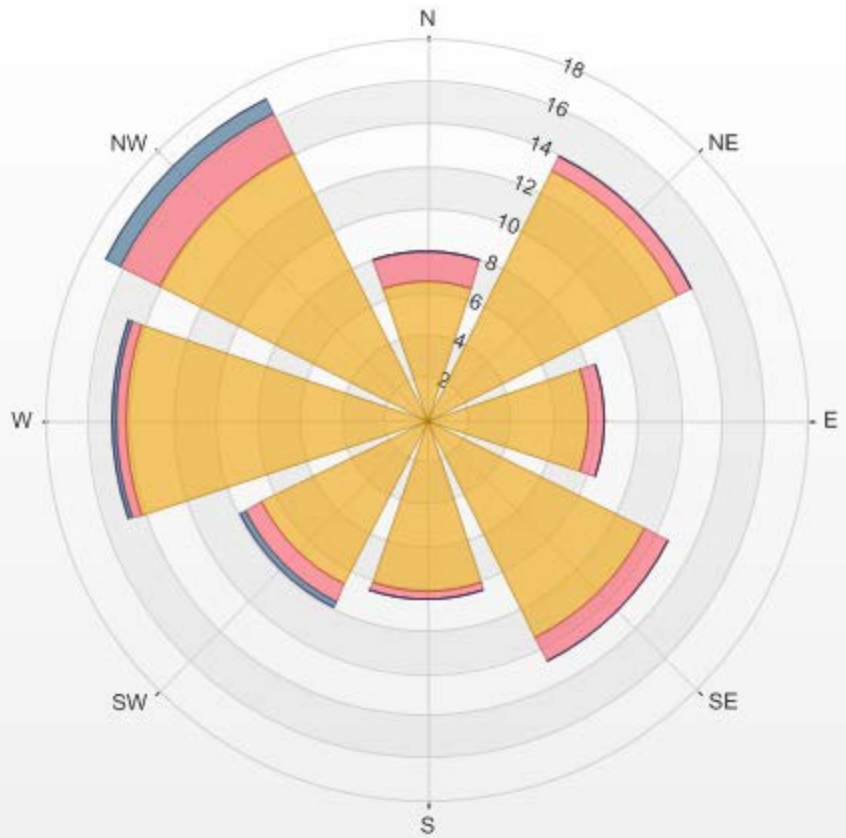
Wind: LICA Bonnyville
Poll.: LICA Bonnyville-NO [ppb]
Monthly: 17/06
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 6.75% Calm Avg: 0.65 [ppb]

| Direction | 0.0-1.5 | 1.5-3.1 | 3.1-4.6 | >4.6 | Total |
|-----------|---------|---------|---------|------|-------|
| N | 6.6 | 1.4 | 0.0 | 0.0 | 8.0 |
| NE | 13.2 | 0.8 | 0.0 | 0.0 | 13.9 |
| E | 7.7 | 0.8 | 0.0 | 0.0 | 8.4 |
| SE | 11.5 | 1.2 | 0.0 | 0.0 | 12.7 |
| S | 8.1 | 0.5 | 0.0 | 0.0 | 8.6 |
| SW | 8.7 | 0.9 | 0.3 | 0.0 | 9.9 |
| W | 14.2 | 0.5 | 0.2 | 0.0 | 14.8 |
| NW | 14.1 | 2.1 | 0.8 | 0.0 | 16.9 |
| Summary | 84.1 | 8.0 | 1.2 | 0.0 | 93.3 |

% Icon Classes (ppb) 84 0.0-1.5 8 1.5-3.1 1 3.1-4.6 0 >4.6

LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.75% Calm Poll Avg: 0.65[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

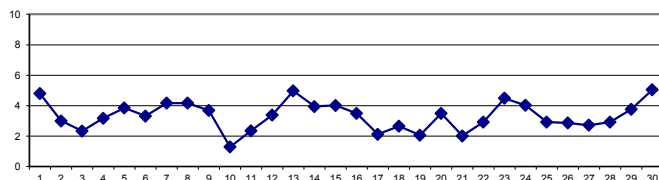
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 673 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 | ON DAY 10 |
| MAXIMUM 1-HR AVERAGE: | 12 ppb | @ HOUR | 21 | ON DAY 30 |
| MAXIMUM 24-HR AVERAGE: | 5 ppb | | | ON DAY 30 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 716 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 99.4 % | |
| STANDARD DEVIATION: | 2 | MONTHLY AVERAGE: | 3 ppb | |

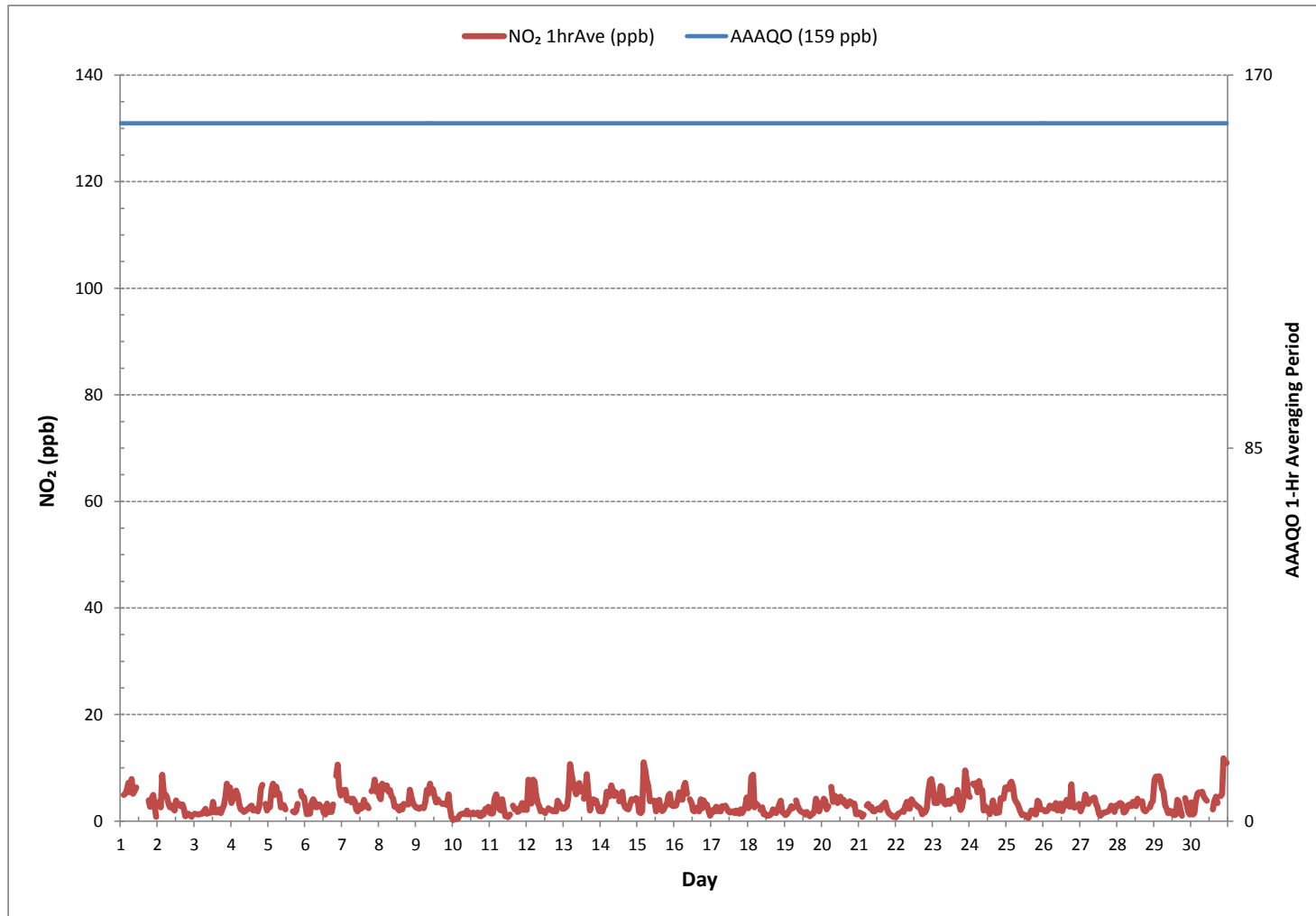
24 HR AVERAGES June 2017





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | |
| DAY 1 | 3 | S | 6 | 6 | 10 | 12 | 13 | 24 | 20 | 8 | 8 | C | C | C | C | C | C | C | 5 | 4 | 6 | 7 | 4 | 4 | 3 | 24 | 9 | 24 |
| 2 | S | 4 | P | 15 | 13 | 13 | 9 | 5 | 6 | 7 | 5 | 4 | 6 | 4 | 5 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | S | 2 | 15 | 6 | 23 |
| 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 49 | 3 | 3 | 4 | 37 | 3 | 4 | 6 | 6 | 10 | S | 7 | 2 | 49 | 7 | 24 |
| 4 | 6 | 6 | 7 | 7 | 7 | 4 | 3 | 3 | 10 | 4 | 4 | 13 | 11 | 4 | 10 | 8 | 10 | 4 | 9 | 15 | 15 | S | 5 | 3 | 3 | 15 | 7 | 24 |
| 5 | 4 | 5 | 9 | 9 | 6 | 11 | 7 | 9 | 3 | 4 | 4 | 3 | Q | Q | Q | Q | Q | 2 | 3 | 6 | S | 9 | 7 | 7 | 2 | 11 | 6 | 24 |
| 6 | 5 | 3 | 3 | 4 | 6 | 14 | 10 | 11 | 11 | 9 | 14 | 22 | 10 | 7 | 16 | 12 | 4 | 15 | 17 | S | 20 | 35 | 8 | 6 | 3 | 35 | 11 | 24 |
| 7 | 7 | 7 | 9 | 7 | 5 | 5 | 9 | 7 | 5 | 14 | 3 | 14 | 4 | 5 | 24 | 11 | 6 | 4 | S | 19 | 8 | 13 | 8 | 10 | 3 | 24 | 9 | 24 |
| 8 | 7 | 5 | 9 | 8 | 10 | 10 | 6 | 15 | 17 | 15 | 10 | 11 | 8 | 3 | 16 | 4 | 14 | S | 5 | 5 | 9 | 5 | 4 | 4 | 3 | 17 | 9 | 24 |
| 9 | 4 | 4 | 3 | 5 | 4 | 3 | 7 | 8 | 7 | 9 | 8 | 8 | 7 | 5 | 6 | 5 | S | 4 | 6 | 7 | 24 | 8 | 4 | 2 | 2 | 24 | 6 | 24 |
| 10 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 5 | 2 | 10 | 2 | 3 | 2 | S | 3 | 2 | 2 | 19 | 11 | 14 | 3 | 6 | 1 | 19 | 4 | 24 | |
| 11 | 2 | 2 | 3 | 5 | 7 | 5 | 3 | 3 | 7 | 6 | 2 | 2 | 2 | 3 | S | 7 | 3 | 3 | 3 | 3 | 5 | 7 | 3 | 4 | 2 | 7 | 4 | 24 |
| 12 | 7 | 15 | 14 | 12 | 13 | 21 | 11 | 17 | 4 | 3 | 7 | 5 | 6 | S | 9 | 8 | 15 | 6 | 4 | 3 | 12 | 9 | 4 | 3 | 3 | 21 | 9 | 24 |
| 13 | 3 | 3 | 4 | 6 | 35 | 16 | 39 | 13 | 14 | 10 | 11 | 9 | S | 5 | 12 | 13 | 10 | 4 | 7 | 8 | 5 | 5 | 4 | 3 | 39 | 10 | 24 | |
| 14 | 4 | 3 | P | 4 | 10 | 17 | 7 | 11 | 9 | 7 | 7 | S | 5 | 8 | 8 | 4 | 4 | 3 | 3 | 5 | 6 | 5 | 6 | 6 | 3 | 17 | 6 | 23 |
| 15 | 5 | 3 | 3 | 6 | 25 | 14 | 14 | 11 | 6 | 7 | S | 8 | 3 | 5 | 5 | 3 | 3 | 5 | 5 | 6 | 7 | 5 | 4 | 3 | 25 | 7 | 24 | |
| 16 | 4 | 4 | 5 | 7 | 6 | 5 | 9 | 11 | 6 | S | 17 | 10 | 3 | 4 | 14 | 17 | 3 | 6 | 5 | 6 | 5 | 4 | 4 | 2 | 2 | 17 | 7 | 24 |
| 17 | 3 | 3 | 4 | 7 | 5 | 4 | 3 | 4 | S | 5 | 3 | 3 | 3 | P | 4 | 2 | 3 | 2 | 3 | 16 | 4 | 4 | 19 | 27 | 2 | 27 | 6 | 23 |
| 18 | 4 | 6 | 11 | 15 | 4 | 7 | 11 | S | 3 | 6 | 4 | 8 | 7 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 4 | 6 | 4 | 3 | 2 | 15 | 5 | 24 |
| 19 | 2 | 3 | 3 | 4 | 5 | 3 | S | 6 | 5 | 3 | 3 | 2 | 2 | 3 | 3 | 10 | 8 | 7 | 15 | 28 | 12 | 17 | 3 | 4 | 2 | 28 | 7 | 24 |
| 20 | 4 | 6 | 6 | 3 | 4 | S | 18 | 14 | 17 | 11 | 14 | 8 | 12 | 13 | 13 | 5 | 3 | 25 | 15 | 11 | 4 | 11 | 2 | P | 2 | 25 | 10 | 23 |
| 21 | 3 | 3 | 1 | 3 | S | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 3 | 4 | 3 | 13 | 5 | 5 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 13 | 3 | 24 |
| 22 | 1 | 2 | 2 | S | 2 | 3 | 4 | 5 | 4 | 5 | 6 | 5 | 5 | 5 | 4 | 5 | 5 | 2 | 3 | 3 | 4 | 8 | 10 | 12 | 1 | 12 | 5 | 24 |
| 23 | 10 | 7 | S | 4 | 6 | 9 | 10 | 6 | 10 | 5 | 7 | 7 | 7 | 8 | 7 | 6 | 10 | 7 | 3 | 3 | 6 | 14 | 16 | 7 | 3 | 16 | 8 | 24 |
| 24 | 6 | S | 8 | 8 | 13 | 10 | 11 | 12 | 11 | 3 | 5 | 3 | 12 | 10 | 7 | 11 | 3 | 3 | 2 | 7 | 14 | 18 | 7 | 9 | 2 | 18 | 8 | 24 |
| 25 | S | 9 | 8 | 9 | 9 | 6 | 5 | 4 | 9 | 8 | 2 | 2 | 9 | 2 | 2 | 3 | 18 | 6 | 9 | 3 | 6 | 5 | 3 | S | 2 | 18 | 6 | 24 |
| 26 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 4 | 16 | 4 | 13 | 21 | 5 | 10 | 12 | 10 | 6 | 4 | 27 | 6 | 4 | 5 | S | 5 | 3 | 27 | 8 | 24 |
| 27 | 4 | 4 | 5 | 10 | 8 | 4 | 5 | 6 | 6 | 6 | 5 | 6 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 4 | 6 | S | 3 | 9 | 1 | 10 | 5 | 24 |
| 28 | 4 | 8 | 9 | 9 | 2 | 3 | 3 | 4 | 7 | 4 | 5 | 8 | 4 | 8 | 9 | 5 | 7 | 3 | 2 | 3 | S | 4 | 6 | 5 | 2 | 9 | 5 | 24 |
| 29 | 12 | 12 | 9 | 11 | 10 | 9 | 7 | 5 | 3 | 3 | 10 | 9 | 3 | 2 | 2 | 23 | 11 | 10 | 2 | S | 14 | 5 | 3 | 3 | 2 | 23 | 8 | 24 |
| 30 | 15 | 7 | 3 | 7 | 7 | 7 | S1 | S1 | 7 | 5 | 6 | C1 | C1 | C1 | 6 | 7 | 7 | 5 | S | 6 | 8 | 17 | 18 | 13 | 3 | 18 | 8 | 19 |
| HOURLY MAX | 15 | 15 | 14 | 15 | 35 | 21 | 39 | 24 | 20 | 15 | 17 | 22 | 49 | 13 | 24 | 23 | 37 | 25 | 27 | 28 | 24 | 35 | 19 | 27 | 3 | 18 | 8 | 19 |
| HOURLY AVG | 5 | 5 | 6 | 7 | 8 | 8 | 9 | 8 | 8 | 6 | 7 | 8 | 7 | 5 | 8 | 8 | 8 | 5 | 6 | 7 | 8 | 9 | 6 | 6 | | | | |

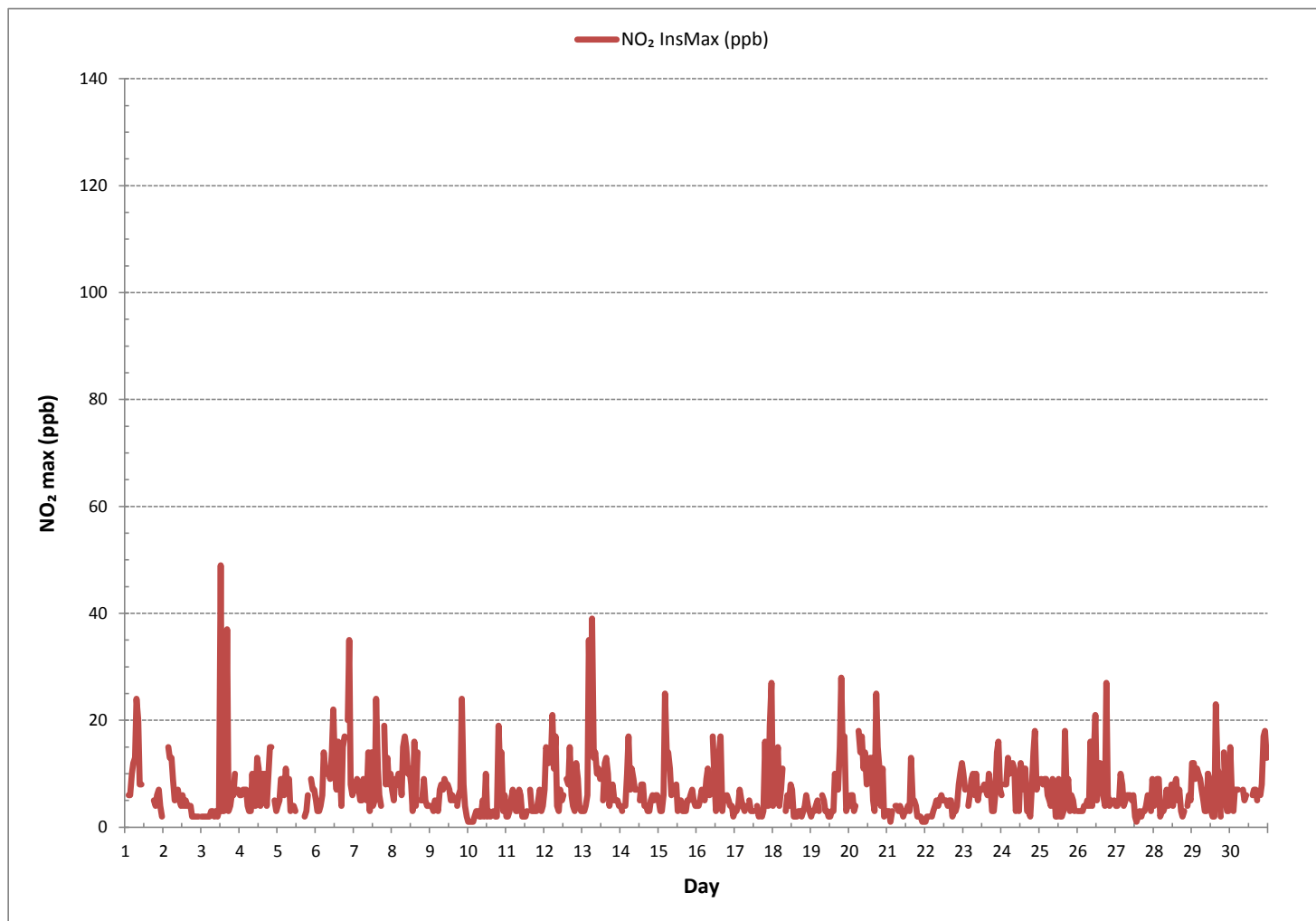
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 667 |
| MAXIMUM INSTANTANEOUS VALUE: | 49 ppb @ HOUR 12 ON DAY 3 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 5 |
| OPERATIONAL TIME: | 711 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NO₂ [ppb]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.75% Calm Avg: 5.96 [ppb]

| Direction | 0.0-4.0 | 4.0-7.9 | 7.9-11.9 | >11.9 | Total |
|----------------|---------|---------|----------|-------|-------|
| N | 4.2 | 3.2 | 0.6 | 0.0 | 8.0 |
| NE | 8.4 | 5.3 | 0.3 | 0.0 | 14.0 |
| E | 4.1 | 4.1 | 0.3 | 0.0 | 8.4 |
| SE | 10.6 | 2.0 | 0.2 | 0.0 | 12.7 |
| S | 8.1 | 0.5 | 0.0 | 0.0 | 8.6 |
| SW | 7.8 | 2.0 | 0.2 | 0.0 | 9.9 |
| W | 14.4 | 0.5 | 0.0 | 0.0 | 14.8 |
| NW | 12.6 | 4.4 | 0.0 | 0.0 | 16.9 |
| Summary | 70.2 | 21.6 | 1.5 | 0.0 | 93.3 |

% Icon Classes (ppb)

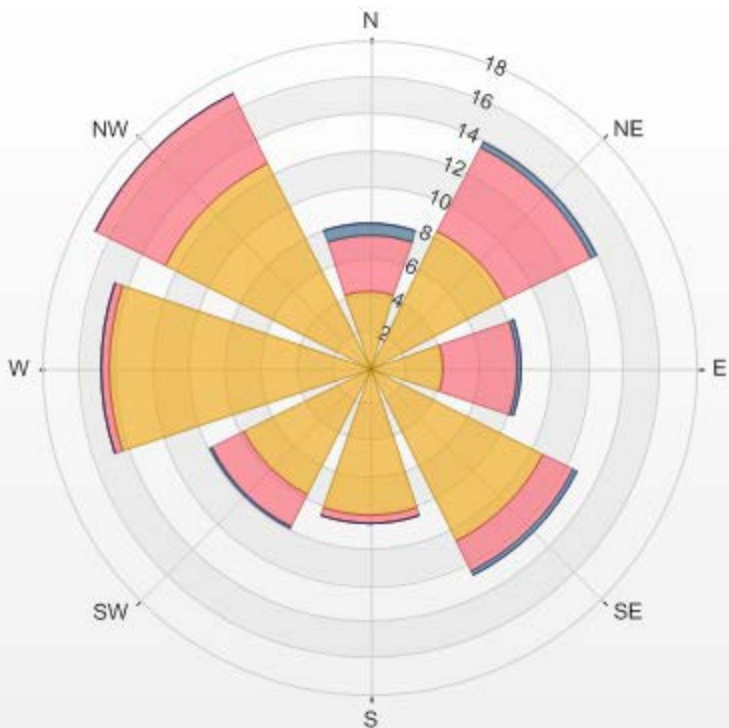
70 0.0-4.0

22 4.0-7.9

2 7.9-11.9

0 >11.9

LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.75% Calm Poll Avg: 5.96[ppb]



NO2[ppb] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

OZONE



OZONE Hourly Averages (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 41.3 | S | 33.1 | 30.2 | 27.5 | 25.7 | 26.0 | 22.2 | 26.0 | 27.2 | 31.4 | 34.0 | 39.3 | 35.9 | 47.1 | 47.7 | 46.6 | 47.1 | 42.4 | 36.4 | 31.4 | 28.4 | 25.9 | 25.2 | 22.2 | 47.7 | 33.8 | 24 |
| 2 | S | 22.2 | 20.1 | 17.7 | 21.0 | 18.8 | 20.6 | 25.4 | 27.1 | 27.0 | 27.3 | 26.7 | 24.8 | 26.7 | 30.4 | 33.5 | C | C | C | C | 30.6 | 29.7 | 24.7 | S | 17.7 | 33.5 | 25.2 | 24 |
| 3 | 25.8 | 24.3 | 24.0 | 22.8 | 22.7 | 24.4 | 27.2 | 28.6 | 30.3 | 32.3 | 34.4 | 33.8 | 34.7 | 35.7 | 37.1 | 40.4 | 42.3 | 44.4 | 44.9 | 41.8 | 35.9 | 30.2 | S | 27.0 | 22.7 | 44.9 | 32.4 | 24 |
| 4 | 30.6 | 25.1 | 21.7 | 14.3 | 13.6 | 15.3 | 19.2 | 22.1 | 25.8 | 33.8 | 40.4 | 43.3 | 44.1 | 43.7 | 47.4 | 49.3 | 47.7 | 46.0 | 44.0 | 36.3 | 31.8 | S | 36.2 | 41.0 | 13.6 | 49.3 | 33.6 | 24 |
| 5 | 38.8 | 30.5 | 24.5 | 21.5 | 24.3 | 23.8 | 26.5 | 20.6 | 25.2 | 28.8 | 30.3 | 35.2 | 38.0 | 41.6 | 44.2 | 43.4 | Q | Q | 41.1 | 38.4 | S | 32.7 | 28.9 | 27.9 | 20.6 | 44.2 | 31.7 | 24 |
| 6 | 29.5 | 30.4 | 30.3 | 30.1 | 26.1 | 24.8 | 27.4 | 34.3 | 35.6 | 35.1 | 39.1 | 40.4 | 40.7 | 41.8 | 42.7 | 46.3 | 45.5 | 46.4 | 44.7 | S | 39.1 | 33.2 | 35.0 | 34.4 | 24.8 | 46.4 | 36.2 | 24 |
| 7 | 32.4 | 29.9 | 27.2 | 35.0 | 36.1 | 34.7 | 38.5 | 42.6 | 46.1 | 50.5 | 55.2 | 57.6 | 57.7 | 57.7 | 56.1 | 57.9 | 57.8 | 57.7 | S | 50.6 | 46.3 | 42.6 | 42.2 | 40.0 | 27.2 | 57.9 | 45.8 | 24 |
| 8 | 40.4 | 38.7 | 28.4 | 23.4 | 21.5 | 21.3 | 22.8 | 28.8 | 35.0 | 45.0 | 51.7 | 53.0 | 55.1 | 56.0 | 56.2 | 57.7 | 57.2 | S | 55.5 | 52.6 | 47.6 | 44.6 | 43.1 | 43.3 | 21.3 | 57.7 | 42.6 | 24 |
| 9 | 41.9 | 38.8 | 36.7 | 34.4 | 33.4 | 32.7 | 30.8 | 27.3 | 26.4 | 23.2 | 23.9 | 25.6 | 27.4 | 31.8 | 35.3 | 33.6 | S | 33.3 | 31.6 | 34.2 | 52.6 | 48.0 | 47.2 | 33.8 | 23.2 | 52.6 | 34.1 | 24 |
| 10 | 21.4 | 20.5 | 20.0 | 21.4 | 21.8 | 21.7 | 22.1 | 22.6 | 22.4 | 22.0 | 22.1 | 21.6 | 21.3 | 21.1 | 21.4 | S | 22.2 | 22.9 | 22.9 | 21.6 | 21.2 | 16.3 | 15.5 | 14.6 | 14.6 | 22.9 | 20.9 | 24 |
| 11 | 14.7 | 13.2 | 12.4 | 11.8 | 18.1 | 23.4 | 26.7 | 30.0 | 28.1 | 31.4 | 32.8 | 33.2 | 34.6 | 34.8 | S | 34.5 | 35.2 | 33.9 | 33.5 | 32.8 | 29.2 | 25.6 | 21.8 | 20.2 | 11.8 | 35.2 | 26.6 | 24 |
| 12 | 19.9 | 14.9 | 14.3 | 20.4 | 10.0 | 11.7 | 18.9 | 24.7 | 26.3 | 28.6 | 29.3 | 32.4 | 34.1 | S | 35.9 | 38.1 | 39.3 | 41.5 | 41.9 | 41.0 | 37.9 | 36.7 | 36.0 | 34.6 | 10.0 | 41.9 | 29.1 | 24 |
| 13 | 33.0 | 30.6 | 28.7 | 25.1 | 16.3 | 18.4 | 21.8 | 24.9 | 28.0 | 27.7 | 26.0 | 32.1 | S | 41.9 | 47.3 | 39.0 | 38.3 | 44.1 | 39.1 | 39.2 | 39.5 | 36.0 | 36.8 | 34.8 | 16.3 | 47.3 | 32.5 | 24 |
| 14 | 32.4 | 32.4 | 27.1 | 25.7 | 22.9 | 23.5 | 23.2 | 23.6 | 28.7 | 29.5 | 30.1 | S | 31.3 | 27.6 | 26.8 | 28.9 | 29.5 | 27.3 | 23.3 | 19.4 | 15.3 | 13.9 | 12.2 | 10.4 | 10.4 | 32.4 | 24.6 | 24 |
| 15 | 9.4 | 25.7 | 29.1 | 30.2 | 17.4 | 16.6 | 21.6 | 31.2 | 35.8 | 35.9 | S | 34.1 | 36.4 | 30.4 | 32.2 | 29.6 | 28.5 | 27.3 | 26.3 | 27.6 | 27.2 | 25.6 | 28.7 | 24.3 | 9.4 | 36.4 | 27.4 | 24 |
| 16 | 20.2 | 20.2 | 16.7 | 13.4 | 14.1 | 15.6 | 13.2 | 13.5 | 13.6 | S | 23.7 | 31.9 | 35.1 | 37.2 | 38.9 | 39.5 | 38.9 | 35.9 | 33.8 | 31.3 | 32.6 | 28.2 | 26.9 | 26.0 | 13.2 | 39.5 | 26.1 | 24 |
| 17 | 21.8 | 19.8 | 22.5 | 21.1 | 22.1 | 19.1 | 17.9 | 20.1 | S | 24.7 | 26.9 | 27.6 | 27.0 | 26.9 | 28.4 | 30.4 | 31.9 | 33.8 | 33.2 | 30.0 | 30.6 | 31.0 | 27.8 | 25.1 | 17.9 | 33.8 | 26.1 | 24 |
| 18 | 25.4 | 22.1 | 15.0 | 10.5 | 19.0 | 21.0 | 22.0 | S | 28.0 | 30.0 | 36.4 | 41.8 | 41.8 | 43.7 | 43.8 | 42.3 | 38.2 | 37.2 | 36.9 | 34.3 | 30.8 | 29.2 | 34.9 | 32.8 | 10.5 | 43.8 | 31.2 | 24 |
| 19 | 35.3 | 33.3 | 30.1 | 27.9 | 23.2 | 20.9 | S | 23.0 | 25.2 | 27.3 | 28.4 | 30.0 | 31.5 | 32.7 | 33.4 | 34.2 | 34.6 | 35.8 | 35.8 | 34.5 | 30.3 | 28.9 | 28.9 | 27.5 | 20.9 | 35.8 | 30.1 | 24 |
| 20 | 27.5 | 26.0 | 28.4 | 30.7 | 30.7 | S | 26.5 | 29.9 | 26.4 | 26.8 | 30.4 | 29.0 | 29.6 | 35.1 | 35.4 | 38.3 | 39.1 | 41.0 | 39.4 | 37.0 | 36.9 | 33.0 | 33.9 | 33.2 | 26.0 | 41.0 | 32.4 | 24 |
| 21 | 33.1 | 32.3 | 31.6 | 27.2 | S | 20.9 | 23.0 | 26.2 | 28.5 | 31.3 | 29.9 | 27.0 | 26.7 | 27.8 | 29.4 | 29.5 | 30.0 | 30.0 | 29.9 | 29.9 | 29.7 | 27.0 | 25.6 | 24.8 | 20.9 | 33.1 | 28.3 | 24 |
| 22 | 22.0 | 18.8 | 17.7 | S | 19.5 | 20.8 | 23.1 | 20.3 | 23.8 | 21.1 | 18.5 | 20.4 | 21.3 | 23.4 | 24.0 | 26.6 | 29.7 | 29.8 | 28.0 | 26.9 | 24.8 | 20.0 | 15.5 | 14.4 | 14.4 | 29.8 | 22.2 | 24 |
| 23 | 13.0 | 14.2 | S | 14.0 | 11.3 | 9.6 | 12.2 | 17.6 | 22.9 | 24.8 | 27.4 | 28.4 | 29.6 | 29.9 | 31.8 | 31.8 | 32.1 | 34.7 | 39.8 | 39.1 | 32.8 | 28.8 | 18.8 | 22.3 | 9.6 | 39.8 | 24.4 | 24 |
| 24 | 28.6 | S | 17.6 | 17.6 | 14.4 | 16.9 | 17.1 | 20.0 | 22.7 | 28.1 | 29.9 | 32.4 | 32.9 | 32.5 | 31.4 | 30.9 | 29.9 | 29.9 | 31.2 | 30.4 | 26.0 | 23.4 | 22.5 | 14.8 | 14.4 | 32.9 | 25.3 | 24 |
| 25 | S | 11.0 | 7.8 | 5.3 | 7.5 | 10.6 | 13.5 | 21.9 | 28.7 | 36.2 | 37.3 | 37.6 | 38.3 | 36.8 | 36.8 | 39.7 | 41.0 | 40.8 | 40.8 | 39.6 | 34.3 | 33.1 | 34.7 | S | 5.3 | 41.0 | 28.8 | 24 |
| 26 | 37.5 | 37.2 | 35.6 | 34.3 | 33.2 | 32.9 | 33.9 | 34.1 | 34.5 | 37.4 | 36.7 | 38.8 | 41.0 | 40.0 | 40.2 | 39.5 | 40.9 | 39.5 | 37.3 | 38.0 | 37.8 | 34.8 | S | 28.2 | 28.2 | 41.0 | 36.7 | 24 |
| 27 | 30.4 | 31.3 | 31.0 | 28.0 | 23.6 | 27.2 | 30.6 | 28.8 | 31.1 | 34.3 | 36.3 | 36.9 | 36.0 | 35.6 | 34.7 | 32.8 | 34.3 | 36.5 | 39.4 | 41.0 | 37.3 | S | 25.9 | 19.5 | 19.5 | 41.0 | 32.3 | 24 |
| 28 | 16.6 | 15.3 | 14.9 | 14.7 | 16.4 | 19.1 | 19.8 | 19.2 | 19.2 | 21.8 | 24.8 | 25.4 | 23.1 | 25.3 | 26.6 | 26.3 | 25.9 | 20.3 | 21.9 | 21.2 | S | 24.8 | 24.1 | 22.1 | 14.7 | 26.6 | 21.3 | 24 |
| 29 | 16.3 | 12.9 | 12.1 | 9.7 | 10.1 | 11.5 | 15.6 | 24.1 | 27.9 | 26.9 | 26.0 | 26.4 | 28.6 | 29.3 | 30.5 | 27.8 | 26.2 | 30.0 | 28.8 | S | 22.0 | 24.1 | 30.3 | 29.7 | 9.7 | 30.5 | 22.9 | 24 |
| 30 | 27.1 | 25.4 | 23.6 | 18.4 | 15.8 | 15.1 | 12.8 | 15.3 | 17.8 | 22.7 | 24.8 | 23.8 | 25.7 | 28.0 | 29.1 | 24.8 | 23.3 | 23.5 | S | 23.6 | 23.2 | 11.2 | 10.5 | 8.0 | 8.0 | 29.1 | 20.6 | 24 |
| HOURLY MAX | 41.9 | 38.8 | 36.7 | 35.0 | 36.1 | 34.7 | 38.5 | 42.6 | 46.1 | 50.5 | 55.2 | 57.6 | 57.7 | 57.7 | 56.2 | 57.9 | 57.8 | 57.7 | 55.5 | 52.6 | 52.6 | 48.0 | 47.2 | 43.3 | | | | |
| HOURLY AVG | 27.4 | 24.9 | 23.5 | 22.0 | 20.5 | 20.6 | 22.6 | 24.9 | 27.5 | 30.0 | 31.4 | 33.1 | 34.1 | 34.9 | 36.4 | 37.0 | 36.5 | 35.9 | 35.8 | 34.4 | 32.7 | 29.1 | 28.4 | 26.4 | | | | |

STATUS FLAG CODES

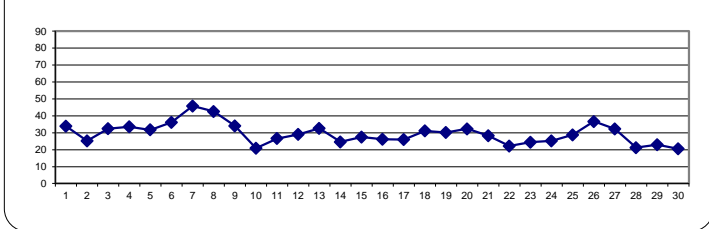
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 1-HR 82 ppb

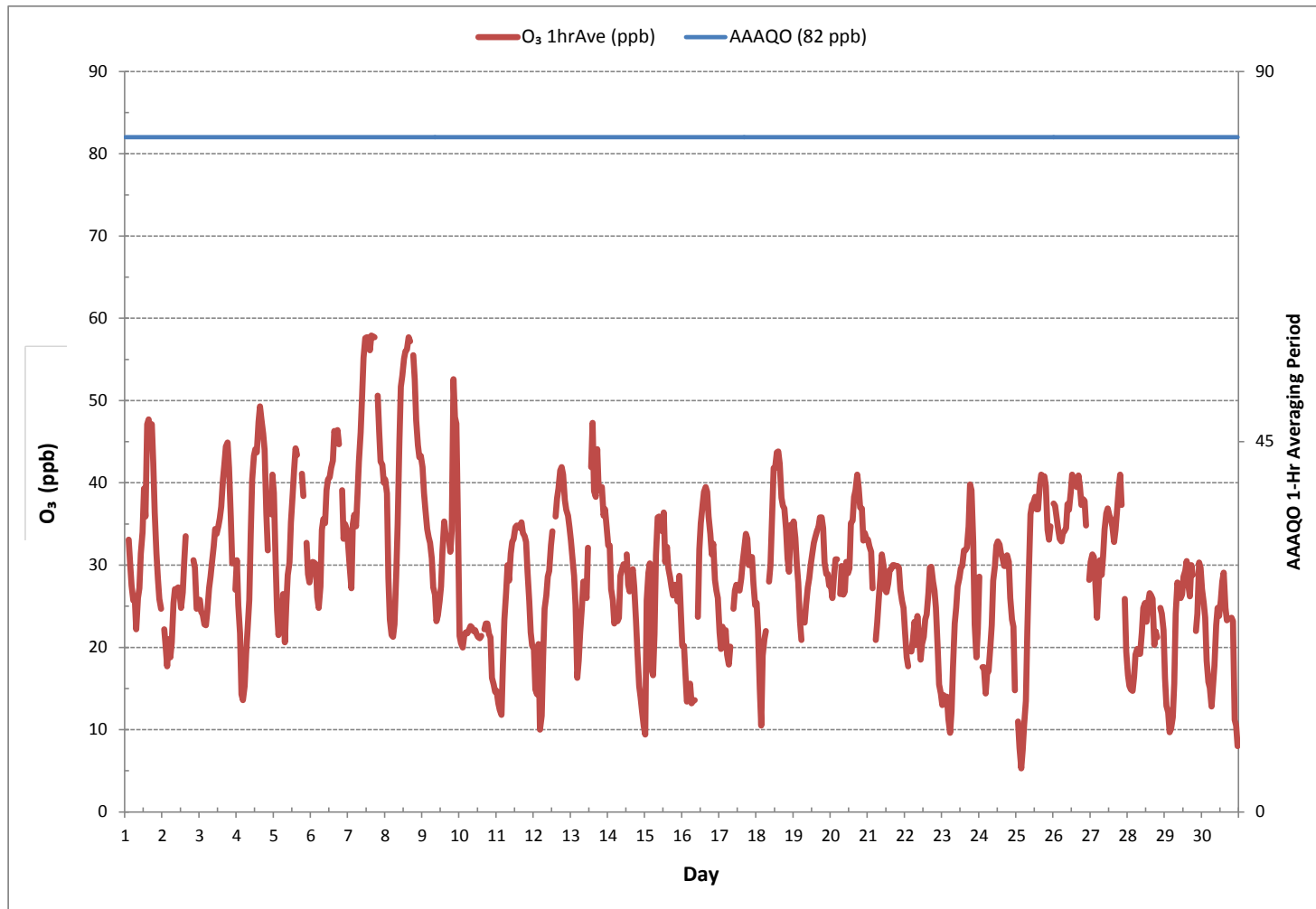
MONTHLY SUMMARY

| | | | | | |
|------------------------------|------|-----|-----------------------|-------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 682 | | | | |
| MINIMUM 1-HR AVERAGE: | 5.3 | ppb | @ HOUR | 3 | ON DAY 25 |
| MAXIMUM 1-HR AVERAGE: | 57.9 | ppb | @ HOUR | 15 | ON DAY 7 |
| MAXIMUM 24-HR AVERAGE: | 45.8 | ppb | | | ON DAY 7 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 720 | hrs |
| MONTHLY CALIBRATION TIME: | 4 | hrs | AMD OPERATION UPTIME: | 100.0 | % |
| STANDARD DEVIATION: | 9.6 | | MONTHLY AVERAGE: | 29.5 | ppb |

