



Lakeland Industry & Community Association

FEBRUARY 2019

Monthly Ambient Air Quality Monitoring Report

LICA-201902

Operation and Maintenance:

Maxxam Analytics

Data Validation and Report:

Maxxam Analytics

April 2, 2019

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Lakeland Industry & Community Association

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April 2, 2019

Alberta Environment and Parks (AEP)

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Edmonton, AB, T5K 2J6

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RE: LICA – February 2019 Monthly Ambient Air Quality Monitoring Report

Enclosed is the February 2019 Monthly Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Lakeland Industry & Community Association (LICA) regional air quality monitoring network.

The representative of the Person Responsible for this monitoring program is

LICA Airshed

Michael Bisaga, Technical Program Manager

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This report has been prepared by Maxxam Analytics, and has been reviewed and submitted by Michael Bisaga & Lily Lin of the LICA Airshed

NETWORK STATION SUMMARY

Listing of Continuous Monitoring Stations and Integrated Sampling Stations

Station Name		Cold Lake South	Maskwa	St. Lina	Bonnyville East
Station ID		1174	1248	1250	1608
Coordinates		54.41402, -110.23316	54.604935, -110.452637	54.215961, -111.503304	54.252747, -110.690611
Continuous Monitoring Parameter	SO2	√	√	√	√
	TRS	√			
	H2S		√	√	√
	THC	√	√	√	√
	CH4	√	√	√	√
	NMHC	√	√	√	√
	NOX	√	√	√	√
	NO	√	√	√	√
	NO2	√	√	√	√
	O3	√		√	√
	PM2.5	√		√	√
	TPX	√	√	√	√
	RH	√	√	√	√
	BP		√	√	
	PRECIPTATION		√	√	
	WS	√	√	√	√
	WD	√	√	√	√
STDWD	√	√	√	√	
Integrated Sampling	VOCs	√			
	PAHs	√			
	Partisol	√			
	Passive	√			
	NMHC Canister				√

List of Contractors who performed the air monitoring activities

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Prepared By	Electronic Submission Conducted By
Continuous Monitoring Station	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Intermittent (VOCs/PAHs)	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Maxxam Analytics
Partisol	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Maxxam Analytics
Passive	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
NMHC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

Monitoring Notes during the Month of February 2019

Cold Lake South:

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- THC/CH4/NMHC:
 - The LICA-supplied Thermo 55i analyzer, s/n: 1180320044, was removed on February 22 and the AEP-supplied Thermo 55i analyzer, s/n: 1180030034, was installed on February 23. Twenty-five hours of downtime were recorded due to the analyzer replacement event.
 - Beginning on February 27, the analyzer began to exhibit frequent poor sample injections. The AEP-supplied Thermo 55i analyzer, s/n: 1180030034, was removed on February 28. The LICA-supplied Thermo 55i analyzer, s/n: 1236656107, was installed on February 28 and was calibrated on March 1. Data was invalidated back to the point of failed performance determined as hour 07:00 on February 27. Forty-one hours of downtime were recorded due to this event.
- The VOCs, PAHs and Partisol samples were processed for analysis by InnoTech and the results will be provided in the 2019, Q1 Integrated Report.
- The passive samples were processed for analysis by Maxxam Analytics and the results will be provided in the 2019, Q1 Integrated Report.

Maskwa:

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Precipitation: One hour of downtime was recorded on February 15 as the equipment was frozen due to low ambient temperatures. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution.

St. Lina Station:

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- SO₂: The analyzer spanned outside the lower acceptance limit on January 29 due to the depletion of the permeation tube. The permeation tube was replaced on February 12, during the monthly calibration. As the monthly calibration result met AMD requirements, no data was discarded due to this issue.

Bonnyville East Station:

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- THC/CH₄/NMHC: The LICA-supplied Thermo 55i analyzer, s/n: 1236656107, was removed on February 23, as it was not operating properly and had earlier exhibited poor sample injection. A LICA-supplied Thermo 55i analyzer, s/n: 1180320044, was installed and calibrated on February 23. Data was invalidated back to the point of failed performance, determined as hour 14:00, on February 22. Twenty-nine hours of downtime were recorded due to this event.
- NMHC Canister System: There was no canister event recorded in February.

Revisions to Alberta's Ambient Air Quality Data Warehouse

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made this month.

Deviations from Authorized Monitoring Methods

At the Maskwa station, nearby trees exceed the height allowed under section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

At the Cold Lake South station, the height of the existing wind sensor tower is shorter than the AMD requirements listed in section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

Certification

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, with the exception of electronic submission for the results of intermittent samples, Partisol samples and passive samples. Electronic submission for the intermittent sample, Partisol sample and passive sample results will be performed during the preparation of the 2019 Q1 integrated sampling report.

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

Respectfully,



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FEBRUARY 1 - 28, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-02-23-C

LICA-201902

Prepared for:

Lakeland Industry & Community Association

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Monitoring Station

Cold Lake South Continuous Monitoring
Station

Date of Report Issuance: March 26, 2019

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LICA-201902

Page 9 of 350

Lakeland Industry & Community Association

5107 50 St.
Bonnyville, Alberta T9N 2J7

Attention: Mike Bisaga

Date: March 26, 2019

Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for FEBRUARY 1 - 28, 2019

In February 2019, 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 program provides measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

Network Parameters for Continuous Monitoring:

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements Chapter 9, 13.1.7, RC 13-R. The station is equipped with analyzers to measure SO₂, TRS, THC, CH₄, NMHC, NOx, NO, NO₂, PM_{2.5} and O₃. The meteorological sensors and equipment capture data for WS, WD, RH, AmbTPX and STDWD.

Exceedance & Performance Reporting:

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the AMD, Chapter 6, DQ 4-C, 2016.

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, January 2019). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied (Chapter 9, Appendix A, AMD 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

Monthly Monitoring Overview:

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program. The evaluation of data collected in the month of February did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

During this monitoring period, there were no scheduled audits, to which Maxxam Analytics was privy to.

THC/CH₄/NMHC:

- On February 22, LICA's Thermo 55i analyzer (s/n: 1180320044) was removed. The AEP-supplied Thermo 55i (s/n: 1180030034), was installed. Twenty-five hours of downtime were recorded due to the analyzer replacement event.
- Beginning on February 27, the analyzer began to exhibit frequent poor sample injections. The AEP-supplied Thermo 55i (s/n: 1180030034) analyzer was removed on February 28 and LICA's Thermo 55i analyzer (s/n: 1236656107) was installed. A successful installation calibration was completed on March 1. Data was invalidated back to the point of failed performance determined as hour 07:00 on February 27. Forty-one hours of downtime were recorded due to this event.

NOx/NO/NO₂: The permeation tube was replaced during the routine monthly calibration on February 8. Following the expected span value update, a repeat zero-span check was completed on February 12, as a quality check. One hour of downtime was recorded due to the additional quality check.

O₃: The analyzer began to span erratically outside the lower acceptance limit on January 29. On February 7, a successful monthly calibration was completed, during which the output of the internal Ozone generator (span level) was adjusted to return span concentrations to the required range. The expected span value was subsequently reset and no further drifts in span response were observed. As this issue did not impact analyzer performance, no data was discarded.

Should you have any questions concerning the results or if we can be of further assistance, please contact your Maxxam representative indicated below.

Reviewed by:



Wunmi Adekanmbi, M.Sc., EPt, PMP
Project Team Lead, Customer Service, Air Services
403-219-3661

I certify that I 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. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.

TABLE OF CONTENTS

TITLE PAGE	1
COVER LETTER	2
TABLE OF CONTENTS	3
ABBREVIATIONS	4
AAAQO EXCEEDANCE SUMMARY	5
MONTHLY CONTINUOUS DATA SUMMARY	6
OPERATIONAL SUMMARY	7
SUMMARY TABLES, GRAPHS AND ROSES	9
Sulphur Dioxide	10
Total Reduced Sulphur	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter _{2.5}	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
Relative Humidity	58
Ambient Temperature	60
MAXIMUM INSTANTANEOUS DATA	62
1.0 Quality Control Activities	82
2.0 Data Verification and Validation	83
Validation Certificate Form	86
End of Report	87

List of Acronyms

AAAQO	Alberta Ambient Air Quality Objectives and Guidelines Summary
AEP	Alberta Environment and Parks
AMBTPX	Ambient Temperature
AMD	Air Monitoring Directive
CH₄	Methane
DAS	Data acquisition system
hr	Hour
hrs	Hours
IZS	Internal zero-span
kph	Kilometers per hour
NO	Nitric Oxide
NO₂	Nitrogen dioxide
NO_x	Total oxides of nitrogen
O₃	Ozone
NMHC	Non-Methane Hydrocarbon
PM_{2.5}	Particulate matter less than or equal to 2.5 microns in diameter
ppb	Parts per billion
ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
RH	Relative Humidity
SHARP	Synchronized Hybrid Ambient Real-time Particulate Monitor
SOP	Standard Operating Procedure
SO₂	Sulphur Dioxide
STDWD	Standard Deviation Wind Direction
THC	Total hydrocarbons
TRS	Total Reduced Sulphur
µg/m³	Microgram per cubic meter
WS	Wind Speed
WD	Wind Direction
°C	Degrees Celsius

AAAQO 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 AAAQG 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 76 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

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	13	12	3.6	W	1	18	100.0
TRS (ppb)	-	-	-	-	0	1	7	3	0.7	ENE	1	7	100.0
THC (ppm)	-	-	-	-	2.16	2.95	26	0	4.4	W	2.45	6	90.2
CH ₄ (ppm)	-	-	-	-	2.16	2.87	13	9	1.1	W	2.45	6	90.2
NMHC (ppm)	-	-	-	-	0.00	0.15	7	21	4.2	SE	0.02	26	90.2
NO ₂ (ppb)	159	-	0	-	8	32	6	17	1.2	ENE	22	6	99.9
NO (ppb)	-	-	-	-	2	62	14	9	1.0	ENE	10	7	99.9
NO _x (ppb)	-	-	-	-	10	93	14	9	1.0	ENE	30	6	99.9
O ₃ (ppb)	76	-	0	-	27.7	44.9	27	15	17.6	NNW	40.5	27	100.0
PM _{2.5} (µg/m ³)	80	29	0	0	4	23	10	1	0.9	E	13	19	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	68	83	20	1	0.6	WSW	77	20	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-22.6	-1.3	27	13	17.8	NNW	-7.4	27	100.0
VECTOR WS (kph)	-	-	-	-	1.2	18.5	27	14	-	NNW	10.7	23	100.0
VECTOR WD (sec)	-	-	-	-	350 (N)	-	-	-	-	-	-	-	100.0

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO ₂)	Thermo 43i TLE Pulsed Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine monthly calibration was performed on February 8, between the hours of 10:00 and 14:00.
TOTAL REDUCED SULPHUR (TRS)	Thermo 450i UV Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine monthly calibration was performed on February 8, between the hours of 10:00 and 14:00.
TOTAL HYDROCARBONS (THC), METHANE (CH ₄) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 90.2%, equivalent to 66 hours of downtime. The routine monthly calibration was performed on February 7, between the hours of 11:00 and 14:00. Following a successful shut-down calibration on February 22, LICA's Thermo 55i analyzer (s/n: 1180320044) was removed. The AEP-supplied Thermo 55i (s/n: 1180030034), which was removed for maintenance on January 25, was installed. The analyzer was allowed time to stabilize overnight and a successful installation calibration was completed on February 23. Twenty-five hours of downtime were recorded due to the analyzer replacement event. Beginning on February 27, frequent poor sample injections were observed, prompting an immediate site visit. A shut-down calibration could not be completed due to the frequency of poor injections, as it would impact the stability criteria. The AEP-supplied analyzer, Thermo 55i (s/n: 1180030034), was therefore removed on February 28. The sample pump, actuator and rotor of LICA's Thermo 55i analyzer (s/n: 1236656107) were replaced and the analyzer was installed. Column conditioning was run overnight and a successful installation calibration was completed on March 1. Data was invalidated back to the point of failed performance determined as hour 07:00 on February 27. Forty-one hours of downtime were recorded due to this event. Minute data for the month was reviewed. CH₄ minute concentrations recorded lower than 1.80 ppm, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly averages were re-calculated. The following hourly averages were re-calculated: February 23, hours 14:00 and 18:00; and February 25, hour 20:00.
OXIDES OF NITROGEN (NO _x), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO ₂)	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO ₂ /NO _x Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. The routine monthly calibration was performed on February 8, between the hours of 10:00 and 16:00. The permeation tube was replaced during the monthly calibration site visit and was allowed time to stabilize. The expected span value was updated following the zero-span check on February 11. A repeat zero-span check was completed as a quality check on February 12, at hour 11:00, incurring one hour of downtime.

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
OZONE (O₃)	Thermo 49i Photometric Analyzer	Maxxam AIR SOP-00212: Ambient O₃ Monitoring	<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 7, between the hours of 11:00 and 16:00. The analyzer began to span erratically outside the lower acceptance limit on January 29. Troubleshooting performed on January 29 did not solve the issue as the analyzer continued to span at the same level. On February 7, a successful monthly calibration was completed between hours 11:00 – 16:00. The output of the internal Ozone generator (span level) was adjusted to return span concentrations to the required range. The expected span value was subsequently reset and no drifts in span response were observed at the updated span level. As the monthly calibration met AMD requirements, demonstrating that analyzer performance was not impacted, no data were discarded due to this event.
PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})	Thermo SHARP 5030 Unit	Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine monthly check was performed on February 21, between the hours of 10:00 and 11:00.
WIND SPEED (WS), WIND DIRECTION (WD) & STANDARD DEVIATION WIND DIRECTION (STDWD)	Met One Unit	Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. 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)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. A humidity sensor check was performed on February 21. The result was satisfactory.
AMBIENT TEMPERATURE (AmbTPX)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. A temperature sensor check was performed on February 21. The result was satisfactory.
Datalogger	EnvistaUltimate Unit	Operation Manual	<ul style="list-style-type: none"> There were no performance issues identified.

SUMMARY TABLES, GRAPHS AND ROSES



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

STATUS FLAG CODES

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

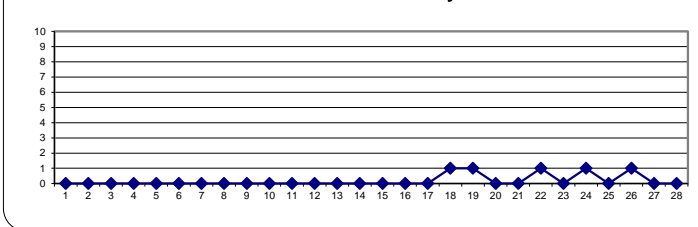
OBJECTIVE LIMIT:

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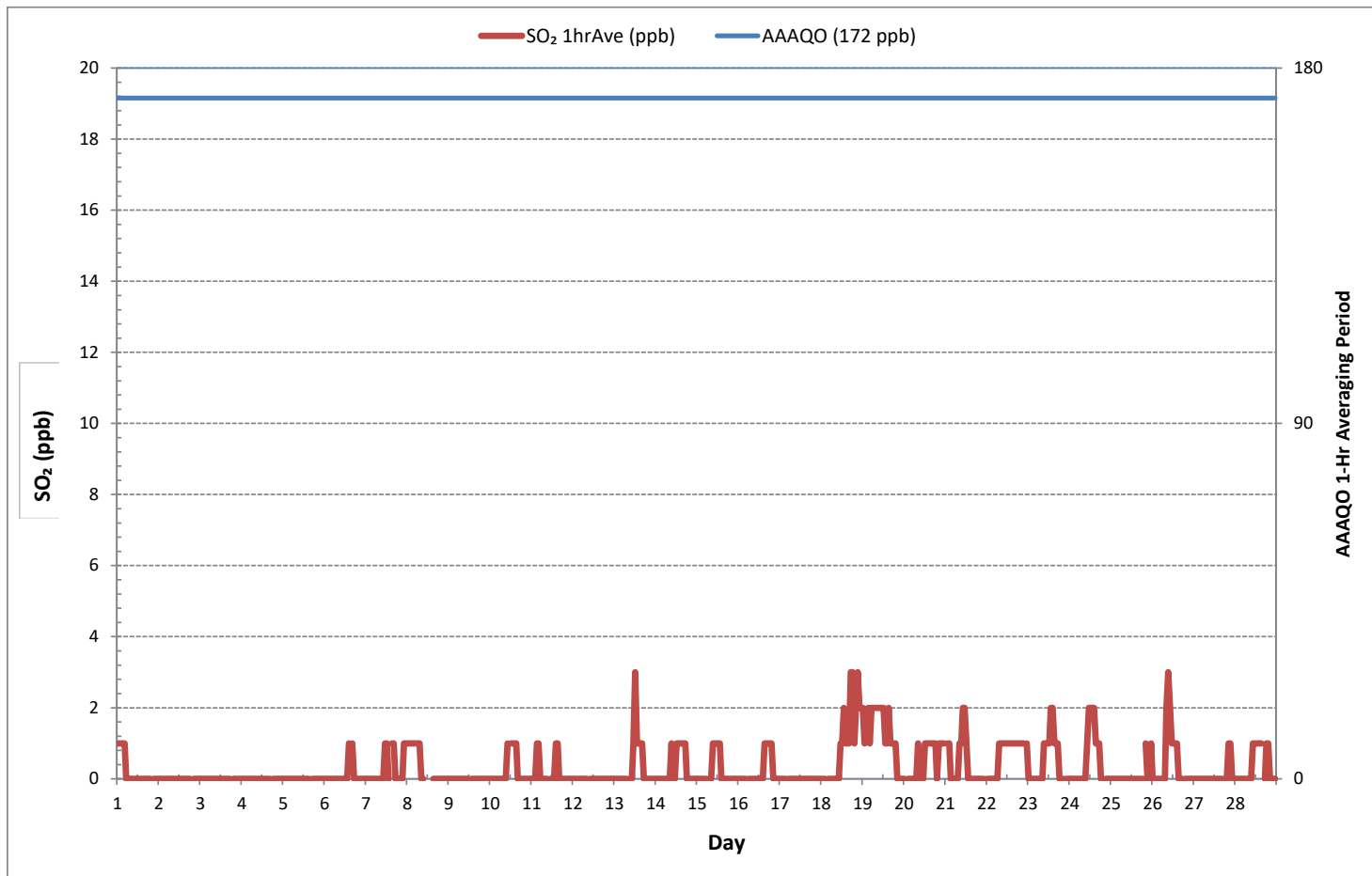
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	156				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	5	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	12	ON DAY	13	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	18	
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0	ppb

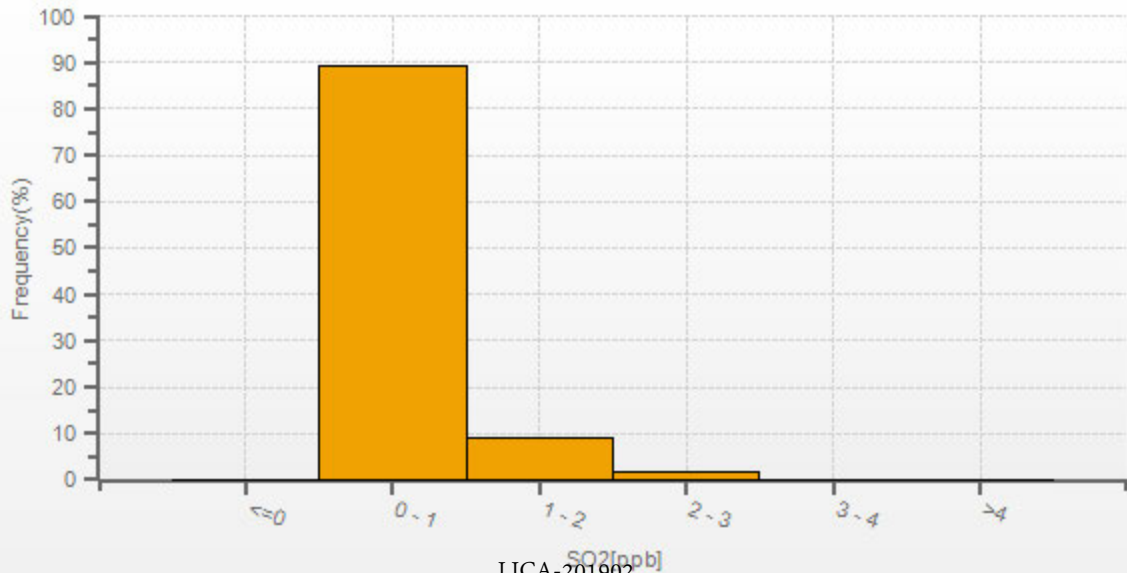
24 HR AVERAGES February 2019



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



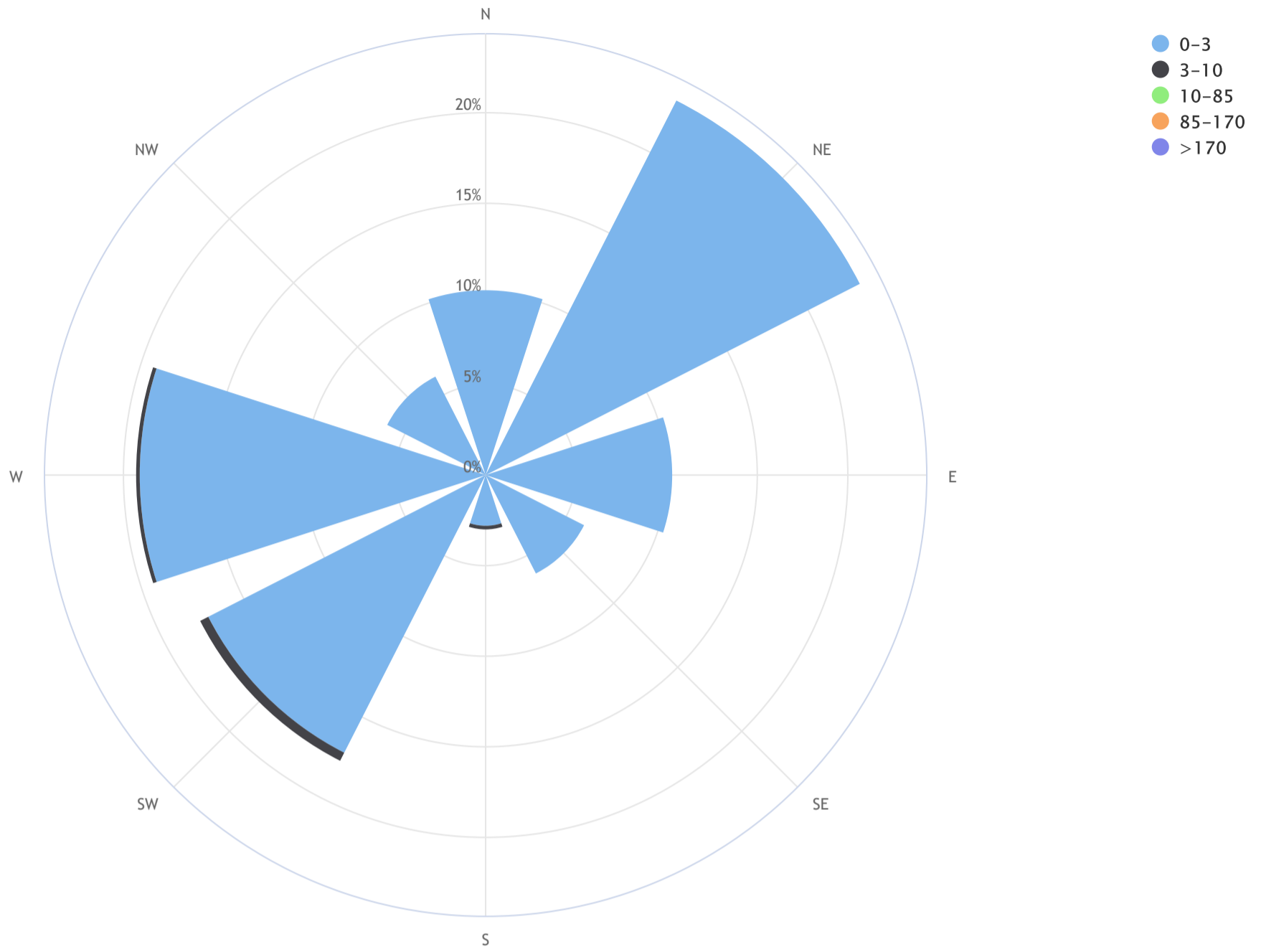
SO₂[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_SO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.0, CALM % = 4.2%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	10.2	0.0	0.0	0.0	0.0	10.2
NE	23.2	0.0	0.0	0.0	0.0	23.2
E	10.3	0.0	0.0	0.0	0.0	10.3
SE	6.1	0.0	0.0	0.0	0.0	6.1
S	2.8	0.2	0.0	0.0	0.0	3.0
SW	17.2	0.5	0.0	0.0	0.0	17.7
W	19.1	0.2	0.0	0.0	0.0	19.3
NW	6.1	0.0	0.0	0.0	0.0	6.1
Summary	95.0	0.8	0.0	0.0	0.0	95.8
CALM	4.2	0.0	0.0	0.0	0.0	4.2



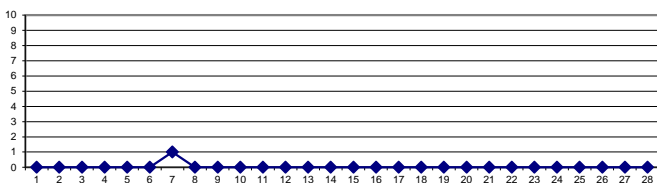
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

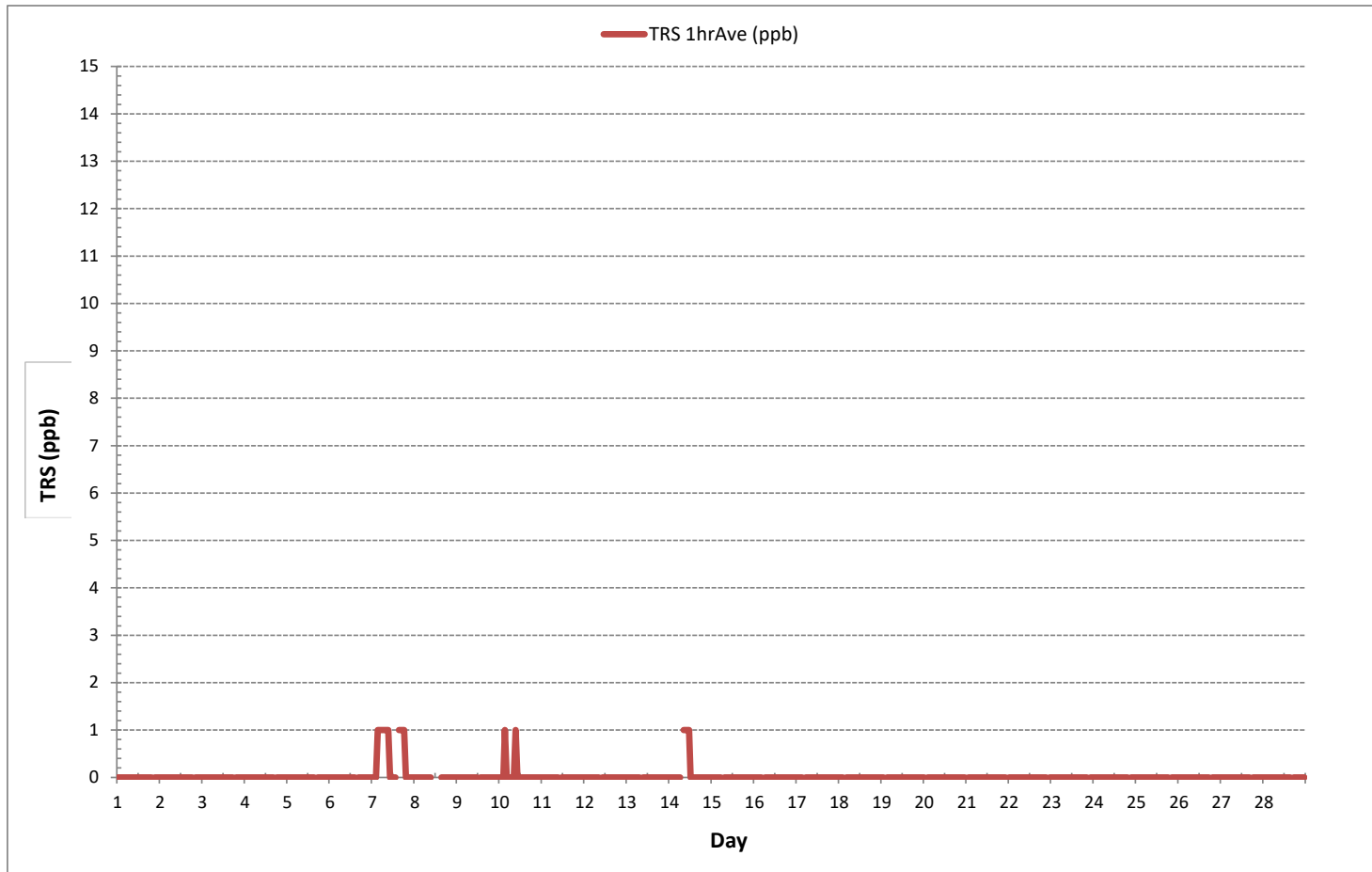
24 HR AVERAGES February 2019



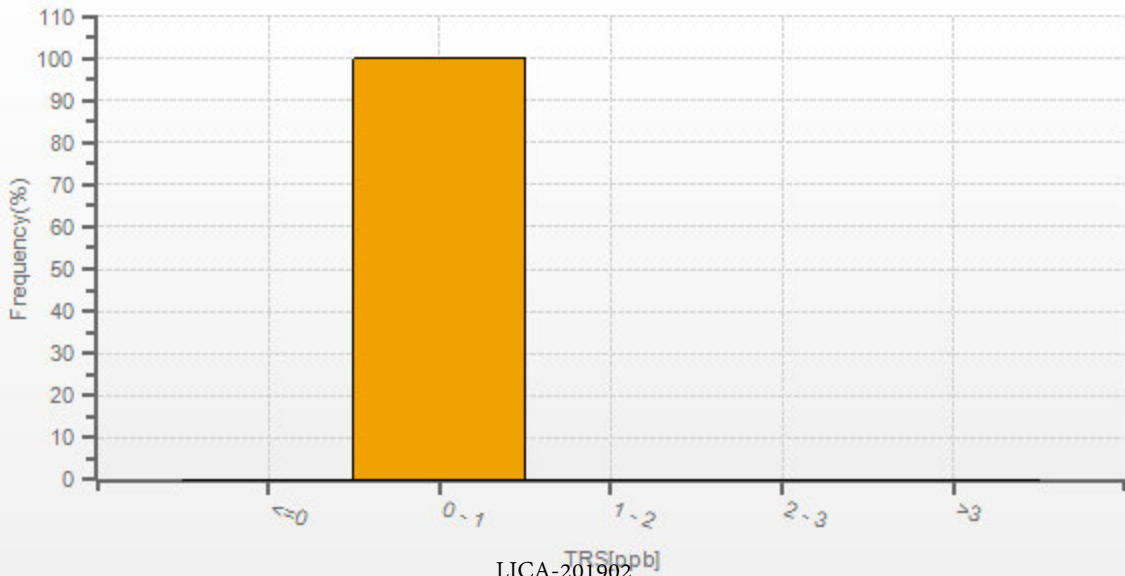
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	17				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	3	ON DAY	7
MAXIMUM 24-HR AVERAGE:	1	ppb		ON DAY	7
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



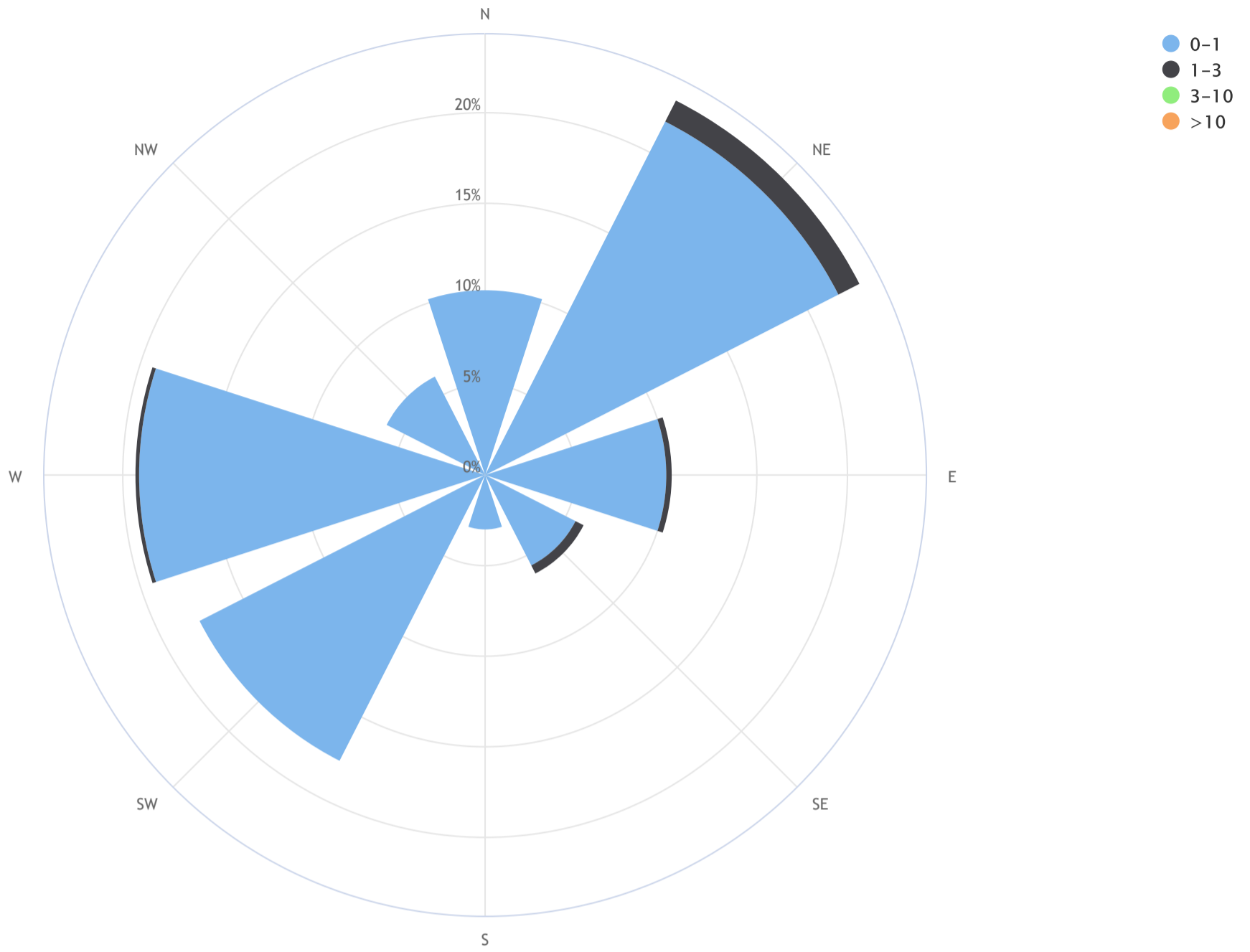
TRS[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_TRS (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.1, CALM % = 4.2%



Direction	0-1	1-3	3-10	>10	TOTAL
N	10.2	0.0	0.0	0.0	10.2
NE	21.9	1.3	0.0	0.0	23.2
E	10.0	0.3	0.0	0.0	10.3
SE	5.6	0.5	0.0	0.0	6.1
S	3.0	0.0	0.0	0.0	3.0
SW	17.7	0.0	0.0	0.0	17.7
W	19.1	0.2	0.0	0.0	19.3
NW	6.1	0.0	0.0	0.0	6.1
Summary	93.6	2.2	0.0	0.0	95.8
CALM	3.8	0.5	0.0	0.0	4.2



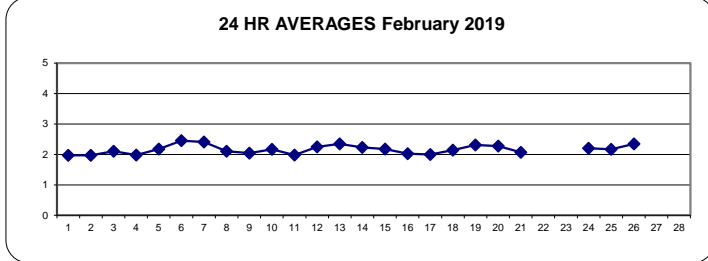
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.00	1.98	1.98	1.98	1.98	1.98	1.99	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.96	1.97	1.96	1.96	1.97	1.96	1.96	1.96	1.97	1.97	1.97	1.96	2.00	1.97	2.00	1.97	24			
2	1.96	1.96	1.97	1.97	1.96	1.96	1.96	1.95	1.96	1.96	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.99	2.00	2.04	2.06	1.95	2.06	1.97	24
3	2.09	2.12	2.17	2.15	2.16	2.20	2.21	2.24	2.23	2.26	2.31	2.15	1.97	1.97	1.97	1.98	1.97	2.00	S	2.08	2.08	2.11	2.00	1.97	1.97	1.97	1.97	2.31	2.10	2.10	2.4			
4	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.98	1.97	1.97	1.96	1.96	1.96	1.97	1.98	1.98	S	2.00	1.98	1.99	2.00	2.00	2.00	2.00	2.00	1.96	2.00	1.98	2.4					
5	2.04	2.06	2.05	2.07	2.07	2.09	2.11	2.10	2.14	2.32	2.41	2.35	2.19	2.07	2.03	2.09	S	2.19	2.19	2.22	2.28	2.35	2.36	2.39	2.03	2.41	2.18	2.4						
6	2.43	2.41	2.43	2.46	2.46	2.48	2.55	2.59	2.63	2.66	2.71	2.65	2.52	2.44	2.22	S	2.26	2.34	2.34	2.35	2.32	2.32	2.36	2.41	2.22	2.71	2.45	2.4						
7	2.41	2.40	2.45	2.51	2.52	2.51	2.48	2.53	2.47	2.38	2.59	C	C	C	C	C	2.37	2.31	2.34	2.37	2.29	2.26	2.45	2.33	2.32	2.26	2.59	2.41	2.4					
8	2.32	2.29	2.28	2.27	2.24	2.19	2.15	2.11	2.08	2.05	2.08	2.09	2.06	S	2.02	2.02	2.02	2.03	2.00	2.01	2.02	2.01	2.00	2.00	2.00	2.00	2.32	2.10	2.4					
9	2.00	2.00	2.01	2.01	2.05	2.05	2.07	2.08	2.08	2.07	2.00	1.99	S	1.98	1.99	1.99	1.99	2.00	2.03	2.03	2.06	2.10	2.16	2.25	1.98	2.25	2.04	2.4						
10	2.36	2.39	2.36	2.39	2.39	2.33	2.34	2.39	2.30	2.30	2.21	S	2.11	2.08	2.06	2.04	2.03	2.00	1.99	1.98	1.98	1.98	1.98	1.97	1.97	2.39	2.17	2.4						
11	1.97	1.96	1.97	1.98	1.98	1.98	1.97	1.97	1.97	1.96	S	1.97	1.98	1.98	1.98	1.98	1.96	1.97	2.00	2.00	2.01	2.01	2.02	2.01	1.96	2.02	1.98	2.4						
12	2.05	2.07	2.11	2.16	2.20	2.22	2.26	2.29	2.35	S	2.51	2.42	2.30	2.28	2.23	2.20	2.19	2.23	2.29	2.27	2.25	2.27	2.33	2.36	2.05	2.51	2.25	2.4						
13	2.41	2.46	2.42	2.48	2.47	2.48	2.46	2.45	S	2.87	2.81	2.67	2.41	2.38	2.23	2.12	2.11	2.09	2.08	2.08	2.10	2.13	2.13	2.17	2.08	2.87	2.35	2.4						
14	2.17	2.20	2.22	2.22	2.26	2.31	2.33	S	2.41	2.53	2.34	2.25	2.19	2.16	2.15	2.11	2.06	2.07	2.12	2.08	2.20	2.26	2.28	2.33	2.06	2.53	2.23	2.4						
15	2.34	2.46	2.35	2.34	2.40	2.42	S	2.41	2.41	2.26	2.16	2.15	2.10	2.09	2.04	2.07	2.05	2.02	2.00	2.00	2.06	2.09	2.05	1.99	1.99	2.46	2.18	2.4						
16	1.98	1.98	1.98	1.98	1.97	S	1.97	1.99	2.01	2.03	2.04	2.03	2.03	2.02	2.02	2.05	2.05	2.05	2.05	2.04	2.03	2.01	2.01	2.01	1.97	2.05	2.02	2.4						
17	2.02	2.01	2.02	2.02	S	2.00	2.00	2.00	1.99	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.00	2.01	2.02	2.00	2.02	2.00	1.98	2.02	2.00	2.00	2.4						
18	2.00	2.05	2.05	S	2.05	2.09	2.17	2.16	2.32	2.30	2.33	2.14	2.13	2.14	2.20	2.15	2.09	2.14	2.11	2.11	2.10	2.10	2.12	2.00	2.33	2.14	2.4							
19	2.13	2.16	S	2.21	2.22	2.23	2.26	2.28	2.31	2.39	2.30	2.21	2.19	2.19	2.14	2.16	2.21	2.45	2.43	2.40	2.45	2.53	2.58	2.61	2.13	2.61	2.31	2.4						
20	2.59	S	2.62	2.75	2.73	2.68	2.52	2.37	2.19	2.17	2.20	2.22	2.20	2.12	2.10	2.09	2.10	2.09	2.09	2.09	2.08	2.05	2.04	2.03	2.03	2.75	2.27	2.4						
21	S	2.04	2.03	2.05	2.06	2.07	2.09	2.10	2.30	2.18	2.04	1.99	1.98	1.99	2.00	2.00	2.03	2.03	2.06	2.06	2.10	2.10	2.13	S	1.98	2.30	2.07	2.4						
22	2.18	2.27	2.15	2.18	2.19	2.19	2.23	2.21	2.25	2.23	2.15	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	11	
23	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	2.00	2.01	2.03	2.03	2.03	2.04	2.04	2.04	S	2.11	2.11	2.00	2.11	-	12					
24	2.15	2.12	2.15	2.19	2.22	2.16	2.22	2.23	2.35	2.60	2.51	2.33	2.18	2.09	2.09	2.11	2.09	2.10	2.11	2.10	S	2.18	2.15	2.17	2.09	2.60	2.20	2.4						
25	2.12	2.13	2.15	2.16	2.16	2.22	2.21	2.19	2.22	2.18	2.14	2.10	2.11	2.09	2.07	2.07	2.06	2.07	2.10	S	2.15	2.15	2.19	2.83	2.06	2.83	2.17	2.4						
26	2.95	2.73	2.55	2.51	2.56	2.60	2.63	2.69	2.38	2.25	2.23	2.21	2.21	2.19	2.18	2.18	2.17	2.17	S	2.13	2.12	2.11	2.16	2.15	2.16	2.95	2.35	2.4						
27	2.17	2.14	2.11	2.08	2.08	2.06	2.05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.05	2.17	-	7					
28	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	0					
HOURLY MAX	2.95	2.73	2.62	2.75	2.73	2.68	2.63	2.69	2.63	2.87	2.81	2.67	2.52	2.44	2.23	2.37	2.31	2.45	2.43	2.40	2.45	2.53	2.58	2.83										
HOURLY AVG	2.19	2.17	2.18	2.20	2.21	2.22	2.21	2.22	2.22	2.25	2.25	2.17	2.12	2.09	2.07	2.07	2.07	2.10	2.10	2.10	2.12	2.14	2.14	2.18										

STATUS FLAG CODES

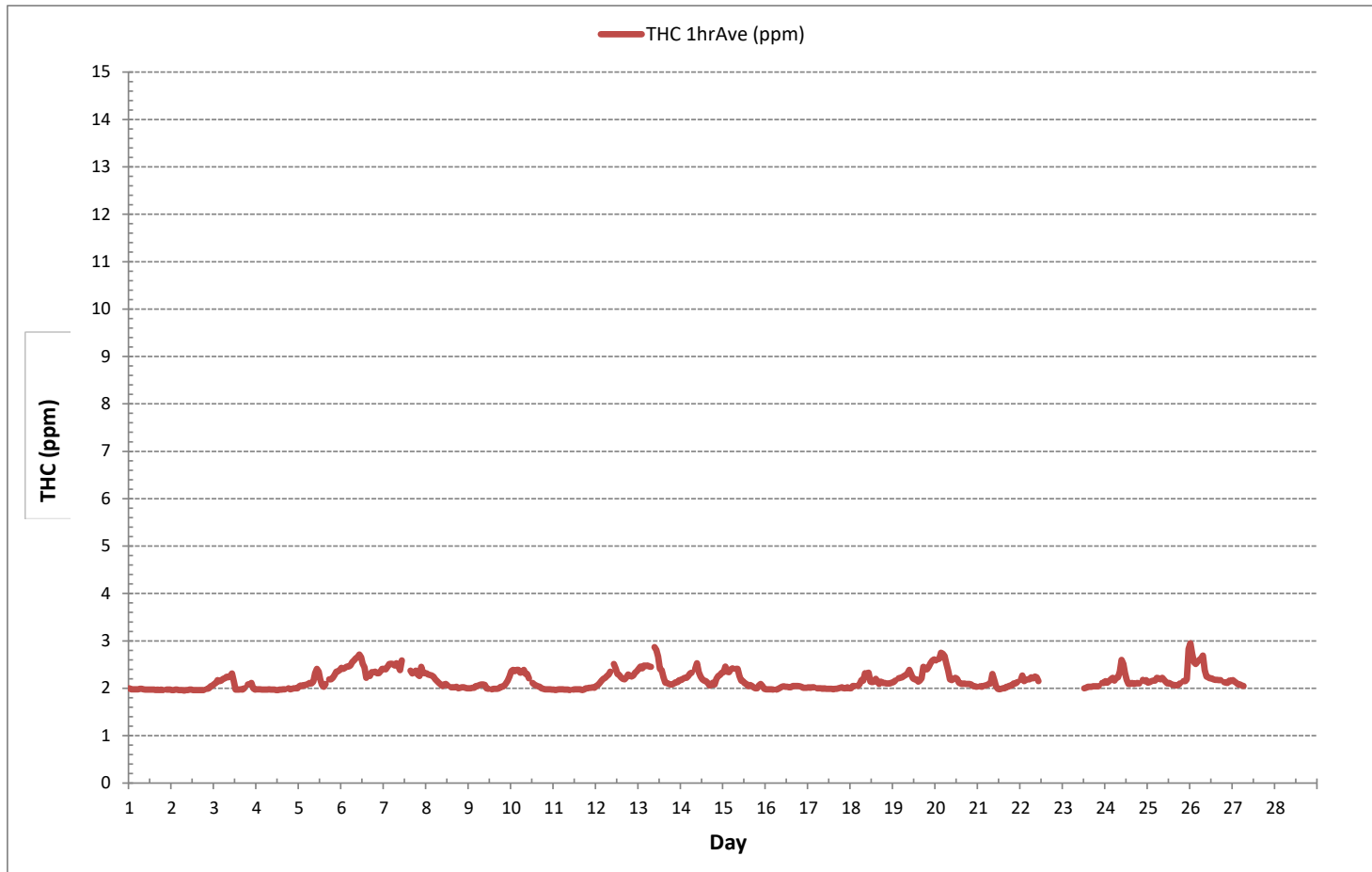
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES February 2019

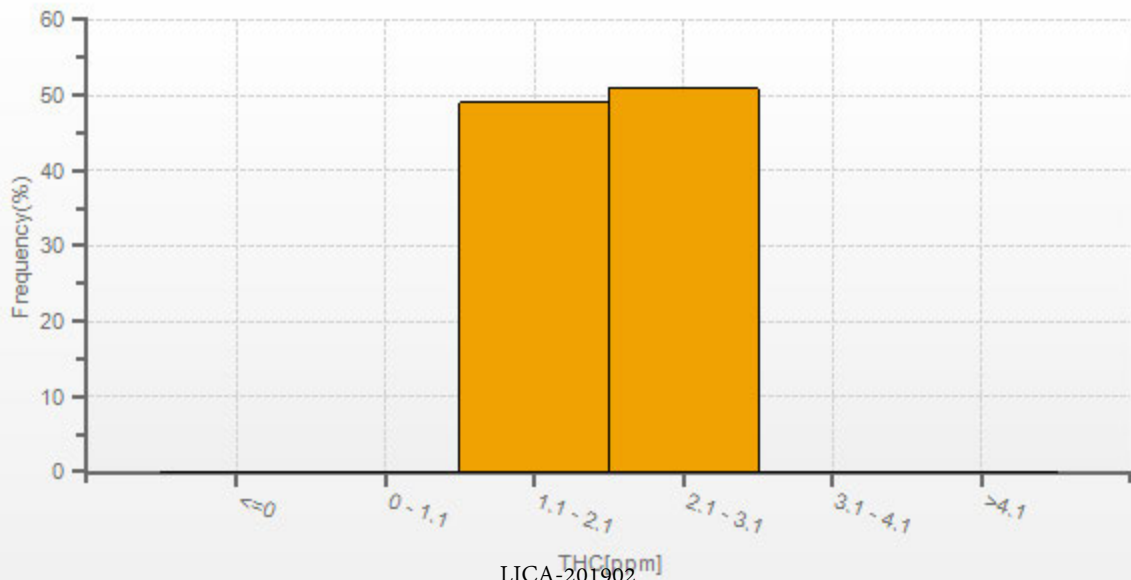


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	577		
MINIMUM 1-HR AVERAGE:	1.95 ppm	@ HOUR	7 ON DAY
MAXIMUM 1-HR AVERAGE:	2.95 ppm	@ HOUR	0 ON DAY
MAXIMUM 24-HR AVERAGE:	2.45 ppm		6 ON DAY
IZS CALIBRATION TIME:	25 hrs	OPERATIONAL TIME:	606 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	90.2 %
STANDARD DEVIATION:	0.19	MONTHLY AVERAGE:	2.16 ppm



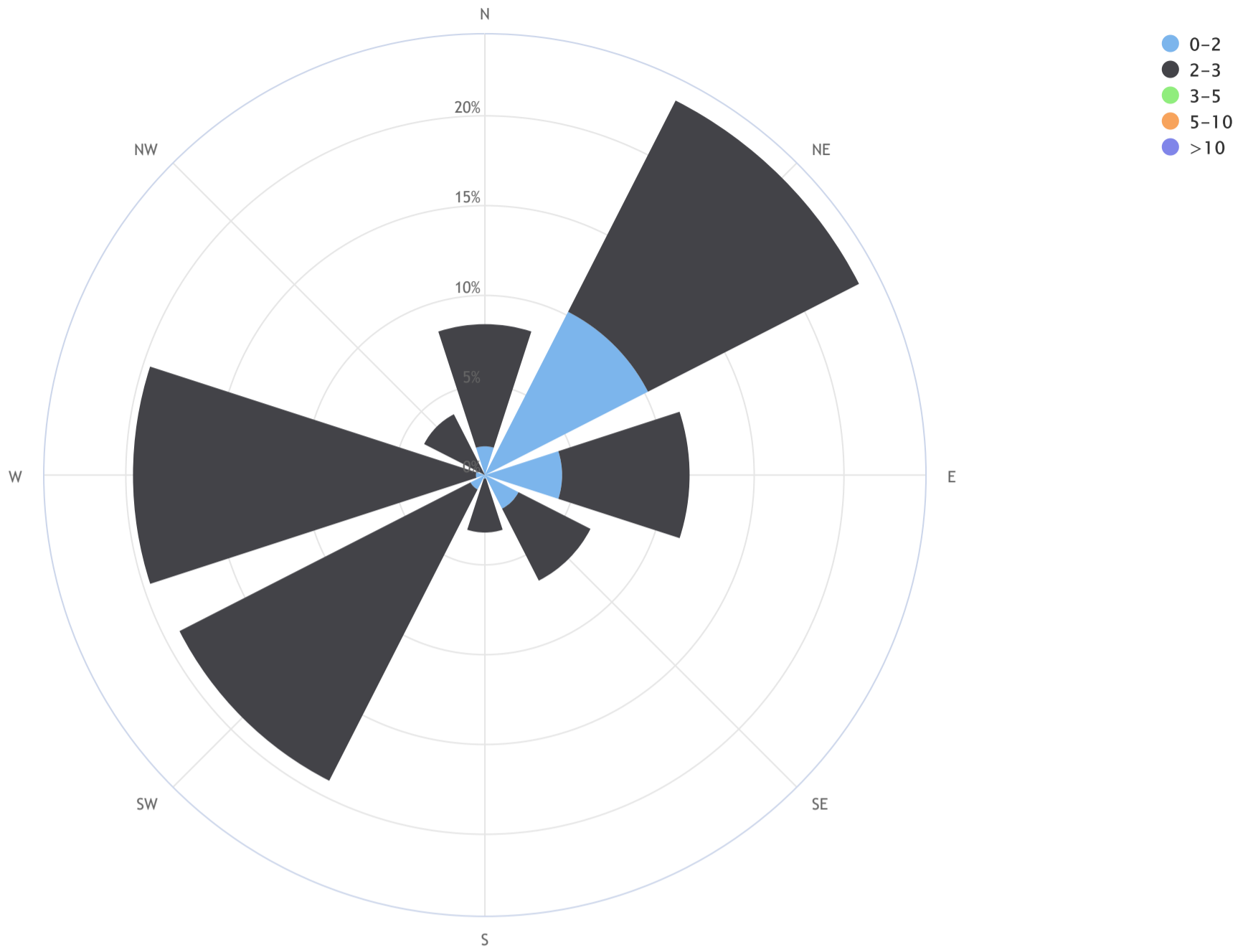
THC[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_THC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.4, CALM % = 4.7%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	1.6	6.8	0.0	0.0	0.0	8.3
NE	10.2	13.2	0.0	0.0	0.0	23.4
E	4.3	7.1	0.0	0.0	0.0	11.4
SE	2.1	4.5	0.0	0.0	0.0	6.6
S	0.2	3.0	0.0	0.0	0.0	3.1
SW	0.9	18.2	0.0	0.0	0.0	19.1
W	0.5	19.1	0.0	0.0	0.0	19.6
NW	0.0	3.8	0.0	0.0	0.0	3.8
Summary	19.8	75.6	0.0	0.0	0.0	95.3
CALM	0.0	4.7	0.0	0.0	0.0	4.7



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

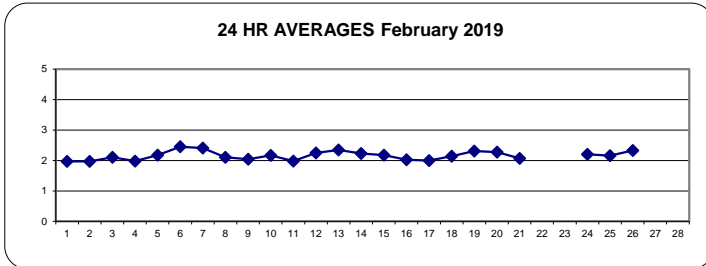
METHANE Hourly Averages (CH₄ ppm)

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	2.00	1.98	1.98	1.98	1.98	1.98	1.99	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.96	1.97	1.96	1.97	1.96	1.97	1.96	1.97	1.97	1.96	1.97	2.00	1.97	1.97	24
2	1.96	1.96	1.97	1.97	1.96	1.96	1.96	1.95	1.96	1.96	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	S	1.99	2.00	2.04	2.06	1.95	2.06	1.97	24
3	2.09	2.12	2.17	2.15	2.16	2.20	2.21	2.24	2.23	2.26	2.31	2.15	1.97	1.97	1.97	1.98	1.97	2.00	S	2.08	2.08	2.11	2.00	1.97	1.97	1.97	2.31	2.10	24	
4	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.96	1.96	1.97	1.97	1.98	1.98	S	2.00	1.98	1.99	2.00	2.00	2.00	1.96	2.00	1.98	24		
5	2.04	2.06	2.05	2.07	2.07	2.09	2.11	2.10	2.14	2.32	2.41	2.35	2.19	2.06	2.03	2.09	S	2.19	2.19	2.22	2.28	2.35	2.36	2.39	2.03	2.41	2.18	24		
6	2.43	2.41	2.43	2.46	2.46	2.48	2.55	2.59	2.63	2.66	2.71	2.65	2.52	2.44	2.22	S	2.26	2.34	2.34	2.35	2.32	2.32	2.36	2.41	2.22	2.71	2.45	24		
7	2.41	2.40	2.45	2.51	2.52	2.51	2.48	2.53	2.47	2.38	2.59	C	C	C	C	2.37	2.31	2.34	2.37	2.29	2.26	2.30	2.33	2.32	2.26	2.59	2.41	24		
8	2.32	2.29	2.28	2.27	2.24	2.18	2.15	2.11	2.08	2.05	2.08	2.09	2.06	S	2.02	2.02	2.02	2.01	2.00	2.01	2.02	2.01	2.00	2.01	2.00	2.00	2.32	2.10	24	
9	2.00	2.00	2.01	2.01	2.05	2.05	2.07	2.08	2.08	2.07	2.00	1.99	S	1.98	1.99	1.99	1.99	2.00	2.03	2.03	2.06	2.10	2.16	2.25	1.98	2.25	2.04	24		
10	2.36	2.39	2.36	2.39	2.39	2.33	2.34	2.39	2.30	2.30	2.21	S	2.11	2.08	2.06	2.04	2.03	2.00	1.99	1.98	1.98	1.98	1.98	1.97	1.97	2.39	2.17	24		
11	1.97	1.96	1.97	1.98	1.98	1.98	1.97	1.97	1.97	1.96	S	1.97	1.98	1.98	1.98	1.98	1.96	1.97	2.00	2.00	2.01	2.01	2.02	2.01	1.96	2.02	1.98	24		
12	2.05	2.07	2.11	2.16	2.20	2.22	2.26	2.29	2.35	S	2.51	2.42	2.30	2.28	2.23	2.20	2.19	2.23	2.26	2.27	2.25	2.27	2.33	2.36	2.05	2.51	2.25	24		
13	2.41	2.46	2.42	2.48	2.47	2.48	2.46	2.45	S	2.87	2.81	2.67	2.41	2.38	2.23	2.12	2.10	2.09	2.08	2.08	2.10	2.13	2.13	2.17	2.08	2.87	2.35	24		
14	2.17	2.20	2.22	2.22	2.26	2.31	2.33	S	2.41	2.53	2.34	2.25	2.19	2.16	2.15	2.11	2.06	2.07	2.12	2.08	2.14	2.26	2.28	2.33	2.06	2.53	2.23	24		
15	2.34	2.46	2.35	2.34	2.40	2.42	S	2.41	2.40	2.26	2.16	2.15	2.10	2.09	2.04	2.07	2.05	2.02	2.00	2.00	2.06	2.09	2.05	1.99	1.99	2.46	2.18	24		
16	1.98	1.98	1.98	1.98	1.97	S	1.97	1.99	2.01	2.03	2.04	2.03	2.03	2.02	2.02	2.05	2.05	2.05	2.05	2.04	2.03	2.01	2.01	2.01	1.97	2.05	2.02	24		
17	2.02	2.01	2.02	2.02	S	2.00	2.00	2.00	1.99	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.00	2.01	2.02	2.00	2.02	2.00	1.98	1.98	2.02	2.00	24		
18	2.00	2.05	2.05	S	2.05	2.09	2.17	2.16	2.32	2.30	2.33	2.14	2.13	2.14	2.20	2.15	2.09	2.14	2.11	2.11	2.10	2.10	2.12	2.00	2.33	2.14	24			
19	2.13	2.16	S	2.21	2.22	2.23	2.26	2.28	2.31	2.39	2.30	2.21	2.19	2.19	2.14	2.16	2.21	2.45	2.42	2.40	2.45	2.53	2.58	2.61	2.13	2.61	2.31	24		
20	2.59	S	2.62	2.75	2.73	2.68	2.52	2.37	2.19	2.17	2.20	2.22	2.20	2.12	2.10	2.09	2.10	2.09	2.09	2.09	2.08	2.05	2.04	2.03	2.03	2.03	2.75	2.27	24	
21	S	2.04	2.03	2.05	2.06	2.07	2.09	2.10	2.30	2.18	2.04	1.99	1.98	1.99	2.00	2.00	2.03	2.03	2.06	2.06	2.09	2.10	2.13	S	1.98	2.30	2.07	24		
22	2.18	2.27	2.15	2.18	2.19	2.19	2.23	2.21	2.25	2.23	2.15	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.15	2.27	-	11
23	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	2.00	2.01	2.03	2.03	2.03	2.04	2.04	2.04	S	2.11	2.11	2.00	2.11	-	12	
24	2.15	2.12	2.14	2.19	2.22	2.16	2.22	2.22	2.34	2.58	2.51	2.33	2.18	2.09	2.09	2.11	2.09	2.10	2.11	2.10	S	2.17	2.15	2.17	2.09	2.58	2.20	24		
25	2.12	2.13	2.15	2.16	2.16	2.21	2.21	2.19	2.21	2.18	2.14	2.10	2.09	2.09	2.07	2.07	2.05	2.07	2.10	S	2.14	2.15	2.19	2.75	2.05	2.75	2.16	24		
26	2.85	2.66	2.51	2.48	2.53	2.56	2.59	2.64	2.36	2.23	2.21	2.20	2.20	2.18	2.17	2.16	2.15	2.15	S	2.12	2.12	2.11	2.16	2.15	2.11	2.85	2.33	24		
27	2.17	2.14	2.11	2.08	2.07	2.06	2.05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.05	2.17	-	7	
28	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	0	
HOURLY MAX	2.85	2.66	2.62	2.75	2.73	2.68	2.59	2.64	2.63	2.87	2.81	2.67	2.52	2.44	2.23	2.37	2.31	2.45	2.42	2.40	2.45	2.53	2.58	2.75						
HOURLY AVG	2.19	2.17	2.18	2.20	2.21	2.22	2.21	2.22	2.22	2.24	2.25	2.17	2.12	2.09	2.07	2.07	2.07	2.10	2.10	2.10	2.11	2.13	2.14	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

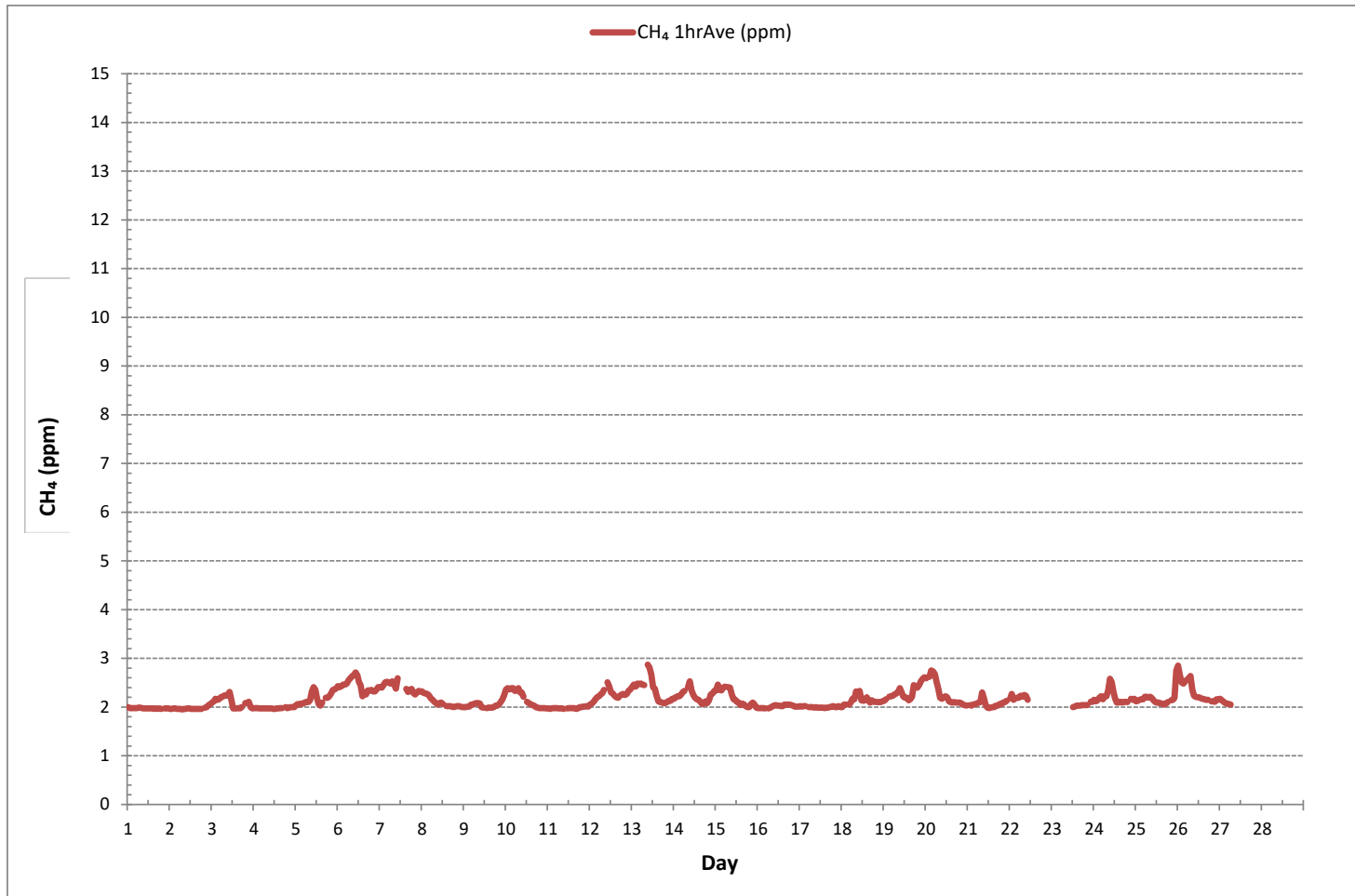
24 HR AVERAGES February 2019



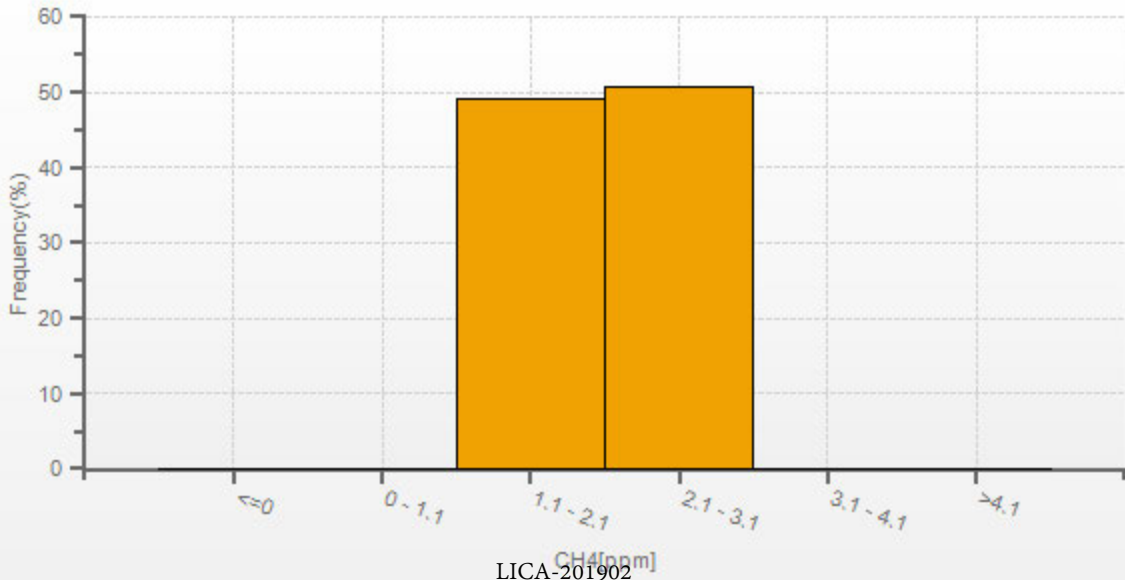
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	577			
MINIMUM 1-HR AVERAGE:	1.95 ppm	@ HOUR	7	ON DAY 2
MAXIMUM 1-HR AVERAGE:	2.87 ppm	@ HOUR	9	ON DAY 13
MAXIMUM 24-HR AVERAGE:	2.45 ppm			ON DAY 6
IZS CALIBRATION TIME:	25 hrs	OPERATIONAL TIME:	606 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	90.2 %	
STANDARD DEVIATION:	0.18	MONTHLY AVERAGE:	2.16 ppm	

METHANE Hourly Averages (CH₄ ppm)

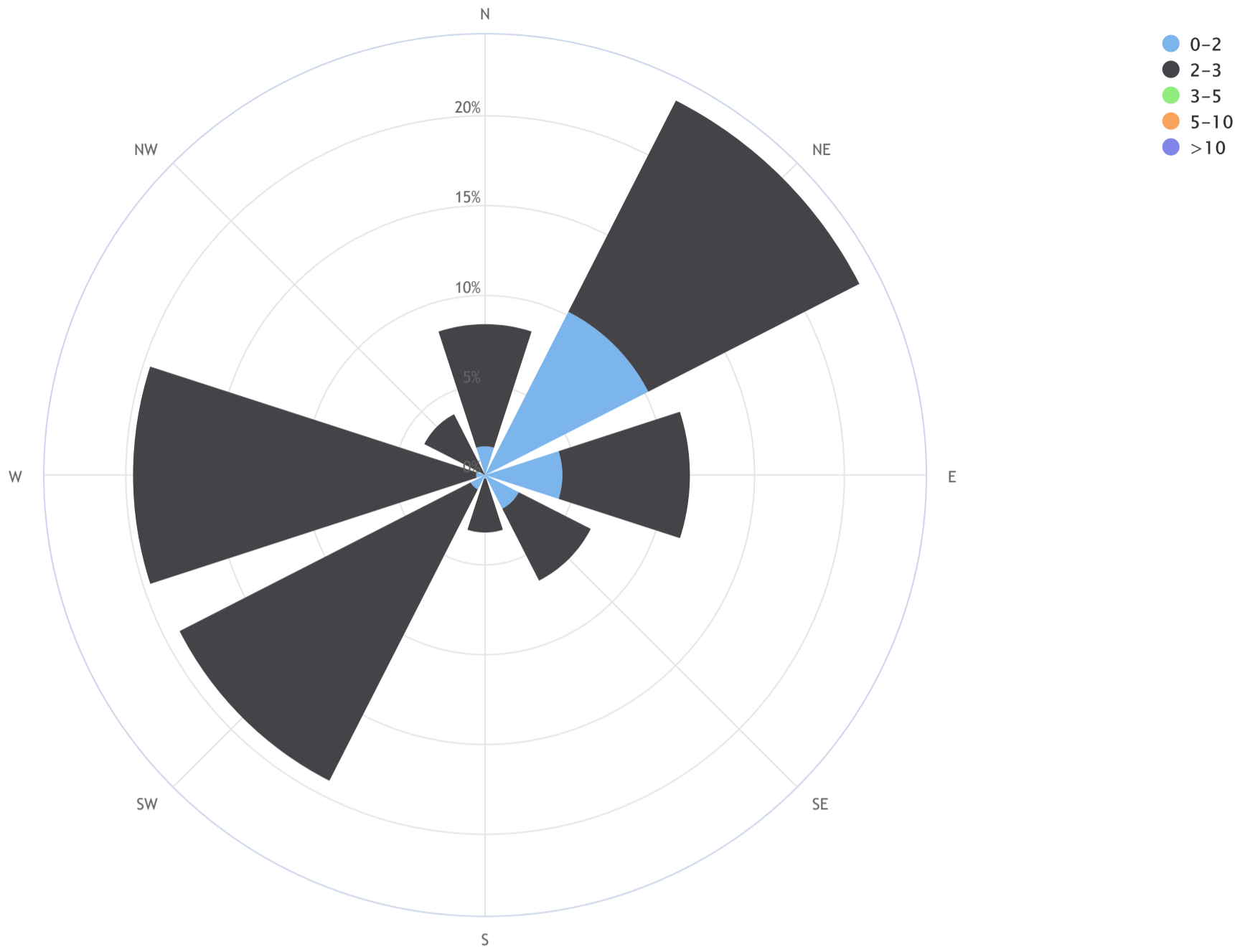


CH4[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



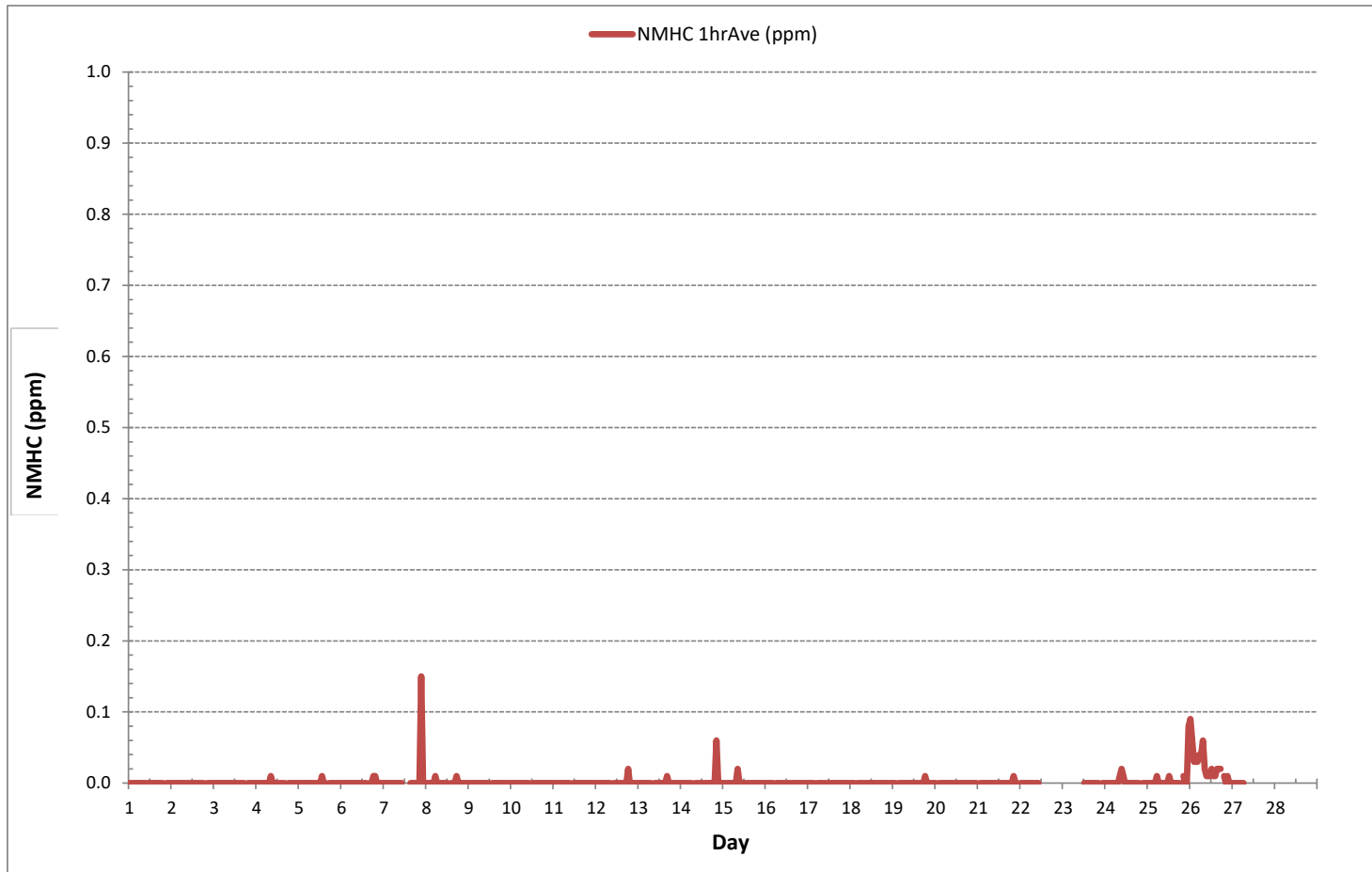
Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_CH4 (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.4, CALM % = 4.7%

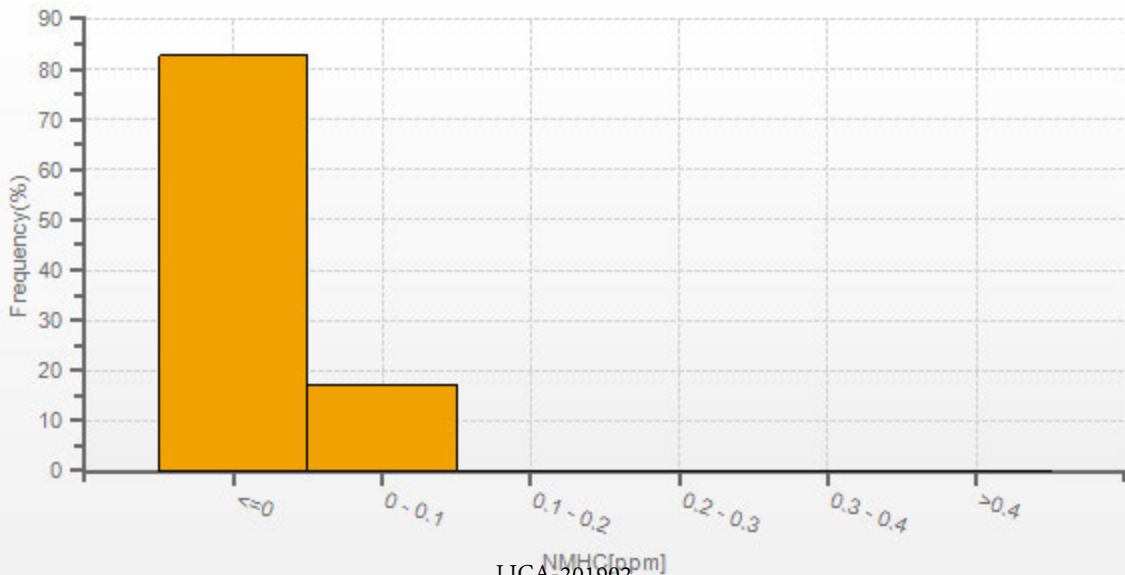


Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	1.6	6.8	0.0	0.0	0.0	8.3
NE	10.2	13.2	0.0	0.0	0.0	23.4
E	4.3	7.1	0.0	0.0	0.0	11.4
SE	2.1	4.5	0.0	0.0	0.0	6.6
S	0.2	3.0	0.0	0.0	0.0	3.1
SW	0.9	18.2	0.0	0.0	0.0	19.1
W	0.5	19.1	0.0	0.0	0.0	19.6
NW	0.0	3.8	0.0	0.0	0.0	3.8
Summary	19.8	75.6	0.0	0.0	0.0	95.3
CALM	0.0	4.7	0.0	0.0	0.0	4.7

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



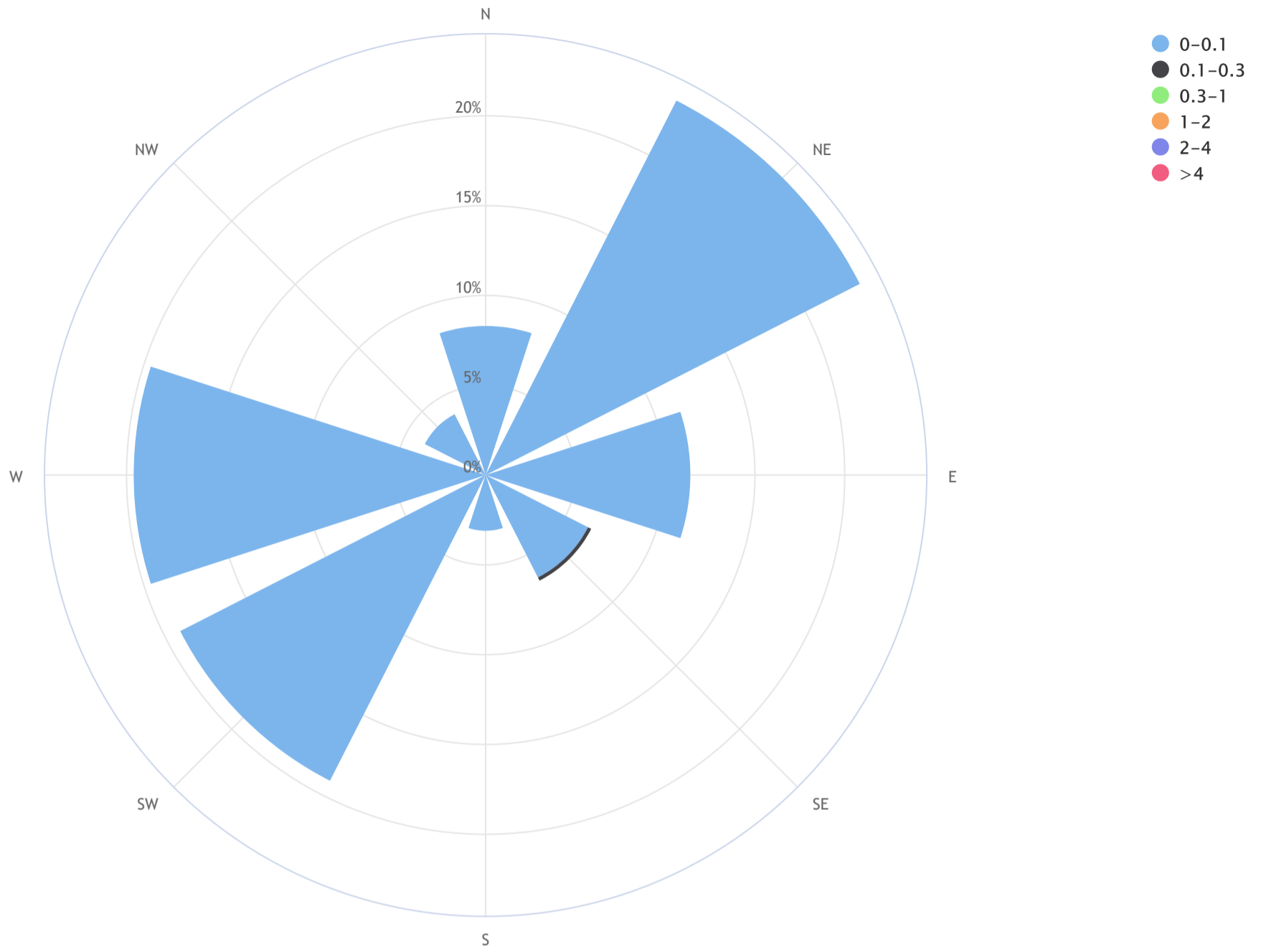
NMHC[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NMHC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.0, CALM % = 4.7%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	8.3	0.0	0.0	0.0	0.0	0.0	8.3
NE	23.4	0.0	0.0	0.0	0.0	0.0	23.4
E	11.4	0.0	0.0	0.0	0.0	0.0	11.4
SE	6.4	0.2	0.0	0.0	0.0	0.0	6.6
S	3.1	0.0	0.0	0.0	0.0	0.0	3.1
SW	19.1	0.0	0.0	0.0	0.0	0.0	19.1
W	19.6	0.0	0.0	0.0	0.0	0.0	19.6
NW	3.8	0.0	0.0	0.0	0.0	0.0	3.8
Summary	95.1	0.2	0.0	0.0	0.0	0.0	95.3
CALM	4.7	0.0	0.0	0.0	0.0	0.0	4.7



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

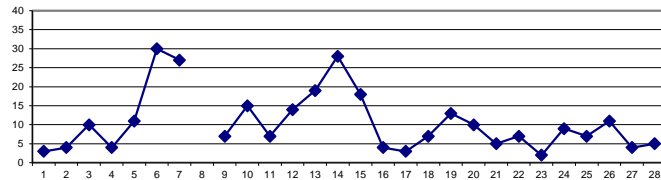
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	2	2	2	3	3	4	4	4	3	2	2	2	2	2	3	2	3	3	S	2	2	2	2	2	2	4	3	24
2	2	2	2	2	3	3	3	4	5	4	2	2	1	1	1	1	1	3	4	S	7	12	13	16	1	16	4	24	
3	10	11	22	13	12	15	14	15	14	13	17	12	3	3	2	4	4	6	S	9	9	9	4	2	2	22	10	24	
4	2	3	2	2	3	4	4	5	7	3	4	3	3	5	7	4	5	S	8	3	3	5	3	4	2	8	4	24	
5	3	2	3	4	6	5	8	11	13	20	24	19	14	10	5	9	S	12	11	11	12	13	15	15	2	24	11	24	
6	16	21	21	22	25	29	31	32	34	41	45	38	37	26	7	S	22	45	32	30	36	35	33	40	7	45	30	24	
7	40	42	48	49	45	48	51	48	46	44	9	10	12	11	S	11	16	28	31	19	5	7	4	4	4	51	27	24	
8	6	6	6	6	6	9	10	11	9	6	C	C	C	C	C	C	C	10	9	9	5	3	3	3	3	11	-	24	
9	3	5	5	3	4	3	4	6	15	19	5	4	S	2	2	2	3	8	7	11	6	7	24	17	2	24	7	24	
10	27	33	36	34	30	29	21	21	27	28	11	S	6	5	5	5	6	5	5	4	4	4	4	4	4	36	15	24	
11	3	2	2	2	3	6	5	10	7	6	S	4	3	4	3	4	8	10	14	15	15	10	12	10	2	15	7	24	
12	10	9	10	17	11	10	14	21	37	S	16	S1	11	13	11	11	10	13	23	21	12	11	10	11	9	37	14	23	
13	11	11	13	14	14	15	22	39	S	55	38	27	22	17	18	12	12	15	16	12	14	13	15	11	11	55	19	24	
14	11	11	13	16	22	28	31	S	60	93	55	33	18	12	14	11	11	17	27	19	29	40	33	35	11	93	28	24	
15	31	29	39	30	28	25	S	33	38	30	14	11	8	6	5	5	7	7	8	13	13	12	14	6	5	39	18	24	
16	6	5	6	6	4	S	5	7	4	4	3	3	3	3	2	3	3	3	3	3	3	3	2	2	2	7	4	24	
17	2	3	3	2	S	4	2	2	3	2	2	2	2	2	2	3	3	6	8	8	3	4	4	3	2	8	3	24	
18	3	4	4	S	5	10	17	23	23	13	7	4	5	5	5	3	5	6	5	4	4	4	4	4	3	23	7	24	
19	4	4	S	6	6	6	7	7	9	11	12	13	12	12	10	10	12	14	17	19	19	24	39	33	4	39	13	24	
20	24	S	26	29	22	20	21	17	9	7	6	5	5	4	4	4	4	4	4	2	3	3	3	3	2	29	10	24	
21	S	3	3	3	2	3	12	15	19	14	8	5	3	2	2	3	3	3	2	2	4	5	3	S	2	19	5	24	
22	4	3	4	7	6	6	23	17	6	8	5	4	5	5	6	6	6	6	9	6	4	S	3	3	23	7	24		
23	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	2	2	2	2	2	4	S	8	9	1	9	2	24	
24	10	8	11	16	16	11	14	11	11	17	16	12	7	4	4	3	3	3	4	5	S	5	5	6	3	17	9	24	
25	7	6	5	7	6	6	10	7	11	11	10	7	7	5	4	3	3	3	4	S	7	8	5	8	3	11	7	24	
26	8	8	8	8	8	8	10	14	13	17	16	15	14	13	13	13	15	12	S	8	11	11	8	8	8	17	11	24	
27	7	7	6	5	5	4	5	5	4	3	3	2	3	3	3	3	2	S	3	2	4	5	5	5	2	7	4	24	
28	5	2	2	2	2	4	14	9	26	10	2	3	2	3	3	3	S	4	4	3	2	2	1	1	1	26	5	24	
HOURLY MAX	40	42	48	49	45	48	51	48	60	93	55	38	37	26	18	13	22	45	32	30	36	40	39	40					
HOURLY AVG	10	9	11	11	11	12	13	15	17	18	13	10	8	7	6	6	7	9	10	10	9	10	10	10					

STATUS FLAG CODES

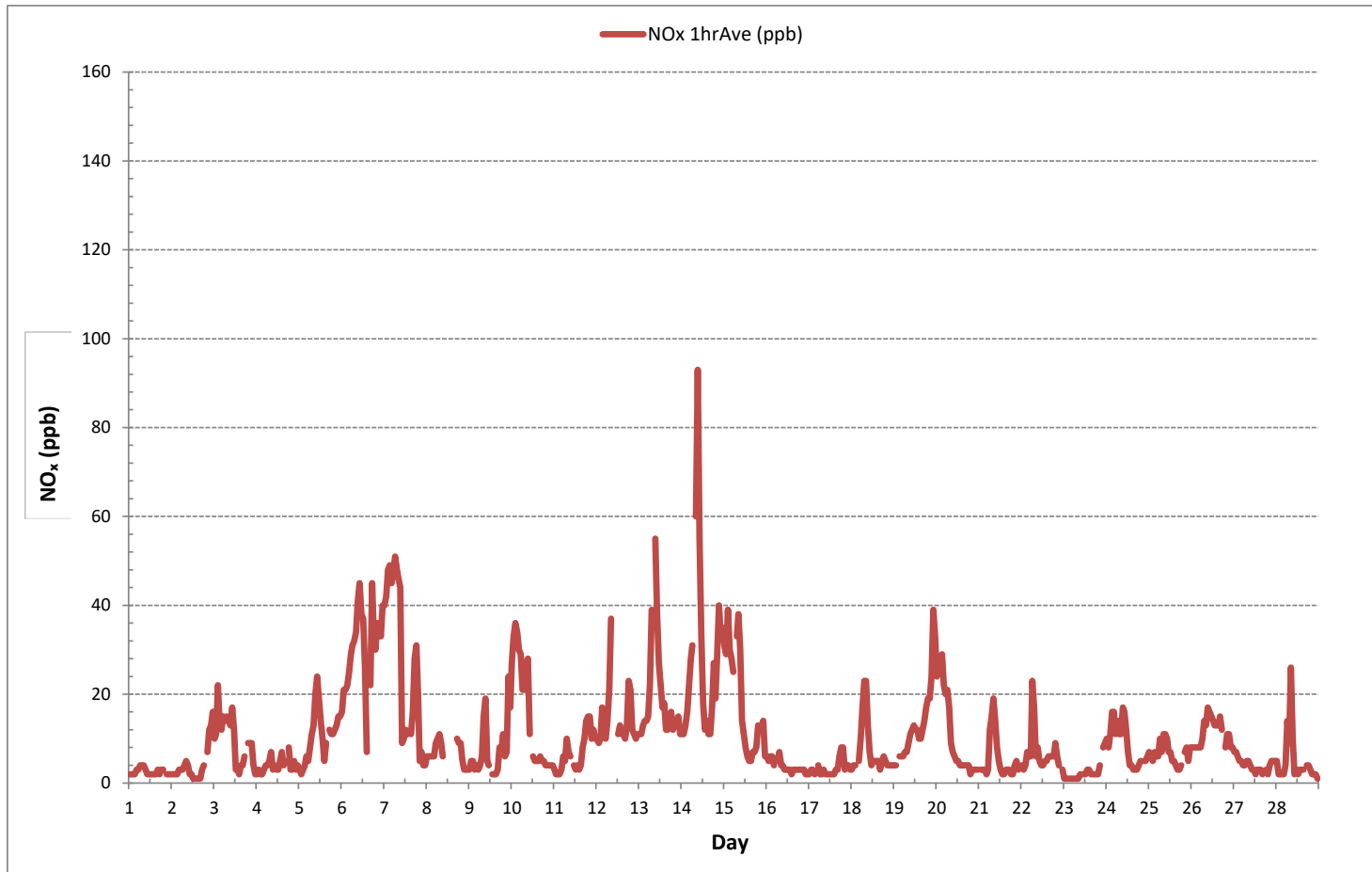
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES February 2019

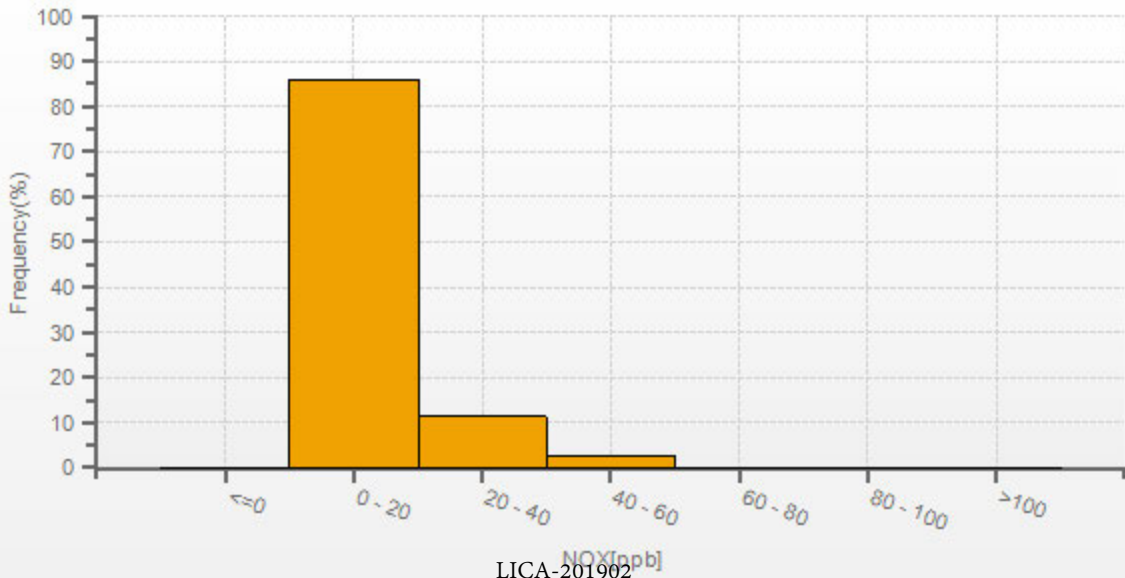


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	636				
MINIMUM 1-HR AVERAGE:	1	ppb @ HOUR	12	ON DAY 2	
MAXIMUM 1-HR AVERAGE:	93	ppb @ HOUR	9	ON DAY 14	
MAXIMUM 24-HR AVERAGE:	30	ppb		ON DAY 6	
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	671	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	11		MONTHLY AVERAGE:	10	ppb



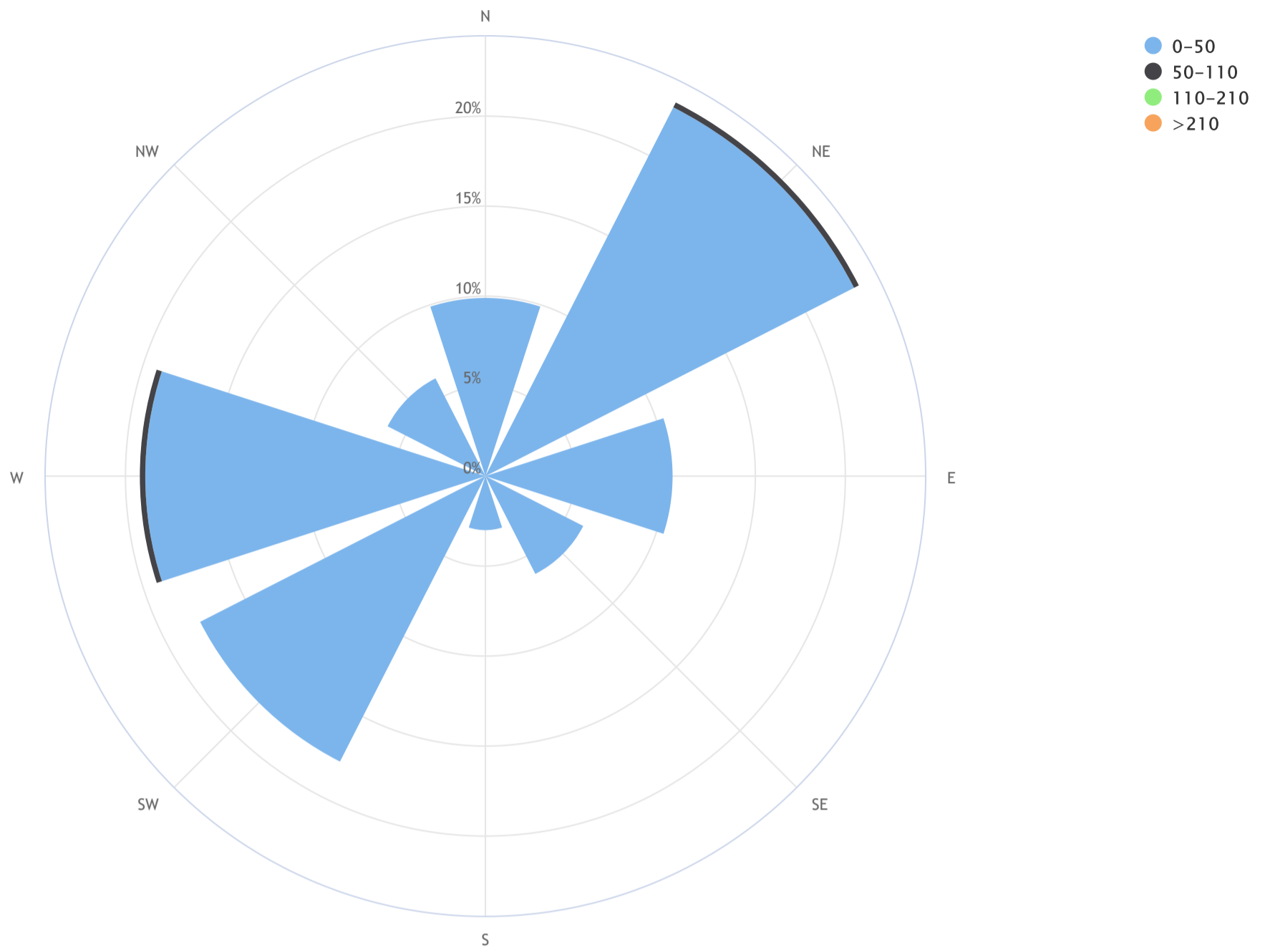
NOX[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO_x (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 23.1, CALM % = 4.2%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.9	0.0	0.0	0.0	9.9
NE	23.0	0.3	0.0	0.0	23.3
E	10.4	0.0	0.0	0.0	10.4
SE	6.1	0.0	0.0	0.0	6.1
S	3.0	0.0	0.0	0.0	3.0
SW	17.8	0.0	0.0	0.0	17.8
W	18.9	0.3	0.0	0.0	19.2
NW	6.1	0.0	0.0	0.0	6.1
Summary	95.1	0.6	0.0	0.0	95.8
CALM	4.1	0.2	0.0	0.0	4.3



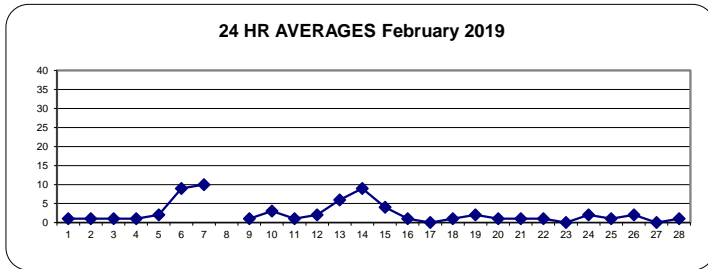
NITRIC OXIDE Hourly Averages (NO ppb)

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	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	1	1	24
2	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	S	0	0	0	1	0	0	1	1	24
3	0	0	2	0	0	0	0	1	2	5	8	5	1	1	0	1	1	0	S	0	0	0	1	1	0	0	8	1	24
4	1	1	1	1	1	1	1	1	2	1	1	1	2	2	1	1	S	1	0	0	0	0	0	1	0	0	2	1	24
5	0	0	0	0	0	0	0	0	3	9	13	10	7	4	2	2	S	1	0	0	0	0	0	0	0	0	13	2	24
6	0	0	0	0	1	2	4	6	13	23	27	23	22	14	3	S	6	13	5	6	8	8	7	12	0	0	27	9	24
7	13	15	20	21	17	21	23	20	23	26	4	5	6	6	S	4	3	3	4	1	0	1	0	0	0	0	26	10	24
8	0	0	0	0	0	1	1	2	2	2	C	C	C	C	C	C	C	2	0	0	0	1	1	0	0	0	2	-	24
9	0	1	0	0	0	0	0	0	3	8	2	2	S	1	1	0	0	0	0	2	0	0	3	1	0	0	8	1	24
10	3	5	7	6	4	3	0	1	9	13	5	S	3	2	1	1	1	1	1	0	0	0	0	0	0	0	13	3	24
11	0	0	0	0	0	1	1	2	1	1	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	1	24
12	0	0	0	1	0	0	0	2	16	S	7	S1	6	6	5	4	2	1	1	2	0	0	0	0	0	0	16	2	23
13	0	0	0	0	0	0	2	14	S	35	23	16	13	9	8	4	2	1	0	0	1	0	0	0	0	0	35	6	24
14	0	0	0	0	1	4	6	S	35	62	34	20	9	6	7	4	2	1	3	0	2	8	5	8	0	0	62	9	24
15	4	4	10	3	4	3	S	12	17	14	6	5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	17	4	24
16	1	0	1	1	1	S	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	1	1	24
17	0	0	0	0	S	1	0	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	0	24
18	0	0	0	S	0	0	0	1	2	8	6	4	2	2	2	2	1	0	0	0	0	0	0	0	0	0	8	1	24
19	0	0	S	0	0	0	0	0	1	3	4	5	4	4	3	2	2	1	1	0	0	1	8	5	0	0	8	2	24
20	1	S	2	4	1	1	2	1	1	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	4	1	24
21	S	0	0	0	0	0	0	1	5	4	3	2	1	1	1	1	1	1	0	0	0	0	0	S	0	0	5	1	24
22	0	0	0	0	0	0	2	2	1	2	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	2	1	24
23	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	1	0	24
24	0	0	0	1	0	0	0	1	4	8	9	6	3	2	1	1	1	0	0	0	S	0	0	0	0	0	9	2	24
25	0	0	0	1	0	0	0	1	3	4	4	3	3	2	2	1	1	0	0	S	0	0	0	0	0	0	4	1	24
26	0	0	0	0	0	0	0	2	3	6	7	6	6	5	4	3	2	1	S	0	1	0	0	0	0	0	7	2	24
27	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	0	S	0	0	0	0	1	1	0	0	1	0	24
28	0	0	0	0	0	0	1	1	9	4	1	1	1	1	1	1	S	1	0	0	0	0	0	0	0	0	9	1	24
HOURLY MAX	13	15	20	21	17	21	23	20	35	62	34	23	22	14	8	4	6	13	5	6	8	8	8	12					
HOURLY AVG	1	1	2	1	1	1	2	3	6	9	7	5	4	3	2	2	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

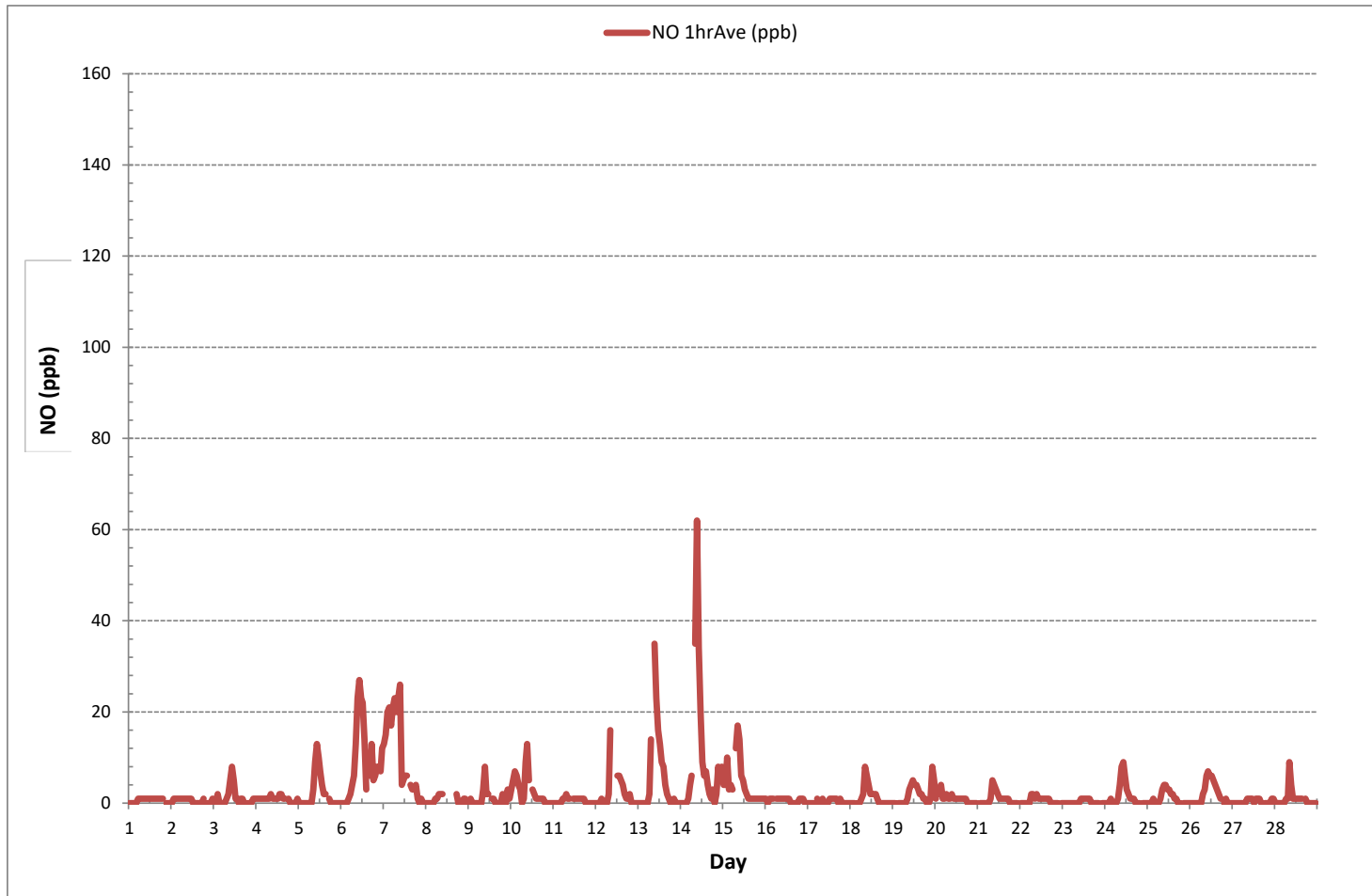
24 HR AVERAGES February 2019



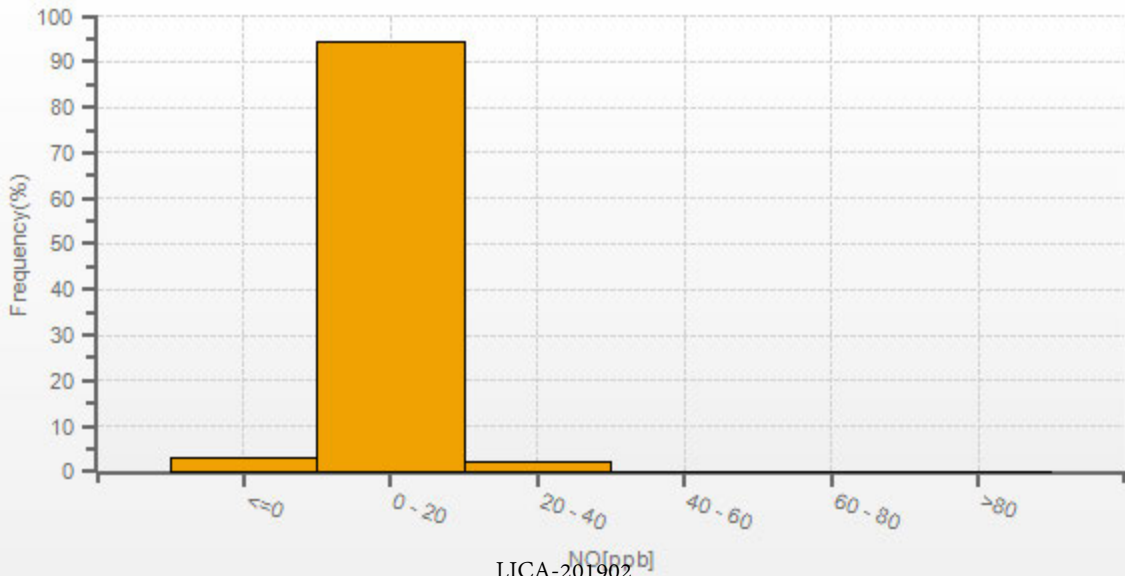
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	365			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	62	ppb @ HOUR	9	ON DAY 14
MAXIMUM 24-HR AVERAGE:	10	ppb		ON DAY 7
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	671 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	2 ppb

NITRIC OXIDE Hourly Averages (NO ppb)



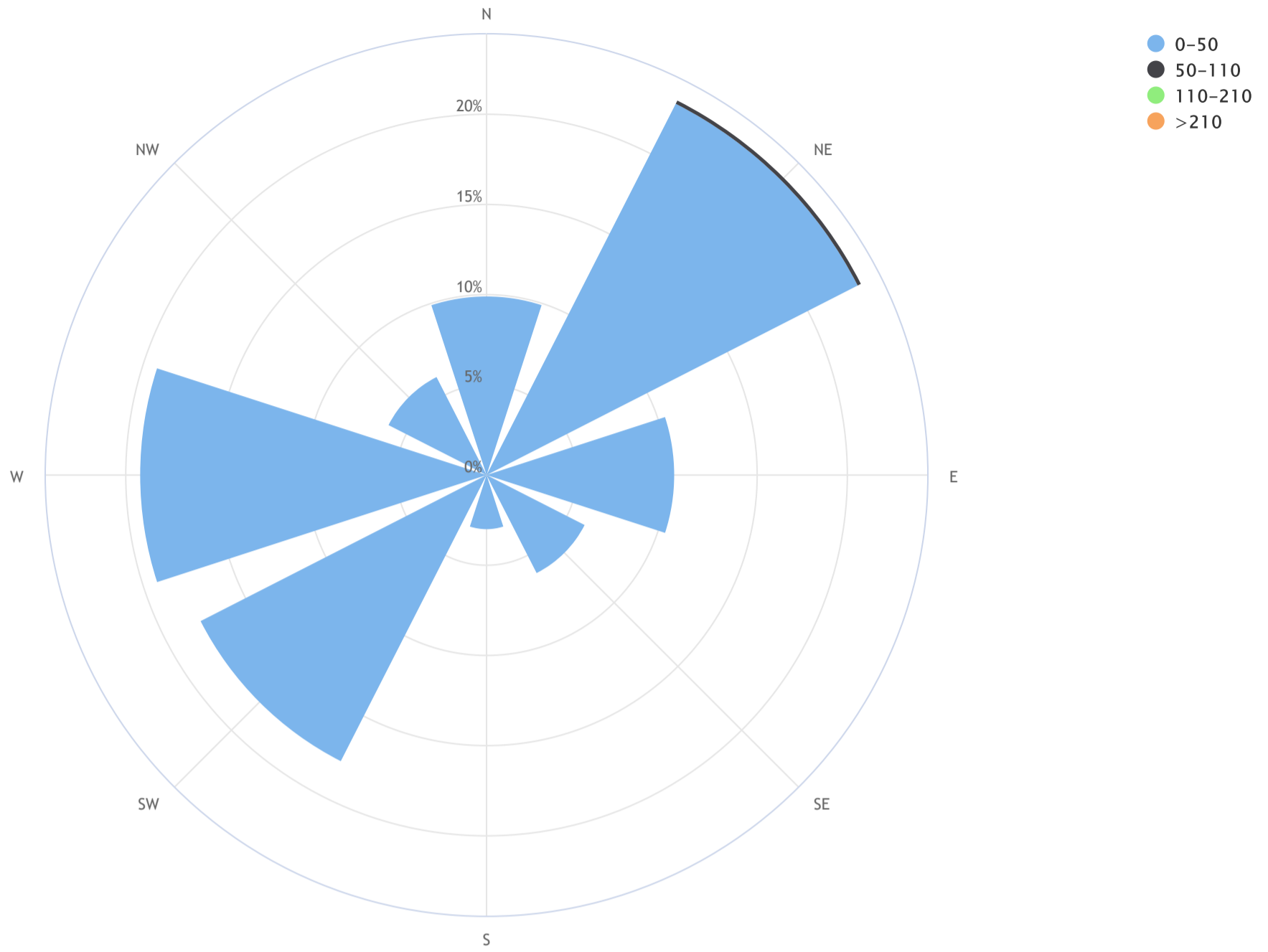
NO[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 4.4, CALM % = 4.2%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.9	0.0	0.0	0.0	9.9
NE	23.1	0.2	0.0	0.0	23.3
E	10.4	0.0	0.0	0.0	10.4
SE	6.1	0.0	0.0	0.0	6.1
S	3.0	0.0	0.0	0.0	3.0
SW	17.8	0.0	0.0	0.0	17.8
W	19.2	0.0	0.0	0.0	19.2
NW	6.1	0.0	0.0	0.0	6.1
Summary	95.6	0.2	0.0	0.0	95.8
CALM	4.3	0.0	0.0	0.0	4.3

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

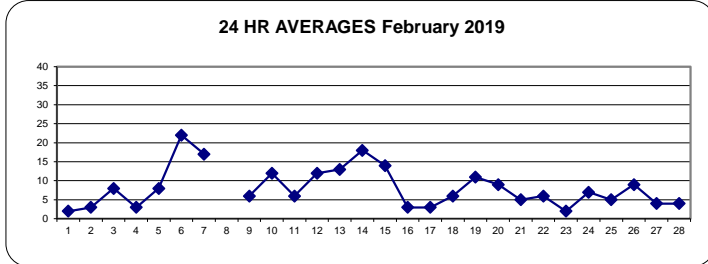
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

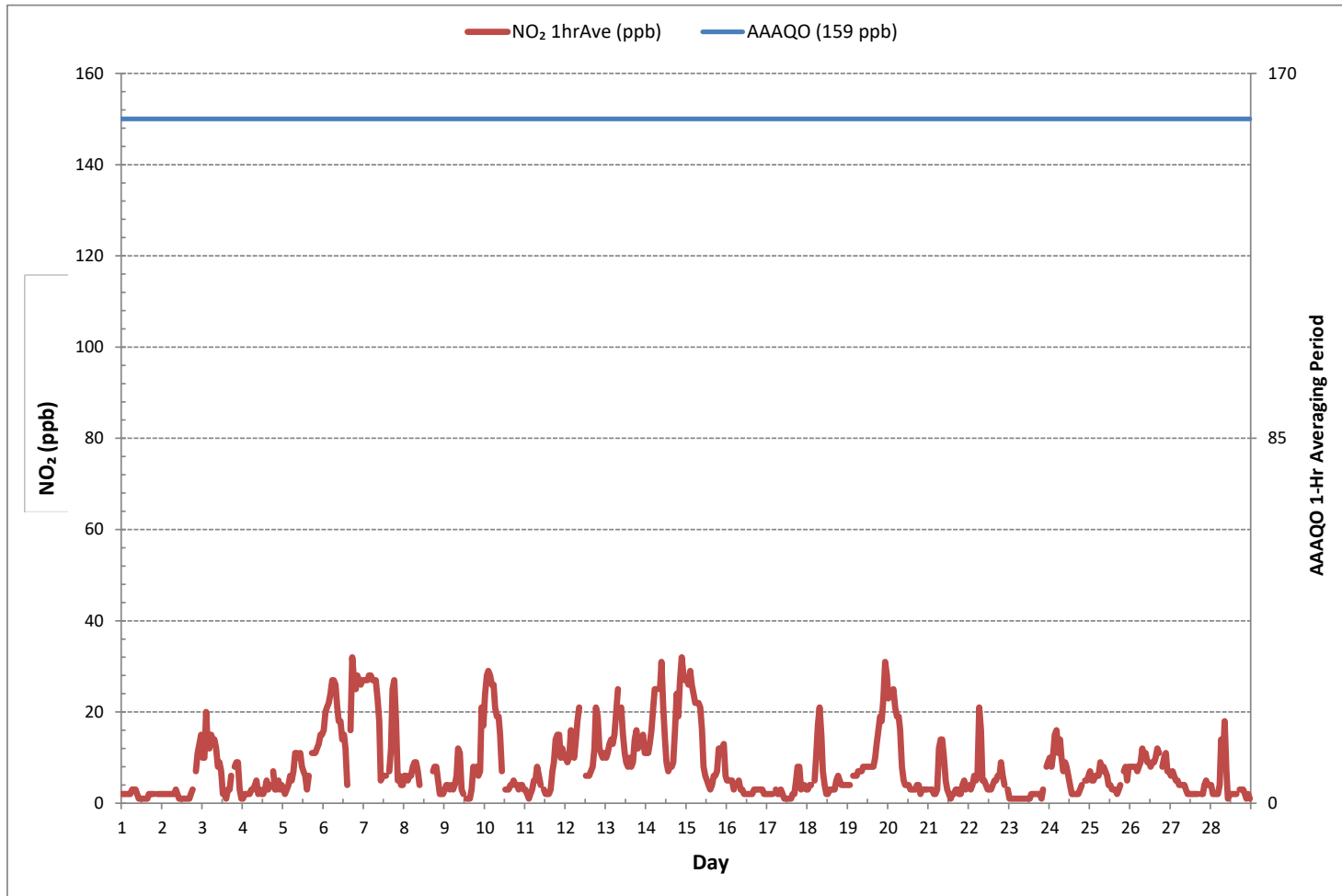
24 HR AVERAGES February 2019



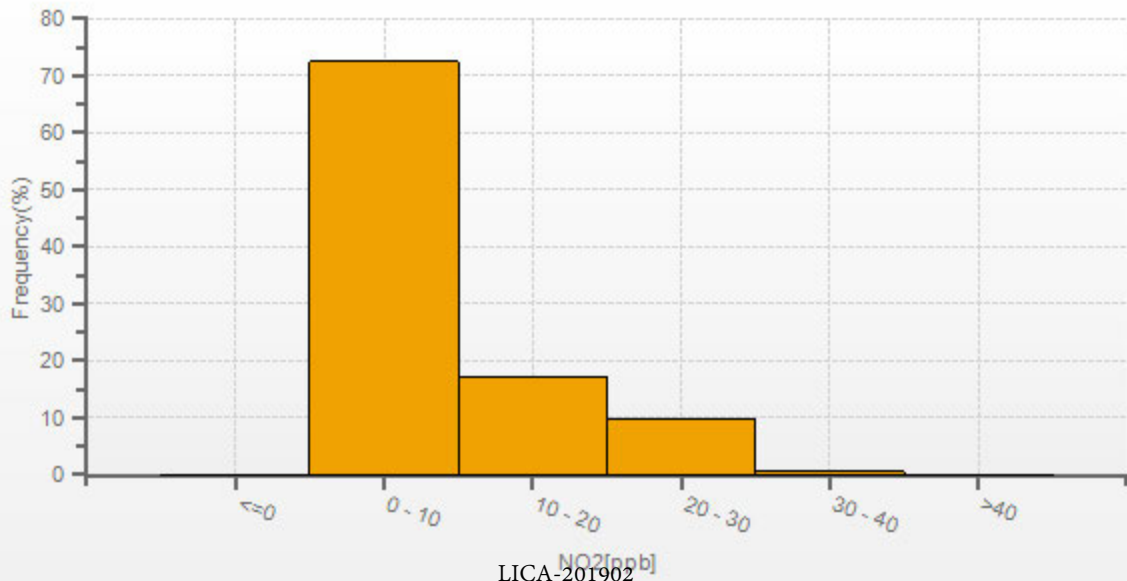
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	636				
MINIMUM 1-HR AVERAGE:	1 ppb	@ HOUR	10	ON DAY	1
MAXIMUM 1-HR AVERAGE:	32 ppb	@ HOUR	17	ON DAY	6
MAXIMUM 24-HR AVERAGE:	22 ppb			ON DAY	6
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	671	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	7		MONTHLY AVERAGE:	8	ppb

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



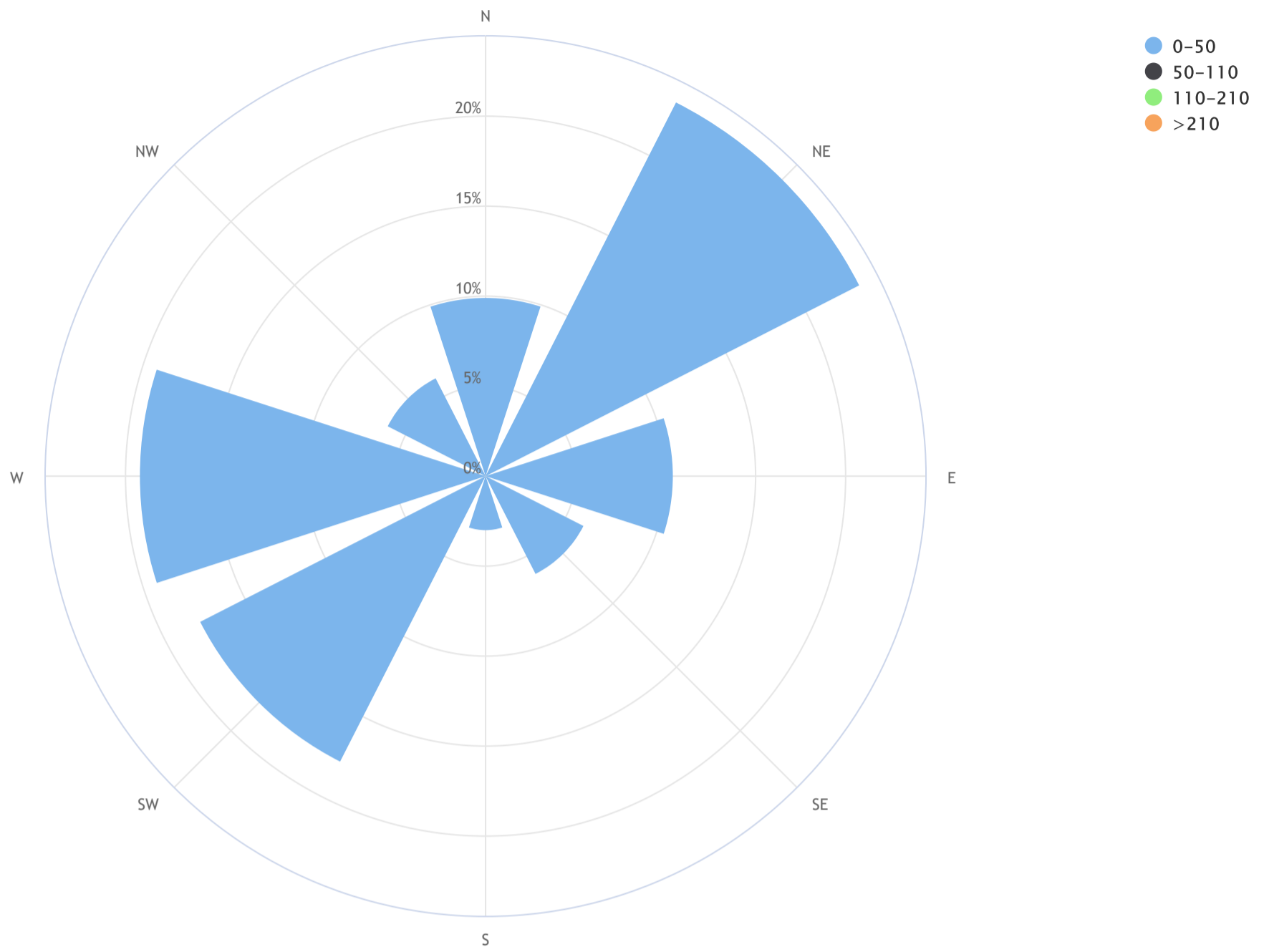
NO2[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_NO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 18.5, CALM % = 4.2%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.9	0.0	0.0	0.0	9.9
NE	23.3	0.0	0.0	0.0	23.3
E	10.4	0.0	0.0	0.0	10.4
SE	6.1	0.0	0.0	0.0	6.1
S	3.0	0.0	0.0	0.0	3.0
SW	17.8	0.0	0.0	0.0	17.8
W	19.2	0.0	0.0	0.0	19.2
NW	6.1	0.0	0.0	0.0	6.1
Summary	95.8	0.0	0.0	0.0	95.8
CALM	4.3	0.0	0.0	0.0	4.3



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

OZONE Hourly Averages (O₃ ppb)

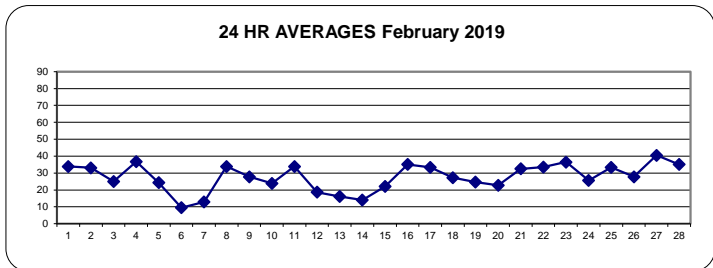
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	30.5	32.5	32.4	32.0	31.9	32.1	31.4	30.9	31.0	33.0	34.3	35.5	35.9	36.0	35.5	34.8	34.3	34.9	35.5	35.9	S	36.1	36.6	35.8	30.5	36.6	33.9	24	
2	35.0	34.9	35.0	34.7	34.4	34.5	34.4	34.0	33.7	34.7	35.5	35.7	36.3	36.6	37.5	37.6	37.6	36.7	35.9	S	27.6	22.9	19.4	16.4	16.4	37.6	33.1	24	
3	19.2	17.4	8.9	14.9	15.7	13.9	14.0	12.4	15.6	18.6	21.0	28.3	37.5	38.2	38.7	37.1	36.8	33.0	S	28.0	26.3	25.1	36.1	38.8	8.9	38.8	25.0	24	
4	38.3	37.8	38.2	38.5	38.4	38.0	37.2	36.4	35.6	37.9	38.0	38.3	38.5	37.7	37.5	37.7	37.0	S	33.5	36.2	33.6	32.6	34.6	33.8	32.6	38.5	36.8	24	
5	32.3	31.6	28.6	26.0	24.3	24.7	22.5	18.7	17.6	19.1	21.2	26.2	30.6	35.2	36.5	33.6	S	25.4	22.0	21.2	17.8	15.4	14.5	14.0	14.0	36.5	24.3	24	
6	12.4	9.0	7.1	6.3	3.2	1.1	0.8	1.1	6.1	12.1	16.7	20.4	22.1	27.0	35.0	S	23.4	3.7	3.6	3.6	1.6	1.4	0.9	0.7	0.7	35.0	9.5	24	
7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.0	5.2	14.3	28.7	C	C	C	C	C	C	C	13.8	12.5	19.6	34.0	33.0	33.1	32.8	0.6	34.0	12.9	24
8	31.6	31.8	31.7	31.9	31.8	30.9	30.2	30.3	31.9	34.6	36.4	37.2	37.7	S	39.3	38.6	36.7	34.0	31.8	30.6	33.9	35.5	35.3	35.6	30.2	39.3	33.9	24	
9	34.8	33.6	32.1	31.2	27.2	26.1	24.7	22.7	18.5	22.0	32.1	34.6	S	38.0	37.7	38.1	37.7	29.5	27.6	23.7	24.2	22.3	9.4	11.6	9.4	38.1	27.8	24	
10	4.8	2.0	1.0	1.3	2.3	3.0	6.1	8.5	11.1	21.0	32.7	S	36.0	36.7	37.6	37.8	37.7	37.9	38.4	38.7	38.7	38.5	38.5	38.5	1.0	38.7	23.9	24	
11	38.9	39.9	40.4	40.8	39.7	36.7	37.0	34.5	35.5	36.9	S	38.3	38.7	38.8	39.7	38.8	35.6	32.4	26.9	22.7	20.3	23.5	20.3	22.5	20.3	40.8	33.9	24	
12	20.4	20.8	18.3	12.0	16.3	17.0	14.1	9.6	9.3	S	25.2	26.8	28.9	28.9	29.8	28.4	26.6	20.2	10.8	11.4	14.8	14.7	13.9	12.8	9.3	29.8	18.7	24	
13	12.9	13.0	10.7	9.1	9.3	7.1	4.1	1.1	S	10.1	16.3	19.5	23.5	25.8	28.1	29.4	27.5	21.2	17.9	20.2	17.1	15.4	14.6	16.0	1.1	29.4	16.1	24	
14	15.1	14.7	13.1	9.0	4.3	1.9	0.7	S	5.5	9.4	16.9	21.8	27.2	29.0	27.2	29.2	30.9	23.8	13.5	14.5	6.2	2.4	3.6	1.5	0.7	30.9	14.0	24	
15	1.7	2.0	0.9	2.0	3.0	3.7	S	5.5	8.7	18.8	29.4	29.8	33.7	37.1	38.3	38.0	36.4	36.2	36.5	30.4	27.7	26.2	27.8	34.6	0.9	38.3	22.1	24	
16	34.8	35.0	34.6	34.9	37.2	S	36.9	34.9	35.3	34.8	35.0	35.7	36.3	36.0	36.9	36.8	35.8	34.5	34.2	33.4	33.5	33.6	33.6	33.9	33.4	37.2	35.1	24	
17	33.5	33.5	33.2	33.2	S	33.2	34.2	34.9	34.4	34.6	35.0	35.7	36.6	36.9	36.7	35.8	35.1	32.5	29.9	27.5	29.3	29.7	29.1	30.2	27.5	36.9	33.3	24	
18	28.9	25.9	24.0	S	22.1	17.3	9.5	7.0	13.4	22.3	28.5	32.4	32.5	33.2	33.9	33.9	34.5	31.5	31.0	32.2	33.6	32.9	33.4	33.6	7.0	34.5	27.3	24	
19	33.6	32.8	S	30.0	28.5	28.0	27.2	26.6	26.4	27.1	27.7	28.7	30.7	31.5	34.1	34.1	31.4	26.0	21.8	16.0	14.1	8.1	1.7	2.9	1.7	34.1	24.7	24	
20	4.0	S	3.6	1.2	2.7	3.6	6.3	11.5	20.5	23.9	26.3	28.5	31.4	35.0	34.8	34.2	33.4	32.8	32.4	32.9	30.9	31.3	31.2	30.7	1.2	35.0	22.7	24	
21	S	32.8	33.1	30.1	27.7	25.2	17.1	16.8	20.6	26.5	33.0	36.7	38.0	39.0	39.3	39.3	39.0	38.6	39.0	39.1	37.0	32.8	33.8	S	16.8	39.3	32.5	24	
22	34.1	35.3	34.5	31.3	32.3	32.0	16.2	22.6	33.6	33.7	35.7	37.7	38.5	38.6	38.4	37.5	36.9	36.1	35.0	31.8	33.0	34.1	S	34.9	16.2	38.6	33.6	24	
23	40.2	39.7	38.7	38.8	39.3	38.4	38.6	38.4	38.6	38.4	38.5	37.7	37.8	37.9	37.8	37.6	37.2	37.4	36.6	36.7	36.9	36.8	33.6	S	23.9	20.2	40.2	36.5	24
24	17.3	19.8	18.0	13.1	10.3	13.8	10.8	13.9	17.4	23.5	26.3	29.7	32.9	34.7	35.3	35.3	35.5	35.8	33.3	32.2	S	33.5	33.4	34.0	10.3	35.8	25.6	24	
25	33.0	34.5	34.7	32.7	30.7	26.3	22.1	27.0	28.7	32.9	35.2	37.2	37.7	38.4	39.2	39.1	39.7	39.3	37.9	S	33.0	28.6	30.3	29.5	22.1	39.7	33.4	24	
26	26.2	24.0	22.7	21.5	21.0	19.6	17.9	17.1	28.1	28.2	30.2	31.2	32.4	33.1	32.7	32.3	30.7	31.4	S	33.5	31.3	29.8	38.8	33.1	33.1	17.1	33.5	27.8	24
27	33.8	33.8	35.2	36.9	38.0	38.6	39.0	38.5	40.1	41.5	42.6	43.1	44.1	44.5	44.8	44.9	44.7	S	44.5	44.3	40.9	38.8	39.2	38.5	33.8	44.9	40.5	24	
28	37.7	38.1	37.6	37.3	35.6	30.1	20.0	24.5	17.9	33.3	41.2	42.2	42.4	42.1	42.2	41.4	S	38.6	36.4	36.1	36.5	36.4	33.0	27.0	17.9	42.4	35.1	24	
HOURLY MAX	40.2	39.9	40.4	40.8	39.7	38.6	39.0	38.5	40.1	41.5	42.6	43.1	44.1	44.5	44.8	44.9	44.7	39.3	44.5	44.3	40.9	38.8	39.2	38.8					
HOURLY AVG	25.4	26.2	24.0	23.4	22.5	21.4	20.5	20.8	22.9	26.8	30.3	32.7	34.5	35.6	36.4	36.2	34.9	30.6	29.2	28.2	27.3	26.5	25.7	25.7					

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:

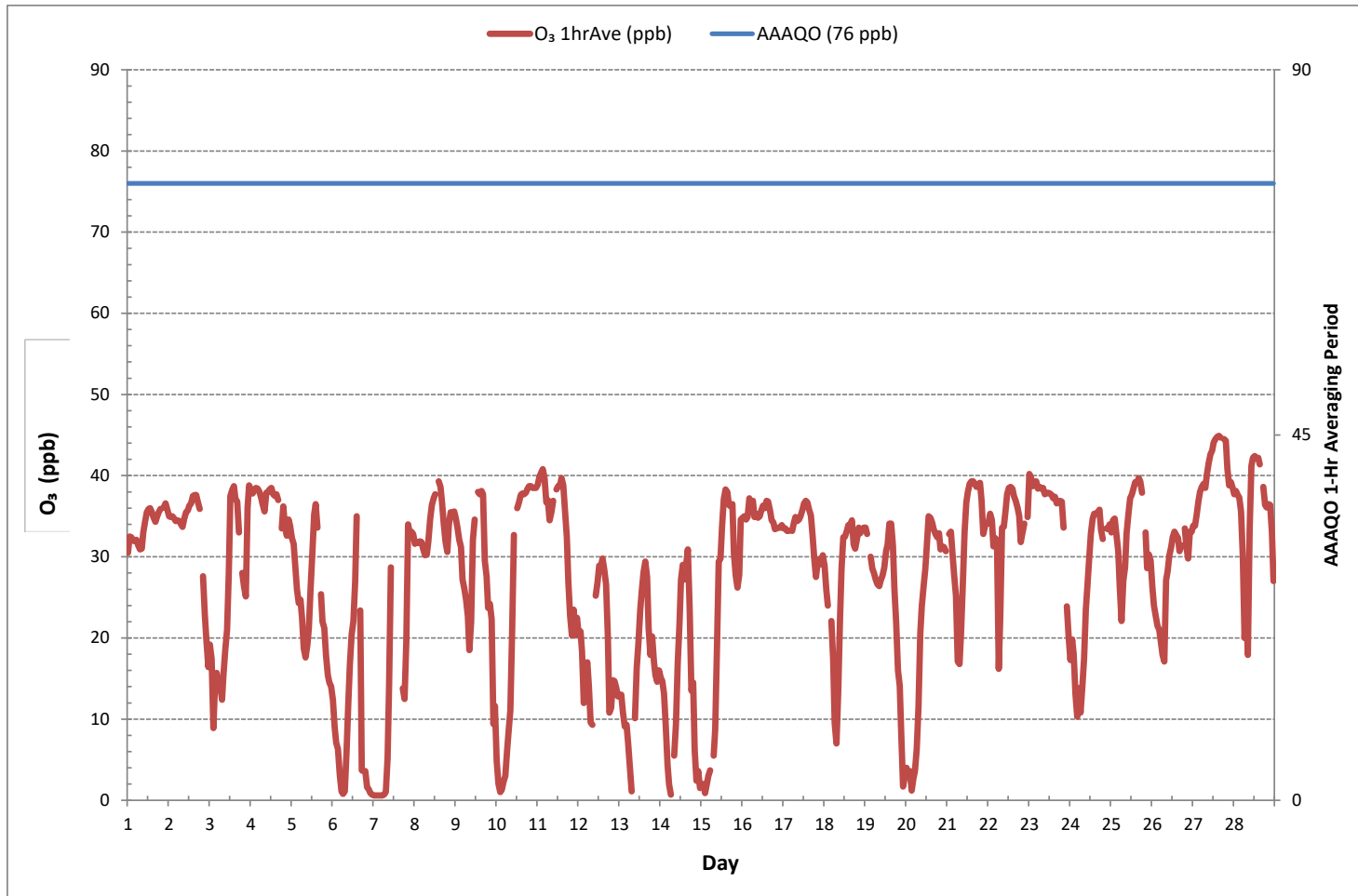
ALBERTA ENVIRONMENT: 1-HR 82 ppb



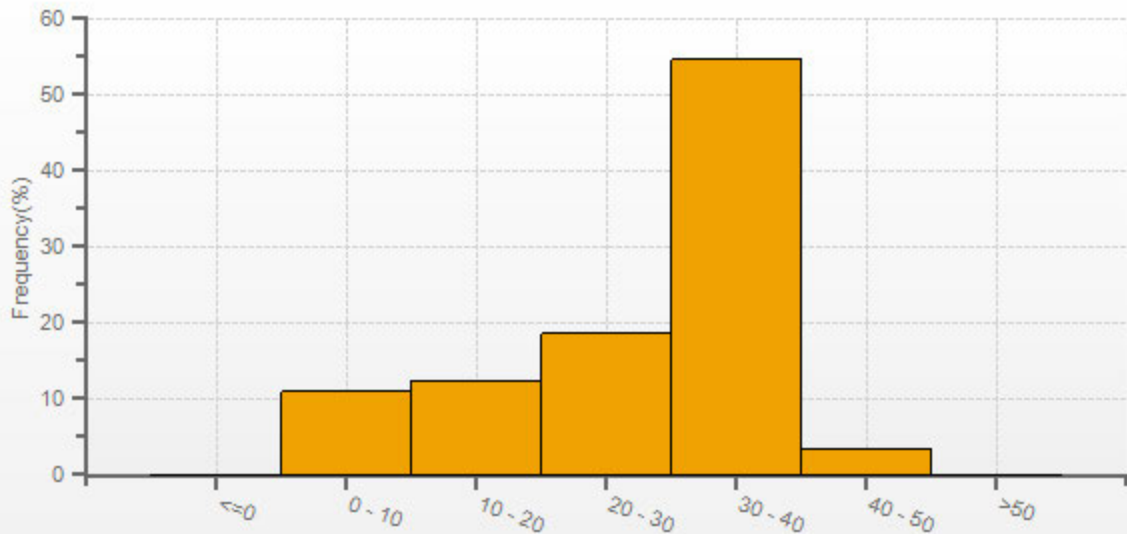
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	638			
MINIMUM 1-HR AVERAGE:	0.6	ppb	@ HOUR	7
MAXIMUM 1-HR AVERAGE:	44.9	ppb	@ HOUR	27
MAXIMUM 24-HR AVERAGE:	40.5	ppb	ON DAY	27
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	672
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	11.2		MONTHLY AVERAGE:	27.7
				ppb

OZONE Hourly Averages (O₃ ppb)



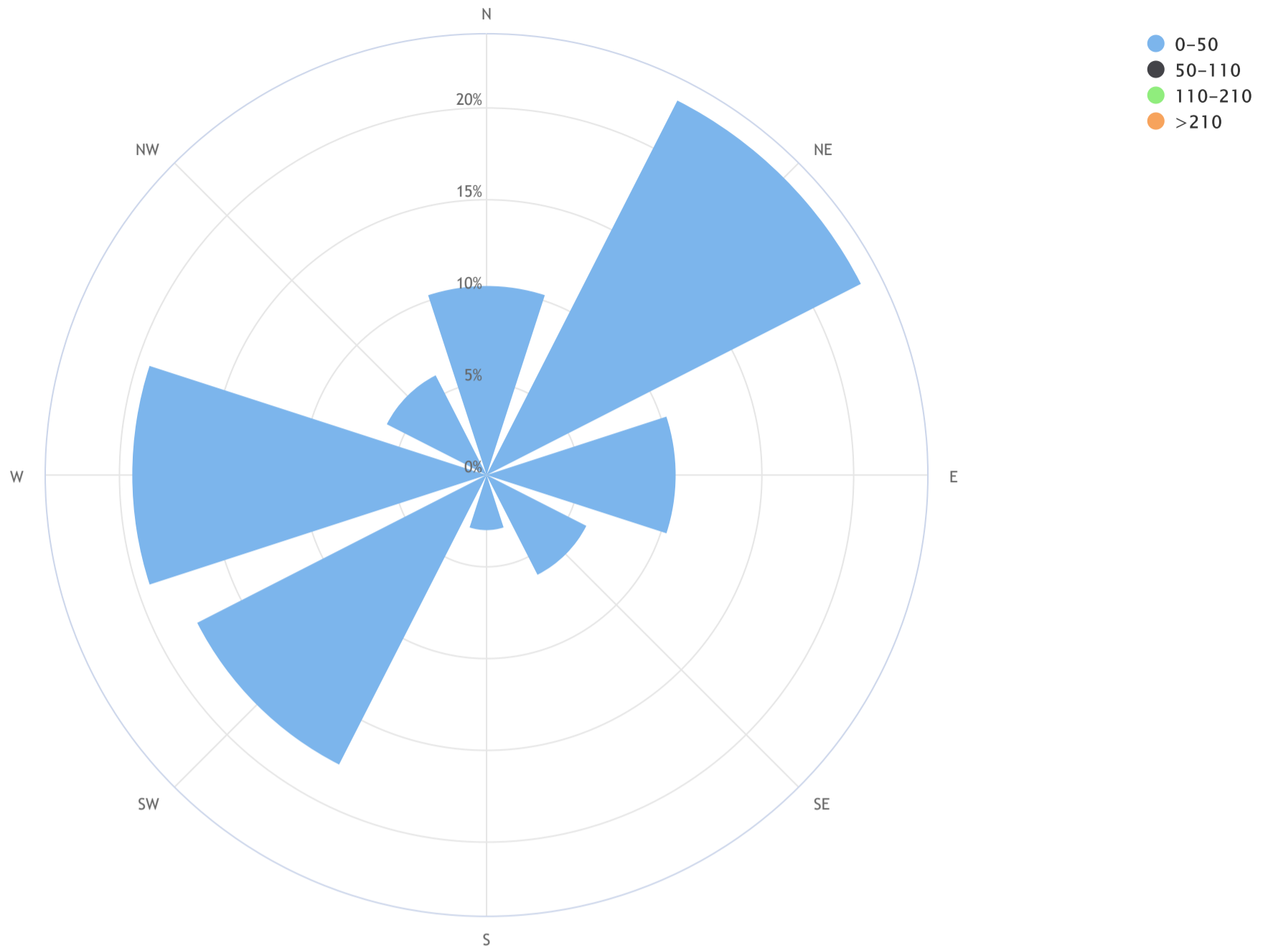
O3[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_O₃ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 9.6, CALM % = 4.2%



Direction	0-50	50-110	110-210	>210	TOTAL
N	10.3	0.0	0.0	0.0	10.3
NE	22.9	0.0	0.0	0.0	22.9
E	10.3	0.0	0.0	0.0	10.3
SE	6.1	0.0	0.0	0.0	6.1
S	3.0	0.0	0.0	0.0	3.0
SW	17.7	0.0	0.0	0.0	17.7
W	19.3	0.0	0.0	0.0	19.3
NW	6.1	0.0	0.0	0.0	6.1
Summary	95.8	0.0	0.0	0.0	95.8
CALM	4.2	0.0	0.0	0.0	4.2



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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

STATUS FLAG CODES

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

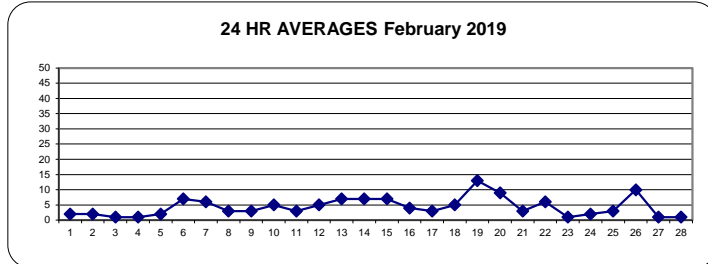
OBJECTIVE LIMIT:

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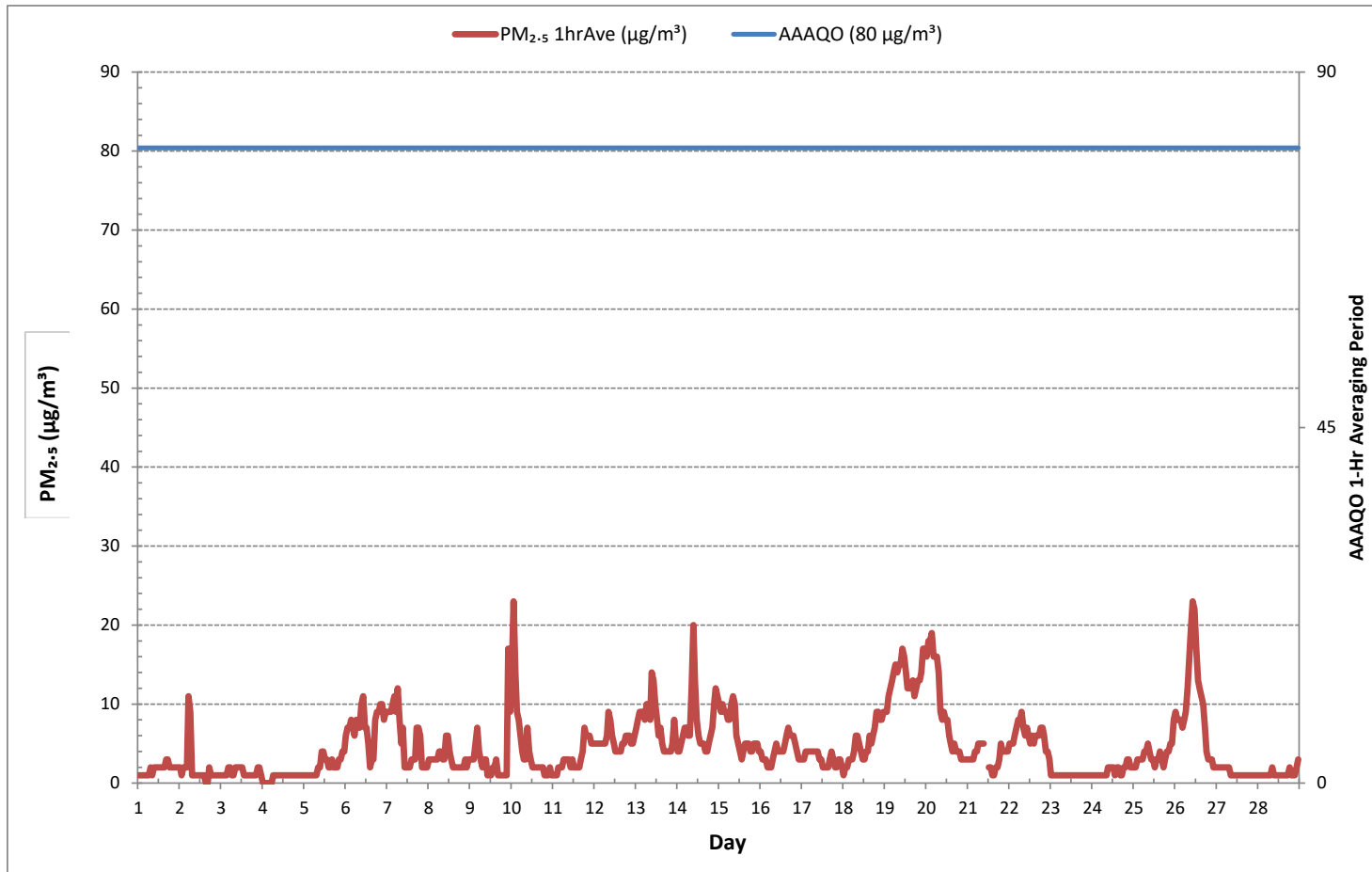
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	662			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	15	ON DAY	2
MAXIMUM 1-HR AVERAGE:	23 µg/m ³ @ HOUR	1	ON DAY	10
MAXIMUM 24-HR AVERAGE:	13 µg/m ³		ON DAY	19
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	672 hrs	
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	4 µg/m ³	

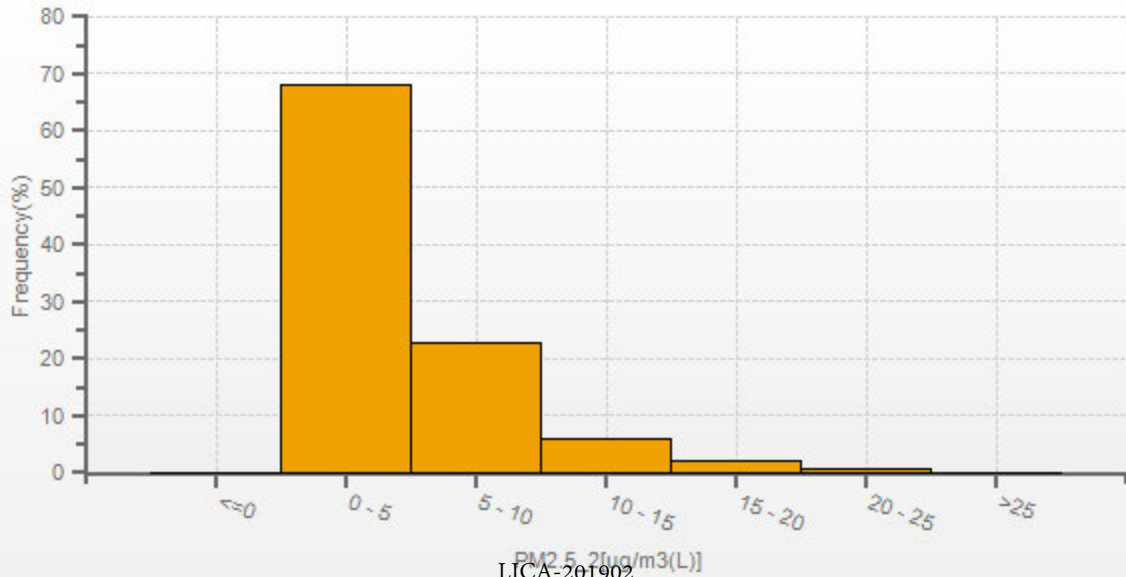
24 HR AVERAGES February 2019



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



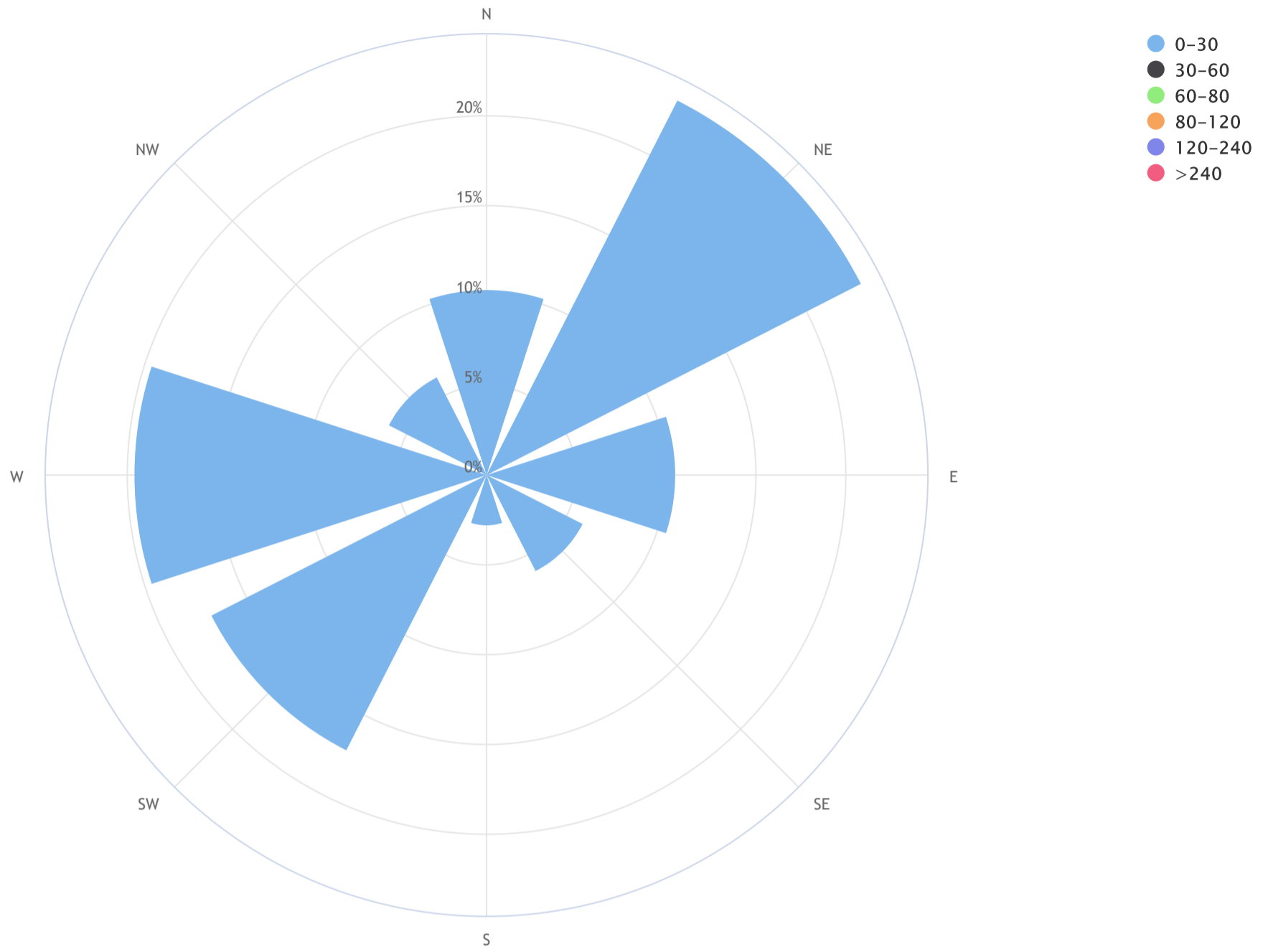
PM2.5_2[ug/m3(L)] Histogram: LICA COLD LAKE SOUTH Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_PM2.5 (µg/m³)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 7.2, CALM % = 4.2%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	10.3	0.0	0.0	0.0	0.0	0.0	10.3
NE	23.4	0.0	0.0	0.0	0.0	0.0	23.4
E	10.5	0.0	0.0	0.0	0.0	0.0	10.5
SE	6.0	0.0	0.0	0.0	0.0	0.0	6.0
S	2.8	0.0	0.0	0.0	0.0	0.0	2.8
SW	17.2	0.0	0.0	0.0	0.0	0.0	17.2
W	19.6	0.0	0.0	0.0	0.0	0.0	19.6
NW	6.1	0.0	0.0	0.0	0.0	0.0	6.1
Summary	95.8	0.0	0.0	0.0	0.0	0.0	95.8
CALM	4.2	0.0	0.0	0.0	0.0	0.0	4.2



