

Alberta Environment and Parks (AEP)
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February 10, 2019

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 December 2018.

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

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

This monthly report only contains the continuous ambient air data. The passive results, intermittent results and partisol results are reported in the quarterly integrated sampling report.

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

All data collected in December 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

SO2: The LICA-owned Thermo 43i analyzer, s/n: 806528242, was removed and a new AEP-supplied Thermo 43i, s/n: 11800260018, was installed on December 27. An installation calibration was successfully completed on December 28.

THC/CH4/NMHC: The LICA-owned Thermo 55i analyzer, s/n: 1180320044, was removed and a new AEP-supplied Thermo 55i, s/n: 1180030034, was installed on December 27. An installation calibration was successfully completed on December 28.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all



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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 Partisol samples. We are currently working with the airdata warehouse to set up codes for some VOC/PAH species that are missing in the parameter list. The results for these data will be submitted once all needed codes are available.

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

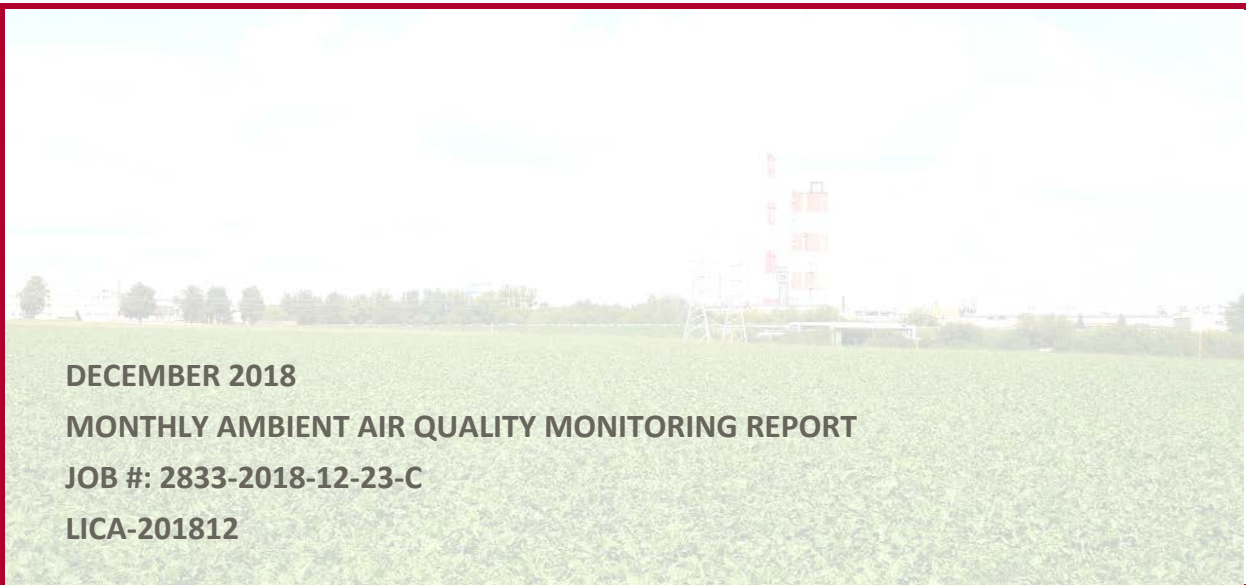
Respectfully,

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

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DECEMBER 2018
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT
JOB #: 2833-2018-12-23-C
LICA-201812

Prepared for:

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Monitoring Station

Cold Lake South Continuous Monitoring Station
EPEA Approval Number N/A

Date of Report Issuance: January 28, 2019

Report Preparation By: **Reviewed By:**

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Project Manager, Customer Service, Air Services

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SUMMARY

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

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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

SO₂: On December 27, LICA's Thermo 43i analyzer (s/n: 806528242) was removed and a new AEP-supplied Thermo 43i (s/n: 11800260018) was installed. An installation calibration was successfully completed on December 28. Twenty-six hours of downtime were recorded due to this analyzer replacement event.

TRS: One hour of downtime was recorded on December 31, at hour 7:00, due to an additional zero-span check performed to assess a biased low drift in span response.

THC/CH₄/NMHC: On December 27, LICA's Thermo 55i analyzer (s/n: 1180320044) was removed and a new AEP-supplied Thermo 55i, (s/n: 1180030034) was installed. An installation calibration was successfully completed on December 28. Twenty-six hours of downtime were recorded due to this analyzer replacement event.

NOX/NO/NO₂: The analyzer spanned outside the upper acceptance limit on December 17 and December 31. Two hours of downtime were recorded on December 18 and December 31, at hours 06:00 and 07:00 respectively, due to additional zero-span checks performed to assess the span drifts.

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.

Monthly Continuous Data Summary

| Lakeland Industry & Community Association | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| Cold Lake South Continuous Monitoring Station | | | | | | 1-HOUR | | | | | 24-HOUR | | |
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | READING | DAY | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | | | | | | | | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 0 | 3 | 8 | 14 | 5.3 | WSW | 1 | 6 | 96.5 |
| TRS (ppb) | - | - | - | - | 0 | 1 | 11 | 8 | 1.2 | E | 0 | 1 | 99.9 |
| THC (ppm) | - | - | - | - | 2.20 | 3.72 | 18 | 8 | 0.4 | S | 2.83 | 10 | 96.5 |
| CH ₄ (ppm) | - | - | - | - | 2.19 | 3.26 | 10 | 14 | 5.3 | WSW | 2.83 | 10 | 96.5 |
| NMHC (ppm) | - | - | - | - | 0.01 | 1.18 | 18 | 8 | 0.4 | S | 0.08 | 18 | 96.5 |
| NO ₂ (ppb) | 159 | - | 0 | - | 7 | 28 | 10 | 16 | 5.6 | SW | 17 | 9 | 99.7 |
| NO (ppb) | - | - | - | - | 2 | 71 | 11 | 8 | 1.2 | E | 9 | 18 | 99.7 |
| NO _x (ppb) | - | - | - | - | 9 | 97 | 11 | 8 | 1.2 | E | 25 | 9 | 99.7 |
| O ₃ (ppb) | 82 | - | 0 | - | 20.1 | 39.8 | 30 | 14 | 9.6 | NE | 32.7 | 13 | 100.0 |
| PM _{2.5} (µg/m ³) | 80 | 29 | 0 | 0 | 5 | 22 | 10 | 15 | 6.6 | SW | 12 | 8 | 100.0 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 78 | 96 | 1 | 8 | 4.3 | E | 90 | 2 | 100.0 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | -10.7 | 2.4 | 15 | 10 | 19.3 | WNW | -2.8 | 13 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 0.8 | 21.5 | 21 | 20 | - | NNW | 9.8 | 15 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 261 (W) | - | - | - | - | - | - | - | 100.0 |

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

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

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 29 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), Total Reduced Sulphur (TRS), 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}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 96.5%, equivalent to 26 hours of downtime.
- The routine monthly calibration was performed on December 13.
- Following a successful shutdown calibration on December 27, LICA's Thermo 43i analyzer (s/n: 806528242) was removed and a new AEP-supplied Thermo 43i (s/n: 11800260018) was installed. The analyzer was left offline to stabilize overnight and a successful installation calibration was completed on December 28. Twenty-six hours of downtime were recorded due to the analyzer replacement event.
- The permeation tube was replaced on December 28; and the expected span value was updated following the daily zero-span check on December 29.
- One instance of maximum instantaneous data was invalidated on December 14, at hour 13:00 as minute data was missing at 13:33 and could not be retrieved from the datalogger.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on December 13.
- The analyzer spanned towards the lower acceptance limit on December 31. A repeat zero-span check was performed at hour 7:00 on the same day and the result was closer to the mean. No further action was required. One hour of downtime was, however, recorded due to the additional quality check.
- One instance of maximum instantaneous data was invalidated on December 14, at hour 13:00 as minute data was missing at 13:33 and could not be retrieved from the datalogger.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period was 96.5%, equivalent to 26 hours of downtime.
- The routine monthly calibration was performed on December 14. The span gas cylinder was replaced during this site visit.
- Following a successful shutdown calibration on December 27, LICA's Thermo 55i analyzer (s/n: 1180320044) was removed and a new AEP-supplied Thermo 55i, (s/n: 1180030034) was installed. Column conditioning was run overnight and a successful installation calibration was completed on December 28. Twenty-six hours of downtime were recorded due to this analyzer replacement event.
- The carrier gas (N₂) cylinder was replaced on December 28.
- One instance of maximum instantaneous data was invalidated on December 14, at hour 13:00 as minute data was missing at 13:33 and could not be retrieved from the datalogger.

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

- Operational time for the monitoring period was 99.7%, equivalent to 2 hours of downtime.
- The routine monthly calibration was performed on December 13.
- The analyzer spanned outside the upper acceptance limit on December 17 and December 31. Additional zero-span checks were performed on December 18, at hour 6:00 and December 31, at hour 07:00, respectively. The results were within acceptance limits. The cause of the span drift could not be determined. No further action was required. Two hours of downtime were, however, incurred due to the additional quality checks.
- One instance of maximum instantaneous data was invalidated on December 14, at hour 13:00 as minute data was missing at 13:33 and could not be retrieved from the datalogger.

OZONE (O₃)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on December 14.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The routine quarterly calibration was performed on December 14.

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

- Operational time for the monitoring period was 100%.
- One instance of maximum instantaneous data was invalidated on December 14, at hour 13:00 as minute data was missing at 13:33 and could not be retrieved from the datalogger.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

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-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O₃ Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43i and Thermo 43i-TLE UV Fluorescent Analyzers
Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter (PM_{2.5}) - Thermo SHARP 5030 Unit
Wind System - Met One Unit
Relative Humidity - Met One Unit
Ambient Temperature - Met One Unit
Datalogger - Envista Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

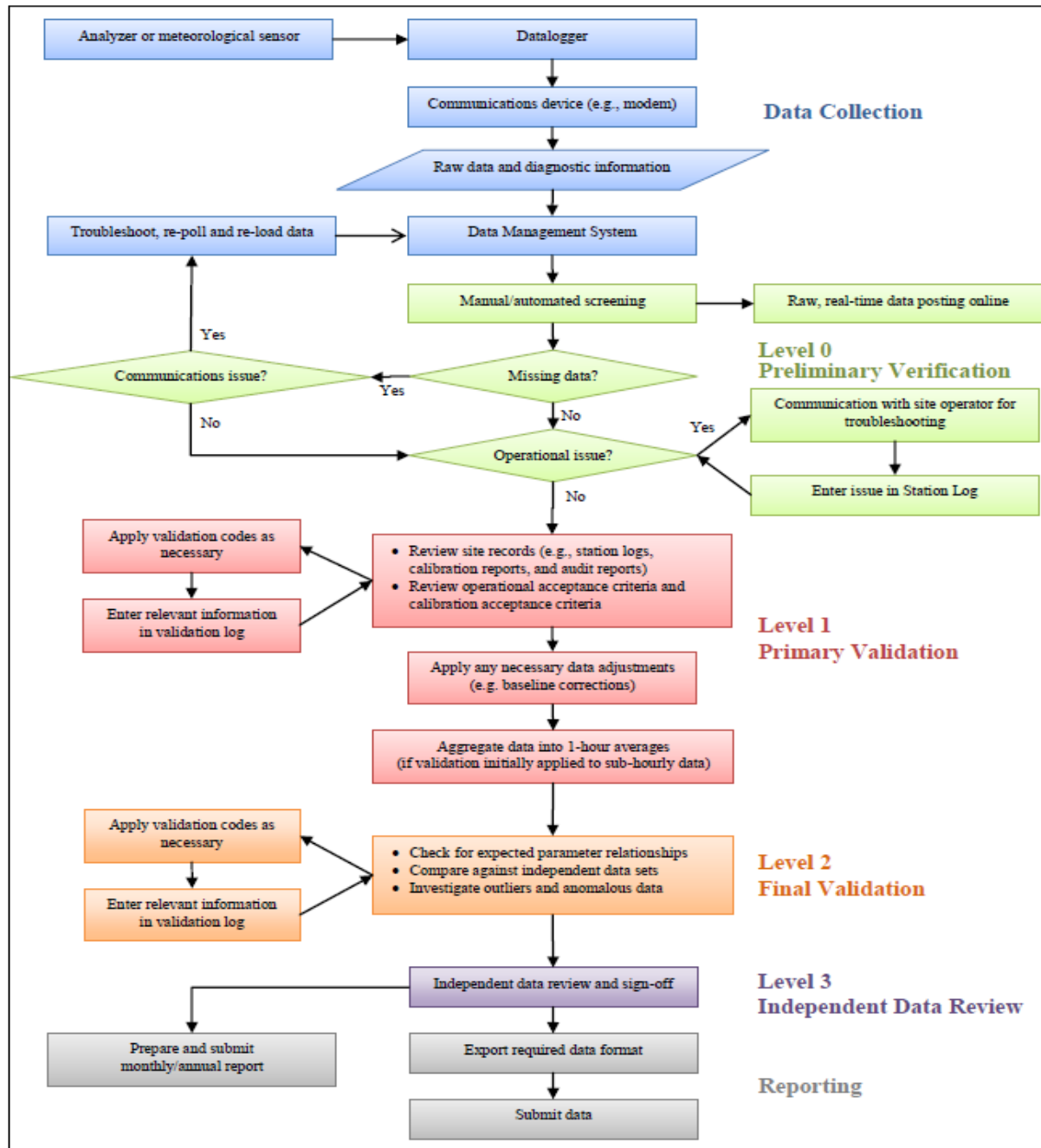
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

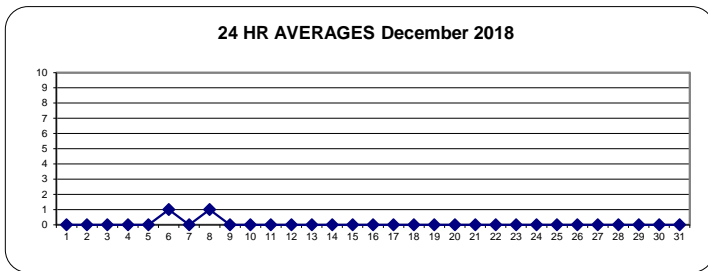
| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|---|---|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 24 |
| 5 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | S | S | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 24 |
| 9 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 10 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 11 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 12 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 13 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C | C | C | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 14 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 20 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 |
| 22 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 26 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | S | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 0 | 0 | 0 | 0 | 11 |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 |
| HOURLY MAX | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| HOURLY AVG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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:

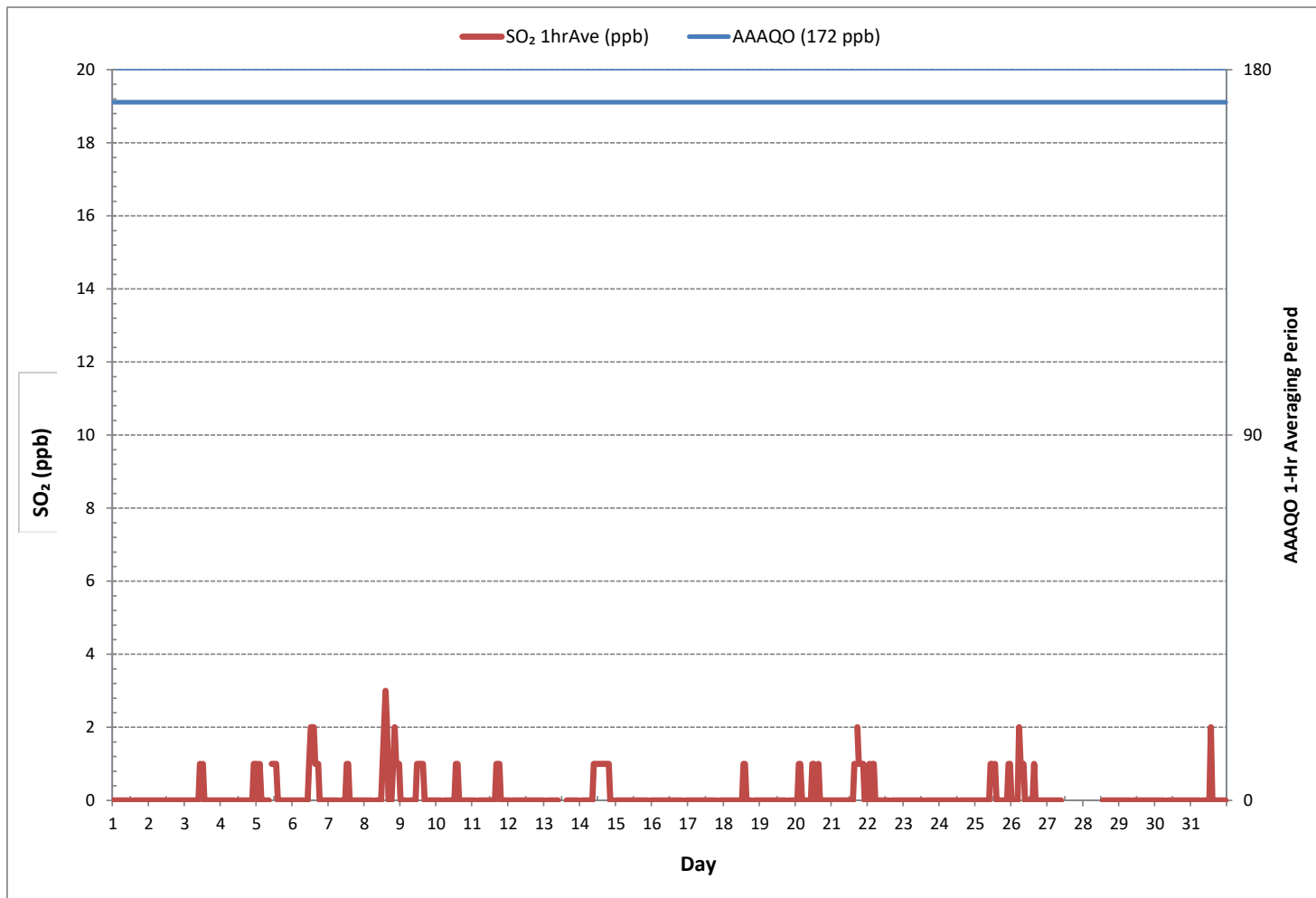
| | | | | | | |
|----------------------|------|-----|-----|-------|----|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 172 | ppb | 24-HR | 48 | ppb |
|----------------------|------|-----|-----|-------|----|-----|



MONTHLY SUMMARY

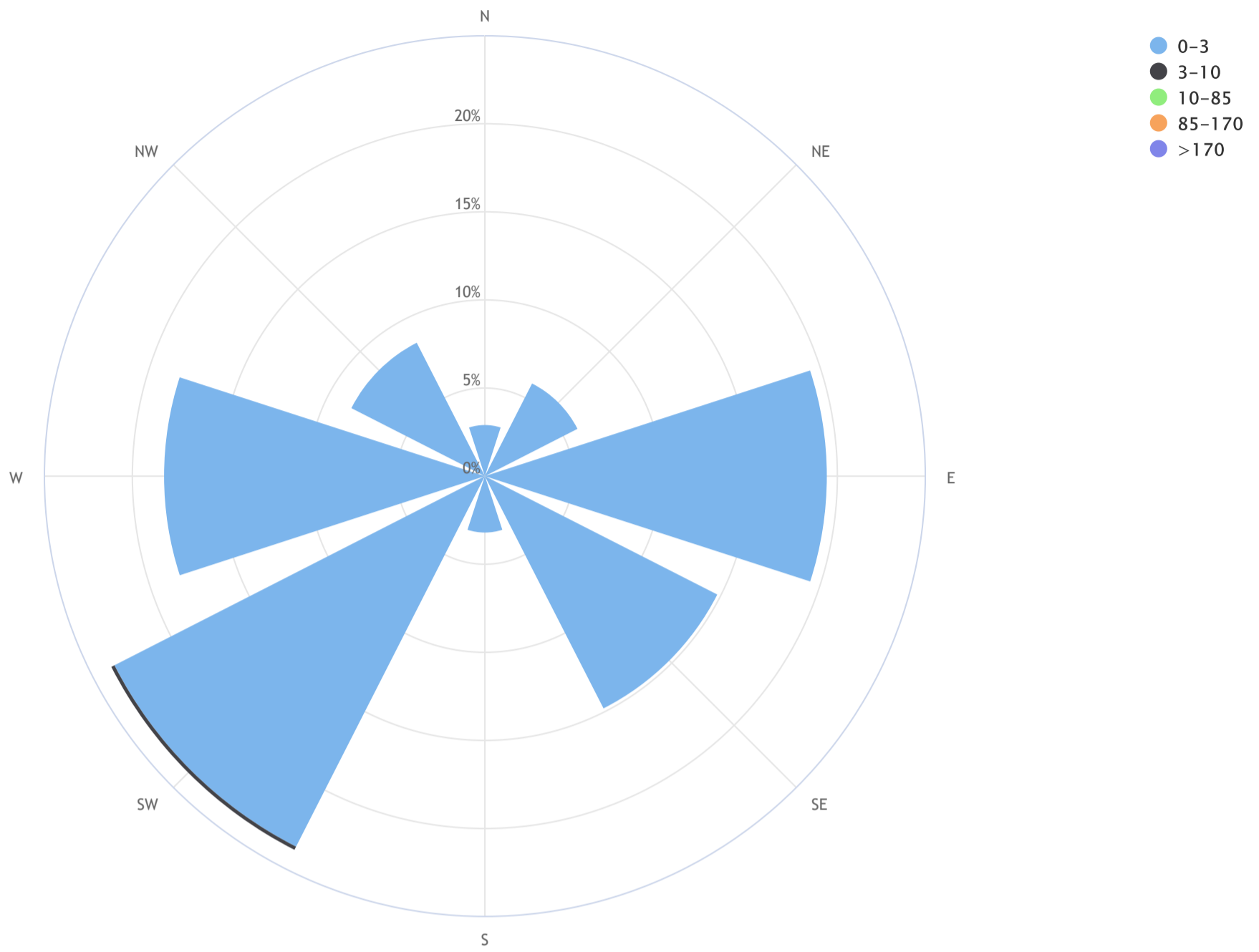
| | |
|------------------------------|--------------------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 |
| NUMBER OF 24-HR EXCEEDANCES: | 0 |
| NUMBER OF NON-ZERO READINGS: | 76 |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 3 ppb @ HOUR 14 ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 1 ppb ON DAY 6 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 718 hrs |
| AMD OPERATION UPTIME: | 96.5 % |
| STANDARD DEVIATION: | 0 |
| MONTHLY AVERAGE: | 0 ppb |

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_SO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 3.4%



| Direction | 0-3 | 3-10 | 10-85 | 85-170 | >170 | TOTAL |
|-----------|------|------|-------|--------|------|-------|
| N | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 |
| NE | 5.9 | 0.0 | 0.0 | 0.0 | 0.0 | 5.9 |
| E | 19.4 | 0.0 | 0.0 | 0.0 | 0.0 | 19.4 |
| SE | 14.8 | 0.0 | 0.0 | 0.0 | 0.0 | 14.8 |
| S | 3.2 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 |
| SW | 23.6 | 0.2 | 0.0 | 0.0 | 0.0 | 23.8 |
| W | 18.2 | 0.0 | 0.0 | 0.0 | 0.0 | 18.2 |
| NW | 8.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Summary | 96.5 | 0.2 | 0.0 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR

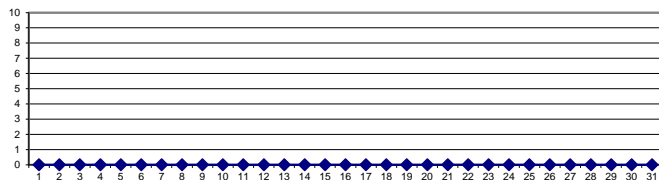
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

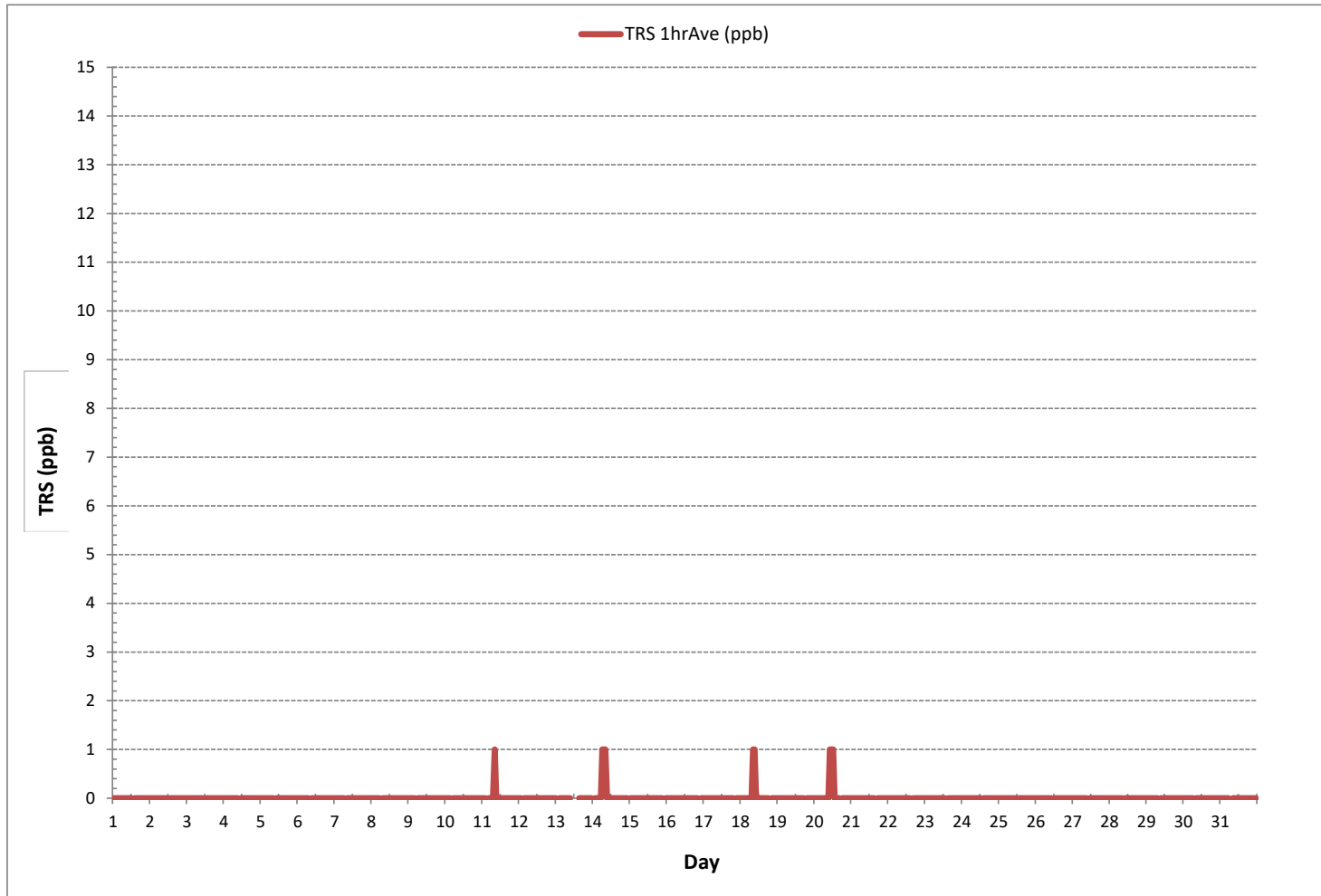
24 HR AVERAGES December 2018



MONTHLY SUMMARY

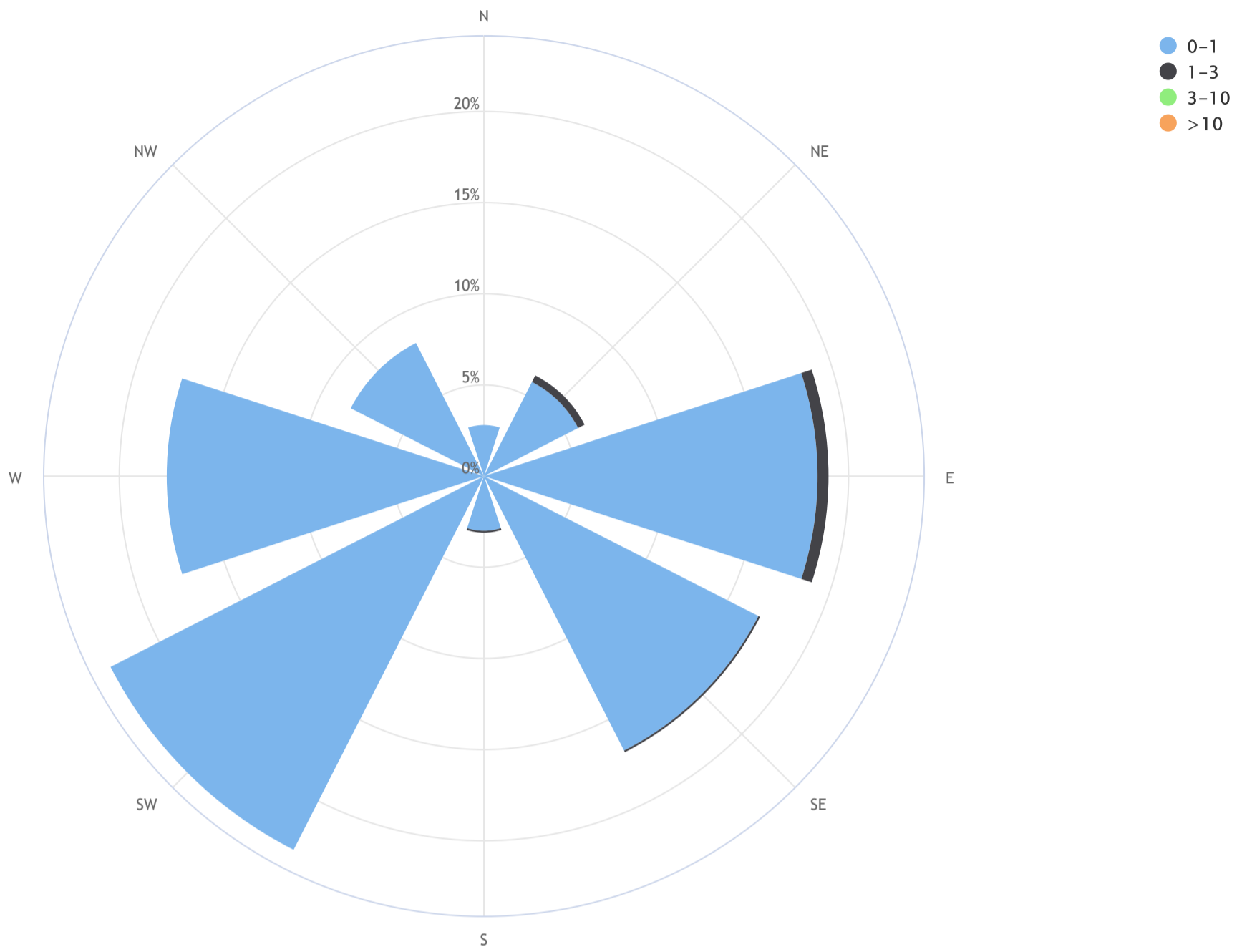
| | | | | |
|------------------------------|----|------------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 9 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 0 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 1 | ppb @ HOUR | 8 | ON DAY 11 |
| MAXIMUM 24-HR AVERAGE: | 0 | ppb | | ON DAY 1 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 743 hrs |
| MONTHLY CALIBRATION TIME: | 5 | hrs | AMD OPERATION UPTIME: | 99.9 % |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 ppb |

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_TRS (ppb)_18/12

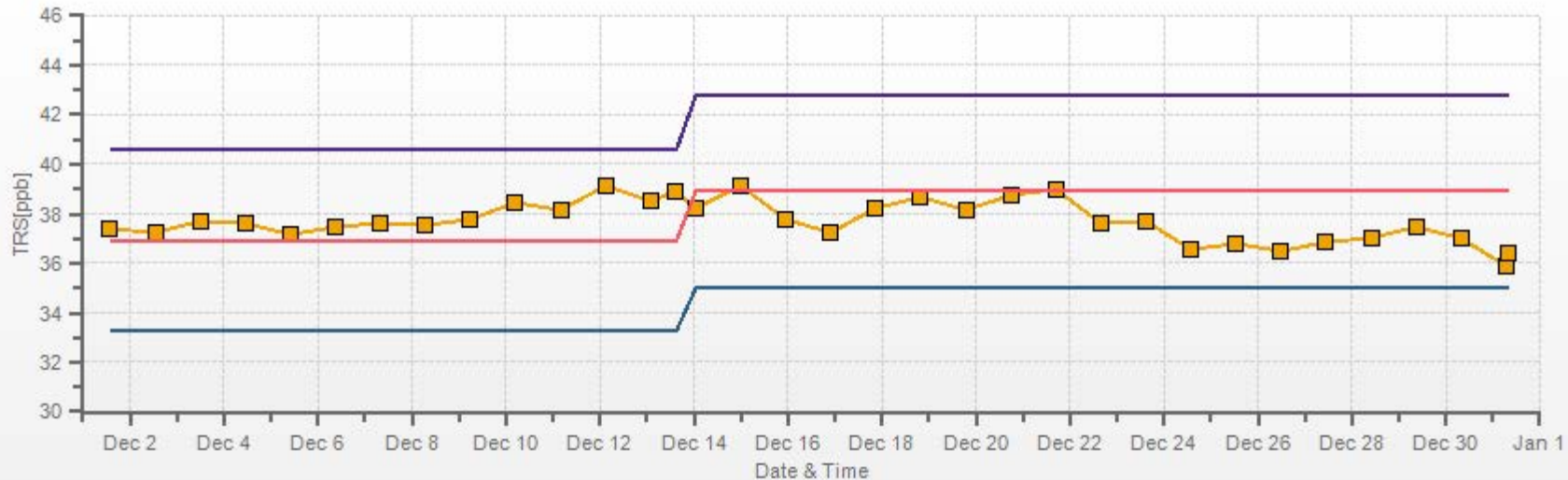
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 3.4%



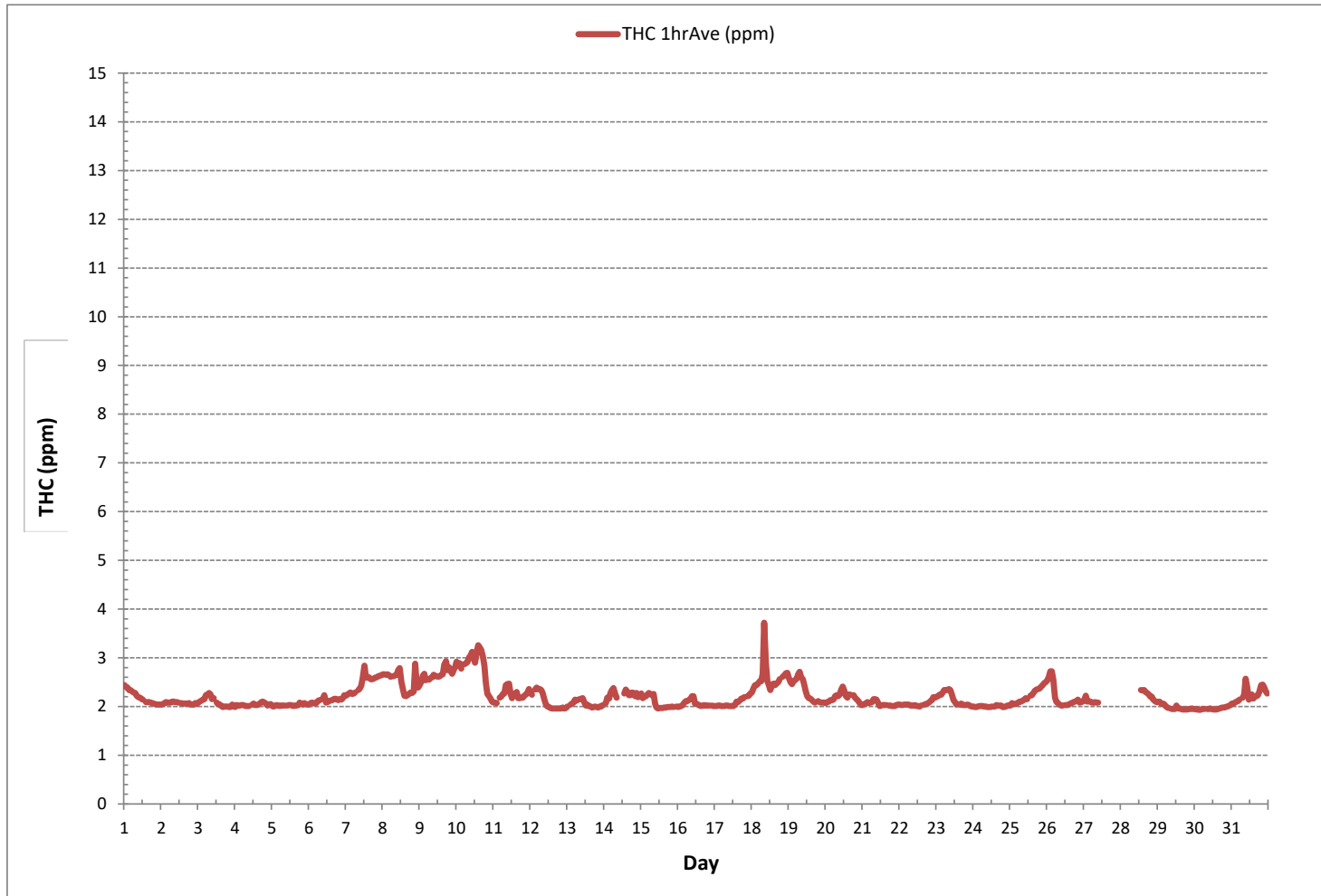
| Direction | 0-1 | 1-3 | 3-10 | >10 | TOTAL |
|----------------|-------------|------------|------------|------------|-------------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 5.8 | 0.4 | 0.0 | 0.0 | 6.2 |
| E | 18.3 | 0.6 | 0.0 | 0.0 | 18.8 |
| SE | 16.9 | 0.1 | 0.0 | 0.0 | 17.0 |
| S | 3.0 | 0.1 | 0.0 | 0.0 | 3.1 |
| SW | 23.0 | 0.0 | 0.0 | 0.0 | 23.0 |
| W | 17.4 | 0.0 | 0.0 | 0.0 | 17.4 |
| NW | 8.2 | 0.0 | 0.0 | 0.0 | 8.2 |
| Summary | 95.3 | 1.3 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 3.4 |

TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High

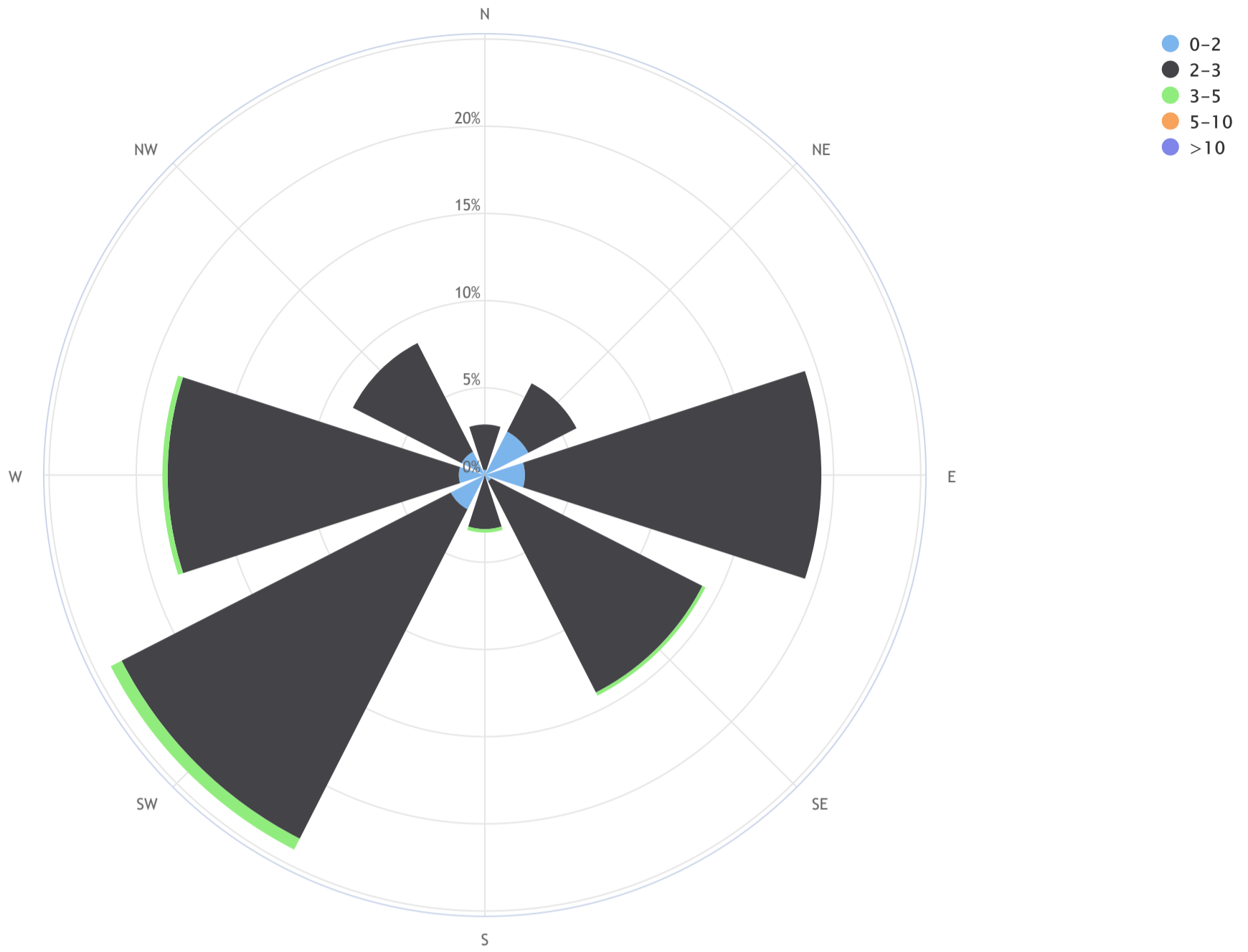


TOTAL HYDROCARBON



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_THC (ppm)_18/12

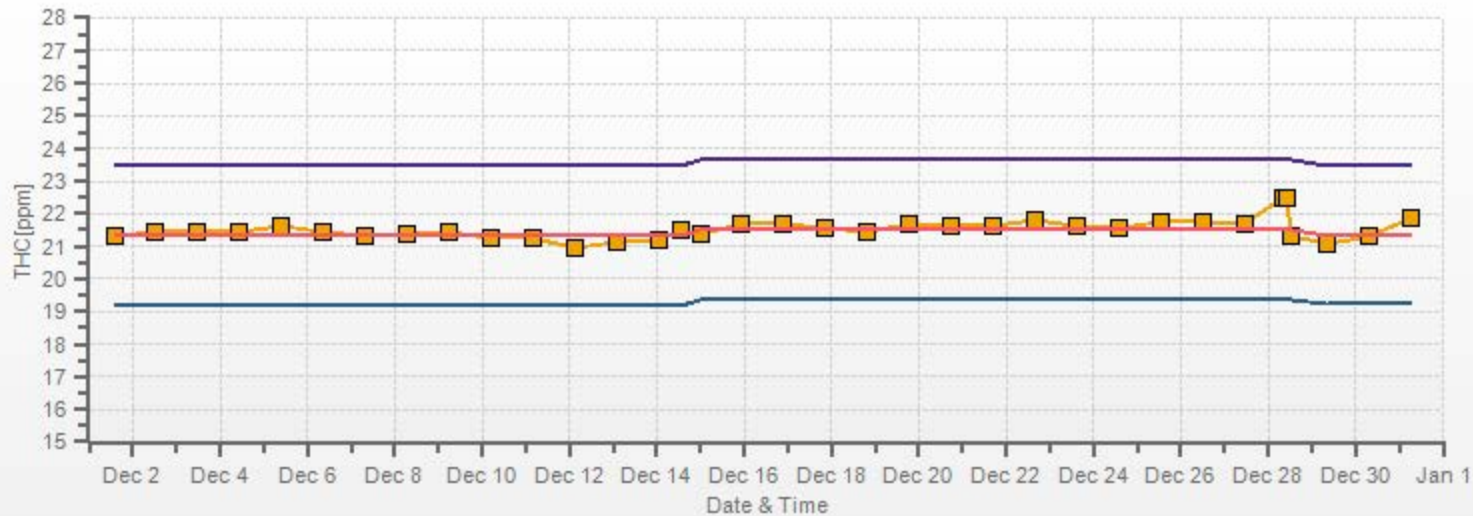
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.4_CALM % = 3.4%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|------|------|-----|------|-----|-------|
| N | 0.3 | 2.6 | 0.0 | 0.0 | 0.0 | 2.9 |
| NE | 2.8 | 3.1 | 0.0 | 0.0 | 0.0 | 5.9 |
| E | 2.3 | 17.0 | 0.0 | 0.0 | 0.0 | 19.3 |
| SE | 0.4 | 13.6 | 0.2 | 0.0 | 0.0 | 14.2 |
| S | 0.0 | 3.1 | 0.2 | 0.0 | 0.0 | 3.2 |
| SW | 2.2 | 21.2 | 0.7 | 0.0 | 0.0 | 24.2 |
| W | 1.5 | 16.7 | 0.3 | 0.0 | 0.0 | 18.4 |
| NW | 1.5 | 7.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Summary | 11.0 | 84.3 | 1.3 | 0.0 | 0.0 | 96.6 |
| CALM | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 3.4 |

THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



METHANE

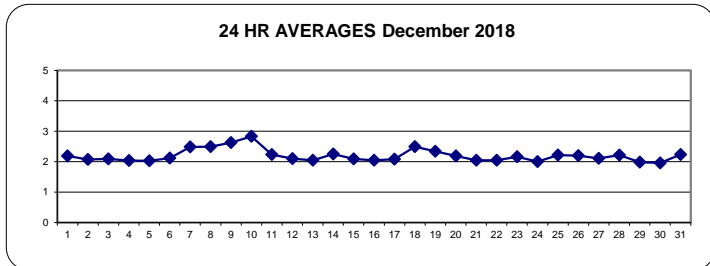
METHANE Hourly Averages (CH₄ ppm)

| 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 | 2.44 | 2.40 | 2.39 | 2.34 | 2.34 | 2.31 | 2.29 | 2.28 | 2.22 | 2.19 | 2.18 | 2.16 | 2.14 | S | 2.09 | 2.09 | 2.09 | 2.08 | 2.07 | 2.06 | 2.05 | 2.04 | 2.04 | 2.04 | 2.04 | 2.04 | 2.44 | 2.19 | 2.4 |
| 2 | 2.04 | 2.05 | 2.07 | 2.09 | 2.08 | 2.08 | 2.08 | 2.10 | 2.10 | 2.09 | 2.09 | 2.08 | S | 2.07 | 2.06 | 2.06 | 2.06 | 2.06 | 2.07 | 2.04 | 2.04 | 2.04 | 2.07 | 2.05 | 2.04 | 2.10 | 2.07 | 2.4 | |
| 3 | 2.08 | 2.10 | 2.12 | 2.14 | 2.15 | 2.23 | 2.24 | 2.28 | 2.25 | 2.15 | 2.15 | S | 2.08 | 2.05 | 2.04 | 2.01 | 1.99 | 2.00 | 2.00 | 2.00 | 1.99 | 1.99 | 2.04 | 2.01 | 1.99 | 2.28 | 2.09 | 2.4 | |
| 4 | 1.99 | 2.03 | 2.02 | 2.02 | 2.03 | 2.03 | 2.02 | 2.01 | 2.01 | 2.01 | S | 2.04 | 2.06 | 2.03 | 2.03 | 2.04 | 2.06 | 2.09 | 2.10 | 2.08 | 2.06 | 2.02 | 2.04 | 2.05 | 1.99 | 2.10 | 2.04 | 2.4 | |
| 5 | 2.01 | 2.00 | 2.02 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.02 | S | 2.02 | 2.03 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.03 | 2.08 | 2.05 | 2.04 | 2.07 | 2.05 | 2.04 | 2.00 | 2.08 | 2.03 | 2.4 | |
| 6 | 2.04 | 2.07 | 2.08 | 2.07 | 2.06 | 2.08 | 2.12 | 2.12 | S | 2.16 | 2.23 | 2.08 | 2.09 | 2.11 | 2.12 | 2.13 | 2.15 | 2.16 | 2.15 | 2.13 | 2.15 | 2.14 | 2.17 | 2.23 | 2.04 | 2.23 | 2.12 | 2.4 | |
| 7 | 2.22 | 2.25 | 2.27 | 2.29 | 2.26 | 2.27 | 2.29 | S | 2.34 | 2.37 | 2.43 | 2.59 | 2.84 | 2.59 | 2.60 | 2.56 | 2.56 | 2.57 | 2.59 | 2.60 | 2.62 | 2.63 | 2.64 | 2.22 | 2.84 | 2.48 | 2.4 | | |
| 8 | 2.66 | 2.66 | 2.65 | 2.66 | 2.64 | 2.61 | S | 2.62 | 2.64 | 2.65 | 2.75 | 2.79 | 2.50 | 2.36 | 2.22 | 2.21 | 2.23 | 2.26 | 2.29 | 2.28 | 2.31 | 2.37 | 2.41 | 2.39 | 2.21 | 2.79 | 2.49 | 2.4 | |
| 9 | 2.42 | 2.45 | 2.48 | 2.56 | 2.54 | S | 2.54 | 2.56 | 2.59 | 2.63 | 2.62 | 2.62 | 2.61 | 2.62 | 2.65 | 2.66 | 2.70 | 2.76 | 2.75 | 2.81 | 2.74 | 2.67 | 2.74 | 2.81 | 2.42 | 2.81 | 2.63 | 2.4 | |
| 10 | 2.92 | 2.85 | 2.89 | 2.78 | S | 2.87 | 2.89 | 2.91 | 3.00 | 3.05 | 3.12 | 2.99 | 2.90 | 3.13 | 3.26 | 3.21 | 3.16 | 3.02 | 2.84 | 2.48 | 2.26 | 2.21 | 2.16 | 2.10 | 2.10 | 3.26 | 2.83 | 2.4 | |
| 11 | 2.08 | 2.08 | 2.07 | S | 2.18 | 2.20 | 2.19 | 2.27 | 2.37 | 2.44 | 2.47 | 2.27 | 2.17 | 2.26 | 2.22 | 2.22 | 2.17 | 2.17 | 2.18 | 2.18 | 2.22 | 2.24 | 2.29 | 2.36 | 2.07 | 2.47 | 2.23 | 2.4 | |
| 12 | 2.28 | 2.24 | S | 2.35 | 2.39 | 2.36 | 2.36 | 2.34 | 2.27 | 2.15 | 2.04 | 2.00 | 1.99 | 1.97 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.98 | 1.96 | 1.97 | 1.96 | 2.39 | 2.10 | 2.4 | |
| 13 | 2.00 | S | 2.04 | 2.06 | 2.08 | 2.14 | 2.12 | 2.14 | 2.15 | 2.16 | 2.17 | 2.08 | 2.02 | 2.04 | 2.01 | 2.00 | 1.98 | 1.99 | 2.00 | 1.99 | 1.98 | 2.00 | 2.00 | 2.03 | 1.98 | 2.17 | 2.05 | 2.4 | |
| 14 | S | 2.07 | 2.18 | 2.16 | 2.28 | 2.34 | 2.38 | 2.26 | 2.18 | C | C | C | C | C | 2.27 | 2.35 | 2.30 | 2.23 | 2.23 | 2.29 | 2.28 | 2.21 | 2.28 | 2.19 | S | 2.07 | 2.38 | 2.25 | 2.4 |
| 15 | 2.27 | 2.17 | 2.20 | 2.21 | 2.25 | 2.28 | 2.26 | 2.23 | 2.26 | 2.06 | 1.98 | 1.96 | 1.97 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 1.99 | 1.99 | 2.00 | 1.99 | S | 2.00 | 1.96 | 2.28 | 2.09 | 2.4 | |
| 16 | 1.99 | 2.00 | 2.01 | 2.03 | 2.08 | 2.11 | 2.11 | 2.13 | 2.16 | 2.20 | 2.10 | 2.06 | 2.05 | 2.04 | 2.02 | 2.01 | 2.02 | 2.03 | 2.02 | 2.02 | 2.02 | S | 2.02 | 2.01 | 1.99 | 2.20 | 2.05 | 2.4 | |
| 17 | 2.01 | 2.01 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.01 | 2.04 | 2.10 | 2.09 | 2.12 | 2.16 | 2.16 | 2.19 | S | 2.21 | 2.22 | 2.27 | 2.01 | 2.27 | 2.08 | 2.4 | |
| 18 | 2.29 | 2.38 | 2.44 | 2.44 | 2.47 | 2.49 | 2.52 | 2.54 | 2.54 | 2.48 | 2.45 | 2.44 | 2.34 | 2.44 | 2.47 | 2.44 | 2.47 | 2.50 | 2.56 | S | 2.61 | 2.64 | 2.68 | 2.69 | 2.29 | 2.69 | 2.49 | 2.4 | |
| 19 | 2.59 | 2.50 | 2.46 | 2.52 | 2.54 | 2.57 | 2.66 | 2.71 | 2.60 | 2.56 | 2.44 | 2.31 | 2.21 | 2.17 | 2.16 | 2.13 | 2.10 | 2.08 | S | 2.11 | 2.09 | 2.08 | 2.08 | 2.08 | 2.08 | 2.71 | 2.34 | 2.4 | |
| 20 | 2.07 | 2.09 | 2.10 | 2.13 | 2.13 | 2.14 | 2.21 | 2.23 | 2.19 | 2.24 | 2.35 | 2.41 | 2.33 | 2.22 | 2.18 | 2.25 | 2.24 | S | 2.23 | 2.18 | 2.15 | 2.12 | 2.07 | 2.03 | 2.03 | 2.41 | 2.19 | 2.4 | |
| 21 | 2.03 | 2.05 | 2.06 | 2.09 | 2.07 | 2.08 | 2.09 | 2.15 | 2.15 | 2.14 | 2.07 | 2.01 | 2.02 | 2.03 | 2.03 | S | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.01 | 2.03 | 2.04 | 2.01 | 2.15 | 2.05 | 2.4 | |
| 22 | 2.04 | 2.03 | 2.03 | 2.04 | 2.04 | 2.04 | 2.02 | 2.02 | 2.02 | 2.03 | 2.01 | 2.01 | 2.00 | 2.02 | S | 2.04 | 2.05 | 2.04 | 2.05 | 2.06 | 2.08 | 2.11 | 2.13 | 2.19 | 2.18 | 2.00 | 2.19 | 2.05 | 2.4 |
| 23 | 2.19 | 2.21 | 2.24 | 2.24 | 2.29 | 2.34 | 2.34 | 2.34 | 2.36 | 2.34 | 2.25 | 2.13 | 2.09 | 2.04 | S | 2.04 | 2.06 | 2.03 | 2.03 | 2.03 | 2.04 | 2.03 | 2.01 | 2.00 | 2.00 | 2.00 | 2.36 | 2.16 | 2.4 |
| 24 | 2.00 | 1.99 | 1.99 | 2.00 | 2.01 | 2.01 | 2.01 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 2.00 | S | 2.00 | 2.02 | 2.02 | 2.02 | 2.02 | 1.99 | 1.99 | 2.00 | 2.02 | 2.02 | 1.99 | 2.02 | 2.00 | 2.4 | |
| 25 | 2.02 | 2.07 | 2.05 | 2.05 | 2.06 | 2.08 | 2.10 | 2.10 | 2.12 | 2.14 | 2.17 | 2.15 | S | 2.22 | 2.23 | 2.28 | 2.33 | 2.35 | 2.36 | 2.37 | 2.41 | 2.44 | 2.48 | 2.50 | 2.02 | 2.50 | 2.22 | 2.4 | |
| 26 | 2.53 | 2.61 | 2.72 | 2.72 | 2.55 | 2.18 | 2.09 | 2.07 | 2.04 | 2.02 | 2.02 | S | 2.03 | 2.03 | 2.04 | 2.06 | 2.07 | 2.09 | 2.10 | 2.11 | 2.12 | 2.08 | 2.09 | 2.10 | 2.02 | 2.72 | 2.20 | 2.4 | |
| 27 | 2.13 | 2.22 | 2.10 | 2.11 | 2.10 | 2.08 | 2.08 | 2.09 | 2.08 | 2.08 | S | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 2.08 | 2.22 | 2.11 | 11 |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 2.32 | 2.31 | 2.31 | 2.27 | 2.25 | 2.22 | 2.19 | 2.19 | 2.14 | 2.11 | 2.09 | 2.09 | 2.32 | 2.22 | 11 |
| 29 | 2.08 | 2.10 | 2.06 | 2.06 | 2.04 | 2.00 | 1.98 | 1.97 | S | 1.95 | 1.95 | 1.95 | 1.98 | 1.96 | 1.96 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.95 | 1.95 | 1.96 | 1.95 | 1.94 | 2.10 | 1.98 | 2.4 |
| 30 | 1.95 | 1.94 | 1.94 | 1.93 | 1.94 | 1.95 | 1.95 | S | 1.95 | 1.95 | 1.96 | 1.95 | 1.94 | 1.94 | 1.94 | 1.95 | 1.96 | 1.97 | 1.98 | 1.98 | 1.99 | 2.00 | 2.01 | 2.03 | 1.93 | 2.03 | 1.96 | 2.4 | |
| 31 | 2.06 | 2.06 | 2.08 | 2.10 | 2.11 | 2.14 | S | 2.18 | 2.23 | 2.49 | 2.38 | 2.14 | 2.19 | 2.25 | 2.16 | 2.21 | 2.21 | 2.23 | 2.31 | 2.44 | 2.44 | 2.40 | 2.31 | 2.27 | 2.06 | 2.49 | 2.23 | 2.4 | |
| HOURLY MAX | 2.92 | 2.85 | 2.89 | 2.78 | 2.64 | 2.87 | 2.89 | 2.91 | 3.00 | 3.05 | 3.12 | 2.99 | 2.90 | 3.13 | 3.26 | 3.21 | 3.16 | 3.02 | 2.84 | 2.81 | 2.74 | 2.67 | 2.74 | 2.81 | | | | | |
| HOURLY AVG | 2.19 | 2.20 | 2.20 | 2.22 | 2.20 | 2.21 | 2.21 | 2.24 | 2.25 | 2.24 | 2.24 | 2.20 | 2.18 | 2.19 | 2.18 | 2.18 | 2.18 | 2.18 | 2.18 | 2.16 | 2.16 | 2.17 | 2.17 | 2.17 | | | | | |

STATUS FLAG CODES

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

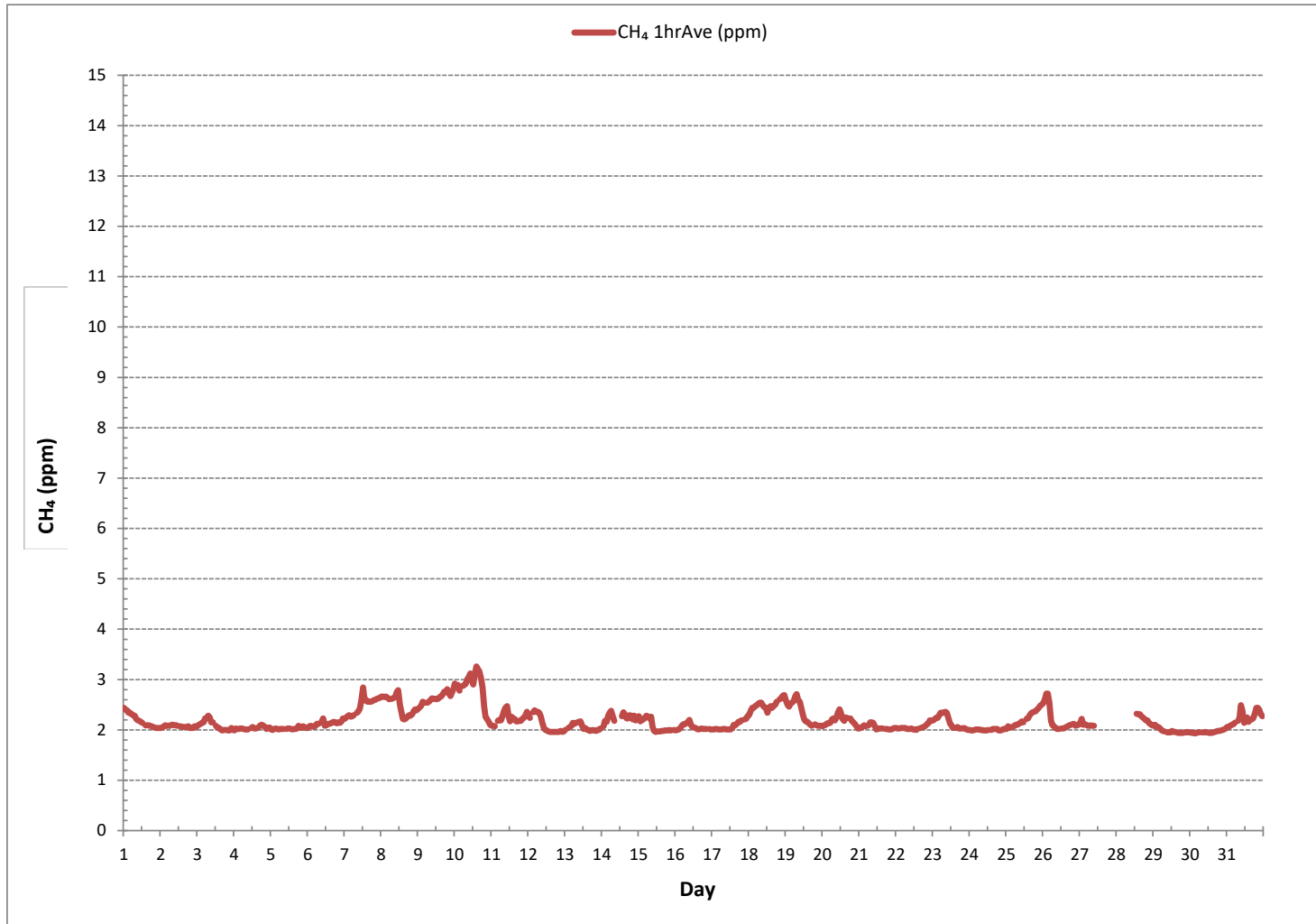
24 HR AVERAGES December 2018



MONTHLY SUMMARY

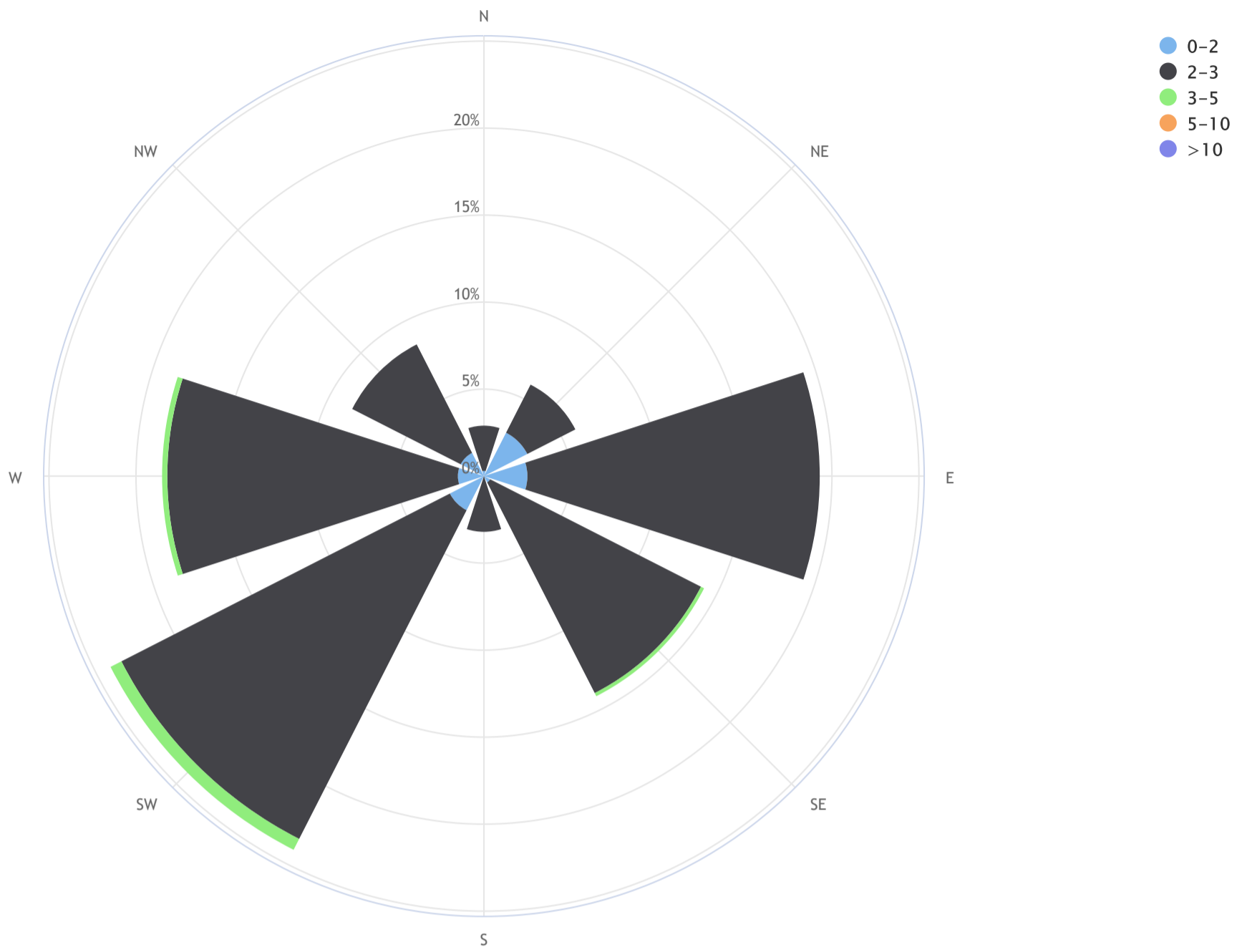
| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 683 | | | |
| MINIMUM 1-HR AVERAGE: | 1.93 ppm | @ HOUR | 3 | ON DAY 30 |
| MAXIMUM 1-HR AVERAGE: | 3.26 ppm | @ HOUR | 14 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 2.83 ppm | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 31 hrs | OPERATIONAL TIME: | 718 hrs | |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 96.5 % | |
| STANDARD DEVIATION: | 0.24 | MONTHLY AVERAGE: | 2.19 ppm | |

METHANE Hourly Averages (CH₄ ppm)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_CH₄ (ppm)_18/12

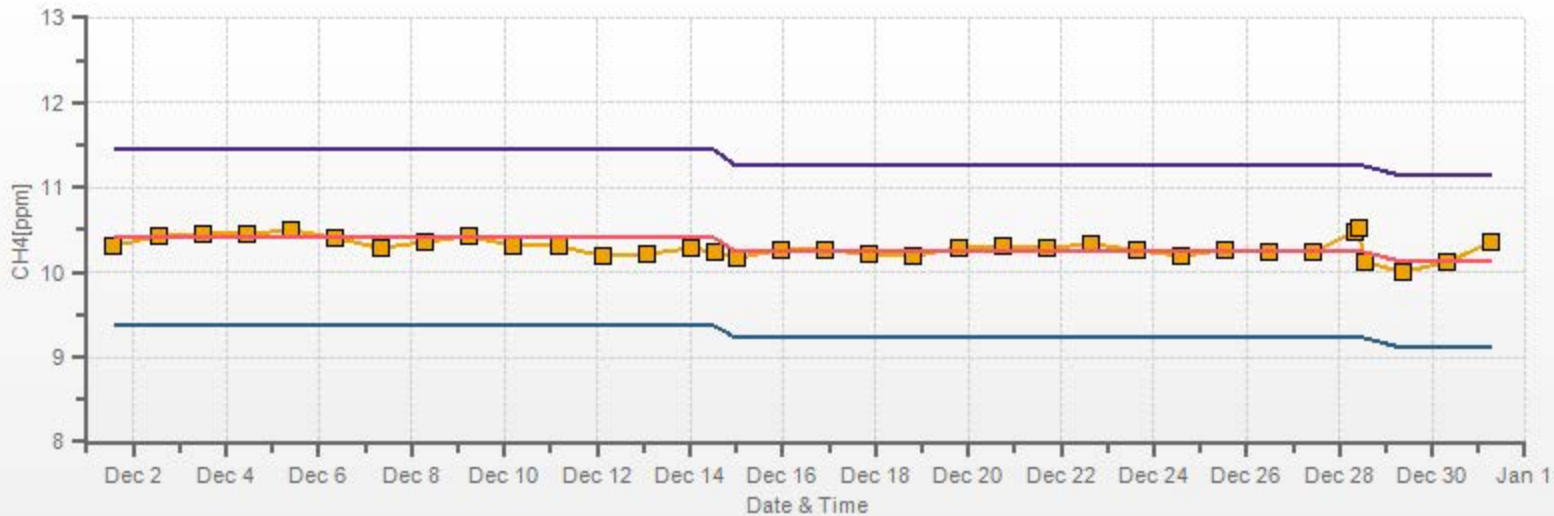
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.3_CALM % = 3.4%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|------|------|-----|------|-----|-------|
| N | 0.3 | 2.6 | 0.0 | 0.0 | 0.0 | 2.9 |
| NE | 2.8 | 3.1 | 0.0 | 0.0 | 0.0 | 5.9 |
| E | 2.5 | 16.8 | 0.0 | 0.0 | 0.0 | 19.3 |
| SE | 0.4 | 13.6 | 0.2 | 0.0 | 0.0 | 14.2 |
| S | 0.0 | 3.2 | 0.0 | 0.0 | 0.0 | 3.2 |
| SW | 2.2 | 21.2 | 0.7 | 0.0 | 0.0 | 24.2 |
| W | 1.5 | 16.7 | 0.3 | 0.0 | 0.0 | 18.4 |
| NW | 1.5 | 7.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Summary | 11.1 | 84.3 | 1.2 | 0.0 | 0.0 | 96.6 |
| CALM | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 3.4 |

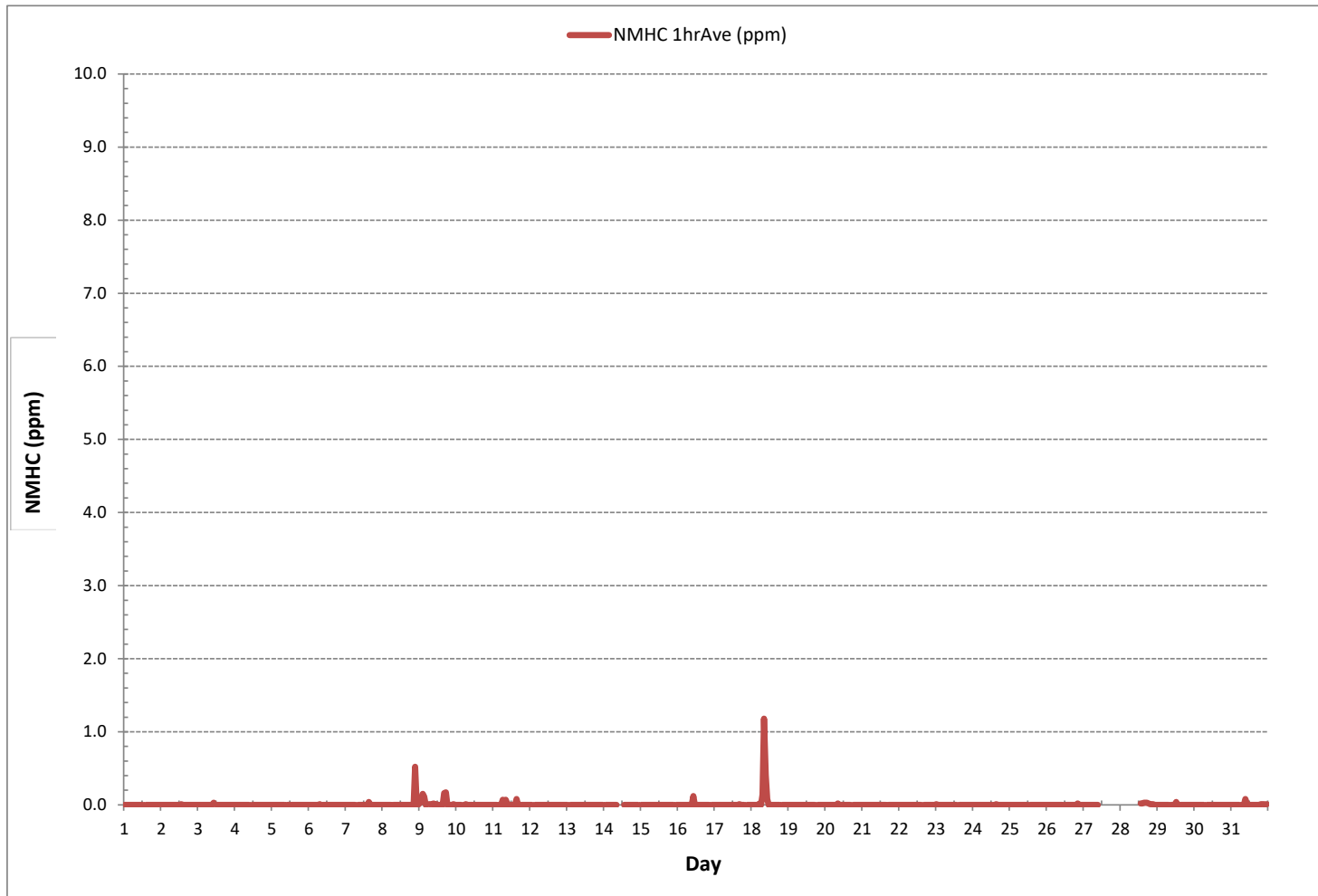
CH4[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



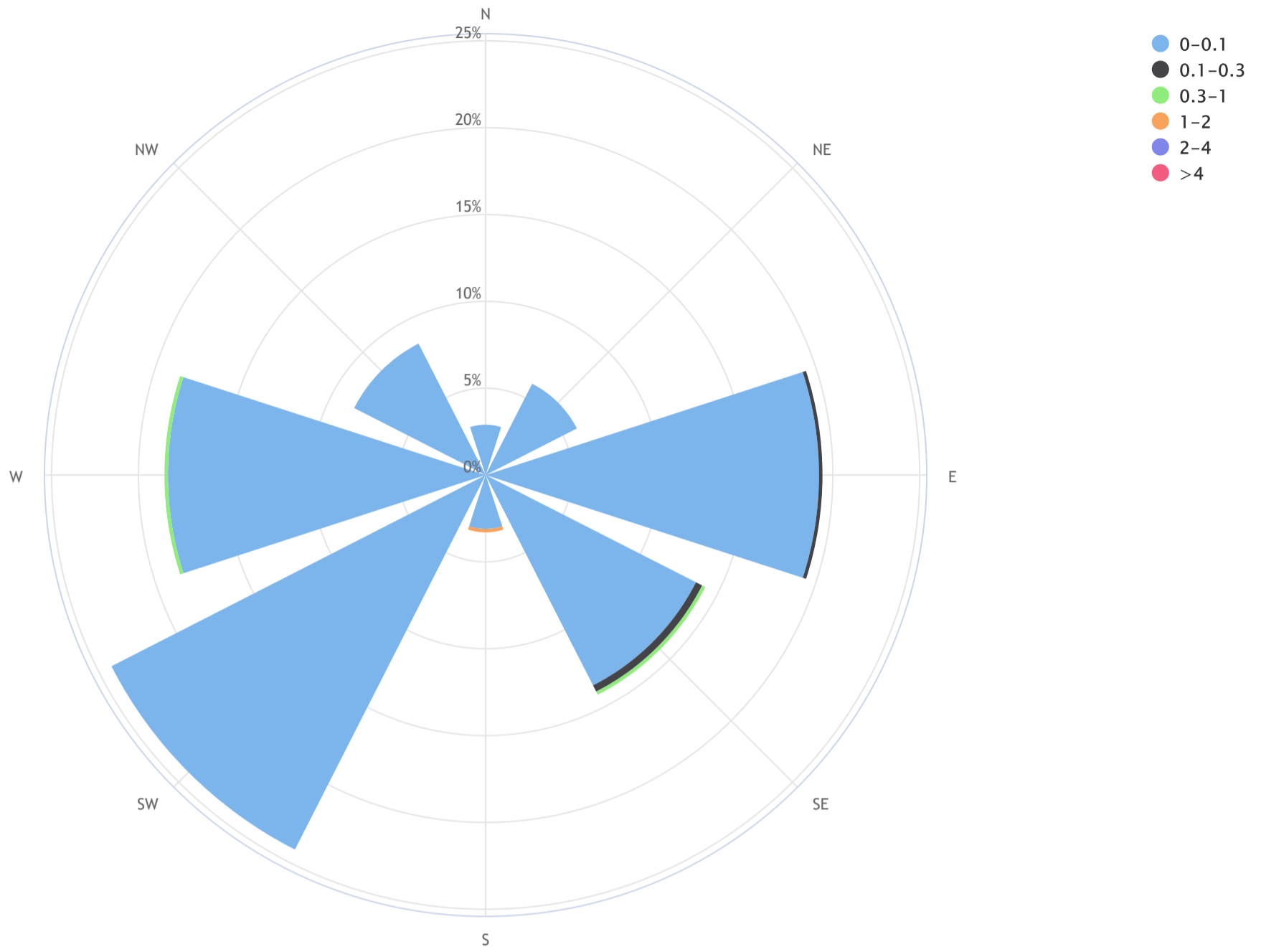
NON-METHANE HYDROCARBON

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NMHC (ppm)_18/12

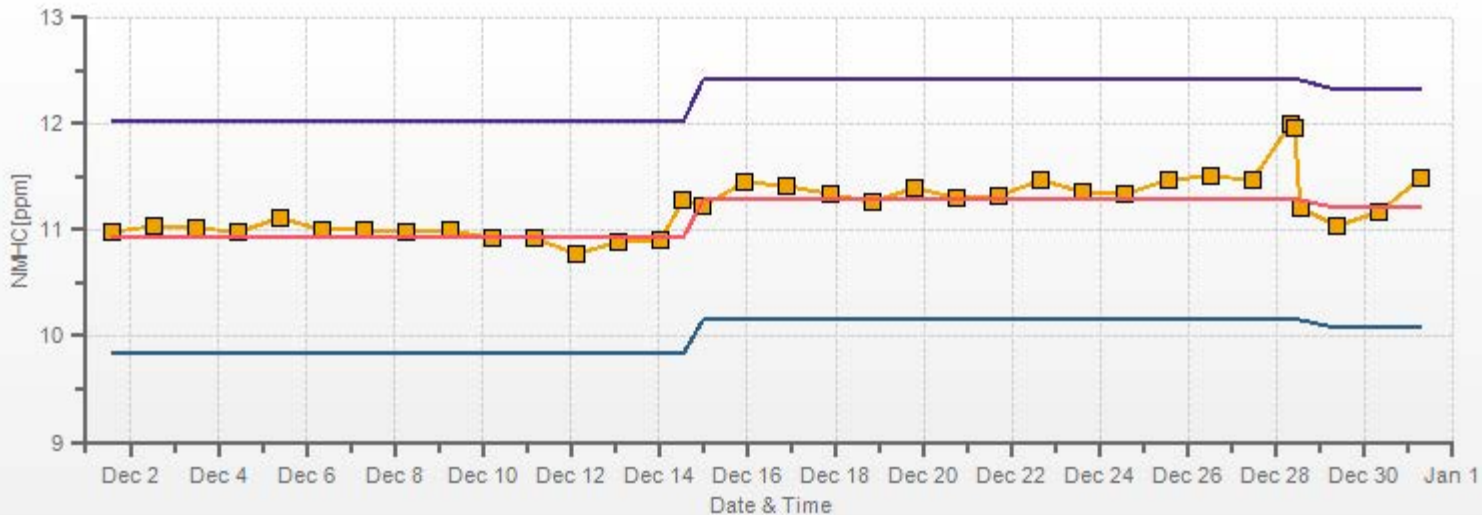
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 3.4%



| Direction | 0-0.1 | 0.1-0.3 | 0.3-1 | 1-2 | 2-4 | >4 | TOTAL |
|-----------|-------|---------|-------|-----|-----|-----|-------|
| N | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 |
| NE | 5.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.9 |
| E | 19.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 19.3 |
| SE | 13.6 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 14.2 |
| S | 3.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 3.2 |
| SW | 24.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24.2 |
| W | 18.3 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 18.5 |
| NW | 8.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Summary | 95.6 | 0.6 | 0.3 | 0.2 | 0.0 | 0.0 | 96.7 |
| CALM | 3.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

NMHC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

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



OXIDES OF NITROGEN

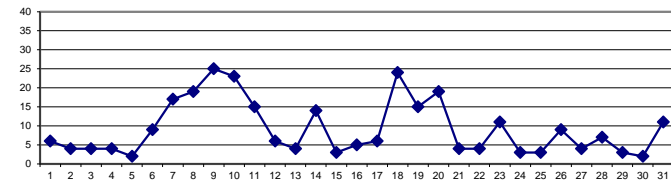
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 8 | 7 | 6 | 8 | 9 | 7 | 6 | 5 | 6 | 7 | 7 | 5 | 6 | S | 5 | 5 | 4 | 5 | 5 | 6 | 4 | 4 | 4 | 2 | 2 | 2 | 9 | 6 | 24 |
| 2 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 2 | 2 | S | 3 | 4 | 4 | 7 | 7 | 9 | 4 | 2 | 3 | 1 | 1 | 1 | 9 | 4 | 24 | |
| 3 | 2 | 2 | 3 | 5 | 3 | 7 | 9 | 11 | 9 | 5 | 7 | S | 5 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 11 | 4 | 24 |
| 4 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | S | 3 | 4 | 3 | 6 | 7 | 8 | 8 | 8 | 5 | 4 | 3 | 5 | 7 | 1 | 8 | 4 | 24 | |
| 5 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | S | 3 | 3 | 4 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 4 | 2 | 24 | |
| 6 | 2 | 2 | 3 | 3 | 3 | 3 | 6 | 12 | S | 11 | 8 | 7 | 9 | 14 | 12 | 13 | 15 | 15 | 13 | 12 | 12 | 12 | 12 | 13 | 2 | 15 | 9 | 24 | |
| 7 | 10 | 9 | 8 | 9 | 9 | 10 | 14 | S | 27 | 23 | 29 | 24 | 25 | 17 | 21 | 19 | 20 | 19 | 17 | 16 | 15 | 15 | 16 | 15 | 8 | 29 | 17 | 24 | |
| 8 | 13 | 14 | 18 | 21 | 19 | 17 | S | 15 | 15 | 17 | 22 | 28 | 31 | 29 | 19 | 21 | 17 | 18 | 19 | 15 | 16 | 17 | 12 | 14 | 12 | 31 | 19 | 24 | |
| 9 | 14 | 12 | 15 | 18 | 12 | S | 12 | 13 | 26 | 35 | 26 | 34 | 26 | 17 | 18 | 17 | 33 | 48 | 35 | 52 | 32 | 19 | 29 | 35 | 12 | 52 | 25 | 24 | |
| 10 | 31 | 23 | 25 | 18 | S | 16 | 23 | 26 | 23 | 31 | 29 | 19 | 20 | 29 | 32 | 32 | 32 | 30 | 27 | 18 | 11 | 10 | 8 | 6 | 6 | 32 | 23 | 24 | |
| 11 | 6 | 5 | 6 | S | 11 | 11 | 15 | 27 | 97 | 45 | 22 | 12 | 7 | 7 | 12 | 18 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 97 | 15 | 24 | |
| 12 | 5 | 4 | S | 6 | 7 | 8 | 10 | 12 | 11 | 11 | 8 | 6 | 4 | 5 | 7 | 8 | 4 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 12 | 6 | 24 | |
| 13 | 2 | S | 5 | 7 | 5 | 4 | 5 | 4 | 5 | 5 | C | C | C | C | C | C | C | 5 | 5 | 4 | 3 | 3 | 3 | 4 | 2 | 7 | 4 | 24 | |
| 14 | S | 5 | 5 | 19 | 17 | 23 | 18 | 25 | 45 | 37 | 11 | 4 | 4 | 7 | 11 | 14 | 13 | 6 | 5 | 8 | 8 | 8 | 7 | 6 | S | 4 | 45 | 14 | 24 |
| 15 | 4 | 4 | 7 | 4 | 11 | 8 | 11 | 6 | 8 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 11 | 3 | 24 |
| 16 | 1 | 2 | 2 | 3 | 3 | 7 | 6 | 6 | 16 | 23 | 9 | 4 | 4 | 3 | 4 | 4 | 4 | 6 | 4 | 3 | 3 | S | 3 | 4 | 1 | 23 | 5 | 24 | |
| 17 | 3 | 3 | 2 | 3 | 4 | 4 | 4 | 7 | 12 | 7 | 6 | 2 | 2 | 3 | 5 | 6 | 10 | 7 | 8 | 13 | S | 10 | 11 | 12 | 2 | 13 | 6 | 24 | |
| 18 | 11 | 24 | 25 | 24 | 24 | 26 | S1 | 37 | 62 | 52 | 33 | 14 | 9 | 11 | 14 | 19 | 18 | 17 | 19 | S | 22 | 22 | 30 | 24 | 9 | 62 | 24 | 23 | |
| 19 | 14 | 15 | 14 | 14 | 15 | 20 | 21 | 21 | 24 | 25 | 21 | 19 | 17 | 14 | 11 | 10 | 10 | 9 | S | 12 | 8 | 7 | 7 | 6 | 6 | 25 | 15 | 24 | |
| 20 | 5 | 5 | 6 | 8 | 8 | 15 | 25 | 37 | 34 | 46 | 66 | 59 | 39 | 22 | 13 | 10 | 7 | S | 6 | 7 | 5 | 5 | 4 | 3 | 3 | 66 | 19 | 24 | |
| 21 | 3 | 4 | 7 | 5 | 5 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 3 | 3 | 4 | 3 | S | 4 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 7 | 4 | 24 | |
| 22 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | S | 8 | 8 | 8 | 6 | 8 | 12 | 16 | 14 | 1 | 16 | 4 | 24 | |
| 23 | 17 | 17 | 18 | 17 | 18 | 20 | 19 | 19 | 14 | 16 | 13 | 6 | 7 | 6 | S | 4 | 5 | 7 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 20 | 11 | 24 |
| 24 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | S | 3 | 3 | 5 | 9 | 5 | 1 | 1 | 2 | 2 | 2 | 1 | 9 | 3 | 24 | |
| 25 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | S | 6 | 4 | 3 | 4 | 4 | 5 | 4 | 5 | 6 | 7 | 7 | 2 | 7 | 3 | 24 | |
| 26 | 8 | 10 | 12 | 13 | 11 | 9 | 7 | 6 | 4 | 2 | 2 | S | 3 | 4 | 7 | 12 | 13 | 19 | 14 | 15 | 14 | 10 | 12 | 9 | 2 | 19 | 9 | 24 | |
| 27 | 6 | 7 | 5 | 6 | 5 | 3 | 2 | 2 | 3 | 2 | S | 3 | 6 | 3 | 3 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 4 | 4 | 2 | 7 | 4 | 24 | |
| 28 | 4 | 5 | 5 | 5 | 5 | 6 | 10 | 11 | 17 | S | 9 | 10 | 9 | 8 | 8 | 9 | 8 | 8 | 7 | 6 | 5 | 5 | 5 | 5 | 4 | 17 | 7 | 24 | |
| 29 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 3 | S | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 4 | 3 | 24 | |
| 30 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | S | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 2 | 24 | |
| 31 | 5 | 5 | 5 | 6 | 8 | 11 | S | S1 | 26 | 49 | 27 | 4 | 4 | 6 | 7 | 5 | 6 | 7 | 8 | 9 | 9 | 11 | 9 | 5 | 4 | 49 | 11 | 23 | |
| HOURLY MAX | 31 | 24 | 25 | 24 | 24 | 26 | 25 | 45 | 97 | 52 | 66 | 59 | 39 | 29 | 32 | 32 | 33 | 48 | 35 | 52 | 32 | 22 | 30 | 35 | 4 | 49 | 11 | 23 | |
| HOURLY AVG | 6 | 7 | 8 | 8 | 8 | 9 | 9 | 12 | 17 | 16 | 13 | 10 | 9 | 8 | 8 | 9 | 9 | 10 | 9 | 8 | 7 | 7 | 8 | 7 | | | | | |

STATUS FLAG CODES

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

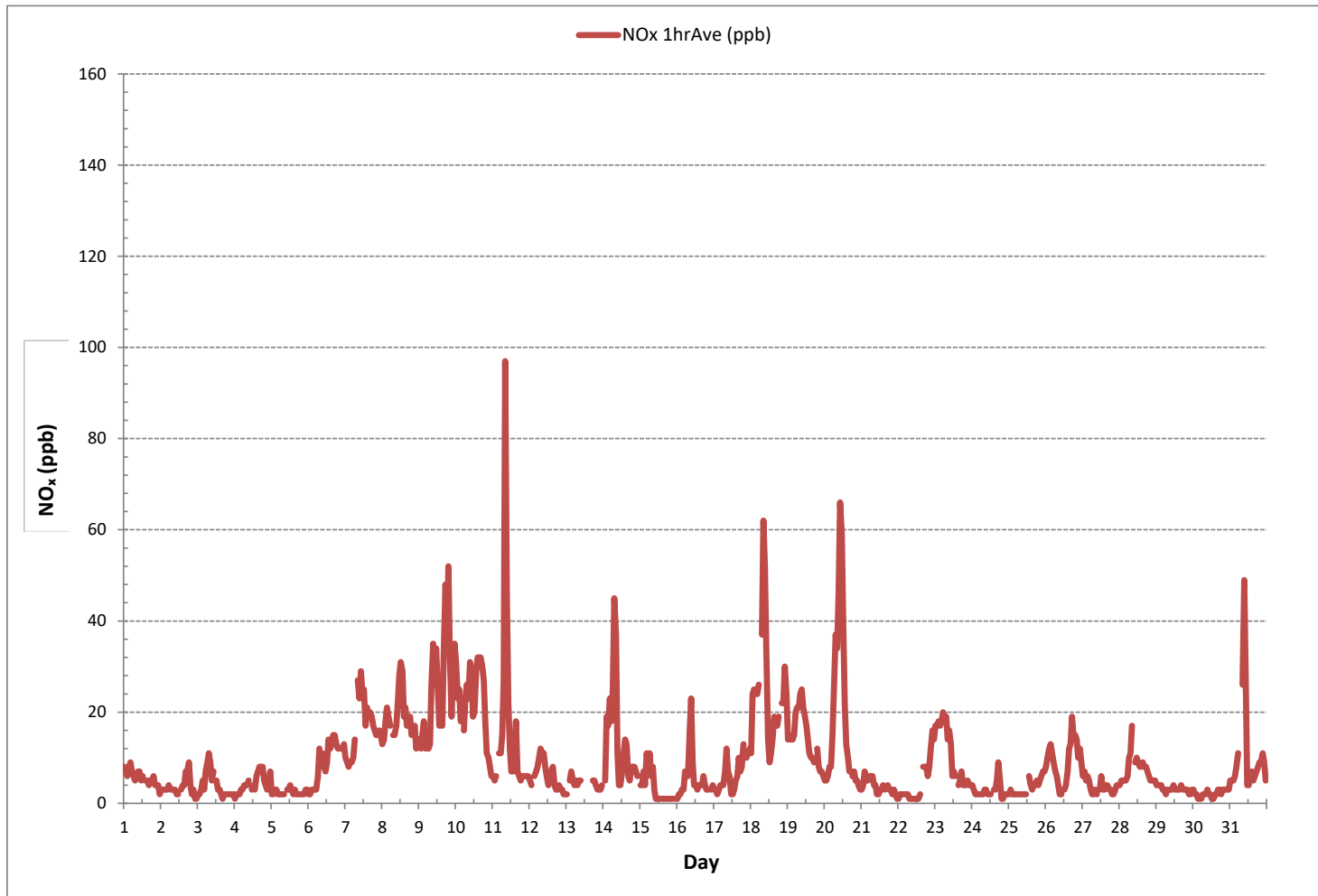
24 HR AVERAGES December 2018



MONTHLY SUMMARY

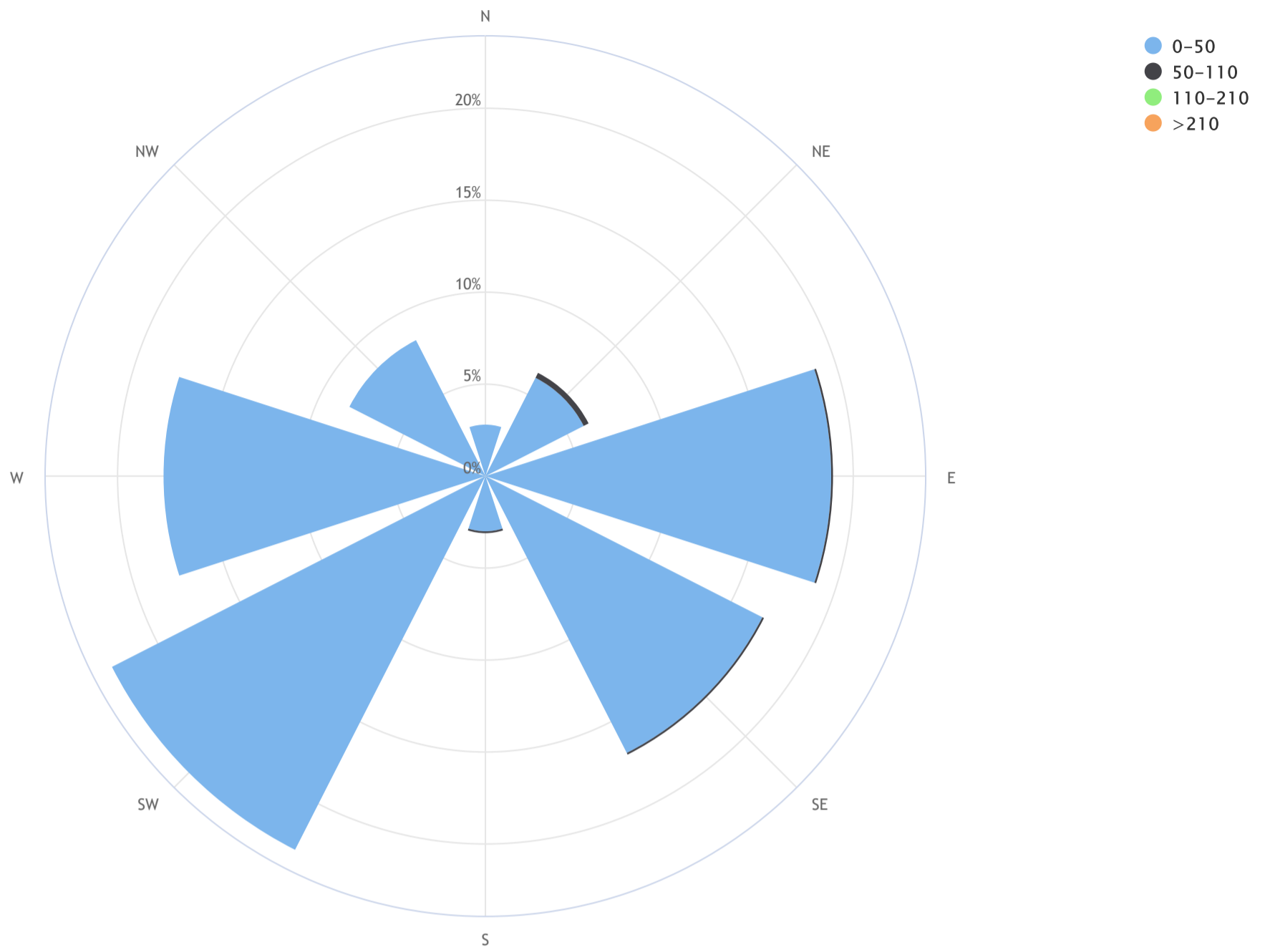
| | | | |
|------------------------------|---------------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 703 | | |
| MINIMUM 1-HR AVERAGE: | 1 ppb @ HOUR | 22 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 97 ppb @ HOUR | 8 | ON DAY 11 |
| MAXIMUM 24-HR AVERAGE: | 25 ppb | | ON DAY 9 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 742 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 99.7 % |
| STANDARD DEVIATION: | 10 | MONTHLY AVERAGE: | 9 ppb |

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO_x (ppb)_18/12

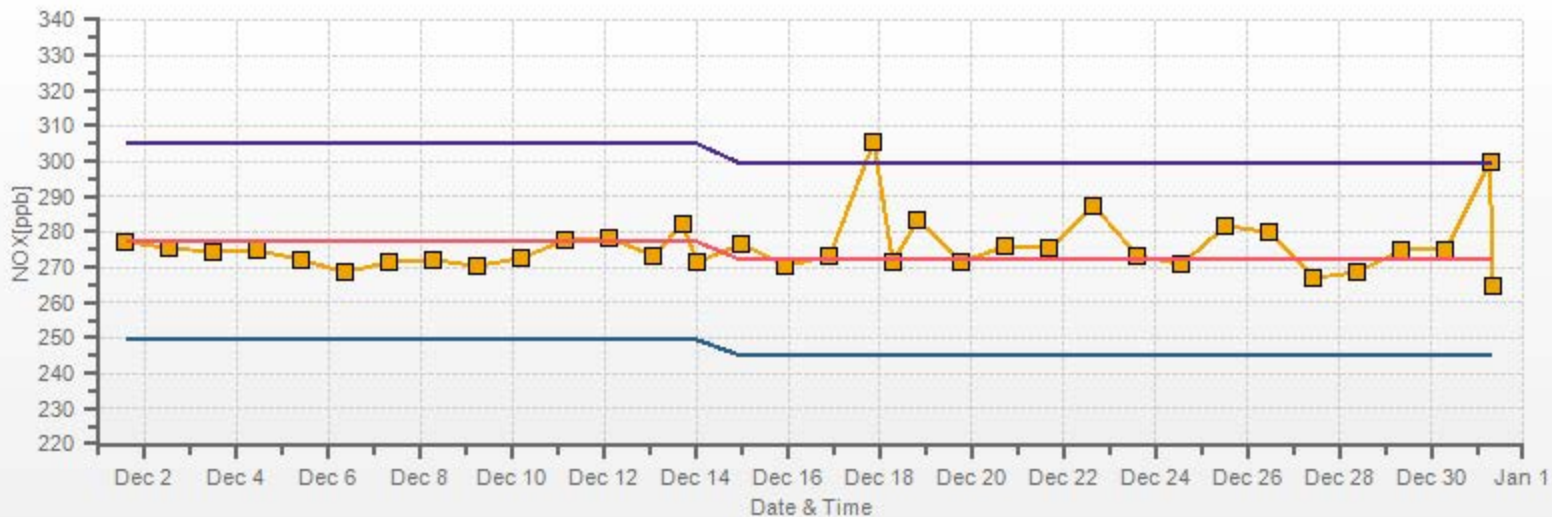
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 16.3_CALM % = 3.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 6.0 | 0.3 | 0.0 | 0.0 | 6.3 |
| E | 18.8 | 0.1 | 0.0 | 0.0 | 18.9 |
| SE | 16.9 | 0.1 | 0.0 | 0.0 | 17.1 |
| S | 3.0 | 0.1 | 0.0 | 0.0 | 3.1 |
| SW | 22.8 | 0.0 | 0.0 | 0.0 | 22.8 |
| W | 17.5 | 0.0 | 0.0 | 0.0 | 17.5 |
| NW | 8.3 | 0.0 | 0.0 | 0.0 | 8.3 |
| Summary | 96.0 | 0.7 | 0.0 | 0.0 | 96.7 |
| CALM | 3.1 | 0.1 | 0.0 | 0.0 | 3.3 |

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

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



NITRIC OXIDE

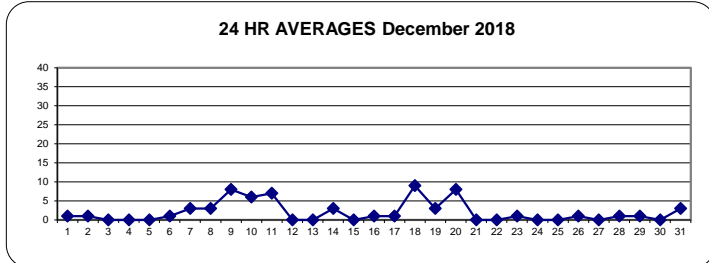
NITRIC OXIDE Hourly Averages (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 24 |
| 2 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 24 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | S | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | S | 3 | 2 | 2 | 3 | 5 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 24 |
| 7 | 0 | 0 | 0 | 0 | 0 | 1 | S | 10 | 11 | 15 | 12 | 12 | 6 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 15 | 3 | 24 | |
| 8 | 0 | 0 | 1 | 3 | 1 | 1 | S | 1 | 2 | 7 | 11 | 14 | 14 | 11 | 4 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 14 | 3 | 24 | |
| 9 | 1 | 0 | 1 | 2 | 1 | S | 1 | 1 | 9 | 18 | 14 | 19 | 12 | 6 | 5 | 2 | 7 | 21 | 11 | 26 | 10 | 2 | 10 | 14 | 0 | 26 | 8 | 24 | |
| 10 | 13 | 7 | 9 | 3 | S | 2 | 4 | 5 | 4 | 13 | 14 | 8 | 9 | 12 | 12 | 10 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 6 | 24 | |
| 11 | 0 | 0 | 0 | S | 2 | 1 | 5 | 11 | 71 | 30 | 13 | 5 | 2 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 71 | 7 | 24 | |
| 12 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | |
| 13 | 0 | S | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | C | C | C | C | C | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 14 | S | 0 | 1 | 1 | 2 | 3 | 6 | 18 | 13 | 2 | 1 | 2 | 3 | 3 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 18 | 3 | 24 | |
| 15 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 0 | 24 | |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | S | 0 | 0 | 0 | 7 | 1 | 24 | |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 0 | 2 | 1 | 24 | |
| 18 | 0 | 7 | 7 | 6 | 7 | 10 | S1 | 20 | 41 | 33 | 18 | 6 | 3 | 4 | 4 | 3 | 1 | 1 | 1 | S | 4 | 4 | 11 | 8 | 0 | 41 | 9 | 23 | |
| 19 | 1 | 1 | 0 | 1 | 2 | 4 | 5 | 5 | 7 | 10 | 9 | 7 | 6 | 4 | 2 | 1 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 3 | 24 | |
| 20 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 16 | 14 | 27 | 43 | 37 | 19 | 7 | 3 | 1 | 0 | 0 | S | 0 | 1 | 0 | 0 | 0 | 0 | 43 | 8 | 24 | |
| 21 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 24 | |
| 23 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 1 | 0 | 4 | 4 | 2 | 3 | 2 | S | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | 1 | 24 |
| 24 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | S | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 2 | 3 | 1 | 5 | 1 | 3 | 1 | 1 | 1 | 0 | 0 | 5 | 1 | 24 | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 24 |
| 28 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | S | 2 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 24 |
| 29 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 30 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | S | 7 | 24 | 12 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 24 | 3 | 23 |
| HOURLY MAX | 13 | 7 | 9 | 6 | 7 | 10 | 7 | 20 | 71 | 33 | 43 | 37 | 19 | 12 | 12 | 10 | 7 | 21 | 11 | 26 | 10 | 4 | 11 | 14 | | | | | |
| HOURLY AVG | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 6 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | | | | | |

STATUS FLAG CODES

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

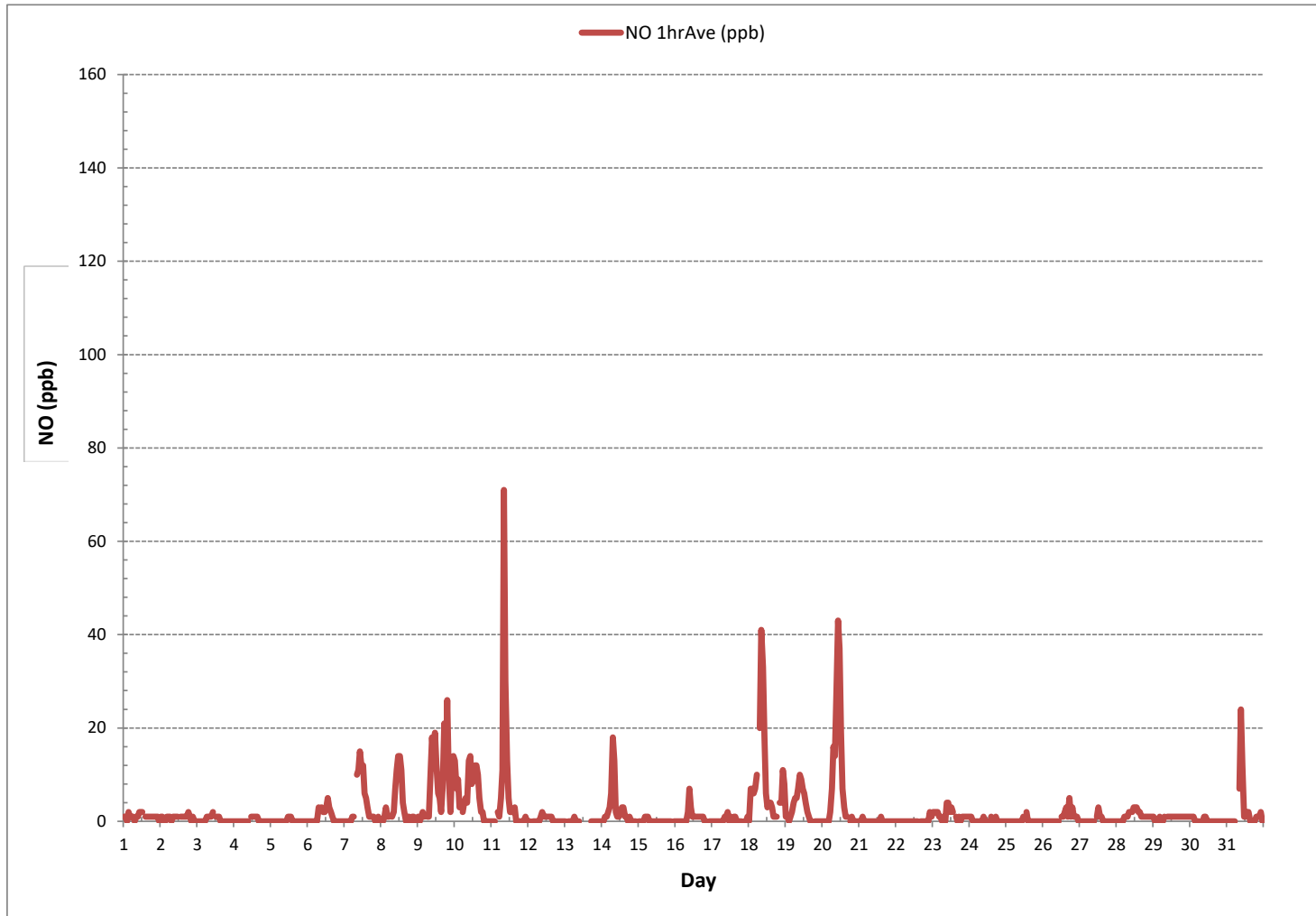
24 HR AVERAGES December 2018



MONTHLY SUMMARY

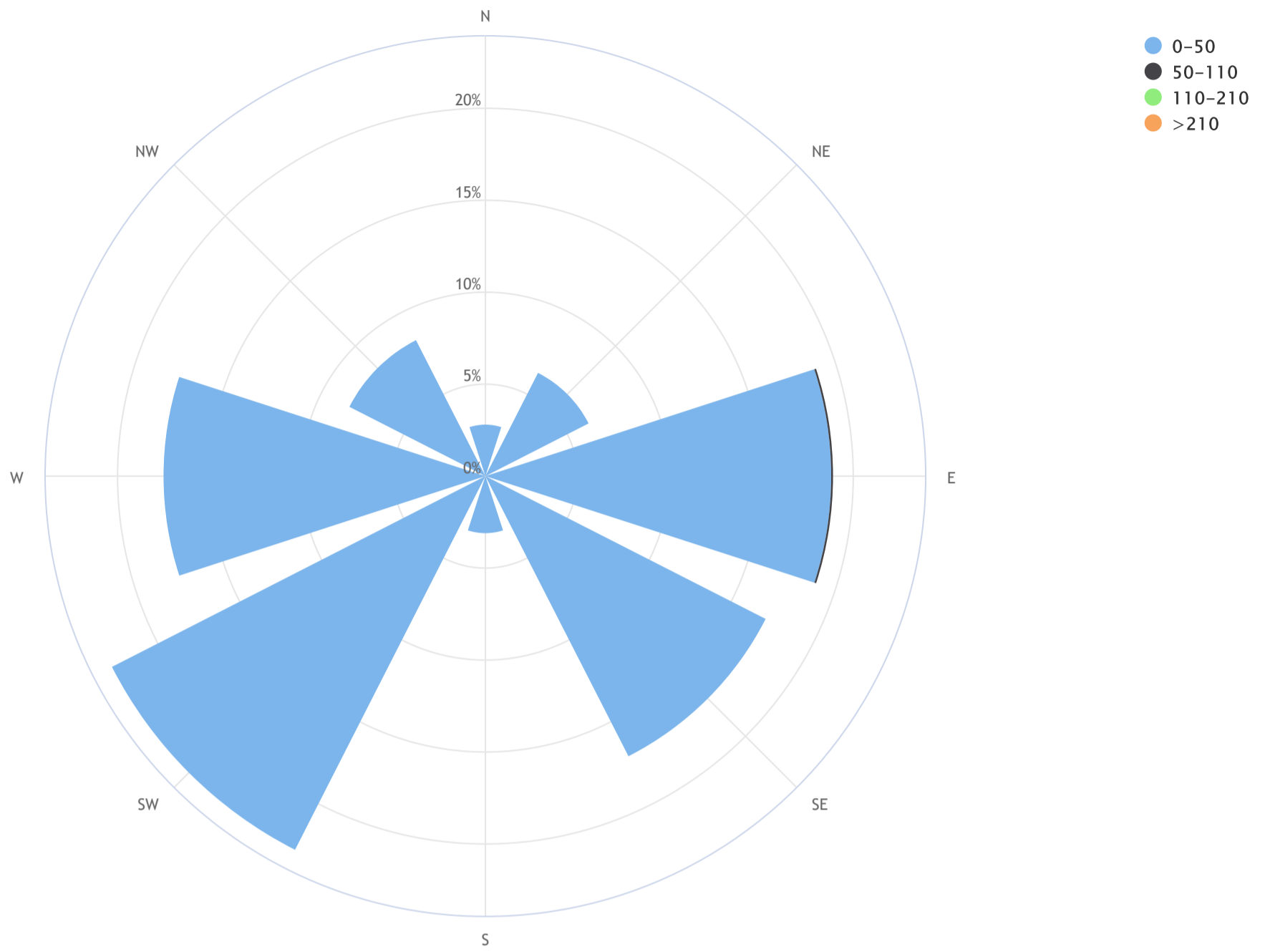
| | | | | |
|------------------------------|-----|------------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 339 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 2 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 71 | ppb @ HOUR | 8 | ON DAY 11 |
| MAXIMUM 24-HR AVERAGE: | 9 | ppb | | ON DAY 18 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 742 hrs |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 99.7 % |
| STANDARD DEVIATION: | 5 | | MONTHLY AVERAGE: | 2 ppb |

NITRIC OXIDE Hourly Averages (NO ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 3.6_CALM % = 3.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 6.3 | 0.0 | 0.0 | 0.0 | 6.3 |
| E | 18.8 | 0.1 | 0.0 | 0.0 | 18.9 |
| SE | 17.1 | 0.0 | 0.0 | 0.0 | 17.1 |
| S | 3.1 | 0.0 | 0.0 | 0.0 | 3.1 |
| SW | 22.8 | 0.0 | 0.0 | 0.0 | 22.8 |
| W | 17.5 | 0.0 | 0.0 | 0.0 | 17.5 |
| NW | 8.3 | 0.0 | 0.0 | 0.0 | 8.3 |
| Summary | 96.6 | 0.1 | 0.0 | 0.0 | 96.7 |
| CALM | 3.3 | 0.0 | 0.0 | 0.0 | 3.3 |

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

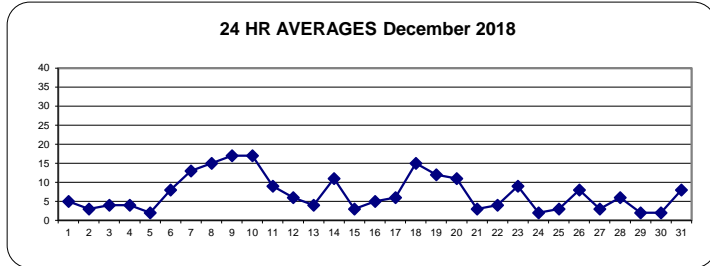
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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 159 ppb

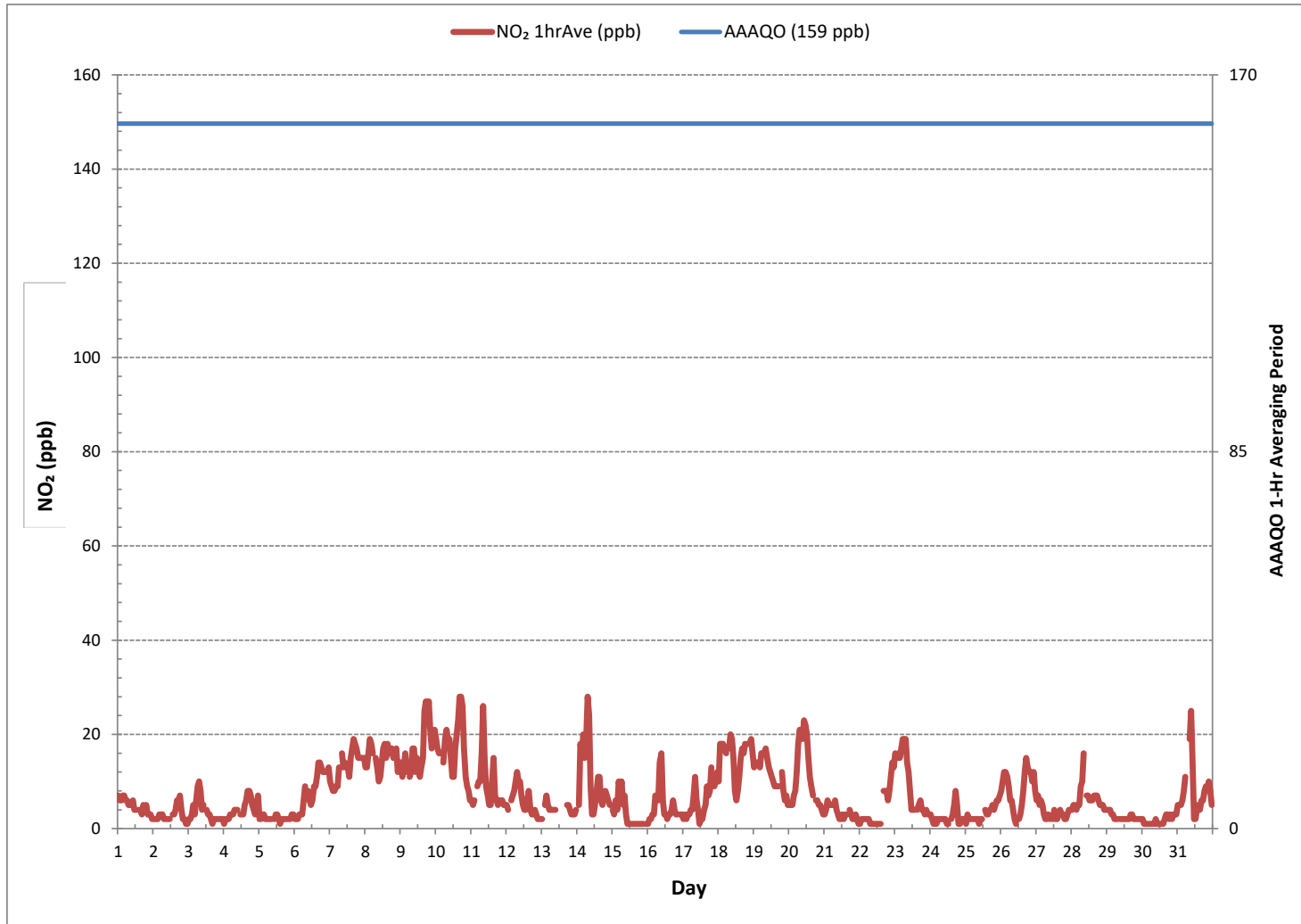
24 HR AVERAGES December 2018



MONTHLY SUMMARY

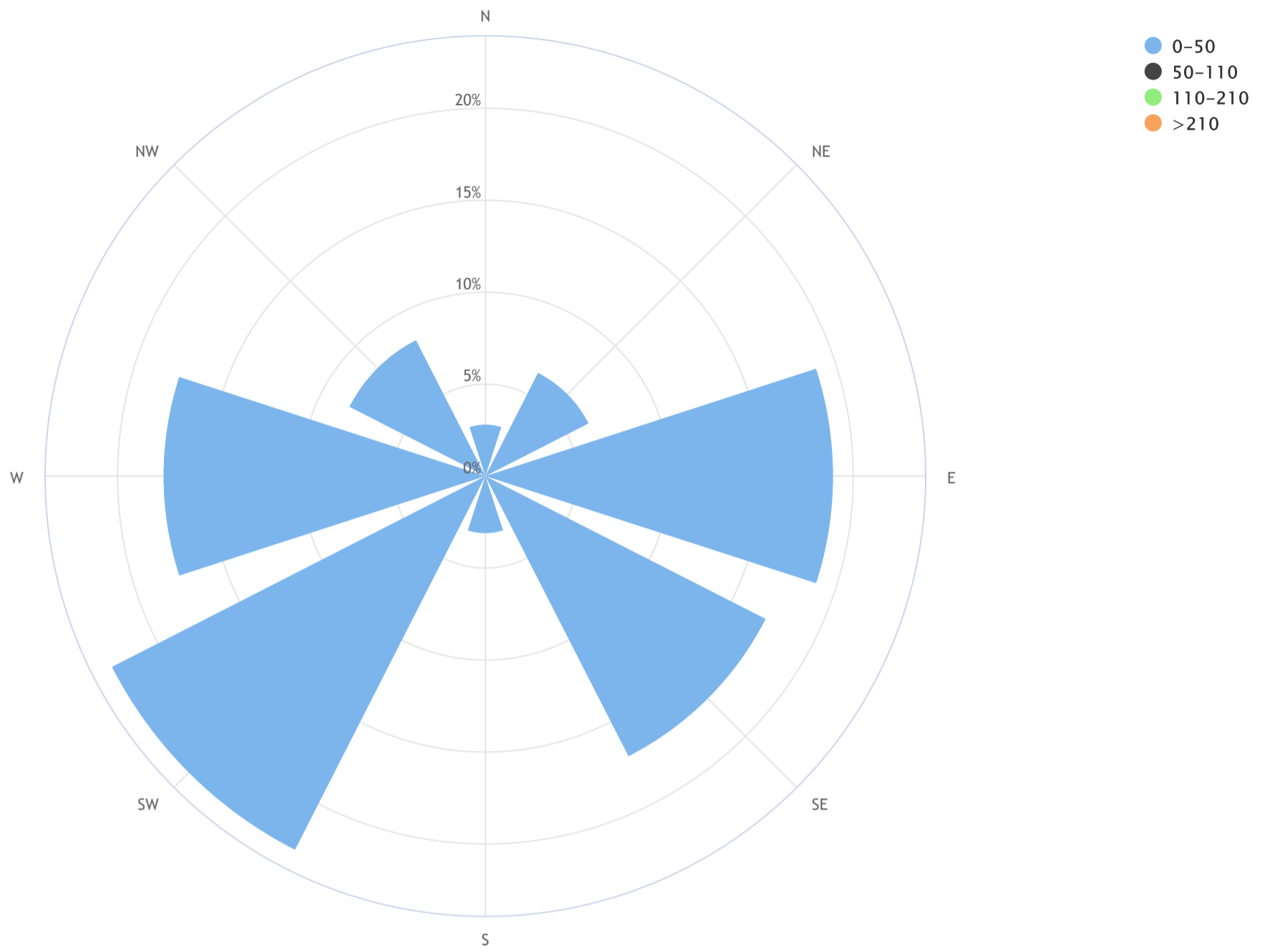
| | | | |
|------------------------------|---------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 703 | | |
| MINIMUM 1-HR AVERAGE: | 1 ppb @ HOUR | 22 ON DAY | 2 |
| MAXIMUM 1-HR AVERAGE: | 28 ppb @ HOUR | 16 ON DAY | 10 |
| MAXIMUM 24-HR AVERAGE: | 17 ppb | ON DAY | 9 |
| Izs CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 742 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 99.7 % |
| STANDARD DEVIATION: | 6 | MONTHLY AVERAGE: | 7 ppb |

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO₂ (ppb)_18/12

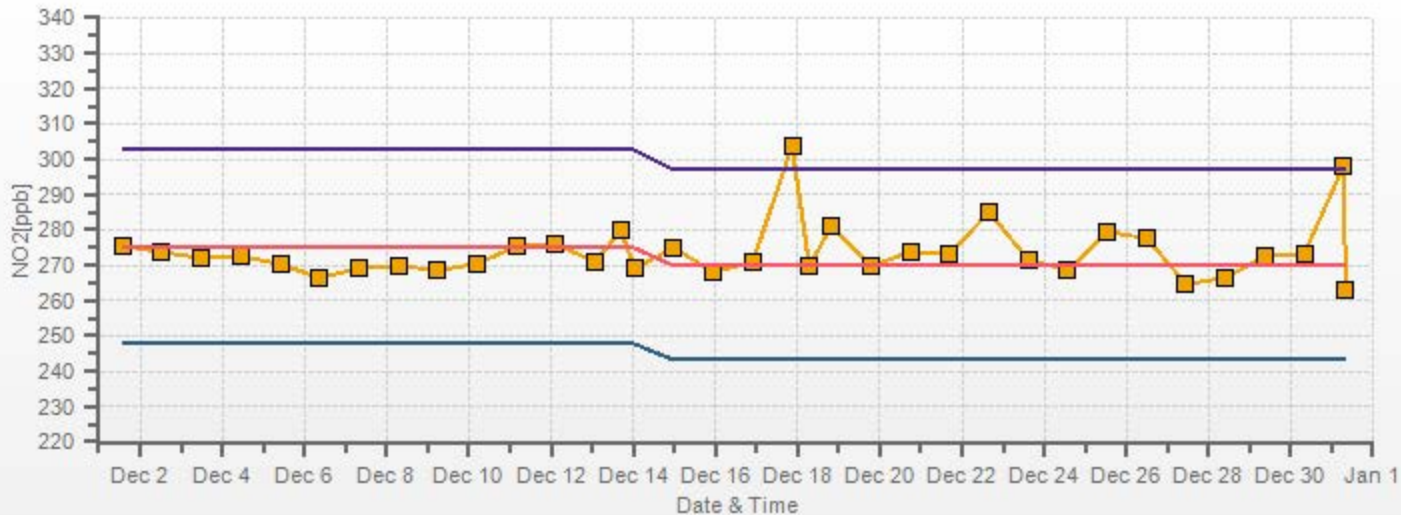
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 12.7_CALM % = 3.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 6.3 | 0.0 | 0.0 | 0.0 | 6.3 |
| E | 18.9 | 0.0 | 0.0 | 0.0 | 18.9 |
| SE | 17.1 | 0.0 | 0.0 | 0.0 | 17.1 |
| S | 3.1 | 0.0 | 0.0 | 0.0 | 3.1 |
| SW | 22.8 | 0.0 | 0.0 | 0.0 | 22.8 |
| W | 17.5 | 0.0 | 0.0 | 0.0 | 17.5 |
| NW | 8.3 | 0.0 | 0.0 | 0.0 | 8.3 |
| Summary | 96.7 | 0.0 | 0.0 | 0.0 | 96.7 |
| CALM | 3.3 | 0.0 | 0.0 | 0.0 | 3.3 |

NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 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 | 7.0 | 8.5 | 8.8 | 8.7 | 8.0 | 9.9 | 9.7 | 10.0 | 12.4 | 14.4 | 14.5 | 16.5 | 16.6 | S | 16.9 | 15.6 | 15.6 | 14.9 | 16.3 | 15.9 | 17.8 | 17.7 | 18.1 | 18.8 | 7.0 | 18.8 | 13.6 | 24 | |
| 2 | 19.1 | 17.7 | 16.0 | 15.1 | 14.6 | 14.2 | 14.3 | 15.0 | 14.8 | 15.4 | 16.7 | 17.9 | S | 19.1 | 19.1 | 19.4 | 17.4 | 17.1 | 16.8 | 20.3 | 21.5 | 21.2 | 20.8 | 20.8 | 14.2 | 21.5 | 17.6 | 24 | |
| 3 | 19.7 | 18.4 | 17.8 | 15.6 | 14.6 | 10.4 | 7.6 | 4.9 | 5.4 | 7.4 | 7.5 | S | 14.5 | 19.2 | 23.7 | 27.6 | 30.0 | 27.7 | 27.7 | 26.3 | 26.1 | 25.9 | 25.3 | 25.7 | 4.9 | 30.0 | 18.7 | 24 | |
| 4 | 28.4 | 26.3 | 27.2 | 28.3 | 28.0 | 27.6 | 28.2 | 29.7 | 31.1 | 32.0 | S | 34.2 | 33.9 | 33.7 | 30.1 | 27.4 | 24.6 | 24.7 | 24.6 | 27.8 | 29.0 | 30.1 | 24.9 | 20.1 | 34.2 | 28.3 | 24 | | |
| 5 | 28.1 | 29.3 | 25.2 | 23.0 | 23.3 | 27.8 | 28.0 | 28.7 | 28.1 | S | 29.2 | 27.9 | 26.8 | 28.4 | 31.7 | 30.9 | 31.0 | 31.7 | 31.2 | 30.0 | 28.9 | 29.2 | 29.9 | 30.7 | 23.0 | 31.7 | 28.7 | 24 | |
| 6 | 30.6 | 30.0 | 30.1 | 30.2 | 28.6 | 23.5 | 23.1 | 16.6 | S | 16.0 | 27.9 | 29.1 | 27.4 | 26.3 | 24.9 | 22.1 | 19.0 | 17.9 | 18.8 | 19.5 | 19.3 | 15.0 | 14.4 | 9.9 | 9.9 | 30.6 | 22.6 | 24 | |
| 7 | 9.7 | 9.6 | 9.8 | 8.8 | 8.7 | 7.4 | 4.1 | S | 2.0 | 7.2 | 11.4 | 16.3 | 17.2 | 19.9 | 16.5 | 16.1 | 11.7 | 9.6 | 9.8 | 11.5 | 12.6 | 13.5 | 9.6 | 6.7 | 2.0 | 19.9 | 10.9 | 24 | |
| 8 | 7.2 | 6.4 | 4.1 | 1.5 | 1.6 | 2.8 | S | 2.4 | 3.3 | 6.6 | 8.8 | 12.7 | 15.8 | 17.8 | 22.8 | 17.7 | 13.7 | 11.9 | 7.8 | 14.6 | 18.5 | 13.5 | 13.6 | 16.8 | 1.5 | 22.8 | 10.5 | 24 | |
| 9 | 12.3 | 9.6 | 6.8 | 3.6 | 4.9 | S | 4.9 | 5.1 | 2.8 | 4.0 | 7.2 | 9.9 | 15.7 | 20.7 | 18.3 | 15.7 | 3.6 | 1.1 | 2.0 | 1.5 | 1.9 | 3.4 | 2.1 | 1.1 | 1.1 | 20.7 | 6.9 | 24 | |
| 10 | 0.8 | 0.7 | 0.5 | 1.0 | S | 4.6 | 3.4 | 2.1 | 2.6 | 5.0 | 8.5 | 13.6 | 12.9 | 10.5 | 8.1 | 5.1 | 1.3 | 1.5 | 3.0 | 15.1 | 21.8 | 22.8 | 22.4 | 23.7 | 0.5 | 23.7 | 8.3 | 24 | |
| 11 | 23.1 | 25.5 | 24.3 | S | 10.6 | 8.0 | 5.4 | 1.0 | 1.6 | 3.2 | 7.0 | 21.4 | 24.1 | 23.9 | 19.3 | 18.5 | 27.8 | 28.0 | 28.3 | 26.3 | 25.9 | 24.6 | 24.0 | 23.4 | 1.0 | 28.3 | 18.5 | 24 | |
| 12 | 23.0 | 22.6 | S | 19.3 | 18.6 | 18.3 | 15.3 | 11.6 | 15.9 | 21.9 | 27.4 | 31.6 | 33.9 | 35.1 | 34.3 | 33.6 | 36.3 | 37.6 | 38.3 | 37.5 | 38.2 | 38.6 | 38.7 | 38.7 | 11.6 | 38.7 | 29.0 | 24 | |
| 13 | 37.7 | S | 27.9 | 24.4 | 22.6 | 31.3 | 31.7 | 31.8 | 30.8 | 30.9 | 30.4 | 32.2 | 33.3 | 33.4 | 33.7 | 35.9 | 36.3 | 35.7 | 35.4 | 35.7 | 36.3 | 36.4 | 35.5 | 32.9 | 22.6 | 37.7 | 32.7 | 24 | |
| 14 | S | 28.6 | 10.7 | 9.6 | 3.1 | 4.6 | 2.9 | 6.9 | 14.1 | C | C | C | C | C | 22.9 | 22.3 | 27.2 | 28.5 | 27.0 | 25.5 | 26.2 | 26.6 | 28.3 | S | 2.9 | 28.6 | 18.5 | 24 | |
| 15 | 28.9 | 28.2 | 21.9 | 18.4 | 12.6 | 10.8 | 12.0 | 19.5 | 23.5 | 31.7 | 36.1 | 34.7 | 35.5 | 36.9 | 35.3 | 33.4 | 32.6 | 31.9 | 31.5 | 31.9 | 32.7 | 36.1 | S | 35.4 | 10.8 | 36.9 | 28.3 | 24 | |
| 16 | 34.6 | 29.7 | 27.5 | 24.2 | 23.6 | 18.6 | 18.4 | 16.6 | 11.0 | 11.2 | 26.5 | 30.0 | 30.3 | 31.2 | 30.6 | 30.2 | 29.3 | 27.1 | 28.4 | 29.1 | 29.5 | S | 31.0 | 29.9 | 11.0 | 34.6 | 26.0 | 24 | |
| 17 | 30.3 | 31.0 | 32.5 | 32.0 | 31.0 | 31.9 | 31.3 | 27.3 | 23.2 | 27.0 | 29.6 | 31.6 | 31.1 | 30.0 | 27.4 | 26.6 | 21.9 | 22.7 | 20.3 | 15.0 | S | 17.1 | 11.2 | 8.7 | 8.7 | 32.5 | 25.7 | 24 | |
| 18 | 8.1 | 1.2 | 0.9 | 0.9 | 0.5 | 0.6 | 0.6 | 0.6 | 0.9 | 1.8 | 5.3 | 15.3 | 18.9 | 19.3 | 18.8 | 13.1 | 10.1 | 7.7 | 4.9 | S | 1.3 | 1.8 | 0.9 | 0.7 | 0.5 | 19.3 | 5.8 | 24 | |
| 19 | 2.6 | 6.0 | 7.2 | 4.4 | 2.4 | 0.8 | 0.6 | 1.2 | 3.3 | 6.6 | 12.4 | 17.4 | 21.1 | 23.3 | 25.5 | 26.8 | 26.3 | 25.8 | S | 22.3 | 26.8 | 28.2 | 27.4 | 25.8 | 0.6 | 28.2 | 15.0 | 24 | |
| 20 | 26.1 | 28.9 | 26.5 | 22.8 | 20.5 | 14.9 | 4.9 | 1.6 | 1.4 | 3.3 | 4.6 | 7.1 | 13.8 | 18.5 | 23.8 | 24.8 | 25.7 | S | 26.4 | 26.2 | 28.0 | 30.1 | 31.7 | 31.8 | 1.4 | 31.8 | 19.3 | 24 | |
| 21 | 30.5 | 27.6 | 23.4 | 22.9 | 21.8 | 20.2 | 20.1 | 21.7 | 23.6 | 25.0 | 27.3 | 28.6 | 26.5 | 26.4 | 25.8 | 25.0 | S | 25.0 | 26.5 | 27.2 | 28.0 | 26.0 | 24.2 | 23.6 | 20.1 | 30.5 | 25.1 | 24 | |
| 22 | 24.5 | 24.5 | 24.9 | 23.8 | 24.2 | 25.1 | 27.2 | 30.9 | 32.8 | 32.7 | 31.4 | 32.2 | 34.1 | 35.9 | 34.3 | S | 24.0 | 20.1 | 17.3 | 18.9 | 18.8 | 15.3 | 6.9 | 7.2 | 6.9 | 35.9 | 24.6 | 24 | |
| 23 | 5.0 | 3.8 | 2.7 | 5.2 | 4.9 | 3.7 | 4.8 | 4.4 | 9.0 | 12.4 | 17.9 | 24.0 | 25.5 | 27.1 | S | 26.1 | 25.7 | 24.9 | 27.8 | 27.5 | 27.6 | 27.8 | 28.7 | 30.6 | 2.7 | 30.6 | 17.3 | 24 | |
| 24 | 31.1 | 31.5 | 32.1 | 31.6 | 32.1 | 31.9 | 32.1 | 33.1 | 32.7 | 32.3 | 33.1 | 32.8 | 32.4 | S | 31.6 | 30.5 | 28.2 | 24.7 | 27.1 | 31.6 | 31.3 | 30.0 | 29.2 | 29.1 | 24.7 | 33.1 | 31.0 | 24 | |
| 25 | 28.3 | 26.8 | 27.6 | 27.2 | 26.9 | 26.6 | 26.3 | 26.0 | 25.6 | 25.6 | 25.6 | 25.8 | S | 25.3 | 25.3 | 24.1 | 22.9 | 22.2 | 21.0 | 21.2 | 20.4 | 18.6 | 17.5 | 17.5 | 17.5 | 28.3 | 24.1 | 24 | |
| 26 | 15.9 | 12.6 | 9.6 | 8.7 | 8.9 | 8.7 | 10.1 | 10.9 | 16.4 | 20.3 | 21.3 | S | 22.1 | 20.9 | 19.1 | 14.9 | 9.6 | 5.2 | 4.6 | 6.1 | 4.8 | 7.5 | 6.7 | 9.2 | 4.6 | 22.1 | 11.9 | 24 | |
| 27 | 11.5 | 10.4 | 14.6 | 14.8 | 16.8 | 19.6 | 20.0 | 19.8 | 19.9 | 20.7 | S | 21.5 | 20.9 | 21.7 | 21.5 | 20.8 | 20.2 | 20.8 | 21.1 | 20.9 | 20.7 | 19.9 | 18.8 | 18.0 | 10.4 | 21.7 | 18.9 | 24 | |
| 28 | 17.5 | 16.1 | 16.5 | 16.1 | 15.0 | 14.2 | 11.0 | 9.3 | 5.0 | S | 12.1 | 13.3 | 14.4 | 14.7 | 15.1 | 14.2 | 14.5 | 14.2 | 14.9 | 14.6 | 14.8 | 14.9 | 15.3 | 15.5 | 5.0 | 17.5 | 14.0 | 24 | |
| 29 | 15.9 | 15.9 | 16.1 | 16.2 | 16.7 | 17.4 | 18.2 | 19.3 | S | 20.4 | 20.9 | 20.8 | 20.3 | 21.0 | 22.0 | 22.5 | 22.7 | 22.3 | 22.2 | 21.7 | 21.8 | 22.1 | 22.4 | 22.7 | 15.9 | 22.7 | 20.1 | 24 | |
| 30 | 22.9 | 23.5 | 24.3 | 24.9 | 25.8 | 27.0 | 29.0 | S | 33.8 | 34.0 | 36.1 | 36.9 | 37.6 | 38.4 | 39.8 | 39.4 | 37.8 | 37.2 | 35.4 | 33.8 | 34.6 | 32.5 | 29.5 | 24.7 | 22.9 | 39.8 | 32.1 | 24 | |
| 31 | 22.9 | 20.4 | 19.7 | 17.8 | 14.7 | 11.3 | S | 6.4 | 3.1 | 5.3 | 15.6 | 28.9 | 27.4 | 25.0 | 26.5 | 26.2 | 22.7 | 20.6 | 16.2 | 15.0 | 15.6 | 14.2 | 16.3 | 20.5 | 3.1 | 28.9 | 17.9 | 24 | |
| HOURLY MAX | 37.7 | 31.5 | 32.5 | 32.0 | 32.1 | 31.9 | 32.1 | 33.1 | 33.8 | 34.0 | 36.1 | 36.9 | 37.6 | 38.4 | 39.8 | 39.4 | 37.8 | 37.6 | 38.3 | 37.5 | 38.2 | 38.6 | 38.7 | 38.7 | | | | | |
| HOURLY AVG | 20.1 | 19.0 | 17.9 | 16.7 | 16.2 | 15.8 | 15.4 | 14.3 | 14.8 | 16.9 | 19.7 | 23.7 | 24.4 | 25.1 | 24.8 | 23.6 | 22.3 | 21.3 | 21.1 | 22.4 | 22.7 | 22.0 | 20.8 | 20.7 | | | | | |

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 |

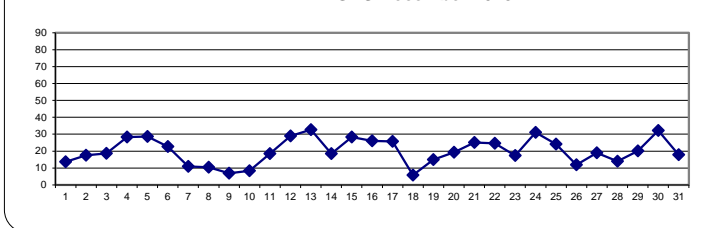
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

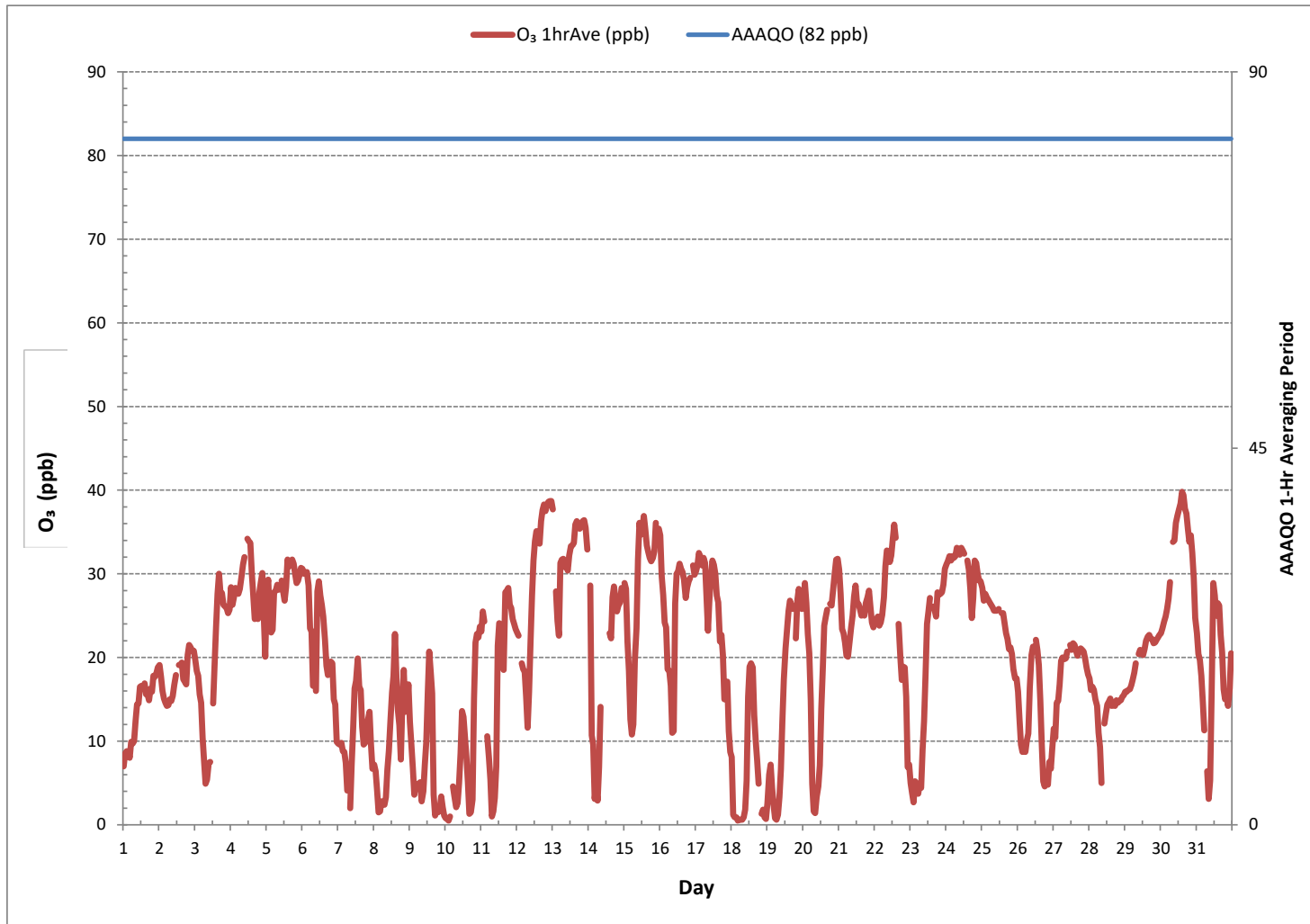
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 707 | | | |
| MINIMUM 1-HR AVERAGE: | 0.5 ppb | @ HOUR | 2 | ON DAY 10 |
| MAXIMUM 1-HR AVERAGE: | 39.8 ppb | @ HOUR | 14 | ON DAY 30 |
| MAXIMUM 24-HR AVERAGE: | 32.7 ppb | | | ON DAY 13 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 9.9 | MONTHLY AVERAGE: | 20.1 ppb | |

24 HR AVERAGES December 2018

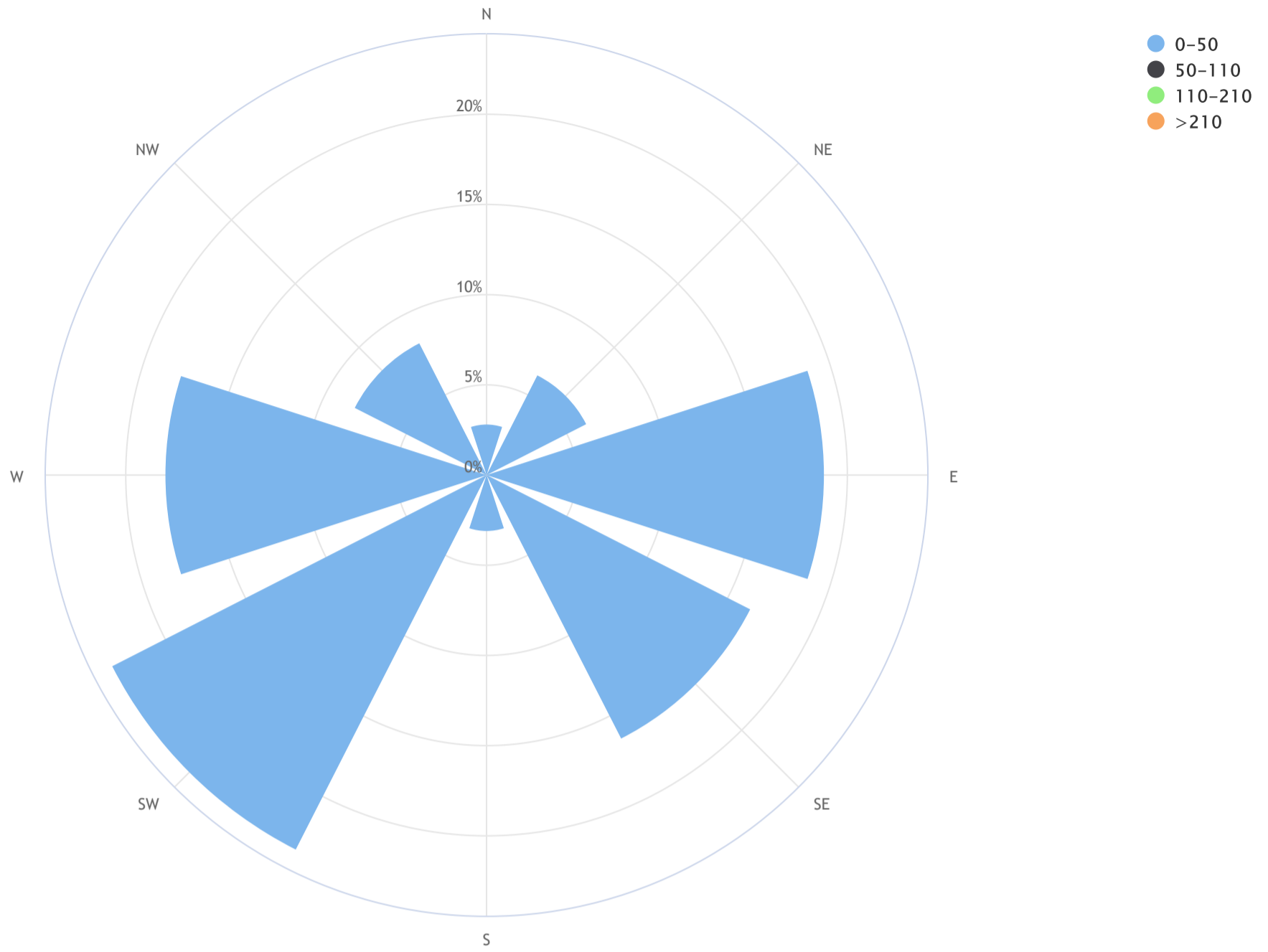


OZONE Hourly Averages (O₃ ppb)



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_O₃ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 6.7_CALM % = 3.4%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 6.2 | 0.0 | 0.0 | 0.0 | 6.2 |
| E | 18.7 | 0.0 | 0.0 | 0.0 | 18.7 |
| SE | 16.4 | 0.0 | 0.0 | 0.0 | 16.4 |
| S | 3.1 | 0.0 | 0.0 | 0.0 | 3.1 |
| SW | 23.3 | 0.0 | 0.0 | 0.0 | 23.3 |
| W | 17.8 | 0.0 | 0.0 | 0.0 | 17.8 |
| NW | 8.2 | 0.0 | 0.0 | 0.0 | 8.2 |
| Summary | 96.6 | 0.0 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 3.4 |

O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



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

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

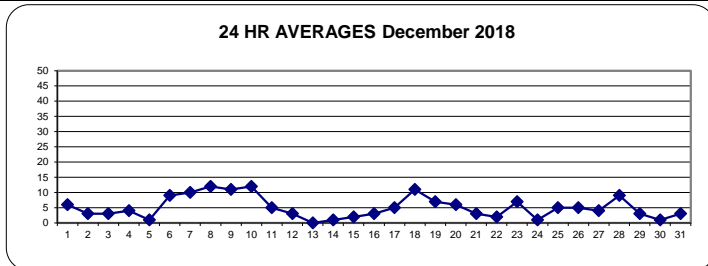
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 80 µg/m³ 24-HR 29 µg/m³

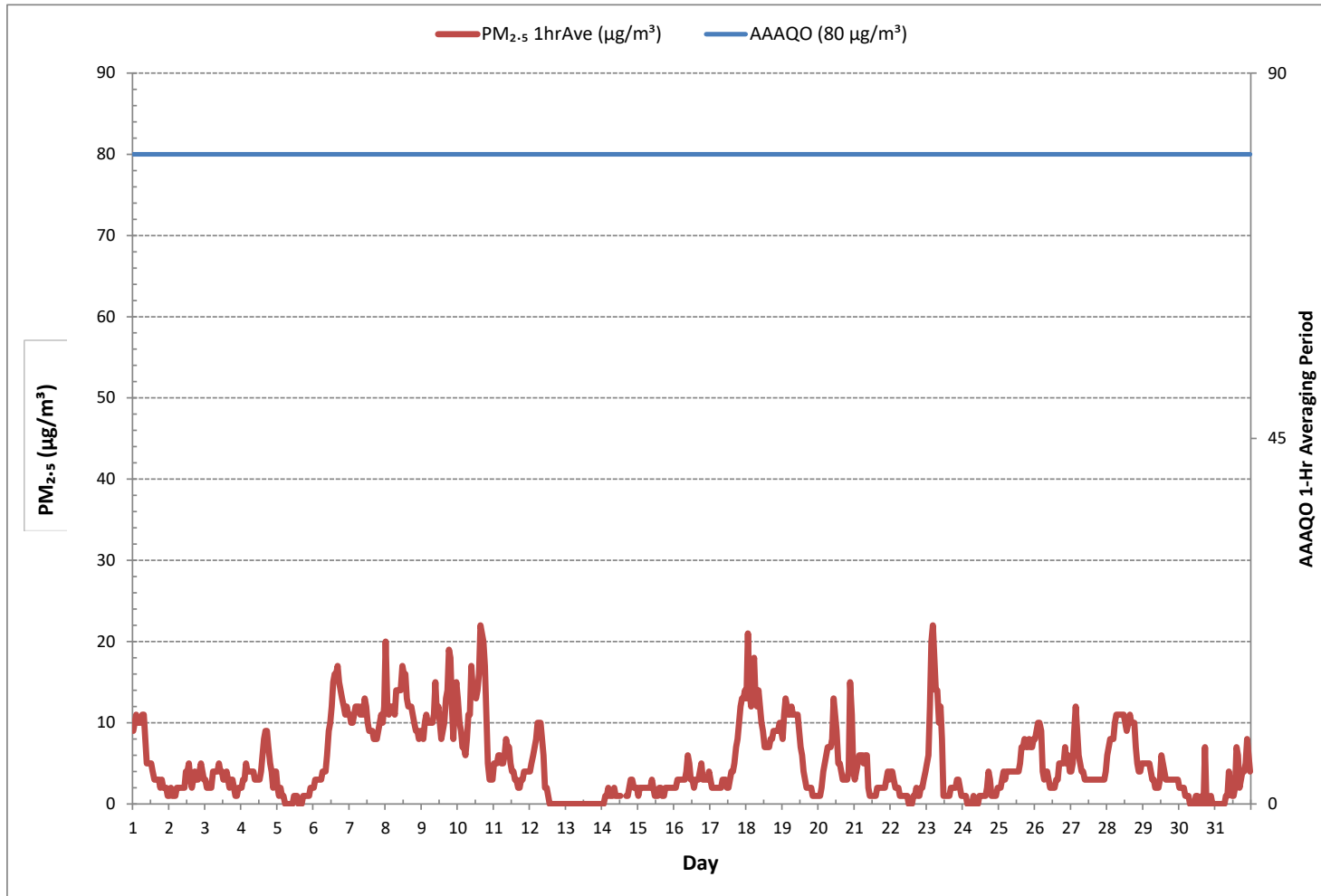
24 HR AVERAGES December 2018



MONTHLY SUMMARY

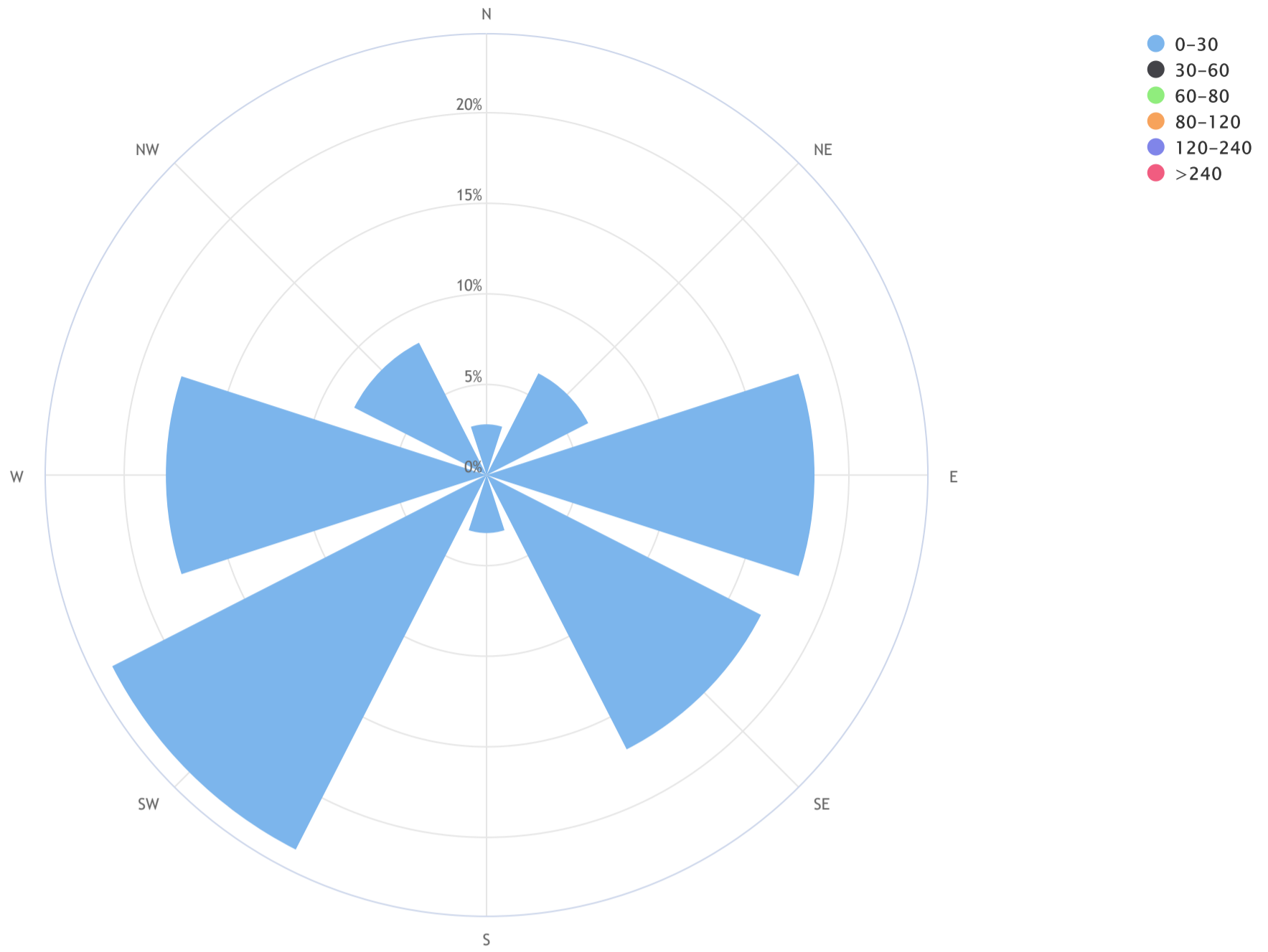
| | |
|------------------------------|--|
| NUMBER OF 1-HR EXCEEDANCES: | 0 |
| NUMBER OF 24-HR EXCEEDANCES: | 0 |
| NUMBER OF NON-ZERO READINGS: | 666 |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR 5 ON DAY 5 |
| MAXIMUM 1-HR AVERAGE: | 22 µg/m ³ @ HOUR 15 ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 12 µg/m ³ ON DAY 8 |
| MONTHLY CALIBRATION TIME: | 3 hrs |
| OPERATIONAL TIME: | 744 hrs |
| AMSD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 5 |
| MONTHLY AVERAGE: | 5 µg/m ³ |

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



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_PM2.5 (µg/m³)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 9.0_CALM % = 3.4%



| Direction | 0-30 | 30-60 | 60-80 | 80-120 | 120-240 | >240 | TOTAL |
|-----------|------|-------|-------|--------|---------|------|-------|
| N | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 |
| E | 18.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.1 |
| SE | 17.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 |
| S | 3.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 |
| SW | 23.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23.2 |
| W | 17.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.7 |
| NW | 8.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.2 |
| Summary | 96.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

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 | 2.5 | 2.8 | 1.8 | 3.4 | 3.0 | 3.2 | 4.2 | 4.9 | 4.3 | 4.7 | 4.8 | 5.1 | 3.9 | 5.3 | 8.2 | 6.3 | 6.8 | 5.9 | 5.4 | 3.0 | 6.8 | 6.3 | 6.5 | 6.5 | 1.8 | 8.2 | 4.6 | 24 |
| 2 | 6.2 | 7.4 | 8.5 | 5.7 | 6.5 | 5.6 | 6.9 | 5.9 | 5.1 | 5.8 | 6.6 | 6.7 | 5.5 | 5.9 | 4.3 | 3.6 | 2.6 | 2.6 | 1.8 | 2.8 | 2.5 | 3.3 | 1.3 | 2.5 | 1.3 | 8.5 | 4.4 | 24 |
| 3 | 2.9 | 2.7 | 3.5 | 3.3 | 2.9 | 4.1 | 3.7 | 3.9 | 4.7 | 6.5 | 4.9 | 7.2 | 8.6 | 9.8 | 8.4 | 7.5 | 7.5 | 8.0 | 8.4 | 7.4 | 10.1 | 6.5 | 6.2 | 6.3 | 2.7 | 10.1 | 5.5 | 24 |
| 4 | 6.1 | 7.5 | 7.9 | 8.8 | 7.9 | 7.3 | 7.2 | 7.9 | 7.8 | 7.4 | 7.4 | 5.2 | 7.1 | 9.8 | 8.2 | 7.2 | 7.5 | 7.1 | 7.0 | 6.3 | 7.4 | 12.2 | 15.3 | 14.1 | 5.2 | 15.3 | 6.7 | 24 |
| 5 | 15.0 | 13.9 | 15.0 | 11.1 | 11.6 | 13.2 | 9.4 | 12.0 | 6.1 | 9.1 | 6.7 | 3.8 | 2.8 | 6.1 | 5.4 | 4.0 | 4.5 | 4.8 | 4.3 | 2.4 | 2.4 | 2.0 | 3.2 | 3.5 | 2.0 | 15.0 | 5.0 | 24 |
| 6 | 2.1 | 3.1 | 2.3 | 2.2 | 1.1 | 2.0 | 2.7 | 1.8 | 1.4 | 3.6 | 7.3 | 11.3 | 10.0 | 9.2 | 9.2 | 7.1 | 7.4 | 6.7 | 7.0 | 6.9 | 6.1 | 1.7 | 4.4 | 1.4 | 1.1 | 11.3 | 4.8 | 24 |
| 7 | 0.6 | 0.8 | 0.7 | 0.3 | 1.2 | 0.2 | 0.9 | 0.8 | 1.7 | 1.4 | 2.3 | 1.7 | 0.9 | 1.9 | 2.3 | 3.7 | 2.7 | 2.5 | 4.2 | 4.0 | 4.2 | 4.1 | 0.5 | 0.5 | 0.2 | 4.2 | 1.6 | 24 |
| 8 | 0.5 | 0.4 | 0.8 | 0.2 | 0.7 | 1.0 | 0.4 | 0.9 | 0.4 | 0.9 | 1.6 | 2.8 | 3.3 | 3.8 | 5.3 | 2.8 | 2.7 | 4.4 | 3.4 | 6.5 | 6.2 | 2.2 | 5.7 | 5.5 | 0.2 | 6.5 | 2.5 | 24 |
| 9 | 2.1 | 2.1 | 0.1 | 1.0 | 1.1 | 0.6 | 0.2 | 1.1 | 0.8 | 1.0 | 1.3 | 0.8 | 1.0 | 1.5 | 1.5 | 1.7 | 0.7 | 0.8 | 0.5 | 0.0 | 1.4 | 0.8 | 0.9 | 1.1 | 0.0 | 2.1 | 0.4 | 24 |
| 10 | 0.8 | 0.3 | 0.8 | 1.0 | 1.2 | 0.7 | 0.4 | 0.9 | 2.0 | 1.4 | 3.1 | 4.1 | 5.5 | 7.3 | 5.3 | 6.6 | 5.6 | 4.1 | 2.2 | 7.2 | 6.6 | 8.2 | 6.3 | 6.4 | 0.3 | 8.2 | 3.3 | 24 |
| 11 | 5.2 | 5.9 | 4.5 | 3.4 | 1.1 | 1.0 | 0.6 | 0.3 | 1.2 | 1.2 | 0.5 | 4.6 | 4.6 | 4.5 | 2.4 | 4.5 | 10.0 | 10.7 | 7.3 | 2.3 | 4.4 | 2.8 | 4.2 | 3.0 | 0.3 | 10.7 | 2.7 | 24 |
| 12 | 2.1 | 2.7 | 3.0 | 3.6 | 4.9 | 6.0 | 5.0 | 3.6 | 5.7 | 7.4 | 7.6 | 9.1 | 11.1 | 11.2 | 10.8 | 11.3 | 11.4 | 11.8 | 9.9 | 9.6 | 7.9 | 10.0 | 8.7 | 9.4 | 2.1 | 11.8 | 7.6 | 24 |
| 13 | 7.1 | 2.2 | 0.7 | 1.0 | 2.3 | 2.2 | 2.7 | 2.6 | 4.2 | 4.3 | 4.1 | 8.2 | 9.8 | 10.8 | 9.4 | 10.2 | 8.8 | 8.2 | 8.2 | 7.6 | 6.1 | 6.7 | 4.4 | 3.1 | 0.7 | 10.8 | 5.2 | 24 |
| 14 | 3.6 | 2.2 | 0.7 | 1.1 | 0.8 | 0.9 | 2.0 | 2.8 | 4.6 | 4.6 | 8.7 | 8.8 | 3.9 | 2.6 | 2.5 | 3.7 | 5.5 | 8.7 | 4.2 | 2.9 | 4.0 | 3.8 | 5.3 | 4.7 | 0.7 | 8.8 | 3.3 | 24 |
| 15 | 6.5 | 4.5 | 1.7 | 1.0 | 0.9 | 1.1 | 2.2 | 3.6 | 10.7 | 16.8 | 19.3 | 18.2 | 20.3 | 20.6 | 18.8 | 17.5 | 18.7 | 16.7 | 16.2 | 15.6 | 11.7 | 10.8 | 6.3 | 6.9 | 0.9 | 20.6 | 9.8 | 24 |
| 16 | 3.3 | 1.9 | 1.7 | 2.3 | 2.1 | 0.6 | 1.6 | 0.3 | 1.9 | 1.6 | 4.5 | 5.6 | 5.7 | 6.6 | 8.0 | 9.2 | 7.0 | 5.3 | 10.1 | 7.5 | 4.6 | 7.2 | 7.2 | 6.4 | 0.3 | 10.1 | 3.7 | 24 |
| 17 | 7.1 | 6.6 | 5.4 | 5.2 | 2.5 | 5.3 | 5.2 | 2.4 | 1.1 | 0.6 | 3.7 | 3.5 | 4.0 | 6.8 | 8.4 | 6.4 | 5.2 | 6.2 | 4.9 | 6.2 | 5.3 | 4.0 | 0.2 | 1.6 | 0.2 | 8.4 | 1.7 | 24 |
| 18 | 0.3 | 1.0 | 1.7 | 1.0 | 0.5 | 0.5 | 0.2 | 0.3 | 0.4 | 0.9 | 1.0 | 1.5 | 4.5 | 4.6 | 4.1 | 3.5 | 2.5 | 3.7 | 1.2 | 0.8 | 1.5 | 2.7 | 0.7 | 0.5 | 0.2 | 4.6 | 1.1 | 24 |
| 19 | 2.2 | 4.1 | 3.0 | 0.9 | 0.3 | 0.6 | 0.8 | 3.9 | 4.0 | 3.9 | 3.7 | 5.3 | 5.8 | 6.2 | 6.8 | 6.1 | 5.4 | 5.3 | 7.0 | 7.6 | 6.4 | 6.9 | 6.0 | 4.6 | 0.3 | 7.6 | 4.3 | 24 |
| 20 | 5.1 | 7.3 | 6.7 | 5.2 | 4.4 | 3.4 | 1.1 | 0.6 | 1.2 | 0.9 | 2.6 | 1.6 | 2.9 | 4.5 | 4.8 | 6.4 | 9.0 | 8.9 | 9.3 | 8.4 | 10.8 | 10.0 | 8.8 | 12.2 | 0.6 | 12.2 | 3.1 | 24 |
| 21 | 8.8 | 6.8 | 4.8 | 2.9 | 1.3 | 2.7 | 5.0 | 8.9 | 12.2 | 11.4 | 13.6 | 14.2 | 20.2 | 15.6 | 10.7 | 13.4 | 17.9 | 17.5 | 18.8 | 18.5 | 21.5 | 13.9 | 15.2 | 16.4 | 1.3 | 21.5 | 9.7 | 24 |
| 22 | 16.7 | 15.3 | 14.4 | 15.2 | 12.7 | 10.6 | 12.1 | 13.1 | 12.8 | 9.9 | 10.3 | 10.4 | 9.6 | 9.7 | 7.8 | 5.0 | 3.3 | 0.7 | 1.2 | 2.5 | 2.9 | 3.4 | 0.6 | 0.3 | 0.3 | 16.7 | 7.7 | 24 |
| 23 | 0.7 | 0.1 | 0.3 | 0.5 | 0.3 | 0.4 | 0.8 | 1.1 | 0.7 | 0.6 | 2.0 | 2.9 | 3.2 | 4.8 | 7.0 | 5.6 | 4.2 | 3.2 | 4.8 | 5.2 | 3.9 | 3.0 | 4.3 | 5.3 | 0.1 | 7.0 | 2.1 | 24 |
| 24 | 4.5 | 4.2 | 3.8 | 3.6 | 4.1 | 2.6 | 2.7 | 3.1 | 2.9 | 3.2 | 4.4 | 6.5 | 13.5 | 4.8 | 3.8 | 2.8 | 2.4 | 2.9 | 3.1 | 6.3 | 7.3 | 4.6 | 3.5 | 4.5 | 2.4 | 13.5 | 4.2 | 24 |
| 25 | 5.7 | 3.5 | 6.5 | 5.2 | 5.0 | 5.5 | 5.8 | 6.0 | 5.7 | 5.5 | 7.5 | 4.4 | 3.1 | 1.9 | 1.4 | 2.6 | 1.8 | 1.5 | 1.0 | 1.7 | 2.3 | 2.7 | 3.3 | 3.5 | 1.0 | 7.5 | 2.8 | 24 |
| 26 | 3.9 | 4.1 | 3.1 | 2.8 | 3.1 | 6.2 | 6.5 | 7.2 | 8.1 | 5.4 | 4.7 | 4.1 | 5.9 | 3.4 | 2.9 | 2.7 | 0.1 | 1.2 | 0.8 | 1.8 | 0.2 | 1.0 | 0.3 | 1.8 | 0.1 | 8.1 | 2.5 | 24 |
| 27 | 2.6 | 3.0 | 2.7 | 1.7 | 1.3 | 2.0 | 2.8 | 2.9 | 2.0 | 1.7 | 3.0 | 4.3 | 2.8 | 2.2 | 3.3 | 4.4 | 5.3 | 7.2 | 6.7 | 3.9 | 4.1 | 3.5 | 2.0 | 2.5 | 1.3 | 7.2 | 2.4 | 24 |
| 28 | 1.6 | 2.6 | 1.9 | 2.0 | 2.0 | 0.2 | 1.3 | 0.9 | 1.3 | 2.6 | 2.7 | 3.8 | 4.6 | 4.4 | 5.1 | 4.4 | 5.3 | 4.5 | 6.3 | 7.1 | 5.0 | 5.2 | 5.0 | 4.4 | 0.2 | 7.1 | 3.2 | 24 |
| 29 | 4.3 | 3.5 | 3.1 | 2.4 | 4.7 | 6.3 | 7.1 | 6.2 | 5.0 | 5.2 | 6.8 | 5.8 | 5.7 | 8.1 | 7.1 | 7.8 | 10.3 | 8.9 | 8.9 | 9.0 | 9.7 | 11.1 | 9.9 | 8.5 | 2.4 | 11.1 | 6.3 | 24 |
| 30 | 7.1 | 8.7 | 11.4 | 11.9 | 10.6 | 9.9 | 9.7 | 9.2 | 9.4 | 7.5 | 8.6 | 9.5 | 10.2 | 9.6 | 9.6 | 8.0 | 5.2 | 2.7 | 0.8 | 4.0 | 4.7 | 1.5 | 0.6 | 1.2 | 0.6 | 11.9 | 6.5 | 24 |
| 31 | 0.5 | 0.3 | 1.4 | 0.4 | 0.3 | 0.9 | 0.3 | 0.4 | 0.7 | 1.3 | 1.4 | 5.0 | 6.6 | 5.8 | 4.5 | 3.7 | 2.5 | 2.8 | 1.3 | 1.6 | 2.2 | 1.8 | 2.9 | 7.4 | 0.3 | 7.4 | 2.2 | 24 |
| HOURLY MAX | 16.7 | 15.3 | 15.0 | 15.2 | 12.7 | 13.2 | 12.1 | 13.1 | 12.8 | 16.8 | 19.3 | 18.2 | 20.3 | 20.6 | 18.8 | 17.5 | 18.7 | 17.5 | 18.8 | 18.5 | 21.5 | 13.9 | 15.3 | 16.4 | | | | |

STATUS FLAG CODES

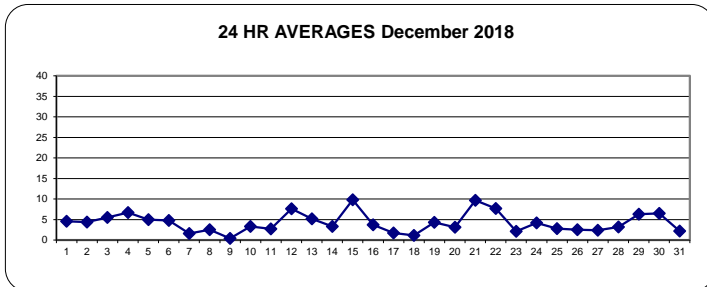
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

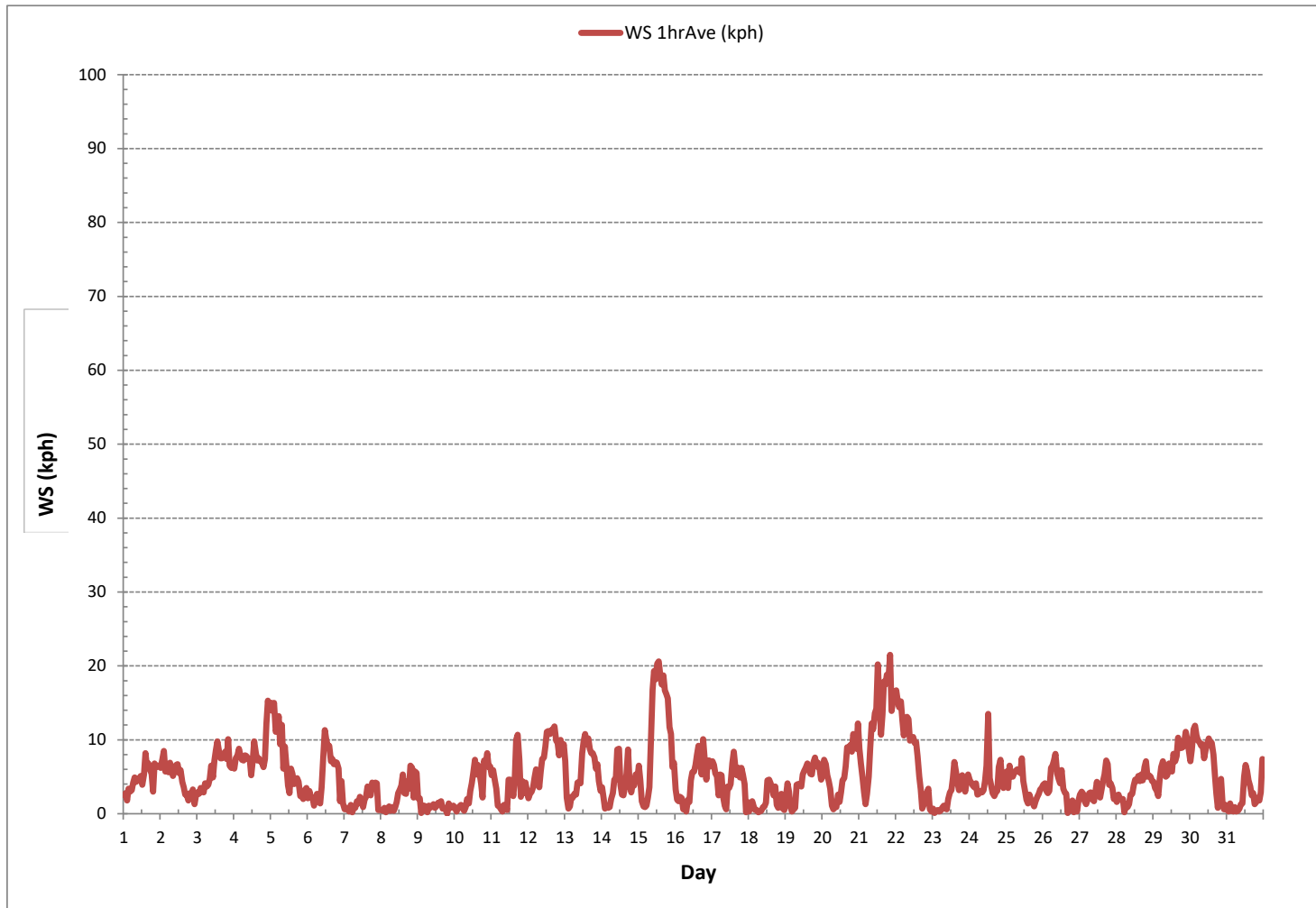
| | |
|-------------------|-------------------------------------|
| LAST CALIBRATION: | November 9, 2017 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 743 |
| MINIMUM 1-HR AVERAGE | 0.0 kph @ HOUR 19 ON DAY 9 |
| MAXIMUM 1-HR AVERAGE: | 21.5 kph @ HOUR 20 ON DAY 21 |
| MAXIMUM 24-HR AVERAGE: | 9.8 kph ON DAY 15 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 744 hrs |
| AMT OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 3.9 |
| MONTHLY AVERAGE: | 0.8 kph |

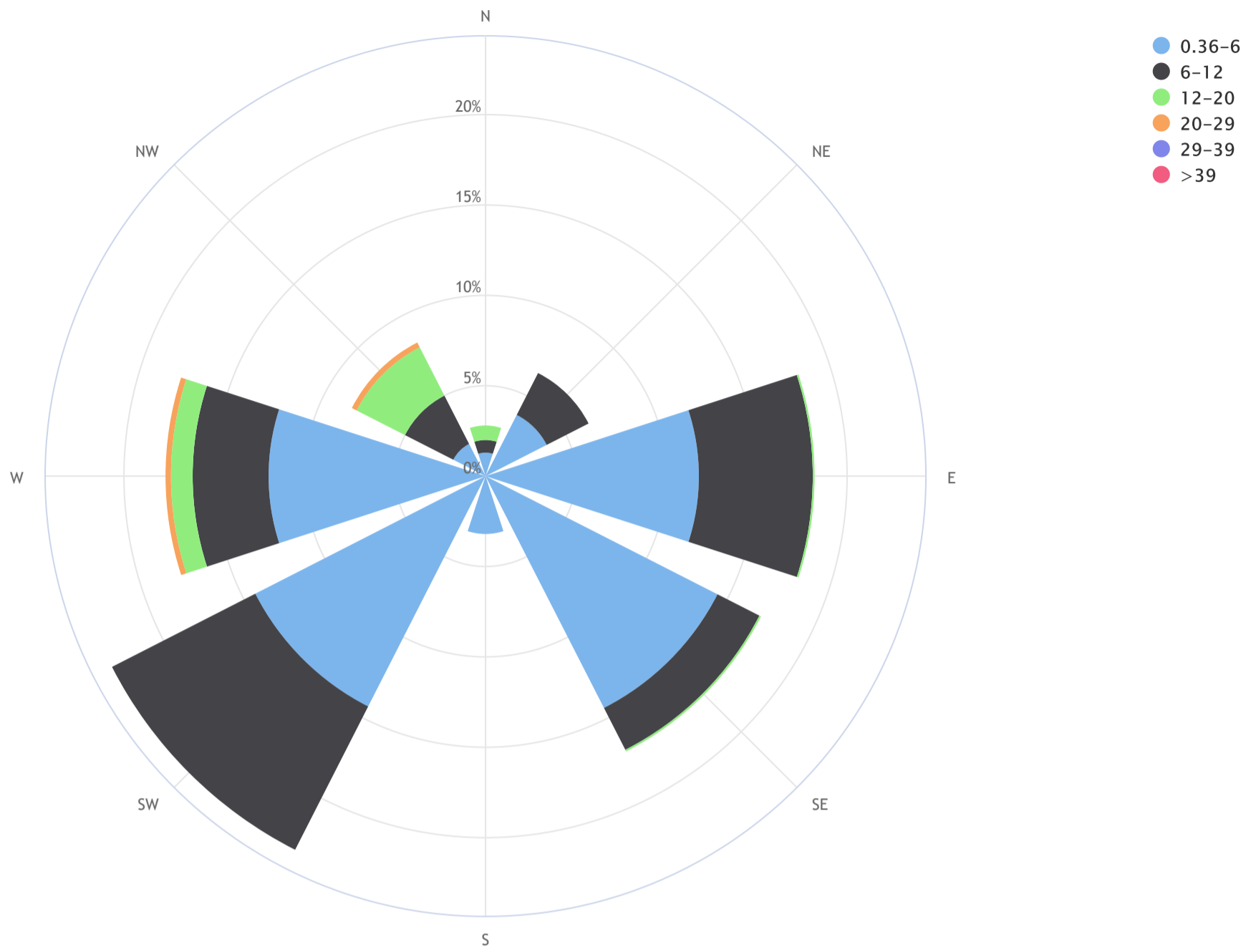
24 HR AVERAGES December 2018





Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_18/12

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 0.2_CALM % = 3.4%



| Direction | 0.36-6 | 6-12 | 12-20 | 20-29 | 29-39 | >39 | TOTAL |
|----------------|-------------|-------------|------------|------------|------------|------------|-------------|
| N | 1.3 | 0.7 | 0.8 | 0.0 | 0.0 | 0.0 | 2.8 |
| NE | 3.8 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 |
| E | 11.8 | 6.3 | 0.1 | 0.0 | 0.0 | 0.0 | 18.3 |
| SE | 14.4 | 2.6 | 0.1 | 0.0 | 0.0 | 0.0 | 17.1 |
| S | 3.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 |
| SW | 14.3 | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 23.1 |
| W | 12.0 | 4.2 | 1.2 | 0.3 | 0.0 | 0.0 | 17.6 |
| NW | 2.0 | 3.0 | 3.0 | 0.3 | 0.0 | 0.0 | 8.2 |
| Summary | 62.8 | 28.1 | 5.2 | 0.5 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24-HOUR AVG | 24-HR | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | QUADRANT | RDGS. | |
| DAY 1 | ESE | ESE | ESE | ENE | ESE | ESE | ESE | ESE | E | ESE | E | ESE | ENE | E | E | ESE | ESE | ESE | E | E | E | E | ENE | ENE | E | 24 | |
| 2 | ENE | E | E | E | E | E | E | ESE | ESE | ESE | ESE | ESE | ESE | E | E | E | ENE | ENE | ESE | SE | SE | SE | SSW | SW | ESE | 24 | |
| 3 | W | WNW | WSW | W | W | W | WSW | W | W | NW | WNW | W | W | W | W | W | WNW | NW | NNW | NW | NNW | NW | NW | WNW | WNW | 24 | |
| 4 | W | W | W | WSW | WSW | WSW | WSW | WSW | WSW | SW | SW | WSW | WSW | SW | WSW | WSW | WSW | W | W | W | WNW | NNW | NNW | NNW | W | 24 | |
| 5 | N | NNW | NNW | NNW | NNW | NNW | NNW | N | N | NW | NNW | NW | WSW | W | W | SW | SW | SW | SW | SW | SW | SW | SW | SW | NW | 24 | |
| 6 | SW | SSW | SSW | SW | S | WSW | SW | S | SSW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | 24 | |
| 7 | SSE | SSE | WSW | SSE | WSW | S | W | SSE | W | W | W | NW | W | W | SW | SW | SW | WSW | WSW | WSW | WSW | SW | ESE | SW | WSW | 24 | |
| 8 | S | WNW | SW | SSW | SSW | WSW | SSW | SW | SW | W | WNW | W | WSW | WSW | WSW | WSW | SSW | WSW | SW | SW | WSW | WSW | SW | WSW | WSW | 24 | |
| 9 | WSW | WSW | N | ESE | WSW | SSW | SSW | SW | ENE | ESE | W | ENE | NW | W | W | W | ESE | SE | ESE | SSE | SW | SW | E | ESE | SW | 24 | |
| 10 | ENE | NW | SSW | W | SE | WSW | SSW | N | WSW | SE | WSW | WSW | WSW | WSW | WSW | SW | SW | WSW | SW | WSW | WSW | WSW | WSW | WSW | WSW | 24 | |
| 11 | SW | WSW | WSW | WSW | SSE | SSE | NNW | ESE | E | NE | SE | SE | SE | ESE | ESE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | 24 | |
| 12 | S | WSW | WSW | SW | SW | WSW | SW | SW | SW | WSW | WSW | SW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | 24 |
| 13 | WSW | WSW | S | S | SSE | SSE | SSE | SSW | SSW | SW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | 24 |
| 14 | WSW | WSW | SSE | ESE | NNE | SE | ENE | E | E | SE | SE | SE | ESE | E | E | ESE | SE | SE | SE | ESE | ESE | SE | SE | SE | SE | 24 | |
| 15 | SE | SE | ESE | S | NNE | WSW | SW | WSW | W | WNW | WNW | WNW | W | W | W | W | W | WNW | WNW | NW | NW | WNW | WNW | WNW | WNW | 24 | |
| 16 | WNW | SSE | WSW | WSW | WSW | S | SW | SSW | ESE | ESE | SE | E | ESE | E | E | E | E | E | E | ESE | ESE | E | E | E | E | 24 | |
| 17 | E | E | ESE | ESE | ESE | E | E | ESE | ESE | S | ESE | SSE | WSW | SW | WSW | WSW | WSW | WSW | SW | WSW | SW | WSW | SE | ESE | S | 24 | |
| 18 | SE | ENE | ENE | ENE | S | E | NW | SE | S | SE | WSW | SSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | NW | SW | WSW | W | SSW | WSW | 24 | |
| 19 | SW | WSW | WSW | WSW | NE | SW | NW | WSW | WSW | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | WSW | SW | SW | SW | SW | WSW | 24 | |
| 20 | WSW | WSW | WSW | WSW | WSW | WSW | NNE | SSE | WSW | ENE | ENE | NE | ENE | ENE | E | E | ESE | ESE | E | E | E | E | ESE | ESE | ESE | 24 | |
| 21 | ESE | E | ENE | E | W | W | WSW | W | W | W | W | WNW | WNW | NW | NW | NW | NW | NW | NW | NNW | NW | NW | NW | NW | NW | 24 | |
| 22 | NW | NW | NW | NW | NW | NW | NW | NW | WNW | W | W | WNW | WNW | WNW | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | ESE | WSW | WNW | 24 |
| 23 | SW | N | SE | WNW | NNW | N | WSW | WSW | SSW | ENE | SSE | SE | E | E | SE | ESE | ESE | ENE | ESE | E | E | ENE | ENE | ENE | E | 24 | |
| 24 | ENE | E | E | ESE | ESE | E | E | ESE | ESE | E | SE | ESE | E | ESE | ESE | ESE | ESE | E | SE | SE | SE | ESE | ESE | SE | ESE | 24 | |
| 25 | SE | ESE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | NE | SW | SSW | SSW | WNW | WSW | SSW | W | W | SW | WSW | SE | 24 |
| 26 | WSW | WSW | W | W | WNW | NW | NNW | NNW | NNW | NNW | NW | N | N | NNE | ENE | ENE | SE | NE | N | NE | NW | W | WNW | W | NNW | 24 | |
| 27 | W | WSW | W | W | WNW | SSE | SSE | S | S | SSW | SSE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SE | SSE | 24 |
| 28 | SE | SE | SE | SE | SSE | SW | NE | NE | ESE | ENE | ENE | ENE | ENE | ENE | E | E | E | E | E | E | E | E | ENE | E | ENE | E | 24 |
| 29 | E | E | E | NE | NNE | NNE | NE | NE | NE | NE | NE | NE | NE | E | ESE | E | E | E | E | E | E | E | E | E | ENE | 24 | |
| 30 | ENE | NE | NE | NE | NE | NE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NE | NE | NNE | N | NW | NNW | NNW | NW | SW | WSW | NNE | 24 | |
| 31 | SSW | S | SW | SE | WNW | SSE | SSW | W | ESE | E | SE | SE | SE | SE | SE | SE | SE | SE | ESE | ESE | ESE | SE | SE | SE | SE | 24 | |

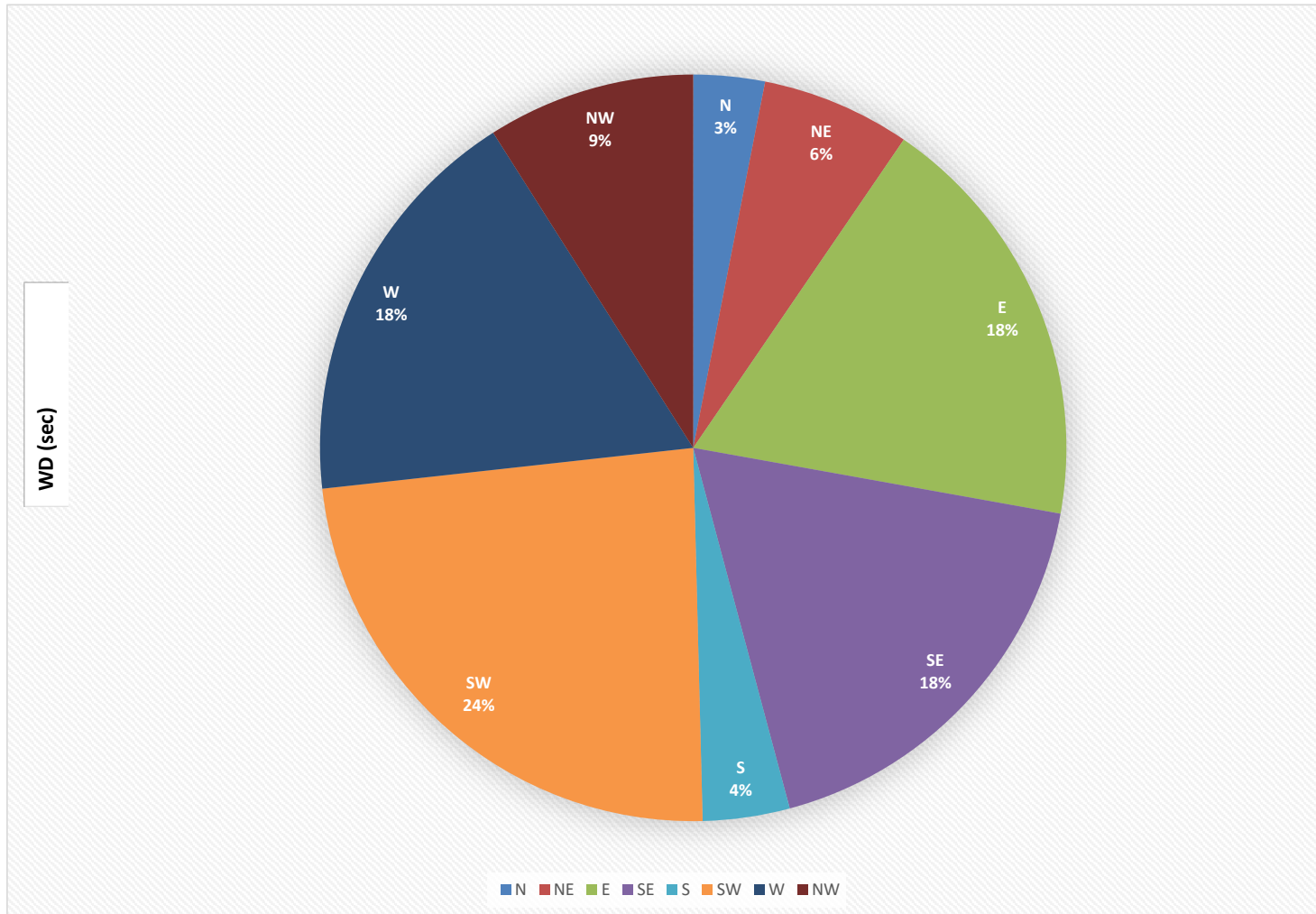
STATUS FLAG CODES

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

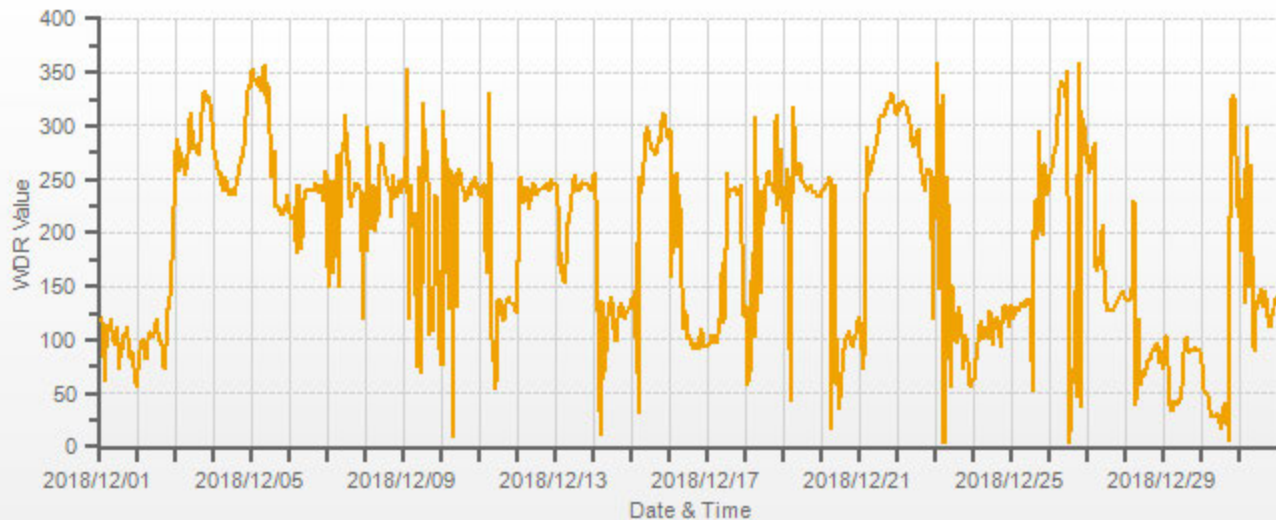
| | |
|-------------------|-------------------------------------|
| LAST CALIBRATION: | November 9, 2017 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

| | | | | | |
|---------------------------|----|-----|-----------------------|-------|-----|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 744 | hrs |
| STANDARD DEVIATION: | 87 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 261 | (W) |

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA COLD LAKE SOUTH Monthly: 18/12 Type: AVG 1 Hr. [1 Hr.]



STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 18 | 16 | 20 | 12 | 26 | 14 | 16 | 14 | 13 | 9 | 12 | 16 | 15 | 12 | 6 | 11 | 11 | 13 | 10 | 21 | 20 | 8 | 12 | 9 | 24 | |
| 2 | 19 | 8 | 6 | 7 | 7 | 6 | 7 | 9 | 9 | 8 | 10 | 9 | 10 | 8 | 8 | 9 | 14 | 10 | 19 | 9 | 10 | 14 | 28 | 17 | 24 | |
| 3 | 25 | 23 | 12 | 25 | 25 | 17 | 8 | 9 | 9 | 14 | 14 | 13 | 9 | 8 | 9 | 12 | 10 | 19 | 13 | 10 | 10 | 8 | 9 | 11 | 24 | |
| 4 | 12 | 7 | 5 | 8 | 6 | 5 | 3 | 5 | 6 | 8 | 10 | 15 | 7 | 6 | 10 | 6 | 6 | 6 | 7 | 9 | 11 | 8 | 5 | 6 | 24 | |
| 5 | 10 | 8 | 6 | 8 | 7 | 9 | 9 | 13 | 27 | 11 | 14 | 18 | 35 | 15 | 26 | 11 | 8 | 6 | 9 | 13 | 15 | 26 | 15 | 15 | 24 | |
| 6 | 21 | 13 | 22 | 30 | 39 | 24 | 25 | 21 | 21 | 13 | 5 | 4 | 5 | 8 | 4 | 4 | 5 | 6 | 4 | 4 | 6 | 36 | 9 | 46 | 24 | |
| 7 | 51 | 40 | 48 | 70 | 35 | 75 | 53 | 54 | 44 | 48 | 27 | 37 | 65 | 45 | 21 | 8 | 13 | 18 | 13 | 13 | 8 | 13 | 61 | 58 | 24 | |
| 8 | 69 | 73 | 64 | 73 | 47 | 38 | 64 | 43 | 66 | 39 | 34 | 26 | 19 | 14 | 10 | 27 | 27 | 12 | 12 | 6 | 11 | 26 | 8 | 7 | 24 | |
| 9 | 25 | 17 | 77 | 45 | 37 | 60 | 75 | 50 | 59 | 55 | 49 | 59 | 53 | 39 | 46 | 49 | 62 | 64 | 70 | 80 | 40 | 54 | 55 | 34 | 24 | |
| 10 | 47 | 72 | 58 | 54 | 53 | 67 | 76 | 63 | 51 | 57 | 36 | 20 | 8 | 8 | 7 | 9 | 10 | 13 | 15 | 7 | 7 | 6 | 5 | 8 | 24 | |
| 11 | 10 | 5 | 7 | 8 | 40 | 29 | 49 | 63 | 27 | 43 | 62 | 8 | 19 | 8 | 17 | 13 | 3 | 6 | 12 | 41 | 13 | 25 | 6 | 20 | 24 | |
| 12 | 50 | 38 | 43 | 33 | 15 | 7 | 11 | 11 | 5 | 7 | 5 | 5 | 4 | 6 | 4 | 4 | 4 | 4 | 8 | 4 | 5 | 4 | 5 | 5 | 24 | |
| 13 | 9 | 18 | 59 | 44 | 40 | 28 | 29 | 34 | 44 | 16 | 18 | 6 | 9 | 3 | 6 | 5 | 9 | 6 | 5 | 7 | 7 | 8 | 11 | 14 | 24 | |
| 14 | 9 | 44 | 59 | 47 | 45 | 53 | 25 | 31 | 18 | 21 | 5 | 6 | 14 | 29 | 17 | 20 | 9 | 7 | 17 | 27 | 14 | 18 | 14 | 12 | 24 | |
| 15 | 4 | 8 | 31 | 53 | 61 | 62 | 44 | 19 | 13 | 6 | 8 | 9 | 8 | 6 | 7 | 8 | 9 | 7 | 8 | 9 | 8 | 8 | 12 | 9 | 24 | |
| 16 | 38 | 35 | 39 | 35 | 25 | 61 | 27 | 69 | 24 | 33 | 16 | 10 | 13 | 9 | 6 | 6 | 6 | 9 | 5 | 10 | 14 | 8 | 6 | 8 | 24 | |
| 17 | 6 | 9 | 9 | 15 | 25 | 8 | 14 | 26 | 58 | 73 | 28 | 32 | 28 | 10 | 7 | 10 | 9 | 9 | 6 | 9 | 6 | 15 | 74 | 28 | 24 | |
| 18 | 72 | 43 | 21 | 46 | 53 | 57 | 75 | 72 | 70 | 62 | 61 | 62 | 14 | 29 | 16 | 16 | 22 | 12 | 52 | 59 | 44 | 29 | 51 | 58 | 24 | |
| 19 | 13 | 10 | 13 | 35 | 70 | 66 | 39 | 16 | 13 | 19 | 16 | 8 | 6 | 5 | 5 | 11 | 6 | 5 | 5 | 6 | 5 | 6 | 5 | 6 | 10 | 24 |
| 20 | 10 | 7 | 4 | 7 | 6 | 15 | 50 | 69 | 42 | 25 | 9 | 37 | 21 | 15 | 16 | 7 | 6 | 11 | 12 | 6 | 8 | 10 | 11 | 8 | 24 | |
| 21 | 16 | 8 | 16 | 37 | 45 | 22 | 12 | 7 | 5 | 6 | 5 | 7 | 7 | 6 | 9 | 7 | 6 | 7 | 7 | 9 | 7 | 7 | 7 | 7 | 24 | |
| 22 | 8 | 9 | 7 | 9 | 7 | 7 | 7 | 8 | 9 | 7 | 10 | 10 | 12 | 12 | 9 | 8 | 12 | 42 | 34 | 11 | 6 | 10 | 50 | 70 | 24 | |
| 23 | 63 | 69 | 64 | 63 | 71 | 61 | 49 | 27 | 43 | 55 | 33 | 16 | 30 | 19 | 6 | 14 | 20 | 13 | 13 | 10 | 15 | 15 | 8 | 11 | 24 | |
| 24 | 10 | 14 | 22 | 16 | 17 | 26 | 22 | 24 | 29 | 20 | 20 | 20 | 14 | 47 | 22 | 12 | 12 | 9 | 10 | 4 | 5 | 9 | 12 | 10 | 24 | |
| 25 | 5 | 10 | 5 | 7 | 7 | 5 | 6 | 6 | 8 | 8 | 5 | 25 | 25 | 24 | 42 | 26 | 42 | 39 | 59 | 52 | 23 | 12 | 12 | 10 | 24 | |
| 26 | 9 | 7 | 16 | 14 | 16 | 8 | 14 | 8 | 8 | 10 | 13 | 19 | 12 | 33 | 20 | 19 | 76 | 32 | 48 | 31 | 76 | 43 | 70 | 27 | 24 | |
| 27 | 27 | 18 | 19 | 31 | 54 | 41 | 30 | 30 | 44 | 36 | 36 | 18 | 27 | 28 | 15 | 14 | 11 | 5 | 7 | 14 | 7 | 10 | 19 | 15 | 24 | |
| 28 | 27 | 9 | 19 | 12 | 32 | 76 | 34 | 53 | 27 | 27 | 32 | 15 | 17 | 14 | 10 | 11 | 11 | 12 | 10 | 8 | 12 | 18 | 11 | 15 | 24 | |
| 29 | 15 | 18 | 23 | 35 | 15 | 10 | 12 | 12 | 11 | 10 | 10 | 10 | 21 | 7 | 10 | 7 | 6 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 24 | |
| 30 | 7 | 15 | 4 | 5 | 5 | 7 | 7 | 6 | 8 | 7 | 9 | 10 | 8 | 9 | 11 | 8 | 7 | 13 | 50 | 12 | 8 | 45 | 48 | 58 | 24 | |
| 31 | 61 | 71 | 34 | 57 | 69 | 52 | 70 | 66 | 59 | 54 | 59 | 12 | 6 | 18 | 11 | 14 | 19 | 13 | 23 | 17 | 13 | 20 | 12 | 5 | 24 | |

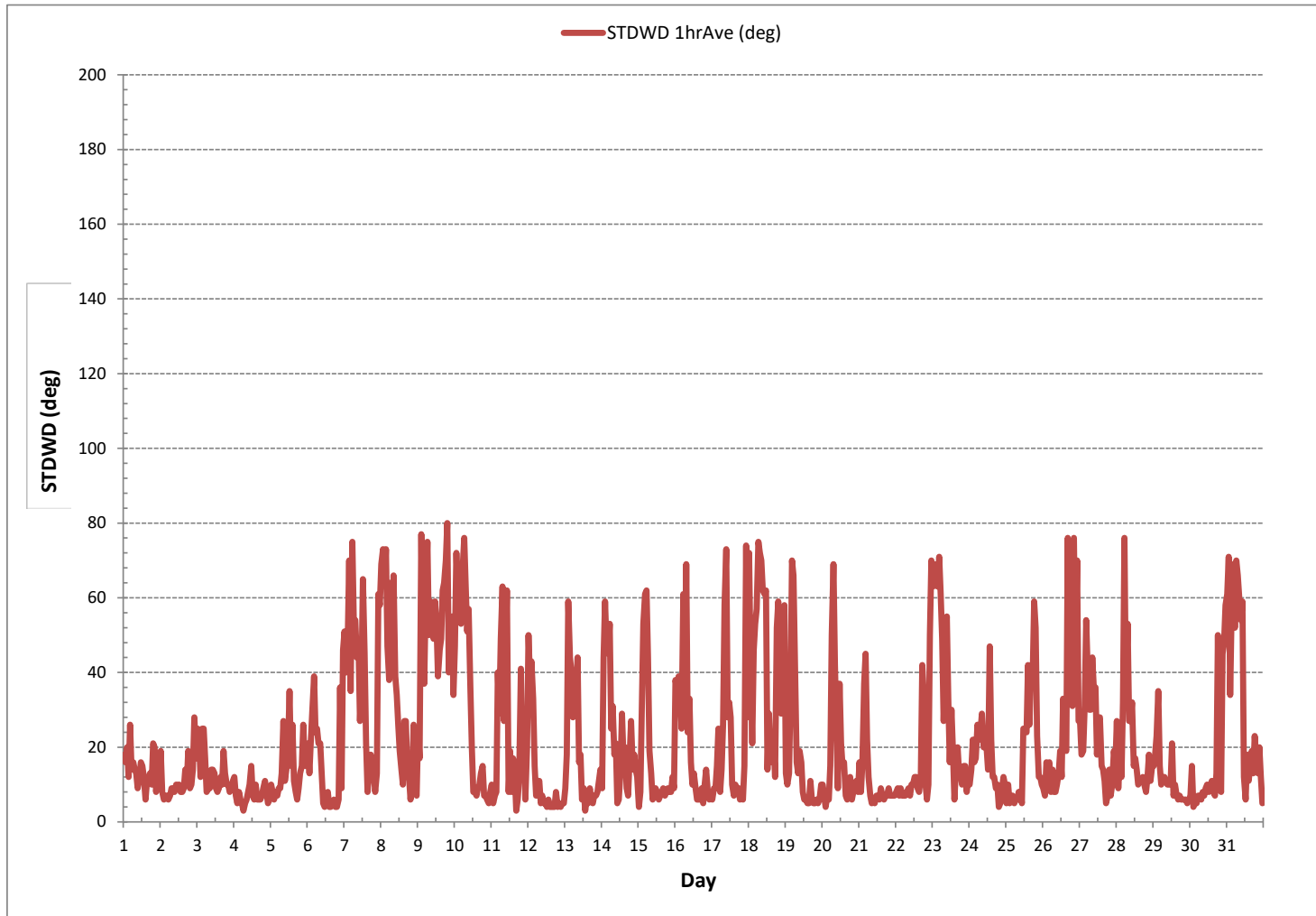
STATUS FLAG CODES

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

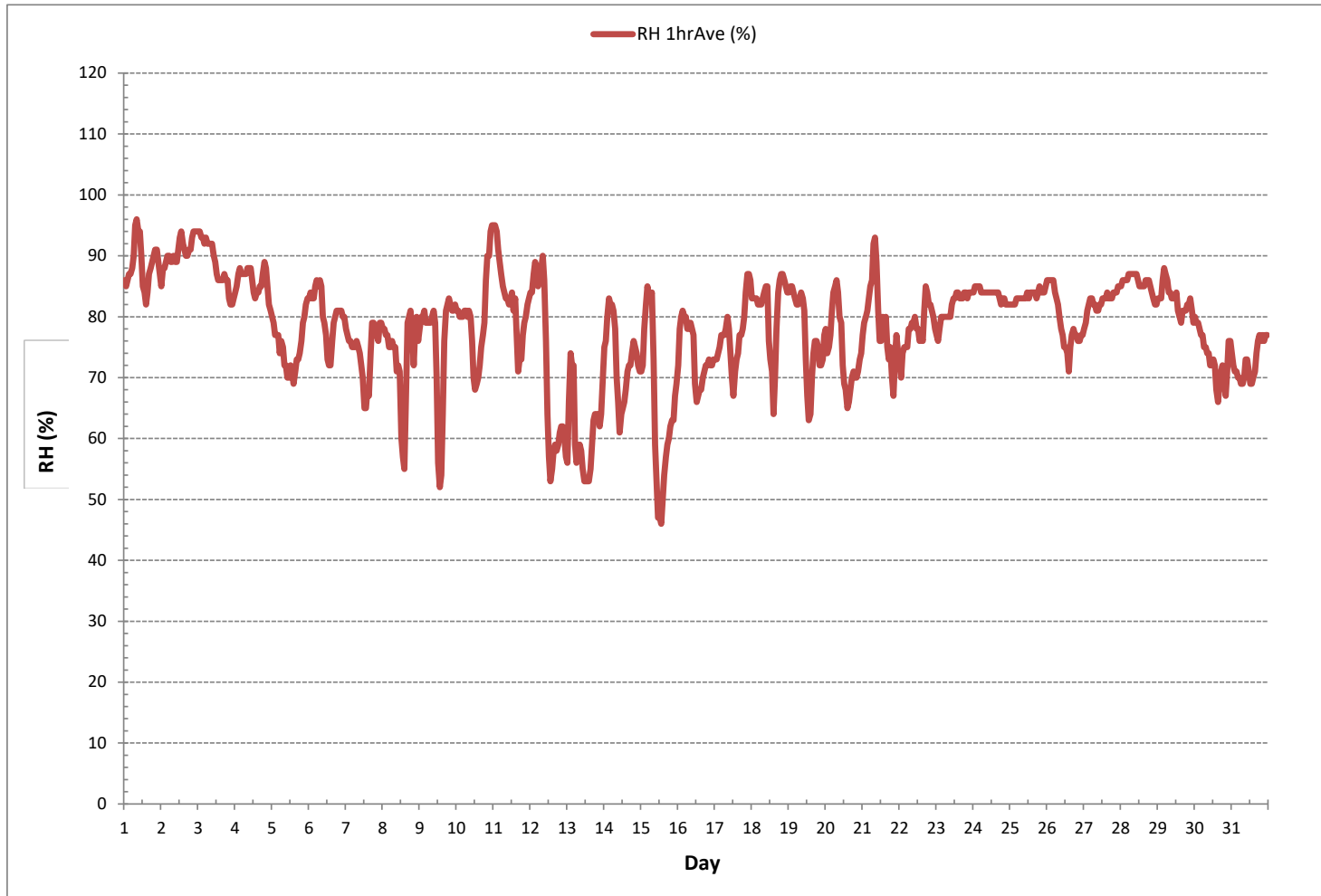
LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

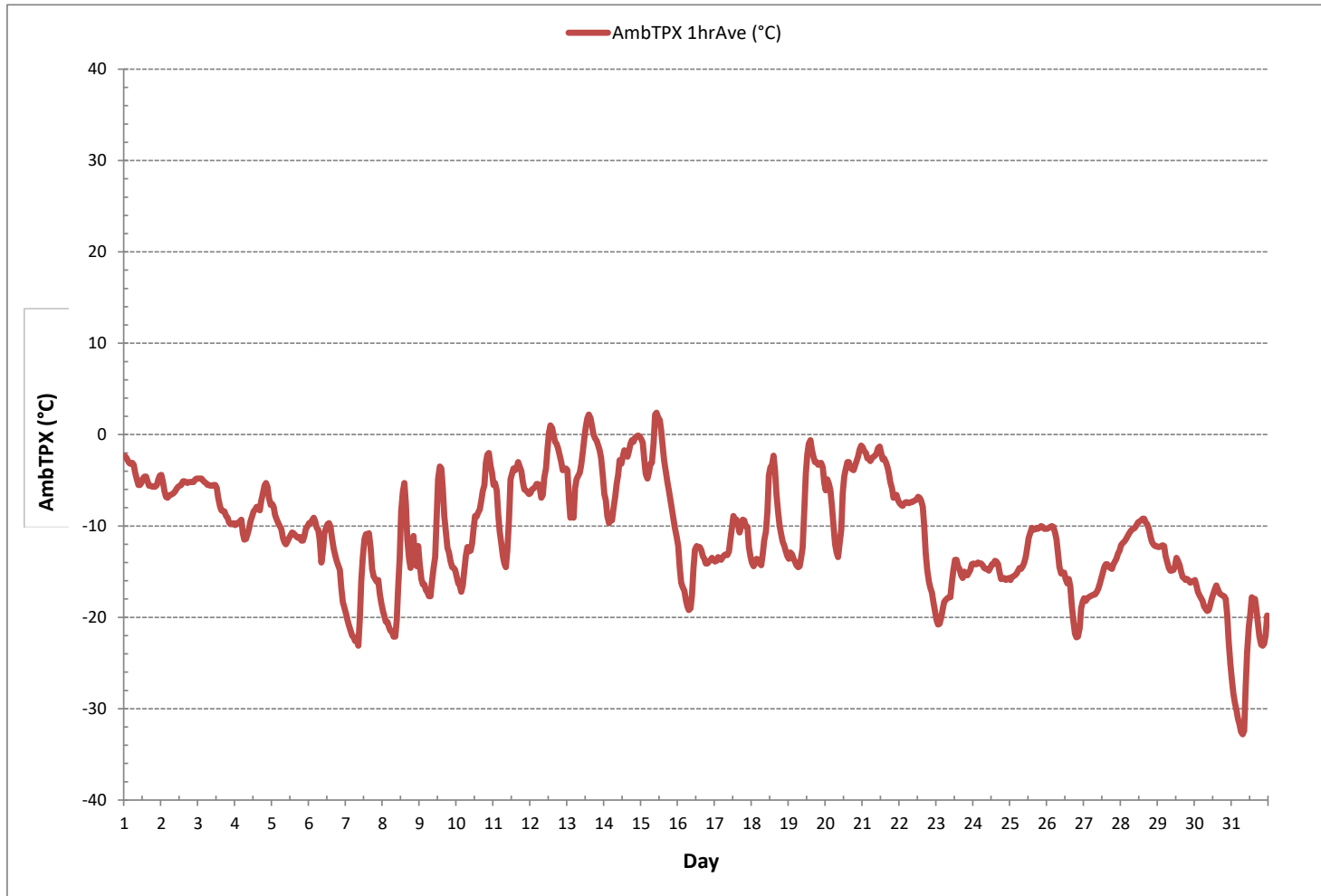


RELATIVE HUMIDITY



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

| | | | | | |
|--------------------------|-------------------|--|---------------------------------------|------------|-----------|
| Date: | December 13, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 935 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | routine monthly | | |
| Start Time 24 hr. (mst): | 10:14 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 14:41 | Cal Gas Expiry Date: | October 24, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | 806528242 LICA | Range ppb: | 500 | | |
| Last Calibration Date: | November 19, 2018 | As Found C.F.: | 1.000 | | |
| Previous C.F.: | 1.000 | New C.F.: | 1.000 | | |

| | |
|---------------------------------|--|
| Calibration Standards: | Standard Calibration Points for Ranges |
| Low Flow Meter ID/Expiry Date: | N/A |
| High Flow Meter ID/Expiry Date: | N/A |
| Calibrator ID/Expiry Date: | API id# 690 expires March 15, 2019 |
| Cal Gas Cylinder I.D. #: | LL 104225 |
| Cal Gas Conc. (ppm): | 49.2 |

| Point | ppb |
|-------|-----|
| High | 380 |
| Mid | 180 |
| Low | 90 |

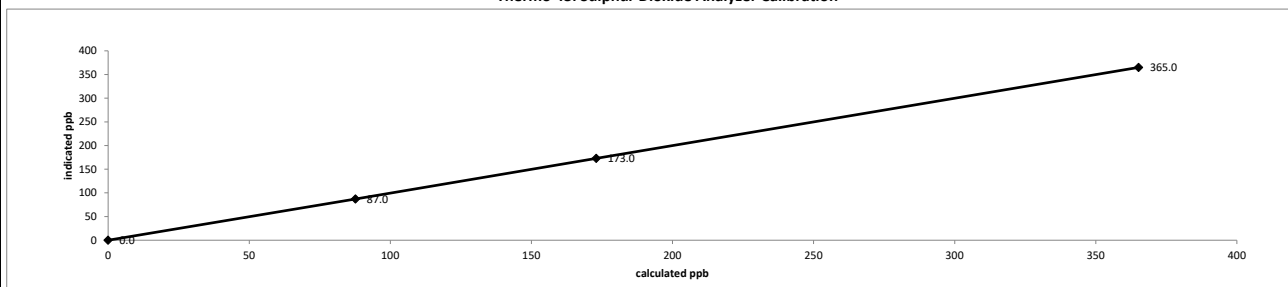
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|-----------------|--------------------------------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| | Diluent | Cal Gas | Total | | | |
| as found zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| as found high | 4940 | 36.94 | 4977 | 365.2 | 365 | 1.000 |
| adjusted zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| adjusted high | 4940 | 36.94 | 4977 | 365.2 | 365 | 1.000 |
| mid | 4927 | 17.38 | 4944 | 173.0 | 173 | 1.000 |
| low | 4941 | 8.82 | 4950 | 87.7 | 87 | 1.008 |
| calibrator zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 1.003 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.000 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.04% | | ± 3% F.S. |
| % change in C.F. from last cal = | -0.05% | | ± 10% |

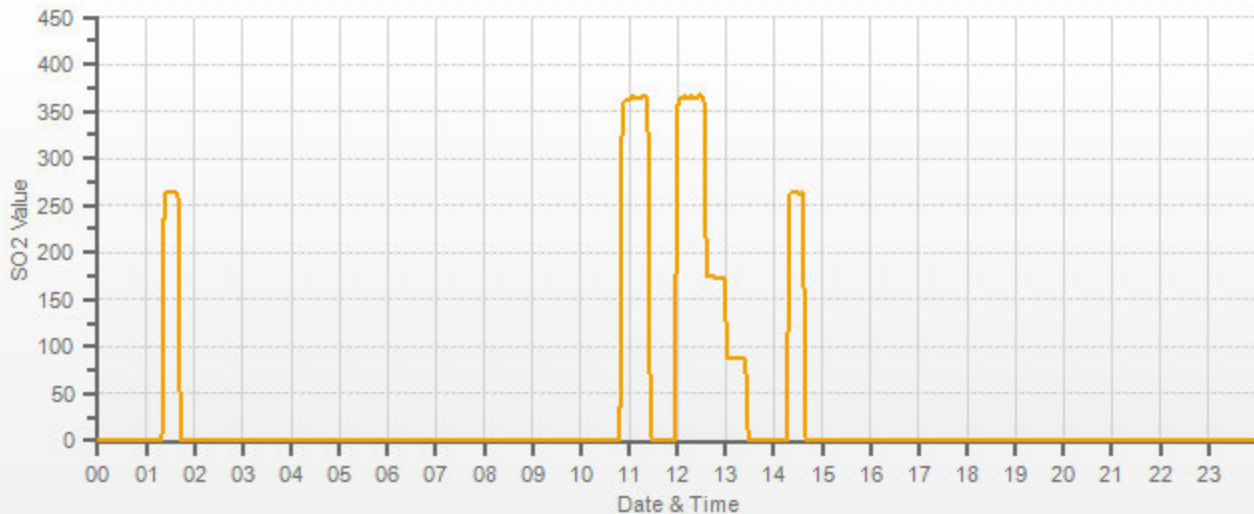
Thermo 43i Sulphur Dioxide Analyzer Calibration



| | | | | | |
|-------------------|--------|-------------------|-----------------|------|-----|
| As found: | Bkg: | 9.2 | As left: | Bkg: | 8.9 |
| Coef: | 0.984 | Coef: | 0.981 | | |
| Pmt: | -623.8 | Pmt: | -623.8 | | |
| Flash: | 763 | Flash: | 764 | | |
| Internal: | 30.2 | Internal: | 31.0 | | |
| Chamber: | 45.1 | Chamber: | 45.2 | | |
| Perm Oven Gas: | 45.00 | Perm Oven Gas: | 45.00 | | |
| Perm Oven Heater: | 44.25 | Perm Oven Heater: | 44.26 | | |
| Pressure: | 670.1 | Pressure: | 671.0 | | |
| Sample Flow: | 0.470 | Sample Flow: | 0.470 | | |
| Lamp Intensity: | 96 | Lamp Intensity: | 96 | | |
| Converter: | n/a | Converter: | n/a | | |
| Converter Set: | n/a | Converter Set: | n/a | | |
| Averaging Time: | 120 | Averaging Time: | 120 | | |
| Expected Value: | 259.0 | Expected Value: | 263.0 | | |

Comments:

SO2[ppb]





Thermo 43i Sulphur Dioxide Analyzer Calibration

| | | | | | |
|--------------------------|-------------------|--|---------------------------------------|------------|-----------|
| Date: | December 27, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 942 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | shut down | | |
| Start Time 24 hr. (mst): | 10:53 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 12:48 | Cal Gas Expiry Date: | October 24, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | 806528242 LICA | Range ppb: | 500 | | |
| Last Calibration Date: | December 13, 2018 | As Found C.F.: | 1.012 | | |
| Previous C.F.: | 1.000 | New C.F.: | n/a | | |

| | | | |
|---------------------------------|------------------------------------|--|-----|
| Calibration Standards: | | Standard Calibration Points for Ranges | |
| Low Flow Meter ID/Expiry Date: | N/A | Point | ppb |
| High Flow Meter ID/Expiry Date: | N/A | High | 380 |
| Calibrator ID/Expiry Date: | API id# 690 expires March 15, 2019 | Mid | 180 |
| Cal Gas Cylinder I.D. #: | LL 104225 | Low | 90 |
| Cal Gas Conc. (ppm): | 49.2 | | |

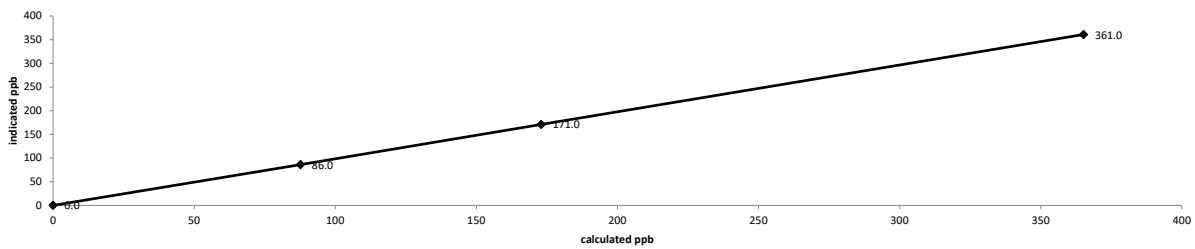
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|----------------|--------------------------------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| | Diluent | Cal Gas | Total | | | |
| as found zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| as found high | 4940 | 36.94 | 4977 | 365.2 | 361 | 1.012 |
| mid | 4927 | 17.38 | 4944 | 173.0 | 171 | 1.011 |
| low | 4941 | 8.82 | 4950 | 87.7 | 86 | 1.019 |
| Average C.F. = | | | | | | 1.014 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.011 | | 0.90-1.10 |
| b (Intercept as % of full scale) = | 0.05% | | ± 3% F.S. |
| % change in C.F. from last cal = | -1.15% | | ± 10% |

Thermo 43i Sulphur Dioxide Analyzer Calibration



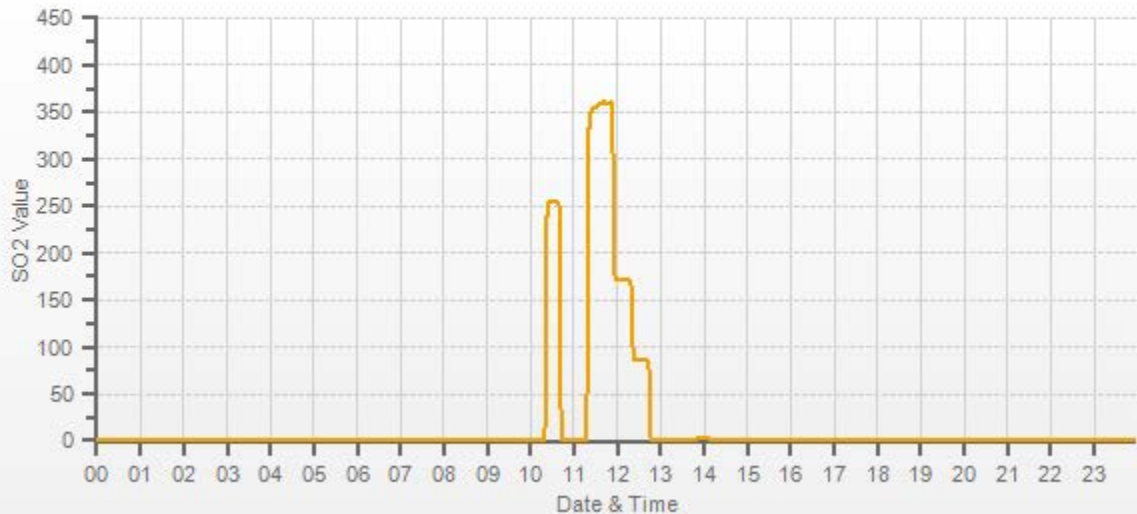
| As found: | | As left: | |
|-------------------|--------|-------------------|-----|
| Bkg: | 8.7 | Bkg: | n/a |
| Coef: | 0.981 | Coef: | n/a |
| Pmt: | -623.8 | Pmt: | n/a |
| Flash: | 767 | Flash: | n/a |
| Internal: | 31.5 | Internal: | n/a |
| Chamber: | 44.9 | Chamber: | n/a |
| Perm Oven Gas: | 45.00 | Perm Oven Gas: | n/a |
| Perm Oven Heater: | 44.26 | Perm Oven Heater: | n/a |
| Pressure: | 689.8 | Pressure: | n/a |
| Sample Flow: | 0.483 | Sample Flow: | n/a |
| Lamp Intensity: | 97 | Lamp Intensity: | n/a |
| Converter: | n/a | Converter: | n/a |
| Converter Set: | n/a | Converter Set: | n/a |
| Averaging Time: | 120 | Averaging Time: | n/a |
| Expected Value: | 263.0 | Expected Value: | n/a |

Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was completed to replace the analyzer with a new analyzer provided by the AEP.

SO2[ppb]





Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

| | | | | | |
|---------------------------------|--------------------|---|---------------------------------------|------------|-----------|
| Date: | December 28, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 950 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | Installation | | |
| Start Time 24 hr. (mst): | 8:50 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 13:14 | Cal Gas Expiry Date: | October 24, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | 11800260018 LICA | Range ppb: | 500 | | |
| Last Calibration Date: | n/a | As Found C.F.: | n/a | | |
| Previous C.F.: | n/a | New C.F.: | 1.000 | | |

| Calibration Standards: | | Standard Calibration Points for Ranges | | | | | | | | |
|--|------------------------------------|--|-------|-----|------|-----|-----|-----|-----|----|
| Low Flow Meter ID/Expiry Date: | N/A | <table border="1"><tr><th>Point</th><th>ppb</th></tr><tr><td>High</td><td>380</td></tr><tr><td>Mid</td><td>180</td></tr><tr><td>Low</td><td>90</td></tr></table> | Point | ppb | High | 380 | Mid | 180 | Low | 90 |
| Point | ppb | | | | | | | | | |
| High | 380 | | | | | | | | | |
| Mid | 180 | | | | | | | | | |
| Low | 90 | | | | | | | | | |
| High Flow Meter ID/Expiry Date: | N/A | | | | | | | | | |
| Calibrator ID/Expiry Date: | API id# 690 expires March 15, 2019 | | | | | | | | | |
| Cal Gas Cylinder I.D. # : | LL 104225 | | | | | | | | | |
| Cal Gas Conc. (ppm): | 49.2 | | | | | | | | | |

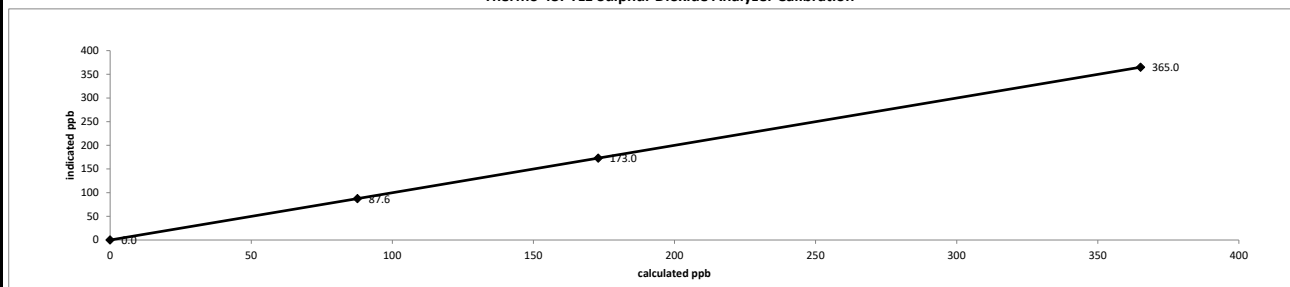
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Diluent | Cal Gas | Total | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|-----------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| adjusted zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| adjusted high | 4940 | 36.94 | 4977 | 365.2 | 365 | 1.000 |
| mid | 4927 | 17.38 | 4944 | 173.0 | 173 | 1.000 |
| low | 4941 | 8.82 | 4950 | 87.7 | 87.6 | 1.001 |
| calibrator zero | 4895 | 0.00 | 4895 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 1.000 |

Linear Regression/Calibration Results:

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

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



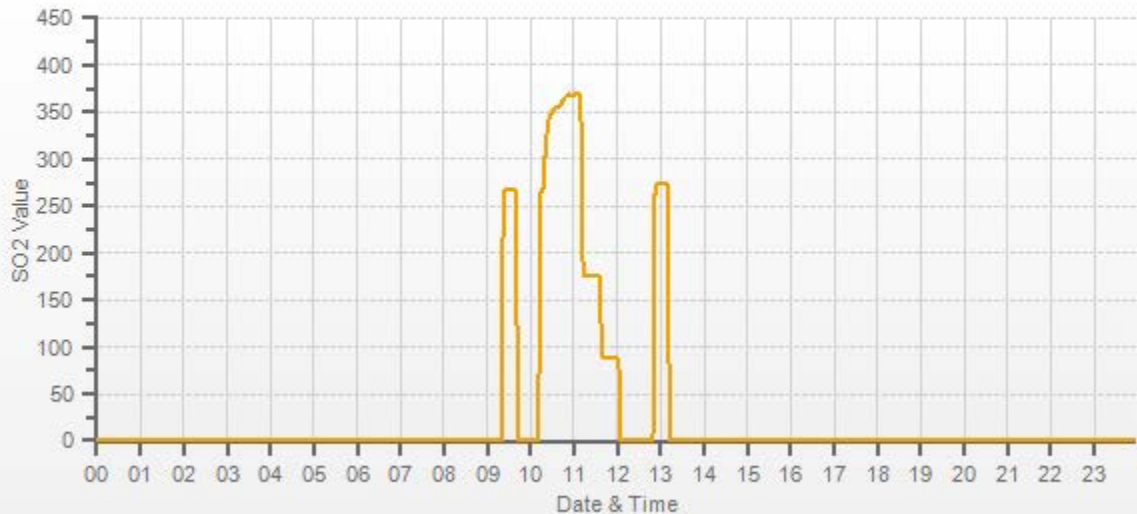
| As found: | As left: |
|-------------------|----------|
| Bkg: | n/a |
| Bkg: | 1.77 |
| Coef: | n/a |
| Coef: | 1.018 |
| Pmt: | n/a |
| Pmt: | -690.1 |
| Flash: | n/a |
| Flash: | 1016 |
| Internal: | n/a |
| Internal: | 32.9 |
| Chamber: | n/a |
| Chamber: | 44.8 |
| Perm Oven Gas: | n/a |
| Perm Oven Gas: | 45.00 |
| Perm Oven Heater: | n/a |
| Perm Oven Heater: | 44.27 |
| Pressure: | n/a |
| Pressure: | 686.4 |
| Sample Flow: | n/a |
| Sample Flow: | 0.450 |
| Lamp Intensity: | n/a |
| Lamp Intensity: | 91 |
| Converter: | n/a |
| Converter: | n/a |
| Converter Set: | n/a |
| Converter Set: | n/a |
| Averaging Time: | n/a |
| Averaging Time: | 120 |
| Expected Value: | n/a |
| Expected Value: | 274.0 |

Comments:

The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.
 The analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.

A new analyzer provided by the AEP was installed.

SO2[ppb]



TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

| | | | |
|--|--|------------|-----------|
| Date: December 13, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 935 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Cold Lake South | Weather Conditions: Cloudy/Overcast | | |
| Parameter: Total Reduced Sulphur | Calibration Purpose: routine monthly | | |
| Start Time 24 hr. (mst): 10:14 | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): 14:47 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): CDNOVA / Model CDN 101 / #501 | | |
| Analyzer: Serial Number/Owner: 8112728560 LICA | Range ppb: 100 | | |
| Last Calibration Date: November 19, 2018 | As Found C.F.: 0.985 | | |
| Previous C.F.: 1.000 | New C.F.: 0.999 | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55 | 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.: 10:16 / 10:32 SO2 Analyzer Range: 500 Target Concentration (ppb): 380 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0 |
|---|--|-------|-----|------|----|-----|----|-----|----|--|
| Point | ppb | | | | | | | | | |
| High | 78 | | | | | | | | | |
| Mid | 38 | | | | | | | | | |
| Low | 19 | | | | | | | | | |

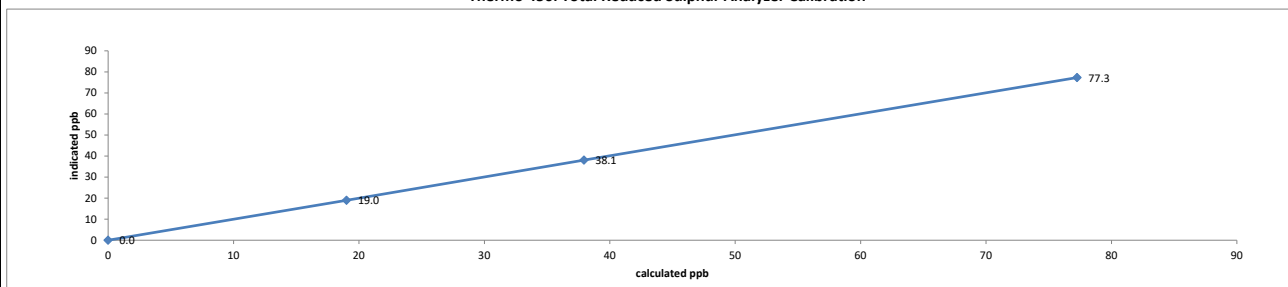
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| as found zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| as found high | 7479 | 61.03 | 7540 | 77.3 | 78.5 | 0.985 |
| adjusted zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| adjusted high | 7479 | 61.00 | 7540 | 77.3 | 77.3 | 0.999 |
| mid | 7420 | 29.60 | 7450 | 37.9 | 38.1 | 0.996 |
| low | 7420 | 14.80 | 7435 | 19.0 | 19 | 1.001 |
| calibrator zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 0.999 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 0.999 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.02% | | ± 3% F.S. |
| % change in C.F. from last cal = | 1.53% | | ± 10% |

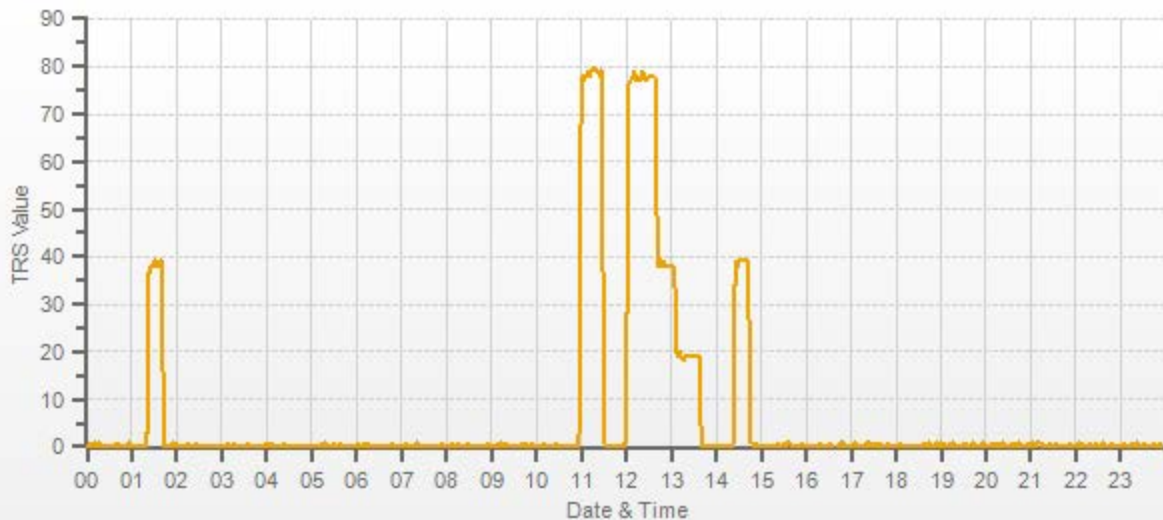
Thermo 450i Total Reduced Sulphur Analyzer Calibration



| | |
|---|--|
| As found: Bkg: 15.2 Coef: 0.902 Pmt: -650.8 Flash: 742 Internal: 33.3 Chamber: 45.2 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 45.00 Perm Oven Htr: 44.37 Pressure: 620.7 Sample Flow: 0.482 Lamp Intensity: 90 Averaging Time: 120 Expected Value: 36.9 | As left: Bkg: 15.2 Coef: 0.899 Pmt: -650.8 Flash: 745 Internal: 33.8 Chamber: 44.8 Converter Temp: 825 Converter Set: 825 Perm Oven Gas: 45.00 Perm Oven Htr: 44.37 Pressure: 621.6 Sample Flow: 0.483 Lamp Intensity: 91 Averaging Time: 120 Expected Value: 38.9 |
|---|--|

Comments:

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



TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | | | |
|------------------------------|-------------------|---------------------------|---------------------------------------|------------|-----------|
| Date: | December 14, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 938 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | A few clouds | | |
| Parameter: | CH4 / NMHC / THC | Calibration Purpose: | routine monthly | | |
| Start/End Time 24 hr. (mst): | 9:35 / 12:54 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | October 18, 2025 | | |

| | | | | | | | |
|-----------|------------------------|-----------------------|------|---------------------|----------------|----------------|-----------|
| Analyzer: | Serial Number/Owner: | 1180320044 | LICA | Correction Factors: | Previous C.F.: | As Found C.F.: | New C.F.: |
| | Measured Flow: | 0.946 | | CH ₄ = | 1.000 | 1.014 | 1.000 |
| | Last Calibration Date: | November 21, 2018 | | NMHC = | 1.000 | 1.008 | 1.001 |
| | Range ppm: | 20 CH4/20 NMHC/40 THC | | THC = | 1.000 | 1.011 | 1.000 |

| | | | |
|------------------------|--|---|--|
| Calibration Standards: | Low Flow Meter ID/Expiry Date: | N/A | Standard Calibration Points for Analyzer Range of 20/20/40 ppm |
| | High Flow Meter ID/Expiry Date: | N/A | Point |
| | Calibrator ID/Expiry Date: | API id# 690 expires March 15, 2019 | High |
| | Cal Gas Cylinder I.D. #: | LL 119471 | Mid |
| | CH4 Cylinder Conc. = | 599.0 207.0 =C ₂ H ₆ Cylinder Conc. | Low |
| | CH ₄ expressed as C ₂ H ₆ = | 569.3 1168.3 =total CH4 equivalent | |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | Correction Factors: | | |
|-----------------|--------------------------------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| | Diluent | Cal Gas | Total Flow | | | | | | | CH ₄ | NMHC | THC |
| as found zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| as found high | 2471 | 55.83 | 2527 | 13.23 | 12.58 | 25.81 | 13.05 | 12.48 | 25.53 | 1.014 | 1.008 | 1.011 |
| adjusted zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| adjusted high | 2471 | 55.83 | 2527 | 13.23 | 12.58 | 25.81 | 13.24 | 12.57 | 25.81 | 1.000 | 1.001 | 1.000 |
| mid | 2469 | 31.00 | 2500 | 7.43 | 7.06 | 14.49 | 7.42 | 7.09 | 14.51 | 1.001 | 0.996 | 0.998 |
| low | 2486 | 14.00 | 2500 | 3.35 | 3.19 | 6.54 | 3.36 | 3.21 | 6.57 | 0.998 | 0.993 | 0.996 |
| calibrator zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| Average C.F. = | | | | | | | | | | 1.000 | 0.996 | 0.998 |

Linear Regression/Calibration Results:

| | | | | |
|------------------------------------|-----------------|--------|--------|--------------|
| Correlation Coefficient = | CH ₄ | NMHC | THC | LIMITS |
| Slope = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| b (Intercept as % of full scale) = | 1.000 | 0.999 | 1.000 | 0.95-1.05 |
| % change in C.F. from last cal = | 0.00% | 0.08% | 0.04% | ± 3% F.S. |
| | -1.41% | -0.77% | -1.10% | ± 10% |

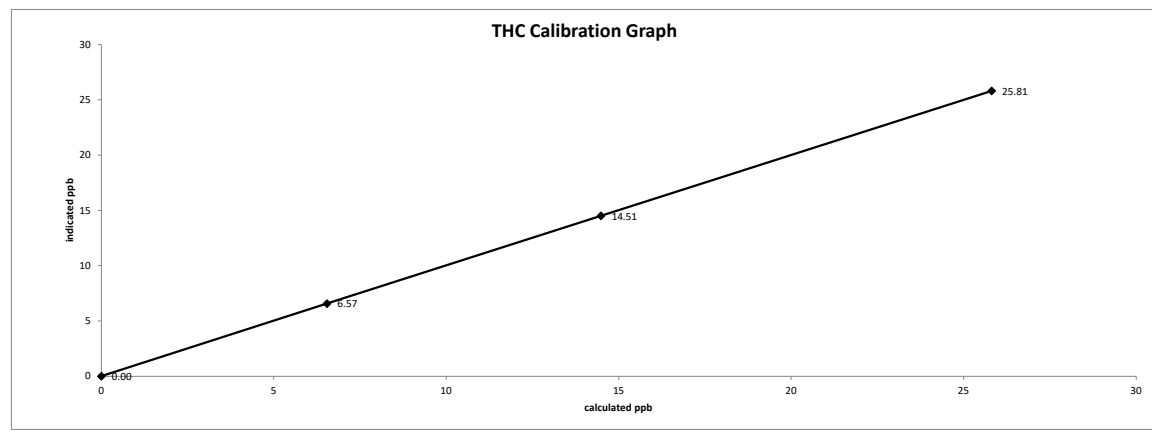
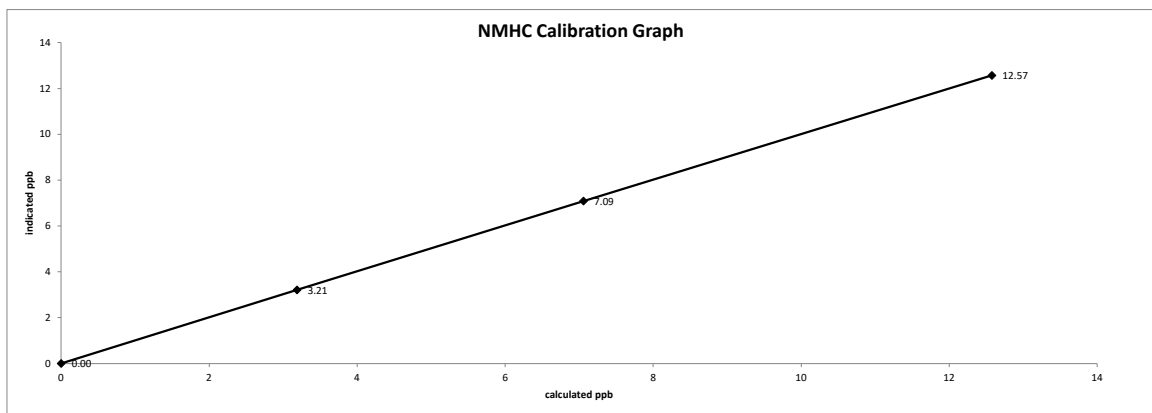
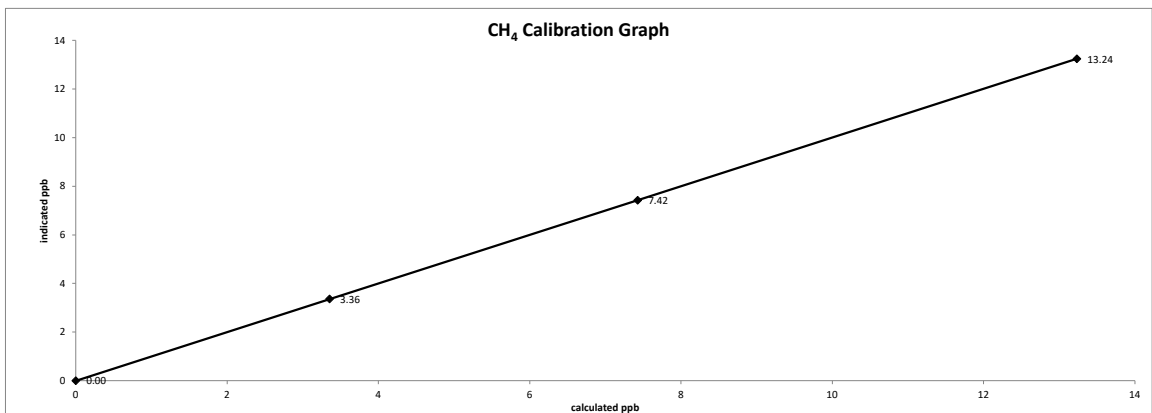
As Left Instrument Diagnostics:

| | | | | | |
|---------------------------|----------------------------|----------------------|----------------------------|----------------------------|--------------|
| Interface Board Voltages: | Bias Supply: | -296.9 | Calibration History cnt'd: | NM Peak Area: | 85920 |
| Temperatures: | Detector Oven: | 175.0 | Crucial Settings: | Methane Start: | n/a |
| | Filter: | 175.1 | | Methane End: | n/a |
| | Column Oven: | 75.0 | | Backflush: | n/a |
| | Internal: | 34.4 | | NMHV Start: | n/a |
| Cylinder Pressures/reg.: | Carrier: | 600 50 | Run History>1: | NMHC End: | n/a |
| | Fuel: | 600 50 | | Date: | Dec 14, 2018 |
| | Span Gas: | 2000 10 | | Time: | 09:57 |
| | Zero Air Generator: | 42 | | CH ₄ PK HT: | 0 |
| Internal Pressures: | Carrier: | 29.4 | | CH ₄ RT: | 12.8 |
| | Fuel: | 44.2 | | CH ₄ Baseline: | 2559 |
| | Air: | 30.2 | | CH ₄ LOD: | 37 |
| FID Status: | Status: | LIT | | CH ₄ SD: | 12 |
| | Counts: | 29444 | | CH ₄ CONC: | 0.00 |
| | Flame: | 340.1 | | NM PK HT: | 0 |
| | Det Base: | 175.0 | | NM Peak Area: | 0 |
| Flame and Power Stats: | Last Power On: | Sep 8, 2018 | | NM CONC: | 0.00 |
| | Flameouts: | 1 | | NM Base Start: | 2546 |
| | Det Oven at Start: | 170.5 | | NM Base End: | 2559 |
| | Col Oven at Start: | 74.6 | | NM LOD: | 12 |
| Calibration History: | Time: | Nov 21, 2018 / 11:25 | | NM Start IDX: | 12 |
| | Type: | SPAN | | NM End IDX: | 56 |
| | Status: | GOOD | | NM Max Slope: | 1.2e+00 |
| | Check/Adjust: | ADJUST | | NM Min Slope: | -3.4e-01 |
| | CH ₄ Span Conc: | 13.30 | Expected Values: | NM PT Count: | 0 |
| | CH ₄ SP Ratio: | 0.000782 | | Previous CH ₄ : | 10.29 |
| | CH ₄ RT: | 13.2 | | Previous NMHC: | 10.91 |
| | CH ₄ PK IDX: | 26 | | Previous THC: | 21.32 |
| | CH ₄ PK HT: | 17018 | | New CH ₄ : | 10.24 |
| | NM Span Conc: | 12.64 | | New NMHC: | 11.28 |
| | NM SP Ratio: | 0.000147 | | New THC: | 21.52 |

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.
 A new span gas cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.

Date: December 14, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:35 / 12:54
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]





Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | |
|---|--|-----|------------|
| Date: December 27, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 942 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Cold Lake South | Weather Conditions: Cloudy/Overcast | | |
| Parameter: CH4 / NMHC / THC | Calibration Purpose: shut down | | |
| Start/End Time 24 hr. (mst): 10:56 / 12:32 | Performed By/Reviewer: Alex Yakupov | | Rob Fisher |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: October 18, 2025 | | |

| | | | | | | | | | | | | | |
|---|--|-------------------|-------|-------|-----|--------|-------|-------|-----|-------|-------|-------|-----|
| Analyzer: | Correction Factors: | | | | | | | | | | | | |
| Serial Number/Owner: 1180320044 LICA | Previous C.F.: | | | | | | | | | | | | |
| Measured Flow: 0.946 | As Found C.F.: | | | | | | | | | | | | |
| Last Calibration Date: December 14, 2018 | New C.F.: | | | | | | | | | | | | |
| Range ppm: 20 CH4/20 NMHC/40 THC | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CH₄ =</td> <td>1.000</td> <td>0.991</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.977</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>0.984</td> <td>n/a</td> </tr> </table> | CH ₄ = | 1.000 | 0.991 | n/a | NMHC = | 1.000 | 0.977 | n/a | THC = | 1.000 | 0.984 | n/a |
| CH ₄ = | 1.000 | 0.991 | n/a | | | | | | | | | | |
| NMHC = | 1.000 | 0.977 | n/a | | | | | | | | | | |
| THC = | 1.000 | 0.984 | n/a | | | | | | | | | | |

| | | | | |
|--|---|--------------|--------------|--------------|
| Calibration Standards: | | | | |
| Low Flow Meter ID/Expiry Date: N/A | Standard Calibration Points for Analyzer Range of 20/20/40 ppm | | | |
| High Flow Meter ID/Expiry Date: N/A | Point | CH4 | NMHC | THC |
| Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 | High | 13.00 | 13.00 | 26.00 |
| Cal Gas Cylinder I.D. #: LL 119471 | Mid | 7.00 | 7.00 | 14.00 |
| CH4 Cylinder Conc. = 599.0 207.0 =C ₃ H ₈ Cylinder Conc. | Low | 3.00 | 3.00 | 6.00 |
| CH₄ expressed as C₃H₈ = 569.3 1168.3 =total CH4 equivalent | | | | |

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 | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| as found high | 2442 | 55.25 | 2497 | 13.25 | 12.60 | 25.85 | 13.37 | 12.89 | 26.27 | 0.991 | 0.977 | 0.984 |
| mid | 2441 | 29.90 | 2471 | 7.25 | 6.89 | 14.14 | 7.28 | 7.01 | 14.29 | 0.996 | 0.983 | 0.989 |
| low | 2486 | 14.00 | 2500 | 3.35 | 3.19 | 6.54 | 3.18 | 3.05 | 6.23 | 1.055 | 1.045 | 1.050 |
| Average C.F. = | | | | | | | | | | 1.014 | 1.002 | 1.008 |

Linear Regression/Calibration Results:

| | | | | | |
|---|-----------------|--------|--------|---------------|--|
| | | | | | |
| Correlation Coefficient = | CH ₄ | NMHC | THC | LIMITS | |
| | 1.000 | 1.000 | 1.000 | > or = 0.995 | |
| Slope = | 1.014 | 1.029 | 1.022 | 0.90-1.10 | |
| b (Intercept as % of full scale) = | -0.45% | -0.47% | -0.46% | ± 3% F.S. | |
| % change in C.F. from last cal = | 0.87% | 2.28% | 1.60% | ± 10% | |

As Left Instrument Diagnostics:

| | | | |
|----------------------------------|------------------------------------|-----------------------------------|--------------------------------|
| Interface Board Voltages: | Bias Supply: -297.2 | Calibration History cnt'd: | NM Peak Area: 84597 |
| Temperatures: | Detector Oven: 175.0 | Crucial Settings: | Methane Start: n/a |
| | Filter: 175.0 | | Methane End: n/a |
| | Column Oven: 74.9 | | Backflush: n/a |
| | Internal: 35.4 | | NMHV Start: n/a |
| Cylinder Pressures/reg.: | Carrier: 300 50 | Run History>1: | NMHC End: n/a |
| | Fuel: 1900 50 | | Date: Dec 27, 2018 |
| | Span Gas: 1300 10 | | Time: 11:04 |
| | Zero Air Generator: 42 | | CH ₄ PK HT: 0 |
| Internal Pressures: | Carrier: 29.4 | CH ₄ RT: 12.4 | CH ₄ Baseline: 2880 |
| | Fuel: 44.2 | CH ₄ LOD: 43 | CH ₄ SD: 14 |
| | Air: 30.2 | CH ₄ CONC: 0.00 | NM PK HT: 0 |
| | Status: LIT | NM Peak Area: 0 | NM CONC: 0.00 |
| FID Status: | Counts: 28029 | NM Base Start: 2869 | NM Base End: 2871 |
| | Flame: 346.4 | NM LOD: 11 | NM Start IDX: 5 |
| | Det Base: 175.0 | NM End IDX: 54 | NM Max Slope: 6.5e-01 |
| | Last Power On: Sep 08, 2018 | NM Min Slope: -5.5e-01 | NM PT Count: 0 |
| Flame and Power Stats: | Flameouts: 1 | Previous CH ₄ : 10.24 | Previous NMHC: 11.28 |
| | Det Oven at Start: 170.5 | Previous THC: 21.52 | New CH ₄ : n/a |
| | Col Oven at Start: 74.6 | New NMHC: n/a | New NMHC: n/a |
| | Time: Dec 14, 2018 / 10:35 | New THC: n/a | |
| Calibration History: | Type: SPAN | Expected Values: | |
| | Status: GOOD | | |
| | Check/Adjust: ADJUST | | |
| | CH ₄ Span Conc: 13.23 | | |
| | CH ₄ SP Ratio: 0.000793 | | |
| | CH ₄ RT: 13.2 | | |
| | CH ₄ PK IDX: 26 | | |
| | CH ₄ PK HT: 16675 | | |
| NM Span Conc: 12.58 | | | |
| NM SP Ratio: 0.000149 | | | |

Comments:

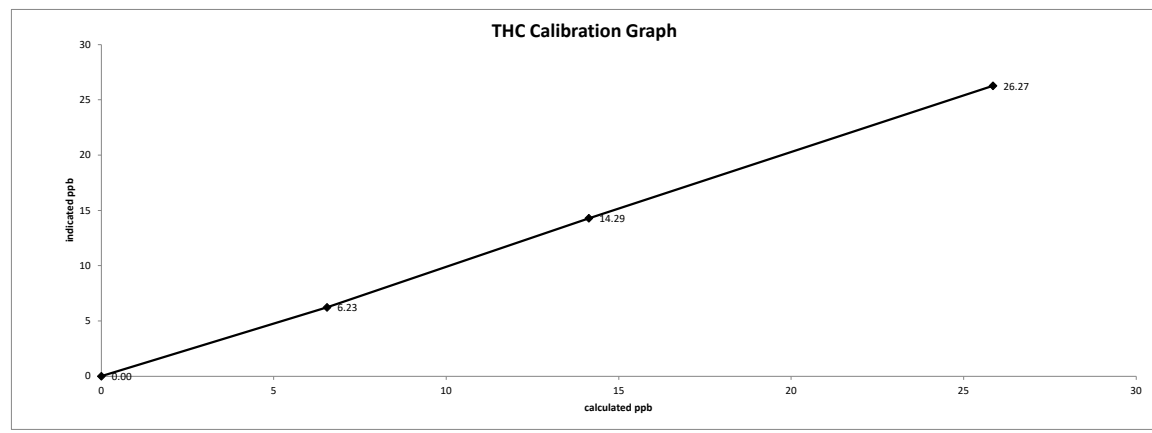
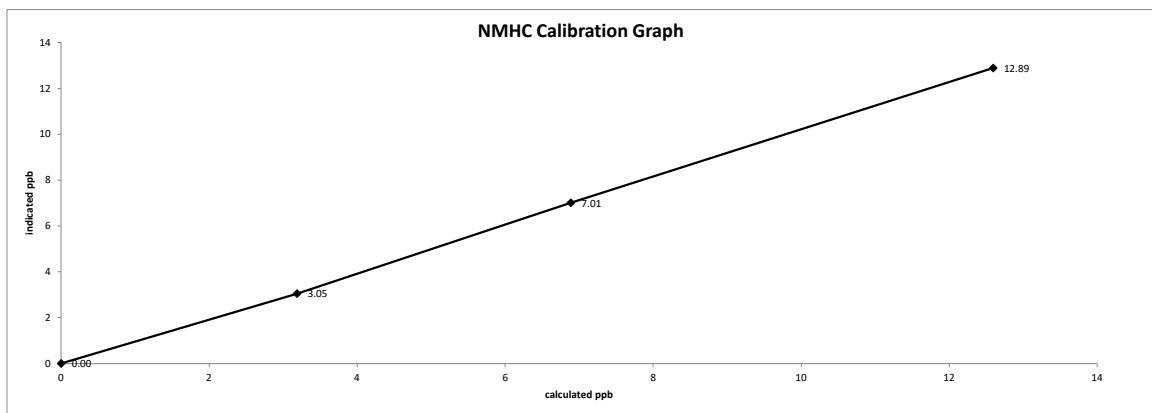
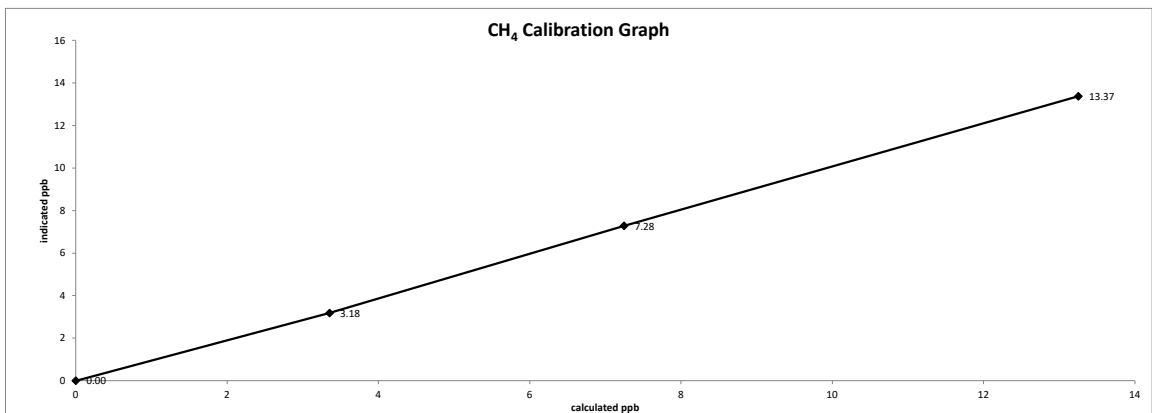
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

The manifold blower was found to be working normally.

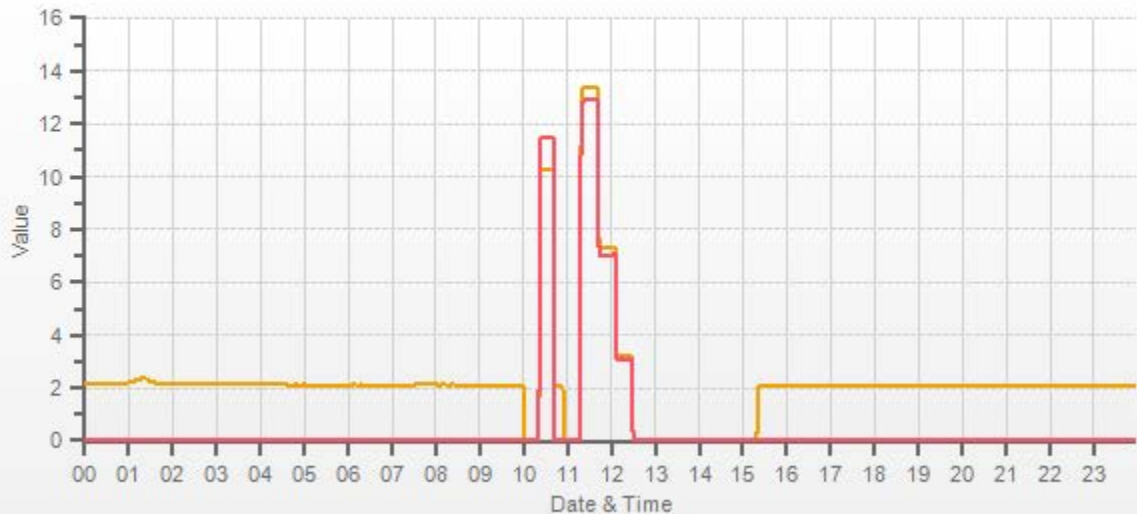
A Shutdown calibration was completed to replace the LICA analyzer with an instrument provided by the AEP.

Date: December 27, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:56 / 12:32
Calibration Purpose: shut down
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]





Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | | | |
|------------------------------|-------------------|---------------------------|---------------------------------------|------------|-----------|
| Date: | December 28, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 950 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Cold Lake South | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | CH4 / NMHC / THC | Calibration Purpose: | Installation | | |
| Start/End Time 24 hr. (mst): | 8:50 / 12:55 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | October 18, 2025 | | |

| | | | | |
|------------------------|-----------------------|---------------------|----------------|-----------|
| Analyzer: | | Correction Factors: | | |
| Serial Number/Owner: | 1180030034 LICA | Previous C.F.: | As Found C.F.: | New C.F.: |
| Measured Flow: | 1.115 | CH ₄ = | n/a | 1.000 |
| Last Calibration Date: | n/a | NMHC = | n/a | 1.000 |
| Range ppm: | 20 CH4/20 NMHC/40 THC | THC = | n/a | 1.000 |

| | | | | | |
|--|---|--|-------|-------|-------|
| Calibration Standards: | | Standard Calibration Points for Analyzer Range of 20/20/40 ppm | | | |
| Low Flow Meter ID/Expiry Date: | N/A | Point | CH4 | NMHC | THC |
| High Flow Meter ID/Expiry Date: | N/A | High | 13.00 | 13.00 | 26.00 |
| Calibrator ID/Expiry Date: | Sabio id# 11900613 expires August 22, 2019 | Mid | 7.00 | 7.00 | 14.00 |
| Cal Gas Cylinder I.D. # : | LL 119471 | Low | 3.00 | 3.00 | 6.00 |
| CH4 Cylinder Conc. = | 599.0 207.0 =C ₂ H ₆ Cylinder Conc. | | | | |
| CH ₄ expressed as C ₂ H ₆ = | 569.3 1168.3 =total CH4 equivalent | | | | |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | Correction Factors: | | |
|-----------------|--------------------------------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| | Diluent | Cal Gas | Total Flow | | | | | | | CH ₄ | NMHC | THC |
| adjusted zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| adjusted high | 2442 | 55.25 | 2497 | 13.25 | 12.60 | 25.85 | 13.25 | 12.60 | 25.85 | 1.000 | 1.000 | 1.000 |
| mid | 2441 | 29.90 | 2471 | 7.25 | 6.89 | 14.14 | 7.17 | 6.74 | 13.90 | 1.011 | 1.022 | 1.017 |
| low | 2475 | 12.90 | 2488 | 3.11 | 2.95 | 6.06 | 3.13 | 2.91 | 6.04 | 0.992 | 1.014 | 1.003 |
| calibrator zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| Average C.F. = | | | | | | | | | | 1.001 | 1.012 | 1.007 |

Linear Regression/Calibration Results:

| | CH ₄ | NMHC | THC | LIMITS |
|------------------------------------|-----------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.998 | 0.999 | 0.999 | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.01% | -0.22% | -0.12% | ± 3% F.S. |
| % change in C.F. from last cal = | n/a | n/a | n/a | n/a |

As Left Instrument Diagnostics:

| | | | | | |
|---------------------------|----------------------------|----------------------|----------------------------|----------------------------|---------------|
| Interface Board Voltages: | Bias Supply: | -303.4 | Calibration History cnt'd: | NM Peak Area: | n/a |
| Temperatures: | Detector Oven: | 175.0 | Crucial Settings: | Methane Start: | n/a |
| | Filter: | 175.0 | | Methane End: | n/a |
| | Column Oven: | 75.0 | | Backflush: | n/a |
| | Internal: | 37.1 | | NMHV Start: | n/a |
| Cylinder Pressures/reg.: | Carrier: | 2500 50 | Run History>1: | NMHC End: | n/a |
| | Fuel: | 1900 50 | | Date: | Dec 28, 2018, |
| | Span Gas: | 1300 10 | | Time: | 10:04 |
| | Zero Air Generator: | 42 | | CH ₄ PK HT: | 0 |
| Internal Pressures: | Carrier: | 26.8 | | CH ₄ RT: | 8.0 |
| | Fuel: | 32.5 | | CH ₄ Baseline: | 115 |
| | Air: | 24.6 | | CH ₄ LOD: | 9 |
| FID Status: | Status: | LIT | | CH ₄ SD: | 3 |
| | Counts: | 11773 | | CH ₄ CONC: | 0.00 |
| | Flame: | 334.8 | | NM PK HT: | 0 |
| | Det Base: | 175.0 | | NM Peak Area: | 0 |
| Flame and Power Stats: | Last Power On: | Dec 27, 2018 / 15:50 | | NM CONC: | 0.00 |
| | Flameouts: | 1 | | NM Base Start: | 107 |
| | Det Oven at Start: | 19.4 | | NM Base End: | 74 |
| | Col Oven at Start: | 18.3 | | NM LOD: | 11 |
| Calibration History: | Time: | n/a | | NM Start IDX: | 64 |
| | Type: | n/a | | NM End IDX: | 72 |
| | Status: | n/a | | NM Max Slope: | 4.4e-01 |
| | Check/Adjust: | n/a | | NM Min Slope: | -7.8e-01 |
| | CH ₄ Span Conc: | n/a | Expected Values: | NM PT Count: | 0 |
| | CH ₄ SP Ratio: | n/a | | Previous CH ₄ : | n/a |
| | CH ₄ RT: | n/a | | Previous NMHC: | n/a |
| | CH ₄ PK IDX: | n/a | | Previous THC: | n/a |
| | CH ₄ PK HT: | n/a | | New CH ₄ : | 10.13 |
| | NM Span Conc: | n/a | | New NMHC: | 11.20 |
| | NM SP Ratio: | n/a | | New THC: | 21.34 |

Comments:

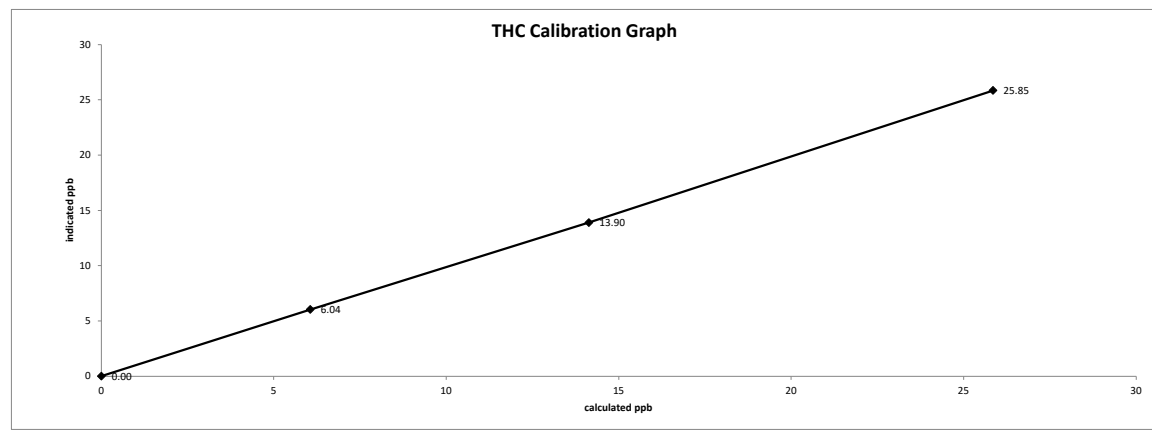
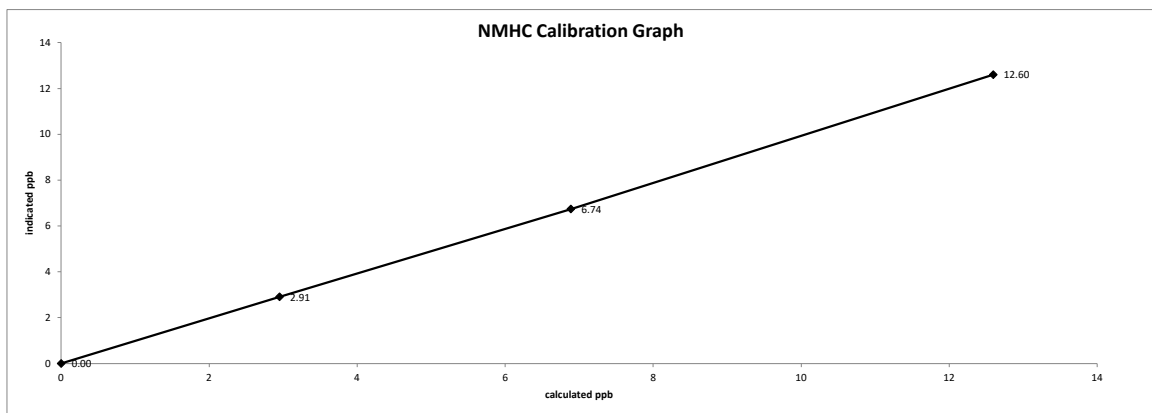
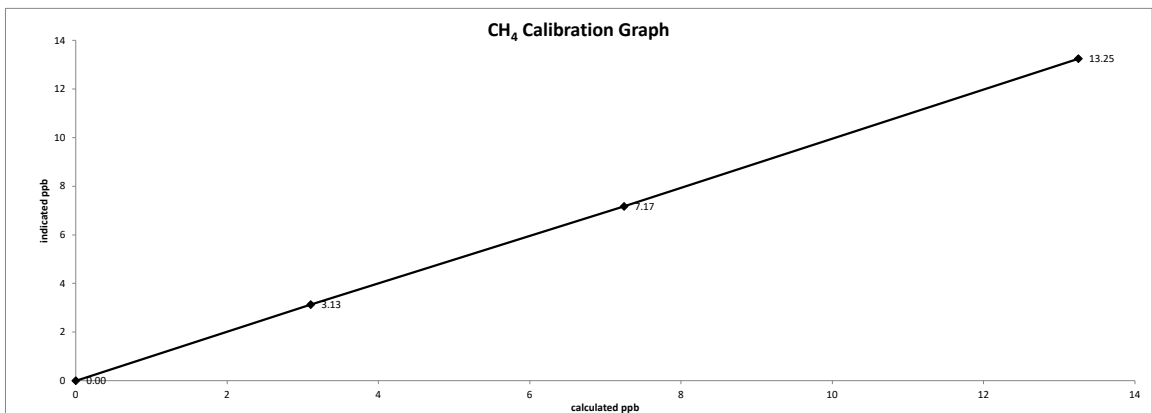
A new nitrogen cylinder was installed.
 A column conditioning was performed.
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

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

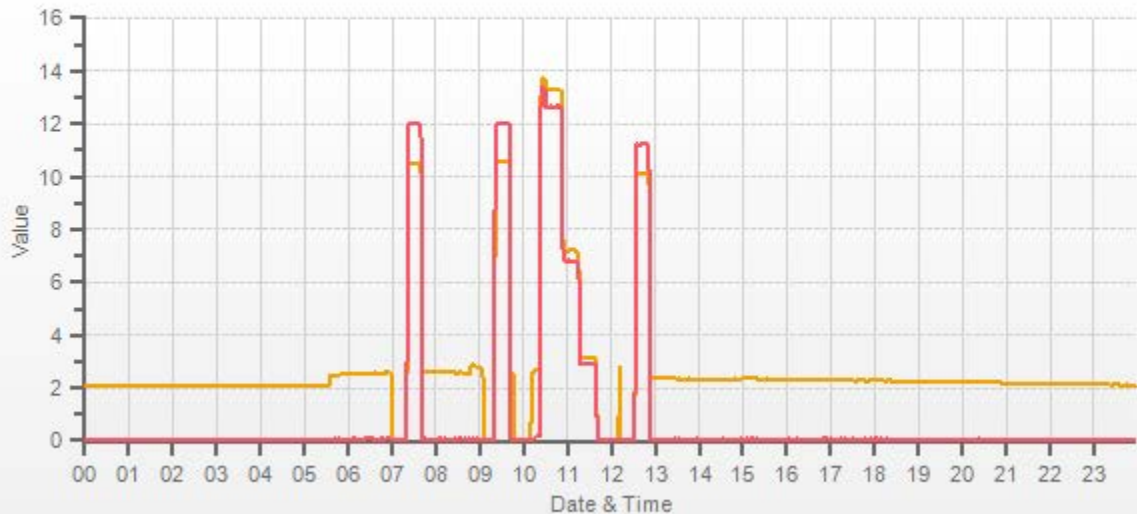
A new analyzer provided by the AEP was installed.

Date: December 28, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 8:50 / 12:55
Calibration Purpose: installation
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 13, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 935 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Cold Lake South | Weather Conditions: Cloudy/Overcast | | |
| Start/End Time 24 hr. (mst): 10:14 / 16:37 | Calibration Purpose: routine monthly | | |
| G.P.T. to be used for Ozone?: No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1505664393 LICA Last Calibration Date: November 19, 2018 Range ppb: 500 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>1.009</td> <td>1.001</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.011</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.001 | 1.009 | 1.001 | NO ₂ = | 1.000 | 1.000 | 1.000 | NOx = | 1.000 | 1.011 | 1.000 |
|--|--|----------------|----------------|----------------|-----------|------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.001 | 1.009 | 1.001 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.000 | 1.000 | | | | | | | | | | | | | | |
| NOx = | 1.000 | 1.011 | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 500 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Standard Calibration Points for a Range of: 500 ppb | | | | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 380 | 250 | n/a | Mid | 180 | 145 | n/a | Low | 90 | 50 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|---|---|------------|--|--|-------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Standard Calibration Points for a Range of: 500 ppb | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High | 380 | 250 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 180 | 145 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low | 90 | 50 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 4895 | 0.0 | 4895 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 4940 | 36.9 | 4977 | 382.2 | 383.0 | 379.0 | 379.0 | 1.009 | 1.011 |
| adjusted zero | 4895 | 0.00 | 4895 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4940 | 36.94 | 4977 | 382.2 | 383.0 | 382.0 | 383.0 | 1.001 | 1.000 |
| mid | 4927 | 17.38 | 4944 | 181.0 | 181.4 | 181.0 | 181.0 | 1.000 | 1.002 |
| low | 4941 | 8.82 | 4950 | 91.8 | 91.9 | 91.0 | 91.0 | 1.008 | 1.010 |
| calibrator zero | 4895 | 0.00 | 4895 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.003 | 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 | 4940 | 36.94 | 4977 | 0.0 | 382.0 | 383.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4940 | 36.94 | 4977 | 255.0 | 133.0 | 383.0 | 250.0 | 249.0 | 249.0 | 1.000 |
| adjusted high NO2 | 4940 | 36.94 | 4977 | 255.0 | 133.0 | 383.0 | 250.0 | 249.0 | 249.0 | 1.000 |
| gpt mid | 4940 | 36.94 | 4977 | 150.0 | 237.0 | 383.0 | 146.0 | 145.0 | 145.0 | 1.000 |
| gpt low | 4940 | 36.94 | 4977 | 52.0 | 331.0 | 383.0 | 52.0 | 51.0 | 51.0 | 1.000 |
| Average NO ₂ C.F.= | | | | | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | NO | NOx | NO ₂ | LIMITS |
|-----------------------------------|--------|--------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.000 | 0.999 | 1.003 | 0.95-1.05 |
| b (Intercept as % of full scale)= | -0.05% | -0.09% | 0.12% | ± 3% F.S. |
| % change in C.F. from last cal= | -0.75% | -1.05% | 0.00% | ± 10% |
| NO2 converter efficiency | | | 1.00 | 0.96 to 1.04 |

| As found: | | As left: | |
|---------------------|--------|---------------------|--------|
| NO Bkg: | 4.3 | NO Bkg: | 4.3 |
| NOx Bkg: | 4.6 | NOx Bkg: | 4.6 |
| NO Coef: | 1.061 | NO Coef: | 1.070 |
| NO2 Coef: | 0.996 | NO2 Coef: | 0.996 |
| NOx Coef: | 0.997 | NOx Coef: | 0.999 |
| PMT: | -855.1 | PMT: | -854.7 |
| Internal: | 28.8 | Internal: | 29.7 |
| Chamber: | 50.2 | Chamber: | 50.5 |
| Cooler: | -2.9 | Cooler: | -2.9 |
| NO2 Converter: | 326.8 | NO2 Converter: | 323.7 |
| NO2 Converter Set: | 325.0 | NO2 Converter Set: | 325.0 |
| Perm Oven Gas: | 35.00 | Perm Oven Gas: | 35.00 |
| Perm Oven Heater: | 34.27 | Perm Oven Heater: | 34.27 |
| Pressure: | 178.7 | Pressure: | 179.9 |
| Flow: | 0.720 | Flow: | 0.731 |
| Ozonator Flow: | OK | Ozonator Flow: | OK |
| Expected Value NO: | 2 | Expected Value NO: | 2 |
| Expected Value NO2: | 275 | Expected Value NO2: | 270 |
| Expected Value NOx: | 277 | Expected Value NOx: | 272 |

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The analyzer cooling fan filter(s) were cleaned.

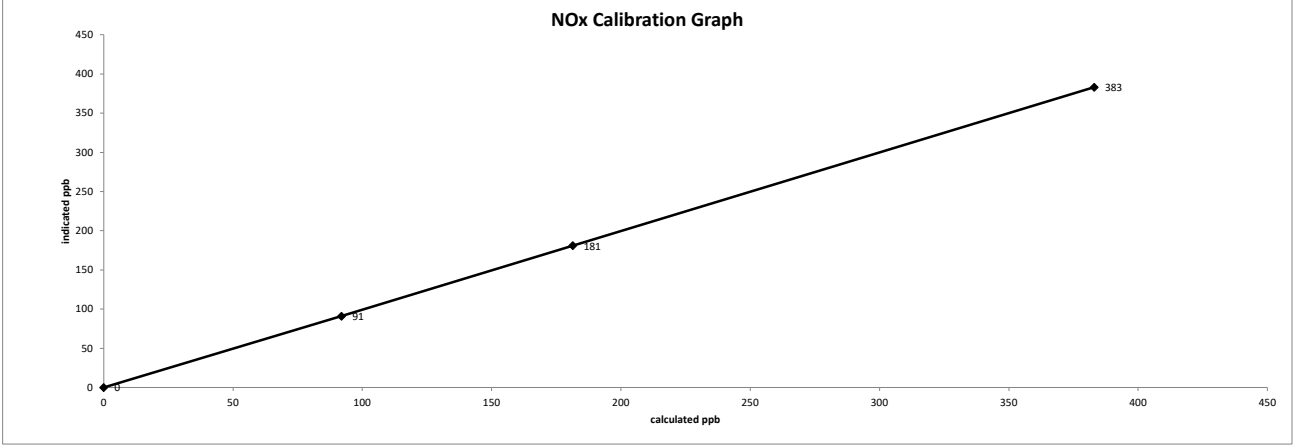
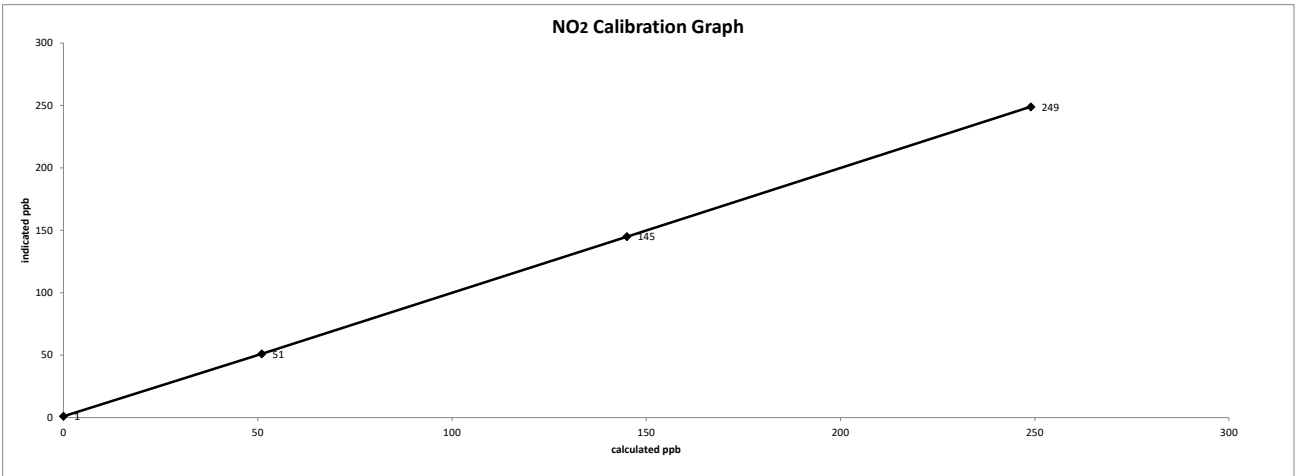
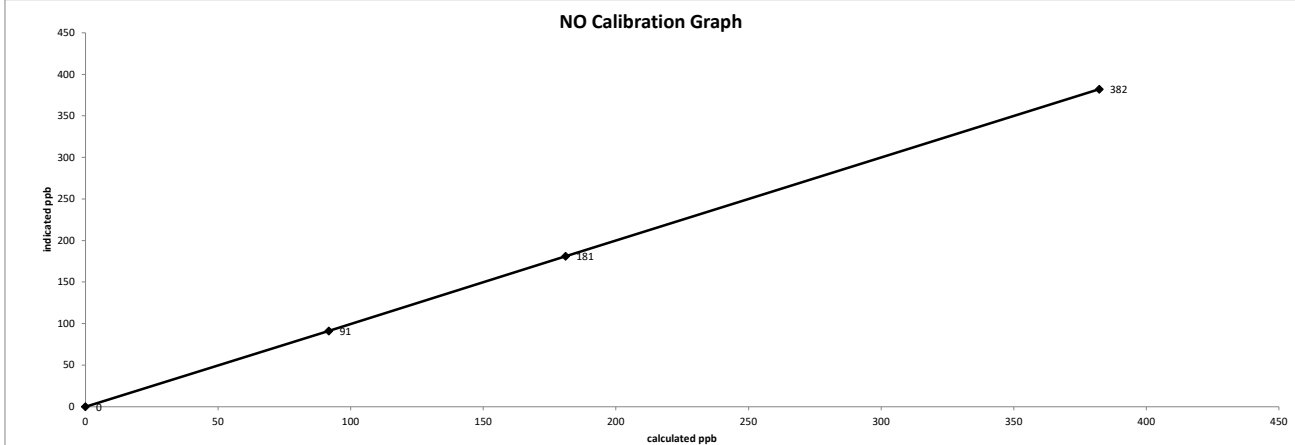
The converter cooling fan filter was cleaned.

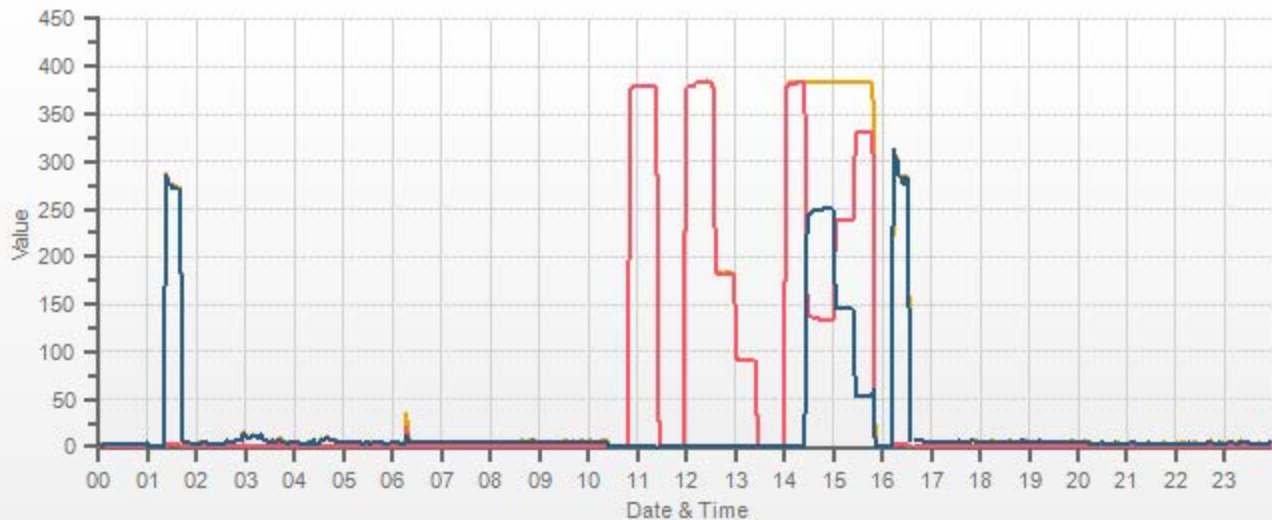
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: December 13, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:14 / 16:37
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





OZONE



Thermo 49i Ozone Analyzer Calibration

| | |
|---|--|
| Date: December 14, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 9:35 / 13:28 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power Analyzer: Serial Number/Owner: 700419951 LICA Last Calibration Date: November 21, 2018 Previous Cal High Point C.F.: 1.000 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 938 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power Ozone Range ppb: 500 As Found C.F.: 1.000 New C.F.: 1.000 |
|---|--|

| | |
|---------------------------------|--|
| Calibration Standards: | |
| Low Flow Meter ID/Expiry Date: | N/A |
| High Flow Meter ID/Expiry Date: | N/A |
| Calibrator ID/Expiry Date: | Sabio id# 11900613 expires August 22, 2019 |
| 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 |

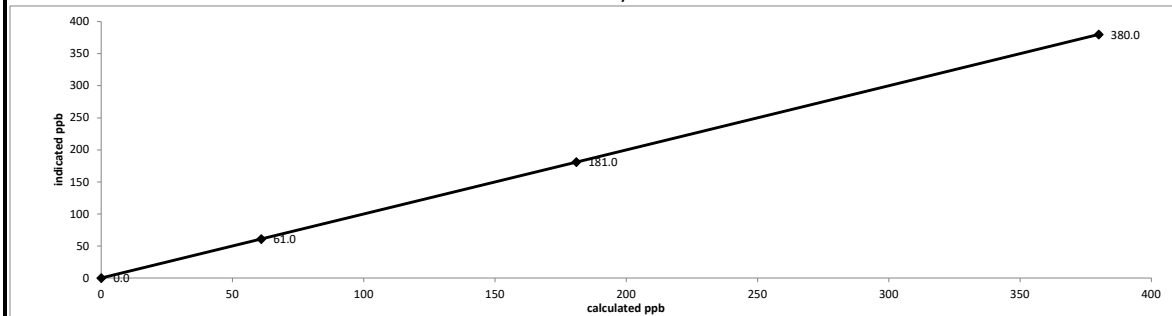
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| 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 | 380.0 | 1.000 |
| adjusted zero | 5000 | 5000 | 0.0 | 0.0 | 0.0 | n/a |
| adjusted high | 5000 | 5000 | 380.0 | 380.0 | 380.0 | 1.000 |
| mid | 5000 | 5000 | 181.0 | 181.0 | 181.0 | 1.000 |
| low | 5000 | 5000 | 61.0 | 61.0 | 61.0 | 1.000 |
| calibrator zero | 5000 | 5000 | 0.0 | n/a | 0.0 | n/a |
| Average C.F.= | | | | | | 1.000 |

Linear Regression/Calibration Results:

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

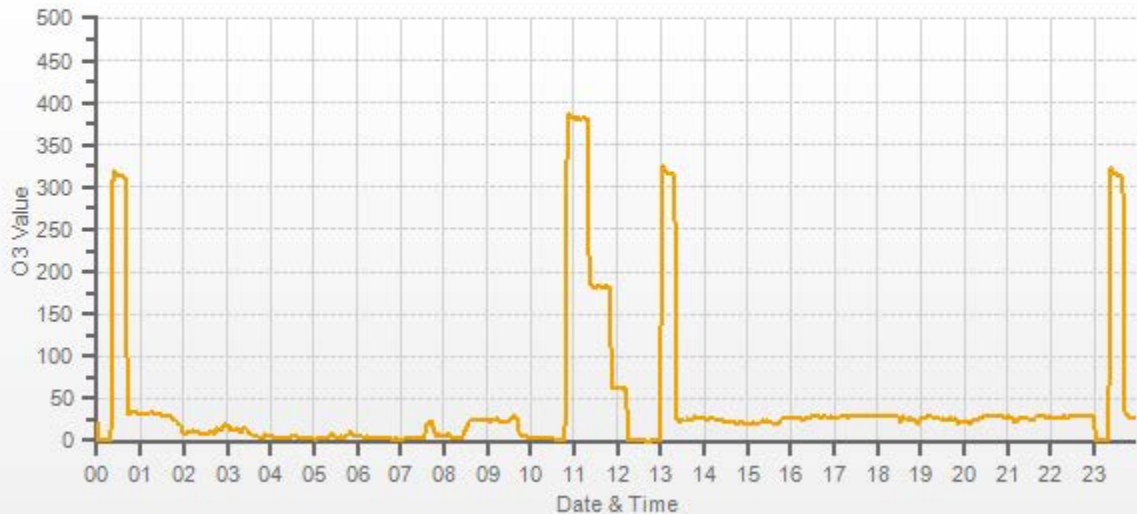
Thermo 49i Ozone Analyzer Calibration



| | |
|---|---|
| As found: O3 Bkg: 0.0 O3 Coef: 1.041 Photo Lamp: 9.6 O3 Lamp: 8.0 Bench: 29.7 Bench Lamp: 53.5 O3 Lamp: 67.5 Pressure: 695.6 Cell A lpm: 0.704 Cell B lpm: 0.747 O3 ppb: 2.0 Cell A ppb: 12.7 Cell B ppb: -8.8 Cell A int (Hz): 77487 Cell B int (Hz): 79313 Expected Value: 312.0 | As left: O3 Bkg: 0.0 O3 Coef: 1.041 Photo Lamp: 9.6 O3 Lamp: 8.0 Bench: 30.0 Bench Lamp: 53.3 O3 Lamp: 67.5 Pressure: 694.1 Cell A lpm: 0.703 Cell B lpm: 0.745 O3 ppb: 0.1 Cell A ppb: 8.2 Cell B ppb: -8.0 Cell A int (Hz): 77508 Cell B int (Hz): 79332 Expected Value: 315.0 |
|---|---|

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

O3[ppb]



PARTICULATE MATTER



Thermo 5030 SHARP Monitor Calibration

| | | | | |
|------------------------|-------------------|------------------------|--------------|------------|
| Date: | December 14, 2018 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher |
| Company: | LICA | Start Time (mst): | 13:39 | |
| Station Name/Location: | Cold Lake South | End Time (mst): | 15:44 | |
| Previous Audit Date: | November 15, 2018 | Calibration Purpose: | quarterly | |
| Parameter: | PM 2.5 | Weather Conditions: | A few clouds | |

| | | | | |
|--------------------------------------|-----------|------|-------------|---|
| SHARP Information and Status: | | | | |
| Serial Number/Owner: | CM - 2209 | LICA | Status Code | 0 |
| Approx. % Tape Reaming | 50% | | Error Code | 0 |

| | |
|---|---|
| Reference Standards/I.D./Cert. Date: | |
| High Flow: | Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019 |
| Digital Manometer: | Dwyer 475 Mark III id# 3 expires January 9, 2019 |
| Temperature: | F.S. 170286131 expires April 19, 2019 |
| Pressure: | F.S. 05544 expires January 15, 2019 |

| | | | | | | |
|---|-----------------------------|---------|---------|---------|----------|--------|
| As Found Temperatures, Pressure, Humidity: | | | | | | |
| | T1 (°C) | T2 (°C) | T3 (°C) | T4 (°C) | P3 (hPa) | RH (%) |
| SHARP: | -1 | 23 | 24 | 24 | 935 | 19 |
| Reference: | -1.8 | 24.3 | 24.3 | 24.4 | 933.0 | 17.4 |
| Difference: | 0.8 | 1.3 | 0.3 | 0.4 | 2.0 | -1.6 |
| | Temp Limit: ± 4 °C | | | | | |
| | Pressure Limit: ± 13.33 hPa | | | | | |
| | RH Limit: ± 2% | | | | | |

| | | | | | | |
|---|-----------------------------|---------|---------|---------|----------|--------|
| As Left Temperature and Pressure (same as above if as found adequate): | | | | | | |
| | T1 (°C) | T2 (°C) | T3 (°C) | T4 (°C) | P3 (hPa) | RH (%) |
| SHARP: | -3 | 24 | 24 | 24 | 933 | 16 |
| Reference: | -2.5 | 23.8 | 23.8 | 23.8 | 933.0 | 16.4 |
| Difference: | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0% |
| | Temp Limit: ± 4 °C | | | | | |
| | Pressure Limit: ± 13.33 hPa | | | | | |
| | RH Limit: ± 2% | | | | | |

| | | | |
|-------------------------------|------------|---------|------------------|
| Mass Foil Calibration: | | | |
| | Mass Foil: | ZERO: | Span Sensitivity |
| Mass Foil ID: | 9015 | QLF: | 7037 |
| Spanfoil Value (µg): | 1294 | CONFID: | 7057 |

| | | | | |
|---------------------------|----------|--|---------|--|
| Nephelometer Zero: | | | | |
| | As Found | | As Left | |
| Analog | 158.00 | | 158.00 | |
| NEPH | -0.70 | | -0.60 | |
| C14 | -3.80 | | 12.00 | |
| Conc | -0.30 | | -0.20 | |

| | | | | | |
|---------------------------|------------------|--|---------|--|---|
| Flow rate: | | | | | |
| | As Found | | As Left | | $%D = 100 \times \frac{Q_m - Q_i}{Q_i}$ |
| SHARP AirFlow l/hr | 1000 | | 1000 | | |
| Reference AirFlow (l/min) | 16.79 | | 16.67 | | |
| Reference AirFlow (l/hr) | 1007 | | 1000 | | |
| % Difference: | -0.7% | | 0.0% | | |
| | Tolerance +/- 5% | | | | |

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

| | | |
|--------------------------|---------|-----------------|
| Pump Assembly: | | |
| | Yes/No? | If no, explain: |
| Pump Inspected / Cleaned | yes | |
| Pump Vanes Replaced | no | Not required |

Comments:

Leak check: 16.67 vs 16.66, Difference=0.01 lpm <0.42 lpm, passed.

WIND SYSTEM

CALIBRATORS

Company: Maxxam Operator: Chris W

| | | | | | | | |
|------------------------|-------------------|-----------|-------------|---------------------------------|--------------------------|--|--|
| Calibrator: | | | | Flow Measurement Device: | | | |
| Make/Model | <u>API 700</u> | | | Make/Model | <u>Mesa Defender 530</u> | | |
| Serial Number | <u>690</u> | | | Serial Number | <u>L-153351 H-152571</u> | | |
| Last Verification Date | <u>March 2016</u> | | | Temperature (°C) | <u>23.5 C</u> | | |
| NO Cylinder S/N | <u>LL108015</u> | | | Barometric Pressure | <u>695 mmHg</u> | | |
| NO [PPM] | <u>52.2</u> | NOx [PPM] | <u>52.3</u> | | | | |
| Expiry Date | <u>Oct 2020</u> | | | | | | |

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

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|-------------------------------------|------|-----------------------|-------|----------------------|-----------------|-------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Limit ± 10% | |
| 4959 | 75.0 | 0.789 | 0.791 | 0.793 | 0.000 | 0.793 | 1% | 0% |
| 4971 | 36.5 | 0.383 | 0.384 | 0.384 | 0.000 | 0.384 | 0% | 0% |
| 4967 | 18.2 | 0.191 | 0.192 | 0.191 | 0.000 | 0.191 | 0% | -1% |
| 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)= | 1.0054 | 0.90-1.10 | | m (Slope)= | 1.0031 |
| b (Intercept % of FS)= | -0.0583 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0795 |

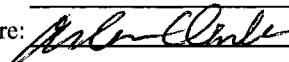
| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|-------|-----------------|-------|----------------------|---------------|
| 4959 | 0.000 | 0.000 | 0.790 | -0.001 | 0.789 | NO ₂ | % Diff. Limit |
| 4959 | 0.500 | 0.497 | 0.293 | 0.493 | 0.786 | -1% | ± 10% |
| 4959 | 0.275 | 0.273 | 0.517 | 0.269 | 0.787 | -1% | ± 10% |
| 4959 | 0.100 | 0.102 | 0.688 | 0.099 | 0.787 | -2% | ± 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)= | 0.9946 | 0.90-1.10 |
| b (Intercept % of FS)= | -0.1817 | ± 3% F.S. |

| | | | |
|-------------------------|--------------------|--------------------------------|-----------------------|
| AENV Standards | | NO_x Analyzer | |
| Audit Calibrator | | Make/Model | <u>Teco 42i</u> |
| Make/Model | <u>Teco 146i</u> | Serial/AMU Number | <u>AMU 1868</u> |
| Serial/AMU Number | <u>AMU 1809</u> | Last Calibration Date | <u>March 14, 2018</u> |
| SRM Gas Cylinder No. | <u>APEX1170572</u> | Full Scale (ppm) | <u>1.0</u> |
| Cylinder Conc. (ppm) | <u>49.99</u> | Cylinder Gas Expiry Date | <u>November 2020</u> |

COMMENTS: Cylinder contains 47.9 ppm SO₂.

Auditor: Al Clark
Operator Signature: 

Date: March 15, 2018
Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

| | | | |
|------------------------|-------------------------|---------------------------------|---------------------------|
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>Sabio</u> | Make/Model | <u>Bios Definer 220</u> |
| Serial Number | <u>11900613</u> | Serial Number | <u>H=128686; L=129069</u> |
| Last Verification Date | <u>March 16, 2018</u> | Temperature (°C) | <u>22.9 C</u> |
| NO Cylinder S/N | <u>LL104183</u> | Barometric Pressure | <u>698 mmHg</u> |
| NO [PPM] | <u>50.8</u> | NOx [PPM] | <u>50.9</u> |
| Expiry Date | <u>October 24, 2020</u> | | |

| | | | |
|----------------------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | |
| Pt. #1 | <u>5059</u> | Pt. #2 | <u>5073</u> |
| Pt. #3 | <u>5073</u> | | |
| Gas Flow (sccm) | | | |
| Pt. #1 | <u>77.5</u> | Pt. #2 | <u>38.2</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 |
| 5124 | 0.0 | 0.0000 | 0.0000 | 0.0000 | -0.0001 | 0.0000 | Limit ± 10% | |
| 5059 | 77.5 | 0.7782 | 0.7797 | 0.7763 | 0.0005 | 0.7767 | 0% | 0% |
| 5073 | 38.2 | 0.3825 | 0.3833 | 0.3794 | 0.0000 | 0.3795 | -1% | -1% |
| 5073 | 19.1 | 0.1913 | 0.1916 | 0.1904 | 0.0000 | 0.1904 | 0% | -1% |
| Absolute Average Percent Difference | | | | | | | 1% | 1% |

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)= | 0.9975 | 0.90-1.10 | | m (Slope)= | 0.9960 |
| b (Intercept % of FS)= | -0.0616 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0661 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 5059 | 0.0 | 0.0000 | 0.7741 | 0.0000 | 0.7741 | NO ₂ | % Diff. Limit |
| 5059 | 500.0 | 0.4918 | 0.2823 | 0.4916 | 0.7739 | 0% | ± 10% |
| 5059 | 275.0 | 0.2774 | 0.4967 | 0.2780 | 0.7747 | 0% | ± 10% |
| 5059 | 100.0 | 0.1031 | 0.6710 | 0.1032 | 0.7743 | 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)= | 0.9998 | 0.90-1.10 | |
| b (Intercept % of FS)= | 0.0173 | ± 3% F.S. | |

| <u>AENV Standards</u> | | <u>NO_x Analyzer</u> | |
|-------------------------|--------------------|--------------------------------|--------------------------|
| 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>August 16, 2018</u> |
| SRM Gas Cylinder No. | <u>APEX1170572</u> | Full Scale (ppm) | <u>1.0</u> |
| Cylinder Conc. (ppm) | <u>49.99</u> | Cylinder Gas Expiry Date | <u>November 15, 2020</u> |

COMMENTS: _____

Auditor: Shea Beaton
Operator Signature: _____

Date: August 22, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

| Reference Calibrator and Gas: | Flow Measurement Device: |
|--|---|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Mesa Definer 220</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>H-133034 / L-132702</u> |
| Last Verification Date: <u>December 13, 2017</u> | Temp. °C: <u>23.4 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>707 mmHg</u> |
| Cylinder Number: <u>CAL016625</u> | |
| Expiry Date: <u>January 2019</u> | |

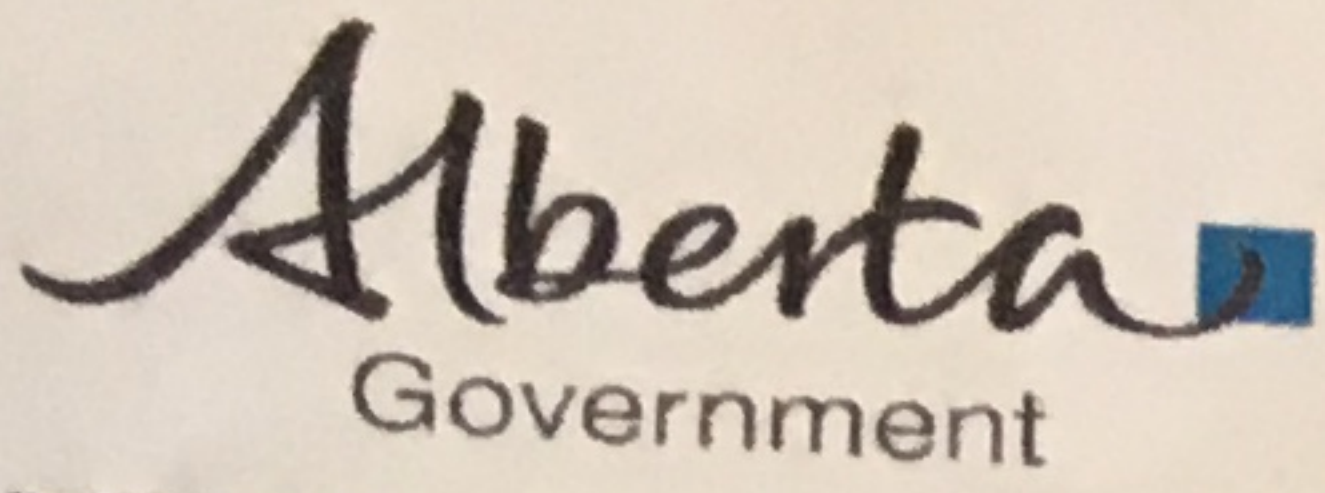
Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | | | |
| 4989 | 79.5 | 0.764 | 0.01594 | 62.755 | 47.9 |
| 4995 | 39.6 | 0.380 | 0.00793 | 126.136 | 47.9 |
| 4992 | 19.6 | 0.188 | 0.00393 | 254.694 | 47.9 |
| Average Cylinder Concentration: | | | | | 47.9 |

Previous Stated Concentration PPM: 49.2
 Percent variance from Stated: 3

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

Auditor: Al Clark Date: December 13, 2017
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5051 | 39.6 | 0.0753 | 0.00784 | 127.551 | 9.60 |
| 5028 | 20.2 | 0.0387 | 0.00402 | 248.911 | 9.63 |
| 5033 | 10.5 | 0.0198 | 0.00209 | 479.333 | 9.49 |
| Average Cylinder Concentration: | | | | | 9.58 |

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *[Signature]*

Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2017-481CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL119471 Conc CH4 (PPM) 599/207 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2025

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------------|------------------|--------------------------|----------------------------|
| Make/Model | <u>R&R MFC 201</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1690</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.1 C</u> |
| Gas Type | <u>CH4</u> | Conc. | <u>990.4</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>5604875</u> | Expiry Date | <u>July 2021</u> | | |
| Gas Type | <u>C3H8</u> | Conc. | <u>246.5</u> | | |
| Cylinder Number | <u>XF003845B</u> | Expiry Date | <u>July 2022</u> | | |

Reference Analyzer:

Make/Model Teco 55i Serial/AMU Number: 2108

Instrument Settings Zero: N/A Span: N/A Range: 20.0

Last Calibration: Date: Dec 12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (scem) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|----------------|
| | | CH4 | C3H8 | | | CH4 | C3H8 |
| 3500 | 0.0 | 0.00 | 0.00 | 0.02 | 45.00 | 603 | 209 |
| 3618 | 80.4 | 13.41 | 12.75 | 0.02 | 45.00 | 603 | 209 |
| 3547 | 39.8 | 6.73 | 6.47 | 0.01 | 89.12 | 600 | 210 |
| 3560 | 19.8 | 3.34 | 3.21 | 0.01 | 179.80 | 601 | 210 |
| Average Cylinder Concentration: | | | | | | 601 | 209 |

| | |
|---|-------------|
| CH4 | C3H8 |
| Previous Stated Concentration PPM: <u>599</u> | <u>207</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on CH4 only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------|--------------|--------------------------|----------------------------|
| Make/Model | <u>Teco 146i</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1809</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.4 C</u> |
| Gas Type | <u>NO</u> | Conc. | <u>50.03</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>APEX 1223938</u> | | | | |
| Expiry Date | <u>June 2020</u> | | | | |

Reference Analyzer:

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

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4989 | 79.5 | 0.813 | 0.812 | 0.016 | 62.755 | 51.0 | 51.0 |
| 4995 | 39.6 | 0.407 | 0.406 | 0.008 | 126.136 | 51.3 | 51.2 |
| 4992 | 19.6 | 0.202 | 0.201 | 0.004 | 254.694 | 51.4 | 51.2 |
| Average Cylinder Concentration: | | | | | | 51.3 | 51.1 |

| | |
|--|-------------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>51.5</u> | <u>51.6</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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

***APPENDIX III
MAXIMUM INSTANTANEOUS DATA***



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

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

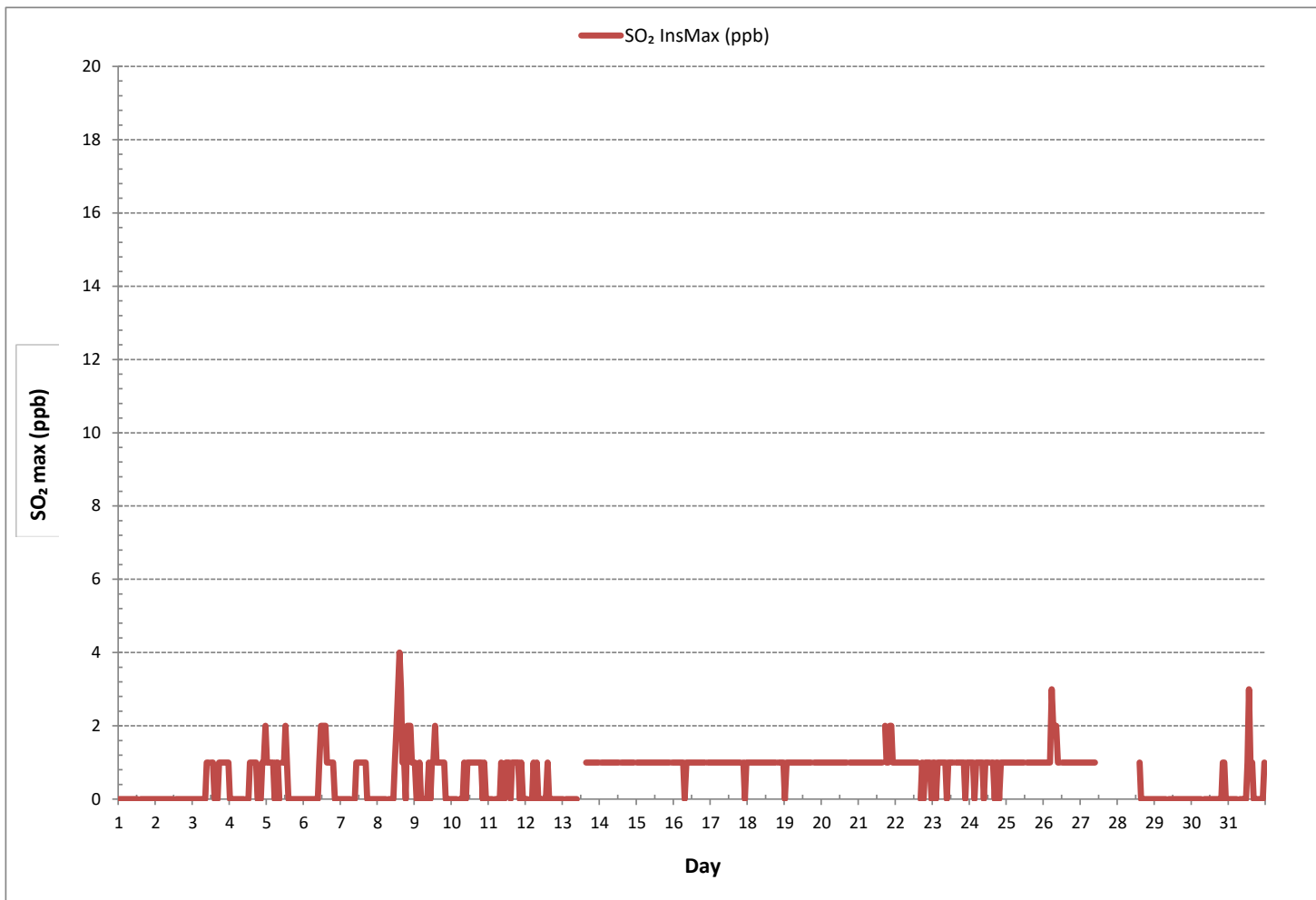
| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 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 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | S | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 | |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 24 | |
| 5 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | S | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 4 | 3 | 1 | 1 | 0 | 2 | 2 | 2 | 1 | 1 | 0 | 4 | 1 | 24 | |
| 9 | 1 | 0 | 0 | 1 | 0 | S | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 |
| 10 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 24 |
| 11 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 24 |
| 12 | 0 | 0 | S | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 13 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C | C | C | C | C | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 14 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 23 |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 24 |
| 16 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 0 | 1 | 1 | 24 |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 0 | 1 | 0 | 1 | 1 | 24 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 19 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 24 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 24 |
| 23 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 24 |
| 24 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | S | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 24 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 26 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 1 | 1 | 11 |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | C1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 10 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 24 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 24 |
| HOURLY MAX | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 4 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 0 | 3 | 0 | | |
| HOURLY AVG | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 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: | 407 |
| MAXIMUM INSTANTANEOUS VALUE: | 4 ppb @ HOUR 14 ON DAY 8 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 1 |
| OPERATIONAL TIME: | 716 hrs |





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

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

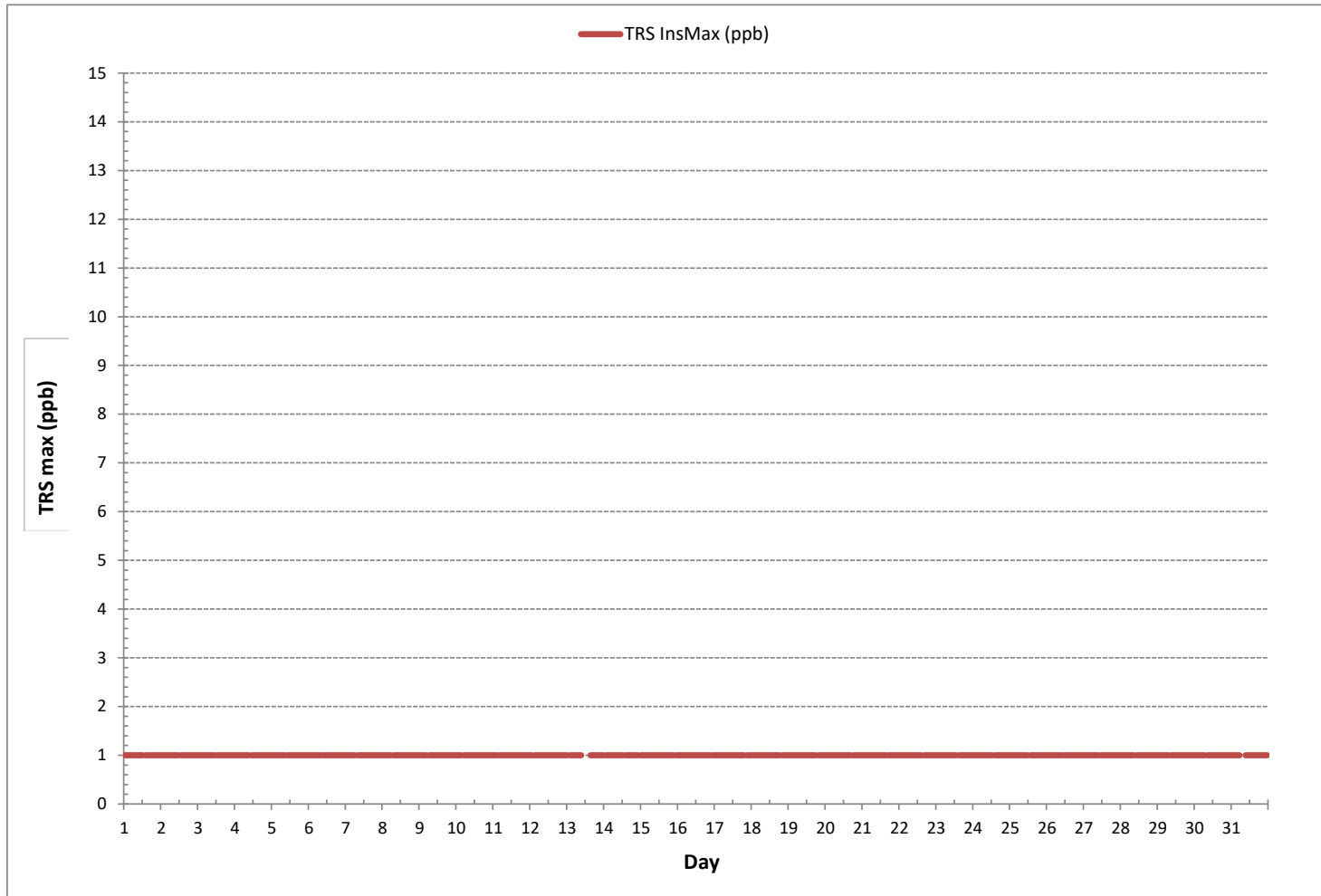
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 704 |
| MAXIMUM INSTANTANEOUS VALUE: | 1 ppb @ HOUR 0 ON DAY 1 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 0 |
| OPERATIONAL TIME: | 741 hrs |

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY 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 | 2.48 | 2.42 | 2.44 | 2.38 | 2.39 | 2.36 | 2.33 | 2.29 | 2.27 | 2.25 | 2.20 | 2.22 | 2.16 | S | 2.12 | 2.13 | 2.10 | 2.10 | 2.08 | 2.07 | 2.14 | 2.07 | 2.05 | 2.05 | 2.05 | 2.05 | 2.48 | 2.22 | 24 |
| 2 | 2.06 | 2.06 | 2.10 | 2.12 | 2.12 | 2.09 | 2.10 | 2.15 | 2.14 | 2.12 | 2.10 | 2.11 | S | 2.40 | 2.10 | 2.10 | 2.09 | 2.09 | 2.14 | 2.07 | 2.06 | 2.05 | 2.13 | 2.06 | 2.05 | 2.05 | 2.40 | 2.11 | 24 |
| 3 | 2.11 | 2.11 | 2.14 | 2.15 | 2.17 | 2.26 | 2.26 | 2.30 | 2.29 | 2.22 | 3.81 | S | 2.11 | 2.07 | 2.08 | 2.08 | 2.02 | 2.02 | 2.03 | 2.07 | 2.03 | 2.00 | 2.17 | 2.06 | 2.00 | 2.00 | 3.81 | 2.20 | 24 |
| 4 | 2.03 | 2.04 | 2.04 | 2.05 | 2.04 | 2.05 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.06 | 2.08 | 2.07 | 2.08 | 2.10 | 2.09 | 2.10 | 2.11 | 2.10 | 2.07 | 2.06 | 2.07 | 2.08 | 2.03 | 2.03 | 2.11 | 2.06 | 24 |
| 5 | 2.03 | 2.02 | 2.04 | 2.04 | 2.03 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.05 | 2.06 | 2.05 | 2.06 | 2.03 | 2.03 | 2.04 | 2.05 | 2.10 | 2.10 | 2.06 | 2.08 | 2.09 | 2.06 | 2.02 | 2.10 | 2.05 | 24 | |
| 6 | 2.05 | 2.10 | 2.10 | 2.10 | 2.08 | 2.11 | 2.13 | 2.58 | S | 2.25 | 2.40 | 2.11 | 2.11 | 2.14 | 2.16 | 2.16 | 2.18 | 2.18 | 2.17 | 2.15 | 2.18 | 2.15 | 2.22 | 2.28 | 2.05 | 2.58 | 2.18 | 24 | |
| 7 | 2.26 | 2.30 | 2.30 | 2.53 | 2.29 | 2.31 | 2.31 | S | 2.40 | 2.43 | 2.55 | 3.23 | 3.23 | 2.62 | 2.65 | 3.69 | 2.59 | 2.63 | 2.62 | 2.63 | 2.62 | 2.66 | 2.68 | 2.66 | 2.26 | 3.69 | 2.62 | 24 | |
| 8 | 2.72 | 2.74 | 2.72 | 2.70 | 2.68 | 2.66 | S | 2.67 | 2.67 | 2.71 | 2.84 | 2.84 | 2.62 | 2.48 | 2.26 | 2.24 | 2.27 | 2.30 | 2.41 | 2.31 | 2.40 | 8.31 | 3.77 | 2.43 | 2.24 | 8.31 | 2.86 | 24 | |
| 9 | 3.04 | 3.12 | 3.64 | 3.30 | 2.75 | S | 2.90 | 2.97 | 3.25 | 3.52 | 2.65 | 3.01 | 2.65 | 2.66 | 2.68 | 2.71 | 3.95 | 3.34 | 3.03 | 2.98 | 2.83 | 2.73 | 3.28 | 2.94 | 2.65 | 3.95 | 3.04 | 24 | |
| 10 | 2.98 | 2.92 | 2.99 | 2.85 | S | 2.92 | 3.25 | 2.95 | 3.13 | 3.43 | 3.28 | 3.18 | 3.00 | 3.26 | 3.41 | 3.26 | 3.22 | 3.09 | 2.94 | 2.85 | 2.30 | 2.24 | 2.19 | 2.13 | 2.13 | 3.43 | 2.95 | 24 | |
| 11 | 2.10 | 2.10 | 2.10 | S | 2.30 | 2.26 | 3.16 | 2.31 | 2.88 | 2.93 | 2.55 | 2.49 | 2.39 | 2.50 | 2.27 | 2.72 | 2.19 | 2.30 | 2.30 | 2.24 | 2.41 | 2.39 | 2.40 | 2.55 | 2.10 | 3.16 | 2.43 | 24 | |
| 12 | 2.46 | 2.30 | S | 2.39 | 2.40 | 2.37 | 2.38 | 2.40 | 2.40 | 2.24 | 2.16 | 2.02 | 2.01 | 1.98 | 1.99 | 2.01 | 2.00 | 1.97 | 1.97 | 1.98 | 1.98 | 2.00 | 1.98 | 1.99 | 1.97 | 2.46 | 2.15 | 24 | |
| 13 | 2.06 | S | 2.12 | 2.14 | 2.17 | 2.17 | 2.15 | 2.15 | 2.17 | 2.22 | 2.21 | 2.18 | 2.11 | 2.10 | 2.07 | 2.08 | 2.00 | 2.01 | 2.02 | 2.01 | 2.00 | 2.01 | 2.03 | 2.07 | 2.00 | 2.22 | 2.10 | 24 | |
| 14 | S | 2.19 | 2.32 | 2.27 | 2.33 | 2.41 | 2.48 | 2.36 | 2.29 | C | C | C | C | X | 2.52 | 2.50 | 2.24 | 2.30 | 2.38 | 2.44 | 2.29 | 2.36 | 2.28 | S | 2.19 | 2.52 | 2.35 | 23 | |
| 15 | 2.42 | 2.29 | 2.34 | 2.28 | 2.28 | 2.34 | 2.33 | 2.32 | 2.24 | 2.02 | 1.98 | 2.03 | 2.03 | 1.98 | 1.99 | 2.00 | 2.00 | 2.00 | 2.01 | 2.00 | 2.02 | 2.00 | S | 2.02 | 1.98 | 2.42 | 2.14 | 24 | |
| 16 | 2.02 | 2.03 | 2.03 | 2.08 | 2.11 | 2.13 | 2.14 | 2.14 | 2.20 | 2.50 | 3.25 | 2.16 | 2.13 | 2.10 | 2.08 | 2.02 | 2.07 | 2.05 | 2.05 | 2.05 | 2.04 | S | 2.07 | 2.04 | 2.02 | 3.25 | 2.15 | 24 | |
| 17 | 2.03 | 2.05 | 2.05 | 2.07 | 2.07 | 2.07 | 2.08 | 2.11 | 2.06 | 2.05 | 2.04 | 2.06 | 2.03 | 2.06 | 2.30 | 2.21 | 2.53 | 2.17 | 2.18 | 2.21 | S | 2.25 | 2.27 | 2.33 | 2.03 | 2.53 | 2.14 | 24 | |
| 18 | 2.37 | 2.48 | 2.48 | 2.60 | 2.50 | 3.82 | 2.57 | 4.04 | 5.09 | 3.39 | 3.05 | 2.66 | 2.38 | 2.53 | 2.61 | 2.47 | 2.48 | 2.58 | 2.63 | S | 2.72 | 2.68 | 2.76 | 2.77 | 2.37 | 5.09 | 2.85 | 24 | |
| 19 | 2.63 | 2.57 | 2.49 | 2.60 | 2.62 | 2.63 | 2.79 | 2.81 | 2.68 | 2.74 | 2.57 | 2.45 | 2.29 | 2.19 | 2.21 | 2.24 | 2.12 | 2.11 | S | 2.15 | 2.12 | 2.10 | 2.12 | 2.11 | 2.10 | 2.81 | 2.41 | 24 | |
| 20 | 2.10 | 2.11 | 2.13 | 2.16 | 2.16 | 2.17 | 2.30 | 2.28 | 3.36 | 2.33 | 2.42 | 2.46 | 2.41 | 2.28 | 2.28 | 2.32 | 2.27 | S | 2.29 | 2.21 | 2.20 | 2.14 | 2.13 | 2.05 | 2.05 | 3.36 | 2.29 | 24 | |
| 21 | 2.06 | 2.08 | 2.08 | 2.16 | 2.10 | 2.12 | 2.12 | 2.19 | 2.16 | 2.16 | 2.12 | 2.04 | 2.03 | 2.04 | 2.04 | 2.04 | S | 2.03 | 2.03 | 2.03 | 2.03 | 2.03 | 2.05 | 2.06 | 2.03 | 2.19 | 2.08 | 24 | |
| 22 | 2.05 | 2.05 | 2.05 | 2.05 | 2.06 | 2.06 | 2.05 | 2.04 | 2.03 | 2.07 | 2.05 | 2.03 | 2.02 | 2.02 | 2.03 | S | 2.07 | 2.07 | 2.11 | 2.11 | 2.14 | 2.15 | 2.25 | 2.22 | 2.02 | 2.25 | 2.08 | 24 | |
| 23 | 2.55 | 2.25 | 2.29 | 2.28 | 2.38 | 2.39 | 2.39 | 2.49 | 2.45 | 2.38 | 2.35 | 2.23 | 2.18 | 2.06 | S | 2.10 | 2.17 | 2.05 | 2.07 | 2.08 | 2.06 | 2.04 | 2.03 | 2.02 | 2.02 | 2.55 | 2.23 | 24 | |
| 24 | 2.01 | 2.02 | 2.02 | 2.04 | 2.03 | 2.02 | 2.03 | 2.04 | 2.05 | 2.01 | 2.01 | 2.05 | 2.01 | S | 2.02 | 2.36 | 2.05 | 2.04 | 2.11 | 2.01 | 2.01 | 2.02 | 2.11 | 2.06 | 2.01 | 2.36 | 2.05 | 24 | |
| 25 | 2.05 | 2.15 | 2.07 | 2.06 | 2.07 | 2.10 | 2.12 | 2.11 | 2.14 | 2.20 | 2.20 | 2.17 | S | 2.28 | 2.27 | 2.32 | 2.35 | 2.37 | 2.38 | 2.39 | 2.42 | 2.48 | 2.52 | 2.52 | 2.05 | 2.52 | 2.25 | 24 | |
| 26 | 2.56 | 2.69 | 2.75 | 2.75 | 2.71 | 2.29 | 2.12 | 2.09 | 2.06 | 2.04 | 2.03 | S | 2.04 | 2.05 | 2.05 | 2.17 | 2.09 | 2.13 | 2.12 | 2.20 | 2.47 | 2.13 | 2.13 | 2.11 | 2.03 | 2.75 | 2.25 | 24 | |
| 27 | 2.19 | 2.35 | 2.16 | 2.15 | 2.12 | 2.09 | 2.09 | 2.10 | 2.11 | S | C1 | C1 | C1 | C1 | 2.41 | 2.40 | 2.45 | 2.36 | 2.37 | 2.33 | 2.33 | 2.27 | 2.22 | 2.16 | 2.16 | 2.09 | 2.35 | 2.15 | 11 |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 2.41 | 2.40 | 2.45 | 2.36 | 2.37 | 2.33 | 2.33 | 2.27 | 2.22 | 2.16 | 2.16 | 11 | |
| 29 | 2.14 | 2.23 | 2.14 | 2.14 | 2.11 | 2.07 | 2.02 | 1.99 | S | 1.97 | 1.96 | 1.99 | 3.54 | 2.00 | 2.00 | 2.07 | 1.96 | 1.97 | 1.96 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.96 | 3.54 | 2.09 | 24 | |
| 30 | 1.98 | 1.96 | 1.95 | 1.94 | 1.97 | 1.96 | 1.97 | S | 1.97 | 1.97 | 1.98 | 2.01 | 1.95 | 1.97 | 2.03 | 2.02 | 1.97 | 1.99 | 1.99 | 1.99 | 1.99 | 2.00 | 2.01 | 2.10 | 2.06 | 1.94 | 2.10 | 24 | |
| 31 | 2.36 | 2.16 | 2.11 | 2.13 | 2.14 | 2.17 | S | 2.22 | 2.48 | 2.77 | 2.65 | 2.16 | 2.26 | 2.30 | 2.27 | 2.29 | 2.24 | 2.28 | 2.42 | 2.80 | 2.59 | 2.48 | 2.36 | 2.34 | 2.11 | 2.80 | 2.35 | 24 | |
| HOURLY MAX | 3.04 | 3.12 | 3.64 | 3.30 | 2.75 | 3.82 | 3.25 | 4.04 | 5.09 | 3.52 | 3.81 | 3.23 | 3.54 | 3.26 | 3.41 | 3.69 | 3.95 | 3.34 | 3.03 | 2.98 | 2.83 | 8.31 | 3.77 | 2.94 | | | | | |
| HOURLY AVG | 2.27 | 2.27 | 2.28 | 2.29 | 2.25 | 2.29 | 2.31 | 2.36 | 2.47 | 2.40 | 2.43 | 2.31 | 2.30 | 2.25 | 2.24 | 2.31 | 2.27 | 2.23 | 2.24 | 2.23 | 2.22 | 2.41 | 2.29 | 2.21 | | | | | |

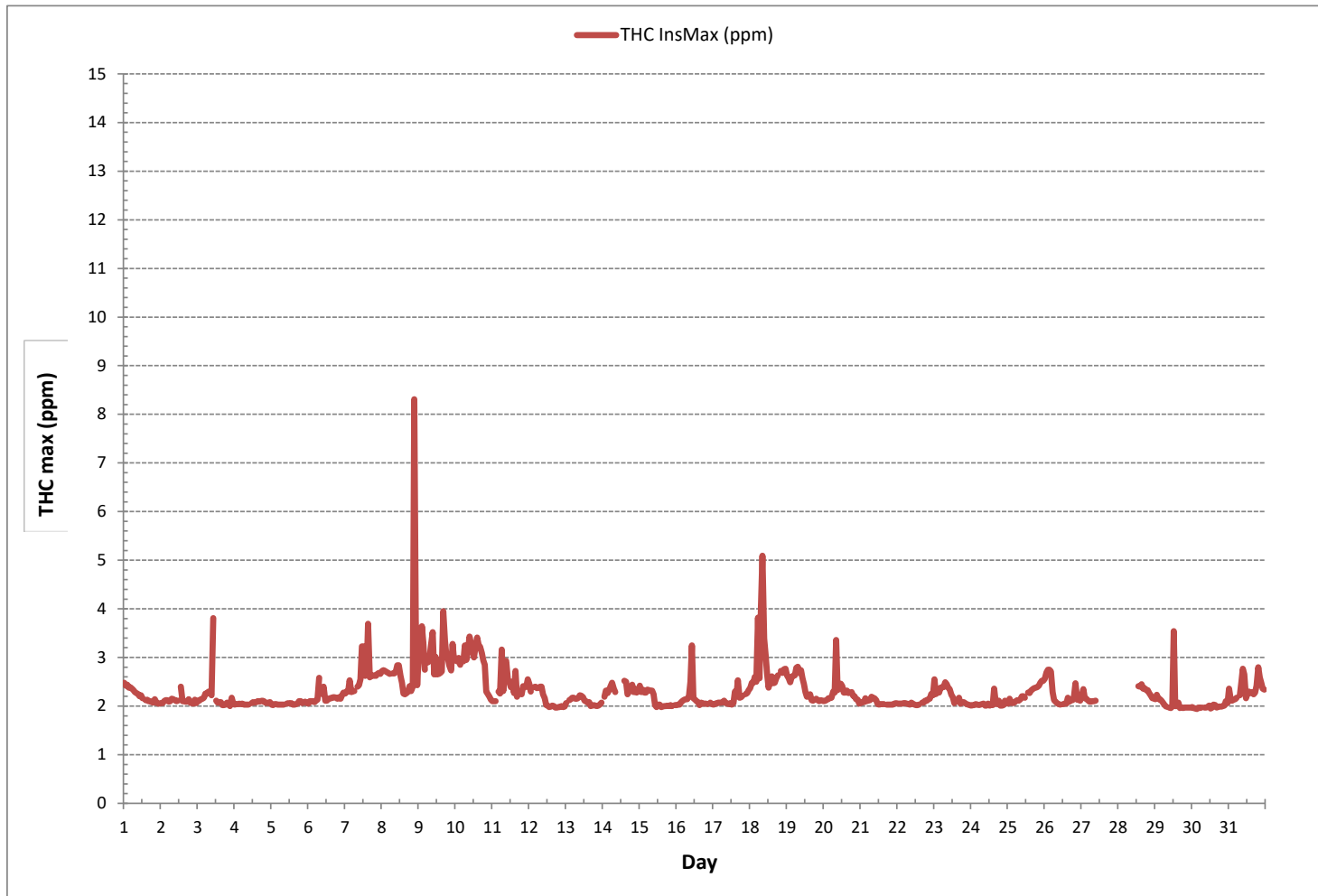
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 682 |
| MAXIMUM INSTANTANEOUS VALUE: | 8.31 ppm @ HOUR 21 ON DAY 8 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 717 hrs |
| STANDARD DEVIATION: | 0.43 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





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

METHANE MAX Instantaneous Maximum (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 2.48 | 2.42 | 2.44 | 2.38 | 2.39 | 2.36 | 2.33 | 2.29 | 2.27 | 2.25 | 2.20 | 2.22 | 2.16 | S | 2.12 | 2.13 | 2.10 | 2.10 | 2.08 | 2.07 | 2.14 | 2.07 | 2.05 | 2.05 | 2.05 | 2.05 | 2.48 | 2.22 | 24 |
| 2 | 2.06 | 2.06 | 2.10 | 2.12 | 2.12 | 2.09 | 2.10 | 2.15 | 2.14 | 2.12 | 2.10 | 2.11 | S | 2.10 | 2.10 | 2.10 | 2.09 | 2.09 | 2.14 | 2.07 | 2.06 | 2.05 | 2.13 | 2.06 | 2.05 | 2.05 | 2.15 | 2.10 | 24 |
| 3 | 2.11 | 2.11 | 2.14 | 2.15 | 2.17 | 2.26 | 2.26 | 2.30 | 2.29 | 2.22 | 2.22 | S | 2.11 | 2.07 | 2.08 | 2.08 | 2.02 | 2.02 | 2.03 | 2.07 | 2.03 | 2.00 | 2.17 | 2.06 | 2.00 | 2.00 | 2.30 | 2.13 | 24 |
| 4 | 2.03 | 2.04 | 2.04 | 2.05 | 2.04 | 2.05 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.06 | 2.08 | 2.07 | 2.08 | 2.10 | 2.09 | 2.10 | 2.11 | 2.10 | 2.07 | 2.06 | 2.07 | 2.08 | 2.03 | 2.03 | 2.11 | 2.06 | 24 |
| 5 | 2.03 | 2.02 | 2.04 | 2.04 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.05 | 2.06 | 2.05 | 2.06 | 2.03 | 2.03 | 2.04 | 2.05 | 2.10 | 2.10 | 2.10 | 2.06 | 2.08 | 2.09 | 2.06 | 2.02 | 2.10 | 2.05 | 24 | |
| 6 | 2.05 | 2.10 | 2.10 | 2.10 | 2.08 | 2.11 | 2.13 | 2.15 | S | 2.25 | 2.40 | 2.11 | 2.11 | 2.14 | 2.16 | 2.16 | 2.18 | 2.18 | 2.17 | 2.15 | 2.18 | 2.15 | 2.22 | 2.28 | 2.05 | 2.40 | 2.16 | 24 | |
| 7 | 2.26 | 2.30 | 2.30 | 2.35 | 2.29 | 2.31 | 2.31 | S | 2.40 | 2.43 | 2.55 | 3.23 | 3.23 | 2.62 | 2.65 | 2.62 | 2.59 | 2.63 | 2.62 | 2.63 | 2.62 | 2.66 | 2.68 | 2.66 | 2.26 | 3.23 | 2.56 | 24 | |
| 8 | 2.72 | 2.74 | 2.72 | 2.70 | 2.68 | 2.66 | S | 2.67 | 2.67 | 2.71 | 2.84 | 2.84 | 2.62 | 2.48 | 2.26 | 2.24 | 2.27 | 2.30 | 2.41 | 2.31 | 2.40 | 2.40 | 2.45 | 2.43 | 2.24 | 2.84 | 2.54 | 24 | |
| 9 | 2.45 | 2.48 | 2.54 | 2.62 | 2.75 | S | 2.59 | 2.60 | 2.64 | 2.68 | 2.65 | 2.66 | 2.65 | 2.66 | 2.68 | 2.71 | 2.78 | 2.83 | 2.87 | 2.98 | 2.83 | 2.73 | 2.85 | 2.94 | 2.45 | 2.98 | 2.70 | 24 | |
| 10 | 2.98 | 2.92 | 2.99 | 2.85 | S | 2.92 | 2.97 | 2.95 | 3.13 | 3.43 | 3.28 | 3.18 | 3.00 | 3.26 | 3.41 | 3.26 | 3.22 | 3.09 | 2.94 | 2.85 | 2.30 | 2.24 | 2.19 | 2.13 | 2.13 | 3.43 | 2.93 | 24 | |
| 11 | 2.10 | 2.10 | 2.10 | S | 2.30 | 2.26 | 2.25 | 2.31 | 2.48 | 2.49 | 2.55 | 2.49 | 2.39 | 2.50 | 2.27 | 2.33 | 2.19 | 2.30 | 2.30 | 2.24 | 2.41 | 2.39 | 2.40 | 2.55 | 2.10 | 2.55 | 2.33 | 24 | |
| 12 | 2.46 | 2.30 | S | 2.39 | 2.40 | 2.37 | 2.38 | 2.40 | 2.40 | 2.24 | 2.16 | 2.02 | 2.01 | 1.98 | 1.99 | 2.01 | 2.00 | 1.97 | 1.97 | 1.98 | 1.98 | 2.00 | 1.98 | 1.99 | 1.97 | 2.46 | 2.15 | 24 | |
| 13 | 2.06 | S | 2.12 | 2.14 | 2.17 | 2.17 | 2.15 | 2.15 | 2.17 | 2.22 | 2.21 | 2.18 | 2.11 | 2.10 | 2.07 | 2.08 | 2.00 | 2.01 | 2.02 | 2.01 | 2.00 | 2.01 | 2.03 | 2.07 | 2.00 | 2.22 | 2.10 | 24 | |
| 14 | S | 2.19 | 2.32 | 2.27 | 2.33 | 2.41 | 2.48 | 2.36 | 2.29 | C | C | C | C | X | 2.52 | 2.50 | 2.24 | 2.30 | 2.38 | 2.44 | 2.29 | 2.36 | 2.28 | S | 2.19 | 2.52 | 2.35 | 23 | |
| 15 | 2.42 | 2.29 | 2.34 | 2.28 | 2.34 | 2.33 | 2.32 | 2.32 | 2.24 | 2.02 | 1.98 | 2.03 | 2.03 | 1.98 | 1.99 | 2.00 | 2.00 | 2.01 | 2.00 | 2.02 | 2.00 | S | 2.02 | 1.98 | 2.42 | 2.14 | 24 | | |
| 16 | 2.02 | 2.03 | 2.03 | 2.08 | 2.11 | 2.13 | 2.14 | 2.14 | 2.20 | 2.26 | 2.18 | 2.16 | 2.13 | 2.10 | 2.08 | 2.02 | 2.07 | 2.05 | 2.05 | 2.05 | 2.04 | S | 2.07 | 2.04 | 2.02 | 2.26 | 2.09 | 24 | |
| 17 | 2.03 | 2.05 | 2.05 | 2.07 | 2.07 | 2.07 | 2.08 | 2.11 | 2.06 | 2.05 | 2.04 | 2.06 | 2.03 | 2.06 | 2.30 | 2.21 | 2.17 | 2.17 | 2.18 | 2.21 | S | 2.25 | 2.27 | 2.33 | 2.03 | 2.33 | 2.13 | 24 | |
| 18 | 2.37 | 2.48 | 2.48 | 2.60 | 2.50 | 2.59 | 2.58 | 2.59 | 2.59 | 2.54 | 2.50 | 2.66 | 2.38 | 2.53 | 2.61 | 2.47 | 2.48 | 2.58 | 2.63 | S | 2.72 | 2.68 | 2.76 | 2.77 | 2.37 | 2.77 | 2.57 | 24 | |
| 19 | 2.63 | 2.57 | 2.49 | 2.60 | 2.62 | 2.63 | 2.79 | 2.81 | 2.68 | 2.74 | 2.57 | 2.45 | 2.29 | 2.19 | 2.21 | 2.24 | 2.12 | 2.11 | S | 2.15 | 2.12 | 2.10 | 2.12 | 2.11 | 2.10 | 2.81 | 2.41 | 24 | |
| 20 | 2.10 | 2.11 | 2.13 | 2.16 | 2.16 | 2.17 | 2.30 | 2.28 | 2.29 | 2.33 | 2.42 | 2.46 | 2.41 | 2.28 | 2.28 | 2.32 | 2.27 | S | 2.29 | 2.21 | 2.20 | 2.14 | 2.13 | 2.05 | 2.05 | 2.46 | 2.24 | 24 | |
| 21 | 2.06 | 2.08 | 2.08 | 2.16 | 2.10 | 2.12 | 2.12 | 2.19 | 2.16 | 2.16 | 2.12 | 2.04 | 2.03 | 2.04 | 2.04 | 2.04 | S | 2.03 | 2.03 | 2.03 | 2.03 | 2.05 | 2.06 | 2.03 | 2.19 | 2.08 | 24 | | |
| 22 | 2.05 | 2.05 | 2.05 | 2.05 | 2.06 | 2.06 | 2.05 | 2.04 | 2.03 | 2.07 | 2.05 | 2.03 | 2.02 | 2.02 | 2.03 | S | 2.07 | 2.07 | 2.11 | 2.11 | 2.14 | 2.15 | 2.25 | 2.22 | 2.02 | 2.25 | 2.08 | 24 | |
| 23 | 2.24 | 2.25 | 2.29 | 2.28 | 2.38 | 2.39 | 2.39 | 2.49 | 2.45 | 2.38 | 2.35 | 2.23 | 2.18 | 2.06 | S | 2.10 | 2.17 | 2.05 | 2.07 | 2.08 | 2.06 | 2.04 | 2.03 | 2.02 | 2.02 | 2.49 | 2.22 | 24 | |
| 24 | 2.01 | 2.02 | 2.02 | 2.04 | 2.03 | 2.02 | 2.03 | 2.04 | 2.05 | 2.01 | 2.01 | 2.05 | 2.01 | S | 2.02 | 2.06 | 2.05 | 2.04 | 2.11 | 2.01 | 2.01 | 2.02 | 2.11 | 2.06 | 2.01 | 2.11 | 2.04 | 24 | |
| 25 | 2.05 | 2.15 | 2.07 | 2.06 | 2.07 | 2.10 | 2.12 | 2.11 | 2.14 | 2.20 | 2.20 | 2.17 | S | 2.28 | 2.27 | 2.32 | 2.35 | 2.37 | 2.38 | 2.39 | 2.42 | 2.48 | 2.52 | 2.52 | 2.05 | 2.52 | 2.25 | 24 | |
| 26 | 2.56 | 2.69 | 2.75 | 2.75 | 2.71 | 2.32 | 2.12 | 2.09 | 2.06 | 2.04 | 2.03 | S | 2.04 | 2.05 | 2.05 | 2.17 | 2.09 | 2.13 | 2.12 | 2.20 | 2.16 | 2.13 | 2.13 | 2.11 | 2.03 | 2.75 | 2.24 | 24 | |
| 27 | 2.19 | 2.35 | 2.16 | 2.15 | 2.12 | 2.09 | 2.09 | 2.10 | 2.10 | 2.11 | S | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 2.09 | 2.35 | 2.15 | 11 | |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 2.36 | 2.33 | 2.33 | 2.30 | 2.30 | 2.26 | 2.23 | 2.23 | 2.17 | 2.12 | 2.12 | 2.12 | 2.36 | 2.25 | 11 |
| 29 | 2.14 | 2.17 | 2.14 | 2.13 | 2.09 | 2.03 | 2.02 | 1.99 | S | 1.96 | 1.96 | 1.99 | 2.02 | 2.00 | 2.00 | 2.02 | 1.95 | 1.97 | 1.96 | 1.97 | 1.96 | 1.97 | 1.97 | 1.97 | 1.95 | 2.17 | 2.02 | 24 | |
| 30 | 1.98 | 1.96 | 1.95 | 1.94 | 1.97 | 1.96 | 1.97 | S | 1.96 | 1.97 | 1.98 | 1.97 | 1.95 | 1.97 | 1.96 | 1.97 | 1.99 | 1.99 | 1.99 | 1.99 | 2.00 | 2.01 | 2.10 | 2.06 | 1.94 | 2.10 | 1.98 | 24 | |
| 31 | 2.32 | 2.16 | 2.11 | 2.13 | 2.14 | 2.17 | S | 2.21 | 2.39 | 2.57 | 2.53 | 2.16 | 2.26 | 2.29 | 2.26 | 2.28 | 2.24 | 2.28 | 2.42 | 2.51 | 2.49 | 2.44 | 2.36 | 2.31 | 2.11 | 2.57 | 2.31 | 24 | |
| HOURLY MAX | 2.98 | 2.92 | 2.99 | 2.85 | 2.75 | 2.92 | 2.97 | 2.95 | 3.13 | 3.43 | 3.28 | 3.23 | 3.23 | 3.26 | 3.41 | 3.26 | 3.22 | 3.09 | 2.94 | 2.98 | 2.83 | 2.73 | 2.85 | 2.94 | | | | | |
| HOURLY AVG | 2.24 | 2.25 | 2.24 | 2.26 | 2.25 | 2.25 | 2.26 | 2.28 | 2.30 | 2.31 | 2.29 | 2.24 | 2.23 | 2.24 | 2.24 | 2.21 | 2.21 | 2.23 | 2.21 | 2.21 | 2.21 | 2.20 | 2.23 | 2.21 | | | | | |

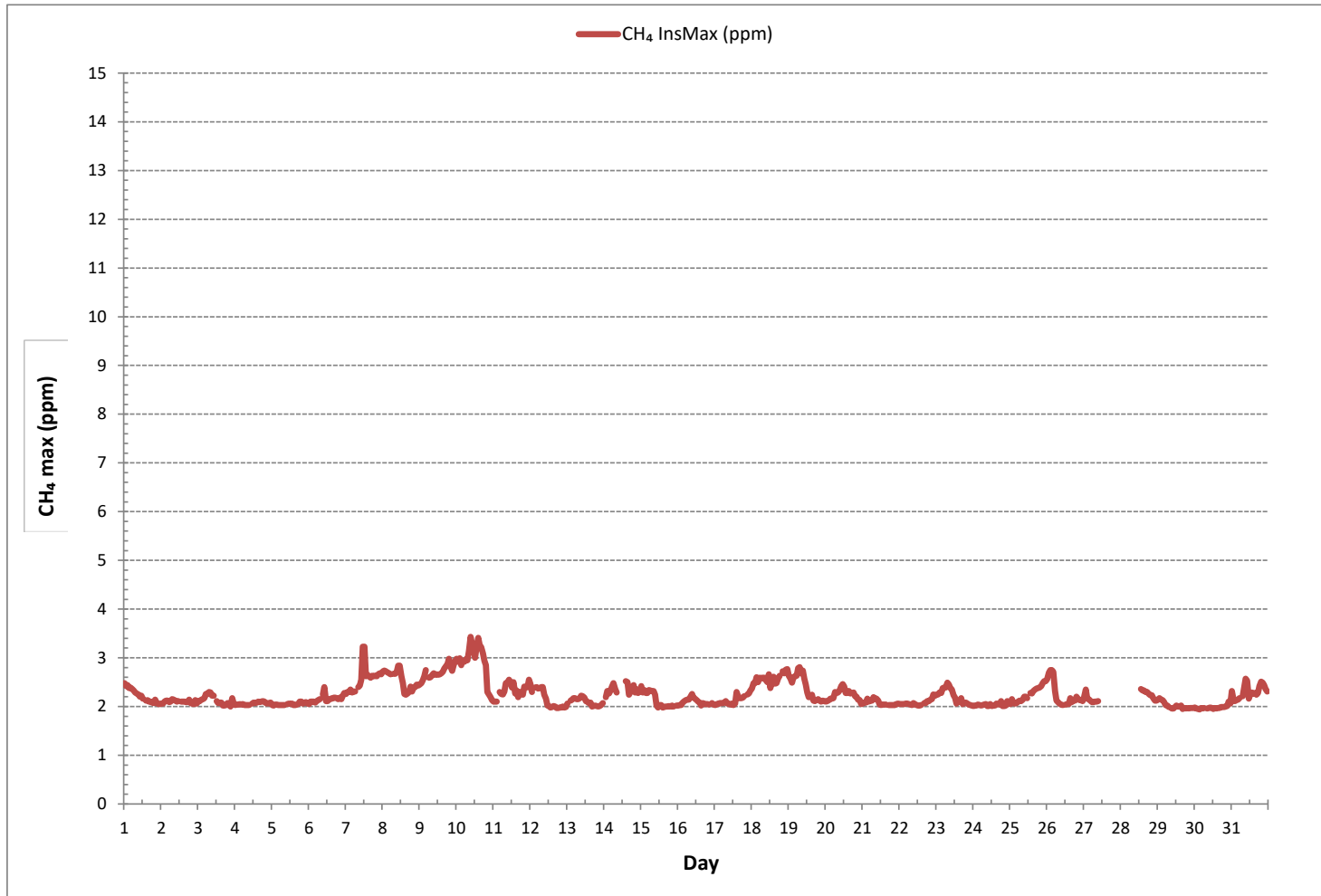
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 682 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.43 ppm @ HOUR 9 ON DAY 10 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 717 hrs |
| STANDARD DEVIATION: | 0.26 |

METHANE MAX Instantaneous Maximum (CH₄ ppm)





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

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 0.00 | 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 | 0.00 | 0.00 | 24 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | 0.01 | 24 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 | 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 | 1.63 | 0.07 | 24 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 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 | 0.43 | 0.02 | 24 | |
| 7 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 | 0.06 | 24 | |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.95 | 1.37 | 0.00 | 0.00 | 5.95 | 0.32 | 24 | |
| 9 | 0.59 | 0.69 | 1.16 | 0.74 | 0.00 | S | 0.31 | 0.41 | 0.62 | 0.93 | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 1.22 | 0.61 | 0.28 | 0.00 | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 1.22 | 0.36 | 24 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.37 | 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 | 0.37 | 0.02 | 24 | |
| 11 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.92 | 0.00 | 0.52 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.11 | 24 | |
| 12 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | |
| 13 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | |
| 14 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | C | C | C | C | X | 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 | 23 | |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 24 | |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 1.11 | 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 | 1.11 | 0.06 | 24 | |
| 17 | 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 | 0.40 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.02 | 24 | |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 1.49 | 2.55 | 0.87 | 0.56 | 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 | 2.55 | 0.29 | 24 | |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 | 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 | 1.07 | 0.05 | 24 | |
| 21 | 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 | 0.00 | 0.00 | 0.00 | 24 | |
| 22 | 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 | |
| 23 | 0.31 | 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 | 0.31 | 0.01 | 24 | |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.02 | 24 | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | |
| 26 | 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 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.01 | 24 | |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 0.00 | 0.00 | 11 | |
| 28 | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 0.08 | 0.08 | 0.13 | 0.09 | 0.12 | 0.09 | 0.10 | 0.06 | 0.07 | 0.06 | 0.07 | 0.06 | 0.13 | 0.09 | 11 | |
| 29 | 0.02 | 0.06 | 0.04 | 0.06 | 0.04 | 0.04 | 0.01 | 0.00 | S | 0.01 | 0.00 | 0.03 | 1.54 | 0.03 | 0.01 | 0.07 | 0.03 | 0.03 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 1.54 | 0.09 | 24 | |
| 30 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 0.09 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.07 | 0.01 | 0.00 | 0.09 | 0.02 | 24 | |
| 31 | 0.05 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | S | 0.03 | 0.09 | 0.20 | 0.12 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.05 | 0.29 | 0.13 | 0.06 | 0.02 | 0.06 | 0.00 | 0.29 | 0.05 | 24 | |
| HOURLY MAX | 0.59 | 0.69 | 1.16 | 0.74 | 0.04 | 1.26 | 0.92 | 1.49 | 2.55 | 0.93 | 1.63 | 0.35 | 1.54 | 0.34 | 0.09 | 1.07 | 1.22 | 0.61 | 0.28 | 0.29 | 0.33 | 5.95 | 1.37 | 0.07 | | | | | |
| HOURLY AVG | 0.03 | 0.03 | 0.04 | 0.04 | 0.00 | 0.04 | 0.06 | 0.08 | 0.17 | 0.10 | 0.13 | 0.02 | 0.06 | 0.02 | 0.01 | 0.08 | 0.06 | 0.03 | 0.01 | 0.01 | 0.02 | 0.21 | 0.07 | 0.00 | | | | | |

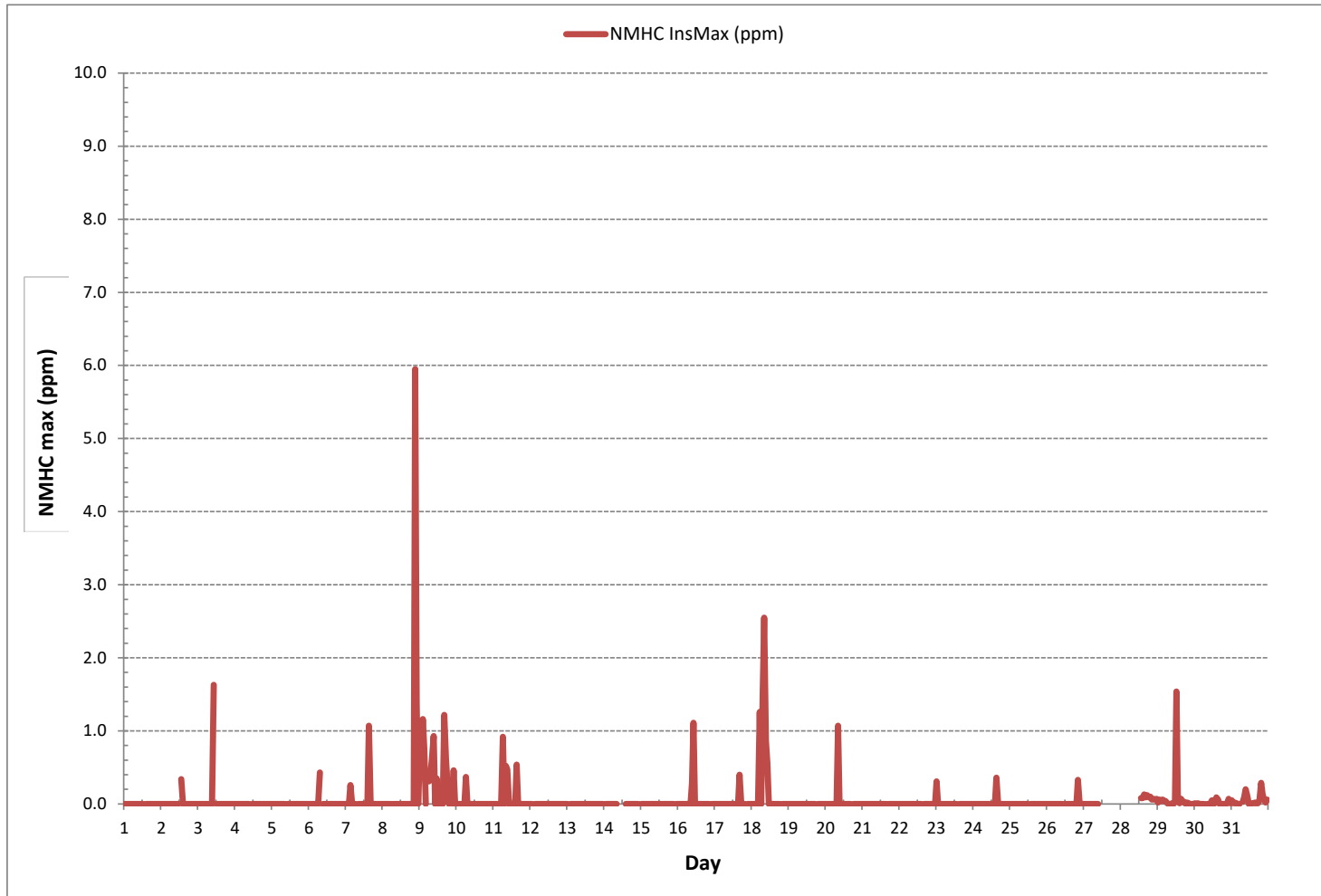
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 93 |
| MAXIMUM INSTANTANEOUS VALUE: | 5.95 ppm @ HOUR 21 ON DAY 8 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| STANDARD DEVIATION: | 0.31 |
| OPERATIONAL TIME: | 717 hrs |

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 27 | 10 | 9 | 22 | 17 | 9 | 9 | 7 | 8 | 10 | 10 | 12 | 10 | S | 8 | 8 | 7 | 11 | 10 | 13 | 7 | 7 | 15 | 4 | 4 | 27 | 11 | 24 |
| 2 | 6 | 7 | 4 | 7 | 9 | 9 | 8 | 5 | 6 | 4 | 5 | 4 | S | 6 | 6 | 7 | 16 | 15 | 56 | 14 | 3 | 28 | 2 | 2 | 2 | 56 | 10 | 24 |
| 3 | 3 | 5 | 5 | 6 | 4 | 10 | 12 | 13 | 11 | 7 | 10 | S | 7 | 4 | 8 | 4 | 2 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 13 | 6 | 24 |
| 4 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 8 | 10 | S | 8 | 5 | 6 | 11 | 10 | 11 | 10 | 9 | 7 | 5 | 4 | 8 | 8 | 3 | 11 | 7 | 24 |
| 5 | 4 | 3 | 3 | 4 | 2 | 3 | 2 | 3 | 5 | S | 5 | 5 | 6 | 6 | 14 | 8 | 4 | 4 | 3 | 3 | 4 | 3 | 5 | 4 | 2 | 14 | 4 | 24 |
| 6 | 4 | 3 | 3 | 5 | 5 | 5 | 16 | 64 | S | 19 | 12 | 9 | 11 | 32 | 29 | 27 | 20 | 17 | 15 | 14 | 14 | 15 | 15 | 18 | 3 | 64 | 16 | 24 |
| 7 | 16 | 12 | 10 | 12 | 12 | 17 | 17 | S | 38 | 30 | 40 | 35 | 45 | 21 | 28 | 26 | 29 | 25 | 21 | 25 | 21 | 20 | 37 | 20 | 10 | 45 | 24 | 24 |
| 8 | 18 | 19 | 24 | 27 | 22 | 21 | S | 18 | 17 | 27 | 27 | 32 | 34 | 35 | 24 | 34 | 21 | 23 | 30 | 18 | 21 | 24 | 16 | 18 | 16 | 35 | 24 | 24 |
| 9 | 24 | 14 | 28 | 30 | 20 | S | 23 | 18 | 44 | 47 | 36 | 44 | 36 | 23 | 34 | 66 | 67 | 56 | 82 | 68 | 31 | 50 | 47 | 14 | 82 | 40 | 24 | 24 |
| 10 | 40 | 33 | 36 | 25 | S | 26 | 44 | 48 | 30 | 38 | 37 | 30 | 31 | 35 | 36 | 65 | 42 | 32 | 34 | 27 | 14 | 11 | 10 | 8 | 8 | 65 | 32 | 24 |
| 11 | 8 | 8 | 10 | S | 25 | 22 | 43 | 45 | 208 | 63 | 43 | 47 | 11 | 10 | 24 | 32 | 15 | 8 | 7 | 10 | 10 | 10 | 11 | 16 | 7 | 208 | 30 | 24 |
| 12 | 7 | 6 | S | 8 | 9 | 9 | 11 | 15 | 14 | 17 | 17 | 8 | 6 | 8 | 11 | 11 | 8 | 8 | 5 | 8 | 4 | 5 | 5 | 3 | 3 | 17 | 9 | 24 |
| 13 | 5 | S | 18 | 14 | 10 | 5 | 37 | 6 | 8 | 7 | C | C | C | C | C | C | C | 7 | 7 | 7 | 7 | 6 | 8 | 8 | 5 | 37 | 10 | 24 |
| 14 | S | 27 | 32 | 35 | 31 | 63 | 40 | 154 | 111 | 33 | 8 | 5 | 36 | X | 35 | 18 | 11 | 8 | 29 | 19 | 14 | 12 | 12 | S | 5 | 154 | 35 | 23 |
| 15 | 5 | 8 | 15 | 12 | 22 | 19 | 21 | 11 | 10 | 8 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | S | 3 | 1 | 22 | 7 | 24 |
| 16 | 4 | 5 | 6 | 7 | 5 | 18 | 13 | 9 | 25 | 34 | 55 | 7 | 10 | 5 | 7 | 6 | 9 | 16 | 7 | 5 | 6 | S | 5 | 5 | 4 | 55 | 12 | 24 |
| 17 | 5 | 6 | 5 | 6 | 7 | 6 | 7 | 12 | 29 | 12 | 17 | 5 | 4 | 6 | 7 | 11 | 14 | 9 | 10 | 15 | S | 12 | 17 | 19 | 4 | 29 | 10 | 24 |
| 18 | 20 | 35 | 31 | 29 | 29 | S1 | S1 | 65 | 78 | 65 | 50 | 31 | 14 | 19 | 18 | 32 | 26 | 22 | 25 | S | 38 | 62 | 63 | 40 | 14 | 78 | 38 | 22 |
| 19 | 16 | 18 | 17 | 26 | 24 | 31 | 26 | 24 | 60 | 49 | 30 | 22 | 26 | 16 | 15 | 14 | 15 | 11 | S | 14 | 14 | 10 | 11 | 9 | 9 | 60 | 22 | 24 |
| 20 | 10 | 7 | 9 | 12 | 12 | 54 | 50 | 56 | 51 | 64 | 97 | 83 | 60 | 34 | 21 | 17 | 10 | S | 8 | 10 | 7 | 11 | 5 | 4 | 4 | 97 | 30 | 24 |
| 21 | 5 | 6 | 15 | 8 | 10 | 9 | 9 | 9 | 6 | 6 | 4 | 3 | 4 | 3 | 12 | 6 | S | 5 | 4 | 4 | 3 | 4 | 3 | 1 | 1 | 15 | 6 | 24 |
| 22 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | S | 17 | 16 | 25 | 11 | 11 | 14 | 25 | 28 | 2 | 28 | 8 | 24 |
| 23 | 23 | 23 | 23 | 31 | 26 | 25 | 25 | 24 | 17 | 36 | 27 | 12 | 14 | 12 | S | 6 | 8 | 14 | 7 | 21 | 7 | 16 | 8 | 8 | 6 | 36 | 18 | 24 |
| 24 | 8 | 7 | 4 | 5 | 3 | 7 | 5 | 4 | 7 | 7 | 15 | 4 | 4 | S | 19 | 5 | 9 | 18 | 9 | 2 | 2 | 4 | 5 | 5 | 2 | 19 | 7 | 24 |
| 25 | 4 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 6 | S | 15 | 5 | 6 | 6 | 7 | 7 | 5 | 6 | 8 | 8 | 9 | 3 | 15 | 5 | 24 |
| 26 | 11 | 13 | 13 | 15 | 13 | 10 | 8 | 7 | 5 | 3 | 2 | S | 5 | 13 | 13 | 20 | 18 | 40 | 20 | 27 | 28 | 18 | 15 | 12 | 2 | 40 | 14 | 24 |
| 27 | 9 | 11 | 8 | 10 | 7 | 5 | 4 | 4 | 11 | 4 | S | 10 | 60 | 6 | 5 | 6 | 7 | 6 | 6 | 4 | 3 | 7 | 5 | 5 | 3 | 60 | 9 | 24 |
| 28 | 6 | 8 | 8 | 6 | 7 | 19 | 19 | 15 | 23 | S | 12 | 15 | 12 | 16 | 11 | 12 | 14 | 12 | 10 | 9 | 9 | 12 | 8 | 9 | 6 | 23 | 12 | 24 |
| 29 | 9 | 6 | 6 | 7 | 5 | 7 | 4 | 5 | S | 6 | 6 | 8 | 6 | 5 | 5 | 5 | 23 | 5 | 6 | 5 | 5 | 5 | 4 | 6 | 4 | 23 | 6 | 24 |
| 30 | 4 | 4 | 7 | 3 | 4 | 3 | 3 | S | 4 | 7 | 3 | 5 | 3 | 3 | 3 | 3 | 5 | 5 | 4 | 4 | 3 | 4 | 9 | 7 | 3 | 9 | 4 | 24 |
| 31 | 12 | 12 | 6 | 11 | 11 | 21 | S | S1 | S1 | 60 | 45 | 6 | 5 | 8 | 23 | 10 | 12 | 17 | 15 | 19 | 17 | 17 | 27 | 11 | 5 | 60 | 17 | 22 |
| HOURLY MAX | 40 | 35 | 36 | 35 | 31 | 63 | 50 | 154 | 208 | 65 | 97 | 83 | 60 | 35 | 36 | 65 | 66 | 67 | 56 | 82 | 68 | 62 | 63 | 47 | | | | |
| HOURLY AVG | 11 | 11 | 12 | 13 | 12 | 15 | 17 | 23 | 30 | 23 | 22 | 16 | 17 | 13 | 15 | 15 | 15 | 15 | 15 | 14 | 12 | 13 | 14 | 11 | | | | |

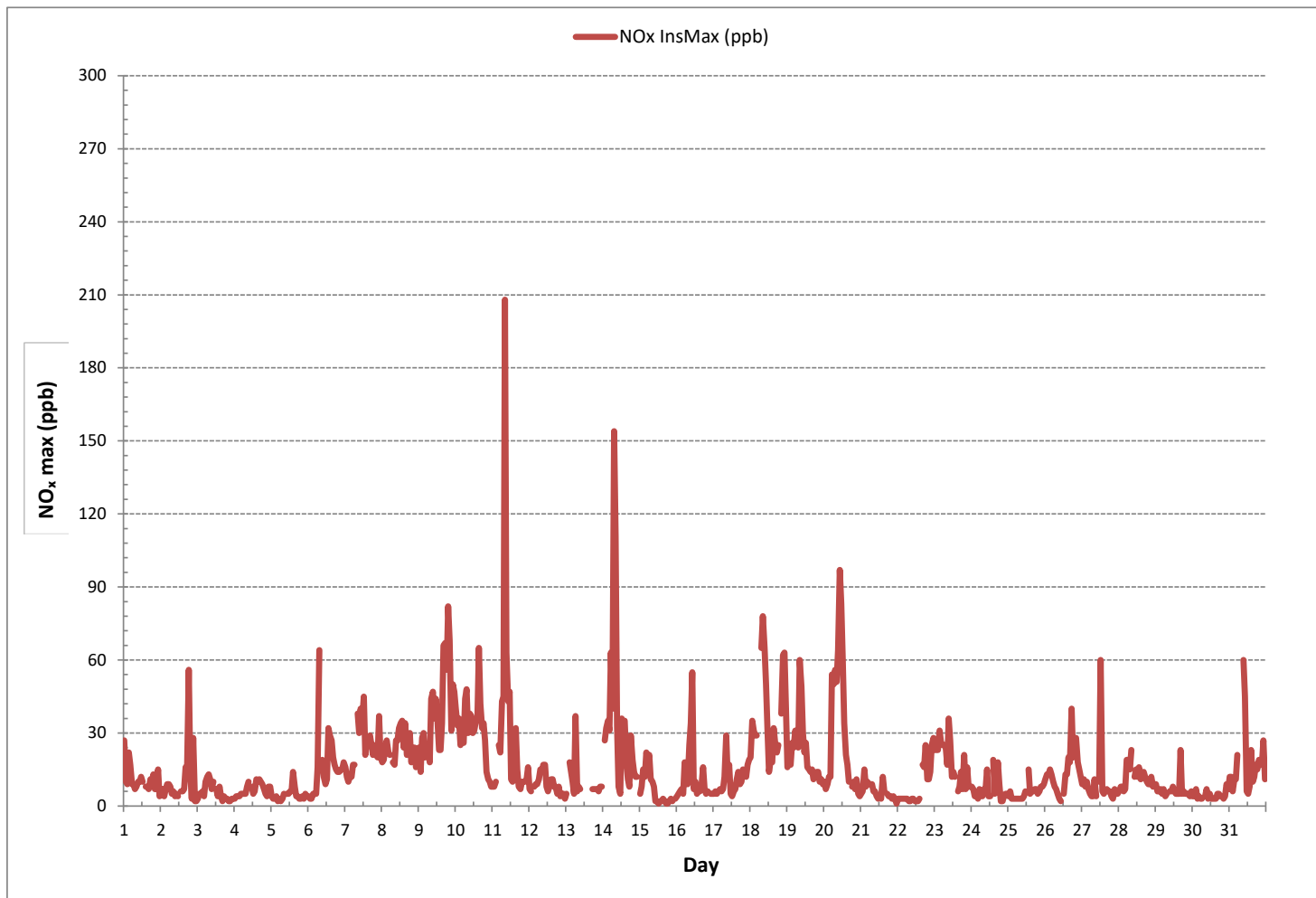
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 700 |
| MAXIMUM INSTANTANEOUS VALUE: | 208 ppb @ HOUR 8 ON DAY 11 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 17 |
| OPERATIONAL TIME: | 739 hrs |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





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

NITRIC OXIDE Instantaneous Maximum (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|--|--|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 18 | 3 | 2 | 12 | 6 | 2 | 1 | 2 | 2 | 2 | 4 | 6 | 5 | S | 2 | 2 | 7 | 3 | 3 | 4 | 3 | 3 | 3 | 1 | 1 | 1 | 18 | 4 | 24 | | | | |
| 2 | 2 | 3 | 1 | 3 | 4 | 4 | 3 | 2 | 3 | 2 | 1 | 3 | S | 3 | 4 | 2 | 6 | 7 | 41 | 12 | 0 | 19 | 0 | 0 | 0 | 0 | 41 | 5 | 24 | | | | |
| 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 4 | S | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 24 | | | | | |
| 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | S | 4 | 1 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 4 | 1 | 24 | | | | | |
| 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | S | 1 | 1 | 2 | 2 | 4 | 3 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 1 | 24 | | | | | |
| 6 | 1 | 0 | 1 | 1 | 1 | 0 | 3 | 62 | S | 6 | 3 | 3 | 4 | 20 | 18 | 13 | 4 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 0 | 62 | 7 | 24 | | | | | |
| 7 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | S | 21 | 13 | 22 | 17 | 27 | 8 | 8 | 6 | 5 | 3 | 5 | 4 | 3 | 3 | 10 | 1 | 0 | 27 | 7 | 24 | | | | | |
| 8 | 2 | 1 | 4 | 6 | 3 | 5 | S | 2 | 5 | 15 | 15 | 16 | 16 | 16 | 7 | 6 | 2 | 2 | 6 | 3 | 4 | 3 | 1 | 1 | 1 | 16 | 6 | 24 | | | | | |
| 9 | 3 | 1 | 7 | 9 | 4 | S | 8 | 2 | 21 | 26 | 19 | 29 | 19 | 9 | 10 | 10 | 35 | 36 | 28 | 50 | 37 | 15 | 25 | 23 | 1 | 50 | 19 | 24 | | | | | |
| 10 | 20 | 15 | 17 | 8 | S | 7 | 23 | 21 | 10 | 18 | 20 | 14 | 17 | 16 | 14 | 58 | 11 | 11 | 7 | 2 | 2 | 1 | 1 | 1 | 1 | 58 | 14 | 24 | | | | | |
| 11 | 0 | 2 | 2 | S | 10 | 5 | 23 | 27 | 151 | 48 | 27 | 30 | 3 | 3 | 7 | 17 | 5 | 1 | 0 | 2 | 1 | 3 | 8 | 4 | 0 | 151 | 17 | 24 | | | | | |
| 12 | 2 | 1 | S | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 5 | 3 | 1 | 2 | 3 | 3 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 24 | | | | | |
| 13 | 2 | S | 3 | 4 | 2 | 1 | 23 | 0 | 1 | 2 | C | C | C | C | C | C | C | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 0 | 23 | 3 | 24 | | | | | |
| 14 | S | 3 | 9 | 8 | 6 | 13 | 17 | 79 | 56 | 21 | 8 | 1 | 17 | X | 33 | 4 | 10 | 3 | 10 | 4 | 1 | 4 | 3 | S | 1 | 79 | 15 | 23 | | | | | |
| 15 | 1 | 1 | 4 | 1 | 4 | 4 | 4 | 3 | 3 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | S | 2 | 0 | 4 | 1 | 24 | | | | | |
| 16 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 6 | 16 | 21 | 5 | 3 | 1 | 2 | 2 | 2 | 9 | 2 | 1 | 2 | S | 1 | 1 | 1 | 21 | 4 | 24 | | | | | |
| 17 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 14 | 1 | 8 | 4 | 2 | 1 | 2 | 3 | 4 | 2 | 1 | 2 | S | 2 | 3 | 3 | 1 | 1 | 14 | 3 | 24 | | | | | |
| 18 | 3 | 14 | 10 | 10 | 11 | S1 | S1 | 44 | 55 | 43 | 32 | 17 | 7 | 7 | 7 | 9 | 2 | 2 | 6 | S | 16 | 35 | 35 | 20 | 2 | 55 | 18 | 22 | | | | | |
| 19 | 1 | 6 | 1 | 5 | 7 | 14 | 9 | 8 | 35 | 23 | 17 | 9 | 10 | 5 | 3 | 7 | 6 | 2 | S | 1 | 3 | 1 | 3 | 2 | 1 | 35 | 8 | 24 | | | | | |
| 20 | 4 | 1 | 3 | 2 | 2 | 23 | 27 | 31 | 29 | 43 | 65 | 56 | 38 | 15 | 6 | 5 | 2 | S | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 65 | 16 | 24 | | | | | |
| 21 | 1 | 1 | 4 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 4 | 2 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 24 | | | | | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | S | 1 | 1 | 6 | 2 | 4 | 2 | 6 | 8 | 0 | 8 | 2 | 24 | | | | | |
| 23 | 5 | 4 | 5 | 14 | 4 | 4 | 2 | 4 | 2 | 15 | 8 | 8 | 8 | 4 | S | 2 | 2 | 4 | 3 | 8 | 2 | 9 | 3 | 4 | 2 | 15 | 5 | 24 | | | | | |
| 24 | 3 | 2 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 2 | 3 | 1 | 1 | S | 9 | 1 | 2 | 5 | 1 | 0 | 0 | 1 | 3 | 1 | 0 | 9 | 2 | 24 | | | | | |
| 25 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 3 | S | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 9 | 1 | 24 | | | | | |
| 26 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | S | 2 | 6 | 6 | 11 | 3 | 22 | 5 | 9 | 9 | 6 | 3 | 3 | 0 | 22 | 4 | 24 | | | | | |
| 27 | 2 | 1 | 2 | 4 | 0 | 1 | 1 | 0 | 4 | 1 | S | 7 | 45 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 4 | 1 | 1 | 0 | 45 | 4 | 24 | | | | | |
| 28 | 1 | 1 | 1 | 1 | 1 | 12 | 5 | 2 | 6 | S | 3 | 6 | 8 | 9 | 3 | 5 | 4 | 3 | 7 | 3 | 5 | 6 | 5 | 1 | 12 | 4 | 24 | | | | | | |
| 29 | 4 | 1 | 1 | 2 | 2 | 3 | 1 | 3 | S | 3 | 3 | 4 | 3 | 2 | 2 | 6 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 6 | 2 | 24 | | | | | |
| 30 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | S | 1 | 4 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 4 | 1 | 24 | | | | | |
| 31 | 3 | 1 | 0 | 2 | 2 | 2 | S | S1 | S1 | 34 | 23 | 3 | 2 | 5 | 14 | 2 | 2 | 2 | 2 | 3 | 5 | 3 | 9 | 2 | 0 | 34 | 6 | 22 | | | | | |
| HOURLY MAX | 20 | 15 | 17 | 14 | 11 | 23 | 27 | 79 | 151 | 48 | 65 | 56 | 45 | 20 | 33 | 58 | 35 | 36 | 41 | 50 | 37 | 35 | 35 | 23 | | | | | | | | | |
| HOURLY AVG | 3 | 2 | 3 | 4 | 3 | 4 | 6 | 11 | 16 | 12 | 11 | 9 | 9 | 6 | 6 | 6 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 3 | | | | | | | | | |

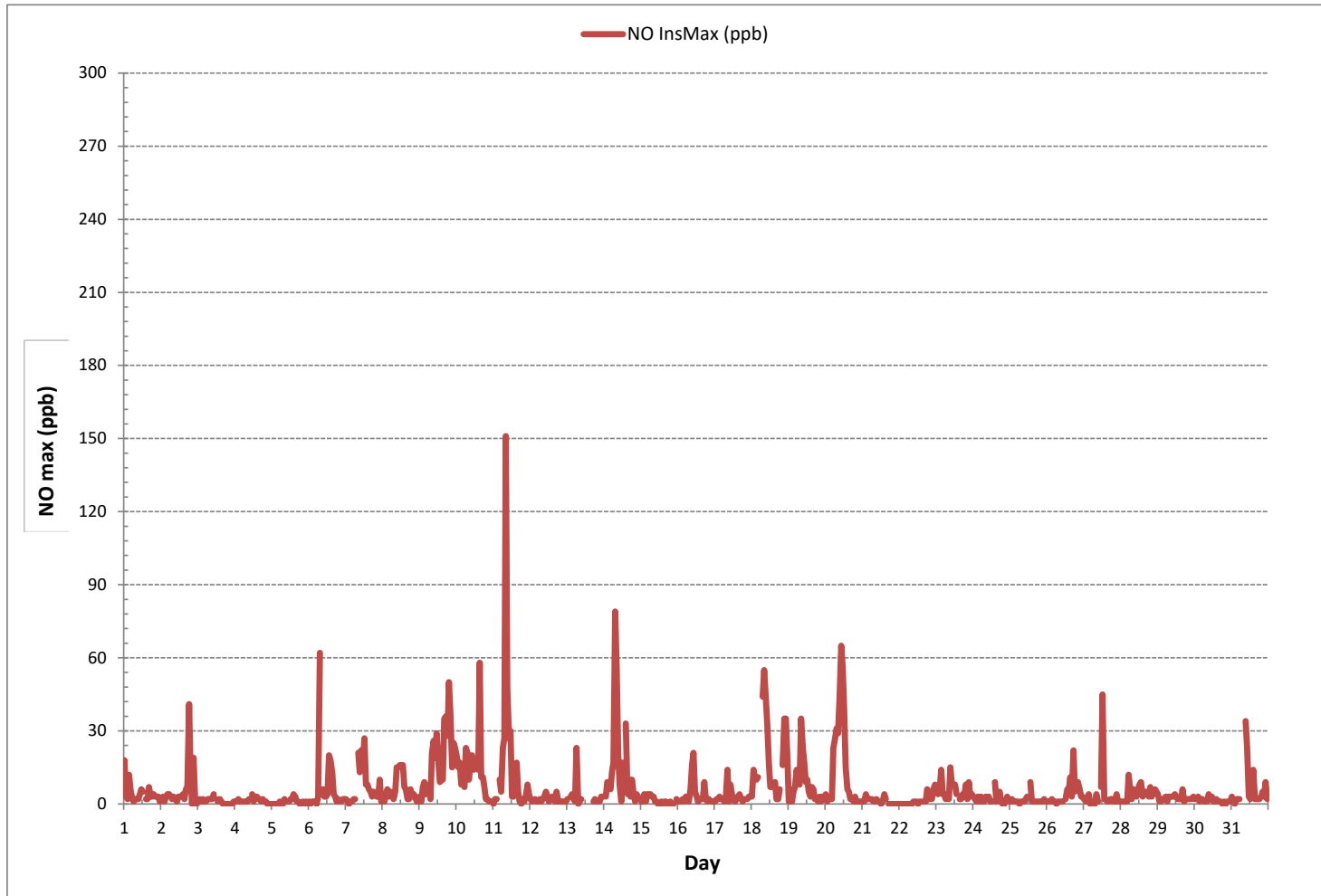
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 636 |
| MAXIMUM INSTANTANEOUS VALUE: | 151 ppb @ HOUR 8 ON DAY 11 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 11 |
| OPERATIONAL TIME: | 739 hrs |

NITRIC OXIDE Instantaneous Maximum (NO ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 13 | 8 | 7 | 11 | 12 | 8 | 8 | 6 | 6 | 8 | 7 | 7 | 7 | S | 6 | 6 | 5 | 7 | 7 | 8 | 6 | 5 | 12 | 3 | 3 | 13 | 8 | 24 | |
| 2 | 5 | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | S | 4 | 4 | 5 | 10 | 10 | 16 | 7 | 3 | 9 | 2 | 2 | 2 | 16 | 5 | 24 | |
| 3 | 3 | 3 | 4 | 6 | 4 | 9 | 10 | 11 | 10 | 5 | 7 | S | 5 | 3 | 7 | 3 | 2 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 11 | 5 | 24 | |
| 4 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 7 | 9 | S | 6 | 4 | 5 | 8 | 10 | 11 | 9 | 8 | 7 | 5 | 4 | 7 | 8 | 3 | 11 | 6 | 24 | |
| 5 | 4 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 4 | S | 3 | 4 | 4 | 4 | 10 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 2 | 10 | 4 | 24 | |
| 6 | 3 | 3 | 3 | 5 | 5 | 5 | 14 | 19 | S | 13 | 9 | 6 | 8 | 24 | 13 | 18 | 18 | 16 | 14 | 13 | 13 | 14 | 14 | 16 | 3 | 24 | 12 | 24 | |
| 7 | 15 | 12 | 10 | 12 | 12 | 15 | 16 | S | 19 | 17 | 18 | 18 | 21 | 15 | 21 | 20 | 24 | 22 | 19 | 21 | 19 | 17 | 26 | 19 | 10 | 26 | 18 | 24 | |
| 8 | 16 | 17 | 21 | 21 | 20 | 19 | S | 16 | 17 | 16 | 13 | 13 | 17 | 19 | 20 | 17 | 28 | 20 | 22 | 25 | 17 | 18 | 22 | 15 | 17 | 13 | 28 | 19 | 24 |
| 9 | 21 | 13 | 22 | 22 | 16 | S | 16 | 16 | 27 | 21 | 17 | 22 | 18 | 15 | 16 | 25 | 34 | 31 | 29 | 36 | 33 | 21 | 25 | 25 | 13 | 36 | 23 | 24 | |
| 10 | 23 | 19 | 21 | 18 | S | 19 | 24 | 27 | 22 | 21 | 18 | 16 | 15 | 20 | 24 | 30 | 31 | 29 | 28 | 25 | 12 | 11 | 9 | 8 | 8 | 31 | 20 | 24 | |
| 11 | 8 | 7 | 9 | S | 18 | 17 | 20 | 22 | 57 | 19 | 15 | 20 | 8 | 8 | 17 | 22 | 10 | 7 | 6 | 10 | 9 | 8 | 7 | 12 | 6 | 57 | 15 | 24 | |
| 12 | 7 | 5 | S | 8 | 9 | 9 | 11 | 15 | 13 | 14 | 13 | 6 | 5 | 6 | 9 | 10 | 7 | 5 | 4 | 8 | 3 | 4 | 3 | 2 | 2 | 15 | 8 | 24 | |
| 13 | 4 | S | 15 | 13 | 9 | 4 | 14 | 5 | 7 | 6 | C | C | C | C | C | C | C | 6 | 6 | 6 | 6 | 5 | 7 | 6 | 4 | 15 | 7 | 24 | |
| 14 | S | 24 | 25 | 28 | 27 | 50 | 26 | 80 | 56 | 18 | 5 | 4 | 19 | X | 18 | 15 | 9 | 7 | 20 | 17 | 13 | 10 | 9 | S | 4 | 80 | 23 | 23 | |
| 15 | 5 | 7 | 14 | 11 | 19 | 15 | 17 | 9 | 10 | 8 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | S | 2 | 1 | 19 | 6 | 24 | |
| 16 | 3 | 5 | 5 | 5 | 4 | 15 | 11 | 9 | 19 | 22 | 34 | 5 | 7 | 4 | 6 | 5 | 7 | 10 | 6 | 4 | 4 | S | 4 | 4 | 3 | 34 | 9 | 24 | |
| 17 | 4 | 5 | 4 | 4 | 5 | 6 | 6 | 10 | 19 | 11 | 10 | 3 | 3 | 5 | 6 | 8 | 11 | 8 | 10 | 14 | S | 12 | 15 | 16 | 3 | 19 | 8 | 24 | |
| 18 | 17 | 21 | 21 | 20 | 19 | S1 | S1 | 20 | 26 | 23 | 20 | 14 | 9 | 12 | 13 | 23 | 25 | 20 | 22 | S | 23 | 27 | 27 | 20 | 9 | 27 | 20 | 22 | |
| 19 | 15 | 16 | 16 | 21 | 17 | 18 | 18 | 18 | 28 | 30 | 17 | 14 | 16 | 12 | 12 | 11 | 11 | S | 14 | 12 | 9 | 8 | 7 | 7 | 30 | 15 | 24 | | |
| 20 | 7 | 6 | 7 | 11 | 12 | 33 | 26 | 26 | 28 | 23 | 32 | 28 | 26 | 19 | 16 | 14 | 8 | S | 7 | 8 | 6 | 10 | 5 | 4 | 4 | 33 | 16 | 24 | |
| 21 | 4 | 5 | 11 | 7 | 8 | 8 | 8 | 9 | 5 | 4 | 3 | 2 | 3 | 3 | 8 | 6 | S | 5 | 4 | 4 | 2 | 3 | 3 | 1 | 1 | 11 | 5 | 24 | |
| 22 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | S | 16 | 15 | 19 | 9 | 10 | 14 | 19 | 20 | 1 | 20 | 7 | 24 | |
| 23 | 19 | 20 | 18 | 19 | 22 | 22 | 23 | 22 | 17 | 21 | 19 | 5 | 8 | 8 | S | 6 | 7 | 10 | 6 | 14 | 5 | 9 | 6 | 6 | 5 | 23 | 13 | 24 | |
| 24 | 6 | 5 | 3 | 3 | 3 | 5 | 4 | 3 | 4 | 4 | 12 | 3 | 3 | S | 10 | 5 | 8 | 13 | 8 | 2 | 2 | 3 | 3 | 4 | 2 | 13 | 5 | 24 | |
| 25 | 3 | 5 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | S | 8 | 4 | 6 | 5 | 6 | 6 | 4 | 6 | 7 | 7 | 8 | 2 | 8 | 4 | 24 | |
| 26 | 10 | 12 | 13 | 13 | 12 | 10 | 8 | 7 | 5 | 3 | 2 | S | 3 | 7 | 8 | 14 | 15 | 20 | 17 | 22 | 19 | 12 | 13 | 11 | 2 | 22 | 11 | 24 | |
| 27 | 8 | 10 | 6 | 7 | 7 | 4 | 3 | 7 | 4 | S | 4 | 18 | 4 | 4 | 5 | 6 | 4 | 6 | 3 | 3 | 4 | 4 | 4 | 5 | 3 | 18 | 6 | 24 | |
| 28 | 5 | 7 | 7 | 5 | 6 | 8 | 14 | 13 | 17 | S | 9 | 9 | 8 | 8 | 8 | 9 | 11 | 8 | 7 | 6 | 7 | 7 | 5 | 6 | 5 | 17 | 8 | 24 | |
| 29 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 3 | S | 4 | 3 | 5 | 4 | 3 | 3 | 17 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 17 | 4 | 24 | |
| 30 | 3 | 3 | 4 | 2 | 2 | 1 | 3 | S | 3 | 4 | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 4 | 3 | 3 | 4 | 8 | 7 | 1 | 8 | 3 | 24 | |
| 31 | 9 | 10 | 6 | 10 | 11 | 19 | S | S1 | S1 | 28 | 23 | 4 | 3 | 6 | 10 | 9 | 10 | 15 | 13 | 16 | 13 | 15 | 18 | 8 | 3 | 28 | 12 | 22 | |
| HOURLY MAX | 23 | 24 | 25 | 28 | 27 | 50 | 26 | 80 | 57 | 30 | 34 | 28 | 26 | 24 | 24 | 30 | 34 | 31 | 29 | 36 | 33 | 27 | 27 | 25 | | | | | |
| HOURLY AVG | 8 | 9 | 10 | 10 | 10 | 12 | 11 | 14 | 16 | 12 | 12 | 8 | 9 | 8 | 10 | 11 | 12 | 11 | 11 | 10 | 9 | 9 | 10 | 9 | | | | | |

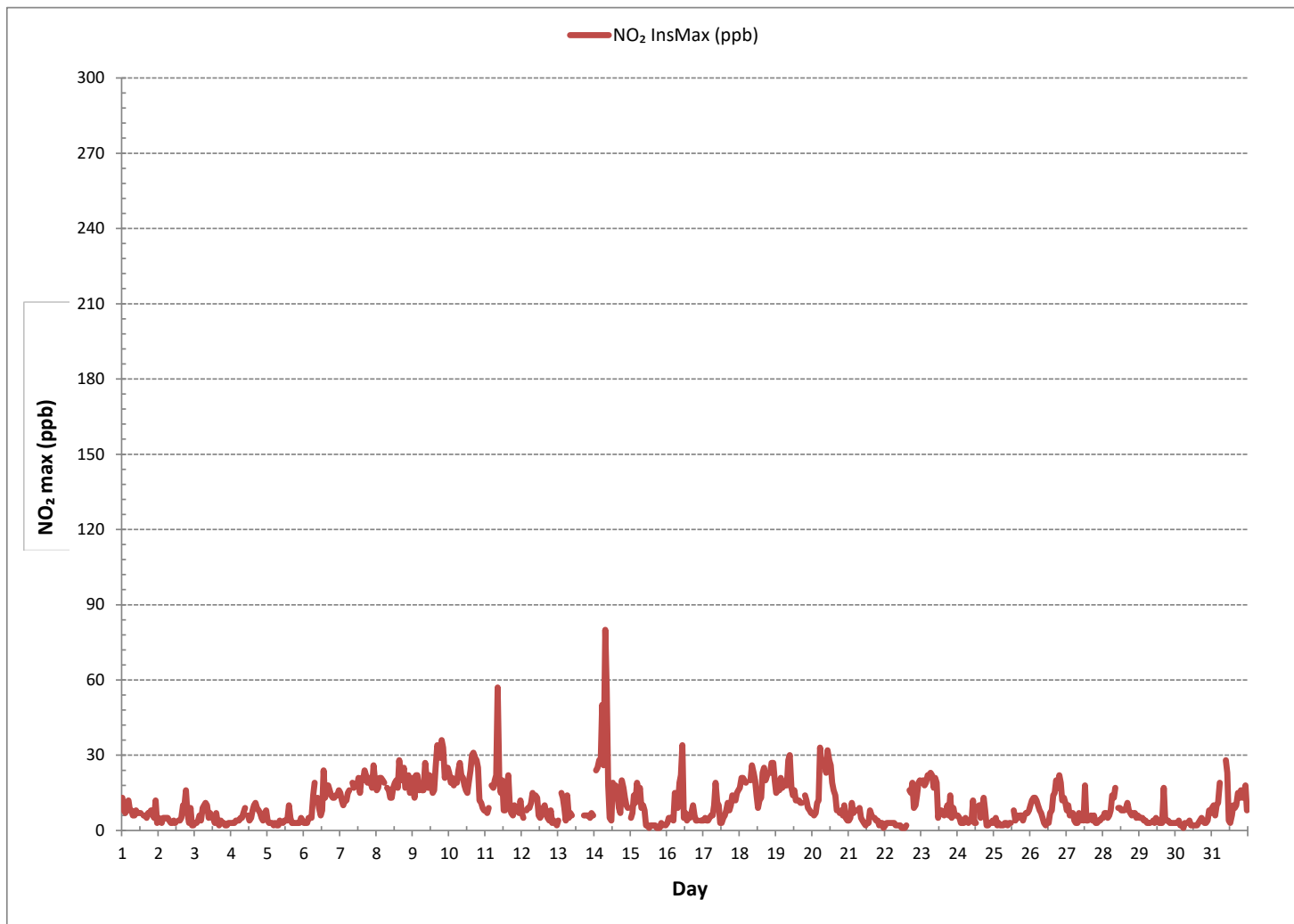
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 700 |
| MAXIMUM INSTANTANEOUS VALUE: | 80 ppb @ HOUR 7 ON DAY 14 |
| VAR-VARIOUS | |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 739 hrs |
| STANDARD DEVIATION: | 8 |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 8.0 | 9.3 | 9.2 | 9.5 | 9.9 | 10.2 | 10.8 | 10.3 | 13.6 | 15.4 | 15.8 | 16.9 | 17.6 | S | 17.9 | 16.5 | 16.3 | 16.0 | 17.7 | 17.1 | 18.5 | 18.3 | 18.9 | 19.1 | 8.0 | 19.1 | 14.5 | 24 |
| 2 | 19.8 | 18.4 | 16.6 | 15.8 | 15.2 | 14.8 | 14.7 | 15.1 | 15.0 | 16.1 | 17.5 | 18.2 | S | 19.5 | 19.8 | 19.7 | 19.8 | 18.3 | 19.4 | 21.8 | 21.9 | 21.9 | 21.0 | 21.0 | 14.7 | 21.9 | 18.3 | 24 |
| 3 | 20.9 | 18.7 | 18.3 | 16.3 | 16.3 | 12.6 | 8.2 | 6.0 | 6.5 | 7.8 | 9.0 | S | 15.8 | 21.7 | 25.7 | 30.4 | 31.0 | 28.8 | 28.1 | 27.9 | 26.5 | 26.3 | 25.8 | 28.1 | 6.0 | 31.0 | 19.9 | 24 |
| 4 | 29.2 | 27.2 | 28.2 | 28.9 | 28.7 | 28.3 | 28.8 | 31.2 | 32.4 | 34.6 | S | 34.9 | 35.2 | 35.1 | 32.4 | 28.9 | 26.0 | 25.1 | 26.0 | 29.2 | 29.3 | 31.5 | 29.2 | 23.3 | 23.3 | 35.2 | 29.7 | 24 |
| 5 | 29.7 | 30.5 | 26.3 | 23.3 | 24.8 | 28.8 | 28.7 | 29.0 | 28.8 | S | 29.6 | 28.2 | 27.7 | 31.9 | 32.2 | 31.8 | 31.8 | 32.1 | 31.8 | 31.1 | 29.9 | 29.9 | 31.3 | 31.3 | 23.3 | 32.2 | 29.6 | 24 |
| 6 | 31.2 | 30.9 | 30.9 | 31.4 | 31.3 | 27.4 | 29.1 | 25.3 | S | 25.1 | 29.7 | 30.3 | 28.5 | 26.9 | 25.7 | 23.4 | 20.0 | 19.2 | 19.6 | 19.8 | 19.9 | 17.6 | 15.6 | 14.3 | 14.3 | 31.4 | 24.9 | 24 |
| 7 | 11.2 | 12.4 | 11.3 | 10.1 | 9.7 | 9.8 | 5.6 | S | 5.8 | 9.5 | 15.6 | 18.8 | 21.3 | 22.2 | 19.1 | 18.6 | 18.2 | 11.5 | 14.1 | 13.9 | 14.5 | 14.9 | 13.0 | 9.2 | 5.6 | 22.2 | 13.5 | 24 |
| 8 | 9.2 | 7.9 | 7.2 | 2.4 | 2.6 | 4.4 | S | 4.5 | 5.5 | 8.2 | 11.2 | 14.8 | 16.7 | 21.0 | 23.7 | 22.4 | 17.0 | 16.7 | 13.1 | 17.9 | 20.1 | 17.3 | 18.2 | 17.9 | 2.4 | 23.7 | 13.0 | 24 |
| 9 | 15.4 | 12.9 | 10.5 | 5.6 | 6.5 | S | 6.6 | 7.5 | 6.1 | 5.8 | 10.7 | 12.4 | 19.4 | 22.7 | 21.4 | 18.5 | 9.3 | 1.8 | 4.0 | 5.9 | 6.5 | 5.9 | 4.3 | 1.9 | 1.8 | 22.7 | 9.6 | 24 |
| 10 | 2.1 | 0.9 | 0.6 | 1.9 | S | 6.3 | 5.3 | 5.3 | 3.5 | 6.6 | 10.6 | 15.7 | 15.7 | 11.6 | 9.1 | 7.1 | 2.4 | 2.8 | 4.8 | 20.9 | 22.2 | 23.2 | 22.8 | 24.1 | 0.6 | 24.1 | 9.8 | 24 |
| 11 | 24.6 | 26.1 | 25.6 | S | 16.2 | 14.1 | 7.5 | 1.2 | 1.9 | 5.1 | 10.9 | 25.0 | 25.2 | 24.5 | 24.0 | 26.8 | 28.7 | 28.8 | 28.7 | 28.6 | 26.5 | 25.7 | 24.4 | 24.1 | 1.2 | 28.8 | 20.6 | 24 |
| 12 | 23.6 | 23.0 | S | 19.8 | 19.0 | 19.0 | 17.0 | 14.8 | 20.9 | 23.4 | 30.5 | 32.5 | 34.9 | 35.7 | 36.7 | 37.1 | 36.6 | 38.4 | 38.7 | 38.6 | 38.7 | 39.0 | 39.0 | 38.8 | 14.8 | 39.0 | 30.2 | 24 |
| 13 | 38.5 | S | 33.7 | 28.7 | 30.5 | 32.3 | 32.6 | 32.1 | 31.8 | 31.5 | 31.8 | 34.3 | 34.4 | 34.0 | 34.7 | 36.3 | 36.8 | 36.3 | 35.8 | 36.3 | 36.4 | 36.6 | 36.1 | 35.9 | 28.7 | 38.5 | 34.2 | 24 |
| 14 | S | 33.8 | 19.1 | 18.0 | 5.5 | 11.7 | 5.7 | 24.6 | 25.3 | C | C | C | C | C | 25.9 | 27.0 | 28.8 | 29.0 | 29.1 | 28.6 | 28.9 | 29.2 | 29.7 | S | 5.5 | 33.8 | 23.5 | 24 |
| 15 | 31.6 | 31.3 | 25.7 | 22.1 | 19.5 | 13.9 | 19.8 | 22.9 | 26.9 | 34.8 | 36.6 | 35.1 | 36.2 | 37.4 | 36.4 | 34.1 | 33.1 | 32.0 | 31.7 | 32.2 | 33.8 | 37.1 | S | 35.6 | 13.9 | 37.4 | 30.4 | 24 |
| 16 | 35.5 | 33.4 | 29.8 | 26.8 | 26.2 | 23.5 | 22.4 | 18.9 | 21.3 | 19.8 | 29.3 | 31.1 | 30.8 | 31.7 | 31.8 | 31.2 | 30.3 | 28.3 | 29.4 | 29.9 | 30.4 | S | 31.2 | 31.2 | 18.9 | 35.5 | 28.4 | 24 |
| 17 | 30.9 | 32.0 | 32.9 | 32.6 | 32.0 | 32.9 | 32.5 | 30.6 | 26.4 | 31.2 | 32.1 | 31.9 | 31.6 | 31.1 | 29.5 | 28.0 | 24.3 | 23.5 | 22.2 | 17.9 | S | 18.6 | 14.1 | 12.7 | 12.7 | 32.9 | 27.4 | 24 |
| 18 | 11.3 | 3.8 | 1.6 | 1.8 | 0.6 | 1.4 | 0.6 | 0.8 | 1.0 | 2.9 | 8.1 | 19.7 | 20.5 | 20.3 | 20.1 | 18.4 | 14.1 | 11.2 | 7.0 | S | 2.0 | 3.8 | 1.1 | 1.7 | 0.6 | 20.5 | 7.5 | 24 |
| 19 | 4.2 | 7.7 | 8.2 | 6.3 | 3.4 | 1.1 | 0.6 | 2.2 | 4.8 | 10.4 | 14.4 | 18.9 | 23.4 | 24.5 | 26.7 | 27.7 | 27.6 | 26.7 | S | 23.6 | 28.5 | 28.6 | 27.9 | 28.7 | 0.6 | 28.7 | 16.3 | 24 |
| 20 | 28.5 | 29.4 | 28.1 | 24.3 | 22.3 | 20.8 | 13.9 | 5.5 | 2.4 | 4.3 | 5.6 | 8.8 | 22.8 | 23.9 | 26.2 | 26.6 | 26.6 | S | 26.8 | 27.0 | 29.1 | 31.0 | 32.3 | 32.3 | 2.4 | 32.3 | 21.7 | 24 |
| 21 | 31.1 | 29.2 | 26.4 | 23.5 | 23.1 | 21.8 | 21.6 | 22.9 | 24.2 | 26.0 | 28.0 | 29.0 | 28.4 | 26.6 | 27.8 | 25.4 | S | 25.9 | 27.2 | 27.9 | 28.4 | 27.2 | 25.6 | 23.9 | 21.6 | 31.1 | 26.1 | 24 |
| 22 | 24.7 | 24.9 | 25.6 | 24.2 | 25.5 | 26.0 | 28.5 | 32.1 | 33.2 | 33.3 | 31.9 | 33.0 | 34.6 | 36.7 | 35.3 | S | 28.9 | 24.3 | 20.5 | 22.3 | 23.5 | 18.3 | 14.3 | 10.3 | 10.3 | 36.7 | 26.6 | 24 |
| 23 | 8.9 | 8.6 | 5.2 | 10.8 | 7.5 | 6.1 | 6.9 | 6.8 | 11.1 | 18.0 | 23.8 | 25.4 | 26.6 | 28.1 | S | 27.4 | 27.0 | 26.4 | 29.2 | 28.4 | 28.3 | 29.8 | 30.4 | 31.4 | 5.2 | 31.4 | 19.7 | 24 |
| 24 | 32.4 | 32.5 | 32.8 | 32.7 | 32.6 | 32.9 | 33.4 | 33.8 | 33.7 | 33.3 | 33.6 | 33.5 | 33.0 | S | 32.3 | 32.5 | 29.3 | 28.5 | 30.1 | 31.8 | 31.7 | 31.3 | 30.0 | 29.5 | 28.5 | 33.8 | 32.0 | 24 |
| 25 | 29.0 | 27.4 | 27.7 | 27.4 | 27.4 | 26.9 | 26.5 | 26.3 | 26.0 | 25.9 | 26.0 | 26.2 | S | 26.4 | 25.7 | 24.9 | 24.4 | 22.8 | 21.8 | 21.7 | 21.1 | 20.0 | 17.8 | 17.8 | 17.8 | 29.0 | 24.7 | 24 |
| 26 | 17.3 | 13.9 | 9.9 | 9.3 | 9.6 | 10.1 | 11.1 | 12.9 | 19.3 | 20.8 | 21.8 | S | 22.3 | 21.6 | 19.9 | 18.6 | 11.5 | 10.8 | 7.4 | 9.2 | 6.4 | 8.8 | 7.6 | 11.0 | 6.4 | 22.3 | 13.5 | 24 |
| 27 | 12.5 | 12.4 | 15.7 | 15.6 | 20.3 | 20.4 | 20.2 | 20.0 | 20.4 | 20.8 | S | 21.8 | 21.7 | 22.1 | 21.9 | 21.3 | 20.9 | 21.0 | 21.1 | 21.1 | 21.0 | 20.5 | 19.3 | 18.6 | 12.4 | 22.1 | 19.6 | 24 |
| 28 | 17.9 | 16.8 | 16.8 | 16.5 | 15.5 | 15.2 | 12.9 | 11.6 | 7.1 | S | 13.1 | 14.3 | 15.6 | 15.5 | 15.7 | 15.2 | 15.5 | 15.3 | 16.4 | 15.4 | 15.3 | 15.5 | 15.6 | 16.2 | 7.1 | 17.9 | 15.0 | 24 |
| 29 | 16.4 | 16.6 | 16.6 | 16.6 | 17.4 | 18.0 | 18.7 | 19.8 | S | 20.6 | 21.2 | 21.2 | 22.3 | 21.5 | 22.6 | 22.9 | 23.4 | 23.0 | 22.9 | 22.4 | 22.2 | 22.5 | 23.0 | 23.4 | 16.4 | 23.4 | 20.6 | 24 |
| 30 | 23.4 | 24.2 | 24.6 | 25.5 | 26.3 | 27.8 | 31.2 | S | 34.4 | 35.4 | 37.1 | 37.3 | 38.2 | 39.3 | 40.5 | 40.5 | 38.8 | 38.0 | 37.6 | 34.6 | 35.7 | 34.2 | 31.3 | 27.6 | 23.4 | 40.5 | 33.2 | 24 |
| 31 | 25.2 | 23.8 | 21.2 | 20.6 | 17.4 | 14.6 | S | 10.5 | 5.8 | 9.4 | 28.5 | 29.3 | 28.5 | 26.2 | 27.3 | 27.2 | 24.9 | 23.7 | 18.9 | 18.5 | 18.1 | 16.5 | 19.7 | 21.6 | 5.8 | 29.3 | 20.8 | 24 |
| HOURLY MAX | 38.5 | 33.8 | 33.7 | 32.7 | 32.6 | 32.9 | 33.4 | 33.8 | 34.4 | 35.4 | 37.1 | 37.3 | 38.2 | 39.3 | 40.5 | 40.5 | 38.8 | 38.4 | 38.7 | 38.6 | 38.7 | 39.0 | 39.0 | 38.8 | | | | |
| HOURLY AVG | 21.5 | 20.7 | 19.5 | 18.3 | 18.1 | 17.8 | 17.3 | 16.7 | 17.1 | 19.1 | 21.9 | 24.9 | 26.0 | 26.4 | 26.3 | 25.5 | 24.1 | 22.9 | 22.7 | 24.1 | 23.8 | 23.4 | 22.4 | 22.1 | | | | |

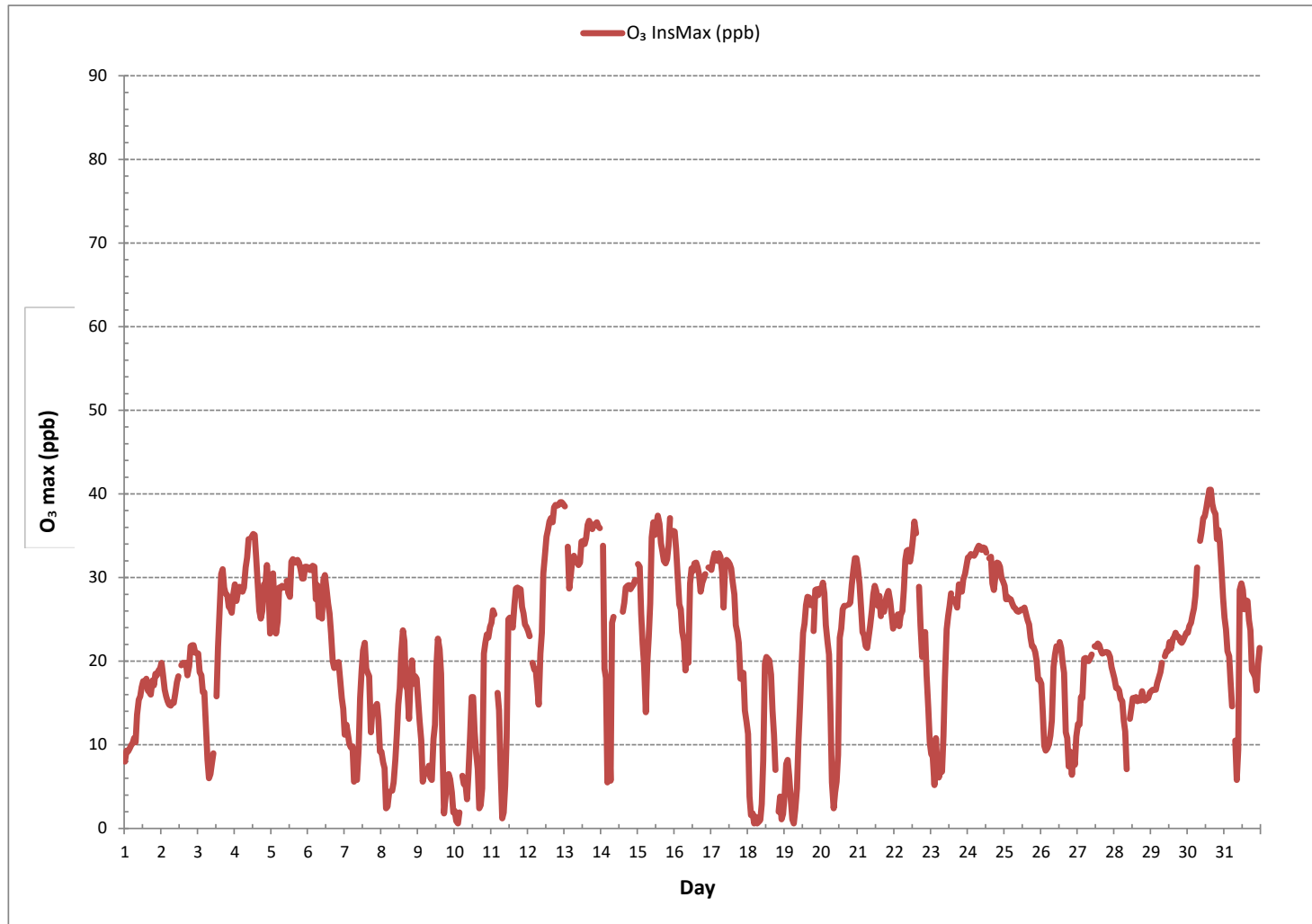
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 707 |
| MAXIMUM INSTANTANEOUS VALUE: | 40.5 ppb @ HOUR 14 ON DAY 30 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 9.5 |

OZONE Instantaneous Maximum (O₃ ppb)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 8.7 | 9.3 | 6.4 | 9.1 | 10.1 | 9.3 | 11.4 | 14.1 | 14.5 | 12.8 | 15.8 | 17.6 | 12.5 | 13.0 | 21.0 | 18.1 | 20.6 | 14.7 | 18.4 | 13.7 | 21.5 | 21.1 | 21.5 | 23.5 | 6.4 | 23.5 | 15.0 | 24 | |
| 2 | 15.7 | 20.8 | 23.5 | 17.4 | 17.4 | 18.9 | 18.9 | 19.1 | 15.9 | 17.9 | 21.8 | 21.0 | 18.6 | 17.7 | 12.6 | 9.8 | 7.6 | 6.9 | 7.9 | 7.4 | 8.6 | 8.1 | 5.3 | 9.1 | 5.3 | 23.5 | 14.5 | 24 | |
| 3 | 8.4 | 7.6 | 9.8 | 9.6 | 8.6 | 11.8 | 9.3 | 10.4 | 12.7 | 16.2 | 14.0 | 19.3 | 28.8 | 35.7 | 28.6 | 21.5 | 20.3 | 29.8 | 25.9 | 25.2 | 30.5 | 18.9 | 18.9 | 22.0 | 7.6 | 35.7 | 18.5 | 24 | |
| 4 | 19.3 | 21.0 | 30.1 | 30.1 | 26.6 | 20.6 | 22.3 | 30.8 | 19.8 | 21.8 | 18.1 | 13.7 | 20.6 | 28.1 | 25.4 | 22.7 | 24.5 | 21.9 | 24.5 | 19.7 | 19.6 | 45.2 | 38.4 | 36.9 | 13.7 | 45.2 | 25.1 | 24 | |
| 5 | 50.9 | 42.8 | 39.3 | 33.3 | 34.5 | 40.1 | 29.8 | 40.2 | 31.0 | 24.2 | 23.7 | 14.0 | 8.4 | 30.8 | 24.0 | 11.6 | 12.1 | 12.0 | 15.2 | 7.1 | 11.8 | 11.9 | 16.2 | 10.6 | 7.1 | 50.9 | 24.0 | 24 | |
| 6 | 7.9 | 8.4 | 9.6 | 8.6 | 6.4 | 7.9 | 10.6 | 11.8 | 5.2 | 10.1 | 20.3 | 26.3 | 30.8 | 29.1 | 22.1 | 23.0 | 26.2 | 15.9 | 17.7 | 19.1 | 17.1 | 13.2 | 13.0 | 11.5 | 5.2 | 30.8 | 15.5 | 24 | |
| 7 | 9.6 | 9.3 | 3.3 | 3.6 | 3.7 | 14.0 | 4.7 | 4.9 | 13.0 | 8.8 | 6.4 | 6.2 | 8.2 | 9.8 | 10.1 | 10.6 | 8.1 | 7.4 | 11.3 | 11.3 | 10.6 | 12.6 | 4.7 | 9.6 | 3.3 | 14.0 | 8.4 | 24 | |
| 8 | 11.5 | 11.3 | 11.5 | 3.5 | 3.3 | 3.7 | 2.4 | 4.2 | 2.8 | 3.6 | 7.1 | 9.1 | 9.6 | 15.9 | 13.7 | 11.8 | 13.7 | 9.3 | 9.2 | 14.9 | 18.4 | 7.9 | 14.9 | 13.5 | 2.4 | 18.4 | 9.5 | 24 | |
| 9 | 10.8 | 8.6 | 6.0 | 4.3 | 4.9 | 3.5 | 4.3 | 5.5 | 6.4 | 5.9 | 7.0 | 7.9 | 6.5 | 5.9 | 7.6 | 10.1 | 10.6 | 6.5 | 10.6 | 10.6 | 12.5 | 14.0 | 4.7 | 4.8 | 3.5 | 14.0 | 7.5 | 24 | |
| 10 | 5.3 | 4.3 | 11.5 | 5.9 | 7.2 | 8.1 | 19.3 | 9.1 | 11.0 | 9.6 | 16.7 | 11.8 | 14.9 | 19.3 | 15.3 | 15.9 | 13.6 | 12.3 | 10.6 | 26.9 | 17.6 | 26.4 | 17.4 | 15.7 | 4.3 | 26.9 | 13.6 | 24 | |
| 11 | 12.0 | 17.6 | 12.5 | 10.1 | 5.2 | 12.5 | 4.3 | 3.0 | 11.1 | 6.0 | 5.2 | 10.8 | 14.8 | 12.0 | 6.7 | 17.4 | 23.2 | 24.2 | 17.9 | 12.5 | 12.5 | 10.1 | 9.6 | 8.2 | 3.0 | 24.2 | 11.6 | 24 | |
| 12 | 10.7 | 13.0 | 13.5 | 14.1 | 14.6 | 16.2 | 12.4 | 11.5 | 18.6 | 19.6 | 25.2 | 26.6 | 30.3 | 32.9 | 34.5 | 36.4 | 34.5 | 42.5 | 32.0 | 30.1 | 19.1 | 30.3 | 28.6 | 30.5 | 10.7 | 42.5 | 24.1 | 24 | |
| 13 | 26.9 | 10.3 | 7.6 | 12.3 | 11.5 | 10.8 | 14.2 | 13.2 | 23.6 | 14.9 | 15.0 | 25.7 | 35.4 | 31.5 | 31.0 | 27.7 | 26.2 | 23.2 | 22.7 | 20.1 | 18.5 | 17.4 | 12.8 | 8.6 | 7.6 | 35.4 | 19.2 | 24 | |
| 14 | 9.4 | 13.2 | 3.8 | 5.7 | 3.3 | 7.6 | 6.0 | 9.1 | 16.4 | 17.1 | 22.5 | 22.3 | 14.1 | X | 9.8 | 14.5 | 13.5 | 20.1 | 18.9 | 10.7 | 13.7 | 14.5 | 14.9 | 14.9 | 3.3 | 22.5 | 12.9 | 23 | |
| 15 | 15.2 | 11.8 | 9.1 | 5.4 | 5.7 | 7.2 | 9.8 | 8.4 | 46.4 | 49.8 | 57.9 | 64.1 | 72.9 | 86.2 | 61.3 | 57.9 | 67.4 | 58.1 | 56.4 | 46.2 | 34.5 | 30.9 | 24.9 | 28.4 | 5.4 | 86.2 | 38.2 | 24 | |
| 16 | 14.8 | 13.0 | 15.7 | 12.3 | 12.7 | 5.0 | 4.9 | 9.6 | 5.2 | 6.0 | 13.0 | 19.4 | 18.2 | 18.2 | 24.2 | 31.1 | 26.7 | 18.1 | 27.4 | 26.7 | 17.4 | 21.0 | 25.3 | 26.3 | 4.9 | 31.1 | 17.2 | 24 | |
| 17 | 19.6 | 19.3 | 17.2 | 15.3 | 14.0 | 14.3 | 22.0 | 9.6 | 7.6 | 21.0 | 14.9 | 13.6 | 12.0 | 16.7 | 23.0 | 22.7 | 17.9 | 17.6 | 12.5 | 16.5 | 13.3 | 14.0 | 4.7 | 3.7 | 3.7 | 23.0 | 15.1 | 24 | |
| 18 | 3.8 | 3.6 | 4.2 | 4.0 | 2.3 | 3.1 | 6.7 | 4.7 | 5.3 | 8.6 | 6.9 | 17.8 | 16.2 | 17.1 | 11.8 | 9.8 | 10.8 | 9.3 | 8.4 | 17.4 | 10.2 | 11.5 | 7.4 | 4.5 | 2.3 | 17.8 | 8.6 | 24 | |
| 19 | 10.6 | 9.8 | 8.7 | 3.2 | 4.6 | 5.3 | 4.7 | 12.3 | 14.5 | 11.8 | 9.8 | 13.3 | 14.5 | 15.7 | 19.3 | 15.3 | 15.7 | 15.7 | 19.4 | 27.1 | 19.1 | 17.9 | 18.1 | 13.1 | 3.2 | 27.1 | 13.3 | 24 | |
| 20 | 16.7 | 21.1 | 18.9 | 14.0 | 9.6 | 10.6 | 5.7 | 11.5 | 5.2 | 3.2 | 7.4 | 5.5 | 6.9 | 10.0 | 18.4 | 21.3 | 32.3 | 33.7 | 34.0 | 24.5 | 33.3 | 38.1 | 37.1 | 40.8 | 3.2 | 40.8 | 19.2 | 24 | |
| 21 | 32.5 | 23.2 | 15.9 | 12.0 | 8.9 | 7.1 | 16.0 | 26.9 | 50.1 | 47.7 | 51.5 | 53.5 | 59.8 | 47.1 | 34.0 | 40.3 | 49.3 | 44.7 | 43.6 | 52.5 | 68.4 | 39.6 | 47.1 | 43.5 | 7.1 | 68.4 | 38.1 | 24 | |
| 22 | 38.7 | 41.3 | 34.7 | 37.6 | 38.1 | 34.2 | 31.3 | 34.5 | 36.9 | 34.5 | 33.7 | 37.6 | 32.8 | 27.5 | 27.9 | 15.9 | 10.3 | 4.8 | 4.0 | 6.9 | 8.8 | 8.0 | 2.8 | 3.3 | 2.8 | 41.3 | 24.4 | 24 | |
| 23 | 4.9 | 2.3 | 2.7 | 4.5 | 2.8 | 3.0 | 4.3 | 4.5 | 3.4 | 3.8 | 7.9 | 8.1 | 10.3 | 13.2 | 16.4 | 15.2 | 12.7 | 9.1 | 15.2 | 14.5 | 12.5 | 8.9 | 10.4 | 13.7 | 2.3 | 16.4 | 8.5 | 24 | |
| 24 | 13.5 | 14.5 | 11.3 | 12.5 | 14.5 | 9.2 | 10.2 | 10.3 | 13.0 | 14.0 | 12.0 | 30.3 | 31.1 | 32.5 | 31.1 | 7.6 | 8.9 | 10.8 | 9.4 | 17.1 | 22.0 | 14.5 | 11.3 | 15.2 | 7.6 | 32.5 | 15.7 | 24 | |
| 25 | 15.3 | 12.7 | 16.2 | 13.6 | 14.9 | 13.7 | 15.0 | 14.7 | 15.4 | 15.2 | 26.7 | 18.9 | 13.2 | 5.4 | 9.8 | 10.6 | 10.6 | 4.6 | 6.3 | 9.6 | 7.2 | 8.4 | 8.4 | 11.4 | 4.6 | 26.7 | 12.4 | 24 | |
| 26 | 11.0 | 10.6 | 9.1 | 9.1 | 8.6 | 14.5 | 16.4 | 21.5 | 22.5 | 19.1 | 14.5 | 15.4 | 21.0 | 16.7 | 8.5 | 9.8 | 9.8 | 4.7 | 11.0 | 11.0 | 2.8 | 4.5 | 3.8 | 4.5 | 2.8 | 22.5 | 11.7 | 24 | |
| 27 | 6.7 | 9.2 | 8.1 | 6.2 | 5.4 | 15.9 | 10.6 | 14.8 | 10.3 | 8.1 | 16.2 | 12.7 | 9.5 | 8.1 | 10.6 | 12.5 | 15.7 | 17.4 | 17.2 | 11.3 | 8.8 | 9.1 | 7.4 | 9.8 | 5.4 | 17.4 | 10.9 | 24 | |
| 28 | 6.7 | 8.7 | 6.2 | 5.9 | 10.6 | 10.3 | 5.4 | 4.6 | 3.6 | 7.6 | 11.9 | 10.1 | 12.5 | 12.8 | 15.0 | 13.7 | 14.5 | 13.6 | 18.4 | 26.2 | 16.2 | 17.9 | 14.7 | 10.8 | 3.6 | 26.2 | 11.6 | 24 | |
| 29 | 14.3 | 10.1 | 9.6 | 8.6 | 20.3 | 21.5 | 18.6 | 18.9 | 18.9 | 14.9 | 19.1 | 18.1 | 15.9 | 24.5 | 22.5 | 23.7 | 32.5 | 28.9 | 33.5 | 30.8 | 33.0 | 34.7 | 30.6 | 34.2 | 8.6 | 34.7 | 22.4 | 24 | |
| 30 | 24.2 | 22.8 | 27.9 | 33.5 | 33.3 | 30.6 | 31.3 | 29.8 | 28.1 | 28.1 | 29.2 | 26.4 | 33.0 | 32.0 | 26.9 | 27.2 | 18.6 | 11.4 | 10.6 | 11.1 | 12.8 | 14.0 | 9.1 | 11.0 | 9.1 | 33.5 | 23.5 | 24 | |
| 31 | 9.2 | 9.3 | 6.0 | 8.1 | 9.1 | 9.3 | 9.6 | 9.3 | 5.9 | 11.3 | 10.6 | 14.5 | 18.6 | 20.6 | 15.9 | 12.5 | 12.7 | 10.3 | 4.9 | 5.2 | 7.1 | 7.4 | 12.3 | 18.5 | 4.9 | 20.6 | 10.8 | 24 | |
| HOURLY MAX | 50.9 | 42.8 | 39.3 | 37.6 | 38.1 | 40.1 | 31.3 | 40.2 | 50.1 | 49.8 | 57.9 | 64.1 | 72.9 | 86.2 | 61.3 | 57.9 | 67.4 | 58.1 | 56.4 | 52.5 | 68.4 | 45.2 | 47.1 | 43.5 | | | | | |

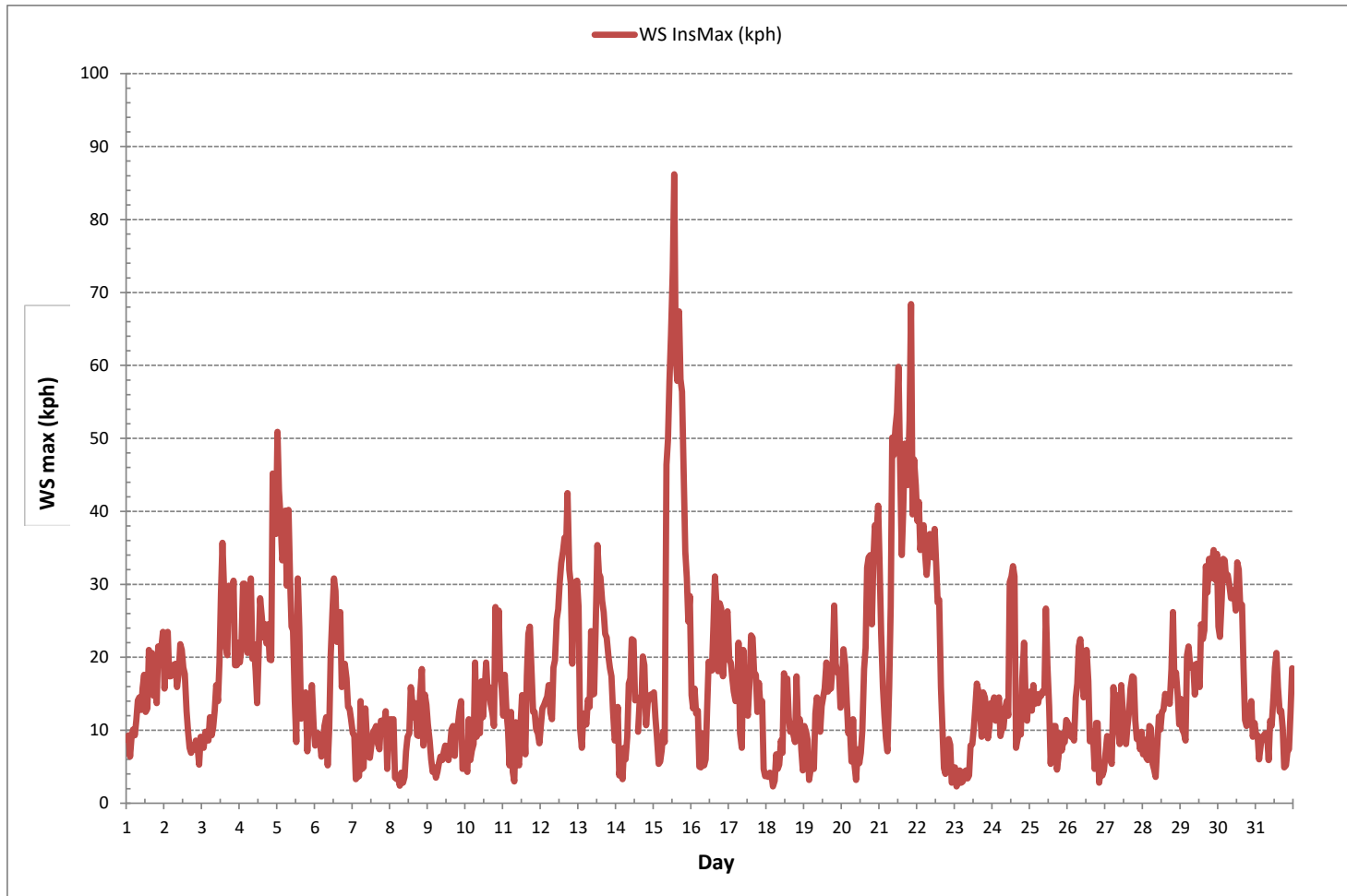
STATUS FLAG CODES

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

| | | | | | | | |
|------------------------------|------|-----|--------|----|--------|-----|-----|
| MAXIMUM INSTANTANEOUS VALUE: | 86.2 | kph | @ HOUR | 13 | ON DAY | 15 | |
| OPERATIONAL TIME: | | | | | | 743 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

| | |
|--|---|
| Alberta Airshed (if applicable) | EPA Approval or Code of Practice Registration # (if applicable) |
| NO | N/A |
| Company Name (if applicable) | Industrial Operation Name (if applicable) |
| Lakeland Industry & Community Association | Cold Lake South Continuous Monitoring Station |
| Name of the Representative of the Person Responsible | Position / Title of the Representative of the Person Responsible |
| Mike Bisaga | |
| Is an External Party Certifying the Report? If 'Yes', fill in the fields below for the external person. | |
| <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| Name of External Person Certifying the Report | Position / Title of External Person Certifying the Report |
| Wunmi Adekanmbi | Project Team Lead, Customer Service - Air Services |
| Company Name for the External Person Certifying the Report | Identification of Qualifications / Professional Designations of the External Person Certifying the Report |
| Maxxam Analytics, A Bureau Veritas Group Company | M.Sc., EPT, PMP |

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the External Person Certifying the Report

28-Jan-2019

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2018-12-23-C</u> |
| Site: <u>Cold Lake South Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|--------------------------|-------------------------|
| Level 0 Preliminary Verification | <u><i>bimadeniji</i></u> | Date <u>18-Jan-2019</u> |
| Level 1 Primary Validation | <u><i>bimadeniji</i></u> | Date <u>18-Jan-2019</u> |
| Level 2 Final Validation | <u><i>bimadeniji</i></u> | Date <u>25-Jan-2019</u> |
| Level 3 Independent Data Review | <u><i>MSLmbq</i></u> | Date <u>28-Jan-2019</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 10, 2019

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 December 2018.