24 HR AVERAGES June 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

OZONE Instantaneous Maximum (O₃ ppb)

| DAY | HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. |
|------------|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|
| | HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | |
| 1 | 43.8 | S | 35.6 | 34.3 | 31.0 | 27.7 | 27.6 | 26.3 | 28.8 | 29.6 | 33.8 | 40.3 | 42.9 | 45.3 | 49.7 | 49.7 | 50.3 | 50.1 | 47.6 | 38.7 | 33.8 | 30.2 | 26.9 | 27.0 | 26.3 | 50.3 | 37.0 | 24 | |
| 2 | S | 24.4 | P | 22.9 | 24.4 | 21.3 | 24.6 | 26.7 | 28.1 | 28.4 | 29.1 | 29.7 | 26.0 | 28.1 | 32.6 | C | C | C | C | C | C | 31.3 | 31.3 | 28.5 | S | 21.3 | 32.6 | 27.3 | 23 |
| 3 | 26.3 | 24.9 | 24.1 | 24.0 | 23.5 | 25.7 | 28.8 | 29.8 | 31.0 | 34.9 | 35.6 | 35.4 | 37.5 | 37.5 | 39.3 | 42.3 | 45.0 | 45.9 | 47.4 | 46.4 | 40.5 | 34.3 | S | 29.2 | 23.5 | 47.4 | 34.3 | 24 | |
| 4 | 31.5 | 30.7 | 24.3 | 15.3 | 14.7 | 16.4 | 21.3 | 24.3 | 29.2 | 39.3 | 41.9 | 45.0 | 45.3 | 45.4 | 48.7 | 51.0 | 49.4 | 47.3 | 46.2 | 43.5 | 38.3 | S | 41.8 | 42.6 | 14.7 | 51.0 | 36.2 | 24 | |
| 5 | 42.2 | 35.9 | 28.0 | 25.3 | 25.4 | 27.6 | 28.7 | 28.0 | 27.8 | 30.0 | 33.5 | 36.6 | 41.4 | 43.5 | 45.4 | 44.7 | Q | Q | 42.3 | 40.7 | S | 34.7 | 31.4 | 30.3 | 25.3 | 45.4 | 34.4 | 24 | |
| 6 | 32.0 | 31.8 | 31.9 | 32.1 | 30.6 | 29.2 | 29.7 | 38.4 | 37.8 | 38.3 | 41.2 | 42.2 | 41.9 | 43.0 | 45.6 | 48.2 | 47.6 | 48.2 | 48.3 | S | 45.8 | 37.9 | 36.3 | 35.1 | 29.2 | 48.3 | 38.8 | 24 | |
| 7 | 33.8 | 33.2 | 32.7 | 38.3 | 37.1 | 35.9 | 42.7 | 44.7 | 48.7 | 53.2 | 57.6 | 61.2 | 59.8 | 59.4 | 58.6 | 60.1 | 61.4 | 59.4 | S | 54.4 | 48.3 | 45.4 | 45.6 | 42.6 | 32.7 | 61.4 | 48.4 | 24 | |
| 8 | 42.6 | 39.6 | 37.9 | 27.0 | 23.4 | 23.4 | 26.1 | 31.7 | 40.6 | 51.5 | 53.9 | 54.9 | 56.8 | 57.4 | 58.5 | 59.8 | 59.5 | S | 57.1 | 54.9 | 50.5 | 45.8 | 43.8 | 43.9 | 23.4 | 59.8 | 45.2 | 24 | |
| 9 | 43.8 | 40.0 | 39.3 | 35.6 | 35.1 | 32.9 | 31.8 | 29.4 | 27.2 | 25.3 | 25.1 | 27.8 | 29.2 | 34.3 | 39.3 | 36.1 | S | 34.0 | 32.6 | 50.7 | 57.3 | 51.2 | 48.3 | 43.3 | 25.1 | 57.3 | 36.9 | 24 | |
| 10 | 23.5 | 20.2 | 19.9 | 22.1 | 22.5 | 22.2 | 22.8 | 22.9 | 22.9 | 23.1 | 22.9 | 22.3 | 22.2 | 22.5 | 22.1 | S | 23.2 | 23.7 | 23.7 | 22.5 | 22.3 | 19.7 | 16.2 | 15.6 | 15.6 | 23.7 | 21.8 | 24 | |
| 11 | 15.0 | 14.4 | 14.3 | 13.9 | 27.5 | 25.7 | 30.9 | 31.3 | 30.6 | 32.9 | 33.7 | 34.4 | 36.0 | 36.3 | S | 36.1 | 38.1 | 35.6 | 34.7 | 34.4 | 31.7 | 27.2 | 23.1 | 21.7 | 13.9 | 38.1 | 28.7 | 24 | |
| 12 | 22.2 | 22.2 | 21.8 | 23.5 | 21.0 | 14.3 | 26.6 | 26.7 | 29.5 | 29.7 | 31.5 | 33.7 | 34.9 | S | 38.1 | 39.4 | 41.0 | 43.1 | 43.2 | 41.7 | 41.9 | 38.7 | 36.6 | 35.6 | 14.3 | 43.2 | 32.0 | 24 | |
| 13 | 33.9 | 32.2 | 29.9 | 29.2 | 23.5 | 22.3 | 24.4 | 26.4 | 30.2 | 30.2 | 30.4 | 35.4 | S | 45.9 | 51.0 | 52.8 | 47.9 | 48.3 | 43.8 | 41.5 | 43.2 | 39.1 | 39.9 | 38.1 | 22.3 | 52.8 | 36.5 | 24 | |
| 14 | 35.9 | 33.7 | P | 26.6 | 24.3 | 25.3 | 26.0 | 30.2 | 30.2 | 31.2 | 33.8 | S | 33.7 | 30.2 | 28.8 | 33.8 | 32.9 | 29.0 | 25.3 | 21.4 | 17.0 | 14.4 | 12.9 | 12.0 | 12.0 | 35.9 | 26.8 | 23 | |
| 15 | 13.3 | 29.5 | 30.0 | 34.7 | 27.5 | 22.3 | 26.1 | 38.4 | 37.2 | 37.8 | S | 36.8 | 38.8 | 32.2 | 34.1 | 31.7 | 29.7 | 29.4 | 28.8 | 29.3 | 28.8 | 28.5 | 31.5 | 26.6 | 13.3 | 38.8 | 30.6 | 24 | |
| 16 | 22.0 | 21.9 | 17.4 | 15.4 | 16.4 | 17.4 | 15.9 | 16.4 | 16.7 | S | 26.1 | 36.1 | 36.9 | 38.7 | 40.5 | 40.7 | 40.2 | 39.8 | 35.0 | 33.7 | 35.0 | 29.7 | 28.7 | 27.0 | 15.4 | 40.7 | 28.2 | 24 | |
| 17 | 23.7 | 21.3 | 23.8 | 22.6 | 23.7 | 21.6 | 18.6 | 22.8 | S | 26.4 | 27.8 | 28.5 | 28.1 | P | 30.4 | 31.3 | 34.7 | 34.7 | 34.9 | 32.2 | 32.0 | 31.9 | 31.7 | 28.0 | 18.6 | 34.9 | 27.8 | 23 | |
| 18 | 28.7 | 24.3 | 19.1 | 19.1 | 22.2 | 25.8 | 24.8 | S | 30.2 | 31.3 | 42.5 | 43.2 | 43.5 | 44.6 | 46.2 | 46.5 | 40.0 | 39.3 | 38.1 | 36.3 | 33.8 | 37.5 | 37.9 | 35.4 | 19.1 | 46.5 | 34.4 | 24 | |
| 19 | 36.8 | 36.2 | 31.3 | 30.2 | 26.3 | 22.3 | S | 25.3 | 27.0 | 29.0 | 29.7 | 31.0 | 34.1 | 34.4 | 34.4 | 35.4 | 36.2 | 36.9 | 37.2 | 36.1 | 34.6 | 32.3 | 30.9 | 30.4 | 22.3 | 37.2 | 32.1 | 24 | |
| 20 | 28.5 | 28.4 | 31.0 | 31.3 | 31.7 | S | 32.3 | 32.0 | 28.2 | 30.6 | 32.7 | 30.9 | 31.7 | 42.0 | 38.7 | 40.3 | 40.5 | 42.5 | 42.2 | 40.5 | 39.6 | 36.8 | 36.8 | P | 28.2 | 42.5 | 35.0 | 23 | |
| 21 | 34.5 | 34.8 | 32.7 | 29.7 | S | 22.5 | 24.5 | 27.3 | 29.5 | 32.6 | 32.1 | 27.7 | 27.7 | 28.4 | 30.3 | 30.9 | 31.9 | 31.0 | 31.2 | 30.4 | 30.3 | 28.1 | 26.0 | 25.6 | 22.5 | 34.8 | 29.6 | 24 | |
| 22 | 23.4 | 19.9 | 17.9 | S | 21.1 | 21.4 | 24.3 | 22.9 | 25.3 | 23.7 | 20.5 | 22.2 | 23.4 | 25.6 | 26.1 | 29.1 | 31.5 | 30.9 | 29.7 | 28.1 | 27.3 | 22.9 | 20.4 | 17.3 | 17.3 | 31.5 | 24.1 | 24 | |
| 23 | 15.7 | 15.4 | S | 15.4 | 13.1 | 11.2 | 14.3 | 21.6 | 24.9 | 26.7 | 30.3 | 30.6 | 31.9 | 33.2 | 34.6 | 34.6 | 35.7 | 38.0 | 41.7 | 41.7 | 37.4 | 29.7 | 22.2 | 25.9 | 11.2 | 41.7 | 27.2 | 24 | |
| 24 | 32.9 | S | 22.8 | 22.9 | 22.2 | 21.1 | 22.5 | 23.8 | 26.0 | 29.9 | 31.5 | 33.7 | 34.9 | 33.7 | 34.0 | 40.8 | 31.6 | 31.5 | 32.6 | 32.5 | 30.2 | 26.1 | 26.0 | 19.7 | 19.7 | 40.8 | 28.8 | 24 | |
| 25 | S | 14.4 | 10.3 | 7.2 | 9.1 | 12.3 | 18.3 | 26.9 | 34.9 | 37.5 | 38.6 | 39.2 | 39.3 | 37.9 | 39.3 | 41.1 | 42.7 | 42.5 | 42.1 | 41.2 | 36.6 | 34.0 | 35.4 | S | 7.2 | 42.7 | 30.9 | 24 | |
| 26 | 38.1 | 37.6 | 36.5 | 34.7 | 34.6 | 33.4 | 34.5 | 34.6 | 37.4 | 38.6 | 38.4 | 41.0 | 42.2 | 41.2 | 41.7 | 42.5 | 42.2 | 40.8 | 45.0 | 40.2 | 39.6 | 35.6 | S | 29.4 | 29.4 | 45.0 | 38.3 | 24 | |
| 27 | 30.9 | 33.7 | 32.1 | 32.0 | 25.6 | 31.5 | 31.8 | 30.7 | 33.7 | 35.7 | 38.8 | 39.5 | 37.1 | 36.5 | 36.1 | 34.1 | 35.7 | 38.8 | 40.5 | 42.9 | 40.8 | S | 26.4 | 24.8 | 24.8 | 42.9 | 34.3 | 24 | |
| 28 | 17.7 | 17.1 | 17.1 | 15.9 | 16.8 | 20.7 | 21.9 | 21.0 | 20.7 | 25.1 | 27.7 | 28.0 | 27.6 | 27.8 | 28.8 | 31.5 | 31.5 | 22.5 | 23.8 | 23.8 | S | 26.6 | 25.8 | 23.5 | 15.9 | 31.5 | 23.6 | 24 | |
| 29 | 22.1 | 14.3 | 13.5 | 11.5 | 11.8 | 12.9 | 18.8 | 27.0 | 30.7 | 31.2 | 27.2 | 27.0 | 29.0 | 30.7 | 30.9 | 31.0 | 29.2 | 32.0 | 29.5 | S | 22.9 | 32.0 | 32.0 | 30.4 | 11.5 | 32.0 | 25.1 | 24 | |
| 30 | 31.7 | 26.9 | 24.8 | 20.8 | 17.8 | 16.8 | 13.6 | 17.0 | 23.5 | 24.5 | 26.7 | 25.6 | 27.2 | 27.2 | 29.2 | 30.0 | 28.7 | 25.3 | 23.8 | S | 25.4 | 25.6 | 18.2 | 14.7 | 11.2 | 11.2 | 31.7 | 23.0 | 24 |
| HOURLY MAX | 43.8 | 40.0 | 39.3 | 38.3 | 37.1 | 35.9 | 42.7 | 44.7 | 48.7 | 53.2 | 57.6 | 61.2 | 59.8 | 59.4 | 58.6 | 60.1 | 61.4 | 59.4 | 57.1 | 54.9 | 57.3 | 51.2 | 48.3 | 43.9 | | | | | |
| HOURLY AVG | 29.5 | 27.1 | 25.9 | 24.6 | 23.6 | 22.9 | 25.3 | 27.7 | 29.9 | 32.4 | 33.6 | 35.2 | 35.9 | 37.3 | 38.4 | 40.2 | 39.1 | 37.7 | 37.9 | 37.2 | 35.6 | 32.1 | 30.6 | 28.6 | | | | | |

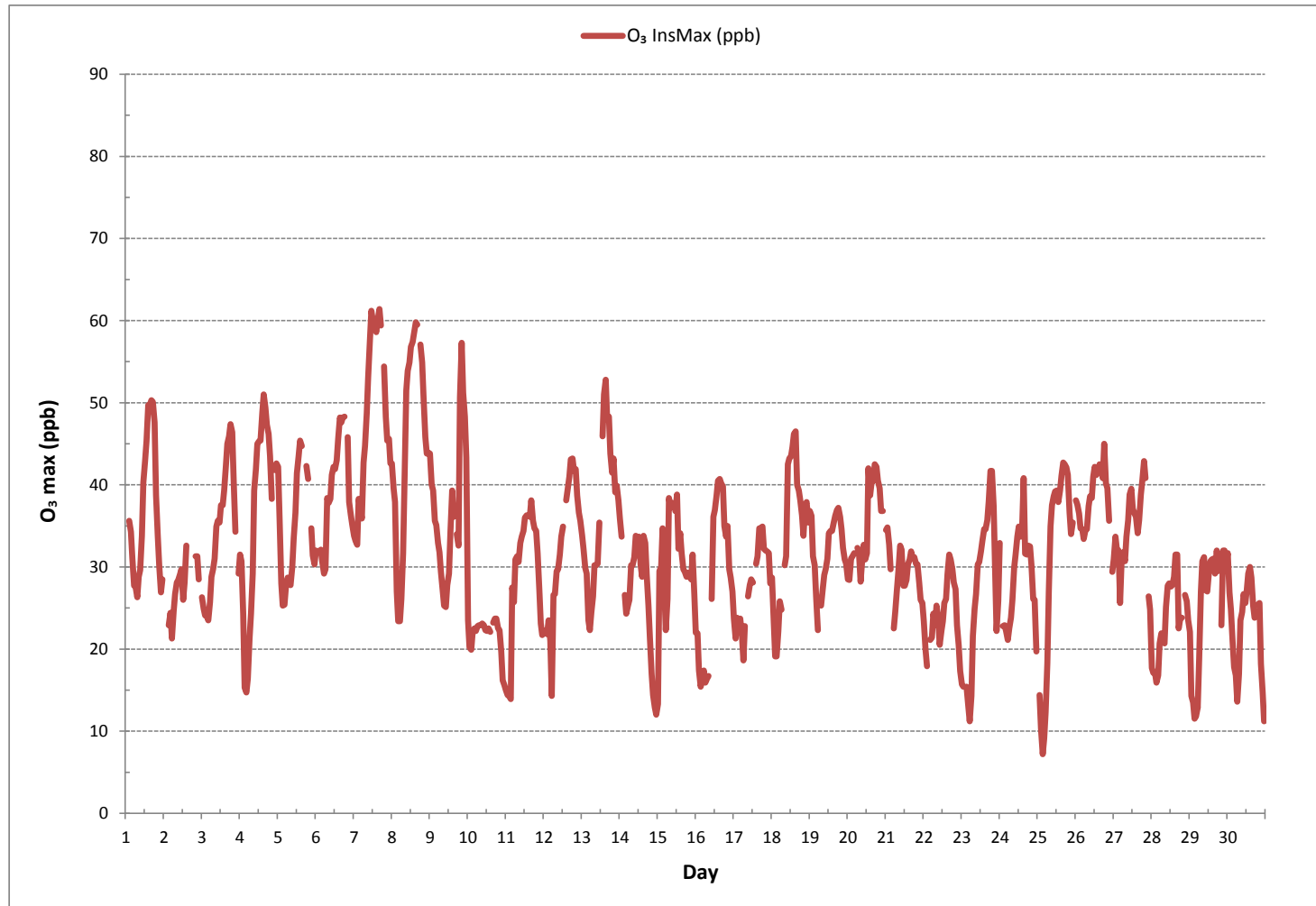
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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

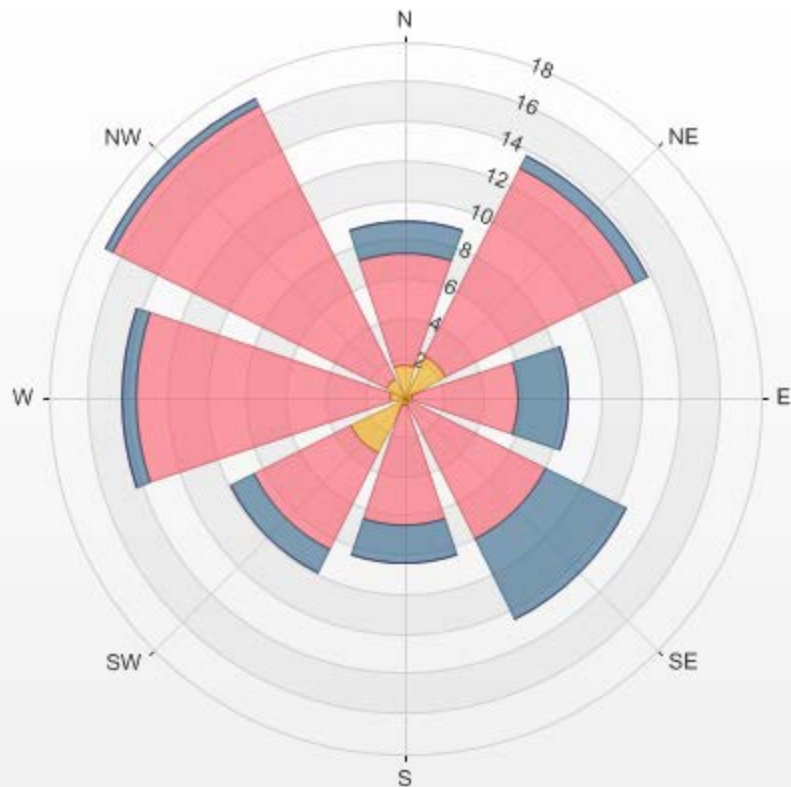
| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 677 |
| MAXIMUM INSTANTANEOUS VALUE: | 61.4 ppb @ HOUR 16 ON DAY 7 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 9.7 |
| OPERATIONAL TIME: | 716 hrs |

OZONE Instantaneous Maximum (O₃ ppb)



% Icon Classes (ppb) 10 0.0-19.7 69 19.7-39.3 14 39.3-59.0 0 >59.0

LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.79% Calm Poll Avg: 20.52[ppb]



O3[ppb] Calibration: LICA Bonnyville Monthly: 17/06 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5



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

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

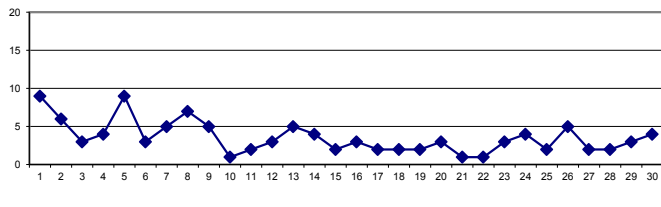
OBJECTIVE LIMIT:

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

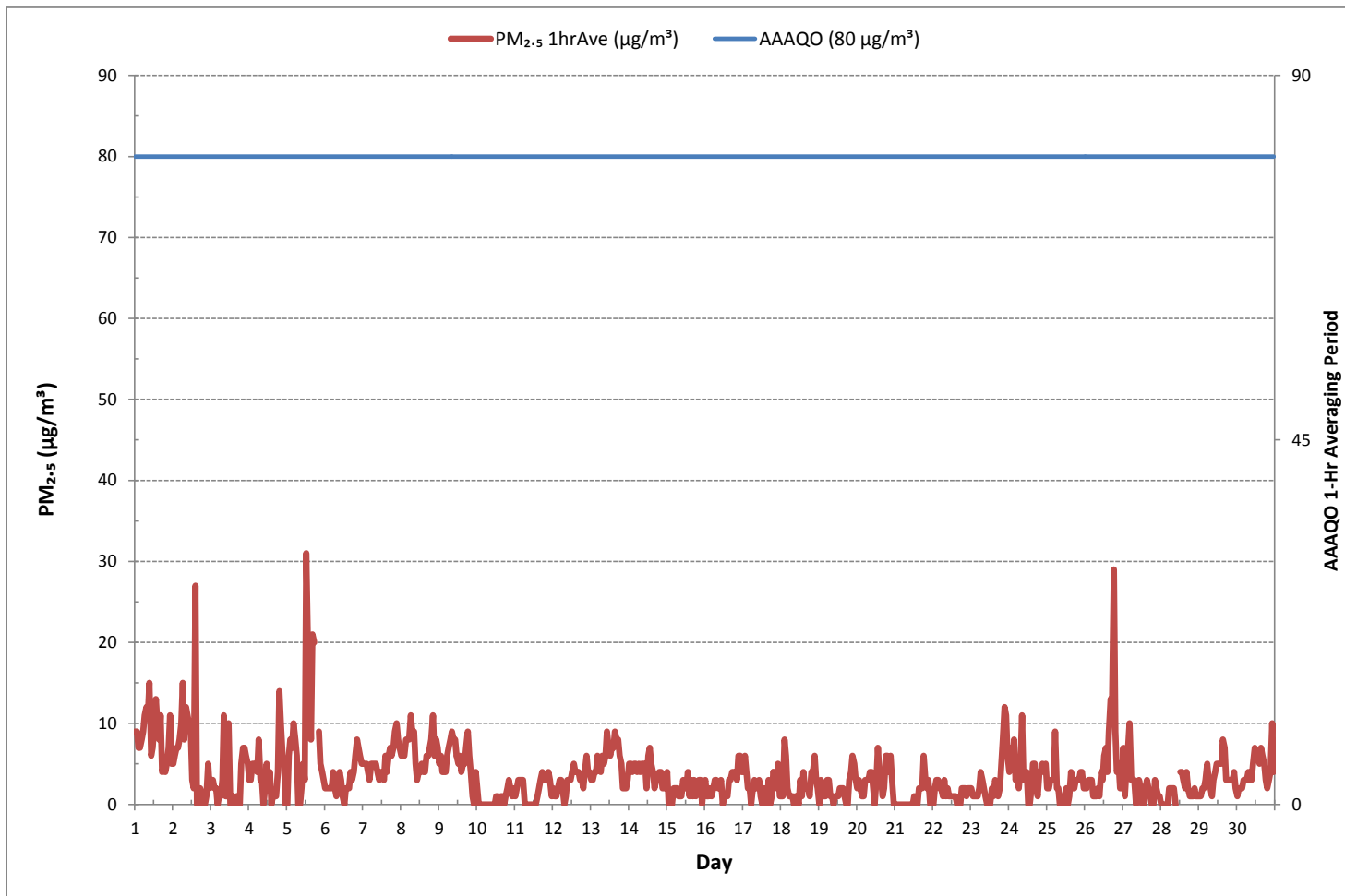
MONTHLY SUMMARY

| | | | | | |
|------------------------------|-----------------------------|-----|-----------------------|-------|-------------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 619 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR | 15 | ON DAY | 2 | |
| MAXIMUM 1-HR AVERAGE: | 31 µg/m ³ @ HOUR | 12 | ON DAY | 5 | |
| MAXIMUM 24-HR AVERAGE: | 9 µg/m ³ | | ON DAY | 1 | |
| MONTHLY CALIBRATION TIME: | 4 | hrs | OPERATIONAL TIME: | 720 | hrs |
| STANDARD DEVIATION: | 3 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 4 | µg/m ³ |

24 HR AVERAGES June 2017



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



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-PM25 [ug/m³(L)]
 Monthly: 17/06
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

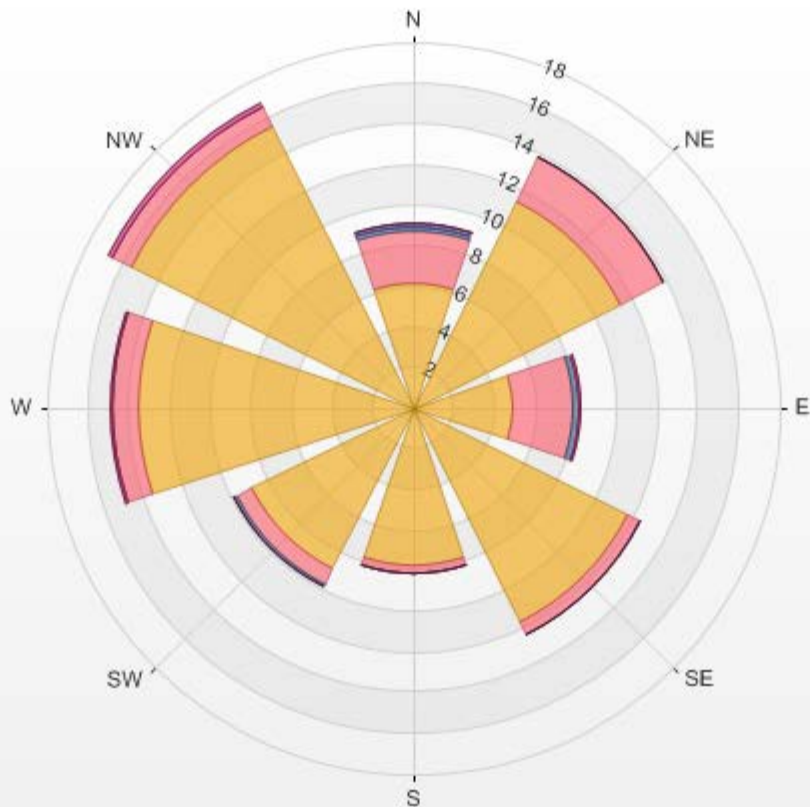
Calm: 6.61%

Calm Avg: 4.28 [ug/m³(L)]

| Direction | 0.0-6.4 | 6.4-12.8 | 12.8-19.2 | 19.2-25.6 | 25.6-32.0 | >32.0 | Total |
|----------------|---------|----------|-----------|-----------|-----------|-------|-------|
| N | 6.2 | 2.5 | 0.1 | 0.3 | 0.0 | 0.0 | 9.1 |
| NE | 11.4 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 13.8 |
| E | 4.9 | 3.0 | 0.3 | 0.0 | 0.1 | 0.0 | 8.3 |
| SE | 11.8 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 12.5 |
| S | 7.7 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 |
| SW | 8.9 | 0.8 | 0.1 | 0.0 | 0.0 | 0.0 | 9.8 |
| W | 13.5 | 1.3 | 0.0 | 0.0 | 0.1 | 0.0 | 14.9 |
| NW | 15.5 | 1.1 | 0.0 | 0.0 | 0.1 | 0.0 | 16.7 |
| Summary | 79.9 | 12.2 | 0.6 | 0.3 | 0.4 | 0.0 | 93.4 |

% Icon Classes (ug/m3(L)) 80 0.0-6.4 12 6.4-12.8 1 12.8-19.2 0 19.2-25.6 0 25.6-32.0 0 >32.0

LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.61% Calm Poll Avg: 4.28[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 14.0 | 11.1 | 2.6 | 5.3 | 5.1 | 6.0 | 7.5 | 4.7 | 3.2 | 1.4 | 5.2 | 6.9 | 8.5 | 3.9 | 4.3 | 7.3 | 8.0 | 7.9 | 11.6 | 9.3 | 5.9 | 3.0 | 2.3 | 2.4 | 1.4 | 14.0 | 2.5 | 24 |
| 2 | 1.6 | 1.1 | 2.0 | 3.3 | 5.7 | 2.9 | 5.7 | 7.7 | 12.0 | 10.6 | 9.4 | 12.6 | 12.0 | 12.8 | 13.4 | 14.1 | 10.6 | 9.2 | 13.0 | 12.6 | 10.5 | 9.9 | 11.5 | 12.2 | 1.1 | 14.1 | 8.6 | 24 |
| 3 | 11.7 | 10.7 | 10.4 | 9.8 | 8.8 | 10.2 | 11.3 | 11.2 | 11.0 | 11.6 | 9.7 | 9.6 | 9.6 | 11.1 | 8.2 | 7.8 | 4.5 | 3.7 | 1.3 | 3.7 | 3.9 | 4.6 | 6.3 | 6.6 | 1.3 | 11.7 | 6.0 | 24 |
| 4 | 6.8 | 4.5 | 5.2 | 5.6 | 7.0 | 8.3 | 9.1 | 10.2 | 10.4 | 11.0 | 13.3 | 11.3 | 9.4 | 6.3 | 10.0 | 12.4 | 8.1 | 6.4 | 3.4 | 1.3 | 3.8 | 4.8 | 6.5 | 5.3 | 1.3 | 13.3 | 5.2 | 24 |
| 5 | 5.3 | 2.8 | 5.0 | 5.5 | 7.0 | 4.7 | 8.8 | 13.0 | 15.9 | 14.0 | 12.5 | 13.6 | 15.1 | 16.3 | 17.8 | 15.3 | 14.9 | 14.2 | 9.6 | 5.0 | 3.0 | 4.4 | 1.2 | 2.5 | 1.2 | 17.8 | 8.4 | 24 |
| 6 | 3.1 | 6.7 | 6.2 | 3.4 | 2.0 | 4.1 | 4.5 | 10.4 | 13.6 | 8.0 | 5.0 | 3.4 | 5.7 | 4.7 | 5.9 | 5.5 | 7.5 | 10.8 | 7.9 | 2.4 | 4.5 | 3.8 | 4.9 | 4.4 | 2.0 | 13.6 | 4.6 | 24 |
| 7 | 3.1 | 1.0 | 1.1 | 4.3 | 6.2 | 4.4 | 4.8 | 1.4 | 0.1 | 2.2 | 4.3 | 9.9 | 7.1 | 9.0 | 7.4 | 8.5 | 6.6 | 10.4 | 9.7 | 6.4 | 4.9 | 6.0 | 5.4 | 5.6 | 0.1 | 10.4 | 4.8 | 24 |
| 8 | 6.2 | 5.9 | 4.6 | 4.8 | 6.0 | 6.2 | 7.4 | 6.9 | 9.6 | 13.3 | 14.1 | 14.1 | 13.3 | 13.4 | 12.5 | 12.4 | 11.6 | 9.8 | 7.2 | 7.6 | 8.0 | 6.8 | 7.5 | 4.6 | 4.6 | 14.1 | 7.4 | 24 |
| 9 | 6.5 | 8.6 | 10.1 | 10.5 | 10.2 | 10.8 | 6.4 | 6.5 | 6.8 | 9.1 | 10.7 | 9.9 | 11.1 | 11.7 | 10.2 | 12.2 | 11.4 | 12.6 | 9.3 | 3.8 | 4.1 | 3.0 | 8.4 | 13.7 | 3.0 | 13.7 | 8.5 | 24 |
| 10 | 16.1 | 14.8 | 14.4 | 15.2 | 14.5 | 12.7 | 12.5 | 13.8 | 12.2 | 12.0 | 11.2 | 10.1 | 9.2 | 8.7 | 8.4 | 5.1 | 3.3 | 3.8 | 3.6 | 9.7 | 8.4 | 11.2 | 13.7 | 11.0 | 3.3 | 16.1 | 6.1 | 24 |
| 11 | 11.8 | 5.7 | 2.6 | 4.1 | 5.1 | 6.2 | 10.7 | 11.9 | 10.5 | 11.1 | 12.8 | 11.1 | 11.5 | 10.9 | 11.9 | 10.9 | 10.1 | 10.4 | 9.8 | 7.1 | 3.2 | 2.5 | 3.8 | 2.7 | 2.5 | 12.8 | 6.9 | 24 |
| 12 | 2.2 | 3.8 | 0.8 | 2.4 | 2.1 | 2.5 | 6.5 | 10.0 | 11.2 | 13.5 | 13.1 | 16.0 | 14.6 | 16.5 | 16.6 | 19.3 | 19.7 | 17.4 | 14.2 | 11.7 | 8.6 | 9.2 | 12.9 | 13.1 | 0.8 | 19.7 | 10.2 | 24 |
| 13 | 16.6 | 17.9 | 8.3 | 2.0 | 2.3 | 3.4 | 6.8 | 7.8 | 4.0 | 4.2 | 6.9 | 6.2 | 6.5 | 8.6 | 11.4 | 11.4 | 5.5 | 19.8 | 3.1 | 5.7 | 6.2 | 4.2 | 3.0 | 4.5 | 2.0 | 19.8 | 1.0 | 24 |
| 14 | 6.7 | 3.6 | 4.3 | 3.8 | 3.9 | 3.9 | 2.0 | 4.9 | 7.3 | 7.2 | 7.2 | 8.4 | 5.7 | 4.7 | 6.6 | 7.9 | 10.0 | 11.1 | 8.6 | 5.5 | 4.7 | 6.0 | 4.0 | 2.9 | 2.0 | 11.1 | 5.1 | 24 |
| 15 | 4.2 | 7.1 | 1.9 | 0.5 | 1.6 | 2.8 | 2.1 | 1.8 | 1.4 | 3.1 | 3.6 | 3.9 | 2.9 | 9.4 | 6.4 | 4.9 | 4.5 | 5.4 | 5.7 | 2.3 | 0.9 | 2.2 | 5.8 | 3.2 | 0.5 | 9.4 | 2.5 | 24 |
| 16 | 2.9 | 3.9 | 3.4 | 3.9 | 4.8 | 3.9 | 1.9 | 4.1 | 4.2 | 5.4 | 5.1 | 4.5 | 2.5 | 1.9 | 2.8 | 5.2 | 15.2 | 10.2 | 7.6 | 4.2 | 1.3 | 6.5 | 6.3 | 7.4 | 1.3 | 15.2 | 1.6 | 24 |
| 17 | 4.4 | 4.8 | 4.5 | 3.4 | 5.2 | 7.0 | 8.4 | 10.2 | 11.7 | 9.9 | 11.3 | 13.5 | 14.4 | 12.6 | 12.6 | 11.5 | 13.3 | 9.0 | 7.1 | 4.7 | 4.9 | 3.8 | 3.4 | 3.7 | 3.4 | 14.4 | 7.9 | 24 |
| 18 | 4.7 | 0.8 | 0.1 | 0.4 | 2.1 | 4.9 | 6.8 | 4.0 | 6.5 | 5.3 | 19.0 | 12.2 | 9.0 | 13.5 | 10.9 | 10.5 | 10.0 | 6.5 | 7.4 | 4.1 | 6.1 | 5.2 | 5.5 | 9.7 | 0.1 | 19.0 | 4.5 | 24 |
| 19 | 10.0 | 4.6 | 6.4 | 7.8 | 8.4 | 8.0 | 8.3 | 11.2 | 8.9 | 10.3 | 9.2 | 8.4 | 5.9 | 6.0 | 7.3 | 5.5 | 6.4 | 5.7 | 3.1 | 5.3 | 4.3 | 3.6 | 5.2 | 6.5 | 3.1 | 11.2 | 4.3 | 24 |
| 20 | 6.9 | 5.9 | 8.1 | 7.9 | 6.4 | 6.1 | 6.3 | 15.7 | 13.4 | 11.7 | 9.3 | 9.5 | 11.7 | 12.5 | 12.7 | 13.0 | 13.8 | 13.9 | 9.6 | 7.2 | 6.8 | 3.1 | 4.9 | 13.6 | 3.1 | 15.7 | 7.3 | 24 |
| 21 | 12.3 | 9.6 | 11.5 | 9.0 | 8.4 | 10.0 | 13.0 | 15.6 | 17.7 | 20.6 | 17.6 | 18.5 | 15.5 | 18.6 | 18.8 | 19.0 | 19.6 | 18.0 | 16.5 | 19.6 | 19.7 | 16.4 | 15.8 | 14.3 | 8.4 | 20.6 | 15.4 | 24 |
| 22 | 15.1 | 14.9 | 15.9 | 14.4 | 17.0 | 17.9 | 18.2 | 14.5 | 19.6 | 18.1 | 18.7 | 19.0 | 19.2 | 17.0 | 14.8 | 16.9 | 16.3 | 14.1 | 10.5 | 8.2 | 6.1 | 3.3 | 2.0 | 1.5 | 1.5 | 19.6 | 13.6 | 24 |
| 23 | 1.2 | 3.9 | 3.2 | 1.9 | 0.3 | 0.2 | 2.6 | 4.8 | 3.7 | 3.7 | 8.4 | 11.3 | 11.3 | 11.2 | 11.9 | 11.2 | 12.5 | 13.0 | 11.8 | 8.2 | 4.6 | 1.2 | 0.6 | 2.5 | 0.2 | 13.0 | 5.3 | 24 |
| 24 | 3.0 | 0.7 | 0.4 | 0.3 | 3.4 | 5.2 | 1.2 | 1.6 | 2.0 | 4.4 | 2.9 | 5.2 | 8.4 | 8.5 | 7.1 | 9.1 | 7.0 | 7.5 | 5.8 | 11.3 | 4.9 | 0.5 | 1.6 | 0.3 | 0.3 | 11.3 | 1.4 | 24 |
| 25 | 0.2 | 0.7 | 0.2 | 0.2 | 0.3 | 0.2 | 0.5 | 1.2 | 3.5 | 5.9 | 7.3 | 8.2 | 7.6 | 4.6 | 4.9 | 6.3 | 8.5 | 9.3 | 10.5 | 10.5 | 8.7 | 9.2 | 10.4 | 12.4 | 0.2 | 12.4 | 5.3 | 24 |
| 26 | 12.2 | 18.9 | 23.3 | 22.0 | 18.5 | 18.4 | 18.7 | 17.1 | 14.2 | 15.5 | 14.6 | 14.3 | 18.1 | 13.5 | 12.6 | 10.9 | 11.1 | 9.8 | 7.8 | 8.5 | 8.6 | 9.8 | 8.7 | 7.8 | 7.8 | 23.3 | 11.9 | 24 |
| 27 | 4.9 | 11.6 | 4.0 | 3.0 | 9.1 | 13.9 | 11.1 | 8.1 | 10.9 | 10.3 | 6.9 | 11.6 | 16.8 | 19.6 | 18.1 | 16.1 | 12.1 | 12.1 | 11.0 | 8.7 | 3.1 | 7.8 | 5.5 | 9.8 | 3.0 | 19.6 | 8.4 | 24 |
| 28 | 7.2 | 10.5 | 9.2 | 9.3 | 11.0 | 8.5 | 4.3 | 7.5 | 6.1 | 5.7 | 1.2 | 1.0 | 2.8 | 2.6 | 2.1 | 6.1 | 13.9 | 13.1 | 13.5 | 10.0 | 8.9 | 6.8 | 5.3 | 6.3 | 1.0 | 13.9 | 0.6 | 24 |
| 29 | 4.8 | 4.4 | 4.3 | 1.5 | 1.0 | 3.1 | 3.7 | 6.5 | 4.8 | 8.1 | 7.0 | 9.3 | 12.2 | 12.5 | 9.9 | 3.9 | 3.3 | 8.4 | 4.0 | 4.4 | 2.9 | 4.5 | 6.2 | 5.6 | 1.0 | 12.5 | 4.4 | 24 |
| 30 | 6.2 | 4.7 | 5.6 | 2.2 | 4.9 | 2.6 | 1.5 | 2.6 | 3.5 | 2.4 | 3.4 | 1.8 | 3.9 | 3.3 | 2.3 | 4.1 | 1.9 | 5.2 | 4.8 | 3.7 | 3.2 | 0.6 | 2.9 | 1.5 | 0.6 | 6.2 | 1.4 | 24 |
| HOURLY MAX | 16.6 | 18.9 | 23.3 | 22.0 | 18.5 | 18.4 | 18.7 | 17.1 | 19.6 | 20.6 | 19.0 | 19.0 | 19.2 | 19.6 | 18.8 | 19.3 | 19.7 | 19.8 | 16.5 | 19.6 | 19.7 | 16.4 | 15.8 | 14.3 | | | | |
| HOURLY AVG | 0.3 | 0.7 | 0.2 | 0.4 | 0.9 | 1.1 | 1.2 | 1.8 | 2.5 | 2.2 | 1.7 | 1.9 | 2.3 | 2.1 | 2.4 | 2.1 | 1.9 | 0.8 | 1.5 | 0.8 | 1.2 | 0.7 | 0.4 | 0.6 | | | | |

STATUS FLAG CODES

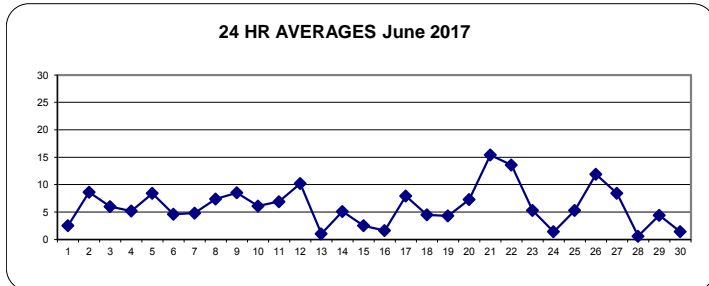
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

| | |
|-------------------|-------------------------------------|
| LAST CALIBRATION: | March 3, 2017 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