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY																												
1	10.4	10.6	10.5	10.7	9.1	9.7	9.9	9.7	12.0	11.6	12.2	11.5	10.4	9.5	9.0	8.8	9.1	10.5	8.6	8.0	7.9	10.3	11.2	10.3	7.9	12.2	9.5	24
2	10.7	9.4	9.5	8.7	7.9	8.1	8.6	8.3	8.6	10.3	8.3	8.5	8.9	8.5	10.1	8.3	6.5	4.7	3.3	1.4	1.8	1.5	0.4	0.7	0.4	10.7	5.6	24
3	1.1	0.5	0.7	1.8	0.7	1.0	0.5	0.2	0.9	1.1	2.5	1.7	6.5	5.3	4.6	2.1	1.3	2.3	3.2	2.8	1.6	1.3	8.1	9.8	0.2	9.8	1.1	24
4	7.8	6.5	5.8	6.0	6.0	5.3	5.5	4.4	4.4	4.6	3.2	2.1	2.4	3.6	4.4	4.5	3.7	2.6	2.6	1.4	0.4	1.5	1.1	0.2	0.2	7.8	3.1	24
5	0.9	0.8	0.2	0.3	0.8	0.4	0.6	0.9	1.6	0.9	1.1	1.5	1.9	2.3	2.2	1.7	4.4	2.3	0.5	2.1	0.4	0.1	0.7	0.5	0.1	4.4	0.6	24
6	0.2	0.3	0.5	0.7	0.2	0.3	1.7	0.1	0.4	0.5	0.5	2.9	1.2	3.4	2.9	3.0	1.7	1.2	0.5	0.5	0.9	0.7	0.3	0.3	0.1	3.4	0.4	24
7	0.3	0.5	0.5	0.7	0.2	0.7	0.1	0.3	0.4	1.6	3.4	2.5	4.6	5.1	5.6	5.2	3.0	1.0	2.4	3.2	5.0	4.2	5.5	5.1	0.1	5.6	1.9	24
8	2.3	3.3	3.6	3.3	3.1	3.5	3.5	4.8	5.5	4.6	4.2	4.1	4.8	3.5	3.4	5.6	4.1	2.0	1.6	2.3	4.5	7.1	6.0	5.5	1.6	7.1	3.1	24
9	4.5	3.6	1.8	0.5	1.1	3.8	1.1	1.4	1.1	1.8	4.2	1.9	1.4	5.6	6.0	5.4	2.6	2.9	3.5	1.2	2.5	1.8	0.5	0.4	0.4	6.0	1.3	24
10	1.1	0.9	0.9	0.5	0.7	0.4	0.8	1.2	0.9	2.1	5.0	4.6	5.4	4.5	4.6	3.8	3.9	4.7	4.8	5.5	5.3	3.9	4.6	4.5	0.4	5.5	2.7	24
11	4.6	5.2	5.0	6.0	2.5	1.9	3.0	3.3	2.1	3.2	3.9	4.1	3.7	4.1	3.1	2.2	3.5	2.3	0.8	3.3	1.6	5.6	2.7	0.3	0.3	6.0	1.8	24
12	1.9	3.0	2.7	1.6	1.2	0.3	0.7	0.2	1.3	4.5	7.5	1.8	5.0	3.1	4.3	4.2	8.3	4.8	0.8	1.0	0.5	0.6	0.6	0.4	0.2	8.3	2.4	24
13	0.2	1.1	0.5	0.7	0.6	1.0	0.4	1.4	0.4	1.1	2.6	5.5	3.6	5.2	4.8	4.4	4.6	2.4	1.5	3.2	2.9	0.4	0.5	1.5	0.2	5.5	2.0	24
14	0.5	0.9	0.2	0.5	1.4	0.5	0.2	1.0	0.7	1.0	2.1	2.7	4.6	5.6	4.3	3.6	3.2	1.5	2.1	4.5	0.6	0.9	0.6	0.7	0.2	5.6	0.8	24
15	1.6	0.8	1.3	0.7	0.4	0.4	0.3	0.9	0.7	3.5	5.5	6.1	6.7	6.5	6.6	5.9	6.4	7.0	6.6	1.6	3.0	1.8	1.6	4.2	0.3	7.0	2.7	24
16	5.1	3.7	4.3	4.9	7.0	7.0	6.0	5.1	5.8	7.4	8.9	9.3	8.7	9.4	11.1	9.4	9.4	9.2	9.7	8.6	9.0	8.1	6.8	8.2	3.7	11.1	7.4	24
17	7.7	6.8	5.3	5.4	6.8	8.5	7.2	7.7	6.0	6.4	7.2	8.0	7.0	6.7	4.8	4.1	2.9	0.8	1.9	3.8	1.2	1.1	3.1	1.6	0.8	8.5	4.3	24
18	0.4	6.0	1.8	1.7	6.0	1.1	0.3	0.9	2.8	3.2	3.6	6.3	6.9	8.9	9.9	9.4	6.2	5.1	6.0	5.1	7.3	7.6	3.9	2.7	0.3	9.9	4.3	24
19	2.3	2.7	4.9	3.5	3.2	4.5	5.3	5.8	5.4	7.7	8.8	6.2	5.0	3.8	6.6	4.4	1.2	2.6	1.0	0.8	0.6	0.5	1.1	0.7	0.5	8.8	3.3	24
20	0.2	0.6	0.3	0.2	0.6	0.4	0.9	2.3	6.5	7.9	7.7	9.1	9.5	10.4	9.7	10.2	9.2	7.5	6.4	8.6	10.1	12.3	9.5	7.9	0.2	12.3	5.6	24
21	8.1	6.2	3.5	1.5	3.4	0.8	0.1	3.8	2.4	0.8	3.2	3.6	7.2	9.3	8.2	6.5	5.3	3.1	4.1	3.1	2.8	2.9	4.1	4.3	0.1	9.3	2.4	24
22	4.2	6.2	4.4	1.8	5.6	4.4	1.8	5.2	6.5	6.6	4.0	5.6	4.0	7.4	5.7	3.0	4.4	3.6	2.4	3.0	7.5	6.5	5.3	10.8	1.8	10.8	1.1	24
23	12.2	11.6	14.3	13.1	13.7	11.2	11.9	17.3	12.1	13.8	16.4	15.7	15.2	13.7	12.7	11.9	11.7	10.7	7.0	6.1	9.1	4.6	4.7	6.3	4.6	10.7	10.7	24
24	2.1	2.3	4.0	3.5	4.5	0.5	0.7	1.6	2.6	6.1	6.9	7.1	10.1	11.0	9.9	9.0	8.7	6.5	6.5	7.5	6.6	6.2	8.3	10.6	0.5	11.0	5.8	24
25	11.6	7.4	6.3	5.4	4.4	3.6	3.6	2.2	5.7	9.1	9.2	9.2	9.2	10.3	9.9	10.8	9.9	9.9	6.9	8.8	6.2	5.1	6.4	4.9	2.2	11.6	7.2	24
26	4.4	4.7	5.6	3.7	2.0	2.0	3.1	4.8	8.6	8.1	10.5	10.6	9.9	13.4	12.4	11.9	9.6	8.6	7.9	8.9	9.7	7.4	7.0	7.8	2.0	13.4	7.5	24
27	7.0	8.5	6.6	7.5	9.9	9.7	10.5	8.7	10.6	12.9	14.2	11.4	13.2	17.8	18.5	17.6	14.6	9.6	8.3	8.2	5.3	3.7	5.1	4.6	3.7	18.5	7.1	24
28	0.7	1.2	1.5	1.4	0.9	3.2	1.3	3.5	0.9	5.7	9.6	9.2	7.1	6.7	8.1	10.6	10.4	10.5	10.7	7.2	6.9	7.9	9.2	8.9	0.7	10.7	4.6	24
HOURLY MAX	12.2	11.6	14.3	13.1	13.7	11.2	11.9	17.3	12.1	13.8	16.4	15.7	15.2	17.8	18.5	17.6	14.6	10.7	10.7	8.9	10.1	12.3	11.2	10.8				

STATUS FLAG CODES

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

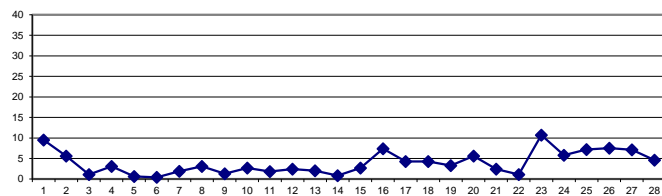
LAST CALIBRATION:

November 9, 2017

DECLINATION :

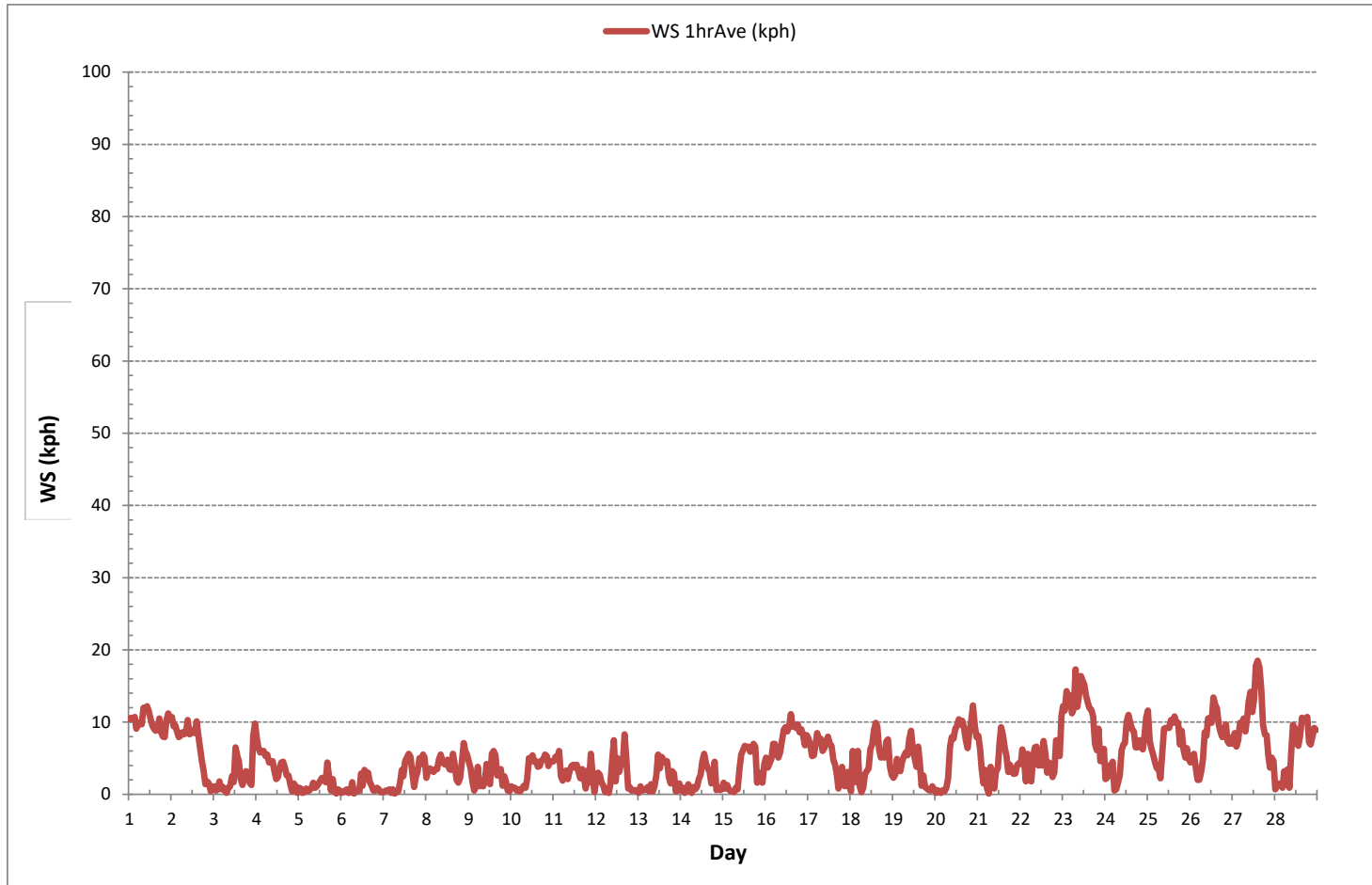
MAGNETIC DECLINATION 19 DEGREE EAST

24 HR AVERAGES February 2019



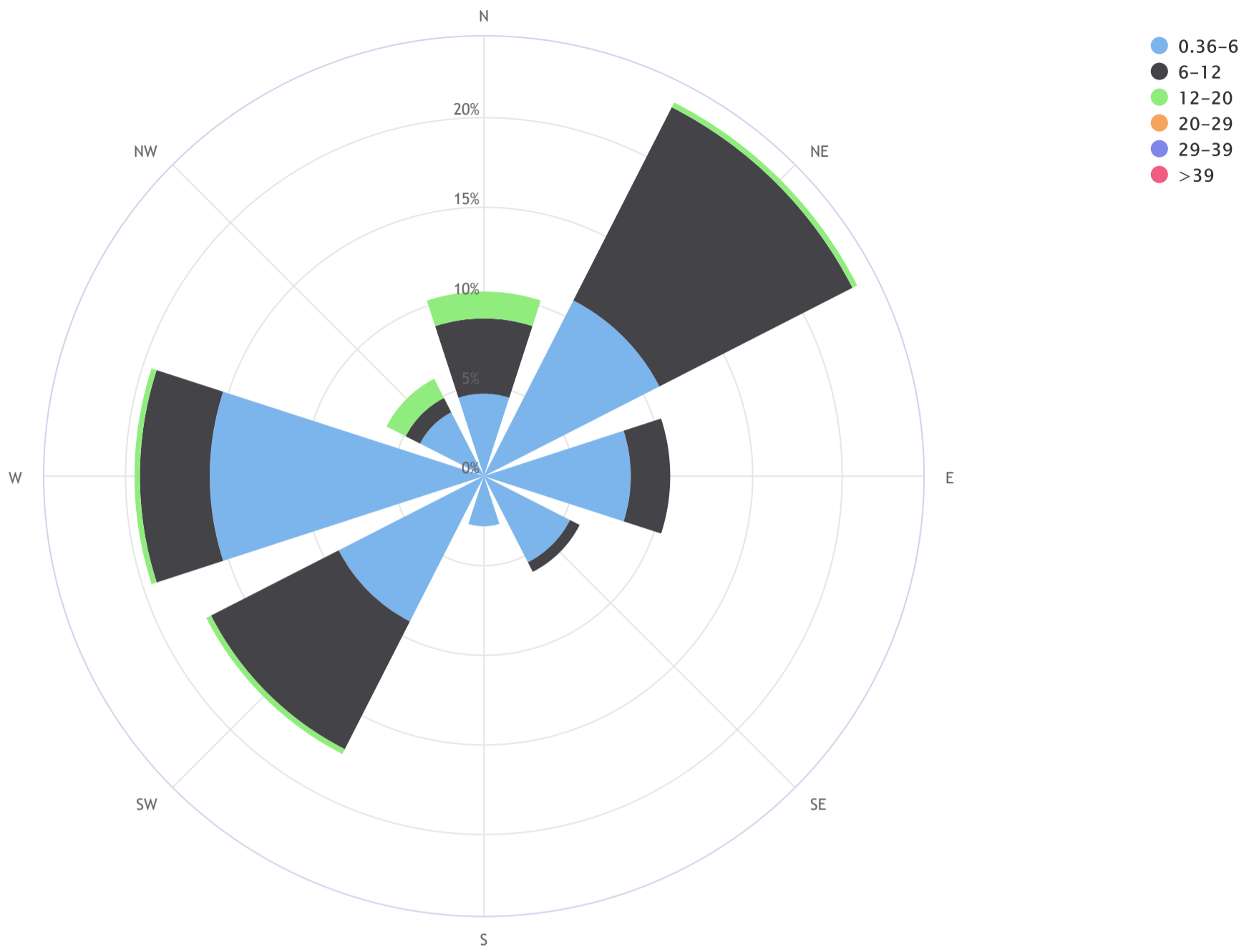
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 21 ON DAY 5
MAXIMUM 1-HR AVERAGE:	18.5 kph @ HOUR 14 ON DAY 27
MAXIMUM 24-HR AVERAGE:	10.7 kph ON DAY 23
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	672 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.7
MONTHLY AVERAGE:	1.2 kph



Lakeland Industry & Community Association_Cold Lake South Continuous Monitoring Station_19/02

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 0.2_CALM % = 4.2%



Direction	0.36-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	4.6	4.2	1.5	0.0	0.0	0.0	10.3
NE	11.0	12.1	0.3	0.0	0.0	0.0	23.4
E	8.2	2.2	0.0	0.0	0.0	0.0	10.4
SE	5.4	0.6	0.0	0.0	0.0	0.0	6.0
S	2.8	0.0	0.0	0.0	0.0	0.0	2.8
SW	9.1	8.0	0.3	0.0	0.0	0.0	17.4
W	15.3	3.9	0.3	0.0	0.0	0.0	19.5
NW	4.0	0.9	1.2	0.0	0.0	0.0	6.1
Summary	60.4	31.9	3.6	0.0	0.0	0.0	95.9
CALM	4.2	0.0	0.0	0.0	0.0	0.0	4.2



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	E	E	E	NE	24	
2	E	E	E	E	ENE	ENE	ENE	ENE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	WNW	SW	WSW	SW	SE	NE	24	
3	SSW	SSW	N	SW	SSW	SW	WSW	S	W	W	W	WNW	NNE	NNE	N	ENE	N	W	WSW	W	W	NNE	NE	NE	N	24	
4	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ESE	ESE	ESE	ESE	NE	NE	NNE	NE	NE	E	SSE	S	SE	SSE	S	ENE	24	
5	S	WSW	ENE	SSW	WSW	SW	SW	W	WSW	NW	WNW	WNW	NW	SE	ENE	E	WSW	WSW	S	WSW	WSW	SSE	SW	WSW	WSW	24	
6	SW	WNW	SW	WSW	NNW	WSW	WSW	NW	W	ENE	ENE	WNW	ENE	NW	WNW	ENE	NNE	ENE	NNE	NE	E	WSW	ENE	E	NNW	24	
7	NW	ENE	ENE	ENE	E	ESE	S	NNW	NE	ESE	SE	ESE	ENE	NE	NE	NE	NNE	ENE	ESE	SE	SE	SE	SE	SE	E	24	
8	SE	ESE	ESE	ESE	E	E	ENE	E	E	E	E	E	ENE	NNE	N	N	NNE	NNE	NNE	NNE	N	NNE	NNE	NNE	ENE	24	
9	NNE	N	WNW	NNW	ENE	W	WSW	WSW	W	NE	NE	N	NW	W	WSW	WSW	SW	WSW	WSW	SSE	WSW	W	S	ENE	W	24	
10	ESE	E	ENE	ENE	ENE	ENE	NE	NE	ENE	ENE	NE	NE	NE	NNE	NE	ENE	E	E	ESE	E	ESE	ESE	E	ESE	ENE	24	
11	ESE	SE	SE	SSE	SSE	E	E	E	ESE	E	ESE	E	ESE	ESE	E	NNE	NE	E	W	WSW	W	WSW	WSW	ESE	24		
12	WSW	W	W	WSW	SW	S	WSW	W	W	W	WSW	W	WSW	WSW	WNW	W	WSW	W	WSW	SW	SSE	SSW	WSW	WSW	WSW	24	
13	SW	WSW	ENE	WSW	W	SW	W	WSW	N	W	WNW	W	W	W	WSW	SW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	24	
14	WNW	SW	NNW	E	WSW	ENE	SSW	WSW	W	ENE	ENE	NE	NE	NE	NE	NNE	NW	WSW	W	E	E	WSW	NE	NE	24		
15	W	E	E	E	NE	SW	NNW	ENE	NW	ENE	ENE	NE	ENE	E	E	E	E	NNE	NW	NE	N	NE	ENE	ENE	24		
16	NE	NNE	NE	ENE	NE	NE	NE	NE	NNE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NNE	NNE	NE	24	
17	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NNE	NNE	NNE	ENE	ENE	ENE	ENE	NE	N	W	WNW	WNW	N	W	N	NNE	24	
18	NNW	W	W	WSW	W	ESE	S	SW	WSW	WNW	W	WSW	WSW	WSW	SW	SSW	SSW	SW	SW	WSW	SSW	SSW	SSW	S	WSW	24	
19	S	SSW	SW	SW	SW	SW	WSW	WSW	SW	SW	WSW	SW	WSW	WSW	WSW	W	S	SSE	SSE	S	SW	ESE	ENE	NW	SW	24	
20	W	WSW	E	NE	WNW	WSW	N	NNE	NE	NNE	NE	NNE	NNE	NNE	NE	NE	NE	NNE	NNE	N	NNW	NNW	NNW	NNW	NNE	24	
21	NNW	NNW	NNW	SW	W	SW	NNW	NW	NNE	NW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	SSW	SSE	SSW	WSW	SE	SE	WSW	WSW	24	
22	SE	SE	SE	ESE	SE	SE	E	SE	SE	SE	S	SE	S	W	W	WNW	NW	NW	WNW	NNW	NNE	NNE	NE	NNE	ESE	24	
23	N	N	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	NW	NW	NW	W	W	WSW	W	NNW	24	
24	WSW	WSW	WSW	W	W	NW	SE	SW	W	W	WSW	WSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
25	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	SW	WSW	WSW	WSW	WSW	SW	WSW	WSW	24	
26	W	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	24	
27	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	NW	NNW	NNW	NNW	NNW	NNW	N	NNW	NW	NNE	NE	NE	NNW	NNW	24	
28	N	WNW	WNW	SW	W	W	WSW	WSW	WNW	NE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	N	NNW	NNE	24	

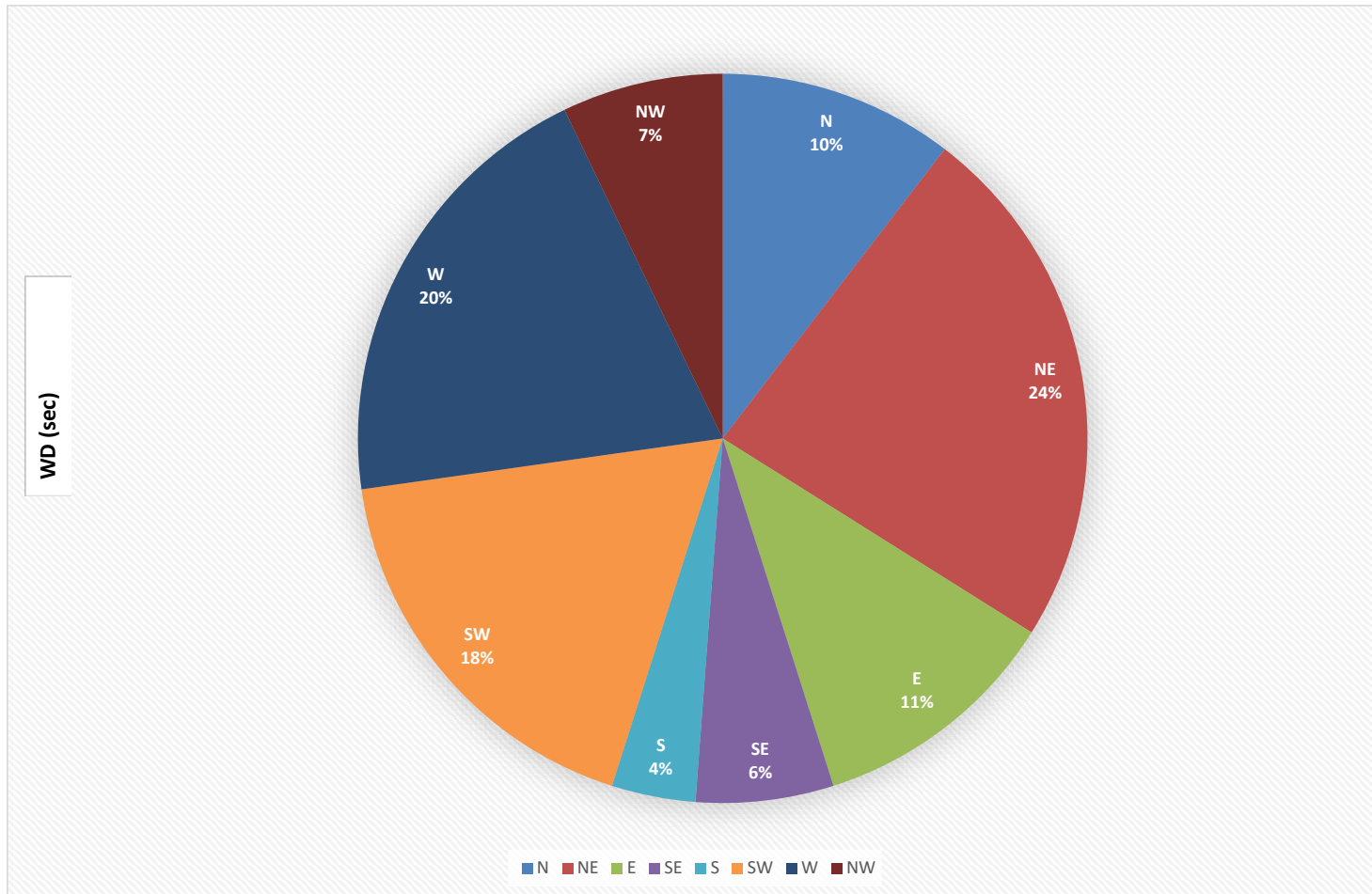
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	672	hrs
STANDARD DEVIATION:	107		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	350	(N)

WIND DIRECTION Hourly Averages (WD)



— WDR[degwdr]



LICA-201902



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	9	6	7	8	7	7	7	10	7	7	5	7	9	10	9	8	7	6	15	9	7	8	7	6	24	
2	6	6	8	9	9	8	6	6	5	5	12	17	14	13	10	12	11	9	39	42	20	29	63	53	24	
3	47	69	65	30	60	48	66	73	46	44	25	57	18	27	26	39	47	18	10	15	28	43	6	6	24	
4	8	10	8	8	8	7	7	10	17	16	23	43	38	18	12	13	22	20	27	28	60	19	36	74	24	
5	37	44	65	56	24	56	45	47	20	36	48	20	20	35	32	45	11	15	51	15	63	70	45	55	24	
6	65	61	40	45	65	64	19	75	68	58	62	40	47	36	36	21	44	24	56	54	43	52	66	66	24	
7	67	41	56	37	69	45	77	74	69	38	18	26	21	5	9	13	36	42	28	10	6	9	7	11	24	
8	47	27	17	12	16	13	9	9	9	21	27	20	28	39	23	10	11	31	21	21	16	17	20	15	24	
9	9	20	50	63	39	20	44	34	45	52	24	41	57	16	14	13	15	28	21	49	32	49	60	57	24	
10	35	39	34	58	22	56	39	25	33	23	12	19	24	27	28	21	17	10	10	9	11	10	9	10	24	
11	16	11	11	12	37	50	40	34	55	36	17	17	21	23	34	43	17	19	53	34	40	12	22	55	24	
12	32	19	30	45	32	69	44	69	58	13	10	45	19	34	24	21	6	8	56	58	60	42	53	53	24	
13	68	31	53	50	47	48	53	18	57	45	23	16	25	25	13	13	9	19	29	18	24	58	46	28	24	
14	53	50	71	42	28	58	70	47	54	39	25	21	10	3	13	18	13	51	43	17	41	52	66	57	24	
15	47	41	24	40	65	61	69	40	65	18	13	9	10	15	13	7	8	8	11	51	26	41	56	14	24	
16	6	11	11	7	6	9	8	7	6	6	9	9	9	7	7	5	6	7	5	5	10	9	8	8	24	
17	8	13	17	14	9	7	8	8	8	16	15	18	12	10	16	20	19	60	49	21	40	35	32	37	24	
18	61	10	52	45	19	35	69	47	37	24	33	17	17	9	8	10	22	17	14	26	10	10	35	34	24	
19	32	23	14	19	11	8	10	10	15	8	5	10	19	20	10	25	60	33	61	54	60	52	23	37	24	
20	69	58	72	70	44	63	60	44	9	10	11	10	11	11	13	8	7	8	10	10	8	6	8	6	24	
21	6	7	19	37	17	40	78	38	26	56	23	24	17	13	11	10	10	22	21	28	40	38	6	6	24	
22	6	4	7	9	3	7	26	11	7	9	30	23	49	14	17	51	19	23	21	28	10	7	12	9	24	
23	9	9	8	9	8	7	9	9	12	13	7	9	11	13	16	12	12	7	7	15	6	10	8	7	24	
24	41	13	7	18	18	42	44	29	21	12	9	10	9	8	8	9	8	6	7	8	5	8	9	4	24	
25	3	6	5	7	8	9	8	23	7	8	9	11	10	7	7	6	6	6	6	8	8	13	9	32	24	
26	18	22	10	23	34	40	22	9	6	6	7	9	7	4	4	5	5	6	6	5	5	5	4	4	24	
27	4	11	7	5	7	5	5	9	7	9	7	10	20	12	10	10	8	9	7	6	6	40	8	10	24	
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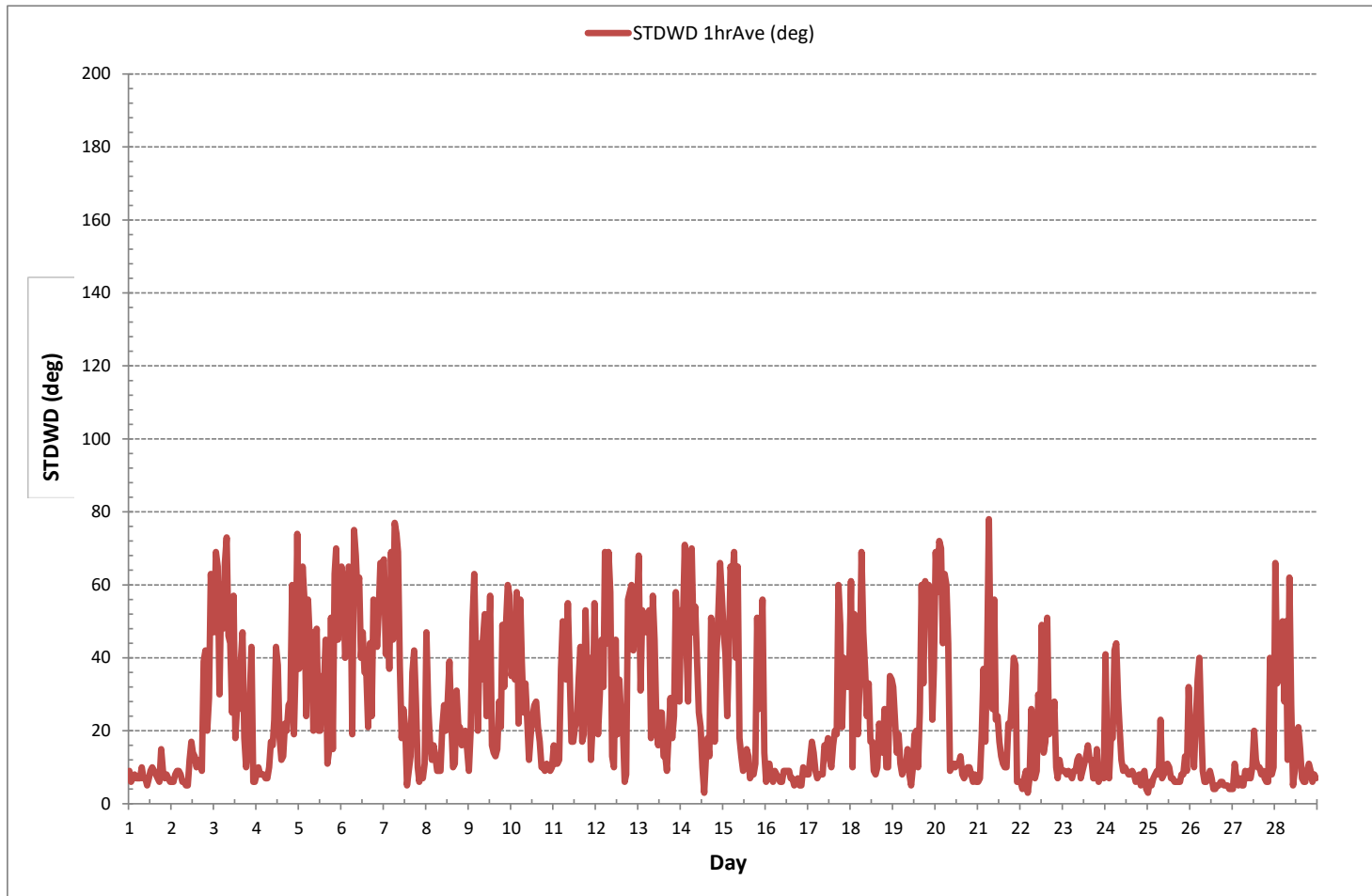
STATUS FLAG CODES

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

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 672 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

RELATIVE HUMIDITY Hourly Averages (RH %)

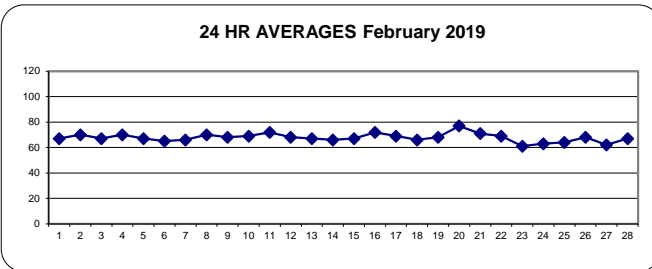
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HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	69	66	65	67	70	71	71	66	66	65	64	61	62	64	64	66	67	67	66	67	70	70	70	71	61	71	67	24				
2	70	70	71	71	72	72	73	74	74	72	69	68	66	67	70	70	70	71	72	71	70	69	68	68	66	74	70	24				
3	67	66	68	66	66	65	65	64	64	64	66	67	67	67	67	67	68	69	69	70	70	71	70	70	64	71	67	24				
4	70	70	70	70	70	71	71	71	71	70	69	68	68	69	69	71	71	72	72	72	72	72	72	72	68	72	70	24				
5	71	70	68	67	66	65	65	64	64	64	64	65	66	66	65	65	68	70	69	69	68	68	67	64	71	67	24					
6	67	66	66	65	65	64	64	64	64	65	65	63	63	61	59	60	63	69	70	69	69	67	66	66	59	70	65	24				
7	65	64	64	64	64	64	64	64	65	67	67	65	63	60	59	58	63	70	72	71	70	71	70	70	58	72	66	24				
8	69	70	70	70	70	70	70	70	70	69	67	66	66	66	67	69	72	74	74	74	74	73	72	73	66	74	70	24				
9	73	74	72	71	70	69	68	67	66	68	69	65	62	62	62	64	65	71	72	71	70	69	69	68	62	74	68	24				
10	68	67	68	67	67	66	67	68	67	67	66	64	65	66	67	69	71	73	73	73	73	74	74	64	74	69	24					
11	74	74	74	74	74	74	74	74	73	73	72	71	70	70	68	68	72	73	75	74	73	72	71	70	68	75	72	24				
12	69	69	69	68	67	67	67	67	67	67	68	67	66	64	64	63	67	72	73	72	71	70	69	68	63	73	68	24				
13	68	67	68	67	67	66	66	66	66	67	65	65	64	62	62	63	63	70	73	72	71	70	69	69	62	73	67	24				
14	68	67	68	68	66	67	67	66	66	66	66	64	62	59	57	57	60	66	73	73	73	74	72	71	57	74	66	24				
15	70	70	71	70	69	69	69	70	70	70	69	64	60	57	55	57	58	61	62	67	70	74	74	74	55	74	67	24				
16	75	75	75	74	73	73	73	74	73	71	68	66	66	67	65	67	71	72	73	73	74	74	74	65	75	72	24					
17	74	74	73	74	74	73	73	72	71	69	66	64	63	62	61	60	61	64	67	69	71	72	74	75	60	75	69	24				
18	76	76	74	73	72	72	71	70	69	66	68	60	55	55	52	51	53	61	65	67	66	65	66	67	51	76	66	24				
19	68	69	70	69	70	68	68	68	66	64	67	65	63	60	61	60	59	61	69	77	80	80	79	80	59	80	68	24				
20	81	83	82	82	80	81	83	83	81	79	77	74	71	69	69	71	71	73	72	73	74	73	74	69	83	77	24					
21	74	73	74	78	78	77	76	77	77	73	69	66	64	64	59	58	59	63	68	72	75	78	78	78	58	78	71	24				
22	77	78	78	76	77	76	76	75	73	70	64	55	51	49	49	52	62	74	75	74	76	74	74	49	78	69	24					
23	69	69	69	68	66	67	65	62	61	61	58	55	52	50	51	51	52	56	59	66	71	72	72	50	72	61	24					
24	72	70	69	70	69	68	68	66	67	66	63	57	55	52	48	48	49	52	58	64	67	70	71	72	48	72	63	24				
25	73	74	74	73	73	72	71	72	67	63	57	51	51	48	49	50	52	55	57	62	68	72	74	48	74	64	24					
26	73	72	72	71	70	70	69	70	71	68	61	57	53	54	56	58	66	76	79	76	72	72	73	74	53	79	68	24				
27	74	73	75	74	72	72	71	71	66	63	60	56	49	47	46	45	46	50	53	57	61	68	72	73	45	75	62	24				
28	73	73	72	71	75	78	80	79	79	70	60	57	54	52	51	58	64	71	71	61	63	67	70	51	80	67	24					
HOURLY MAX	81	83	82	82	80	81	83	83	81	79	77	74	71	70	71	72	76	79	77	80	80	79	80									
HOURLY AVG	71	71	71	71	71	70	70	70	69	68	66	63	61	60	60	60	63	67	69	69	70	71	71	72								

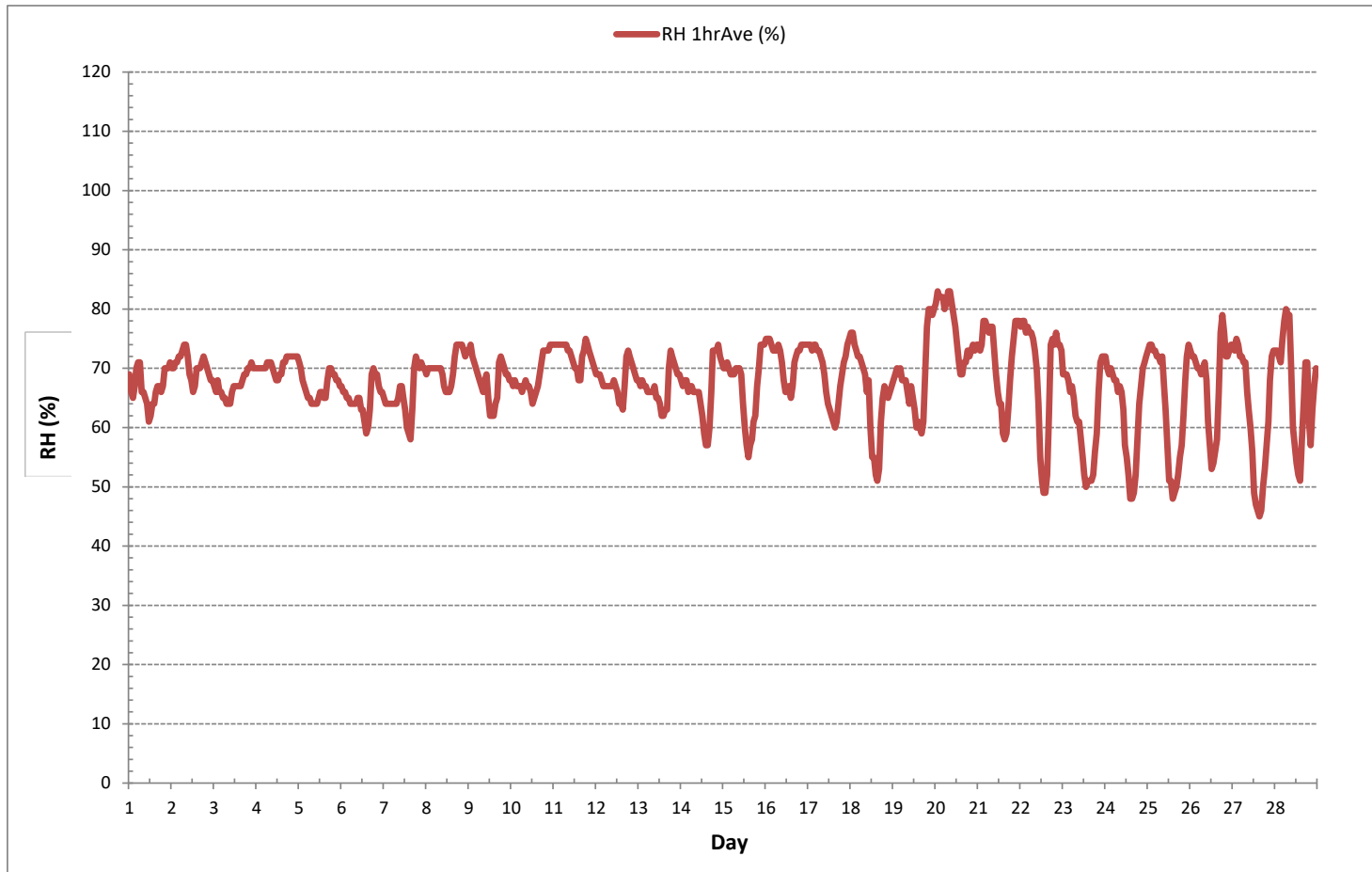
STATUS FLAG CODES

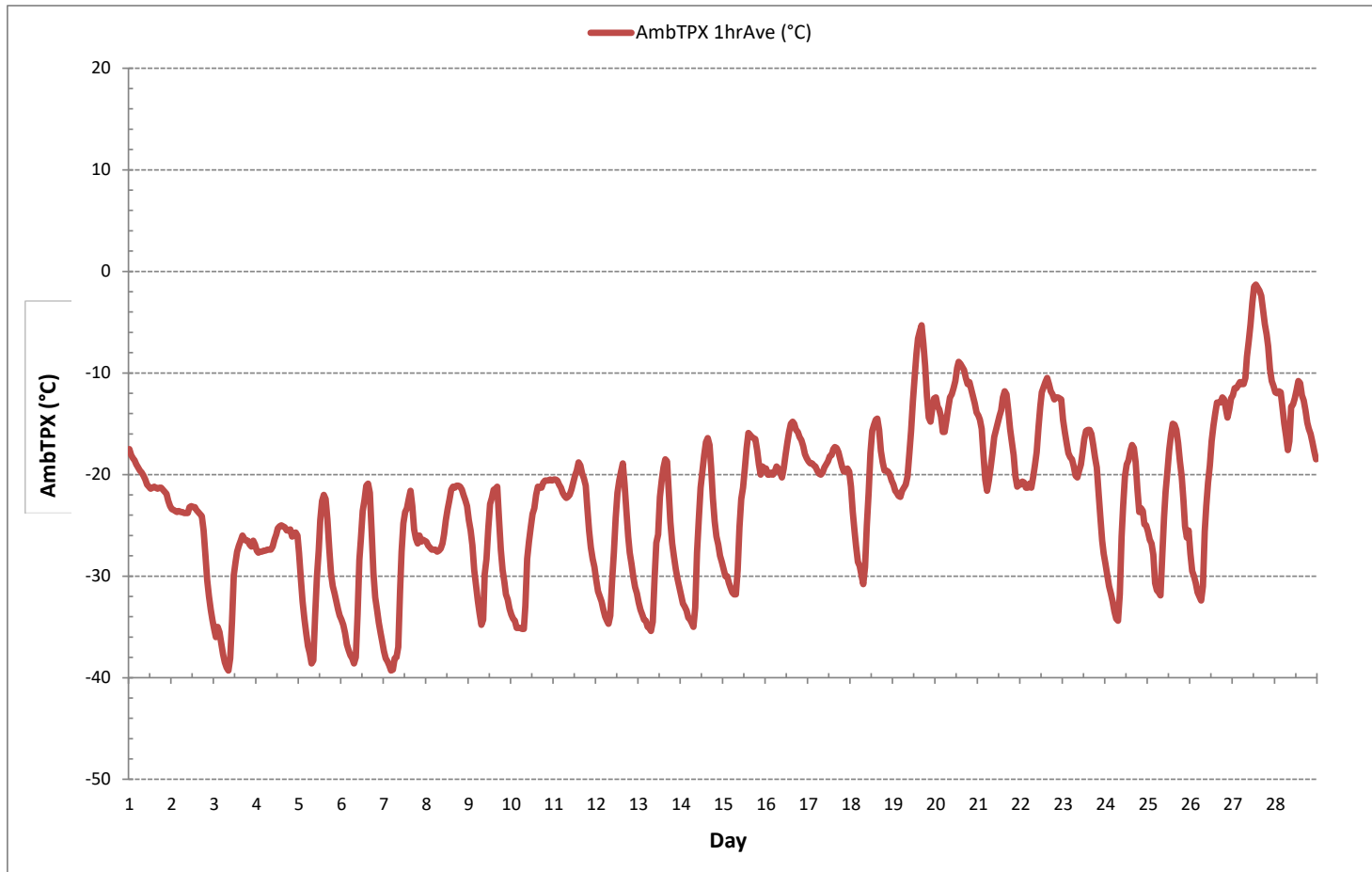
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	45	%	@ HOUR	15	ON DAY	27
MAXIMUM 1-HR AVERAGE:	83	%	@ HOUR	1	ON DAY	20
MAXIMUM 24-HR AVERAGE:	77	%			ON DAY	20
OPERATIONAL TIME:						672 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	7					MONTHLY AVERAGE: 68 %









LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

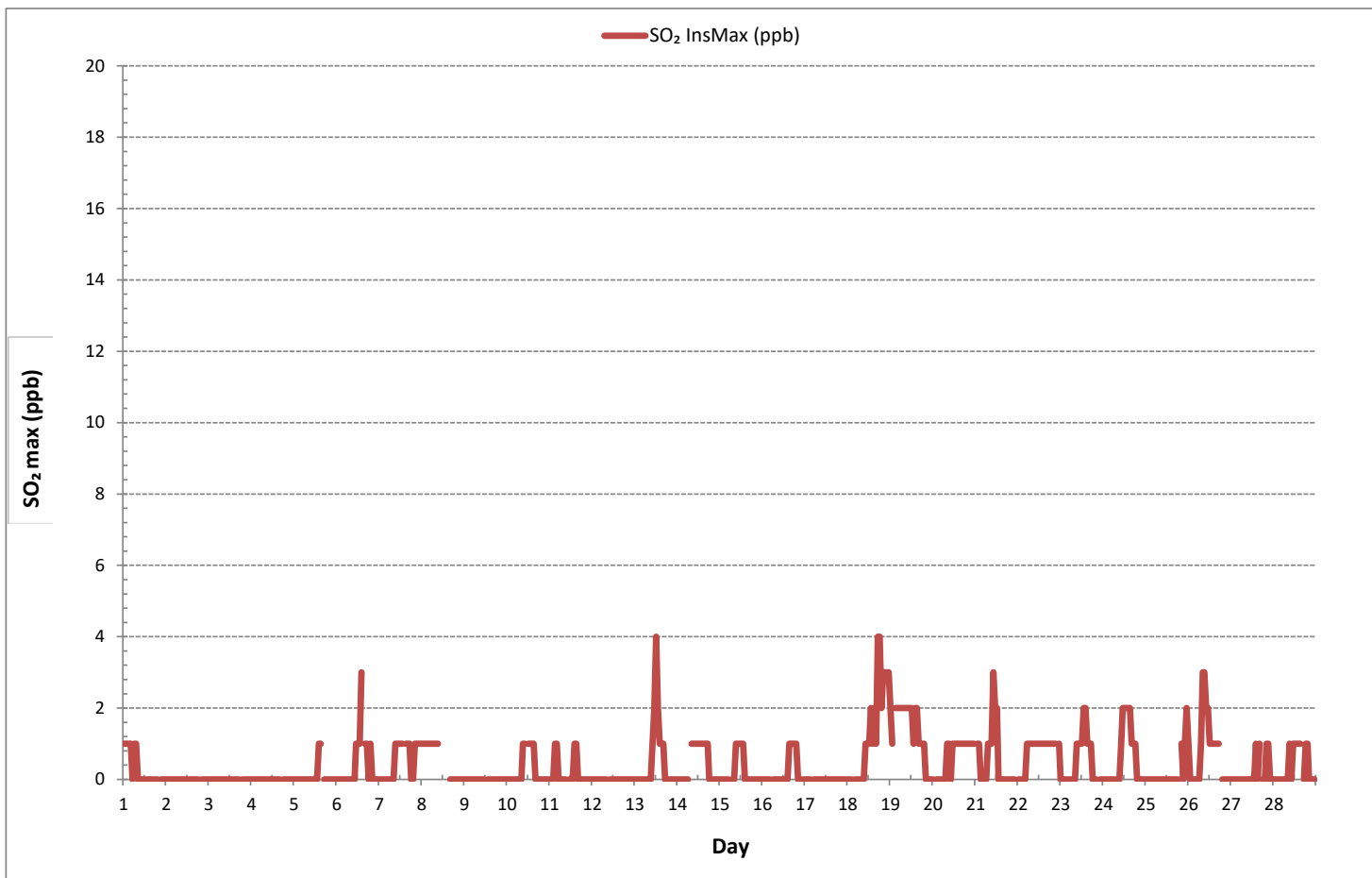
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59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

STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	194
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 12 ON DAY 13
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	1





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

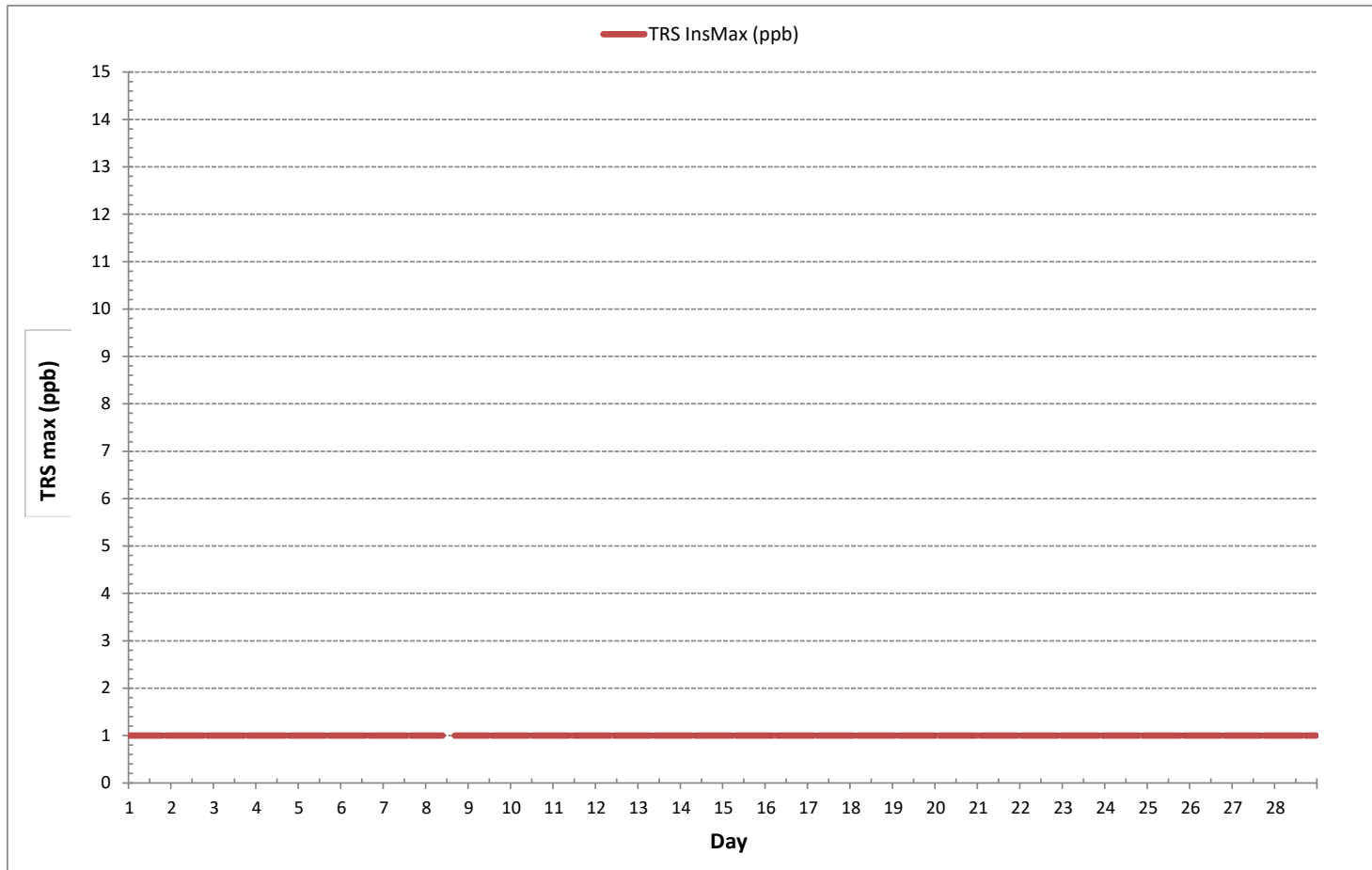
STATUS FLAG CODES

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:	638
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	2.01	2.00	1.99	1.99	1.99	1.99	2.00	2.00	2.00	1.99	1.98	1.98	1.98	1.98	1.98	1.97	1.98	1.98	1.98	1.98	1.98	S	1.98	1.99	1.98	1.97	2.01	1.99	24
2	1.98	1.98	1.97	1.98	1.98	1.98	1.99	1.97	1.98	1.98	1.99	1.99	1.97	1.98	1.98	1.98	1.96	1.97	2.01	S	2.04	2.04	2.09	2.23	1.96	2.23	2.00	24	
3	2.16	2.22	2.40	2.19	2.24	2.32	2.26	2.27	2.29	2.45	2.45	2.28	1.99	1.99	1.98	2.00	2.00	2.04	S	2.11	2.09	2.16	2.14	1.99	1.98	2.45	2.17	24	
4	1.99	1.99	1.99	1.98	1.99	1.99	1.98	2.23	2.29	1.99	1.98	1.98	1.99	1.99	1.99	2.00	S	2.04	2.00	2.00	2.02	2.03	2.01	1.98	2.29	2.02	24		
5	2.07	2.08	2.07	2.12	2.09	2.16	2.14	2.15	2.22	2.43	2.47	2.43	2.27	2.72	2.05	2.12	S	2.22	2.24	2.28	2.35	2.42	2.38	2.42	2.05	2.72	2.26	24	
6	2.49	2.45	2.44	2.50	2.48	2.53	2.69	2.68	2.69	2.71	2.75	2.77	2.60	2.56	2.43	S	2.34	2.39	2.74	2.71	2.43	2.37	2.44	2.45	2.34	2.77	2.55	24	
7	2.48	2.48	2.52	2.56	2.62	2.59	2.56	2.57	2.54	2.49	2.66	C	C	C	C	C	2.33	2.47	2.50	2.43	2.31	7.62	2.40	2.34	2.31	7.62	2.76	24	
8	2.33	2.33	2.30	2.29	2.26	2.55	2.17	2.13	2.09	2.08	2.15	2.18	2.10	S	2.06	2.05	2.04	2.47	2.02	2.03	2.04	2.03	2.02	2.01	2.01	2.55	2.16	24	
9	2.02	2.01	2.03	2.04	2.13	2.18	2.15	2.15	2.15	2.11	2.02	2.00	S	2.03	2.01	2.02	2.02	2.02	2.02	2.13	2.08	2.10	2.19	2.28	2.36	2.00	2.36	2.10	24
10	2.46	2.44	2.42	2.53	2.47	2.43	2.40	2.51	2.44	2.37	2.29	S	2.13	2.11	2.07	2.07	2.06	2.03	1.99	1.99	1.99	2.00	1.99	1.99	1.99	2.53	2.22	24	
11	1.98	1.98	1.98	2.01	2.04	1.99	1.98	1.98	1.98	1.97	S	1.98	2.01	2.04	2.01	2.02	1.97	1.98	2.05	2.05	2.06	2.04	2.11	2.06	1.97	2.11	2.01	24	
12	2.16	2.10	2.20	2.32	2.25	2.28	2.29	2.32	2.76	S	2.59	2.52	2.36	2.30	2.27	2.22	2.23	2.25	2.78	2.38	2.32	2.31	2.39	2.41	2.10	2.78	2.35	24	
13	2.49	2.56	2.53	2.61	2.54	2.54	2.50	2.53	S	3.03	2.96	2.92	2.60	2.49	2.32	2.18	2.35	2.10	2.12	2.16	2.16	2.25	2.16	2.27	2.10	3.03	2.45	24	
14	2.22	2.30	2.31	2.31	2.35	2.37	2.44	S	2.45	2.62	2.54	2.29	2.21	2.18	2.18	2.15	2.09	2.14	2.35	2.10	2.57	2.44	2.38	2.41	2.09	2.62	2.32	24	
15	2.65	2.76	2.42	2.39	2.53	2.49	S	2.48	3.44	2.36	2.22	2.17	2.12	2.17	2.08	2.11	2.12	2.03	2.01	2.25	2.11	2.16	2.12	2.02	2.01	3.44	2.31	24	
16	1.99	2.00	1.99	1.99	1.99	S	1.99	2.00	2.02	2.04	2.04	2.04	2.04	2.03	2.04	2.06	2.06	2.06	2.06	2.06	2.05	2.03	2.03	2.03	1.99	2.06	2.03	24	
17	2.03	2.04	2.03	2.04	S	2.02	2.01	2.01	2.00	2.03	2.00	2.00	2.00	2.00	1.99	2.00	2.00	2.02	2.05	2.07	2.01	2.08	2.11	2.01	1.99	2.11	2.02	24	
18	2.01	2.15	2.14	S	2.17	2.15	2.23	2.23	2.42	2.39	2.81	2.19	2.17	2.17	2.23	2.23	2.11	2.15	2.13	2.14	2.11	2.11	2.11	2.13	2.01	2.81	2.20	24	
19	2.15	2.20	S	2.24	2.25	2.24	2.28	2.29	2.34	2.47	2.43	2.25	2.21	2.21	2.26	2.18	2.34	2.49	2.85	2.46	2.54	2.66	2.64	2.69	2.15	2.85	2.37	24	
20	2.64	S	2.84	2.87	2.80	2.79	2.74	2.46	2.22	2.20	2.22	2.24	2.24	2.16	2.13	2.10	2.11	2.11	2.10	2.10	2.09	2.06	2.05	2.04	2.04	2.87	2.32	24	
21	S	2.06	2.06	2.09	2.10	2.11	2.12	2.13	2.40	2.30	2.16	2.04	1.99	2.02	2.02	2.02	2.04	2.05	2.08	2.08	2.57	2.31	2.23	S	1.99	2.57	2.13	24	
22	2.32	2.33	2.21	2.35	2.27	2.21	2.28	2.53	2.32	2.32	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.21	2.53	-	10
23	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.03	2.04	2.04	2.04	2.07	2.06	2.07	2.09	S	2.17	2.28	2.03	2.28	-	11
24	2.28	2.16	2.19	2.26	2.28	2.18	2.29	2.32	2.50	2.72	2.64	2.50	2.25	2.14	2.12	2.14	2.11	2.12	2.13	2.15	S	2.20	2.18	2.21	2.11	2.72	2.26	24	
25	2.14	2.16	2.17	2.18	2.18	2.35	2.24	2.21	2.34	2.20	2.19	2.11	3.05	2.11	2.15	2.09	2.15	2.11	2.19	S	2.27	2.27	2.49	3.13	2.09	3.13	2.28	24	
26	3.03	3.00	2.68	2.72	2.64	2.68	2.79	2.80	2.57	2.37	2.28	2.27	2.27	2.27	2.25	2.33	2.26	2.31	S	2.19	2.16	2.19	2.23	2.18	2.16	3.03	2.45	24	
27	2.21	2.19	2.17	2.13	2.10	2.11	2.08	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.08	2.21	-	7
28	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	0
HOURLY MAX	3.03	3.00	2.84	2.87	2.80	2.79	2.79	2.80	3.44	3.03	2.96	2.92	3.05	2.72	2.43	2.33	2.35	2.49	2.85	2.71	2.57	7.62	2.64	3.13					
HOURLY AVG	2.25	2.24	2.24	2.27	2.27	2.29	2.26	2.29	2.35	2.32	2.34	2.23	2.21	2.16	2.11	2.09	2.11	2.15	2.20	2.17	2.19	2.41	2.21	2.24					

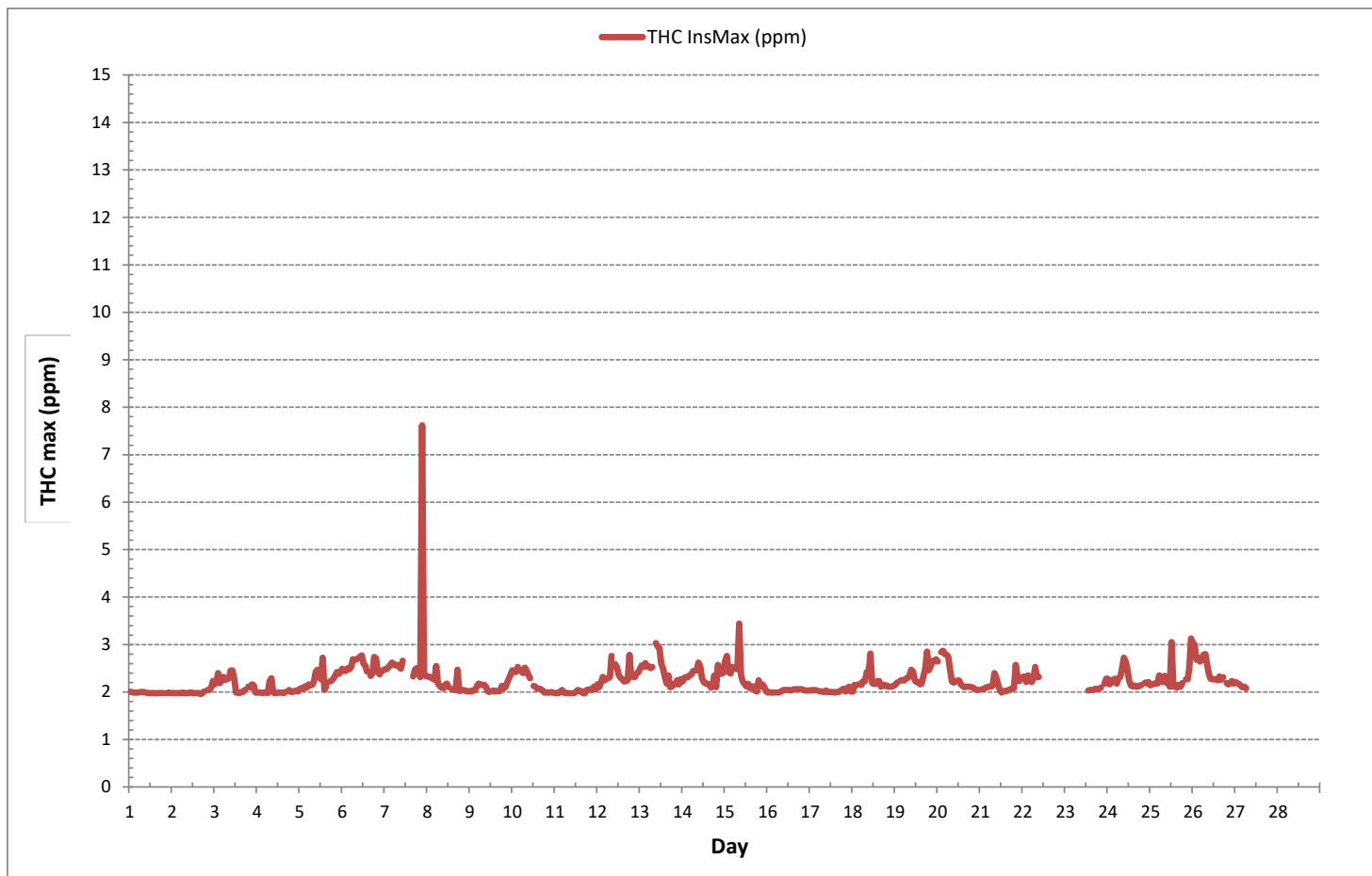
STATUS FLAG CODES

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:	574
MAXIMUM INSTANTANEOUS VALUE:	7.62 ppm @ HOUR 21 ON DAY 7
IZS CALIBRATION TIME:	25 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	604 hrs
STANDARD DEVIATION:	0.32

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	2.01	2.00	1.99	1.99	1.99	1.99	2.00	2.00	2.00	1.99	1.98	1.98	1.98	1.98	1.98	1.97	1.98	1.98	1.98	1.98	1.98	S	1.98	1.99	1.98	1.97	2.01	1.99	24
2	1.98	1.98	1.97	1.98	1.98	1.98	1.99	1.97	1.98	1.98	1.99	1.99	1.97	1.98	1.98	1.98	1.96	1.97	2.01	S	2.04	2.04	2.09	2.23	1.96	2.23	2.00	24	
3	2.16	2.22	2.40	2.19	2.24	2.32	2.26	2.27	2.29	2.45	2.45	2.28	1.99	1.99	1.98	2.00	2.00	2.04	S	2.11	2.09	2.16	2.14	1.99	1.98	2.45	2.17	24	
4	1.99	1.99	1.99	1.98	1.99	1.99	1.98	1.99	2.00	1.99	1.98	1.98	1.99	1.99	1.99	1.98	2.00	S	2.04	2.00	2.00	2.02	2.03	2.01	1.98	2.04	1.99	24	
5	2.07	2.08	2.07	2.12	2.09	2.16	2.14	2.15	2.22	2.43	2.47	2.43	2.27	2.10	2.05	2.12	S	2.22	2.24	2.28	2.35	2.42	2.38	2.42	2.05	2.47	2.23	24	
6	2.49	2.45	2.44	2.50	2.48	2.53	2.69	2.68	2.69	2.71	2.75	2.77	2.60	2.56	2.43	S	2.34	2.39	2.46	2.40	2.43	2.37	2.44	2.45	2.34	2.77	2.52	24	
7	2.48	2.48	2.52	2.56	2.62	2.59	2.56	2.57	2.54	2.49	2.66	C	C	C	C	C	2.33	2.47	2.50	2.43	2.31	2.44	2.40	2.34	2.31	2.66	2.49	24	
8	2.33	2.33	2.30	2.29	2.26	2.20	2.17	2.13	2.09	2.08	2.15	2.18	2.10	S	2.06	2.05	2.04	2.06	2.02	2.03	2.04	2.03	2.02	2.01	2.01	2.33	2.13	24	
9	2.02	2.01	2.03	2.04	2.13	2.18	2.15	2.15	2.15	2.11	2.02	2.00	S	2.03	2.01	2.02	2.02	2.02	2.13	2.08	2.10	2.19	2.28	2.36	2.00	2.36	2.10	24	
10	2.46	2.46	2.42	2.53	2.47	2.43	2.40	2.51	2.44	2.37	2.29	S	2.13	2.11	2.07	2.07	2.06	2.03	1.99	1.99	1.99	1.99	2.00	1.99	1.99	2.53	2.23	24	
11	1.98	1.98	1.98	2.01	2.04	1.99	1.98	1.98	1.98	1.97	S	1.98	2.01	2.04	2.01	2.02	1.97	1.98	2.05	2.05	2.06	2.04	2.11	2.06	1.97	2.11	2.01	24	
12	2.16	2.10	2.20	2.32	2.25	2.28	2.29	2.32	2.76	S	2.59	2.52	2.36	2.30	2.27	2.22	2.23	2.25	2.35	2.38	2.32	2.31	2.39	2.41	2.10	2.76	2.33	24	
13	2.49	2.56	2.53	2.61	2.54	2.54	2.50	2.53	S	3.03	2.96	2.92	2.60	2.49	2.32	2.18	2.13	2.10	2.12	2.16	2.16	2.25	2.16	2.27	2.10	3.03	2.44	24	
14	2.22	2.30	2.31	2.31	2.35	2.37	2.44	S	2.45	2.62	2.54	2.29	2.21	2.18	2.18	2.15	2.09	2.14	2.35	2.10	2.24	2.44	2.38	2.41	2.09	2.62	2.31	24	
15	2.65	2.76	2.42	2.39	2.53	2.49	S	2.48	2.52	2.36	2.22	2.17	2.12	2.17	2.08	2.11	2.12	2.03	2.01	2.25	2.11	2.16	2.12	2.02	2.01	2.76	2.27	24	
16	1.99	2.00	1.99	1.99	1.99	S	1.99	2.00	2.02	2.04	2.04	2.04	2.04	2.03	2.04	2.06	2.06	2.06	2.06	2.06	2.05	2.03	2.03	2.03	1.99	2.06	2.03	24	
17	2.03	2.04	2.03	2.04	S	2.02	2.01	2.01	2.00	2.03	2.00	2.00	2.00	2.00	1.99	2.00	2.00	2.02	2.05	2.07	2.01	2.08	2.11	2.01	1.99	2.11	2.02	24	
18	2.01	2.15	2.14	S	2.17	2.15	2.23	2.23	2.42	2.39	2.81	2.19	2.17	2.17	2.23	2.23	2.11	2.15	2.13	2.14	2.11	2.11	2.11	2.13	2.01	2.81	2.20	24	
19	2.15	2.20	S	2.24	2.25	2.24	2.28	2.29	2.34	2.47	2.43	2.25	2.21	2.21	2.16	2.18	2.34	2.49	2.53	2.46	2.54	2.66	2.64	2.69	2.15	2.69	2.36	24	
20	2.64	S	2.84	2.87	2.80	2.79	2.74	2.46	2.22	2.20	2.22	2.24	2.24	2.16	2.13	2.10	2.11	2.11	2.10	2.09	2.06	2.05	2.04	2.04	2.04	2.87	2.32	24	
21	S	2.06	2.06	2.09	2.10	2.11	2.12	2.13	2.40	2.30	2.16	2.04	1.99	2.02	2.02	2.02	2.04	2.05	2.08	2.08	2.18	2.31	2.23	S	1.99	2.40	2.12	24	
22	2.32	2.33	2.21	2.35	2.27	2.21	2.28	2.28	2.32	2.32	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.21	2.35	-	10
23	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.03	2.04	2.04	2.04	2.06	2.06	2.07	2.08	S	2.17	2.27	2.03	2.27	-	11	
24	2.27	2.16	2.18	2.24	2.27	2.18	2.28	2.28	2.48	2.66	2.60	2.47	2.25	2.14	2.12	2.14	2.11	2.12	2.13	2.14	S	2.20	2.17	2.21	2.11	2.66	2.25	24	
25	2.14	2.14	2.17	2.18	2.18	2.28	2.24	2.21	2.34	2.20	2.17	2.11	2.27	2.11	2.11	2.09	2.15	2.10	2.19	S	2.19	2.27	2.45	3.01	2.09	3.01	2.23	24	
26	2.92	2.93	2.64	2.68	2.59	2.63	2.73	2.72	2.53	2.35	2.25	2.23	2.22	2.26	2.23	2.18	2.17	2.18	S	2.14	2.15	2.19	2.20	2.16	2.14	2.93	2.40	24	
27	2.21	2.19	2.17	2.12	2.09	2.08	2.08	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.08	2.21	-	7
28	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	0
HOURLY MAX	2.92	2.93	2.84	2.87	2.80	2.79	2.74	2.72	2.76	3.03	2.96	2.92	2.60	2.56	2.43	2.23	2.34	2.49	2.53	2.46	2.54	2.66	2.64	3.01					
HOURLY AVG	2.25	2.24	2.24	2.26	2.27	2.27	2.26	2.26	2.30	2.31	2.34	2.23	2.17	2.13	2.10	2.08	2.10	2.13	2.16	2.15	2.16	2.20	2.20	2.23					

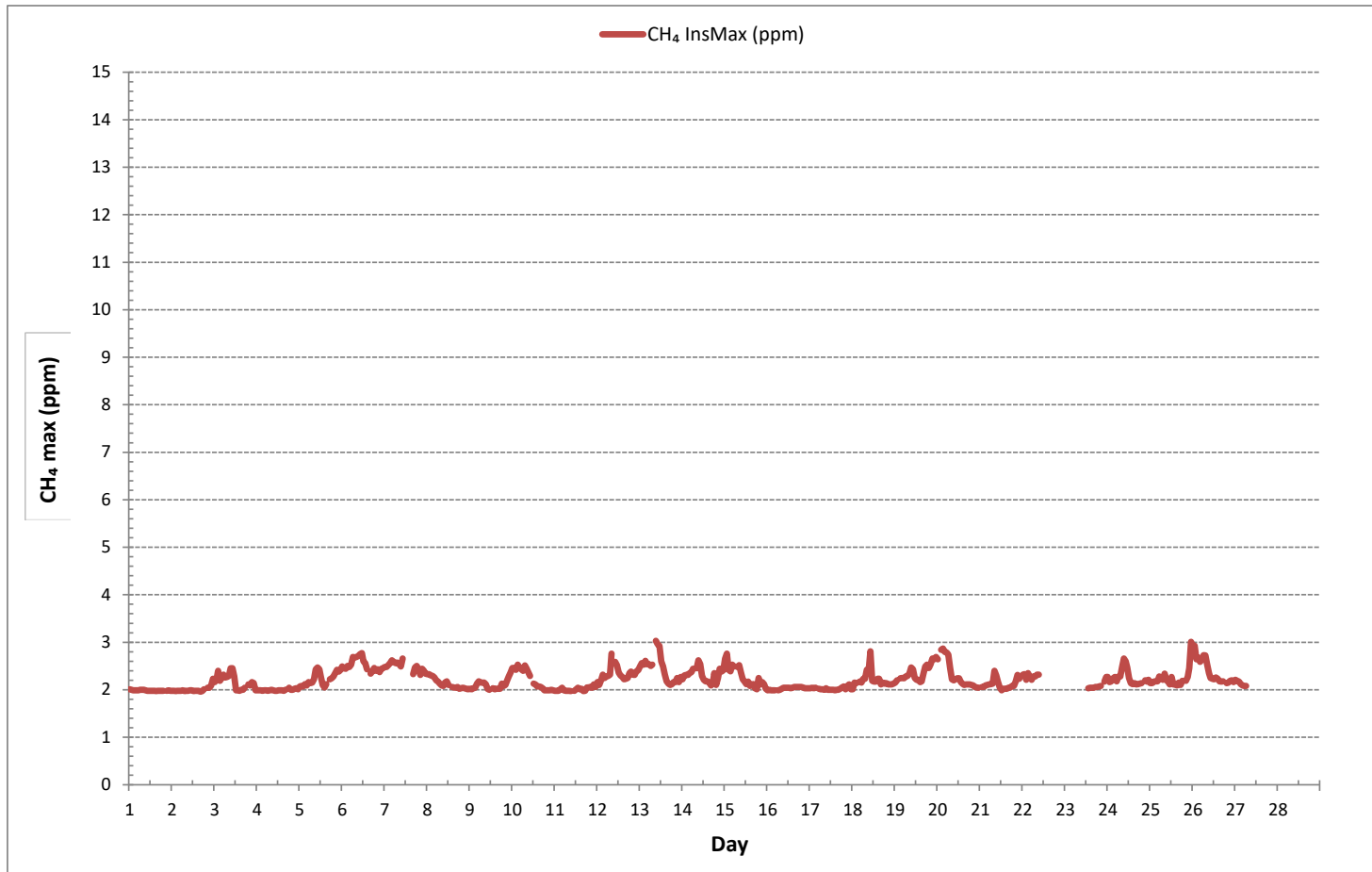
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	574
MAXIMUM INSTANTANEOUS VALUE:	3.03 ppm @ HOUR 9 ON DAY 13
IZS CALIBRATION TIME:	25 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	604 hrs
STANDARD DEVIATION:	0.22

METHANE MAX Instantaneous Maximum (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	0.00	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
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	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	0.00	0.00	S	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	0.24	0.29	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	0.29	0.02	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	0.65	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	0.65	0.03	24
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.37	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.03	24
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	0.00	0.00	0.00	0.00	0.00	5.18	0.00	0.00	0.00	5.18	0.27	24	
8	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.03	24	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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	0.00	0.00	0.00	0.00	0.00	0.00	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
12	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	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.02	24
13	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	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.01	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	0.44	0.00	0.00	0.00	0.00	0.44	0.02	24	
15	0.00	0.00	0.00	0.00	0.00	S	0.00	1.03	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	0.00	0.00	1.03	0.04	24	
16	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
17	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
18	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
19	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	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.02	24	
20	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
21	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	0.43	0.00	0.00	S	0.00	0.43	0.02	24	
22	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.00	0.27	-	10
23	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	0.00	0.01	0.01	0.00	0.00	0.00	0.02	0.01	S	0.01	0.02	0.00	0.02	-	11	
24	0.02	0.01	0.03	0.04	0.03	0.02	0.02	0.04	0.06	0.08	0.04	0.03	0.03	0.01	0.02	0.00	0.02	0.00	0.02	0.01	S	0.02	0.01	0.01	0.00	0.08	0.02	24	
25	0.01	0.01	0.00	0.01	0.01	0.12	0.01	0.01	0.04	0.01	0.05	0.01	0.78	0.01	0.05	0.02	0.05	0.03	0.01	S	0.11	0.07	0.04	0.13	0.00	0.78	0.07	24	
26	0.13	0.10	0.08	0.08	0.08	0.11	0.09	0.10	0.07	0.04	0.07	0.05	0.07	0.05	0.08	0.16	0.10	0.13	S	0.07	0.05	0.07	0.03	0.03	0.03	0.16	0.08	24	
27	0.03	0.04	0.03	0.02	0.03	0.04	0.04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.02	0.04	-	7
28	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	0
HOURLY MAX	0.13	0.10	0.08	0.08	0.08	0.35	0.09	0.27	1.03	0.08	0.07	0.05	0.78	0.65	0.08	0.16	0.25	0.41	0.48	0.32	0.44	5.18	0.04	0.13					
HOURLY AVG	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.03	0.06	0.01	0.01	0.00	0.04	0.03	0.01	0.01	0.02	0.02	0.06	0.02	0.05	0.22	0.00	0.01					

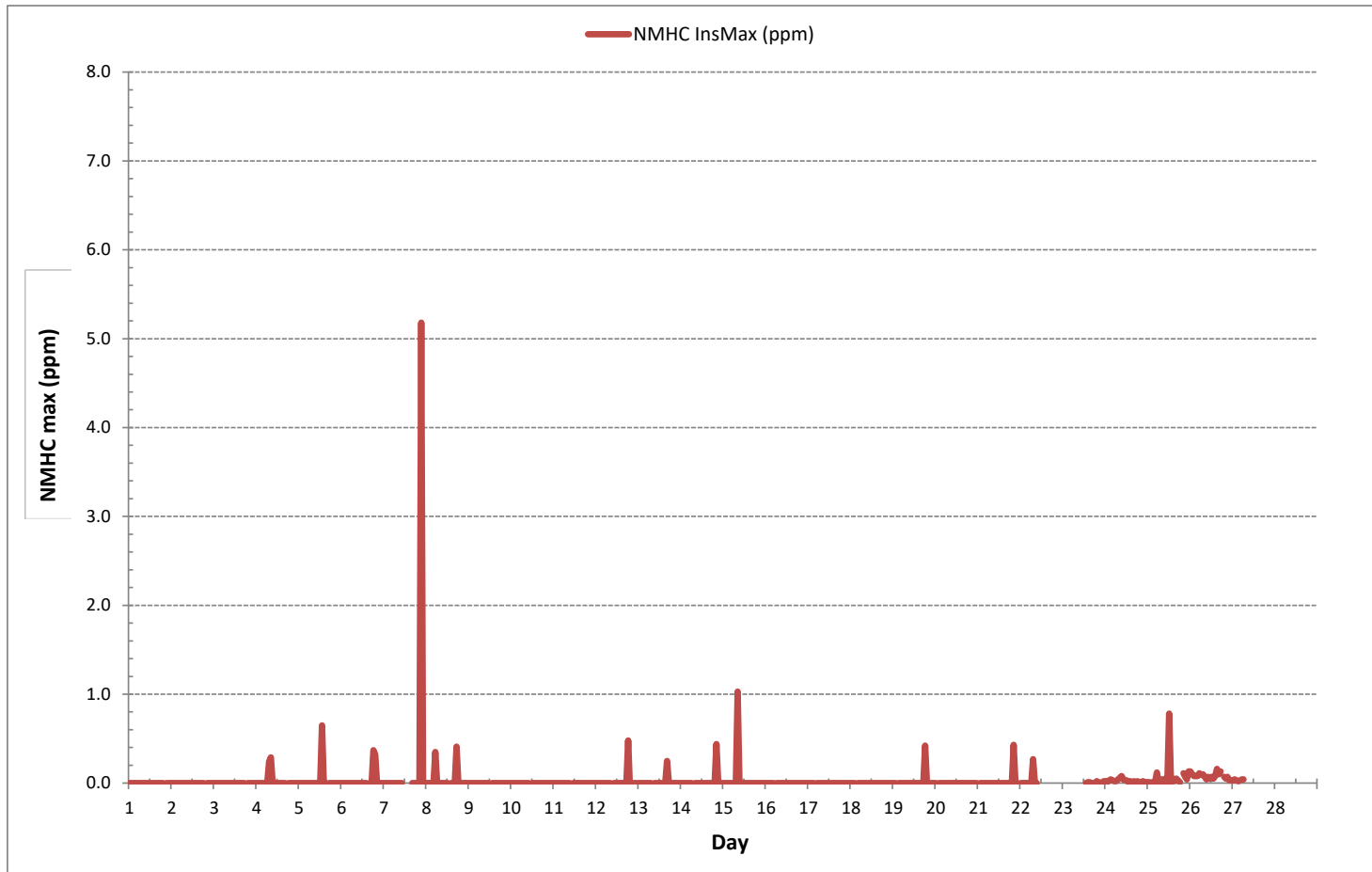
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	94
MAXIMUM INSTANTANEOUS VALUE:	5.18 ppm @ HOUR 21 ON DAY 7
IZS CALIBRATION TIME:	25 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	604 hrs
STANDARD DEVIATION:	0.23

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	5	3	4	4	5	6	6	6	8	6	5	5	6	6	6	16	5	9	8	S	6	3	4	3	3	16	6	24	
2	4	4	4	4	7	7	8	14	7	9	4	4	3	3	4	4	3	10	10	S	12	18	20	32	3	32	9	24	
3	18	18	33	21	18	18	18	24	18	15	20	19	4	7	5	7	9	9	S	12	13	14	14	5	4	33	15	24	
4	4	7	6	6	9	8	9	10	13	7	9	8	8	9	75	6	12	S	16	4	6	8	4	20	4	75	11	24	
5	6	5	5	6	10	7	14	14	19	27	31	25	17	17	20	18	S	24	16	15	15	17	20	18	5	31	16	24	
6	26	27	25	26	33	32	37	41	43	47	51	42	48	46	15	S	49	61	44	85	46	51	42	57	15	85	42	24	
7	45	47	56	58	56	53	60	60	61	62	18	20	18	17	S	16	24	38	49	35	8	33	5	6	5	62	37	24	
8	10	9	7	9	10	15	15	14	14	9	C	C	C	C	C	C	C	C	C	19	17	12	5	6	6	5	19	-	24
9	7	14	8	7	9	6	7	15	27	30	20	7	S	3	4	4	6	13	12	71	9	15	51	30	3	71	16	24	
10	40	39	42	47	40	36	23	30	36	44	17	S	11	7	9	11	15	10	7	6	5	7	6	6	5	47	21	24	
11	5	4	4	3	8	8	8	18	11	10	S	9	6	13	7	12	13	22	22	27	28	12	21	13	3	28	12	24	
12	16	15	14	29	15	16	19	36	63	S	25	S1	14	15	12	16	16	26	35	48	17	16	12	13	12	63	22	23	
13	21	12	20	18	18	18	33	48	S	65	52	40	25	20	24	16	18	22	28	14	36	23	18	14	12	65	26	24	
14	16	14	21	23	30	33	46	S	115	102	97	43	27	18	22	17	15	22	67	23	44	54	39	57	14	115	41	24	
15	37	37	47	35	44	33	S	79	50	41	26	14	13	10	12	8	13	11	23	24	27	19	24	9	8	79	28	24	
16	12	10	12	13	8	S	11	12	6	6	6	5	4	4	4	5	4	4	5	5	7	8	3	3	3	3	13	7	24
17	4	8	5	4	S	7	4	5	7	5	3	4	7	5	5	8	8	9	18	16	6	6	5	6	3	18	7	24	
18	5	8	8	S	8	18	28	31	36	24	11	6	7	7	6	6	4	7	7	6	10	5	5	5	4	36	11	24	
19	5	5	S	9	6	7	8	8	11	12	13	17	14	14	13	12	18	18	33	23	25	40	53	47	5	53	18	24	
20	30	S	33	36	28	31	30	24	11	10	10	9	9	6	6	7	6	7	8	4	4	3	4	4	3	36	14	24	
21	S	4	4	7	4	9	24	29	35	21	13	7	4	4	4	6	7	12	3	4	11	8	5	S	3	35	10	24	
22	11	5	6	13	9	15	35	35	9	15	7	6	6	17	9	7	7	7	8	13	11	8	S	9	5	35	12	24	
23	2	2	2	2	1	2	2	2	2	3	3	3	3	4	4	3	3	3	2	3	9	S	10	14	1	14	4	24	
24	14	11	15	24	20	14	20	17	13	20	19	15	9	6	5	4	4	4	7	11	S	8	7	8	4	24	12	24	
25	9	8	6	10	9	11	15	11	16	14	14	8	9	7	7	6	5	5	6	S	13	16	7	9	5	16	10	24	
26	11	10	12	11	12	12	16	18	15	19	17	19	17	16	15	16	22	16	S	10	24	16	9	11	9	24	15	24	
27	8	11	8	6	7	6	5	7	6	5	4	4	3	8	8	10	3	S	9	3	6	12	10	10	3	12	7	24	
28	12	4	3	4	4	16	39	13	42	26	4	23	9	9	5	5	S	7	6	8	4	3	3	2	2	42	11	24	
HOURLY MAX	45	47	56	58	56	53	60	79	115	102	97	43	48	46	75	18	49	61	67	85	46	54	53	57					
HOURLY AVG	14	13	15	16	16	16	20	23	26	24	19	14	12	11	12	9	12	15	18	19	16	16	15	15					

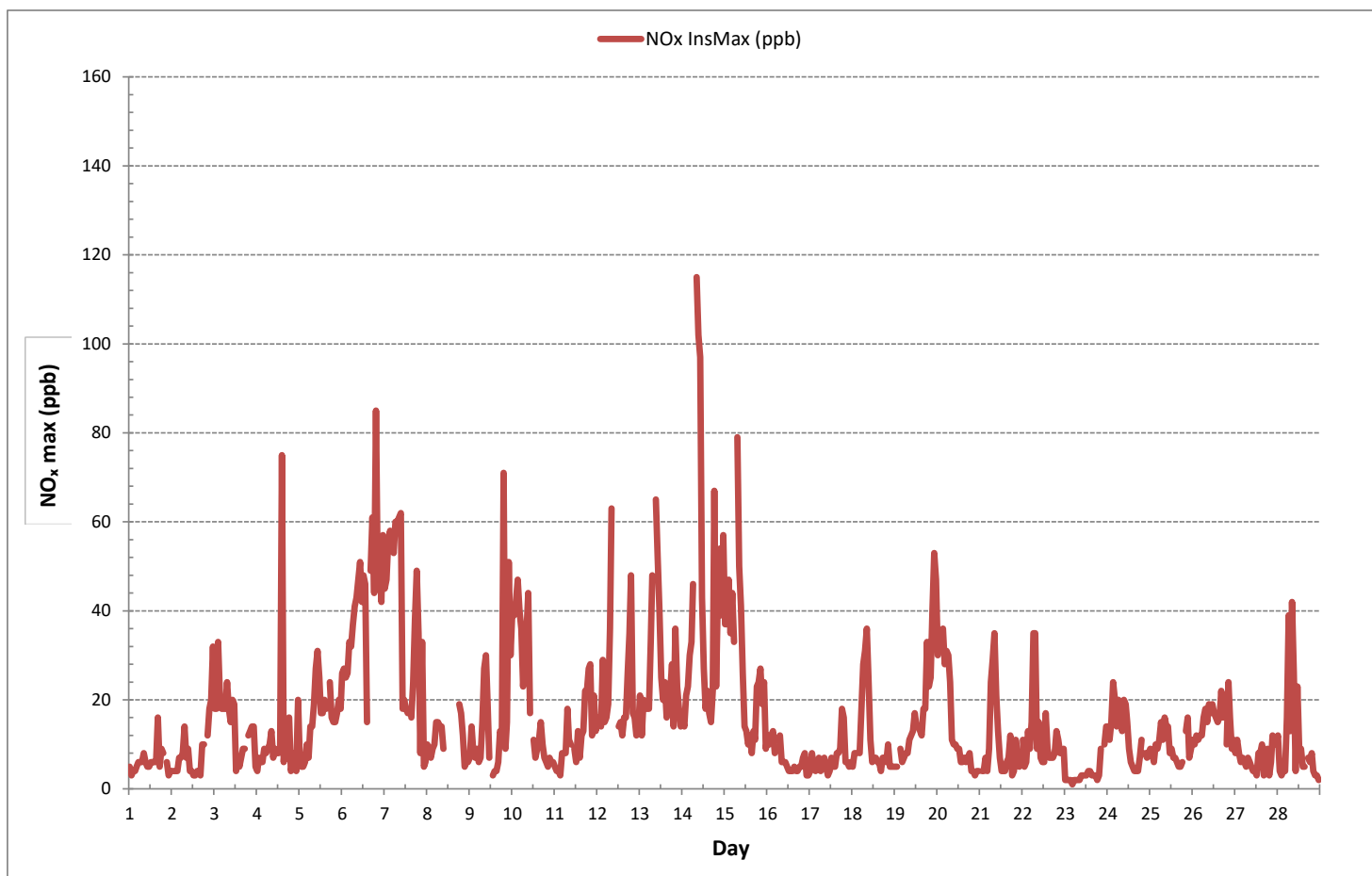
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	635
MAXIMUM INSTANTANEOUS VALUE:	115 ppb @ HOUR 8 ON DAY 14
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	15
OPERATIONAL TIME:	671 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	1	2	1	2	3	3	1	2	3	3	2	3	3	2	3	16	2	9	3	S	2	1	2	1	16	3	24	
2	1	2	1	2	3	4	3	9	3	3	2	3	1	1	2	2	1	3	4	S	0	0	1	7	0	9	3	24	
3	2	2	7	1	3	3	1	19	6	7	9	9	2	3	2	2	3	2	S	2	2	2	3	2	1	19	4	24	
4	2	5	4	2	2	3	4	4	4	2	3	5	3	9	5	3	4	S	5	1	0	1	0	11	0	11	4	24	
5	0	1	0	0	0	0	1	2	4	14	17	14	9	9	14	6	S	9	3	1	1	0	0	0	0	17	5	24	
6	2	2	1	2	4	4	9	11	18	26	31	26	28	27	7	S	23	26	12	45	15	18	13	28	1	45	17	24	
7	18	20	27	29	27	25	32	31	35	55	9	11	14	9	S	6	7	9	12	7	1	18	0	1	0	55	17	24	
8	2	1	1	2	2	4	3	3	6	4	C	C	C	C	C	C	C	C	C	3	3	2	2	2	2	1	6	-	24
9	2	4	4	1	1	0	0	2	10	15	8	4	S	2	2	1	1	0	0	46	0	1	22	5	0	46	6	24	
10	8	9	11	16	11	8	1	9	16	21	7	S	7	3	4	5	6	2	1	2	1	2	1	2	1	21	7	24	
11	1	1	1	1	2	3	4	2	3	S	3	3	7	3	4	3	5	5	2	1	0	3	0	0	0	7	3	24	
12	3	1	1	4	1	2	2	21	33	S	11	S1	7	7	6	6	4	3	9	11	1	2	1	1	1	33	6	23	
13	3	1	4	1	2	2	8	21	S	42	34	25	14	12	11	6	4	4	3	1	11	3	0	0	0	42	9	24	
14	0	0	1	1	6	7	19	S	83	69	65	30	13	9	10	8	5	3	40	1	9	19	9	36	0	83	19	24	
15	8	9	15	7	15	8	S	57	26	23	13	7	6	4	8	2	4	4	9	9	9	2	7	3	2	57	11	24	
16	4	2	4	5	3	S	3	4	1	1	2	3	2	2	1	1	1	1	2	4	2	3	1	1	1	5	2	24	
17	1	3	2	1	S	2	1	2	2	2	2	2	3	2	4	4	3	2	4	3	0	1	0	0	0	4	2	24	
18	0	0	0	S	1	2	6	6	17	12	5	3	3	3	3	2	1	0	1	0	2	0	0	0	0	17	3	24	
19	0	0	S	2	0	1	2	1	4	4	6	7	5	5	4	3	4	7	7	1	2	9	20	13	0	20	5	24	
20	2	S	8	8	3	5	7	3	3	3	5	4	4	2	2	3	2	3	2	1	0	0	1	0	0	8	3	24	
21	S	1	0	1	1	0	3	5	12	6	4	2	1	2	1	2	2	8	0	1	4	1	0	S	0	12	3	24	
22	3	1	1	4	1	2	6	5	2	5	3	2	2	2	3	2	1	1	1	1	1	1	2	S	2	1	6	2	24
23	0	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	2	S	0	1	0	2	1	24	
24	1	0	2	4	1	1	3	4	6	10	10	8	5	3	2	1	1	1	1	4	S	1	2	2	0	10	3	24	
25	1	1	1	3	2	1	3	4	5	6	6	4	5	4	3	3	2	4	1	S	2	1	0	1	0	6	3	24	
26	0	1	2	1	1	1	1	7	5	8	8	7	7	6	5	7	5	3	S	2	4	1	1	1	0	8	4	24	
27	1	1	0	1	2	1	1	3	1	2	2	1	1	4	3	4	1	S	10	0	0	3	3	3	0	10	2	24	
28	4	0	0	0	2	1	14	2	18	10	2	4	2	5	2	2	S	3	2	1	2	1	1	1	0	18	3	24	
HOURLY MAX	18	20	27	29	27	25	32	57	83	69	65	30	28	27	14	8	23	26	40	46	15	19	22	36					
HOURLY AVG	3	3	4	4	4	3	5	9	12	13	10	7	6	5	4	3	4	4	6	6	3	4	3	5					

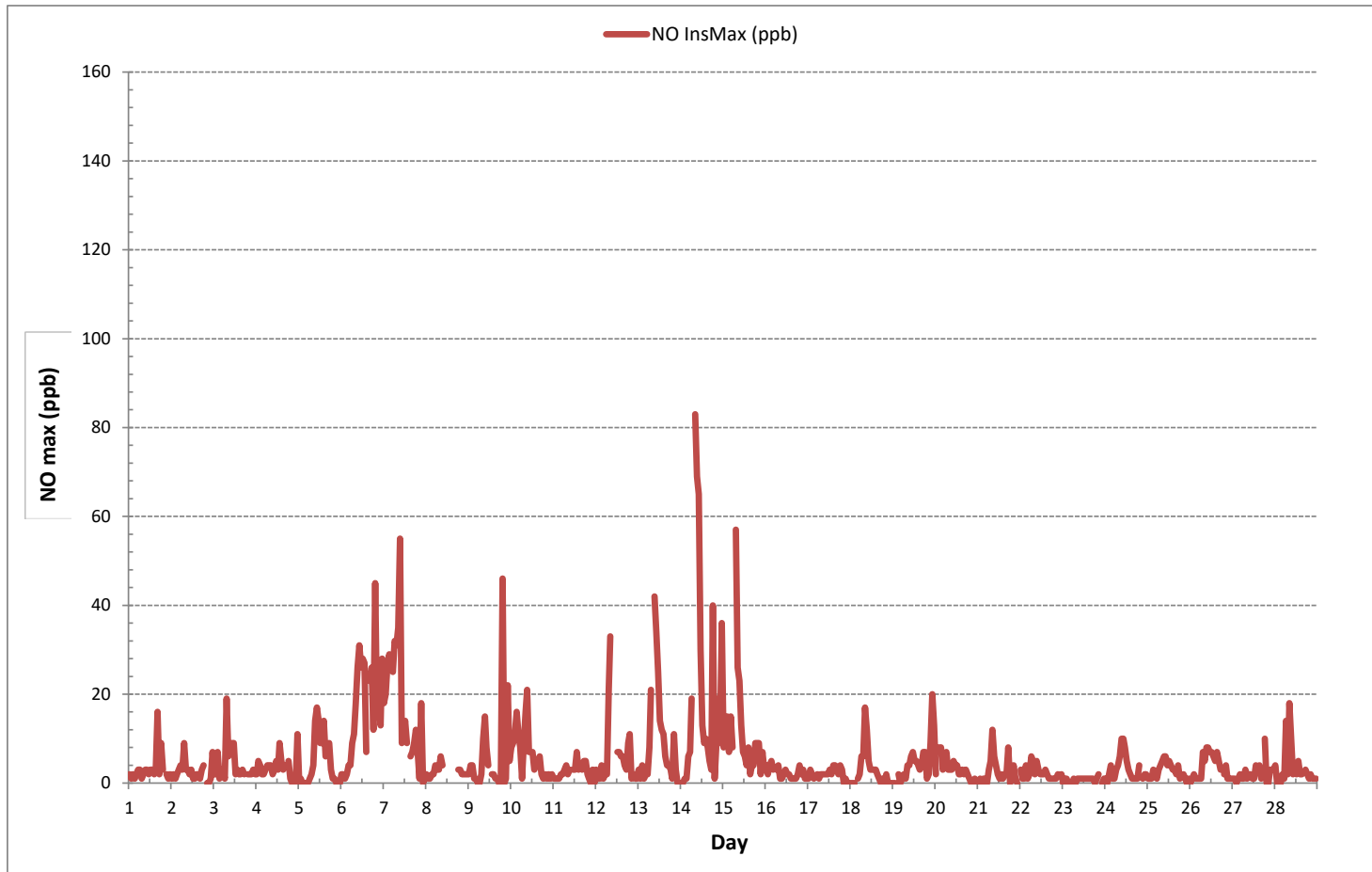
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	574
MAXIMUM INSTANTANEOUS VALUE:	83 ppb @ HOUR 8 ON DAY 14
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	671 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	3	2	3	3	4	4	4	5	6	3	3	4	3	4	5	4	5	4	5	5	S	4	3	3	2	6	4	24	
2	3	3	3	3	5	5	6	6	6	6	3	2	2	1	3	2	2	8	6	S	12	18	20	25	1	25	6	24	
3	15	16	27	20	16	18	17	18	14	10	11	10	3	5	4	5	6	8	S	11	11	12	11	2	2	27	12	24	
4	3	4	3	4	7	6	6	7	10	5	7	6	5	5	72	5	9	S	14	4	6	7	4	9	3	72	9	24	
5	5	4	5	6	10	7	14	14	15	13	14	10	8	9	6	12	S	16	13	14	15	17	20	17	4	20	11	24	
6	24	25	24	25	29	29	28	30	27	21	19	16	20	19	9	S	30	38	32	42	31	32	30	30	9	42	26	24	
7	28	28	29	29	29	30	30	30	29	25	10	9	9	9	S	10	18	33	38	28	7	17	5	5	5	38	21	24	
8	8	8	6	7	8	11	12	12	11	6	C	C	C	C	C	C	C	C	C	16	14	10	3	4	4	3	16	-	24
9	5	10	6	6	9	6	7	14	16	17	13	3	S	2	3	3	5	13	11	25	9	14	29	25	2	29	11	24	
10	32	32	31	32	30	30	23	22	24	23	10	S	6	4	5	7	9	9	6	5	4	5	5	5	4	32	16	24	
11	4	3	3	3	6	7	7	14	9	8	S	6	3	6	4	8	11	17	21	25	27	12	18	13	3	27	10	24	
12	14	13	14	25	15	15	18	23	31	S	15	S1	7	8	7	10	12	23	29	40	16	15	12	13	7	40	17	23	
13	18	12	16	17	16	18	25	28	S	23	18	15	11	11	13	10	14	20	26	14	27	22	18	13	10	28	18	24	
14	16	14	21	22	25	27	28	S	37	34	32	17	17	10	13	11	11	21	34	22	35	36	31	30	10	37	24	24	
15	30	27	32	29	30	27	S	32	27	22	14	8	7	8	6	6	9	8	14	15	21	17	18	8	6	32	18	24	
16	8	8	8	8	6	S	8	9	5	4	4	3	3	3	3	3	3	3	4	4	5	5	3	2	2	9	5	24	
17	3	5	4	3	S	6	3	3	5	4	2	2	4	3	3	5	5	8	14	13	6	5	5	5	2	14	5	24	
18	5	8	8	S	7	18	22	27	21	13	6	3	4	4	4	4	4	7	7	6	9	5	4	5	3	27	9	24	
19	5	5	S	7	6	7	8	8	8	8	9	11	9	10	9	10	15	16	26	22	23	31	33	35	5	35	14	24	
20	27	S	27	29	25	26	24	22	9	8	5	6	5	4	4	5	5	6	3	3	3	4	4	3	29	11	24		
21	S	4	4	5	3	9	22	24	24	15	9	5	3	3	3	5	5	6	3	3	8	8	5	S	3	24	8	24	
22	8	5	6	12	8	13	29	31	8	10	5	4	4	15	6	5	6	7	7	12	11	6	S	6	4	31	10	24	
23	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	3	2	2	2	7	S	10	13	1	13	3	24	
24	13	11	14	20	19	13	19	14	8	11	9	7	5	3	3	3	4	5	9	S	7	6	7	3	20	9	24		
25	9	7	6	8	7	10	14	9	11	9	8	5	5	4	4	4	3	5	6	S	13	15	6	9	3	15	8	24	
26	11	10	11	11	11	14	14	11	12	10	11	10	10	11	12	17	13	S	9	19	15	9	10	9	19	12	24		
27	7	10	7	6	6	5	5	5	6	4	3	3	2	3	7	6	2	S	4	3	6	12	7	6	2	12	5	24	
28	8	4	3	4	4	16	26	12	26	16	2	20	7	4	3	3	S	6	5	7	3	2	2	2	2	26	8	24	
HOURLY MAX	32	32	32	32	30	30	30	32	37	34	32	20	20	19	72	12	30	38	38	42	35	36	33	35					
HOURLY AVG	12	10	12	13	13	14	16	16	15	12	9	8	6	6	8	6	8	12	14	14	13	13	12	11					

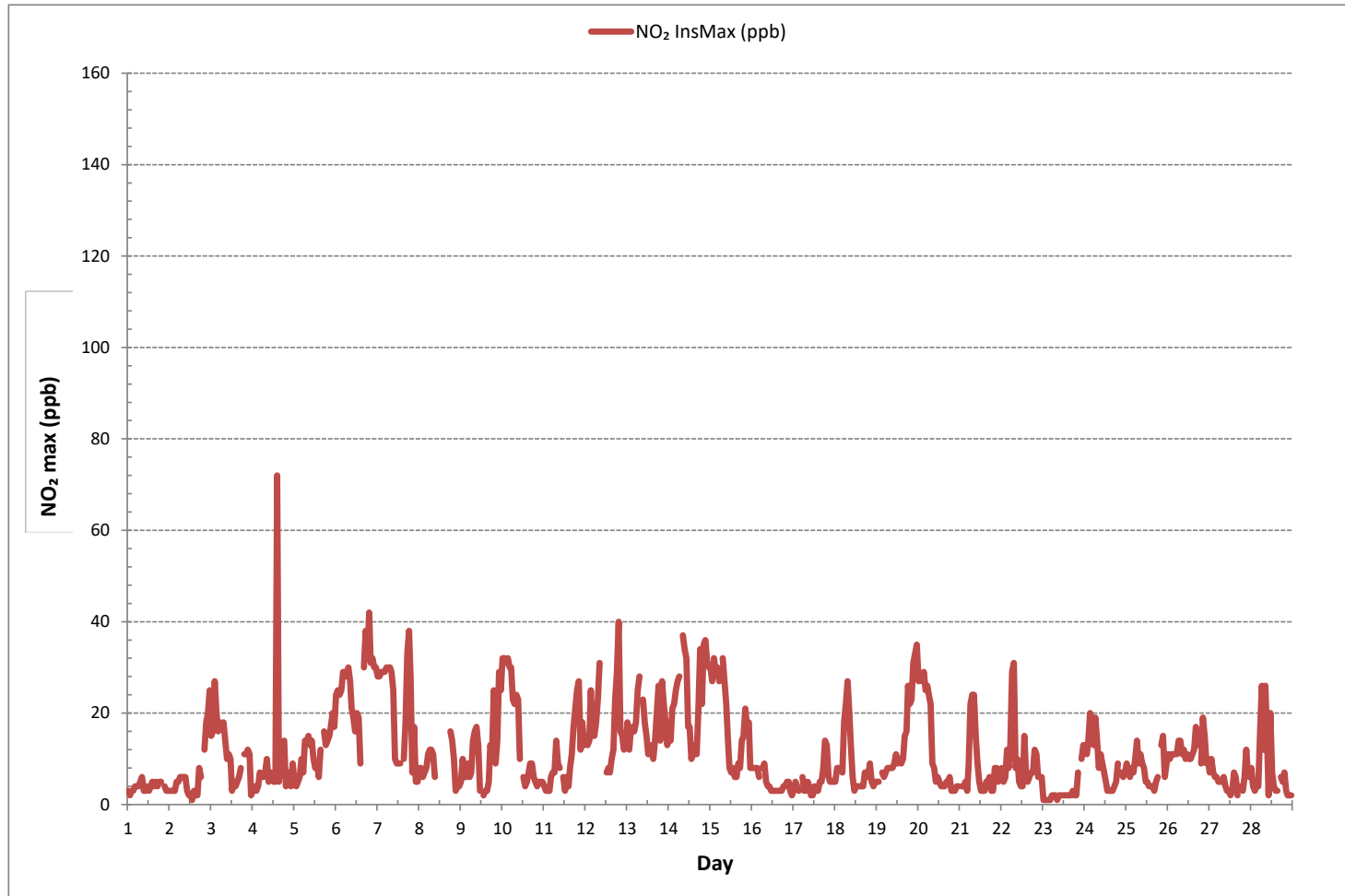
STATUS FLAG CODES

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:	635
MAXIMUM INSTANTANEOUS VALUE:	72 ppb @ HOUR 14 ON DAY 4
	VAR-VARIOUS
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	9

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

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	31.7	33.0	32.9	32.4	32.5	32.7	32.3	31.3	32.2	34.0	34.8	36.0	36.4	36.4	36.0	35.4	34.9	35.9	36.6	36.8	S	36.6	37.0	36.2	31.3	37.0	34.5	24
2	35.7	35.7	35.6	35.5	35.0	36.6	37.1	34.7	34.5	35.6	35.9	36.3	36.7	37.4	38.1	38.1	38.1	38.0	37.3	S	32.9	29.2	22.5	21.3	21.3	38.1	34.7	24
3	22.0	19.8	14.0	19.9	17.6	17.4	17.8	16.5	18.0	20.6	23.0	36.4	38.3	39.1	39.2	38.1	37.9	34.0	S	29.3	28.9	26.6	39.3	39.4	14.0	39.4	27.5	24
4	38.9	38.5	38.6	39.1	39.1	39.2	38.5	37.3	37.2	38.7	38.9	38.9	39.2	38.9	38.6	38.4	38.1	S	37.6	37.3	36.5	35.0	36.1	36.6	35.0	39.2	38.0	24
5	33.3	32.9	31.2	28.4	27.4	27.2	26.9	20.9	20.6	21.3	23.4	28.2	35.0	36.8	37.2	36.2	S	29.2	23.8	24.1	20.9	16.9	16.7	14.6	14.6	37.2	26.7	24
6	14.2	14.0	9.7	8.2	7.1	1.9	1.2	2.2	9.3	15.4	19.0	22.5	22.9	34.3	36.7	S	29.0	10.6	7.3	5.6	3.3	2.7	1.6	0.8	0.8	36.7	12.2	24
7	0.6	0.6	0.6	0.6	0.7	0.6	0.9	1.3	9.2	24.3	29.9	C	C	C	C	C	C	20.6	24.3	31.9	34.8	38.6	33.1	33.0	0.6	38.6	15.9	24
8	32.5	32.5	32.1	32.6	32.8	32.4	33.4	32.3	34.4	35.4	37.4	37.7	38.3	S	40.2	39.9	37.7	44.1	34.3	31.7	36.5	36.0	35.8	36.2	31.7	44.1	35.5	24
9	36.1	35.3	34.4	32.6	30.8	26.9	27.0	26.2	20.4	29.0	34.2	35.3	S	38.8	38.8	39.5	53.3	35.4	29.4	27.9	27.2	24.9	17.0	17.8	17.0	53.3	31.2	24
10	9.9	3.4	1.7	2.8	5.7	7.4	7.1	10.2	13.8	29.9	35.4	S	36.5	37.4	38.2	39.0	39.1	39.1	39.3	39.4	39.2	39.2	39.4	39.0	1.7	39.4	25.7	24
11	39.5	40.8	40.9	41.3	40.8	37.9	38.8	37.4	37.9	38.4	S	39.5	39.3	40.1	40.6	40.0	38.1	34.8	30.9	25.4	25.0	26.2	26.2	25.1	25.0	41.3	35.9	24
12	22.8	22.5	19.9	15.4	18.9	18.7	16.4	13.6	15.8	S	26.3	28.1	29.6	29.5	30.4	29.4	30.0	24.5	18.7	18.2	17.0	17.1	14.8	13.8	13.6	30.4	21.4	24
13	13.8	14.7	13.8	11.6	10.3	8.4	7.2	2.3	S	14.3	17.3	21.2	24.9	27.0	29.5	29.9	28.9	25.3	23.5	22.3	21.0	20.0	16.7	18.7	2.3	29.9	18.4	24
14	17.2	16.0	19.6	12.3	7.2	4.6	0.9	S	8.0	13.2	20.1	26.1	29.9	30.5	28.3	30.7	32.2	29.1	20.3	16.5	11.5	5.0	9.3	3.0	0.9	32.2	17.0	24
15	4.6	4.6	3.3	3.0	8.3	8.0	S	12.2	11.9	23.6	33.8	32.4	35.8	38.5	38.7	38.8	38.1	37.4	38.0	35.3	30.8	28.6	32.1	36.3	3.0	38.8	24.9	24
16	36.4	36.4	35.5	36.1	38.0	S	38.3	36.4	35.9	35.0	35.6	36.1	36.6	36.4	37.1	37.0	36.6	34.9	34.4	33.9	34.2	34.2	34.0	34.1	33.9	38.3	35.8	24
17	34.0	33.7	33.7	33.9	S	34.2	34.6	35.4	34.9	35.0	35.3	36.4	36.8	37.2	37.1	36.7	36.0	34.7	32.2	31.8	30.3	31.1	31.3	32.8	30.3	37.2	34.3	24
18	30.4	29.9	27.8	S	23.8	21.9	13.3	10.8	18.6	27.2	31.7	33.0	32.9	33.9	34.1	34.8	34.9	33.6	31.8	32.8	34.0	32.9	33.6	33.7	10.8	34.9	29.2	24
19	33.9	33.6	S	30.7	28.8	28.2	27.6	26.9	26.8	27.6	28.2	29.6	31.4	32.6	34.7	34.4	34.0	26.7	27.0	20.4	19.0	12.0	4.3	7.4	4.3	34.7	26.3	24
20	6.4	S	7.6	1.9	4.8	5.9	11.9	18.6	22.1	25.3	27.1	29.9	33.6	35.7	35.2	34.5	34.0	33.5	33.8	33.6	32.4	31.8	31.2	1.9	35.7	24.5	24	
21	S	33.4	33.7	31.2	30.1	27.6	23.7	24.7	27.7	29.2	35.9	37.2	39.2	39.2	39.5	39.8	39.6	39.6	39.2	39.4	39.1	34.7	35.4	S	23.7	39.8	34.5	24
22	35.9	36.0	35.5	34.0	34.0	33.4	25.1	32.8	34.8	35.6	37.0	38.4	38.7	38.8	40.1	37.8	37.3	36.7	35.5	34.2	33.9	34.5	S	39.4	25.1	40.1	35.6	24
23	40.5	40.2	39.4	39.4	39.4	39.0	39.1	38.7	38.8	38.2	38.0	38.0	37.9	37.9	37.4	37.7	37.1	37.1	37.3	37.1	36.6	S	25.9	22.4	22.4	40.5	37.1	24
24	18.4	21.2	20.0	18.7	12.9	17.1	15.4	15.8	21.5	24.4	28.0	31.3	33.9	35.2	35.5	35.4	36.3	36.6	34.4	33.7	S	34.7	34.5	34.4	12.9	36.6	27.4	24
25	34.2	34.7	35.3	34.5	32.9	29.0	26.9	29.0	31.9	33.7	36.5	37.6	38.3	39.1	39.3	39.5	39.9	40.1	38.6	S	36.3	32.1	32.1	31.5	26.9	40.1	34.9	24
26	28.8	26.0	26.4	24.8	23.8	23.0	20.3	24.3	28.3	29.1	30.7	32.1	33.2	33.4	33.3	33.0	31.5	31.9	S	34.5	34.4	32.8	34.0	34.5	20.3	34.5	29.7	24
27	34.5	34.7	36.7	37.2	38.4	39.0	39.3	39.1	40.8	42.2	43.0	43.8	44.6	45.5	45.3	45.4	45.2	S	45.0	44.7	43.2	41.6	39.8	39.5	34.5	45.5	41.2	24
28	39.3	39.4	40.5	40.1	37.8	33.3	26.4	26.9	26.7	39.4	42.5	42.7	42.7	43.0	42.4	42.0	S	40.0	37.5	36.6	37.0	36.9	35.3	30.3	26.4	43.0	37.3	24
HOURLY MAX	40.5	40.8	40.9	41.3	40.8	39.2	39.3	39.1	40.8	42.2	43.0	43.8	44.6	45.5	45.3	45.4	53.3	44.1	45.0	44.7	43.2	41.6	39.8	39.5				
HOURLY AVG	26.9	27.5	25.9	25.1	24.4	23.4	23.2	23.6	25.6	29.5	31.8	34.0	35.5	36.6	37.1	37.0	36.7	33.2	31.8	30.6	29.8	28.6	27.8	27.5				

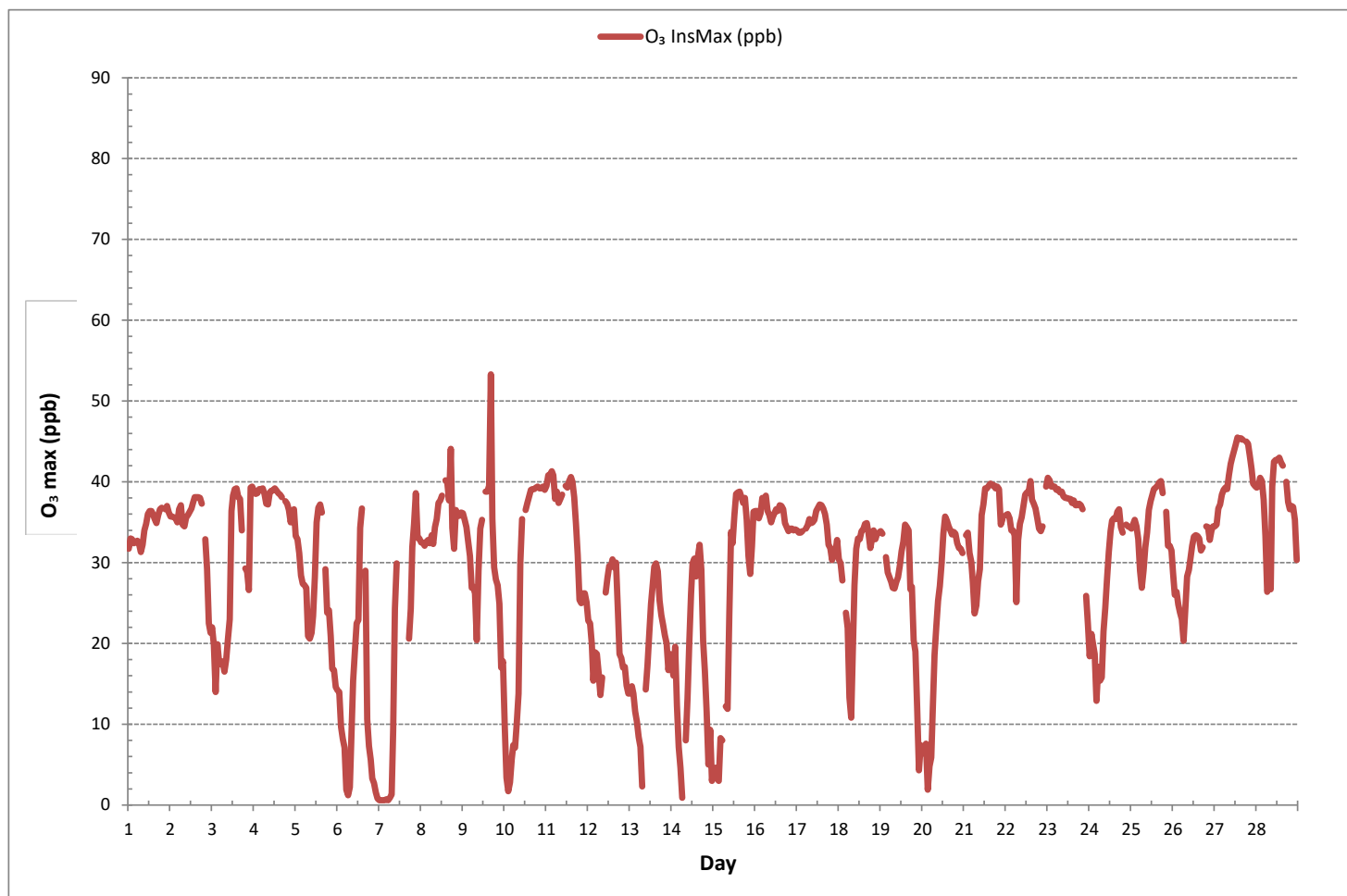
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	638
MAXIMUM INSTANTANEOUS VALUE:	53.3 ppb @ HOUR 16 ON DAY 9
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	10.5

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - February 2019

WIND SPEED Instantaneous Maximum (WS kph)

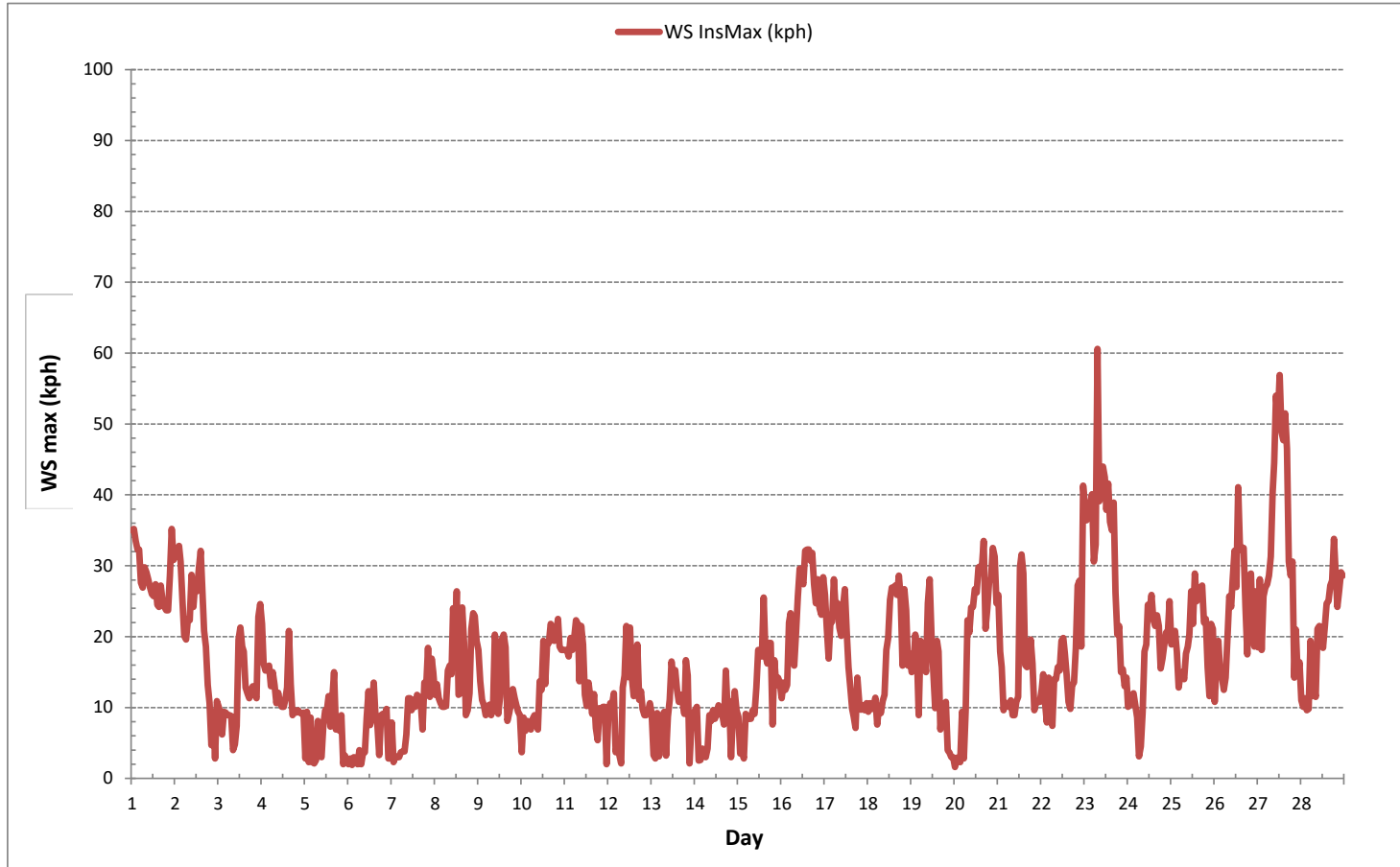
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	35.0	35.2	33.5	32.3	32.3	27.6	26.9	29.8	29.1	28.1	26.9	26.0	25.7	27.4	24.5	24.2	27.2	25.0	24.2	23.7	23.7	28.6	35.2	30.8	23.7	35.2	28.5	24
2	31.8	31.6	32.8	30.6	25.2	20.1	19.6	22.5	22.3	28.7	24.2	27.6	26.4	29.6	32.1	26.9	20.8	18.6	13.2	10.6	4.7	9.4	2.8	10.9	2.8	32.8	21.8	24
3	10.1	9.2	6.2	9.4	9.3	8.9	8.9	8.8	4.0	4.8	7.4	19.6	21.3	18.6	17.9	12.8	12.0	11.3	12.6	13.0	11.8	11.3	22.8	24.6	4.0	24.6	12.4	24
4	21.8	16.2	15.2	15.3	15.9	13.0	15.0	13.2	10.6	12.1	10.6	10.1	10.1	11.1	12.8	20.8	13.3	8.9	9.6	9.3	9.6	9.3	9.1	9.3	8.9	21.8	12.6	24
5	2.8	9.4	2.3	8.6	2.3	2.1	2.6	8.1	3.2	3.0	7.5	9.6	9.4	11.6	7.3	11.1	15.0	6.9	8.6	6.7	8.9	2.0	3.2	2.4	2.0	15.0	6.4	24
6	2.0	2.8	1.9	3.0	2.3	2.0	4.0	2.0	3.6	3.7	8.6	12.3	7.5	9.9	13.5	8.6	7.6	3.3	8.9	9.1	8.9	9.8	2.8	2.8	1.9	13.5	5.9	24
7	7.9	2.3	3.1	3.0	3.0	3.7	3.8	3.8	6.2	11.3	11.3	9.6	11.1	10.1	11.8	11.5	10.8	6.9	13.5	13.0	18.4	11.5	16.9	15.0	2.3	18.4	9.1	24
8	11.8	13.3	11.3	10.6	10.1	10.1	10.2	15.2	15.9	14.7	24.0	19.1	26.4	11.8	12.0	24.1	19.1	8.9	9.6	12.0	21.1	23.3	22.9	19.4	8.9	26.4	15.7	24
9	18.1	13.7	11.1	10.3	8.9	9.9	10.4	8.9	9.8	20.3	18.6	9.1	11.5	19.6	20.3	18.5	8.1	9.2	10.6	12.6	11.3	10.4	9.4	8.9	8.1	20.3	12.5	24
10	3.7	8.6	6.7	8.1	7.1	6.9	8.4	8.9	7.9	6.9	13.7	12.5	19.4	13.3	18.9	19.1	21.8	21.1	19.4	20.6	22.5	18.6	18.1	18.1	3.7	22.5	13.8	24
11	18.1	18.1	17.2	19.8	18.1	19.8	22.3	21.8	13.7	21.5	18.9	11.8	10.2	13.5	11.3	9.1	11.9	7.1	5.4	9.9	8.9	10.1	10.1	2.0	2.0	22.3	13.8	24
12	9.1	10.6	10.3	12.0	3.7	5.0	3.3	2.1	12.8	14.5	21.5	14.3	21.3	14.2	11.6	13.2	18.9	11.1	12.3	9.8	8.9	8.9	9.4	10.6	2.1	21.5	11.2	24
13	9.1	3.3	2.8	9.2	3.1	8.1	8.9	9.4	3.2	8.7	11.1	16.5	14.1	15.3	12.5	10.8	11.8	10.9	9.1	16.7	14.5	2.1	7.5	8.9	2.1	16.7	9.5	24
14	9.6	10.1	2.5	2.6	4.2	3.5	3.0	4.2	8.9	8.1	9.6	8.4	9.1	10.3	9.0	9.1	7.6	15.2	10.3	10.9	3.0	8.7	12.3	9.6	2.5	15.2	7.9	24
15	8.7	3.5	4.0	2.8	9.1	8.7	8.4	8.4	9.6	9.1	12.8	18.1	17.3	17.2	25.5	17.4	16.2	19.1	19.1	7.6	16.7	13.2	14.2	13.5	2.8	25.5	12.5	24
16	11.3	13.5	12.5	13.2	22.0	23.3	20.2	15.9	20.6	25.7	29.6	28.1	27.4	32.1	32.3	32.3	30.7	31.8	27.4	24.7	28.1	24.0	23.1	28.4	11.3	32.3	24.1	24
17	25.9	21.1	16.9	22.3	22.1	28.1	23.7	24.7	21.3	20.1	24.2	26.7	20.8	15.7	12.8	9.8	8.7	7.1	14.2	10.8	9.7	10.3	9.6	10.6	7.1	28.1	17.4	24
18	9.4	10.6	9.8	10.4	11.4	7.6	10.2	9.2	10.9	11.8	18.1	19.8	25.2	26.9	26.4	27.2	25.9	28.6	25.4	15.9	26.7	23.7	15.9	17.6	7.6	28.6	17.7	24
19	15.0	15.9	20.3	17.9	8.9	19.4	18.4	17.4	15.0	24.7	28.1	20.1	15.0	9.9	19.4	17.9	6.9	10.1	7.4	10.8	4.0	3.6	3.0	3.0	3.0	28.1	13.8	24
20	1.6	2.9	2.4	2.3	9.4	2.8	9.6	22.3	20.6	24.1	24.2	26.7	26.2	29.8	29.9	29.8	33.5	21.1	24.0	27.9	28.1	32.5	31.3	24.7	1.6	33.5	20.3	24
21	25.9	17.9	15.7	9.6	10.6	10.1	11.0	8.9	8.9	10.8	11.5	29.8	31.6	28.9	16.0	15.7	16.2	19.6	16.2	9.6	10.8	10.8	10.8	10.8	8.9	31.6	15.3	24
22	12.5	14.7	10.7	7.9	14.2	11.5	7.4	14.0	14.0	15.7	15.2	19.4	19.8	17.6	14.5	10.8	9.8	13.2	13.5	18.4	27.2	27.9	18.6	41.3	7.4	41.3	16.2	24
23	38.9	36.4	38.1	38.6	40.1	30.6	33.0	60.6	39.1	42.3	44.0	42.5	37.9	41.6	36.2	35.0	38.9	26.2	20.3	21.5	15.0	15.4	13.0	14.2	13.0	60.6	33.3	24
24	10.1	10.3	11.5	12.0	10.3	8.6	3.1	4.5	9.4	17.9	18.9	24.5	23.8	25.9	22.4	21.5	23.0	21.5	15.5	16.9	18.9	20.6	20.8	25.0	3.1	25.9	16.5	24
25	18.9	19.6	20.8	17.9	12.8	14.7	15.0	14.0	17.6	18.6	20.3	26.4	21.8	28.9	25.0	26.9	26.7	27.2	22.0	22.5	15.7	11.6	21.8	21.1	11.6	28.9	20.3	24
26	10.8	16.2	19.4	15.0	14.2	12.5	14.2	19.8	25.7	24.2	28.1	32.1	27.0	41.1	32.3	32.6	32.5	24.2	17.5	28.6	28.9	21.8	18.6	26.4	10.8	41.1	23.5	24
27	18.5	28.1	18.1	25.7	26.9	27.4	28.6	31.3	40.3	44.5	54.0	50.8	56.9	48.9	47.7	51.5	46.5	30.6	28.6	30.6	14.2	21.0	14.5	16.4	14.2	56.9	33.4	24
28	11.0	10.1	11.3	9.6	9.8	19.4	11.6	13.0	11.5	21.1	21.5	21.3	18.4	21.4	24.7	25.0	27.2	27.9	33.8	28.6	24.2	26.5	29.1	28.6	9.6	33.8	20.3	24
HOURLY MAX	38.9	36.4	38.1	38.6	40.1	30.6	33.0	60.6	40.3	44.5	54.0	50.8	56.9	48.9	47.7	51.5	46.5	31.8	33.8	30.6	28.9	32.5	35.2	41.3				

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:	60.6	kph	@ HOUR	7	ON DAY	23	
OPERATIONAL TIME:						672	hrs



1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than $\pm 10\%$ from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO₂/NO_x and CH₄/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, 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.

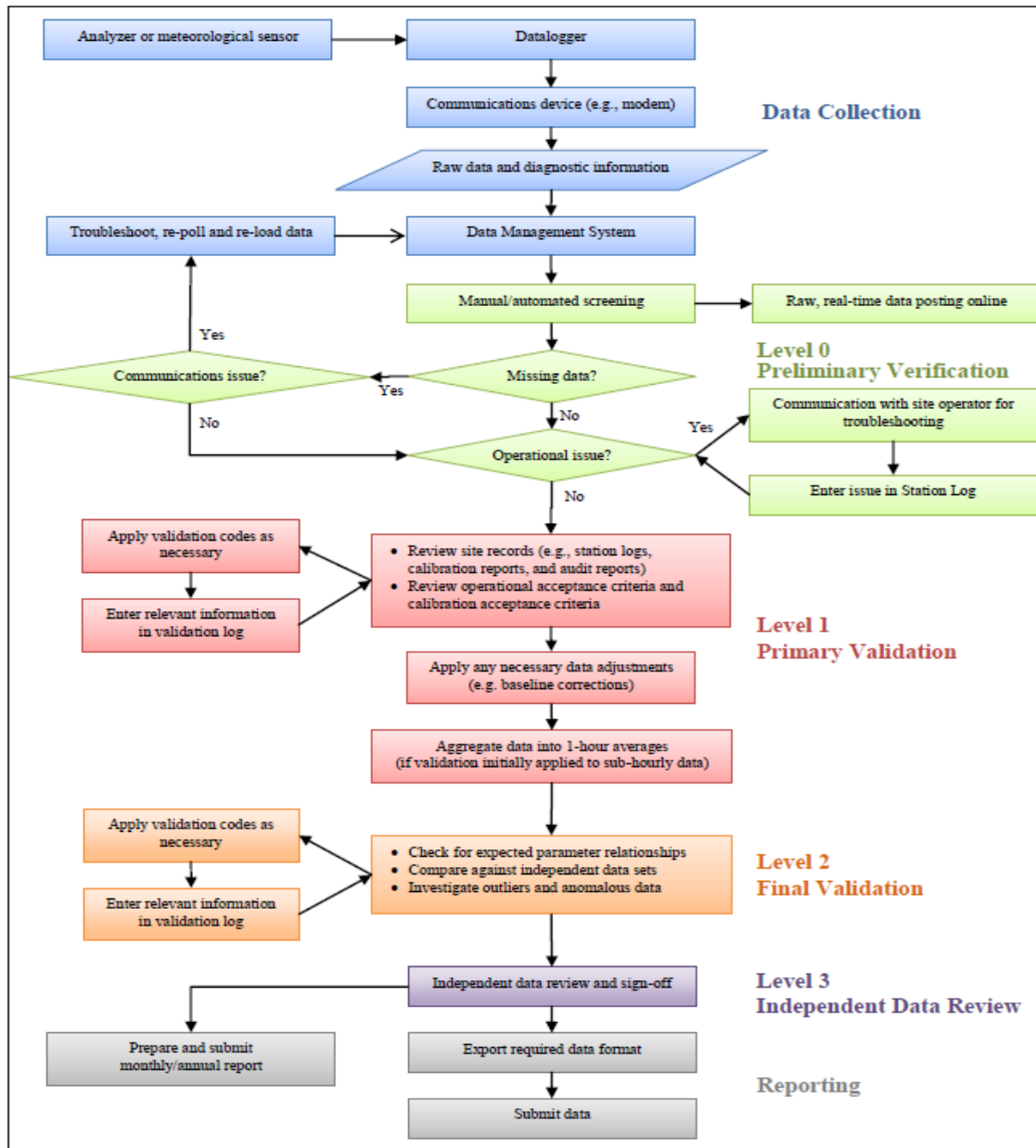
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

AMD Data Verification and Validation Process

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

<p>Level 0 Preliminary Verification</p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p>Level 1 Primary Validation</p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p>Level 2 Final Validation</p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p>Level 3 Independent Data Review</p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p>Post-Final Validation</p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2019-02-23-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>22-Mar-2019</u>
Level 1 Primary Validation	<u><i>bimadeniji</i></u>	Date <u>22-Mar-2019</u>
Level 2 Final Validation	<u><i>bimadeniji</i></u>	Date <u>26-Mar-2019</u>
Level 3 Independent Data Review	<u><i>MSLmbq</i></u>	Date <u>26-Mar-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.

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FEBRUARY 1 - 28, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-02-24-C

LICA-201902

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

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Maskwa Continuous Monitoring Station

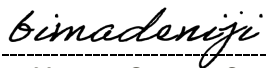
Date of Report Issuance: March 18, 2019

Report Preparation By:

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Project Team Lead, Customer Service, Air Services



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LICA-201902

Page 96 of 350

Lakeland Industry & Community Association

5107 50 St.
Bonnyville, Alberta T9N 2J7

Attention: Mike Bisaga

Date: March 18, 2019

Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for FEBRUARY 1 - 28, 2019

In February 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station near Cold Lake, Alberta. The monitoring program provides continuous measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

Network Parameters for Continuous Monitoring:

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements (Chapter 9, 13.1.7, RC 13-R, AMD 2016). The station is equipped with analyzers to measure SO₂, H₂S, THC, CH₄, NMHC, NO_x, NO and NO₂. The meteorological sensors and equipment capture data for WS, WD, RH, BP, PRECIP, AmbTPX and STDWD.

Exceedance & Performance Reporting:

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the Alberta Air Monitoring Directive (AMD, Chapter 6, DQ 4-C, 2016).

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, January 2019). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with AMD, Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied. (AMD, Chapter 9, Appendix A, 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

Monthly Monitoring Overview:

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of February did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

During this monitoring period, there were no scheduled audits, to which Maxxam Analytics was privy.

All Parameters: A power failure occurred on February 23, at hour 8:00, incurring one hour of downtime.

THC/CH₄/NMHC:

- One hour of data was invalidated on February 14, at hour 10:00, as data quality was impacted by interference from routine station activities.
- Two hours of downtime were recorded on February 15, due to maintenance activities that were performed to address a biased high baseline zero drift.

Precipitation: One hour of downtime was recorded on February 15 as the equipment was frozen due to low ambient temperatures. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution.

Should you have any questions concerning the results or if we can be of further assistance, please contact your Maxxam representative indicated below.

Reviewed by:



Wunmi Adekanmbi, M.Sc., EPT, PMP
Project Team Lead, Customer Service, Air Services
403-219-3661

I certify that I 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. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.

TABLE OF CONTENTS

TITLE PAGE	1
COVER LETTER	2
TABLE OF CONTENTS	3
ABBREVIATIONS	4
AAAQO EXCEEDANCE SUMMARY	5
MONTHLY CONTINUOUS DATA SUMMARY	6
OPERATIONAL SUMMARY	7
SUMMARY TABLES, GRAPHS AND ROSES	9
Sulphur Dioxide	10
Hydrogen Sulphide	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Wind Speed	42
Wind Direction	45
Standard Deviation Wind Direction	48
Relative Humidity	50
Barometric Pressure	52
Ambient Temperature	54
Precipitation	56
MAXIMUM INSTANTANEOUS DATA	58
1.0 Quality Control Activities	76
2.0 Data Verification and Validation	77
Validation Certificate Form	80
End of Report	81

List of Acronyms

AAAQO	Alberta Ambient Air Quality Objectives and Guidelines Summary
AEP	Alberta Environment and Parks
AMBTPX	Ambient Temperature
AMD	Air Monitoring Directive
BP	Barometric Pressure
CH₄	Methane
DAS	Data acquisition system
hr	Hour
hrs	Hours
H₂S	Hydrogen Sulphide
IZS	Internal zero-span
kph	Kilometers per hour
NO	Nitric Oxide
NO₂	Nitrogen dioxide
NO_x	Total oxides of nitrogen
NMHC	Non-Methane Hydrocarbon
Precip	Precipitation
ppb	Parts per billion
ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
RH	Relative Humidity
SOP	Standard Operating Procedure
SO₂	Sulphur Dioxide
STDWD	Standard Deviation Wind Direction
THC	Total hydrocarbons
WS	Wind Speed
WD	Wind Direction
°C	Degrees Celsius

AAAQO Exceedance Summary

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
						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	1	7	5	15	0.7	NNE	2	19	99.9
H ₂ S (ppb)	10	3	0	0	0	2	4	15	4.3	NE	1	7	99.9
THC (ppm)	-	-	-	-	2.14	2.76	13	14	7.0	SSW	2.44	12	99.4
CH ₄ (ppm)	-	-	-	-	2.14	2.76	13	14	7.0	SSW	2.44	12	99.4
NMHC (ppm)	-	-	-	-	0.00	0.13	5	9	0.1	SW	0.01	5	99.4
NO ₂ (ppb)	159	-	0	-	5	28	12	7	0.4	SSE	12	12	99.9
NO (ppb)	-	-	-	-	1	24	12	9	1.2	SW	4	12	99.9
NO _x (ppb)	-	-	-	-	6	45	12	9	1.2	SW	17	12	99.9
RELATIVE HUMIDITY (%)	-	-	-	-	74	96	20	2	0.5	ESE	88	20	99.9
BAROMETRIC PRESSURE (millibar)	-	-	-	-	941	962	9	6	0.3	W	958	9	99.9
AMBIENT TEMPERATURE (°C)	-	-	-	-	-22.3	-2.2	27	12	8.7	NNW	-7.3	27	99.9
PRECIPITATION (mm)	-	-	-	-	0.0	0.0	1	0	12.1	NNE	0.0	1	99.7
VECTOR WS (kph)	-	-	-	-	1.0	14.2	18	15	-	SSW	8.2	1	99.9
VECTOR WD (sec)	-	-	-	-	24 (NNE)	-	-	-	-	-	-	-	99.9

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

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO ₂)	Thermo 43i TLE Pulsed Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. The routine monthly calibration was performed on February 14, between the hours of 11:00 and 16:00.
HYDROGEN SULPHIDE (H ₂ S)	Thermo 450i UV Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. The analyzer exhibited erratic span response across the month, with the lower acceptance limit exceeded three times between February 6 and February 10. A correlation between drifts in span response and shifts in ambient temperatures was observed. The drift pattern in span response appeared to mirror that of ambient temperature. The routine monthly calibration was performed on February 14, between hours 11:00 and 17:00. As the calibration results met AMD requirements, no data was discarded due to the span drift. The analyzer spanned outside the upper acceptance limit on February 19. The results of subsequent scheduled span checks were within AMD limit confirming analyzer performance was not impacted. Therefore, no data was discarded due to the failed span.
TOTAL HYDROCARBONS (THC), METHANE (CH ₄) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.4%, equivalent to 4 hours of downtime. One hour of data was invalidated on February 14, at hour 10:00 as data quality was impacted by interference from station activities. The external zero/span system began exhibiting a biased high drift in baseline zero readings at the start of the month. Following a successful shut-down calibration on February 15, testing was conducted on the zero air supply system and a zero chromatograph was run. A successful post-repair calibration was subsequently completed. Two hours of downtime were recorded due to this maintenance event. A power failure occurred on February 23, at hour 8:00, resulting in one hour of downtime.
OXIDES OF NITROGEN (NO _x), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO ₂)	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO ₂ /NO _x Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. The routine monthly calibration was performed on February 14, between the hours of 11:00 and 17:00.
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)	RM Young Unit	Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
RELATIVE HUMIDITY (RH)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. A humidity sensor check was performed on February 15. The result was satisfactory.
BAROMETRIC PRESSURE (BP)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. A pressure sensor check was performed on February 15. The result was satisfactory.
PRECIPITATION (PRECIP)	Met One Unit	Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.7%, equivalent to 2 hours of downtime. Upon arrival at the station for a sensor audit on February 15, the equipment was found frozen due to low ambient temperatures, with the discharge holes blocked with ice. The equipment was defrosted, using hot water; and a successful audit was subsequently completed. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution. One hour of downtime was recorded due to this event. A power failure occurred on February 23, at hour 8:00, resulting in one hour of downtime.
AMBIENT TEMPERATURE (AmbTPX)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred due to a power failure that occurred on February 23, at hour 8:00. A temperature sensor check was performed on February 15. The result was satisfactory.
Datalogger	Envista Ultimate	Operation Manual	<ul style="list-style-type: none"> No Operational issues were identified.