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

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

All data collected in December was compliant with the requirements outlined in the Air Monitoring Directive 2016 (AMD 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, except CH₄ and NMHC (85.5%).

A Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was installed on December 4. No CH₄ and NMHC data were collected until hour 16:00 on December 5. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the December monitoring period.

THC/CH₄/NMHC: The LICA-owned Thermo 51C Total Hydrocarbon analyzer, s/n: 436609738, was removed for repairs as the sample pump had failed on December 4. An alternate model LICA-owned, Thermo 55i Methane/Non-Methane analyzer, s/n: 1108930026, was installed and calibrated on December 5.

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
monitoring@lica.ca

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca



DECEMBER 2018
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT
JOB #: 2833-2018-12-23-C
LICA-201812

Prepared for:

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

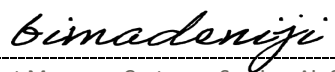
Facility:

Maskwa Continuous Monitoring Station
EPEA Approval Number N/A

Date of Report Issuance: January 25, 2019

Report Preparation By:

Bim Adeniji, M.Sc.
403-219-3677
aadeniji@maxxam.ca



Project Manager, Customer Service, Air Services

Reviewed By:

Wunmi Adekanmbi, M.Sc., EPT, PMP
403-219-3661
aadekanmbi@maxxam.ca



Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

SUMMARY

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

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

With the exception of CH₄ and NMHC, the operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

The operational uptime was 85.5% for the CH₄ and NMHC channels. The Thermo 51c Total Hydrocarbon analyzer was removed from site, and a Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was installed. No CH₄ and NMHC data were collected until hour 16:00 on December 5. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the December monitoring period.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

H₂S: Fourteen hours of downtime were recorded across the month due to additional zero-span checks and repeat calibrations performed to address drifts in span response.

THC/CH₄/NMHC: On December 4, the LICA-owned resident Thermo 51c Total Hydrocarbon analyzer (s/n: 436609738), was removed for repairs as the sample pump had failed. An alternate model, Thermo 55i Methane/Non-Methane analyzer (s/n: 1108930026), also LICA-owned, was installed and successfully calibrated on December 5. Thirty three hours of downtime were incurred on the THC channel due to this event. Data collection on the CH₄ and NMHC channels commenced at hour 16:00 on December 5.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

| Lakeland Industry & Community Association Maskwa Continuous Monitoring Station | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | 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 | 12 | 21 | 15 | 8.0 | NW | 3 | 21 | 100.0 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 0 | 2 | 10 | 11 | 1.5 | WNW | 1 | 10 | 98.1 |
| THC (ppm) | - | - | - | - | 2.17 | 3.26 | 10 | 11 | 1.5 | WNW | 2.47 | 10 | 95.6 |
| CH ₄ (ppm) | - | - | - | - | 2.17 | 2.90 | 10 | 11 | 1.5 | WNW | 2.43 | 10 | 85.5 |
| NMHC (ppm) | - | - | - | - | 0.00 | 0.36 | 10 | 11 | 1.5 | WNW | 0.05 | 10 | 85.5 |
| NO ₂ (ppb) | 159 | - | 0 | - | 7 | 32 | 9 | 0 | 5.7 | SSW | 24 | 8 | 100.0 |
| NO (ppb) | - | - | - | - | 1 | 43 | 8 | 8 | 3.8 | SSW | 7 | 8 | 100.0 |
| NO _x (ppb) | - | - | - | - | 8 | 67 | 8 | 8 | 3.8 | SSW | 30 | 8 | 100.0 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 88 | 100 | 1 | 0 | 0.7 | NE | 98 | 1 | 100.0 |
| BAROMETRIC PRESSURE (millibar) | - | - | - | - | 933 | 953 | 31 | 1 | 0.5 | S | 947 | 31 | 100.0 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | -10.6 | 2.2 | 13 | 14 | 5.3 | SW | -2.5 | 13 | 100.0 |
| PRECIPITATION (mm) | - | - | - | - | 0.0 | 0.0 | 1 | 0 | 0.7 | NE | 0.0 | 1 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 0.6 | 16.7 | 16 | 12 | - | WNW | 7.6 | 15 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 251 (WSW) | - | - | - | - | - | - | - | 100.0 |

* Precipitation: data represents the total (sum) for the indicated time frame.

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), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on December 4.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 98.1%, equivalent to 14 hours of downtime.
- The routine monthly calibration was performed on December 5.
- The analyzer spanned close to the upper acceptance limit on December 11. A repeat zero-span check performed later in the day exhibited similar response. Subsequent scheduled and repeat span check results exceeded the upper acceptance limit, prompting an immediate site visit. On December 12, a repeat multi-point calibration was successfully completed and the span drift issue was resolved. Seven hours of downtime were recorded due to the additional quality checks.
- The analyzer exhibited a biased low drift in span response on December 23. An additional zero-span check was performed on December 24, at hour 7:00 and the result was closer to the mean. No further action was required. One hour of downtime was, however, incurred due to the additional quality check.
- The analyzer spanned outside the lower acceptance limit on December 31. A repeat zero-span check performed later in the day also exceeded the limit. This prompted an immediate site visit where a repeat calibration was successfully completed and the span drift issue was resolved. Six hours of downtime were recorded due to this event.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period was 95.6% for THC, equivalent to 33 hours of downtime. The CH₄/NMHC channel operational time was 85.5%. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the December monitoring period.
- A site visit was scheduled on December 4 in response to a "low flow" alarm. Upon arrival at the station, it was discovered that the analyzer's sample pump had failed. As a result, a shut-down calibration could not be completed. The LICA-owned analyzer, Thermo 51c Total Hydrocarbon (s/n: 436609738), which monitors THC only, was therefore removed for repairs. LICA's alternate analyzer model, Thermo 55i Methane/Non- Methane (s/n: 1108930026), which was removed for factory maintenance on October 3 and monitors THC/CH₄/NMHC, was installed. The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on December 5. THC data was invalidated back to the point of failed performance, determined as hour 03:00 on December 4. Thirty-three hours of downtime were recorded on the THC channel due to this event.
- The span gas cylinder was replaced on December 5.
- CH₄/NMHC data collection commenced at hour 16:00 on December 5, following the installation calibration of the Thermo 55i analyzer.

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

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on December 4.

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

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

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.

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

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta

With the exception of CH₄ and NMHC, the operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

The operational uptime was 85.5% for the CH₄ and NMHC channels. The Thermo 51c Total Hydrocarbon analyzer was removed from site, and a Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was installed. No CH₄ and NMHC data were collected until hour 16:00 on December 5. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the December monitoring period.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

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-00013: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43I - TLE UV Fluorescent Analyzer
- Hydrogen Sulphide - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Wind System - RM Young Unit
- Relative Humidity - Rotronic Hygroclip Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Rotronic Hygroclip Unit
- Precipitation - Met One Unit
- Datalogger - Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

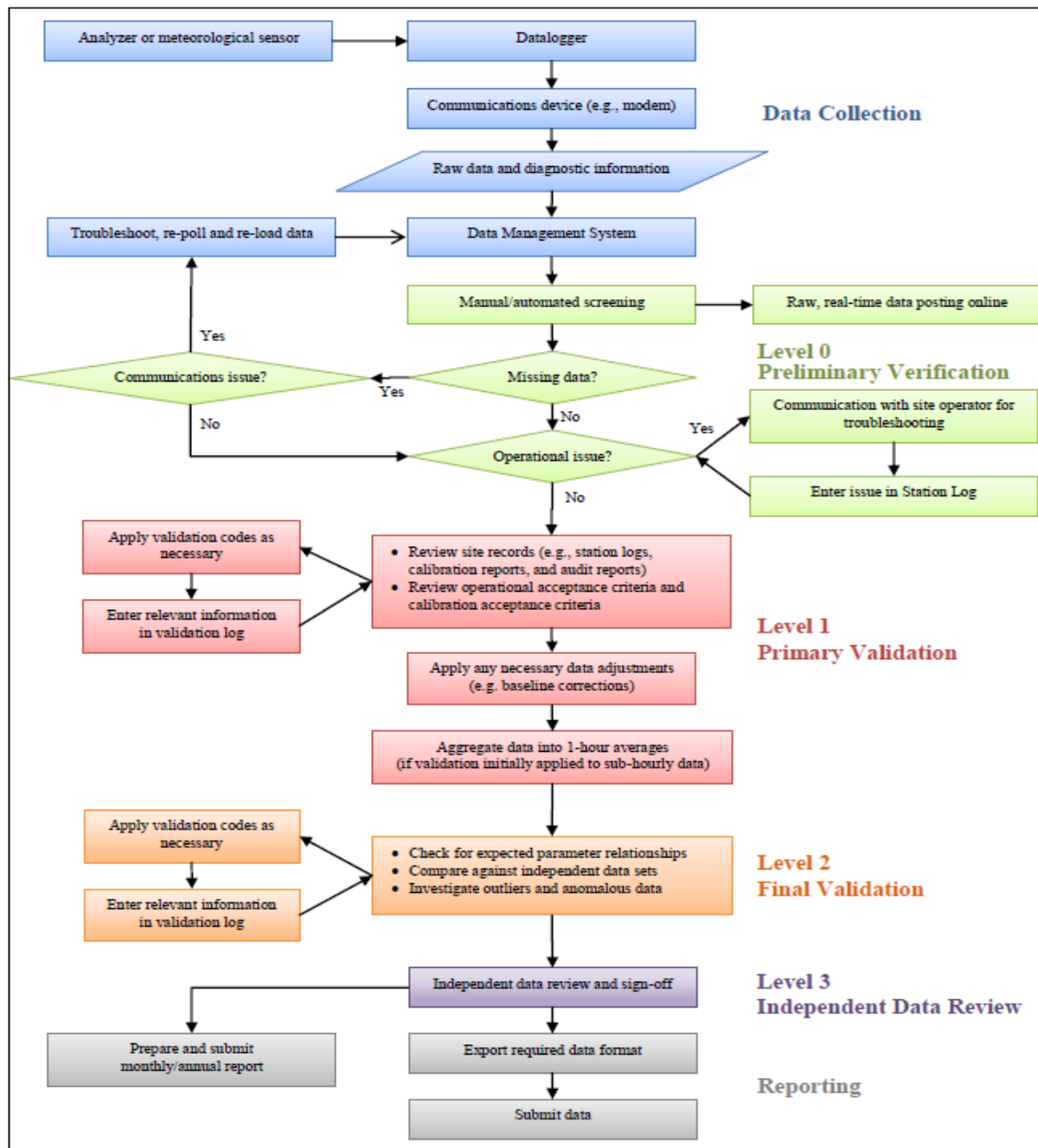
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

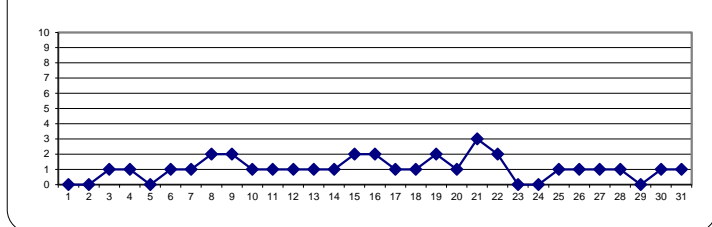
OBJECTIVE LIMIT:

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

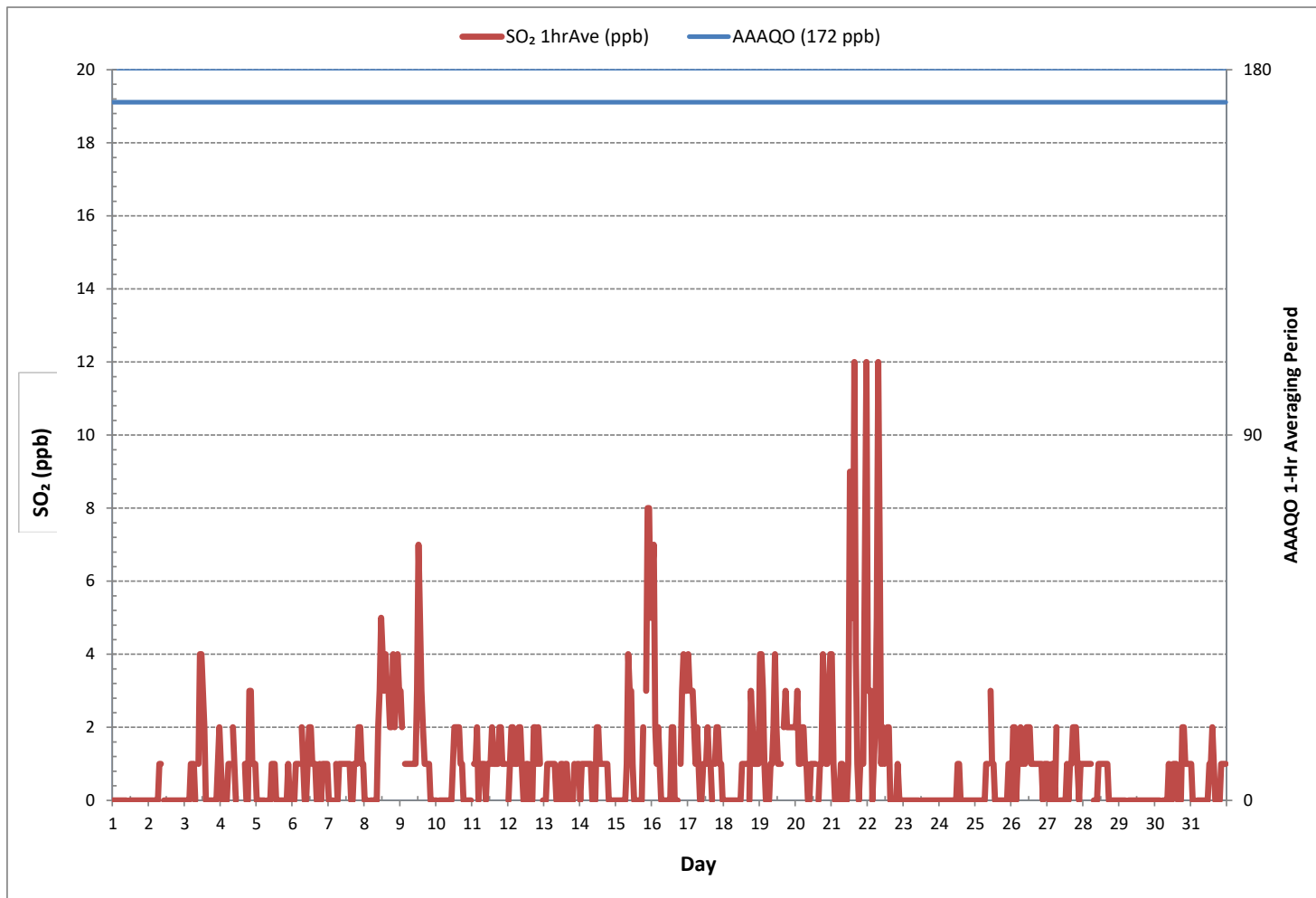
MONTHLY SUMMARY

| | | | | | |
|------------------------------|---------------|-----|-----------------------|-------|-----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 359 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 | ON DAY | 1 | |
| MAXIMUM 1-HR AVERAGE: | 12 ppb @ HOUR | 15 | ON DAY | 21 | |
| MAXIMUM 24-HR AVERAGE: | 3 ppb | | ON DAY | 21 | |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 744 | hrs |
| MONTHLY CALIBRATION TIME: | 5 | hrs | AMD OPERATION UPTIME: | 100.0 | % |
| STANDARD DEVIATION: | 1 | | MONTHLY AVERAGE: | 1 | ppb |

24 HR AVERAGES December 2018

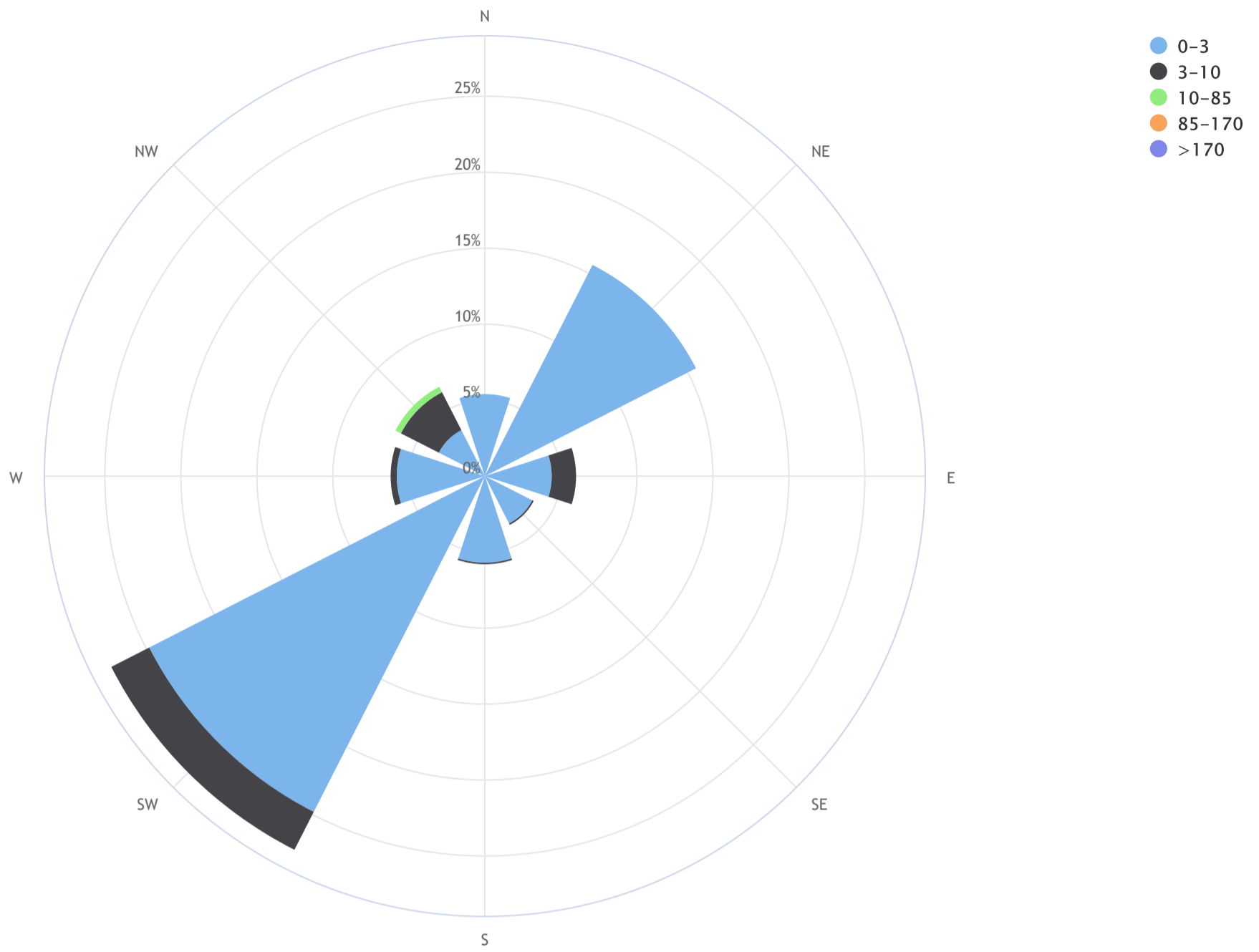


SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_SO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.4_CALM % = 23.2%



| Direction | 0-3 | 3-10 | 10-85 | 85-170 | >170 | TOTAL |
|----------------|-------------|------------|------------|------------|------------|-------------|
| N | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 |
| NE | 15.6 | 0.0 | 0.0 | 0.0 | 0.0 | 15.6 |
| E | 4.4 | 1.6 | 0.0 | 0.0 | 0.0 | 5.9 |
| SE | 3.5 | 0.1 | 0.0 | 0.0 | 0.0 | 3.7 |
| S | 5.7 | 0.1 | 0.0 | 0.0 | 0.0 | 5.8 |
| SW | 24.8 | 2.8 | 0.0 | 0.0 | 0.0 | 27.6 |
| W | 5.8 | 0.4 | 0.0 | 0.0 | 0.0 | 6.2 |
| NW | 3.4 | 2.8 | 0.4 | 0.0 | 0.0 | 6.6 |
| Summary | 68.5 | 7.9 | 0.4 | 0.0 | 0.0 | 76.8 |
| CALM | 22.8 | 0.4 | 0.0 | 0.0 | 0.0 | 23.2 |

SO2[ppb] Calibration: LICA MASKWA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|---|---|----|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 4 | 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 | |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | C | C | C | C | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 6 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 7 | 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 | |
| 8 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 9 | 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 | |
| 10 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 | |
| 11 | S | 0 | 0 | 0 | 0 | 0 | 0 | S1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 23 | |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | S1 | S1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C1 | C1 | C1 | C1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 18 | |
| 13 | 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 | |
| 14 | 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 | |
| 15 | 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 | |
| 16 | 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 | |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 19 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 20 | 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 | |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 23 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | S | 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 | 0 | S1 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 26 | 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 | |
| 27 | 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 | |
| 28 | 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 | |
| 29 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 30 | 0 | 0 | 0 | 0 | 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 | |
| 31 | 0 | 0 | 0 | 0 | S | 0 | 0 | S1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C1 | C1 | C1 | C1 | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 18 | |
| HOURLY MAX | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 |

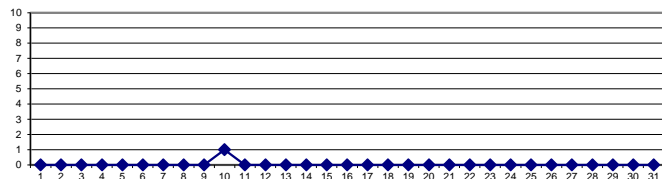
OBJECTIVE LIMIT:

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

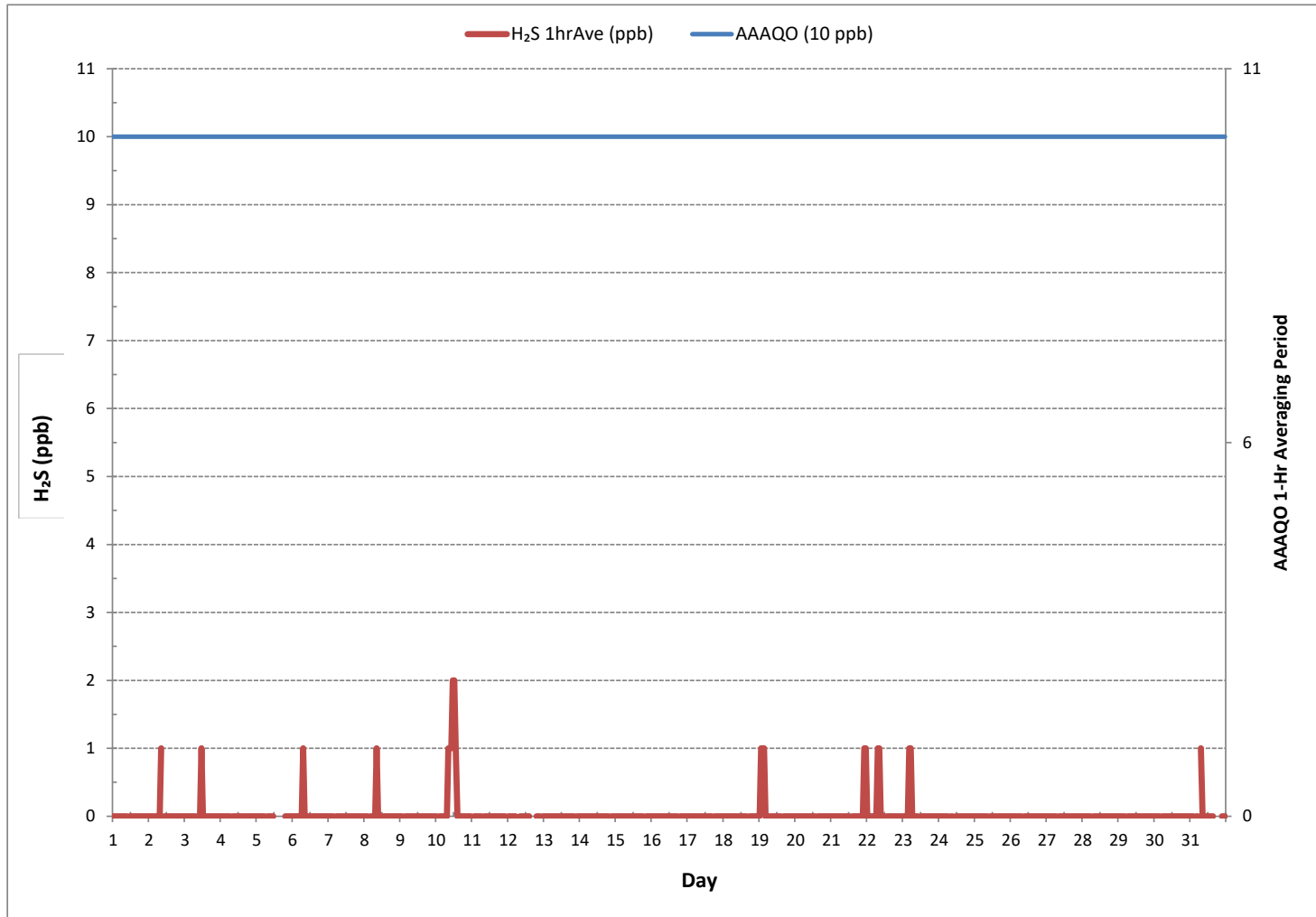
MONTHLY SUMMARY

| | | | | | |
|------------------------------|--------------|-----|-----------------------|------|-----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 20 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 | ON DAY | 1 | |
| MAXIMUM 1-HR AVERAGE: | 2 ppb @ HOUR | 11 | ON DAY | 10 | |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | ON DAY | 10 | |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 730 | hrs |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 98.1 | % |
| STANDARD DEVIATION: | 0 | | MONTHLY AVERAGE: | 0 | ppb |

24 HR AVERAGES December 2018

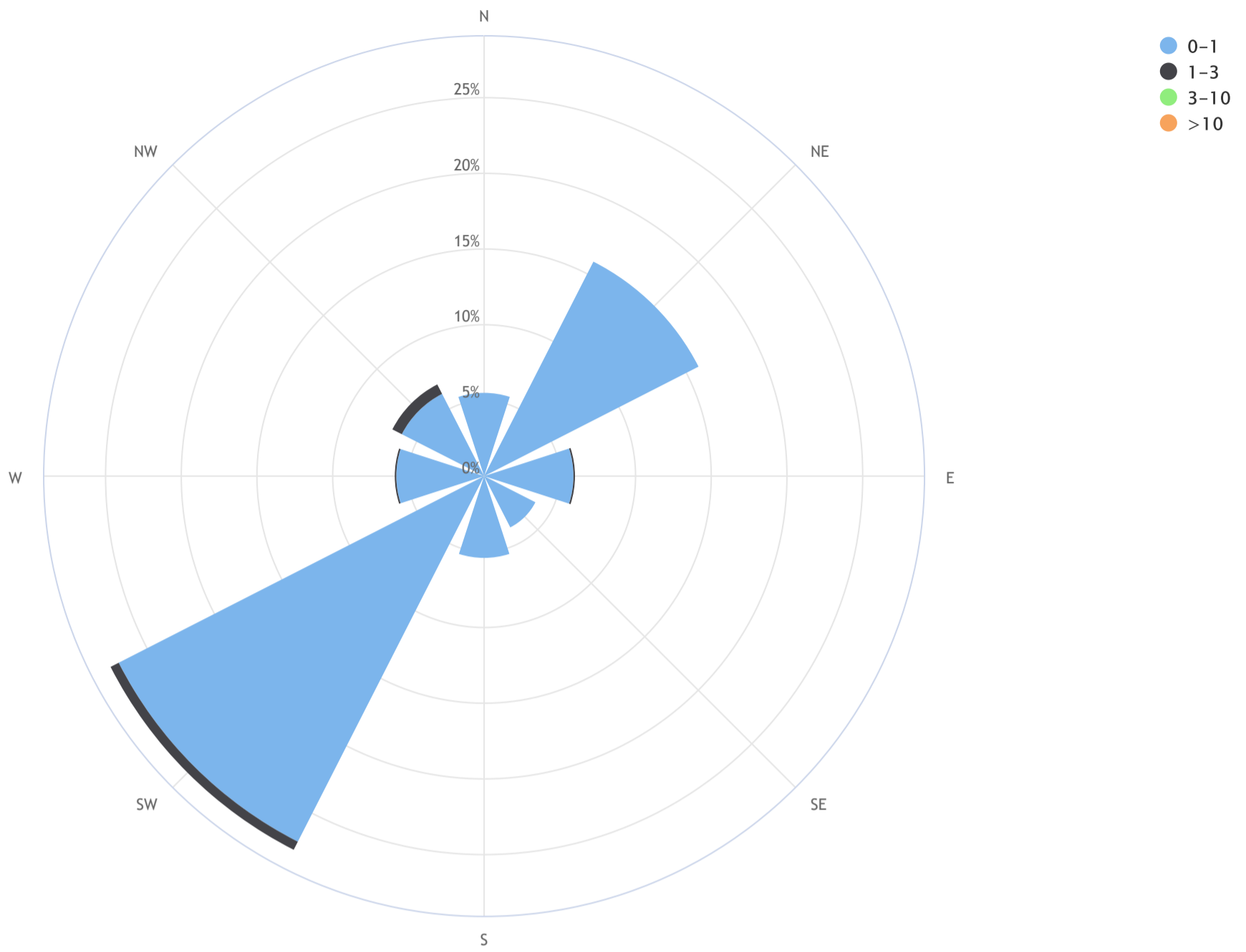


HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_H₂S (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.1_CALM % = 23.0%



| Direction | 0-1 | 1-3 | 3-10 | >10 | TOTAL |
|----------------|-------------|------------|------------|------------|-------------|
| N | 5.5 | 0.0 | 0.0 | 0.0 | 5.5 |
| NE | 15.9 | 0.0 | 0.0 | 0.0 | 15.9 |
| E | 5.9 | 0.1 | 0.0 | 0.0 | 6.1 |
| SE | 3.8 | 0.0 | 0.0 | 0.0 | 3.8 |
| S | 5.4 | 0.0 | 0.0 | 0.0 | 5.4 |
| SW | 27.1 | 0.6 | 0.0 | 0.0 | 27.6 |
| W | 5.8 | 0.1 | 0.0 | 0.0 | 5.9 |
| NW | 6.1 | 0.7 | 0.0 | 0.0 | 6.8 |
| Summary | 75.4 | 1.6 | 0.0 | 0.0 | 77.0 |
| CALM | 21.7 | 1.3 | 0.0 | 0.0 | 23.0 |

H2S[ppb] Calibration: LICA MASKWA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

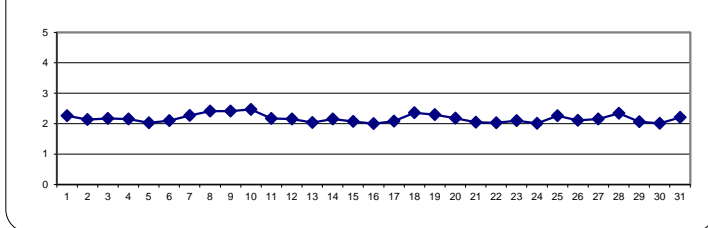
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| 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 | 2.40 | 2.39 | 2.43 | 2.51 | 2.54 | 2.50 | 2.39 | 2.35 | 2.36 | 2.31 | S | 2.26 | 2.20 | 2.18 | 2.16 | 2.15 | 2.16 | 2.15 | 2.12 | 2.09 | 2.08 | 2.08 | 2.12 | 2.14 | 2.08 | 2.54 | 2.26 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 2.14 | 2.13 | 2.13 | 2.12 | 2.13 | 2.15 | 2.18 | 2.20 | 2.20 | S | 2.16 | 2.16 | 2.16 | 2.14 | 2.13 | 2.12 | 2.13 | 2.13 | 2.12 | 2.13 | 2.13 | 2.12 | 2.12 | 2.11 | 2.11 | 2.20 | 2.14 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 2.12 | 2.13 | 2.14 | 2.16 | 2.20 | 2.18 | 2.18 | 2.20 | S | 2.24 | 2.23 | 2.26 | 2.23 | 2.16 | 2.14 | 2.12 | 2.11 | 2.12 | 2.13 | 2.15 | 2.14 | 2.15 | 2.15 | 2.17 | 2.11 | 2.26 | 2.17 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 2.17 | 2.15 | 2.13 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Y | Y | Y | 2.13 | 2.17 | 2.15 | 3 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 2.00 | 2.05 | 2.01 | 2.01 | 2.01 | 2.03 | 2.04 | 2.05 | 2.00 | 2.05 | 2.03 | 12 | | | | | | | | | | | | | | | | | | | | | |
| 6 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | S | 2.10 | 2.10 | 2.05 | 2.04 | 2.05 | 2.07 | 2.13 | 2.17 | 2.19 | 2.14 | 2.06 | 2.02 | 2.05 | 2.08 | 2.16 | 2.19 | 2.22 | 2.31 | 2.02 | 2.31 | 2.10 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 2.24 | 2.13 | 2.16 | 2.14 | S | 2.12 | 2.18 | 2.11 | 2.28 | 2.39 | 2.31 | 2.32 | 2.27 | 2.27 | 2.28 | 2.34 | 2.34 | 2.27 | 2.25 | 2.27 | 2.29 | 2.34 | 2.40 | 2.43 | 2.11 | 2.43 | 2.27 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 2.46 | 2.63 | 2.54 | S | 2.51 | 2.52 | 2.50 | 2.49 | 2.46 | 2.41 | 2.26 | 2.27 | 2.23 | 2.20 | 2.44 | 2.49 | 2.43 | 2.38 | 2.37 | 2.39 | 2.36 | 2.35 | 2.33 | 2.37 | 2.20 | 2.63 | 2.41 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 2.46 | 2.52 | S | 2.55 | 2.50 | 2.43 | 2.38 | 2.50 | 2.43 | 2.59 | 2.66 | 2.37 | 2.13 | 2.08 | 2.19 | 2.30 | 2.32 | 2.31 | 2.35 | 2.37 | 2.33 | 2.39 | 2.64 | 2.63 | 2.08 | 2.66 | 2.41 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 2.53 | S | 2.37 | 2.42 | 2.55 | 2.50 | 2.49 | 2.52 | 2.65 | 2.70 | 2.91 | 3.26 | 2.80 | 2.65 | 2.46 | 2.40 | 2.78 | 2.76 | 2.22 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 3.26 | 2.47 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 11 | S | 2.07 | 2.19 | 2.21 | 2.21 | 2.15 | 2.09 | 2.11 | 2.17 | 2.46 | 2.39 | 2.26 | 2.11 | 2.10 | 2.11 | 2.10 | 2.13 | 2.13 | 2.15 | 2.15 | 2.16 | 2.16 | 2.18 | S | 2.07 | 2.46 | 2.17 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 2.22 | 2.25 | 2.23 | 2.20 | 2.22 | 2.41 | 2.58 | 2.50 | 2.36 | 2.12 | 2.03 | 2.02 | 2.07 | 2.07 | 1.98 | 1.96 | 1.96 | 2.02 | 2.03 | 2.06 | 2.06 | 2.06 | S | 2.02 | 1.96 | 2.58 | 2.15 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 2.00 | 2.01 | 2.00 | 1.99 | 2.01 | 2.04 | 2.07 | 2.15 | 2.14 | 2.13 | 2.14 | 2.10 | 2.08 | 2.06 | 2.05 | 2.00 | 1.96 | 1.96 | 1.96 | 1.96 | 1.98 | S | 2.06 | 2.03 | 1.96 | 2.15 | 2.04 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 2.05 | 2.07 | 2.10 | 2.08 | 2.03 | 2.03 | 2.10 | 2.15 | 2.15 | 2.14 | 2.11 | 2.18 | 2.20 | 2.20 | 2.19 | 2.17 | 2.16 | 2.17 | 2.18 | 2.20 | S | 2.28 | 2.32 | 2.24 | 2.03 | 2.32 | 2.15 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 2.22 | 2.25 | 2.24 | 2.20 | 2.18 | 2.19 | 2.17 | 2.17 | 2.10 | 2.06 | 2.03 | 1.97 | 1.96 | 1.95 | 1.96 | 1.97 | 1.98 | 1.98 | 2.00 | S | 1.97 | 1.99 | 2.00 | 2.00 | 1.95 | 2.25 | 2.07 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.99 | 2.03 | 2.05 | 2.07 | 2.03 | 2.05 | 2.01 | 2.00 | 2.00 | 1.98 | 1.97 | 1.98 | S | 1.99 | 1.99 | 1.98 | 1.97 | 1.99 | 1.97 | 2.07 | 2.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 2.00 | 1.98 | 1.99 | 1.99 | 1.97 | 1.96 | 1.98 | 1.96 | 1.96 | 1.97 | 1.98 | 2.00 | 2.01 | 2.03 | 2.09 | 2.12 | 2.15 | S | 2.27 | 2.25 | 2.34 | 2.34 | 2.31 | 2.25 | 1.96 | 2.34 | 2.08 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 2.26 | 2.26 | 2.26 | 2.26 | 2.23 | 2.23 | 2.23 | 2.22 | 2.21 | 2.25 | 2.27 | 2.28 | 2.39 | 2.34 | 2.31 | 2.32 | S | 2.45 | 2.56 | 2.60 | 2.69 | 2.72 | 2.56 | 2.41 | 2.21 | 2.72 | 2.36 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 19 | 2.26 | 2.23 | 2.19 | 2.24 | 2.32 | 2.48 | 2.48 | 2.48 | 2.50 | 2.43 | 2.28 | 2.18 | 2.26 | 2.30 | 2.12 | S | 2.33 | 2.31 | 2.26 | 2.23 | 2.32 | 2.20 | 2.19 | 2.24 | 2.12 | 2.50 | 2.30 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 2.20 | 2.20 | 2.25 | 2.27 | 2.26 | 2.30 | 2.25 | 2.19 | 2.17 | 2.12 | 2.26 | 2.26 | 2.19 | S | 2.11 | 2.14 | 2.16 | 2.19 | 2.12 | 2.08 | 2.10 | 2.08 | 2.06 | 2.06 | 2.30 | 2.18 | 2.18 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 21 | 2.06 | 2.04 | 2.05 | 2.05 | 2.06 | 2.06 | 2.07 | 2.07 | 2.09 | 2.09 | 2.04 | 2.03 | 2.03 | S | 2.04 | 2.05 | 2.03 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.09 | 2.05 | 2.02 | 2.09 | 2.05 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 22 | 2.03 | 2.03 | 2.03 | 2.02 | 2.02 | 2.02 | 2.02 | 2.04 | 2.03 | 2.01 | 2.01 | 2.00 | S | 2.01 | 2.01 | 2.00 | 2.01 | 2.01 | 2.01 | 2.05 | 2.07 | 2.03 | 2.06 | 2.05 | 2.10 | 2.00 | 2.10 | 2.03 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 23 | 2.15 | 2.17 | 2.17 | 2.20 | 2.33 | 2.26 | 2.21 | 2.18 | 2.13 | 2.11 | 2.07 | S | 2.03 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.03 | 2.02 | 2.03 | 2.02 | 2.03 | 2.02 | 2.01 | 2.33 | 2.10 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.01 | 2.00 | 2.00 | 2.01 | 2.01 | S | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.01 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.03 | 2.03 | 2.00 | 2.03 | 2.01 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 2.04 | 2.08 | 2.11 | 2.11 | 2.10 | 2.09 | 2.10 | 2.12 | 2.16 | S | 2.22 | 2.26 | 2.27 | 2.28 | 2.27 | 2.27 | 2.27 | 2.32 | 2.42 | 2.45 | 2.48 | 2.51 | 2.52 | 2.56 | 2.04 | 2.56 | 2.26 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 26 | 2.58 | 2.42 | 2.21 | 2.12 | 2.10 | 2.09 | 2.07 | 2.04 | S | 2.05 | 2.05 | 2.04 | 2.05 | 2.05 | 2.04 | 2.05 | 2.06 | 2.06 | 2.07 | 2.08 | 2.08 | 2.11 | 2.10 | 2.09 | 2.04 | 2.58 | 2.11 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 27 | 2.09 | 2.09 | 2.11 | 2.11 | 2.11 | 2.12 | 2.12 | S | 2.13 | 2.12 | 2.12 | 2.14 | 2.13 | 2.12 | 2.12 | 2.16 | 2.16 | 2.14 | 2.15 | 2.16 | 2.17 | 2.22 | 2.27 | 2.27 | 2.09 | 2.27 | 2.15 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | 2.37 | 2.44 | 2.47 | 2.49 | 2.50 | 2.49 | S | 2.48 | 2.46 | 2.42 | 2.40 | 2.35 | 2.31 | 2.27 | 2.30 | 2.31 | 2.32 | 2.23 | 2.18 | 2.18 | 2.25 | 2.23 | 2.20 | 2.18 | 2.18 | 2.50 | 2.34 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 29 | 2.17 | 2.17 | 2.16 | 2.14 | 2.13 | S | 2.08 | 2.06 | 2.04 | 2.04 | 2.04 | 2.03 | 2.02 | 2.03 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.01 | 2.02 | 2.01 | 2.17 | 2.06 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 2.01 | 2.01 | 2.01 | 2.01 | S | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.99 | 2.00 | 2.00 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.02 | 2.04 | 2.06 | 1.99 | 2.06 | 2.01 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 31 | 2.12 | 2.23 | 2.18 | S | 2.24 | 2.22 | 2.22 | 2.23 | 2.24 | 2.25 | 2.20 | 2.17 | 2.17 | 2.28 | 2.26 | 2.16 | 2.13 | 2.14 | 2.16 | 2.21 | 2.25 | 2.24 | 2.27 | 2.27 | 2.12 | 2.28 | 2.21 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| HOURLY MAX | 2.58 | 2.63 | 2.54 | 2.55 | 2.55 | 2.52 | 2.58 | 2.52 | 2.65 | 2.70 | 2.91 | 3.26 | 2.80 | 2.65 | 2.46 | 2.49 | 2.78 | 2.76 | 2.56 | 2.60 | 2.69 | 2.72 | 2.64 | 2.63 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOURLY AVG | 2.19 | 2.18 | 2.17 | 2.17 | 2.20 | 2.21 | 2.19 | 2.20 | 2.21 | 2.21 | 2.19 | 2.19 | 2.16 | 2.15 | 2.14 | 2.14 | 2.14 | 2.15 | 2.15 | 2.15 | 2.15 | 2.17 | 2.18 | 2.18 | | | | | | | | | | | | | | | | | | | | | | | | | | |

STATUS FLAG CODES

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

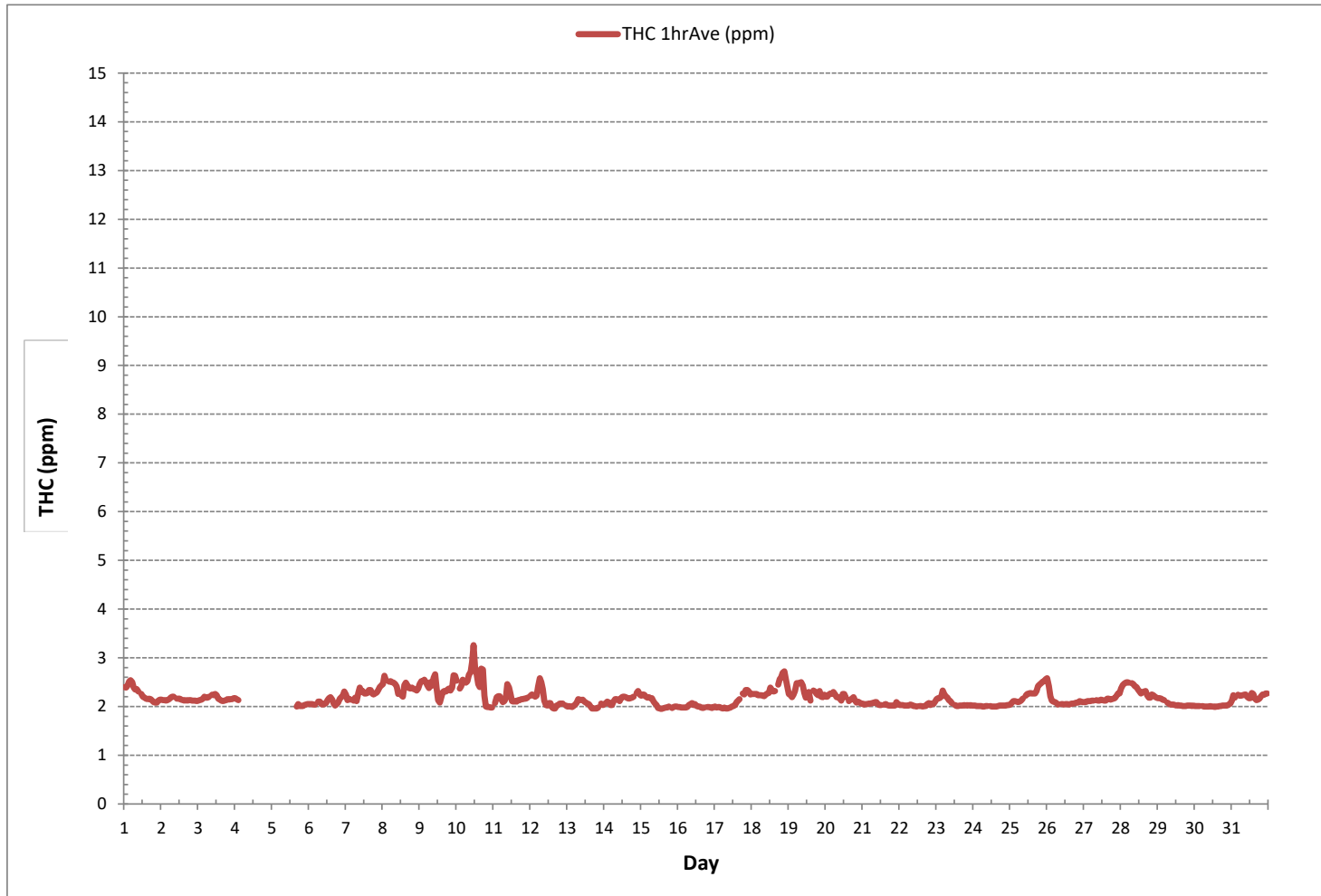
24 HR AVERAGES December 2018



MONTHLY SUMMARY

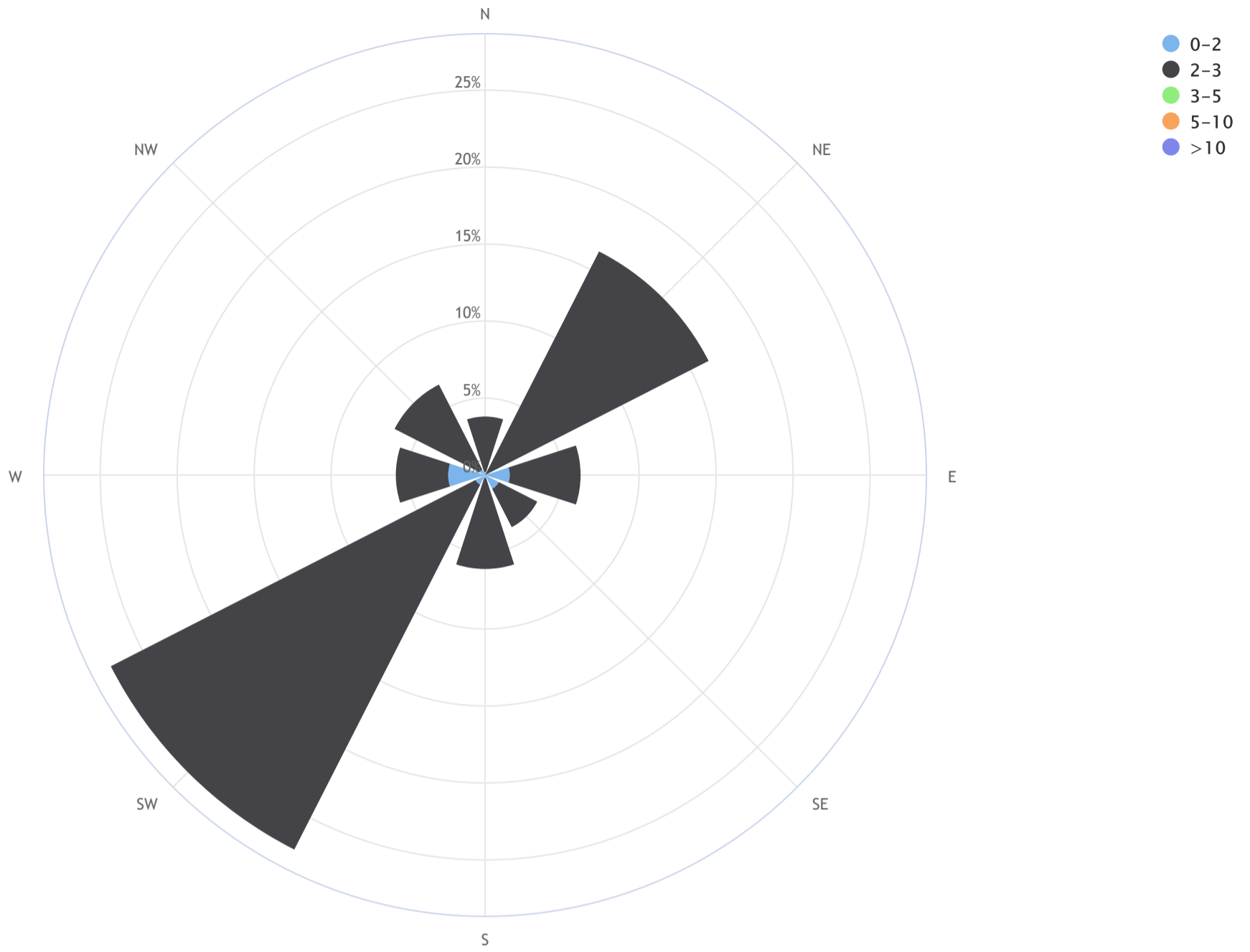
| | | | | |
|------------------------------|----------|-----------------------|------|-----------|
| NUMBER OF NON-ZERO READINGS: | 677 | | | |
| MINIMUM 1-HR AVERAGE: | 1.95 ppm | @ HOUR | 13 | ON DAY 15 |
| MAXIMUM 1-HR AVERAGE: | 3.26 ppm | @ HOUR | 11 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 2.47 ppm | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 30 hrs | OPERATIONAL TIME: | 711 | hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 95.6 | % |
| STANDARD DEVIATION: | 0.17 | MONTHLY AVERAGE: | 2.17 | ppm |

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



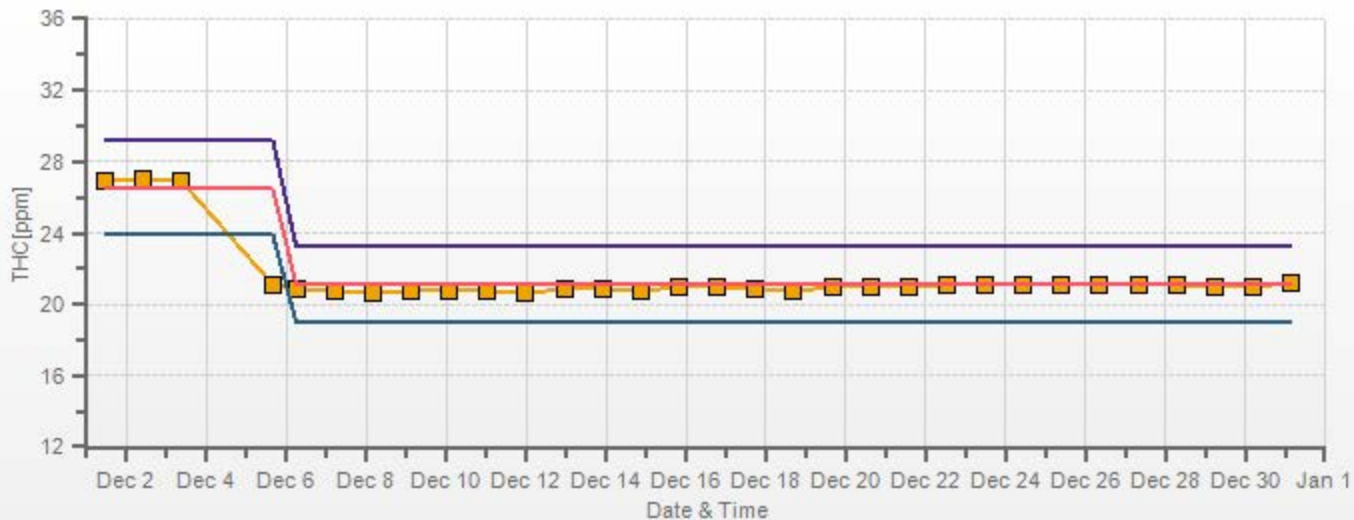
Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_THC (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.2_CALM % = 24.2%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|-----|------|-----|------|-----|-------|
| N | 0.2 | 3.6 | 0.0 | 0.0 | 0.0 | 3.7 |
| NE | 0.0 | 16.3 | 0.0 | 0.0 | 0.0 | 16.3 |
| E | 1.6 | 4.6 | 0.0 | 0.0 | 0.0 | 6.2 |
| SE | 1.0 | 2.8 | 0.0 | 0.0 | 0.0 | 3.8 |
| S | 0.2 | 5.9 | 0.0 | 0.0 | 0.0 | 6.1 |
| SW | 0.7 | 26.6 | 0.0 | 0.0 | 0.0 | 27.3 |
| W | 2.4 | 3.4 | 0.0 | 0.0 | 0.0 | 5.8 |
| NW | 0.4 | 6.2 | 0.0 | 0.0 | 0.0 | 6.6 |
| Summary | 6.5 | 69.3 | 0.0 | 0.0 | 0.0 | 75.8 |
| CALM | 0.6 | 23.5 | 0.2 | 0.0 | 0.0 | 24.2 |

THC[ppm] Calibration: LICA MASKWA Monthly: 18/12 Type: Span



METHANE



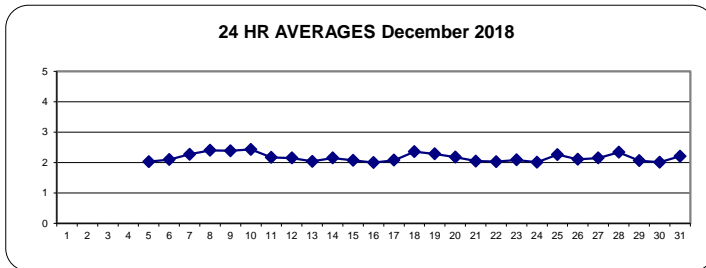
METHANE Hourly Averages (CH₄ ppm)

| 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 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 2.00 | 2.05 | 2.01 | 2.01 | 2.01 | 2.03 | 2.04 | 2.05 | 2.00 | 2.05 | 2.03 | 2.03 | 12 |
| 6 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | S | 2.10 | 2.10 | 2.05 | 2.04 | 2.05 | 2.07 | 2.13 | 2.17 | 2.19 | 2.14 | 2.06 | 2.02 | 2.05 | 2.08 | 2.16 | 2.19 | 2.22 | 2.31 | 2.02 | 2.31 | 2.10 | 24 | |
| 7 | 2.24 | 2.13 | 2.16 | 2.14 | S | 2.12 | 2.18 | 2.11 | 2.28 | 2.39 | 2.31 | 2.32 | 2.27 | 2.27 | 2.28 | 2.34 | 2.34 | 2.27 | 2.25 | 2.27 | 2.29 | 2.34 | 2.40 | 2.43 | 2.11 | 2.43 | 2.27 | 24 | |
| 8 | 2.46 | 2.63 | 2.54 | S | 2.51 | 2.52 | 2.50 | 2.49 | 2.46 | 2.41 | 2.26 | 2.27 | 2.23 | 2.20 | 2.43 | 2.46 | 2.41 | 2.37 | 2.36 | 2.38 | 2.35 | 2.33 | 2.32 | 2.36 | 2.20 | 2.63 | 2.40 | 24 | |
| 9 | 2.44 | 2.51 | S | 2.53 | 2.48 | 2.42 | 2.36 | 2.48 | 2.42 | 2.53 | 2.54 | 2.32 | 2.13 | 2.08 | 2.19 | 2.30 | 2.32 | 2.31 | 2.35 | 2.37 | 2.32 | 2.39 | 2.64 | 2.63 | 2.08 | 2.64 | 2.39 | 24 | |
| 10 | 2.52 | S | 2.37 | 2.42 | 2.50 | 2.49 | 2.48 | 2.52 | 2.56 | 2.60 | 2.66 | 2.90 | 2.63 | 2.58 | 2.46 | 2.40 | 2.77 | 2.76 | 2.22 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 2.90 | 2.43 | 24 | |
| 11 | S | 2.07 | 2.19 | 2.21 | 2.21 | 2.15 | 2.09 | 2.11 | 2.17 | 2.46 | 2.39 | 2.26 | 2.11 | 2.10 | 2.11 | 2.10 | 2.13 | 2.13 | 2.15 | 2.15 | 2.16 | 2.16 | 2.18 | S | 2.07 | 2.46 | 2.17 | 24 | |
| 12 | 2.22 | 2.25 | 2.23 | 2.20 | 2.22 | 2.41 | 2.58 | 2.50 | 2.36 | 2.12 | 2.03 | 2.02 | 2.07 | 2.07 | 1.98 | 1.96 | 1.96 | 2.02 | 2.03 | 2.06 | 2.06 | 2.06 | S | 2.02 | 1.96 | 2.58 | 2.15 | 24 | |
| 13 | 2.00 | 2.01 | 2.00 | 1.99 | 2.01 | 2.04 | 2.07 | 2.15 | 2.14 | 2.13 | 2.14 | 2.10 | 2.08 | 2.06 | 2.05 | 2.00 | 1.96 | 1.96 | 1.96 | 1.96 | 1.98 | S | 2.06 | 2.03 | 1.96 | 2.15 | 2.04 | 24 | |
| 14 | 2.05 | 2.07 | 2.10 | 2.08 | 2.03 | 2.03 | 2.10 | 2.15 | 2.15 | 2.14 | 2.11 | 2.18 | 2.20 | 2.20 | 2.19 | 2.17 | 2.16 | 2.17 | 2.18 | 2.20 | S | 2.28 | 2.32 | 2.24 | 2.03 | 2.32 | 2.15 | 24 | |
| 15 | 2.22 | 2.25 | 2.24 | 2.20 | 2.18 | 2.19 | 2.17 | 2.17 | 2.09 | 2.06 | 2.03 | 1.97 | 1.96 | 1.95 | 1.96 | 1.97 | 1.98 | 1.98 | 2.00 | S | 1.97 | 1.99 | 2.00 | 2.00 | 1.95 | 2.25 | 2.07 | 24 | |
| 16 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.99 | 2.03 | 2.05 | 2.07 | 2.03 | 2.05 | 2.01 | 2.00 | 2.00 | 1.98 | 1.97 | 1.98 | S | 1.99 | 1.99 | 1.98 | 1.97 | 1.98 | 1.97 | 2.07 | 2.00 | 24 | |
| 17 | 2.00 | 1.98 | 1.99 | 1.99 | 1.97 | 1.96 | 1.98 | 1.96 | 1.97 | 1.98 | 2.00 | 2.01 | 2.03 | 2.09 | 2.12 | 2.15 | S | 2.27 | 2.25 | 2.34 | 2.34 | 2.31 | 2.25 | 1.96 | 2.34 | 2.08 | 24 | | |
| 18 | 2.26 | 2.26 | 2.26 | 2.26 | 2.23 | 2.23 | 2.23 | 2.22 | 2.21 | 2.25 | 2.27 | 2.28 | 2.39 | 2.34 | 2.31 | 2.32 | S | 2.45 | 2.56 | 2.60 | 2.69 | 2.72 | 2.56 | 2.40 | 2.21 | 2.72 | 2.36 | 24 | |
| 19 | 2.25 | 2.20 | 2.18 | 2.24 | 2.32 | 2.48 | 2.48 | 2.48 | 2.50 | 2.43 | 2.28 | 2.18 | 2.26 | 2.30 | 2.12 | S | 2.33 | 2.31 | 2.26 | 2.23 | 2.32 | 2.32 | 2.20 | 2.19 | 2.24 | 2.12 | 2.50 | 2.29 | 24 |
| 20 | 2.20 | 2.20 | 2.25 | 2.27 | 2.26 | 2.30 | 2.25 | 2.19 | 2.17 | 2.12 | 2.26 | 2.26 | 2.19 | S | 2.11 | 2.14 | 2.16 | 2.18 | 2.12 | 2.08 | 2.10 | 2.08 | 2.06 | 2.06 | 2.30 | 2.18 | 24 | | |
| 21 | 2.06 | 2.04 | 2.05 | 2.05 | 2.06 | 2.06 | 2.07 | 2.07 | 2.09 | 2.09 | 2.04 | 2.03 | 2.03 | S | 2.04 | 2.05 | 2.03 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.08 | 2.05 | 2.02 | 2.09 | 2.05 | 24 |
| 22 | 2.03 | 2.03 | 2.03 | 2.02 | 2.02 | 2.02 | 2.02 | 2.04 | 2.03 | 2.01 | 2.01 | 2.00 | S | 2.01 | 2.01 | 2.00 | 2.01 | 2.01 | 2.01 | 2.05 | 2.07 | 2.03 | 2.06 | 2.05 | 2.10 | 2.00 | 2.10 | 2.03 | 24 |
| 23 | 2.15 | 2.17 | 2.17 | 2.20 | 2.28 | 2.23 | 2.20 | 2.18 | 2.13 | 2.11 | 2.07 | S | 2.03 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.03 | 2.02 | 2.03 | 2.02 | 2.03 | 2.02 | 2.01 | 2.28 | 2.09 | 24 | |
| 24 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.01 | 2.00 | 2.00 | 2.01 | 2.01 | S | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.01 | 2.02 | 2.02 | 2.02 | 2.02 | 2.02 | 2.03 | 2.03 | 2.00 | 2.03 | 2.01 | 24 | |
| 25 | 2.04 | 2.08 | 2.11 | 2.11 | 2.10 | 2.09 | 2.10 | 2.12 | 2.16 | S | 2.22 | 2.26 | 2.27 | 2.28 | 2.27 | 2.27 | 2.27 | 2.32 | 2.42 | 2.45 | 2.48 | 2.51 | 2.52 | 2.56 | 2.04 | 2.56 | 2.26 | 24 | |
| 26 | 2.58 | 2.42 | 2.21 | 2.12 | 2.10 | 2.09 | 2.07 | 2.04 | S | 2.05 | 2.05 | 2.04 | 2.05 | 2.05 | 2.04 | 2.05 | 2.06 | 2.06 | 2.07 | 2.08 | 2.08 | 2.11 | 2.10 | 2.09 | 2.04 | 2.58 | 2.11 | 24 | |
| 27 | 2.09 | 2.09 | 2.11 | 2.11 | 2.11 | 2.12 | 2.12 | S | 2.13 | 2.12 | 2.12 | 2.14 | 2.13 | 2.12 | 2.12 | 2.16 | 2.16 | 2.14 | 2.15 | 2.16 | 2.17 | 2.22 | 2.27 | 2.27 | 2.09 | 2.27 | 2.15 | 24 | |
| 28 | 2.37 | 2.44 | 2.47 | 2.49 | 2.50 | 2.49 | S | 2.48 | 2.46 | 2.42 | 2.40 | 2.35 | 2.31 | 2.27 | 2.30 | 2.31 | 2.32 | 2.23 | 2.18 | 2.18 | 2.25 | 2.23 | 2.20 | 2.18 | 2.18 | 2.50 | 2.34 | 24 | |
| 29 | 2.17 | 2.17 | 2.16 | 2.14 | 2.13 | S | 2.08 | 2.06 | 2.04 | 2.04 | 2.04 | 2.03 | 2.02 | 2.03 | 2.02 | 2.02 | 2.01 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.01 | 2.02 | 2.01 | 2.17 | 2.06 | 24 | |
| 30 | 2.01 | 2.01 | 2.01 | 2.01 | S | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.99 | 2.00 | 2.00 | 2.01 | 2.01 | 2.02 | 2.02 | 2.02 | 2.02 | 2.04 | 2.06 | 1.99 | 2.06 | 2.01 | 24 | |
| 31 | 2.12 | 2.23 | 2.18 | S | 2.24 | 2.22 | 2.22 | 2.23 | 2.24 | 2.25 | 2.20 | 2.17 | 2.17 | 2.28 | 2.26 | 2.16 | 2.13 | 2.14 | 2.16 | 2.21 | 2.25 | 2.24 | 2.27 | 2.27 | 2.12 | 2.28 | 2.21 | 24 | |
| HOURLY MAX | 2.58 | 2.63 | 2.54 | 2.53 | 2.51 | 2.52 | 2.58 | 2.52 | 2.56 | 2.60 | 2.66 | 2.90 | 2.63 | 2.58 | 2.46 | 2.46 | 2.77 | 2.76 | 2.56 | 2.60 | 2.69 | 2.72 | 2.64 | 2.63 | | | | | |
| HOURLY AVG | 2.18 | 2.17 | 2.16 | 2.16 | 2.19 | 2.19 | 2.18 | 2.20 | 2.20 | 2.19 | 2.17 | 2.17 | 2.15 | 2.14 | 2.14 | 2.14 | 2.14 | 2.15 | 2.15 | 2.15 | 2.16 | 2.18 | 2.19 | 2.18 | | | | | |

STATUS FLAG CODES

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

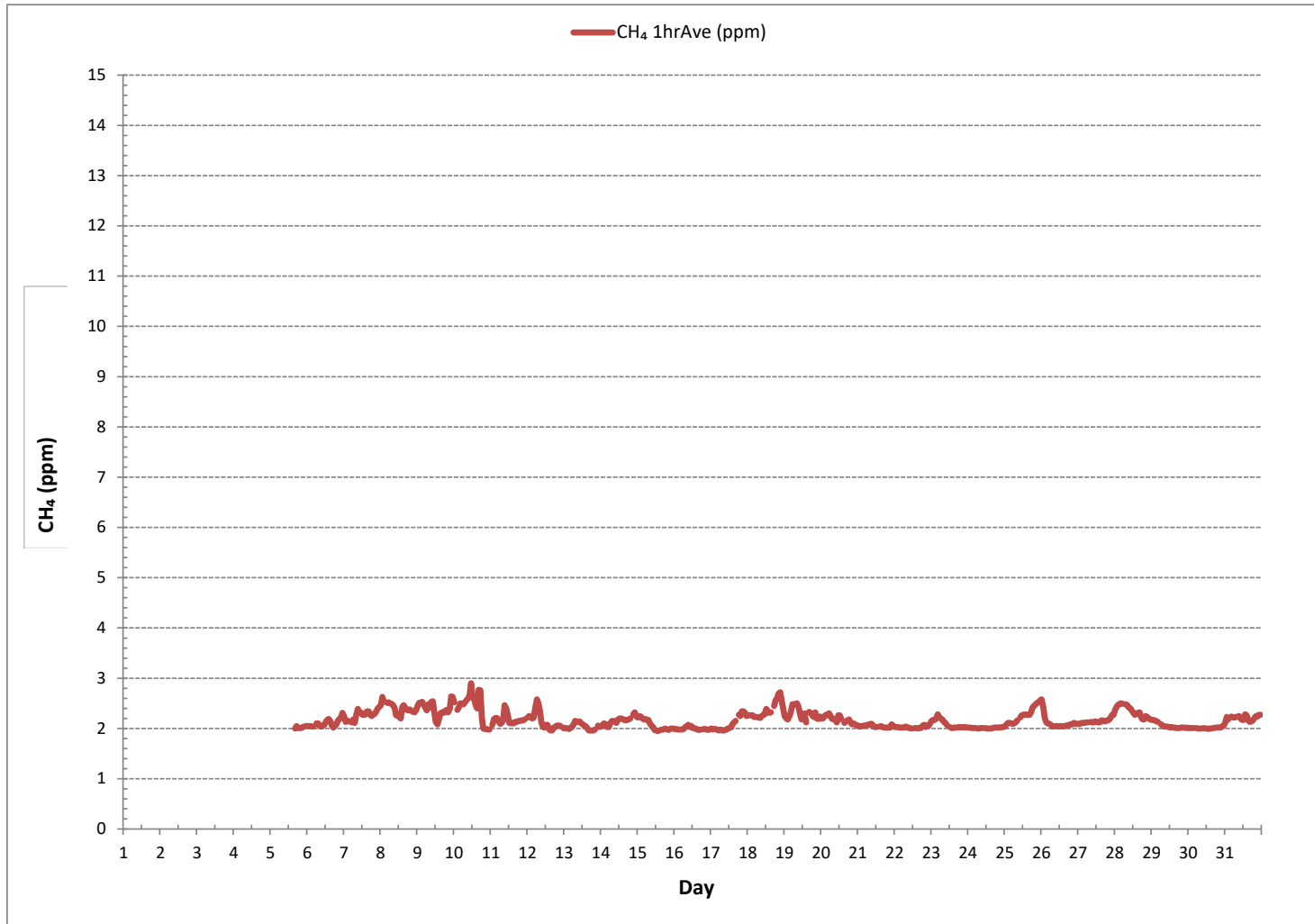
24 HR AVERAGES December 2018



MONTHLY SUMMARY

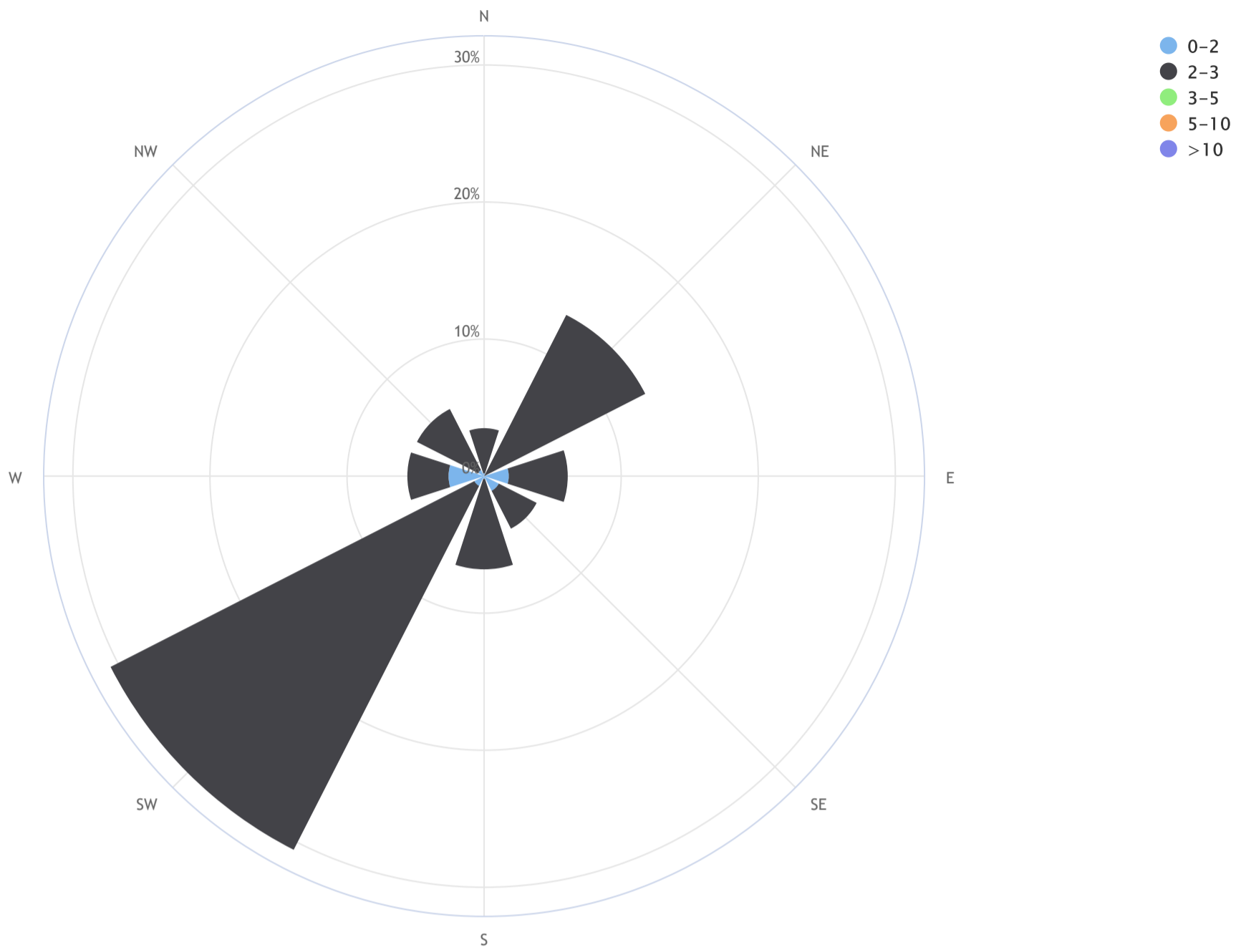
| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 605 | | | |
| MINIMUM 1-HR AVERAGE: | 1.95 ppm | @ HOUR | 13 | ON DAY 15 |
| MAXIMUM 1-HR AVERAGE: | 2.90 ppm | @ HOUR | 11 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 2.43 ppm | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 27 hrs | OPERATIONAL TIME: | 636 hrs | |
| MONTHLY CALIBRATION TIME: | 4 hrs | AMD OPERATION UPTIME: | 85.5 % | |
| STANDARD DEVIATION: | 0.17 | MONTHLY AVERAGE: | 2.17 ppm | |

METHANE Hourly Averages (CH₄ ppm)



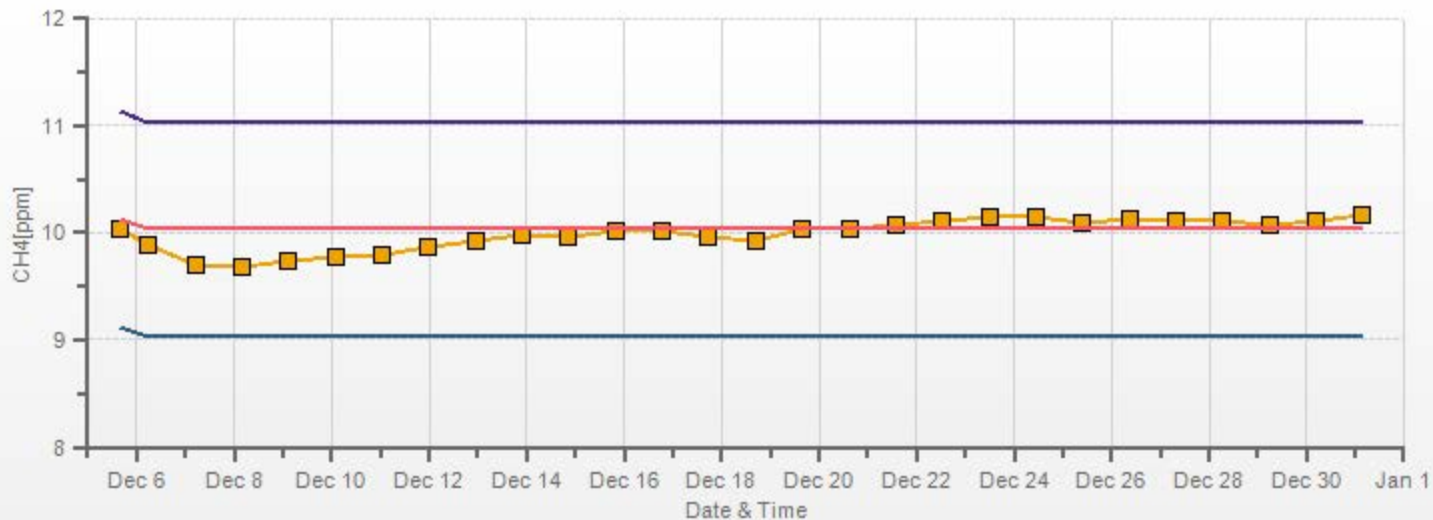
Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_CH4 (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.2_CALM % = 24.5%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|-----|------|-----|------|-----|-------|
| N | 0.2 | 3.3 | 0.0 | 0.0 | 0.0 | 3.5 |
| NE | 0.0 | 13.2 | 0.0 | 0.0 | 0.0 | 13.2 |
| E | 1.8 | 4.3 | 0.0 | 0.0 | 0.0 | 6.1 |
| SE | 1.2 | 3.1 | 0.0 | 0.0 | 0.0 | 4.3 |
| S | 0.2 | 6.6 | 0.0 | 0.0 | 0.0 | 6.8 |
| SW | 0.8 | 29.8 | 0.0 | 0.0 | 0.0 | 30.6 |
| W | 2.6 | 3.0 | 0.0 | 0.0 | 0.0 | 5.6 |
| NW | 0.5 | 5.0 | 0.0 | 0.0 | 0.0 | 5.5 |
| Summary | 7.3 | 68.3 | 0.0 | 0.0 | 0.0 | 75.6 |
| CALM | 0.7 | 23.8 | 0.0 | 0.0 | 0.0 | 24.5 |

CH4[ppm] Calibration: LICA MASKWA Monthly: 18/12 Type: Span



NON-METHANE HYDROCARBON



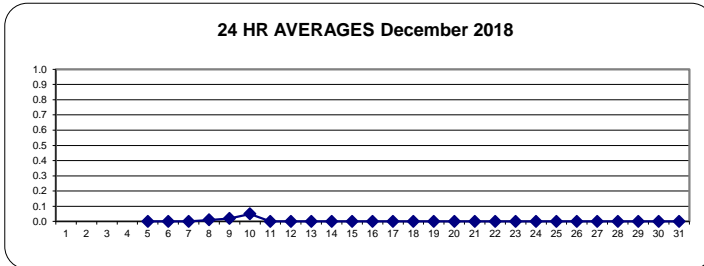
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

| 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 |
| 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 8 | 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 | 0.01 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.03 | 0.01 | 24 |
| 9 | 0.02 | 0.01 | S | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.06 | 0.12 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.02 | 24 |
| 10 | 0.00 | S | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 0.00 | 0.08 | 0.10 | 0.24 | 0.36 | 0.17 | 0.07 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.05 | 24 | |
| 11 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 16 | 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 | 0.00 | 0.00 | 24 |
| 17 | 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 | 0.00 | 0.00 | 24 |
| 18 | 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 | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | 24 |
| 19 | 0.01 | 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 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 24 |
| 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 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 24 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 31 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| HOURLY MAX | 0.02 | 0.03 | 0.00 | 0.02 | 0.05 | 0.03 | 0.01 | 0.02 | 0.08 | 0.10 | 0.24 | 0.36 | 0.17 | 0.07 | 0.01 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | | | | |
| HOURLY AVG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |

STATUS FLAG CODES

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

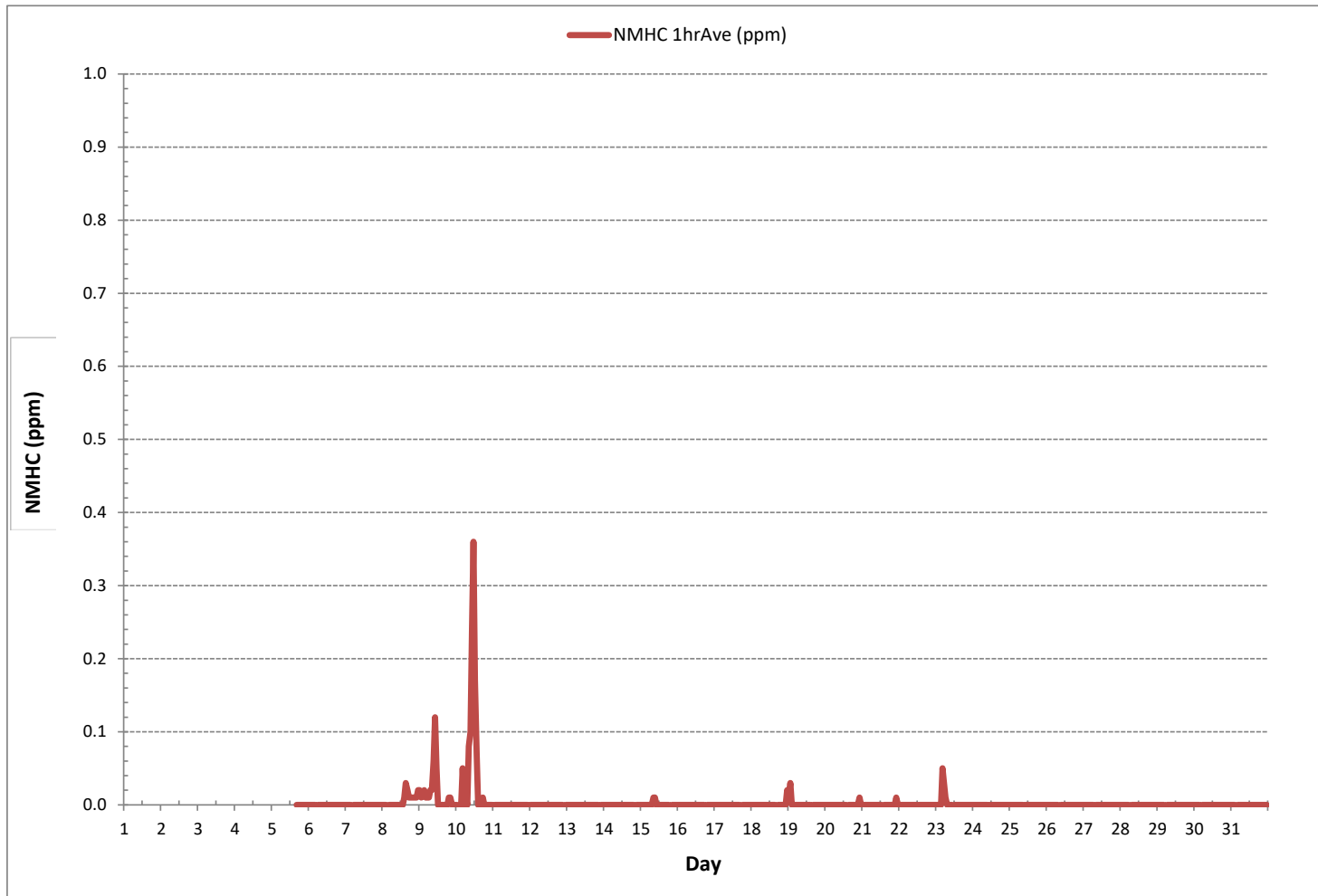
24 HR AVERAGES December 2018



MONTHLY SUMMARY

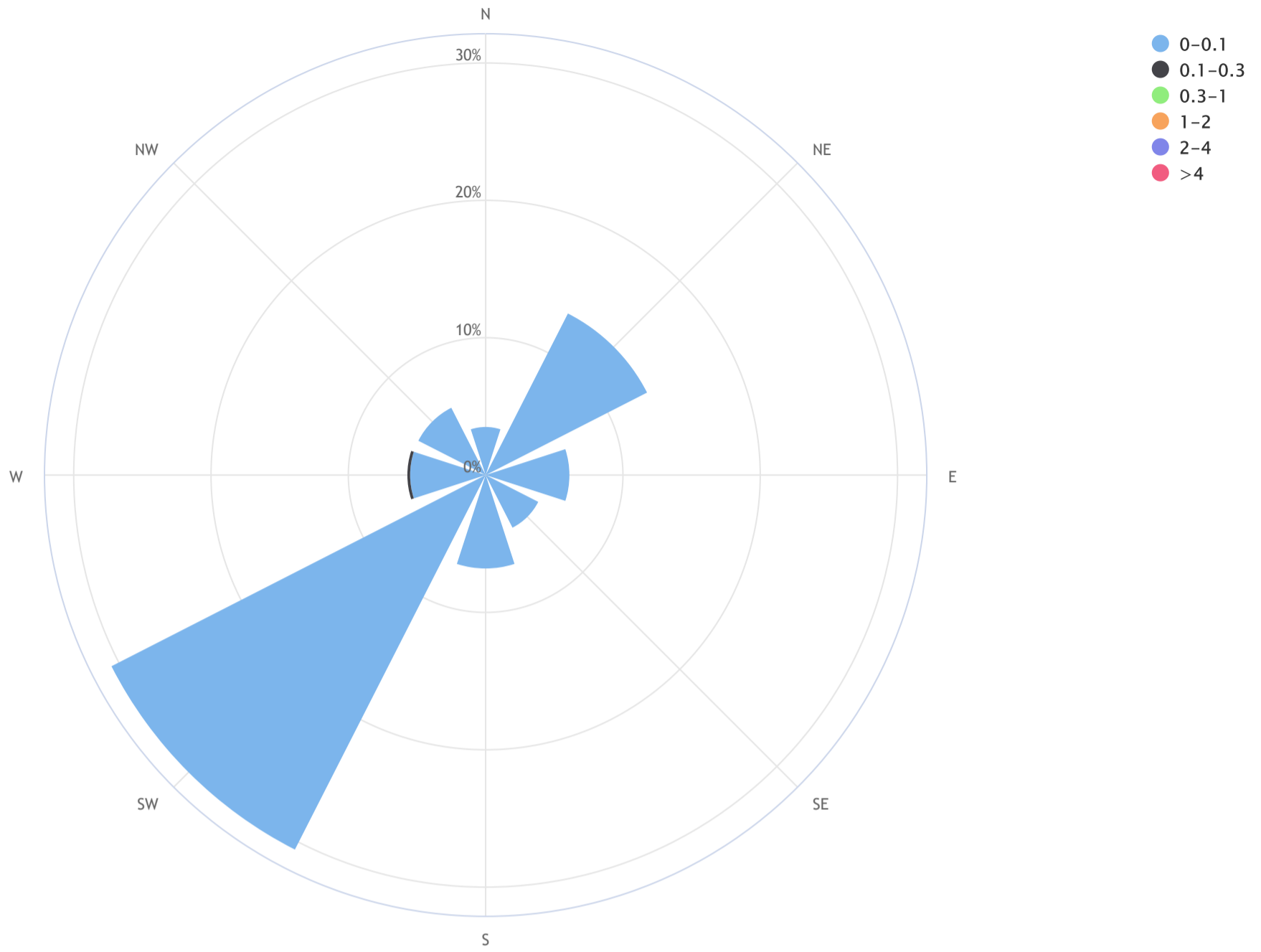
| | | | | |
|------------------------------|------|------------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 42 | | | |
| MINIMUM 1-HR AVERAGE: | 0.00 | ppm @ HOUR | 16 | ON DAY 5 |
| MAXIMUM 1-HR AVERAGE: | 0.36 | ppm @ HOUR | 11 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 0.05 | ppm | | ON DAY 10 |
| IZS CALIBRATION TIME: | 27 | hrs | OPERATIONAL TIME: | 636 |
| MONTHLY CALIBRATION TIME: | 4 | hrs | AMD OPERATION UPTIME: | 85.5 |
| STANDARD DEVIATION: | 0.02 | | MONTHLY AVERAGE: | 0.00 |
| | | | | ppm |

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



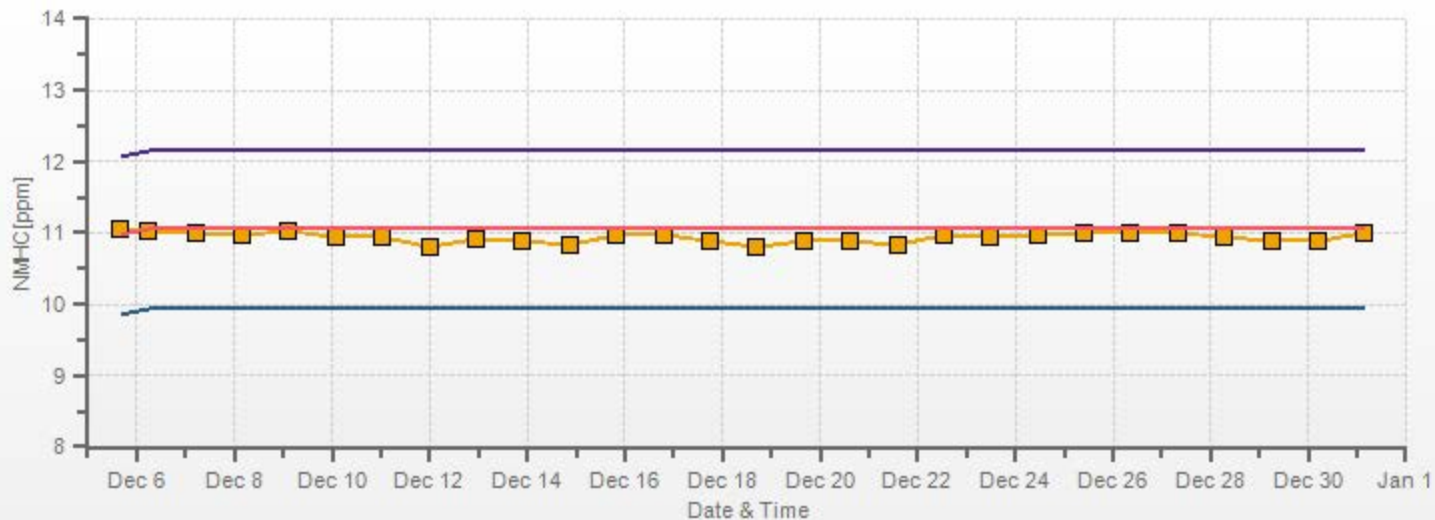
Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NMHC (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 24.5%



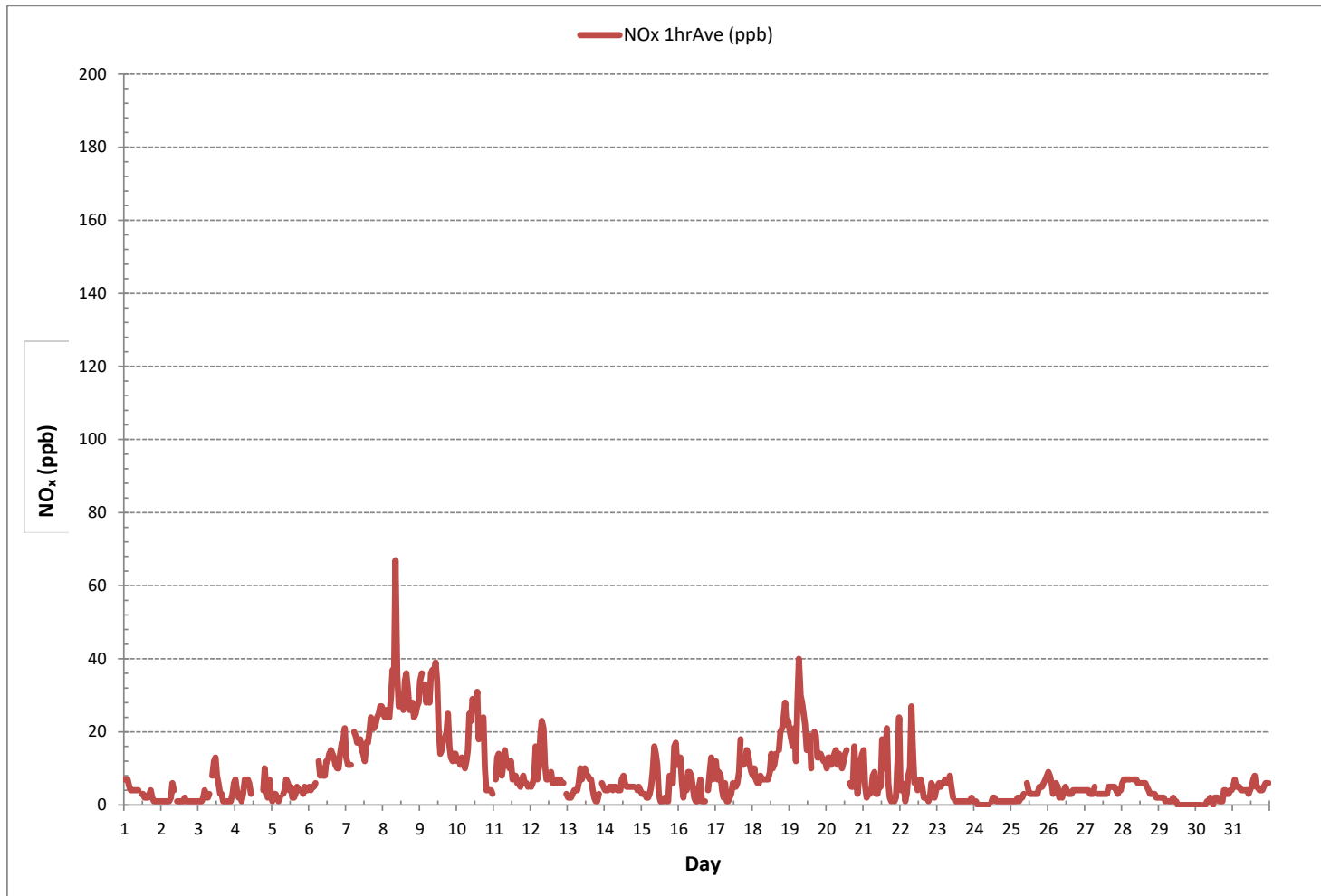
| Direction | 0-0.1 | 0.1-0.3 | 0.3-1 | 1-2 | 2-4 | >4 | TOTAL |
|-----------|-------|---------|-------|-----|-----|-----|-------|
| N | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 |
| NE | 13.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.2 |
| E | 6.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.1 |
| SE | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.3 |
| S | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.8 |
| SW | 30.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30.6 |
| W | 5.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 |
| NW | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 |
| Summary | 75.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 75.5 |
| CALM | 23.8 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 24.5 |

NMHC[ppm] Calibration: LICA MASKWA Monthly: 18/12 Type: Span



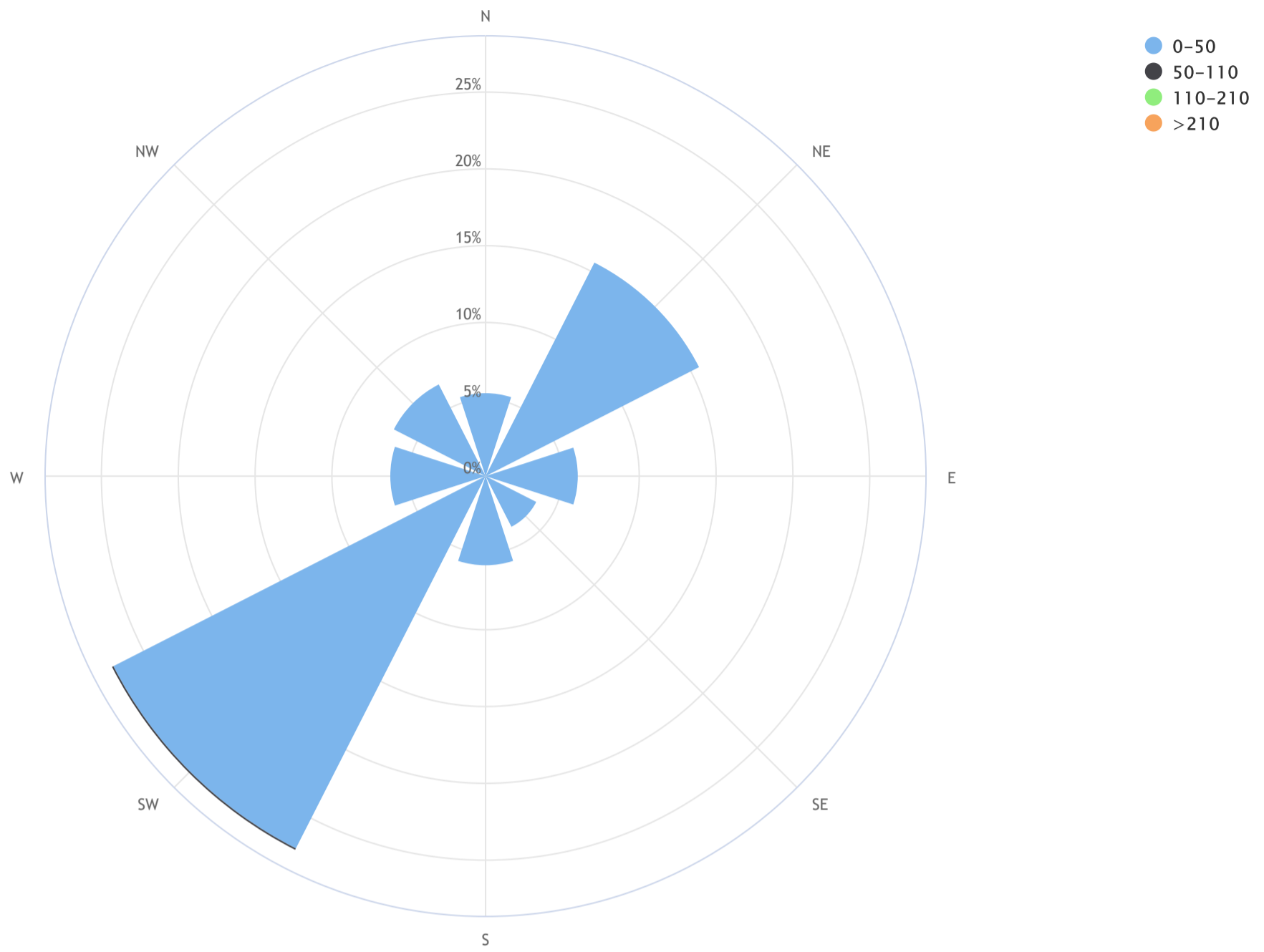
OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO_x (ppb)_18/12

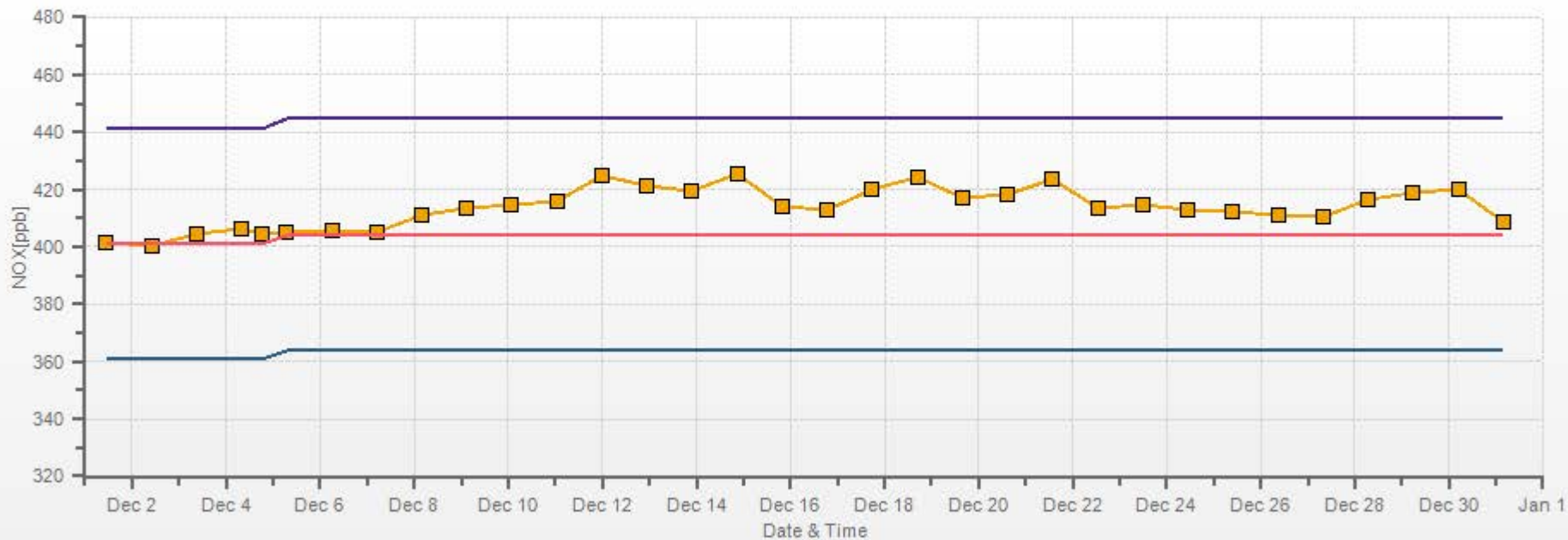
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 8.3_CALM % = 23.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 5.4 | 0.0 | 0.0 | 0.0 | 5.4 |
| NE | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| E | 6.0 | 0.0 | 0.0 | 0.0 | 6.0 |
| SE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| S | 5.8 | 0.0 | 0.0 | 0.0 | 5.8 |
| SW | 27.2 | 0.1 | 0.0 | 0.0 | 27.4 |
| W | 6.2 | 0.0 | 0.0 | 0.0 | 6.2 |
| NW | 6.7 | 0.0 | 0.0 | 0.0 | 6.7 |
| Summary | 76.6 | 0.1 | 0.0 | 0.0 | 76.7 |
| CALM | 23.3 | 0.0 | 0.0 | 0.0 | 23.3 |

NOX[ppb] Calibration: LICA MASKWA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDE

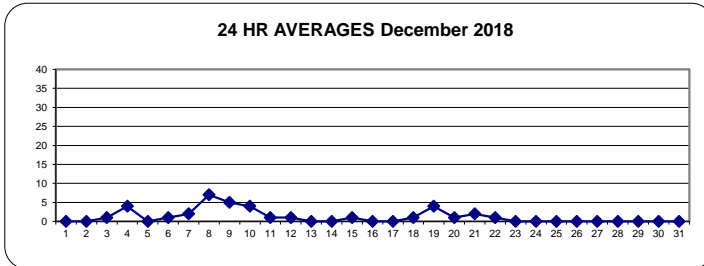
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

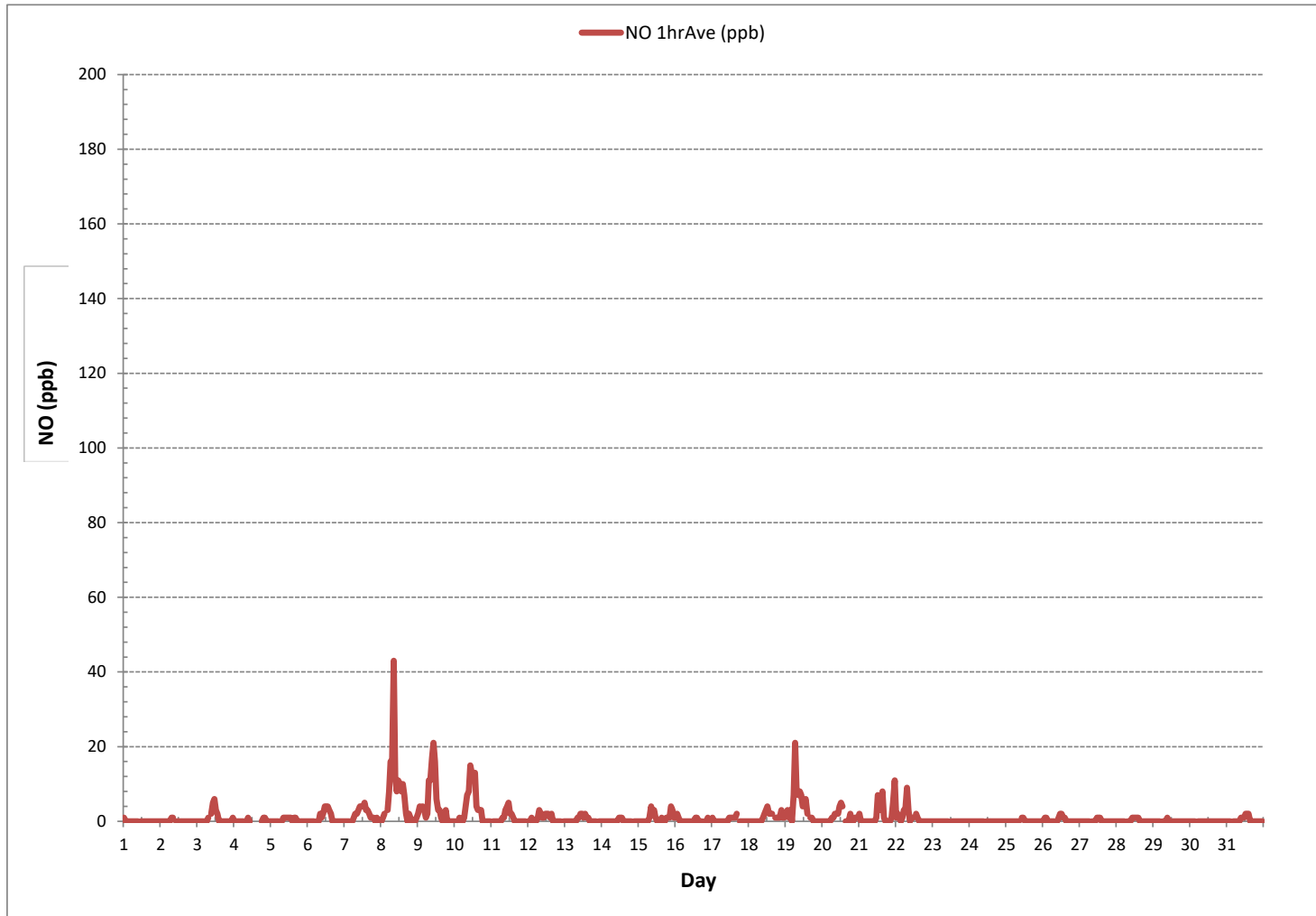
24 HR AVERAGES December 2018



MONTHLY SUMMARY

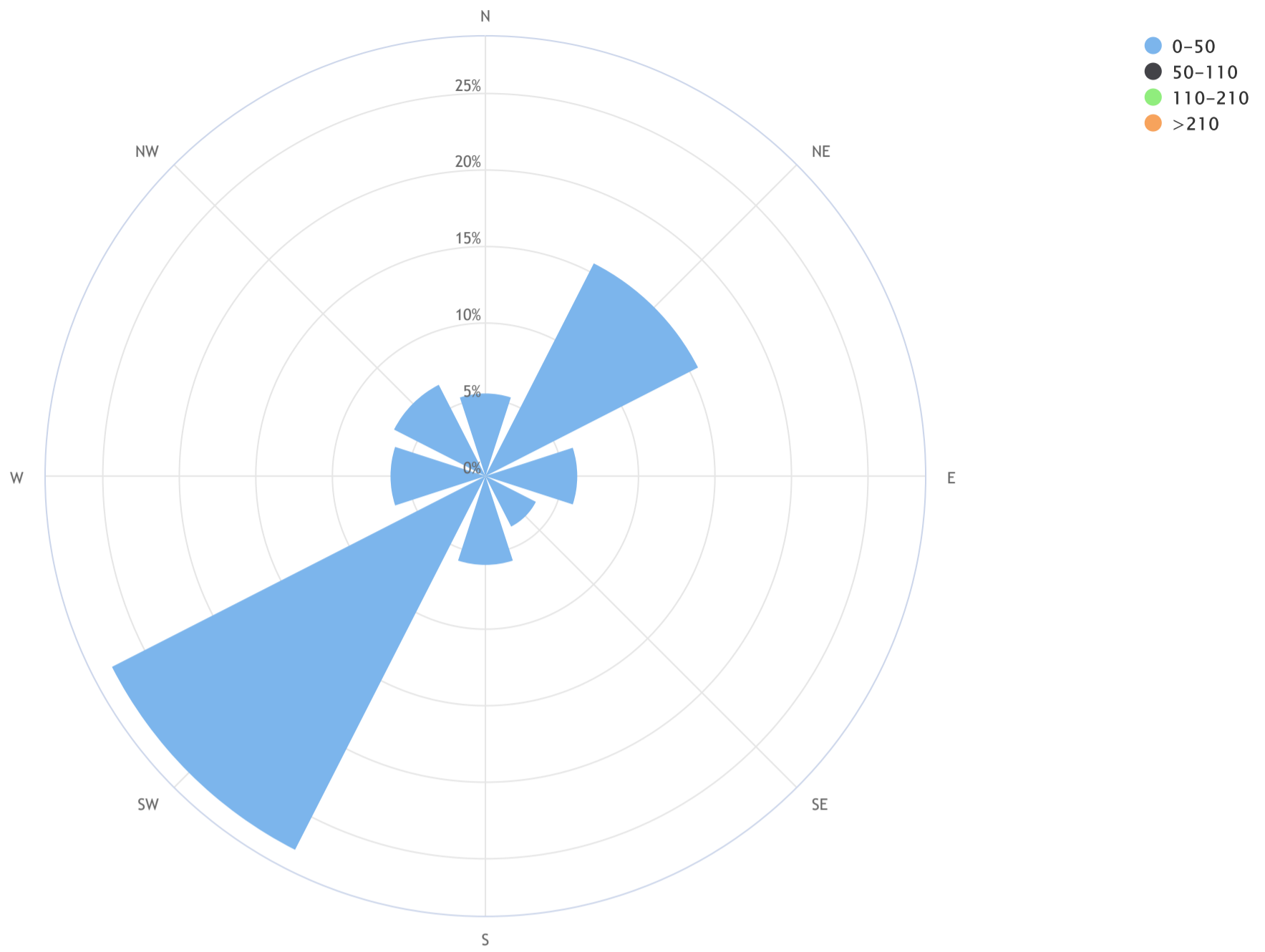
| | | | | |
|------------------------------|-----|------------|-----------------------|----------|
| NUMBER OF NON-ZERO READINGS: | 232 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 1 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 43 | ppb @ HOUR | 8 | ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 7 | ppb | | ON DAY 8 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 744 |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 3 | | MONTHLY AVERAGE: | 1 |
| | | | | ppb |

NITRIC OXIDE Hourly Averages (NO ppb)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 1.0_CALM % = 23.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 5.4 | 0.0 | 0.0 | 0.0 | 5.4 |
| NE | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| E | 6.0 | 0.0 | 0.0 | 0.0 | 6.0 |
| SE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| S | 5.8 | 0.0 | 0.0 | 0.0 | 5.8 |
| SW | 27.4 | 0.0 | 0.0 | 0.0 | 27.4 |
| W | 6.2 | 0.0 | 0.0 | 0.0 | 6.2 |
| NW | 6.7 | 0.0 | 0.0 | 0.0 | 6.7 |
| Summary | 76.8 | 0.0 | 0.0 | 0.0 | 76.8 |
| CALM | 23.3 | 0.0 | 0.0 | 0.0 | 23.3 |

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

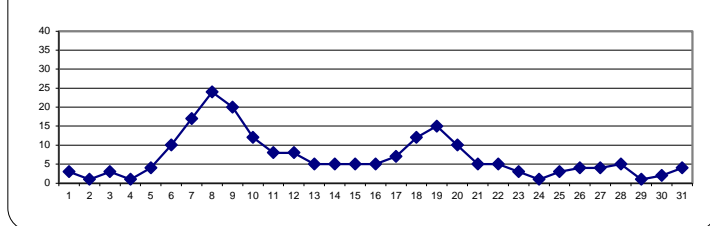
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

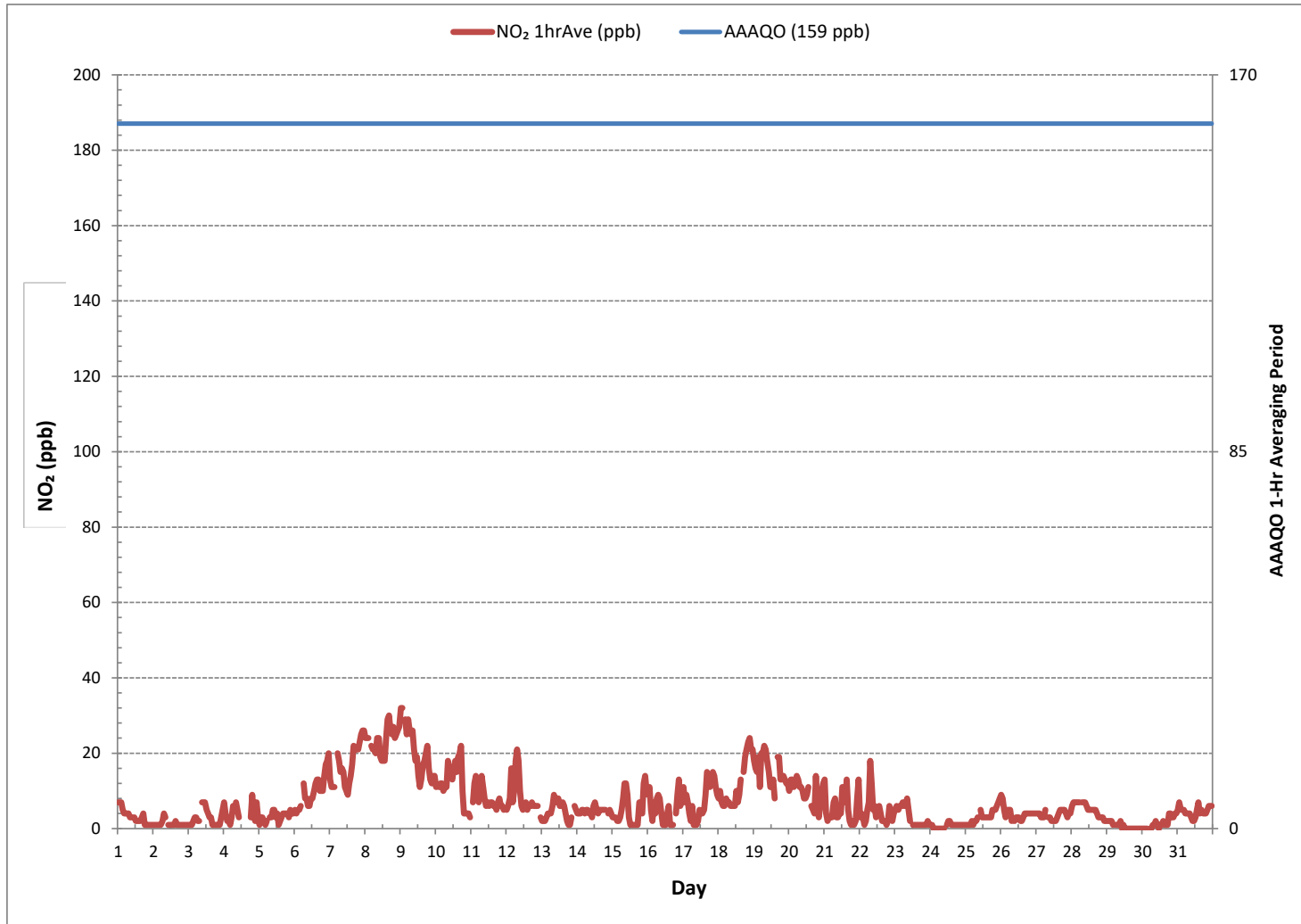
MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 677 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 2 | ON DAY 24 |
| MAXIMUM 1-HR AVERAGE: | 32 ppb | @ HOUR | 0 | ON DAY 9 |
| MAXIMUM 24-HR AVERAGE: | 24 ppb | | | ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 7 | MONTHLY AVERAGE: | 7 ppb | |

24 HR AVERAGES December 2018

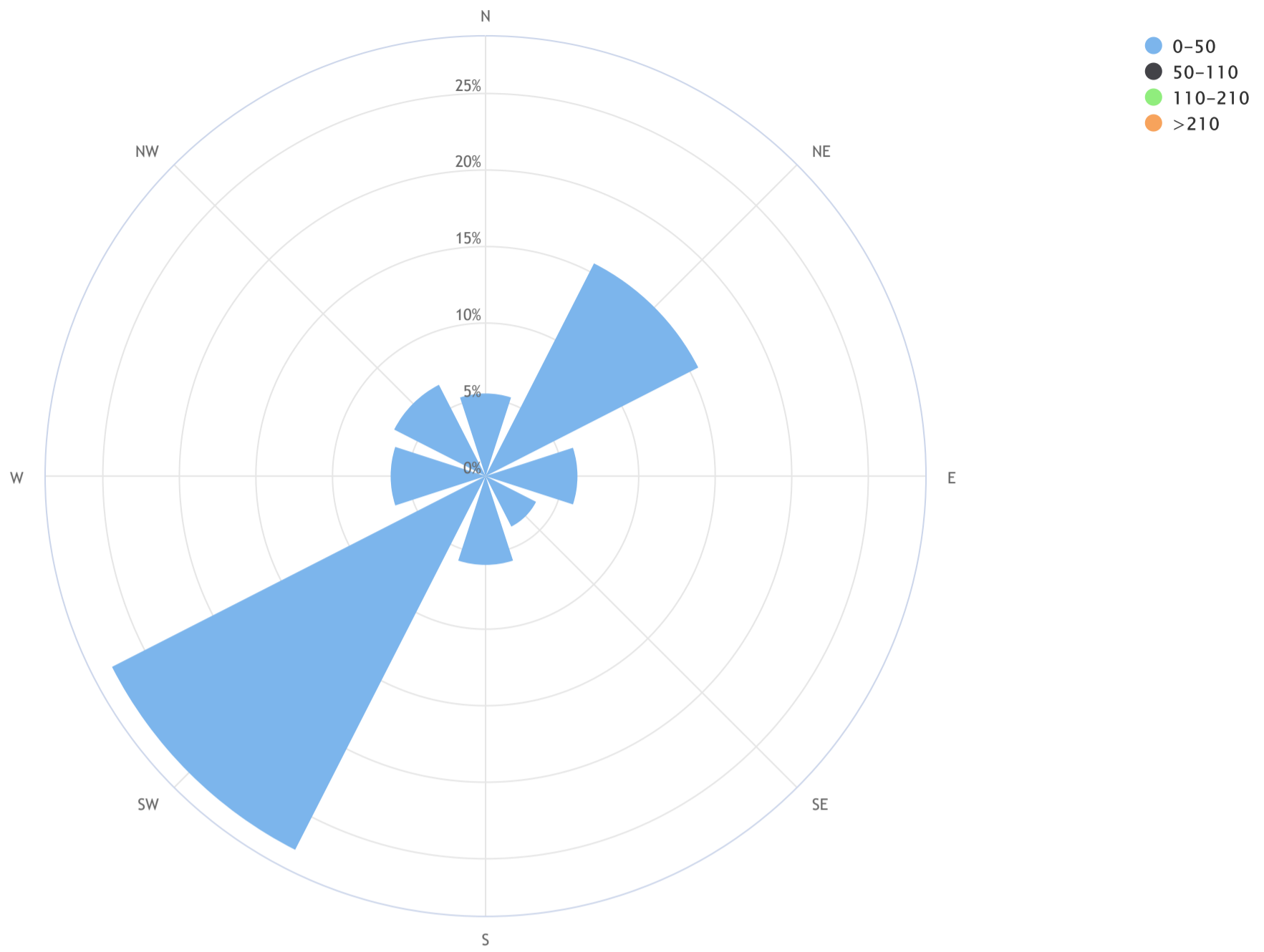


NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 7.2_CALM % = 23.3%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 5.4 | 0.0 | 0.0 | 0.0 | 5.4 |
| NE | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| E | 6.0 | 0.0 | 0.0 | 0.0 | 6.0 |
| SE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| S | 5.8 | 0.0 | 0.0 | 0.0 | 5.8 |
| SW | 27.4 | 0.0 | 0.0 | 0.0 | 27.4 |
| W | 6.2 | 0.0 | 0.0 | 0.0 | 6.2 |
| NW | 6.7 | 0.0 | 0.0 | 0.0 | 6.7 |
| Summary | 76.8 | 0.0 | 0.0 | 0.0 | 76.8 |
| CALM | 23.3 | 0.0 | 0.0 | 0.0 | 23.3 |

NO2[ppb] Calibration: LICA MASKWA Monthly: 18/12 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 | 0.7 | 1.1 | 1.3 | 0.7 | 1.2 | 2.7 | 3.7 | 3.4 | 3.4 | 4.8 | 5.1 | 4.7 | 3.6 | 5.4 | 5.0 | 3.3 | 3.1 | 3.2 | 3.8 | 3.9 | 4.4 | 5.0 | 7.1 | 5.7 | 0.7 | 7.1 | 3.6 | 24 |
| 2 | 6.1 | 5.8 | 5.8 | 5.9 | 4.7 | 3.3 | 4.8 | 4.5 | 2.6 | 3.2 | 4.6 | 5.2 | 4.5 | 3.5 | 3.2 | 2.7 | 2.4 | 1.6 | 2.2 | 0.7 | 0.5 | 2.4 | 1.2 | 0.5 | 0.5 | 6.1 | 3.2 | 24 |
| 3 | 0.1 | 0.1 | 0.7 | 0.7 | 1.0 | 1.7 | 2.5 | 3.0 | 3.6 | 3.2 | 3.9 | 5.4 | 4.9 | 4.7 | 4.8 | 4.2 | 4.7 | 4.8 | 5.6 | 5.6 | 4.0 | 3.6 | 3.5 | 5.3 | 0.1 | 5.6 | 3.2 | 24 |
| 4 | 5.2 | 4.9 | 5.0 | 4.3 | 3.1 | 4.5 | 5.2 | 4.0 | 4.1 | 5.3 | 6.6 | 5.6 | 6.7 | 4.1 | 3.4 | 4.1 | 4.3 | 3.0 | 3.9 | 5.1 | 6.0 | 7.2 | 9.1 | 9.6 | 3.0 | 9.6 | 3.0 | 24 |
| 5 | 7.6 | 9.0 | 7.0 | 7.8 | 7.3 | 6.1 | 6.5 | 5.9 | 4.3 | 2.6 | 2.0 | 2.1 | 4.8 | 4.2 | 4.2 | 5.2 | 4.9 | 6.1 | 6.9 | 6.8 | 6.4 | 4.6 | 6.0 | 6.1 | 2.0 | 9.0 | 1.9 | 24 |
| 6 | 5.2 | 5.6 | 4.0 | 3.9 | 2.6 | 2.6 | 3.0 | 4.7 | 4.7 | 6.9 | 4.5 | 4.5 | 5.4 | 6.4 | 4.5 | 4.4 | 3.2 | 2.5 | 4.7 | 3.7 | 6.6 | 4.7 | 5.9 | 5.0 | 2.5 | 6.9 | 4.5 | 24 |
| 7 | 5.8 | 3.4 | 0.6 | 2.3 | 4.3 | 2.2 | 1.5 | 5.5 | 8.6 | 4.6 | 2.2 | 4.6 | 6.3 | 4.3 | 3.2 | 2.7 | 2.8 | 3.5 | 4.3 | 2.9 | 5.0 | 5.5 | 2.4 | 0.7 | 0.6 | 8.6 | 3.7 | 24 |
| 8 | 0.6 | 1.5 | 2.5 | 1.3 | 1.5 | 1.6 | 1.5 | 2.1 | 3.8 | 5.4 | 5.4 | 4.4 | 3.8 | 5.3 | 5.5 | 5.8 | 4.9 | 2.5 | 3.4 | 7.2 | 4.8 | 4.0 | 6.4 | 5.7 | 0.6 | 7.2 | 3.8 | 24 |
| 9 | 5.7 | 5.1 | 4.5 | 1.2 | 3.6 | 3.5 | 2.7 | 2.2 | 2.0 | 0.4 | 0.2 | 2.0 | 3.4 | 3.2 | 5.2 | 2.8 | 0.2 | 0.7 | 0.4 | 0.4 | 0.5 | 0.4 | 1.0 | 0.4 | 0.2 | 5.7 | 2.0 | 24 |
| 10 | 0.7 | 0.3 | 0.5 | 1.1 | 0.9 | 0.3 | 0.9 | 0.4 | 0.9 | 0.2 | 0.5 | 1.5 | 1.9 | 2.4 | 2.3 | 3.0 | 3.5 | 3.6 | 6.2 | 5.0 | 8.5 | 7.0 | 5.4 | 3.4 | 0.2 | 8.5 | 2.0 | 24 |
| 11 | 3.3 | 6.4 | 5.5 | 4.8 | 6.4 | 6.4 | 3.4 | 2.3 | 0.9 | 1.8 | 2.5 | 1.0 | 2.8 | 2.8 | 2.5 | 2.6 | 2.4 | 3.6 | 6.1 | 3.3 | 2.3 | 1.6 | 0.9 | 1.0 | 0.9 | 6.4 | 2.0 | 24 |
| 12 | 1.8 | 2.0 | 2.9 | 1.8 | 3.1 | 7.1 | 6.2 | 5.2 | 6.4 | 5.2 | 4.8 | 4.2 | 7.0 | 6.7 | 4.6 | 3.7 | 5.1 | 6.4 | 6.3 | 7.1 | 6.5 | 6.4 | 6.9 | 7.8 | 1.8 | 7.8 | 4.9 | 24 |
| 13 | 7.3 | 7.7 | 8.2 | 6.8 | 5.3 | 6.5 | 5.2 | 6.0 | 3.4 | 7.1 | 4.0 | 5.2 | 4.8 | 5.0 | 5.3 | 4.0 | 4.1 | 4.7 | 3.9 | 4.1 | 5.4 | 8.0 | 7.9 | 8.1 | 3.4 | 8.2 | 5.4 | 24 |
| 14 | 9.5 | 7.5 | 6.3 | 5.1 | 7.6 | 5.2 | 0.9 | 3.5 | 4.0 | 2.9 | 4.8 | 4.6 | 2.7 | 1.6 | 2.8 | 2.4 | 2.7 | 2.4 | 2.5 | 1.1 | 1.3 | 1.3 | 1.4 | 2.2 | 0.9 | 9.5 | 1.9 | 24 |
| 15 | 1.5 | 1.1 | 0.6 | 0.2 | 0.2 | 1.8 | 6.8 | 4.4 | 10.8 | 11.3 | 14.2 | 14.9 | 16.7 | 13.9 | 10.9 | 14.3 | 12.3 | 14.3 | 12.2 | 10.2 | 6.8 | 6.3 | 6.4 | 5.2 | 0.2 | 16.7 | 7.6 | 24 |
| 16 | 4.4 | 4.5 | 2.9 | 1.0 | 0.6 | 0.0 | 0.6 | 0.8 | 1.5 | 2.1 | 2.6 | 3.6 | 1.9 | 4.8 | 4.7 | 5.8 | 4.6 | 3.1 | 5.3 | 4.3 | 5.1 | 6.7 | 7.3 | 5.9 | 0.0 | 7.3 | 2.2 | 24 |
| 17 | 3.3 | 4.1 | 3.7 | 5.1 | 5.2 | 4.4 | 4.3 | 3.9 | 3.5 | 3.1 | 3.4 | 3.7 | 4.0 | 4.1 | 3.2 | 3.5 | 5.0 | 3.3 | 4.0 | 4.5 | 2.4 | 2.4 | 1.2 | 1.2 | 5.2 | 2.3 | 24 | |
| 18 | 1.1 | 0.4 | 1.4 | 1.2 | 0.7 | 0.1 | 0.3 | 0.4 | 0.5 | 0.6 | 0.3 | 0.4 | 3.2 | 2.1 | 3.1 | 2.0 | 3.2 | 4.0 | 6.2 | 4.5 | 4.2 | 1.3 | 0.9 | 0.6 | 0.1 | 6.2 | 1.3 | 24 |
| 19 | 1.3 | 0.7 | 1.3 | 2.8 | 3.0 | 1.3 | 2.1 | 4.8 | 4.6 | 4.5 | 4.2 | 3.0 | 3.8 | 3.5 | 3.3 | 5.7 | 5.5 | 5.8 | 5.6 | 6.6 | 5.9 | 5.5 | 6.3 | 8.7 | 0.7 | 8.7 | 4.1 | 24 |
| 20 | 6.1 | 7.0 | 7.8 | 7.3 | 7.2 | 6.3 | 4.6 | 6.2 | 5.1 | 3.8 | 3.0 | 1.2 | 3.1 | 4.6 | 4.5 | 4.6 | 5.3 | 6.8 | 7.0 | 6.8 | 7.9 | 9.5 | 8.4 | 7.0 | 1.2 | 9.5 | 2.3 | 24 |
| 21 | 7.4 | 5.1 | 4.5 | 2.7 | 1.0 | 2.1 | 4.5 | 7.3 | 8.0 | 8.0 | 9.9 | 10.8 | 9.1 | 7.5 | 5.7 | 8.0 | 7.9 | 9.1 | 8.5 | 10.0 | 6.2 | 7.6 | 7.3 | 10.1 | 1.0 | 10.8 | 5.3 | 24 |
| 22 | 8.3 | 7.2 | 7.8 | 7.0 | 7.6 | 7.1 | 7.2 | 7.7 | 6.2 | 6.1 | 6.4 | 5.3 | 5.7 | 5.8 | 4.7 | 3.3 | 1.6 | 0.9 | 2.1 | 2.0 | 0.2 | 2.3 | 0.5 | 0.9 | 0.2 | 8.3 | 4.2 | 24 |
| 23 | 0.3 | 0.1 | 0.1 | 0.3 | 0.5 | 0.5 | 1.0 | 1.3 | 0.2 | 1.3 | 3.0 | 3.1 | 3.7 | 4.2 | 3.7 | 3.0 | 2.3 | 1.9 | 3.3 | 2.6 | 2.4 | 2.3 | 2.1 | 3.2 | 0.1 | 4.2 | 1.8 | 24 |
| 24 | 2.6 | 2.0 | 2.8 | 1.6 | 0.8 | 1.5 | 0.5 | 1.1 | 1.3 | 2.1 | 1.8 | 1.5 | 1.6 | 1.0 | 3.1 | 1.7 | 2.2 | 1.5 | 1.9 | 1.8 | 1.3 | 2.5 | 2.8 | 1.9 | 0.5 | 3.1 | 1.4 | 24 |
| 25 | 3.8 | 2.4 | 2.3 | 3.0 | 1.8 | 2.9 | 1.8 | 1.3 | 1.2 | 3.5 | 2.8 | 2.3 | 2.5 | 1.6 | 4.4 | 3.0 | 1.8 | 1.5 | 2.6 | 1.2 | 1.4 | 2.1 | 2.0 | 1.0 | 1.0 | 4.4 | 1.6 | 24 |
| 26 | 1.1 | 2.8 | 3.3 | 3.6 | 4.1 | 4.0 | 5.1 | 4.6 | 1.9 | 3.0 | 5.0 | 2.9 | 2.7 | 1.8 | 1.8 | 2.0 | 0.9 | 2.3 | 1.6 | 1.4 | 1.3 | 2.1 | 1.6 | 1.5 | 0.9 | 5.1 | 2.2 | 24 |
| 27 | 0.3 | 0.2 | 1.0 | 2.5 | 2.4 | 1.1 | 2.8 | 2.5 | 2.2 | 2.1 | 3.5 | 2.8 | 1.2 | 1.2 | 2.2 | 1.3 | 1.6 | 1.6 | 1.6 | 1.7 | 2.3 | 3.6 | 2.9 | 1.9 | 0.2 | 3.6 | 1.8 | 24 |
| 28 | 2.7 | 2.4 | 1.4 | 2.5 | 2.2 | 0.3 | 0.2 | 0.1 | 1.2 | 2.1 | 2.8 | 3.2 | 3.1 | 3.5 | 3.5 | 3.9 | 4.3 | 4.4 | 4.8 | 3.9 | 3.2 | 4.4 | 3.6 | 3.8 | 0.1 | 4.8 | 1.9 | 24 |
| 29 | 2.8 | 3.6 | 3.8 | 4.7 | 5.2 | 4.3 | 4.3 | 4.7 | 4.5 | 4.5 | 4.7 | 4.8 | 4.7 | 5.7 | 4.7 | 4.4 | 5.9 | 5.9 | 6.0 | 7.2 | 7.2 | 7.0 | 7.4 | 7.4 | 2.8 | 7.4 | 5.2 | 24 |
| 30 | 9.2 | 8.5 | 9.6 | 10.3 | 11.4 | 11.3 | 10.7 | 8.8 | 9.2 | 7.6 | 10.9 | 9.3 | 8.7 | 9.1 | 9.1 | 4.2 | 3.2 | 2.4 | 2.1 | 2.0 | 1.1 | 0.4 | 1.4 | 0.6 | 0.4 | 11.4 | 6.4 | 24 |
| 31 | 1.7 | 0.5 | 0.2 | 0.7 | 0.5 | 0.1 | 0.3 | 0.2 | 1.0 | 0.6 | 1.5 | 1.7 | 1.2 | 3.6 | 2.1 | 1.1 | 0.7 | 0.7 | 1.0 | 1.8 | 4.5 | 3.2 | 4.1 | 2.9 | 0.1 | 4.5 | 0.9 | 24 |
| HOURLY MAX | 9.5 | 9.0 | 9.6 | 10.3 | 11.4 | 11.3 | 10.7 | 8.8 | 10.8 | 11.3 | 14.2 | 14.9 | 16.7 | 13.9 | 10.9 | 14.3 | 12.3 | 14.3 | 12.2 | 10.2 | 8.5 | 9.5 | 9.1 | 10.1 | | | | |

STATUS FLAG CODES

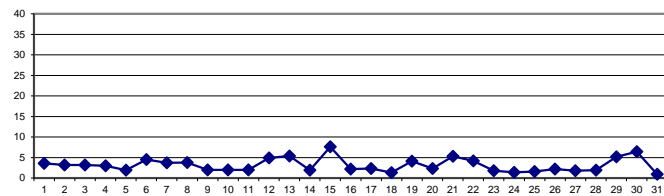
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

| | |
|-------------------|-------------------------------------|
| LAST CALIBRATION: | September 17, 2018 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

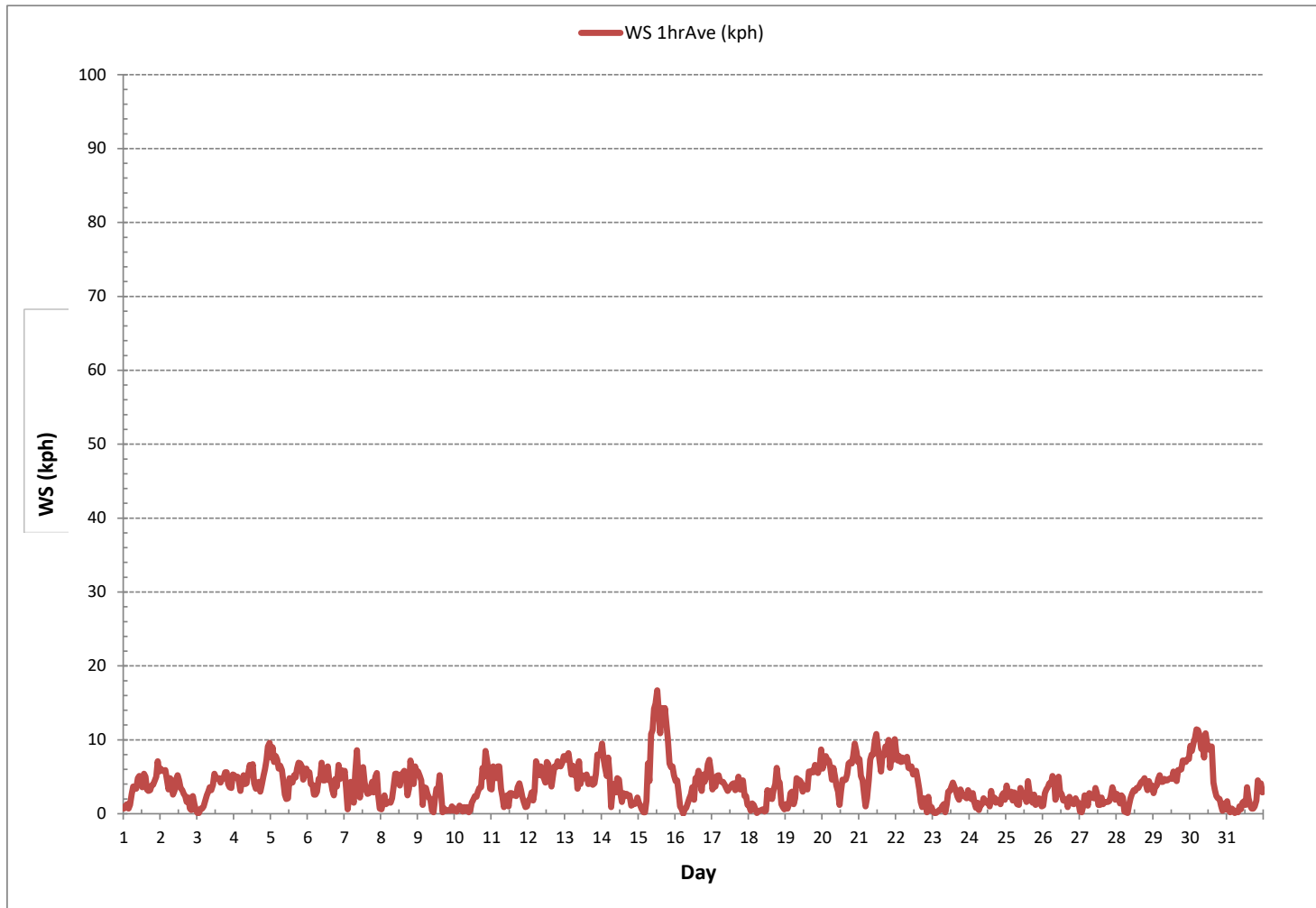
MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 743 |
| MINIMUM 1-HR AVERAGE | 0.0 kph @ HOUR 5 ON DAY 16 |
| MAXIMUM 1-HR AVERAGE: | 16.7 kph @ HOUR 12 ON DAY 15 |
| MAXIMUM 24-HR AVERAGE: | 7.6 kph ON DAY 15 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 744 hrs |
| AMSD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 2.6 |
| MONTHLY AVERAGE: | 0.6 kph |

24 HR AVERAGES December 2018

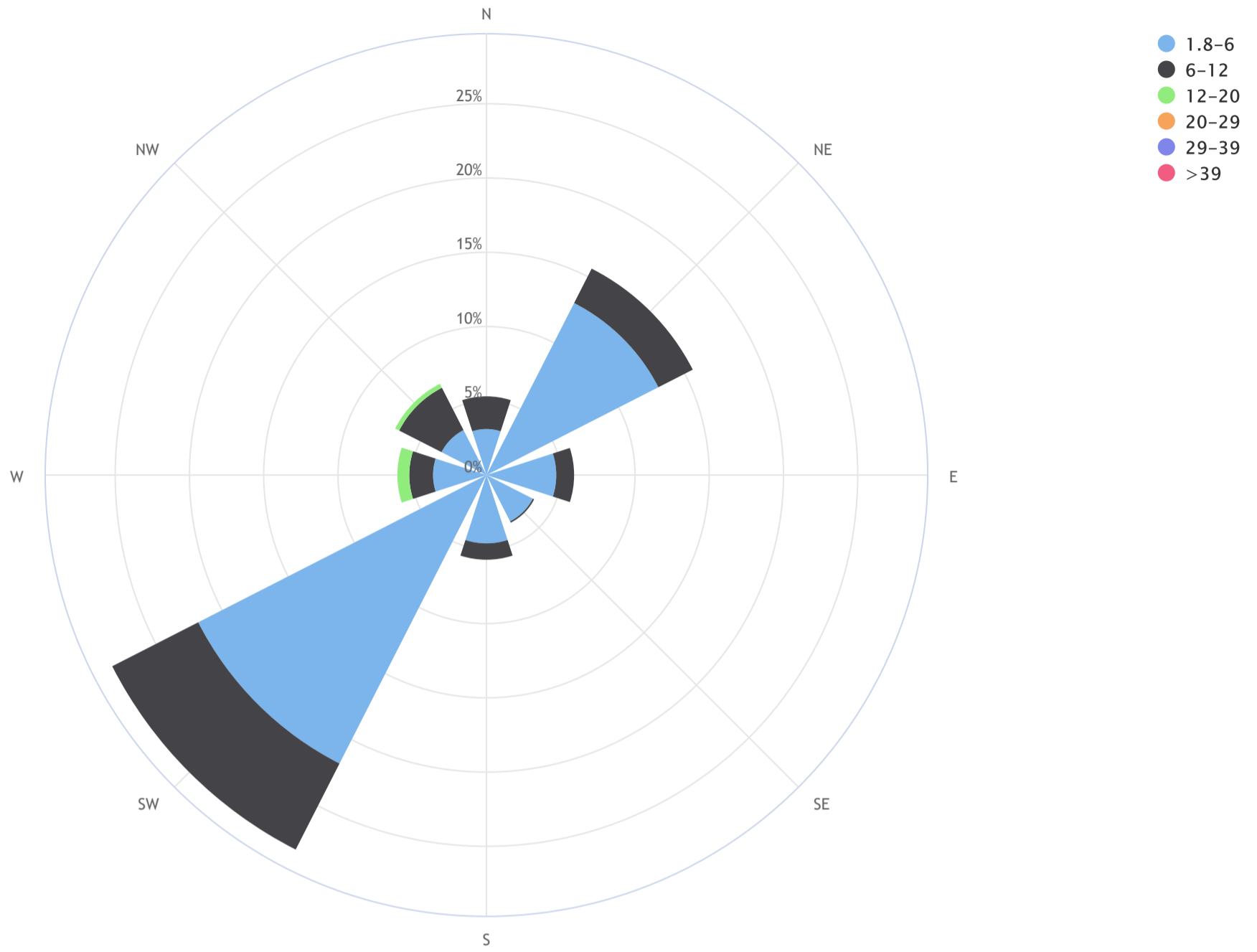


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_18/12

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 0.9_CALM % = 22.8%



| Direction | 1.8-6 | 6-12 | 12-20 | 20-29 | 29-39 | >39 | TOTAL |
|-----------|-------|------|-------|-------|-------|-----|-------|
| N | 3.1 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 5.2 |
| NE | 13.0 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 15.6 |
| E | 4.7 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 5.9 |
| SE | 3.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 |
| S | 4.6 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 5.7 |
| SW | 21.8 | 6.5 | 0.0 | 0.0 | 0.0 | 0.0 | 28.2 |
| W | 3.6 | 1.6 | 0.8 | 0.0 | 0.0 | 0.0 | 6.1 |
| NW | 3.4 | 3.2 | 0.3 | 0.0 | 0.0 | 0.0 | 6.9 |
| Summary | 57.7 | 18.4 | 1.1 | 0.0 | 0.0 | 0.0 | 77.1 |
| CALM | 22.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.9 |

WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24-HOUR AVG | 24-HR | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|-----|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | QUADRANT | RDGS. | | |
| DAY 1 | NE | NE | NE | ENE | NE | ENE | NE | ENE | NE | NE | NE | NE | ENE | NE | ENE | NE | NE | NE | NE | NE | ENE | NE | NE | NE | NE | NE | 24 | |
| 2 | NE | NE | NE | ENE | ENE | ENE | E | E | E | ENE | ENE | NE | NE | NE | ENE | NE | ENE | NE | NE | ENE | NE | NNE | NNE | NNE | NNE | ENE | 24 | |
| 3 | NNW | N | NNW | W | WNW | NW | NW | NW | NNW | NNW | WNW | WNW | NW | WNW | W | NW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | 24 | |
| 4 | W | W | W | W | SW | SSW | SSW | SW | SW | SSW | SW | SW | SSW | SW | SW | SW | SSW | SW | W | WNW | NNW | N | N | N | WSW | 24 | | |
| 5 | N | N | N | N | N | NNW | NNW | NNW | N | N | N | NW | WNW | W | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | WNW | 24 | |
| 6 | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | 24 | |
| 7 | SSW | SSW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | S | SSW | 24 | |
| 8 | S | SW | SSW | SW | S | SW | SW | SW | SSW | SW | SW | SW | SSW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | 24 | |
| 9 | SSW | SSW | SSW | SW | SW | SW | SW | SW | SW | NW | S | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | E | SSW | 24 |
| 10 | ENE | SSW | SE | SE | E | WNW | SSE | SW | SSE | WNW | SSW | WNW | WSW | SW | WSW | SW | SSW | WSW | W | W | W | W | W | W | WSW | W | 24 | |
| 11 | SW | SSW | SSW | SSW | SSW | SSW | SW | SW | SSW | NNE | NNE | N | S | SE | SE | ESE | E | SE | SSE | SE | SSE | ESE | SSE | SSE | SSE | S | 24 | |
| 12 | SSW | W | NW | SW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | 24 |
| 13 | SSW | SSW | SSW | SSW | SSW | S | S | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | 24 |
| 14 | SSW | SSW | SSW | SSW | SSW | SSW | ENE | NE | ENE | ENE | SE | SSE | ESE | ESE | ESE | SE | ESE | ESE | E | E | NE | NNE | NE | ENE | SSE | 24 | | |
| 15 | NNE | NNE | ENE | NE | NNW | SW | SSW | SW | WNW | WNW | WNW | WNW | WNW | W | W | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | 24 |
| 16 | WNW | WNW | WNW | NNW | W | SSW | SE | S | ESE | ENE | NE | NE | ENE | E | E | ENE | ENE | ENE | ENE | E | ESE | ESE | ESE | ESE | E | 24 | | |
| 17 | E | E | E | ESE | ESE | ESE | ESE | ESE | ESE | SE | SSE | SSE | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSE | 24 | |
| 18 | SSW | E | ENE | NE | E | ENE | NE | ESE | ESE | NE | S | S | SW | W | SW | SW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | 24 | |
| 19 | W | WSW | SW | SSW | SSW | SW | SW | SSW | SW | SW | SW | SW | SW | SW | WSW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SSW | SSW | 24 | |
| 20 | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | S | NNE | NNE | NE | NE | NE | ENE | ENE | E | E | E | E | E | E | E | SE | 24 | |
| 21 | ESE | E | ENE | ENE | NNW | WNW | W | W | W | WNW | WNW | WNW | NW | NW | NW | NW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NW | 24 | |
| 22 | NW | NW | NW | NW | NW | NW | NW | WNW | WNW | W | WNW | WNW | WNW | WNW | WNW | W | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | WNW | 24 | |
| 23 | S | NNW | WNW | W | SE | NE | NE | NNE | E | NNE | NNE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | 24 | |
| 24 | NE | NE | NE | NE | NE | NNE | NNE | NE | NE | NE | ENE | NE | SSE | ESE | NE | ESE | ESE | E | ESE | SE | SE | ESE | ESE | ESE | E | 24 | | |
| 25 | ESE | ESE | ESE | ESE | E | ESE | ESE | E | SE | SE | SSE | SSE | SSW | S | S | S | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSE | 24 | |
| 26 | WSW | WNW | NW | NW | NW | NNW | N | NNE | N | NNE | NNE | NNE | N | N | N | NNE | NE | NE | NE | NE | ENE | NNE | NE | NE | N | 24 | | |
| 27 | N | WSW | SW | SSW | SSW | S | S | S | S | SSE | S | S | SSE | SSW | S | SE | SE | SE | SSE | S | S | SSW | SSW | SSW | S | 24 | | |
| 28 | SSW | SSW | SSW | SSW | SSW | SSW | WNW | NE | ENE | NE | NE | ENE | NE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | 24 | |
| 29 | ENE | NE | NE | NNE | NNE | NE | NE | NE | NE | NE | NE | NE | NE | NE | ENE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | 24 | |
| 30 | NE | NE | NE | NE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | N | N | N | NNW | N | NNW | NNW | NNW | SSW | S | NNE | 24 | |
| 31 | SSW | S | WSW | S | SSW | N | ESE | WNW | NE | N | NE | NE | S | SSE | SE | NNE | NE | E | SE | SSE | S | SSE | S | SSE | SSE | 24 | | |

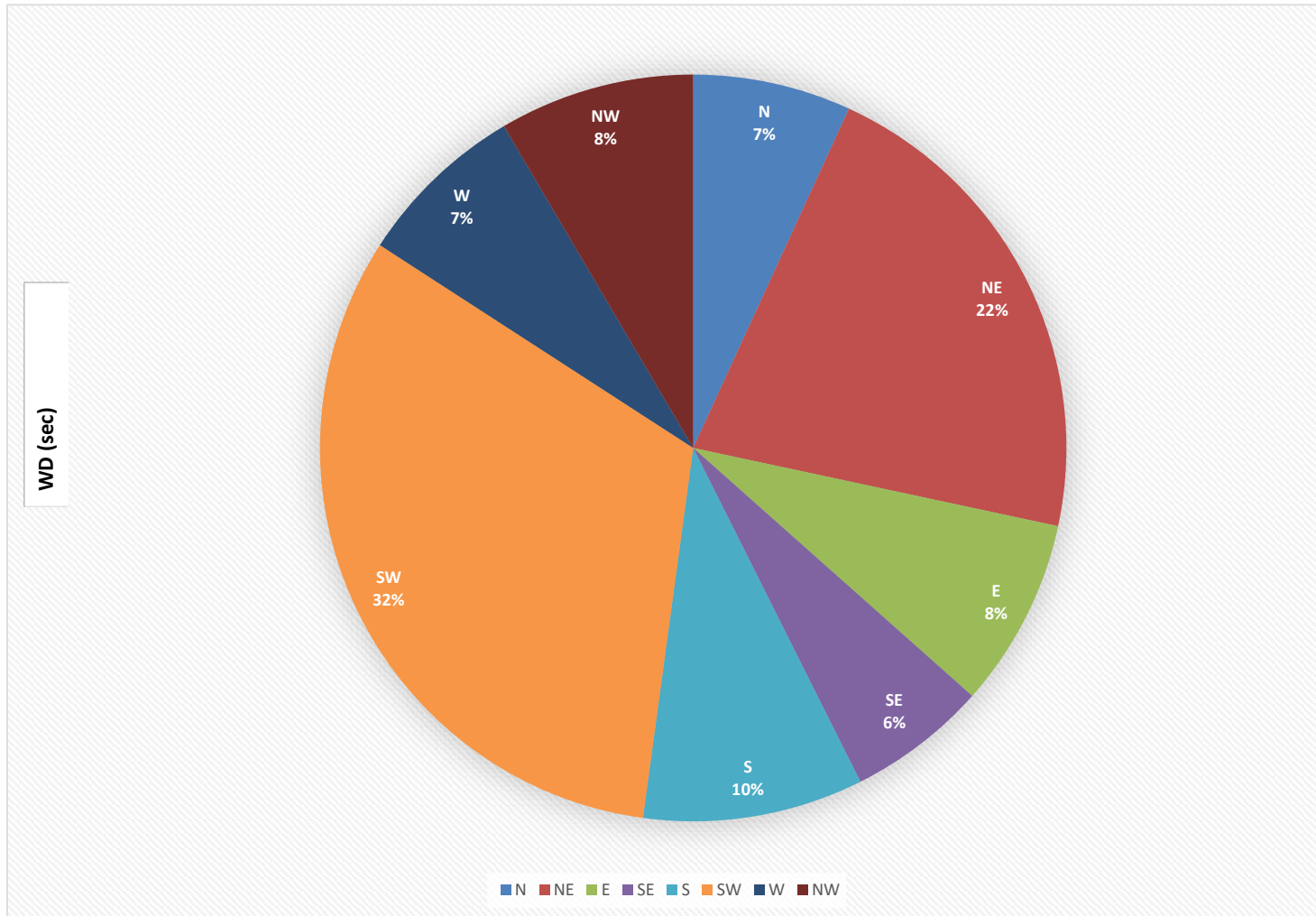
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | September 17, 2018 |
| DECLINATION : | MAGNETIC DECLINATION 19 DEGREE EAST |

| | | | | | |
|---------------------------|----|-----|-----------------------|-------|-------|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 744 | hrs |
| STANDARD DEVIATION: | 97 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 251 | (WSW) |

WIND DIRECTION Hourly Averages (WD)





STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 18 | 28 | 17 | 20 | 18 | 12 | 11 | 15 | 12 | 11 | 11 | 13 | 18 | 11 | 13 | 16 | 10 | 7 | 9 | 9 | 19 | 9 | 10 | 9 | 24 | |
| 2 | 10 | 9 | 11 | 12 | 12 | 17 | 11 | 16 | 20 | 17 | 21 | 13 | 13 | 20 | 15 | 19 | 14 | 22 | 16 | 15 | 13 | 7 | 10 | 17 | 24 | |
| 3 | 18 | 21 | 19 | 31 | 40 | 21 | 15 | 17 | 16 | 17 | 12 | 15 | 20 | 23 | 11 | 28 | 14 | 16 | 16 | 14 | 16 | 18 | 20 | 13 | 24 | |
| 4 | 11 | 10 | 10 | 12 | 11 | 8 | 6 | 9 | 11 | 12 | 9 | 13 | 10 | 16 | 17 | 11 | 7 | 26 | 12 | 16 | 18 | 12 | 8 | 8 | 24 | |
| 5 | 10 | 9 | 10 | 9 | 8 | 14 | 17 | 20 | 11 | 17 | 23 | 30 | 19 | 30 | 12 | 8 | 9 | 7 | 4 | 6 | 7 | 10 | 6 | 6 | 24 | |
| 6 | 7 | 6 | 10 | 15 | 15 | 17 | 13 | 6 | 7 | 8 | 8 | 9 | 10 | 7 | 7 | 8 | 9 | 10 | 4 | 7 | 7 | 6 | 5 | 8 | 24 | |
| 7 | 6 | 11 | 37 | 13 | 11 | 40 | 39 | 7 | 9 | 17 | 27 | 12 | 11 | 16 | 12 | 11 | 11 | 9 | 7 | 13 | 7 | 7 | 12 | 41 | 24 | |
| 8 | 61 | 38 | 15 | 35 | 23 | 28 | 16 | 14 | 9 | 6 | 6 | 10 | 9 | 9 | 6 | 7 | 10 | 15 | 7 | 3 | 9 | 6 | 5 | 6 | 24 | |
| 9 | 4 | 7 | 7 | 22 | 8 | 10 | 16 | 43 | 45 | 68 | 76 | 31 | 18 | 14 | 7 | 19 | 72 | 60 | 73 | 52 | 48 | 61 | 52 | 37 | 24 | |
| 10 | 22 | 66 | 60 | 54 | 54 | 70 | 58 | 73 | 57 | 76 | 66 | 32 | 27 | 18 | 13 | 22 | 12 | 20 | 7 | 8 | 6 | 5 | 5 | 13 | 24 | |
| 11 | 18 | 4 | 6 | 5 | 4 | 7 | 10 | 12 | 66 | 12 | 6 | 42 | 24 | 19 | 24 | 30 | 32 | 19 | 16 | 21 | 41 | 20 | 47 | 49 | 24 | |
| 12 | 32 | 45 | 34 | 55 | 26 | 7 | 9 | 9 | 4 | 9 | 8 | 14 | 14 | 9 | 11 | 14 | 10 | 6 | 8 | 4 | 4 | 4 | 7 | 5 | 24 | |
| 13 | 7 | 4 | 4 | 7 | 11 | 10 | 14 | 15 | 32 | 11 | 11 | 10 | 12 | 10 | 11 | 20 | 11 | 10 | 11 | 9 | 10 | 4 | 4 | 5 | 24 | |
| 14 | 4 | 5 | 8 | 9 | 4 | 6 | 67 | 20 | 27 | 27 | 14 | 14 | 20 | 33 | 16 | 26 | 33 | 34 | 24 | 49 | 35 | 21 | 33 | 33 | 24 | |
| 15 | 28 | 35 | 47 | 55 | 69 | 36 | 5 | 29 | 9 | 6 | 8 | 7 | 6 | 8 | 7 | 7 | 7 | 6 | 12 | 12 | 17 | 12 | 13 | 24 | 24 | |
| 16 | 20 | 11 | 22 | 53 | 59 | 80 | 46 | 40 | 31 | 25 | 20 | 15 | 43 | 13 | 17 | 10 | 14 | 22 | 13 | 15 | 19 | 12 | 13 | 16 | 24 | |
| 17 | 21 | 21 | 16 | 13 | 13 | 13 | 22 | 14 | 21 | 25 | 30 | 29 | 15 | 15 | 13 | 15 | 12 | 12 | 11 | 9 | 7 | 8 | 11 | 37 | 24 | |
| 18 | 28 | 39 | 34 | 12 | 35 | 48 | 32 | 58 | 60 | 52 | 70 | 75 | 30 | 33 | 12 | 32 | 8 | 7 | 5 | 9 | 6 | 21 | 16 | 39 | 24 | |
| 19 | 31 | 34 | 19 | 10 | 11 | 20 | 21 | 5 | 9 | 5 | 8 | 10 | 6 | 10 | 21 | 5 | 7 | 6 | 5 | 3 | 7 | 4 | 7 | 3 | 24 | |
| 20 | 5 | 5 | 4 | 5 | 4 | 4 | 8 | 5 | 7 | 9 | 12 | 56 | 12 | 16 | 16 | 13 | 15 | 14 | 13 | 15 | 13 | 10 | 11 | 13 | 24 | |
| 21 | 11 | 15 | 13 | 32 | 25 | 21 | 11 | 8 | 7 | 7 | 7 | 9 | 11 | 12 | 14 | 10 | 11 | 11 | 12 | 16 | 14 | 12 | 14 | 9 | 24 | |
| 22 | 11 | 12 | 10 | 13 | 12 | 12 | 15 | 10 | 16 | 9 | 12 | 22 | 9 | 13 | 10 | 10 | 18 | 15 | 15 | 15 | 47 | 8 | 34 | 32 | 24 | |
| 23 | 66 | 59 | 38 | 45 | 54 | 43 | 20 | 15 | 48 | 23 | 6 | 12 | 13 | 13 | 16 | 19 | 10 | 11 | 9 | 11 | 10 | 16 | 16 | 9 | 24 | |
| 24 | 7 | 11 | 11 | 15 | 23 | 7 | 13 | 19 | 15 | 17 | 22 | 31 | 27 | 63 | 19 | 33 | 20 | 13 | 21 | 14 | 19 | 20 | 14 | 15 | 24 | |
| 25 | 10 | 14 | 17 | 13 | 10 | 14 | 23 | 18 | 30 | 12 | 27 | 28 | 20 | 32 | 16 | 19 | 23 | 29 | 25 | 25 | 20 | 17 | 15 | 24 | 24 | |
| 26 | 34 | 18 | 18 | 14 | 12 | 14 | 15 | 10 | 13 | 7 | 12 | 23 | 30 | 28 | 25 | 8 | 24 | 12 | 13 | 15 | 22 | 13 | 19 | 19 | 24 | |
| 27 | 31 | 41 | 27 | 18 | 16 | 26 | 18 | 27 | 26 | 28 | 20 | 24 | 37 | 26 | 29 | 27 | 32 | 21 | 26 | 23 | 15 | 15 | 21 | 15 | 24 | |
| 28 | 13 | 21 | 18 | 12 | 37 | 68 | 41 | 26 | 22 | 25 | 21 | 18 | 21 | 16 | 16 | 12 | 12 | 12 | 13 | 13 | 20 | 16 | 17 | 14 | 24 | |
| 29 | 14 | 15 | 16 | 8 | 6 | 13 | 16 | 14 | 12 | 14 | 13 | 15 | 13 | 12 | 14 | 10 | 11 | 10 | 8 | 10 | 9 | 11 | 7 | 10 | 24 | |
| 30 | 8 | 8 | 7 | 6 | 5 | 5 | 4 | 4 | 5 | 6 | 6 | 7 | 6 | 6 | 5 | 7 | 7 | 18 | 17 | 13 | 17 | 39 | 19 | 55 | 24 | |
| 31 | 21 | 41 | 62 | 38 | 57 | 70 | 55 | 31 | 58 | 56 | 26 | 19 | 55 | 24 | 27 | 27 | 36 | 52 | 36 | 27 | 10 | 12 | 9 | 18 | 24 | |

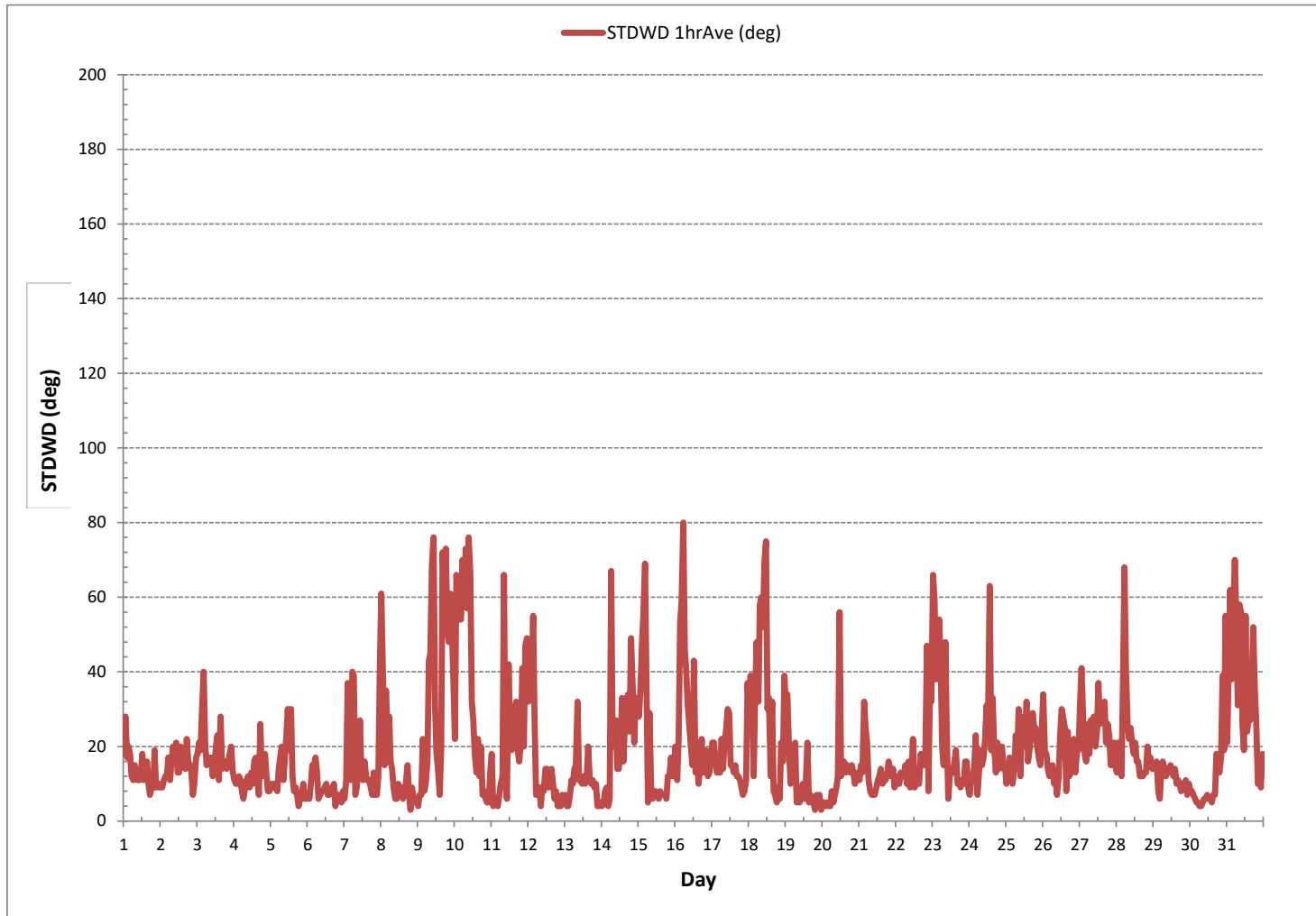
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: September 17, 2018

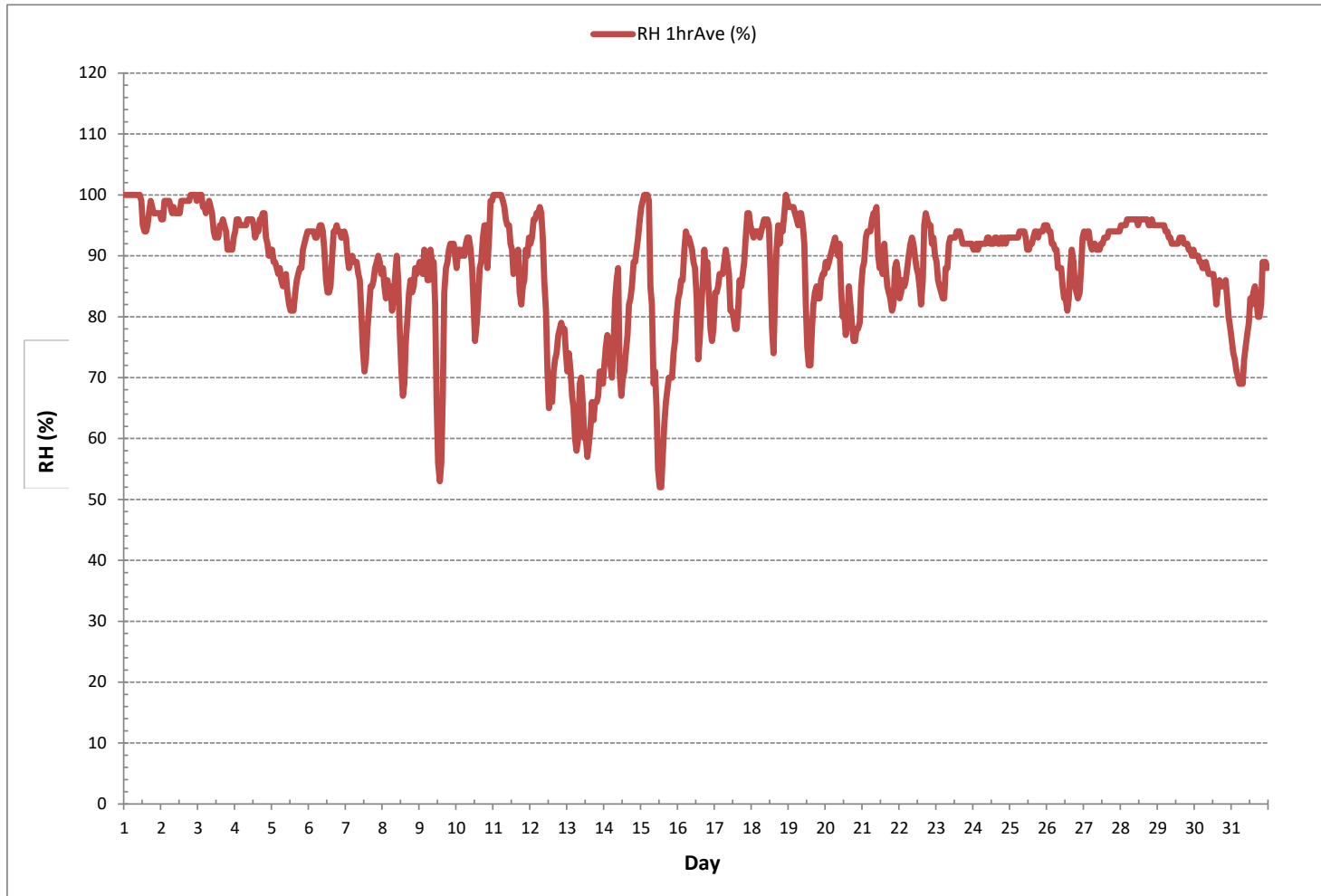
CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



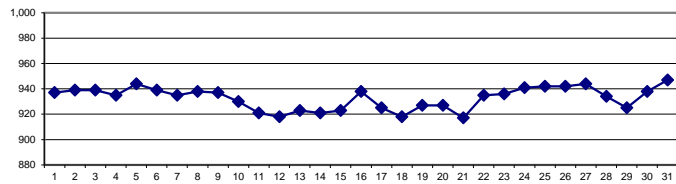
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 934 | 934 | 935 | 935 | 935 | 936 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 937 | 937 | 938 | 938 | 938 | 938 | 938 | 939 | 939 | 939 | 939 | 939 | 934 | 939 | 937 | 24 |
| 2 | 939 | 939 | 939 | 938 | 938 | 938 | 938 | 938 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 938 | 939 | 939 | 24 |
| 3 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 24 |
| 4 | 939 | 938 | 938 | 937 | 937 | 936 | 936 | 935 | 935 | 934 | 934 | 933 | 932 | 932 | 931 | 931 | 932 | 932 | 932 | 933 | 933 | 934 | 936 | 937 | 931 | 939 | 935 | 24 | |
| 5 | 939 | 940 | 941 | 942 | 943 | 944 | 944 | 945 | 945 | 946 | 946 | 946 | 946 | 946 | 945 | 945 | 944 | 944 | 943 | 943 | 942 | 942 | 942 | 942 | 939 | 946 | 944 | 24 | |
| 6 | 941 | 941 | 941 | 940 | 940 | 940 | 940 | 939 | 939 | 939 | 939 | 939 | 938 | 938 | 938 | 938 | 938 | 938 | 937 | 937 | 937 | 937 | 938 | 938 | 937 | 941 | 939 | 24 | |
| 7 | 938 | 938 | 938 | 937 | 937 | 936 | 936 | 935 | 935 | 935 | 935 | 935 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 934 | 935 | 935 | 935 | 935 | 934 | 938 | 935 | 24 | |
| 8 | 936 | 937 | 937 | 937 | 937 | 937 | 938 | 938 | 938 | 938 | 938 | 938 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 939 | 940 | 940 | 940 | 936 | 940 | 938 | 24 | |
| 9 | 940 | 940 | 940 | 940 | 939 | 939 | 939 | 939 | 939 | 939 | 938 | 939 | 938 | 938 | 938 | 937 | 936 | 936 | 935 | 934 | 934 | 934 | 934 | 933 | 933 | 940 | 937 | 24 | |
| 10 | 933 | 932 | 932 | 932 | 931 | 931 | 931 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 933 | 930 | 24 | |
| 11 | 930 | 929 | 929 | 929 | 928 | 928 | 927 | 926 | 925 | 924 | 923 | 922 | 921 | 920 | 919 | 917 | 916 | 915 | 914 | 913 | 913 | 912 | 912 | 912 | 912 | 930 | 921 | 24 | |
| 12 | 911 | 912 | 912 | 912 | 912 | 913 | 914 | 914 | 915 | 916 | 917 | 918 | 918 | 919 | 920 | 921 | 921 | 922 | 923 | 923 | 923 | 924 | 924 | 924 | 911 | 924 | 918 | 24 | |
| 13 | 924 | 923 | 923 | 922 | 921 | 921 | 920 | 920 | 920 | 920 | 920 | 921 | 921 | 922 | 922 | 923 | 923 | 924 | 925 | 925 | 926 | 926 | 927 | 927 | 920 | 927 | 923 | 24 | |
| 14 | 927 | 927 | 927 | 927 | 927 | 926 | 926 | 925 | 924 | 923 | 923 | 922 | 921 | 921 | 920 | 919 | 918 | 917 | 916 | 914 | 913 | 913 | 912 | 912 | 912 | 927 | 921 | 24 | |
| 15 | 912 | 911 | 911 | 911 | 911 | 912 | 913 | 914 | 916 | 919 | 921 | 922 | 923 | 924 | 925 | 927 | 929 | 930 | 932 | 933 | 934 | 936 | 937 | 938 | 911 | 938 | 923 | 24 | |
| 16 | 939 | 939 | 940 | 940 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 940 | 939 | 939 | 938 | 937 | 937 | 936 | 935 | 934 | 933 | 932 | 932 | 932 | 932 | 941 | 938 | 24 | |
| 17 | 931 | 929 | 928 | 927 | 927 | 926 | 925 | 925 | 924 | 924 | 924 | 924 | 924 | 923 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 923 | 923 | 931 | 925 | 24 | |
| 18 | 923 | 922 | 921 | 921 | 920 | 919 | 918 | 918 | 918 | 917 | 917 | 916 | 916 | 917 | 917 | 917 | 916 | 917 | 917 | 917 | 918 | 918 | 919 | 919 | 916 | 923 | 918 | 24 | |
| 19 | 920 | 921 | 922 | 922 | 923 | 923 | 924 | 924 | 925 | 926 | 927 | 928 | 928 | 929 | 929 | 930 | 930 | 930 | 931 | 931 | 931 | 932 | 932 | 932 | 920 | 932 | 927 | 24 | |
| 20 | 933 | 933 | 933 | 934 | 934 | 933 | 933 | 933 | 932 | 932 | 932 | 931 | 930 | 929 | 927 | 926 | 923 | 922 | 920 | 919 | 917 | 915 | 913 | 912 | 912 | 934 | 927 | 24 | |
| 21 | 911 | 910 | 909 | 909 | 909 | 910 | 911 | 911 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 | 921 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 909 | 929 | 917 | 24 | |
| 22 | 930 | 930 | 931 | 932 | 933 | 933 | 934 | 935 | 935 | 936 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 938 | 938 | 937 | 938 | 938 | 938 | 937 | 930 | 938 | 935 | 24 | |
| 23 | 937 | 937 | 937 | 937 | 937 | 936 | 936 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 935 | 936 | 936 | 936 | 937 | 937 | 937 | 937 | 938 | 935 | 938 | 936 | 24 | |
| 24 | 938 | 938 | 939 | 939 | 939 | 940 | 940 | 940 | 940 | 941 | 941 | 941 | 941 | 941 | 941 | 941 | 942 | 942 | 941 | 942 | 942 | 942 | 942 | 942 | 938 | 942 | 941 | 24 | |
| 25 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 941 | 942 | 942 | 941 | 942 | 942 | 24 | |
| 26 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 942 | 943 | 942 | 942 | 942 | 941 | 942 | 942 | 942 | 942 | 943 | 943 | 944 | 944 | 944 | 944 | 941 | 944 | 942 | 24 | |
| 27 | 944 | 945 | 945 | 945 | 945 | 945 | 945 | 945 | 946 | 946 | 946 | 946 | 945 | 945 | 945 | 944 | 944 | 944 | 944 | 944 | 943 | 943 | 942 | 942 | 942 | 946 | 944 | 24 | |
| 28 | 941 | 941 | 940 | 940 | 939 | 938 | 938 | 937 | 937 | 937 | 937 | 935 | 934 | 933 | 933 | 932 | 932 | 931 | 930 | 929 | 929 | 929 | 928 | 928 | 928 | 941 | 934 | 24 | |
| 29 | 928 | 928 | 928 | 928 | 928 | 927 | 927 | 927 | 927 | 926 | 925 | 925 | 924 | 923 | 922 | 922 | 922 | 921 | 921 | 922 | 922 | 922 | 922 | 923 | 921 | 928 | 925 | 24 | |
| 30 | 923 | 924 | 925 | 926 | 927 | 929 | 931 | 932 | 934 | 935 | 937 | 938 | 939 | 940 | 942 | 944 | 945 | 946 | 947 | 949 | 950 | 950 | 951 | 952 | 923 | 952 | 938 | 24 | |
| 31 | 952 | 953 | 953 | 953 | 953 | 953 | 953 | 953 | 952 | 951 | 950 | 948 | 947 | 946 | 946 | 945 | 945 | 946 | 947 | 949 | 950 | 950 | 951 | 952 | 936 | 953 | 947 | 24 | |
| HOURLY MAX | 952 | 953 | 953 | 953 | 953 | 953 | 953 | 953 | 952 | 951 | 950 | 948 | 947 | 946 | 946 | 945 | 945 | 946 | 947 | 949 | 950 | 950 | 951 | 952 | | | | | |
| HOURLY AVG | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | | | | | |

STATUS FLAG CODES

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

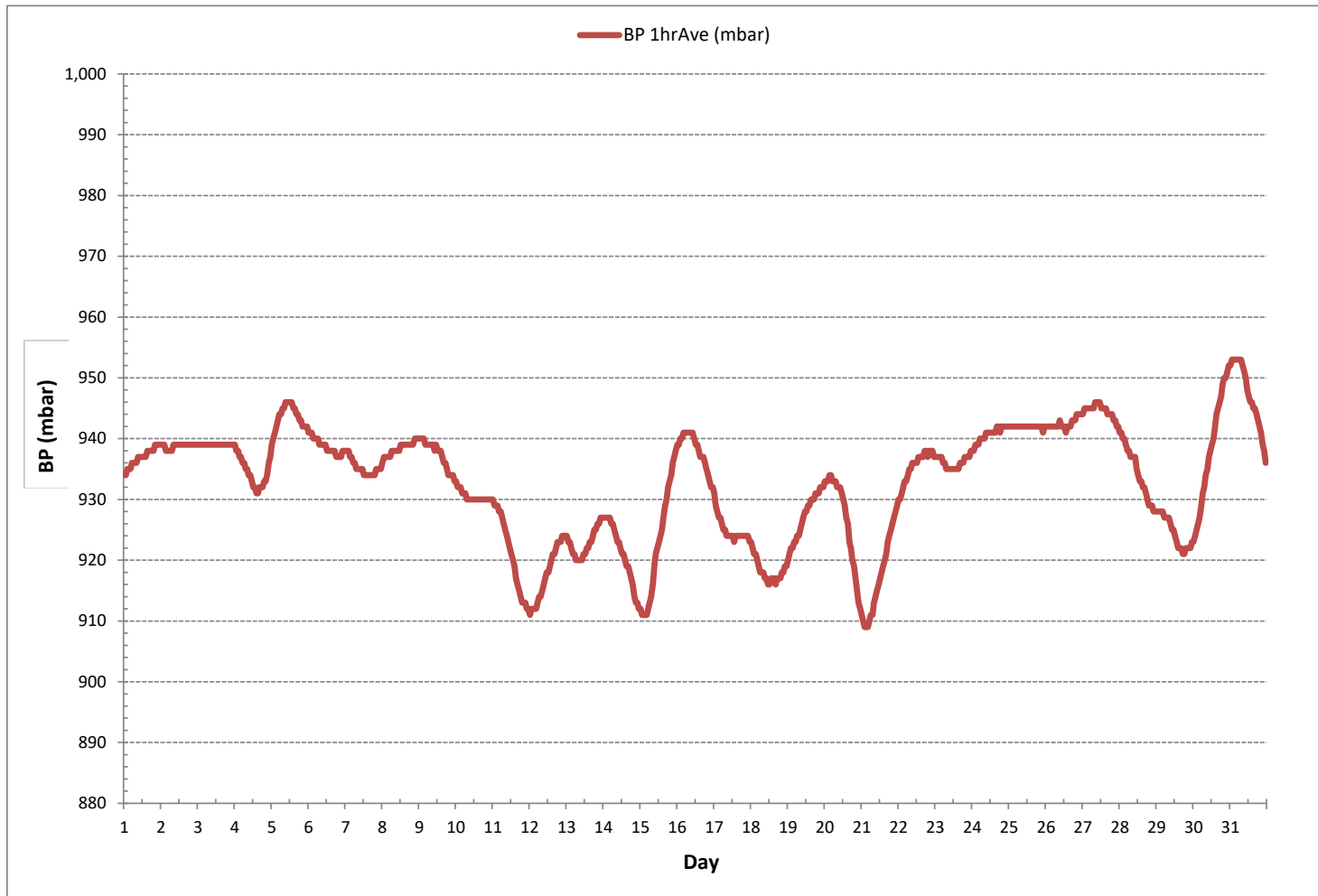
24 HR AVERAGES December 2018



MONTHLY SUMMARY

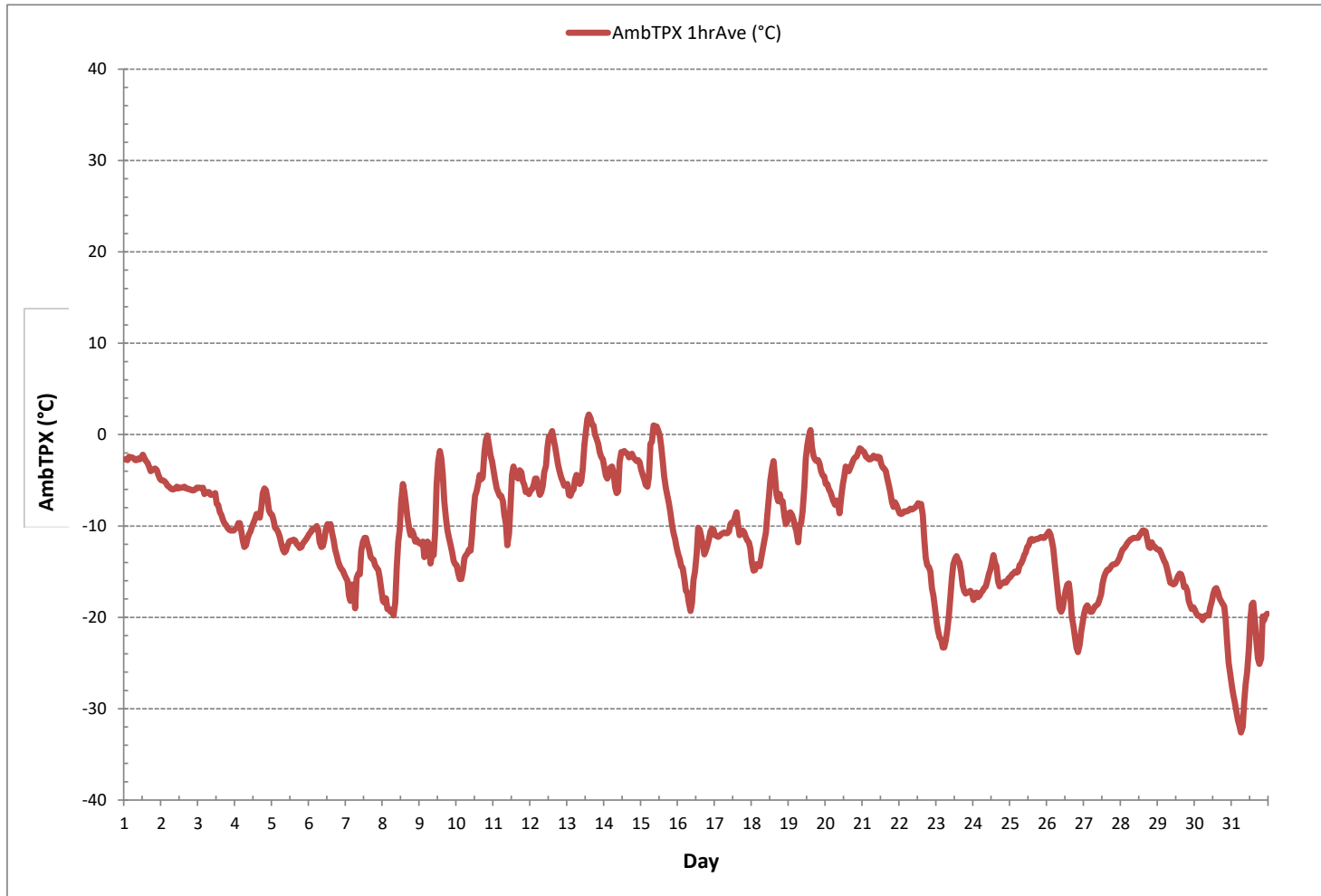
| | | | | | | |
|------------------------|-----|------|--------|---|------------------|----------|
| MINIMUM 1-HR AVERAGE: | 909 | mbar | @ HOUR | 2 | ON DAY | 21 |
| MAXIMUM 1-HR AVERAGE: | 953 | mbar | @ HOUR | 1 | ON DAY | 31 |
| MAXIMUM 24-HR AVERAGE: | 947 | mbar | | | ON DAY | 31 |
| OPERATIONAL TIME: | | | | | | 744 hrs |
| AMD OPERATION UPTIME: | | | | | | 100.0 % |
| STANDARD DEVIATION: | 10 | | | | MONTHLY AVERAGE: | 933 mbar |

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

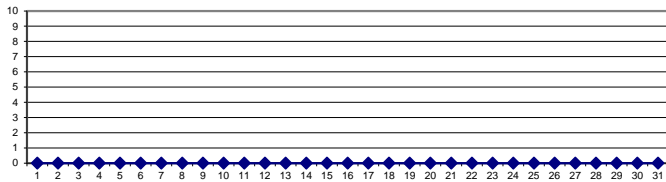
PRECIPITATION Hourly TOTALS (mm)

| 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. | SUM | | | | | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 10 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 11 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 13 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 15 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 16 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 17 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 18 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 19 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 21 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 22 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 23 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 25 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 26 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 27 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 30 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 31 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| HOURLY MAX | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| HOURLY SUM | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

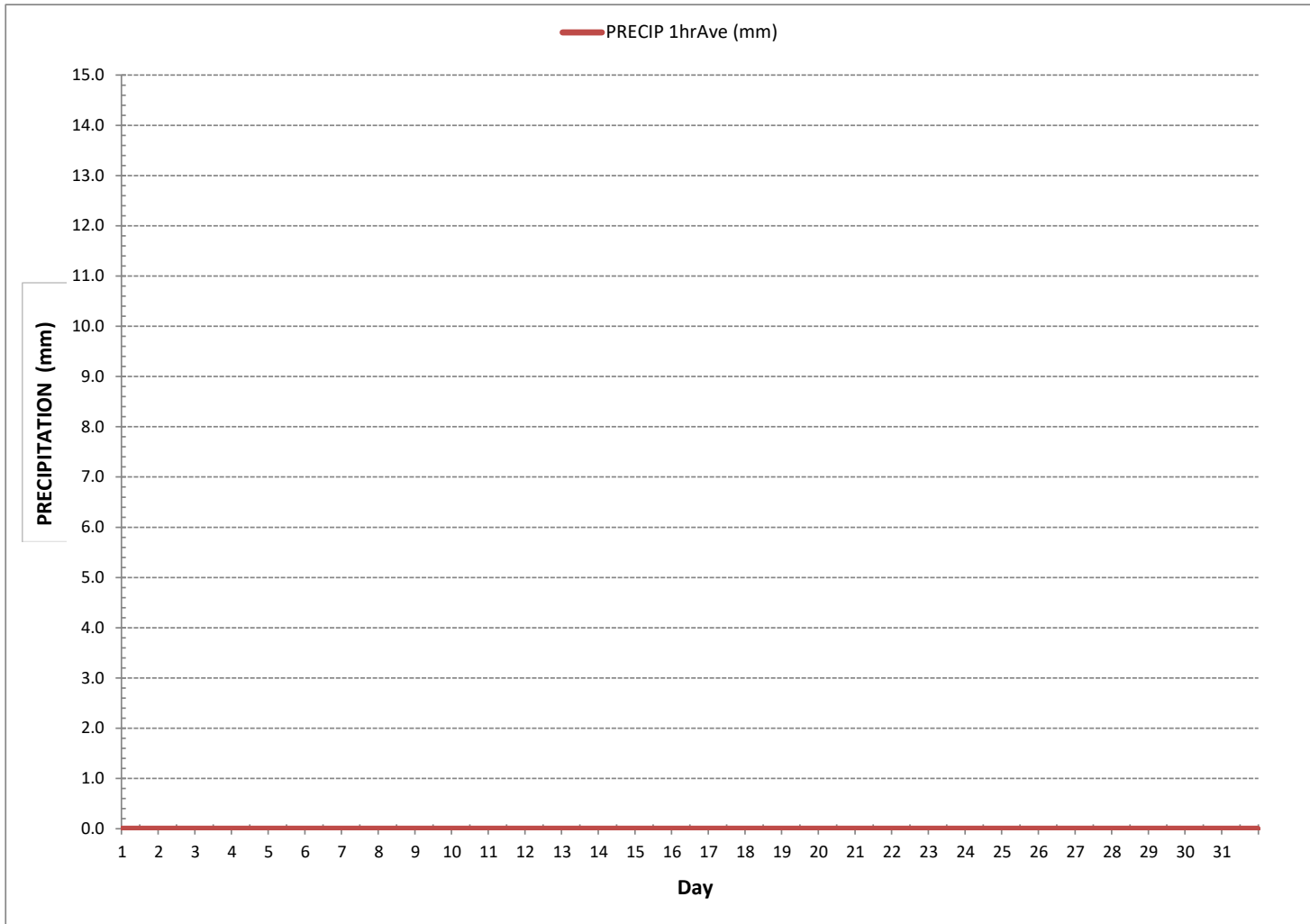
24 HR TOTALS December 2018



MONTHLY SUMMARY

| | | | | | | |
|-----------------------|-----|----|----------------|---|--------|---------|
| MINIMUM 1-HR TOTAL: | 0.0 | mm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR TOTAL: | 0.0 | mm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 24-HR TOTAL: | 0.0 | mm | | | ON DAY | 1 |
| OPERATIONAL TIME: | | | | | | 744 hrs |
| AMD OPERATION UPTIME: | | | | | | 100.0 % |
| STANDARD DEVIATION: | 0.0 | | MONTHLY TOTAL: | | | 0.0 mm |

PRECIPITATION Hourly TOTALS (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

| | | | | | |
|--------------------------|-------------------|--|---------------------------------------|------------|-----------|
| Date: | December 4, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 933 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Maskwa | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | routine monthly | | |
| Start Time 24 hr. (mst): | 11:09 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 16:05 | Cal Gas Expiry Date: | October 24, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | 1180930031 LICA | Range ppb: | 1000 | | |
| Last Calibration Date: | November 27, 2018 | As Found C.F.: | 1.002 | | |
| Previous C.F.: | 1.000 | New C.F.: | 1.001 | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2 | Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table> | Point | ppb | High | 780 | Mid | 380 | Low | 190 |
|---|---|-------|-----|------|-----|-----|-----|-----|-----|
| Point | ppb | | | | | | | | |
| High | 780 | | | | | | | | |
| Mid | 380 | | | | | | | | |
| Low | 190 | | | | | | | | |

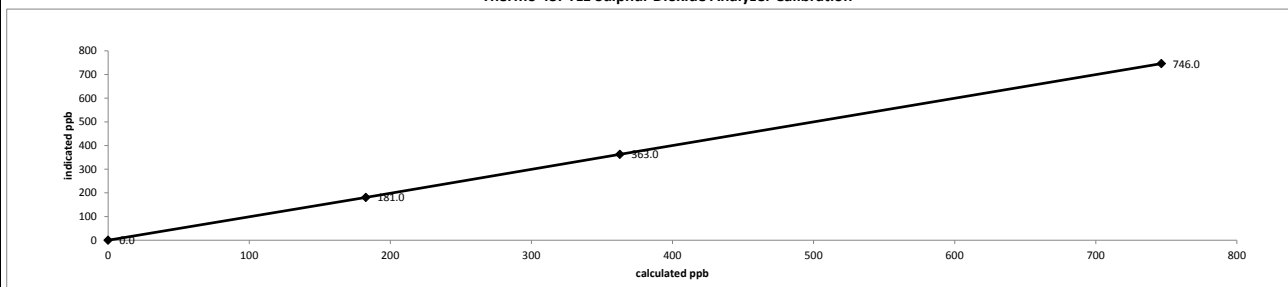
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| as found zero | 5007 | 0.00 | 5007 | 0.0 | 0 | n/a |
| as found high | 4934 | 76.01 | 5010 | 746.4 | 745 | 1.002 |
| adjusted zero | 5007 | 0.00 | 5007 | 0.0 | 0 | n/a |
| adjusted high | 4934 | 76.01 | 5010 | 746.4 | 746 | 1.001 |
| mid | 4925 | 36.58 | 4962 | 362.7 | 363 | 0.999 |
| low | 4933 | 18.38 | 4951 | 182.6 | 181 | 1.009 |
| calibrator zero | 5007 | 0.00 | 5007 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 1.003 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.000 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.05% | | ± 3% F.S. |
| % change in C.F. from last cal = | -0.19% | | ± 10% |

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



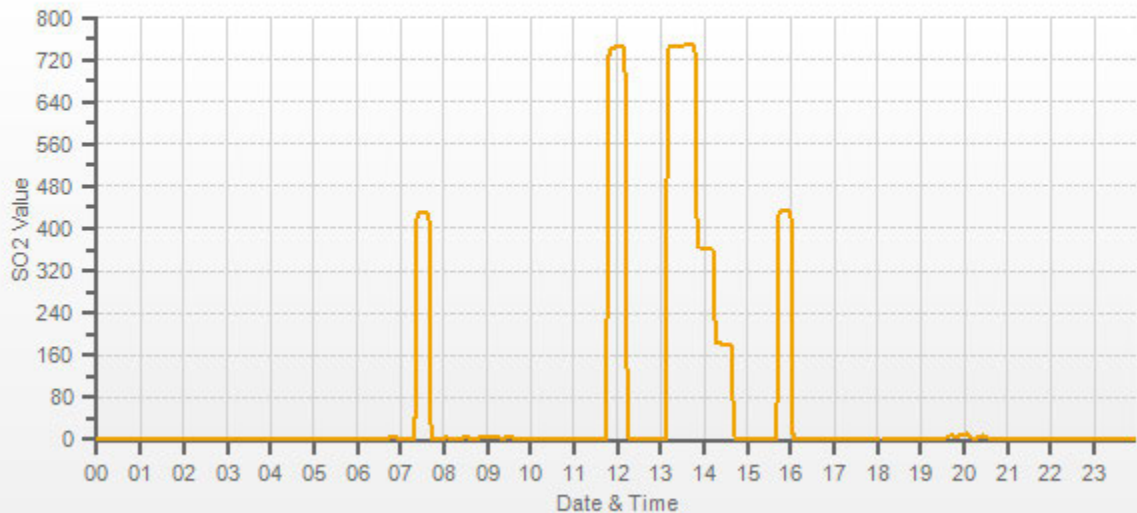
| As found: | | As left: | |
|-------------------|--------|-------------------|--------|
| Bkg: | 2.11 | Bkg: | 2.11 |
| Coef: | 0.960 | Coef: | 0.961 |
| Pmt: | -700.8 | Pmt: | -700.4 |
| Flash: | 991 | Flash: | 992 |
| Internal: | 29.8 | Internal: | 30.3 |
| Chamber: | 45.0 | Chamber: | 45.2 |
| Perm Oven Gas: | 35.00 | Perm Oven Gas: | 35.00 |
| Perm Oven Heater: | 34.25 | Perm Oven Heater: | 34.26 |
| Pressure: | 670.1 | Pressure: | 668.6 |
| Sample Flow: | 0.458 | Sample Flow: | 0.458 |
| Lamp Intensity: | 90 | Lamp Intensity: | 90 |
| Converter: | n/a | Converter: | n/a |
| Converter Set: | n/a | Converter Set: | n/a |
| Averaging Time: | 120 | Averaging Time: | 120 |
| Expected Value: | 435.0 | Expected Value: | 431.0 |

Comments:

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

SO2[ppb] Station: LICA MASKWA Daily: 18/12/04 Type: AVG 1 Min. [1 Min.]