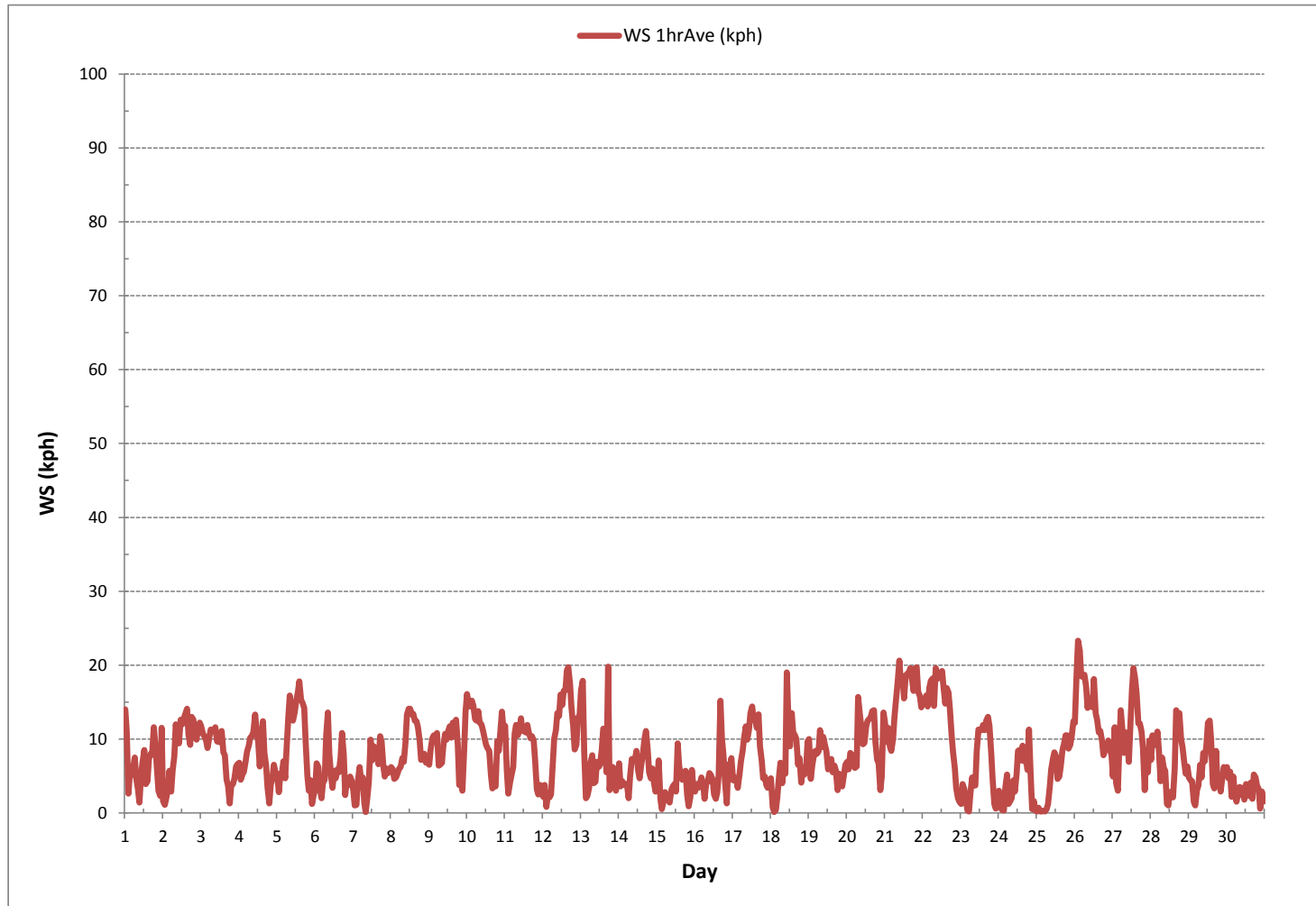
MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 720 |
| MINIMUM 1-HR AVERAGE | 0.1 kph @ HOUR 8 ON DAY 7 |
| MAXIMUM 1-HR AVERAGE: | 23.3 kph @ HOUR 2 ON DAY 26 |
| MAXIMUM 24-HR AVERAGE: | 15.4 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 720 hrs |
| AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 4.7 |
| MONTHLY AVERAGE: | 1.1 kph |

24 HR AVERAGES June 2017



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 33.0 | 26.4 | 9.1 | 13.7 | 12.3 | 12.4 | 20.2 | 14.5 | 18.9 | 8.3 | 14.9 | 18.1 | 18.3 | 15.0 | 15.2 | 20.2 | 18.9 | 21.7 | 30.6 | 28.3 | 14.0 | 9.4 | 8.5 | 11.9 | 8.3 | 33.0 | 17.2 | 24 | |
| 2 | 6.8 | 6.4 | P | 8.7 | 10.7 | 7.8 | 16.2 | 23.5 | 29.9 | 22.1 | 24.2 | 29.9 | 34.9 | 32.6 | 38.7 | 36.7 | 31.4 | 24.5 | 37.7 | 35.2 | 29.2 | 30.9 | 26.9 | 35.0 | 6.4 | 38.7 | 25.2 | 23 | |
| 3 | 31.2 | 29.6 | 27.8 | 29.0 | 23.4 | 28.8 | 29.6 | 28.6 | 26.2 | 30.1 | 27.3 | 25.7 | 26.7 | 28.9 | 23.7 | 20.4 | 14.4 | 11.7 | 7.8 | 10.4 | 11.3 | 11.3 | 13.4 | 16.6 | 7.8 | 31.2 | 22.2 | 24 | |
| 4 | 17.4 | 11.5 | 12.2 | 11.9 | 15.4 | 17.3 | 21.9 | 22.5 | 24.1 | 28.8 | 29.1 | 24.0 | 18.5 | 14.8 | 28.0 | 26.9 | 20.3 | 19.2 | 13.6 | 11.9 | 11.8 | 11.9 | 19.7 | 13.8 | 11.5 | 29.1 | 18.6 | 24 | |
| 5 | 16.1 | 17.0 | 12.3 | 26.8 | 42.1 | 17.1 | 25.2 | 37.6 | 39.4 | 35.4 | 30.1 | 35.9 | 41.9 | 45.7 | 41.7 | 33.9 | 37.0 | 32.0 | 26.6 | 16.1 | 9.5 | 10.6 | 10.3 | 7.8 | 7.8 | 45.7 | 27.0 | 24 | |
| 6 | 8.2 | 12.7 | 13.0 | 11.1 | 10.6 | 12.2 | 10.2 | 26.0 | 24.6 | 16.9 | 13.4 | 11.7 | 20.1 | 17.4 | 16.6 | 17.1 | 18.0 | 20.3 | 18.4 | 9.5 | 9.5 | 7.8 | 9.2 | 11.1 | 7.8 | 26.0 | 14.4 | 24 | |
| 7 | 7.8 | 5.9 | 9.2 | 12.3 | 13.4 | 12.4 | 13.4 | 11.5 | 6.5 | 7.7 | 17.6 | 22.2 | 20.3 | 22.7 | 20.2 | 22.9 | 20.1 | 22.7 | 20.3 | 17.8 | 10.3 | 11.8 | 11.8 | 10.9 | 5.9 | 22.9 | 14.7 | 24 | |
| 8 | 11.0 | 11.7 | 8.4 | 12.3 | 13.0 | 13.1 | 13.6 | 16.5 | 15.6 | 25.0 | 29.5 | 30.0 | 35.2 | 32.4 | 29.9 | 31.4 | 29.4 | 26.5 | 22.0 | 18.1 | 17.5 | 18.1 | 19.1 | 17.4 | 8.4 | 35.2 | 20.7 | 24 | |
| 9 | 15.5 | 22.7 | 21.5 | 23.6 | 26.4 | 29.9 | 16.2 | 15.6 | 17.7 | 26.6 | 29.3 | 27.8 | 28.8 | 27.9 | 23.7 | 28.9 | 33.7 | 32.4 | 25.2 | 18.2 | 22.0 | 11.9 | 29.6 | 39.4 | 11.9 | 39.4 | 24.8 | 24 | |
| 10 | 50.3 | 40.3 | 36.3 | 42.6 | 35.3 | 32.8 | 30.3 | 34.0 | 29.0 | 33.7 | 32.8 | 26.5 | 21.6 | 21.7 | 21.6 | 15.6 | 12.1 | 12.3 | 10.4 | 16.4 | 15.6 | 19.3 | 23.4 | 20.2 | 10.4 | 50.3 | 26.4 | 24 | |
| 11 | 19.4 | 17.1 | 13.2 | 11.0 | 14.4 | 17.0 | 27.4 | 24.5 | 24.3 | 30.9 | 30.7 | 31.3 | 31.7 | 30.5 | 32.8 | 29.9 | 23.8 | 25.3 | 23.1 | 18.1 | 13.9 | 8.7 | 8.3 | 9.7 | 8.3 | 32.8 | 21.5 | 24 | |
| 12 | 11.1 | 10.5 | 6.5 | 9.3 | 8.2 | 9.3 | 20.2 | 20.7 | 27.3 | 26.2 | 27.0 | 34.1 | 29.8 | 32.1 | 35.5 | 41.1 | 38.7 | 34.3 | 28.1 | 25.7 | 18.7 | 18.3 | 25.7 | 25.3 | 6.5 | 41.1 | 23.5 | 24 | |
| 13 | 28.2 | 35.8 | 24.5 | 17.1 | 7.9 | 13.0 | 14.4 | 17.0 | 13.2 | 14.0 | 16.2 | 13.6 | 22.4 | 19.1 | 24.5 | 25.2 | 38.3 | 42.7 | 13.1 | 13.3 | 13.9 | 11.9 | 13.9 | 18.6 | 7.9 | 42.7 | 19.7 | 24 | |
| 14 | 18.7 | 14.4 | P | 7.7 | 10.1 | 12.4 | 8.1 | 11.4 | 16.9 | 15.7 | 18.1 | 22.0 | 15.7 | 11.3 | 19.0 | 17.3 | 21.3 | 21.9 | 18.4 | 12.4 | 10.2 | 12.2 | 10.1 | 7.9 | 7.7 | 22.0 | 14.5 | 23 | |
| 15 | 17.7 | 18.4 | 8.4 | 7.4 | 5.6 | 6.3 | 5.7 | 8.3 | 8.9 | 10.8 | 11.6 | 12.3 | 22.1 | 28.1 | 14.9 | 12.9 | 11.9 | 16.3 | 11.1 | 8.0 | 7.1 | 9.9 | 14.5 | 10.1 | 5.6 | 28.1 | 12.0 | 24 | |
| 16 | 8.4 | 11.6 | 10.5 | 8.6 | 10.5 | 10.3 | 8.5 | 11.6 | 11.1 | 14.9 | 13.0 | 18.9 | 13.8 | 15.2 | 9.3 | 41.3 | 41.5 | 28.4 | 19.9 | 13.3 | 9.5 | 18.3 | 18.0 | 20.0 | 8.4 | 41.5 | 16.1 | 24 | |
| 17 | 11.8 | 16.7 | 13.9 | 11.9 | 17.9 | 19.1 | 24.2 | 26.0 | 36.9 | 26.4 | 30.8 | 37.6 | 39.0 | P | 38.5 | 30.9 | 36.2 | 23.0 | 19.7 | 15.6 | 15.8 | 10.2 | 8.4 | 8.2 | 8.2 | 39.0 | 22.6 | 23 | |
| 18 | 8.4 | 8.1 | 3.2 | 6.1 | 8.4 | 14.3 | 13.2 | 10.6 | 19.9 | 17.1 | 35.9 | 23.5 | 21.2 | 27.7 | 41.6 | 36.5 | 27.6 | 19.6 | 28.7 | 13.7 | 16.6 | 29.0 | 19.9 | 33.2 | 3.2 | 41.6 | 20.2 | 24 | |
| 19 | 31.2 | 12.6 | 17.9 | 21.6 | 20.9 | 18.7 | 22.4 | 26.5 | 24.5 | 27.1 | 22.0 | 24.4 | 19.9 | 18.7 | 20.6 | 19.3 | 17.6 | 15.9 | 16.2 | 11.0 | 10.2 | 10.7 | 13.3 | 15.0 | 10.2 | 31.2 | 19.1 | 24 | |
| 20 | 14.1 | 13.1 | 20.2 | 20.6 | 14.2 | 12.4 | 25.5 | 28.8 | 24.8 | 25.4 | 21.6 | 23.5 | 26.1 | 32.9 | 27.8 | 28.9 | 27.1 | 30.4 | 29.5 | 27.8 | 33.8 | 17.1 | 22.7 | P | 12.4 | 33.8 | 23.8 | 23 | |
| 21 | 35.8 | 27.0 | 28.2 | 24.7 | 22.4 | 32.6 | 41.5 | 44.5 | 42.7 | 58.9 | 57.7 | 46.9 | 49.3 | 52.9 | 49.0 | 60.2 | 48.2 | 46.2 | 46.7 | 53.9 | 48.3 | 46.1 | 41.3 | 48.5 | 22.4 | 60.2 | 43.9 | 24 | |
| 22 | 40.6 | 36.1 | 38.9 | 34.8 | 43.1 | 48.3 | 46.0 | 34.5 | 46.9 | 44.9 | 47.4 | 46.8 | 48.0 | 42.3 | 35.8 | 41.0 | 42.8 | 43.5 | 27.9 | 19.4 | 14.0 | 8.0 | 5.1 | 5.7 | 5.1 | 48.3 | 35.1 | 24 | |
| 23 | 6.8 | 9.7 | 7.5 | 7.4 | 5.4 | 5.2 | 7.2 | 10.6 | 11.6 | 14.3 | 35.5 | 28.6 | 31.3 | 30.3 | 34.7 | 31.1 | 30.3 | 29.2 | 30.5 | 21.1 | 10.0 | 3.8 | 4.0 | 31.7 | 3.8 | 35.5 | 18.2 | 24 | |
| 24 | 13.2 | 10.6 | 6.7 | 5.6 | 8.9 | 12.6 | 6.7 | 6.5 | 10.0 | 11.9 | 11.5 | 13.3 | 19.6 | 22.8 | 27.0 | 40.4 | 30.7 | 16.2 | 15.1 | 22.1 | 14.9 | 7.0 | 6.6 | 6.3 | 5.6 | 40.4 | 14.4 | 24 | |
| 25 | 2.6 | 6.8 | 4.1 | 3.0 | 4.0 | 3.6 | 6.1 | 8.9 | 10.5 | 13.7 | 17.2 | 18.5 | 20.7 | 18.1 | 17.6 | 17.2 | 19.3 | 22.7 | 22.6 | 20.7 | 17.1 | 20.9 | 24.6 | 27.3 | 2.6 | 27.3 | 14.5 | 24 | |
| 26 | 29.2 | 42.9 | 47.5 | 43.2 | 40.7 | 37.0 | 39.4 | 34.1 | 42.5 | 42.6 | 32.0 | 31.8 | 43.5 | 34.3 | 27.8 | 25.8 | 24.4 | 23.2 | 20.0 | 22.4 | 20.3 | 23.9 | 23.3 | 20.9 | 20.0 | 47.5 | 32.2 | 24 | |
| 27 | 30.5 | 39.3 | 20.5 | 16.3 | 24.6 | 38.4 | 30.4 | 24.5 | 27.0 | 26.9 | 24.7 | 35.2 | 39.8 | 44.5 | 41.0 | 42.1 | 34.1 | 32.5 | 31.9 | 23.0 | 11.8 | 32.8 | 15.1 | 19.7 | 11.8 | 44.5 | 29.4 | 24 | |
| 28 | 14.3 | 21.1 | 17.7 | 17.3 | 18.8 | 25.9 | 15.0 | 18.2 | 15.1 | 14.9 | 8.9 | 9.2 | 8.5 | 11.8 | 10.0 | 34.0 | 33.4 | 36.2 | 34.4 | 25.0 | 22.9 | 15.5 | 12.5 | 13.4 | 8.5 | 36.2 | 18.9 | 24 | |
| 29 | 10.2 | 7.9 | 8.3 | 5.7 | 5.8 | 9.8 | 11.6 | 14.0 | 12.1 | 17.6 | 16.1 | 18.1 | 24.6 | 26.2 | 21.4 | 32.9 | 28.4 | 22.3 | 9.6 | 10.6 | 7.5 | 16.5 | 19.1 | 24.8 | 5.7 | 32.9 | 15.9 | 24 | |
| 30 | 13.1 | 13.0 | 13.1 | 8.6 | 9.9 | 10.5 | 5.4 | 10.2 | 9.8 | 8.2 | 11.7 | 8.5 | 11.5 | 13.2 | 11.6 | 29.2 | 8.6 | 16.0 | 14.6 | 10.7 | 7.4 | 3.5 | 5.3 | 4.3 | 3.5 | 29.2 | 10.7 | 24 | |
| HOURLY MAX | 50.3 | 42.9 | 47.5 | 43.2 | 43.1 | 48.3 | 46.0 | 44.5 | 46.9 | 58.9 | 57.7 | 46.9 | 49.3 | 52.9 | 49.0 | 60.2 | 48.2 | 46.2 | 46.7 | 53.9 | 48.3 | 46.1 | 41.3 | 48.5 | | | | | |
| HOURLY AVG | 18.8 | 18.6 | 16.5 | 16.0 | 16.8 | 18.0 | 19.2 | 20.7 | 22.3 | 23.2 | 24.6 | 25.0 | 26.8 | 26.6 | 26.7 | 29.7 | 27.3 | 25.6 | 22.5 | 19.0 | 15.8 | 15.6 | 16.1 | 18.4 | | | | | |

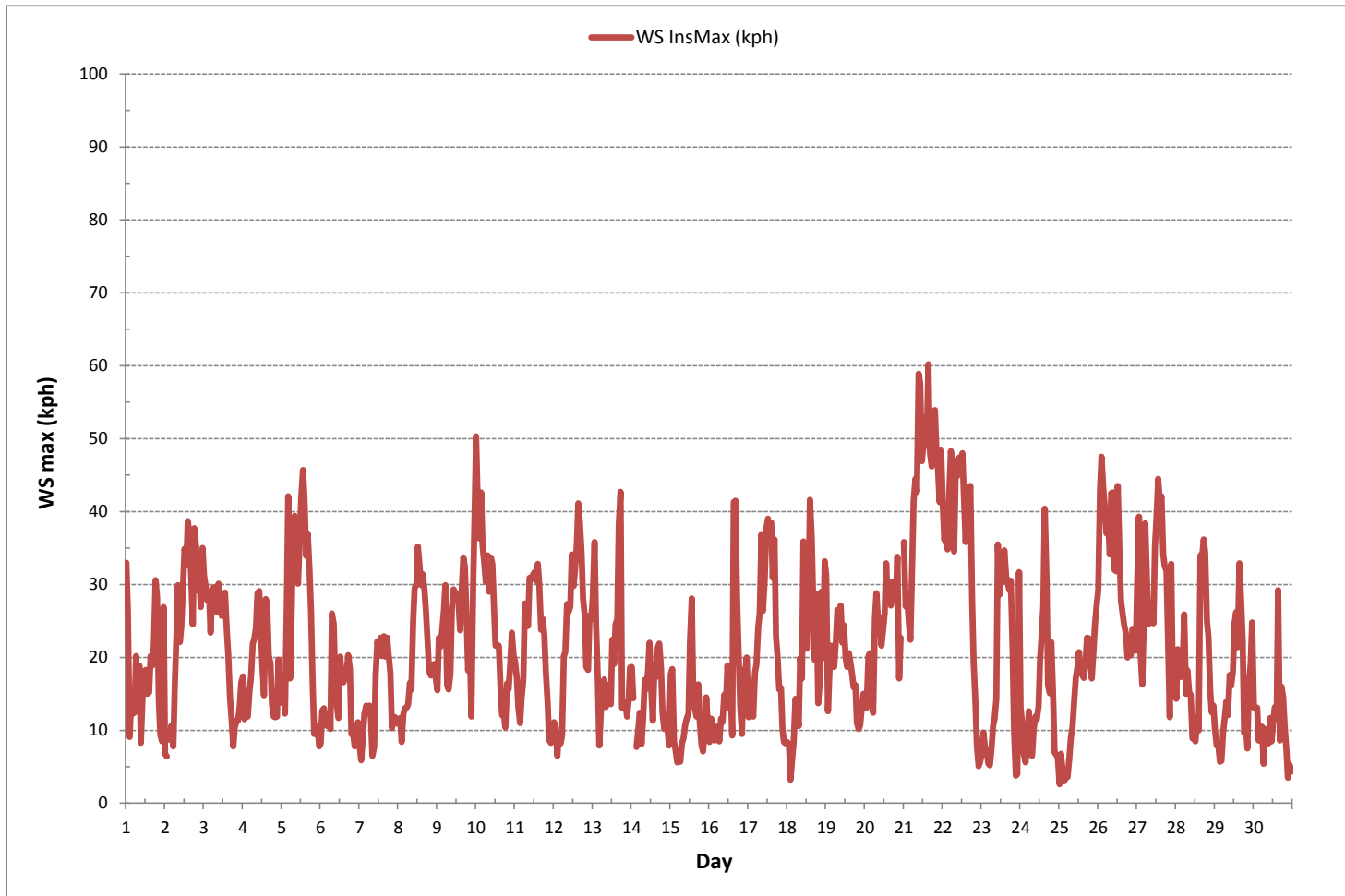
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | | | | | | | |
|------------------------------|------|-----|--------|----|--------|-----|-----|
| MAXIMUM INSTANTANEOUS VALUE: | 60.2 | kph | @ HOUR | 15 | ON DAY | 21 | |
| OPERATIONAL TIME: | | | | | | 716 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



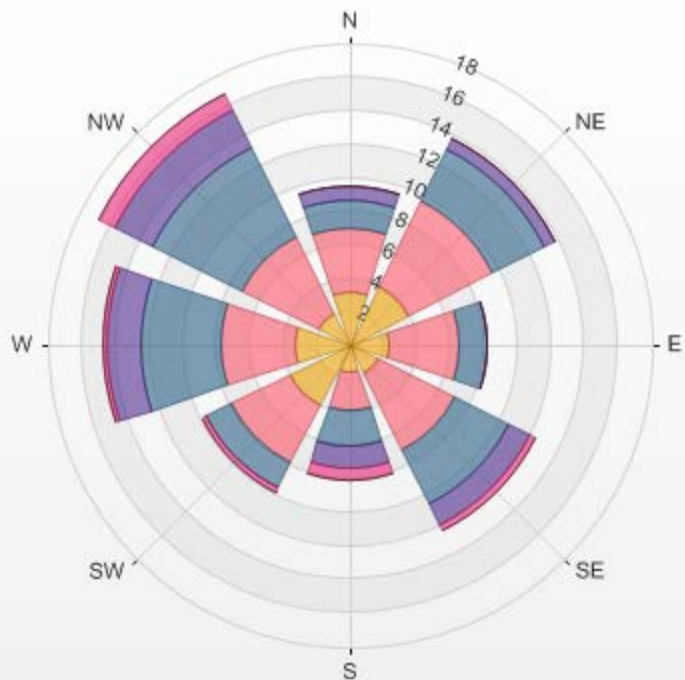
Wind: LICA Bonnyville
 Monitor: WSP [kph]
 Monthly: 17/06
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 6.81%

| Direction | 1.8-4.7 | 4.7-9.4 | 9.4-14.0 | 14.0-18.7 | 18.7-23.4 | >23.4 | Total |
|----------------|---------|---------|----------|-----------|-----------|-------|-------|
| N | 3.2 | 3.8 | 1.7 | 0.8 | 0.0 | 0.0 | 9.4 |
| NE | 3.9 | 5.7 | 3.5 | 0.7 | 0.0 | 0.0 | 13.7 |
| E | 2.4 | 4.2 | 1.7 | 0.0 | 0.0 | 0.0 | 8.2 |
| SE | 1.9 | 5.1 | 3.5 | 1.5 | 0.3 | 0.0 | 12.4 |
| S | 1.7 | 2.2 | 2.2 | 1.3 | 0.7 | 0.0 | 8.1 |
| SW | 4.0 | 3.9 | 1.7 | 0.0 | 0.3 | 0.0 | 9.9 |
| W | 3.3 | 4.3 | 4.9 | 1.9 | 0.3 | 0.0 | 14.7 |
| NW | 2.1 | 5.1 | 6.0 | 2.5 | 1.1 | 0.0 | 16.8 |
| Summary | 22.5 | 34.3 | 25.0 | 8.7 | 2.6 | 0.0 | 93.2 |

% Icon Classes (kph) 22  1.8-4.7 34  4.7-9.4 25  9.4-14.0 9  14.0-18.7 3  18.7-23.4 0  >23.4

LICA Bonnyville 2017/06/01 00:00 - 2017/06/30 23:00 Calm: 6.81% Calm Wind Avg Speed: 0.91(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

WIND DIRECTION Hourly Averages (WD)

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

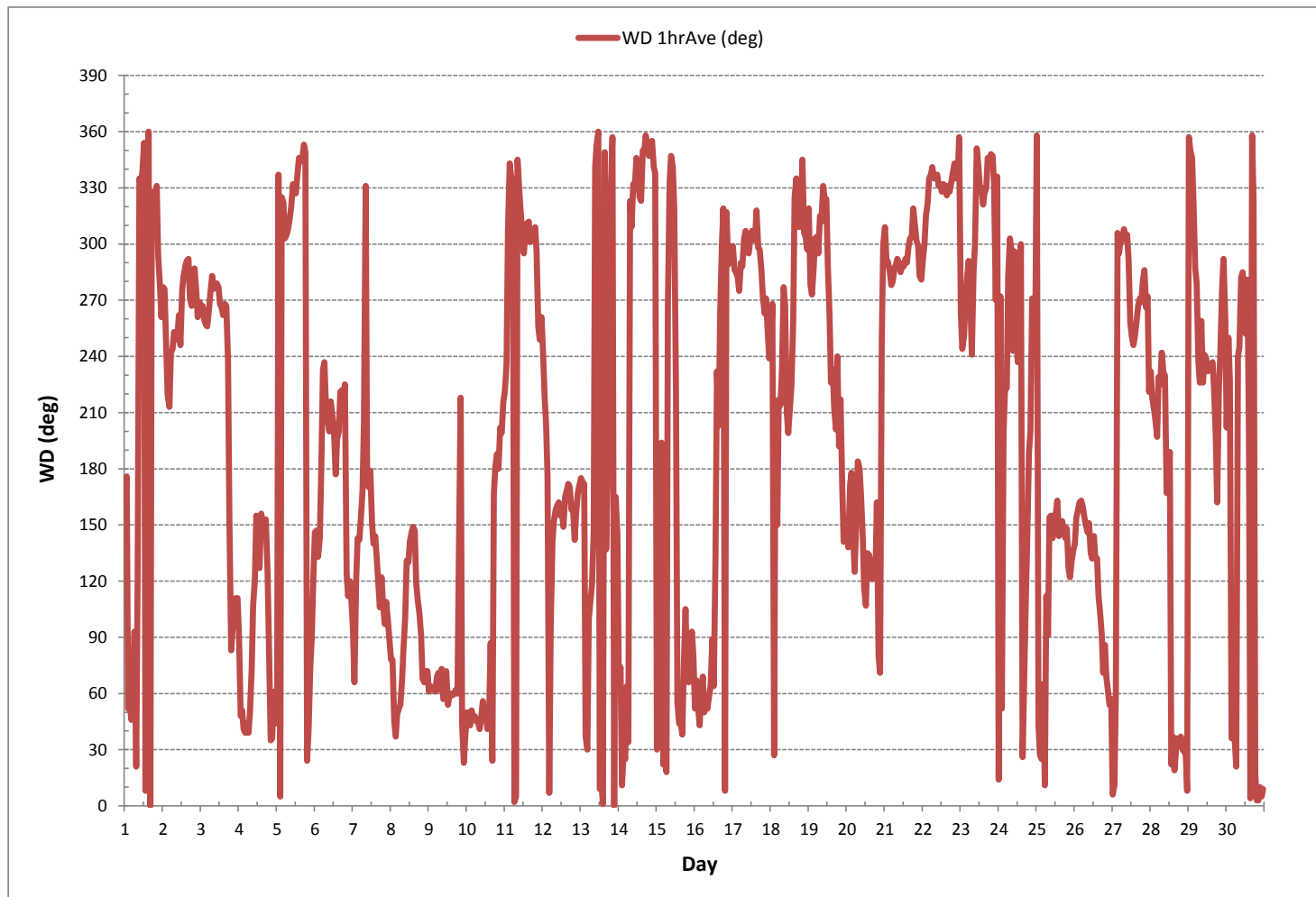
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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 3, 2017 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

| | | | | | |
|---------------------------|-----|-----|-----------------------|-----------|-----|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 720 | hrs |
| STANDARD DEVIATION: | 107 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 299 (WNW) | |

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - June 2017

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | RDGS. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 15 | 35 | 16 | 15 | 15 | 19 | 24 | 21 | 42 | 26 | 22 | 20 | 18 | 34 | 34 | 21 | 17 | 27 | 17 | 16 | 13 | 22 | 22 | 17 | 24 | |
| 2 | 18 | 22 | 25 | 29 | 15 | 27 | 26 | 23 | 17 | 19 | 21 | 19 | 21 | 21 | 22 | 21 | 21 | 21 | 21 | 21 | 21 | 22 | 20 | 21 | 24 | |
| 3 | 22 | 21 | 20 | 17 | 17 | 21 | 21 | 22 | 22 | 23 | 25 | 26 | 25 | 21 | 31 | 23 | 27 | 23 | 56 | 28 | 26 | 24 | 16 | 18 | 24 | |
| 4 | 18 | 17 | 20 | 14 | 15 | 17 | 17 | 18 | 23 | 24 | 20 | 15 | 20 | 26 | 17 | 18 | 18 | 26 | 40 | 59 | 26 | 19 | 20 | 16 | 24 | |
| 5 | 17 | 52 | 17 | 12 | 37 | 14 | 15 | 17 | 18 | 17 | 18 | 20 | 20 | 19 | 19 | 19 | 19 | 19 | 17 | 17 | 16 | 19 | 28 | 31 | 24 | |
| 6 | 36 | 13 | 17 | 37 | 47 | 24 | 21 | 13 | 13 | 21 | 33 | 64 | 53 | 54 | 42 | 39 | 28 | 12 | 15 | 47 | 19 | 18 | 16 | 19 | 24 | |
| 7 | 20 | 19 | 25 | 29 | 21 | 33 | 41 | 69 | 60 | 76 | 65 | 21 | 36 | 32 | 27 | 32 | 29 | 18 | 18 | 19 | 19 | 16 | 16 | 15 | 24 | |
| 8 | 15 | 15 | 12 | 16 | 16 | 16 | 18 | 21 | 23 | 23 | 20 | 23 | 23 | 21 | 18 | 20 | 19 | 19 | 17 | 18 | 17 | 17 | 19 | 18 | 24 | |
| 9 | 18 | 18 | 17 | 20 | 23 | 23 | 19 | 18 | 21 | 20 | 20 | 20 | 22 | 21 | 22 | 22 | 22 | 22 | 22 | 32 | 50 | 29 | 16 | 22 | 24 | |
| 10 | 22 | 22 | 21 | 21 | 21 | 22 | 21 | 21 | 22 | 22 | 23 | 20 | 22 | 22 | 24 | 34 | 35 | 52 | 61 | 16 | 17 | 13 | 12 | 13 | 24 | |
| 11 | 10 | 25 | 21 | 11 | 14 | 16 | 18 | 17 | 19 | 20 | 22 | 25 | 23 | 23 | 21 | 23 | 18 | 19 | 17 | 18 | 26 | 23 | 20 | 24 | 24 | |
| 12 | 30 | 36 | 37 | 58 | 18 | 29 | 25 | 17 | 18 | 16 | 18 | 16 | 17 | 17 | 16 | 15 | 15 | 16 | 15 | 16 | 15 | 16 | 15 | 14 | 24 | |
| 13 | 11 | 12 | 57 | 43 | 19 | 36 | 18 | 17 | 28 | 16 | 16 | 21 | 21 | 20 | 19 | 19 | 37 | 16 | 33 | 15 | 12 | 11 | 44 | 42 | 24 | |
| 14 | 21 | 21 | 11 | 11 | 12 | 20 | 16 | 14 | 17 | 17 | 16 | 18 | 17 | 16 | 18 | 16 | 17 | 15 | 15 | 13 | 9 | 11 | 10 | 9 | 24 | |
| 15 | 17 | 21 | 20 | 43 | 9 | 10 | 11 | 33 | 21 | 15 | 18 | 28 | 50 | 20 | 18 | 23 | 19 | 25 | 20 | 23 | 16 | 17 | 18 | 19 | 24 | |
| 16 | 14 | 20 | 16 | 12 | 16 | 19 | 21 | 21 | 21 | 23 | 24 | 39 | 48 | 62 | 45 | 39 | 22 | 19 | 19 | 16 | 17 | 20 | 17 | 17 | 24 | |
| 17 | 17 | 19 | 22 | 20 | 24 | 20 | 21 | 20 | 19 | 25 | 23 | 22 | 22 | 23 | 23 | 18 | 20 | 21 | 23 | 19 | 21 | 18 | 20 | 19 | 24 | |
| 18 | 13 | 20 | 7 | 41 | 49 | 27 | 19 | 30 | 25 | 25 | 13 | 16 | 25 | 19 | 24 | 24 | 20 | 21 | 20 | 17 | 13 | 20 | 19 | 18 | 24 | |
| 19 | 18 | 20 | 20 | 20 | 18 | 17 | 19 | 18 | 23 | 22 | 21 | 23 | 43 | 35 | 33 | 39 | 28 | 33 | 39 | 26 | 39 | 62 | 21 | 18 | 24 | |
| 20 | 18 | 19 | 18 | 33 | 23 | 21 | 39 | 13 | 14 | 17 | 18 | 18 | 18 | 22 | 18 | 18 | 16 | 17 | 20 | 35 | 36 | 37 | 46 | 20 | 24 | |
| 21 | 18 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 23 | 21 | 23 | 22 | 22 | 20 | 19 | 19 | 20 | 18 | 18 | 20 | 22 | 23 | 24 | |
| 22 | 20 | 18 | 18 | 17 | 20 | 20 | 19 | 19 | 20 | 19 | 21 | 21 | 20 | 21 | 21 | 21 | 19 | 18 | 16 | 12 | 5 | 5 | 23 | 24 | 24 | |
| 23 | 19 | 22 | 20 | 13 | 9 | 10 | 22 | 28 | 34 | 39 | 22 | 23 | 23 | 24 | 25 | 23 | 21 | 18 | 18 | 13 | 8 | 10 | 11 | 17 | 24 | |
| 24 | 24 | 43 | 43 | 49 | 24 | 32 | 19 | 15 | 30 | 32 | 33 | 28 | 20 | 23 | 26 | 30 | 30 | 22 | 24 | 14 | 32 | 32 | 28 | 37 | 24 | |
| 25 | 17 | 9 | 14 | 9 | 10 | 12 | 40 | 43 | 40 | 26 | 25 | 23 | 30 | 44 | 36 | 35 | 25 | 22 | 20 | 15 | 16 | 14 | 17 | 17 | 24 | |
| 26 | 18 | 16 | 14 | 15 | 16 | 15 | 15 | 15 | 20 | 17 | 19 | 18 | 19 | 18 | 18 | 18 | 17 | 19 | 20 | 22 | 18 | 17 | 20 | 19 | 24 | |
| 27 | 26 | 23 | 37 | 29 | 21 | 18 | 19 | 19 | 20 | 19 | 25 | 26 | 20 | 19 | 19 | 21 | 23 | 23 | 22 | 20 | 18 | 21 | 20 | 12 | 24 | |
| 28 | 15 | 11 | 14 | 14 | 14 | 20 | 45 | 23 | 21 | 18 | 53 | 50 | 34 | 25 | 36 | 28 | 21 | 21 | 20 | 21 | 18 | 16 | 15 | 11 | 24 | |
| 29 | 9 | 7 | 8 | 13 | 21 | 27 | 31 | 22 | 29 | 24 | 23 | 19 | 18 | 19 | 20 | 29 | 40 | 18 | 34 | 38 | 33 | 25 | 23 | 25 | 24 | |
| 30 | 22 | 30 | 31 | 11 | 13 | 15 | 18 | 38 | 29 | 27 | 25 | 34 | 38 | 30 | 61 | 32 | 13 | 17 | 18 | 12 | 8 | 2 | 2 | 5 | 24 | |

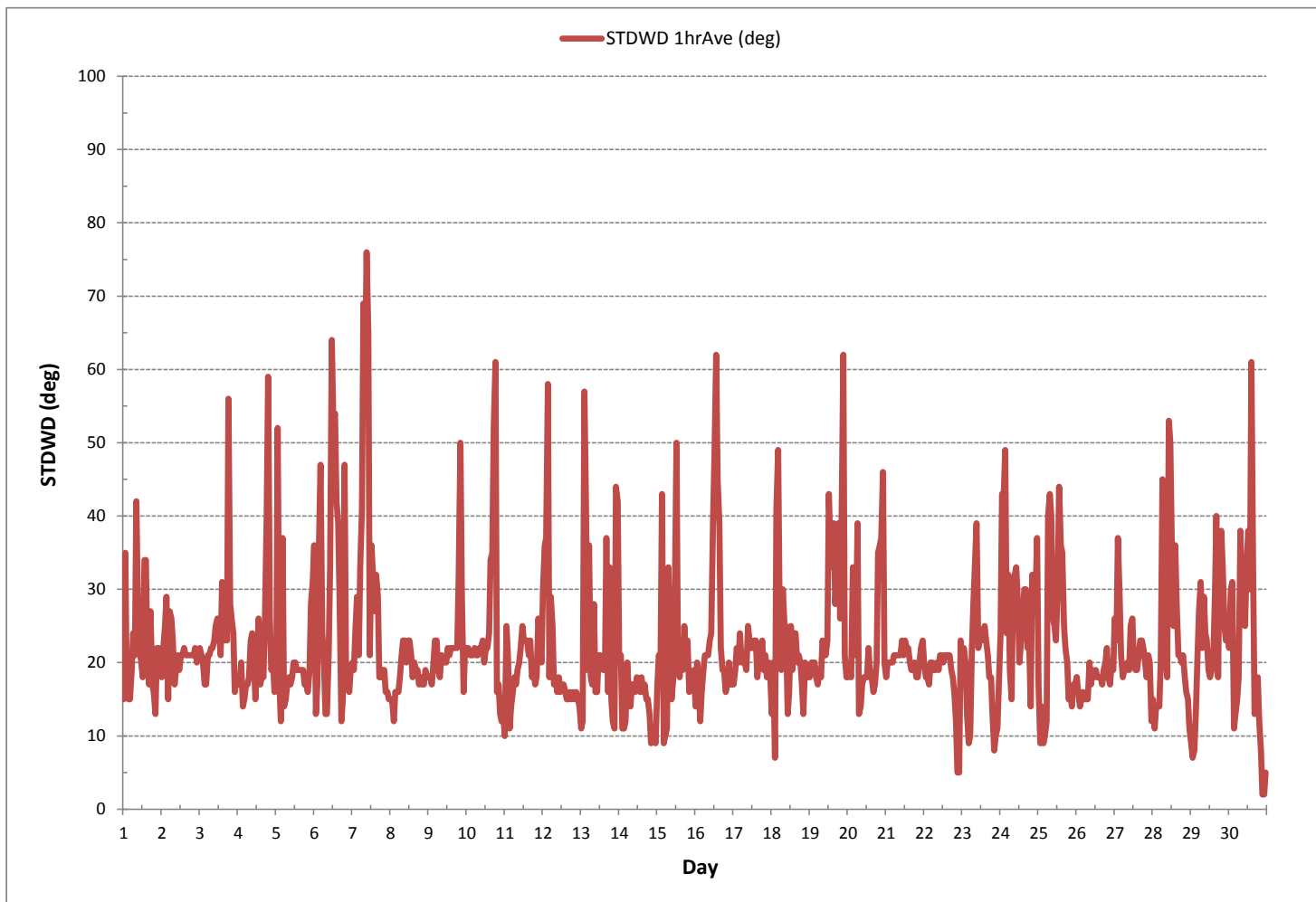
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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 |

LAST CALIBRATION: March 3, 2017

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

Sample ID: 17060101-001

Customer ID: LICA
Cust Samp ID: LICA/VOC/Bonnyville/June 06, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 23791
 Station ID: LICA-37 Installation Date/Time (mst): Jun 05, 2017 @ 10:59
 Sample ID: LICA/VOC/Bonnyville/June 06, 2017 Removal Date/Time (mst): Jun 09, 2017 @ 12:28

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>- 27.6</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>27.5</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 09, 2017



Volatile Organics Data Results

Date: June 6, 2017
Canister ID: 23791

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.04 |
| 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 | 0.03 |
| 2,3-Dimethylpentane | 0.04 |
| 2,4-Dimethylpentane | 0.01 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | 0.08 |
| 2-Methylpentane | 0.08 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.07 |
| 3-Methylpentane | 0.05 |
| Acetone | 4.6 |
| Acrolein | < 0.3 |
| Benzene | 0.06 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | 0.01 |
| Carbon disulfide | 0.03 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | < 0.02 |
| Chloromethane | 0.48 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | < 0.02 |
| Cyclopentane | < 0.01 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.5 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | < 0.01 |
| Freon-11 | 0.36 |
| Freon-113 | 0.08 |

Volatile Organics Data Results

Date: June 6, 2017
Canister ID: 23791

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.5 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.4 |
| Isopentane | 0.36 |
| Isoprene | 0.12 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | < 0.03 |
| m-Diethylbenzene | < 0.04 |
| m-Ethyltoluene | < 0.08 |
| Methyl butyl ketone | < 0.50 |
| Methyl ethyl ketone | < 0.3 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 0.07 |
| Methylcyclopentane | 0.04 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.35 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.07 |
| n-Hexane | 0.18 |
| 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 | 0.09 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 14999
 Station ID: LICA-37 Installation Date/Time (mst): Jun 09, 2017 @ 12:28
 Sample ID: LICA/~~PTT~~/Bonnyville/June 12, 2017 Removal Date/Time (mst): Jun 16, 2017 @ 10:16
VOC
A.Y.