SUMMARY TABLES, GRAPHS AND ROSES



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

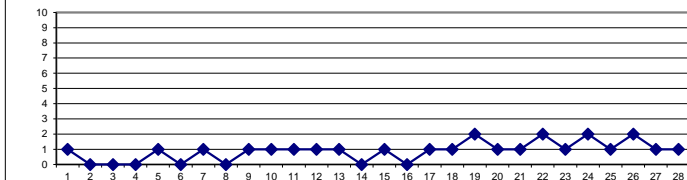
OBJECTIVE LIMIT:

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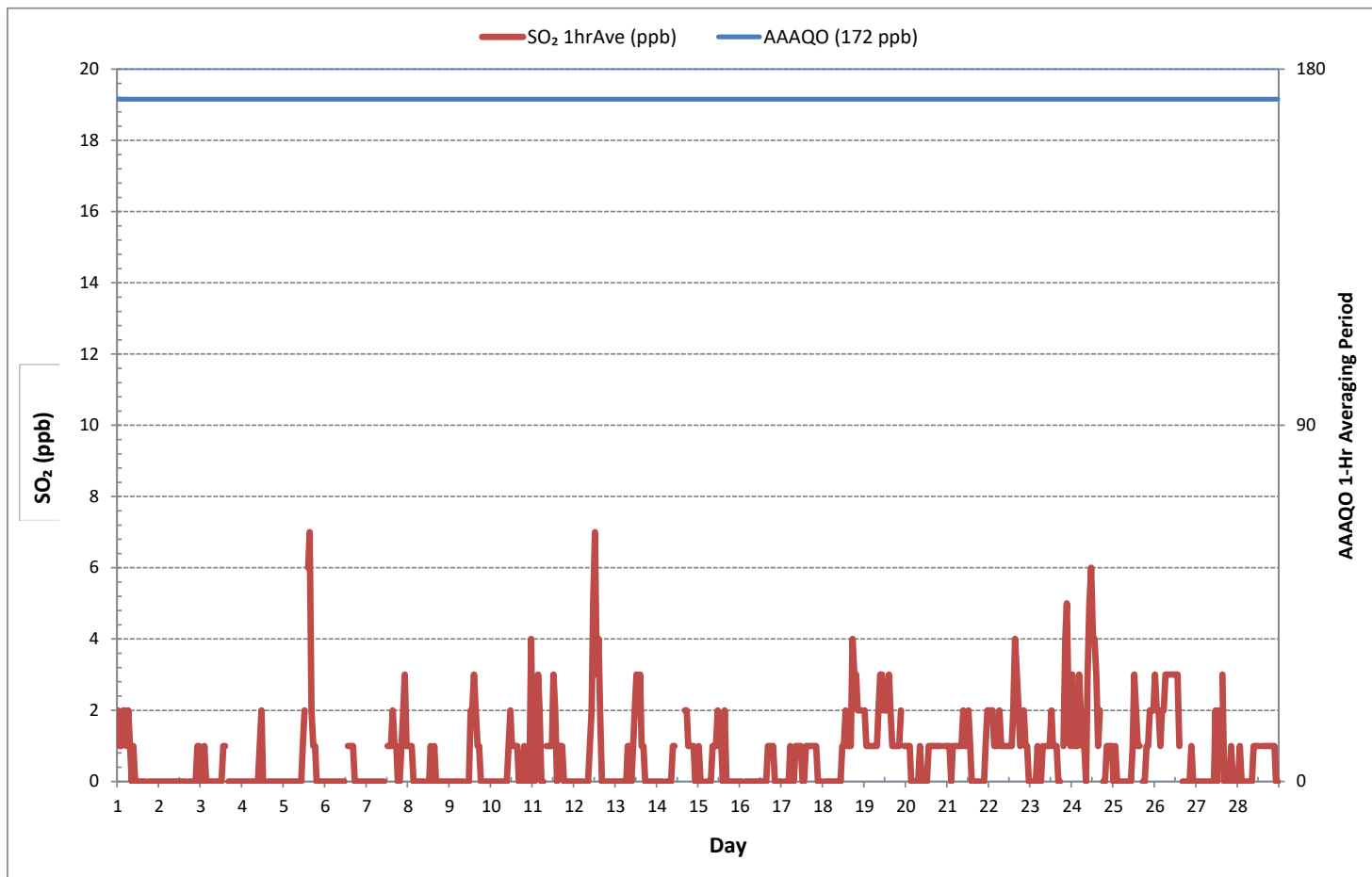
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	281
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 8 ON DAY 1
MAXIMUM 1-HR AVERAGE:	7 ppb @ HOUR 15 ON DAY 5
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 19
I2S CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	671 hrs
AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	1 ppb

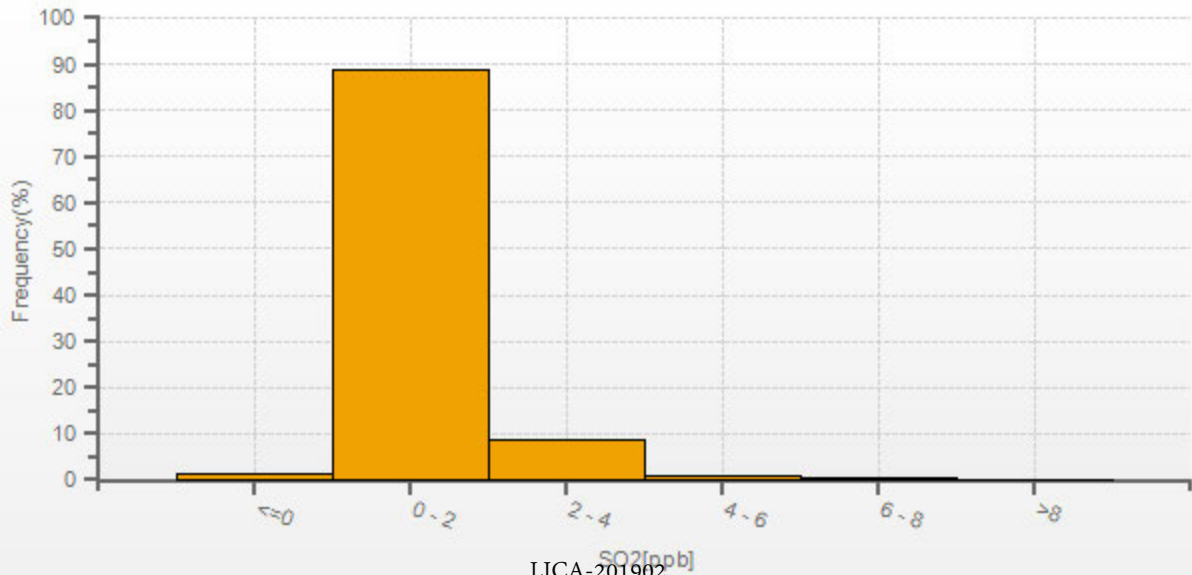
24 HR AVERAGES February 2019



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



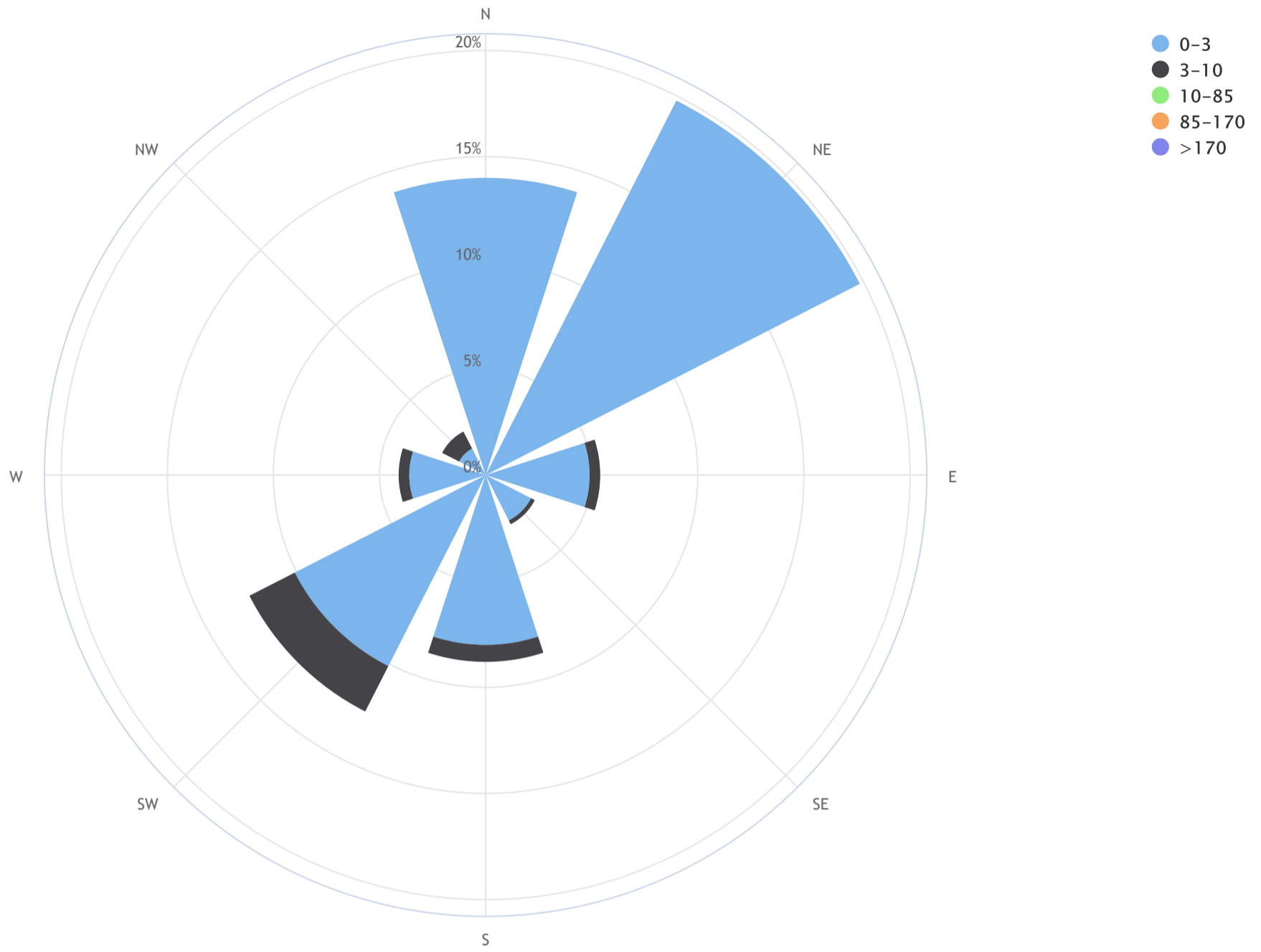
SO2[ppb] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 107 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_SO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.4, CALM % = 30.8%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	14.0	0.0	0.0	0.0	0.0	14.0
NE	19.8	0.0	0.0	0.0	0.0	19.8
E	4.9	0.5	0.0	0.0	0.0	5.3
SE	2.4	0.2	0.0	0.0	0.0	2.5
S	8.0	0.8	0.0	0.0	0.0	8.8
SW	10.1	2.4	0.0	0.0	0.0	12.4
W	3.6	0.5	0.0	0.0	0.0	4.1
NW	1.4	0.9	0.0	0.0	0.0	2.4
Summary	64.1	5.2	0.0	0.0	0.0	69.2
CALM	29.4	1.4	0.0	0.0	0.0	30.8



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	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	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	S	0	0	0	0	0	0	0	0	0	0	0	0	24																					
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	2	0	0	0	0	0	0	0	0	0	0	2	0	24																					
5	0	0	0	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
6	0	0	0	0	0	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	1	1	2	0	0	2	0	24																					
7	2	2	1	1	1	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	24																					
8	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
9	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
10	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
11	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
12	0	0	0	0	0	0	S	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
13	0	0	0	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
14	0	0	0	0	S	0	0	0	1	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	-	24																					
15	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
16	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																					
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
18	S	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24																					
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	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	S	0	0	0	0	0	0	24																					
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24																					
23	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	23																					
24	0	0	0	0	1	1	1	1	0	1	0	0	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	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24																					
26	0	0	0	1	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																					
27	0	1	1	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
28	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
HOURLY MAX	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	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																									

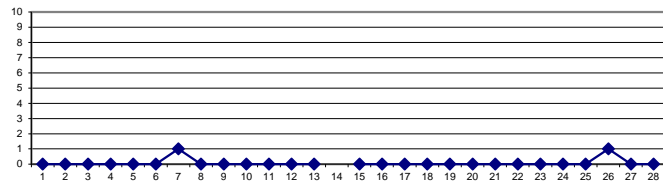
STATUS FLAG CODES

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
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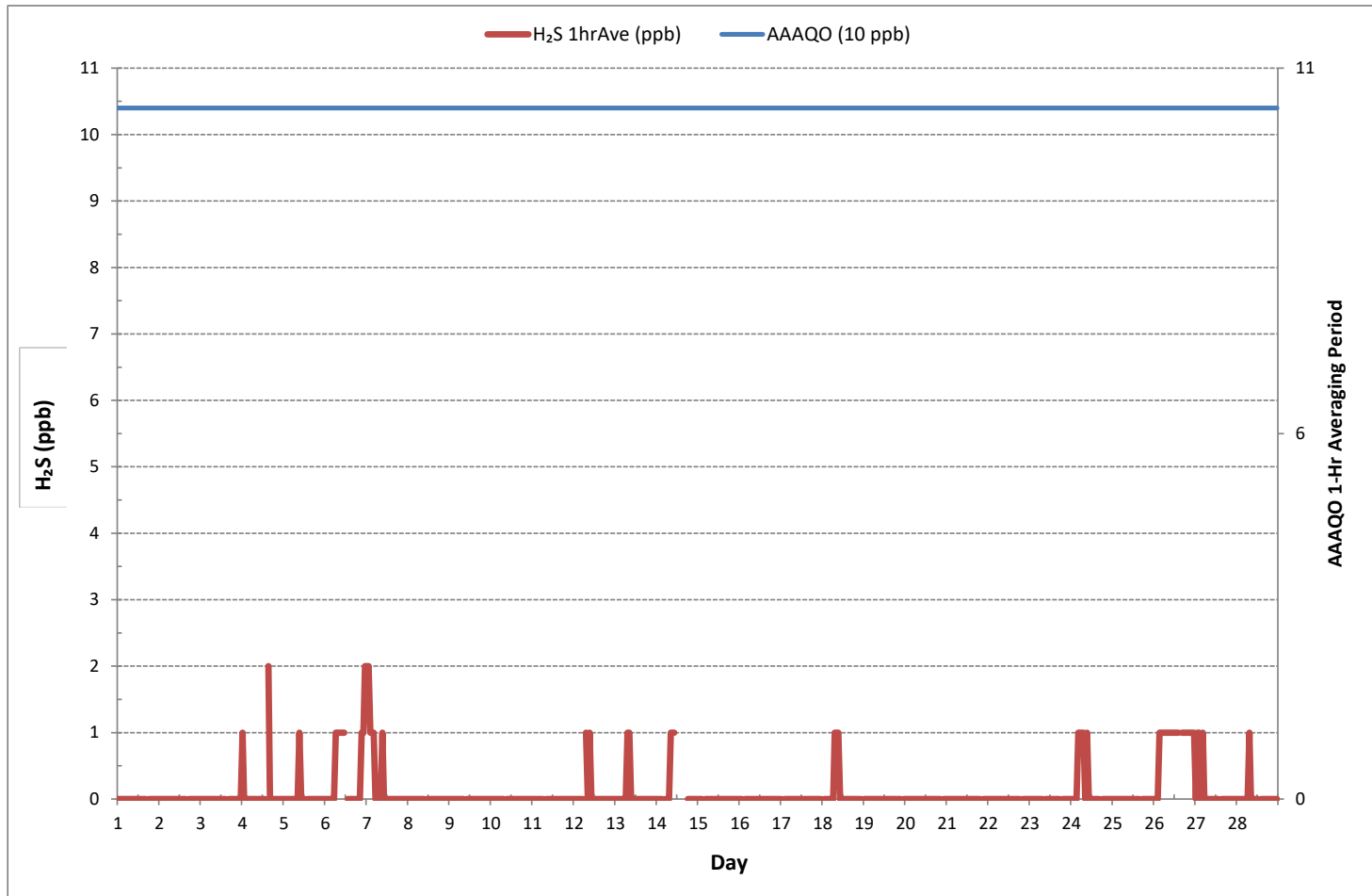
24 HR AVERAGES February 2019



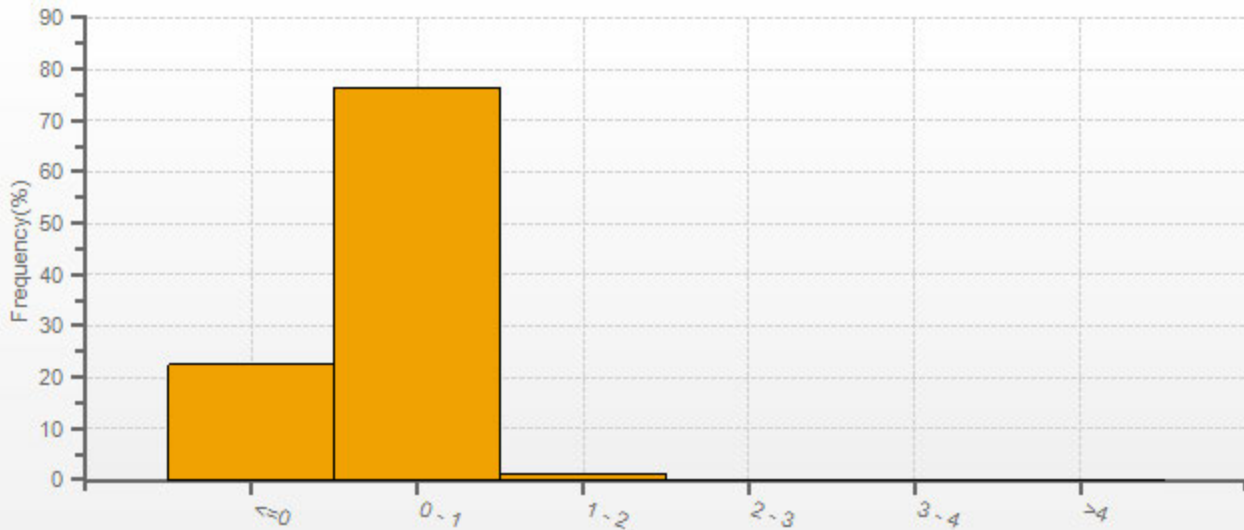
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	57				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	15	ON DAY	4	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	7	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	671	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



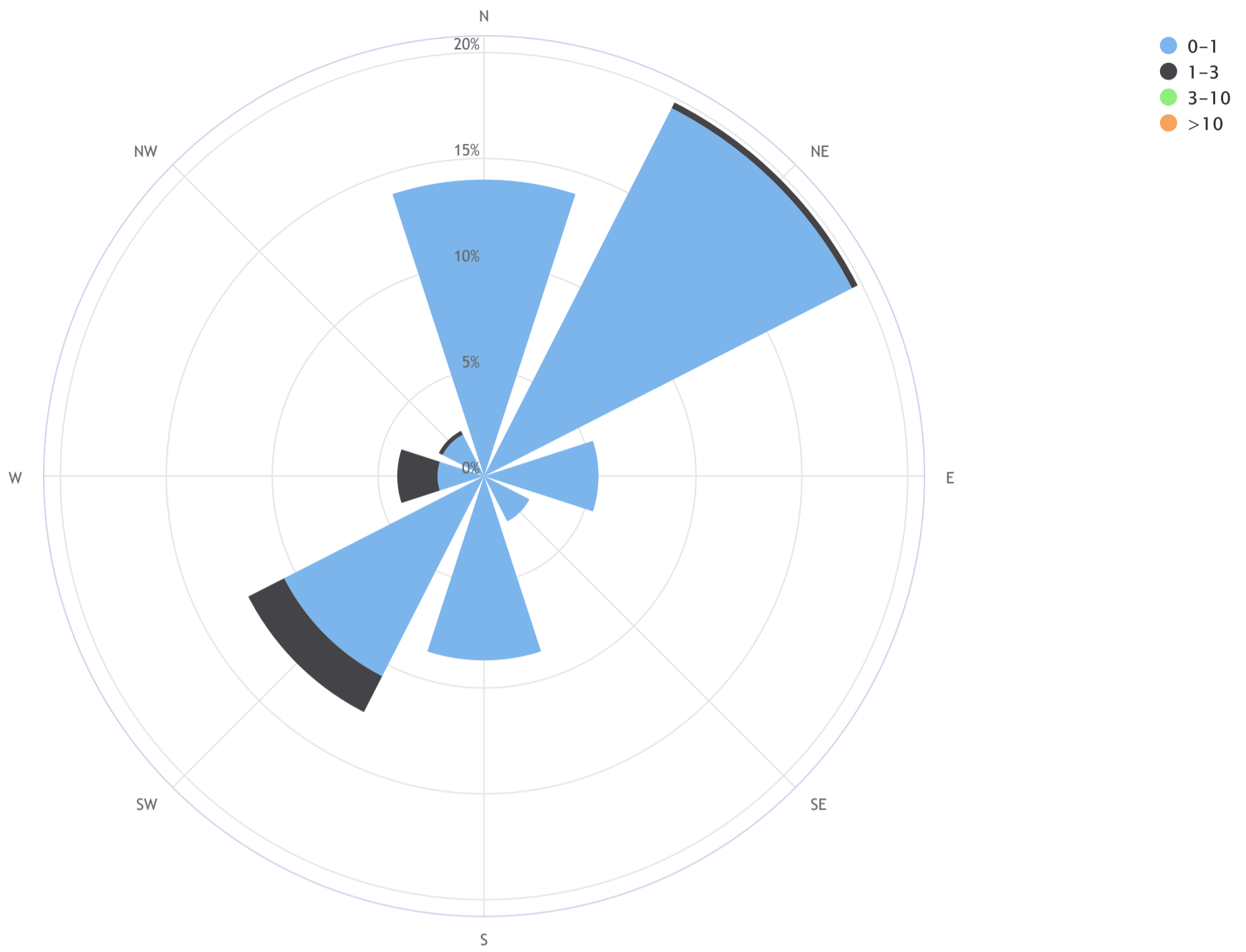
H2S[ppb] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 111 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_H₂S (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.2, CALM % = 30.9%



Direction	0-1	1-3	3-10	>10	TOTAL
N	14.0	0.0	0.0	0.0	14.0
NE	19.5	0.3	0.0	0.0	19.8
E	5.4	0.0	0.0	0.0	5.4
SE	2.4	0.0	0.0	0.0	2.4
S	8.7	0.0	0.0	0.0	8.7
SW	10.6	1.9	0.0	0.0	12.4
W	2.2	1.9	0.0	0.0	4.1
NW	2.2	0.2	0.0	0.0	2.4
Summary	64.9	4.3	0.0	0.0	69.1
CALM	26.1	4.7	0.0	0.0	30.9

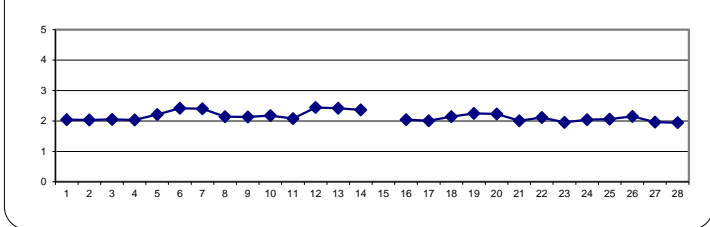
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.06	2.05	2.05	2.05	2.07	2.06	2.07	2.06	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.03	S	2.03	2.03	2.02	2.02	2.02	2.02	2.03	2.02	2.02	2.07	2.04	24
2	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.02	2.02	2.02	2.02	2.02	2.02	S	2.03	2.03	2.03	2.04	2.04	2.06	2.08	2.01	2.08	2.03	2.04	24	
3	2.05	2.06	2.09	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.03	2.03	2.04	S	2.03	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	2.09	2.05	24	
4	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.03	2.03	2.03	2.04	2.04	2.04	2.04	S	2.05	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.02	2.05	2.03	24	
5	2.04	2.06	2.06	2.09	2.12	2.13	2.16	2.21	2.24	2.54	2.19	2.14	2.11	S	2.19	2.11	2.14	2.28	2.27	2.28	2.34	2.36	2.36	2.35	2.04	2.54	2.21	24	
6	2.40	2.42	2.50	2.56	2.59	2.57	2.70	2.62	2.61	2.67	2.55	2.38	S	2.19	2.18	2.19	2.18	2.23	2.25	2.34	2.34	2.32	2.37	2.51	2.18	2.70	2.42	24	
7	2.51	2.51	2.49	2.53	2.52	2.39	2.37	2.50	2.50	2.52	2.35	S	2.28	2.31	2.31	2.30	2.33	2.37	2.34	2.32	2.30	2.33	2.40	2.40	2.28	2.53	2.40	24	
8	2.42	2.40	2.32	2.24	2.25	2.23	2.20	2.17	2.15	2.11	S	2.07	2.04	2.03	2.05	2.05	2.04	2.05	2.06	2.08	2.08	2.07	2.07	2.03	2.42	2.14	24		
9	2.06	2.07	2.08	2.09	2.10	2.11	2.11	2.12	2.15	S	2.09	2.06	2.07	2.08	2.16	2.17	2.10	2.18	2.17	2.17	2.24	2.14	2.21	2.21	2.06	2.24	2.13	24	
10	2.27	2.32	2.27	2.23	2.27	2.25	2.25	2.30	S	2.33	2.34	2.27	2.21	2.16	2.12	2.11	2.10	2.09	2.07	2.06	2.05	2.05	2.04	2.08	2.04	2.34	2.18	24	
11	2.05	2.05	2.06	2.07	2.07	2.05	2.05	S	2.05	2.05	2.04	2.06	2.07	2.05	2.05	2.06	2.05	2.06	2.07	2.08	2.15	2.21	2.23	2.20	2.04	2.23	2.08	24	
12	2.22	2.33	2.40	2.44	2.44	2.43	S	2.50	2.46	2.45	2.40	2.36	2.28	2.34	2.21	2.46	2.58	2.53	2.47	2.47	2.51	2.55	2.60	2.60	2.21	2.60	2.44	24	
13	2.55	2.57	2.52	2.46	S	2.61	2.59	2.54	2.41	2.34	2.32	2.15	2.31	2.76	2.65	2.41	2.23	2.22	2.22	2.29	2.32	2.32	2.29	2.15	2.76	2.42	24		
14	2.33	2.32	2.40	2.44	S	2.33	2.36	2.42	2.49	2.50	X	2.30	2.31	2.32	2.39	2.36	2.35	2.33	2.31	2.29	2.27	2.30	2.34	2.39	2.27	2.50	2.36	23	
15	2.33	2.38	2.38	S	2.33	2.35	2.35	2.38	2.40	2.42	2.36	C	C	Y	Y	C	C	C	2.01	2.02	2.04	2.04	2.06	2.05	2.01	2.42	-	22	
16	2.03	2.03	S	2.04	2.03	2.02	2.03	2.05	2.05	2.05	2.04	2.02	2.01	2.01	2.02	2.03	2.04	2.06	2.08	2.05	2.03	2.03	2.02	2.01	2.08	2.04	24		
17	2.03	S	2.03	2.02	2.03	2.03	2.03	2.02	2.01	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.00	2.00	2.00	2.01	2.00	2.03	2.01	24		
18	S	2.05	2.09	2.07	2.14	2.24	2.20	2.19	2.19	2.21	2.19	2.20	2.08	2.08	2.06	2.07	2.09	2.11	2.15	2.14	2.15	2.20	2.18	S	2.05	2.24	2.14	24	
19	2.17	2.17	2.18	2.18	2.19	2.21	2.23	2.23	2.25	2.29	2.30	2.29	2.27	2.29	2.26	2.21	2.20	2.19	2.19	2.21	2.25	2.41	S	2.47	2.17	2.47	2.25	24	
20	2.50	2.57	2.58	2.55	2.51	2.42	2.43	2.29	2.17	2.15	2.17	2.13	2.06	2.07	2.08	2.08	2.08	2.09	2.09	2.08	2.05	S	2.04	2.03	2.03	2.58	2.23	24	
21	2.02	2.02	2.02	2.02	2.01	1.99	1.99	1.98	1.98	1.98	1.98	2.00	2.01	2.00	2.00	2.00	1.98	1.98	1.99	2.04	S	2.06	2.06	2.08	1.98	2.08	2.01	24	
22	2.09	2.11	2.12	2.14	2.13	2.14	2.15	2.16	2.18	2.13	2.16	2.14	2.13	2.13	2.14	2.16	2.17	2.19	2.13	S	1.99	1.99	2.00	1.94	1.94	2.19	2.11	24	
23	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	P	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.95	1.95	S	1.95	1.97	1.98	1.97	1.97	1.94	1.98	1.95	23	
24	1.99	1.99	2.00	2.00	2.11	2.13	2.08	2.05	2.06	2.18	2.02	2.00	1.98	1.97	1.97	1.98	2.03	S	2.02	2.04	2.04	2.03	2.05	2.10	1.97	2.18	2.04	24	
25	2.09	2.10	2.07	2.06	2.03	1.99	1.98	1.99	2.00	2.00	2.11	2.16	2.24	2.17	2.07	2.02	S	2.01	2.03	2.03	2.05	2.06	2.05	2.06	1.98	2.24	2.06	24	
26	2.09	2.10	2.14	2.21	2.22	2.22	2.26	2.33	2.37	2.31	2.35	2.44	2.42	2.20	1.99	S	1.96	1.97	1.98	1.98	1.98	1.99	1.98	1.98	1.96	2.44	2.15	24	
27	1.98	1.98	1.97	1.97	1.97	1.98	1.98	1.99	1.97	1.97	1.97	1.96	1.95	1.94	S	1.95	1.94	1.94	1.94	1.94	1.93	1.93	1.94	1.95	1.95	1.93	1.99	1.96	24
28	1.95	1.94	1.94	1.94	1.93	1.94	1.95	2.00	1.98	1.93	1.92	1.93	1.93	S	1.93	1.94	1.94	1.94	1.94	1.93	1.94	1.93	1.93	1.94	1.92	2.00	1.94	24	
HOURLY MAX	2.55	2.57	2.58	2.56	2.59	2.57	2.70	2.62	2.61	2.67	2.55	2.44	2.42	2.34	2.76	2.65	2.58	2.53	2.47	2.47	2.51	2.55	2.60	2.60					
HOURLY AVG	2.16	2.17	2.18	2.16	2.17	2.16	2.17	2.19	2.19	2.20	2.15	2.13	2.10	2.11	2.12	2.12	2.11	2.12	2.11	2.11	2.12	2.13	2.13	2.14					

STATUS FLAG CODES

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

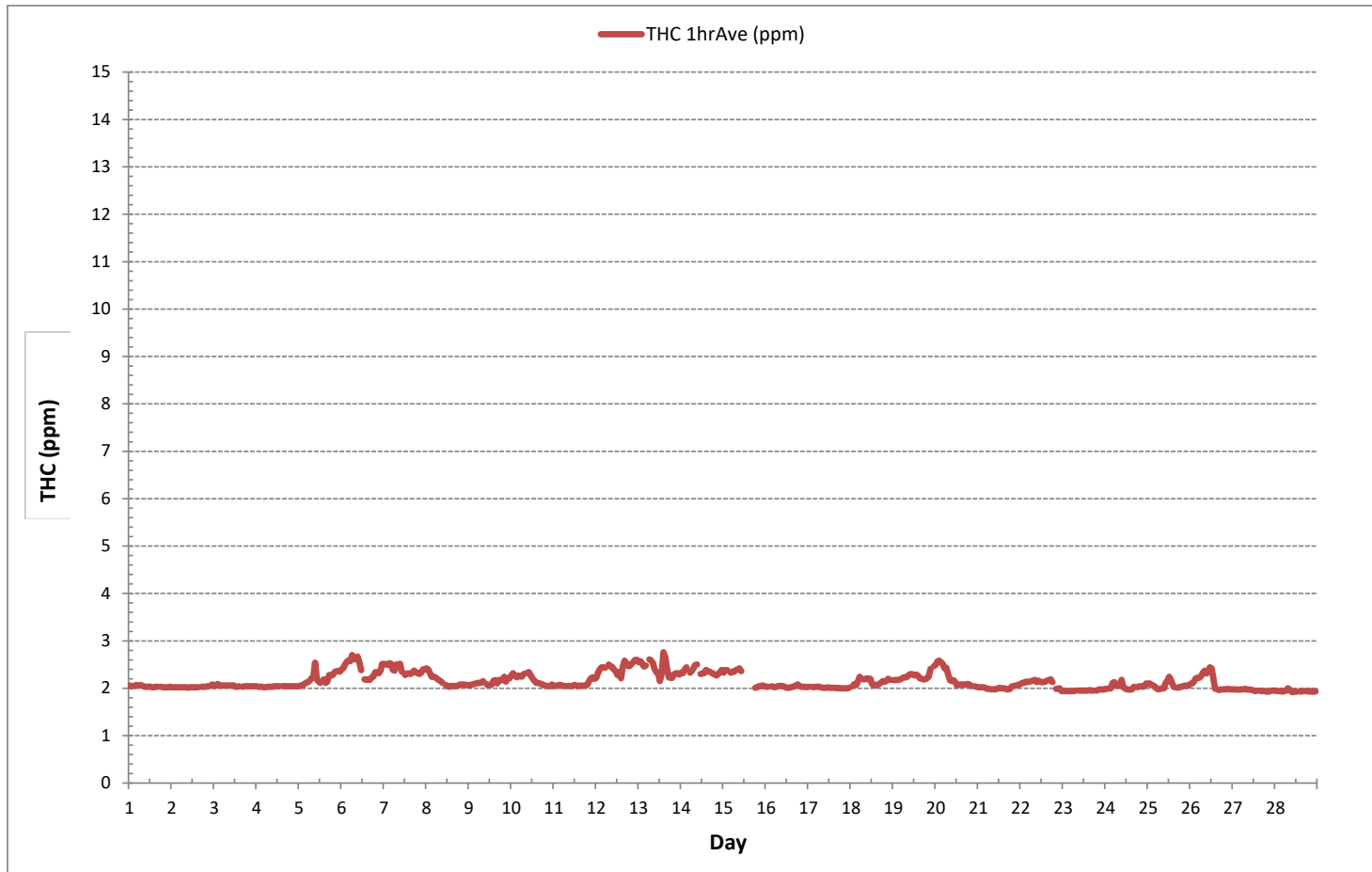
24 HR AVERAGES February 2019



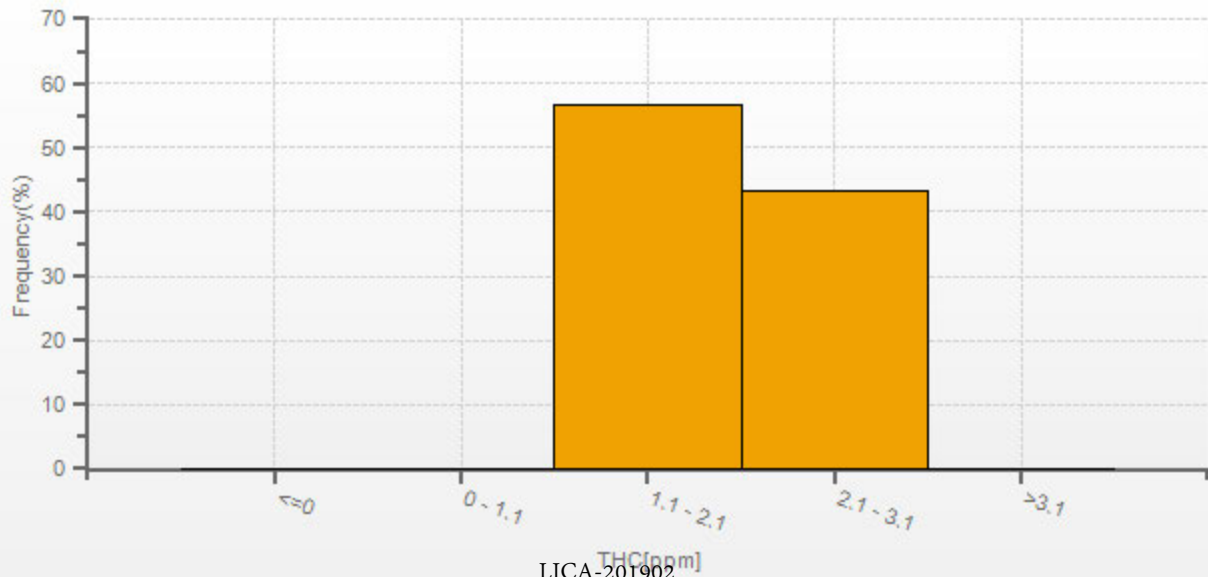
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	634			
MINIMUM 1-HR AVERAGE:	1.92 ppm	@ HOUR	10 ON DAY	28
MAXIMUM 1-HR AVERAGE:	2.76 ppm	@ HOUR	14 ON DAY	13
MAXIMUM 24-HR AVERAGE:	2.44 ppm		ON DAY	12
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	668 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.4 %	
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.14 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



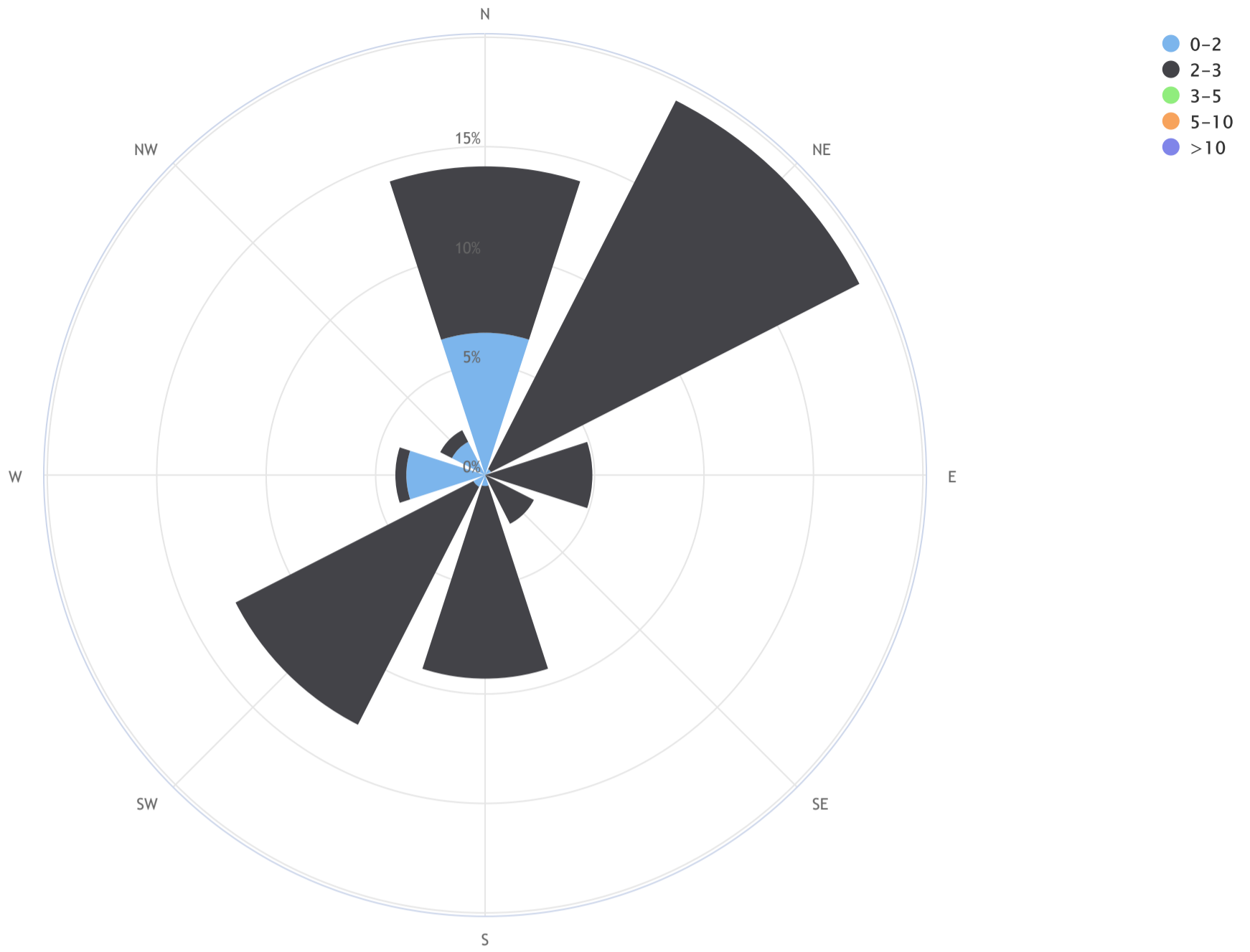
THC[ppm] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 115 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_THC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.3, CALM % = 30.8%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	6.5	7.6	0.0	0.0	0.0	14.0
NE	0.3	18.9	0.0	0.0	0.0	19.3
E	0.0	4.9	0.0	0.0	0.0	4.9
SE	0.0	2.5	0.0	0.0	0.0	2.5
S	0.5	8.8	0.0	0.0	0.0	9.3
SW	0.6	12.2	0.0	0.0	0.0	12.8
W	3.6	0.5	0.0	0.0	0.0	4.1
NW	1.7	0.6	0.0	0.0	0.0	2.4
Summary	13.3	56.0	0.0	0.0	0.0	69.3
CALM	2.1	28.7	0.0	0.0	0.0	30.8



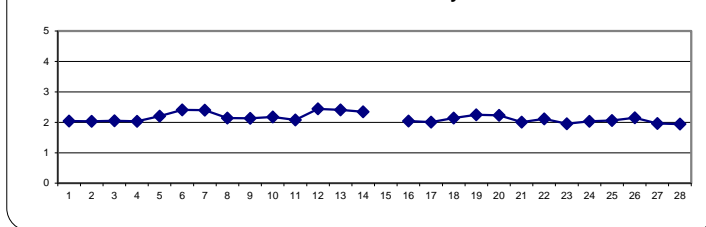
METHANE Hourly Averages (CH₄ ppm)

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	2.06	2.05	2.05	2.05	2.07	2.06	2.07	2.06	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.03	S	2.03	2.02	2.02	2.02	2.02	2.02	2.03	2.02	2.07	2.04	24	
2	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.02	2.02	2.02	2.02	2.02	2.02	2.02	S	2.03	2.03	2.03	2.04	2.04	2.06	2.08	2.01	2.08	2.03	24	
3	2.05	2.06	2.09	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.03	2.03	2.04	S	2.03	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	2.09	2.05	24	
4	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.03	2.03	2.03	2.04	2.04	2.04	2.04	2.04	S	2.05	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.02	2.05	2.03	24	
5	2.04	2.06	2.06	2.09	2.12	2.13	2.16	2.21	2.24	2.40	2.19	2.14	2.11	S	2.10	2.09	2.14	2.28	2.27	2.28	2.34	2.36	2.36	2.35	2.04	2.40	2.02	24	
6	2.40	2.42	2.50	2.56	2.59	2.57	2.64	2.59	2.57	2.58	2.51	2.37	S	2.19	2.18	2.19	2.18	2.23	2.25	2.34	2.34	2.32	2.37	2.51	2.18	2.64	2.41	24	
7	2.51	2.51	2.49	2.53	2.52	2.39	2.37	2.50	2.50	2.52	2.35	S	2.28	2.31	2.31	2.30	2.33	2.37	2.34	2.32	2.30	2.33	2.40	2.40	2.28	2.53	2.40	24	
8	2.42	2.40	2.32	2.24	2.25	2.23	2.20	2.17	2.15	2.11	S	2.07	2.04	2.03	2.05	2.05	2.04	2.05	2.06	2.08	2.08	2.08	2.07	2.07	2.03	2.42	2.14	24	
9	2.06	2.07	2.08	2.09	2.10	2.11	2.11	2.12	2.15	S	2.09	2.06	2.07	2.08	2.16	2.17	2.10	2.18	2.17	2.17	2.24	2.14	2.21	2.21	2.06	2.24	2.13	24	
10	2.27	2.32	2.27	2.23	2.27	2.25	2.25	2.30	S	2.33	2.34	2.27	2.21	2.16	2.12	2.11	2.10	2.09	2.07	2.06	2.05	2.05	2.04	2.08	2.04	2.34	2.18	24	
11	2.05	2.05	2.06	2.07	2.07	2.05	2.05	S	2.05	2.05	2.04	2.06	2.07	2.05	2.05	2.06	2.05	2.06	2.07	2.08	2.15	2.21	2.23	2.20	2.04	2.23	2.08	24	
12	2.22	2.33	2.40	2.44	2.44	2.43	S	2.50	2.46	2.45	2.40	2.36	2.28	2.34	2.21	2.46	2.58	2.53	2.47	2.47	2.51	2.55	2.60	2.60	2.21	2.60	2.44	24	
13	2.55	2.57	2.52	2.46	2.48	S	2.61	2.59	2.54	2.41	2.34	2.30	2.15	2.31	2.76	2.65	2.41	2.23	2.22	2.22	2.29	2.32	2.32	2.29	2.15	2.76	2.41	24	
14	2.33	2.32	2.40	2.44	S	2.33	2.36	2.42	2.42	2.46	X	2.30	2.31	2.32	2.39	2.36	2.35	2.33	2.31	2.29	2.27	2.30	2.34	2.39	2.27	2.46	2.35	23	
15	2.33	2.38	2.38	S	2.33	2.35	2.35	2.38	2.40	2.42	2.36	C	C	Y	Y	C	C	C	2.01	2.02	2.04	2.04	2.06	2.05	2.01	2.42	-	22	
16	2.03	2.03	S	2.04	2.03	2.02	2.03	2.05	2.05	2.05	2.04	2.02	2.01	2.01	2.02	2.03	2.04	2.06	2.08	2.05	2.03	2.03	2.02	2.01	2.08	2.04	24		
17	2.03	S	2.03	2.02	2.03	2.03	2.03	2.02	2.01	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.00	2.00	2.00	2.01	2.00	2.01	2.03	2.01	24	
18	S	2.05	2.09	2.07	2.14	2.24	2.20	2.19	2.19	2.21	2.19	2.20	2.08	2.08	2.06	2.07	2.09	2.11	2.15	2.14	2.15	2.20	2.18	S	2.05	2.24	2.14	24	
19	2.17	2.17	2.18	2.18	2.19	2.21	2.23	2.23	2.25	2.29	2.30	2.29	2.27	2.29	2.26	2.21	2.20	2.19	2.19	2.21	2.25	2.41	S	2.47	2.17	2.47	2.25	24	
20	2.50	2.57	2.58	2.55	2.51	2.42	2.43	2.29	2.17	2.15	2.17	2.13	2.06	2.07	2.08	2.08	2.08	2.08	2.09	2.08	2.05	S	2.04	2.03	2.03	2.58	2.23	24	
21	2.02	2.02	2.02	2.02	2.01	1.99	1.99	1.98	1.98	1.98	1.98	2.00	2.01	2.00	2.00	2.00	1.98	1.98	1.99	2.04	S	2.06	2.06	2.08	1.98	2.08	2.01	24	
22	2.09	2.11	2.12	2.14	2.13	2.14	2.15	2.16	2.18	2.13	2.16	2.14	2.13	2.13	2.14	2.16	2.17	2.19	2.13	S	1.99	1.99	2.00	1.94	1.94	2.19	2.11	24	
23	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	P	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	S	1.95	1.97	1.98	1.97	1.97	1.94	1.98	1.95	23
24	1.99	1.99	2.00	2.00	2.09	2.11	2.08	2.05	2.06	2.14	2.02	2.00	1.98	1.97	1.97	1.98	2.03	S	2.02	2.04	2.04	2.03	2.05	2.10	1.97	2.14	2.03	24	
25	2.09	2.10	2.07	2.06	2.03	1.99	1.98	1.99	2.00	2.00	2.11	2.16	2.24	2.17	2.07	2.02	S	2.01	2.03	2.03	2.05	2.06	2.05	2.06	1.98	2.24	2.06	24	
26	2.09	2.10	2.14	2.21	2.22	2.22	2.26	2.33	2.37	2.31	2.35	2.44	2.42	2.20	1.99	S	1.96	1.97	1.98	1.98	1.98	1.99	1.98	1.98	1.96	2.44	2.15	24	
27	1.98	1.98	1.97	1.97	1.97	1.98	1.98	1.99	1.97	1.97	1.97	1.96	1.95	1.94	S	1.95	1.94	1.94	1.94	1.93	1.93	1.94	1.95	1.95	1.93	1.99	1.96	24	
28	1.95	1.94	1.94	1.94	1.93	1.94	1.95	2.00	1.98	1.93	1.92	1.93	1.93	S	1.93	1.94	1.94	1.94	1.94	1.93	1.94	1.93	1.93	1.94	1.92	2.00	1.94	24	
HOURLY MAX	2.55	2.57	2.58	2.56	2.59	2.57	2.64	2.59	2.57	2.58	2.51	2.44	2.42	2.34	2.76	2.65	2.58	2.53	2.47	2.47	2.51	2.55	2.60	2.60					
HOURLY AVG	2.16	2.17	2.18	2.16	2.17	2.16	2.17	2.19	2.19	2.18	2.15	2.13	2.10	2.11	2.12	2.12	2.11	2.12	2.11	2.11	2.12	2.13	2.13	2.14					

STATUS FLAG CODES

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

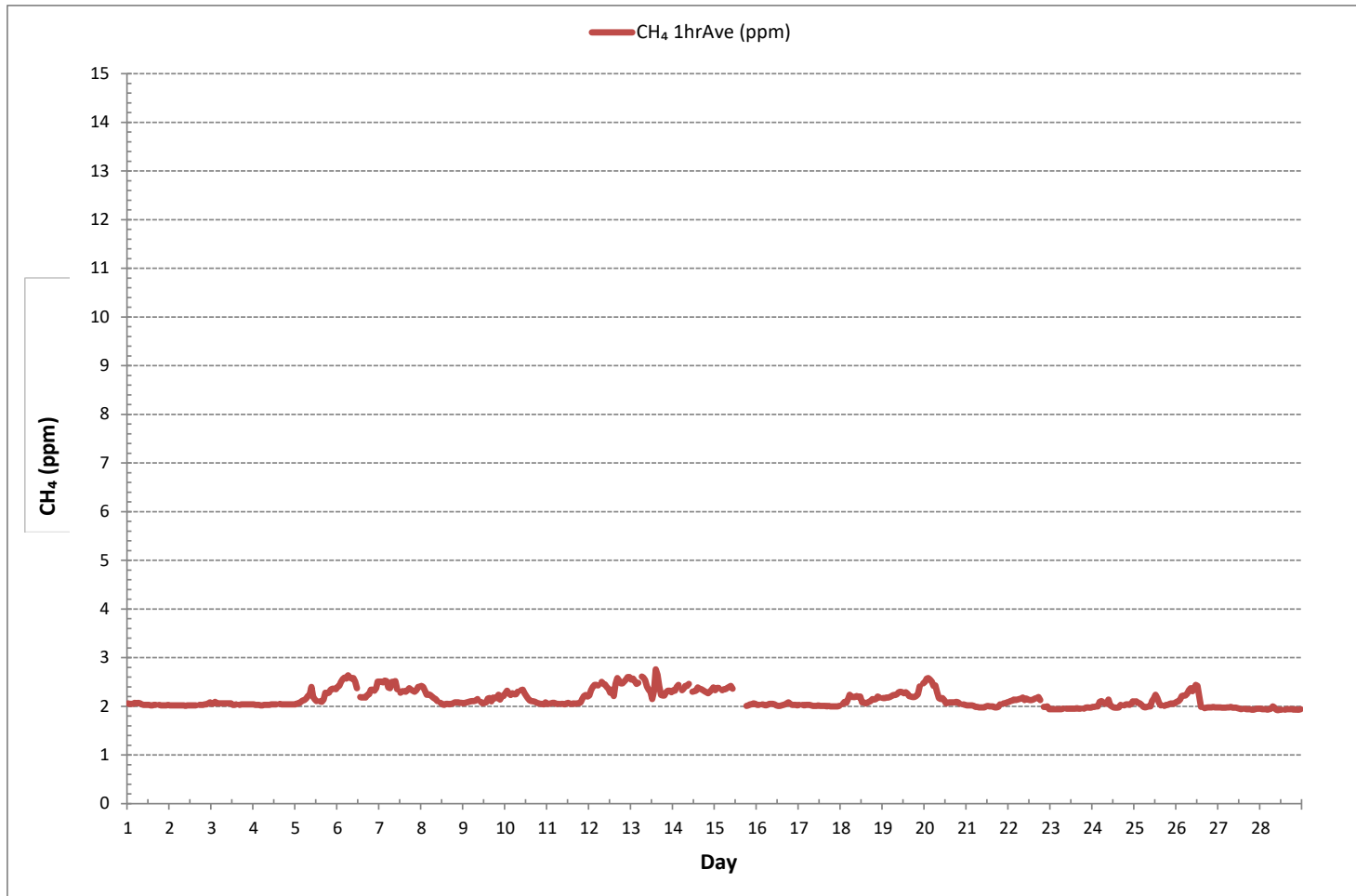
24 HR AVERAGES February 2019



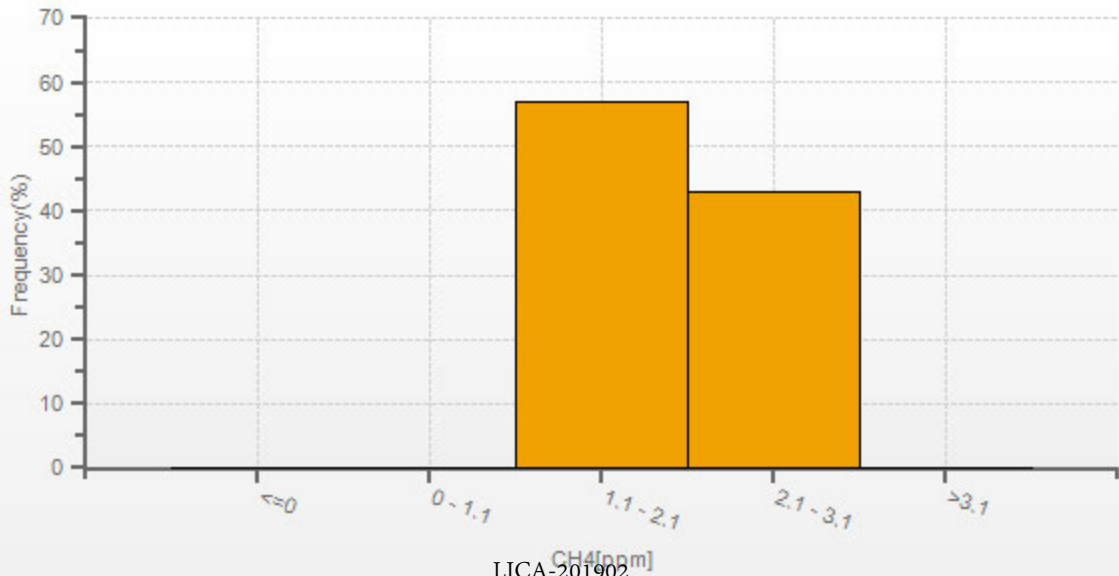
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	634			
MINIMUM 1-HR AVERAGE:	1.92 ppm	@ HOUR	10 ON DAY	28
MAXIMUM 1-HR AVERAGE:	2.76 ppm	@ HOUR	14 ON DAY	13
MAXIMUM 24-HR AVERAGE:	2.44 ppm		ON DAY	12
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	668 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.4 %	
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.14 ppm	

METHANE Hourly Averages (CH₄ ppm)



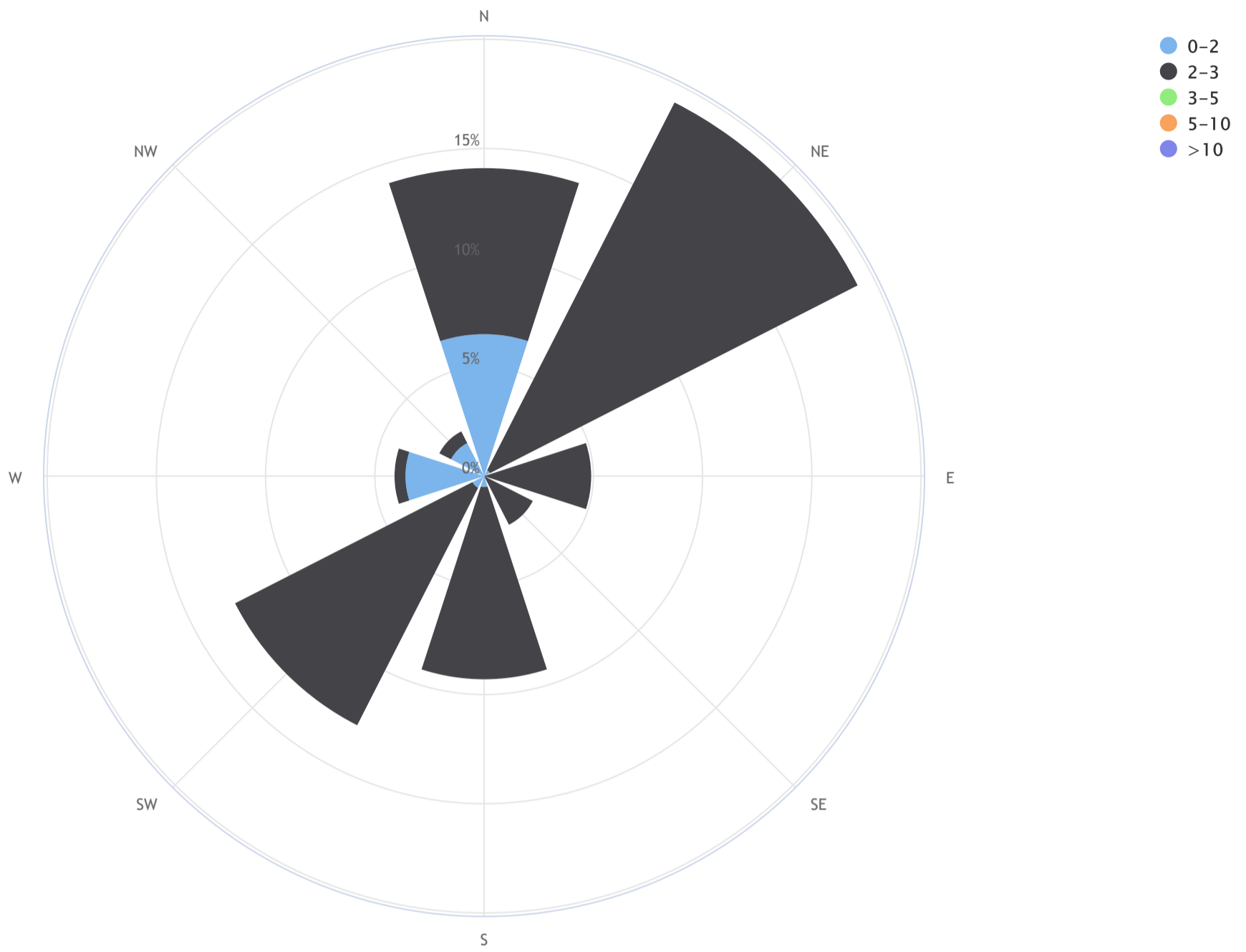
CH4[ppm] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 119 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_CH4 (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.3, CALM % = 30.8%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	6.5	7.6	0.0	0.0	0.0	14.0
NE	0.3	18.9	0.0	0.0	0.0	19.3
E	0.0	4.9	0.0	0.0	0.0	4.9
SE	0.0	2.5	0.0	0.0	0.0	2.5
S	0.5	8.8	0.0	0.0	0.0	9.3
SW	0.6	12.2	0.0	0.0	0.0	12.8
W	3.6	0.5	0.0	0.0	0.0	4.1
NW	1.7	0.6	0.0	0.0	0.0	2.4
Summary	13.3	56.0	0.0	0.0	0.0	69.3
CALM	2.1	28.7	0.0	0.0	0.0	30.8



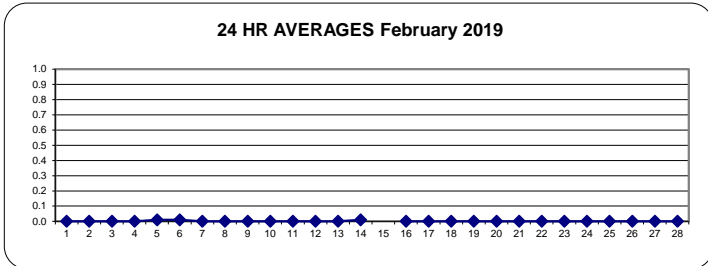
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	S	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	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
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	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	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	0.13	0.00	0.00	0.00	S	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	24
6	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.03	0.04	0.09	0.04	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	0.09	0.01	24
7	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
8	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
9	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
10	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
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
12	0.00	0.00	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
13	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	0.00	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	24
14	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.07	0.04	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	0.00	0.00	0.07	0.01	23	
15	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	Y	Y	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	22	
16	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
17	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
18	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	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
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	S	0.00	0.00	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	S	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	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	0.00	0.00	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23
24	0.00	0.00	0.00	0.00	0.01	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	0.00	0.00	0.00	0.00	0.00	0.00	0.04	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	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
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	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
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	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	0.00	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
HOURLY MAX	0.00	0.00	0.00	0.00	0.01	0.01	0.06	0.03	0.07	0.13	0.04	0.02	0.00	0.00	0.09	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	
HOURLY AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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

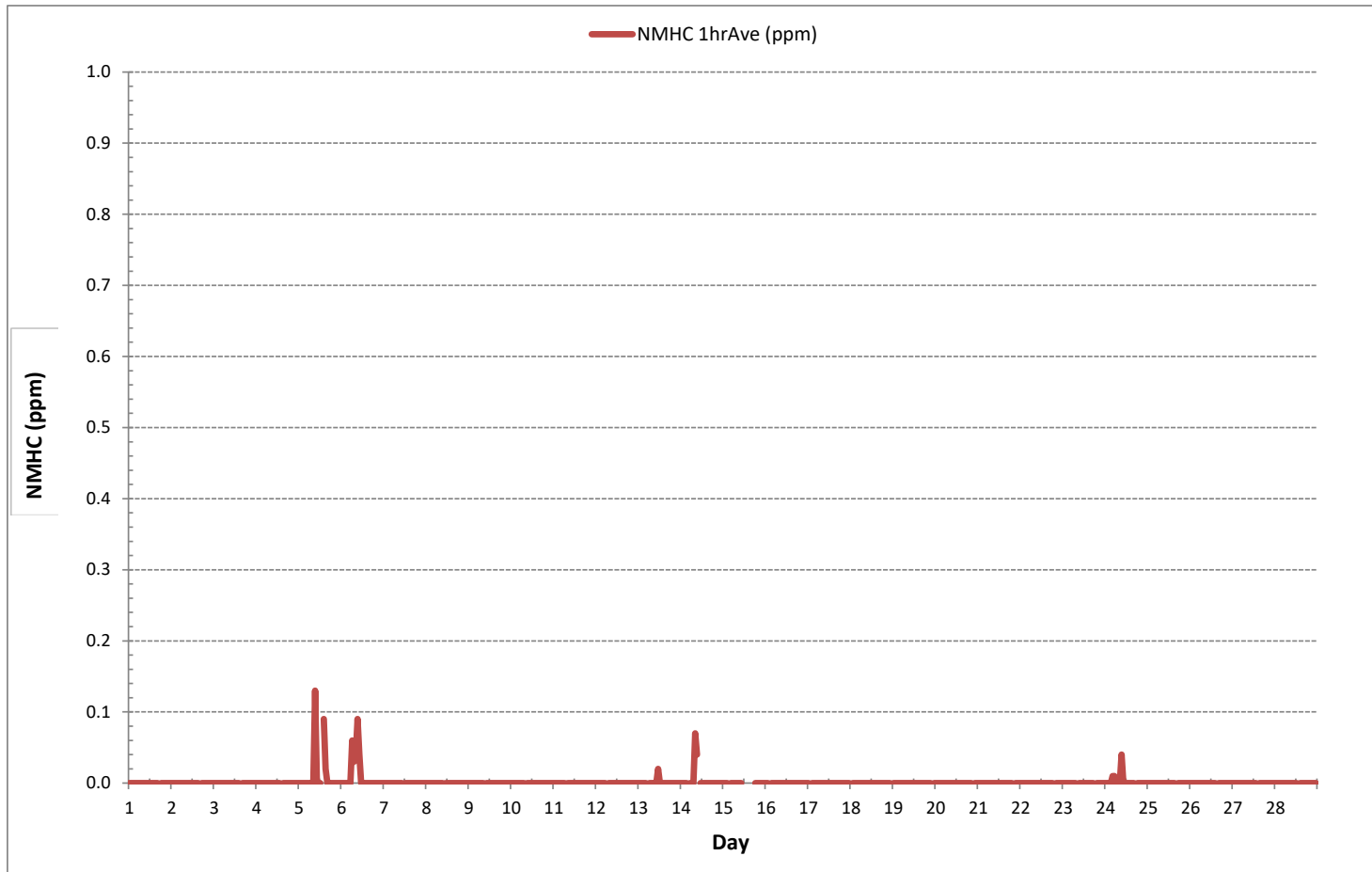
24 HR AVERAGES February 2019



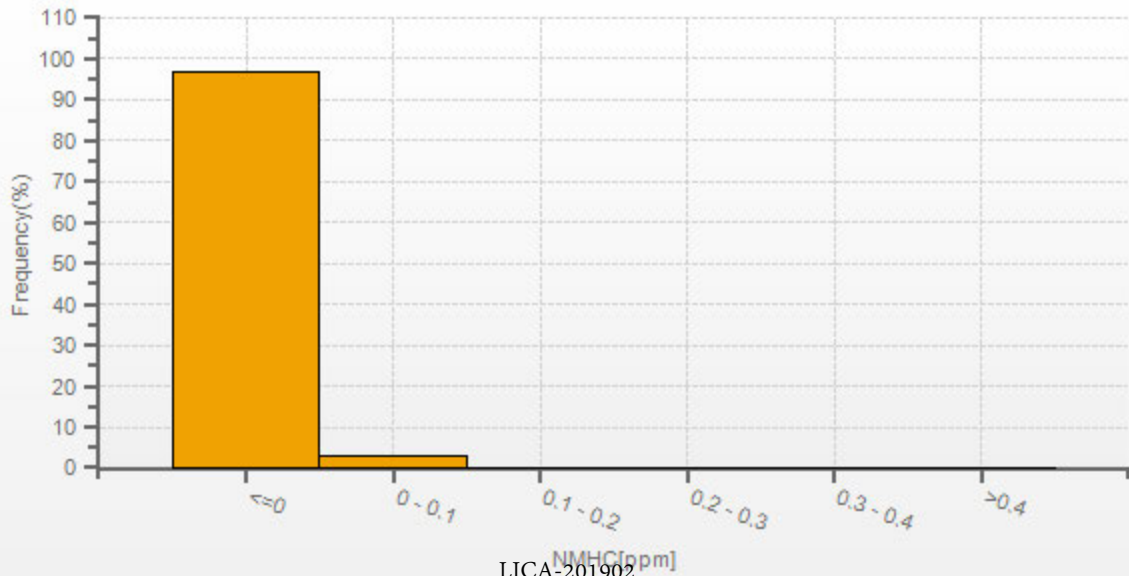
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	14				
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.13	ppm @ HOUR	9	ON DAY	5
MAXIMUM 24-HR AVERAGE:	0.01	ppm		ON DAY	5
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	668	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	99.4	%
STANDARD DEVIATION:	0.01		MONTHLY AVERAGE:	0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



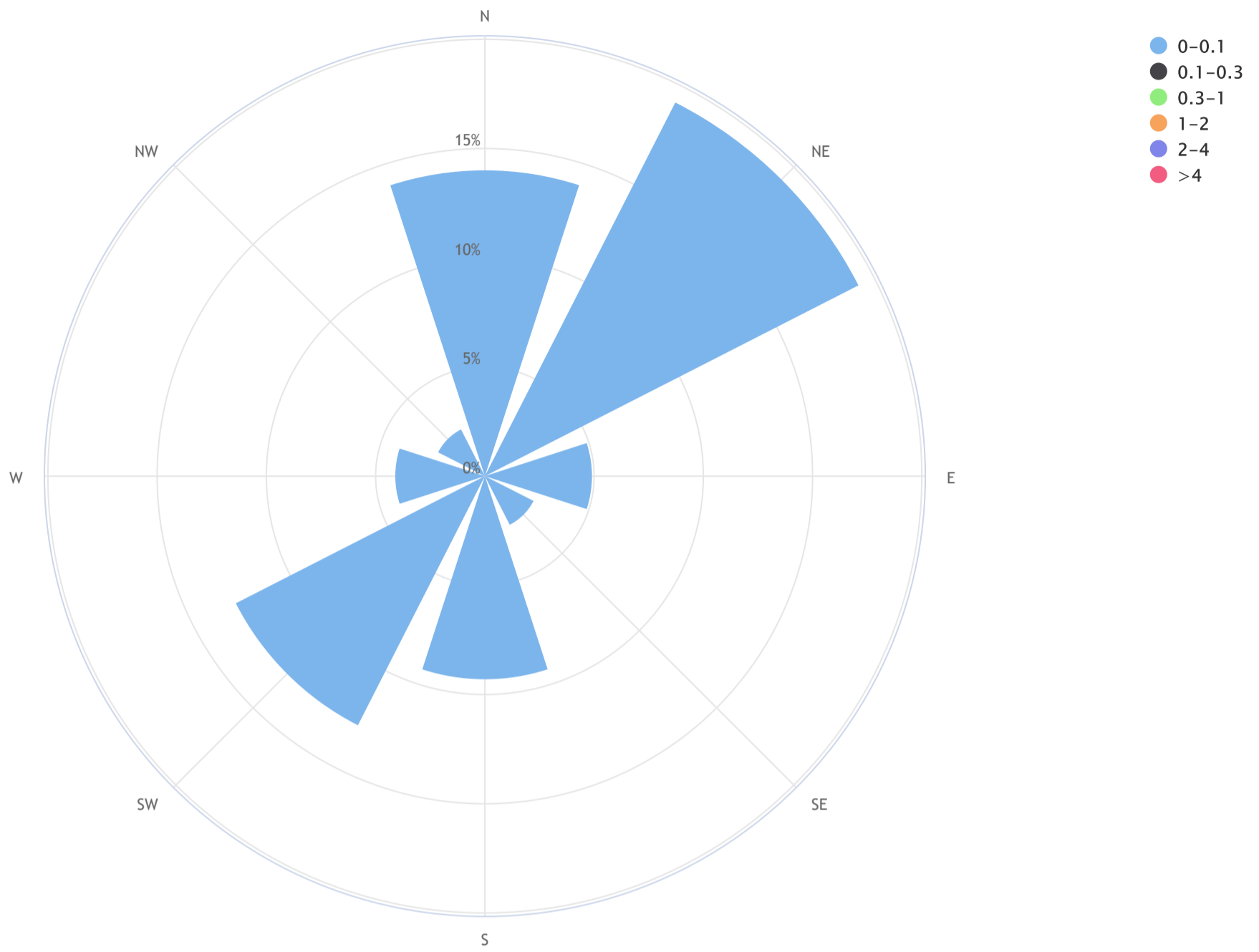
NMHC[ppm] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 123 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NMHC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.0, CALM % = 30.8%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	14.0	0.0	0.0	0.0	0.0	0.0	14.0
NE	19.2	0.0	0.0	0.0	0.0	0.0	19.2
E	4.9	0.0	0.0	0.0	0.0	0.0	4.9
SE	2.5	0.0	0.0	0.0	0.0	0.0	2.5
S	9.3	0.0	0.0	0.0	0.0	0.0	9.3
SW	12.8	0.0	0.0	0.0	0.0	0.0	12.8
W	4.1	0.0	0.0	0.0	0.0	0.0	4.1
NW	2.4	0.0	0.0	0.0	0.0	0.0	2.4
Summary	69.3	0.0	0.0	0.0	0.0	0.0	69.3
CALM	30.6	0.2	0.0	0.0	0.0	0.0	30.8



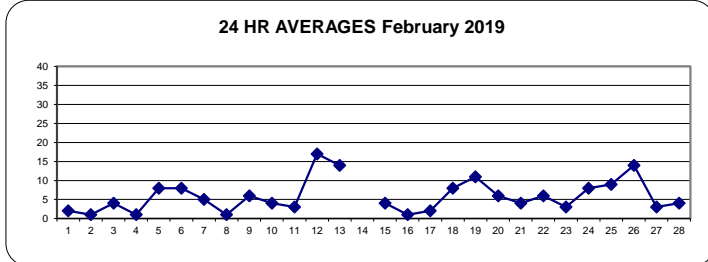
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	3	2	3	4	6	5	7	5	3	2	2	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	7	2	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	S	1	0	1	2	2	4	4	4	0	4	1	24
3	2	3	5	3	3	4	7	14	10	8	6	4	2	3	3	S	1	1	1	1	1	1	1	1	1	1	14	4	24
4	0	0	0	0	0	0	0	0	0	0	3	4	1	1	S	1	1	1	1	1	1	1	2	1	1	0	4	1	24
5	1	1	1	1	1	1	2	3	17	19	8	5	7	S	14	18	10	13	10	10	12	10	9	10	1	1	19	8	24
6	10	9	10	9	11	10	11	12	17	19	15	9	S	3	3	4	3	4	5	7	7	5	5	5	3	3	19	8	24
7	6	7	8	7	7	7	6	6	5	5	6	S	4	4	5	5	4	4	3	3	3	6	7	5	3	8	5	5	24
8	5	3	3	2	2	2	1	1	1	1	S	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	5	1	24
9	2	2	2	3	3	3	5	21	15	S	4	2	5	6	11	9	5	9	7	5	5	4	6	6	2	21	6	6	24
10	4	5	6	5	4	4	4	7	S	6	5	4	3	3	2	2	1	1	1	3	1	1	2	10	1	10	4	24	
11	3	1	3	6	5	1	1	S	1	2	1	3	5	4	1	1	1	1	2	3	3	3	4	9	1	9	3	24	
12	9	8	9	8	12	14	S	37	35	45	23	19	24	14	16	15	14	12	11	11	11	12	12	12	8	45	17	24	
13	29	19	14	13	13	S	17	19	19	16	15	21	14	16	21	17	14	9	5	5	6	9	8	8	5	29	14	24	
14	6	8	21	12	S	4	5	10	27	15	13	C	C	C	C	C	C	C	12	9	5	9	14	9	4	27	-	24	
15	5	5	5	S	4	4	4	4	6	11	10	8	4	3	2	1	5	2	1	1	1	1	1	1	1	1	11	4	24
16	1	1	S	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	24
17	1	S	1	1	1	2	2	1	3	2	3	2	1	2	3	3	4	4	3	3	2	2	2	2	2	1	4	2	24
18	S	4	3	5	6	7	8	23	28	20	8	8	4	5	3	3	4	7	7	6	6	5	5	S	3	28	8	24	
19	5	5	5	5	5	6	7	10	11	12	13	12	13	13	15	11	12	14	17	14	15	15	S	14	5	17	11	24	
20	15	19	15	12	10	9	10	7	5	4	3	3	2	2	3	3	2	2	2	3	S	3	3	3	2	19	6	24	
21	3	2	2	3	5	3	4	4	6	5	6	3	5	5	3	2	3	3	4	4	S	2	4	5	2	6	4	24	
22	5	6	6	5	5	5	8	7	5	4	5	5	5	5	6	10	11	13	10	S	4	4	4	1	1	13	6	24	
23	1	1	1	1	1	1	1	1	P	2	2	2	3	3	3	2	2	1	S	3	10	11	4	3	1	11	3	23	
24	7	3	3	4	8	6	11	16	17	20	12	12	6	7	6	3	5	S	4	5	5	6	6	7	3	20	8	24	
25	7	8	7	6	5	6	9	23	15	18	10	11	15	11	7	4	S	6	9	8	9	9	7	8	4	23	9	24	
26	10	9	10	10	13	14	22	25	28	29	28	27	27	18	7	S	5	4	4	4	3	8	3	3	3	29	14	24	
27	3	2	3	4	2	3	5	3	3	2	3	6	2	5	S	7	1	1	1	1	4	2	3	1	1	7	3	24	
28	1	1	2	1	1	1	22	30	8	2	3	3	2	S	3	2	2	2	2	2	2	2	1	1	1	1	30	4	24
HOURLY MAX	29	19	21	13	13	14	22	37	35	45	28	27	27	18	21	18	14	14	17	14	15	15	14	14	14				
HOURLY AVG	5	5	5	5	5	5	7	11	11	10	8	7	6	5	6	5	4	5	5	4	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

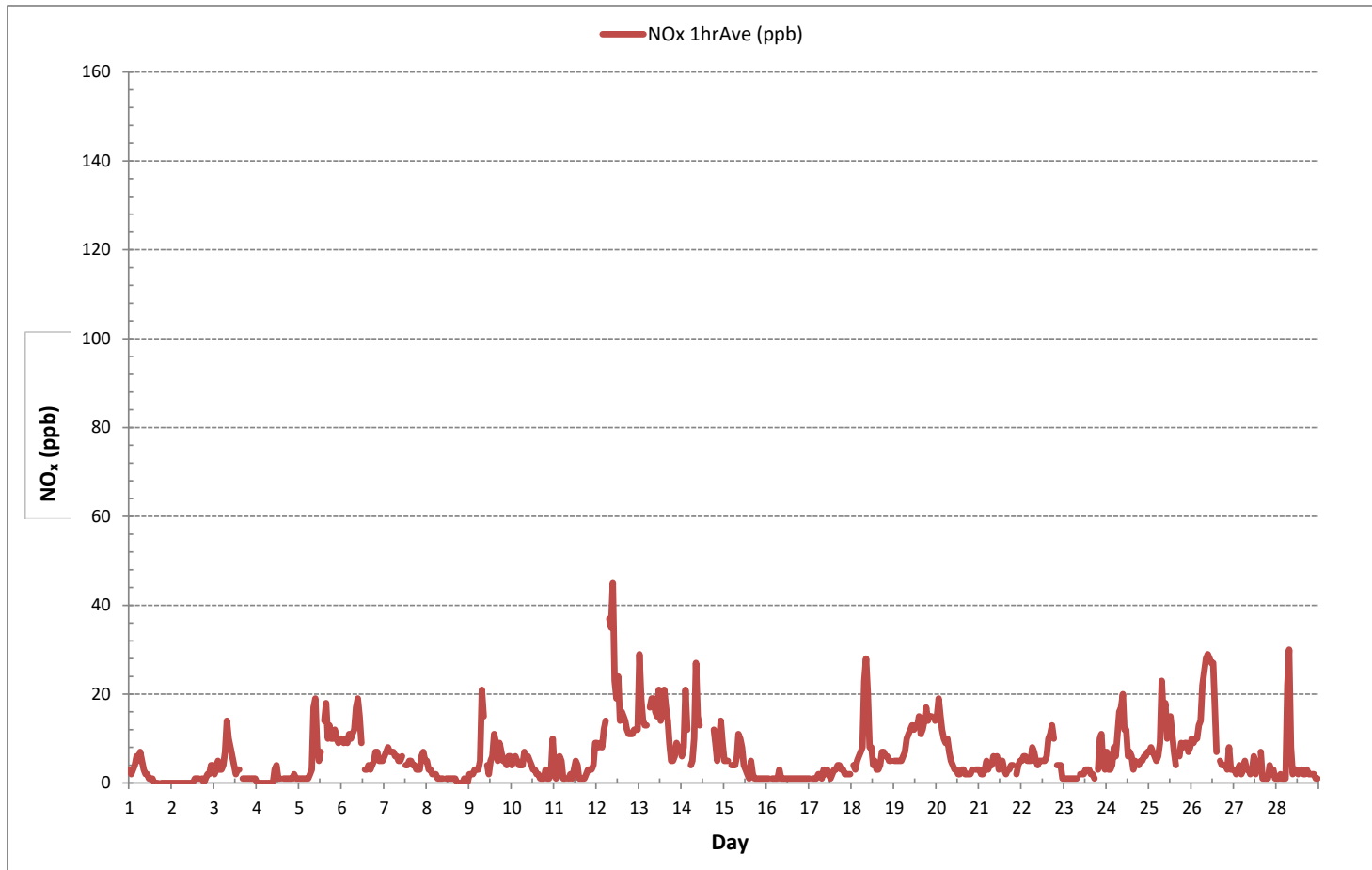
24 HR AVERAGES February 2019



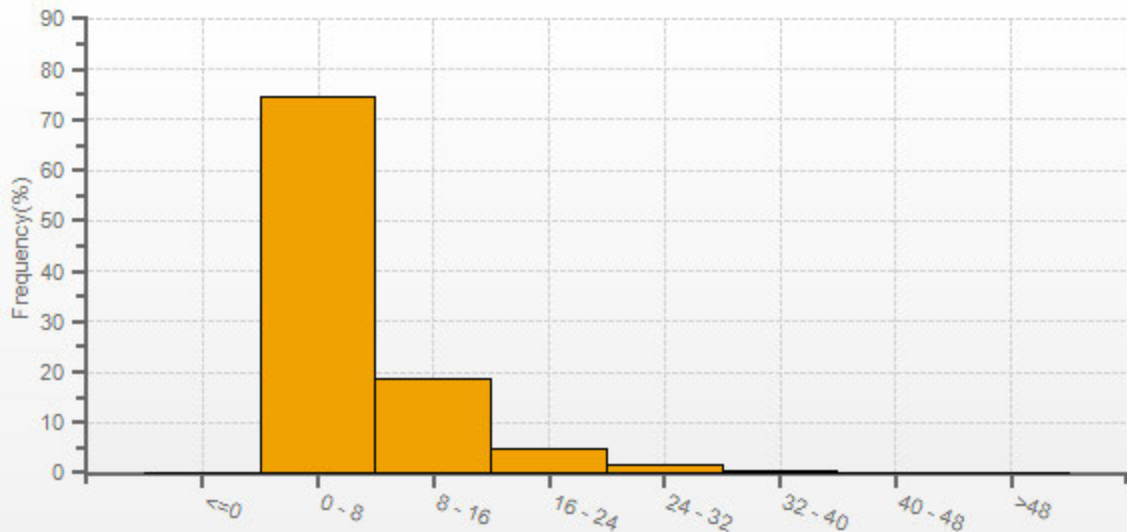
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	596			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	14	ON DAY 1
MAXIMUM 1-HR AVERAGE:	45	ppb @ HOUR	9	ON DAY 12
MAXIMUM 24-HR AVERAGE:	17	ppb		ON DAY 12
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	671 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)



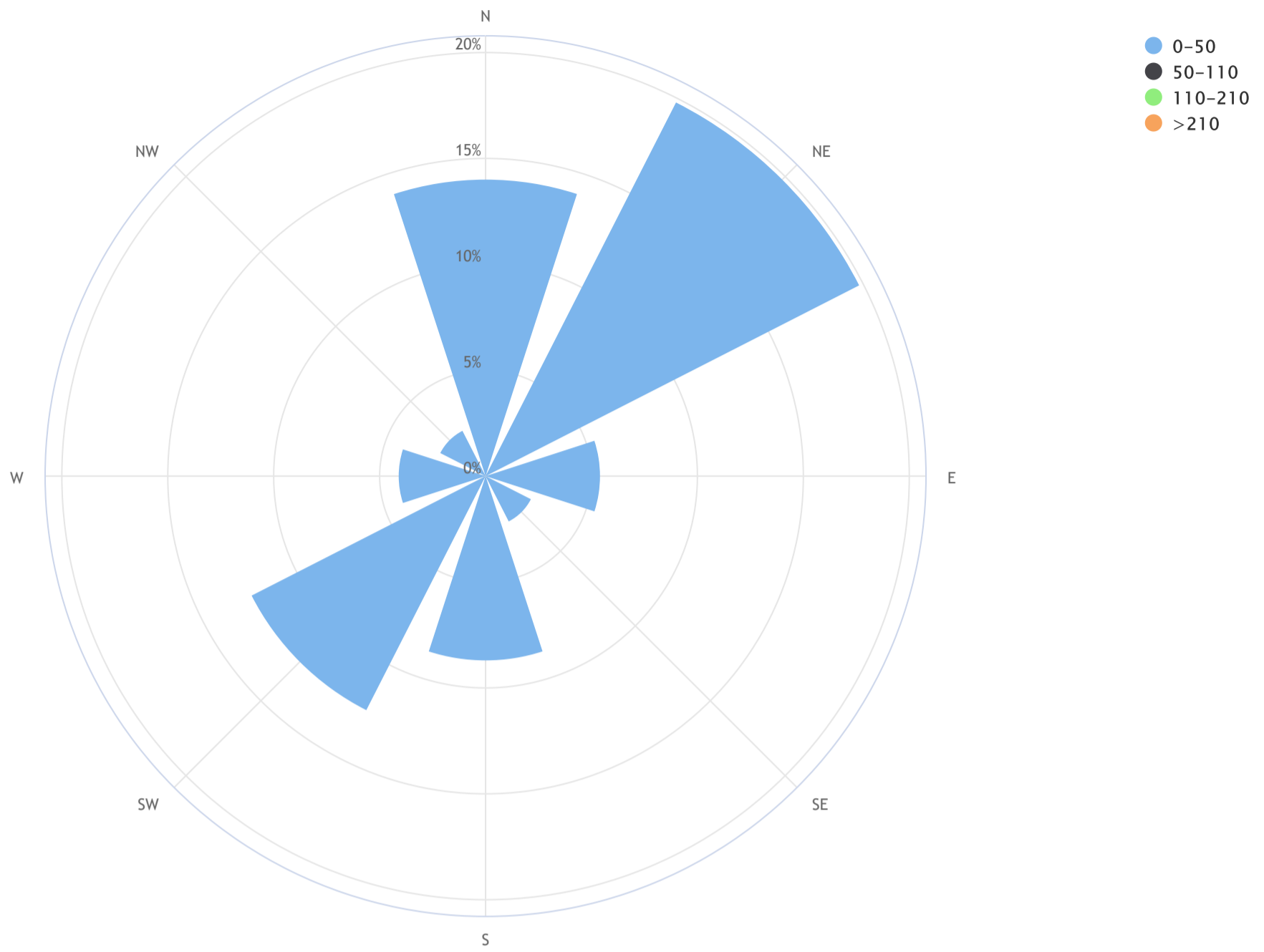
NOX[ppb] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 127 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO_x (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 8.8, CALM % = 30.9%



Direction	0-50	50-110	110-210	>210	TOTAL
N	14.0	0.0	0.0	0.0	14.0
NE	19.8	0.0	0.0	0.0	19.8
E	5.4	0.0	0.0	0.0	5.4
SE	2.4	0.0	0.0	0.0	2.4
S	8.7	0.0	0.0	0.0	8.7
SW	12.4	0.0	0.0	0.0	12.4
W	4.1	0.0	0.0	0.0	4.1
NW	2.4	0.0	0.0	0.0	2.4
Summary	69.1	0.0	0.0	0.0	69.1
CALM	30.9	0.0	0.0	0.0	30.9



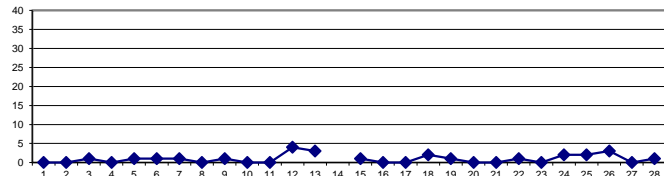
NITRIC OXIDE Hourly Averages (NO ppb)

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

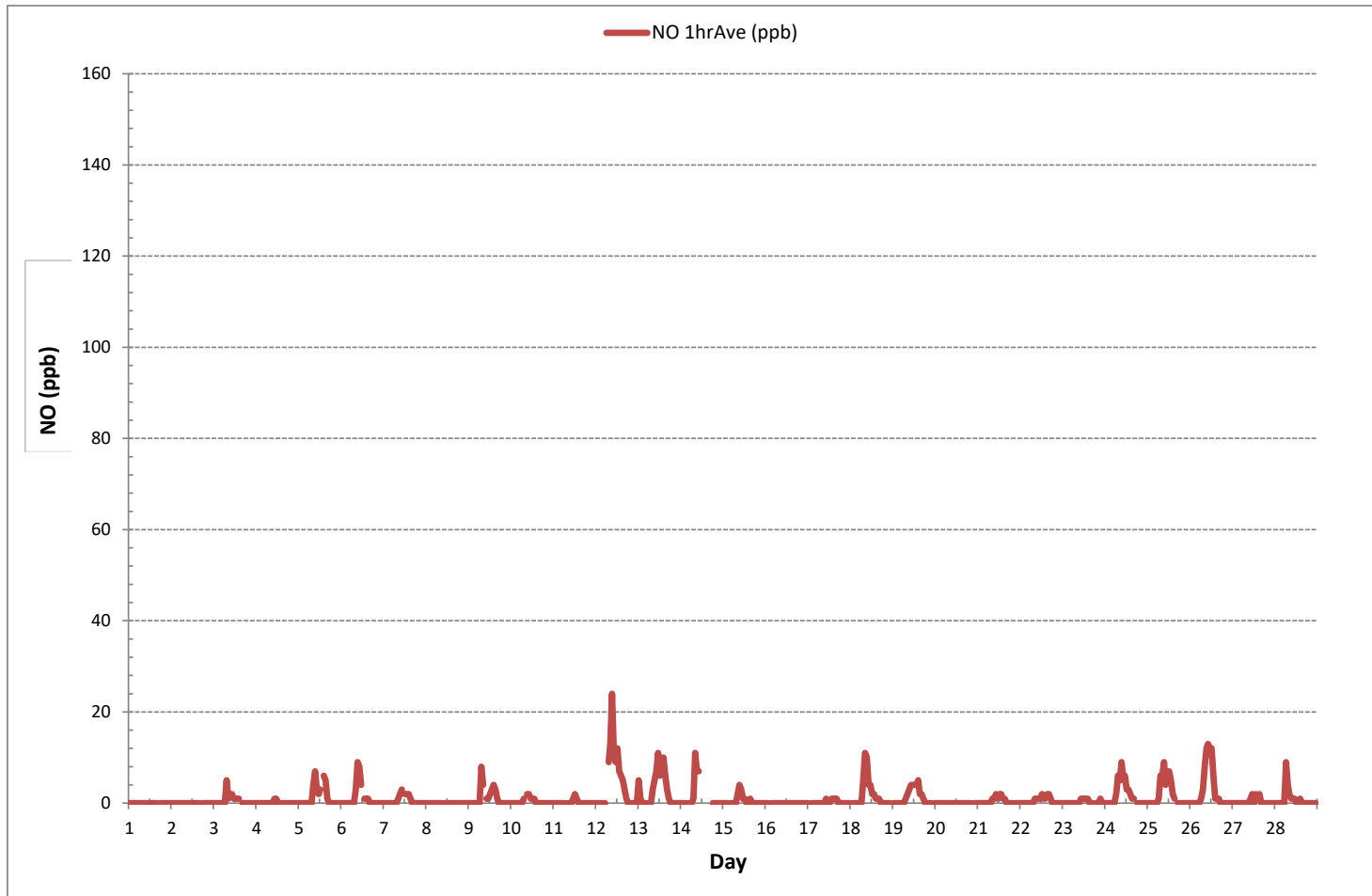
24 HR AVERAGES February 2019



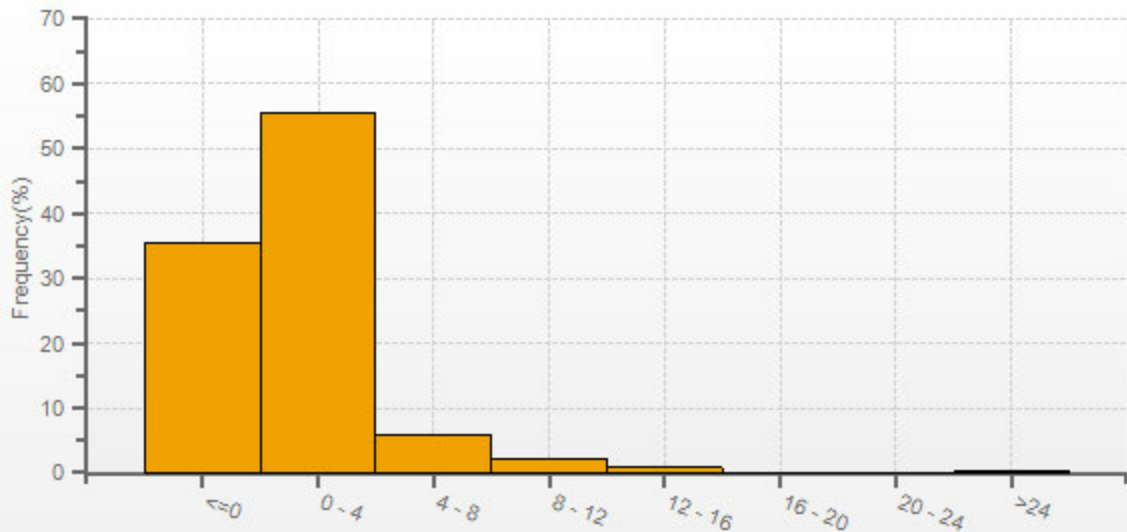
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	175				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	24	ppb @ HOUR	9	ON DAY	12
MAXIMUM 24-HR AVERAGE:	4	ppb		ON DAY	12
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	671	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	1	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



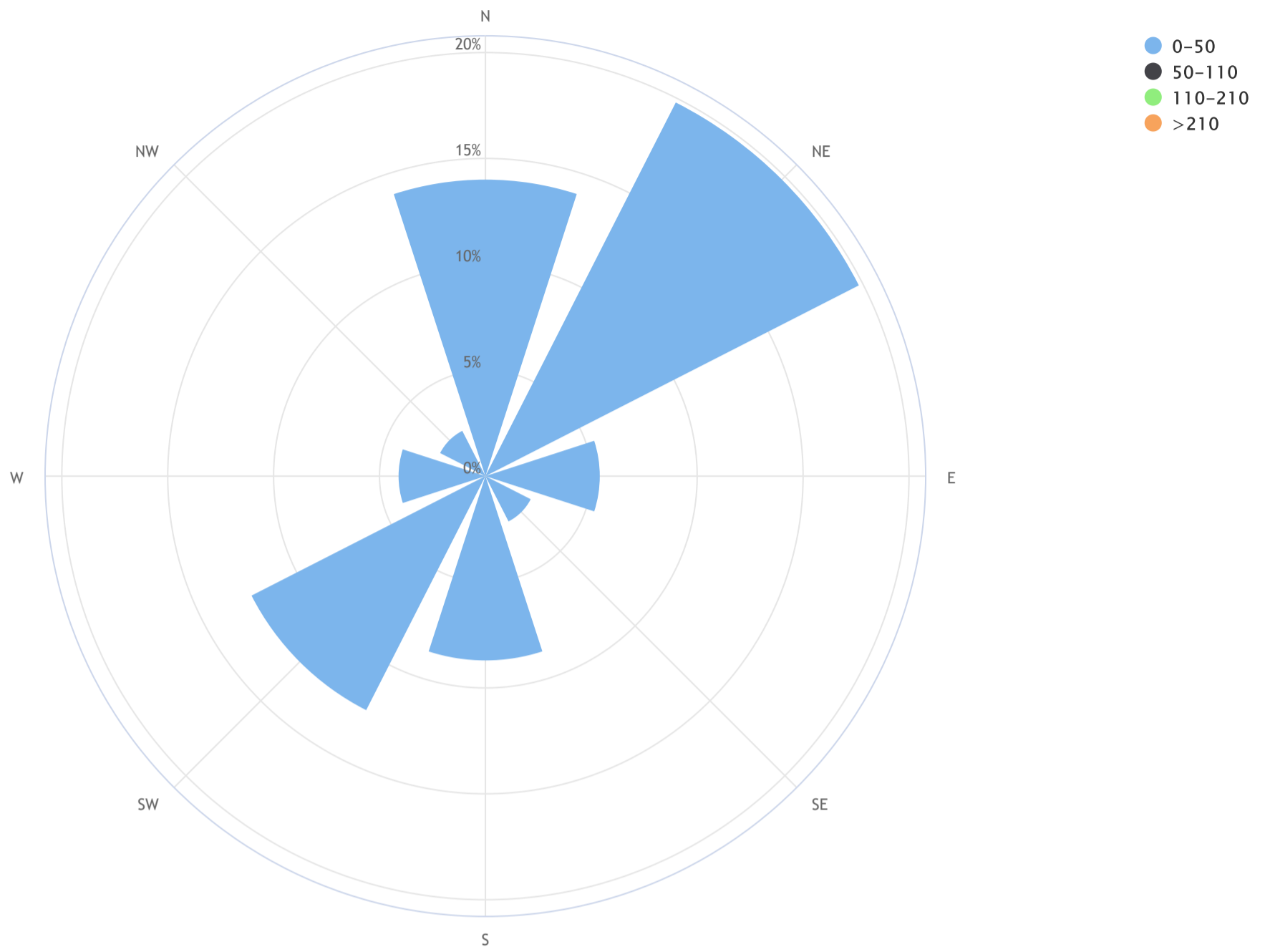
NO[ppb] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 131 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 1.3, CALM % = 30.9%



Direction	0-50	50-110	110-210	>210	TOTAL
N	14.0	0.0	0.0	0.0	14.0
NE	19.8	0.0	0.0	0.0	19.8
E	5.4	0.0	0.0	0.0	5.4
SE	2.4	0.0	0.0	0.0	2.4
S	8.7	0.0	0.0	0.0	8.7
SW	12.4	0.0	0.0	0.0	12.4
W	4.1	0.0	0.0	0.0	4.1
NW	2.4	0.0	0.0	0.0	2.4
Summary	69.1	0.0	0.0	0.0	69.1
CALM	30.9	0.0	0.0	0.0	30.9

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

STATUS FLAG CODES

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

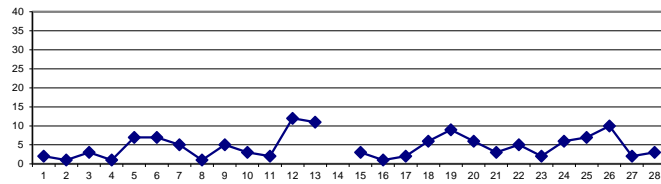
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

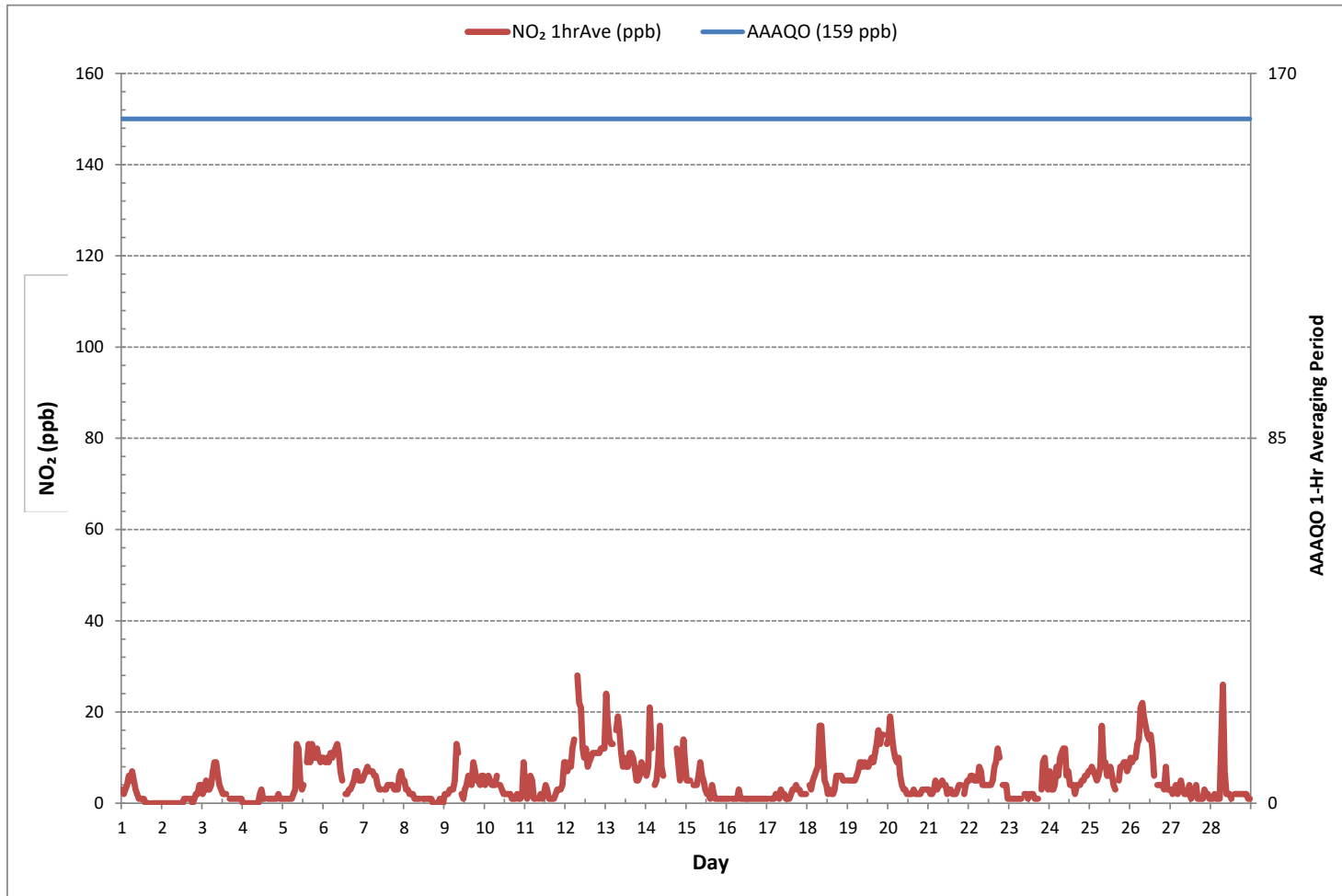
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	596					
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	14	ON DAY	1
MAXIMUM 1-HR AVERAGE:	28	ppb	@ HOUR	7	ON DAY	12
MAXIMUM 24-HR AVERAGE:	12	ppb			ON DAY	12
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	671	hrs	
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.9	%	
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	5	ppb	

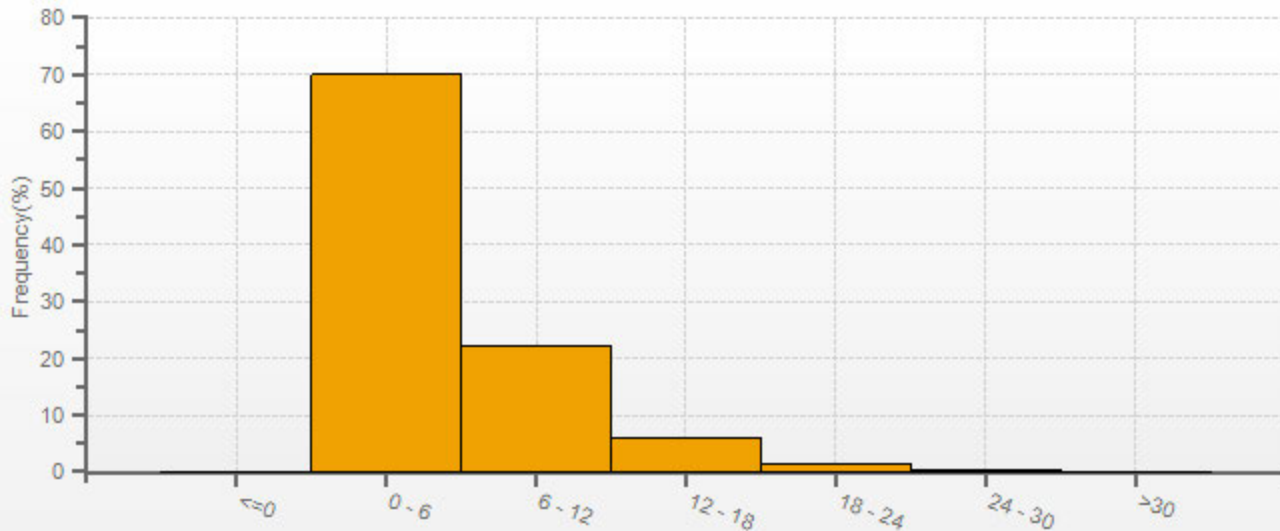
24 HR AVERAGES February 2019



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



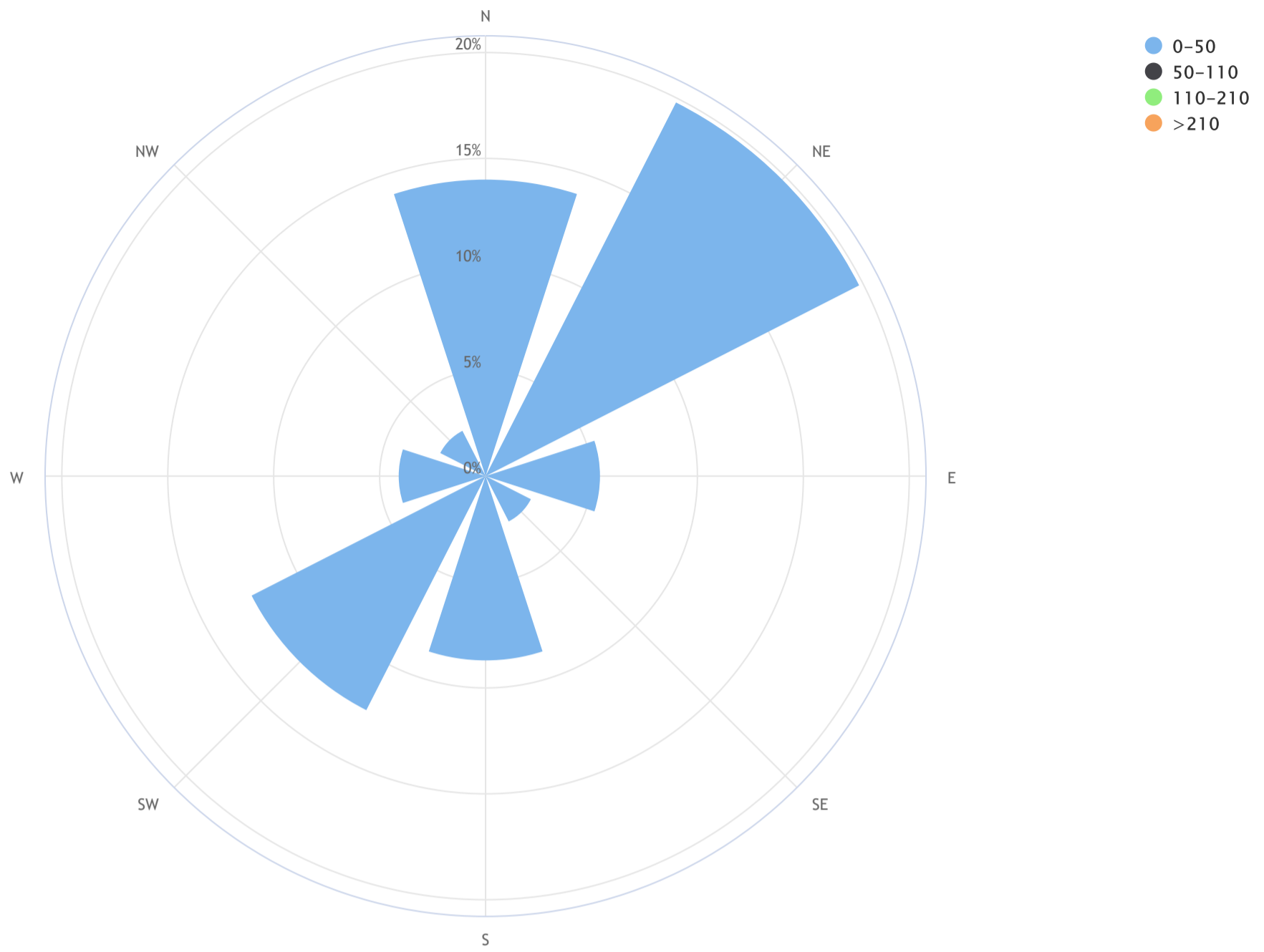
NO2[ppb] Histogram: LICA MASKWA Monthly: 19/02 1 Hr.



LICA-201902
Page 135 of 350

Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_NO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 7.5, CALM % = 30.9%



Direction	0-50	50-110	110-210	>210	TOTAL
N	14.0	0.0	0.0	0.0	14.0
NE	19.8	0.0	0.0	0.0	19.8
E	5.4	0.0	0.0	0.0	5.4
SE	2.4	0.0	0.0	0.0	2.4
S	8.7	0.0	0.0	0.0	8.7
SW	12.4	0.0	0.0	0.0	12.4
W	4.1	0.0	0.0	0.0	4.1
NW	2.4	0.0	0.0	0.0	2.4
Summary	69.1	0.0	0.0	0.0	69.1
CALM	30.9	0.0	0.0	0.0	30.9



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	12.1	12.5	9.6	8.0	9.8	8.9	9.3	8.5	11.2	11.7	11.0	9.6	5.8	5.8	6.9	6.4	6.8	8.1	7.2	6.8	6.3	7.4	7.6	7.6	5.8	12.5	8.2	24
2	7.6	7.0	6.7	6.6	7.4	7.6	6.5	7.2	9.7	8.3	8.3	8.7	8.3	8.8	7.9	6.1	5.8	4.0	1.4	1.1	1.4	1.3	1.9	2.1	1.1	9.7	5.4	24
3	1.4	1.6	0.8	2.3	1.5	1.3	1.3	1.5	1.4	1.3	1.9	1.6	2.6	0.9	1.3	4.1	3.0	3.1	4.8	2.3	2.8	0.6	4.0	4.6	0.6	4.8	1.9	24
4	5.5	4.2	3.0	3.2	3.9	3.4	3.4	3.3	3.2	3.3	2.5	2.1	2.7	3.2	4.2	4.3	3.6	1.8	1.4	0.7	0.6	0.0	0.4	0.2	0.0	5.5	2.4	24
5	0.3	0.3	0.5	0.4	0.2	0.1	0.2	0.2	0.1	0.1	0.0	1.2	1.5	1.1	1.6	0.7	5.6	4.4	2.3	1.2	1.2	0.5	0.6	1.5	0.0	5.6	0.6	24
6	0.9	0.9	0.2	0.2	0.4	0.2	0.4	0.1	0.1	0.2	0.2	0.4	2.9	5.0	4.5	3.6	3.7	1.9	2.1	1.4	0.3	0.3	0.3	0.4	0.1	5.0	1.2	24
7	0.3	0.1	0.2	0.2	0.9	1.0	0.3	0.5	0.9	1.6	0.8	4.0	4.5	4.6	5.1	4.8	3.0	2.6	2.4	2.6	3.2	3.1	1.9	2.7	0.1	5.1	1.6	24
8	1.9	1.7	2.7	3.1	3.4	3.9	1.9	3.0	3.8	4.8	6.3	6.6	5.6	6.2	6.7	7.4	5.6	3.3	6.0	5.6	7.5	8.8	7.3	5.1	1.7	8.8	4.8	24
9	2.4	3.2	1.1	1.5	0.4	0.5	0.3	0.5	0.7	4.1	3.1	1.2	2.2	5.0	5.4	6.2	4.8	2.5	3.2	3.3	3.4	1.2	0.3	1.2	0.3	6.2	0.9	24
10	4.6	3.8	1.2	0.1	0.5	0.1	0.1	0.2	0.6	3.4	4.4	6.5	6.5	6.0	4.8	4.0	4.7	4.3	5.0	4.7	5.0	3.9	4.2	4.2	0.1	6.5	2.7	24
11	5.3	5.2	4.4	4.0	3.3	4.7	3.7	2.7	3.2	3.3	4.0	3.3	1.8	2.5	6.0	4.8	3.8	0.8	0.5	2.1	1.2	0.8	0.6	0.1	0.1	6.0	2.4	24
12	0.6	1.7	0.3	0.3	0.7	0.6	0.4	0.4	0.1	1.2	2.5	1.0	2.0	2.6	1.7	4.4	7.2	3.3	1.7	1.0	0.7	0.5	0.3	0.4	0.1	7.2	1.4	24
13	0.9	0.9	0.3	0.3	0.8	1.4	0.2	0.5	0.1	0.3	0.4	1.9	1.4	5.3	7.0	6.8	4.2	3.9	4.1	3.7	1.2	0.9	0.2	0.4	0.1	7.0	1.9	24
14	0.0	0.4	0.0	0.5	0.2	0.2	0.2	0.3	0.5	1.0	1.6	5.2	5.0	2.7	4.2	3.8	2.9	2.1	2.1	0.1	0.3	2.1	0.9	1.0	0.0	5.2	1.1	24
15	0.7	0.6	1.2	1.2	2.0	0.6	0.5	2.8	2.8	3.8	4.5	7.1	6.3	7.5	6.2	4.3	4.3	5.2	3.5	3.8	3.1	4.0	3.1	4.0	0.5	7.5	3.3	24
16	5.5	5.4	5.5	5.9	5.3	4.5	5.4	4.5	8.3	8.4	7.7	8.4	10.3	8.4	10.1	12.8	10.4	7.2	5.7	10.5	11.3	8.4	7.7	8.6	4.5	12.8	7.7	24
17	7.9	6.1	5.4	6.3	3.2	5.8	6.2	6.6	6.7	8.5	8.4	5.9	5.9	4.0	5.4	4.6	2.8	5.3	5.5	3.8	3.1	3.3	1.3	0.7	0.7	8.5	5.0	24
18	1.0	0.3	0.5	1.2	0.7	0.4	1.4	0.1	0.4	2.8	6.7	8.2	10.9	10.1	12.2	14.2	10.3	8.8	9.2	9.5	6.2	7.7	6.9	5.0	0.1	14.2	5.4	24
19	4.1	7.0	6.1	5.6	5.6	5.7	4.5	4.1	4.7	4.5	5.1	6.2	6.1	5.2	4.9	5.1	3.5	1.8	0.7	1.3	1.5	2.5	0.3	0.4	0.3	7.0	3.9	24
20	0.8	0.6	0.5	0.8	0.3	0.2	0.7	3.8	7.4	7.2	8.0	8.9	10.7	7.5	10.8	11.0	9.3	8.8	7.2	5.3	6.0	5.7	4.1	4.4	0.2	11.0	5.0	24
21	4.2	3.3	1.3	1.1	1.2	2.7	0.6	1.1	0.3	0.6	3.3	5.1	5.6	5.2	5.8	8.8	8.2	5.8	4.2	6.0	6.2	4.6	4.4	4.4	0.3	8.8	2.5	24
22	5.0	4.7	2.6	1.2	3.1	2.5	2.6	2.1	0.5	7.2	6.8	6.2	4.4	4.7	2.9	0.8	0.7	0.5	4.9	9.6	14.1	11.1	10.1	10.3	0.5	14.1	0.8	24
23	7.1	11.1	8.2	6.9	6.6	6.5	10.6	10.1	P	8.3	9.2	9.6	8.3	7.9	8.2	7.9	7.6	5.5	4.3	2.4	2.9	2.9	2.4	1.8	1.8	11.1	6.6	23
24	1.7	1.0	0.8	0.7	0.9	0.3	0.7	0.6	0.5	1.9	4.0	4.3	3.1	3.8	4.1	3.9	6.2	6.1	5.5	4.6	4.1	2.9	2.9	2.9	0.3	6.2	2.2	24
25	3.2	4.2	3.1	2.4	3.0	3.0	3.1	1.9	2.3	1.9	4.0	7.1	9.1	10.3	9.6	8.9	10.0	7.2	7.1	5.8	5.9	6.5	6.9	3.9	1.9	10.3	5.3	24
26	3.6	4.1	6.2	3.8	3.5	3.7	5.3	7.8	5.3	4.9	6.9	8.2	8.4	6.7	6.3	6.2	9.4	9.2	7.3	6.0	5.9	7.0	6.2	6.5	3.5	9.4	5.1	24
27	6.6	5.6	7.2	5.8	5.2	4.5	3.8	4.9	9.0	9.3	8.2	9.1	8.7	10.0	9.0	7.5	7.5	6.7	4.5	3.0	2.7	4.9	1.5	3.4	1.5	10.0	4.9	24
28	0.7	1.9	0.8	0.1	0.0	0.2	0.5	1.2	2.2	7.6	4.8	4.7	4.5	4.5	6.6	7.9	11.5	11.1	9.8	6.7	5.1	5.2	6.9	6.2	0.0	11.5	4.5	24
HOURLY MAX	12.1	12.5	9.6	8.0	9.8	8.9	10.6	10.1	11.2	11.7	11.0	9.6	10.9	10.3	12.2	14.2	11.5	11.1	9.8	10.5	14.1	11.1	10.1	10.3				

STATUS FLAG CODES

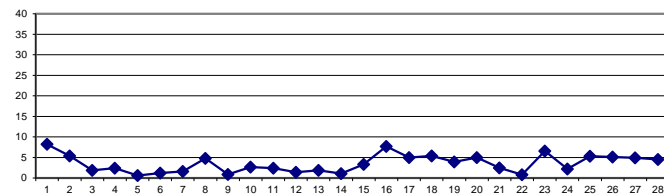
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

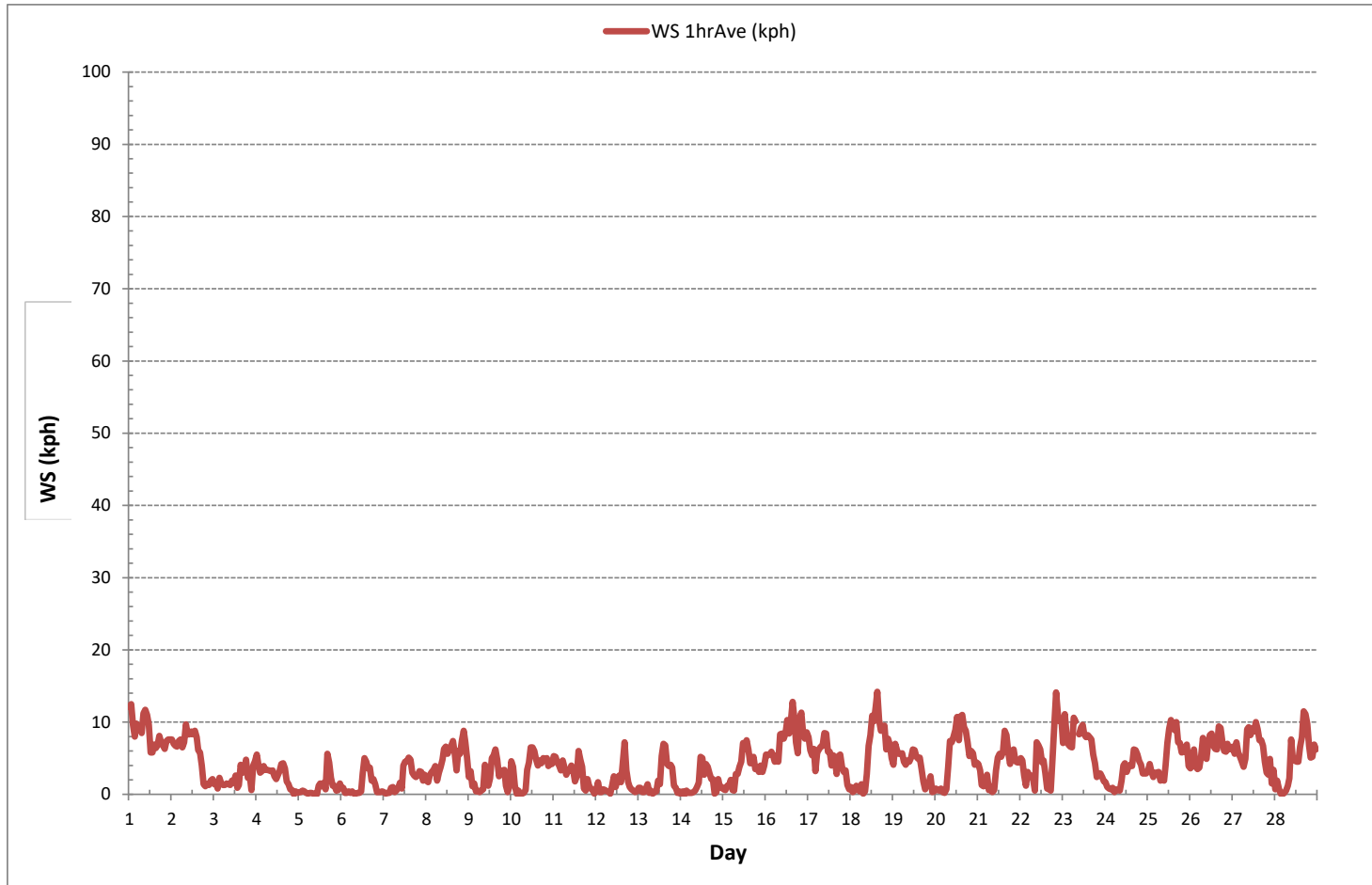
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	666
MINIMUM 1-HR AVERAGE	0.0 kph @ HOUR 21 ON DAY 4
MAXIMUM 1-HR AVERAGE:	14.2 kph @ HOUR 15 ON DAY 18
MAXIMUM 24-HR AVERAGE:	8.2 kph ON DAY 1
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	671 hrs
AMSD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	3.1
MONTHLY AVERAGE:	1.0 kph

24 HR AVERAGES February 2019

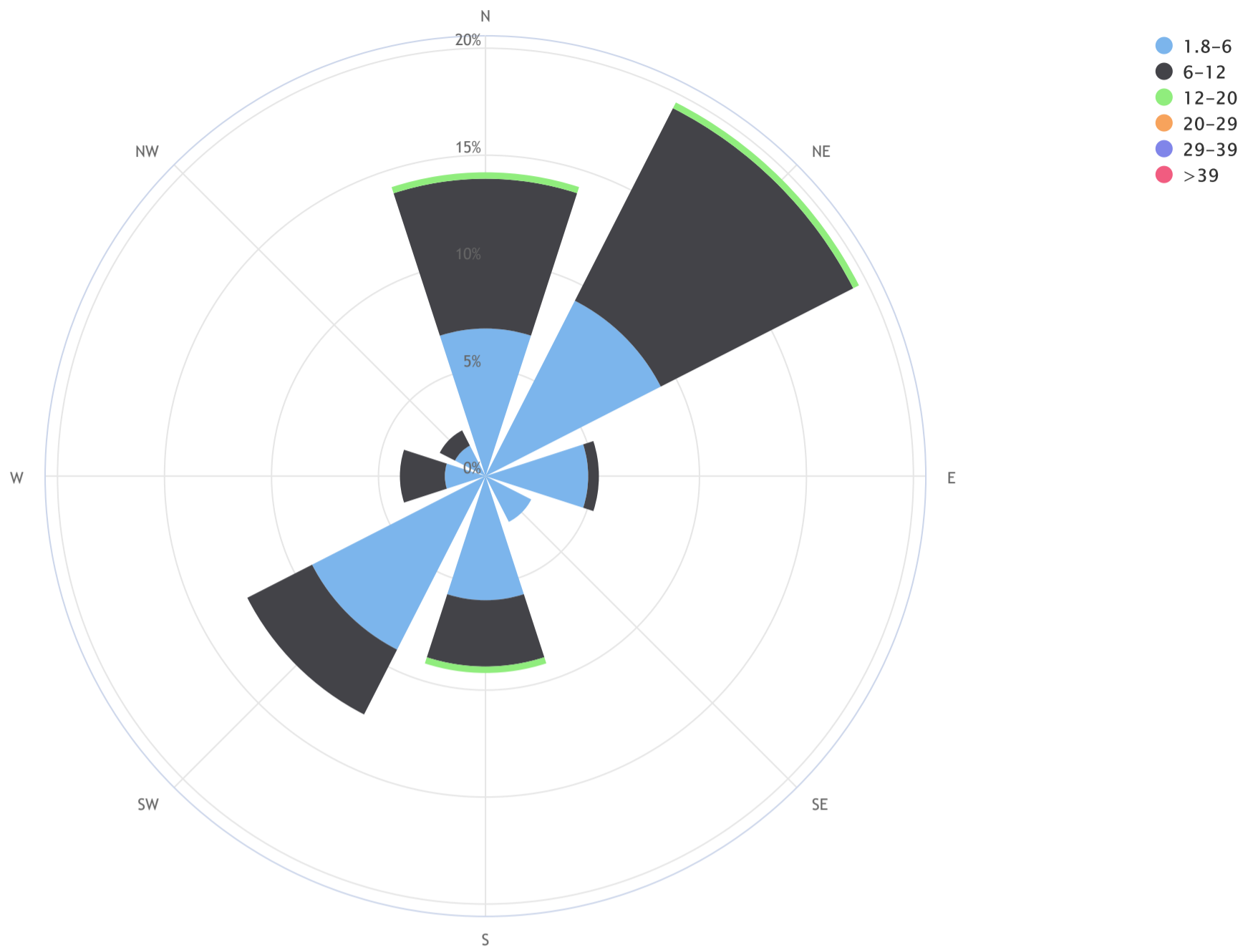


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association_Maskwa Continuous Monitoring Station_19/02

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 0.7_CALM % = 30.4%



Direction	1.8-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	6.9	7.0	0.3	0.0	0.0	0.0	14.2
NE	9.2	10.1	0.3	0.0	0.0	0.0	19.7
E	4.8	0.5	0.0	0.0	0.0	0.0	5.2
SE	2.4	0.0	0.0	0.0	0.0	0.0	2.4
S	5.8	3.1	0.3	0.0	0.0	0.0	9.2
SW	9.1	3.4	0.0	0.0	0.0	0.0	12.5
W	1.9	2.1	0.0	0.0	0.0	0.0	4.0
NW	1.6	0.8	0.0	0.0	0.0	0.0	2.4
Summary	41.7	27.0	0.9	0.0	0.0	0.0	69.6
CALM	30.4	0.0	0.0	0.0	0.0	0.0	30.4



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

WIND DIRECTION Hourly Averages (WD)

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

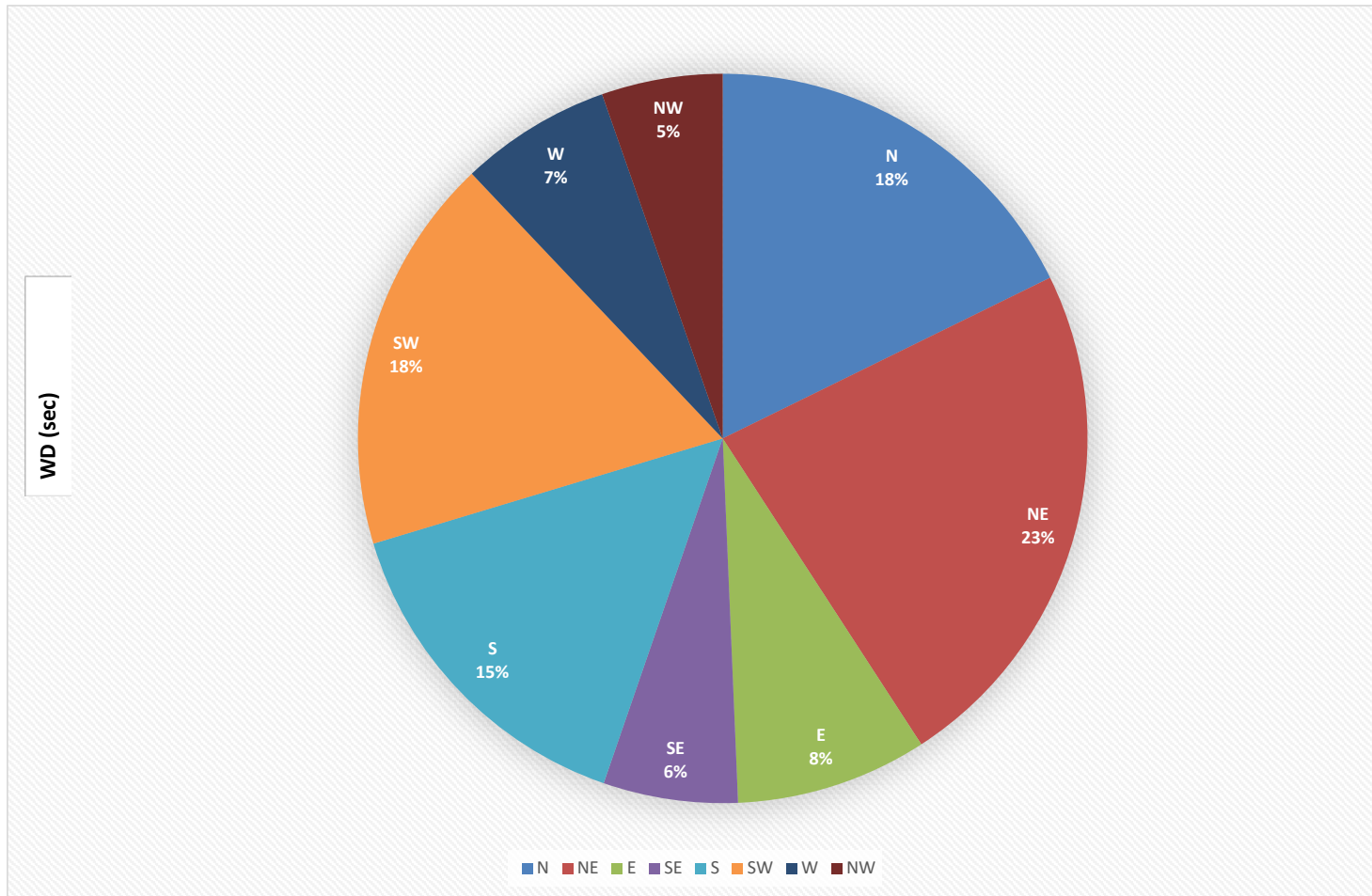
STATUS FLAG CODES

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:	671	hrs
STANDARD DEVIATION:	106		AMD OPERATION UPTIME:	99.9	%
			MONTHLY AVERAGE:	24	(NNE)

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA MASKWA Monthly: 19/02 Type: AVG 1 Hr. [1 Hr.]

WDR[degwdr]



LICA-201902

Page 142 of 350



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

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	6	5	5	7	7	7	5	9	8	6	6	8	14	24	16	14	13	9	12	12	12	10	10	10	24
2	11	10	9	10	11	13	10	11	10	11	15	9	8	6	10	16	11	11	46	17	24	27	11	21	24
3	29	46	61	14	20	37	29	18	22	16	21	29	34	66	43	15	11	10	7	8	7	18	7	13	24
4	10	25	19	17	12	11	16	15	16	28	34	38	29	25	21	23	21	24	24	27	32	66	28	18	24
5	38	52	36	29	54	58	38	36	31	43	63	22	45	61	50	50	5	8	7	9	11	30	15	8	24
6	10	23	33	47	49	49	41	46	63	54	26	49	27	16	25	17	10	13	26	18	20	46	61	60	24
7	62	64	30	28	19	14	45	39	31	35	61	26	27	29	16	14	15	13	18	15	34	15	21	14	24
8	24	16	26	11	13	13	16	17	13	16	17	16	17	25	9	9	7	10	8	9	8	7	7	7	24
9	6	5	8	10	27	32	55	48	47	4	13	49	29	17	16	12	9	12	12	12	9	11	46	20	24
10	6	13	43	67	16	42	62	40	20	5	5	6	10	24	19	17	13	13	11	13	10	14	9	15	24
11	13	10	16	13	15	11	15	19	18	18	19	38	51	47	12	21	20	24	36	8	7	17	25	38	24
12	50	18	73	71	56	49	50	39	74	50	18	48	49	32	49	37	9	16	23	13	25	26	29	41	24
13	30	13	48	30	27	15	48	29	62	45	56	19	55	17	10	11	14	7	6	7	20	22	43	27	24
14	63	25	77	27	51	41	41	56	26	15	28	23	15	28	17	19	23	19	10	72	35	9	17	27	24
15	17	41	20	18	13	44	37	17	11	3	14	11	17	13	24	23	18	10	11	15	13	4	15	11	24
16	7	9	9	6	9	12	7	6	4	7	10	16	12	12	8	6	8	8	8	5	5	5	9	6	24
17	7	8	10	4	11	6	7	6	7	7	8	20	16	34	20	19	25	7	6	7	9	10	23	24	24
18	18	51	56	34	59	66	20	77	28	25	9	9	8	9	8	7	8	6	8	5	7	6	11	12	24
19	14	7	8	13	9	10	11	13	10	9	13	9	11	11	12	14	13	19	55	36	18	12	35	20	24
20	18	27	33	30	63	68	54	12	9	10	13	12	8	15	9	8	7	7	7	9	9	9	12	11	24
21	13	14	23	14	23	14	20	41	68	67	27	26	20	25	17	11	9	11	8	7	7	9	8	10	24
22	11	8	18	44	9	13	23	18	67	14	10	13	25	15	22	48	29	37	17	5	6	7	7	7	24
23	9	8	6	9	11	8	7	7	P	13	12	16	19	16	18	15	11	18	12	23	16	18	19	15	23
24	14	28	22	20	17	17	36	21	29	16	16	26	43	28	27	39	10	7	4	4	7	7	7	8	24
25	6	6	6	12	15	16	10	15	14	20	11	10	10	6	10	6	6	8	6	9	6	5	10	16	24
26	17	9	8	15	12	10	6	5	5	9	6	6	7	11	17	15	7	7	7	6	6	5	7	7	24
27	7	7	6	8	11	13	13	10	8	7	9	19	14	19	18	20	17	15	13	14	23	9	30	15	24
28	48	19	21	69	77	61	40	40	26	11	30	34	28	33	21	12	7	8	6	6	6	6	7	7	24

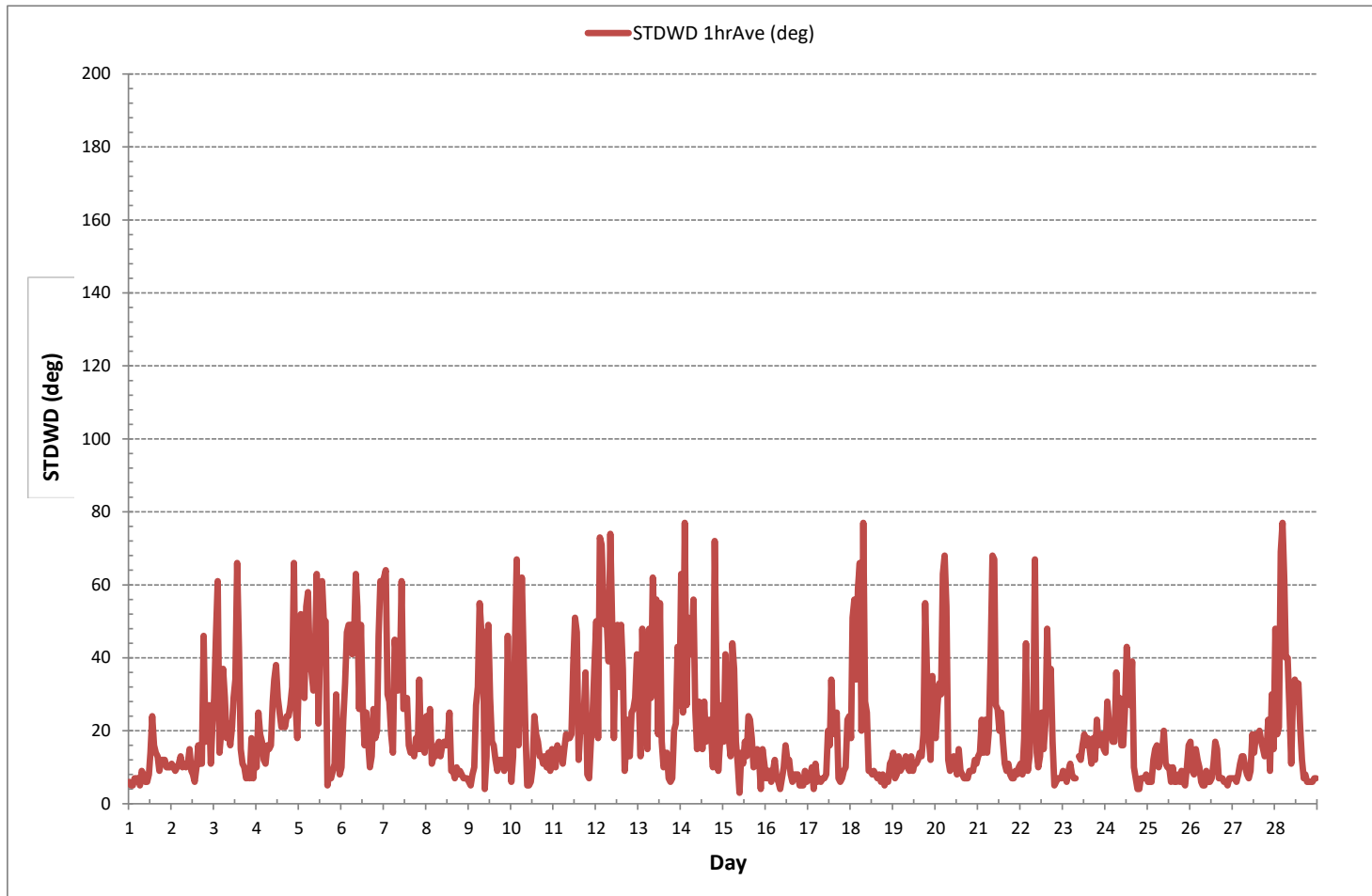
STATUS FLAG CODES

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: 671 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY Hourly Averages (RH %)

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

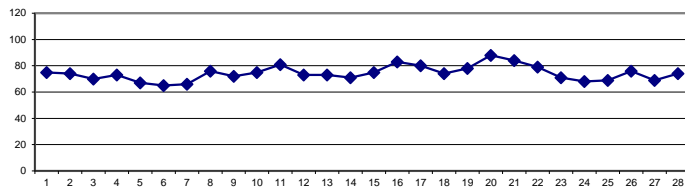
STATUS FLAG CODES

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

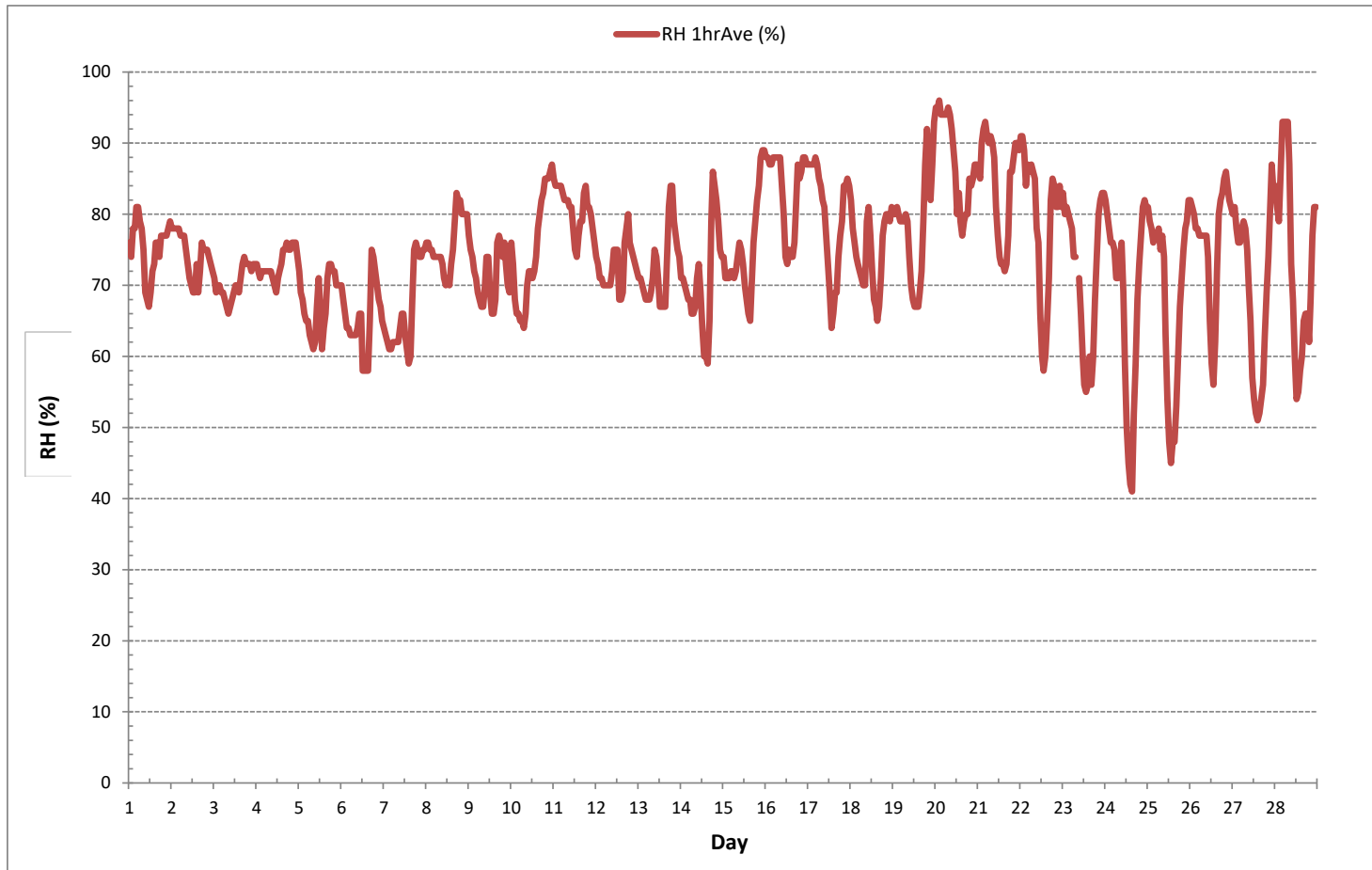
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	41	%	@ HOUR	15	ON DAY	24
MAXIMUM 1-HR AVERAGE:	96	%	@ HOUR	2	ON DAY	20
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	20
OPERATIONAL TIME:						671 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	9					MONTHLY AVERAGE: 74 %

24 HR AVERAGES February 2019



RELATIVE HUMIDITY Hourly Averages (RH %)





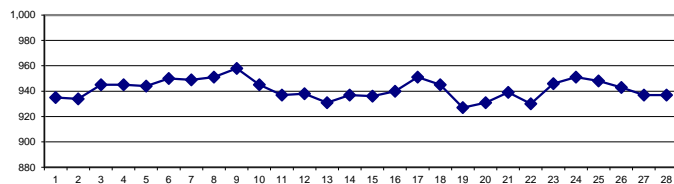
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	932	933	933	934	935	935	935	935	936	936	937	937	937	937	936	936	936	936	936	935	935	934	934	934	934	932	937	935	24				
2	933	933	932	932	932	932	932	931	931	932	932	933	933	933	934	935	936	937	938	939	939	940	941	941	941	931	941	934	24				
3	941	942	942	942	943	944	944	945	946	946	945	945	944	944	944	945	945	946	946	946	947	947	947	947	947	941	947	945	24				
4	947	947	947	946	946	946	946	946	946	946	945	945	944	944	943	943	943	943	943	943	942	942	942	942	942	942	942	945	24				
5	943	943	944	944	944	944	944	945	946	946	944	943	943	942	942	943	944	945	946	946	947	947	947	947	948	942	948	944	24				
6	948	949	949	950	950	950	951	951	952	951	950	949	949	949	949	949	950	950	951	952	952	953	953	953	948	953	950	24					
7	953	954	954	953	953	953	952	952	952	951	949	948	948	947	946	946	946	946	947	947	947	946	946	946	946	946	954	949	24				
8	946	946	947	947	947	947	948	949	949	950	950	950	951	951	952	952	953	954	955	956	956	957	958	958	946	958	951	24					
9	959	960	960	961	961	961	962	962	962	961	960	959	958	957	956	956	955	955	955	954	953	953	953	953	953	953	962	958	24				
10	952	950	951	950	950	950	949	949	949	947	946	945	944	943	942	941	941	940	940	939	939	939	938	938	938	938	952	945	24				
11	937	937	937	936	936	935	935	935	936	935	935	935	935	935	936	936	937	937	938	938	939	939	939	939	939	935	939	937	24				
12	939	940	940	940	940	940	940	940	940	940	939	938	938	937	936	936	936	936	936	936	936	936	935	934	934	934	940	938	24				
13	934	934	934	933	933	933	932	932	931	930	929	929	929	928	928	928	928	929	930	930	931	932	932	933	928	934	931	24					
14	934	935	935	935	936	937	937	938	938	938	937	937	937	937	937	936	937	937	937	937	937	937	937	937	938	934	938	937	24				
15	938	938	938	938	938	937	938	938	937	937	936	936	936	935	935	935	935	935	935	935	935	935	935	935	935	935	938	936	24				
16	935	935	936	936	936	937	937	937	938	939	939	940	940	940	941	942	942	943	944	944	945	946	946	946	935	946	940	24					
17	947	947	947	948	949	949	950	951	951	951	951	951	951	951	951	951	952	952	952	952	953	953	953	947	953	951	24						
18	953	953	953	952	951	951	951	951	950	948	947	946	945	944	944	942	941	940	938	937	936	935	934	934	934	953	945	24					
19	932	931	931	930	929	928	928	927	927	927	926	926	925	925	925	924	924	924	924	924	924	924	924	924	924	924	932	927	24				
20	924	925	925	925	926	926	927	927	928	929	930	931	931	932	933	934	935	936	937	938	938	939	940	940	940	924	940	931	24				
21	941	941	941	942	942	942	942	942	942	942	941	941	941	940	939	938	938	937	937	936	935	934	934	933	933	942	939	24					
22	932	931	930	930	929	929	928	928	928	927	928	928	928	928	928	929	929	930	931	932	933	933	934	936	927	936	930	24					
23	937	938	939	940	941	942	943	944	P	946	946	947	947	947	947	948	948	949	949	950	951	951	951	952	937	952	946	23					
24	952	953	953	953	954	954	954	954	953	952	952	951	950	950	949	949	948	948	948	948	948	948	948	949	948	948	954	951	24				
25	949	949	949	949	949	949	949	949	949	948	948	948	948	947	947	947	946	946	946	946	946	946	946	946	946	949	948	24					
26	946	946	946	946	946	946	945	945	944	944	943	943	942	941	941	940	940	940	940	940	940	941	941	940	940	940	946	943	24				
27	940	939	939	939	938	937	937	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	940	937	24					
28	937	937	937	937	936	936	936	936	936	936	936	936	936	935	935	935	936	937	937	938	939	940	941	942	935	942	937	24					
HOURLY MAX	959	960	960	961	961	961	962	962	962	961	960	959	958	957	956	956	955	955	955	956	956	957	958	958									
HOURLY AVG	941	942	942	942	942	942	942	942	942	942	941	941	941	941	940	940	941	941	941	941	941	941	942	942									

STATUS FLAG CODES

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

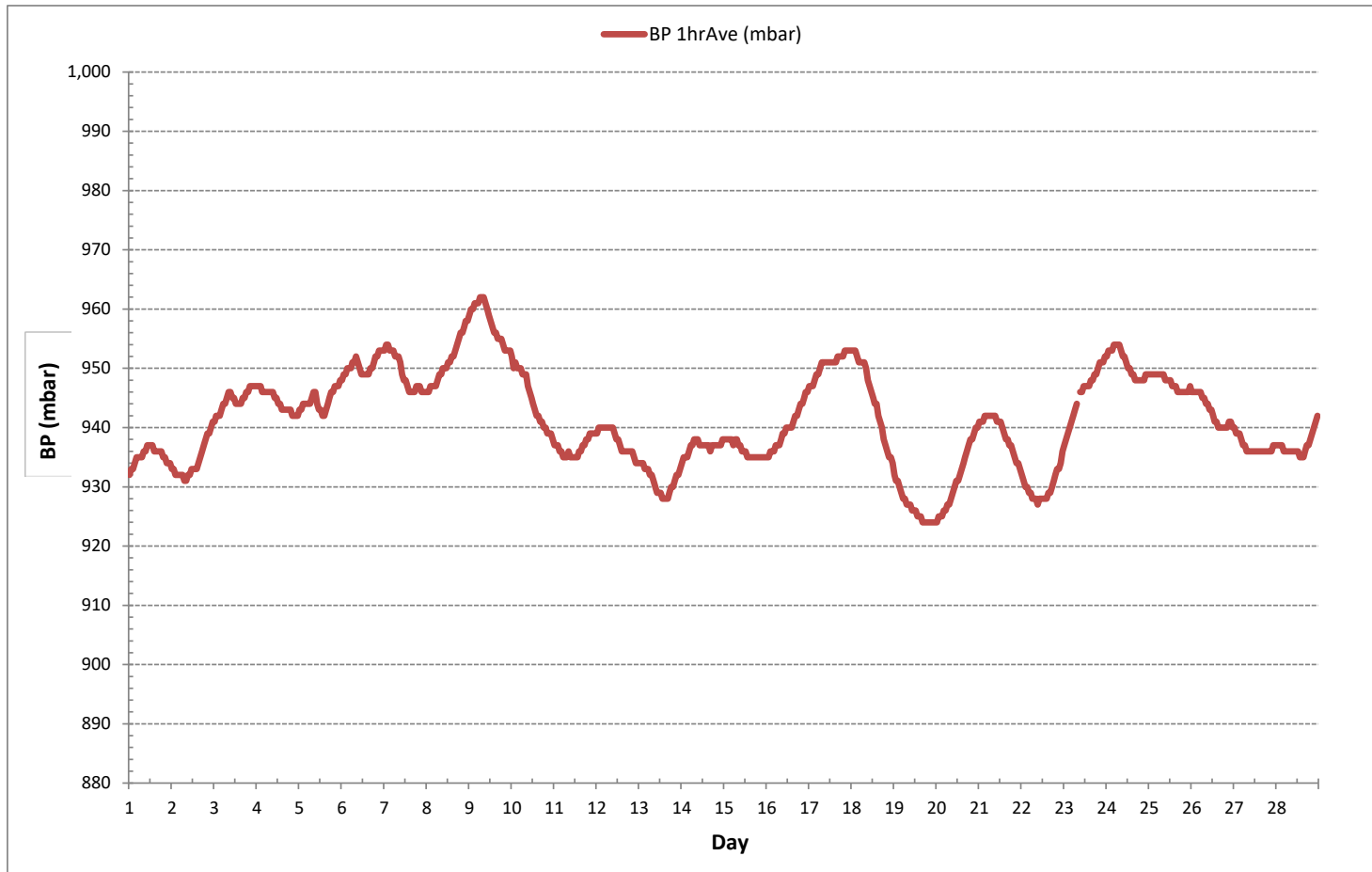
24 HR AVERAGES February 2019



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	924	mbar	@ HOUR	16	ON DAY	19
MAXIMUM 1-HR AVERAGE:	962	mbar	@ HOUR	6	ON DAY	9
MAXIMUM 24-HR AVERAGE:	958	mbar			ON DAY	9
OPERATIONAL TIME:						671 hrs
AMD OPERATION UPTIME:						99.9 %
STANDARD DEVIATION:	8					MONTHLY AVERAGE: 941 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



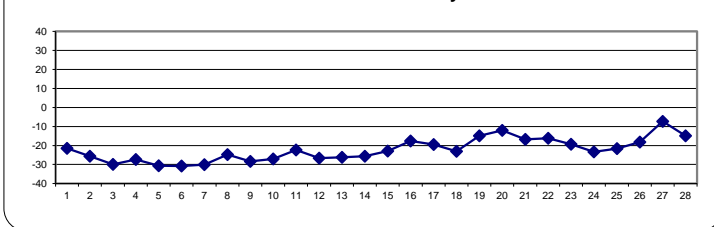
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	-18.9	-19.1	-19.2	-19.4	-19.8	-20.1	-20.4	-20.6	-20.9	-21.5	-22.0	-22.1	-21.8	-21.5	-21.7	-22.1	-22.5	-22.8	-23.0	-23.1	-23.4	-23.7	-24.0	-24.0	-24.0	-18.9	-21.5	24	
2	-24.3	-24.6	-24.8	-25.0	-25.1	-25.1	-25.3	-25.4	-25.3	-24.8	-24.7	-24.5	-24.3	-24.1	-23.9	-24.1	-25.5	-27.3	-27.6	-28.1	-28.7	-29.7	-29.9	-29.9	-29.9	-29.9	-23.9	-25.7	24
3	-30.5	-32.5	-32.1	-31.5	-32.2	-33.3	-34.0	-34.6	-34.6	-33.8	-31.5	-29.7	-28.0	-26.7	-25.9	-25.4	-25.4	-26.0	-26.6	-27.5	-28.2	-28.8	-29.3	-28.9	-34.6	-25.4	-29.9	24	
4	-28.9	-28.9	-28.8	-28.8	-28.8	-28.7	-28.6	-28.8	-28.7	-28.1	-27.2	-26.5	-26.0	-25.7	-25.5	-25.6	-25.8	-26.3	-26.6	-26.7	-26.6	-26.6	-26.5	-26.9	-28.2	-28.9	-25.5	-27.4	24
5	-30.5	-32.5	-33.8	-35.1	-36.1	-35.4	-37.0	-37.8	-38.1	-36.5	-29.6	-25.9	-24.1	-22.9	-22.6	-22.4	-24.4	-26.7	-28.8	-30.2	-31.0	-31.5	-31.1	-31.6	-38.1	-22.4	-30.7	24	
6	-31.9	-32.8	-34.5	-35.6	-36.4	-36.9	-36.9	-37.2	-37.2	-34.8	-29.0	-24.5	-22.3	-21.8	-21.5	-21.4	-22.9	-26.3	-29.0	-30.6	-32.5	-33.8	-34.7	-35.8	-37.2	-21.4	-30.8	24	
7	-36.5	-37.3	-38.0	-38.6	-38.6	-38.1	-37.6	-37.9	-37.9	-34.3	-28.8	-23.8	-22.9	-21.9	-21.1	-21.0	-22.7	-25.2	-26.8	-27.6	-27.1	-25.8	-25.8	-26.3	-38.6	-21.0	-30.1	24	
8	-26.5	-26.7	-27.0	-27.7	-27.6	-27.8	-28.3	-27.9	-27.4	-26.7	-25.9	-25.1	-23.9	-22.3	-21.9	-21.7	-21.3	-21.7	-21.9	-22.3	-22.6	-23.0	-23.4	-24.6	-28.3	-21.3	-24.8	24	
9	-26.8	-28.1	-29.0	-30.1	-31.2	-32.5	-33.5	-34.2	-34.3	-31.2	-27.6	-25.2	-22.3	-21.8	-21.7	-21.8	-23.2	-25.7	-28.2	-29.3	-28.1	-30.0	-32.1	-32.9	-34.3	-21.7	-28.4	24	
10	-28.4	-29.1	-33.8	-34.4	-35.1	-35.4	-35.6	-35.9	-34.9	-31.7	-27.4	-25.1	-23.9	-22.3	-22.2	-22.0	-21.9	-21.9	-21.7	-21.3	-21.2	-21.4	-21.0	-21.0	-35.9	-21.0	-27.0	24	
11	-21.1	-21.4	-21.4	-21.7	-21.9	-22.5	-22.8	-23.1	-22.9	-22.2	-20.7	-20.0	-19.6	-19.8	-20.1	-20.2	-20.7	-22.7	-24.5	-24.6	-25.8	-26.3	-27.3	-27.3	-27.3	-19.6	-22.3	24	
12	-28.7	-29.6	-30.7	-31.2	-31.8	-31.7	-31.4	-31.3	-31.4	-29.0	-24.9	-21.7	-19.8	-18.7	-17.7	-18.1	-20.5	-23.3	-25.6	-27.6	-28.8	-28.7	-28.9	-29.5	-31.8	-17.7	-26.7	24	
13	-30.8	-31.3	-31.9	-32.5	-32.9	-32.8	-32.9	-33.0	-30.6	-27.2	-23.2	-19.7	-17.7	-17.5	-17.8	-17.9	-19.1	-21.0	-22.7	-23.7	-26.0	-27.3	-28.5	-29.3	-33.0	-17.5	-26.2	24	
14	-30.3	-30.9	-31.5	-32.7	-33.0	-33.6	-34.1	-34.3	-33.4	-29.2	-24.1	-19.4	-17.5	-15.4	-14.9	-14.6	-15.5	-18.3	-21.5	-23.7	-25.0	-26.2	-27.6	-28.8	-34.3	-14.6	-25.6	24	
15	-29.0	-30.2	-30.9	-31.2	-31.1	-30.6	-30.8	-30.9	-29.0	-25.8	-22.5	-19.8	-18.7	-17.1	-15.6	-14.5	-15.2	-16.4	-17.4	-17.6	-18.1	-19.0	-19.3	-19.3	-31.2	-14.5	-22.9	24	
16	-18.8	-18.8	-19.0	-19.4	-19.9	-19.8	-19.9	-20.2	-20.1	-19.5	-18.3	-15.8	-14.8	-14.7	-14.1	-14.0	-14.3	-15.3	-16.8	-16.8	-17.3	-18.2	-18.6	-18.9	-20.2	-14.0	-17.6	24	
17	-18.8	-19.2	-19.4	-19.6	-20.6	-20.6	-20.5	-20.4	-20.5	-20.1	-19.6	-19.0	-18.5	-17.5	-17.8	-17.9	-18.4	-19.2	-19.8	-20.0	-20.2	-20.7	-23.1	-23.1	-23.1	-17.5	-19.5	24	
18	-24.9	-26.3	-27.6	-28.6	-29.5	-30.4	-31.0	-31.5	-30.1	-25.2	-22.1	-20.2	-18.8	-17.3	-16.5	-16.5	-17.2	-18.1	-19.2	-19.9	-20.5	-20.8	-20.9	-21.5	-31.5	-16.5	-23.1	24	
19	-21.7	-22.0	-22.3	-21.9	-21.6	-21.3	-21.0	-21.0	-20.2	-18.2	-15.9	-14.0	-12.2	-10.7	-8.6	-7.7	-7.7	-8.4	-10.3	-11.1	-10.3	-9.8	-10.1	-10.9	-22.3	-7.7	-14.9	24	
20	-11.9	-12.5	-12.8	-13.9	-14.7	-14.3	-13.3	-12.3	-11.9	-11.4	-10.9	-9.8	-8.8	-8.7	-8.9	-9.3	-10.2	-10.9	-11.6	-12.9	-13.1	-13.9	-14.7	-15.0	-15.0	-8.7	-12.0	24	
21	-15.4	-15.8	-17.6	-18.5	-19.5	-18.4	-19.3	-19.4	-18.5	-17.0	-15.9	-15.2	-14.8	-14.3	-14.0	-13.6	-13.8	-14.9	-16.9	-17.3	-17.9	-18.5	-18.6	-18.6	-19.5	-13.6	-16.8	24	
22	-19.0	-19.0	-20.4	-23.9	-22.5	-22.4	-20.5	-21.7	-21.0	-17.6	-16.9	-14.8	-13.3	-12.6	-12.1	-11.3	-11.1	-12.6	-12.3	-11.7	-12.0	-12.0	-12.7	-15.0	-23.9	-11.1	-16.2	24	
23	-16.3	-18.1	-19.4	-19.5	-19.9	-20.6	-21.0	-20.9	P	-20.1	-19.6	-18.1	-17.0	-16.3	-16.2	-16.6	-16.9	-17.8	-19.2	-20.5	-21.4	-22.2	-23.2	-24.3	-24.3	-16.2	-19.3	23	
24	-25.3	-26.2	-27.6	-28.3	-28.6	-29.2	-31.1	-31.3	-28.8	-24.5	-20.6	-18.7	-17.5	-16.7	-15.8	-15.4	-16.8	-18.5	-20.7	-22.1	-22.9	-24.1	-24.6	-25.1	-31.3	-15.4	-23.4	24	
25	-25.6	-26.2	-26.9	-28.4	-27.9	-27.1	-26.9	-28.2	-25.8	-21.7	-18.6	-16.3	-15.2	-14.3	-14.0	-13.8	-15.0	-16.7	-18.8	-20.1	-21.5	-22.7	-23.2	-24.7	-28.4	-13.8	-21.6	24	
26	-25.2	-26.0	-26.2	-27.2	-27.4	-27.5	-27.5	-26.3	-23.7	-20.4	-17.8	-16.0	-12.4	-10.3	-10.0	-10.0	-10.4	-10.7	-11.3	-11.6	-11.1	-10.6	-10.3	-27.5	-10.0	-18.2	24		
27	-10.2	-9.9	-9.3	-9.2	-9.3	-9.9	-10.0	-9.2	-8.0	-6.6	-4.6	-2.8	-2.2	-2.3	-2.6	-2.7	-3.7	-4.8	-6.3	-7.7	-8.9	-10.8	-11.9	-12.1	-12.1	-2.2	-7.3	24	
28	-12.6	-12.4	-12.4	-14.1	-15.9	-16.3	-16.7	-17.8	-15.6	-13.4	-13.0	-12.6	-12.2	-12.0	-12.0	-12.3	-13.3	-14.6	-15.8	-16.5	-17.5	-18.8	-19.6	-20.5	-20.5	-12.0	-14.9	24	
HOURLY MAX	-10.2	-9.9	-9.3	-9.2	-9.3	-9.9	-10.0	-9.2	-8.0	-6.6	-4.6	-2.8	-2.2	-2.3	-2.6	-2.7	-3.7	-4.8	-6.3	-7.7	-8.9	-9.8	-10.1	-10.3					
HOURLY AVG	-23.9	-24.6	-25.3	-26.0	-26.4	-26.5	-26.7	-26.9	-26.4	-24.2	-21.7	-19.6	-18.4	-17.5	-17.0	-16.9	-17.6	-18.9	-20.3	-21.1	-21.6	-22.3	-22.8	-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

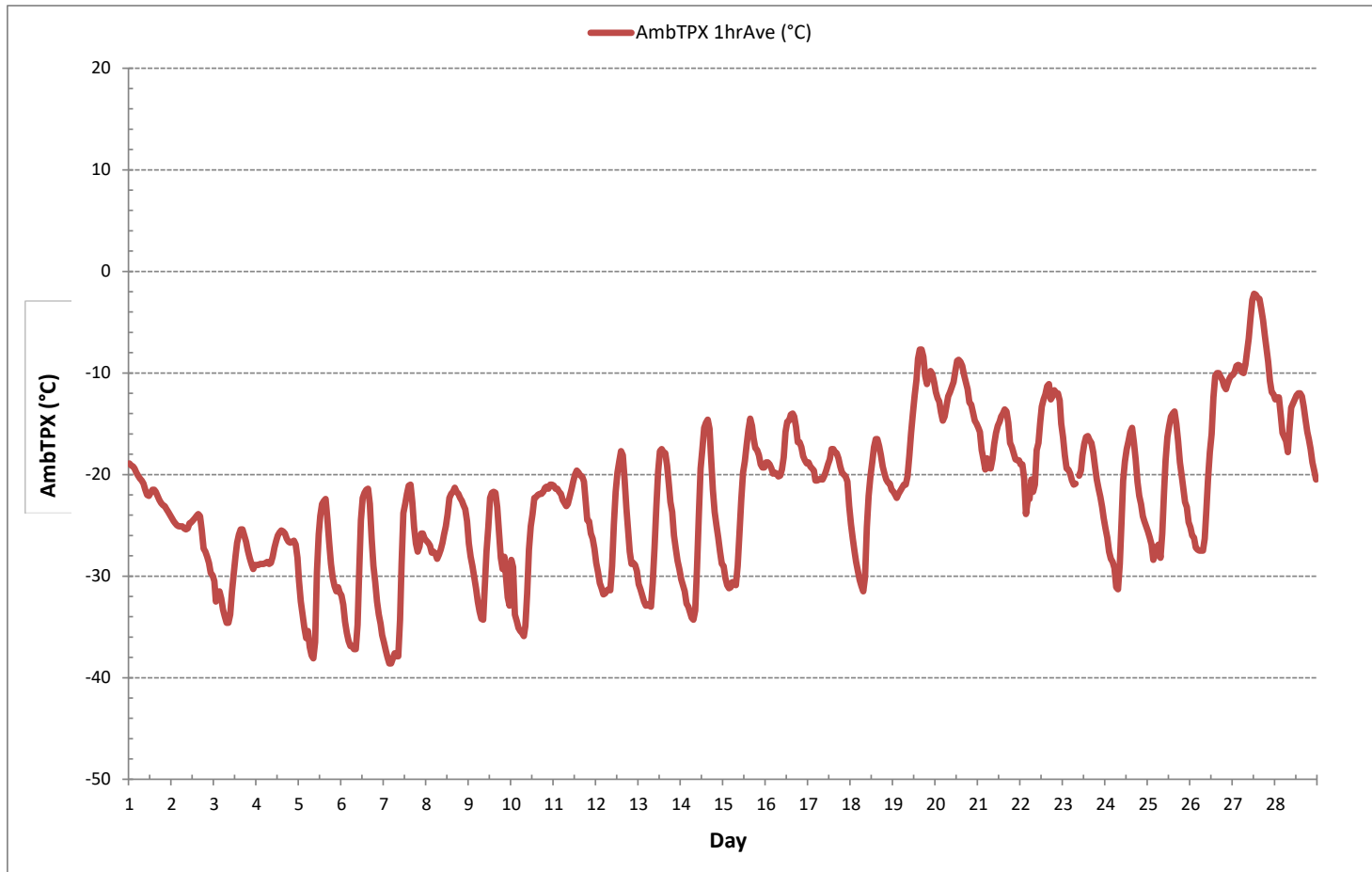
24 HR AVERAGES February 2019



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-38.6 °C	@ HOUR	3	ON DAY	7
MAXIMUM 1-HR AVERAGE:	-2.2 °C	@ HOUR	12	ON DAY	27
MAXIMUM 24-HR AVERAGE:	-7.3 °C			ON DAY	27
OPERATIONAL TIME:					671 hrs
AMD OPERATION UPTIME:					99.9 %
STANDARD DEVIATION:	7.3			MONTHLY AVERAGE:	-22.3 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



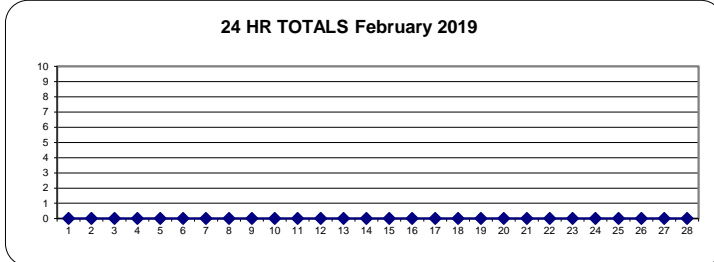
PRECIPITATION Hourly TOTALS (mm)

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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	Y C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	
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	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	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	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	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	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	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	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	
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	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	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	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	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	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	
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	

STATUS FLAG CODES

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

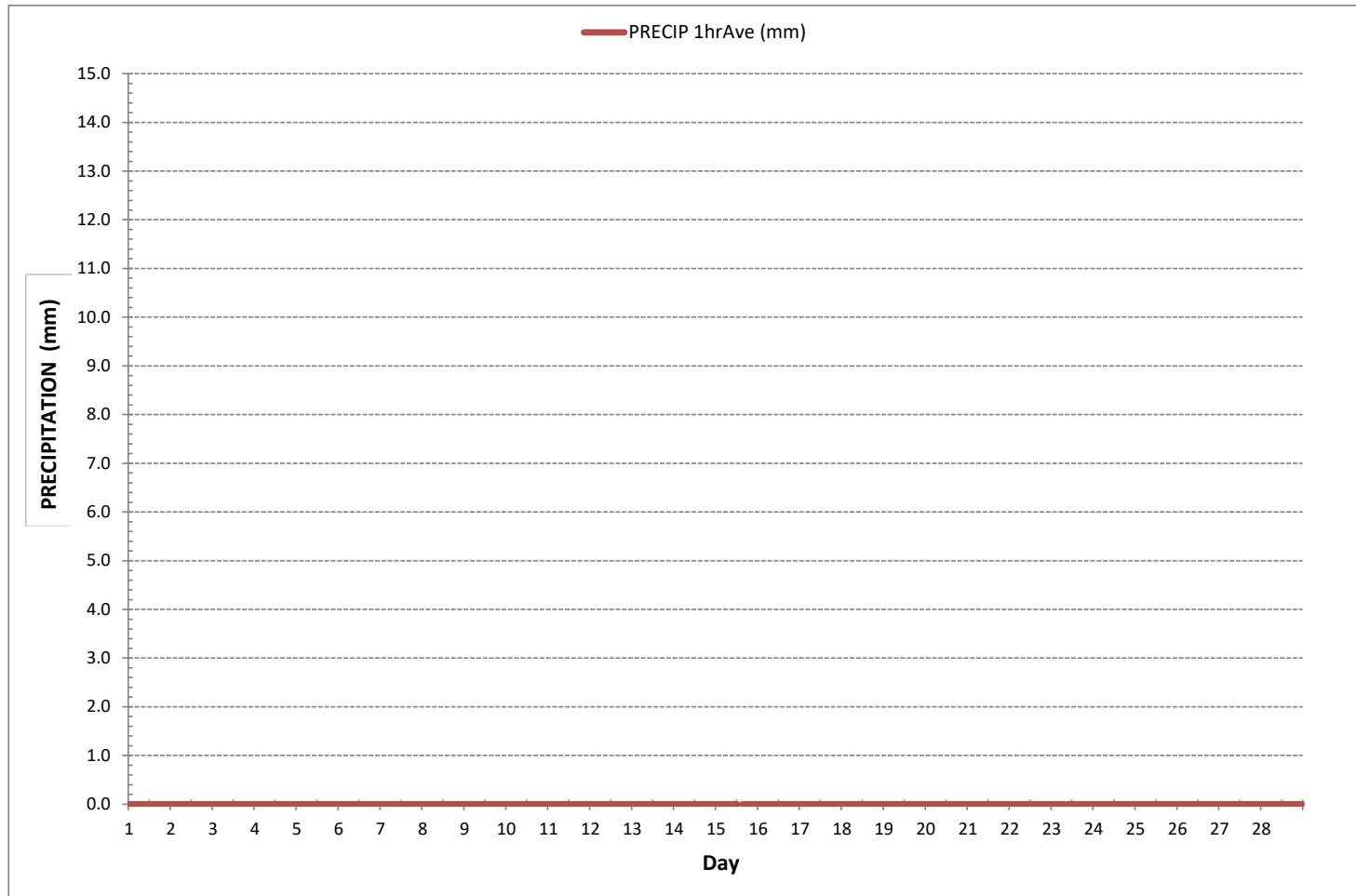
24 HR TOTALS February 2019



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:						670 hrs
AMD OPERATION UPTIME:						99.7 %
STANDARD DEVIATION:	0.0		MONTHLY TOTAL:			0.0 mm

PRECIPITATION Hourly TOTALS (mm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

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

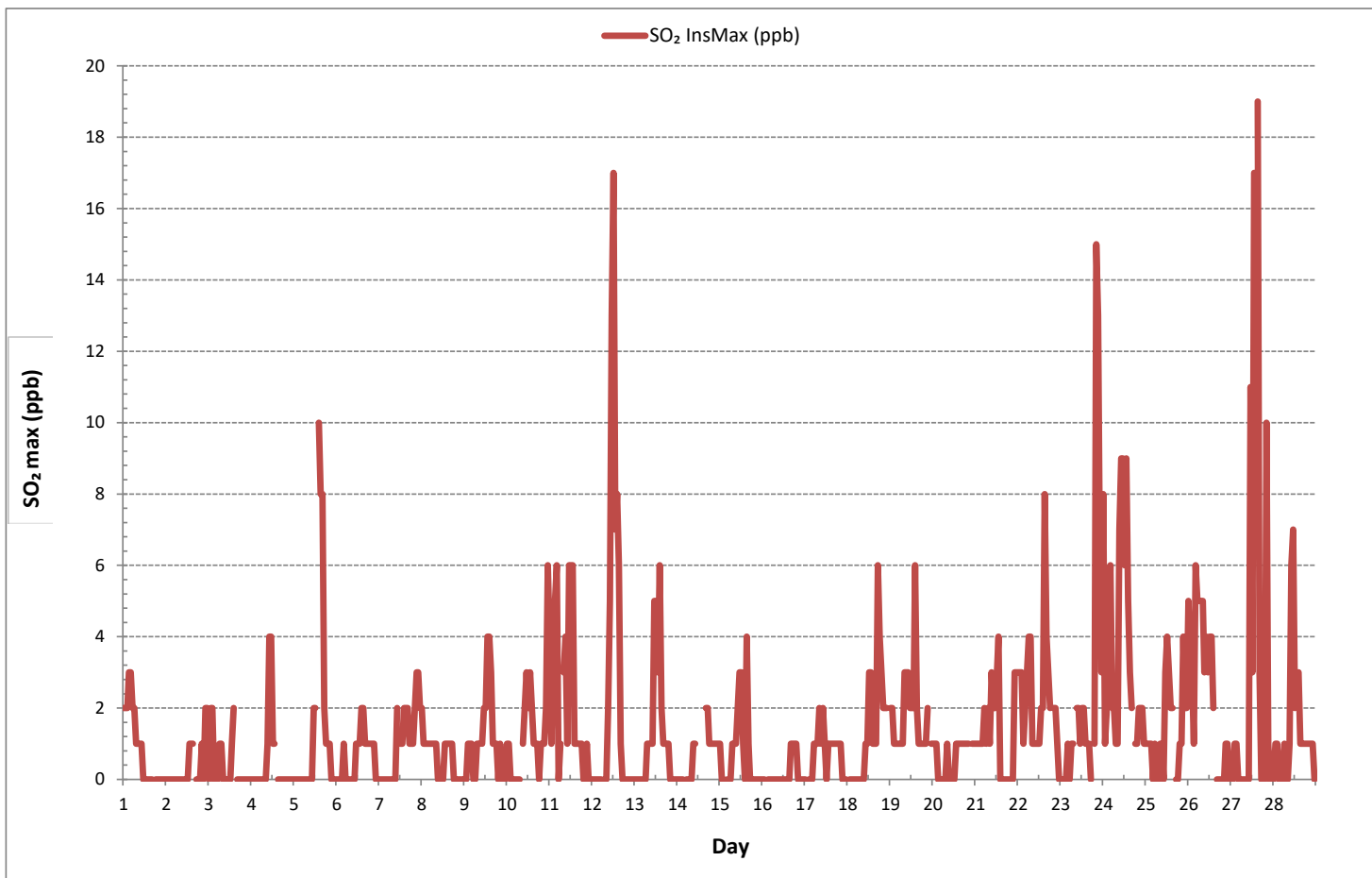
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	370
MAXIMUM INSTANTANEOUS VALUE:	19 ppb @ HOUR 15 ON DAY 27
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	2