— SO2[ppb]



HYDROGEN SULPHIDE



Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | | | |
|--------------------------|----------------------|--|---------------------------------------|------------|-----------|
| Date: | December 5, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 945 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Maskwa | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | routine monthly | | |
| Start Time 24 hr. (mst): | 12:42 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 18:24 | Cal Gas Expiry Date: | October 20, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | CM 17360005 Maxxam | Range ppb: | 100 | | |
| Last Calibration Date: | November 27, 2018 | As Found C.F.: | 0.995 | | |
| Previous C.F.: | 1.000 | New C.F.: | 0.998 | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55 | Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 | SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 12:52 / 13:08 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0 |
|--|--|-------|-----|------|----|-----|----|-----|----|---|
| Point | ppb | | | | | | | | | |
| High | 78 | | | | | | | | | |
| Mid | 38 | | | | | | | | | |
| Low | 19 | | | | | | | | | |

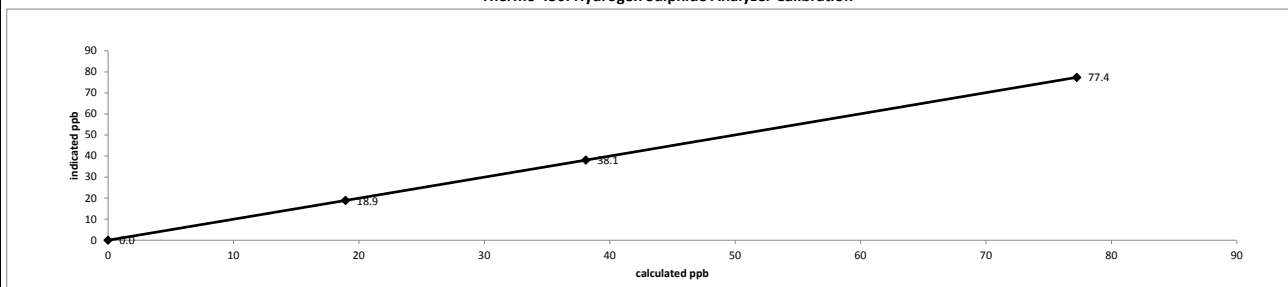
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| as found zero | 7559 | 0.00 | 7559 | 0.0 | 0 | n/a |
| as found high | 7484 | 61.02 | 7545 | 77.2 | 77.6 | 0.995 |
| adjusted zero | 7559 | 0.00 | 7559 | 0.0 | 0 | n/a |
| adjusted high | 7484 | 61.02 | 7545 | 77.2 | 77.4 | 0.998 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.1 | 1.000 |
| low | 7554 | 15.00 | 7569 | 18.9 | 18.9 | 1.001 |
| calibrator zero | 7559 | 0.00 | 7559 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|-------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 0.998 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.04% | | ± 3% F.S. |
| % change in C.F. from last cal = | 0.47% | | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



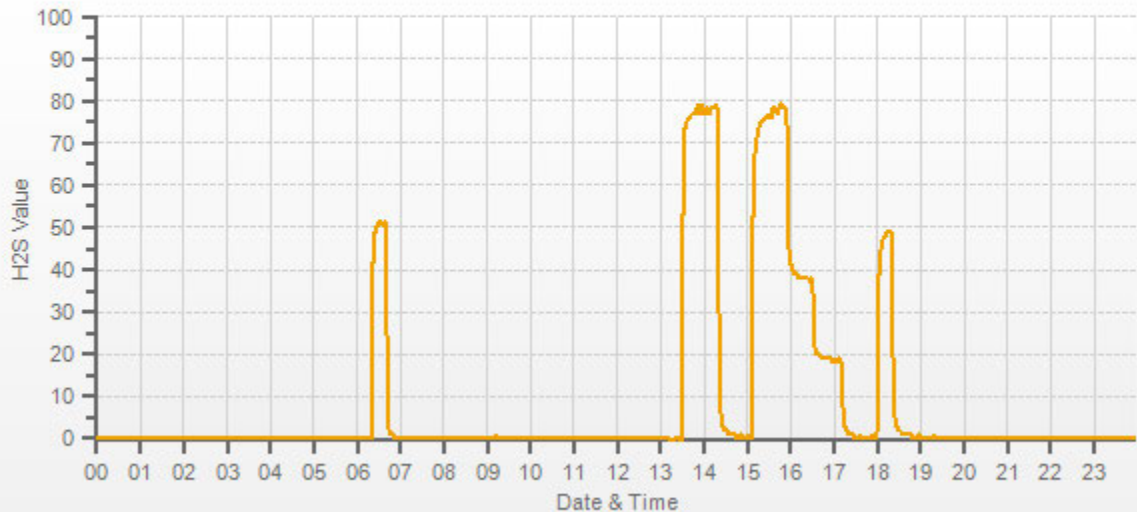
| As found: | | As left: | |
|-----------------|--------|-----------------|--------|
| Bkg: | 19.0 | Bkg: | 19.4 |
| Coef: | 0.857 | Coef: | 0.876 |
| Pmt: | -602.0 | Pmt: | -602.4 |
| Flash: | 809 | Flash: | 809 |
| Internal: | 34.4 | Internal: | 34.2 |
| Chamber: | 45.1 | Chamber: | 45.0 |
| Converter Temp: | 323.6 | Converter Temp: | 325.2 |
| Converter Set: | 325.0 | Converter Set: | 352.0 |
| Perm Oven Gas: | 35.00 | Perm Oven Gas: | 35.00 |
| Perm Oven Htr: | 34.28 | Perm Oven Htr: | 34.30 |
| Pressure: | 573.7 | Pressure: | 573.1 |
| Sample Flow: | 0.954 | Sample Flow: | 0.956 |
| Lamp Intensity: | 90 | Lamp Intensity: | 91 |
| Averaging Time: | 120 | Averaging Time: | 120 |
| Expected Value: | 50.1 | Expected Value: | 49.5 |

Comments:

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

H2S[ppb] Station: LICA MASKWA Daily: 18/12/05 Type: AVG 1 Min. [1 Min.]

— H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | |
|---|---|------------|-----------|
| Date: December 12, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 920 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Maskwa | Weather Conditions: Cloudy/Overcast | | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: repeat | | |
| Start Time 24 hr. (mst): 15:13 | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): 18:52 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: Serial Number/Owner: CM 17360005 Maxxam | Range ppb: 100 | | |
| Last Calibration Date: December 5, 2018 | As Found C.F.: 0.943 | | |
| Previous C.F.: 0.998 | New C.F.: 0.999 | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
|--|--|-------|-----|------|----|-----|----|-----|----|
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |

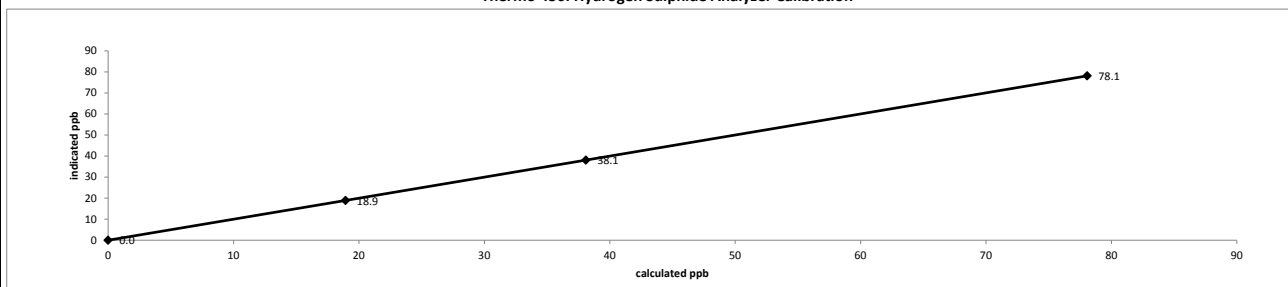
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| as found zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| as found high | 7413 | 61.09 | 7474 | 78.1 | 82.8 | 0.943 |
| adjusted zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| adjusted high | 7413 | 61.09 | 7474 | 78.1 | 78.1 | 0.999 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.1 | 1.000 |
| low | 7554 | 15.00 | 7569 | 18.9 | 18.9 | 1.001 |
| calibrator zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|-------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 0.999 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.02% | | ± 3% F.S. |
| % change in C.F. from last cal = | 5.54% | | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



| | |
|---|--|
| As found: Bkg: 19.8 Coef: 0.867 Pmt: -602.0 Flash: 811 Internal: 34.1 Chamber: 45.1 Converter Temp: 327.5 Converter Set: 325.0 Perm Oven Gas: 35.00 Perm Oven Htr: 34.29 Pressure: 558.5 Sample Flow: 0.936 Lamp Intensity: 90 Averaging Time: 120 Expected Value: 49.5 | As left: Bkg: 18.6 Coef: 0.827 Pmt: -602.0 Flash: 809 Internal: 33.9 Chamber: 45.1 Converter Temp: 322.6 Converter Set: 325.0 Perm Oven Gas: 35.00 Perm Oven Htr: 34.32 Pressure: 560.0 Sample Flow: 0.937 Lamp Intensity: 90 Averaging Time: 120 Expected Value: 50.4 |
|---|--|

Comments:

The manifold blower was found to be working normally.

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

A repeat calibration was completed to correct SPAN drift. SO2 scrubber was tested during a monthly calibration on Dec 5.

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

H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | | | |
|--------------------------|----------------------|--|---------------------------------------|------------|-----------|
| Date: | December 31, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 944 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Maskwa | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | repeat | | |
| Start Time 24 hr. (mst): | 16:08 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 20:45 | Cal Gas Expiry Date: | October 20, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | | | | |
| Serial Number/Owner: | CM 17360005 Maxxam | Range ppb: | 100 | | |
| Last Calibration Date: | December 12, 2018 | As Found C.F.: | 1.065 | | |
| Previous C.F.: | 0.999 | New C.F.: | 0.999 | | |

| | | | | | | | | | |
|---|--|-------|-----|------|----|-----|----|-----|----|
| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55 | Standard Calibration Points for Ranges <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |

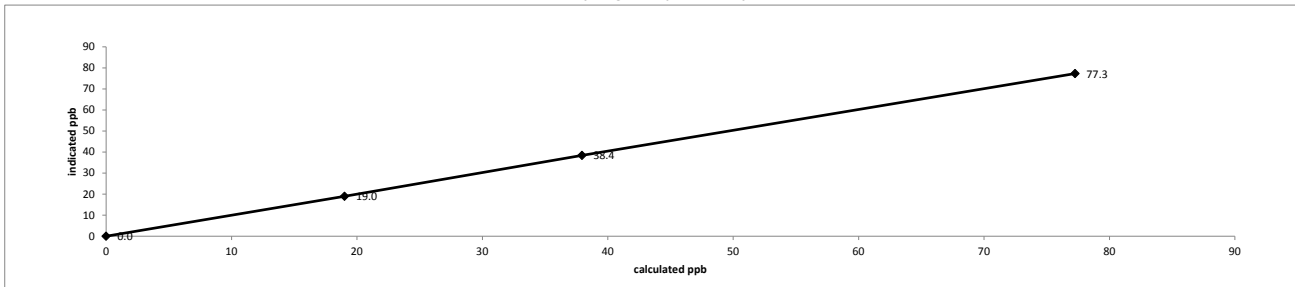
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| as found zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| as found high | 7479 | 61.03 | 7540 | 77.3 | 72.6 | 1.065 |
| adjusted zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| adjusted high | 7479 | 61.00 | 7540 | 77.3 | 77.3 | 0.999 |
| mid | 7420 | 29.60 | 7450 | 37.9 | 38.4 | 0.988 |
| low | 7420 | 14.80 | 7435 | 19.0 | 19 | 1.001 |
| calibrator zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| Average C.F. = | | | | | | 0.996 |

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 0.999 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.08% | | ± 3% F.S. |
| % change in C.F. from last cal = | -6.58% | | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



| As found: | | As left: | |
|-----------------|--------|-----------------|--------|
| Bkg: | 18.3 | Bkg: | 19.9 |
| Coef: | 0.927 | Coef: | 0.894 |
| Pmt: | -602.7 | Pmt: | -601.6 |
| Flash: | 815 | Flash: | 812 |
| Internal: | 33.8 | Internal: | 33.7 |
| Chamber: | 45.1 | Chamber: | 45.2 |
| Converter Temp: | 326.0 | Converter Temp: | 330.2 |
| Converter Set: | 325.0 | Converter Set: | 325.0 |
| Perm Oven Gas: | 35.00 | Perm Oven Gas: | 35.00 |
| Perm Oven Htr: | 34.32 | Perm Oven Htr: | 34.29 |
| Pressure: | 572.5 | Pressure: | 571.0 |
| Sample Flow: | 0.956 | Sample Flow: | 0.955 |
| Lamp Intensity: | 90 | Lamp Intensity: | 90 |
| Averaging Time: | 120 | Averaging Time: | 120 |
| Expected Value: | 50.4 | Expected Value: | 49.2 |

Comments:

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

Repeat calibration to correct SPAN drift. SO2 scrubber was tested during a monthly calibration on Dec 5.

H2S[ppb] Station: LICA MASKWA Daily: 18/12/31 Type: AVG 1 Min. [1 Min.]

H2S[ppb]



TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | | | |
|------------------------------|------------------|---------------------------|---------------------------------------|------------|-----------|
| Date: | December 5, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 945 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Maskwa | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | CH4 / NMHC / THC | Calibration Purpose: | installation | | |
| Start/End Time 24 hr. (mst): | 12:42 / 15:44 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| Calibration Method: | Gas Dilution | Cal Gas Expiry Date: | October 18, 2025 | | |

| | | | | |
|------------------------|-----------------------|---------------------|----------------|-----------|
| Analyzer: | | Correction Factors: | | |
| Serial Number/Owner: | 1108930026 LICA | Previous C.F.: | As Found C.F.: | New C.F.: |
| Measured Flow: | 1112 | CH ₄ = | n/a | 1.000 |
| Last Calibration Date: | n/a | NMHC = | n/a | 1.000 |
| Range ppm: | 20 CH4/20 NMHC/40 THC | THC = | n/a | 1.000 |

| | | | | | |
|--|---|--|-------|-------|-------|
| Calibration Standards: | | Standard Calibration Points for Analyzer Range of 20/20/40 ppm | | | |
| Low Flow Meter ID/Expiry Date: | Defender Low 152019 expires December 13, 2018 | Point | CH4 | NMHC | THC |
| High Flow Meter ID/Expiry Date: | Defender High 148944 expires December 13, 2018 | High | 13.00 | 13.00 | 26.00 |
| Calibrator ID/Expiry Date: | Sabio id# 11900613 expires August 22, 2019 | Mid | 7.00 | 7.00 | 14.00 |
| Cal Gas Cylinder I.D. #: | LL 119471 | Low | 3.00 | 3.00 | 6.00 |
| CH4 Cylinder Conc. = | 599.0 207.0 =C ₂ H ₆ Cylinder Conc. | | | | |
| CH ₄ expressed as C ₂ H ₆ = | 569.3 1168.3 =total CH4 equivalent | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated | | | | | | Correction Factors: | | |
|--------------------------------|---------|---------|------------|-----------------------|------------|-----------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| Point | Diluent | Cal Gas | Total Flow | CH ₄ (ppm) | NMHC (ppm) | THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | CH ₄ | NMHC | THC |
| adjusted zero | 2501 | 0.00 | 2501 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| adjusted high | 2444 | 55.43 | 2499 | 13.29 | 12.63 | 25.91 | 13.29 | 12.63 | 25.92 | 1.000 | 1.000 | 1.000 |
| mid | 2441 | 29.90 | 2471 | 7.25 | 6.89 | 14.14 | 7.24 | 6.86 | 14.10 | 1.001 | 1.004 | 1.003 |
| low | 2481 | 12.90 | 2494 | 3.10 | 2.94 | 6.04 | 3.14 | 2.93 | 6.07 | 0.987 | 1.005 | 0.995 |
| calibrator zero | 2501 | 0.00 | 2501 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| Average C.F. = | | | | | | | | | | 0.996 | 1.003 | 0.999 |

| | | | | |
|--|-----------------|--------|-------|--------------|
| Linear Regression/Calibration Results: | | | | |
| Correlation Coefficient = | CH ₄ | NMHC | THC | LIMITS |
| Slope = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| b (Intercept as % of full scale) = | 0.999 | 1.000 | 1.000 | 0.95-1.05 |
| % change in C.F. from last cal = | 0.08% | -0.06% | 0.01% | ± 3% F.S. |
| | n/a | n/a | n/a | n/a |

As Left Instrument Diagnostics:

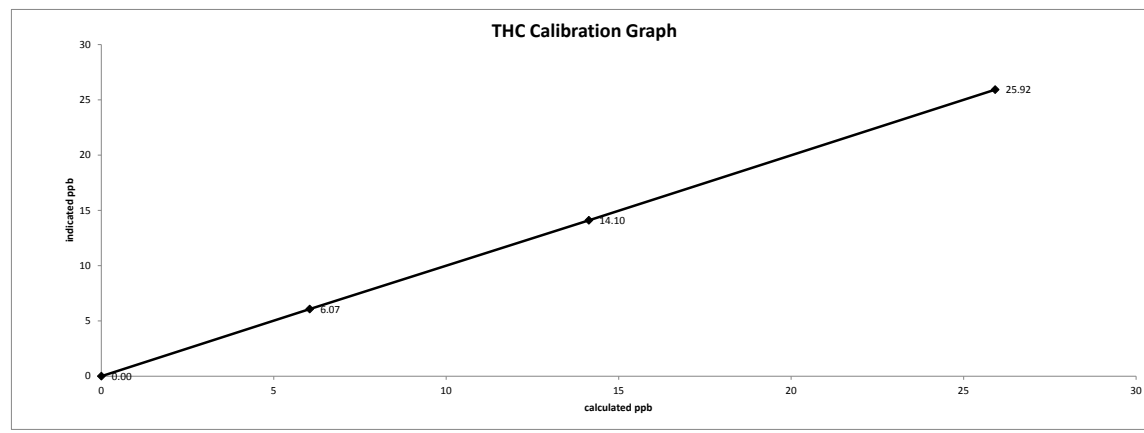
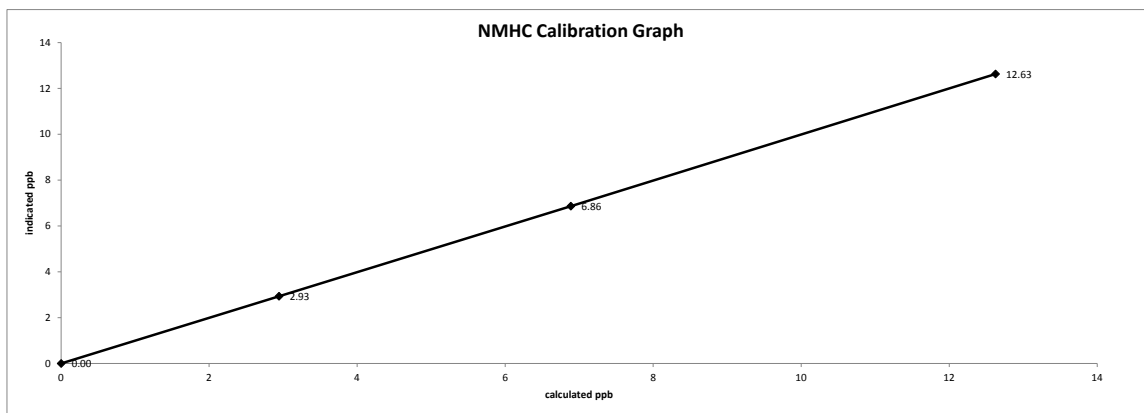
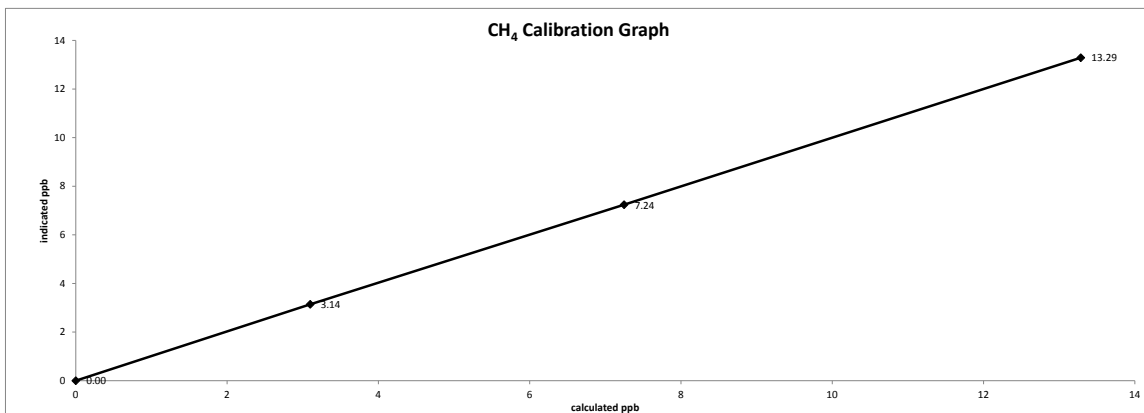
| | | | | | |
|---------------------------|----------------------------|--------------------|----------------------------|----------------------------|-------------|
| Interface Board Voltages: | Bias Supply: | -300.8 | Calibration History cnt'd: | NM Peak Area: | n/a |
| Temperatures: | Detector Oven: | 175.0 | Crucial Settings: | Methane Start: | n/a |
| | Filter: | 175.0 | | Methane End: | n/a |
| | Column Oven: | 75.0 | | Backflush: | n/a |
| | Internal: | 28.7 | | NMHV Start: | n/a |
| Cylinder Pressures/reg.: | Carrier: | 1500 50 | Run History>1: | NMHC End: | n/a |
| | Fuel: | 1500 50 | | Date: | Dec 5, 2018 |
| | Span Gas: | 1600 13 | | Time: | 12:40 |
| | Zero Air Generator: | 50 | | CH ₄ PK HT: | 0 |
| Internal Pressures: | Carrier: | 28.5 | | CH ₄ RT: | 8.0 |
| | Fuel: | 42.9 | | CH ₄ Baseline: | -3 |
| | Air: | 30.5 | | CH ₄ LOD: | 9 |
| FID Status: | Status: | LIT | | CH ₄ SD: | 3 |
| | Counts: | 19162 | | CH ₄ CONC: | 0.00 |
| | Flame: | 384.6 | | NM PK HT: | 0 |
| | Det Base: | 175.0 | | NM Peak Area: | 0 |
| Flame and Power Stats: | Last Power On: | Dec 4, 2018 | | NM CONC: | 0.00 |
| | Flameouts: | 3 | | NM Base Start: | -7 |
| | Det Oven at Start: | 22.7 | | NM Base End: | -11 |
| | Col Oven at Start: | 21.6 | | NM LOD: | 16 |
| Calibration History: | Time: | Jan 01, 1970 / n/a | | NM Start IDX: | 11 |
| | Type: | n/a | | NM End IDX: | 91 |
| | Status: | n/a | | NM Max Slope: | 6.3e-01 |
| | Check/Adjust: | n/a | | NM Min Slope: | -8.0e-01 |
| | CH ₄ Span Conc: | n/a | Expected Values: | NM PT Count: | 0 |
| | CH ₄ SP Ratio: | n/a | | Previous CH ₄ : | n/a |
| | CH ₄ RT: | n/a | | Previous NMHC: | n/a |
| | CH ₄ PK IDX: | n/a | | Previous THC: | n/a |
| | CH ₄ PK HT: | n/a | | New CH ₄ : | 10.03 |
| | NM Span Conc: | n/a | | New NMHC: | 11.05 |
| | NM SP Ratio: | n/a | | New THC: | 21.09 |

Comments:
 The analyzer sample inlet filter was changed.
 A column conditioning was performed.
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.
 A new span gas cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.

The 51C Analyzer pump failed on Deceember 4, 2018; therefore, a shutdown calibration was not possible. A 55i analyzer was installed to replace the failed THC analyzer.

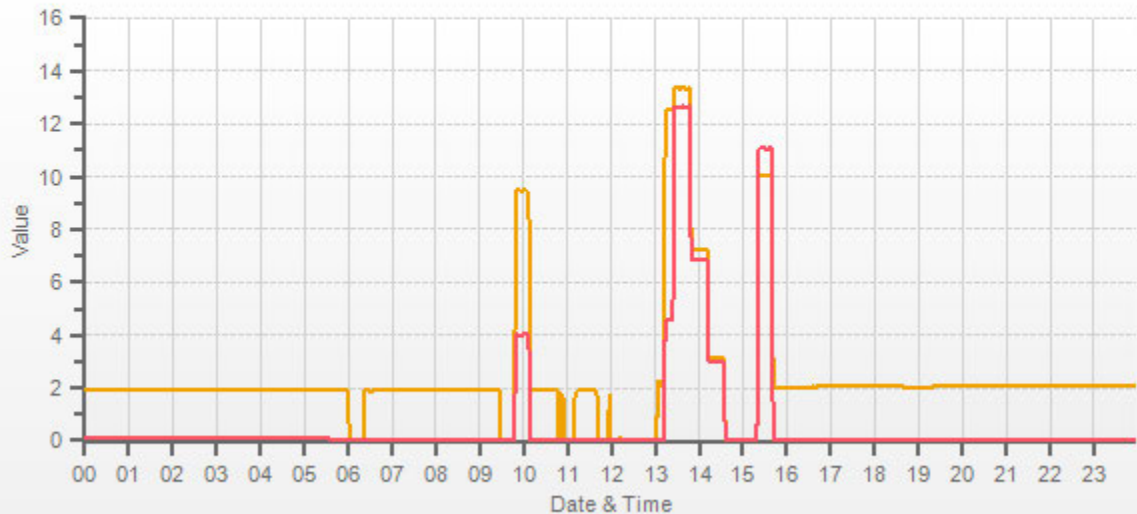
Date: December 5, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 12:42 / 15:44
Calibration Purpose: installation
Calibration Method: Gas Dilution



Station: LICA MASKWA Daily: 18/12/05 Type: AVG 1 Min. [1 Min.]

CH4[ppm] NMHC[ppm]



NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 4, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 933 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Maskwa | Weather Conditions: Cloudy/Overcast | | |
| Start/End Time 24 hr. (mst): 11:09 / 18:01 | Calibration Purpose: routine monthly | | |
| G.P.T. to be used for Ozone?: No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930028 LICA Last Calibration Date: November 27, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>0.994</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.995</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 0.994 | 1.000 | NO ₂ = | 1.000 | 1.000 | 1.000 | NOx = | 1.000 | 0.995 | 1.000 |
|--|---|----------------|----------------|----------------|-----------|------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 0.994 | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.000 | 1.000 | | | | | | | | | | | | | | |
| NOx = | 1.000 | 0.995 | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|---|------------------------------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5007 | 0.0 | 5007 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 4934 | 76.0 | 5010 | 781.3 | 782.9 | 786.0 | 787.0 | 0.994 | 0.995 |
| adjusted zero | 5007 | 0.00 | 5007 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4934 | 76.01 | 5010 | 781.3 | 782.9 | 781.0 | 783.0 | 1.000 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 380.0 | 381.0 | 0.999 | 0.998 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 192.0 | 192.0 | 0.996 | 0.998 |
| calibrator zero | 5007 | 0.00 | 5007 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 0.998 | 0.999 |

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

| Calibrator Flow Rates (cc/min) | | | | Calibrator Setting | Indicated NO | Indicated NOx | Indicated NO ₂ | NO drop | NO ₂ gain | NO ₂ C.F. |
|--------------------------------|---------|---------|------------|--------------------|--------------|---------------|---------------------------|---------|----------------------|----------------------|
| Point | Diluent | Cal Gas | Total Flow | volts or ppb | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| NOx reference | 4934 | 76.01 | 5010 | 0.0 | 780.0 | 781.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4934 | 76.01 | 5010 | 505.0 | 281.0 | 781.0 | 500.0 | 499.0 | 499.0 | 1.000 |
| adjusted high NO2 | 4934 | 76.01 | 5010 | 505.0 | 281.0 | 781.0 | 500.0 | 499.0 | 499.0 | 1.000 |
| gpt mid | 4934 | 76.01 | 5010 | 275.0 | 509.0 | 781.0 | 272.0 | 271.0 | 271.0 | 1.000 |
| gpt low | 4934 | 76.01 | 5010 | 100.0 | 680.0 | 781.0 | 101.0 | 100.0 | 100.0 | 1.000 |
| Average NO ₂ C.F.= | | | | | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | NO | NOx | NO ₂ | LIMITS |
|-----------------------------------|-------|-------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 1.001 | 1.000 | 1.002 | 0.95-1.05 |
| b (Intercept as % of full scale)= | 0.05% | 0.03% | 0.06% | ± 3% F.S. |
| % change in C.F. from last cal= | 0.59% | 0.53% | 0.00% | ± 10% |
| NO2 converter efficiency | | | 1.00 | 0.96 to 1.04 |

| As found: | As left: |
|--------------------------|--------------------------|
| NO Bkg: 2.6 | NO Bkg: 2.6 |
| NOx Bkg: 2.7 | NOx Bkg: 2.7 |
| NO Coef: 0.976 | NO Coef: 0.971 |
| NO2 Coef: 1.000 | NO2 Coef: 1.000 |
| NOx Coef: 1.000 | NOx Coef: 1.000 |
| PMT: -866.5 | PMT: -866.5 |
| Internal: 28.0 | Internal: 29.2 |
| Chamber: 50.4 | Chamber: 50.4 |
| Cooler: -3.0 | Cooler: -3.0 |
| NO2 Converter: 326.0 | NO2 Converter: 323.4 |
| NO2 Converter Set: 325.0 | NO2 Converter Set: 325.0 |
| Perm Oven Gas: 45.01 | Perm Oven Gas: 45.01 |
| Perm Oven Heater: 44.16 | Perm Oven Heater: 44.17 |
| Pressure: 255.8 | Pressure: 256.1 |
| Flow: 0.551 | Flow: 0.551 |
| Ozonator Flow: OK | Ozonator Flow: OK |
| Expected Value NO: 5 | Expected Value NO: 4 |
| Expected Value NO2: 397 | Expected Value NO2: 404 |
| Expected Value NOx: 401 | Expected Value NOx: 401 |

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The converter cooling fan filter was cleaned.

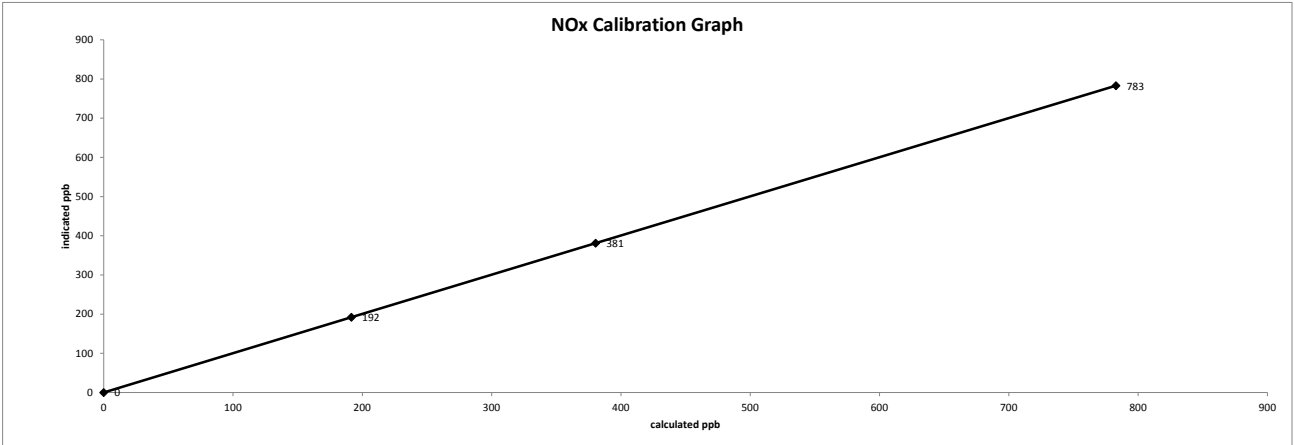
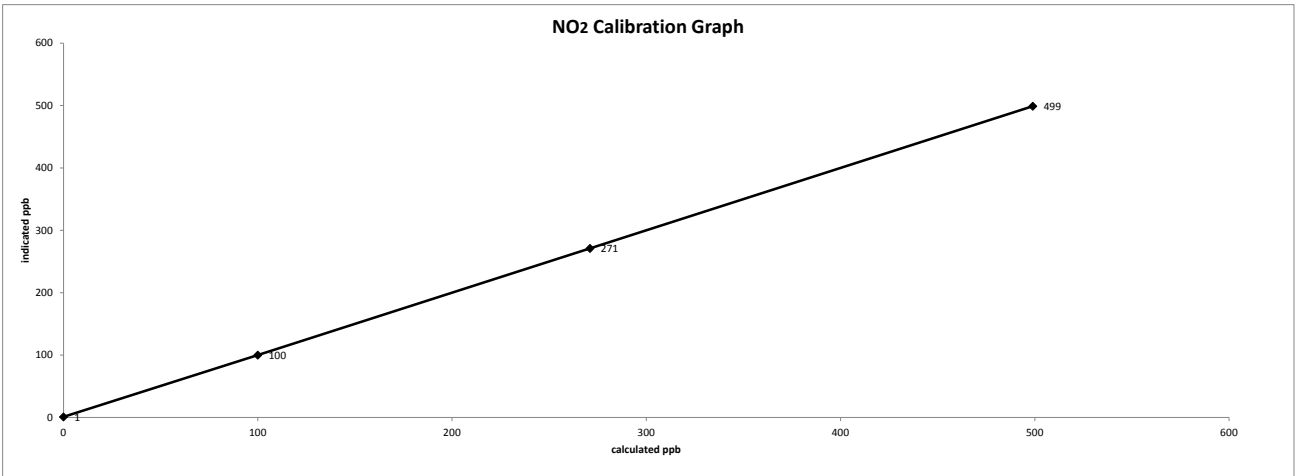
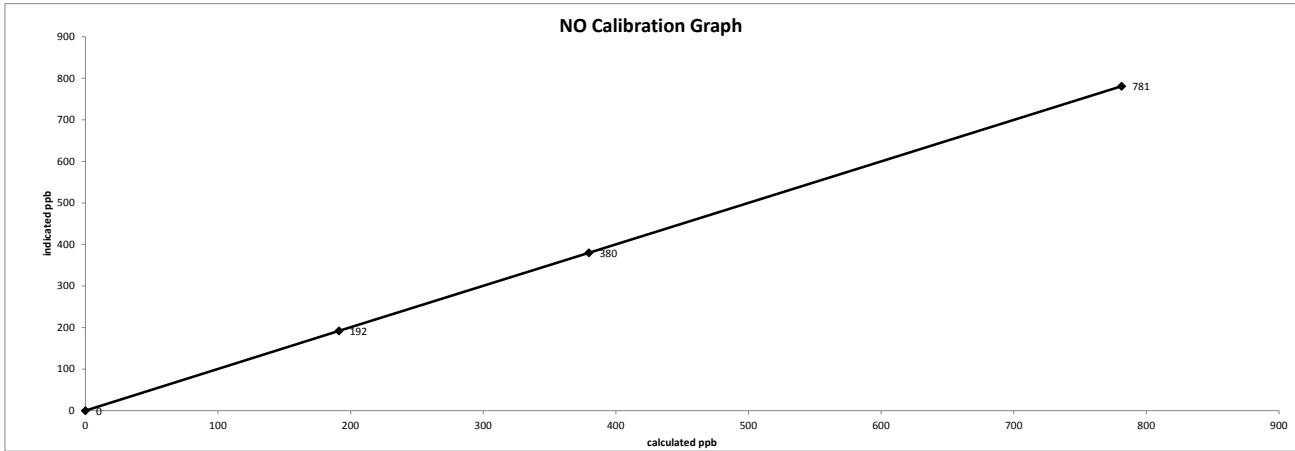
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

Date: December 4, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

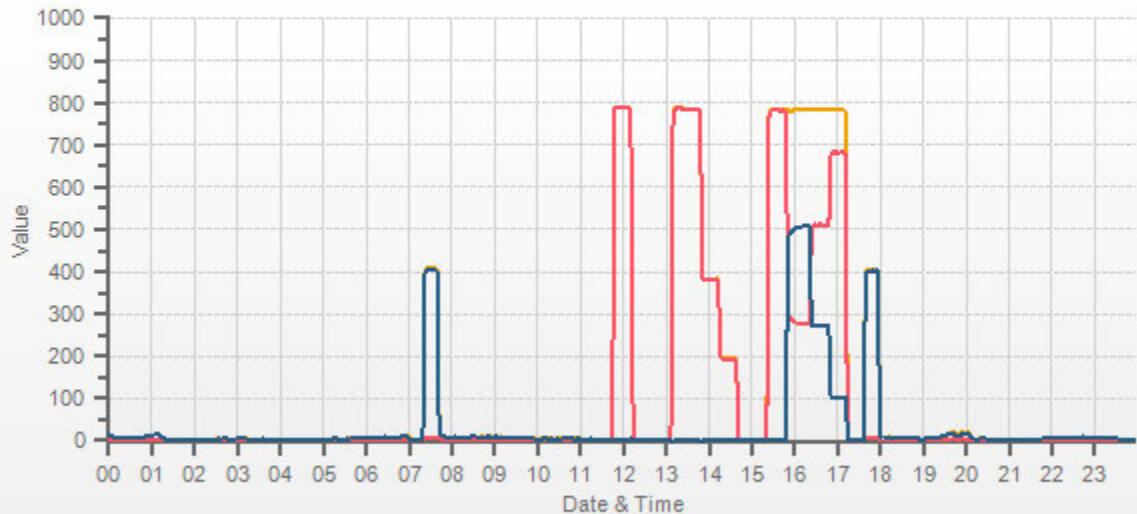
Start/End Time 24 hr. (mst): 11:09 / 18:01
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 18/12/04 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]



WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

| | | | |
|----------------------|--------------------|-----------------------|-----------------|
| Company: | LICA | Performed By: | Alex Yakupov |
| Audit Location: | Maskwa | Reviewed By: | Rob Fisher |
| Audit Date: | September 17, 2018 | Start/End Time (mst): | 9:36 / 12:48 |
| Calibration Purpose: | installation | Weather Conditions: | Cloudy/Overcast |

Wind Sensor Information

| Sensor ID Data: | | Sensor Outputs: | |
|--------------------------|--------------|---------------------------------|---------------|
| Sensor Make: | RM Young | Velocity Voltage Output Range: | 0-1 V |
| Sensor Model: | 05305VK | Velocity Unit Output Range: | 0-200 km/h |
| Serial #: | 161465 | Direction Voltage Output Range: | 0-1 V |
| Previous Cal/Audit Date: | May 17, 2018 | Direction Unit Output Range: | 0-360 degrees |

Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744; expiration May 18, 2019

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 | 0.1 | 0.1 | - |
| 1000 | 18.4 | 18.5 | 18.5 | 0.995 |
| 2000 | 36.9 | 36.9 | 36.9 | 1.000 |
| 3000 | 55.3 | 55.4 | 55.4 | 0.998 |
| 4000 | 73.7 | 73.8 | 73.8 | 0.999 |
| 5000 | 92.2 | 92.3 | 92.3 | 0.999 |
| 6000 | 110.6 | 110.8 | 110.8 | 0.998 |
| 7000 | 129.0 | 129.3 | 129.3 | 0.998 |
| 8000 | 147.4 | 147.7 | 147.7 | 0.998 |
| 9000 | 165.9 | 166.1 | 166.1 | 0.999 |
| 10000 | 184.3 | 184.9 | 184.9 | 0.997 |
| The audit meets AMD requirements. | | | Average Correction Factor= | 0.998 |

Wind Direction Audit Data ****+/- 3° 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 | 355 | 0.3 | 0.1 | 0.2 |
| 30 | 330 | 30 | 329 | -0.4 | 0.7 | 0.5 |
| 60 | 300 | 62 | 300 | -1.9 | -0.3 | 1.1 |
| 90 | 270 | 91 | 270 | -1.3 | -0.3 | 0.8 |
| 120 | 240 | 121 | 241 | -1.0 | -0.8 | 0.9 |
| 150 | 210 | 152 | 212 | -1.7 | -1.7 | 1.7 |
| 180 | 180 | 181 | 182 | -1.1 | -2.0 | 1.6 |
| 210 | 150 | 211 | 152 | -1.1 | -1.8 | 1.5 |
| 240 | 120 | 241 | 122 | -0.5 | -1.8 | 1.2 |
| 270 | 90 | 270 | 91 | -0.1 | -0.8 | 0.5 |
| 300 | 60 | 300 | 61 | 0.4 | -0.6 | 0.5 |
| 330 | 30 | 330 | 31 | -0.1 | -0.7 | 0.4 |
| 355 | 0 | 354 | 0 | 0.6 | 0.3 | 0.5 |
| The audit meets AMD requirements. | | | Average Absolute Degrees Difference= | | 0.9 | |

Comments:

CALIBRATORS

| | | | |
|------------------------|-------------------|---------------------------------|--------------------------|
| Company: <u>Maxxam</u> | | Operator: <u>Chris W</u> | |
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>API 700</u> | Make/Model | <u>Mesa Defender 530</u> |
| Serial Number | <u>690</u> | Serial Number | <u>L-153351 H-152571</u> |
| Last Verification Date | <u>March 2016</u> | Temperature (°C) | <u>23.5 C</u> |
| NO Cylinder S/N | <u>LL108015</u> | Barometric Pressure | <u>695 mmHg</u> |
| NO [PPM] | <u>52.2</u> | NOx [PPM] | <u>52.3</u> |
| Expiry Date | <u>Oct 2020</u> | | |

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

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|-------------------------------------|------|-----------------------|-------|----------------------|-----------------|-------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Limit ± 10% | |
| 4959 | 75.0 | 0.789 | 0.791 | 0.793 | 0.000 | 0.793 | 1% | 0% |
| 4971 | 36.5 | 0.383 | 0.384 | 0.384 | 0.000 | 0.384 | 0% | 0% |
| 4967 | 18.2 | 0.191 | 0.192 | 0.191 | 0.000 | 0.191 | 0% | -1% |
| 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)= 1.0054 | 0.90-1.10 | m (Slope)= 1.0031 |
| b (Intercept % of FS)= -0.0583 | ± 3% F.S. | b (Intercept % of FS)= -0.0795 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|-------|-----------------|-------|----------------------|---------------|
| 4959 | 0.000 | 0.000 | 0.790 | -0.001 | 0.789 | NO ₂ | % Diff. Limit |
| 4959 | 0.500 | 0.497 | 0.293 | 0.493 | 0.786 | -1% | ± 10% |
| 4959 | 0.275 | 0.273 | 0.517 | 0.269 | 0.787 | -1% | ± 10% |
| 4959 | 0.100 | 0.102 | 0.688 | 0.099 | 0.787 | -2% | ± 10% |
| Absolute Average Percent Difference | | | | | | 1% | ± 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)= 0.9946 | 0.90-1.10 | |
| b (Intercept % of FS)= -0.1817 | ± 3% F.S. | |

| | |
|---|---|
| AENV Standards | NO_x Analyzer |
| Audit Calibrator | Make/Model <u>Teco 42i</u> |
| Make/Model <u>Teco 146i</u> | Serial/AMU Number <u>AMU 1868</u> |
| Serial/AMU Number <u>AMU 1809</u> | Last Calibration Date <u>March 14, 2018</u> |
| SRM Gas Cylinder No. <u>APEX1170572</u> | Full Scale (ppm) <u>1.0</u> |
| Cylinder Conc. (ppm) <u>49.99</u> | Cylinder Gas Expiry Date <u>November 2020</u> |

COMMENTS: Cylinder contains 47.9 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 15, 2018
Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

| | | | |
|------------------------|-------------------------|---------------------------------|---------------------------|
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>Sabio</u> | Make/Model | <u>Bios Definer 220</u> |
| Serial Number | <u>11900613</u> | Serial Number | <u>H=128686; L=129069</u> |
| Last Verification Date | <u>March 16, 2018</u> | Temperature (°C) | <u>22.9 C</u> |
| NO Cylinder S/N | <u>LL104183</u> | Barometric Pressure | <u>698 mmHg</u> |
| NO [PPM] | <u>50.8</u> | NOx [PPM] | <u>50.9</u> |
| Expiry Date | <u>October 24, 2020</u> | | |

| | | | |
|----------------------|-------------|--------|-------------|
| Dilution Flow (sccm) | | | |
| Pt. #1 | <u>5059</u> | Pt. #2 | <u>5073</u> |
| | | Pt. #3 | <u>5073</u> |
| Gas Flow (sccm) | | | |
| Pt. #1 | <u>77.5</u> | Pt. #2 | <u>38.2</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 |
| 5124 | 0.0 | 0.0000 | 0.0000 | 0.0000 | -0.0001 | 0.0000 | Limit ± 10% | |
| 5059 | 77.5 | 0.7782 | 0.7797 | 0.7763 | 0.0005 | 0.7767 | 0% | 0% |
| 5073 | 38.2 | 0.3825 | 0.3833 | 0.3794 | 0.0000 | 0.3795 | -1% | -1% |
| 5073 | 19.1 | 0.1913 | 0.1916 | 0.1904 | 0.0000 | 0.1904 | 0% | -1% |
| Absolute Average Percent Difference | | | | | | | 1% | 1% |

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)= | 0.9975 | 0.90-1.10 | | m (Slope)= | 0.9960 |
| b (Intercept % of FS)= | -0.0616 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0661 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|--------|-----------------|--------|----------------------|---------------|
| 5059 | 0.0 | 0.0000 | 0.7741 | 0.0000 | 0.7741 | NO ₂ | % Diff. Limit |
| 5059 | 500.0 | 0.4918 | 0.2823 | 0.4916 | 0.7739 | 0% | ± 10% |
| 5059 | 275.0 | 0.2774 | 0.4967 | 0.2780 | 0.7747 | 0% | ± 10% |
| 5059 | 100.0 | 0.1031 | 0.6710 | 0.1032 | 0.7743 | 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)= | 0.9998 | 0.90-1.10 | |
| b (Intercept % of FS)= | 0.0173 | ± 3% F.S. | |

| <u>AENV Standards</u> | | <u>NO_x Analyzer</u> | |
|-------------------------|--------------------|--------------------------------|--------------------------|
| <u>Audit Calibrator</u> | | | |
| Make/Model | <u>Thermo 146i</u> | Make/Model | <u>Thermo 42i</u> |
| Serial/AMU Number | <u>1809</u> | Serial/AMU Number | <u>1868</u> |
| SRM Gas Cylinder No. | <u>APEX1170572</u> | Last Calibration Date | <u>August 16, 2018</u> |
| Cylinder Conc. (ppm) | <u>49.99</u> | Full Scale (ppm) | <u>1.0</u> |
| | | Cylinder Gas Expiry Date | <u>November 15, 2020</u> |

COMMENTS: _____

Auditor: Shea Beaton
Operator Signature: _____

Date: August 22, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: December 13, 2017
Gas Type: SO2 **Conc.** 98.07
Cylinder Number: CAL016625
Expiry Date: January 2019

Flow Measurement Device:

Make/Model: Mesa Definer 220
Serial Number: H-133034 / L-132702
Temp. °C: 23.4 C
B.P. 707 mmHg

Reference Analyzer:

Make/Model: Teco 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 10.0 **Span:** 1.006 **Range:** 1.0
Last Calibration: **Date:** Dec12/17 **C.F.** 1.000 **Done By:** Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4989 | 79.5 | 0.764 | 0.01594 | 62.755 | 47.9 |
| 4995 | 39.6 | 0.380 | 0.00793 | 126.136 | 47.9 |
| 4992 | 19.6 | 0.188 | 0.00393 | 254.694 | 47.9 |
| Average Cylinder Concentration: | | | | | 47.9 |

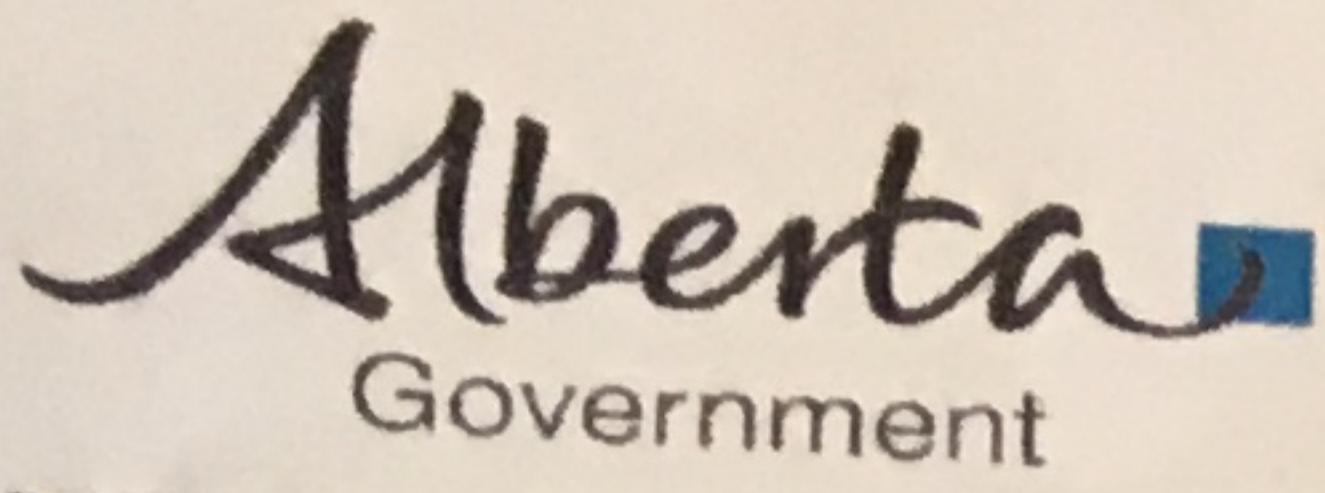
Previous Stated Concentration PPM: 49.2

Percent variance from Stated: 3

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

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: December 13, 2017
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%): 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5051 | 39.6 | 0.0753 | 0.00784 | 127.551 | 9.60 |
| 5028 | 20.2 | 0.0387 | 0.00402 | 248.911 | 9.63 |
| 5033 | 10.5 | 0.0198 | 0.00209 | 479.333 | 9.49 |
| Average Cylinder Concentration: | | | | | 9.58 |

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: [Signature]

Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------|--------------|--------------------------|----------------------------|
| Make/Model | <u>Teco 146i</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1809</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.4 C</u> |
| Gas Type | <u>NO</u> | Conc. | <u>50.03</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>APEX 1223938</u> | | | | |
| Expiry Date | <u>June 2020</u> | | | | |

Reference Analyzer:

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

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4989 | 79.5 | 0.813 | 0.812 | 0.016 | 62.755 | 51.0 | 51.0 |
| 4995 | 39.6 | 0.407 | 0.406 | 0.008 | 126.136 | 51.3 | 51.2 |
| 4992 | 19.6 | 0.202 | 0.201 | 0.004 | 254.694 | 51.4 | 51.2 |
| Average Cylinder Concentration: | | | | | | 51.3 | 51.1 |

| | |
|--|-------------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>51.5</u> | <u>51.6</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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

APPENDIX ~~@@~~
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SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

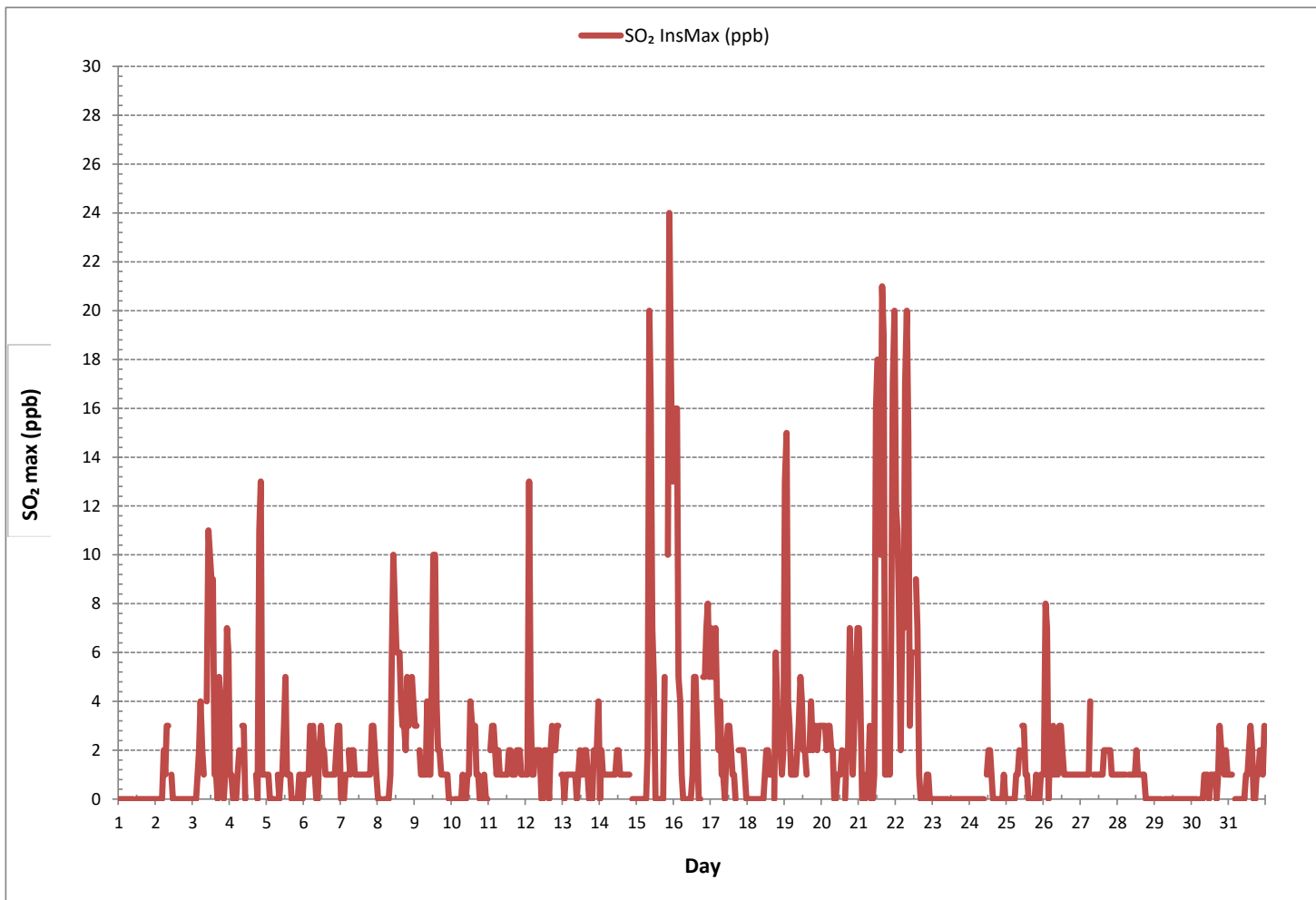
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|----------------------------|
| NUMBER OF NON-ZERO READINGS: | 453 |
| MAXIMUM INSTANTANEOUS VALUE: | 24 ppb @ HOUR 21 ON DAY 15 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 3 |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | |
| DAY 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | S | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 24 | | |
| 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 24 | | |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 24 | | |
| 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 24 | | |
| 5 | 0 | 0 | 1 | 1 | 1 | 1 | S | 0 | 0 | 1 | 0 | 0 | C | C | C | C | C | C | C | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | |
| 6 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 24 | | |
| 7 | 1 | 0 | 0 | 1 | S | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 8 | 1 | 1 | 0 | S | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 24 | |
| 9 | 1 | 1 | S | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 | |
| 10 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 | |
| 11 | S | 1 | 1 | 1 | 1 | 1 | 0 | S1 | S1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 0 | 1 | 1 | 23 | |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | S1 | S1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | C1 | C1 | C1 | C1 | 1 | 1 | 1 | 1 | S | 1 | 0 | 1 | 1 | 18 | |
| 13 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | S | 1 | 1 | 0 | 1 | 1 | 24 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | S | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 15 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | S | 1 | 2 | 1 | 1 | 0 | 2 | 1 | 24 |
| 16 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 17 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 18 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 24 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 24 | |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 3 | 1 | 24 | |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | S | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 23 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 24 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 24 |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 28 | 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 | 1 | 24 |
| 29 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 30 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 |
| 31 | 1 | 1 | 1 | S | 1 | 1 | S1 | S1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | C1 | C1 | C1 | C1 | C1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 24 |
| HOURLY MAX | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | | | | |
| HOURLY AVG | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |

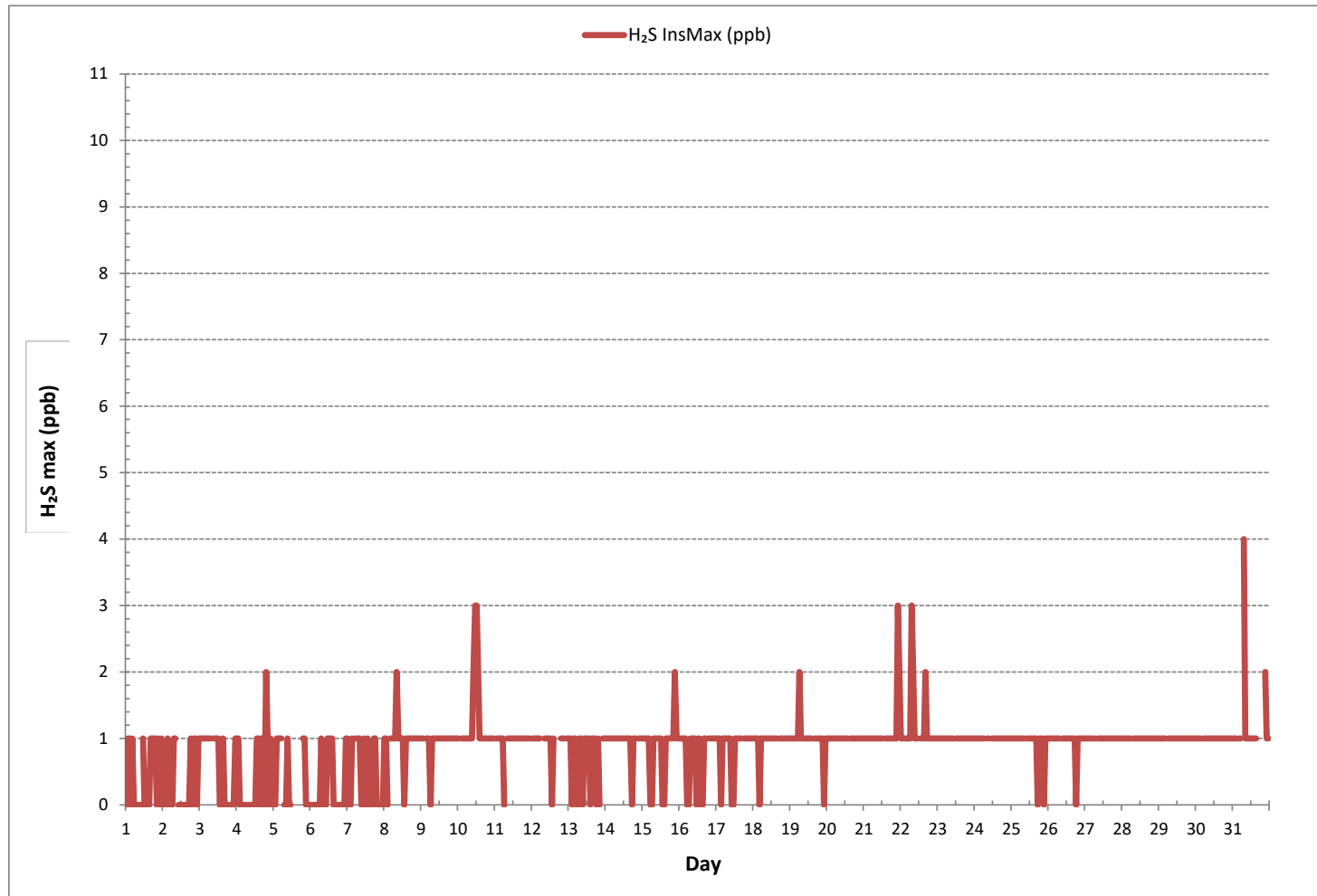
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 569 |
| MAXIMUM INSTANTANEOUS VALUE: | 4 ppb @ HOUR 11 ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 728 hrs |
| STANDARD DEVIATION: | 0 |

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY MIN. | DAILY MAX. | 24-HR AVG. | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|------------|------------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | | | |
| DAY 1 | 2.61 | 2.57 | 2.68 | 2.71 | 2.78 | 2.75 | 2.65 | 2.58 | 2.91 | 2.57 | S | 2.54 | 2.50 | 2.44 | 2.42 | 2.41 | 2.42 | 2.41 | 2.39 | 2.36 | 2.34 | 2.35 | 2.40 | 2.41 | 2.34 | 2.91 | 2.53 | 24 |
| 2 | 2.42 | 2.42 | 2.40 | 2.40 | 2.41 | 2.48 | 2.51 | 2.52 | 2.52 | S | 2.48 | 2.46 | 2.45 | 2.44 | 2.43 | 2.42 | 2.42 | 2.43 | 2.42 | 2.43 | 2.42 | 2.43 | 2.42 | 2.41 | 2.40 | 2.52 | 2.44 | 24 |
| 3 | 2.43 | 2.43 | 2.44 | 2.51 | 2.52 | 2.51 | 2.49 | 2.51 | S | 2.55 | 2.65 | 2.65 | 2.85 | 2.49 | 2.42 | 2.41 | 2.38 | 2.38 | 2.41 | 2.39 | 2.39 | 2.39 | 2.40 | 2.44 | 2.38 | 2.85 | 2.48 | 24 |
| 4 | 2.43 | 2.41 | 2.36 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Y | Y | Y | 2.36 | 2.43 | 2.40 | 3 |
| 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 2.03 | 2.08 | 2.06 | 2.05 | 2.03 | 2.05 | 2.07 | 2.06 | 2.03 | 2.08 | 2.05 | 12 |
| 6 | 2.06 | 2.07 | 2.07 | 2.07 | 2.06 | S | 2.13 | 2.14 | 2.09 | 2.06 | 2.07 | 2.11 | 2.17 | 2.21 | 2.23 | 2.19 | 2.12 | 2.06 | 2.14 | 2.11 | 2.24 | 2.24 | 2.31 | 2.38 | 2.06 | 2.38 | 2.15 | 24 |
| 7 | 2.38 | 2.15 | 2.20 | 2.19 | S | 2.24 | 2.27 | 2.18 | 2.42 | 2.46 | 2.34 | 2.42 | 2.29 | 2.31 | 2.32 | 2.37 | 2.38 | 2.33 | 2.32 | 2.30 | 2.33 | 2.39 | 2.47 | 2.48 | 2.15 | 2.48 | 2.33 | 24 |
| 8 | 2.54 | 2.75 | 2.73 | S | 2.64 | 2.59 | 2.63 | 2.55 | 2.65 | 2.48 | 2.32 | 2.36 | 2.36 | 2.30 | 2.58 | 2.61 | 2.58 | 2.51 | 2.49 | 2.49 | 2.48 | 2.48 | 2.47 | 2.49 | 2.30 | 2.75 | 2.52 | 24 |
| 9 | 2.65 | 2.69 | S | 2.69 | 2.75 | 2.57 | 2.59 | 2.72 | 2.71 | 2.92 | 2.85 | 2.74 | 2.25 | 2.13 | 2.25 | 2.39 | 2.33 | 2.43 | 2.45 | 2.46 | 2.43 | 2.58 | 2.90 | 2.76 | 2.13 | 2.92 | 2.58 | 24 |
| 10 | 2.64 | S | 2.42 | 2.49 | 3.45 | 2.61 | 2.61 | 2.56 | 2.81 | 2.98 | 3.13 | 3.95 | 3.22 | 2.82 | 2.62 | 2.52 | 3.17 | 3.10 | 2.57 | 2.03 | 2.01 | 2.01 | 2.00 | 1.99 | 1.99 | 3.95 | 2.68 | 24 |
| 11 | S | 2.12 | 2.26 | 2.24 | 2.24 | 2.18 | 2.12 | 2.15 | 2.37 | 2.84 | 2.78 | 2.53 | 2.18 | 2.12 | 2.13 | 2.12 | 2.16 | 2.15 | 2.17 | 2.17 | 2.17 | 2.18 | 2.21 | S | 2.12 | 2.84 | 2.25 | 24 |
| 12 | 2.24 | 2.34 | 2.26 | 2.23 | 2.29 | 2.50 | 2.64 | 2.61 | 2.45 | 2.26 | 2.06 | 2.05 | 2.17 | 2.13 | 2.02 | 1.99 | 2.00 | 2.04 | 2.05 | 2.10 | 2.07 | 2.08 | S | 2.06 | 1.99 | 2.64 | 2.20 | 24 |
| 13 | 2.03 | 2.03 | 2.00 | 2.01 | 2.04 | 2.06 | 2.12 | 2.19 | 2.19 | 2.17 | 2.12 | 2.12 | 2.11 | 2.09 | 2.10 | 2.08 | 2.01 | 1.97 | 1.98 | 1.98 | 2.05 | S | 2.07 | 2.06 | 1.97 | 2.19 | 2.07 | 24 |
| 14 | 2.08 | 2.10 | 2.11 | 2.11 | 2.06 | 2.10 | 2.22 | 2.24 | 2.26 | 2.27 | 2.16 | 2.20 | 2.22 | 2.22 | 2.21 | 2.19 | 2.18 | 2.19 | 2.23 | 2.25 | S | 2.38 | 2.39 | 2.35 | 2.06 | 2.39 | 2.20 | 24 |
| 15 | 2.28 | 2.36 | 2.35 | 2.35 | 2.21 | 2.29 | 2.21 | 2.19 | 2.23 | 2.27 | 2.10 | 2.01 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 2.01 | 2.01 | S | 1.98 | 2.02 | 2.03 | 2.03 | 1.97 | 2.36 | 2.12 | 24 |
| 16 | 2.02 | 2.03 | 2.00 | 2.01 | 2.01 | 2.00 | 2.02 | 2.06 | 2.13 | 2.11 | 2.08 | 2.11 | 2.04 | 2.05 | 2.03 | 2.02 | 1.98 | 2.01 | S | 2.03 | 2.03 | 2.00 | 2.01 | 2.15 | 1.98 | 2.15 | 2.04 | 24 |
| 17 | 2.05 | 2.03 | 2.03 | 2.05 | 1.99 | 1.99 | 2.04 | 1.98 | 2.00 | 1.99 | 2.01 | 2.04 | 2.03 | 2.09 | 2.14 | 2.15 | 2.19 | S | 2.33 | 2.31 | 2.40 | 2.37 | 2.34 | 2.29 | 1.98 | 2.40 | 2.12 | 24 |
| 18 | 2.31 | 2.29 | 2.30 | 2.29 | 2.27 | 2.25 | 2.27 | 2.25 | 2.24 | 2.34 | 2.31 | 2.35 | 2.41 | 2.39 | 2.33 | 2.36 | S | 2.50 | 2.66 | 2.63 | 2.78 | 2.75 | 2.71 | 2.56 | 2.24 | 2.78 | 2.41 | 24 |
| 19 | 2.49 | 2.47 | 2.29 | 2.32 | 2.50 | 2.53 | 2.54 | 2.54 | 2.55 | 2.47 | 2.41 | 2.23 | 2.33 | 2.36 | 2.24 | S | 2.40 | 2.34 | 2.30 | 3.35 | 3.82 | 2.23 | 2.21 | 2.27 | 2.21 | 3.82 | 2.49 | 24 |
| 20 | 2.24 | 2.24 | 2.31 | 2.31 | 2.29 | 2.34 | 2.29 | 2.24 | 2.22 | 2.28 | 2.16 | 2.35 | 2.30 | 2.23 | S | 2.14 | 2.18 | 2.19 | 2.29 | 2.18 | 2.11 | 2.26 | 2.31 | 2.10 | 2.10 | 2.35 | 2.24 | 24 |
| 21 | 2.22 | 2.10 | 2.06 | 2.07 | 2.08 | 2.09 | 2.10 | 2.10 | 2.11 | 2.11 | 2.08 | 2.05 | 2.05 | S | 2.06 | 2.08 | 2.09 | 2.04 | 2.04 | 2.05 | 2.04 | 2.04 | 2.49 | 2.12 | 2.04 | 2.49 | 2.10 | 24 |
| 22 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | 2.04 | 2.05 | 2.08 | 2.06 | 2.03 | 2.04 | 2.03 | S | 2.03 | 2.03 | 2.02 | 2.02 | 2.04 | 2.10 | 2.21 | 2.04 | 2.12 | 2.12 | 2.15 | 2.02 | 2.21 | 2.06 | 24 |
| 23 | 2.23 | 2.23 | 2.21 | 2.26 | 2.57 | 2.37 | 2.36 | 2.21 | 2.16 | 2.14 | 2.09 | S | 2.05 | 2.03 | 2.03 | 2.03 | 2.03 | 2.04 | 2.04 | 2.04 | 2.05 | 2.04 | 2.05 | 2.04 | 2.03 | 2.57 | 2.14 | 24 |
| 24 | 2.04 | 2.05 | 2.02 | 2.02 | 2.03 | 2.02 | 2.02 | 2.03 | 2.02 | 2.03 | S | 2.03 | 2.02 | 2.03 | 2.01 | 2.03 | 2.04 | 2.04 | 2.05 | 2.04 | 2.07 | 2.04 | 2.05 | 2.04 | 2.01 | 2.07 | 2.03 | 24 |
| 25 | 2.09 | 2.11 | 2.14 | 2.13 | 2.12 | 2.11 | 2.12 | 2.14 | 2.20 | S | 2.25 | 2.28 | 2.30 | 2.30 | 2.30 | 2.30 | 2.29 | 2.37 | 2.47 | 2.47 | 2.51 | 2.53 | 2.55 | 2.60 | 2.09 | 2.60 | 2.29 | 24 |
| 26 | 2.60 | 2.55 | 2.34 | 2.16 | 2.12 | 2.11 | 2.10 | 2.07 | S | 2.07 | 2.06 | 2.06 | 2.07 | 2.07 | 2.06 | 2.06 | 2.09 | 2.10 | 2.09 | 2.12 | 2.11 | 2.18 | 2.14 | 2.11 | 2.06 | 2.60 | 2.15 | 24 |
| 27 | 2.10 | 2.11 | 2.12 | 2.13 | 2.13 | 2.14 | 2.14 | S | 2.14 | 2.14 | 2.15 | 2.16 | 2.15 | 2.14 | 2.14 | 2.20 | 2.19 | 2.16 | 2.17 | 2.18 | 2.19 | 2.26 | 2.29 | 2.32 | 2.10 | 2.32 | 2.17 | 24 |
| 28 | 2.42 | 2.48 | 2.49 | 2.51 | 2.53 | 2.52 | S | 2.56 | 2.50 | 2.45 | 2.44 | 2.37 | 2.36 | 2.30 | 2.32 | 2.33 | 2.35 | 2.32 | 2.20 | 2.21 | 2.29 | 2.26 | 2.22 | 2.21 | 2.20 | 2.56 | 2.38 | 24 |
| 29 | 2.19 | 2.18 | 2.18 | 2.15 | 2.16 | S | 2.10 | 2.08 | 2.07 | 2.06 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | 2.04 | 2.03 | 2.03 | 2.03 | 2.03 | 2.04 | 2.03 | 2.04 | 2.03 | 2.03 | 2.19 | 2.07 | 24 |
| 30 | 2.03 | 2.03 | 2.03 | S | 2.02 | 2.03 | 2.03 | 2.02 | 2.03 | 2.02 | 2.03 | 2.01 | 2.01 | 2.01 | 2.02 | 2.02 | 2.03 | 2.03 | 2.04 | 2.04 | 2.04 | 2.04 | 2.08 | 2.10 | 2.01 | 2.10 | 2.03 | 24 |
| 31 | 2.31 | 2.43 | 2.30 | S | 2.29 | 2.26 | 2.25 | 2.29 | 2.29 | 2.29 | 2.24 | 2.23 | 2.25 | 2.31 | 2.29 | 2.25 | 2.17 | 2.16 | 2.20 | 2.25 | 2.31 | 2.29 | 2.29 | 2.30 | 2.16 | 2.43 | 2.27 | 24 |
| HOURLY MAX | 2.65 | 2.75 | 2.73 | 2.71 | 3.45 | 2.75 | 2.65 | 2.72 | 2.91 | 2.98 | 3.13 | 3.95 | 3.22 | 2.82 | 2.62 | 2.61 | 3.17 | 3.10 | 2.66 | 3.35 | 3.82 | 2.75 | 2.90 | 2.76 | | | | |
| HOURLY AVG | 2.28 | 2.27 | 2.25 | 2.24 | 2.32 | 2.28 | 2.27 | 2.28 | 2.31 | 2.31 | 2.28 | 2.30 | 2.26 | 2.22 | 2.21 | 2.20 | 2.22 | 2.22 | 2.23 | 2.25 | 2.27 | 2.24 | 2.28 | 2.25 | | | | |

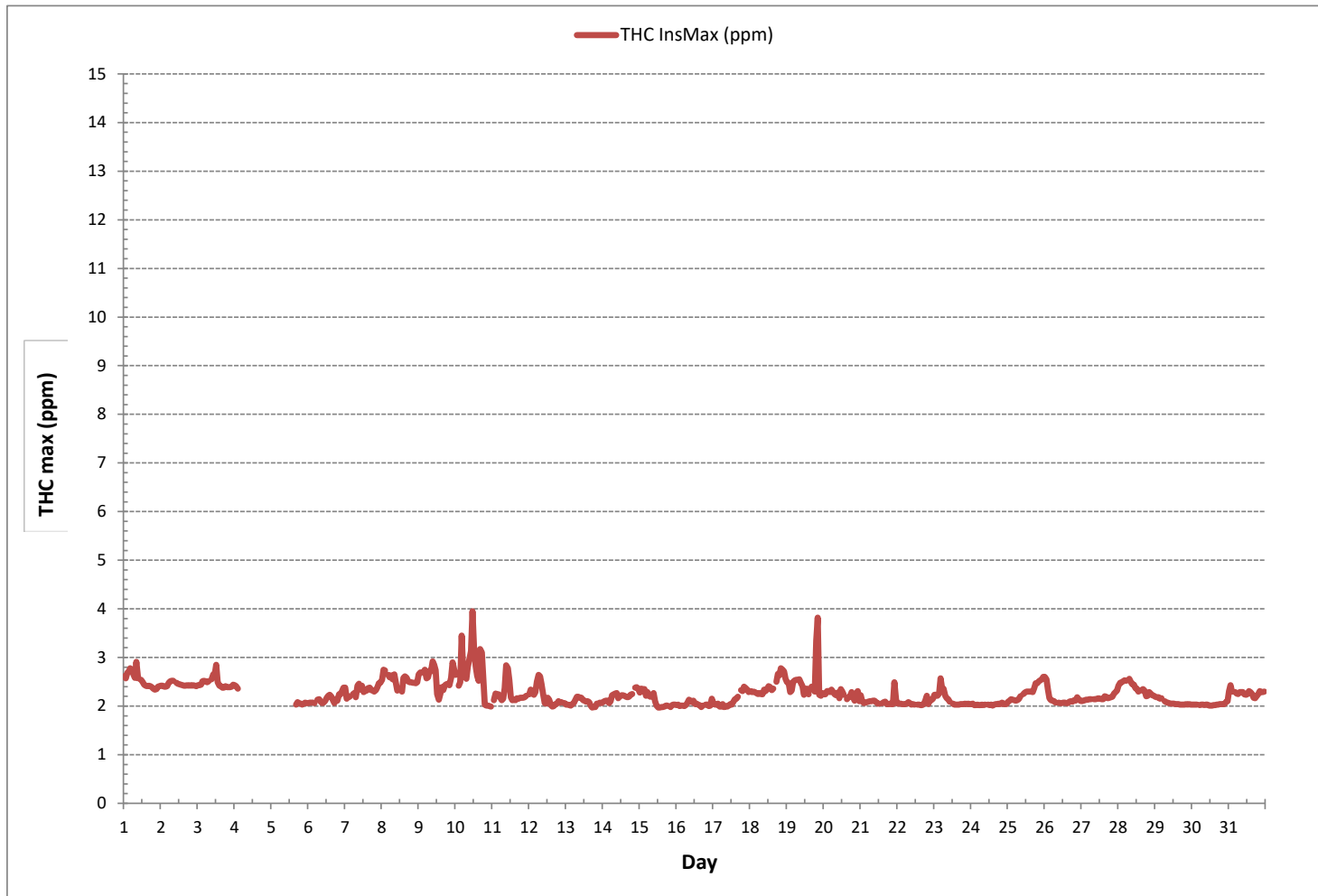
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 3.95 ppm @ HOUR 11 ON DAY 10 |
| IZS CALIBRATION TIME: | 30 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 711 hrs |
| STANDARD DEVIATION: | 0.24 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





METHANE MAX Instantaneous Maximum (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 2.03 | 2.08 | 2.06 | 2.05 | 2.03 | 2.05 | 2.07 | 2.06 | 2.03 | 2.08 | 2.05 | 12 | |
| DAY 6 | 2.06 | 2.07 | 2.07 | 2.07 | 2.06 | S | 2.13 | 2.14 | 2.09 | 2.06 | 2.07 | 2.11 | 2.17 | 2.21 | 2.23 | 2.19 | 2.12 | 2.06 | 2.14 | 2.11 | 2.24 | 2.24 | 2.31 | 2.38 | 2.06 | 2.38 | 2.15 | 24 | |
| DAY 7 | 2.38 | 2.15 | 2.20 | 2.19 | S | 2.24 | 2.27 | 2.18 | 2.42 | 2.46 | 2.34 | 2.38 | 2.29 | 2.31 | 2.32 | 2.37 | 2.38 | 2.33 | 2.32 | 2.30 | 2.33 | 2.39 | 2.47 | 2.48 | 2.15 | 2.48 | 2.33 | 24 | |
| DAY 8 | 2.54 | 2.75 | 2.73 | S | 2.64 | 2.59 | 2.53 | 2.55 | 2.53 | 2.48 | 2.32 | 2.30 | 2.28 | 2.30 | 2.48 | 2.48 | 2.45 | 2.40 | 2.41 | 2.41 | 2.39 | 2.38 | 2.36 | 2.41 | 2.28 | 2.75 | 2.47 | 24 | |
| DAY 9 | 2.49 | 2.57 | S | 2.60 | 2.63 | 2.47 | 2.52 | 2.61 | 2.60 | 2.66 | 2.64 | 2.57 | 2.23 | 2.12 | 2.25 | 2.36 | 2.33 | 2.35 | 2.41 | 2.42 | 2.36 | 2.58 | 2.90 | 2.70 | 2.12 | 2.90 | 2.49 | 24 | |
| DAY 10 | 2.62 | S | 2.42 | 2.48 | 2.90 | 2.54 | 2.51 | 2.56 | 2.61 | 2.69 | 2.79 | 3.36 | 2.86 | 2.62 | 2.52 | 2.44 | 3.03 | 2.97 | 2.57 | 2.03 | 2.01 | 2.01 | 2.00 | 1.99 | 1.99 | 3.36 | 2.54 | 24 | |
| DAY 11 | S | 2.12 | 2.26 | 2.24 | 2.24 | 2.18 | 2.12 | 2.15 | 2.37 | 2.84 | 2.78 | 2.53 | 2.18 | 2.12 | 2.13 | 2.12 | 2.16 | 2.15 | 2.17 | 2.17 | 2.17 | 2.18 | 2.21 | S | 2.12 | 2.84 | 2.25 | 24 | |
| DAY 12 | 2.24 | 2.27 | 2.26 | 2.23 | 2.29 | 2.50 | 2.64 | 2.61 | 2.45 | 2.26 | 2.06 | 2.05 | 2.17 | 2.13 | 2.02 | 1.99 | 2.00 | 2.04 | 2.05 | 2.10 | 2.07 | 2.08 | S | 2.06 | 1.99 | 2.64 | 2.20 | 24 | |
| DAY 13 | 2.03 | 2.03 | 2.02 | 2.01 | 2.04 | 2.06 | 2.12 | 2.19 | 2.19 | 2.17 | 2.17 | 2.12 | 2.11 | 2.09 | 2.10 | 2.08 | 2.01 | 1.97 | 1.98 | 1.98 | 2.05 | S | 2.07 | 2.06 | 1.97 | 2.19 | 2.07 | 24 | |
| DAY 14 | 2.08 | 2.10 | 2.11 | 2.11 | 2.06 | 2.10 | 2.17 | 2.24 | 2.26 | 2.27 | 2.16 | 2.20 | 2.22 | 2.22 | 2.21 | 2.19 | 2.18 | 2.19 | 2.23 | 2.25 | S | 2.38 | 2.39 | 2.35 | 2.06 | 2.39 | 2.20 | 24 | |
| DAY 15 | 2.28 | 2.36 | 2.35 | 2.35 | 2.21 | 2.29 | 2.21 | 2.19 | 2.17 | 2.12 | 2.10 | 2.01 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 2.01 | 2.01 | S | 1.98 | 2.02 | 2.03 | 2.03 | 1.97 | 2.36 | 2.11 | 24 | |
| DAY 16 | 2.02 | 2.03 | 2.00 | 2.01 | 2.01 | 2.00 | 2.02 | 2.06 | 2.13 | 2.11 | 2.08 | 2.11 | 2.04 | 2.05 | 2.03 | 2.02 | 1.98 | 2.01 | S | 2.03 | 2.03 | 2.00 | 2.01 | 2.10 | 1.98 | 2.13 | 2.04 | 24 | |
| DAY 17 | 2.05 | 2.03 | 2.03 | 2.05 | 1.99 | 1.99 | 2.04 | 1.98 | 2.00 | 1.99 | 2.01 | 2.04 | 2.03 | 2.09 | 2.14 | 2.15 | 2.19 | S | 2.33 | 2.31 | 2.40 | 2.37 | 2.34 | 2.29 | 1.98 | 2.40 | 2.12 | 24 | |
| DAY 18 | 2.31 | 2.29 | 2.30 | 2.29 | 2.27 | 2.25 | 2.27 | 2.25 | 2.24 | 2.34 | 2.31 | 2.35 | 2.41 | 2.39 | 2.33 | 2.36 | S | 2.50 | 2.66 | 2.63 | 2.78 | 2.75 | 2.71 | 2.44 | 2.24 | 2.78 | 2.41 | 24 | |
| DAY 19 | 2.44 | 2.26 | 2.22 | 2.32 | 2.50 | 2.53 | 2.54 | 2.54 | 2.55 | 2.47 | 2.41 | 2.23 | 2.33 | 2.36 | 2.23 | S | 2.40 | 2.34 | 2.30 | 3.35 | 3.82 | 2.23 | 2.21 | 2.27 | 2.21 | 3.82 | 2.47 | 24 | |
| DAY 20 | 2.24 | 2.24 | 2.31 | 2.31 | 2.29 | 2.34 | 2.29 | 2.24 | 2.22 | 2.28 | 2.16 | 2.35 | 2.30 | 2.23 | S | 2.14 | 2.18 | 2.19 | 2.23 | 2.18 | 2.11 | 2.16 | 2.16 | 2.10 | 2.10 | 2.35 | 2.23 | 24 | |
| DAY 21 | 2.12 | 2.10 | 2.06 | 2.07 | 2.08 | 2.09 | 2.10 | 2.10 | 2.11 | 2.11 | 2.08 | 2.05 | 2.05 | 2.05 | S | 2.06 | 2.08 | 2.05 | 2.04 | 2.05 | 2.04 | 2.32 | 2.12 | 2.12 | 2.04 | 2.32 | 2.09 | 24 | |
| DAY 22 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | 2.04 | 2.05 | 2.08 | 2.06 | 2.03 | 2.04 | 2.03 | S | 2.03 | 2.03 | 2.02 | 2.02 | 2.04 | 2.10 | 2.21 | 2.04 | 2.12 | 2.12 | 2.15 | 2.02 | 2.21 | 2.06 | 24 | |
| DAY 23 | 2.23 | 2.23 | 2.21 | 2.26 | 2.39 | 2.27 | 2.24 | 2.21 | 2.16 | 2.14 | 2.09 | S | 2.05 | 2.03 | 2.03 | 2.03 | 2.03 | 2.04 | 2.04 | 2.04 | 2.04 | 2.05 | 2.04 | 2.05 | 2.04 | 2.03 | 2.39 | 2.13 | 24 |
| DAY 24 | 2.04 | 2.05 | 2.02 | 2.02 | 2.03 | 2.02 | 2.02 | 2.03 | 2.02 | 2.03 | S | 2.03 | 2.02 | 2.03 | 2.01 | 2.03 | 2.04 | 2.04 | 2.05 | 2.04 | 2.07 | 2.04 | 2.05 | 2.04 | 2.01 | 2.07 | 2.03 | 24 | |
| DAY 25 | 2.09 | 2.11 | 2.14 | 2.13 | 2.12 | 2.11 | 2.12 | 2.14 | 2.20 | S | 2.25 | 2.28 | 2.30 | 2.30 | 2.30 | 2.30 | 2.29 | 2.37 | 2.47 | 2.47 | 2.51 | 2.53 | 2.55 | 2.60 | 2.09 | 2.60 | 2.29 | 24 | |
| DAY 26 | 2.60 | 2.55 | 2.34 | 2.16 | 2.12 | 2.11 | 2.10 | 2.07 | S | 2.07 | 2.06 | 2.06 | 2.07 | 2.07 | 2.06 | 2.06 | 2.09 | 2.10 | 2.09 | 2.12 | 2.11 | 2.18 | 2.14 | 2.11 | 2.06 | 2.60 | 2.15 | 24 | |
| DAY 27 | 2.10 | 2.11 | 2.12 | 2.13 | 2.13 | 2.14 | 2.14 | S | 2.14 | 2.14 | 2.15 | 2.16 | 2.15 | 2.14 | 2.14 | 2.20 | 2.19 | 2.16 | 2.17 | 2.18 | 2.19 | 2.26 | 2.29 | 2.32 | 2.10 | 2.32 | 2.17 | 24 | |
| DAY 28 | 2.42 | 2.48 | 2.49 | 2.51 | 2.53 | 2.52 | S | 2.50 | 2.50 | 2.45 | 2.44 | 2.37 | 2.36 | 2.30 | 2.32 | 2.33 | 2.35 | 2.32 | 2.20 | 2.21 | 2.29 | 2.26 | 2.22 | 2.21 | 2.20 | 2.53 | 2.37 | 24 | |
| DAY 29 | 2.19 | 2.18 | 2.18 | 2.15 | 2.16 | S | 2.10 | 2.08 | 2.07 | 2.06 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | 2.04 | 2.03 | 2.03 | 2.03 | 2.03 | 2.04 | 2.03 | 2.04 | 2.03 | 2.03 | 2.19 | 2.07 | 24 | |
| DAY 30 | 2.03 | 2.03 | 2.03 | 2.03 | S | 2.02 | 2.03 | 2.03 | 2.02 | 2.03 | 2.03 | 2.01 | 2.01 | 2.01 | 2.02 | 2.02 | 2.03 | 2.03 | 2.04 | 2.04 | 2.04 | 2.03 | 2.08 | 2.10 | 2.01 | 2.10 | 2.03 | 24 | |
| DAY 31 | 2.31 | 2.43 | 2.30 | S | 2.29 | 2.26 | 2.25 | 2.29 | 2.29 | 2.29 | 2.24 | 2.23 | 2.25 | 2.31 | 2.29 | 2.25 | 2.17 | 2.16 | 2.20 | 2.25 | 2.31 | 2.29 | 2.29 | 2.30 | 2.16 | 2.43 | 2.27 | 24 | |
| HOURLY MAX | 2.62 | 2.75 | 2.73 | 2.60 | 2.90 | 2.59 | 2.64 | 2.61 | 2.61 | 2.84 | 2.79 | 3.36 | 2.86 | 2.62 | 2.52 | 2.48 | 3.03 | 2.97 | 2.66 | 3.35 | 3.82 | 2.75 | 2.90 | 2.70 | | | | | |
| HOURLY AVG | 2.24 | 2.22 | 2.21 | 2.20 | 2.25 | 2.24 | 2.22 | 2.24 | 2.26 | 2.26 | 2.23 | 2.24 | 2.20 | 2.18 | 2.17 | 2.17 | 2.18 | 2.19 | 2.20 | 2.23 | 2.25 | 2.22 | 2.25 | 2.22 | | | | | |

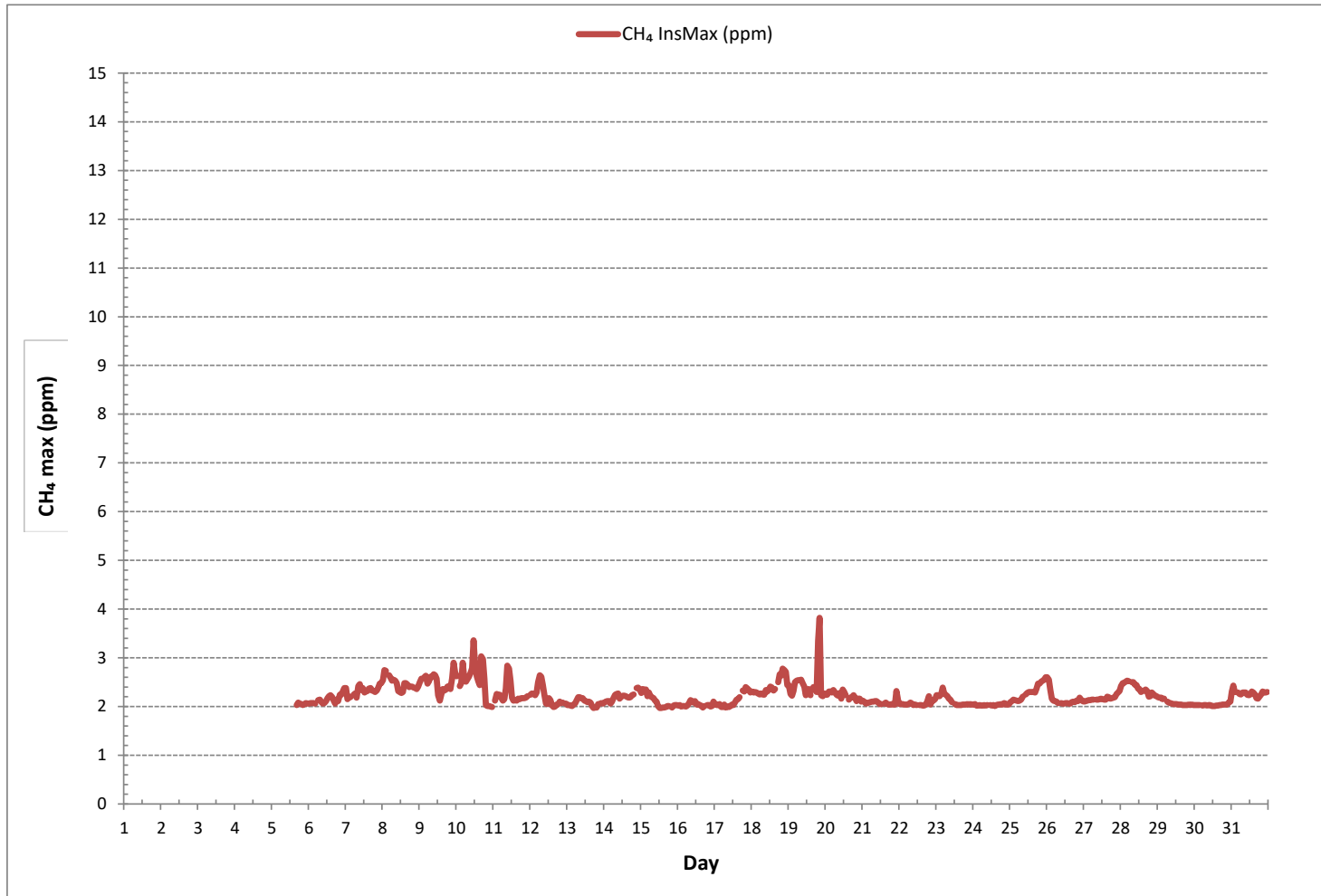
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 605 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.82 ppm @ HOUR 20 ON DAY 19 |
| IZS CALIBRATION TIME: | 27 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 636 hrs |
| STANDARD DEVIATION: | 0.21 |

METHANE MAX Instantaneous Maximum (CH₄ ppm)





NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| DAY 5 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C | C | C | C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12 |
| DAY 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 7 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.01 | 24 |
| DAY 8 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.13 | 0.00 | 0.12 | 0.00 | 0.00 | 0.09 | 0.09 | 0.00 | 0.12 | 0.15 | 0.16 | 0.12 | 0.12 | 0.10 | 0.11 | 0.11 | 0.13 | 0.12 | 0.00 | 0.16 | 0.07 | 24 |
| DAY 9 | 0.19 | 0.18 | S | 0.17 | 0.14 | 0.13 | 0.12 | 0.16 | 0.17 | 0.26 | 0.25 | 0.22 | 0.09 | 0.07 | 0.00 | 0.10 | 0.00 | 0.13 | 0.09 | 0.13 | 0.11 | 0.00 | 0.00 | 0.10 | 0.00 | 0.26 | 0.12 | 24 |
| DAY 10 | 0.09 | S | 0.00 | 0.09 | 0.55 | 0.11 | 0.12 | 0.00 | 0.24 | 0.28 | 0.35 | 0.61 | 0.36 | 0.21 | 0.11 | 0.09 | 0.16 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.61 | 0.15 | 24 |
| DAY 11 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 24 |
| DAY 12 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.09 | 0.00 | 24 |
| DAY 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.17 | 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 | 0.17 | 0.01 | 24 |
| DAY 16 | 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 | 0.06 | 0.00 | 0.06 | 0.00 | 24 |
| DAY 17 | 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 | 0.00 | 0.00 | 24 |
| DAY 18 | 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 | 0.20 | 0.00 | 0.20 | 0.01 | 24 |
| DAY 19 | 0.16 | 0.21 | 0.10 | 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 | 0.21 | 0.02 | 24 |
| DAY 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 | 0.02 | S | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.10 | 0.15 | 0.00 | 0.00 | 0.15 | 0.02 | 24 |
| DAY 21 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.17 | 0.01 | 24 |
| DAY 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.13 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.02 | 24 |
| DAY 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 28 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 24 |
| DAY 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 30 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| DAY 31 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| HOURLY MAX | 0.19 | 0.21 | 0.10 | 0.17 | 0.55 | 0.13 | 0.13 | 0.16 | 0.24 | 0.28 | 0.35 | 0.61 | 0.36 | 0.21 | 0.12 | 0.15 | 0.16 | 0.17 | 0.12 | 0.13 | 0.11 | 0.11 | 0.17 | 0.20 | | | | |
| HOURLY AVG | 0.02 | 0.02 | 0.00 | 0.01 | 0.04 | 0.02 | 0.02 | 0.01 | 0.03 | 0.03 | 0.02 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | | | | |

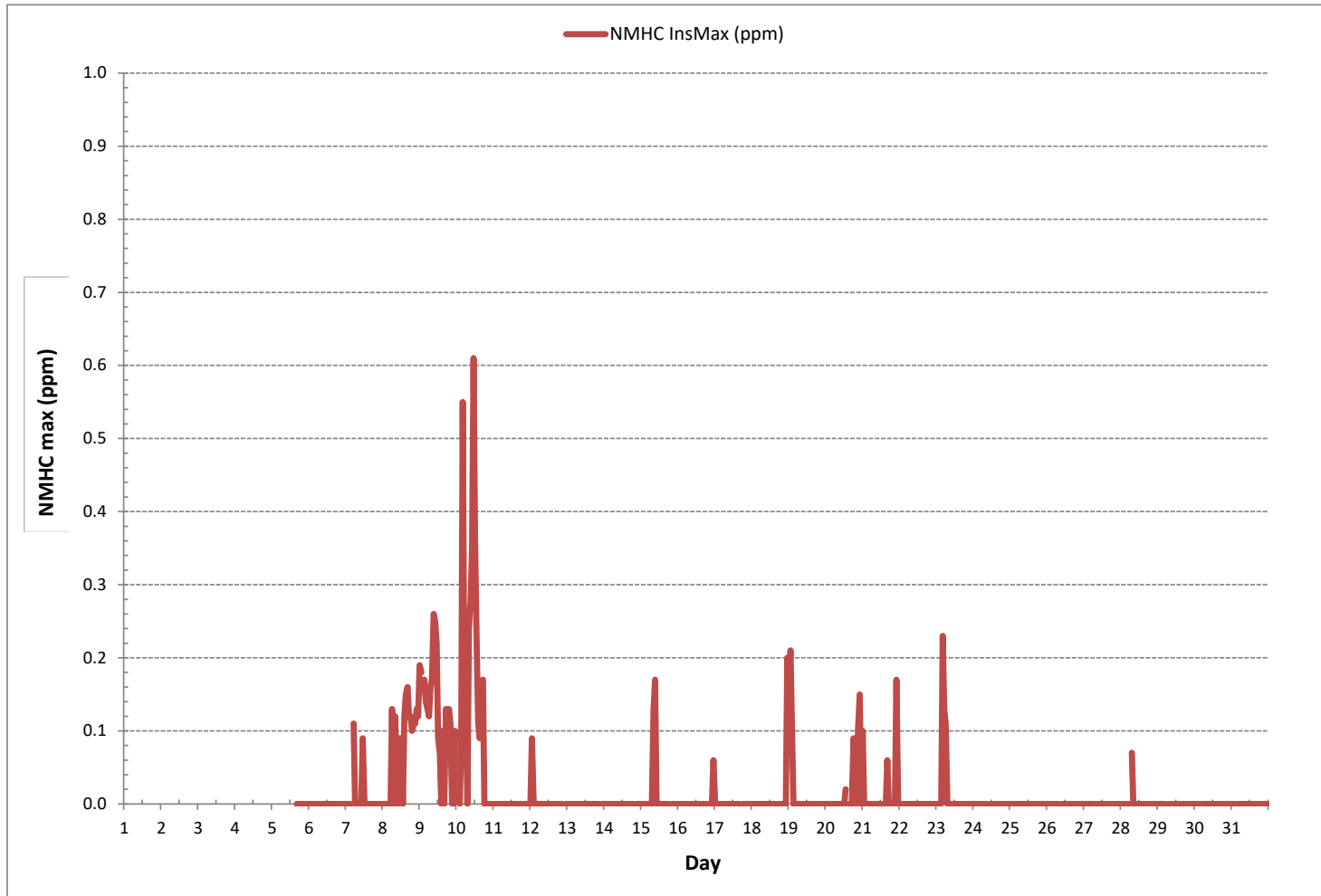
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 69 |
| MAXIMUM INSTANTANEOUS VALUE: | 0.61 ppm @ HOUR 11 ON DAY 10 |
| IZS CALIBRATION TIME: | 27 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| STANDARD DEVIATION: | 0.06 |
| OPERATIONAL TIME: | 636 hrs |

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | 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 | 12 | 11 | 7 | 5 | 5 | 4 | 4 | 5 | 4 | S | 4 | 4 | 3 | 3 | 4 | 6 | 12 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 18 | 5 | 24 | |
| 2 | 3 | 1 | 1 | 1 | 1 | 6 | 7 | 11 | 10 | S | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 3 | 24 |
| 3 | 1 | 1 | 1 | 3 | 5 | 7 | 6 | 17 | S | 17 | 25 | 35 | 22 | 15 | 6 | 11 | 3 | 7 | 5 | 6 | 1 | 2 | 12 | 13 | 1 | 35 | 10 | 24 | |
| 4 | 13 | 15 | 4 | 5 | 2 | 8 | 13 | S | 11 | 11 | 7 | C | C | C | C | C | C | C | C | 23 | 19 | 5 | 8 | 5 | 2 | 23 | 10 | 24 | |
| 5 | 3 | 3 | 3 | 3 | 2 | 3 | S | 6 | 11 | 12 | 15 | 13 | 16 | 7 | 5 | 10 | 24 | 5 | 8 | 6 | 4 | 5 | 5 | 6 | 2 | 24 | 8 | 24 | |
| 6 | 6 | 5 | 6 | 6 | 8 | S | 17 | 17 | 27 | 19 | 14 | 22 | 19 | 18 | 16 | 19 | 18 | 13 | 13 | 15 | 23 | 21 | 20 | 22 | 5 | 27 | 16 | 24 | |
| 7 | 21 | 17 | 12 | 14 | S | 25 | 24 | 42 | 29 | 23 | 18 | 16 | 14 | 54 | 32 | 34 | 36 | 25 | 39 | 30 | 27 | 37 | 29 | 29 | 12 | 54 | 27 | 24 | |
| 8 | 27 | 27 | 29 | S | 38 | 42 | 60 | 46 | 186 | 50 | 38 | 35 | 36 | 38 | 41 | 42 | 39 | 30 | 46 | 31 | 26 | 28 | 29 | 31 | 26 | 186 | 43 | 24 | |
| 9 | 36 | 39 | S | 36 | 32 | 36 | 47 | 56 | 52 | 43 | 47 | 51 | 30 | 21 | 20 | 26 | 22 | 25 | 43 | 22 | 13 | 15 | 20 | 16 | 13 | 56 | 33 | 24 | |
| 10 | 13 | S | 13 | 17 | 15 | 11 | 15 | 60 | 36 | 30 | 40 | 37 | 46 | 124 | 25 | 32 | 37 | 30 | 20 | 5 | 5 | 9 | 17 | 6 | 5 | 124 | 28 | 24 | |
| 11 | S | 8 | 18 | 17 | 13 | 10 | 20 | 33 | 26 | 12 | 11 | 13 | 10 | 9 | 10 | 9 | 6 | 9 | 10 | 8 | 7 | 6 | S | 6 | 6 | 33 | 13 | 24 | |
| 12 | 6 | 7 | 23 | 23 | 9 | 16 | 33 | 35 | 31 | 17 | 12 | 20 | 11 | 14 | 32 | 42 | 12 | 9 | 7 | 8 | 9 | 9 | S | 4 | 4 | 42 | 17 | 24 | |
| 13 | 3 | 3 | 3 | 4 | 4 | 7 | 6 | 12 | 36 | 11 | 12 | 13 | 11 | 12 | 12 | 30 | 18 | 4 | 2 | 2 | 6 | S | 7 | 9 | 2 | 36 | 10 | 24 | |
| 14 | 19 | 5 | 5 | 6 | 9 | 6 | 11 | 7 | 6 | 5 | 5 | 9 | 9 | 7 | 5 | 8 | 5 | 7 | 8 | 6 | S | 6 | 9 | 5 | 5 | 19 | 7 | 24 | |
| 15 | 4 | 4 | 4 | 3 | 3 | 5 | 6 | 26 | 44 | 40 | 20 | 15 | 2 | 6 | 9 | 23 | 1 | 3 | 18 | S | 19 | 46 | 37 | 27 | 1 | 46 | 16 | 24 | |
| 16 | 22 | 30 | 28 | 9 | 9 | 6 | 24 | 14 | 9 | 7 | 3 | 2 | 3 | 11 | 14 | 8 | 2 | 1 | S | 14 | 14 | 18 | 18 | 16 | 1 | 30 | 12 | 24 | |
| 17 | 18 | 17 | 19 | 20 | 9 | 5 | 13 | 2 | 4 | 2 | 6 | 10 | 13 | 7 | 22 | 16 | 47 | S | 15 | 15 | 16 | 16 | 13 | 10 | 2 | 47 | 14 | 24 | |
| 18 | 9 | 15 | 9 | 7 | 7 | 11 | 8 | 11 | 10 | 12 | 9 | 20 | 23 | 14 | 13 | 23 | S | 37 | 26 | 25 | 28 | 30 | 25 | 28 | 7 | 37 | 17 | 24 | |
| 19 | 42 | 47 | 25 | 41 | 20 | 58 | 131 | 45 | 54 | 51 | 30 | 21 | 24 | 27 | 20 | S | 26 | 28 | 15 | 14 | 16 | 15 | 16 | 14 | 14 | 131 | 34 | 24 | |
| 20 | 12 | 15 | 15 | 12 | 14 | 22 | 28 | 40 | 33 | 29 | 16 | 15 | 19 | 22 | S | 9 | 12 | 12 | 24 | 16 | 5 | 14 | 19 | 23 | 5 | 40 | 19 | 24 | |
| 21 | 23 | 18 | 3 | 4 | 4 | 7 | 15 | 18 | 3 | 4 | 12 | 41 | 36 | S | 21 | 42 | 38 | 2 | 1 | 10 | 2 | 17 | 38 | 41 | 1 | 42 | 17 | 24 | |
| 22 | 22 | 21 | 17 | 4 | 15 | 115 | 35 | 42 | 29 | 13 | 16 | 17 | S | 22 | 17 | 9 | 3 | 3 | 2 | 3 | 11 | 11 | 3 | 9 | 2 | 115 | 19 | 24 | |
| 23 | 8 | 7 | 5 | 8 | 7 | 9 | 7 | 7 | 16 | 8 | 3 | S | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 1 | 16 | 4 | 24 | |
| 24 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | S | 2 | 5 | 5 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 1 | 24 | |
| 25 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | S | 6 | 6 | 4 | 3 | 3 | 3 | 3 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 1 | 9 | 4 | 24 | |
| 26 | 10 | 19 | 13 | 3 | 8 | 8 | 7 | 3 | S | 3 | 6 | 6 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 19 | 6 | 24 | |
| 27 | 4 | 4 | 4 | 4 | 4 | 3 | 8 | S | 6 | 4 | 5 | 6 | 3 | 5 | 6 | 5 | 6 | 6 | 6 | 5 | 5 | 4 | 4 | 5 | 3 | 8 | 5 | 24 | |
| 28 | 7 | 7 | 7 | 7 | 7 | 7 | S | 7 | 8 | 7 | 7 | 7 | 9 | 6 | 6 | 6 | 6 | 6 | 5 | 3 | 3 | 3 | 3 | 3 | 2 | 9 | 6 | 24 | |
| 29 | 2 | 2 | 2 | 2 | 2 | S | 1 | 1 | 5 | 9 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 2 | 24 | |
| 30 | 0 | 0 | 0 | 0 | S | 1 | 0 | 1 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 0 | 5 | 2 | 24 | |
| 31 | 6 | 16 | 7 | S | 7 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 6 | 8 | 10 | 7 | 18 | 4 | 4 | 5 | 8 | 7 | 6 | 8 | 4 | 18 | 7 | 24 | |
| HOURLY MAX | 42 | 47 | 29 | 41 | 38 | 115 | 131 | 60 | 186 | 51 | 47 | 51 | 46 | 124 | 41 | 42 | 47 | 37 | 46 | 31 | 28 | 46 | 38 | 41 | | | | | |
| HOURLY AVG | 12 | 12 | 10 | 9 | 9 | 15 | 19 | 20 | 24 | 16 | 14 | 15 | 13 | 16 | 12 | 15 | 14 | 10 | 12 | 10 | 10 | 12 | 12 | 12 | | | | | |

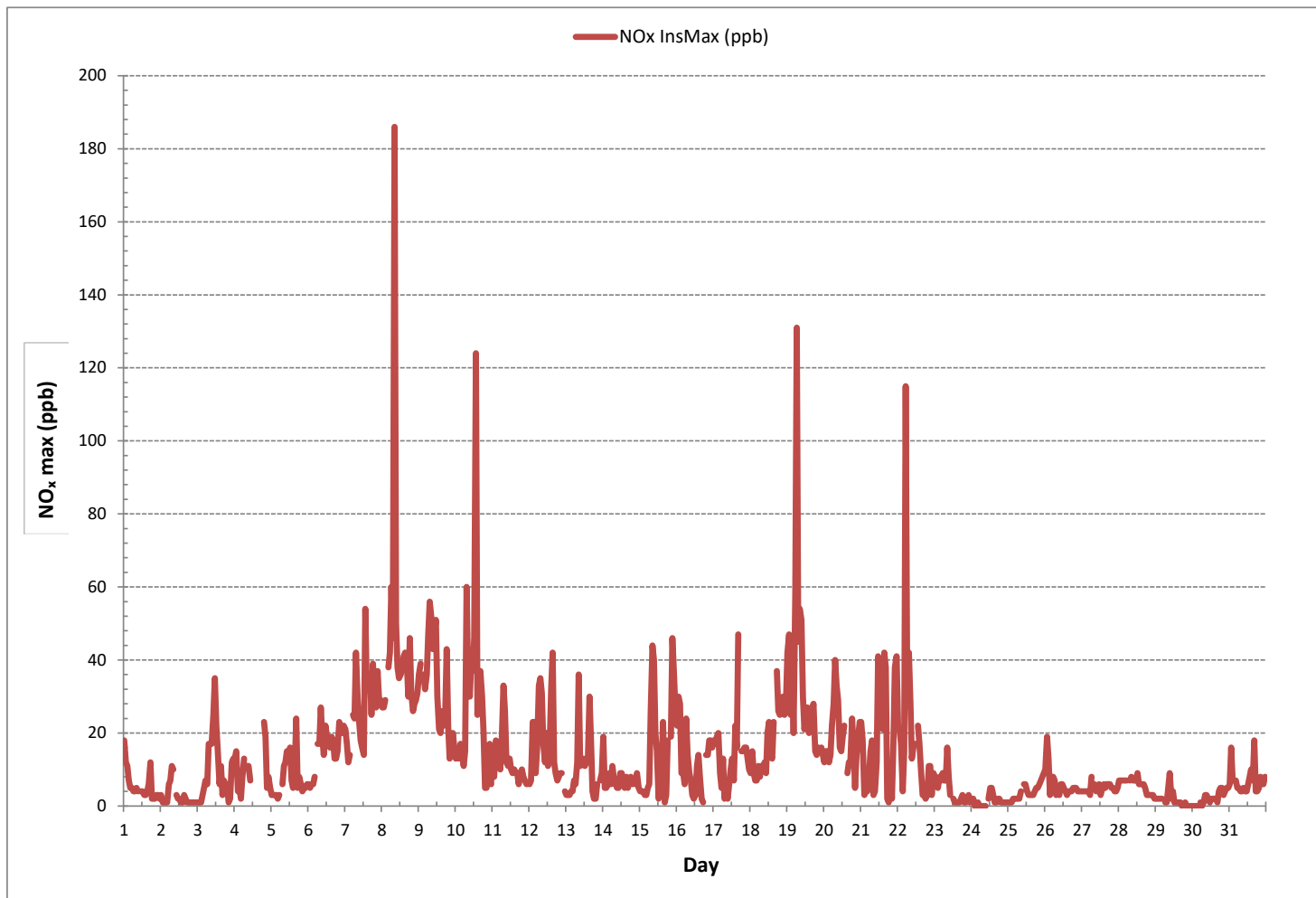
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 686 |
| MAXIMUM INSTANTANEOUS VALUE: | 186 ppb @ HOUR 8 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 16 |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 6 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 24 |
| 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | S | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 |
| 3 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 12 | S | 7 | 14 | 21 | 11 | 6 | 2 | 5 | 1 | 1 | 1 | 3 | 0 | 0 | 3 | 2 | 0 | 21 | 4 | 24 | |
| 4 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | S | 1 | 2 | 2 | C | C | C | C | C | C | C | C | 5 | 4 | 0 | 0 | 0 | 0 | 5 | 1 | 24 | |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 4 | 4 | 5 | 4 | 7 | 4 | 1 | 4 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 9 | 2 | 24 | |
| 6 | 0 | 0 | 0 | 0 | 0 | S | 2 | 3 | 12 | 8 | 5 | 11 | 8 | 7 | 4 | 5 | 2 | 0 | 0 | 2 | 5 | 3 | 0 | 0 | 0 | 12 | 3 | 24 | |
| 7 | 0 | 4 | 0 | 0 | S | 1 | 2 | 25 | 9 | 6 | 5 | 5 | 4 | 32 | 11 | 9 | 9 | 2 | 14 | 4 | 2 | 8 | 1 | 1 | 0 | 32 | 7 | 24 | |
| 8 | 1 | 2 | 3 | S | 14 | 18 | 38 | 26 | 154 | 22 | 13 | 14 | 14 | 17 | 13 | 12 | 9 | 2 | 18 | 1 | 0 | 0 | 1 | 1 | 0 | 154 | 17 | 24 | |
| 9 | 3 | 6 | S | 6 | 7 | 4 | 17 | 33 | 28 | 20 | 28 | 27 | 13 | 7 | 6 | 3 | 1 | 1 | 16 | 1 | 0 | 0 | 1 | 0 | 0 | 33 | 10 | 24 | |
| 10 | 0 | S | 0 | 2 | 1 | 0 | 4 | 49 | 14 | 14 | 24 | 22 | 26 | 93 | 7 | 8 | 7 | 6 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 93 | 13 | 24 | |
| 11 | S | 0 | 3 | 1 | 0 | 1 | 7 | 14 | 9 | 4 | 5 | 6 | 4 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 14 | 3 | 24 | |
| 12 | 0 | 0 | 6 | 3 | 0 | 1 | 9 | 16 | 9 | 3 | 4 | 10 | 4 | 5 | 16 | 18 | 2 | 1 | 0 | 1 | 0 | 0 | S | 0 | 0 | 18 | 5 | 24 | |
| 13 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 16 | 2 | 2 | 3 | 3 | 5 | 1 | 14 | 5 | 1 | 0 | 0 | 0 | S | 0 | 0 | 0 | 16 | 2 | 24 | |
| 14 | 12 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 12 | 1 | 24 | |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 19 | 15 | 6 | 5 | 1 | 3 | 3 | 18 | 0 | 0 | 5 | S | 6 | 17 | 11 | 5 | 0 | 19 | 6 | 24 | |
| 16 | 5 | 7 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 3 | 1 | 0 | 0 | S | 1 | 1 | 1 | 2 | 1 | 0 | 7 | 2 | 24 | |
| 17 | 1 | 2 | 3 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 5 | 2 | 13 | 1 | 21 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 2 | 24 | |
| 18 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 3 | 2 | 7 | 9 | 5 | 3 | 5 | S | 13 | 3 | 2 | 2 | 8 | 2 | 4 | 0 | 13 | 3 | 24 | |
| 19 | 15 | 18 | 5 | 19 | 3 | 32 | 111 | 24 | 28 | 34 | 12 | 6 | 9 | 13 | 6 | S | 3 | 4 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 111 | 15 | 24 | |
| 20 | 0 | 0 | 0 | 0 | 1 | 5 | 11 | 18 | 12 | 8 | 4 | 5 | 7 | 8 | S | 1 | 1 | 1 | 5 | 2 | 1 | 2 | 3 | 3 | 0 | 18 | 4 | 24 | |
| 21 | 4 | 2 | 0 | 0 | 0 | 1 | 4 | 2 | 1 | 0 | 2 | 20 | 17 | S | 9 | 19 | 17 | 0 | 0 | 3 | 0 | 6 | 19 | 22 | 0 | 22 | 6 | 24 | |
| 22 | 10 | 8 | 6 | 1 | 5 | 67 | 13 | 17 | 10 | 1 | 5 | 5 | S | 7 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 7 | 24 | |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 24 | |
| 24 | 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 | 1 | 0 | 24 | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 26 | 0 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | S | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 24 | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | S | 1 | 0 | 2 | 3 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 24 | |
| 28 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | |
| 29 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 2 | 4 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 24 | |
| 30 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 31 | 0 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 2 | 1 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 24 | |
| HOURLY MAX | 15 | 18 | 7 | 19 | 14 | 67 | 111 | 49 | 154 | 34 | 28 | 27 | 26 | 93 | 16 | 19 | 21 | 13 | 18 | 5 | 6 | 17 | 19 | 22 | | | | | |
| HOURLY AVG | 2 | 2 | 1 | 1 | 1 | 5 | 8 | 9 | 12 | 6 | 5 | 6 | 5 | 8 | 4 | 5 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | | | | | |

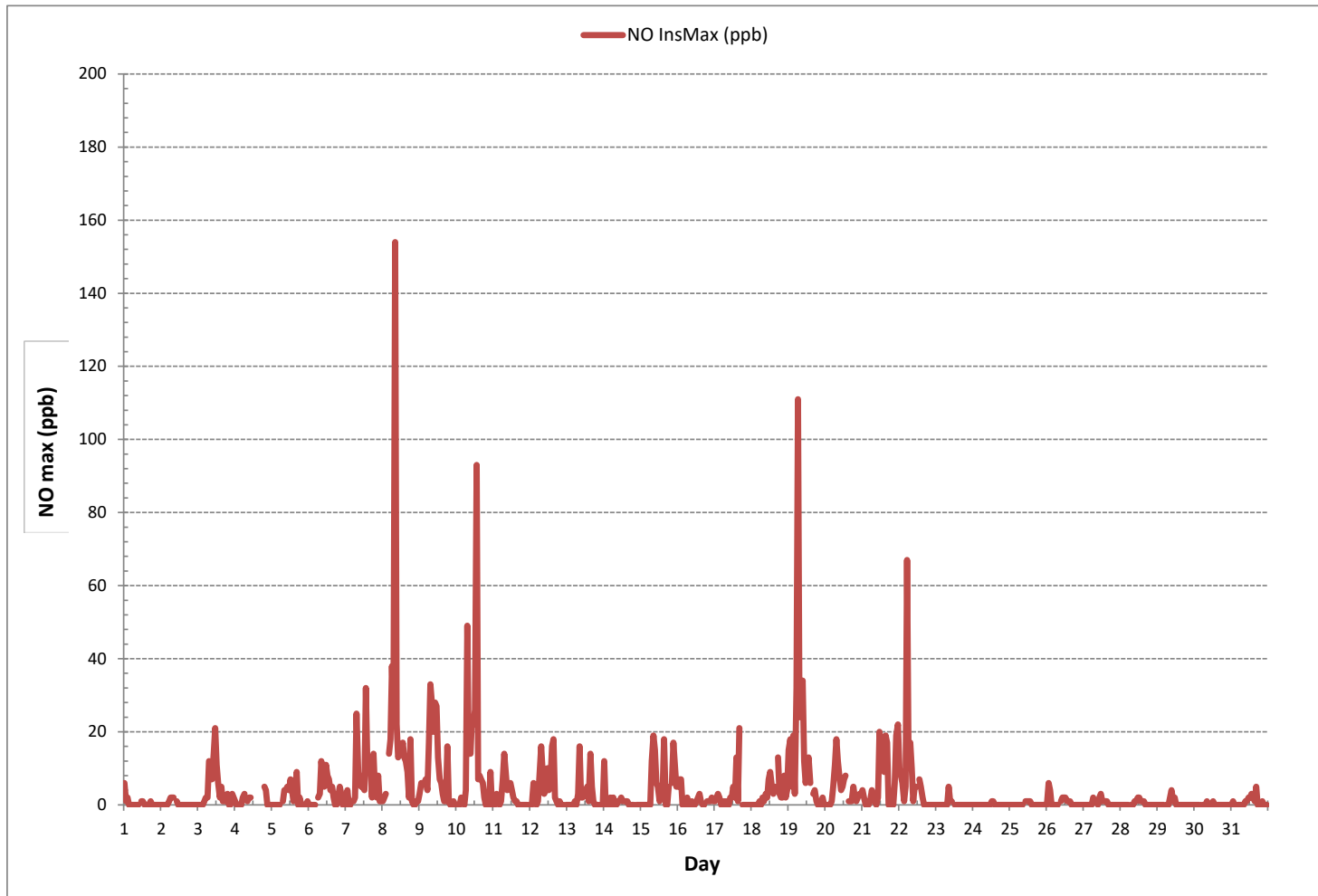
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 366 |
| MAXIMUM INSTANTANEOUS VALUE: | 154 ppb @ HOUR 8 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| STANDARD DEVIATION: | 10 |
| OPERATIONAL TIME: | 744 hrs |

NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 11 | 11 | 9 | 6 | 5 | 5 | 4 | 4 | 5 | 4 | S | 4 | 3 | 3 | 2 | 4 | 6 | 11 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 11 | 5 | 24 |
| 2 | 3 | 1 | 1 | 1 | 1 | 5 | 5 | 8 | 8 | S | 3 | 2 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 2 | 24 |
| 3 | 1 | 1 | 1 | 3 | 5 | 5 | 4 | 5 | S | 10 | 11 | 14 | 12 | 9 | 4 | 6 | 2 | 6 | 5 | 3 | 1 | 2 | 10 | 13 | 1 | 14 | 6 | 24 | |
| 4 | 13 | 15 | 4 | 4 | 2 | 6 | 10 | S | 10 | 9 | 5 | C | C | C | C | C | C | C | C | 18 | 15 | 5 | 8 | 5 | 2 | 18 | 9 | 24 | |
| 5 | 3 | 3 | 4 | 3 | 2 | 3 | S | 5 | 8 | 9 | 10 | 9 | 10 | 4 | 5 | 6 | 16 | 5 | 6 | 5 | 4 | 5 | 5 | 6 | 2 | 16 | 6 | 24 | |
| 6 | 6 | 5 | 6 | 6 | 8 | S | 17 | 14 | 16 | 11 | 9 | 12 | 11 | 11 | 13 | 15 | 16 | 13 | 13 | 12 | 19 | 19 | 20 | 22 | 5 | 22 | 13 | 24 | |
| 7 | 21 | 13 | 12 | 14 | S | 24 | 22 | 20 | 21 | 17 | 13 | 12 | 10 | 24 | 21 | 24 | 28 | 24 | 25 | 26 | 25 | 30 | 28 | 29 | 10 | 30 | 21 | 24 | |
| 8 | 27 | 26 | 27 | S | 24 | 25 | 24 | 23 | 42 | 28 | 25 | 20 | 21 | 23 | 28 | 32 | 32 | 29 | 30 | 29 | 26 | 27 | 28 | 30 | 20 | 42 | 27 | 24 | |
| 9 | 33 | 33 | S | 32 | 29 | 32 | 30 | 28 | 29 | 24 | 21 | 27 | 20 | 15 | 16 | 23 | 21 | 25 | 28 | 22 | 13 | 15 | 19 | 16 | 13 | 33 | 24 | 24 | |
| 10 | 13 | S | 13 | 15 | 14 | 11 | 15 | 17 | 22 | 18 | 17 | 16 | 21 | 36 | 19 | 25 | 29 | 26 | 18 | 5 | 5 | 8 | 10 | 6 | 5 | 36 | 16 | 24 | |
| 11 | S | 8 | 16 | 16 | 13 | 10 | 13 | 20 | 17 | 10 | 7 | 8 | 7 | 7 | 9 | 8 | 9 | 6 | 9 | 10 | 8 | 7 | 6 | S | 6 | 20 | 10 | 24 | |
| 12 | 6 | 7 | 19 | 22 | 9 | 15 | 24 | 23 | 22 | 15 | 8 | 11 | 8 | 10 | 16 | 24 | 10 | 8 | 7 | 8 | 9 | 9 | S | 4 | 4 | 24 | 13 | 24 | |
| 13 | 3 | 3 | 3 | 4 | 4 | 6 | 6 | 9 | 20 | 9 | 10 | 10 | 8 | 8 | 11 | 16 | 13 | 4 | 2 | 2 | 6 | S | 7 | 9 | 2 | 20 | 8 | 24 | |
| 14 | 7 | 5 | 5 | 6 | 8 | 6 | 10 | 7 | 5 | 4 | 4 | 8 | 8 | 6 | 5 | 7 | 5 | 6 | 8 | 6 | S | 6 | 9 | 5 | 4 | 10 | 6 | 24 | |
| 15 | 4 | 4 | 4 | 3 | 3 | 5 | 6 | 16 | 25 | 25 | 14 | 10 | 1 | 4 | 6 | 7 | 1 | 3 | 14 | S | 15 | 30 | 26 | 21 | 1 | 30 | 11 | 24 | |
| 16 | 19 | 24 | 21 | 9 | 9 | 6 | 22 | 13 | 9 | 7 | 2 | 2 | 2 | 8 | 12 | 7 | 2 | 1 | S | 13 | 13 | 17 | 16 | 15 | 1 | 24 | 11 | 24 | |
| 17 | 17 | 16 | 16 | 18 | 9 | 5 | 13 | 2 | 3 | 2 | 5 | 7 | 8 | 5 | 10 | 15 | 26 | S | 15 | 15 | 16 | 16 | 13 | 10 | 2 | 26 | 11 | 24 | |
| 18 | 9 | 15 | 9 | 7 | 7 | 10 | 8 | 9 | 8 | 10 | 6 | 12 | 14 | 9 | 11 | 19 | S | 24 | 24 | 23 | 26 | 27 | 24 | 25 | 6 | 27 | 15 | 24 | |
| 19 | 27 | 29 | 22 | 24 | 19 | 26 | 30 | 24 | 26 | 20 | 19 | 15 | 15 | 16 | 13 | S | 24 | 24 | 15 | 14 | 15 | 15 | 14 | 14 | 13 | 30 | 20 | 24 | |
| 20 | 12 | 15 | 15 | 12 | 14 | 17 | 22 | 23 | 23 | 21 | 12 | 10 | 12 | 14 | S | 9 | 11 | 11 | 20 | 14 | 4 | 12 | 16 | 20 | 4 | 23 | 15 | 24 | |
| 21 | 19 | 16 | 3 | 4 | 4 | 7 | 13 | 17 | 3 | 4 | 10 | 21 | 20 | S | 14 | 23 | 21 | 2 | 1 | 7 | 2 | 11 | 19 | 19 | 1 | 23 | 11 | 24 | |
| 22 | 12 | 13 | 12 | 3 | 10 | 49 | 21 | 26 | 20 | 12 | 11 | 12 | S | 14 | 12 | 6 | 3 | 3 | 2 | 3 | 11 | 11 | 3 | 9 | 2 | 49 | 12 | 24 | |
| 23 | 8 | 7 | 5 | 7 | 7 | 9 | 7 | 7 | 11 | 7 | 3 | S | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 1 | 11 | 4 | 24 | |
| 24 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | S | 1 | 4 | 4 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 4 | 1 | 24 | |
| 25 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | S | 6 | 5 | 3 | 3 | 3 | 3 | 3 | 4 | 5 | 5 | 6 | 7 | 8 | 8 | 1 | 8 | 4 | 24 | |
| 26 | 10 | 13 | 9 | 3 | 8 | 8 | 6 | 3 | S | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 13 | 5 | 24 |
| 27 | 4 | 4 | 4 | 4 | 4 | 3 | 7 | S | 5 | 4 | 3 | 3 | 3 | 4 | 5 | 5 | 6 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 5 | 3 | 7 | 4 | 24 |
| 28 | 7 | 7 | 7 | 7 | 7 | 7 | S | 7 | 8 | 7 | 7 | 6 | 7 | 5 | 5 | 6 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 8 | 6 | 24 |
| 29 | 2 | 2 | 2 | 2 | 2 | S | 2 | 1 | 3 | 5 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 1 | 24 |
| 30 | 0 | 0 | 0 | 0 | S | 1 | 0 | 1 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 0 | 5 | 2 | 24 | |
| 31 | 6 | 16 | 7 | S | 7 | 5 | 5 | 4 | 4 | 4 | 3 | 2 | 4 | 6 | 8 | 6 | 13 | 4 | 4 | 5 | 7 | 7 | 7 | 8 | 2 | 16 | 6 | 24 | |
| HOURLY MAX | 33 | 33 | 27 | 32 | 29 | 49 | 30 | 28 | 42 | 28 | 25 | 27 | 21 | 36 | 28 | 32 | 32 | 29 | 30 | 29 | 26 | 30 | 28 | 30 | | | | | |
| HOURLY AVG | 10 | 11 | 9 | 8 | 8 | 11 | 12 | 12 | 13 | 10 | 9 | 9 | 8 | 9 | 9 | 11 | 11 | 9 | 10 | 9 | 9 | 10 | 11 | 11 | | | | | |

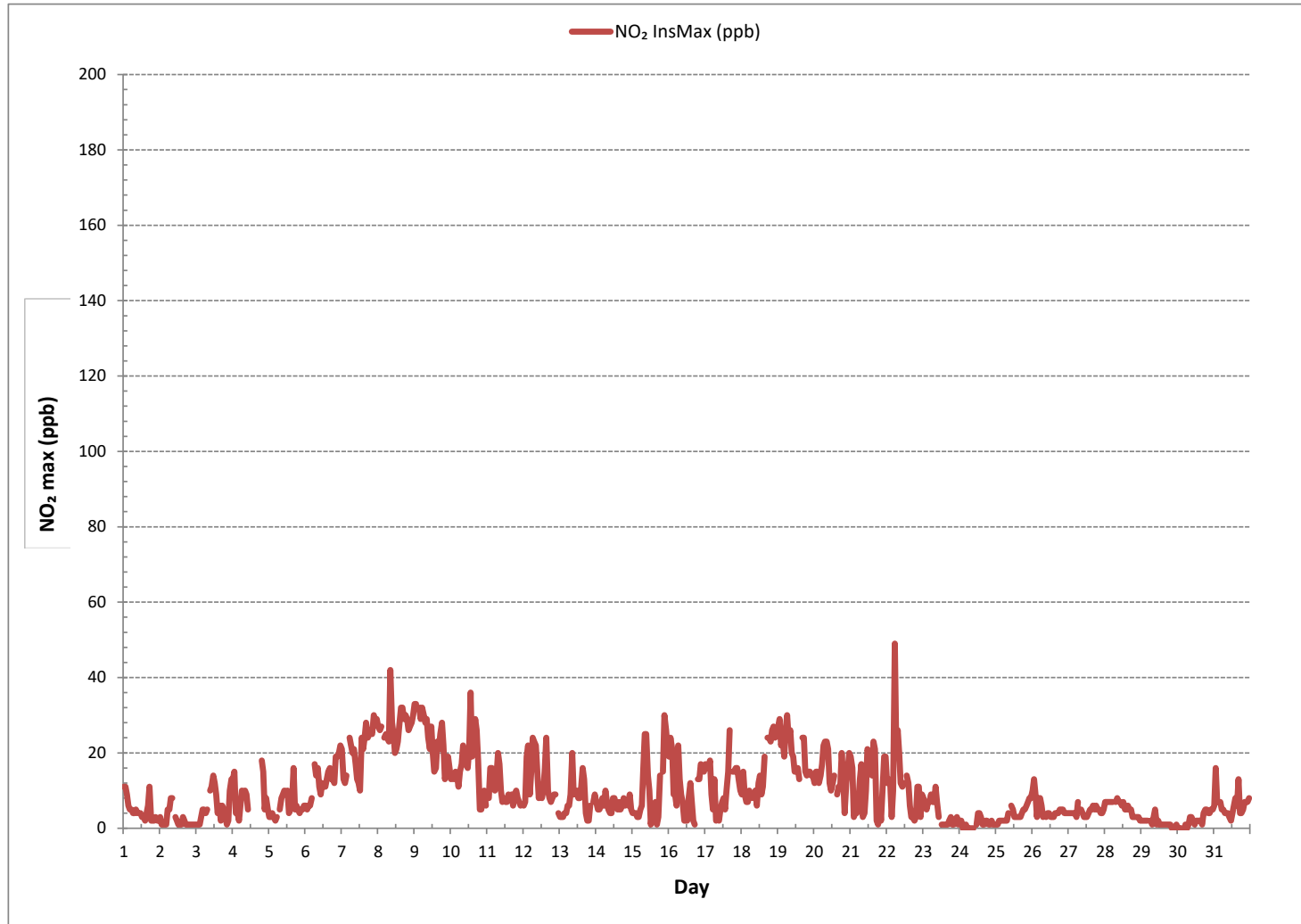
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 689 |
| MAXIMUM INSTANTANEOUS VALUE: | 49 ppb @ HOUR 5 ON DAY 22 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| STANDARD DEVIATION: | 8 |
| OPERATIONAL TIME: | 744 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1.4 | 2.2 | 1.7 | 2.6 | 2.0 | 4.1 | 5.1 | 4.7 | 4.2 | 5.8 | 6.2 | 6.3 | 5.9 | 7.0 | 8.6 | 6.2 | 5.0 | 3.5 | 6.0 | 5.5 | 6.3 | 7.5 | 9.2 | 8.0 | 1.4 | 9.2 | 5.2 | 24 |
| 2 | 8.4 | 7.2 | 7.7 | 8.7 | 7.2 | 8.5 | 7.9 | 7.5 | 7.2 | 5.8 | 6.4 | 7.1 | 6.9 | 5.1 | 4.7 | 3.3 | 3.3 | 3.8 | 3.1 | 1.9 | 1.3 | 2.5 | 1.9 | 1.8 | 1.3 | 8.7 | 5.4 | 24 |
| 3 | 0.0 | 0.1 | 3.2 | 2.1 | 3.8 | 5.1 | 5.3 | 6.6 | 7.7 | 6.5 | 6.0 | 10.6 | 10.3 | 9.0 | 8.0 | 9.4 | 8.8 | 9.4 | 11.3 | 12.1 | 8.3 | 8.9 | 7.4 | 9.4 | 0.0 | 12.1 | 7.1 | 24 |
| 4 | 8.5 | 9.0 | 8.2 | 11.3 | 4.9 | 5.3 | 6.2 | 6.1 | 8.7 | 8.5 | 9.7 | 8.2 | 10.9 | 8.7 | 6.5 | 5.5 | 6.5 | 7.0 | 8.0 | 9.4 | 12.9 | 11.3 | 15.2 | 14.4 | 4.9 | 15.2 | 8.8 | 24 |
| 5 | 13.3 | 14.7 | 12.4 | 16.3 | 11.9 | 11.1 | 14.0 | 11.8 | 8.7 | 4.3 | 4.5 | 5.0 | 8.6 | 8.1 | 4.7 | 6.1 | 6.8 | 6.7 | 8.7 | 8.6 | 7.1 | 6.8 | 6.6 | 6.7 | 4.3 | 16.3 | 8.9 | 24 |
| 6 | 6.3 | 7.5 | 5.2 | 5.3 | 4.6 | 6.9 | 5.6 | 5.8 | 6.9 | 7.6 | 7.6 | 6.4 | 6.6 | 8.5 | 7.3 | 7.1 | 5.7 | 4.2 | 5.4 | 4.9 | 6.1 | 5.1 | 6.2 | 6.2 | 4.2 | 8.5 | 6.2 | 24 |
| 7 | 7.1 | 5.5 | 2.9 | 5.3 | 6.7 | 5.0 | 3.6 | 7.1 | 10.1 | 7.8 | 5.3 | 7.8 | 9.1 | 8.1 | 6.4 | 4.7 | 5.4 | 5.6 | 5.6 | 5.2 | 5.2 | 5.6 | 5.0 | 2.2 | 2.2 | 10.1 | 5.9 | 24 |
| 8 | 2.0 | 3.7 | 3.4 | 2.9 | 2.6 | 3.0 | 2.3 | 3.7 | 5.3 | 7.8 | 7.9 | 6.5 | 5.1 | 7.7 | 6.7 | 7.5 | 6.3 | 4.1 | 5.0 | 10.4 | 7.4 | 5.1 | 7.1 | 6.6 | 2.0 | 10.4 | 5.4 | 24 |
| 9 | 6.0 | 6.4 | 7.0 | 4.1 | 5.9 | 5.5 | 5.0 | 5.5 | 6.8 | 3.9 | 3.1 | 5.9 | 5.1 | 5.6 | 6.0 | 4.6 | 2.5 | 3.2 | 3.3 | 1.5 | 1.7 | 2.0 | 2.9 | 1.8 | 1.5 | 7.0 | 4.4 | 24 |
| 10 | 2.0 | 1.7 | 1.7 | 2.1 | 3.3 | 2.0 | 4.0 | 5.0 | 3.9 | 3.5 | 2.2 | 3.4 | 3.6 | 4.5 | 5.2 | 5.2 | 3.9 | 6.8 | 9.6 | 8.9 | 12.0 | 10.7 | 10.0 | 6.9 | 1.7 | 12.0 | 5.1 | 24 |
| 11 | 4.4 | 6.6 | 6.5 | 5.6 | 6.4 | 7.1 | 5.6 | 5.8 | 4.9 | 2.3 | 2.1 | 2.9 | 4.9 | 5.7 | 4.4 | 6.4 | 4.6 | 7.5 | 6.9 | 4.7 | 6.1 | 2.9 | 2.9 | 2.9 | 2.1 | 7.5 | 5.0 | 24 |
| 12 | 6.4 | 6.9 | 6.7 | 8.1 | 5.1 | 8.2 | 8.8 | 6.5 | 6.5 | 7.3 | 11.0 | 9.4 | 9.5 | 10.9 | 11.5 | 9.5 | 9.2 | 7.9 | 6.8 | 7.4 | 7.1 | 7.6 | 9.8 | 8.8 | 5.1 | 11.5 | 8.2 | 24 |
| 13 | 9.1 | 7.9 | 9.6 | 8.8 | 6.6 | 9.1 | 8.5 | 8.5 | 7.1 | 9.8 | 6.9 | 8.4 | 8.8 | 10.5 | 10.4 | 8.4 | 9.4 | 9.5 | 6.6 | 7.9 | 7.7 | 8.1 | 9.0 | 11.0 | 6.6 | 11.0 | 8.6 | 24 |
| 14 | 9.1 | 7.4 | 7.2 | 7.2 | 9.1 | 6.2 | 3.7 | 4.3 | 5.3 | 4.4 | 8.0 | 6.3 | 4.3 | 3.2 | 4.8 | 4.3 | 6.6 | 4.5 | 3.5 | 2.6 | 2.1 | 2.3 | 2.8 | 4.5 | 2.1 | 9.1 | 5.1 | 24 |
| 15 | 3.1 | 2.6 | 2.2 | 1.6 | 2.0 | 5.8 | 8.6 | 8.9 | 19.1 | 18.4 | 24.1 | 33.5 | 27.1 | 23.1 | 18.4 | 26.1 | 19.3 | 28.3 | 19.7 | 18.9 | 15.6 | 12.1 | 11.9 | 9.1 | 1.6 | 33.5 | 15.0 | 24 |
| 16 | 10.2 | 9.4 | 7.3 | 3.3 | 3.1 | 1.7 | 2.1 | 2.3 | 2.5 | 3.2 | 3.8 | 3.4 | 8.8 | 9.3 | 8.5 | 8.9 | 9.9 | 4.8 | 9.0 | 8.3 | 12.4 | 13.0 | 14.9 | 9.0 | 1.7 | 14.9 | 7.0 | 24 |
| 17 | 6.6 | 10.1 | 7.7 | 8.0 | 10.9 | 7.8 | 8.8 | 7.0 | 9.9 | 7.1 | 5.1 | 6.2 | 6.4 | 6.3 | 7.8 | 5.1 | 4.3 | 8.5 | 6.3 | 5.5 | 5.6 | 4.4 | 3.9 | 2.7 | 2.7 | 10.9 | 6.7 | 24 |
| 18 | 2.6 | 1.5 | 2.4 | 2.3 | 1.7 | 1.2 | 1.2 | 1.5 | 2.2 | 1.6 | 2.9 | 7.4 | 8.4 | 4.7 | 3.7 | 4.2 | 4.3 | 4.6 | 6.0 | 5.3 | 5.6 | 3.1 | 1.8 | 3.3 | 1.2 | 8.4 | 3.5 | 24 |
| 19 | 3.7 | 2.7 | 3.2 | 2.8 | 4.2 | 2.4 | 5.0 | 5.0 | 5.5 | 5.5 | 5.2 | 4.8 | 4.6 | 4.6 | 5.5 | 6.7 | 6.5 | 6.3 | 7.7 | 7.1 | 8.6 | 6.4 | 6.7 | 8.7 | 2.4 | 8.7 | 5.4 | 24 |
| 20 | 7.9 | 6.7 | 7.7 | 7.3 | 7.7 | 7.2 | 6.2 | 6.4 | 6.7 | 5.3 | 6.4 | 2.7 | 2.8 | 4.7 | 6.0 | 5.2 | 11.8 | 10.8 | 13.1 | 11.1 | 15.1 | 17.1 | 15.0 | 11.5 | 2.7 | 17.1 | 8.4 | 24 |
| 21 | 11.3 | 10.0 | 6.5 | 6.1 | 2.2 | 3.9 | 8.5 | 13.4 | 14.2 | 14.3 | 19.3 | 17.3 | 15.4 | 16.0 | 11.9 | 14.2 | 14.6 | 17.0 | 17.9 | 20.6 | 19.7 | 14.8 | 16.0 | 17.7 | 2.2 | 20.6 | 13.4 | 24 |
| 22 | 18.3 | 17.6 | 14.2 | 15.6 | 15.6 | 14.4 | 12.6 | 15.5 | 10.7 | 11.0 | 11.7 | 8.4 | 9.3 | 11.0 | 8.6 | 5.9 | 3.0 | 2.0 | 3.5 | 3.4 | 1.8 | 2.8 | 1.1 | 1.9 | 1.1 | 18.3 | 9.2 | 24 |
| 23 | 1.5 | 0.9 | 0.8 | 1.3 | 1.6 | 1.6 | 2.1 | 1.6 | 1.2 | 2.2 | 2.7 | 3.4 | 4.9 | 5.1 | 5.0 | 4.2 | 3.3 | 2.8 | 4.1 | 3.2 | 3.4 | 3.8 | 3.4 | 4.0 | 0.8 | 5.1 | 2.8 | 24 |
| 24 | 3.7 | 3.0 | 3.3 | 2.7 | 2.2 | 2.5 | 1.9 | 2.3 | 2.5 | 3.5 | 3.4 | 2.4 | 3.0 | 4.2 | 4.2 | 3.2 | 3.1 | 2.8 | 3.8 | 3.3 | 3.2 | 4.2 | 4.6 | 3.8 | 1.9 | 4.6 | 3.2 | 24 |
| 25 | 6.1 | 5.9 | 5.2 | 4.6 | 2.9 | 5.1 | 3.7 | 2.8 | 4.0 | 6.7 | 5.9 | 4.5 | 3.9 | 3.1 | 5.7 | 5.2 | 2.6 | 4.2 | 4.5 | 4.0 | 2.8 | 3.5 | 3.1 | 3.1 | 2.6 | 6.7 | 4.3 | 24 |
| 26 | 3.5 | 6.0 | 5.8 | 6.8 | 7.6 | 7.3 | 8.8 | 6.6 | 2.9 | 4.9 | 5.7 | 4.9 | 4.1 | 3.5 | 2.8 | 2.8 | 2.1 | 3.5 | 2.9 | 2.5 | 2.8 | 2.4 | 2.3 | 2.1 | 2.1 | 8.8 | 4.4 | 24 |
| 27 | 1.7 | 1.6 | 3.0 | 3.8 | 3.7 | 3.0 | 4.6 | 4.0 | 3.0 | 4.4 | 6.8 | 4.3 | 2.8 | 2.4 | 3.5 | 3.5 | 5.8 | 3.1 | 3.9 | 3.3 | 3.9 | 4.6 | 4.9 | 2.8 | 1.6 | 6.8 | 3.7 | 24 |
| 28 | 4.1 | 3.8 | 2.8 | 3.3 | 3.4 | 2.7 | 1.5 | 0.9 | 2.4 | 3.8 | 6.6 | 4.8 | 4.6 | 5.5 | 6.0 | 7.9 | 8.0 | 6.1 | 7.4 | 5.6 | 7.1 | 6.2 | 5.3 | 5.3 | 0.9 | 8.0 | 4.8 | 24 |
| 29 | 4.7 | 6.5 | 5.4 | 4.9 | 6.0 | 5.8 | 6.2 | 6.2 | 6.7 | 5.7 | 6.4 | 6.5 | 6.5 | 8.1 | 7.0 | 5.7 | 8.1 | 9.7 | 8.8 | 9.1 | 10.2 | 8.3 | 9.2 | 9.9 | 4.7 | 10.2 | 7.1 | 24 |
| 30 | 11.2 | 12.3 | 10.7 | 12.8 | 13.1 | 12.5 | 10.2 | 10.4 | 10.2 | 8.6 | 11.4 | 11.1 | 10.5 | 10.6 | 9.6 | 5.4 | 5.9 | 4.6 | 3.7 | 4.0 | 2.9 | 1.4 | 2.0 | 1.9 | 1.4 | 13.1 | 8.2 | 24 |
| 31 | 2.4 | 1.7 | 1.3 | 2.1 | 1.4 | 1.4 | 1.6 | 1.3 | 4.1 | 2.2 | 2.2 | 2.4 | 4.6 | 6.0 | 4.2 | 2.2 | 1.4 | 3.3 | 3.4 | 5.9 | 7.0 | 5.0 | 6.5 | 5.5 | 1.3 | 7.0 | 3.3 | 24 |
| HOURLY MAX | 18.3 | 17.6 | 14.2 | 16.3 | 15.6 | 14.4 | 14.0 | 15.5 | 19.1 | 18.4 | 24.1 | 33.5 | 27.1 | 23.1 | 18.4 | 26.1 | 19.3 | 28.3 | 19.7 | 20.6 | 19.7 | 17.1 | 16.0 | 17.7 | | | | |

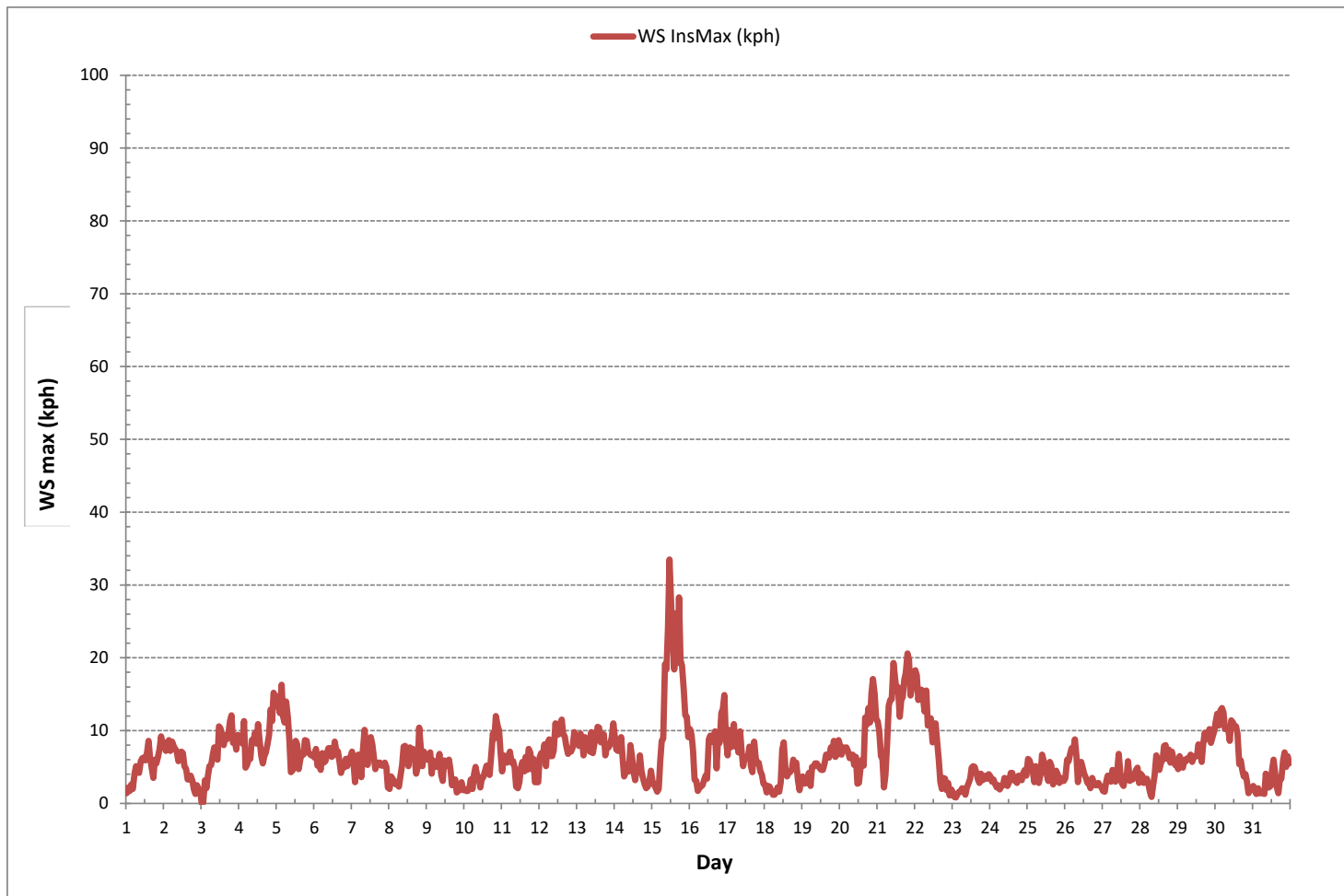
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | | | | | | | |
|------------------------------|------|-----|--------|----|--------|-----|-----|
| MAXIMUM INSTANTANEOUS VALUE: | 33.5 | kph | @ HOUR | 11 | ON DAY | 15 | |
| OPERATIONAL TIME: | | | | | | 744 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

| | |
|---|---|
| Alberta Airshed (if applicable) | EPA Approval or Code of Practice Registration # (if applicable) |
| YES | NA |
| Company Name (if applicable) | Industrial Operation Name (if applicable) |
| LAKELAND INDUSTRY & COMMUNITY ASSOCIATION | Maskwa Continuous Monitoring Station |
| Name of the Representative of the Person Responsible | Position / Title of the Representative of the Person Responsible |
| Mike Bisaga | Environment Monitoring Program Manager |
| Is an External Party Certifying the Report? | |
| <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| Name of External Person Certifying the Report | Position / Title of External Person Certifying the Report |
| Wunmi Adeganmbi | Project Team Lead, Customer Service - Air Services |
| Company Name for External Person Certifying the Report | Identification of Qualifications / Professional Designations of the External Person Certifying the Report |
| Maxxam Analytics, A Bureau Veritas Group Company | M.Sc., EPt., PMP |

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.

Signature of the External Person Certifying the Report

25 - Jan - 2019

Report Issued Date (dd-mon-yyyy)

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



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2018-12-30-C</u> |
| Site: <u>Maskwa Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|--------------------------|-----------------------------|
| Level 0 Preliminary Verification | <u><i>bimadeniji</i></u> | Date <u>08 - Jan - 2019</u> |
| Level 1 Primary Validation | <u><i>bimadeniji</i></u> | Date <u>15 - Jan - 2019</u> |
| Level 2 Final Validation | <u><i>bimadeniji</i></u> | Date <u>25 - Jan - 2019</u> |
| Level 3 Independent Data Review | <u><i>msadmbg</i></u> | Date <u>25 - Jan - 2019</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 10, 2019

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 December 2018.

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

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

All data collected in December 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

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

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

Respectfully,



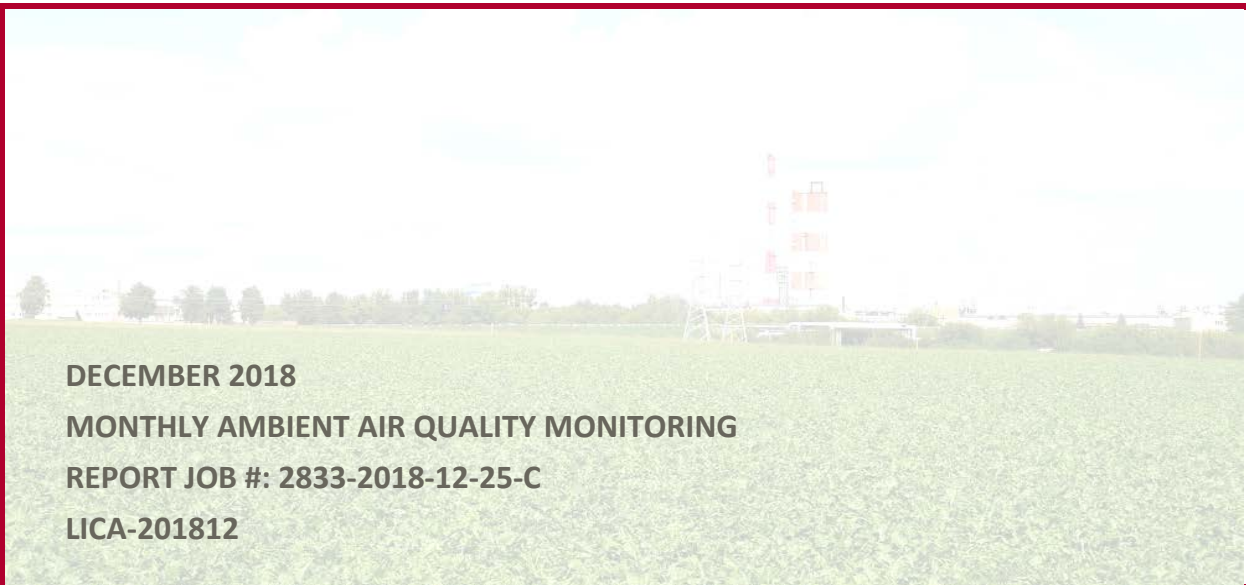
Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

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

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

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca



DECEMBER 2018
MONTHLY AMBIENT AIR QUALITY MONITORING
REPORT JOB #: 2833-2018-12-25-C
LICA-201812

Prepared for:

Lakeland Industry & Community Association
Mike Bisaga
 5107 50 St.
 Bonnyville, Alberta T9N 2J7

Monitoring Station

St. Lina Continuous Monitoring Station
EPEA Approval Number N/A

Date of Report Issuance: January 30, 2019

Report Preparation By: **Reviewed By:**

| | |
|--|--|
| <p>Bim Adeniji, M.Sc. 403-219-3677 aadeniji@maxxam.ca</p> | <p>Wunmi Adekanmbi, M.Sc., EPT, PMP 403-219-3661 aadekanmbi@maxxam.ca</p> |
|--|--|

| | |
|--------------------------|-------------------------------|
| <p><i>Bimadeniji</i></p> | <p><i>Wunmi Adekanmbi</i></p> |
|--------------------------|-------------------------------|

| | |
|--|--|
| <p>Project Manager, Customer Service, Air Services</p> | <p>Project Team Lead, Customer Service, Air Services</p> |
|--|--|



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

SUMMARY

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

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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

H₂S: The analyzer spanned outside the lower acceptance limit on December 31. A repeat zero-span was performed at hour 20:00 and the result was within acceptance limits. One hour of downtime was recorded due to the additional quality check.

NO_x/NO/NO₂: One hour of downtime was recorded on December 16, due to an additional zero-span check performed to assess a biased low drift in span response.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

| Lakeland Industry & Community Association | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| St. Lina Continuous Monitoring Station | | | | | | 1-HOUR | | | | | 24-HOUR | | |
| PARAMETER | OBJECTIVES | | EXCEEDANCES | | MONTHLY AVERAGE | READING | DAY | HOUR | WIND SPEED (kph) | WIND DIRECTION (sector) | READING | DAY | |
| | 1-hr | 24-hr | 1-hr | 24-hr | | | | | | | | | |
| SO ₂ (ppb) | 172 | 48 | 0 | 0 | 0 | 3 | 7 | 14 | 17.4 | SW | 2 | 8 | 100.0 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 0 | 1 | 11 | 0 | 10.3 | SW | 0 | 1 | 99.9 |
| THC (ppm) | - | - | - | - | 2.10 | 2.60 | 10 | 5 | 8.8 | WSW | 2.43 | 25 | 100.0 |
| CH ₄ (ppm) | - | - | - | - | 2.10 | 2.60 | 10 | 5 | 8.8 | WSW | 2.43 | 25 | 100.0 |
| NMHC (ppm) | - | - | - | - | 0.00 | 0.09 | 8 | 9 | 12.9 | SW | 0.01 | 8 | 100.0 |
| NO ₂ (ppb) | 159 | - | 0 | - | 5 | 38 | 8 | 6 | 12.8 | WSW | 21 | 8 | 99.9 |
| NO (ppb) | - | - | - | - | 0 | 19 | 8 | 9 | 12.9 | SW | 4 | 8 | 99.9 |
| NO _x (ppb) | - | - | - | - | 6 | 53 | 8 | 6 | 12.8 | WSW | 25 | 8 | 99.9 |
| O ₃ (ppb) | 82 | - | 0 | - | 25.5 | 40.7 | 12 | 18 | 21.9 | WSW | 36.3 | 15 | 100.0 |
| PM _{2.5} (µg/m ³) | 80 | 29 | 0 | 0 | 7 | 27 | 7 | 23 | 11.4 | SW | 17 | 8 | 100.0 |
| RELATIVE HUMIDITY (%) | - | - | - | - | 84 | 100 | 1 | 0 | 6.0 | SE | 98 | 1 | 100.0 |
| BAROMETRIC PRESSURE (millibar) | - | - | - | - | 923 | 940 | 31 | 1 | 7.2 | WSW | 934 | 5 | 100.0 |
| AMBIENT TEMPERATURE (°C) | - | - | - | - | -9.3 | 6.3 | 15 | 6 | 15.2 | WNW | -0.8 | 14 | 100.0 |
| PRECIPITATION (mm) | - | - | - | - | 24.5 | 1.9 | 2 | 2 | 11.4 | ENE | 13.7 | 2 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 3.6 | 29.3 | 15 | 13 | - | WNW | 17.9 | 21 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 238 (SW) | - | - | - | - | - | - | - | 100.0 |

* Precipitation: data represents the total (sum) for the indicated time frame

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 29 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), 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}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on December 17.
- A brief power outage occurred for a few minutes on December 20. The SO₂ channel was not impacted as the analyzer is connected to a different UPS system.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on December 17.
- The analyzer spanned outside the lower acceptance limit on December 31. A repeat zero-span was performed at hour 20:00 on the same day and the result was within acceptance limits. The cause of the span drift could not be determined. No further action was required. One hour of downtime was, however, recorded due to the additional quality check.
- A brief power outage occurred for a few minutes on December 20. The H₂S channel was not impacted as the analyzer is connected to a different UPS system.

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 December 18.
- The analyzer exhibited poor sample injections on December 15, between hours 14:00 and 15:00, as demonstrated by sporadic minute data recorded at concentrations lower than 1.80 ppm. CH₄ minute concentrations < 1.80 ppm, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly averages were re-calculated.
- A brief power outage occurred for a few minutes on December 20, rendering the maximum instantaneous data at hour 14:00 invalid.

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

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The analyzer spanned close to the lower acceptance limit on December 16. An additional zero-span check conducted at hour 07:00 on the same day drifted further low and the daily zero-span check result of December 17 was outside the lower acceptance limit, indicating the depletion of the permeation tube. This prompted an immediate site visit where a new permeation tube was installed and the routine monthly calibration was completed. The expected span value was updated after the post-calibration span response. The new permeation tube was allowed time to stabilize and the expected span value was updated again following the daily zero-span check on December 23. One hour of downtime was incurred due to the additional quality check.
- A brief power outage occurred for a few minutes on December 20, rendering the maximum instantaneous data at hour 14:00 invalid.

OZONE (O₃)

- Operational time, for the monitoring period was 100%.
- The routine monthly calibration was performed on December 18.
- A brief power outage occurred for a few minutes on December 20, rendering the maximum instantaneous data at hour 14:00 invalid.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time, for the monitoring period was 100%.
- The routine monthly check was performed on December 18.

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

- Operational time, for the monitoring period was 100%.
- A brief power outage occurred for a few minutes on December 20, rendering the maximum instantaneous data at hour 14:00 invalid.
- One instance of maximum instantaneous data was invalidated on December 26, at hour 16:00, due to an anomalous spike. Review of the minute data, bracketing the spike, did not support the validity of the elevated measurement.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

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

BAROMETRIC PRESSURE (BP)

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

PRECIPITATION (PRECIP)

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

AMBIENT TEMPERATURE (AmbTPX)

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

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

All data collected this month 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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

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-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O₃ Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43i - TLE UV Fluorescent Analyzer
Hydrogen Sulphide - Thermo 450i UV Fluorescent Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter (PM_{2.5}) - Thermo SHARP 5030i Unit
Wind System - Met One Unit
Relative Humidity - Campbell Scientific Unit
Barometric Pressure - Met One Unit
Ambient Temperature - Campbell Scientific Unit
Precipitation - Met One Unit
Datalogger - Envista Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

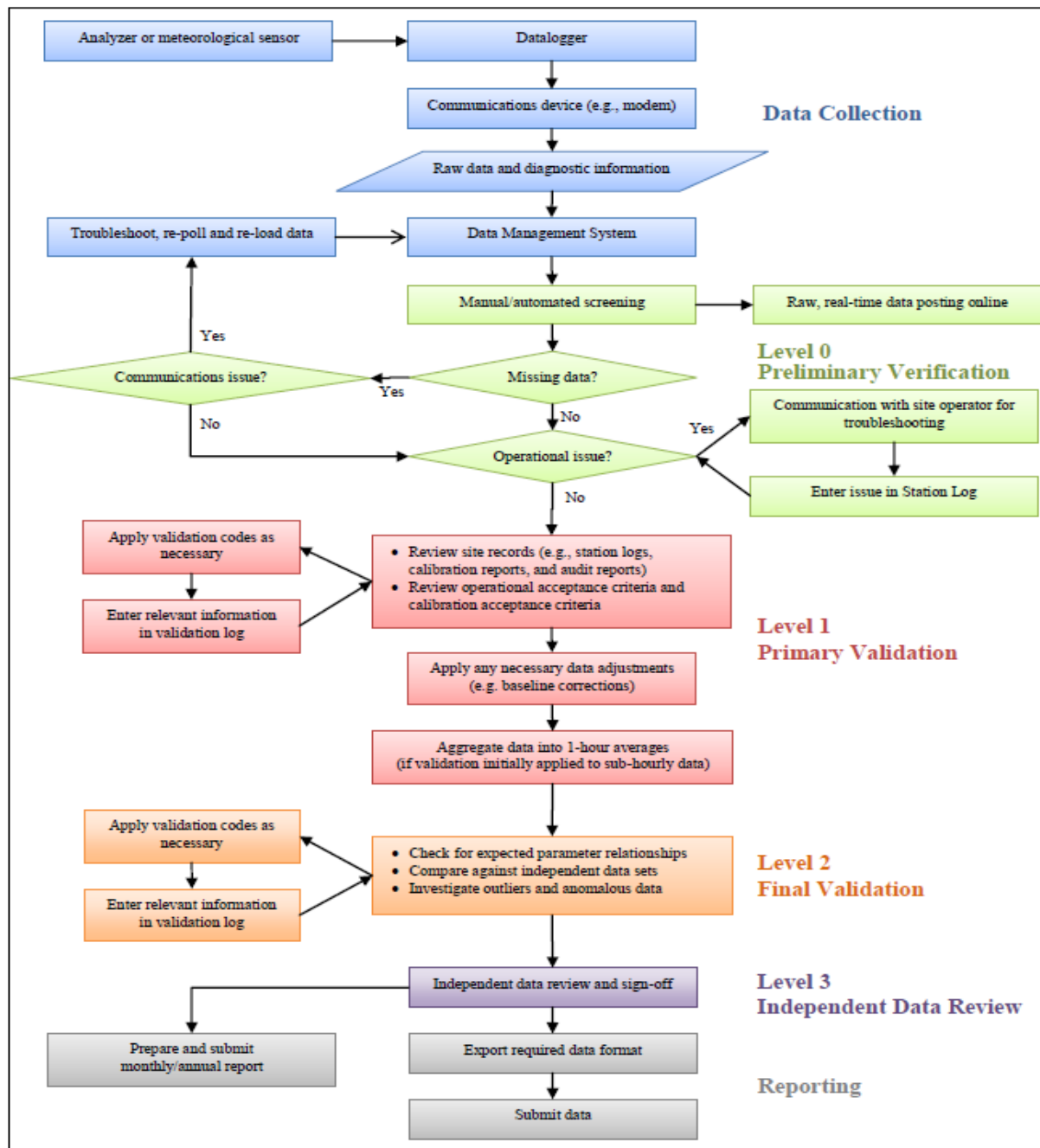
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

STATUS FLAG CODES

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

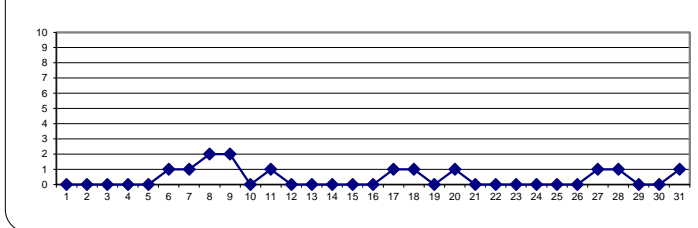
OBJECTIVE LIMIT:

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

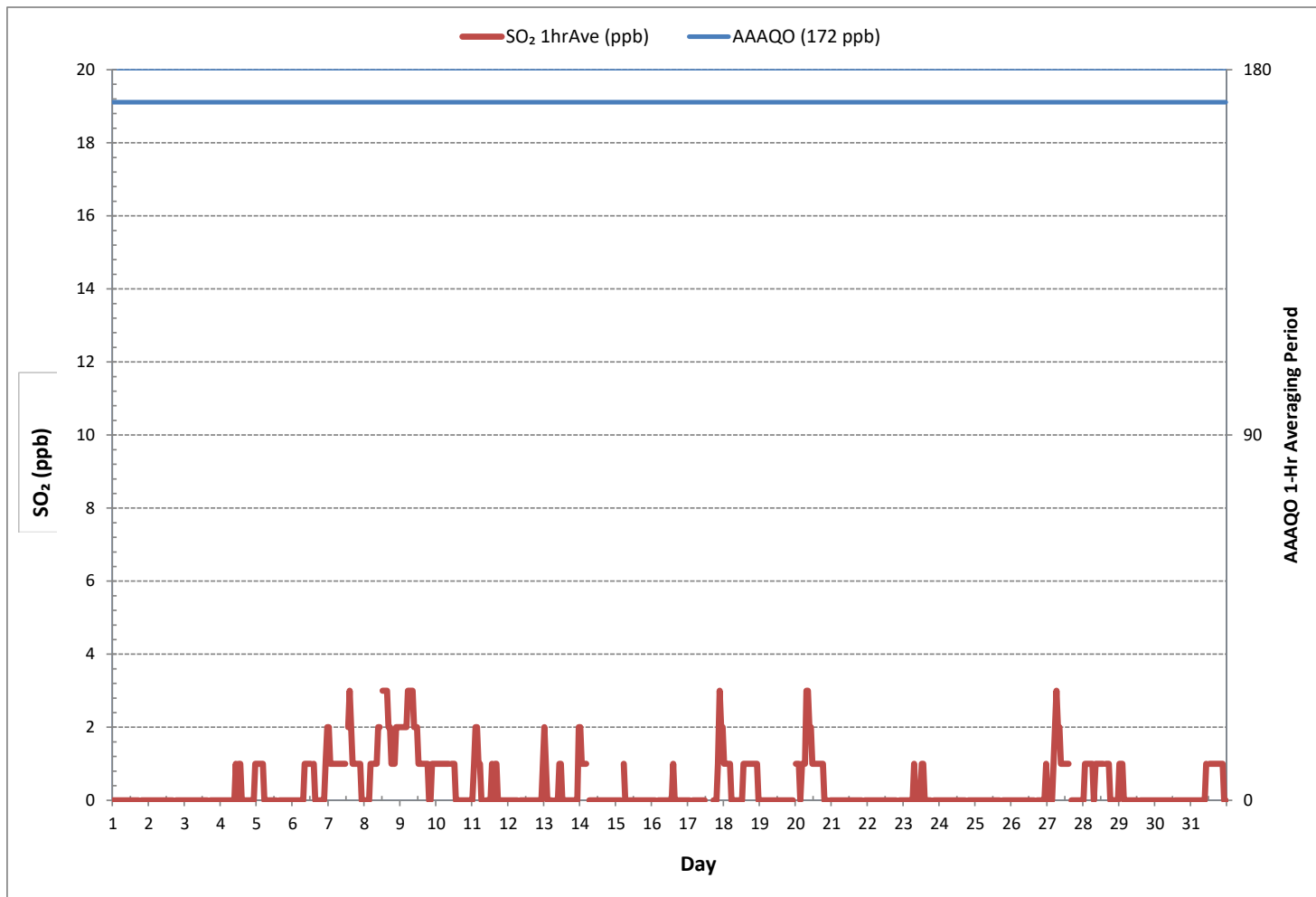
MONTHLY SUMMARY

| | | | |
|------------------------------|--------------------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 191 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR ON DAY 1 | | |
| MAXIMUM 1-HR AVERAGE: | 3 ppb @ HOUR 14 ON DAY 7 | | |
| MAXIMUM 24-HR AVERAGE: | 2 ppb ON DAY 8 | | |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb |

24 HR AVERAGES December 2018

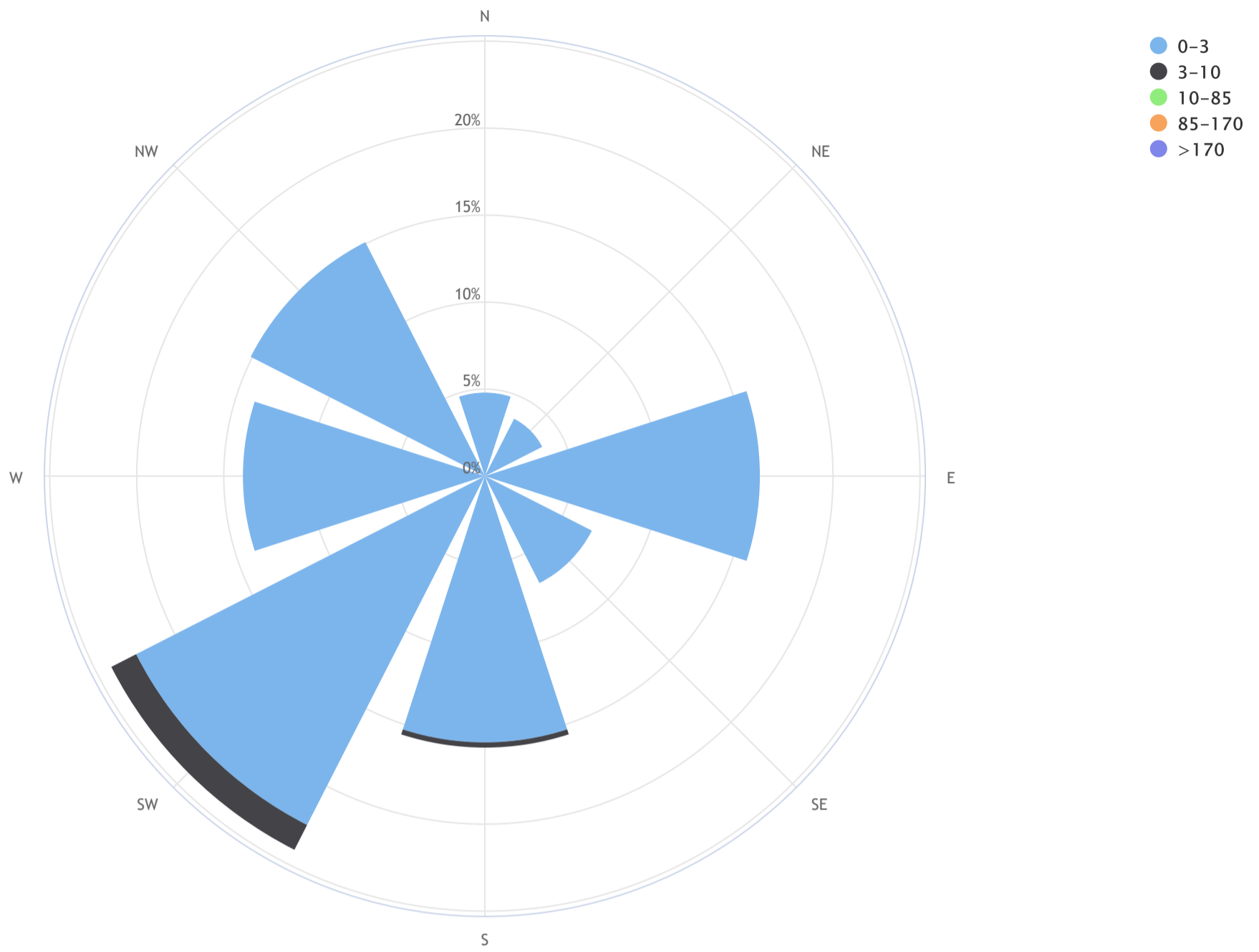


SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_SO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 0.1%



| Direction | 0-3 | 3-10 | 10-85 | 85-170 | >170 | TOTAL |
|-----------|------|------|-------|--------|------|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.8 | 0.0 | 0.0 | 0.0 | 0.0 | 15.8 |
| SE | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 15.3 | 0.3 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 22.5 | 1.6 | 0.0 | 0.0 | 0.0 | 24.1 |
| W | 13.9 | 0.0 | 0.0 | 0.0 | 0.0 | 13.9 |
| NW | 15.1 | 0.0 | 0.0 | 0.0 | 0.0 | 15.1 |
| Summary | 98.0 | 1.8 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |

SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

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

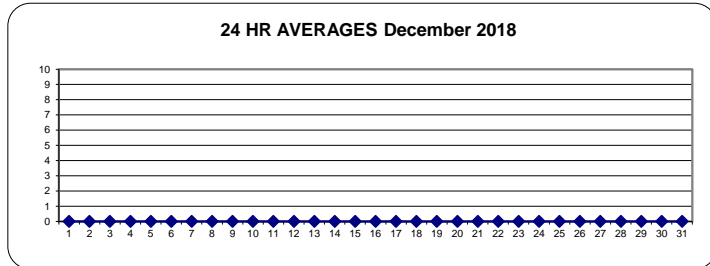
OBJECTIVE LIMIT:

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

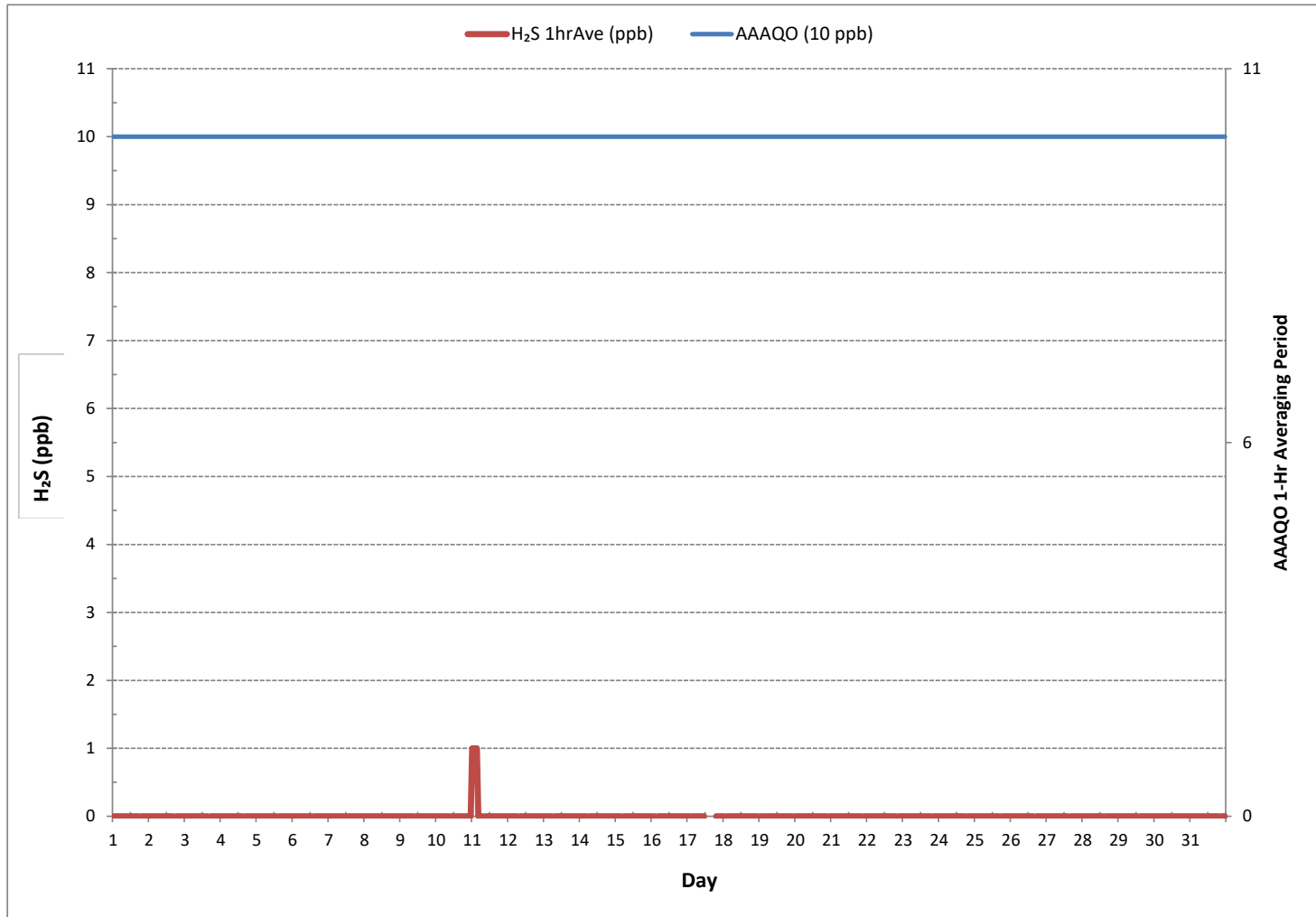
MONTHLY SUMMARY

| | | | |
|------------------------------|--------------------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 4 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR 0 ON DAY 1 | | |
| MAXIMUM 1-HR AVERAGE: | 1 ppb @ HOUR 0 ON DAY 11 | | |
| MAXIMUM 24-HR AVERAGE: | 0 ppb ON DAY 1 | | |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 743 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 99.9 % |
| STANDARD DEVIATION: | 0 | MONTHLY AVERAGE: | 0 ppb |

24 HR AVERAGES December 2018

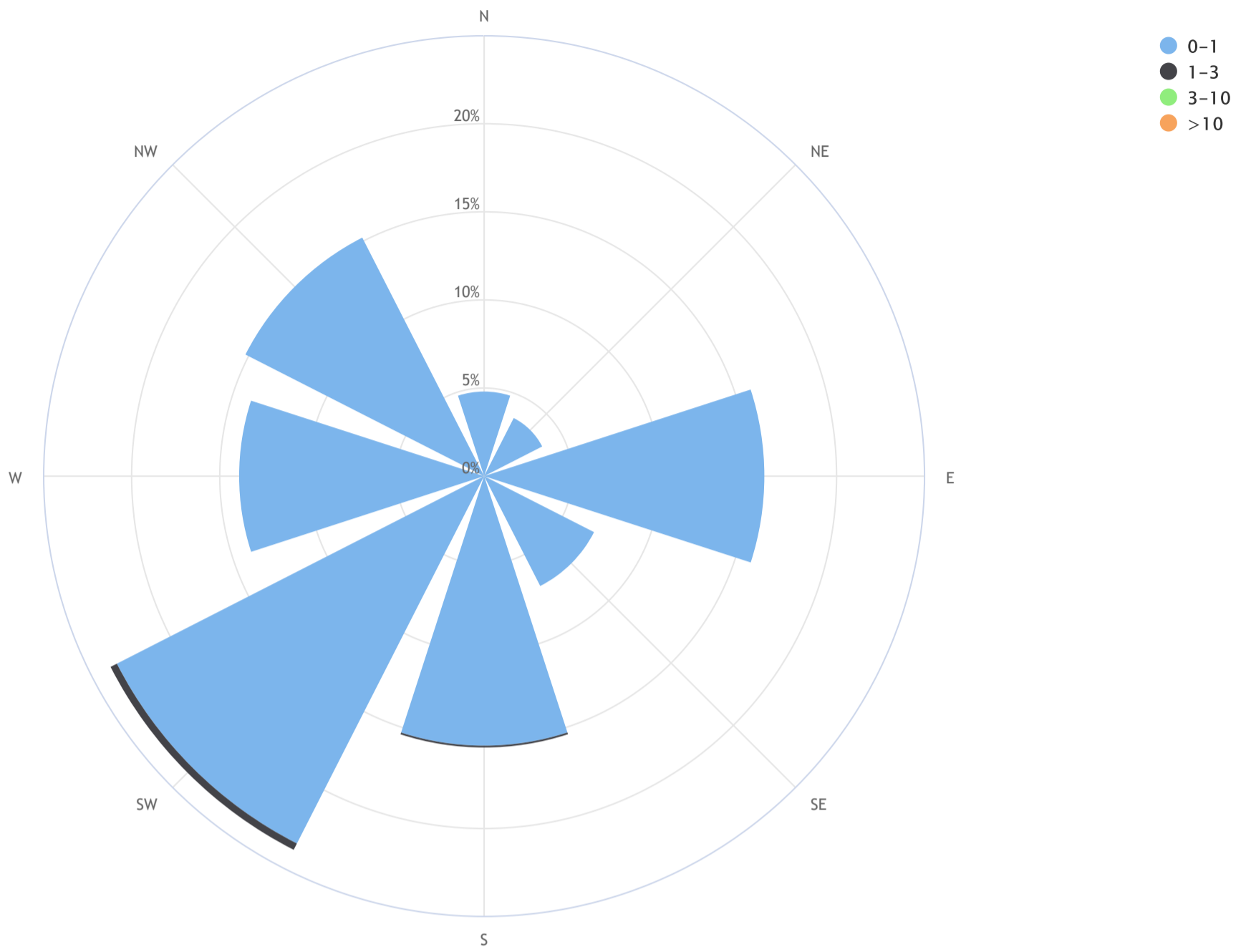


HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_H₂S (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 0.1%



| Direction | 0-1 | 1-3 | 3-10 | >10 | TOTAL |
|-----------|------|-----|------|-----|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.9 | 0.0 | 0.0 | 0.0 | 15.9 |
| SE | 7.0 | 0.0 | 0.0 | 0.0 | 7.0 |
| S | 15.3 | 0.1 | 0.0 | 0.0 | 15.5 |
| SW | 23.4 | 0.4 | 0.0 | 0.0 | 23.9 |
| W | 13.9 | 0.0 | 0.0 | 0.0 | 13.9 |
| NW | 15.2 | 0.0 | 0.0 | 0.0 | 15.2 |
| Summary | 99.3 | 0.6 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



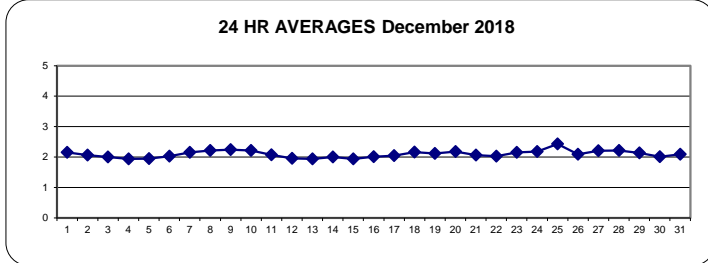
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| 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 | 2.19 | 2.22 | 2.07 | 2.08 | 2.20 | 2.24 | 2.35 | 2.23 | 2.16 | 2.18 | 2.21 | 2.17 | 2.14 | 2.18 | 2.16 | 2.12 | 2.14 | 2.11 | S | 2.10 | 2.08 | 2.05 | 2.04 | 2.02 | 2.02 | 2.35 | 2.15 | 2.15 | 24 |
| 2 | 2.01 | 2.00 | 2.02 | 2.01 | 2.02 | 2.04 | 2.04 | 2.05 | 2.05 | 2.06 | 2.06 | 2.09 | 2.08 | 2.07 | 2.08 | 2.08 | 2.07 | S | 2.06 | 2.04 | 2.06 | 2.03 | 2.15 | 2.15 | 2.00 | 2.15 | 2.06 | 24 | |
| 3 | 2.12 | 2.13 | 2.12 | 2.04 | 2.00 | 2.00 | 2.02 | 2.01 | 2.02 | 1.99 | 1.99 | 1.95 | 1.96 | 1.93 | 1.94 | 1.96 | S | 1.95 | 1.95 | 1.95 | 1.95 | 1.97 | 1.96 | 1.98 | 1.93 | 2.13 | 2.00 | 24 | |
| 4 | 1.97 | 1.96 | 1.94 | 1.94 | 1.95 | 1.94 | 1.93 | 1.93 | 1.93 | 1.93 | 1.95 | 1.96 | 1.97 | 1.98 | 1.97 | S | 1.98 | 1.95 | 1.92 | 1.92 | 1.92 | 1.92 | 1.93 | 1.95 | 1.92 | 1.98 | 1.94 | 24 | |
| 5 | 1.97 | 1.97 | 1.97 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.97 | 1.94 | 1.95 | 2.01 | 1.94 | S | 1.95 | 1.96 | 1.95 | 1.94 | 1.96 | 1.97 | 1.96 | 1.95 | 1.95 | 1.94 | 2.01 | 1.95 | 24 |
| 6 | 1.94 | 1.94 | 1.96 | 1.96 | 1.97 | 1.97 | 1.98 | 1.99 | 2.01 | 2.03 | 2.05 | 2.08 | 2.09 | S | 2.08 | 2.07 | 2.06 | 2.06 | 2.06 | 2.05 | 2.06 | 2.08 | 2.09 | 2.10 | 1.94 | 2.10 | 2.03 | 24 | |
| 7 | 2.12 | 2.13 | 2.10 | 2.09 | 2.09 | 2.12 | 2.12 | 2.11 | 2.10 | 2.11 | 2.13 | 2.13 | S | 2.14 | 2.15 | 2.16 | 2.16 | 2.17 | 2.18 | 2.19 | 2.22 | 2.24 | 2.25 | 2.25 | 2.09 | 2.25 | 2.15 | 24 | |
| 8 | 2.17 | 2.14 | 2.17 | 2.20 | 2.21 | 2.30 | 2.36 | 2.25 | 2.29 | 2.40 | 2.26 | S | 2.20 | 2.18 | 2.17 | 2.18 | 2.18 | 2.16 | 2.17 | 2.18 | 2.21 | 2.21 | 2.21 | 2.22 | 2.14 | 2.40 | 2.22 | 24 | |
| 9 | 2.24 | 2.23 | 2.24 | 2.24 | 2.26 | 2.24 | 2.22 | 2.21 | 2.18 | 2.17 | S | 2.13 | 2.11 | 2.11 | 2.12 | 2.14 | 2.19 | 2.20 | 2.23 | 2.31 | 2.43 | 2.49 | 2.45 | 2.40 | 2.11 | 2.49 | 2.24 | 24 | |
| 10 | 2.33 | 2.46 | 2.52 | 2.53 | 2.49 | 2.60 | 2.52 | 2.42 | 2.37 | S | 2.27 | 2.24 | 2.18 | 2.13 | 2.08 | 2.06 | 1.98 | 1.96 | 2.01 | 2.01 | 1.97 | 1.97 | 1.98 | 1.97 | 1.96 | 2.60 | 2.22 | 24 | |
| 11 | 1.97 | 2.01 | 2.03 | 2.01 | 1.99 | 1.99 | 2.04 | 2.04 | S | 2.01 | 2.02 | 2.05 | 2.08 | 2.07 | 2.08 | 2.14 | 2.14 | 2.16 | 2.13 | 2.11 | 2.10 | 2.13 | 2.14 | 2.14 | 1.97 | 2.16 | 2.07 | 24 | |
| 12 | 2.11 | 2.07 | 2.07 | 2.00 | 1.96 | 1.97 | 1.96 | S | 1.98 | 1.98 | 1.98 | 1.95 | 1.93 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.92 | 1.92 | 1.92 | 1.93 | 1.91 | 2.11 | 1.96 | 24 | |
| 13 | 1.94 | 1.96 | 1.97 | 1.99 | 1.99 | 1.98 | S | 1.96 | 1.96 | 1.96 | 1.95 | 1.94 | 1.93 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.93 | 1.94 | 1.96 | 1.91 | 1.99 | 1.94 | 24 | |
| 14 | 1.97 | 1.95 | 1.97 | 2.00 | 1.96 | S | 1.98 | 2.14 | 2.21 | 2.25 | 2.17 | 2.13 | 2.06 | 1.99 | 1.96 | 2.01 | 2.04 | 1.97 | 1.94 | 1.87 | 1.87 | 1.89 | 1.88 | 1.87 | 1.87 | 2.25 | 2.00 | 24 | |
| 15 | 1.92 | 1.94 | 1.93 | 1.92 | S | 1.98 | 1.94 | 1.93 | 1.93 | 1.95 | 1.96 | 1.90 | 1.89 | 1.89 | 1.90 | 1.94 | 1.92 | 1.93 | 1.96 | 1.96 | 1.97 | 1.98 | 2.00 | 2.05 | 1.89 | 2.05 | 1.94 | 24 | |
| 16 | 2.02 | 2.01 | 1.96 | S | 1.92 | 1.92 | 1.93 | 1.95 | 1.99 | 1.99 | 2.01 | 1.97 | 2.05 | 2.11 | 2.05 | 2.10 | 2.08 | 2.05 | 2.02 | 2.03 | 2.03 | 1.99 | 2.01 | 2.05 | 1.92 | 2.11 | 2.01 | 24 | |
| 17 | 2.02 | 2.04 | S | 2.03 | 2.05 | 2.06 | 2.05 | 2.01 | 2.02 | 2.08 | 2.13 | 2.07 | 2.04 | 2.04 | 2.05 | 2.06 | 2.06 | 2.05 | 2.05 | 2.05 | 2.05 | 2.07 | 2.09 | 2.07 | 2.01 | 2.13 | 2.05 | 24 | |
| 18 | 2.05 | S | 2.02 | 2.02 | 2.08 | 2.17 | 2.17 | 2.22 | 2.23 | 2.21 | C | C | C | C | C | 2.14 | 2.18 | 2.22 | 2.25 | 2.21 | 2.18 | 2.14 | 2.15 | 2.22 | 2.02 | 2.25 | 2.16 | 24 | |
| 19 | S | 2.12 | 2.20 | 2.19 | 2.22 | 2.21 | 2.16 | 2.23 | 2.25 | 2.20 | 2.16 | 2.10 | 2.07 | 2.05 | 2.05 | 2.07 | 2.07 | 2.05 | 2.04 | 2.04 | 2.04 | 2.04 | 2.03 | S | 2.03 | 2.25 | 2.12 | 24 | |
| 20 | 2.06 | 2.06 | 2.07 | 2.05 | 2.10 | 2.14 | 2.11 | 2.10 | 2.15 | 2.09 | 2.07 | 2.05 | 2.07 | 2.18 | 2.20 | 2.24 | 2.35 | 2.49 | 2.47 | 2.42 | 2.28 | 2.16 | S | 2.11 | 2.05 | 2.49 | 2.18 | 24 | |
| 21 | 2.10 | 2.09 | 2.11 | 2.09 | 2.10 | 2.17 | 2.20 | 2.15 | 2.07 | 2.02 | 1.99 | 1.98 | 1.98 | 1.99 | 2.01 | 2.02 | 2.06 | 2.06 | 2.05 | 2.05 | 2.06 | S | 2.06 | 2.05 | 1.98 | 2.20 | 2.06 | 24 | |
| 22 | 2.06 | 2.05 | 2.05 | 2.03 | 2.05 | 2.05 | 2.01 | 2.02 | 2.03 | 2.05 | 2.05 | 2.06 | 2.03 | 1.98 | 1.98 | 1.99 | 1.98 | 2.01 | 2.01 | S | 2.03 | 2.02 | 2.03 | 1.98 | 2.06 | 2.03 | 24 | | |
| 23 | 2.04 | 2.02 | 2.03 | 2.07 | 2.10 | 2.17 | 2.06 | 2.17 | 2.09 | 2.14 | 2.20 | 2.29 | 2.36 | 2.31 | 2.35 | 2.36 | 2.22 | 2.09 | 2.06 | S | 2.08 | 2.08 | 2.07 | 2.06 | 2.02 | 2.36 | 2.15 | 24 | |
| 24 | 2.05 | 2.05 | 2.05 | 2.03 | 2.18 | 2.04 | 2.04 | 2.15 | 2.14 | 2.13 | 2.19 | 2.19 | 2.18 | 2.12 | 2.19 | 2.16 | 2.24 | 2.21 | S | 2.24 | 2.33 | 2.35 | 2.40 | 2.36 | 2.03 | 2.40 | 2.18 | 24 | |
| 25 | 2.36 | 2.37 | 2.41 | 2.45 | 2.52 | 2.52 | 2.48 | 2.49 | 2.57 | 2.52 | 2.47 | 2.39 | 2.41 | 2.30 | 2.33 | 2.43 | 2.57 | S | 2.58 | 2.53 | 2.52 | 2.40 | 2.21 | 2.16 | 2.16 | 2.58 | 2.43 | 24 | |
| 26 | 2.12 | 2.10 | 2.07 | 2.05 | 2.08 | 2.10 | 2.07 | 2.08 | 2.04 | 2.02 | 2.03 | 2.03 | 2.04 | 2.04 | 2.08 | S | 2.10 | 2.16 | 2.08 | 2.10 | 2.20 | 2.20 | 2.20 | 2.02 | 2.02 | 2.24 | 2.09 | 24 | |
| 27 | 2.13 | 2.12 | 2.12 | 2.22 | 2.14 | 2.12 | 2.12 | 2.12 | 2.17 | 2.14 | 2.16 | 2.15 | 2.20 | 2.31 | 2.34 | S | 2.26 | 2.28 | 2.27 | 2.29 | 2.32 | 2.33 | 2.33 | 2.29 | 2.12 | 2.34 | 2.21 | 24 | |
| 28 | 2.27 | 2.25 | 2.25 | 2.24 | 2.23 | 2.23 | 2.30 | 2.33 | 2.27 | 2.27 | 2.21 | 2.19 | 2.20 | 2.20 | S | 2.21 | 2.22 | 2.20 | 2.24 | 2.18 | 2.16 | 2.15 | 2.14 | 2.15 | 2.14 | 2.33 | 2.22 | 24 | |
| 29 | 2.16 | 2.21 | 2.20 | 2.15 | 2.09 | 2.12 | 2.12 | 2.30 | 2.32 | 2.27 | 2.29 | 2.30 | 2.18 | S | 2.14 | 2.09 | 2.07 | 2.05 | 2.04 | 2.02 | 2.01 | 2.02 | 2.02 | 2.02 | 2.01 | 2.32 | 2.14 | 24 | |
| 30 | 2.02 | 2.02 | 2.01 | 2.02 | 2.04 | 2.05 | 2.03 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | S | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.99 | 1.98 | 2.00 | 2.06 | 2.10 | 1.97 | 2.10 | 2.01 | 24 | |
| 31 | 2.03 | 2.04 | 2.04 | 2.06 | 2.05 | 2.07 | 2.08 | 2.10 | 2.09 | 2.07 | 2.07 | S | 2.08 | 2.09 | 2.12 | 2.13 | 2.15 | 2.15 | 2.14 | 2.14 | 2.13 | 2.14 | 2.09 | 2.05 | 2.03 | 2.15 | 2.09 | 24 | |
| HOURLY MAX | 2.36 | 2.46 | 2.52 | 2.53 | 2.52 | 2.60 | 2.52 | 2.49 | 2.57 | 2.52 | 2.47 | 2.39 | 2.41 | 2.31 | 2.35 | 2.43 | 2.57 | 2.49 | 2.58 | 2.53 | 2.52 | 2.49 | 2.45 | 2.40 | | | | | |
| HOURLY AVG | 2.08 | 2.09 | 2.09 | 2.09 | 2.10 | 2.12 | 2.11 | 2.12 | 2.12 | 2.11 | 2.10 | 2.09 | 2.09 | 2.08 | 2.08 | 2.09 | 2.11 | 2.08 | 2.09 | 2.09 | 2.10 | 2.10 | 2.09 | 2.10 | | | | | |