Date and Time Information

| Sample Date: | Start Time (mst) | End Time (mst) | Elapsed Time (hours) |
|---------------------|------------------|-------------------------------------|----------------------|
| <u>Jun 12, 2017</u> | <u>00:00</u> | <u>00:00</u> <u>Jun 13, 2017</u> | <u>24.0</u> |

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.7</u> | <u>+19.2</u> |

| Flow Settings | | |
|---------------------|---------------|----------------|
| Flow Reading (sccm) | Pot Set Point | Pump Set (psi) |
| <u>10.0</u> | <u>4.94</u> | <u>27.5</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 16, 2017

Sample ID: 17060233-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jun 12, 2017



Volatile Organics Data Results

Date: June 12, 2017
Canister ID: 14999

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.03 |
| 1-Hexene | < 0.02 |
| 1-Pentene | < 0.01 |
| 2,2,4-Trimethylpentane | 0.02 |
| 2,2-Dimethylbutane | < 0.01 |
| 2,3,4-Trimethylpentane | < 0.01 |
| 2,3-Dimethylbutane | 0.03 |
| 2,3-Dimethylpentane | 0.03 |
| 2,4-Dimethylpentane | 0.01 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | 0.04 |
| 2-Methylpentane | 0.05 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.03 |
| 3-Methylpentane | 0.04 |
| Acetone | 4.6 |
| Acrolein | < 0.3 |
| Benzene | 0.1 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.08 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | < 0.02 |
| Chloromethane | 0.41 |
| 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 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | < 0.01 |
| Freon-11 | 0.35 |
| Freon-113 | 0.09 |

Volatile Organics Data Results

Date: June 12, 2017
Canister ID: 14999

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | 0.02 |
| Freon-12 | 0.48 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.37 |
| Isopentane | 0.4 |
| Isoprene | 0.12 |
| 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 | 0.38 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.03 |
| n-Hexane | 0.07 |
| n-Nonane | < 0.01 |
| n-Octane | < 0.02 |
| n-Pentane | 0.1 |
| n-Propylbenzene | < 0.05 |
| n-Undecane | < 0.5 |
| Naphthalene | < 0.5 |
| o-Ethyltoluene | < 0.01 |
| o-Xylene | < 0.01 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | < 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.06 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 14980
 Station ID: LICA-37 Installation Date/Time (mst): JUN 16, 2017 @ 10:16
 Sample ID: LICA/VOC/Bonnyville/Jun 18, 2017 Removal Date/Time (mst): JUN 19, 2017 @ 10:07

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>- 27.2</u> | <u>+ 18.6</u> |

| Flow Settings | | |
|---------------------|---------------|----------------|
| Flow Reading (sccm) | Pot Set Point | Pump Set (psi) |
| <u>10.0</u> | <u>4.94</u> | <u>27.5</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = — @ — mst
 Final leak check deployment vacuum (in. Hg) = — @ — mst
 Total leak rate = — psi over — minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 19, 2017

Sample ID: 17060233-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jun 18, 2017



Volatile Organics Data Results

Date: June 18, 2017
Canister ID: 14980

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.03 |
| 1-Hexene | < 0.02 |
| 1-Pentene | < 0.01 |
| 2,2,4-Trimethylpentane | 0.04 |
| 2,2-Dimethylbutane | < 0.01 |
| 2,3,4-Trimethylpentane | 0.01 |
| 2,3-Dimethylbutane | 0.03 |
| 2,3-Dimethylpentane | 0.06 |
| 2,4-Dimethylpentane | 0.02 |
| 2-Methylheptane | 0.06 |
| 2-Methylhexane | 0.21 |
| 2-Methylpentane | 0.2 |
| 3-Methylheptane | 0.03 |
| 3-Methylhexane | 0.1 |
| 3-Methylpentane | 0.13 |
| Acetone | 6.0 |
| Acrolein | < 0.3 |
| Benzene | 0.37 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.03 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | < 0.02 |
| Chloromethane | 0.4 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | 0.12 |
| Cyclopentane | 0.06 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.7 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.07 |
| Freon-11 | 0.34 |
| Freon-113 | 0.08 |

Volatile Organics Data Results

Date: June 18, 2017
Canister ID: 14980

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.48 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.27 |
| Isopentane | 0.76 |
| Isoprene | 0.12 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | 0.25 |
| m-Diethylbenzene | < 0.04 |
| m-Ethyltoluene | < 0.08 |
| Methyl butyl ketone | < 0.50 |
| Methyl ethyl ketone | 1 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 0.27 |
| Methylcyclopentane | 0.2 |
| Methylene chloride | < 0.3 |
| n-Butane | 1.68 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.21 |
| n-Hexane | 0.39 |
| n-Nonane | 0.03 |
| n-Octane | 0.09 |
| n-Pentane | 0.8 |
| n-Propylbenzene | < 0.05 |
| n-Undecane | < 0.5 |
| Naphthalene | < 0.5 |
| o-Ethyltoluene | 0.01 |
| o-Xylene | 0.09 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | < 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.82 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/June 24, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: S5619
 Station ID: LICA-37 Installation Date/Time (mst): JUN 19, 2017 @ 16:07
 Sample ID: LICA/VOC/Bonnyville/June 24, 2017 Removal Date/Time (mst): JUN 26, 2017 @ 15:29

Date and Time Information

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

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.7</u> | <u>+19.5</u> |

| Flow Settings | | |
|---------------------|---------------|----------------|
| Flow Reading (sccm) | Pot Set Point | Pump Set (psi) |
| <u>10.0</u> | <u>4.94</u> | <u>27.5</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jun 26, 2017



Volatile Organics Data Results

Date: June 24, 2017
Canister ID: S5619

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.04 |
| 1-Hexene | < 0.02 |
| 1-Pentene | 0.02 |
| 2,2,4-Trimethylpentane | 0.04 |
| 2,2-Dimethylbutane | 0.02 |
| 2,3,4-Trimethylpentane | 0.01 |
| 2,3-Dimethylbutane | 0.04 |
| 2,3-Dimethylpentane | 0.03 |
| 2,4-Dimethylpentane | 0.02 |
| 2-Methylheptane | < 0.01 |
| 2-Methylhexane | 0.04 |
| 2-Methylpentane | 0.08 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.04 |
| 3-Methylpentane | 0.05 |
| Acetone | 6.4 |
| Acrolein | < 0.3 |
| Benzene | 0.06 |
| Benzyl chloride | < 0.4 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 0.52 |
| Carbon tetrachloride | 0.11 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | < 0.02 |
| Chloromethane | 0.54 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | 0.03 |
| Cyclopentane | 0.02 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 1.5 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.02 |
| Freon-11 | 0.3 |
| Freon-113 | 0.1 |

Volatile Organics Data Results

Date: June 24, 2017
Canister ID: S5619

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | 0.02 |
| Freon-12 | 0.65 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.17 |
| Isopentane | 0.4 |
| 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 | < 0.3 |
| Methyl isobutyl ketone | < 0.4 |
| Methyl methacrylate | < 0.07 |
| Methyl tert butyl ether | < 0.03 |
| Methylcyclohexane | 0.06 |
| Methylcyclopentane | 0.05 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.32 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.04 |
| n-Hexane | 0.07 |
| n-Nonane | 0.02 |
| n-Octane | < 0.02 |
| n-Pentane | 0.2 |
| n-Propylbenzene | < 0.05 |
| n-Undecane | < 0.5 |
| Naphthalene | < 0.5 |
| o-Ethyltoluene | < 0.01 |
| o-Xylene | 0.03 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | < 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.1 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | < 0.02 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/June 30, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: S5589
 Station ID: LICA-37 Installation Date/Time (mst): Jun 26, 2017 @ 15:39
 Sample ID: LICA/VOC/Bonnyville/June 30, 2017 Removal Date/Time (mst): July 05, 2017 @ 13:02

Date and Time Information

| Sample Date: | Start Time (mst) | End Time (mst) | Elapsed Time (hours) |
|---------------------|------------------|----------------------------|----------------------|
| <u>Jun 30, 2017</u> | <u>00:00</u> | <u>00:00 July 01, 2017</u> | <u>24.0</u> |

| Canister Pressure/Vacuum | |
|--------------------------|----------------------|
| Initial Vacuum (in. Hg) | Final Pressure (psi) |
| <u>-27.2</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>27.5</u> |

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Apr 06, 2017 (due every 3 months)
 Last date of sample line & fitting replacement: Apr 05, 2017 (due every 6 months)

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

Comments: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: July 05, 2017



Volatile Organics Data Results

Date: June 30, 2017
Canister ID: S5589

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.04 |
| 1,2,3-Trimethylbenzene | < 0.05 |
| 1,2,4-Trichlorobenzene | < 0.8 |
| 1,2,4-Trimethylbenzene | < 0.05 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.03 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | < 0.02 |
| 1,3-Dichlorobenzene | < 0.3 |
| 1,4-Dichlorobenzene | < 0.4 |
| 1,4-Dioxane | < 0.4 |
| 1-Butene | 0.03 |
| 1-Hexene | < 0.02 |
| 1-Pentene | 0.02 |
| 2,2,4-Trimethylpentane | 0.05 |
| 2,2-Dimethylbutane | 0.01 |
| 2,3,4-Trimethylpentane | < 0.01 |
| 2,3-Dimethylbutane | 0.05 |
| 2,3-Dimethylpentane | 0.04 |
| 2,4-Dimethylpentane | 0.01 |
| 2-Methylheptane | 0.02 |
| 2-Methylhexane | 0.07 |
| 2-Methylpentane | 0.21 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.05 |
| 3-Methylpentane | 0.13 |
| Acetone | 4.4 |
| Acrolein | < 0.3 |
| Benzene | 0.1 |
| 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 | 0.54 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.04 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | 0.11 |
| Cyclopentane | 0.05 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 2.2 |
| Ethyl acetate | < 0.4 |
| Ethylbenzene | 0.05 |
| Freon-11 | 0.32 |
| Freon-113 | 0.11 |

Volatile Organics Data Results

Date: June 30, 2017
Canister ID: S5589

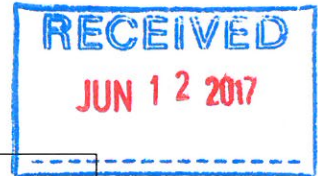
| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.02 |
| Freon-12 | 0.65 |
| Hexachloro-1,3-butadiene | < 0.50 |
| Isobutane | 0.23 |
| Isopentane | 0.64 |
| Isoprene | 0.17 |
| Isopropyl alcohol | < 0.4 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | 0.13 |
| 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 | 0.1 |
| Methylcyclopentane | 0.22 |
| Methylene chloride | < 0.3 |
| n-Butane | 0.42 |
| n-Decane | < 0.06 |
| n-Dodecane | < 0.4 |
| n-Heptane | 0.17 |
| n-Hexane | 0.23 |
| n-Nonane | < 0.01 |
| n-Octane | 0.07 |
| n-Pentane | 0.3 |
| n-Propylbenzene | < 0.05 |
| n-Undecane | < 0.5 |
| Naphthalene | < 0.5 |
| o-Ethyltoluene | < 0.01 |
| o-Xylene | 0.05 |
| p-Diethylbenzene | < 0.04 |
| p-Ethyltoluene | < 0.07 |
| Styrene | < 0.04 |
| Tetrachloroethylene | 0.04 |
| Tetrahydrofuran | < 0.4 |
| Toluene | 0.27 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.04 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | 0.03 |
| Trichloroethylene | < 0.04 |
| Vinyl acetate | < 0.4 |
| Vinyl chloride | < 0.02 |

PAH RESULTS

Sample ID: 17060101-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/June 06, 2017



TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|--|-------------------------|---------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>TE-01</u> |
| Location: | <u>Bonnyville - AER</u> | Motor S/N: | <u>1139/100-1015</u> |
| Station ID: | <u>LICA-37</u> | Installation Date/Time: | <u>Jun 05, 2017/10:52</u> |
| Field Sample ID: | <u>LICA/PUF/Bonnyville/June 06, 2017</u> | Removal Date/Time: | <u>Jun 09, 2017/12:36</u> |

Sample Data Collection Information

| | | | |
|-----------------------|----------------------------|----------------------------------|---------------|
| Sample Date: | <u>June 06, 2017</u> | Average Pressure (mmHg) | <u>708</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 June 07, 2017</u> | Average Temperature (°C) | <u>17.9°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (Vstd m ³) | <u>330.20</u> |

Sample Recovery Checklist

(circle one)

| | | |
|---|--------------------------------------|-------------------------------------|
| Flow Rate 230 slpm +/- 0.2 slpm ? | <input checked="" type="radio"/> YES | <input type="radio"/> NO |
| Average temperature appears correct? | <input checked="" type="radio"/> YES | <input type="radio"/> NO |
| Average pressure appears correct? | <input checked="" type="radio"/> YES | <input type="radio"/> NO |
| Any error messages? (if yes list below) | YES | <input checked="" type="radio"/> NO |
| Sample duration 24 hours? | <input checked="" type="radio"/> YES | <input type="radio"/> NO |
| Date of last calibration/audit: | <u>Apr 06, 2017</u> | |
| Other observations? | <u>n/a</u> | |

| | |
|---------------|---|
| Deployed By: | <u>Alex Yakupov</u> |
| Collected By: | <u>Alex Yakupov</u> Date: <u>Jun 09, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 6, 2017
PUF S/N: TE-01

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.13 |
| 2-Methylnaphthalene | 0.28 |
| 3-Methylcholanthrene | < 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | < 0.01 |
| Acenaphthylene | 0.28 |
| Acridine | 0.02 |
| Anthracene | 0.02 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | < 0.01 |
| Benzo(b,j,k)fluoranthene | 0.03 |
| Benzo(c)phenanthrene | < 0.01 |
| Benzo(e)pyrene | 0.01 |
| Benzo(ghi)perylene | < 0.01 |
| Chrysene | 0.02 |
| Dibenzo(a,h)pyrene | < 0.01 |
| Dibenzo(a,i)pyrene | 0.01 |
| Dibenzo(a,l)pyrene | < 0.01 |
| Dibenzo(ah)anthracene | < 0.01 |
| Fluoranthene | 0.11 |
| Fluorene | 0.1 |
| Indeno(1,2,3-cd)pyrene | 0.01 |
| Naphthalene | 0.07 |
| Perylene | 0.01 |
| Phenanthrene | 0.45 |
| Pyrene | 0.08 |
| Retene | 0.12 |

Sample ID: 17060233-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jun 12, 2017

GISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|---|-------------------------|-----------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>A13-02</u> |
| Location: | <u>Bonnyville - AER</u> | Motor S/N: | <u>1139 / 100 - 1015</u> |
| Station ID: | <u>LICA-37</u> | Installation Date/Time: | <u>Jun 09, 2017 / 12:36</u> |
| Field Sample ID: | <u>LICA/PUF/Bonnyville/Jun 12, 2017</u> | Removal Date/Time: | <u>Jun 16, 2017 / 10:08</u> |

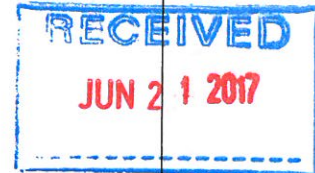
Sample Data Collection Information

| | | | |
|-----------------------|---------------------------|---|---------------|
| Sample Date: | <u>Jun 12, 2017</u> | Average Pressure (mmHg) | <u>699</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 Jun 13, 2017</u> | Average Temperature (°C) | <u>16.0°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (V _{std} m ³) | <u>330.19</u> |

Sample Recovery Checklist

(circle one)

| | | |
|---|--------------------------------------|-------------------------------------|
| Flow Rate 230 slpm +/- 0.2 slpm ? | <input checked="" type="radio"/> YES | 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>Apr 06, 2017</u> | |
| Other observations? | <u>n/a</u> | |



| | | |
|---------------|---------------------|---------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | Date: <u>Jun 16, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 12, 2017
PUF S/N: A13-02

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.06 |
| 2-Methylnaphthalene | 0.11 |
| 3-Methylcholanthrene | 0.02 |
| 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 | 0.03 |
| 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 | 0.09 |
| Fluorene | 0.05 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.02 |
| Perylene | < 0.01 |
| Phenanthrene | 0.30 |
| Pyrene | 0.09 |
| Retene | 0.04 |

Sample ID: 17060233-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jun 18, 2017

RECEIVED
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TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|---|-------------------------|----------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>TE-05</u> |
| Location: | <u>Bonnyville - AER</u> | Motor S/N: | <u>1139/100-1Q15</u> |
| Station ID: | <u>LICA-37</u> | Installation Date/Time: | <u>Jun 16, 2017/ 10:08</u> |
| Field Sample ID: | <u>LICA/PUF/Bonnyville/Jun 18, 2017</u> | Removal Date/Time: | <u>Jun 19, 2017/ 16:16</u> |

Sample Data Collection Information

| | | | |
|-----------------------|---------------------------|----------------------------------|---------------|
| Sample Date: | <u>Jun 18, 2017</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 Jun 19, 2017</u> | Average Temperature (°C) | <u>15.4°</u> |
| Elapsed Time (Hours): | <u>24.0</u> | Volume (Vstd 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>Apr 06, 2017</u> | |
| Other observations? | <u>n/a</u> | |

| | | |
|---------------|---------------------|---------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | <u>Date: Jun 19, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 18, 2017
PUF S/N: TE-05

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.05 |
| 2-Methylnaphthalene | 0.09 |
| 3-Methylcholanthrene | 0.02 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | < 0.01 |
| Acenaphthylene | < 0.01 |
| Acridine | < 0.01 |
| Anthracene | 0.05 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | 0.01 |
| Benzo(b,j,k)fluoranthene | 0.04 |
| Benzo(c)phenanthrene | < 0.01 |
| Benzo(e)pyrene | 0.01 |
| Benzo(ghi)perylene | < 0.01 |
| Chrysene | 0.02 |
| Dibenzo(a,h)pyrene | < 0.01 |
| Dibenzo(a,i)pyrene | < 0.01 |
| Dibenzo(a,l)pyrene | < 0.01 |
| Dibenzo(ah)anthracene | < 0.01 |
| Fluoranthene | 0.1 |
| Fluorene | 0.06 |
| Indeno(1,2,3-cd)pyrene | 0.01 |
| Naphthalene | 0.05 |
| Perylene | < 0.01 |
| Phenanthrene | 0.42 |
| Pyrene | 0.08 |
| Retene | 0.15 |

Sample ID: 17060331-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/June 24, 2017



TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|--|-------------------------|-----------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>P13-01</u> |
| Location: | <u>Bonnyville - AER</u> | Motor S/N: | <u>1139 / 100-1015</u> |
| Station ID: | <u>LICA - 37</u> | Installation Date/Time: | <u>Jun 19, 2017 / 16:16</u> |
| Field Sample ID: | <u>LICA/PUF/Bonnyville/June 24, 2017</u> | Removal Date/Time: | <u>Jun 26, 2017 / 15:30</u> |

Sample Data Collection Information

| | | | |
|-----------------------|---------------------------|---|---------------|
| Sample Date: | <u>Jun 24, 2017</u> | Average Pressure (mmHg) | <u>710</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 Jun 25, 2017</u> | Average Temperature (°C) | <u>15.3</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>Apr 06, 2017</u> | |
| Other observations? | <u>n/a</u> | |

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Jun 26, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 24, 2017
PUF S/N: P13-01

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.09 |
| 2-Methylnaphthalene | 0.17 |
| 3-Methylcholanthrene | 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | < 0.01 |
| Acenaphthylene | 0.05 |
| Acridine | < 0.01 |
| Anthracene | 0.02 |
| Benzo(a)anthracene | < 0.01 |
| Benzo(a)pyrene | 0.01 |
| Benzo(b,j,k)fluoranthene | 0.03 |
| Benzo(c)phenanthrene | < 0.01 |
| Benzo(e)pyrene | 0.01 |
| Benzo(ghi)perylene | < 0.01 |
| Chrysene | 0.02 |
| Dibenzo(a,h)pyrene | < 0.01 |
| Dibenzo(a,i)pyrene | < 0.01 |
| Dibenzo(a,l)pyrene | < 0.01 |
| Dibenzo(ah)anthracene | < 0.01 |
| Fluoranthene | 0.08 |
| Fluorene | 0.06 |
| Indeno(1,2,3-cd)pyrene | < 0.01 |
| Naphthalene | 0.09 |
| Perylene | < 0.01 |
| Phenanthrene | 0.42 |
| Pyrene | 0.07 |
| Retene | 0.13 |

Sample ID: 17070018-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/June 30, 2017



TISCH PUF PLUS Sample Collection Data Sheet

| | | | |
|------------------|--|-------------------------|-----------------------------|
| Client: | <u>LICA</u> | Puf+ S/N: | <u>9702</u> |
| Location: | <u>Bonnyville - AER</u> | Motor S/N: | <u>1139/100-1015</u> |
| Station ID: | <u>LICA-37</u> | Installation Date/Time: | <u>Jun 26, 2017/ 15:30</u> |
| Field Sample ID: | <u>LICA/PUF/Bonnyville/June 30, 2017</u> | Removal Date/Time: | <u>July 05, 2017/ 13:16</u> |

Sample Data Collection Information

| | | | |
|-----------------------|----------------------------|---|---------------|
| Sample Date: | <u>Jun 30, 2017</u> | Average Pressure (mmHg) | <u>702</u> |
| Start Time (mst): | <u>00:00</u> | Average Flow (Q _{std}) | <u>229</u> |
| End Time (mst): | <u>00:00 July 01, 2017</u> | Average Temperature (°C) | <u>16.3°</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>Apr 06, 2017</u> | |
| Other observations? | <u>n/a</u> | |

| | | |
|---------------|---------------------|----------------------------|
| Deployed By: | <u>Alex Yakupov</u> | |
| Collected By: | <u>Alex Yakupov</u> | Date: <u>July 05, 2017</u> |

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: June 30 , 2017
PUF S/N: 9702

| PARAMETERS | CONCENTRATION (µg/puf) |
|--------------------------------|------------------------|
| 1-Methylnaphthalene | 0.09 |
| 2-Methylnaphthalene | 0.2 |
| 3-Methylcholanthrene | < 0.01 |
| 7,12-Dimethylbenz(a)anthracene | < 0.01 |
| Acenaphthene | 0.25 |
| Acenaphthylene | 0.11 |
| 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 | 0.02 |
| 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 | 0.08 |
| Perylene | < 0.01 |
| Phenanthrene | 0.31 |
| Pyrene | 0.06 |
| Retene | 0.03 |

NMHC CANISTER RESULTS

Sample ID: 17060101-003

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/June 08,
2017/20:30



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 14708
 Station ID: LICA 37 Canister Installation Date/Time: May 29, 2017 / 13:41
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: Jun 09, 2017 / 11:55
Jun 08, 20:30

| Date and Time Information <u>2017</u> | | | |
|---------------------------------------|------------------|----------------|----------------------|
| Sample Date | Start Time (MST) | End Time (MST) | Elapsed Time (Hours) |
| <u>Jun 08, 2017</u> | <u>20:30</u> | n/a | n/a |

| Flow Settings | | |
|----------------------|-------------|------------------------------|
| Meter Reading (sccm) | Pot Set Pt. | Pump Pressure Setting (psig) |
| n/a | n/a | n/a |

| Canister Information | |
|--------------------------------|------------------------------|
| Initial Canister Vacuum (inHg) | Final Canister Vacuum (inHg) |
| <u>-27.5</u> | <u>-2.0</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: Jun 09, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: June 8, 2017
Canister ID: 14708

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.02 |
| 1,1,2,2-Tetrachloroethane | < 0.02 |
| 1,1,2-Trichloroethane | < 0.02 |
| 1,1-Dichloroethane | < 0.02 |
| 1,1-Dichloroethylene | < 0.05 |
| 1,2,3-Trimethylbenzene | < 0.06 |
| 1,2,4-Trichlorobenzene | < 1.0 |
| 1,2,4-Trimethylbenzene | < 0.06 |
| 1,2-Dibromoethane | < 0.02 |
| 1,2-Dichlorobenzene | < 0.04 |
| 1,2-Dichloroethane | 0.04 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | < 0.02 |
| 1,3-Butadiene | 0.05 |
| 1,3-Dichlorobenzene | < 0.4 |
| 1,4-Dichlorobenzene | < 0.5 |
| 1,4-Dioxane | < 0.5 |
| 1-Butene | 0.13 |
| 1-Hexene | < 0.02 |
| 1-Pentene | < 0.01 |
| 2,2,4-Trimethylpentane | 0.09 |
| 2,2-Dimethylbutane | 0.02 |
| 2,3,4-Trimethylpentane | 0.03 |
| 2,3-Dimethylbutane | 0.06 |
| 2,3-Dimethylpentane | 0.1 |
| 2,4-Dimethylpentane | 0.04 |
| 2-Methylheptane | 0.02 |
| 2-Methylhexane | 0.09 |
| 2-Methylpentane | 0.17 |
| 3-Methylheptane | < 0.02 |
| 3-Methylhexane | 0.07 |
| 3-Methylpentane | 0.12 |
| Acetone | 4.9 |
| Acrolein | < 0.4 |
| Benzene | 0.29 |
| Benzyl chloride | < 0.5 |
| Bromodichloromethane | < 0.02 |
| Bromoform | < 0.02 |
| Bromomethane | 0.03 |
| Carbon disulfide | 0.04 |
| Carbon tetrachloride | 0.11 |
| Chlorobenzene | < 0.02 |
| Chloroethane | < 0.02 |
| Chloroform | 0.03 |
| Chloromethane | 0.46 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.05 |
| cis-2-Butene | < 0.02 |
| cis-2-Pentene | < 0.02 |
| Cyclohexane | < 0.02 |
| Cyclopentane | 0.03 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 3.2 |
| Ethyl acetate | < 0.5 |
| Ethylbenzene | 0.03 |
| Freon-11 | 0.36 |
| Freon-113 | 0.1 |

Volatile Organics Data Results (NMHC Canister System)

Date: June 8, 2017
Canister ID: 14708

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | 0.03 |
| Freon-12 | 0.51 |
| Hexachloro-1,3-butadiene | < 0.62 |
| Isobutane | 0.46 |
| Isopentane | 0.81 |
| Isoprene | 1.15 |
| Isopropyl alcohol | < 0.5 |
| Isopropylbenzene | < 0.01 |
| m,p-Xylene | 0.08 |
| m-Diethylbenzene | < 0.05 |
| m-Ethyltoluene | < 0.10 |
| Methyl butyl ketone | < 0.62 |
| Methyl ethyl ketone | < 0.4 |
| Methyl isobutyl ketone | < 0.5 |
| Methyl methacrylate | < 0.09 |
| Methyl tert butyl ether | < 0.04 |
| Methylcyclohexane | 0.04 |
| Methylcyclopentane | 0.11 |
| Methylene chloride | < 0.4 |
| n-Butane | 1.1 |
| n-Decane | < 0.07 |
| n-Dodecane | < 0.5 |
| n-Heptane | 0.04 |
| n-Hexane | 0.16 |
| n-Nonane | < 0.01 |
| n-Octane | < 0.02 |
| n-Pentane | 0.4 |
| n-Propylbenzene | < 0.06 |
| n-Undecane | < 0.6 |
| Naphthalene | < 0.6 |
| o-Ethyltoluene | < 0.01 |
| o-Xylene | 0.04 |
| p-Diethylbenzene | < 0.05 |
| p-Ethyltoluene | < 0.09 |
| Styrene | < 0.05 |
| Tetrachloroethylene | 0.55 |
| Tetrahydrofuran | < 0.5 |
| Toluene | 0.17 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.05 |
| trans-2-Butene | < 0.01 |
| trans-2-Pentene | 0.04 |
| Trichloroethylene | 0.12 |
| Vinyl acetate | < 0.5 |
| Vinyl chloride | < 0.02 |

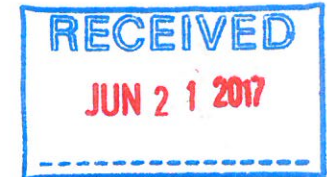
Sample ID: 17060233-005

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Jun 09, 2017

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: 14997
Canister Installation Date/Time: Jun 09, 2017 / 11:55
Canister Removal Date/Time: Jun 13, 2017 / 15:36

Jun 12, 2017 Jun 09, 2017
A.Y.

| Date and Time Information | | | |
|----------------------------------|------------------------------|----------------|----------------------|
| Sample Date | Start Time (MST) | End Time (MST) | Elapsed Time (Hours) |
| <u>09</u> <u>Jun 12, 2017</u> | <u>16:45</u> <u>21:20</u> | n/a | n/a |

A.Y.

A.Y.

| Flow Settings | | |
|----------------------|-------------|------------------------------|
| Meter Reading (sccm) | Pot Set Pt. | Pump Pressure Setting (psig) |
| n/a | n/a | n/a |

| Canister Information | |
|--------------------------------|------------------------------|
| Initial Canister Vacuum (inHg) | Final Canister Vacuum (inHg) |
| <u>-27.7</u> | <u>-3.0</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: Jun 13, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: June 9, 2017
Canister ID: 14997

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.03 |
| 1,1,2,2-Tetrachloroethane | < 0.03 |
| 1,1,2-Trichloroethane | < 0.03 |
| 1,1-Dichloroethane | < 0.03 |
| 1,1-Dichloroethylene | < 0.05 |
| 1,2,3-Trimethylbenzene | 0.13 |
| 1,2,4-Trichlorobenzene | < 1.0 |
| 1,2,4-Trimethylbenzene | 0.42 |
| 1,2-Dibromoethane | < 0.03 |
| 1,2-Dichlorobenzene | < 0.04 |
| 1,2-Dichloroethane | 0.03 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | 0.18 |
| 1,3-Butadiene | < 0.03 |
| 1,3-Dichlorobenzene | < 0.4 |
| 1,4-Dichlorobenzene | < 0.5 |
| 1,4-Dioxane | < 0.5 |
| 1-Butene | 0.08 |
| 1-Hexene | < 0.03 |
| 1-Pentene | 0.14 |
| 2,2,4-Trimethylpentane | 0.1 |
| 2,2-Dimethylbutane | 0.06 |
| 2,3,4-Trimethylpentane | 0.03 |
| 2,3-Dimethylbutane | 0.14 |
| 2,3-Dimethylpentane | 0.11 |
| 2,4-Dimethylpentane | 0.06 |
| 2-Methylheptane | 0.06 |
| 2-Methylhexane | 0.19 |
| 2-Methylpentane | 0.53 |
| 3-Methylheptane | 0.04 |
| 3-Methylhexane | 0.14 |
| 3-Methylpentane | 0.3 |
| Acetone | 5.3 |
| Acrolein | < 0.4 |
| Benzene | 3.96 |
| Benzyl chloride | < 0.5 |
| Bromodichloromethane | < 0.03 |
| Bromoform | < 0.03 |
| Bromomethane | < 0.01 |
| Carbon disulfide | < 0.01 |
| Carbon tetrachloride | 0.09 |
| Chlorobenzene | < 0.03 |
| Chloroethane | < 0.03 |
| Chloroform | < 0.03 |
| Chloromethane | 0.41 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.05 |
| cis-2-Butene | < 0.03 |
| cis-2-Pentene | 0.09 |
| Cyclohexane | 0.12 |
| Cyclopentane | 0.13 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 3 |
| Ethyl acetate | < 0.5 |
| Ethylbenzene | 0.33 |
| Freon-11 | 0.32 |
| Freon-113 | 0.07 |

Volatile Organics Data Results (NMHC Canister System)

Date: June 9, 2017
Canister ID: 14997

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.03 |
| Freon-12 | 0.44 |
| Hexachloro-1,3-butadiene | < 0.64 |
| Isobutane | 1.08 |
| Isopentane | 4.45 |
| Isoprene | 0.05 |
| Isopropyl alcohol | 4.6 |
| Isopropylbenzene | 0.05 |
| m,p-Xylene | 2.22 |
| m-Diethylbenzene | < 0.05 |
| m-Ethyltoluene | 0.17 |
| Methyl butyl ketone | < 0.64 |
| Methyl ethyl ketone | < 0.4 |
| Methyl isobutyl ketone | < 0.5 |
| Methyl methacrylate | < 0.09 |
| Methyl tert butyl ether | < 0.04 |
| Methylcyclohexane | 0.2 |
| Methylcyclopentane | 0.25 |
| Methylene chloride | 0.5 |
| n-Butane | 18.1 |
| n-Decane | < 0.08 |
| n-Dodecane | < 0.5 |
| n-Heptane | 0.49 |
| n-Hexane | 1.56 |
| n-Nonane | 0.09 |
| n-Octane | 0.17 |
| n-Pentane | 6.3 |
| n-Propylbenzene | 0.09 |
| n-Undecane | < 0.6 |
| Naphthalene | < 0.6 |
| o-Ethyltoluene | 0.07 |
| o-Xylene | 0.49 |
| p-Diethylbenzene | 0.07 |
| p-Ethyltoluene | 0.12 |
| Styrene | 0.06 |
| Tetrachloroethylene | 0.12 |
| Tetrahydrofuran | < 0.5 |
| Toluene | 7.59 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.05 |
| trans-2-Butene | 0.01 |
| trans-2-Pentene | 0.14 |
| Trichloroethylene | < 0.05 |
| Vinyl acetate | < 0.5 |
| Vinyl chloride | < 0.03 |

Sample ID: 17060331-003

Customer ID: LICA

Cust Samp ID: LICA/NMHC
VOC/Bonnyville/June 26,
2017



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: S 5590
 Station ID: LICA 37 Canister Installation Date/Time: Jun 13, 2017 / 15:56
 Field Sample ID: LICA/NMHC VOC/Bonnyville/June 26, 2017 Canister Removal Date/Time: Jun 27, 2017 / 11:37

| Date and Time Information | | | |
|---------------------------|------------------|----------------|----------------------|
| Sample Date | Start Time (MST) | End Time (MST) | Elapsed Time (Hours) |
| <u>Jun 26, 2017</u> | <u>15:40</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>-27.7</u> | <u>-2.5</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: Jun 27, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: June 26, 2017
Canister ID: S5590

| PARAMETERS | CONCENTRATION (PPB) |
|---------------------------|---------------------|
| 1,1,1-Trichloroethane | < 0.03 |
| 1,1,2,2-Tetrachloroethane | < 0.03 |
| 1,1,2-Trichloroethane | < 0.03 |
| 1,1-Dichloroethane | < 0.03 |
| 1,1-Dichloroethylene | < 0.05 |
| 1,2,3-Trimethylbenzene | 0.42 |
| 1,2,4-Trichlorobenzene | < 1.0 |
| 1,2,4-Trimethylbenzene | 0.19 |
| 1,2-Dibromoethane | < 0.03 |
| 1,2-Dichlorobenzene | < 0.04 |
| 1,2-Dichloroethane | 0.02 |
| 1,2-Dichloropropane | < 0.01 |
| 1,3,5-Trimethylbenzene | 0.07 |
| 1,3-Butadiene | < 0.03 |
| 1,3-Dichlorobenzene | < 0.4 |
| 1,4-Dichlorobenzene | < 0.5 |
| 1,4-Dioxane | < 0.5 |
| 1-Butene | 0.49 |
| 1-Hexene | < 0.03 |
| 1-Pentene | 0.11 |
| 2,2,4-Trimethylpentane | 1.5 |
| 2,2-Dimethylbutane | 0.03 |
| 2,3,4-Trimethylpentane | 0.33 |
| 2,3-Dimethylbutane | 0.19 |
| 2,3-Dimethylpentane | 0.89 |
| 2,4-Dimethylpentane | 0.3 |
| 2-Methylheptane | 0.08 |
| 2-Methylhexane | 0.26 |
| 2-Methylpentane | 0.43 |
| 3-Methylheptane | 0.06 |
| 3-Methylhexane | 0.23 |
| 3-Methylpentane | 0.33 |
| Acetone | 6.7 |
| Acrolein | < 0.4 |
| Benzene | 0.33 |
| Benzyl chloride | < 0.5 |
| Bromodichloromethane | < 0.03 |
| Bromoform | < 0.03 |
| Bromomethane | < 0.01 |
| Carbon disulfide | 1.44 |
| Carbon tetrachloride | 0.1 |
| Chlorobenzene | < 0.03 |
| Chloroethane | < 0.03 |
| Chloroform | 0.03 |
| Chloromethane | 0.54 |
| cis-1,2-Dichloroethene | < 0.01 |
| cis-1,3-Dichloropropene | < 0.05 |
| cis-2-Butene | 0.05 |
| cis-2-Pentene | 0.05 |
| Cyclohexane | 0.07 |
| Cyclopentane | 0.04 |
| Dibromochloromethane | < 0.01 |
| Ethanol | 6.3 |
| Ethyl acetate | < 0.5 |
| Ethylbenzene | 0.16 |
| Freon-11 | 0.29 |
| Freon-113 | 0.11 |

Volatile Organics Data Results (NMHC Canister System)

Date: June 26, 2017
Canister ID: S5590

| PARAMETERS | CONCENTRATION (PPB) |
|-----------------------------|---------------------|
| Freon-114 | < 0.03 |
| Freon-12 | 0.62 |
| Hexachloro-1,3-butadiene | < 0.66 |
| Isobutane | 0.35 |
| Isopentane | 1.26 |
| Isoprene | 0.56 |
| Isopropyl alcohol | < 0.5 |
| Isopropylbenzene | 0.02 |
| m,p-Xylene | 0.55 |
| m-Diethylbenzene | < 0.05 |
| m-Ethyltoluene | 0.13 |
| Methyl butyl ketone | < 0.66 |
| Methyl ethyl ketone | 0.6 |
| Methyl isobutyl ketone | < 0.5 |
| Methyl methacrylate | < 0.09 |
| Methyl tert butyl ether | < 0.04 |
| Methylcyclohexane | 0.16 |
| Methylcyclopentane | 0.26 |
| Methylene chloride | < 0.4 |
| n-Butane | 1.1 |
| n-Decane | < 0.08 |
| n-Dodecane | < 0.5 |
| n-Heptane | 0.21 |
| n-Hexane | 0.61 |
| n-Nonane | 0.03 |
| n-Octane | 0.08 |
| n-Pentane | 0.4 |
| n-Propylbenzene | < 0.07 |
| n-Undecane | < 0.7 |
| Naphthalene | < 0.7 |
| o-Ethyltoluene | 0.07 |
| o-Xylene | 0.43 |
| p-Diethylbenzene | < 0.05 |
| p-Ethyltoluene | < 0.09 |
| Styrene | 0.14 |
| Tetrachloroethylene | < 0.05 |
| Tetrahydrofuran | < 0.5 |
| Toluene | 0.75 |
| trans-1,2-Dichloroethylene | < 0.01 |
| trans-1,3-Dichloropropylene | < 0.05 |
| trans-2-Butene | 0.09 |
| trans-2-Pentene | 0.1 |
| Trichloroethylene | < 0.05 |
| Vinyl acetate | < 0.5 |
| Vinyl chloride | < 0.03 |

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ESulphur Dioxide Analyzer Calibration

| | | | | |
|--------------------------|------------------|--|---|----------------|
| Date: | June 1, 2017 | Barometer ID #/Last Cert. Date/B.P.: | fisher Scientific 05544, December 5, 2016 | 934 mb |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: | Bonnyville - AER | Weather Conditions: | A few clouds | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | routine monthly | |
| Start Time 24 hr. (mst): | 11:42 | Performed By/Reviewer: | Alex Yakupov | Trina Whitsitt |
| End Time 24 hr. (mst): | 15:48 | Cal Gas Expiry Date: | July 18, 2019 | |
| Calibration Method: | Gas Dilution | <input checked="" type="checkbox"/> Converter Model & s/n (if applicable): | n/a | |

| | | | |
|------------------------|-------------|----------------|-------|
| Analyzer: | | | |
| ID# or Serial Number: | 467 | Range ppb: | 1000 |
| Last Calibration Date: | May 4, 2017 | As Found C.F.: | 0.994 |
| Previous C.F.: | 1.000 | New C.F.: | 1.000 |

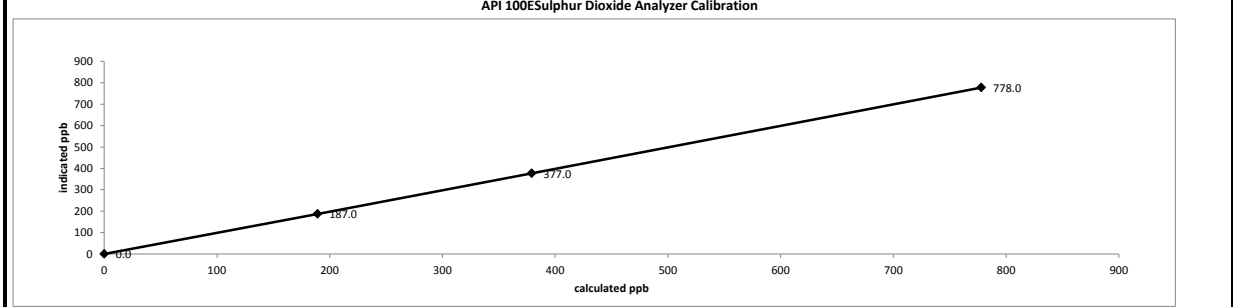
| | | | |
|--------------------------------|--|---|-----|
| Calibration Standards: | | Standard Calibration Points for Ranges | |
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 | Point | ppb |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 | High | 780 |
| Calibrator ID/Cert. Date: | API 700 627, January 27, 2017 | Mid | 380 |
| Cal Gas Cylinder I.D. # : | LL104222 | Low | 190 |
| Cal Gas Conc. (ppm): | 50.6 | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 5000 | 0.00 | 5000 | 0.0 | 2.0 | n/a |
| as found high | 4924 | 76.90 | 5001 | 778.1 | 785.0 | 0.994 |
| adjusted zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| adjusted high | 4924 | 76.90 | 5001 | 778.1 | 778.0 | 1.000 |
| mid | 4966 | 37.50 | 5003 | 379.3 | 377.0 | 1.006 |
| low | 4980 | 18.70 | 4999 | 189.3 | 187.0 | 1.012 |
| calibrator zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.006 |