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

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

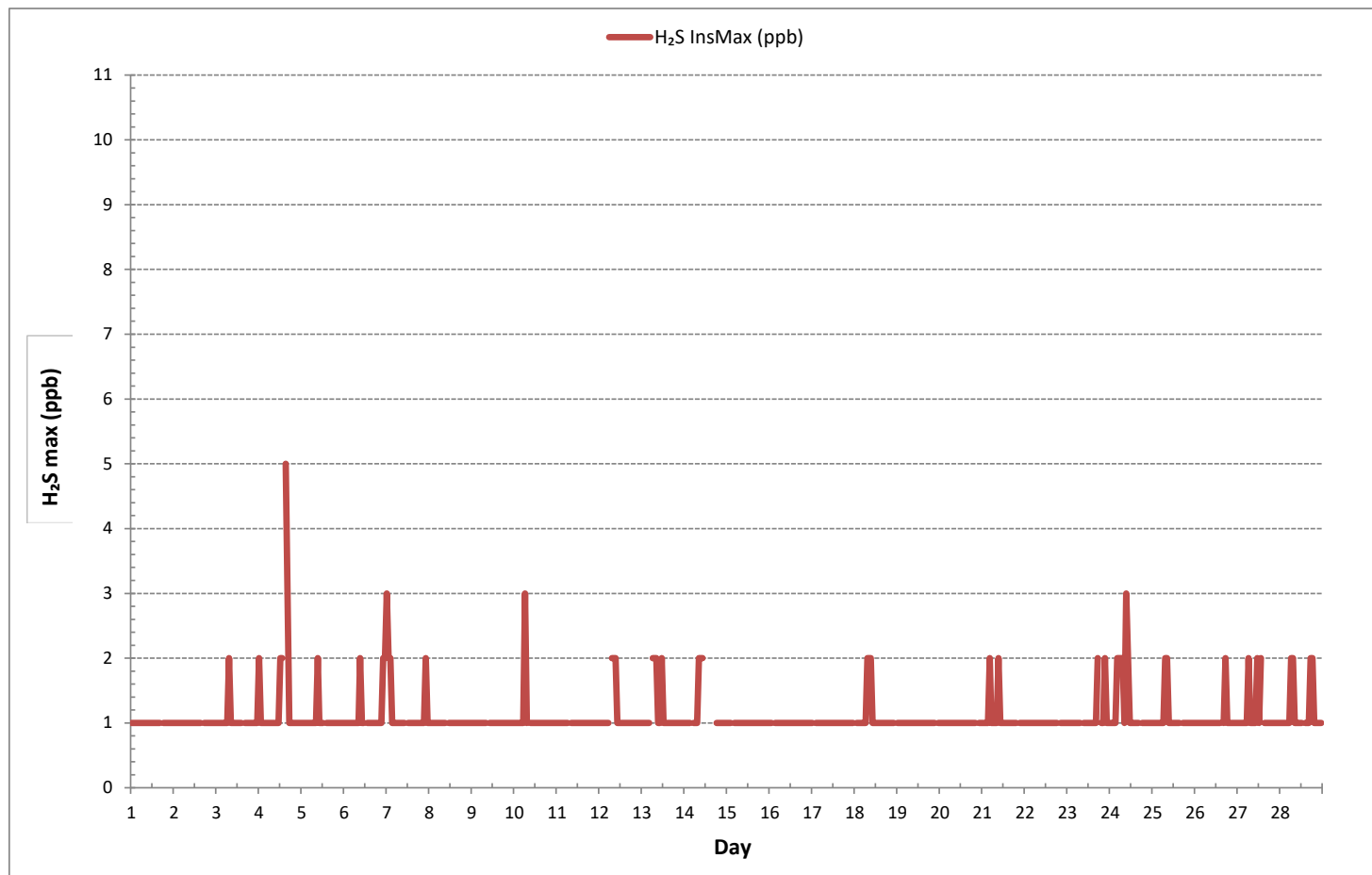
STATUS FLAG CODES

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:	635
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 15 ON DAY 4
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	0

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

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	2.08	2.07	2.07	2.07	2.08	2.07	2.09	2.08	2.06	2.05	2.05	2.05	2.05	2.04	2.04	2.04	2.04	S	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.09	2.05	24	
2	2.04	2.03	2.04	2.04	2.04	2.04	2.05	2.04	2.04	2.03	2.04	2.03	2.04	2.04	2.04	2.04	S	2.05	2.04	2.05	2.06	2.06	2.06	2.09	2.11	2.03	2.11	2.05	24	
3	2.07	2.10	2.13	2.08	2.08	2.08	2.08	2.08	2.07	2.08	2.08	2.07	2.05	2.06	2.05	S	2.05	2.06	2.05	2.05	2.05	2.05	2.06	2.05	2.06	2.05	2.05	2.13	2.07	24
4	2.06	2.04	2.05	2.04	2.04	2.04	2.05	2.05	2.05	2.05	2.08	2.07	2.07	2.07	S	2.11	2.08	2.05	2.05	2.06	2.05	2.06	2.05	2.06	2.06	2.04	2.11	2.06	24	
5	2.07	2.09	2.11	2.12	2.14	2.15	2.19	2.23	2.26	2.89	2.54	2.29	2.17	S	2.31	2.25	2.22	2.33	2.30	2.30	2.38	2.41	2.41	2.39	2.07	2.89	2.28	24		
6	2.43	2.44	2.58	2.64	2.63	2.61	2.99	2.81	2.78	3.00	2.77	2.59	S	2.23	2.20	2.22	2.23	2.25	2.29	2.39	2.38	2.34	2.48	2.59	2.20	3.00	2.52	24		
7	2.55	2.53	2.52	2.86	2.86	2.47	2.41	2.67	2.67	2.80	2.43	S	2.32	2.34	2.33	2.33	2.39	2.40	2.38	2.35	2.38	2.39	2.43	2.42	2.32	2.86	2.49	24		
8	2.44	2.43	2.41	2.26	2.26	2.26	2.22	2.20	2.17	2.13	S	2.09	2.07	2.05	2.08	2.07	2.06	2.07	2.09	2.10	2.10	2.10	2.09	2.08	2.05	2.44	2.17	24		
9	2.08	2.09	2.09	2.11	2.13	2.13	2.13	2.15	2.17	S	2.14	2.08	2.10	2.11	2.31	2.31	2.18	2.19	2.21	2.26	2.31	2.21	2.28	2.29	2.08	2.31	2.18	24		
10	2.30	2.40	2.33	2.25	2.32	2.30	2.34	2.34	S	2.37	2.37	2.30	2.25	2.20	2.16	2.13	2.12	2.11	2.10	2.08	2.07	2.07	2.08	2.12	2.07	2.40	2.22	24		
11	2.07	2.07	2.09	2.09	2.11	2.07	2.06	S	2.06	2.08	2.06	2.23	2.13	2.07	2.08	2.07	2.07	2.07	2.07	2.14	2.23	2.28	2.28	2.23	2.06	2.28	2.12	24		
12	2.24	2.45	2.50	2.52	2.52	2.49	S	2.53	2.49	2.48	2.46	2.46	2.34	2.43	2.24	2.60	2.65	2.65	2.53	2.49	2.60	2.58	2.73	2.65	2.24	2.73	2.51	24		
13	2.58	2.62	2.64	2.60	2.53	S	2.65	2.64	2.61	2.54	2.38	2.64	2.17	2.50	3.03	2.85	2.57	2.29	2.26	2.26	2.34	2.36	2.37	2.35	2.17	3.03	2.51	24		
14	2.39	2.41	2.53	2.48	S	2.37	2.55	2.56	2.83	2.73	X	2.46	2.33	2.34	2.42	2.39	2.37	2.43	2.34	2.33	2.31	2.35	2.38	2.50	2.31	2.83	2.45	23		
15	2.50	2.49	2.45	S	2.35	2.37	2.38	2.41	2.41	2.48	C	C	C	Y	Y	C	C	C	2.03	2.04	2.07	2.07	2.10	2.10	2.03	2.50	-	22		
16	2.05	2.04	S	2.05	2.04	2.04	2.06	2.07	2.07	2.07	2.07	2.04	2.02	2.02	2.04	2.04	2.06	2.09	2.11	2.07	2.05	2.04	2.05	2.04	2.02	2.11	2.05	24		
17	2.04	S	2.05	2.04	2.04	2.05	2.04	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.05	2.01	2.05	2.03	24		
18	S	2.19	2.14	2.10	2.27	2.32	2.23	2.21	2.21	2.25	2.22	2.28	2.11	2.11	2.08	2.10	2.10	2.17	2.17	2.15	2.17	2.24	2.21	S	2.08	2.32	2.18	24		
19	2.19	2.18	2.20	2.21	2.21	2.23	2.25	2.25	2.28	2.31	2.31	2.31	2.29	2.30	2.30	2.24	2.22	2.21	2.21	2.25	2.28	2.50	S	2.49	2.18	2.50	2.27	24		
20	2.55	2.61	2.62	2.58	2.55	2.49	2.49	2.45	2.20	2.18	2.20	2.17	2.09	2.11	2.11	2.09	2.10	2.10	2.11	2.10	2.08	S	2.06	2.06	2.06	2.62	2.26	24		
21	2.04	2.04	2.04	2.03	2.03	2.02	2.01	1.99	1.99	2.00	2.03	2.04	2.02	2.02	2.03	2.00	2.00	2.01	2.07	S	2.07	2.07	2.08	2.11	1.99	2.11	2.03	24		
22	2.10	2.13	2.17	2.22	2.18	2.18	2.22	2.21	2.21	2.15	2.18	2.17	2.16	2.15	2.17	2.19	2.19	2.21	2.21	S	2.03	2.03	2.03	1.98	1.98	2.22	2.15	24		
23	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.97	P	1.97	1.96	1.96	1.98	1.98	1.97	1.97	1.97	1.98	S	1.97	2.02	2.02	2.00	2.00	1.96	2.02	1.97	23		
24	2.02	2.00	2.03	2.04	2.29	2.25	2.14	2.10	2.11	2.35	2.07	2.04	2.01	1.99	1.98	2.09	2.08	S	2.04	2.07	2.07	2.05	2.10	2.13	1.98	2.35	2.09	24		
25	2.12	2.13	2.11	2.09	2.10	2.01	2.04	2.07	2.06	2.04	2.16	2.33	2.37	2.21	2.16	2.05	S	2.04	2.06	2.05	2.09	2.08	2.08	2.08	2.01	2.37	2.11	24		
26	2.12	2.12	2.20	2.28	2.24	2.28	2.29	2.39	2.40	2.37	2.41	2.51	2.45	2.44	2.11	S	1.98	1.99	2.00	2.00	2.01	2.01	2.02	2.00	1.98	2.51	2.20	24		
27	2.00	2.00	2.00	2.00	1.99	2.01	2.00	2.01	1.99	1.99	1.99	2.01	1.97	1.97	S	1.97	1.96	1.96	2.00	1.96	1.96	1.96	1.96	1.97	1.97	1.96	2.01	1.98	24	
28	1.98	1.97	1.96	1.97	1.96	1.96	2.03	2.05	2.03	1.97	1.96	1.95	1.97	S	1.96	1.96	1.96	1.96	1.96	1.95	1.96	1.96	1.95	1.97	1.95	2.05	1.97	24		
HOURLY MAX	2.58	2.62	2.64	2.86	2.86	2.61	2.99	2.81	2.83	3.00	2.77	2.64	2.45	2.50	3.03	2.85	2.65	2.65	2.53	2.49	2.60	2.58	2.73	2.65						
HOURLY AVG	2.19	2.21	2.22	2.21	2.22	2.19	2.22	2.24	2.24	2.27	2.20	2.20	2.14	2.15	2.17	2.17	2.15	2.15	2.13	2.13	2.15	2.16	2.16	2.18						

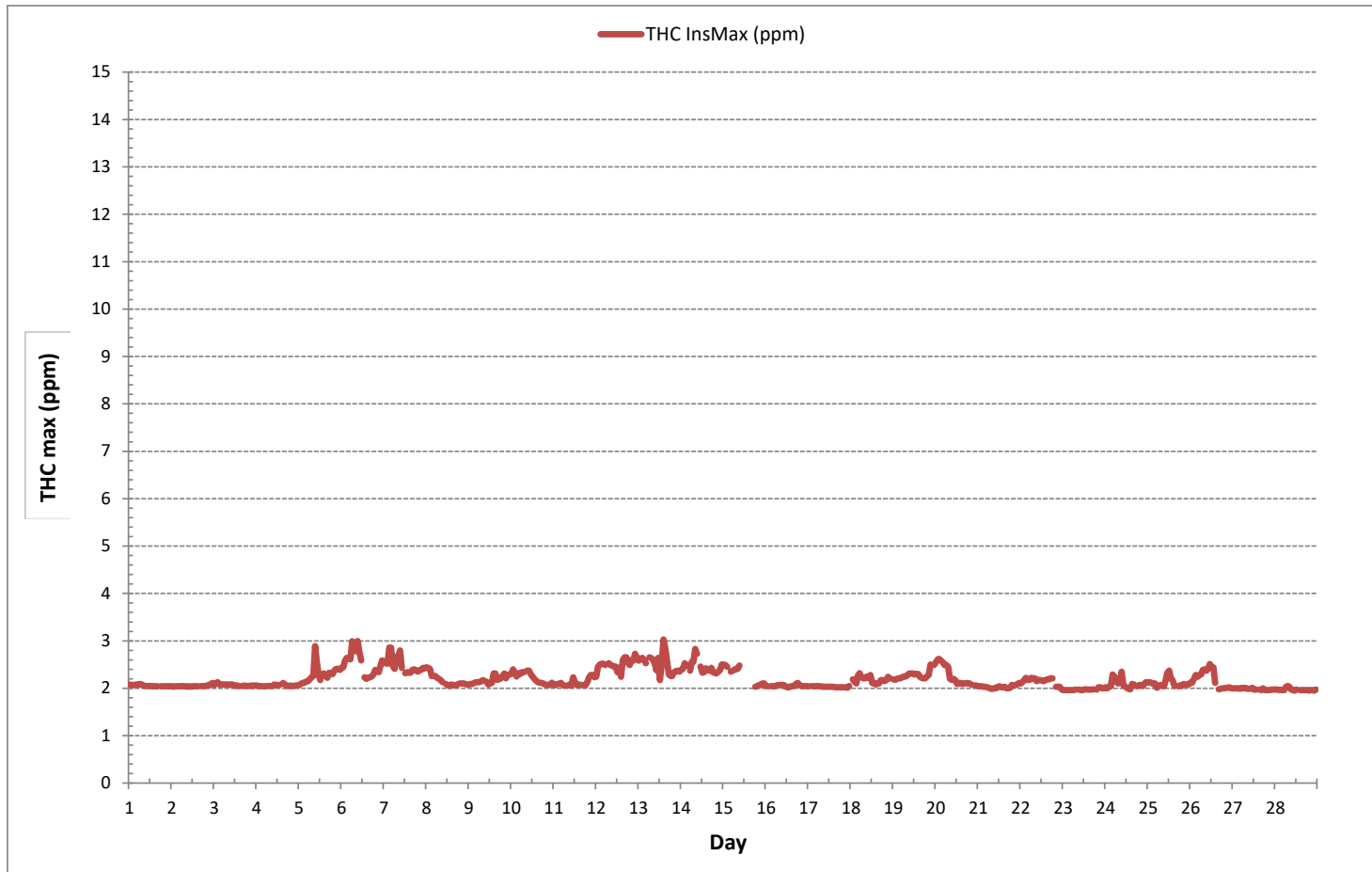
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	633
MAXIMUM INSTANTANEOUS VALUE:	3.03 ppm @ HOUR 14 ON DAY 13
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	0.20

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	2.08	2.07	2.07	2.07	2.08	2.07	2.09	2.08	2.06	2.05	2.05	2.05	2.05	2.04	2.04	2.04	2.04	S	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.09	2.05	24	
2	2.04	2.03	2.04	2.04	2.04	2.04	2.05	2.04	2.04	2.03	2.04	2.03	2.04	2.04	2.04	2.04	S	2.05	2.04	2.05	2.06	2.06	2.09	2.11	2.03	2.11	2.05	24		
3	2.07	2.10	2.13	2.08	2.08	2.08	2.08	2.08	2.07	2.08	2.08	2.07	2.05	2.06	2.05	S	2.05	2.06	2.05	2.05	2.05	2.06	2.05	2.06	2.05	2.06	2.05	2.13	2.07	24
4	2.06	2.04	2.05	2.04	2.04	2.04	2.05	2.05	2.05	2.05	2.08	2.07	2.07	2.07	S	2.11	2.08	2.05	2.05	2.06	2.05	2.05	2.06	2.06	2.06	2.04	2.11	2.06	24	
5	2.07	2.09	2.11	2.12	2.14	2.15	2.19	2.23	2.26	2.59	2.40	2.22	2.17	S	2.12	2.10	2.22	2.33	2.30	2.30	2.38	2.41	2.41	2.39	2.07	2.59	2.25	24		
6	2.43	2.44	2.58	2.64	2.63	2.61	2.77	2.66	2.64	2.73	2.59	2.49	S	2.23	2.20	2.22	2.23	2.25	2.29	2.39	2.38	2.34	2.48	2.59	2.20	2.77	2.47	24		
7	2.55	2.53	2.52	2.86	2.86	2.47	2.41	2.67	2.67	2.80	2.43	S	2.32	2.34	2.33	2.33	2.39	2.40	2.38	2.35	2.38	2.39	2.43	2.42	2.32	2.86	2.49	24		
8	2.44	2.43	2.41	2.26	2.26	2.26	2.22	2.20	2.17	2.13	S	2.09	2.07	2.05	2.08	2.07	2.06	2.07	2.09	2.10	2.10	2.10	2.09	2.08	2.05	2.44	2.17	24		
9	2.08	2.09	2.09	2.11	2.13	2.13	2.13	2.15	2.17	S	2.14	2.08	2.10	2.11	2.31	2.31	2.18	2.19	2.21	2.26	2.31	2.21	2.28	2.29	2.08	2.31	2.18	24		
10	2.30	2.40	2.33	2.25	2.32	2.30	2.34	2.34	S	2.37	2.37	2.30	2.25	2.20	2.16	2.13	2.12	2.11	2.10	2.08	2.07	2.07	2.08	2.12	2.07	2.40	2.22	24		
11	2.07	2.07	2.09	2.09	2.11	2.07	2.06	S	2.06	2.08	2.06	2.23	2.13	2.07	2.08	2.07	2.07	2.07	2.14	2.23	2.28	2.28	2.23	2.06	2.28	2.12	24			
12	2.24	2.45	2.50	2.52	2.52	2.49	S	2.53	2.49	2.48	2.46	2.46	2.34	2.43	2.24	2.60	2.65	2.53	2.49	2.60	2.58	2.73	2.65	2.24	2.73	2.51	24			
13	2.58	2.62	2.64	2.60	2.53	S	2.65	2.64	2.61	2.54	2.38	2.46	2.17	2.50	3.03	2.85	2.57	2.29	2.26	2.26	2.34	2.36	2.37	2.35	2.17	3.03	2.50	24		
14	2.39	2.41	2.53	2.48	S	2.37	2.44	2.50	2.50	2.57	X	2.46	2.33	2.34	2.42	2.39	2.37	2.35	2.34	2.33	2.31	2.35	2.38	2.50	2.31	2.57	2.41	23		
15	2.50	2.49	2.45	S	2.35	2.37	2.38	2.41	2.41	2.48	C	C	C	Y	Y	C	C	C	C	2.03	2.04	2.07	2.10	2.10	2.03	2.50	-	22		
16	2.05	2.04	S	2.05	2.04	2.04	2.06	2.07	2.07	2.07	2.07	2.04	2.02	2.02	2.04	2.04	2.06	2.09	2.11	2.07	2.05	2.04	2.05	2.04	2.02	2.11	2.05	24		
17	2.04	S	2.05	2.04	2.04	2.05	2.04	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.05	2.01	2.05	2.03	24			
18	S	2.19	2.14	2.10	2.27	2.32	2.23	2.21	2.21	2.25	2.22	2.28	2.11	2.11	2.08	2.10	2.10	2.17	2.17	2.15	2.17	2.24	2.21	S	2.08	2.32	2.18	24		
19	2.19	2.18	2.20	2.21	2.21	2.23	2.25	2.25	2.28	2.31	2.31	2.31	2.29	2.30	2.30	2.24	2.22	2.21	2.21	2.25	2.28	2.50	S	2.49	2.18	2.50	2.27	24		
20	2.55	2.61	2.62	2.58	2.55	2.49	2.49	2.45	2.20	2.18	2.20	2.17	2.09	2.11	2.11	2.09	2.10	2.10	2.11	2.10	2.08	S	2.06	2.06	2.06	2.62	2.26	24		
21	2.04	2.04	2.04	2.03	2.03	2.02	2.01	1.99	1.99	2.00	2.00	2.03	2.04	2.02	2.02	2.03	2.00	2.00	2.01	2.07	S	2.07	2.08	2.11	1.99	2.11	2.03	24		
22	2.10	2.13	2.17	2.22	2.18	2.18	2.22	2.21	2.21	2.15	2.18	2.17	2.16	2.15	2.17	2.19	2.19	2.21	2.21	S	2.03	2.03	2.03	1.98	1.98	2.22	2.15	24		
23	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.97	P	1.97	1.96	1.96	1.98	1.98	1.97	1.97	1.97	1.98	S	1.97	2.02	2.02	2.00	2.00	1.96	2.02	1.97	23		
24	2.02	2.00	2.03	2.04	2.15	2.15	2.14	2.10	2.11	2.20	2.07	2.04	2.01	1.99	1.98	2.09	2.08	S	2.04	2.07	2.07	2.05	2.10	2.13	1.98	2.20	2.07	24		
25	2.12	2.13	2.11	2.09	2.10	2.01	2.04	2.07	2.06	2.04	2.16	2.33	2.37	2.21	2.16	2.05	S	2.04	2.06	2.05	2.09	2.08	2.08	2.08	2.01	2.37	2.11	24		
26	2.12	2.12	2.20	2.28	2.24	2.28	2.29	2.39	2.40	2.37	2.41	2.51	2.45	2.44	2.11	S	1.98	1.99	2.00	2.00	2.01	2.01	2.02	2.00	1.98	2.51	2.20	24		
27	2.00	2.00	2.00	2.00	1.99	2.01	2.00	2.01	1.99	1.99	1.99	2.01	1.97	1.97	S	1.97	1.96	2.00	1.96	1.96	1.96	1.96	1.97	1.97	1.96	2.01	1.98	24		
28	1.98	1.97	1.96	1.97	1.96	1.96	2.03	2.05	2.03	1.97	1.96	1.95	1.97	S	1.96	1.96	1.96	1.96	1.96	1.95	1.96	1.96	1.95	1.97	1.95	2.05	1.97	24		
HOURLY MAX	2.58	2.62	2.64	2.86	2.86	2.61	2.77	2.67	2.67	2.80	2.59	2.51	2.45	2.50	3.03	2.85	2.65	2.65	2.65	2.53	2.49	2.60	2.58	2.73	2.65					
HOURLY AVG	2.19	2.21	2.22	2.21	2.22	2.19	2.21	2.24	2.22	2.24	2.19	2.19	2.14	2.15	2.16	2.16	2.15	2.15	2.15	2.13	2.13	2.15	2.16	2.16	2.18					

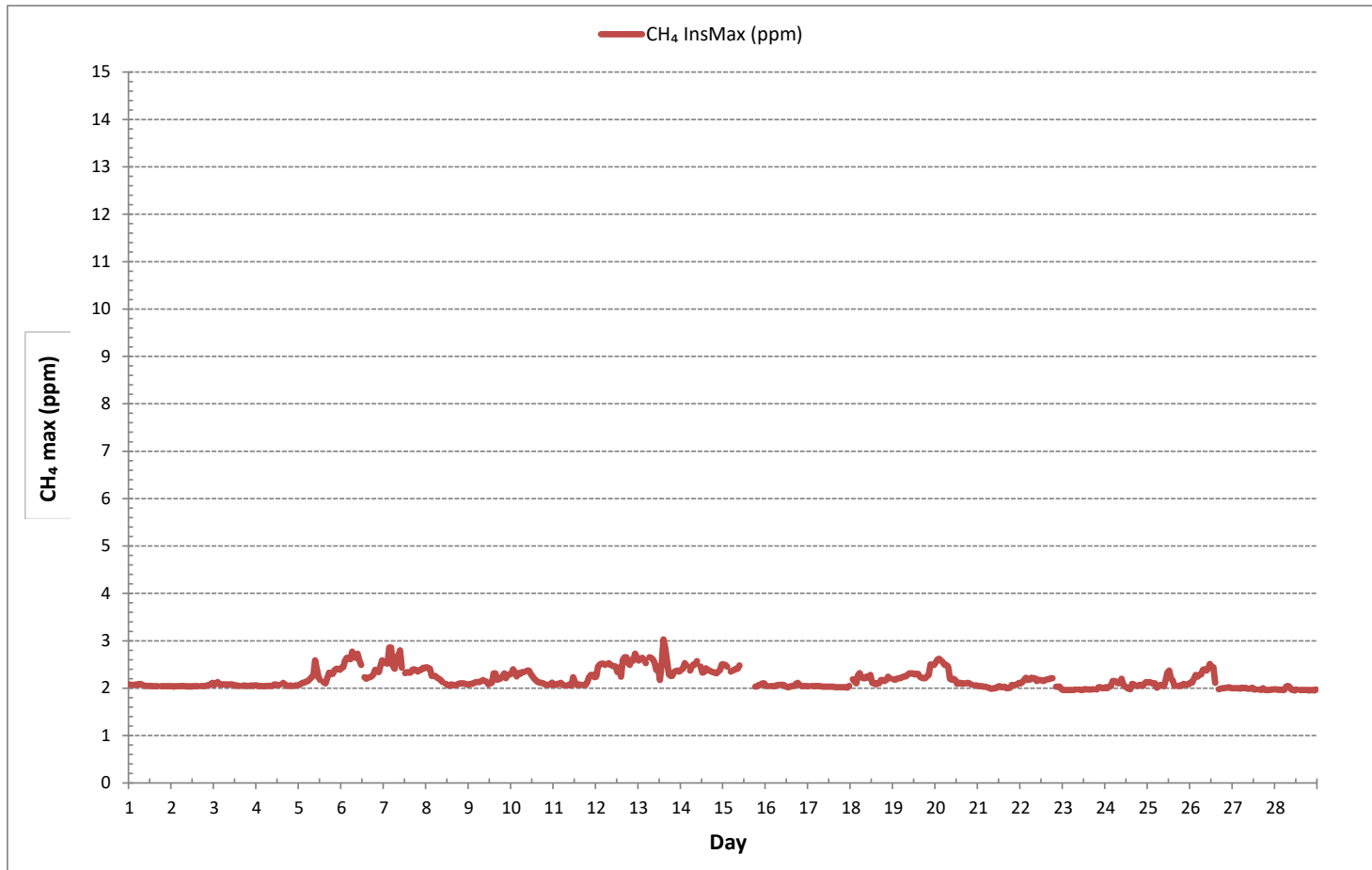
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	633
MAXIMUM INSTANTANEOUS VALUE:	3.03 ppm @ HOUR 14 ON DAY 13
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	0.19

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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
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	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	S	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	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	0.31	0.15	0.12	0.00	S	0.21	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.04	24
6	0.00	0.00	0.00	0.00	0.00	0.24	0.16	0.18	0.28	0.18	0.10	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	0.28	0.05	24
7	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
8	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
9	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
10	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
11	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
12	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
13	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.01	24
14	0.00	0.00	0.00	0.00	S	0.00	0.12	0.11	0.34	0.22	X	0.06	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.04	23
15	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	Y	Y	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	22
16	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
17	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
18	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	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
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	S	0.00	0.00	0.00	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	S	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	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	0.00	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23
24	0.00	0.00	0.00	0.00	0.14	0.10	0.00	0.00	0.00	0.17	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	0.17	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	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
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	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
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	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	0.00	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
HOURLY MAX	0.00	0.00	0.00	0.00	0.14	0.10	0.24	0.16	0.34	0.31	0.18	0.20	0.00	0.00	0.21	0.14	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HOURLY AVG	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.02	0.04	0.01	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

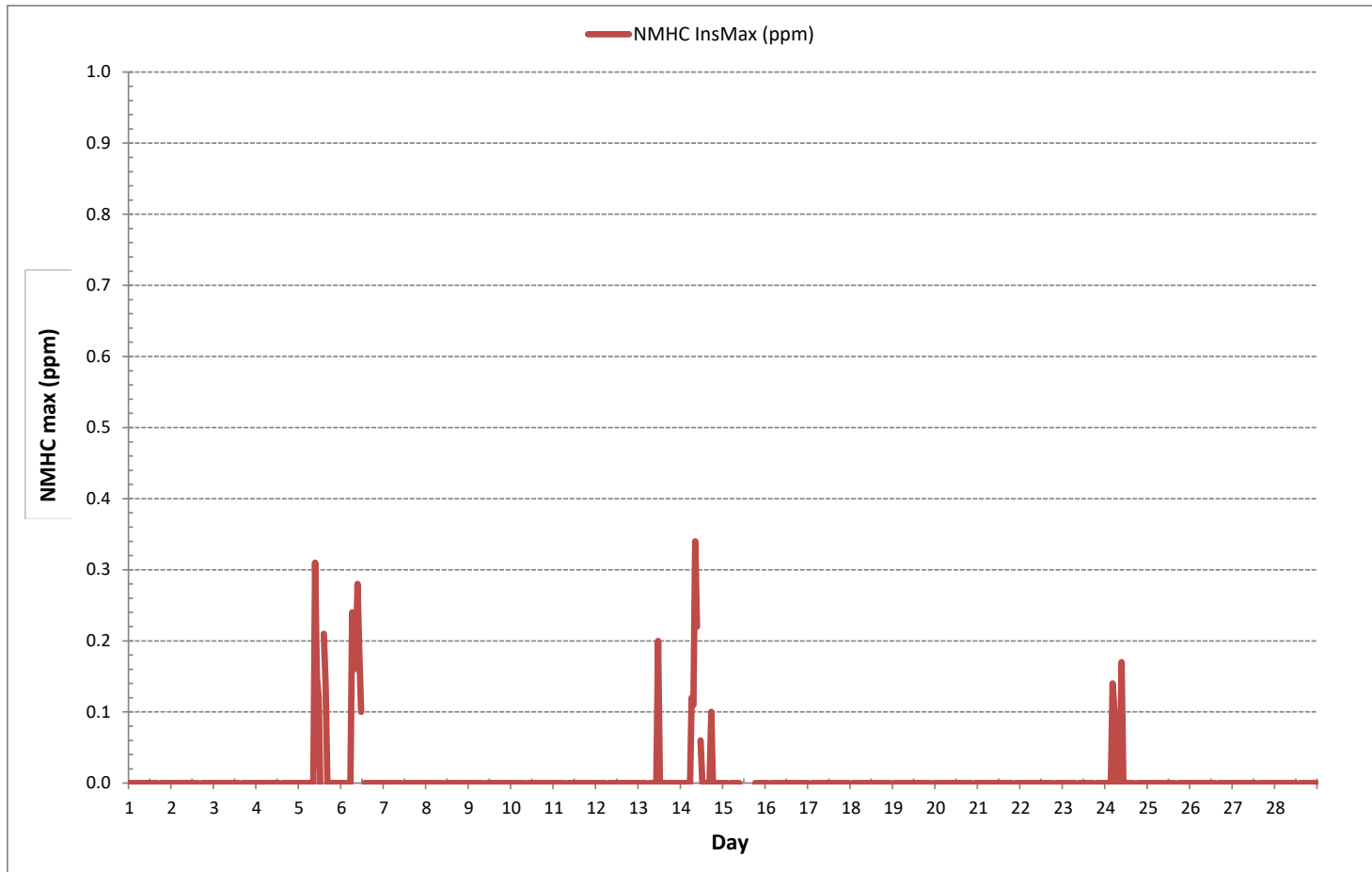
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	21
MAXIMUM INSTANTANEOUS VALUE:	0.34 ppm @ HOUR 8 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	0.03

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	4	3	3	6	6	6	7	7	4	2	3	3	1	1	1	1	0	S	0	0	0	0	0	0	0	0	7	3	24
2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	S	1	1	1	1	4	4	6	6	0	6	1	24
3	2	6	7	3	3	4	10	105	21	15	8	6	6	6	6	S	2	1	1	1	1	1	2	1	1	1	105	9	24
4	1	0	0	0	0	1	0	0	0	2	7	8	3	2	S	1	1	1	1	1	1	2	2	2	2	0	8	2	24
5	1	1	1	1	2	2	3	7	26	25	19	7	8	S	22	30	21	14	12	11	13	12	10	11	1	30	11	24	
6	11	10	10	10	13	12	12	17	27	24	19	12	S	4	4	5	5	5	7	9	8	6	6	8	4	27	11	24	
7	8	8	9	9	9	8	6	6	6	8	28	S	7	6	6	6	5	5	4	3	4	7	7	6	3	28	7	24	
8	6	4	4	2	2	2	2	2	2	S	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	6	2	24	
9	3	2	3	3	3	3	8	113	70	S	8	5	8	10	13	13	8	10	9	6	6	5	7	7	2	113	14	24	
10	4	7	7	5	4	4	7	34	S	7	7	5	5	6	3	2	2	1	2	5	3	4	6	16	1	34	6	24	
11	8	2	7	9	11	1	2	S	4	6	1	11	15	13	1	1	1	1	3	3	3	4	7	12	1	15	6	24	
12	12	12	13	10	15	17	S	52	62	81	37	34	42	28	22	18	17	16	13	13	12	14	14	20	10	81	25	24	
13	44	38	16	16	17	S	20	20	25	25	23	32	17	20	27	25	45	25	7	6	9	11	10	9	6	45	21	24	
14	7	17	27	18	S	6	10	26	38	25	15	C	C	C	C	C	C	C	17	20	7	15	17	11	6	38	-	24	
15	8	7	6	S	5	4	5	7	25	25	11	9	10	3	2	14	3	2	1	1	1	1	2	1	1	25	7	24	
16	1	1	S	1	1	1	2	4	3	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	4	1	24	
17	1	S	1	1	1	2	2	2	4	3	3	3	2	3	5	4	12	4	4	3	3	2	2	2	1	12	3	24	
18	S	7	3	3	8	10	9	17	37	42	48	10	11	5	6	5	4	10	11	10	9	6	6	6	S	3	48	13	24
19	6	5	5	6	5	9	9	20	23	13	16	13	14	15	24	14	20	18	22	17	16	17	S	16	5	24	14	24	
20	17	22	18	14	11	15	13	9	5	4	3	3	2	2	4	4	3	2	2	5	3	S	4	3	2	22	7	24	
21	3	3	3	4	9	9	7	9	42	9	10	5	6	21	6	3	7	9	5	6	S	3	5	6	3	42	8	24	
22	7	6	6	7	5	6	18	15	9	11	8	5	9	8	11	19	12	18	16	S	5	6	6	2	2	19	9	24	
23	1	1	1	1	1	1	2	2	P	3	3	2	4	4	4	3	1	S	3	3	28	23	11	5	1	28	5	23	
24	13	3	5	10	16	7	39	121	40	38	20	17	12	16	13	5	7	S	10	8	6	6	7	8	3	121	19	24	
25	7	9	8	6	6	17	25	84	88	65	14	16	18	13	10	10	S	11	27	12	9	11	14	10	6	88	21	24	
26	12	12	13	11	17	18	36	32	37	46	31	31	29	28	14	S	17	12	20	17	5	13	8	5	5	46	20	24	
27	4	4	10	10	20	4	11	6	7	7	17	20	6	32	S	42	7	2	1	1	17	20	22	2	1	42	12	24	
28	1	2	2	1	1	2	103	48	20	4	12	15	4	S	6	3	3	7	3	2	3	3	3	1	1	103	11	24	
HOURLY MAX	44	38	27	18	20	18	103	121	88	81	37	34	42	32	27	42	45	25	27	20	28	23	22	20					
HOURLY AVG	7	7	7	6	7	6	14	29	24	18	12	11	9	10	9	9	9	7	7	6	7	7	7	6					

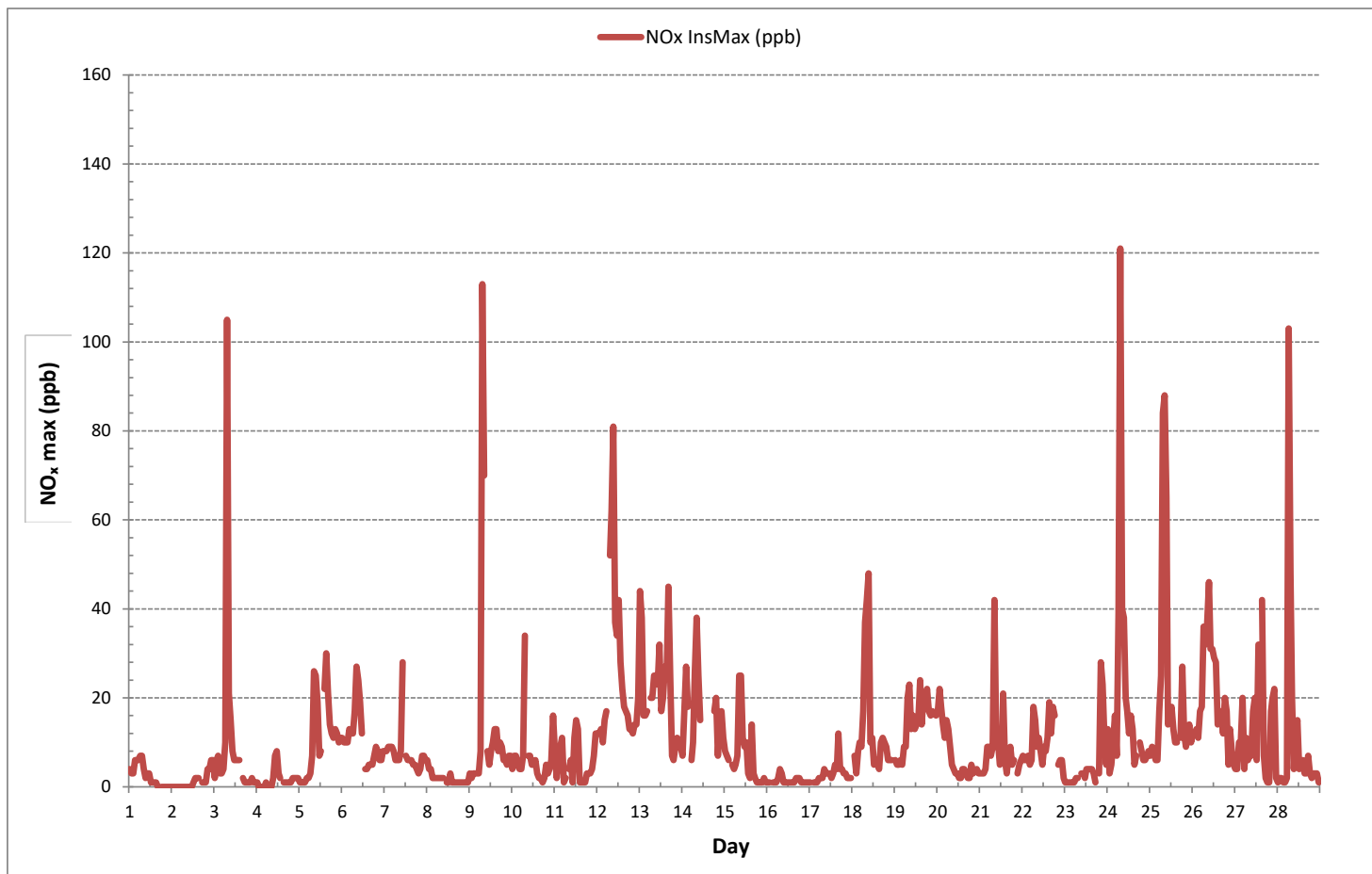
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	609
MAXIMUM INSTANTANEOUS VALUE:	121 ppb @ HOUR 7 ON DAY 24
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	14

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

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	1	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
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	0	0	1	0	24
3	0	0	0	0	0	0	0	79	6	4	2	2	2	2	2	S	0	0	0	0	0	0	0	0	0	0	79	4	24
4	0	0	0	0	0	0	0	0	0	0	2	2	1	0	S	0	0	0	0	0	0	0	0	0	0	0	2	0	24
5	0	0	0	0	0	0	0	0	8	11	8	3	3	S	9	10	5	1	0	0	0	0	0	0	0	0	11	3	24
6	0	0	0	0	0	0	0	1	9	13	10	6	S	2	1	1	1	0	0	0	0	0	0	0	0	0	13	2	24
7	0	0	0	0	0	0	0	0	1	4	20	S	3	2	2	2	1	0	0	0	0	0	0	0	0	0	20	2	24
8	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	83	45	S	3	2	3	5	5	5	3	1	0	0	0	0	0	0	0	0	83	7	24
10	0	0	0	0	0	0	0	21	S	3	3	2	2	2	1	0	0	0	0	0	0	0	0	1	0	21	2	24	
11	0	0	0	0	0	0	0	S	0	1	0	4	6	4	0	0	0	0	0	0	0	0	0	0	0	0	6	1	24
12	0	0	0	0	0	2	S	23	31	51	20	19	24	17	10	9	5	2	0	0	0	0	0	1	0	51	9	24	
13	17	10	0	0	1	S	1	1	8	8	12	17	8	10	13	11	22	8	0	0	0	0	0	0	0	22	7	24	
14	0	0	1	0	S	0	4	11	16	12	9	C	C	C	C	C	C	C	0	0	0	0	0	0	0	16	-	24	
15	0	0	0	S	0	0	0	0	10	12	4	3	3	1	0	4	0	0	0	0	0	0	0	0	0	12	2	24	
16	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
17	0	S	0	0	0	0	0	0	0	0	1	1	0	1	1	1	5	0	0	0	0	0	0	0	0	5	1	24	
18	S	0	0	0	0	0	3	18	22	29	5	6	3	3	2	2	4	3	2	2	0	0	0	S	0	29	5	24	
19	0	0	0	0	0	2	1	6	9	4	5	4	5	4	10	3	5	2	1	1	0	0	S	0	0	10	3	24	
20	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	1	0	S	0	0	1	0	24
21	0	0	0	0	1	4	0	1	21	2	3	2	2	9	3	1	3	2	0	0	0	S	0	0	0	21	2	24	
22	0	0	0	0	0	0	4	2	1	4	2	2	3	3	5	3	2	0	S	0	0	0	0	0	0	5	2	24	
23	0	0	0	0	0	0	0	0	P	1	1	1	1	2	2	2	1	0	S	0	2	4	1	0	0	4	1	23	
24	0	0	0	0	0	0	18	88	17	22	10	9	6	7	7	2	2	S	3	1	0	0	0	0	0	88	8	24	
25	0	0	0	0	0	4	6	58	78	43	6	8	9	6	4	4	S	3	9	1	0	0	3	0	0	78	11	24	
26	0	0	0	0	1	0	10	9	14	26	15	16	13	14	4	S	7	5	6	5	0	0	0	0	0	26	6	24	
27	0	0	0	2	10	0	2	2	3	3	11	9	2	14	S	20	1	0	0	0	0	4	7	8	0	20	4	24	
28	0	0	0	0	0	0	71	13	3	1	4	5	1	2	1	1	2	0	0	0	0	0	1	0	0	71	5	24	
HOURLY MAX	17	10	1	2	10	4	71	88	78	51	20	19	24	17	13	20	22	8	9	5	4	7	8	1	0	71	5	24	
HOURLY AVG	1	0	0	0	0	0	4	15	12	9	6	5	4	4	3	3	3	1	1	0	0	0	0	0	0	0	0	0	24

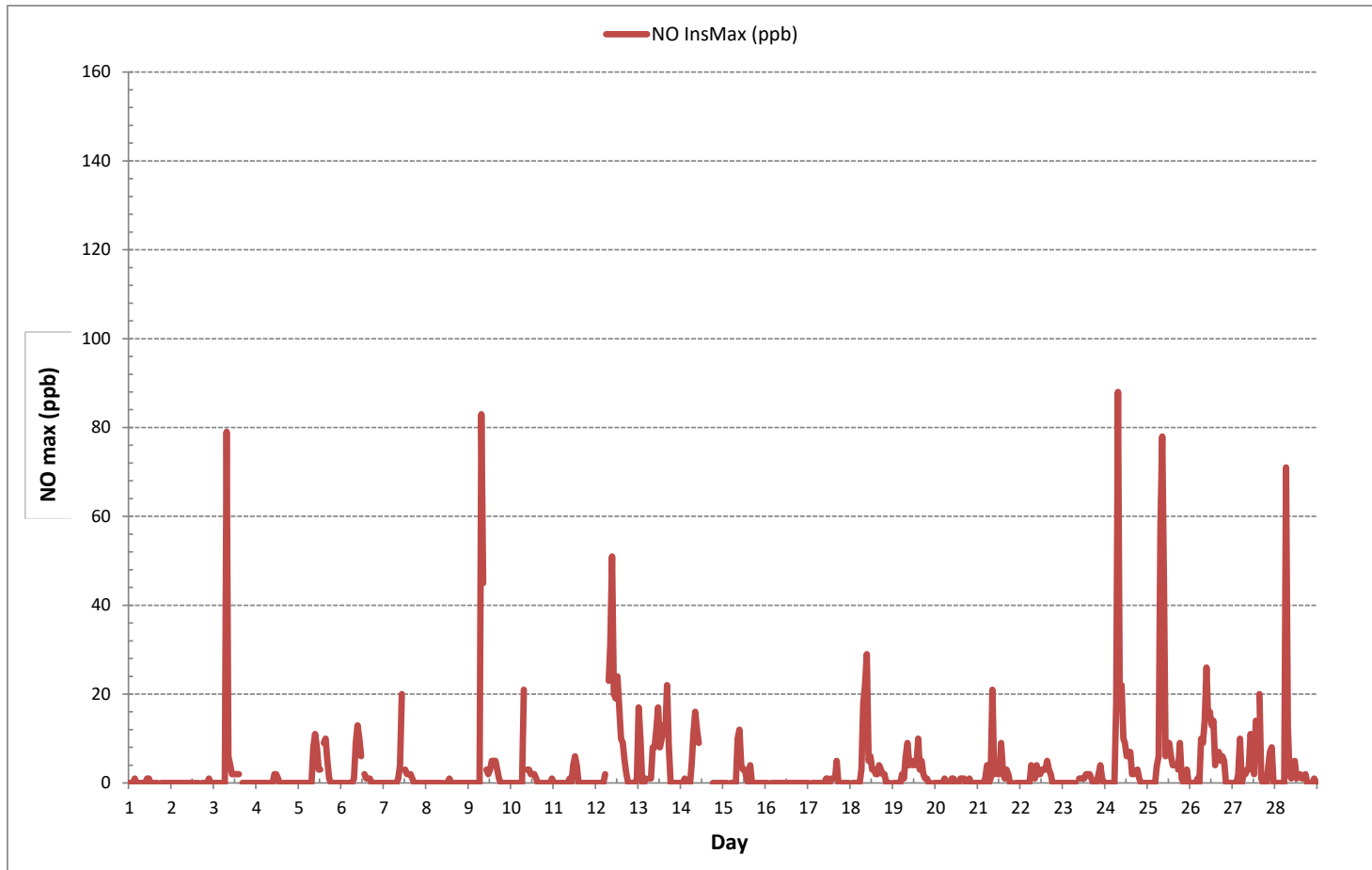
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	252
MAXIMUM INSTANTANEOUS VALUE:	88 ppb @ HOUR 7 ON DAY 24
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	671 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	4	3	3	6	6	6	7	7	4	2	2	3	1	1	1	1	0	S	1	0	0	0	0	0	0	7	3	24	
2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	S	1	1	1	1	4	3	6	6	0	6	1	24
3	2	7	7	3	3	4	10	33	15	11	6	4	4	4	4	S	2	1	1	1	1	2	1	1	1	1	33	6	24
4	1	0	0	0	0	1	0	0	0	2	5	6	2	2	S	1	1	1	1	1	1	2	2	2	2	0	6	1	24
5	1	1	1	1	2	2	3	7	20	15	11	4	4	S	13	21	16	14	12	11	13	12	10	11	1	21	9	24	
6	11	10	10	10	13	12	12	16	18	12	9	6	S	3	3	3	4	5	7	9	8	7	6	8	3	18	9	24	
7	8	8	9	9	9	7	6	6	5	4	9	S	4	4	4	5	5	5	4	3	4	7	7	6	3	9	6	24	
8	6	4	4	2	2	2	2	2	2	1	S	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	6	2	24
9	3	2	3	3	3	3	8	35	26	S	5	3	5	6	8	8	8	9	9	6	6	5	7	7	2	35	8	24	
10	4	7	7	5	5	4	7	15	S	5	4	3	3	4	2	2	2	1	2	5	2	3	6	15	1	15	5	24	
11	8	2	7	9	11	1	2	S	4	5	1	8	9	9	1	1	1	1	3	3	3	4	7	12	1	12	5	24	
12	12	11	13	10	15	16	S	32	31	31	17	16	18	13	12	11	13	14	13	13	12	13	14	19	10	32	16	24	
13	28	28	16	16	16	S	19	20	20	17	12	15	9	10	15	14	23	16	7	6	9	11	10	9	6	28	15	24	
14	7	16	26	18	S	6	7	15	22	14	7	C	C	C	C	C	C	C	17	20	7	15	17	11	6	26	-	24	
15	8	7	6	S	5	4	5	7	15	15	7	6	7	2	2	11	2	2	1	1	1	2	2	1	1	15	5	24	
16	1	1	S	1	1	1	2	4	3	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	4	1	24	
17	1	S	1	1	1	2	2	2	3	3	2	2	1	2	3	3	7	4	4	3	3	2	2	2	1	7	2	24	
18	S	7	3	8	10	9	14	25	22	21	6	6	3	4	3	3	7	9	9	8	6	6	6	S	3	25	9	24	
19	6	5	5	6	5	7	9	13	14	10	11	9	9	11	13	11	14	16	22	16	16	17	S	16	5	22	11	24	
20	17	22	18	14	11	14	13	9	5	4	3	3	2	2	3	3	2	2	5	3	S	4	3	2	2	22	7	24	
21	3	3	3	4	8	5	7	9	22	7	8	3	4	12	4	2	5	7	5	6	S	3	5	6	2	22	6	24	
22	7	6	6	7	5	6	14	13	8	6	5	4	6	5	8	14	10	18	16	S	5	6	6	2	2	18	8	24	
23	1	1	1	1	1	1	2	2	P	2	2	1	2	2	3	2	2	1	S	3	25	20	11	5	1	25	4	23	
24	13	3	5	10	16	7	23	35	23	18	10	9	6	8	6	4	5	S	7	7	6	6	7	8	3	35	11	24	
25	7	9	8	6	6	12	19	31	28	26	8	9	9	7	6	5	S	8	18	11	9	11	11	9	5	31	12	24	
26	12	12	13	11	16	18	27	24	23	24	16	15	16	15	10	S	10	7	15	12	5	13	8	5	5	27	14	24	
27	4	4	10	9	11	4	9	5	5	4	8	12	4	18	S	22	6	2	1	1	15	13	14	2	1	22	8	24	
28	1	2	2	1	1	2	34	35	17	3	8	10	3	S	4	3	2	5	3	2	3	3	2	1	1	35	6	24	
HOURLY MAX	28	28	26	18	16	18	34	35	31	31	17	16	18	18	15	22	23	18	22	20	25	20	17	19					
HOURLY AVG	7	7	7	6	7	6	10	15	14	10	7	6	5	6	5	6	6	6	7	6	6	7	6	6					

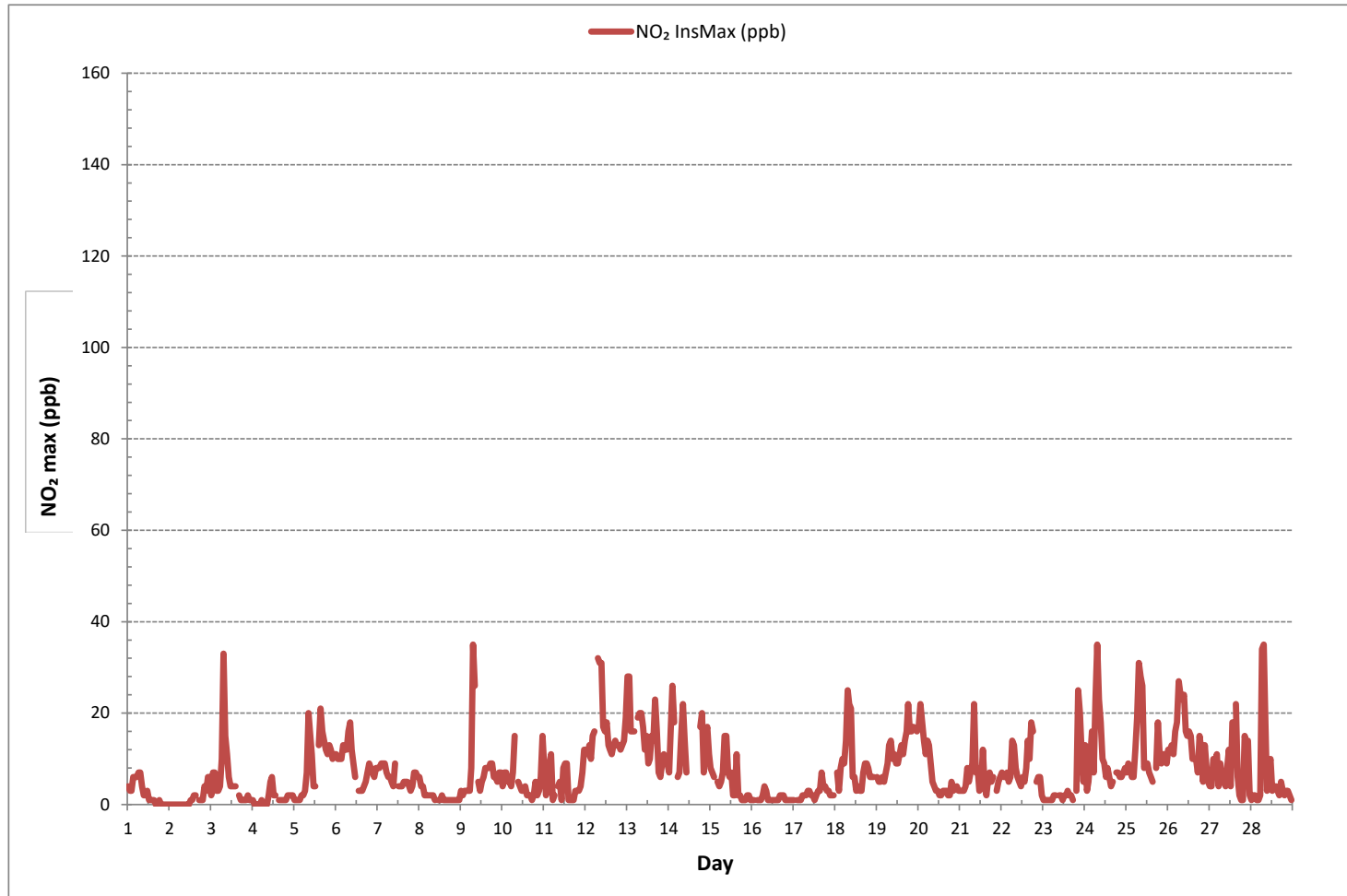
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	610
MAXIMUM INSTANTANEOUS VALUE:	35 ppb @ HOUR 7 ON DAY 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	7

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2019

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	14.2	13.9	12.3	11.5	10.7	10.4	10.6	9.9	12.1	11.0	11.1	11.0	6.5	8.1	8.6	8.5	9.7	10.1	9.4	10.3	8.4	11.3	10.7	12.6	6.5	14.2	10.5	24	
2	12.0	10.3	9.2	8.6	10.0	9.6	8.5	11.5	13.5	10.7	10.8	9.6	8.8	10.0	9.5	8.2	6.3	5.8	5.4	2.5	3.9	3.4	3.4	4.0	2.5	13.5	8.1	24	
3	4.8	3.4	3.0	4.4	4.5	2.5	2.5	2.8	2.0	2.1	2.9	3.4	4.6	5.3	3.4	6.3	5.3	5.4	6.4	3.3	4.6	2.0	5.5	6.6	2.0	6.6	4.0	24	
4	7.1	6.0	4.7	4.4	5.1	5.3	4.3	4.4	4.2	5.4	4.1	4.2	4.8	5.1	5.1	6.4	5.3	3.4	2.7	1.7	1.5	0.6	1.2	0.9	0.6	7.1	4.1	24	
5	1.3	1.3	1.5	1.4	1.1	0.9	0.9	0.9	0.6	0.0	0.6	3.1	3.6	4.5	3.3	2.3	5.9	5.5	3.3	1.6	1.9	1.5	1.5	1.9	0.0	5.9	2.1	24	
6	1.8	1.7	1.1	1.2	1.3	1.1	1.1	1.0	1.0	1.1	2.5	5.5	6.5	5.4	4.7	4.2	2.1	2.5	2.5	1.0	1.3	1.3	1.1	1.0	6.5	2.2	24		
7	1.9	0.8	1.2	1.1	1.8	1.6	1.6	1.6	2.1	2.6	5.4	7.1	8.6	7.2	7.1	7.0	5.2	3.3	3.7	3.5	7.1	6.6	4.2	4.7	0.8	8.6	4.0	24	
8	4.3	2.3	3.5	3.8	5.4	5.8	3.6	5.1	5.2	6.7	9.5	8.4	7.0	9.5	8.1	8.2	6.5	5.1	9.9	7.8	10.5	10.0	9.7	5.4	2.3	10.5	6.7	24	
9	3.2	3.7	1.7	2.2	1.4	1.3	1.2	1.6	1.9	5.3	4.9	3.8	5.2	6.4	6.3	7.2	6.2	2.5	3.5	2.9	4.3	2.3	1.3	3.6	1.2	7.2	3.5	24	
10	6.2	5.8	2.8	1.0	1.3	0.9	0.9	1.0	1.8	2.6	4.6	6.5	6.6	8.2	6.6	6.1	6.3	7.2	7.7	8.5	7.3	9.4	6.0	6.6	0.9	9.4	5.1	24	
11	10.4	8.1	5.9	5.5	6.0	6.6	5.6	4.3	4.9	4.7	6.0	6.0	7.3	6.2	6.2	5.4	6.0	1.8	1.3	2.3	1.7	1.5	1.3	0.9	0.9	10.4	4.8	24	
12	2.0	2.7	4.0	2.0	1.7	1.3	1.6	1.5	1.2	3.7	4.0	3.4	6.4	5.8	5.0	7.7	7.7	5.5	3.2	2.4	2.9	1.7	1.3	1.2	1.2	7.7	3.3	24	
13	1.7	1.8	1.5	1.1	2.7	2.4	1.1	1.3	1.0	1.6	2.4	3.2	4.8	6.3	7.5	6.8	6.0	4.3	3.6	4.1	2.7	2.2	1.1	1.3	1.0	7.5	3.0	24	
14	0.9	1.2	1.1	1.3	1.1	1.0	0.9	1.5	1.3	1.8	2.4	6.4	6.3	5.0	5.9	6.0	3.9	2.9	3.4	1.4	2.1	5.4	3.3	1.6	0.9	6.4	2.8	24	
15	1.3	1.5	1.6	2.3	3.7	1.6	1.7	3.8	3.5	3.3	3.9	8.5	7.2	8.4	10.2	7.1	6.6	6.4	4.7	6.2	4.6	4.0	3.6	5.4	1.3	10.2	4.6	24	
16	6.8	8.3	6.7	7.5	7.0	7.7	6.2	5.0	10.6	9.3	9.0	10.3	13.4	13.0	12.9	13.1	11.4	9.7	8.8	11.9	11.8	9.3	9.9	9.7	5.0	13.4	9.5	24	
17	8.2	7.1	6.0	6.2	4.7	7.1	7.5	7.7	8.1	10.1	8.8	7.6	7.8	7.2	6.9	6.7	4.6	6.1	6.3	5.6	4.5	4.8	2.5	1.3	1.3	10.1	6.4	24	
18	1.5	1.3	1.5	1.7	1.7	1.7	2.4	1.2	1.2	5.7	7.0	10.6	13.5	11.3	13.6	15.9	13.6	11.4	12.1	11.5	7.2	9.6	8.9	8.6	1.2	15.9	7.3	24	
19	7.9	8.0	8.0	9.0	9.2	9.6	8.3	7.2	7.3	6.4	7.0	7.0	6.6	6.1	6.6	7.7	5.4	2.8	2.5	3.3	3.6	4.8	1.8	1.5	1.5	9.6	6.1	24	
20	1.7	1.4	1.4	2.0	1.3	1.9	2.6	4.8	8.9	9.6	11.3	11.8	12.8	8.8	12.6	12.3	14.1	13.3	12.6	8.2	9.2	10.6	7.8	7.9	1.3	14.1	7.9	24	
21	8.1	6.2	3.4	3.2	3.6	6.0	2.1	3.0	2.7	4.6	5.8	7.7	8.6	9.3	9.3	10.7	9.4	7.0	5.7	8.0	9.3	6.0	7.4	6.9	2.1	10.7	6.4	24	
22	7.1	6.9	5.2	3.9	3.3	4.6	5.8	4.1	5.0	9.5	7.6	8.0	6.7	7.2	4.7	2.5	1.9	2.3	9.5	15.8	18.7	14.1	14.4	14.5	1.9	18.7	7.6	24	
23	11.3	15.5	11.6	13.4	10.1	9.4	17.8	16.3	P	12.6	15.3	16.9	13.8	14.1	13.6	12.8	13.3	10.6	10.1	6.6	6.1	5.7	5.8	5.6	5.6	17.8	11.7	23	
24	4.1	2.5	2.4	2.2	2.3	1.5	2.0	1.7	1.8	3.5	6.3	7.3	6.6	7.6	7.0	6.7	9.5	7.8	5.4	4.4	4.9	3.8	3.7	4.4	1.5	9.5	4.6	24	
25	4.1	4.3	3.9	3.5	5.0	6.1	6.1	4.0	4.4	3.7	4.4	7.7	10.3	11.0	12.0	11.0	11.2	10.3	8.3	7.0	7.8	7.6	9.5	7.8	3.5	12.0	7.1	24	
26	9.3	5.2	7.8	7.1	5.4	6.2	6.9	8.0	6.0	6.1	6.8	8.5	9.6	8.6	11.4	10.9	15.7	14.4	12.0	9.4	8.9	10.7	11.7	9.8	5.2	15.7	9.0	24	
27	10.7	10.4	11.1	11.7	9.5	8.4	8.3	9.9	13.4	13.5	12.0	18.8	17.1	18.6	19.1	17.0	13.1	15.6	7.1	6.6	5.4	8.0	6.2	7.0	5.4	19.1	11.6	24	
28	2.8	3.9	3.4	1.5	1.3	1.2	2.0	3.4	3.8	9.5	8.1	8.1	8.7	8.3	10.3	11.5	13.6	13.7	11.8	8.4	6.4	8.2	9.4	10.4	1.2	13.7	7.1	24	
HOURLY MAX	14.2	15.5	12.3	13.4	10.7	10.4	17.8	16.3	13.5	13.5	15.3	18.8	17.1	18.6	19.1	17.0	15.7	15.6	12.6	15.8	18.7	14.1	14.4	14.5					

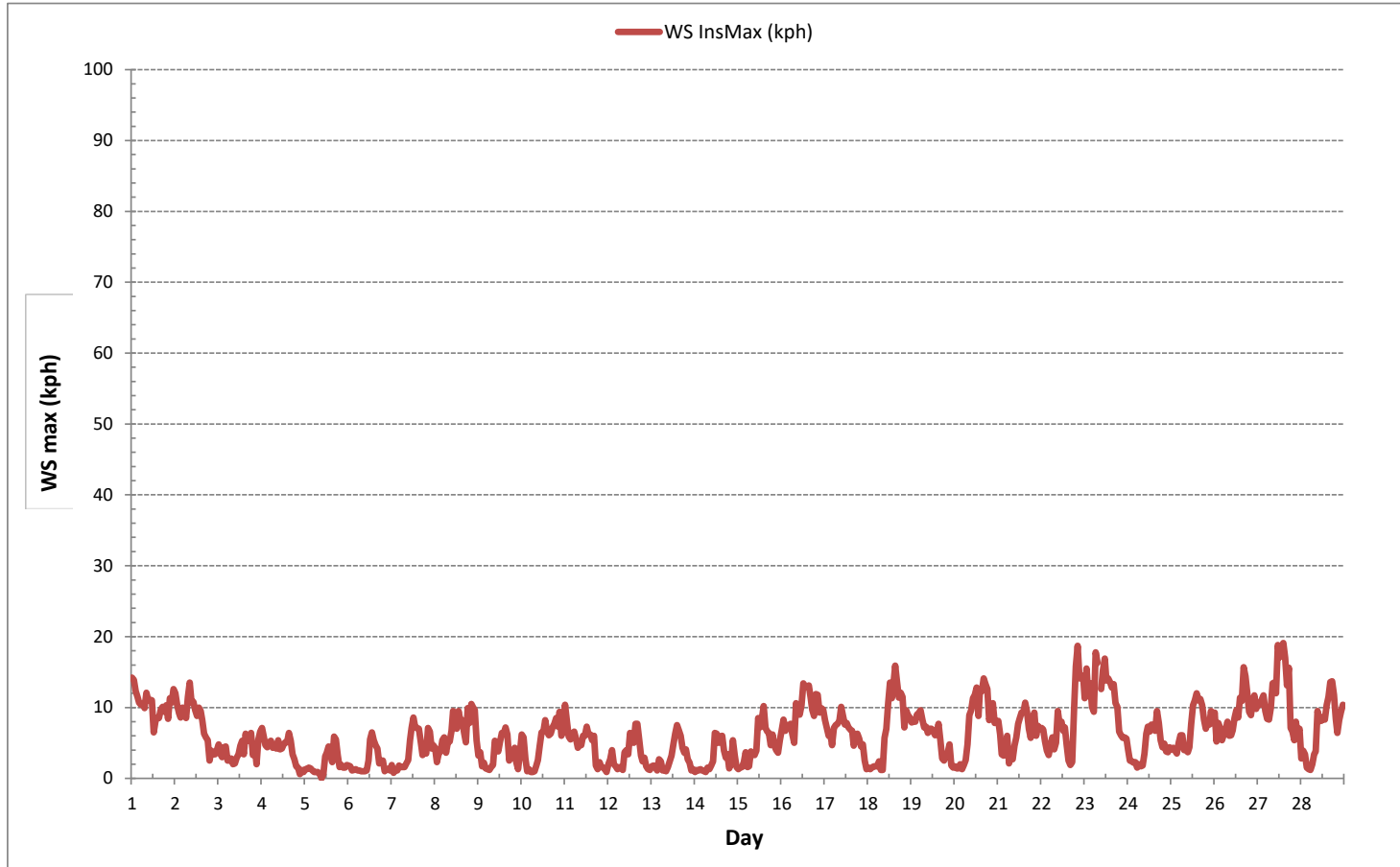
STATUS FLAG CODES

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:	19.1	kph	@ HOUR	14	ON DAY	27	
OPERATIONAL TIME:						671	hrs

WIND SPEED Instantaneous Maximum (WS kph)



1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than $\pm 10\%$ from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO₂/NO_x and CH₄/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, 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.

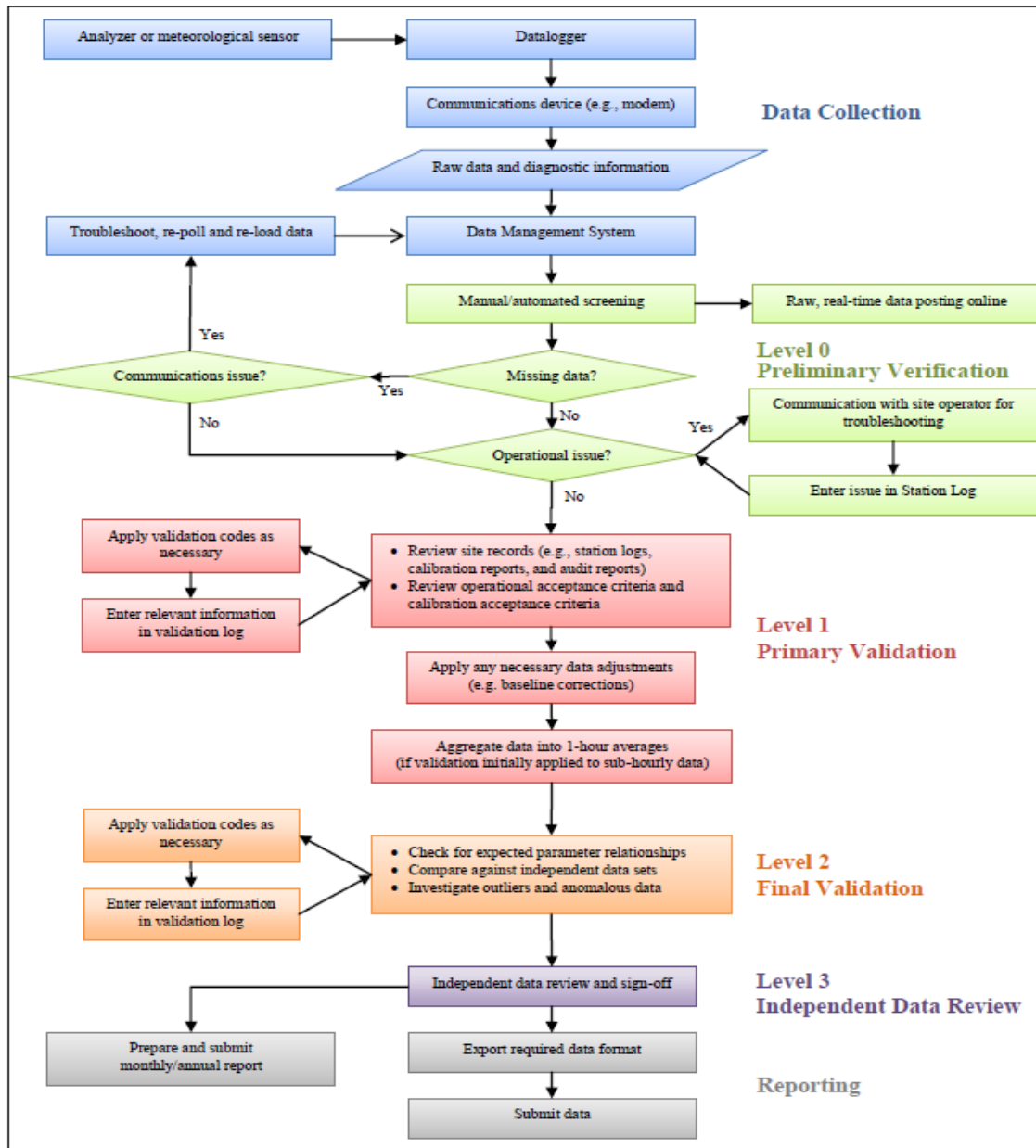
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

AMD Data Verification and Validation Process

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

<p>Level 0 Preliminary Verification</p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p>Level 1 Primary Validation</p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p>Level 2 Final Validation</p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p>Level 3 Independent Data Review</p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p>Post-Final Validation</p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2019-02-24-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>11- Mar- 2019</u>
Level 1 Primary Validation	<u><i>bimadeniji</i></u>	Date <u>11- Mar- 2019</u>
Level 2 Final Validation	<u><i>bimadeniji</i></u>	Date <u>12- Mar- 2019</u>
Level 3 Independent Data Review	<u><i>msadmbg</i></u>	Date <u>14- Mar- 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.

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FEBRUARY 1 - 28, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-02-25-C

LICA-201902

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

Monitoring Station

St. Lina Continuous Monitoring Station

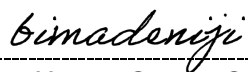
Date of Report Issuance: March 22, 2019

Report Preparation By:

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Project Manager, Customer Service, Air Services

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Project Team Lead, Customer Service, Air Services



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

LICA-201902

Page 177 of 350

Lakeland Industry & Community Association

5107 50 St.

Bonnyville, Alberta T9N 2J7

Attention: Mike Bisaga

Date: March 22, 2019

Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for FEBRUARY 1 - 28, 2019

In February 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station near St. Lina, Alberta. The monitoring program provides measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

Network Parameters for Continuous Monitoring:

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements Chapter 9, 13.1.7, RC 13-R. The station is equipped with analyzers to measure SO₂, H₂S, THC, CH₄, NMHC, NOx, NO, NO₂, PM_{2.5} and O₃. The meteorological sensors and equipment capture data for WS, WD, RH, BP, PRECIP, AmbTPX and STDWD.

Exceedance & Performance Reporting:

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the AMD, Chapter 6, DQ 4-C, 2016.

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, January 2019). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied (Chapter 9, Appendix A, AMD 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

Monthly Monitoring Overview:

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of February did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

During this monitoring period, there were no scheduled audits, to which Maxxam Analytics was privy to.

SO₂: The analyzer spanned outside the lower acceptance limit on January 29. The results of subsequent scheduled zero-span checks drifted further outside limit, indicating the depletion of the permeation tube. The permeation tube was replaced on February 12, during the monthly calibration. As the monthly calibration result met AMD requirements, no data was discarded due to this issue.

O₃:

- The automated daily zero-span check, scheduled for hour 20:00 on February 6, was not executed. A successful zero-span check was completed on February 7, at hour 7:00. Two hours of downtime were recorded due to this event.
- One hour of downtime was recorded on February 17, due to an additional zero-span check performed to assess a biased high baseline zero drift.

WS/WD/STDWD: Anomalous WS spikes were recorded on February 5, between hours 4:00 and 8:00. Impacted WS data were therefore invalidated, along with the corresponding WD and STDWD data. Three hours of downtime were attributed to this event.

Should you have any questions concerning the results or if we can be of further assistance, please contact your Maxxam representative indicated below.

Reviewed by:



Wunmi Adekanmbi, M.Sc., EPT, PMP

Project Team Lead, Customer Service, Air Services

403-219-3677

I certify that I 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. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.

Maxxam Analytics Inc.

#1, 2080 - 39th Avenue, NE Calgary, AB, T2E 6P7
LICA-201902

Page 178 of 350

TABLE OF CONTENTS

TITLE PAGE	1
COVER LETTER	2
TABLE OF CONTENTS	3
ABBREVIATIONS	4
AAAQO EXCEEDANCE SUMMARY	5
MONTHLY CONTINUOUS DATA SUMMARY	6
OPERATIONAL SUMMARY	7
SUMMARY TABLES, GRAPHS AND ROSES	9
Sulphur Dioxide	10
Hydrogen Sulphide	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter _{2.5}	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
Relative Humidity	58
Barometric Pressure	60
Ambient Temperature	62
Precipitation	64
MAXIMUM INSTANTANEOUS DATA	66
1.0 Quality Control Activities	86
2.0 Data Verification and Validation	87
Validation Certificate Form	90
End of Report	91

List of Acronyms

AAAQO	Alberta Ambient Air Quality Objectives and Guidelines Summary
AEP	Alberta Environment and Parks
AMBTPX	Ambient Temperature
AMD	Air Monitoring Directive
BP	Barometric Pressure
CH₄	Methane
DAS	Data acquisition system
hr	Hour
hrs	Hours
H₂S	Hydrogen Sulphide
IZS	Internal zero-span
kph	Kilometers per hour
NO	Nitric Oxide
NO₂	Nitrogen dioxide
NO_x	Total oxides of nitrogen
O₃	Ozone
NMHC	Non-Methane Hydrocarbon
PM_{2.5}	Particulate matter less than or equal to 2.5 microns in diameter
Precip	Precipitation
ppb	Parts per billion
ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
RH	Relative Humidity
SHARP	Synchronized Hybrid Ambient Real-time Particulate Monitor
SOP	Standard Operating Procedure
SO₂	Sulphur Dioxide
STDWD	Standard Deviation Wind Direction
THC	Total hydrocarbons
WS	Wind Speed
WD	Wind Direction
°C	Degrees Celsius

AAAQO 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 AAAQG 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 76 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

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	1	7	14	13	8.6	SE	3	14	100.0
H ₂ S (ppb)	10	3	0	0	0	1	20	10	11.7	ENE	1	20	100.0
THC (ppm)	-	-	-	-	2.15	3.06	15	3	13.3	E	2.52	7	100.0
CH ₄ (ppm)	-	-	-	-	2.15	3.06	15	3	13.3	E	2.52	7	100.0
NMHC (ppm)	-	-	-	-	0.00	0.03	27	11	19.6	WNW	0.00	1	100.0
NO ₂ (ppb)	159	-	0	-	4	17	15	3	13.3	E	11	14	100.0
NO (ppb)	-	-	-	-	1	9	26	10	12.7	SW	2	19	100.0
NO _x (ppb)	-	-	-	-	5	20	19	15	10.9	SW	12	14	100.0
O ₃ (ppb)	76	-	0	-	34.1	47.1	27	15	17.5	NW	43.8	27	99.6
PM _{2.5} (µg/m ³)	80	29	0	0	6	57	8	6	5.7	NNE	15	14	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	75	98	20	0	8.5	NNW	90	20	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	929	947	9	2	8.3	NNE	944	9	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-21.1	-1.6	27	15	17.5	NW	-7.2	27	100.0
PRECIPITATION (mm)	-	-	-	-	6.9	0.9	1	22	16.7	E	5.5	1	100.0
VECTOR WS (kph)	-	-	-	-	0.5	22.4	23	0	-	N	16.2	23	99.6
VECTOR WD (sec)	-	-	-	-	300 (WNW)	-	-	-	-	-	-	-	99.6

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

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO ₂)	Thermo 43i TLE Pulsed Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 12, between the hours of 12:00 and 16:00. The analyzer spanned outside the lower acceptance limit on January 29. The results of subsequent scheduled zero-span checks drifted further outside limit, indicating the depletion of the permeation tube. The permeation tube was replaced on February 12, during the monthly calibration and was allowed time to stabilize. The span reference value was updated following the scheduled daily zero-span check on February 14. As the monthly calibration result met AMD requirements, no data was discarded due to this issue.
HYDROGEN SULPHIDE (H ₂ S)	Thermo 450i UV Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time was 100%. The analyzer exhibited erratic span response across the month, with the lower acceptance limit exceeded five times between February 6 and February 10. A correlation between drifts in span response and shifts in ambient temperatures was observed. The drift pattern in span response appeared to mirror that of ambient temperature. The routine monthly calibration was performed on February 12, between hours 12:00 and 17:00. As the calibration results met AMD requirements, no data was discarded due to the span drift. The analyzer spanned outside the upper acceptance limit on February 20 and February 22. The results of subsequent scheduled span checks were within AMD limit confirming analyzer performance was not impacted. Therefore, no data was discarded due to the failed spans.
TOTAL HYDROCARBONS (THC), METHANE (CH ₄) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine monthly calibration was performed on February 13, between the hours of 10:00 and 14:00. The fuel gas (H₂) cylinder was replaced on February 21.
OXIDES OF NITROGEN (NO _x), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO ₂)	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO ₂ /NO _x Monitoring	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine monthly calibration was performed on February 12, between the hours of 12:00 and 18:00.
OZONE (O ₃)	Thermo 49i Photometric Analyzer	Maxxam AIR SOP-00212: Ambient O ₃ Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. The automated daily zero-span check, scheduled for hour 20:00 on February 6, was not executed. A successful zero-span check was completed on February 7, at hour 7:00. Two hours of downtime were recorded due to this event. The routine monthly calibration was performed on February 13, between the hours of 10:00 and 16:00. The baseline zero reading exceeded the acceptable range on February 16. A repeat zero-span check was triggered on February 17, at hour 8:00 and no further drift was observed. One hour of downtime was incurred due to the additional quality check. Data collected on February 16 was baseline-corrected incrementally using the daily zero result of February 15 and the result of the repeat zero check on February 17, which are both valid.

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
PARTICULATE MATTER < 2.5 MICRONS (PM _{2.5})	Thermo SHARP 5030i Unit	Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. The routine quarterly calibration was performed on February 13, between the hours of 16:00 and 18:00.
WIND SPEED (WS), WIND DIRECTION (WD) & STANDARD DEVIATION WIND DIRECTION (STDWD)	Met One Unit	Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. Anomalous WS spikes were recorded on February 5, between hours 4:00 and 8:00, as the sensor was obstructed by ice crystals. Impacted WS data were therefore invalidated, along with the corresponding WD and STDWD data. Three hours of downtime were attributed to this event. Nine instances of maximum instantaneous data were invalidated across the month, 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)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. A humidity sensor check was performed on February 21. The result was satisfactory.
BAROMETRIC PRESSURE (BP)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. A pressure sensor check was performed on February 21. The result was satisfactory.
PRECIPITATION (PRECIP)	Met One Unit	Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified.
AMBIENT TEMPERATURE (AmbTPX)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified. A temperature sensor check was performed on February 21. The result was satisfactory.
Datalogger	Envista Ultimate Unit	Operation Manual	<ul style="list-style-type: none"> Operational time was 100% and there were no performance issues identified.

SUMMARY TABLES, GRAPHS AND ROSES

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

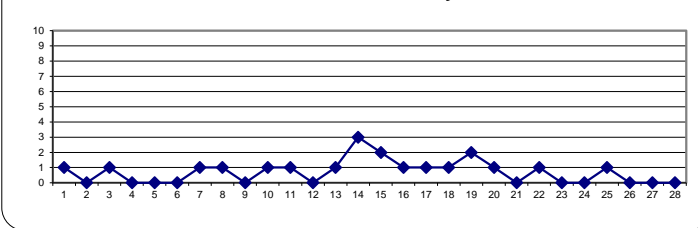
OBJECTIVE LIMIT:

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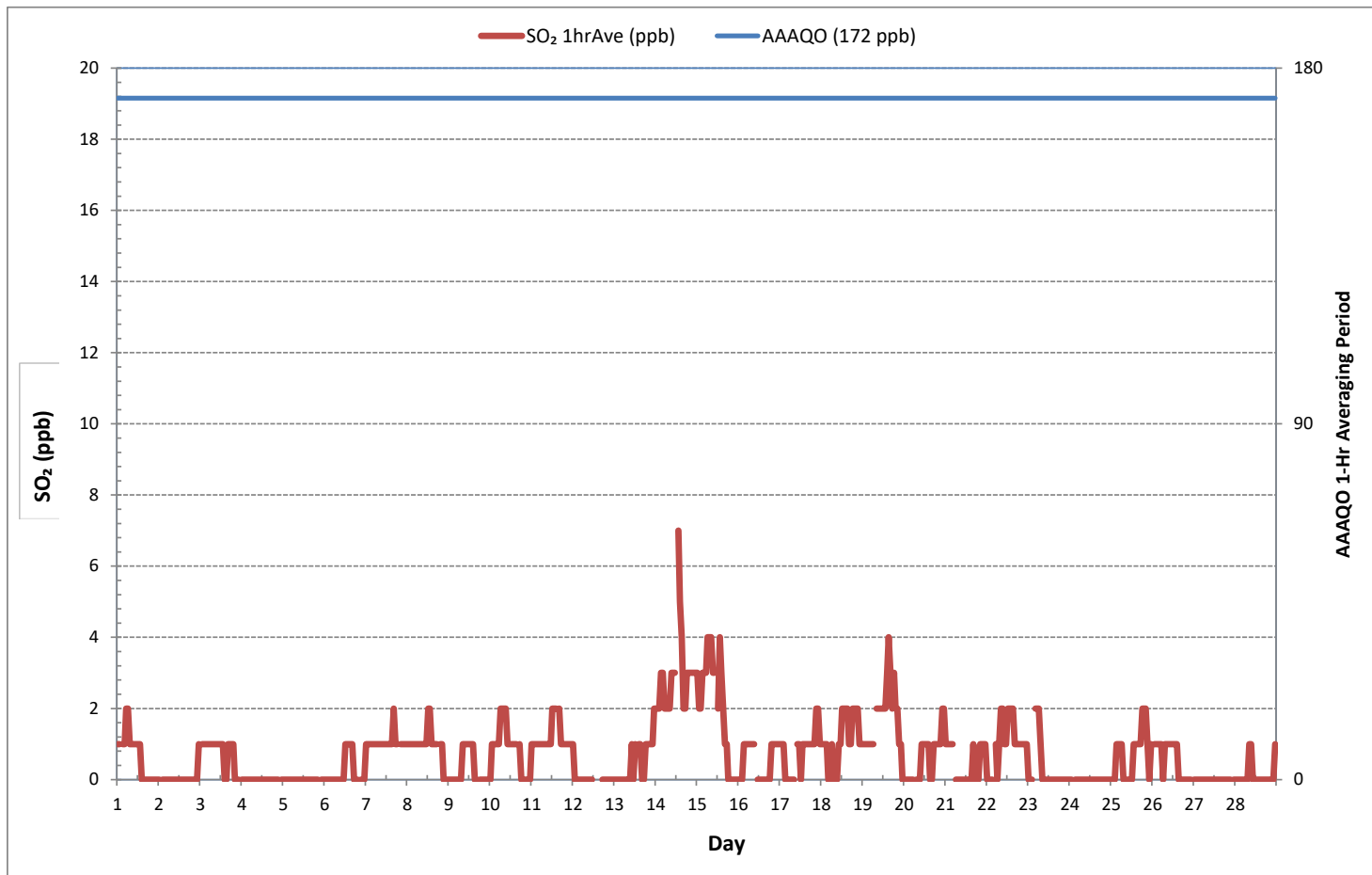
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	319		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	14 ON DAY	1
MAXIMUM 1-HR AVERAGE:	7 ppb @ HOUR	13 ON DAY	14
MAXIMUM 24-HR AVERAGE:	3 ppb	ON DAY	14
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

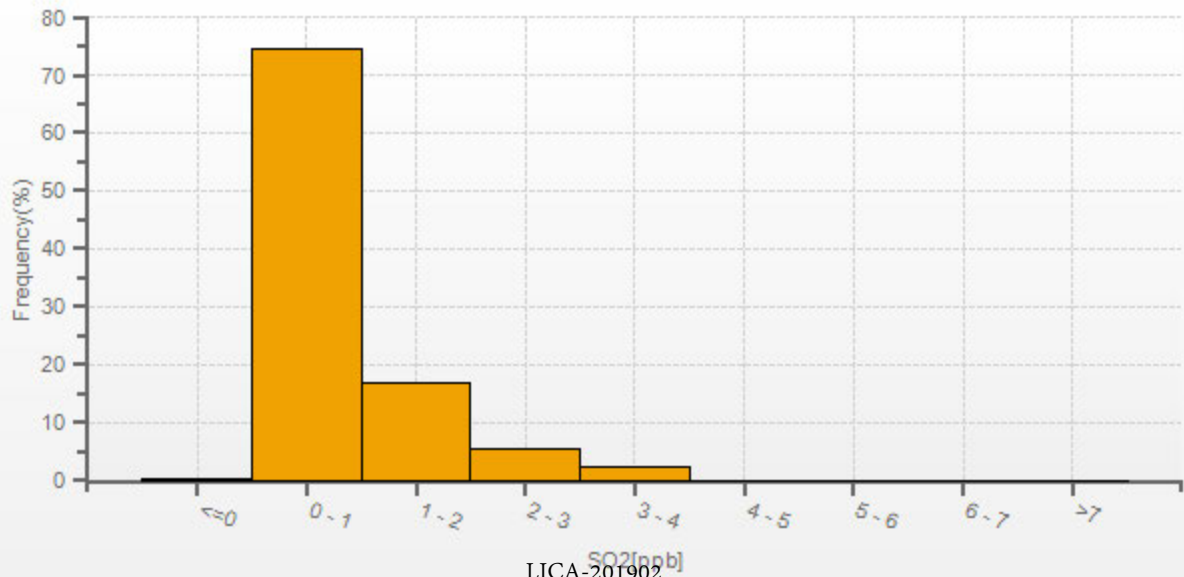
24 HR AVERAGES February 2019



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



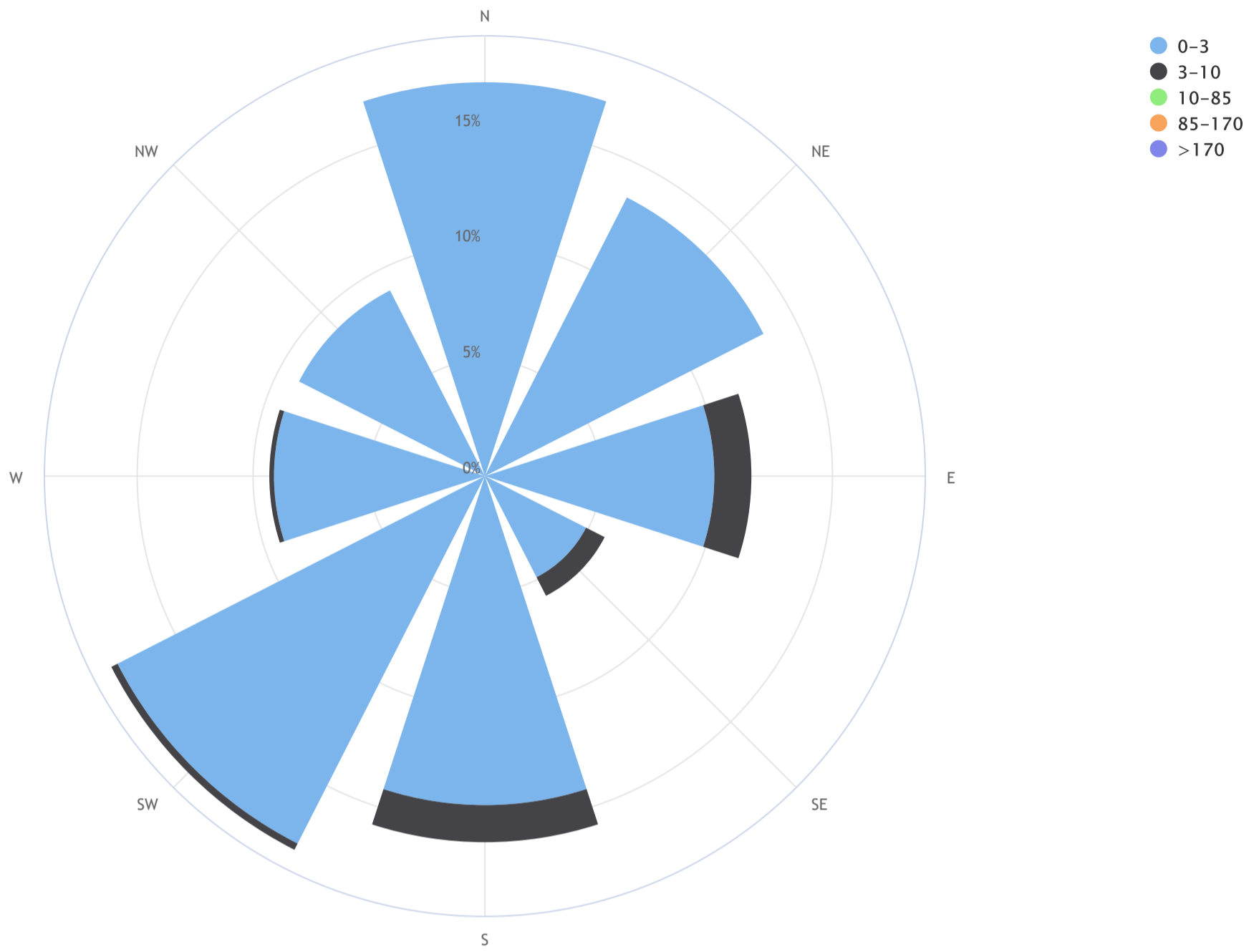
SO2[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902
Page 188 of 350

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_SO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	17.0	0.0	0.0	0.0	0.0	17.0
NE	13.5	0.0	0.0	0.0	0.0	13.5
E	9.9	1.6	0.0	0.0	0.0	11.5
SE	4.9	0.9	0.0	0.0	0.0	5.8
S	14.2	1.6	0.0	0.0	0.0	15.7
SW	17.8	0.3	0.0	0.0	0.0	18.1
W	9.1	0.2	0.0	0.0	0.0	9.3
NW	9.0	0.0	0.0	0.0	0.0	9.0
Summary	95.4	4.6	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0



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

STATUS FLAG CODES

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

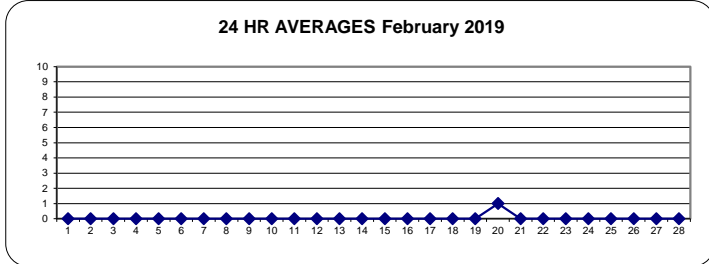
OBJECTIVE LIMIT:

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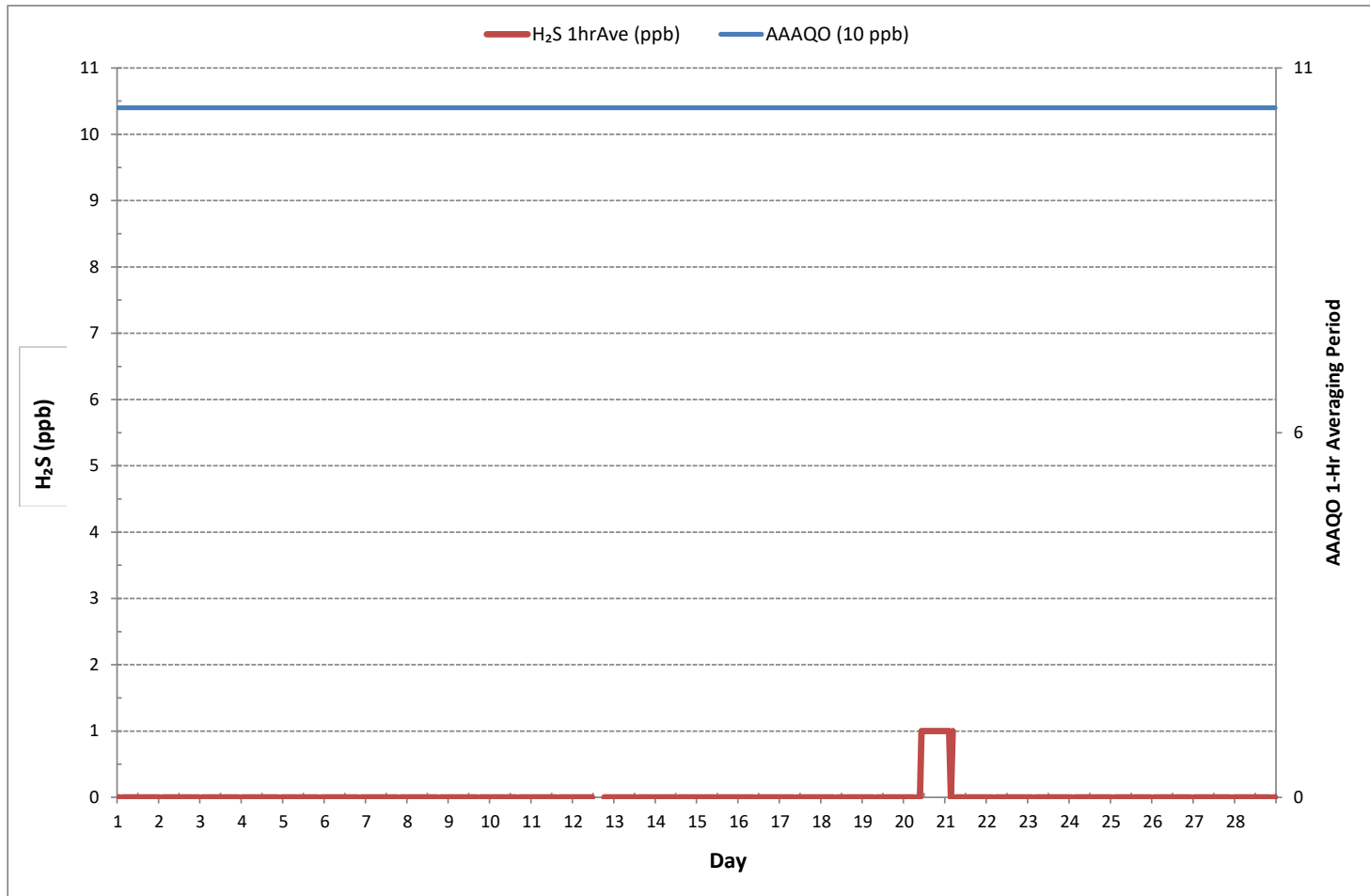
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	18
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR 10 ON DAY 20
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 20
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	672 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

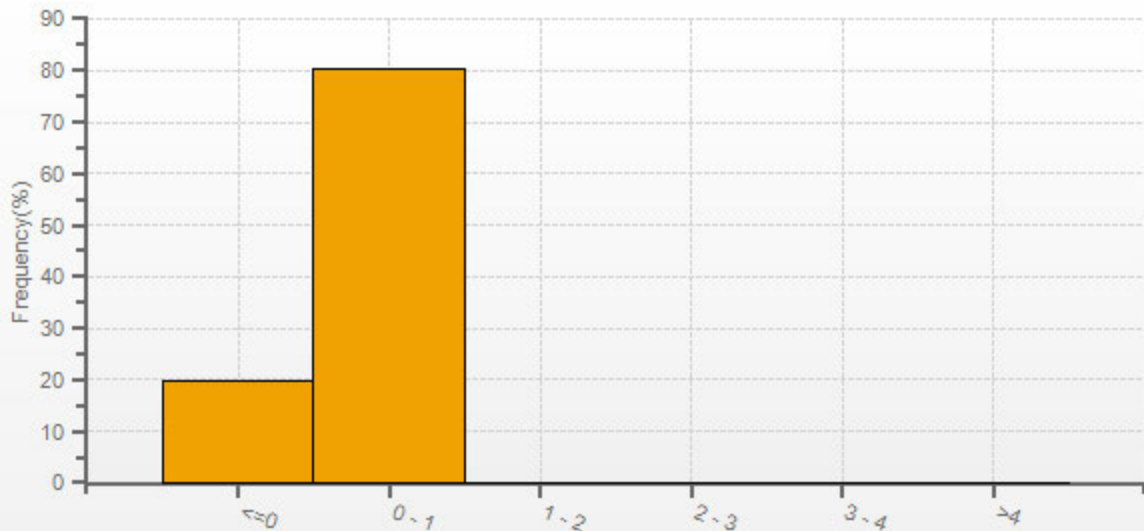
24 HR AVERAGES February 2019



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



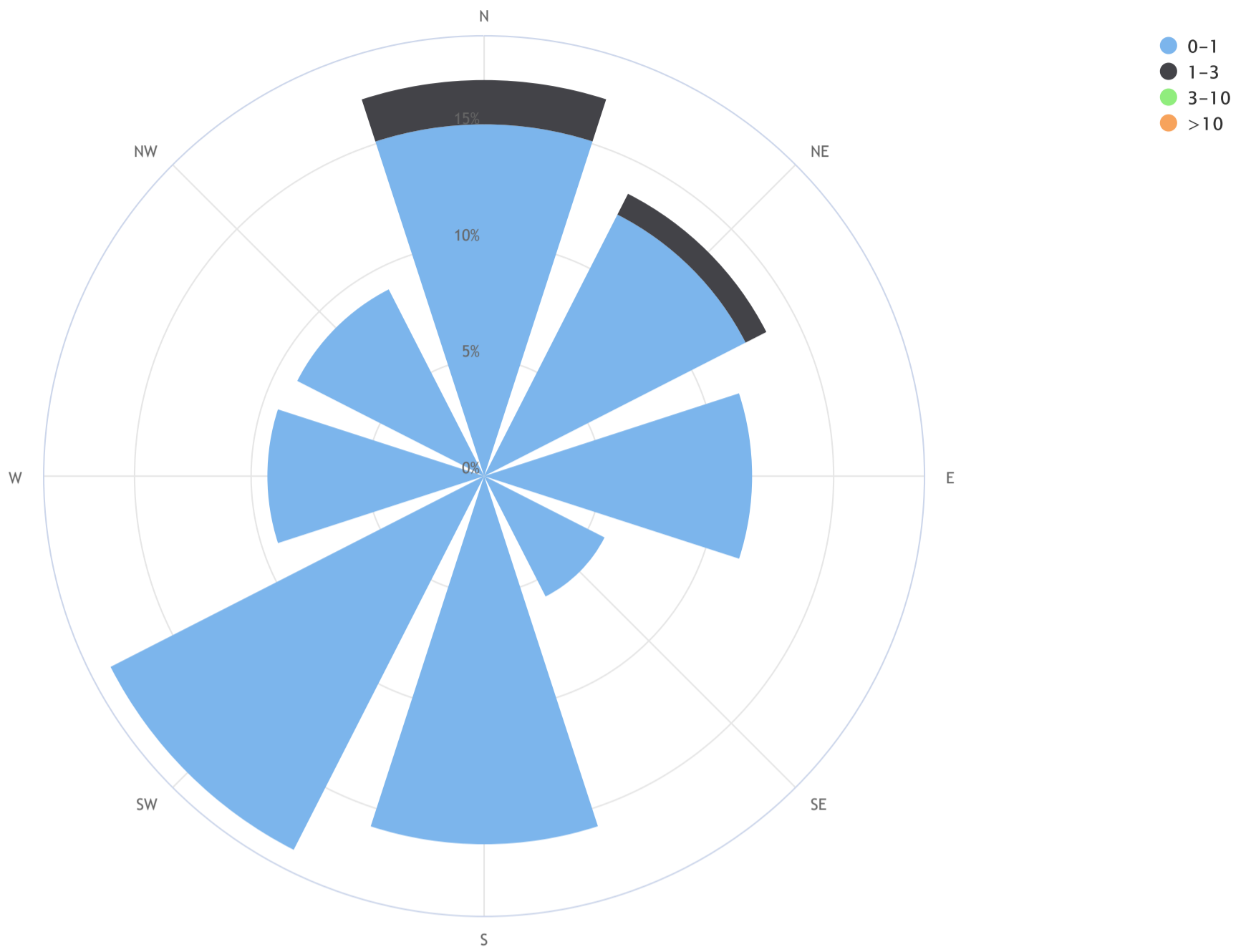
H2S[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_H2S (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-1	1-3	3-10	>10	TOTAL
N	15.1	1.9	0.0	0.0	17.0
NE	12.6	1.0	0.0	0.0	13.6
E	11.5	0.0	0.0	0.0	11.5
SE	5.8	0.0	0.0	0.0	5.8
S	15.8	0.0	0.0	0.0	15.8
SW	18.0	0.0	0.0	0.0	18.0
W	9.3	0.0	0.0	0.0	9.3
NW	9.0	0.0	0.0	0.0	9.0
Summary	97.2	2.8	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0



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	2.01	2.00	S	1.98	2.01	2.01	2.01	2.00	2.02	2.01	2.01	1.98	1.98	1.98	1.96	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	2.02	1.99	24	
2	1.96	S	1.96	1.96	1.96	1.96	1.95	1.98	1.98	1.98	1.98	1.99	1.96	1.97	1.96	1.98	1.99	1.97	2.02	2.07	2.05	2.00	2.02	1.95	2.07	1.98	24			
3	S	2.01	2.00	1.99	2.08	2.01	2.00	2.01	1.99	1.99	1.98	1.98	1.97	1.96	1.96	1.97	1.98	2.02	1.98	1.98	1.98	1.97	S	1.96	2.08	1.99	24			
4	2.05	2.09	2.06	2.02	2.03	2.01	2.00	1.99	2.00	2.01	2.00	2.00	1.99	1.99	2.00	2.00	2.01	2.01	2.00	2.00	2.00	2.07	S	2.15	1.99	2.15	2.02	24		
5	2.15	2.12	2.09	2.10	2.10	2.09	2.06	2.05	2.08	2.21	2.22	2.28	2.24	2.13	2.11	2.12	2.11	2.13	2.23	2.19	2.19	S	2.27	2.29	2.05	2.29	2.15	24		
6	2.26	2.34	2.33	2.37	2.56	2.59	2.33	2.21	2.26	2.27	2.14	2.15	2.08	2.08	2.08	2.08	2.11	2.14	2.39	2.53	S	2.52	2.48	2.53	2.08	2.59	2.30	24		
7	2.52	2.51	2.46	2.45	2.40	2.37	2.42	2.39	2.33	2.37	2.38	2.36	2.39	2.37	2.36	2.49	2.64	2.69	2.69	S	2.80	2.79	2.93	2.87	2.33	2.93	2.52	24		
8	2.82	2.84	2.85	2.82	2.78	2.82	2.83	2.80	2.75	2.68	2.61	2.45	2.37	2.27	2.16	2.14	2.08	2.03	S	2.05	2.00	2.02	2.03	2.05	2.00	2.85	2.45	24		
9	2.02	2.02	2.02	2.02	2.02	2.03	2.04	2.04	2.03	2.03	2.03	2.02	2.04	2.03	2.03	1.98	1.99	S	2.15	2.15	2.09	2.12	2.12	2.17	1.98	2.17	2.05	24		
10	2.27	2.37	2.31	2.35	2.45	2.54	2.60	2.59	2.55	2.44	2.38	2.41	2.33	2.32	2.27	2.23	S	2.11	2.10	2.08	2.08	2.07	2.06	2.08	2.06	2.60	2.30	24		
11	2.08	2.05	2.06	2.06	2.07	2.08	2.07	2.07	2.08	2.08	2.07	2.06	2.06	2.06	2.05	S	2.02	2.01	2.05	2.05	2.07	2.08	2.06	2.06	2.01	2.08	2.06	24		
12	2.06	2.11	2.14	2.14	2.15	2.16	2.19	2.23	2.28	2.25	2.30	2.25	2.16	2.15	S	2.17	2.17	2.17	2.15	2.13	2.13	2.14	2.16	2.16	2.06	2.30	2.17	24		
13	2.17	2.14	2.16	2.13	2.13	2.09	2.08	2.12	2.12	2.10	C	C	C	C	C	2.06	2.06	2.19	2.23	2.22	2.19	2.18	2.18	2.18	2.06	2.23	2.14	24		
14	2.22	2.20	2.18	2.20	2.20	2.27	2.30	2.41	2.49	2.50	2.54	2.50	S	2.45	2.49	2.47	2.75	2.80	2.66	2.81	2.84	2.83	2.88	2.89	2.18	2.89	2.52	24		
15	2.85	2.74	2.94	3.06	2.93	2.82	2.66	2.79	2.62	2.59	2.59	S	2.45	2.32	2.20	2.16	2.13	2.12	2.11	2.09	2.07	2.07	2.07	2.05	2.05	3.06	2.45	24		
16	2.07	2.09	2.12	2.11	2.09	2.08	2.13	2.10	2.08	2.07	S	2.08	2.07	2.05	2.04	2.03	2.03	2.04	2.06	2.09	2.11	2.09	2.10	2.10	2.03	2.13	2.08	24		
17	2.07	2.08	2.09	2.07	2.06	2.05	2.05	2.06	2.06	S	2.06	2.06	2.06	2.06	2.07	2.07	2.06	2.07	2.04	2.02	2.01	2.01	2.05	2.24	2.01	2.24	2.06	24		
18	2.03	2.03	2.03	2.04	2.06	2.06	2.03	2.07	S	2.08	2.12	2.12	2.11	2.09	2.10	2.11	2.07	2.06	2.08	2.12	2.12	2.13	2.13	2.13	2.03	2.13	2.08	24		
19	2.15	2.16	2.19	2.19	2.20	2.21	2.22	S	2.25	2.27	2.25	2.25	2.21	2.19	2.17	2.18	2.21	2.20	2.17	2.16	2.18	2.14	2.10	2.11	2.10	2.27	2.19	24		
20	2.04	2.08	2.08	2.05	2.03	2.02	S	2.05	2.05	2.06	2.18	2.45	2.29	2.11	2.05	2.07	2.10	2.09	2.08	2.09	2.07	2.07	2.08	2.07	2.02	2.45	2.10	24		
21	2.05	2.03	2.01	2.02	2.03	S	2.04	2.04	2.04	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.04	2.04	2.05	2.04	2.04	2.05	2.07	2.08	2.01	2.08	2.03	24		
22	2.08	2.09	2.10	2.11	S	2.11	2.11	2.11	2.12	2.12	2.12	2.12	2.14	2.14	2.12	2.12	2.14	2.17	2.18	2.18	2.16	2.10	2.03	2.03	2.03	2.18	2.12	24		
23	1.98	1.97	1.97	S	1.98	1.98	1.99	1.99	1.98	1.98	1.98	1.99	1.99	1.99	1.99	1.98	1.98	1.98	2.00	2.01	1.99	2.02	1.97	2.02	1.97	2.02	1.99	24		
24	2.02	1.99	S	2.14	2.16	2.17	2.00	2.01	2.00	2.01	2.03	2.04	2.05	2.02	2.01	2.00	2.00	2.00	2.01	2.02	2.03	2.02	2.03	2.04	1.99	2.17	2.03	24		
25	2.05	S	2.04	2.04	2.03	2.04	2.05	2.10	2.12	2.13	2.14	2.10	2.06	2.06	2.04	2.04	2.03	2.02	2.02	2.03	2.06	2.12	2.17	2.20	2.02	2.20	2.07	24		
26	S	2.23	2.24	2.23	2.21	2.24	2.25	2.24	2.23	2.24	2.25	2.20	2.17	2.15	2.13	2.11	2.09	2.07	2.06	2.06	2.07	2.06	2.05	S	2.05	2.25	2.16	24		
27	2.05	2.04	2.03	2.05	2.05	2.03	2.02	2.02	2.01	2.01	1.99	2.98	1.98	2.18	1.99	2.06	2.05	1.98	2.08	2.19	2.15	2.07	S	1.97	1.97	2.98	2.09	24		
28	1.98	1.99	1.97	1.98	1.99	2.04	2.10	1.98	1.97	1.97	1.97	1.97	1.99	1.97	1.96	1.96	1.96	1.97	1.97	1.98	1.98	S	1.98	1.98	1.96	2.10	1.98	24		
HOURLY MAX	2.85	2.84	2.94	3.06	2.93	2.82	2.83	2.80	2.75	2.68	2.61	2.98	2.45	2.45	2.49	2.49	2.75	2.80	2.69	2.81	2.84	2.83	2.93	2.89						
HOURLY AVG	2.15	2.17	2.17	2.17	2.18	2.18	2.17	2.16	2.17	2.17	2.17	2.19	2.12	2.11	2.09	2.09	2.10	2.11	2.13	2.12	2.13	2.14	2.15	2.17						

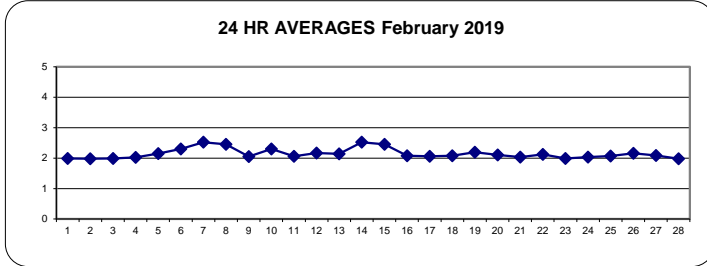
STATUS FLAG CODES

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

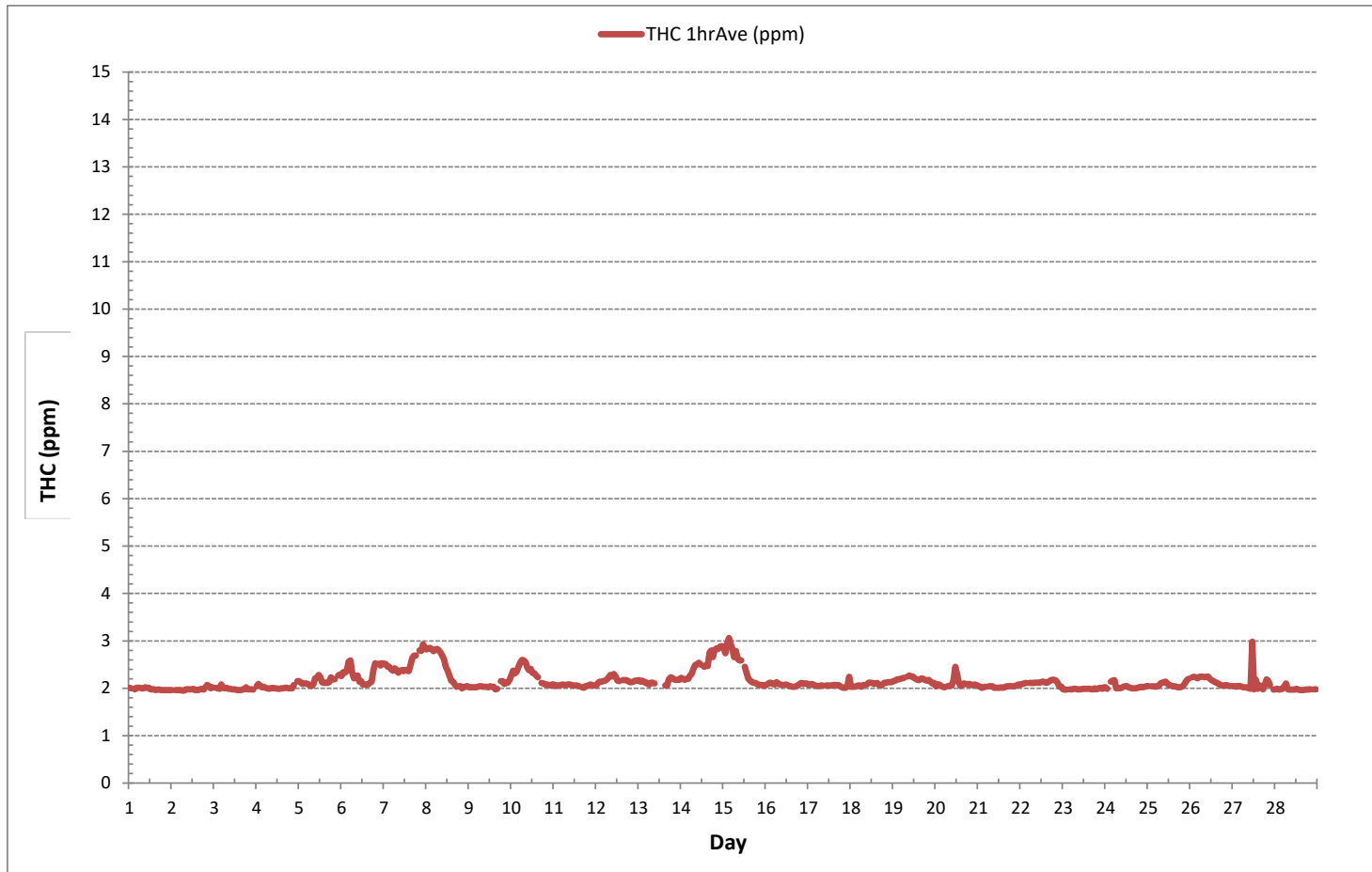
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	638			
MINIMUM 1-HR AVERAGE:	1.95 ppm	@ HOUR	6	ON DAY 2
MAXIMUM 1-HR AVERAGE:	3.06 ppm	@ HOUR	3	ON DAY 15
MAXIMUM 24-HR AVERAGE:	2.52 ppm			ON DAY 7
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.21	MONTHLY AVERAGE:	2.15 ppm	

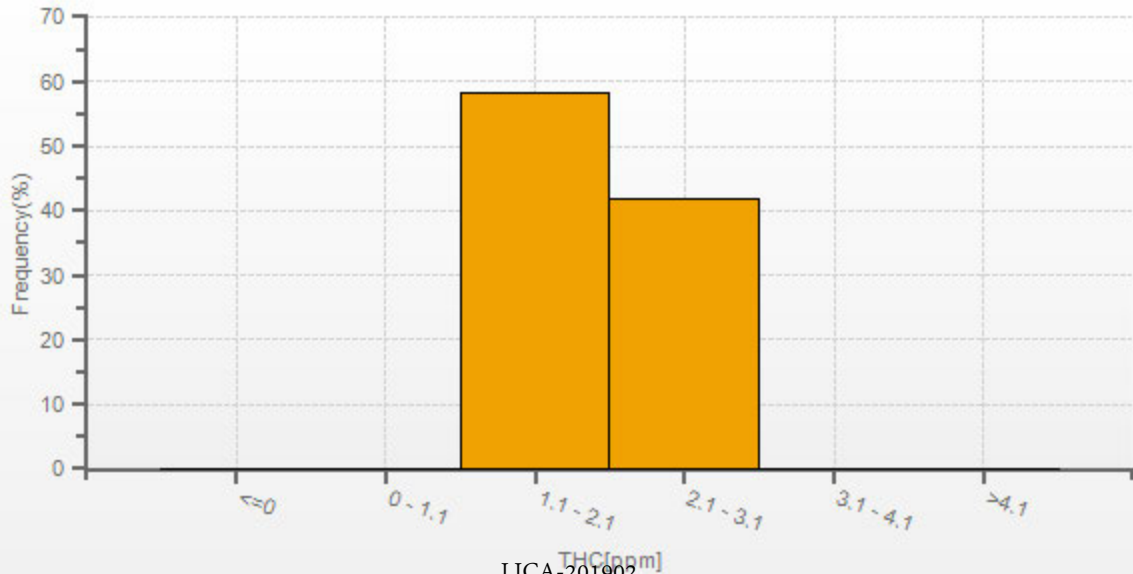
24 HR AVERAGES February 2019



TOTAL HYDROCARBONS Hourly Averages (THC ppm)



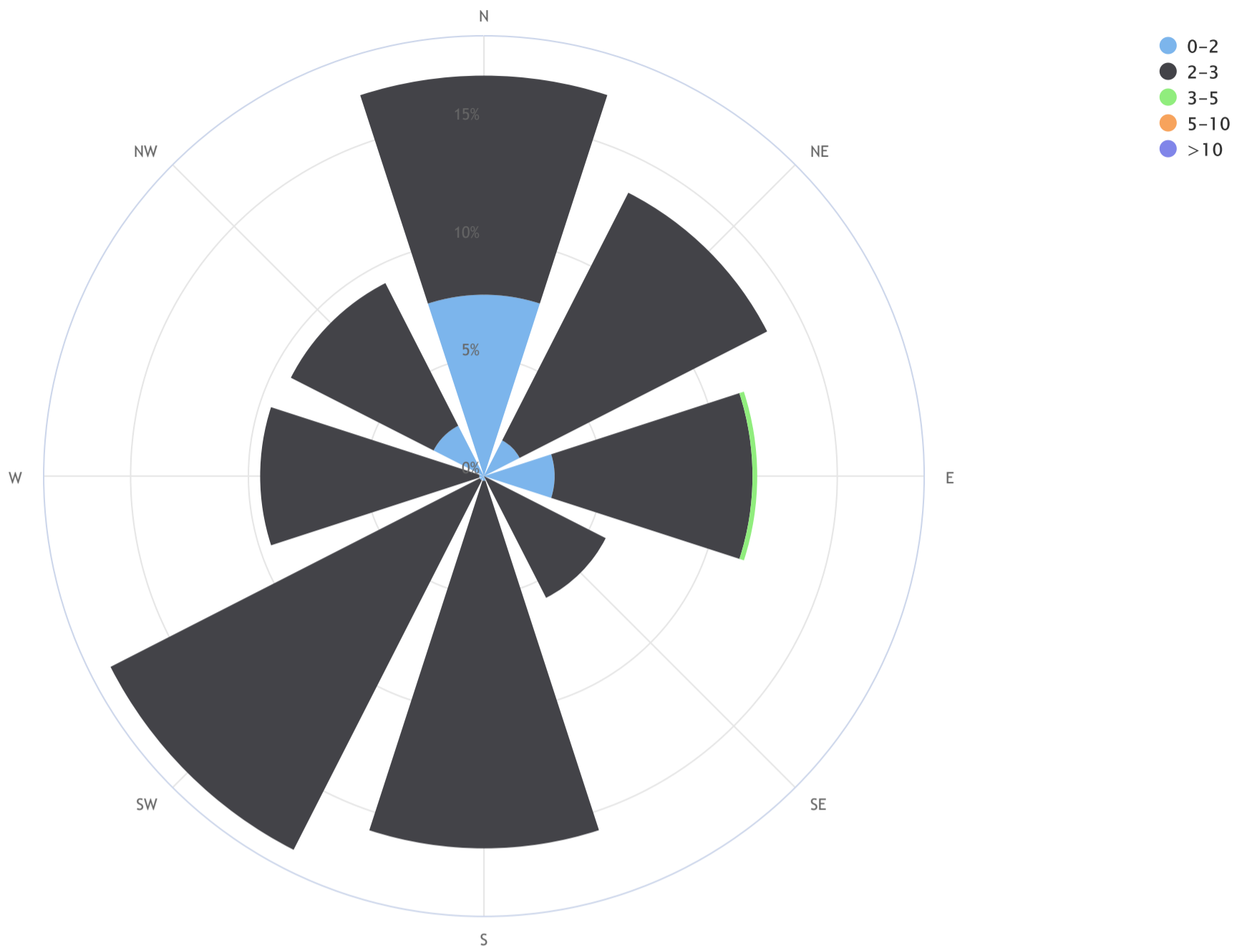
THC[ppm] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_THC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	7.7	9.3	0.0	0.0	0.0	17.0
NE	1.7	11.8	0.0	0.0	0.0	13.5
E	3.0	8.4	0.2	0.0	0.0	11.5
SE	0.0	5.8	0.0	0.0	0.0	5.8
S	0.2	15.6	0.0	0.0	0.0	15.8
SW	0.2	17.6	0.0	0.0	0.0	17.8
W	0.2	9.3	0.0	0.0	0.0	9.5
NW	2.4	6.8	0.0	0.0	0.0	9.1
Summary	15.3	84.6	0.2	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0



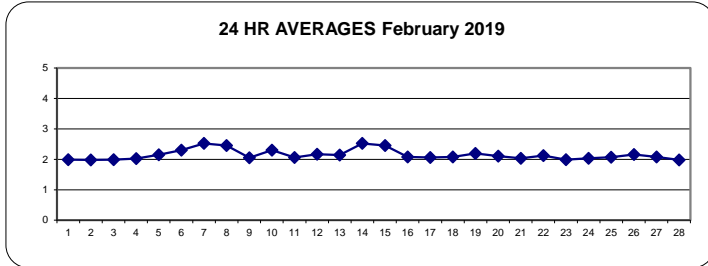
METHANE Hourly Averages (CH₄ ppm)

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	2.01	2.00	S	1.98	2.01	2.01	2.01	2.00	2.02	2.01	2.01	1.98	1.98	1.97	1.96	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	2.02	1.99	24
2	1.96	S	1.96	1.96	1.96	1.96	1.95	1.98	1.98	1.98	1.98	1.99	1.96	1.97	1.96	1.98	1.99	1.97	2.02	2.07	2.05	2.00	2.02	1.95	2.07	1.98	24		
3	S	2.01	2.00	1.99	2.08	2.01	2.00	2.01	1.99	1.99	1.98	1.98	1.97	1.96	1.96	1.97	1.98	2.02	1.98	1.98	1.98	1.97	S	1.96	2.08	1.99	24		
4	2.05	2.09	2.06	2.02	2.03	2.01	2.00	1.99	2.00	2.01	2.00	2.00	1.99	1.99	2.00	2.00	2.01	2.00	2.00	2.00	2.00	2.07	S	2.15	1.99	2.15	2.02	24	
5	2.15	2.12	2.09	2.10	2.10	2.09	2.06	2.05	2.08	2.21	2.22	2.28	2.24	2.13	2.11	2.12	2.11	2.13	2.23	2.19	2.19	S	2.27	2.29	2.05	2.29	2.15	24	
6	2.26	2.34	2.33	2.37	2.56	2.59	2.33	2.21	2.26	2.27	2.14	2.15	2.08	2.08	2.08	2.08	2.11	2.14	2.39	2.53	S	2.52	2.48	2.53	2.08	2.59	2.30	24	
7	2.52	2.51	2.46	2.45	2.40	2.37	2.42	2.39	2.33	2.37	2.38	2.36	2.39	2.37	2.36	2.49	2.64	2.69	2.69	S	2.80	2.79	2.93	2.87	2.33	2.93	2.52	24	
8	2.82	2.84	2.85	2.82	2.78	2.82	2.83	2.80	2.75	2.68	2.61	2.45	2.37	2.27	2.16	2.14	2.08	2.03	S	2.05	2.00	2.02	2.03	2.05	2.00	2.85	2.45	24	
9	2.02	2.02	2.02	2.02	2.02	2.03	2.04	2.04	2.03	2.03	2.03	2.02	2.04	2.03	2.03	1.98	1.99	S	2.15	2.15	2.09	2.12	2.12	2.17	1.98	2.17	2.05	24	
10	2.27	2.37	2.31	2.35	2.45	2.54	2.60	2.59	2.55	2.44	2.38	2.41	2.33	2.32	2.27	2.23	S	2.11	2.10	2.08	2.08	2.07	2.06	2.08	2.06	2.60	2.30	24	
11	2.08	2.05	2.06	2.06	2.07	2.08	2.07	2.07	2.08	2.08	2.07	2.06	2.06	2.06	2.05	S	2.02	2.01	2.05	2.05	2.07	2.08	2.06	2.06	2.01	2.08	2.06	24	
12	2.06	2.11	2.14	2.14	2.15	2.16	2.19	2.23	2.28	2.25	2.30	2.25	2.16	2.15	S	2.17	2.17	2.17	2.15	2.13	2.13	2.14	2.16	2.16	2.06	2.30	2.17	24	
13	2.17	2.14	2.16	2.13	2.13	2.09	2.08	2.12	2.12	2.10	C	C	C	C	C	2.06	2.06	2.19	2.23	2.22	2.19	2.18	2.18	2.18	2.06	2.23	2.14	24	
14	2.21	2.20	2.18	2.20	2.20	2.27	2.30	2.41	2.49	2.50	2.54	2.50	S	2.45	2.49	2.47	2.75	2.80	2.66	2.81	2.84	2.83	2.88	2.89	2.18	2.89	2.52	24	
15	2.85	2.74	2.94	3.06	2.93	2.82	2.66	2.79	2.62	2.59	2.59	S	2.45	2.32	2.20	2.16	2.13	2.12	2.11	2.09	2.07	2.07	2.07	2.05	2.05	3.06	2.45	24	
16	2.07	2.09	2.12	2.11	2.09	2.08	2.13	2.10	2.08	2.07	S	2.08	2.07	2.05	2.04	2.03	2.03	2.04	2.06	2.09	2.11	2.09	2.10	2.10	2.03	2.13	2.08	24	
17	2.07	2.08	2.09	2.07	2.06	2.05	2.06	2.06	S	2.06	2.06	2.06	2.06	2.06	2.07	2.07	2.06	2.07	2.04	2.02	2.01	2.01	2.05	2.24	2.01	2.24	2.06	24	
18	2.03	2.03	2.03	2.04	2.06	2.06	2.03	2.07	S	2.08	2.12	2.12	2.11	2.09	2.10	2.11	2.07	2.06	2.08	2.12	2.12	2.13	2.13	2.13	2.03	2.13	2.08	24	
19	2.15	2.16	2.19	2.19	2.20	2.21	2.22	S	2.25	2.27	2.25	2.25	2.20	2.19	2.17	2.18	2.21	2.20	2.17	2.16	2.18	2.14	2.10	2.11	2.10	2.27	2.19	24	
20	2.04	2.08	2.08	2.05	2.03	2.02	S	2.05	2.05	2.06	2.18	2.45	2.29	2.11	2.05	2.07	2.10	2.09	2.08	2.09	2.07	2.07	2.08	2.07	2.02	2.45	2.10	24	
21	2.05	2.03	2.01	2.02	2.03	S	2.04	2.04	2.04	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.04	2.04	2.05	2.04	2.04	2.05	2.07	2.08	2.01	2.08	2.03	24	
22	2.08	2.09	2.10	2.11	S	2.11	2.11	2.11	2.12	2.12	2.12	2.12	2.14	2.14	2.12	2.12	2.14	2.17	2.18	2.18	2.16	2.10	2.03	2.03	2.03	2.18	2.12	24	
23	1.98	1.97	1.97	S	1.98	1.98	1.99	1.99	1.98	1.98	1.98	1.99	1.99	1.99	1.99	1.99	1.98	1.98	2.00	1.98	2.00	2.01	1.99	2.02	1.97	2.02	1.99	24	
24	2.02	1.99	S	2.14	2.16	2.17	2.00	2.01	2.00	2.01	2.03	2.04	2.05	2.02	2.01	2.00	2.00	2.00	2.01	2.02	2.03	2.02	2.03	2.04	1.99	2.17	2.03	24	
25	2.05	S	2.04	2.04	2.03	2.04	2.05	2.10	2.12	2.13	2.14	2.10	2.06	2.06	2.04	2.04	2.03	2.02	2.02	2.03	2.06	2.12	2.17	2.20	2.02	2.20	2.07	24	
26	S	2.23	2.24	2.23	2.21	2.24	2.25	2.24	2.23	2.24	2.25	2.20	2.17	2.15	2.13	2.11	2.09	2.07	2.06	2.06	2.07	2.06	2.05	S	2.05	2.25	2.16	24	
27	2.05	2.04	2.03	2.05	2.05	2.03	2.02	2.02	2.01	2.01	1.99	2.95	1.98	2.17	1.99	2.06	2.05	1.98	2.08	2.19	2.15	2.07	S	1.97	1.97	2.95	2.08	24	
28	1.98	1.99	1.97	1.98	1.99	2.04	2.10	1.98	1.97	1.97	1.97	1.97	1.99	1.97	1.96	1.96	1.96	1.97	1.97	1.98	1.98	S	1.98	1.98	1.96	2.10	1.98	24	
HOURLY MAX	2.85	2.84	2.94	3.06	2.93	2.82	2.83	2.80	2.75	2.68	2.61	2.95	2.45	2.45	2.49	2.49	2.75	2.80	2.69	2.81	2.84	2.83	2.93	2.89					
HOURLY AVG	2.15	2.17	2.17	2.17	2.18	2.18	2.17	2.16	2.17	2.17	2.17	2.18	2.12	2.11	2.09	2.09	2.10	2.11	2.13	2.12	2.13	2.14	2.15	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

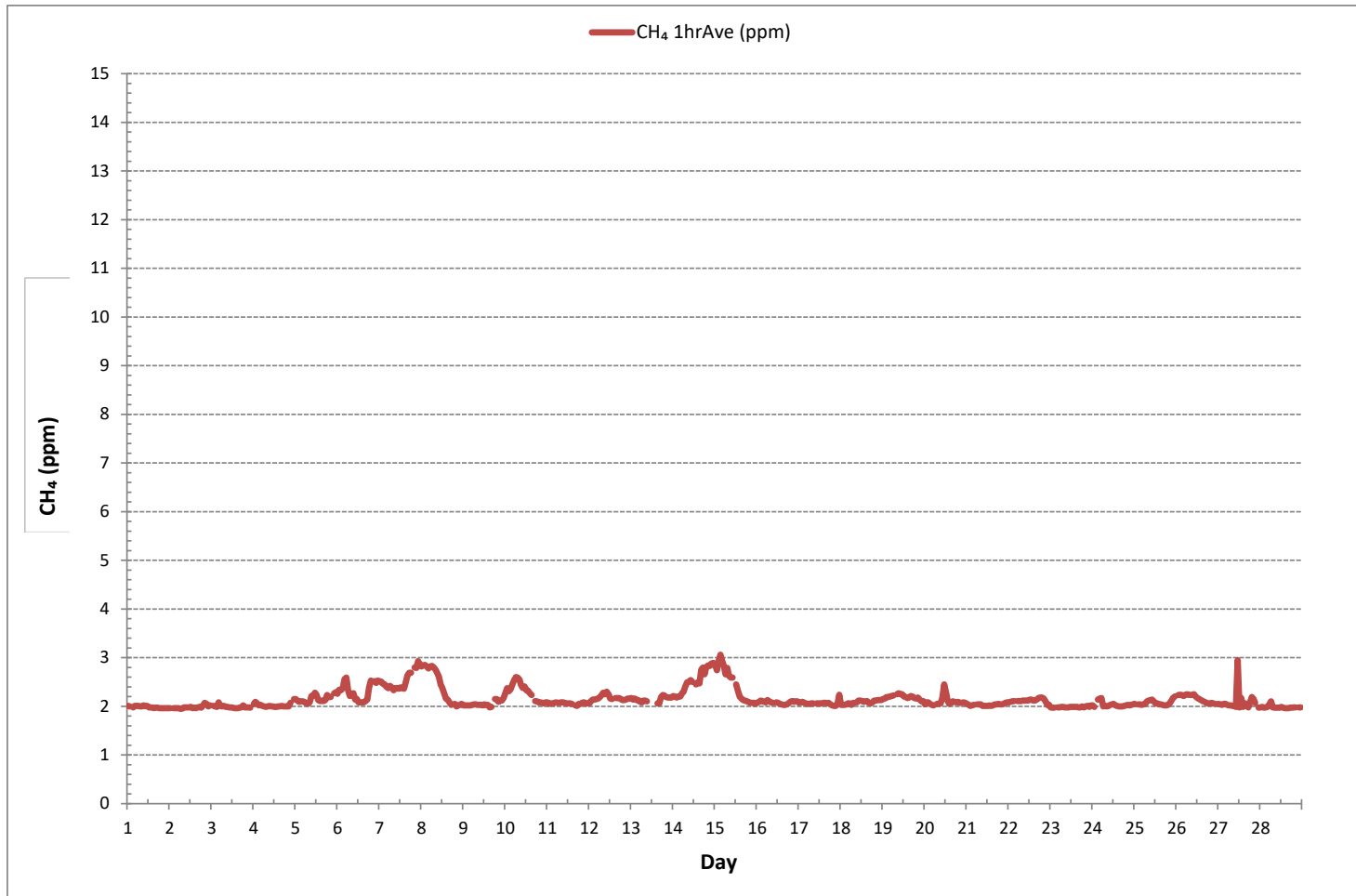
24 HR AVERAGES February 2019



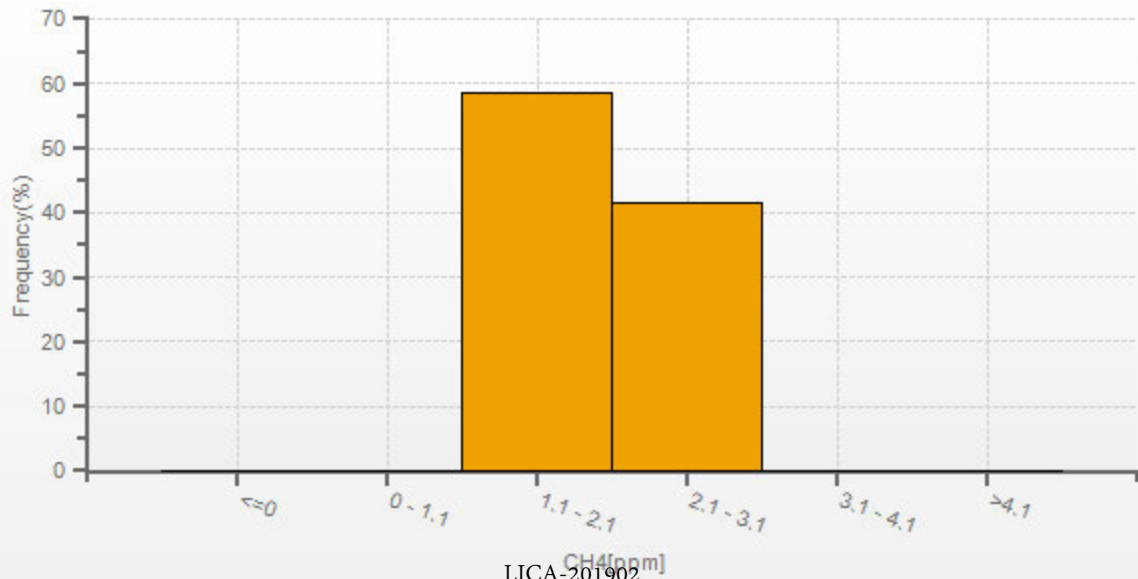
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	638			
MINIMUM 1-HR AVERAGE:	1.95 ppm	@ HOUR	6	ON DAY 2
MAXIMUM 1-HR AVERAGE:	3.06 ppm	@ HOUR	3	ON DAY 15
MAXIMUM 24-HR AVERAGE:	2.52 ppm			ON DAY 7
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.21	MONTHLY AVERAGE:	2.15 ppm	

METHANE Hourly Averages (CH₄ ppm)



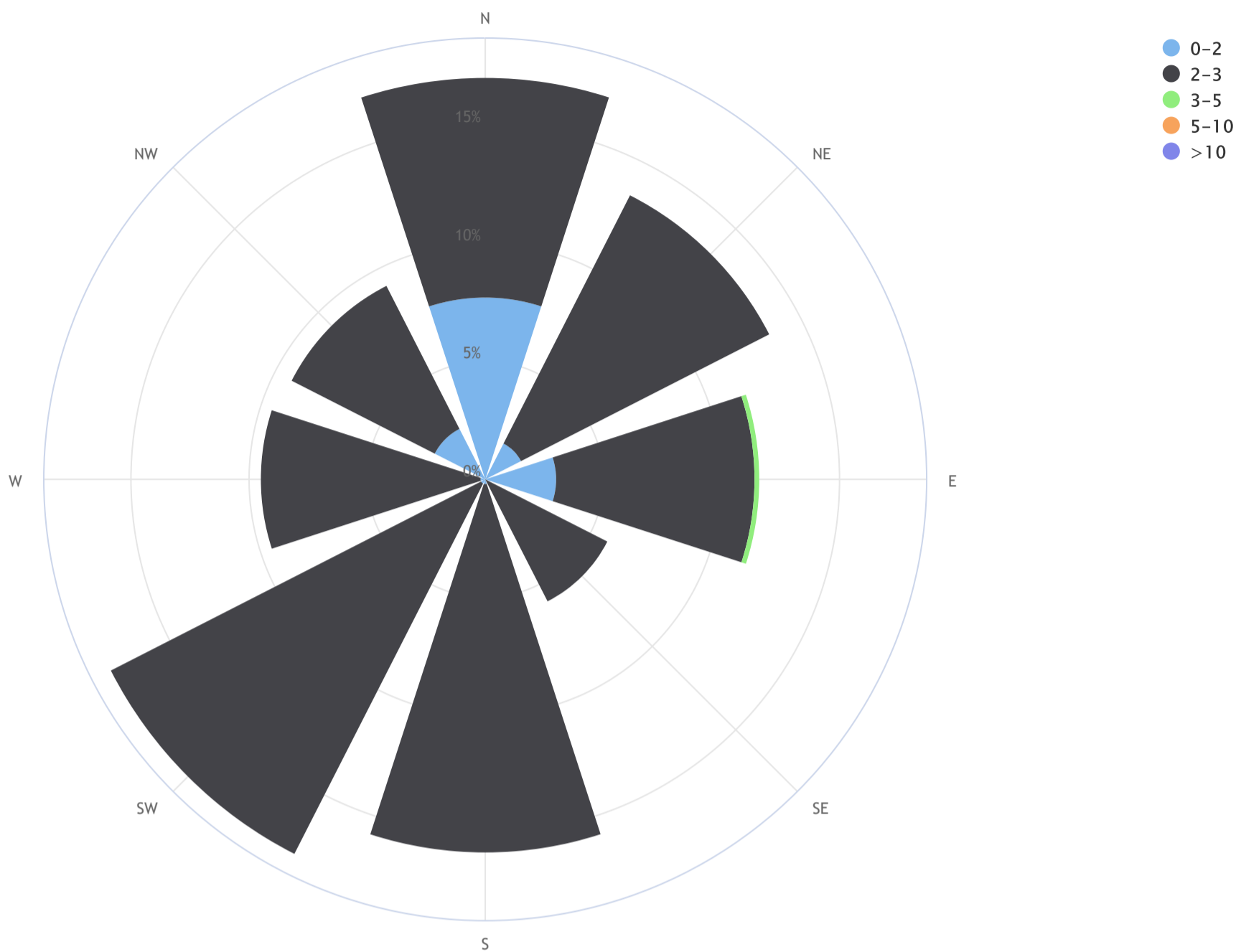
CH4[ppm] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902
Page 200 of 350

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_CH4 (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	7.7	9.3	0.0	0.0	0.0	17.0
NE	1.7	11.8	0.0	0.0	0.0	13.5
E	3.0	8.4	0.2	0.0	0.0	11.5
SE	0.0	5.8	0.0	0.0	0.0	5.8
S	0.2	15.6	0.0	0.0	0.0	15.8
SW	0.2	17.6	0.0	0.0	0.0	17.8
W	0.2	9.3	0.0	0.0	0.0	9.5
NW	2.4	6.8	0.0	0.0	0.0	9.1
Summary	15.3	84.6	0.2	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0



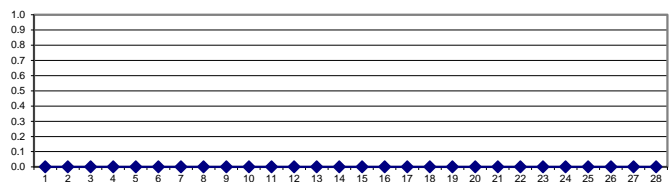
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	23:59	MIN.	MAX.	AVG.			
DAY																													
1	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
2	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
3	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	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	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
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	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
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	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	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
8	0.00	0.00	0.00	0.00	0.00	0.00	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
9	0.00	0.00	0.00	0.00	0.00	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
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
12	0.00	0.00	0.00	0.00	0.00	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
13	0.00	0.00	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
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	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	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
16	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
17	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
18	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
19	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
20	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
21	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
22	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
23	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
24	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
25	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
26	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
27	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	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	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	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	0.00	0.00	0.00	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

24 HR AVERAGES February 2019



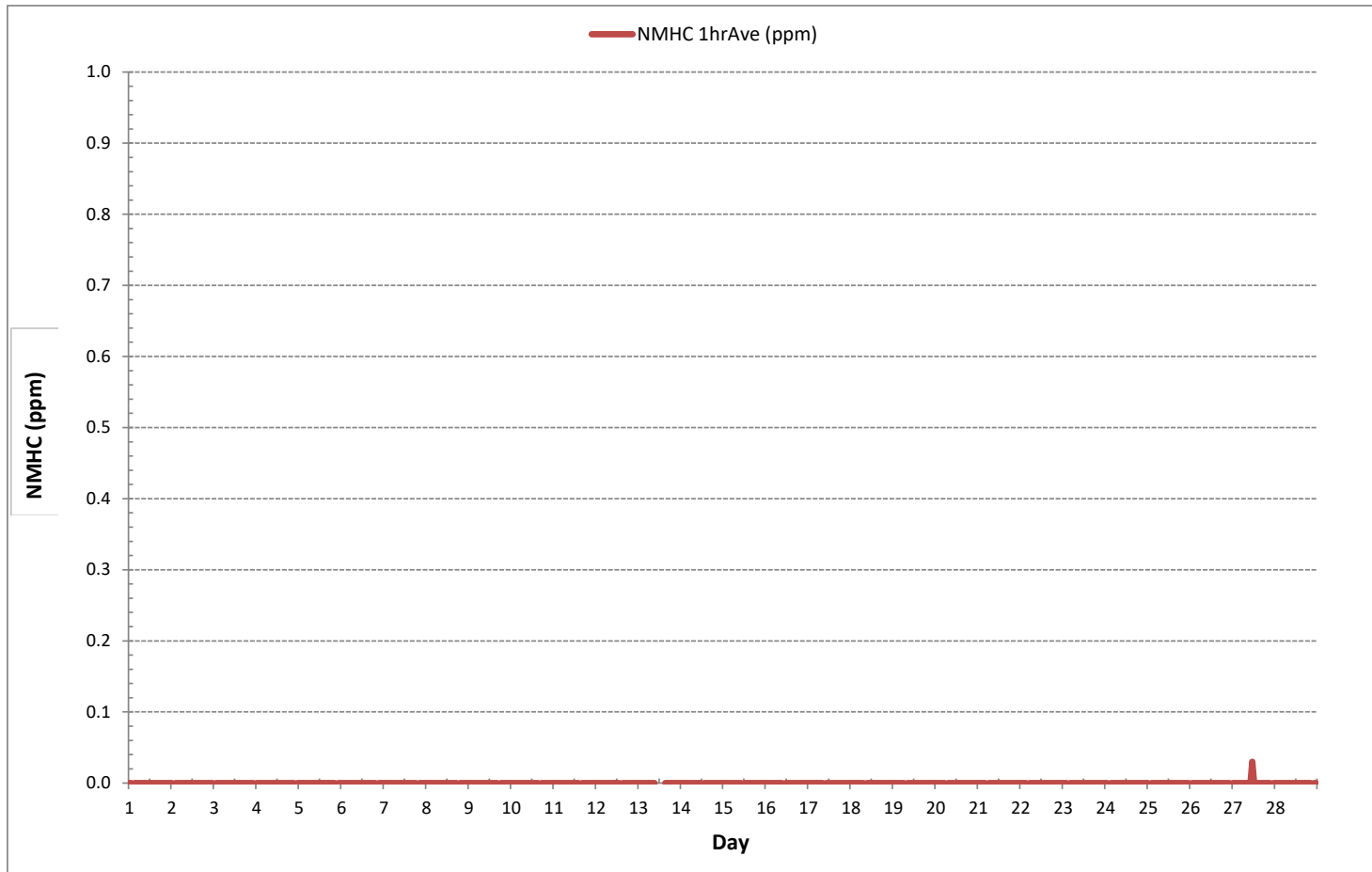
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	1				
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	0.03	ppm @ HOUR	11	ON DAY 27	
MAXIMUM 24-HR AVERAGE:	0.00	ppm		ON DAY 1	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:	0.00	ppm

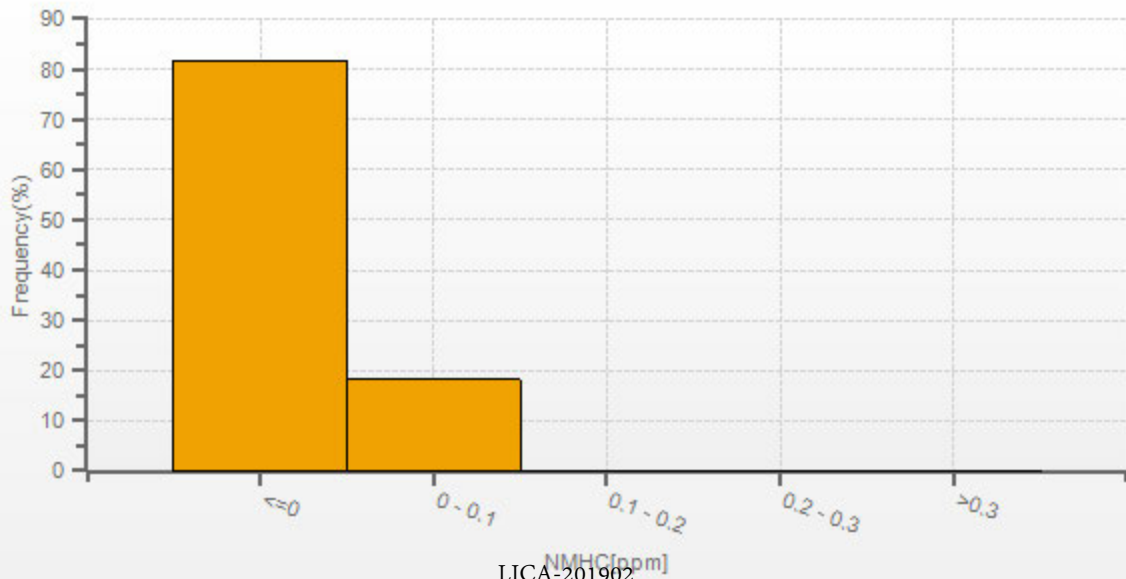


LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

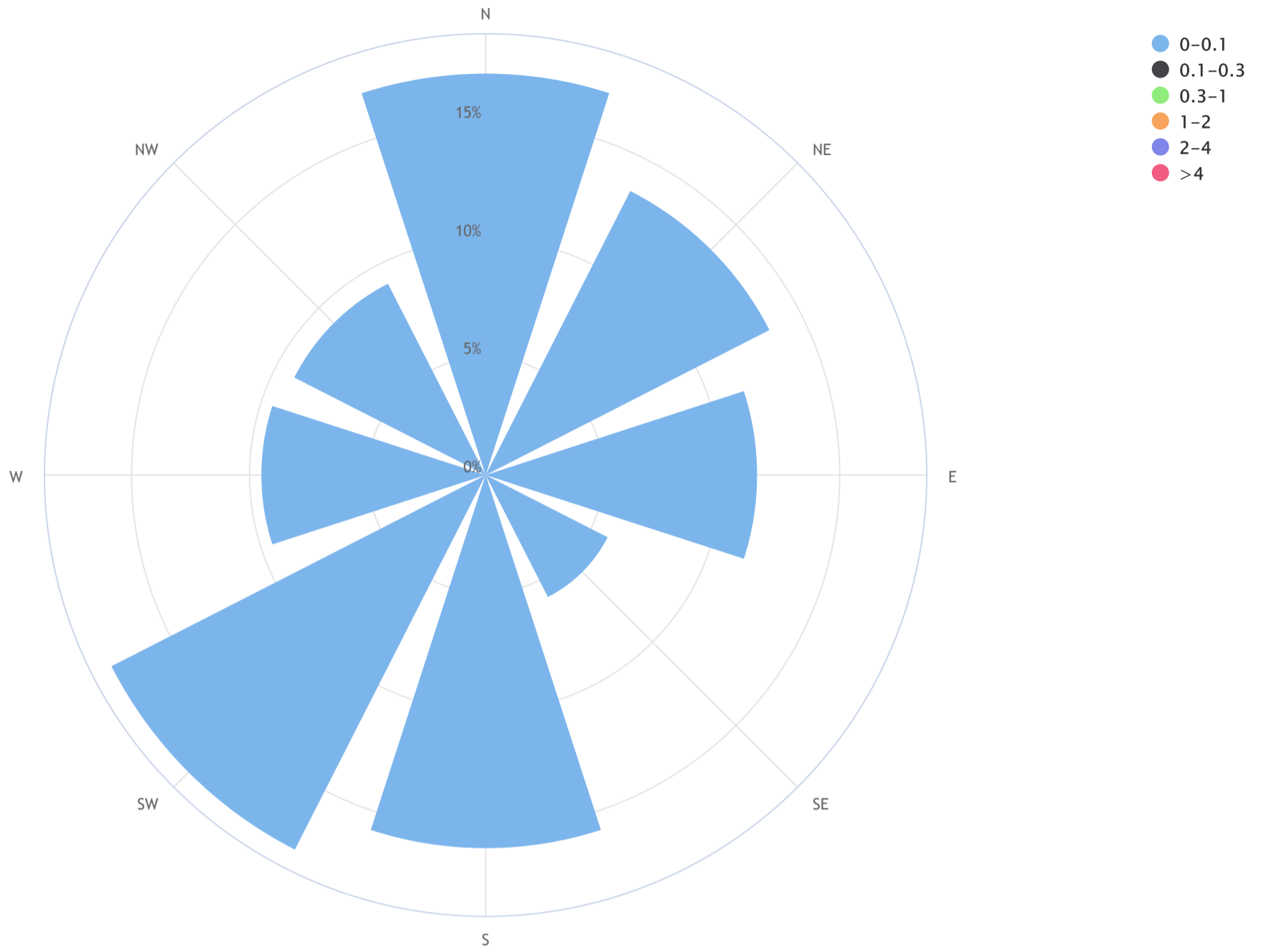


NMHC[ppm] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NMHC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	17.0	0.0	0.0	0.0	0.0	0.0	17.0
NE	13.5	0.0	0.0	0.0	0.0	0.0	13.5
E	11.5	0.0	0.0	0.0	0.0	0.0	11.5
SE	5.8	0.0	0.0	0.0	0.0	0.0	5.8
S	15.8	0.0	0.0	0.0	0.0	0.0	15.8
SW	17.8	0.0	0.0	0.0	0.0	0.0	17.8
W	9.5	0.0	0.0	0.0	0.0	0.0	9.5
NW	9.1	0.0	0.0	0.0	0.0	0.0	9.1
Summary	100.0	0.0	0.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0



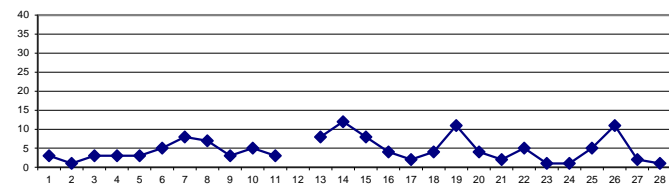
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

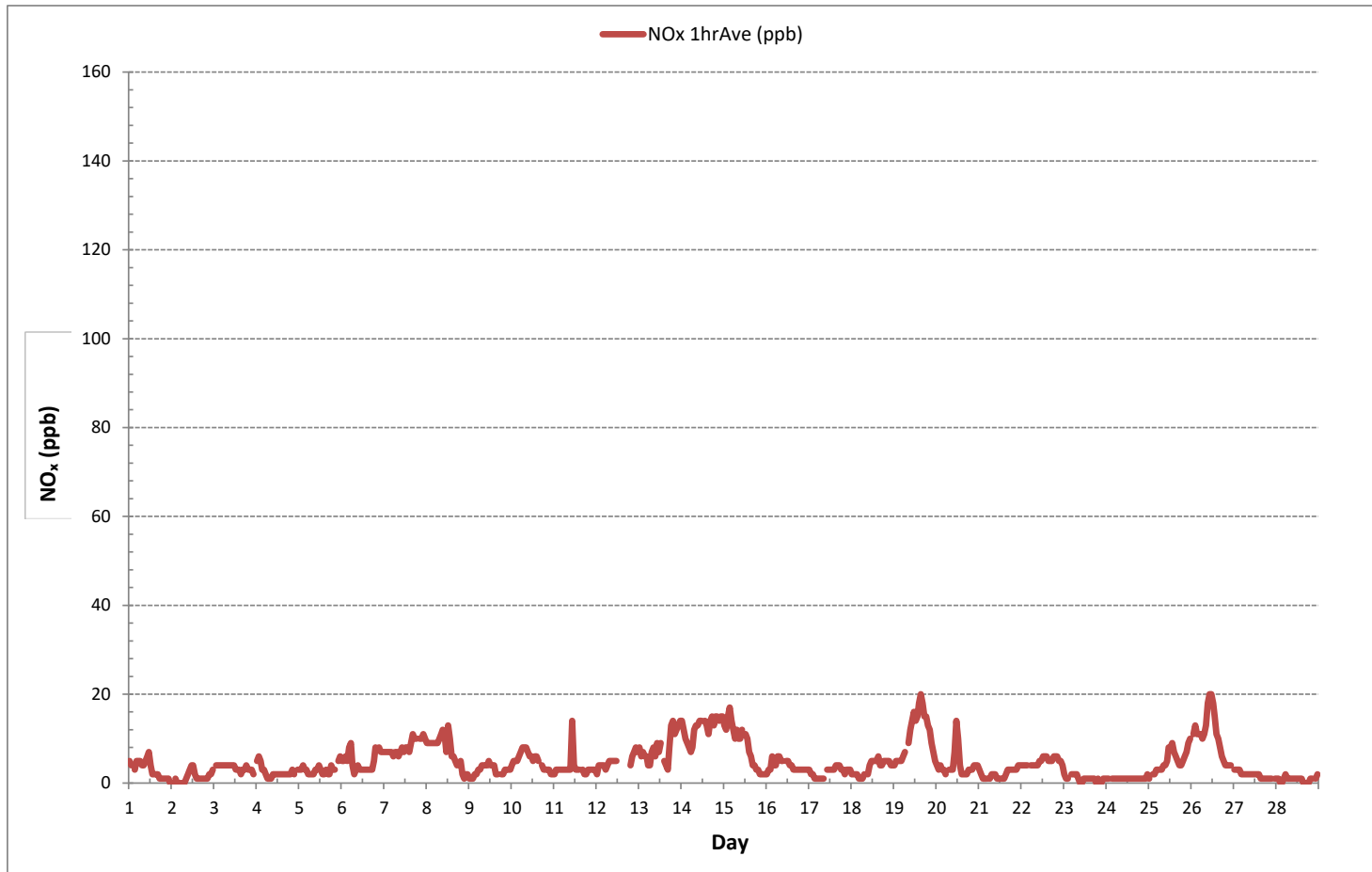
24 HR AVERAGES February 2019



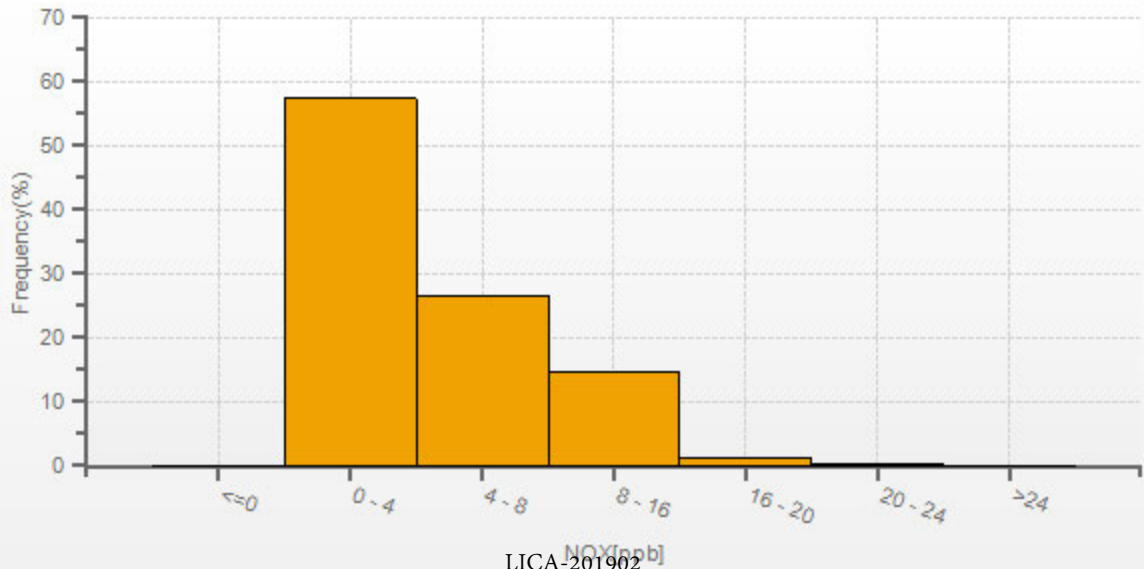
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	618			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	23	ON DAY 1
MAXIMUM 1-HR AVERAGE:	20 ppb	@ HOUR	15	ON DAY 19
MAXIMUM 24-HR AVERAGE:	12 ppb			ON DAY 14
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4	MONTHLY AVERAGE:	5 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



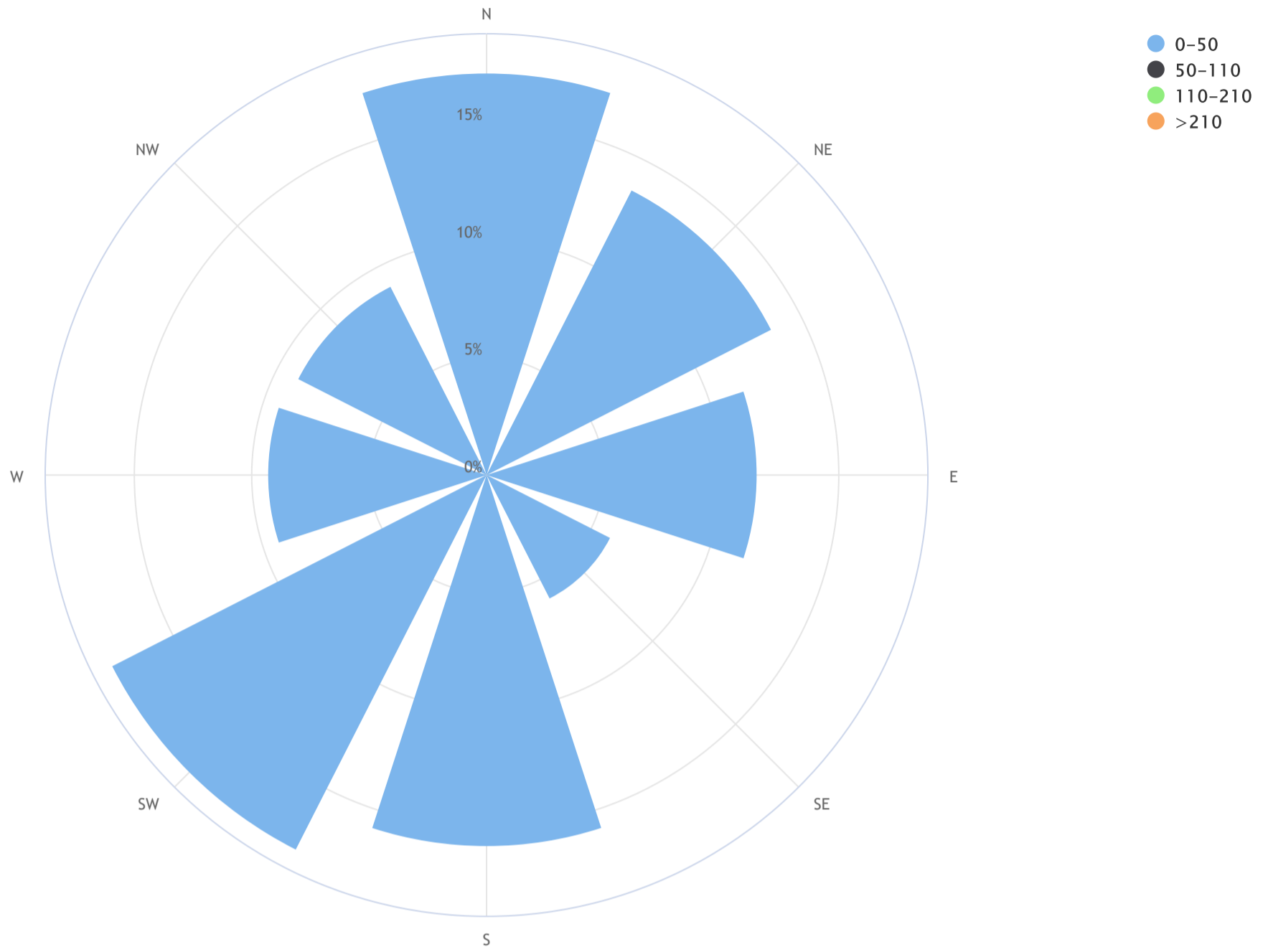
NOX[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902
Page 208 of 350

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO_x (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-50	50-110	110-210	>210	TOTAL
N	17.1	0.0	0.0	0.0	17.1
NE	13.6	0.0	0.0	0.0	13.6
E	11.5	0.0	0.0	0.0	11.5
SE	5.9	0.0	0.0	0.0	5.9
S	15.8	0.0	0.0	0.0	15.8
SW	17.9	0.0	0.0	0.0	17.9
W	9.3	0.0	0.0	0.0	9.3
NW	9.0	0.0	0.0	0.0	9.0
Summary	100.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0



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

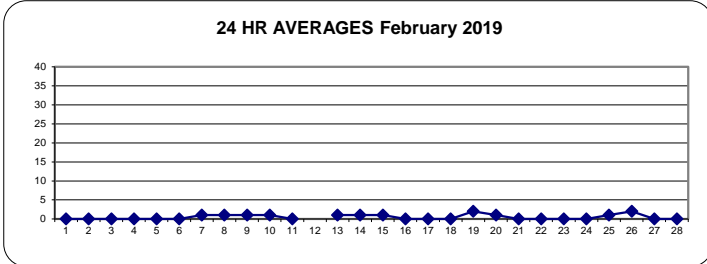
STATUS FLAG CODES

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

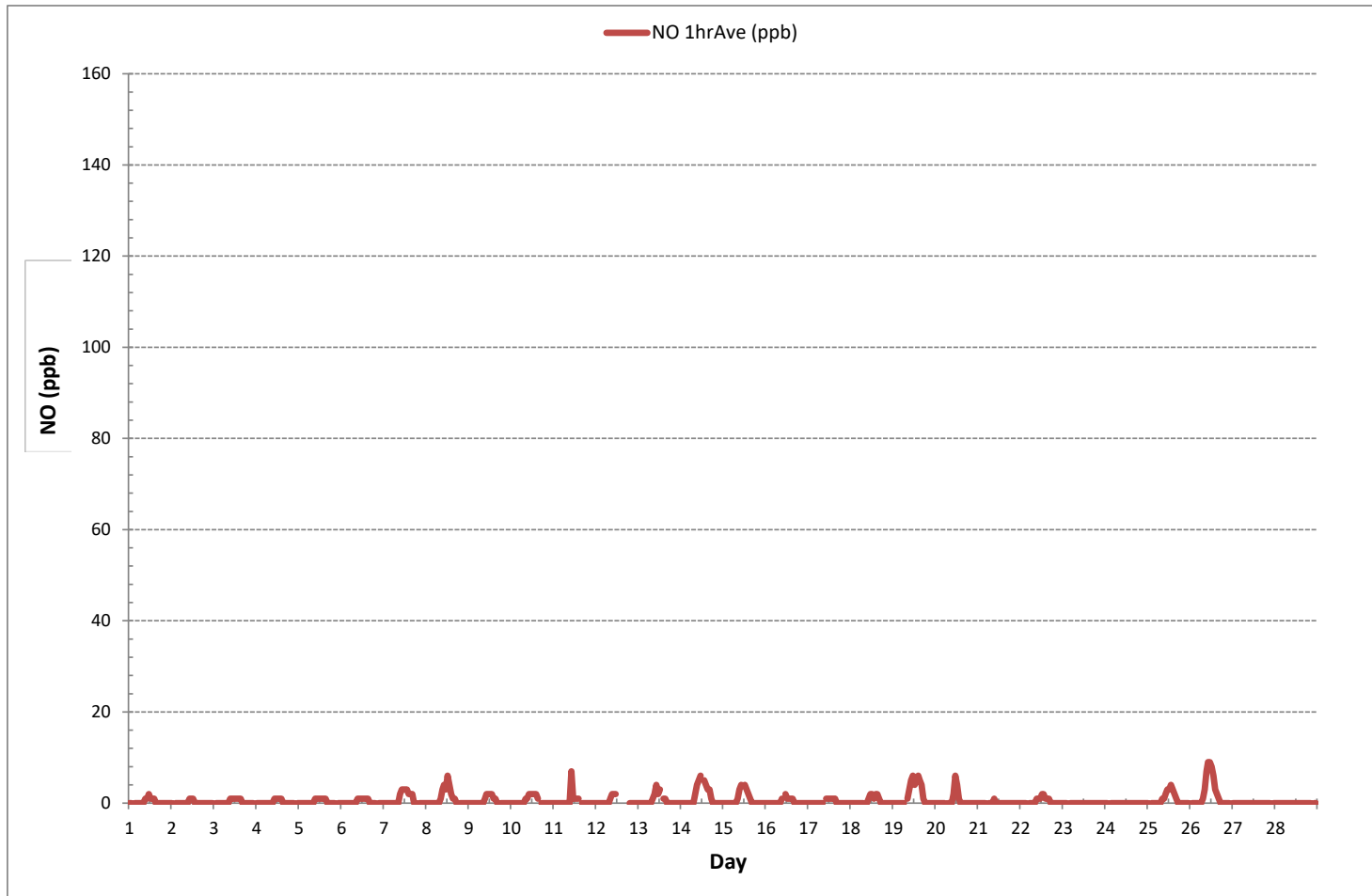
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	160			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9	ppb @ HOUR	10	ON DAY 26
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY 19
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	1
				ppb

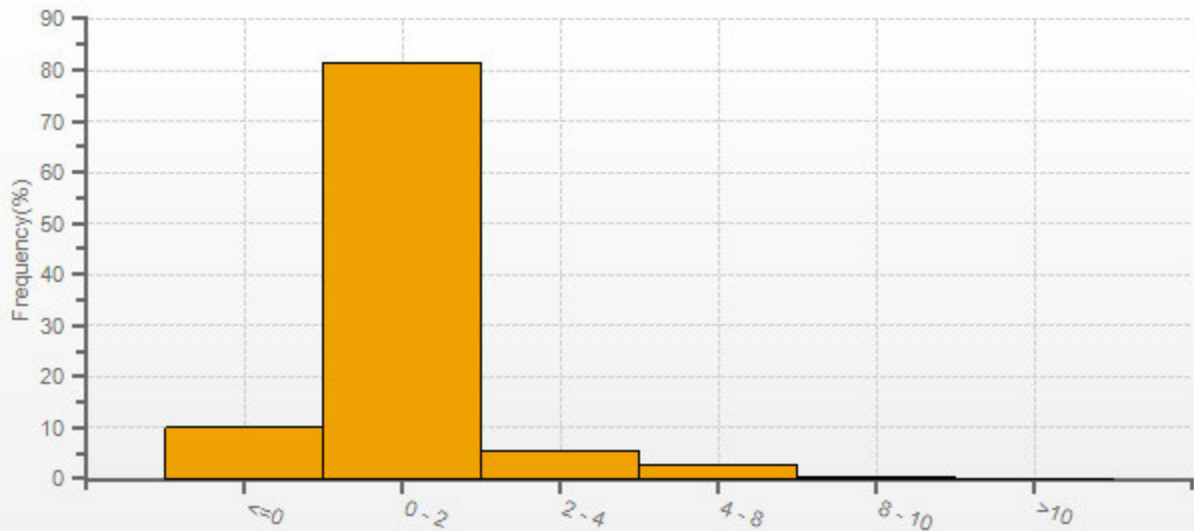
24 HR AVERAGES February 2019



NITRIC OXIDE Hourly Averages (NO ppb)



NO[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.