STATUS FLAG CODES

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

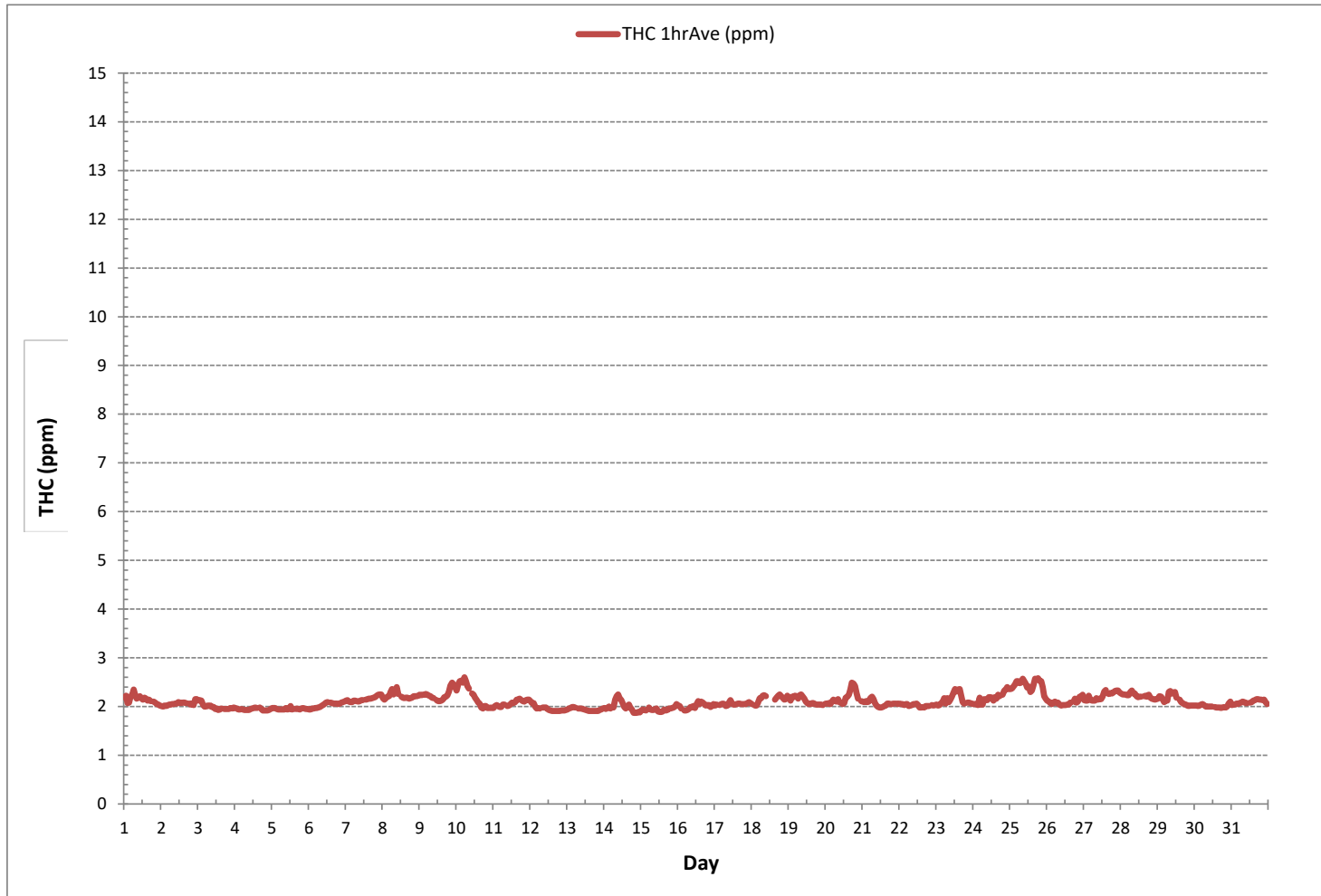
24 HR AVERAGES December 2018



MONTHLY SUMMARY

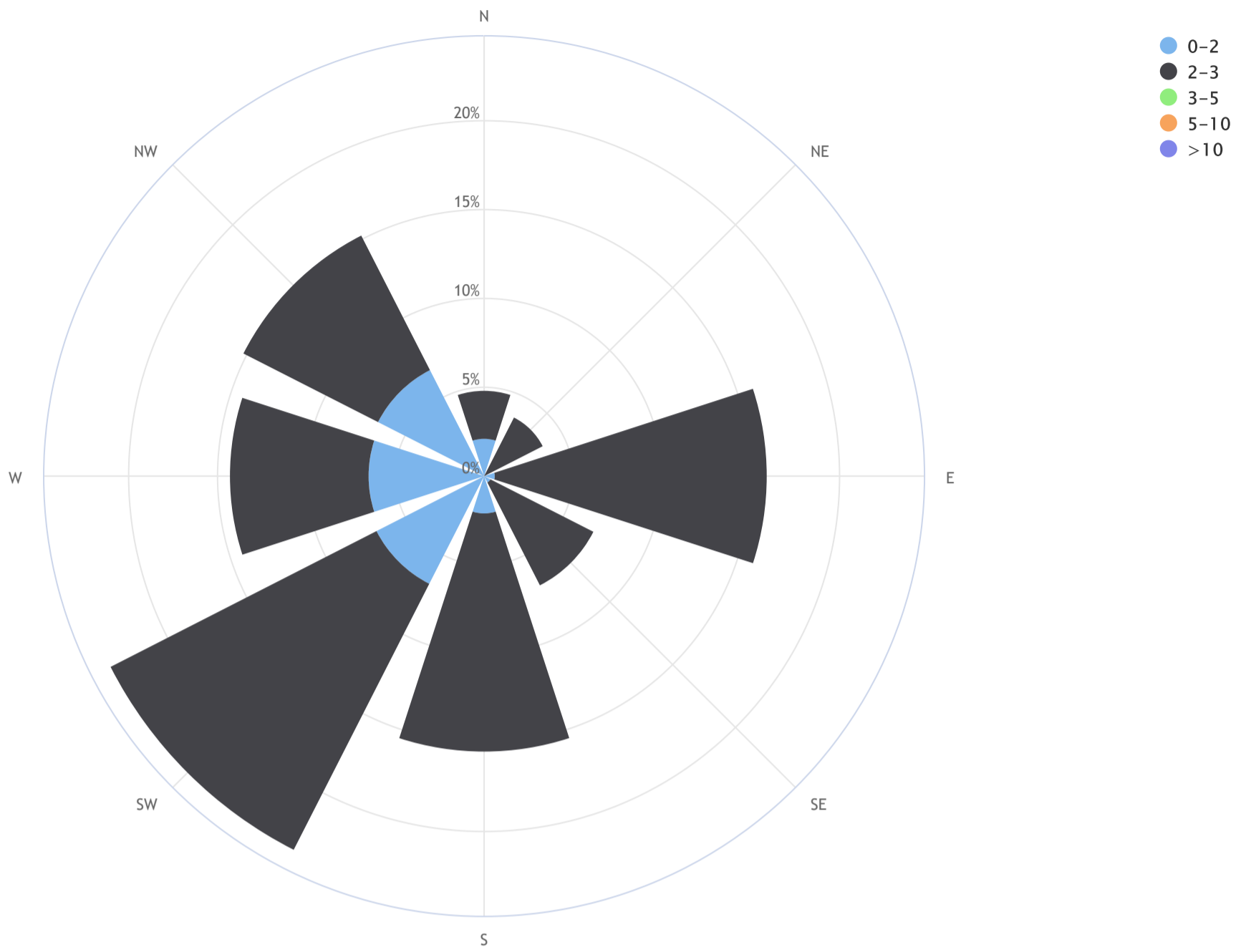
| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 707 | | | |
| MINIMUM 1-HR AVERAGE: | 1.87 ppm | @ HOUR | 19 | ON DAY 14 |
| MAXIMUM 1-HR AVERAGE: | 2.60 ppm | @ HOUR | 5 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 2.43 ppm | | | ON DAY 25 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.14 | MONTHLY AVERAGE: | 2.10 ppm | |

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_THC (ppm)_18/12

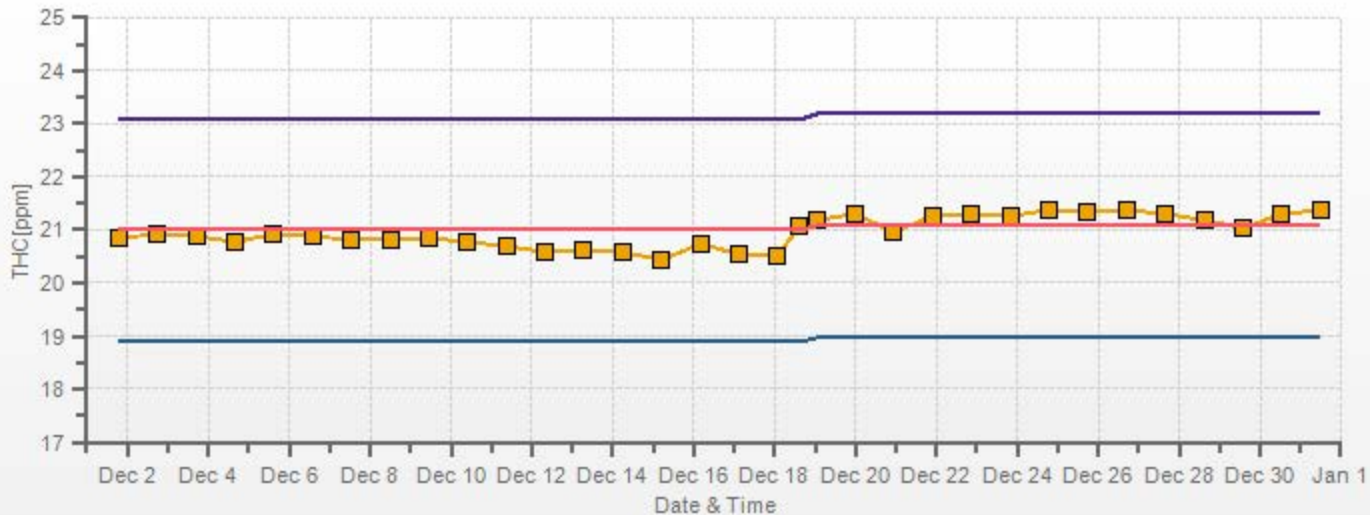
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.6_CALM % = 0.1%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|------|------|-----|------|-----|-------|
| N | 2.1 | 2.7 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 0.0 | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 0.6 | 15.3 | 0.0 | 0.0 | 0.0 | 15.9 |
| SE | 0.4 | 6.5 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 2.1 | 13.4 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 6.8 | 16.8 | 0.0 | 0.0 | 0.0 | 23.6 |
| W | 6.5 | 7.8 | 0.0 | 0.0 | 0.0 | 14.3 |
| NW | 6.7 | 8.5 | 0.0 | 0.0 | 0.0 | 15.1 |
| Summary | 25.2 | 74.7 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

THC[ppm] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span

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



METHANE



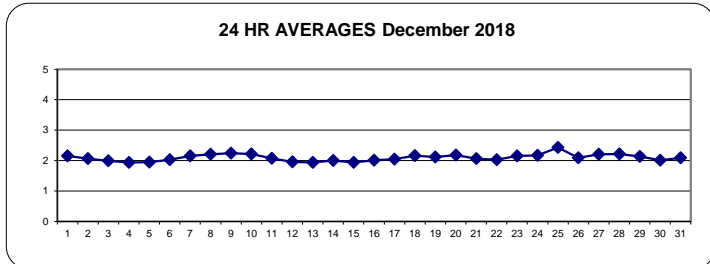
METHANE Hourly Averages (CH₄ ppm)

| 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 | 2.19 | 2.22 | 2.07 | 2.08 | 2.20 | 2.24 | 2.35 | 2.23 | 2.16 | 2.18 | 2.21 | 2.17 | 2.14 | 2.18 | 2.16 | 2.12 | 2.14 | 2.11 | S | 2.10 | 2.08 | 2.05 | 2.03 | 2.02 | 2.02 | 2.35 | 2.15 | 2.15 | 24 |
| 2 | 2.01 | 2.00 | 2.02 | 2.01 | 2.02 | 2.04 | 2.04 | 2.05 | 2.05 | 2.06 | 2.06 | 2.09 | 2.08 | 2.07 | 2.08 | 2.08 | 2.07 | S | 2.06 | 2.04 | 2.06 | 2.03 | 2.15 | 2.15 | 2.00 | 2.15 | 2.06 | 24 | |
| 3 | 2.12 | 2.13 | 2.12 | 2.04 | 2.00 | 2.00 | 2.02 | 2.01 | 2.02 | 1.99 | 1.98 | 1.95 | 1.95 | 1.93 | 1.93 | 1.96 | S | 1.95 | 1.95 | 1.95 | 1.95 | 1.97 | 1.96 | 1.97 | 1.93 | 2.13 | 1.99 | 24 | |
| 4 | 1.97 | 1.96 | 1.93 | 1.93 | 1.95 | 1.94 | 1.93 | 1.92 | 1.93 | 1.93 | 1.95 | 1.95 | 1.96 | 1.97 | 1.97 | S | 1.98 | 1.95 | 1.92 | 1.92 | 1.91 | 1.92 | 1.92 | 1.95 | 1.91 | 1.98 | 1.94 | 24 | |
| 5 | 1.97 | 1.97 | 1.96 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.97 | 1.94 | 1.95 | 2.01 | 1.94 | S | 1.95 | 1.96 | 1.95 | 1.94 | 1.96 | 1.97 | 1.96 | 1.95 | 1.94 | 1.94 | 2.01 | 1.95 | 24 | |
| 6 | 1.94 | 1.94 | 1.95 | 1.95 | 1.97 | 1.97 | 1.98 | 1.99 | 2.00 | 2.03 | 2.05 | 2.07 | 2.09 | S | 2.08 | 2.07 | 2.05 | 2.06 | 2.05 | 2.05 | 2.05 | 2.06 | 2.08 | 2.09 | 2.10 | 1.94 | 2.10 | 2.03 | 24 |
| 7 | 2.11 | 2.12 | 2.10 | 2.09 | 2.09 | 2.12 | 2.12 | 2.11 | 2.10 | 2.11 | 2.13 | 2.13 | S | 2.14 | 2.15 | 2.16 | 2.16 | 2.17 | 2.18 | 2.19 | 2.22 | 2.24 | 2.25 | 2.25 | 2.09 | 2.25 | 2.15 | 24 | |
| 8 | 2.17 | 2.14 | 2.16 | 2.20 | 2.21 | 2.29 | 2.33 | 2.24 | 2.27 | 2.31 | 2.25 | S | 2.20 | 2.18 | 2.17 | 2.18 | 2.18 | 2.16 | 2.17 | 2.18 | 2.21 | 2.21 | 2.21 | 2.22 | 2.14 | 2.33 | 2.21 | 24 | |
| 9 | 2.24 | 2.23 | 2.24 | 2.24 | 2.26 | 2.24 | 2.22 | 2.21 | 2.18 | 2.17 | S | 2.13 | 2.11 | 2.11 | 2.12 | 2.14 | 2.19 | 2.19 | 2.22 | 2.31 | 2.43 | 2.49 | 2.45 | 2.40 | 2.11 | 2.49 | 2.24 | 24 | |
| 10 | 2.33 | 2.46 | 2.52 | 2.53 | 2.49 | 2.60 | 2.52 | 2.42 | 2.37 | S | 2.27 | 2.24 | 2.18 | 2.13 | 2.08 | 2.06 | 1.98 | 1.96 | 2.01 | 2.01 | 1.97 | 1.97 | 1.98 | 1.97 | 1.96 | 2.60 | 2.22 | 24 | |
| 11 | 1.97 | 2.01 | 2.03 | 2.01 | 1.99 | 1.99 | 2.04 | 2.04 | S | 2.01 | 2.02 | 2.05 | 2.08 | 2.07 | 2.09 | 2.14 | 2.14 | 2.16 | 2.13 | 2.11 | 2.10 | 2.13 | 2.14 | 2.14 | 1.97 | 2.16 | 2.07 | 24 | |
| 12 | 2.11 | 2.07 | 2.07 | 2.00 | 1.96 | 1.97 | 1.96 | S | 1.98 | 1.98 | 1.98 | 1.95 | 1.93 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.92 | 1.92 | 1.92 | 1.93 | 1.91 | 2.11 | 1.96 | 24 |
| 13 | 1.94 | 1.96 | 1.97 | 1.99 | 1.99 | 1.98 | S | 1.96 | 1.96 | 1.96 | 1.95 | 1.94 | 1.93 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.91 | 1.93 | 1.94 | 1.96 | 1.91 | 1.99 | 1.94 | 24 | |
| 14 | 1.97 | 1.95 | 1.97 | 2.00 | 1.96 | S | 1.98 | 2.14 | 2.21 | 2.25 | 2.17 | 2.13 | 2.06 | 1.99 | 1.96 | 2.01 | 2.04 | 1.97 | 1.94 | 1.87 | 1.87 | 1.89 | 1.88 | 1.87 | 1.87 | 2.25 | 2.00 | 24 | |
| 15 | 1.91 | 1.94 | 1.93 | 1.92 | S | 1.98 | 1.94 | 1.93 | 1.93 | 1.95 | 1.96 | 1.90 | 1.89 | 1.89 | 1.89 | 1.90 | 1.92 | 1.93 | 1.96 | 1.96 | 1.97 | 1.98 | 2.00 | 2.05 | 1.89 | 2.05 | 1.94 | 24 | |
| 16 | 2.02 | 2.01 | 1.96 | S | 1.92 | 1.92 | 1.93 | 1.95 | 1.99 | 1.98 | 2.01 | 1.97 | 2.05 | 2.11 | 2.05 | 2.10 | 2.07 | 2.04 | 2.02 | 2.03 | 2.03 | 1.99 | 2.01 | 2.05 | 1.92 | 2.11 | 2.01 | 24 | |
| 17 | 2.02 | 2.04 | S | 2.03 | 2.04 | 2.06 | 2.05 | 2.01 | 2.02 | 2.08 | 2.13 | 2.07 | 2.04 | 2.04 | 2.05 | 2.06 | 2.06 | 2.05 | 2.05 | 2.05 | 2.05 | 2.07 | 2.09 | 2.07 | 2.01 | 2.13 | 2.05 | 24 | |
| 18 | 2.05 | S | 2.02 | 2.02 | 2.08 | 2.17 | 2.17 | 2.22 | 2.23 | 2.21 | C | C | C | C | C | 2.14 | 2.18 | 2.22 | 2.25 | 2.21 | 2.18 | 2.14 | 2.15 | 2.21 | 2.02 | 2.25 | 2.16 | 24 | |
| 19 | S | 2.12 | 2.20 | 2.19 | 2.22 | 2.21 | 2.16 | 2.23 | 2.25 | 2.20 | 2.16 | 2.10 | 2.07 | 2.05 | 2.05 | 2.07 | 2.07 | 2.05 | 2.04 | 2.04 | 2.04 | 2.04 | 2.03 | S | 2.03 | 2.25 | 2.12 | 24 | |
| 20 | 2.06 | 2.06 | 2.07 | 2.05 | 2.10 | 2.14 | 2.11 | 2.10 | 2.15 | 2.09 | 2.07 | 2.05 | 2.07 | 2.18 | 2.20 | 2.24 | 2.35 | 2.49 | 2.47 | 2.42 | 2.28 | 2.16 | S | 2.11 | 2.05 | 2.49 | 2.18 | 24 | |
| 21 | 2.10 | 2.09 | 2.11 | 2.09 | 2.10 | 2.17 | 2.20 | 2.15 | 2.07 | 2.02 | 1.99 | 1.98 | 1.98 | 1.99 | 2.01 | 2.02 | 2.06 | 2.06 | 2.05 | 2.05 | 2.06 | S | 2.06 | 2.05 | 1.98 | 2.20 | 2.06 | 24 | |
| 22 | 2.06 | 2.05 | 2.05 | 2.03 | 2.05 | 2.05 | 2.01 | 2.02 | 2.03 | 2.05 | 2.05 | 2.06 | 2.03 | 1.98 | 1.98 | 1.99 | 1.98 | 2.01 | 2.01 | 2.01 | S | 2.03 | 2.02 | 2.03 | 1.98 | 2.06 | 2.03 | 24 | |
| 23 | 2.04 | 2.02 | 2.03 | 2.07 | 2.10 | 2.17 | 2.06 | 2.17 | 2.09 | 2.14 | 2.20 | 2.28 | 2.36 | 2.31 | 2.35 | 2.36 | 2.22 | 2.09 | 2.06 | S | 2.08 | 2.08 | 2.06 | 2.06 | 2.02 | 2.36 | 2.15 | 24 | |
| 24 | 2.05 | 2.05 | 2.05 | 2.03 | 2.18 | 2.04 | 2.04 | 2.15 | 2.14 | 2.13 | 2.19 | 2.19 | 2.18 | 2.12 | 2.19 | 2.16 | 2.24 | 2.21 | S | 2.24 | 2.33 | 2.35 | 2.40 | 2.36 | 2.03 | 2.40 | 2.17 | 24 | |
| 25 | 2.35 | 2.37 | 2.40 | 2.45 | 2.52 | 2.52 | 2.47 | 2.49 | 2.57 | 2.52 | 2.47 | 2.38 | 2.41 | 2.30 | 2.33 | 2.43 | 2.56 | S | 2.58 | 2.52 | 2.52 | 2.40 | 2.21 | 2.16 | 2.16 | 2.58 | 2.43 | 24 | |
| 26 | 2.12 | 2.09 | 2.07 | 2.05 | 2.08 | 2.10 | 2.07 | 2.08 | 2.04 | 2.02 | 2.03 | 2.03 | 2.03 | 2.04 | 2.04 | 2.08 | S | 2.10 | 2.16 | 2.08 | 2.10 | 2.20 | 2.20 | 2.02 | 2.02 | 2.24 | 2.09 | 24 | |
| 27 | 2.13 | 2.12 | 2.12 | 2.22 | 2.14 | 2.12 | 2.12 | 2.12 | 2.17 | 2.14 | 2.16 | 2.15 | 2.20 | 2.31 | 2.34 | S | 2.26 | 2.28 | 2.27 | 2.29 | 2.32 | 2.33 | 2.33 | 2.29 | 2.12 | 2.34 | 2.21 | 24 | |
| 28 | 2.27 | 2.25 | 2.25 | 2.24 | 2.23 | 2.23 | 2.30 | 2.33 | 2.27 | 2.27 | 2.21 | 2.19 | 2.20 | 2.20 | S | 2.21 | 2.22 | 2.20 | 2.24 | 2.18 | 2.16 | 2.15 | 2.14 | 2.15 | 2.14 | 2.33 | 2.22 | 24 | |
| 29 | 2.16 | 2.21 | 2.20 | 2.15 | 2.09 | 2.12 | 2.12 | 2.30 | 2.32 | 2.27 | 2.29 | 2.30 | 2.18 | S | 2.14 | 2.09 | 2.07 | 2.05 | 2.04 | 2.02 | 2.01 | 2.02 | 2.02 | 2.02 | 2.01 | 2.32 | 2.14 | 24 | |
| 30 | 2.02 | 2.02 | 2.01 | 2.02 | 2.04 | 2.05 | 2.03 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | S | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.99 | 1.98 | 2.00 | 2.06 | 2.10 | 1.97 | 2.10 | 2.01 | 24 | |
| 31 | 2.03 | 2.04 | 2.04 | 2.06 | 2.05 | 2.07 | 2.08 | 2.10 | 2.09 | 2.07 | 2.07 | S | 2.08 | 2.09 | 2.12 | 2.13 | 2.15 | 2.15 | 2.14 | 2.14 | 2.13 | 2.14 | 2.09 | 2.05 | 2.03 | 2.15 | 2.09 | 24 | |
| HOURLY MAX | 2.35 | 2.46 | 2.52 | 2.53 | 2.52 | 2.60 | 2.52 | 2.49 | 2.57 | 2.52 | 2.47 | 2.38 | 2.41 | 2.31 | 2.35 | 2.43 | 2.56 | 2.49 | 2.58 | 2.52 | 2.52 | 2.49 | 2.45 | 2.40 | | | | | |
| HOURLY AVG | 2.08 | 2.09 | 2.09 | 2.09 | 2.10 | 2.11 | 2.11 | 2.12 | 2.12 | 2.10 | 2.10 | 2.09 | 2.09 | 2.08 | 2.08 | 2.09 | 2.11 | 2.08 | 2.09 | 2.09 | 2.10 | 2.10 | 2.09 | 2.10 | | | | | |

STATUS FLAG CODES

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

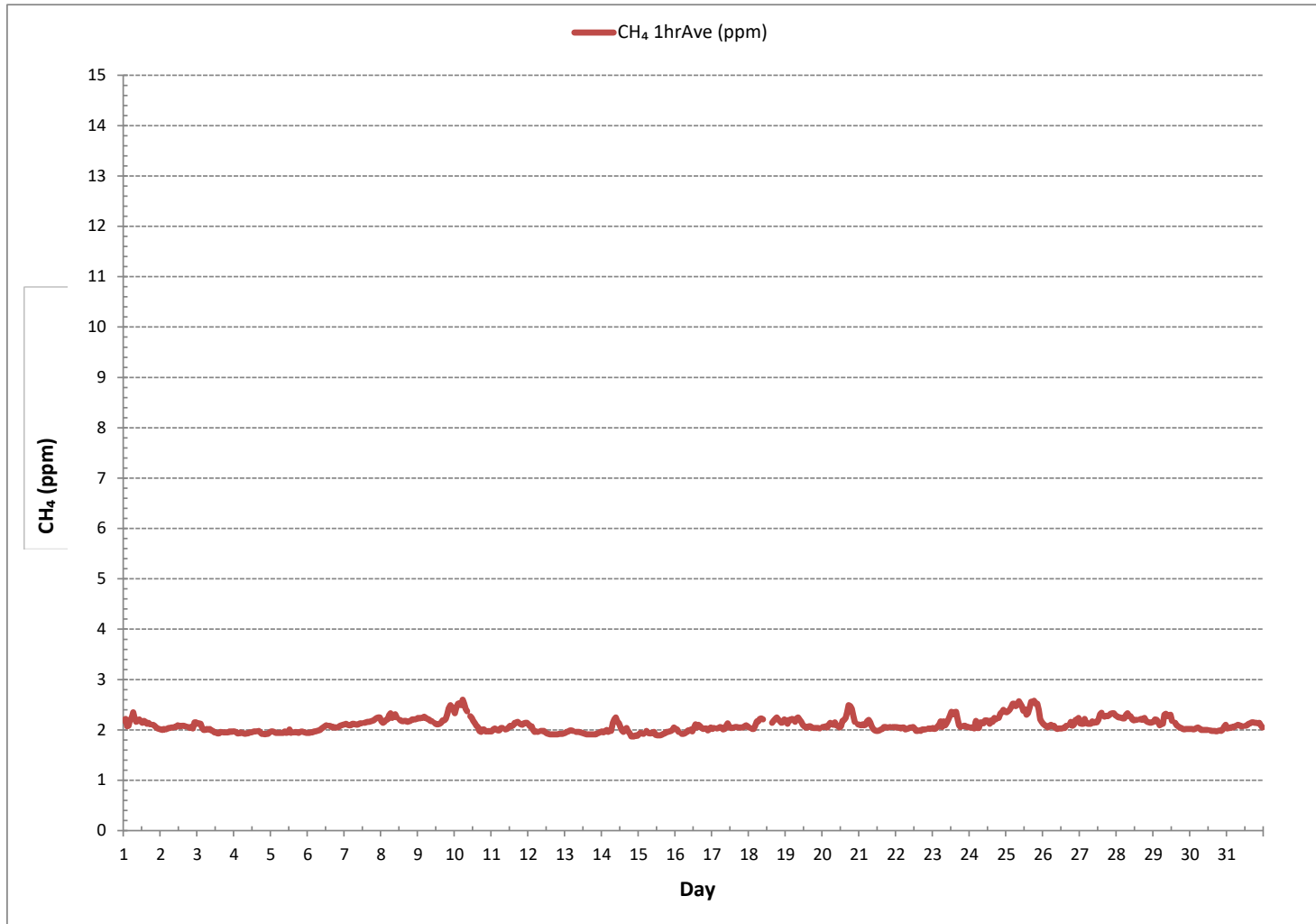
24 HR AVERAGES December 2018



MONTHLY SUMMARY

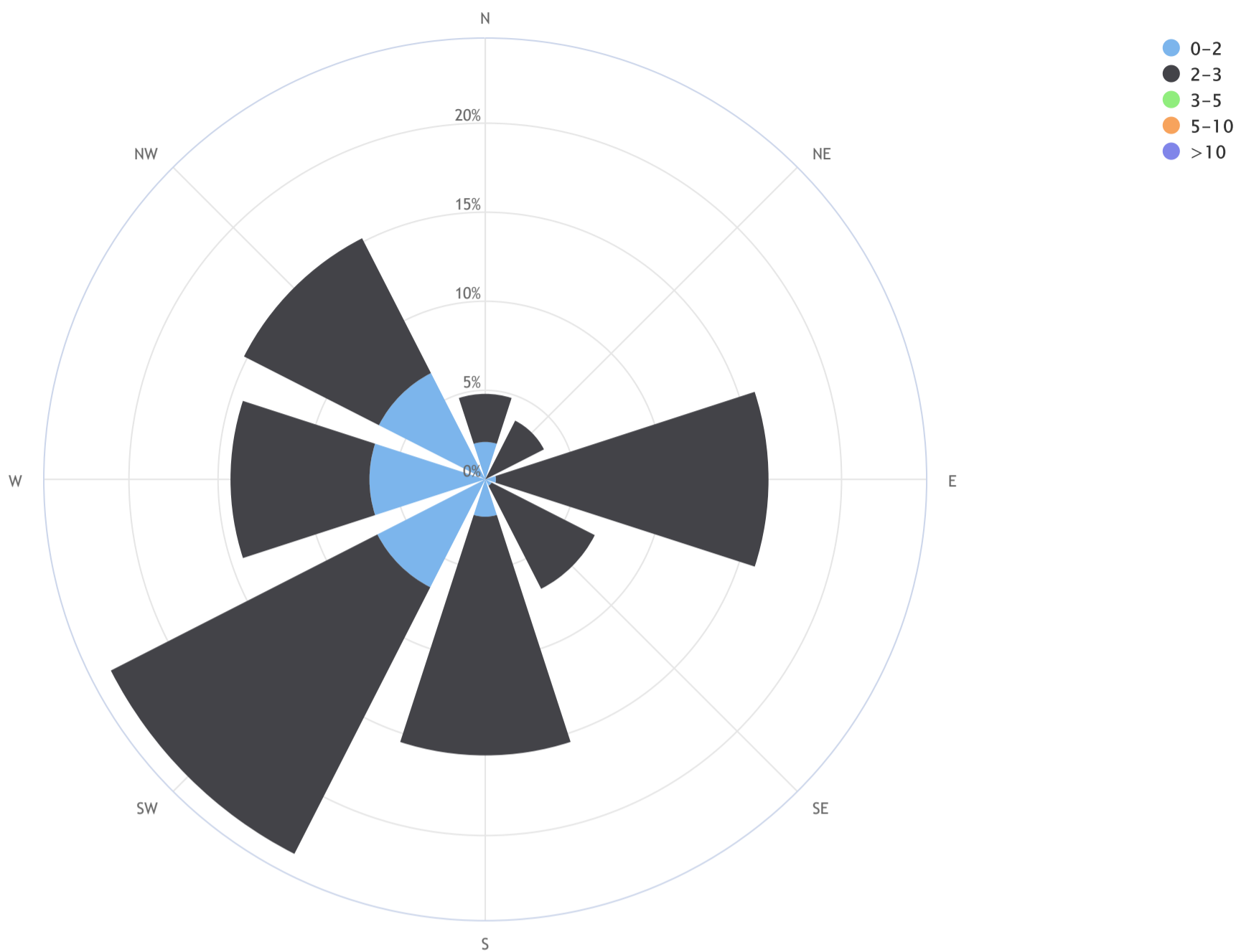
| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 707 | | | |
| MINIMUM 1-HR AVERAGE: | 1.87 ppm | @ HOUR | 19 | ON DAY 14 |
| MAXIMUM 1-HR AVERAGE: | 2.60 ppm | @ HOUR | 5 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 2.43 ppm | | | ON DAY 25 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 5 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.14 | MONTHLY AVERAGE: | 2.10 ppm | |

METHANE Hourly Averages (CH₄ ppm)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_CH4 (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.6_CALM % = 0.1%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|-----------|------|------|-----|------|-----|-------|
| N | 2.1 | 2.7 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 0.0 | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 0.6 | 15.3 | 0.0 | 0.0 | 0.0 | 15.9 |
| SE | 0.4 | 6.5 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 2.1 | 13.4 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 6.8 | 16.8 | 0.0 | 0.0 | 0.0 | 23.6 |
| W | 6.5 | 7.8 | 0.0 | 0.0 | 0.0 | 14.3 |
| NW | 6.7 | 8.5 | 0.0 | 0.0 | 0.0 | 15.1 |
| Summary | 25.2 | 74.7 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

CH4[ppm] Calibration: LICA ST. LINA Monthly: 18/12 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 | 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 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 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 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.09 | 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 | 0.09 | 0.01 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 15 | 0.01 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 16 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 17 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 18 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | C | C | C | C | C | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 19 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 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 | 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 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 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 | 0.01 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |
| HOURLY MAX | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.09 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.04 | 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 | | | | | | | | | | | | | | | | | | | | | |
| HOURLY AVG | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | | | | | | | | | | | | | | | | | | | | | |

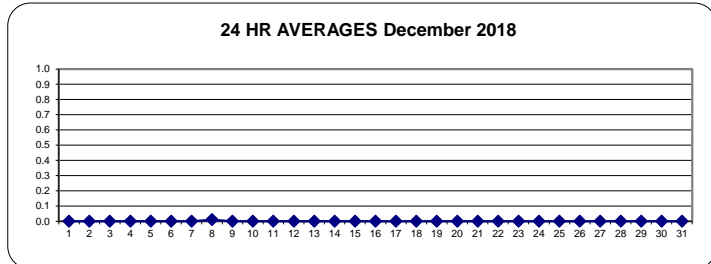
STATUS FLAG CODES

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

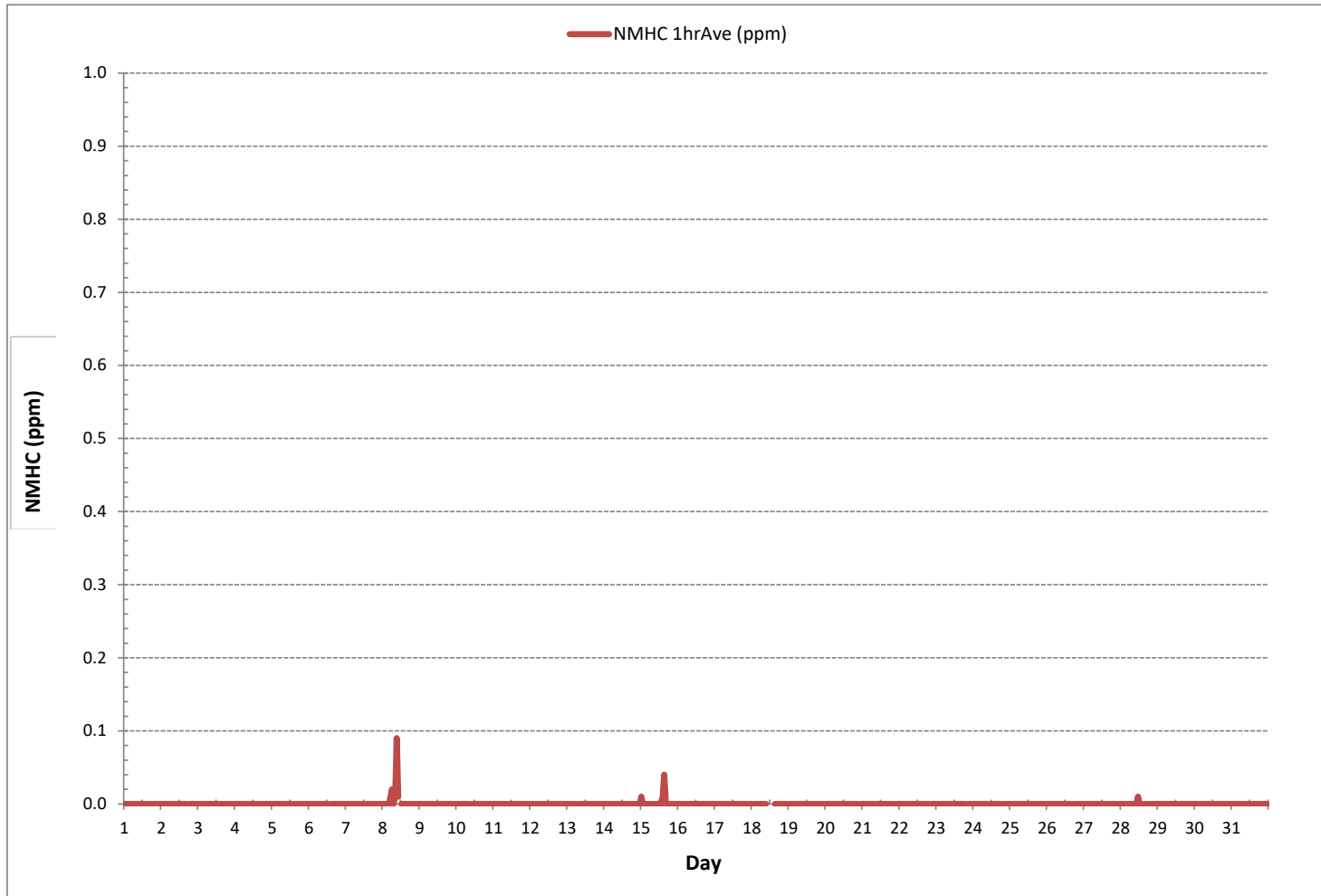
MONTHLY SUMMARY

| | | | | |
|------------------------------|------|------------|-----------------------|----------|
| NUMBER OF NON-ZERO READINGS: | 9 | | | |
| MINIMUM 1-HR AVERAGE: | 0.00 | ppm @ HOUR | 0 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 0.09 | ppm @ HOUR | 9 | ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 0.01 | ppm | | ON DAY 8 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 5 | hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 0.00 | | MONTHLY AVERAGE: | 0.00 ppm |

24 HR AVERAGES December 2018

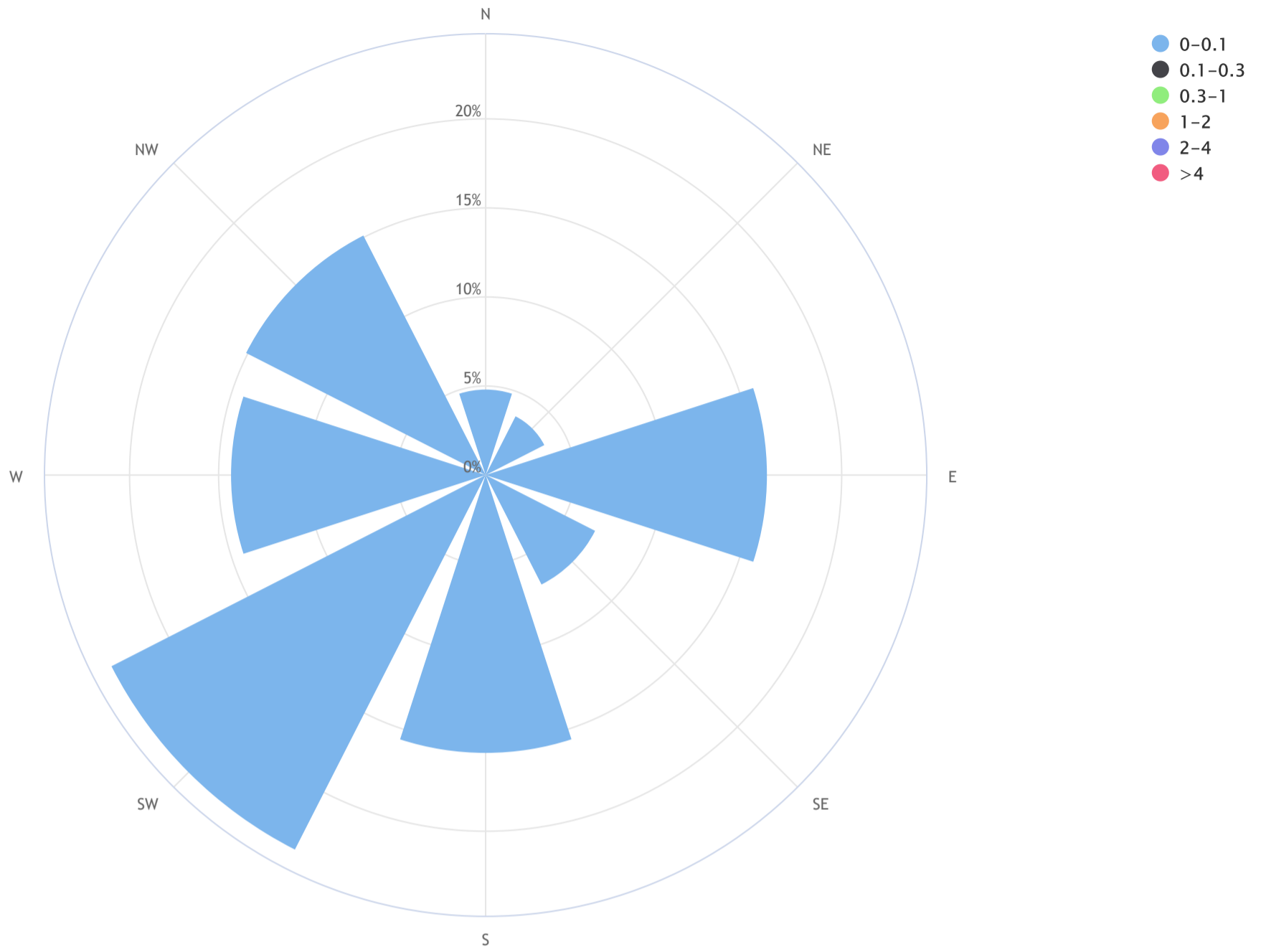


NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NMHC (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 0.1%



| Direction | 0-0.1 | 0.1-0.3 | 0.3-1 | 1-2 | 2-4 | >4 | TOTAL |
|-----------|-------|---------|-------|-----|-----|-----|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.8 |
| SE | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 15.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 23.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23.6 |
| W | 14.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.3 |
| NW | 15.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.1 |
| Summary | 99.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |

NMHC[ppm] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



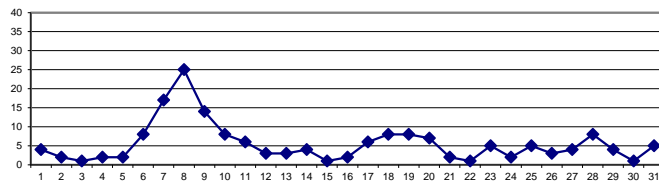
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

| 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 | 5 | 5 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | S | 4 | 3 | 3 | 4 | 2 | 2 | 2 | 5 | 4 | 24 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | S | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 24 |
| 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | S | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 4 | 5 | 7 | S | 6 | 4 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 7 | 2 | 24 | |
| 5 | 4 | 4 | 4 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 3 | 2 | 2 | 3 | 4 | 4 | 3 | 2 | 0 | 4 | 2 | 24 | |
| 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 6 | 6 | 8 | 14 | 17 | S | 14 | 12 | 9 | 8 | 7 | 7 | 8 | 10 | 13 | 15 | 3 | 17 | 8 | 24 | |
| 7 | 23 | 23 | 16 | 12 | 9 | 9 | 9 | 8 | 9 | 9 | 12 | 14 | S | 20 | 21 | 20 | 20 | 22 | 23 | 27 | 26 | 24 | 22 | 21 | 8 | 27 | 17 | 24 | |
| 8 | 17 | 15 | 16 | 18 | 23 | 44 | 53 | 42 | 46 | 48 | 34 | S | 21 | 20 | 20 | 16 | 15 | 14 | 14 | 15 | 16 | 19 | 27 | 24 | 14 | 53 | 25 | 24 | |
| 9 | 23 | 20 | 18 | 17 | 20 | 20 | 18 | 14 | 12 | 12 | S | 11 | 10 | 9 | 9 | 10 | 12 | 11 | 9 | 10 | 12 | 13 | 13 | 12 | 9 | 23 | 14 | 24 | |
| 10 | 10 | 11 | 13 | 12 | 10 | 12 | 11 | 10 | 9 | S | 8 | 10 | 10 | 9 | 7 | 8 | 6 | 5 | 6 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 13 | 8 | 24 |
| 11 | 5 | 10 | 14 | 9 | 5 | 4 | 6 | 6 | S | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 6 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 14 | 6 | 24 | |
| 12 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | S | 4 | 4 | 6 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 6 | 3 | 24 | |
| 13 | 4 | 3 | 3 | 3 | 3 | 3 | S | 3 | 4 | 3 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 7 | 1 | 7 | 3 | 24 | |
| 14 | 6 | 4 | 4 | 4 | 3 | S | 3 | 5 | 5 | 6 | 6 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 6 | 4 | 24 | |
| 15 | 2 | 2 | 2 | 2 | S | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 24 | |
| 16 | 1 | 1 | 1 | S | 1 | 1 | 1 | S1 | 1 | 1 | 1 | 2 | 3 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 23 | |
| 17 | 2 | 2 | S | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | C | C | C | C | C | C | C | 8 | 10 | 19 | 21 | 14 | 1 | 21 | 6 | 24 | |
| 18 | 11 | S | 6 | 6 | 7 | 9 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 8 | 9 | 9 | 8 | 8 | 10 | 9 | 11 | 10 | 8 | 6 | 6 | 11 | 8 | 24 | |
| 19 | S | 7 | 10 | 9 | 10 | 11 | 10 | 14 | 19 | 14 | 11 | 8 | 6 | 5 | 6 | 9 | 8 | 7 | 6 | 4 | 4 | 4 | 4 | S | 4 | 19 | 8 | 24 | |
| 20 | 6 | 6 | 6 | 5 | 8 | 10 | 11 | 14 | 15 | 8 | 7 | 5 | 5 | 7 | 6 | 7 | 8 | 9 | 8 | 7 | 5 | 4 | S | 3 | 3 | 15 | 7 | 24 | |
| 21 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 4 | 2 | 24 | |
| 22 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | S | 3 | 3 | 3 | 0 | 3 | 1 | 24 | |
| 23 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 4 | 5 | 5 | 7 | 10 | 10 | 10 | 11 | 12 | 9 | 4 | 3 | S | 3 | 3 | 2 | 2 | 2 | 12 | 5 | 24 | |
| 24 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | S | 5 | 4 | 4 | 4 | 5 | 1 | 5 | 2 | 24 | |
| 25 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | S | 6 | 6 | 5 | 5 | 3 | 3 | 6 | 5 | 24 | | |
| 26 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | S | 3 | 3 | 4 | 3 | 5 | 5 | 5 | 1 | 5 | 3 | 24 | |
| 27 | 4 | 3 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | S | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 2 | 5 | 4 | 24 | |
| 28 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 9 | 9 | 12 | S | 11 | 10 | 9 | 9 | 11 | 9 | 9 | 9 | 9 | 4 | 12 | 8 | 24 | |
| 29 | 9 | 10 | 10 | 8 | 6 | 6 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | S | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 10 | 4 | 24 | |
| 30 | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 3 | 1 | 24 | |
| 31 | 2 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 4 | 5 | 4 | S | 5 | 6 | 6 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 4 | 2 | 7 | 5 | 24 | |
| HOURLY MAX | 23 | 23 | 18 | 18 | 23 | 44 | 53 | 42 | 46 | 48 | 34 | 14 | 21 | 20 | 21 | 20 | 20 | 22 | 23 | 27 | 26 | 24 | 27 | 24 | | | | | |
| HOURLY AVG | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | | | | | |

STATUS FLAG CODES

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

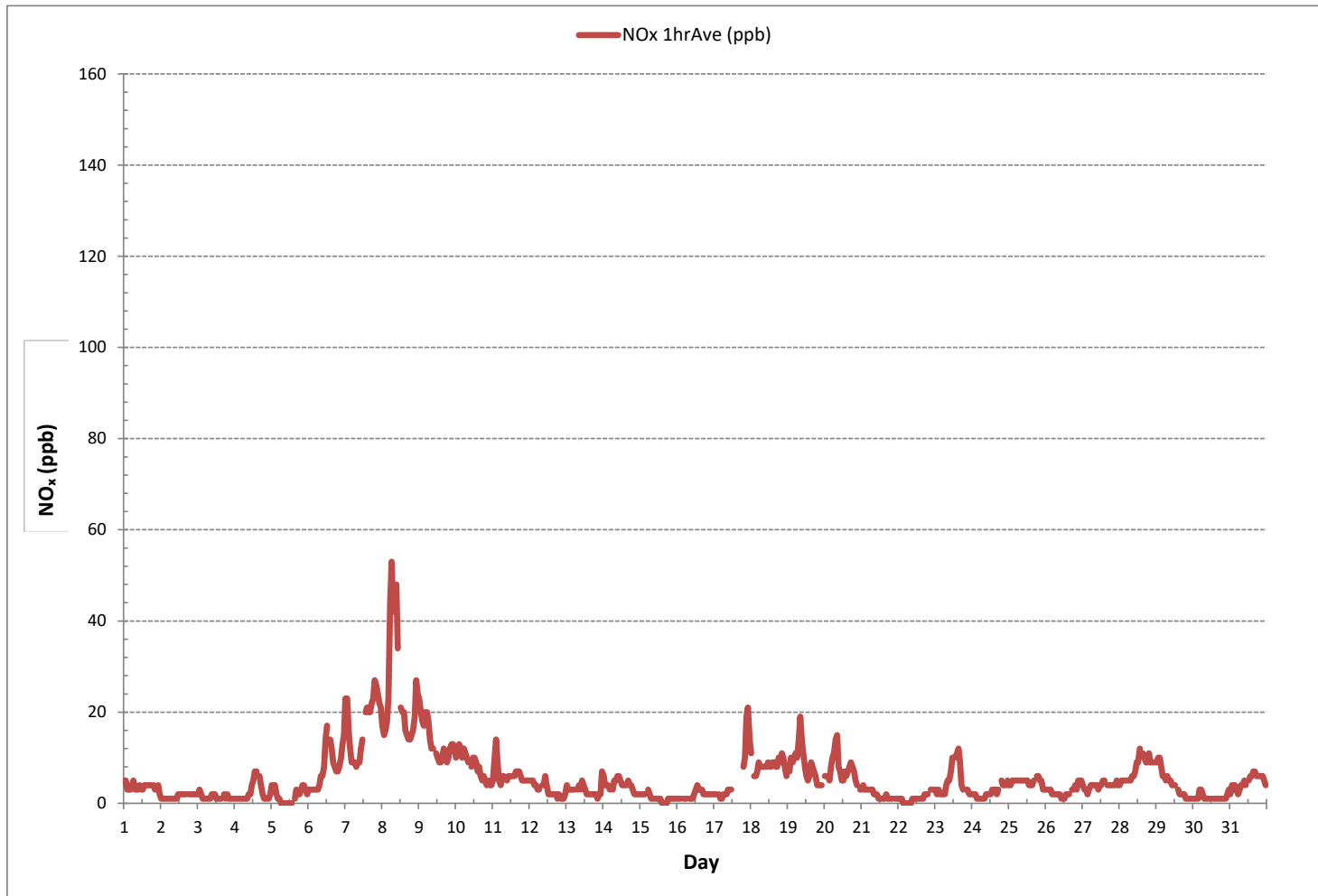
24 HR AVERAGES December 2018



MONTHLY SUMMARY

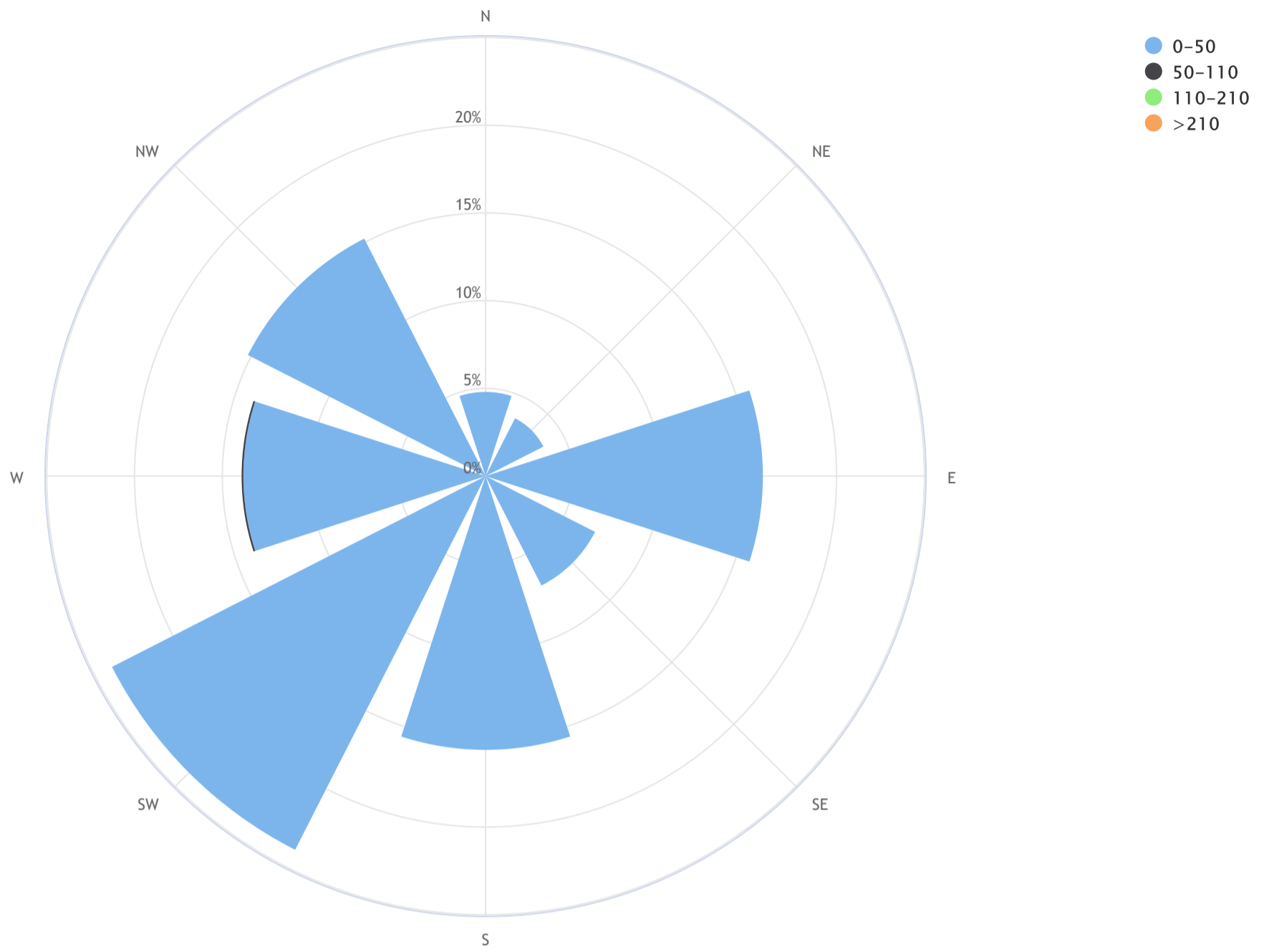
| | | | | |
|------------------------------|--------|-----------------------|---------|----------|
| NUMBER OF NON-ZERO READINGS: | 686 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 6 | ON DAY 5 |
| MAXIMUM 1-HR AVERAGE: | 53 ppb | @ HOUR | 6 | ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 25 ppb | | | ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 743 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 99.9 % | |
| STANDARD DEVIATION: | 6 | MONTHLY AVERAGE: | 6 ppb | |

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO_x (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 6.0_CALM % = 0.1%



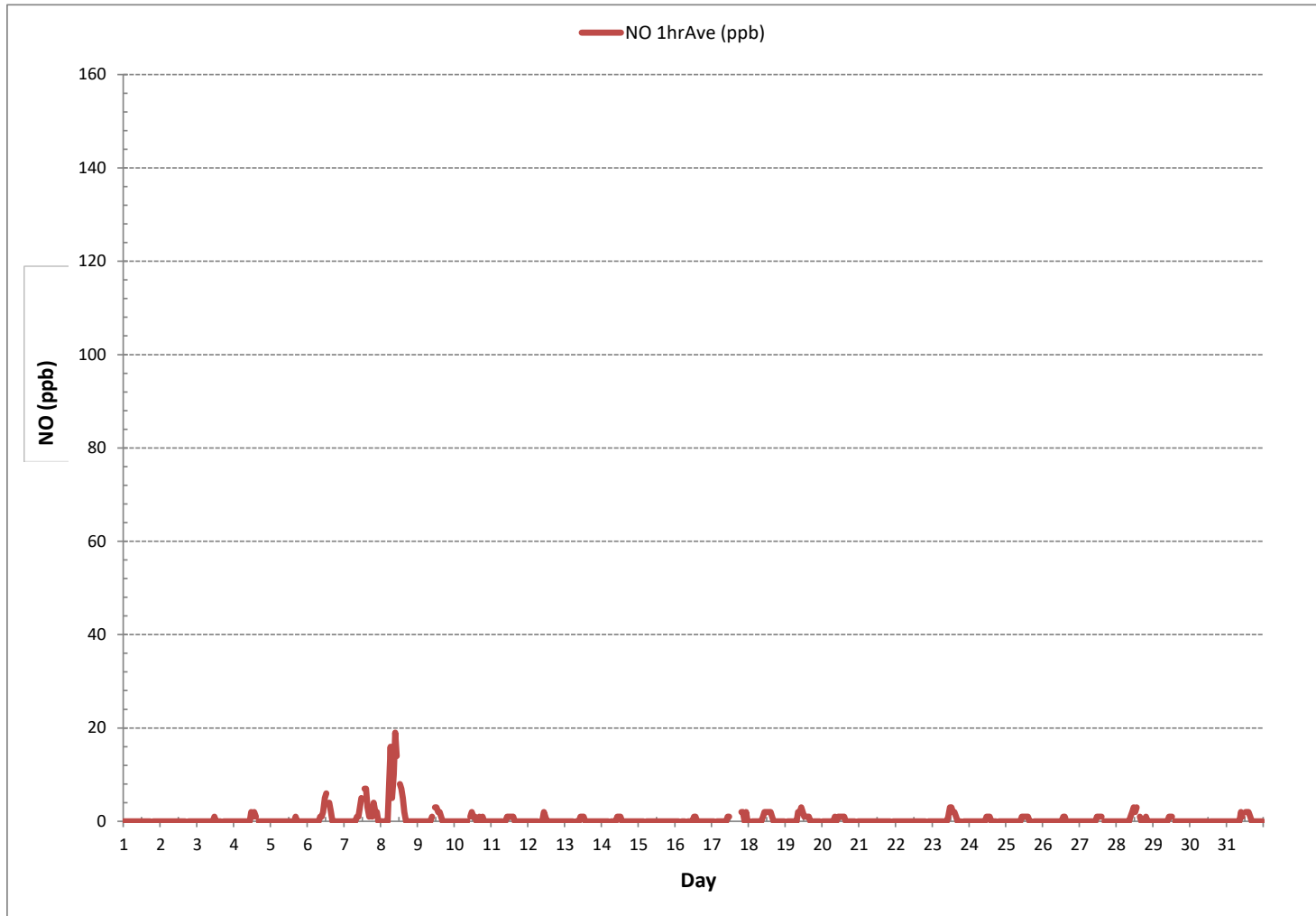
| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|----------------|-------------|------------|------------|------------|-------------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.8 | 0.0 | 0.0 | 0.0 | 15.8 |
| SE | 7.0 | 0.0 | 0.0 | 0.0 | 7.0 |
| S | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 23.9 | 0.0 | 0.0 | 0.0 | 23.9 |
| W | 13.8 | 0.1 | 0.0 | 0.0 | 13.9 |
| NW | 15.2 | 0.0 | 0.0 | 0.0 | 15.2 |
| Summary | 99.7 | 0.1 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span



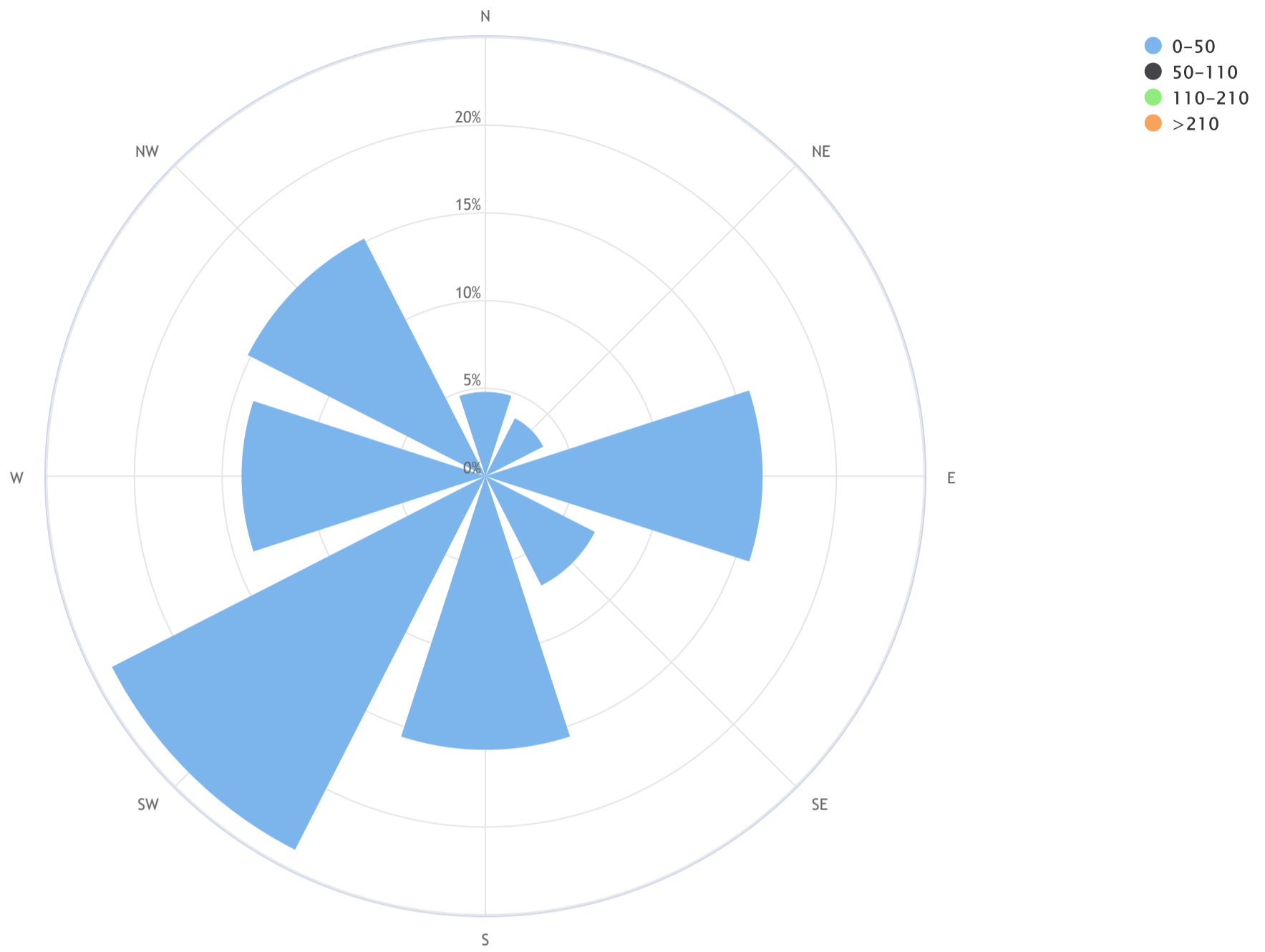
NITRIC OXIDE

NITRIC OXIDE Hourly Averages (NO ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 0.1%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.8 | 0.0 | 0.0 | 0.0 | 15.8 |
| SE | 7.0 | 0.0 | 0.0 | 0.0 | 7.0 |
| S | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 23.9 | 0.0 | 0.0 | 0.0 | 23.9 |
| W | 13.9 | 0.0 | 0.0 | 0.0 | 13.9 |
| NW | 15.2 | 0.0 | 0.0 | 0.0 | 15.2 |
| Summary | 99.9 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

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 | 5 | 5 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | S | 4 | 3 | 3 | 4 | 2 | 2 | 5 | 3 | 24 | |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | S | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 24 |
| 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 24 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 5 | S | 6 | 4 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 6 | 2 | 24 | |
| 5 | 4 | 4 | 4 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 2 | 1 | 2 | 3 | 4 | 3 | 3 | 2 | 0 | 4 | 2 | 24 | |
| 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 6 | 5 | 6 | 9 | 10 | S | 11 | 10 | 9 | 8 | 7 | 7 | 8 | 10 | 13 | 15 | 3 | 15 | 7 | 24 | |
| 7 | 23 | 23 | 16 | 12 | 9 | 9 | 9 | 8 | 8 | 8 | 9 | 9 | S | 13 | 13 | 14 | 16 | 19 | 19 | 21 | 23 | 24 | 23 | 22 | 21 | 8 | 24 | 16 | 24 |
| 8 | 17 | 15 | 16 | 18 | 23 | 36 | 38 | 36 | 35 | 29 | 20 | S | 13 | 13 | 15 | 14 | 15 | 14 | 14 | 14 | 14 | 16 | 19 | 27 | 24 | 13 | 38 | 21 | 24 |
| 9 | 23 | 20 | 18 | 17 | 20 | 20 | 17 | 14 | 11 | 10 | S | 8 | 7 | 7 | 8 | 9 | 12 | 11 | 9 | 10 | 12 | 13 | 13 | 12 | 7 | 23 | 13 | 24 | |
| 10 | 10 | 11 | 13 | 12 | 10 | 12 | 11 | 9 | 9 | S | 7 | 8 | 9 | 8 | 7 | 7 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 13 | 8 | 24 |
| 11 | 5 | 10 | 14 | 9 | 5 | 4 | 6 | 6 | S | 5 | 5 | 5 | 5 | 6 | 7 | 7 | 7 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 14 | 6 | 24 | |
| 12 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | S | 4 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 5 | 3 | 24 | |
| 13 | 4 | 3 | 3 | 3 | 3 | 3 | S | 3 | 3 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 7 | 1 | 7 | 3 | 24 | |
| 14 | 6 | 4 | 4 | 4 | 3 | S | 3 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 6 | 4 | 24 | |
| 15 | 2 | 2 | 2 | 2 | S | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 24 | |
| 16 | 1 | 1 | 1 | S | 1 | 1 | 1 | S1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 23 | |
| 17 | 2 | 2 | S | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | C | C | C | C | C | C | C | C | 6 | 9 | 19 | 19 | 14 | 1 | 19 | 6 | 24 | |
| 18 | 11 | S | 6 | 6 | 7 | 9 | 8 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 7 | 8 | 8 | 8 | 10 | 9 | 11 | 9 | 8 | 6 | 6 | 11 | 8 | 24 | |
| 19 | S | 7 | 10 | 9 | 10 | 11 | 10 | 14 | 18 | 12 | 8 | 6 | 5 | 4 | 5 | 8 | 8 | 7 | 6 | 4 | 4 | 4 | 4 | S | 4 | 18 | 8 | 24 | |
| 20 | 6 | 6 | 6 | 5 | 8 | 10 | 11 | 14 | 14 | 8 | 6 | 4 | 5 | 6 | 5 | 6 | 8 | 9 | 8 | 7 | 5 | 4 | S | 3 | 3 | 14 | 7 | 24 | |
| 21 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 4 | 2 | 24 | |
| 22 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | S | 3 | 3 | 3 | 0 | 3 | 1 | 24 | |
| 23 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 4 | 5 | 5 | 6 | 7 | 7 | 8 | 8 | 11 | 9 | 4 | 3 | S | 3 | 3 | 2 | 2 | 2 | 11 | 4 | 24 | |
| 24 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | S | 5 | 4 | 4 | 4 | 4 | 5 | 1 | 5 | 2 | 24 | |
| 25 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 5 | S | 6 | 6 | 5 | 5 | 3 | 3 | 6 | 4 | 24 | | |
| 26 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | S | 2 | 3 | 4 | 3 | 5 | 5 | 5 | 1 | 5 | 3 | 24 | |
| 27 | 4 | 3 | 3 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 3 | 3 | 4 | 4 | S | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 2 | 5 | 4 | 24 |
| 28 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 9 | S | 10 | 10 | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 4 | 10 | 7 | 24 | |
| 29 | 9 | 10 | 10 | 8 | 6 | 6 | 5 | 6 | 5 | 5 | 4 | 3 | 3 | S | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 4 | 24 | |
| 30 | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 3 | 1 | 24 | |
| 31 | 2 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | 2 | 3 | S | 3 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 4 | 2 | 6 | 4 | 24 | |
| HOURLY MAX | 23 | 23 | 18 | 18 | 23 | 36 | 38 | 36 | 35 | 29 | 20 | 9 | 13 | 13 | 15 | 16 | 19 | 19 | 21 | 23 | 24 | 23 | 27 | 24 | | | | | |
| HOURLY AVG | 6 | 6 | 6 | 5 | 5 | 6 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | | | | | |

STATUS FLAG CODES

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

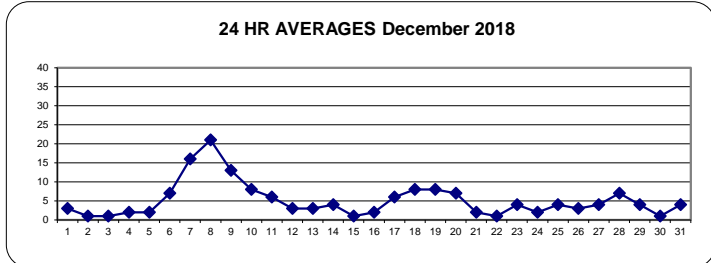
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

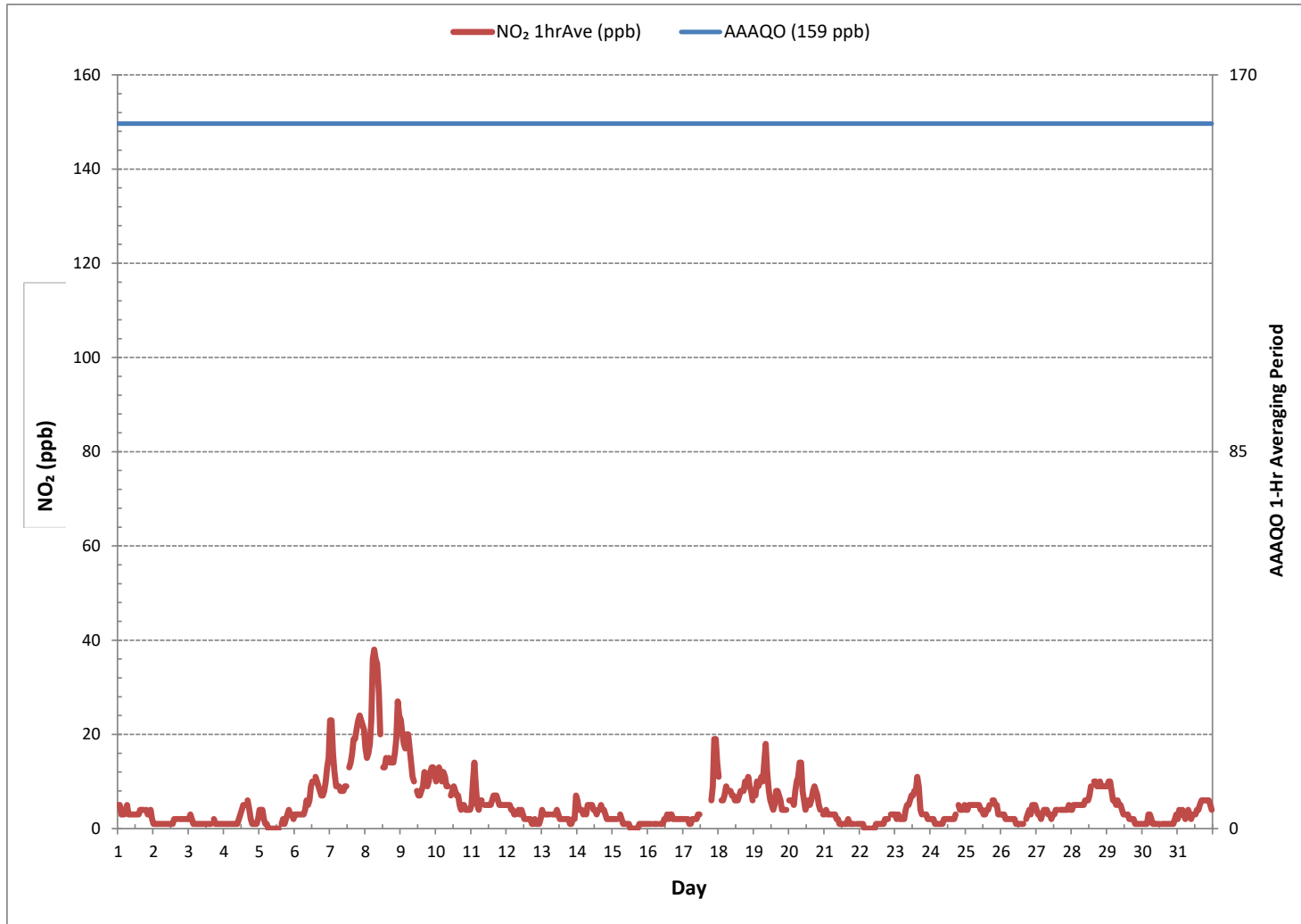
MONTHLY SUMMARY

| | | | | |
|------------------------------|-----|------------|-----------------------|----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 682 | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 6 | ON DAY 5 |
| MAXIMUM 1-HR AVERAGE: | 38 | ppb @ HOUR | 6 | ON DAY 8 |
| MAXIMUM 24-HR AVERAGE: | 21 | ppb | | ON DAY 8 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 743 |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 99.9 % |
| STANDARD DEVIATION: | 5 | | MONTHLY AVERAGE: | 5 ppb |

24 HR AVERAGES December 2018

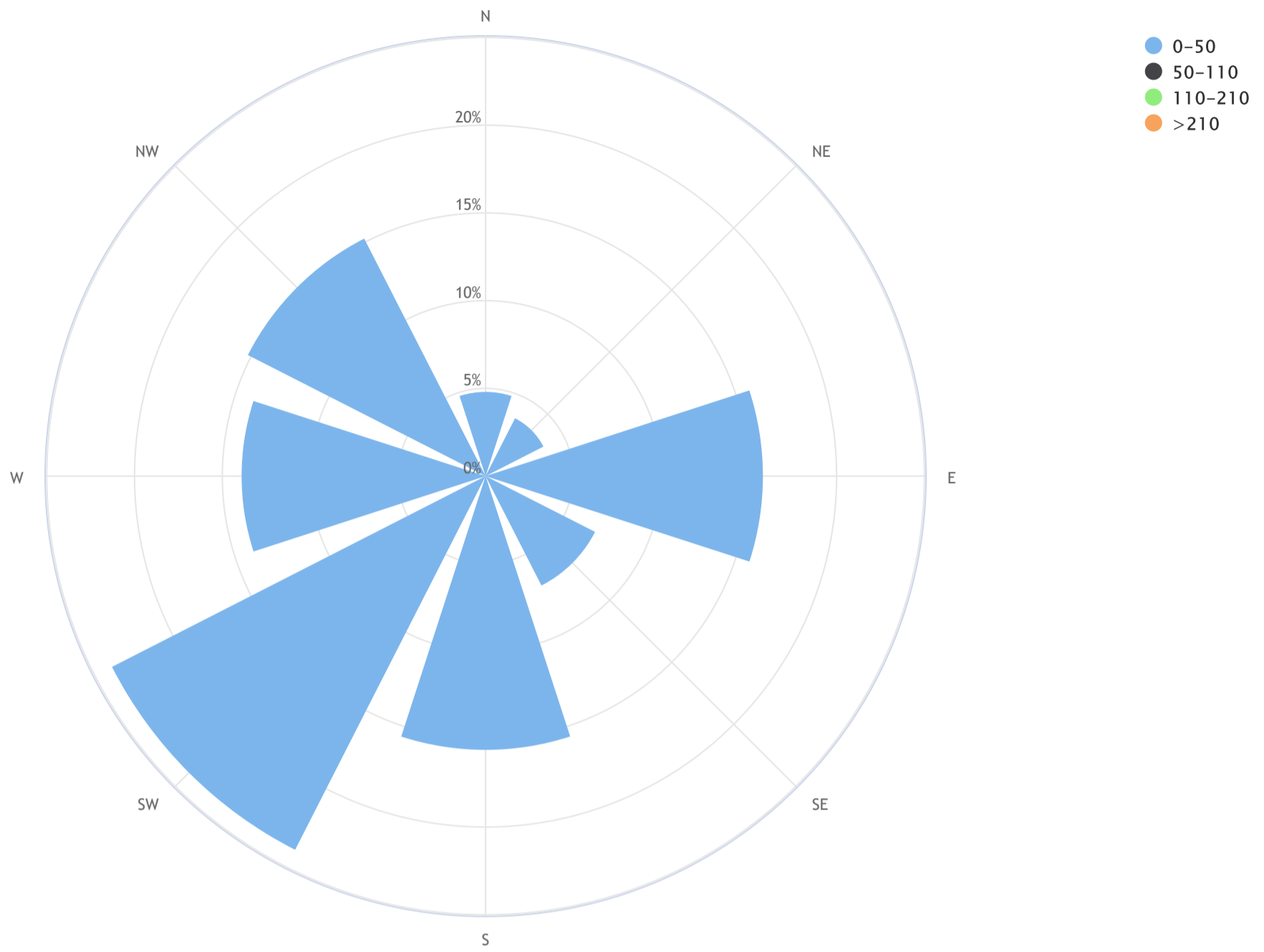


NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 6.0_CALM % = 0.1%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.7 | 0.0 | 0.0 | 0.0 | 3.7 |
| E | 15.8 | 0.0 | 0.0 | 0.0 | 15.8 |
| SE | 7.0 | 0.0 | 0.0 | 0.0 | 7.0 |
| S | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 23.9 | 0.0 | 0.0 | 0.0 | 23.9 |
| W | 13.9 | 0.0 | 0.0 | 0.0 | 13.9 |
| NW | 15.2 | 0.0 | 0.0 | 0.0 | 15.2 |
| Summary | 99.9 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/12 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 | 19.6 | 19.2 | 24.7 | 25.5 | 23.6 | 21.5 | 18.5 | 22.2 | 24.8 | 22.6 | 20.3 | 21.8 | 22.3 | 20.2 | 18.4 | 17.3 | 15.3 | 16.5 | S | 15.8 | 15.5 | 15.8 | 16.4 | 19.5 | 15.3 | 25.5 | 19.9 | 24 |
| 2 | 19.9 | 19.5 | 19.7 | 18.8 | 17.6 | 16.0 | 15.0 | 14.6 | 14.3 | 14.3 | 14.5 | 14.7 | 15.1 | 15.9 | 16.0 | 15.7 | 15.3 | S | 15.9 | 16.4 | 16.7 | 17.5 | 16.8 | 15.2 | 14.3 | 19.9 | 16.3 | 24 |
| 3 | 13.4 | 11.8 | 12.3 | 15.8 | 19.3 | 20.5 | 21.1 | 21.6 | 22.1 | 22.5 | 24.1 | 28.2 | 30.7 | 30.8 | 30.2 | 27.8 | S | 27.6 | 28.0 | 28.7 | 27.9 | 28.0 | 29.7 | 30.3 | 11.8 | 30.8 | 24.0 | 24 |
| 4 | 30.9 | 31.2 | 31.7 | 31.9 | 31.8 | 35.2 | 36.3 | 36.0 | 35.0 | 34.1 | 31.0 | 30.2 | 29.0 | 28.3 | 28.7 | S | 28.1 | 31.5 | 35.4 | 37.6 | 37.4 | 34.8 | 32.6 | 30.3 | 28.1 | 37.6 | 32.6 | 24 |
| 5 | 26.8 | 25.2 | 24.8 | 26.8 | 29.2 | 30.6 | 29.8 | 29.6 | 30.2 | 31.7 | 33.5 | 34.2 | 34.1 | 34.1 | S | 33.8 | 33.4 | 33.5 | 32.2 | 30.4 | 29.3 | 30.3 | 32.2 | 33.1 | 24.8 | 34.2 | 30.8 | 24 |
| 6 | 31.8 | 31.1 | 30.1 | 30.3 | 29.3 | 29.1 | 29.9 | 29.6 | 27.3 | 27.4 | 26.3 | 24.2 | 24.0 | S | 24.2 | 23.3 | 24.2 | 25.1 | 25.7 | 25.9 | 24.6 | 21.1 | 17.4 | 15.5 | 15.5 | 31.8 | 26.0 | 24 |
| 7 | 9.4 | 9.4 | 14.9 | 19.3 | 22.5 | 23.6 | 23.2 | 24.5 | 25.0 | 24.8 | 24.2 | 25.1 | S | 24.0 | 23.0 | 19.7 | 16.4 | 15.1 | 13.3 | 11.7 | 9.7 | 10.0 | 10.3 | 10.5 | 9.4 | 25.1 | 17.8 | 24 |
| 8 | 18.6 | 20.7 | 17.9 | 13.6 | 9.7 | 1.2 | 1.0 | 2.5 | 3.3 | 8.2 | 15.4 | S | 21.5 | 22.1 | 21.4 | 20.6 | 19.8 | 20.5 | 21.1 | 20.7 | 18.5 | 15.3 | 9.3 | 10.9 | 1.0 | 22.1 | 14.5 | 24 |
| 9 | 10.8 | 13.0 | 14.2 | 14.3 | 12.4 | 12.0 | 14.0 | 17.5 | 21.2 | 23.1 | S | 28.3 | 30.1 | 30.6 | 30.2 | 29.7 | 26.5 | 26.1 | 24.4 | 23.8 | 22.1 | 20.5 | 21.6 | 23.4 | 10.8 | 30.6 | 21.3 | 24 |
| 10 | 26.4 | 23.3 | 19.9 | 20.9 | 23.8 | 19.3 | 20.9 | 22.4 | 22.9 | S | 24.4 | 23.9 | 26.0 | 28.0 | 31.2 | 29.8 | 34.5 | 33.5 | 29.4 | 29.3 | 30.2 | 29.2 | 29.1 | 27.8 | 19.3 | 34.5 | 26.4 | 24 |
| 11 | 25.3 | 17.7 | 13.5 | 19.4 | 25.4 | 27.0 | 24.4 | 25.6 | S | 27.9 | 28.0 | 27.9 | 28.9 | 30.4 | 30.7 | 29.4 | 28.9 | 28.3 | 28.6 | 28.1 | 27.9 | 27.2 | 26.8 | 26.0 | 13.5 | 30.7 | 26.2 | 24 |
| 12 | 25.5 | 25.9 | 25.8 | 31.2 | 31.3 | 29.7 | 29.7 | S | 30.1 | 29.8 | 30.2 | 34.9 | 37.3 | 38.5 | 39.0 | 39.6 | 40.1 | 40.5 | 40.7 | 40.4 | 40.1 | 39.8 | 39.3 | 37.6 | 25.5 | 40.7 | 34.7 | 24 |
| 13 | 34.5 | 34.2 | 34.4 | 34.4 | 34.2 | 33.1 | S | 33.7 | 33.0 | 33.7 | 33.6 | 35.5 | 37.0 | 37.7 | 38.8 | 39.6 | 39.5 | 39.0 | 39.2 | 39.5 | 39.7 | 38.1 | 37.3 | 30.9 | 30.9 | 39.7 | 36.1 | 24 |
| 14 | 30.4 | 32.2 | 31.8 | 31.1 | 33.6 | S | 36.2 | 31.4 | 29.1 | 29.2 | 29.2 | 29.9 | 31.0 | 32.9 | 34.2 | 33.8 | 33.0 | 34.5 | 35.7 | 37.2 | 37.7 | 37.5 | 36.7 | 36.2 | 29.1 | 37.7 | 33.2 | 24 |
| 15 | 35.6 | 35.2 | 35.1 | 34.5 | S | 36.3 | 39.4 | 39.4 | 39.8 | 39.7 | 37.0 | 35.6 | 35.4 | 36.8 | 37.4 | 37.2 | 36.8 | 36.1 | 35.0 | 35.7 | 36.1 | 34.9 | 33.7 | 33.3 | 33.3 | 39.8 | 36.3 | 24 |
| 16 | 33.5 | 33.7 | 34.0 | S | 33.5 | 33.1 | 33.1 | 32.4 | 33.3 | 32.8 | 33.4 | 34.3 | 34.2 | 34.7 | 37.0 | 34.7 | 33.3 | 33.0 | 33.2 | 32.9 | 33.9 | 34.9 | 34.4 | 32.1 | 32.1 | 37.0 | 33.7 | 24 |
| 17 | 31.7 | 31.4 | S | 30.8 | 30.3 | 29.9 | 29.3 | 28.9 | 28.0 | 27.4 | 26.7 | 26.6 | 26.3 | 25.8 | 25.3 | 24.5 | 23.8 | 24.0 | 24.0 | 22.7 | 18.4 | 9.1 | 8.4 | 13.3 | 8.4 | 31.7 | 24.6 | 24 |
| 18 | 18.3 | S | 25.0 | 25.7 | 22.2 | 19.8 | 21.4 | 21.5 | 21.2 | 22.6 | C | C | C | C | C | C | C | 26.5 | 19.7 | 20.6 | 19.5 | 23.1 | 25.0 | 30.4 | 18.3 | 30.4 | 22.7 | 24 |
| 19 | S | 24.2 | 18.4 | 19.7 | 16.8 | 16.3 | 19.8 | 13.7 | 10.2 | 16.8 | 22.7 | 28.0 | 31.3 | 32.9 | 31.3 | 28.3 | 27.6 | 28.8 | 29.2 | 31.4 | 31.5 | 31.2 | S | 10.2 | 32.9 | 24.6 | 24 | |
| 20 | 27.1 | 27.1 | 26.4 | 28.2 | 23.3 | 19.5 | 19.1 | 16.9 | 17.0 | 25.9 | 30.0 | 33.9 | 33.4 | 31.8 | 32.0 | 30.7 | 27.7 | 25.5 | 24.7 | 24.2 | 24.6 | 27.1 | S | 28.0 | 16.9 | 33.9 | 26.3 | 24 |
| 21 | 28.0 | 27.3 | 27.0 | 26.6 | 25.6 | 24.9 | 25.2 | 26.1 | 28.2 | 29.0 | 29.8 | 29.3 | 29.3 | 29.6 | 28.9 | 27.4 | 24.7 | 22.8 | 24.4 | 25.6 | 27.9 | S | 27.2 | 27.0 | 22.8 | 29.8 | 27.0 | 24 |
| 22 | 27.8 | 28.8 | 29.8 | 31.4 | 33.2 | 34.4 | 35.8 | 36.3 | 35.7 | 35.8 | 35.0 | 34.5 | 34.3 | 34.6 | 36.3 | 36.8 | 35.0 | 33.8 | 33.9 | 33.7 | S | 31.4 | 31.5 | 30.6 | 27.8 | 36.8 | 33.5 | 24 |
| 23 | 30.8 | 31.2 | 30.9 | 32.7 | 33.1 | 32.9 | 31.0 | 27.2 | 25.7 | 25.1 | 24.2 | 22.4 | 22.4 | 22.0 | 21.1 | 19.2 | 21.2 | 26.0 | 26.6 | S | 25.9 | 25.2 | 25.8 | 26.1 | 19.2 | 33.1 | 26.5 | 24 |
| 24 | 26.4 | 26.7 | 27.3 | 28.7 | 29.1 | 29.2 | 29.2 | 29.7 | 29.3 | 28.3 | 28.8 | 29.2 | 29.4 | 29.5 | 29.1 | 28.8 | 28.3 | 27.6 | S | 26.0 | 26.8 | 27.2 | 26.4 | 26.2 | 26.0 | 29.7 | 28.2 | 24 |
| 25 | 26.5 | 26.4 | 25.2 | 24.6 | 24.2 | 23.7 | 23.7 | 23.0 | 23.2 | 23.7 | 24.0 | 24.1 | 23.5 | 22.8 | 21.7 | S | 19.8 | 19.6 | 19.7 | 19.6 | 20.2 | 19.1 | 19.1 | 19.1 | 26.5 | 22.9 | 24 | |
| 26 | 17.2 | 16.4 | 16.1 | 18.5 | 18.4 | 19.2 | 19.4 | 20.0 | 20.4 | 20.5 | 20.5 | 20.4 | 20.6 | 20.4 | 20.1 | S | 19.3 | 18.5 | 17.6 | 18.7 | 16.9 | 16.4 | 15.6 | 15.6 | 20.6 | 18.8 | 24 | |
| 27 | 16.2 | 19.7 | 20.9 | 20.5 | 18.9 | 18.0 | 19.1 | 19.6 | 19.5 | 19.8 | 21.2 | 21.0 | 20.7 | 19.9 | 20.0 | S | 20.7 | 20.2 | 20.3 | 19.7 | 18.8 | 18.0 | 17.3 | 17.0 | 16.2 | 21.2 | 19.4 | 24 |
| 28 | 16.7 | 15.9 | 15.6 | 15.5 | 15.8 | 16.2 | 16.2 | 15.9 | 15.7 | 16.3 | 17.4 | 17.5 | 17.4 | 16.8 | S | 17.6 | 19.0 | 17.5 | 17.3 | 18.1 | 18.5 | 18.3 | 18.5 | 18.3 | 15.5 | 19.0 | 17.0 | 24 |
| 29 | 17.6 | 16.5 | 16.2 | 18.5 | 21.3 | 18.9 | 19.4 | 13.6 | 12.9 | 14.2 | 14.2 | 15.2 | 15.9 | S | 18.6 | 19.4 | 20.2 | 20.8 | 21.5 | 22.5 | 22.6 | 22.5 | 22.6 | 22.8 | 12.9 | 22.8 | 18.6 | 24 |
| 30 | 23.0 | 23.6 | 23.5 | 22.8 | 21.5 | 21.4 | 22.6 | 24.0 | 25.0 | 26.2 | 26.2 | 26.8 | S | 31.2 | 32.7 | 34.4 | 34.9 | 34.3 | 31.5 | 29.5 | 31.1 | 30.0 | 28.6 | 26.0 | 21.4 | 34.9 | 27.4 | 24 |
| 31 | 26.2 | 23.7 | 24.3 | 24.1 | 25.3 | 25.7 | 24.5 | 20.5 | 22.6 | 23.2 | 22.7 | S | 19.8 | 18.9 | 18.2 | 17.2 | 17.2 | 17.1 | 17.1 | 17.1 | 17.7 | 19.7 | 24.6 | 30.4 | 17.1 | 30.4 | 21.6 | 24 |
| HOURLY MAX | 35.6 | 35.2 | 35.1 | 34.5 | 34.2 | 36.3 | 39.4 | 39.4 | 39.8 | 39.7 | 37.0 | 35.6 | 37.3 | 38.5 | 39.0 | 39.6 | 40.1 | 40.5 | 40.7 | 40.4 | 40.1 | 39.8 | 39.3 | 37.6 | | | | |
| HOURLY AVG | 24.2 | 24.1 | 23.7 | 24.5 | 24.5 | 23.9 | 24.3 | 24.0 | 24.2 | 25.2 | 25.8 | 27.1 | 27.2 | 28.0 | 27.8 | 27.1 | 26.7 | 27.1 | 26.4 | 26.1 | 25.6 | 25.2 | 24.9 | 24.8 | | | | |

STATUS FLAG CODES

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

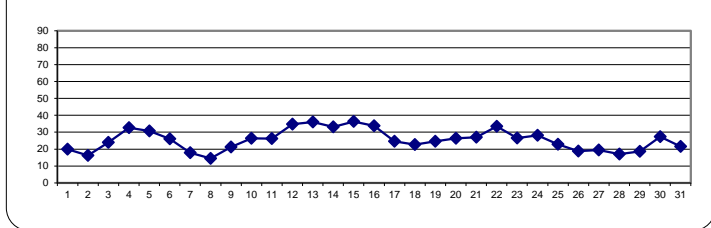
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

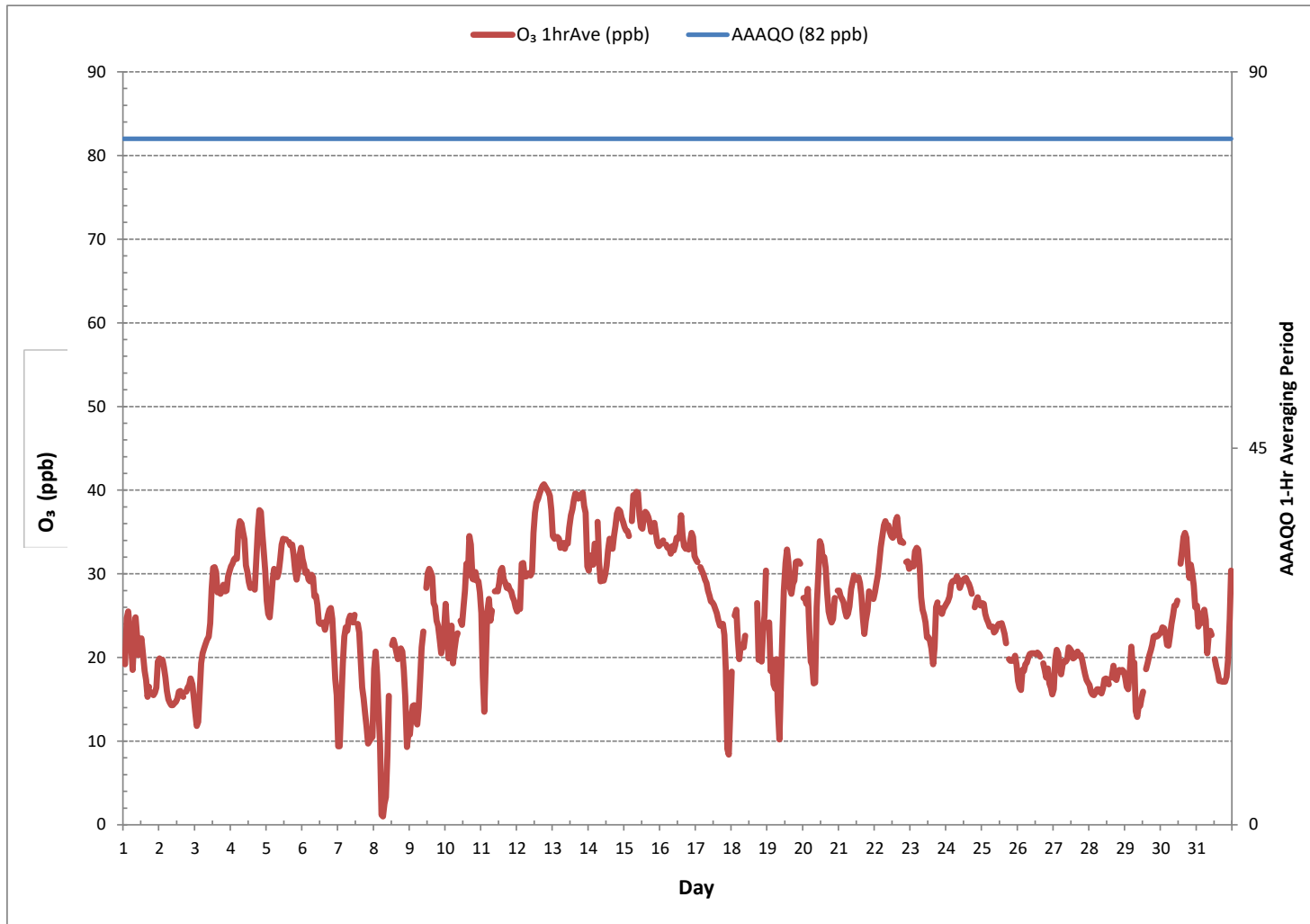
MONTHLY SUMMARY

| | | | | |
|------------------------------|------|-----|-----------------------|--------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 705 | | | |
| MINIMUM 1-HR AVERAGE: | 1.0 | ppb | @ HOUR | 6 ON DAY 8 |
| MAXIMUM 1-HR AVERAGE: | 40.7 | ppb | @ HOUR | 18 ON DAY 12 |
| MAXIMUM 24-HR AVERAGE: | 36.3 | ppb | | ON DAY 15 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 7.3 | | MONTHLY AVERAGE: | 25.5 ppb |

24 HR AVERAGES December 2018

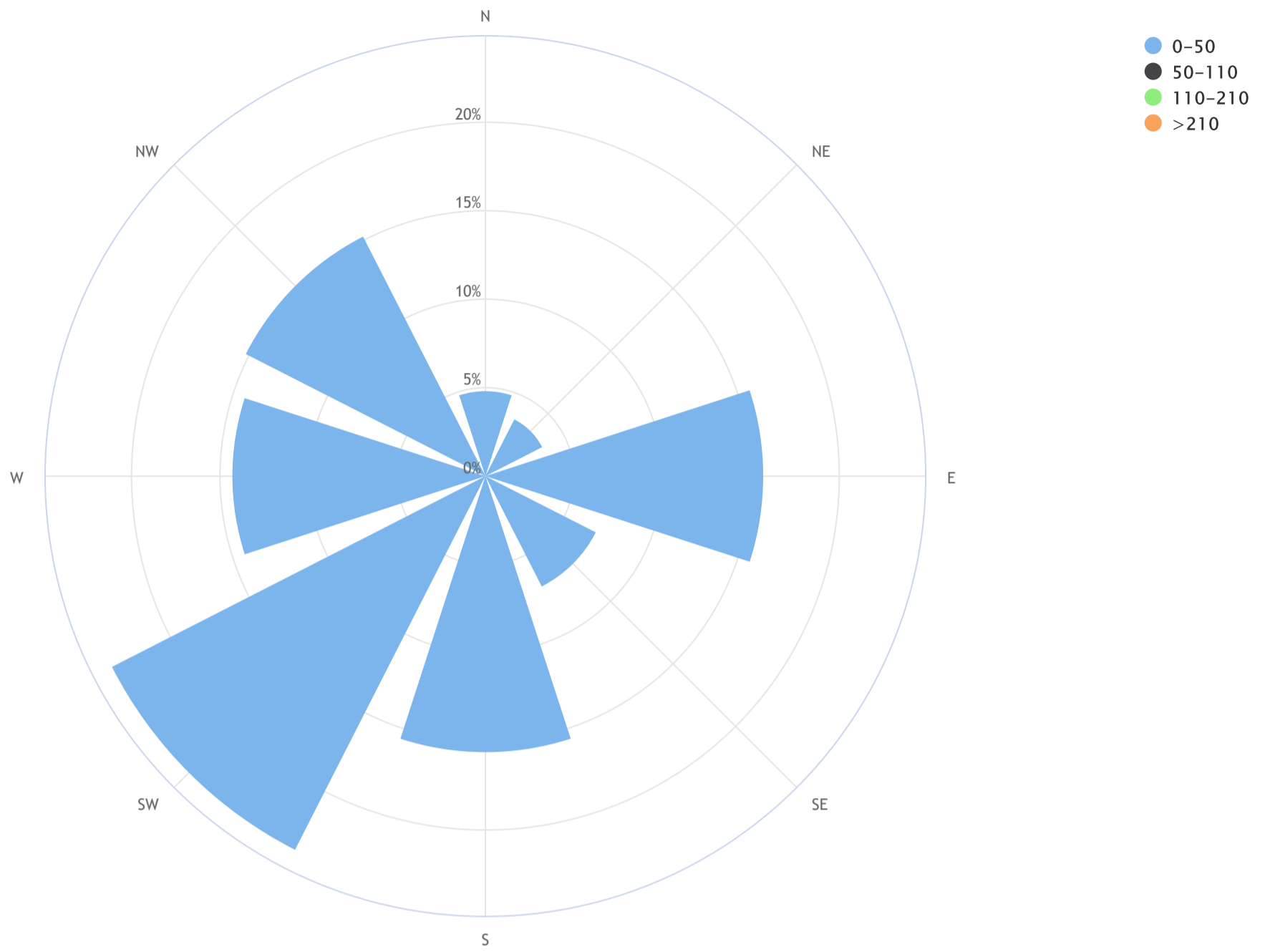


OZONE Hourly Averages (O₃ ppb)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_O₃ (ppb)_18/12

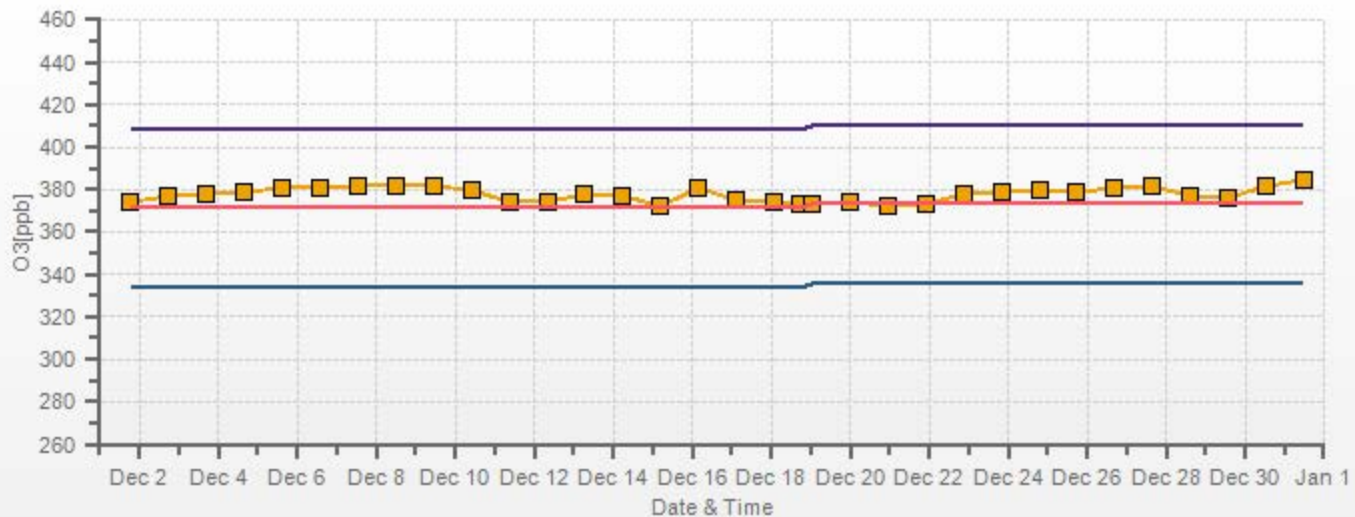
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 19.8_CALM % = 0.1%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 4.8 | 0.0 | 0.0 | 0.0 | 4.8 |
| NE | 3.6 | 0.0 | 0.0 | 0.0 | 3.6 |
| E | 15.7 | 0.0 | 0.0 | 0.0 | 15.7 |
| SE | 7.0 | 0.0 | 0.0 | 0.0 | 7.0 |
| S | 15.6 | 0.0 | 0.0 | 0.0 | 15.6 |
| SW | 23.7 | 0.0 | 0.0 | 0.0 | 23.7 |
| W | 14.3 | 0.0 | 0.0 | 0.0 | 14.3 |
| NW | 15.2 | 0.0 | 0.0 | 0.0 | 15.2 |
| Summary | 99.9 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |

O3[ppb] Calibration: LICA ST. LINA Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



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

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

STATUS FLAG CODES

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

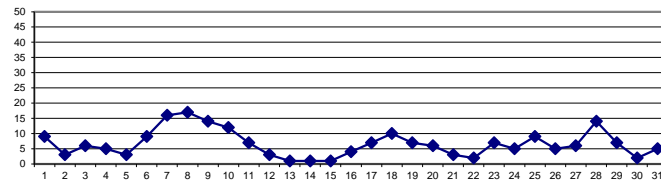
OBJECTIVE LIMIT:

| | | | | |
|----------------------|------|----------------------|-------|----------------------|
| ALBERTA ENVIRONMENT: | 1-HR | 80 µg/m ³ | 24-HR | 29 µg/m ³ |
|----------------------|------|----------------------|-------|----------------------|

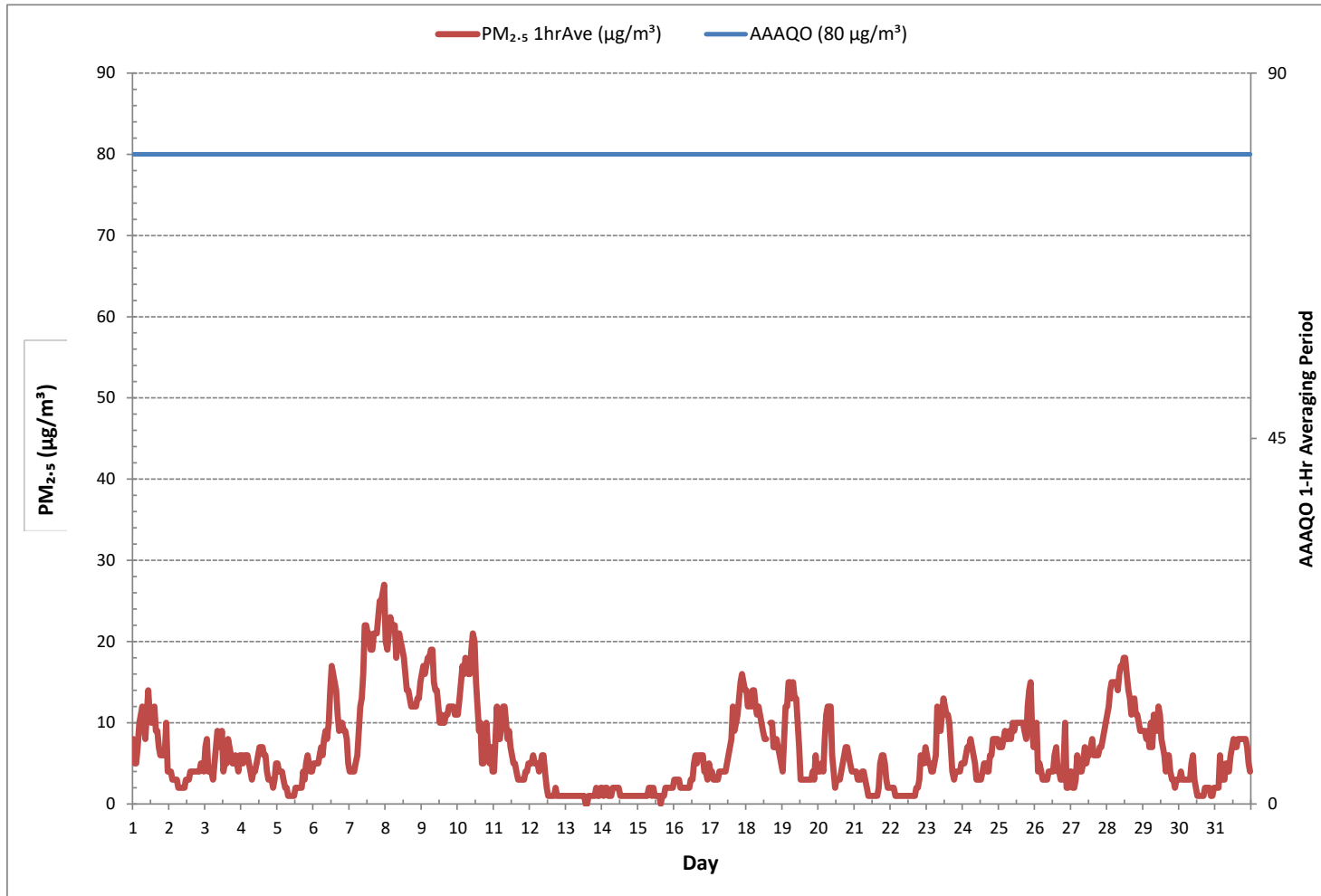
MONTHLY SUMMARY

| | | | |
|------------------------------|-----------------------------|-----------------------|---------------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 739 | | |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR | 13 ON DAY | 13 |
| MAXIMUM 1-HR AVERAGE: | 27 µg/m ³ @ HOUR | 23 ON DAY | 7 |
| MAXIMUM 24-HR AVERAGE: | 17 µg/m ³ | ON DAY | 8 |
| MONTHLY CALIBRATION TIME: | 2 hrs | OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 5 | AMD OPERATION UPTIME: | 100.0 % |
| | | MONTHLY AVERAGE: | 7 µg/m ³ |

24 HR AVERAGES December 2018

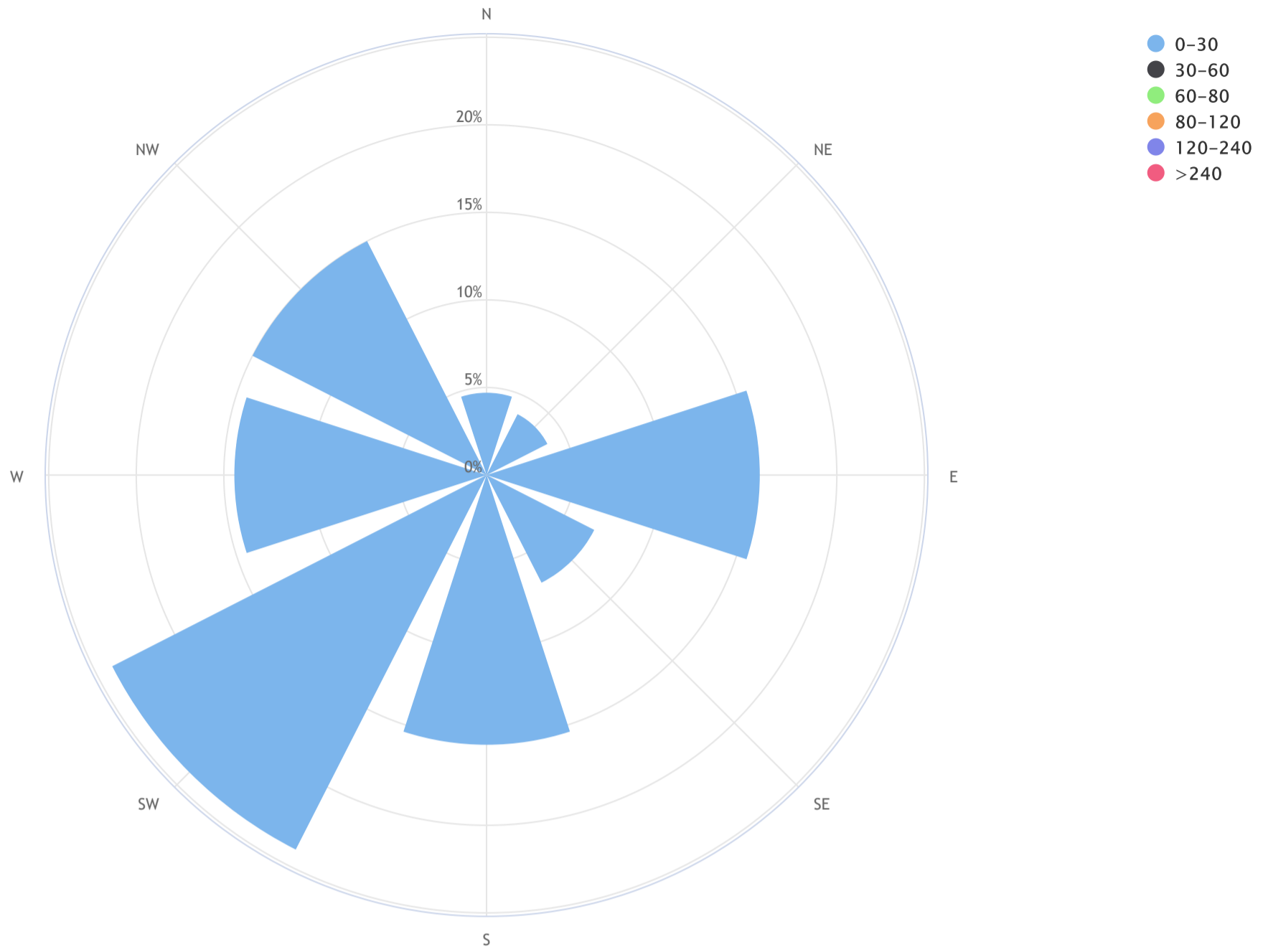


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_PM2.5 (µg/m³)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 8.0_CALM % = 0.1%



| Direction | 0-30 | 30-60 | 60-80 | 80-120 | 120-240 | >240 | TOTAL |
|-----------|------|-------|-------|--------|---------|------|-------|
| N | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 |
| NE | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.9 |
| E | 15.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.6 |
| SE | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 15.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.4 |
| SW | 24.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24.0 |
| W | 14.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.4 |
| NW | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.0 |
| Summary | 99.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |

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 | 6.0 | 5.3 | 5.3 | 4.9 | 4.8 | 5.5 | 7.1 | 7.9 | 7.0 | 7.8 | 10.7 | 10.5 | 8.6 | 5.2 | 6.0 | 8.2 | 8.5 | 10.9 | 10.5 | 11.3 | 10.5 | 11.5 | 12.7 | 12.3 | 4.8 | 12.7 | 7.9 | 24 |
| 2 | 12.2 | 11.5 | 11.4 | 10.7 | 10.0 | 10.6 | 10.2 | 9.1 | 7.8 | 8.3 | 7.4 | 7.5 | 6.8 | 6.4 | 6.8 | 6.1 | 4.7 | 4.0 | 3.6 | 3.3 | 2.9 | 1.8 | 2.5 | 4.5 | 1.8 | 12.2 | 6.5 | 24 |
| 3 | 5.2 | 4.1 | 5.7 | 6.7 | 8.8 | 9.9 | 10.5 | 9.8 | 9.7 | 9.1 | 11.6 | 12.5 | 12.1 | 9.3 | 9.1 | 10.1 | 11.5 | 12.4 | 14.0 | 13.3 | 15.2 | 13.9 | 14.0 | 12.3 | 4.1 | 15.2 | 10.2 | 24 |
| 4 | 11.7 | 11.1 | 9.2 | 8.5 | 8.1 | 13.8 | 13.9 | 15.2 | 12.3 | 11.3 | 12.3 | 13.1 | 13.8 | 16.2 | 15.4 | 15.2 | 12.6 | 10.8 | 11.3 | 12.7 | 14.1 | 14.5 | 15.1 | 19.2 | 8.1 | 19.2 | 9.9 | 24 |
| 5 | 17.3 | 17.1 | 17.3 | 16.4 | 15.3 | 14.9 | 13.5 | 13.7 | 10.6 | 10.1 | 8.9 | 7.1 | 4.4 | 6.2 | 6.5 | 7.8 | 10.0 | 7.9 | 8.7 | 12.1 | 9.2 | 6.6 | 5.7 | 5.4 | 4.4 | 17.3 | 6.0 | 24 |
| 6 | 7.2 | 7.1 | 7.8 | 7.8 | 8.8 | 13.3 | 14.3 | 12.5 | 14.3 | 13.3 | 13.4 | 12.2 | 12.5 | 12.7 | 16.2 | 14.8 | 12.5 | 12.9 | 11.0 | 12.3 | 10.0 | 10.4 | 9.9 | 11.0 | 7.1 | 16.2 | 11.4 | 24 |
| 7 | 10.5 | 11.8 | 10.7 | 11.1 | 10.8 | 12.8 | 14.0 | 14.9 | 14.7 | 14.7 | 16.2 | 16.4 | 15.0 | 15.4 | 17.4 | 11.2 | 11.4 | 10.4 | 10.5 | 9.4 | 9.9 | 10.5 | 8.5 | 11.4 | 8.5 | 17.4 | 12.2 | 24 |
| 8 | 14.5 | 11.8 | 10.7 | 10.5 | 10.5 | 11.8 | 12.8 | 12.2 | 13.9 | 12.9 | 13.5 | 15.6 | 15.6 | 13.0 | 16.0 | 15.3 | 16.2 | 16.4 | 15.0 | 14.3 | 14.3 | 13.5 | 13.1 | 12.4 | 10.5 | 16.4 | 13.2 | 24 |
| 9 | 11.4 | 10.2 | 11.6 | 10.9 | 11.8 | 12.3 | 13.2 | 12.8 | 12.9 | 12.7 | 11.6 | 9.5 | 11.3 | 11.6 | 9.7 | 9.9 | 11.8 | 12.4 | 13.8 | 13.4 | 15.0 | 13.5 | 13.1 | 12.2 | 9.5 | 15.0 | 11.7 | 24 |
| 10 | 11.4 | 9.6 | 8.8 | 10.5 | 10.1 | 8.8 | 7.3 | 8.6 | 8.5 | 9.8 | 16.0 | 13.0 | 12.9 | 9.8 | 11.1 | 7.6 | 12.0 | 11.9 | 12.7 | 13.5 | 13.3 | 14.0 | 10.7 | 11.3 | 7.3 | 16.0 | 7.5 | 24 |
| 11 | 10.3 | 7.9 | 7.5 | 8.9 | 8.8 | 9.3 | 9.8 | 10.7 | 11.9 | 12.0 | 12.2 | 12.5 | 11.5 | 15.2 | 14.8 | 14.9 | 18.1 | 18.5 | 14.1 | 11.9 | 8.7 | 7.0 | 6.7 | 11.4 | 6.7 | 18.5 | 11.0 | 24 |
| 12 | 12.0 | 12.3 | 12.0 | 10.5 | 12.4 | 12.5 | 12.3 | 13.8 | 16.8 | 13.6 | 9.7 | 17.0 | 18.9 | 23.5 | 23.4 | 21.7 | 23.5 | 24.0 | 21.9 | 22.4 | 23.2 | 17.5 | 13.5 | 11.5 | 9.7 | 24.0 | 15.9 | 24 |
| 13 | 10.9 | 11.5 | 12.4 | 12.7 | 12.7 | 12.8 | 16.3 | 11.9 | 8.4 | 12.9 | 13.3 | 21.8 | 15.2 | 17.8 | 23.2 | 20.1 | 16.6 | 15.2 | 15.6 | 13.3 | 9.3 | 10.6 | 11.1 | 9.6 | 8.4 | 23.2 | 12.0 | 24 |
| 14 | 10.0 | 8.6 | 10.9 | 9.8 | 12.9 | 14.8 | 16.9 | 14.8 | 8.6 | 8.5 | 9.6 | 10.5 | 12.5 | 11.7 | 11.1 | 14.5 | 17.5 | 19.3 | 20.2 | 19.0 | 17.1 | 16.3 | 13.0 | 11.0 | 8.5 | 20.2 | 12.0 | 24 |
| 15 | 12.1 | 12.1 | 13.5 | 11.9 | 10.4 | 12.0 | 15.2 | 27.2 | 28.8 | 22.7 | 17.4 | 29.0 | 28.1 | 29.3 | 25.1 | 22.6 | 24.6 | 23.4 | 23.6 | 17.6 | 17.8 | 15.4 | 13.0 | 10.5 | 10.4 | 29.3 | 17.5 | 24 |
| 16 | 10.9 | 9.5 | 5.8 | 1.6 | 5.1 | 4.6 | 5.1 | 12.9 | 13.9 | 15.1 | 14.7 | 14.2 | 14.8 | 15.9 | 14.8 | 16.8 | 12.9 | 18.1 | 19.9 | 16.7 | 15.6 | 16.4 | 13.1 | 14.3 | 1.6 | 19.9 | 9.7 | 24 |
| 17 | 14.8 | 13.7 | 15.1 | 13.7 | 13.3 | 11.5 | 11.4 | 8.9 | 4.6 | 5.5 | 5.3 | 9.0 | 10.2 | 13.2 | 9.2 | 8.7 | 11.6 | 11.7 | 11.3 | 12.7 | 13.2 | 12.8 | 12.3 | 12.3 | 4.6 | 15.1 | 4.5 | 24 |
| 18 | 15.4 | 15.8 | 13.4 | 11.4 | 14.7 | 12.9 | 12.7 | 12.6 | 10.7 | 8.0 | 11.4 | 12.2 | 12.0 | 9.7 | 7.8 | 2.4 | 6.5 | 5.1 | 10.2 | 9.2 | 11.4 | 13.1 | 14.6 | 15.6 | 2.4 | 15.8 | 8.3 | 24 |
| 19 | 11.8 | 10.8 | 11.0 | 13.0 | 12.1 | 12.2 | 12.2 | 12.2 | 10.9 | 12.7 | 14.6 | 13.9 | 14.3 | 15.9 | 12.3 | 10.5 | 12.7 | 15.4 | 13.3 | 12.7 | 11.9 | 11.0 | 12.0 | 11.9 | 10.5 | 15.9 | 12.2 | 24 |
| 20 | 13.0 | 10.2 | 11.3 | 11.2 | 8.3 | 11.1 | 10.2 | 8.5 | 10.5 | 13.2 | 14.1 | 12.8 | 13.0 | 12.1 | 16.0 | 16.2 | 16.9 | 17.4 | 18.0 | 20.5 | 23.0 | 23.8 | 22.1 | 14.1 | 8.3 | 23.8 | 9.3 | 24 |
| 21 | 9.8 | 7.4 | 4.8 | 14.3 | 14.3 | 14.5 | 21.3 | 21.6 | 20.8 | 22.4 | 23.1 | 22.1 | 21.1 | 22.7 | 23.6 | 20.6 | 20.4 | 25.2 | 23.5 | 23.8 | 24.0 | 24.0 | 23.5 | 23.0 | 4.8 | 25.2 | 17.9 | 24 |
| 22 | 21.5 | 18.4 | 20.3 | 22.1 | 20.7 | 18.6 | 17.6 | 17.4 | 13.7 | 14.8 | 12.8 | 11.8 | 11.4 | 10.3 | 9.2 | 7.4 | 7.4 | 8.9 | 8.7 | 7.1 | 7.8 | 8.5 | 6.7 | 6.7 | 6.7 | 22.1 | 11.6 | 24 |
| 23 | 6.5 | 5.8 | 7.0 | 7.7 | 8.2 | 7.2 | 7.9 | 7.9 | 9.5 | 10.7 | 10.0 | 8.0 | 7.2 | 8.1 | 10.2 | 10.3 | 11.0 | 11.7 | 10.1 | 9.6 | 9.8 | 9.2 | 10.4 | 10.6 | 5.8 | 11.7 | 7.2 | 24 |
| 24 | 10.4 | 10.5 | 10.2 | 10.5 | 7.0 | 6.7 | 7.7 | 7.8 | 7.8 | 8.1 | 7.3 | 6.3 | 6.9 | 7.4 | 5.6 | 5.9 | 7.8 | 7.7 | 7.5 | 7.3 | 8.3 | 7.8 | 7.0 | 7.8 | 5.6 | 10.5 | 7.1 | 24 |
| 25 | 8.5 | 7.3 | 7.9 | 5.6 | 6.5 | 6.3 | 6.4 | 5.6 | 4.8 | 7.1 | 10.5 | 5.4 | 0.5 | 4.5 | 2.4 | 2.9 | 1.7 | 1.8 | 0.3 | 2.9 | 4.8 | 4.8 | 7.1 | 6.5 | 0.3 | 10.5 | 2.5 | 24 |
| 26 | 8.1 | 7.9 | 8.0 | 8.8 | 8.6 | 6.5 | 5.1 | 5.4 | 4.8 | 4.1 | 2.3 | 4.6 | 2.6 | 1.5 | 1.8 | 4.0 | 2.8 | 4.3 | 0.7 | 4.3 | 6.0 | 7.1 | 6.2 | 9.1 | 0.7 | 9.1 | 2.7 | 24 |
| 27 | 6.2 | 5.0 | 6.1 | 7.2 | 5.9 | 7.6 | 6.7 | 5.6 | 3.7 | 4.1 | 5.2 | 5.8 | 8.1 | 9.6 | 8.7 | 7.9 | 5.0 | 5.0 | 6.9 | 7.1 | 4.8 | 8.0 | 6.7 | 8.9 | 3.7 | 9.6 | 5.9 | 24 |
| 28 | 7.8 | 6.7 | 7.7 | 5.7 | 5.2 | 5.4 | 2.5 | 1.8 | 4.0 | 4.6 | 5.8 | 5.2 | 5.6 | 4.8 | 3.6 | 5.9 | 4.6 | 4.6 | 4.1 | 4.8 | 4.1 | 4.4 | 2.4 | 2.6 | 1.8 | 7.8 | 4.1 | 24 |
| 29 | 3.0 | 5.5 | 6.4 | 9.5 | 9.8 | 8.6 | 6.3 | 4.6 | 5.5 | 6.6 | 7.6 | 9.0 | 10.6 | 12.5 | 13.4 | 17.1 | 19.1 | 19.4 | 18.6 | 19.6 | 19.1 | 19.7 | 21.1 | 20.6 | 3.0 | 21.1 | 9.7 | 24 |
| 30 | 18.5 | 18.3 | 17.5 | 14.3 | 14.4 | 13.1 | 13.4 | 15.8 | 13.8 | 12.5 | 13.0 | 13.3 | 12.8 | 11.0 | 11.9 | 13.0 | 12.2 | 12.1 | 10.4 | 8.7 | 9.2 | 9.7 | 8.1 | 6.2 | 6.2 | 18.5 | 10.3 | 24 |
| 31 | 7.6 | 7.2 | 10.2 | 12.3 | 9.3 | 8.8 | 7.1 | 8.8 | 12.0 | 10.3 | 12.2 | 13.2 | 13.7 | 14.0 | 12.0 | 13.8 | 15.4 | 17.7 | 16.9 | 17.6 | 17.0 | 17.5 | 17.5 | 18.8 | 7.1 | 18.8 | 12.6 | 24 |
| HOURLY MAX | 21.5 | 18.4 | 20.3 | 22.1 | 20.7 | 18.6 | 21.3 | 27.2 | 28.8 | 22.7 | 23.1 | 29.0 | 28.1 | 29.3 | 25.1 | 22.6 | 24.6 | 25.2 | 23.6 | 23.8 | 24.0 | 24.0 | 23.5 | 23.0 | | | | |

STATUS FLAG CODES

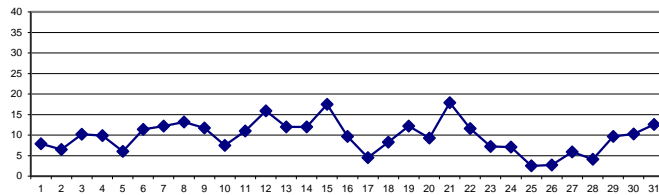
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

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

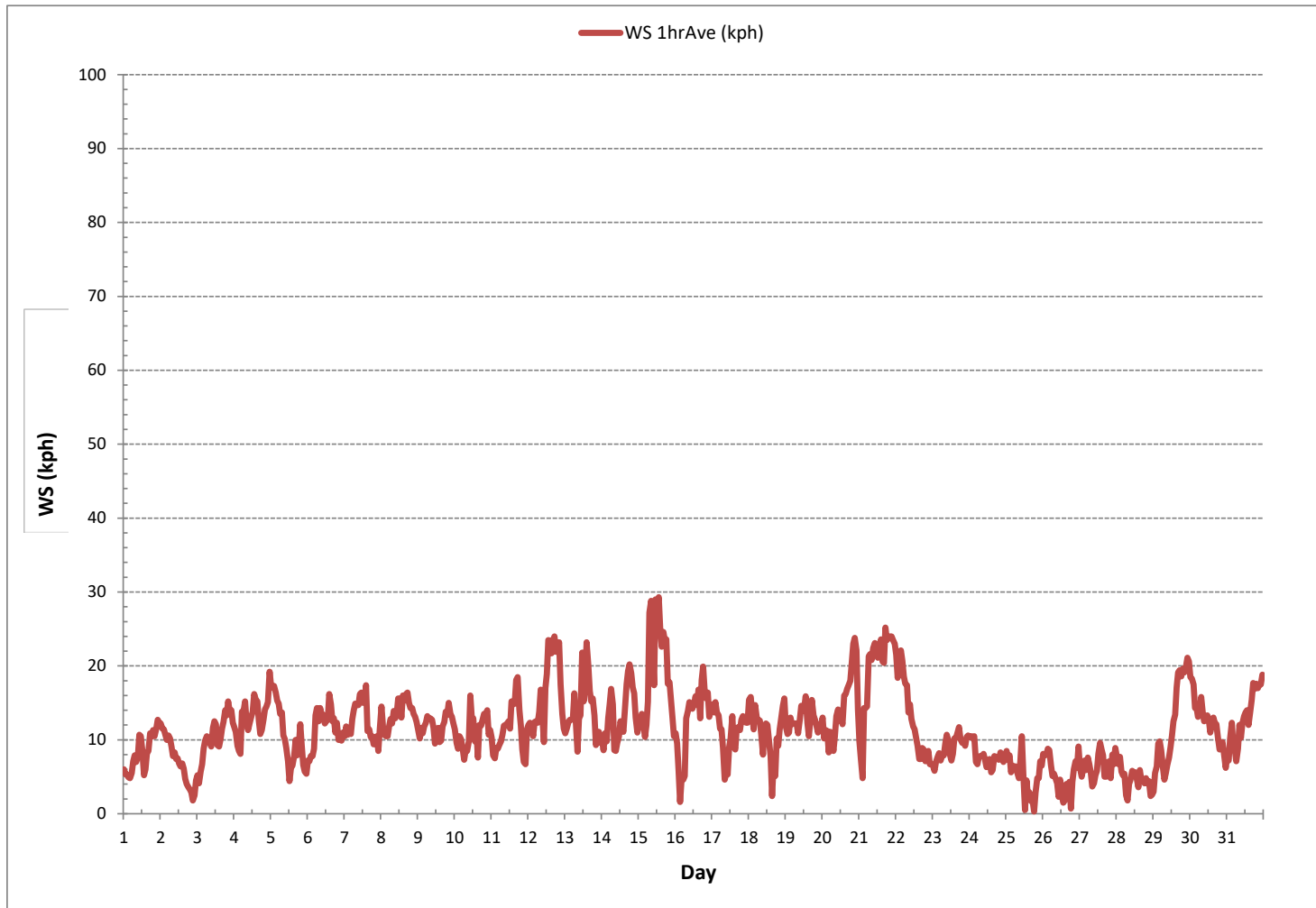
MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 744 |
| MINIMUM 1-HR AVERAGE | 0.3 kph @ HOUR 18 ON DAY 25 |
| MAXIMUM 1-HR AVERAGE: | 29.3 kph @ HOUR 13 ON DAY 15 |
| MAXIMUM 24-HR AVERAGE: | 17.9 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 744 hrs |
| AMSD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 5.0 |
| MONTHLY AVERAGE: | 3.6 kph |

24 HR AVERAGES December 2018

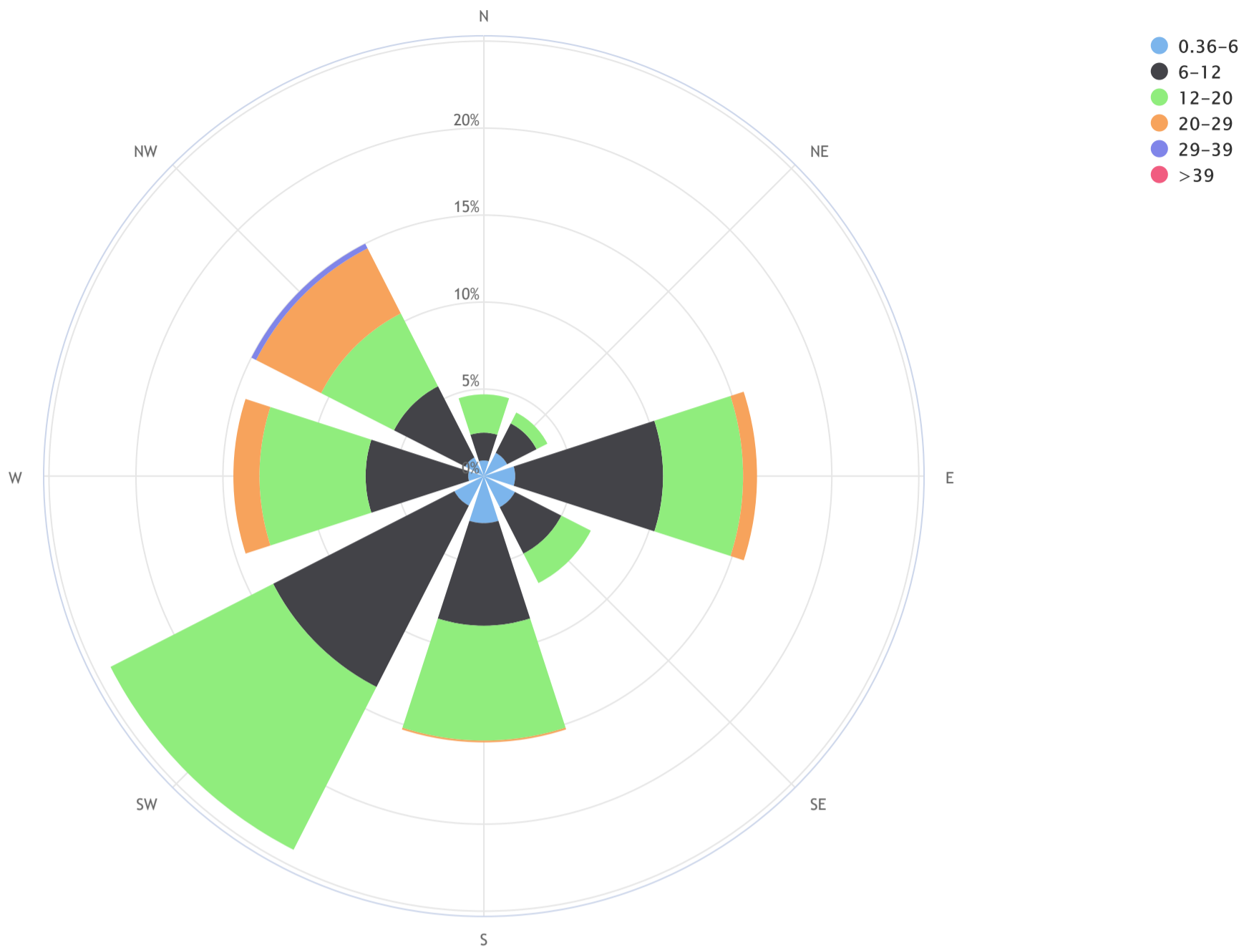


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_18/12

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 0.3_CALM % = 0.1%



| Direction | 0.36-6 | 6-12 | 12-20 | 20-29 | 29-39 | >39 | TOTAL |
|----------------|-------------|-------------|-------------|------------|------------|------------|-------------|
| N | 0.9 | 1.6 | 2.2 | 0.0 | 0.0 | 0.0 | 4.7 |
| NE | 1.5 | 1.9 | 0.7 | 0.0 | 0.0 | 0.0 | 4.0 |
| E | 1.8 | 8.5 | 4.6 | 0.8 | 0.0 | 0.0 | 15.6 |
| SE | 2.0 | 3.0 | 1.9 | 0.0 | 0.0 | 0.0 | 6.9 |
| S | 2.7 | 5.9 | 6.6 | 0.1 | 0.0 | 0.0 | 15.3 |
| SW | 1.9 | 11.7 | 10.5 | 0.0 | 0.0 | 0.0 | 24.1 |
| W | 0.9 | 5.9 | 6.1 | 1.5 | 0.0 | 0.0 | 14.4 |
| NW | 1.2 | 4.6 | 4.7 | 4.2 | 0.3 | 0.0 | 14.9 |
| Summary | 12.9 | 43.0 | 37.1 | 6.6 | 0.3 | 0.0 | 99.9 |
| CALM | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |

WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24-HOUR AVG | 24-HR | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | QUADRANT | RDGS. | |
| DAY 1 | SE | SE | SE | ESE | ESE | E | E | E | E | E | ENE | E | E | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | E | E | 24 | |
| 2 | ENE | ENE | ENE | E | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | NE | NE | ENE | NNE | WNW | WNW | ENE | 24 |
| 3 | NW | WNW | NW | WNW | NW | NW | NW | NW | NW | WNW | NW | WNW | NW | WNW | WNW | NW | NNW | NNW | NNW | NNW | NNW | NNW | NW | NW | NW | NW | 24 |
| 4 | NW | WNW | W | WSW | SW | WSW | SW | SW | SW | SSW | SW | WSW | WSW | WSW | WSW | W | W | W | W | WNW | NNW | NNW | NNW | N | W | 24 | |
| 5 | N | N | N | N | N | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | 24 |
| 6 | SW | SW | SSW | SW | SW | SW | SW | SW | SW | SW | SW | SW | WSW | SW | WSW | SW | SW | SW | SW | SW | WSW | WSW | SW | SSW | SW | SW | 24 |
| 7 | SW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SW | WSW | SW | SW | SW | SW | SW | 24 |
| 8 | W | W | WSW | WSW | SSW | SW | WSW | WSW | WSW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SW | SW | WSW | SW | SW | SW | 24 |
| 9 | SW | SSW | SSW | SSW | SSW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | S | SSW | S | S | S | S | SSW | 24 |
| 10 | SSE | S | S | S | S | WSW | SW | W | W | NW | NW | NW | NW | NW | NW | W | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | 24 |
| 11 | SW | SSW | SSW | SSW | SSW | S | S | S | S | S | S | S | S | S | SSE | SSE | S | S | S | SSW | S | S | S | S | SW | S | 24 |
| 12 | SW | WNW | NW | NW | WNW | W | W | WSW | WSW | WSW | SW | WSW | W | W | W | WSW | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | W | 24 |
| 13 | SSW | SSW | S | S | S | SSW | SSW | SW | SSW | SW | WSW | W | WSW | WSW | WSW | W | W | W | W | W | W | SSW | SSW | SW | SW | SW | 24 |
| 14 | SW | SSW | SSW | S | S | SSE | SE | SE | SE | ESE | SSE | SSE | S | S | S | S | S | S | SSW | SSW | SSW | SSW | SSW | SSW | SSW | S | 24 |
| 15 | SSW | SW | SW | WSW | WNW | WNW | WNW | NW | NW | NW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | NW | NW | NW | NW | NW | NW | WNW | 24 |
| 16 | NW | NW | NW | W | SSW | SW | ESE | ENE | E | E | ESE | SE | SE | ESE | ESE | E | E | E | E | E | ESE | ESE | ESE | E | ESE | ESE | 24 |
| 17 | E | E | E | E | E | E | E | ENE | ESE | E | S | WSW | WSW | WSW | WSW | WSW | SW | SW | SW | SW | SW | SSW | SSW | SSW | SSW | S | 24 |
| 18 | S | S | SSW | SSW | S | S | SSW | SSW | SSW | SW | SSW | SW | SSW | SW | SW | SW | NE | ENE | SSW | SSW | SW | WSW | WNW | WNW | NW | SW | 24 |
| 19 | WNW | WSW | SW | WSW | WSW | WSW | W | SW | SW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | 24 |
| 20 | W | W | WSW | WSW | SW | SSW | SSW | SW | S | S | SSE | SSE | SE | SE | SSE | ESE | ESE | ESE | ESE | ESE | ESE | ESE | ESE | ESE | ESE | SE | 24 |
| 21 | ENE | ENE | WSW | W | W | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | 24 |
| 22 | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | NW | WNW | WNW | W | WSW | W | W | WSW | WSW | WSW | W | SW | WNW | 24 |
| 23 | SSW | SSE | SSE | SE | SE | SE | E | E | ENE | ENE | ENE | ENE | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | E | 24 |
| 24 | ENE | ENE | ENE | ENE | E | ENE | ENE | E | E | E | ESE | E | ESE | ESE | ESE | ESE | ESE | ESE | ESE | SE | SE | SSE | SE | SE | E | 24 | |
| 25 | SE | SE | SE | SSE | SSE | SE | SE | SE | E | SSE | S | SSW | SSE | S | S | SE | ESE | ENE | NE | NNW | NNW | NNW | NNW | NNW | NNW | SE | 24 |
| 26 | NNW | NNW | N | N | NNW | NW | NNW | NNW | NNW | N | NNE | N | N | NNE | NE | ENE | ENE | S | NNE | NE | ENE | E | SSE | S | N | 24 | |
| 27 | SSW | SW | S | SE | SSE | S | SSE | SSE | ESE | SSE | SSE | S | S | S | SSE | S | S | S | SSW | S | SSW | S | SW | SW | S | 24 | |
| 28 | SW | SW | SW | SW | SSW | SW | WSW | ESE | S | S | S | SSW | S | SSW | S | S | SSE | SE | SSE | SSW | SSW | SW | SW | WSW | SSW | 24 | |
| 29 | WSW | W | WNW | NNW | NNW | N | NNE | E | E | ESE | ESE | E | E | E | E | E | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | 24 |
| 30 | ENE | ENE | ENE | NE | NE | NE | NNE | NNE | NNE | N | N | N | N | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNW | NNE | 24 |
| 31 | WSW | WSW | SW | SW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | SSW | S | SSW | SSW | SSW | S | SSW | SSW | SSW | 24 |

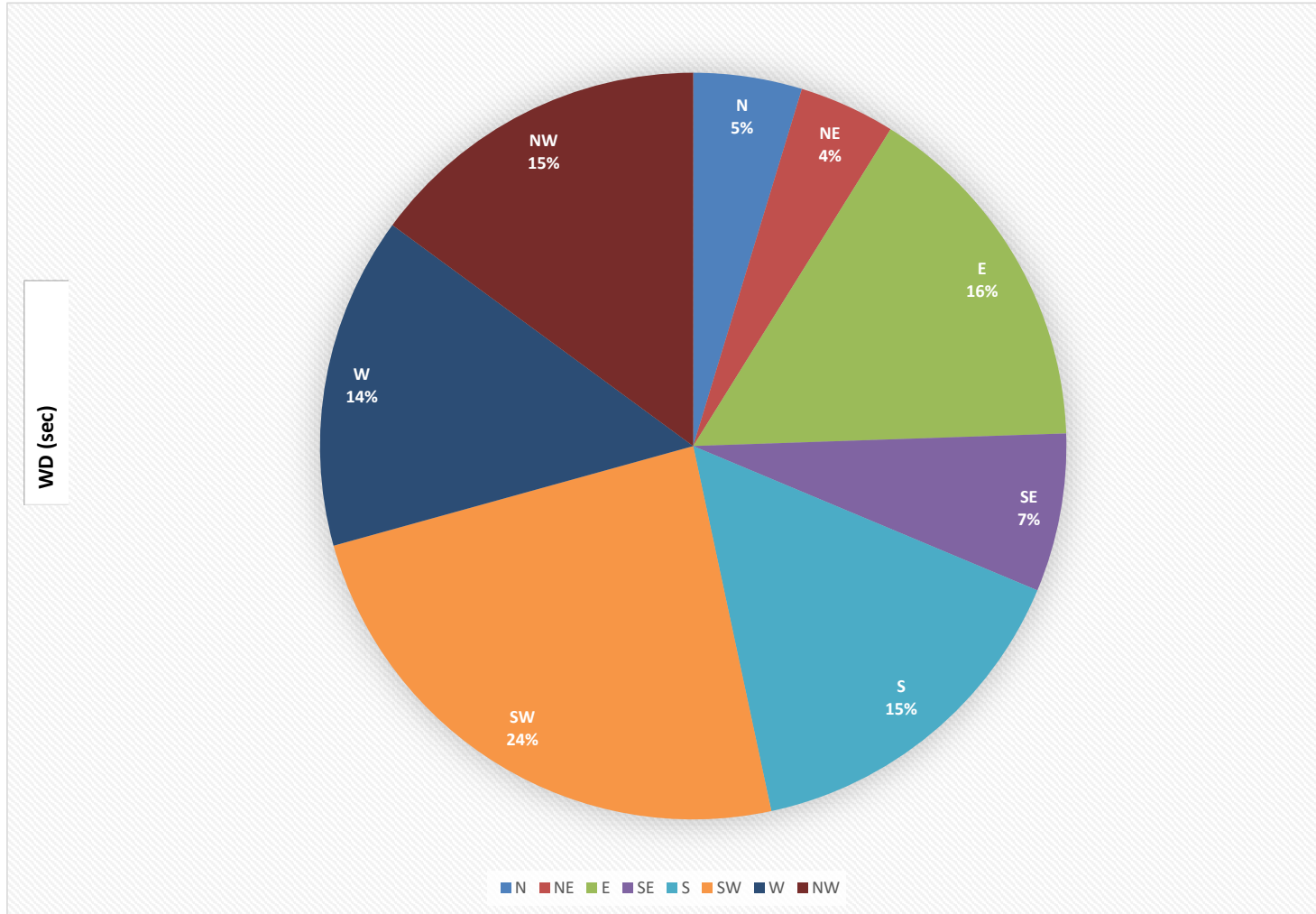
STATUS FLAG CODES

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

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

| | | | | | |
|---------------------------|----|-----|-----------------------|-------|------|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 744 | hrs |
| STANDARD DEVIATION: | 85 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 238 | (SW) |

WIND DIRECTION Hourly Averages (WD)





STANDARD DEVIATION WIND DIRECTION



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

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 18 | 22 | 14 | 20 | 8 | 12 | 9 | 8 | 10 | 10 | 9 | 5 | 9 | 11 | 8 | 5 | 3 | 3 | 4 | 3 | 4 | 5 | 3 | 4 | 24 | |
| 2 | 4 | 5 | 9 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 6 | 7 | 9 | 10 | 23 | 25 | 8 | 24 | |
| 3 | 17 | 19 | 12 | 8 | 9 | 7 | 6 | 7 | 6 | 8 | 9 | 8 | 6 | 11 | 14 | 10 | 6 | 7 | 6 | 10 | 6 | 6 | 6 | 5 | 24 | |
| 4 | 7 | 8 | 13 | 8 | 8 | 4 | 7 | 5 | 8 | 6 | 11 | 4 | 10 | 5 | 4 | 6 | 7 | 5 | 5 | 9 | 15 | 5 | 5 | 7 | 24 | |
| 5 | 6 | 5 | 6 | 5 | 5 | 9 | 11 | 6 | 5 | 9 | 8 | 7 | 25 | 16 | 12 | 5 | 4 | 7 | 5 | 5 | 6 | 6 | 11 | 11 | 24 | |
| 6 | 9 | 12 | 9 | 6 | 4 | 4 | 5 | 5 | 2 | 2 | 3 | 6 | 6 | 5 | 5 | 4 | 4 | 3 | 6 | 7 | 9 | 6 | 3 | 4 | 24 | |
| 7 | 3 | 6 | 4 | 8 | 5 | 4 | 4 | 5 | 11 | 3 | 5 | 5 | 5 | 6 | 3 | 7 | 4 | 8 | 9 | 9 | 8 | 14 | 20 | 9 | 24 | |
| 8 | 7 | 7 | 4 | 7 | 13 | 4 | 10 | 5 | 5 | 5 | 3 | 3 | 3 | 4 | 5 | 4 | 5 | 6 | 4 | 5 | 3 | 9 | 4 | 9 | 24 | |
| 9 | 9 | 4 | 5 | 6 | 6 | 12 | 7 | 7 | 7 | 4 | 5 | 9 | 5 | 4 | 11 | 4 | 9 | 8 | 3 | 7 | 6 | 6 | 6 | 10 | 24 | |
| 10 | 7 | 23 | 13 | 8 | 28 | 16 | 29 | 9 | 6 | 19 | 5 | 9 | 8 | 9 | 7 | 22 | 6 | 3 | 2 | 3 | 3 | 2 | 5 | 9 | 24 | |
| 11 | 10 | 6 | 6 | 6 | 6 | 6 | 3 | 5 | 4 | 3 | 3 | 5 | 7 | 4 | 3 | 4 | 3 | 9 | 13 | 9 | 15 | 16 | 19 | 15 | 24 | |
| 12 | 8 | 15 | 13 | 17 | 11 | 7 | 6 | 3 | 4 | 4 | 10 | 11 | 4 | 4 | 4 | 3 | 2 | 3 | 6 | 4 | 7 | 7 | 10 | 12 | 24 | |
| 13 | 9 | 6 | 4 | 5 | 8 | 5 | 7 | 11 | 10 | 3 | 14 | 4 | 6 | 5 | 4 | 3 | 5 | 4 | 6 | 4 | 9 | 14 | 5 | 8 | 24 | |
| 14 | 17 | 6 | 7 | 8 | 6 | 6 | 10 | 14 | 18 | 9 | 18 | 9 | 6 | 5 | 6 | 3 | 5 | 3 | 4 | 3 | 4 | 5 | 14 | 14 | 24 | |
| 15 | 7 | 6 | 6 | 12 | 9 | 8 | 4 | 8 | 4 | 4 | 7 | 9 | 8 | 5 | 7 | 7 | 6 | 7 | 5 | 7 | 5 | 5 | 6 | 7 | 24 | |
| 16 | 7 | 10 | 30 | 68 | 21 | 19 | 25 | 5 | 6 | 5 | 9 | 7 | 6 | 6 | 7 | 6 | 7 | 5 | 4 | 7 | 7 | 4 | 10 | 5 | 24 | |
| 17 | 6 | 8 | 3 | 6 | 4 | 7 | 8 | 9 | 37 | 23 | 31 | 14 | 12 | 7 | 12 | 9 | 5 | 4 | 8 | 8 | 3 | 3 | 5 | 5 | 24 | |
| 18 | 4 | 5 | 4 | 5 | 3 | 7 | 6 | 7 | 10 | 37 | 11 | 11 | 8 | 9 | 18 | 59 | 17 | 21 | 6 | 19 | 12 | 7 | 7 | 5 | 24 | |
| 19 | 5 | 23 | 14 | 3 | 8 | 9 | 13 | 14 | 8 | 13 | 6 | 4 | 4 | 6 | 10 | 6 | 4 | 3 | 9 | 3 | 7 | 4 | 5 | 24 | | |
| 20 | 4 | 16 | 4 | 6 | 23 | 5 | 10 | 7 | 7 | 13 | 5 | 6 | 12 | 14 | 11 | 14 | 6 | 6 | 5 | 4 | 5 | 3 | 3 | 9 | 24 | |
| 21 | 21 | 12 | 50 | 9 | 14 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 8 | 5 | 5 | 8 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 24 | |
| 22 | 5 | 5 | 5 | 4 | 4 | 5 | 7 | 6 | 8 | 7 | 10 | 7 | 7 | 12 | 9 | 10 | 15 | 6 | 8 | 4 | 8 | 12 | 21 | 10 | 24 | |
| 23 | 12 | 8 | 20 | 11 | 9 | 14 | 6 | 10 | 3 | 2 | 6 | 5 | 9 | 10 | 3 | 3 | 4 | 3 | 9 | 5 | 3 | 5 | 3 | 8 | 24 | |
| 24 | 3 | 3 | 5 | 6 | 7 | 5 | 4 | 6 | 5 | 6 | 6 | 8 | 8 | 12 | 8 | 10 | 3 | 4 | 8 | 10 | 6 | 5 | 10 | 8 | 24 | |
| 25 | 5 | 6 | 4 | 10 | 8 | 5 | 9 | 16 | 14 | 15 | 7 | 25 | 69 | 17 | 29 | 21 | 30 | 27 | 67 | 15 | 14 | 13 | 10 | 8 | 24 | |
| 26 | 6 | 6 | 11 | 6 | 12 | 11 | 15 | 14 | 16 | 13 | 23 | 13 | 26 | 44 | 34 | 11 | 36 | 19 | 74 | 4 | 19 | 9 | 20 | 4 | 24 | |
| 27 | 18 | 20 | 27 | 11 | 26 | 7 | 6 | 19 | 17 | 14 | 9 | 10 | 9 | 7 | 9 | 9 | 18 | 9 | 6 | 9 | 7 | 6 | 12 | 3 | 24 | |
| 28 | 5 | 5 | 12 | 18 | 14 | 17 | 38 | 51 | 16 | 12 | 11 | 15 | 15 | 13 | 15 | 10 | 25 | 24 | 25 | 13 | 14 | 7 | 19 | 22 | 24 | |
| 29 | 28 | 20 | 10 | 12 | 10 | 15 | 8 | 28 | 13 | 10 | 7 | 6 | 11 | 7 | 5 | 3 | 5 | 4 | 4 | 5 | 3 | 4 | 4 | 4 | 24 | |
| 30 | 4 | 4 | 5 | 6 | 3 | 4 | 5 | 4 | 4 | 6 | 7 | 5 | 6 | 7 | 6 | 5 | 5 | 4 | 8 | 7 | 4 | 8 | 19 | 28 | 24 | |
| 31 | 10 | 11 | 7 | 4 | 13 | 10 | 8 | 9 | 11 | 12 | 5 | 6 | 5 | 5 | 4 | 5 | 3 | 2 | 4 | 3 | 4 | 3 | 4 | 9 | 24 | |

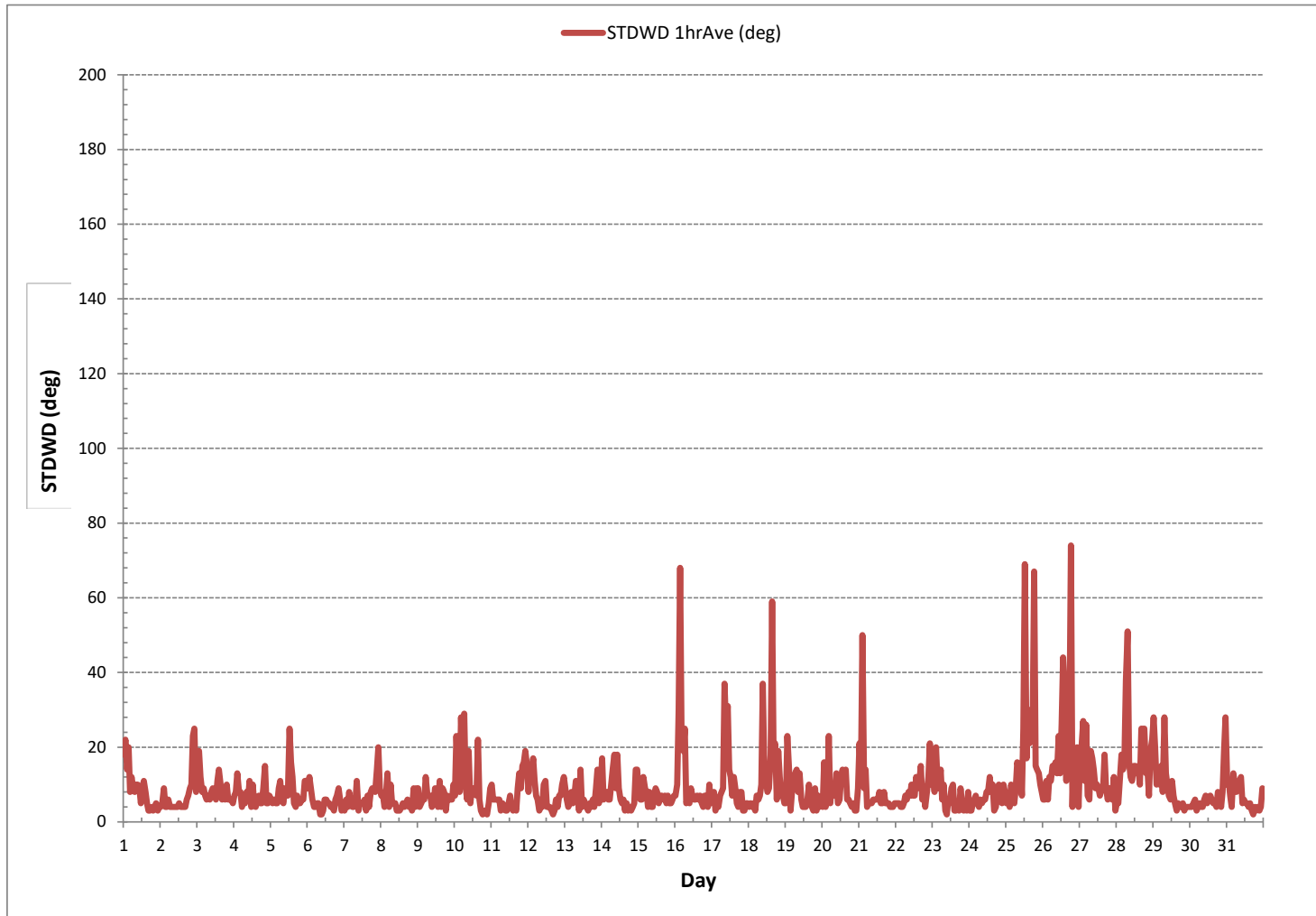
STATUS FLAG CODES

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

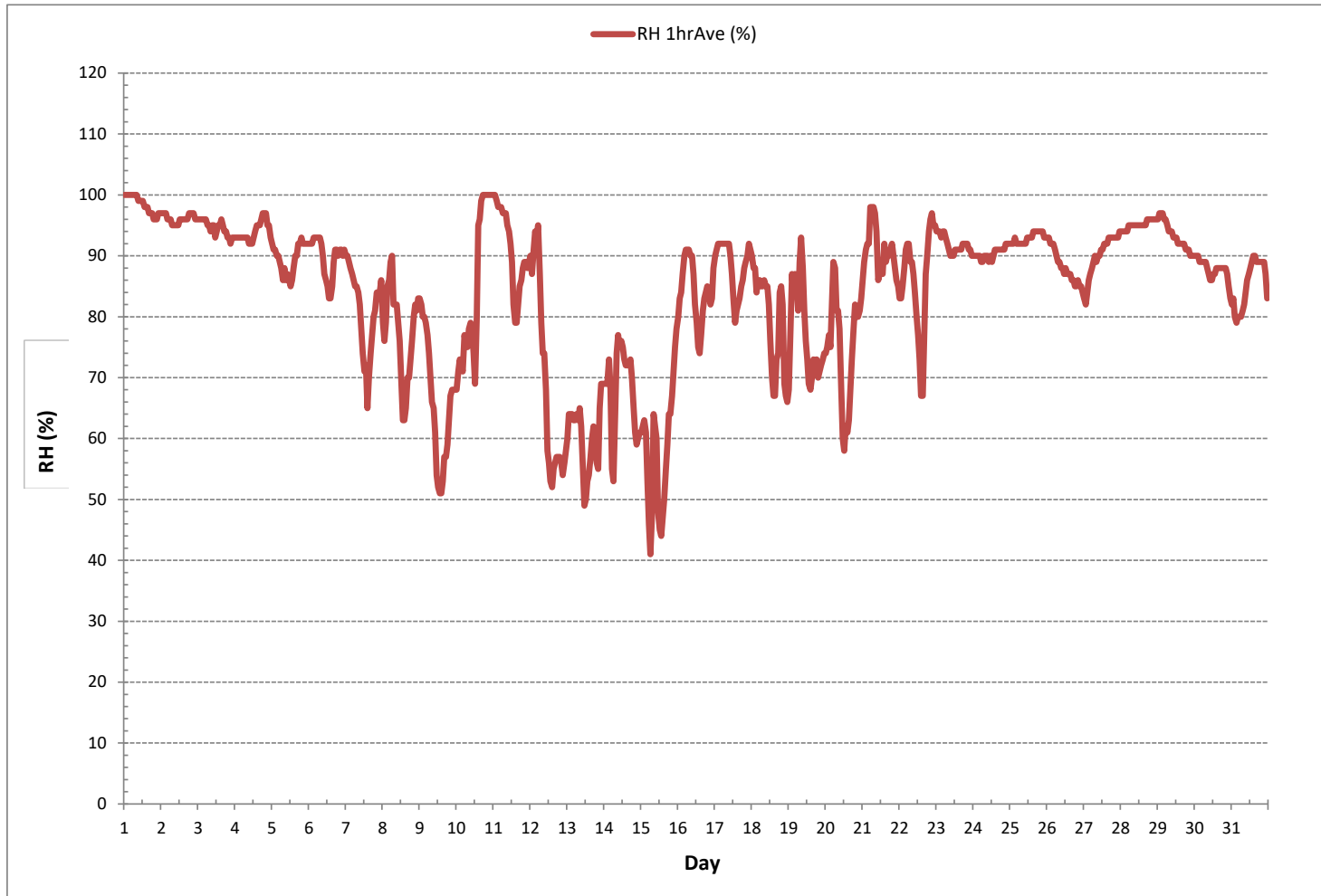
CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



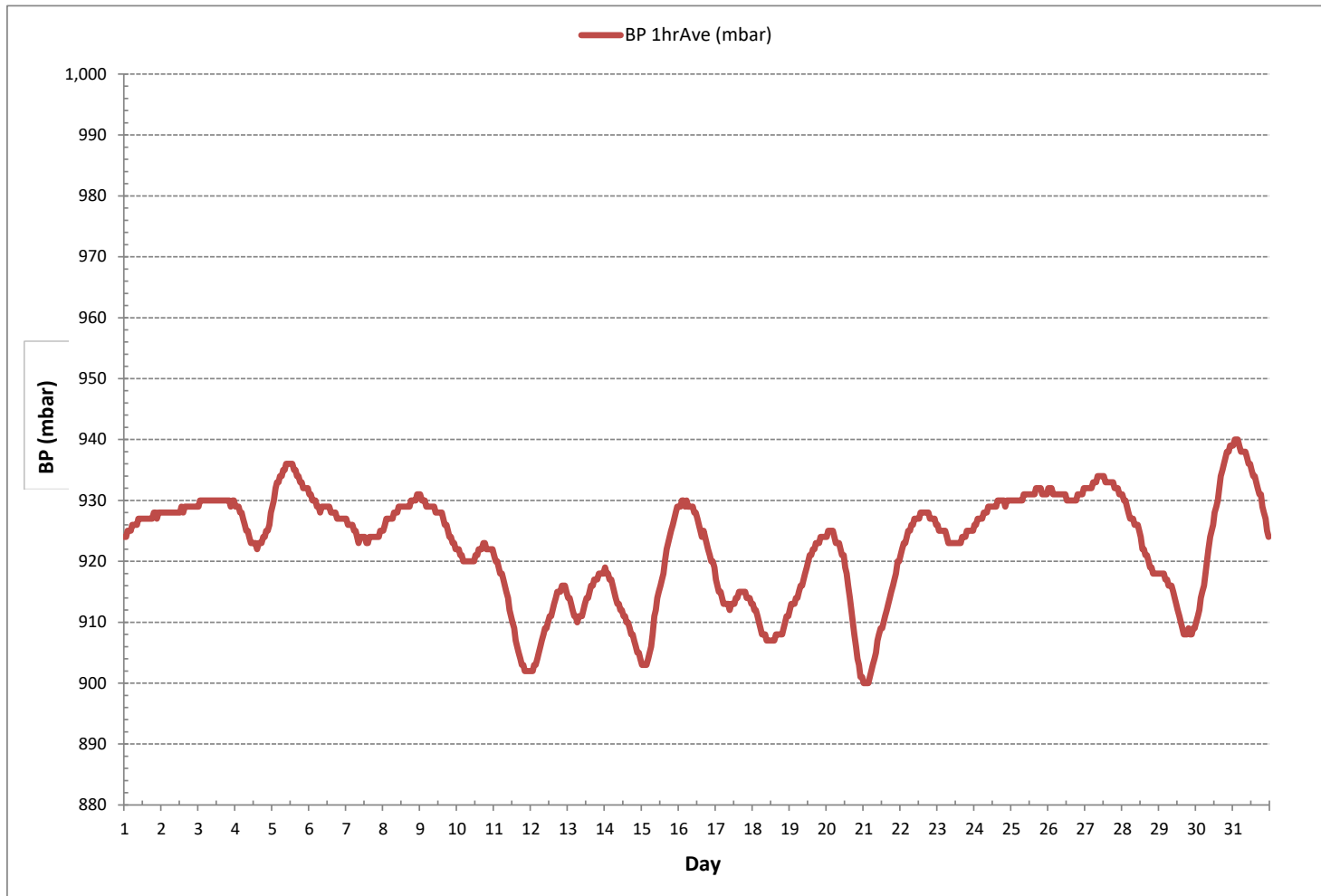
RELATIVE HUMIDITY

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



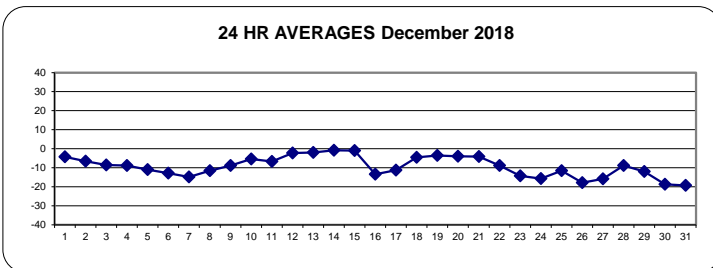
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

| 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 | -2.3 | -2.8 | -2.8 | -2.5 | -2.4 | -2.3 | -2.4 | -2.7 | -2.9 | -3.0 | -3.5 | -3.3 | -3.6 | -3.8 | -4.1 | -4.6 | -5.5 | -6.1 | -6.4 | -6.6 | -6.6 | -6.7 | -6.6 | -6.3 | -6.7 | -2.3 | -4.2 | 24 | |
| 2 | -6.0 | -6.0 | -5.8 | -5.9 | -6.4 | -6.7 | -7.4 | -7.8 | -7.9 | -7.7 | -7.2 | -6.9 | -6.4 | -6.1 | -6.4 | -6.6 | -6.6 | -6.4 | -6.3 | -6.3 | -6.3 | -6.4 | -6.7 | -7.9 | -5.8 | -6.6 | 24 | | |
| 3 | -6.9 | -6.8 | -6.8 | -7.1 | -7.5 | -7.8 | -8.1 | -8.3 | -8.4 | -8.2 | -8.7 | -9.7 | -9.4 | -8.5 | -7.9 | -7.6 | -7.9 | -8.7 | -9.0 | -9.5 | -10.2 | -11.0 | -11.0 | -10.8 | -11.0 | -6.8 | -8.6 | 24 | |
| 4 | -10.6 | -10.3 | -10.2 | -10.2 | -10.6 | -10.6 | -10.6 | -11.0 | -11.0 | -11.2 | -11.4 | -10.4 | -9.4 | -7.9 | -7.1 | -7.5 | -8.0 | -6.7 | -5.5 | -4.9 | -5.1 | -6.4 | -7.1 | -8.2 | -11.4 | -4.9 | -8.8 | 24 | |
| 5 | -9.1 | -9.7 | -10.1 | -10.8 | -11.1 | -11.3 | -11.6 | -11.9 | -12.2 | -12.4 | -12.3 | -11.8 | -11.5 | -11.2 | -11.0 | -10.8 | -10.6 | -10.5 | -10.9 | -11.2 | -11.0 | -10.7 | -10.3 | -10.1 | -12.4 | -9.1 | -11.0 | 24 | |
| 6 | -9.9 | -9.7 | -10.2 | -11.1 | -11.7 | -12.1 | -12.6 | -13.3 | -14.1 | -14.8 | -14.3 | -12.5 | -10.5 | -10.2 | -10.5 | -12.1 | -13.5 | -14.3 | -14.3 | -14.5 | -14.6 | -15.7 | -16.1 | -16.5 | -16.5 | -9.7 | -12.9 | 24 | |
| 7 | -16.4 | -16.8 | -17.1 | -17.1 | -16.6 | -16.2 | -16.3 | -16.2 | -16.3 | -15.6 | -15.1 | -13.7 | -12.1 | -11.7 | -10.6 | -11.5 | -12.9 | -13.9 | -14.5 | -14.8 | -15.7 | -15.6 | -15.7 | -16.0 | -17.1 | -10.6 | -14.9 | 24 | |
| 8 | -13.0 | -12.0 | -12.7 | -14.2 | -14.3 | -14.8 | -14.9 | -12.5 | -13.1 | -12.5 | -11.3 | -10.8 | -9.1 | -6.8 | -6.5 | -7.9 | -9.8 | -10.1 | -11.0 | -11.2 | -11.9 | -12.2 | -11.4 | -12.1 | -14.9 | -6.5 | -11.5 | 24 | |
| 9 | -12.4 | -12.5 | -12.3 | -12.6 | -12.4 | -11.5 | -11.0 | -10.3 | -9.3 | -9.2 | -8.5 | -6.2 | -5.0 | -4.5 | -4.4 | -5.6 | -7.1 | -7.3 | -7.8 | -8.4 | -9.0 | -9.3 | -8.6 | -8.1 | -12.6 | -4.4 | -8.9 | 24 | |
| 10 | -7.4 | -8.5 | -9.6 | -9.0 | -8.0 | -10.0 | -9.4 | -9.2 | -9.5 | -9.4 | -8.6 | -7.0 | -4.7 | -3.1 | -1.8 | -1.6 | -0.3 | -0.2 | -0.6 | -1.1 | -1.7 | -2.5 | -2.9 | -4.7 | -10.0 | -0.2 | -5.4 | 24 | |
| 11 | -6.1 | -6.7 | -7.4 | -8.2 | -7.6 | -7.5 | -7.1 | -6.7 | -6.6 | -6.4 | -6.6 | -5.7 | -5.0 | -5.1 | -5.5 | -6.0 | -6.7 | -6.9 | -7.2 | -7.1 | -7.1 | -6.6 | -6.5 | -8.2 | -5.0 | -6.7 | 24 | | |
| 12 | -6.5 | -5.9 | -4.8 | -1.9 | -1.6 | -2.5 | -2.3 | -2.6 | -2.6 | -3.4 | -2.7 | -0.8 | 0.2 | 1.0 | 1.1 | 0.2 | -0.5 | -0.9 | -1.2 | -2.0 | -2.4 | -2.7 | -3.7 | -4.9 | -6.5 | 1.1 | -2.2 | 24 | |
| 13 | -5.3 | -6.8 | -7.2 | -6.9 | -6.4 | -5.3 | -4.0 | -3.1 | -3.1 | -2.6 | -0.9 | 1.7 | 2.3 | 1.8 | 2.8 | 2.5 | 1.6 | 0.4 | 0.5 | 0.4 | 0.0 | -2.2 | -3.0 | -2.9 | -7.2 | 2.8 | -1.9 | 24 | |
| 14 | -3.3 | -3.8 | -3.8 | -4.5 | -3.3 | -1.1 | -1.1 | -2.9 | -4.8 | -5.1 | -4.1 | -3.2 | -2.1 | -0.4 | 0.8 | 1.0 | 1.1 | 1.7 | 2.4 | 3.4 | 3.8 | 3.9 | 3.6 | 3.2 | -5.1 | 3.9 | -0.8 | 24 | |
| 15 | 3.1 | 2.8 | 2.6 | 2.6 | 3.7 | 4.8 | 6.3 | 5.5 | 2.1 | 1.5 | 1.2 | 1.1 | 0.6 | 0.0 | -0.9 | -1.8 | -2.9 | -3.7 | -5.2 | -7.0 | -8.4 | -9.4 | -10.3 | -11.2 | -11.2 | 6.3 | -1.0 | 24 | |
| 16 | -12.1 | -12.8 | -13.1 | -13.8 | -14.1 | -14.1 | -14.2 | -15.2 | -15.1 | -15.1 | -14.6 | -13.3 | -12.6 | -11.9 | -11.2 | -12.2 | -13.0 | -13.4 | -13.7 | -14.0 | -13.4 | -12.7 | -12.4 | -14.4 | -15.2 | -11.2 | -13.4 | 24 | |
| 17 | -14.6 | -14.9 | -15.4 | -15.6 | -15.4 | -15.0 | -14.5 | -14.2 | -13.5 | -13.4 | -11.8 | -10.3 | -9.1 | -7.8 | -8.2 | -8.3 | -8.5 | -9.3 | -9.7 | -10.1 | -9.4 | -8.1 | -7.3 | -6.2 | -15.6 | -6.2 | -11.3 | 24 | |
| 18 | -5.2 | -4.0 | -4.7 | -4.7 | -6.0 | -6.9 | -6.6 | -6.8 | -6.8 | -6.7 | -6.6 | -6.0 | -4.0 | -2.6 | -1.7 | -1.5 | -2.9 | -3.0 | -5.3 | -5.5 | -5.2 | -2.8 | -2.1 | -0.8 | -6.9 | -0.8 | -4.5 | 24 | |
| 19 | -1.1 | -4.3 | -7.5 | -6.6 | -7.5 | -6.8 | -5.1 | -7.6 | -8.3 | -7.3 | -5.2 | -2.6 | -0.9 | 0.3 | 0.1 | -0.7 | -1.4 | -1.6 | -1.9 | -1.6 | -2.0 | -2.4 | -2.5 | -3.0 | -8.3 | 0.3 | -3.6 | 24 | |
| 20 | -3.7 | -4.0 | -4.5 | -4.5 | -6.2 | -8.3 | -8.2 | -6.7 | -6.9 | -6.7 | -4.1 | -1.8 | -1.5 | -2.0 | -1.4 | -1.8 | -2.8 | -3.4 | -3.8 | -3.8 | -3.0 | -2.0 | -1.7 | -1.7 | -8.3 | -1.4 | -3.9 | 24 | |
| 21 | -2.0 | -3.0 | -3.2 | -3.2 | -2.8 | -2.9 | -3.0 | -3.0 | -2.7 | -2.4 | -2.2 | -2.4 | -2.7 | -3.4 | -4.4 | -4.6 | -4.9 | -6.1 | -6.5 | -6.6 | -6.4 | -6.3 | -6.7 | -7.1 | -7.1 | -2.0 | -4.1 | 24 | |
| 22 | -7.0 | -7.0 | -7.1 | -7.6 | -7.9 | -8.2 | -8.2 | -8.2 | -8.3 | -8.5 | -8.1 | -7.7 | -7.2 | -6.6 | -6.3 | -6.7 | -8.7 | -10.1 | -10.5 | -11.2 | -11.9 | -12.6 | -12.4 | -13.7 | -13.7 | -6.3 | -8.8 | 24 | |
| 23 | -14.4 | -13.4 | -13.1 | -12.0 | -11.8 | -11.9 | -12.7 | -13.9 | -16.5 | -16.7 | -16.0 | -15.5 | -14.3 | -14.1 | -15.2 | -14.9 | -14.7 | -14.2 | -14.0 | -13.9 | -14.1 | -14.6 | -15.5 | -16.2 | -16.7 | -11.8 | -14.3 | 24 | |
| 24 | -16.8 | -17.1 | -17.3 | -17.3 | -16.9 | -17.4 | -17.6 | -17.0 | -16.5 | -16.1 | -15.3 | -15.3 | -14.9 | -14.7 | -14.6 | -14.8 | -15.5 | -15.6 | -15.5 | -15.3 | -14.5 | -14.1 | -14.1 | -13.6 | -17.6 | -13.6 | -15.7 | 24 | |
| 25 | -13.3 | -13.1 | -12.9 | -12.6 | -12.7 | -13.3 | -13.4 | -13.0 | -12.8 | -12.6 | -12.0 | -11.0 | -10.1 | -10.1 | -9.7 | -9.9 | -10.0 | -10.2 | -10.3 | -10.4 | -10.5 | -10.6 | -11.0 | -11.3 | -13.4 | -9.7 | -11.5 | 24 | |
| 26 | -11.5 | -12.0 | -13.0 | -14.2 | -15.2 | -16.5 | -17.2 | -17.9 | -18.6 | -19.2 | -18.3 | -18.1 | -17.5 | -17.0 | -16.9 | -18.7 | -20.5 | -20.9 | -21.4 | -20.9 | -20.8 | -21.0 | -21.1 | -21.9 | -21.9 | -11.5 | -17.9 | 24 | |
| 27 | -22.4 | -22.7 | -22.1 | -20.5 | -20.3 | -19.6 | -17.9 | -17.3 | -17.1 | -16.8 | -15.8 | -15.1 | -14.2 | -13.5 | -13.1 | -12.8 | -12.6 | -12.6 | -12.4 | -12.4 | -12.2 | -12.1 | -11.7 | -11.3 | -22.7 | -11.3 | -15.8 | 24 | |
| 28 | -11.0 | -10.6 | -10.3 | -10.1 | -9.9 | -9.5 | -9.3 | -9.3 | -9.2 | -8.7 | -7.6 | -7.3 | -8.4 | -8.4 | -8.6 | -8.8 | -8.9 | -8.5 | -8.3 | -8.2 | -8.6 | -8.6 | -8.2 | -8.1 | -11.0 | -7.3 | -8.9 | 24 | |
| 29 | -7.9 | -7.8 | -7.7 | -7.8 | -8.3 | -8.9 | -9.5 | -9.9 | -10.8 | -10.8 | -11.3 | -11.5 | -11.9 | -12.8 | -13.3 | -13.6 | -13.8 | -14.2 | -14.8 | -15.4 | -15.9 | -16.3 | -16.6 | -16.8 | -16.8 | -7.7 | -12.0 | 24 | |
| 30 | -17.0 | -17.2 | -17.2 | -17.2 | -17.6 | -18.0 | -18.0 | -18.1 | -19.0 | -19.4 | -19.3 | -19.5 | -19.1 | -18.8 | -18.8 | -18.5 | -18.5 | -18.5 | -18.6 | -18.9 | -19.1 | -20.1 | -20.7 | -21.7 | -21.7 | -17.0 | -18.7 | 24 | |
| 31 | -22.7 | -22.3 | -23.6 | -24.4 | -24.0 | -24.1 | -24.2 | -23.6 | -22.8 | -21.6 | -19.6 | -17.7 | -17.0 | -15.9 | -15.3 | -15.1 | -15.8 | -16.7 | -16.8 | -16.8 | -17.0 | -16.7 | -16.0 | -14.4 | -24.4 | -14.4 | -19.3 | 24 | |
| HOURLY MAX | 3.1 | 2.8 | 2.6 | 2.6 | 3.7 | 4.8 | 6.3 | 5.5 | 2.1 | 1.5 | 1.2 | 1.7 | 2.3 | 1.8 | 2.8 | 2.5 | 1.6 | 1.7 | 2.4 | 3.4 | 3.8 | 3.9 | 3.6 | 3.2 | | | | | |
| HOURLY AVG | -9.5 | -9.7 | -10.0 | -10.0 | -10.1 | -10.2 | -10.1 | -10.2 | -10.5 | -10.4 | -9.7 | -8.9 | -8.1 | -7.6 | -7.4 | -7.8 | -8.4 | -8.8 | -9.0 | -9.2 | -9.4 | -9.5 | -9.6 | -9.8 | | | | | |

STATUS FLAG CODES

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

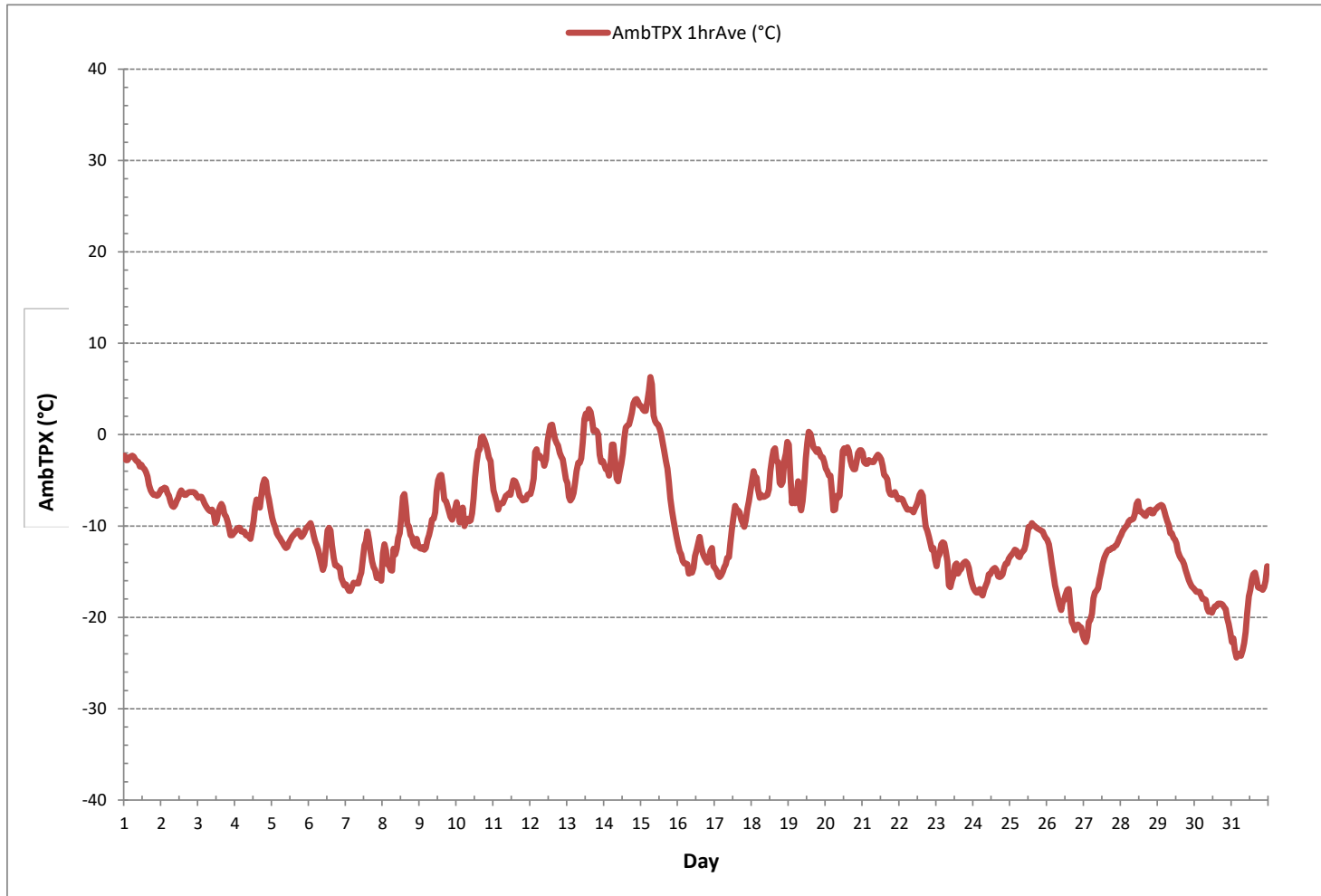
24 HR AVERAGES December 2018



MONTHLY SUMMARY

| | | | | | |
|------------------------|----------|--------|---|------------------|---------|
| MINIMUM 1-HR AVERAGE: | -24.4 °C | @ HOUR | 3 | ON DAY | 31 |
| MAXIMUM 1-HR AVERAGE: | 6.3 °C | @ HOUR | 6 | ON DAY | 15 |
| MAXIMUM 24-HR AVERAGE: | -0.8 °C | | | ON DAY | 14 |
| OPERATIONAL TIME: | | | | | 744 hrs |
| AMD OPERATION UPTIME: | | | | | 100.0 % |
| STANDARD DEVIATION: | 5.8 | | | MONTHLY AVERAGE: | -9.3 °C |

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



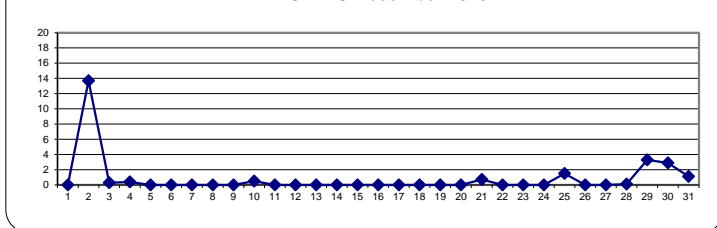
PRECIPITATION Hourly TOTALS (mm)

| 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. | SUM | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 | |
| 2 | 0.0 | 0.4 | 1.9 | 1.7 | 1.3 | 1.2 | 0.9 | 0.7 | 1.0 | 0.6 | 0.9 | 0.8 | 0.5 | 0.3 | 1.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 1.9 | 13.7 | 24 | |
| 3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 24 | |
| 4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 0.4 | 24 | |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 10 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.5 | 24 | |
| 11 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 13 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 14 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 15 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 16 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 17 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 18 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 0.0 | 24 |
| 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 21 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.7 | 24 | |
| 22 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 23 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 0.0 | 24 |
| 25 | 0.0 | 0.1 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.5 | 1.5 | 24 | |
| 26 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 27 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 28 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 24 | |
| 29 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.6 | 0.1 | 1.3 | 0.5 | 0.0 | 1.3 | 3.3 | 24 | | |
| 30 | 0.4 | 1.1 | 0.4 | 0.3 | 0.3 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 2.9 | 24 | |
| 31 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.6 | 1.1 | 24 | | |
| HOURLY MAX | 0.4 | 1.1 | 1.9 | 1.7 | 1.3 | 1.2 | 0.9 | 0.7 | 1.0 | 0.6 | 0.9 | 0.8 | 0.5 | 0.3 | 1.1 | 0.1 | 0.0 | 0.1 | 0.5 | 0.4 | 0.6 | 0.2 | 1.3 | 0.6 | | | | | | |
| HOURLY SUM | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

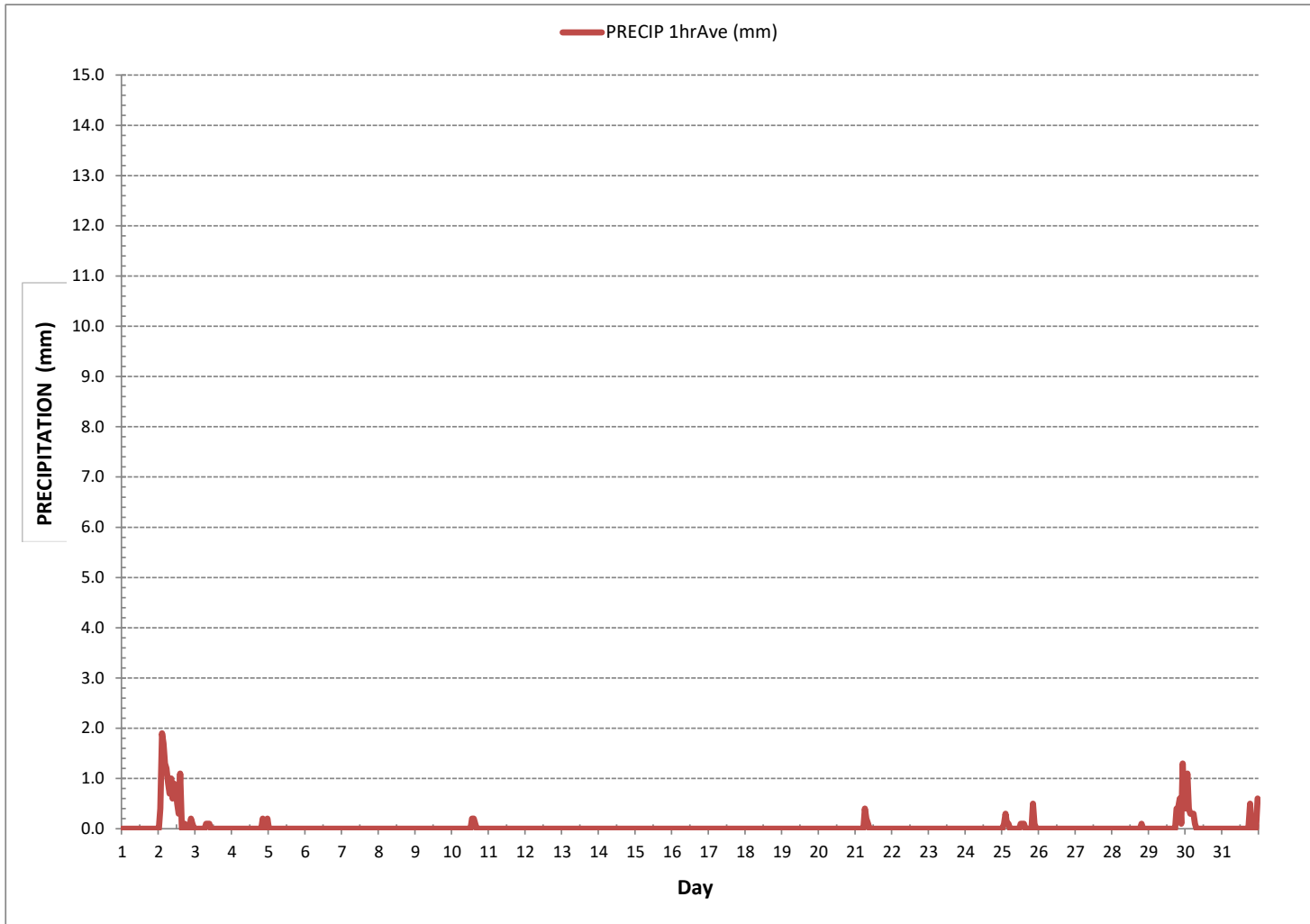
24 HR TOTALS December 2018



MONTHLY SUMMARY

| | | | | | | |
|-----------------------|------|----|----------------|---|--------|---------|
| MINIMUM 1-HR TOTAL: | 0.0 | mm | @ HOUR | 0 | ON DAY | 1 |
| MAXIMUM 1-HR TOTAL: | 1.9 | mm | @ HOUR | 2 | ON DAY | 2 |
| MAXIMUM 24-HR TOTAL: | 13.7 | mm | | | ON DAY | 2 |
| OPERATIONAL TIME: | | | | | | 744 hrs |
| AMD OPERATION UPTIME: | | | | | | 100.0 % |
| STANDARD DEVIATION: | 0.2 | | MONTHLY TOTAL: | | | 24.5 mm |

PRECIPITATION Hourly TOTALS (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

| | | | | | |
|--------------------------|-------------------|--|---------------------------------------|------------|-----------|
| Date: | December 17, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 913 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | St. Lina | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Sulphur Dioxide | Calibration Purpose: | routine monthly | | |
| Start Time 24 hr. (mst): | 12:03 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 17:01 | Cal Gas Expiry Date: | October 24, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | Range ppb: | 1000 | | |
| Serial Number/Owner: | 1180930030 LICA | As Found C.F.: | 1.014 | | |
| Last Calibration Date: | November 16, 2018 | New C.F.: | 1.000 | | |
| Previous C.F.: | 1.000 | | | | |

| | | | |
|---------------------------------|------------------------------------|--|-----|
| Calibration Standards: | | Standard Calibration Points for Ranges | |
| Low Flow Meter ID/Expiry Date: | N/A | Point | ppb |
| High Flow Meter ID/Expiry Date: | N/A | High | 780 |
| Calibrator ID/Expiry Date: | API id# 690 expires March 15, 2019 | Mid | 380 |
| Cal Gas Cylinder I.D. #: | LL 104225 | Low | 190 |
| Cal Gas Conc. (ppm): | 49.2 | | |

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

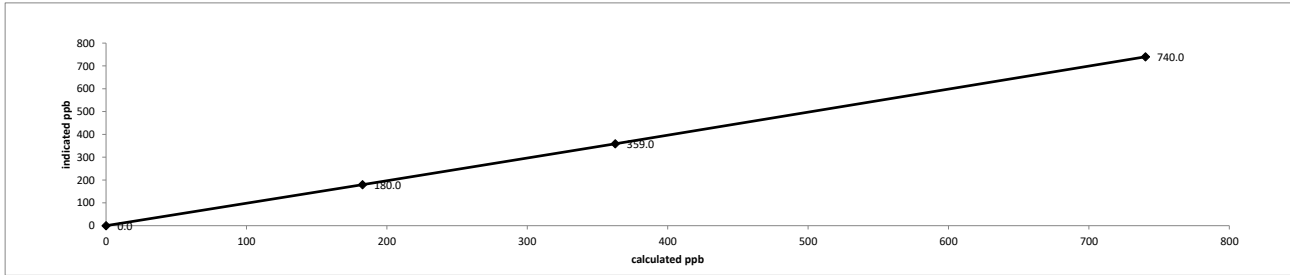
| Point | Diluent | Cal Gas | Total | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|-----------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| as found zero | 5037 | 0.00 | 5037 | 0.0 | 0 | n/a |
| as found high | 4958 | 75.74 | 5034 | 740.2 | 730 | 1.014 |
| adjusted zero | 5037 | 0.00 | 5037 | 0.0 | 0 | n/a |
| adjusted high | 4958 | 75.74 | 5034 | 740.2 | 740 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 362.7 | 359 | 1.010 |
| low | 4933 | 18.38 | 4951 | 182.6 | 180 | 1.015 |
| calibrator zero | 5037 | 0.00 | 5037 | 0.0 | 0 | n/a |

Average C.F. = 1.008

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.000 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.18% | | ± 3% F.S. |
| % change in C.F. from last cal = | -1.40% | | ± 10% |

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

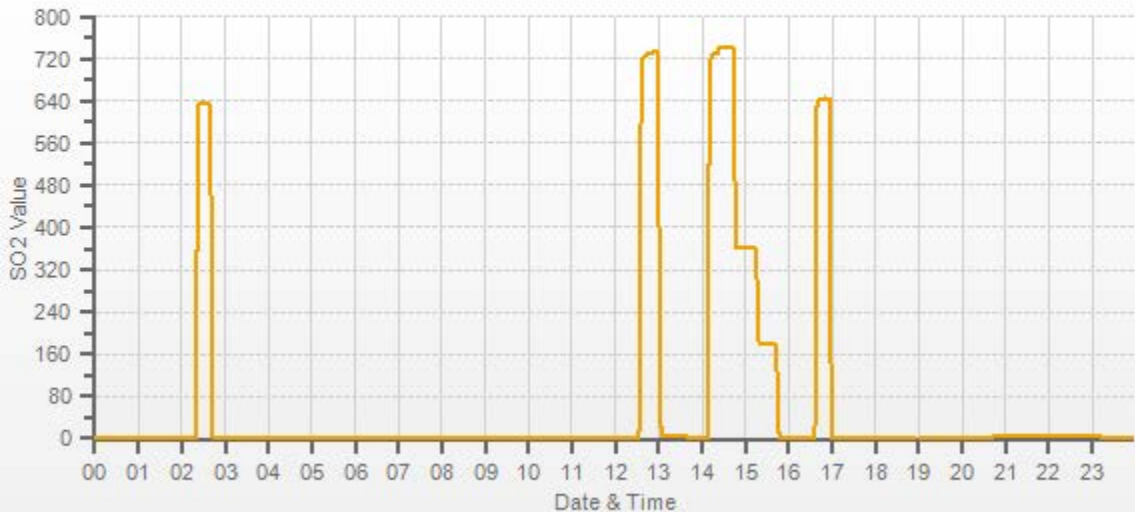


| As found: | | As left: | |
|-------------------|--------|-------------------|--------|
| Bkg: | 3.84 | Bkg: | 3.87 |
| Coef: | 1.042 | Coef: | 1.056 |
| Pmt: | -696.0 | Pmt: | -696.7 |
| Flash: | 1009 | Flash: | 1006 |
| Internal: | 30.2 | Internal: | 32.1 |
| Chamber: | 44.9 | Chamber: | 44.8 |
| Perm Oven Gas: | 45.00 | Perm Oven Gas: | 45.00 |
| Perm Oven Heater: | 44.14 | Perm Oven Heater: | 44.15 |
| Pressure: | 661.2 | Pressure: | 662.4 |
| Sample Flow: | 0.434 | Sample Flow: | 0.432 |
| Lamp Intensity: | 91 | Lamp Intensity: | 90 |
| Converter: | n/a | Converter: | n/a |
| Converter Set: | n/a | Converter Set: | n/a |
| Averaging Time: | 120 | Averaging Time: | 120 |
| Expected Value: | 619.0 | Expected Value: | 644.0 |

Comments:

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

SO2[ppb]



HYDROGEN SULPHIDE



Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | | | |
|--------------------------|--------------------|--|---------------------------------------|------------|-----------|
| Date: | December 17, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 913 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | St. Lina | Weather Conditions: | Cloudy/Overcast | | |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | routine monthly | | |
| Start Time 24 hr. (mst): | 12:03 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 18:40 | Cal Gas Expiry Date: | October 20, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | Range ppb: | 100 | | |
| Serial Number/Owner: | CM 18010058 LICA | As Found C.F.: | 1.016 | | |
| Last Calibration Date: | November 13, 2018 | New C.F.: | 0.999 | | |
| Previous C.F.: | 1.000 | | | | |

| | | | |
|---------------------------------|--|--|----------------------------------|
| Calibration Standards: | | Standard Calibration Points for Ranges | SO2 Scrubber Check (10 minutes): |
| Low Flow Meter ID/Expiry Date: | N/A | Point | Start/End Time 24 hr.: |
| High Flow Meter ID/Expiry Date: | N/A | High | 12:12 / 12:28 |
| Calibrator ID/Expiry Date: | Sabio id# 11900613 expires August 22, 2019 | Mid | SO2 Analyzer Range: |
| Cal Gas Cylinder I.D. #: | EY 0001003 | Low | 1000 |
| Cal Gas Conc. (ppm): | 9.55 | | Target Concentration (ppb): |
| | | | 780 |
| | | | As Found Zero: |
| | | | 1.0 |
| | | | Analyzer Response: (ppb): |
| | | | 1.0 |
| | | | Zero Corrected Result (ppb): |
| | | | 0.0 |

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

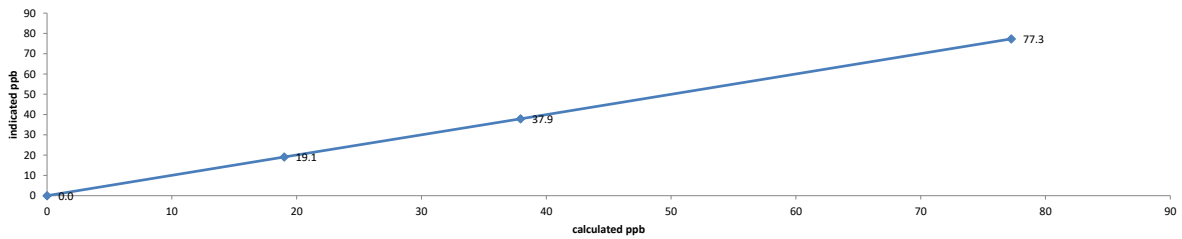
| Point | Diluent | Cal Gas | Total | Calculated Concentration (ppb) | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|-----------------|---------|---------|-------|--------------------------------|--------------------------------|----------------------------|
| as found zero | 7499 | 0.00 | 7499 | 0.0 | 1 | n/a |
| as found high | 7479 | 61.03 | 7540 | 77.3 | 77.1 | 1.016 |
| adjusted zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| adjusted high | 7479 | 61.00 | 7540 | 77.3 | 77.3 | 0.999 |
| mid | 7420 | 29.60 | 7450 | 37.9 | 37.9 | 1.001 |
| low | 7420 | 14.80 | 7435 | 19.0 | 19.1 | 0.995 |
| calibrator zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |

Average C.F. = 0.999

Linear Regression/Calibration Results:

| | | | |
|------------------------------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | LIMITS | > or = 0.995 |
| Slope = | 1.000 | | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.02% | | ± 3% F.S. |
| % change in C.F. from last cal = | -1.58% | | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration

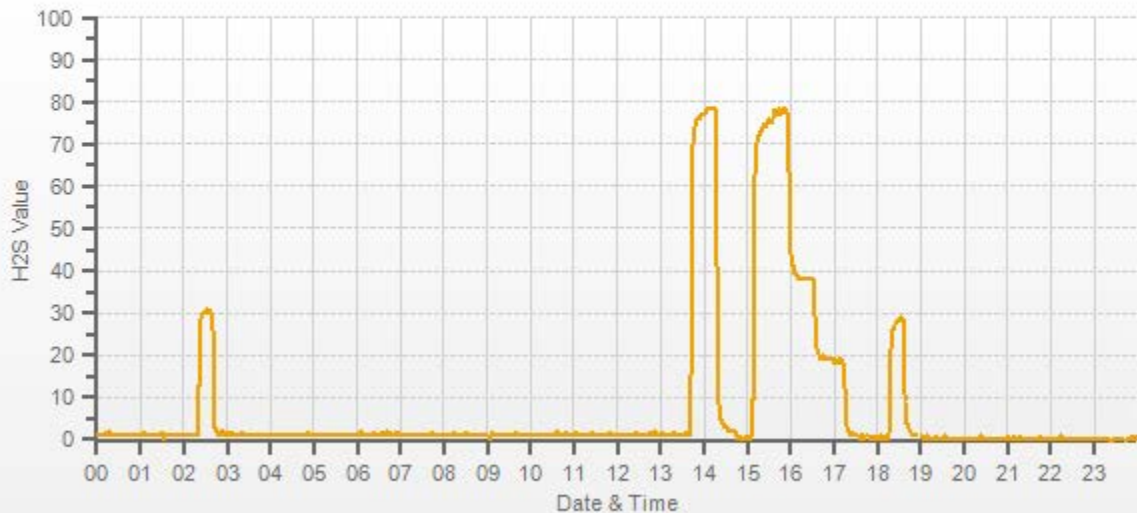


| As found: | As left: |
|-----------------------|-----------------------|
| Bkg: 31.5 | Bkg: 33.5 |
| Coef: 0.884 | Coef: 0.912 |
| Pmt: -634.2 | Pmt: -634.2 |
| Flash: 905 | Flash: 906 |
| Internal: 33.0 | Internal: 34.6 |
| Chamber: 45.0 | Chamber: 45.1 |
| Converter Temp: 326.5 | Converter Temp: 326.2 |
| Converter Set: 325.0 | Converter Set: 325.0 |
| Perm Oven Gas: 45.00 | Perm Oven Gas: 45.00 |
| Perm Oven Htr: 44.10 | Perm Oven Htr: 44.11 |
| Pressure: 574.7 | Pressure: 574.1 |
| Sample Flow: 0.817 | Sample Flow: 0.818 |
| Lamp Intensity: 91 | Lamp Intensity: 89 |
| Averaging Time: 120 | Averaging Time: 120 |
| Expected Value: 30.6 | Expected Value: 30.7 |

Comments:

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

H2S[ppb]



TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: December 18, 2018
 Company/Airshed: LICA
 Location/Station Name: St. Lina
 Parameter: CH4 / NMHC / THC
 Start/End Time 24 hr. (mst): 10:37 / 14:30
 Calibration Method: Gas Dilution

Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 910 | millibars
 Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C
 Weather Conditions: A few clouds
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Alex Yakupov | Rob Fisher
 Cal Gas Expiry Date: October 18, 2025

Analyzer:

| | | | | | |
|------------------------|------------------------------------|-------------------|----------------|-----------|-------|
| Serial Number/Owner: | 1180930025 LICA | Previous C.F.: | As Found C.F.: | New C.F.: | |
| Measured Flow: | 1244 | CH ₄ = | 1.000 | 1.047 | 1.000 |
| Last Calibration Date: | November 16, 2018 | NMHC = | 1.000 | 1.026 | 1.000 |
| Range ppm: | 20 CH ₄ /20 NMHC/40 THC | THC = | 1.000 | 1.036 | 1.000 |

Calibration Standards:

Low Flow Meter ID/Expiry Date: N/A
 High Flow Meter ID/Expiry Date: N/A
 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019
 Cal Gas Cylinder I.D. #: LL 119471
 CH₄ Cylinder Conc.: 599.0 | 207.0 = C₂H₆ Cylinder Conc.
 CH₄ expressed as C₂H₆: 569.3 | 1168.3 = total CH₄ equivalent

| 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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | Correction Factors: | | |
|-----------------|--------------------------------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| | Diluent | Cal Gas | Total Flow | | | | | | | CH ₄ | NMHC | THC |
| as found zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| as found high | 2471 | 55.83 | 2527 | 13.23 | 12.58 | 25.81 | 12.64 | 12.26 | 24.91 | 1.047 | 1.026 | 1.036 |
| adjusted zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| adjusted high | 2471 | 55.83 | 2527 | 13.23 | 12.58 | 25.81 | 13.23 | 12.58 | 25.81 | 1.000 | 1.000 | 1.000 |
| mid | 2469 | 31.00 | 2500 | 7.43 | 7.06 | 14.49 | 7.39 | 7.07 | 14.46 | 1.005 | 0.998 | 1.002 |
| low | 2486 | 14.00 | 2500 | 3.35 | 3.19 | 6.54 | 3.36 | 3.21 | 6.57 | 0.998 | 0.993 | 0.996 |
| calibrator zero | 2500 | 0.00 | 2500 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| Average C.F. = | | | | | | | | | | 1.001 | 0.997 | 0.999 |

Linear Regression/Calibration Results:

| | CH ₄ | NMHC | THC | LIMITS |
|------------------------------------|-----------------|--------|--------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.999 | 1.000 | 0.999 | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.02% | 0.05% | 0.02% | ± 3% F.S. |
| % change in C.F. from last cal = | -4.70% | -2.58% | -3.62% | ± 10% |

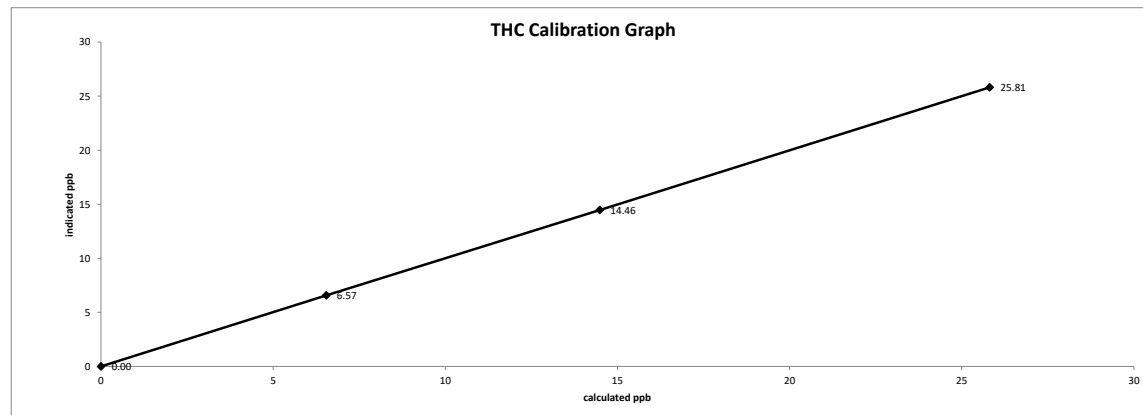
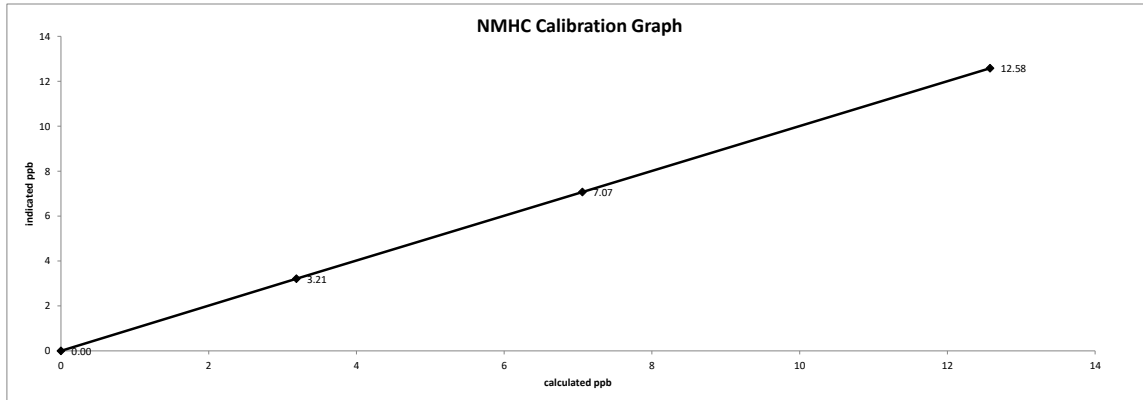
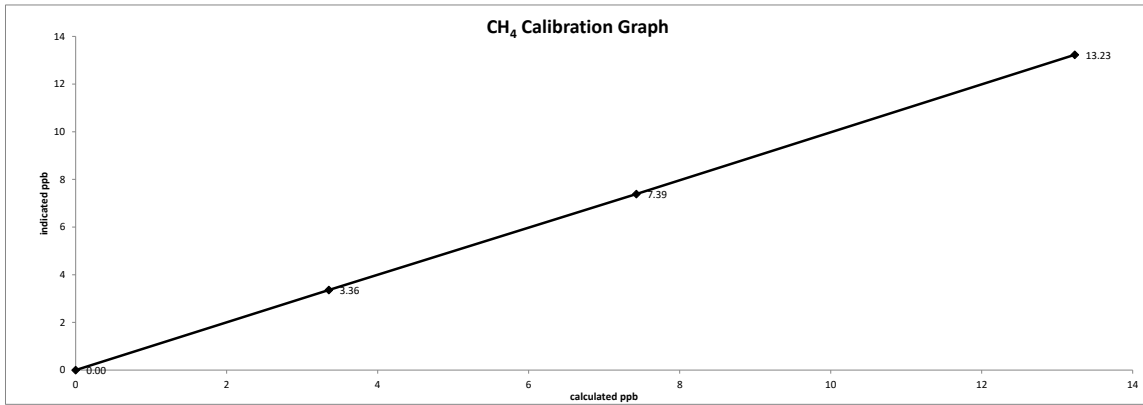
As Left Instrument Diagnostics:

| | | | |
|---------------------------|-------------------------------------|----------------------------|---------------------------------|
| Interface Board Voltages: | Bias Supply: -296.3 | Calibration History cnt'd: | NM Peak Area: 82534 |
| Temperatures: | Detector Oven: 175.1 | Crucial Settings: | Methane Start: n/a |
| | Filter: 175.1 | | Methane End: n/a |
| | Column Oven: 75.0 | | Backflush: n/a |
| | Internal: 28.3 | | NMHV Start: n/a |
| Cylinder Pressures/reg.: | Carrier: 1500 55 | Run History>1: | NMHC End: n/a |
| | Fuel: 800 55 | | Date: Dec 18, 2018 |
| | Span Gas: 1400 10 | | Time: 10:48 |
| | Zero Air Generator: 42 | | CH ₄ PK HT: 0 |
| Internal Pressures: | Carrier: 32.0 | | CH ₄ RT: 12.6 |
| | Fuel: 48.1 | | CH ₄ Baseline: 3460 |
| | Air: 36.2 | | CH ₄ LOD: 43 |
| FID Status: | Status: LIT | | CH ₄ SD: 14 |
| | Counts: 38440 | | CH ₄ CONC: 0.00 |
| | Flame: 405.0 | | NM PK HT: 0 |
| | Det Base: 175.0 | | NM Peak Area: 0 |
| Flame and Power Stats: | Last Power On: Oct 17, 2018 / 10:05 | | NM CONC: 0.00 |
| | Flameouts: 1 | | NM Base Start: 3414 |
| | Det Oven at Start: 114.5 | | NM Base End: 3471 |
| | Col Oven at Start: 60.7 | | NM LOD: 44 |
| Calibration History: | Time: Nov 16, 2018 / 13:54 | Expected Values: | NM Start IDX: 4 |
| | Type: SPAN | | NM End IDX: 90 |
| | Status: GOOD | | NM Max Slope: 2.5e+00 |
| | Check/Adjust: ADJUST | | NM Min Slope: -5.0e-01 |
| | CH ₄ Span Conc: 13.24 | | NM PT Count: 0 |
| | CH ₄ SP Ratio: 0.000686 | | Previous CH ₄ : 9.92 |
| | CH ₄ RT: 13.2 | | Previous NMHC: 11.08 |
| | CH ₄ PK IDX: 26 | | Previous THC: 20.99 |
| | CH ₄ PK HT: 19287 | | New CH ₄ : 9.95 |
| | NM Span Conc: 12.59 | | New NMHC: 11.14 |
| | NM SP Ratio: 0.000153 | | New THC: 21.08 |

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.
 The manifold blower was found to be working normally.