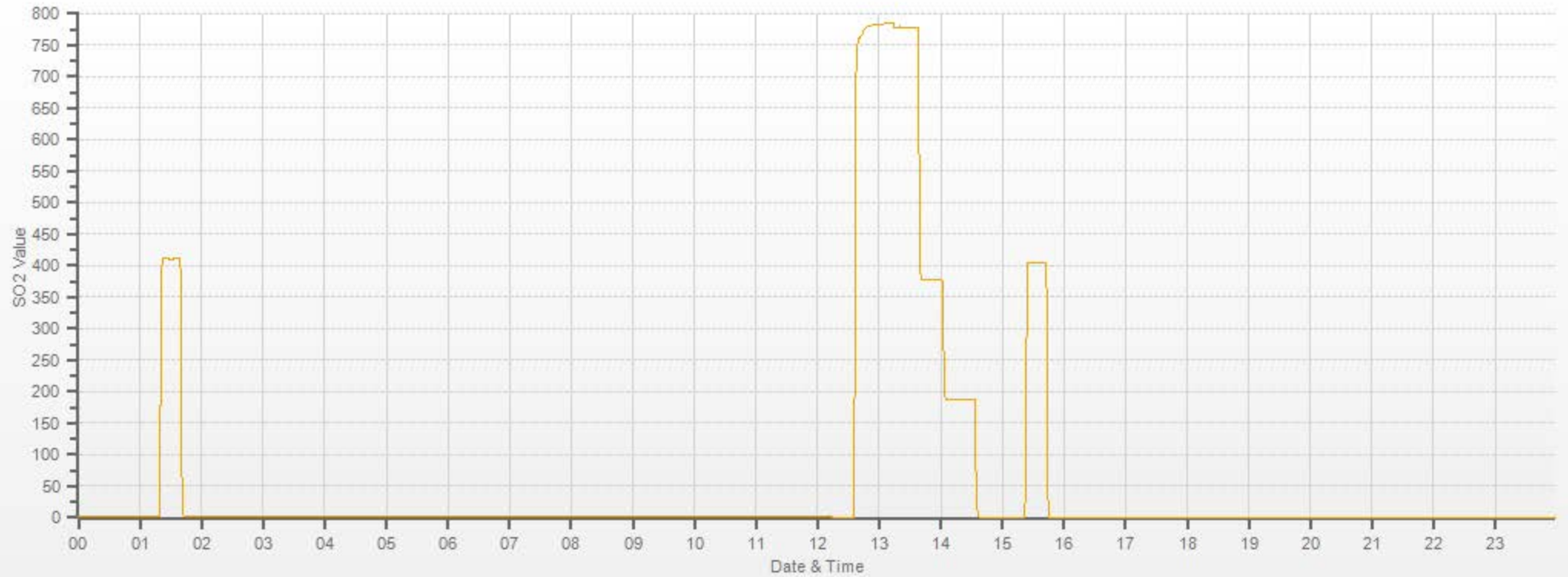
Linear Regression/Calibration Results:

| | | |
|-----------------------------------|--------------|--------------|
| Correlation Coefficient = | <u>1.000</u> | > or = 0.995 |
| Slope = | <u>0.999</u> | .95-1.05 |
| b (Intercept as % of full scale)= | <u>0.14%</u> | ± 3% F.S. |
| % change in C.F. from last cal= | <u>0.63%</u> | ± 10% |



| | |
|--|---|
| <p style="text-align: center;">As found:</p> Slope: <u>1.056</u> Offset: <u>116.5</u> Hvps: <u>488</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.2</u> Pmt Temp: <u>8.1</u> Izs Temp: <u>50.0</u> Pres: <u>24.9</u> Samp Fl: <u>576</u> Norm Pmt: <u>120.3</u> Uv Lamp: <u>3860.2</u> Lamp Ratio: <u>89.1</u> Str Lgt: <u>61.5</u> Drk Pmt: <u>16.5</u> Drk Lmp: <u>3.0</u> Expected Value: <u>403.0</u> | <p style="text-align: center;">As left:</p> Slope: <u>1.048</u> Offset: <u>120.2</u> Hvps: <u>488</u> Rcell Temp: <u>50.0</u> Box Temp: <u>33.5</u> Pmt Temp: <u>8.1</u> Izs Temp: <u>50.0</u> Pres: <u>24.9</u> Samp Fl: <u>576</u> Norm Pmt: <u>120.3</u> Uv Lamp: <u>3858.3</u> Lamp Ratio: <u>89.0</u> Str Lgt: <u>63.0</u> Drk Pmt: <u>16.8</u> Drk Lmp: <u>2.9</u> Expected Value: <u>404.0</u> |
|--|---|

Comments:
The analyzer sample inlet filter was changed.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

| | | | |
|--------------------------|-------------------|--|---|
| Date: | June 1, 2017 | Barometer ID #/Last Cert. Date/B.P.: | fisher Scientific 05544, December 5, 2016 934 mb |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | FLUKE 2329070, November 15, 2016 22 °C |
| Location/Station Name: | Bonnyville - AER | Weather Conditions: | A few clouds |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | routine monthly |
| Start Time 24 hr. (mst): | 11:42 | Performed By/Reviewer: | Alex Yakupov Trina Whitsitt |
| End Time 24 hr. (mst): | 15:48 | Cal Gas Expiry Date: | June 14, 2019 |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|------------------------|-------------|
| Analyzer: | |
| ID# or Serial Number: | 510 |
| Range ppb: | 100 |
| Last Calibration Date: | May 4, 2017 |
| As Found C.F.: | 1.001 |
| Previous C.F.: | 1.000 |
| New C.F.: | 1.000 |

| | | | |
|--------------------------------|--|---|-------------|
| Calibration Standards: | | Standard Calibration Points for Ranges | |
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 | Point | ppb |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 | High | 78 |
| Calibrator ID/Cert. Date: | Sabio 2010D 11900613, March 16, 2017 | Mid | 38 |
| Cal Gas Cylinder I.D. # : | EY0000654 | Low | 19 |
| Cal Gas Conc. (ppm): | 10.2 | | |
| | | | 12:40/12:50 |
| | | | 1000 |
| | | | 780 |
| | | | 0.0 |
| | | | 0.0 |
| | | | 0.0 |

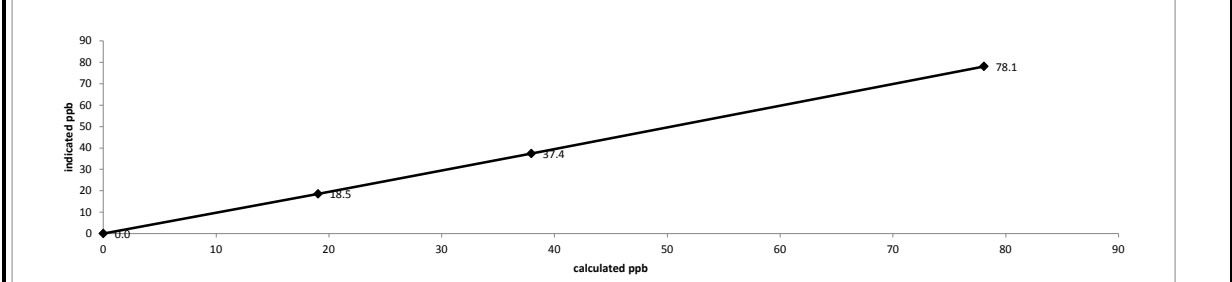
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| 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 | 0.5 | n/a |
| as found high | 7442 | 57.40 | 7499 | 78.1 | 78.5 | 1.001 |
| adjusted zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| adjusted high | 7442 | 57.40 | 7499 | 78.1 | 78.1 | 1.000 |
| mid | 7472 | 27.90 | 7500 | 37.9 | 37.4 | 1.015 |
| low | 7486 | 14.00 | 7500 | 19.0 | 18.5 | 1.029 |
| calibrator zero | 7500 | 0.00 | 7500 | 0.0 | 0.0 | n/a |
| Average C.F.= | | | | | | 1.014 |

Linear Regression/Calibration Results:

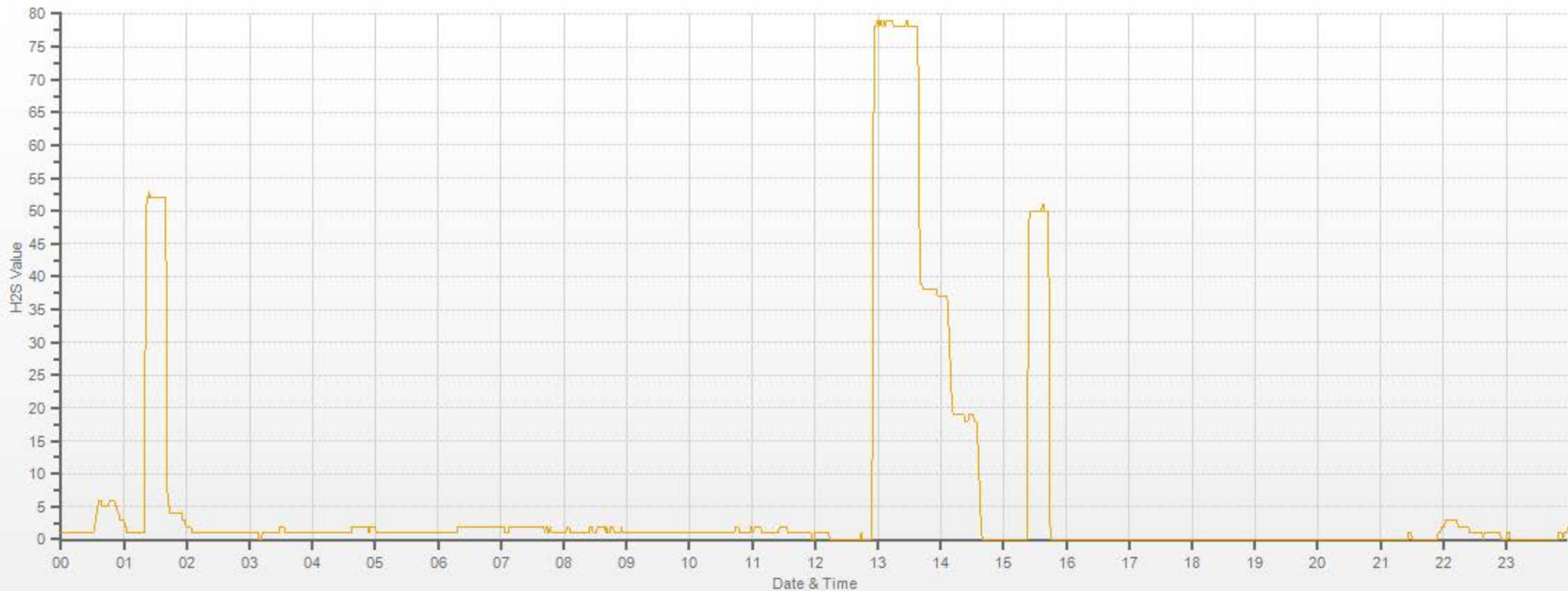
| | | |
|-----------------------------------|---------------|--------------|
| Correlation Coefficient = | <u>1.000</u> | > or = 0.995 |
| Slope = | <u>0.998</u> | .95-1.05 |
| b (Intercept as % of full scale)= | <u>0.34%</u> | ± 3% F.S. |
| % change in C.F. from last cal= | <u>-0.10%</u> | ± 10% |

API 101E Hydrogen Sulphide Analyzer Calibration



| | |
|--|---|
| <p style="text-align: center;">As found:</p> <p>Slope: <u>1.052</u></p> <p>Offset: <u>29.6</u></p> <p>Hvps: <u>530</u></p> <p>Rcell Temp: <u>50.0</u></p> <p>Box Temp: <u>35.5</u></p> <p>Pmt Temp: <u>8.4</u></p> <p>Izs Temp: <u>45.0</u></p> <p>Converter Temp: <u>314.6</u></p> <p>Pres: <u>20.4</u></p> <p>Samp Fl: <u>529</u></p> <p>Uv Lamp: <u>3239.2</u></p> <p>Lamp Ratio: <u>96.4</u></p> <p>Str Lgt: <u>15.6</u></p> <p>Drk Pmt: <u>35.1</u></p> <p>Drk Lmp: <u>-1.8</u></p> <p>Expected Value: <u>49.4</u></p> | <p style="text-align: center;">As left:</p> <p>Slope: <u>1.052</u></p> <p>Offset: <u>30.6</u></p> <p>Hvps: <u>530</u></p> <p>Rcell Temp: <u>50.0</u></p> <p>Box Temp: <u>34.5</u></p> <p>Pmt Temp: <u>8.4</u></p> <p>Izs Temp: <u>45.0</u></p> <p>Converter Temp: <u>314.7</u></p> <p>Pres: <u>20.3</u></p> <p>Samp Fl: <u>529</u></p> <p>Uv Lamp: <u>3242.0</u></p> <p>Lamp Ratio: <u>96.6</u></p> <p>Str Lgt: <u>16.1</u></p> <p>Drk Pmt: <u>35.2</u></p> <p>Drk Lmp: <u>-1.8</u></p> <p>Expected Value: <u>50.4</u></p> |
|--|---|

Comments:
The analyzer sample inlet filter was changed.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | | |
|------------------------------|------------------------------|--|---|----------------|
| Date: | June 2, 2017 | Barometer ID #/Last Cert. Date/B.P.: | fisher Scientific 05544, December 5, 2016 | 936 mb |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | FLUKE 2329070, November 15, 2016 | 24 °C |
| Location/Station Name: | Bonnyville - AER | Weather Conditions: | Rain fall heavy at times | |
| Parameter: | CH ₄ / NMHC / THC | Calibration Purpose: | routine monthly | |
| Start/End Time 24 hr. (mst): | 15:54 / 19:13 | Performed By/Reviewer: | Alex Yakupov | Trina Whitsitt |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | November 25, 2023 | |

| | | | | | |
|------------------------|------------------------------------|---------------------|----------------|-----------|-------|
| Analyzer: | | Correction Factors: | | | |
| ID# or Serial Number: | 1236656107 | Previous C.F.: | As Found C.F.: | New C.F.: | |
| Measured Flow: | 1.142 L/min | CH ₄ = | 1.000 | 1.002 | 1.000 |
| Last Calibration Date: | May 5, 2017 | NMHC = | 0.998 | 1.001 | 1.000 |
| Range ppm: | 20 CH ₄ /20 NMHC/40 THC | THC = | 0.999 | 1.001 | 1.000 |

| | | | | | |
|--|--|--|-----------------|-------|-------|
| Calibration Standards: | | Standard Calibration Points for Analyzer Range of 20/20/40 ppm | | | |
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 | Point | CH ₄ | NMHC | THC |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 | High | 13.00 | 13.00 | 26.00 |
| Calibrator ID/Cert. Date: | API 700 627, January 27, 2017 | Mid | 7.00 | 7.00 | 14.00 |
| Cal Gas Cylinder I.D. #: | LL165372 | Low | 3.00 | 3.00 | 6.00 |
| CH ₄ Cylinder Conc.: | 606.0 | =C ₂ H ₆ Cylinder Conc. | | | |
| CH ₄ as C ₂ H ₆ : | 583.0 | =total CH ₄ equivalent | | | |

| ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015 | | | | | | | | | | Correction Factors: | | |
|---|---------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| Calibrator Flow Rates (cc/min) | | | | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | CH ₄ | NMHC | THC |
| Point | Diluent | Cal Gas | Total Flow | | | | | | | | | |
| as found zero | 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 | 13.60 | 13.09 | 26.70 | 1.002 | 1.001 | 1.001 |
| 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 | 13.62 | 13.11 | 26.74 | 1.000 | 1.000 | 1.000 |
| mid | 2000 | 24.00 | 2024 | 7.19 | 6.91 | 14.10 | 7.18 | 6.92 | 14.11 | 1.001 | 0.999 | 0.999 |
| low | 2000 | 11.00 | 2011 | 3.31 | 3.19 | 6.50 | 3.33 | 3.23 | 6.55 | 0.995 | 0.987 | 0.993 |
| 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.= | | |
| | | | | | | | | | | 0.999 | 0.995 | 0.997 |

| Linear Regression/Calibration Results: | | | | LIMITS | |
|--|-----------------|--------|--------|--------|---------|
| Correlation Coefficient = | CH ₄ | NMHC | THC | > or = | 0.995 |
| Slope = | 0.999 | 0.999 | 1.000 | .95- | 1.05 |
| b (Intercept as % of full scale) = | 0.03% | 0.09% | 0.05% | ± | 3% F.S. |
| % change in C.F. from last cal = | -0.18% | -0.33% | -0.22% | ± | 10% |

| | | | | | |
|---------------------------|----------------------------|---------------------|----------------------------|------------------|----------------------------------|
| Interface Board Voltages: | Bias Supply: | -292.9 | Calibration History cnt'd: | NM Peak Area: | 86715 |
| 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: | 32.5 | | NMHV Start: | n/a |
| Cylinder Pressures/reg.: | Carrier: | 2500 | 50 | NMHC End: | n/a |
| | Fuel: | 300 | 50 | Run History>1: | Date: June 2, 2017 |
| | Span Gas: | 1600 | 22 | | Time: 18:02 |
| | Zero Air Generator: | 55 | | | CH ₄ PK HT: 0 |
| Internal Pressures: | Carrier: | 31.1 | | | CH ₄ RT: 8.0 |
| | Fuel: | 40.3 | | | CH ₄ Baseline: 2444 |
| | Air: | 32.0 | | | CH ₄ LOD: 65 |
| FID Status: | Status: | LIT | | | CH ₄ SD: 21 |
| | Counts: | 27882 | | | CH ₄ CONC: 0.00 |
| | Flame: | 370.9 | | | NM PK HT: 0 |
| | Det Base: | 175.0 | | | NM Peak Area: 0 |
| Flame and Power Stats: | Last Power On: | Aug 3, 2016 / 10:48 | | | NM CONC: 0.00 |
| | Flameouts: | 3 | | | NM Base Start: 2397 |
| | Det Oven at Start: | 169.0 | | | NM Base End: 2427 |
| | Col Oven at Start: | 74.5 | | | NM LOD: 7 |
| Calibration History: | Time: | May 5, 2017 / 12:03 | | | NM Start IDX: 27 |
| | Type: | SPAN | | | NM End IDX: 91 |
| | Status: | GOOD | | | NM Max Slope: 1.2e+0.0 |
| | Check/Adjust: | ADJUST | | | NM Min Slope: -3.3e-0.1 |
| | CH ₄ Span Conc: | 13.62 | | | NM PT Count: 0 |
| | CH ₄ SP Ratio: | 0.00076 | | Expected Values: | Previous CH ₄ : 10.32 |
| | CH ₄ RT: | 13.2 | | | Previous NMHC: 11.07 |
| | CH ₄ PK IDX: | 26 | | | Previous THC: 21.41 |
| | CH ₄ PK HT: | 17930 | | | New CH ₄ : 10.28 |
| | NM Span Conc: | 13.11 | | | New NMHC: 11.12 |
| | NM SP Ratio: | 0.000151 | | | New THC: 21.43 |

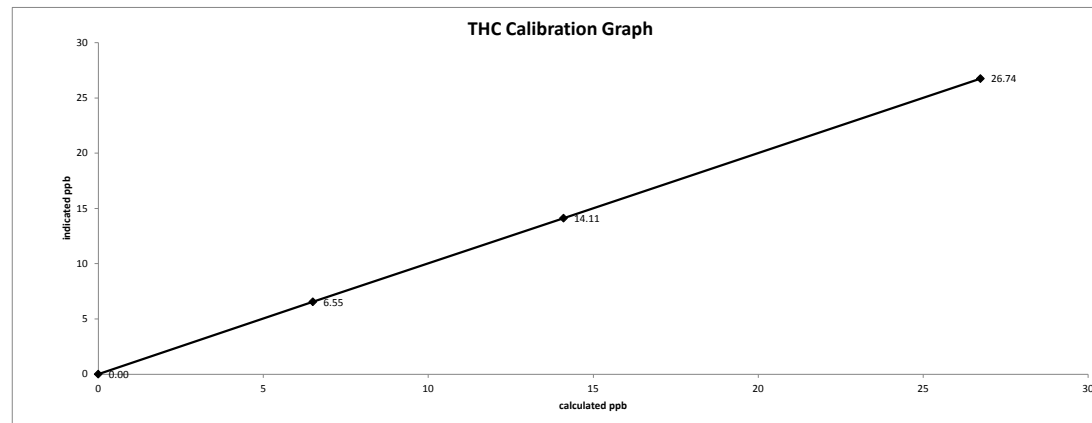
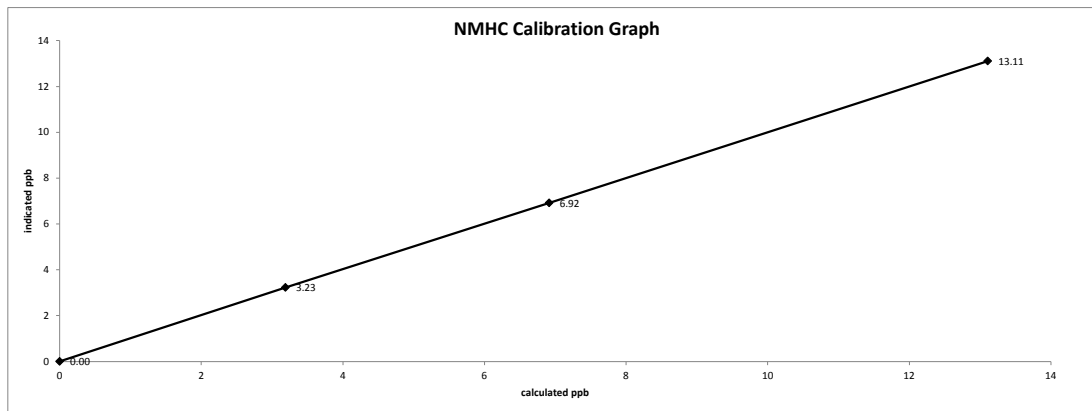
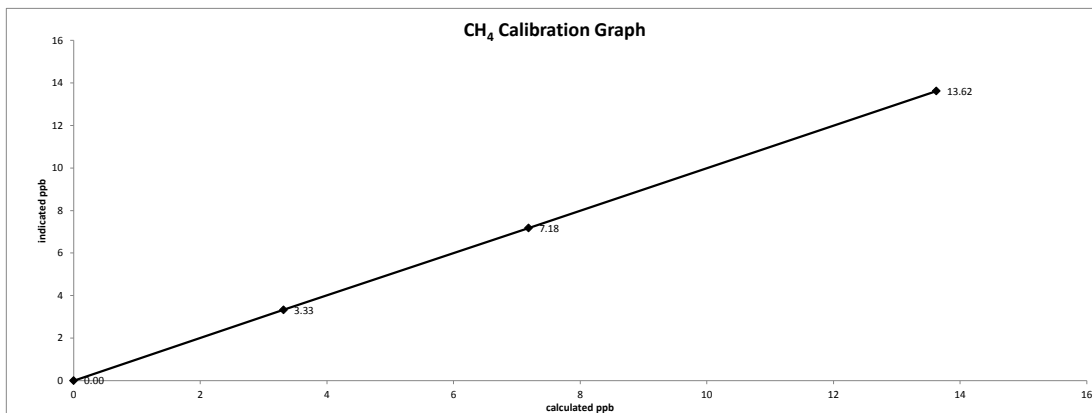
Comments:
 The analyzer sample inlet filter was changed.

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

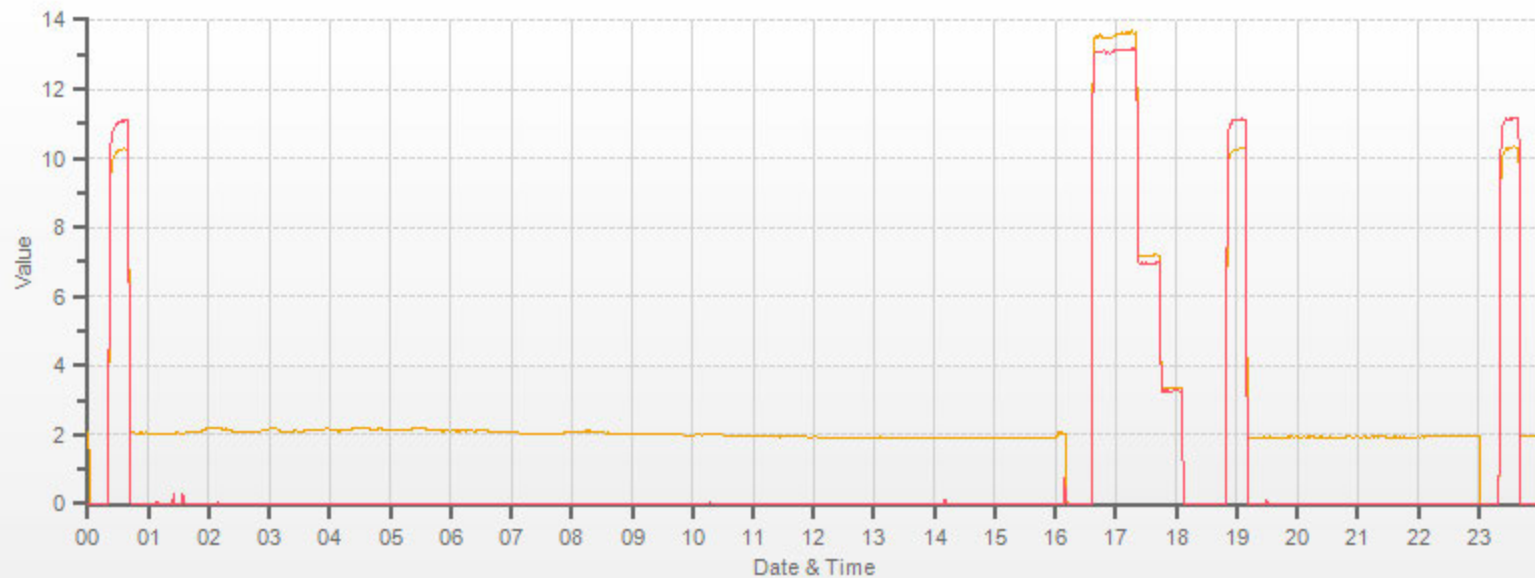
The analyzer cooling fan filter(s) were cleaned.

Date: June 2, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 15:54 / 19:13
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



Station: LICA Bonnyville Daily: 17.06.02 Type: AVG 1 Min. [1 Min.]



— CH4[ppm] — NMHC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

| | | |
|--|--|----------------|
| Date: June 1, 2017 | Barometer ID #/Last Cert. Date/B.P.: fisher Scientific 05544, December 5, 2016 | 934 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: FLUKE 2329070, November 15, 2016 | 22 °C |
| Location/Station Name: Bonnyville - AER | Weather Conditions: A few clouds | |
| Start/End Time 24 hr. (mst): 11:42 / 18:58 | Calibration Purpose: routine monthly | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: July 18, 2019 | |

| | | | | |
|------------------------------------|-------------------|---------------------|----------------|-----------|
| Analyzer: | | Correction Factors: | | |
| | | Previous C.F.: | As Found C.F.: | New C.F.: |
| ID# or Serial Number: 593 | NO = | 1.000 | 1.000 | 1.000 |
| Last Calibration Date: May 4, 2017 | NO ₂ = | 1.004 | 1.000 | 1.000 |
| Range ppb: 1000 | NOx = | 1.000 | 1.000 | 1.000 |

| | | | | | |
|---|--|--|-----------------|------------------------------|------------|
| Calibration Standards: | | Standard Calibration Points for a Range of: 1000 ppb | | | |
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | | High | 780 | 500 | n/a |
| Calibrator ID/Cert. Date: API 700 627, January 27, 2017 | | Mid | 380 | 275 | n/a |
| Cal Gas Cylinder I.D. #: LL104222 | | Low | 190 | 100 | n/a |
| Cal Gas Conc. (ppm): 50.7 | | 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 | 4924 | 76.9 | 5001 | 779.6 | 779.6 | 780.0 | 780.0 | 1.000 | 1.000 |
| adjusted zero | 5000 | 0.00 | 5000 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4924 | 76.90 | 5001 | 779.6 | 779.6 | 780.0 | 780.0 | 1.000 | 1.000 |
| mid | 4966 | 37.50 | 5003 | 380.0 | 380.0 | 379.0 | 379.0 | 1.003 | 1.003 |
| low | 4980 | 18.70 | 4999 | 189.7 | 189.7 | 188.0 | 188.0 | 1.009 | 1.009 |
| calibrator zero | 5000 | 0.00 | 5000 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.004 | 1.004 |

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 | 76.90 | 5001 | 0.0 | 779.0 | 780.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4924 | 76.90 | 5001 | 500.0 | 282.0 | 780.0 | 498.0 | 497.0 | 497.0 | 1.000 |
| adjusted high NO2 | 4924 | 76.90 | 5001 | 500.0 | 282.0 | 780.0 | 498.0 | 497.0 | 497.0 | 1.000 |
| gpt mid | 4924 | 76.90 | 5001 | 275.0 | 503.0 | 780.0 | 277.0 | 276.0 | 276.0 | 1.000 |
| gpt low | 4924 | 76.90 | 5001 | 95.0 | 685.0 | 780.0 | 95.0 | 94.0 | 94.0 | 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 | 1.002 | .95-1.05 |
| b (Intercept as % of full scale)= | -0.10% | -0.10% | 0.06% | ± 3% F.S. |
| % change in C.F. from last cal= | 0.05% | 0.05% | 0.40% | ± 10% |
| NO2 converter efficiency | 1.00 | 1.00 | 1.00 | 0.96 to 1.04 |

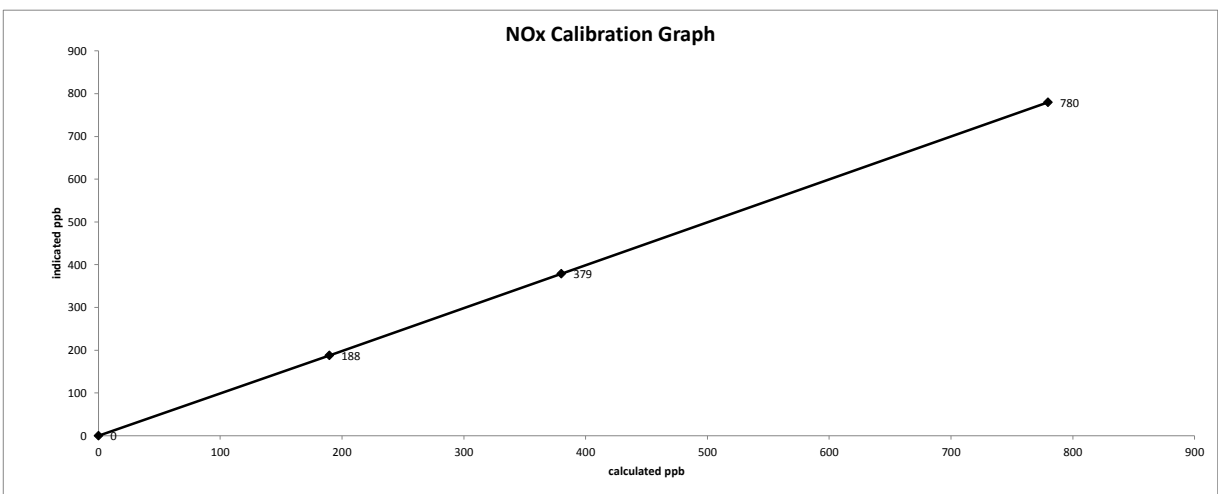
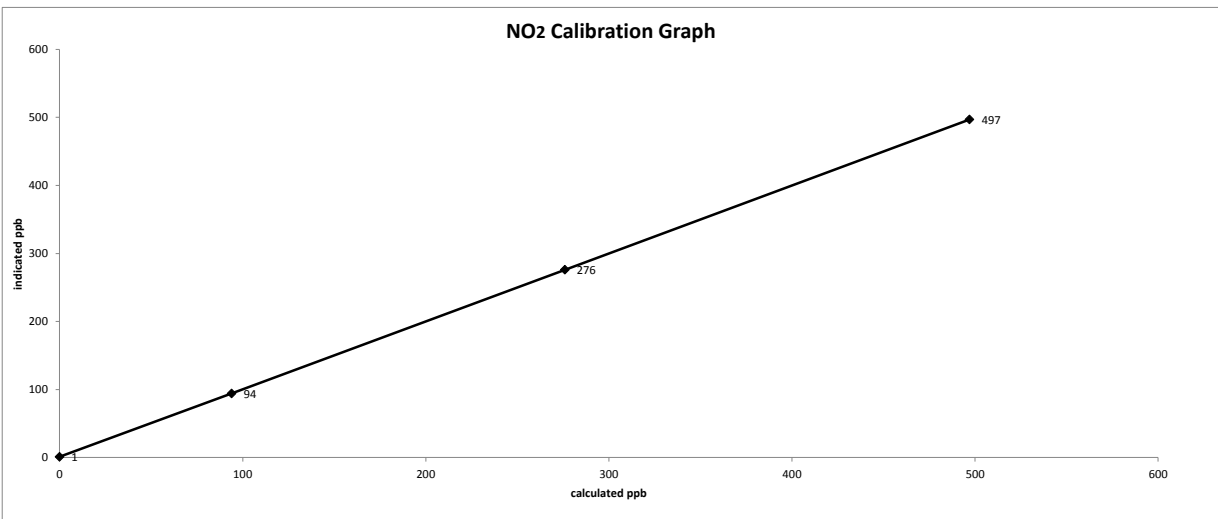
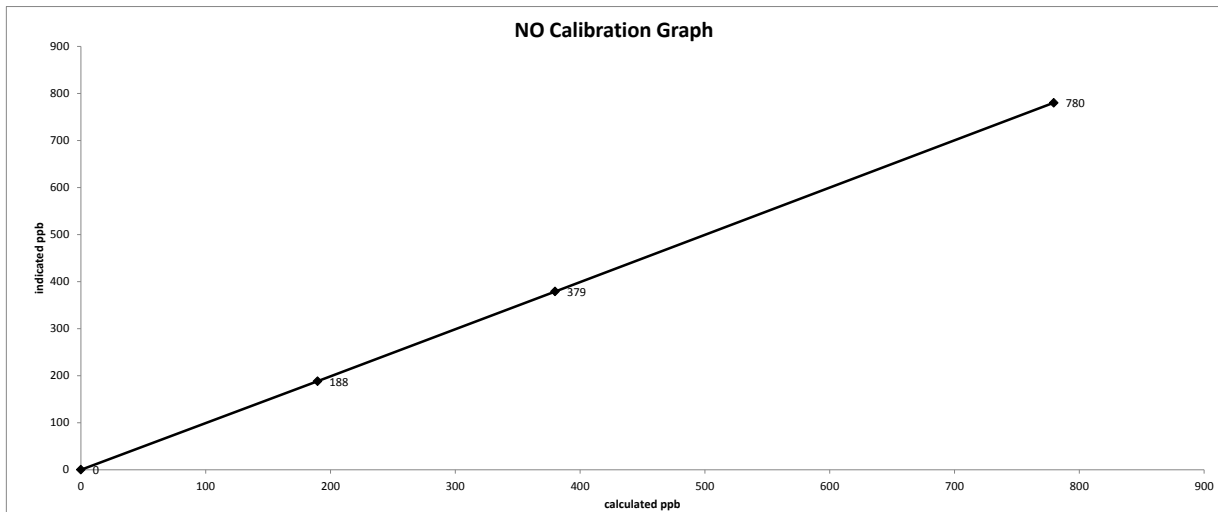
| As found: | | As left: | |
|---------------------|-------|---------------------|-------|
| NOx SLOPE: | 0.902 | NOx SLOPE: | 0.903 |
| NOx OFFS: | -1.2 | NOx OFFS: | -1.8 |
| NO SLOPE: | 0.906 | NO SLOPE: | 0.904 |
| NO OFFS: | -2.8 | NO OFFS: | -2.7 |
| SAMP FLW: | 472 | SAMP FLW: | 472 |
| OZONE FL: | 76 | OZONE FL: | 76 |
| PMT: | 10.8 | PMT: | 8.7 |
| NORM PMT: | -1.5 | NORM PMT: | -1.0 |
| AZERO: | 11.5 | AZERO: | 10.9 |
| HVPS: | 670 | HVPS: | 670 |
| RCELL TEMP: | 50.0 | RCELL TEMP: | 50.0 |
| BOX TEMP: | 33.3 | BOX TEMP: | 32.5 |
| PMT TEMP: | 6.7 | PMT TEMP: | 6.7 |
| IZS TEMP: | 45.0 | IZS TEMP: | 45.1 |
| MOLY TEMP: | 314.5 | MOLY TEMP: | 315.5 |
| RCEL: | 5.4 | RCEL: | 5.4 |
| SAMP: | 26.7 | SAMP: | 26.7 |
| Expected Value NO: | 6.1 | Expected Value NO: | 6.1 |
| Expected Value NO2: | 434.0 | Expected Value NO2: | 434.0 |
| Expected Value NOx: | 440.0 | Expected Value NOx: | 440.0 |

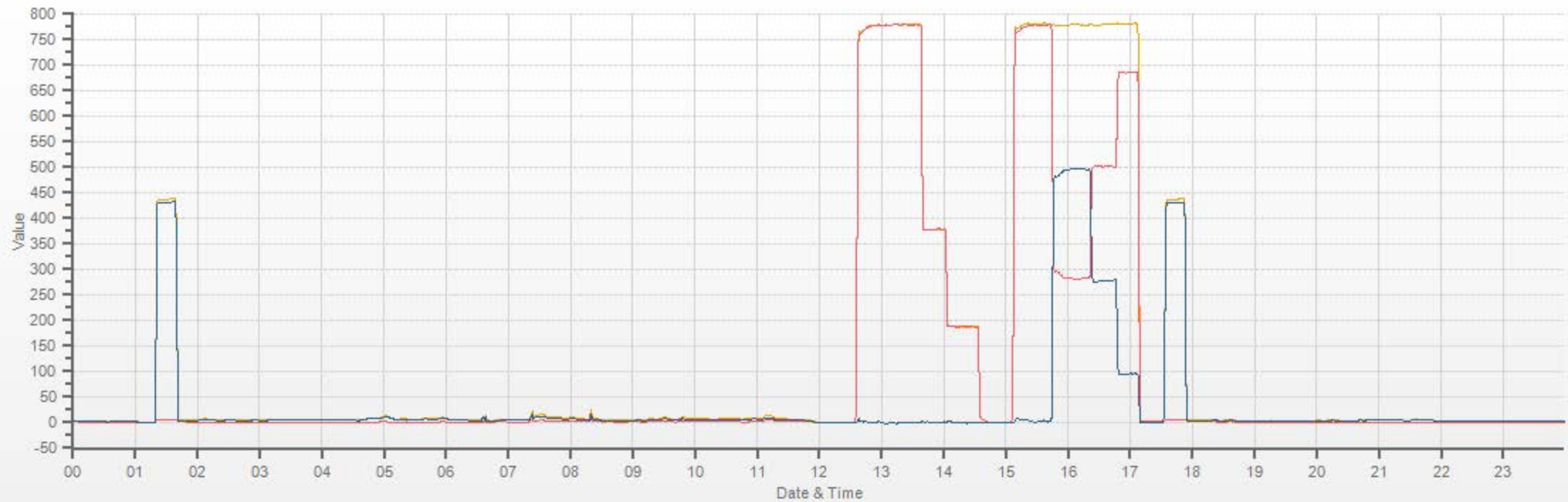
Comments:
 The analyzer sample inlet filter was changed.
 No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

The EV will be corrected after a first scheduled ZS check. A post-calibration ZS check does not reflect true values of SPAN reading for this analyzer.