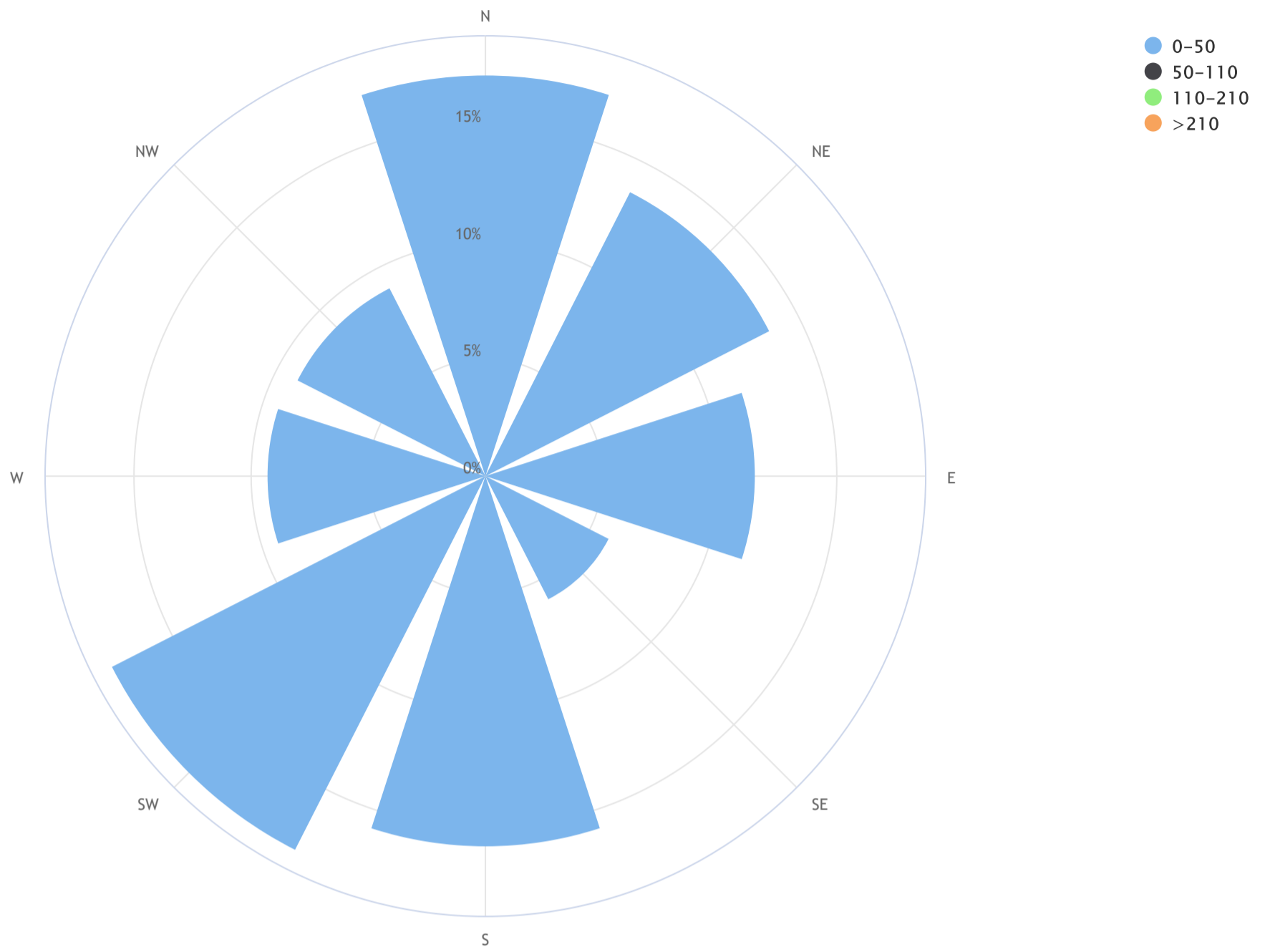


LICA-201902

Page 212 of 350

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-50	50-110	110-210	>210	TOTAL
N	17.1	0.0	0.0	0.0	17.1
NE	13.6	0.0	0.0	0.0	13.6
E	11.5	0.0	0.0	0.0	11.5
SE	5.9	0.0	0.0	0.0	5.9
S	15.8	0.0	0.0	0.0	15.8
SW	17.9	0.0	0.0	0.0	17.9
W	9.3	0.0	0.0	0.0	9.3
NW	9.0	0.0	0.0	0.0	9.0
Summary	100.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0

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

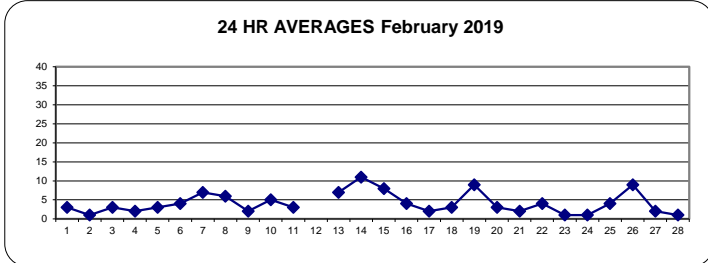
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

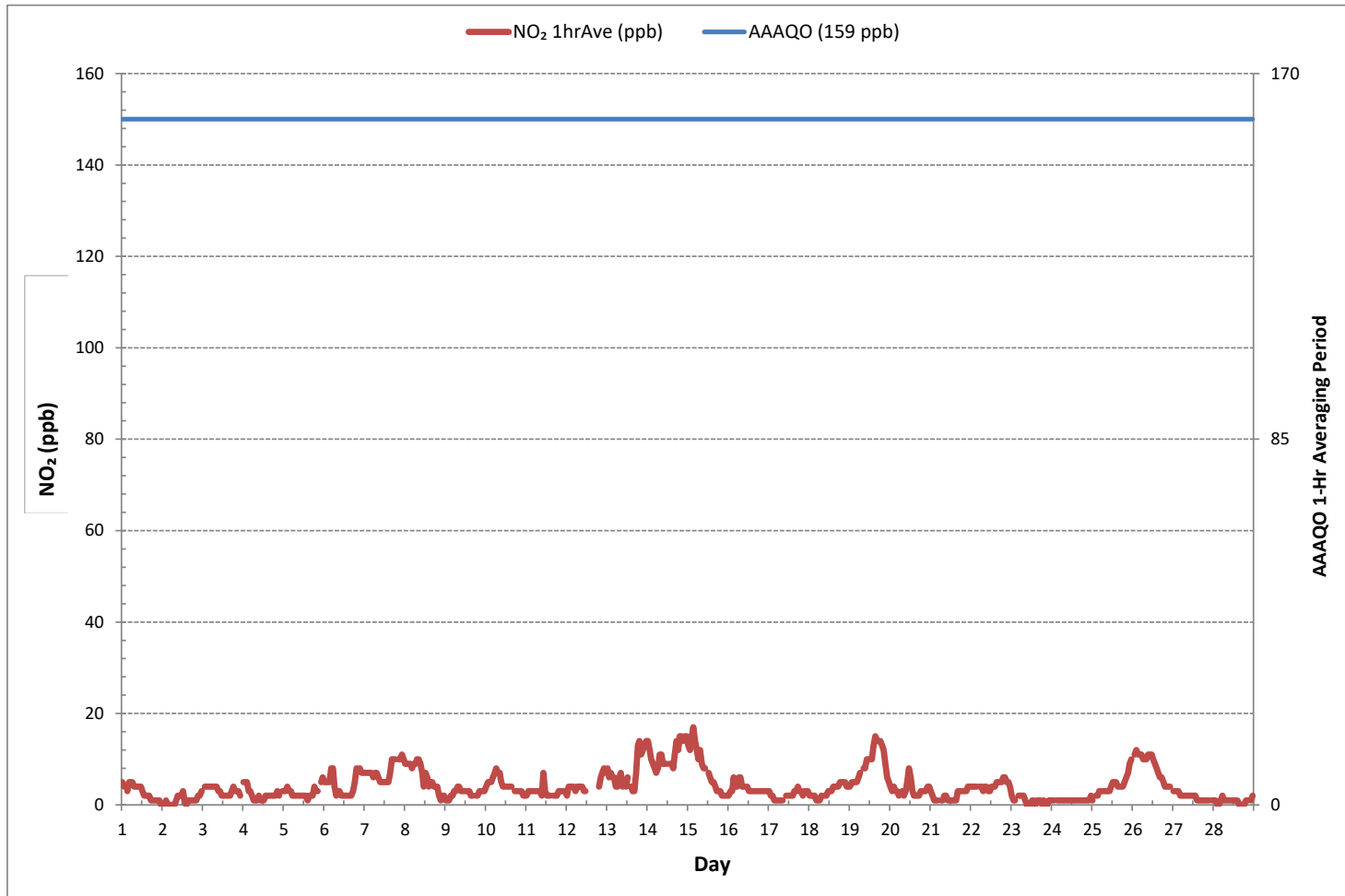
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	615				
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	23	ON DAY 1
MAXIMUM 1-HR AVERAGE:	17	ppb	@ HOUR	3	ON DAY 15
MAXIMUM 24-HR AVERAGE:	11	ppb			ON DAY 14
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	4	ppb

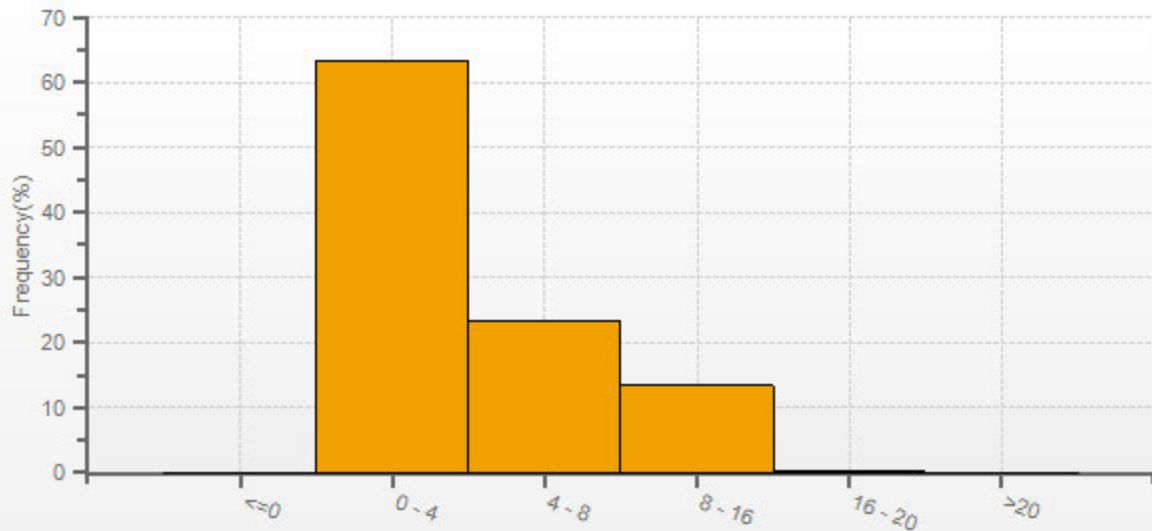
24 HR AVERAGES February 2019



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



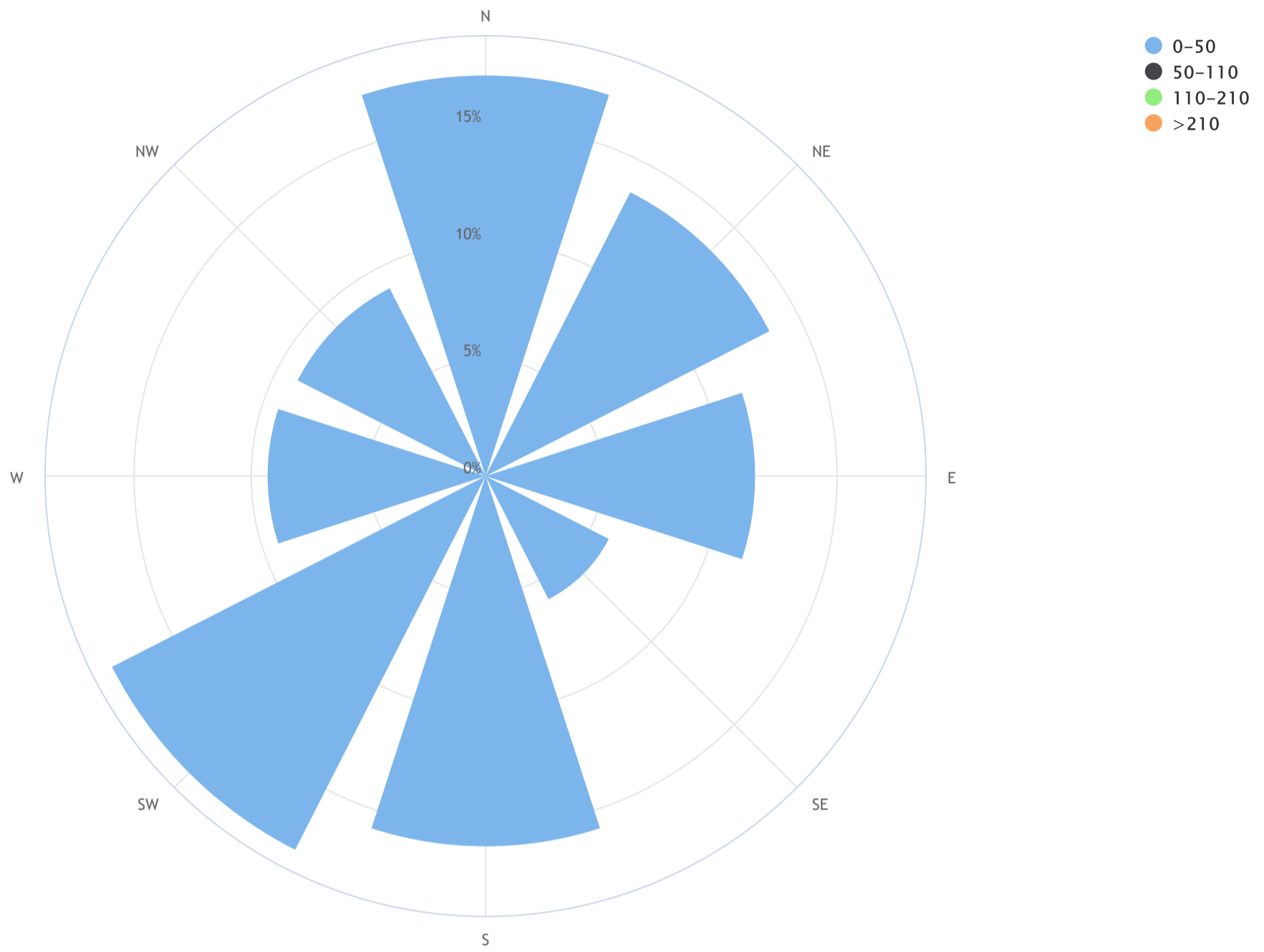
NO2[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902

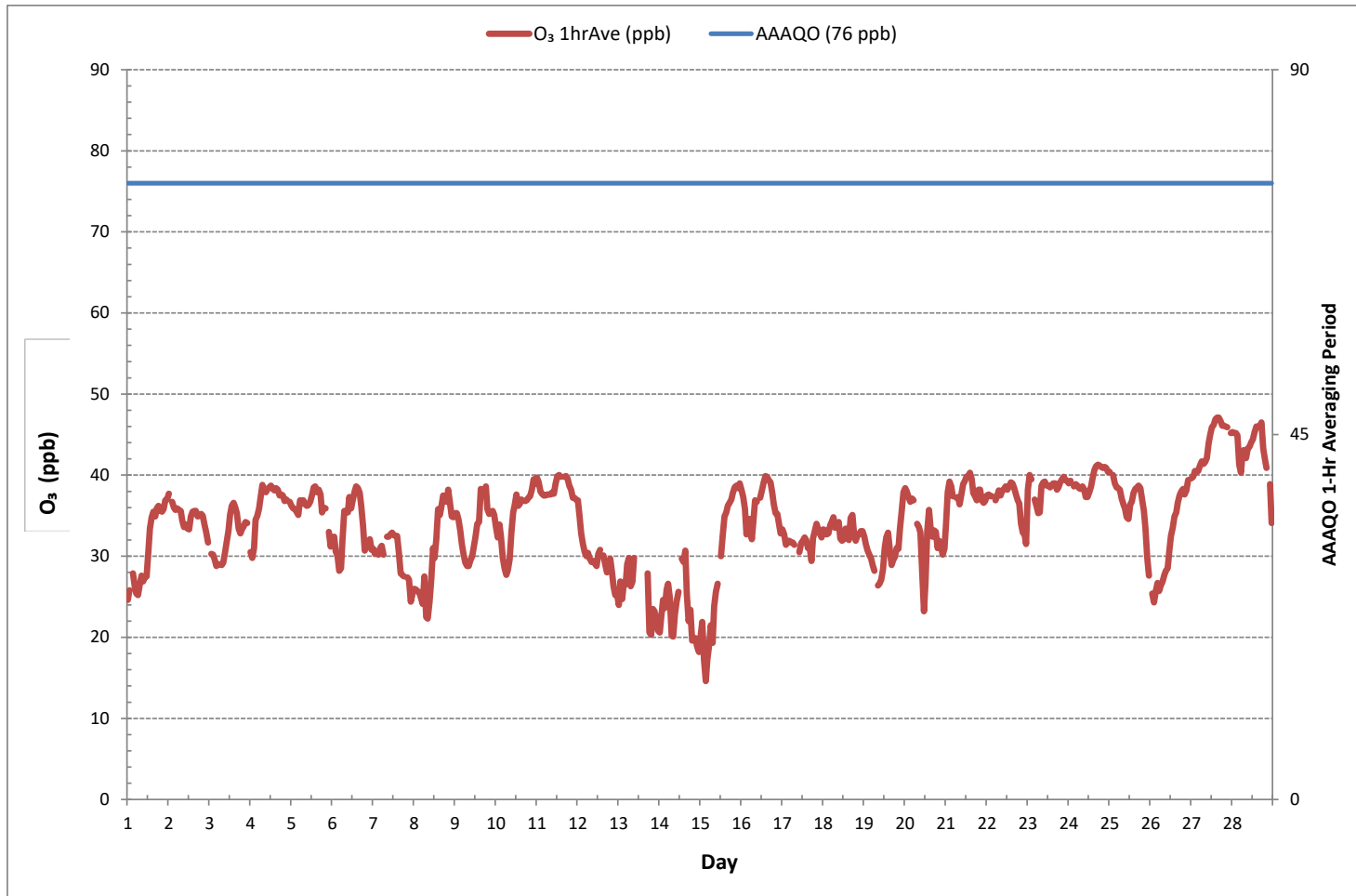
Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_NO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%

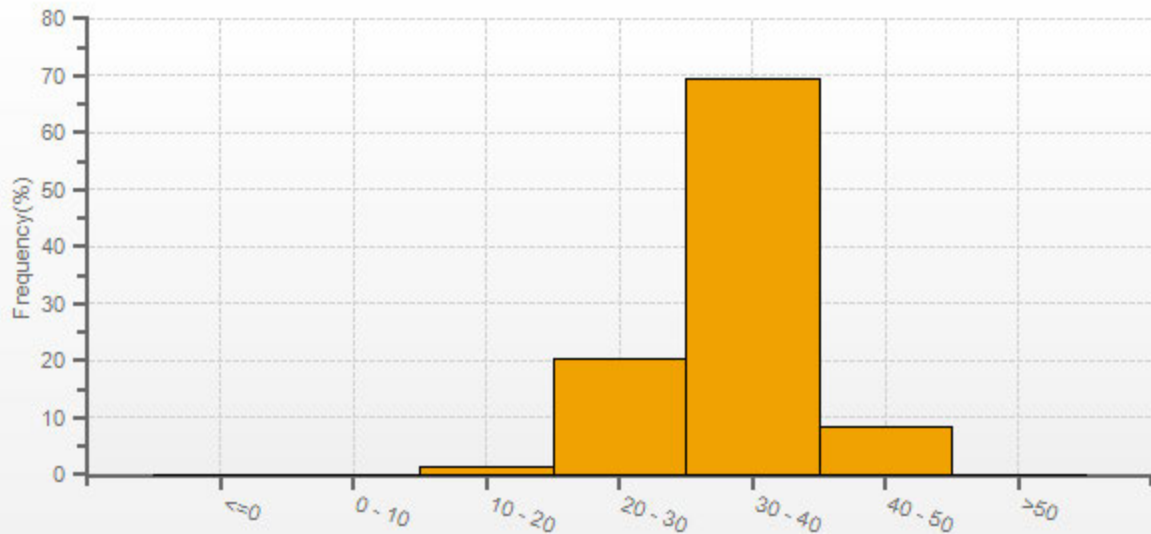


Direction	0-50	50-110	110-210	>210	TOTAL
N	17.1	0.0	0.0	0.0	17.1
NE	13.6	0.0	0.0	0.0	13.6
E	11.5	0.0	0.0	0.0	11.5
SE	5.9	0.0	0.0	0.0	5.9
S	15.8	0.0	0.0	0.0	15.8
SW	17.9	0.0	0.0	0.0	17.9
W	9.3	0.0	0.0	0.0	9.3
NW	9.0	0.0	0.0	0.0	9.0
Summary	100.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0

OZONE Hourly Averages (O₃ ppb)



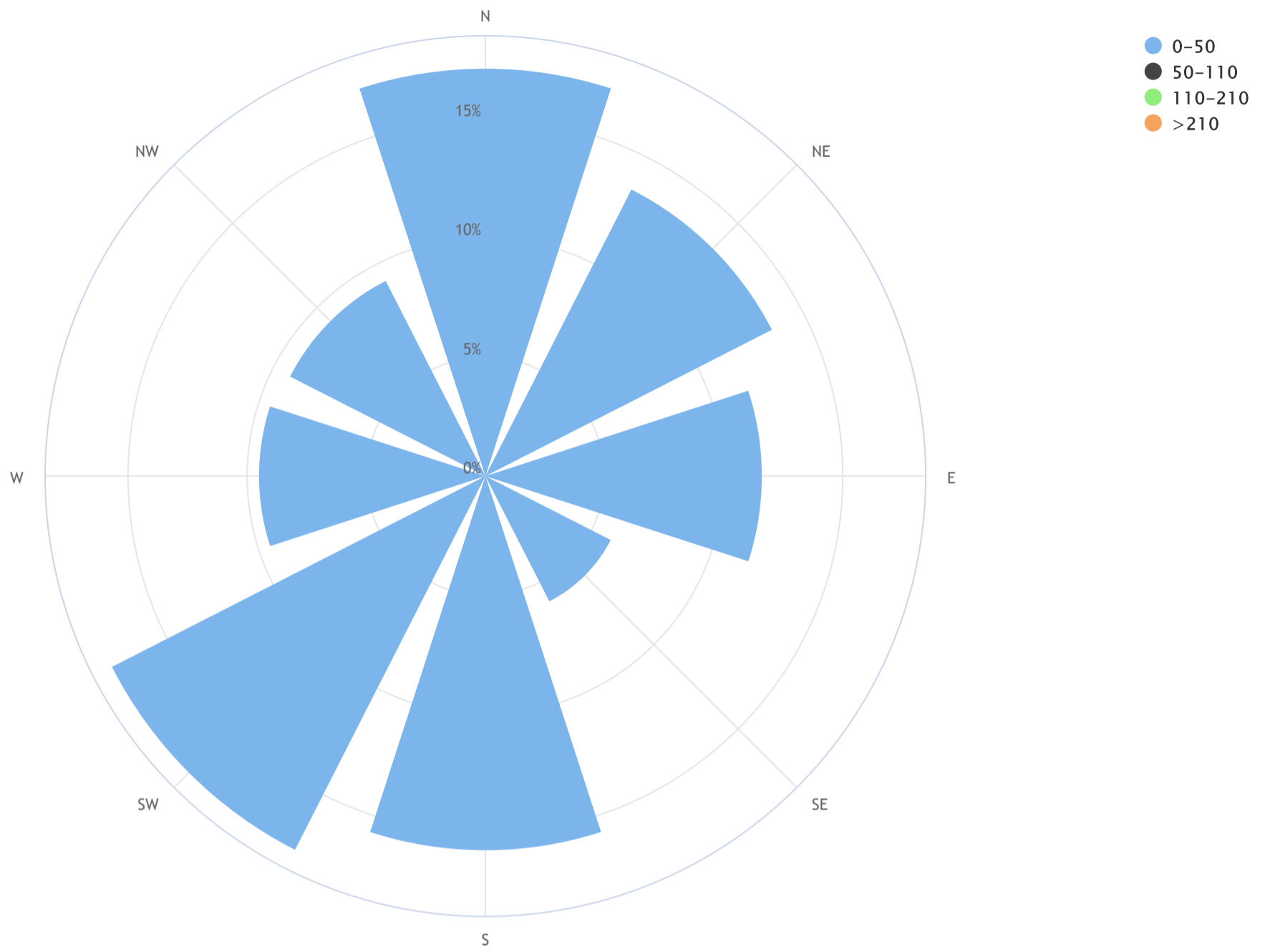
O3[ppb] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_O₃ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-50	50-110	110-210	>210	TOTAL
N	17.1	0.0	0.0	0.0	17.1
NE	13.5	0.0	0.0	0.0	13.5
E	11.6	0.0	0.0	0.0	11.6
SE	5.9	0.0	0.0	0.0	5.9
S	15.7	0.0	0.0	0.0	15.7
SW	17.6	0.0	0.0	0.0	17.6
W	9.5	0.0	0.0	0.0	9.5
NW	9.2	0.0	0.0	0.0	9.2
Summary	100.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0

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

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

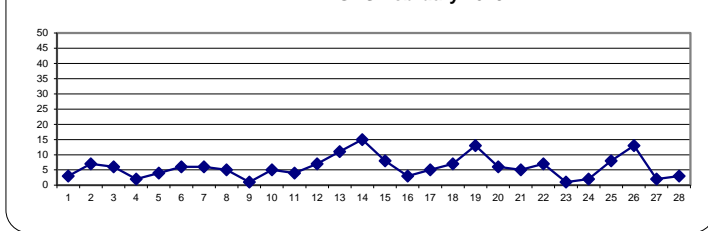
OBJECTIVE LIMIT:

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

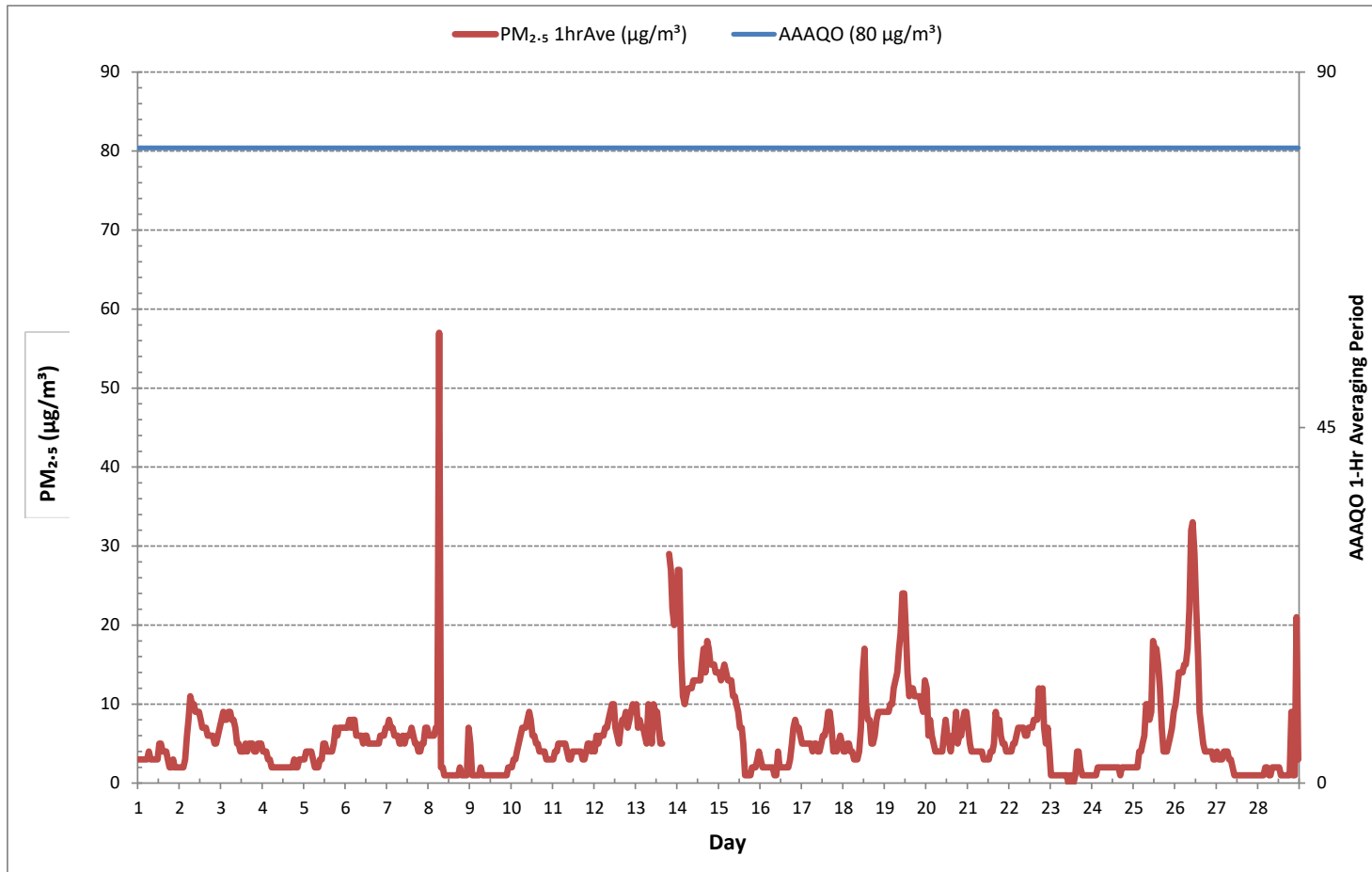
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	667
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR 10 ON DAY 23
MAXIMUM 1-HR AVERAGE:	57 µg/m ³ @ HOUR 6 ON DAY 8
MAXIMUM 24-HR AVERAGE:	15 µg/m ³ ON DAY 14
MONTHLY CALIBRATION TIME:	3 hrs
OPERATIONAL TIME:	672 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	5
MONTHLY AVERAGE:	6 µg/m ³

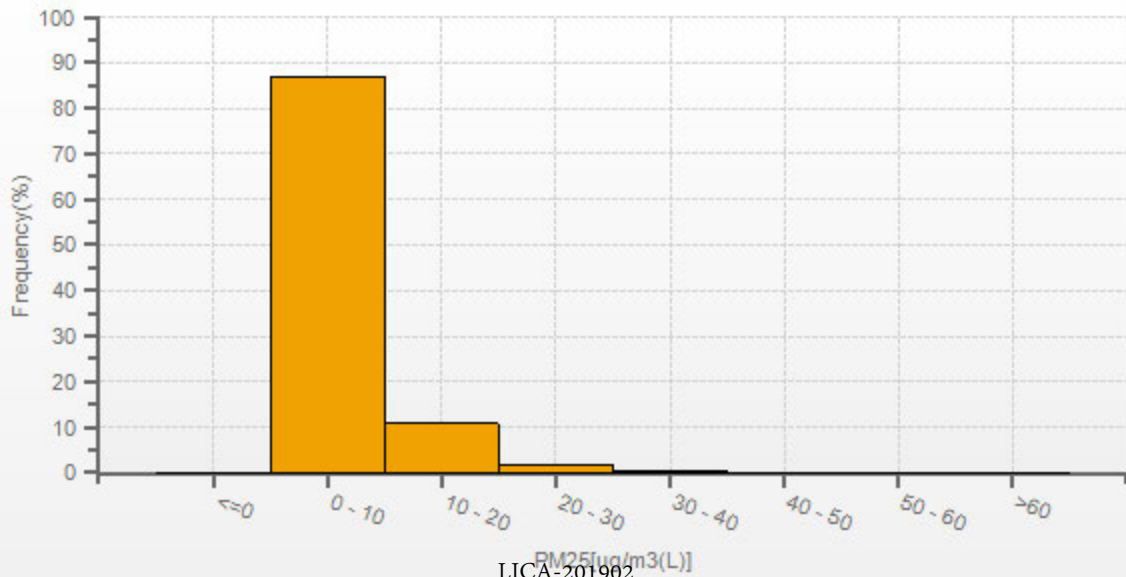
24 HR AVERAGES February 2019



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

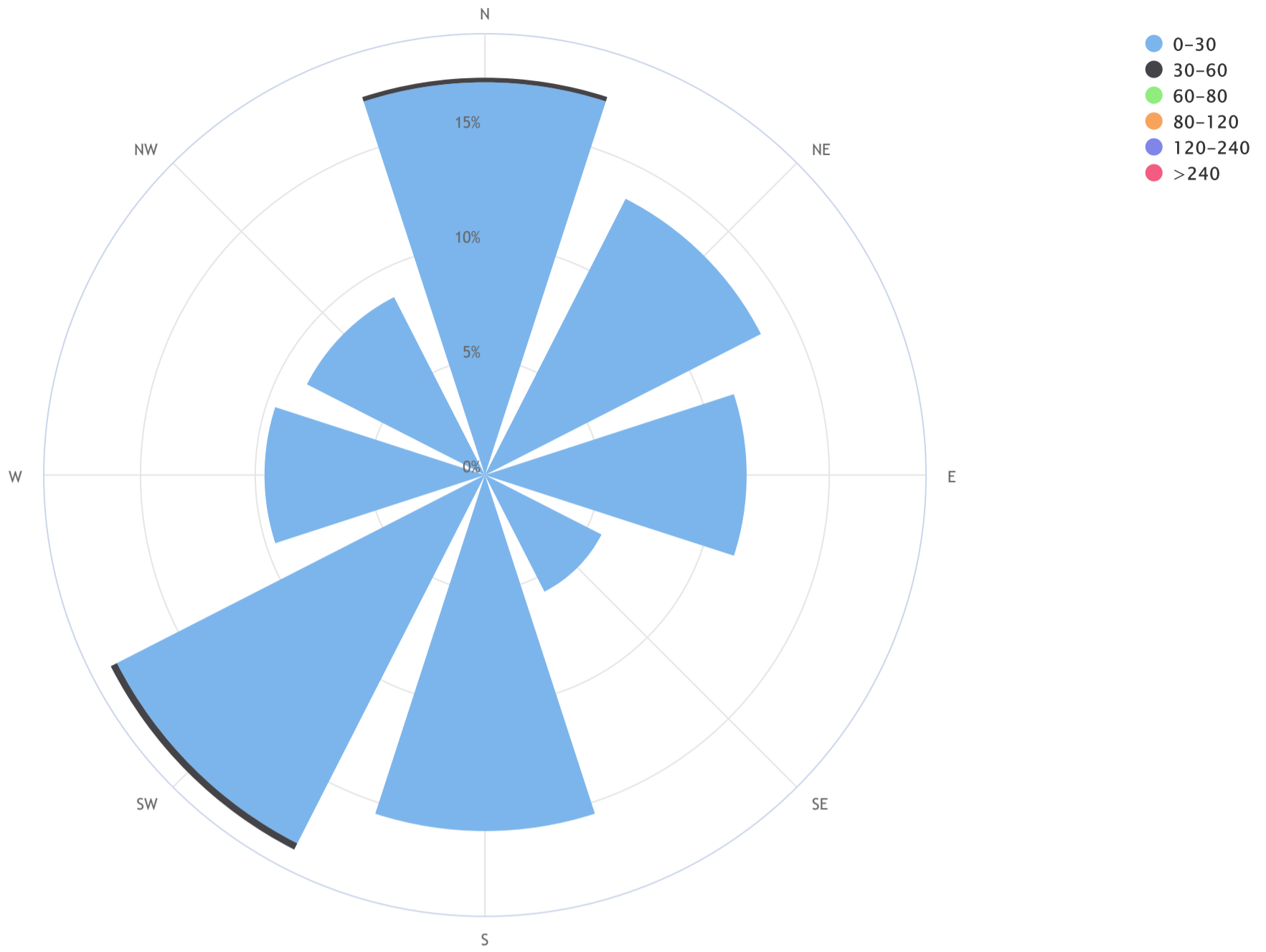


PM25[ug/m3(L)] Histogram: LICA ST. LINA Monthly: 19/02 1 Hr.



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_PM2.5 (µg/m³)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = N/A, CALM % = 0.0%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	17.1	0.2	0.0	0.0	0.0	0.0	17.3
NE	13.5	0.0	0.0	0.0	0.0	0.0	13.5
E	11.4	0.0	0.0	0.0	0.0	0.0	11.4
SE	5.7	0.0	0.0	0.0	0.0	0.0	5.7
S	15.5	0.0	0.0	0.0	0.0	0.0	15.5
SW	18.0	0.3	0.0	0.0	0.0	0.0	18.3
W	9.6	0.0	0.0	0.0	0.0	0.0	9.6
NW	8.7	0.0	0.0	0.0	0.0	0.0	8.7
Summary	99.6	0.5	0.0	0.0	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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	15.2	14.7	12.2	12.0	10.4	10.5	10.4	12.7	10.7	10.4	12.2	12.3	11.1	10.9	12.1	13.5	14.0	15.8	16.5	16.1	17.7	16.0	16.7	16.9	10.4	17.7	12.9	24
2	18.2	17.9	19.1	17.8	18.7	17.8	18.3	17.8	13.5	11.6	8.9	9.1	9.6	8.4	8.5	14.1	13.7	11.3	12.3	12.0	11.1	12.3	11.7	9.3	8.4	19.1	8.2	24
3	12.5	13.6	12.2	9.9	8.7	8.3	10.9	10.7	10.6	11.1	8.2	7.9	7.9	9.4	7.6	7.5	9.5	7.8	7.8	7.7	8.1	8.6	6.2	5.4	5.4	13.6	8.3	24
4	6.1	4.8	4.9	6.1	5.7	6.1	6.8	7.4	7.3	8.6	5.9	4.0	2.6	4.3	3.2	2.8	3.8	4.2	3.7	6.6	4.9	3.3	4.9	7.7	2.6	8.6	4.3	24
5	8.3	6.5	5.8	5.2	X	2.7	3.9	X	X	1.3	5.2	3.5	3.7	3.7	1.1	4.9	2.5	4.4	6.3	4.3	4.2	5.4	4.9	4.6	1.1	8.3	3.1	21
6	5.4	8.3	7.4	6.1	4.2	5.6	7.9	7.4	6.3	7.6	7.3	8.0	8.3	7.9	7.9	6.6	5.7	7.4	9.1	9.8	11.7	14.0	12.5	12.5	4.2	14.0	7.7	24
7	13.4	14.7	14.8	14.5	14.0	10.4	11.8	12.7	12.4	12.6	13.7	11.0	8.8	7.7	8.2	8.3	8.5	9.2	11.2	10.6	8.5	6.6	11.0	11.1	6.6	14.8	10.2	24
8	8.0	5.0	3.6	3.4	4.1	3.0	5.7	6.6	6.6	4.4	5.6	9.7	11.5	11.5	10.5	8.1	7.9	4.5	4.5	7.2	9.8	11.1	10.6	9.9	3.0	11.5	6.6	24
9	10.3	8.5	8.3	8.1	8.9	8.3	8.8	10.5	8.7	6.2	3.7	1.9	0.6	4.5	6.3	4.2	5.5	6.0	7.9	9.6	13.2	14.4	14.9	11.9	0.6	14.9	0.8	24
10	11.8	13.4	12.0	12.4	10.6	10.1	9.5	10.5	10.2	11.0	9.2	8.9	11.2	13.3	11.4	14.3	14.2	14.9	9.2	8.8	8.6	9.3	9.8	9.6	8.6	14.9	8.8	24
11	8.7	9.5	8.2	8.2	5.7	6.8	5.5	2.1	2.2	3.1	3.2	2.2	2.6	1.6	3.0	2.8	1.9	3.7	2.8	6.0	9.1	7.6	7.2	8.7	1.6	9.5	1.2	24
12	10.0	8.9	11.1	9.7	8.9	8.2	7.5	7.1	8.2	5.6	8.6	5.8	6.9	2.6	4.6	9.0	9.2	9.4	9.0	8.1	7.9	9.9	9.4	10.8	2.6	11.1	7.7	24
13	9.7	10.3	4.3	3.9	2.7	3.1	4.1	6.9	6.9	6.2	6.2	5.8	6.2	6.1	4.2	3.2	4.1	6.2	8.4	8.8	8.9	10.0	9.1	9.9	2.7	10.3	5.2	24
14	7.9	9.1	11.4	12.2	12.0	9.0	9.9	11.5	11.2	8.6	10.1	10.2	11.5	8.6	10.1	10.4	8.2	9.1	11.8	10.7	10.9	11.8	15.4	12.7	7.9	15.4	9.9	24
15	11.3	8.6	11.2	13.3	11.9	12.7	14.9	14.9	14.6	13.2	12.6	12.7	14.1	15.4	13.0	14.5	17.3	16.9	15.7	14.8	13.8	13.7	10.8	9.6	8.6	17.3	12.6	24
16	11.0	12.2	12.3	12.6	13.7	14.6	13.9	13.5	12.8	11.0	11.6	13.5	11.8	11.5	11.4	14.6	12.5	10.2	11.6	13.7	14.8	15.3	14.1	12.8	10.2	15.3	12.6	24
17	12.1	10.2	10.9	10.3	10.4	12.6	11.3	11.3	10.3	6.8	8.4	9.6	6.9	9.0	6.9	8.9	7.7	6.5	7.6	8.1	8.0	4.3	3.3	3.3	3.3	12.6	8.2	24
18	6.9	8.0	7.1	1.1	6.8	7.8	7.2	8.1	7.2	9.3	9.5	13.1	15.5	14.6	15.0	15.1	18.4	16.6	17.3	20.4	19.5	19.6	20.0	18.8	1.1	20.4	10.8	24
19	20.0	20.8	18.4	16.8	16.4	15.9	14.3	12.5	10.9	11.6	9.6	9.1	15.2	13.1	14.8	10.9	8.8	5.2	7.1	6.8	6.8	8.3	8.4	8.2	5.2	20.8	11.3	24
20	8.5	6.9	7.8	7.9	7.2	7.8	7.2	5.6	6.0	9.3	11.7	12.2	10.8	14.5	11.8	14.6	14.6	14.3	12.4	15.2	15.3	13.4	11.4	11.1	5.6	15.3	9.6	24
21	10.7	12.2	13.3	10.7	7.3	2.4	5.5	4.4	4.2	3.3	10.0	14.2	16.8	16.2	13.7	13.2	13.9	13.8	13.1	17.9	16.5	17.5	18.1	18.1	2.4	18.1	7.4	24
22	16.5	17.6	18.6	20.4	19.9	20.0	15.3	12.1	11.6	11.6	10.5	9.5	5.4	3.1	1.0	4.0	4.3	6.3	8.3	9.2	12.8	14.2	14.1	17.5	1.0	20.4	4.2	24
23	22.4	20.6	20.0	19.5	17.7	18.7	15.8	13.8	19.8	22.3	21.2	18.5	18.4	17.9	16.5	18.2	18.7	14.3	11.2	12.9	9.9	8.5	8.9	8.1	8.1	22.4	16.2	24
24	9.8	8.8	8.5	6.5	6.9	5.0	3.3	1.8	5.8	5.8	6.9	6.7	6.9	8.4	9.2	12.5	14.4	10.7	9.5	9.9	7.5	9.9	9.5	9.9	1.8	14.4	6.0	24
25	9.7	9.3	12.8	10.0	9.9	9.3	10.6	9.4	9.8	7.7	7.6	10.4	12.3	12.7	12.8	14.7	15.2	14.9	12.8	13.2	13.6	11.4	12.7	12.4	7.6	15.2	10.8	24
26	13.5	11.2	10.6	11.8	11.3	10.0	12.1	11.1	10.0	11.5	12.7	16.8	19.4	17.6	16.4	17.2	19.8	16.1	15.2	13.3	12.3	9.8	12.3	14.0	9.8	19.8	12.8	24
27	13.0	12.6	15.1	16.1	15.9	16.2	16.4	17.1	19.6	17.2	16.7	19.6	18.0	19.0	17.7	17.5	15.8	13.9	9.3	9.0	8.9	7.3	7.8	10.5	7.3	19.6	12.7	24
28	14.0	13.3	12.9	11.8	5.4	2.1	10.1	12.7	11.2	11.5	11.5	11.3	13.8	15.9	17.4	15.3	15.9	15.3	16.6	15.2	10.9	11.6	11.8	11.8	2.1	17.4	11.5	24
HOURLY MAX	22.4	20.8	20.0	20.4	19.9	20.0	18.3	17.8	19.8	22.3	21.2	19.6	19.4	19.0	17.7	18.2	19.8	16.9	17.3	20.4	19.5	19.6	20.0	18.8				

STATUS FLAG CODES

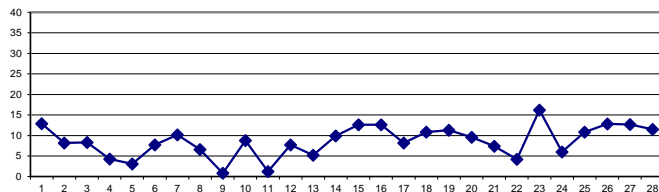
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

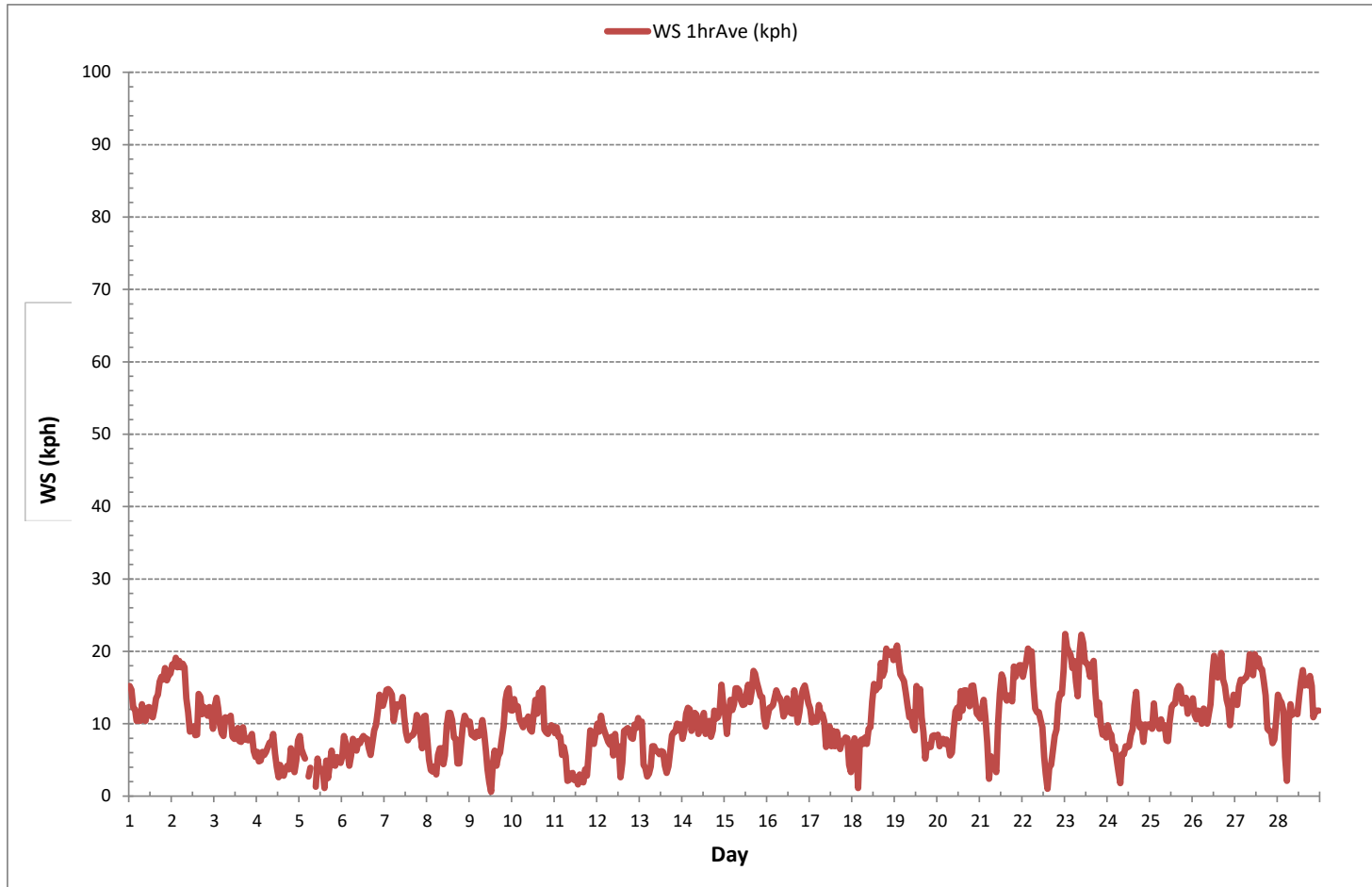
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	669
MINIMUM 1-HR AVERAGE	0.6 kph @ HOUR 12 ON DAY 9
MAXIMUM 1-HR AVERAGE:	22.4 kph @ HOUR 0 ON DAY 23
MAXIMUM 24-HR AVERAGE:	16.2 kph ON DAY 23
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	669 hrs
AMT OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	4.3
MONTHLY AVERAGE:	0.5 kph

24 HR AVERAGES February 2019

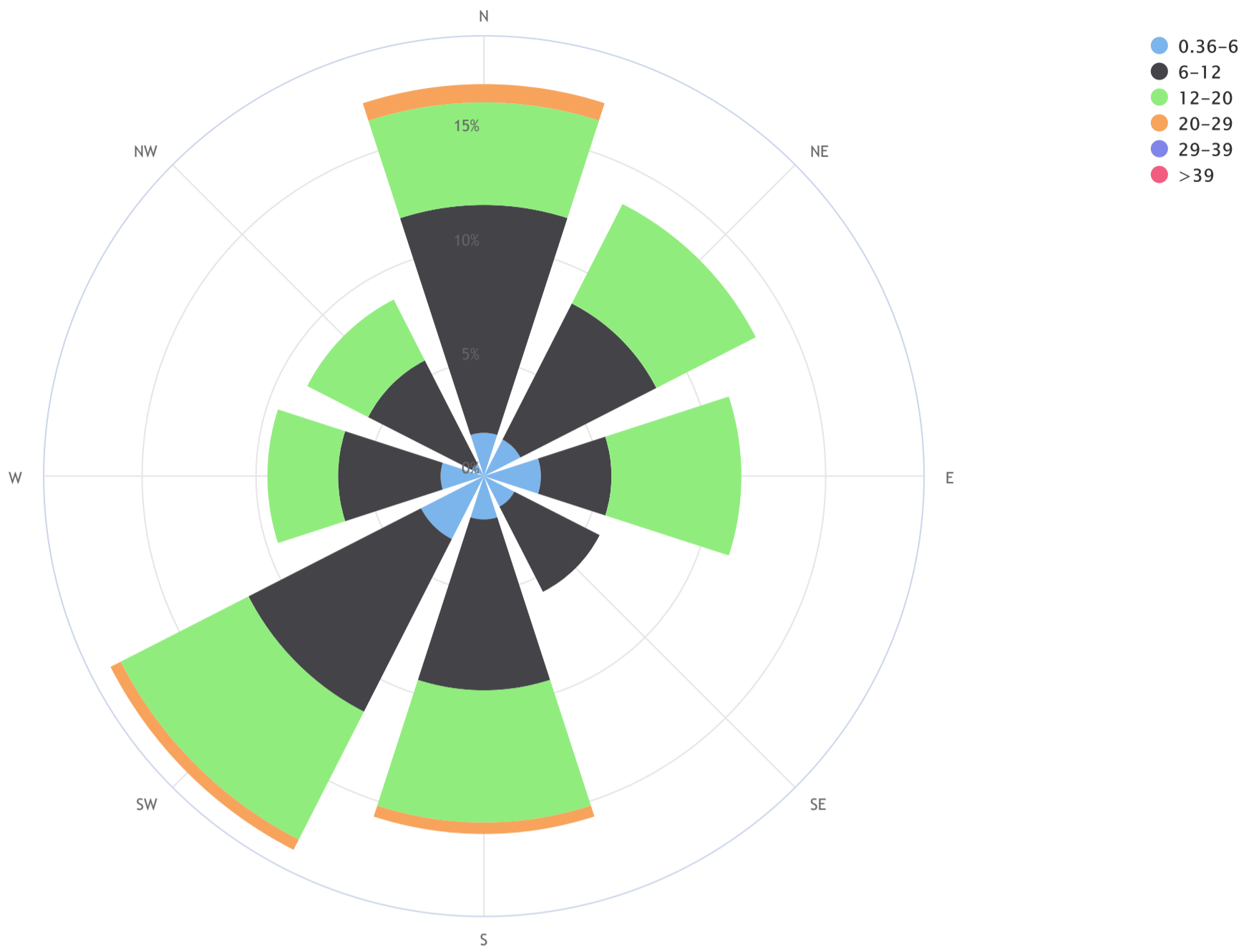


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association_St. Lina Continuous Monitoring Station_19/02

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = N/A_CALM % = 0.0%



Direction	0.36-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	1.9	10.0	4.5	0.8	0.0	0.0	17.2
NE	1.8	6.7	4.9	0.0	0.0	0.0	13.5
E	2.5	3.1	5.7	0.0	0.0	0.0	11.4
SE	1.5	4.2	0.0	0.0	0.0	0.0	5.7
S	1.9	7.5	5.8	0.5	0.0	0.0	15.7
SW	3.1	8.5	6.3	0.5	0.0	0.0	18.4
W	1.9	4.5	3.1	0.0	0.0	0.0	9.6
NW	0.6	5.1	3.0	0.0	0.0	0.0	8.7
Summary	15.4	49.6	33.3	1.7	0.0	0.0	100.0
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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	ENE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	E	E	ENE	ENE	E	E	E	ENE	24	
2	E	E	E	ENE	ENE	ENE	ENE	ENE	NE	NE	NNE	NNE	N	N	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	WNW	NNE	24	
3	WNW	NW	NNW	NNW	NNW	NW	NNW	NNW	N	N	N	N	N	N	NNE	N	N	NNW	NW	N	N	NNE	NNE	NNE	NNW	NNW	24
4	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	E	ESE	E	ENE	ESE	E	E	SE	ESE	ESE	SE	SE	SE	SE	SSE	S	E	24	
5	S	SSW	SSW	WSW	X	NNE	ENE	X	X	WSW	S	S	S	SE	S	ESE	ESE	SSE	S	SSW	WSW	SW	SSW	SSW	S	24	
6	SSW	SSW	SSW	S	SSW	SSW	S	SSE	SSE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSE	SE	SSE	SSE	S	S	S	S	S	24	
7	S	S	S	S	SSE	SSE	S	SSE	SSE	SSE	SSE	S	SSE	SSE	SSE	SE	ESE	SE	SE	SSE	SE	SE	E	E	SSE	24	
8	E	E	E	NE	NE	N	NNE	N	N	NNE	NNE	N	NNE	NE	NE	NE	NE	NE	N	N	NNE	NNE	NE	NNE	NNE	NNE	24
9	NNE	NNE	NNE	N	NNE	N	N	N	N	NNE	NE	ENE	WSW	SSW	SW	SSW	SSE	SSE	S	S	S	S	S	SSW	ESE	24	
10	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SSE	ESE	ESE	E	E	E	ENE	ENE	E	E	E	ESE	ESE	E	ESE	24	
11	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	E	ENE	ESE	SE	ESE	ENE	NNE	NNE	NNE	N	S	WSW	W	WNW	WNW	W	ESE	24	
12	W	WSW	W	W	W	WNW	WSW	WSW	SW	W	SW	WSW	W	WNW	WSW	SW	SW	WSW	WSW	WSW	WSW	SW	WSW	W	WSW	WSW	24
13	W	N	WNW	WNW	W	W	WSW	WSW	SW	WSW	WSW	SW	SW	SW	WSW	WSW	SSW	SSW	S	SSW	SW	SW	SW	SSW	SW	24	
14	SSW	S	S	S	S	SSE	SSE	S	SSE	S	SSE	SSE	SSE	SE	SE	SE	ESE	ESE	SE	SE	SSE	SSE	S	SSE	SSE	24	
15	SSE	SE	E	E	E	E	ESE	E	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	E	24	
16	ENE	ENE	NE	NE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NNE	NNE	NE	NE	NE	NE	NE	24	
17	NE	NE	NNE	N	N	NNE	NNE	NNE	NNE	NE	N	N	N	NNW	N	NNW	NNW	NNW	NNW	N	NNW	N	N	NW	N	24	
18	NNW	NW	NNW	WNW	WSW	WSW	WSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
19	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	WSW	WSW	WSW	W	WNW	NW	SW	24	
20	NNW	NW	NW	NNW	NNW	NNW	N	NNW	NNW	NNE	ENE	ENE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNW	NNW	N	24	
21	NNW	NNW	NNW	N	NNW	W	WSW	WSW	SW	WSW	WSW	SW	WSW	SW	WSW	S	SSW	S	S	S	S	S	S	S	SW	24	
22	S	S	S	S	S	S	SSW	SSW	SSW	SSW	S	SSW	SW	SW	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	S	24	
23	N	N	N	N	NNW	N	NNW	N	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
24	NNW	NNW	NNW	NNW	NW	NW	NNE	W	W	W	WSW	WSW	NW	WNW	W	SW	SW	SW	WSW	WSW	WSW	SW	SW	SW	W	24	
25	WSW	WSW	W	WNW	WNW	W	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SSW	SW	SW	SW	24	
26	SW	SW	SSW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	W	W	W	W	W	W	W	WSW	24	
27	W	W	W	WSW	WSW	WSW	WSW	WSW	W	W	W	WNW	NW	WNW	NW	NW	NNW	NNW	NNW	NNW	NNW	N	NNW	NNW	NNW	24	
28	NNW	NNW	NNW	NNW	ENE	NNW	NW	N	N	N	N	NNW	NNW	NNW	NNW	N	N	NNW	NNE	NNE	NNE	NNE	NNE	NNE	N	24	

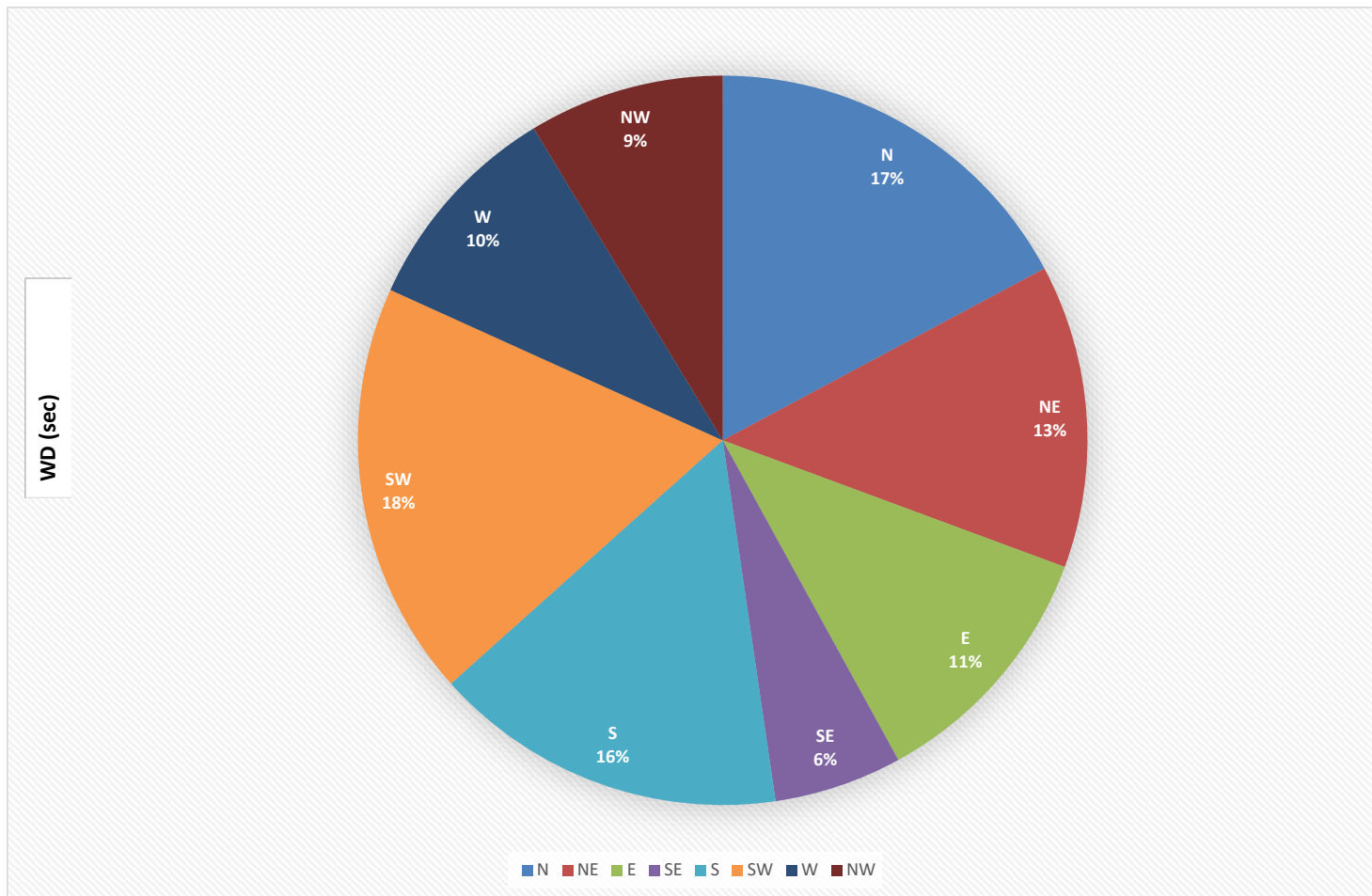
STATUS FLAG CODES

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:	669	hrs
STANDARD DEVIATION:	108		AMD OPERATION UPTIME:	99.6	%
			MONTHLY AVERAGE:	300 (WNW)	

WIND DIRECTION Hourly Averages (WD)



— WDR[degwdr]



LICA-201902



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - February 2019

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	6	9	6	6	4	8	6	6	7	8	8	7	10	10	11	6	8	5	5	5	4	5	4	4	24	
2	4	5	4	5	5	5	5	7	4	7	11	12	12	17	14	7	8	4	3	4	4	3	3	11	24	
3	8	11	6	8	5	17	4	6	5	3	6	6	10	8	13	12	8	8	7	12	7	6	13	11	24	
4	8	10	10	8	8	7	6	6	4	16	19	23	35	25	30	32	22	30	32	5	9	7	4	4	24	
5	7	8	10	15	X	40	6	X	X	73	11	26	21	27	70	18	52	29	9	12	13	13	4	7	21	
6	12	3	3	8	6	4	13	3	9	7	10	8	12	19	11	14	27	4	7	5	3	2	5	4	24	
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8	9	10	14	20	9	21	6	4	6	14	18	15	12	8	8	6	10	26	10	17	4	5	4	6	24	
9	5	5	7	9	4	11	4	5	4	9	15	50	73	26	16	13	12	14	3	4	4	2	6	7	24	
10	8	2	3	2	4	5	4	4	5	5	11	15	9	10	7	6	6	4	8	5	6	6	6	9	24	
11	11	7	7	8	14	7	10	27	28	19	36	42	48	43	29	19	26	18	51	9	8	8	6	6	24	
12	9	9	5	9	10	24	24	24	11	20	6	9	20	45	32	5	9	4	11	6	8	9	15	7	24	
13	9	45	37	42	49	29	24	6	6	9	4	8	7	13	13	12	15	7	7	8	2	2	7	15	24	
14	6	8	7	6	8	7	8	4	4	7	7	9	10	11	13	9	10	8	5	4	5	7	3	4	24	
15	4	20	9	6	7	7	4	6	5	5	5	5	7	5	5	5	3	4	4	3	6	3	10	4	24	
16	3	5	4	3	4	3	5	4	5	5	5	6	7	7	7	7	5	4	3	4	7	4	4	5	24	
17	5	5	6	8	5	6	5	3	4	8	9	5	13	8	16	14	10	11	12	9	5	5	20	15	24	
18	4	3	15	68	14	12	17	7	8	5	7	4	5	9	7	6	5	8	3	3	5	7	19	5	24	
19	2	4	3	2	2	3	3	3	3	3	9	8	6	4	6	9	6	22	6	18	12	6	12	6	24	
20	7	13	8	3	4	7	8	15	17	11	10	9	11	6	16	5	5	5	5	9	6	6	4	5	24	
21	5	8	5	5	8	51	14	14	23	24	17	11	13	11	13	10	6	4	9	6	3	3	2	4	24	
22	4	4	3	2	4	3	5	10	8	10	10	15	13	17	66	25	12	8	12	7	12	7	5	11	24	
23	4	5	5	4	4	4	4	5	6	5	9	9	8	8	9	7	5	3	4	4	6	7	6	8	24	
24	11	5	3	10	5	9	32	60	11	10	16	23	18	25	18	10	4	3	5	5	8	3	7	4	24	
25	4	3	5	11	5	16	9	10	8	6	7	6	4	6	5	6	4	6	4	7	4	4	4	10	24	
26	8	9	4	12	6	15	7	3	5	4	2	3	3	3	6	5	4	6	5	3	2	10	2	4	24	
27	4	8	7	3	3	4	2	4	3	6	13	6	10	9	8	6	8	5	11	4	7	18	8	7	24	
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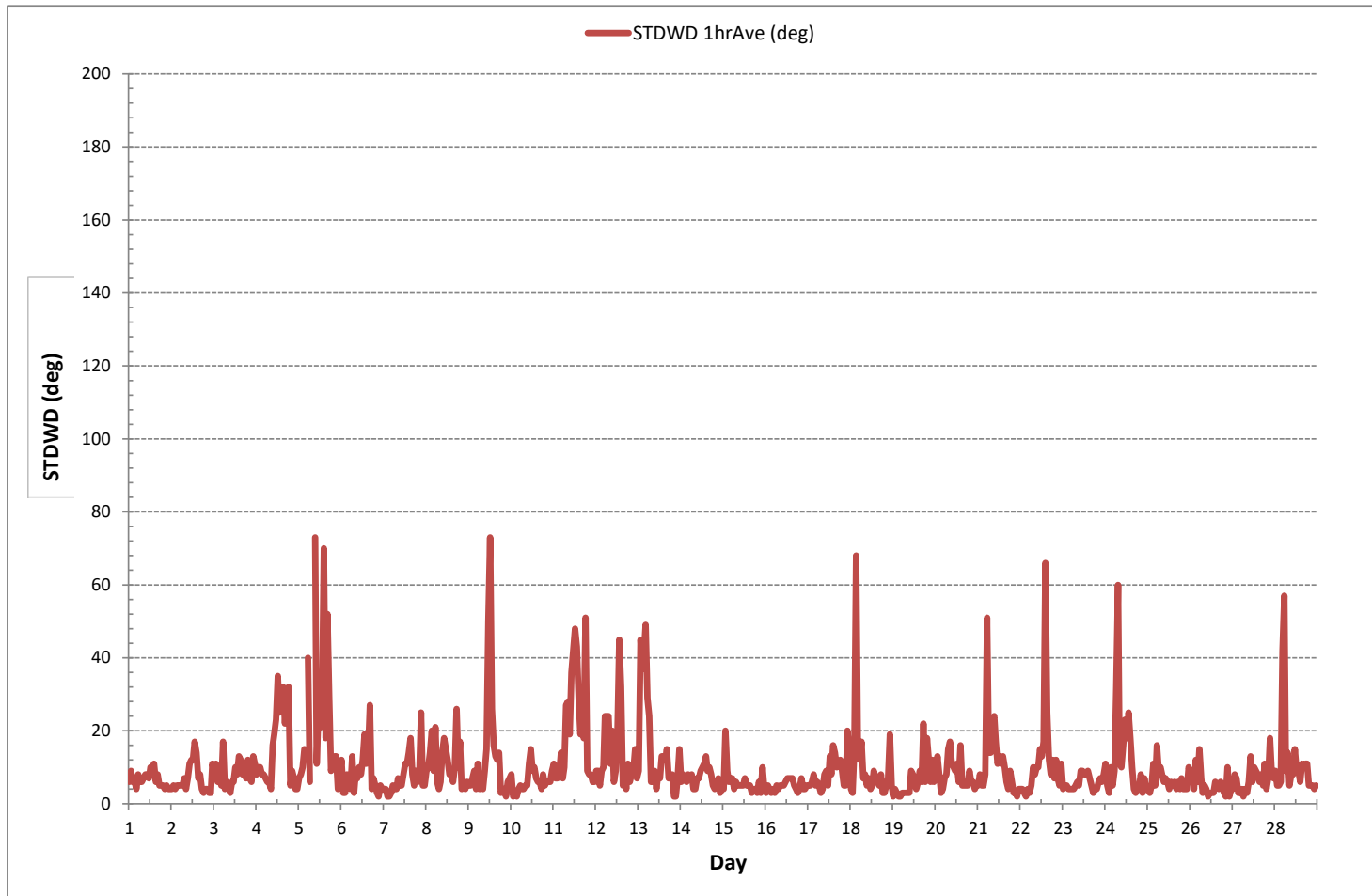
STATUS FLAG CODES

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

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 669 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	86	83	85	85	86	87	85	84	83	83	80	77	76	76	78	79	79	80	80	80	80	80	80	80	80	76	87	81	24
2	79	78	77	76	76	76	76	76	76	75	73	72	72	72	70	68	68	72	73	74	75	73	72	72	72	68	79	74	24
3	71	71	69	68	68	67	67	67	66	66	67	68	68	69	70	71	71	71	71	71	71	72	72	72	73	66	73	69	24
4	73	73	73	73	73	73	73	73	72	72	71	70	70	70	70	71	73	74	73	74	74	74	74	74	74	70	74	72	24
5	74	75	75	73	73	73	73	73	72	73	73	73	71	68	67	68	69	70	71	72	74	74	74	76	76	67	76	72	24
6	76	75	75	75	75	76	75	74	74	74	75	73	68	65	62	62	65	71	72	73	74	75	74	72	62	76	72	24	
7	72	71	71	71	71	71	71	71	71	70	70	67	62	63	63	66	68	70	71	71	71	71	72	72	73	62	73	70	24
8	73	74	74	74	74	73	74	74	74	73	71	66	65	69	72	74	76	78	79	81	82	81	80	80	65	82	75	24	
9	79	78	78	77	76	74	73	72	71	70	70	70	68	66	64	66	69	74	78	78	78	78	78	77	75	64	79	73	24
10	73	73	73	72	72	72	72	72	71	72	72	72	72	74	75	78	80	82	82	82	82	82	81	80	71	82	75	24	
11	80	80	80	80	80	80	80	80	80	79	77	76	75	76	78	78	77	79	81	83	82	81	82	81	75	83	79	24	
12	79	76	77	76	74	76	73	71	68	71	71	75	78	78	76	73	76	79	81	81	81	81	78	78	77	68	81	76	24
13	76	76	75	76	76	77	76	74	73	74	74	78	75	74	72	71	71	75	78	80	81	81	81	81	71	81	76	24	
14	80	81	79	79	80	81	80	78	79	80	81	78	71	65	64	64	67	74	78	79	80	80	80	79	80	64	81	77	24
15	81	81	79	80	79	79	79	78	77	76	75	72	70	68	68	72	73	74	75	75	75	75	79	81	68	81	76	24	
16	83	86	88	89	87	86	86	85	84	83	80	75	70	69	70	69	70	74	77	80	83	83	86	87	69	89	80	24	
17	87	88	89	88	87	86	85	85	84	82	76	73	70	66	66	69	70	74	77	79	80	81	81	83	66	89	79	24	
18	85	85	85	83	82	82	84	80	80	80	80	78	70	63	62	65	69	71	75	77	78	78	77	77	62	85	77	24	
19	78	78	78	78	78	79	81	83	84	82	78	71	70	68	66	65	68	73	75	77	80	79	87	95	65	95	77	24	
20	98	98	98	98	98	97	97	97	97	95	90	83	81	81	80	79	79	81	83	88	86	88	88	79	98	98	90	24	
21	87	84	82	83	86	87	90	89	87	82	78	75	74	70	65	67	72	78	83	87	88	90	90	88	65	90	82	24	
22	86	85	84	82	81	80	80	81	76	73	68	63	60	54	53	56	60	67	71	71	80	87	87	85	53	87	74	24	
23	78	71	75	77	78	77	78	81	76	73	69	65	61	61	59	60	60	63	68	67	65	69	75	78	59	81	70	24	
24	77	79	81	84	86	85	85	83	82	81	79	68	61	56	52	54	56	63	69	74	78	79	81	52	86	73	24		
25	82	82	82	80	79	80	75	73	73	73	71	64	58	56	55	56	60	68	74	80	84	82	80	55	84	73	24		
26	79	77	76	76	76	74	73	72	71	73	75	72	57	54	55	60	66	68	68	72	74	75	74	54	79	71	24		
27	74	75	76	79	78	77	76	77	75	72	65	60	56	55	52	50	49	51	55	54	55	56	59	61	49	79	64	24	
28	60	60	61	63	77	82	77	80	76	67	62	58	55	49	44	43	43	42	56	75	80	76	82	83	42	83	65	24	
HOURLY MAX	98	98	98	98	98	97	97	97	97	95	90	83	81	81	80	79	80	83	87	88	90	90	95						
HOURLY AVG	79	78	78	78	79	79	79	78	77	76	74	72	68	66	65	66	68	71	74	76	77	78	79	79					

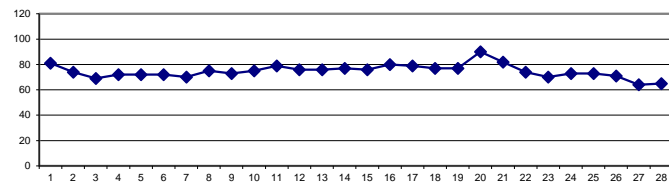
STATUS FLAG CODES

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

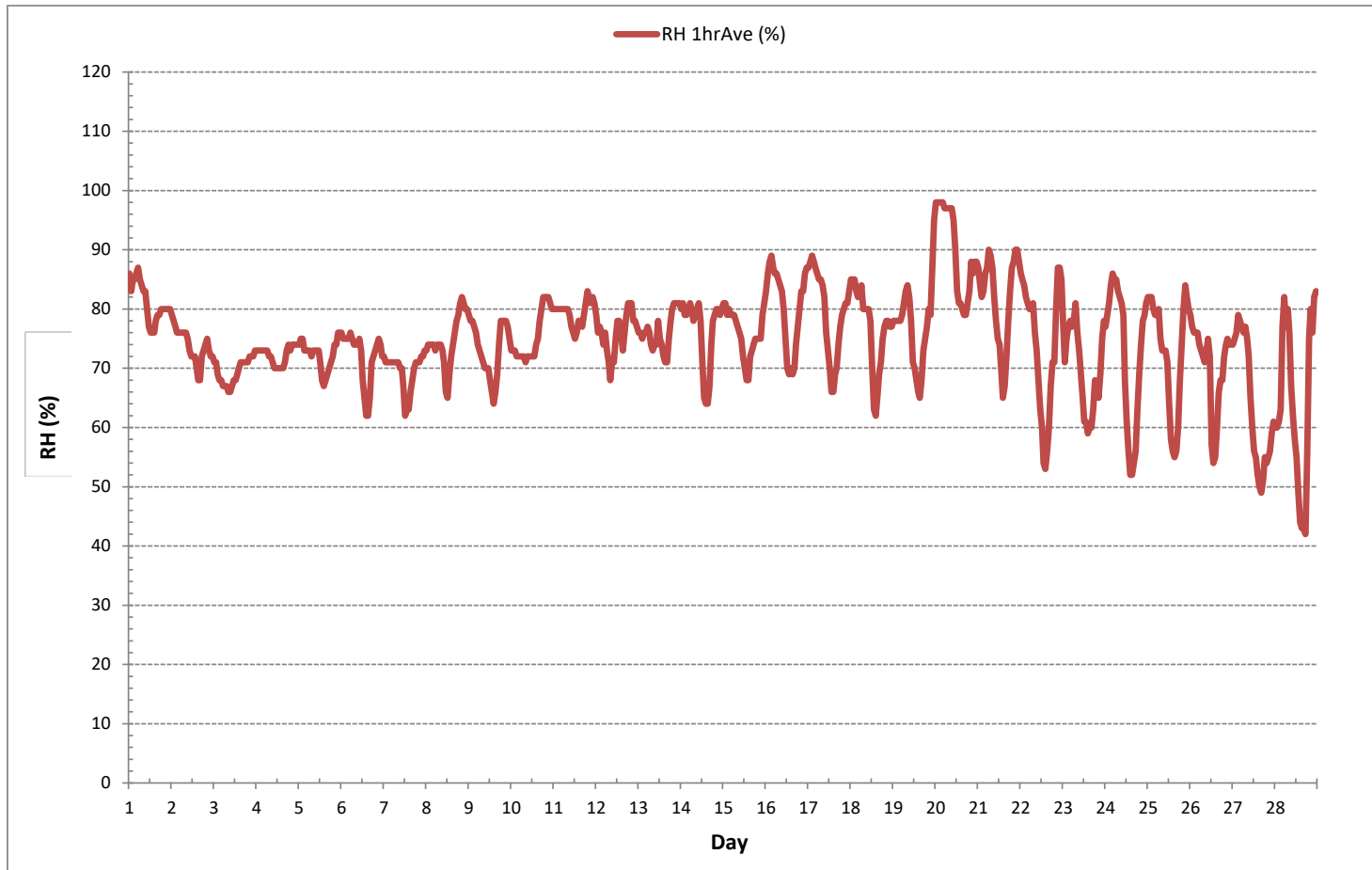
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	42	%	@ HOUR	17	ON DAY	28
MAXIMUM 1-HR AVERAGE:	98	%	@ HOUR	0	ON DAY	20
MAXIMUM 24-HR AVERAGE:	90	%			ON DAY	20
OPERATIONAL TIME:						672 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	8					MONTHLY AVERAGE: 75 %

24 HR AVERAGES February 2019



RELATIVE HUMIDITY Hourly Averages (RH %)





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

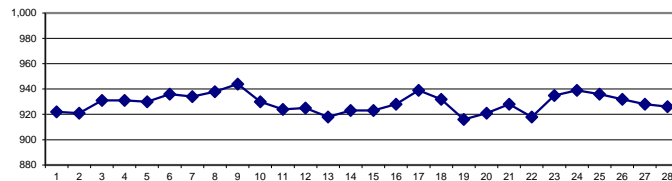
STATUS FLAG CODES

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

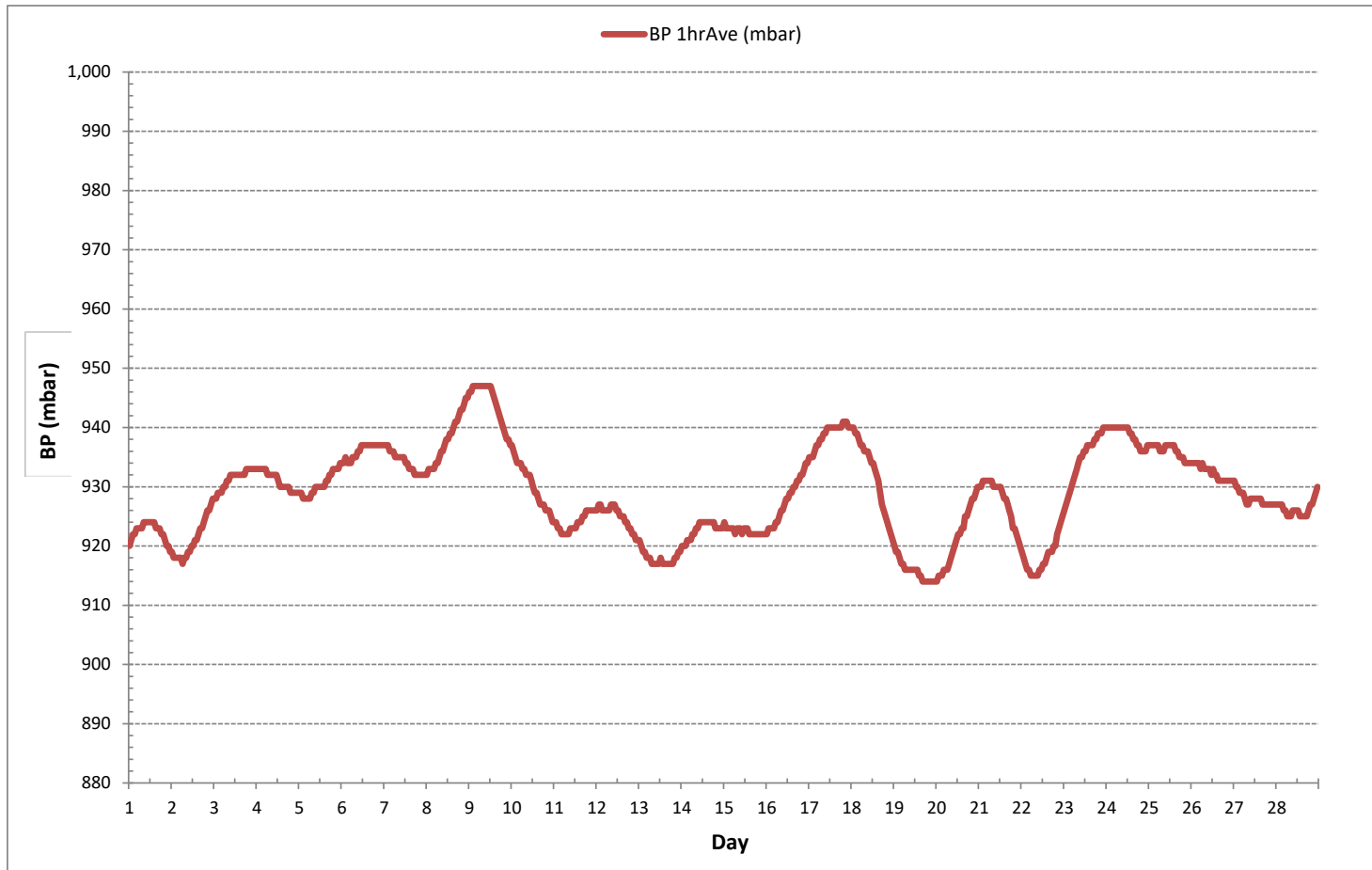
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	914	mbar	@ HOUR	16	ON DAY	19
MAXIMUM 1-HR AVERAGE:	947	mbar	@ HOUR	2	ON DAY	9
MAXIMUM 24-HR AVERAGE:	944	mbar			ON DAY	9
OPERATIONAL TIME:						672 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	8					MONTHLY AVERAGE: 929 mbar

24 HR AVERAGES February 2019



BAROMETRIC PRESSURE Hourly Averages (BP mbar)





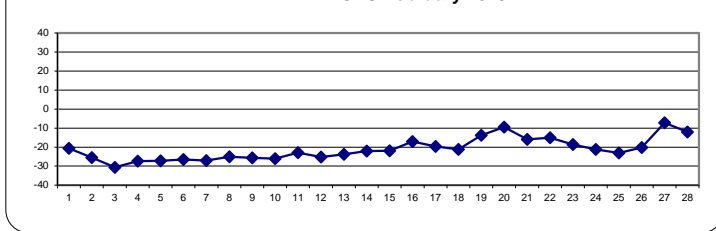
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-16.7	-17.5	-18.4	-18.9	-19.0	-19.2	-19.6	-20.1	-20.3	-20.3	-20.1	-20.0	-20.3	-20.6	-20.8	-21.3	-21.7	-22.1	-22.5	-22.7	-22.9	-23.0	-23.0	-23.1	-23.1	-23.1	-16.7	-20.6	24
2	-23.4	-24.0	-24.5	-24.8	-25.0	-25.1	-25.0	-25.0	-25.3	-24.9	-24.6	-24.5	-24.2	-23.7	-23.5	-23.7	-24.4	-25.7	-26.6	-27.3	-28.0	-28.7	-29.5	-30.3	-30.3	-30.3	-23.4	-25.5	24
3	-31.0	-31.1	-31.5	-32.0	-32.4	-33.2	-33.6	-33.9	-34.2	-33.6	-31.9	-30.8	-29.9	-29.3	-28.8	-28.6	-28.8	-28.9	-29.0	-29.0	-28.7	-28.4	-28.2	-28.1	-34.2	-28.1	-30.6	24	
4	-27.9	-27.8	-27.6	-27.5	-27.7	-27.8	-28.0	-28.4	-28.5	-28.3	-27.6	-26.6	-26.0	-26.2	-26.2	-25.7	-26.2	-27.3	-27.8	-27.5	-27.5	-27.7	-28.1	-28.1	-28.5	-25.7	-27.4	24	
5	-28.7	-28.9	-29.2	-29.9	-30.0	-29.1	-29.0	-29.5	-28.5	-27.2	-25.8	-24.4	-23.3	-23.6	-23.4	-24.9	-26.0	-26.8	-27.0	-27.1	-27.7	-27.7	-27.7	-27.6	-30.0	-23.3	-27.2	24	
6	-27.8	-29.1	-29.5	-29.1	-28.4	-28.2	-28.8	-28.6	-28.3	-27.1	-25.1	-23.7	-22.6	-22.1	-22.0	-21.9	-23.1	-24.9	-26.2	-27.0	-27.6	-28.3	-28.6	-29.0	-29.5	-21.9	-26.5	24	
7	-29.0	-29.4	-29.6	-29.9	-29.7	-29.6	-30.0	-29.7	-28.8	-27.5	-26.2	-24.4	-23.3	-22.9	-22.5	-23.7	-25.1	-25.9	-26.6	-26.8	-27.0	-26.7	-27.5	-27.4	-30.0	-22.5	-27.0	24	
8	-27.1	-27.0	-26.8	-27.0	-27.2	-27.2	-27.4	-27.5	-27.3	-26.3	-25.5	-24.4	-23.8	-24.1	-23.8	-23.1	-22.9	-23.2	-23.2	-22.8	-22.3	-22.7	-23.1	-23.4	-27.5	-22.3	-25.0	24	
9	-24.1	-24.5	-25.1	-25.9	-26.8	-27.7	-28.9	-29.6	-29.5	-28.0	-26.1	-24.1	-22.6	-21.8	-22.0	-21.5	-22.7	-24.1	-25.3	-25.8	-26.5	-27.5	-28.5	-29.1	-29.6	-21.5	-25.7	24	
10	-29.2	-29.0	-28.9	-29.3	-29.4	-29.6	-29.8	-29.7	-29.4	-27.7	-26.2	-25.6	-24.7	-24.1	-23.1	-23.0	-23.1	-23.3	-22.9	-22.8	-23.1	-23.3	-23.3	-23.8	-29.8	-22.8	-26.0	24	
11	-23.5	-23.3	-23.6	-23.6	-23.7	-23.7	-23.7	-23.7	-23.5	-23.0	-22.4	-21.8	-21.5	-21.2	-21.0	-20.7	-20.6	-22.1	-23.0	-23.4	-23.8	-23.9	-23.7	-24.7	-24.7	-20.6	-22.9	24	
12	-25.1	-26.9	-27.2	-27.0	-27.8	-26.8	-29.4	-29.7	-31.1	-27.6	-26.4	-23.1	-20.4	-19.6	-19.1	-19.7	-21.4	-23.0	-24.1	-24.5	-25.0	-26.4	-26.5	-26.4	-31.1	-19.1	-25.2	24	
13	-27.1	-26.5	-27.5	-26.8	-27.0	-26.4	-26.0	-27.5	-28.0	-24.9	-23.6	-20.0	-18.3	-18.7	-18.1	-17.8	-18.6	-21.3	-23.2	-24.1	-24.3	-24.9	-25.0	-24.9	-28.0	-17.8	-23.8	24	
14	-25.6	-25.3	-25.1	-24.9	-24.1	-23.7	-24.6	-26.1	-25.0	-22.8	-21.1	-19.1	-17.6	-16.8	-16.7	-16.7	-18.5	-20.6	-21.3	-22.1	-22.5	-23.2	-23.6	-23.9	-26.1	-16.7	-22.1	24	
15	-23.9	-23.9	-26.1	-26.4	-26.5	-26.1	-25.6	-26.4	-25.1	-24.5	-24.0	-22.7	-21.9	-20.2	-19.2	-19.1	-18.6	-18.5	-18.2	-17.8	-17.5	-17.4	-18.2	-18.5	-26.5	-17.4	-21.9	24	
16	-19.0	-19.5	-19.7	-19.7	-19.5	-19.4	-19.4	-19.2	-19.0	-18.6	-17.9	-16.9	-15.9	-14.9	-13.7	-13.3	-13.6	-14.4	-14.8	-15.2	-15.8	-16.5	-17.2	-17.8	-19.7	-13.3	-17.1	24	
17	-18.4	-18.8	-19.4	-20.3	-21.1	-21.1	-21.2	-21.9	-21.8	-21.0	-20.1	-19.1	-17.8	-17.3	-17.1	-17.4	-17.7	-18.4	-19.4	-20.3	-20.3	-20.5	-20.8	-21.3	-21.9	-17.1	-19.7	24	
18	-22.0	-22.3	-22.3	-23.0	-24.7	-25.0	-23.7	-26.0	-24.7	-23.3	-21.7	-19.8	-18.4	-17.2	-16.8	-17.2	-17.8	-18.5	-19.6	-20.4	-20.8	-21.1	-21.0	-21.1	-26.0	-16.8	-21.2	24	
19	-21.6	-22.1	-22.5	-22.5	-22.2	-22.6	-23.2	-22.9	-21.2	-18.5	-14.4	-11.2	-9.0	-6.9	-5.7	-5.3	-6.9	-7.6	-7.5	-7.7	-8.2	-7.6	-7.5	-7.3	-23.2	-5.3	-13.8	24	
20	-7.5	-7.5	-7.8	-8.1	-8.2	-8.2	-8.2	-8.0	-8.2	-7.5	-8.0	-8.2	-7.7	-7.6	-7.7	-8.4	-9.6	-10.4	-11.1	-11.9	-13.0	-14.0	-15.4	-15.4	-15.4	-7.5	-9.5	24	
21	-15.5	-15.9	-16.3	-16.4	-16.5	-16.6	-17.0	-16.8	-16.5	-15.3	-14.9	-14.4	-14.1	-13.3	-12.5	-13.0	-14.0	-15.3	-16.9	-17.9	-18.3	-18.5	-18.5	-18.1	-18.5	-12.5	-15.9	24	
22	-18.2	-18.4	-18.8	-18.8	-18.5	-18.3	-18.4	-18.6	-18.1	-17.0	-16.1	-14.5	-13.5	-11.4	-10.1	-10.2	-11.0	-12.7	-13.6	-13.1	-12.3	-12.4	-12.5	-13.1	-18.8	-10.1	-15.0	24	
23	-14.9	-16.9	-18.3	-19.4	-20.1	-20.4	-20.8	-20.7	-19.9	-19.5	-18.9	-18.0	-17.3	-17.1	-16.9	-16.9	-17.2	-18.1	-18.3	-18.6	-19.0	-19.2	-19.3	-19.5	-20.8	-14.9	-18.6	24	
24	-20.1	-20.9	-21.8	-22.7	-23.2	-23.5	-23.4	-24.0	-23.7	-22.5	-21.0	-19.0	-18.4	-17.5	-16.9	-17.0	-17.6	-18.9	-20.5	-21.6	-22.5	-23.3	-23.9	-24.7	-24.7	-16.9	-21.2	24	
25	-25.2	-25.7	-25.4	-24.1	-24.3	-25.2	-26.5	-29.4	-28.3	-26.6	-24.3	-21.4	-18.6	-17.0	-16.4	-16.7	-17.5	-18.9	-20.7	-22.5	-23.7	-24.7	-25.6	-26.0	-29.4	-16.4	-23.1	24	
26	-26.5	-27.6	-27.8	-27.8	-27.6	-28.8	-30.1	-30.1	-28.8	-25.9	-22.6	-19.4	-16.5	-14.8	-14.2	-13.2	-13.2	-13.0	-13.0	-12.8	-13.1	-13.2	-12.3	-11.8	-30.1	-11.8	-20.2	24	
27	-11.7	-11.9	-12.1	-13.0	-12.9	-12.0	-11.3	-11.1	-10.1	-8.9	-5.5	-3.6	-2.7	-2.3	-1.7	-1.6	-1.9	-2.9	-4.4	-5.2	-6.0	-6.4	-6.4	-7.1	-13.0	-1.6	-7.2	24	
28	-7.4	-7.9	-8.3	-8.5	-10.9	-11.7	-11.0	-12.2	-12.5	-11.9	-11.0	-10.5	-10.3	-10.4	-10.5	-10.8	-11.5	-12.8	-14.7	-16.0	-16.9	-17.1	-17.7	-18.7	-18.7	-7.4	-12.1	24	
HOURLY MAX	-7.4	-7.5	-7.8	-8.1	-8.2	-8.2	-8.2	-8.0	-8.2	-7.5	-5.5	-3.6	-2.7	-2.3	-1.7	-1.6	-1.9	-2.9	-4.4	-5.2	-6.0	-6.4	-6.4	-7.1					
HOURLY AVG	-22.1	-22.5	-22.9	-23.1	-23.4	-23.4	-23.7	-24.2	-23.8	-22.5	-21.2	-19.7	-18.6	-18.0	-17.5	-17.6	-18.3	-19.3	-20.1	-20.5	-20.8	-21.2	-21.5	-21.8					

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

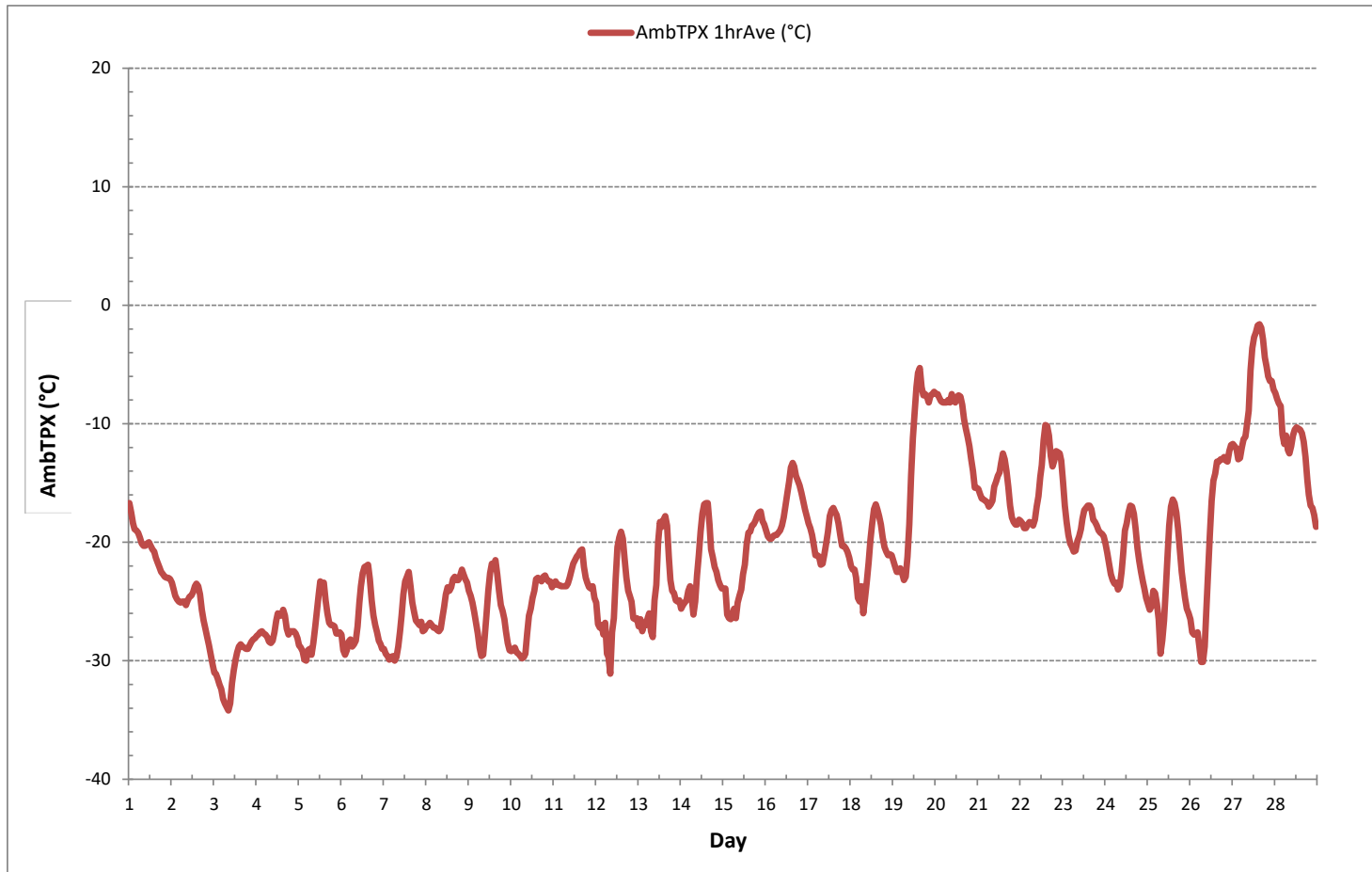
24 HR AVERAGES February 2019



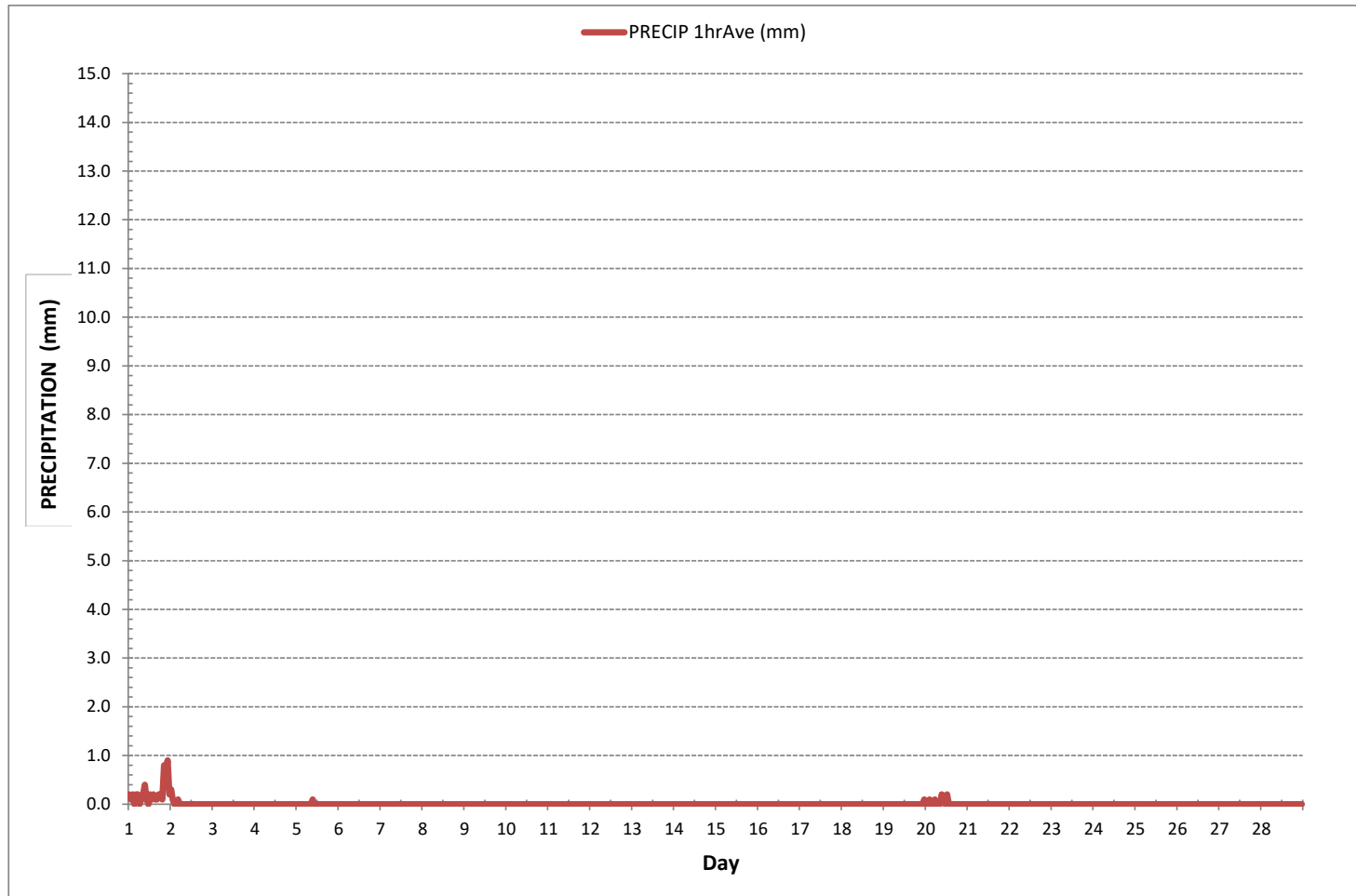
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-34.2 °C	@ HOUR	8	ON DAY	3
MAXIMUM 1-HR AVERAGE:	-1.6 °C	@ HOUR	15	ON DAY	27
MAXIMUM 24-HR AVERAGE:	-7.2 °C			ON DAY	27
OPERATIONAL TIME:					672 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	6.5			MONTHLY AVERAGE:	-21.1 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION Hourly TOTALS (mm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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

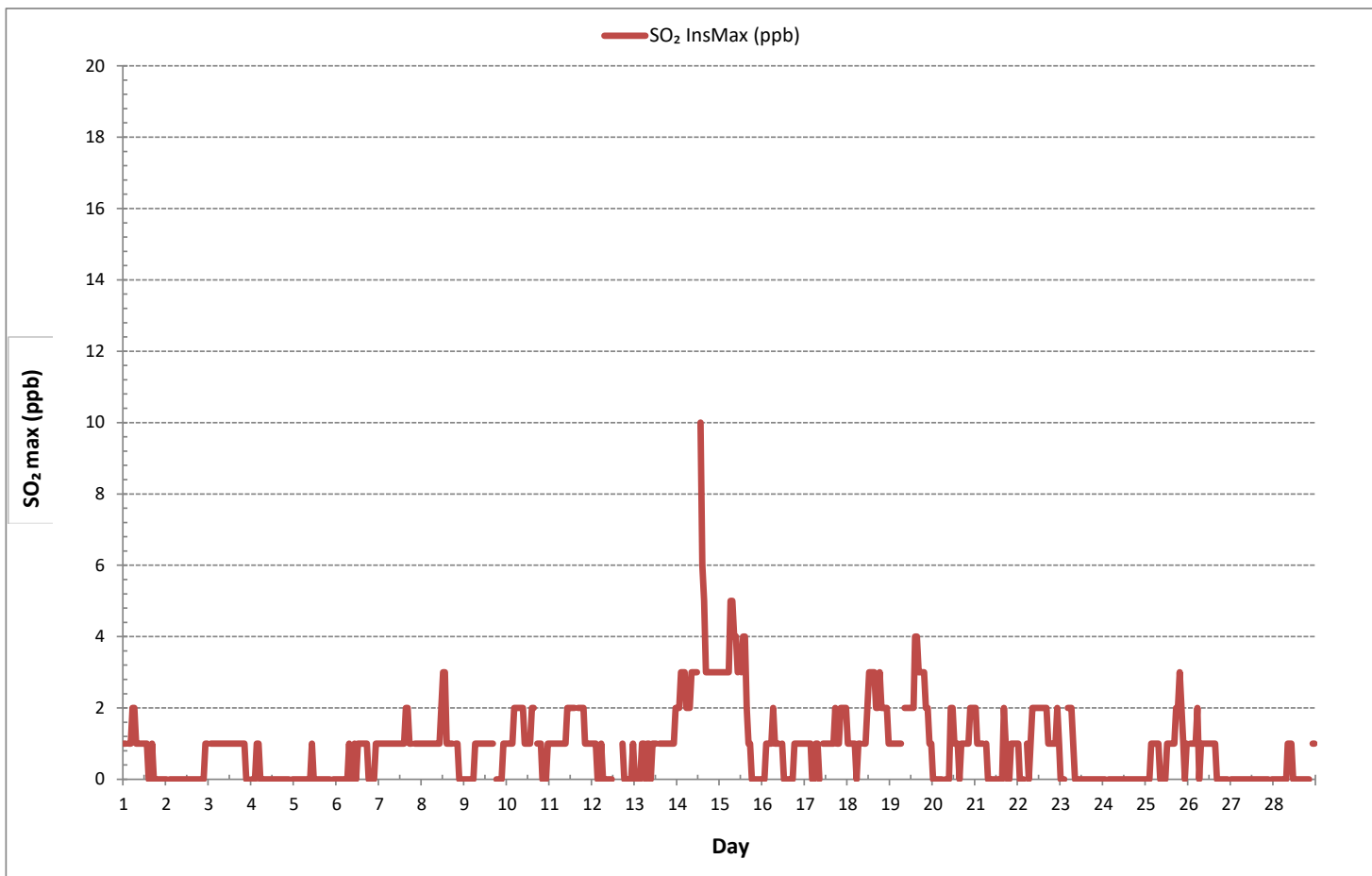
STATUS FLAG CODES

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:	374
MAXIMUM INSTANTANEOUS VALUE:	10 ppb @ HOUR 13 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

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

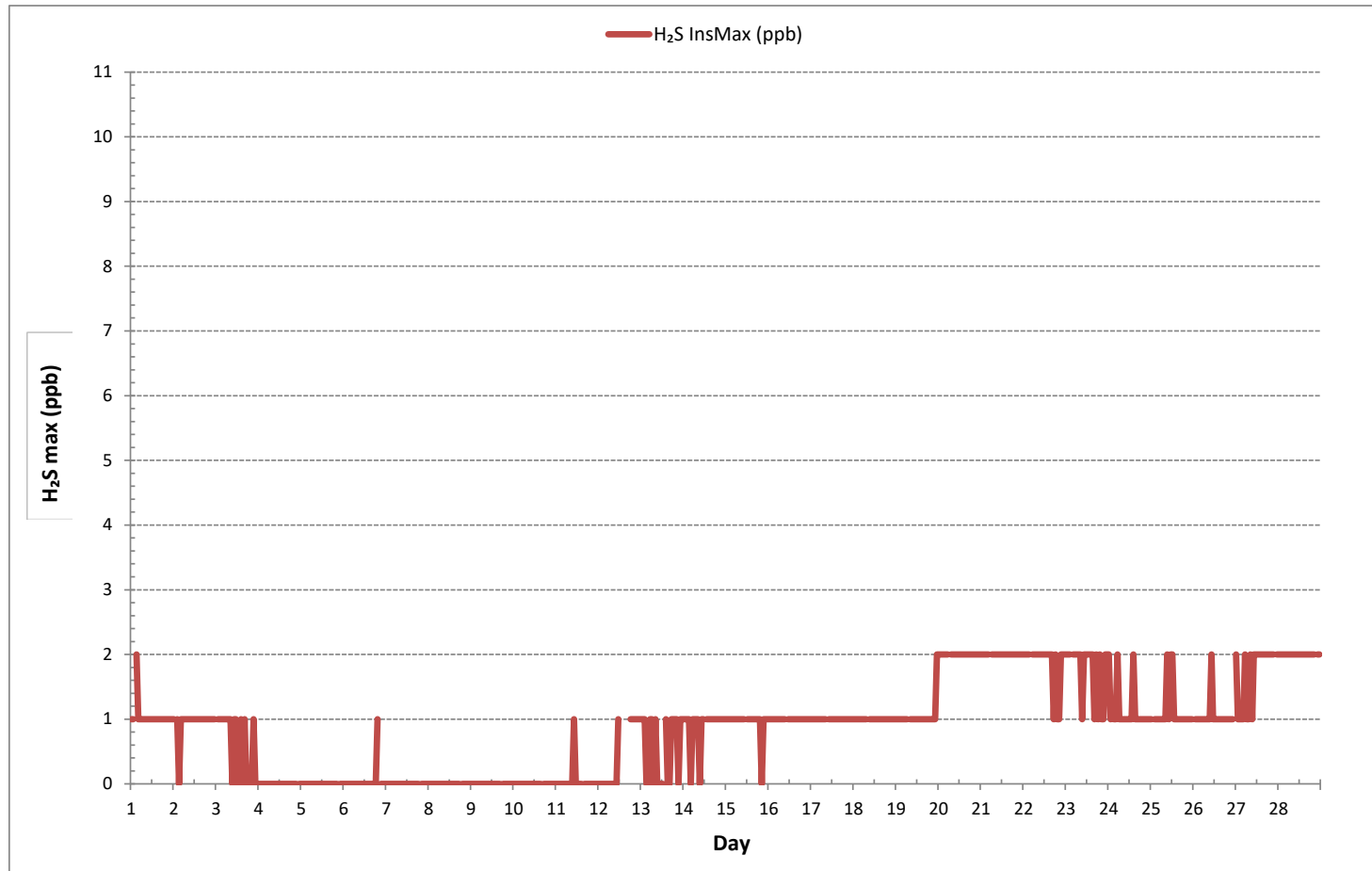
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	421
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 3 ON DAY 1
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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	2.03	2.01	S	2.00	2.03	2.03	2.03	2.01	2.01	2.05	2.02	2.04	1.99	1.99	2.04	1.97	2.02	2.03	2.00	1.98	1.98	1.99	2.05	2.02	1.97	2.05	2.01	24	
2	2.02	S	1.97	1.98	1.97	1.97	1.98	1.97	1.99	2.00	1.99	2.00	2.00	2.04	2.24	2.13	2.21	2.23	2.06	2.33	2.49	2.18	2.15	2.22	1.97	2.49	2.09	24	
3	S	2.12	2.25	2.49	2.76	2.42	2.11	2.47	2.00	2.00	1.99	1.99	2.00	1.97	1.98	1.97	2.01	2.13	2.24	2.00	1.99	1.99	1.98	S	1.97	2.76	2.13	24	
4	2.10	2.11	2.11	2.06	2.07	2.05	2.01	2.00	2.02	2.08	2.03	2.04	2.04	2.06	2.04	2.03	2.04	2.08	2.01	2.02	2.03	2.11	S	2.25	2.00	2.25	2.06	24	
5	2.18	2.17	2.12	2.15	2.13	2.15	2.09	2.06	2.09	2.32	2.29	2.38	2.34	2.17	2.13	2.15	2.18	2.30	2.37	2.27	2.23	S	2.32	2.31	2.06	2.38	2.21	24	
6	2.30	2.44	2.37	2.45	2.97	3.13	2.38	2.27	2.32	2.31	2.25	2.17	2.13	2.09	2.09	2.10	2.16	2.25	2.52	2.60	S	2.55	2.54	2.57	2.09	3.13	2.39	24	
7	2.55	2.55	2.50	2.49	2.47	2.43	2.45	2.41	2.40	2.40	2.40	2.39	2.43	2.43	2.41	2.68	2.68	2.77	2.74	S	2.84	2.96	3.01	2.95	2.39	3.01	2.58	24	
8	2.89	2.92	3.01	2.93	2.80	3.19	2.85	2.82	2.80	2.73	2.74	2.54	2.40	2.32	2.21	2.15	2.15	2.07	S	2.36	2.02	2.03	2.05	2.06	2.02	3.19	2.52	24	
9	2.03	2.03	2.03	2.03	2.03	2.10	2.06	2.05	2.04	2.04	2.04	2.03	2.10	2.07	2.08	2.02	2.00	S	2.28	2.19	2.16	2.14	2.14	2.23	2.00	2.28	2.08	24	
10	2.34	2.39	2.34	2.39	2.51	2.60	2.62	2.63	2.60	2.55	2.42	2.48	2.41	2.36	2.32	2.29	S	2.14	2.14	2.15	2.20	2.16	2.23	2.29	2.14	2.63	2.37	24	
11	2.19	2.06	2.08	2.07	2.11	2.15	2.17	2.18	2.13	2.13	2.09	2.07	2.08	2.07	2.10	S	2.04	2.02	2.21	2.08	2.09	2.09	2.07	2.08	2.02	2.21	2.10	24	
12	2.07	2.17	2.17	2.16	2.17	2.48	2.24	2.27	2.29	2.28	2.34	2.28	2.21	2.26	S	2.21	2.23	2.23	2.16	2.15	2.15	2.16	2.18	2.18	2.07	2.48	2.22	24	
13	2.18	2.18	2.21	2.19	2.21	2.20	2.10	2.16	2.19	2.28	C	C	C	C	S	2.08	2.09	2.24	2.28	2.24	2.22	2.20	2.20	2.20	2.08	2.28	2.19	24	
14	2.43	2.28	2.21	2.23	2.27	2.35	2.40	2.50	2.53	2.56	2.57	2.55	S	2.51	2.55	2.55	2.89	2.88	2.71	2.86	2.89	2.85	2.92	2.92	2.21	2.92	2.58	24	
15	2.92	2.86	3.11	3.17	3.01	2.88	2.74	2.94	2.78	2.67	2.67	S	2.50	2.45	2.26	2.18	2.16	2.14	2.12	2.12	2.12	2.10	2.15	2.07	2.07	3.17	2.53	24	
16	2.09	2.10	2.15	2.14	2.10	2.11	2.14	2.13	2.09	2.09	S	2.09	2.10	2.07	2.05	2.04	2.05	2.06	2.08	2.11	2.12	2.11	2.12	2.11	2.04	2.15	2.10	24	
17	2.10	2.10	2.11	2.08	2.07	2.06	2.07	2.07	2.07	S	2.08	2.08	2.07	2.07	2.09	2.13	2.07	2.50	2.36	2.04	2.03	2.03	2.67	7.01	2.03	7.01	2.34	24	
18	2.37	2.13	2.04	2.08	2.07	2.08	2.05	2.09	S	2.13	2.13	2.14	2.13	2.10	2.11	2.12	2.10	2.09	2.12	2.13	2.13	2.14	2.15	2.14	2.04	2.37	2.12	24	
19	2.17	2.18	2.20	2.22	2.22	2.23	2.24	S	2.28	2.29	2.27	2.27	2.25	2.20	2.20	2.22	2.22	2.22	2.21	2.19	2.19	2.20	2.18	2.14	2.27	2.14	2.29	2.22	24
20	2.09	2.43	2.26	2.10	2.06	2.10	S	2.53	2.07	2.09	2.32	2.57	2.56	2.16	2.06	2.10	2.11	2.10	2.09	2.10	2.08	2.08	2.09	2.09	2.06	2.57	2.18	24	
21	2.07	2.07	2.03	2.03	2.21	S	2.06	2.05	2.06	2.04	2.02	2.02	2.02	2.03	2.02	2.04	2.05	2.05	2.05	2.06	2.06	2.05	2.08	2.08	2.10	2.02	2.21	2.06	24
22	2.09	2.10	2.13	2.12	S	2.13	2.12	2.18	2.13	2.13	2.15	2.14	2.16	2.20	2.14	2.15	2.15	2.19	2.20	2.21	2.19	2.19	2.06	2.05	2.05	2.21	2.14	24	
23	2.01	1.98	1.99	S	2.00	1.99	2.01	2.00	2.01	2.00	1.99	2.12	2.05	2.01	2.00	2.10	2.00	2.00	2.33	2.01	2.28	2.20	2.05	2.29	1.98	2.33	2.06	24	
24	2.25	2.04	S	3.31	2.79	3.04	2.01	2.37	2.02	2.02	2.09	2.15	2.34	2.12	2.10	2.02	2.02	2.01	2.03	2.04	2.05	2.03	2.06	2.06	2.01	3.31	2.22	24	
25	2.06	S	2.06	2.08	2.04	2.06	2.09	2.12	2.15	2.16	2.17	2.15	2.09	2.08	2.06	2.05	2.04	2.03	2.05	2.05	2.09	2.16	2.20	2.24	2.03	2.24	2.10	24	
26	S	2.26	2.26	2.27	2.23	2.29	2.26	2.28	2.24	2.26	2.29	2.23	2.20	2.16	2.20	2.13	2.12	2.09	2.09	2.10	2.08	2.09	2.06	S	2.06	2.29	2.19	24	
27	2.06	2.06	2.04	2.08	2.07	2.07	2.05	2.03	2.05	2.03	2.06	12.78	2.07	7.82	2.17	2.35	2.50	2.11	2.90	2.73	3.03	2.65	S	2.00	2.00	12.78	2.94	24	
28	2.35	2.21	2.15	2.18	2.03	2.76	2.88	2.52	1.99	2.08	1.98	2.00	2.14	2.01	1.99	2.17	1.97	2.21	1.98	2.00	2.00	S	2.01	2.00	1.97	2.88	2.16	24	
HOURLY MAX	2.92	2.92	3.11	3.31	3.01	3.19	2.88	2.94	2.80	2.73	2.74	12.78	2.56	7.82	2.55	2.68	2.89	2.88	2.90	2.86	3.03	2.96	3.01	7.01					
HOURLY AVG	2.23	2.23	2.23	2.28	2.27	2.34	2.23	2.26	2.20	2.21	2.21	2.60	2.19	2.36	2.14	2.15	2.16	2.19	2.23	2.19	2.21	2.21	2.22	2.41					

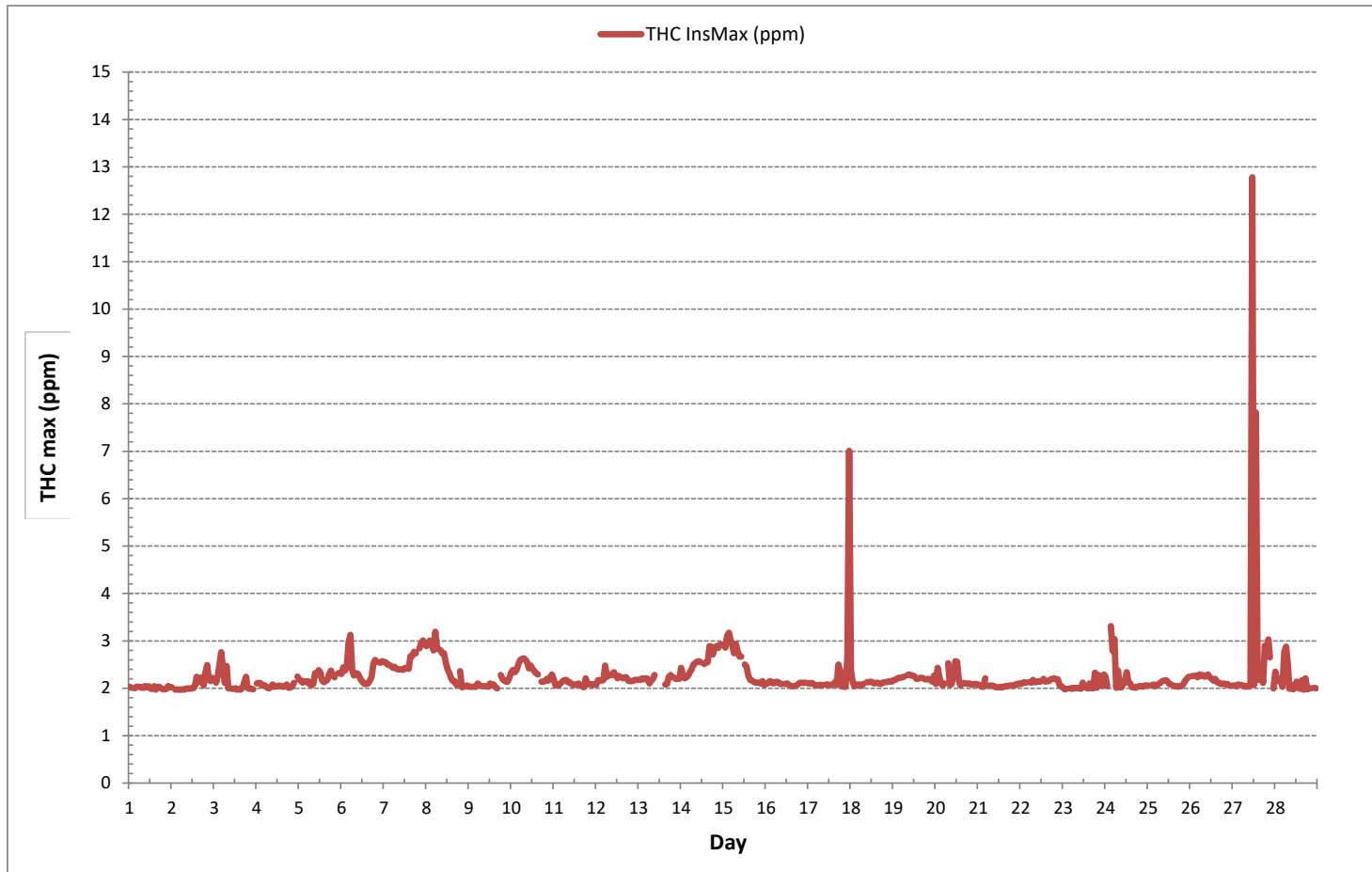
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	12.78	ppm	@ HOUR	11	ON DAY 27
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	5	hrs			
STANDARD DEVIATION:	0.56				

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	2.03	2.01	S	2.00	2.03	2.03	2.03	2.01	2.01	2.05	2.02	2.04	1.99	1.99	2.00	1.97	2.02	2.03	2.00	1.98	1.98	1.99	2.05	2.02	1.97	2.05	2.01	24
2	2.02	S	1.97	1.98	1.97	1.97	1.98	1.97	1.99	2.00	1.99	2.00	2.00	2.04	2.24	2.13	2.21	2.23	2.06	2.33	2.49	2.18	2.15	2.22	1.97	2.49	2.09	24
3	S	2.12	2.25	2.49	2.76	2.42	2.11	2.47	2.00	2.00	1.99	1.99	2.00	1.97	1.98	1.97	1.99	2.13	2.24	2.00	1.99	1.99	1.98	S	1.97	2.76	2.13	24
4	2.10	2.11	2.11	2.06	2.07	2.05	2.01	2.00	2.02	2.08	2.03	2.04	2.04	2.06	2.04	2.03	2.04	2.02	2.01	2.02	2.03	2.11	S	2.25	2.00	2.25	2.06	24
5	2.18	2.17	2.12	2.15	2.13	2.15	2.08	2.06	2.09	2.32	2.29	2.38	2.34	2.17	2.13	2.15	2.18	2.30	2.37	2.27	2.23	S	2.32	2.31	2.06	2.38	2.21	24
6	2.30	2.44	2.37	2.45	2.97	3.13	2.38	2.27	2.32	2.31	2.25	2.17	2.13	2.09	2.09	2.10	2.16	2.25	2.52	2.60	S	2.55	2.54	2.57	2.09	3.13	2.39	24
7	2.55	2.55	2.50	2.49	2.47	2.43	2.45	2.41	2.40	2.40	2.40	2.39	2.43	2.43	2.41	2.68	2.68	2.77	2.74	S	2.84	2.96	3.01	2.95	2.39	3.01	2.58	24
8	2.89	2.92	3.01	2.93	2.80	3.19	2.85	2.82	2.80	2.73	2.74	2.54	2.40	2.32	2.21	2.15	2.15	2.07	S	2.36	2.02	2.03	2.05	2.06	2.02	3.19	2.52	24
9	2.03	2.03	2.03	2.03	2.03	2.10	2.05	2.05	2.04	2.04	2.04	2.03	2.10	2.07	2.08	2.02	2.00	S	2.28	2.19	2.16	2.14	2.14	2.23	2.00	2.28	2.08	24
10	2.34	2.39	2.35	2.39	2.51	2.60	2.62	2.63	2.60	2.55	2.42	2.48	2.41	2.36	2.32	2.29	S	2.14	2.14	2.15	2.20	2.16	2.23	2.29	2.14	2.63	2.37	24
11	2.19	2.06	2.08	2.07	2.11	2.15	2.17	2.18	2.13	2.13	2.09	2.07	2.08	2.07	2.10	S	2.04	2.02	2.21	2.08	2.09	2.09	2.07	2.08	2.02	2.21	2.10	24
12	2.07	2.17	2.17	2.16	2.17	2.48	2.24	2.27	2.29	2.28	2.34	2.28	2.21	2.26	S	2.21	2.23	2.23	2.16	2.15	2.15	2.16	2.18	2.18	2.07	2.48	2.22	24
13	2.18	2.18	2.21	2.19	2.21	2.20	2.10	2.16	2.19	2.27	C	C	C	C	C	2.08	2.09	2.24	2.25	2.24	2.22	2.20	2.20	2.20	2.08	2.27	2.19	24
14	2.26	2.28	2.21	2.23	2.27	2.35	2.40	2.50	2.53	2.56	2.57	2.55	S	2.51	2.55	2.55	2.89	2.88	2.71	2.86	2.89	2.85	2.92	2.92	2.21	3.92	2.57	24
15	2.92	2.86	3.11	3.17	3.01	2.88	2.74	2.94	2.78	2.67	2.67	S	2.50	2.45	2.26	2.18	2.16	2.14	2.12	2.12	2.12	2.10	2.15	2.07	2.07	3.17	2.53	24
16	2.09	2.10	2.15	2.14	2.10	2.11	2.14	2.13	2.09	2.09	S	2.09	2.10	2.07	2.05	2.04	2.05	2.06	2.08	2.11	2.12	2.11	2.12	2.11	2.04	2.15	2.10	24
17	2.10	2.10	2.11	2.08	2.07	2.06	2.07	2.07	2.07	S	2.08	2.07	2.07	2.07	2.09	2.13	2.07	2.50	2.36	2.04	2.03	2.03	2.67	6.90	2.03	6.90	2.34	24
18	2.37	2.13	2.04	2.08	2.07	2.08	2.05	2.09	S	2.13	2.13	2.14	2.13	2.10	2.11	2.12	2.10	2.09	2.12	2.13	2.13	2.14	2.15	2.14	2.04	2.37	2.12	24
19	2.17	2.18	2.20	2.22	2.22	2.23	2.24	S	2.28	2.29	2.27	2.27	2.25	2.20	2.20	2.22	2.22	2.21	2.19	2.18	2.20	2.18	2.14	2.27	2.14	2.29	2.22	24
20	2.06	2.43	2.26	2.10	2.06	2.10	S	2.53	2.07	2.09	2.32	2.57	2.56	2.16	2.07	2.10	2.11	2.10	2.09	2.10	2.08	2.08	2.09	2.09	2.06	2.57	2.18	24
21	2.07	2.07	2.03	2.03	2.21	S	2.06	2.05	2.06	2.04	2.02	2.02	2.02	2.03	2.02	2.04	2.05	2.05	2.06	2.06	2.05	2.08	2.08	2.10	2.02	2.21	2.06	24
22	2.09	2.10	2.13	2.12	S	2.13	2.12	2.18	2.13	2.13	2.15	2.14	2.16	2.20	2.14	2.15	2.15	2.19	2.20	2.21	2.19	2.19	2.06	2.05	2.05	2.21	2.14	24
23	2.01	1.98	1.99	S	2.00	1.99	2.01	2.00	2.01	2.00	1.99	2.12	2.05	2.01	2.00	2.10	2.00	2.00	2.33	2.01	2.28	2.20	2.05	2.29	1.98	2.33	2.06	24
24	2.25	2.04	S	3.31	2.79	3.04	2.01	2.37	2.02	2.02	2.09	2.15	2.34	2.12	2.10	2.02	2.02	2.01	2.03	2.04	2.05	2.03	2.06	2.06	2.01	3.31	2.21	24
25	2.06	S	2.06	2.08	2.04	2.06	2.09	2.12	2.15	2.16	2.17	2.15	2.09	2.08	2.06	2.05	2.04	2.03	2.05	2.05	2.09	2.16	2.20	2.24	2.03	2.24	2.10	24
26	S	2.26	2.26	2.27	2.23	2.29	2.26	2.28	2.24	2.26	2.29	2.23	2.20	2.16	2.20	2.13	2.12	2.09	2.09	2.10	2.08	2.09	2.06	S	2.06	2.29	2.19	24
27	2.06	2.06	2.04	2.08	2.06	2.07	2.05	2.03	2.05	2.03	2.06	12.37	2.07	7.62	2.17	2.35	2.50	2.11	2.90	2.73	3.03	2.65	S	2.00	2.00	12.37	2.92	24
28	2.35	2.21	2.15	2.18	2.03	2.76	2.88	2.52	1.99	2.08	1.98	2.00	2.14	2.01	1.99	2.17	1.97	2.21	1.98	2.00	2.00	S	2.01	2.00	1.97	2.88	2.16	24
HOURLY MAX	2.92	2.92	3.11	3.31	3.01	3.19	2.88	2.94	2.80	2.73	2.74	12.37	2.56	7.62	2.55	2.68	2.89	2.88	2.90	2.86	3.03	2.96	3.01	6.90				
HOURLY AVG	2.22	2.23	2.23	2.28	2.27	2.34	2.23	2.26	2.20	2.21	2.21	2.59	2.19	2.36	2.14	2.15	2.16	2.19	2.23	2.19	2.21	2.21	2.22	2.41				

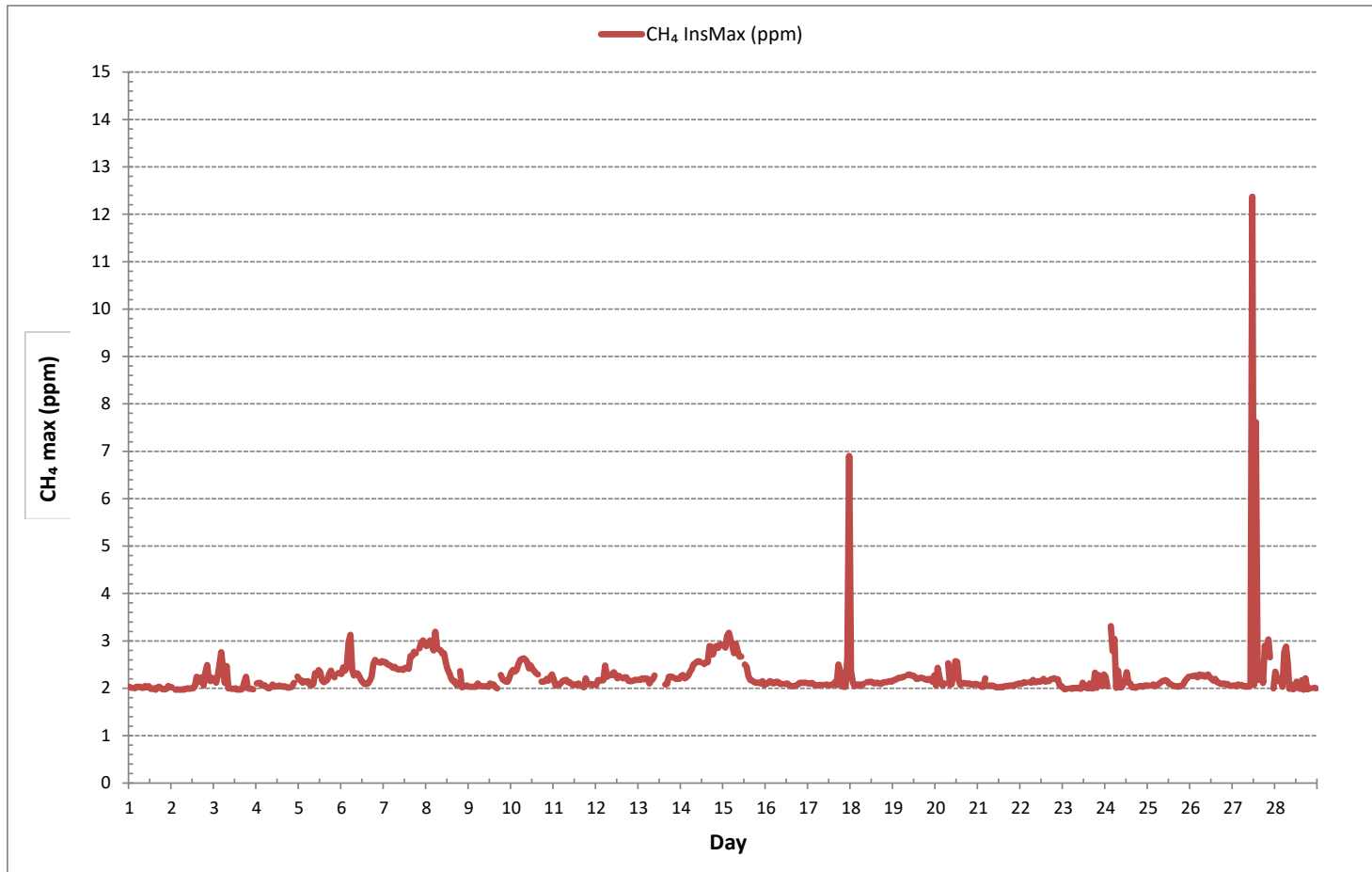
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	12.37 ppm @ HOUR 11 ON DAY 27
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.55

METHANE MAX Instantaneous Maximum (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	24
2	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
3	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	0.04	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.04	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	0.00	0.00	0.08	0.00	0.00	0.00	0.00	S	0.00	0.00	0.08	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	24
6	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.01	0.00	24
7	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	S	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
8	0.00	0.00	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	S	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	24
9	0.00	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	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	24
10	0.00	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24
11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
12	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	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	24
13	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	C	C	C	C	C	0.00	0.01	0.00	0.05	0.01	0.00	0.00	0.01	0.00	0.00	0.05	0.01	24
14	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.01	0.00	0.00	0.10	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.22	0.02	24
15	0.00	0.00	0.00	0.12	0.00	0.00	0.05	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.12	0.01	24
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	S	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.01	24
18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.02	0.00	24
20	0.05	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	24
21	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
22	0.00	0.00	0.06	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	24
23	0.00	0.00	0.00	S	0.00	0.01	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	0.00	0.01	0.00	24
24	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	0.01	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	24
25	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
26	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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.00	24
27	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.41	0.03	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	24
HOURLY MAX	0.22	0.01	0.06	0.12	0.02	0.02	0.05	0.03	0.00	0.02	0.01	0.41	0.04	0.20	0.08	0.06	0.04	0.10	0.05	0.01	0.01	0.02	0.02	0.10				
HOURLY AVG	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00				

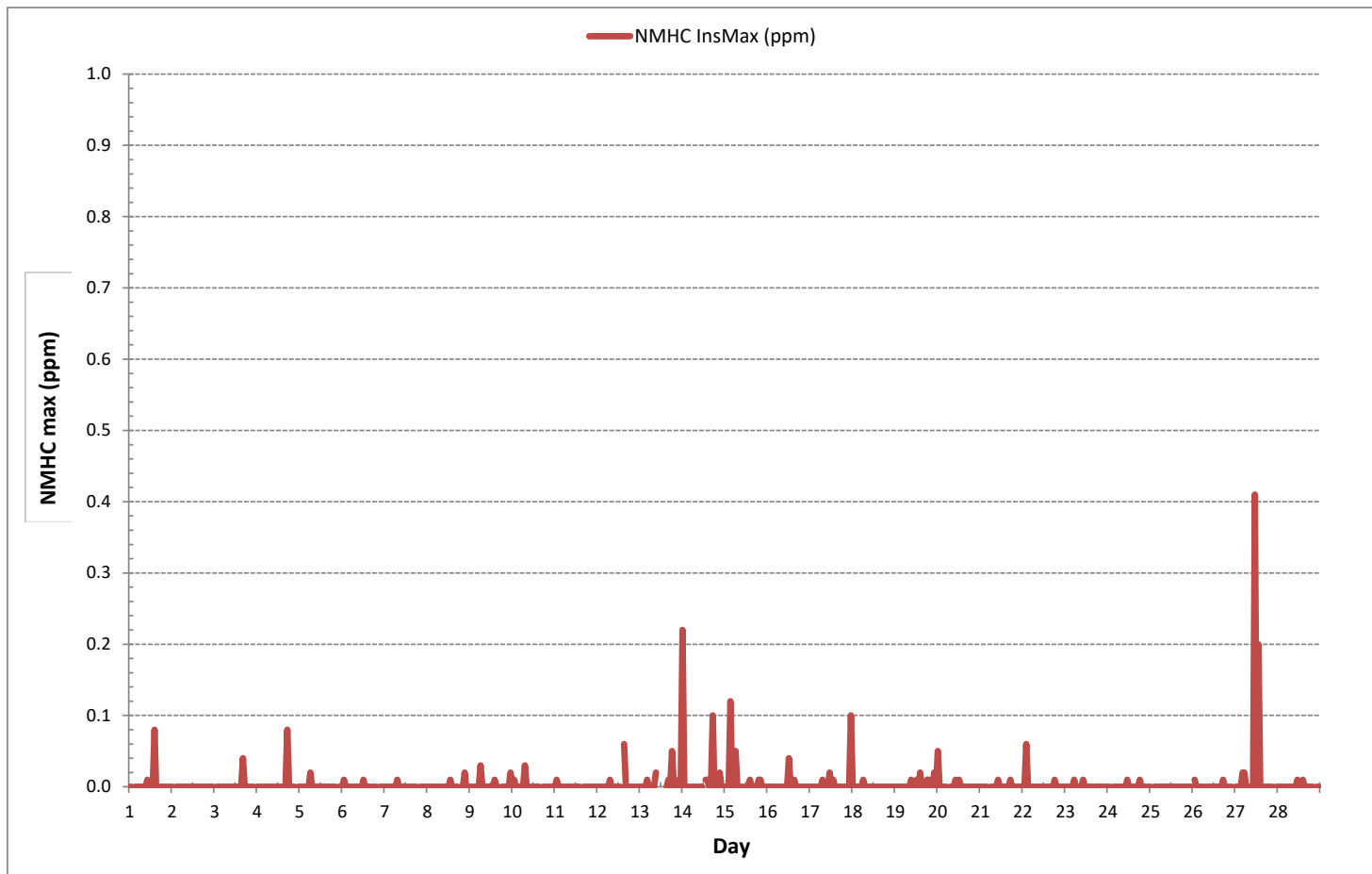
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	66
MAXIMUM INSTANTANEOUS VALUE:	0.41 ppm @ HOUR 11 ON DAY 27
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.02

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	5	5	S	4	5	5	5	5	4	6	7	8	5	3	3	3	3	2	1	1	1	1	1	1	1	1	8	4	24
2	0	S	1	1	1	1	0	1	2	3	3	5	6	3	2	2	2	18	1	2	1	3	5	4	0	18	3	24	
3	S	4	4	4	5	4	4	4	4	4	5	9	4	3	3	3	5	5	4	3	3	3	3	S	3	9	4	24	
4	6	6	5	4	3	3	2	1	1	3	2	2	2	2	3	3	2	2	2	3	3	3	S	3	1	6	3	24	
5	3	4	4	4	4	7	2	2	2	4	4	7	11	3	2	3	3	4	5	4	4	S	6	7	2	11	4	24	
6	6	5	6	6	16	18	5	3	4	4	3	4	4	19	4	10	4	4	7	9	S	8	8	8	3	19	7	24	
7	7	7	7	7	7	7	7	7	7	8	8	9	8	8	8	12	12	11	11	S	10	11	12	11	7	12	9	24	
8	10	9	9	9	9	9	11	11	12	14	16	9	15	13	7	7	7	5	S	6	4	2	3	3	2	16	9	24	
9	2	2	2	2	3	3	4	4	4	5	5	7	5	6	8	11	3	S	2	3	3	3	3	4	2	11	4	24	
10	5	5	5	6	7	7	8	8	8	8	7	7	6	7	7	6	S	4	4	4	4	3	3	3	3	8	6	24	
11	3	3	4	4	4	3	3	3	3	3	136	14	3	3	4	S	5	3	3	3	3	3	3	3	3	136	10	24	
12	3	6	5	5	5	5	6	13	12	11	7	6	C	C	C	C	C	C	C	7	8	11	8	9	3	13	-	24	
13	10	8	10	9	11	9	5	12	26	11	25	10	17	S	10	6	5	16	16	20	13	13	15	15	5	26	13	24	
14	16	15	11	10	9	8	10	14	14	15	16	16	S	15	15	12	16	16	14	17	16	14	16	16	8	17	14	24	
15	15	13	17	19	16	13	12	13	12	12	13	S	12	12	8	7	6	4	4	3	3	3	2	2	2	19	10	24	
16	3	3	6	7	5	6	7	7	5	6	S	6	6	4	4	4	3	3	3	3	3	4	3	3	4	3	7	5	24
17	3	3	3	2	1	1	2	2	2	S	7	3	5	4	3	4	5	5	4	3	3	3	3	9	1	9	3	24	
18	2	2	3	3	2	1	1	5	S	3	7	6	7	5	6	6	5	5	5	9	5	5	5	4	1	9	5	24	
19	5	6	5	5	6	6	7	S	13	15	17	20	16	18	22	22	59	20	16	16	13	11	8	6	5	59	14	24	
20	5	4	4	3	3	3	S	10	4	4	11	17	18	5	3	3	2	3	3	7	4	5	12	4	2	18	6	24	
21	3	2	1	1	2	S	2	9	9	22	1	1	1	4	3	3	4	3	4	3	3	3	4	4	1	22	4	24	
22	4	4	4	4	S	4	4	10	9	5	7	6	12	6	6	6	6	6	6	6	6	7	7	6	6	4	12	6	24
23	2	1	3	S	2	2	3	3	1	1	1	2	1	1	2	6	2	7	1	1	0	2	2	1	0	7	2	24	
24	1	1	S	1	1	1	1	7	1	1	5	3	1	4	1	4	4	1	6	1	1	1	1	19	1	19	3	24	
25	1	S	2	3	3	3	3	6	5	6	11	11	10	10	16	11	10	13	4	6	6	8	10	11	1	16	7	24	
26	S	12	32	12	11	13	11	21	24	30	24	24	19	21	12	11	10	7	5	5	4	4	4	S	4	32	14	24	
27	4	3	4	3	3	2	2	4	4	2	3	3	3	2	6	2	2	2	4	1	1	1	S	1	1	6	3	24	
28	1	1	1	1	2	2	1	2	6	1	5	2	2	2	1	1	1	0	0	1	1	S	2	2	0	6	2	24	
HOURLY MAX	16	15	32	19	16	18	12	21	26	30	136	24	19	21	22	22	59	20	16	20	16	14	16	19					
HOURLY AVG	5	5	6	5	5	5	5	7	7	8	13	8	8	7	6	6	7	7	5	5	5	5	6	6					

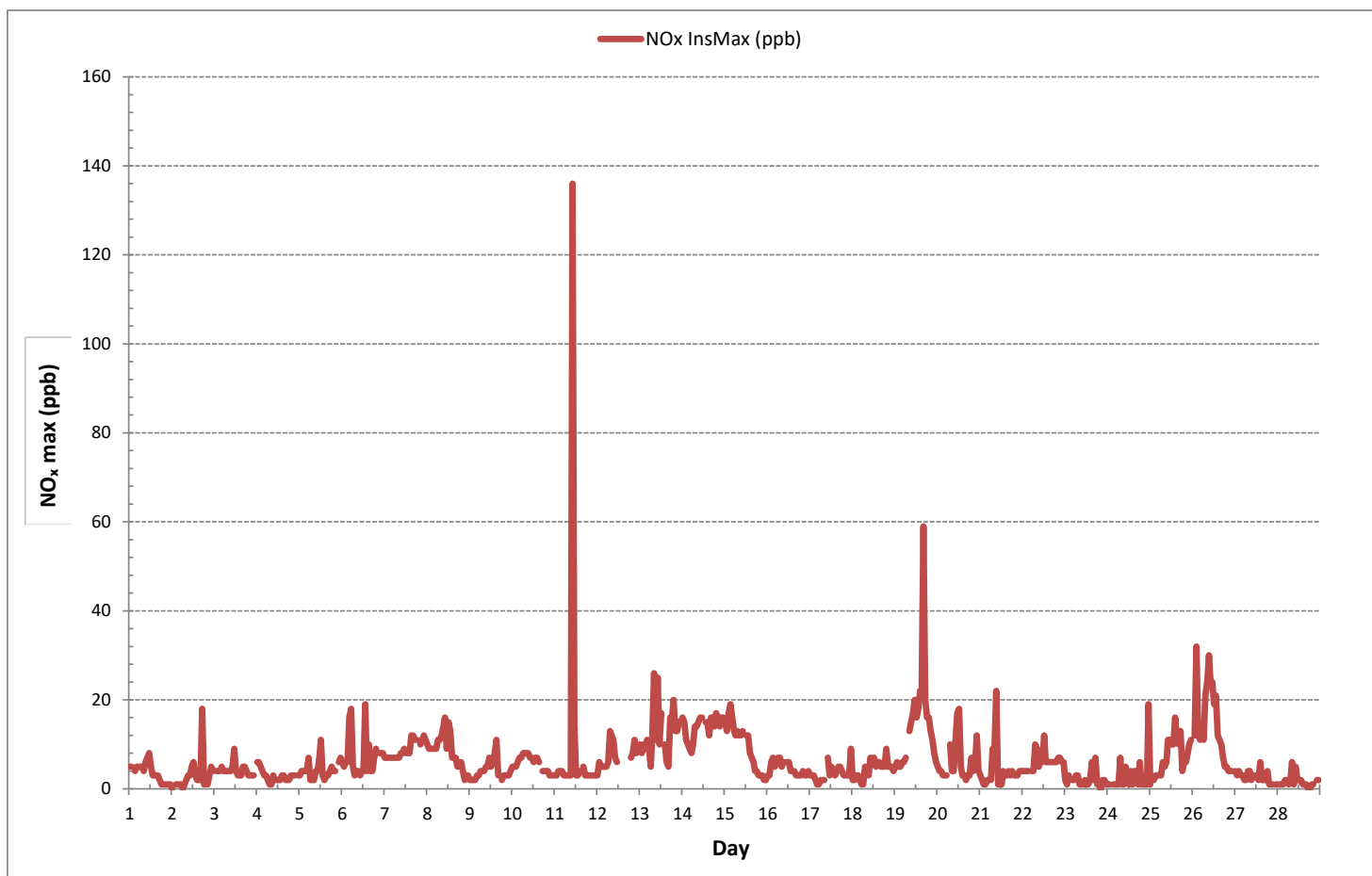
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	631
MAXIMUM INSTANTANEOUS VALUE:	136 ppb @ HOUR 10 ON DAY 11
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	7
OPERATIONAL TIME:	672 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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	S	0	0	0	0	0	0	1	2	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	3	1	24																					
2	0	S	0	0	0	0	0	0	0	1	1	2	2	1	1	1	1	9	0	1	0	1	2	0	0	0	9	1	24																					
3	S	0	0	0	0	0	0	0	1	1	2	4	1	1	1	1	1	2	0	0	0	0	0	S	0	0	4	1	24																					
4	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	1	0	24																					
5	0	0	0	0	0	0	0	0	0	1	1	4	3	1	1	1	0	0	0	0	0	0	S	0	0	0	4	1	24																					
6	0	0	0	0	0	0	0	0	0	1	1	1	1	15	2	4	1	0	0	0	0	S	0	0	0	0	15	1	24																					
7	0	0	0	0	0	0	0	0	1	2	3	3	3	3	2	3	3	1	0	S	0	0	0	0	0	0	3	1	24																					
8	0	0	0	0	0	0	1	0	2	5	6	4	7	5	2	1	1	0	S	0	0	0	0	0	0	0	7	2	24																					
9	0	0	0	0	0	0	0	0	1	2	2	3	2	3	3	5	0	S	0	0	0	0	0	0	0	0	5	1	24																					
10	0	0	0	0	0	0	0	0	1	2	2	3	2	2	2	1	S	0	0	0	0	0	0	0	0	0	3	1	24																					
11	0	0	0	0	0	0	0	0	0	0	113	5	1	1	1	S	2	0	0	0	0	0	0	0	0	0	113	5	24																					
12	0	0	0	0	0	0	1	5	4	5	4	3	C	C	C	C	C	C	C	1	2	2	0	0	0	0	5	-	24																					
13	0	0	0	0	0	0	0	2	6	4	16	4	9	S	4	2	1	3	0	5	0	0	0	0	0	0	16	3	24																					
14	1	0	0	0	0	0	0	1	3	5	7	7	S	5	5	3	3	2	0	0	0	0	0	0	0	0	7	2	24																					
15	0	0	0	0	0	0	0	1	2	3	4	S	4	4	2	1	1	0	0	0	0	0	0	0	0	0	4	1	24																					
16	0	0	0	0	0	0	0	0	1	1	S	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	24																					
17	0	0	0	0	0	0	0	0	0	S	2	1	2	1	1	1	1	1	0	0	0	0	0	2	0	0	2	1	24																					
18	0	0	0	0	0	0	0	1	S	1	4	2	3	2	2	2	1	0	0	3	0	0	0	0	0	0	4	1	24																					
19	0	1	0	0	0	0	0	S	5	6	6	9	5	7	7	7	29	2	1	1	0	0	0	0	0	0	29	4	24																					
20	0	0	0	0	0	0	S	3	1	1	4	8	8	2	1	0	0	0	0	1	0	1	4	0	0	0	8	1	24																					
21	0	0	0	0	0	S	0	4	3	10	0	1	0	2	2	1	1	0	0	0	0	0	0	0	0	0	10	1	24																					
22	0	0	0	0	S	0	0	4	4	2	2	3	5	2	1	1	1	0	0	0	0	0	0	0	0	0	5	1	24																					
23	0	0	1	S	0	0	0	0	0	0	0	1	1	0	0	1	5	1	2	0	0	0	0	0	0	0	5	1	24																					
24	0	0	S	0	0	0	0	6	0	0	3	1	0	3	0	2	1	0	2	0	0	0	0	11	0	0	11	1	24																					
25	0	S	0	0	0	0	0	1	1	3	5	6	4	4	7	7	6	4	0	0	0	0	0	0	0	0	7	2	24																					
26	S	0	8	0	0	0	0	8	13	12	12	11	9	8	5	5	6	1	0	0	0	0	0	S	0	0	13	5	24																					
27	0	0	1	0	0	0	0	1	3	0	1	1	1	1	3	0	1	0	1	0	0	0	S	0	0	0	3	1	24																					
28	0	0	0	0	0	0	0	0	2	0	2	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	2	0	24																					
HOURLY MAX	1	1	8	0	0	0	1	8	13	12	113	11	9	15	7	7	29	9	2	5	2	2	4	11																										
HOURLY AVG	0	0	0	0	0	0	0	1	2	3	8	3	3	3	2	2	2	1	0	0	0	0	0	1																										