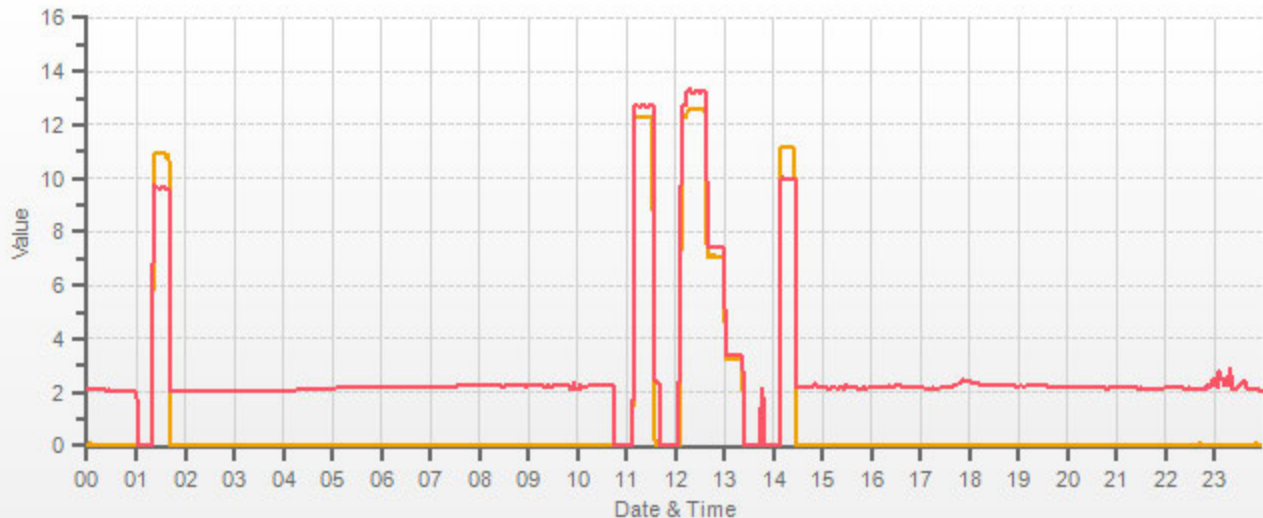
Date: December 18, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:37 / 14:30
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



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

NMHC[ppm] CH4 MAX[ppm]



NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 17, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 913 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: St. Lina | Weather Conditions: Cloudy/Overcast | | |
| Start/End Time 24 hr. (mst): 12:03 / 18:55 | Calibration Purpose: routine monthly | | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930029 LICA Last Calibration Date: November 16, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> <tr> <td>NO =</td> <td>1.000</td> <td>0.997</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.998</td> <td>1.000</td> </tr> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 0.997 | 1.000 | NO ₂ = | 1.000 | 1.000 | 1.000 | NOx = | 1.000 | 0.998 | 1.000 |
|---|--|----------------|----------------|----------------|-----------|------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 0.997 | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.000 | 1.000 | | | | | | | | | | | | | | |
| NOx = | 1.000 | 0.998 | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|--|------------------------------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|-----------------|--------------------------------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5037 | 0.0 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 4958 | 75.7 | 5034 | 774.9 | 776.4 | 777.0 | 778.0 | 0.997 | 0.998 |
| adjusted zero | 5037 | 0.00 | 5037 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4958 | 75.74 | 5034 | 774.9 | 776.4 | 775.0 | 776.0 | 1.000 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 377.0 | 378.0 | 1.007 | 1.006 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 189.0 | 189.0 | 1.012 | 1.014 |
| calibrator zero | 5037 | 0.00 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.006 | 1.007 |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calibrator Setting | Indicated NO | Indicated NOx | Indicated NO ₂ | NO drop | NO ₂ gain | NO ₂ C.F. |
|-------------------------------|--------------------------------|---------|------------|--------------------|--------------|---------------|---------------------------|---------|----------------------|----------------------|
| | Diluent | Cal Gas | Total Flow | volts or ppb | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| NOx reference | 4958 | 75.74 | 5034 | 0.0 | 776.0 | 777.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4958 | 75.74 | 5034 | 505.0 | 272.0 | 777.0 | 505.0 | 504.0 | 504.0 | 1.000 |
| adjusted high NO2 | 4958 | 75.74 | 5034 | 505.0 | 272.0 | 777.0 | 505.0 | 504.0 | 504.0 | 1.000 |
| gpt mid | 4958 | 75.74 | 5034 | 275.0 | 507.0 | 777.0 | 270.0 | 269.0 | 269.0 | 1.000 |
| gpt low | 4958 | 75.74 | 5034 | 100.0 | 678.0 | 777.0 | 99.0 | 98.0 | 98.0 | 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 | 1.000 | 1.001 | 0.95-1.05 |
| b (Intercept as % of full scale)= | -0.14% | -0.14% | 0.06% | ± 3% F.S. |
| % change in C.F. from last cal= | 0.28% | 0.21% | 0.00% | ± 10% |
| NO2 converter efficiency | | | 1.00 | 0.96 to 1.04 |

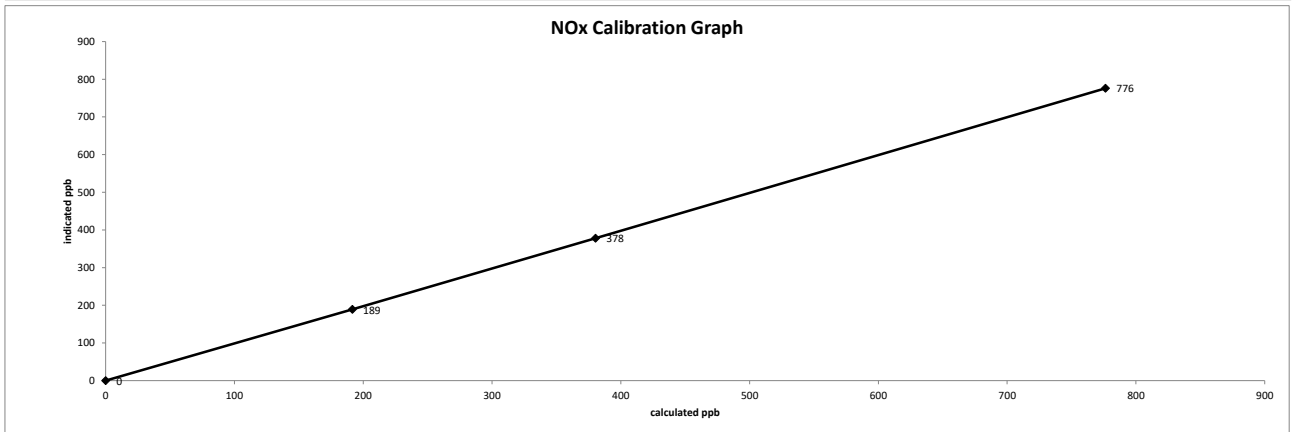
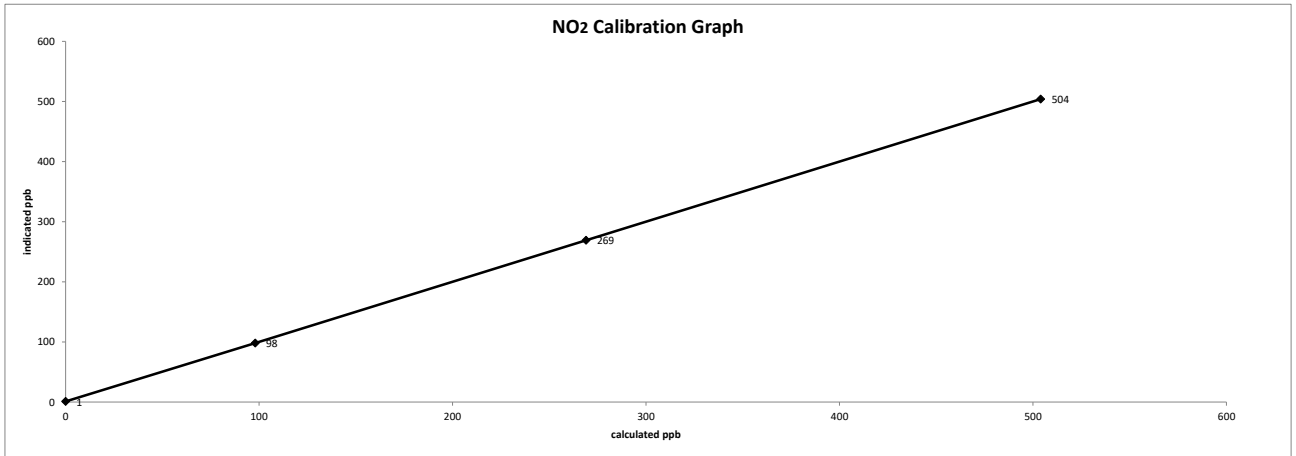
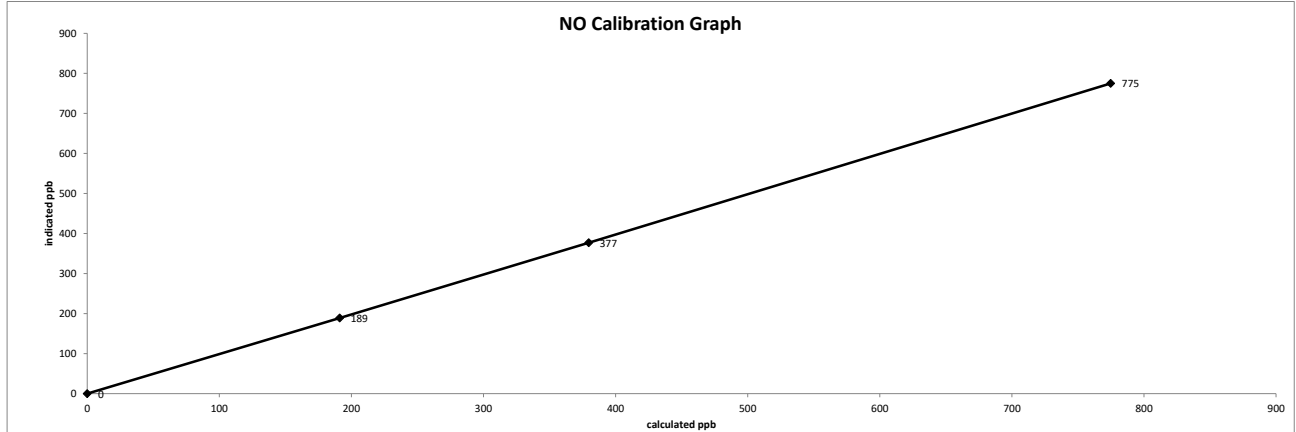
| As found: | | As left: | |
|---------------------|--------|---------------------|--------|
| NO Bkg: | 5.2 | NO Bkg: | 5.2 |
| NOx Bkg: | 5.3 | NOx Bkg: | 5.4 |
| NO Coef: | 1.147 | NO Coef: | 1.147 |
| NO2 Coef: | 0.995 | NO2 Coef: | 0.995 |
| NOx Coef: | 1.001 | NOx Coef: | 0.999 |
| PMT: | -824.0 | PMT: | -824.4 |
| Internal: | 27.5 | Internal: | 29.4 |
| Chamber: | 50.2 | Chamber: | 50.4 |
| Cooler: | -2.9 | Cooler: | -3.1 |
| NO2 Converter: | 322.6 | NO2 Converter: | 322.9 |
| NO2 Converter Set: | 325.0 | NO2 Converter Set: | 325.0 |
| Perm Oven Gas: | 44.99 | Perm Oven Gas: | 44.99 |
| Perm Oven Heater: | 44.14 | Perm Oven Heater: | 44.16 |
| Pressure: | 251.3 | Pressure: | 252.5 |
| Flow: | 0.525 | Flow: | 0.528 |
| Ozonator Flow: | OK | Ozonator Flow: | OK |
| Expected Value NO: | 4 | Expected Value NO: | 3 |
| Expected Value NO2: | 455 | Expected Value NO2: | 386 |
| Expected Value NOx: | 459 | Expected Value NOx: | 389 |

Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 The converter cooling fan filter was cleaned.
 No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.
 The analyzer perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized.
 The analyzer cooling fan filter(s) were cleaned.

Date: December 17, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

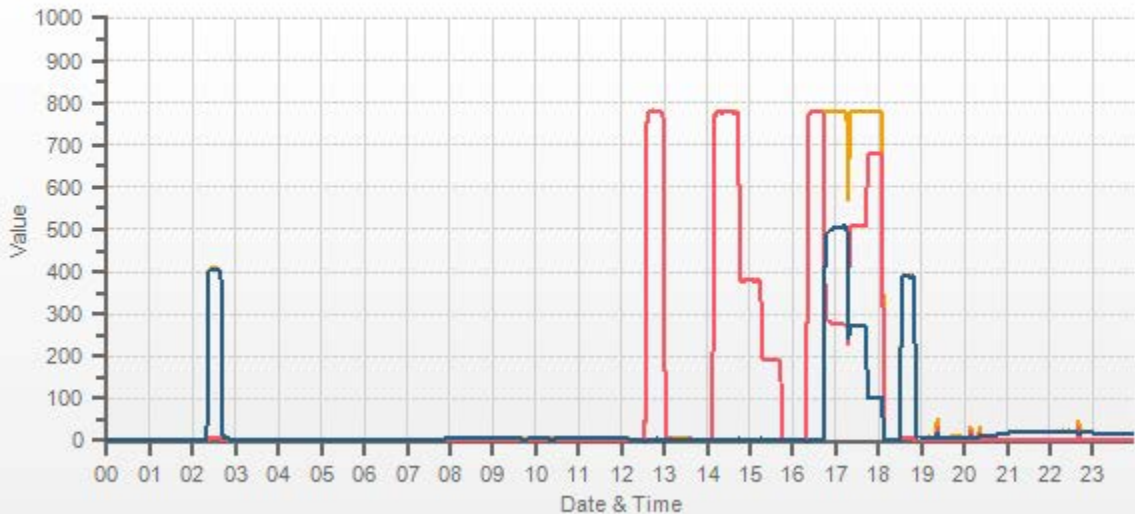
Start/End Time 24 hr. (mst): 12:03 / 18:55
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/12/17 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]



OZONE



Thermo 49i Ozone Analyzer Calibration

| | |
|--|--|
| Date: December 18, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 10:37 / 16:55 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power Analyzer: Serial Number/Owner: 1002240371 LICA Last Calibration Date: November 13, 2018 Previous Cal High Point C.F.: 1.000 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 910 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Cheri Sinclair Cal Gas Expiry Date: n/a-done by Varying UV Lamp Power Ozone Range ppb: 500 As Found C.F.: 1.000 New C.F.: 1.000 |
|--|--|

| | |
|---------------------------------|--|
| Calibration Standards: | |
| Low Flow Meter ID/Expiry Date: | N/A |
| High Flow Meter ID/Expiry Date: | N/A |
| Calibrator ID/Expiry Date: | Sabio id# 11900613 expires August 22, 2019 |
| Cal Gas Cylinder I.D. #: | N/A |

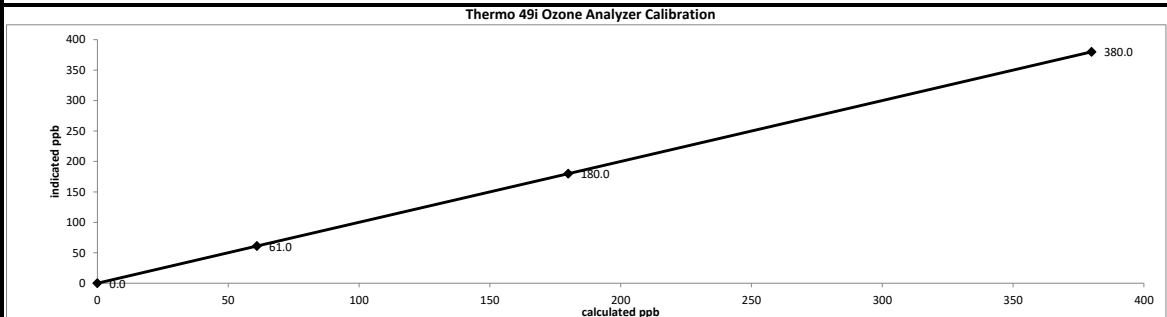
| Point | AMD Required Range of Ozone Calibration Points |
|-------|--|
| High | 300-400 ppb |
| Mid | 150-200 ppb |
| Low | 50-75 ppb |

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 | 380.0 | 1.000 |
| adjusted zero | 5000 | 5000 | 0.0 | 0.0 | 0.0 | n/a |
| adjusted high | 5000 | 5000 | 380.0 | 380.0 | 380.0 | 1.000 |
| mid | 5000 | 5000 | 180.0 | 180.0 | 180.0 | 1.000 |
| low | 5000 | 5000 | 61.0 | 61.0 | 61.0 | 1.000 |
| calibrator zero | 5000 | 5000 | 0.0 | n/a | 0.0 | n/a |
| | | | | | Average C.F. = | 1.000 |

Linear Regression/Calibration Results:

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

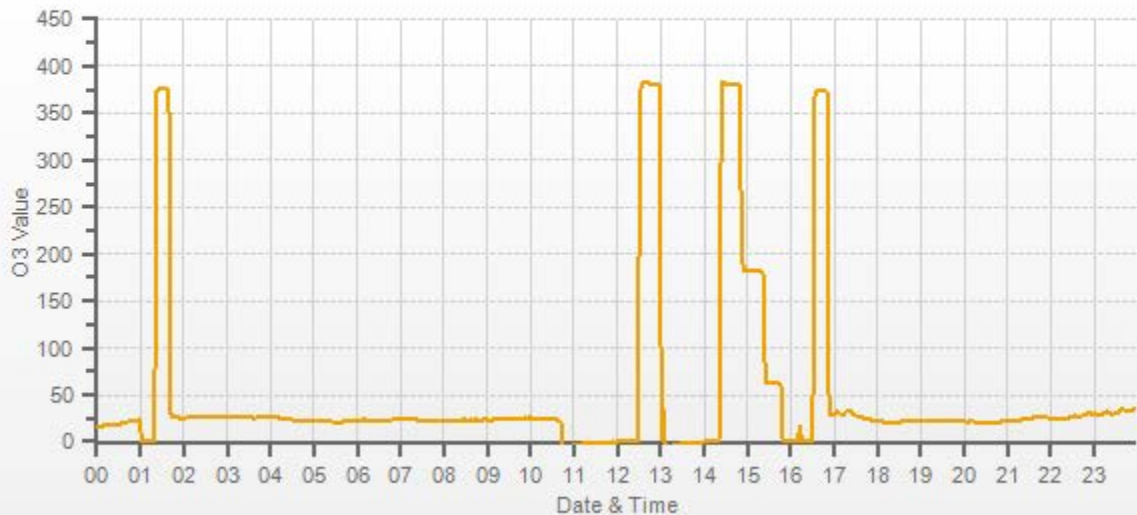


Comments:

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

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

O3[ppb]



PARTICULATE MATTER



Thermo 5030i SHARP Monitor Monthly Check

Date: December 18, 2018
Company: LICA
Station Name/Location: St. Lina
Previous Audit Date: November 23, 2018
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Robert Fisher
Start Time (mst): 14:24
End Time (mst): 15:19
Calibration Purpose: routine monthly
Weather Conditions: A few clouds

SHARP 5030i Information and Status:

Serial Number: CM117461021 **Filter Tape Counter:** 209

Reference Standards:

Air Flow

| | Manometer | Orifice | Pressure: | Temp / RH: |
|-------------------------------------|-----------------|----------------|------------------|----------------|
| Make: | Dwyer 475 | Airmetrics | F. Scientific | F. Scientific |
| Model: | Mark III | Chinook High | FB 61291 | 11-661-7A |
| Serial Number: | Maxxam ID# 3 | Maxxam ID# 2 | 05544 | 170286131 |
| Calibration Expiration Date: | January 9, 2019 | April 24, 2019 | January 15, 2019 | April 19, 2019 |

| Ambient Temperature (°C) | | | | Range | Action |
|--------------------------|------------------|--------------|-------------------|---------|-------------|
| | Reference | SHARP | Difference | < ± 2°C | OK |
| #1 | -2.59 | -2.0 | -0.6 | 2-3 °C | Recalibrate |
| | | | | > 3°C | Fail |

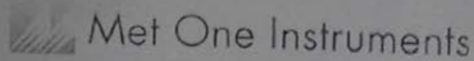
| Ambient Relative Humidity (%RH) | | | | Range | Action |
|---------------------------------|------------------|--------------|-------------------|-----------|-------------|
| As Found: | | | | < ± 2 %RH | OK |
| | Reference | SHARP | Difference | 2-5 %RH | Recalibrate |
| #1 | 65.10 | 64.8 | 0.3 | > 5 %RH | Fail |

| Barometric Pressure (mmHg) | | | | Range | Action |
|----------------------------|------------------|--------------|-------------------|-------------|-------------|
| As Found: | | | | < ± 10 mmHg | OK |
| | Reference | SHARP | Difference | 10-12 mmHg | Recalibrate |
| #1 | 682.0 | 681.4 | 0.6 | > 12 mmHg | Fail |

| Flow Audit (L/min) | | | | | | Range | Action |
|--------------------|------------------|--------------|--|---------------------|--|--------|-------------|
| As Found: | | | | | | < ± 4% | OK |
| | Reference | SHARP | | % Difference | | 4-5% | Recalibrate |
| #1 | 16.71 | 16.69 | | -0.019996001 | | >5% | Fail |
| #2 | 16.64 | 16.65 | | | | | |
| #3 | 16.66 | 16.66 | | | | | |
| Average | 16.67 | 16.67 | | | | | |

| Leak Check (L/min) | | | | | | |
|----------------------------|------------------|--------------|-------------------|-------------------------|--------------|-------------------------------|
| Without Leak Check Adapter | | | | With leak Check Adapter | | |
| | Reference | SHARP | Difference | Reference | SHARP | Difference |
| #1 | 16.66 | 16.66 | 0.00 | 16.61 | 16.63 | -0.02 |
| | | | | | | <i>Leak Limit: 0.80 L/min</i> |
| | | | | | | LEAK RATE: -0.02 |

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

| Description | Manufacturer | Model No. | Serial No. | Cal Date | Cal Due | Voltage Accuracy | Time Base Accuracy |
|------------------|---------------------|-----------|------------|-----------|-----------|------------------------------|--------------------|
| Data Acquisition | Campbell Scientific | CR1000 | 6569 | 4/06/2015 | 4/06/2018 | +/- 3mV | < 6 ppm |
| NIST Cupset | Met One Instruments | 170-41 | 3309 | 1/26/2017 | 1/26/2022 | Accuracy < 0.15 mph or 1% WS | |

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company: Maxxam Operator: Chris W

| | | | | | | | |
|------------------------|-------------------|-----------|-------------|---------------------------------|--------------------------|--|--|
| Calibrator: | | | | Flow Measurement Device: | | | |
| Make/Model | <u>API 700</u> | | | Make/Model | <u>Mesa Defender 530</u> | | |
| Serial Number | <u>690</u> | | | Serial Number | <u>L-153351 H-152571</u> | | |
| Last Verification Date | <u>March 2016</u> | | | Temperature (°C) | <u>23.5 C</u> | | |
| NO Cylinder S/N | <u>LL108015</u> | | | Barometric Pressure | <u>695 mmHg</u> | | |
| NO [PPM] | <u>52.2</u> | NOx [PPM] | <u>52.3</u> | | | | |
| Expiry Date | <u>Oct 2020</u> | | | | | | |

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

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|-------------------------------------|------|-----------------------|-------|----------------------|-----------------|-------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Limit ± 10% | |
| 4959 | 75.0 | 0.789 | 0.791 | 0.793 | 0.000 | 0.793 | 1% | 0% |
| 4971 | 36.5 | 0.383 | 0.384 | 0.384 | 0.000 | 0.384 | 0% | 0% |
| 4967 | 18.2 | 0.191 | 0.192 | 0.191 | 0.000 | 0.191 | 0% | -1% |
| 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)= | 1.0054 | 0.90-1.10 | | m (Slope)= | 1.0031 |
| b (Intercept % of FS)= | -0.0583 | ± 3% F.S. | | b (Intercept % of FS)= | -0.0795 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|-------|-----------------|-------|----------------------|---------------|
| 4959 | 0.000 | 0.000 | 0.790 | -0.001 | 0.789 | NO ₂ | % Diff. Limit |
| 4959 | 0.500 | 0.497 | 0.293 | 0.493 | 0.786 | -1% | ± 10% |
| 4959 | 0.275 | 0.273 | 0.517 | 0.269 | 0.787 | -1% | ± 10% |
| 4959 | 0.100 | 0.102 | 0.688 | 0.099 | 0.787 | -2% | ± 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)= | 0.9946 | 0.90-1.10 |
| b (Intercept % of FS)= | -0.1817 | ± 3% F.S. |

| | | | |
|-------------------------|--------------------|--------------------------------|-----------------------|
| AENV Standards | | NO_x Analyzer | |
| Audit Calibrator | | Make/Model | <u>Teco 42i</u> |
| Make/Model | <u>Teco 146i</u> | Serial/AMU Number | <u>AMU 1868</u> |
| Serial/AMU Number | <u>AMU 1809</u> | Last Calibration Date | <u>March 14, 2018</u> |
| SRM Gas Cylinder No. | <u>APEX1170572</u> | Full Scale (ppm) | <u>1.0</u> |
| Cylinder Conc. (ppm) | <u>49.99</u> | Cylinder Gas Expiry Date | <u>November 2020</u> |

COMMENTS: Cylinder contains 47.9 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 15, 2018
Location: McIntyre Center Edmonton

Company: Maxxam

Operator: Mike

| Calibrator: | | Flow Measurement Device: | |
|------------------------|-----------------------|--------------------------|----------------|
| Make/Model | <u>Sabio 2010D</u> | Make/Model | <u>NA</u> |
| Serial Number | <u>11900613</u> | Serial Number | <u>NA</u> |
| Oven Temperature | <u>49.7</u> | Temperature (°C) | <u>22.9</u> |
| Last Verification Date | <u>March 16, 2017</u> | Barometric Pressure | <u>698mmHg</u> |

Flow Measurements

Pt. No. 1 NA Pt. No. 2 NA Pt. No. 3 NA

| Calibrator Flow (sccm) | Calculated Concentration (ppm) | Indicated Concentration (ppm) | % Difference | |
|-------------------------------------|-----------------------------------|----------------------------------|--------------|---------------|
| | | | vs Audit Gas | % Diff. Limit |
| Zero Air | 0.000 | 0.001 | | |
| 5000 | 0.400 | 0.383 | -4% | ± 10% |
| 5000 | 0.200 | 0.192 | -4% | ± 10% |
| 5000 | 0.100 | 0.097 | -4% | ± 10% |
| Absolute Average Percent Difference | | | 4% | ± 10% |

LINEAR REGRESSION ANALYSIS

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

| <u>O₃</u> | | <u>LIMITS</u> |
|------------------------|--------|---------------|
| Correlation= | 1.0000 | ≥ 0.995 |
| m (Slope)= | 0.9554 | 0.90-1.10 |
| b (Intercept % of FS)= | 0.2160 | ± 3% F.S. |

AENV Standards

Ozone Analyzer

Audit Calibrator

Make/Model Thermo 49iPS
Serial/AMU Number 1808
Ozone Standard Thermo 49iPS

Make/Model Thermo 49i
Serial/AMU Number 1843
Last Calibration Date August 16, 2018
Full Scale (ppm) 0.5

COMMENTS:

Auditor: Shea Beaton

Date: August 22, 2018

Operator Signature:

Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5051 | 39.6 | 0.0753 | 0.00784 | 127.551 | 9.60 |
| 5028 | 20.2 | 0.0387 | 0.00402 | 248.911 | 9.63 |
| 5033 | 10.5 | 0.0198 | 0.00209 | 479.333 | 9.49 |
| Average Cylinder Concentration: | | | | | 9.58 |

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------|--------------|--------------------------|----------------------------|
| Make/Model | <u>Teco 146i</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1809</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.4 C</u> |
| Gas Type | <u>NO</u> | Conc. | <u>50.03</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>APEX 1223938</u> | | | | |
| Expiry Date | <u>June 2020</u> | | | | |

Reference Analyzer:

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

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4989 | 79.5 | 0.813 | 0.812 | 0.016 | 62.755 | 51.0 | 51.0 |
| 4995 | 39.6 | 0.407 | 0.406 | 0.008 | 126.136 | 51.3 | 51.2 |
| 4992 | 19.6 | 0.202 | 0.201 | 0.004 | 254.694 | 51.4 | 51.2 |
| Average Cylinder Concentration: | | | | | | 51.3 | 51.1 |

| | |
|--|-------------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>51.5</u> | <u>51.6</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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

***APPENDIX III
MAXIMUM INSTANTANEOUS DATA***



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

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

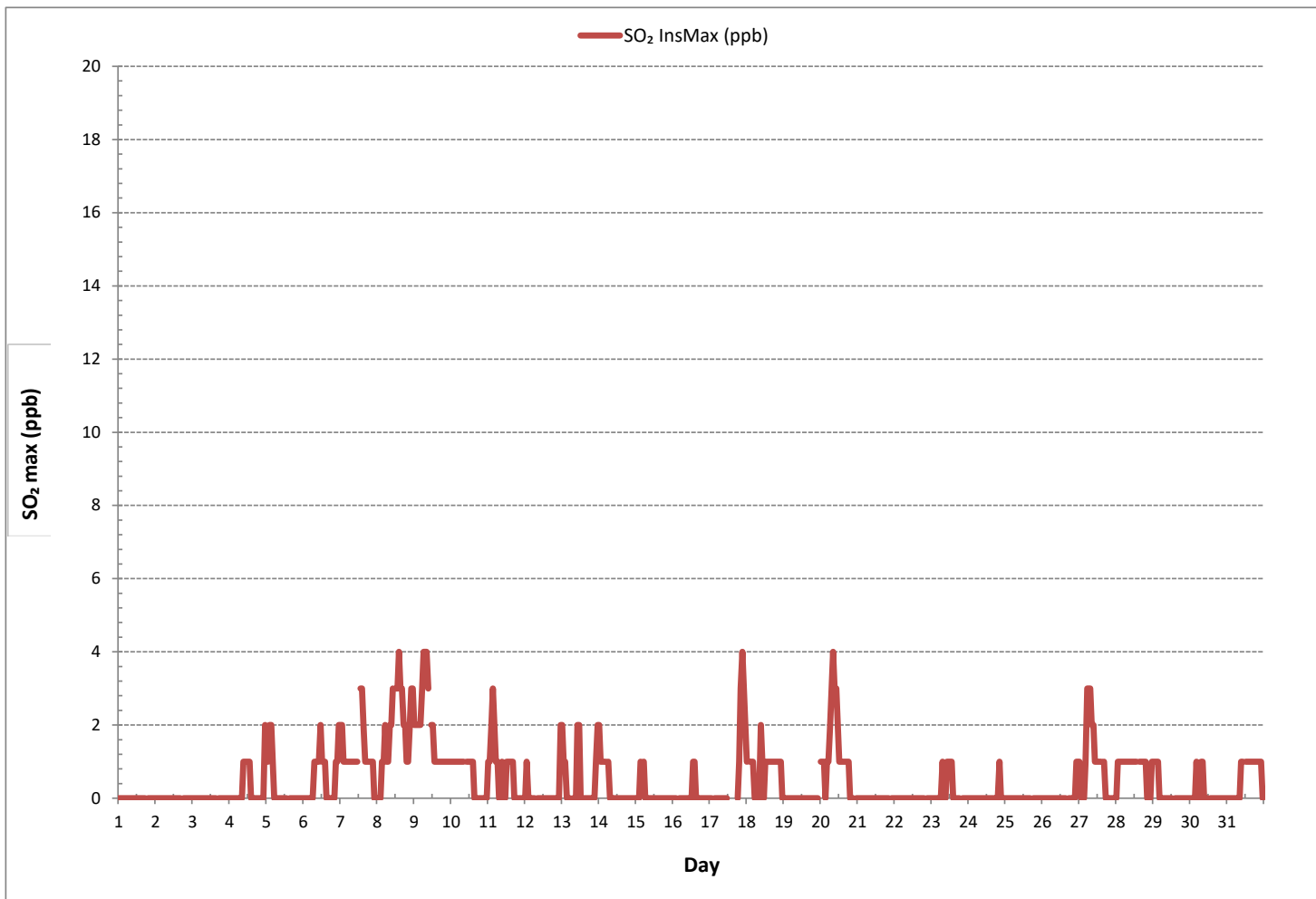
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|--------------------------|
| NUMBER OF NON-ZERO READINGS: | 231 |
| MAXIMUM INSTANTANEOUS VALUE: | 4 ppb @ HOUR 14 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 1 |

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

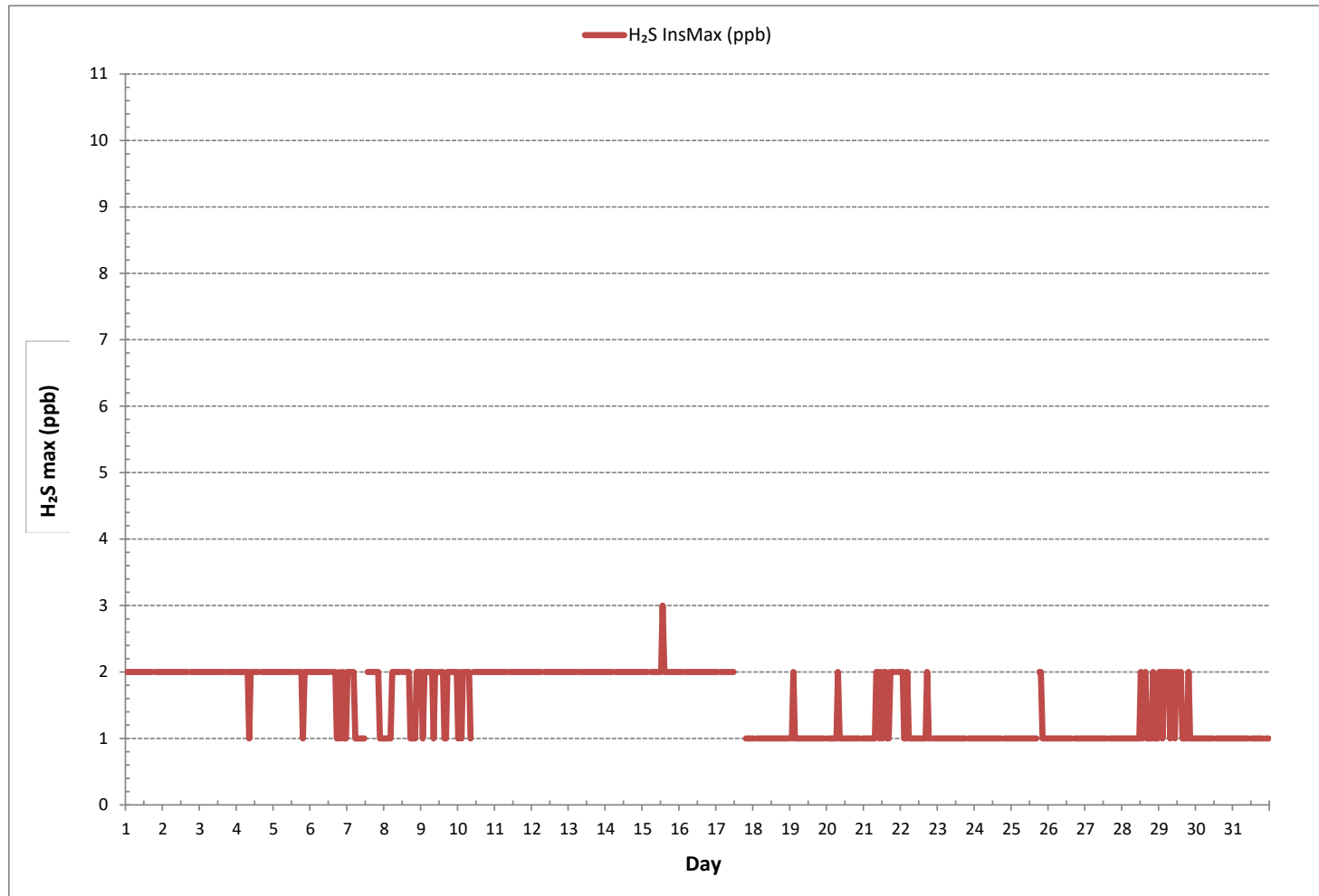
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 704 |
| MAXIMUM INSTANTANEOUS VALUE: | 3 ppb @ HOUR 13 ON DAY 15 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 1 |

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY 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 | 2.28 | 2.30 | 2.14 | 2.48 | 2.56 | 2.68 | 2.60 | 2.35 | 2.60 | 2.46 | 2.37 | 2.34 | 2.32 | 2.28 | 2.31 | 2.21 | 2.17 | 2.15 | S | 2.28 | 2.16 | 2.09 | 2.11 | 2.16 | 2.09 | 2.68 | 2.32 | 24 | |
| 2 | 2.11 | 2.20 | 2.22 | 2.20 | 2.14 | 2.64 | 2.18 | 2.20 | 2.07 | 2.23 | 2.19 | 2.21 | 2.31 | 2.31 | 2.63 | 2.30 | 2.08 | S | 2.07 | 2.09 | 2.23 | 2.06 | 2.96 | 2.58 | 2.06 | 2.96 | 2.27 | 24 | |
| 3 | 2.42 | 2.30 | 2.31 | 2.18 | 2.11 | 2.06 | 2.19 | 2.11 | 2.18 | 2.15 | 2.09 | 2.03 | 2.02 | 2.05 | 1.98 | 2.04 | S | 2.08 | 2.07 | 2.02 | 2.01 | 2.19 | 2.03 | 2.04 | 1.98 | 2.42 | 2.11 | 24 | |
| 4 | 2.15 | 2.15 | 2.04 | 1.94 | 1.96 | 1.95 | 1.94 | 1.93 | 1.94 | 1.94 | 1.96 | 2.03 | 1.98 | 1.98 | 1.98 | S | 1.99 | 1.97 | 1.93 | 1.94 | 1.95 | 1.93 | 1.96 | 1.96 | 1.93 | 2.15 | 1.98 | 24 | |
| 5 | 1.98 | 1.98 | 1.98 | 1.96 | 1.95 | 1.97 | 2.01 | 2.12 | 2.08 | 2.12 | 2.16 | 2.12 | 2.95 | 1.98 | S | 1.96 | 1.96 | 1.96 | 1.95 | 1.98 | 1.98 | 1.98 | 1.95 | 1.96 | 1.95 | 2.95 | 2.04 | 24 | |
| 6 | 1.94 | 1.97 | 1.96 | 1.99 | 1.98 | 1.98 | 1.99 | 2.00 | 2.07 | 2.04 | 2.07 | 2.09 | 2.10 | S | 2.09 | 2.08 | 2.06 | 2.07 | 2.07 | 2.06 | 2.07 | 2.09 | 2.10 | 2.11 | 1.94 | 2.11 | 2.04 | 24 | |
| 7 | 2.13 | 2.14 | 2.12 | 2.11 | 2.11 | 2.15 | 2.14 | 2.12 | 2.11 | 2.13 | 2.15 | 2.15 | S | 2.17 | 2.16 | 2.17 | 2.17 | 2.19 | 2.19 | 2.17 | 2.19 | 2.20 | 2.23 | 2.25 | 2.26 | 2.11 | 2.26 | 2.16 | 24 |
| 8 | 2.26 | 2.20 | 2.39 | 2.23 | 2.28 | 2.41 | 2.58 | 2.43 | 2.50 | 2.54 | 2.43 | S | 2.23 | 2.30 | 2.20 | 2.19 | 2.19 | 2.18 | 2.18 | 2.21 | 2.22 | 2.22 | 2.37 | 2.30 | 2.18 | 2.58 | 2.31 | 24 | |
| 9 | 2.35 | 2.24 | 2.28 | 2.31 | 2.30 | 2.28 | 2.23 | 2.24 | 2.23 | 2.19 | S | 2.17 | 2.12 | 2.13 | 2.15 | 2.16 | 2.21 | 2.44 | 2.42 | 2.44 | 2.51 | 2.53 | 2.50 | 2.51 | 2.12 | 2.53 | 2.30 | 24 | |
| 10 | 2.41 | 2.55 | 2.63 | 2.60 | 2.65 | 2.66 | 2.54 | 2.50 | 2.47 | S | 2.60 | 2.37 | 2.32 | 2.29 | 2.20 | 2.14 | 2.01 | 1.98 | 2.03 | 2.03 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 2.66 | 2.30 | 24 | |
| 11 | 1.99 | 2.05 | 2.05 | 2.03 | 2.00 | 2.02 | 2.05 | 2.06 | S | 2.03 | 2.04 | 2.06 | 2.12 | 2.10 | 2.15 | 2.15 | 2.16 | 2.18 | 2.17 | 2.14 | 2.22 | 2.16 | 2.16 | 2.18 | 1.99 | 2.22 | 2.10 | 24 | |
| 12 | 2.12 | 2.11 | 2.14 | 2.32 | 2.01 | 2.00 | 1.96 | S | 1.99 | 1.99 | 1.99 | 1.98 | 1.94 | 1.93 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.91 | 1.93 | 1.92 | 1.93 | 1.95 | 1.91 | 2.32 | 1.99 | 24 | |
| 13 | 1.96 | 1.97 | 2.00 | 2.02 | 1.99 | 1.99 | S | 1.97 | 1.97 | 1.97 | 2.05 | 1.95 | 1.94 | 1.93 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.94 | 1.96 | 2.01 | 1.92 | 2.05 | 1.96 | 24 | |
| 14 | 1.99 | 1.97 | 2.00 | 2.01 | 1.99 | S | 2.05 | 2.19 | 2.64 | 3.00 | 2.35 | 2.16 | 2.10 | 2.01 | 1.99 | 2.05 | 2.07 | 2.02 | 1.96 | 1.93 | 1.90 | 1.88 | 2.28 | 2.04 | 1.88 | 3.00 | 2.11 | 24 | |
| 15 | 2.26 | 1.96 | 1.95 | 1.95 | S | 2.34 | 2.21 | 2.11 | 2.08 | 2.14 | 2.09 | 2.09 | 2.09 | 1.97 | 2.16 | 3.01 | 2.03 | 2.03 | 2.14 | 2.15 | 2.21 | 2.22 | 2.24 | 2.54 | 1.95 | 3.01 | 2.17 | 24 | |
| 16 | 2.66 | 2.56 | 2.63 | S | 1.95 | 1.95 | 1.96 | 1.98 | 2.38 | 2.24 | 2.20 | 2.04 | 2.09 | 2.14 | 2.10 | 2.24 | 2.48 | 2.29 | 2.19 | 2.25 | 2.31 | 2.27 | 2.33 | 2.50 | 1.95 | 2.66 | 2.25 | 24 | |
| 17 | 2.27 | 2.33 | S | 2.19 | 2.41 | 2.65 | 2.26 | 2.26 | 2.24 | 3.81 | 2.61 | 2.12 | 2.07 | 2.05 | 2.08 | 2.07 | 2.08 | 2.06 | 2.06 | 2.06 | 2.07 | 2.10 | 2.12 | 2.09 | 2.05 | 3.81 | 2.26 | 24 | |
| 18 | 2.23 | S | 2.04 | 2.03 | 2.12 | 2.20 | 2.20 | 2.28 | 2.29 | 2.36 | C | C | C | C | C | 2.29 | 2.22 | 2.45 | 2.39 | 2.23 | 2.20 | 2.17 | 2.53 | 2.90 | 2.03 | 2.90 | 2.28 | 24 | |
| 19 | S | 2.21 | 2.22 | 2.21 | 2.26 | 2.23 | 2.23 | 2.26 | 2.27 | 2.24 | 2.19 | 2.15 | 2.08 | 2.06 | 2.06 | 2.14 | 2.08 | 2.07 | 2.05 | 2.05 | 2.04 | 2.04 | S | 2.04 | 2.04 | 2.27 | 2.14 | 24 | |
| 20 | 2.08 | 2.07 | 2.09 | 2.07 | 2.15 | 2.16 | 2.15 | 2.12 | 2.37 | 2.13 | 2.12 | 2.08 | 2.14 | 2.31 | P | 2.41 | 2.44 | 2.54 | 2.54 | 2.54 | 2.41 | 2.24 | S | 2.28 | 2.07 | 2.54 | 2.25 | 23 | |
| 21 | 2.44 | 2.43 | 2.55 | 2.12 | 2.13 | 2.42 | 2.33 | 2.47 | 2.25 | 2.41 | 2.32 | 2.06 | 2.19 | 2.16 | 2.12 | 2.27 | 2.26 | 2.24 | 2.23 | 2.33 | 2.41 | S | 2.42 | 2.38 | 2.06 | 2.55 | 2.30 | 24 | |
| 22 | 2.24 | 2.27 | 2.28 | 2.26 | 2.28 | 2.28 | 2.25 | 2.22 | 2.28 | 2.31 | 2.26 | 2.55 | 2.36 | 2.20 | 2.24 | 2.30 | 2.00 | 2.02 | 2.03 | 2.03 | S | 2.06 | 2.05 | 2.04 | 2.00 | 2.55 | 2.21 | 24 | |
| 23 | 2.07 | 2.05 | 2.06 | 2.50 | 2.33 | 2.87 | 2.87 | 2.57 | 2.11 | 2.17 | 2.24 | 2.33 | 2.62 | 2.57 | 2.38 | 2.39 | 2.32 | 2.13 | 2.08 | S | 2.10 | 2.10 | 2.08 | 2.07 | 2.05 | 2.87 | 2.30 | 24 | |
| 24 | 2.11 | 2.07 | 2.07 | 2.11 | 2.83 | 2.30 | 2.06 | 2.95 | 2.52 | 2.45 | 2.46 | 2.78 | 2.47 | 2.26 | 2.42 | 2.43 | 2.90 | 2.60 | S | 2.28 | 2.36 | 2.41 | 2.46 | 2.38 | 2.06 | 2.95 | 2.42 | 24 | |
| 25 | 2.38 | 2.40 | 2.43 | 2.49 | 2.57 | 2.56 | 2.49 | 2.71 | 2.84 | 2.57 | 2.54 | 2.40 | 3.74 | 2.36 | 2.42 | 2.69 | 3.56 | S | 2.94 | 2.62 | 3.02 | 2.72 | 2.98 | 2.46 | 2.36 | 3.74 | 2.69 | 24 | |
| 26 | 2.28 | 2.17 | 2.10 | 2.10 | 2.49 | 2.54 | 2.32 | 2.59 | 2.23 | 2.05 | 2.05 | 2.05 | 2.04 | 2.09 | 2.13 | 2.21 | S | 2.26 | 2.29 | 2.10 | 2.99 | 2.70 | 2.70 | 2.57 | 2.04 | 2.99 | 2.31 | 24 | |
| 27 | 2.15 | 2.70 | 2.32 | 2.78 | 2.19 | 2.17 | 2.14 | 2.16 | 2.71 | 2.20 | 2.20 | 2.22 | 2.28 | 2.34 | 2.37 | S | 2.29 | 2.32 | 2.29 | 2.32 | 2.34 | 2.36 | 2.36 | 2.32 | 2.14 | 2.78 | 2.33 | 24 | |
| 28 | 2.29 | 2.27 | 2.41 | 2.26 | 2.28 | 2.25 | 3.02 | 2.80 | 2.29 | 2.30 | 2.27 | 2.39 | 2.22 | 2.22 | S | 2.30 | 2.63 | 2.25 | 2.35 | 2.21 | 2.17 | 2.17 | 2.16 | 2.17 | 2.16 | 3.02 | 2.33 | 24 | |
| 29 | 2.19 | 2.63 | 2.51 | 2.39 | 2.15 | 2.15 | 2.15 | 2.66 | 2.61 | 2.61 | 2.74 | 2.56 | 2.33 | S | 2.37 | 2.25 | 2.21 | 2.07 | 2.13 | 2.14 | 2.03 | 2.08 | 2.04 | 2.08 | 2.03 | 2.74 | 2.31 | 24 | |
| 30 | 2.14 | 2.15 | 2.03 | 2.04 | 2.05 | 2.07 | 2.06 | 2.04 | 2.01 | 2.02 | 2.01 | 2.01 | S | 2.05 | 2.00 | 1.99 | 1.99 | 1.98 | 2.00 | 2.04 | 2.00 | 2.02 | 2.39 | 2.63 | 1.98 | 2.63 | 2.07 | 24 | |
| 31 | 2.05 | 2.07 | 2.06 | 2.08 | 2.07 | 2.10 | 2.10 | 2.14 | 2.12 | 2.09 | 2.10 | S | 2.10 | 2.11 | 2.13 | 2.15 | 2.17 | 2.17 | 2.16 | 2.15 | 2.16 | 2.17 | 2.12 | 2.08 | 2.05 | 2.17 | 2.11 | 24 | |
| HOURLY MAX | 2.66 | 2.70 | 2.63 | 2.78 | 2.83 | 2.87 | 3.02 | 2.95 | 2.84 | 3.81 | 2.74 | 2.78 | 3.74 | 2.57 | 2.63 | 3.01 | 3.56 | 2.60 | 2.94 | 2.62 | 3.02 | 2.72 | 2.98 | 2.90 | | | | | |
| HOURLY AVG | 2.20 | 2.22 | 2.20 | 2.20 | 2.21 | 2.27 | 2.24 | 2.28 | 2.28 | 2.30 | 2.24 | 2.20 | 2.26 | 2.16 | 2.17 | 2.22 | 2.23 | 2.16 | 2.16 | 2.16 | 2.21 | 2.17 | 2.25 | 2.25 | | | | | |

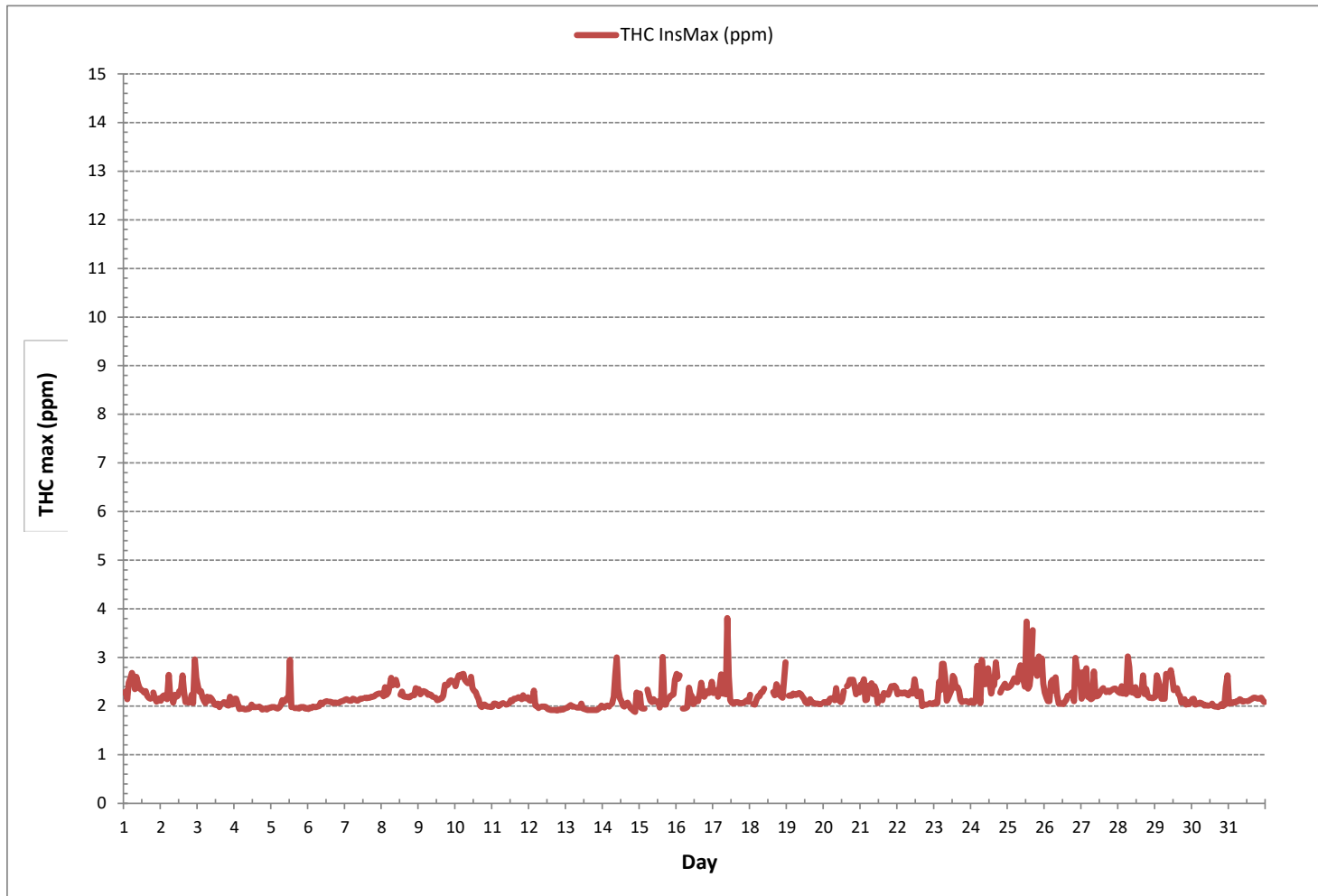
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 706 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.81 ppm @ HOUR 9 ON DAY 17 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.24 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





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

METHANE MAX Instantaneous Maximum (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 2.28 | 2.30 | 2.14 | 2.48 | 2.56 | 2.68 | 2.60 | 2.35 | 2.60 | 2.46 | 2.37 | 2.34 | 2.32 | 2.29 | 2.31 | 2.21 | 2.17 | 2.15 | S | 2.28 | 2.16 | 2.09 | 2.11 | 2.16 | 2.09 | 2.68 | 2.32 | 24 |
| 2 | 2.11 | 2.20 | 2.22 | 2.20 | 2.14 | 2.64 | 2.18 | 2.20 | 2.07 | 2.23 | 2.19 | 2.21 | 2.31 | 2.31 | 2.63 | 2.30 | 2.08 | S | 2.07 | 2.09 | 2.23 | 2.06 | 2.96 | 2.58 | 2.06 | 2.96 | 2.27 | 24 |
| 3 | 2.42 | 2.30 | 2.31 | 2.18 | 2.11 | 2.06 | 2.19 | 2.11 | 2.18 | 2.15 | 2.09 | 2.03 | 2.02 | 2.05 | 1.98 | 2.04 | S | 2.08 | 2.07 | 2.02 | 2.01 | 2.19 | 2.03 | 2.04 | 1.98 | 2.42 | 2.11 | 24 |
| 4 | 2.15 | 2.15 | 1.95 | 1.94 | 1.96 | 1.95 | 1.94 | 1.93 | 1.94 | 1.94 | 1.96 | 2.03 | 1.98 | 1.98 | 1.98 | S | 1.99 | 1.97 | 1.93 | 1.94 | 1.95 | 1.93 | 1.96 | 1.96 | 1.93 | 2.15 | 1.97 | 24 |
| 5 | 1.98 | 1.98 | 1.98 | 1.96 | 1.95 | 1.97 | 2.01 | 2.12 | 2.08 | 2.12 | 2.16 | 2.12 | 2.95 | 1.98 | S | 1.96 | 1.96 | 1.96 | 1.95 | 1.98 | 1.98 | 1.98 | 1.95 | 1.96 | 1.95 | 2.95 | 2.04 | 24 |
| 6 | 1.94 | 1.97 | 1.96 | 1.96 | 1.98 | 1.98 | 1.99 | 2.00 | 2.07 | 2.04 | 2.07 | 2.09 | 2.10 | S | 2.09 | 2.08 | 2.06 | 2.07 | 2.07 | 2.06 | 2.07 | 2.09 | 2.10 | 2.11 | 1.94 | 2.11 | 2.04 | 24 |
| 7 | 2.13 | 2.14 | 2.12 | 2.11 | 2.11 | 2.15 | 2.14 | 2.12 | 2.11 | 2.13 | 2.15 | 2.15 | S | 2.17 | 2.16 | 2.17 | 2.17 | 2.19 | 2.19 | 2.20 | 2.23 | 2.25 | 2.26 | 2.26 | 2.11 | 2.26 | 2.16 | 24 |
| 8 | 2.26 | 2.20 | 2.21 | 2.23 | 2.28 | 2.33 | 2.39 | 2.33 | 2.34 | 2.33 | 2.27 | S | 2.23 | 2.20 | 2.20 | 2.19 | 2.19 | 2.18 | 2.18 | 2.21 | 2.22 | 2.22 | 2.22 | 2.23 | 2.18 | 2.39 | 2.24 | 24 |
| 9 | 2.25 | 2.24 | 2.28 | 2.27 | 2.30 | 2.28 | 2.23 | 2.24 | 2.23 | 2.19 | S | 2.17 | 2.12 | 2.13 | 2.15 | 2.16 | 2.21 | 2.21 | 2.25 | 2.44 | 2.51 | 2.53 | 2.50 | 2.51 | 2.12 | 2.53 | 2.28 | 24 |
| 10 | 2.41 | 2.55 | 2.63 | 2.60 | 2.65 | 2.66 | 2.54 | 2.50 | 2.47 | S | 2.60 | 2.37 | 2.32 | 2.29 | 2.20 | 2.14 | 2.01 | 1.98 | 2.03 | 2.03 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 2.66 | 2.30 | 24 |
| 11 | 1.99 | 2.05 | 2.05 | 2.03 | 2.00 | 2.02 | 2.05 | 2.06 | S | 2.03 | 2.04 | 2.06 | 2.12 | 2.10 | 2.15 | 2.15 | 2.16 | 2.18 | 2.17 | 2.14 | 2.12 | 2.16 | 2.16 | 2.18 | 1.99 | 2.18 | 2.09 | 24 |
| 12 | 2.12 | 2.11 | 2.14 | 2.32 | 2.01 | 2.00 | 1.96 | S | 1.99 | 1.99 | 1.99 | 1.98 | 1.94 | 1.93 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.93 | 1.95 | 1.91 | 2.32 | 1.99 | 24 |
| 13 | 1.96 | 1.97 | 2.00 | 2.02 | 1.99 | 1.99 | S | 1.97 | 1.97 | 1.97 | 2.05 | 1.95 | 1.94 | 1.93 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.92 | 1.94 | 1.96 | 2.01 | 1.92 | 2.05 | 1.96 | 24 |
| 14 | 1.99 | 1.97 | 2.00 | 2.01 | 1.99 | S | 2.05 | 2.19 | 2.64 | 3.00 | 2.35 | 2.16 | 2.10 | 2.01 | 1.99 | 2.05 | 2.07 | 2.02 | 1.96 | 1.93 | 1.90 | 1.88 | 2.28 | 2.04 | 1.88 | 3.00 | 2.11 | 24 |
| 15 | 1.94 | 1.96 | 1.95 | 1.95 | S | 2.34 | 2.21 | 2.11 | 2.08 | 2.14 | 2.09 | 2.09 | 1.97 | 2.13 | 2.05 | 2.03 | 2.03 | 2.14 | 2.15 | 2.21 | 2.22 | 2.24 | 2.54 | 1.94 | 2.54 | 2.12 | 24 | |
| 16 | 2.66 | 2.56 | 2.63 | S | 1.95 | 1.95 | 1.96 | 1.98 | 2.38 | 2.24 | 2.20 | 2.04 | 2.09 | 2.14 | 2.10 | 2.24 | 2.48 | 2.29 | 2.19 | 2.25 | 2.32 | 2.27 | 2.33 | 2.50 | 1.95 | 2.66 | 2.25 | 24 |
| 17 | 2.27 | 2.33 | S | 2.19 | 2.41 | 2.65 | 2.26 | 2.26 | 2.24 | 3.81 | 2.61 | 2.12 | 2.07 | 2.05 | 2.08 | 2.07 | 2.08 | 2.06 | 2.06 | 2.06 | 2.07 | 2.10 | 2.12 | 2.09 | 2.05 | 3.81 | 2.26 | 24 |
| 18 | 2.07 | S | 2.04 | 2.03 | 2.12 | 2.20 | 2.20 | 2.28 | 2.29 | 2.36 | C | C | C | C | C | 2.29 | 2.22 | 2.45 | 2.39 | 2.23 | 2.20 | 2.17 | 2.53 | 2.90 | 2.03 | 2.90 | 2.28 | 24 |
| 19 | S | 2.21 | 2.22 | 2.21 | 2.26 | 2.23 | 2.23 | 2.26 | 2.27 | 2.24 | 2.19 | 2.15 | 2.08 | 2.06 | 2.06 | 2.14 | 2.08 | 2.07 | 2.05 | 2.05 | 2.05 | 2.04 | 2.04 | S | 2.04 | 2.27 | 2.14 | 24 |
| 20 | 2.08 | 2.07 | 2.09 | 2.07 | 2.15 | 2.16 | 2.15 | 2.12 | 2.37 | 2.13 | 2.12 | 2.08 | 2.14 | 2.31 | P | 2.41 | 2.44 | 2.54 | 2.54 | 2.54 | 2.41 | 2.24 | S | 2.28 | 2.07 | 2.54 | 2.25 | 23 |
| 21 | 2.44 | 2.43 | 2.55 | 2.12 | 2.13 | 2.42 | 2.33 | 2.47 | 2.25 | 2.41 | 2.32 | 2.06 | 2.19 | 2.16 | 2.12 | 2.27 | 2.26 | 2.24 | 2.23 | 2.41 | S | 2.42 | 2.38 | 2.06 | 2.55 | 2.30 | 24 | |
| 22 | 2.24 | 2.27 | 2.28 | 2.26 | 2.28 | 2.28 | 2.25 | 2.22 | 2.28 | 2.31 | 2.26 | 2.55 | 2.36 | 2.20 | 2.24 | 2.30 | 2.00 | 2.02 | 2.03 | 2.03 | S | 2.06 | 2.05 | 2.04 | 2.00 | 2.55 | 2.21 | 24 |
| 23 | 2.07 | 2.05 | 2.06 | 2.50 | 2.33 | 2.87 | 2.87 | 2.57 | 2.11 | 2.17 | 2.24 | 2.33 | 2.62 | 2.57 | 2.38 | 2.39 | 2.32 | 2.13 | 2.08 | S | 2.10 | 2.10 | 2.08 | 2.07 | 2.05 | 2.87 | 2.30 | 24 |
| 24 | 2.11 | 2.07 | 2.07 | 2.11 | 2.83 | 2.30 | 2.06 | 2.95 | 2.52 | 2.45 | 2.46 | 2.78 | 2.47 | 2.26 | 2.42 | 2.43 | 2.90 | 2.60 | S | 2.28 | 2.36 | 2.41 | 2.46 | 2.38 | 2.06 | 2.95 | 2.42 | 24 |
| 25 | 2.38 | 2.40 | 2.43 | 2.49 | 2.57 | 2.56 | 2.49 | 2.71 | 2.84 | 2.57 | 2.54 | 2.40 | 3.74 | 2.36 | 2.42 | 2.69 | 3.56 | S | 2.94 | 2.62 | 3.02 | 2.72 | 2.98 | 2.46 | 2.36 | 3.74 | 2.69 | 24 |
| 26 | 2.28 | 2.17 | 2.10 | 2.10 | 2.49 | 2.54 | 2.32 | 2.59 | 2.23 | 2.05 | 2.05 | 2.05 | 2.04 | 2.09 | 2.13 | 2.21 | S | 2.26 | 2.29 | 2.10 | 2.99 | 2.70 | 2.70 | 2.57 | 2.04 | 2.99 | 2.31 | 24 |
| 27 | 2.15 | 2.70 | 2.32 | 2.78 | 2.19 | 2.17 | 2.14 | 2.16 | 2.71 | 2.20 | 2.20 | 2.19 | 2.28 | 2.34 | 2.37 | S | 2.29 | 2.32 | 2.29 | 2.32 | 2.34 | 2.36 | 2.36 | 2.32 | 2.14 | 2.78 | 2.33 | 24 |
| 28 | 2.29 | 2.26 | 2.27 | 2.26 | 2.25 | 2.24 | 3.02 | 2.80 | 2.29 | 2.30 | 2.27 | 2.21 | 2.22 | 2.22 | S | 2.30 | 2.63 | 2.25 | 2.35 | 2.21 | 2.17 | 2.17 | 2.16 | 2.17 | 2.16 | 3.02 | 2.32 | 24 |
| 29 | 2.19 | 2.63 | 2.51 | 2.39 | 2.15 | 2.15 | 2.15 | 2.66 | 2.61 | 2.61 | 2.74 | 2.56 | 2.33 | S | 2.37 | 2.25 | 2.21 | 2.07 | 2.13 | 2.14 | 2.03 | 2.08 | 2.04 | 2.08 | 2.03 | 2.74 | 2.31 | 24 |
| 30 | 2.14 | 2.15 | 2.03 | 2.04 | 2.05 | 2.07 | 2.06 | 2.04 | 2.01 | 2.02 | 2.01 | 2.01 | S | 2.05 | 2.00 | 1.99 | 1.99 | 1.98 | 2.00 | 2.04 | 2.00 | 2.02 | 2.39 | 2.63 | 1.98 | 2.63 | 2.07 | 24 |
| 31 | 2.05 | 2.07 | 2.06 | 2.08 | 2.07 | 2.10 | 2.10 | 2.12 | 2.12 | 2.09 | 2.10 | S | 2.10 | 2.11 | 2.13 | 2.15 | 2.17 | 2.17 | 2.16 | 2.15 | 2.16 | 2.17 | 2.12 | 2.08 | 2.05 | 2.17 | 2.11 | 24 |
| HOURLY MAX | 2.66 | 2.70 | 2.63 | 2.78 | 2.83 | 2.87 | 3.02 | 2.95 | 2.84 | 3.81 | 2.74 | 2.78 | 3.74 | 2.57 | 2.63 | 2.69 | 3.56 | 2.60 | 2.94 | 2.62 | 3.02 | 2.72 | 2.98 | 2.90 | | | | |
| HOURLY AVG | 2.18 | 2.22 | 2.19 | 2.20 | 2.21 | 2.26 | 2.24 | 2.28 | 2.28 | 2.29 | 2.23 | 2.19 | 2.26 | 2.15 | 2.17 | 2.19 | 2.23 | 2.15 | 2.16 | 2.16 | 2.20 | 2.17 | 2.25 | 2.25 | | | | |

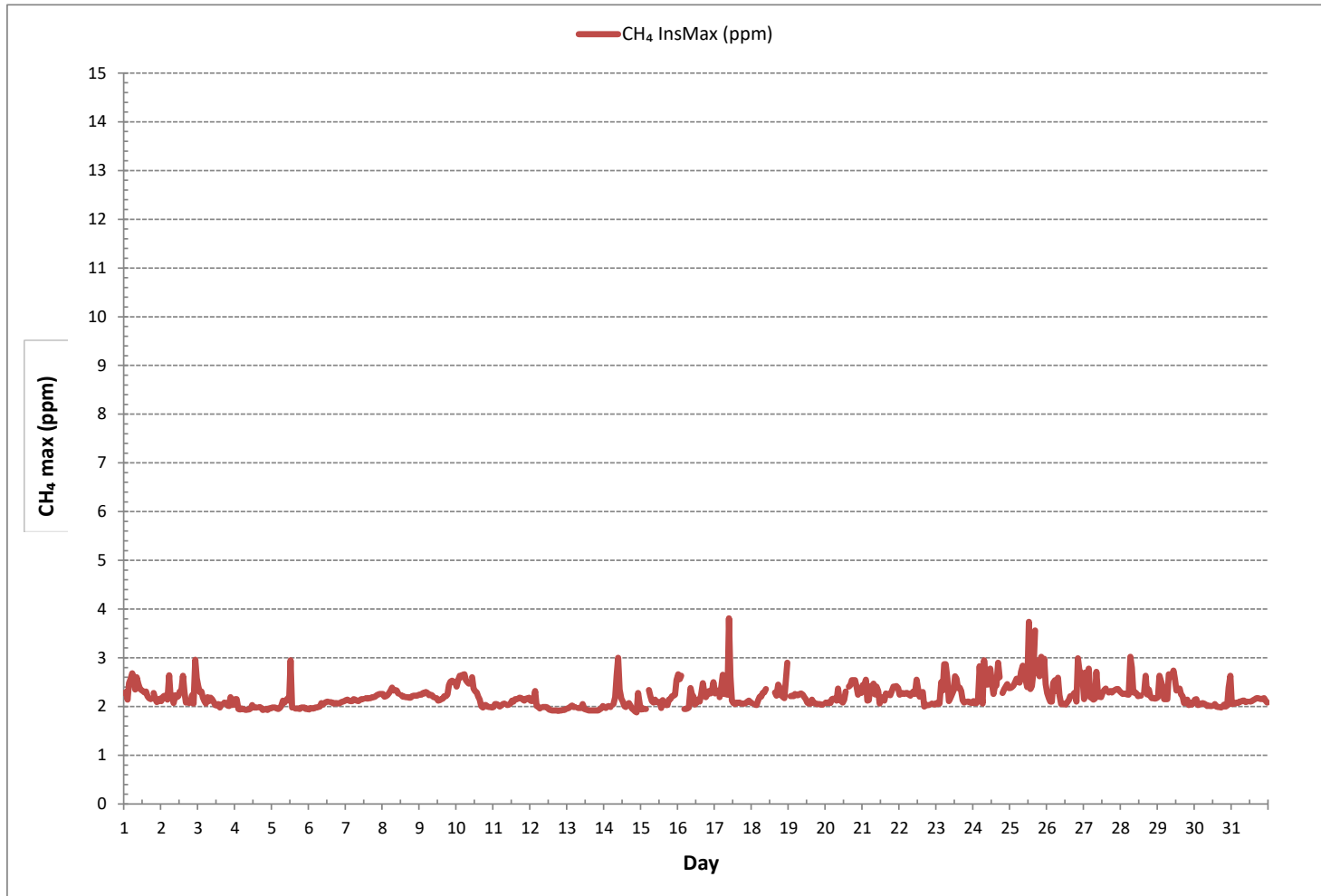
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 706 |
| MAXIMUM INSTANTANEOUS VALUE: | 3.81 ppm @ HOUR 9 ON DAY 17 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.24 |

METHANE MAX Instantaneous Maximum (CH₄ ppm)





NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| 2 | 0.00 | 0.00 | 0.01 | 0.00 | 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 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 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 | 0.01 | 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 | 0.01 | 0.00 | 24 |
| 4 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.01 | 24 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 |
| 6 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 24 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 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 | 0.02 | 0.00 | 24 |
| 8 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.12 | 0.25 | 0.10 | 0.17 | 0.22 | 0.18 | S | 0.00 | 0.11 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.16 | 0.08 | 0.00 | 0.25 | 0.07 | 24 | |
| 9 | 0.14 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.25 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.03 | 24 | |
| 10 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.07 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 24 | |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.12 | 0.01 | 24 | |
| 12 | 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 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 | |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 | |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 | |
| 15 | 0.38 | 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 | 0.36 | 1.15 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.15 | 0.08 | 24 | |
| 16 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 | 24 | |
| 17 | 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 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 | |
| 18 | 0.15 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | C | C | C | C | C | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.01 | 0.00 | 0.21 | 0.17 | 0.00 | 0.21 | 0.03 | 24 | |
| 19 | S | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.01 | 0.00 | 24 | |
| 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 | P | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.02 | 0.00 | 0.02 | 0.00 | 23 | |
| 21 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.09 | 0.00 | 0.00 | 0.09 | 0.01 | 24 | |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 | |
| 23 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 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 | 0.06 | 0.00 | 24 | |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 | |
| 25 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | S | 0.00 | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 24 | |
| 26 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 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 | 0.05 | 0.00 | 24 | |
| 27 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.07 | 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 | 0.07 | 0.01 | 24 | |
| 28 | 0.00 | 0.02 | 0.15 | 0.00 | 0.05 | 0.01 | 0.00 | 0.07 | 0.01 | 0.00 | 0.08 | 0.20 | 0.00 | 0.00 | S | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.20 | 0.03 | 24 | | |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.07 | 0.07 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.01 | 24 | |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 | |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 0.03 | 0.01 | S | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 24 | |
| HOURLY MAX | 0.38 | 0.02 | 0.23 | 0.06 | 0.05 | 0.12 | 0.25 | 0.10 | 0.17 | 0.22 | 0.18 | 0.20 | 0.01 | 0.11 | 0.36 | 1.15 | 0.18 | 0.25 | 0.17 | 0.02 | 0.12 | 0.01 | 0.21 | 0.17 | | | | | |
| HOURLY AVG | 0.02 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.02 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.02 | 0.01 | | | | | |

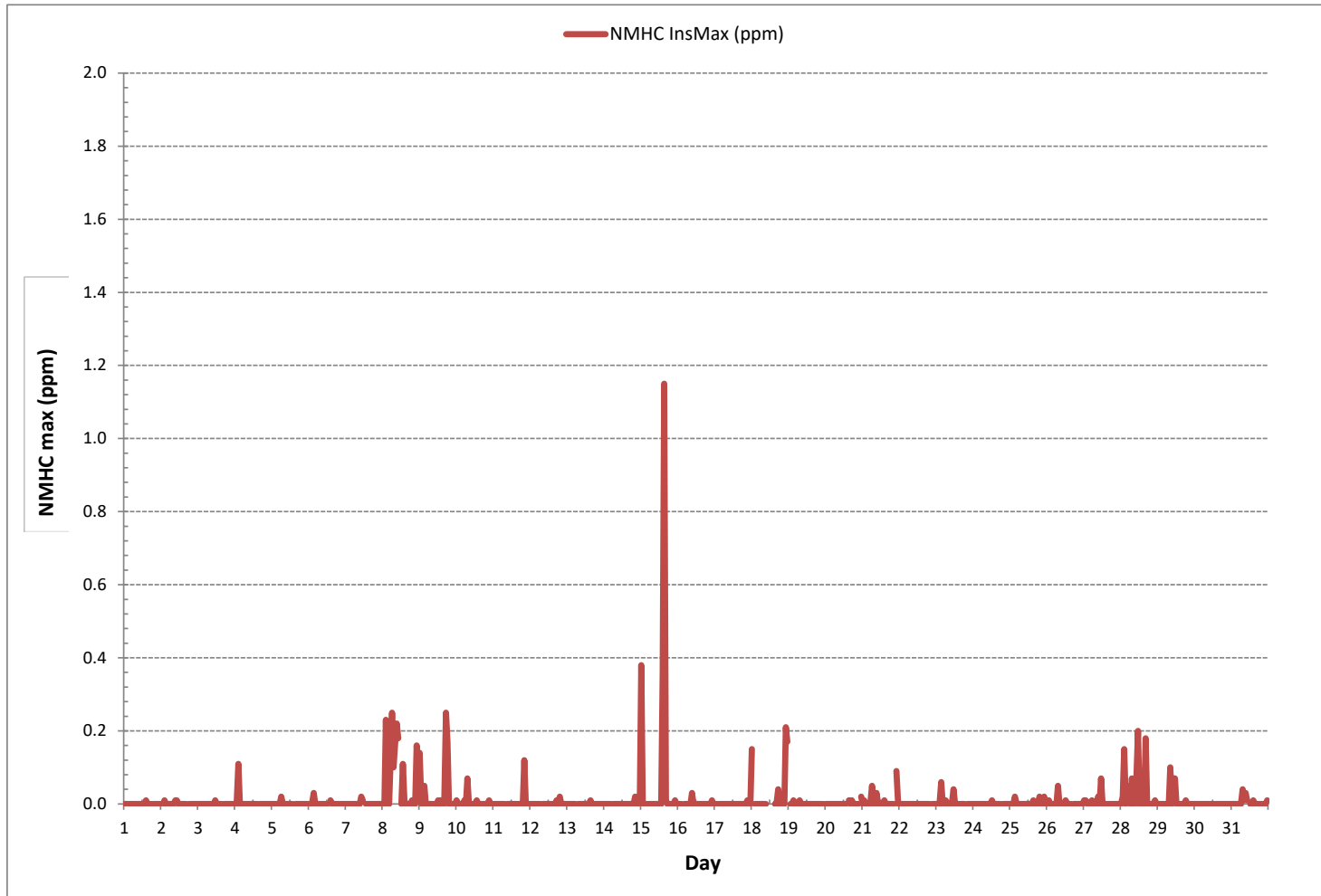
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 98 |
| MAXIMUM INSTANTANEOUS VALUE: | 1.15 ppm @ HOUR 15 ON DAY 15 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.06 |

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 6 | 6 | 4 | 4 | 4 | 5 | 6 | 5 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | S | 5 | 4 | 5 | 5 | 3 | 3 | 3 | 6 | 4 | 24 | |
| 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | S | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 24 |
| 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 11 | 6 | 16 | 4 | 2 | 1 | 3 | S | 2 | 2 | 7 | 3 | 3 | 1 | 1 | 1 | 1 | 16 | 4 | 24 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 4 | 4 | 6 | 6 | 30 | 8 | 10 | 10 | S | 8 | 5 | 3 | 3 | 2 | 1 | 1 | 4 | 1 | 30 | 5 | 24 | |
| 5 | 4 | 5 | 4 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | S | 2 | 30 | 17 | 18 | 4 | 16 | 8 | 4 | 3 | 1 | 30 | 6 | 24 | |
| 6 | 4 | 5 | 4 | 3 | 4 | 4 | 10 | 10 | 15 | 11 | 13 | 22 | 22 | S | 23 | 20 | 18 | 13 | 15 | 11 | 10 | 14 | 14 | 18 | 3 | 23 | 12 | 24 | |
| 7 | 29 | 26 | 20 | 15 | 11 | 9 | 13 | 11 | 22 | 11 | 15 | 37 | S | 62 | 37 | 34 | 43 | 55 | 54 | 95 | 65 | 62 | 25 | 22 | 9 | 95 | 34 | 24 | |
| 8 | 22 | 19 | 20 | 20 | 34 | 50 | 55 | 54 | 54 | 53 | 41 | S | 26 | 22 | 27 | 18 | 23 | 16 | 16 | 27 | 18 | 24 | 31 | 31 | 16 | 55 | 30 | 24 | |
| 9 | 25 | 23 | 19 | 19 | 21 | 22 | 29 | 16 | 13 | 15 | S | 13 | 14 | 10 | 14 | 13 | 13 | 14 | 10 | 12 | 13 | 15 | 14 | 14 | 10 | 29 | 16 | 24 | |
| 10 | 12 | 14 | 14 | 13 | 13 | 13 | 13 | 12 | 11 | S | 17 | 25 | 14 | 11 | 9 | 19 | 29 | 9 | 30 | 6 | 5 | 10 | 5 | 5 | 5 | 30 | 13 | 24 | |
| 11 | 7 | 15 | 16 | 12 | 7 | 6 | 7 | 7 | S | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 7 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 16 | 8 | 24 | |
| 12 | 5 | 6 | 6 | 5 | 5 | 4 | 9 | S | 5 | 4 | 37 | 9 | 4 | 2 | 2 | 2 | 3 | 3 | 4 | 2 | 3 | 1 | 1 | 3 | 1 | 37 | 6 | 24 | |
| 13 | 4 | 4 | 3 | 3 | 3 | 3 | S | 7 | 13 | 7 | 6 | 6 | 4 | 2 | 2 | 3 | 6 | 6 | 5 | 3 | 2 | 2 | 4 | 8 | 2 | 13 | 5 | 24 | |
| 14 | 8 | 5 | 4 | 5 | 4 | S | 4 | 5 | 6 | 6 | 6 | 6 | 5 | 7 | 4 | 4 | 5 | 5 | 7 | 4 | 3 | 2 | 2 | 3 | 2 | 8 | 5 | 24 | |
| 15 | 3 | 3 | 2 | 4 | S | 4 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 4 | 2 | 24 | |
| 16 | 1 | 1 | 1 | S | 1 | 1 | 1 | S1 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 23 |
| 17 | 2 | 2 | S | 2 | 2 | 2 | 2 | 3 | 3 | 9 | 7 | 6 | C | C | C | C | C | C | C | 54 | 35 | 23 | 48 | 17 | 2 | 54 | 14 | 24 | |
| 18 | 14 | S | 8 | 6 | 9 | 10 | 11 | 13 | 15 | 9 | 12 | 15 | 14 | 10 | 28 | 10 | 9 | 12 | 13 | 11 | 12 | 12 | 10 | 7 | 6 | 28 | 12 | 24 | |
| 19 | S | 10 | 10 | 10 | 12 | 12 | 13 | 25 | 49 | 22 | 15 | 10 | 10 | 6 | 11 | 14 | 13 | 8 | 14 | 5 | 6 | 4 | 5 | S | 4 | 49 | 13 | 24 | |
| 20 | 7 | 7 | 7 | 6 | 11 | 11 | 12 | 18 | 26 | 10 | 8 | 6 | 6 | 8 | P | 8 | 9 | 9 | 9 | 8 | 6 | 5 | S | 4 | 4 | 26 | 9 | 23 | |
| 21 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 5 | 2 | 6 | 3 | 3 | 2 | 1 | 3 | 5 | 2 | 1 | 1 | 1 | S | 2 | 1 | 1 | 6 | 3 | 24 | |
| 22 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 5 | 1 | 2 | 1 | 2 | 1 | 6 | 6 | 2 | 2 | 2 | S | 4 | 3 | 3 | 0 | 6 | 2 | 24 | |
| 23 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 4 | 5 | 6 | 8 | 11 | 12 | 12 | 13 | 12 | 5 | 4 | S | 3 | 3 | 2 | 2 | 2 | 2 | 13 | 6 | 24 | |
| 24 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | S | 5 | 5 | 5 | 5 | 5 | 1 | 5 | 3 | 24 | |
| 25 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 11 | 8 | 4 | 4 | 5 | 5 | S | 6 | 8 | 13 | 10 | 4 | 7 | 4 | 13 | 6 | 24 | |
| 26 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 4 | 5 | 3 | 2 | 2 | 2 | 2 | 2 | S | 7 | 4 | 7 | 4 | 6 | 6 | 6 | 2 | 7 | 4 | 24 | | |
| 27 | 5 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 3 | 7 | 5 | 5 | 5 | S | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 7 | 3 | 7 | 4 | 24 | |
| 28 | 5 | 20 | 6 | 5 | 5 | 5 | 5 | 11 | 7 | 8 | 8 | 17 | 10 | 16 | S | 11 | 11 | 10 | 10 | 32 | 10 | 9 | 9 | 9 | 5 | 32 | 10 | 24 | |
| 29 | 10 | 11 | 11 | 10 | 7 | 7 | 5 | 8 | 7 | 6 | 5 | 5 | S | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 11 | 5 | 24 | |
| 30 | 1 | 1 | 1 | 3 | 3 | 4 | 3 | 1 | 1 | 2 | 1 | 3 | S | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 4 | 4 | 1 | 4 | 2 | 24 | |
| 31 | 3 | 4 | 4 | 4 | 3 | 3 | 7 | 5 | 5 | 33 | 9 | S | 6 | 6 | 7 | 8 | 11 | 6 | 7 | 6 | 6 | 7 | 6 | 5 | 3 | 33 | 7 | 24 | |
| HOURLY MAX | 29 | 26 | 20 | 20 | 34 | 50 | 55 | 54 | 54 | 53 | 41 | 37 | 26 | 62 | 37 | 34 | 43 | 55 | 54 | 95 | 65 | 62 | 48 | 31 | | | | | |
| HOURLY AVG | 7 | 7 | 6 | 6 | 6 | 7 | 8 | 8 | 10 | 9 | 9 | 10 | 7 | 8 | 8 | 8 | 10 | 8 | 9 | 11 | 9 | 9 | 8 | 7 | | | | | |

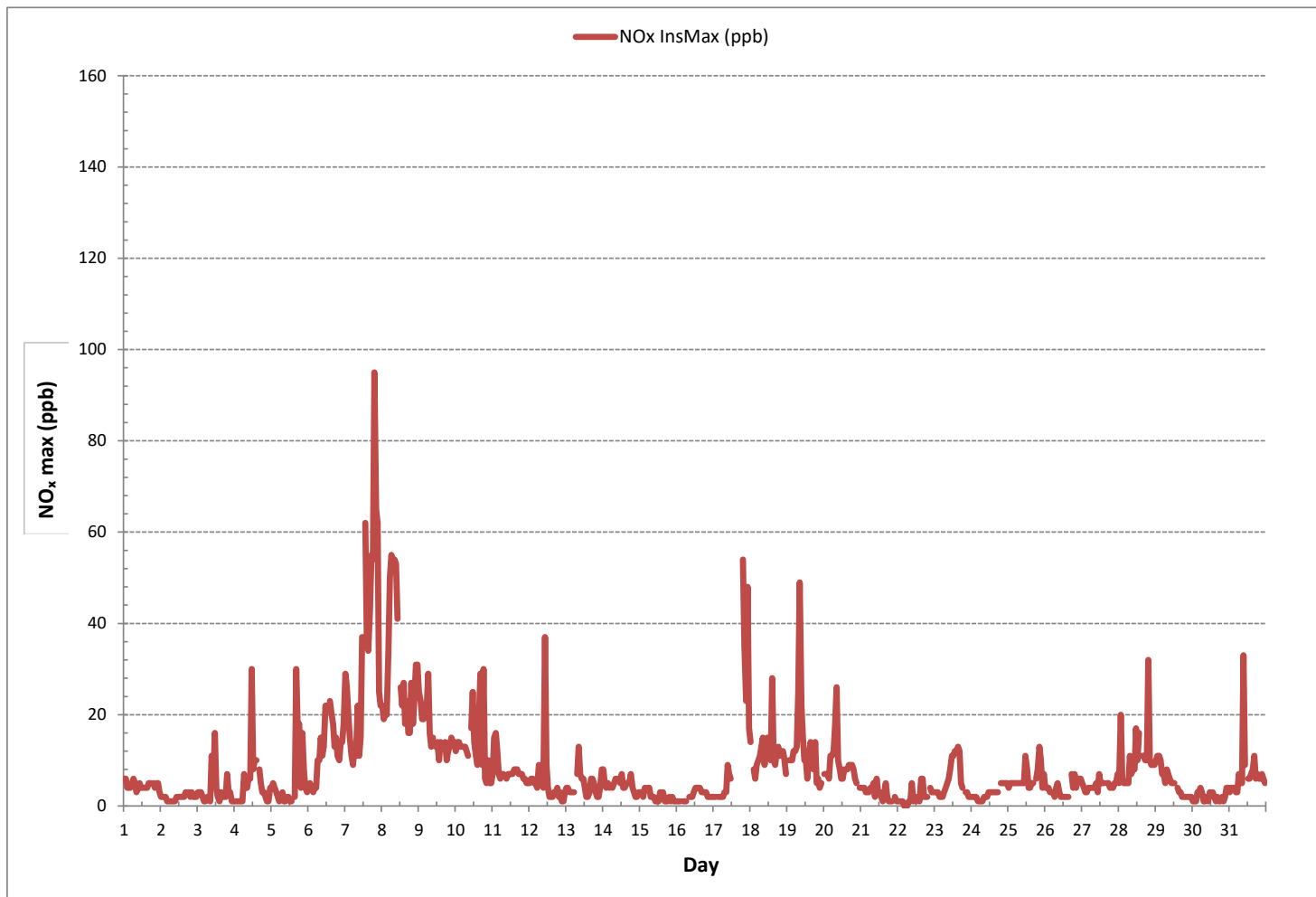
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 700 |
| MAXIMUM INSTANTANEOUS VALUE: | 95 ppb @ HOUR 19 ON DAY 7 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 742 hrs |
| STANDARD DEVIATION: | 10 |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





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

NITRIC OXIDE Instantaneous Maximum (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----|--|--|--|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | |
| 2 | 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 | | | | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | 5 | 8 | 1 | 1 | 0 | 1 | S | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 24 | | | | |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 4 | 4 | 23 | 3 | 3 | 5 | S | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 2 | 24 | | | | | |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 17 | 7 | 7 | 1 | 7 | 3 | 0 | 0 | 0 | 0 | 17 | 2 | 24 | | | | | |
| 6 | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 3 | 7 | 6 | 6 | 12 | 8 | S | 7 | 8 | 5 | 3 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 12 | 3 | 24 | | | | | |
| 7 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 10 | 2 | 6 | 21 | S | 37 | 20 | 13 | 20 | 33 | 23 | 68 | 25 | 39 | 1 | 0 | 0 | 68 | 14 | 24 | | | | | | |
| 8 | 0 | 0 | 0 | 0 | 1 | 13 | 17 | 16 | 18 | 20 | 16 | S | 10 | 8 | 7 | 4 | 7 | 0 | 1 | 10 | 1 | 0 | 0 | 0 | 0 | 20 | 6 | 24 | | | | | | |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 0 | 2 | S | 3 | 5 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 24 | | | | | |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | S | 7 | 11 | 2 | 1 | 1 | 8 | 14 | 3 | 19 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 19 | 3 | 24 | | | | | | |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | S | 0 | 1 | 23 | 3 | 1 | 0 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 2 | 24 | | | | | | |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 5 | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 24 | | | | | | |
| 14 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | |
| 15 | 0 | 0 | 0 | 0 | S | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 24 | | | | | | |
| 16 | 0 | 0 | 0 | S | 0 | 0 | 0 | S1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | | | | | | |
| 17 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | C | C | C | C | C | C | C | 33 | 22 | 2 | 32 | 0 | 0 | 33 | 6 | 24 | | | | | | |
| 18 | 0 | S | 0 | 0 | 0 | 0 | 2 | 3 | 4 | 1 | 3 | 8 | 6 | 4 | 17 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 2 | 24 | | | | | | |
| 19 | S | 0 | 0 | 0 | 0 | 0 | 8 | 28 | 13 | 8 | 4 | 3 | 2 | 7 | 4 | 4 | 1 | 4 | 0 | 1 | 0 | 0 | S | 0 | 0 | 28 | 4 | 24 | | | | | | |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 1 | 1 | 1 | 1 | 1 | P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 11 | 1 | 23 | | | | | | |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 2 | 0 | 24 | | | | | | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 4 | 0 | 24 | | | | | | |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 3 | 1 | 24 | | | | | | |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 3 | 1 | 1 | 0 | 0 | S | 0 | 1 | 4 | 2 | 0 | 2 | 0 | 4 | 1 | 24 | | | | | | | |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | S | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | | | | | | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 24 | | | | | | |
| 28 | 0 | 13 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 2 | 8 | 2 | 5 | S | 1 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 16 | 2 | 24 | | | | | | |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | S | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 24 | | | | | | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 45 | 2 | S | 2 | 2 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 3 | 24 | | | | | | |
| HOURLY MAX | 4 | 13 | 0 | 0 | 1 | 13 | 17 | 16 | 28 | 45 | 23 | 23 | 10 | 37 | 20 | 13 | 20 | 33 | 23 | 68 | 25 | 39 | 32 | 4 | | | | | | | | | | |
| HOURLY AVG | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 5 | 2 | 2 | 1 | 0 | | | | | | | | | | |

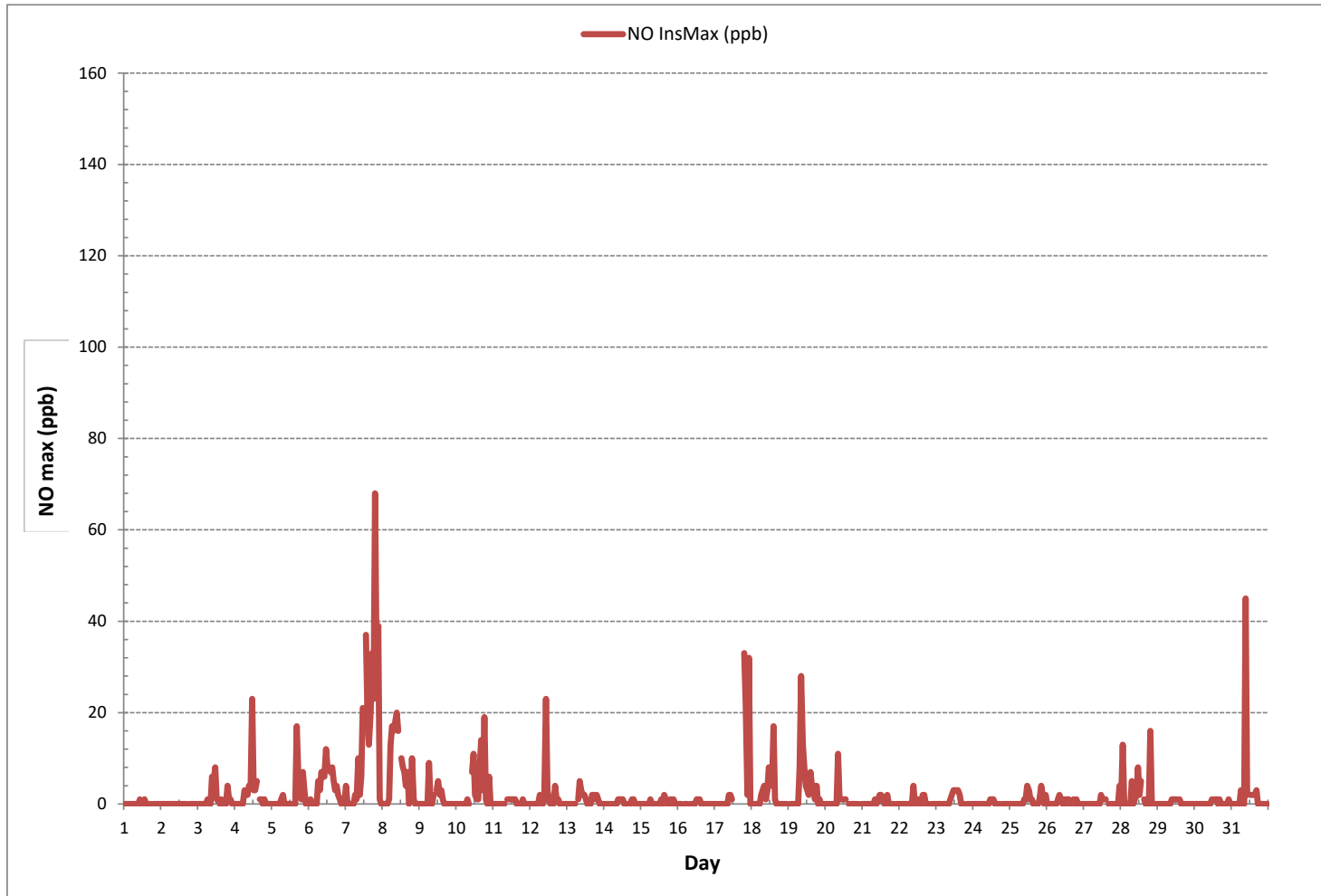
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 249 |
| MAXIMUM INSTANTANEOUS VALUE: | 68 ppb @ HOUR 19 ON DAY 7 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| STANDARD DEVIATION: | 6 |
| OPERATIONAL TIME: | 742 hrs |

NITRIC OXIDE Instantaneous Maximum (NO ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 6 | 6 | 4 | 4 | 4 | 5 | 6 | 5 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | S | 5 | 4 | 5 | 5 | 3 | 3 | 6 | 4 | 24 | |
| 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | S | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 24 |
| 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 6 | 3 | 7 | 3 | 1 | 1 | 2 | S | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 7 | 2 | 24 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 3 | 3 | 2 | 3 | 11 | 5 | 7 | 6 | S | 8 | 5 | 3 | 2 | 2 | 1 | 1 | 4 | 1 | 11 | 3 | 24 | |
| 5 | 5 | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | S | 2 | 14 | 10 | 11 | 4 | 9 | 5 | 3 | 3 | 1 | 14 | 4 | 24 | |
| 6 | 4 | 5 | 4 | 3 | 4 | 4 | 5 | 6 | 10 | 7 | 7 | 12 | 14 | S | 16 | 13 | 14 | 11 | 11 | 9 | 9 | 14 | 14 | 18 | 3 | 18 | 9 | 24 | |
| 7 | 27 | 26 | 20 | 15 | 11 | 9 | 11 | 9 | 13 | 10 | 10 | 20 | S | 30 | 25 | 23 | 26 | 28 | 33 | 33 | 40 | 28 | 24 | 22 | 9 | 40 | 21 | 24 | |
| 8 | 22 | 19 | 20 | 20 | 33 | 38 | 39 | 39 | 39 | 34 | 24 | S | 16 | 15 | 20 | 16 | 19 | 16 | 15 | 18 | 18 | 24 | 31 | 31 | 15 | 39 | 25 | 24 | |
| 9 | 25 | 23 | 19 | 19 | 21 | 22 | 22 | 16 | 13 | 13 | S | 9 | 9 | 8 | 11 | 12 | 13 | 14 | 10 | 12 | 13 | 15 | 14 | 15 | 8 | 25 | 15 | 24 | |
| 10 | 12 | 14 | 14 | 14 | 13 | 13 | 13 | 11 | 11 | S | 10 | 15 | 11 | 10 | 8 | 12 | 15 | 6 | 15 | 6 | 5 | 7 | 5 | 5 | 5 | 15 | 11 | 24 | |
| 11 | 7 | 15 | 16 | 12 | 7 | 6 | 7 | 7 | S | 6 | 6 | 6 | 6 | 6 | 7 | 8 | 8 | 8 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 16 | 7 | 24 | |
| 12 | 5 | 6 | 6 | 5 | 5 | 4 | 7 | S | 4 | 4 | 14 | 6 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 14 | 4 | 24 | |
| 13 | 4 | 4 | 3 | 3 | 3 | 3 | S | 6 | 9 | 5 | 5 | 4 | 3 | 2 | 2 | 2 | 5 | 4 | 4 | 2 | 2 | 2 | 5 | 8 | 2 | 9 | 4 | 24 | |
| 14 | 8 | 5 | 4 | 5 | 4 | S | 4 | 5 | 6 | 5 | 5 | 5 | 6 | 4 | 4 | 5 | 5 | 5 | 6 | 4 | 3 | 2 | 2 | 3 | 2 | 8 | 5 | 24 | |
| 15 | 3 | 3 | 3 | 4 | S | 4 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 24 | |
| 16 | 1 | 1 | 1 | S | 1 | 1 | 1 | S1 | 2 | 2 | 2 | 2 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 23 |
| 17 | 2 | 2 | S | 2 | 2 | 2 | 2 | 3 | 3 | 7 | 5 | 5 | C | C | C | C | C | C | C | 21 | 16 | 21 | 23 | 17 | 2 | 23 | 8 | 24 | |
| 18 | 14 | S | 8 | 7 | 9 | 10 | 9 | 10 | 11 | 8 | 9 | 9 | 9 | 7 | 11 | 9 | 9 | 11 | 13 | 12 | 12 | 12 | 10 | 7 | 7 | 14 | 10 | 24 | |
| 19 | S | 10 | 10 | 10 | 12 | 12 | 13 | 19 | 21 | 15 | 9 | 7 | 7 | 5 | 8 | 10 | 9 | 8 | 11 | 5 | 5 | 4 | 5 | S | 4 | 21 | 10 | 24 | |
| 20 | 7 | 7 | 7 | 6 | 11 | 11 | 12 | 18 | 18 | 9 | 8 | 5 | 6 | 7 | P | 8 | 9 | 9 | 9 | 8 | 6 | 5 | S | 4 | 4 | 18 | 9 | 23 | |
| 21 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 2 | 5 | 2 | 2 | 1 | 1 | 2 | 4 | 2 | 1 | 1 | 1 | S | 2 | 1 | 1 | 5 | 3 | 24 | |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 2 | 2 | 2 | S | 4 | 3 | 3 | 1 | 4 | 2 | 24 | |
| 23 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 8 | 8 | 9 | 10 | 12 | 11 | 5 | 4 | S | 3 | 3 | 3 | 2 | 2 | 12 | 5 | 24 | |
| 24 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | S | 5 | 5 | 5 | 5 | 5 | 1 | 5 | 3 | 24 | |
| 25 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 4 | 4 | 4 | 5 | S | 6 | 8 | 9 | 8 | 5 | 5 | 4 | 9 | 5 | 24 | |
| 26 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | S | 6 | 4 | 6 | 4 | 6 | 6 | 6 | 1 | 6 | 3 | 24 | |
| 27 | 5 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 5 | 4 | 4 | 4 | S | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 3 | 5 | 4 | 24 | |
| 28 | 5 | 11 | 6 | 6 | 6 | 5 | 5 | 7 | 7 | 7 | 6 | 9 | 8 | 11 | S | 10 | 10 | 10 | 10 | 17 | 10 | 9 | 9 | 9 | 5 | 17 | 8 | 24 | |
| 29 | 10 | 11 | 11 | 10 | 7 | 7 | 5 | 8 | 7 | 5 | 5 | 4 | 4 | S | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 11 | 5 | 24 | |
| 30 | 1 | 1 | 1 | 3 | 3 | 4 | 3 | 2 | 2 | 1 | 1 | 2 | S | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 1 | 4 | 2 | 24 | |
| 31 | 3 | 4 | 4 | 4 | 3 | 3 | 5 | 5 | 5 | 5 | 6 | S | 4 | 4 | 5 | 6 | 8 | 6 | 6 | 7 | 6 | 7 | 6 | 5 | 3 | 8 | 5 | 24 | |
| HOURLY MAX | 27 | 26 | 20 | 20 | 33 | 38 | 39 | 39 | 39 | 34 | 24 | 20 | 16 | 30 | 25 | 23 | 26 | 28 | 33 | 33 | 40 | 28 | 31 | 31 | | | | | |
| HOURLY AVG | 7 | 7 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 6 | 6 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | |

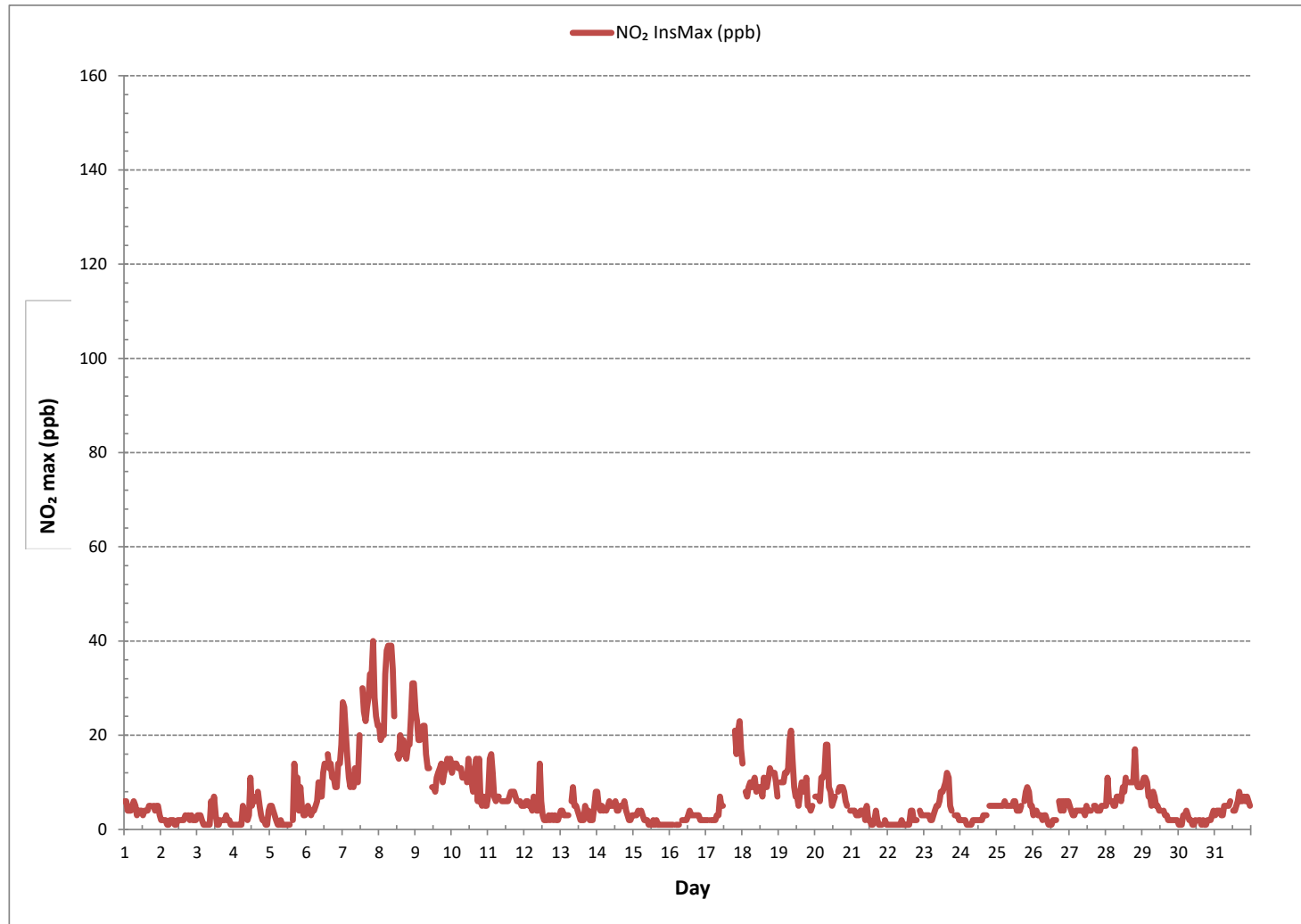
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 703 |
| MAXIMUM INSTANTANEOUS VALUE: | 40 ppb @ HOUR 20 ON DAY 7 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 742 hrs |
| STANDARD DEVIATION: | 6 |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

OZONE Instantaneous Maximum (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | 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 | 22.1 | 24.0 | 27.3 | 27.2 | 25.7 | 24.1 | 21.6 | 25.1 | 26.9 | 26.4 | 24.0 | 23.4 | 23.9 | 22.1 | 19.7 | 18.8 | 17.4 | 17.8 | S | 16.8 | 16.7 | 17.5 | 19.1 | 20.7 | 16.7 | 27.3 | 22.1 | 24 |
| 2 | 20.9 | 20.7 | 20.8 | 20.3 | 19.0 | 17.7 | 16.1 | 15.7 | 15.3 | 15.3 | 15.7 | 15.7 | 16.4 | 17.0 | 17.1 | 16.8 | 16.5 | S | 17.2 | 17.5 | 18.3 | 18.8 | 18.4 | 17.0 | 15.3 | 20.9 | 17.6 | 24 |
| 3 | 15.4 | 13.3 | 13.8 | 19.1 | 20.8 | 21.7 | 22.1 | 23.0 | 23.2 | 24.5 | 27.1 | 30.9 | 32.1 | 31.8 | 31.7 | 29.5 | S | 29.1 | 29.8 | 29.8 | 29.4 | 29.2 | 31.1 | 31.9 | 13.3 | 32.1 | 25.7 | 24 |
| 4 | 32.0 | 32.3 | 32.8 | 33.2 | 33.8 | 36.9 | 37.9 | 37.2 | 36.5 | 36.2 | 33.3 | 31.7 | 30.6 | 29.7 | 30.1 | S | 30.4 | 34.6 | 37.2 | 39.2 | 39.1 | 36.8 | 34.3 | 32.5 | 29.7 | 39.2 | 34.3 | 24 |
| 5 | 29.5 | 27.4 | 25.9 | 29.7 | 32.1 | 32.1 | 31.3 | 30.7 | 31.5 | 34.0 | 34.9 | 35.3 | 35.2 | 35.1 | S | 34.8 | 35.1 | 34.8 | 34.0 | 32.3 | 30.7 | 32.1 | 33.8 | 34.3 | 25.9 | 35.3 | 32.5 | 24 |
| 6 | 33.6 | 32.5 | 31.3 | 31.3 | 30.6 | 31.2 | 31.2 | 31.3 | 28.8 | 28.6 | 28.2 | 26.1 | 25.7 | S | 25.8 | 24.9 | 25.9 | 26.2 | 27.5 | 27.8 | 25.9 | 24.3 | 18.8 | 17.6 | 17.6 | 33.6 | 27.6 | 24 |
| 7 | 14.8 | 12.9 | 17.2 | 22.3 | 24.5 | 26.1 | 26.5 | 26.0 | 26.5 | 26.3 | 25.3 | 27.2 | S | 25.8 | 24.7 | 22.5 | 18.4 | 17.0 | 14.8 | 13.9 | 11.3 | 12.2 | 13.1 | 11.6 | 11.3 | 27.2 | 20.0 | 24 |
| 8 | 26.5 | 25.1 | 22.8 | 18.8 | 19.0 | 3.6 | 1.9 | 7.8 | 7.5 | 13.0 | 18.9 | S | 23.1 | 23.3 | 23.0 | 21.9 | 20.8 | 22.4 | 22.5 | 22.3 | 20.6 | 18.1 | 13.3 | 13.1 | 1.9 | 26.5 | 17.8 | 24 |
| 9 | 13.1 | 14.8 | 15.3 | 15.8 | 14.2 | 13.2 | 16.7 | 19.9 | 23.3 | 25.7 | S | 31.2 | 31.9 | 32.0 | 31.8 | 31.0 | 29.0 | 27.5 | 26.4 | 25.5 | 24.7 | 23.4 | 22.9 | 26.1 | 13.1 | 32.0 | 23.3 | 24 |
| 10 | 28.7 | 30.2 | 22.0 | 24.6 | 26.1 | 21.0 | 22.2 | 25.6 | 25.3 | S | 26.3 | 25.4 | 27.7 | 29.7 | 34.2 | 34.2 | 36.4 | 35.0 | 32.4 | 31.0 | 31.5 | 30.5 | 30.2 | 30.1 | 21.0 | 36.4 | 28.7 | 24 |
| 11 | 28.0 | 23.0 | 16.5 | 23.8 | 27.9 | 28.5 | 26.1 | 27.1 | S | 29.2 | 29.4 | 29.5 | 30.4 | 32.0 | 32.4 | 30.6 | 29.9 | 29.4 | 29.8 | 29.2 | 29.0 | 28.6 | 27.8 | 27.5 | 16.5 | 32.4 | 28.1 | 24 |
| 12 | 26.6 | 27.1 | 27.4 | 39.7 | 39.0 | 31.9 | 31.5 | S | 31.7 | 32.1 | 32.6 | 36.9 | 39.2 | 39.4 | 40.3 | 40.8 | 41.1 | 41.7 | 41.7 | 41.3 | 41.0 | 40.8 | 40.6 | 39.9 | 26.6 | 41.7 | 36.7 | 24 |
| 13 | 36.2 | 35.7 | 35.8 | 35.6 | 35.3 | 34.6 | S | 35.0 | 34.9 | 34.8 | 34.8 | 37.0 | 38.4 | 39.1 | 40.0 | 40.6 | 40.6 | 40.0 | 40.3 | 40.5 | 40.7 | 40.3 | 39.1 | 34.6 | 34.6 | 40.7 | 37.6 | 24 |
| 14 | 32.4 | 33.6 | 33.2 | 32.5 | 35.6 | S | 38.3 | 35.0 | 30.6 | 30.3 | 30.4 | 31.5 | 32.9 | 34.4 | 35.7 | 35.3 | 34.2 | 36.8 | 37.1 | 38.5 | 38.8 | 38.5 | 38.0 | 37.4 | 30.3 | 38.8 | 34.8 | 24 |
| 15 | 36.8 | 36.4 | 36.3 | 35.7 | S | 38.8 | 40.8 | 41.5 | 41.5 | 41.6 | 38.9 | 37.2 | 36.6 | 38.3 | 38.5 | 38.3 | 37.9 | 37.3 | 36.6 | 37.0 | 37.2 | 36.7 | 35.1 | 34.2 | 34.2 | 41.6 | 37.8 | 24 |
| 16 | 34.4 | 35.0 | 35.2 | S | 34.8 | 34.2 | 34.9 | 35.1 | 34.7 | 34.2 | 34.4 | 36.0 | 35.6 | 36.9 | 38.5 | 37.9 | 34.8 | 35.0 | 34.7 | 34.4 | 36.2 | 36.3 | 35.8 | 33.7 | 33.7 | 38.5 | 35.3 | 24 |
| 17 | 32.8 | 32.6 | S | 31.8 | 31.4 | 30.8 | 30.4 | 30.0 | 29.2 | 28.7 | 28.0 | 27.6 | 27.4 | 27.1 | 26.5 | 26.1 | 24.9 | 25.0 | 25.0 | 24.6 | 22.9 | 12.2 | 12.3 | 15.8 | 12.2 | 32.8 | 26.2 | 24 |
| 18 | 23.1 | S | 26.6 | 26.8 | 25.8 | 21.0 | 23.4 | 23.3 | 23.1 | 26.3 | C | C | C | C | C | C | C | 34.3 | 21.4 | 21.8 | 21.1 | 27.0 | 29.9 | 35.4 | 21.0 | 35.4 | 25.6 | 24 |
| 19 | S | 32.1 | 19.9 | 21.1 | 19.8 | 21.2 | 23.0 | 16.6 | 13.5 | 22.1 | 26.1 | 31.2 | 33.2 | 34.1 | 34.2 | 31.0 | 29.2 | 29.8 | 30.7 | 33.0 | 32.6 | 32.5 | 32.3 | S | 13.5 | 34.2 | 27.2 | 24 |
| 20 | 29.4 | 28.4 | 27.9 | 29.5 | 28.7 | 20.5 | 20.3 | 19.2 | 23.5 | 29.2 | 34.6 | 35.4 | 35.1 | 34.0 | P | 33.4 | 29.2 | 27.0 | 25.7 | 25.4 | 26.8 | 28.8 | S | 29.3 | 19.2 | 35.4 | 28.2 | 23 |
| 21 | 29.2 | 28.5 | 29.4 | 27.8 | 27.0 | 26.5 | 26.4 | 27.9 | 29.7 | 30.2 | 30.8 | 30.7 | 30.4 | 30.8 | 30.4 | 28.8 | 28.0 | 24.5 | 25.7 | 27.5 | 29.3 | S | 28.7 | 28.1 | 24.5 | 30.8 | 28.5 | 24 |
| 22 | 29.1 | 30.3 | 31.3 | 33.2 | 34.6 | 36.0 | 37.4 | 37.9 | 37.5 | 38.5 | 36.0 | 35.8 | 35.3 | 36.3 | 37.8 | 37.9 | 37.6 | 34.8 | 35.0 | 34.9 | S | 33.0 | 33.4 | 32.0 | 29.1 | 38.5 | 35.0 | 24 |
| 23 | 31.8 | 32.4 | 33.9 | 34.6 | 34.6 | 34.4 | 33.7 | 29.9 | 27.0 | 26.5 | 25.7 | 24.8 | 24.6 | 24.8 | 22.9 | 21.2 | 25.6 | 27.6 | 27.8 | S | 27.2 | 26.3 | 27.0 | 27.3 | 21.2 | 34.6 | 28.3 | 24 |
| 24 | 27.4 | 27.9 | 28.8 | 30.0 | 30.1 | 30.2 | 30.3 | 30.7 | 30.6 | 29.6 | 30.3 | 30.3 | 30.6 | 30.7 | 30.2 | 30.2 | 29.5 | 28.8 | S | 27.3 | 28.3 | 28.7 | 27.5 | 27.4 | 27.3 | 30.7 | 29.4 | 24 |
| 25 | 27.8 | 27.6 | 26.4 | 25.6 | 25.4 | 24.7 | 24.6 | 24.8 | 24.5 | 24.6 | 24.9 | 25.3 | 25.4 | 25.4 | 24.6 | 24.1 | 23.2 | S | 20.9 | 21.0 | 21.0 | 20.7 | 21.7 | 20.6 | 20.6 | 27.8 | 24.1 | 24 |
| 26 | 18.9 | 17.5 | 17.4 | 20.4 | 20.2 | 20.3 | 20.4 | 21.1 | 21.7 | 21.8 | 21.5 | 21.5 | 21.5 | 22.3 | 21.7 | 21.2 | S | 20.9 | 19.9 | 20.0 | 22.1 | 18.6 | 17.6 | 16.9 | 16.9 | 22.3 | 20.2 | 24 |
| 27 | 18.1 | 22.2 | 22.2 | 22.0 | 20.7 | 19.7 | 20.2 | 21.0 | 20.8 | 21.7 | 22.1 | 21.9 | 21.7 | 21.0 | 21.2 | S | 21.7 | 21.1 | 21.2 | 21.0 | 19.8 | 19.3 | 18.5 | 17.9 | 17.9 | 22.2 | 20.7 | 24 |
| 28 | 17.8 | 17.2 | 16.5 | 16.5 | 17.0 | 17.4 | 17.3 | 17.2 | 16.9 | 17.7 | 18.6 | 18.8 | 18.5 | 18.1 | S | 20.4 | 20.5 | 19.7 | 19.3 | 20.0 | 20.1 | 19.7 | 19.7 | 19.5 | 16.5 | 20.5 | 18.4 | 24 |
| 29 | 19.1 | 17.7 | 17.4 | 22.8 | 23.5 | 21.2 | 21.4 | 18.8 | 15.3 | 16.3 | 15.8 | 16.4 | 17.5 | S | 19.9 | 20.7 | 21.5 | 22.0 | 23.0 | 23.8 | 23.7 | 23.5 | 23.8 | 24.1 | 15.3 | 24.1 | 20.4 | 24 |
| 30 | 24.3 | 24.6 | 24.7 | 24.4 | 22.6 | 23.5 | 24.1 | 25.3 | 27.1 | 27.5 | 27.9 | 28.7 | S | 32.5 | 34.5 | 35.6 | 35.9 | 35.6 | 34.2 | 31.2 | 32.3 | 31.6 | 30.2 | 28.5 | 22.6 | 35.9 | 29.0 | 24 |
| 31 | 28.1 | 25.4 | 25.7 | 25.7 | 26.8 | 26.9 | 26.6 | 22.8 | 24.8 | 24.5 | 23.9 | S | 21.0 | 19.9 | 19.3 | 18.6 | 18.3 | 18.1 | 18.1 | 18.3 | 18.8 | 22.6 | 28.5 | 32.2 | 18.1 | 32.2 | 23.3 | 24 |
| HOURLY MAX | 36.8 | 36.4 | 36.3 | 39.7 | 39.0 | 38.8 | 40.8 | 41.5 | 41.5 | 41.6 | 38.9 | 37.2 | 39.2 | 39.4 | 40.3 | 40.8 | 41.1 | 41.7 | 41.7 | 41.3 | 41.0 | 40.8 | 40.6 | 39.9 | | | | |
| HOURLY AVG | 26.3 | 26.3 | 25.4 | 26.7 | 26.9 | 25.7 | 26.0 | 26.1 | 26.1 | 27.2 | 27.6 | 28.7 | 28.6 | 29.4 | 29.1 | 28.8 | 28.3 | 28.8 | 27.9 | 27.6 | 27.2 | 27.0 | 26.8 | 26.6 | | | | |

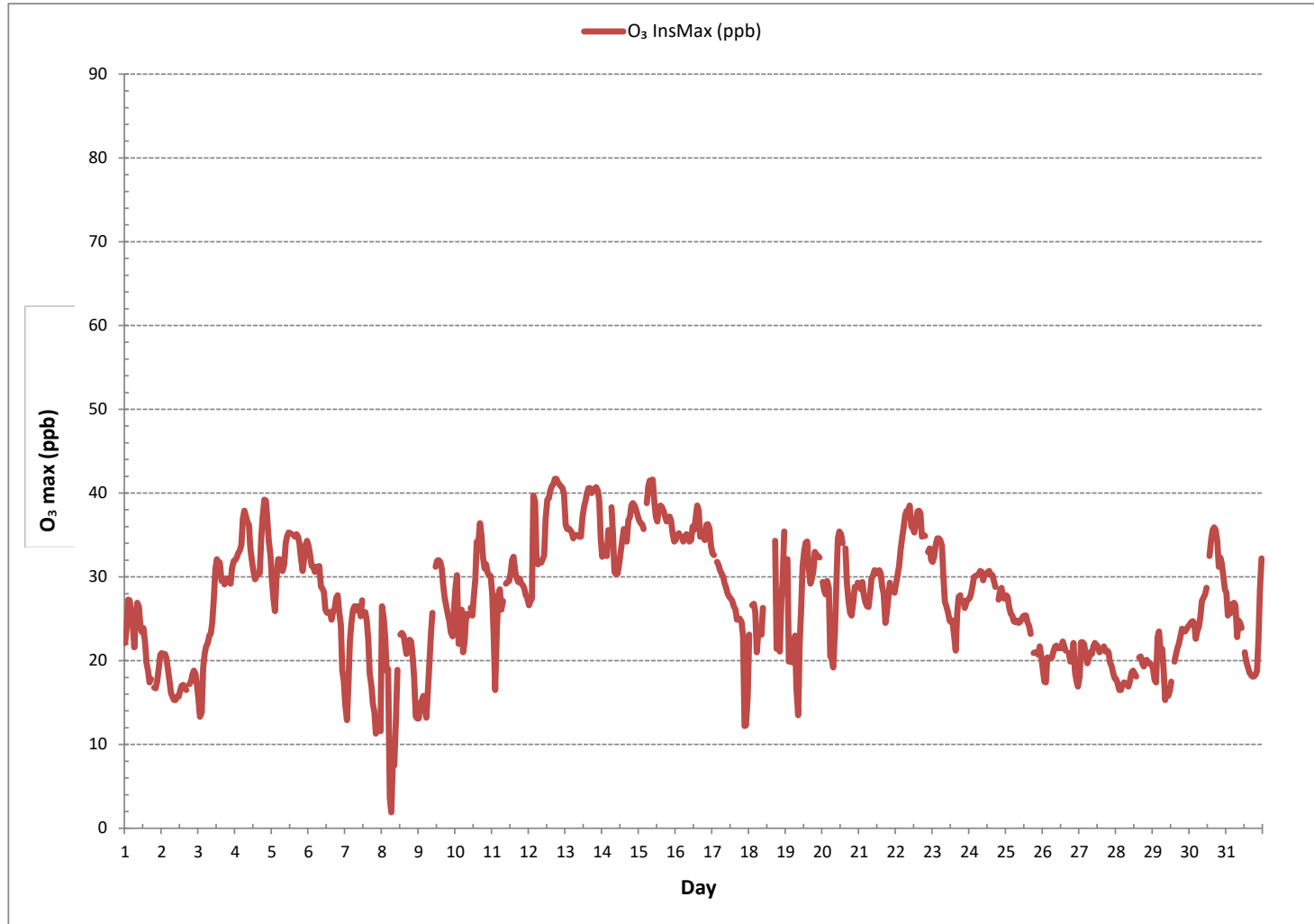
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 704 |
| MAXIMUM INSTANTANEOUS VALUE: | 41.7 ppb @ HOUR 17 ON DAY 12 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 7 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 7.1 |

OZONE Instantaneous Maximum (O₃ ppb)





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

WIND SPEED Instantaneous Maximum (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 13.0 | 13.2 | 13.6 | 12.3 | 12.5 | 15.4 | 15.8 | 20.2 | 25.4 | 27.4 | 24.3 | 37.5 | 21.7 | 13.6 | 16.0 | 20.8 | 19.5 | 21.1 | 22.6 | 22.2 | 25.0 | 25.0 | 29.0 | 34.2 | 12.3 | 37.5 | 20.9 | 24 | |
| 2 | 36.0 | 30.1 | 34.0 | 34.0 | 21.9 | 38.4 | 24.1 | 20.6 | 16.5 | 16.0 | 15.2 | 17.4 | 14.7 | 14.1 | 15.6 | 13.2 | 11.2 | 9.9 | 10.3 | 8.8 | 11.0 | 10.3 | 10.2 | 11.2 | 8.8 | 38.4 | 18.5 | 24 | |
| 3 | 12.5 | 13.4 | 14.3 | 18.1 | 19.1 | 26.7 | 23.3 | 24.6 | 26.1 | 24.8 | 28.7 | 30.9 | 27.8 | 20.8 | 25.2 | 25.0 | 30.1 | 31.8 | 36.2 | 34.4 | 35.7 | 34.0 | 34.2 | 26.3 | 12.5 | 36.2 | 26.0 | 24 | |
| 4 | 26.3 | 26.3 | 17.0 | 12.3 | 16.5 | 24.3 | 27.2 | 27.8 | 27.6 | 25.5 | 27.4 | 23.3 | 25.3 | 30.7 | 25.4 | 26.3 | 24.6 | 25.7 | 29.2 | 31.8 | 35.3 | 38.6 | 38.1 | 60.3 | 12.3 | 60.3 | 28.0 | 24 | |
| 5 | 48.5 | 53.7 | 47.6 | 50.2 | 43.7 | 38.8 | 41.2 | 37.1 | 26.3 | 25.9 | 27.8 | 20.9 | 15.8 | 17.1 | 16.3 | 14.1 | 16.7 | 14.3 | 18.2 | 21.3 | 17.8 | 11.4 | 11.4 | 10.9 | 10.9 | 53.7 | 27.0 | 24 | |
| 6 | 13.2 | 13.2 | 15.6 | 13.4 | 16.0 | 18.5 | 21.1 | 17.6 | 18.0 | 17.6 | 18.0 | 18.9 | 20.4 | 19.1 | 26.1 | 20.2 | 16.3 | 17.1 | 15.6 | 20.0 | 12.5 | 14.7 | 14.1 | 15.8 | 12.5 | 26.1 | 17.2 | 24 | |
| 7 | 15.6 | 16.0 | 18.5 | 17.8 | 19.4 | 26.6 | 26.1 | 28.3 | 31.4 | 30.7 | 28.1 | 26.8 | 21.9 | 21.5 | 23.0 | 16.0 | 14.5 | 13.4 | 13.2 | 12.5 | 11.9 | 13.4 | 17.2 | 14.5 | 11.9 | 31.4 | 19.9 | 24 | |
| 8 | 24.6 | 20.8 | 17.1 | 13.9 | 15.2 | 16.5 | 22.8 | 19.1 | 18.5 | 18.5 | 20.2 | 21.5 | 20.7 | 18.9 | 24.1 | 21.5 | 22.2 | 20.2 | 18.9 | 16.9 | 17.4 | 16.3 | 16.3 | 14.3 | 13.9 | 24.6 | 19.0 | 24 | |
| 9 | 13.8 | 14.1 | 19.1 | 14.3 | 17.8 | 17.4 | 18.1 | 21.5 | 20.6 | 18.2 | 17.6 | 16.3 | 19.7 | 17.4 | 17.1 | 15.6 | 25.0 | 23.3 | 25.2 | 25.2 | 28.7 | 25.0 | 26.1 | 23.3 | 13.8 | 28.7 | 20.0 | 24 | |
| 10 | 23.9 | 23.5 | 20.0 | 24.3 | 28.5 | 19.9 | 19.1 | 20.8 | 17.4 | 19.8 | 31.1 | 27.0 | 30.1 | 23.5 | 23.9 | 18.5 | 20.4 | 19.3 | 19.1 | 21.3 | 21.1 | 20.8 | 14.8 | 16.0 | 14.8 | 31.1 | 21.8 | 24 | |
| 11 | 14.9 | 13.4 | 12.7 | 14.9 | 15.6 | 15.4 | 18.5 | 19.5 | 26.3 | 27.4 | 30.7 | 27.9 | 27.6 | 35.5 | 33.2 | 31.8 | 32.7 | 36.6 | 31.2 | 29.6 | 21.3 | 18.5 | 18.5 | 23.5 | 12.7 | 36.6 | 24.0 | 24 | |
| 12 | 16.2 | 31.0 | 25.7 | 23.5 | 29.2 | 20.4 | 24.1 | 23.0 | 41.9 | 26.1 | 20.8 | 39.0 | 48.4 | 50.8 | 51.8 | 43.6 | 45.0 | 51.5 | 39.2 | 47.8 | 46.7 | 43.5 | 29.6 | 20.6 | 16.2 | 51.8 | 35.0 | 24 | |
| 13 | 27.6 | 23.5 | 27.0 | 26.8 | 29.4 | 24.6 | 30.1 | 31.4 | 18.6 | 20.4 | 35.3 | 47.2 | 27.6 | 35.5 | 51.5 | 45.5 | 40.6 | 25.2 | 32.7 | 25.7 | 16.7 | 16.7 | 17.6 | 13.2 | 13.2 | 51.5 | 28.8 | 24 | |
| 14 | 14.7 | 14.3 | 19.5 | 22.2 | 26.7 | 30.9 | 34.2 | 32.0 | 18.3 | 16.3 | 27.2 | 25.9 | 28.5 | 26.5 | 26.1 | 31.1 | 31.8 | 37.9 | 38.4 | 39.5 | 30.9 | 36.2 | 29.6 | 22.2 | 14.3 | 39.5 | 27.5 | 24 | |
| 15 | 22.6 | 22.6 | 21.0 | 19.5 | 20.8 | 29.8 | 35.1 | 81.2 | 72.9 | 51.0 | 37.3 | 72.9 | 76.7 | 71.0 | 61.6 | 57.2 | 55.7 | 55.0 | 56.7 | 44.7 | 40.6 | 33.1 | 27.6 | 24.3 | 19.5 | 81.2 | 45.5 | 24 | |
| 16 | 20.6 | 19.8 | 19.1 | 28.1 | 15.8 | 12.1 | 17.8 | 28.1 | 27.8 | 33.8 | 30.7 | 30.1 | 28.7 | 34.7 | 28.5 | 44.3 | 31.6 | 41.2 | 38.6 | 33.2 | 37.1 | 31.6 | 32.9 | 26.5 | 12.1 | 44.3 | 28.9 | 24 | |
| 17 | 30.1 | 27.8 | 31.2 | 29.0 | 27.6 | 26.1 | 25.2 | 21.7 | 19.8 | 19.8 | 16.5 | 19.5 | 21.9 | 25.0 | 20.6 | 15.6 | 18.5 | 18.3 | 18.2 | 19.8 | 19.5 | 21.1 | 20.2 | 21.3 | 15.6 | 31.2 | 22.3 | 24 | |
| 18 | 28.7 | 29.4 | 31.4 | 26.5 | 27.4 | 25.9 | 25.7 | 25.0 | 20.2 | 18.7 | 28.3 | 19.3 | 16.5 | 16.2 | 13.0 | 11.9 | 15.8 | 11.7 | 13.4 | 14.1 | 18.5 | 22.8 | 27.4 | 27.0 | 11.7 | 31.4 | 21.4 | 24 | |
| 19 | 23.5 | 15.1 | 14.7 | 17.8 | 14.5 | 18.9 | 22.1 | 15.2 | 14.3 | 19.8 | 21.7 | 21.3 | 28.9 | 27.8 | 21.5 | 19.1 | 22.2 | 25.0 | 25.2 | 23.7 | 18.0 | 18.4 | 16.9 | 18.4 | 14.3 | 28.9 | 20.2 | 24 | |
| 20 | 20.4 | 17.1 | 15.1 | 20.4 | 11.2 | 14.1 | 16.9 | 11.5 | 24.6 | 25.0 | 28.3 | 27.2 | 30.1 | 37.3 | X | 34.4 | 34.4 | 35.1 | 34.7 | 48.9 | 47.6 | 60.2 | 51.4 | 47.1 | 11.2 | 60.2 | 30.1 | 23 | |
| 21 | 28.1 | 14.7 | 18.5 | 23.7 | 26.3 | 32.5 | 48.0 | 50.4 | 47.6 | 51.0 | 51.5 | 50.4 | 53.5 | 55.4 | 54.6 | 47.3 | 44.5 | 54.8 | 53.9 | 53.7 | 52.8 | 53.5 | 48.9 | 53.5 | 14.7 | 55.4 | 44.5 | 24 | |
| 22 | 47.6 | 47.6 | 51.7 | 46.3 | 45.6 | 43.0 | 44.3 | 40.8 | 37.7 | 34.9 | 28.7 | 26.3 | 24.8 | 25.0 | 22.8 | 18.2 | 16.7 | 17.4 | 16.9 | 11.7 | 16.3 | 15.4 | 71.9 | 8.9 | 8.9 | 71.9 | 31.7 | 24 | |
| 23 | 10.1 | 7.3 | 10.3 | 12.5 | 14.1 | 11.7 | 15.4 | 17.4 | 20.2 | 16.3 | 17.4 | 16.9 | 18.7 | 16.3 | 19.4 | 21.5 | 22.2 | 23.3 | 23.5 | 20.6 | 17.8 | 20.9 | 19.5 | 23.0 | 7.3 | 23.5 | 17.3 | 24 | |
| 24 | 23.9 | 22.2 | 23.9 | 25.7 | 21.9 | 17.6 | 17.8 | 20.6 | 19.8 | 21.7 | 23.9 | 17.4 | 20.2 | 21.7 | 31.6 | 33.6 | 19.8 | 19.6 | 17.4 | 16.3 | 20.2 | 19.3 | 14.9 | 16.7 | 14.9 | 33.6 | 21.2 | 24 | |
| 25 | 16.5 | 14.3 | 16.1 | 15.2 | 14.7 | 12.1 | 15.6 | 14.5 | 16.9 | 21.7 | 29.4 | 19.5 | 13.2 | 15.4 | 13.0 | 12.7 | 32.3 | 32.3 | 16.0 | 15.6 | 14.7 | 14.7 | 20.0 | 25.0 | 12.1 | 32.3 | 18.0 | 24 | |
| 26 | 23.5 | 23.5 | 24.4 | 23.9 | 22.2 | 18.5 | 16.5 | 16.0 | 25.2 | 29.9 | 20.9 | 16.3 | 15.8 | 18.9 | 16.5 | 28.1 | X | 29.4 | 16.9 | 20.6 | 16.3 | 18.0 | 15.0 | 17.4 | 15.0 | 29.9 | 20.6 | 23 | |
| 27 | 15.0 | 8.2 | 14.5 | 14.7 | 15.6 | 18.5 | 20.4 | 14.7 | 12.6 | 10.4 | 12.1 | 20.4 | 25.0 | 24.4 | 25.9 | 23.3 | 17.8 | 17.4 | 19.5 | 20.0 | 14.3 | 20.8 | 16.9 | 19.5 | 8.2 | 25.9 | 17.6 | 24 | |
| 28 | 16.5 | 14.1 | 16.5 | 16.9 | 14.3 | 14.9 | 17.1 | 16.7 | 15.1 | 15.2 | 17.1 | 17.1 | 18.9 | 14.5 | 19.3 | 21.5 | 16.7 | 17.6 | 14.1 | 17.4 | 12.3 | 9.9 | 11.0 | 11.9 | 9.9 | 21.5 | 15.7 | 24 | |
| 29 | 15.4 | 15.4 | 15.0 | 30.1 | 25.2 | 25.2 | 20.2 | 18.1 | 16.9 | 17.4 | 20.7 | 24.1 | 30.5 | 29.6 | 38.4 | 49.5 | 42.5 | 48.0 | 44.8 | 42.3 | 52.4 | 48.0 | 45.6 | 44.3 | 15.0 | 52.4 | 31.7 | 24 | |
| 30 | 48.7 | 41.7 | 38.8 | 29.6 | 30.7 | 26.6 | 31.2 | 38.2 | 29.4 | 30.5 | 33.1 | 33.4 | 35.6 | 29.4 | 31.4 | 36.0 | 27.4 | 26.6 | 26.1 | 20.6 | 25.9 | 20.2 | 20.9 | 22.8 | 20.2 | 48.7 | 30.6 | 24 | |
| 31 | 15.8 | 14.3 | 14.1 | 15.6 | 15.6 | 20.2 | 15.4 | 25.9 | 28.5 | 22.8 | 26.8 | 29.4 | 33.6 | 28.3 | 27.0 | 30.9 | 29.6 | 34.7 | 29.6 | 34.2 | 32.5 | 33.8 | 34.5 | 40.8 | 14.1 | 40.8 | 26.4 | 24 | |
| HOURLY MAX | 48.7 | 53.7 | 51.7 | 50.2 | 45.6 | 43.0 | 48.0 | 81.2 | 72.9 | 51.0 | 51.5 | 72.9 | 76.7 | 71.0 | 61.6 | 57.2 | 55.7 | 55.0 | 56.7 | 53.7 | 52.8 | 60.2 | 71.9 | 60.3 | | | | | |

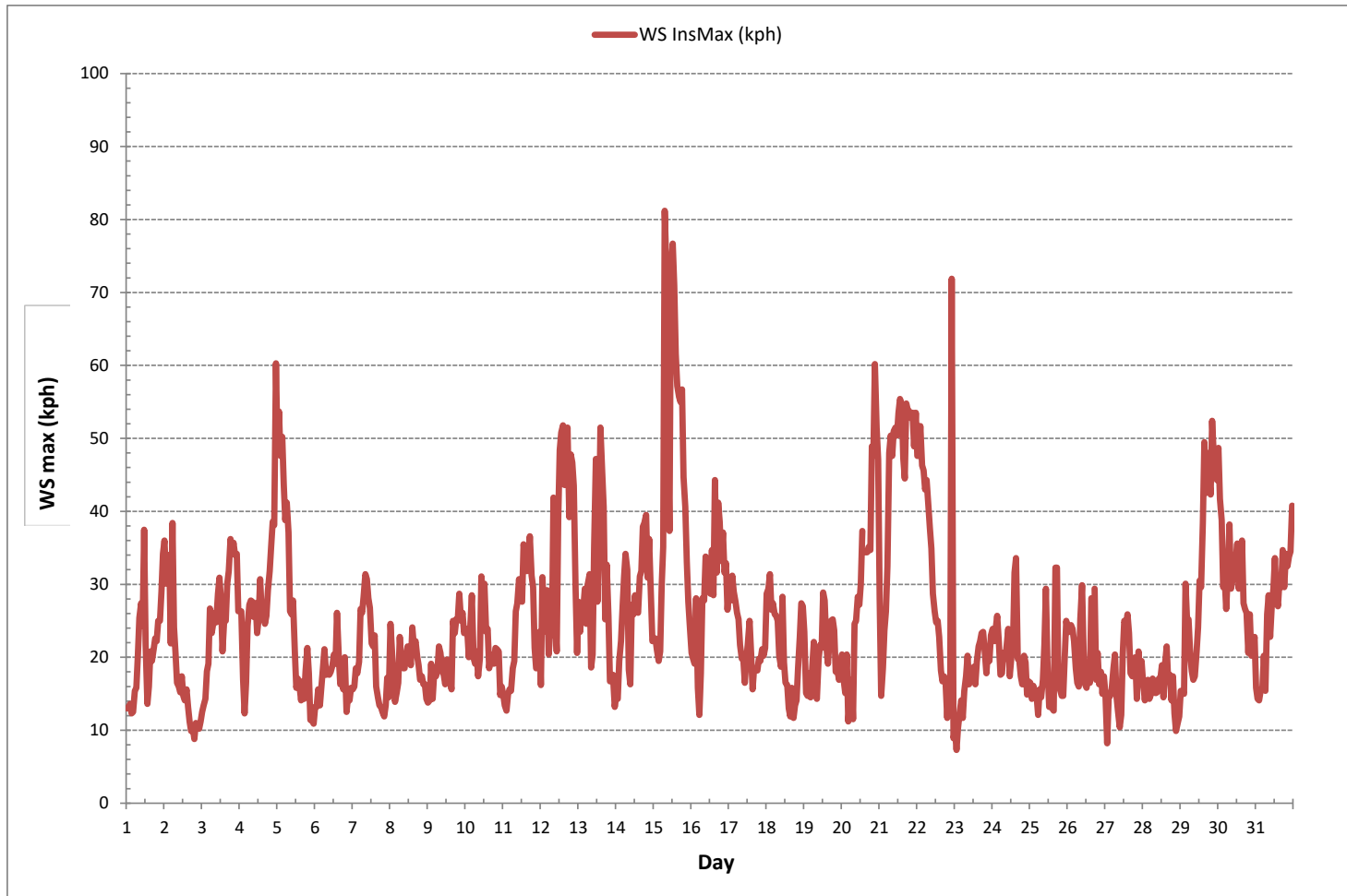
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 94.2 kph | @ HOUR | 7 | ON DAY | 15 |
| OPERATIONAL TIME: | | | | 742 | hrs |

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

| | |
|---|---|
| Alberta Airshed (if applicable) | EPA Approval or Code of Practice Registration # (if applicable) |
| YES | NA |
| Company Name (if applicable) | Industrial Operation Name (if applicable) |
| LAKELAND INDUSTRY & COMMUNITY ASSOCIATION | ST. LINA CONTINUOUS MONITORING STATION |
| Name of the Representative of the Person Responsible | Position / Title of the Representative of the Person Responsible |
| Mike Bisaga | Environment Monitoring Program Manager |
| Is an External Party Certifying the Report? | |
| <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| Name of External Person Certifying the Report | Position / Title of External Person Certifying the Report |
| Wunmi Adeganmbi | Project Team Lead, Customer Service - Air Services |
| Company Name for External Person Certifying the Report | Identification of Qualifications / Professional Designations of the External Person Certifying the Report |
| Maxxam Analytics, A Bureau Veritas Group Company | M.Sc., EPt., PMP |

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the External Person Certifying the Report

30- Jan - 2019

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2018-12-25-C</u> |
| Site: <u>St. Lina Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

| | | |
|----------------------------------|--------------------------|----------------------------|
| Level 0 Preliminary Verification | <u><i>bimadeniji</i></u> | Date <u>23- Jan - 2019</u> |
| Level 1 Primary Validation | <u><i>bimadeniji</i></u> | Date <u>23- Jan - 2019</u> |
| Level 2 Final Validation | <u><i>bimadeniji</i></u> | Date <u>29- Jan - 2019</u> |
| Level 3 Independent Data Review | <u><i>MA dmh</i></u> | Date <u>30- Jan - 2019</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 10, 2019

Subject: Monthly Report Submission for the LICA Bonnyville East station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Bonnyville East AQM Station in the month of December 2018.

The air monitoring program consists of continuous air monitoring, intermittent sampling and NMHC canister sampling. The continuous air monitoring includes the monitoring of ambient 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 intermittent sampling includes both VOC and PAH sampling program.

| 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 |
| NMHC Canister | Maxxam Analytics | InnoTech Alberta Inc | InnoTech Alberta Inc | Not Applicable |

This monthly report only contains the continuous ambient air data. The intermittent results and NMHC canister results are reported in the quarterly integrated sampling report.

All data collected in December 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

Canister System: A canister event was recorded on December 10 at 05:05, at an initial concentration of 0.39 ppm. The sample results will be provided in the 2019, Q1 integrated sampling report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Due to issues on the Alberta's Ambient Air Quality Data Warehouse, data submission cannot be performed at the time when the monthly report is completed. We are working with the airdata warehouse for the troubleshooting as well as



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

setting up codes for some VOC/PAH species that are missing in the parameter list. The results for these data will be submitted once issues are resolved and all needed codes are available.

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

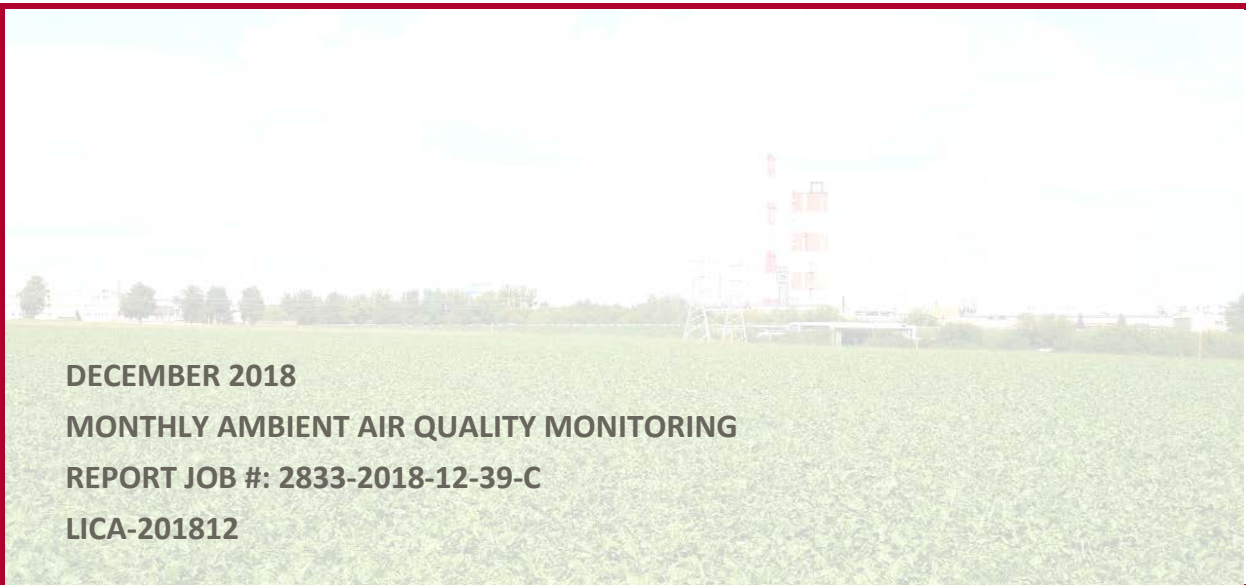
Respectfully,

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

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

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca



DECEMBER 2018
MONTHLY AMBIENT AIR QUALITY MONITORING
REPORT JOB #: 2833-2018-12-39-C
LICA-201812

Prepared for:

Lakeland Industry & Community Association
Mike Bisaga
 5107 50 St.
 Bonnyville, Alberta T9N 2J7

Monitoring Station

Bonnyville East Continuous Monitoring Station
EPEA Approval Number N/A

Date of Report Issuance: February 1, 2019

Report Preparation By: **Reviewed By:**

| | |
|--|--|
| <p>Bim Adeniji, M.Sc. 403-219-3677 aadeniji@maxxam.ca</p> | <p>Wunmi Adekanmbi, M.Sc., EPT, PMP 403-219-3661 aadekanmbi@maxxam.ca</p> |
| <p><i>Bimadeniji</i></p> | <p><i>Wunmi Adekanmbi</i></p> |

Project Manager, Customer Service, Air Services

Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

SUMMARY

In December 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville East 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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

Canister System: A canister event was recorded on December 10 at 05:05, at an initial concentration of 0.39 ppm. The sample was processed for analysis by InnoTech and the results will be provided in the 2019, Q1 integrated report.

H₂S: Thirty-three hours of downtime were recorded across the month due to drifts in span response and the consequent corrective actions performed.

NO_x/NO/NO₂: Sixteen hours of downtime were recorded between December 20 and December 30 due to biased high drifts in span response and the consequent corrective actions performed.

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 East Continuous Monitoring Station.

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

Monthly Continuous Data Summary

| Lakeland Industry & Community Association | | | | | | MAXIMUM VALUES | | | | | | | OPERATIONAL TIME (%) |
|---|------------|-------|-------------|-------|-----------------|----------------|-----|------|------------------|-------------------------|---------|-----|----------------------|
| Bonnyville East 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 | 4 | 8 | 13 | 11.4 | WSW | 2 | 8 | 100.0 |
| H ₂ S (ppb) | 10 | 3 | 0 | 0 | 0 | 5 | 11 | 5 | 6.6 | SSE | 1 | 9 | 95.6 |
| THC (ppm) | - | - | - | - | 2.23 | 5.54 | 23 | 5 | 3.6 | ENE | 3.02 | 10 | 100.0 |
| CH ₄ (ppm) | - | - | - | - | 2.21 | 5.41 | 23 | 5 | 3.6 | ENE | 2.93 | 10 | 100.0 |
| NMHC (ppm) | - | - | - | - | 0.01 | 0.22 | 10 | 5 | 2.6 | N | 0.09 | 9 | 100.0 |
| NO ₂ (ppb) | 159 | - | 0 | - | 5 | 29 | 10 | 7 | 7.6 | WNW | 16 | 10 | 97.8 |
| NO (ppb) | - | - | - | - | 1 | 27 | 18 | 11 | 3.0 | SSW | 7 | 18 | 97.8 |
| NO _x (ppb) | - | - | - | - | 6 | 46 | 10 | 7 | 7.6 | WNW | 23 | 18 | 97.8 |
| O ₃ (ppb) | 82 | - | 0 | - | 23.3 | 40.8 | 12 | 20 | 21.2 | WSW | 36.2 | 13 | 100.0 |
| PM _{2.5} (µg/m ³) | 80 | 29 | 0 | 0 | 7 | 24 | 26 | 23 | 5.9 | WNW | 15 | 8 | 100.0 |
| VECTOR WS (kph) | - | - | - | - | 1.8 | 42.0 | 15 | 12 | - | WNW | 20.1 | 21 | 100.0 |
| VECTOR WD (sec) | - | - | - | - | 266 (W) | - | - | - | - | - | - | - | 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 29 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), 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 sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on December 10.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 95.6%, equivalent to 33 hours of downtime.
- The routine monthly calibration was performed on December 7.
- The analyzer spanned outside the upper acceptance limit on December 11. An additional zero-span check performed at hour 09:00 on the same day exhibited a similar response, prompting an immediate site visit. Following a successful repeat calibration, the analyzer's orifice was cleaned; and the sample pump was dis-assembled, inspected and subsequently rebuilt. The analyzer was left offline to stabilize overnight and a successful post-repair calibration was completed on December 12. Twenty-five hours of downtime were recorded due to this event.
- Span response started to trend again towards the upper acceptance limit about a week after the December 12 calibration, prompting another site visit. On December 21, following a successful shut-down calibration, the internal sample pump was by-passed and an external sample pump was installed. A successful post-repair calibration was subsequently completed. Seven hours of downtime were recorded due to this event.
- The expected span value was updated after the post-repair calibration on December 21 and was re-adjusted on Dec 22, following the daily zero-span check.
- The daily span result exceeded the lower acceptance limit on December 31. The result of a repeat zero-span check triggered later that day was within limits, but still displayed a biased low drift. A successful monthly calibration was subsequently completed on January 4 and improved span results were recorded afterwards. One hour of downtime was incurred due to the additional quality check.

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 December 7.
- An anomalous spike in CH₄/CH₄max concentration was recorded on December 13 at hour 15:00, due to a communication error between the analyzer and datalogger. Minute concentrations recorded for THC/CH₄/NMHC at 15:25 were therefore excluded, along with the corresponding maximum instantaneous data; and the hourly average was subsequently re-calculated.
- 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.
- A canister event was recorded on December 10 at 05:05, at an initial concentration of 0.39 ppm. The sample was processed for analysis by InnoTech and the results will be provided in the 2019, Q1 integrated report.

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

- Operational time for the monitoring period was 97.8%, equivalent to 16 hours of downtime.
- The routine monthly calibration was performed on December 10.
- The analyzer exhibited a biased high drift in span response on December 19. A repeat zero-span check triggered on December 20, at hour 8:00 displayed a similar response. The result of the next scheduled zero-span check exceeded the upper acceptance limit, prompting an immediate site visit. On December 21, following a successful shut-down calibration, an external sample pump was installed to by-pass the internal pump. A successful post-repair calibration was subsequently completed. Nine hours of downtime were attributed to the additional quality checks.
- The span result exceeded the upper acceptance limit again on December 29. A repeat zero-span performed on December 30, at hour 7:00, yielded similar results. A technician was immediately dispatched to site to complete a repeat multi-point calibration. The calibration results met AMD requirements. Seven hours of downtime were incurred due to this event.

OZONE (O₃)

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

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The routine monthly check was performed on December 10.

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

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

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

All data collected this month 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.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

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-00013: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43I-TLE UV Fluorescent Analyzer
- Hydrogen Sulphide - Thermo 450i UV Fluorescent Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo SHARP 5030i Unit
- Wind System - RM Young Unit
- Datalogger - Envista Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

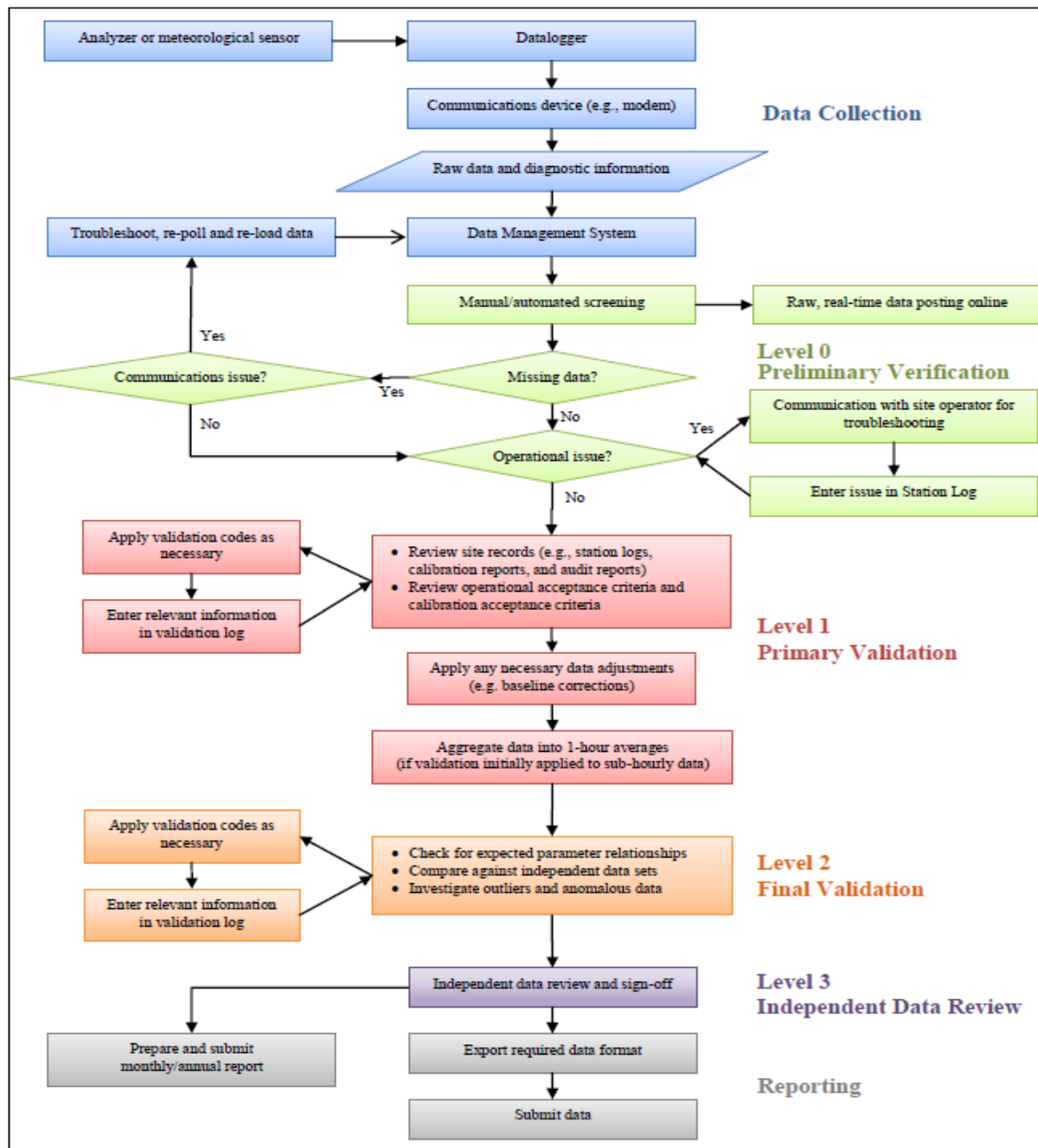
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

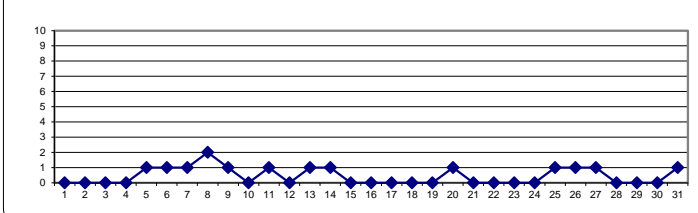
OBJECTIVE LIMIT:

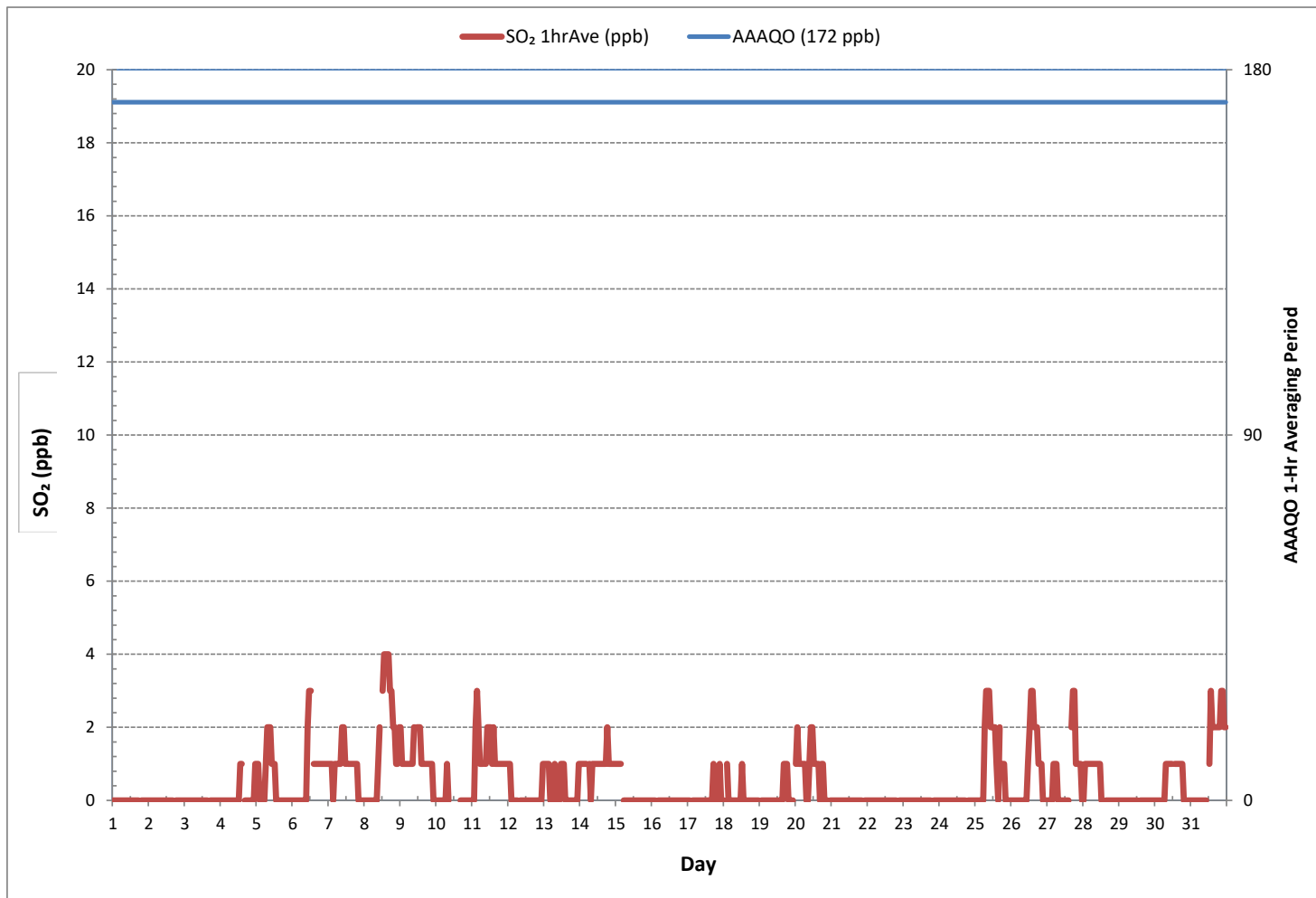
| | | | | | | |
|----------------------|------|-----|-----|-------|----|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 172 | ppb | 24-HR | 48 | ppb |
|----------------------|------|-----|-----|-------|----|-----|

MONTHLY SUMMARY

| | | | |
|------------------------------|--------------|-----------------------|---------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | |
| NUMBER OF NON-ZERO READINGS: | 226 | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 ON DAY | 1 |
| MAXIMUM 1-HR AVERAGE: | 4 ppb @ HOUR | 13 ON DAY | 8 |
| MAXIMUM 24-HR AVERAGE: | 2 ppb | ON DAY | 8 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 1 | MONTHLY AVERAGE: | 0 ppb |

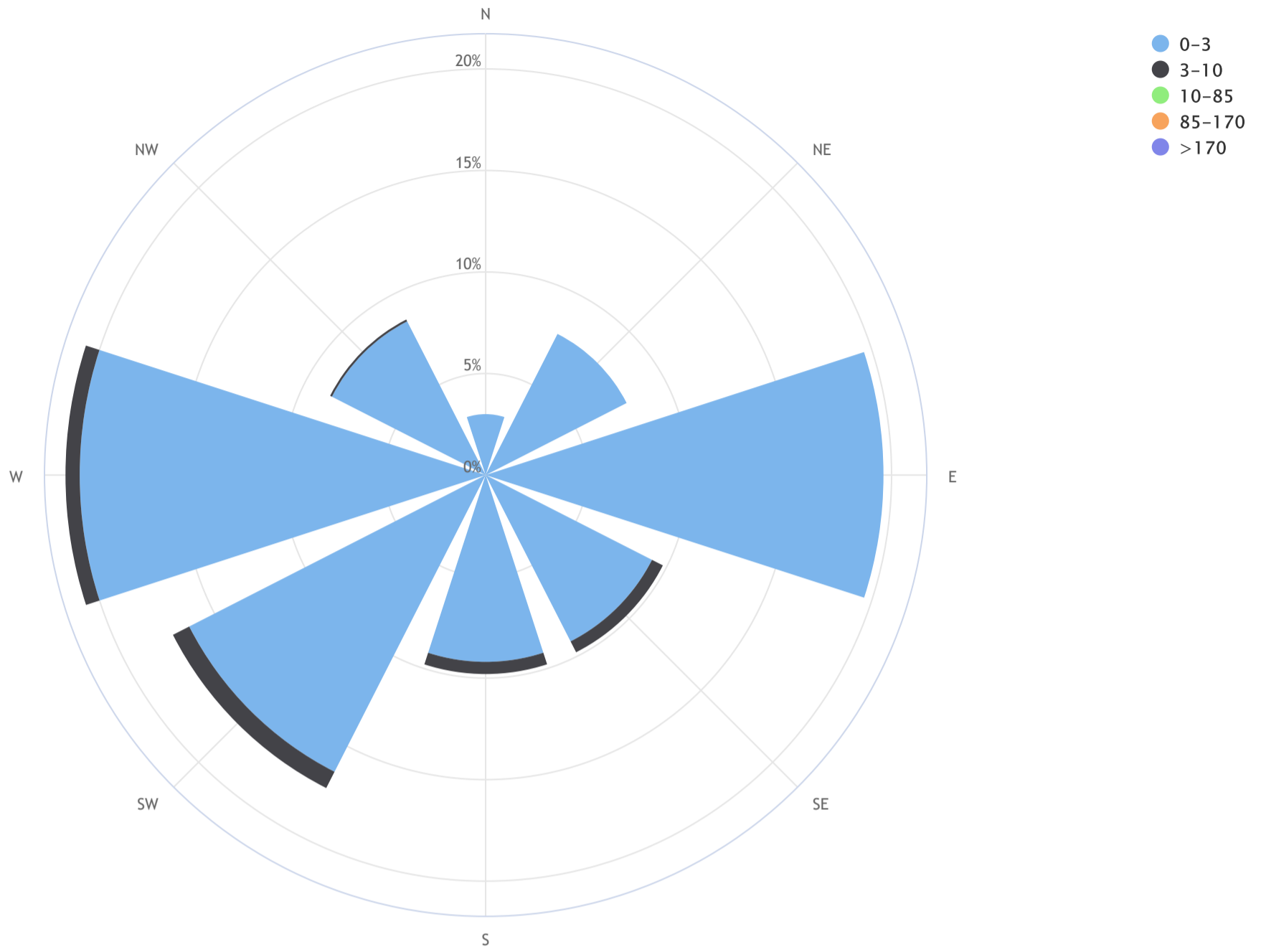
24 HR AVERAGES December 2018





Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_SO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.4_CALM % = 3.5%



| Direction | 0-3 | 3-10 | 10-85 | 85-170 | >170 | TOTAL |
|-----------|------|------|-------|--------|------|-------|
| N | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| NE | 7.8 | 0.0 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 19.6 | 0.0 | 0.0 | 0.0 | 0.0 | 19.6 |
| SE | 9.2 | 0.6 | 0.0 | 0.0 | 0.0 | 9.8 |
| S | 9.2 | 0.6 | 0.0 | 0.0 | 0.0 | 9.8 |
| SW | 16.4 | 0.9 | 0.0 | 0.0 | 0.0 | 17.3 |
| W | 20.0 | 0.7 | 0.0 | 0.0 | 0.0 | 20.7 |
| NW | 8.5 | 0.1 | 0.0 | 0.0 | 0.0 | 8.6 |
| Summary | 93.6 | 2.8 | 0.0 | 0.0 | 0.0 | 96.5 |
| CALM | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 |

SO2[ppb] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | | | | | | | | | | | | | | | | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | | | | | | | | | | | | | | | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 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 | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C | C | C | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | S | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 2 | 1 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 11 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 3 | S | S1 | 0 | 0 | 0 | 0 | C1 | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | 0 | 0 | 5 | 1 | 13 | | | | | | | | | | | | | | | | | | | | | |
| 12 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | | | | | | | | | | | | | | | | | | | | | |
| 13 | 0 | 0 | 0 | 0 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 14 | 0 | 0 | 2 | 2 | 1 | S | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 3 | 4 | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 0 | 4 | 1 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 15 | 1 | 2 | 1 | 1 | S | 0 | 0 | 0 | 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 | S | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 17 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 18 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 19 | S | 0 | 1 | 1 | 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 | | | | | | | | | | | | | | | | | | | | | |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 2 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 21 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C1 | C1 | Y | C1 | C1 | C1 | C1 | 1 | 0 | S | 0 | 0 | 0 | 0 | 1 | 0 | 17 | | | | | | | | | | | | | | | | | | | | | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 23 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 24 | 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 | | | | | | | | | | | | | | | | | | | | | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 28 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 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 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | | | | | | | | | | | | | | | | | | | | | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | S1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | | | | | | | | | | | | | | | | | | | | | |
| HOURLY MAX | 1 | 2 | 2 | 2 | 1 | 5 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 2 | 3 | 4 | 1 | 2 | 1 | 1 | 3 | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOURLY AVG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |

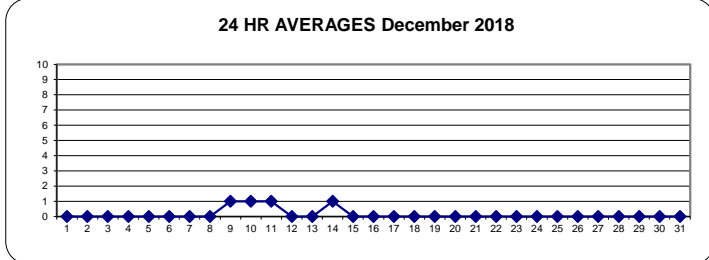
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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:

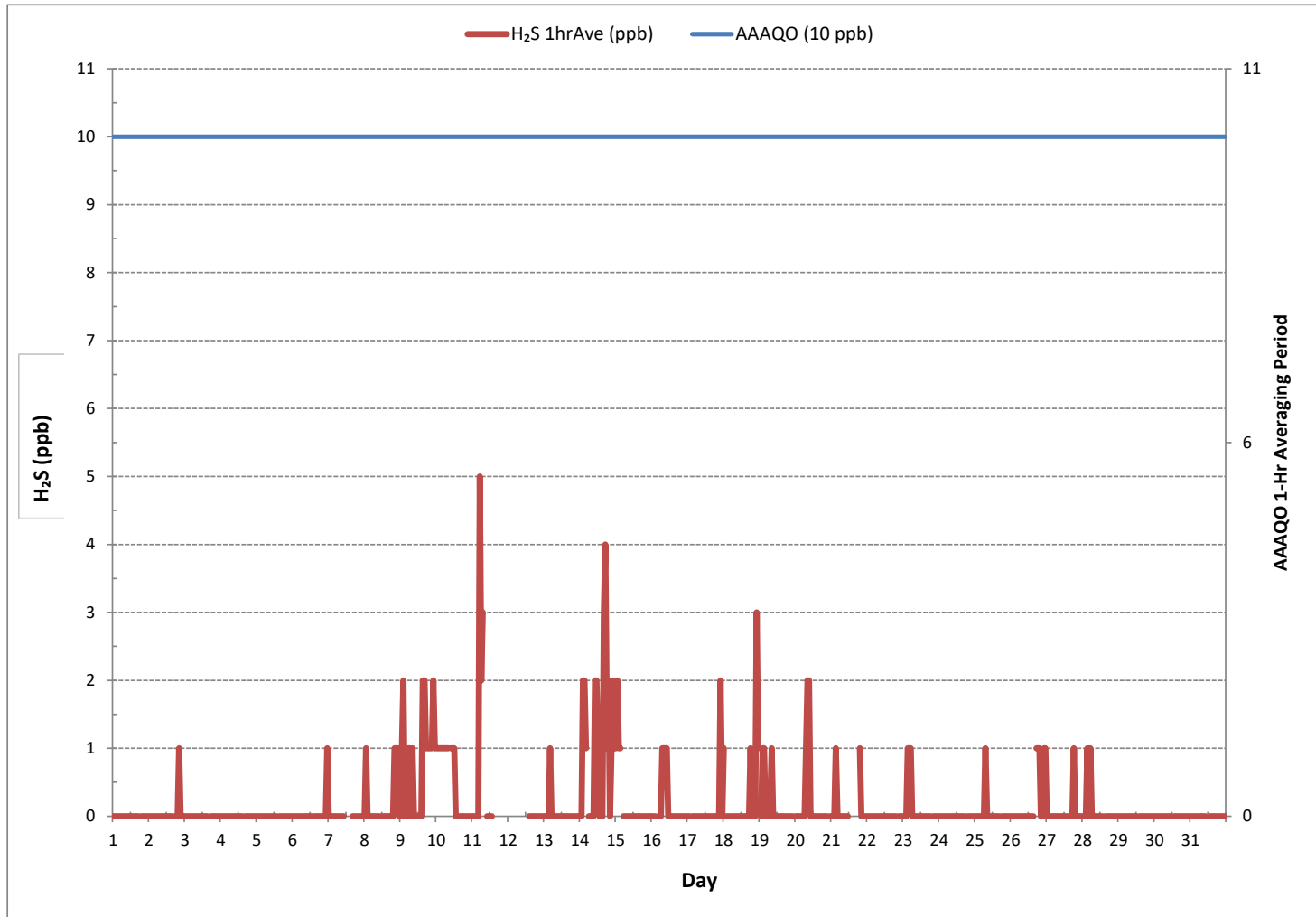
| | | | | | | |
|----------------------|------|----|-----|-------|---|-----|
| ALBERTA ENVIRONMENT: | 1-HR | 10 | ppb | 24-HR | 3 | ppb |
|----------------------|------|----|-----|-------|---|-----|

24 HR AVERAGES December 2018



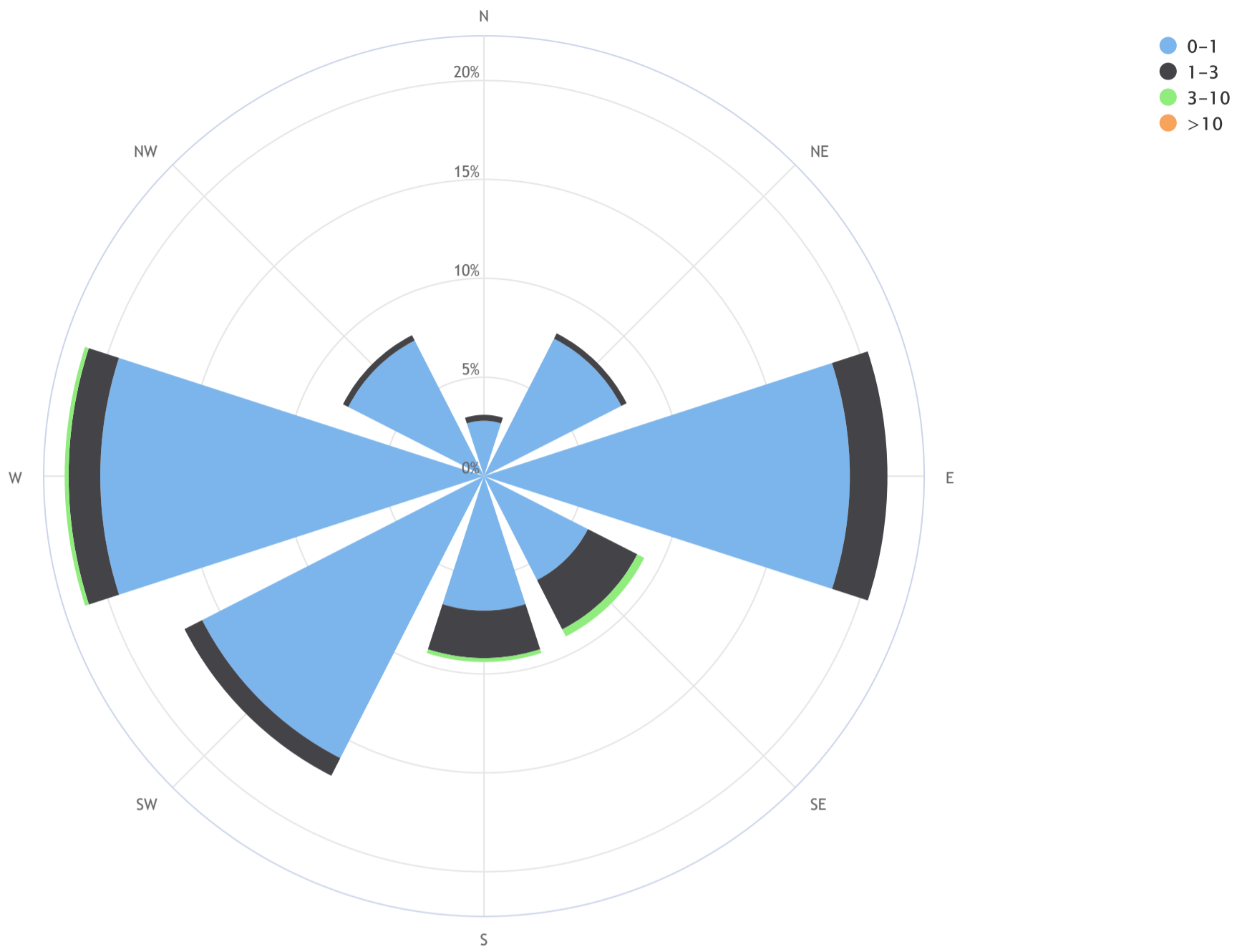
MONTHLY SUMMARY

| | | | | | |
|------------------------------|--------------|-----|-----------------------|------|-----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | | |
| NUMBER OF NON-ZERO READINGS: | 82 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb @ HOUR | 0 | ON DAY | 1 | |
| MAXIMUM 1-HR AVERAGE: | 5 ppb @ HOUR | 5 | ON DAY | 11 | |
| MAXIMUM 24-HR AVERAGE: | 1 ppb | | ON DAY | 9 | |
| IZS CALIBRATION TIME: | 30 | hrs | OPERATIONAL TIME: | 711 | hrs |
| MONTHLY CALIBRATION TIME: | 5 | hrs | AMD OPERATION UPTIME: | 95.6 | % |
| STANDARD DEVIATION: | 1 | | MONTHLY AVERAGE: | 0 | ppb |



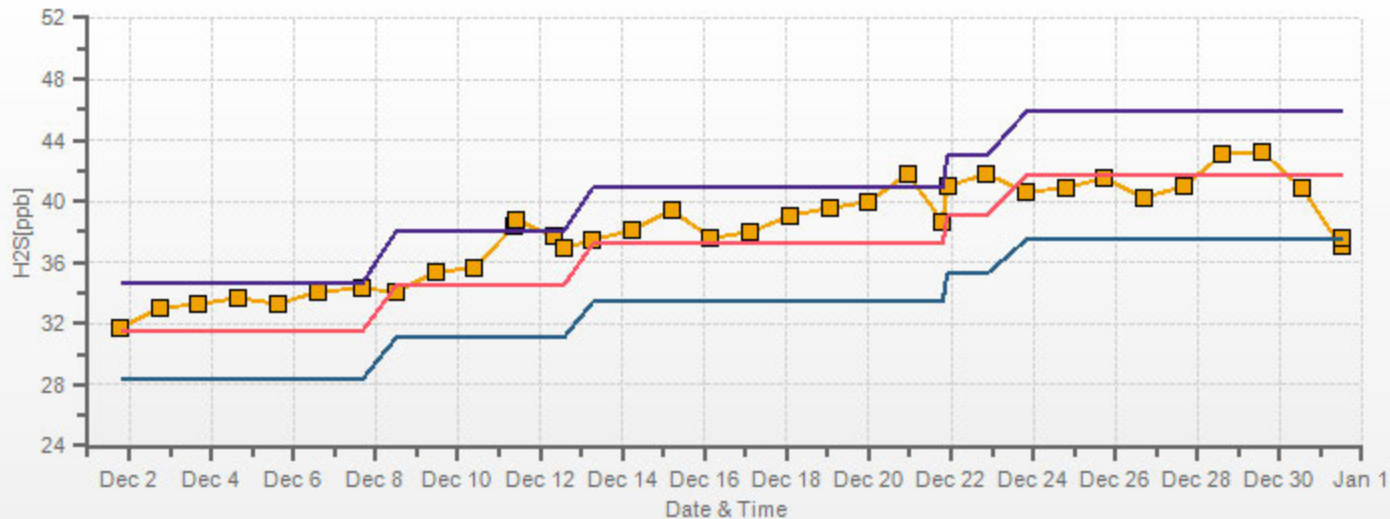
Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_H₂S (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.2_CALM % = 3.7%



| Direction | 0-1 | 1-3 | 3-10 | >10 | TOTAL |
|----------------|-------------|-------------|------------|------------|-------------|
| N | 2.8 | 0.3 | 0.0 | 0.0 | 3.1 |
| NE | 7.8 | 0.3 | 0.0 | 0.0 | 8.1 |
| E | 18.5 | 1.9 | 0.0 | 0.0 | 20.4 |
| SE | 5.9 | 2.8 | 0.4 | 0.0 | 9.2 |
| S | 6.8 | 2.4 | 0.2 | 0.0 | 9.3 |
| SW | 16.0 | 1.0 | 0.0 | 0.0 | 17.0 |
| W | 19.4 | 1.6 | 0.2 | 0.0 | 21.2 |
| NW | 7.7 | 0.3 | 0.0 | 0.0 | 8.0 |
| Summary | 84.9 | 10.7 | 0.7 | 0.0 | 96.3 |
| CALM | 3.0 | 0.7 | 0.0 | 0.0 | 3.7 |

H2S[ppb] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



TOTAL HYDROCARBON



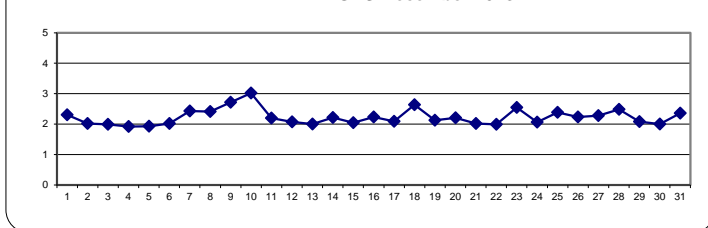
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

| 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 | 2.90 | 3.00 | 3.06 | 2.74 | 2.20 | 2.60 | 2.54 | 2.43 | 2.34 | 2.29 | 2.27 | 2.19 | 2.15 | 2.12 | 2.07 | 2.07 | 2.10 | 2.12 | S | 2.03 | 2.01 | 1.99 | 1.97 | 1.98 | 1.97 | 3.06 | 2.31 | 2.4 | |
| 2 | 1.97 | 1.97 | 1.98 | 1.99 | 2.02 | 2.04 | 2.03 | 2.06 | 2.06 | 2.06 | 2.03 | 2.03 | 2.04 | 2.01 | 2.04 | 2.02 | 2.01 | S | 2.02 | 2.08 | 2.00 | 1.96 | 1.98 | 2.01 | 1.96 | 2.08 | 2.02 | 2.4 | |
| 3 | 2.04 | 2.08 | 2.19 | 2.25 | 2.18 | 2.11 | 2.03 | 1.97 | 1.98 | 1.99 | 1.95 | 1.95 | 1.95 | 1.92 | 1.92 | 1.93 | S | 1.91 | 1.91 | 1.92 | 1.92 | 1.93 | 1.93 | 1.92 | 1.91 | 2.25 | 1.99 | 2.4 | |
| 4 | 1.93 | 1.92 | 1.92 | 1.91 | 1.91 | 1.93 | 1.93 | 1.92 | 1.91 | 1.91 | 1.90 | 1.90 | 1.92 | 1.92 | 1.94 | S | 1.96 | 1.95 | 1.94 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 | 1.96 | 1.90 | 1.96 | 1.92 | 2.4 |
| 5 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.92 | 1.93 | 1.93 | 1.93 | 1.94 | 1.94 | 1.93 | 1.93 | 1.93 | 1.92 | S | 1.93 | 1.93 | 1.92 | 1.92 | 1.94 | 1.96 | 1.94 | 1.95 | 1.94 | 1.92 | 1.96 | 1.93 | 2.4 |
| 6 | 1.94 | 1.94 | 1.95 | 1.95 | 1.95 | 1.97 | 1.98 | 1.98 | 2.02 | 1.98 | 1.99 | 2.01 | 2.04 | S | 2.04 | 2.05 | 2.08 | 2.06 | 2.09 | 2.11 | 2.06 | 2.09 | 2.09 | 2.08 | 1.94 | 2.11 | 2.02 | 2.4 | |
| 7 | 2.09 | 2.27 | 2.37 | 2.40 | 2.37 | 2.27 | 2.48 | 2.66 | 2.58 | 2.46 | 2.44 | 2.40 | S | 2.22 | C | C | C | 2.39 | 2.53 | 2.55 | 2.59 | 2.57 | 2.51 | 2.51 | 2.09 | 2.66 | 2.43 | 2.4 | |
| 8 | 2.50 | 2.74 | 2.50 | 2.76 | 2.80 | 2.69 | 2.72 | 2.63 | 2.49 | 2.42 | 2.33 | S | 2.30 | 2.18 | 2.13 | 2.18 | 2.18 | 2.18 | 2.26 | 2.30 | 2.21 | 2.23 | 2.27 | 2.34 | 2.36 | 2.13 | 2.80 | 2.41 | 2.4 |
| 9 | 2.33 | 2.43 | 2.44 | 2.47 | 2.39 | 2.46 | 2.46 | 2.46 | 2.51 | 2.41 | S | 2.66 | 2.63 | 2.63 | 2.65 | 2.77 | 2.83 | 2.88 | 3.08 | 3.13 | 3.23 | 3.26 | 3.27 | 3.23 | 2.33 | 3.27 | 2.72 | 2.4 | |
| 10 | 3.52 | 4.07 | 4.18 | 3.85 | 3.62 | 3.93 | 3.99 | 3.58 | 3.38 | S | 3.43 | 3.33 | 3.25 | 3.15 | 2.94 | 2.55 | 2.27 | 2.22 | 2.11 | 2.02 | 2.02 | 2.02 | 1.99 | 1.98 | 1.98 | 4.18 | 3.02 | 2.4 | |
| 11 | 2.01 | 2.02 | 2.05 | 2.03 | 2.05 | 2.12 | 2.10 | 2.16 | S | 2.37 | 2.21 | 2.20 | 2.17 | 2.17 | 2.22 | 2.22 | 2.21 | 2.22 | 2.29 | 2.29 | 2.33 | 2.36 | 2.37 | 2.46 | 2.01 | 2.46 | 2.20 | 2.4 | |
| 12 | 2.48 | 2.33 | 2.30 | 2.29 | 2.29 | 2.27 | 2.21 | S | 1.98 | 1.99 | 2.00 | 1.99 | 1.97 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.95 | 1.95 | 1.94 | 2.48 | 2.07 | 2.4 | |
| 13 | 1.97 | 1.97 | 1.95 | 1.99 | 2.03 | 2.07 | S | 2.20 | 2.08 | 2.03 | 2.00 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | 1.96 | 1.97 | 1.96 | 1.96 | 1.99 | 1.95 | 2.20 | 2.00 | 2.4 | |
| 14 | 2.01 | 2.01 | 2.01 | 2.04 | 2.18 | S | 2.30 | 2.51 | 2.22 | 2.24 | 2.30 | 2.24 | 2.36 | 2.36 | 2.25 | 2.31 | 2.31 | 2.34 | 2.23 | 2.16 | 2.13 | 2.16 | 2.14 | 2.01 | 2.51 | 2.51 | 2.22 | 2.4 | |
| 15 | 2.15 | 2.26 | 2.70 | 2.31 | S | 2.11 | 2.06 | 2.05 | 2.08 | 1.95 | 1.95 | 1.95 | 1.94 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.96 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 1.94 | 2.70 | 2.05 | 2.4 | |
| 16 | 2.01 | 2.03 | 2.05 | S | 2.02 | 2.07 | 2.04 | 2.18 | 3.81 | 3.39 | 2.98 | 2.31 | 2.09 | 2.03 | 2.03 | 2.00 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.01 | 2.03 | 2.05 | 2.00 | 3.81 | 2.23 | 2.4 | |
| 17 | 2.05 | 2.06 | S | 2.05 | 2.06 | 2.04 | 2.05 | 2.04 | 2.03 | 2.03 | 2.17 | 2.10 | 2.04 | 2.04 | 2.08 | 2.09 | 2.16 | 2.13 | 2.11 | 2.09 | 2.12 | 2.12 | 2.14 | 2.18 | 2.03 | 2.18 | 2.09 | 2.4 | |
| 18 | 2.29 | S | 3.23 | 2.86 | 2.62 | 2.66 | 2.70 | 2.61 | 2.65 | 2.70 | 2.83 | 2.73 | 2.66 | 2.52 | 2.51 | 2.55 | 2.59 | 2.56 | 2.55 | 2.62 | 2.70 | 2.52 | 2.56 | 2.52 | 2.29 | 3.23 | 2.64 | 2.4 | |
| 19 | S | 2.21 | 2.36 | 2.42 | 2.35 | 2.19 | 2.17 | 2.23 | 2.27 | 2.22 | 2.18 | 2.10 | 2.04 | 2.03 | 2.03 | 2.05 | 2.04 | 2.04 | 2.03 | 2.01 | 1.99 | 1.99 | S | 1.99 | 2.42 | 2.13 | 2.4 | | |
| 20 | 2.03 | 2.06 | 2.05 | 2.05 | 2.04 | 2.04 | 2.04 | 2.14 | 2.14 | 2.36 | 2.45 | 2.86 | 2.73 | 2.50 | 2.22 | 2.15 | 2.19 | 2.12 | 2.17 | 2.16 | 2.15 | 2.11 | S | 2.04 | 2.03 | 2.86 | 2.21 | 2.4 | |
| 21 | 2.04 | 2.03 | 2.02 | 2.03 | 2.06 | 2.06 | 2.14 | 2.17 | 2.15 | 2.06 | 1.99 | 1.97 | 1.98 | 1.99 | 1.98 | 1.97 | 1.98 | 1.99 | 1.99 | 1.97 | 1.97 | S | 1.97 | 1.98 | 1.97 | 2.17 | 2.02 | 2.4 | |
| 22 | 1.97 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 | 1.98 | 1.97 | 1.96 | 1.96 | 1.97 | 1.97 | 1.97 | 2.01 | 2.00 | 2.02 | 2.04 | S | 2.09 | 2.08 | 2.06 | 1.96 | 2.09 | 1.99 | 2.4 | |
| 23 | 2.07 | 2.10 | 2.13 | 2.92 | 5.46 | 5.54 | 3.30 | 2.95 | 2.75 | 2.31 | 2.18 | 2.18 | 2.13 | 2.09 | 2.07 | 2.08 | 2.11 | 2.09 | 2.09 | S | 2.07 | 2.05 | 2.02 | 2.03 | 2.02 | 5.54 | 2.55 | 2.4 | |
| 24 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.06 | 2.09 | 2.16 | 2.06 | 2.06 | 2.05 | 2.03 | 2.01 | 1.99 | 2.01 | 2.03 | 2.07 | 2.11 | S | 2.18 | 2.14 | 2.13 | 2.13 | 2.10 | 1.99 | 2.18 | 2.06 | 2.4 | |
| 25 | 2.15 | 2.15 | 2.14 | 2.12 | 2.19 | 2.26 | 2.42 | 2.54 | 2.54 | 2.51 | 2.49 | 2.46 | 2.44 | 2.40 | 2.38 | 2.39 | 2.42 | S | 2.43 | 2.44 | 2.46 | 2.50 | 2.52 | 2.55 | 2.12 | 2.55 | 2.39 | 2.4 | |
| 26 | 2.49 | 2.30 | 2.11 | 2.09 | 2.06 | 2.06 | 2.06 | 2.07 | 2.12 | 2.07 | 2.09 | 2.10 | 2.11 | 2.09 | 2.09 | S | 2.12 | 2.16 | 2.36 | 2.25 | 2.25 | 3.44 | 2.65 | 2.06 | 3.44 | 2.23 | 2.4 | | |
| 27 | 2.21 | 2.20 | 2.20 | 2.22 | 2.36 | 2.35 | 2.37 | 2.47 | 2.33 | 2.19 | 2.22 | 2.21 | 2.21 | 2.20 | 2.21 | S | 2.20 | 2.21 | 2.29 | 2.30 | 2.35 | 2.42 | 2.40 | 2.41 | 2.19 | 2.47 | 2.28 | 2.4 | |
| 28 | 2.43 | 2.47 | 2.45 | 2.51 | 2.48 | 2.47 | 2.45 | 2.46 | 2.51 | 2.73 | 2.89 | 2.73 | 2.64 | 2.57 | S | 2.39 | 2.42 | 2.37 | 2.38 | 2.39 | 2.43 | 2.39 | 2.25 | 2.25 | 2.25 | 2.89 | 2.48 | 2.4 | |
| 29 | 2.23 | 2.24 | 2.22 | 2.17 | 2.16 | 2.15 | 2.18 | 2.14 | 2.10 | 2.06 | 2.04 | 2.07 | 2.04 | S | 2.03 | 2.02 | 2.03 | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.24 | 2.08 | 2.4 |
| 30 | 2.00 | 1.99 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | S | 2.03 | 2.00 | 1.99 | 1.98 | 2.00 | 2.02 | 2.02 | 2.01 | 2.03 | 2.08 | 2.09 | 1.98 | 2.09 | 2.00 | 2.4 | |
| 31 | 2.09 | 2.14 | 2.16 | 2.16 | 2.21 | 2.13 | 2.59 | 3.40 | 2.77 | 2.59 | 2.32 | S | 2.34 | 2.35 | 2.31 | 2.31 | 2.29 | 2.28 | 2.33 | 2.29 | 2.26 | 2.28 | 2.31 | 2.32 | 2.09 | 3.40 | 2.36 | 2.4 | |
| HOURLY MAX | 3.52 | 4.07 | 4.18 | 3.85 | 5.46 | 5.54 | 3.99 | 3.58 | 3.81 | 3.39 | 3.43 | 3.33 | 3.25 | 3.15 | 2.94 | 2.77 | 2.83 | 2.88 | 3.08 | 3.13 | 3.23 | 3.26 | 3.44 | 3.23 | | | | | |
| HOURLY AVG | 2.20 | 2.23 | 2.29 | 2.28 | 2.33 | 2.35 | 2.31 | 2.34 | 2.32 | 2.24 | 2.25 | 2.23 | 2.20 | 2.18 | 2.15 | 2.14 | 2.15 | 2.14 | 2.17 | 2.17 | 2.17 | 2.17 | 2.21 | 2.19 | | | | | |

STATUS FLAG CODES

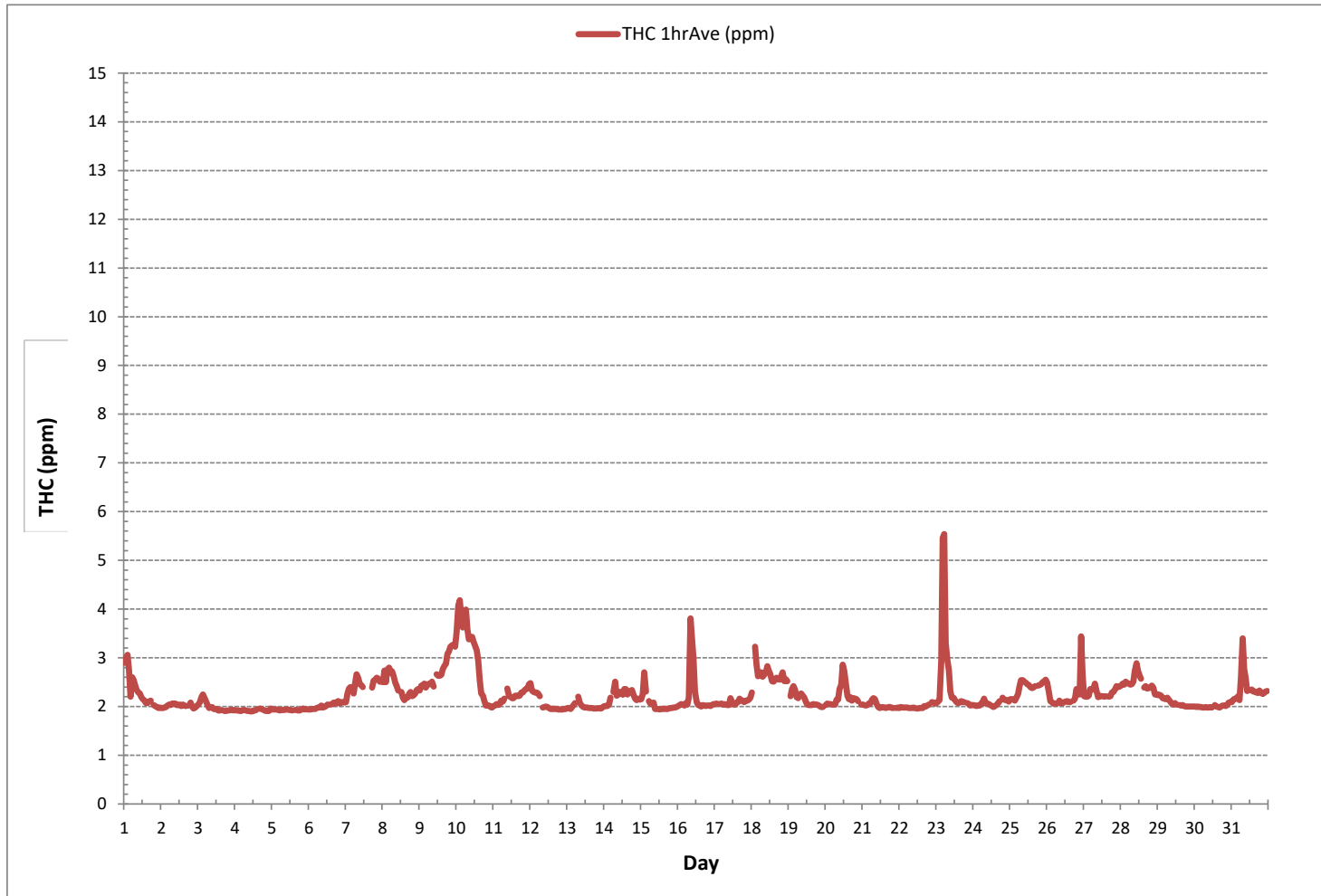
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