Date: June 1, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 11:42 / 18:58
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

| | | |
|---|---|----------------|
| Date: June 30, 2017 | Barometer Data/B.P.: Fisher Scientific, I.D. # 05544 | 945 mb |
| Company/Airshed: LICA | Thermometer Data/Station Temp °C: FLUKE 1551 A Ex STIK / I.D. # 4294 | 22 °C |
| Location/Station Name: Bonnyville | Weather Conditions: Moderate rain | |
| Start/End Time 24 hr. (mst): 11:18 / 13:29 | Calibration Purpose: as found | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: July 18, 2019 | |

| | | | | | | | | | | | | | | | | | |
|--|---|----------------|----------------|----------------|-----------|-------------|-------|-------|-----|-------------------------|-------|-------|-----|--------------|-------|-------|-----|
| Analyzer: | Correction Factors: | | | | | | | | | | | | | | | | |
| ID# or Serial Number: 593 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td>NO =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.023</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.002</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.020</td> <td style="text-align: center;">n/a</td> </tr> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 1.023 | n/a | NO₂ = | 1.000 | 1.002 | n/a | NOx = | 1.000 | 1.020 | n/a |
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 1.023 | n/a | | | | | | | | | | | | | | |
| NO₂ = | 1.000 | 1.002 | n/a | | | | | | | | | | | | | | |
| NOx = | 1.000 | 1.020 | n/a | | | | | | | | | | | | | | |
| Last Calibration Date: June 1, 2017 | | | | | | | | | | | | | | | | | |
| Range ppb: 1000 | | | | | | | | | | | | | | | | | |

| Calibration Standards: | Standard Calibration Points for a Range of: 1000 ppb | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-----------------|------------------------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Low Flow Meter ID/Cert. Date: Defender 530 /s.n. 152020 / Nov 21, 2016 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td style="text-align: center;">780</td> <td style="text-align: center;">500</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">380</td> <td style="text-align: center;">275</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">190</td> <td style="text-align: center;">100</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #1</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #2</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
| Point | | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | |
| High | | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Mid | | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Low | | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| High Flow Meter ID/Cert. Date: Defender 530 /s.n. 148943 / Nov 21, 2016 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calibrator ID/Cert. Date: API 700, #627 / Jan 27, 2017 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cal Gas Cylinder I.D. #: LL104222 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cal Gas Conc. (ppm): 50.7 50.7 | | | | | | | | | | | | | | | | | | | | | | | | | |

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 | 4920 | 0.0 | 4920 | 0 | 0 | 0.6 | 1.0 | n/a | n/a |
| as found high | 4951 | 78.1 | 5029 | 787.2 | 787.2 | 770.0 | 773.0 | 1.023 | 1.020 |
| Average C.F.= | | | | | | | | | |

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

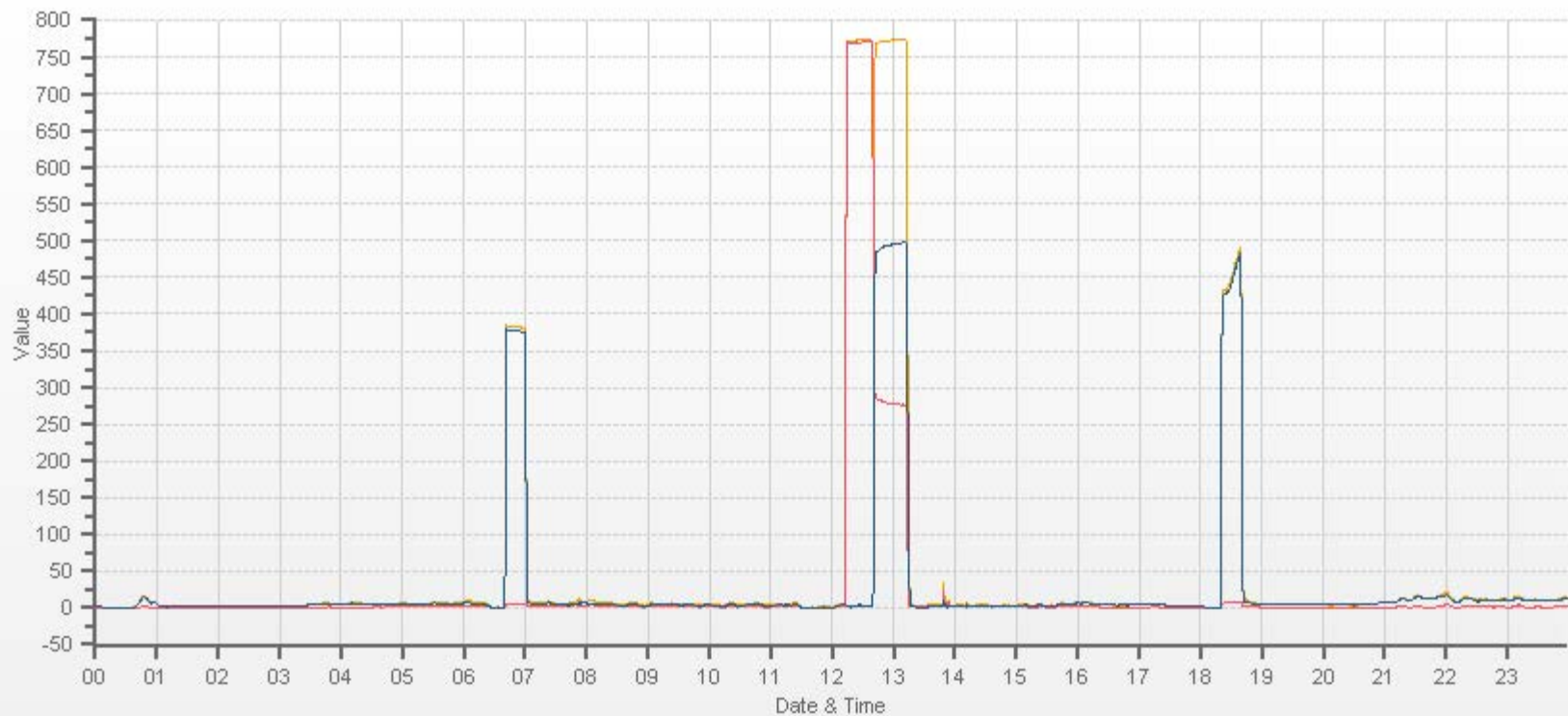
| Calibrator Flow Rates (cc/min) | | | | Calibrator Setting | Indicated NO | Indicated NOx | Indicated NO ₂ | NO drop | NO ₂ gain | NO ₂ C.F. |
|-------------------------------------|---------|---------|------------|--------------------|--------------|---------------|---------------------------|---------|----------------------|----------------------|
| Point | Diluent | Cal Gas | Total Flow | volts or ppb | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| NOx reference | 4951 | 78.10 | 5029 | 0.0 | 770.0 | 773.0 | 3.0 | 0.6 | 3.0 | n/a |
| as found high NO ₂ | 4951 | 78.10 | 5029 | 500.0 | 281.0 | 772.0 | 491.0 | 489.0 | 488.0 | 1.002 |
| Average NO₂ C.F.= | | | | | | | | | | n/a |

Linear Regression/Calibration Results:

| | | | | |
|--|--------|--------|-----------------|---------------|
| | NO | NOx | NO ₂ | LIMITS |
| Correlation Coefficient = | n/a | n/a | n/a | > or = 0.995 |
| Slope = | n/a | n/a | n/a | .95-1.05 |
| b (Intercept as % of full scale)= | n/a | n/a | n/a | ± 3% F.S. |
| % change in C.F. from last cal= | -2.31% | -0.20% | -1.96% | ± 10% |
| NO₂ converter efficiency | n/a | n/a | 1.00 | 0.96 to 1.04 |

| | |
|---|---|
| <p style="text-align: center;">As found:</p> NOx SLOPE: 0.903 NOx OFFS: -1.8 NO SLOPE: 0.904 NO OFFS: -2.7 SAMP FLW: 477 OZONE FL: 77 PMT: 6.5 NORM PMT: 0.5 AZERO: 11.0 HVPS: 670 RCELL TEMP: 50.0 BOX TEMP: 30.5 PMT TEMP: 6.7 IZS TEMP: 45.0 MOLY TEMP: 314.8 RCEL: 5.6 SAMP: 26.9 Expected Value NO: 5.6 Expected Value NO ₂ : 429.0 Expected Value NOx: 435.0 | <p style="text-align: center;">As left:</p> NOx SLOPE: 0.903 NOx OFFS: -1.8 NO SLOPE: 0.904 NO OFFS: -2.7 SAMP FLW: 477 OZONE FL: 77 PMT: 10.4 NORM PMT: 2.9 AZERO: 10.9 HVPS: 670 RCELL TEMP: 50.0 BOX TEMP: 30.2 PMT TEMP: 6.7 IZS TEMP: 45.0 MOLY TEMP: 316.0 RCEL: 5.5 SAMP: 26.9 Expected Value NO: 5.6 Expected Value NO ₂ : 429.0 Expected Value NOx: 435.0 |
|---|---|

Comments:
No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.
The analyzer perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized.
"As Found" calibration was completed because, according to a daily report, the NOx second span check was low: 381.4/435, -12.32%. A permeation device was suspected to be depleting.



— NOx[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

| | | |
|--|---|----------------|
| Date: June 2, 2017 | Barometer ID #/Last Cert. Date/B.P.: fisher Scientific 05544, December 5, 2016 | 936 mb |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: FLUKE 2329070, November 15, 2016 | 24 °C |
| Location/Station Name: Bonnyville - AER | Weather Conditions: Rain fall heavy at times | |
| Start/End Time 24 hr. (mst): 15:54 / 19:20 | Calibration Purpose: routine monthly | |
| Ozone Calibration Method: Varying UV Lamp Power | Performed By/Reviewer: Alex Yakupov | Trina Whitsitt |
| G.P.T. Date: n/a-done by Varying UV Lamp Power | Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power | |

| | |
|--|-----------------------------|
| Analyzer: | |
| ID# or Serial Number: 1002240372 | Ozone Range ppb: 500 |
| Last Calibration Date: May 5, 2017 | As Found C.F.: 1.005 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: 1.000 |

| | |
|--|--|
| Calibration Standards: | |
| Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 | |
| High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 | |
| Calibrator ID/Cert. Date: Sabio 2010D 11900613, March 16, 2017 | |
| Cal Gas Cylinder I.D. #: n/a | |

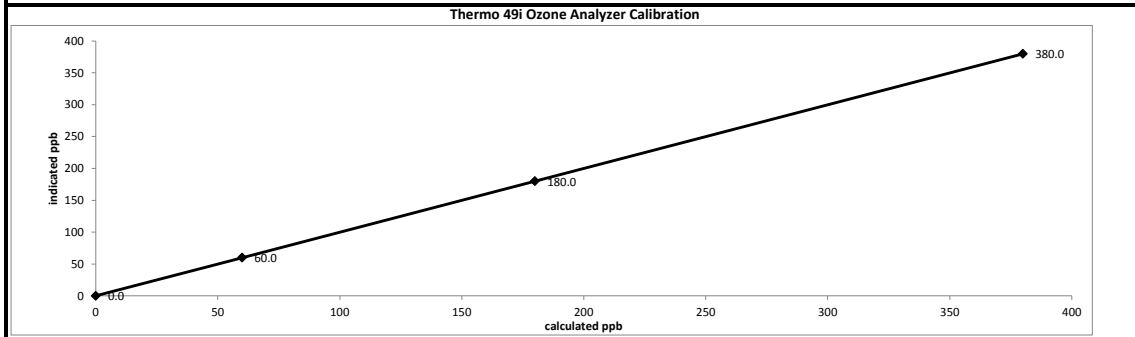
| Point | AMD Required Range of Ozone Calibration Points |
|-------|--|
| High | 300-400 ppb |
| Mid | 150-200 ppb |
| Low | 50-75 ppb |

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 | 378.0 | 1.005 |
| 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 | 60.0 | 1.000 |
| calibrator zero | 5000 | 5000 | 0.0 | n/a | 0.0 | n/a |
| Average C.F.= | | | | | 1.000 | |

Linear Regression/Calibration Results:

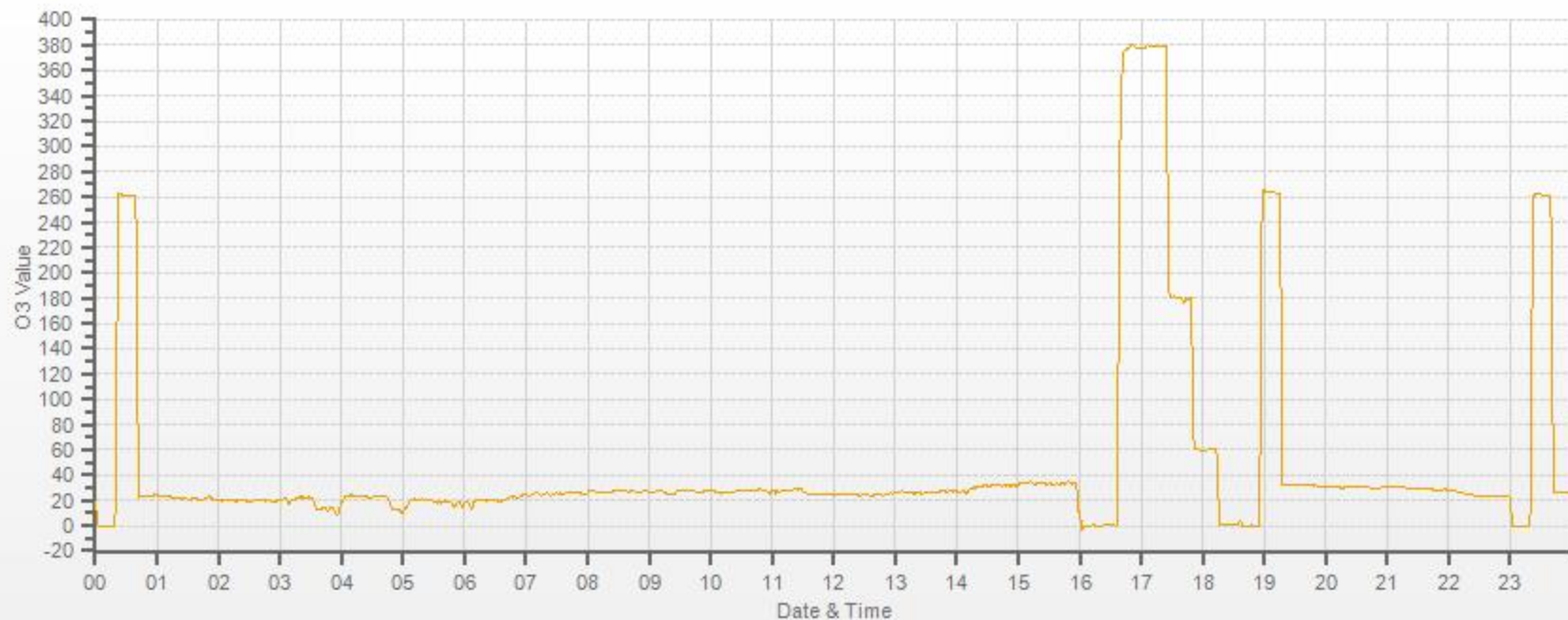
| | |
|---|---------------|
| Correlation Coefficient = <u>1.000</u> | LIMITS |
| Slope = <u>1.000</u> | > or = 0.995 |
| b (Intercept as % of full scale) = <u>0.00%</u> | .95-1.05 |
| % change in C.F. from last cal = <u>-0.53%</u> | ± 3% F.S. |
| | ± 10% |



| | |
|------------------------------|------------------------------|
| As found: | As left: |
| O3 Bkg: <u>-0.2</u> | O3 Bkg: <u>-0.2</u> |
| O3 Coef: <u>0.978</u> | O3 Coef: <u>0.982</u> |
| Photo Lamp: <u>14.2</u> | Photo Lamp: <u>14.2</u> |
| O3 Lamp: <u>5.8</u> | O3 Lamp: <u>5.8</u> |
| Bench: <u>29.7</u> | Bench: <u>29.6</u> |
| Bench Lamp: <u>54.1</u> | Bench Lamp: <u>54.1</u> |
| O3 Lamp: <u>68.1</u> | O3 Lamp: <u>68.1</u> |
| Pressure: <u>698.3</u> | Pressure: <u>698.3</u> |
| Cell A lpm: <u>0.752</u> | Cell A lpm: <u>0.753</u> |
| Cell B lpm: <u>0.765</u> | Cell B lpm: <u>0.764</u> |
| O3 ppb: <u>0.2</u> | O3 ppb: <u>0.2</u> |
| Cell A ppb: <u>2.3</u> | Cell A ppb: <u>0.6</u> |
| Cell B ppb: <u>-2.0</u> | Cell B ppb: <u>0.2</u> |
| Cell A int: <u>79021</u> | Cell A int: <u>79042</u> |
| Expected Value: <u>269.0</u> | Expected Value: <u>263.0</u> |

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

O3[ppb] Station: LICA Bonnyville Daily: 17.06.02 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER

Maxxam R & P 1400A TEOM PM 2.5 Analyzer Audit/Calibration

Date: June 5, 2017 Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Company: LICA Start Time (mst): 17:46
 Station Name/Location: Bonnyville - AER End Time (mst): 19:04
 Previous Audit Date: May 8, 2017 Calibration Purpose: routine monthly
 Parameter: PM 2.5 Weather Conditions: A few clouds

1400A Information and Status:

| | | | |
|-------------------------|-----------------------|----------------------------|--------------|
| ID# or Serial Number: | <u>140AB229030002</u> | As Found Filter Loading %: | <u>36%</u> |
| K ₀ Factor: | <u>13319</u> | As Left Filter Loading %: | <u>23%</u> |
| Ambient Temperature °C: | <u>18.1</u> | As Found Noise: | <u>0.032</u> |
| Ambient Pressure atm: | <u>0.938</u> | As Left Noise: | <u>0.000</u> |
| Main Flow Reading lpm: | <u>2.99</u> | Pump Vacuum: | <u>n/a</u> |
| Aux Flow Reading lpm: | <u>13.62</u> | Warnings: | <u>None</u> |

Reference Standards/I.D./Cert. Date:

Low Flow: n/a
 High Flow: n/a
 Digital Manometer: Dwyer ID#3, 475 Mark III January 1, 2017
 Temperature: FLUKE 2329070, November 15, 2016
 Pressure: fisher Scientific 05544, December 5, 2016

As Found Pump Off Test and Leak Check :

| | main flow | auxillary flow | |
|---------------------------------------|-------------|------------------------------------|---|
| pump unplugged zero (lpm) | <u>0.09</u> | <u>0.09</u> | |
| seconds to reach full flow (max. 60s) | <u>48</u> | <u>50</u> | (maintenance required if either > 60 seconds) |
| leak rate (lpm) | <u>0.11</u> | <u>0.09</u> | |
| 0 corrected leak rate (lpm) | <u>0.02</u> | <u>0.00</u> | |
| limit (lpm) | <u>0.15</u> | <u>.15 or (.60 with FDMS unit)</u> | |

As Left Pump Off Test and Leak Check (same as above if as found adequate):

| | main flow | auxillary flow | |
|---------------------------------------|-------------|------------------------------------|---|
| pump unplugged zero (lpm) | <u>0.09</u> | <u>0.09</u> | |
| seconds to reach full flow (max. 60s) | <u>48</u> | <u>50</u> | (maintenance required if either > 60 seconds) |
| leak rate (lpm) | <u>0.11</u> | <u>0.09</u> | |
| 0 corrected leak rate (lpm) | <u>0.02</u> | <u>0.00</u> | |
| limit (lpm) | <u>0.15</u> | <u>.15 or (.60 with FDMS unit)</u> | |

As found temperature and pressure:

| | | | |
|---------------------------|-------------|------------------------|--------------|
| tolerance +/- 2.0°C | | tolerance +/- 0.01 atm | |
| 1400A temperature °C: | <u>17.4</u> | 1400A pressure atm: | <u>0.937</u> |
| reference temperature °C: | <u>18.1</u> | reference pressure: | <u>0.938</u> |
| difference °C: | <u>0.7</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 | |
| 1400A temperature °C: | <u>17.4</u> | 1400A pressure atm: | <u>0.937</u> |
| reference temperature °C: | <u>18.1</u> | reference pressure: | <u>0.938</u> |
| difference °C: | <u>0.7</u> | difference : | <u>0.001</u> |

As found flows:

| | | | |
|---|-------------|--|--------------|
| main flow tolerance 3.00 lpm +/- 0.20 lpm | | total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% | |
| 1400A main flow lpm: | <u>3.00</u> | 1400A total/aux flow lpm: | <u>16.67</u> |
| reference main flow lpm: | <u>3.09</u> | reference total/aux flow lpm: | <u>16.83</u> |
| difference lpm: | <u>0.09</u> | difference lpm: | <u>0.16</u> |

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

| | | | |
|---|-------------|--|--------------|
| main flow tolerance 3.00 lpm +/- 0.20 lpm | | total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% | |
| 1400A main flow lpm: | <u>3.00</u> | 1400A total/aux flow lpm: | <u>16.67</u> |
| reference main flow lpm: | <u>3.09</u> | reference total/aux flow lpm: | <u>16.83</u> |
| difference lpm: | <u>0.09</u> | difference lpm: | <u>0.16</u> |

K₀ Audit:

Last K₀ audit date: June 5, 2017
 1400A K₀ factor: 13319
 Measured K₀ factor: 13564
 % difference: 1.84%

Instrument Operating Parameters:

Pump Vacuum: n/a
 Main F_{adj}: 1.000
 Aux F_{adj}: 1.000

Comments:

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

Low Flow cell: CHN0910 calibration date - March 24, 2017; High Flow cell: CHN0901, calibration date - March 24, 2017.

Maxxam R & P 1400A TEOM PM 2.5 Analyzer Audit/Calibration

Date: June 28, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: June 5, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 10:11
 End Time (mst): 11:48
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

| | | | |
|-------------------------|-----------------------|----------------------------|--------------|
| ID# or Serial Number: | <u>140AB229030002</u> | As Found Filter Loading %: | <u>37%</u> |
| K _o Factor: | <u>13319</u> | As Left Filter Loading %: | <u>21%</u> |
| Ambient Temperature °C: | <u>18.2</u> | As Found Noise: | <u>0.034</u> |
| Ambient Pressure atm: | <u>0.925</u> | As Left Noise: | <u>0.026</u> |
| Main Flow Reading lpm: | <u>2.99</u> | Pump Vacuum: | <u>n/a</u> |
| Aux Flow Reading lpm: | <u>13.63</u> | Warnings: | <u>None</u> |

Reference Standards/I.D./Cert. Date:

Low Flow: Chinook Eng. / sn # 091099, I.D.#3 / March 24, 2017
 High Flow: Chinook Eng. / sn # 091001, I.D. #2 / March 24, 2017
 Digital Manometer: Dwyer, Series 475 Mark III / I.D. #3 / January 01, 2017
 Temperature: FLUKE 1551A Ex STIK / I.D. #4295 / November 15, 2016
 Pressure: Fisher Scientific / I.D. #05544 / December 05, 2016

As Found Pump Off Test and Leak Check :

| | main flow | auxiliary flow | |
|---------------------------------------|-------------|------------------------------------|---|
| pump unplugged zero (lpm) | <u>0.10</u> | <u>0.10</u> | |
| seconds to reach full flow (max. 60s) | <u>53</u> | <u>56</u> | (maintenance required if either > 60 seconds) |
| leak rate (lpm) | <u>0.11</u> | <u>0.08</u> | |
| 0 corrected leak rate (lpm) | <u>0.01</u> | <u>-0.02</u> | |
| limit (lpm) | <u>0.15</u> | <u>.15 or (.60 with FDMS unit)</u> | |

As Left Pump Off Test and Leak Check (same as above if as found adequate):

| | main flow | auxiliary flow | |
|---------------------------------------|-------------|------------------------------------|---|
| pump unplugged zero (lpm) | <u>0.10</u> | <u>0.10</u> | |
| seconds to reach full flow (max. 60s) | <u>53</u> | <u>56</u> | (maintenance required if either > 60 seconds) |
| leak rate (lpm) | <u>0.11</u> | <u>0.08</u> | |
| 0 corrected leak rate (lpm) | <u>0.01</u> | <u>-0.02</u> | |
| limit (lpm) | <u>0.15</u> | <u>.15 or (.60 with FDMS unit)</u> | |

As found temperature and pressure:

| | | | |
|---------------------------|-------------|------------------------|---------------|
| tolerance +/- 2.0°C | | tolerance +/- 0.01 atm | |
| 1400A temperature °C: | <u>18.2</u> | 1400A pressure atm: | <u>0.925</u> |
| reference temperature °C: | <u>18.2</u> | reference pressure: | <u>0.924</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 | |
| 1400A temperature °C: | <u>18.2</u> | 1400A pressure atm: | <u>0.925</u> |
| reference temperature °C: | <u>18.2</u> | reference pressure: | <u>0.924</u> |
| difference °C: | <u>0.0</u> | difference: | <u>-0.001</u> |

As found flows:

| | | | |
|---|-------------|--|--------------|
| main flow tolerance 3.00 lpm +/- 0.20 lpm | | total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% | |
| 1400A main flow lpm: | <u>3.00</u> | 1400A total/aux flow lpm: | <u>16.67</u> |
| reference main flow lpm: | <u>3.10</u> | reference total/aux flow lpm: | <u>16.90</u> |
| difference lpm: | <u>0.10</u> | difference lpm: | <u>0.23</u> |

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

| | | | |
|---|-------------|--|--------------|
| main flow tolerance 3.00 lpm +/- 0.20 lpm | | total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% | |
| 1400A main flow lpm: | <u>3.00</u> | 1400A total/aux flow lpm: | <u>16.67</u> |
| reference main flow lpm: | <u>3.10</u> | reference total/aux flow lpm: | <u>16.90</u> |
| difference lpm: | <u>0.10</u> | difference lpm: | <u>0.23</u> |

K_o Audit:

Last K_o audit date: June 5, 2017
 1400A K_o factor: 13319
 Measured K_o factor: 13564
 % difference: 1.84%

Instrument Operating Parameters:

Pump Vacuum: n/a
 Main F_{adj}: 1.000
 Aux F_{adj}: 1.000

Comments:

The TEOM sample filter was changed.

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

WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

| | | | |
|-----------------|------------------|-----------------------|----------------|
| Company: | LICA | Performed By: | Alex Yakupov |
| Audit Location: | Bonnyville - AER | Reviewed By: | Trina Whitsitt |
| Audit Date: | March 3, 2017 | Start /EndTime (mst): | 10:11 / 13:14 |

Wind Sensor Information

| Sensor ID Data: | | Sensor Outputs: | |
|--------------------------|------------------|---------------------------------|-------|
| Sensor Make: | R.M. Young | Velocity Voltage Output Range: | 0-1 |
| Sensor Model: | 5103 VK | Velocity Unit Output Range: | 0-200 |
| Serial #: | 56589 | Direction Voltage Output Range: | 0-1 |
| Previous Cal/Audit Date: | January 26, 2016 | Direction Unit Output Range: | 0-360 |

Wind Calibrator Information

| | | | |
|-------------------------|------------------------|---------------------|-----------------|
| Calibrator Make/ Model: | RM Young / Model 18802 | Serial #: | CA 03309 |
| Maxxam Unit ID #: | 13-3357 | Certification Date: | October 6, 2016 |

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

| RPM | Wind Speed Generated kph | Clockwise Wind Speed kph | Counter Clockwise Wind Speed kph | Correction Factor |
|-----------------------------------|--------------------------|--------------------------|----------------------------------|-------------------|
| 0 | 0 | 0.0 | 0.0 | - |
| 1000 | 17.6 | 17.7 | 17.6 | 0.998 |
| 2000 | 35.3 | 35.3 | 35.3 | 0.999 |
| 3000 | 52.9 | 53.0 | 53.0 | 0.999 |
| 4000 | 70.6 | 70.6 | 70.7 | 0.999 |
| 5000 | 88.2 | 88.3 | 88.4 | 0.998 |
| 6000 | 105.8 | 106.0 | 106.0 | 0.998 |
| 7000 | 123.5 | 123.6 | 123.7 | 0.999 |
| 8000 | 141.1 | 141.3 | 141.4 | 0.998 |
| 9000 | 158.8 | 159.0 | 159.1 | 0.998 |
| 10000 | 176.4 | 176.7 | 176.7 | 0.998 |
| The audit meets AMD requirements. | | | Average Correction Factor= | 0.998 |

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

| Generated Wind Direction 0-360 (Up) | Generated Wind Direction 360-0 (Down) | Indicated Wind Direction 0-360 (Up) | Indicated Wind Direction 360-0 (Down) | Degrees Difference 0-360 (Up) | Degrees Difference 360-0 (Down) | Average Absolute Degrees Difference |
|-------------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|---------------------------------|-------------------------------------|
| 0 | 355 | 0 | 354 | 0.2 | 1.3 | 0.8 |
| 30 | 330 | 30 | 329 | -0.4 | 0.9 | 0.6 |
| 60 | 300 | 60 | 300 | -0.4 | 0.3 | 0.4 |
| 90 | 270 | 91 | 271 | -0.8 | -0.6 | 0.7 |
| 120 | 240 | 120 | 240 | 0.3 | 0.4 | 0.4 |
| 150 | 210 | 149 | 210 | 0.7 | -0.3 | 0.5 |
| 180 | 180 | 180 | 181 | 0.5 | -0.9 | 0.7 |
| 210 | 150 | 209 | 150 | 1.1 | -0.2 | 0.6 |
| 240 | 120 | 239 | 121 | 1.4 | -0.5 | 1.0 |
| 270 | 90 | 269 | 90 | 1.5 | -0.2 | 0.9 |
| 300 | 60 | 296 | 60 | 3.6 | 0.0 | 1.8 |
| 330 | 30 | 325 | 30 | 4.7 | 0.0 | 2.4 |
| 355 | 0 | 352 | 0 | 3.2 | 0.2 | 1.7 |
| The audit meets AMD requirements. | | | | Average Absolute Degrees Difference= | | 1.0 |

Comments:

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

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

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

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

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

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

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

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

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

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

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

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

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

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

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

| | | | | | |
|------------------------|---------|------------------|--|------------------------|---------|
| NO | | LIMITS | | NOx | |
| Correlation= | 1.0000 | ≥ 0.990 | | Correlation= | 1.0000 |
| m (Slope)= | 1.0301 | 0.90-1.10 | | m (Slope)= | 1.0291 |
| b (Intercept % of FS)= | -0.0919 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0881 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 4954 | 0.000 | 0.0000 | 0.7949 | 0.0005 | 0.7954 | NO ₂ | % Diff. Limit |
| 4954 | 0.510 | 0.5104 | 0.2845 | 0.5072 | 0.7917 | -1% | ± 10% |
| 4954 | 0.250 | 0.2516 | 0.5433 | 0.2514 | 0.7944 | 0% | ± 10% |
| 4954 | 0.100 | 0.1085 | 0.6864 | 0.1087 | 0.7951 | 0% | ± 10% |
| Absolute Average Percent Difference | | | | | | 0% | ± 10% |

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

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

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

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

| | | | |
|------------------------------|-------------------------|---------------------------------|---------------------------|
| Company <u>Maxxam</u> | | Operator: <u>Mike</u> | |
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>Sabio 2010</u> | Make/Model | <u>Bios Defender 530</u> |
| Serial Number | <u>42531101</u> | Serial Number | <u>HI148944 Lo 152019</u> |
| Last Verification Date | <u>February 4, 2016</u> | Temperature (°C) | <u>24.6</u> |
| NO Cylinder S/N | <u>EY0000597</u> | Barometric Pressure | <u>701.4mmHg</u> |
| NO [PPM] | <u>49.0</u> | NOx [PPM] | <u>49.0</u> |
| Expiry Date | <u>December 8, 2019</u> | | |

| | | | |
|-----------------------------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | |
| Pt. #1 | <u>4919</u> | Pt. #2 | <u>4939</u> |
| | | Pt. #3 | <u>4958</u> |
| Gas Flow (sccm) | | | |
| Pt. #1 | <u>79.7</u> | Pt. #2 | <u>38.5</u> |
| | | Pt. #3 | <u>19.0</u> |

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|--|------|-----------------------|--------|----------------------|-----------------|--------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5005 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0002 | Limit ± 10% | |
| 4999 | 79.7 | 0.7812 | 0.7812 | 0.7827 | -0.0004 | 0.7823 | 0% | 0% |
| 4977 | 38.5 | 0.3790 | 0.3790 | 0.3803 | -0.0004 | 0.3799 | 0% | 0% |
| 4977 | 19.0 | 0.1871 | 0.1871 | 0.1874 | 0.0001 | 0.1875 | 0% | 0% |
| Absolute Average Percent Difference | | | | | | | 0% | 0% |

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

| | | |
|-------------------------------|------------------|-------------------------------|
| NO | LIMITS | NOx |
| Correlation= 1.0000 | ≥ 0.990 | Correlation= 1.0000 |
| m (Slope)= 1.0020 | 0.90-1.10 | m (Slope)= 1.0012 |
| b (Intercept % of FS)= 0.0095 | ± 3% F.S. | b (Intercept % of FS)= 0.0248 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOx | % Diff. Vs Audit gas | |
|--|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 4999 | 0.000 | 0.0000 | 0.7868 | -0.0007 | 0.7861 | NO ₂ | % Diff. Limit |
| 4999 | 0.500 | 0.5116 | 0.2752 | 0.5118 | 0.7870 | 0% | ± 10% |
| 4999 | 0.250 | 0.2843 | 0.5025 | 0.2832 | 0.7857 | 0% | ± 10% |
| 4999 | 0.100 | 0.1034 | 0.6834 | 0.1031 | 0.7866 | 0% | ± 10% |
| Absolute Average Percent Difference | | | | | | 0% | ± 10% |

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

| | | |
|--------------------------------|------------------|--|
| NO₂ | LIMITS | |
| Correlation= 1.0000 | ≥ 0.995 | |
| m (Slope)= 1.0012 | 0.90-1.10 | |
| b (Intercept % of FS)= -0.0751 | ± 3% F.S. | |

| | |
|---------------------------------------|--|
| AENV Standards | NO_x Analyzer |
| Audit Calibrator | Make/Model <u>Thermo 42i</u> |
| Make/Model <u>Thermo 146i</u> | Serial/AMU Number <u>1868</u> |
| Serial/AMU Number <u>1809</u> | Last Calibration Date <u>February 13, 2017</u> |
| SRM Gas Cylinder No. <u>CAL018140</u> | Full Scale (ppm) <u>1.0</u> |
| Cylinder Conc. (ppm) <u>48.79</u> | Cylinder Gas Expiry Date <u>March 28, 2019</u> |

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton Date: February 14, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company: Maxxam **Operator:** Mike

| Calibrator: | | Flow Measurement Device: | |
|--------------------------------|-------------------------|--------------------------|---------------------------|
| Make/Model | <u>API 700</u> | Make/Model | <u>Bios Defender 530+</u> |
| Serial Number | <u>831</u> | Serial Number | <u>Hi148944 Lo 152019</u> |
| Last Verification Date | <u>January 19, 2016</u> | Temperature (°C) | <u>24.6</u> |
| SO ₂ Cylinder Conc. | <u>50.5</u> | Barometric Pressure | <u>701.4mmHg</u> |
| SO ₂ Cylinder S/N | <u>EY0000769</u> | | |
| Expiry Date | <u>December 8, 2019</u> | | |

Flow Measurements

Pt. No. 1 77.3 **Pt. No. 2** 37.5 **Pt. No. 3** 18.8

| Calibrator Flow (sccm) | Calculated Concentration (ppm) | Indicated Concentration (ppm) | % Difference | |
|-------------------------------------|-----------------------------------|----------------------------------|--------------|---------------|
| | | | vs Audit Gas | % Diff. Limit |
| Zero Air | 0.0000 | 0.0001 | | |
| 4995 | 0.7815 | 0.7889 | 1% | ± 10% |
| 5003 | 0.3785 | 0.3840 | 1% | ± 10% |
| 5007 | 0.1896 | 0.1911 | 1% | ± 10% |
| Absolute Average Percent Difference | | | 1% | ± 10% |

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

| SO ₂ | | LIMITS | |
|------------------------|--------|--------|-----------|
| Correlation= | 1.0000 | ≥ | 0.995 |
| m (Slope)= | 1.0097 | | 0.90-1.10 |
| b (Intercept % of FS)= | 0.0341 | ± | 3% F.S. |

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

COMMENTS: Analyzer verified prior to audit

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

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

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

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

Expiry Date: July 2019

| Reference Calibrator and Gas: | Flow Measurement Device: |
|---|--------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMY 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.5 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CA:016625</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:

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

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

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.0000 | 0.0000 | 0.000 |
| 4935 | 82.0 | 0.830 | 0.01662 | 60.183 | 50.0 |
| 4968 | 40.8 | 0.412 | 0.00821 | 121.765 | 50.2 |
| 4955 | 20.2 | 0.203 | 0.00408 | 245.297 | 49.8 |
| Average Cylinder Concentration: | | | | | 50.0 |

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

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

Auditor: Al Clark

Operator Signature: *Al Clark*

Date: October 19, 2016

Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

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

| Reference Calibrator and Gas: | Flow Measurement Device: |
|---|--------------------------------|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Bios DC2</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>AMU 1659</u> |
| Last Verification Date: <u>October 19, 2016</u> | Temp. °C: <u>24.0 C</u> |
| Gas Type: <u>H2S</u> Conc. <u>20.43</u> | B.P. <u>706 mmhg</u> |
| Cylinder Number: <u>CAL015584</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1
 Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (scm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5050 | 38.0 | 0.0764 | 0.00752 | 132.895 | 10.2 |
| 5050 | 17.8 | 0.0355 | 0.00352 | 283.708 | 10.1 |
| 5023 | 9.1 | 0.0182 | 0.00181 | 551.978 | 10.0 |
| Average Cylinder Concentration: | | | | | 10.1 |

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

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

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: October 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

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

Reference Calibrator and Gas:

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

Flow Measurement Device:

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

Reference Analyzer:

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

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

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

Cylinder gas tolerances based on CH4 only

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

Auditor: Shea Beaton
 Operator Signature: _____

Date: January 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-336CGA

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

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

Expiry Date: July 2019

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

Reference Analyzer:

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

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4935 | 82.0 | 0.838 | 0.837 | 0.017 | 60.183 | 50.4 | 50.4 |
| 4968 | 40.8 | 0.417 | 0.417 | 0.008 | 121.765 | 50.8 | 50.8 |
| 4955 | 20.2 | 0.207 | 0.207 | 0.004 | 245.297 | 50.8 | 50.8 |
| Average Cylinder Concentration: | | | | | | 50.7 | 50.6 |

| | |
|--|-------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>50.7</u> | <u>50.9</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.

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

Auditor: Al Clark Date: October 19, 2016

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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-250CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: LL74267 Concentration PPM: 9.88 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: AI Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.00755 | 282.889 | 9.67 |
| 5099 | 38.5 | 0.0731 | 0.00755 | 132.442 | 9.68 |
| 5092 | 18.0 | 0.0342 | 0.00353 | 282.889 | 9.67 |
| 5066 | 9.2 | 0.0173 | 0.00182 | 550.652 | 9.53 |
| Average Cylinder Concentration: | | | | | 9.63 |

Previous Stated Concentration PPM: 9.88

Percent variance from Stated: 2.6

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: AI Clark
Operator Signature: *AI 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 | <u>CH4</u> | Conc. | <u>999.2</u> |
| Cylinder Number | <u>D751932</u> | | |
| Gas Type | <u>C3H8</u> | Conc. | <u>246.5</u> |
| Cylinder Number | <u>XF0037998</u> | | |

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. 2015-110CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119329 **Conc (PPM)** 50.3/50.3 **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:** 01-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 |
| 4960 | 0.0 | 0.000 | 0.000 | | | | |
| 4959 | 79.09 | 0.805 | 0.805 | 0.01595 | 62.701 | 50.5 | 50.5 |
| 4950 | 39.44 | 0.401 | 0.401 | 0.00797 | 125.507 | 50.3 | 50.3 |
| 4942 | 19.44 | 0.199 | 0.199 | 0.00393 | 254.218 | 50.6 | 50.6 |
| Average Cylinder Concentration: | | | | | | 50.5 | 50.5 |

| | | | |
|------------------------------------|-------------|--|-------------|
| | <u>NO</u> | | <u>NOx</u> |
| Previous Stated Concentration PPM: | <u>50.3</u> | | <u>50.3</u> |
| Percent variance from Stated: | <u>0.3</u> | | <u>0.3</u> |

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 50.1PPM 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



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-111CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119329 **Concentration PPM:** 50.1 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: Thermo146i
Serial Number: 1809
Last Verification Date: February 2, 2016
Gas Type: SO2 **Conc.** 98.07
Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC-2
Serial Number: Bios D
Temp. °C: 24.5
B.P. 702mmHg

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 (scm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|-------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 4960 | 0.0 | 0.000 | 0.00000 | 0.00000 | 0.000 |
| 4959 | 79.09 | 0.791 | 0.01595 | 62.701 | 49.6 |
| 4950 | 39.44 | 0.394 | 0.00797 | 125.507 | 49.4 |
| 4942 | 19.44 | 0.194 | 0.00393 | 254.218 | 49.3 |
| Average Cylinder Concentration: | | | | | 49.5 |

Previous Stated Concentration PPM: 50.1

Percent variance from Stated: 1.3

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.3ppm 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

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/VOC/Bonnyville/June 06, 2017 | 23791 | Ambient Air | 06-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1-Butene | | 0.04 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2,2,4-Trimethylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2,3-Dimethylbutane | | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2,3-Dimethylpentane | | 0.04 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|-----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| .ICA/VOC/Bonnyville/June 06, 2017 | 23791 | Ambient Air | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-001 | 2,4-Dimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2-Methylhexane | | 0.08 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 2-Methylpentane | | 0.08 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 3-Methylhexane | | 0.07 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | 3-Methylpentane | | 0.05 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Acetone | | 4.6 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060101-001 | Benzene | | 0.06 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Bromomethane | I | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Carbon disulfide | I | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Chloroform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Chloromethane | | 0.48 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/VOC/Bonnyville/June 06, 2017 | 23791 | Ambient Air | 06-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-001 | Cyclopentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Ethanol | | 1.5 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060101-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Ethylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Freon-11 | | 0.36 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Freon-113 | I | 0.08 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Freon-12 | | 0.50 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 20-Jun-17 |
| 17060101-001 | Isobutane | | 0.40 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Isopentane | | 0.36 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060101-001 | Isoprene | | 0.12 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | m,p-Xylene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060101-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methyl ethyl ketone | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methylcyclohexane | | 0.07 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | Methylcyclopentane | | 0.04 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/VOC/Bonnyville/June 06, 2017 | 23791 | Ambient Air | 06-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Butane | | 0.35 | ppbv | 0.03 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Heptane | | 0.07 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Hexane | | 0.18 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Pentane | | 0.1 | ppbv | 0.1 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | o-Xylene | | 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 20-Jun-17 |
| 17060101-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Toluene | | 0.09 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |

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Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/VOC/Bonnyville/June 06, 2017 | 23791 | Ambient Air | 06-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17060101-001 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-001 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 20-Jun-17 |

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

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 12, 2017 | 14999 | Ambient Air | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1-Butene | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2,2,4-Trimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2,3-Dimethylbutane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2,3-Dimethylpentane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 12, 2017 | 14999 | Ambient Air | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-001 | 2,4-Dimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2-Methylhexane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 2-Methylpentane | | 0.05 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 3-Methylhexane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | 3-Methylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Acetone | | 4.6 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-001 | Benzene | | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Carbon disulfide | I | 0.08 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Chloroform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Chloromethane | | 0.41 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 12, 2017 | 14999 | Ambient Air | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-001 | Cyclopentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Ethanol | | 1.0 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Ethylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Freon-11 | | 0.35 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Freon-113 | I | 0.09 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Freon-114 | I | 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Freon-12 | | 0.48 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060233-001 | Isobutane | | 0.37 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Isopentane | | 0.40 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-001 | Isoprene | | 0.12 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | m,p-Xylene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methyl ethyl ketone | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methylcyclohexane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | Methylcyclopentane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 12, 2017 | 14999 | Ambient Air | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Butane | | 0.38 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Heptane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Hexane | | 0.07 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Pentane | | 0.1 | ppbv | 0.1 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | o-Xylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060233-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Toluene | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 12, 2017 | 14999 | Ambient Air | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17060233-001 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-001 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 23-Jun-17 |

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 18, 2017 | 14980 | Ambient Air | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-003 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1-Butene | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2,2,4-Trimethylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2,2-Dimethylbutane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2,3,4-Trimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2,3-Dimethylbutane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2,3-Dimethylpentane | | 0.06 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/Jun 18, 2017 | 14980 | Ambient Air | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-003 | 2,4-Dimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2-Methylheptane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2-Methylhexane | | 0.21 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 2-Methylpentane | | 0.20 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | 3-Methylheptane | | 0.03 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 3-Methylhexane | | 0.10 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | 3-Methylpentane | | 0.13 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Acetone | | 6.0 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-003 | Benzene | | 0.37 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Carbon disulfide | I | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Chloroform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Chloromethane | | 0.40 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Cyclohexane | | 0.12 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Rebecca Holgate, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | Monday, July 31, 2017 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 18, 2017 | 14980 | Ambient Air | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-003 | Cyclopentane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Ethanol | | 1.7 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-003 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Ethylbenzene | | 0.07 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Freon-11 | | 0.34 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Freon-113 | I | 0.08 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Freon-12 | | 0.48 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060233-003 | Isobutane | | 0.27 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Isopentane | | 0.76 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-003 | Isoprene | | 0.12 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | m,p-Xylene | | 0.25 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-003 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methyl ethyl ketone | | 1.0 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methylcyclohexane | | 0.27 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | Methylcyclopentane | | 0.20 | ppbv | 0.02 | AC-058 | 23-Jun-17 |

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/VOC/Bonnyville/June 18, 2017 | 14980 | Ambient Air | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-003 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Butane | | 1.68 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Heptane | | 0.21 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Hexane | | 0.39 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Octane | | 0.09 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Pentane | | 0.8 | ppbv | 0.1 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-003 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-003 | n-Nonane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | o-Ethyltoluene | I | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | o-Xylene | | 0.09 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 23-Jun-17 |
| 17060233-003 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Toluene | | 0.82 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-003 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-003 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 23-Jun-17 |
| 17060233-003 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |

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 Canada T9C 1T4
 (780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/VOC/Bonnyville/Jun 18, 2017 | 14980 | Ambient Air | 18-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville- AER | | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17060233-003 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-003 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