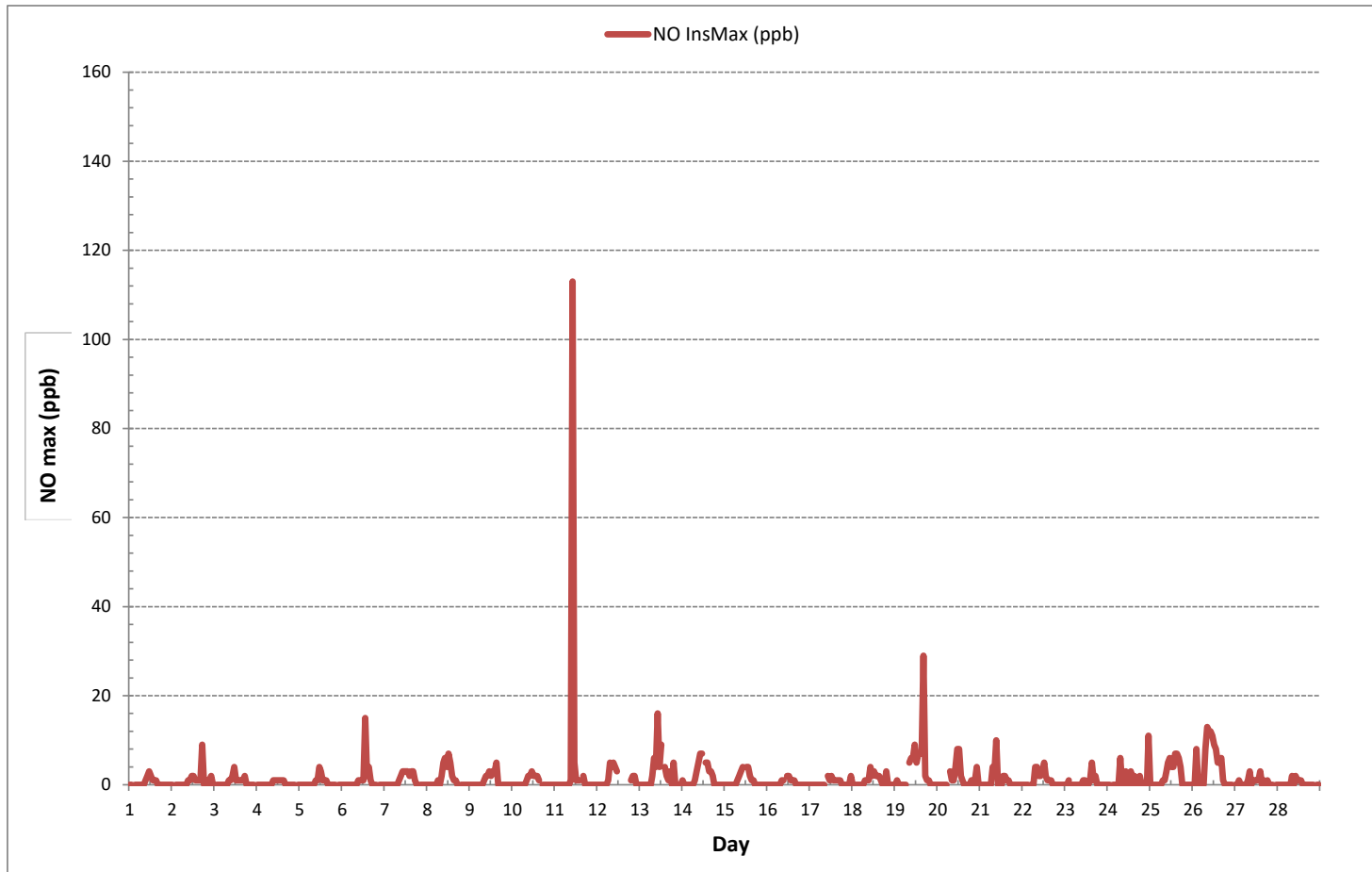
STATUS FLAG CODES

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:	255
MAXIMUM INSTANTANEOUS VALUE:	113 ppb @ HOUR 10 ON DAY 11
I2S CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	672 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	5	4	S	4	5	5	5	5	4	5	5	5	3	2	2	3	3	2	1	1	1	1	1	1	1	1	5	3	24
2	0	S	1	1	1	1	0	1	2	2	2	3	4	2	1	1	1	9	1	1	1	2	3	4	0	9	2	24	
3	S	4	4	4	5	4	4	4	4	3	3	5	2	2	2	2	4	4	4	3	3	3	3	S	2	5	4	24	
4	6	6	5	4	3	3	2	1	1	2	2	1	1	2	2	2	2	2	2	3	3	3	S	3	1	6	3	24	
5	3	4	4	4	4	7	2	2	2	3	3	4	8	2	2	3	2	4	5	4	4	S	6	7	2	8	4	24	
6	6	5	6	6	16	18	5	3	3	4	3	3	3	11	3	6	3	4	6	9	S	8	8	8	3	18	6	24	
7	7	7	7	7	7	7	7	7	7	6	6	5	5	6	6	10	10	10	11	S	10	11	12	11	5	12	8	24	
8	10	9	9	9	9	9	11	11	11	10	10	5	8	8	5	6	6	5	S	5	4	2	3	3	2	11	7	24	
9	2	2	2	2	3	3	4	4	4	3	3	4	3	3	4	7	2	S	2	3	3	3	3	4	2	7	3	24	
10	5	5	5	6	7	8	8	8	8	7	5	5	4	5	5	4	S	4	4	4	4	3	3	3	3	8	5	24	
11	3	3	4	4	3	3	3	3	3	3	96	9	2	2	3	S	4	3	3	3	3	3	3	2	96	7	24		
12	3	6	5	5	5	5	6	9	8	6	4	3	C	C	C	C	C	C	C	6	7	9	8	9	3	9	-	24	
13	9	8	10	9	11	9	5	10	20	7	10	6	8	S	6	4	4	12	16	16	13	13	15	15	4	20	10	24	
14	16	15	11	10	9	8	10	14	13	10	10	10	S	10	10	10	14	15	14	17	16	14	16	16	8	17	12	24	
15	14	13	17	19	16	13	12	13	11	8	8	S	8	8	6	6	5	4	4	3	3	3	3	2	2	19	9	24	
16	3	3	6	7	5	6	7	7	5	5	S	4	4	3	3	3	3	3	3	3	3	4	3	3	4	3	7	4	24
17	3	3	3	2	1	1	2	1	2	S	4	2	3	3	3	3	4	4	4	3	3	3	3	7	1	7	3	24	
18	2	2	3	3	2	1	1	4	S	2	4	4	4	3	4	5	4	4	5	7	5	5	5	4	1	7	4	24	
19	5	5	5	5	6	6	7	S	9	10	11	12	10	12	15	16	30	17	15	15	13	11	8	5	5	30	11	24	
20	4	4	4	3	3	3	S	7	4	4	7	10	10	4	2	2	2	3	3	6	3	4	8	4	2	10	5	24	
21	3	2	1	1	2	S	2	5	6	12	1	1	1	3	2	2	3	3	4	3	3	3	4	4	1	12	3	24	
22	4	4	4	4	S	4	4	6	6	4	5	4	7	4	5	5	5	6	6	6	7	7	6	6	4	7	5	24	
23	2	1	2	S	2	2	3	2	1	1	1	1	1	1	1	2	1	5	1	1	0	1	2	1	0	5	2	24	
24	1	1	S	1	1	1	1	1	2	1	1	3	2	1	2	1	3	3	1	4	1	1	1	1	9	1	9	2	24
25	1	S	2	3	3	3	3	5	4	3	6	6	6	6	10	6	6	11	4	6	6	8	9	11	1	11	6	24	
26	S	12	24	12	11	12	11	14	12	19	13	14	11	14	9	8	7	6	5	5	5	4	4	S	4	24	11	24	
27	4	3	4	3	2	2	2	3	2	2	3	2	2	2	3	2	2	2	4	1	1	1	S	1	1	4	2	24	
28	1	1	1	1	2	2	1	1	4	1	3	1	2	1	1	1	0	1	1	1	1	S	2	2	0	4	1	24	
HOURLY MAX	16	15	24	19	16	18	12	14	20	19	96	14	11	14	15	16	30	17	16	17	16	14	16	16					
HOURLY AVG	5	5	6	5	5	5	5	6	6	5	9	5	5	5	4	5	5	6	5	5	5	5	5	6					

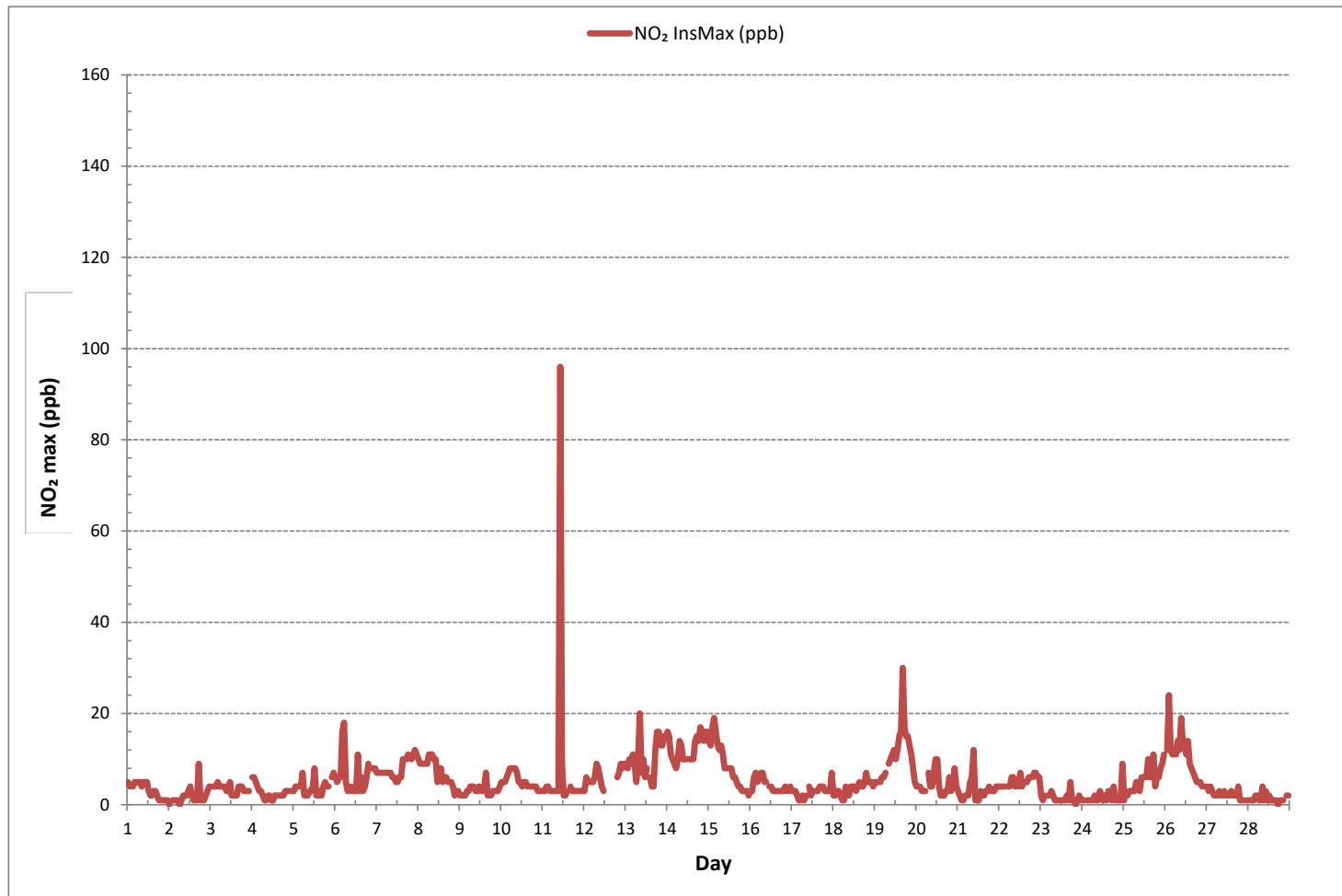
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	632
MAXIMUM INSTANTANEOUS VALUE:	96 ppb @ HOUR 10 ON DAY 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	26.3	27.2	S	29.1	28.1	26.8	26.5	28.8	29.0	28.2	28.6	31.3	32.8	34.9	37.1	37.1	36.1	37.4	37.3	36.7	36.6	37.2	38.0	38.0	26.3	38.0	32.6	24
2	38.9	S	37.9	37.1	36.8	36.9	36.7	36.7	36.3	34.7	35.1	34.6	35.0	36.1	36.5	36.7	36.8	36.2	36.1	36.2	36.1	35.6	34.3	33.3	33.3	38.9	36.1	24
3	S	31.4	31.3	30.9	30.0	30.1	30.1	29.9	30.6	32.0	33.2	35.4	36.4	38.3	38.8	37.8	36.9	35.4	34.3	34.4	34.9	35.2	35.1	S	29.9	38.8	33.7	24
4	32.5	31.0	34.0	36.2	36.1	37.8	39.7	39.9	39.2	39.1	39.3	39.7	39.9	39.6	39.3	39.5	39.5	38.6	38.9	38.9	37.9	38.1	S	37.9	31.0	39.9	37.9	24
5	37.2	37.1	37.6	36.9	36.9	42.2	37.7	37.9	37.7	37.6	38.4	38.5	38.9	39.6	39.8	39.3	39.2	39.1	36.7	37.4	37.5	S	36.3	32.7	32.7	42.2	37.9	24
6	35.3	34.5	32.2	31.8	32.9	33.3	34.4	37.2	36.7	36.7	39.4	37.4	38.3	39.7	39.7	39.7	39.5	37.8	36.1	33.2	X	33.0	33.6	33.0	31.8	39.7	35.9	23
7	32.3	31.6	31.9	32.0	33.3	33.2	31.6	S1	S1	33.5	33.7	33.9	33.5	33.8	33.7	32.7	29.1	28.9	28.5	S	28.7	28.3	25.6	26.6	25.6	33.9	31.3	22
8	26.9	26.9	26.7	26.4	26.1	25.4	33.5	28.8	24.7	25.5	30.4	32.7	32.2	35.3	37.1	36.6	38.5	38.7	S	38.5	39.5	38.5	36.2	36.4	24.7	39.5	32.2	24
9	36.9	36.5	35.9	35.1	33.1	31.9	30.8	29.9	30.1	30.8	31.3	33.4	35.0	37.2	37.2	40.5	39.9	S	40.3	38.3	37.4	36.9	36.8	36.6	29.9	40.5	35.3	24
10	35.3	34.1	35.1	34.5	32.1	30.3	28.7	29.8	31.3	35.1	37.3	37.9	39.2	38.0	38.1	38.3	S	38.0	38.2	38.2	38.5	40.4	41.1	40.5	28.7	41.1	36.1	24
11	40.8	40.6	39.6	38.8	38.5	38.6	38.6	38.6	38.9	39.0	39.5	40.4	40.9	41.0	40.8	S	41.0	41.0	41.0	40.3	39.3	38.8	38.4	38.2	38.2	41.0	39.7	24
12	38.1	37.2	34.0	33.0	31.7	31.4	32.0	30.9	30.6	30.7	30.4	29.9	32.1	32.6	S	32.1	31.6	29.6	30.0	31.3	31.0	28.1	26.6	28.0	26.6	38.1	31.4	24
13	26.3	30.1	31.1	32.8	34.3	32.3	32.3	30.4	32.0	34.3	C	C	C	C	C	C	C	35.2	25.1	22.6	25.4	24.8	23.2	21.9	21.9	35.2	-	24
14	23.8	24.7	25.9	25.1	27.5	27.5	26.5	22.6	22.6	24.2	25.4	27.0	S	31.2	30.8	32.2	29.5	23.3	24.7	22.6	20.7	20.7	20.4	19.5	19.5	32.2	25.1	24
15	21.3	23.7	21.1	16.4	20.0	21.1	23.5	23.4	26.1	27.9	28.6	S	31.4	35.2	35.9	36.5	37.1	37.3	37.9	38.7	39.5	39.7	39.3	39.9	16.4	39.9	30.5	24
16	39.4	38.0	37.8	33.6	36.3	36.3	33.9	36.2	37.9	37.9	S	38.3	39.3	40.0	41.4	41.0	40.4	40.0	39.3	37.9	37.0	36.2	35.5	33.5	33.5	41.4	37.7	24
17	34.2	34.5	32.4	32.4	32.6	32.3	32.4	32.0	S1	S	31.6	32.9	32.8	33.2	32.8	32.7	33.2	31.4	33.4	34.1	34.8	34.3	33.6	33.7	31.4	34.8	33.1	23
18	34.2	34.0	33.6	34.2	35.4	35.2	35.5	35.1	S	35.5	33.5	34.5	33.8	34.2	34.3	33.6	36.5	36.4	34.4	32.9	33.2	33.7	33.7	33.8	32.9	36.5	34.4	24
19	33.6	32.3	31.6	30.9	30.5	29.7	28.9	S	27.1	27.5	28.0	29.8	32.5	33.9	35.0	32.3	30.5	31.1	30.8	33.6	32.7	34.8	37.5	39.2	27.1	39.2	31.9	24
20	39.3	39.2	38.2	37.6	38.0	37.9	S	35.6	35.2	34.1	33.0	25.5	31.7	35.8	36.7	35.0	33.6	34.5	34.5	32.9	33.0	32.6	31.3	32.7	25.5	39.3	34.7	24
21	36.2	39.7	40.0	40.2	38.4	S	38.1	38.7	38.6	39.3	39.6	40.3	40.5	40.9	41.4	40.6	39.3	38.1	37.8	39.4	39.3	38.2	37.6	38.0	36.2	41.4	39.1	24
22	38.3	38.3	38.1	38.0	S	37.9	38.5	38.9	38.4	39.0	39.1	39.3	39.1	39.3	40.1	39.9	39.3	39.3	40.1	41.2	36.0	34.2	34.0	35.2	34.0	41.2	38.3	24
23	40.5	40.7	40.4	S	38.2	37.2	36.2	36.9	40.1	40.0	39.9	39.5	39.5	39.2	39.7	39.9	39.7	39.4	39.2	40.0	40.3	40.4	40.1	40.0	36.2	40.7	39.4	24
24	39.7	39.9	S	39.3	39.5	39.4	39.1	39.3	39.3	38.9	38.5	38.5	38.7	40.0	40.3	41.6	41.7	42.0	41.9	41.6	41.7	41.7	41.7	41.3	38.5	42.0	40.2	24
25	41.1	S	40.8	40.4	39.2	39.3	39.0	38.5	37.1	36.9	36.2	36.3	38.3	38.0	39.1	39.2	39.8	40.2	39.0	38.8	36.4	35.8	31.8	29.6	29.6	41.1	37.8	24
26	S	27.0	25.4	27.7	27.8	26.7	27.4	28.1	29.0	29.9	29.9	32.6	33.3	35.0	35.8	36.9	37.4	38.6	38.9	39.1	38.3	39.2	40.8	S	25.4	40.8	32.9	24
27	40.4	40.8	41.2	41.1	41.3	42.1	42.4	42.2	42.4	43.4	45.2	46.2	46.7	47.0	47.9	47.9	47.9	47.0	46.7	46.7	46.6	S	45.9	40.4	40.4	47.9	44.6	24
28	46.0	46.0	45.9	45.9	45.2	41.8	44.3	44.3	43.2	44.2	44.4	45.1	45.3	46.5	46.8	46.9	47.0	47.3	46.9	43.1	42.3	S	41.2	37.6	37.6	47.3	44.6	24
HOURLY MAX	46.0	46.0	45.9	45.9	45.2	42.2	44.3	44.3	43.2	44.2	44.4	45.2	46.2	46.7	47.0	47.9	47.9	47.9	47.0	46.7	46.7	46.6	41.7	45.9				
HOURLY AVG	35.2	34.5	34.6	34.0	34.1	33.9	34.0	34.3	34.2	34.6	35.0	35.8	36.8	37.6	38.3	37.9	37.7	37.1	36.6	36.6	36.1	35.5	34.8	34.7				

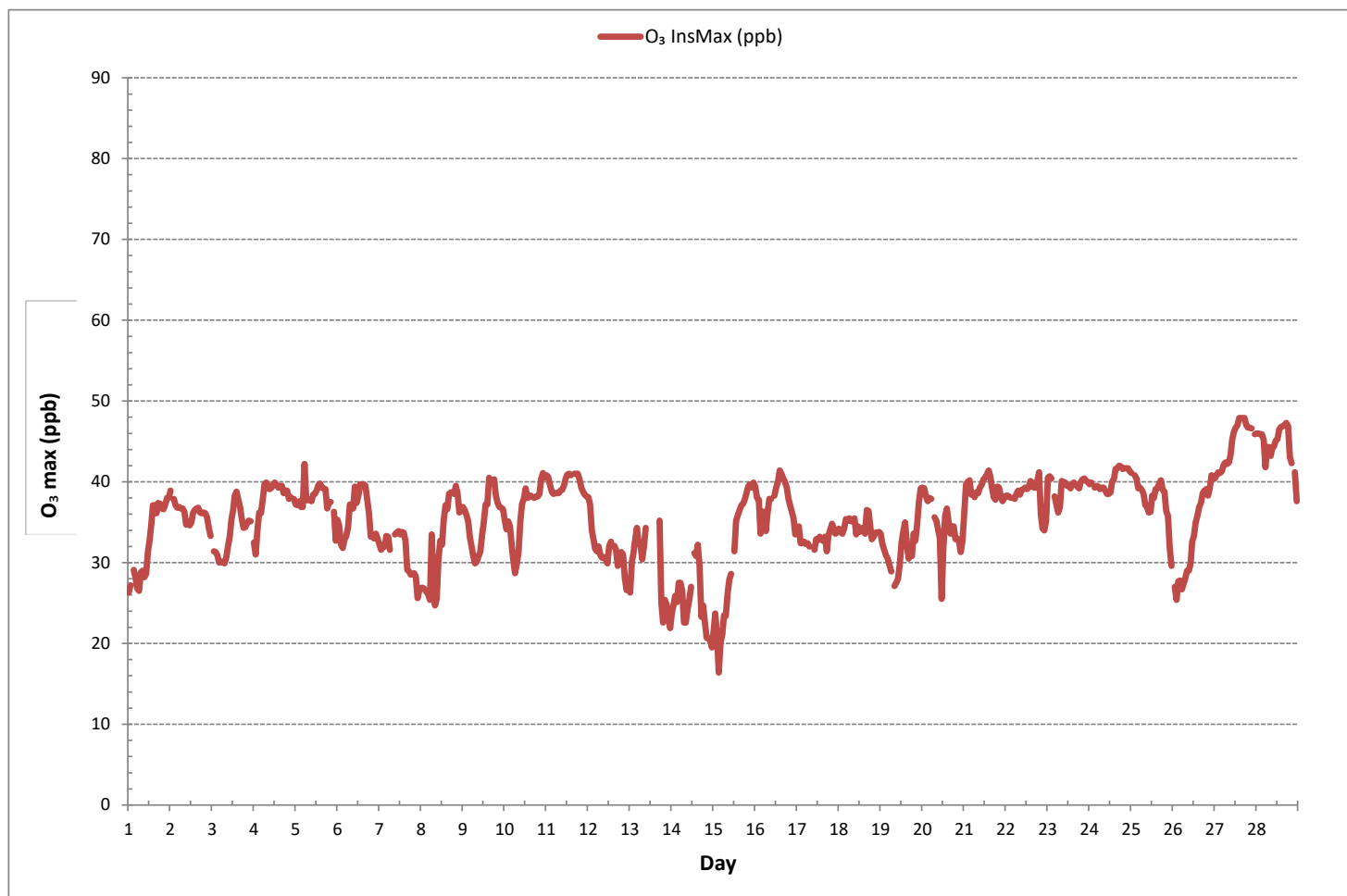
STATUS FLAG CODES

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:	633
MAXIMUM INSTANTANEOUS VALUE:	47.9 ppb @ HOUR 14 ON DAY 27
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	5.3

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2019

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	31.4	36.0	25.3	25.0	22.7	23.1	23.5	28.8	21.5	24.2	28.3	25.9	24.8	26.1	29.4	29.0	36.6	40.4	36.0	38.4	43.9	41.1	39.5	45.0	21.5	45.0	31.1	24
2	42.6	42.3	52.4	52.2	43.9	49.3	42.8	49.6	25.7	23.5	22.8	25.7	27.0	25.3	28.1	32.1	34.3	22.4	23.7	25.5	21.7	23.9	24.6	18.7	18.7	52.4	32.5	24
3	24.4	25.9	23.7	24.6	20.5	45.0	27.5	26.2	29.0	27.5	22.4	24.8	27.2	41.9	22.4	24.4	27.0	25.7	20.7	20.0	27.5	25.3	18.7	53.5	18.7	53.5	27.3	24
4	13.6	13.2	45.0	53.1	23.5	26.8	18.3	22.4	19.1	23.1	50.2	71.7	78.5	33.4	67.5	61.2	57.7	X	X	12.4	11.9	17.8	12.6	15.6	11.9	78.5	34.0	22
5	15.8	18.0	18.9	22.0	X	76.1	5.6	X	X	54.4	31.4	20.9	17.2	41.5	64.7	47.4	X	50.0	29.2	50.2	11.9	7.1	6.6	20.2	5.6	76.1	30.5	20
6	18.3	14.5	14.7	14.5	6.6	12.5	19.6	15.6	15.8	18.7	21.3	20.2	22.6	20.6	21.1	15.0	15.8	13.2	15.4	20.7	24.2	24.6	23.7	22.6	6.6	24.6	18.0	24
7	24.4	26.6	25.9	25.0	28.4	23.3	24.6	27.2	27.0	27.0	28.8	24.8	22.8	18.5	20.9	19.6	18.3	18.0	27.0	29.0	19.2	19.4	25.9	25.0	18.0	29.0	24.0	24
8	53.1	73.3	78.7	X	11.7	70.6	23.7	59.8	50.9	37.3	18.3	25.7	28.8	25.5	23.1	18.3	17.0	39.9	44.3	20.2	25.0	25.9	24.2	26.6	11.7	78.7	35.7	23
9	21.5	20.9	17.6	19.8	39.7	41.9	33.4	23.7	21.7	19.6	46.9	33.2	67.3	17.4	16.2	27.9	15.8	15.6	16.5	22.6	27.4	27.0	28.3	28.8	15.6	67.3	27.1	24
10	22.4	29.4	26.6	26.6	23.7	23.3	23.1	24.8	20.4	23.5	23.1	20.9	24.4	32.9	29.0	39.1	37.7	30.8	26.8	25.0	25.0	20.4	21.3	22.2	20.4	39.1	25.9	24
11	22.0	18.9	17.6	18.3	54.2	17.8	23.5	52.4	X	54.2	34.9	29.0	18.0	26.6	22.2	23.7	25.9	61.0	X	52.6	21.3	16.5	15.0	20.6	15.0	61.0	29.4	22
12	18.7	15.8	24.4	25.3	38.0	23.9	27.6	28.2	12.1	19.8	13.6	23.5	27.0	13.2	13.4	15.4	12.7	17.8	10.1	14.5	13.6	23.1	23.3	10.1	10.1	38.0	19.5	24
13	23.5	X	21.3	71.0	19.6	41.2	X	11.9	9.9	11.4	8.0	10.1	11.9	15.0	47.8	28.8	14.5	16.0	16.7	12.5	11.9	13.6	13.0	20.0	8.0	71.0	20.4	22
14	17.4	17.6	19.1	20.4	19.6	19.8	21.7	24.2	22.0	22.6	24.4	23.5	28.4	23.0	22.8	21.7	17.1	19.8	22.8	18.9	24.6	26.3	30.5	26.2	17.1	30.5	22.3	24
15	25.7	22.4	24.4	32.3	23.5	29.2	32.9	29.9	30.5	30.3	28.3	27.9	28.5	31.4	28.8	31.9	41.5	34.5	31.6	33.6	31.2	30.1	29.2	21.5	21.5	41.5	29.6	24
16	21.5	25.7	22.6	24.4	25.5	25.7	26.3	26.3	24.5	22.0	25.5	27.2	26.8	26.1	27.4	31.8	28.3	20.6	25.5	30.1	32.9	32.3	32.9	28.8	20.6	32.9	26.7	24
17	26.6	20.4	25.2	26.1	30.1	30.1	26.3	25.5	23.1	16.3	20.4	22.2	24.6	25.5	21.9	23.5	20.6	23.7	20.4	21.9	21.9	19.1	46.7	31.8	16.3	46.7	24.8	24
18	16.1	13.2	31.4	57.9	15.0	16.1	16.3	16.7	15.2	24.6	24.1	26.3	27.9	27.8	29.6	35.1	36.0	35.8	35.8	39.5	34.1	42.7	43.2	39.1	13.2	57.9	29.1	24
19	32.1	30.3	28.5	24.1	25.0	22.8	21.7	17.8	15.8	16.7	15.2	16.7	24.8	20.0	22.6	21.5	15.4	12.7	15.2	15.8	14.7	16.7	16.3	15.4	12.7	32.1	19.9	24
20	18.7	17.1	16.9	18.5	15.6	15.8	16.5	16.7	17.8	22.2	23.1	25.9	29.6	29.0	30.7	36.8	37.5	34.2	29.5	37.1	36.4	31.2	28.8	29.2	15.6	37.5	25.6	24
21	29.0	28.7	32.3	27.4	22.8	34.5	14.9	44.1	16.0	28.3	24.6	29.6	30.9	27.6	26.1	30.9	29.8	27.6	27.0	34.5	31.8	34.2	34.0	34.2	14.9	44.1	29.2	24
22	31.4	32.5	33.8	41.5	36.6	36.7	29.6	24.8	26.1	26.3	25.5	21.1	14.9	11.0	13.6	16.3	16.3	10.6	18.9	23.5	30.7	29.6	34.0	40.1	10.6	41.5	26.1	24
23	52.6	53.0	47.4	47.4	43.2	55.2	41.2	33.4	50.2	50.7	50.4	47.8	49.4	50.9	41.9	42.4	42.8	34.0	25.2	28.1	25.5	19.3	21.7	19.5	19.3	55.2	40.6	24
24	24.1	19.6	19.8	18.0	10.1	11.5	62.3	X	70.1	55.5	16.5	22.2	27.9	23.9	22.6	18.9	20.9	18.9	16.1	14.3	10.8	12.1	11.9	13.4	10.1	70.1	23.5	23
25	13.4	11.7	20.4	19.8	19.1	17.4	17.4	11.1	11.5	9.3	11.2	18.0	19.1	20.2	20.4	23.0	24.1	25.3	17.4	20.6	19.6	17.6	17.2	18.3	9.3	25.3	17.6	24
26	18.9	17.6	19.1	17.2	18.9	15.3	15.2	15.4	13.2	16.3	19.1	23.7	26.6	23.9	27.2	32.9	34.7	32.7	29.4	27.4	24.6	20.4	25.0	26.1	13.2	34.7	22.5	24
27	25.2	23.5	27.6	27.2	28.5	26.3	24.2	29.8	47.8	32.7	41.2	41.2	41.0	41.9	40.3	43.2	34.9	36.6	26.1	18.0	18.0	21.5	24.6	28.3	18.0	47.8	31.2	24
28	33.2	28.1	32.5	30.1	29.4	57.9	20.6	31.6	29.2	28.8	32.5	29.8	33.8	34.9	37.5	36.6	38.4	36.2	41.5	37.7	24.6	33.6	28.5	27.0	20.6	57.9	33.1	24
HOURLY MAX	53.1	73.3	78.7	71.0	54.2	76.1	62.3	59.8	70.1	55.5	50.4	71.7	78.5	50.9	67.5	61.2	57.7	61.0	44.3	52.6	43.9	42.7	46.7	53.5				

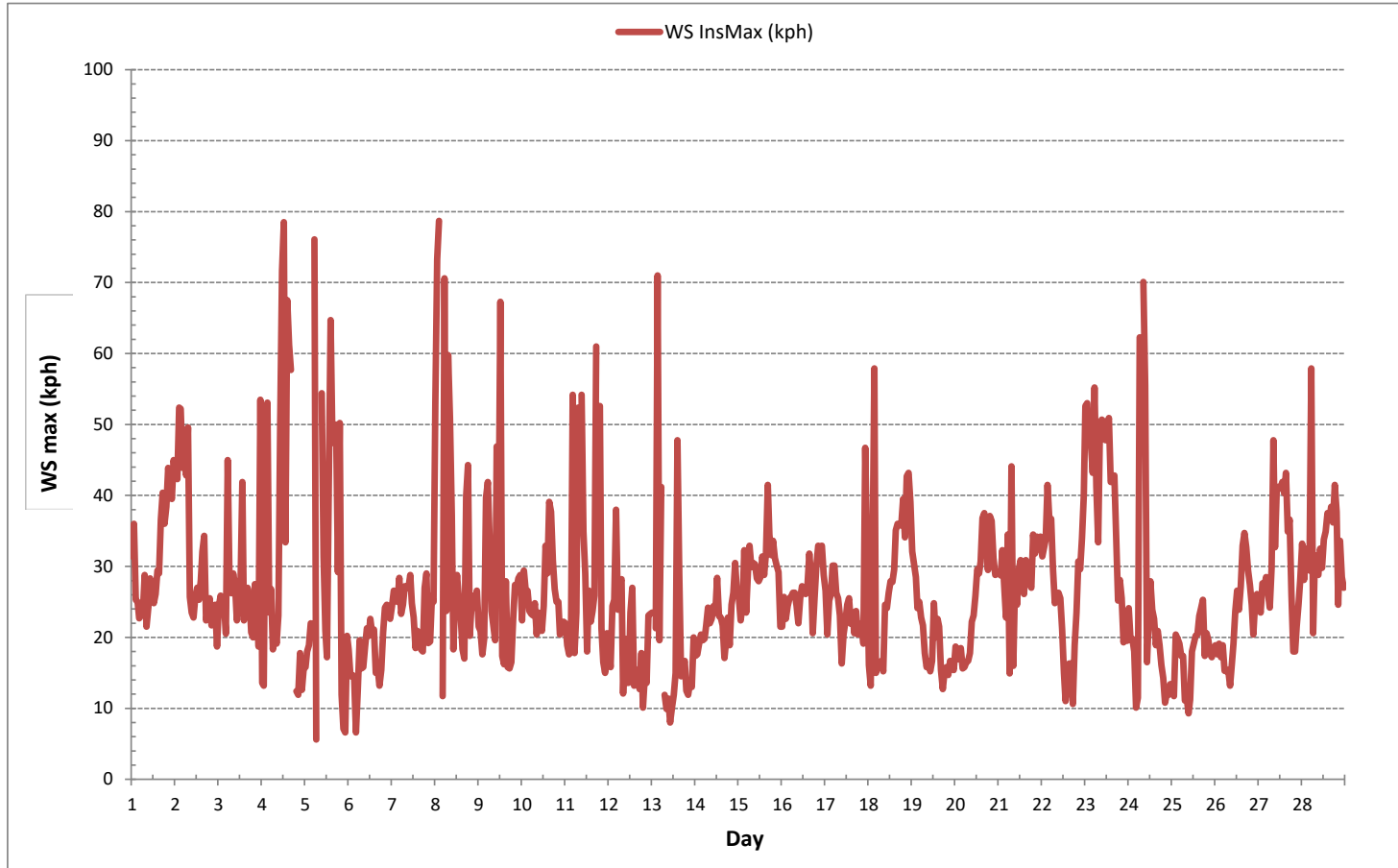
STATUS FLAG CODES

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:	78.7	kph	@ HOUR	2	ON DAY	8	
OPERATIONAL TIME:						660	hrs

WIND SPEED Instantaneous Maximum (WS kph)



1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than $\pm 10\%$ from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO₂/NO_x and CH₄/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, 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.

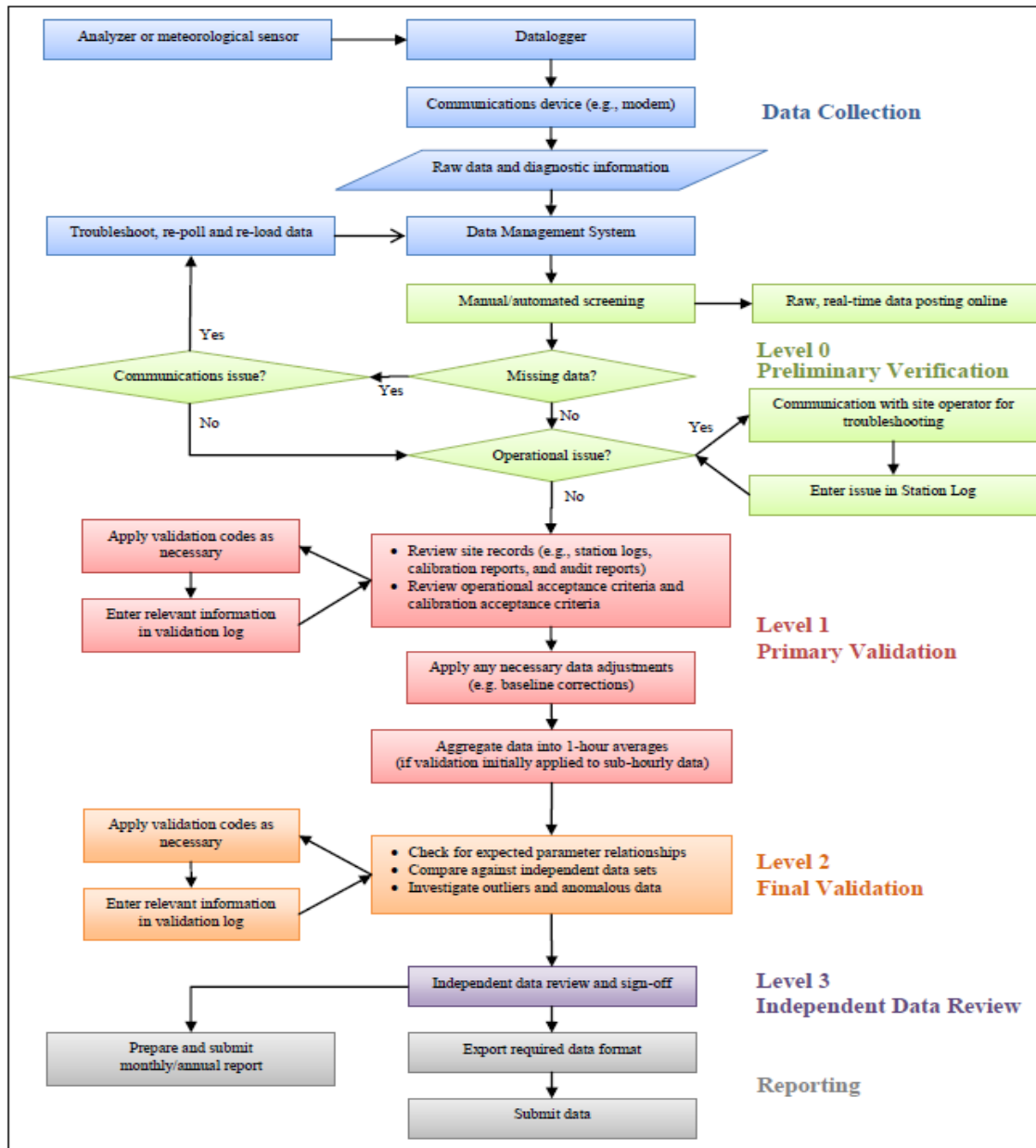
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

AMD Data Verification and Validation Process

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

<p>Level 0 Preliminary Verification</p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p>Level 1 Primary Validation</p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p>Level 2 Final Validation</p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p>Level 3 Independent Data Review</p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p>Post-Final Validation</p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2019-02-25-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification *bimadeniji* Date 13- Mar- 2019

Level 1 Primary Validation *bimadeniji* Date 13- Mar- 2019

Level 2 Final Validation *bimadeniji* Date 14- Mar- 2019

Level 3 Independent Data Review *cradamba* Date 20- Mar- 2019

Post-Final Validation NA Date NA

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

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FEBRUARY 1 - 28, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-02-39-C

LICA-201902

Prepared for:

Lakeland Industry & Community Association

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Monitoring Station

Bonnyville East Site Continuous Monitoring
Station


Date of Report Issuance: March 22, 2019

Report Preparation By:

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Project Team Lead, Customer Service, Air Services



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LICA-201902

Page 268 of 350

Lakeland Industry & Community Association

5107 50 St.
Bonnyville, Alberta T9N 2J5

Attention: Mike Bisaga

Date: March 22, 2019

Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for FEBRUARY 1 - 28, 2019

In February 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville East Site Continuous Monitoring Station near Bonnyville, Alberta. The monitoring program provides measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

Network Parameters for Continuous Monitoring:

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements Chapter 9, 13.1.7, RC 13-R. The station is equipped with analyzers to measure SO₂, H₂S, THC, CH₄, NMHC, NOx, NO, NO₂, PM_{2.5} and O₃. The meteorological sensors and equipment capture data for WS, WD and STDWD.

Exceedance & Performance Reporting:

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the AMD, Chapter 6, DQ 4-C, 2016.

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, January 2019). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied (Chapter 9, Appendix A, AMD 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

Monthly Monitoring Overview:

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program. The evaluation of data collected in the month of February did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

During this monitoring period, there were no scheduled audits, to which Maxxam Analytics was privy to.

All Parameters: A power failure occurred on February 22, between hours 11:00 and 13:00, incurring three hours of downtime. An additional hour of downtime was recorded at hour 14:00 on the H₂S channel as the analyzer was recovering from the power outage.

H₂S: Five hours of downtime were recorded across the month due to additional quality checks and corrective actions performed to address drifts in span response.

THC/CH₄/NMHC: On February 23, LICA's Thermo 55i analyzer (s/n: 1236656107) was removed as it was not sampling and had earlier exhibited poor sample injection. LICA's Thermo 55i analyzer (s/n: 1180320044) was subsequently installed and calibrated successfully. Data was invalidated back to the point of failed performance, determined as hour 14:00, on February 22. Twenty-nine hours of downtime were recorded due to this event.

Should you have any questions concerning the results or if we can be of further assistance, please contact your Maxxam representative indicated below.

Reviewed by:



Wunmi Adekanmbi, M.Sc., EPT, PMP
Project Team Lead, Customer Service, Air Services
403-219-3677

I certify that I 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. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.

TABLE OF CONTENTS

TITLE PAGE	1
COVER LETTER	2
TABLE OF CONTENTS	3
ABBREVIATIONS	4
AAAQO EXCEEDANCE SUMMARY	5
MONTHLY CONTINUOUS DATA SUMMARY	6
OPERATIONAL SUMMARY	7
SUMMARY TABLES, GRAPHS AND ROSES	9
Sulphur Dioxide	10
Hydrogen Sulphide	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter _{2.5}	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
MAXIMUM INSTANTANEOUS DATA	58
1.0 Quality Control Activities	78
2.0 Data Verification and Validation	79
Validation Certificate Form	82
End of Report	83

List of Acronyms

AAAQO	Alberta Ambient Air Quality Objectives and Guidelines Summary
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
CH₄	Methane
DAS	Data acquisition system
hr	Hour
hrs	Hours
H₂S	Hydrogen Sulphide
IZS	Internal zero-span
kph	Kilometers per hour
NO	Nitric Oxide
NO₂	Nitrogen dioxide
NO_x	Total oxides of nitrogen
O₃	Ozone
NMHC	Non-Methane Hydrocarbon
PM_{2.5}	Particulate matter less than or equal to 2.5 microns in diameter
ppb	Parts per billion
ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
SHARP	Synchronized Hybrid Ambient Real-time Particulate Monitor
SOP	Standard Operating Procedure
SO₂	Sulphur Dioxide
STDWD	Standard Deviation Wind Direction
THC	Total hydrocarbons
µg/m³	Microgram per cubic meter
WS	Wind Speed
WD	Wind Direction
°C	Degrees Celsius

AAAQO 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 AAAQG 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 76 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

MONTHLY CONTINUOUS DATA SUMMARY

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Bonnyville East Site 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	1	5	7	16	12.1	SSE	2	19	99.6
H ₂ S (ppb)	10	3	0	0	0	3	19	20	5.8	SSE	1	14	98.7
THC (ppm)	-	-	-	-	2.33	6.27	14	6	6.4	E	3.47	14	95.2
CH ₄ (ppm)	-	-	-	-	2.32	6.10	14	6	6.4	E	3.40	14	95.2
NMHC (ppm)	-	-	-	-	0.01	0.17	14	6	6.4	E	0.06	14	95.2
NO ₂ (ppb)	159	-	0	-	6	26	7	6	6.7	ESE	14	14	99.6
NO (ppb)	-	-	-	-	1	39	14	11	2.3	SSW	8	14	99.6
NO _x (ppb)	-	-	-	-	7	61	5	12	1.8	ENE	22	14	99.6
O ₃ (ppb)	76	-	0	-	31.1	45.6	27	15	22.9	NW	41.8	27	99.6
PM _{2.5} (µg/m ³)	80	29	0	0	6	24	14	12	2.3	SE	16	19	99.6
VECTOR WS (kph)	-	-	-	-	1.0	28.2	1	0	-	NNE	17.8	1	99.6
VECTOR WD (sec)	-	-	-	-	36 (NE)	-	-	-	-	-	-	-	99.6

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

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO ₂)	Thermo 43I-TLE Pulsed Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. This was incurred due to a power failure that occurred on February 22, between hours 11:00 and 13:00. The routine monthly calibration was performed on February 6, between the hours of 10:00 and 14:00.
HYDROGEN SULPHIDE (H ₂ S)	Thermo 450i UV Fluorescence Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 98.7%, equivalent to 9 hours of downtime The analyzer spanned outside the lower acceptance limit on February 2. The results of subsequent scheduled and repeat span checks exhibited similar response. This prompted a site visit on February 4 where the routine monthly calibration was successfully completed between hours 14:00 - 19:00. The expected span value was updated following the scheduled daily zero-span check on February 4, at extremely low ambient temperatures as recorded across the LICA network. As the weather warmed up, span response began to drift high because the conditions under which the expected span value was previously set had changed. As a result, daily span results exceeded the upper acceptance limit beginning on February 8. On February 19, after ambient temperatures had fairly stabilized, a successful repeat calibration was completed, and the expected span value was updated again. Span response improved after this point. As both the routine monthly and repeat calibrations met AMD requirements, no data was discarded due to the span drift. Five hours of downtime were, however, recorded due to the additional quality checks. A power failure occurred on February 22, between hours 11:00 and 13:00, resulting in three hours of downtime. Data recorded at hour 14:00 was invalidated as the analyzer was recovering following the power failure.
TOTAL HYDROCARBONS (THC), METHANE (CH ₄) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canisters and Xontech	<ul style="list-style-type: none"> Operational time for the monitoring period was 95.2%, equivalent to 32 hours of downtime. Anomalous spikes in CH₄/CH₄max concentration were recorded on February 1, at hour 11:00, and February 19, at hour 13:00. This occurred due to a communication error between the analyzer and the datalogger. Impacted minute concentrations recorded for THC/CH₄/NMHC were therefore excluded, along with the corresponding maximum instantaneous data; and the hourly average was subsequently re-calculated. The routine monthly calibration was performed on February 5, between the hours of 13:00 and 17:00. A power failure occurred on February 22, between hours 11:00 and 13:00, resulting in three hours of downtime.

OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
TOTAL HYDROCARBONS (THC), METHANE (CH ₄) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	<p>Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring</p> <p>Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canisters and Xontech</p>	<ul style="list-style-type: none"> Following the power failure, frequent poor sample injections were observed. This prompted a site visit on February 23 where LICA's Thermo 55i analyzer (s/n: 1236656107) was removed as it was not operating properly. LICA's Thermo 55i analyzer (s/n: 1180320044) was subsequently installed and calibrated successfully. Data was invalidated back to the point of failed performance, determined as hour 14:00 on February 22. Twenty-nine hours of downtime were recorded due to this event. Minute data for the month was reviewed. CH₄ minute concentrations recorded lower than 1.80 ppm, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly averages were re-calculated. The following hourly averages were re-calculated: February 16, at hour 21:00, and February 18, at hour 10:00. 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. No canister event was recorded this month.
OXIDES OF NITROGEN (NO _x), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO ₂)	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. This was incurred due to a power failure that occurred on February 22, between hours 11:00 and 13:00. The routine monthly calibration was performed on February 6, between the hours of 10:00 and 16:00.
OZONE (O ₃)	Thermo 49i Photometric Analyzer	Maxxam AIR SOP-00212: Ambient O₃ Monitoring	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. This was incurred due to a power failure that occurred on February 22, between hours 11:00 and 13:00. The routine monthly calibration was performed on February 5, between the hours of 13:00 and 17:00.
PARTICULATE MATTER < 2.5 MICRONS (PM _{2.5})	Thermo SHARP 5030i Unit	Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. This was incurred due to a power failure that occurred on February 22, between hours 11:00 and 13:00. The routine monthly check was performed on February 6, between the hours of 16:00 and 17:00.
WIND SPEED (WS), WIND DIRECTION (WD) & STANDARD DEVIATION WIND DIRECTION (STDWD)	RM Young Unit	Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration	<ul style="list-style-type: none"> Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime. This was incurred due to a power failure that occurred on February 22, between hours 11:00 and 13:00. Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.
Datalogger	Envista Ultimate Unit	Operation Manual	<ul style="list-style-type: none"> There were no performance issues identified.

SUMMARY TABLES, GRAPHS AND ROSES



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

STATUS FLAG CODES

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

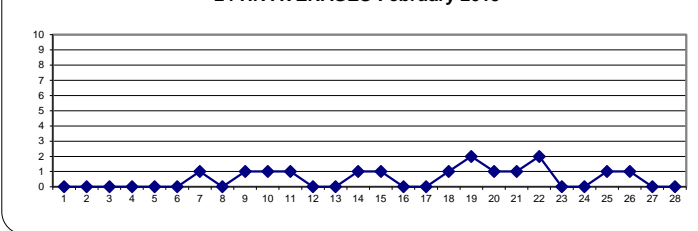
OBJECTIVE LIMIT:

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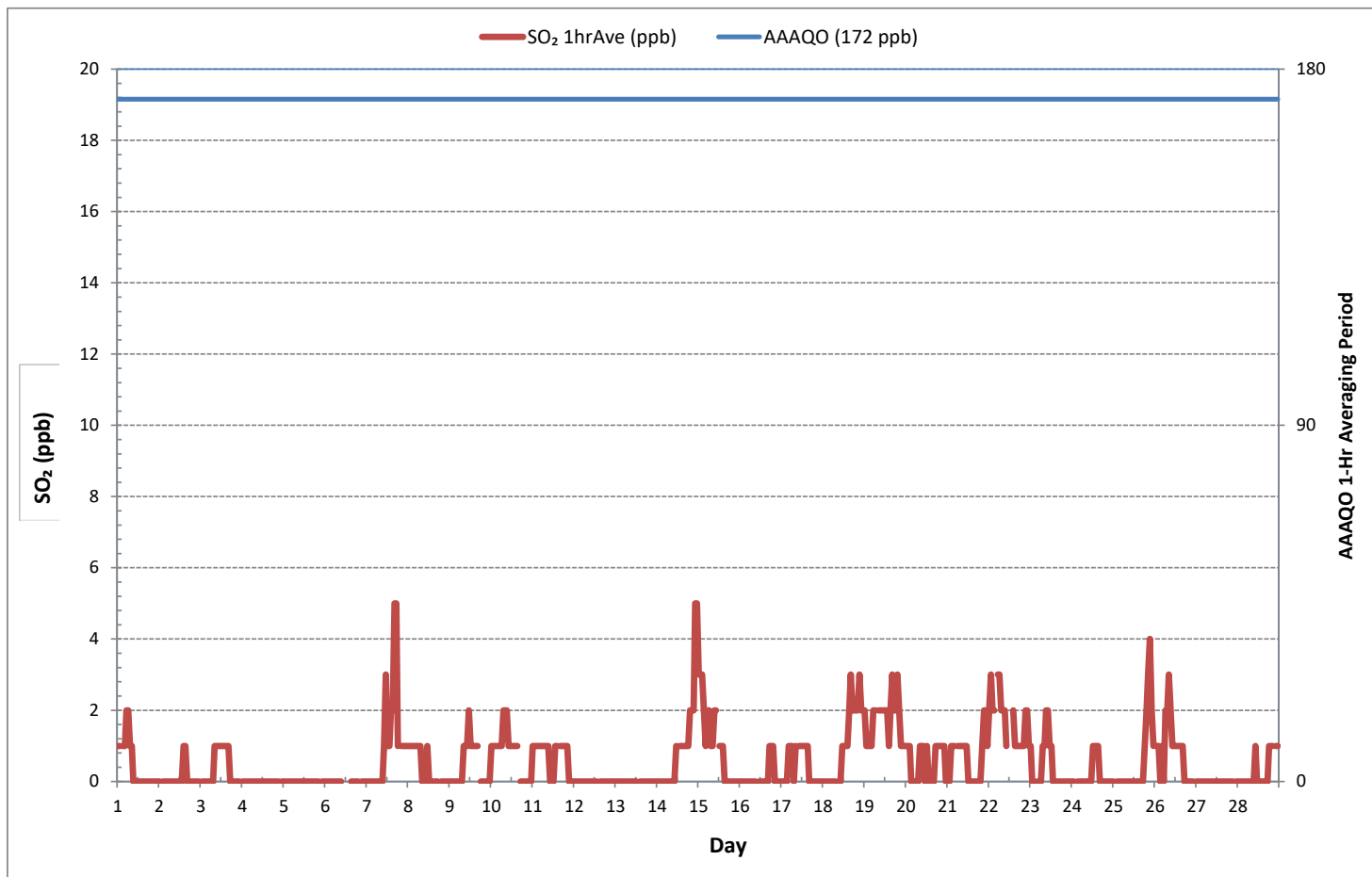
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	241
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 9 ON DAY 1
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR 16 ON DAY 7
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 19
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	669 hrs
AMD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	1 ppb

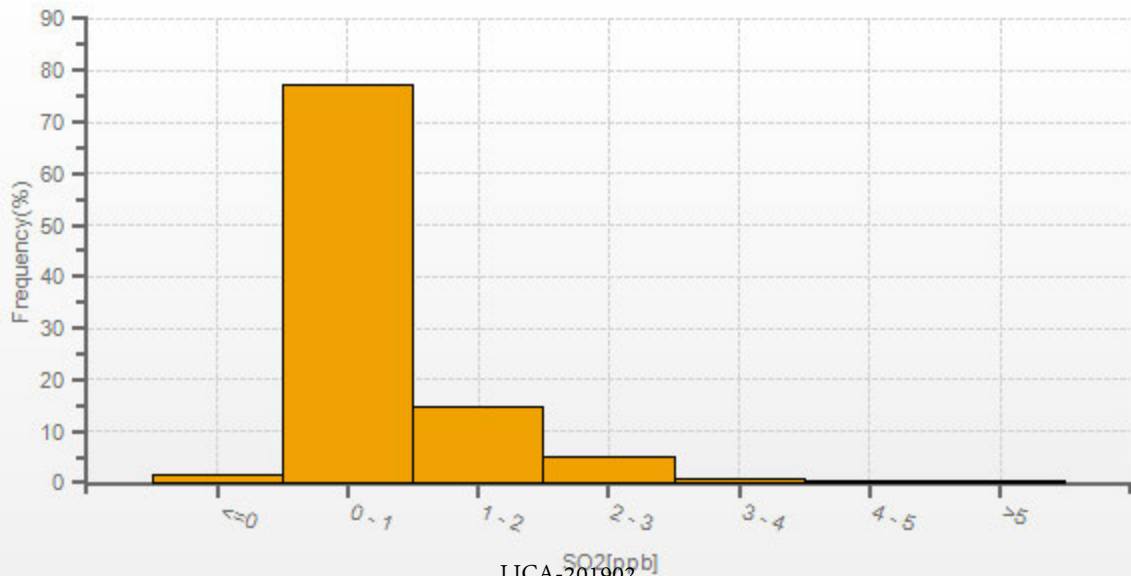
24 HR AVERAGES February 2019



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019
SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



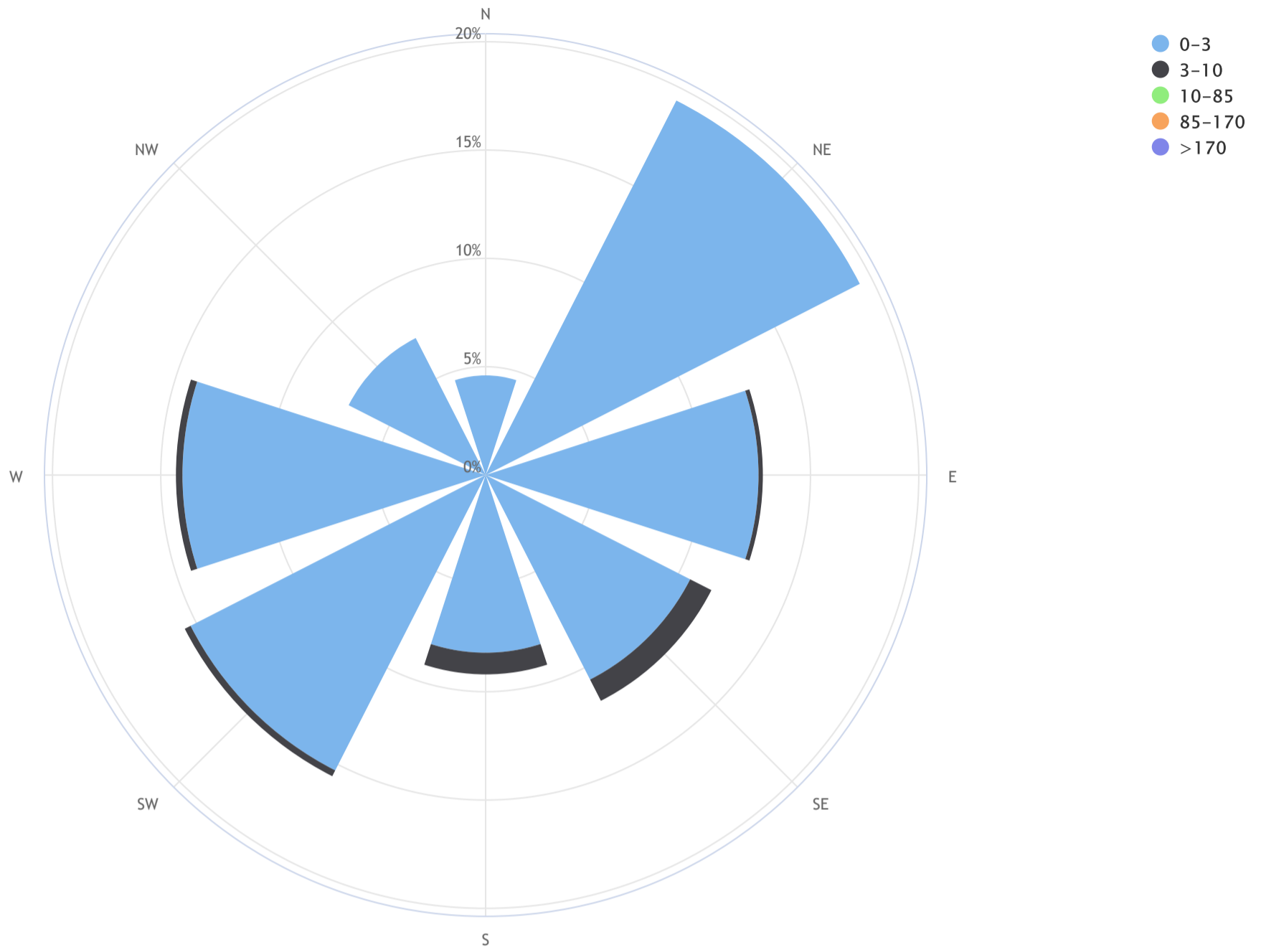
SO₂[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902
Page 279 of 350

Lakeland Industry & Community Association_Bonnyville East Site_SO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.2, CALM % = 5.4%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	4.6	0.0	0.0	0.0	0.0	4.6
NE	19.4	0.0	0.0	0.0	0.0	19.4
E	12.6	0.2	0.0	0.0	0.0	12.8
SE	10.6	1.1	0.0	0.0	0.0	11.7
S	8.2	1.0	0.0	0.0	0.0	9.2
SW	15.3	0.3	0.0	0.0	0.0	15.6
W	14.0	0.3	0.0	0.0	0.0	14.4
NW	7.1	0.0	0.0	0.0	0.0	7.1
Summary	91.8	2.9	0.0	0.0	0.0	94.7
CALM	5.4	0.0	0.0	0.0	0.0	5.4



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	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
2	0	S	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	S	0	0	0	0	0	0	0	0	24
5	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	24
6	0	0	0	0	0	1	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
7	1	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	1	0	24
8	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
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	1	1	1	1	0	0	0	0	1	0	24
10	1	1	0	1	0	0	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
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	1	0	1	0	0	1	0	24
12	0	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
13	0	0	0	0	0	0	0	1	1	0	0	0	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
14	0	0	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	1	1	24
15	0	1	1	1	1	0	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24
18	0	1	0	1	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	1	0	24
19	0	0	0	0	0	0	0	S	0	0	0	0	0	0	C1	C1	C1	C1	1	1	3	1	0	1	0	1	0	0	0	3	1	20
20	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	0	0	0	0	0	24
21	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	24
22	0	0	0	0	S	0	0	0	0	0	0	P	P	P	R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
23	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
24	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
25	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	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	S	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	S	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	3	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

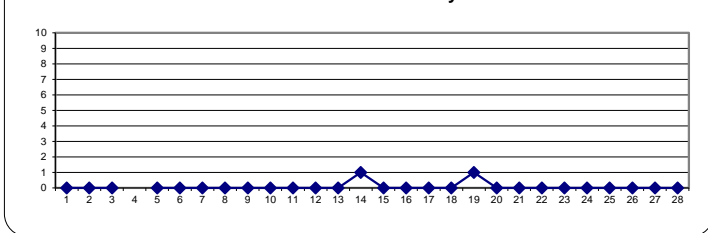
OBJECTIVE LIMIT:

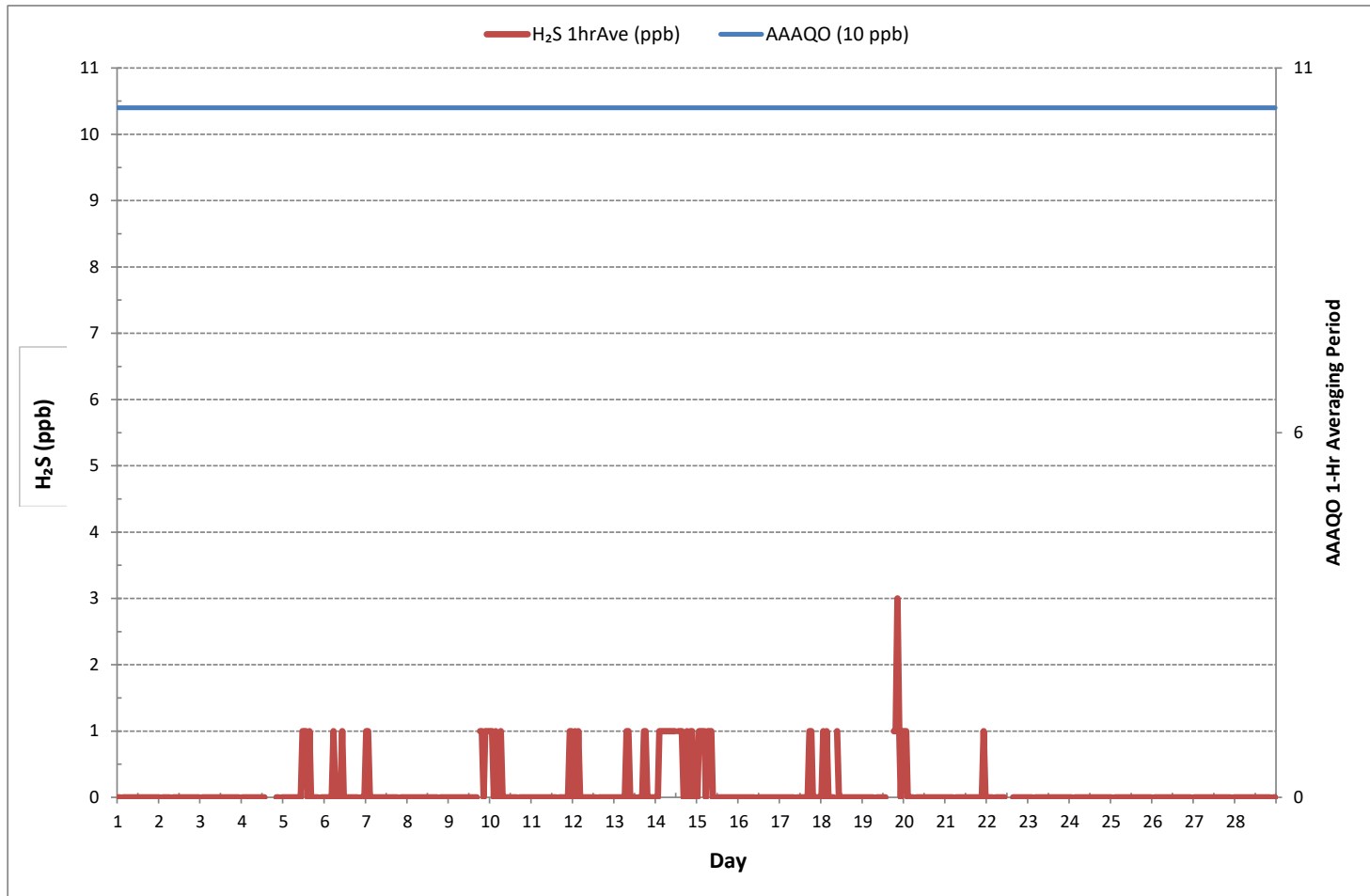
ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
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MONTHLY SUMMARY

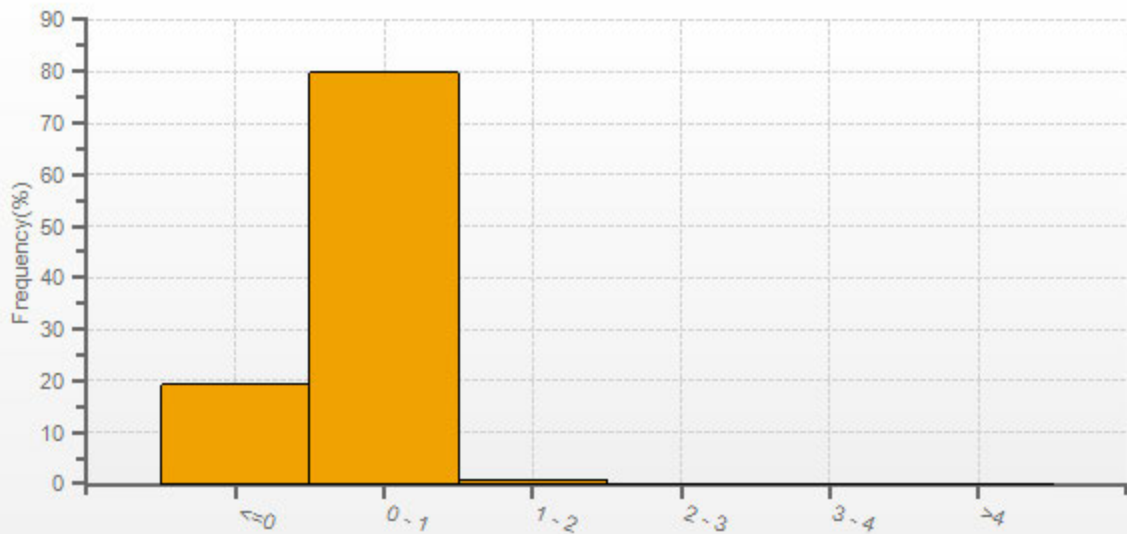
NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	61		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	20 ON DAY	19
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	14
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	663 hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	98.7 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES February 2019





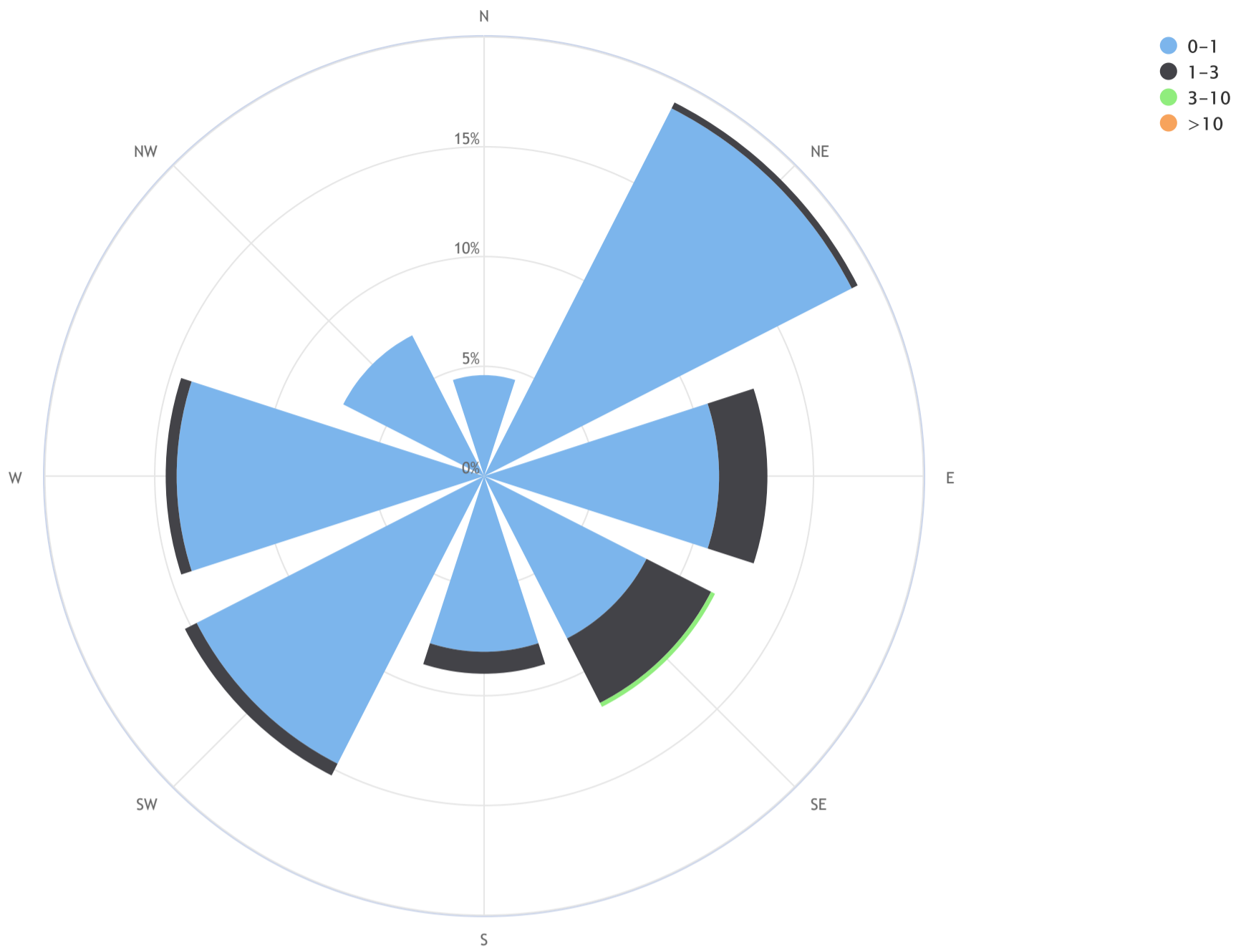
H2S[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902
Page 283 of 350

Lakeland Industry & Community Association_Bonnyville East Site_H2S (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.3, CALM % = 5.7%



Direction	0-1	1-3	3-10	>10	TOTAL
N	4.6	0.0	0.0	0.0	4.6
NE	18.8	0.3	0.0	0.0	19.1
E	10.7	2.2	0.0	0.0	12.9
SE	8.3	3.3	0.2	0.0	11.8
S	8.0	1.0	0.0	0.0	8.9
SW	14.7	0.6	0.0	0.0	15.3
W	14.0	0.5	0.0	0.0	14.5
NW	7.2	0.0	0.0	0.0	7.2
Summary	86.2	8.0	0.2	0.0	94.3
CALM	4.0	1.8	0.0	0.0	5.7

TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.99	2.01	S	1.99	1.99	2.00	2.01	2.00	1.99	1.99	1.98	1.97	1.97	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.97	1.98	1.98	1.98	1.96	2.01	1.98	24
2	1.98	S	1.98	1.98	1.97	1.97	1.98	1.97	1.97	1.97	1.96	1.96	1.97	1.97	1.96	1.97	1.99	2.01	2.06	2.10	2.11	2.16	2.15	1.96	2.16	2.00	24		
3	S	2.09	2.11	2.11	2.12	2.14	2.16	2.17	2.19	2.17	2.19	2.14	2.07	2.03	2.02	2.01	2.03	2.06	2.04	2.04	2.06	2.06	2.08	S	2.01	2.19	2.09	24	
4	2.00	1.98	1.97	1.98	1.98	1.99	1.98	1.99	2.00	2.01	2.03	2.03	2.00	1.98	1.99	1.98	2.01	2.02	2.04	2.03	2.06	2.12	S	2.10	1.97	2.12	2.01	24	
5	2.13	2.15	2.20	2.23	2.27	2.19	2.19	2.24	2.32	2.27	2.32	2.32	2.46	C	C	C	C	C	2.16	2.19	2.21	S	2.26	2.23	2.13	2.46	2.24	24	
6	2.22	2.32	2.48	2.54	3.00	4.52	3.12	2.45	2.40	3.24	5.54	4.65	3.83	3.27	2.90	2.68	2.58	2.39	2.40	2.45	S	2.41	2.51	2.76	2.22	5.54	2.99	24	
7	3.52	4.63	5.39	4.85	4.44	4.39	4.57	4.53	4.77	4.18	2.72	2.65	2.45	2.35	2.33	2.33	2.35	2.41	2.55	S	2.87	2.86	2.88	2.91	2.33	5.39	3.43	24	
8	2.85	2.66	2.63	2.61	2.69	2.67	2.60	2.49	2.35	2.28	2.20	2.17	2.12	2.11	2.09	2.07	2.07	2.08	S	2.10	2.11	2.11	2.08	2.07	2.07	2.85	2.31	24	
9	2.06	2.07	2.16	2.16	2.19	2.21	2.23	2.26	2.27	2.29	2.30	2.25	2.15	2.09	2.10	2.14	2.13	S	2.19	2.21	2.28	3.49	3.78	3.18	2.06	3.78	2.36	24	
10	2.96	3.63	3.77	3.40	3.31	3.58	4.19	3.06	2.99	2.98	2.56	2.44	2.33	2.21	2.17	2.16	S	2.10	2.10	2.10	2.09	2.07	2.08	2.13	2.07	4.19	2.71	24	
11	2.05	2.06	2.09	2.11	2.16	2.11	2.09	2.11	2.14	2.08	2.07	2.06	2.04	2.03	2.02	S	2.06	2.05	2.11	2.11	2.13	2.18	2.30	2.23	2.02	2.30	2.10	24	
12	2.28	2.27	2.34	2.40	2.39	2.35	2.38	2.38	2.40	2.42	2.42	2.37	2.26	2.24	S	2.23	2.22	2.22	2.22	2.26	2.31	2.41	2.36	2.41	2.37	2.22	2.42	2.33	24
13	2.47	2.43	2.57	2.44	2.41	2.51	2.47	2.58	2.64	2.62	2.59	2.46	2.24	S	2.18	2.21	2.19	2.23	2.19	2.17	2.20	2.17	2.31	2.17	2.17	2.64	2.37	24	
14	2.31	2.35	3.20	4.54	5.03	5.34	6.27	5.02	4.35	4.35	4.15	3.49	S	2.89	2.82	2.77	2.51	2.53	2.49	2.48	2.61	2.64	2.77	2.82	2.31	6.27	3.47	24	
15	2.80	2.85	3.15	3.74	3.70	3.12	3.03	3.26	3.40	2.81	2.39	S	2.18	2.14	2.13	2.12	2.12	2.13	2.11	2.11	2.10	2.08	2.10	2.08	2.08	3.74	2.59	24	
16	2.11	2.09	2.09	2.07	2.10	2.11	2.07	2.05	2.07	2.08	S	2.04	2.03	2.03	2.03	2.01	2.03	2.05	2.05	2.05	2.05	2.04	2.03	2.02	2.01	2.11	2.06	24	
17	2.02	2.02	2.02	2.03	2.08	2.14	2.11	2.04	2.05	S	2.02	2.00	2.00	2.00	2.00	2.00	2.01	2.02	2.11	2.12	2.09	2.16	2.16	2.20	2.00	2.20	2.06	24	
18	2.23	2.33	2.38	2.50	2.35	2.35	2.35	2.31	S	2.24	2.21	2.14	2.07	2.15	2.14	2.06	2.08	2.09	2.12	2.14	2.15	2.17	2.11	2.10	2.06	2.50	2.21	24	
19	2.15	2.19	2.24	2.23	2.29	2.26	2.24	S	2.27	2.23	2.22	2.20	2.19	2.12	2.10	2.21	2.25	2.56	2.61	2.58	2.73	2.62	2.57	2.59	2.10	2.73	2.33	24	
20	2.59	2.60	2.65	2.83	2.76	2.80	S	3.03	3.10	2.85	2.27	2.21	2.23	2.16	2.06	2.08	2.10	2.09	2.11	2.10	2.08	2.11	2.10	2.09	2.06	3.10	2.39	24	
21	2.12	2.14	2.14	2.13	2.12	S	2.03	2.04	2.03	2.01	1.98	2.01	1.99	1.98	1.99	1.99	2.00	2.00	2.03	2.07	2.10	2.12	2.15	2.16	1.98	2.16	2.06	24	
22	2.18	2.20	2.18	2.21	S	2.20	2.22	2.24	2.25	2.23	2.14	P	P	P	X	X	X	X	X	X	X	X	X	X	2.14	2.25	-	11	
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	X	X	X	X	X	2.14	2.05	2.14	-	5
24	2.14	2.13	S	2.18	2.18	2.25	2.23	2.39	2.47	2.25	2.26	2.19	2.10	2.03	2.03	2.04	2.03	2.03	2.03	2.05	2.06	2.08	2.08	2.08	2.07	2.03	2.47	2.15	24
25	2.10	S	2.16	2.16	2.22	2.16	2.15	2.16	2.18	2.17	2.12	2.07	2.05	2.04	2.03	2.03	2.03	2.03	2.05	2.09	2.08	2.09	2.13	2.18	2.03	2.22	2.11	24	
26	S	2.24	2.30	2.29	2.28	2.32	2.26	2.22	2.21	2.20	2.17	2.12	2.12	2.13	2.14	2.14	2.15	2.14	2.11	2.10	2.09	2.08	2.07	2.08	S	2.07	2.32	2.17	24
27	2.04	2.04	2.07	2.05	2.05	2.05	2.04	2.03	2.02	2.03	2.02	2.00	2.00	2.00	1.98	1.98	1.98	1.98	1.99	2.01	2.01	2.02	2.02	S	2.19	1.98	2.19	2.03	24
28	2.40	2.20	2.07	2.08	2.22	2.21	2.28	2.26	2.20	2.20	2.02	1.99	1.97	1.97	1.96	1.96	1.96	1.99	2.01	2.02	2.01	S	2.02	2.04	1.96	2.40	2.10	24	
HOURLY MAX	3.52	4.63	5.39	4.85	5.03	5.34	6.27	5.02	4.77	4.35	5.54	4.65	3.83	3.27	2.90	2.77	2.58	2.56	2.61	2.58	2.87	3.49	3.78	3.18					
HOURLY AVG	2.31	2.39	2.49	2.51	2.55	2.61	2.59	2.51	2.50	2.47	2.42	2.32	2.19	2.16	2.13	2.13	2.12	2.13	2.15	2.14	2.18	2.25	2.29	2.28					

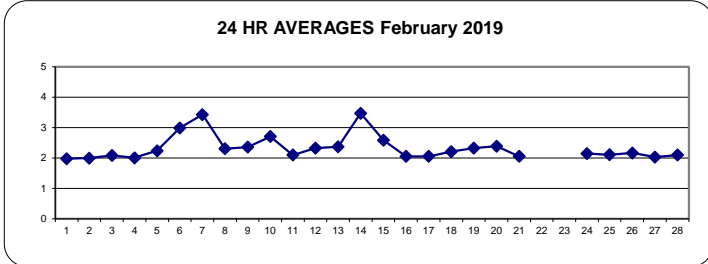
STATUS FLAG CODES

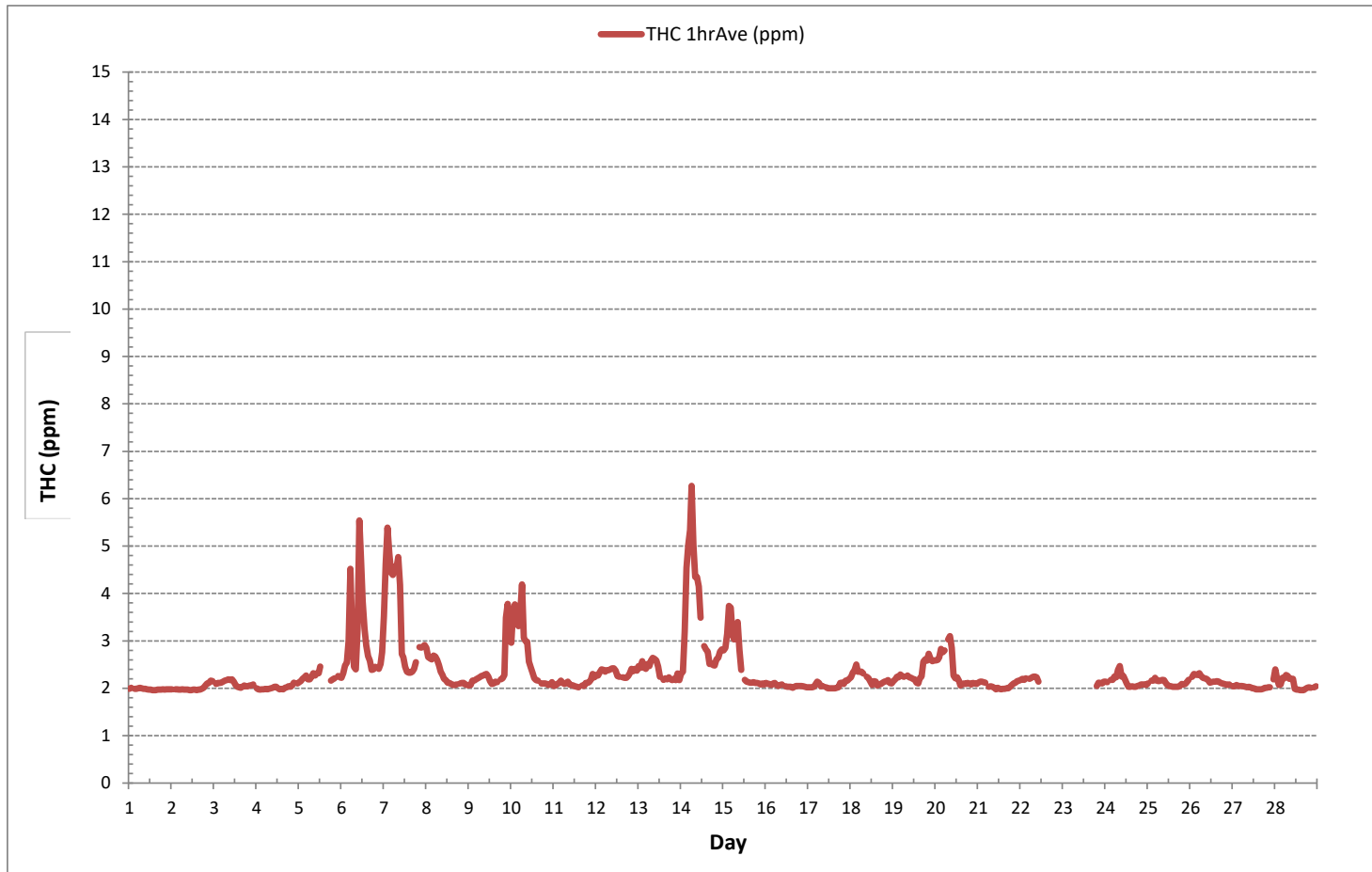
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

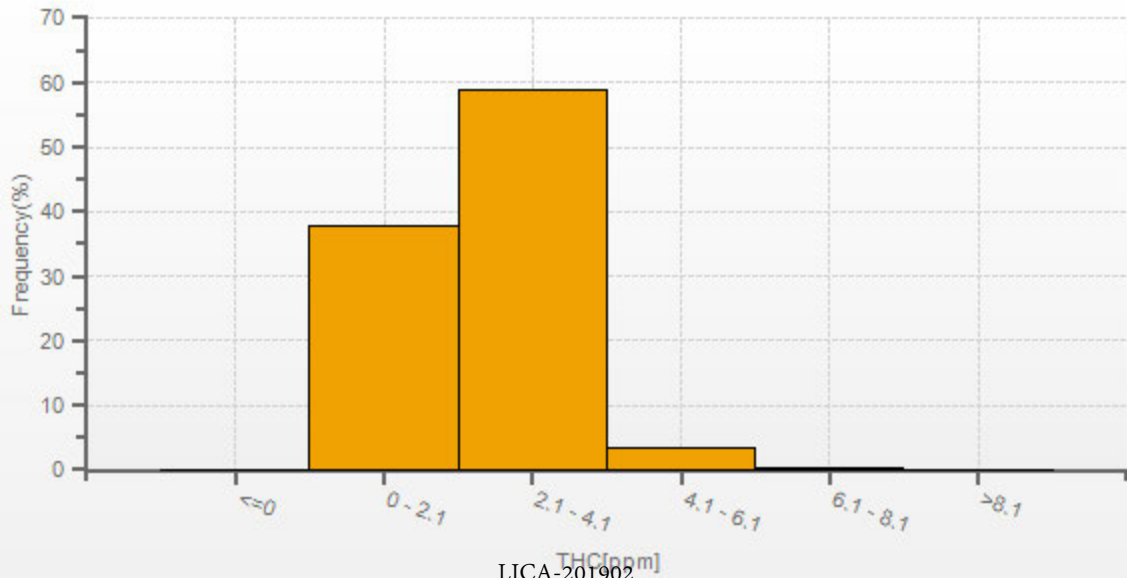
NUMBER OF NON-ZERO READINGS:	606			
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR	13	ON DAY 1
MAXIMUM 1-HR AVERAGE:	6.27 ppm	@ HOUR	6	ON DAY 14
MAXIMUM 24-HR AVERAGE:	3.47 ppm			ON DAY 14
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	640 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	95.2 %	
STANDARD DEVIATION:	0.57	MONTHLY AVERAGE:	2.33 ppm	

24 HR AVERAGES February 2019



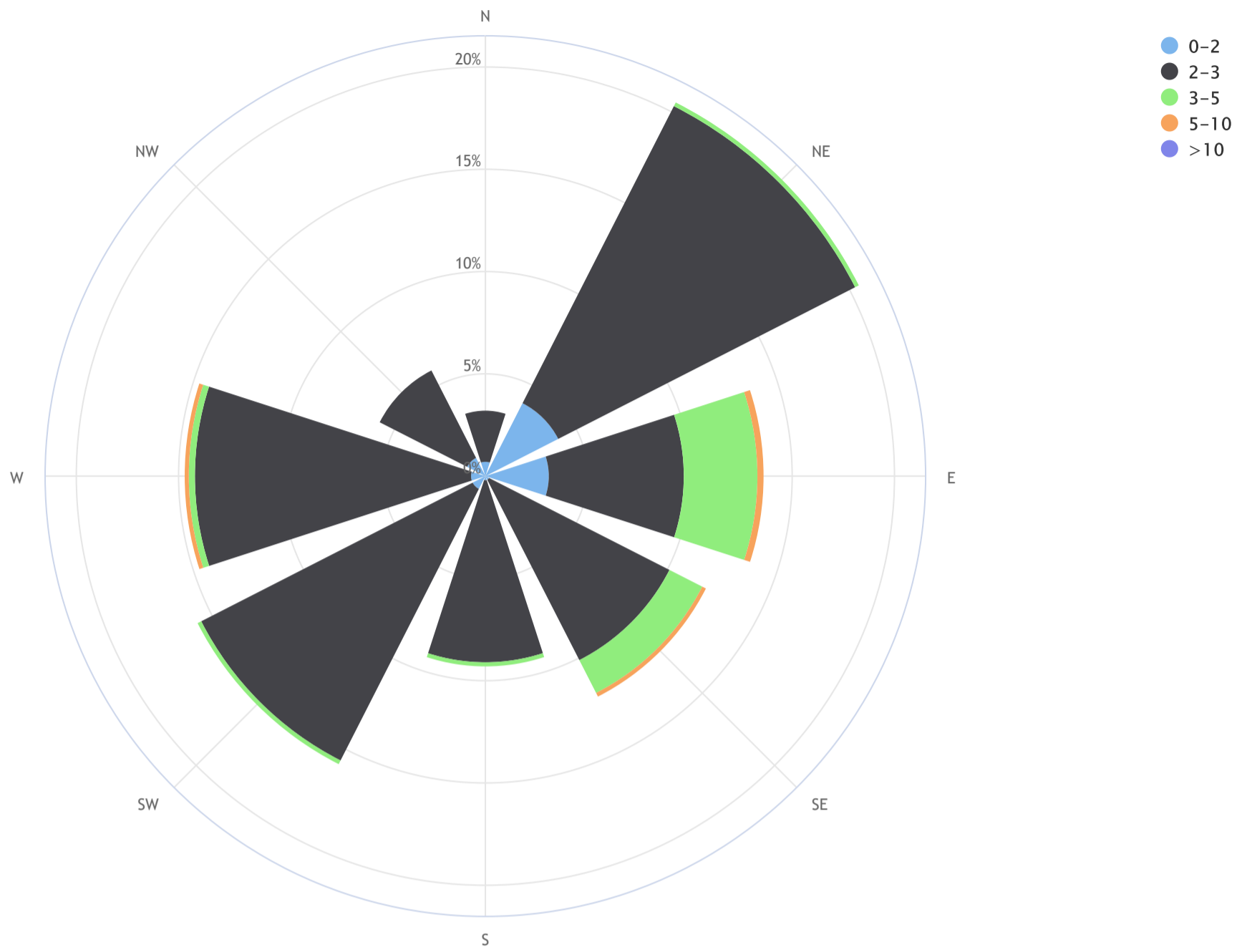


THC[ppm] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



Lakeland Industry & Community Association_Bonnyville East Site_THC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.7, CALM % = 5.3%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	0.7	2.5	0.0	0.0	0.0	3.1
NE	4.0	16.3	0.2	0.0	0.0	20.5
E	3.1	6.6	3.6	0.3	0.0	13.7
SE	0.2	9.9	1.8	0.2	0.0	12.1
S	0.2	8.9	0.2	0.0	0.0	9.3
SW	0.7	14.9	0.2	0.0	0.0	15.7
W	0.7	13.5	0.3	0.2	0.0	14.7
NW	1.0	4.8	0.0	0.0	0.0	5.8
Summary	10.4	77.4	6.3	0.7	0.0	94.8
CALM	0.0	4.5	0.5	0.3	0.0	5.3



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	1.99	2.01	S	1.99	1.99	2.00	2.01	2.00	1.99	1.99	1.98	1.97	1.97	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.97	1.98	1.98	1.98	1.96	2.01	1.98	24
2	1.98	S	1.98	1.98	1.97	1.97	1.98	1.97	1.97	1.97	1.96	1.96	1.97	1.97	1.96	1.97	1.99	2.01	2.06	2.10	2.11	2.16	2.15	1.96	2.16	2.00	24		
3	S	2.09	2.11	2.11	2.12	2.14	2.16	2.17	2.19	2.17	2.19	2.14	2.07	2.03	2.02	2.01	2.03	2.06	2.04	2.04	2.06	2.06	2.08	S	2.01	2.19	2.09	24	
4	2.00	1.98	1.97	1.98	1.98	1.99	1.98	1.99	2.00	2.01	2.03	2.03	2.00	1.98	1.99	1.98	2.01	2.02	2.04	2.03	2.06	2.12	S	2.10	1.97	2.12	2.01	24	
5	2.13	2.15	2.20	2.23	2.26	2.19	2.19	2.24	2.31	2.27	2.32	2.32	2.40	C	C	C	C	C	2.16	2.19	2.21	S	2.26	2.23	2.13	2.40	2.24	24	
6	2.22	2.32	2.48	2.53	2.99	4.45	3.10	2.44	2.40	3.23	5.42	4.57	3.80	3.21	2.89	2.68	2.58	2.39	2.40	2.44	S	2.41	2.51	2.76	2.22	5.42	2.97	24	
7	3.48	4.54	5.27	4.75	4.37	4.33	4.46	4.43	4.64	4.12	2.71	2.65	2.45	2.35	2.33	2.35	2.41	2.54	S	2.86	2.84	2.85	2.84	2.33	5.27	3.39	24		
8	2.81	2.65	2.62	2.60	2.64	2.59	2.53	2.45	2.35	2.28	2.20	2.17	2.12	2.11	2.09	2.07	2.07	2.08	S	2.10	2.11	2.11	2.08	2.07	2.81	2.30	24		
9	2.06	2.07	2.16	2.16	2.19	2.21	2.23	2.26	2.27	2.29	2.30	2.25	2.15	2.09	2.10	2.14	2.13	S	2.19	2.21	2.28	3.44	3.75	3.17	2.06	3.75	2.35	24	
10	2.96	3.60	3.74	3.39	3.30	3.56	4.11	3.05	2.98	2.97	2.56	2.44	2.33	2.21	2.17	2.16	S	2.10	2.10	2.10	2.09	2.07	2.08	2.13	2.07	4.11	2.70	24	
11	2.05	2.06	2.09	2.11	2.16	2.11	2.09	2.11	2.14	2.08	2.07	2.06	2.04	2.03	2.02	S	2.06	2.05	2.10	2.11	2.13	2.18	2.29	2.23	2.02	2.29	2.10	24	
12	2.28	2.27	2.34	2.40	2.39	2.35	2.38	2.37	2.39	2.42	2.42	2.37	2.26	2.24	S	2.23	2.22	2.22	2.22	2.26	2.31	2.40	2.35	2.40	2.36	2.22	2.42	2.33	24
13	2.46	2.43	2.56	2.42	2.38	2.48	2.46	2.54	2.64	2.60	2.56	2.44	2.24	S	2.18	2.21	2.19	2.23	2.19	2.17	2.19	2.17	2.29	2.17	2.17	2.64	2.36	24	
14	2.31	2.35	3.17	4.46	4.93	5.22	6.10	4.90	4.24	4.23	4.02	3.40	S	2.87	2.78	2.74	2.49	2.50	2.44	2.43	2.55	2.60	2.73	2.77	2.31	6.10	3.40	24	
15	2.77	2.80	3.08	3.64	3.60	3.07	2.98	3.19	3.31	2.78	2.39	S	2.18	2.14	2.13	2.12	2.12	2.13	2.11	2.11	2.10	2.08	2.10	2.08	2.08	3.64	2.57	24	
16	2.11	2.09	2.09	2.07	2.10	2.11	2.07	2.05	2.07	2.08	S	2.04	2.03	2.03	2.03	2.01	2.03	2.05	2.05	2.05	2.05	2.04	2.03	2.02	2.01	2.11	2.06	24	
17	2.02	2.02	2.02	2.03	2.08	2.14	2.11	2.04	2.05	S	2.02	2.00	2.00	2.00	2.00	2.00	2.01	2.02	2.10	2.12	2.09	2.16	2.16	2.20	2.00	2.20	2.06	24	
18	2.23	2.33	2.38	2.50	2.35	2.35	2.35	2.30	S	2.24	2.21	2.14	2.07	2.15	2.14	2.06	2.08	2.09	2.12	2.14	2.15	2.17	2.11	2.10	2.06	2.50	2.21	24	
19	2.15	2.19	2.24	2.23	2.28	2.25	2.23	S	2.24	2.20	2.19	2.17	2.17	2.11	2.09	2.19	2.22	2.51	2.55	2.52	2.66	2.56	2.50	2.53	2.09	2.66	2.30	24	
20	2.54	2.56	2.29	2.75	2.69	2.72	S	2.94	2.99	2.79	2.26	2.21	2.22	2.16	2.06	2.08	2.10	2.09	2.10	2.10	2.08	2.11	2.10	2.09	2.06	2.99	2.36	24	
21	2.12	2.14	2.14	2.13	2.12	S	2.03	2.04	2.03	2.01	1.98	2.01	1.99	1.98	1.99	1.99	2.00	2.00	2.03	2.07	2.10	2.12	2.15	2.16	1.98	2.16	2.06	24	
22	2.18	2.20	2.18	2.21	S	2.20	2.21	2.24	2.25	2.22	2.14	P	P	P	X	X	X	X	X	X	X	X	X	X	2.14	2.25	-	11	
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	X	X	X	X	X	2.14	2.05	2.14	-	5
24	2.14	2.13	S	2.18	2.18	2.25	2.23	2.39	2.47	2.25	2.26	2.19	2.10	2.03	2.03	2.04	2.03	2.03	2.03	2.05	2.06	2.08	2.08	2.08	2.07	2.03	2.47	2.15	24
25	2.10	S	2.16	2.16	2.22	2.16	2.15	2.16	2.18	2.17	2.12	2.07	2.05	2.04	2.03	2.03	2.03	2.03	2.05	2.09	2.08	2.09	2.13	2.18	2.03	2.22	2.11	24	
26	S	2.24	2.30	2.29	2.28	2.32	2.26	2.22	2.21	2.20	2.17	2.12	2.12	2.13	2.14	2.14	2.15	2.14	2.11	2.10	2.09	2.08	2.07	2.08	S	2.07	2.32	2.17	24
27	2.04	2.04	2.07	2.05	2.05	2.05	2.04	2.03	2.02	2.03	2.02	2.00	2.00	1.98	1.98	1.98	1.98	1.99	2.01	2.01	2.02	2.02	S	2.19	1.98	2.19	2.03	24	
28	2.40	2.20	2.07	2.08	2.22	2.21	2.28	2.26	2.20	2.20	2.02	1.99	1.97	1.97	1.96	1.96	1.96	1.99	2.01	2.02	2.01	S	2.02	2.04	1.96	2.40	2.10	24	
HOURLY MAX	3.48	4.54	5.27	4.75	4.93	5.22	6.10	4.90	4.64	4.23	5.42	4.57	3.80	3.21	2.89	2.74	2.58	2.51	2.55	2.52	2.86	3.44	3.75	3.17					
HOURLY AVG	2.30	2.38	2.48	2.50	2.53	2.59	2.57	2.49	2.48	2.45	2.41	2.31	2.19	2.16	2.13	2.13	2.12	2.13	2.15	2.14	2.18	2.24	2.28	2.27					

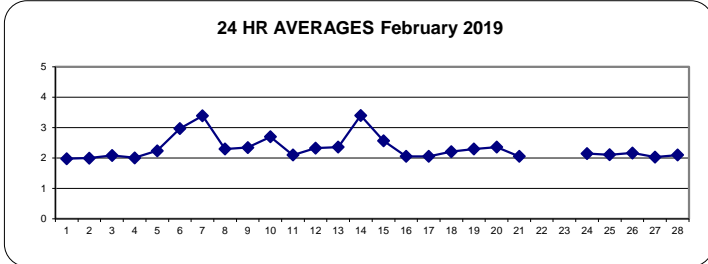
STATUS FLAG CODES

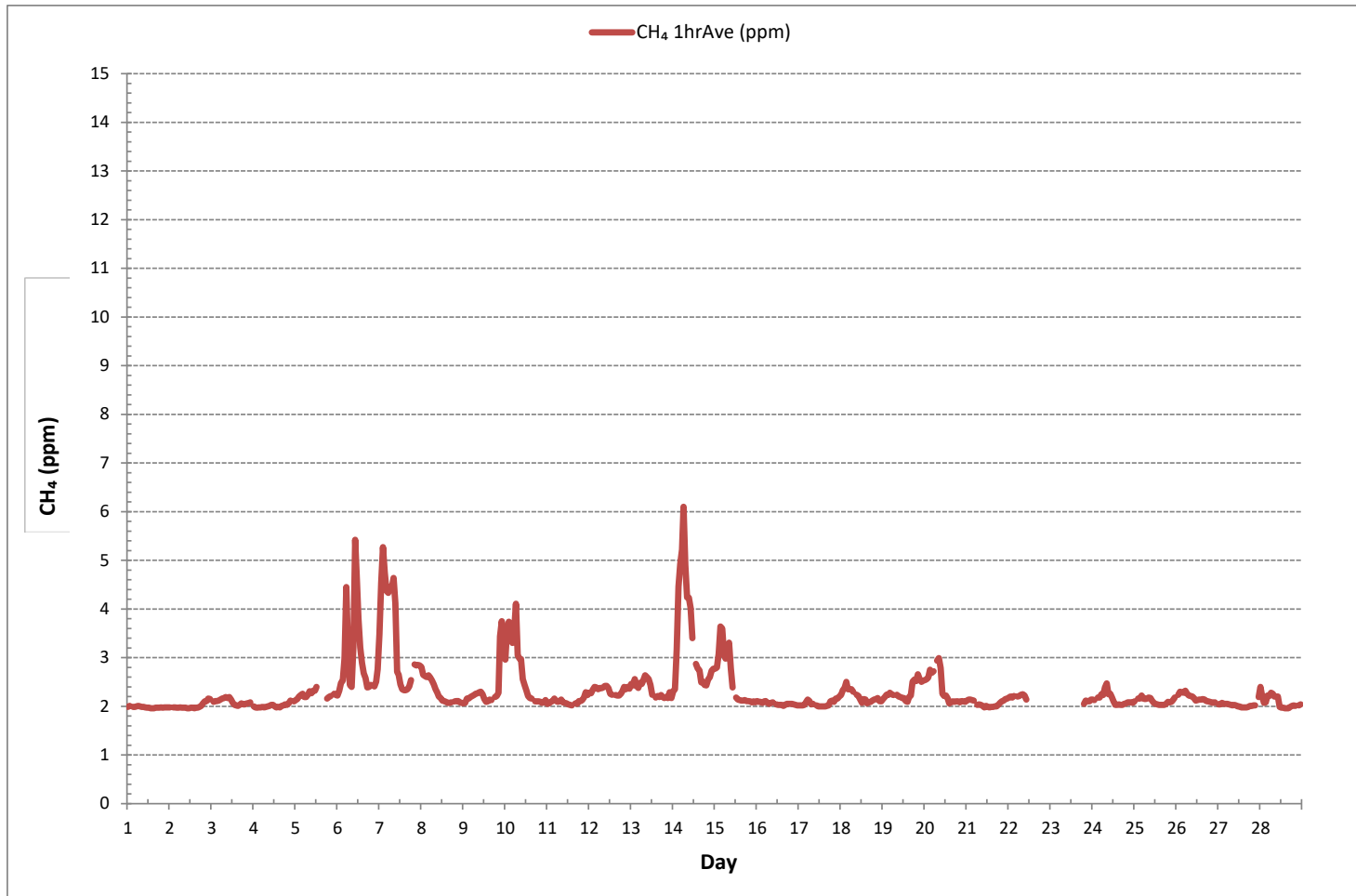
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

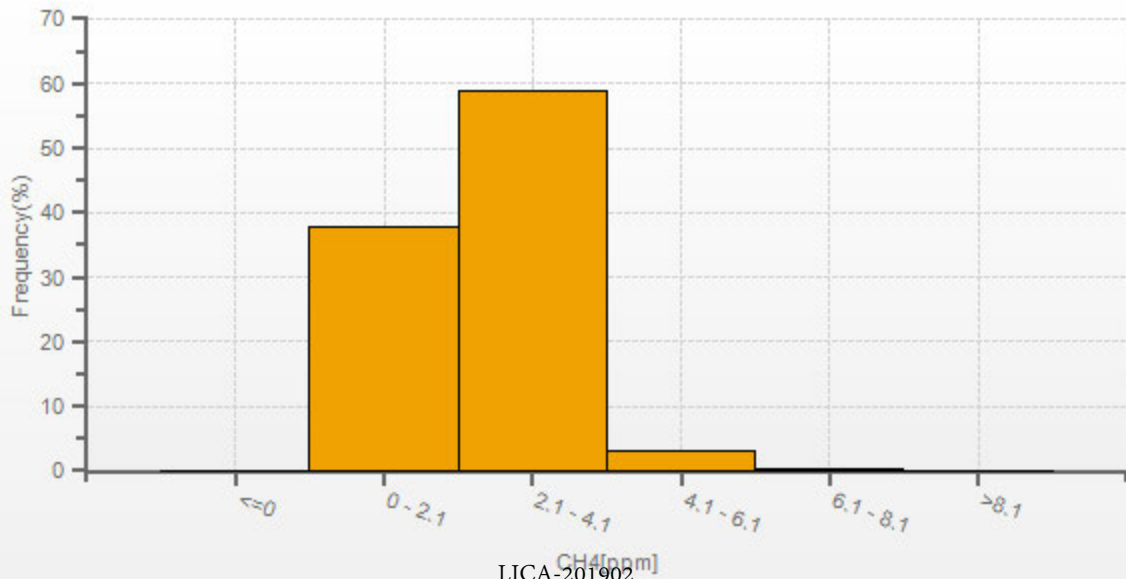
NUMBER OF NON-ZERO READINGS:	606			
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR	13	ON DAY 1
MAXIMUM 1-HR AVERAGE:	6.10 ppm	@ HOUR	6	ON DAY 14
MAXIMUM 24-HR AVERAGE:	3.40 ppm			ON DAY 14
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	640 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	95.2 %	
STANDARD DEVIATION:	0.54	MONTHLY AVERAGE:	2.32 ppm	

24 HR AVERAGES February 2019





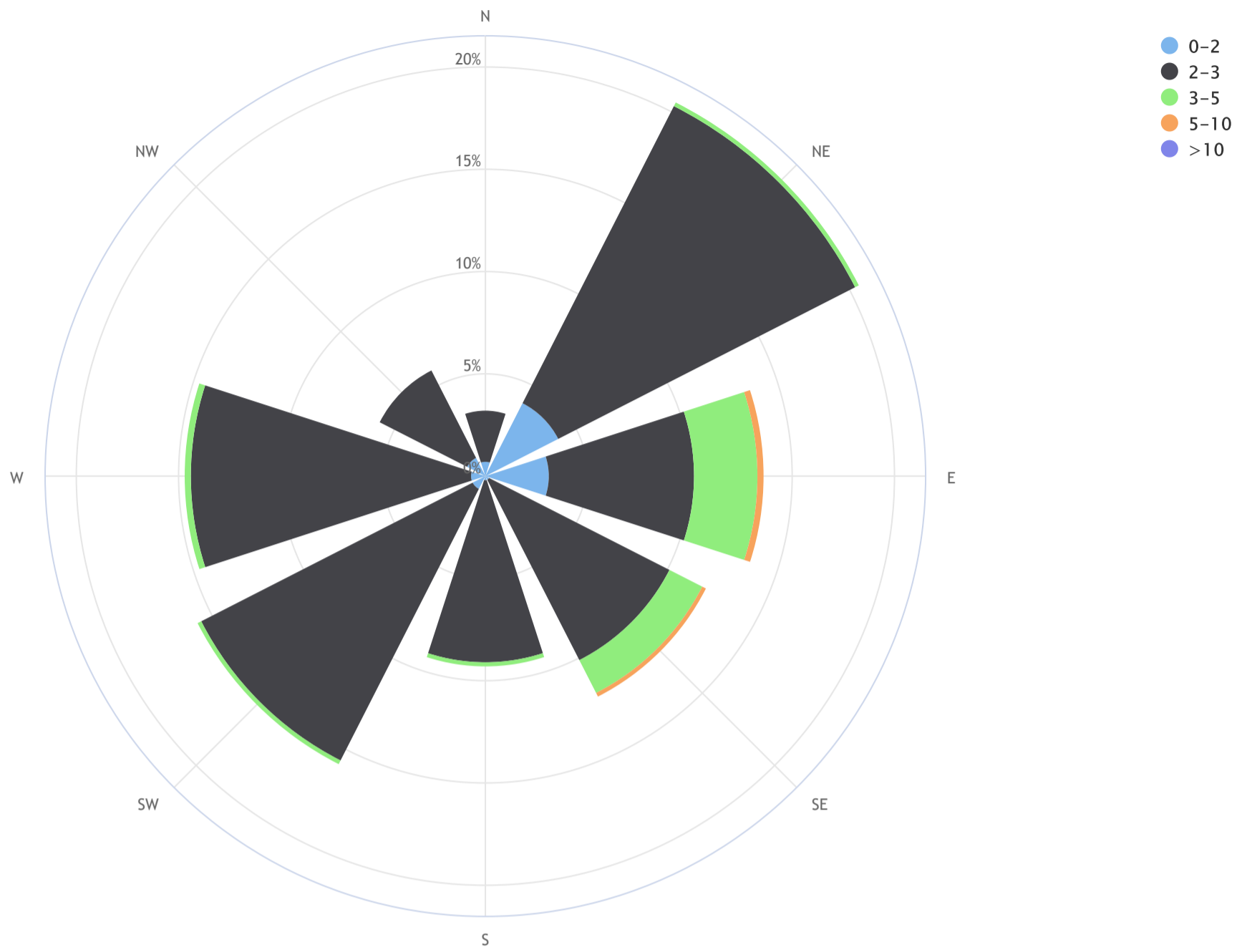
CH4[ppm] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902
Page 291 of 350

Lakeland Industry & Community Association_Bonnyville East Site_CH₄ (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 2.6, CALM % = 5.3%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	0.7	2.5	0.0	0.0	0.0	3.1
NE	4.0	16.3	0.2	0.0	0.0	20.5
E	3.1	7.1	3.1	0.3	0.0	13.7
SE	0.2	9.9	1.8	0.2	0.0	12.1
S	0.2	8.9	0.2	0.0	0.0	9.3
SW	0.7	14.9	0.2	0.0	0.0	15.7
W	0.7	13.7	0.3	0.0	0.0	14.7
NW	1.0	4.8	0.0	0.0	0.0	5.8
Summary	10.4	78.1	5.8	0.5	0.0	94.8
CALM	0.0	4.5	0.7	0.2	0.0	5.3



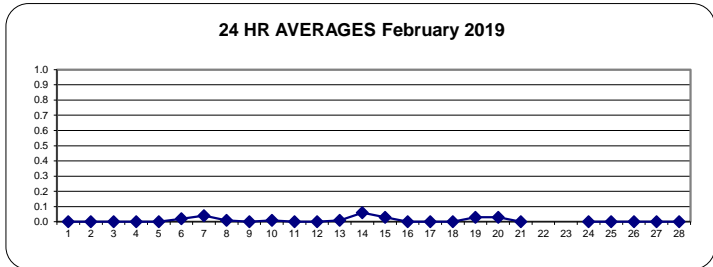
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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
2	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
3	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	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	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
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.06	C	C	C	C	C	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.06	0.00	24
6	0.00	0.00	0.00	0.00	0.01	0.08	0.02	0.00	0.00	0.02	0.12	0.08	0.03	0.06	0.01	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.12	0.02	24
7	0.03	0.09	0.13	0.09	0.07	0.06	0.11	0.11	0.12	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.01	0.03	0.07	0.00	0.00	0.13	0.04	24
8	0.04	0.01	0.01	0.01	0.05	0.07	0.07	0.04	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	0.07	0.01	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.04	0.03	0.01	0.00	0.04	0.00	24
10	0.00	0.03	0.03	0.01	0.01	0.02	0.07	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.02	0.00	24
13	0.01	0.00	0.02	0.02	0.03	0.03	0.02	0.04	0.01	0.02	0.02	0.02	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	0.04	0.01	24
14	0.00	0.00	0.03	0.08	0.11	0.12	0.17	0.12	0.11	0.12	0.13	0.09	S	0.02	0.04	0.04	0.02	0.03	0.05	0.05	0.05	0.04	0.04	0.00	0.00	0.00	0.17	0.06	24
15	0.04	0.05	0.07	0.10	0.10	0.05	0.05	0.06	0.08	0.03	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	0.10	0.03	24
16	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
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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
18	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
19	0.00	0.00	0.00	0.00	0.01	0.01	0.01	S	0.02	0.03	0.02	0.03	0.02	0.01	0.00	0.02	0.03	0.04	0.06	0.06	0.08	0.06	0.07	0.06	0.00	0.00	0.08	0.03	24
20	0.05	0.04	0.06	0.08	0.08	S	0.09	0.11	0.05	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.03	24
21	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
22	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P	P	X	X	X	X	X	X	X	X	X	X	0.00	0.00	-	11	
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	X	X	X	X	0.00	0.00	-	5	
24	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
25	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
26	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	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	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
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.05	0.09	0.13	0.10	0.11	0.12	0.17	0.12	0.12	0.12	0.13	0.09	0.06	0.06	0.04	0.04	0.03	0.04	0.06	0.06	0.08	0.06	0.07	0.07	0.00				
HOURLY AVG	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00				

STATUS FLAG CODES

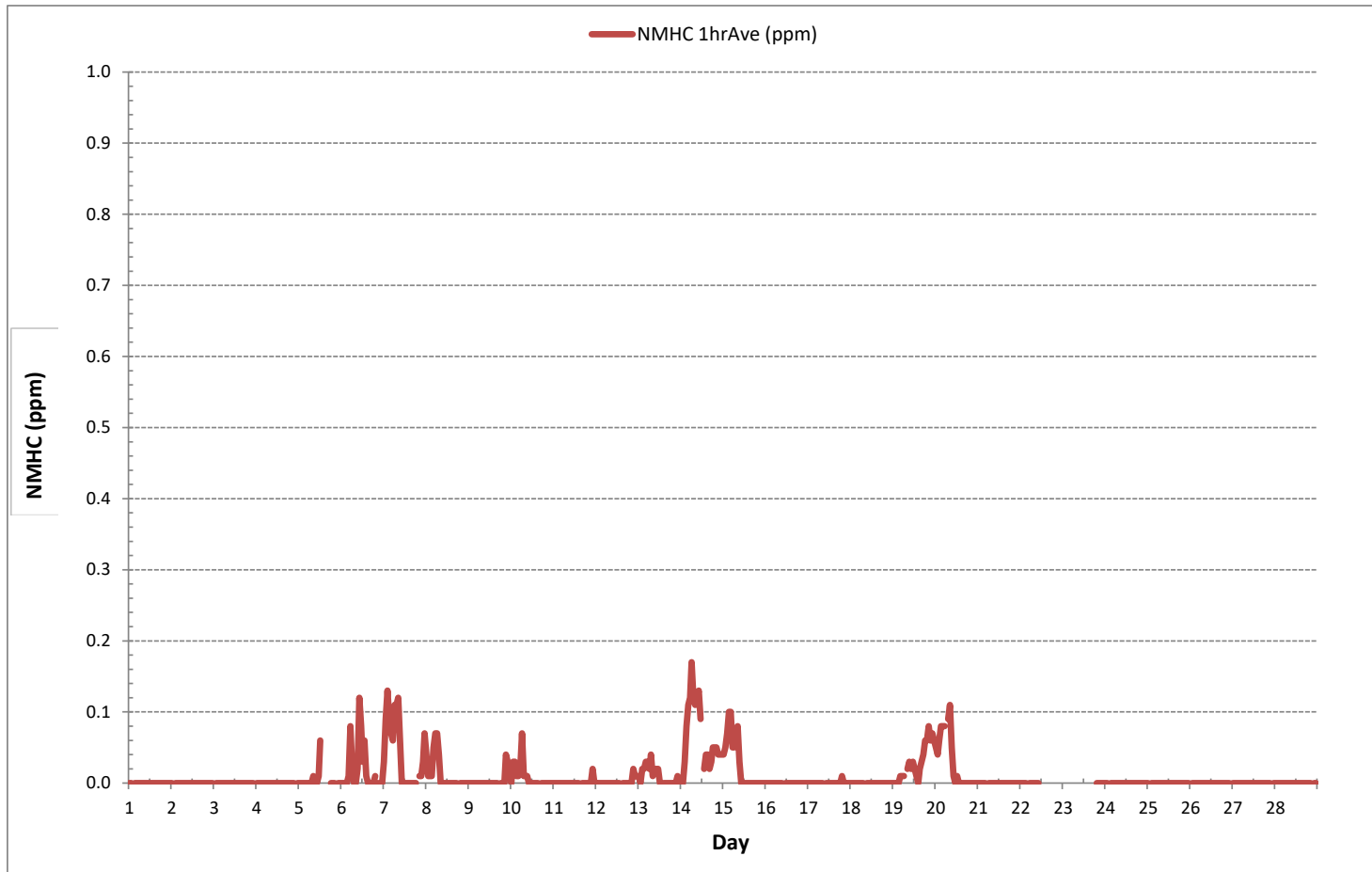
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES February 2019

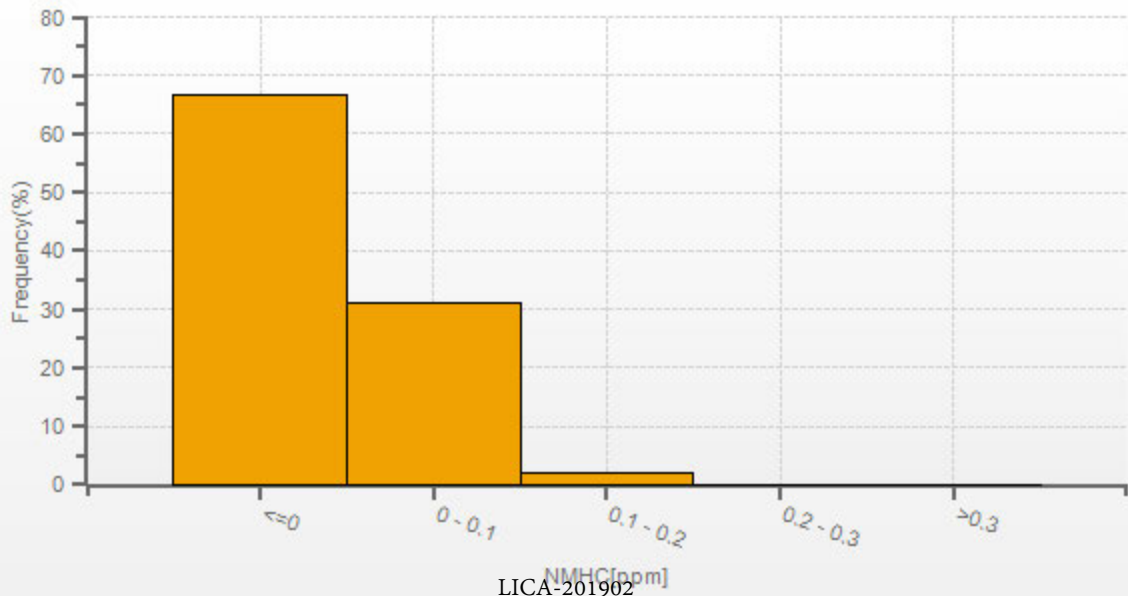


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	124			
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	0.17	ppm @ HOUR	6	ON DAY 14
MAXIMUM 24-HR AVERAGE:	0.06	ppm		ON DAY 14
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	640 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	95.2 %
STANDARD DEVIATION:	0.02		MONTHLY AVERAGE:	0.01 ppm



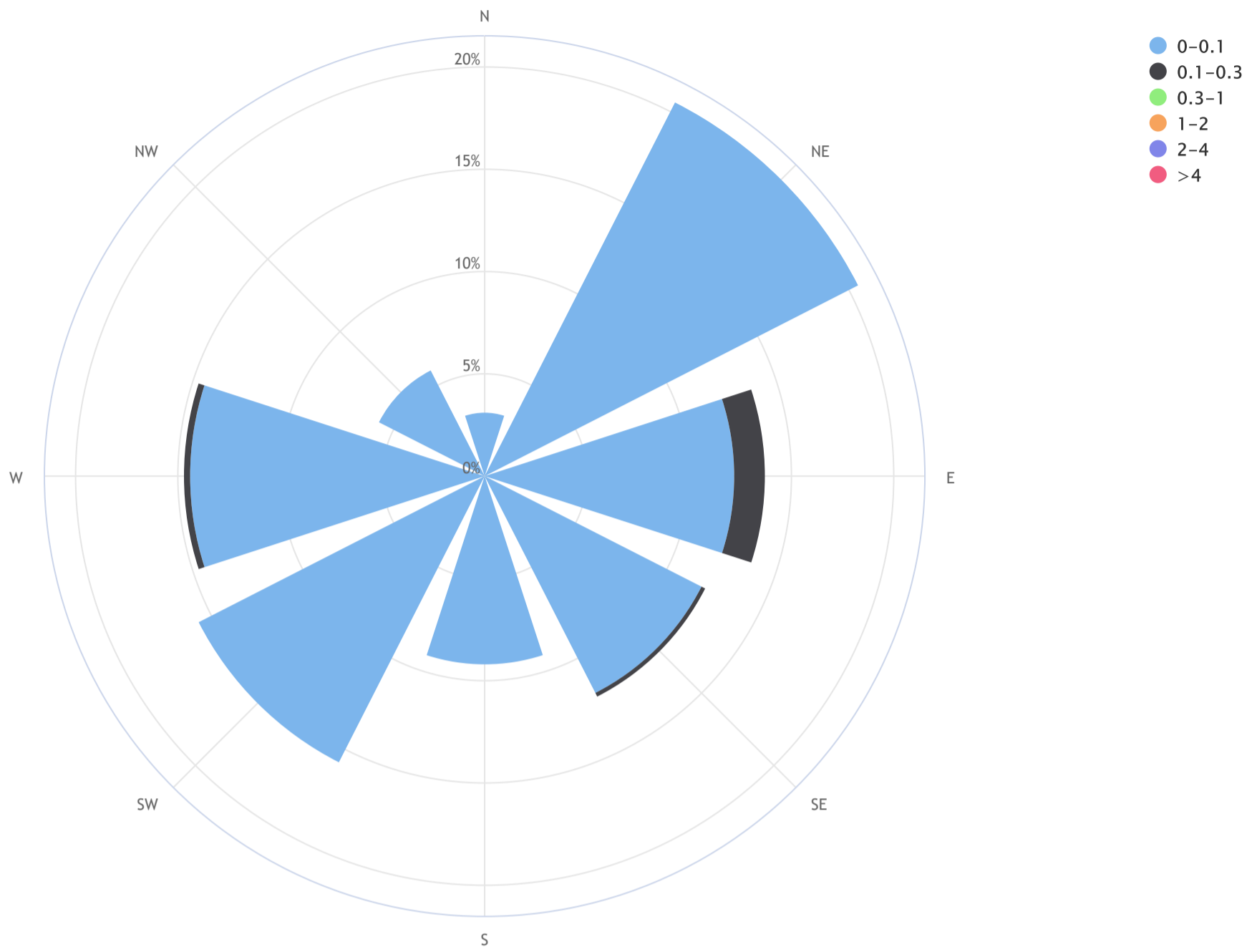
NMHC[ppm] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Bonnyville East Site_NMHC (ppm)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 0.0, CALM % = 5.3%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	3.1	0.0	0.0	0.0	0.0	0.0	3.1
NE	20.5	0.0	0.0	0.0	0.0	0.0	20.5
E	12.2	1.5	0.0	0.0	0.0	0.0	13.7
SE	11.9	0.2	0.0	0.0	0.0	0.0	12.1
S	9.2	0.0	0.0	0.0	0.0	0.0	9.2
SW	15.7	0.0	0.0	0.0	0.0	0.0	15.7
W	14.4	0.3	0.0	0.0	0.0	0.0	14.7
NW	5.8	0.0	0.0	0.0	0.0	0.0	5.8
Summary	92.8	2.0	0.0	0.0	0.0	0.0	94.7
CALM	4.8	0.5	0.0	0.0	0.0	0.0	5.3



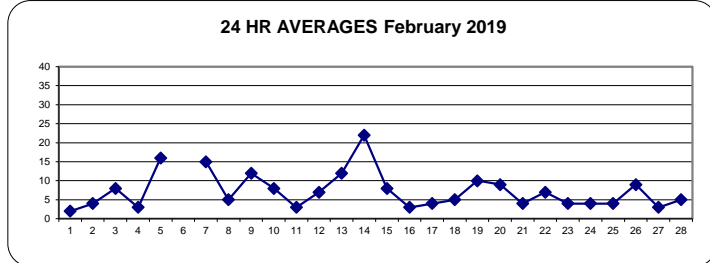
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	3	3	S	2	2	4	6	4	4	3	2	1	1	1	1	1	1	1	1	0	0	0	0	1	0	6	2	24				
2	0	S	0	0	0	0	0	0	0	1	1	1	1	1	3	3	3	3	15	21	17	11	9	10	0	21	4	24				
3	S	7	9	7	6	8	10	14	15	14	13	13	8	6	6	6	7	7	5	4	4	6	8	S	4	15	8	24				
4	2	1	1	1	1	1	1	2	3	2	2	2	2	2	2	2	3	4	6	6	12	6	S	6	1	12	3	24				
5	5	4	4	5	6	5	5	6	8	8	39	48	61	51	34	33	16	10	6	7	7	S	5	5	4	61	16	24				
6	4	4	6	14	12	18	12	6	5	11	C	C	C	C	C	C	C	13	13	9	S	10	9	11	4	18	-	24				
7	21	24	22	22	22	21	27	25	30	22	10	10	7	6	6	7	9	10	7	S	9	8	8	8	6	30	15	24				
8	9	6	6	6	6	5	5	5	5	3	3	2	3	2	3	3	5	8	S	14	8	4	2	2	2	14	5	24				
9	1	1	2	6	8	12	11	11	11	19	23	25	12	7	9	13	17	S	14	16	11	16	23	17	1	25	12	24				
10	13	16	16	12	12	16	15	10	11	11	8	7	5	4	3	4	S	2	2	2	2	1	2	3	1	16	8	24				
11	2	2	3	3	3	3	3	3	4	3	2	2	2	1	2	S	3	5	5	6	4	4	4	1	6	6	3	24				
12	4	4	5	5	6	6	5	7	9	7	10	10	6	5	S	4	4	5	7	8	8	9	10	11	4	11	7	24				
13	11	10	11	11	12	14	14	21	15	16	19	21	11	S	10	13	14	17	9	5	7	4	6	4	4	21	12	24				
14	5	6	10	15	17	18	25	21	37	38	40	58	S	30	33	39	22	17	13	9	9	10	13	14	5	58	22	24				
15	12	12	14	19	17	15	12	17	16	16	8	S	5	3	3	3	3	4	3	3	3	3	2	2	2	19	8	24				
16	2	2	3	3	3	4	4	3	3	5	S	3	3	3	2	2	2	3	2	2	2	2	2	1	1	5	3	24				
17	1	1	2	1	4	6	5	3	4	S	3	3	3	3	3	3	3	3	3	4	7	6	5	6	1	7	4	24				
18	5	6	6	6	5	6	9	8	S	4	5	5	4	5	5	4	5	5	6	5	5	5	4	4	4	9	5	24				
19	4	5	6	6	7	7	8	S	9	10	10	10	9	8	11	11	16	15	14	13	18	13	15	4	4	18	10	24				
20	12	12	13	11	17	16	S	23	36	14	7	5	5	4	3	3	4	4	4	4	3	4	4	4	3	36	9	24				
21	7	6	6	6	6	S	6	10	8	4	3	3	2	1	1	1	1	2	2	2	4	4	5	5	1	10	4	24				
22	6	6	5	6	S	6	6	6	6	5	4	P	P	P	10	9	11	10	11	10	13	5	4	5	4	13	7	21				
23	2	2	2	S	1	1	2	3	4	3	3	2	2	1	1	1	1	1	4	8	15	16	9	10	1	16	4	24				
24	10	7	S	9	10	8	6	5	6	7	8	7	4	2	1	1	1	1	2	1	2	2	2	2	1	10	4	24				
25	2	S	2	2	3	3	4	4	6	6	5	5	5	5	3	3	4	4	3	5	5	6	7	5	2	7	4	24				
26	S	8	8	9	9	8	9	10	12	13	13	11	11	11	12	13	13	8	7	6	4	4	4	S	4	13	9	24				
27	3	3	3	3	3	2	2	2	2	2	2	3	4	3	3	2	2	5	3	5	5	7	S	7	2	7	3	24				
28	7	3	3	3	3	3	4	10	14	20	8	2	1	1	1	2	3	4	3	3	3	S	3	4	1	20	5	24				
HOURLY MAX	21	24	22	22	22	21	27	25	37	38	40	58	61	51	34	39	22	17	15	21	17	18	23	17								
HOURLY AVG	6	6	6	7	7	8	8	9	10	10	10	10	7	7	6	7	6	6	6	7	7	7	6	6								

STATUS FLAG CODES

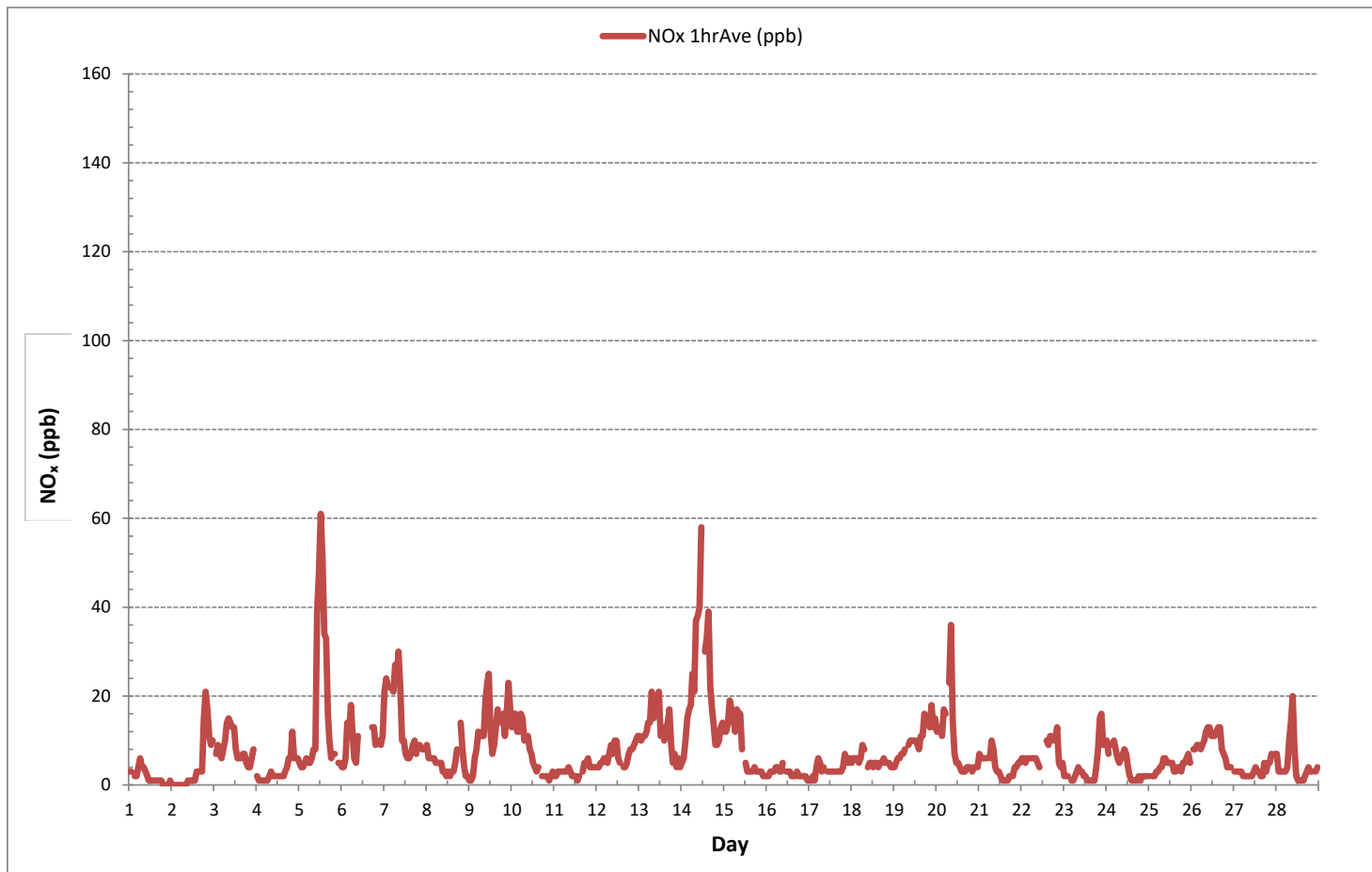
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES February 2019

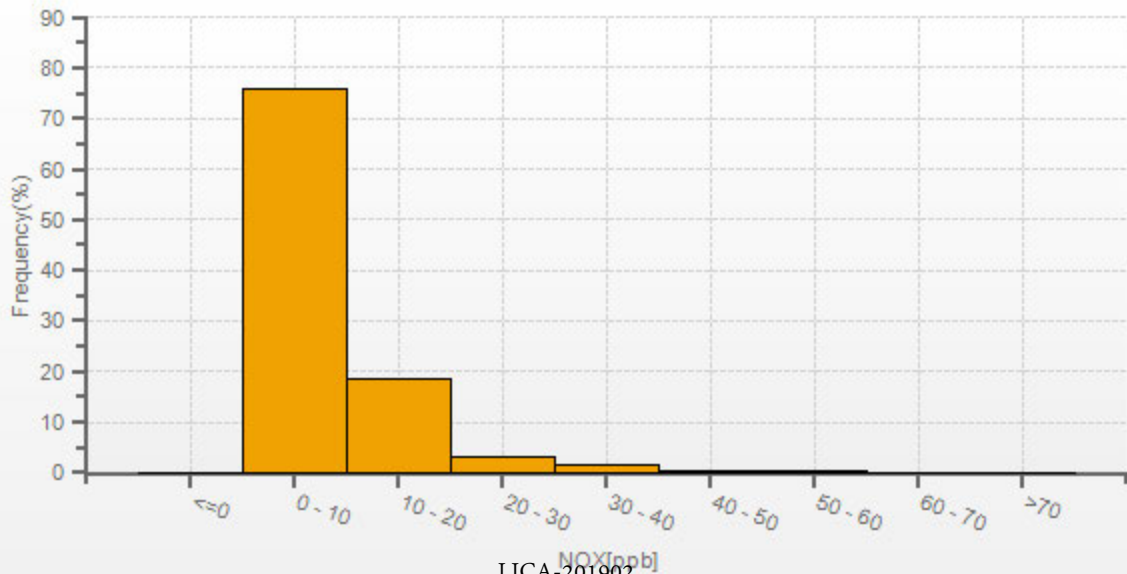


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	620			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	19	ON DAY 1
MAXIMUM 1-HR AVERAGE:	61	ppb @ HOUR	12	ON DAY 5
MAXIMUM 24-HR AVERAGE:	22	ppb		ON DAY 14
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	669 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	7		MONTHLY AVERAGE:	7 ppb



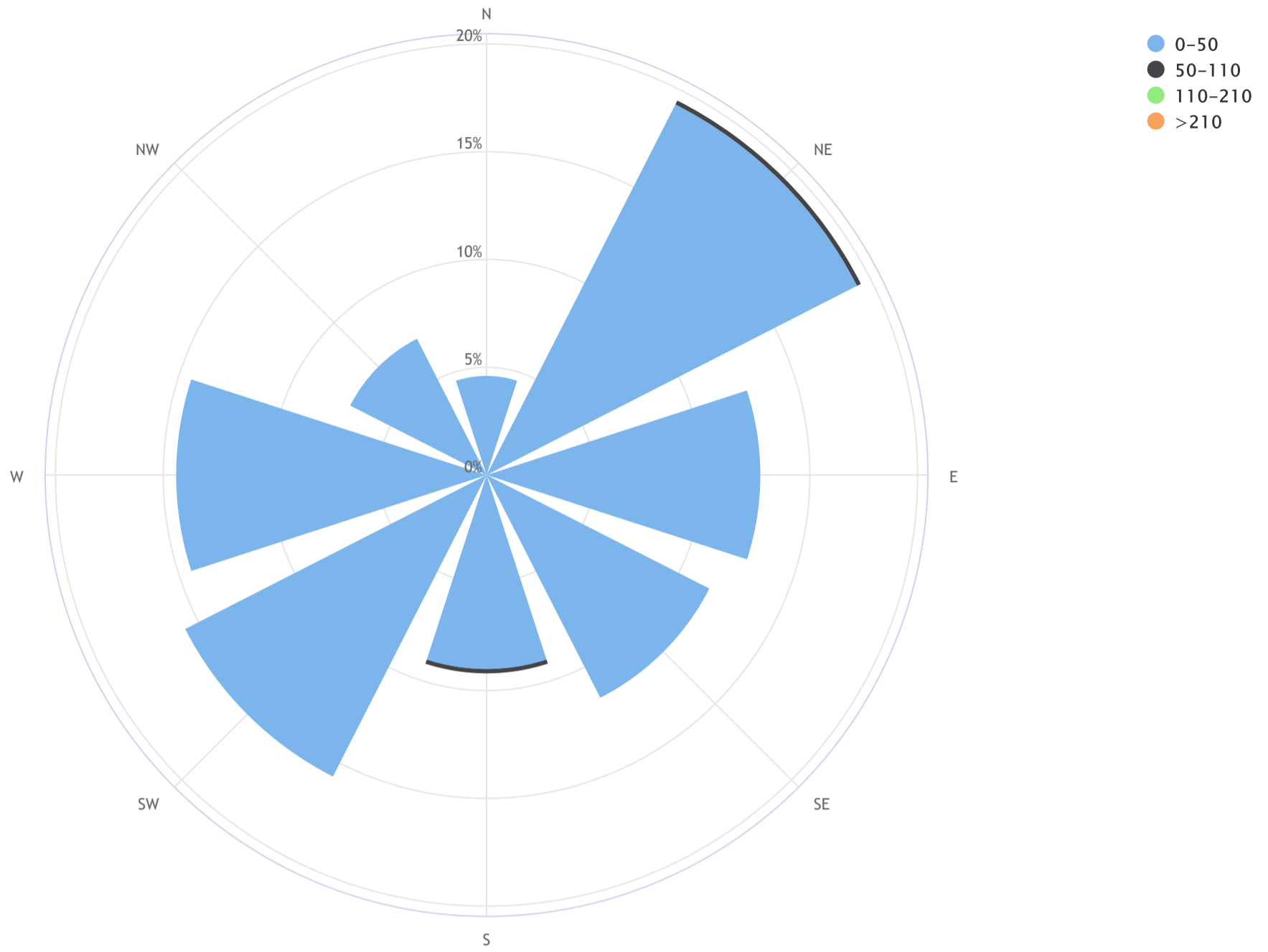
NOX[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902
Page 299 of 350

Lakeland Industry & Community Association_Bonnyville East Site_NO_x (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 16.1, CALM % = 5.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	4.6	0.0	0.0	0.0	4.6
NE	19.3	0.2	0.0	0.0	19.5
E	12.7	0.0	0.0	0.0	12.7
SE	11.6	0.0	0.0	0.0	11.6
S	9.0	0.2	0.0	0.0	9.2
SW	15.7	0.0	0.0	0.0	15.7
W	14.4	0.0	0.0	0.0	14.4
NW	7.1	0.0	0.0	0.0	7.1
Summary	94.3	0.3	0.0	0.0	94.6
CALM	5.2	0.2	0.0	0.0	5.4



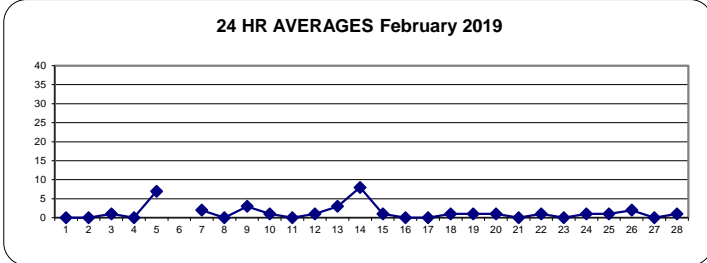
NITRIC OXIDE Hourly Averages (NO ppb)

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	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
2	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24
3	S	0	0	0	0	0	0	0	2	5	6	6	4	3	2	1	1	0	0	0	0	0	0	S	0	6	1	24
4	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	S	0	0	1	0	24
5	0	0	0	0	0	0	0	0	1	3	23	29	37	31	19	15	3	0	0	0	0	S	0	0	0	37	7	24
6	0	0	0	0	0	0	0	0	1	6	C	C	C	C	C	C	C	0	0	0	S	0	0	0	0	6	-	24
7	5	4	0	0	0	0	2	1	9	11	5	5	3	3	2	2	1	0	0	S	0	0	0	0	0	11	2	24
8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	0	2	9	14	15	7	4	4	6	5	S	0	2	0	0	3	1	0	15	3	24
10	0	0	0	0	0	0	0	0	2	4	3	3	2	1	1	1	S	0	0	0	0	0	0	1	0	4	1	24
11	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24
12	0	0	0	0	0	0	0	0	2	3	5	6	3	2	S	1	1	0	0	0	0	0	0	0	0	6	1	24
13	0	0	0	0	0	0	0	1	5	8	11	13	6	S	5	5	4	1	1	0	0	0	0	0	0	13	3	24
14	0	0	0	0	0	0	2	2	17	23	26	39	S	18	18	20	7	1	1	0	0	0	0	0	0	39	8	24
15	0	0	0	0	0	0	0	1	4	7	4	S	2	1	0	0	0	0	0	0	0	0	0	0	0	7	1	24
16	0	0	0	0	0	0	0	0	0	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	0	0	0	1	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24
18	0	0	0	0	0	0	0	0	S	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	2	1	24
19	0	0	0	0	0	0	0	S	2	3	3	3	3	3	3	2	3	2	1	0	0	2	0	0	0	3	1	24
20	0	0	0	0	0	0	S	2	13	5	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	13	1	24
21	0	0	0	0	0	S	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
22	0	0	0	0	S	0	0	0	1	2	1	P	P	P	8	3	2	1	0	0	0	0	0	0	0	8	1	21
23	0	0	0	S	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	S	0	0	0	0	0	2	4	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0	4	1	24
25	0	S	0	0	0	0	0	0	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	2	1	24
26	S	0	0	0	0	0	0	1	3	5	6	5	5	4	4	4	3	1	0	0	0	0	0	S	0	6	2	24
27	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	1	0	24
28	0	0	0	0	0	0	0	1	5	9	4	1	0	0	0	0	0	0	0	0	0	S	0	0	0	9	1	24
HOURLY MAX	5	4	0	0	0	0	2	2	17	23	26	39	37	31	19	20	7	1	1	2	0	2	3	1				
HOURLY AVG	0	0	0	0	0	0	0	0	3	4	5	6	3	3	3	3	1	0	0	0	0	0	0	0				

STATUS FLAG CODES

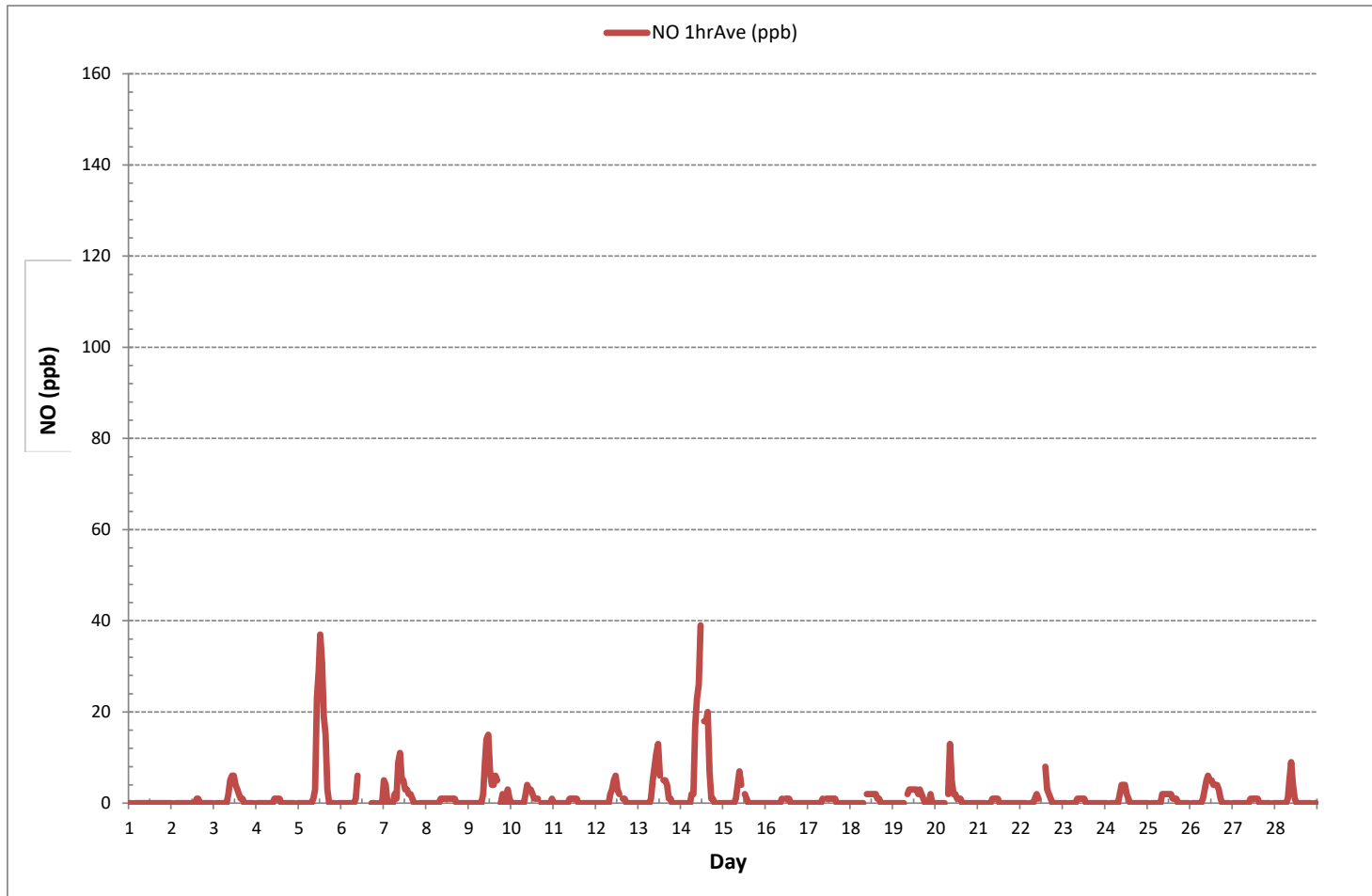
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES February 2019

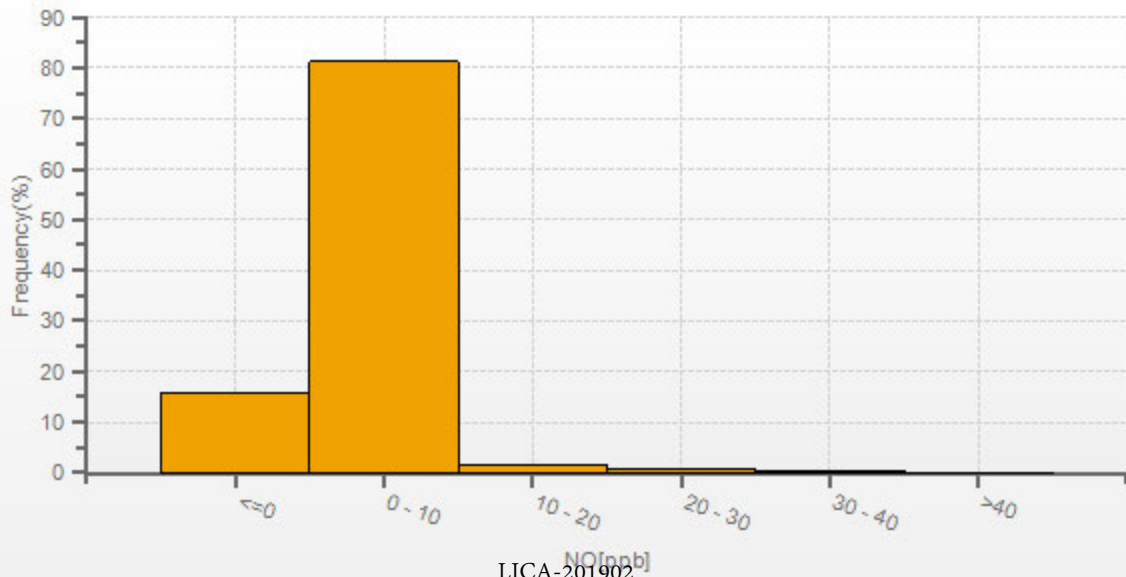


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	201			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	39	ppb @ HOUR	11	ON DAY 14
MAXIMUM 24-HR AVERAGE:	8	ppb		ON DAY 14
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	669 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	1 ppb



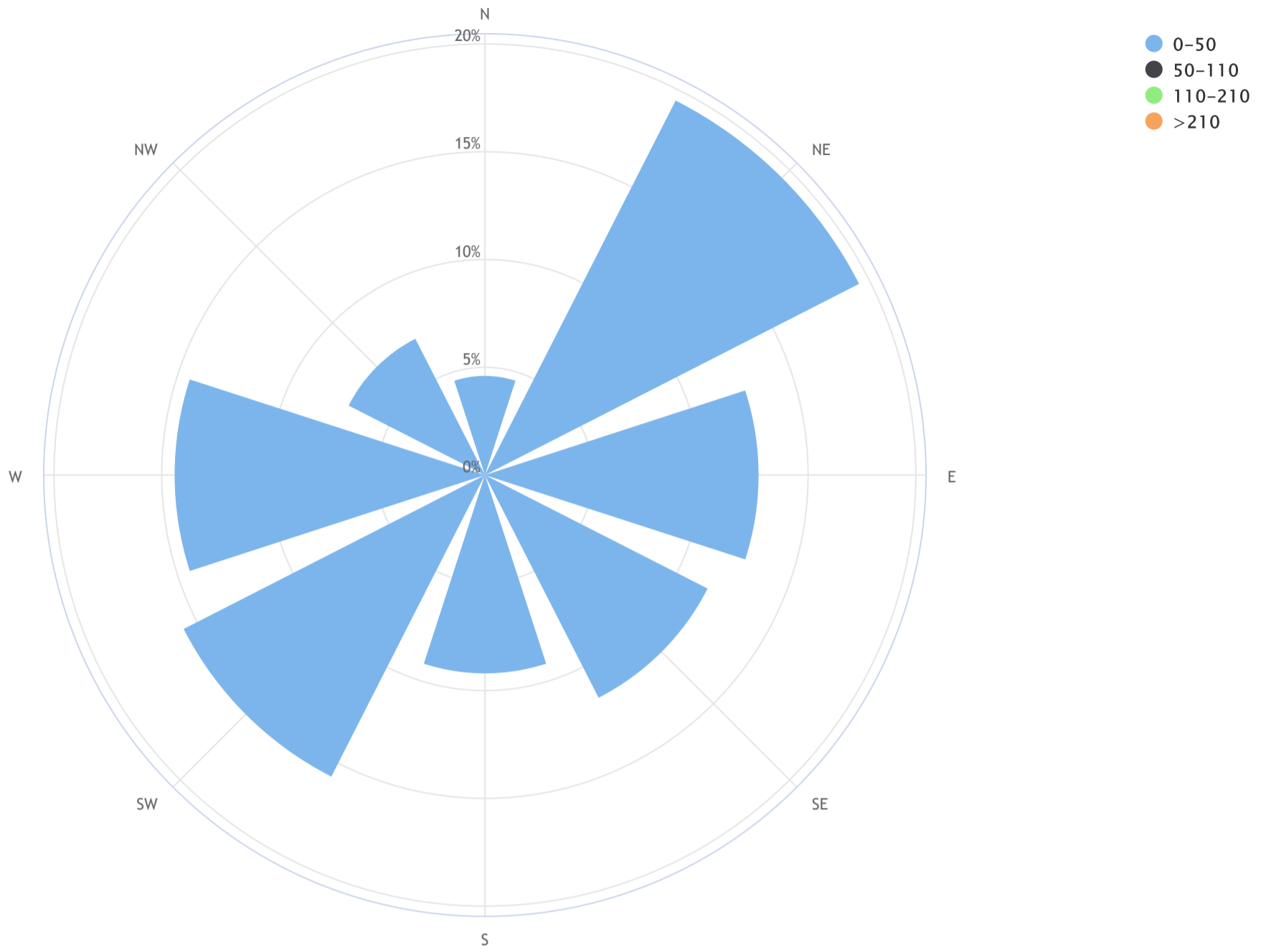
NO[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902
Page 303 of 350

Lakeland Industry & Community Association_Bonnyville East Site_NO (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 6.0, CALM % = 5.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	4.6	0.0	0.0	0.0	4.6
NE	19.5	0.0	0.0	0.0	19.5
E	12.7	0.0	0.0	0.0	12.7
SE	11.6	0.0	0.0	0.0	11.6
S	9.2	0.0	0.0	0.0	9.2
SW	15.7	0.0	0.0	0.0	15.7
W	14.4	0.0	0.0	0.0	14.4
NW	7.1	0.0	0.0	0.0	7.1
Summary	94.6	0.0	0.0	0.0	94.6
CALM	5.4	0.0	0.0	0.0	5.4



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

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

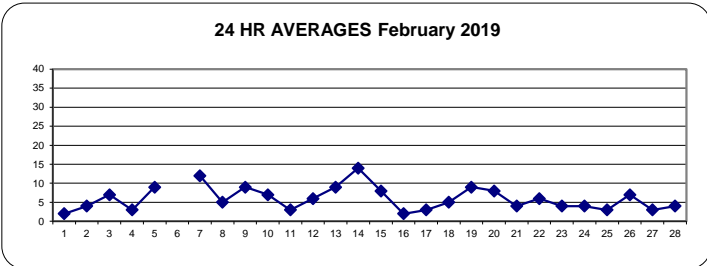
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

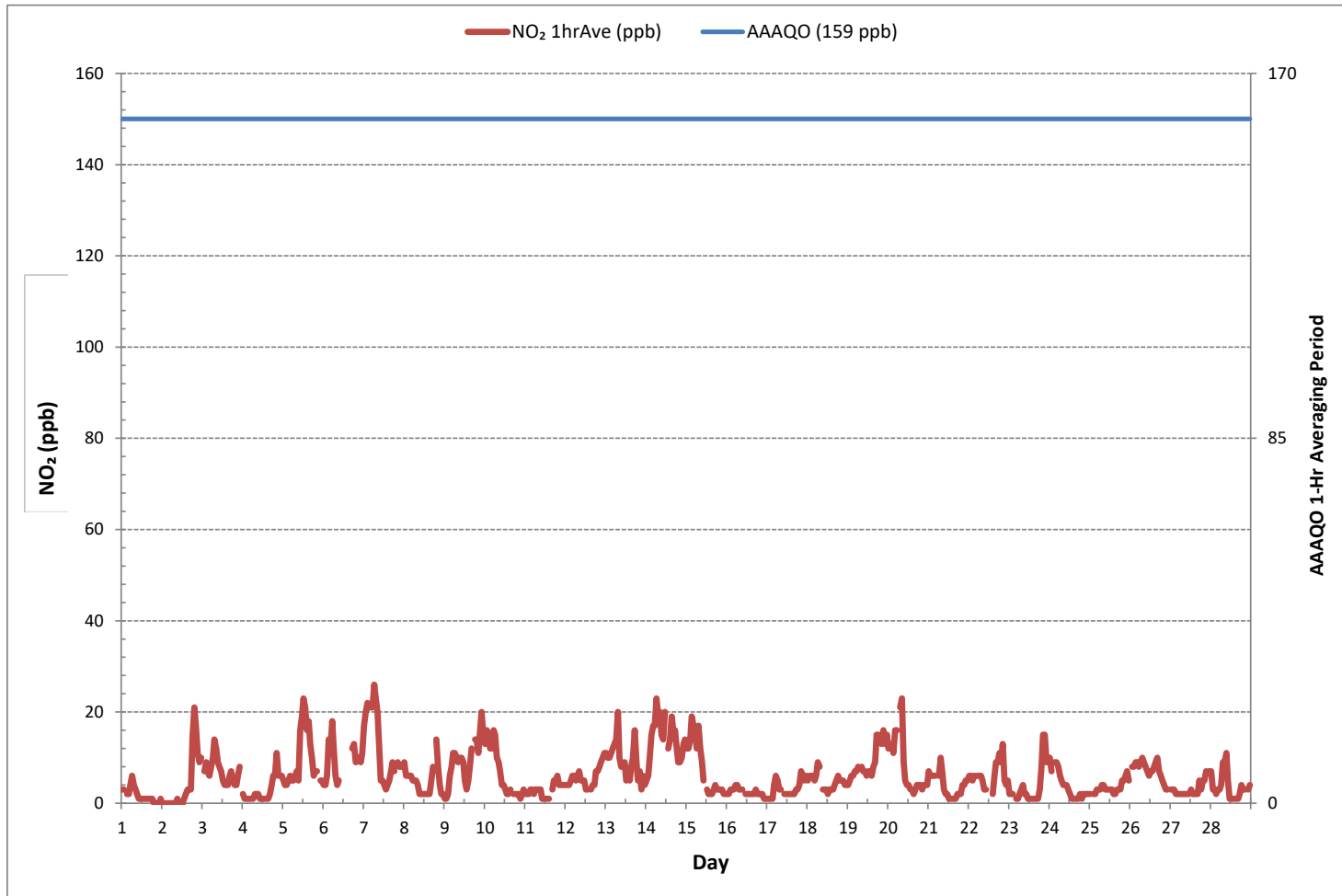
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	617					
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	19	ON DAY	1
MAXIMUM 1-HR AVERAGE:	26	ppb	@ HOUR	6	ON DAY	7
MAXIMUM 24-HR AVERAGE:	14	ppb			ON DAY	14
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	669 hrs		
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.6 %		
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	6 ppb		

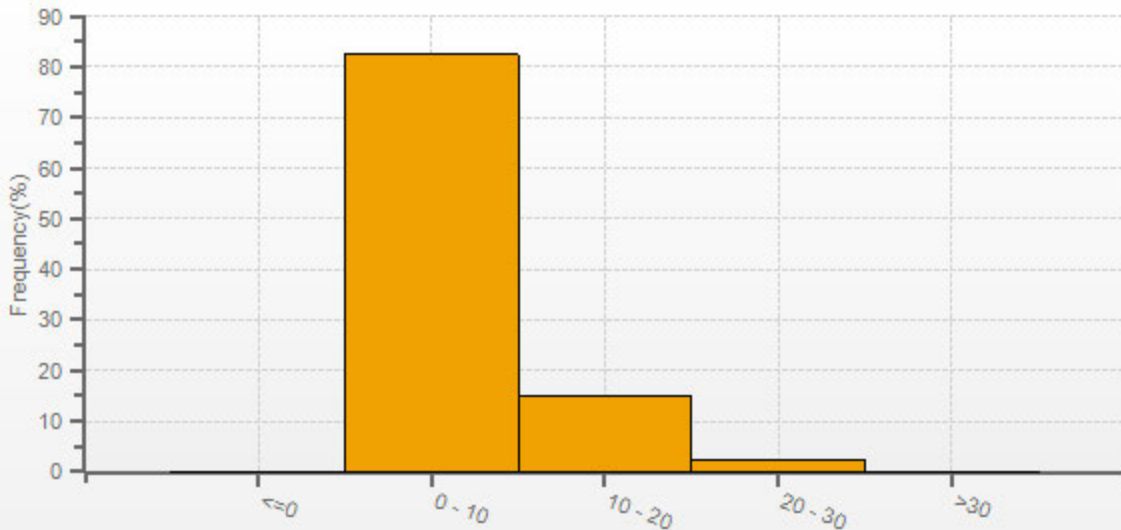
24 HR AVERAGES February 2019



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



NO2[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.