24 HR AVERAGES December 2018



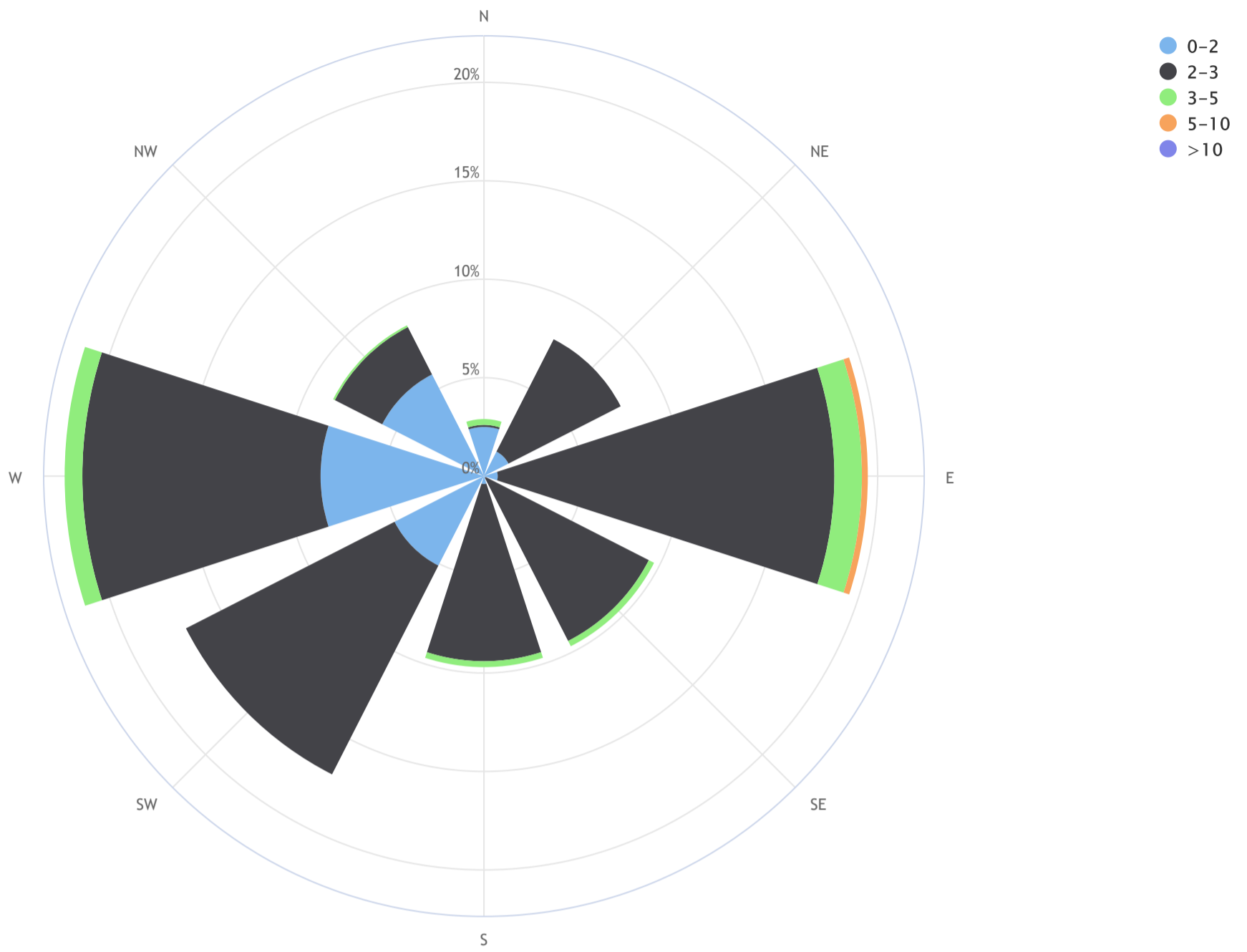
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 709 | | | |
| MINIMUM 1-HR AVERAGE: | 1.90 ppm | @ HOUR | 10 | ON DAY 4 |
| MAXIMUM 1-HR AVERAGE: | 5.54 ppm | @ HOUR | 5 | ON DAY 23 |
| MAXIMUM 24-HR AVERAGE: | 3.02 ppm | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 3 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.38 | MONTHLY AVERAGE: | 2.23 ppm | |



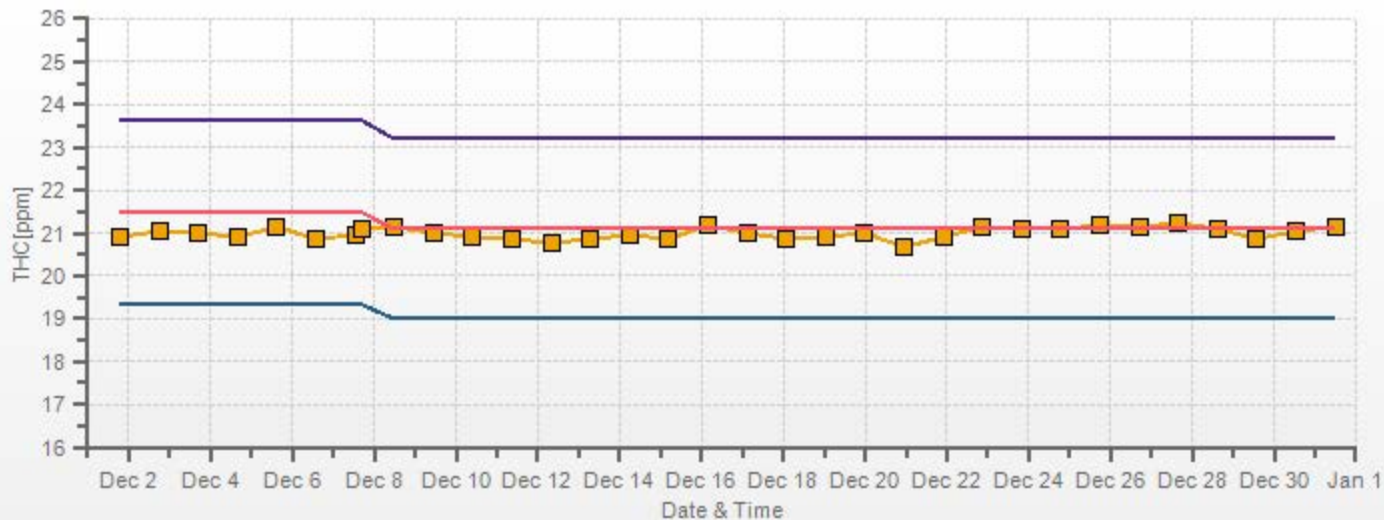
Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_THC (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.6_CALM % = 3.5%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|----------------|-------------|-------------|------------|------------|------------|-------------|
| N | 2.5 | 0.1 | 0.3 | 0.0 | 0.0 | 3.0 |
| NE | 1.4 | 6.4 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 0.7 | 17.1 | 1.4 | 0.3 | 0.0 | 19.5 |
| SE | 0.1 | 9.3 | 0.3 | 0.0 | 0.0 | 9.7 |
| S | 0.4 | 9.0 | 0.3 | 0.0 | 0.0 | 9.7 |
| SW | 5.1 | 11.9 | 0.0 | 0.0 | 0.0 | 16.9 |
| W | 8.3 | 12.1 | 0.9 | 0.0 | 0.0 | 21.3 |
| NW | 5.8 | 2.7 | 0.1 | 0.0 | 0.0 | 8.6 |
| Summary | 24.4 | 68.6 | 3.2 | 0.3 | 0.0 | 96.5 |
| CALM | 0.1 | 2.8 | 0.6 | 0.0 | 0.0 | 3.5 |

THC[ppm] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



METHANE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

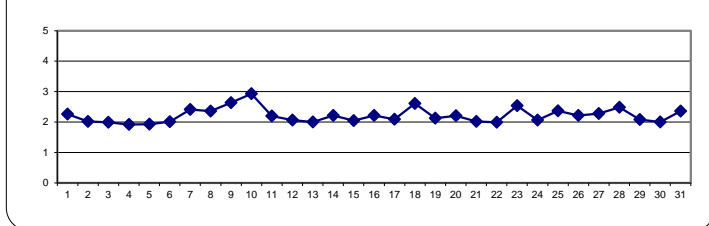
METHANE Hourly Averages (CH₄ ppm)

| 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 | 2.78 | 2.87 | 2.91 | 2.62 | 2.18 | 2.46 | 2.38 | 2.31 | 2.25 | 2.21 | 2.20 | 2.16 | 2.13 | 2.11 | 2.07 | 2.07 | 2.10 | 2.12 | S | 2.03 | 2.00 | 1.99 | 1.97 | 1.98 | 1.97 | 2.91 | 2.26 | 24 | |
| 2 | 1.97 | 1.97 | 1.98 | 1.99 | 2.02 | 2.04 | 2.03 | 2.06 | 2.06 | 2.06 | 2.03 | 2.03 | 2.04 | 2.01 | 2.04 | 2.02 | 2.01 | S | 2.02 | 2.08 | 2.00 | 1.96 | 1.98 | 2.01 | 1.96 | 2.08 | 2.02 | 24 | |
| 3 | 2.04 | 2.08 | 2.19 | 2.25 | 2.18 | 2.11 | 2.03 | 1.97 | 1.98 | 1.99 | 1.95 | 1.95 | 1.95 | 1.92 | 1.92 | 1.93 | S | 1.91 | 1.91 | 1.92 | 1.92 | 1.93 | 1.93 | 1.92 | 1.91 | 2.25 | 1.99 | 24 | |
| 4 | 1.93 | 1.92 | 1.92 | 1.91 | 1.91 | 1.93 | 1.93 | 1.92 | 1.91 | 1.91 | 1.90 | 1.90 | 1.92 | 1.92 | 1.94 | S | 1.96 | 1.95 | 1.94 | 1.92 | 1.91 | 1.91 | 1.91 | 1.96 | 1.90 | 1.96 | 1.92 | 24 | |
| 5 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.92 | 1.93 | 1.93 | 1.93 | 1.94 | 1.94 | 1.93 | 1.93 | 1.92 | S | 1.93 | 1.93 | 1.92 | 1.92 | 1.94 | 1.96 | 1.94 | 1.95 | 1.94 | 1.92 | 1.96 | 1.93 | 24 | |
| 6 | 1.94 | 1.94 | 1.95 | 1.95 | 1.95 | 1.97 | 1.98 | 1.98 | 2.02 | 1.98 | 1.99 | 2.01 | 2.02 | S | 2.02 | 2.04 | 2.06 | 2.05 | 2.08 | 2.09 | 2.06 | 2.07 | 2.07 | 2.07 | 1.94 | 2.09 | 2.01 | 24 | |
| 7 | 2.07 | 2.25 | 2.34 | 2.37 | 2.33 | 2.25 | 2.46 | 2.63 | 2.54 | 2.41 | 2.40 | 2.37 | S | 2.21 | C | C | C | 2.38 | 2.52 | 2.53 | 2.56 | 2.55 | 2.48 | 2.48 | 2.07 | 2.63 | 2.41 | 24 | |
| 8 | 2.45 | 2.71 | 2.46 | 2.72 | 2.73 | 2.65 | 2.66 | 2.56 | 2.41 | 2.33 | 2.26 | S | 2.22 | 2.12 | 2.11 | 2.16 | 2.14 | 2.23 | 2.27 | 2.19 | 2.19 | 2.22 | 2.26 | 2.26 | 2.11 | 2.73 | 2.36 | 24 | |
| 9 | 2.25 | 2.35 | 2.37 | 2.40 | 2.32 | 2.39 | 2.39 | 2.37 | 2.43 | 2.35 | S | 2.56 | 2.52 | 2.51 | 2.54 | 2.69 | 2.75 | 2.81 | 2.99 | 3.04 | 3.13 | 3.15 | 3.17 | 3.13 | 2.25 | 3.17 | 2.64 | 24 | |
| 10 | 3.40 | 3.92 | 4.03 | 3.71 | 3.47 | 3.71 | 3.80 | 3.42 | 3.25 | S | 3.29 | 3.21 | 3.13 | 3.05 | 2.85 | 2.48 | 2.25 | 2.20 | 2.11 | 2.02 | 2.02 | 2.02 | 1.99 | 1.98 | 1.98 | 4.03 | 2.93 | 24 | |
| 11 | 2.01 | 2.02 | 2.05 | 2.03 | 2.05 | 2.12 | 2.10 | 2.16 | S | 2.36 | 2.21 | 2.20 | 2.17 | 2.17 | 2.22 | 2.22 | 2.21 | 2.21 | 2.29 | 2.28 | 2.32 | 2.35 | 2.35 | 2.41 | 2.01 | 2.41 | 2.20 | 24 | |
| 12 | 2.44 | 2.32 | 2.30 | 2.29 | 2.29 | 2.27 | 2.21 | S | 1.98 | 1.98 | 2.00 | 1.99 | 1.97 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.95 | 1.95 | 1.94 | 2.44 | 2.06 | 24 | |
| 13 | 1.97 | 1.97 | 1.95 | 1.99 | 2.03 | 2.07 | S | 2.20 | 2.08 | 2.03 | 2.00 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | 1.97 | 1.96 | 1.96 | 1.96 | 1.99 | 1.95 | 2.20 | 2.00 | 24 | |
| 14 | 2.01 | 2.01 | 2.01 | 2.04 | 2.18 | S | 2.30 | 2.51 | 2.22 | 2.24 | 2.30 | 2.30 | 2.24 | 2.36 | 2.25 | 2.31 | 2.31 | 2.33 | 2.23 | 2.16 | 2.13 | 2.16 | 2.14 | 2.01 | 2.51 | 2.22 | 24 | | |
| 15 | 2.15 | 2.26 | 2.70 | 2.31 | S | 2.11 | 2.06 | 2.05 | 2.08 | 1.95 | 1.95 | 1.95 | 1.94 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.96 | 1.97 | 1.97 | 1.98 | 1.98 | 1.99 | 1.94 | 2.70 | 2.05 | 24 | |
| 16 | 2.01 | 2.03 | 2.05 | S | 2.02 | 2.07 | 2.04 | 2.18 | 3.76 | 3.37 | 2.98 | 2.31 | 2.09 | 2.03 | 2.03 | 2.00 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.01 | 2.03 | 2.05 | 2.00 | 3.76 | 2.22 | 24 | |
| 17 | 2.05 | 2.06 | S | 2.05 | 2.06 | 2.04 | 2.05 | 2.04 | 2.03 | 2.03 | 2.17 | 2.10 | 2.04 | 2.04 | 2.08 | 2.09 | 2.16 | 2.13 | 2.11 | 2.09 | 2.12 | 2.12 | 2.14 | 2.18 | 2.03 | 2.18 | 2.09 | 24 | |
| 18 | 2.29 | S | 3.18 | 2.82 | 2.60 | 2.64 | 2.67 | 2.59 | 2.63 | 2.66 | 2.76 | 2.67 | 2.62 | 2.52 | 2.50 | 2.53 | 2.55 | 2.54 | 2.52 | 2.60 | 2.68 | 2.51 | 2.55 | 2.52 | 2.29 | 3.18 | 2.61 | 24 | |
| 19 | S | 2.20 | 2.35 | 2.41 | 2.34 | 2.19 | 2.17 | 2.22 | 2.23 | 2.20 | 2.17 | 2.09 | 2.04 | 2.03 | 2.03 | 2.05 | 2.04 | 2.04 | 2.03 | 2.01 | 1.99 | 1.99 | S | 1.99 | 2.41 | 2.13 | 24 | | |
| 20 | 2.03 | 2.06 | 2.05 | 2.05 | 2.04 | 2.10 | 2.04 | 2.14 | 2.14 | 2.35 | 2.44 | 2.84 | 2.72 | 2.49 | 2.22 | 2.15 | 2.19 | 2.12 | 2.17 | 2.16 | 2.14 | 2.10 | S | 2.04 | 2.03 | 2.84 | 2.21 | 24 | |
| 21 | 2.04 | 2.03 | 2.02 | 2.03 | 2.06 | 2.06 | 2.14 | 2.17 | 2.15 | 2.06 | 1.99 | 1.97 | 1.98 | 1.99 | 1.98 | 1.97 | 1.98 | 1.99 | 1.99 | 1.97 | 1.97 | S | 1.97 | 1.98 | 1.97 | 2.17 | 2.02 | 24 | |
| 22 | 1.97 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.98 | 1.97 | 1.96 | 1.96 | 1.97 | 1.97 | 1.97 | 2.01 | 2.00 | 2.02 | 2.04 | S | 2.09 | 2.08 | 2.06 | 1.96 | 2.09 | 1.99 | 24 | | |
| 23 | 2.07 | 2.10 | 2.13 | 2.92 | 5.36 | 5.41 | 3.25 | 2.94 | 2.75 | 2.31 | 2.18 | 2.18 | 2.13 | 2.09 | 2.07 | 2.08 | 2.11 | 2.09 | 2.09 | S | 2.07 | 2.05 | 2.02 | 2.03 | 2.02 | 5.41 | 2.54 | 24 | |
| 24 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.06 | 2.09 | 2.16 | 2.06 | 2.06 | 2.05 | 2.03 | 2.01 | 1.99 | 2.01 | 2.03 | 2.07 | 2.11 | S | 2.18 | 2.14 | 2.13 | 2.13 | 2.10 | 1.99 | 2.18 | 2.06 | 24 | |
| 25 | 2.15 | 2.15 | 2.14 | 2.12 | 2.19 | 2.26 | 2.42 | 2.53 | 2.51 | 2.48 | 2.47 | 2.45 | 2.43 | 2.39 | 2.37 | 2.38 | 2.39 | S | 2.41 | 2.41 | 2.43 | 2.46 | 2.48 | 2.50 | 2.12 | 2.53 | 2.37 | 24 | |
| 26 | 2.48 | 2.30 | 2.11 | 2.09 | 2.06 | 2.06 | 2.06 | 2.07 | 2.12 | 2.07 | 2.07 | 2.09 | 2.10 | 2.11 | 2.09 | 2.09 | S | 2.12 | 2.16 | 2.36 | 2.24 | 2.25 | 3.40 | 2.65 | 2.06 | 3.40 | 2.22 | 24 | |
| 27 | 2.21 | 2.20 | 2.20 | 2.22 | 2.36 | 2.35 | 2.37 | 2.47 | 2.33 | 2.19 | 2.22 | 2.21 | 2.21 | 2.20 | 2.21 | S | 2.20 | 2.21 | 2.29 | 2.30 | 2.35 | 2.42 | 2.40 | 2.41 | 2.19 | 2.47 | 2.28 | 24 | |
| 28 | 2.43 | 2.46 | 2.45 | 2.51 | 2.48 | 2.46 | 2.45 | 2.46 | 2.51 | 2.73 | 2.88 | 2.73 | 2.63 | 2.56 | S | 2.38 | 2.42 | 2.37 | 2.38 | 2.39 | 2.42 | 2.39 | 2.25 | 2.25 | 2.25 | 2.88 | 2.48 | 24 | |
| 29 | 2.23 | 2.24 | 2.22 | 2.17 | 2.16 | 2.15 | 2.18 | 2.14 | 2.10 | 2.06 | 2.04 | 2.07 | 2.04 | S | 2.03 | 2.02 | 2.03 | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.24 | 2.08 | 24 | |
| 30 | 2.00 | 1.99 | 2.00 | 1.99 | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | 1.98 | 1.99 | 1.98 | S | 2.03 | 2.00 | 1.99 | 1.98 | 2.00 | 2.02 | 2.02 | 2.01 | 2.03 | 2.08 | 2.09 | 1.98 | 2.09 | 2.00 | 24 | |
| 31 | 2.09 | 2.14 | 2.16 | 2.16 | 2.21 | 2.13 | 2.59 | 3.38 | 2.77 | 2.59 | 2.32 | S | 2.34 | 2.35 | 2.31 | 2.31 | 2.29 | 2.28 | 2.33 | 2.29 | 2.26 | 2.28 | 2.31 | 2.31 | 2.09 | 3.38 | 2.36 | 24 | |
| HOURLY MAX | 3.40 | 3.92 | 4.03 | 3.71 | 5.36 | 5.41 | 3.80 | 3.42 | 3.76 | 3.37 | 3.29 | 3.21 | 3.13 | 3.05 | 2.85 | 2.69 | 2.75 | 2.81 | 2.99 | 3.04 | 3.13 | 3.15 | 3.40 | 3.13 | | | | | |
| HOURLY AVG | 2.18 | 2.22 | 2.27 | 2.27 | 2.32 | 2.33 | 2.29 | 2.32 | 2.31 | 2.23 | 2.24 | 2.21 | 2.19 | 2.17 | 2.14 | 2.13 | 2.14 | 2.14 | 2.16 | 2.17 | 2.17 | 2.16 | 2.20 | 2.18 | | | | | |

STATUS FLAG CODES

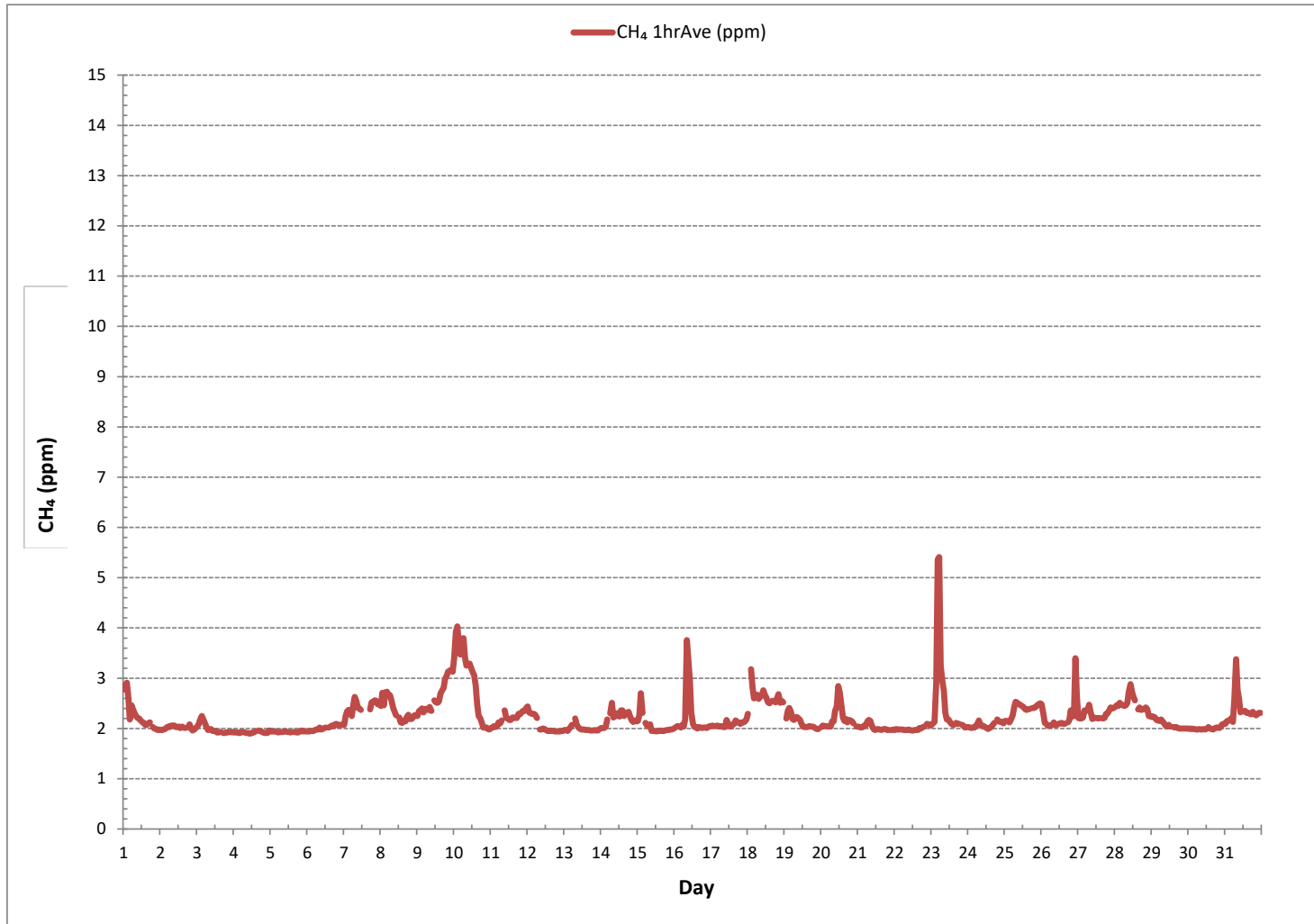
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

24 HR AVERAGES December 2018



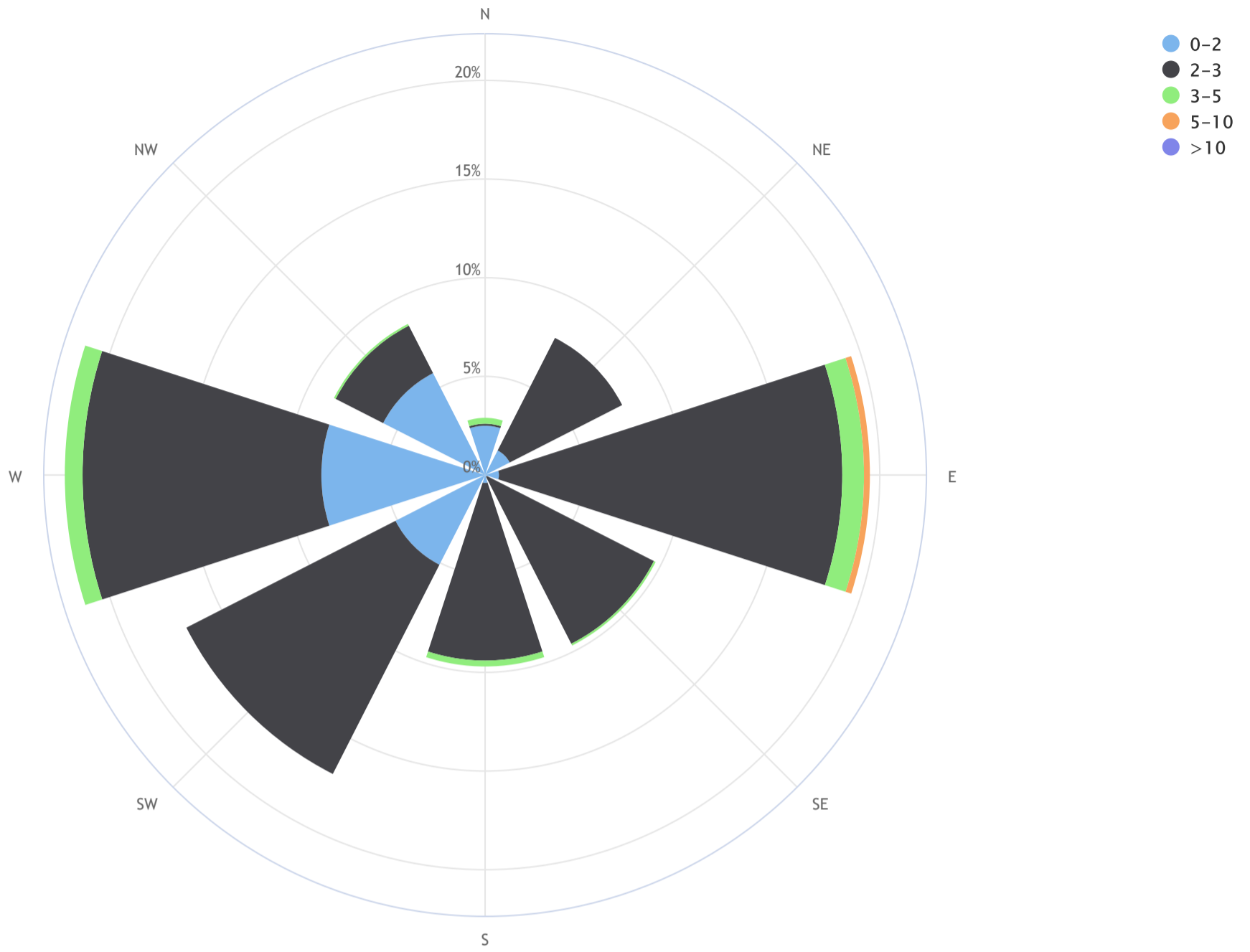
MONTHLY SUMMARY

| | | | | |
|------------------------------|----------|-----------------------|----------|-----------|
| NUMBER OF NON-ZERO READINGS: | 709 | | | |
| MINIMUM 1-HR AVERAGE: | 1.90 ppm | @ HOUR | 10 | ON DAY 4 |
| MAXIMUM 1-HR AVERAGE: | 5.41 ppm | @ HOUR | 5 | ON DAY 23 |
| MAXIMUM 24-HR AVERAGE: | 2.93 ppm | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 744 hrs | |
| MONTHLY CALIBRATION TIME: | 3 hrs | AMD OPERATION UPTIME: | 100.0 % | |
| STANDARD DEVIATION: | 0.36 | MONTHLY AVERAGE: | 2.21 ppm | |



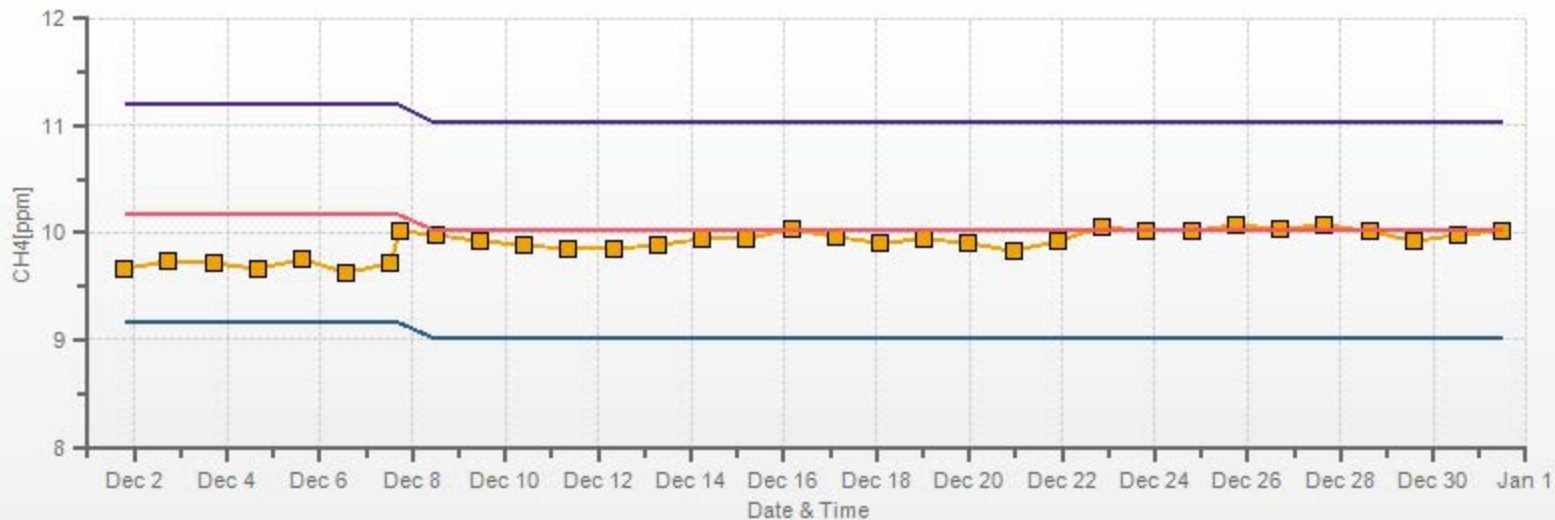
Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_CH4 (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 2.6_CALM % = 3.5%



| Direction | 0-2 | 2-3 | 3-5 | 5-10 | >10 | TOTAL |
|----------------|-------------|-------------|------------|------------|------------|-------------|
| N | 2.5 | 0.1 | 0.3 | 0.0 | 0.0 | 3.0 |
| NE | 1.4 | 6.4 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 0.7 | 17.4 | 1.1 | 0.3 | 0.0 | 19.5 |
| SE | 0.1 | 9.5 | 0.1 | 0.0 | 0.0 | 9.7 |
| S | 0.4 | 9.0 | 0.3 | 0.0 | 0.0 | 9.7 |
| SW | 5.1 | 11.9 | 0.0 | 0.0 | 0.0 | 16.9 |
| W | 8.3 | 12.1 | 0.9 | 0.0 | 0.0 | 21.3 |
| NW | 5.8 | 2.7 | 0.1 | 0.0 | 0.0 | 8.6 |
| Summary | 24.4 | 69.0 | 2.8 | 0.3 | 0.0 | 96.5 |
| CALM | 0.1 | 2.8 | 0.6 | 0.0 | 0.0 | 3.5 |

CH4[ppm] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



NON-METHANE HYDROCARBON



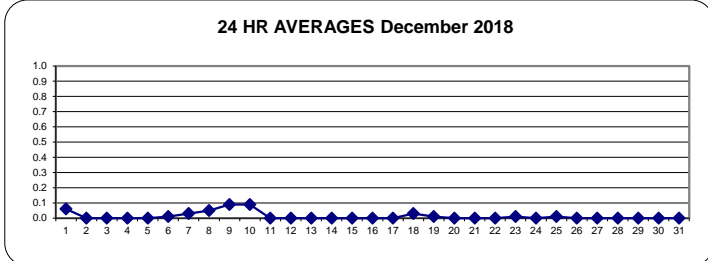
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

| 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 | 0.12 | 0.13 | 0.15 | 0.11 | 0.01 | 0.14 | 0.15 | 0.12 | 0.10 | 0.08 | 0.06 | 0.03 | 0.03 | 0.01 | 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 | 0.15 | 0.06 | 24 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 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 | 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 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 5 | 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 | 0.00 | 0.00 | 24 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | S | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.01 | 24 |
| 7 | 0.01 | 0.02 | 0.03 | 0.02 | 0.04 | 0.03 | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | 0.03 | S | 0.01 | C | C | C | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.03 | 0.01 | 0.01 | 0.04 | 0.03 | 0.03 | 24 |
| 8 | 0.05 | 0.03 | 0.04 | 0.04 | 0.07 | 0.04 | 0.05 | 0.07 | 0.08 | 0.08 | 0.07 | S | 0.08 | 0.06 | 0.02 | 0.02 | 0.04 | 0.03 | 0.03 | 0.02 | 0.04 | 0.05 | 0.09 | 0.10 | 0.02 | 0.01 | 0.10 | 0.05 | 0.05 | 24 |
| 9 | 0.09 | 0.08 | 0.07 | 0.07 | 0.08 | 0.07 | 0.07 | 0.09 | 0.08 | 0.07 | S | 0.10 | 0.11 | 0.12 | 0.11 | 0.08 | 0.08 | 0.07 | 0.08 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.07 | 0.07 | 0.12 | 0.09 | 0.09 | 24 |
| 10 | 0.12 | 0.15 | 0.16 | 0.15 | 0.14 | 0.22 | 0.19 | 0.17 | 0.13 | S | 0.14 | 0.12 | 0.12 | 0.10 | 0.09 | 0.06 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.09 | 24 |
| 11 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 | 0.05 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 24 |
| 12 | 0.04 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 24 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 16 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 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 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 24 |
| 17 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 18 | 0.00 | S | 0.05 | 0.04 | 0.01 | 0.02 | 0.03 | 0.02 | 0.02 | 0.04 | 0.08 | 0.06 | 0.05 | 0.01 | 0.01 | 0.02 | 0.04 | 0.03 | 0.03 | 0.02 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.08 | 0.03 | 0.03 | 24 |
| 19 | S | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.03 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.03 | 0.01 | 0.01 | 24 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 24 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.13 | 0.05 | 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 | 0.13 | 0.01 | 24 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.03 | S | 0.02 | 0.02 | 0.02 | 0.04 | 0.04 | 0.04 | 0.04 | 0.00 | 0.00 | 0.04 | 0.01 | 0.01 | 24 |
| 26 | 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 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 24 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 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 | 0.01 | 0.00 | 0.00 | 24 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 24 |
| HOURLY MAX | 0.12 | 0.15 | 0.16 | 0.15 | 0.14 | 0.22 | 0.19 | 0.17 | 0.13 | 0.08 | 0.14 | 0.12 | 0.12 | 0.12 | 0.11 | 0.08 | 0.08 | 0.07 | 0.08 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | | | |
| HOURLY AVG | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 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 |

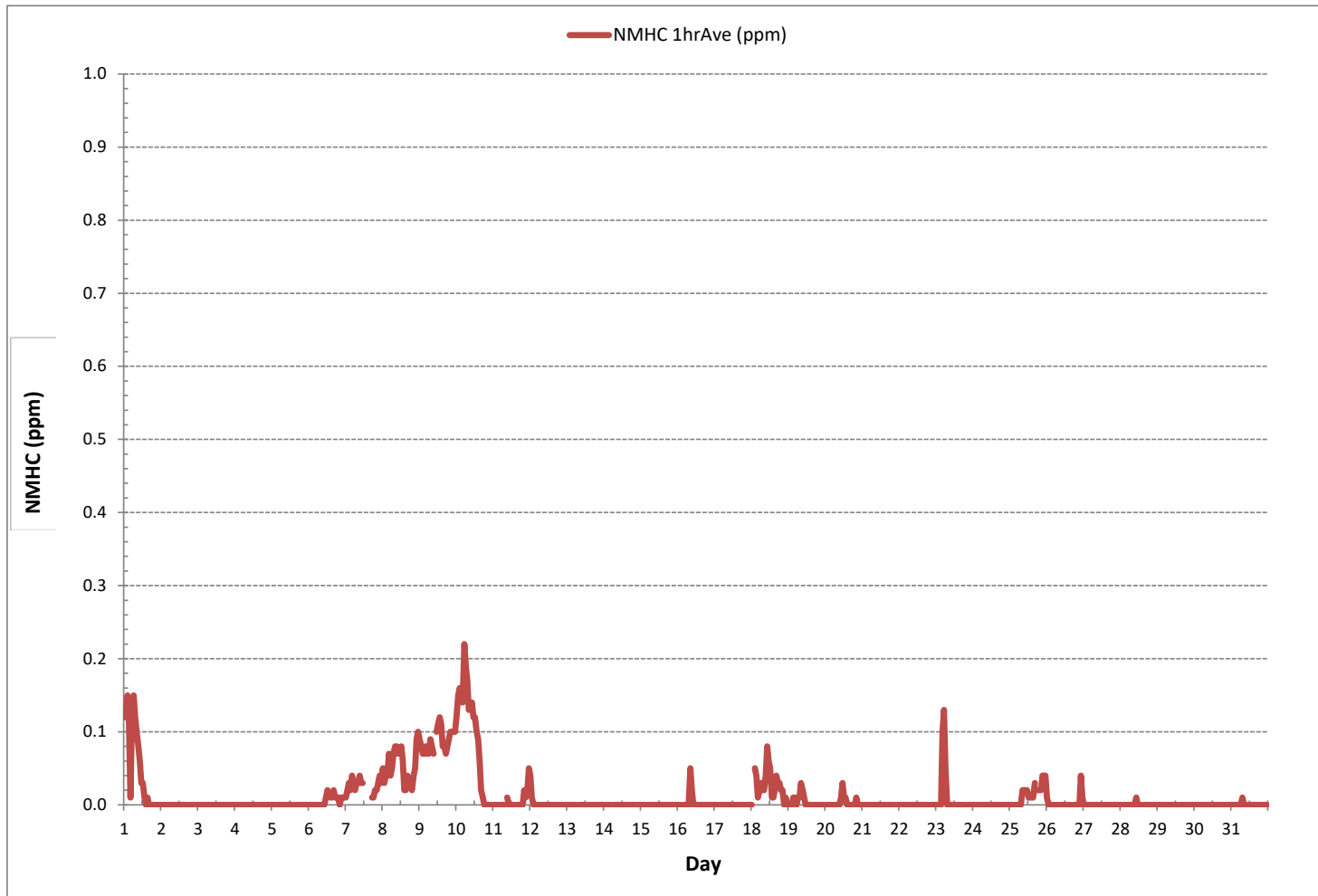
24 HR AVERAGES December 2018



MONTHLY SUMMARY

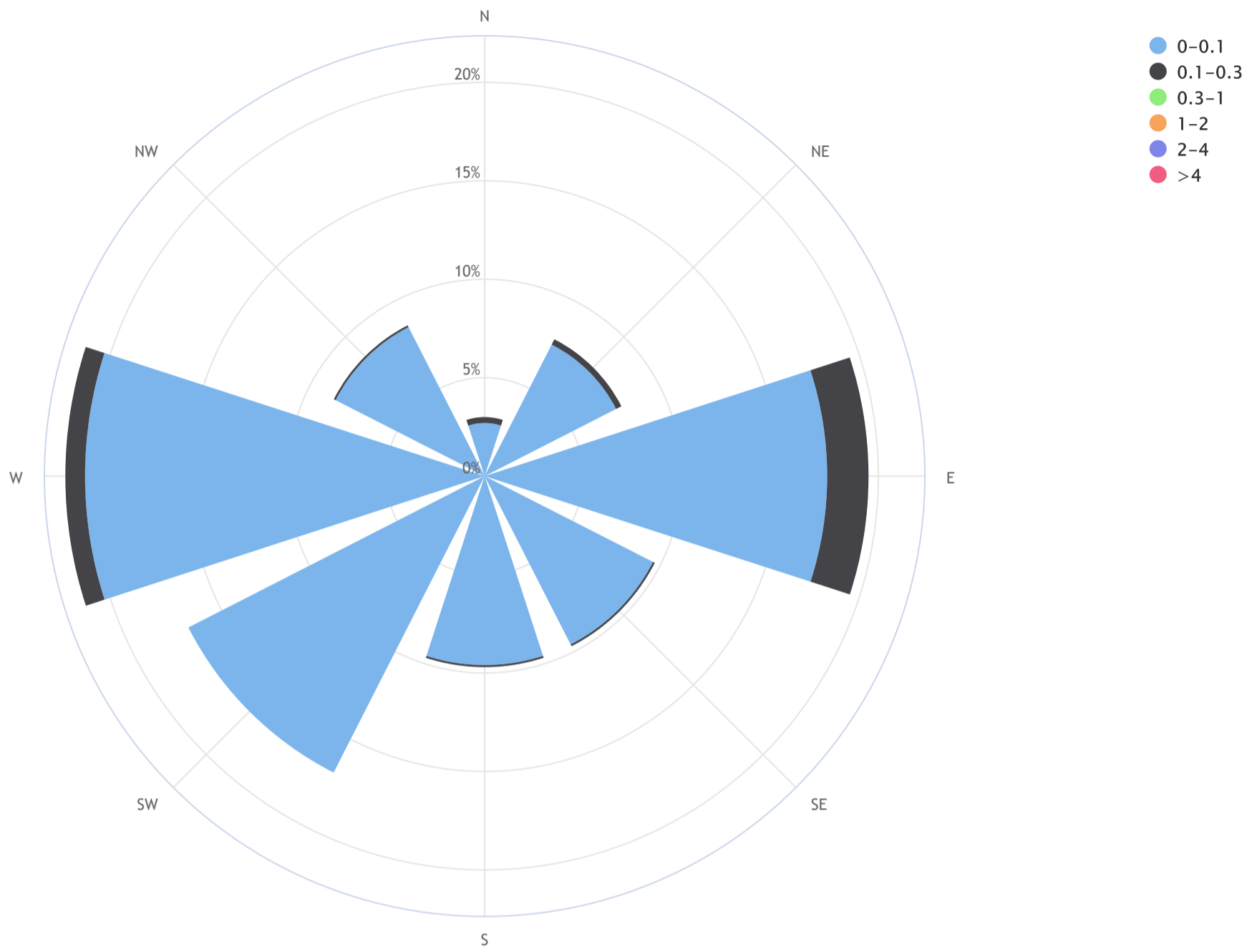
| | | | | |
|------------------------------|------|------------|-----------------------|-----------|
| NUMBER OF NON-ZERO READINGS: | 173 | | | |
| MINIMUM 1-HR AVERAGE: | 0.00 | ppm @ HOUR | 14 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 0.22 | ppm @ HOUR | 5 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 0.09 | ppm | | ON DAY 9 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 3 | hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 0.03 | | MONTHLY AVERAGE: | 0.01 ppm |

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_NMHC (ppm)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.0_CALM % = 3.5%



| Direction | 0-0.1 | 0.1-0.3 | 0.3-1 | 1-2 | 2-4 | >4 | TOTAL |
|-----------|-------|---------|-------|-----|-----|-----|-------|
| N | 2.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| NE | 7.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 17.4 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 19.5 |
| SE | 9.6 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| S | 9.6 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| SW | 16.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.9 |
| W | 20.3 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21.3 |
| NW | 8.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 8.6 |
| Summary | 92.4 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 96.5 |
| CALM | 3.1 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 |

NMHC[ppm] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



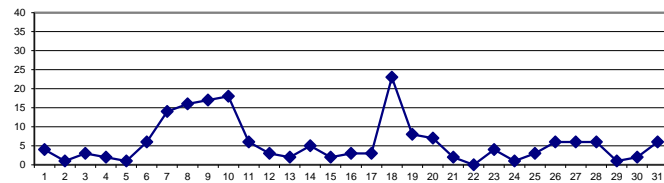
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

| 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 | 12 | 12 | 11 | 7 | 4 | 6 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 4 | S | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | 4 | 24 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | S | 3 | 2 | 1 | 1 | 1 | 2 | 0 | 3 | 1 | 0 | 3 | 1 | 24 | |
| 3 | 3 | 3 | 9 | 13 | 6 | 3 | 1 | 1 | 4 | 6 | 3 | 2 | 3 | 2 | 3 | 4 | S | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 13 | 3 | 24 | |
| 4 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | S | 8 | 6 | 4 | 3 | 3 | 1 | 1 | 5 | 0 | 8 | 2 | 0 | 8 | 2 | 24 | |
| 5 | 3 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 0 | S | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 0 | 3 | 1 | 24 | |
| 6 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 5 | 9 | 11 | S | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 10 | 10 | 9 | 1 | 12 | 6 | 1 | 12 | 6 | 24 | |
| 7 | 12 | 13 | 15 | 14 | 19 | 17 | 17 | 16 | 14 | 13 | 13 | 13 | S | 13 | 10 | 11 | 11 | 11 | 13 | 14 | 14 | 13 | 14 | 14 | 10 | 19 | 14 | 10 | 19 | 14 | 24 | |
| 8 | 14 | 17 | 15 | 16 | 17 | 17 | 16 | 22 | 24 | 28 | 21 | S | 22 | 14 | 11 | 11 | 11 | 11 | 12 | 10 | 10 | 11 | 12 | 14 | 10 | 28 | 16 | 10 | 28 | 16 | 24 | |
| 9 | 13 | 12 | 12 | 12 | 11 | 11 | 12 | 16 | 14 | 14 | S | 23 | 22 | 23 | 24 | 19 | 18 | 17 | 19 | 19 | 22 | 22 | 24 | 22 | 11 | 24 | 17 | 11 | 24 | 17 | 24 | |
| 10 | 24 | 24 | 24 | 26 | 24 | 31 | 28 | 46 | 32 | S | C | C | C | C | C | C | C | 17 | 7 | 3 | 2 | 2 | 2 | 1 | 1 | 46 | 18 | 1 | 46 | 18 | 24 | |
| 11 | 1 | 5 | 9 | 7 | 5 | 5 | 6 | S | 12 | 9 | 8 | 7 | 6 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 7 | 1 | 12 | 6 | 24 | 1 | 12 | 6 | 24 | |
| 12 | 7 | 5 | 5 | 6 | 8 | 6 | 4 | S | 5 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 3 | 0 | 8 | 3 | 24 | |
| 13 | 2 | 2 | 1 | 2 | 3 | 3 | S | 7 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 7 | 2 | 0 | 7 | 2 | 24 | |
| 14 | 4 | 3 | 2 | 2 | 5 | S | 7 | 10 | 4 | 4 | 4 | 6 | 5 | 11 | 9 | 6 | 6 | 7 | 7 | 6 | 4 | 3 | 3 | 4 | 2 | 11 | 5 | 2 | 11 | 5 | 24 | |
| 15 | 4 | 4 | 7 | 4 | S | 5 | 3 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 2 | 0 | 7 | 2 | 24 | |
| 16 | 2 | 1 | 1 | S | 2 | 1 | 0 | 1 | 11 | 15 | 13 | 5 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 3 | 0 | 15 | 3 | 24 | |
| 17 | 0 | 0 | S | 2 | 1 | 0 | 0 | 0 | 1 | 2 | 3 | 3 | 12 | 7 | 2 | 3 | 6 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 0 | 12 | 3 | 0 | 12 | 3 | 24 | |
| 18 | 6 | S | 18 | 17 | 14 | 16 | 18 | 22 | 24 | 32 | 41 | 44 | 43 | 27 | 26 | 27 | 30 | 29 | 27 | 18 | 16 | 14 | 11 | 9 | 6 | 44 | 23 | 1 | 44 | 23 | 24 | |
| 19 | S | 8 | 7 | 7 | 7 | 7 | 9 | 11 | 14 | 16 | 14 | 10 | 6 | 4 | 4 | 6 | 9 | 10 | 8 | 6 | 3 | 2 | 1 | S | 1 | 16 | 8 | 1 | 16 | 8 | 24 | |
| 20 | 6 | 8 | 8 | 5 | 4 | 4 | 4 | 6 | S1 | 13 | 14 | 17 | 15 | 11 | 6 | 4 | 5 | 3 | 3 | 3 | 3 | 2 | S | 4 | 2 | 17 | 7 | 2 | 17 | 7 | 23 | |
| 21 | 2 | 2 | 1 | 0 | 4 | 4 | 4 | 1 | 2 | 1 | 0 | 0 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | 4 | S | 0 | 0 | 0 | 4 | 2 | 0 | 4 | 2 | 16 | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 24 | |
| 23 | 1 | 1 | 1 | 6 | 11 | 13 | 18 | 16 | 10 | 2 | 1 | 2 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | S | 1 | 0 | 0 | 0 | 0 | 18 | 4 | 0 | 18 | 4 | 24 | |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | S | 3 | 1 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 3 | 1 | 24 | |
| 25 | 1 | 1 | 0 | 0 | 1 | 1 | 3 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 3 | 2 | 4 | S | 5 | 4 | 4 | 4 | 4 | 4 | 0 | 5 | 3 | 0 | 5 | 3 | 24 | |
| 26 | 4 | 5 | 3 | 2 | 1 | 2 | 2 | 2 | 4 | 3 | 4 | 6 | 7 | 7 | 7 | 7 | S | 9 | 8 | 12 | 8 | 7 | 17 | 19 | 1 | 19 | 6 | 1 | 19 | 6 | 24 | |
| 27 | 12 | 7 | 9 | 9 | 14 | 12 | 13 | 12 | 6 | 3 | 2 | 1 | 2 | 2 | 3 | S | 5 | 5 | 6 | 4 | 4 | 5 | 3 | 4 | 1 | 14 | 6 | 1 | 14 | 6 | 24 | |
| 28 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 10 | 11 | 9 | 9 | 8 | S | 5 | 6 | 5 | 5 | 5 | 5 | 6 | 5 | 3 | 2 | 11 | 6 | 2 | 11 | 6 | 24 | |
| 29 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 3 | 1 | 24 | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | S1 | 2 | 3 | 3 | 3 | 3 | S | C1 | C1 | C1 | C1 | C1 | C1 | 5 | 2 | 3 | 6 | 3 | 0 | 6 | 2 | 0 | 6 | 2 | 17 | |
| 31 | 2 | 2 | 3 | 2 | 3 | 2 | 6 | 9 | 8 | 9 | 8 | S | 9 | 9 | 7 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 2 | 11 | 6 | 2 | 11 | 6 | 24 | |
| HOURLY MAX | 24 | 24 | 24 | 26 | 24 | 31 | 28 | 46 | 32 | 32 | 41 | 44 | 43 | 27 | 26 | 27 | 30 | 29 | 27 | 19 | 22 | 22 | 24 | 22 | | | | | | | | |
| HOURLY AVG | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 8 | 7 | 7 | 7 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 4 | 5 | 5 | | | | | | | | |

STATUS FLAG CODES

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

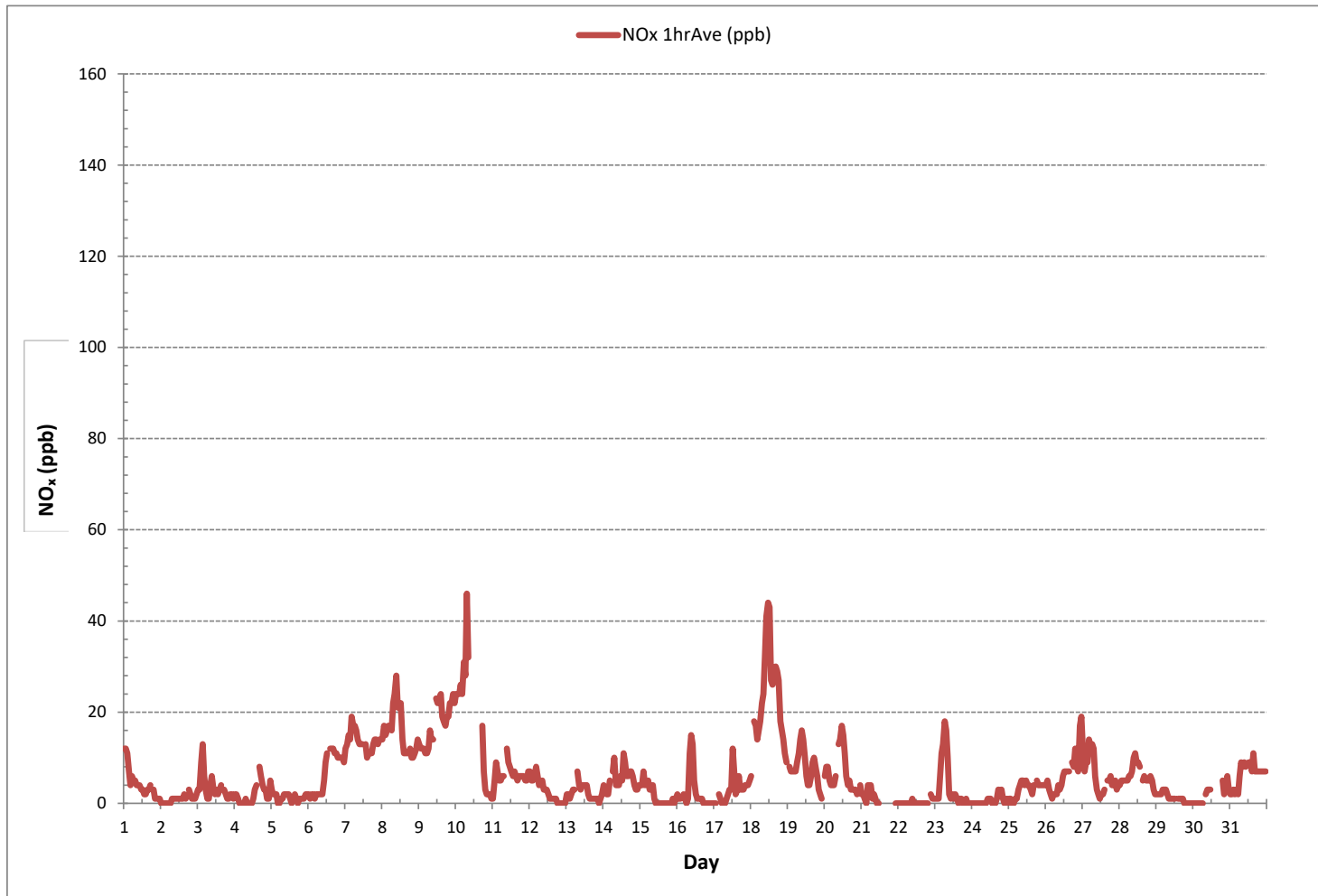
24 HR AVERAGES December 2018



MONTHLY SUMMARY

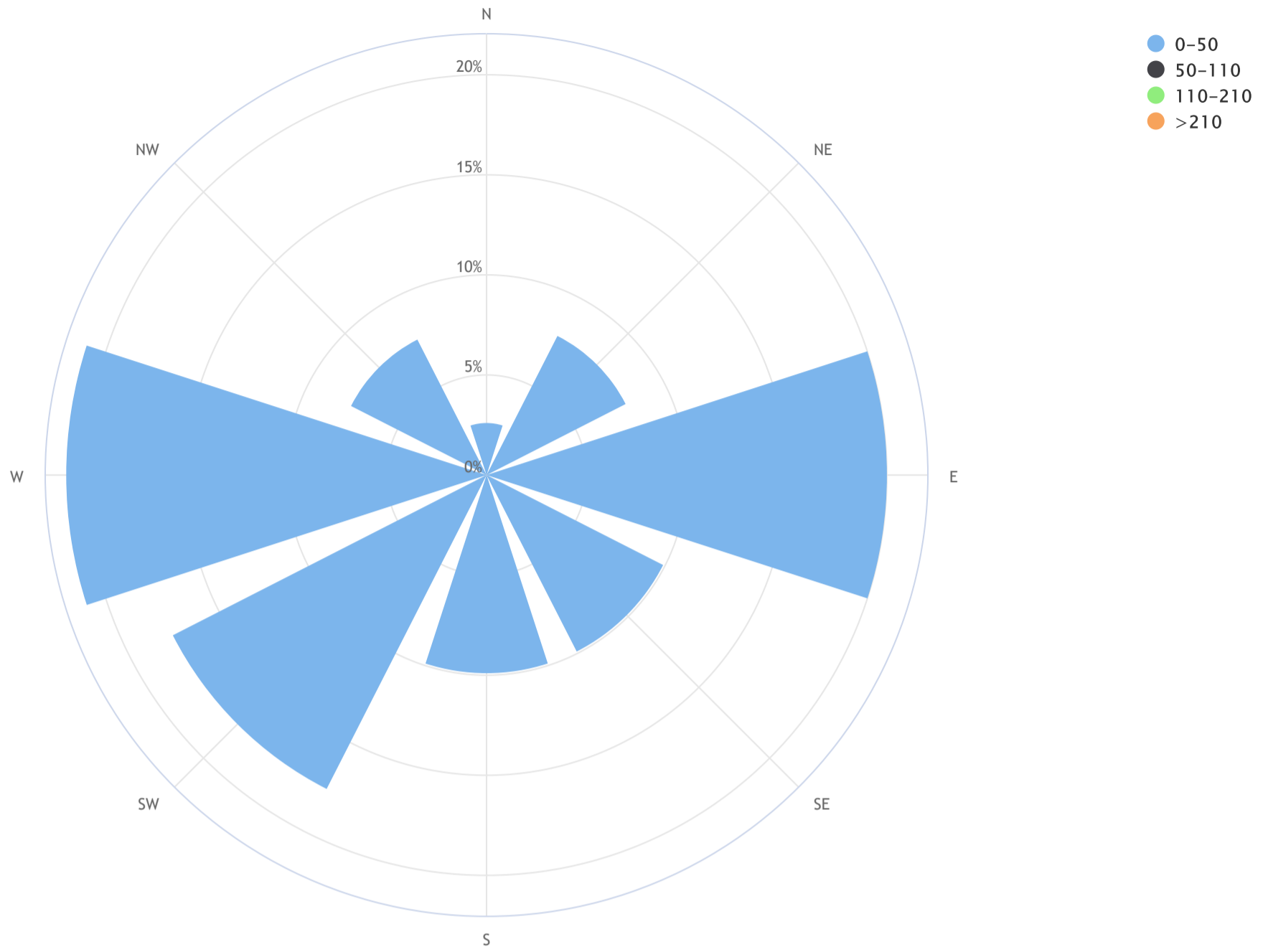
| | | | | | |
|------------------------------|-----|------------|-----------------------|--------|-----|
| NUMBER OF NON-ZERO READINGS: | 579 | | | | |
| MINIMUM 1-HR AVERAGE: | 0 | ppb @ HOUR | 0 | ON DAY | 2 |
| MAXIMUM 1-HR AVERAGE: | 46 | ppb @ HOUR | 7 | ON DAY | 10 |
| MAXIMUM 24-HR AVERAGE: | 23 | ppb | | ON DAY | 18 |
| IZS CALIBRATION TIME: | 32 | hrs | OPERATIONAL TIME: | 728 | hrs |
| MONTHLY CALIBRATION TIME: | 7 | hrs | AMD OPERATION UPTIME: | 97.8 | % |
| STANDARD DEVIATION: | 7 | | MONTHLY AVERAGE: | 6 | ppb |

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_NO_x (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 10.8_CALM % = 3.6%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.6 | 0.0 | 0.0 | 0.0 | 2.6 |
| NE | 7.8 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 20.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| SE | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| S | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| SW | 17.6 | 0.0 | 0.0 | 0.0 | 17.6 |
| W | 21.0 | 0.0 | 0.0 | 0.0 | 21.0 |
| NW | 7.6 | 0.0 | 0.0 | 0.0 | 7.6 |
| Summary | 96.4 | 0.0 | 0.0 | 0.0 | 96.4 |
| CALM | 3.6 | 0.0 | 0.0 | 0.0 | 3.6 |

NOX[ppb] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



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

NITRIC OXIDE



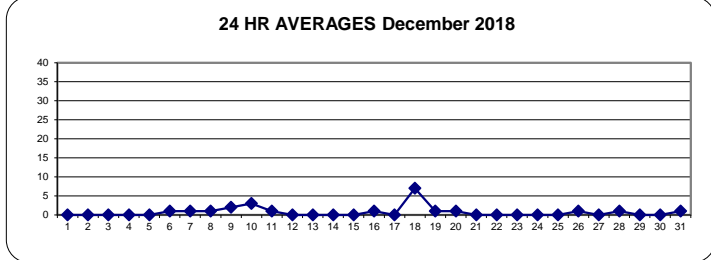
NITRIC OXIDE Hourly Averages (NO ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | | | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----|----|--|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | | | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | |
| 4 | 0 | 0 | 0 | 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 | 1 | 0 | 24 | |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 4 | S | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 24 | |
| 7 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 3 | 5 | 5 | S | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 24 | |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 8 | S | 8 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 24 | |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | S | 9 | 10 | 10 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 10 | 2 | 24 | | |
| 10 | 1 | 1 | 1 | 2 | 1 | 5 | 3 | 18 | 8 | S | C | C | C | C | C | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 3 | 24 | |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 2 | 3 | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 24 | |
| 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | S | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 14 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 24 | |
| 15 | 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 | |
| 16 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 24 | |
| 17 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 24 | |
| 18 | 0 | S | 0 | 1 | 0 | 1 | 1 | 3 | 5 | 15 | 25 | 27 | 27 | 15 | 12 | 9 | 6 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 7 | 24 | |
| 19 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 5 | 1 | 24 | | |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S1 | 3 | 4 | 7 | 6 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 7 | 1 | 23 | | |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | | |
| 22 | 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 | | |
| 23 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | | |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 5 | 4 | 3 | 2 | S | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 5 | 1 | 24 | | |
| 27 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | | |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 4 | 4 | 3 | S | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 24 | | |
| 29 | 0 | 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 | | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S1 | 0 | 1 | 1 | 1 | S | C1 | C1 | C1 | C1 | C1 | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 17 | | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | S | 4 | 4 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 24 | | |
| HOURLY MAX | 1 | 1 | 1 | 2 | 2 | 5 | 3 | 18 | 8 | 15 | 25 | 27 | 27 | 15 | 12 | 9 | 6 | 5 | 4 | 0 | 0 | 0 | 1 | 2 | 3 | | | | | | | |
| HOURLY AVG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |

STATUS FLAG CODES

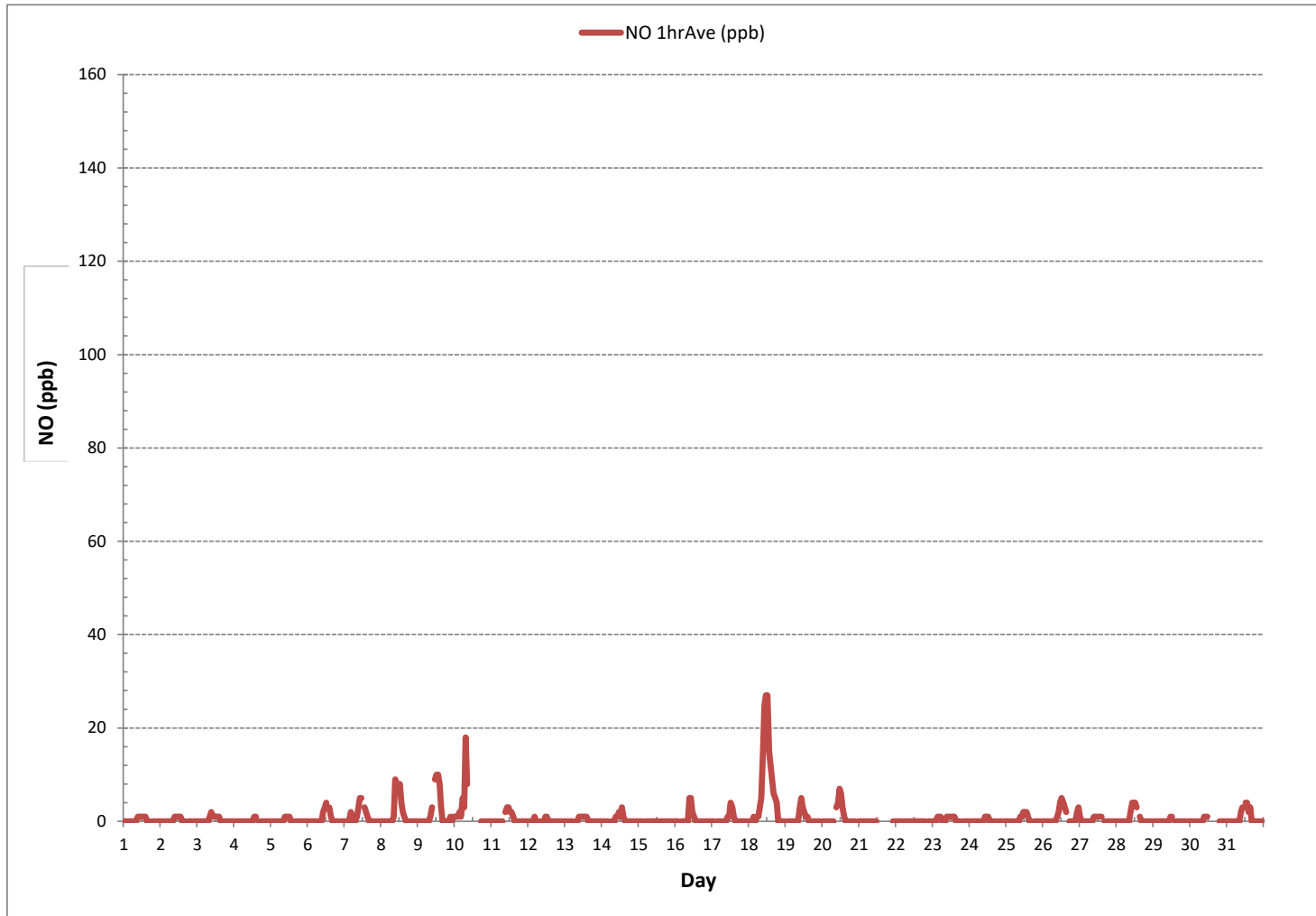
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

24 HR AVERAGES December 2018



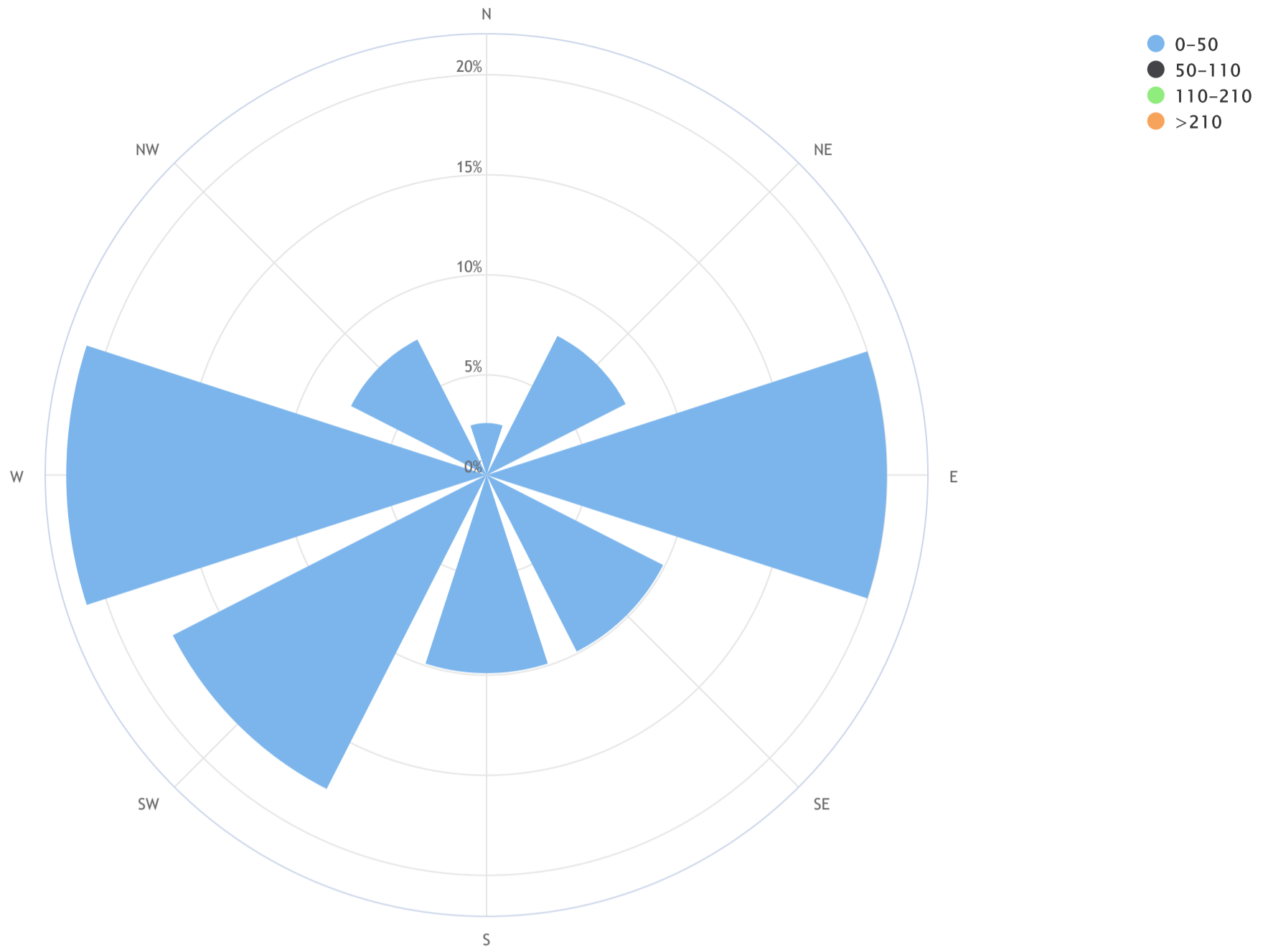
MONTHLY SUMMARY

| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF NON-ZERO READINGS: | 171 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 | ON DAY 1 |
| MAXIMUM 1-HR AVERAGE: | 27 ppb | @ HOUR | 11 | ON DAY 18 |
| MAXIMUM 24-HR AVERAGE: | 7 ppb | | | ON DAY 18 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 728 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 97.8 % | |
| STANDARD DEVIATION: | 2 | MONTHLY AVERAGE: | 1 ppb | |



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_NO (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 0.7_CALM % = 3.6%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.6 | 0.0 | 0.0 | 0.0 | 2.6 |
| NE | 7.8 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 20.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| SE | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| S | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| SW | 17.6 | 0.0 | 0.0 | 0.0 | 17.6 |
| W | 21.0 | 0.0 | 0.0 | 0.0 | 21.0 |
| NW | 7.6 | 0.0 | 0.0 | 0.0 | 7.6 |
| Summary | 96.4 | 0.0 | 0.0 | 0.0 | 96.4 |
| CALM | 3.6 | 0.0 | 0.0 | 0.0 | 3.6 |

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

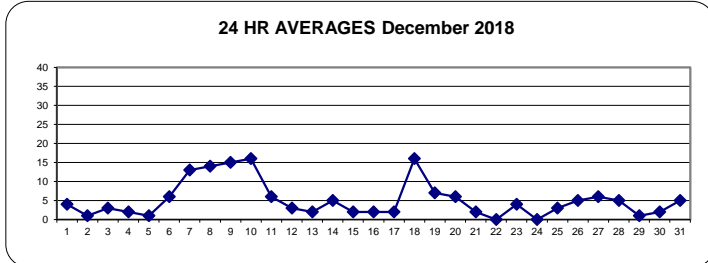
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

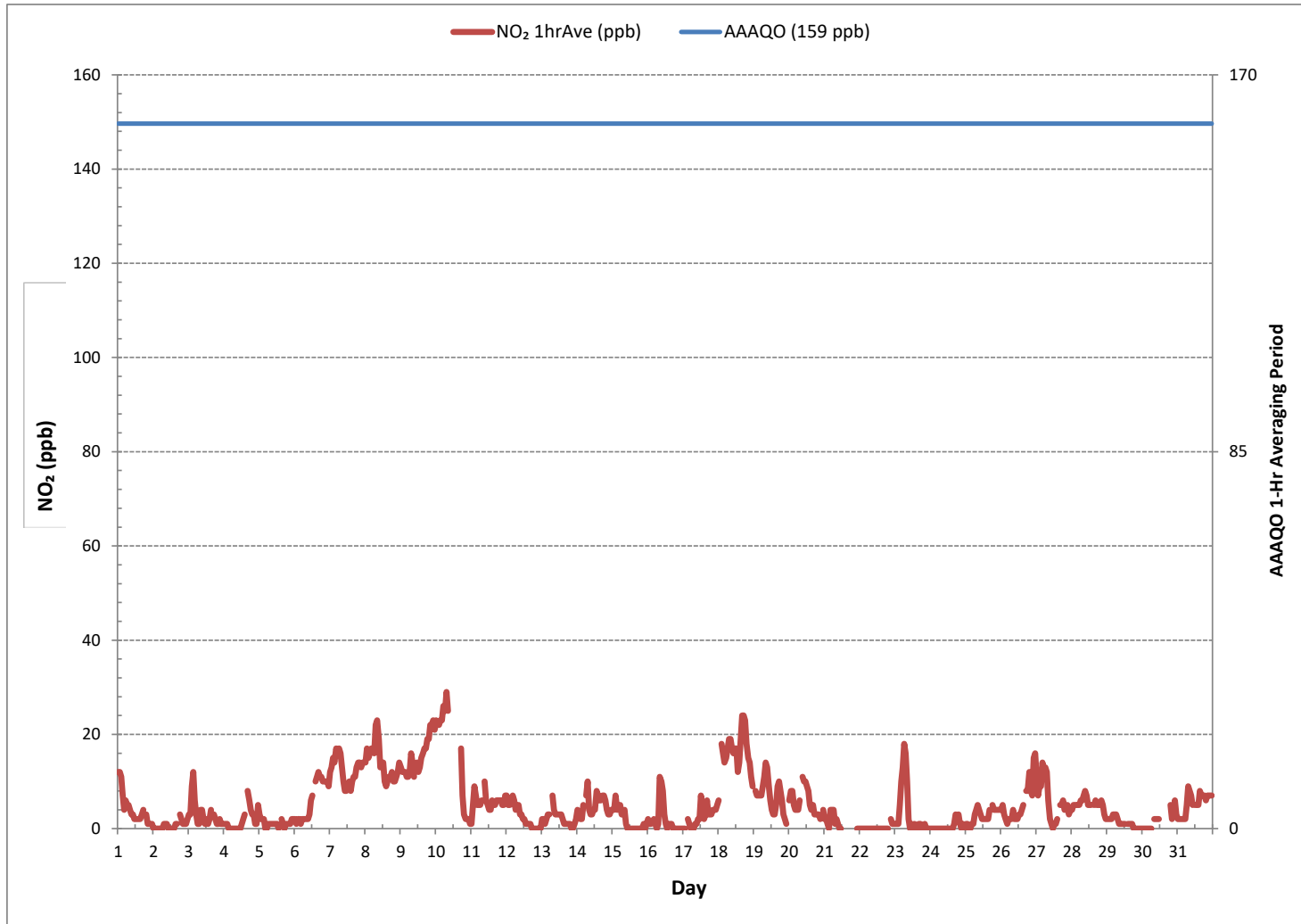
24 HR AVERAGES December 2018



MONTHLY SUMMARY

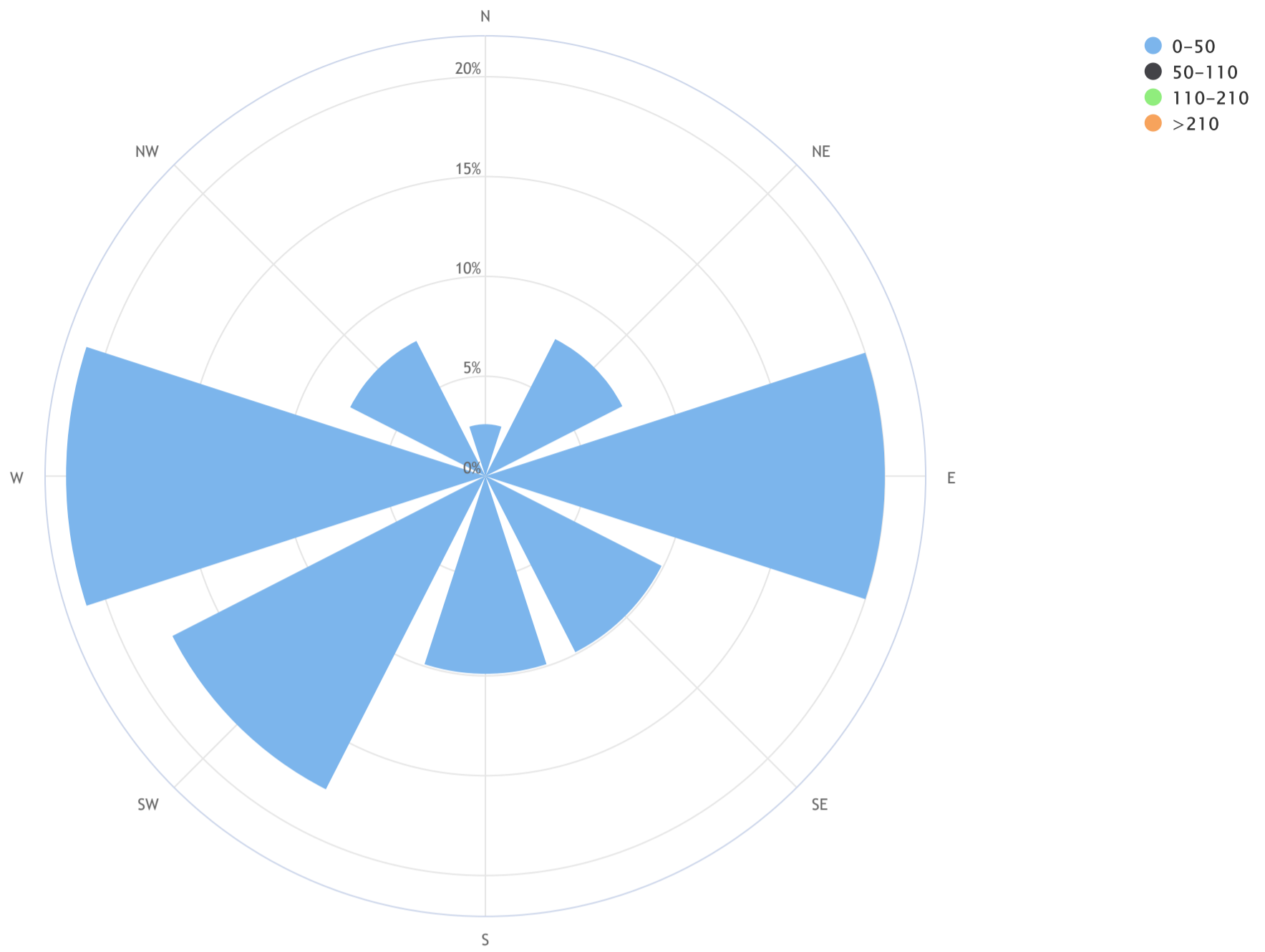
| | | | | |
|------------------------------|--------|-----------------------|---------|-----------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 562 | | | |
| MINIMUM 1-HR AVERAGE: | 0 ppb | @ HOUR | 0 | ON DAY 2 |
| MAXIMUM 1-HR AVERAGE: | 29 ppb | @ HOUR | 7 | ON DAY 10 |
| MAXIMUM 24-HR AVERAGE: | 16 ppb | | | ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs | OPERATIONAL TIME: | 727 hrs | |
| MONTHLY CALIBRATION TIME: | 7 hrs | AMD OPERATION UPTIME: | 97.8 % | |
| STANDARD DEVIATION: | 6 | MONTHLY AVERAGE: | 5 ppb | |

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_NO₂ (ppb)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 10.0_CALM % = 3.6%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|-----------|------|--------|---------|------|-------|
| N | 2.6 | 0.0 | 0.0 | 0.0 | 2.6 |
| NE | 7.7 | 0.0 | 0.0 | 0.0 | 7.7 |
| E | 20.0 | 0.0 | 0.0 | 0.0 | 20.0 |
| SE | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| S | 9.9 | 0.0 | 0.0 | 0.0 | 9.9 |
| SW | 17.6 | 0.0 | 0.0 | 0.0 | 17.6 |
| W | 21.0 | 0.0 | 0.0 | 0.0 | 21.0 |
| NW | 7.6 | 0.0 | 0.0 | 0.0 | 7.6 |
| Summary | 96.2 | 0.0 | 0.0 | 0.0 | 96.2 |
| CALM | 3.6 | 0.0 | 0.0 | 0.0 | 3.6 |

NO2[ppb] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span



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 | 3.7 | 2.8 | 2.8 | 10.2 | 23.4 | 9.2 | 8.9 | 12.7 | 15.0 | 13.3 | 12.9 | 14.2 | 14.7 | 16.5 | 17.8 | 16.9 | 14.8 | 12.6 | S | 15.4 | 17.2 | 18.5 | 19.2 | 18.6 | 2.8 | 23.4 | 13.5 | 24 |
| 2 | 18.6 | 18.4 | 17.4 | 15.4 | 15.2 | 15.0 | 14.9 | 14.1 | 14.5 | 15.2 | 15.7 | 16.3 | 17.3 | 18.6 | 19.0 | 18.4 | 19.3 | S | 20.0 | 21.3 | 24.2 | 25.2 | 24.2 | 20.8 | 14.1 | 25.2 | 18.2 | 24 |
| 3 | 16.0 | 14.1 | 8.3 | 4.8 | 9.6 | 11.1 | 13.5 | 16.6 | 13.9 | 14.1 | 18.9 | 20.4 | 22.6 | 29.0 | 28.1 | 24.8 | S | 26.9 | 25.9 | 26.3 | 26.9 | 26.3 | 26.7 | 28.1 | 4.8 | 29.0 | 19.7 | 24 |
| 4 | 28.0 | 28.7 | 30.0 | 31.6 | 32.7 | 33.8 | 33.9 | 35.2 | 37.3 | 36.6 | 37.4 | 36.7 | 34.5 | 32.2 | 30.8 | S | 27.9 | 28.7 | 30.3 | 31.8 | 33.1 | 32.2 | 32.5 | 23.5 | 23.5 | 37.4 | 32.1 | 24 |
| 5 | 25.6 | 26.8 | 24.7 | 23.5 | 27.0 | 30.4 | 28.0 | 27.3 | 27.9 | 27.6 | 28.1 | 28.1 | 29.4 | 31.9 | S | 33.4 | 32.8 | 33.6 | 33.5 | 33.4 | 33.2 | 32.5 | 32.1 | 32.7 | 23.5 | 33.6 | 29.7 | 24 |
| 6 | 33.1 | 33.4 | 32.9 | 32.8 | 32.9 | 32.4 | 32.1 | 31.4 | 30.2 | 31.9 | 30.0 | 27.3 | 27.4 | S | 26.2 | 23.3 | 21.9 | 22.1 | 21.5 | 21.3 | 22.5 | 21.6 | 21.9 | 21.6 | 21.3 | 33.4 | 27.5 | 24 |
| 7 | 18.6 | 14.2 | 12.0 | 11.4 | 10.2 | 13.0 | 13.6 | 14.8 | 17.8 | 22.3 | 24.4 | C | C | C | C | 27.1 | 25.2 | 23.8 | 20.0 | 18.4 | 17.1 | 16.2 | 15.6 | 14.4 | 10.2 | 27.1 | 17.5 | 24 |
| 8 | 14.8 | 11.4 | 13.6 | 9.7 | 10.4 | 10.1 | 9.6 | 6.7 | 9.7 | 15.0 | 21.8 | S | 25.8 | 30.1 | 32.4 | 29.3 | 26.7 | 24.2 | 23.3 | 25.1 | 24.0 | 20.9 | 19.4 | 18.1 | 6.7 | 32.4 | 18.8 | 24 |
| 9 | 19.2 | 17.9 | 17.9 | 17.6 | 19.1 | 16.7 | 15.0 | 12.4 | 13.1 | 19.3 | S | 19.8 | 20.3 | 19.6 | 16.8 | 17.7 | 15.3 | 16.1 | 11.9 | 12.1 | 8.4 | 7.2 | 4.9 | 5.1 | 4.9 | 20.3 | 14.9 | 24 |
| 10 | 3.5 | 2.6 | 2.6 | 2.1 | 2.7 | 0.9 | 1.0 | 0.7 | 2.3 | S | 9.5 | 13.2 | 15.0 | 14.5 | 15.7 | 19.8 | 27.1 | 27.6 | 31.1 | 34.4 | 31.8 | 31.0 | 30.7 | 30.7 | 0.7 | 34.4 | 15.2 | 24 |
| 11 | 29.9 | 24.1 | 19.5 | 21.3 | 20.8 | 19.9 | 21.9 | 21.2 | S | 23.0 | 26.3 | 27.6 | 28.9 | 29.4 | 28.0 | 28.8 | 28.8 | 28.2 | 25.5 | 24.3 | 23.7 | 22.9 | 22.4 | 20.4 | 19.5 | 29.9 | 24.6 | 24 |
| 12 | 19.6 | 21.3 | 20.7 | 20.4 | 19.2 | 20.5 | 23.7 | S | 32.0 | 32.3 | 33.1 | 34.8 | 36.2 | 37.8 | 38.2 | 38.6 | 39.7 | 40.4 | 40.5 | 40.5 | 40.8 | 40.2 | 39.7 | 38.7 | 19.2 | 40.8 | 32.6 | 24 |
| 13 | 36.5 | 36.1 | 37.3 | 34.9 | 33.8 | 33.3 | S | 30.3 | 31.8 | 33.7 | 34.9 | 35.5 | 35.3 | 35.9 | 37.1 | 38.3 | 38.6 | 39.0 | 38.9 | 38.9 | 39.1 | 39.4 | 38.7 | 36.2 | 30.3 | 39.4 | 36.2 | 24 |
| 14 | 33.0 | 33.2 | 33.5 | 33.1 | 29.4 | S | 29.4 | 23.8 | 32.2 | 30.9 | 30.3 | 29.2 | 29.4 | 24.9 | 25.6 | 28.9 | 28.3 | 32.2 | 26.6 | 30.1 | 33.8 | 34.1 | 33.4 | 31.8 | 23.8 | 34.1 | 30.1 | 24 |
| 15 | 30.6 | 27.9 | 24.0 | 28.7 | S | 33.7 | 34.0 | 34.1 | 31.4 | 37.9 | 36.1 | 35.0 | 35.6 | 36.3 | 35.4 | 34.5 | 34.8 | 33.6 | 32.8 | 32.7 | 33.1 | 32.9 | 33.5 | 33.0 | 24.0 | 37.9 | 33.1 | 24 |
| 16 | 32.0 | 31.8 | 31.2 | S | 31.9 | 29.5 | 28.5 | 22.7 | 12.9 | 14.8 | 19.4 | 28.1 | 31.3 | 32.3 | 32.1 | 31.6 | 31.7 | 32.3 | 32.0 | 31.2 | 30.9 | 31.7 | 31.2 | 31.1 | 12.9 | 32.3 | 28.8 | 24 |
| 17 | 30.6 | 30.5 | S | 30.1 | 30.5 | 31.4 | 32.1 | 31.5 | 30.9 | 31.0 | 29.6 | 30.0 | 25.5 | 27.3 | 27.3 | 25.2 | 20.9 | 23.2 | 23.9 | 24.0 | 21.9 | 21.6 | 19.5 | 17.0 | 17.0 | 32.1 | 26.8 | 24 |
| 18 | 15.0 | S | 6.2 | 5.1 | 7.2 | 3.7 | 2.5 | 1.2 | 1.4 | 4.7 | 7.2 | 9.0 | 11.3 | 12.9 | 11.9 | 8.0 | 4.1 | 1.8 | 3.1 | 5.8 | 7.7 | 9.2 | 11.3 | 12.1 | 1.2 | 15.0 | 7.1 | 24 |
| 19 | S | 19.9 | 14.9 | 14.2 | 15.5 | 18.7 | 16.9 | 13.1 | 12.3 | 16.4 | 20.7 | 26.5 | 31.3 | 31.7 | 32.0 | 30.5 | 25.7 | 24.7 | 25.6 | 27.1 | 29.9 | 32.3 | 33.5 | S | 12.3 | 33.5 | 23.3 | 24 |
| 20 | 28.5 | 22.8 | 23.4 | 26.6 | 28.5 | 27.9 | 26.5 | 20.9 | 20.3 | 18.7 | 19.7 | 19.4 | 22.2 | 25.4 | 31.7 | 33.3 | 29.5 | 33.4 | 31.3 | 29.3 | 28.5 | 28.9 | S | 29.3 | 18.7 | 33.4 | 26.4 | 24 |
| 21 | 27.7 | 28.0 | 29.4 | 28.8 | 24.1 | 23.0 | 22.7 | 24.0 | 24.1 | 26.0 | 27.2 | 27.4 | 25.9 | 24.8 | 25.7 | 25.5 | 23.2 | 20.9 | 22.2 | 28.0 | 28.5 | S | 27.0 | 26.7 | 20.9 | 29.4 | 25.7 | 24 |
| 22 | 27.0 | 26.7 | 25.9 | 26.7 | 26.8 | 27.7 | 30.7 | 32.1 | 32.4 | 31.7 | 33.3 | 35.8 | 34.9 | 33.5 | 33.5 | 34.6 | 33.1 | 32.6 | 32.4 | 31.9 | S | 30.5 | 29.3 | 28.5 | 25.9 | 35.8 | 30.9 | 24 |
| 23 | 26.4 | 23.6 | 21.1 | 13.0 | 7.1 | 5.4 | 6.7 | 9.6 | 15.7 | 24.1 | 26.2 | 26.2 | 27.1 | 26.7 | 27.2 | 26.5 | 24.8 | 24.7 | 25.6 | S | 26.6 | 27.1 | 28.0 | 28.5 | 5.4 | 28.5 | 21.6 | 24 |
| 24 | 29.1 | 30.5 | 31.8 | 31.8 | 31.6 | 30.0 | 27.6 | 28.1 | 32.0 | 30.7 | 29.4 | 30.6 | 32.1 | 31.9 | 31.7 | 30.8 | 28.1 | 24.5 | S | 27.3 | 28.2 | 28.3 | 27.1 | 27.9 | 24.5 | 32.1 | 29.6 | 24 |
| 25 | 26.8 | 26.0 | 26.5 | 26.3 | 24.9 | 25.1 | 23.7 | 21.7 | 21.0 | 21.6 | 22.5 | 23.6 | 24.0 | 23.7 | 23.8 | 23.1 | 21.0 | S | 20.9 | 20.7 | 20.2 | 19.4 | 19.1 | 18.4 | 18.4 | 26.8 | 22.8 | 24 |
| 26 | 17.2 | 15.4 | 16.2 | 14.8 | 16.4 | 17.0 | 16.4 | 13.4 | 13.0 | 17.2 | 18.7 | 19.2 | 19.6 | 19.5 | 18.8 | 17.5 | S | 14.4 | 13.0 | 9.2 | 12.3 | 11.2 | 3.3 | 3.8 | 3.3 | 19.6 | 14.7 | 24 |
| 27 | 7.8 | 10.3 | 9.7 | 9.4 | 5.4 | 6.7 | 6.3 | 7.2 | 14.1 | 20.1 | 22.1 | 22.8 | 22.5 | 21.9 | 20.5 | S | 19.3 | 18.5 | 17.4 | 19.1 | 18.5 | 17.6 | 18.7 | 17.8 | 5.4 | 22.8 | 15.4 | 24 |
| 28 | 17.0 | 15.3 | 14.9 | 14.2 | 14.0 | 14.1 | 13.7 | 13.2 | 12.0 | 11.2 | 12.2 | 13.5 | 14.1 | 13.9 | S | 14.8 | 13.1 | 13.5 | 13.8 | 13.5 | 12.4 | 13.1 | 15.8 | 15.9 | 11.2 | 17.0 | 13.9 | 24 |
| 29 | 15.4 | 15.2 | 15.1 | 15.4 | 14.8 | 15.2 | 15.5 | 16.3 | 17.1 | 18.5 | 19.3 | 19.8 | 20.7 | S | 21.2 | 22.1 | 22.1 | 23.0 | 23.6 | 23.4 | 23.2 | 23.1 | 23.6 | 24.1 | 14.8 | 24.1 | 19.5 | 24 |
| 30 | 24.4 | 24.7 | 24.7 | 24.5 | 25.0 | 26.3 | 27.3 | 28.5 | 29.6 | 29.5 | 30.2 | 32.1 | S | 31.4 | 33.7 | 35.4 | 36.4 | 33.9 | 33.4 | 31.4 | 33.9 | 32.6 | 29.2 | 30.4 | 24.4 | 36.4 | 29.9 | 24 |
| 31 | 30.6 | 28.2 | 27.6 | 26.2 | 25.5 | 25.6 | 19.1 | 15.5 | 18.8 | 21.9 | 25.6 | S | 23.1 | 22.6 | 22.2 | 19.8 | 19.6 | 19.7 | 20.5 | 20.3 | 19.9 | 19.5 | 18.7 | 18.4 | 15.5 | 30.6 | 22.1 | 24 |
| HOURLY MAX | 36.5 | 36.1 | 37.3 | 34.9 | 33.8 | 33.8 | 34.0 | 35.2 | 37.3 | 37.9 | 37.4 | 36.7 | 36.2 | 37.8 | 38.2 | 38.6 | 39.7 | 40.4 | 40.5 | 40.5 | 40.8 | 40.2 | 39.7 | 38.7 | | | | |
| HOURLY AVG | 22.9 | 22.1 | 20.5 | 20.2 | 20.5 | 20.2 | 19.9 | 19.3 | 20.6 | 23.0 | 24.1 | 25.1 | 25.4 | 26.3 | 26.6 | 26.2 | 25.3 | 25.0 | 24.8 | 24.9 | 25.1 | 24.9 | 24.3 | 23.5 | | | | |

STATUS FLAG CODES

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

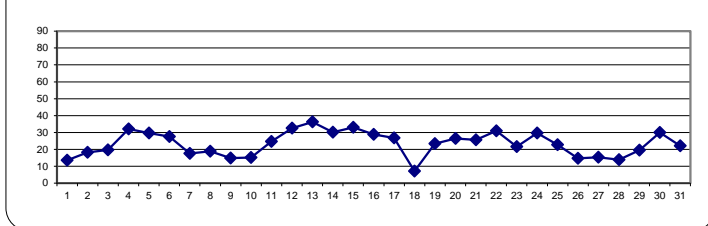
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

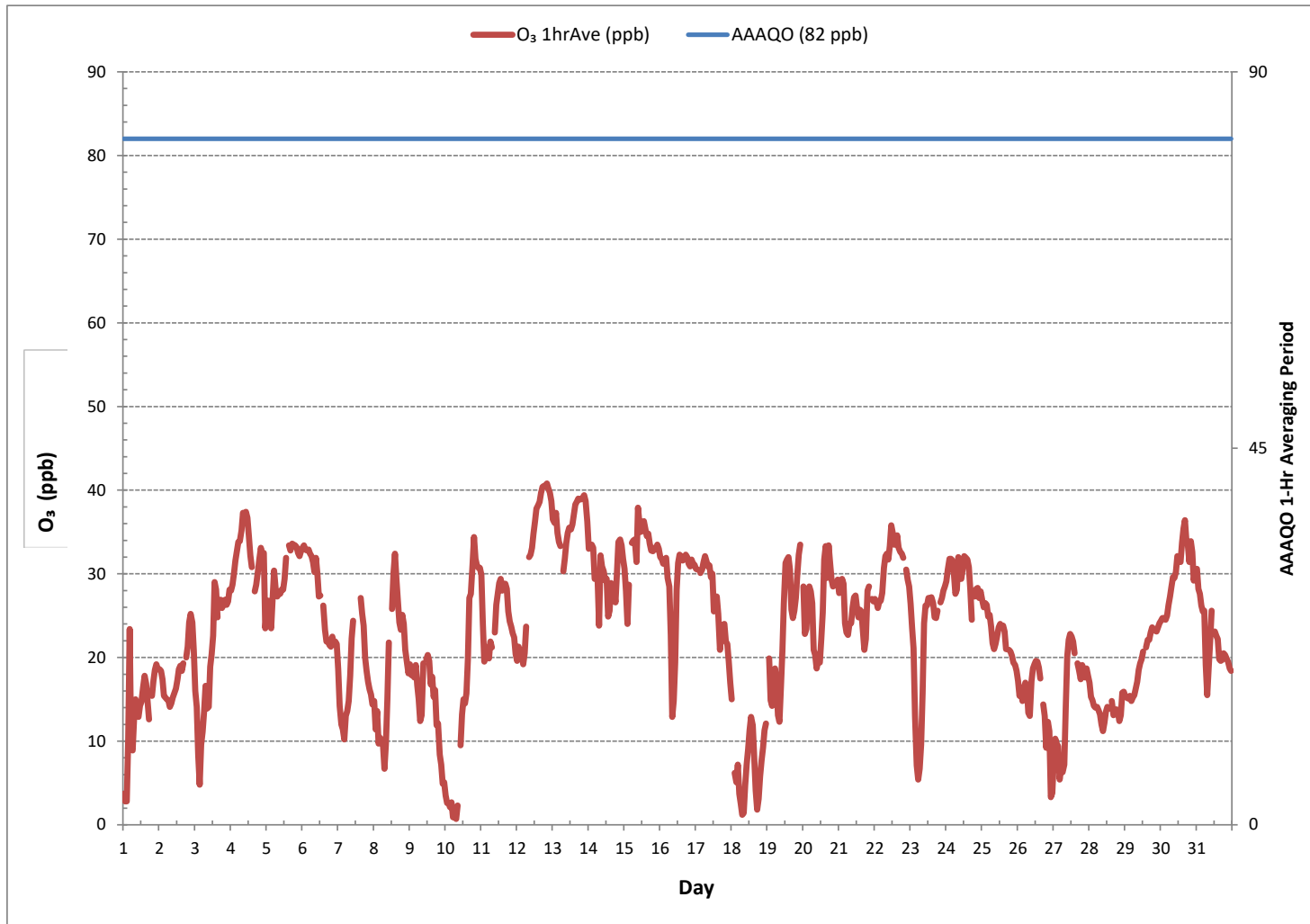
MONTHLY SUMMARY

| | | | | |
|------------------------------|------|-----|-----------------------|--------------|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 709 | | | |
| MINIMUM 1-HR AVERAGE: | 0.7 | ppb | @ HOUR | 7 ON DAY 10 |
| MAXIMUM 1-HR AVERAGE: | 40.8 | ppb | @ HOUR | 20 ON DAY 12 |
| MAXIMUM 24-HR AVERAGE: | 36.2 | ppb | | ON DAY 13 |
| IZS CALIBRATION TIME: | 31 | hrs | OPERATIONAL TIME: | 744 hrs |
| MONTHLY CALIBRATION TIME: | 4 | hrs | AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 8.7 | | MONTHLY AVERAGE: | 23.3 ppb |

24 HR AVERAGES December 2018

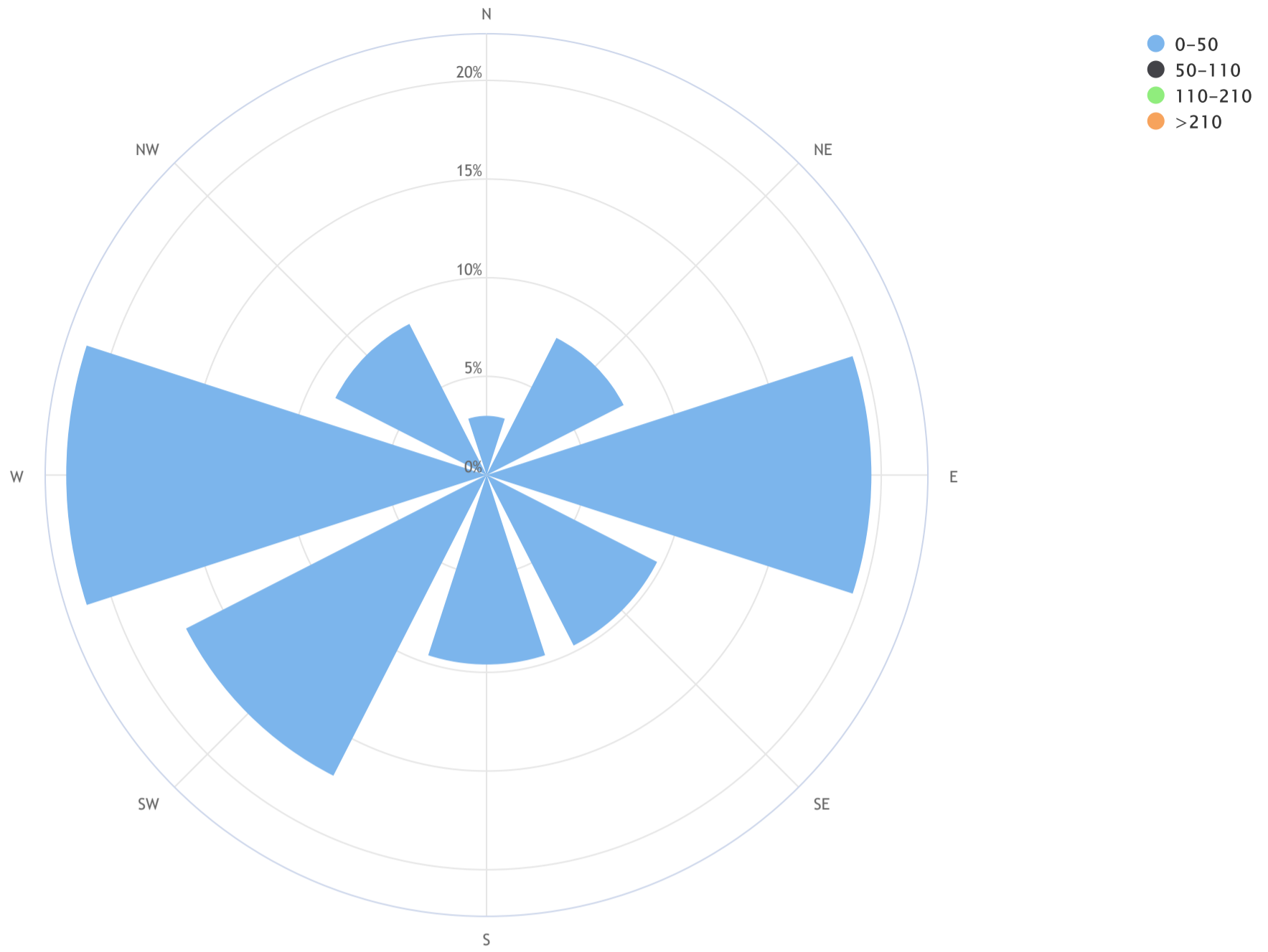


OZONE Hourly Averages (O₃ ppb)



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_O₃ (ppb)_18/12

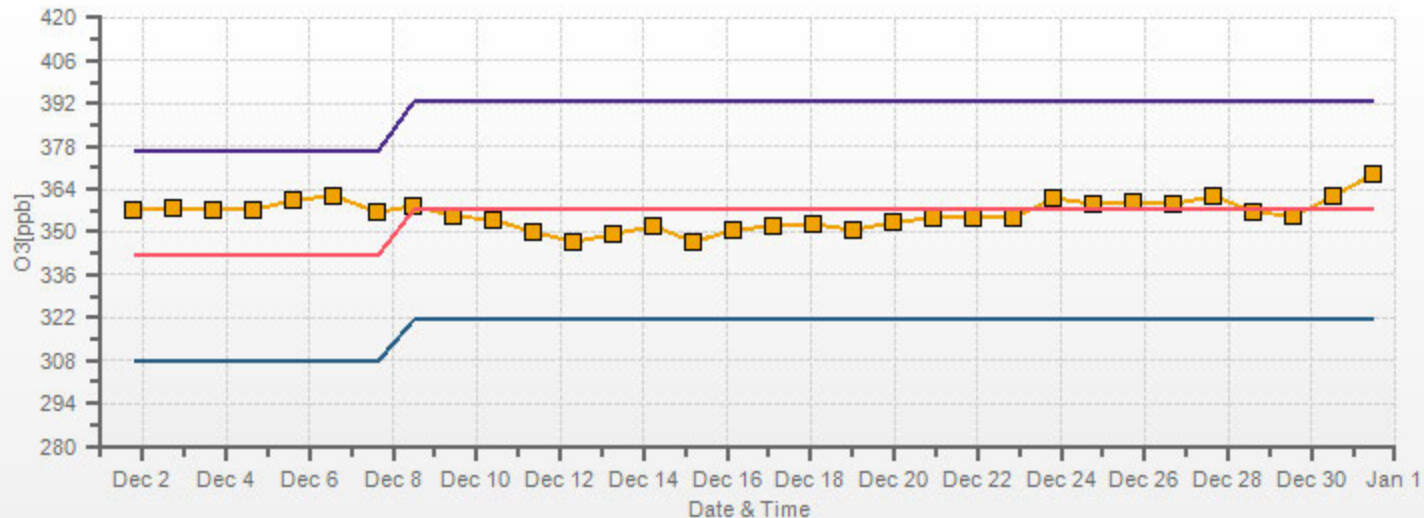
Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 14.3_CALM % = 3.5%



| Direction | 0-50 | 50-110 | 110-210 | >210 | TOTAL |
|----------------|-------------|------------|------------|------------|-------------|
| N | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| NE | 7.8 | 0.0 | 0.0 | 0.0 | 7.8 |
| E | 19.5 | 0.0 | 0.0 | 0.0 | 19.5 |
| SE | 9.7 | 0.0 | 0.0 | 0.0 | 9.7 |
| S | 9.6 | 0.0 | 0.0 | 0.0 | 9.6 |
| SW | 17.1 | 0.0 | 0.0 | 0.0 | 17.1 |
| W | 21.3 | 0.0 | 0.0 | 0.0 | 21.3 |
| NW | 8.6 | 0.0 | 0.0 | 0.0 | 8.6 |
| Summary | 96.5 | 0.0 | 0.0 | 0.0 | 96.5 |
| CALM | 3.5 | 0.0 | 0.0 | 0.0 | 3.5 |

O3[ppb] Calibration: LICA Bonnyville East Monthly: 18/12 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



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

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

STATUS FLAG CODES

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

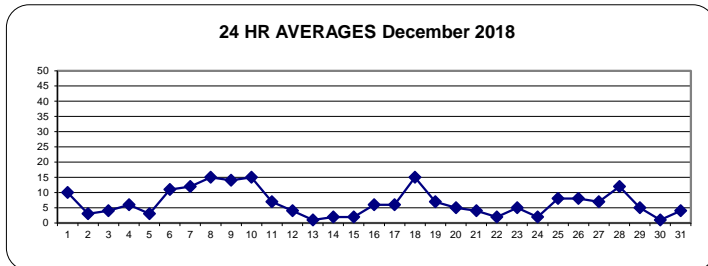
OBJECTIVE LIMIT:

| | | | | |
|----------------------|------|----------------------|-------|----------------------|
| ALBERTA ENVIRONMENT: | 1-HR | 80 µg/m ³ | 24-HR | 29 µg/m ³ |
|----------------------|------|----------------------|-------|----------------------|

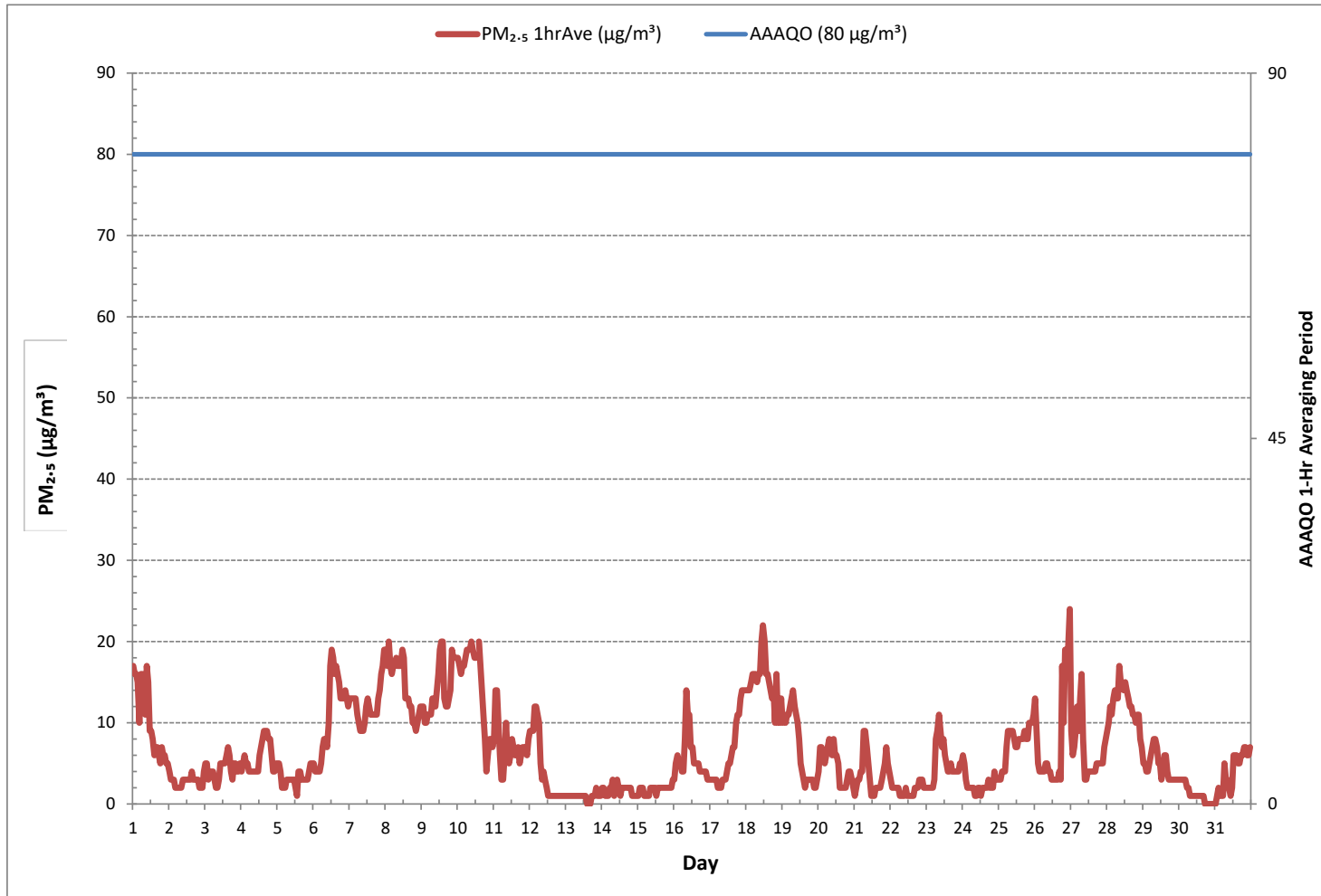
MONTHLY SUMMARY

| | | | | |
|------------------------------|-----------------------------|-----------------------|---------------------|----|
| NUMBER OF 1-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF 24-HR EXCEEDANCES: | 0 | | | |
| NUMBER OF NON-ZERO READINGS: | 732 | | | |
| MINIMUM 1-HR AVERAGE: | 0 µg/m ³ @ HOUR | 14 | ON DAY | 13 |
| MAXIMUM 1-HR AVERAGE: | 24 µg/m ³ @ HOUR | 23 | ON DAY | 26 |
| MAXIMUM 24-HR AVERAGE: | 15 µg/m ³ | | ON DAY | 8 |
| MONTHLY CALIBRATION TIME: | 1 hrs | OPERATIONAL TIME: | 744 hrs | |
| STANDARD DEVIATION: | 5 | AMD OPERATION UPTIME: | 100.0 % | |
| | | MONTHLY AVERAGE: | 7 µg/m ³ | |

24 HR AVERAGES December 2018

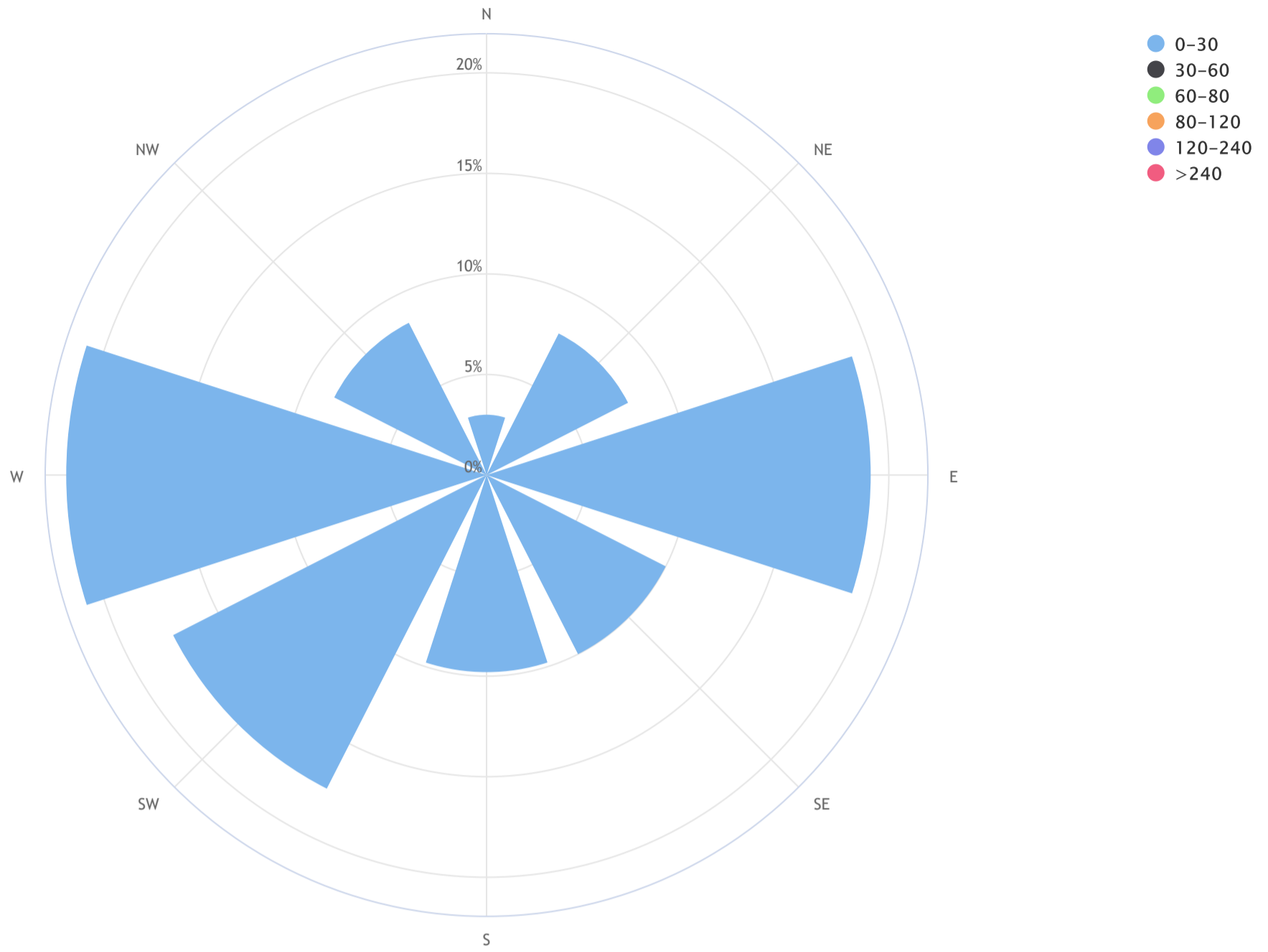


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_PM2.5 (µg/m³)_18/12

Pollutant Rose_Wind Frequency (Blowing From)_CALM Avg = 10.6_CALM % = 3.4%



| Direction | 0-30 | 30-60 | 60-80 | 80-120 | 120-240 | >240 | TOTAL |
|-----------|------|-------|-------|--------|---------|------|-------|
| N | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| NE | 7.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.9 |
| E | 19.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.1 |
| SE | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| S | 9.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.8 |
| SW | 17.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.5 |
| W | 20.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.9 |
| NW | 8.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 |
| Summary | 96.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

WIND SPEED Hourly Averages (WS kph)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 6.1 | 6.3 | 5.6 | 8.7 | 6.4 | 12.0 | 10.7 | 14.0 | 12.5 | 13.0 | 10.7 | 11.3 | 13.9 | 16.4 | 15.3 | 11.3 | 11.6 | 11.8 | 11.9 | 13.6 | 15.1 | 14.8 | 12.9 | 11.0 | 5.6 | 16.4 | 11.4 | 24 |
| 2 | 13.8 | 14.2 | 17.5 | 20.7 | 20.8 | 17.0 | 12.4 | 12.8 | 12.9 | 12.6 | 12.1 | 11.2 | 10.6 | 8.9 | 7.9 | 6.4 | 7.6 | 5.7 | 4.6 | 3.6 | 4.5 | 3.9 | 2.3 | 6.1 | 2.3 | 20.8 | 9.1 | 24 |
| 3 | 7.2 | 7.7 | 8.6 | 6.4 | 7.4 | 9.7 | 11.7 | 12.0 | 12.4 | 13.1 | 12.5 | 17.2 | 20.4 | 17.5 | 14.9 | 17.0 | 17.3 | 22.8 | 16.2 | 14.7 | 13.8 | 17.6 | 18.1 | 16.5 | 6.4 | 22.8 | 13.0 | 24 |
| 4 | 16.2 | 14.7 | 15.6 | 15.2 | 12.0 | 11.9 | 12.9 | 12.9 | 12.2 | 13.0 | 14.4 | 13.5 | 9.6 | 13.0 | 13.9 | 12.7 | 11.8 | 16.9 | 15.7 | 13.8 | 18.5 | 21.1 | 25.7 | 22.4 | 9.6 | 25.7 | 11.5 | 24 |
| 5 | 24.8 | 23.4 | 24.5 | 22.6 | 24.5 | 21.6 | 17.7 | 16.3 | 13.5 | 9.1 | 6.3 | 0.9 | 6.2 | 13.2 | 2.8 | 6.1 | 8.6 | 6.5 | 12.9 | 13.5 | 11.6 | 11.0 | 10.6 | 11.7 | 0.9 | 24.8 | 6.9 | 24 |
| 6 | 11.0 | 12.0 | 12.8 | 11.4 | 7.9 | 9.1 | 7.5 | 8.0 | 8.9 | 10.1 | 12.2 | 12.8 | 12.6 | 16.0 | 11.1 | 11.5 | 11.8 | 13.5 | 13.0 | 12.4 | 13.5 | 8.5 | 9.3 | 4.3 | 4.3 | 16.0 | 10.7 | 24 |
| 7 | 8.5 | 4.3 | 2.0 | 4.5 | 4.6 | 9.2 | 9.4 | 9.6 | 8.8 | 6.1 | 3.4 | 3.3 | 9.6 | 9.9 | 11.3 | 11.1 | 9.1 | 8.1 | 8.7 | 7.2 | 2.2 | 3.1 | 5.5 | 2.0 | 11.3 | 5.6 | 24 | |
| 8 | 5.5 | 1.1 | 1.8 | 1.1 | 2.2 | 1.1 | 0.5 | 3.5 | 5.7 | 7.4 | 9.6 | 12.7 | 13.3 | 11.4 | 10.2 | 7.3 | 7.5 | 9.7 | 7.8 | 9.7 | 5.3 | 5.9 | 4.6 | 5.7 | 0.5 | 13.3 | 6.0 | 24 |
| 9 | 8.7 | 4.3 | 2.0 | 2.2 | 4.3 | 2.3 | 2.2 | 1.3 | 6.5 | 4.6 | 5.6 | 3.7 | 1.4 | 3.0 | 3.5 | 5.5 | 4.2 | 4.9 | 10.0 | 3.4 | 1.8 | 2.5 | 2.0 | 4.9 | 1.3 | 10.0 | 1.5 | 24 |
| 10 | 2.7 | 7.5 | 0.4 | 4.2 | 2.1 | 2.6 | 1.4 | 7.6 | 5.5 | 3.0 | 4.5 | 7.6 | 9.1 | 9.3 | 12.0 | 11.1 | 9.6 | 12.9 | 13.7 | 16.2 | 16.0 | 15.2 | 14.5 | 11.6 | 0.4 | 16.2 | 6.9 | 24 |
| 11 | 11.6 | 14.3 | 13.6 | 10.3 | 3.3 | 6.6 | 9.1 | 9.7 | 6.8 | 5.3 | 11.9 | 12.5 | 12.5 | 15.6 | 19.4 | 22.0 | 21.2 | 16.1 | 14.0 | 17.3 | 13.3 | 4.8 | 7.4 | 6.0 | 3.3 | 22.0 | 10.0 | 24 |
| 12 | 6.4 | 3.4 | 7.9 | 8.8 | 7.2 | 7.3 | 9.6 | 16.0 | 15.8 | 18.4 | 18.2 | 19.2 | 20.1 | 19.5 | 21.0 | 20.0 | 24.6 | 24.8 | 20.5 | 19.2 | 21.2 | 19.0 | 16.1 | 13.3 | 3.4 | 24.8 | 15.6 | 24 |
| 13 | 9.1 | 10.4 | 16.4 | 6.8 | 6.5 | 5.4 | 10.4 | 6.0 | 3.9 | 14.3 | 18.3 | 24.6 | 16.6 | 18.3 | 17.3 | 16.3 | 18.9 | 15.7 | 14.2 | 13.5 | 15.2 | 13.5 | 11.1 | 11.7 | 3.9 | 24.6 | 11.2 | 24 |
| 14 | 12.9 | 12.7 | 4.8 | 6.6 | 8.9 | 17.7 | 14.9 | 8.9 | 10.4 | 10.3 | 14.2 | 12.7 | 9.1 | 7.0 | 8.2 | 10.0 | 11.8 | 10.7 | 5.0 | 6.6 | 6.6 | 4.3 | 9.4 | 4.9 | 4.3 | 17.7 | 7.7 | 24 |
| 15 | 7.6 | 7.1 | 6.9 | 10.0 | 10.0 | 7.6 | 6.1 | 12.8 | 28.6 | 32.6 | 36.1 | 33.9 | 42.0 | 36.2 | 35.7 | 28.3 | 33.5 | 36.8 | 36.4 | 29.0 | 23.1 | 16.4 | 17.2 | 13.3 | 6.1 | 42.0 | 19.1 | 24 |
| 16 | 9.1 | 8.5 | 8.1 | 5.6 | 5.4 | 4.9 | 1.7 | 5.5 | 5.5 | 6.1 | 6.4 | 9.0 | 11.7 | 15.7 | 15.2 | 19.4 | 15.6 | 21.2 | 21.2 | 19.7 | 18.6 | 19.1 | 14.5 | 14.0 | 1.7 | 21.2 | 8.1 | 24 |
| 17 | 15.5 | 15.1 | 14.8 | 13.1 | 15.0 | 14.4 | 13.6 | 12.7 | 8.3 | 6.9 | 2.5 | 3.8 | 5.1 | 5.4 | 8.5 | 6.4 | 6.6 | 8.3 | 9.4 | 8.0 | 8.4 | 1.7 | 4.3 | 4.3 | 1.7 | 15.5 | 2.9 | 24 |
| 18 | 6.1 | 9.1 | 9.6 | 2.2 | 3.0 | 2.4 | 3.5 | 4.3 | 3.1 | 3.3 | 3.6 | 3.0 | 4.6 | 2.4 | 7.1 | 5.5 | 4.4 | 3.0 | 2.2 | 9.1 | 8.5 | 5.6 | 4.5 | 4.7 | 2.2 | 9.6 | 1.9 | 24 |
| 19 | 4.9 | 6.7 | 2.8 | 7.8 | 7.8 | 9.9 | 7.5 | 5.4 | 6.9 | 9.1 | 13.3 | 13.1 | 14.4 | 15.9 | 12.8 | 13.1 | 14.9 | 15.8 | 17.3 | 17.5 | 14.7 | 16.9 | 15.2 | 12.7 | 2.8 | 17.5 | 11.3 | 24 |
| 20 | 15.3 | 16.2 | 16.2 | 14.9 | 12.2 | 11.1 | 4.9 | 2.7 | 6.0 | 5.5 | 6.8 | 6.5 | 9.2 | 11.6 | 11.6 | 10.7 | 16.3 | 15.1 | 12.4 | 17.9 | 19.4 | 22.7 | 19.7 | 17.7 | 2.7 | 22.7 | 5.7 | 24 |
| 21 | 10.8 | 9.1 | 8.4 | 3.7 | 9.1 | 12.0 | 18.3 | 24.5 | 25.5 | 28.4 | 28.2 | 30.7 | 31.1 | 26.4 | 25.9 | 27.0 | 19.7 | 23.7 | 29.1 | 34.3 | 26.6 | 32.3 | 33.2 | 30.1 | 3.7 | 34.3 | 20.1 | 24 |
| 22 | 28.9 | 24.0 | 22.4 | 25.4 | 25.4 | 22.7 | 24.2 | 20.6 | 16.7 | 12.7 | 14.9 | 20.1 | 14.8 | 10.5 | 10.4 | 11.5 | 11.0 | 12.0 | 12.6 | 11.0 | 10.0 | 7.9 | 2.9 | 2.2 | 2.2 | 28.9 | 13.9 | 24 |
| 23 | 2.3 | 2.5 | 2.8 | 1.6 | 3.0 | 3.6 | 1.7 | 3.2 | 3.3 | 4.3 | 2.9 | 2.9 | 4.6 | 5.2 | 8.9 | 7.9 | 8.6 | 10.8 | 9.4 | 10.5 | 10.1 | 9.6 | 9.2 | 7.9 | 1.6 | 10.8 | 5.4 | 24 |
| 24 | 7.3 | 8.2 | 7.9 | 5.4 | 2.9 | 1.6 | 0.8 | 2.7 | 6.1 | 5.0 | 4.6 | 5.7 | 8.3 | 8.3 | 7.9 | 8.8 | 6.6 | 4.5 | 4.7 | 7.7 | 7.9 | 9.0 | 10.2 | 11.0 | 0.8 | 11.0 | 6.2 | 24 |
| 25 | 12.1 | 11.9 | 10.8 | 11.1 | 9.5 | 8.9 | 9.8 | 11.1 | 10.9 | 10.1 | 13.1 | 11.4 | 5.8 | 5.7 | 5.5 | 8.1 | 7.9 | 5.5 | 3.0 | 4.1 | 4.9 | 5.3 | 4.1 | 6.0 | 3.0 | 13.1 | 5.4 | 24 |
| 26 | 8.5 | 11.0 | 12.2 | 15.2 | 16.7 | 16.4 | 14.3 | 13.5 | 11.9 | 10.3 | 9.1 | 5.6 | 7.0 | 4.4 | 2.4 | 1.9 | 2.7 | 0.8 | 3.6 | 2.1 | 1.6 | 3.3 | 2.7 | 5.9 | 0.8 | 16.7 | 6.2 | 24 |
| 27 | 6.8 | 3.2 | 0.9 | 2.4 | 3.2 | 0.9 | 1.2 | 0.3 | 1.9 | 3.5 | 2.8 | 2.1 | 0.7 | 2.7 | 6.1 | 7.7 | 7.3 | 10.3 | 8.1 | 2.9 | 2.8 | 6.4 | 4.3 | 3.5 | 0.3 | 10.3 | 2.4 | 24 |
| 28 | 1.7 | 5.4 | 5.0 | 2.5 | 2.2 | 4.8 | 2.6 | 1.7 | 4.8 | 4.6 | 6.2 | 9.5 | 6.6 | 9.4 | 8.7 | 10.2 | 9.4 | 10.0 | 12.7 | 10.5 | 8.6 | 8.4 | 10.3 | 8.9 | 1.7 | 12.7 | 5.3 | 24 |
| 29 | 9.9 | 8.5 | 7.2 | 8.9 | 8.2 | 7.5 | 8.4 | 11.1 | 12.5 | 11.5 | 11.2 | 13.0 | 13.3 | 14.7 | 19.2 | 18.8 | 20.7 | 23.4 | 24.5 | 22.6 | 24.2 | 25.4 | 27.2 | 26.5 | 7.2 | 27.2 | 15.4 | 24 |
| 30 | 24.2 | 24.3 | 23.1 | 19.6 | 18.1 | 20.4 | 21.1 | 17.9 | 14.4 | 11.5 | 8.5 | 10.6 | 13.8 | 12.2 | 9.8 | 8.2 | 8.3 | 11.2 | 7.6 | 7.6 | 7.8 | 7.7 | 4.8 | 7.4 | 4.8 | 24.3 | 8.4 | 24 |
| 31 | 6.0 | 6.9 | 3.9 | 4.2 | 2.0 | 4.8 | 4.0 | 1.7 | 5.6 | 4.2 | 3.7 | 4.9 | 5.6 | 11.1 | 10.5 | 7.9 | 9.3 | 10.7 | 14.1 | 13.2 | 19.1 | 17.3 | 19.3 | 16.6 | 1.7 | 19.3 | 7.7 | 24 |
| HOURLY MAX | 28.9 | 24.3 | 24.5 | 25.4 | 25.4 | 22.7 | 24.2 | 24.5 | 28.6 | 32.6 | 36.1 | 33.9 | 42.0 | 36.2 | 35.7 | 28.3 | 33.5 | 36.8 | 36.4 | 34.3 | 26.6 | 32.3 | 33.2 | 30.1 | | | | |

STATUS FLAG CODES

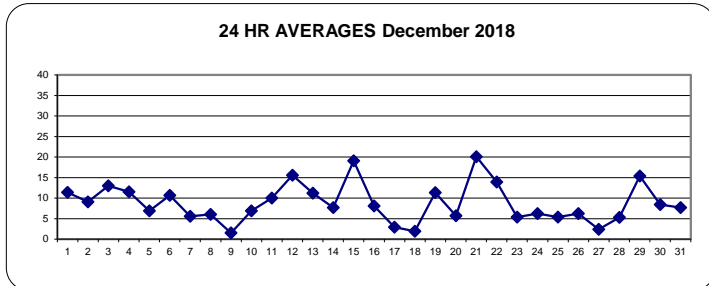
| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | R | - RECOVERY |
| Y | - MAINTENANCE | X | - MACHINE MALFUNCTION |
| S | - DAILY ZERO/SPAN CHECK | G | - OUT FOR REPAIR |
| S1 | - REPEAT ZERO/SPAN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

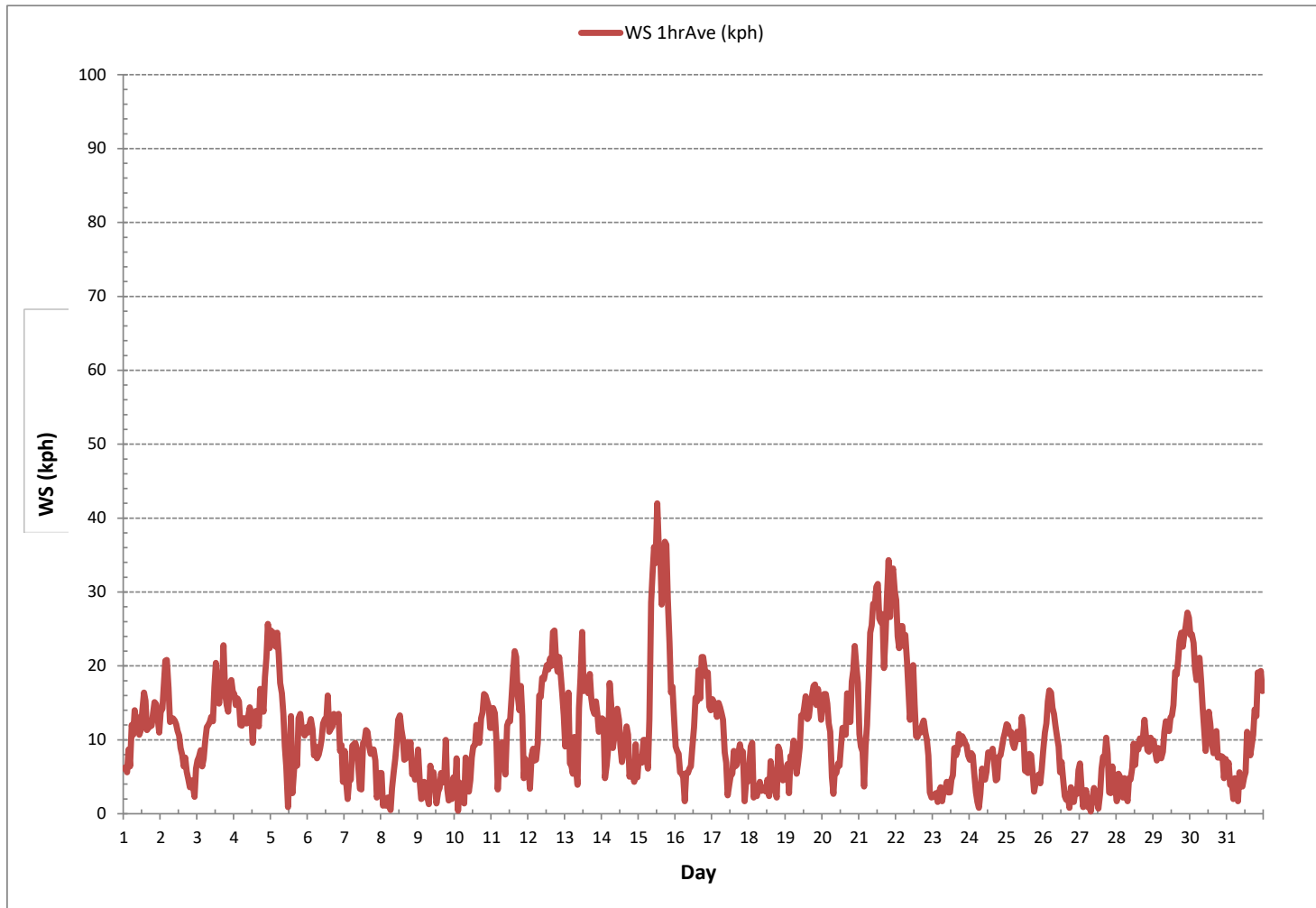
| | |
|-------------------|-------------------------------------|
| LAST CALIBRATION: | October 24, 2018 |
| DECLINATION : | MAGNETIC DECLINATION 13 DEGREE EAST |

MONTHLY SUMMARY

| | |
|------------------------------|------------------------------|
| NUMBER OF NON-ZERO READINGS: | 744 |
| MINIMUM 1-HR AVERAGE | 0.3 kph @ HOUR 7 ON DAY 27 |
| MAXIMUM 1-HR AVERAGE: | 42.0 kph @ HOUR 12 ON DAY 15 |
| MAXIMUM 24-HR AVERAGE: | 20.1 kph ON DAY 21 |
| MONTHLY CALIBRATION TIME: | 0 hrs |
| OPERATIONAL TIME: | 744 hrs |
| AMD OPERATION UPTIME: | 100.0 % |
| STANDARD DEVIATION: | 7.0 |
| MONTHLY AVERAGE: | 1.8 kph |

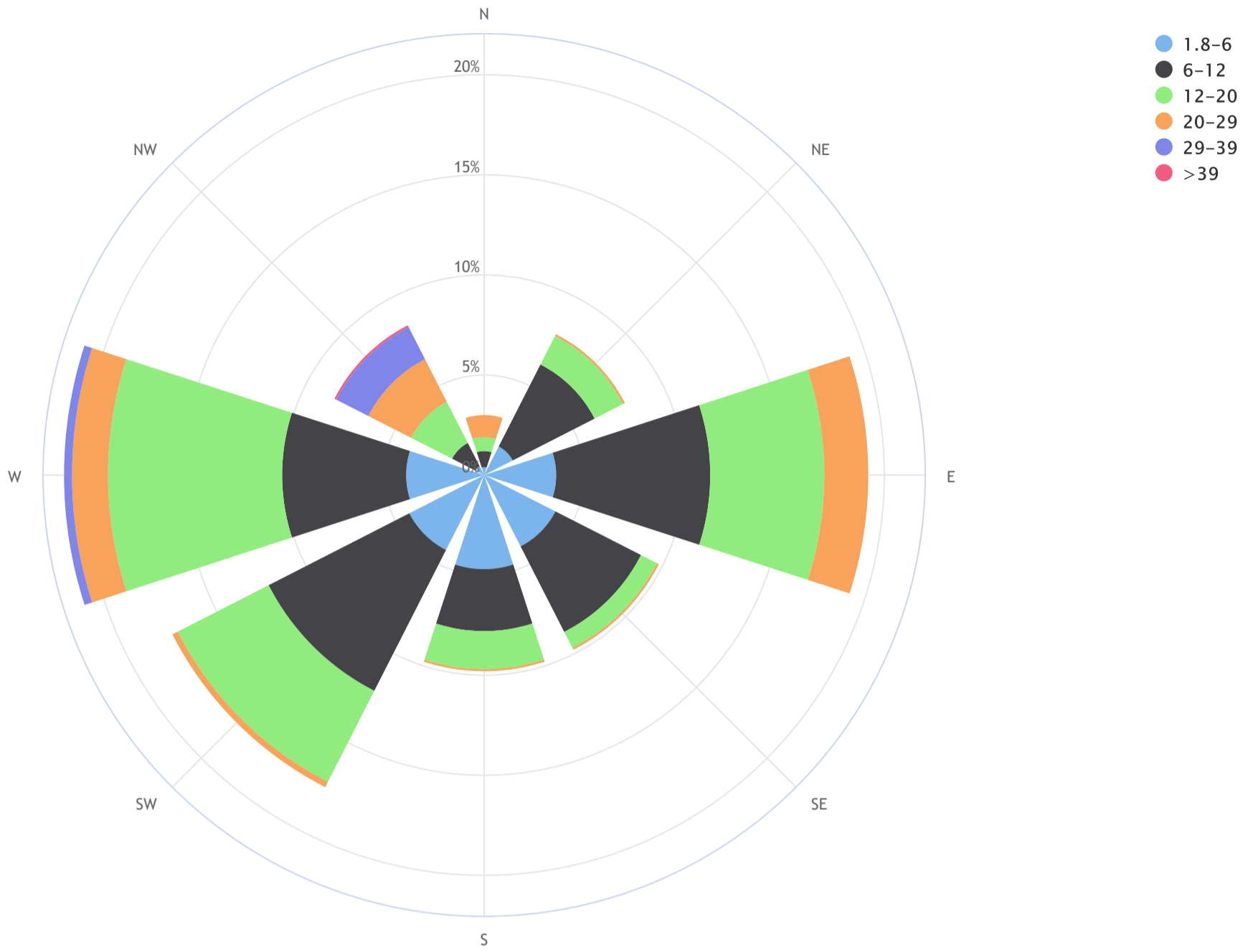
24 HR AVERAGES December 2018





Lakeland Industry & Community Association_Bonnyville East Continuous Monitoring Station_18/12

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 1.2_CALM % = 3.4%



| Direction | 1.8-6 | 6-12 | 12-20 | 20-29 | 29-39 | >39 | TOTAL |
|-----------|-------|------|-------|-------|-------|-----|-------|
| N | 0.4 | 0.8 | 0.7 | 1.1 | 0.0 | 0.0 | 3.0 |
| NE | 1.6 | 4.6 | 1.6 | 0.1 | 0.0 | 0.0 | 7.9 |
| E | 3.6 | 7.7 | 5.7 | 2.2 | 0.0 | 0.0 | 19.1 |
| SE | 4.0 | 4.8 | 0.9 | 0.1 | 0.0 | 0.0 | 9.9 |
| S | 4.7 | 3.1 | 1.9 | 0.1 | 0.0 | 0.0 | 9.8 |
| SW | 4.2 | 7.9 | 5.1 | 0.3 | 0.0 | 0.0 | 17.5 |
| W | 3.9 | 6.2 | 8.7 | 1.8 | 0.4 | 0.0 | 21.0 |
| NW | 0.5 | 1.3 | 2.3 | 2.4 | 1.8 | 0.1 | 8.5 |
| Summary | 23.0 | 36.4 | 26.9 | 8.1 | 2.2 | 0.1 | 96.6 |
| CALM | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 |

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

WIND DIRECTION Hourly Averages (WD)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24-HOUR AVG | 24-HR | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | QUADRANT | RDGS. | |
| DAY 1 | ENE | E | ENE | E | E | ENE | ENE | E | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | E | ENE | ENE | ENE | ENE | ENE | ENE | 24 | |
| 2 | ENE | ENE | ENE | ENE | ENE | E | E | E | ESE | ESE | E | E | E | ENE | NE | ENE | NE | NE | E | SSE | S | SW | W | W | E | 24 | |
| 3 | W | W | NW | W | WSW | W | W | W | W | WNW | W | WNW | WNW | WNW | WNW | WNW | NW | NW | NW | NNW | NNW | WNW | WNW | WNW | WNW | 24 | |
| 4 | WNW | WNW | W | W | WSW | WSW | WSW | WSW | SW | SW | SSW | SW | SW | WSW | WSW | W | W | W | W | W | NW | NNW | NNW | N | W | 24 | |
| 5 | N | NNW | N | NNW | NNW | NNW | NNW | N | N | N | NE | W | W | SW | S | SSW | SSW | SSW | SW | SW | SW | SW | SW | SSW | NW | 24 | |
| 6 | SW | SW | SW | SSW | SW | WSW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | 24 | |
| 7 | SW | SSE | SSE | SSE | SSE | SSE | SSE | SSE | SSE | SSE | S | S | SW | SW | SW | SW | WSW | SW | WSW | WSW | WSW | WSW | SW | WSW | SSW | 24 | |
| 8 | W | WSW | WSW | SE | SSE | WSW | S | SW | SW | SW | WSW | WSW | WSW | WSW | SW | WSW | SW | WSW | WSW | WSW | SW | WSW | WSW | WSW | WSW | 24 | |
| 9 | WSW | WSW | SSW | SW | SW | SSW | NE | ENE | SSE | SE | NNE | ENE | E | NE | ESE | SSE | SSE | S | SE | S | NNE | NNW | E | ENE | SSE | 24 | |
| 10 | E | E | S | W | ESE | N | NW | WNW | S | W | WSW | W | W | W | W | WSW | SW | W | W | W | WSW | WSW | WSW | WSW | WSW | 24 | |
| 11 | SW | WSW | WSW | WSW | SSE | SSE | SSE | SE | SE | SE | SSE | SSE | S | SSE | SSE | SSE | SSE | SSE | SSE | SSE | SE | ESE | SSE | SE | SSE | 24 | |
| 12 | W | W | W | WSW | SSW | WSW | WSW | WSW | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | 24 |
| 13 | SW | SW | SSW | SE | SSE | SSE | SE | SSE | SW | SSW | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | SW | WSW | 24 | |
| 14 | WSW | WSW | S | S | SSE | SSE | SSE | E | ESE | SE | SE | SE | SE | E | ESE | SE | SE | SSE | ESE | S | SSE | S | SE | SSW | SSE | 24 | |
| 15 | SE | ESE | ESE | SSE | S | SSW | SW | WSW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | NW | WNW | WNW | WNW | WNW | 24 | |
| 16 | WNW | W | WSW | WSW | WSW | SW | SSW | E | ESE | ESE | E | ENE | E | E | ENE | ENE | ENE | ENE | E | E | ENE | ENE | ENE | ENE | ENE | 24 | |
| 17 | E | E | E | E | E | ENE | ENE | E | ENE | E | ESE | WSW | W | WSW | W | WSW | WSW | WSW | WSW | WSW | SW | SW | SSW | SE | SSE | 24 | |
| 18 | ESE | ESE | E | SSW | SW | SSE | WNW | SE | WSW | W | S | SSW | WSW | WSW | ENE | SSE | SSW | WSW | WSW | WSW | W | WSW | WSW | W | SSW | 24 | |
| 19 | SW | SW | SSE | WSW | WSW | WSW | WSW | WSW | SW | SW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | WSW | W | WSW | SW | 24 | |
| 20 | WSW | WSW | WSW | WSW | SW | SW | SSW | SE | SSE | SE | SE | ENE | E | ENE | ESE | ESE | E | ESE | E | ENE | E | E | E | E | E | 24 | |
| 21 | E | NE | ENE | SW | W | W | W | W | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | WNW | NW | NNW | NNW | NW | NW | 24 | |
| 22 | NW | NW | NW | NW | NW | NW | NW | NW | WNW | WNW | WNW | WNW | W | W | W | WSW | W | WSW | WSW | WSW | WSW | WSW | WSW | SSE | SSW | 24 | |
| 23 | SE | SSE | SE | ESE | ENE | ENE | E | ENE | NE | ENE | NE | ENE | NE | NE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | 24 | |
| 24 | ENE | ENE | E | E | ESE | E | E | E | E | ENE | ENE | ENE | ENE | ENE | NE | NE | E | E | E | E | E | E | E | E | ENE | 24 | |
| 25 | E | E | E | ENE | ENE | ESE | SE | SSE | SE | SSE | SSE | S | SSE | SSE | SSE | SSE | S | S | SSW | SSW | WSW | W | WSW | W | SE | 24 | |
| 26 | W | WNW | NW | NW | NW | WNW | NW | NW | NW | NW | NW | WNW | NW | NW | W | WSW | SSE | SE | ENE | SE | SSE | SE | SE | WNW | NW | 24 | |
| 27 | W | WSW | S | ENE | NE | E | E | ESE | E | E | ESE | SE | E | SE | E | SE | SE | SE | SSE | SW | SSE | SSE | SSW | SSW | SE | 24 | |
| 28 | SSW | SSW | SSW | SSE | S | SSE | S | E | SE | ESE | NE | ENE | NE | ENE | ENE | ENE | ENE | ENE | ENE | E | E | NE | ENE | NE | ENE | 24 | |
| 29 | NE | NE | NE | NNE | NE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | E | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | ENE | 24 | |
| 30 | ENE | ENE | ENE | ENE | NE | NNE | NNE | NNE | NNE | NNE | NNE | NNE | WSW | ESE | NNE | NNE | NE | WSW | NNW | NW | NNW | NNW | W | W | NE | 24 | |
| 31 | WSW | WSW | SW | SSE | SSW | SSE | E | SE | SE | E | SE | S | SE | SSE | SSE | SSE | SSE | SSE | SSE | S | S | SSE | SSE | SSE | SSE | 24 | |

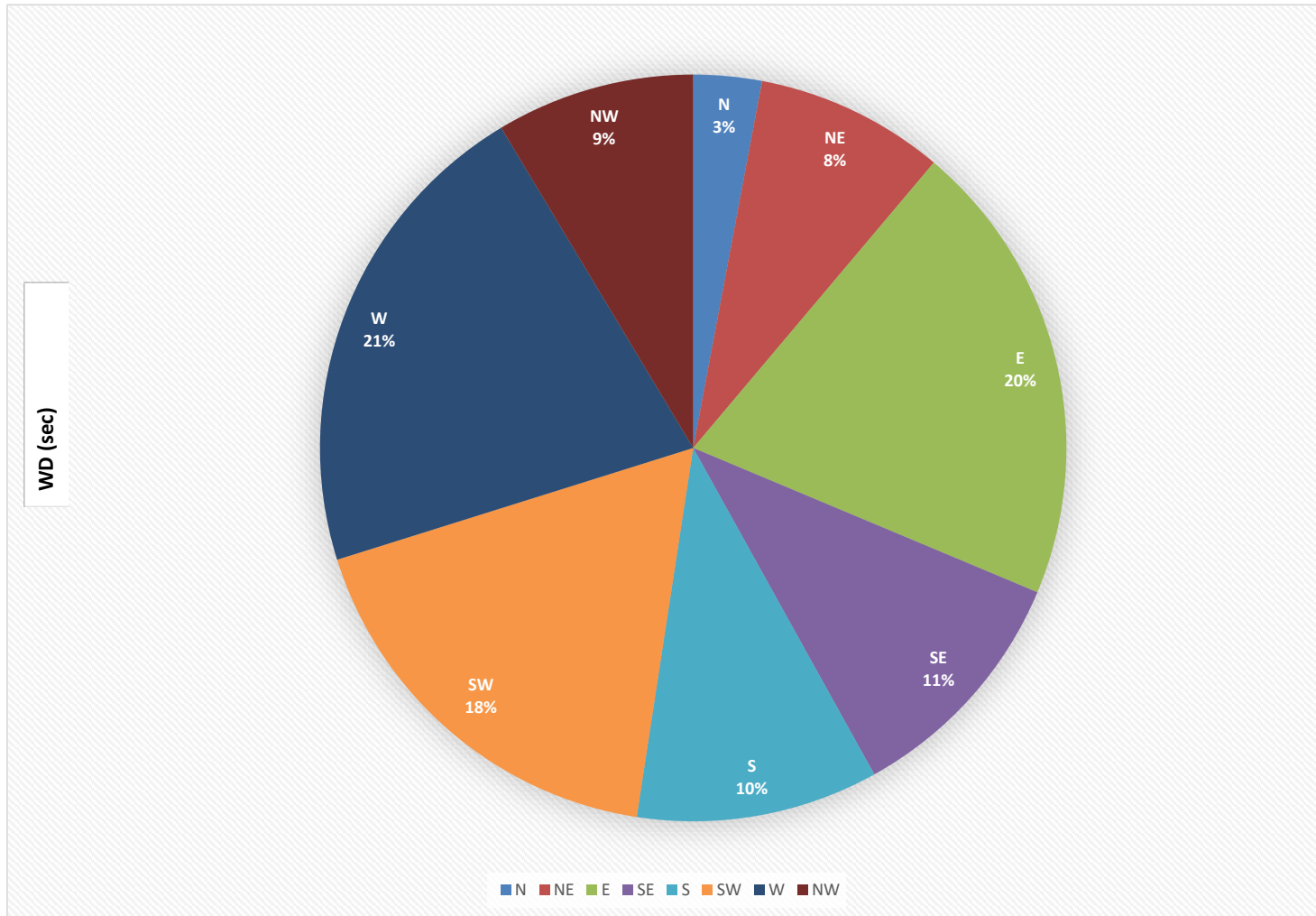
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | October 24, 2018 |
| DECLINATION : | MAGNETIC DECLINATION 13 DEGREE EAST |

| | | | | | |
|---------------------------|----|-----|-----------------------|-------|-----|
| MONTHLY CALIBRATION TIME: | 0 | hrs | OPERATIONAL TIME: | 744 | hrs |
| STANDARD DEVIATION: | 88 | | AMD OPERATION UPTIME: | 100.0 | % |
| | | | MONTHLY AVERAGE: | 266 | (W) |

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018
WIND DIRECTION Hourly Averages (WD)



WDV[degwdr] Station: LICA Bonnyville East Monthly: 18/12 Type: AVG 1 Hr. [1 Hr.]

— WDV[degwdr]



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 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 | 7 | 8 | 8 | 15 | 20 | 7 | 14 | 6 | 6 | 4 | 12 | 4 | 3 | 4 | 2 | 4 | 4 | 3 | 4 | 6 | 6 | 6 | 4 | 4 | 24 |
| 2 | 4 | 3 | 7 | 3 | 2 | 4 | 4 | 3 | 5 | 2 | 5 | 4 | 4 | 8 | 6 | 5 | 3 | 5 | 15 | 10 | 16 | 7 | 19 | 6 | 24 |
| 3 | 10 | 4 | 13 | 21 | 6 | 3 | 4 | 2 | 6 | 6 | 2 | 6 | 9 | 10 | 9 | 5 | 7 | 4 | 4 | 5 | 16 | 5 | 3 | 4 | 24 |
| 4 | 3 | 4 | 10 | 4 | 6 | 3 | 3 | 9 | 8 | 18 | 4 | 8 | 8 | 8 | 5 | 5 | 3 | 3 | 3 | 13 | 5 | 7 | 9 | 24 | |
| 5 | 4 | 4 | 4 | 4 | 5 | 8 | 10 | 9 | 4 | 6 | 8 | 55 | 36 | 10 | 52 | 7 | 3 | 6 | 4 | 3 | 6 | 6 | 4 | 6 | 24 |
| 6 | 4 | 4 | 3 | 7 | 16 | 7 | 6 | 11 | 3 | 5 | 5 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | 4 | 3 | 3 | 5 | 11 | 29 | 24 |
| 7 | 5 | 32 | 49 | 13 | 8 | 6 | 10 | 11 | 10 | 10 | 28 | 46 | 7 | 14 | 6 | 4 | 7 | 11 | 12 | 10 | 11 | 36 | 35 | 8 | 24 |
| 8 | 16 | 62 | 50 | 54 | 30 | 71 | 69 | 31 | 6 | 6 | 8 | 13 | 7 | 12 | 11 | 22 | 14 | 10 | 10 | 9 | 16 | 27 | 8 | 17 | 24 |
| 9 | 16 | 18 | 32 | 49 | 41 | 56 | 61 | 54 | 20 | 49 | 17 | 32 | 57 | 53 | 30 | 17 | 20 | 48 | 8 | 48 | 56 | 54 | 34 | 10 | 24 |
| 10 | 46 | 12 | 75 | 34 | 57 | 47 | 61 | 14 | 21 | 44 | 25 | 9 | 4 | 7 | 4 | 8 | 12 | 5 | 3 | 2 | 3 | 3 | 3 | 8 | 24 |
| 11 | 5 | 4 | 3 | 13 | 24 | 13 | 16 | 6 | 9 | 17 | 5 | 4 | 8 | 6 | 5 | 3 | 5 | 4 | 11 | 6 | 9 | 17 | 6 | 18 | 24 |
| 12 | 36 | 42 | 12 | 15 | 32 | 31 | 9 | 6 | 4 | 3 | 5 | 3 | 4 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 2 | 2 | 5 | 6 | 24 |
| 13 | 12 | 13 | 3 | 37 | 22 | 31 | 12 | 41 | 49 | 13 | 8 | 3 | 9 | 9 | 9 | 8 | 7 | 10 | 8 | 7 | 7 | 8 | 8 | 7 | 24 |
| 14 | 5 | 3 | 6 | 4 | 8 | 4 | 3 | 4 | 6 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 6 | 8 | 10 | 12 | 11 | 6 | 8 | 24 |
| 15 | 4 | 4 | 2 | 2 | 4 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 6 | 5 | 24 |
| 16 | 5 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 24 |
| 17 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 9 | 7 | 9 | 8 | 7 | 3 | 4 | 7 | 4 | 5 | 4 | 4 | 3 | 3 | 24 |
| 18 | 3 | 3 | 4 | 6 | 3 | 4 | 4 | 5 | 3 | 5 | 8 | 8 | 7 | 9 | 5 | 2 | 2 | 2 | 2 | 1 | 2 | 4 | 4 | 5 | 24 |
| 19 | 3 | 4 | 3 | 2 | 4 | 3 | 7 | 6 | 3 | 4 | 4 | 5 | 6 | 5 | 5 | 6 | 5 | 6 | 6 | 4 | 5 | 5 | 4 | 4 | 24 |
| 20 | 3 | 4 | 3 | 3 | 3 | 3 | 7 | 3 | 2 | 5 | 6 | 5 | 4 | 6 | 8 | 6 | 4 | 4 | 8 | 4 | 4 | 3 | 4 | 3 | 24 |
| 21 | 4 | 4 | 5 | 5 | 3 | 6 | 7 | 8 | 8 | 8 | 7 | 8 | 7 | 6 | 7 | 7 | 7 | 7 | 5 | 6 | 6 | 5 | 5 | 5 | 24 |
| 22 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 7 | 7 | 8 | 7 | 7 | 5 | 6 | 7 | 2 | 2 | 2 | 2 | 1 | 2 | 4 | 4 | 24 |
| 23 | 2 | 2 | 2 | 2 | 1 | 2 | 5 | 5 | 5 | 5 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 24 |
| 24 | 5 | 6 | 5 | 5 | 2 | 1 | 1 | 5 | 4 | 3 | 2 | 4 | 5 | 5 | 4 | 3 | 2 | 1 | 3 | 4 | 5 | 5 | 4 | 4 | 24 |
| 25 | 4 | 4 | 4 | 4 | 4 | 5 | 6 | 6 | 6 | 5 | 5 | 6 | 4 | 3 | 4 | 4 | 5 | 3 | 6 | 6 | 8 | 8 | 8 | 7 | 24 |
| 26 | 8 | 6 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 4 | 5 | 5 | 4 | 2 | 1 | 2 | 2 | 3 | 3 | 7 | 7 | 24 |
| 27 | 7 | 8 | 10 | 8 | 6 | 7 | 6 | 6 | 7 | 4 | 6 | 7 | 8 | 8 | 6 | 6 | 6 | 5 | 7 | 11 | 4 | 5 | 8 | 6 | 24 |
| 28 | 11 | 7 | 8 | 2 | 4 | 4 | 7 | 2 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 24 |
| 29 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 24 |
| 30 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 4 | 4 | 6 | 8 | 7 | 8 | 6 | 6 | 7 | 7 | 4 | 3 | 4 | 2 | 3 | 1 | 24 |
| 31 | 1 | 2 | 3 | 2 | 3 | 2 | 3 | 10 | 5 | 5 | 10 | 5 | 5 | 5 | 5 | 4 | 3 | 4 | 5 | 6 | 5 | 5 | 5 | 5 | 24 |

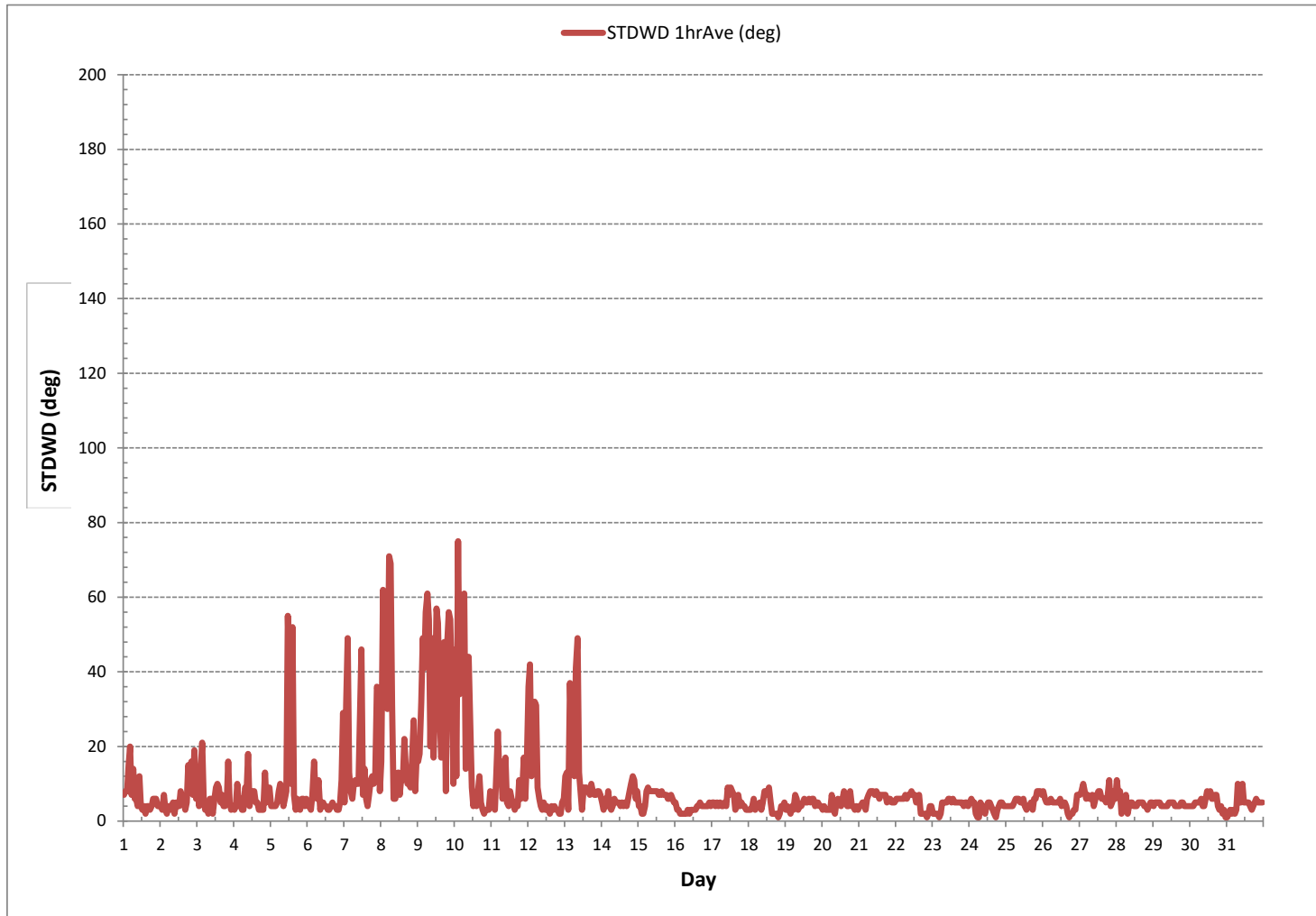
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: October 24, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 10, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 941 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Cloudy/Overcast | | |
| Parameter: Sulphur Dioxide | Calibration Purpose: routine monthly | | |
| Start Time 24 hr. (mst): 10:26 | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): 15:34 | Cal Gas Expiry Date: October 24, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: Serial Number/Owner: 1180320043 LICA | Range ppb: 1000 | | |
| Last Calibration Date: November 6, 2018 | As Found C.F.: 0.954 | | |
| Previous C.F.: 1.000 | New C.F.: 1.000 | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>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 | | | | | | | | |

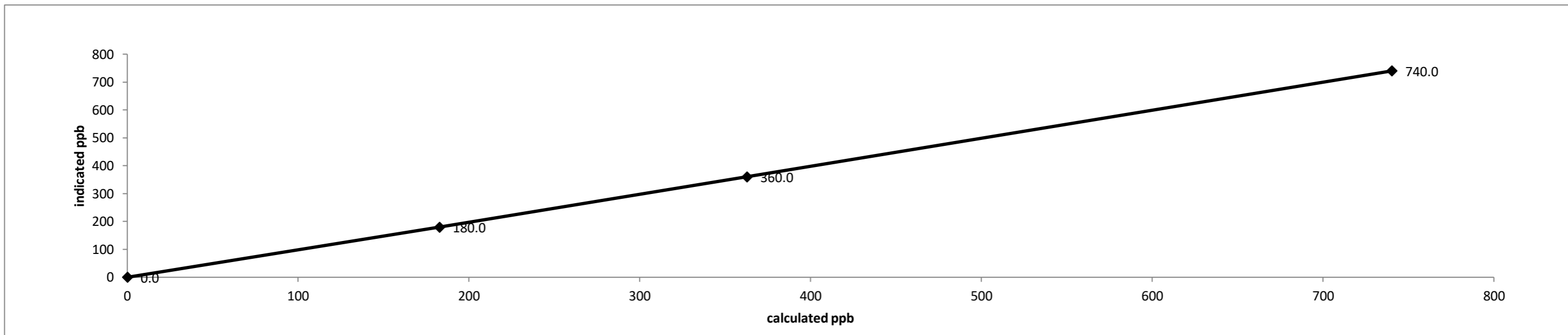
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|-----------------|--------------------------------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| | Diluent | Cal Gas | Total | | | |
| as found zero | 5037 | 0.00 | 5037 | 0.0 | 0.1 | n/a |
| as found high | 4958 | 75.74 | 5034 | 740.2 | 776 | 0.954 |
| adjusted zero | 5037 | 0.00 | 5037 | 0.0 | 0 | n/a |
| adjusted high | 4958 | 75.74 | 5034 | 740.2 | 740 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 362.7 | 360 | 1.008 |
| low | 4933 | 18.38 | 4951 | 182.6 | 180 | 1.015 |
| calibrator zero | 5037 | 0.00 | 5037 | 0.0 | 0 | n/a |
| Average C.F.= | | | | | | 1.008 |

Linear Regression/Calibration Results:

| | | |
|-----------------------------------|-------|---------------|
| Correlation Coefficient = | 1.000 | LIMITS |
| Slope = | 0.999 | > or = 0.995 |
| b (Intercept as % of full scale)= | 0.16% | 0.95-1.05 |
| % change in C.F. from last cal= | 4.59% | ± 3% F.S. |
| | | ± 10% |

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

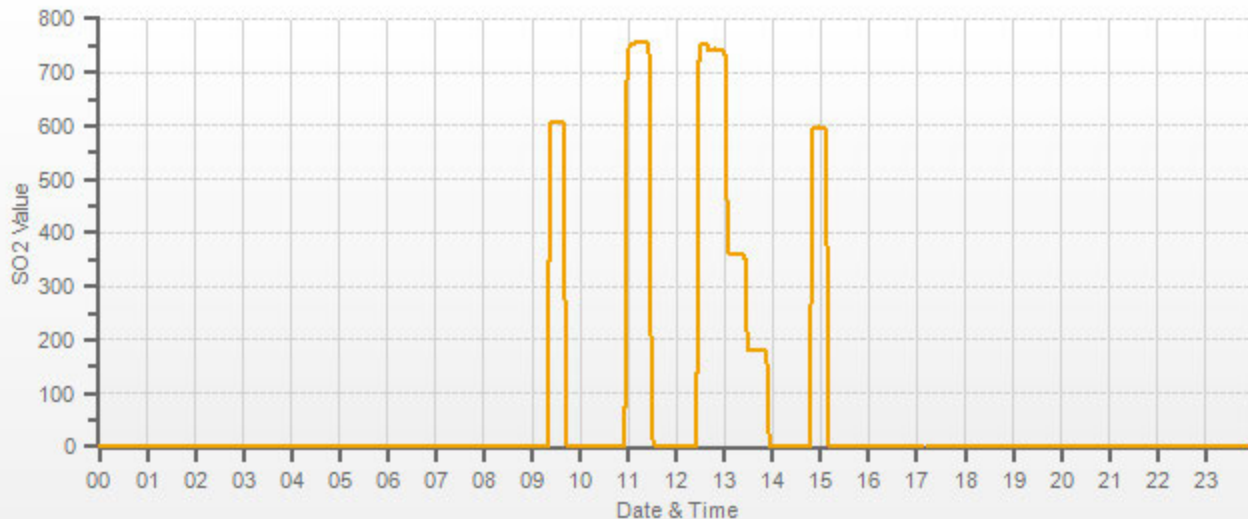


| | |
|-------------------------|-------------------------|
| As found: | As left: |
| Bkg: 4.49 | Bkg: 4.55 |
| Coef: 1.004 | Coef: 0.982 |
| Pmt: -667.8 | Pmt: -677.8 |
| Flash: 1077 | Flash: 1075 |
| Internal: 32.5 | Internal: 34.5 |
| Chamber: 44.8 | Chamber: 45.4 |
| Perm Oven Gas: 45.00 | Perm Oven Gas: 45.00 |
| Perm Oven Heater: 44.24 | Perm Oven Heater: 44.26 |
| Pressure: 678.3 | Pressure: 676.8 |
| Sample Flow: 0.456 | Sample Flow: 0.457 |
| Lamp Intensity: 90 | Lamp Intensity: 90 |
| Converter: n/a | Converter: n/a |
| Converter Set: n/a | Converter Set: n/a |
| Averaging Time: 120 | Averaging Time: 120 |
| Expected Value: 598.0 | Expected Value: 598.0 |

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

The EV did not require adjustment after the calibration.

SO2[ppb]



HYDROGEN SULPHIDE



Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | |
|---|--|------------|-----------|
| Date: December 7, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 945 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Mainly sunny | | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: routine monthly | | |
| Start Time 24 hr. (mst): 10:51 | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): 15:51 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: | | | |
| Serial Number/Owner: CM 17360002 LICA | Range ppb: 100 | | |
| Last Calibration Date: November 29, 2018 | As Found C.F.: 1.004 | | |
| Previous C.F.: 1.000 | New C.F.: 0.999 | | |

| Calibration Standards: | Standard Calibration Points for Ranges | SO2 Scrubber Check (10 minutes): | | | | | | | | |
|---|--|---|-----|------|----|-----|----|-----|----|---|
| Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 | <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 | Start/End Time 24 hr.: 10:56 / 11:12 |
| Point | ppb | | | | | | | | | |
| High | 78 | | | | | | | | | |
| Mid | 38 | | | | | | | | | |
| Low | 19 | | | | | | | | | |
| High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 | | SO2 Analyzer Range: 1000 | | | | | | | | |
| Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 | | Target Concentration (ppb): 780 | | | | | | | | |
| Cal Gas Cylinder I.D. #: EY 0001003 | | As Found Zero: 0.0 | | | | | | | | |
| Cal Gas Conc. (ppm): 9.55 | | Analyzer Response: (ppb): 0.0 | | | | | | | | |
| | | Zero Corrected Result (ppb): 0.0 | | | | | | | | |

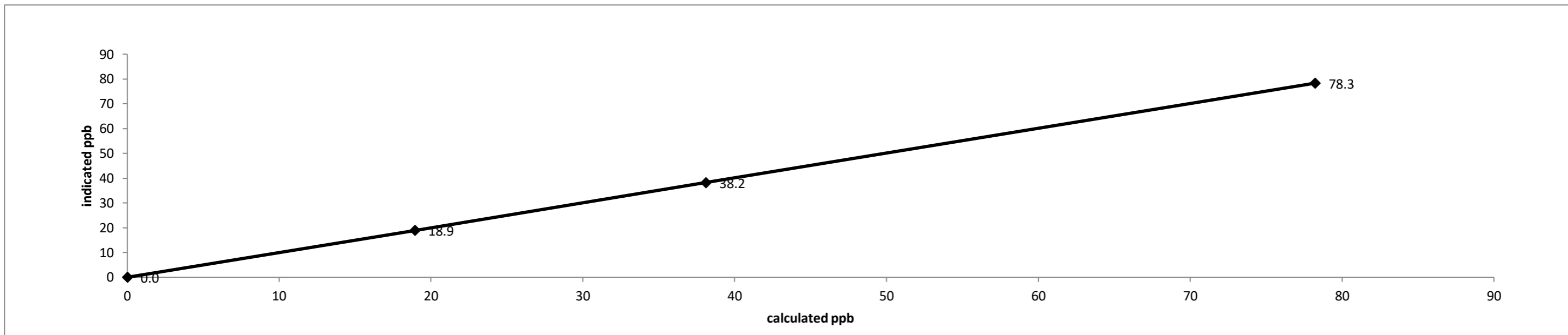
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|----------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | Concentration (ppb): | | |
| as found zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| as found high | 7391 | 61.03 | 7452 | 78.2 | 77.9 | 1.004 |
| adjusted zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| adjusted high | 7391 | 61.03 | 7452 | 78.2 | 78.3 | 0.999 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.2 | 0.997 |
| low | 7554 | 15.00 | 7569 | 18.9 | 18.9 | 1.001 |
| calibrator zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| Average C.F.= | | | | | | 0.999 |

Linear Regression/Calibration Results:

| | |
|--|-------------------------------|
| Correlation Coefficient = 1.000 | LIMITS > or = 0.995 |
| Slope = 0.999 | 0.95-1.05 |
| b (Intercept as % of full scale)= 0.01% | ± 3% F.S. |
| % change in C.F. from last cal= -0.40% | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration

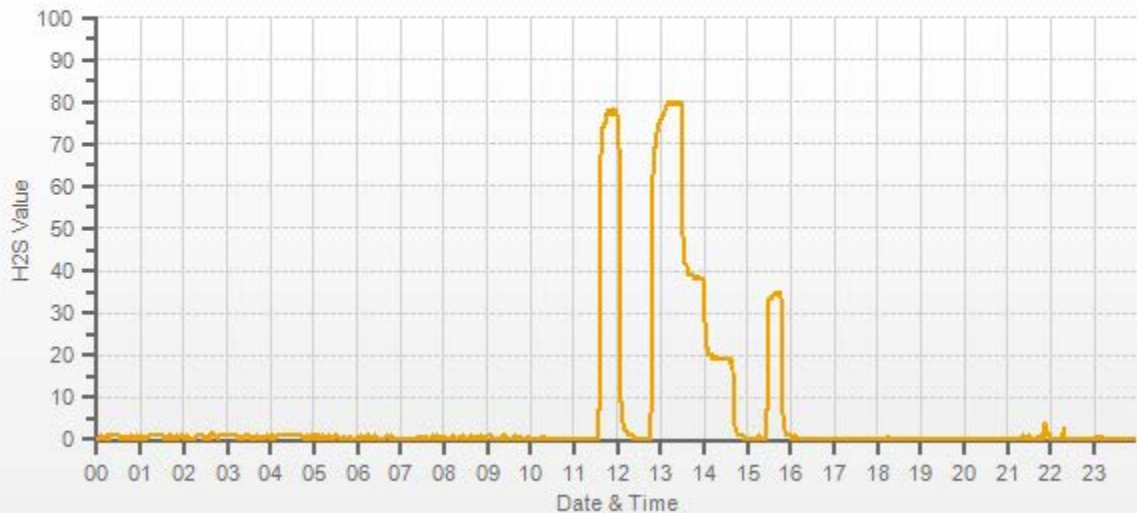


| As found: | | As left: | |
|-----------------|--------|-----------------|--------|
| Bkg: | 17.3 | Bkg: | 18.2 |
| Coef: | 1.209 | Coef: | 1.243 |
| Pmt: | -638.3 | Pmt: | -638.6 |
| Flash: | 777 | Flash: | 776 |
| Internal: | 34.5 | Internal: | 36.6 |
| Chamber: | 45.3 | Chamber: | 45.3 |
| Converter Temp: | 325.2 | Converter Temp: | 324.9 |
| Converter Set: | 325.0 | Converter Set: | 325.0 |
| Perm Oven Gas: | 45.00 | Perm Oven Gas: | 45.00 |
| Perm Oven Htr: | 43.92 | Perm Oven Htr: | 43.93 |
| Pressure: | 559.8 | Pressure: | 560.7 |
| Sample Flow: | 0.946 | Sample Flow: | 0.943 |
| Lamp Intensity: | 91 | Lamp Intensity: | 91 |
| Averaging Time: | 120 | Averaging Time: | 120 |
| Expected Value: | 31.5 | Expected Value: | 34.5 |

Comments:

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

H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | |
|---|--|-----|------------|
| Date: December 11, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 927 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Cloudy/Overcast | | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: repeat | | |
| Start Time 24 hr. (mst): 14:03 | Performed By/Reviewer: Alex Yakupov | | Rob Fisher |
| End Time 24 hr. (mst): 16:32 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: | | | |
| Serial Number/Owner: CM 17360002 LICA | Range ppb: 100 | | |
| Last Calibration Date: December 7, 2018 | As Found C.F.: 0.941 | | |
| Previous C.F.: 0.999 | New C.F.: 1.001 | | |

| Calibration Standards: | Standard Calibration Points for Ranges | | | | | | | | |
|---|---|-------|-----|------|----|-----|----|-----|----|
| Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 | <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |
| High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 | | | | | | | | | |
| Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 | | | | | | | | | |
| Cal Gas Cylinder I.D. # : EY 0001003 | | | | | | | | | |
| Cal Gas Conc. (ppm): 9.6 | | | | | | | | | |

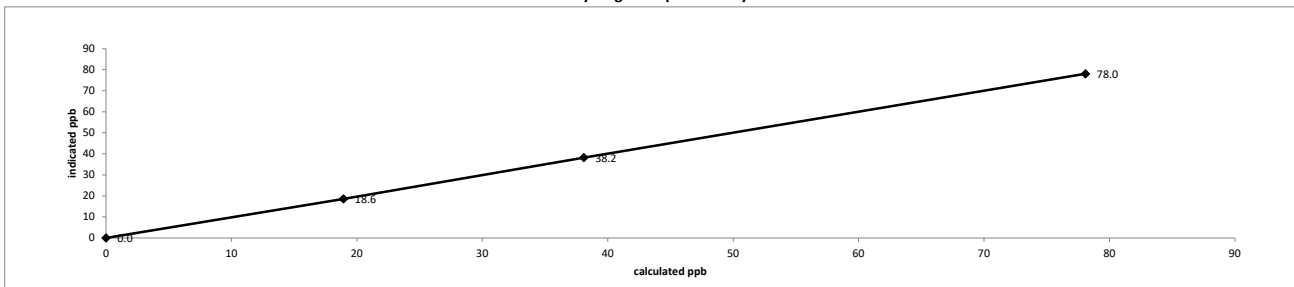
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|----------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | Concentration (ppb): | | |
| as found zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| as found high | 7410 | 61.09 | 7471 | 78.1 | 83 | 0.941 |
| adjusted high | 7410 | 61.09 | 7471 | 78.1 | 78 | 1.001 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.2 | 0.997 |
| low | 7554 | 15.00 | 7569 | 18.9 | 18.6 | 1.018 |
| Average C.F. = | | | | | | 1.005 |

Linear Regression/Calibration Results:

| | |
|---|---------------|
| Correlation Coefficient = 1.000 | LIMITS |
| Slope = 1.000 | > or = 0.995 |
| b (Intercept as % of full scale) = 0.09% | 0.95-1.05 |
| % change in C.F. from last cal = 5.82% | ± 3% F.S. |
| | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found:

| | |
|-----------------|--------|
| Bkg: | 18.4 |
| Coef: | 1.243 |
| Pmt: | -639.7 |
| Flash: | 776 |
| Internal: | 35.8 |
| Chamber: | 45.0 |
| Converter Temp: | 325.4 |
| Converter Set: | 325.0 |
| Perm Oven Gas: | 45.00 |
| Perm Oven Htr: | 43.93 |
| Pressure: | 550.8 |
| Sample Flow: | 0.933 |
| Lamp Intensity: | 91 |
| Averaging Time: | 120 |
| Expected Value: | 34.5 |

As left:

| | |
|-----------------|-----|
| Bkg: | n/a |
| Coef: | n/a |
| Pmt: | n/a |
| Flash: | n/a |
| Internal: | n/a |
| Chamber: | n/a |
| Converter Temp: | n/a |
| Converter Set: | n/a |
| Perm Oven Gas: | n/a |
| Perm Oven Htr: | n/a |
| Pressure: | n/a |
| Sample Flow: | n/a |
| Lamp Intensity: | n/a |
| Averaging Time: | n/a |
| Expected Value: | n/a |

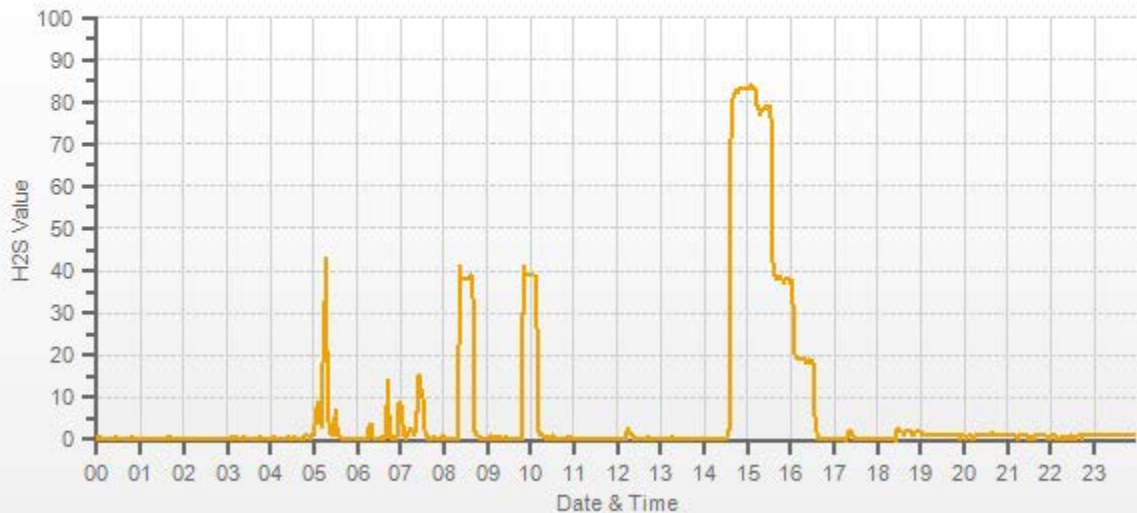
Comments:

The SO2 scrubber check was not performed.
The manifold blower was found to be working normally.

No zero adjustment was required/made.

A repeat calibration was performed as a result of drift in the daily span. Following this calibration, maintenance was performed on the analyzer (orifice cleaning) and a post-repair calibration completed.

H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | |
|---|--|-----|------------|
| Date: December 12, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 927 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Cloudy/Overcast | | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: post repair | | |
| Start Time 24 hr. (mst): 9:51 | Performed By/Reviewer: Alex Yakupov | | Rob Fisher |
| End Time 24 hr. (mst): 13:36 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: | | | |
| Serial Number/Owner: CM 17360002 LICA | Range ppb: 100 | | |
| Last Calibration Date: December 7, 2018 | As Found C.F.: n/a | | |
| Previous C.F.: 0.999 | New C.F.: 0.999 | | |

| Calibration Standards: | Standard Calibration Points for Ranges | | | | | | | | |
|---|---|-------|-----|------|----|-----|----|-----|----|
| Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 | <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |
| High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 | | | | | | | | | |
| Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 | | | | | | | | | |
| Cal Gas Cylinder I.D. # : EY 0001003 | | | | | | | | | |
| Cal Gas Conc. (ppm): 9.55 | | | | | | | | | |

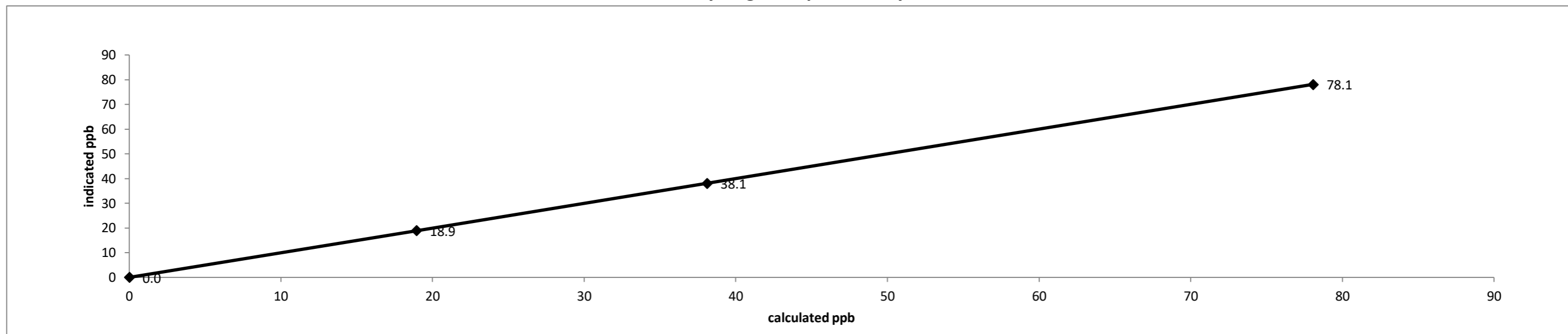
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| adjusted zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| adjusted high | 7413 | 61.09 | 7474 | 78.1 | 78.1 | 0.999 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.1 | 1.000 |
| low | 7554 | 15.00 | 7569 | 18.9 | 18.9 | 1.001 |
| calibrator zero | 7461 | 0.00 | 7461 | 0.0 | 0 | n/a |
| Average C.F.= | | | | | | 1.000 |

Linear Regression/Calibration Results:

| | | | |
|-----------------------------------|-------|---------------|--|
| Correlation Coefficient = | 1.000 | LIMITS | |
| Slope = | 0.999 | > or = 0.995 | |
| b (Intercept as % of full scale)= | 0.02% | 0.95-1.05 | |
| % change in C.F. from last cal= | n/a | ± 3% F.S. | |
| | | n/a | |

Thermo 450i Hydrogen Sulphide Analyzer Calibration

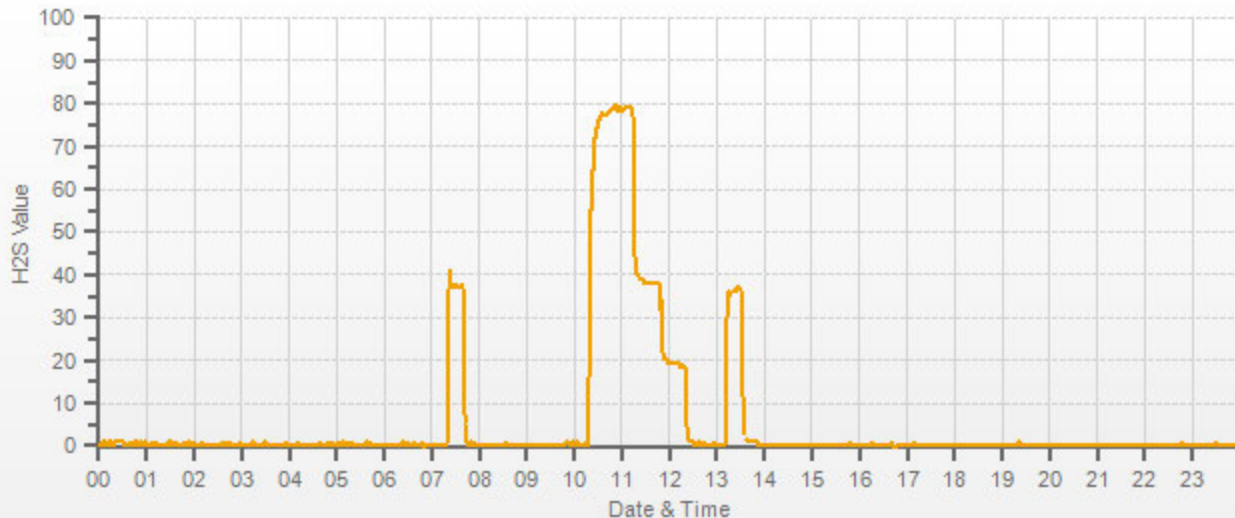


| As found: | As left: |
|---------------------|-----------------------|
| Bkg: n/a | Bkg: 17.4 |
| Coef: n/a | Coef: 1.176 |
| Pmt: n/a | Pmt: -638.6 |
| Flash: n/a | Flash: 778 |
| Internal: n/a | Internal: 35.6 |
| Chamber: n/a | Chamber: 45.1 |
| Converter Temp: n/a | Converter Temp: 324.9 |
| Converter Set: n/a | Converter Set: 325.0 |
| Perm Oven Gas: n/a | Perm Oven Gas: 45.00 |
| Perm Oven Htr: n/a | Perm Oven Htr: 43.93 |
| Pressure: n/a | Pressure: 551.4 |
| Sample Flow: n/a | Sample Flow: 0.933 |
| Lamp Intensity: n/a | Lamp Intensity: 89 |
| Averaging Time: n/a | Averaging Time: 120 |
| Expected Value: n/a | Expected Value: 37.2 |

Comments:
 The SO2 scrubber check was not performed, see comments below.
 The manifold blower was found to be working normally.

A Post - repair calibration was completed after the orifice was cleaned and an internal sample pump disassembled and inspected. SO2 scrubber was tested during monthly calibration on Dec 7.

— H2S[ppb]





Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | |
|---|--|-----|-----------|
| Date: December 21, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 921 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville East | Weather Conditions: Mainly cloudy with snow | | |
| Parameter: Hydrogen Sulphide | Calibration Purpose: shut down | | |
| Start Time 24 hr. (mst): 11:49 | Performed By/Reviewer: Alex Yakupov Rob Fisher | | |
| End Time 24 hr. (mst): 13:50 | Cal Gas Expiry Date: October 20, 2020 | | |
| Calibration Method: Gas Dilution | Converter Model & s/n (if applicable): n/a | | |
| Analyzer: | | | |
| Serial Number/Owner: CM 17360002 LICA | Range ppb: 100 | | |
| Last Calibration Date: December 12, 2018 | As Found C.F.: 0.999 | | |
| Previous C.F.: 0.999 | New C.F.: n/a | | |

| Calibration Standards: | Standard Calibration Points for Ranges | | | | | | | | |
|--|--|-------|-----|------|----|-----|----|-----|----|
| Low Flow Meter ID/Expiry Date: N/A | <table border="1" style="margin: auto;"><tr><th>Point</th><th>ppb</th></tr><tr><td>High</td><td>78</td></tr><tr><td>Mid</td><td>38</td></tr><tr><td>Low</td><td>19</td></tr></table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |
| High Flow Meter ID/Expiry Date: N/A | | | | | | | | | |
| Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 | | | | | | | | | |
| Cal Gas Cylinder I.D. #: EY 0001003 | | | | | | | | | |
| Cal Gas Conc. (ppm): 9.55 | | | | | | | | | |

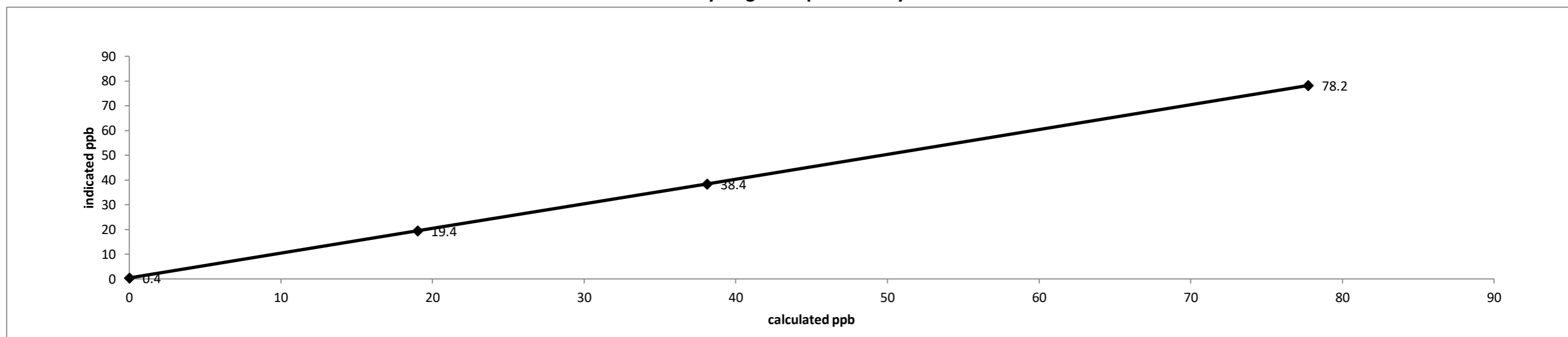
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Point | Calibrator Flow Rates (cc/min) | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|----------------------|--------------------------------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| | Diluent | Cal Gas | Total | | | |
| as found zero | 7523 | 0.00 | 7523 | 0.0 | 0.4 | n/a |
| as found high | 7442 | 61.08 | 7503 | 77.7 | 78.2 | 0.999 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.4 | 1.003 |
| low | 7470 | 14.90 | 7485 | 19.0 | 19.4 | 1.001 |
| 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)= -0.36% | 0.90-1.10 |
| % change in C.F. from last cal= -0.03% | ± 3% F.S. |
| | ± 10% |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



| As found: | As left: |
|-----------------------|---------------------|
| Bkg: 17.4 | Bkg: n/a |
| Coef: 1.176 | Coef: n/a |
| Pmt: -639.0 | Pmt: n/a |
| Flash: 778 | Flash: n/a |
| Internal: 37.2 | Internal: n/a |
| Chamber: 44.9 | Chamber: n/a |
| Converter Temp: 325.4 | Converter Temp: n/a |
| Converter Set: 325.0 | Converter Set: n/a |
| Perm Oven Gas: 45.00 | Perm Oven Gas: n/a |
| Perm Oven Htr: 43.94 | Perm Oven Htr: n/a |
| Pressure: 548.1 | Pressure: n/a |
| Sample Flow: 0.931 | Sample Flow: n/a |
| Lamp Intensity: 90 | Lamp Intensity: n/a |
| Averaging Time: 120 | Averaging Time: n/a |
| Expected Value: 37.2 | Expected Value: n/a |

Comments:

The SO2 scrubber check was not performed, see comments below.
 The manifold blower was found to be working normally.
 No high point adjustment was required/made.

A Shutdown calibration was completed to address the issue of unstable SPAN check values. An external sample pump will be intalled. SO2 scrubber was tested during a monthly calibration



Thermo 450i Hydrogen Sulphide Analyzer Calibration

| | | | | | |
|--------------------------|--------------------|--|---------------------------------------|------------|-----------|
| Date: | December 21, 2018 | Barometer/B.P./units: | F.S. 05544 expires January 15, 2019 | 921 | millibars |
| Company/Airshed: | LICA | Thermometer/Station Temp: | F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: | Bonnyville East | Weather Conditions: | Mainly cloudy with snow | | |
| Parameter: | Hydrogen Sulphide | Calibration Purpose: | post repair | | |
| Start Time 24 hr. (mst): | 15:02 | Performed By/Reviewer: | Alex Yakupov | Rob Fisher | |
| End Time 24 hr. (mst): | 19:05 | Cal Gas Expiry Date: | October 20, 2020 | | |
| Calibration Method: | Gas Dilution | Converter Model & s/n (if applicable): | n/a | | |
| Analyzer: | | Range ppb: | 100 | | |
| Serial Number/Owner: | CM 17360002 LICA | As Found C.F.: | n/a | | |
| Last Calibration Date: | December 12, 2018 | New C.F.: | 1.001 | | |
| Previous C.F.: | 0.999 | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55 | Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table> | Point | ppb | High | 78 | Mid | 38 | Low | 19 |
|---|--|-------|-----|------|----|-----|----|-----|----|
| Point | ppb | | | | | | | | |
| High | 78 | | | | | | | | |
| Mid | 38 | | | | | | | | |
| Low | 19 | | | | | | | | |

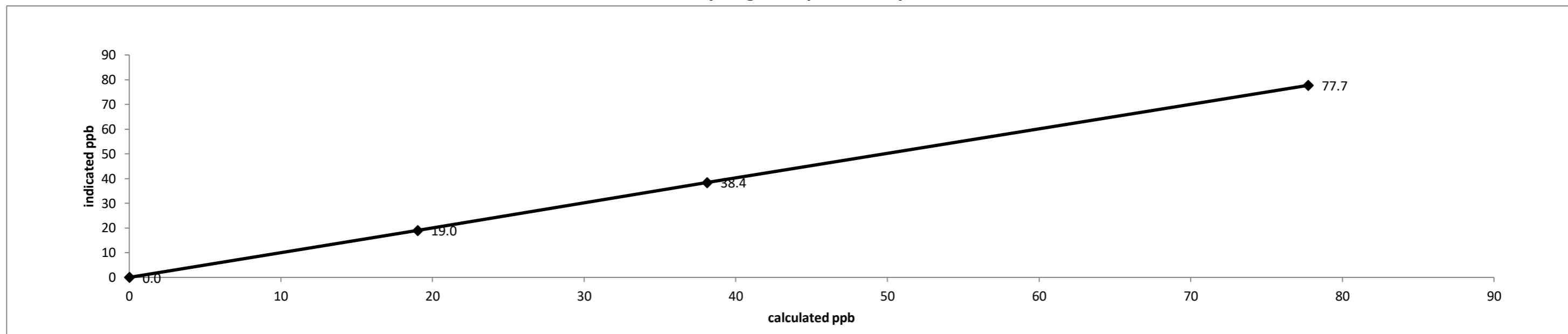
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| Calibrator Flow Rates (cc/min) | | | | Calculated Concentration (ppb): | Indicated Concentration (ppb): | Correction Factors (C.F.): |
|--------------------------------|---------|---------|-------|---------------------------------|--------------------------------|----------------------------|
| Point | Diluent | Cal Gas | Total | | | |
| adjusted zero | 7499 | 0.00 | 7499 | 0.0 | 0 | n/a |
| adjusted high | 7442 | 61.08 | 7503 | 77.7 | 77.7 | 1.001 |
| mid | 7440 | 29.80 | 7470 | 38.1 | 38.4 | 0.992 |
| low | 7470 | 14.90 | 7485 | 19.0 | 19 | 1.001 |
| calibrator zero | 7400 | 0.00 | 7400 | 0.0 | 0 | n/a |
| Average C.F.= | | | | | | 0.998 |

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>-0.07%</u> | 0.95-1.05 |
| % change in C.F. from last cal= | <u>n/a</u> | ± 3% F.S. |
| | | n/a |

Thermo 450i Hydrogen Sulphide Analyzer Calibration



| | |
|--|---|
| As found: Bkg: <u>n/a</u> Coef: <u>n/a</u> Pmt: <u>n/a</u> Flash: <u>n/a</u> Internal: <u>n/a</u> Chamber: <u>n/a</u> Converter Temp: <u>n/a</u> Converter Set: <u>n/a</u> Perm Oven Gas: <u>n/a</u> Perm Oven Htr: <u>n/a</u> Pressure: <u>n/a</u> Sample Flow: <u>n/a</u> Lamp Intensity: <u>n/a</u> Averaging Time: <u>n/a</u> Expected Value: <u>n/a</u> | As left: Bkg: <u>18.6</u> Coef: <u>1.236</u> Pmt: <u>-638.3</u> Flash: <u>778.0</u> Internal: <u>34.9</u> Chamber: <u>45.0</u> Converter Temp: <u>327.0</u> Converter Set: <u>325.0</u> Perm Oven Gas: <u>45.00</u> Perm Oven Htr: <u>43.93</u> Pressure: <u>553.5</u> Sample Flow: <u>0.943</u> Lamp Intensity: <u>90</u> Averaging Time: <u>120</u> Expected Value: <u>39.1</u> |
|--|---|

Comments:
 The manifold blower was found to be working normally.

A different external sample pump was installed. And the internal sample pump was bypassed and switched off. Reason for the change: unstable SPAN check results and drift over 12% within a week.