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| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 24, 2017 | S5619 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1-Butene | | 0.04 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 1-Pentene | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2,2,4-Trimethylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2,2-Dimethylbutane | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2,3,4-Trimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2,3-Dimethylbutane | | 0.04 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2,3-Dimethylpentane | | 0.03 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 24, 2017 | S5619 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-001 | 2,4-Dimethylpentane | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2-Methylheptane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2-Methylhexane | | 0.04 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 2-Methylpentane | | 0.08 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 3-Methylhexane | | 0.04 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | 3-Methylpentane | | 0.05 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Acetone | | 6.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060331-001 | Benzene | | 0.06 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Carbon disulfide | | 0.52 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Chloroform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Chloromethane | | 0.54 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Cyclohexane | | 0.03 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

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| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 24, 2017 | S5619 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-001 | Cyclopentane | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Ethanol | | 1.5 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060331-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Ethylbenzene | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Freon-11 | | 0.30 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Freon-113 | I | 0.10 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Freon-114 | I | 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Freon-12 | | 0.65 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 07-Jul-17 |
| 17060331-001 | Isobutane | | 0.17 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Isopentane | | 0.40 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-001 | Isoprene | | 0.14 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | m,p-Xylene | | 0.06 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methyl ethyl ketone | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methylcyclohexane | | 0.06 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | Methylcyclopentane | | 0.05 | ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 24, 2017 | S5619 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Butane | | 0.32 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Heptane | | 0.04 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Hexane | | 0.07 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Pentane | | 0.2 | ppbv | 0.1 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-001 | n-Nonane | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | o-Xylene | | 0.03 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060331-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | Tetrachloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Toluene | | 0.10 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-001 | trans-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 07-Jul-17 |
| 17060331-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 24, 2017 | S5619 | Ambient Air | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------------|------|--------|---------------|
| 17060331-001 | Vinyl acetate | K, T, U | < 0.4 ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-001 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 30, 2017 | S5589 | Ambient Air | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17070018-001 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,1-Dichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2,3-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2,4-Trichlorobenzene | K, T, U | < 0.8 | ppbv | 0.8 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2,4-Trimethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2-Dichlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,3-Butadiene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,3-Dichlorobenzene | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,4-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1,4-Dioxane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1-Butene | | 0.03 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 1-Pentene | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2,2,4-Trimethylpentane | | 0.05 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2,2-Dimethylbutane | | 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2,3,4-Trimethylpentane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2,3-Dimethylbutane | | 0.05 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2,3-Dimethylpentane | | 0.04 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 30, 2017 | S5589 | Ambient Air | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17070018-001 | 2,4-Dimethylpentane | | 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2-Methylheptane | | 0.02 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2-Methylhexane | | 0.07 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 2-Methylpentane | | 0.21 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 3-Methylhexane | | 0.05 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | 3-Methylpentane | | 0.13 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Acetone | | 4.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Acrolein | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070018-001 | Benzene | | 0.10 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Benzyl chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Carbon disulfide | I | 0.03 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Chloroform | I | 0.03 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Chloromethane | | 0.54 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | cis-1,3-Dichloropropene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Cyclohexane | | 0.11 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

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|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 30, 2017 | S5589 | Ambient Air | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17070018-001 | Cyclopentane | | 0.05 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Ethanol | | 2.2 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070018-001 | Ethyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Ethylbenzene | | 0.05 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Freon-11 | | 0.32 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Freon-113 | I | 0.11 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Freon-114 | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Freon-12 | | 0.65 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Hexachloro-1,3-butadiene | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 08-Jul-17 |
| 17070018-001 | Isobutane | | 0.23 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Isopentane | | 0.64 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070018-001 | Isoprene | | 0.17 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Isopropyl alcohol | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | m,p-Xylene | | 0.13 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070018-001 | m-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | m-Ethyltoluene | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methyl butyl ketone | K, T, U | < 0.50 | ppbv | 0.50 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methyl ethyl ketone | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methyl isobutyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methyl methacrylate | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methyl tert butyl ether | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methylcyclohexane | | 0.10 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | Methylcyclopentane | | 0.22 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

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| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| ICA/VOC/Bonnyville/June 30, 2017 | S5589 | Ambient Air | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17070018-001 | Methylene chloride | K, T, U | < 0.3 | ppbv | 0.3 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Butane | | 0.42 | ppbv | 0.03 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Decane | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Dodecane | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Heptane | | 0.17 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Hexane | | 0.23 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Octane | | 0.07 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Pentane | | 0.3 | ppbv | 0.1 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Propylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Undecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 08-Jul-17 |
| 17070018-001 | Naphthalene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 08-Jul-17 |
| 17070018-001 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | o-Xylene | | 0.05 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | p-Diethylbenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | p-Ethyltoluene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 08-Jul-17 |
| 17070018-001 | Styrene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | Tetrachloroethylene | I | 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | Tetrahydrofuran | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Toluene | | 0.27 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | trans-1,3-Dichloropropylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |
| 17070018-001 | trans-2-Butene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 08-Jul-17 |
| 17070018-001 | trans-2-Pentene | | 0.03 | ppbv | 0.02 | AC-058 | 08-Jul-17 |
| 17070018-001 | Trichloroethylene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 08-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| ICA/VOC/Bonnyville/June 30, 2017 | S5589 | Ambient Air | 30-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|----------------|-----------|--------|-------|------|--------|---------------|
| 17070018-001 | Vinyl acetate | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 08-Jul-17 |
| 17070018-001 | Vinyl chloride | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 08-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

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PAHS SAMPLES

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/PUF/Bonnyville/June 06, 2017 | TE-01 | Air Filter | 06-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|------------------|------|--------|---------------|
| 17060101-002 | 1-Methylnaphthalene | | 0.13 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | 2-Methylnaphthalene | | 0.28 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | 3-Methylcholanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Acenaphthene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Acenaphthylene | | 0.28 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Acridine | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Anthracene | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(a)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(a)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(b,j,k)fluoranthene | | 0.03 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(e)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Benzo(ghi)perylene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Chrysene | | 0.02 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Dibenzo(a,i)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Fluoranthene | | 0.11 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Fluorene | | 0.10 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Indeno(1,2,3-cd)pyrene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Naphthalene | | 0.07 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Perylene | | 0.01 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Phenanthrene | | 0.45 ug/Filter | 0.01 | NA-017 | 15-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|-----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| .ICA/PUF/Bonnyville/June 06, 2017 | TE-01 | Air Filter | 06-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|--------|-----------|------|--------|---------------|
| 17060101-002 | Pyrene | | 0.08 | ug/Filter | 0.01 | NA-017 | 15-Jun-17 |
| 17060101-002 | Retene | | 0.12 | ug/Filter | 0.01 | NA-017 | 15-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/PUF/Bonnyville/June 12, 2017 | A13-02 | Air Filter | 12-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060233-002 | 1-Methylnaphthalene | | 0.06 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | 2-Methylnaphthalene | | 0.11 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | 3-Methylcholanthrene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Acenaphthene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Acenaphthylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Acridine | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Anthracene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(a)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(b,j,k)fluoranthene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(e)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Chrysene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Fluoranthene | | 0.09 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Fluorene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Naphthalene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Phenanthrene | | 0.30 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

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 (780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|-----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| LICA/PUF/Bonnyville/June 12, 2017 | A13-02 | Air Filter | 12-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville- AER | | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|--------|-----------|------|--------|---------------|
| 17060233-002 | Pyrene | | 0.09 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-002 | Retene | | 0.04 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/PUF/Bonnyville/June 18, 2017 | TE-05 | Air Filter | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060233-004 | 1-Methylnaphthalene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | 2-Methylnaphthalene | | 0.09 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | 3-Methylcholanthrene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Acenaphthene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Acenaphthylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Acridine | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Anthracene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(a)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(b,j,k)fluoranthene | | 0.04 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(e)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Chrysene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Fluoranthene | | 0.10 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Fluorene | | 0.06 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Indeno(1,2,3-cd)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Naphthalene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Phenanthrene | | 0.42 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | |
|----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| LICA/PUF/Bonnyville/Jun 18, 2017 | TE-05 | Air Filter | 18-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|----------------|------|--------|---------------|
| 17060233-004 | Pyrene | | 0.08 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060233-004 | Retene | | 0.15 ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

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| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/PUF/Bonnyville/June 24, 2017 | P13-01 | Air Filter | 24-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|-----------|------|--------|---------------|
| 17060331-002 | 1-Methylnaphthalene | | 0.09 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | 2-Methylnaphthalene | | 0.17 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | 3-Methylcholanthrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Acenaphthene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Acenaphthylene | | 0.05 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Acridine | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Anthracene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(a)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(a)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(b,j,k)fluoranthene | | 0.03 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(e)pyrene | | 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Chrysene | | 0.02 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Dibenzo(a,i)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Dibenzo(a,l)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Fluoranthene | | 0.08 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Fluorene | | 0.06 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Naphthalene | | 0.09 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Perylene | K, T, U | < 0.01 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Phenanthrene | | 0.42 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, July 31, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|-----------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| .ICA/PUF/Bonnyville/June 24, 2017 | P13-01 | Air Filter | 24-Jun-17 | 0:00 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|--------|-----------|------|--------|---------------|
| 17060331-002 | Pyrene | | 0.07 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |
| 17060331-002 | Retene | | 0.13 | ug/Filter | 0.01 | NA-017 | 01-Jul-17 |

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/PUF/Bonnyville/June 30, 2017 | 9702 | Air Filter | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------------|-----------|--------|--------|------|--------|---------------|
| 17070018-002 | 1-Methylnaphthalene | | 0.09 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | 2-Methylnaphthalene | | 0.20 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | 3-Methylcholanthrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | 7,12-Dimethylbenz(a)anthracene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Acenaphthene | | 0.25 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Acenaphthylene | | 0.11 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Acridine | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Anthracene | | 0.03 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(a)anthracene | | 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(a)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(b,j,k)fluoranthene | | 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(c)phenanthrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(e)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Benzo(ghi)perylene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Chrysene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Dibenzo(a,h)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Dibenzo(a,i)pyrene | | 0.02 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Dibenzo(a,l)pyrene | | 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Dibenzo(ah)anthracene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Fluoranthene | | 0.07 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Fluorene | | 0.09 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Indeno(1,2,3-cd)pyrene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Naphthalene | | 0.08 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Perylene | K, T, U | < 0.01 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Phenanthrene | | 0.31 | ug/PUF | 0.01 | NA-017 | 27-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | |
|-----------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| .ICA/PUF/Bonnyville/June 30, 2017 | 9702 | Air Filter | 30-Jun-17 0:00 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17070018 | REPORT CREATED: | 04-Aug-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|-----------|-----------|--------------|------|--------|---------------|
| 17070018-002 | Pyrene | | 0.06 ug/PUF | 0.01 | NA-017 | 27-Jul-17 |
| 17070018-002 | Retene | | 0.03 ug/PUF | 0.01 | NA-017 | 27-Jul-17 |

Report certified by: Graham Knox, Team Lead

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

Date: Friday, August 04, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

NMHC CANISTER SAMPLES

| | | | | |
|---|--|-----------------------------|---------------------------------|---------------------------|
| RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 | CLIENT SAMPLE ID 1HC VOC/Bonnyville/June 08, 201 | CANISTER ID 14708 | Matrix Ambient Air | Priority Normal |
| | DESCRIPTION: Bonnyville - AER | | | |
| INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5 | DATE SAMPLED: 08-Jun-17 | 20:30 | DATE RECEIVED: 12-Jun-17 | |
| | REPORT CREATED: 22-Jun-17 | | REPORT NUMBER: 17060101 | |
| | | | VERSION: Version 01 | |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-003 | 1,1,1-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,1,2-Trichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,1-Dichloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,1-Dichloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2,3-Trimethylbenzene | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2,4-Trichlorobenzene | K, T, U | < 1.0 | ppbv | 1.0 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2,4-Trimethylbenzene | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2-Dibromoethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2-Dichlorobenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2-Dichloroethane | I | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,3,5-Trimethylbenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,3-Butadiene | I | 0.05 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,3-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,4-Dichlorobenzene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1,4-Dioxane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1-Butene | | 0.13 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|---------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| MHC VOC/Bonnyville/June 08, 201 | 14708 | Ambient Air | 08-Jun-17 20:30 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-003 | 1-Hexene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 1-Pentene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,2,4-Trimethylpentane | | 0.09 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,2-Dimethylbutane | | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,3,4-Trimethylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,3-Dimethylbutane | | 0.06 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,3-Dimethylpentane | | 0.10 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2,4-Dimethylpentane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2-Methylheptane | | 0.02 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2-Methylhexane | | 0.09 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 2-Methylpentane | | 0.17 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | 3-Methylheptane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 3-Methylhexane | | 0.07 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | 3-Methylpentane | | 0.12 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Acetone | | 4.9 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Acrolein | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-003 | Benzene | | 0.29 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Benzyl chloride | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Bromodichloromethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Bromoform | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Bromomethane | I | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Carbon disulfide | I | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Carbon tetrachloride | I | 0.11 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Chlorobenzene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Chloroethane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| MHC VOC/Bonnyville/June 08, 201 | 14708 | Ambient Air | 08-Jun-17 | 20:30 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-003 | Chloroform | I | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Chloromethane | | 0.46 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | cis-1,3-Dichloropropene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | cis-2-Butene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | cis-2-Pentene | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Cyclohexane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Cyclopentane | | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Ethanol | | 3.2 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-003 | Ethyl acetate | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Ethylbenzene | | 0.03 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Freon-11 | I | 0.36 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Freon-113 | I | 0.10 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Freon-114 | I | 0.03 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Freon-12 | | 0.51 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Hexachloro-1,3-butadiene | K, T, U | < 0.62 | ppbv | 0.62 | AC-058 | 20-Jun-17 |
| 17060101-003 | Isobutane | | 0.46 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Isopentane | | 0.81 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-003 | Isoprene | | 1.15 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Isopropyl alcohol | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Isopropylbenzene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | m,p-Xylene | | 0.08 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-003 | m-Diethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | m-Ethyltoluene | K, T, U | < 0.10 | ppbv | 0.10 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

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| | | | |
|---------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| MHC VOC/Bonnyville/June 08, 201 | 14708 | Ambient Air | 08-Jun-17 20:30 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060101-003 | Methyl butyl ketone | K, T, U | < 0.62 | ppbv | 0.62 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methyl ethyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methyl isobutyl ketone | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methyl methacrylate | K, T, U | < 0.09 | ppbv | 0.09 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methyl tert butyl ether | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methylcyclohexane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methylcyclopentane | | 0.11 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Methylene chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Butane | | 1.10 | ppbv | 0.04 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Decane | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Dodecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Heptane | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Hexane | | 0.16 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Octane | K, T, U | < 0.02 | ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Pentane | | 0.4 | ppbv | 0.1 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Propylbenzene | K, T, U | < 0.06 | ppbv | 0.06 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Undecane | K, T, U | < 0.6 | ppbv | 0.6 | AC-058 | 20-Jun-17 |
| 17060101-003 | Naphthalene | K, T, U | < 0.6 | ppbv | 0.6 | AC-058 | 20-Jun-17 |
| 17060101-003 | n-Nonane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | o-Ethyltoluene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | o-Xylene | | 0.04 | ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | p-Diethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | p-Ethyltoluene | K, T, U | < 0.09 | ppbv | 0.09 | AC-058 | 20-Jun-17 |
| 17060101-003 | Styrene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | Tetrachloroethylene | | 0.55 | ppbv | 0.05 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|---------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| MHC VOC/Bonnyville/June 08, 201 | 14708 | Ambient Air | 08-Jun-17 20:30 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060101 | REPORT CREATED: | 22-Jun-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------------|------|--------|---------------|
| 17060101-003 | Tetrahydrofuran | K, T, U | < 0.5 ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Toluene | | 0.17 ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | trans-1,3-Dichloropropylene | K, T, U | < 0.05 ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | trans-2-Butene | K, T, U | < 0.01 ppbv | 0.01 | AC-058 | 20-Jun-17 |
| 17060101-003 | trans-2-Pentene | | 0.04 ppbv | 0.02 | AC-058 | 20-Jun-17 |
| 17060101-003 | Trichloroethylene | I | 0.12 ppbv | 0.05 | AC-058 | 20-Jun-17 |
| 17060101-003 | Vinyl acetate | K, T, U | < 0.5 ppbv | 0.5 | AC-058 | 20-Jun-17 |
| 17060101-003 | Vinyl chloride | K, T, U | < 0.02 ppbv | 0.02 | AC-058 | 20-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, June 22, 2017

Inquiries: (780) 632 8455

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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|---|--|-----------------------------|---------------------------------|---------------------------|
| RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 | CLIENT SAMPLE ID /NMHC VOC/Bonnyville/June 09, 2 | CANISTER ID 14997 | Matrix Ambient Air | Priority Normal |
| | DESCRIPTION: Bonnyville- AER | | | |
| INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5 | DATE SAMPLED: 09-Jun-17 | 21:20 | DATE RECEIVED: 21-Jun-17 | |
| | REPORT CREATED: 31-Jul-17 | | REPORT NUMBER: 17060233 | |
| | | | VERSION: Version 01 | |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-005 | 1,1,1-Trichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,1,2-Trichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,1-Dichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,1-Dichloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2,3-Trimethylbenzene | I | 0.13 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2,4-Trichlorobenzene | K, T, U | < 1.0 | ppbv | 1.0 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2,4-Trimethylbenzene | | 0.42 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2-Dibromoethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2-Dichlorobenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2-Dichloroethane | I | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,3,5-Trimethylbenzene | | 0.18 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,3-Butadiene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,3-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,4-Dichlorobenzene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1,4-Dioxane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1-Butene | | 0.08 | ppbv | 0.03 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| √NMHC VOC/Bonnyville/June 09, 2 | 14997 | Ambient Air | 09-Jun-17 | 21:20 |
| DESCRIPTION: | Bonnyville- AER | | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-005 | 1-Hexene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 1-Pentene | | 0.14 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,2,4-Trimethylpentane | | 0.10 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,2-Dimethylbutane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,3,4-Trimethylpentane | | 0.03 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,3-Dimethylbutane | | 0.14 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,3-Dimethylpentane | | 0.11 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2,4-Dimethylpentane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2-Methylheptane | | 0.06 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2-Methylhexane | | 0.19 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 2-Methylpentane | | 0.53 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | 3-Methylheptane | | 0.04 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 3-Methylhexane | | 0.14 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | 3-Methylpentane | | 0.30 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Acetone | | 5.3 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Acrolein | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-005 | Benzene | | 3.96 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Benzyl chloride | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Bromodichloromethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Bromoform | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Carbon disulfide | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Carbon tetrachloride | I | 0.09 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Chlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Chloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |

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| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| √NMHC VOC/Bonnyville/June 09, 2 | 14997 | Ambient Air | 09-Jun-17 | 21:20 |
| DESCRIPTION: | Bonnyville- AER | | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-005 | Chloroform | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Chloromethane | | 0.41 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | cis-1,3-Dichloropropene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | cis-2-Butene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | cis-2-Pentene | | 0.09 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Cyclohexane | | 0.12 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Cyclopentane | | 0.13 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Ethanol | | 3.0 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-005 | Ethyl acetate | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Ethylbenzene | | 0.33 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Freon-11 | I | 0.32 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Freon-113 | I | 0.07 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Freon-114 | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Freon-12 | | 0.44 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Hexachloro-1,3-butadiene | K, T, U | < 0.64 | ppbv | 0.64 | AC-058 | 23-Jun-17 |
| 17060233-005 | Isobutane | | 1.08 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Isopentane | | 4.45 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-005 | Isoprene | | 0.05 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Isopropyl alcohol | | 4.6 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Isopropylbenzene | | 0.05 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | m,p-Xylene | | 2.22 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-005 | m-Diethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | m-Ethyltoluene | I | 0.17 | ppbv | 0.10 | AC-058 | 23-Jun-17 |

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| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| √NMHC VOC/Bonnyville/June 09, 2 | 14997 | Ambient Air | 09-Jun-17 | 21:20 |
| DESCRIPTION: | Bonnyville- AER | | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-005 | Methyl butyl ketone | K, T, U | < 0.64 | ppbv | 0.64 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methyl ethyl ketone | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methyl isobutyl ketone | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methyl methacrylate | K, T, U | < 0.09 | ppbv | 0.09 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methyl tert butyl ether | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methylcyclohexane | | 0.20 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methylcyclopentane | | 0.25 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Methylene chloride | | 0.5 | ppbv | 0.4 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Butane | | 18.1 | ppbv | 0.11 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Decane | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Dodecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Heptane | | 0.49 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Hexane | | 1.56 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Octane | | 0.17 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Pentane | | 6.3 | ppbv | 0.1 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Propylbenzene | | 0.09 | ppbv | 0.06 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Undecane | K, T, U | < 0.6 | ppbv | 0.6 | AC-058 | 23-Jun-17 |
| 17060233-005 | Naphthalene | K, T, U | < 0.6 | ppbv | 0.6 | AC-058 | 23-Jun-17 |
| 17060233-005 | n-Nonane | | 0.09 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | o-Ethyltoluene | I | 0.07 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | o-Xylene | | 0.49 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | p-Diethylbenzene | I | 0.07 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | p-Ethyltoluene | I | 0.12 | ppbv | 0.09 | AC-058 | 23-Jun-17 |
| 17060233-005 | Styrene | I | 0.06 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | Tetrachloroethylene | I | 0.12 | ppbv | 0.05 | AC-058 | 23-Jun-17 |

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| | | | |
|---------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| √NMHC VOC/Bonnyville/June 09, 2 | 14997 | Ambient Air | 09-Jun-17 21:20 |
| DESCRIPTION: | Bonnyville- AER | | |
| REPORT NUMBER: | 17060233 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060233-005 | Tetrahydrofuran | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Toluene | | 7.59 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | trans-1,3-Dichloropropylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | trans-2-Butene | | 0.01 | ppbv | 0.01 | AC-058 | 23-Jun-17 |
| 17060233-005 | trans-2-Pentene | | 0.14 | ppbv | 0.03 | AC-058 | 23-Jun-17 |
| 17060233-005 | Trichloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 23-Jun-17 |
| 17060233-005 | Vinyl acetate | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 23-Jun-17 |
| 17060233-005 | Vinyl chloride | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 23-Jun-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|---|---|-----------------------------|---------------------------------|---------------------------|
| RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 | CLIENT SAMPLE ID NMHC VOC/Bonnyville/June 26, | CANISTER ID S5590 | Matrix Ambient Air | Priority Normal |
| | DESCRIPTION: Bonnyville - AER | | | |
| INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5 | DATE SAMPLED: 26-Jun-17 | 15:40 | DATE RECEIVED: 28-Jun-17 | |
| | REPORT CREATED: 31-Jul-17 | | REPORT NUMBER: 17060331 | |
| | | | VERSION: Version 01 | |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|---------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-003 | 1,1,1-Trichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,1,2,2-Tetrachloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,1,2-Trichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,1-Dichloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,1-Dichloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2,3-Trimethylbenzene | | 0.42 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2,4-Trichlorobenzene | K, T, U | < 1.0 | ppbv | 1.0 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2,4-Trimethylbenzene | | 0.19 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2-Dibromoethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2-Dichlorobenzene | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2-Dichloroethane | I | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,2-Dichloropropane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,3,5-Trimethylbenzene | | 0.07 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,3-Butadiene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,3-Dichlorobenzene | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,4-Dichlorobenzene | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1,4-Dioxane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1-Butene | | 0.49 | ppbv | 0.03 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

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| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| /NMHC VOC/Bonnyville/June 26, 2 | S5590 | Ambient Air | 26-Jun-17 | 15:40 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-003 | 1-Hexene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 1-Pentene | | 0.11 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,2,4-Trimethylpentane | | 1.50 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,2-Dimethylbutane | | 0.03 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,3,4-Trimethylpentane | | 0.33 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,3-Dimethylbutane | | 0.19 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,3-Dimethylpentane | | 0.89 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2,4-Dimethylpentane | | 0.30 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2-Methylheptane | | 0.08 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2-Methylhexane | | 0.26 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 2-Methylpentane | | 0.43 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | 3-Methylheptane | | 0.06 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 3-Methylhexane | | 0.23 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | 3-Methylpentane | | 0.33 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Acetone | | 6.7 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Acrolein | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-003 | Benzene | | 0.33 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Benzyl chloride | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Bromodichloromethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Bromoform | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Bromomethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Carbon disulfide | | 1.44 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Carbon tetrachloride | I | 0.10 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Chlorobenzene | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Chloroethane | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |

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|-----------------------------|--------------------------------------|----------------------|--|
| Report certified by: | Rebecca Holgate, Account Coordinator | On behalf of: | PJ Pretorius, Manager, Analysis and Testing Services |
| Date: | Monday, July 31, 2017 | Inquiries: | (780) 632 8455 |
| | | E-mail: | EAS.Results@innotechalberta.ca |

| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| /NMHC VOC/Bonnyville/June 26, 2 | S5590 | Ambient Air | 26-Jun-17 | 15:40 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|--------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-003 | Chloroform | I | 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Chloromethane | | 0.54 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | cis-1,2-Dichloroethene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | cis-1,3-Dichloropropene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | cis-2-Butene | | 0.05 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | cis-2-Pentene | | 0.05 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Cyclohexane | | 0.07 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Cyclopentane | | 0.04 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Dibromochloromethane | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Ethanol | | 6.3 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-003 | Ethyl acetate | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Ethylbenzene | | 0.16 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Freon-11 | I | 0.29 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Freon-113 | I | 0.11 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Freon-114 | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Freon-12 | | 0.62 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Hexachloro-1,3-butadiene | K, T, U | < 0.66 | ppbv | 0.66 | AC-058 | 07-Jul-17 |
| 17060331-003 | Isobutane | | 0.35 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Isopentane | | 1.26 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-003 | Isoprene | | 0.56 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Isopropyl alcohol | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Isopropylbenzene | | 0.02 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | m,p-Xylene | | 0.55 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-003 | m-Diethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | m-Ethyltoluene | I | 0.13 | ppbv | 0.10 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

| | | | |
|---------------------------------|--------------------|------------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED |
| /NMHC VOC/Bonnyville/June 26, 2 | S5590 | Ambient Air | 26-Jun-17 15:40 |
| DESCRIPTION: | Bonnyville - AER | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 |
| | | | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-003 | Methyl butyl ketone | K, T, U | < 0.66 | ppbv | 0.66 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methyl ethyl ketone | | 0.6 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methyl isobutyl ketone | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methyl methacrylate | K, T, U | < 0.09 | ppbv | 0.09 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methyl tert butyl ether | K, T, U | < 0.04 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methylcyclohexane | | 0.16 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methylcyclopentane | | 0.26 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Methylene chloride | K, T, U | < 0.4 | ppbv | 0.4 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Butane | | 1.10 | ppbv | 0.04 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Decane | K, T, U | < 0.08 | ppbv | 0.08 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Dodecane | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Heptane | | 0.21 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Hexane | | 0.61 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Octane | | 0.08 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Pentane | | 0.4 | ppbv | 0.1 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Propylbenzene | K, T, U | < 0.07 | ppbv | 0.07 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Undecane | K, T, U | < 0.7 | ppbv | 0.7 | AC-058 | 07-Jul-17 |
| 17060331-003 | Naphthalene | K, T, U | < 0.7 | ppbv | 0.7 | AC-058 | 07-Jul-17 |
| 17060331-003 | n-Nonane | | 0.03 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | o-Ethyltoluene | I | 0.07 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | o-Xylene | | 0.43 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | p-Diethylbenzene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | p-Ethyltoluene | K, T, U | < 0.09 | ppbv | 0.09 | AC-058 | 07-Jul-17 |
| 17060331-003 | Styrene | I | 0.14 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | Tetrachloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |

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Date: Monday, July 31, 2017

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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

| | | | | |
|---------------------------------|--------------------|------------------------|---------------------|----------------------------|
| CLIENT SAMPLE ID | CANISTER ID | Matrix | DATE SAMPLED | |
| /NMHC VOC/Bonnyville/June 26, 2 | S5590 | Ambient Air | 26-Jun-17 | 15:40 |
| DESCRIPTION: | Bonnyville - AER | | | |
| REPORT NUMBER: | 17060331 | REPORT CREATED: | 31-Jul-17 | VERSION: Version 01 |

| Lab ID | Parameter | Qualifier | Result | Units | RDL | Method | Analysis Date |
|--------------|-----------------------------|-----------|--------|-------|------|--------|---------------|
| 17060331-003 | Tetrahydrofuran | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Toluene | | 0.75 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | trans-1,2-Dichloroethylene | K, T, U | < 0.01 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | trans-1,3-Dichloropropylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | trans-2-Butene | | 0.09 | ppbv | 0.01 | AC-058 | 07-Jul-17 |
| 17060331-003 | trans-2-Pentene | | 0.10 | ppbv | 0.03 | AC-058 | 07-Jul-17 |
| 17060331-003 | Trichloroethylene | K, T, U | < 0.05 | ppbv | 0.05 | AC-058 | 07-Jul-17 |
| 17060331-003 | Vinyl acetate | K, T, U | < 0.5 | ppbv | 0.5 | AC-058 | 07-Jul-17 |
| 17060331-003 | Vinyl chloride | K, T, U | < 0.03 | ppbv | 0.03 | AC-058 | 07-Jul-17 |

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, July 31, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

APPENDIX V
INTERNAL AUDIT RESULTS

COMPANY: LICA STATION: Bonnyville DATE: June 5, 2017

Station Location: X,Y Coordinates: 54.266,-110.744
 Elevation (m): 552
 Declination: 13°

| GENERAL | Yes | No | n/a | Comments: |
|--|-----|----|-----|--|
| Has site location changed from previous audit? | X | | | |
| Is site secure? | X | | | |
| Are station operating conditions adequate? | X | | | |
| Is the AC & heat working properly? | | X | | Using portable ac |
| Last twelve month's of calibrations available? | X | | | |
| All applicable SOP's available in station? | | X | | |
| Site documentation up to date? | | | X | working with Mike to verify and update |

| STATION COMPONENTS | Yes | No | n/a | Comments: |
|--|-----------------------------|-----|-----|---|
| Are spare manifold ports capped? | X | | | |
| Is sampling manifold clean and free of chips and cracks? | X | | | |
| Is manifold pump properly installed and operative? | X | | | |
| Manifold cleaned all the way through? | X | | | |
| Manifold measured velocity / units | anemometer doesn't fit port | | | |
| Hot wire anemometer ID# | anemometer doesn't fit port | | | |
| Do sample lines extend halfway into manifold? | X | | | |
| Are monitor sampling lines connected to manifold? | X | | | |
| Are sampling lines clean? | X | | | |
| Are monitors properly mounted and secure? | X | | | |
| Are monitors properly exhausted from room or scrubbed (NOx pump inlet scrubbed and dated)? | X | | | TEOM 1400A installed temporarily - it's on the floor. |
| Are zero and span systems operational? | X | | | |
| Modifications to any equipment? | | X | | |
| Black tape on anything? | | X | | |
| All scrubbers have dates? | X | | | yes, some are on internal scrubbers. |
| TEOM flow control set to active? | X | | | active |
| All TEOM particulate intakes clean? | X | | | |
| Sharp tape advancement set to 8 hours? | X | | | |
| Modifications to any equipment? | | X | | |
| All pumps fastened down? | | X | | Loose on cabinet floor, but okay. |
| Noisy pumps or zero air generator? | | X | | |
| TRS/H2S converter, single scrubber, no brass, no mods? | X | | | |
| Precip screen in/out? | | out | | |

| Meteorological | Yes | No | n/a | Comments: |
|-----------------------|-----|-----------------|-----|----------------|
| Head Type | | rm young 5103vk | | |
| Calibration date okay | X | | | March 23, 2017 |

| | Indicated Value: | Audit Value: | % Difference | Scalar Difference: |
|-----------------------------------|------------------|--------------|--------------|--------------------|
| Station Temperature °C | n/a | 19.7 | n/a | n/a |
| Barometric Pressure | n/a | 948 mb | n/a | n/a |
| Wind Speed (kph) | 16.8 | n/a | n/a | n/a |
| Wind Direction (Deg) | 337 | n/a | n/a | n/a |
| Relative Humidity % | n/a | n/a | n/a | n/a |
| Ambient Temperature °C | n/a | n/a | n/a | n/a |
| Solar Radiation kW/m ² | n/a | n/a | n/a | n/a |
| Precipitation (Tipping Bucket mm) | n/a | n/a | n/a | n/a |

Recommendations: Generally good condition, Alex has a brush to properly clean the manifold straight through. No odd fittings, black tape or modifications. NMHC purifiers are almost due to be changed. Asked Alex to order 2 more from Trina. Station needs a thorough cleaning. Xonteck quarterly audits done. Alex told to back off to 1 TEOM audit/month, talk to Shawn about this.

AUDITOR: Tom Bourque



API 100ESulphur Dioxide Analyzer Calibration

| | | |
|-----------------------------------|--|------------------|
| Date: June 5, 2017 | Barometer ID #/Last Cert. Date/B.P.: Fisher Scientific 10528, January 5, 2017 | 948 millibars |
| Company/Airshed: LICA | Thermometer ID #/Last Cert. Date/Temp: Fisher Scientific 10528, February 8, 2016 | 20.2 C |
| Location/Station Name: Bonnyville | Weather Conditions: Cloudy/Overcast | |
| Parameter: Sulphur Dioxide | Calibration Purpose: Internal Audit | |
| Start Time 24 hr. (mst): 12:11 | Performed By/Reviewer: Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): 14:04 | Cal Gas Expiry Date: December 2, 2019 | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): | n/a |

| | |
|-------------------------------------|----------------------|
| Analyzer: | |
| ID# or Serial Number: 467 | Range ppb: 1000 |
| Last Calibration Date: June 1, 2017 | As Found C.F.: 1.021 |
| Previous C.F.: 1.000 | New C.F.: n/a |

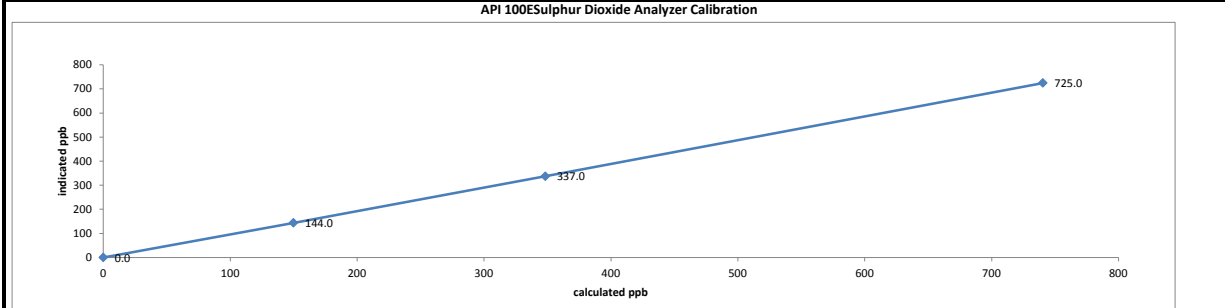
| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.1 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|--|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

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 | 5000 | 75.00 | 5075 | 740.4 | 725.0 | 1.021 |
| mid | 4998 | 35.00 | 5033 | 348.4 | 337.0 | 1.034 |
| low | 4998 | 15.00 | 5013 | 149.9 | 144.0 | 1.041 |
| Average C.F.= | | | | | | 1.032 |

Linear Regression/Calibration Results:

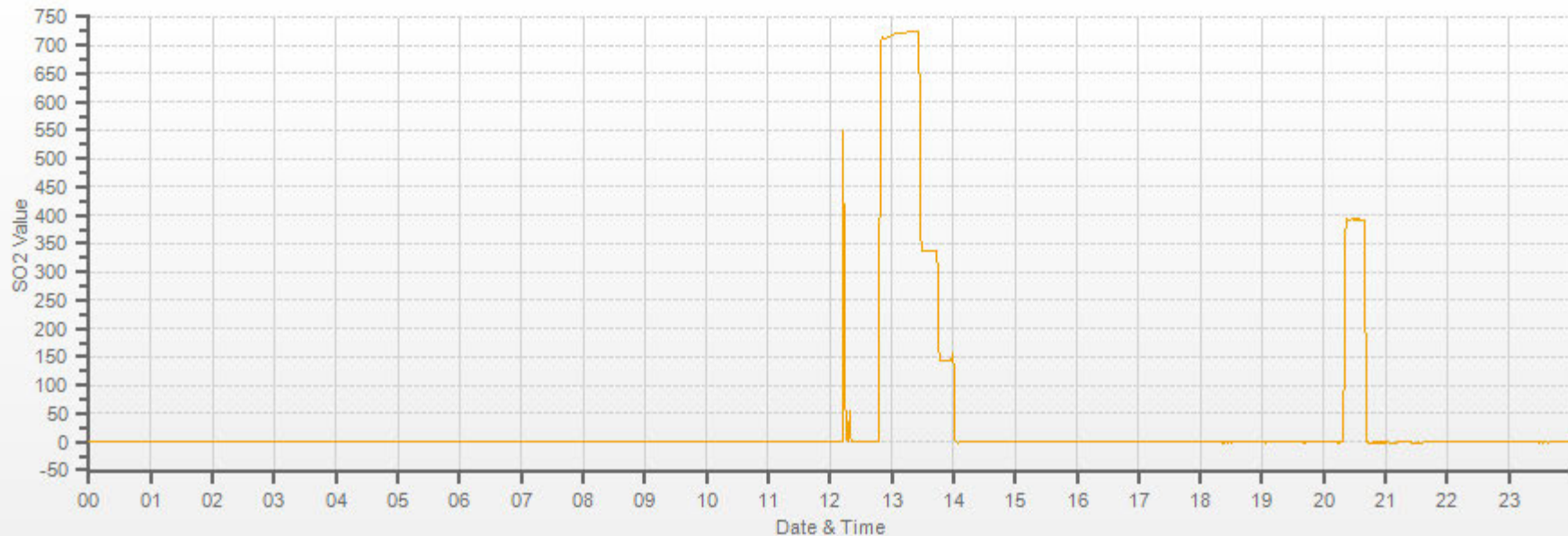
| | |
|--|---------------------|
| Correlation Coefficient = 1.000 | LIMITS > or = 0.995 |
| Slope = 1.020 | 0.90-1.10 |
| b (Intercept as % of full scale) = 0.21% | ± 3% F.S. |
| % change in C.F. from last cal = -2.12% | ± 10% |



| | |
|---|--|
| As found: Slope: 1.048 Offset: 120.2 Hvps: 488 Rcell Temp: 50.0 Box Temp: 31.7 Pmt Temp: 8.1 Izs Temp: 50.0 Pres: 25.3 Samp Fl: 588 Norm Pmt: 1501.7 Uv Lamp: 3820 Lamp Ratio: 88.2 Str Lgt: 63.0 Drk Pmt: 16.7 Drk Lmp: 2.9 Expected Value: 404.0 | As left: Slope: 1.048 Offset: 120.2 Hvps: 488 Rcell Temp: 50.0 Box Temp: 31.7 Pmt Temp: 8.1 Izs Temp: 50.0 Pres: 25.3 Samp Fl: 588 Norm Pmt: 1501.7 Uv Lamp: 3820 Lamp Ratio: 88.2 Str Lgt: 63.0 Drk Pmt: 16.7 Drk Lmp: 2.9 Expected Value: 404.0 |
|---|--|

Comments:

SO2[ppb] Station: LICA Bonnyville Daily: 17.06.05 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

| | | | | |
|--------------------------|-------------------|--|---|------------------|
| Date: | June 5, 2017 | Barometer ID #/Last Cert. Date/B.P.: | Fisher Scientific 10528, January 5, 2017 | 948 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 20.2 C |
| Location/Station Name: | Bonnyville | Weather Conditions: | Cloudy/Overcast | |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | Internal Audit | |
| Start Time 24 hr. (mst): | 13:30 | Performed By/Reviewer: | Tom Bourque | Not yet reviewed |
| End Time 24 hr. (mst): | 14:49 | Cal Gas Expiry Date: | July 15, 2017 | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | |

| | | | | |
|------------------------|--------------|----------------|-------|--|
| Analyzer: | | | | |
| ID# or Serial Number: | 510 | Range ppb: | 100 | |
| Last Calibration Date: | June 1, 2017 | As Found C.F.: | 1.015 | |
| Previous C.F.: | 1.000 | New C.F.: | n/a | |

| | | | | |
|--------------------------------|--|---|------------|-------------|
| Calibration Standards: | | Standard Calibration Points for Ranges | | |
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 | Point | ppb | 12:37-12:42 |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 | High | 78 | 1000 |
| Calibrator ID/Cert. Date: | API 700 831, February 14, 2017 | Mid | 38 | 780 |
| Cal Gas Cylinder I.D. #: | LL74267 | Low | 19 | -0.2 |
| Cal Gas Conc. (ppm): | 9.9 | | | 0.0 |
| | | | | 0.2 |

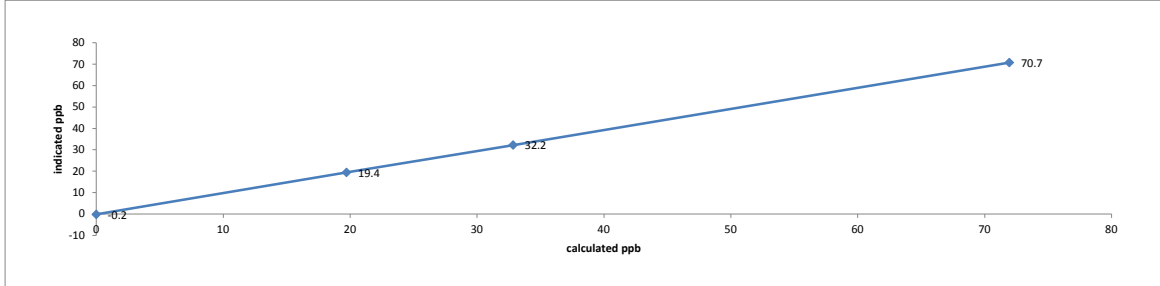
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration: | Indicated Concentration: | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------|--------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | (ppb) | (ppb) | |
| as found zero | 5000 | 0.00 | 5000 | 0.0 | -0.2 | n/a |
| as found high | 7497 | 55.00 | 7552 | 72.0 | 70.7 | 1.015 |
| mid | 7494 | 25.00 | 7519 | 32.9 | 32.2 | 1.014 |
| low | 7499 | 15.00 | 7514 | 19.7 | 19.4 | 1.006 |
| Average C.F.= | | | | | | 1.012 |