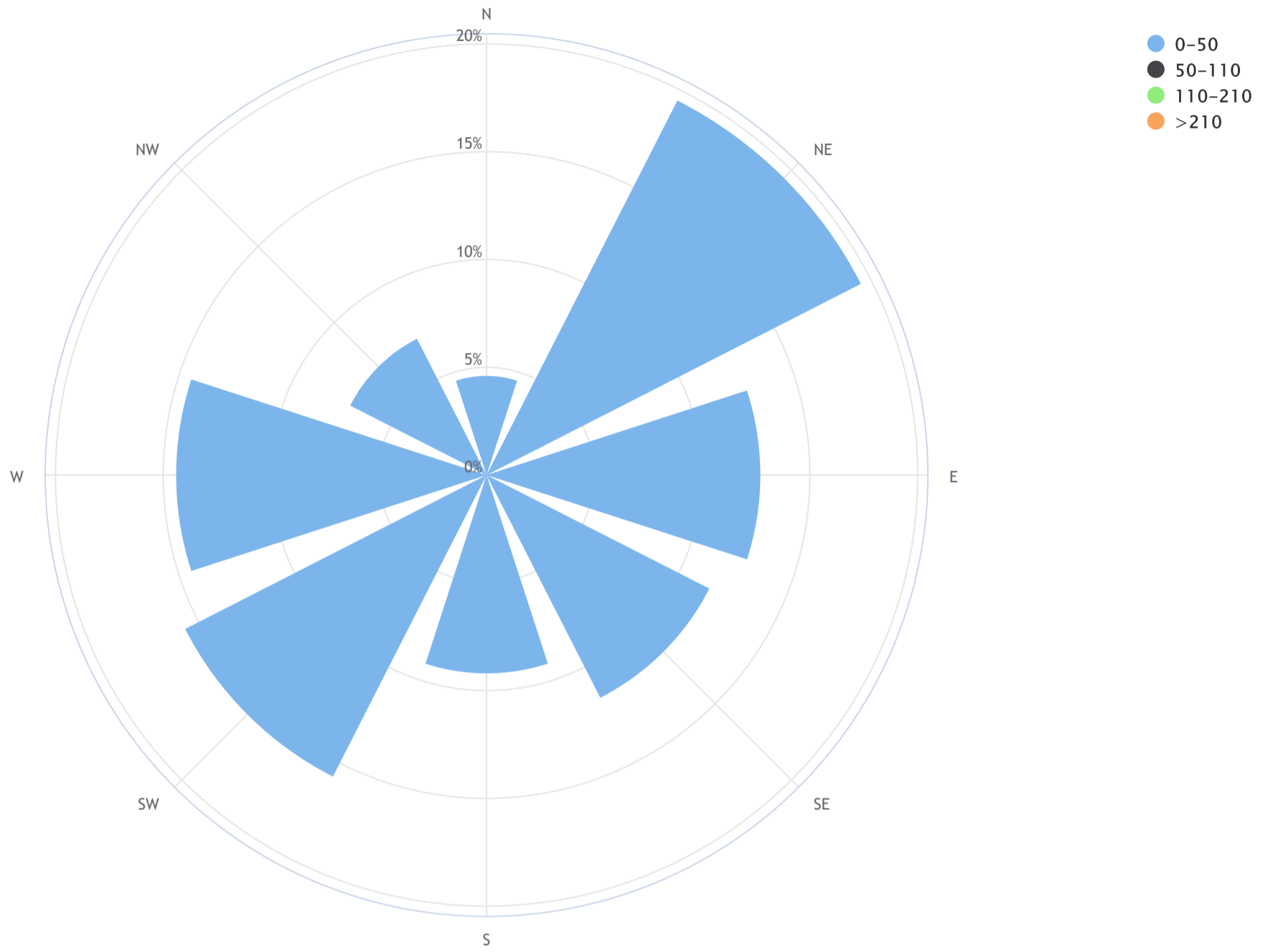


LICA-201902

Page 307 of 350

Lakeland Industry & Community Association_Bonnyville East Site_NO₂ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 10.2, CALM % = 5.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	4.6	0.0	0.0	0.0	4.6
NE	19.5	0.0	0.0	0.0	19.5
E	12.7	0.0	0.0	0.0	12.7
SE	11.6	0.0	0.0	0.0	11.6
S	9.2	0.0	0.0	0.0	9.2
SW	15.7	0.0	0.0	0.0	15.7
W	14.4	0.0	0.0	0.0	14.4
NW	7.1	0.0	0.0	0.0	7.1
Summary	94.6	0.0	0.0	0.0	94.6
CALM	5.4	0.0	0.0	0.0	5.4



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

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	29.1	28.6	S	31.9	31.3	28.0	26.6	28.8	29.6	31.6	32.7	34.2	35.1	35.8	36.0	36.4	35.9	35.4	35.2	36.1	37.2	37.1	37.4	37.4	26.6	37.4	33.4	24
2	37.0	S	35.9	36.0	35.9	35.6	35.7	36.1	36.0	36.1	36.1	36.1	36.1	36.1	35.6	35.1	35.0	34.1	23.6	18.9	21.9	25.8	26.0	25.8	18.9	37.0	32.6	24
3	S	28.6	26.1	26.8	27.6	25.2	23.2	19.2	20.9	24.3	26.9	29.2	32.5	34.4	34.2	33.8	32.0	30.5	32.6	32.9	32.0	30.4	28.8	S	19.2	34.4	28.7	24
4	38.2	39.6	39.3	39.5	39.3	39.2	38.7	37.5	37.3	38.6	39.2	39.4	39.7	39.5	38.8	38.6	37.6	35.7	33.4	33.6	27.6	31.9	S	30.6	27.6	39.7	37.1	24
5	32.0	30.2	29.6	30.4	29.3	28.9	27.7	26.9	27.1	26.4	23.5	24.6	23.6	C	C	C	C	C	31.6	29.1	28.7	S	28.8	30.0	23.5	32.0	28.2	24
6	30.0	26.9	25.1	18.6	18.4	9.3	18.7	24.7	25.8	21.8	17.3	20.1	21.8	23.0	24.0	24.7	23.9	24.6	23.8	27.2	S	25.5	24.1	20.5	9.3	30.0	22.6	24
7	13.2	8.0	6.2	8.9	9.3	8.9	4.8	6.8	10.4	20.6	31.0	32.4	35.1	35.4	35.4	34.8	32.7	29.9	32.1	S	27.7	28.1	28.1	28.0	4.8	35.4	23.1	24
8	27.2	30.1	30.0	29.4	29.2	29.3	29.2	31.1	32.2	34.7	35.8	36.4	37.0	37.8	38.4	36.6	33.6	S	27.1	31.8	34.6	35.7	35.9	27.1	38.4	33.1	24	
9	36.9	36.5	35.2	31.6	28.2	23.7	22.5	21.8	22.5	22.2	22.4	23.4	28.7	31.7	30.7	27.7	24.2	S	22.1	21.4	23.5	15.9	12.9	18.6	12.9	36.9	25.4	24
10	20.6	17.9	18.7	22.9	23.2	17.6	18.6	25.5	26.7	28.1	31.5	33.0	34.7	36.2	37.3	37.2	S	38.8	38.6	38.7	39.1	40.3	39.3	37.6	40.3	30.6	24	
11	40.8	40.0	39.3	38.8	38.4	38.5	38.5	37.9	38.0	38.4	39.4	39.6	40.0	40.5	40.8	S	39.7	37.5	35.9	35.0	36.0	33.7	34.4	33.9	33.7	40.8	38.0	24
12	33.0	31.8	30.8	29.6	28.6	27.7	29.0	26.1	26.1	27.7	27.5	28.3	29.8	29.8	S	30.2	29.8	28.7	26.0	24.2	23.1	22.2	21.0	19.9	19.9	33.0	27.4	24
13	19.6	19.8	18.2	18.6	17.6	15.4	14.0	9.2	15.8	19.1	20.3	23.3	28.3	S	29.2	27.5	25.7	20.9	26.9	30.4	28.6	30.5	27.6	29.1	9.2	30.5	22.4	24
14	25.4	24.1	18.0	12.1	8.9	6.4	1.7	6.5	10.0	15.2	17.8	19.3	S	22.5	22.7	19.7	21.3	21.1	25.4	28.8	26.5	24.7	21.0	19.5	1.7	28.8	18.2	24
15	20.2	19.4	17.0	10.9	13.2	17.2	18.6	14.2	18.9	23.2	29.0	S	35.3	37.1	37.6	37.8	37.8	37.0	37.5	36.9	37.9	39.4	38.9	38.6	10.9	39.4	28.4	24
16	37.7	37.9	36.8	36.8	35.9	34.9	35.5	37.0	36.8	36.5	S	37.2	37.7	38.1	38.8	38.8	38.8	37.5	36.6	34.1	34.1	34.1	34.5	35.1	34.1	38.8	36.6	24
17	35.0	35.1	34.7	34.4	31.5	29.4	28.5	32.4	31.3	S	34.1	34.5	34.8	34.6	34.5	34.1	33.6	32.8	31.7	30.3	27.8	28.9	30.3	29.3	27.8	35.1	32.3	24
18	29.9	28.1	27.7	27.3	27.6	25.8	22.2	23.5	S	27.9	28.0	31.3	33.5	33.2	33.6	34.2	33.4	31.8	31.4	32.5	33.0	33.2	34.9	35.4	22.2	35.4	30.4	24
19	34.1	32.0	30.3	30.1	28.4	28.2	27.7	S	27.4	29.0	30.4	31.9	33.4	35.4	37.4	34.5	32.8	25.4	25.8	26.5	26.7	23.6	26.0	23.2	23.2	37.4	29.6	24
20	24.9	23.5	21.3	21.3	16.8	16.1	S	10.3	10.6	20.2	25.2	28.8	31.4	34.9	38.0	36.7	33.9	30.7	29.8	29.9	29.8	29.0	30.7	31.2	10.3	38.0	26.3	24
21	28.5	29.0	28.9	28.5	28.6	S	32.3	28.7	31.8	35.0	36.5	37.3	39.3	39.8	40.1	40.2	40.3	39.9	39.6	38.1	35.9	35.0	34.8	34.7	28.5	40.3	34.9	24
22	34.1	33.9	34.2	32.7	S	32.2	33.0	33.3	34.3	35.7	37.1	P	P	P	31.8	36.0	34.1	32.6	30.2	31.5	26.3	33.2	34.4	32.0	26.3	37.1	33.1	21
23	38.5	38.7	38.3	S	38.6	38.5	37.8	36.5	35.1	36.1	37.2	37.8	38.2	38.5	39.1	39.3	38.5	38.0	35.5	31.3	25.1	24.6	29.7	28.3	24.6	39.3	35.6	24
24	28.3	30.9	S	27.5	26.3	25.7	25.8	24.7	25.6	27.5	29.3	31.5	34.1	36.2	37.2	37.8	38.1	37.7	37.8	38.8	39.1	39.6	39.6	39.5	24.7	39.6	33.0	24
25	39.1	S	38.6	38.2	37.0	36.6	36.1	35.0	34.1	34.7	36.8	37.9	38.9	39.1	40.2	40.5	39.0	39.1	39.7	37.6	37.1	34.1	32.9	33.9	32.9	40.5	37.2	24
26	S	29.4	29.3	28.5	28.7	28.2	29.8	29.6	30.7	31.2	32.8	34.9	35.6	35.4	34.7	34.3	33.5	35.2	35.8	36.7	37.6	38.3	37.8	S	28.2	38.3	33.1	24
27	39.4	40.6	40.2	40.7	40.5	40.4	41.0	41.4	42.0	42.2	43.2	44.0	44.3	44.7	44.8	45.6	44.9	41.9	42.9	41.4	40.3	38.3	S	36.2	36.2	45.6	41.8	24
28	34.5	38.6	38.5	38.9	38.6	37.6	35.3	30.0	30.4	30.3	37.0	43.7	44.7	45.4	45.2	44.9	44.5	41.3	36.7	35.6	36.1	S	34.8	28.6	29	45	38	24
HOURLY MAX	40.8	40.6	40.2	40.7	40.5	40.4	41.0	41.4	42.0	42.2	43.2	44.0	44.7	45.4	45.2	45.6	44.9	41.9	42.9	41.4	40.3	40.3	39.6	39.5				
HOURLY AVG	31.0	30.0	29.5	28.6	28.0	26.8	27.1	26.5	27.7	29.4	31.0	32.7	34.8	35.8	36.0	35.3	34.5	33.5	32.5	32.0	31.5	31.2	30.9	30.6				

STATUS FLAG CODES

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

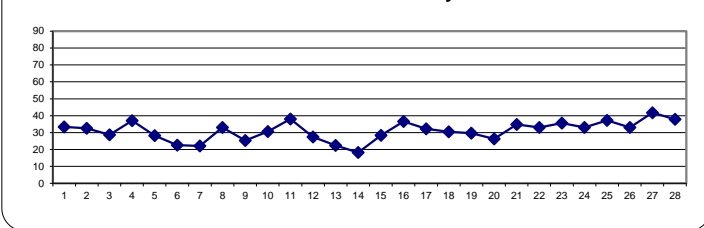
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

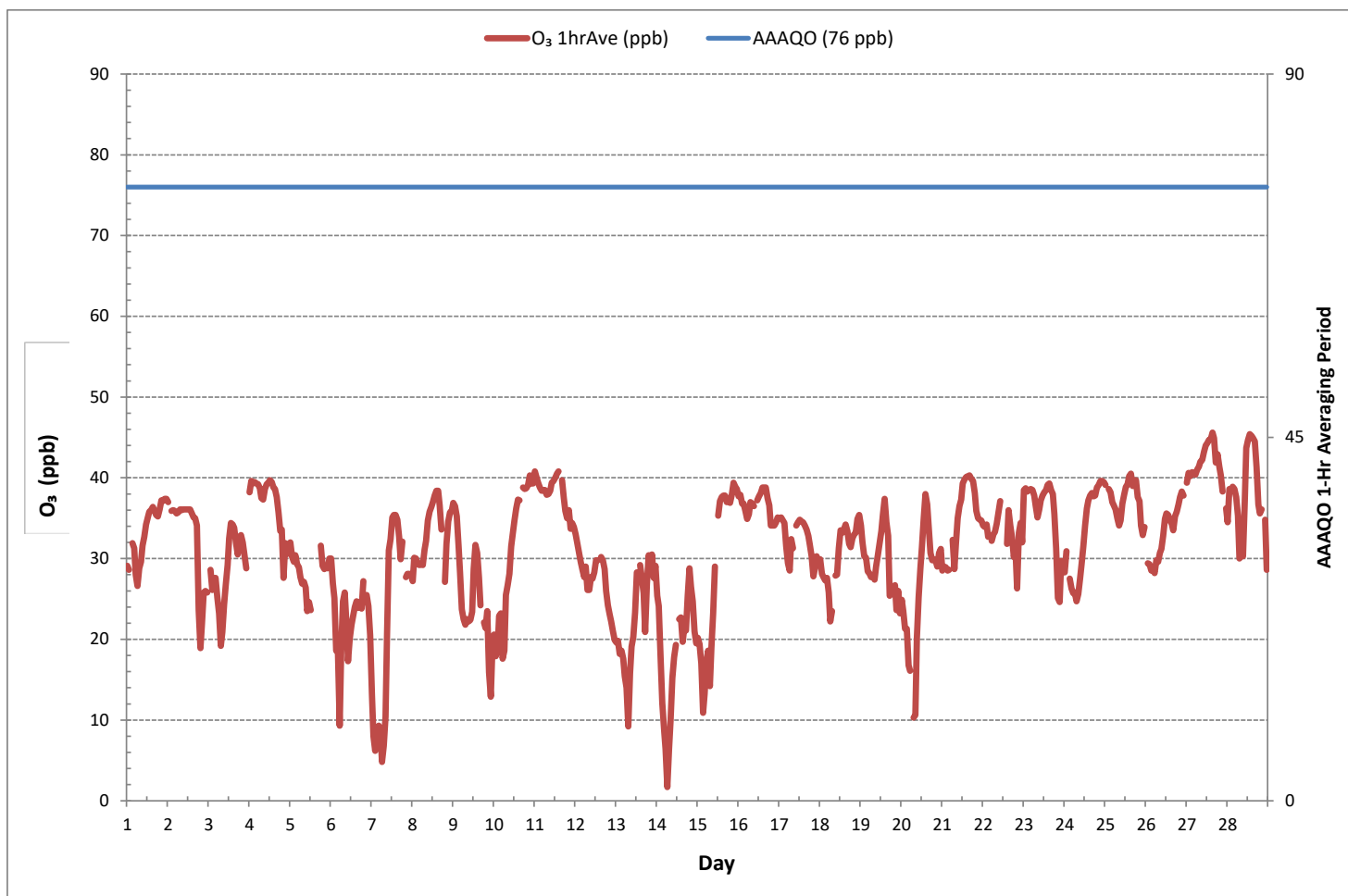
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	634			
MINIMUM 1-HR AVERAGE:	1.7 ppb	@ HOUR	6	ON DAY 14
MAXIMUM 1-HR AVERAGE:	45.6 ppb	@ HOUR	15	ON DAY 27
MAXIMUM 24-HR AVERAGE:	41.8 ppb			ON DAY 27
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	669 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.6 %	
STANDARD DEVIATION:	7.7	MONTHLY AVERAGE:	31.1 ppb	

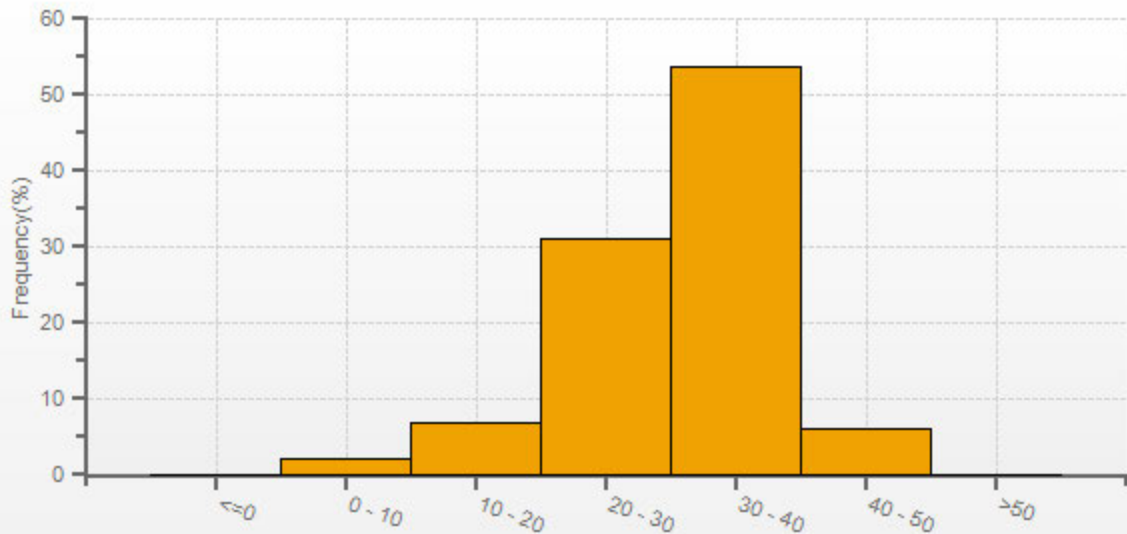
24 HR AVERAGES February 2019



OZONE Hourly Averages (O₃ ppb)



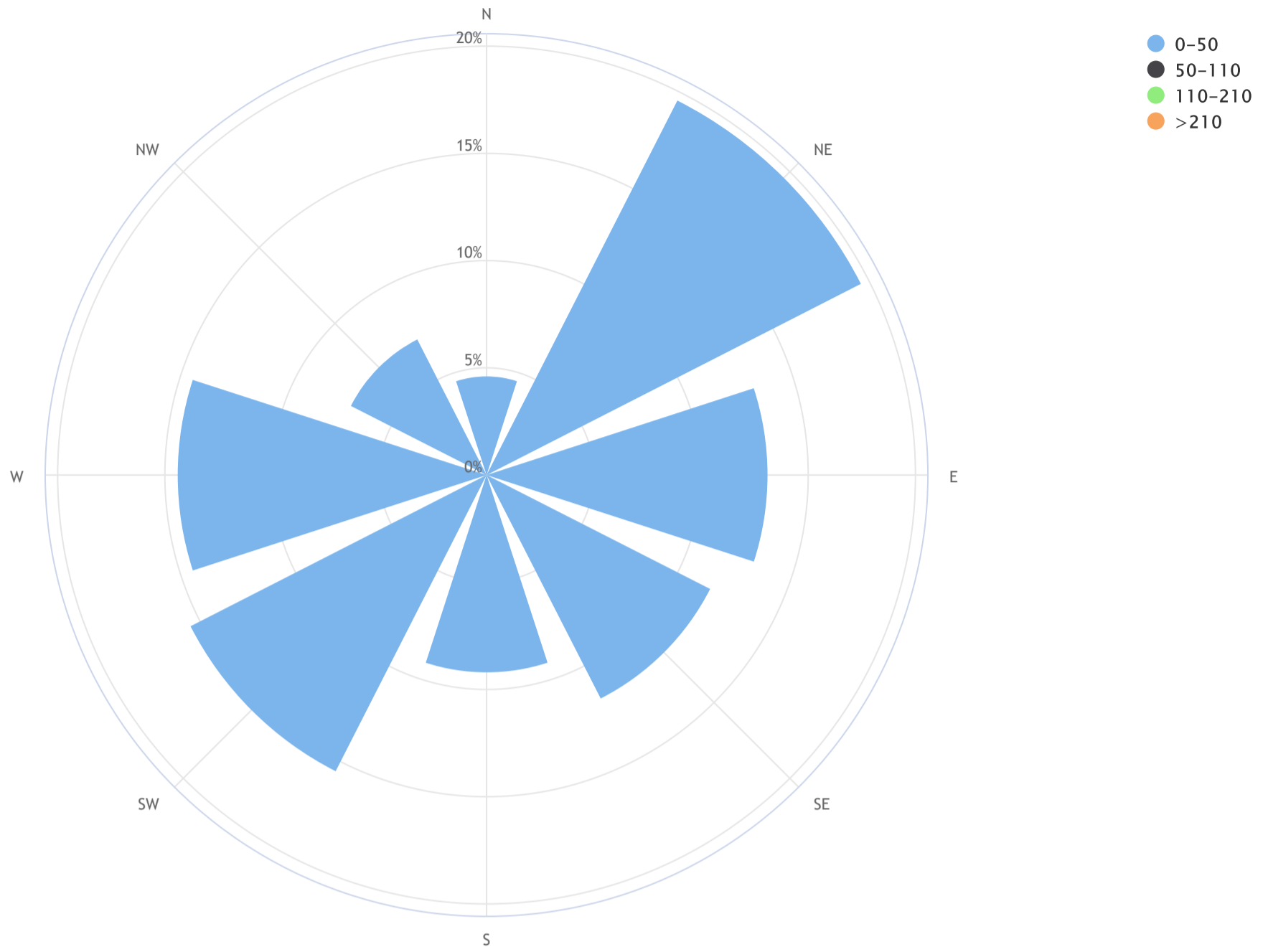
O3[ppb] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Bonnyville East Site_O₃ (ppb)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 22.5, CALM % = 5.0%



Direction	0-50	50-110	110-210	>210	TOTAL
N	4.6	0.0	0.0	0.0	4.6
NE	19.6	0.0	0.0	0.0	19.6
E	13.1	0.0	0.0	0.0	13.1
SE	11.7	0.0	0.0	0.0	11.7
S	9.2	0.0	0.0	0.0	9.2
SW	15.5	0.0	0.0	0.0	15.5
W	14.4	0.0	0.0	0.0	14.4
NW	7.1	0.0	0.0	0.0	7.1
Summary	95.0	0.0	0.0	0.0	95.0
CALM	5.1	0.0	0.0	0.0	5.1



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

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

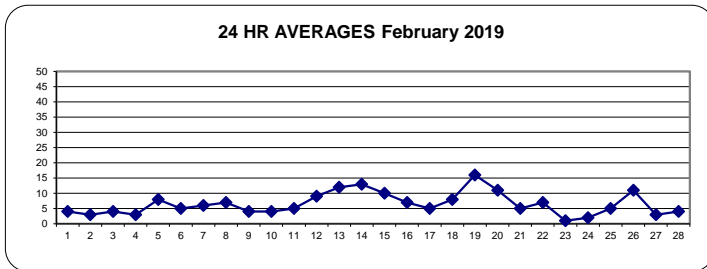
OBJECTIVE LIMIT:

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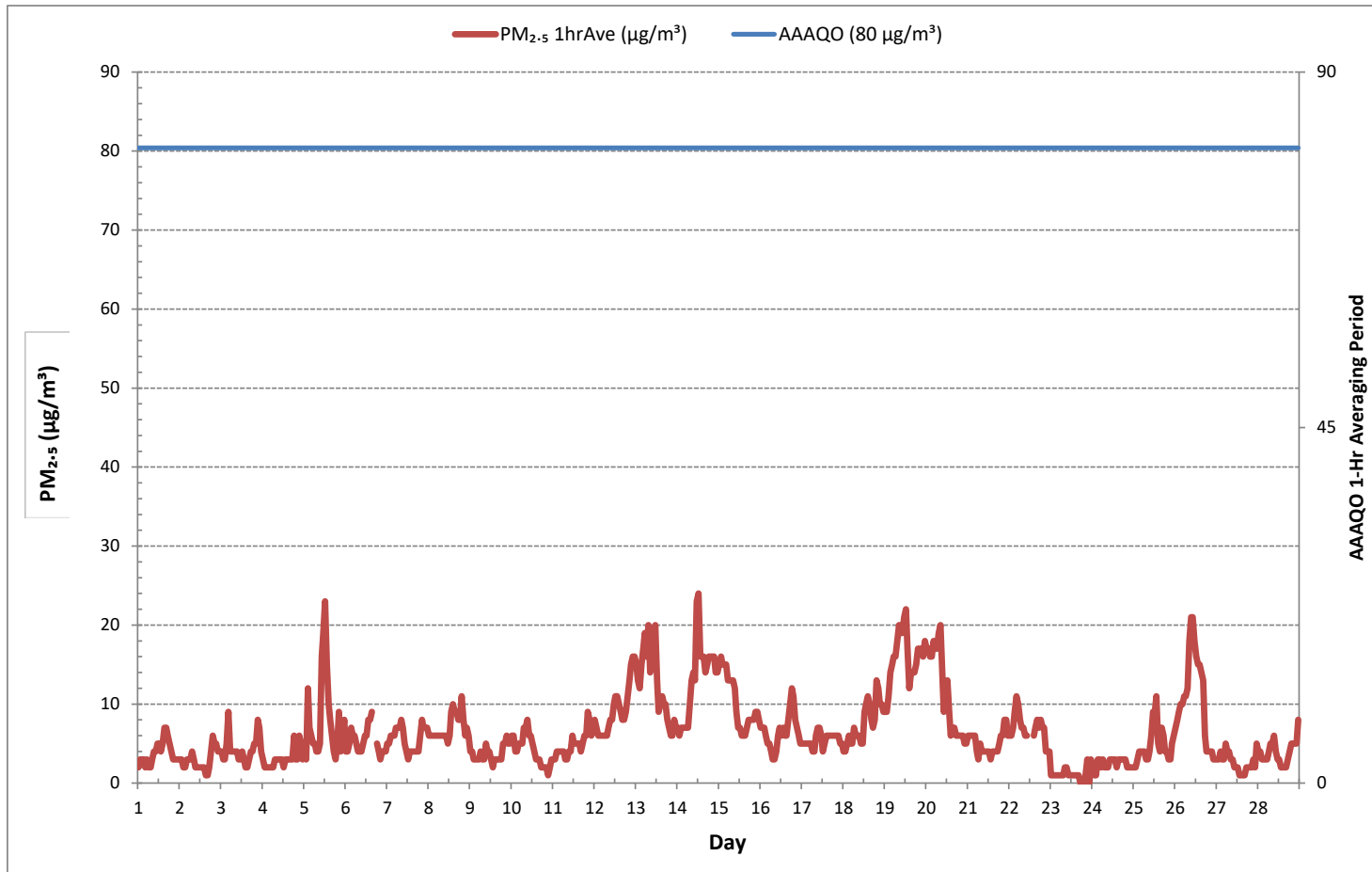
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	663
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR 17 ON DAY 23
MAXIMUM 1-HR AVERAGE:	24 µg/m ³ @ HOUR 12 ON DAY 14
MAXIMUM 24-HR AVERAGE:	16 µg/m ³ ON DAY 19
MONTHLY CALIBRATION TIME:	2 hrs
OPERATIONAL TIME:	669 hrs
AMSD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	5
MONTHLY AVERAGE:	6 µg/m ³

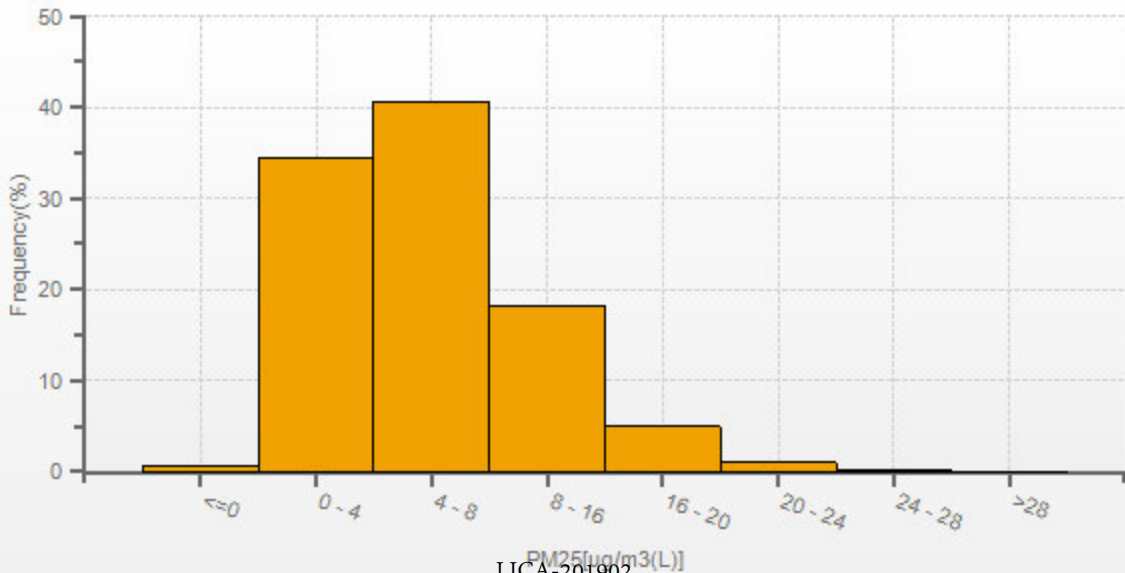
24 HR AVERAGES February 2019



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



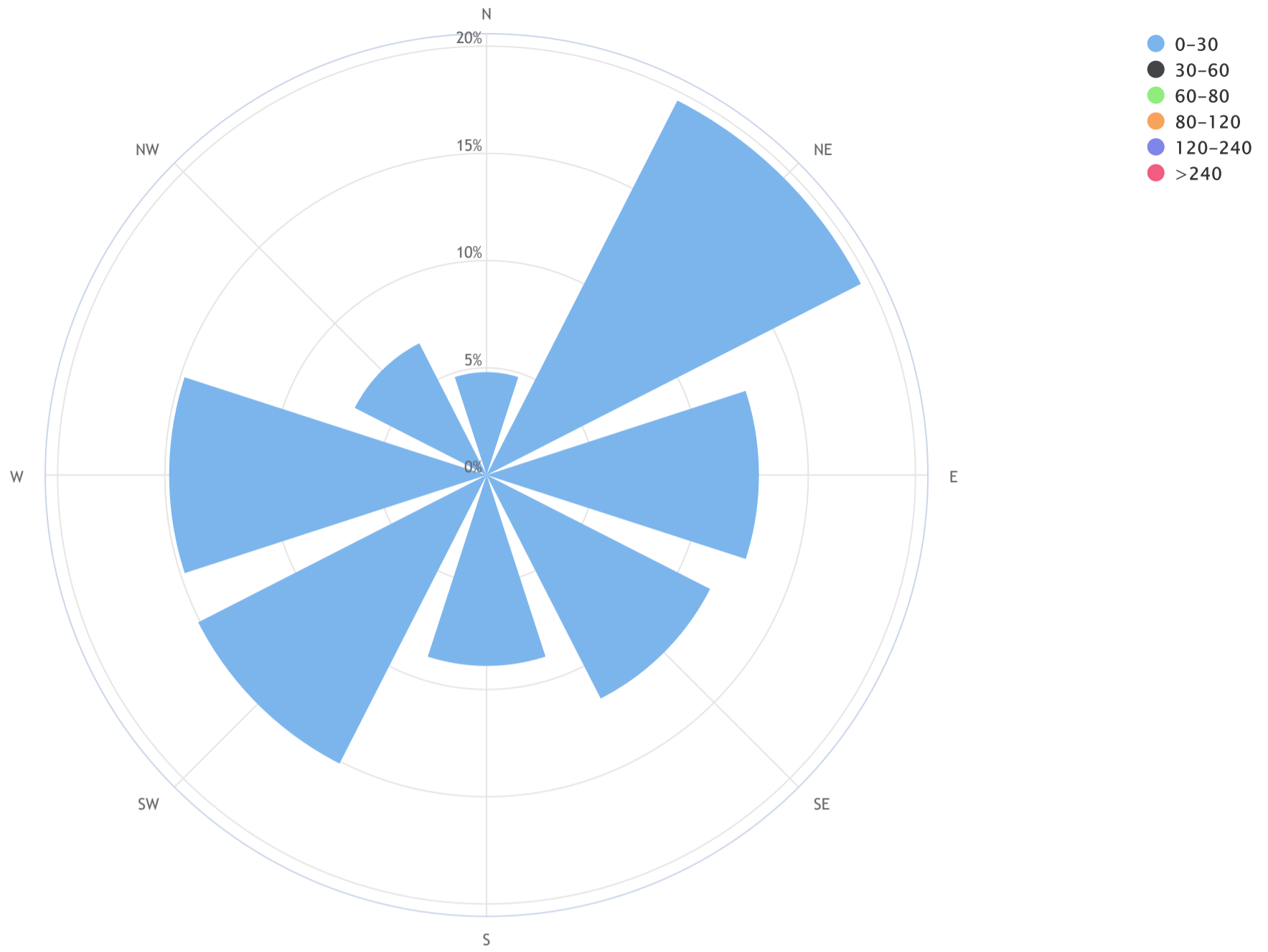
PM25[ug/m3(L)] Histogram: LICA Bonnyville East Monthly: 19/02 1 Hr.



LICA-201902

Lakeland Industry & Community Association_Bonnyville East Site_PM_{2.5} (µg/m³)_19/02

Pollutant Rose_Wind Frequency (Blowing From)_ CALM Avg = 9.9, CALM % = 5.4%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	4.8	0.0	0.0	0.0	0.0	0.0	4.8
NE	19.6	0.0	0.0	0.0	0.0	0.0	19.6
E	12.7	0.0	0.0	0.0	0.0	0.0	12.7
SE	11.7	0.0	0.0	0.0	0.0	0.0	11.7
S	8.9	0.0	0.0	0.0	0.0	0.0	8.9
SW	15.1	0.0	0.0	0.0	0.0	0.0	15.1
W	14.8	0.0	0.0	0.0	0.0	0.0	14.8
NW	6.9	0.0	0.0	0.0	0.0	0.0	6.9
Summary	94.6	0.0	0.0	0.0	0.0	0.0	94.6
CALM	5.4	0.0	0.0	0.0	0.0	0.0	5.4



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	28.2	21.5	19.5	14.7	13.4	17.2	17.8	17.8	17.6	16.9	17.9	18.5	18.1	17.8	17.0	16.3	17.0	18.8	19.8	20.3	22.8	23.3	22.4	23.0	13.4	28.2	17.8	24	
2	23.4	24.0	23.9	22.0	22.8	20.2	19.7	21.3	19.1	17.3	14.2	11.0	13.2	13.0	11.5	6.3	9.9	7.3	7.9	12.4	10.4	10.3	11.5	11.9	6.3	24.0	8.9	24	
3	11.9	12.0	11.3	11.0	10.8	10.0	10.5	9.4	8.7	8.2	8.5	8.2	7.4	8.1	7.8	3.7	3.3	3.3	5.7	5.1	1.7	4.5	7.7	12.9	1.7	12.9	5.4	24	
4	10.2	13.2	11.6	12.1	9.3	8.5	10.3	9.1	8.4	11.5	7.2	6.2	7.7	10.4	9.9	9.1	6.3	4.8	2.8	3.5	2.9	2.3	2.8	3.4	2.3	13.2	6.6	24	
5	3.8	1.9	4.2	2.9	3.1	4.1	3.4	1.3	2.8	1.2	1.8	1.2	1.8	1.1	0.4	0.4	0.8	4.0	2.8	3.6	3.2	2.7	0.9	2.1	0.4	4.2	1.5	24	
6	4.1	3.3	5.5	3.8	3.9	1.8	2.0	2.4	2.2	1.6	1.6	2.6	2.3	1.6	2.3	2.5	3.7	4.9	4.2	3.3	2.9	3.1	4.2	2.2	1.6	5.5	2.0	24	
7	3.9	5.6	6.7	6.0	2.1	4.0	6.7	6.7	7.9	7.9	11.1	12.7	12.3	13.6	14.7	14.5	12.1	10.3	11.0	9.6	7.4	5.6	8.3	12.6	2.1	14.7	8.3	24	
8	9.4	8.7	11.4	9.5	9.3	8.5	8.0	8.3	8.5	8.1	10.2	12.1	8.6	6.9	4.9	5.9	3.6	4.1	4.9	5.9	6.9	9.7	10.8	11.2	3.6	12.1	6.8	24	
9	13.1	6.8	2.7	3.7	4.2	6.3	6.6	7.3	6.6	4.0	1.1	0.4	2.7	1.6	2.3	2.7	3.7	4.1	6.0	6.0	8.2	6.3	6.3	5.8	0.4	13.1	0.4	24	
10	5.8	4.6	3.6	6.2	5.1	4.9	6.3	4.2	6.2	7.1	9.0	10.4	11.7	13.4	17.6	18.8	16.7	17.9	21.3	21.0	16.4	14.7	12.7	10.8	3.6	21.3	10.4	24	
11	13.2	13.9	11.3	8.8	5.5	5.9	7.4	8.2	7.4	10.0	8.2	8.1	7.2	7.7	6.2	5.2	4.2	3.5	6.6	7.5	7.0	2.7	2.5	3.4	2.5	13.9	2.9	24	
12	3.7	2.2	3.4	1.5	1.9	1.6	2.9	2.8	5.6	4.3	1.4	3.1	3.0	1.9	2.4	4.9	8.6	8.7	8.6	5.1	4.8	5.7	7.8	5.0	1.4	8.7	3.7	24	
13	3.2	1.5	1.7	0.8	1.5	1.5	1.3	1.5	2.8	1.3	0.7	2.8	5.6	2.7	0.8	4.2	3.1	0.8	2.8	4.4	3.0	2.9	2.3	2.0	0.7	5.6	1.4	24	
14	2.7	1.4	3.1	2.6	1.4	5.9	6.4	3.7	2.0	2.5	1.7	2.3	2.3	4.3	3.3	2.9	2.1	4.2	9.8	11.7	9.5	9.2	12.0	6.7	1.4	12.0	3.5	24	
15	8.5	9.0	5.4	7.8	7.2	4.1	5.8	8.4	7.3	7.6	10.9	12.9	14.7	13.9	14.1	18.1	15.8	16.0	11.4	10.9	16.1	15.3	15.5	12.1	4.1	18.1	10.6	24	
16	13.0	14.2	11.0	7.1	7.6	9.0	10.2	3.9	5.3	7.9	8.2	7.2	6.6	7.4	12.0	14.1	14.7	16.2	18.1	19.5	17.7	15.5	18.5	19.9	3.9	19.9	11.7	24	
17	19.2	15.7	12.0	11.5	13.1	11.9	12.9	11.9	8.0	8.3	7.9	9.8	4.5	2.7	3.3	2.6	3.7	3.3	2.4	3.5	4.4	8.2	5.6	4.6	2.4	19.2	5.8	24	
18	6.0	4.2	2.9	4.6	5.2	3.8	5.2	4.9	4.1	2.5	2.4	6.0	13.5	12.9	12.1	11.9	16.0	16.5	15.1	19.3	16.6	8.0	12.2	9.8	2.4	19.3	7.4	24	
19	8.1	10.0	10.1	10.6	7.9	7.7	9.6	8.4	6.6	5.9	7.2	7.4	3.3	12.0	8.6	8.6	8.7	8.1	6.1	5.8	5.8	5.2	2.8	2.2	2.2	12.0	6.6	24	
20	0.5	1.3	2.9	2.1	4.2	3.9	7.6	3.5	6.8	12.0	12.4	13.8	13.2	14.2	14.7	16.5	12.6	19.2	16.6	21.4	20.1	16.8	15.8	11.5	0.5	21.4	6.2	24	
21	5.0	5.7	6.8	8.1	9.5	15.7	6.1	4.0	5.2	3.8	5.0	5.6	10.1	13.5	8.7	9.1	9.6	12.8	11.2	11.3	4.9	5.8	10.4	17.5	3.8	17.5	4.6	24	
22	20.8	18.5	13.3	9.6	18.3	11.8	11.1	13.1	12.4	10.9	11.6	P	P	P	3.7	2.7	2.0	5.1	3.2	1.9	12.9	20.8	15.4	25.7	1.9	25.7	6.1	21	
23	25.2	23.5	22.4	22.1	27.5	22.3	20.5	12.8	17.6	24.6	26.2	25.4	24.8	23.0	19.0	21.3	22.1	16.5	12.2	12.3	10.5	10.4	11.4	9.8	9.8	27.5	16.7	24	
24	9.9	9.2	9.2	6.5	7.5	4.1	3.5	3.7	1.9	1.5	1.0	3.0	3.2	4.8	5.4	7.6	6.9	5.5	7.7	8.7	11.2	12.6	11.9	13.1	1.0	13.1	5.0	24	
25	12.6	11.8	9.2	9.7	6.4	7.1	7.7	5.1	3.0	4.7	10.5	12.7	13.1	11.8	13.3	13.3	12.4	9.1	9.2	11.0	6.6	5.5	6.1	8.1	3.0	13.3	9.0	24	
26	5.4	5.5	5.4	4.1	7.1	3.6	9.5	11.1	12.0	14.9	14.1	15.4	16.5	17.4	17.6	18.4	17.4	15.7	17.1	15.2	15.7	16.4	14.3	14.5	3.6	18.4	12.6	24	
27	14.6	14.6	15.1	16.8	20.0	20.6	21.1	17.9	18.2	22.7	26.1	21.2	22.3	20.7	22.0	22.9	20.1	14.4	14.1	8.5	8.6	5.6	8.4	7.0	5.6	26.1	13.7	24	
28	5.9	10.4	7.8	6.6	5.3	1.8	2.8	3.9	7.4	7.4	8.7	14.9	13.8	18.9	17.2	15.8	13.7	14.2	19.6	20.0	12.6	10.3	14.9	15.6	1.8	20.0	5.8	24	
HOURLY MAX	28.2	24.0	23.9	22.1	27.5	22.3	21.1	21.3	19.1	24.6	26.2	25.4	24.8	23.0	22.0	22.9	22.1	19.2	21.3	21.4	22.8	23.3	22.4	25.7					

STATUS FLAG CODES

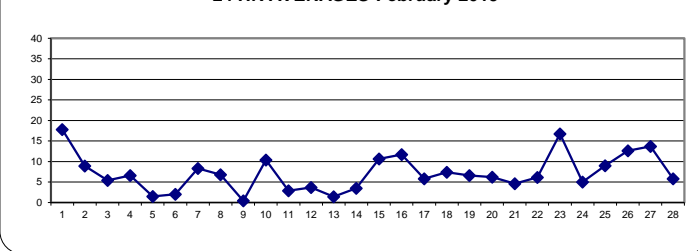
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

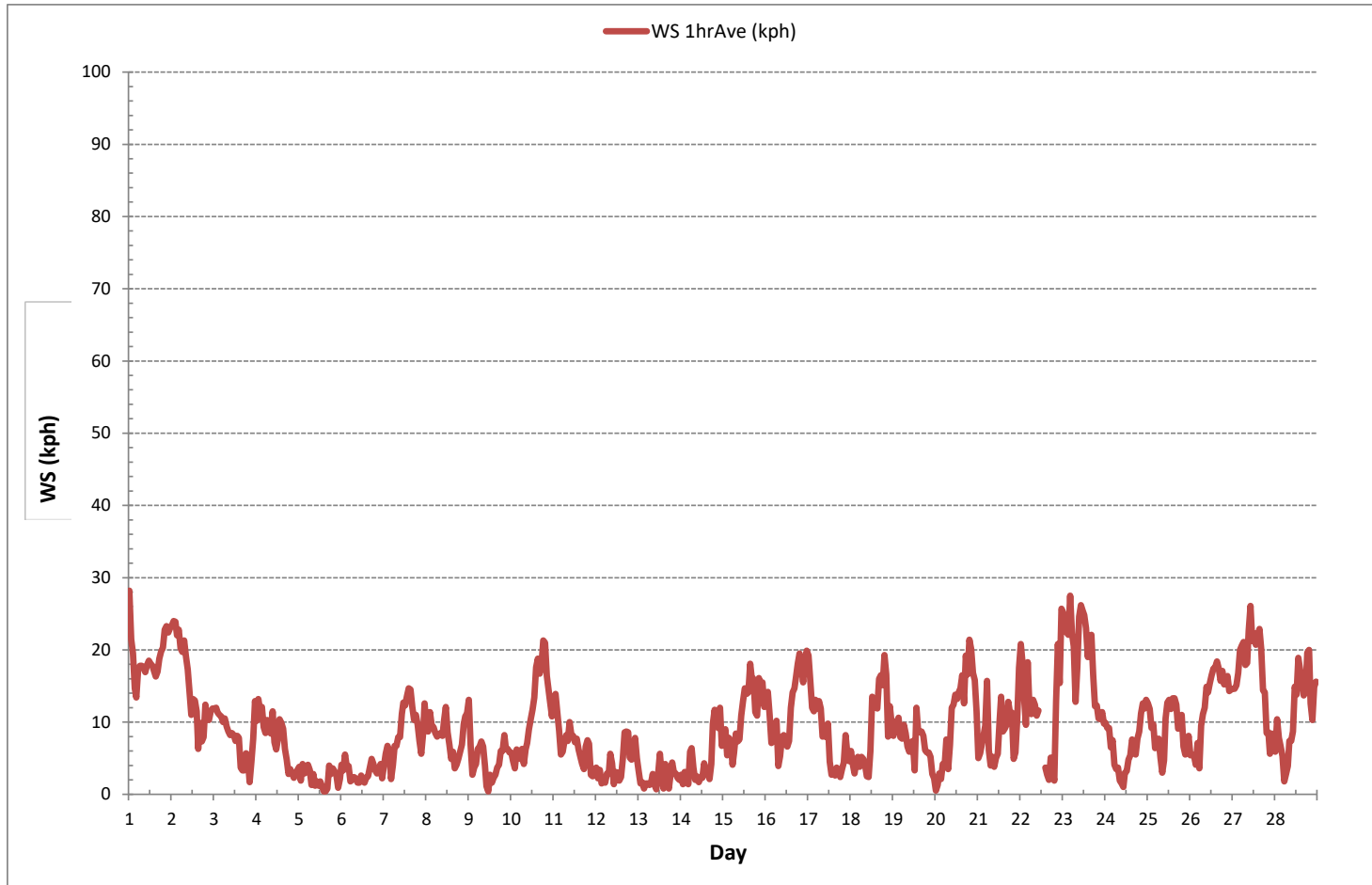
LAST CALIBRATION:	October 24, 2018
DECLINATION :	MAGNETIC DECLINATION 13 DEGREE EAST

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	669
MINIMUM 1-HR AVERAGE	0.4 kph @ HOUR 14 ON DAY 5
MAXIMUM 1-HR AVERAGE:	28.2 kph @ HOUR 0 ON DAY 1
MAXIMUM 24-HR AVERAGE:	17.8 kph ON DAY 1
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	669 hrs
AMSD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	6.0
MONTHLY AVERAGE:	1.0 kph

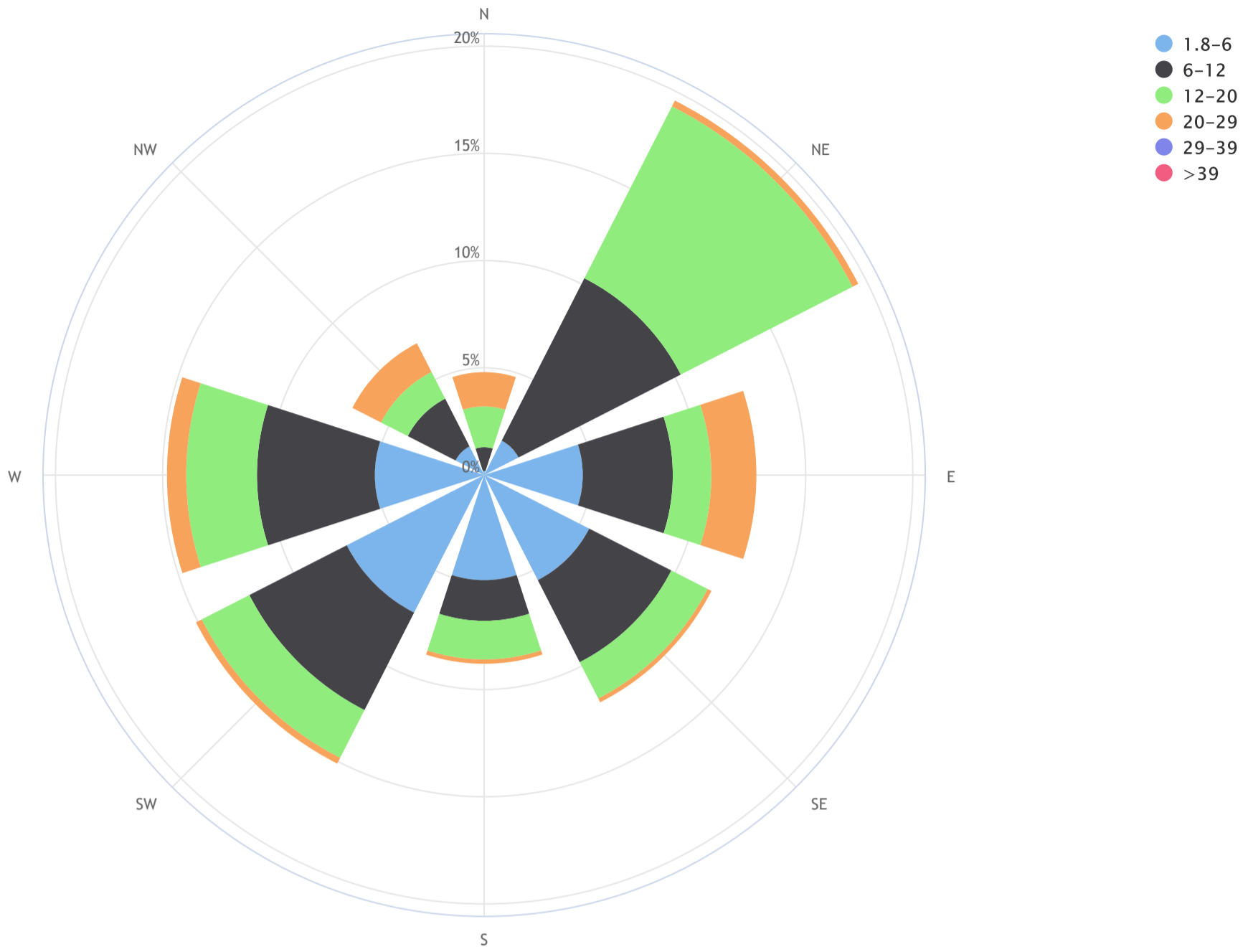
24 HR AVERAGES February 2019





Lakeland Industry & Community Association_Bonnyville East Site_19/02

Wind Rose_Wind Frequency (Blowing From)_CALM Avg = 1.2_CALM % = 5.4%



Direction	1.8-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	0.2	1.1	1.9	1.6	0.0	0.0	4.8
NE	1.8	8.5	9.0	0.3	0.0	0.0	19.6
E	4.6	4.2	1.8	2.1	0.0	0.0	12.7
SE	5.5	4.3	1.9	0.2	0.0	0.0	12.0
S	4.9	1.9	1.8	0.2	0.0	0.0	8.8
SW	7.2	5.1	2.5	0.3	0.0	0.0	15.1
W	5.1	5.5	3.3	0.9	0.0	0.0	14.8
NW	1.5	2.5	1.4	1.5	0.0	0.0	6.9
Summary	30.8	33.2	23.6	7.0	0.0	0.0	94.6
CALM	5.4	0.0	0.0	0.0	0.0	0.0	5.4



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

WIND DIRECTION Hourly Averages (WD)

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

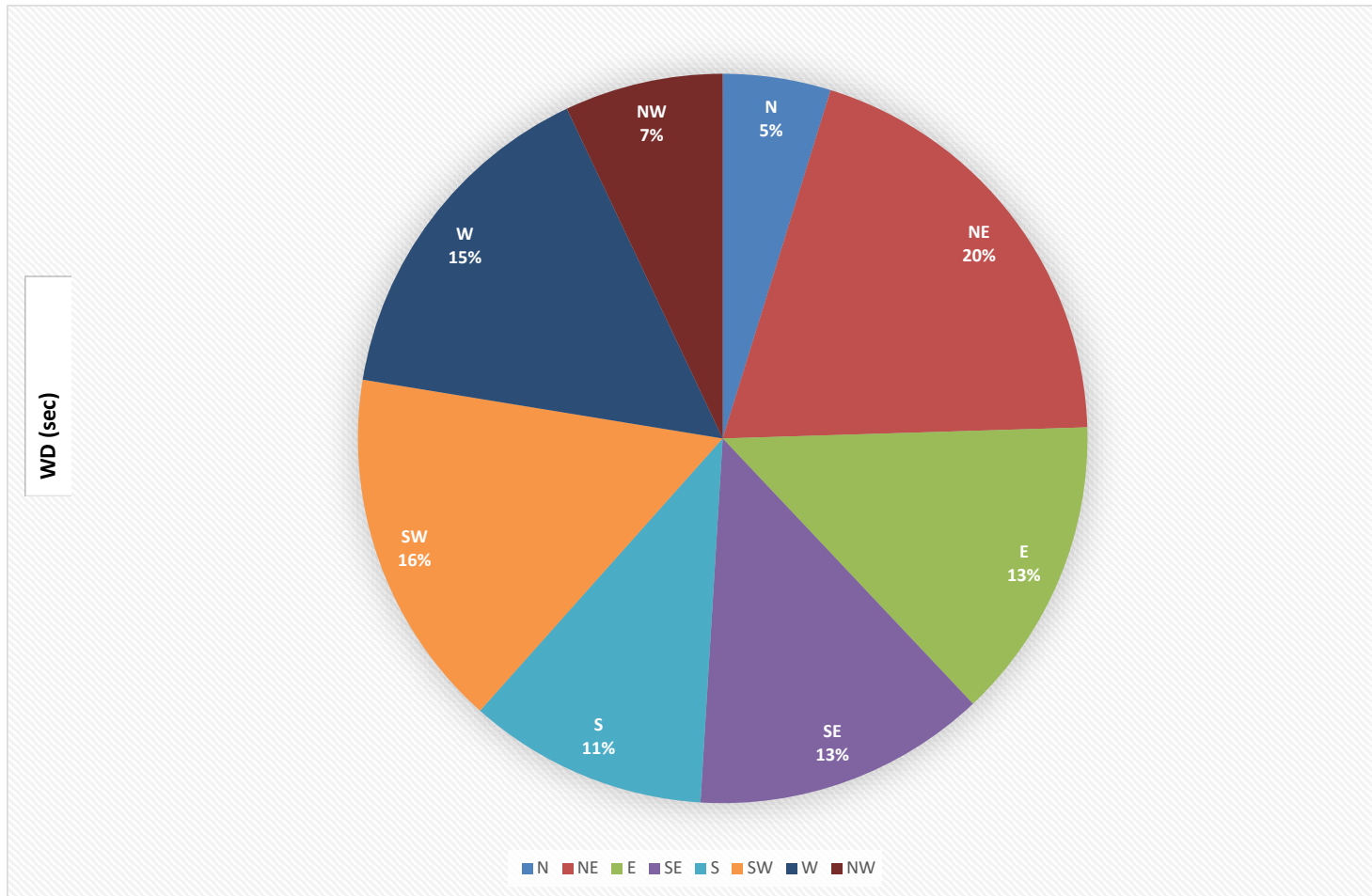
STATUS FLAG CODES

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:	669	hrs
STANDARD DEVIATION:	94		AMD OPERATION UPTIME:	99.6	%
			MONTHLY AVERAGE:	36	(NE)

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019
WIND DIRECTION Hourly Averages (WD)



— WDV[degwdr]



LICA 201902



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville East Site Continuous Monitoring Station - February 2019

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

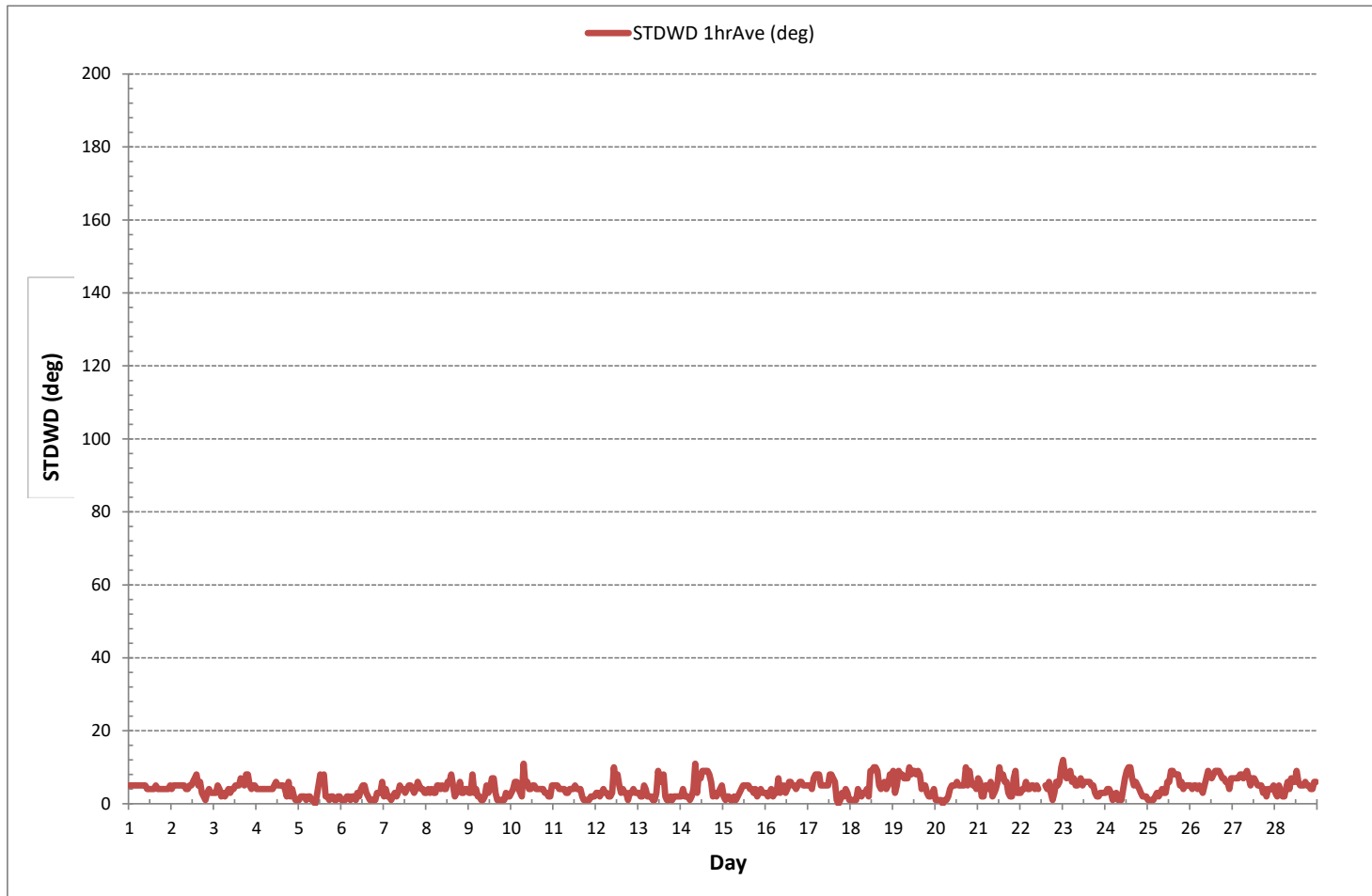
STATUS FLAG CODES

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: 669 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

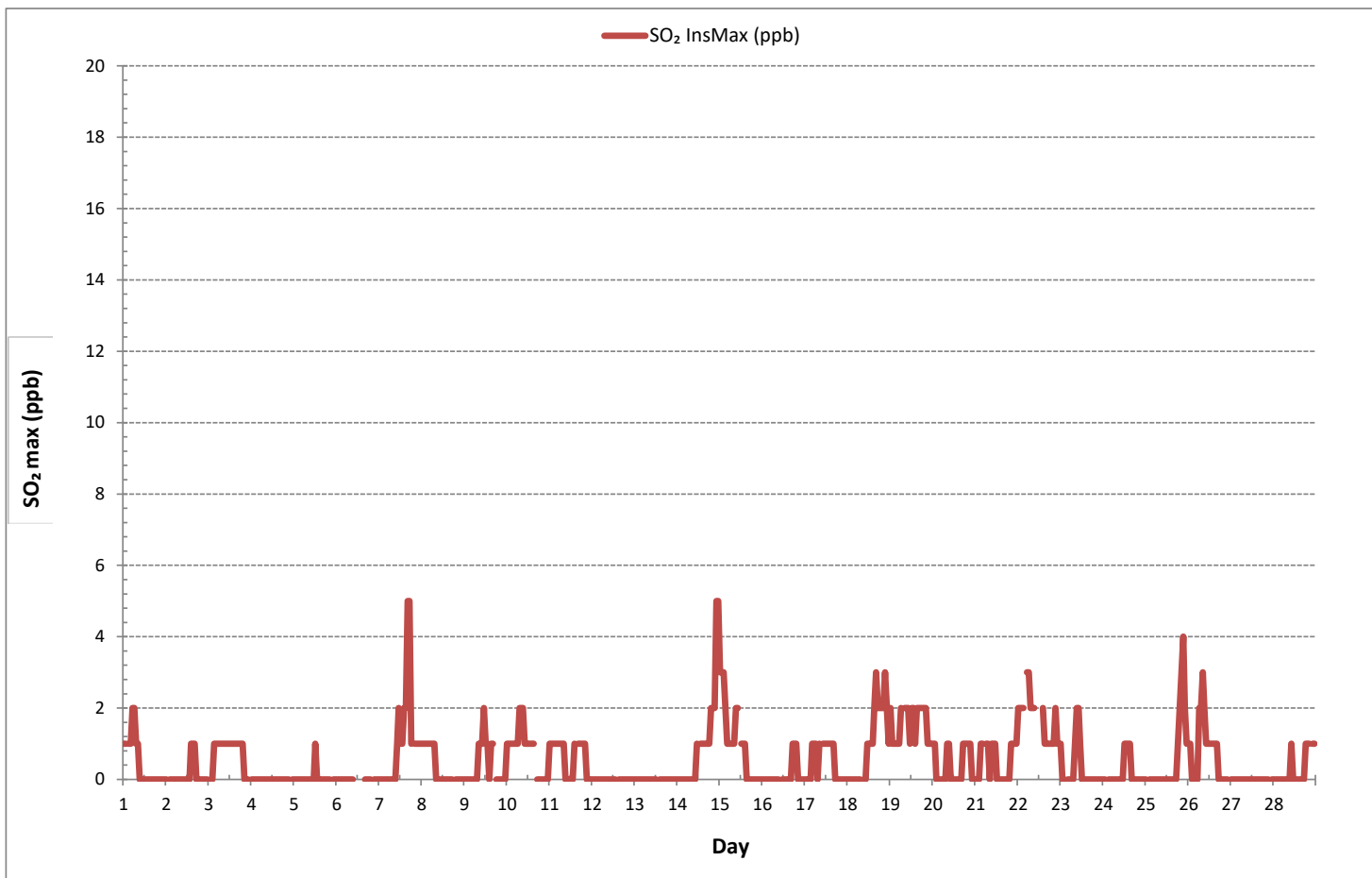
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	1	1	S	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	24	
2	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	1	0	24
3	S	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	S	0	1	1	24
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	0	0	0	1	0	24
6	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	S	0	0	0	0	0	0	-	24
7	0	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	5	5	1	S	1	1	1	1	1	0	5	1	24
8	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	0	1	1	1	2	1	1	0	1	1	S	0	0	0	0	0	0	0	0	2	0	24
10	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	2	1	24
11	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	S	1	1	1	1	1	1	0	0	0	0	1	1	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
13	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
14	0	0	0	0	0	0	0	0	0	0	0	1	S	1	1	1	1	1	1	2	2	2	5	5	0	5	1	24	
15	3	3	3	2	1	1	1	1	1	2	2	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3	1	24
16	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	24
17	0	0	0	0	1	1	1	0	1	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	24
18	0	0	0	0	0	0	0	0	S	0	0	1	1	1	1	2	3	2	2	2	2	3	2	1	0	3	1	24	
19	2	1	1	1	1	1	2	S	2	2	2	2	1	2	2	1	2	2	2	2	2	2	1	1	1	1	2	2	24
20	1	1	0	0	0	0	S	0	1	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	24	
21	0	0	0	1	1	S	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	24	
22	2	2	2	2	S	3	3	2	2	2	P	P	P	P	2	1	1	1	1	1	1	2	1	1	1	3	2	20	
23	1	0	0	S	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
24	0	0	S	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
25	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	4	2	1	0	4	1	24	
26	S	1	0	0	0	0	2	2	3	2	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	3	1	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	S	0	0	0	0	24
28	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	S	1	1	0	1	0	24	
HOURLY MAX	3	3	3	2	1	3	3	2	3	2	2	2	2	2	2	2	5	5	2	2	3	4	5	5					
HOURLY AVG	1	0	0	0	0	0	1	0	1	1	1	1	0	0	1	1	1	1	0	1	1	1	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:	237
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 16 ON DAY 7
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	1





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

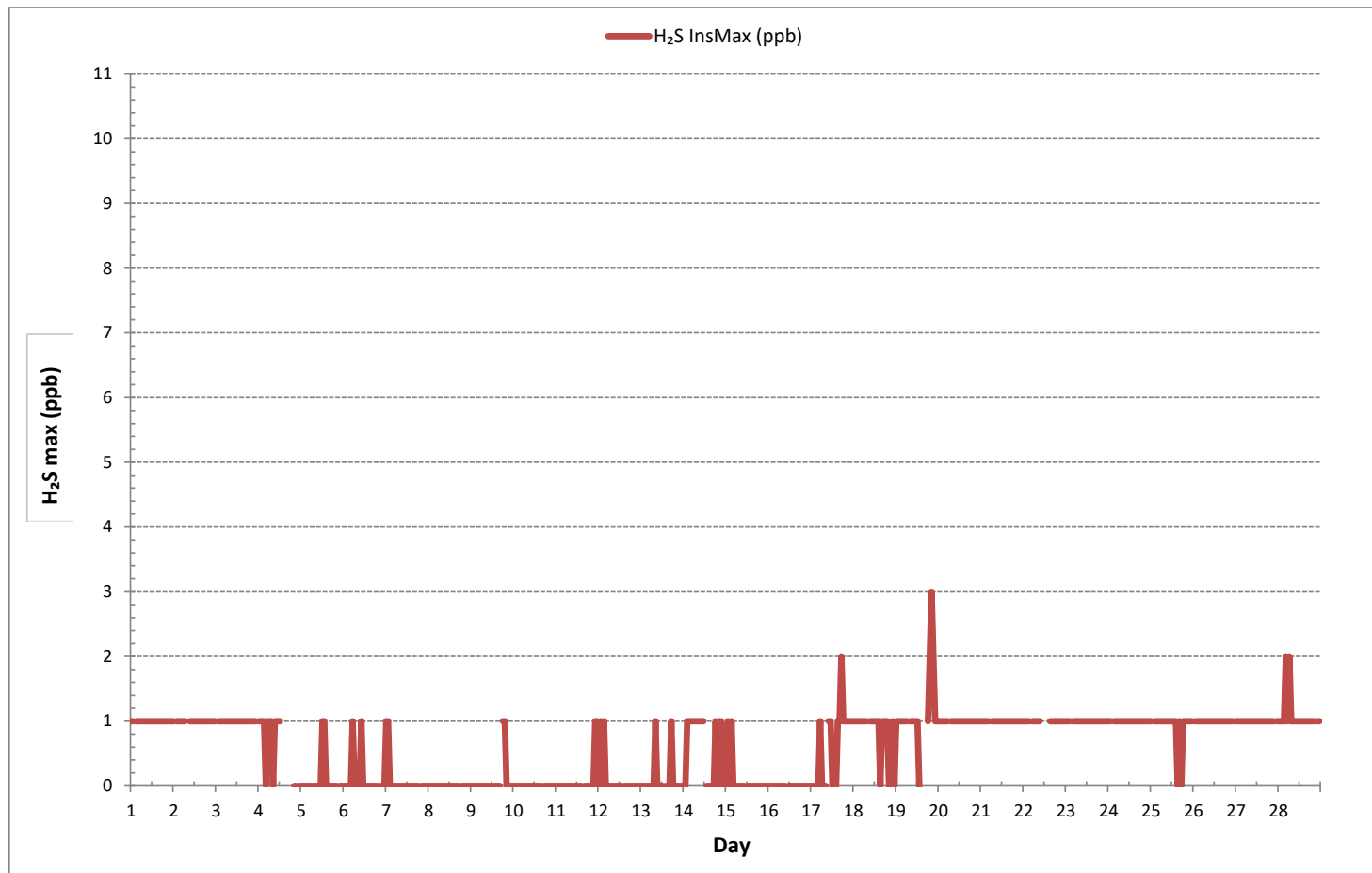
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	1	1	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		
2	1	S	1	1	1	1	1	S1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22		
3	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	24		
4	1	1	1	1	0	1	1	1	0	1	1	1	1	C	C	C	C	C	C	C	0	0	S	0	0	0	1	0	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
6	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
7	1	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	1	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	1	0	24	
12	0	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
13	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	1	0	24	
14	0	0	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	1	0	1	0	1	1	0	0	1	1	24	
15	0	1	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
16	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	1	0	0	0	S	1	1	0	0	0	1	1	2	1	1	1	1	1	1	1	0	2	1	24	
18	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	0	0	1	1	24	
19	1	1	1	1	1	1	1	S	1	1	1	1	1	0	C1	C1	C1	C1	1	2	3	2	1	1	0	3	1	20		
20	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	
21	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	
22	1	1	1	1	S	1	1	1	1	1	P	P	P	P	R	1	1	1	1	1	1	1	1	1	1	1	1	1	20	
23	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	
24	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
25	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	24	
26	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24	
27	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	1	24	
28	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	2	1	24
HOURLY MAX	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	2	3	2	1	1						
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	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:	354
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 20 ON DAY 19
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	662 hrs
STANDARD DEVIATION:	1





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville East Site Continuous Monitoring Station - February 2019

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	1.99	2.01	S	1.99	1.99	2.00	2.01	2.00	2.00	1.99	1.98	X	1.97	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.98	1.98	1.98	1.97	2.01	1.98	23				
2	1.99	S	1.98	1.98	1.98	1.98	1.98	1.97	1.98	1.98	1.96	1.96	1.97	1.97	1.96	1.97	1.97	2.00	2.02	2.06	2.11	2.11	2.17	2.15	1.96	2.17	2.01	24				
3	S	2.10	2.11	2.11	2.13	2.15	2.16	2.17	2.19	2.17	2.19	2.14	2.07	2.03	2.02	2.01	2.03	2.07	2.04	2.05	2.07	2.06	2.08	S	2.01	2.19	2.10	24				
4	2.00	1.98	1.98	1.98	1.98	1.99	1.99	2.00	2.00	2.02	2.03	2.03	2.00	1.98	1.99	2.01	2.03	2.04	2.03	2.06	2.13	S	2.11	1.98	2.13	2.01	24					
5	2.16	2.15	2.21	2.24	2.29	2.20	2.19	2.24	2.34	2.28	2.33	2.33	2.48	C	C	C	C	C	2.18	2.19	2.23	S	2.27	2.24	2.15	2.48	2.25	24				
6	2.23	2.33	2.52	2.55	3.03	4.59	3.14	2.46	2.41	3.28	5.61	4.70	3.88	3.30	2.92	2.69	2.59	2.40	2.41	2.47	S	2.42	2.53	2.82	2.23	5.61	3.01	24				
7	3.59	4.74	5.45	4.91	4.49	4.41	4.61	4.58	4.80	4.21	2.72	2.66	2.45	2.35	2.33	2.34	2.35	2.42	2.55	S	2.88	2.88	2.90	2.93	2.33	5.45	3.46	24				
8	2.87	2.68	2.65	2.63	2.71	2.68	2.62	2.51	2.36	2.28	2.20	2.17	2.12	2.11	2.10	2.07	2.08	2.08	S	2.11	2.11	2.11	2.08	2.08	2.07	2.87	2.32	24				
9	2.06	2.08	2.17	2.17	2.20	2.21	2.24	2.27	2.27	2.30	2.26	2.15	2.09	2.11	2.14	2.14	2.14	S	2.21	2.22	2.29	3.51	3.82	3.25	2.06	3.82	2.37	24				
10	2.99	3.68	3.81	3.43	3.32	3.61	4.22	3.09	3.01	2.99	2.56	2.44	2.33	2.21	2.17	2.17	S	2.10	2.10	2.09	2.08	2.09	2.14	2.08	4.22	2.73	24					
11	2.05	2.07	2.10	2.11	2.17	2.12	2.09	2.12	2.15	2.08	2.08	2.06	2.05	2.03	2.03	S	2.07	2.05	2.11	2.11	2.13	2.19	2.34	2.24	2.03	2.34	2.11	24				
12	2.29	2.28	2.36	2.42	2.42	2.36	2.40	2.39	2.41	2.42	2.42	2.37	2.26	2.24	S	2.23	2.22	2.22	2.26	2.32	2.42	2.39	2.42	2.38	2.22	2.42	2.34	24				
13	2.50	2.45	2.60	2.48	2.45	2.54	2.49	2.60	2.67	2.64	2.60	2.48	2.24	S	2.19	2.21	2.19	2.26	2.21	2.19	2.21	2.18	2.33	2.18	2.18	2.67	2.39	24				
14	2.35	2.38	3.28	4.69	5.09	5.36	6.31	5.11	4.38	4.38	4.17	3.51	S	2.91	2.84	2.80	2.53	2.56	2.51	2.50	2.62	2.65	2.78	2.84	2.35	6.31	3.50	24				
15	2.82	2.87	3.17	3.79	3.72	3.16	3.05	3.28	3.42	2.83	2.40	S	2.18	2.14	2.13	2.13	2.12	2.14	2.12	2.12	2.11	2.08	2.11	2.08	2.08	3.79	2.61	24				
16	2.11	2.09	2.09	2.07	2.10	2.12	2.08	2.05	2.08	2.08	S	2.04	2.04	2.03	2.03	2.02	2.04	2.05	2.02	2.06	2.05	2.04	2.02	2.02	2.02	2.12	2.06	24				
17	2.02	2.02	2.02	2.03	2.09	2.15	2.11	2.05	2.06	S	2.02	2.00	2.00	2.00	2.01	2.01	2.01	2.01	2.02	2.13	2.14	2.09	2.17	2.16	2.21	2.00	2.21	2.07	24			
18	2.24	2.34	2.40	2.54	2.36	2.36	2.36	2.33	S	2.25	2.21	2.15	2.07	2.16	2.14	2.06	2.08	2.09	2.13	2.14	2.16	2.17	2.12	2.11	2.06	2.54	2.22	24				
19	2.15	2.20	2.25	2.23	2.31	2.27	2.25	S	2.28	2.24	2.23	2.22	2.20	X	2.11	2.22	2.27	2.57	2.64	2.60	2.78	2.65	2.59	2.62	2.11	2.78	2.36	23				
20	2.61	2.62	2.67	2.86	2.78	2.82	S	3.04	3.11	2.88	2.28	2.21	2.23	2.17	2.07	2.08	2.11	2.09	2.11	2.10	2.08	2.12	2.10	2.09	2.07	3.11	2.40	24				
21	2.13	2.15	2.14	2.13	2.12	S	2.04	2.05	2.04	2.02	1.99	2.02	1.99	1.98	1.99	2.00	2.01	2.03	2.08	2.11	2.12	2.16	2.17	1.98	2.17	2.06	24					
22	2.18	2.20	2.19	2.22	S	2.20	2.22	2.28	2.26	2.23	P	P	P	P	X	X	X	X	X	X	X	X	X	X	2.18	2.28	-	10				
23	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	2.05	2.12	2.11	2.15	2.05	2.15	-	5
24	2.14	2.13	S	2.18	2.19	2.27	2.24	2.42	2.50	2.26	2.27	2.20	2.10	2.03	2.03	2.04	2.04	2.03	2.05	2.06	2.08	2.09	2.08	2.07	2.03	2.50	2.15	24				
25	2.11	S	2.16	2.16	2.23	2.16	2.16	2.17	2.19	2.17	2.12	2.07	2.05	2.04	2.04	2.03	2.04	2.04	2.05	2.09	2.08	2.09	2.14	2.18	2.03	2.23	2.11	24				
26	S	2.25	2.30	2.30	2.28	2.33	2.27	2.22	2.21	2.20	2.17	2.13	2.13	2.14	2.14	2.15	2.14	2.11	2.10	2.10	2.08	2.07	2.08	S	2.07	2.33	2.18	24				
27	2.04	2.04	2.07	2.05	2.06	2.04	2.03	2.02	2.03	2.03	2.00	2.00	2.00	1.99	1.98	1.98	1.98	1.98	2.00	2.01	2.01	2.02	S	2.19	1.98	2.19	2.03	24				
28	2.41	2.21	2.08	2.08	2.25	2.22	2.30	2.28	2.20	2.20	2.20	2.00	1.98	1.97	1.96	1.99	1.99	1.99	2.01	2.02	2.01	S	2.02	2.04	1.96	2.41	2.10	24				
HOURLY MAX	3.59	4.74	5.45	4.91	5.09	5.36	6.31	5.11	4.80	4.38	5.61	4.70	3.88	3.30	2.92	2.80	2.59	2.57	2.64	2.60	2.88	3.51	3.82	3.25								
HOURLY AVG	2.32	2.40	2.51	2.53	2.57	2.63	2.60	2.53	2.51	2.48	2.44	2.34	2.20	2.17	2.14	2.14	2.12	2.14	2.16	2.15	2.19	2.26	2.30	2.29								

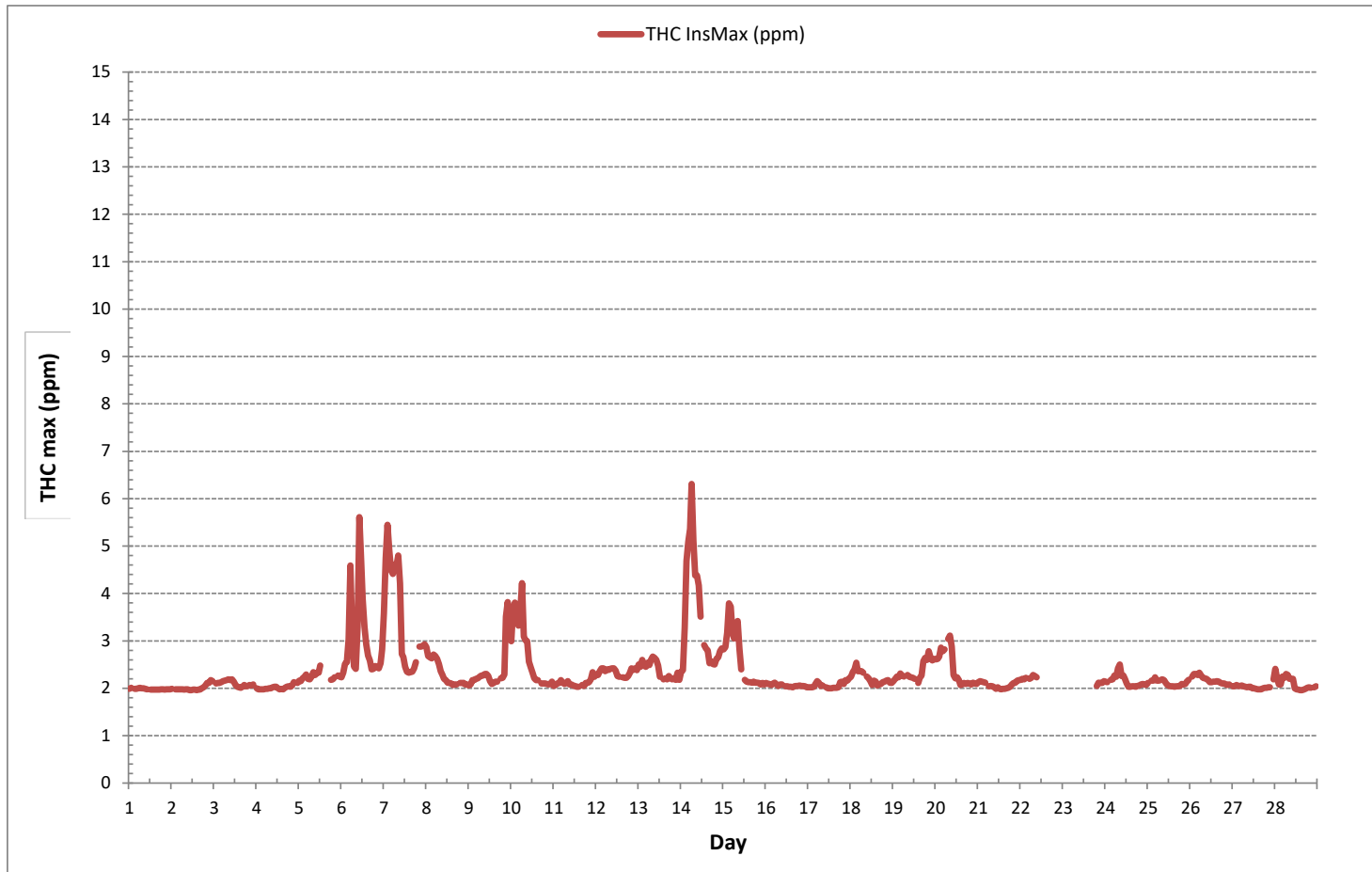
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	603
MAXIMUM INSTANTANEOUS VALUE:	6.31 ppm @ HOUR 6 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	637 hrs
STANDARD DEVIATION:	0.58

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

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	1.99	2.01	S	1.99	1.99	2.00	2.01	2.00	2.00	1.99	1.98	X	1.97	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.98	1.98	1.98	1.97	2.01	1.98	23
2	1.99	S	1.98	1.98	1.98	1.98	1.98	1.97	1.98	1.98	1.96	1.96	1.97	1.97	1.96	1.97	1.97	2.00	2.02	2.06	2.11	2.11	2.17	2.15	1.96	2.17	2.01	24
3	S	2.10	2.11	2.11	2.13	2.15	2.16	2.17	2.19	2.17	2.19	2.14	2.07	2.03	2.02	2.01	2.03	2.07	2.04	2.05	2.07	2.06	2.08	S	2.01	2.19	2.10	24
4	2.00	1.98	1.98	1.98	1.98	1.99	1.99	2.00	2.00	2.02	2.03	2.03	2.00	1.98	1.99	1.98	2.01	2.03	2.04	2.03	2.06	2.13	S	2.11	1.98	2.13	2.01	24
5	2.15	2.15	2.21	2.24	2.29	2.20	2.19	2.24	2.33	2.28	2.33	2.32	2.41	C	C	C	C	C	2.18	2.19	2.23	S	2.27	2.24	2.15	2.41	2.25	24
6	2.23	2.33	2.51	2.55	3.01	4.50	3.13	2.46	2.41	3.26	5.49	4.61	3.83	3.23	2.91	2.69	2.59	2.40	2.41	2.46	S	2.42	2.52	2.81	2.23	5.49	2.99	24
7	3.55	4.64	5.32	4.82	4.41	4.34	4.49	4.47	4.67	4.15	2.72	2.66	2.45	2.35	2.33	2.34	2.35	2.41	2.55	S	2.86	2.85	2.86	2.85	2.33	5.32	3.41	24
8	2.82	2.65	2.63	2.61	2.64	2.60	2.54	2.45	2.36	2.28	2.20	2.17	2.12	2.11	2.10	2.07	2.08	2.09	S	2.11	2.11	2.11	2.08	2.08	2.07	2.82	2.31	24
9	2.06	2.08	2.17	2.17	2.20	2.21	2.24	2.27	2.27	2.30	2.30	2.26	2.15	2.09	2.11	2.14	2.14	S	2.21	2.22	2.29	3.47	3.78	3.24	2.06	3.78	2.36	24
10	2.98	3.64	3.77	3.42	3.31	3.58	4.14	3.07	3.00	2.98	2.56	2.44	2.33	2.21	2.17	2.17	S	2.10	2.10	2.10	2.09	2.08	2.09	2.14	2.08	4.14	2.72	24
11	2.05	2.07	2.10	2.11	2.17	2.12	2.09	2.12	2.15	2.08	2.08	2.06	2.05	2.03	2.03	S	2.07	2.05	2.11	2.11	2.13	2.19	2.32	2.24	2.03	2.32	2.11	24
12	2.29	2.29	2.35	2.42	2.41	2.36	2.40	2.39	2.41	2.42	2.42	2.37	2.26	2.24	S	2.23	2.22	2.22	2.26	2.32	2.42	2.37	2.40	2.37	2.02	2.42	2.34	24
13	2.48	2.45	2.58	2.45	2.41	2.51	2.47	2.56	2.65	2.61	2.58	2.45	2.24	S	2.19	2.21	2.19	2.26	2.21	2.19	2.21	2.18	2.32	2.18	2.18	2.65	2.37	24
14	2.35	2.38	3.25	4.59	4.98	5.24	6.14	4.98	4.27	4.25	4.03	3.41	S	2.88	2.79	2.75	2.50	2.51	2.45	2.44	2.56	2.60	2.73	2.77	2.35	6.14	3.43	24
15	2.77	2.81	3.09	3.69	3.62	3.09	2.99	3.21	3.33	2.79	2.39	S	2.18	2.14	2.13	2.13	2.12	2.14	2.12	2.12	2.11	2.08	2.11	2.08	2.08	3.69	2.57	24
16	2.11	2.09	2.09	2.07	2.10	2.12	2.08	2.05	2.08	2.08	S	2.04	2.04	2.03	2.03	2.02	2.04	2.05	2.05	2.06	2.05	2.05	2.04	2.02	2.02	2.12	2.06	24
17	2.02	2.02	2.02	2.03	2.09	2.15	2.11	2.05	2.06	S	2.02	2.00	2.00	2.00	2.01	2.01	2.01	2.02	2.13	2.14	2.09	2.17	2.16	2.20	2.00	2.20	2.07	24
18	2.24	2.34	2.39	2.53	2.36	2.36	2.36	2.32	S	2.25	2.21	2.15	2.07	2.16	2.14	2.06	2.08	2.09	2.13	2.14	2.16	2.17	2.12	2.11	2.06	2.53	2.21	24
19	2.15	2.20	2.24	2.23	2.29	2.25	2.23	S	2.25	2.20	2.20	2.18	2.17	X	2.10	2.19	2.22	2.52	2.57	2.53	2.71	2.59	2.52	2.54	2.10	2.71	2.32	23
20	2.54	2.56	2.60	2.76	2.69	2.73	S	2.95	3.00	2.82	2.26	2.21	2.23	2.16	2.07	2.08	2.10	2.09	2.11	2.10	2.08	2.12	2.10	2.09	2.07	3.00	2.37	24
21	2.12	2.14	2.14	2.13	2.12	S	2.04	2.05	2.04	2.02	1.99	2.02	1.99	1.98	1.99	1.99	2.00	2.01	2.03	2.08	2.11	2.12	2.16	2.17	1.98	2.17	2.06	24
22	2.18	2.20	2.19	2.21	S	2.20	2.22	2.28	2.25	2.23	P	P	P	P	X	X	X	X	X	X	X	X	X	X	2.18	2.28	-	10
23	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	2.05	2.12	2.11	2.11	2.15	2.05	2.15	-	5
24	2.14	2.13	S	2.18	2.19	2.27	2.24	2.42	2.50	2.26	2.27	2.20	2.10	2.03	2.03	2.04	2.04	2.03	2.05	2.06	2.08	2.09	2.08	2.07	2.03	2.50	2.15	24
25	2.11	S	2.16	2.16	2.23	2.16	2.16	2.17	2.19	2.17	2.12	2.07	2.05	2.04	2.04	2.03	2.04	2.04	2.05	2.09	2.08	2.09	2.14	2.18	2.03	2.23	2.11	24
26	S	2.25	2.30	2.30	2.28	2.33	2.27	2.22	2.21	2.20	2.17	2.13	2.13	2.14	2.14	2.15	2.14	2.11	2.10	2.10	2.08	2.07	2.08	S	2.07	2.33	2.18	24
27	2.04	2.04	2.07	2.05	2.05	2.06	2.04	2.03	2.02	2.03	2.03	2.00	2.00	1.99	1.98	1.98	1.98	2.00	2.01	2.01	2.02	2.02	S	2.19	1.98	2.19	2.03	24
28	2.41	2.21	2.08	2.08	2.25	2.22	2.31	2.28	2.20	2.20	2.20	2.00	1.98	1.97	1.96	1.96	1.96	1.99	2.01	2.02	2.01	S	2.02	2.04	1.96	2.41	2.10	24
HOURLY MAX	3.55	4.64	5.32	4.82	4.98	5.24	6.14	4.98	4.67	4.25	5.49	4.61	3.83	3.23	2.91	2.75	2.59	2.52	2.57	2.53	2.86	3.47	3.78	3.24				
HOURLY AVG	2.31	2.39	2.49	2.51	2.55	2.60	2.58	2.51	2.49	2.46	2.43	2.33	2.19	2.16	2.13	2.13	2.12	2.13	2.16	2.14	2.19	2.25	2.29	2.28				

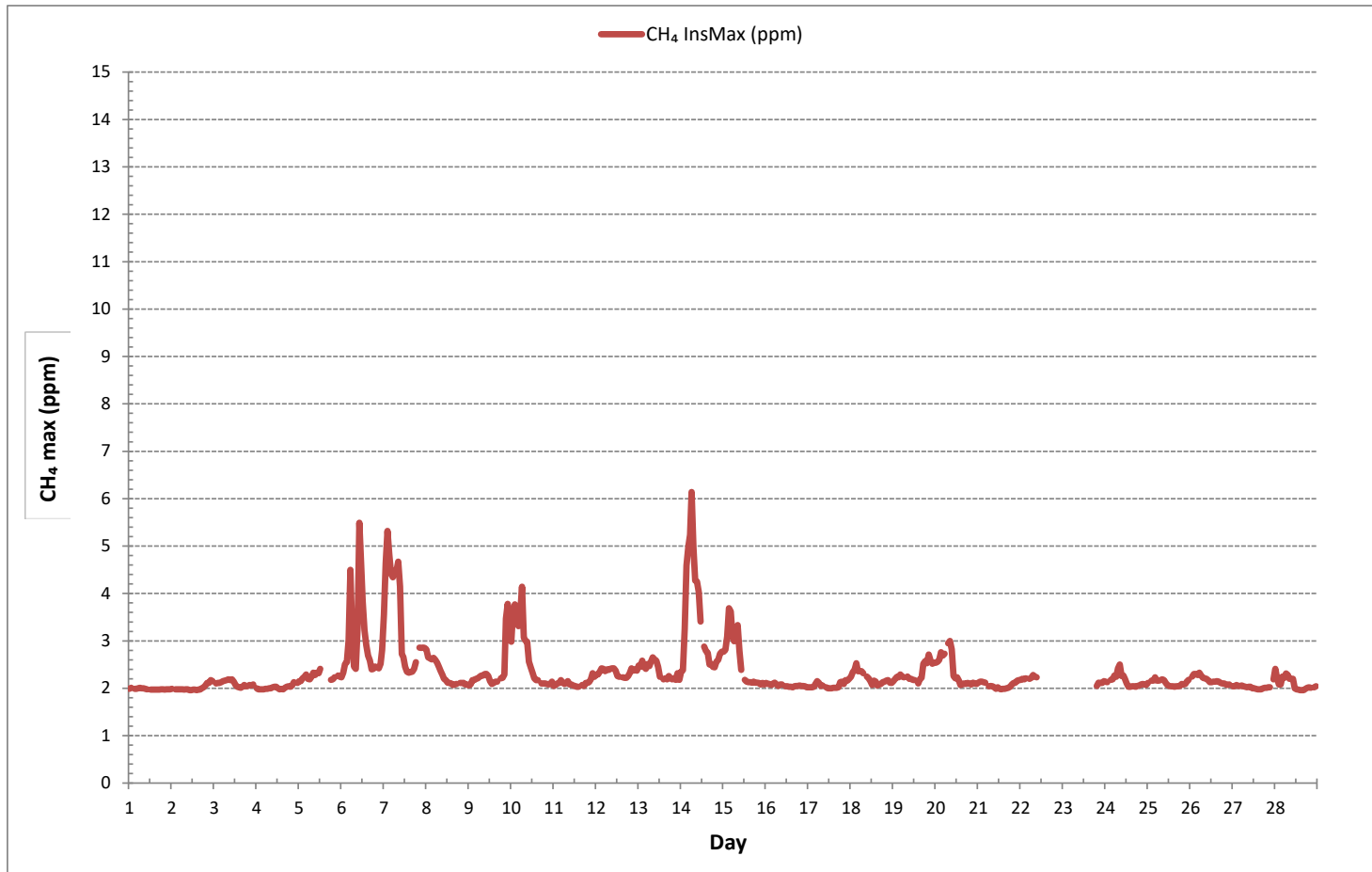
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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:	603
MAXIMUM INSTANTANEOUS VALUE:	6.14 ppm @ HOUR 6 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	637 hrs
STANDARD DEVIATION:	0.55

METHANE MAX Instantaneous Maximum (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

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	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	0.00	0.00	0.00	23
2	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
3	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
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24
5	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.08	C	C	C	C	C	0.00	0.00	0.01	S	0.00	0.00	0.00	0.08	0.01	24
6	0.00	0.00	0.01	0.00	0.02	0.09	0.03	0.00	0.00	0.02	0.13	0.10	0.04	0.08	0.01	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.00	0.13	0.02	24
7	0.04	0.11	0.14	0.11	0.08	0.08	0.12	0.12	0.13	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S	0.02	0.03	0.05	0.09	0.00	0.14	0.05	24
8	0.05	0.03	0.02	0.02	0.07	0.09	0.09	0.05	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	0.09	0.02	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.05	0.05	0.02	0.00	0.05	0.01	24
10	0.00	0.04	0.04	0.01	0.02	0.03	0.09	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	24
12	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.01	0.03	0.01	0.02	0.00	0.03	0.00	24
13	0.02	0.01	0.03	0.03	0.04	0.04	0.03	0.05	0.02	0.03	0.03	0.03	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.05	0.02	24
14	0.00	0.00	0.04	0.09	0.11	0.13	0.17	0.14	0.12	0.13	0.14	0.11	S	0.03	0.06	0.06	0.03	0.05	0.06	0.07	0.07	0.05	0.05	0.07	0.00	0.17	0.08	24
15	0.05	0.07	0.08	0.11	0.12	0.07	0.07	0.08	0.10	0.04	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	0.03	24
16	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
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	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
18	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
19	0.00	0.00	0.01	0.00	0.01	0.02	0.02	S	0.04	0.04	0.04	0.04	0.04	X	0.01	0.03	0.05	0.06	0.07	0.07	0.10	0.08	0.08	0.08	0.00	0.10	0.04	23
20	0.07	0.06	0.08	0.10	0.09	0.09	S	0.10	0.12	0.06	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.04	24
21	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
22	0.00	0.00	0.00	0.00	S	0.00	0.00	0.05	0.00	0.00	P	P	P	P	X	X	X	X	X	X	X	X	X	X	0.00	0.05	-	10
23	X	X	X	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	C1	C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	5
24	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
25	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
26	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
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.07	0.11	0.14	0.11	0.12	0.13	0.17	0.14	0.13	0.13	0.14	0.11	0.08	0.08	0.06	0.06	0.05	0.06	0.07	0.07	0.10	0.08	0.08	0.09				
HOURLY AVG	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01				

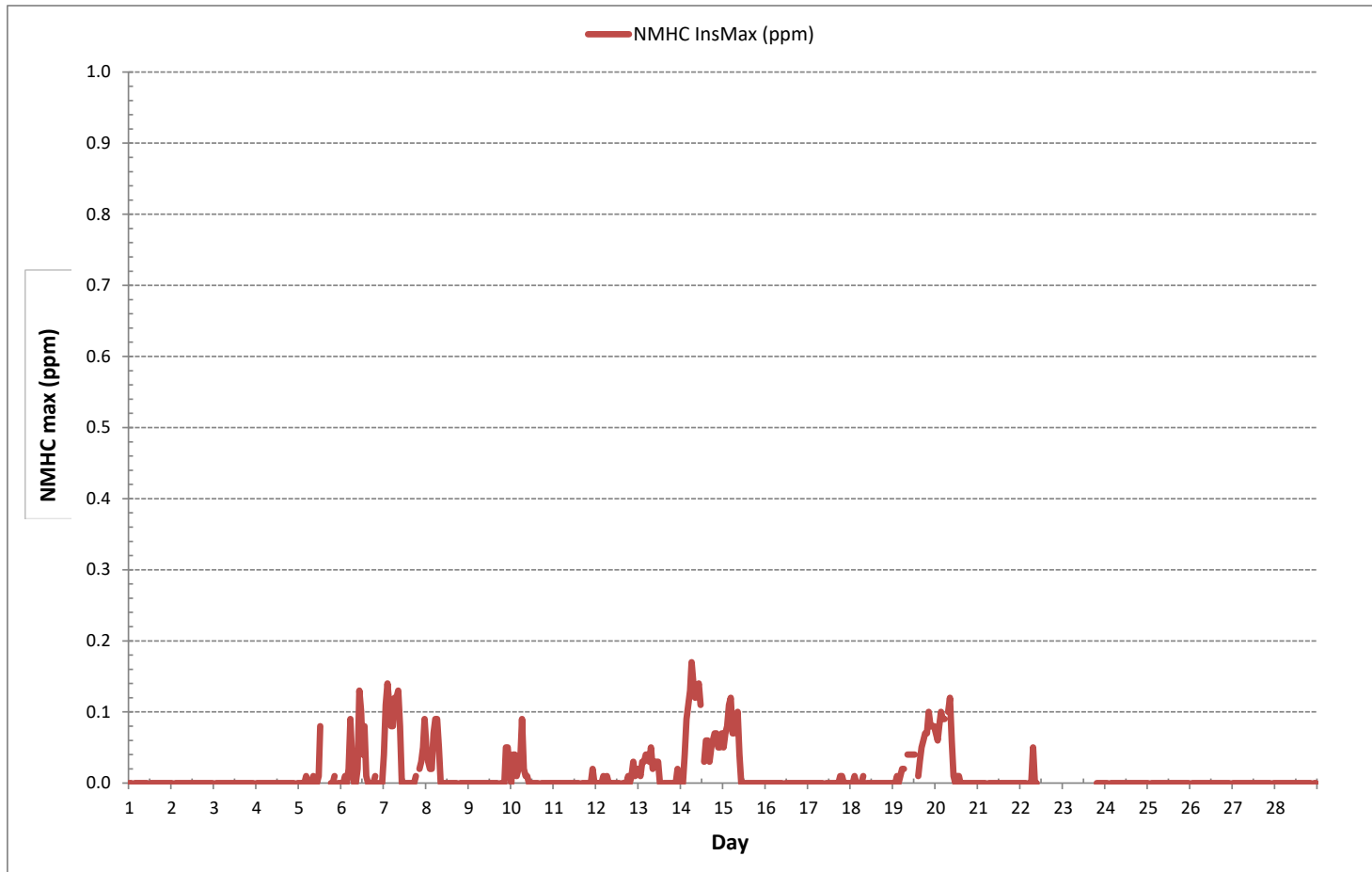
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	139
MAXIMUM INSTANTANEOUS VALUE:	0.17 ppm @ HOUR 6 ON DAY 14
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	637 hrs
STANDARD DEVIATION:	0.03

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

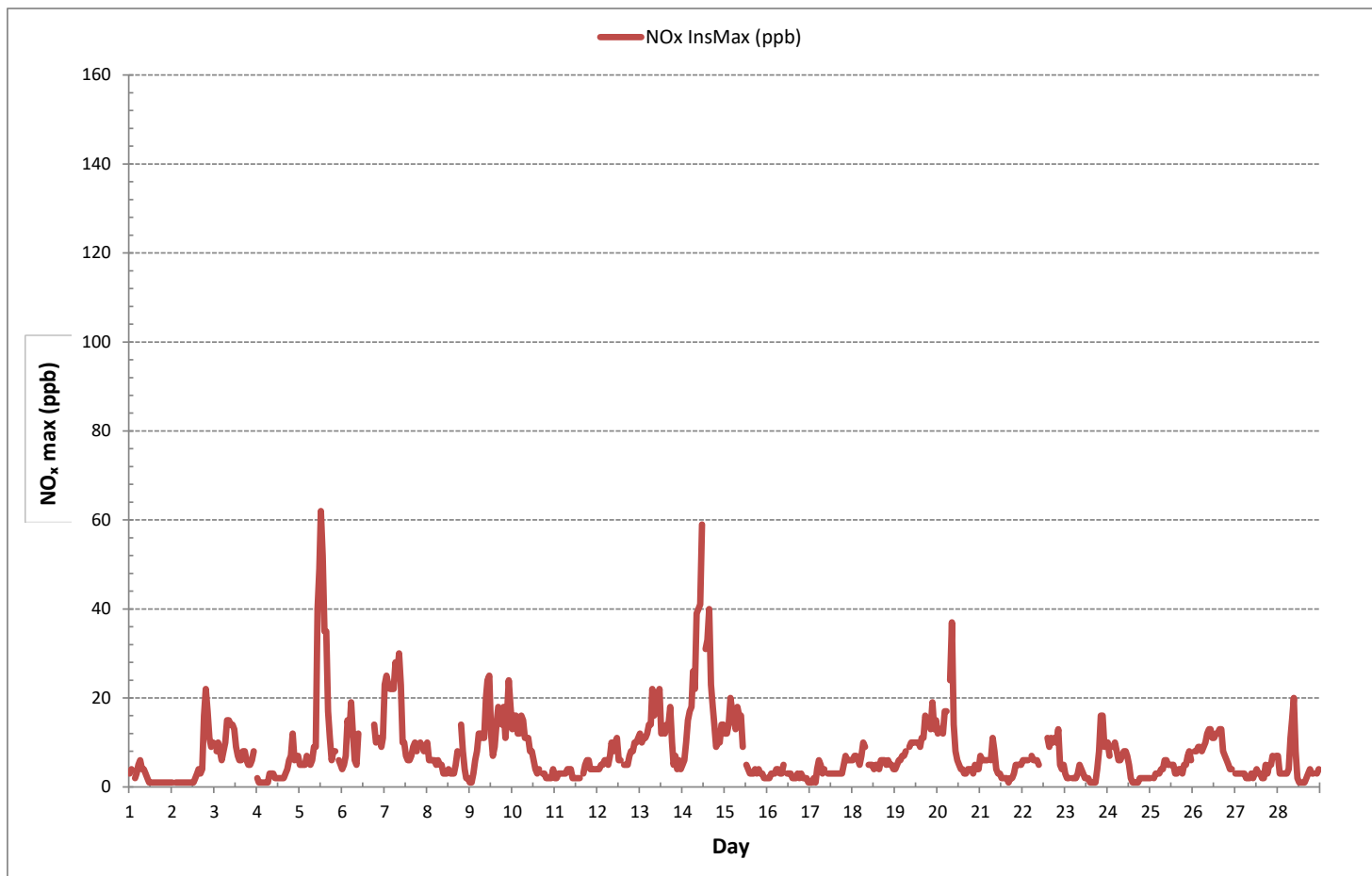
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	3	4	S	2	3	5	6	4	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	2	24
2	1	S	1	1	1	1	1	1	1	1	1	1	1	2	3	4	3	4	16	22	17	11	9	10	1	22	5	24
3	S	8	10	8	6	8	10	15	15	14	14	13	9	7	6	6	8	8	6	5	5	6	8	S	5	15	9	24
4	2	1	1	1	1	1	1	3	3	3	2	2	2	2	2	2	3	4	6	7	12	6	S	7	1	12	3	24
5	5	5	5	5	7	6	5	6	9	9	40	49	62	52	35	35	17	11	6	8	8	S	6	5	5	62	17	24
6	4	5	7	15	12	19	12	6	5	12	C	C	C	C	C	C	C	C	14	10	S	11	9	11	4	19	-	24
7	23	25	23	22	22	22	28	25	30	23	10	10	7	6	6	7	9	10	8	S	10	9	8	9	6	30	15	24
8	10	6	6	6	6	5	6	5	5	3	3	3	4	3	3	5	8	S	14	8	4	4	2	2	2	14	5	24
9	1	1	3	6	8	12	12	11	11	20	24	25	12	7	9	14	18	S	14	18	11	16	24	18	1	25	13	24
10	13	16	16	12	12	16	15	11	11	11	8	8	6	4	3	4	S	3	3	2	2	2	2	4	2	16	8	24
11	2	2	3	3	3	3	3	4	4	4	2	2	2	2	S	3	5	6	6	4	4	4	4	4	2	6	3	24
12	4	4	5	5	6	6	5	7	10	8	10	11	6	6	S	5	5	7	8	8	10	10	11	4	11	7	24	
13	12	10	11	11	12	14	14	22	16	17	19	22	12	S	12	14	14	18	10	5	7	4	6	4	4	22	12	24
14	5	6	10	15	17	18	26	22	39	40	41	59	S	31	33	40	23	18	14	9	10	10	14	14	5	59	22	24
15	12	12	14	20	17	16	13	18	16	16	9	S	5	4	3	3	3	4	3	4	3	3	2	2	2	20	9	24
16	2	2	3	3	3	4	4	3	3	5	S	3	3	3	2	2	2	3	2	3	2	2	2	1	1	5	3	24
17	1	1	2	1	4	6	5	3	4	S	3	3	3	3	3	3	3	3	5	7	6	6	6	6	1	7	4	24
18	6	7	7	6	5	7	10	9	S	5	5	5	4	5	5	4	6	6	6	5	6	5	5	4	4	10	6	24
19	4	5	6	6	7	7	8	S	9	10	10	10	10	9	11	11	16	15	15	13	19	13	15	4	19	10	24	
20	12	13	13	12	17	17	S	24	37	14	8	6	5	4	4	3	3	4	4	4	3	5	4	4	3	37	10	24
21	7	6	6	6	6	S	6	11	8	4	3	3	2	2	2	2	2	2	3	5	5	5	5	1	11	4	24	
22	6	6	6	6	S	7	6	6	6	5	P	P	P	P	11	9	11	10	11	10	13	5	4	5	4	13	8	20
23	3	2	2	S	2	2	2	3	5	4	3	2	2	2	1	1	1	1	4	8	16	16	9	10	1	16	4	24
24	10	7	S	9	10	8	6	6	7	8	8	7	5	2	1	1	1	1	2	2	2	2	2	2	1	10	5	24
25	2	S	2	3	3	3	4	4	6	6	5	5	5	5	3	3	4	4	3	5	5	7	8	6	2	8	4	24
26	S	8	8	9	9	8	9	10	12	13	13	11	11	12	12	13	13	8	7	6	5	4	4	S	4	13	9	24
27	3	3	3	3	3	3	2	2	2	3	2	3	4	3	3	2	2	5	3	5	5	7	S	7	2	7	3	24
28	7	3	3	3	3	3	4	11	15	20	8	2	1	1	1	1	2	3	4	3	3	S	3	4	1	20	5	24
HOURLY MAX	23	25	23	22	22	22	28	25	39	40	41	59	62	52	35	40	23	18	16	22	17	19	24	18				
HOURLY AVG	6	6	7	7	8	8	8	9	11	10	10	11	7	7	7	7	7	6	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:	630
MAXIMUM INSTANTANEOUS VALUE:	62 ppb @ HOUR 12 ON DAY 5
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	668 hrs





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

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	S	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
2	0	S	0	0	0	0	0	0	0	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
3	S	0	0	0	0	0	0	0	3	5	6	6	4	3	2	2	1	0	0	0	0	0	0	S	0	6	2	24	
4	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	1	0	24	
5	0	0	0	0	0	0	0	0	2	4	24	29	38	31	19	16	4	1	0	0	0	S	0	0	0	38	7	24	
6	0	0	0	0	0	0	0	0	1	6	C	C	C	C	C	C	C	C	0	0	S	0	0	0	0	6	-	24	
7	6	5	0	1	0	1	2	2	10	11	5	5	3	3	2	2	1	0	1	S	0	0	0	0	0	11	3	24	
8	0	0	0	0	0	0	0	0	1	1	1	1	2	1	1	1	1	0	S	0	0	0	0	0	0	2	0	24	
9	0	0	0	0	0	0	0	0	2	9	14	16	7	4	4	6	6	S	0	3	1	0	4	2	0	16	3	24	
10	0	0	0	0	0	0	0	0	2	4	4	4	2	2	1	1	S	0	0	0	0	0	0	1	0	4	1	24	
11	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	2	3	5	6	3	2	S	1	1	0	0	0	0	0	0	0	0	6	1	24	
13	0	0	0	0	0	1	0	2	5	8	11	13	6	S	6	6	4	2	1	0	0	0	0	0	0	13	3	24	
14	0	0	0	0	0	0	2	2	18	24	26	39	S	19	19	21	7	2	1	0	0	0	0	0	0	39	8	24	
15	0	0	0	0	0	0	0	1	5	7	4	S	2	1	1	0	0	0	0	0	0	0	0	0	0	7	1	24	
16	0	0	0	0	0	0	0	0	0	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
17	0	0	0	0	0	0	0	0	1	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24	
18	0	0	0	0	0	0	0	0	S	2	3	3	2	2	2	1	1	0	0	0	0	0	0	0	0	3	1	24	
19	0	0	0	0	0	0	0	S	2	3	3	3	3	3	2	3	2	1	0	0	0	3	0	0	0	3	1	24	
20	0	0	0	0	0	0	S	3	14	5	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	14	1	24	
21	0	0	0	0	0	S	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
22	0	0	0	0	0	S	0	1	1	2	P	P	P	P	9	3	2	1	0	0	0	0	0	0	0	9	1	20	
23	0	0	0	S	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24	
24	0	0	S	0	0	0	0	1	2	4	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
25	0	S	0	0	0	0	0	0	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	2	1	24	
26	S	0	0	0	0	0	0	1	3	5	6	5	5	4	4	5	3	1	0	0	0	0	0	S	0	6	2	24	
27	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	1	0	24	
28	0	0	0	0	0	0	0	1	6	9	4	1	1	0	0	0	0	0	0	0	0	S	0	0	0	9	1	24	
HOURLY MAX	6	5	0	1	0	1	2	3	18	24	26	39	38	31	19	21	7	2	1	3	1	3	4	2					
HOURLY AVG	0	0	0	0	0	0	0	1	3	5	5	6	4	3	3	3	1	0	0	0	0	0	0	0					

STATUS FLAG CODES

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

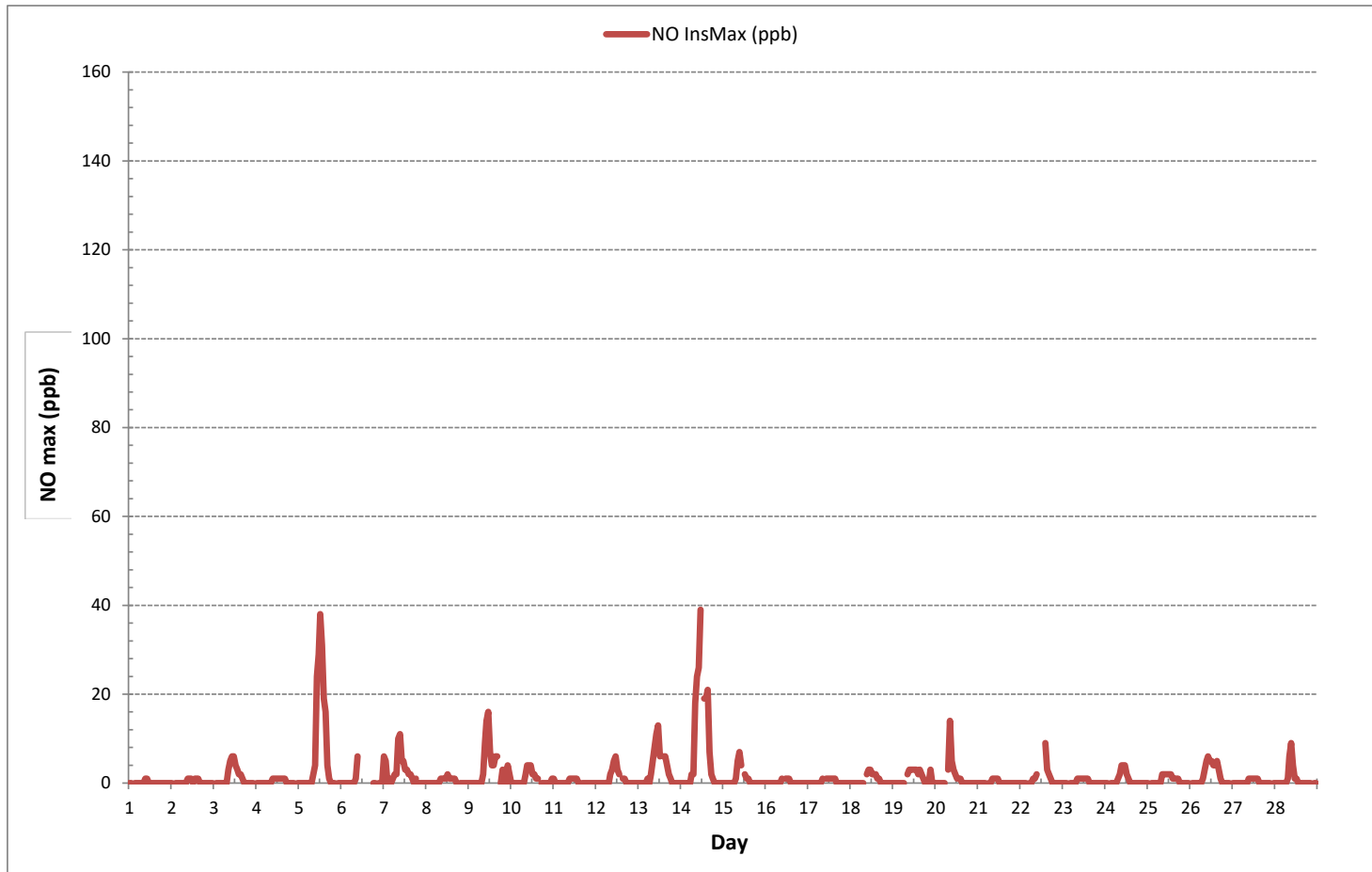
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	225
MAXIMUM INSTANTANEOUS VALUE:	39 ppb @ HOUR 11 ON DAY 14
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	668 hrs



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

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

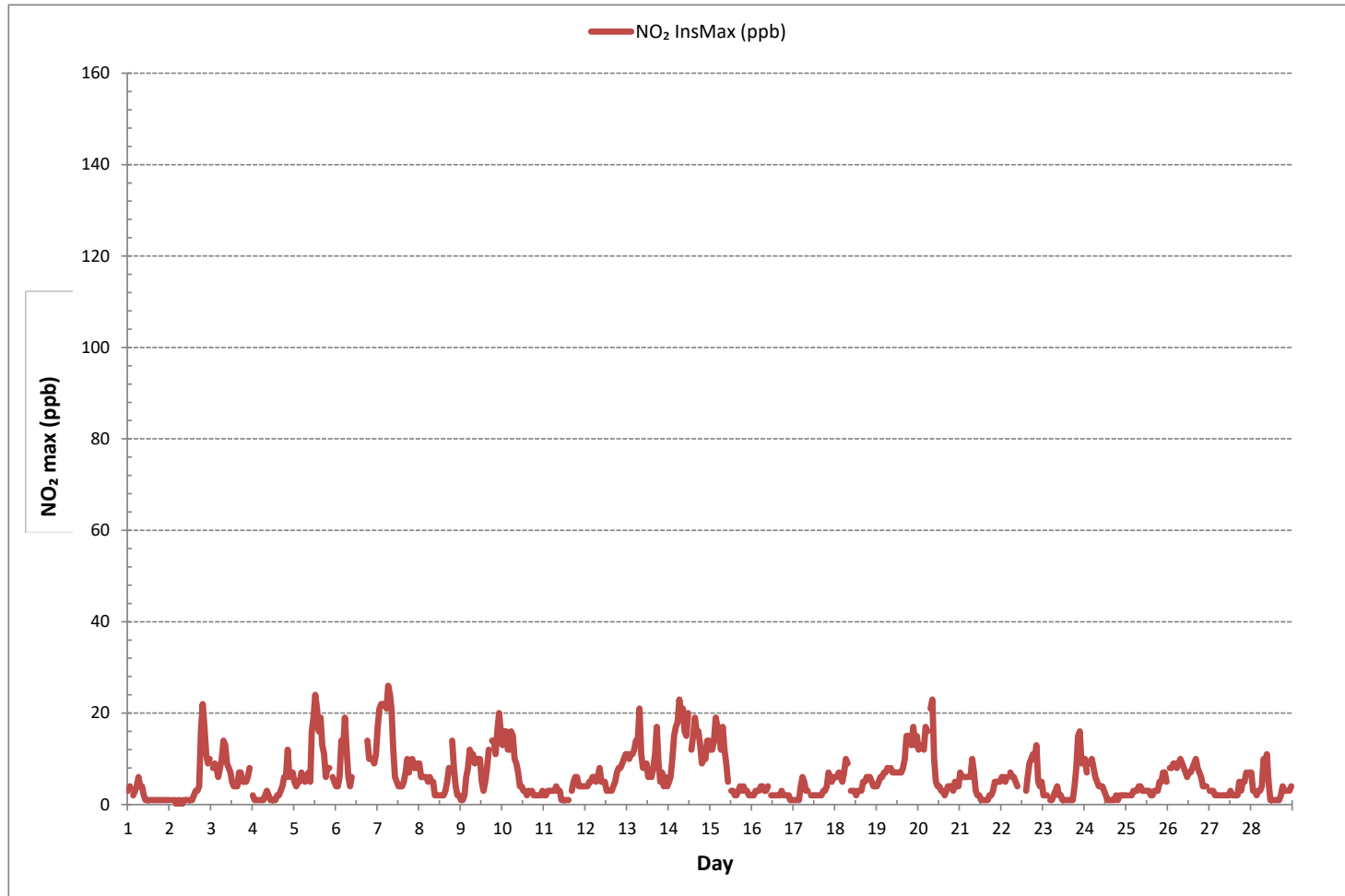
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	628
MAXIMUM INSTANTANEOUS VALUE:	26 ppb @ HOUR 6 ON DAY 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

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	29.1	28.6	S	31.9	31.3	28.0	26.6	28.8	29.6	31.6	32.7	34.2	35.1	35.8	36.0	36.4	35.9	35.4	35.2	36.1	37.2	37.1	37.4	37.4	26.6	37.4	33.4	24
2	36.9	S	35.9	36.0	35.8	35.6	35.6	36.0	36.0	36.0	36.1	36.1	36.0	35.5	35.0	34.9	34.0	23.7	19.1	22.0	25.7	25.9	25.7	19.1	36.9	32.6	24	
3	S	28.5	26.0	26.7	27.4	25.0	23.1	19.1	20.9	24.1	26.7	29.0	32.3	34.2	34.0	33.6	31.8	30.3	32.4	32.7	31.7	30.2	28.6	S	19.1	34.2	28.6	24
4	37.9	39.4	39.1	39.3	39.0	39.0	38.5	37.3	37.0	38.4	39.0	39.2	39.4	39.3	38.6	38.3	37.5	35.5	33.2	33.4	27.6	31.7	S	30.4	27.6	39.4	36.9	24
5	31.8	30.0	29.6	30.3	29.4	28.9	27.7	26.9	27.3	26.6	23.6	24.7	23.7	C	C	C	C	C	32.0	29.4	29.1	S	29.1	30.3	23.6	32.0	28.4	24
6	30.2	27.3	25.7	19.1	18.8	9.7	19.2	25.0	26.2	22.2	17.7	20.4	22.1	23.3	24.3	25.0	24.4	25.5	24.1	27.8	S	26.0	24.5	21.0	9.7	30.2	23.0	24
7	13.9	8.5	6.5	9.3	9.6	9.2	5.1	7.1	10.7	20.9	31.2	32.5	35.3	35.6	35.6	34.9	32.8	30.1	32.4	S	27.8	28.2	28.2	28.1	5.1	35.6	22.3	24
8	27.4	30.3	30.2	29.6	29.4	29.5	29.5	31.4	32.4	34.9	36.1	36.6	37.3	38.1	38.7	36.8	33.9	S	27.4	32.1	34.9	36.0	36.2	27.4	38.7	33.4	24	
9	37.2	36.8	35.5	32.0	28.6	24.1	22.9	22.1	22.8	22.6	22.7	23.8	29.2	32.0	31.1	28.1	24.9	S	22.5	22.3	23.9	16.3	13.6	19.5	13.6	37.2	25.9	24
10	21.1	18.4	19.1	23.3	23.6	18.1	19.0	25.9	27.1	28.5	31.9	33.4	35.1	36.5	37.7	37.5	S	39.2	39.0	39.1	39.4	40.6	39.7	39.8	18.1	40.6	31.0	24
11	41.2	40.4	39.7	39.2	38.8	38.9	38.9	38.3	38.4	38.8	39.8	40.0	40.4	40.9	41.2	S	40.1	37.9	36.4	35.5	36.4	34.2	34.8	34.3	34.2	41.2	38.5	24
12	33.5	32.3	31.3	30.0	29.1	28.2	29.5	26.6	26.7	28.1	27.9	28.7	30.2	30.2	S	30.6	30.2	29.1	26.4	24.7	23.5	22.7	21.3	20.2	20.2	33.5	27.9	24
13	20.0	20.2	18.6	19.0	18.0	15.8	14.4	9.8	16.2	19.5	20.8	23.7	28.7	S	29.7	28.0	26.1	21.7	27.7	30.8	29.1	30.9	28.1	29.4	9.8	30.9	22.9	24
14	25.8	24.5	18.6	12.6	9.3	6.7	2.0	7.0	10.3	15.5	18.0	19.5	S	22.8	23.0	20.2	21.6	26.1	29.0	26.8	25.0	21.2	19.7	2.0	29.0	18.6	24	
15	20.4	19.6	17.2	11.3	13.5	17.6	18.9	14.5	19.1	23.5	29.3	S	35.6	37.3	37.9	38.0	38.0	37.3	37.8	37.3	38.2	39.6	39.2	38.9	11.3	39.6	28.7	24
16	38.0	38.1	37.0	37.1	36.1	35.2	35.8	37.3	37.0	36.8	S	37.5	38.0	38.4	39.1	39.1	39.0	37.8	36.9	34.3	34.4	34.3	34.8	35.3	34.3	39.1	36.8	24
17	35.3	35.3	34.9	34.6	31.7	29.7	28.7	32.6	31.5	S	34.3	34.7	35.0	34.8	34.7	34.3	33.8	33.1	32.0	30.6	28.1	29.1	30.5	29.6	28.1	35.3	32.6	24
18	30.1	28.3	28.0	27.7	27.9	26.3	22.8	23.9	S	28.2	28.3	31.5	33.7	33.4	33.8	34.4	33.6	32.0	31.5	32.7	33.2	33.4	35.1	35.6	22.8	35.6	30.7	24
19	34.3	32.2	30.5	30.3	28.6	28.4	27.8	S	27.6	29.2	30.5	32.1	33.6	35.7	37.6	34.8	33.0	25.6	26.0	26.8	27.0	24.6	26.4	23.6	23.6	37.6	29.8	24
20	25.2	23.8	21.6	21.7	17.2	16.5	S	10.8	10.9	20.5	25.6	29.1	31.7	35.2	38.3	37.0	34.2	31.0	30.2	30.2	30.1	29.3	31.0	31.5	10.8	38.3	26.6	24
21	28.8	29.4	29.2	28.9	29.0	S	32.7	29.2	32.2	35.4	36.9	37.6	39.6	40.1	40.4	40.6	40.7	40.3	40.0	38.5	36.3	35.4	35.1	35.0	28.8	40.7	35.3	24
22	34.4	34.3	34.5	33.1	S	32.6	33.3	34.1	34.7	36.1	P	P	P	P	33.6	36.2	34.4	32.9	30.5	31.8	26.7	33.5	34.7	32.3	26.7	36.2	33.4	20
23	38.8	38.9	38.5	S	38.9	38.7	38.1	36.8	35.4	36.4	37.5	38.1	38.5	38.8	39.4	39.6	38.8	38.3	35.9	31.7	25.7	25.1	30.2	28.8	25.1	39.6	35.9	24
24	28.8	31.4	S	28.0	26.7	26.2	26.3	25.1	26.1	28.0	29.8	32.0	34.5	36.6	37.8	38.1	38.4	38.1	38.2	39.1	39.4	39.9	40.0	39.8	25.1	40.0	33.4	24
25	39.5	S	38.9	38.5	37.4	37.0	36.5	35.4	34.5	35.1	37.2	38.3	39.2	39.5	40.6	40.9	39.4	39.5	40.0	38.0	37.6	34.7	33.6	34.3	33.6	40.9	37.6	24
26	S	29.9	29.7	28.9	29.1	28.7	30.2	30.0	31.1	31.6	33.2	35.3	36.0	35.8	35.1	34.7	33.9	35.6	36.2	37.1	38.1	38.7	38.2	S	28.7	38.7	33.5	24
27	39.8	41.0	40.6	41.0	40.9	40.8	41.4	41.8	42.3	42.6	43.6	44.4	44.7	45.1	45.2	45.9	45.3	42.2	43.3	41.8	40.6	38.7	S	36.5	36.5	45.9	42.2	24
28	34.9	38.9	38.8	39.3	38.9	38.0	35.7	30.6	30.8	30.6	37.4	44.1	45.1	45.7	45.5	45.3	44.8	41.7	37.0	35.9	36.4	S	35.2	29.0	29.0	45.7	38.2	24
HOURLY MAX	41.2	41.0	40.6	41.0	40.9	40.8	41.4	41.8	42.3	42.6	43.6	44.4	45.1	45.7	45.5	45.9	45.3	42.2	43.3	41.8	40.6	40.6	40.0	39.8				
HOURLY AVG	31.3	30.2	29.8	28.8	28.3	27.1	27.4	26.8	28.0	29.7	31.1	32.9	35.0	36.0	36.3	35.6	34.8	33.8	32.8	32.3	31.8	31.5	31.2	30.9				

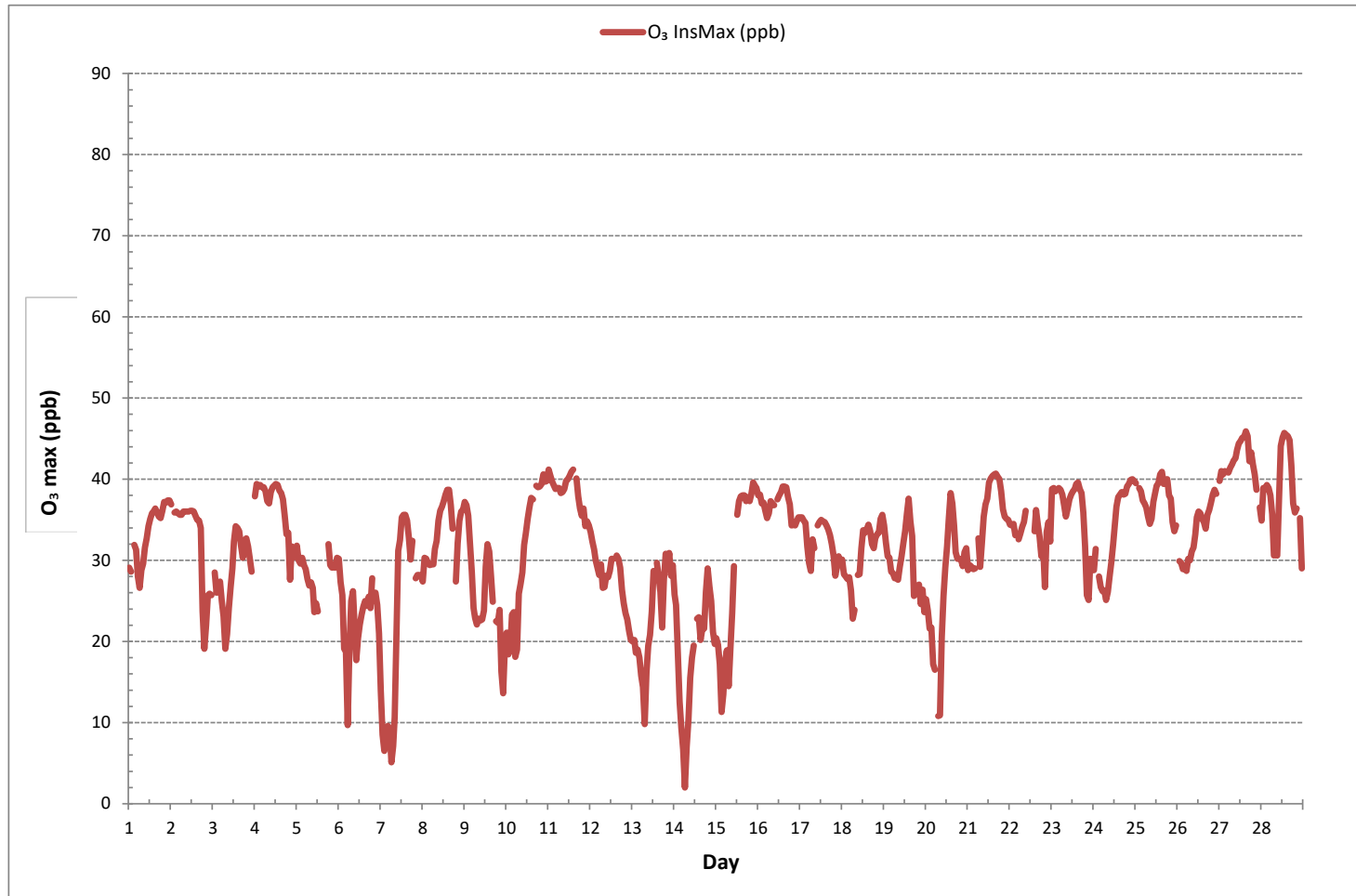
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	633
MAXIMUM INSTANTANEOUS VALUE:	45.9 ppb @ HOUR 15 ON DAY 27
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	7.6

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville East Site Continuous Monitoring Station - February 2019

WIND SPEED Instantaneous Maximum (WS kph)

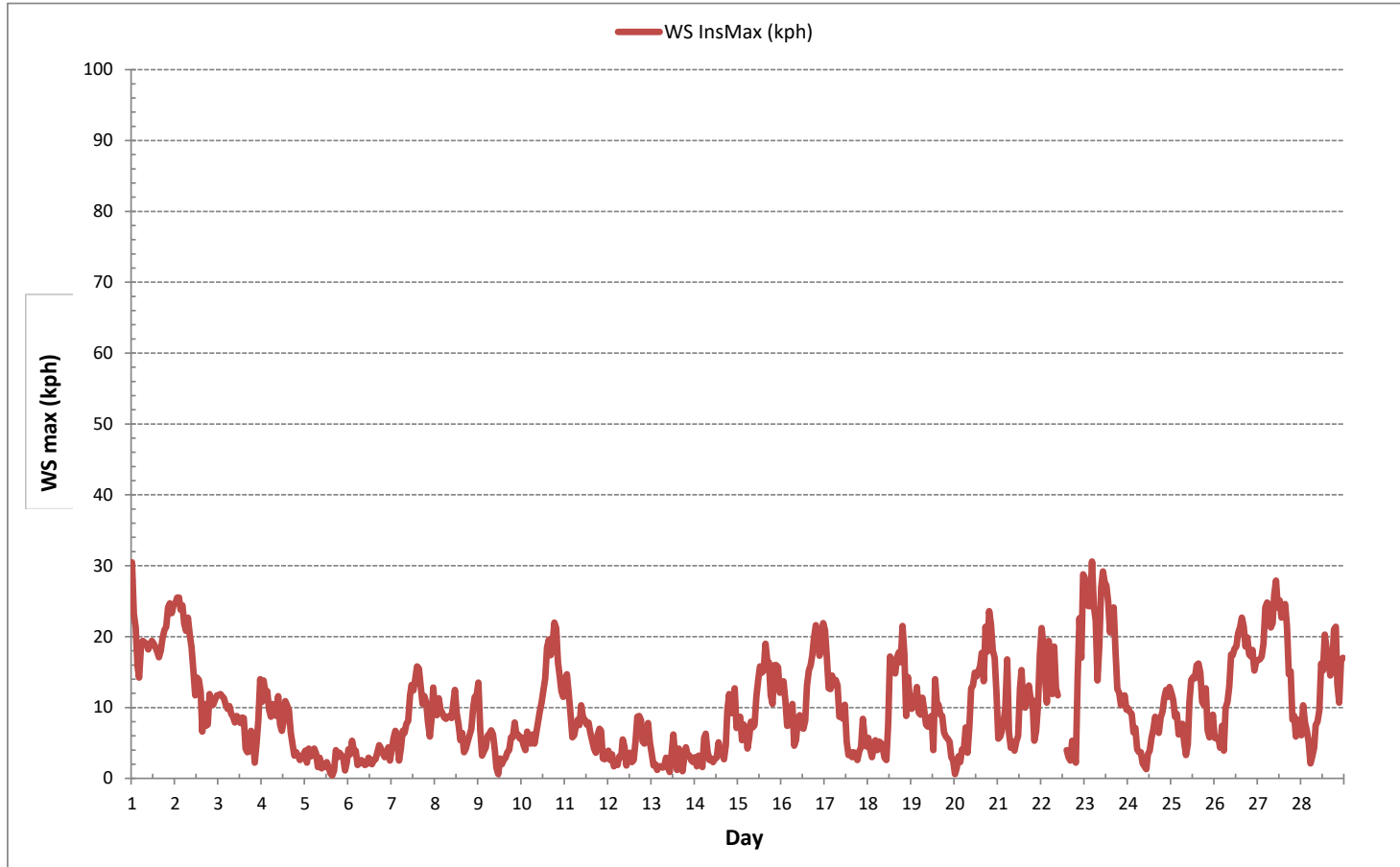
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	30.5	23.2	21.3	15.8	14.2	18.5	19.4	19.2	19.0	18.2	18.8	19.4	19.0	18.5	17.8	17.1	18.0	19.8	20.9	21.4	24.1	24.7	23.3	24.5	14.2	30.5	20.3	24
2	24.7	25.5	25.5	23.8	24.4	21.8	20.8	22.7	20.3	18.5	15.2	11.7	14.2	13.9	12.2	6.6	10.5	7.4	7.6	11.9	10.4	10.4	11.1	11.7	6.6	25.5	15.9	24
3	11.7	11.9	11.6	11.3	10.4	9.8	10.2	9.1	8.7	7.9	8.8	8.4	7.8	8.6	8.5	4.2	3.7	3.8	6.7	6.1	2.2	4.9	8.3	14.0	2.2	14.0	8.3	24
4	10.8	13.8	12.1	12.3	9.7	8.7	10.5	9.6	8.8	11.6	7.6	6.7	8.1	10.9	10.3	9.6	6.5	4.8	3.2	3.7	3.2	2.6	2.9	3.4	2.6	13.8	8.0	24
5	3.9	2.2	4.2	3.1	3.2	4.2	3.5	1.6	2.9	1.4	2.1	1.6	2.3	1.6	0.7	0.4	1.1	4.0	3.0	3.6	3.3	2.9	1.1	2.3	0.4	4.2	2.5	24
6	4.1	3.4	5.3	3.9	3.9	1.9	2.1	2.6	2.4	1.9	2.0	2.9	2.7	2.0	2.6	2.7	3.7	4.7	4.2	3.5	3.0	3.3	4.4	2.5	1.9	5.3	3.2	24
7	4.0	5.7	6.7	6.1	2.5	4.2	6.7	6.4	7.7	8.1	11.7	13.2	12.4	14.0	15.8	15.5	13.0	10.5	11.6	10.7	7.9	5.9	8.6	12.8	2.5	15.8	9.2	24
8	9.5	8.9	11.3	9.7	9.2	8.6	8.4	8.7	8.8	8.5	10.4	12.5	9.2	7.6	5.4	6.4	3.7	4.2	5.2	6.1	7.0	10.0	11.5	11.6	3.7	12.5	8.4	24
9	13.5	6.9	3.2	3.8	4.3	6.0	6.3	6.8	6.2	4.0	1.5	0.6	2.8	2.0	2.6	2.9	3.7	4.0	5.8	5.8	7.9	6.3	6.2	5.6	0.6	13.5	4.9	24
10	5.8	4.7	4.0	6.6	5.3	4.9	6.2	4.9	6.5	7.8	9.4	10.7	12.4	14.1	18.5	19.6	17.4	18.9	22.0	21.2	16.3	14.6	12.3	11.5	4.0	22.0	11.5	24
11	14.0	14.7	12.0	9.1	5.8	6.1	7.5	8.3	7.5	10.3	8.5	8.3	7.6	7.9	6.4	5.3	4.2	3.6	6.2	7.0	6.7	2.8	2.7	3.5	2.7	14.7	7.3	24
12	3.9	2.6	3.4	1.7	2.1	1.9	3.1	3.0	5.5	4.4	1.8	3.5	3.6	2.3	2.6	5.2	8.7	8.8	8.2	5.2	4.9	6.1	7.8	5.1	1.7	8.8	4.4	24
13	3.5	1.8	2.0	1.2	1.7	1.7	1.5	1.7	2.9	1.6	0.9	3.4	6.2	2.9	1.2	4.2	3.2	1.0	3.0	4.4	3.2	3.2	2.5	2.3	0.9	6.2	2.5	24
14	3.0	1.7	3.2	2.8	1.6	5.7	6.3	3.8	2.6	2.8	2.3	2.8	2.9	5.1	4.0	3.5	2.7	4.7	9.7	11.9	9.2	9.2	12.7	7.1	1.6	12.7	5.1	24
15	8.3	8.7	5.4	7.6	7.0	4.2	5.6	8.0	7.2	7.5	11.5	13.9	15.8	14.9	15.2	19.0	16.5	16.4	11.7	10.5	16.0	16.0	15.7	12.1	4.2	19.0	11.4	24
16	13.1	13.7	11.0	7.4	7.5	9.2	10.5	4.6	5.4	8.4	8.9	7.2	7.0	8.1	13.1	15.2	16.0	17.3	19.9	21.6	19.9	17.3	19.8	21.9	4.6	21.9	12.7	24
17	20.9	17.1	12.7	12.6	14.5	13.2	13.9	13.1	8.7	8.7	8.4	10.4	5.2	3.3	3.7	3.0	3.7	3.3	2.6	3.8	4.4	8.4	5.7	4.5	2.6	20.9	8.6	24
18	5.7	4.1	3.0	4.5	5.4	4.0	5.2	5.0	4.3	2.9	2.6	7.6	17.2	16.6	15.5	14.8	17.1	17.8	16.4	21.5	17.6	8.8	14.3	11.2	2.6	21.5	10.1	24
19	9.8	10.1	11.2	12.9	9.3	9.0	11.4	9.7	7.6	7.3	8.5	8.8	4.0	14.0	10.4	10.4	9.0	8.8	6.5	5.9	5.6	5.2	3.0	2.5	2.5	14.0	8.4	24
20	0.6	1.5	3.1	2.3	4.1	4.0	7.2	3.6	7.2	12.7	13.1	14.9	14.4	15.2	15.8	17.7	13.7	21.4	17.9	23.6	21.7	18.0	17.0	12.0	0.6	23.6	11.8	24
21	5.6	5.9	6.6	7.8	10.1	16.8	6.4	4.3	5.2	3.9	5.2	6.0	12.7	15.3	10.1	10.0	10.7	13.1	11.2	11.0	5.3	6.7	10.3	17.4	3.9	17.4	9.1	24
22	21.2	19.0	14.2	10.7	19.4	12.3	11.9	18.6	12.7	11.7	P	P	P	P	4.0	3.0	2.5	5.3	3.3	2.2	14.2	22.6	17.0	28.8	2.2	28.8	12.7	20
23	28.3	25.8	24.3	24.3	30.6	24.3	22.3	13.8	18.7	26.9	29.2	27.6	27.2	24.9	20.6	23.2	24.1	18.0	12.6	12.1	10.3	10.4	11.7	9.7	9.7	30.6	20.9	24
24	9.9	9.4	9.1	6.5	7.1	4.1	3.7	3.7	2.1	1.7	1.3	3.4	3.9	5.7	6.9	8.7	7.5	6.4	8.6	9.4	11.4	12.5	11.5	12.9	1.3	12.9	7.0	24
25	12.1	11.1	8.7	9.1	6.2	7.1	7.7	5.1	3.3	4.8	10.7	13.9	14.3	14.1	16.0	16.2	14.9	10.8	10.3	12.7	6.8	5.8	6.7	9.0	3.3	16.2	9.9	24
26	5.7	5.6	5.7	4.3	7.4	3.9	10.0	10.8	13.0	17.5	17.4	18.3	18.6	20.5	21.3	22.7	21.5	18.6	19.9	17.5	17.2	18.1	15.2	16.5	3.9	22.7	14.5	24
27	16.7	16.8	17.2	19.0	24.1	24.8	24.5	21.3	21.9	25.9	27.9	24.1	25.1	22.7	24.1	24.6	21.4	14.7	15.1	8.3	8.8	5.9	8.3	7.4	5.9	27.9	18.8	24
28	6.1	10.3	7.9	6.7	5.2	2.1	3.1	4.3	7.5	8.0	9.6	16.2	15.2	20.3	18.2	16.5	14.5	15.6	21.0	21.4	13.3	10.7	16.6	17.0	2.1	21.4	12.0	24
HOURLY MAX	30.5	25.8	25.5	24.3	30.6	24.8	24.5	22.7	21.9	26.9	29.2	27.6	27.2	24.9	24.1	24.6	24.1	21.4	22.0	23.6	24.1	24.7	23.3	28.8				

STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	30.6	kph	@ HOUR	4	ON DAY	23
OPERATIONAL TIME:					668	hrs



1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than $\pm 10\%$ from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO₂/NO_x and CH₄/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, 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.

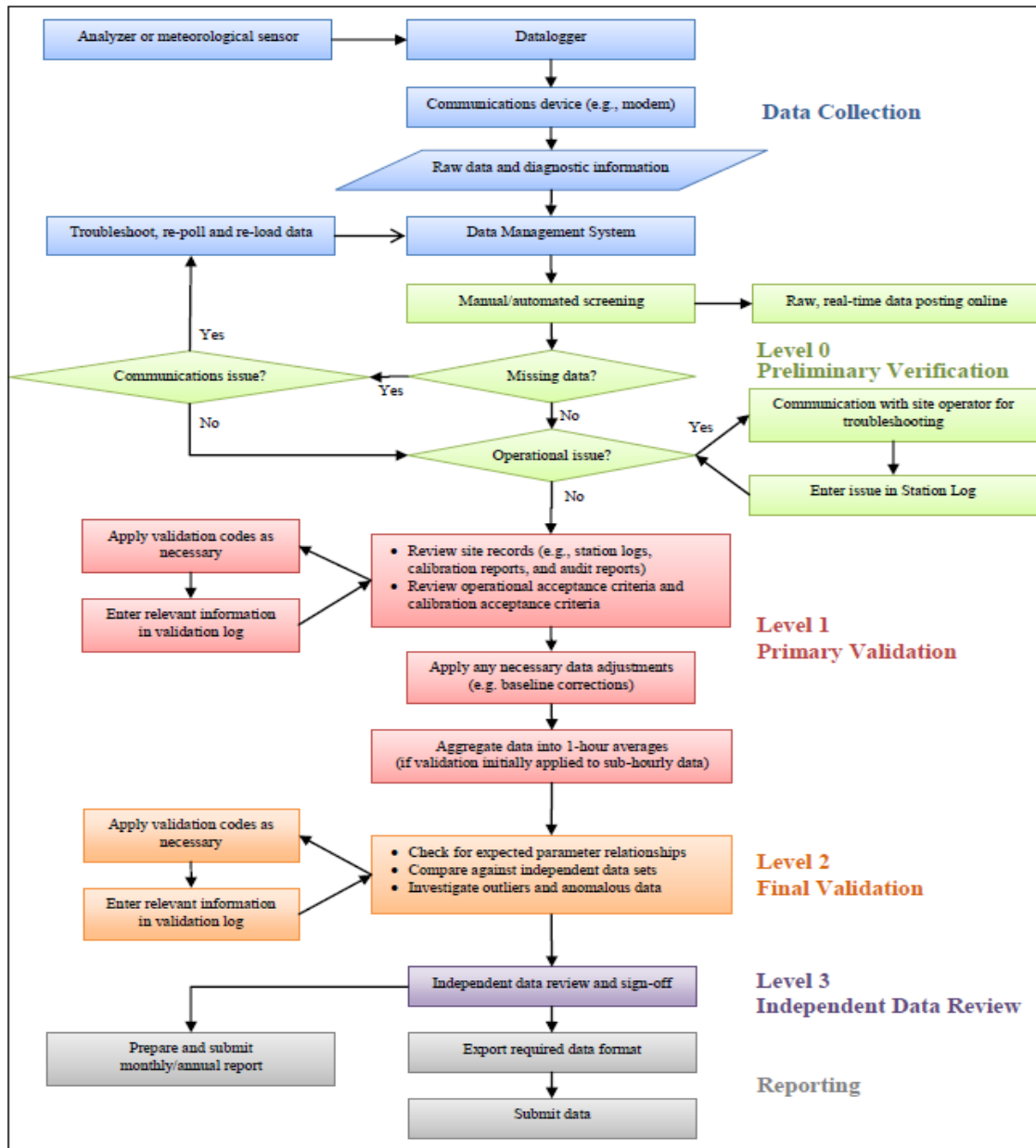
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

AMD Data Verification and Validation Process

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

<p>Level 0 Preliminary Verification</p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p>Level 1 Primary Validation</p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p>Level 2 Final Validation</p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p>Level 3 Independent Data Review</p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p>Post-Final Validation</p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2019-02-39-C</u>
Site: <u>Bonnyville East Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u><i>bimadeniji</i></u>	Date <u>18- Mar- 2019</u>
Level 1 Primary Validation	<u><i>bimadeniji</i></u>	Date <u>18- Mar- 2019</u>
Level 2 Final Validation	<u><i>bimadeniji</i></u>	Date <u>20- Mar- 2019</u>
Level 3 Independent Data Review	<u><i>msalmbg</i></u>	Date <u>21- Mar- 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.

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Lakeland Industry & Community Association

FEBRUARY 2019
Ambient Air Monitoring Calibration Report
- COLD LAKE SOUTH STATION-
CAL-LICA-201902-01174

Station Operation and Maintenance:
Maxxam Analytics

Data Validation and Report:
Maxxam Analytics

April 2, 2019

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

April 2, 2019

Subject:

February 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Cold Lake South Station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Cold Lake South AQM Station in the month of February 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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


Respectfully,



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



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



FEBRUARY 1 - 28, 2019
MONTHLY CALIBRATION REPORT
Project #: 2833-2019-02-23-C
LICA-201902

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

Monitoring Station

**Cold Lake South Continuous Monitoring
Station**

Date of Report Issuance: March 26, 2019



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

CAL-LICA-201902-01174



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date:	February 8, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	962	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mix of sun and clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:17	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:06	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:	January 8, 2019	As Found C.F.:	1.026		
Previous 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: 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>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

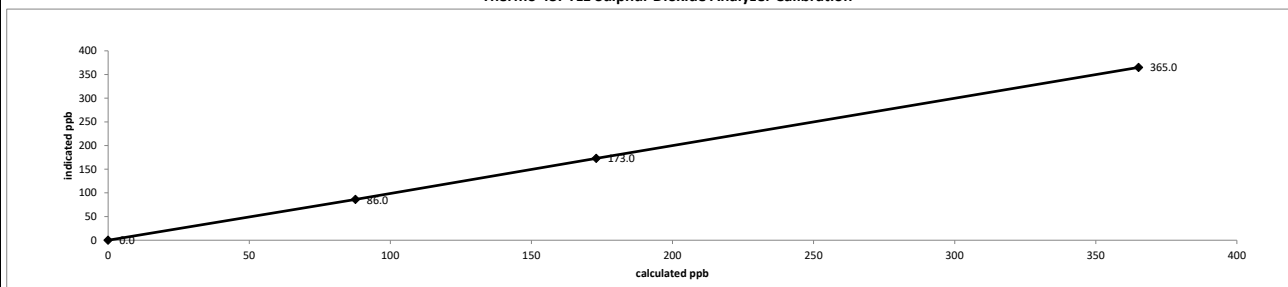
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	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	356	1.026
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	86	1.019
calibrator zero	4895	0.00	4895	0.0	0	n/a
Average C.F. =						1.007

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) =	0.12%		± 3% F.S.
% change in C.F. from last cal =	-2.58%		± 10%

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



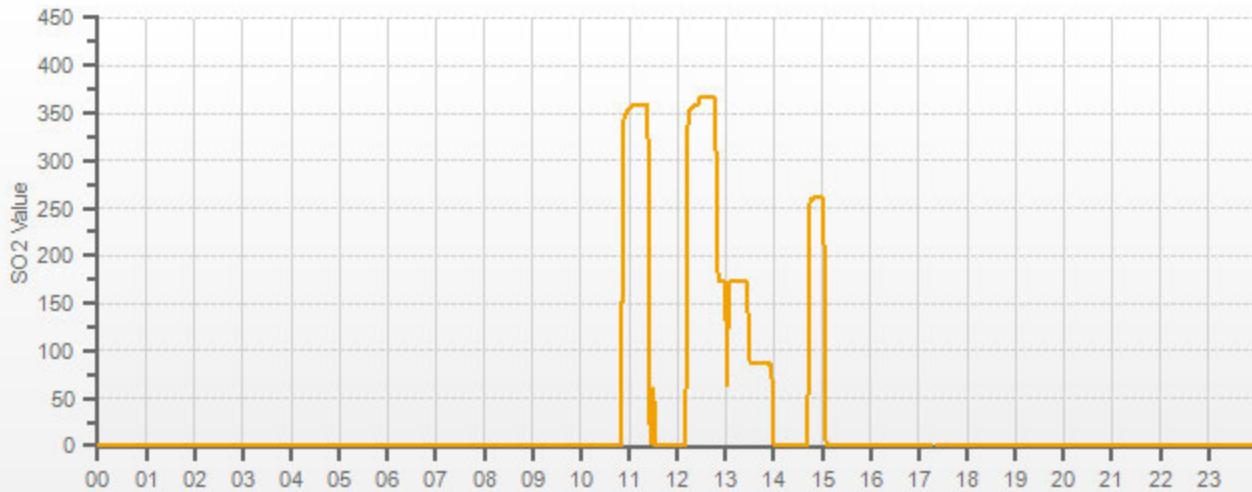
As found:	As left:		
Bkg:	1.75	Bkg:	2.01
Coef:	1.020	Coef:	1.040
Pmt:	-690.8	Pmt:	-690.8
Flash:	1.045	Flash:	1043
Internal:	32.8	Internal:	32.7
Chamber:	44.9	Chamber:	44.8
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.28	Perm Oven Heater:	44.28
Pressure:	696.5	Pressure:	697.4
Sample Flow:	0.456	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:	260.0	Expected Value:	260.0

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 Mid-point was re-started due to the scheduled ZS check interrupting the calibration at 13:00.