H2S[ppb]



TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

| | | | |
|---|--|-----|------------|
| Date: December 7, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 945 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Mainly sunny | | |
| Parameter: CH4 / NMHC / THC | Calibration Purpose: routine monthly | | |
| Start/End Time 24 hr. (mst): 14:12 / 17:11 | Performed By/Reviewer: Alex Yakupov | | Rob Fisher |
| Calibration Method: Gas Dilution | Cal Gas Expiry Date: October 18, 2025 | | |

| | | | | |
|--|--|----------------------------|-----------------------|------------------|
| Analyzer: | | Correction Factors: | | |
| Serial Number/Owner: 1236656107 LICA | | Previous C.F.: | As Found C.F.: | New C.F.: |
| Measured Flow: 1.112 | | CH ₄ = 1.000 | 1.031 | 1.000 |
| Last Calibration Date: November 6, 2018 | | NMHC = 0.999 | 0.987 | 1.000 |
| Range ppm: 20 CH4/20 NMHC/40 THC | | THC = 0.999 | 1.009 | 1.000 |

| | | | | | |
|---|--|---|--------------|--------------|--------------|
| Calibration Standards: | | Standard Calibration Points for Analyzer Range of 20/20/40 ppm | | | |
| Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 | | Point | CH4 | NMHC | THC |
| High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 | | High | 13.00 | 13.00 | 26.00 |
| Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 | | Mid | 7.00 | 7.00 | 14.00 |
| Cal Gas Cylinder I.D. # : LL 119471 | | Low | 3.00 | 3.00 | 6.00 |
| CH4 Cylinder Conc. = 599.0 207.0 =C ₃ H ₈ Cylinder Conc. | | | | | |
| CH4 expressed as C₃H₈ = 569.3 1168.3 =total CH4 equivalent | | | | | |

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

| Point | Calibrator Flow Rates (cc/min) | | | Calculated CH ₄ (ppm) | Calculated NMHC (ppm) | Calculated THC (ppm) | Indicated CH ₄ (ppm) | Indicated NMHC (ppm) | Indicated THC (ppm) | Correction Factors: | | |
|-----------------------|--------------------------------|---------|------------|----------------------------------|-----------------------|----------------------|---------------------------------|----------------------|---------------------|---------------------|-------|-------|
| | Diluent | Cal Gas | Total Flow | | | | | | | CH ₄ | NMHC | THC |
| as found zero | 2501 | 0.00 | 2501 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| as found high | 2452 | 55.56 | 2508 | 13.27 | 12.61 | 25.88 | 12.87 | 12.78 | 25.65 | 1.031 | 0.987 | 1.009 |
| adjusted zero | 2501 | 0.00 | 2501 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| adjusted high | 2452 | 55.56 | 2508 | 13.27 | 12.61 | 25.88 | 13.27 | 12.61 | 25.88 | 1.000 | 1.000 | 1.000 |
| mid | 2441 | 29.90 | 2471 | 7.25 | 6.89 | 14.14 | 7.25 | 6.85 | 14.10 | 1.000 | 1.006 | 1.003 |
| low | 2481 | 12.90 | 2494 | 3.10 | 2.94 | 6.04 | 3.17 | 2.98 | 6.15 | 0.977 | 0.988 | 0.983 |
| calibrator zero | 2501 | 0.00 | 2501 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | n/a | n/a | n/a |
| Average C.F. = | | | | | | | | | | 0.992 | 0.998 | 0.995 |

| | | | | |
|---|-----------------------|-------------|------------|---------------|
| Linear Regression/Calibration Results: | | | | |
| | CH₄ | NMHC | THC | LIMITS |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.998 | 0.998 | 0.998 | 0.95-1.05 |
| b (Intercept as % of full scale) = | 0.15% | 0.04% | 0.10% | ± 3% F.S. |
| % change in C.F. from last cal = | -3.11% | 1.23% | -1.00% | ± 10% |

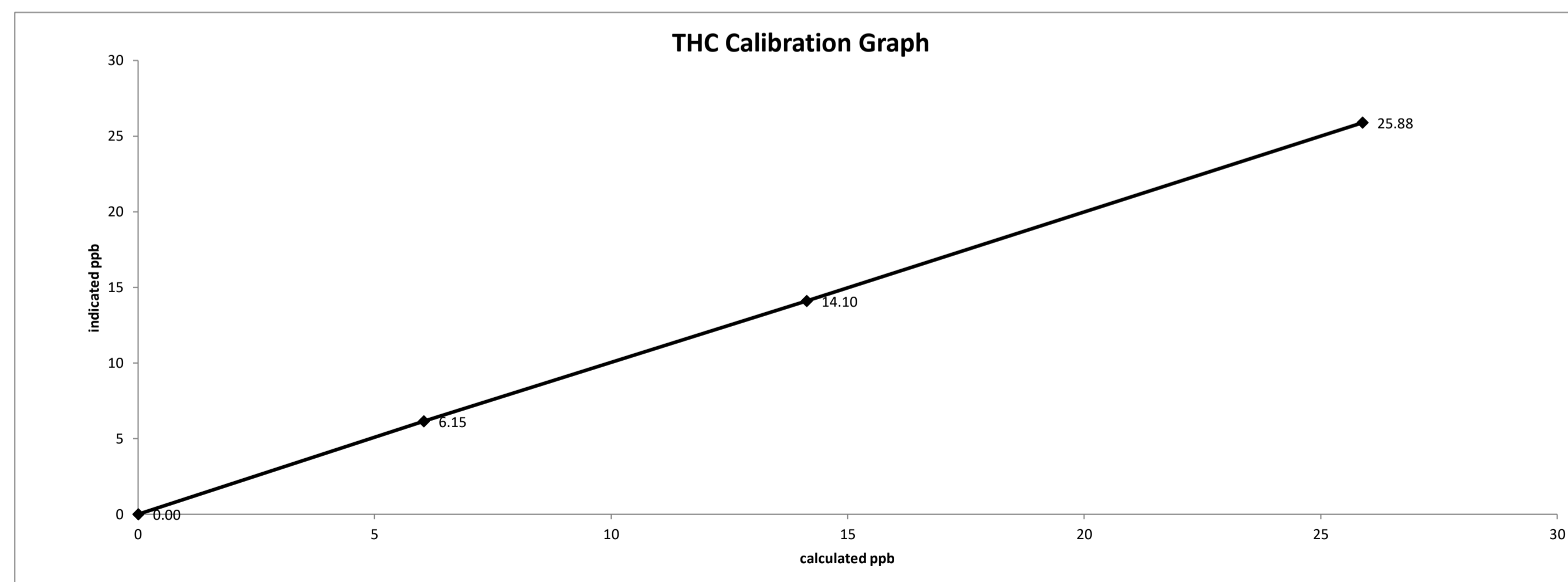
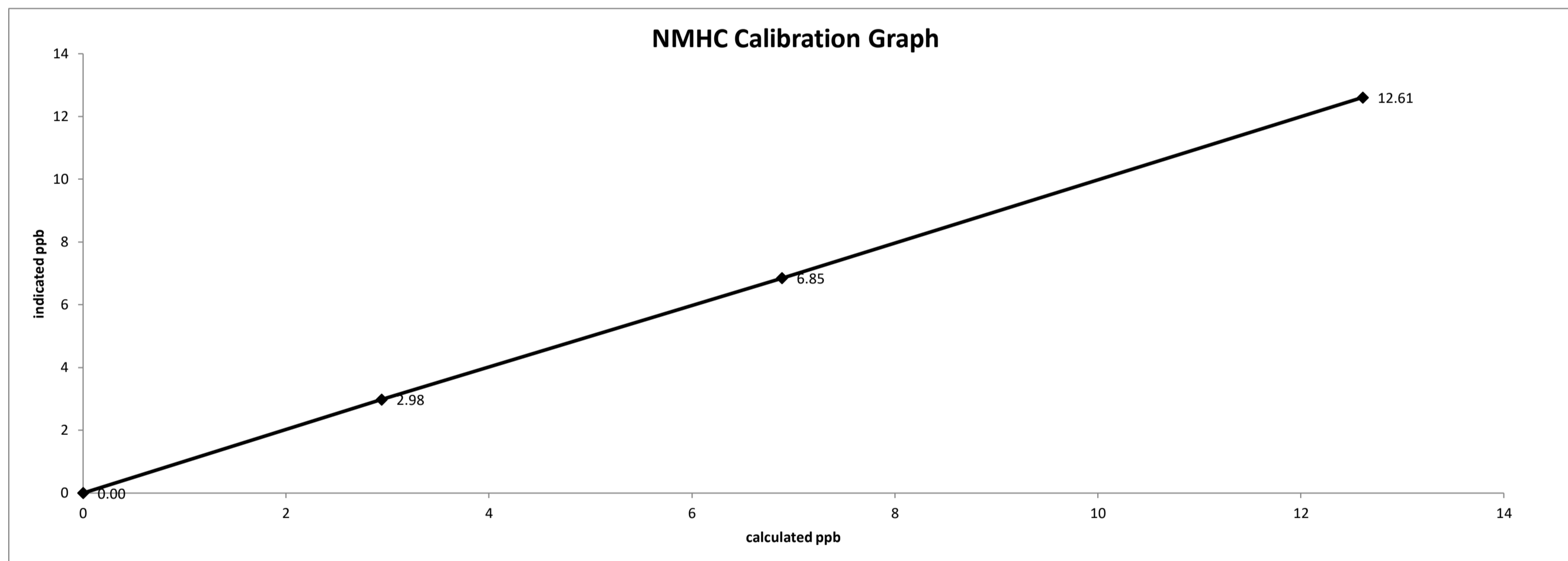
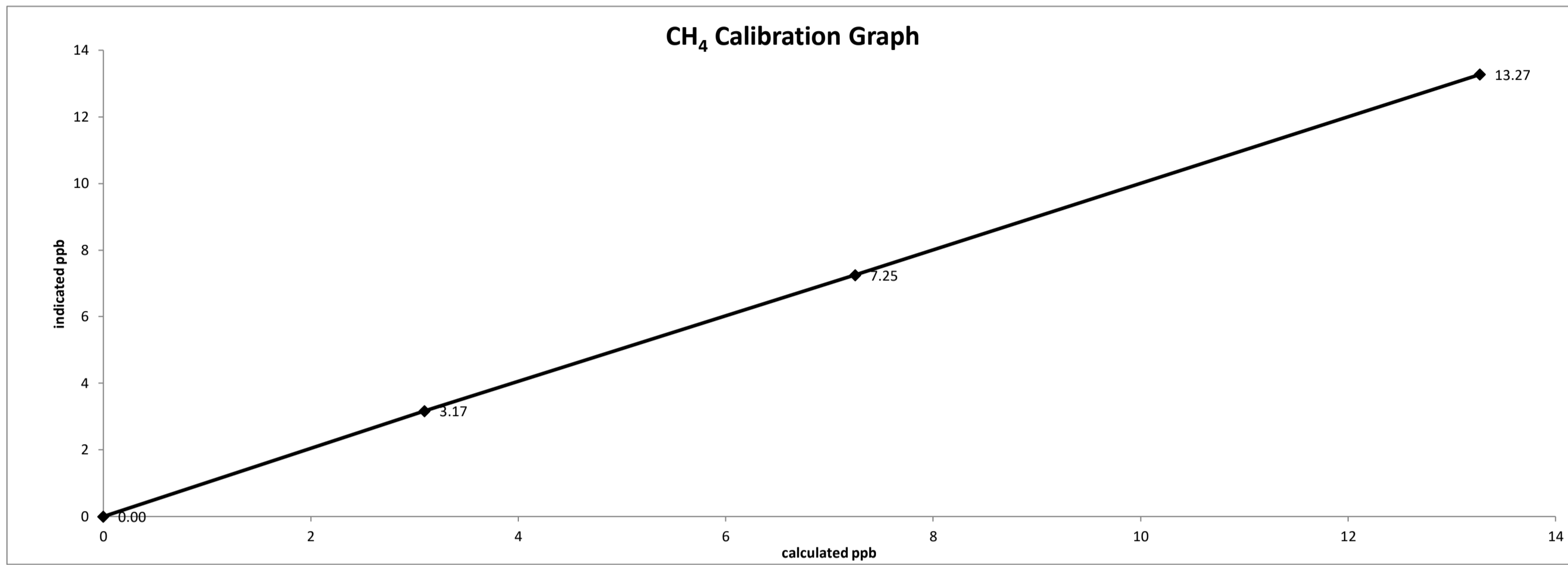
As Left Instrument Diagnostics:

| | | | |
|----------------------------------|------------------------------------|-----------------------------------|--------------------------------|
| Interface Board Voltages: | Bias Supply: -292.8 | Calibration History cnt'd: | NM Peak Area: 91026 |
| 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: 32.9 | | NMHV Start: n/a |
| Cylinder Pressures/reg.: | Carrier: 1300 50 | Run History>1: | NMHC End: n/a |
| | Fuel: 550 50 | | Date: Dec 07, 2018 |
| | Span Gas: 1100 22 | | Time: 14:19 |
| | Zero Air Generator: 48 | | CH ₄ PK HT: 0 |
| Internal Pressures: | Carrier: 31.0 | | CH ₄ RT: 13.8 |
| | Fuel: 40.3 | | CH ₄ Baseline: 2428 |
| | Air: 31.8 | | CH ₄ LOD: 37 |
| FID Status: | Status: LIT | | CH ₄ SD: 12 |
| | Counts: 31015 | | CH ₄ CONC: 0.00 |
| | Flame: 362.0 | | NM PK HT: 0 |
| | Det Base: 175.1 | | NM Peak Area: 0 |
| Flame and Power Stats: | Last Power On: Oct 18, 2018 | | NM CONC: 0.00 |
| | Flameouts: 1 | | NM Base Start: 2344 |
| | Det Oven at Start: 23.1 | | NM Base End: 2359 |
| | Col Oven at Start: 22.3 | | NM LOD: 12 |
| Calibration History: | Time: Nov 6, 2018 / 13:20 | | NM Start IDX: 28 |
| | Type: Span | | NM End IDX: 72 |
| | Status: Good | | NM Max Slope: 7.2e-01 |
| | Check/Adjust: Adjust | | NM Min Slope: -6.4e-01 |
| | CH ₄ Span Conc: 14.60 | | NM PT Count: 0 |
| | CH ₄ SP Ratio: 0.000778 | Expected Values: | Previous CH4: 10.17 |
| | CH ₄ RT: 13.8 | | Previous NMHC: 11.31 |
| | CH ₄ PK IDX: 29 | | Previous THC: 21.48 |
| | CH ₄ PK HT: 18756 | | New CH4: 10.02 |
| | NM Span Conc: 13.87 | | New NMHC: 11.06 |
| | NM SP Ratio: 0.000152 | | New THC: 21.08 |

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.
 The manifold blower was found to be working normally.

Date: December 7, 2018
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 14:12 / 17:11
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 10, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 941 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Cloudy/Overcast | | |
| Start/End Time 24 hr. (mst): 10:26 / 17:07 | Calibration Purpose: routine monthly | | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930027 LICA Last Calibration Date: November 14, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.959</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.959</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 0.999 | 0.959 | 1.000 | NO ₂ = | 1.000 | 1.000 | 1.000 | NOx = | 1.000 | 0.959 | 1.000 |
|---|--|----------------|----------------|----------------|-----------|------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 0.999 | 0.959 | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.000 | 1.000 | | | | | | | | | | | | | | |
| NOx = | 1.000 | 0.959 | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|--|--|------------------------------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5037 | 0.0 | 5037 | 0 | 0 | 0.0 | 1.2 | n/a | n/a |
| as found high | 4958 | 75.7 | 5034 | 774.9 | 776.4 | 808.0 | 811.0 | 0.959 | 0.959 |
| adjusted zero | 5037 | 0.00 | 5037 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4958 | 75.74 | 5034 | 774.9 | 776.4 | 775.0 | 776.0 | 1.000 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 378.0 | 379.0 | 1.004 | 1.004 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 190.0 | 190.0 | 1.006 | 1.008 |
| calibrator zero | 5037 | 0.00 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.003 | 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 | 4958 | 75.74 | 5034 | 0.0 | 776.0 | 777.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4958 | 75.74 | 5034 | 505.0 | 274.0 | 777.0 | 503.0 | 502.0 | 502.0 | 1.000 |
| adjusted high NO2 | 4958 | 75.74 | 5034 | 505.0 | 274.0 | 777.0 | 503.0 | 502.0 | 502.0 | 1.000 |
| gpt mid | 4958 | 75.74 | 5034 | 275.0 | 506.0 | 777.0 | 271.0 | 270.0 | 270.0 | 1.000 |
| gpt low | 4958 | 75.74 | 5034 | 100.0 | 676.0 | 776.0 | 100.0 | 100.0 | 99.0 | 1.010 |
| Average NO₂ C.F.= | | | | | | | | | 1.003 | |

| | | | |
|---|--------|--------|-----------------|
| Linear Regression/Calibration Results: | | | |
| | NO | NOx | NO ₂ |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 |
| Slope = | 0.999 | 1.000 | 1.001 |
| b (Intercept as % of full scale) = | -0.08% | -0.08% | 0.02% |
| % change in C.F. from last cal = | 4.01% | 4.13% | 0.00% |
| NO ₂ converter efficiency | | | 1.00 |

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

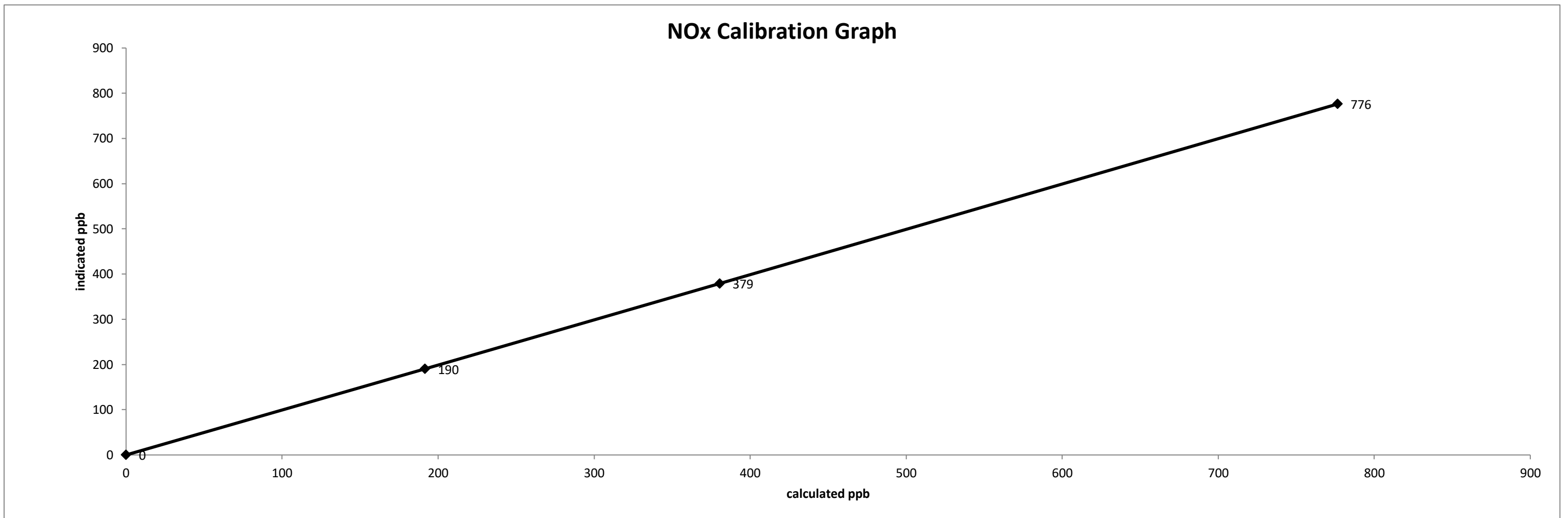
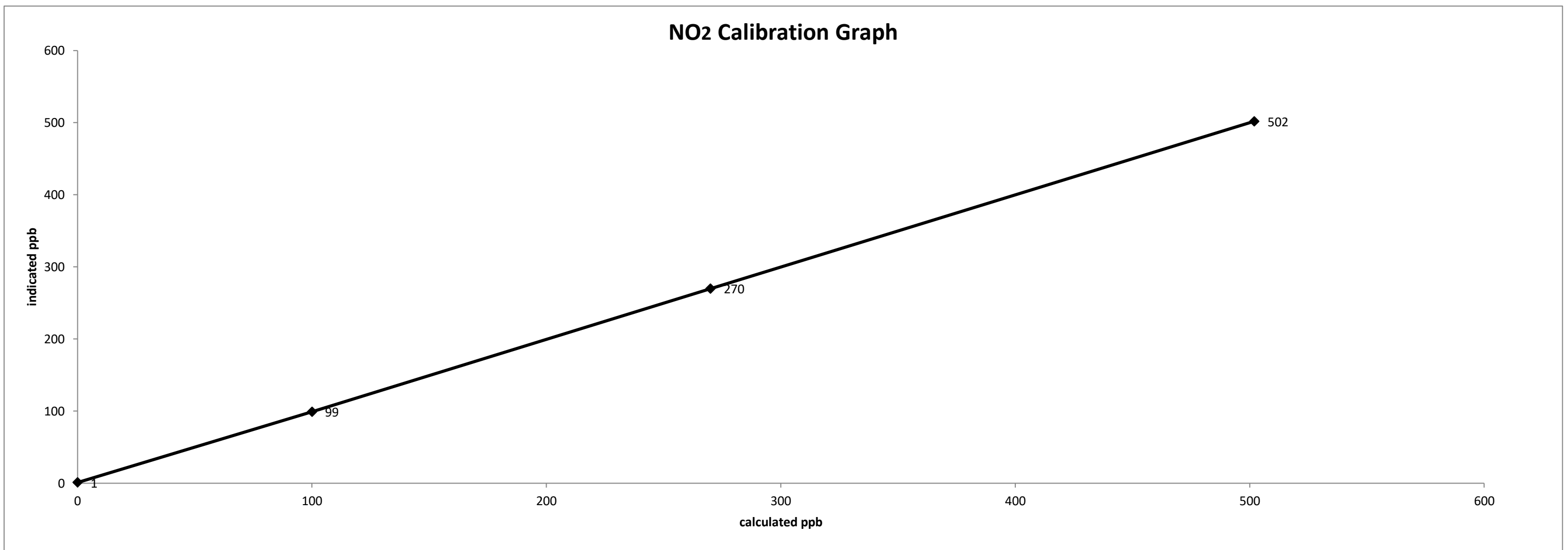
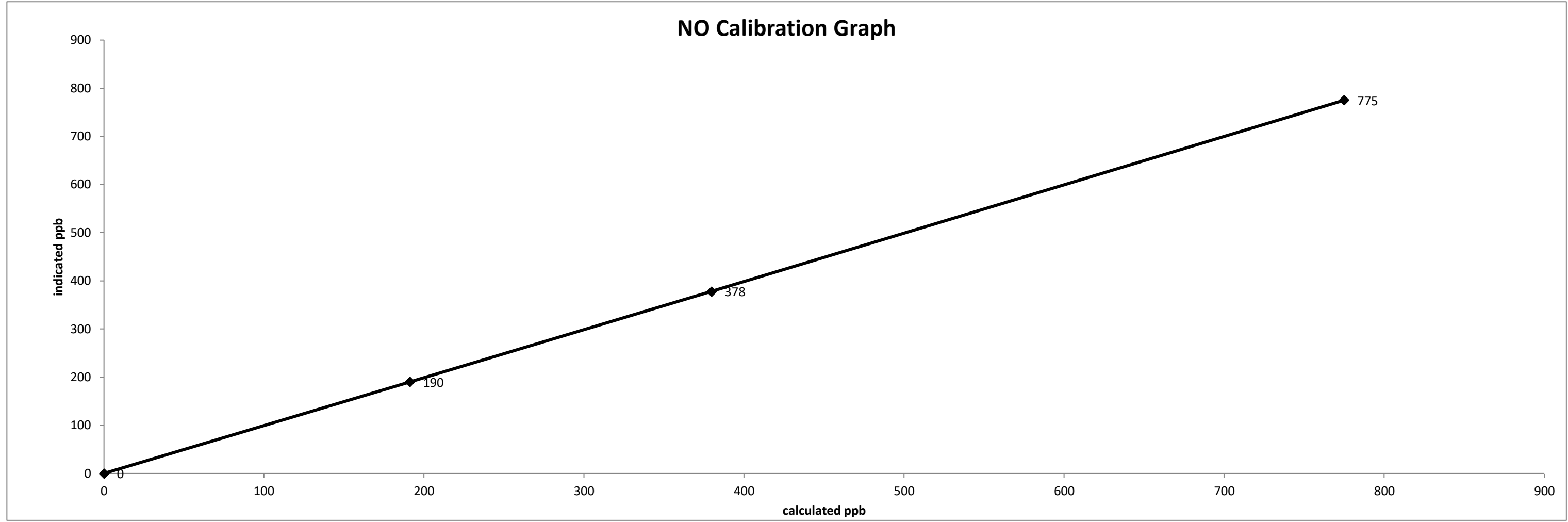
| As found: | | As left: | |
|----------------------------------|--------|----------------------------------|--------|
| NO Bkg: | 9.3 | NO Bkg: | 9.1 |
| NOx Bkg: | 9.4 | NOx Bkg: | 11.1 |
| NO Coef: | 1.141 | NO Coef: | 1.095 |
| NO ₂ Coef: | 0.994 | NO ₂ Coef: | 0.994 |
| NOx Coef: | 0.999 | NOx Coef: | 1.000 |
| PMT: | -906.1 | PMT: | -906.1 |
| Internal: | 29.4 | Internal: | 31.5 |
| Chamber: | 50.2 | Chamber: | 50.0 |
| Cooler: | -3.0 | Cooler: | -2.7 |
| NO ₂ Converter: | 324.7 | NO ₂ Converter: | 325.5 |
| NO ₂ Converter Set: | 325.0 | NO ₂ Converter Set: | 325.0 |
| Perm Oven Gas: | 45.00 | Perm Oven Gas: | 45.00 |
| Perm Oven Heater: | 44.23 | Perm Oven Heater: | 44.24 |
| Pressure: | 253.8 | Pressure: | 253.5 |
| Flow: | 0.552 | Flow: | 0.552 |
| Ozonator Flow: | OK | Ozonator Flow: | OK |
| Expected Value NO: | 6 | Expected Value NO: | 6 |
| Expected Value NO ₂ : | 310 | Expected Value NO ₂ : | 300 |
| Expected Value NOx: | 316 | Expected Value NOx: | 306 |

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

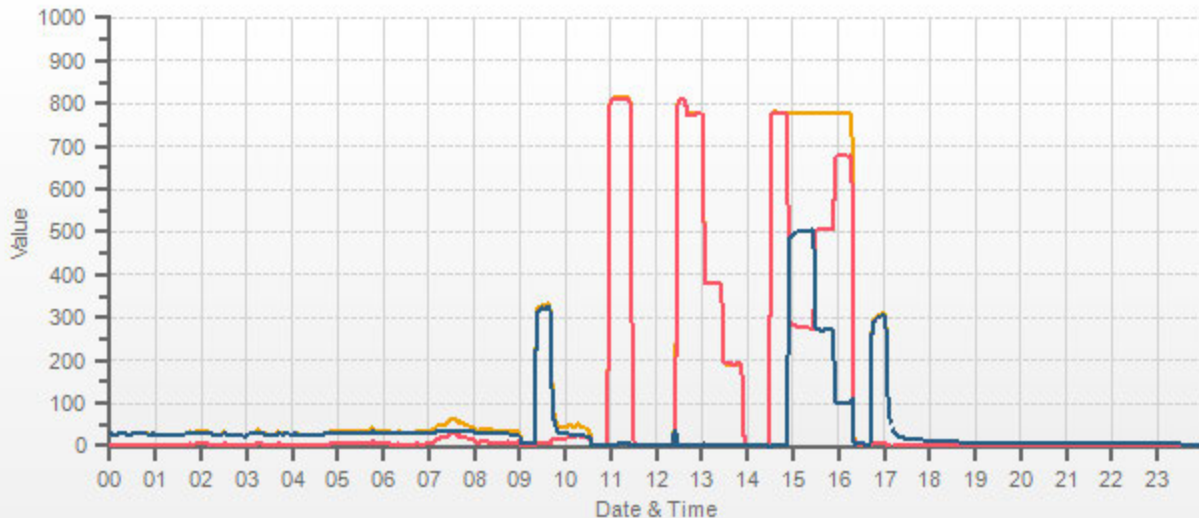
Date: December 10, 2018
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 10:26 / 17:07
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



— NOX[ppb] — NO[ppb] — NO2[ppb]





Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 21, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 921 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville East | Weather Conditions: Mainly cloudy with snow | | |
| Start/End Time 24 hr. (mst): 11:49 / 15:25 | Calibration Purpose: shut down | | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930027 LICA Last Calibration Date: December 10, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.982</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.996</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.982</td> <td>n/a</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 0.999 | 0.982 | n/a | NO ₂ = | 1.000 | 0.996 | n/a | NOx = | 1.000 | 0.982 | n/a |
|---|--|----------------|----------------|----------------|-----------|------|-------|-------|-----|-------------------|-------|-------|-----|-------|-------|-------|-----|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 0.999 | 0.982 | n/a | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 0.996 | n/a | | | | | | | | | | | | | | |
| NOx = | 1.000 | 0.982 | n/a | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|--|------------------------------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5037 | 0.0 | 5037 | 0 | 0 | -0.2 | -1.9 | n/a | n/a |
| as found high | 4958 | 75.7 | 5034 | 774.9 | 776.4 | 789.0 | 789.0 | 0.982 | 0.982 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 378.0 | 377.0 | 1.004 | 1.004 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 188.0 | 187.0 | 1.016 | 1.014 |
| Average C.F.= | | | | | | | | 1.001 | 1.000 |

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

| Calibrator Flow Rates (cc/min) | | | | Calibrator Setting | Indicated NO | Indicated NOx | Indicated NO ₂ | NO drop | NO ₂ gain | NO ₂ C.F. |
|-------------------------------------|---------|---------|------------|--------------------|--------------|---------------|---------------------------|---------|----------------------|----------------------|
| Point | Diluent | Cal Gas | Total Flow | volts or ppb | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| NOx reference | 4958 | 75.74 | 5034 | 0.0 | 780.0 | 779.0 | -1.0 | -0.2 | -1.0 | |
| as found high NO ₂ | 4958 | 75.74 | 5034 | 505.0 | 281.0 | 780.0 | 500.0 | 499.0 | 501.0 | 0.996 |
| gpt mid | 4958 | 75.74 | 5034 | 275.0 | 509.0 | 779.0 | 270.0 | 271.0 | 271.0 | 1.000 |
| gpt low | 4958 | 75.74 | 5034 | 100.0 | 684.0 | 783.0 | 99.0 | 96.0 | 100.0 | 0.960 |
| Average NO₂ C.F.= | | | | | | | | | | 0.985 |

| | | | | |
|---|--------|--------|-----------------|--|
| Linear Regression/Calibration Results: | | | | |
| | NO | NOx | NO ₂ | LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10% 0.96 to 1.04 |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | |
| Slope = | 0.980 | 0.980 | 0.998 | |
| b (Intercept as % of full scale) = | -0.45% | -0.62% | 0.09% | |
| % change in C.F. from last cal = | 1.72% | 0.40% | 1.84% | |
| NO ₂ converter efficiency | | | 1.00 | |

| | |
|---|--|
| As found: NO Bkg: 9.1 NOx Bkg: 11.1 NO Coef: 1.095 NO ₂ Coef: 0.994 NOx Coef: 1.000 PMT: -906.1 Internal: 31.8 Chamber: 50.2 Cooler: -3.1 NO ₂ Converter: 323.2 NO ₂ Converter Set: 325.0 Perm Oven Gas: 45.01 Perm Oven Heater: 44.26 Pressure: 250.2 Flow: 0.545 Ozonator Flow: OK Expected Value NO: 6 Expected Value NO ₂ : 300 Expected Value NOx: 306 | As left: NO Bkg: n/a NOx Bkg: n/a NO Coef: n/a NO ₂ Coef: n/a NOx Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO ₂ Converter: n/a NO ₂ Converter Set: n/a Perm Oven Gas: n/a Perm Oven Heater: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NOx: n/a |
|---|--|

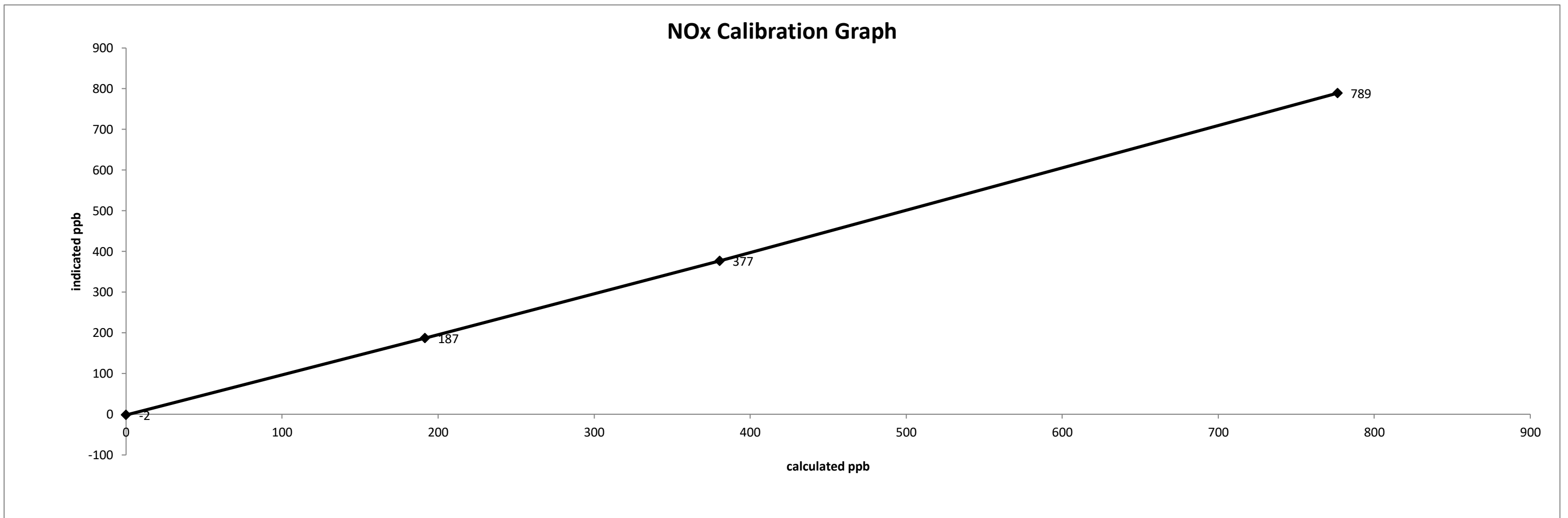
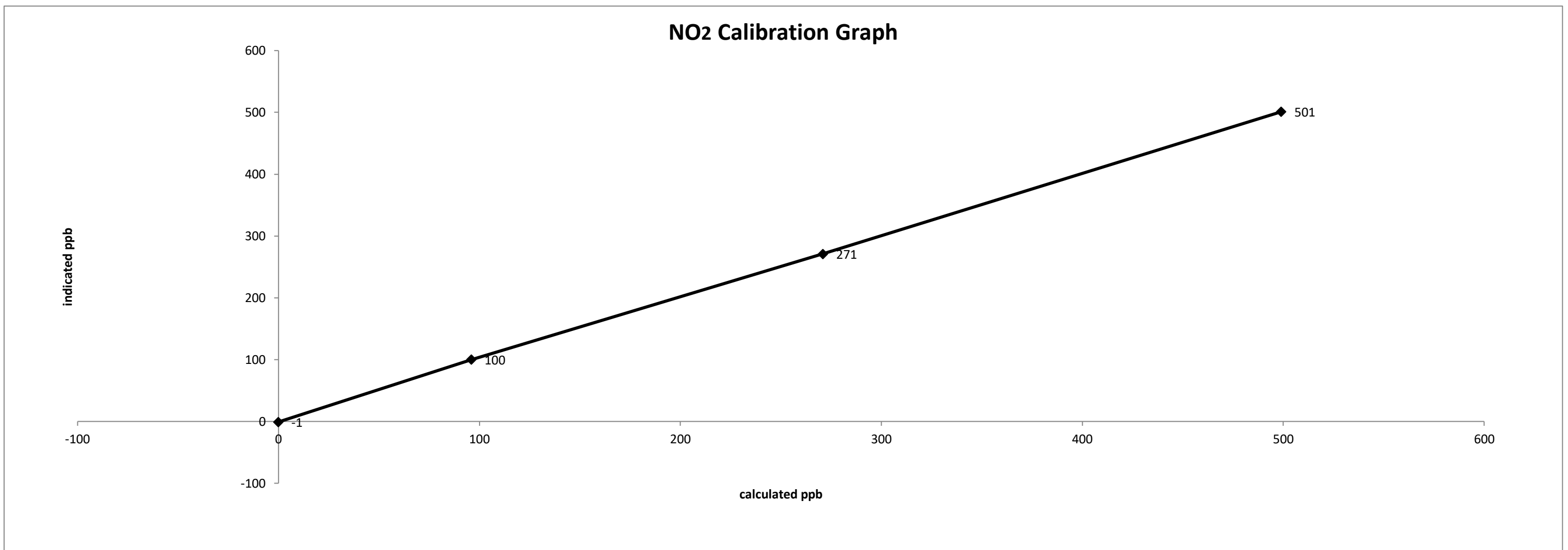
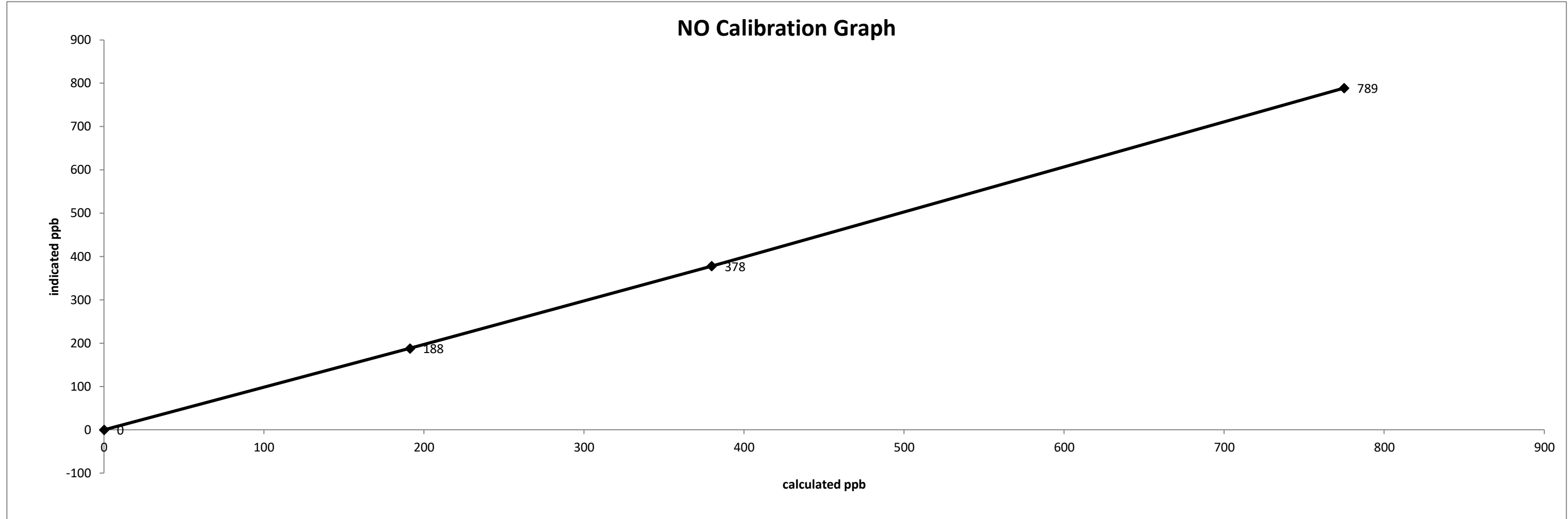
Comments: The manifold blower was found to be working normally. No zero adjustment was required/made.

A Shutdown calibration was completed to address the issue of unstable SPAN check values. A separate external sample pump will be installed.

Date: December 21, 2018
Company/Airshed: LICA
Location/Station Name: Bonnyville East

Start/End Time 24 hr. (mst): 11:49 / 15:25
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: Dec 21, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 921 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville East | Weather Conditions: Mainly cloudy with snow | | |
| Start/End Time 24 hr. (mst): 15:38 / 20:12 | Calibration Purpose: post repair | | |
| G.P.T. to be used for Ozone? No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930027 LICA Last Calibration Date: December 10, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO_x =</td> <td>1.000</td> <td>n/a</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 0.999 | n/a | 1.000 | NO ₂ = | 1.000 | n/a | 1.000 | NO _x = | 1.000 | n/a | 1.000 |
|---|---|----------------|----------------|----------------|-----------|------|-------|-----|-------|-------------------|-------|-----|-------|-------------------|-------|-----|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 0.999 | n/a | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | n/a | 1.000 | | | | | | | | | | | | | | |
| NO _x = | 1.000 | n/a | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <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> | Standard Calibration Points for a Range of: 1000 ppb | | | | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|---|--|--|------------|--|--|-------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Standard Calibration Points for a Range of: 1000 ppb | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015 | | | | | | | | | |
|--|---------|---------|------------|---------------|----------------------------|--------------|---------------------------|---------|----------------------|
| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NO _x | Indicated NO | Indicated NO _x | NO C.F. | NO _x C.F. |
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| adjusted zero | 5037 | 0.0 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4958 | 75.7 | 5034 | 774.9 | 776.4 | 775.0 | 776.0 | 1.000 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 378.0 | 378.0 | 1.004 | 1.006 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 190.0 | 190.0 | 1.006 | 1.008 |
| calibrator zero | 5037 | 0.00 | 5037 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.003 | 1.005 |

| 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 | 4958 | 75.74 | 5034 | 0.0 | 780.0 | 780.0 | 0.0 | 0.0 | 0.0 | |
| adjusted high NO ₂ | 4958 | 75.74 | 5034 | 505.0 | 276.0 | 780.0 | 504.0 | 504.0 | 504.0 | 1.000 |
| gpt mid | 4958 | 75.74 | 5034 | 275.0 | 510.0 | 781.0 | 270.0 | 270.0 | 270.0 | 1.000 |
| gpt low | 4958 | 75.74 | 5034 | 100.0 | 681.0 | 781.0 | 99.0 | 99.0 | 99.0 | 1.000 |
| Average NO₂ C.F.= | | | | | | | | | 1.000 | |

| | | | |
|---|--------|-----------------|-----------------|
| Linear Regression/Calibration Results: | | | |
| | NO | NO _x | NO ₂ |
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 |
| Slope = | 0.999 | 1.000 | 1.000 |
| b (Intercept as % of full scale) = | -0.08% | -0.10% | 0.00% |
| % change in C.F. from last cal = | n/a | n/a | n/a |
| NO ₂ converter efficiency | | | 1.00 |

| |
|---------------|
| LIMITS |
| > or = 0.995 |
| 0.95-1.05 |
| ± 3% F.S. |
| n/a |
| 0.96 to 1.04 |

| | |
|--|--|
| As found: NO Bkg: n/a NO _x Bkg: n/a NO Coef: n/a NO ₂ Coef: n/a NO _x Coef: n/a PMT: n/a Internal: n/a Chamber: n/a Cooler: n/a NO ₂ Converter: n/a NO ₂ Converter Set: n/a Perm Oven Gas: n/a Perm Oven Heater: n/a Pressure: n/a Flow: n/a Ozonator Flow: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NO _x : n/a | As left: NO Bkg: 7.4 NO _x Bkg: 7.7 NO Coef: 0.889 NO ₂ Coef: 1.003 NO _x Coef: 0.999 PMT: -906.1 Internal: 32.4 Chamber: 49.9 Cooler: -3.1 NO ₂ Converter: 327.7 NO ₂ Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Heater: 44.25 Pressure: 204.6 Flow: 0.693 Ozonator Flow: OK Expected Value NO: 5 Expected Value NO ₂ : 314 Expected Value NO _x : 319 |
|--|--|

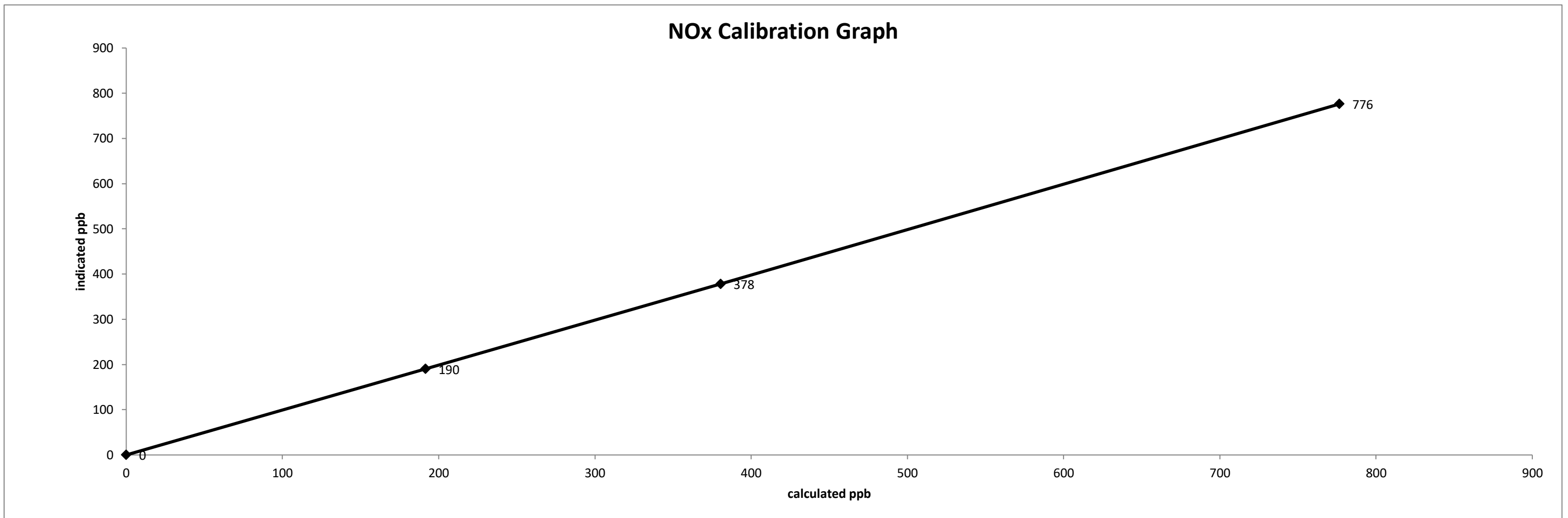
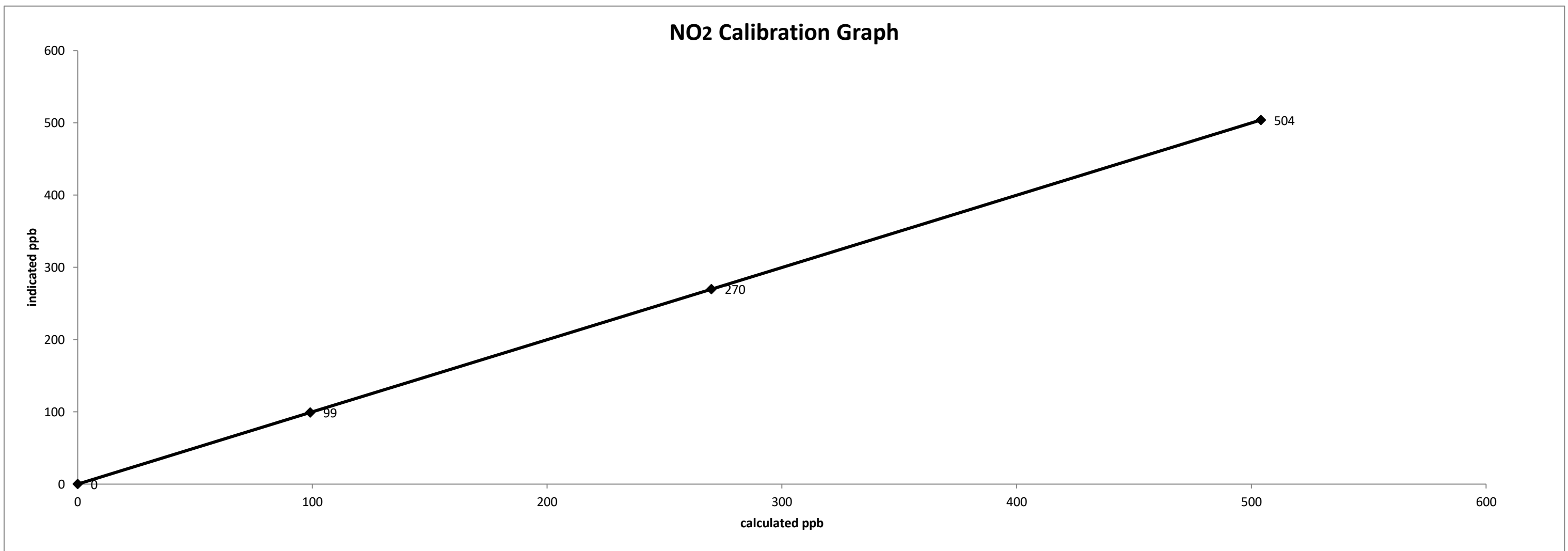
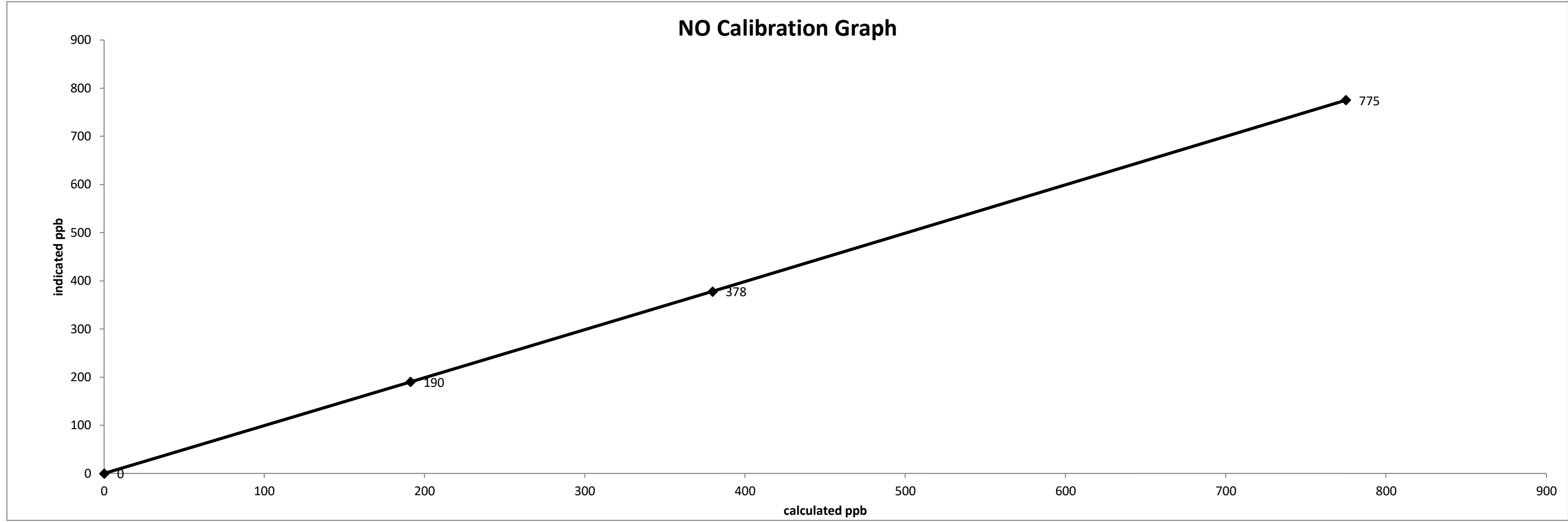
Comments: The manifold blower was found to be working normally.
 The NO_x pump scrubber was replaced.

A different external sample pump was installed. The internal sample pump was bypassed and switched off. Reason for the change: unstable SPAN check results and drift within 5 days to 12%.

Date: Dec 21, 2018
Company/Airshed: LICA
Location/Station Name: Bonnyville East

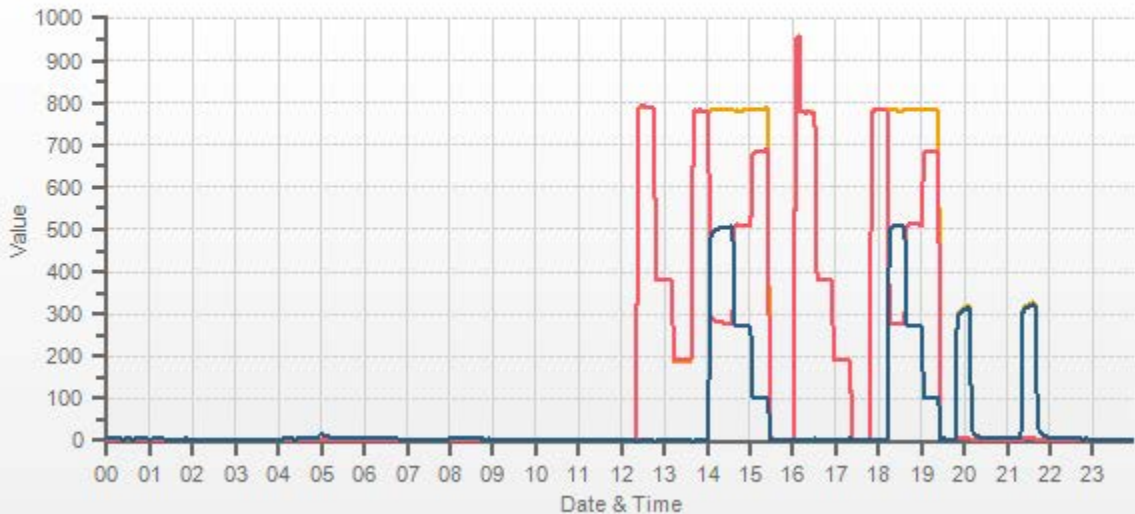
Start/End Time 24 hr. (mst): 15:38 / 20:12
Calibration Purpose: post repair
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



Station: LICA Bonnyville East Daily: 18/12/21 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]





Thermo 42i NO-NO2-NOx Analyzer Calibration

| | | | |
|--|---|------------|-----------|
| Date: December 30, 2018 | Barometer/B.P./units: F.S. 05544 January 15, 2019 | 947 | millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 | 22 | °C |
| Location/Station Name: Bonnyville - East | Weather Conditions: Light snow | | |
| Start/End Time 24 hr. (mst): 12:50 / 18:16 | Calibration Purpose: repeat | | |
| G.P.T. to be used for Ozone?: No | Performed By/Reviewer: Alex Yakupov | Rob Fisher | |
| Calibration Method: Gas Dilution & Gas Phase Titration | Cal Gas Expiry Date: October 24, 2020 | | |

| Analyzer: Serial Number/Owner: 1180930027 LICA Last Calibration Date: December 21, 2018 Range ppb: 1000 | Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>0.953</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.004</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.954</td> <td>1.000</td> </tr> </tbody> </table> | | Previous C.F.: | As Found C.F.: | New C.F.: | NO = | 1.000 | 0.953 | 1.000 | NO ₂ = | 1.000 | 1.004 | 1.000 | NOx = | 1.000 | 0.954 | 1.000 |
|--|---|----------------|----------------|----------------|-----------|------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|
| | Previous C.F.: | As Found C.F.: | New C.F.: | | | | | | | | | | | | | | |
| NO = | 1.000 | 0.953 | 1.000 | | | | | | | | | | | | | | |
| NO ₂ = | 1.000 | 1.004 | 1.000 | | | | | | | | | | | | | | |
| NOx = | 1.000 | 0.954 | 1.000 | | | | | | | | | | | | | | |

| Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6 | Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> | Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | High | 780 | 500 | n/a | Mid | 380 | 275 | n/a | Low | 190 | 100 | n/a | Extra Point #1 | n/a | n/a | n/a | Extra Point #2 | n/a | n/a | n/a |
|--|---|------------------------------|-----------------|------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|-----|-----|----------------|-----|-----|-----|
| Point | Target NO (ppb) | Target NO ₂ (ppb) | Cc Ozone ? | | | | | | | | | | | | | | | | | | | | | | |
| High | 780 | 500 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Mid | 380 | 275 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Low | 190 | 100 | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #1 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |
| Extra Point #2 | n/a | n/a | n/a | | | | | | | | | | | | | | | | | | | | | | |

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

| Calibrator Flow Rates (cc/min) | | | | Calculated NO | Calculated NOx | Indicated NO | Indicated NOx | NO C.F. | NOx C.F. |
|--------------------------------|---------|---------|------------|---------------|----------------|--------------|---------------|---------|----------|
| Point | Diluent | Cal Gas | Total Flow | (ppb) | (ppb) | (ppb) | (ppb) | | |
| as found zero | 5037 | 0.0 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| as found high | 4958 | 75.7 | 5034 | 774.9 | 776.4 | 813.0 | 814.0 | 0.953 | 0.954 |
| adjusted zero | 5037 | 0.00 | 5037 | 0.0 | 0.0 | 0.0 | 0.0 | n/a | n/a |
| adjusted high | 4958 | 75.74 | 5034 | 774.9 | 776.4 | 775.0 | 776.0 | 1.000 | 1.000 |
| mid | 4925 | 36.58 | 4962 | 379.7 | 380.4 | 377.0 | 378.0 | 1.007 | 1.006 |
| low | 4933 | 18.38 | 4951 | 191.2 | 191.6 | 188.0 | 189.0 | 1.017 | 1.014 |
| calibrator zero | 5037 | 0.00 | 5037 | 0 | 0 | 0.0 | 0.0 | n/a | n/a |
| Average C.F.= | | | | | | | | 1.008 | 1.007 |

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 | 4958 | 75.74 | 5034 | 0.0 | 774.0 | 775.0 | 1.0 | 0.0 | 1.0 | |
| as found high NO2 | 4958 | 75.74 | 5034 | 500.0 | 273.0 | 773.0 | 500.0 | 501.0 | 499.0 | 1.004 |
| adjusted high NO2 | 4958 | 75.74 | 5034 | 500.0 | 270.0 | 775.0 | 505.0 | 504.0 | 504.0 | 1.000 |
| gpt mid | 4958 | 75.74 | 5034 | 270.0 | 506.0 | 775.0 | 269.0 | 268.0 | 268.0 | 1.000 |
| gpt low | 4958 | 75.74 | 5034 | 100.0 | 673.0 | 774.0 | 101.0 | 101.0 | 100.0 | 1.010 |
| Average NO ₂ C.F.= | | | | | | | | | | 1.003 |

Linear Regression/Calibration Results:

| | NO | NOx | NO ₂ | LIMITS |
|------------------------------------|--------|--------|-----------------|--------------|
| Correlation Coefficient = | 1.000 | 1.000 | 1.000 | > or = 0.995 |
| Slope = | 0.999 | 1.000 | 1.001 | 0.95-1.05 |
| b (Intercept as % of full scale) = | -0.18% | -0.14% | 0.02% | ± 3% F.S. |
| % change in C.F. from last cal = | 4.69% | 4.62% | -0.40% | ± 10% |
| NO2 converter efficiency | | | 1.00 | 0.96 to 1.04 |

| | |
|---|--|
| As found: NO Bkg: 7.4 NOx Bkg: 7.7 NO Coef: 0.889 NO2 Coef: 1.003 NOx Coef: 0.999 PMT: -906.1 Internal: 30.4 Chamber: 50.1 Cooler: -3.0 NO2 Converter: 325.5 NO2 Converter Set: 325.0 Perm Oven Gas: 45.02 Perm Oven Heater: 44.24 Pressure: 205.8 Flow: 0.705 Ozonator Flow: OK Expected Value NO: 5 Expected Value NO2: 314 Expected Value NOx: 319 | As left: NO Bkg: 7.0 NOx Bkg: 7.4 NO Coef: 0.846 NO2 Coef: 0.995 NOx Coef: 0.999 PMT: -906.1 Internal: 31.0 Chamber: 50.0 Cooler: -2.9 NO2 Converter: 325.0 NO2 Converter Set: 325.0 Perm Oven Gas: 45.01 Perm Oven Heater: 44.25 Pressure: 207.6 Flow: 0.711 Ozonator Flow: OK Expected Value NO: 3 Expected Value NO2: 332 Expected Value NOx: 335 |
|---|--|

Comments:

The manifold blower was found to be working normally.

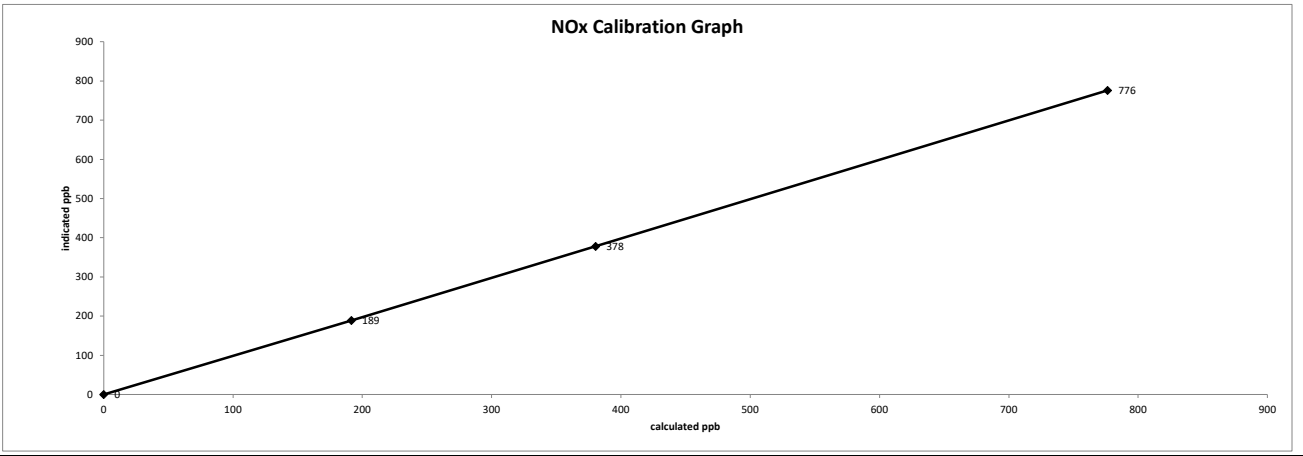
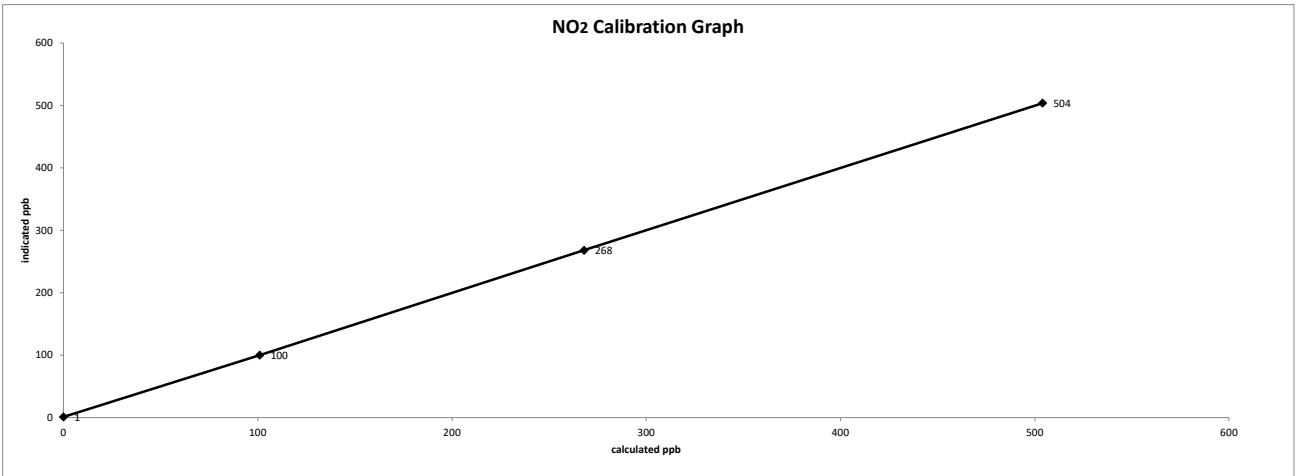
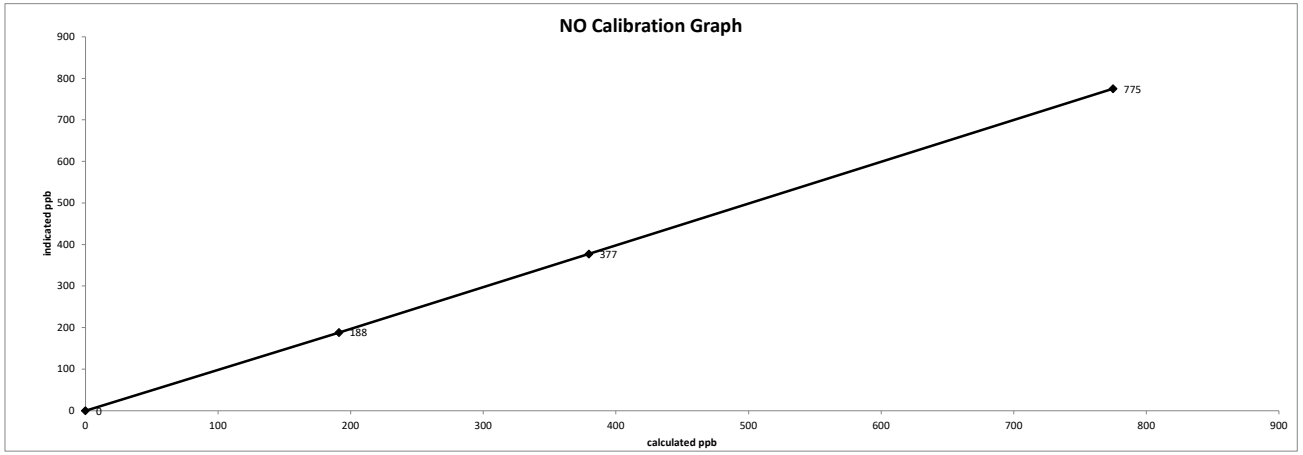
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

Repeat calibration completed because span check failed with 13.8%.

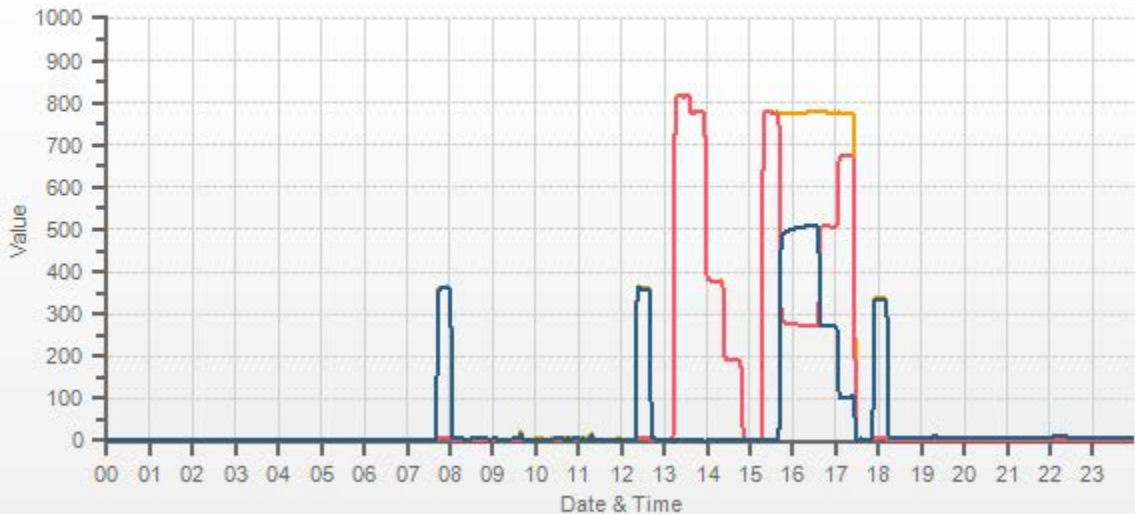
Date: December 30, 2018
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 12:50 / 18:16
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



— NOX[ppb] — NO[ppb] — NO2[ppb]



OZONE



Thermo 49i Ozone Analyzer Calibration

| | |
|--|--|
| Date: December 7, 2018 | Barometer/B.P./units: F.S. 05544 expires January 15, 2019 945 millibars |
| Company/Airshed: LICA | Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C |
| Location/Station Name: Bonnyville East | Weather Conditions: Mainly sunny |
| Start/End Time 24 hr. (mst): 10:50 / 14:56 | Calibration Purpose: routine monthly |
| Ozone Calibration Method: Varying UV Lamp Power | Performed By/Reviewer: Alex Yakupov Rob Fisher |
| 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: | |
| Serial Number/Owner: 1002240372 LICA | Ozone Range ppb: 500 |
| Last Calibration Date: November 22, 2018 | As Found C.F.: 1.000 |
| Previous Cal High Point C.F.: 1.000 | New C.F.: 1.000 |

Calibration Standards:

| | |
|---|--------------|
| Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 | Point |
| High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 | High |
| Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 | Mid |
| Cal Gas Cylinder I.D. # : n/a | Low |

| AMD Required Range of Ozone Calibration Points |
|--|
| High 300-400 ppb |
| Mid 150-200 ppb |
| Low 50-75 ppb |

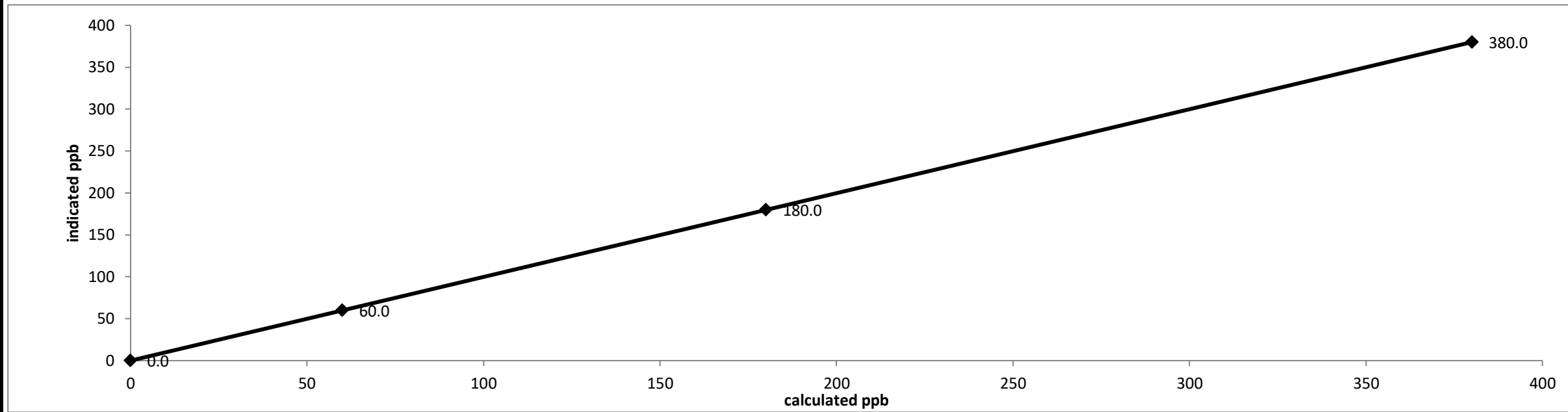
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

| 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 | 380.0 | 1.000 |
| adjusted zero | 5000 | 5000 | 0.0 | 0.0 | 0.0 | n/a |
| adjusted high | 5000 | 5000 | 380.0 | 380.0 | 380.0 | 1.000 |
| mid | 5000 | 5000 | 180.0 | 180.0 | 180.0 | 1.000 |
| low | 5000 | 5000 | 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 = 1.000 | LIMITS |
| Slope = 1.000 | > or = 0.995 |
| b (Intercept as % of full scale) = 0.00% | 0.95-1.05 |
| % change in C.F. from last cal = 0.00% | ± 3% F.S. |
| | ± 10% |

Thermo 49i Ozone Analyzer Calibration



As found:

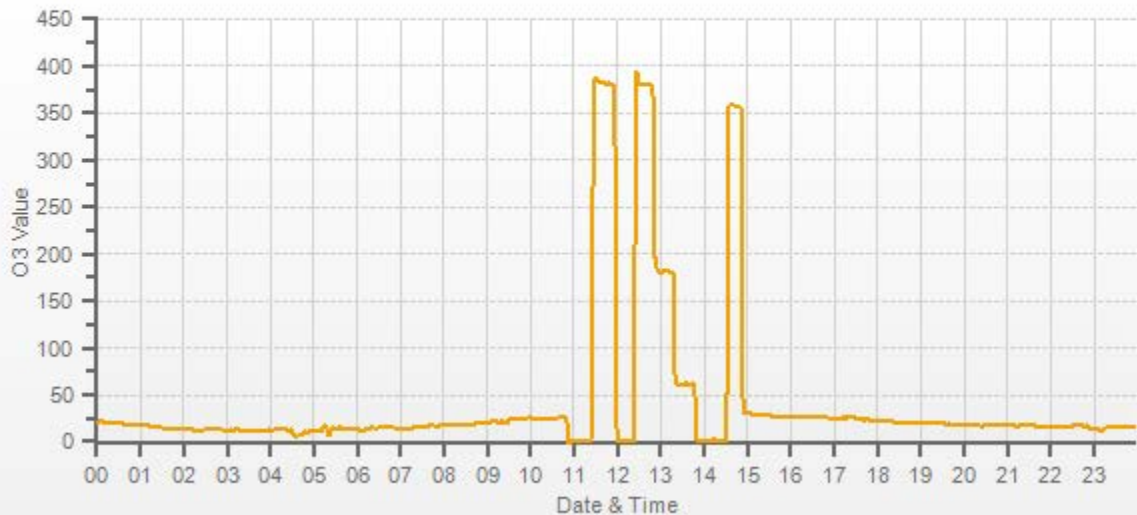
| | |
|------------------|-------|
| O3 Bkg: | -0.2 |
| O3 Coef: | 1.035 |
| Photo Lamp: | 14.2 |
| O3 Lamp: | 9.3 |
| Bench: | 30.3 |
| Bench Lamp: | 54.0 |
| O3 Lamp: | 68.0 |
| Pressure: | 696.5 |
| Cell A lpm: | 0.759 |
| Cell B lpm: | 0.764 |
| O3 ppb: | 0.2 |
| Cell A ppb: | 0.2 |
| Cell B ppb: | -1.1 |
| Cell A int (Hz): | 77777 |
| Cell B int (Hz): | 80630 |
| Expected Value: | 342.0 |

As left:

| | |
|------------------|-------|
| O3 Bkg: | 0.1 |
| O3 Coef: | 1.033 |
| Photo Lamp: | 14.2 |
| O3 Lamp: | 5.8 |
| Bench: | 31.5 |
| Bench Lamp: | 54.1 |
| O3 Lamp: | 68.0 |
| Pressure: | 696.5 |
| Cell A lpm: | 0.759 |
| Cell B lpm: | 0.762 |
| O3 ppb: | 0.2 |
| Cell A ppb: | 0.8 |
| Cell B ppb: | -0.5 |
| Cell A int (Hz): | 77718 |
| Cell B int (Hz): | 80524 |
| Expected Value: | 357.0 |

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

O3[ppb]



PARTICULATE MATTER



Thermo 5030i SHARP Monitor Monthly Check

Date: December 10, 2018
Company: LICA
Station Name/Location: Bonnyville - East
Previous Audit Date: November 6, 2018
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher
Start Time (mst): 12:54
End Time (mst): 13:48
Calibration Purpose: routine monthly
Weather Conditions: Overcast

SHARP 5030i Information and Status:

Serial Number: CM 17071016 **Filter Tape Counter:** 159

Reference Standards:

| | Air Flow | | Pressure: | | Temp / RH: | |
|-------------------------------------|-----------------|----------------|-------------------|--|---------------------|--|
| | Manometer | Orifice | | | | |
| Make: | Dwyer | Chinook | Fisher Scientific | | Fisher Scientific | |
| Model: | 475 Mk.III | CHN0901 | FB61291 | | 11-661-7A, 11745843 | |
| Serial Number: | #3 | #2 | 05544 | | 170286131 | |
| Calibration Expiration Date: | January 9, 2019 | April 24, 2019 | January 15, 2019 | | April 19, 2019 | |

| Ambient Temperature (°C) | | | | Range | Action |
|--------------------------|------------------|--------------|-------------------|---------|-------------|
| | Reference | SHARP | Difference | < ± 2°C | OK |
| #1 | -8.52 | -9.0 | 0.5 | 2-3 °C | Recalibrate |
| | | | | > 3°C | Fail |

| Ambient Relative Humidity (%RH) | | | | Range | Action |
|---------------------------------|------------------|--------------|-------------------|-----------|-------------|
| | As Found: | | | < ± 2 %RH | OK |
| | Reference | SHARP | Difference | 2-5 %RH | Recalibrate |
| #1 | 72.40 | 73.1 | -0.7 | > 5 %RH | Fail |

| Barometric Pressure (mmHg) | | | | Range | Action |
|----------------------------|------------------|--------------|-------------------|-------------|-------------|
| | As Found: | | | < ± 10 mmHg | OK |
| | Reference | SHARP | Difference | 10-12 mmHg | Recalibrate |
| #1 | 705.1 | 705.3 | -0.2 | > 12 mmHg | Fail |

| Flow Audit (L/min) | | | | Range | Action |
|--------------------|------------------|--------------|--------------|--------|-------------|
| | As Found: | | | < ± 4% | OK |
| | Reference | SHARP | | 4-5% | Recalibrate |
| #1 | 16.55 | 16.66 | % Difference | >5% | Fail |
| | #2 | 16.57 | 16.67 | | |
| | #3 | 16.57 | 16.67 | | |
| | Average | 16.56 | 16.67 | | |
| | | | 0.623867981 | | |

| Leak Check (L/min) | | | | | | |
|----------------------------|-----------|-------|-------------------------|-----------|-------------------|--------------|
| Without Leak Check Adapter | | | With leak Check Adapter | | | |
| | Reference | SHARP | Difference | Reference | SHARP | Difference |
| #1 | 16.57 | 16.67 | -0.10 | 16.55 | 16.67 | -0.12 |
| | | | | | LEAK RATE: | -0.02 |

Leak Limit: 0.80 L/min

WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

| | | | |
|----------------------|------------------|-----------------------|---------------|
| Company: | LICA | Performed By: | Alex Yakupov |
| Audit Location: | Bonnyville East | Reviewed By: | Rob Fisher |
| Audit Date: | October 24, 2018 | Start/End Time (mst): | 12:56 / 14:01 |
| Calibration Purpose: | installation | Weather Conditions: | Mainly sunny |

Wind Sensor Information

| Sensor ID Data: | | Sensor Outputs: | |
|--------------------------|----------------|---------------------------------|---------------|
| Sensor Make: | RM Young | Velocity Voltage Output Range: | 0-1 V |
| Sensor Model: | 05305VK | Velocity Unit Output Range: | 0-200 km/h |
| Serial #: | 56778 | Direction Voltage Output Range: | 0-1 V |
| Previous Cal/Audit Date: | n/a or unknown | Direction Unit Output Range: | 0-360 degrees |

Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744, calibrated on May 18, 2018

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 | 18.4 | 18.4 | 18.4 | 1.000 |
| 2000 | 36.9 | 36.8 | 36.8 | 1.003 |
| 3000 | 55.3 | 55.4 | 55.4 | 0.998 |
| 4000 | 73.7 | 73.8 | 73.8 | 0.999 |
| 5000 | 92.2 | 92.2 | 92.2 | 1.000 |
| 6000 | 110.6 | 110.6 | 110.6 | 1.000 |
| 7000 | 129.0 | 129.0 | 129.0 | 1.000 |
| 8000 | 147.4 | 147.4 | 147.4 | 1.000 |
| 9000 | 165.9 | 165.8 | 166.0 | 1.000 |
| 10000 | 184.3 | 184.0 | 184.4 | 1.001 |
| The audit meets AMD requirements. | | | Average Correction Factor= | 1.000 |

Wind Direction Audit Data ****+/- 3° 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 | 355 | 0.0 | 0.0 | 0.0 |
| 30 | 330 | 30 | 331 | 0.0 | -0.6 | 0.3 |
| 60 | 300 | 60 | 301 | 0.0 | -0.8 | 0.4 |
| 90 | 270 | 90 | 271 | 0.0 | -1.0 | 0.5 |
| 120 | 240 | 121 | 241 | -0.6 | -0.8 | 0.7 |
| 150 | 210 | 151 | 211 | -0.8 | -1.3 | 1.1 |
| 180 | 180 | 181 | 182 | -0.9 | -1.8 | 1.4 |
| 210 | 150 | 211 | 152 | -1.0 | -2.3 | 1.7 |
| 240 | 120 | 240 | 121 | -0.3 | -1.4 | 0.9 |
| 270 | 90 | 270 | 92 | 0.0 | -2.0 | 1.0 |
| 300 | 60 | 300 | 62 | 0.1 | -1.6 | 0.9 |
| 330 | 30 | 330 | 31 | -0.1 | -1.0 | 0.6 |
| 355 | 0 | 355 | 0 | 0.0 | 0.3 | 0.2 |
| The audit meets AMD requirements. | | | Average Absolute Degrees Difference= | | 0.7 | |

Comments:

CALIBRATORS

| | | | |
|------------------------|-------------------|---------------------------------|--------------------------|
| Company: <u>Maxxam</u> | | Operator: <u>Chris W</u> | |
| Calibrator: | | Flow Measurement Device: | |
| Make/Model | <u>API 700</u> | Make/Model | <u>Mesa Defender 530</u> |
| Serial Number | <u>690</u> | Serial Number | <u>L-153351 H-152571</u> |
| Last Verification Date | <u>March 2016</u> | Temperature (°C) | <u>23.5 C</u> |
| NO Cylinder S/N | <u>LL108015</u> | Barometric Pressure | <u>695 mmHg</u> |
| NO [PPM] | <u>52.2</u> | NOx [PPM] | <u>52.3</u> |
| Expiry Date | <u>Oct 2020</u> | | |

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

| Calibrator Flow (sccm) | | Calculated Conc.(ppm) | | Indicated Conc.(ppm) | | | % Difference vs Audit Gas | |
|-------------------------------------|------|-----------------------|-------|----------------------|-----------------|-------|---------------------------|-----|
| Dilution | Gas | NO | NOx | NO | NO ₂ | NOx | NO | NOx |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Limit ± 10% | |
| 4959 | 75.0 | 0.789 | 0.791 | 0.793 | 0.000 | 0.793 | 1% | 0% |
| 4971 | 36.5 | 0.383 | 0.384 | 0.384 | 0.000 | 0.384 | 0% | 0% |
| 4967 | 18.2 | 0.191 | 0.192 | 0.191 | 0.000 | 0.191 | 0% | -1% |
| 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)= 1.0054 | 0.90-1.10 | m (Slope)= 1.0031 |
| b (Intercept % of FS)= -0.0583 | ± 3% F.S. | b (Intercept % of FS)= -0.0795 |

| Flow | O ₃ Conc | NO Decrease | NO | NO ₂ | NOX | % Diff. Vs Audit gas | |
|-------------------------------------|---------------------|-------------|-------|-----------------|-------|----------------------|---------------|
| 4959 | 0.000 | 0.000 | 0.790 | -0.001 | 0.789 | NO ₂ | % Diff. Limit |
| 4959 | 0.500 | 0.497 | 0.293 | 0.493 | 0.786 | -1% | ± 10% |
| 4959 | 0.275 | 0.273 | 0.517 | 0.269 | 0.787 | -1% | ± 10% |
| 4959 | 0.100 | 0.102 | 0.688 | 0.099 | 0.787 | -2% | ± 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)= 0.9946 | 0.90-1.10 | |
| b (Intercept % of FS)= -0.1817 | ± 3% F.S. | |

| | |
|--|---|
| AENV Standards Audit Calibrator | NO_x Analyzer |
| Make/Model <u>Teco 146i</u> | Make/Model <u>Teco 42i</u> |
| Serial/AMU Number <u>AMU 1809</u> | Serial/AMU Number <u>AMU 1868</u> |
| SRM Gas Cylinder No. <u>APEX1170572</u> | Last Calibration Date <u>March 14, 2018</u> |
| Cylinder Conc. (ppm) <u>49.99</u> | Full Scale (ppm) <u>1.0</u> |
| | Cylinder Gas Expiry Date <u>November 2020</u> |

COMMENTS: Cylinder contains 47.9 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 15, 2018
Location: McIntyre Center Edmonton

Company: Maxxam Operator: Mike

| Calibrator: | | Flow Measurement Device: | |
|------------------------|-----------------------|--------------------------|----------------|
| Make/Model | <u>Sabio 2010D</u> | Make/Model | <u>NA</u> |
| Serial Number | <u>11900613</u> | Serial Number | <u>NA</u> |
| Oven Temperature | <u>49.7</u> | Temperature (°C) | <u>22.9</u> |
| Last Verification Date | <u>March 16, 2017</u> | Barometric Pressure | <u>698mmHg</u> |

Flow Measurements

Pt. No. 1 NA Pt. No. 2 NA Pt. No. 3 NA

| Calibrator Flow (sccm) | Calculated Concentration (ppm) | Indicated Concentration (ppm) | % Difference | |
|-------------------------------------|-----------------------------------|----------------------------------|--------------|---------------|
| | | | vs Audit Gas | % Diff. Limit |
| Zero Air | 0.000 | 0.001 | | |
| 5000 | 0.400 | 0.383 | -4% | ± 10% |
| 5000 | 0.200 | 0.192 | -4% | ± 10% |
| 5000 | 0.100 | 0.097 | -4% | ± 10% |
| Absolute Average Percent Difference | | | 4% | ± 10% |

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

| <u>O₃</u> | | <u>LIMITS</u> |
|------------------------|--------|---------------|
| Correlation= | 1.0000 | ≥ 0.995 |
| m (Slope)= | 0.9554 | 0.90-1.10 |
| b (Intercept % of FS)= | 0.2160 | ± 3% F.S. |

| AENV Standards | | Ozone Analyzer | |
|-------------------------|---------------------|-----------------------|------------------------|
| Audit Calibrator | | Make/Model | <u>Thermo 49i</u> |
| Make/Model | <u>Thermo 49iPS</u> | Serial/AMU Number | <u>1843</u> |
| Serial/AMU Number | <u>1808</u> | Last Calibration Date | <u>August 16, 2018</u> |
| Ozone Standard | <u>Thermo 49iPS</u> | Full Scale (ppm) | <u>0.5</u> |

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: August 22, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam **Operator's Name:** Mike
Cylinder #: LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: October 2020

| Reference Calibrator and Gas: | Flow Measurement Device: |
|--|---|
| Make/Model: <u>R&R MFC 201</u> | Make/Model: <u>Mesa Definer 220</u> |
| Serial Number: <u>AMU 1690</u> | Serial Number: <u>H-133034 / L-132702</u> |
| Last Verification Date: <u>December 13, 2017</u> | Temp. °C: <u>23.4 C</u> |
| Gas Type: <u>SO2</u> Conc. <u>98.07</u> | B.P. <u>707 mmHg</u> |
| Cylinder Number: <u>CAL016625</u> | |
| Expiry Date: <u>January 2019</u> | |

Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Concentration (PPM) | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration |
|---------------------------------|------|-------------------------------|----------------------------|----------------------|------------------------|
| Dilution | Gas | | | | |
| 5000 | 0.0 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4989 | 79.5 | 0.764 | 0.01594 | 62.755 | 47.9 |
| 4995 | 39.6 | 0.380 | 0.00793 | 126.136 | 47.9 |
| 4992 | 19.6 | 0.188 | 0.00393 | 254.694 | 47.9 |
| Average Cylinder Concentration: | | | | | 47.9 |

Previous Stated Concentration PPM: 49.2

Percent variance from Stated: 3

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

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 13, 2017
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair
 Expiry Date: October 2020

Reference Calibrator and Gas:
 Make/Model: Sabio 2010
 Serial Number: AMU 2092
 Last Verification Date: January 17, 2018
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015272
 Expiry Date: January 2019

Flow Measurement Device:
 Make/Model: Mesa Defender 530
 Serial Number: H-153961 / L-153874
 Temp. °C: 23.0 C
 B.P.: 697 mmHg

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1
 Last Calibration: Date: Jan 17/18 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 | | | |
| 5051 | 39.6 | 0.0753 | 0.00784 | 127.551 | 9.60 |
| 5028 | 20.2 | 0.0387 | 0.00402 | 248.911 | 9.63 |
| 5033 | 10.5 | 0.0198 | 0.00209 | 479.333 | 9.49 |
| Average Cylinder Concentration: | | | | | 9.58 |

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2017-481CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL119471 Conc CH4 (PPM) 599/207 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2025

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------------|------------------|--------------------------|----------------------------|
| Make/Model | <u>R&R MFC 201</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1690</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.1 C</u> |
| Gas Type | <u>CH4</u> | Conc. | <u>990.4</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>5604875</u> | Expiry Date | <u>July 2021</u> | | |
| Gas Type | <u>C3H8</u> | Conc. | <u>246.5</u> | | |
| Cylinder Number | <u>XF003845B</u> | Expiry Date | <u>July 2022</u> | | |

Reference Analyzer:

Make/Model Teco 55i Serial/AMU Number: 2108

Instrument Settings Zero: N/A Span: N/A Range: 20.0

Last Calibration: Date: Dec 12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (scem) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|----------------|
| Dilution | Gas | CH4 | C3H8 | | | CH4 | C3H8 |
| 3500 | 0.0 | 0.00 | 0.00 | 0.02 | 45.00 | 603 | 209 |
| 3618 | 80.4 | 13.41 | 12.75 | 0.02 | 45.00 | 603 | 209 |
| 3547 | 39.8 | 6.73 | 6.47 | 0.01 | 89.12 | 600 | 210 |
| 3560 | 19.8 | 3.34 | 3.21 | 0.01 | 179.80 | 601 | 210 |
| Average Cylinder Concentration: | | | | | | 601 | 209 |

| | | | |
|------------------------------------|-------------------|--|--------------------|
| | <u>CH4</u> | | <u>C3H8</u> |
| Previous Stated Concentration PPM: | <u>599</u> | | <u>207</u> |
| Percent variance from Stated: | <u>0</u> | | <u>1</u> |

Cylinder gas tolerances based on CH4 only

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

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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



Calibration Gas Audit

NO Cylinder Gas

File No. 2017-483CGA

Company: Maxxam **Operators name:** Mike

Cylinder #: LL104225 Conc (PPM) 51.5/51.6 Tolerance (%) 2 Certified By: Praxair

Expiry Date: October 2020

| Reference Calibrator and Gas: | | | | Flow Measurement Device: | |
|-------------------------------|--------------------------|-------|--------------|--------------------------|----------------------------|
| Make/Model | <u>Teco 146i</u> | | | Make/Model | <u>Mesa Definer 220</u> |
| Serial Number | <u>AMU 1809</u> | | | Serial Number | <u>H-133034 / L-132702</u> |
| Last Verification Date | <u>December 13, 2017</u> | | | Temp. °C | <u>23.4 C</u> |
| Gas Type | <u>NO</u> | Conc. | <u>50.03</u> | B.P. | <u>707 mmHg</u> |
| Cylinder Number | <u>APEX 1223938</u> | | | | |
| Expiry Date | <u>June 2020</u> | | | | |

Reference Analyzer:

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

Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0

Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

| Calibrator Flows (sccm) | | Indicated Conc. (ppm) | | Gas Flow/ Dilution Flow | Concentration Factor | Cylinder Concentration | |
|---------------------------------|------|-----------------------|-------|----------------------------|-------------------------|------------------------|-------------|
| Dilution | Gas | NO | NOX | | | NO | NOX |
| 5000 | 0.0 | 0.000 | 0.000 | | | | |
| 4989 | 79.5 | 0.813 | 0.812 | 0.016 | 62.755 | 51.0 | 51.0 |
| 4995 | 39.6 | 0.407 | 0.406 | 0.008 | 126.136 | 51.3 | 51.2 |
| 4992 | 19.6 | 0.202 | 0.201 | 0.004 | 254.694 | 51.4 | 51.2 |
| Average Cylinder Concentration: | | | | | | 51.3 | 51.1 |

| | |
|--|-------------------|
| <u>NO</u> | <u>NOx</u> |
| Previous Stated Concentration PPM: <u>51.5</u> | <u>51.6</u> |
| Percent variance from Stated: <u>0</u> | <u>1</u> |

Cylinder gas tolerances based on NO only

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

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

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

Auditor: Al Clark Date: December 13, 2017

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

APPENDIX III
MAXIMUM INSTANTANEOUS DATA



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

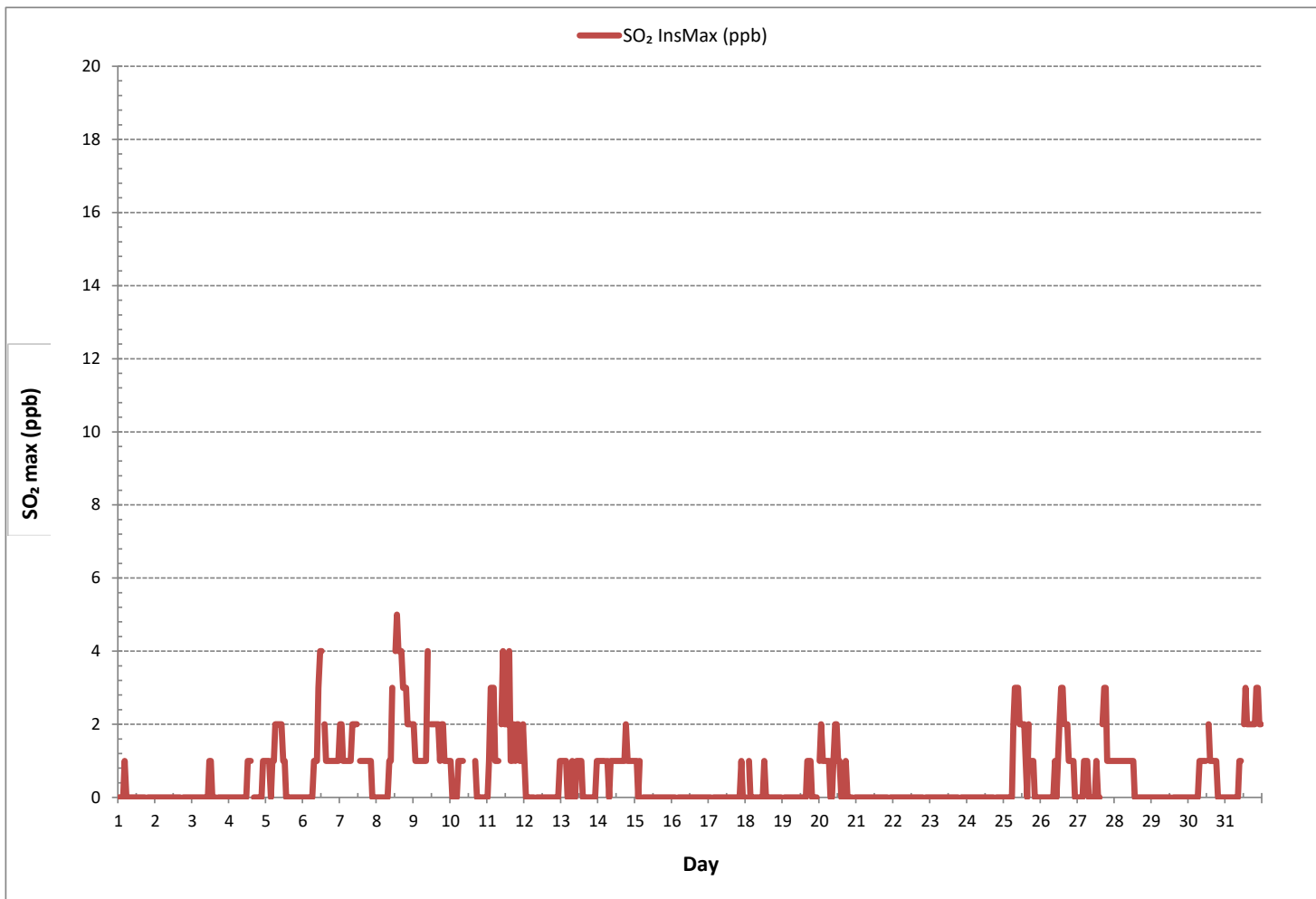
| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 2 | 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 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 24 |
| 5 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 4 | 4 | S | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | 1 | 24 | |
| 7 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 24 | |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | S | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 0 | 5 | 2 | 24 | |
| 9 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | S | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 24 |
| 10 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | S | C | C | C | C | C | C | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 11 | 0 | 1 | 3 | 3 | 3 | 1 | 1 | 1 | S | 2 | 4 | 2 | 2 | 2 | 4 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 0 | 4 | 2 | 24 | |
| 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 24 |
| 13 | 1 | 1 | 1 | 1 | 0 | 0 | S | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 24 |
| 14 | 1 | 1 | 1 | 1 | 1 | S | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 24 | |
| 15 | 1 | 1 | 0 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 16 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 17 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 24 | |
| 18 | 0 | S | 1 | 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 | |
| 19 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 0 | 24 |
| 20 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 2 | 1 | 24 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 24 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 24 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 0 | 2 | S | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 24 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 3 | 3 | 2 | S | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 3 | 1 | 24 | |
| 27 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | S | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 24 | |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 29 | 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 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | S | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 24 | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | S | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 0 | 3 | 1 | 24 |
| HOURLY MAX | 2 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | | | | |
| HOURLY AVG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 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: | 251 |
| MAXIMUM INSTANTANEOUS VALUE: | 5 ppb @ HOUR 13 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| OPERATIONAL TIME: | 744 hrs |
| STANDARD DEVIATION: | 1 |





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

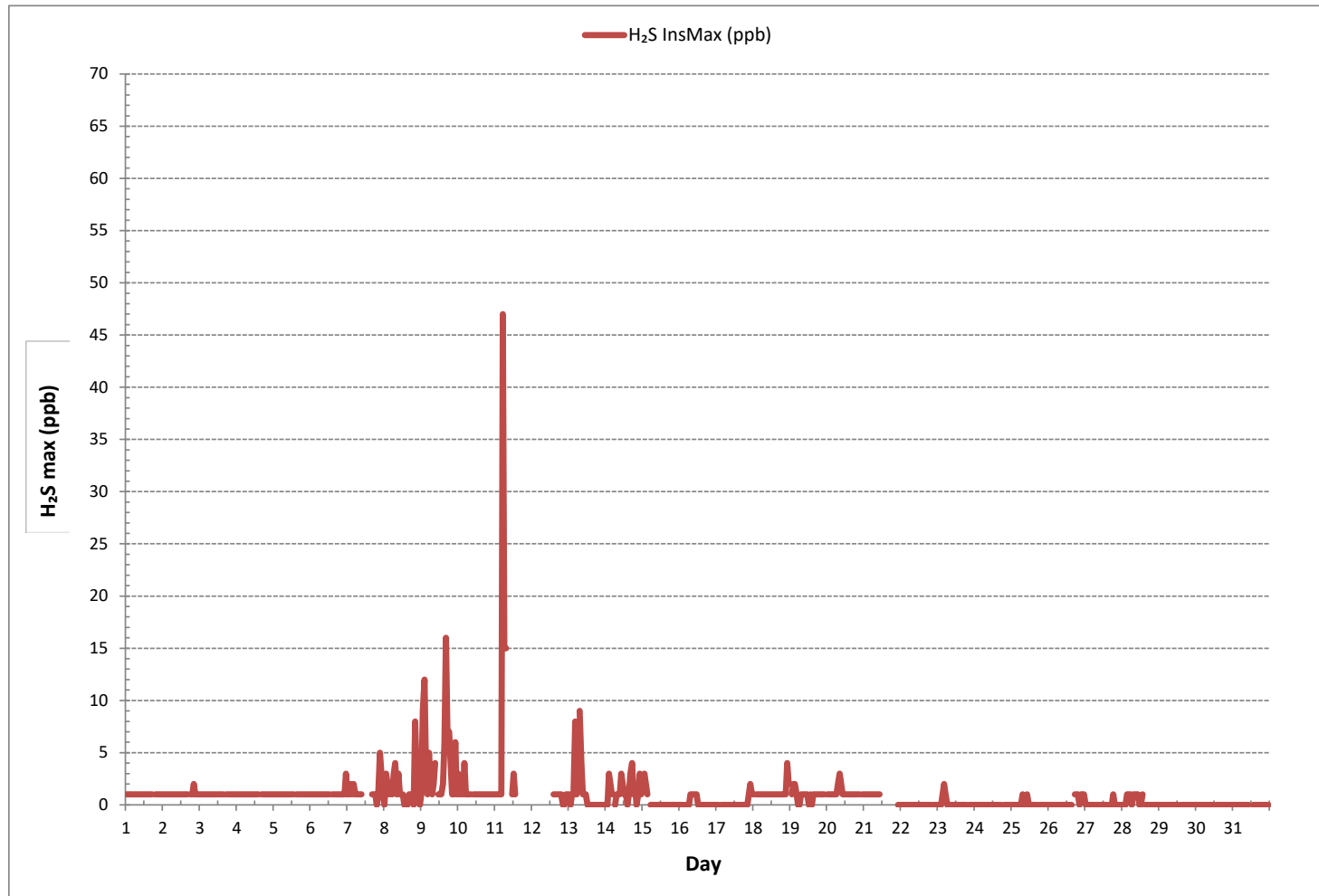
| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 | |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 24 | |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 | |
| 4 | 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 | |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 24 | |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 24 | |
| 7 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | C | C | C | C | C | C | 1 | 1 | 1 | 0 | 1 | 5 | 3 | 1 | 0 | 5 | 1 | 24 | |
| 8 | 0 | 3 | 2 | 1 | 2 | 1 | 3 | 4 | 1 | 3 | 1 | S | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 8 | 3 | 2 | 0 | 0 | 8 | 2 | 24 | |
| 9 | 1 | 9 | 12 | 3 | 1 | 5 | 2 | 1 | 2 | 4 | S | 1 | 1 | 1 | 2 | 6 | 16 | 7 | 7 | 4 | 1 | 1 | 6 | 1 | 1 | 16 | 4 | 24 | |
| 10 | 3 | 1 | 2 | 1 | 4 | 1 | 1 | 1 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 24 | |
| 11 | 1 | 1 | 1 | 1 | 1 | 47 | 15 | 15 | S | S1 | S1 | 1 | 3 | 1 | C1 | C1 | C1 | Y | Y | Y | Y | Y | Y | Y | 1 | 47 | 8 | 12 | |
| 12 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | C1 | C1 | C1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 10 | |
| 13 | 1 | 0 | 1 | 1 | 8 | 1 | S | 9 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 24 | |
| 14 | 0 | 0 | 3 | 2 | 1 | S | 0 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 0 | 1 | 3 | 4 | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 4 | 1 | 24 | |
| 15 | 2 | 3 | 2 | 1 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 24 | |
| 16 | 0 | 0 | 0 | S | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 17 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 0 | 24 | |
| 18 | 1 | S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 1 | 4 | 1 | 24 | |
| 19 | S | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 0 | 2 | 1 | 24 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S | 1 | 1 | 3 | 1 | 24 | |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | C1 | C1 | C1 | Y | C1 | C1 | C1 | C1 | C1 | 0 | S | 0 | 0 | 0 | 1 | 1 | 15 | |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 23 | 0 | 0 | 0 | 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 | |
| 24 | 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 | |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 24 | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | |
| 28 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | S | 0 | 0 | 0 | 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 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | S | S1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | |
| HOURLY MAX | 3 | 9 | 12 | 3 | 8 | 47 | 15 | 15 | 4 | 4 | 3 | 2 | 3 | 1 | 2 | 6 | 16 | 7 | 7 | 4 | 8 | 5 | 6 | 3 | | | | | |
| HOURLY AVG | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 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: | 372 |
| MAXIMUM INSTANTANEOUS VALUE: | 47 ppb @ HOUR 5 ON DAY 11 |
| IZS CALIBRATION TIME: | 30 hrs |
| MONTHLY CALIBRATION TIME: | 6 hrs |
| OPERATIONAL TIME: | 708 hrs |
| STANDARD DEVIATION: | 2 |





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville East Continuous Monitoring Station - December 2018

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY 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 | 3.08 | 3.17 | 3.17 | 3.02 | 2.58 | 2.72 | 2.59 | 2.54 | 2.45 | 2.36 | 2.34 | 2.29 | 2.23 | 2.20 | 2.14 | 2.15 | 2.17 | 2.23 | S | 2.05 | 2.05 | 2.01 | 1.99 | 1.99 | 1.99 | 1.99 | 3.17 | 2.41 | 24 |
| 2 | 1.98 | 1.98 | 2.00 | 2.01 | 2.07 | 2.09 | 2.08 | 2.09 | 2.09 | 2.11 | 2.06 | 2.06 | 2.07 | 2.05 | 2.06 | 2.06 | 2.05 | S | 2.08 | 2.11 | 2.07 | 1.97 | 2.01 | 2.04 | 1.97 | 2.11 | 2.05 | 24 | |
| 3 | 2.06 | 2.11 | 2.27 | 2.30 | 2.24 | 2.13 | 2.12 | 1.98 | 2.08 | 2.01 | 1.98 | 1.97 | 1.96 | 1.94 | 1.93 | 1.94 | S | 1.93 | 1.93 | 2.01 | 1.93 | 1.95 | 1.94 | 1.94 | 1.93 | 2.30 | 2.03 | 24 | |
| 4 | 1.94 | 1.93 | 1.93 | 1.92 | 1.92 | 1.95 | 1.95 | 1.94 | 1.93 | 1.93 | 1.91 | 1.91 | 1.92 | 1.94 | 1.95 | S | 2.00 | 1.96 | 1.98 | 1.94 | 1.93 | 1.92 | 1.93 | 1.98 | 1.91 | 2.00 | 1.94 | 24 | |
| 5 | 1.99 | 1.95 | 1.96 | 1.97 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.96 | 1.96 | 1.94 | 1.94 | 1.93 | S | 1.98 | 1.97 | 1.93 | 1.93 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | 1.93 | 1.99 | 1.95 | 24 | |
| 6 | 1.96 | 1.95 | 1.97 | 1.97 | 1.98 | 2.00 | 2.01 | 2.02 | 2.11 | 2.03 | 2.01 | 2.09 | 2.12 | S | 2.13 | 2.12 | 2.16 | 2.12 | 2.16 | 2.22 | 2.13 | 2.16 | 2.17 | 2.32 | 1.95 | 2.32 | 2.08 | 24 | |
| 7 | 2.16 | 2.50 | 2.50 | 2.65 | 2.53 | 2.41 | 2.70 | 2.77 | 2.65 | 2.59 | 2.67 | 2.52 | S | 2.33 | C | C | C | C | 2.64 | 2.66 | 2.66 | 2.69 | 2.66 | 2.66 | 2.66 | 2.16 | 2.77 | 2.58 | 24 |
| 8 | 2.78 | 2.89 | 2.83 | 2.92 | 3.11 | 2.78 | 2.80 | 2.83 | 2.59 | 2.56 | 2.52 | S | 2.38 | 2.26 | 2.25 | 2.26 | 2.26 | 2.40 | 3.13 | 2.30 | 2.33 | 2.33 | 2.42 | 2.48 | 2.25 | 3.13 | 2.58 | 24 | |
| 9 | 2.48 | 2.55 | 2.55 | 2.62 | 2.49 | 2.52 | 2.59 | 2.52 | 2.59 | 2.53 | S | 2.77 | 2.67 | 2.69 | 2.71 | 3.13 | 3.14 | 3.00 | 3.17 | 3.39 | 3.33 | 3.37 | 3.37 | 3.87 | 2.48 | 3.87 | 2.87 | 24 | |
| 10 | 4.06 | 5.56 | 5.59 | 4.86 | 3.79 | 4.20 | 4.09 | 4.02 | 3.78 | S | 3.52 | 3.44 | 3.43 | 3.29 | 3.11 | 2.74 | 2.43 | 2.45 | 2.22 | 2.06 | 2.04 | 2.04 | 2.00 | 2.04 | 2.00 | 5.59 | 3.34 | 24 | |
| 11 | 2.07 | 2.12 | 2.10 | 2.08 | 2.13 | 2.51 | 2.25 | 2.26 | S | 2.46 | 2.28 | 2.21 | 2.21 | 2.22 | 2.24 | 2.25 | 2.27 | 2.28 | 2.40 | 2.38 | 2.41 | 2.44 | 2.48 | 2.62 | 2.07 | 2.62 | 2.29 | 24 | |
| 12 | 2.63 | 2.40 | 2.35 | 2.31 | 2.36 | 2.33 | 2.36 | S | 2.00 | 2.02 | 2.02 | 2.00 | 1.99 | 1.97 | 1.96 | 1.97 | 1.96 | 1.96 | 1.95 | 1.95 | 1.95 | 1.96 | 1.98 | 1.97 | 1.95 | 2.63 | 2.10 | 24 | |
| 13 | 1.99 | 2.00 | 1.96 | 2.02 | 2.09 | 2.12 | S | 2.26 | 2.14 | 2.13 | 2.02 | 2.00 | 1.98 | 1.98 | 1.97 | X | 1.97 | 1.96 | 1.96 | 1.96 | 1.97 | 1.97 | 1.97 | 1.97 | 1.99 | 1.96 | 2.26 | 2.02 | 23 |
| 14 | 2.01 | 2.01 | 2.01 | 2.05 | 2.18 | S | 2.31 | 2.52 | 2.23 | 2.25 | 2.31 | 2.31 | 2.24 | 2.36 | 2.37 | 2.25 | 2.31 | 2.31 | 2.34 | 2.24 | 2.17 | 2.14 | 2.17 | 2.15 | 2.01 | 2.52 | 2.23 | 24 | |
| 15 | 2.16 | 2.28 | 2.72 | 2.33 | S | 2.11 | 2.06 | 2.06 | 2.09 | 1.96 | 1.95 | 1.95 | 1.95 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.96 | 1.97 | 1.97 | 1.98 | 1.98 | 2.00 | 1.95 | 2.72 | 2.05 | 24 | |
| 16 | 2.01 | 2.03 | 2.05 | S | 2.03 | 2.07 | 2.05 | 2.19 | 3.88 | 3.42 | 2.99 | 2.32 | 2.09 | 2.03 | 2.03 | 2.01 | 2.03 | 2.02 | 2.01 | 2.03 | 2.03 | 2.01 | 2.03 | 2.05 | 2.01 | 3.88 | 2.23 | 24 | |
| 17 | 2.05 | 2.06 | S | 2.05 | 2.07 | 2.05 | 2.05 | 2.05 | 2.03 | 2.04 | 2.18 | 2.10 | 2.04 | 2.04 | 2.08 | 2.09 | 2.16 | 2.14 | 2.12 | 2.09 | 2.13 | 2.13 | 2.15 | 2.19 | 2.03 | 2.19 | 2.09 | 24 | |
| 18 | 2.30 | S | 3.26 | 2.88 | 2.63 | 2.68 | 2.72 | 2.62 | 2.66 | 2.72 | 2.86 | 2.75 | 2.68 | 2.53 | 2.52 | 2.57 | 2.62 | 2.59 | 2.57 | 2.63 | 2.72 | 2.52 | 2.58 | 2.53 | 2.30 | 3.26 | 2.66 | 24 | |
| 19 | S | 2.21 | 2.37 | 2.44 | 2.36 | 2.19 | 2.18 | 2.24 | 2.29 | 2.23 | 2.18 | 2.10 | 2.04 | 2.04 | 2.03 | 2.03 | 2.06 | 2.04 | 2.04 | 2.03 | 2.01 | 1.99 | 1.99 | S | 1.99 | 2.44 | 2.14 | 24 | |
| 20 | 2.03 | 2.07 | 2.06 | 2.06 | 2.04 | 2.05 | 2.04 | 2.15 | 2.15 | 2.36 | 2.46 | 2.88 | 2.75 | 2.51 | 2.22 | 2.16 | 2.20 | 2.13 | 2.18 | 2.17 | 2.16 | 2.11 | S | 2.04 | 2.03 | 2.88 | 2.22 | 24 | |
| 21 | 2.04 | 2.03 | 2.02 | 2.03 | 2.06 | 2.07 | 2.15 | 2.17 | 2.15 | 2.06 | 1.99 | 1.97 | 1.99 | 1.99 | 1.98 | 1.97 | 1.99 | 2.00 | 1.99 | 1.97 | 1.97 | S | 1.97 | 1.98 | 1.97 | 2.17 | 2.02 | 24 | |
| 22 | 1.97 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.98 | 1.97 | 1.96 | 1.96 | 1.98 | 1.97 | 1.97 | 2.01 | 2.00 | 2.02 | 2.04 | S | 2.09 | 2.09 | 2.07 | 1.96 | 2.09 | 2.00 | 24 | |
| 23 | 2.08 | 2.10 | 2.14 | 3.00 | 5.52 | 5.58 | 3.33 | 2.96 | 2.76 | 2.31 | 2.18 | 2.19 | 2.13 | 2.09 | 2.07 | 2.08 | 2.12 | 2.09 | 2.10 | S | 2.07 | 2.05 | 2.02 | 2.03 | 2.02 | 5.58 | 2.57 | 24 | |
| 24 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.06 | 2.09 | 2.16 | 2.06 | 2.06 | 2.05 | 2.03 | 2.01 | 2.00 | 2.01 | 2.03 | 2.07 | 2.11 | S | 2.19 | 2.15 | 2.13 | 2.14 | 2.10 | 2.00 | 2.19 | 2.07 | 24 | |
| 25 | 2.15 | 2.16 | 2.14 | 2.12 | 2.20 | 2.27 | 2.42 | 2.54 | 2.54 | 2.53 | 2.50 | 2.47 | 2.45 | 2.41 | 2.38 | 2.39 | 2.43 | S | 2.45 | 2.45 | 2.47 | 2.51 | 2.54 | 2.57 | 2.12 | 2.57 | 2.40 | 24 | |
| 26 | 2.50 | 2.30 | 2.11 | 2.09 | 2.06 | 2.06 | 2.06 | 2.08 | 2.12 | 2.07 | 2.07 | 2.10 | 2.10 | 2.11 | 2.09 | 2.09 | S | 2.12 | 2.17 | 2.40 | 2.27 | 2.28 | 3.49 | 2.67 | 2.06 | 3.49 | 2.24 | 24 | |
| 27 | 2.21 | 2.21 | 2.20 | 2.22 | 2.37 | 2.36 | 2.38 | 2.48 | 2.34 | 2.19 | 2.22 | 2.22 | 2.21 | 2.20 | 2.21 | S | 2.20 | 2.22 | 2.29 | 2.31 | 2.35 | 2.43 | 2.40 | 2.41 | 2.19 | 2.48 | 2.29 | 24 | |
| 28 | 2.43 | 2.47 | 2.45 | 2.52 | 2.49 | 2.47 | 2.45 | 2.46 | 2.52 | 2.74 | 2.92 | 2.74 | 2.64 | 2.57 | S | 2.39 | 2.42 | 2.37 | 2.38 | 2.40 | 2.43 | 2.40 | 2.25 | 2.25 | 2.25 | 2.92 | 2.49 | 24 | |
| 29 | 2.23 | 2.24 | 2.22 | 2.17 | 2.16 | 2.15 | 2.18 | 2.14 | 2.10 | 2.06 | 2.04 | 2.07 | 2.04 | S | 2.03 | 2.03 | 2.03 | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.24 | 2.08 | 24 | |
| 30 | 2.00 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 1.98 | 1.99 | 1.98 | 1.98 | 2.00 | 1.98 | S | 2.03 | 2.01 | 1.99 | 1.98 | 2.00 | 2.02 | 2.02 | 2.02 | 2.01 | 2.03 | 2.09 | 2.10 | 1.98 | 2.10 | 2.01 | 24 |
| 31 | 2.10 | 2.14 | 2.17 | 2.16 | 2.22 | 2.14 | 2.62 | 3.48 | 2.81 | 2.61 | 2.32 | S | 2.34 | 2.35 | 2.31 | 2.31 | 2.30 | 2.29 | 2.33 | 2.29 | 2.26 | 2.28 | 2.32 | 2.32 | 2.10 | 3.48 | 2.37 | 24 | |
| HOURLY MAX | 4.06 | 5.56 | 5.59 | 4.86 | 5.52 | 5.58 | 4.09 | 4.02 | 3.88 | 3.42 | 3.52 | 3.44 | 3.43 | 3.29 | 3.11 | 3.13 | 3.14 | 3.00 | 3.17 | 3.39 | 3.33 | 3.37 | 3.49 | 3.87 | | | | | |
| HOURLY AVG | 2.25 | 2.31 | 2.37 | 2.36 | 2.39 | 2.40 | 2.35 | 2.38 | 2.37 | 2.28 | 2.28 | 2.25 | 2.23 | 2.21 | 2.17 | 2.18 | 2.19 | 2.16 | 2.22 | 2.21 | 2.20 | 2.20 | 2.24 | 2.24 | | | | | |

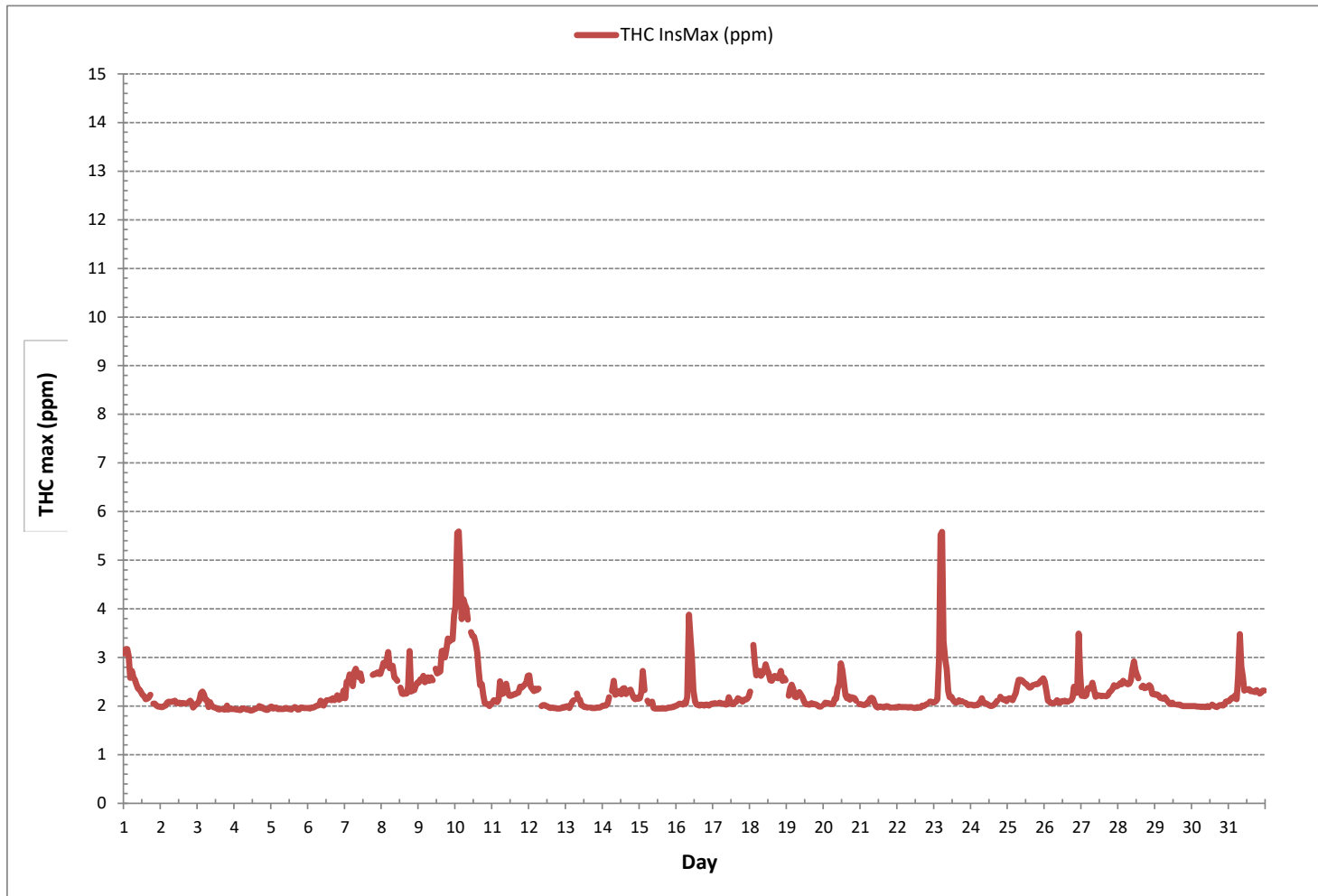
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 707 |
| MAXIMUM INSTANTANEOUS VALUE: | 5.59 ppm @ HOUR 2 ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.44 |

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

METHANE MAX Instantaneous Maximum (CH₄ ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 2.93 | 3.00 | 3.02 | 2.87 | 2.50 | 2.55 | 2.43 | 2.39 | 2.31 | 2.24 | 2.22 | 2.22 | 2.14 | 2.14 | 2.09 | 2.07 | 2.13 | 2.23 | S | 2.05 | 2.04 | 2.01 | 1.99 | 1.99 | 1.99 | 3.02 | 2.33 | 24 |
| 2 | 1.98 | 1.98 | 2.00 | 2.01 | 2.05 | 2.09 | 2.08 | 2.09 | 2.09 | 2.11 | 2.06 | 2.06 | 2.07 | 2.05 | 2.06 | 2.06 | 2.05 | S | 2.08 | 2.11 | 2.07 | 1.97 | 2.01 | 2.04 | 1.97 | 2.11 | 2.05 | 24 |
| 3 | 2.06 | 2.11 | 2.27 | 2.27 | 2.24 | 2.13 | 2.12 | 1.98 | 2.00 | 2.01 | 1.98 | 1.97 | 1.96 | 1.94 | 1.93 | 1.94 | S | 1.93 | 1.93 | 1.94 | 1.93 | 1.95 | 1.94 | 1.94 | 1.93 | 2.27 | 2.02 | 24 |
| 4 | 1.94 | 1.93 | 1.93 | 1.92 | 1.92 | 1.95 | 1.95 | 1.94 | 1.93 | 1.93 | 1.91 | 1.91 | 1.92 | 1.94 | 1.95 | S | 2.00 | 1.96 | 1.98 | 1.94 | 1.93 | 1.92 | 1.93 | 1.98 | 1.91 | 2.00 | 1.94 | 24 |
| 5 | 1.99 | 1.95 | 1.96 | 1.97 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.96 | 1.96 | 1.94 | 1.94 | 1.93 | S | 1.98 | 1.97 | 1.93 | 1.93 | 1.97 | 1.97 | 1.96 | 1.96 | 1.96 | 1.93 | 1.99 | 1.95 | 24 |
| 6 | 1.96 | 1.95 | 1.97 | 1.97 | 1.98 | 2.00 | 2.01 | 2.02 | 2.11 | 2.03 | 2.01 | 2.02 | 2.04 | S | 2.04 | 2.05 | 2.09 | 2.09 | 2.11 | 2.16 | 2.10 | 2.09 | 2.10 | 2.24 | 1.95 | 2.24 | 2.05 | 24 |
| 7 | 2.10 | 2.44 | 2.43 | 2.58 | 2.50 | 2.32 | 2.64 | 2.68 | 2.57 | 2.51 | 2.58 | 2.43 | S | 2.27 | C | C | C | C | 2.57 | 2.60 | 2.60 | 2.62 | 2.60 | 2.63 | 2.10 | 2.68 | 2.51 | 24 |
| 8 | 2.72 | 2.83 | 2.72 | 2.86 | 3.00 | 2.74 | 2.71 | 2.74 | 2.51 | 2.48 | 2.45 | S | 2.26 | 2.17 | 2.15 | 2.19 | 2.18 | 2.32 | 2.98 | 2.25 | 2.28 | 2.26 | 2.34 | 2.35 | 2.15 | 3.00 | 2.50 | 24 |
| 9 | 2.40 | 2.45 | 2.46 | 2.51 | 2.41 | 2.42 | 2.48 | 2.41 | 2.49 | 2.42 | S | 2.66 | 2.55 | 2.53 | 2.57 | 2.97 | 2.99 | 2.92 | 3.04 | 3.26 | 3.22 | 3.27 | 3.23 | 3.77 | 2.40 | 3.77 | 2.76 | 24 |
| 10 | 3.89 | 5.34 | 5.34 | 4.65 | 3.64 | 3.87 | 3.90 | 3.82 | 3.59 | S | 3.36 | 3.29 | 3.26 | 3.17 | 2.97 | 2.65 | 2.34 | 2.37 | 2.22 | 2.06 | 2.04 | 2.04 | 2.00 | 2.04 | 2.00 | 5.34 | 3.21 | 24 |
| 11 | 2.07 | 2.12 | 2.10 | 2.07 | 2.13 | 2.51 | 2.25 | 2.26 | S | 2.40 | 2.28 | 2.21 | 2.21 | 2.22 | 2.24 | 2.25 | 2.27 | 2.28 | 2.36 | 2.34 | 2.36 | 2.38 | 2.40 | 2.52 | 2.07 | 2.52 | 2.27 | 24 |
| 12 | 2.53 | 2.34 | 2.35 | 2.31 | 2.36 | 2.32 | 2.36 | S | 2.00 | 1.99 | 2.02 | 2.00 | 1.99 | 1.97 | 1.96 | 1.97 | 1.96 | 1.96 | 1.95 | 1.95 | 1.95 | 1.96 | 1.98 | 1.97 | 1.95 | 2.53 | 2.09 | 24 |
| 13 | 1.99 | 2.00 | 1.96 | 2.02 | 2.09 | 2.12 | S | 2.26 | 2.14 | 2.13 | 2.02 | 2.00 | 1.98 | 1.98 | 1.97 | X | 1.97 | 1.96 | 1.96 | 1.96 | 1.97 | 1.97 | 1.97 | 1.99 | 1.96 | 2.26 | 2.02 | 23 |
| 14 | 2.01 | 2.01 | 2.01 | 2.05 | 2.18 | S | 2.31 | 2.52 | 2.23 | 2.25 | 2.31 | 2.31 | 2.24 | 2.36 | 2.36 | 2.25 | 2.31 | 2.31 | 2.34 | 2.24 | 2.17 | 2.14 | 2.17 | 2.15 | 2.01 | 2.52 | 2.23 | 24 |
| 15 | 2.16 | 2.28 | 2.72 | 2.33 | S | 2.11 | 2.06 | 2.06 | 2.09 | 1.96 | 1.95 | 1.95 | 1.95 | 1.95 | 1.96 | 1.95 | 1.95 | 1.96 | 1.96 | 1.97 | 1.97 | 1.98 | 1.98 | 2.00 | 1.95 | 2.72 | 2.05 | 24 |
| 16 | 2.01 | 2.03 | 2.05 | S | 2.02 | 2.07 | 2.05 | 2.19 | 3.83 | 3.40 | 2.99 | 2.32 | 2.09 | 2.03 | 2.03 | 2.01 | 2.03 | 2.02 | 2.01 | 2.03 | 2.03 | 2.01 | 2.03 | 2.05 | 2.01 | 3.83 | 2.23 | 24 |
| 17 | 2.05 | 2.06 | S | 2.05 | 2.07 | 2.05 | 2.05 | 2.05 | 2.03 | 2.04 | 2.18 | 2.10 | 2.04 | 2.04 | 2.08 | 2.09 | 2.16 | 2.14 | 2.12 | 2.09 | 2.12 | 2.12 | 2.14 | 2.18 | 2.03 | 2.18 | 2.09 | 24 |
| 18 | 2.30 | S | 3.20 | 2.84 | 2.61 | 2.65 | 2.68 | 2.59 | 2.63 | 2.66 | 2.77 | 2.67 | 2.62 | 2.52 | 2.50 | 2.53 | 2.57 | 2.55 | 2.53 | 2.61 | 2.69 | 2.52 | 2.57 | 2.53 | 2.30 | 3.20 | 2.62 | 24 |
| 19 | S | 2.21 | 2.36 | 2.43 | 2.35 | 2.19 | 2.17 | 2.23 | 2.24 | 2.20 | 2.17 | 2.09 | 2.04 | 2.03 | 2.03 | 2.05 | 2.04 | 2.04 | 2.03 | 2.01 | 1.99 | 1.99 | S | 1.99 | 2.43 | 2.13 | 24 | |
| 20 | 2.03 | 2.06 | 2.06 | 2.06 | 2.04 | 2.05 | 2.04 | 2.15 | 2.15 | 2.36 | 2.44 | 2.84 | 2.73 | 2.50 | 2.22 | 2.16 | 2.19 | 2.13 | 2.18 | 2.16 | 2.15 | 2.10 | S | 2.04 | 2.03 | 2.84 | 2.21 | 24 |
| 21 | 2.04 | 2.03 | 2.02 | 2.03 | 2.06 | 2.07 | 2.15 | 2.17 | 2.15 | 2.06 | 1.99 | 1.97 | 1.99 | 1.99 | 1.98 | 1.97 | 1.99 | 2.00 | 1.99 | 1.97 | 1.97 | S | 1.97 | 1.98 | 1.97 | 2.17 | 2.02 | 24 |
| 22 | 1.97 | 1.99 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.98 | 1.98 | 1.97 | 1.96 | 1.96 | 1.97 | 1.97 | 1.97 | 2.01 | 2.00 | 2.02 | 2.04 | S | 2.09 | 2.09 | 2.07 | 1.96 | 2.09 | 2.00 | 24 |
| 23 | 2.08 | 2.10 | 2.14 | 3.00 | 5.42 | 5.46 | 3.28 | 2.95 | 2.76 | 2.31 | 2.18 | 2.19 | 2.13 | 2.09 | 2.07 | 2.08 | 2.12 | 2.09 | 2.10 | S | 2.07 | 2.05 | 2.02 | 2.03 | 2.02 | 5.46 | 2.55 | 24 |
| 24 | 2.03 | 2.02 | 2.01 | 2.02 | 2.02 | 2.06 | 2.09 | 2.16 | 2.06 | 2.06 | 2.05 | 2.03 | 2.01 | 2.00 | 2.01 | 2.03 | 2.07 | 2.11 | S | 2.19 | 2.15 | 2.13 | 2.14 | 2.10 | 2.00 | 2.19 | 2.07 | 24 |
| 25 | 2.15 | 2.15 | 2.14 | 2.12 | 2.20 | 2.27 | 2.42 | 2.54 | 2.52 | 2.49 | 2.47 | 2.45 | 2.44 | 2.39 | 2.37 | 2.38 | 2.39 | S | 2.41 | 2.41 | 2.43 | 2.46 | 2.48 | 2.50 | 2.12 | 2.54 | 2.37 | 24 |
| 26 | 2.48 | 2.30 | 2.11 | 2.09 | 2.06 | 2.06 | 2.06 | 2.08 | 2.12 | 2.07 | 2.07 | 2.10 | 2.10 | 2.11 | 2.09 | 2.09 | S | 2.12 | 2.17 | 2.40 | 2.27 | 2.27 | 3.44 | 2.66 | 2.06 | 3.44 | 2.23 | 24 |
| 27 | 2.21 | 2.21 | 2.20 | 2.22 | 2.37 | 2.36 | 2.38 | 2.48 | 2.34 | 2.19 | 2.22 | 2.22 | 2.21 | 2.20 | 2.21 | S | 2.20 | 2.22 | 2.29 | 2.31 | 2.35 | 2.43 | 2.40 | 2.41 | 2.19 | 2.48 | 2.29 | 24 |
| 28 | 2.43 | 2.47 | 2.45 | 2.52 | 2.49 | 2.47 | 2.45 | 2.46 | 2.51 | 2.74 | 2.91 | 2.73 | 2.64 | 2.57 | S | 2.39 | 2.42 | 2.37 | 2.38 | 2.40 | 2.43 | 2.40 | 2.26 | 2.25 | 2.25 | 2.91 | 2.48 | 24 |
| 29 | 2.23 | 2.24 | 2.22 | 2.17 | 2.16 | 2.15 | 2.18 | 2.14 | 2.10 | 2.06 | 2.04 | 2.07 | 2.04 | S | 2.03 | 2.03 | 2.03 | 2.01 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.24 | 2.08 | 24 |
| 30 | 2.00 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 1.98 | 1.99 | 1.98 | 1.98 | 2.00 | 1.98 | S | 2.03 | 2.01 | 1.99 | 1.98 | 2.00 | 2.02 | 2.02 | 2.01 | 2.03 | 2.09 | 2.10 | 1.98 | 2.10 | 2.01 | 24 |
| 31 | 2.10 | 2.14 | 2.17 | 2.16 | 2.22 | 2.14 | 2.62 | 3.46 | 2.80 | 2.61 | 2.32 | S | 2.34 | 2.35 | 2.31 | 2.31 | 2.30 | 2.29 | 2.33 | 2.29 | 2.26 | 2.28 | 2.31 | 2.32 | 2.10 | 3.46 | 2.37 | 24 |
| HOURLY MAX | 3.89 | 5.34 | 5.34 | 4.65 | 5.42 | 5.46 | 3.90 | 3.82 | 3.83 | 3.40 | 3.36 | 3.29 | 3.26 | 3.17 | 2.97 | 2.99 | 2.92 | 3.04 | 3.26 | 3.22 | 3.27 | 3.44 | 3.77 | | | | | |
| HOURLY AVG | 2.23 | 2.29 | 2.35 | 2.34 | 2.37 | 2.37 | 2.33 | 2.36 | 2.34 | 2.25 | 2.26 | 2.23 | 2.20 | 2.19 | 2.15 | 2.16 | 2.17 | 2.15 | 2.21 | 2.19 | 2.18 | 2.18 | 2.22 | 2.23 | | | | |

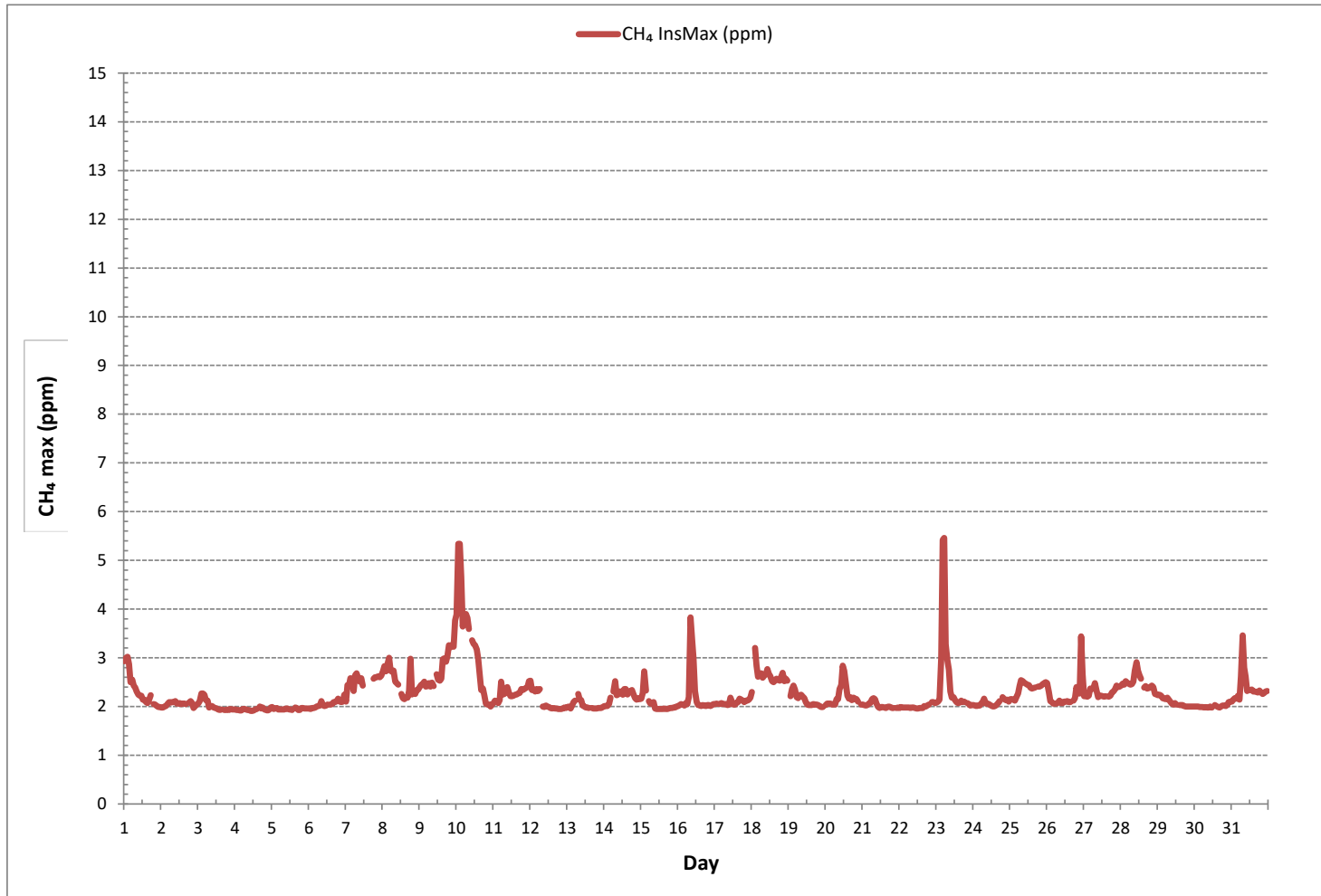
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|-----------------------------|
| NUMBER OF NON-ZERO READINGS: | 707 |
| MAXIMUM INSTANTANEOUS VALUE: | 5.46 ppm @ HOUR 5 ON DAY 23 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.41 |

METHANE MAX Instantaneous Maximum (CH₄ ppm)





NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 0.17 | 0.20 | 0.19 | 0.19 | 0.10 | 0.19 | 0.19 | 0.17 | 0.16 | 0.12 | 0.12 | 0.10 | 0.10 | 0.09 | 0.07 | 0.08 | 0.07 | 0.07 | S | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.11 | 24 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 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 | 0.03 | 0.00 | 24 |
| 3 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.01 | 24 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 |
| 5 | 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 | 0.00 | 24 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.09 | S | 0.11 | 0.07 | 0.09 | 0.07 | 0.08 | 0.08 | 0.07 | 0.08 | 0.07 | 0.09 | 0.00 | 0.11 | 0.04 | 0.04 | 24 |
| 7 | 0.09 | 0.09 | 0.10 | 0.08 | 0.15 | 0.11 | 0.09 | 0.09 | 0.09 | 0.10 | 0.12 | 0.10 | S | 0.06 | C | C | C | C | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.09 | 0.06 | 0.15 | 0.10 | 0.10 | 24 |
| 8 | 0.10 | 0.08 | 0.12 | 0.10 | 0.11 | 0.10 | 0.11 | 0.11 | 0.14 | 0.16 | 0.12 | S | 0.12 | 0.11 | 0.10 | 0.08 | 0.11 | 0.09 | 0.15 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.08 | 0.16 | 0.11 | 0.11 | 24 |
| 9 | 0.11 | 0.12 | 0.11 | 0.13 | 0.11 | 0.11 | 0.12 | 0.14 | 0.12 | 0.13 | S | 0.16 | 0.15 | 0.19 | 0.15 | 0.16 | 0.15 | 0.11 | 0.15 | 0.16 | 0.14 | 0.15 | 0.15 | 0.14 | 0.11 | 0.19 | 0.14 | 0.14 | 24 |
| 10 | 0.18 | 0.24 | 0.27 | 0.23 | 0.19 | 0.60 | 0.22 | 0.22 | 0.19 | S | 0.18 | 0.18 | 0.18 | 0.18 | 0.14 | 0.12 | 0.09 | 0.15 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.60 | 0.16 | 0.16 | 24 |
| 11 | 0.00 | 0.00 | 0.04 | 0.05 | 0.02 | 0.00 | 0.00 | 0.04 | S | 0.09 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.06 | 0.08 | 0.08 | 0.07 | 0.09 | 0.11 | 0.00 | 0.11 | 0.04 | 0.04 | 24 |
| 12 | 0.11 | 0.07 | 0.05 | 0.01 | 0.00 | 0.05 | 0.07 | S | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.02 | 0.02 | 24 |
| 13 | 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 | X | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 23 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 16 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 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 | 0.00 | 0.06 | 0.00 | 0.00 | 24 |
| 17 | 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 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 18 | 0.01 | S | 0.07 | 0.05 | 0.02 | 0.03 | 0.05 | 0.03 | 0.04 | 0.06 | 0.09 | 0.08 | 0.06 | 0.01 | 0.02 | 0.04 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | 0.00 | 0.09 | 0.04 | 0.04 | 24 |
| 19 | S | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.02 | 0.05 | 0.03 | 0.02 | 0.01 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.05 | 0.01 | 0.01 | 24 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | S | 0.00 | 0.00 | 0.04 | 0.01 | 0.01 | 24 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 24 |
| 23 | 0.00 | 0.00 | 0.00 | 0.01 | 0.11 | 0.14 | 0.06 | 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 | 0.14 | 0.01 | 0.01 | 24 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.03 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.04 | S | 0.04 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.00 | 0.07 | 0.02 | 0.02 | 24 |
| 26 | 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 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.06 | 0.01 | 0.00 | 0.06 | 0.00 | 0.00 | 24 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | S | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 24 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 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 | 0.02 | 0.00 | 0.00 | 24 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 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 | 24 |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 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 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 24 |
| HOURLY MAX | 0.18 | 0.24 | 0.27 | 0.23 | 0.19 | 0.60 | 0.22 | 0.22 | 0.19 | 0.16 | 0.18 | 0.18 | 0.18 | 0.19 | 0.15 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 | 0.16 | 0.14 | 0.15 | 0.15 | 0.14 | | | | |
| HOURLY AVG | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | | | | |

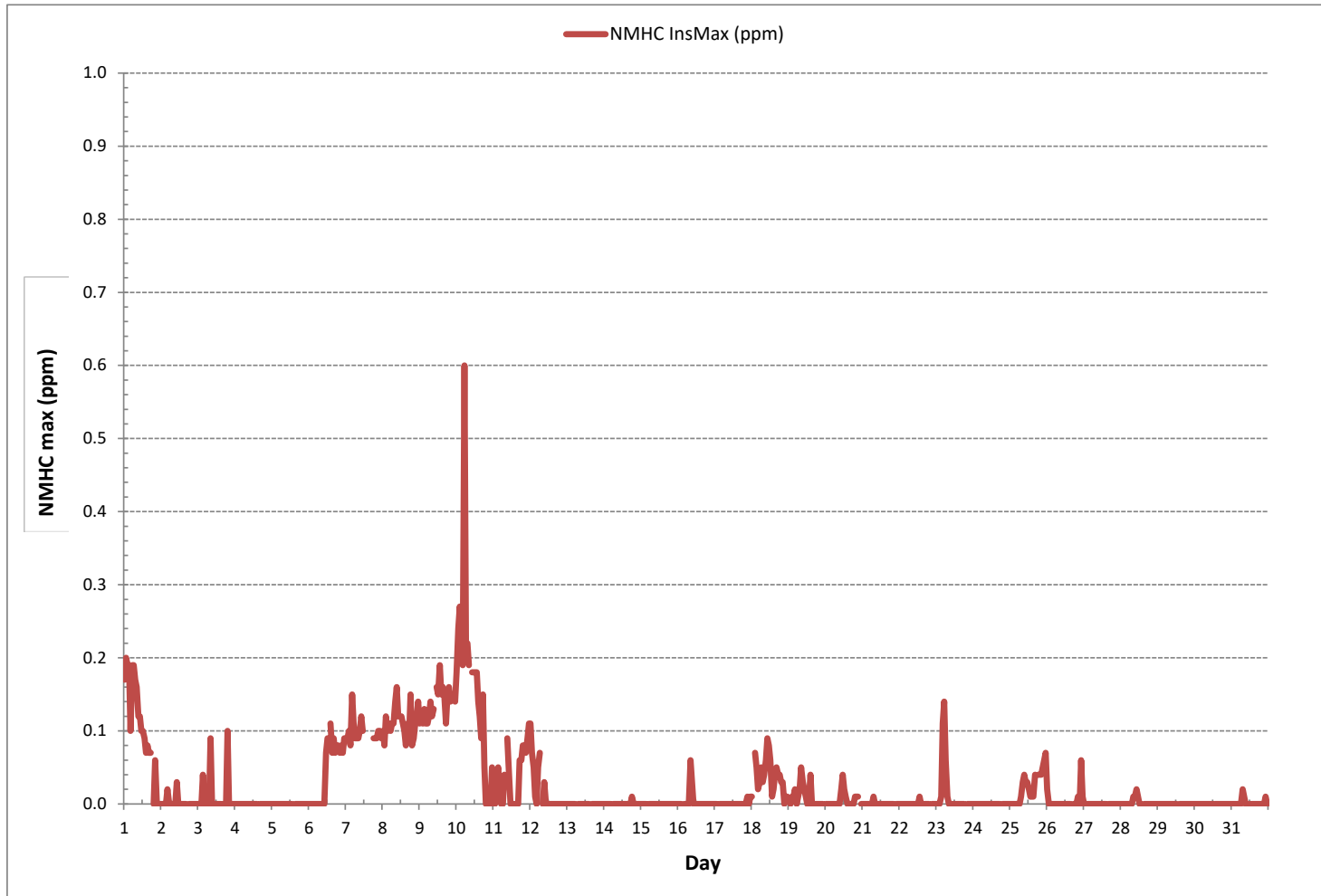
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| C | - MONTHLY CALIBRATION | Q | - QUALITY ASSURANCE |
| C1 | - REPEAT CALIBRATION | 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: | 218 |
| MAXIMUM INSTANTANEOUS VALUE: | 0.60 ppm @ HOUR 5 ON DAY 10 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 4 hrs |
| OPERATIONAL TIME: | 743 hrs |
| STANDARD DEVIATION: | 0.05 |

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | 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 | 17 | 16 | 12 | 9 | 10 | 8 | 8 | 7 | 7 | 7 | 6 | 5 | 5 | 4 | 5 | 9 | 9 | S | 7 | 4 | 3 | 3 | 3 | 3 | 3 | 17 | 8 | 24 |
| 2 | 2 | 3 | 2 | 2 | 10 | 6 | 3 | 4 | 3 | 10 | 3 | 3 | 12 | 3 | 5 | 7 | 8 | S | 8 | 7 | 3 | 2 | 3 | 4 | 2 | 2 | 12 | 5 | 24 |
| 3 | 6 | 5 | 16 | 16 | 11 | 5 | 3 | 3 | 9 | 9 | 6 | 5 | 5 | 5 | 5 | 7 | S | 8 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 16 | 6 | 24 |
| 4 | 4 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 3 | 5 | 6 | S | 11 | 9 | 7 | 8 | 8 | 3 | 3 | 8 | 1 | 11 | 4 | 24 | |
| 5 | 7 | 4 | 4 | 4 | 2 | 2 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 3 | S | 6 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 7 | 4 | 24 | |
| 6 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 5 | 4 | 10 | 14 | 14 | S | 17 | 15 | 14 | 14 | 14 | 13 | 13 | 13 | 12 | 13 | 3 | 17 | 9 | 24 | |
| 7 | 17 | 18 | 18 | 17 | 40 | 49 | 31 | 19 | 16 | 23 | 36 | 32 | S | 19 | 13 | 14 | 14 | 14 | 17 | 19 | 17 | 17 | 18 | 17 | 13 | 49 | 22 | 24 | |
| 8 | 19 | 20 | 20 | 21 | 21 | 20 | 22 | 31 | 31 | 73 | 33 | S | 30 | 20 | 14 | 14 | 14 | 14 | 16 | 14 | 14 | 15 | 16 | 19 | 14 | 73 | 22 | 24 | |
| 9 | 16 | 15 | 15 | 15 | 14 | 15 | 18 | 21 | 18 | 22 | S | 29 | 25 | 39 | 32 | 25 | 25 | 21 | 23 | 23 | 28 | 38 | 32 | 36 | 14 | 39 | 24 | 24 | |
| 10 | 30 | 34 | 35 | 37 | 35 | 43 | 34 | 61 | 44 | S | C | C | C | C | C | C | C | C | 10 | 6 | 4 | 4 | 4 | 3 | 3 | 61 | 26 | 24 | |
| 11 | 3 | 9 | 10 | 9 | 6 | 6 | 24 | 10 | S | 16 | 16 | 11 | 10 | 8 | 9 | 7 | 6 | 7 | 7 | 6 | 6 | 6 | 6 | 9 | 3 | 24 | 9 | 24 | |
| 12 | 9 | 6 | 6 | 7 | 38 | 15 | 5 | S | 11 | 4 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 38 | 5 | 24 | |
| 13 | 2 | 2 | 1 | 3 | 5 | 3 | S | 10 | 5 | 4 | 4 | 4 | 4 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 10 | 2 | 24 | |
| 14 | 3 | 3 | 2 | 2 | 5 | S | 7 | 10 | 3 | 3 | 4 | 5 | 5 | 10 | 8 | 6 | 6 | 6 | 7 | 5 | 4 | 3 | 3 | 4 | 2 | 10 | 5 | 24 | |
| 15 | 3 | 4 | 7 | 4 | S | 5 | 3 | 2 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 1 | 24 | |
| 16 | 1 | 1 | 0 | S | 2 | 1 | 0 | 0 | 11 | 15 | 13 | 5 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 2 | 24 | |
| 17 | 0 | 0 | S | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 4 | 4 | 13 | 7 | 3 | 4 | 7 | 4 | 4 | 4 | 4 | 5 | 4 | 6 | 0 | 13 | 3 | 24 | |
| 18 | 7 | S | 19 | 18 | 15 | 17 | 19 | 23 | 26 | 34 | 43 | 46 | 45 | 29 | 28 | 29 | 33 | 31 | 29 | 20 | 17 | 16 | 13 | 11 | 7 | 46 | 25 | 24 | |
| 19 | S | 10 | 9 | 8 | 9 | 9 | 10 | 12 | 15 | 17 | 15 | 11 | 6 | 5 | 5 | 6 | 10 | 10 | 8 | 6 | 4 | 3 | 2 | S | 2 | 17 | 9 | 24 | |
| 20 | 6 | 9 | 8 | 6 | 4 | 5 | 5 | S1 | S1 | 14 | 15 | 18 | 16 | 12 | 6 | 4 | 6 | 3 | 3 | 3 | 2 | S | 5 | 2 | 18 | 7 | 22 | | |
| 21 | 3 | 2 | 1 | 1 | 5 | 5 | 4 | 2 | 3 | 2 | 1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | S | 3 | 2 | 1 | 5 | 3 | 14 | |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | S | 4 | 3 | 3 | 1 | 4 | 2 | 24 | |
| 23 | 3 | 3 | 3 | 8 | 13 | 16 | 20 | 18 | 12 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | S | 3 | 2 | 2 | 2 | 2 | 2 | 20 | 6 | 24 | |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 4 | 4 | 2 | 1 | 1 | 2 | 4 | 5 | S | 5 | 3 | 3 | 3 | 2 | 1 | 5 | 2 | 24 | |
| 25 | 3 | 3 | 2 | 2 | 3 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 5 | 4 | 6 | S | 7 | 6 | 6 | 6 | 6 | 6 | 2 | 7 | 5 | 24 | |
| 26 | 6 | 7 | 5 | 4 | 3 | 4 | 4 | 4 | 6 | 5 | 6 | 8 | 9 | 9 | 9 | 9 | S | 11 | 10 | 14 | 10 | 9 | 19 | 21 | 3 | 21 | 8 | 24 | |
| 27 | 14 | 9 | 10 | 11 | 16 | 14 | 14 | 13 | 8 | 5 | 4 | 3 | 4 | 4 | 5 | S | 7 | 7 | 7 | 5 | 6 | 6 | 5 | 5 | 3 | 16 | 8 | 24 | |
| 28 | 5 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 9 | 12 | 12 | 10 | 10 | 9 | S | 7 | 7 | 6 | 6 | 6 | 7 | 6 | 4 | 3 | 3 | 12 | 7 | 24 | |
| 29 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | S | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 4 | 2 | 24 | |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | S1 | S1 | 4 | 3 | 4 | S | C1 | C1 | C1 | C1 | C1 | C1 | 6 | 3 | 4 | 7 | 4 | 0 | 7 | 2 | 16 | |
| 31 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 10 | 9 | 9 | 8 | S | 10 | 9 | 8 | 13 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 3 | 13 | 7 | 24 | |
| HOURLY MAX | 30 | 34 | 35 | 37 | 40 | 49 | 34 | 61 | 44 | 73 | 43 | 46 | 45 | 39 | 32 | 29 | 33 | 31 | 29 | 23 | 28 | 38 | 32 | 36 | | | | | |
| HOURLY AVG | 7 | 7 | 8 | 8 | 10 | 9 | 9 | 10 | 10 | 11 | 9 | 9 | 9 | 8 | 7 | 7 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 7 | | | | | |

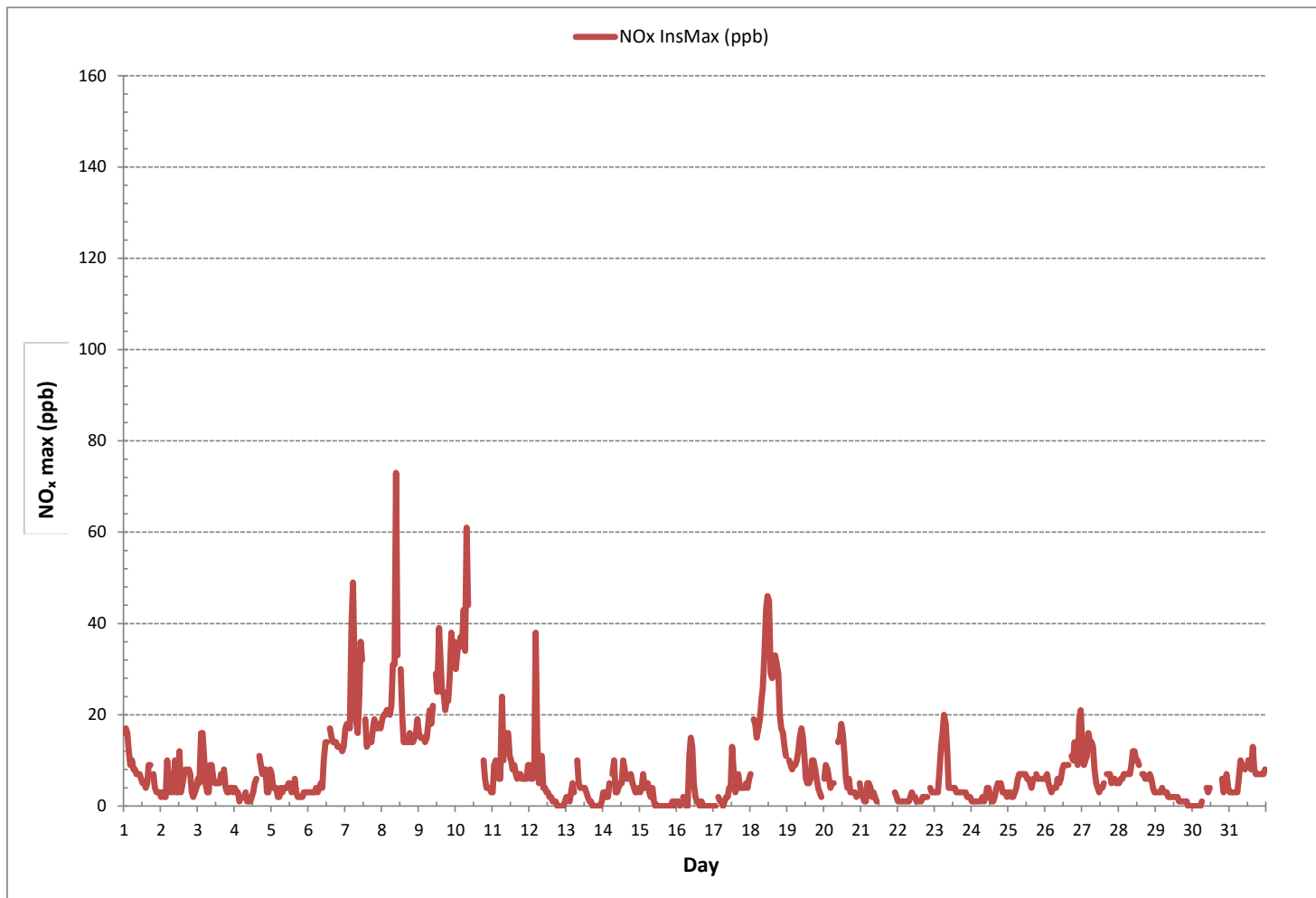
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|--------------------------|
| NUMBER OF NON-ZERO READINGS: | 638 |
| MAXIMUM INSTANTANEOUS VALUE: | 73 ppb @ HOUR 9 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| OPERATIONAL TIME: | 724 hrs |
| STANDARD DEVIATION: | 9 |

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)

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

STATUS FLAG CODES

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

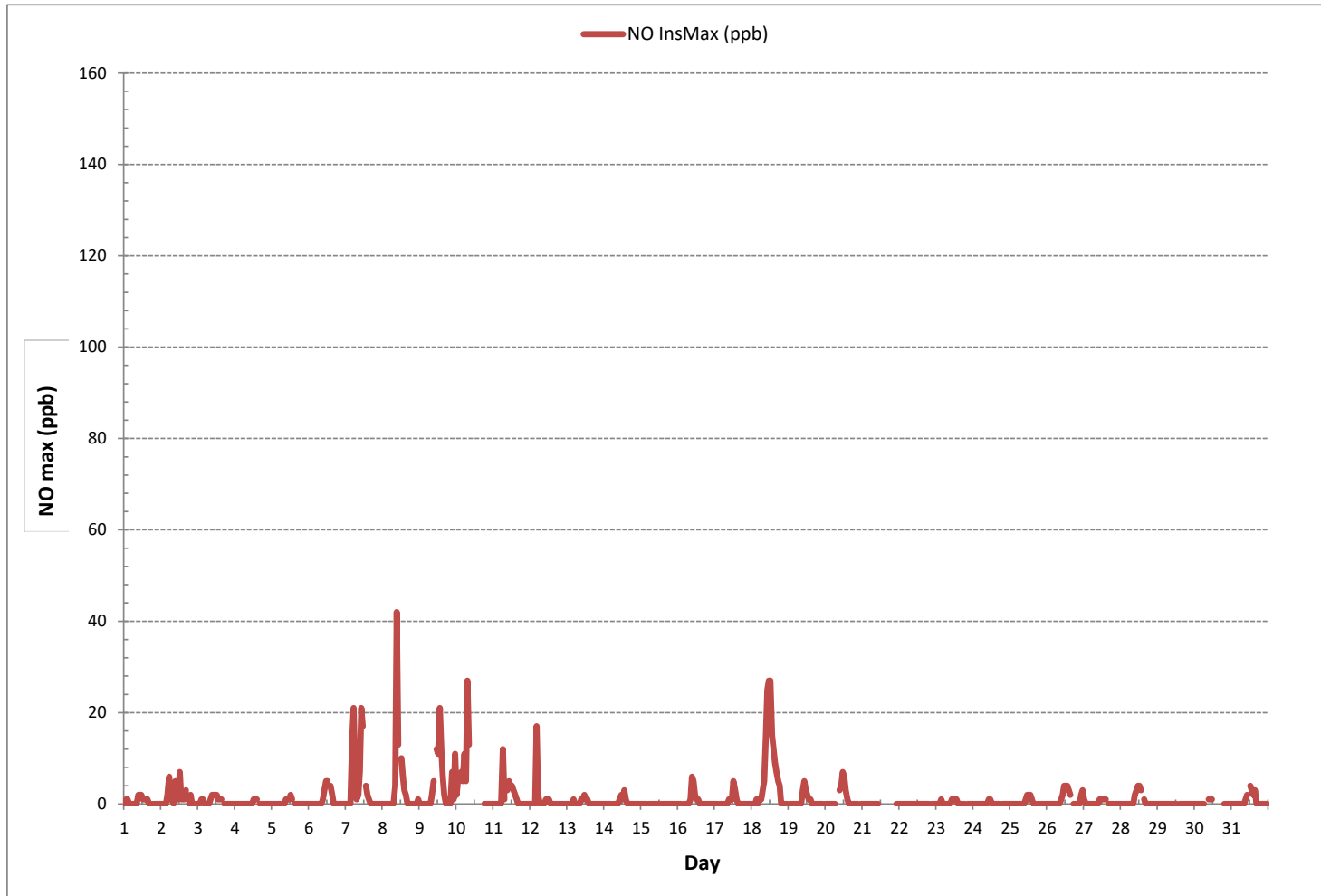
MONTHLY SUMMARY

| | |
|------------------------------|--------------------------|
| NUMBER OF NON-ZERO READINGS: | 191 |
| MAXIMUM INSTANTANEOUS VALUE: | 42 ppb @ HOUR 9 ON DAY 8 |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| STANDARD DEVIATION: | 4 |
| OPERATIONAL TIME: | 724 hrs |



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville East Continuous Monitoring Station - December 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 15 | 16 | 15 | 12 | 9 | 10 | 8 | 8 | 7 | 6 | 5 | 5 | 4 | 4 | 4 | 5 | 9 | 8 | S | 7 | 4 | 3 | 3 | 3 | 3 | 3 | 16 | 7 | 24 |
| 2 | 2 | 3 | 2 | 2 | 8 | 3 | 3 | 4 | 3 | 5 | 3 | 2 | 5 | 2 | 4 | 6 | 5 | S | 8 | 6 | 3 | 2 | 3 | 4 | 2 | 8 | 4 | 24 | |
| 3 | 6 | 5 | 15 | 16 | 11 | 5 | 4 | 3 | 8 | 8 | 4 | 3 | 4 | 4 | 5 | 6 | S | 8 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 16 | 6 | 24 | |
| 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | S | 11 | 9 | 7 | 8 | 8 | 3 | 3 | 8 | 1 | 11 | 4 | 24 | |
| 5 | 8 | 4 | 5 | 4 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 2 | S | 6 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 8 | 4 | 24 | |
| 6 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 5 | 4 | 7 | 9 | 9 | S | 14 | 14 | 14 | 14 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 3 | 14 | 8 | 24 |
| 7 | 17 | 18 | 18 | 17 | 27 | 28 | 23 | 19 | 16 | 16 | 17 | 15 | S | 15 | 11 | 14 | 14 | 14 | 15 | 17 | 19 | 18 | 17 | 18 | 18 | 11 | 28 | 18 | 24 |
| 8 | 19 | 20 | 20 | 21 | 21 | 20 | 22 | 31 | 31 | 32 | 19 | S | 22 | 14 | 12 | 14 | 14 | 14 | 16 | 14 | 14 | 15 | 16 | 18 | 12 | 32 | 19 | 24 | |
| 9 | 16 | 15 | 15 | 15 | 14 | 15 | 18 | 21 | 18 | 18 | S | 21 | 15 | 19 | 20 | 20 | 23 | 21 | 23 | 23 | 28 | 31 | 31 | 28 | 14 | 31 | 20 | 24 | |
| 10 | 29 | 29 | 29 | 30 | 29 | 32 | 29 | 34 | 31 | S | C | C | C | C | C | C | C | C | 10 | 6 | 4 | 4 | 4 | 3 | 3 | 34 | 20 | 24 | |
| 11 | 4 | 10 | 10 | 9 | 6 | 6 | 12 | 10 | S | 15 | 11 | 7 | 6 | 6 | 8 | 6 | 6 | 7 | 7 | 7 | 6 | 7 | 6 | 9 | 4 | 15 | 8 | 24 | |
| 12 | 9 | 6 | 6 | 7 | 22 | 12 | 5 | S | 11 | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 22 | 4 | 24 | |
| 13 | 2 | 2 | 1 | 3 | 4 | 3 | S | 10 | 5 | 4 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 10 | 2 | 24 | |
| 14 | 3 | 3 | 2 | 2 | 5 | S | 7 | 10 | 3 | 3 | 3 | 4 | 4 | 8 | 7 | 5 | 6 | 6 | 7 | 5 | 4 | 3 | 3 | 4 | 2 | 10 | 5 | 24 | |
| 15 | 3 | 4 | 7 | 4 | S | 5 | 3 | 2 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 2 | 24 | |
| 16 | 1 | 0 | 0 | S | 2 | 0 | 0 | 0 | 10 | 10 | 8 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 2 | 24 | |
| 17 | 0 | 0 | S | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 2 | 8 | 5 | 2 | 3 | 7 | 4 | 4 | 4 | 5 | 5 | 6 | 0 | 8 | 3 | 24 | | |
| 18 | 7 | S | 19 | 17 | 15 | 16 | 18 | 20 | 20 | 18 | 18 | 18 | 18 | 14 | 16 | 20 | 26 | 26 | 25 | 20 | 17 | 16 | 13 | 11 | 7 | 26 | 18 | 24 | |
| 19 | S | 10 | 9 | 9 | 9 | 9 | 11 | 12 | 15 | 14 | 11 | 7 | 5 | 4 | 4 | 6 | 10 | 11 | 9 | 6 | 4 | 3 | 2 | S | 2 | 15 | 8 | 24 | |
| 20 | 6 | 9 | 8 | 6 | 5 | 5 | 5 | S1 | S1 | 12 | 11 | 11 | 10 | 8 | 5 | 4 | 6 | 4 | 3 | 3 | 2 | S | 5 | 2 | 12 | 6 | 22 | | |
| 21 | 3 | 2 | 1 | 1 | 5 | 5 | 5 | 2 | 3 | 2 | 1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | C1 | S | 4 | 2 | 1 | 5 | 3 | 14 | | |
| 22 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | S | 4 | 3 | 3 | 1 | 4 | 2 | 24 | |
| 23 | 3 | 3 | 3 | 7 | 13 | 15 | 20 | 18 | 12 | 4 | 3 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | S | 4 | 2 | 2 | 2 | 2 | 20 | 6 | 24 | |
| 24 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 2 | 4 | 6 | S | 5 | 3 | 3 | 4 | 2 | 1 | 6 | 2 | 24 | |
| 25 | 3 | 3 | 2 | 2 | 3 | 4 | 6 | 7 | 7 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 7 | S | 7 | 6 | 6 | 6 | 6 | 6 | 2 | 7 | 5 | 24 | |
| 26 | 7 | 7 | 5 | 4 | 4 | 4 | 4 | 5 | 6 | 5 | 4 | 4 | 5 | 5 | 6 | 7 | S | 11 | 10 | 14 | 10 | 10 | 17 | 19 | 4 | 19 | 7 | 24 | |
| 27 | 13 | 9 | 11 | 11 | 16 | 14 | 15 | 14 | 9 | 4 | 3 | 3 | 3 | 3 | 4 | S | 7 | 7 | 8 | 6 | 6 | 7 | 5 | 5 | 3 | 16 | 8 | 24 | |
| 28 | 5 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 9 | 10 | 9 | 7 | 6 | 6 | S | 6 | 7 | 6 | 6 | 6 | 7 | 6 | 4 | 3 | 3 | 10 | 7 | 24 | |
| 29 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | S | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 24 | |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | S1 | S1 | 3 | 3 | 3 | S | C1 | C1 | C1 | C1 | C1 | C1 | 6 | 4 | 5 | 7 | 5 | 1 | 7 | 3 | 16 | |
| 31 | 4 | 3 | 4 | 3 | 4 | 3 | 7 | 10 | 9 | 8 | 6 | S | 6 | 6 | 6 | 9 | 8 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 3 | 10 | 6 | 24 | |
| HOURLY MAX | 29 | 29 | 29 | 30 | 29 | 32 | 29 | 34 | 31 | 32 | 19 | 21 | 22 | 19 | 20 | 20 | 26 | 26 | 25 | 23 | 28 | 31 | 31 | 28 | | | | | |
| HOURLY AVG | 7 | 7 | 8 | 7 | 9 | 8 | 8 | 10 | 9 | 8 | 6 | 6 | 6 | 5 | 6 | 6 | 8 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | | | | | |

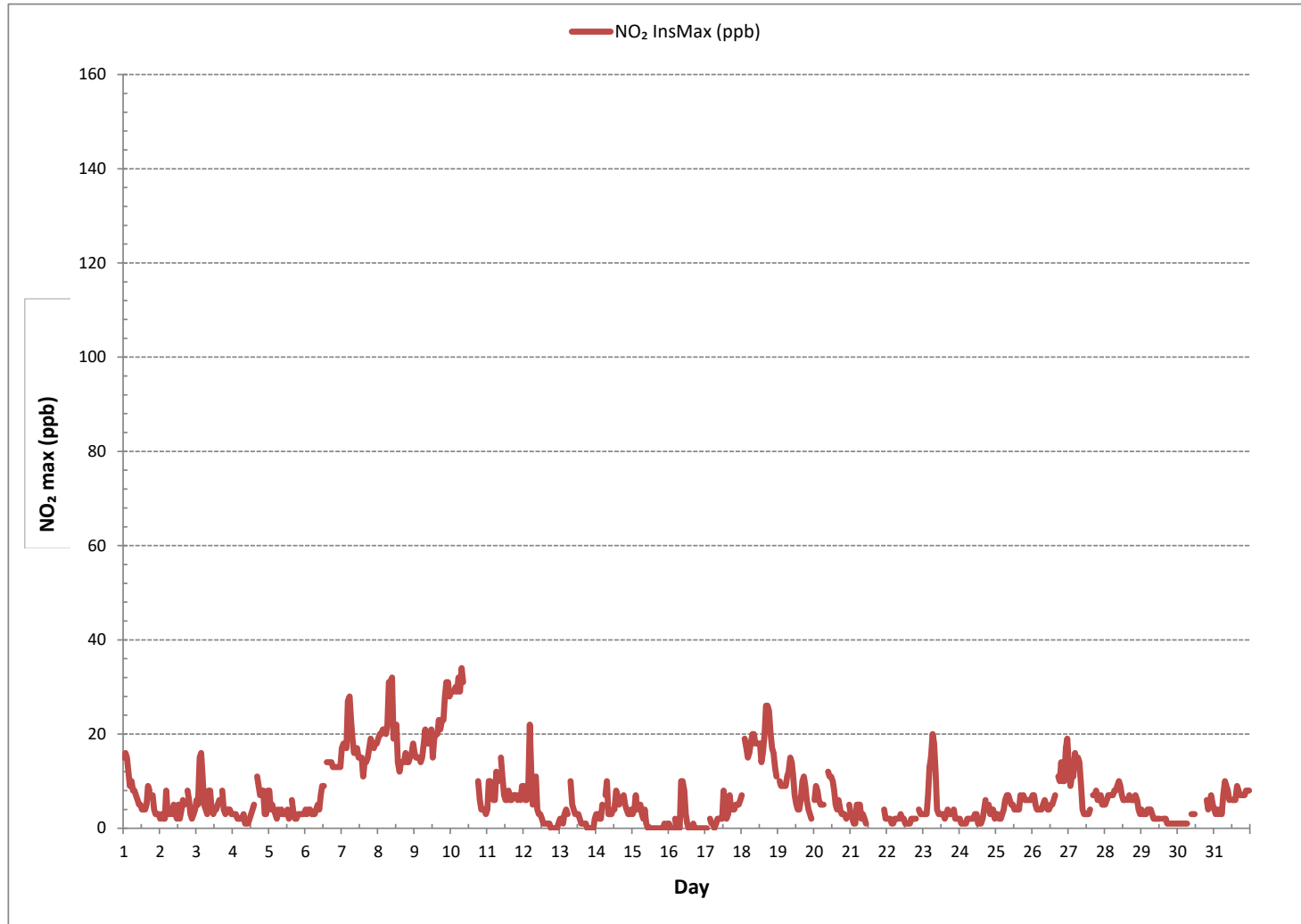
STATUS FLAG CODES

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

MONTHLY SUMMARY

| | |
|------------------------------|---------------------------|
| NUMBER OF NON-ZERO READINGS: | 644 |
| MAXIMUM INSTANTANEOUS VALUE: | 34 ppb @ HOUR 7 ON DAY 10 |
| | VAR-VARIOUS |
| IZS CALIBRATION TIME: | 32 hrs |
| MONTHLY CALIBRATION TIME: | 8 hrs |
| STANDARD DEVIATION: | 7 |
| OPERATIONAL TIME: | 724 hrs |

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

OZONE Instantaneous Maximum (O₃ ppb)

| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. | |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | | |
| DAY 1 | 4.3 | 3.8 | 4.7 | 29.6 | 29.4 | 18.6 | 10.1 | 15.5 | 18.1 | 16.2 | 13.7 | 15.0 | 15.8 | 17.7 | 18.0 | 17.7 | 15.7 | 14.1 | S | 15.8 | 18.1 | 19.0 | 19.5 | 19.2 | 3.8 | 29.6 | 16.1 | 24 | |
| 2 | 18.9 | 18.7 | 18.2 | 16.4 | 15.6 | 15.5 | 15.3 | 14.9 | 15.8 | 16.0 | 16.3 | 16.8 | 18.1 | 19.5 | 19.5 | 19.8 | 20.1 | S | 21.1 | 22.4 | 25.7 | 25.7 | 25.0 | 23.7 | 14.9 | 25.7 | 19.1 | 24 | |
| 3 | 17.6 | 14.6 | 13.7 | 6.8 | 11.3 | 11.7 | 16.5 | 17.2 | 16.4 | 16.7 | 20.1 | 21.0 | 26.5 | 30.9 | 30.7 | 26.1 | S | 27.5 | 27.3 | 27.5 | 28.4 | 26.8 | 28.0 | 28.4 | 6.8 | 30.9 | 21.4 | 24 | |
| 4 | 28.7 | 29.3 | 31.9 | 31.9 | 33.7 | 34.3 | 34.4 | 37.3 | 37.8 | 37.0 | 37.8 | 37.8 | 35.4 | 33.4 | 31.5 | S | 28.8 | 29.4 | 31.6 | 32.7 | 34.3 | 33.6 | 33.8 | 29.9 | 28.7 | 37.8 | 33.3 | 24 | |
| 5 | 28.8 | 28.3 | 25.9 | 24.8 | 29.9 | 31.7 | 30.6 | 28.5 | 28.7 | 28.3 | 28.6 | 28.7 | 31.6 | 34.0 | S | 34.0 | 33.8 | 34.3 | 34.1 | 34.1 | 33.7 | 33.2 | 32.8 | 33.3 | 24.8 | 34.3 | 30.9 | 24 | |
| 6 | 33.8 | 33.8 | 33.7 | 33.5 | 33.8 | 33.0 | 32.8 | 32.1 | 31.4 | 33.5 | 32.4 | 28.3 | 27.9 | S | 27.1 | 25.0 | 22.5 | 22.8 | 22.8 | 22.2 | 23.8 | 22.5 | 22.5 | 22.8 | 22.2 | 33.8 | 28.4 | 24 | |
| 7 | 20.6 | 18.2 | 12.7 | 12.3 | 13.3 | 17.0 | 14.6 | 16.8 | 19.5 | 25.2 | C | C | C | C | C | C | 29.1 | 25.8 | 24.9 | 22.1 | 19.2 | 17.9 | 17.2 | 17.5 | 15.6 | 12.3 | 29.1 | 18.9 | 24 |
| 8 | 16.1 | 15.1 | 14.7 | 12.4 | 11.8 | 11.5 | 10.7 | 8.5 | 13.1 | 18.0 | 25.3 | S | 27.9 | 33.2 | 33.1 | 30.6 | 28.0 | 25.9 | 24.7 | 26.8 | 25.9 | 22.9 | 20.9 | 18.9 | 8.5 | 33.2 | 20.7 | 24 | |
| 9 | 21.0 | 20.8 | 20.6 | 21.7 | 20.9 | 17.6 | 17.1 | 13.2 | 15.4 | 22.0 | S | 21.4 | 21.1 | 21.5 | 18.5 | 21.7 | 17.5 | 17.8 | 14.0 | 14.5 | 10.1 | 9.0 | 7.9 | 7.4 | 7.4 | 22.0 | 17.1 | 24 | |
| 10 | 5.0 | 4.3 | 6.2 | 3.7 | 4.9 | 1.4 | 1.3 | 0.9 | 5.6 | S | 11.6 | 14.7 | 16.0 | 15.1 | 17.5 | 24.4 | 30.0 | 29.8 | 34.8 | 35.3 | 33.1 | 31.3 | 31.0 | 31.3 | 0.9 | 35.3 | 16.9 | 24 | |
| 11 | 31.3 | 27.4 | 20.7 | 24.4 | 24.2 | 22.7 | 25.2 | 22.7 | S | 25.2 | 27.6 | 28.2 | 29.5 | 30.6 | 29.3 | 29.7 | 29.4 | 29.8 | 26.1 | 25.0 | 24.0 | 23.5 | 23.1 | 21.7 | 20.7 | 31.3 | 26.1 | 24 | |
| 12 | 21.1 | 21.5 | 21.3 | 21.1 | 20.9 | 21.5 | 26.4 | S | 32.3 | 32.4 | 34.2 | 35.0 | 37.5 | 37.9 | 38.3 | 38.8 | 40.4 | 40.5 | 40.5 | 40.6 | 40.9 | 40.5 | 39.9 | 39.7 | 20.9 | 40.9 | 33.2 | 24 | |
| 13 | 37.2 | 37.0 | 37.8 | 37.9 | 34.5 | 34.4 | S | 32.5 | 32.5 | 34.9 | 35.9 | 35.8 | 35.2 | 35.8 | 37.0 | 38.2 | 38.5 | 38.9 | 38.8 | 38.7 | 38.9 | 39.3 | 38.5 | 36.0 | 32.5 | 39.3 | 36.7 | 24 | |
| 14 | 32.8 | 33.0 | 33.4 | 32.9 | 29.3 | S | 29.3 | 24.0 | 32.0 | 30.8 | 30.1 | 29.1 | 29.2 | 24.8 | 25.4 | 28.8 | 28.1 | 28.1 | 26.5 | 30.1 | 33.7 | 34.0 | 33.3 | 31.8 | 24.0 | 34.0 | 30.0 | 24 | |
| 15 | 30.6 | 28.0 | 23.9 | 28.7 | S | 33.6 | 33.9 | 33.9 | 31.4 | 37.8 | 35.9 | 34.8 | 35.5 | 36.2 | 35.2 | 34.4 | 34.6 | 33.4 | 32.6 | 32.5 | 33.0 | 32.8 | 33.4 | 32.8 | 23.9 | 37.8 | 33.0 | 24 | |
| 16 | 31.9 | 31.6 | 31.0 | S | 31.8 | 29.5 | 28.5 | 22.7 | 13.0 | 14.9 | 19.3 | 28.0 | 31.3 | 32.2 | 32.0 | 31.6 | 31.7 | 32.2 | 32.0 | 31.2 | 30.9 | 31.7 | 31.2 | 31.1 | 13.0 | 32.2 | 28.7 | 24 | |
| 17 | 30.6 | 30.5 | S | 30.1 | 30.5 | 31.5 | 32.1 | 31.5 | 30.9 | 31.0 | 29.6 | 30.0 | 25.5 | 27.3 | 27.2 | 25.2 | 21.0 | 23.2 | 23.8 | 24.0 | 21.9 | 21.5 | 19.4 | 17.0 | 17.0 | 32.1 | 26.7 | 24 | |
| 18 | 14.9 | S | 6.1 | 5.1 | 7.2 | 3.6 | 2.5 | 1.1 | 1.3 | 4.6 | 7.2 | 9.0 | 11.2 | 12.9 | 12.0 | 8.0 | 4.2 | 1.9 | 3.2 | 5.9 | 7.8 | 9.2 | 11.4 | 12.2 | 1.1 | 14.9 | 7.1 | 24 | |
| 19 | S | 19.9 | 14.9 | 14.3 | 15.5 | 18.7 | 16.9 | 13.2 | 12.4 | 16.4 | 20.8 | 26.5 | 31.3 | 31.8 | 32.0 | 30.6 | 25.7 | 24.7 | 25.6 | 27.2 | 30.0 | 32.3 | 33.6 | S | 12.4 | 33.6 | 23.4 | 24 | |
| 20 | 28.6 | 22.9 | 23.5 | 26.7 | 28.6 | 27.9 | 26.6 | 21.1 | 20.6 | 18.8 | 19.8 | 19.4 | 22.3 | 25.5 | 31.9 | 33.4 | 29.6 | 33.5 | 31.3 | 29.3 | 28.6 | 28.9 | S | 29.3 | 18.8 | 33.5 | 26.4 | 24 | |
| 21 | 27.7 | 28.0 | 29.5 | 28.8 | 24.2 | 23.1 | 22.7 | 24.0 | 24.1 | 26.0 | 27.2 | 27.4 | 25.8 | 24.8 | 25.7 | 25.5 | 23.3 | 21.0 | 22.2 | 28.1 | 28.5 | S | 27.0 | 26.7 | 21.0 | 29.5 | 25.7 | 24 | |
| 22 | 27.0 | 26.7 | 25.9 | 26.7 | 26.8 | 27.6 | 30.7 | 32.0 | 32.3 | 31.7 | 33.2 | 35.7 | 34.8 | 33.4 | 33.4 | 34.5 | 33.0 | 32.5 | 32.3 | 31.8 | S | 30.4 | 29.2 | 28.5 | 25.9 | 35.7 | 30.9 | 24 | |
| 23 | 26.4 | 23.7 | 21.1 | 13.2 | 7.0 | 5.3 | 6.7 | 9.5 | 15.6 | 24.0 | 26.1 | 26.1 | 27.0 | 26.6 | 27.1 | 26.4 | 24.7 | 24.6 | 25.5 | S | 26.5 | 27.0 | 27.9 | 28.4 | 5.3 | 28.4 | 21.6 | 24 | |
| 24 | 29.0 | 30.4 | 31.7 | 31.6 | 31.5 | 29.9 | 27.6 | 28.1 | 31.9 | 30.6 | 29.3 | 30.5 | 31.9 | 31.8 | 31.6 | 30.6 | 28.0 | 24.4 | S | 27.1 | 28.1 | 28.2 | 27.0 | 27.8 | 24.4 | 31.9 | 29.5 | 24 | |
| 25 | 26.6 | 25.9 | 26.4 | 26.2 | 24.8 | 24.9 | 23.5 | 21.5 | 20.8 | 21.5 | 22.4 | 23.4 | 23.8 | 23.6 | 23.6 | 23.0 | 20.9 | S | 20.7 | 20.5 | 20.0 | 19.2 | 18.9 | 18.2 | 18.2 | 26.6 | 22.6 | 24 | |
| 26 | 17.0 | 15.2 | 16.0 | 14.6 | 16.1 | 16.8 | 16.2 | 13.1 | 12.7 | 17.0 | 18.4 | 18.9 | 19.3 | 19.2 | 18.5 | 17.2 | S | 14.2 | 12.8 | 9.1 | 12.2 | 11.0 | 3.1 | 3.6 | 3.1 | 19.3 | 14.4 | 24 | |
| 27 | 7.5 | 10.0 | 9.5 | 9.1 | 5.2 | 6.5 | 6.1 | 7.0 | 14.0 | 19.9 | 21.9 | 22.6 | 22.4 | 21.7 | 20.4 | S | 19.2 | 18.4 | 17.3 | 19.0 | 18.3 | 17.4 | 18.6 | 17.7 | 5.2 | 22.6 | 15.2 | 24 | |
| 28 | 16.9 | 15.2 | 14.7 | 14.1 | 13.9 | 13.9 | 13.6 | 13.1 | 11.9 | 11.1 | 12.0 | 13.3 | 14.0 | 13.7 | S | 14.6 | 13.0 | 13.4 | 13.7 | 13.4 | 12.3 | 13.1 | 15.7 | 15.8 | 11.1 | 16.9 | 13.8 | 24 | |
| 29 | 15.3 | 15.2 | 15.0 | 15.3 | 14.7 | 15.2 | 15.5 | 16.3 | 17.0 | 18.5 | 19.3 | 19.8 | 20.6 | S | 21.2 | 22.1 | 22.1 | 23.0 | 23.5 | 23.3 | 23.2 | 23.1 | 23.6 | 24.1 | 14.7 | 24.1 | 19.4 | 24 | |
| 30 | 24.5 | 24.7 | 24.8 | 24.5 | 25.0 | 26.3 | 27.3 | 28.5 | 29.7 | 29.7 | 30.3 | 32.2 | S | 31.4 | 33.7 | 35.4 | 36.4 | 33.9 | 33.5 | 31.4 | 33.9 | 32.7 | 29.2 | 30.5 | 24.5 | 36.4 | 30.0 | 24 | |
| 31 | 30.6 | 28.2 | 27.6 | 26.2 | 25.5 | 25.5 | 19.0 | 15.5 | 18.9 | 22.0 | 25.6 | S | 23.1 | 22.5 | 22.1 | 20.1 | 19.6 | 19.6 | 20.5 | 20.3 | 19.8 | 19.4 | 18.6 | 18.4 | 15.5 | 30.6 | 22.1 | 24 | |
| HOURLY MAX | 37.2 | 37.0 | 37.8 | 37.9 | 34.5 | 34.4 | 34.4 | 37.3 | 37.8 | 37.8 | 37.8 | 37.8 | 37.5 | 37.9 | 38.3 | 38.8 | 40.4 | 40.5 | 40.5 | 40.6 | 40.9 | 40.5 | 39.9 | 39.7 | | | | | |
| HOURLY AVG | 23.4 | 22.7 | 21.2 | 21.5 | 21.4 | 21.0 | 20.5 | 19.9 | 21.2 | 23.7 | 24.5 | 25.3 | 25.9 | 26.8 | 26.9 | 26.8 | 25.7 | 25.4 | 25.3 | 25.3 | 25.5 | 25.2 | 24.7 | 24.1 | | | | | |

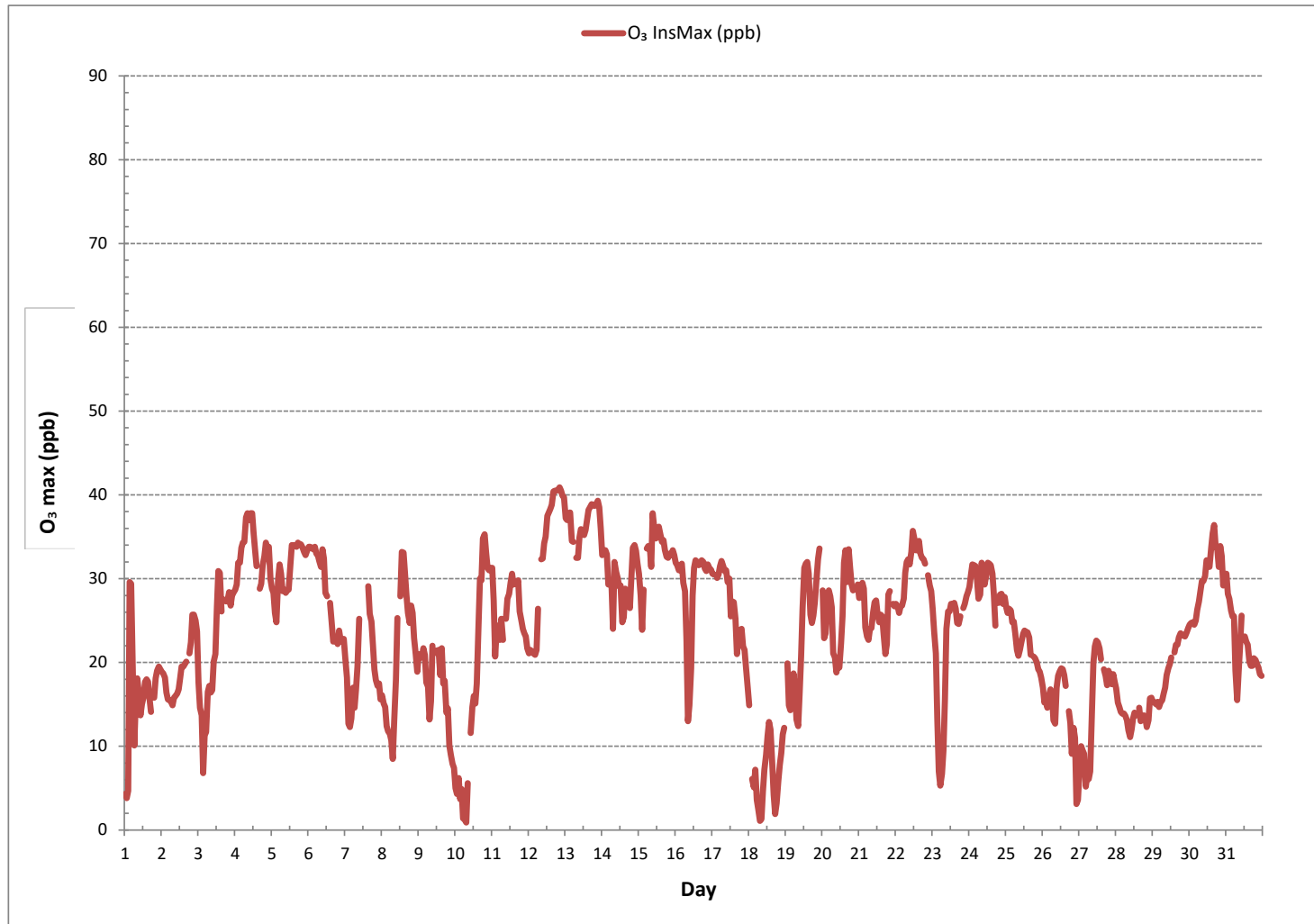
STATUS FLAG CODES

| | | | |
|----|--------------------------|---|-----------------------|
| 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: | 708 |
| MAXIMUM INSTANTANEOUS VALUE: | 40.9 ppb @ HOUR 20 ON DAY 12 |
| IZS CALIBRATION TIME: | 31 hrs |
| MONTHLY CALIBRATION TIME: | 5 hrs |
| STANDARD DEVIATION: | 8.6 |
| OPERATIONAL TIME: | 744 hrs |

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Continuous Monitoring Station - December 2018

WIND SPEED Instantaneous Maximum (WS kph)

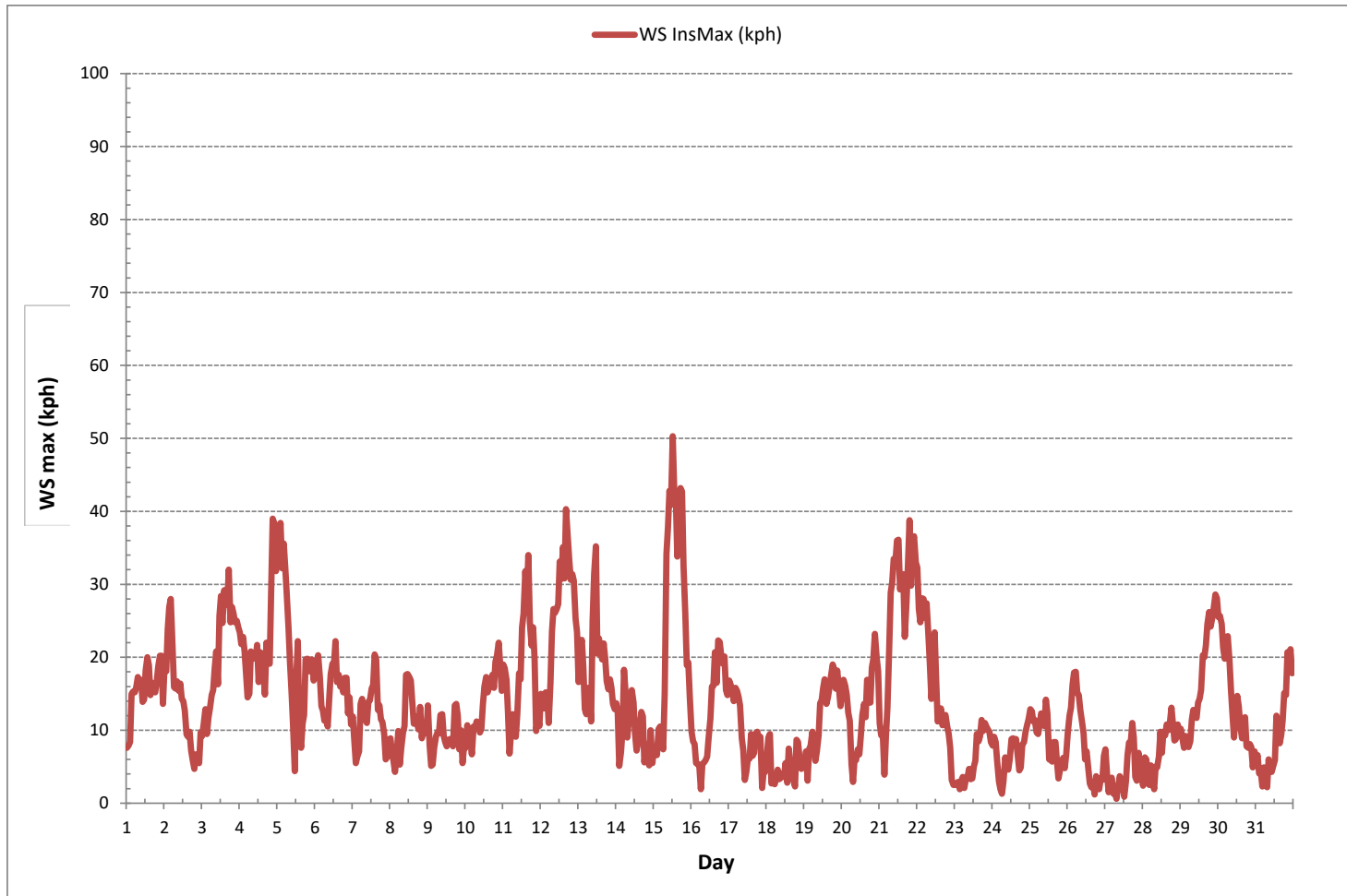
| HR START (MST) | 0:00 | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | DAILY | DAILY | 24-HR | RDGS. |
|----------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HR END (MST) | 0:59 | 1:59 | 2:59 | 3:59 | 4:59 | 5:59 | 6:59 | 7:59 | 8:59 | 9:59 | 10:59 | 11:59 | 12:59 | 13:59 | 14:59 | 15:59 | 16:59 | 17:59 | 18:59 | 19:59 | 20:59 | 21:59 | 22:59 | 23:59 | MIN. | MAX. | AVG. | |
| DAY 1 | 7.6 | 7.9 | 8.4 | 15.0 | 15.3 | 15.2 | 16.0 | 17.3 | 15.9 | 16.9 | 13.9 | 14.2 | 18.2 | 20.0 | 18.9 | 14.8 | 16.5 | 15.6 | 15.2 | 16.6 | 18.7 | 20.2 | 20.2 | 13.6 | 7.6 | 20.2 | 15.5 | 24 |
| 2 | 18.6 | 18.1 | 23.9 | 26.9 | 28.0 | 21.6 | 15.9 | 15.7 | 16.7 | 15.4 | 16.4 | 14.3 | 14.0 | 12.7 | 9.4 | 9.1 | 9.8 | 7.3 | 5.8 | 4.7 | 6.7 | 6.3 | 5.5 | 9.7 | 4.7 | 28.0 | 13.9 | 24 |
| 3 | 9.2 | 10.8 | 12.9 | 9.5 | 11.7 | 13.0 | 14.8 | 15.5 | 18.5 | 20.8 | 16.3 | 25.7 | 28.4 | 24.7 | 29.2 | 27.6 | 27.2 | 32.0 | 24.8 | 26.9 | 26.0 | 24.8 | 25.0 | 24.1 | 9.2 | 32.0 | 20.8 | 24 |
| 4 | 23.4 | 21.8 | 22.8 | 20.8 | 17.7 | 14.5 | 15.0 | 20.8 | 19.8 | 20.1 | 19.8 | 21.7 | 16.6 | 20.7 | 20.5 | 18.0 | 14.9 | 22.0 | 19.3 | 19.1 | 29.3 | 39.0 | 38.4 | 31.8 | 14.5 | 39.0 | 22.0 | 24 |
| 5 | 36.8 | 32.8 | 38.4 | 32.2 | 35.6 | 32.3 | 28.6 | 24.0 | 19.2 | 15.3 | 10.8 | 4.4 | 17.1 | 22.2 | 9.9 | 7.6 | 10.9 | 12.1 | 19.7 | 19.8 | 18.1 | 19.1 | 19.7 | 16.8 | 4.4 | 38.4 | 21.0 | 24 |
| 6 | 17.5 | 19.2 | 20.3 | 17.2 | 13.3 | 12.7 | 11.3 | 11.6 | 10.5 | 14.3 | 17.7 | 19.1 | 19.0 | 22.2 | 16.6 | 17.6 | 16.0 | 16.4 | 15.2 | 17.2 | 17.2 | 12.3 | 14.5 | 10.8 | 10.5 | 22.2 | 15.8 | 24 |
| 7 | 11.9 | 8.6 | 5.5 | 6.4 | 7.1 | 13.6 | 14.3 | 12.6 | 11.4 | 11.0 | 13.9 | 14.1 | 15.7 | 16.2 | 20.4 | 19.7 | 12.8 | 13.4 | 11.5 | 11.1 | 9.5 | 6.0 | 6.4 | 8.7 | 5.5 | 20.4 | 11.7 | 24 |
| 8 | 8.9 | 6.7 | 5.8 | 4.3 | 6.8 | 9.9 | 5.3 | 7.6 | 9.7 | 10.6 | 17.6 | 17.7 | 17.3 | 16.8 | 13.8 | 10.9 | 11.9 | 10.9 | 10.1 | 13.2 | 8.9 | 10.9 | 9.6 | 9.6 | 4.3 | 17.7 | 10.6 | 24 |
| 9 | 13.4 | 7.9 | 5.1 | 5.3 | 7.6 | 9.1 | 9.7 | 9.6 | 12.1 | 12.2 | 9.2 | 8.4 | 7.8 | 8.7 | 8.8 | 8.3 | 7.8 | 13.4 | 13.6 | 12.0 | 7.4 | 10.0 | 5.5 | 7.8 | 5.1 | 13.6 | 9.2 | 24 |
| 10 | 7.6 | 10.7 | 8.8 | 8.9 | 6.7 | 10.5 | 10.3 | 11.2 | 10.9 | 9.7 | 10.2 | 13.5 | 16.0 | 17.3 | 15.2 | 16.0 | 16.8 | 17.6 | 15.8 | 19.4 | 20.2 | 22.0 | 18.9 | 15.4 | 6.7 | 22.0 | 13.7 | 24 |
| 11 | 19.0 | 18.5 | 16.9 | 12.4 | 6.8 | 9.6 | 12.2 | 10.6 | 9.1 | 12.2 | 17.8 | 17.0 | 24.1 | 26.0 | 31.8 | 28.2 | 34.0 | 24.8 | 21.6 | 24.1 | 19.6 | 9.9 | 11.8 | 10.6 | 6.8 | 34.0 | 17.9 | 24 |
| 12 | 15.0 | 13.2 | 13.0 | 15.2 | 14.8 | 11.0 | 16.4 | 23.5 | 26.6 | 26.1 | 26.6 | 27.3 | 33.1 | 30.7 | 35.1 | 30.8 | 40.3 | 37.0 | 33.3 | 30.6 | 31.4 | 30.5 | 25.3 | 23.4 | 11.0 | 40.3 | 25.4 | 24 |
| 13 | 16.6 | 21.3 | 22.4 | 18.6 | 12.9 | 12.2 | 15.8 | 14.4 | 11.2 | 25.1 | 31.4 | 35.2 | 20.5 | 22.6 | 21.2 | 19.7 | 21.9 | 19.8 | 16.7 | 15.6 | 17.0 | 15.8 | 13.6 | 12.9 | 11.2 | 35.2 | 18.9 | 24 |
| 14 | 13.7 | 12.4 | 5.1 | 7.0 | 10.0 | 18.3 | 15.3 | 9.0 | 11.3 | 11.1 | 15.5 | 13.8 | 9.5 | 7.2 | 8.3 | 10.6 | 12.5 | 11.9 | 5.6 | 8.0 | 8.1 | 5.2 | 10.0 | 5.5 | 5.1 | 18.3 | 10.2 | 24 |
| 15 | 7.7 | 7.2 | 6.6 | 10.2 | 10.5 | 8.7 | 7.4 | 15.1 | 34.2 | 37.8 | 42.8 | 40.9 | 50.3 | 42.8 | 42.6 | 33.8 | 39.9 | 43.2 | 42.7 | 32.5 | 26.0 | 18.9 | 19.3 | 14.5 | 6.6 | 50.3 | 26.5 | 24 |
| 16 | 9.8 | 8.5 | 8.1 | 5.5 | 5.4 | 5.0 | 1.9 | 5.4 | 5.6 | 5.9 | 6.4 | 9.0 | 11.6 | 16.0 | 16.1 | 20.7 | 16.5 | 22.3 | 22.1 | 20.3 | 19.1 | 20.1 | 15.5 | 14.8 | 1.9 | 22.3 | 12.1 | 24 |
| 17 | 16.8 | 16.2 | 15.5 | 14.0 | 15.8 | 15.4 | 14.6 | 13.4 | 8.9 | 7.2 | 3.2 | 4.3 | 6.0 | 6.1 | 9.5 | 6.5 | 6.9 | 9.6 | 9.8 | 8.7 | 9.1 | 2.1 | 4.4 | 4.3 | 2.1 | 16.8 | 9.5 | 24 |
| 18 | 6.1 | 9.0 | 9.5 | 2.7 | 3.3 | 2.6 | 3.6 | 4.6 | 3.3 | 3.5 | 4.1 | 3.6 | 5.5 | 2.8 | 7.5 | 5.5 | 4.5 | 3.1 | 2.3 | 8.7 | 8.4 | 5.8 | 4.7 | 4.9 | 2.3 | 9.5 | 5.0 | 24 |
| 19 | 5.1 | 7.1 | 3.1 | 7.4 | 7.9 | 9.8 | 7.9 | 5.8 | 7.1 | 9.3 | 13.7 | 14.1 | 15.8 | 17.0 | 13.6 | 14.5 | 15.8 | 17.4 | 19.0 | 18.3 | 15.7 | 18.2 | 15.7 | 13.3 | 3.1 | 19.0 | 12.2 | 24 |
| 20 | 15.4 | 16.9 | 16.1 | 14.8 | 12.4 | 11.3 | 5.3 | 2.9 | 6.0 | 5.9 | 7.4 | 6.7 | 9.2 | 12.1 | 13.6 | 11.8 | 16.9 | 15.9 | 13.8 | 18.6 | 19.8 | 23.2 | 20.0 | 18.1 | 2.9 | 23.2 | 13.1 | 24 |
| 21 | 11.0 | 9.3 | 9.1 | 3.9 | 9.2 | 13.1 | 21.2 | 28.9 | 30.3 | 33.5 | 33.2 | 36.0 | 36.1 | 29.3 | 30.1 | 31.4 | 22.8 | 26.9 | 32.1 | 38.8 | 29.8 | 35.8 | 36.6 | 33.0 | 3.9 | 38.8 | 25.9 | 24 |
| 22 | 32.3 | 26.6 | 24.8 | 28.1 | 28.0 | 25.4 | 27.4 | 23.1 | 19.0 | 14.3 | 17.1 | 23.4 | 17.0 | 11.2 | 11.7 | 13.0 | 10.7 | 11.6 | 12.1 | 10.5 | 9.5 | 7.6 | 3.2 | 2.5 | 2.5 | 32.3 | 17.1 | 24 |
| 23 | 2.5 | 2.7 | 2.9 | 1.9 | 3.1 | 3.6 | 2.1 | 3.5 | 3.6 | 4.7 | 3.3 | 3.4 | 5.0 | 5.8 | 9.5 | 8.5 | 9.2 | 11.4 | 9.9 | 11.0 | 10.5 | 10.1 | 9.8 | 8.4 | 1.9 | 11.4 | 6.1 | 24 |
| 24 | 7.9 | 9.1 | 8.4 | 5.7 | 3.0 | 1.9 | 1.3 | 3.0 | 6.3 | 5.1 | 4.6 | 6.0 | 8.8 | 8.9 | 8.2 | 8.8 | 6.5 | 4.5 | 4.9 | 8.0 | 8.4 | 9.8 | 10.7 | 11.5 | 1.3 | 11.5 | 6.7 | 24 |
| 25 | 12.9 | 12.6 | 11.2 | 11.4 | 9.7 | 9.5 | 10.7 | 12.3 | 11.8 | 10.6 | 14.2 | 12.3 | 6.0 | 5.9 | 5.7 | 8.4 | 8.4 | 5.7 | 3.4 | 4.5 | 5.7 | 6.2 | 4.8 | 6.7 | 3.4 | 14.2 | 8.8 | 24 |
| 26 | 9.6 | 12.0 | 13.1 | 16.2 | 17.9 | 18.0 | 15.1 | 14.8 | 12.8 | 11.1 | 9.6 | 6.0 | 7.1 | 4.7 | 2.7 | 2.2 | 2.9 | 1.2 | 3.7 | 2.3 | 1.9 | 3.5 | 3.2 | 6.5 | 1.2 | 18.0 | 8.2 | 24 |
| 27 | 7.4 | 3.7 | 1.5 | 2.8 | 3.5 | 1.3 | 1.7 | 0.6 | 2.1 | 3.7 | 3.2 | 2.5 | 0.9 | 3.1 | 6.6 | 8.3 | 7.9 | 11.0 | 9.0 | 3.6 | 3.1 | 6.9 | 5.1 | 3.9 | 0.6 | 11.0 | 4.3 | 24 |
| 28 | 2.4 | 6.3 | 6.0 | 2.8 | 2.5 | 5.2 | 3.2 | 1.9 | 5.0 | 4.9 | 6.4 | 9.8 | 6.9 | 9.8 | 9.3 | 10.8 | 10.0 | 10.8 | 13.1 | 10.8 | 8.6 | 8.8 | 10.8 | 9.3 | 1.9 | 13.1 | 7.3 | 24 |
| 29 | 10.2 | 9.0 | 7.6 | 9.2 | 8.6 | 7.7 | 8.5 | 11.4 | 12.8 | 11.9 | 11.7 | 13.8 | 14.3 | 15.5 | 20.3 | 20.0 | 21.6 | 24.5 | 26.2 | 24.2 | 25.3 | 26.7 | 28.6 | 28.1 | 7.6 | 28.6 | 16.6 | 24 |
| 30 | 25.5 | 25.7 | 24.6 | 21.3 | 19.8 | 7.7 | 22.9 | 19.6 | 15.5 | 12.2 | 9.0 | 12.2 | 14.7 | 13.3 | 10.7 | 8.9 | 9.2 | 11.8 | 7.8 | 7.6 | 8.1 | 7.7 | 4.9 | 7.1 | 4.9 | 25.7 | 14.2 | 24 |
| 31 | 5.8 | 6.6 | 4.1 | 4.3 | 2.3 | 4.9 | 4.2 | 2.2 | 6.0 | 4.6 | 4.3 | 5.2 | 5.9 | 12.0 | 11.2 | 8.2 | 9.3 | 11.4 | 15.1 | 14.8 | 20.7 | 18.9 | 21.1 | 17.8 | 2.2 | 21.1 | 9.2 | 24 |
| HOURLY MAX | 36.8 | 32.8 | 38.4 | 32.2 | 35.6 | 32.3 | 28.6 | 28.9 | 34.2 | 37.8 | 42.8 | 40.9 | 50.3 | 42.8 | 42.6 | 33.8 | 40.3 | 43.2 | 42.7 | 38.8 | 31.4 | 39.0 | 38.4 | 33.0 | | | | |

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: | 50.3 | kph | @ HOUR | 12 | ON DAY | 15 | |
| OPERATIONAL TIME: | | | | | | 744 | hrs |



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 | Bonnyville East Continuous Monitoring Station |
| Name of the Representative of the Person Responsible | Position / Title of the Representative of the Person Responsible |
| Mike Bisaga | Environment Monitoring Program Manager |
| Is an External Party Certifying the Report? | |
| <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| Name of External Person Certifying the Report | Position / Title of External Person Certifying the Report |
| Wunmi Adeganbi | Project Team Lead, Customer Service - Air Services |
| Company Name for External Person Certifying the Report | Identification of Qualifications / Professional Designations of the External Person Certifying the Report |
| Maxxam Analytics, A Bureau Veritas Group Company | M.Sc., EPt., PMP |

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the External Person Certifying the Report

01 - Feb - 2019

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

| | |
|---|--|
| Client: <u>Lakeland Industry & Community Association</u> | Project #: <u>2833-2018-12-39-C</u> |
| Site: <u>Bonnyville East Continuous Monitoring Station</u> | Contact: <u>Mike Bisaga</u> |

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|----------------------------------|--------------------------|-----------------------------|
| Level 0 Preliminary Verification | <u><i>bimadeniji</i></u> | Date <u>29- Jan - 2019</u> |
| Level 1 Primary Validation | <u><i>bimadeniji</i></u> | Date <u>29 - Jan - 2019</u> |
| Level 2 Final Validation | <u><i>bimadeniji</i></u> | Date <u>30 - Jan - 2019</u> |
| Level 3 Independent Data Review | <u><i>msalmbg</i></u> | Date <u>31 - Jan - 2019</u> |
| Post-Final Validation | <u>NA</u> | Date <u>NA</u> |

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