Linear Regression/Calibration Results:

| | | | |
|-----------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.016 | | 0.90-1.10 |
| b (Intercept as % of full scale)= | 0.13% | | ± 3% F.S. |
| % change in C.F. from last cal= | -1.49% | | ± 10% |

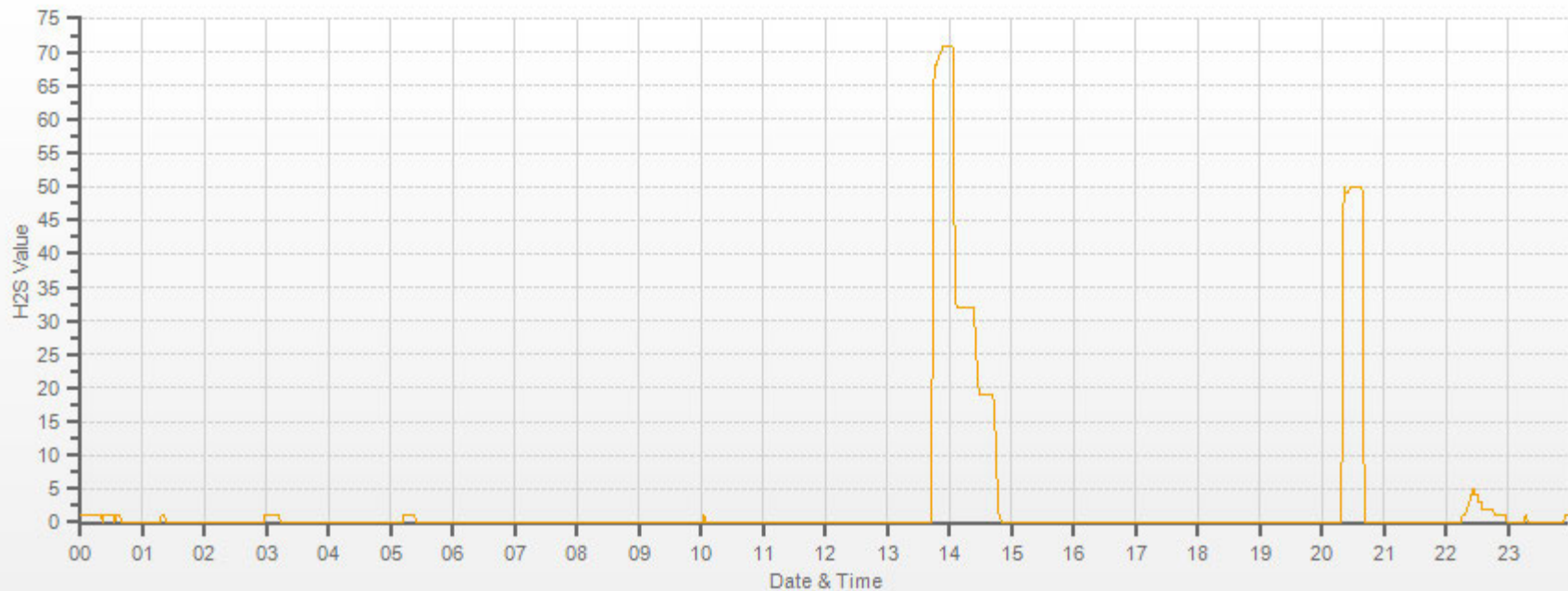
API 101E Hydrogen Sulphide Analyzer Calibration



| | |
|--|---|
| <p style="text-align: center;">As found:</p> <p>Slope: 1.052</p> <p>Offset: 30.6</p> <p>Hvps: 530</p> <p>Rcell Temp: 50.0</p> <p>Box Temp: 33.6</p> <p>Pmt Temp: 8.4</p> <p>Izs Temp: 45.0</p> <p>Converter Temp: 314.9</p> <p>Pres: 20.7</p> <p>Samp Fl: 537</p> <p>Uv Lamp: 3234</p> <p>Lamp Ratio: 96.3</p> <p>Str Lgt: 16.1</p> <p>Drk Pmt: 34.4</p> <p>Drk Lmp: -1.8</p> <p>Expected Value: 50.5</p> | <p style="text-align: center;">As left:</p> <p>Slope: 1.052</p> <p>Offset: 30.6</p> <p>Hvps: 530</p> <p>Rcell Temp: 50.0</p> <p>Box Temp: 33.6</p> <p>Pmt Temp: 8.4</p> <p>Izs Temp: 45.0</p> <p>Converter Temp: 314.9</p> <p>Pres: 20.7</p> <p>Samp Fl: 537</p> <p>Uv Lamp: 3234</p> <p>Lamp Ratio: 96.3</p> <p>Str Lgt: 16.1</p> <p>Drk Pmt: 34.4</p> <p>Drk Lmp: -1.8</p> <p>Expected Value: 50.5</p> |
|--|---|

Comments:

H2S[ppb] Station: LICA Bonnyville Daily: 17.06.05 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | | |
|------------------------------|------------------------------|--|---|------------------|
| Date: | June 5, 2017 | Barometer ID #/Last Cert. Date/B.P.: | Fisher Scientific 10528, January 5, 2017 | 948 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 20.2 C |
| Location/Station Name: | Bonnyville | Weather Conditions: | Cloudy/Overcast | |
| Parameter: | CH ₄ / NMHC / THC | Calibration Purpose: | Internal Audit | |
| Start/End Time 24 hr. (mst): | 14:44-16:34 | Performed By/Reviewer: | Tom Bourque | not yet reviewed |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | November 25, 2023 | |

| Analyzer: ID# or Serial Number: 1236656107 Measured Flow: _____ Last Calibration Date: June 2, 2017 Range ppm: 20 CH ₄ /20 NMHC/40 THC | Correction Factors: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.000</td> <td>1.018</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>1.013</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>1.014</td> <td>n/a</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | CH ₄ = | 1.000 | 1.018 | n/a | NMHC = | 1.000 | 1.013 | n/a | THC = | 1.000 | 1.014 | n/a |
|--|---|----------------|----------------|----------------|-----------|-------------------|-------|-------|-----|--------|-------|-------|-----|-------|-------|-------|-----|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| CH ₄ = | 1.000 | 1.018 | n/a | | | | | | | | | | | | | | |
| NMHC = | 1.000 | 1.013 | n/a | | | | | | | | | | | | | | |
| THC = | 1.000 | 1.014 | n/a | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 831, February 14, 2017 Cal Gas Cylinder I.D. #: LL165372 CH ₄ Cylinder Conc.: 606.0 212.0 = C ₂ H ₆ Cylinder Conc. CH ₄ as C ₂ H ₆ : 583.0 1189.0 = total CH ₄ equivalent | Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table> | Point | CH ₄ | NMHC | THC | High | 13.00 | 13.00 | 26.00 | Mid | 7.00 | 7.00 | 14.00 | Low | 3.00 | 3.00 | 6.00 |
|--|---|-------|-----------------|------|-----|------|-------|-------|-------|-----|------|------|-------|-----|------|------|------|
| Point | CH ₄ | NMHC | THC | | | | | | | | | | | | | | |
| High | 13.00 | 13.00 | 26.00 | | | | | | | | | | | | | | |
| Mid | 7.00 | 7.00 | 14.00 | | | | | | | | | | | | | | |
| Low | 3.00 | 3.00 | 6.00 | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | | | | | | | Correction Factors: | | |
|--------------------------------|---------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| Point | Diluent | Cal Gas | Total Flow | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | 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 | 13.38 | 12.94 | 26.36 | 1.018 | 1.013 | 1.014 |
| mid | 1999 | 23.00 | 2022 | 6.89 | 6.63 | 13.52 | 6.80 | 6.61 | 13.39 | 1.014 | 1.003 | 1.010 |
| low | 2000 | 11.00 | 2011 | 3.31 | 3.19 | 6.50 | 3.29 | 3.23 | 6.50 | 1.008 | 0.987 | 1.001 |
| Average C.F. = | | | | | | | | | | 1.013 | 1.001 | 1.008 |

Linear Regression/Calibration Results:

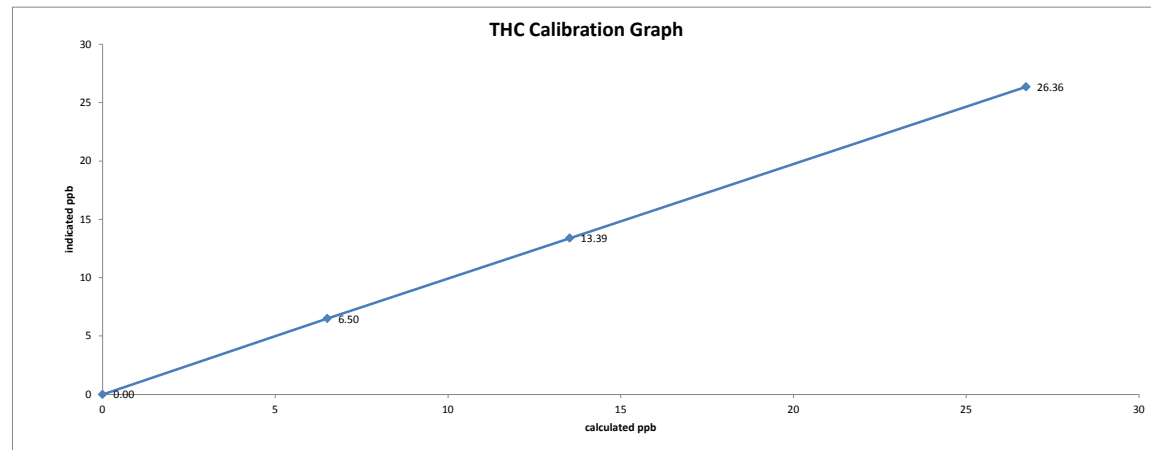
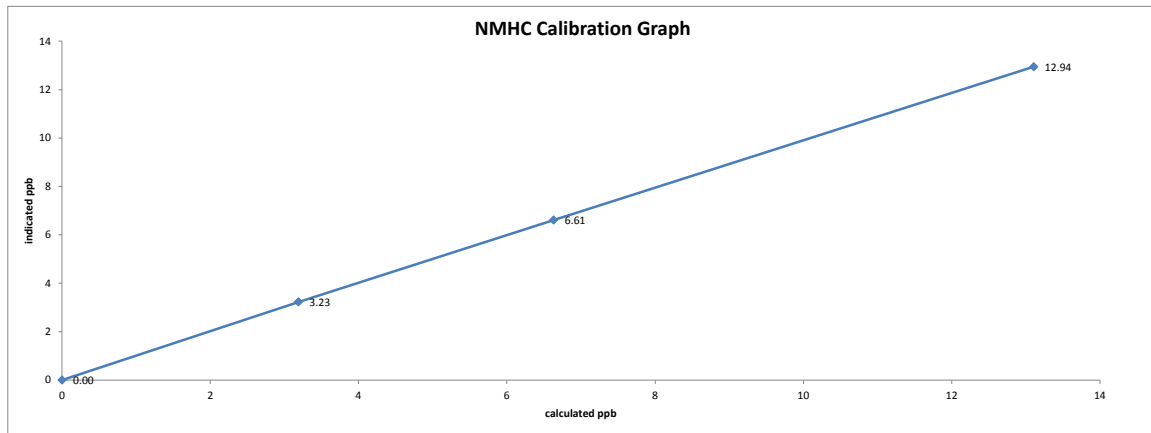
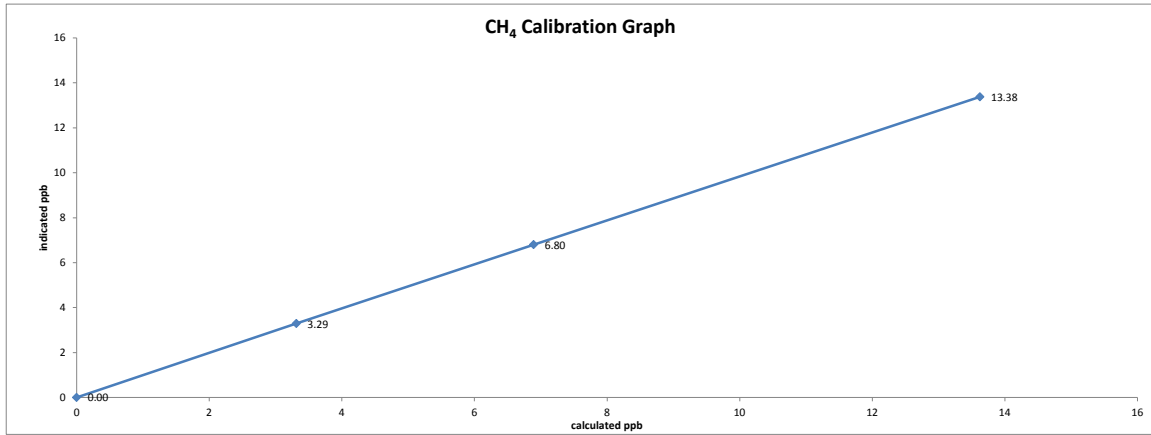
| | CH ₄ | NMHC | THC | LIMITS |
|------------------------------------|-----------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.981 | 0.986 | 0.985 | 0.90-1.10 |
| b (Intercept as % of full scale) = | 0.10% | 0.23% | 0.11% | ± 3% F.S. |
| % change in C.F. from last cal = | -1.83% | -1.29% | -1.41% | ± 10% |

| | | |
|--|--|--|
| Interface Board Voltages: Bias Supply: -293.1 Temperatures: Detector Oven: 175.1 Filter: 175.0 Column Oven: 75.2 Internal: 34.2 Cylinder Pressures/reg.: Carrier: 2500 50 Fuel: 2000 50 Span Gas: 1200 22 Zero Air Generator: 55 Internal Pressures: Carrier: 31.1 Fuel: 40.3 Air: 32.0 FID Status: Status: LIT Counts: 28970 Flame: 372.6 Det Base: 175.0 Flame and Power Stats: Last Power On: Aug 3, 2016 Flameouts: 3 Det Oven at Start: 169.0 Col Oven at Start: 74.5 Calibration History: Time: June 02, 2017 16:56 Type: SPAN Status: GOOD Check/Adjust: ADJUST CH ₄ Span Conc: 13.62 CH ₄ SP Ratio: 0.000766 CH ₄ RT: 13.4 CH ₄ PK IDX: 27 CH ₄ PK HT: 17792 NM Span Conc: 13.11 NM SP Ratio: 0.000152 | Calibration History cnt'd: Crucial Settings: Run History>1: Expected Values: | As left: NM Peak Area: 86378 Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Date: June 05, 2017, 16:32 Time: 16:32 CH ₄ PK HT: 26.27 CH ₄ RT: 13.2 CH ₄ Baseline: 2554 CH ₄ LOD: 58 CH ₄ SD: 19 CH ₄ CONC: 2.01 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2499 NM Base End: 2523 NM LOD: 8 NM Start IDX: 8 NM End IDX: 64 NM Max Slope: 1.9e+00 NM Min Slope: -8.9e-01 NM PT Count: 0 Previous CH ₄ : 10.32 Previous NMHC: 11.07 Previous THC: 21.5 New CH ₄ : 10.32 New NMHC: 11.07 New THC: 21.50 |
|--|--|--|

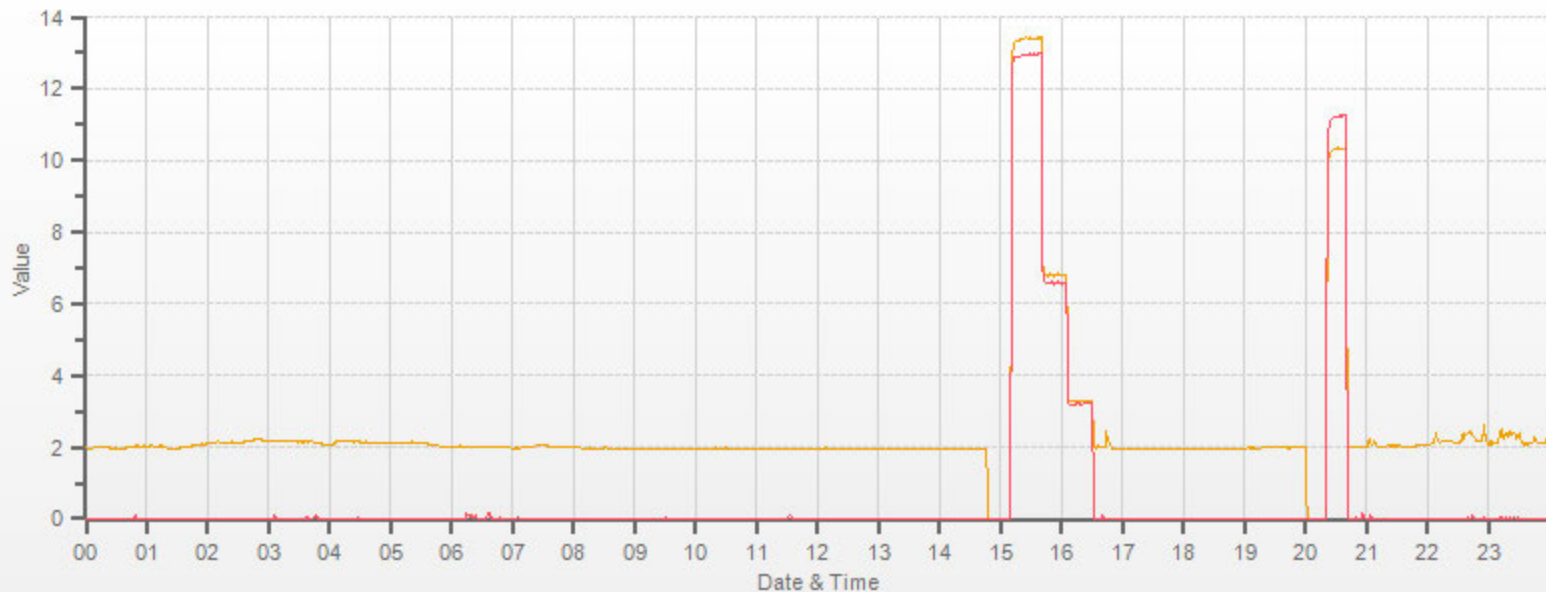
Comments:

Date: June 5, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville

Start/End Time 24 hr. (mst): 14:44-16:34
Calibration Purpose: shut down
Calibration Method: Gas Dilution



Station: LICA Bonnyville Daily: 17.06.05 Type: AVG 1 Min. [1 Min.]



— CH4[ppm] — NMHC[ppm]



API 200E NO-NO2-NOx Analyzer Calibration

| | | | | |
|------------------------------|------------------------------------|--|---|------------------|
| Date: | June 5, 2017 | Barometer ID #/Last Cert. Date/B.P.: | Fisher Scientific 10528, January 5, 2017 | 948 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 20.2 C |
| Location/Station Name: | Bonnyville | Weather Conditions: | Cloudy/Overcast | |
| Start/End Time 24 hr. (mst): | 12:11-16:06 | Calibration Purpose: | Internal Audit | |
| G.P.T. to be used for Ozone? | Yes with 1000 ppb NOx full scale | Performed By/Reviewer: | Tom Bourque | not yet reviewed |
| Calibration Method: | Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: | December 2, 2019 | |

| Analyzer: ID# or Serial Number: 593 Last Calibration Date: June 1, 2017 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.005</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.013</td> <td>n/a</td> </tr> <tr> <td>NO_x =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 1.005 | n/a | NO ₂ = | 1.000 | 1.013 | n/a | NO _x = | 1.000 | 1.000 | n/a |
|---|---|----------------|----------------|----------------|-----------|------|-------|-------|-----|-------------------|-------|-------|-----|-------------------|-------|-------|-----|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 1.005 | n/a | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.013 | n/a | | | | | | | | | | | | | | |
| NO _x = | 1.000 | 1.000 | n/a | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: Sabio 2010 42531101, February 14, 2017 Cal Gas Cylinder I.D. #: LL119329 Cal Gas Conc. (ppm): 50.3 50.3 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>610</td> <td>375</td> <td><-high ozone</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>190</td> <td><-mid ozone</td> </tr> <tr> <td>Low</td> <td>190</td> <td>70</td> <td><-low ozone</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 610 | 375 | <-high ozone | Mid | 380 | 190 | <-mid ozone | Low | 190 | 70 | <-low ozone | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|---|------------------------------|-----------------|------------------------------|------------|------|-----|-----|--------------|-----|-----|-----|-------------|-----|-----|----|-------------|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 610 | 375 | <-high ozone | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 190 | <-mid ozone | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 70 | <-low ozone | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Point | Diluent | Cal Gas | Total Flow | Calculated NO (ppb) | Calculated NO _x (ppb) | Indicated NO (ppb) | Indicated NO _x (ppb) | NO C.F. | NO _x C.F. |
|----------------------|---------|---------|------------|---------------------|----------------------------------|--------------------|---------------------------------|---------|----------------------|
| as found zero | 5000 | 0.0 | 5000 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 5000 | 75.00 | 5075 | 743.3 | 743.3 | 740.0 | 743.0 | 1.005 | 1.000 |
| mid | 4998 | 35.00 | 5033 | 349.8 | 349.8 | 345.0 | 346.0 | 1.014 | 1.011 |
| low | 4998 | 15.00 | 5013 | 150.5 | 150.5 | 149.0 | 148.0 | 1.010 | 1.017 |
| Average C.F.= | | | | | | | | 1.010 | 1.009 |

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

| Point | Diluent | Cal Gas | Total Flow | Calibrator Setting (volts or ppb) | Indicated NO (ppb) | Indicated NO _x (ppb) | Indicated NO ₂ (ppb) | NO drop (ppb) | NO ₂ gain (ppb) | NO ₂ C.F. (ppb) |
|-------------------------------------|---------|---------|------------|-----------------------------------|--------------------|---------------------------------|---------------------------------|---------------|----------------------------|----------------------------|
| NO _x reference | 5000 | 75.00 | 5075 | 0.0 | 745.0 | 748.0 | 3.0 | 0.0 | 3.0 | |
| as found high NO ₂ | 5000 | 75.00 | 5075 | 1.3 | 356.0 | 743.0 | 387.0 | 389.0 | 384.0 | 1.013 |
| gpt mid | 5000 | 75.00 | 5075 | 0.65 | 553.0 | 745.0 | 192.0 | 192.0 | 189.0 | 1.016 |
| gpt low | 5000 | 75.00 | 5075 | .237 | 679.0 | 751.0 | 72.0 | 66.0 | 69.0 | 0.957 |
| Average NO₂ C.F.= | | | | | | | | | | 0.995 |

Linear Regression/Calibration Results:

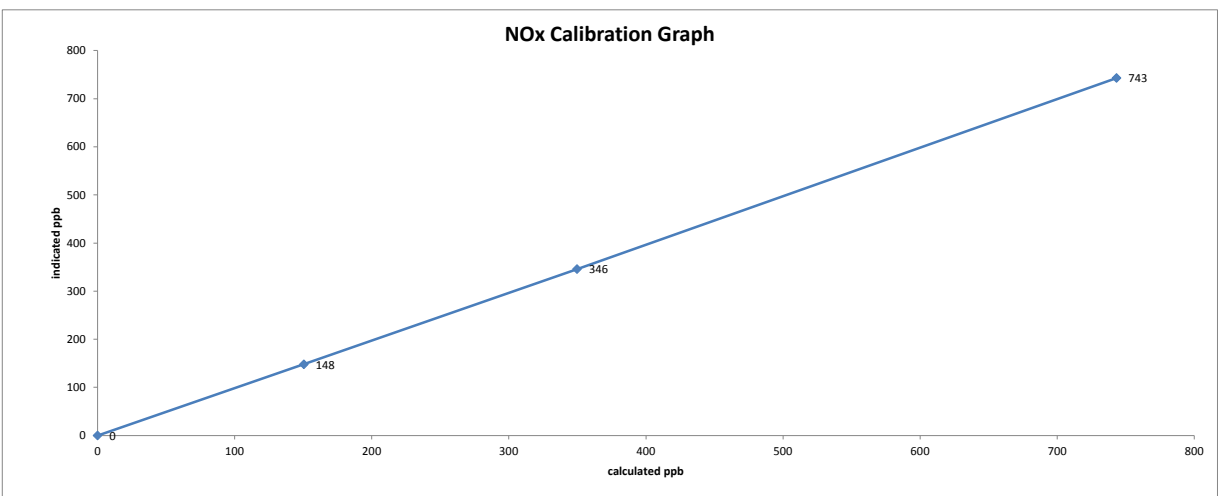
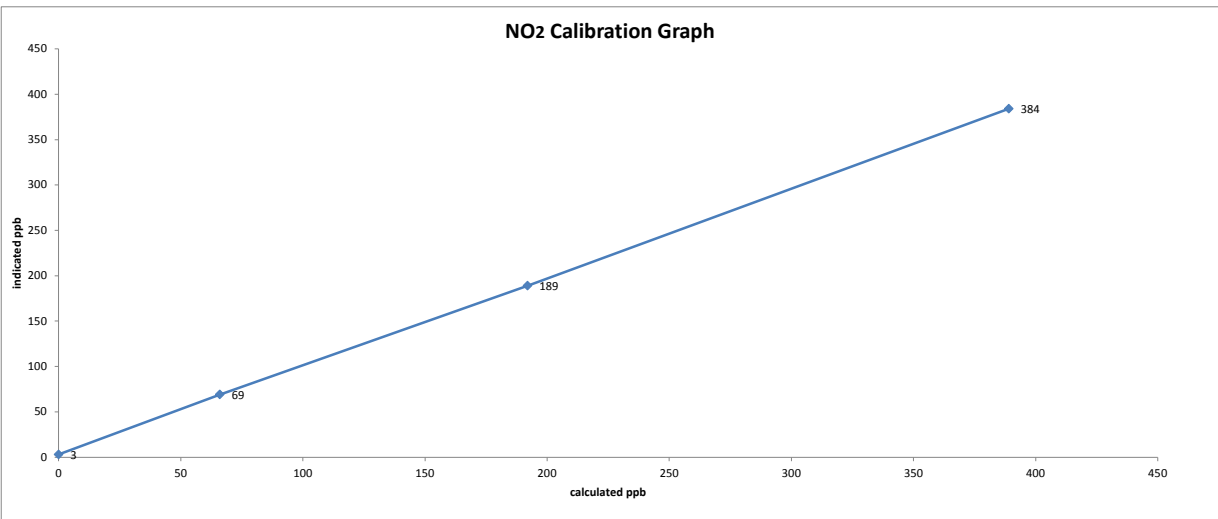
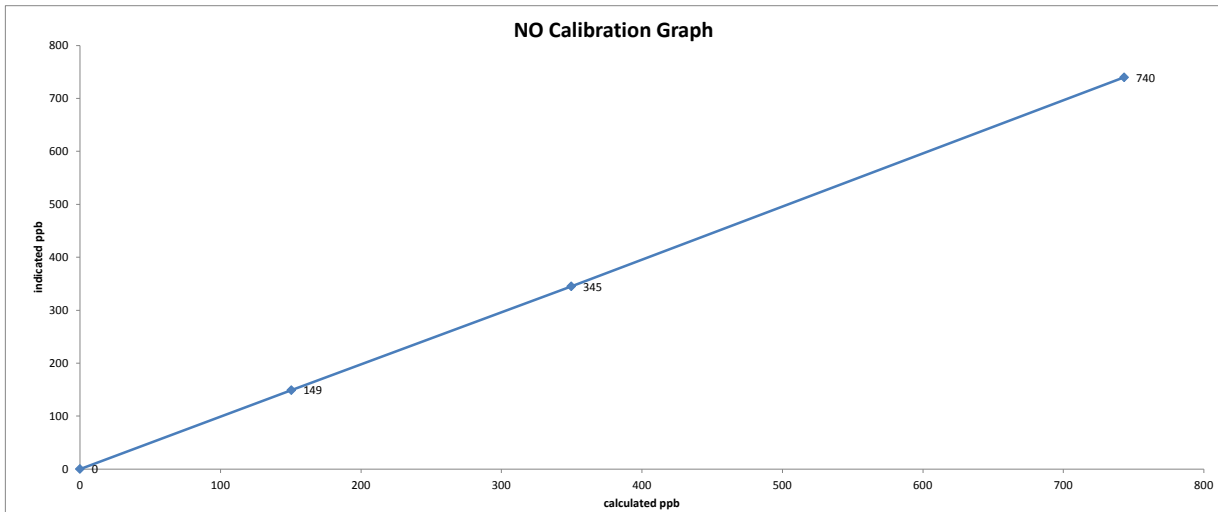
| | NO | NO _x | NO ₂ | LIMITS |
|--------------------------------------|--------|-----------------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.004 | 1.000 | 1.023 | 0.90-1.10 |
| b (Intercept as % of full scale)= | -0.10% | -0.18% | 0.32% | ± 3% F.S. |
| % change in C.F. from last cal= | -0.45% | -1.30% | -0.05% | ± 10% |
| NO ₂ converter efficiency | | | 1.00 | 0.96 to 1.04 |

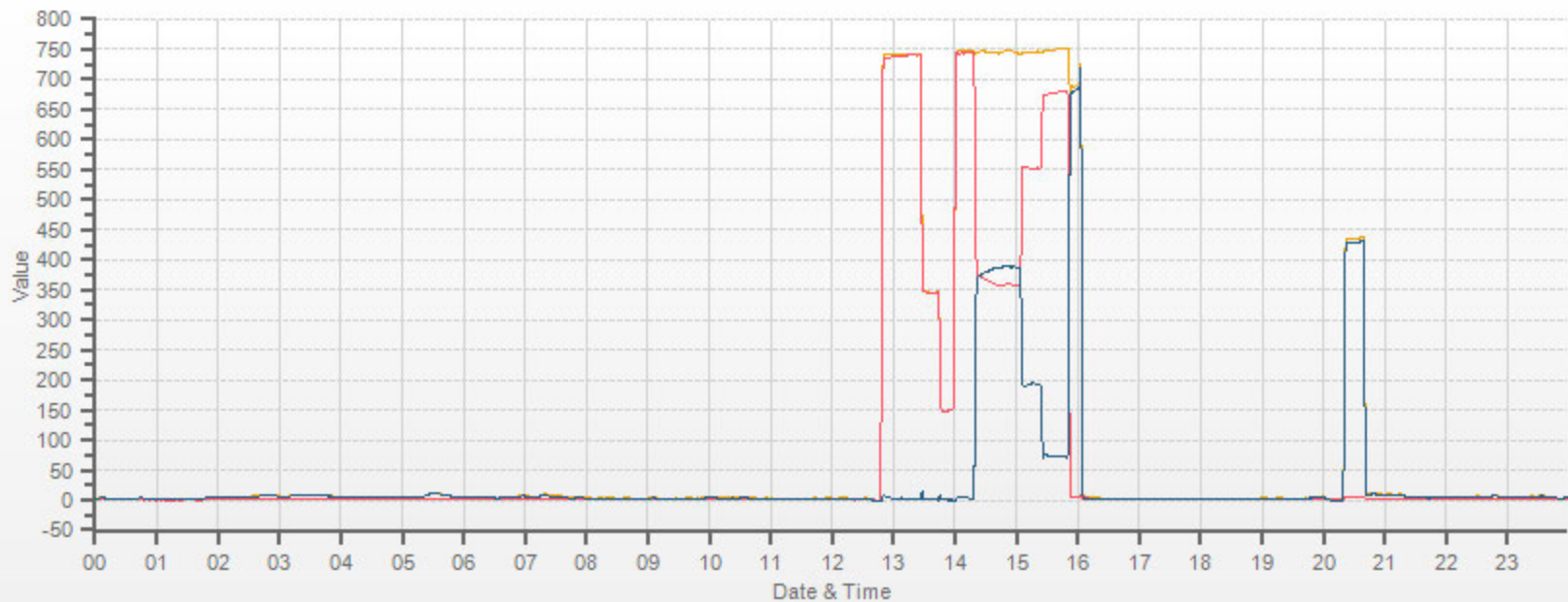
| As found: | As left: |
|--|--|
| NO _x SLOPE: .903 | NO _x SLOPE: .903 |
| NO _x OFFS: -1.8 | NO _x OFFS: -1.8 |
| NO SLOPE: .904 | NO SLOPE: .904 |
| NO OFFS: -2.7 | NO OFFS: -2.7 |
| SAMP FLW: 747 | SAMP FLW: 747 |
| OZONE FL: 77 | OZONE FL: 77 |
| PMT: 1342 | PMT: 1342 |
| NORM PMT: 1643 | NORM PMT: 1643 |
| AZERO: 12.0 | AZERO: 12.0 |
| HVPS: 670 | HVPS: 670 |
| RCELL TEMP: 50.0 | RCELL TEMP: 50.0 |
| BOX TEMP: 30.9 | BOX TEMP: 30.9 |
| PMT TEMP: 6.7 | PMT TEMP: 6.7 |
| IZS TEMP: 45.1 | IZS TEMP: 45.1 |
| MOLY TEMP: 314.9 | MOLY TEMP: 314.9 |
| RCEL: 5.6 | RCEL: 5.6 |
| SAMP: 27.0 | SAMP: 27.0 |
| Expected Value NO: 5.6 | Expected Value NO: 5.6 |
| Expected Value NO ₂ : 429.0 | Expected Value NO ₂ : 429.0 |
| Expected Value NO _x : 435.0 | Expected Value NO _x : 435.0 |

Comments:
 Calibrator not typically used for ozone, and photometer is not ranged high enough for a 1000 ppb NOx analyzer.

Date: June 5, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville

Start/End Time 24 hr. (mst): 12:11-16:06
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



Thermo 49C Ozone Analyzer Calibration

| | | | | |
|------------------------------|-----------------------|--|---|------------------|
| Date: | June 5, 2017 | Barometer ID #/Last Cert. Date/B.P.: | Fisher Scientific 10528, January 5, 2017 | 948 millibars |
| Company/Airshed: | LICA | Thermometer ID #/Last Cert. Date/Temp: | Fisher Scientific 10528, February 8, 2016 | 20.2 C |
| Location/Station Name: | Bonnyville | Weather Conditions: | Cloudy/Overcast | |
| Start/End Time 24 hr. (mst): | 16:06-17:28 | Calibration Purpose: | Internal Audit | |
| Ozone Calibration Method: | Varying UV Lamp Power | Performed By/Reviewer: | Tom Bourque | not yet reviewed |
| G.P.T. Date: | June 5, 2017 | Cal Gas Expiry Date: | December 2, 2019 | |

| | |
|-------------------------------|--------------|
| Analyzer: | |
| ID# or Serial Number: | 1002240372 |
| Last Calibration Date: | June 2, 2017 |
| Previous Cal High Point C.F.: | 1.000 |
| Ozone Range ppb: | 500 |
| As Found C.F.: | 1.030 |
| New C.F.: | n/a |

| | |
|--------------------------------|--|
| Calibration Standards: | |
| Low Flow Meter ID/Cert. Date: | Definer Low ID# 129069 February 5, 2017 |
| High Flow Meter ID/Cert. Date: | Definer High ID# 128686 February 5, 2017 |
| Calibrator ID/Cert. Date: | Sabio 2010 42531101, February 14, 2017 |
| Cal Gas Cylinder I.D. #: | LL119329 |

| Point | AMD Required Range of Ozone Calibration Points |
|-------|--|
| High | 300-400 ppb |
| Mid | 150-200 ppb |
| Low | 50-75 ppb |

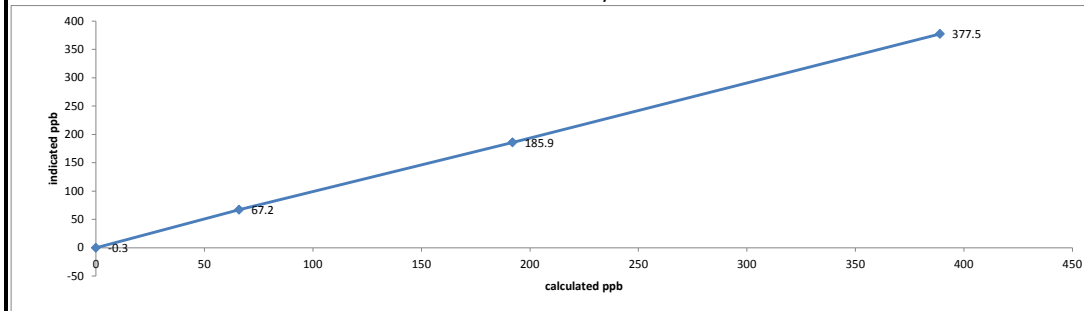
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rate (cc/min) | | Calculated Concentration: | Corrected Calculated Concentration: | Indicated Concentration: | Correction Factors: |
|---------------|-------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------|---------------------|
| | Total Flow @ Point Start | Total Flow @ Point Finish | (ppb) | (ppb) | (ppb) | |
| as found zero | 5075 | 5075 | 0.0 | n/a | -0.3 | n/a |
| as found high | 5075 | 5075 | 389.0 | 389.0 | 377.5 | 1.030 |
| mid | 5075 | 5075 | 192.0 | 192.0 | 185.9 | 1.031 |
| low | 5075 | 5075 | 66.0 | 66.0 | 67.2 | 0.978 |
| Average C.F.= | | | | | | 1.013 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.034 | | 0.90-1.10 |
| b (Intercept as % of full scale) = | -0.22% | | ± 3% F.S. |
| % change in C.F. from last cal = | -2.96% | | ± 10% |

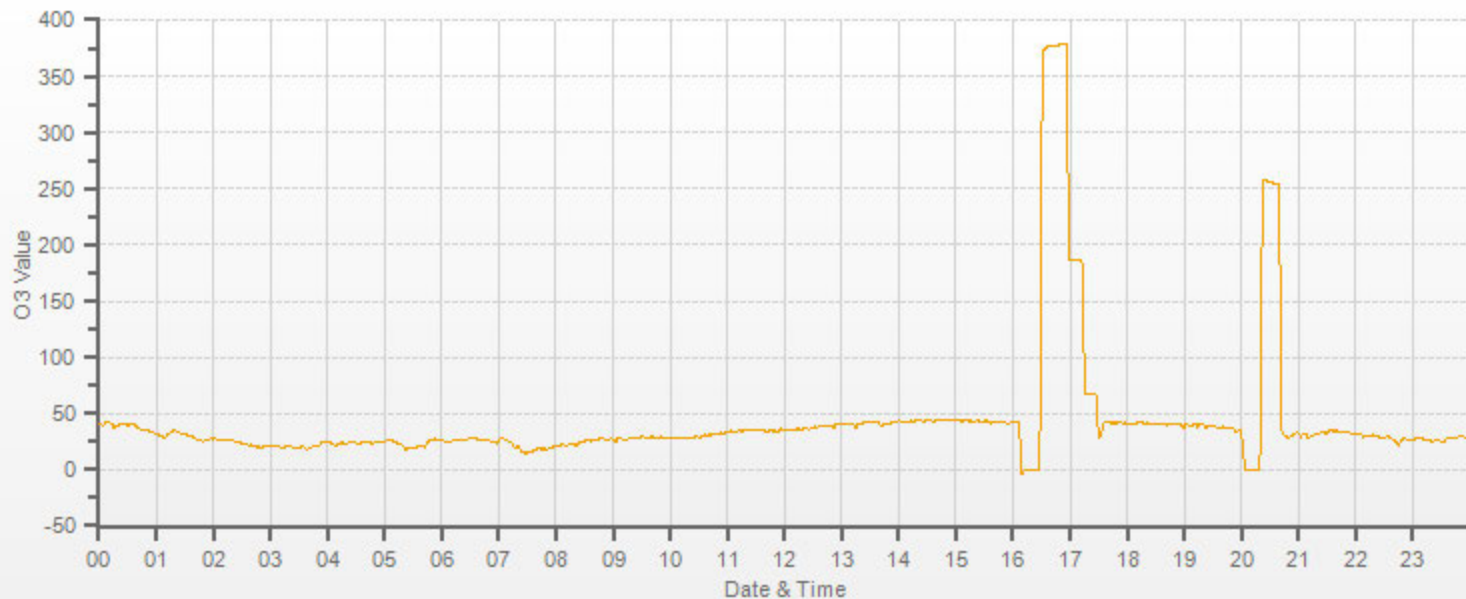
Thermo 49C Ozone Analyzer Calibration



| As found: | | As left: | |
|-----------------|-------|-----------------|-------|
| O3 Bkg ppb: | -0.2 | O3 Bkg ppb: | -0.2 |
| O3 Coef: | 0.982 | O3 Coef: | 0.982 |
| Battery: | 14.2 | Battery: | 14.2 |
| Bench: | 5.8 | Bench: | 5.8 |
| Bench Lamp: | 29.6 | Bench Lamp: | 29.6 |
| O3 Lamp: | 54.1 | O3 Lamp: | 54.1 |
| Pressure: | 68.1 | Pressure: | 68.1 |
| Cell A lpm: | 698.3 | Cell A lpm: | 698.3 |
| Cell B lpm: | 0.753 | Cell B lpm: | 0.753 |
| O3 ppb: | 0.764 | O3 ppb: | 0.764 |
| Cell A ppb: | 0.2 | Cell A ppb: | 0.2 |
| Cell B ppb: | 0.6 | Cell B ppb: | 0.6 |
| Cell A int: | 0.2 | Cell A int: | 0.2 |
| Cell B int: | 79042 | Cell B int: | 79042 |
| Expected Value: | 263.0 | Expected Value: | 263.0 |

Comments:

O3[ppb] Station: LICA Bonnyville Daily: 17.06.05 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

APPENDIX VI
REPORT CERTIFICATION FORM

Report Certification Form

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

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

Maram Ghaleb

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

August 16, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX VII
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2017-06-35-C</u> |
| Site: <u>Bonnyville Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|---------------------|-----------------------------|
| Level 0 Preliminary Verification | <u>Maram Ghalab</u> | Date <u>July 21, 2017</u> |
| Level 1 Primary Validation | <u>Maram Ghalab</u> | Date <u>July 21, 2017</u> |
| Level 2 Final Validation | <u>Maram Ghalab</u> | Date <u>August 14, 2017</u> |
| Level 3 Independent Data Review | <u>Chris Smith</u> | Date <u>August 14, 2017</u> |
| Post-Final Validation | <u>NA</u> | Date <u>NA</u> |

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