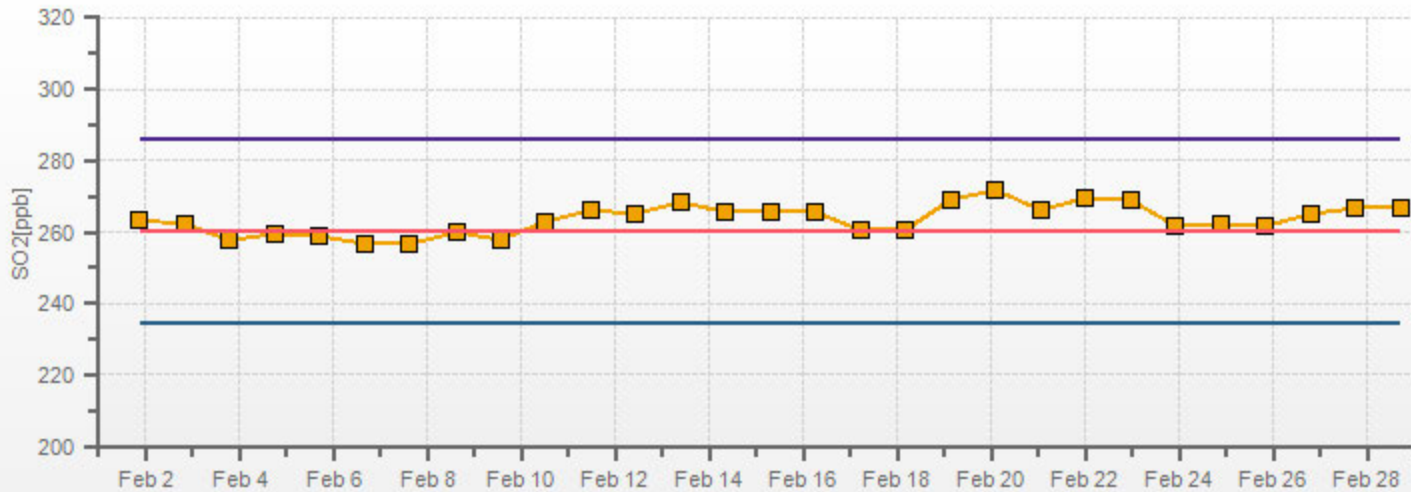
SO2[ppb]



CAL-LICA-201902-01174

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	February 8, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	962	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mix of sun and clouds		
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:17	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:05	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:	812728560 LICA	Range ppb:	100		
Last Calibration Date:	January 8, 2019	As Found C.F.:	0.992		
Previous C.F.:	0.999	New C.F.:	0.999		

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

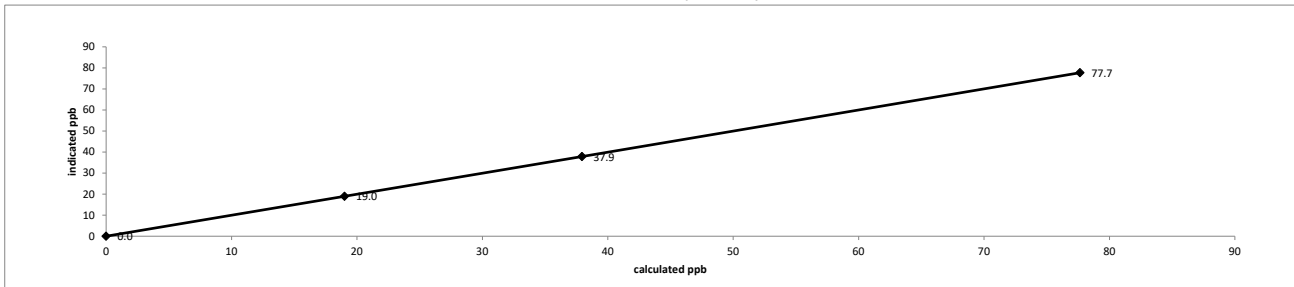
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0	n/a
as found high	7441	61.00	7502	77.7	78.3	0.992
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7441	61.00	7502	77.7	77.7	0.999
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	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 =	0.73%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:		As left:	
Bkg:	15.0	Bkg:	14.9
Coef:	0.906	Coef:	0.903
Pmt:	-650.5	Pmt:	-650.5
Flash:	745	Flash:	744
Internal:	34.1	Internal:	34.2
Chamber:	44.9	Chamber:	45.3
Converter Temp:	324.4	Converter Temp:	327.5
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.37	Perm Oven Htr:	44.37
Pressure:	643.1	Pressure:	642.2
Sample Flow:	0.498	Sample Flow:	0.498
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	37.0	Expected Value:	36.2

Comments:

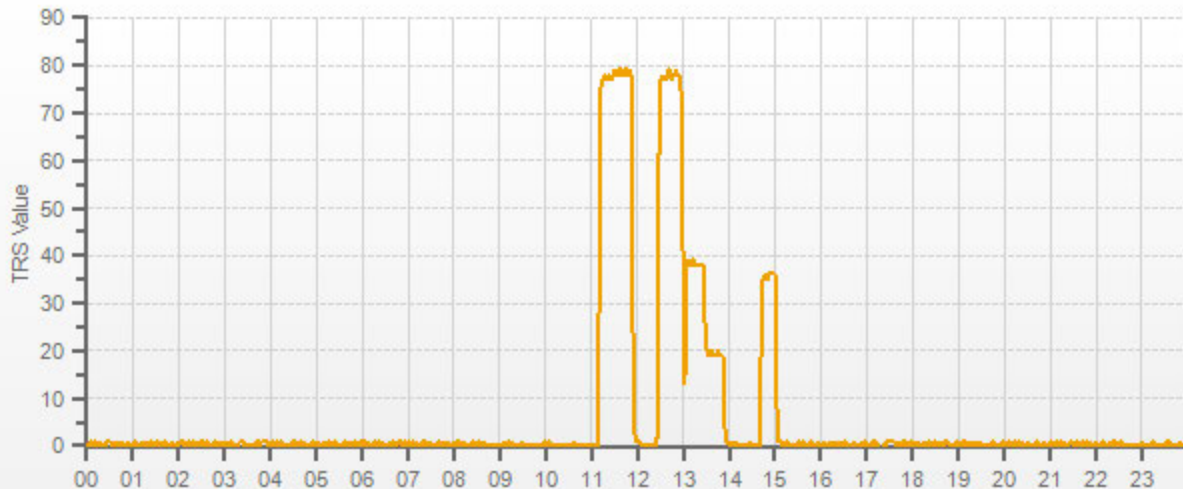
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

The Mid-point was re-started due to the scheduled ZS check interrupting the calibration at 13:00.

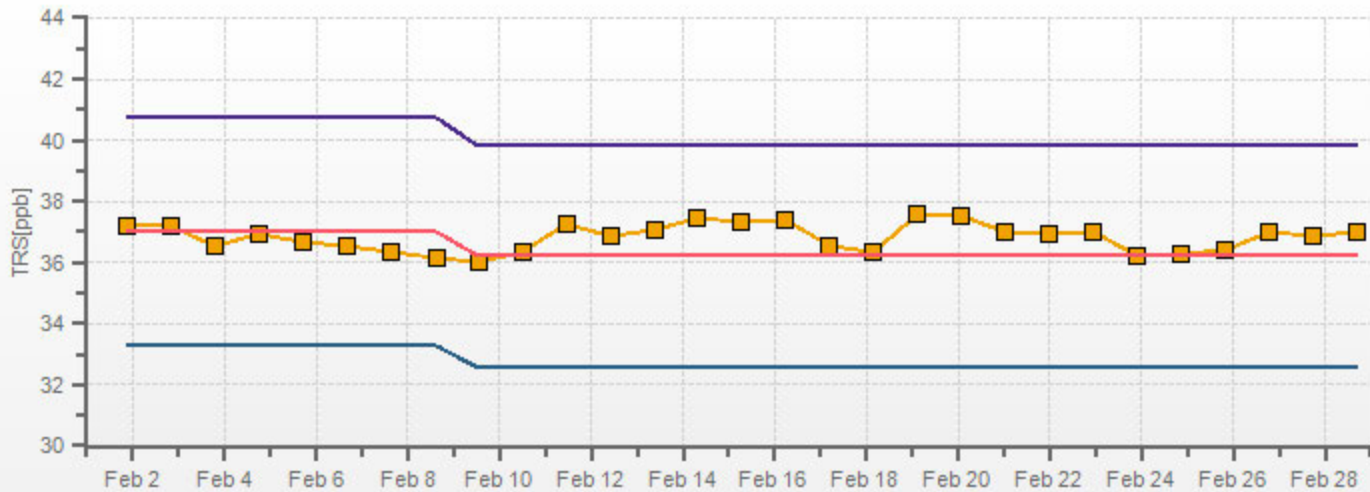
— TRS[ppb]



CAL-LICA-201902-01174

TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 7, 2019	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 961 millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 21 °C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: CH4 / NMHC / THC	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 11:17 / 15:14	Performed By/Reviewer: Alex Yakupov Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026

Analyzer:	Correction Factors:
Serial Number/Owner: 1180320044 LICA	Previous C.F.: As Found C.F.: New C.F.:
Measured Flow: 0.946	CH ₄ = 1.000 0.985 1.000
Last Calibration Date: January 25, 2019	NMHC = 1.000 1.003 1.000
Range ppm: 20 CH4/20 NMHC/40 THC	THC = 1.000 0.994 1.000

Calibrator 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 29687 CH4 Cylinder Conc.: 598.0 198.0 = C ₂ H ₆ Cylinder Conc. CH₄ expressed as C₂H₆: 544.5 1142.5 = total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>CH4</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH4	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH4	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	2469	57.64	2527	13.64	12.42	26.06	13.85	12.38	26.23	0.985	1.003	0.994
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	2469	57.64	2527	13.64	12.42	26.06	13.64	12.42	26.06	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.37	6.71	14.07	1.006	1.006	1.007
low	2486	14.00	2500	3.35	3.05	6.40	3.32	3.05	6.37	1.009	1.000	1.004
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. =										1.005	1.002	1.004

Linear Regression/Calibration Results:

Correlation Coefficient =	CH ₄	NMHC	THC	LIMITS		
	1.000	1.000	1.000		> or = 0.995	
	Slope =	1.000	0.999		1.000	0.95-1.05
	b (Intercept as % of full scale) =	-0.10%	-0.03%		-0.07%	± 3% F.S.
	% change in C.F. from last cal =	1.51%	-0.32%		0.65%	± 10%

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply: -296.8	Calibration History cnt'd:	NM Peak Area: 89055
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
Cylinder Pressures/reg.:	Internal: 34.1	Run History>1:	NMHV Start: n/a
	Carrier: 1500 50		NMHC End: n/a
	Fuel: 600 50		Date: Feb 07, 2019
Internal Pressures:	Span Gas: 900 10	Time: 11:25	CH ₄ PK HT: 0
	Zero Air Generator: 50	CH ₄ PK RT: 12.4	CH ₄ Baseline: 2815
	Carrier: 29.4	CH ₄ LOD: 36	CH ₄ SD: 12
FID Status:	Fuel: 44.2	CH ₄ CONC: 0.00	NM PK HT: 0
	Air: 30.2	NM Peak Area: 0	NM CONC: 0.00
	Status: LIT	NM Base Start: 2799	NM Base End: 2805
Flame and Power Stats:	Counts: 32010	NM LOD: 16	NM Start IDX: 4
	Flame: 342.0	NM Min Slope: -4.1e-01	NM End IDX: 41
	Det Base: 175.0	NM PT Count: 0	NM Max Slope: 8.3e-01
Calibration History:	Det Oven at Start: 14.4	Previous CH ₄ : 10.06	Previous NMHC: 10.70
	Col Oven at Start: 17.1	Previous THC: 20.75	New CH ₄ : 10.16
	Time: Jan 25, 2019, 14:09	New NMHC: 10.77	New THC: 20.93
	Type: SPAN		
	Status: GOOD		
	Check/Adjust: ADJUST		
	CH ₄ Span Conc: 13.56		
	CH ₄ SP Ratio: 0.000782		
	CH ₄ RT: 13.2		
	CH ₄ PK IDX: 26		
	CH ₄ PK HT: 17347		
	NM Span Conc: 12.34		
	NM SP Ratio: 0.000139		

Comments:

The analyzer sample inlet filter was changed.

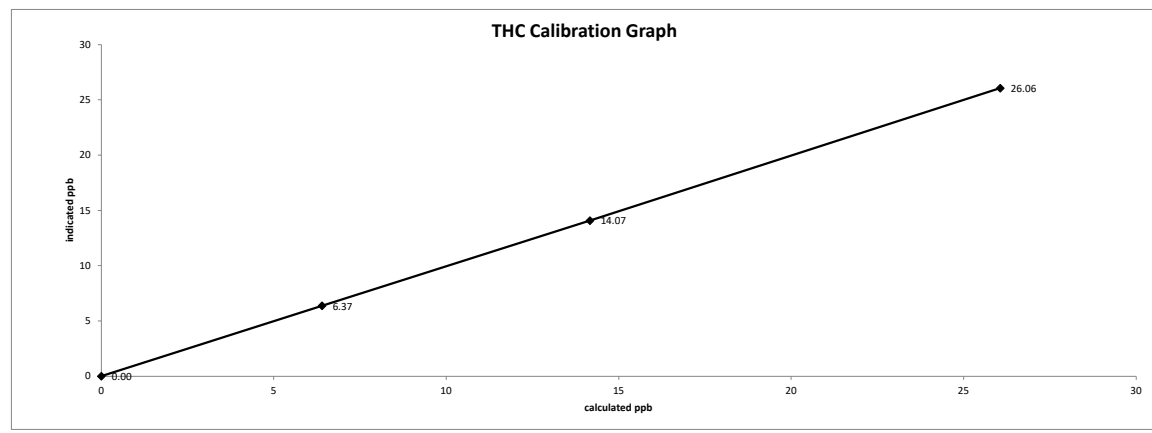
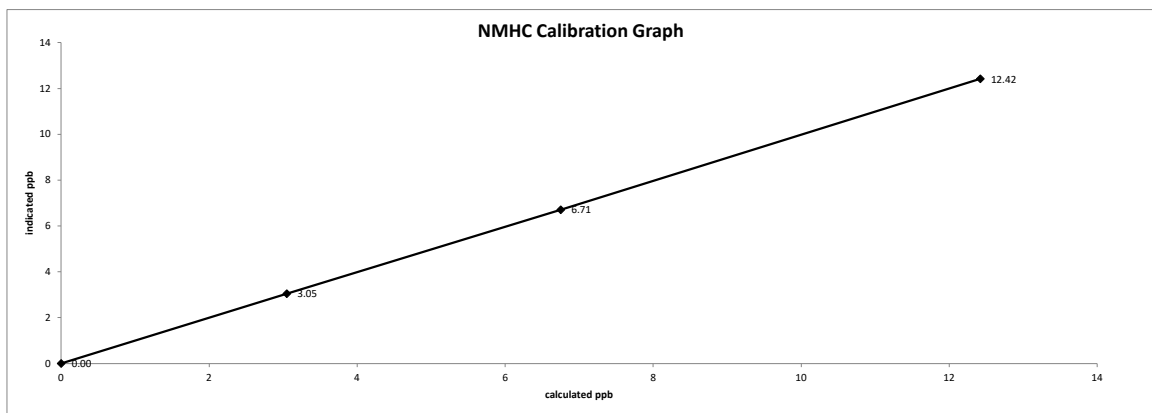
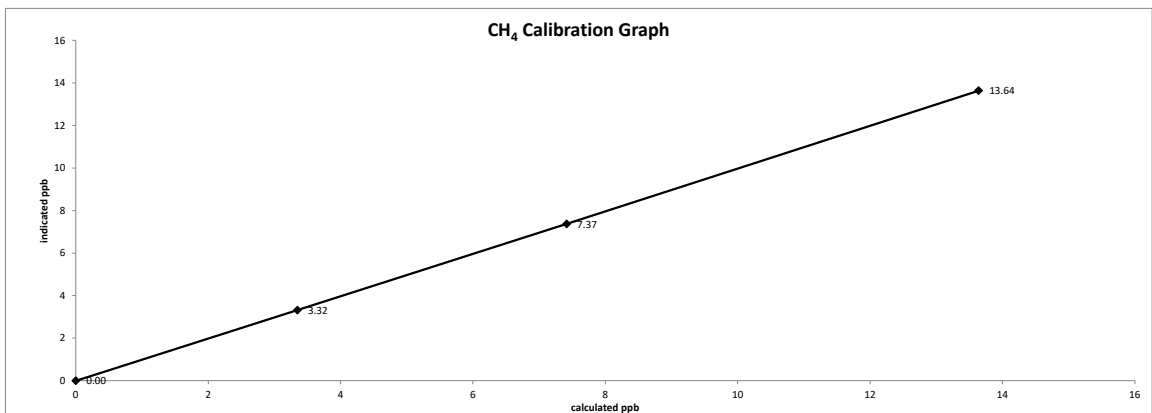
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

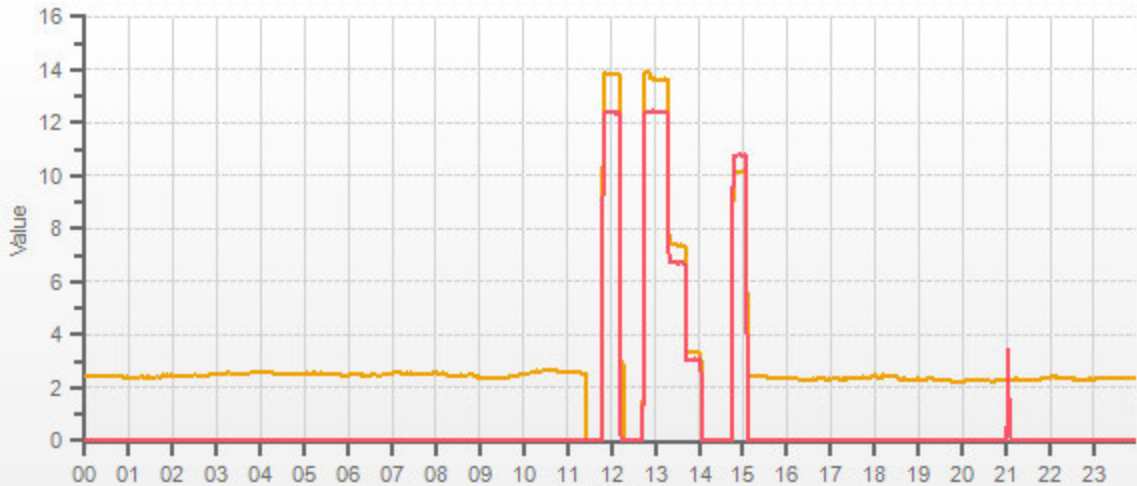
The manifold blower was found to be working normally.

Date: February 7, 2019
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 11:17 / 15:14
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



CAL-LICA 201902-01174



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 22, 2019	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2020	941	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. #170286131, expires Apr 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: A few clouds		
Parameter: CH4 / NMHC / THC	Calibration Purpose: shut down		
Start/End Time 24 hr. (mst): 10:45 / 12:39	Performed By/Reviewer: Alex Yakupov / Rob Fisher		
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026		

Analyzer:	Correction Factors:												
Serial Number/Owner: 1180320044 LICA	Previous C.F.:												
Measured Flow: 0.945	As Found C.F.:												
Last Calibration Date: February 7, 2019	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>1.026</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>1.026</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>1.026</td> <td>n/a</td> </tr> </table>	CH ₄ =	1.000	1.026	n/a	NMHC =	1.000	1.026	n/a	THC =	1.000	1.026	n/a
CH ₄ =	1.000	1.026	n/a										
NMHC =	1.000	1.026	n/a										
THC =	1.000	1.026	n/a										

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm
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 29687		
CH₄ Cylinder Conc. = 598.0 198.0 =C ₂ H ₆ Cylinder Conc.		
CH₄ expressed as C₂H₆ = 544.5 1142.5 =total CH ₄ 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	2469	57.64	2527	13.64	12.42	26.06	13.30	12.11	25.41	1.026	1.026	1.026
mid	2469	31.00	2500	7.42	6.75	14.17	7.19	6.54	13.73	1.031	1.032	1.032
low	2486	14.00	2500	3.35	3.05	6.40	3.25	3.00	6.25	1.030	1.016	1.024
Average C.F. =										1.029	1.025	1.027

Linear Regression/Calibration Results:			
Correlation Coefficient =	1.000	1.000	1.000
Slope =	0.975	0.974	0.974
b (Intercept as % of full scale) =	-0.07%	0.02%	-0.02%
% change in C.F. from last cal =	-2.56%	-2.56%	-2.56%
	CH ₄	NMHC	THC
	LIMITS		
	> or = 0.995		
	0.90-1.10		
	± 3% F.S.		
	± 10%		

As Left Instrument Diagnostics:			
Interface Board Voltages:	Bias Supply: -297.0	Calibration History cnt'd:	NM Peak Area: 89564
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: 34.6		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 1000 50	Run History>1:	NMHC End: n/a
	Fuel: 1900 50		Date: Feb 22, 2019
	Span Gas: 700 10		Time: 10:52
Internal Pressures:	Zero Air Generator: 50	CH ₄ PK RT: 0	CH ₄ RT: 12.4
	Carrier: 29.4	CH ₄ Baseline: 2718	CH ₄ LOD: 37
	Fuel: 44.2	CH ₄ SD: 12	CH ₄ CONC: 0.00
FID Status:	Air: 30.2	NM PK HT: 0	NM Peak Area: 0
	Status: UT	NM CONC: 0.00	NM Base Start: 2705
	Counts: 30887	NM Base End: 2711	NM LOD: 7
Flame and Power Stats:	Flame: 341.0	CH ₄ PK HT: 17768	New CH ₄ : n/a
	Det Base: 175.1	NM Span Conc: 12.42	New NMHC: n/a
	Last Power On: Jan 25, 2019	NM SP Ratio: 0.000139	New THC: n/a
Calibration History:	Flameouts: 1		
	Det Oven at Start: 14.4		
	Col Oven at Start: 17.1		
	Time: Feb 7, 2019 / 12:50		
	Type: GOOD		
	Status: SPAN		
	Check/Adjust: ADJUST		
	CH ₄ Span Conc: 13.64		
	CH ₄ SP Ratio: 0.000768		
	CH ₄ RT: 13.0		

Comments:

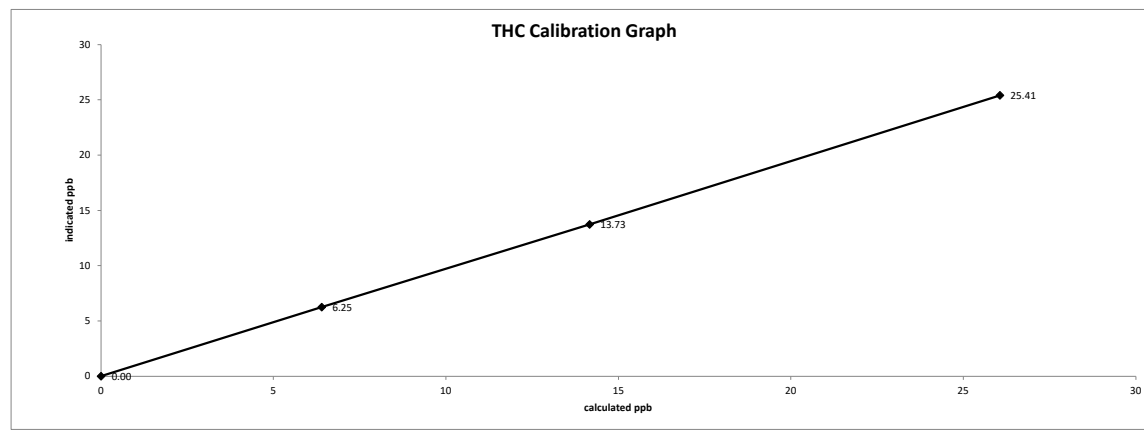
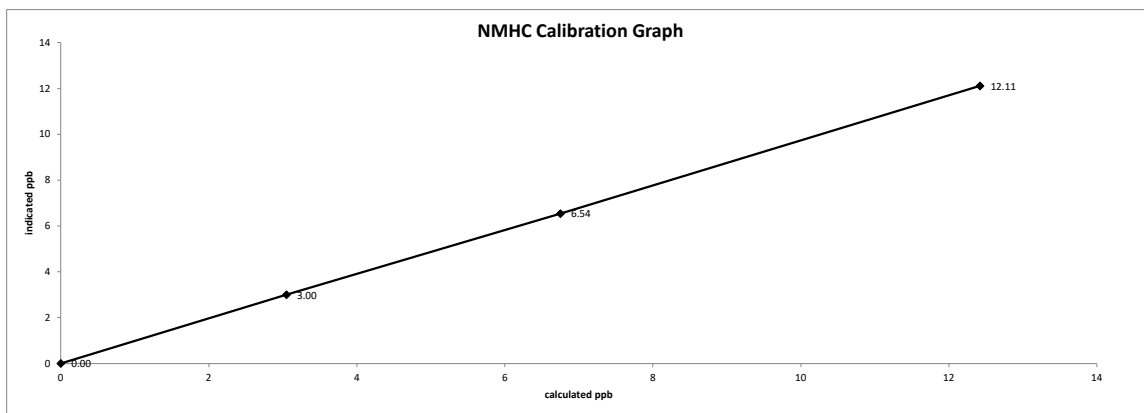
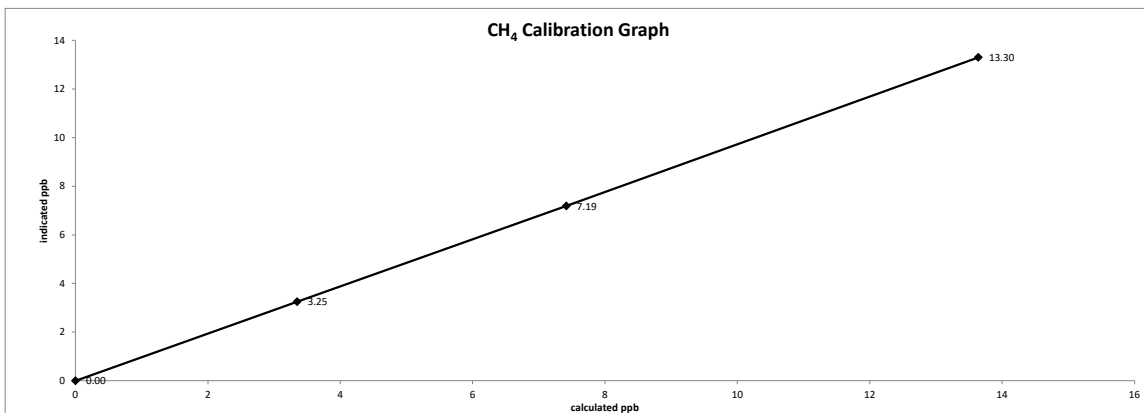
No zero adjustment was required/made.

The manifold blower was found to be working normally.

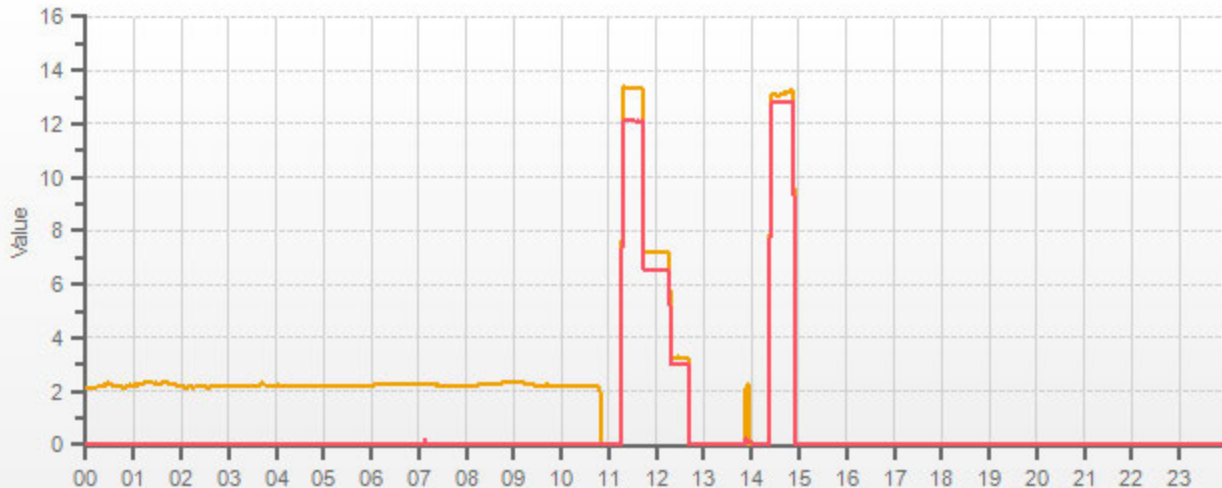
The LICA analyzer was removed to install the AEP owned analyzer.

Date: February 22, 2019
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:45 / 12:39
Calibration Purpose: shut down
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



CAL-LICA-201902-01174



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	February 23, 2019	Barometer/B.P./units:	F.S. #05544, expires Jan 17, 2020	941	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. #170286131, expires Apr 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	installation		
Start/End Time 24 hr. (mst):	9:03 / 12:10	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	August 1, 2026		

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	n/a	1.000
Last Calibration Date:	n/a	NMHC =	n/a	n/a	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	n/a	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:	API id# 690 expires March 15, 2019	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL 29687	Low	3.00	3.00	6.00
CH4 Cylinder Conc. =	598.0 198.0 =C ₂ H ₆ Cylinder Conc.				
CH ₄ expressed as C ₂ H ₆ =	544.5 1142.5 =total CH4 equivalent				

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

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:		
Point	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	2469	57.64	2527	13.64	12.42	26.06	13.64	12.42	26.06	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.41	6.70	14.12	1.001	1.008	1.003
low	2486	14.00	2500	3.35	3.05	6.40	3.35	3.04	6.40	1.000	1.003	1.000
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	1.004	1.001

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	1.000	0.95-1.05
b (Intercept as % of full scale) =	0.00%	-0.06%	-0.02%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a

Interface Board Voltages:				Bias Supply:	-303.1	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:	36.4			NMHV Start:	n/a
Cylinder Pressures/reg.:				Carrier:	1000 50	Run History>1:		NMHC End:	n/a
				Fuel:	1900 50			Date:	Feb 23, 2019
				Span Gas:	700 10			Time:	09:07
				Zero Air Generator:	50			CH ₄ PK HT:	2736
Internal Pressures:				Carrier:	26.8			CH ₄ RT:	13.4
				Fuel:	32.5			CH ₄ Baseline:	12
				Air:	24.6			CH ₄ LOD:	70
FID Status:				Status:	LIT			CH ₄ SD:	24
				Counts:	10766			CH ₄ CONC:	1.95
				Flame:	335.0			NM PK HT:	10
				Det Base:	175.0			NM Peak Area:	0
Flame and Power Stats:				Last Power On:	Feb 22, 2019/ 13:01			NM CONC:	0.00
				Flameouts:	1			NM Base Start:	5
				Det Oven at Start:	24.4			NM Base End:	-17
				Col Oven at Start:	23.6			NM LOD:	12
Calibration History:				Time:	Jan 01, 1970 / n/a			NM Start IDX:	33
				Type:	n/a			NM End IDX:	83
				Status:	n/a			NM Max Slope:	7.1e-01
				Check/Adjust:	n/a			NM Min Slope:	-1.4e+00
				CH ₄ Span Conc:	n/a			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 :	10.42
				NM Span Conc:	n/a			New NMHC:	10.98
				NM SP Ratio:	n/a			New THC:	21.40

Comments:

A column conditioning was performed.

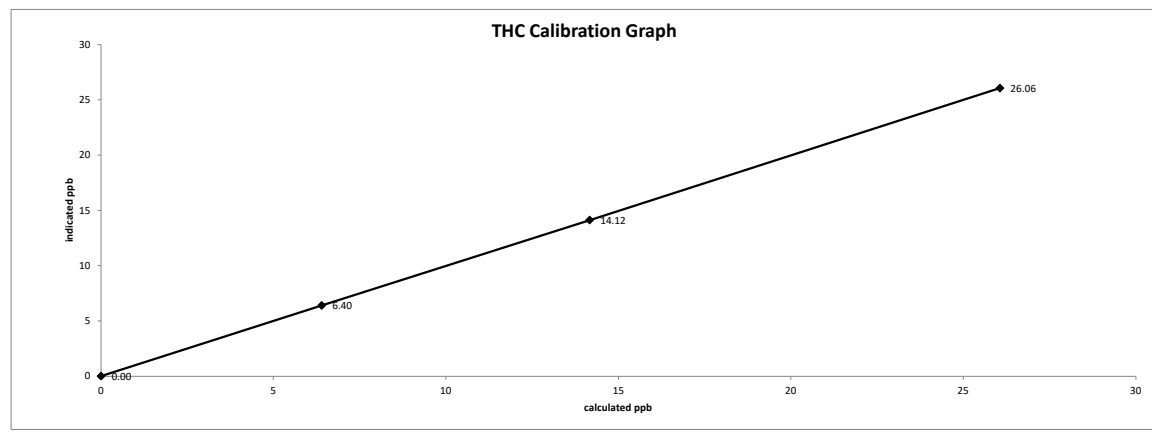
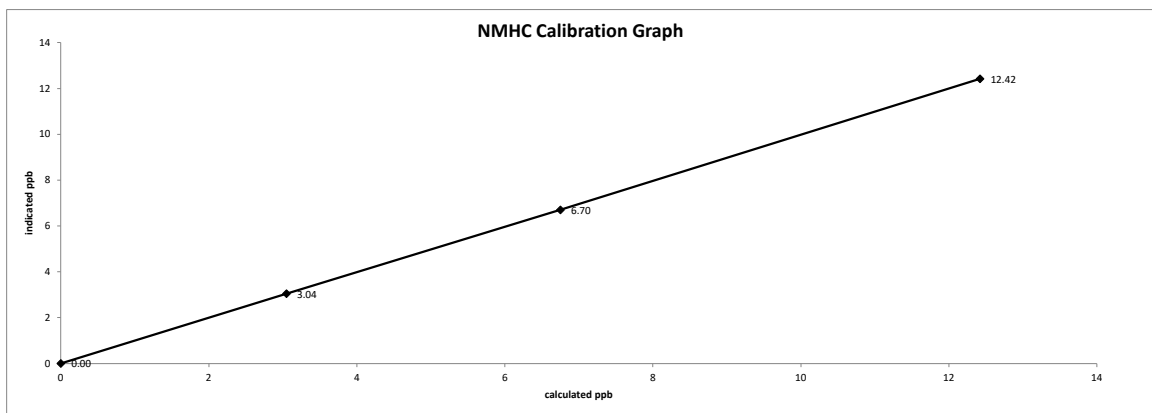
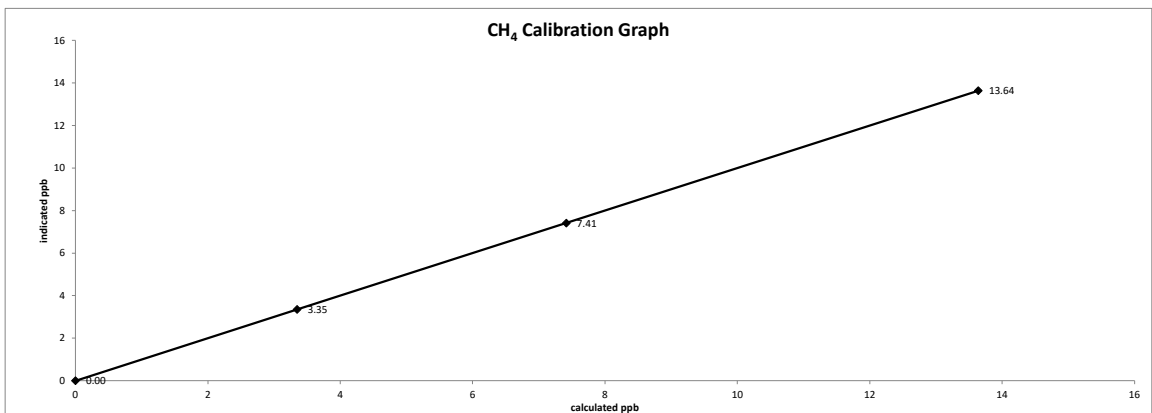
No zero adjustment was required/made.

The manifold blower was found to be working normally.

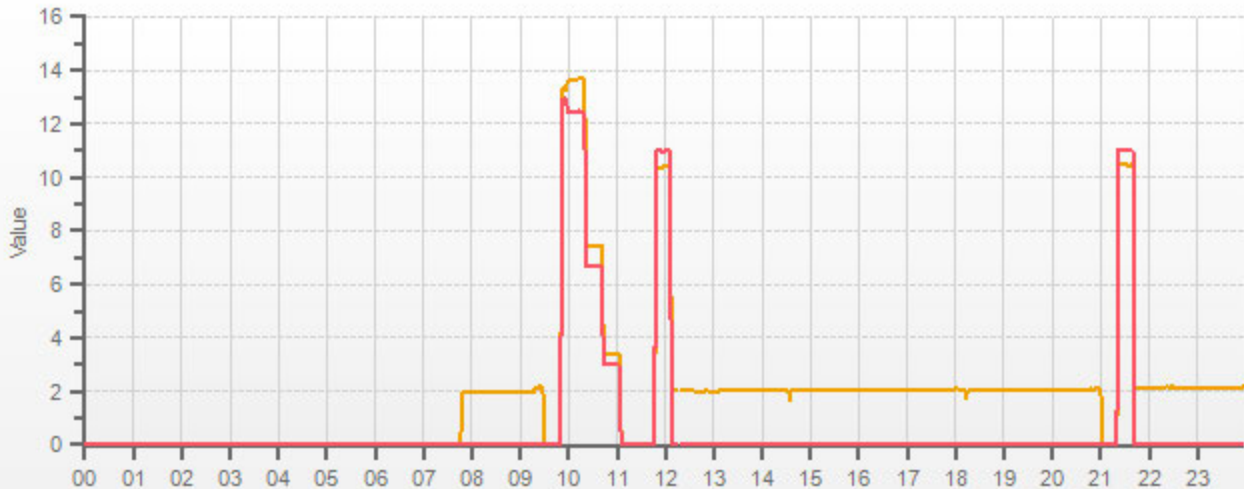
The AEP analyzer was installed to replace LICA analyzer.

Date: February 23, 2019
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:03 / 12:10
Calibration Purpose: installation
Calibration Method: Gas Dilution



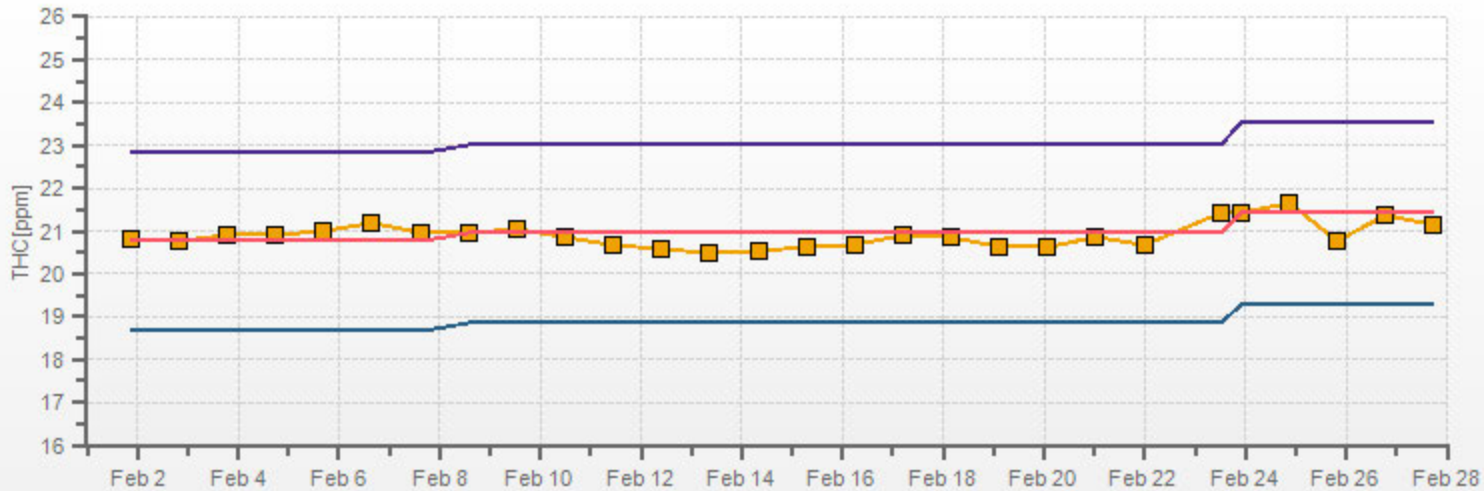
CH4[ppm] NMHC[ppm]



CAL-LICA-201902-01174

THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

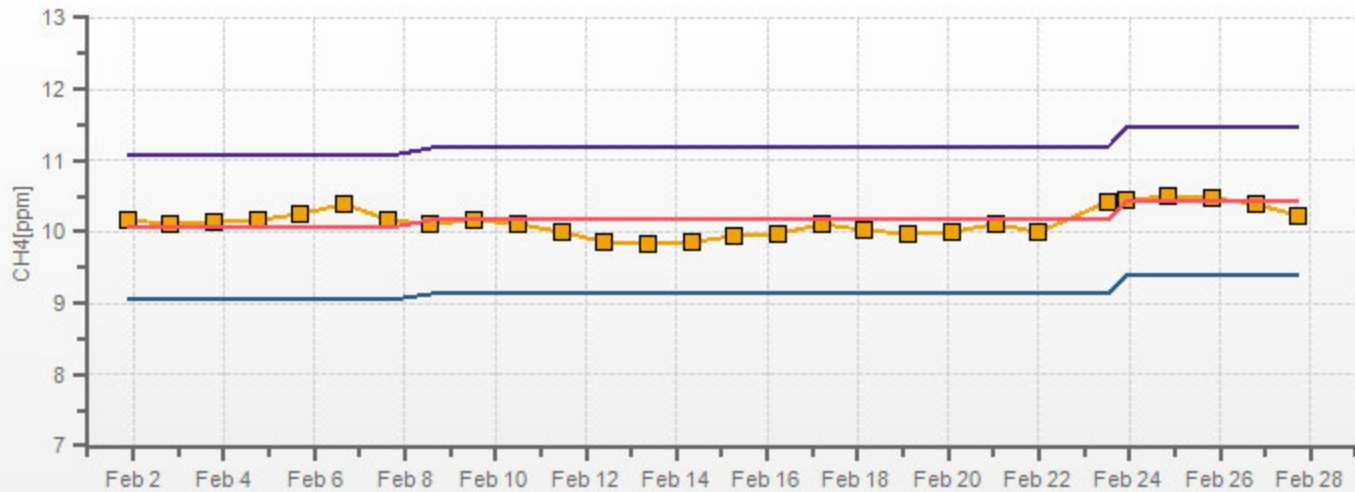
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174

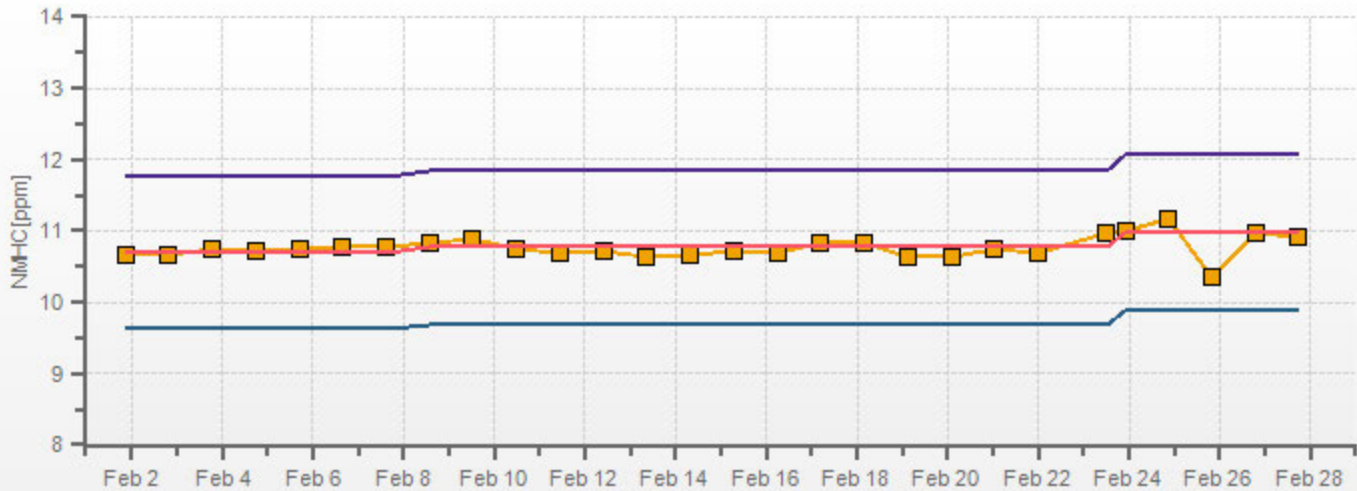
CH4[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174

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



CAL-LICA-201902-01174



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: February 8, 2019	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020	962	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: Mix of sun and clouds		
Start/End Time 24 hr. (mst): 10:17 / 17:13	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: January 8, 2019 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>1.004</td> <td>0.999</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>1.004</td> <td>1.001</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	1.004	0.999	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	1.004	1.001
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	1.004	0.999														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	1.004	1.001														

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	4928	36.6	4965	379.6	380.4	378.0	379.0	1.004	1.004
adjusted zero	4895	0.00	4895	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4928	36.60	4965	379.6	380.4	380.0	380.0	0.999	1.001
mid	4927	17.38	4944	181.0	181.4	179.0	179.0	1.011	1.013
low	4941	8.82	4950	91.8	91.9	90.0	90.0	1.020	1.022
calibrator zero	4895	0.00	4895	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.010	1.012

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	379.0	379.0	0.0	0.0	0.0	
as found high NO2	4940	36.94	4977	255.0	124.0	379.0	255.0	255.0	255.0	1.000
adjusted high NO2	4940	36.94	4977	255.0	124.0	379.0	255.0	255.0	255.0	1.000
gpt mid	4940	36.94	4977	145.0	235.0	379.0	144.0	144.0	144.0	1.000
gpt low	4940	36.94	4977	50.0	327.0	379.0	52.0	52.0	52.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	1.000	1.000	0.95-1.05
b (Intercept as % of full scale)=	-0.24%	-0.24%	0.00%	± 3% F.S.
% change in C.F. from last cal=	-0.33%	-0.36%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.3	NO Bkg:	4.4
NOx Bkg:	4.5	NOx Bkg:	4.5
NO Coef:	1.058	NO Coef:	1.067
NO2 Coef:	0.996	NO2 Coef:	0.996
NOx Coef:	1.001	NOx Coef:	0.997
PMT:	-854.7	PMT:	-854.7
Internal:	29.1	Internal:	29.8
Chamber:	50.4	Chamber:	50.4
Cooler:	-3.0	Cooler:	-2.7
NO2 Converter:	324.7	NO2 Converter:	326.0
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	34.27	Perm Oven Gas:	35.00
Perm Oven Heater:	35.90	Perm Oven Heater:	34.27
Pressure:	183.5	Pressure:	183.5
Flow:	0.735	Flow:	0.737
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO2:	277	Expected Value NO2:	277
Expected Value NOx:	279	Expected Value NOx:	279

Comments:

The analyzer sample inlet filter was changed. The converter cooling fan filter was cleaned. The analyzer perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized.

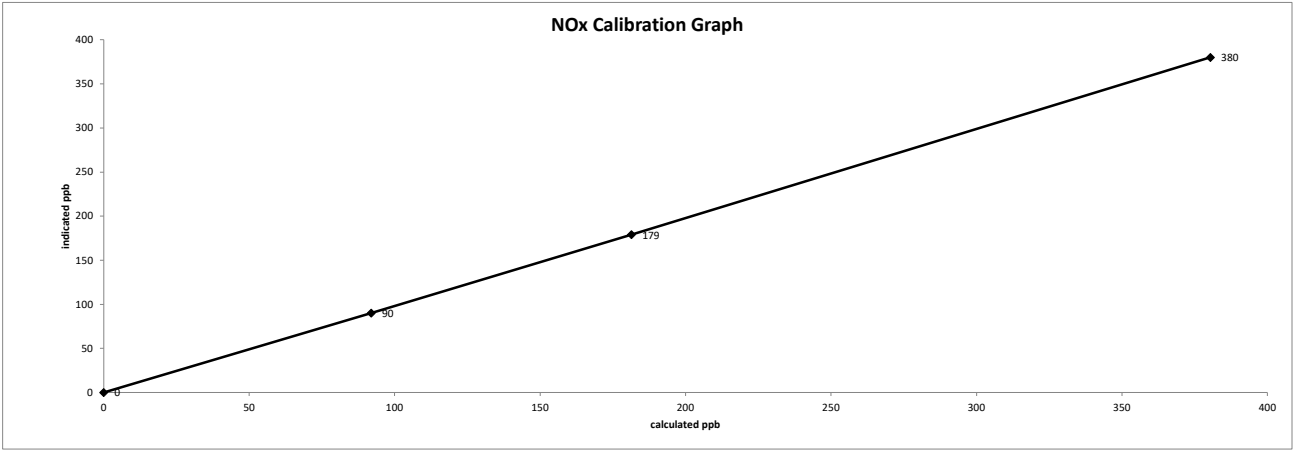
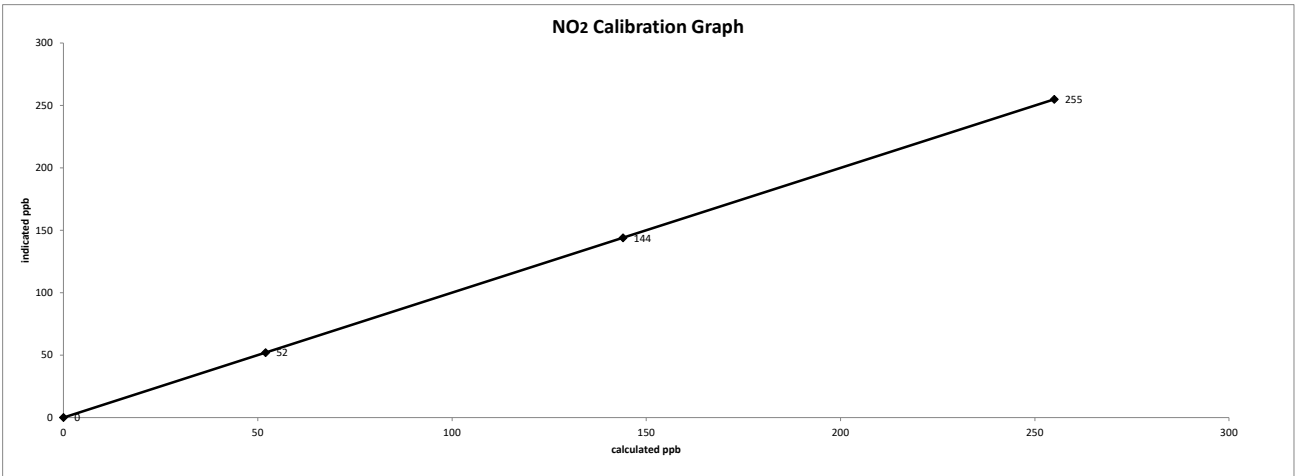
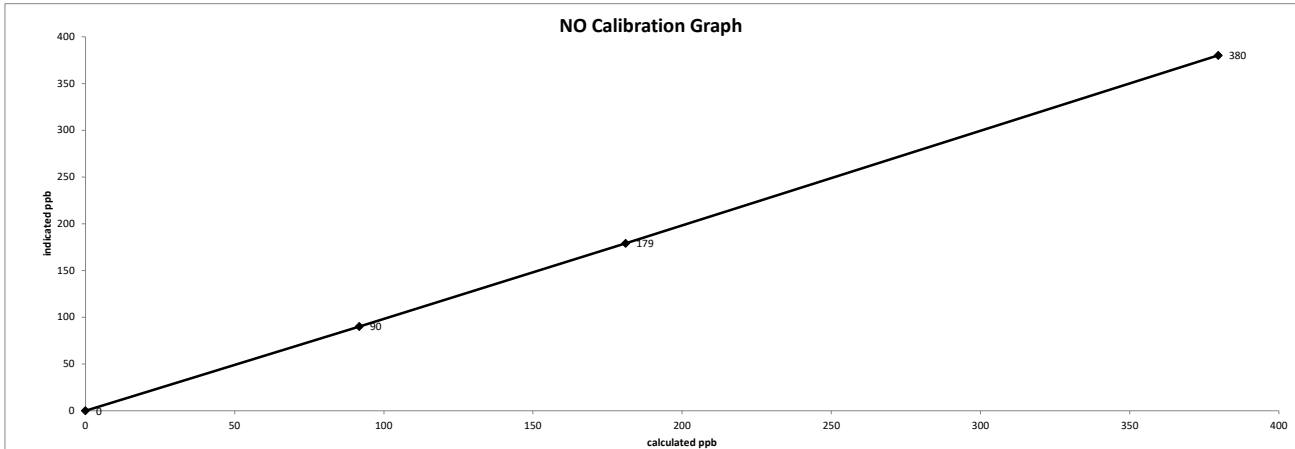
The manifold blower was found to be working normally. No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes. The analyzer cooling fan filter(s) were cleaned.

The Mid-point was re-started due to the scheduled Z5 check interrupting the calibration at 13:00. A new perm tube was installed.

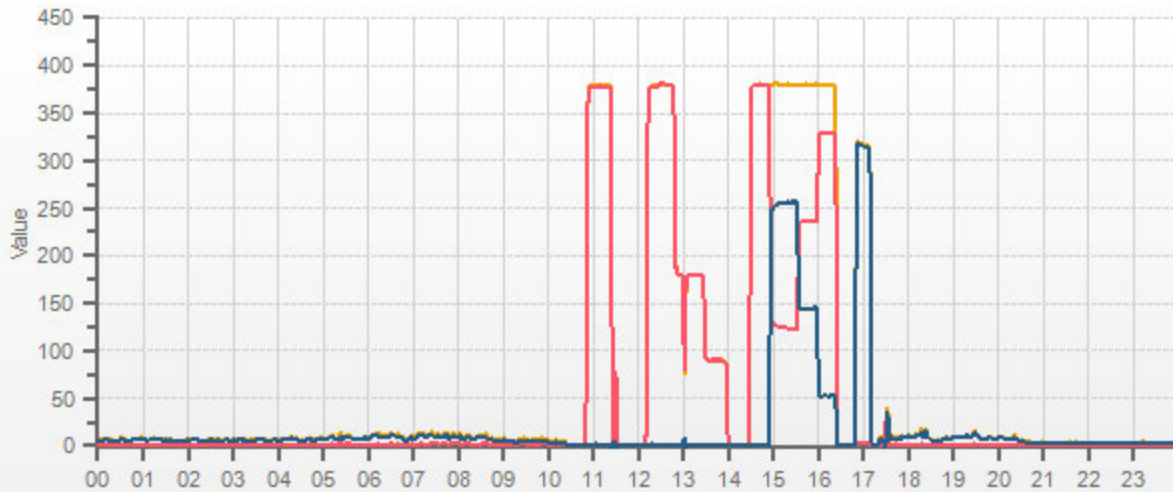
Date: February 8, 2019
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:17 / 17:13
 Calibration Purpose: routine monthly
 Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



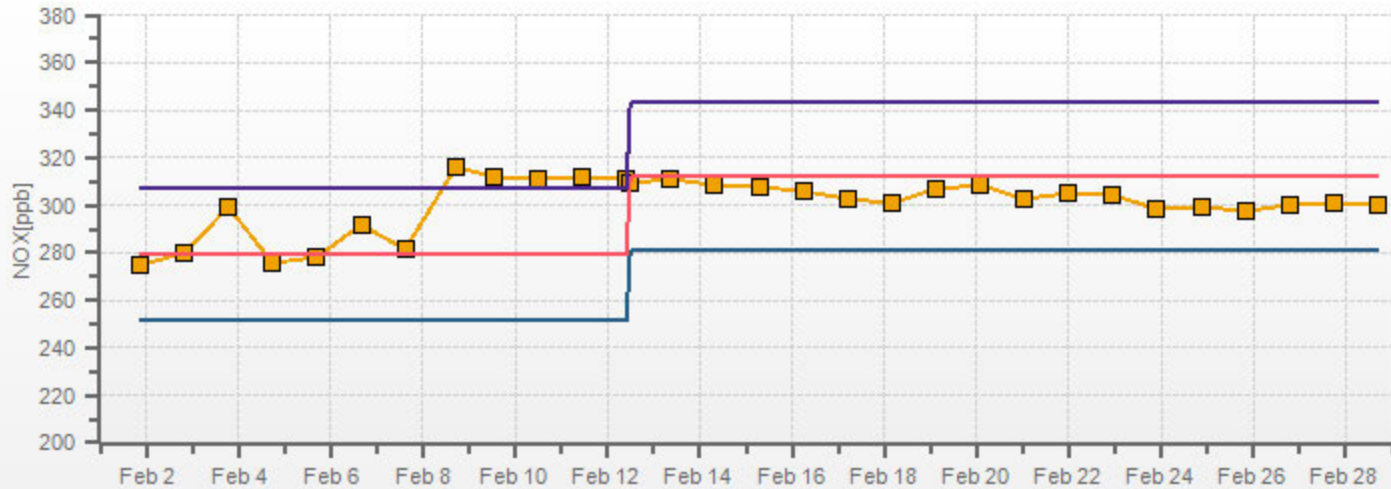
NOX[ppb] NO[ppb] NO2[ppb]



CAL-LICA-201902-01174

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174

NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174



Thermo 49i Ozone Analyzer Calibration

Date: February 7, 2019 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 11:17 / 16:22 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: January 9, 2019 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 961 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 21 °C Weather Conditions: Mainly sunny 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.: 1.002 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

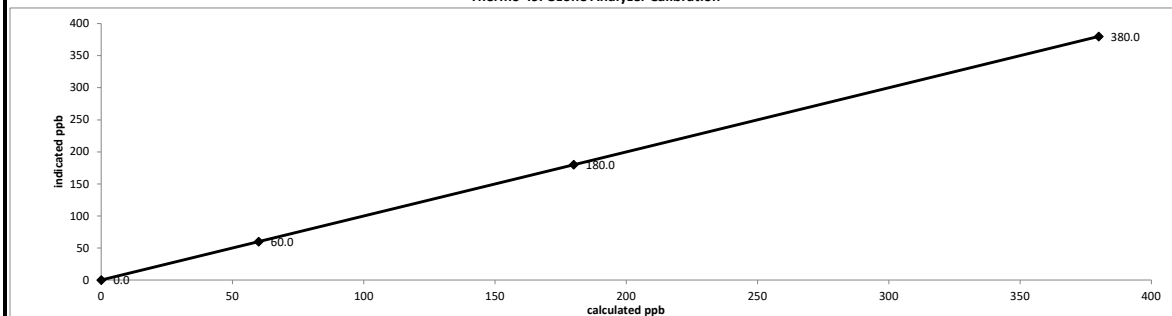
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	0.8	n/a
as found high	5000	5000	380.0	380.0	380.0	1.002
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= -0.21%	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	0.0
O3 Coef:	1.048
Photo Lamp:	9.6
O3 Lamp:	8.0
Bench:	30.0
Bench Lamp:	53.5
O3 Lamp:	67.4
Pressure:	714.4
Cell A lpm:	0.712
Cell B lpm:	0.756
O3 ppb:	0.0
Cell A ppb:	3.1
Cell B ppb:	0.0
Cell A int (Hz):	76447
Cell B int (Hz):	78485
Expected Value:	322.0

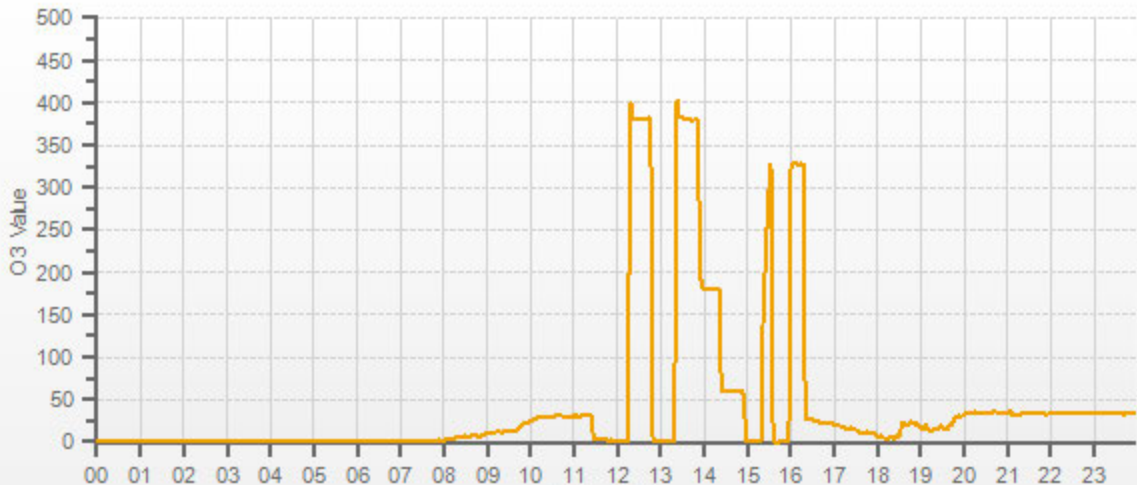
As left:

O3 Bkg:	0.0
O3 Coef:	1.045
Photo Lamp:	9.6
O3 Lamp:	5.7
Bench:	30.6
Bench Lamp:	53.5
O3 Lamp:	67.4
Pressure:	712.6
Cell A lpm:	0.711
Cell B lpm:	0.756
O3 ppb:	0.2
Cell A ppb:	-5.2
Cell B ppb:	5.9
Cell A int (Hz):	76393
Cell B int (Hz):	78455
Expected Value:	327.0

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

The SPAN level 1 was changed from 22% to 31% after calibration at 15:17. The level of SPAN was tested before the ZS check was triggered.

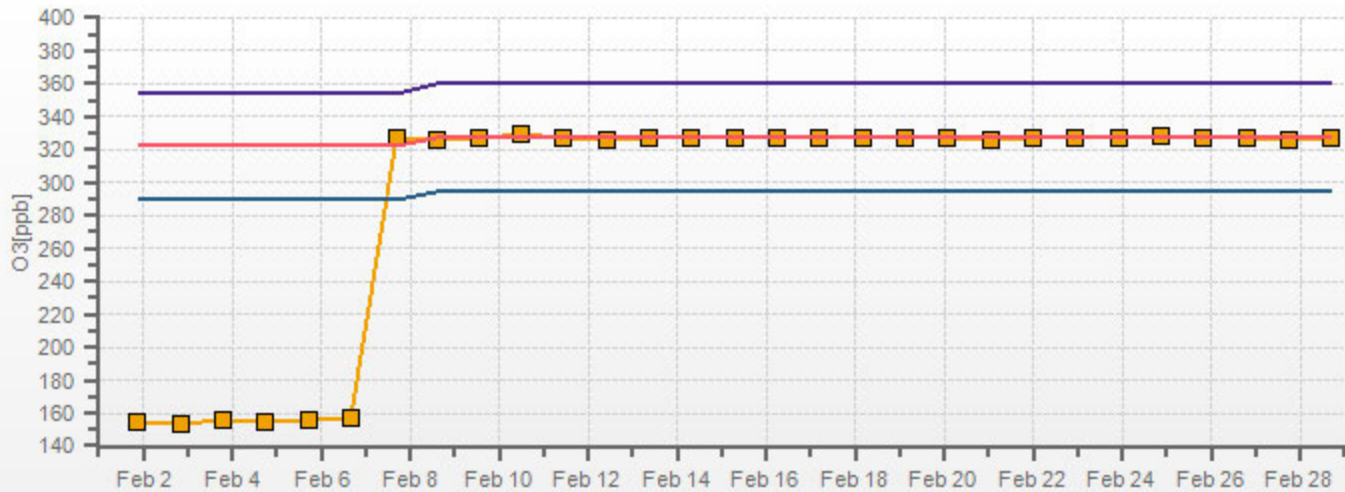
O3[ppb]



CAL-LICA-201902-01174

O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01174



Thermo 5030 SHARP Monitor Monthly Check

Date: February 21, 2019
Company: LICA
Station Name/Location: Cold Lake South
Previous Audit Date: January 25, 2019
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher
Start Time (mst): 10:41
End Time (mst): 11:29
Calibration Purpose: routine monthly
Weather Conditions: Light snow

SHARP Information and Status:

Serial Number: CM - 2209 **Status:** 0.00
Approx Tape remaining: 4/10 **Error Code:** 0.00

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:		Temperature:	
Make:	Dwyer	Airmetrics	Fisher Scientific	17-Jan-20	Fisher Scientific	
Model:	475 Mark III	Chinook / High	FB61291		11745843	
Serial Number:	#3	#2	#05544		170286131	
Calibration Expiration Date:	January 17, 2020	April 24, 2019	January 17, 2020		April 19, 2019	

As found temperature and pressure:

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>-15.0</u></p> <p>Reference °C: <u>-15.3</u></p> <p>Difference °C: <u>-0.3</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>954.000</u></p> <p>Reference (hPa): <u>955.000</u></p> <p>Difference (hPa): <u>-1.000</u></p>
---	--

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

<p style="text-align: center;">Tolerance +/- 4°C</p> <p>SHARP T1 °C: <u>-15.0</u></p> <p>Reference °C: <u>-15.3</u></p> <p>Difference °C: <u>-0.3</u></p>	<p style="text-align: center;">Tolerance +/- 13.33 hPa</p> <p>SHARP P3 (hPa): <u>954.000</u></p> <p>Reference (hPa): <u>955.000</u></p> <p>Difference: <u>-1.000</u></p>
---	--

As found flows:

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>52.10</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.67</u></p> <p>Difference (l/min) <u>0.00</u></p>
---	--

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

<p>Targets: 1000 l/hr / <90%</p> <p>SHARP AirFlow l/hr <u>1000.00</u></p> <p>Pump Voltage (%) <u>52.10</u></p>	<p>Flow Tolerance 16.67 lpm +/- 0.67 lpm</p> <p>SHARP Airflow (l/min) <u>16.67</u></p> <p>Reference AirFlow (l/min) <u>16.67</u></p> <p>Difference (l/min) <u>0.00</u></p>
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Inlet Assembly:

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

Comments:



Met One Instruments

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H Sensor Serial No.: F1644
Sensor Output Swing: 0V - 1.0V Sensor Output Range: 0 - 50.0 MPS
Customer: Maxxam Analytics Sales Order No.: 125713
Tested per PO: P00000003392 Calibration Date: 11/09/2017
Calibrated by: David Frith D7 QC Inspection: Debra Paulsen

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

As Found Test Date: N/A As Left Test Date: 11/09/2017

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

50.5 - 9600 Rev A

October 2016



Meteorological System Checklist

Date:	February 21, 2019		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Cold Lake South		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Rotronic	Hydroclip - S3	PFD 919-121406 / Part 50.5 PS
Relative Humidity Sensor:	Rotronic	Hydroclip - S3	PFD 919-121406 / Part 50.5 PS
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	January 26, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	-15.2		
Station - Ambient Temperature (°C):	-15.9		
Temperature Difference (°C):	0.7		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	January 26, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	68.62		
Station Hygrometer % RH- Reading:	69.20		
RH Tolerance +/- 15% of difference:	58.33 - 78.91	-0.8%	

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.

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

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 Date: August 22, 2018
Operator Signature: _____ Location: McIntyre Center Edmonton



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>	

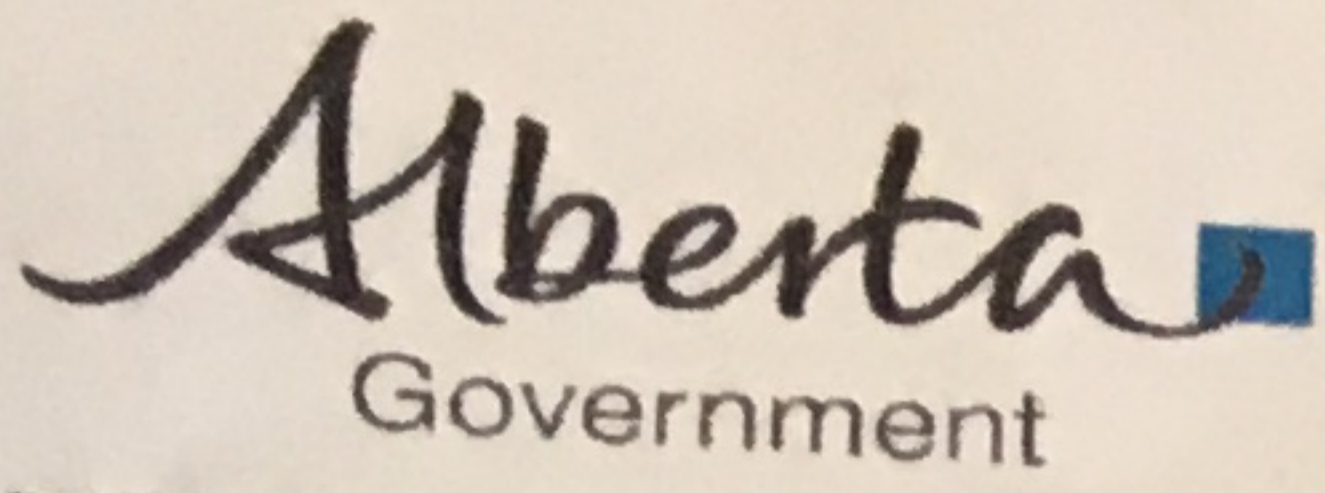
Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

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 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. 2019-393CGA

Company: Maxxam **Operators name:** Alex
Cylinder #: LL29687 **Conc CH₄ (PPM)** 598/198 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>Mesa Definer 220</u>		
Serial Number	<u>AMU 2092</u>	Serial Number	<u>H-133034 / L-132702</u>		
Last Verification Date	<u>January 14, 2019</u>		Temp. °C	<u>23.8 C</u>	
Gas Type	<u>CH₄</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>05604875</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:** 2221
Instrument Settings **Zero:** N/A **Span:** N/A **Range:** 20.0
Last Calibration: **Date:** Jan 14/19 **C.F.** 1.000 **Done By:** Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
5000	0.0	0.00	0.00	0.02	51.48	603	209
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						597	209

	<u>CH₄</u>	<u>C₃H₈</u>
Previous Stated Concentration PPM:	<u>598</u>	<u>198</u>
Percent variance from Stated:	<u>0</u>	<u>6</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:** January 15, 2019
Operator 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



Lakeland Industry & Community Association

FEBRUARY 2019
Ambient Air Monitoring Calibration Report
- MASKWA STATION-
CAL-LICA-201902-01248

Station Operation and Maintenance:
Maxxam Analytics

Data Validation and Report:
Maxxam Analytics

April 2, 2019

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

April 2, 2019

Subject:

February 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Maskwa Station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Maskwa AQM Station in the month of February 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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

Respectfully,



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



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



FEBRUARY 1 - 28, 2019
MONTHLY CALIBRATION REPORT
Project #: 2833-2019-02-24-C
LICA-201902

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

5107 50 St.
Bonnyville, Alberta T9N 2J7
monitoring@lica.ca
780-266-7068

Monitoring Station

Maskwa Continuous Monitoring Station

Date of Report Issuance: March , 2019



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7
CAL-LICA-201902-01248



Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration

Date:	February 14, 2019	Barometer/B.P./units:	F.S. #05544, expires Jan 17, 2020	937	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:13	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:35	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:	January 4, 2019	As Found C.F.:	1.028		
Previous C.F.:	1.001	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: 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								

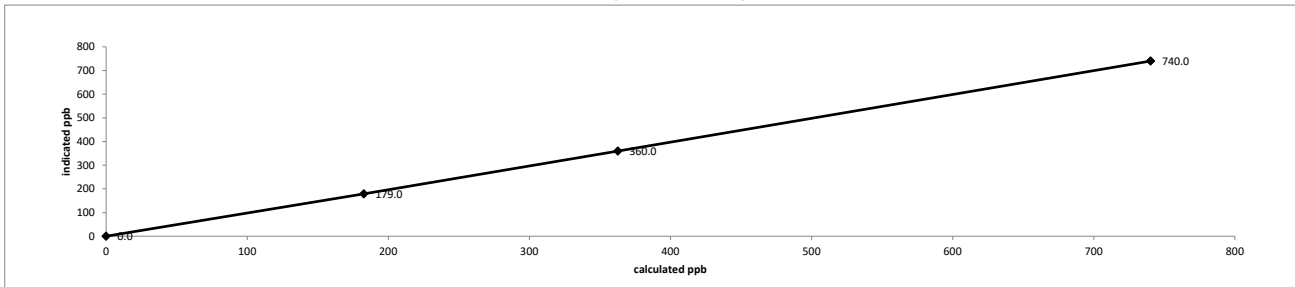
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5037	0.00	5037	0.0	0.1	n/a
as found high	4958	75.74	5034	740.2	720	1.028
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	179	1.020
calibrator zero	5037	0.00	5037	0.0	0	n/a
Average C.F. =						1.009

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) =	0.20%		± 3% F.S.
% change in C.F. from last cal =	-2.72%		± 10%

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration

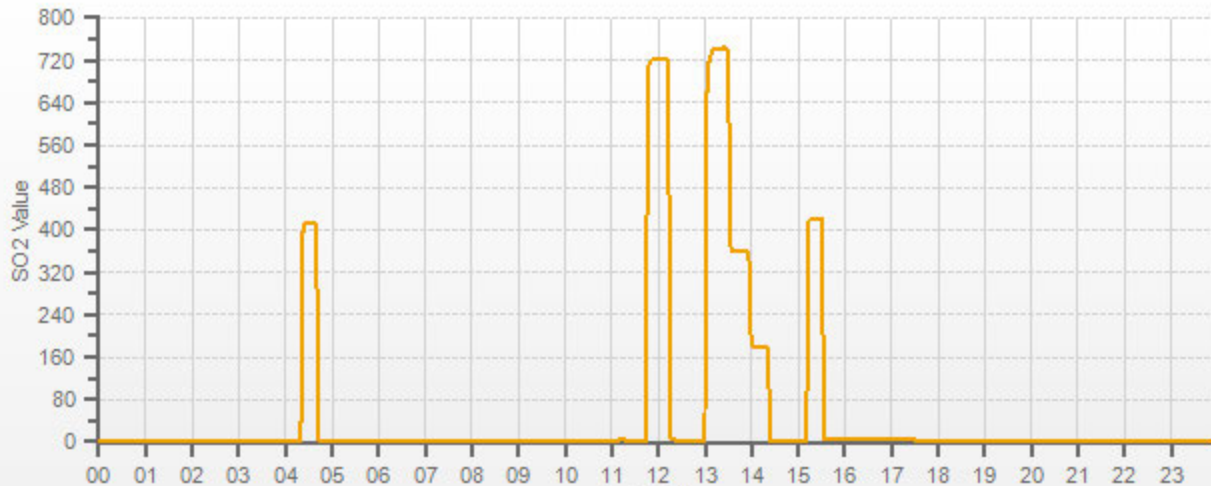


As found:		As left:	
Bkg:	2.10	Bkg:	2.32
Coef:	0.958	Coef:	0.984
Pmt:	-700.8	Pmt:	701.2
Flash:	1009	Flash:	1005
Internal:	29.7	Internal:	29.9
Chamber:	45.1	Chamber:	45.3
Perm Oven Gas:	35.01	Perm Oven Gas:	35.00
Perm Oven Heater:	34.25	Perm Oven Heater:	34.26
Pressure:	673.4	Pressure:	672.8
Sample Flow:	0.459	Sample Flow:	0.459
Lamp Intensity:	91	Lamp Intensity:	91
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	431.0	Expected Value:	420.0

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.

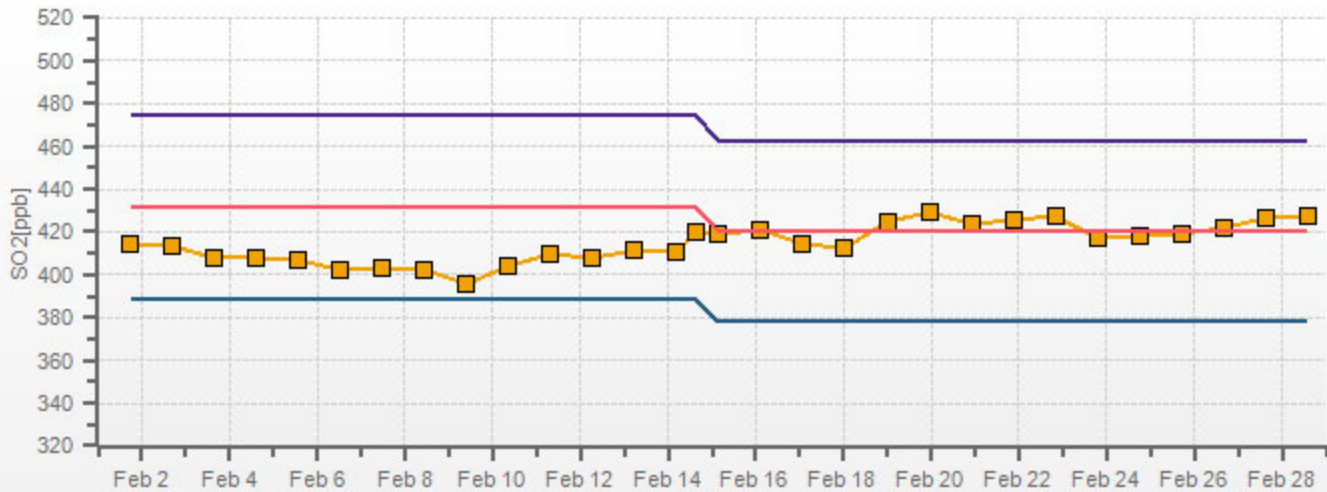
SO2[ppb]



CAL-LICA-201902-01248

SO2[ppb] Calibration: LICA MASKWA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	February 14, 2019	Barometer/B.P./units:	F.S. #05544, expires Jan 17, 2020	937	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	A few clouds		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:13	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:16	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 LICA	Range ppb:	100		
Last Calibration Date:	January 4, 2019	As Found C.F.:	1.094		
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"> <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.: 11:22 / 11:38 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.4 Analyzer Response: (ppb): 0.4 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

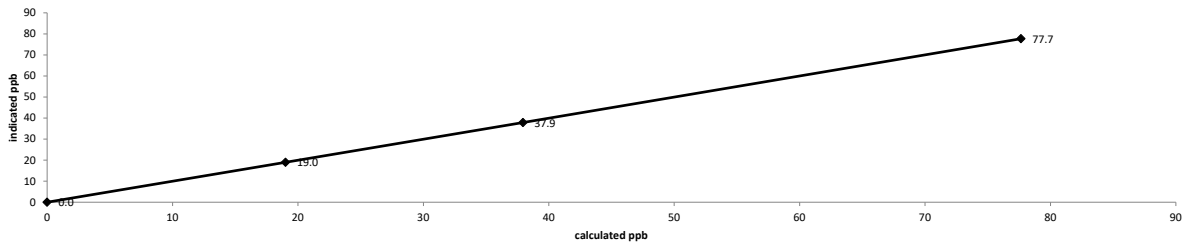
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.4	n/a
as found high	7441	61.00	7502	77.7	71.4	1.094
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7441	61.00	7502	77.7	77.7	0.999
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	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 =	-9.37%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration

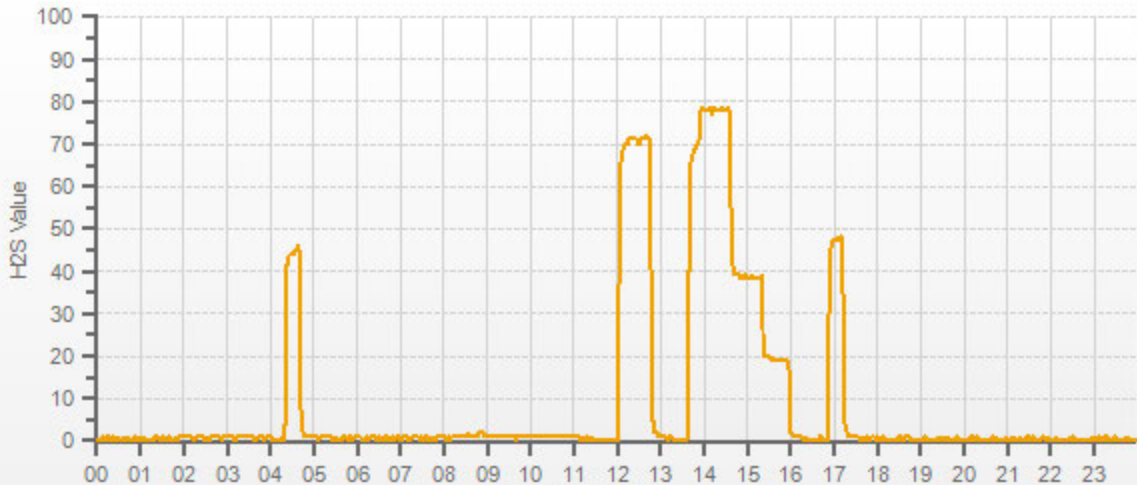


As found:		As left:	
Bkg:	17.8	Bkg:	19.9
Coef:	0.791	Coef:	0.877
Pmt:	-602.4	Pmt:	-602.4
Flash:	816	Flash:	816
Internal:	34.3	Internal:	34.0
Chamber:	45.0	Chamber:	45.0
Converter Temp:	327.3	Converter Temp:	328.3
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	35.01	Perm Oven Gas:	35.00
Perm Oven Htr:	34.30	Perm Oven Htr:	34.29
Pressure:	567.0	Pressure:	564.9
Sample Flow:	0.948	Sample Flow:	0.945
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	47.9	Expected Value:	48.9

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.

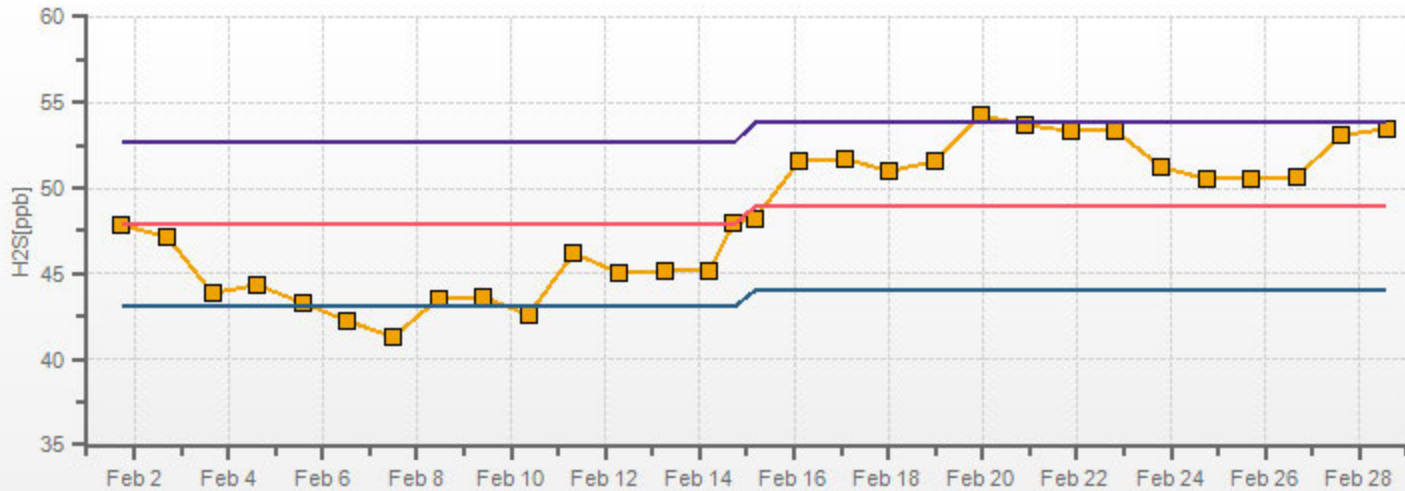
H2S[ppb]



CAL-LICA-201902-01248

H2S[ppb] Calibration: LICA MASKWA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 15, 2019	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2020	936	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: A few clouds		
Parameter: CH4 / NMHC / THC	Calibration Purpose: shut down		
Start/End Time 24 hr. (mst): 10:48 / 12:21	Performed By/Reviewer: Alex Yakupov		Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026		

Analyzer: Serial Number/Owner: 1108930026 LICA Measured Flow: 1112 Last Calibration Date: January 4, 2019 Range ppm: 20 CH4/20 NMHC/40 THC	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>CH₄ =</td> <td>1.000</td> <td>0.963</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.953</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>0.958</td> <td>n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.000	0.963	n/a	NMHC =	1.000	0.953	n/a	THC =	1.000	0.958	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	1.000	0.963	n/a														
NMHC =	1.000	0.953	n/a														
THC =	1.000	0.958	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 29687 CH ₄ Cylinder Conc.: 598.0 198.0 =C ₂ H ₆ Cylinder Conc. CH ₄ expressed as C ₂ H ₆ : 544.5 1142.5 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH ₄	NMHC	THC														
High	13.00	13.00	26.00														
Mid	7.00	7.00	14.00														
Low	3.00	3.00	6.00														

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

Calibrator Flow Rates (cc/min)				Correction Factors:								
Point	Diluent	Cal Gas	Total Flow	Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC
as found zero	2500	0.00	2500	0.00	0.00	0.00	0.03	0.00	0.03	n/a	n/a	n/a
as found high	2469	57.64	2527	13.64	12.42	26.06	14.20	13.03	27.23	0.963	0.953	0.958
mid	2469	31.00	2500	7.42	6.75	14.17	7.70	7.03	14.73	0.967	0.960	0.964
low	2486	14.00	2500	3.35	3.05	6.40	3.50	3.21	6.70	0.965	0.950	0.959
Average C.F. =										0.965	0.955	0.960

Linear Regression/Calibration Results:

Correlation Coefficient =	CH ₄	NMHC	THC	LIMITS	> or = 0.995
Slope =	1.039	1.048	1.043		0.90-1.10
b (Intercept as % of full scale) =	0.10%	-0.02%	0.03%		± 3% F.S.
% change in C.F. from last cal =	3.74%	4.68%	4.19%		± 10%

As Left Instrument Diagnostics:

Interface Board Voltages: Bias Supply: -300.9 Temperatures: Detector Oven: 175.0 Filter: 175.0 Column Oven: 75.0 Internal: 29.9 Cylinder Pressures/reg.: Carrier: 2000 50 Fuel: 700 50 Span Gas: 700 13 Zero Air Generator: 50 Internal Pressures: Carrier: 28.5 Fuel: 42.9 Air: 30.5 FID Status: Status: UT Counts: 20713 Flame: 379.2 Det Base: 175.1 Flame and Power Stats: Last Power On: Dec 04, 2018 / 12:07 Flameouts: 3 Det Oven at Start: 22.7 Col Oven at Start: 21.6 Calibration History: Time: Jan 4, 2019 / 18:42 Type: SPAN Status: GOOD Check/Adjust: ADJUST CH ₄ Span Conc: 13.29 CH ₄ SP Ratio: 0.00106 CH ₄ RT: 13.6 CH ₄ PK IDX: 28 CH ₄ PK HT: 12550 NM Span Conc: 12.63 NM SP Ratio: 0.000207	Calibration History cnt'd: NM Peak Area: 60981 Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: Feb 15, 2019 / 10:49 Time: 10:49 CH ₄ PK RT: 29 CH ₄ RT: 13.0 CH ₄ Baseline: -244 CH ₄ LOD: 14 CH ₄ SD: 4 CH ₄ CONC: 0.03 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: -241 NM Base End: -240 NM LOD: 16 NM Start IDX: 32 NM End IDX: 78 NM Max Slope: 7.3e-01 NM Min Slope: -8.2e-01 NM PT Count: 0 Previous CH ₄ : 10.11 Previous NMHC: 11.07 Previous THC: 21.17 New CH ₄ : n/a New NMHC: n/a New THC: n/a
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Comments:

The analyzer sample inlet filter was changed.

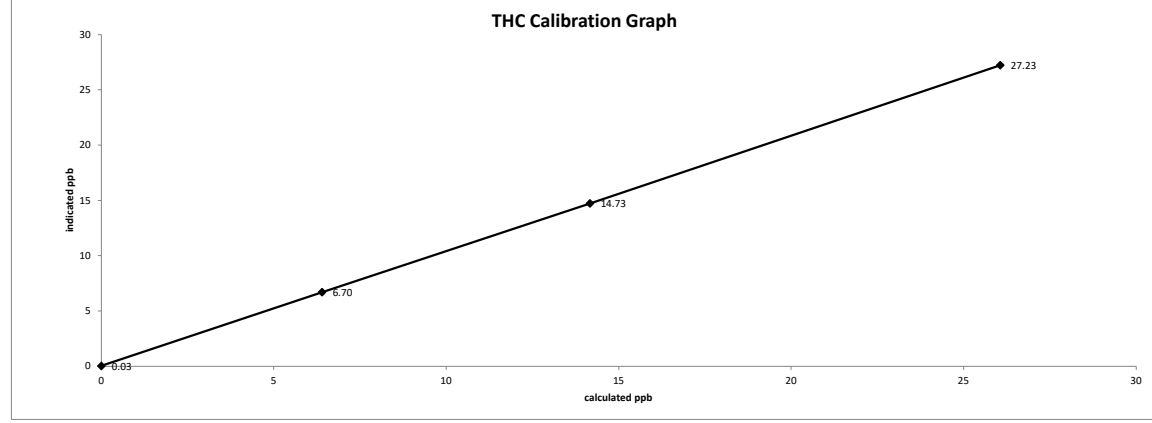
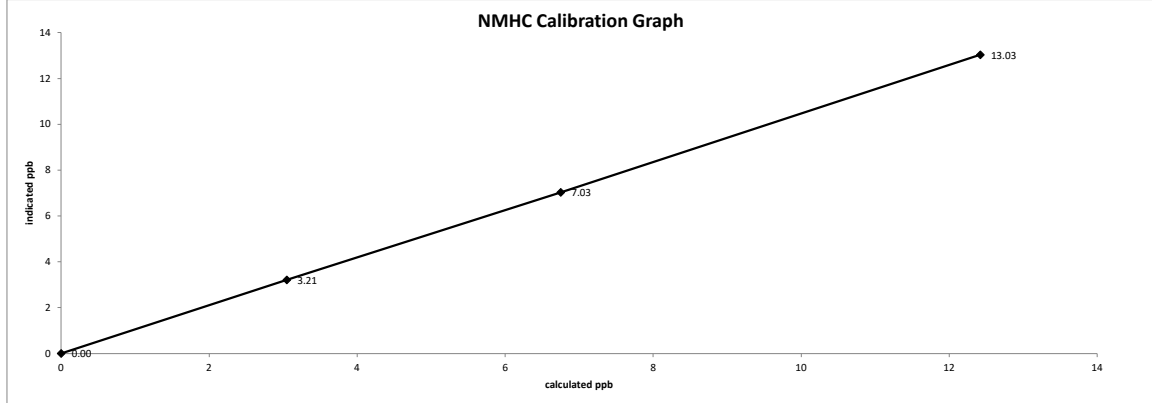
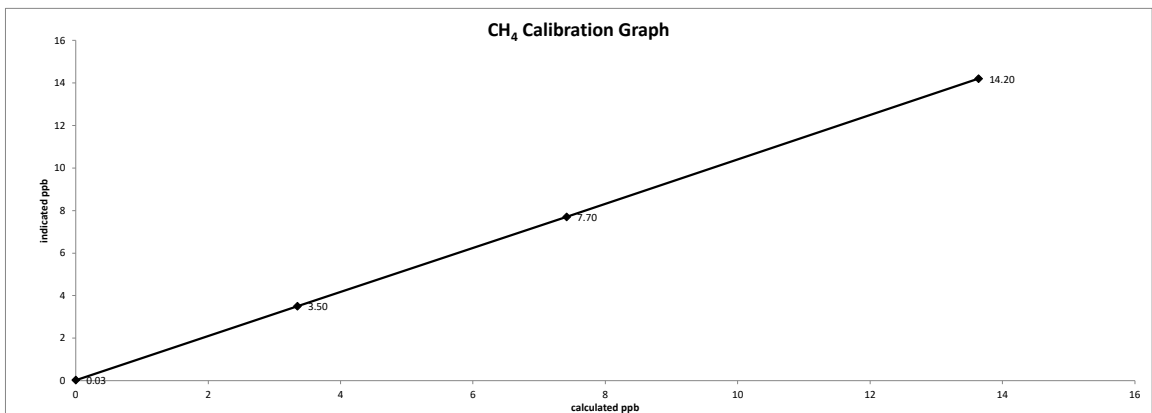
The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

A Shutdown calibration was completed to check the analyzer and zero air as well as to correct Zero base line.

Date: February 15, 2019
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:48 / 12:21
Calibration Purpose: shut down
Calibration Method: Gas Dilution





Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 15, 2019	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2020 936 millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Parameter: CH4 / NMHC / THC	Calibration Purpose: post repair
Start/End Time 24 hr. (mst): 14:48 / 17:32	Performed By/Reviewer: Alex Yakupov Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026

Analyzer:			
Serial Number/Owner: 1108930026 LICA	Correction Factors:		
Measured Flow: 1112	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: January 4, 2019	CH ₄ = 1.000	n/a	1.000
Range ppm: 20 CH4/20 NMHC/40 THC	NMHC = 1.000	n/a	1.000
	THC = 1.000	n/a	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	CH4	NMHC	THC
Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019	High	13.00	13.00	26.00
Cal Gas Cylinder I.D. # : LL 29687	Mid	7.00	7.00	14.00
CH4 Cylinder Conc. = 598.0 198.0 =C ₂ H ₆ Cylinder Conc.	Low	3.00	3.00	6.00
CH₄ expressed as C₂H₆ = 544.5 1142.5 =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
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	2469	57.64	2527	13.64	12.42	26.06	13.64	12.42	26.06	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.40	6.73	14.13	1.002	1.003	1.003
low	2486	14.00	2500	3.35	3.05	6.40	3.38	3.04	6.41	0.991	1.003	0.998
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. =										0.998	1.002	1.000

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	1.000	0.95-1.05
b (Intercept as % of full scale) =	0.05%	-0.04%	0.00%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a

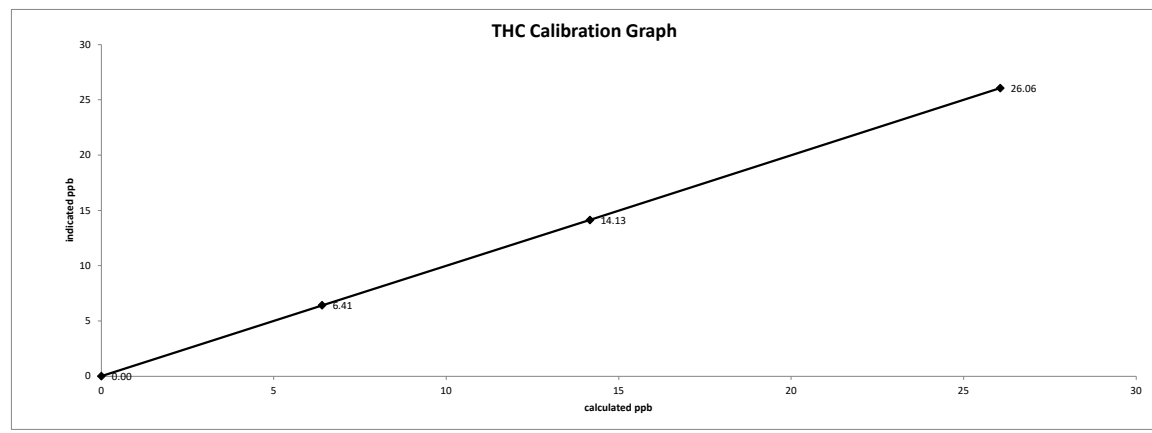
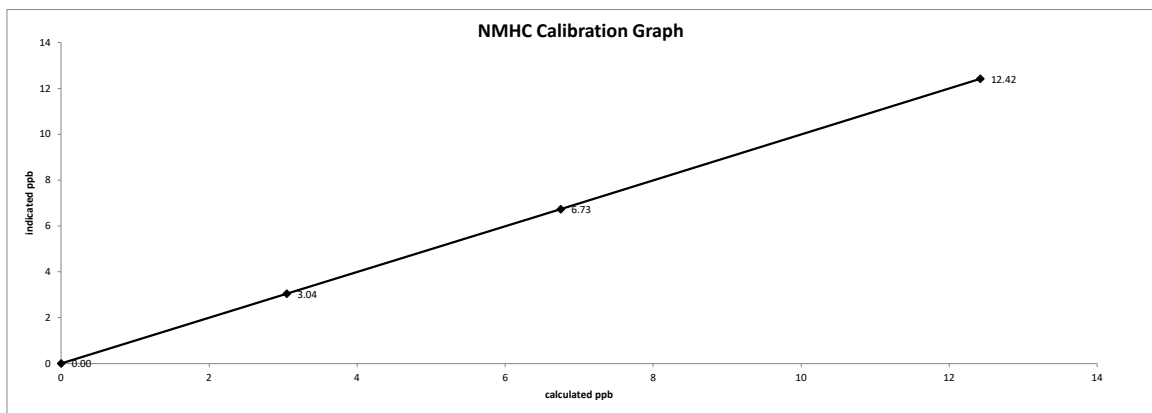
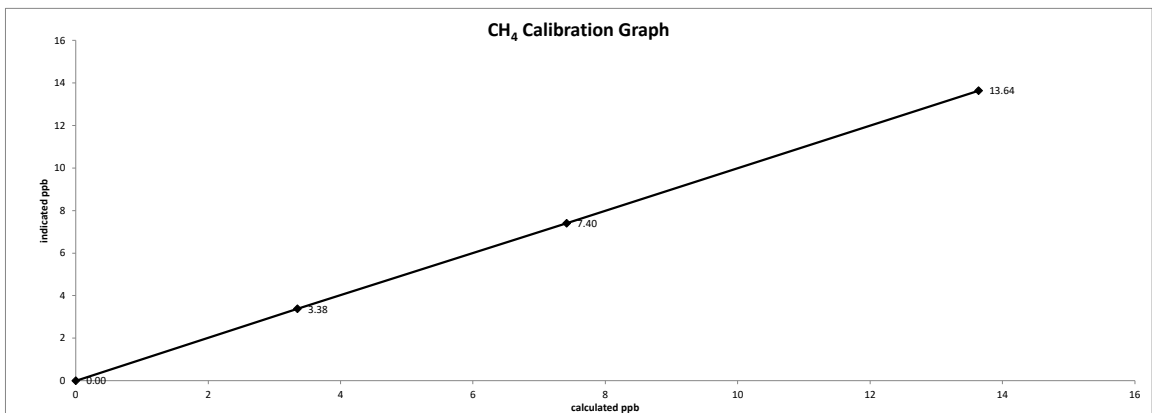
As Left Instrument Diagnostics:			
Interface Board Voltages:	Bias Supply: -300.9	Calibration History cnt'd:	NM Peak Area: 60981
Temperatures:	Detector Oven: 175.0	Crucial Settings:	Methane Start: n/a
	Filter: 175.0		Methane End: n/a
	Column Oven: 75.0		Backflush: n/a
	Internal: 29.9		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 2000 50	Run History>1:	NMHC End: n/a
	Fuel: 700 50		Date: Feb 15, 2019 / 14:35
	Span Gas: 700 13		Time: 14:35
Internal Pressures:	Zero Air Generator: 50	CH ₄ PK HT: 0	CH ₄ RT: 8.0
	Carrier: 28.5	CH ₄ Baseline: 1	CH ₄ LOD: 5
	Fuel: 42.9	CH ₄ SD: 1	CH ₄ CONC: 0.00
FID Status:	Air: 30.5	NM PK HT: 0	NM Peak Area: 0
	Status: LIT	NM CONC: 0.00	NM Base Start: 0
	Counts: 20713	NM Base End: 0	NM LOD: 14
	Flame: 379.2	NM Start IDX: 53	NM End IDX: 38
Flame and Power Stats:	Det Base: 175.1	NM Max Slope: 6.4e-01	NM Min Slope: -6.7e-01
	Last Power On: Dec 04, 2018 / 12:07	NM PT Count: 0	Previous CH4: 10.11
	Flameouts: 3	Previous NMHC: 11.07	Previous THC: 21.17
Calibration History:	Det Oven at Start: 22.7	New CH4: 9.90	New NMHC: 10.62
	Col Oven at Start: 21.6	New THC: 20.51	
	Time: Jan 4, 2019 / 18:42		
	Type: SPAN		
	Status: GOOD		
	Check/Adjust: ADJUST		
	CH ₄ Span Conc: 13.29		
CH ₄ SP Ratio: 0.00106			
CH ₄ RT: 13.6			
CH ₄ PK IDX: 28			
CH ₄ PK HT: 12550			
NM Span Conc: 12.63			
NM SP Ratio: 0.000207			

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.

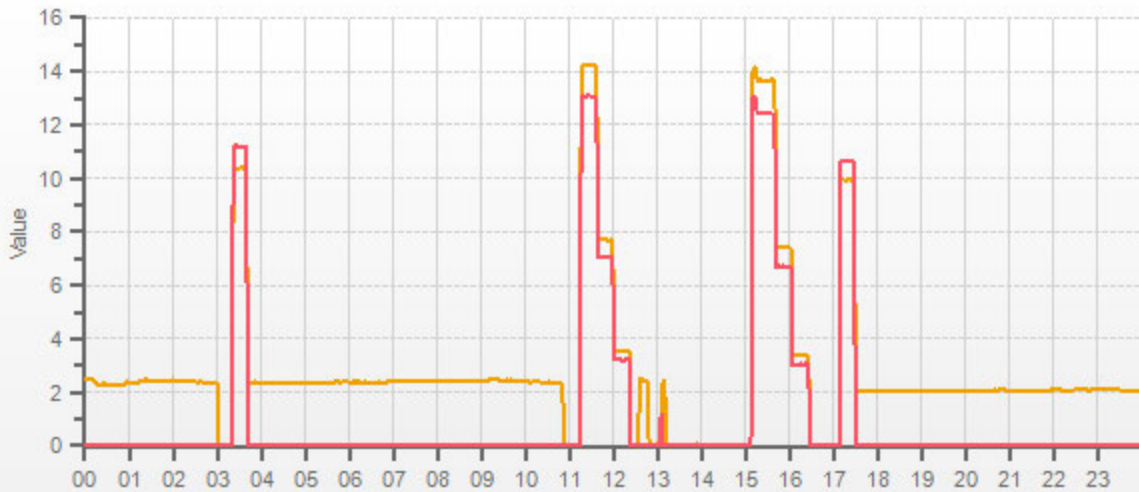
The Zero Air was tested and Zero Chromatogram was completed.

Date: February 15, 2019
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 14:48 / 17:32
Calibration Purpose: post repair
Calibration Method: Gas Dilution



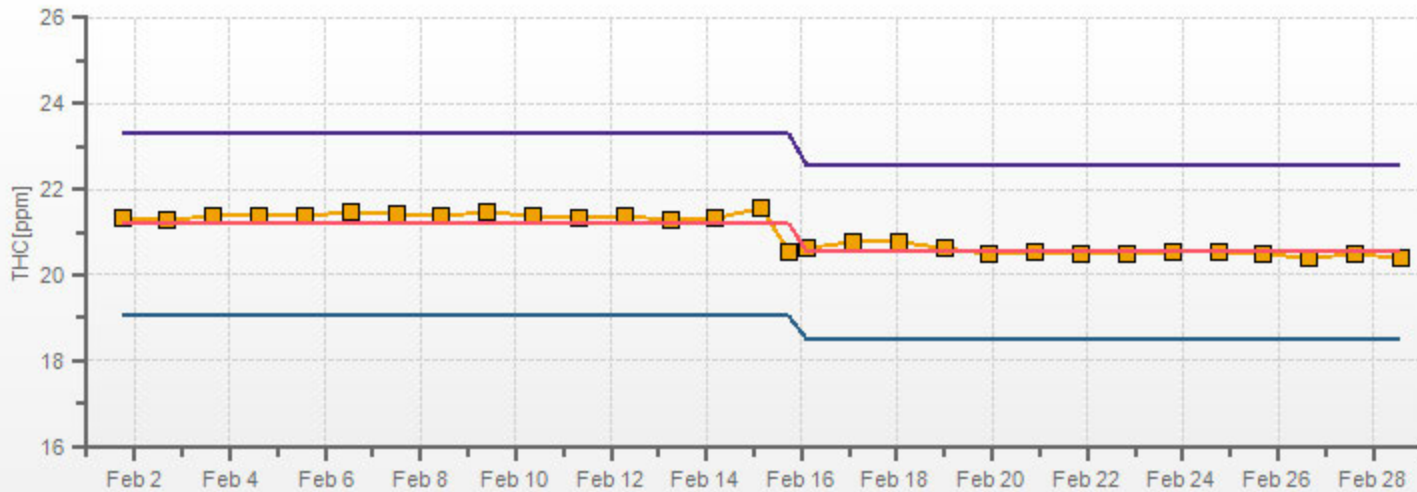
CH4[ppm] NMHC[ppm]



CAL-LICA-201902-01248

THC[ppm] Calibration: LICA MASKWA Monthly: 19/02 Type: Span

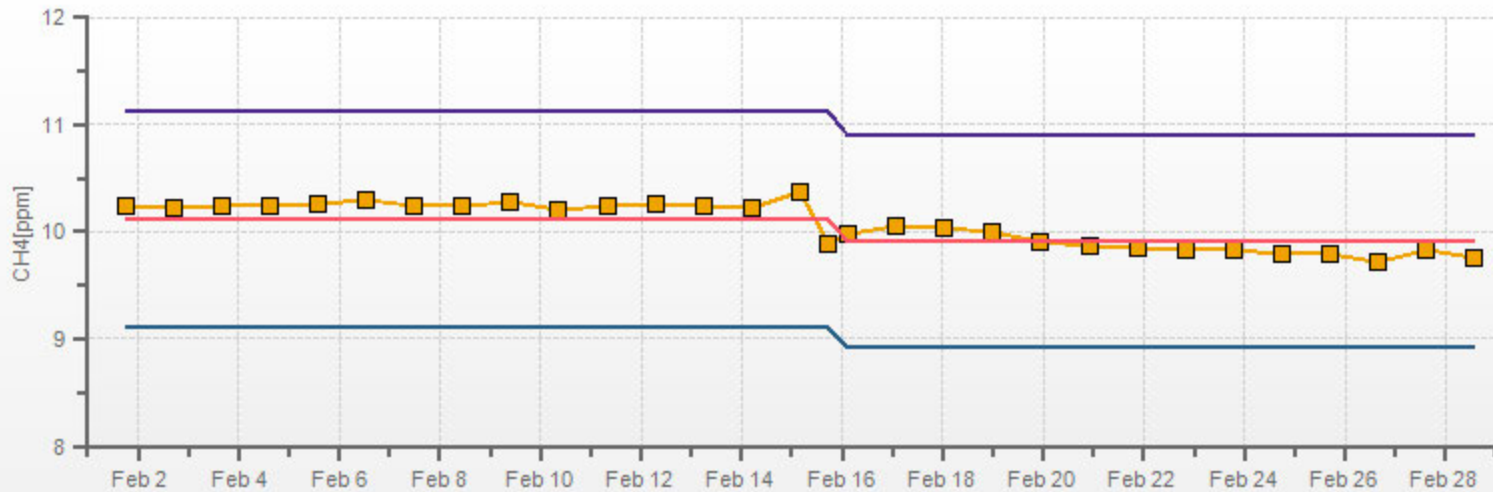
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248

CH4[ppm] Calibration: LICA MASKWA Monthly: 19/02 Type: Span

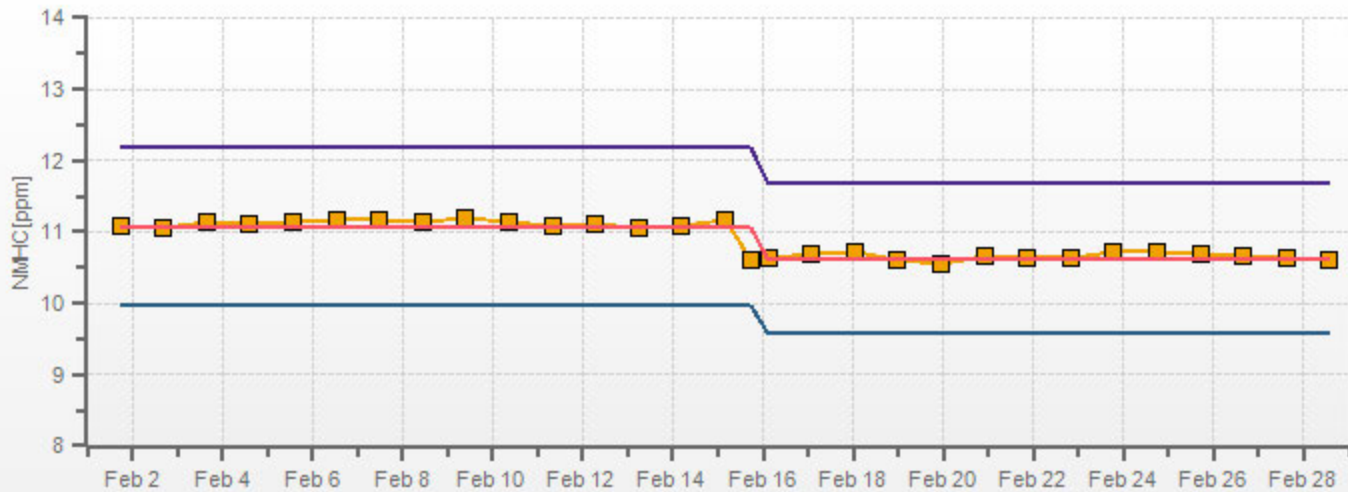
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248

NMHC[ppm] Calibration: LICAMASKWA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: February 14, 2019 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 11:13 / 17:39 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2020 937 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 24, 2020
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Analyzer: Serial Number/Owner: 1180930028 LICA Last Calibration Date: January 4, 2019 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>0.963</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>0.962</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	0.963	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	0.962	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	0.963	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	0.962	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.#: LL104225 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	0.1	0.1	n/a	n/a
as found high	4958	75.7	5034	774.9	776.4	805.0	807.0	0.963	0.962
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	774.0	775.0	1.0	0.0	1.0	
as found high NO2	4958	75.74	5034	500.0	272.0	775.0	503.0	502.0	502.0	1.000
gpt mid	4958	75.74	5034	270.0	505.0	775.0	270.0	269.0	269.0	1.000
gpt low	4958	75.74	5034	100.0	673.0	775.0	102.0	101.0	101.0	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	1.002	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=	3.73%	3.79%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	2.5	NO Bkg:	2.5
NOx Bkg:	2.6	NOx Bkg:	2.6
NO Coef:	0.949	NO Coef:	0.916
NO ₂ Coef:	1.000	NO ₂ Coef:	1.000
NOx Coef:	0.999	NOx Coef:	1.000
PMT:	-866.5	PMT:	-866.9
Internal:	28.4	Internal:	29.2
Chamber:	50.4	Chamber:	50.5
Cooler:	-3.0	Cooler:	-3.1
NO ₂ Converter:	325.0	NO ₂ Converter:	323.7
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:	44.15	Perm Oven Heater:	44.17
Pressure:	259.4	Pressure:	259.7
Flow:	0.549	Flow:	0.547
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	3	Expected Value NO:	3
Expected Value NO ₂ :	405	Expected Value NO ₂ :	392
Expected Value NOx:	409	Expected Value NOx:	395

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The converter cooling fan filter was cleaned.

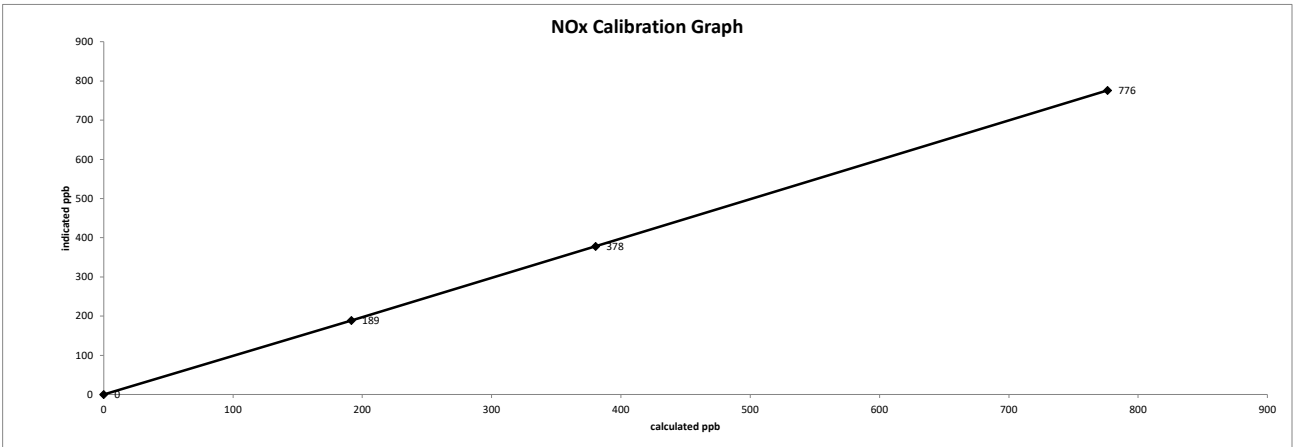
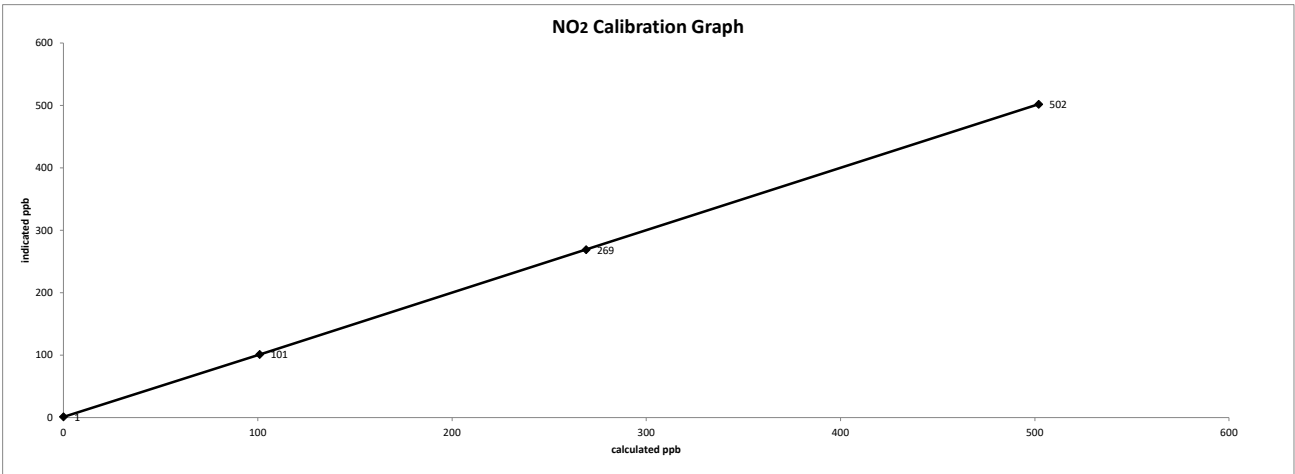
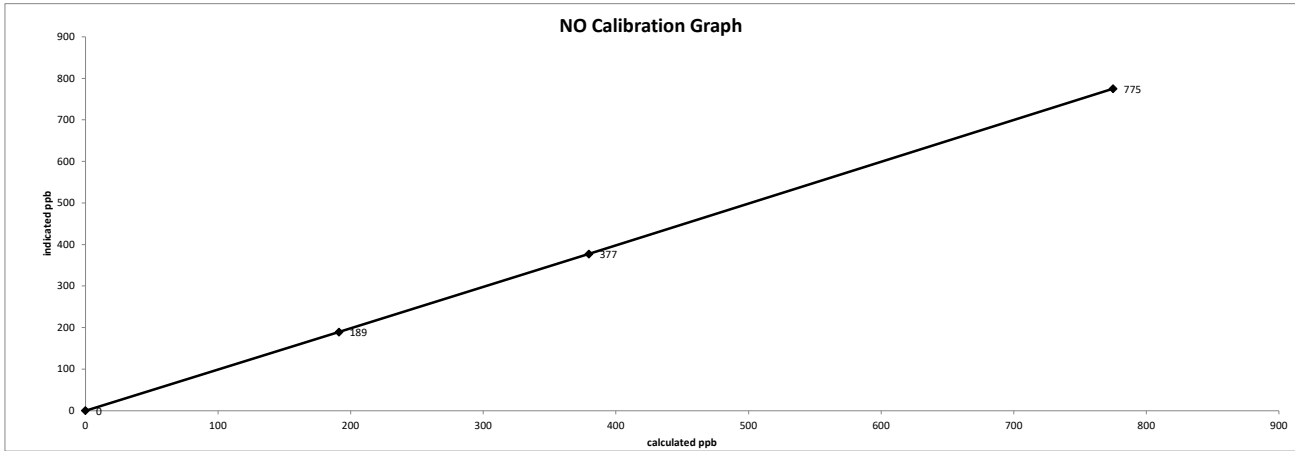
No high point NO₂ adjustment was required/made.

The analyzer cooling fan filter(s) were cleaned.

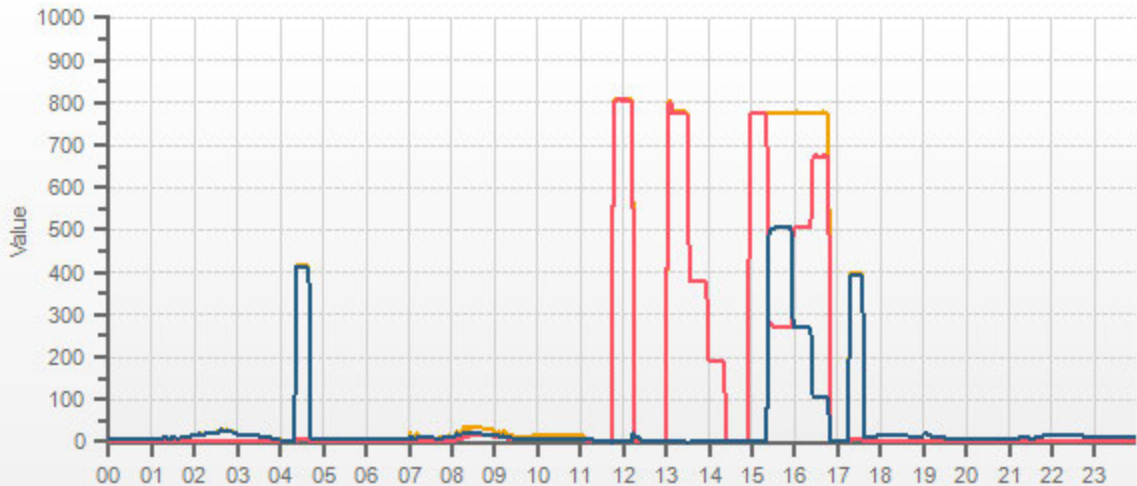
Date: February 14, 2019
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 11:13 / 17:39
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



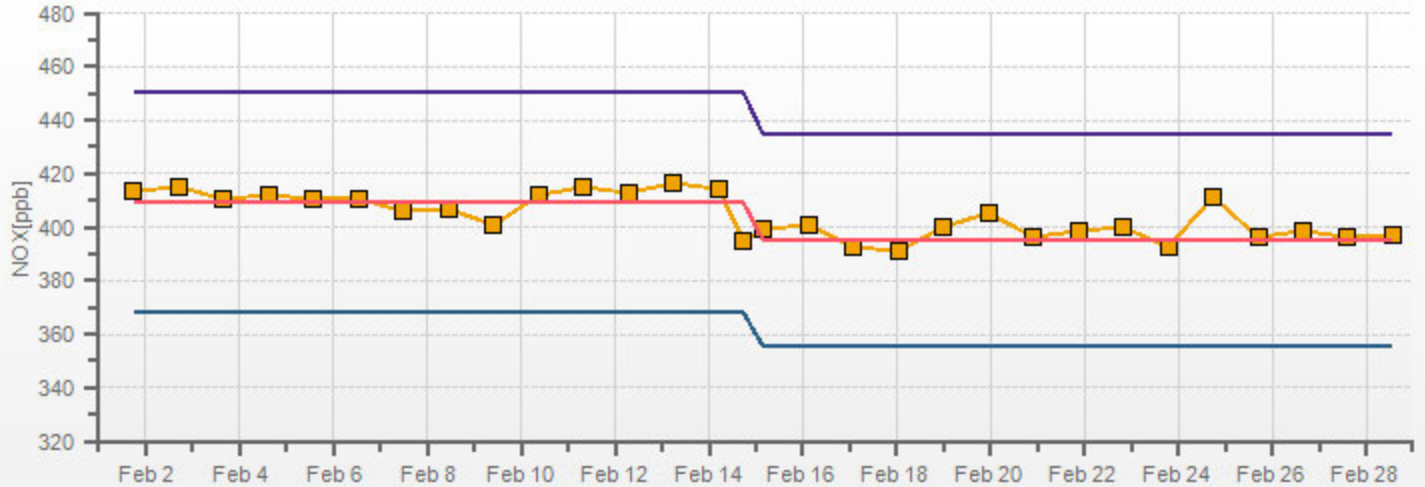
— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201902-01248

NOX[ppb] Calibration: LICAMASKWA Monthly: 19/02 Type: Span

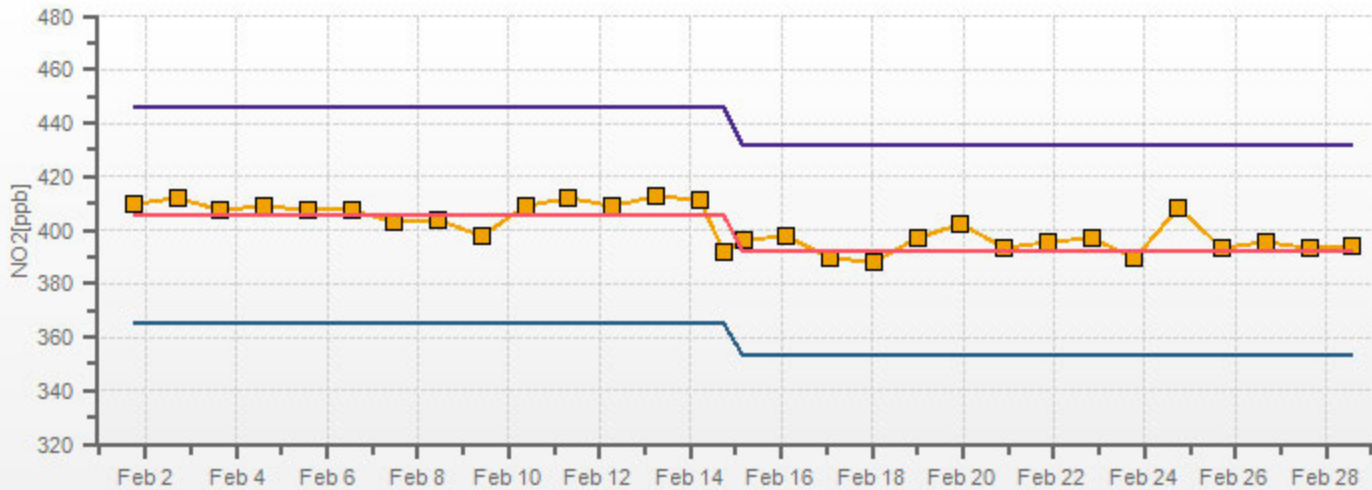
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248

NO2[ppb] Calibration: LICAMASKWA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01248



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:



Meteorological System Checklist

Date:	February 15, 2019		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One	Part 387 - Heated Rain Gauge	F 4481
Temperature Sensor:	Met One	083D-1-35 - Relative Humidity /w Temp	F 4090
Barometric Pressure Sensor:	Met One	Part 090D - Barometric Pressure Sens.	F 4497
Relative Humidity Sensor:	Met One	083D-1-35 - Relative Humidity /w Temp	F4090
Anemometer:			
PRECIPITATION SENSOR CHECK			
Checklist:	Reply:	Comments:	
Previous check date:	January 23, 2019	Rain gauge was found blocked with ice again, and required de-icing	
Is the sensor Level?	yes		
Is the heater operating properly?	other - see comments	Bucket - yes, base - no.	
Are the bucket drain holes clean?	yes		
Is the screen on the housing? (screen should be on between July and September)	no		
Is the housing clean?	other - see comments	covered with ice / the ice was heated and cleaned out of housing, test was completed.	
Is the area around the housing clean and free from obstacles?	yes		
TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)			
# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml	
10	1.00	0.00	
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	January 25, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	-15.1		
Station - Ambient Temperature (°C):	-14.7		
Temperature Difference (°C):	-0.4		
BAROMETRIC PRESSURE SENSOR CHECK			
Previous check date:	January 25, 2018		
Reference Barometer ID:	F.S. 05544 expires January 16, 2020		
Reference Pressure - Units/Reading:	millibar	935	
Station Pressure - Units/Reading:	millibar	935	
Pressure Tolerance +/- 15% of error:	795 - 1075	0.00%	
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	January 25, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	68.20		
Station Hygrometer % RH- Reading:	66.40		
RH Tolerance +/- 15% of difference:	57.97 - 78.43	2.6%	
Comments			

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</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 Date: August 22, 2018
Operator Signature: _____ Location: McIntyre Center Edmonton



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>	

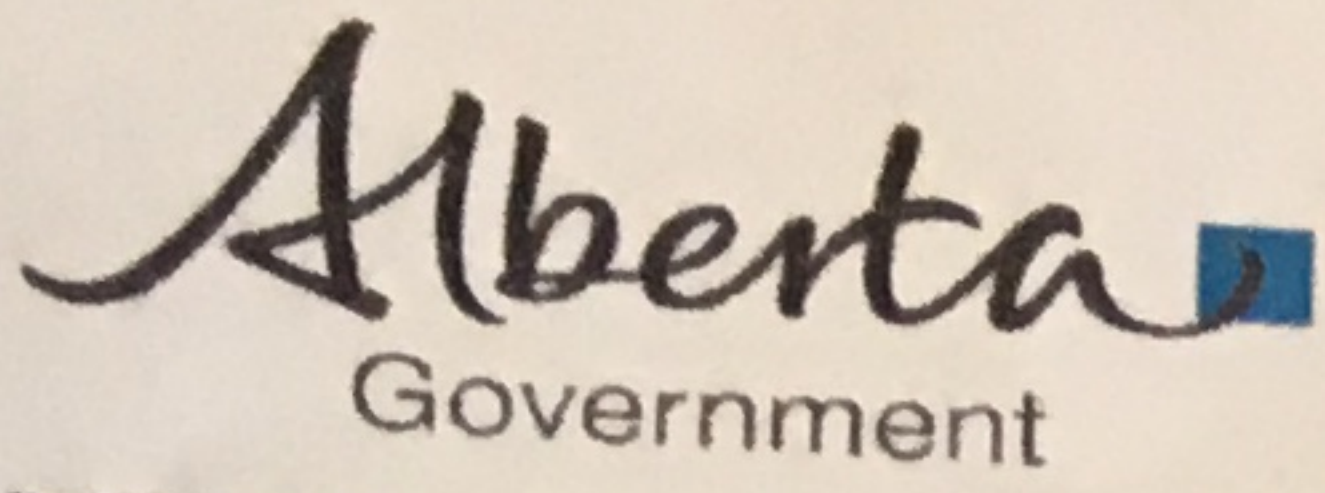
Reference Analyzer:
 Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

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. 2019-393CGA

Company: Maxxam **Operators name:** Alex

Cylinder #: LL29687 Conc CH₄ (PPM) 598/198 Tolerance (%) 1 Certified By: Praxair

Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 2092</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>January 14, 2019</u>			Temp. °C	<u>23.8 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>05604875</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: 2221

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

Last Calibration: Date: Jan 14/19 C.F. 1.000 Done By: Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
5000	0.0	0.00	0.00	0.02	51.48	603	209
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						597	209

	CH₄	C₃H₈
Previous Stated Concentration PPM:	<u>598</u>	<u>198</u>
Percent variance from Stated:	<u>0</u>	<u>6</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: January 15, 2019

Operator 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



Lakeland Industry & Community Association

FEBRUARY 2019
Ambient Air Monitoring Calibration Report
- ST. LINA STATION-
CAL-LICA-201902-01250

Station Operation and Maintenance:
Maxxam Analytics

Data Validation and Report:
Maxxam Analytics

April 2, 2019

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

April 2, 2019

Subject:

February 2019 Ambient Air Monitoring Calibration Report Submission for the LICA St. Lina Station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA St. Lina AQM Station in the month of February 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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

Respectfully,



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



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

**FEBRUARY 1 - 28, 2019 MONTHLY
CALIBRATION REPORT**
Project #: 2833-2019-02-25-C
LICA-201902

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

St. Lina Continuous Monitoring Station

Date of Report Issuance: March 22, 2019



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

CAL-LICA-201902-01250



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date:	February 12, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	926	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	12:13	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	16:42	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	1180930030 LICA	Range ppb:	1000		
Last Calibration Date:	January 21, 2019	As Found C.F.:	1.028		
Previous 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: 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><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

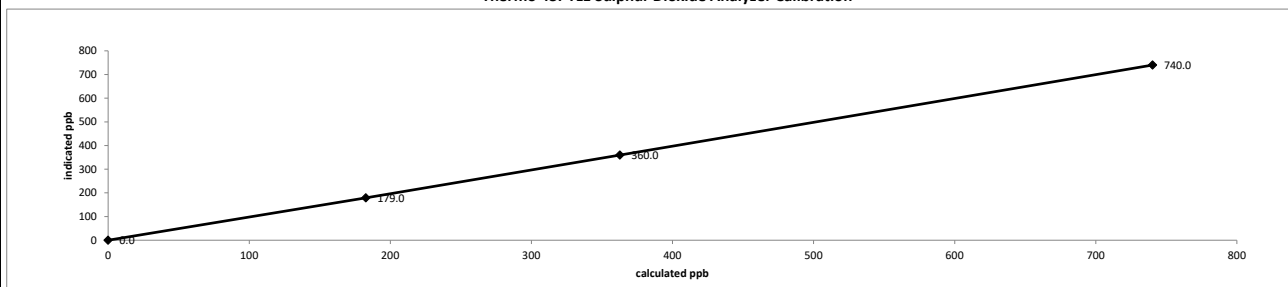
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5037	0.00	5037	0.0	0	n/a
as found high	4958	75.74	5034	740.2	720	1.028
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	179	1.020
calibrator zero	5037	0.00	5037	0.0	0	n/a
Average C.F. =						1.009

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) =	0.20%		± 3% F.S.
% change in C.F. from last cal =	-2.81%		± 10%

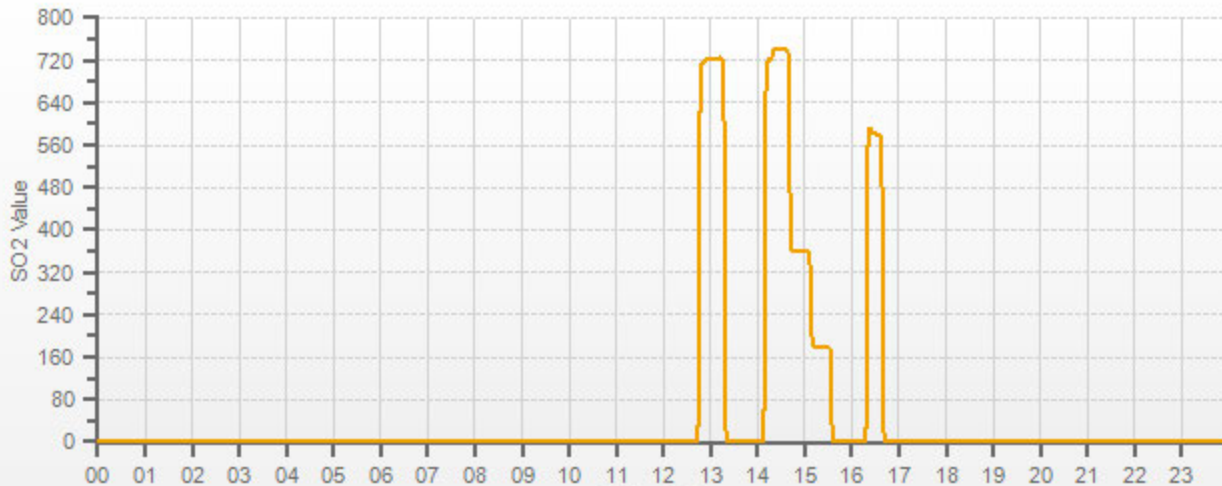
Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	3.97	Bkg:	4.13
Coef:	1.080	Coef:	1.107
Pmt:	696.7	Pmt:	-697.1
Flash:	1009	Flash:	1009
Internal:	30.4	Internal:	29.9
Chamber:	45.2	Chamber:	44.8
Perm Oven Gas:	45.00	Perm Oven Gas:	40.00
Perm Oven Heater:	44.15	Perm Oven Heater:	43.93
Pressure:	670.2	Pressure:	669.6
Sample Flow:	0.437	Sample Flow:	0.437
Lamp Intensity:	90	Lamp Intensity:	91
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	622.0	Expected Value:	622.0

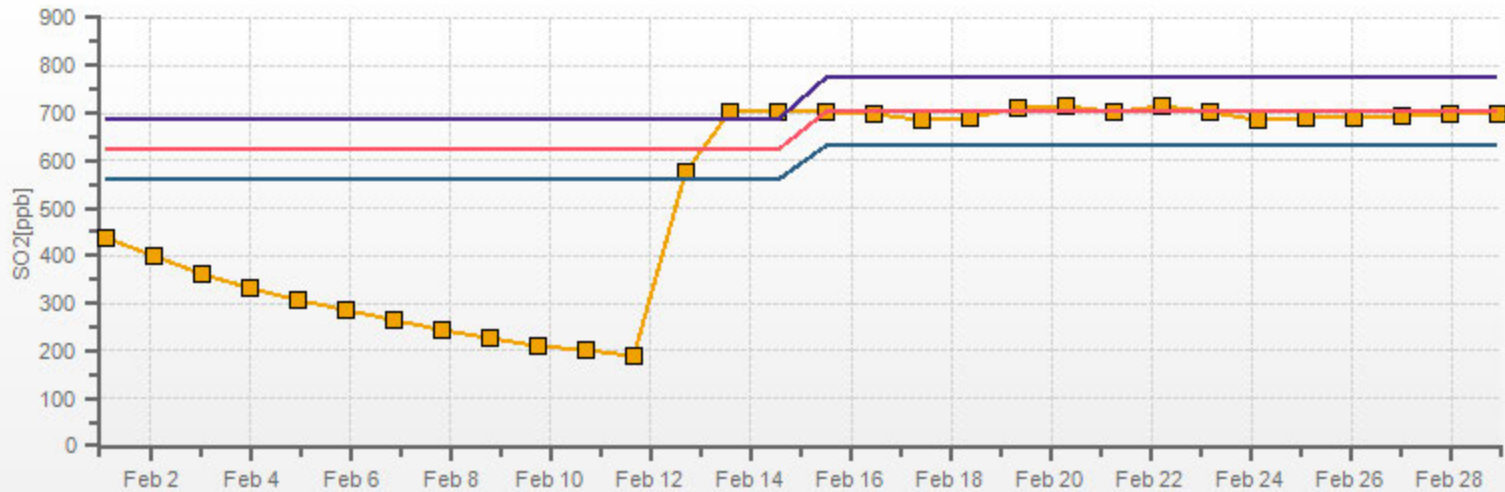
Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.
 The analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.

SO2[ppb]



CAL-LICA-201902-01250

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



CAL-LICA-201902-01250



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	February 12, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	926	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	12:14	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:16	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	CM 18010058 LICA	Range ppb:	100		
Last Calibration Date:	January 18, 2019	As Found C.F.:	1.042		
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:	N/A	Start/End Time 24 hr.:
High Flow Meter ID/Expiry Date:	N/A	SO2 Analyzer Range:
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	EY 0001003	As Found Zero:
Cal Gas Conc. (ppm):	9.55	Analyzer Response: (ppb):
		Zero Corrected Result (ppb):

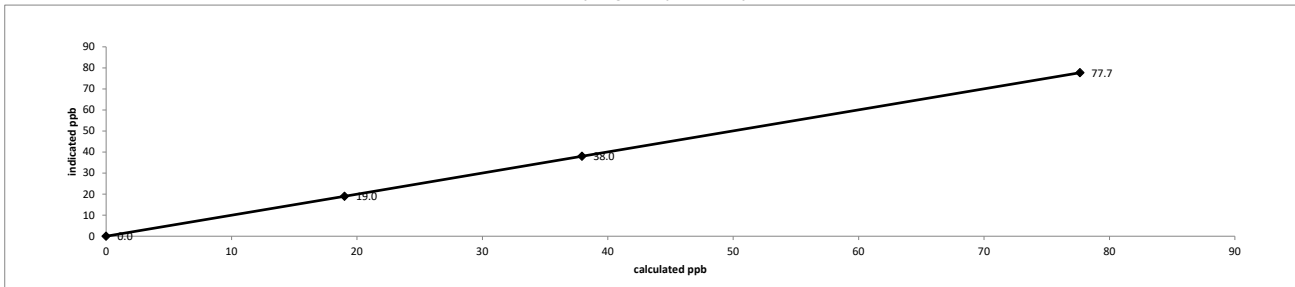
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	-0.3	n/a
as found high	7441	61.00	7502	77.7	74.2	1.042
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7441	61.00	7502	77.7	77.7	0.999
mid	7420	29.60	7450	37.9	38	0.999
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	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) =	0.00%		± 3% F.S.
% change in C.F. from last cal =	-4.23%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration

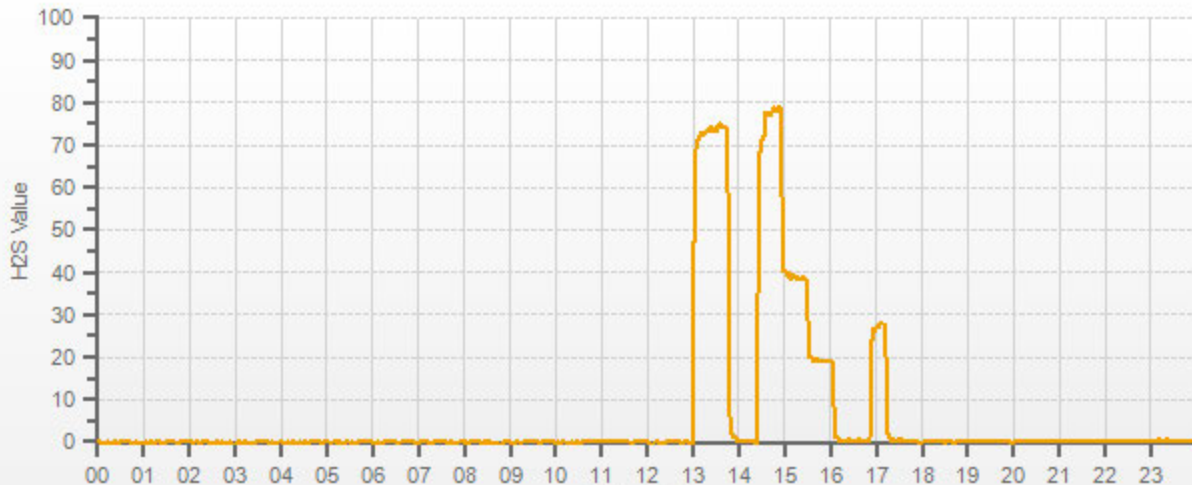


As found:		As left:	
Bkg:	31.6	Bkg:	33.3
Coef:	0.837	Coef:	0.887
Pmt:	-634.2	Pmt:	-634.2
Flash:	908	Flash:	908
Internal:	33.6	Internal:	33.0
Chamber:	45.1	Chamber:	45.2
Converter Temp:	323.1	Converter Temp:	323.3
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.10	Perm Oven Htr:	44.08
Pressure:	581.2	Pressure:	582.1
Sample Flow:	0.824	Sample Flow:	0.825
Lamp Intensity:	90	Lamp Intensity:	90
Averaging Time:	120	Averaging Time:	120
Expected Value:	28.1	Expected Value:	27.6

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.

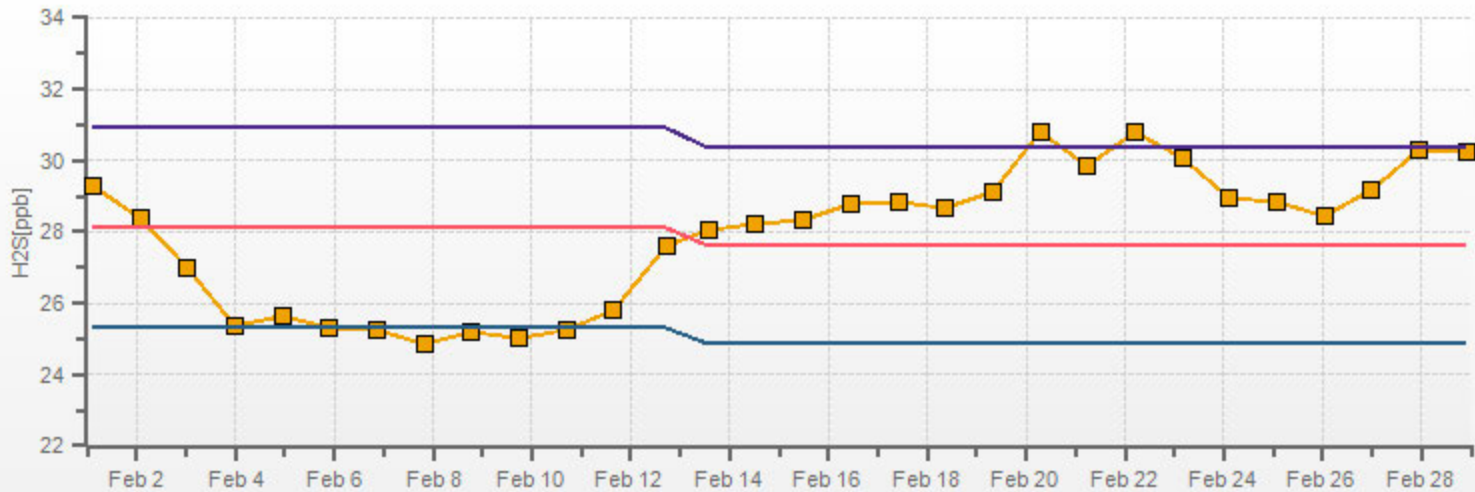
H2S[ppb]



CAL-LICA-201902-01250

H2S[ppb] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 13, 2019	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 917 millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Parameter: CH4 / NMHC / THC	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 10:42 / 14:44	Performed By/Reviewer: Alex Yakupov Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026

Analyzer:	Correction Factors:
Serial Number/Owner: 1180930025 LICA	Previous C.F.: As Found C.F.: New C.F.:
Measured Flow: 1241	CH₄ = 1.000 1.013 1.000
Last Calibration Date: January 21, 2019	NMHC = 1.000 0.996 1.000
Range ppm: 20 CH4/20 NMHC/40 THC	THC = 1.000 1.005 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 29687

CH4 Cylinder Conc.: 598.0 198.0 =C₃H₈ Cylinder Conc.

CH₄ expressed as C₃H₈: 544.5 1142.5 =total CH₄ equivalent

Point	CH4	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	2469	57.64	2527	13.64	12.42	26.06	13.46	12.47	25.92	1.013	0.996	1.005
adjusted high	2469	57.64	2527	13.64	12.42	26.06	13.64	12.42	26.06	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.36	6.72	14.08	1.008	1.005	1.006
low	2486	14.00	2500	3.35	3.05	6.40	3.35	3.05	6.40	1.000	1.000	1.000
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. =										1.002	1.001	1.002

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) =	-0.04%	-0.03%	-0.04%	± 3% F.S.
% change in C.F. from last cal =	-1.34%	0.40%	-0.54%	± 10%

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply: -296.8	Calibration History cnt'd:	NM Peak Area: 82455
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: 29.5		NMHC Start: n/a
Cylinder Pressures/reg.:	Carrier: 2300 55	Run History>1:	NMHC End: n/a
	Fuel: 600 55		Date: Feb 13, 2019
	Span Gas: 2000 10		Time: 10:53
	Zero Air Generator: 50		CH₄ PK HT: 0
Internal Pressures:	Carrier: 32.0		CH₄ RT: 12.8
	Fuel: 48.1		CH₄ Baseline: 3445
	Air: 36.2		CH₄ LOD: 37
FID Status:	Status: LIT		CH₄ SD: 12
	Counts: 38436		CH₄ 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: Dec 20, 2018 / 14:07		NM CONC: 0.00
	Flameouts: 300		NM Base Start: 3404
	Det Oven at Start: 166.9		NM Base End: 3455
	Col Oven at Start: 73.6		NM LOD: 45
Calibration History:	Time: Jan 21, 2019 / 15:06	Expected Values:	NM Start IDX: 4
	Type: SPAN		NM End IDX: 54
	Status: GOOD		NM Max Slope: 2.7e+00
	Check/Adjust: ADJUST		NM Min Slope: -4.6e-01
	CH₄ Span Conc: 13.67		NM PT Count: 0
	CH₄ SP Ratio: 0.000695		Previous CH₄: 9.86
	CH₄ RT: 13.2		Previous NMHC: 10.71
	CH₄ PK IDX: 26		Previous THC: 20.57
	CH₄ PK HT: 19682		New CH₄: 9.92
	NM Span Conc: 12.45		New NMHC: 10.63
	NM SP Ratio: 0.000151		New THC: 20.55

Comments:

The analyzer sample inlet filter was changed.

A new span gas cylinder was installed.

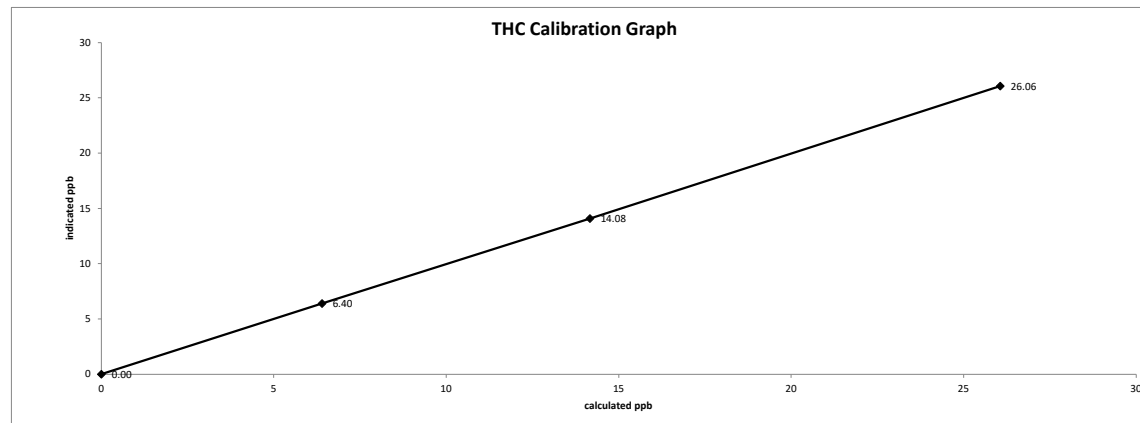
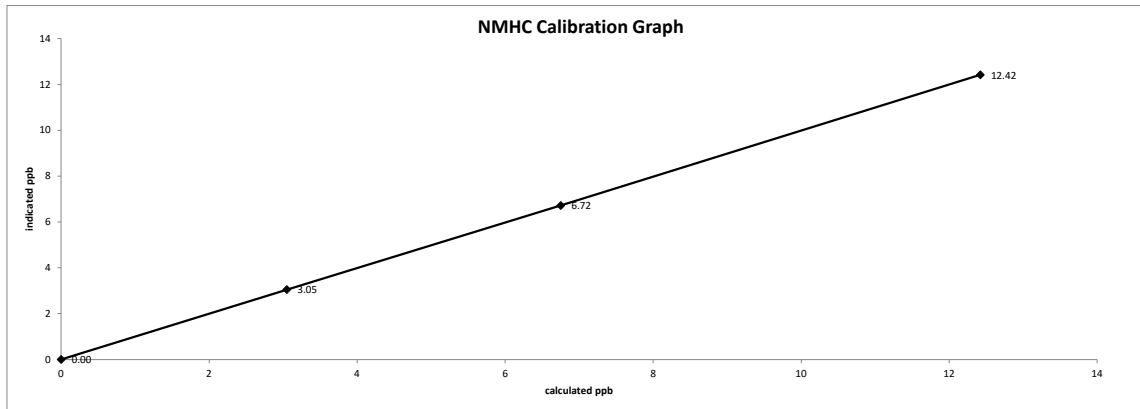
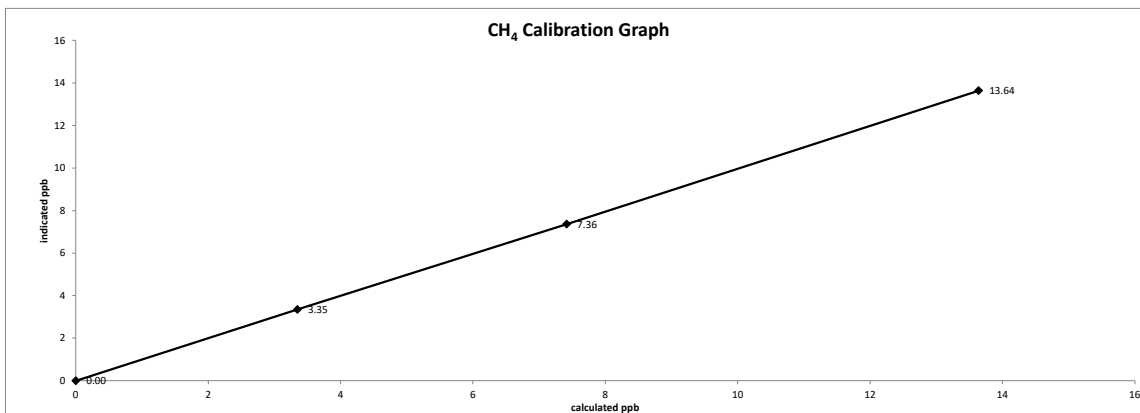
The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

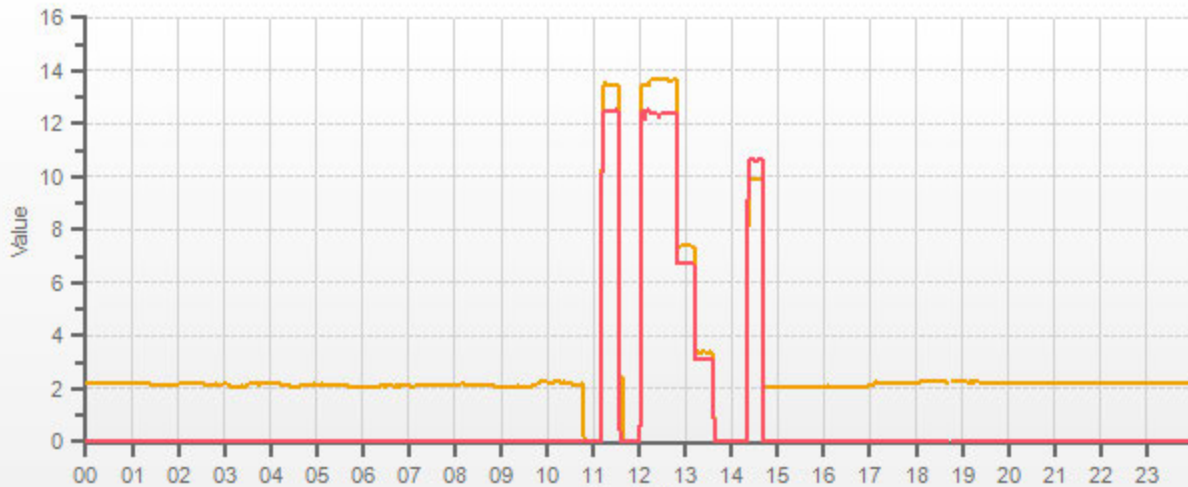
No zero adjustment was required/made.

Date: February 13, 2019
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:42 / 14:44
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution



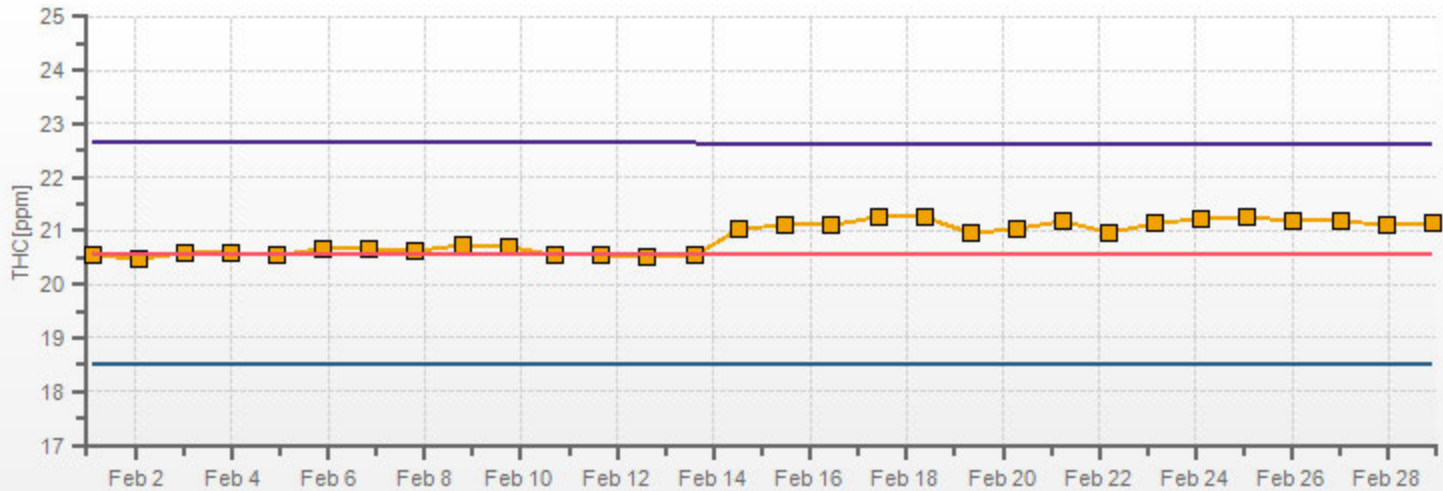
CH4[ppm] NMHC[ppm]



CAL-LICA-201902-01250

THC[ppm] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

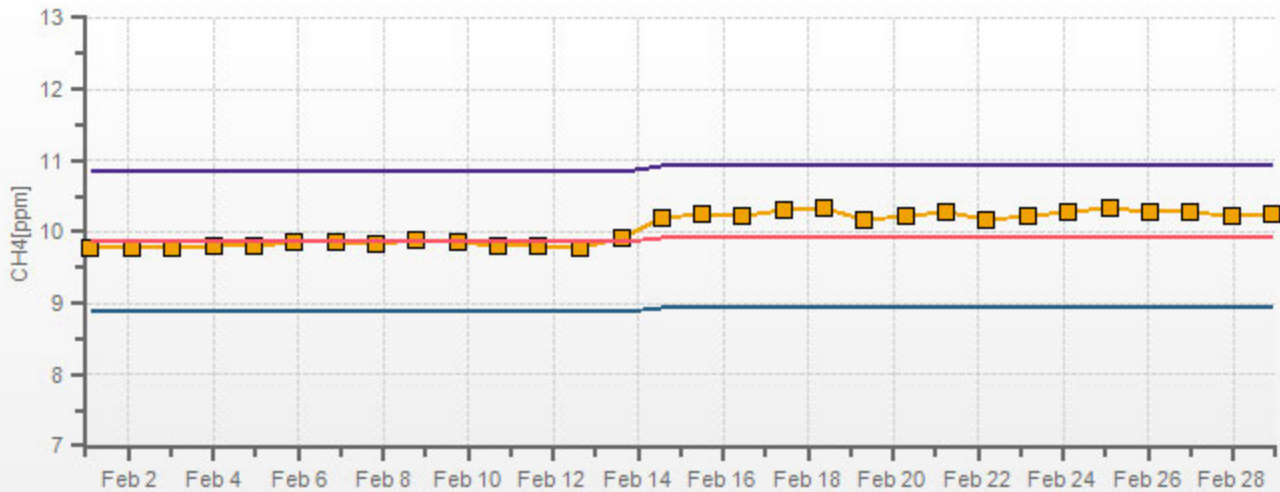
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250

CH4[ppm] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

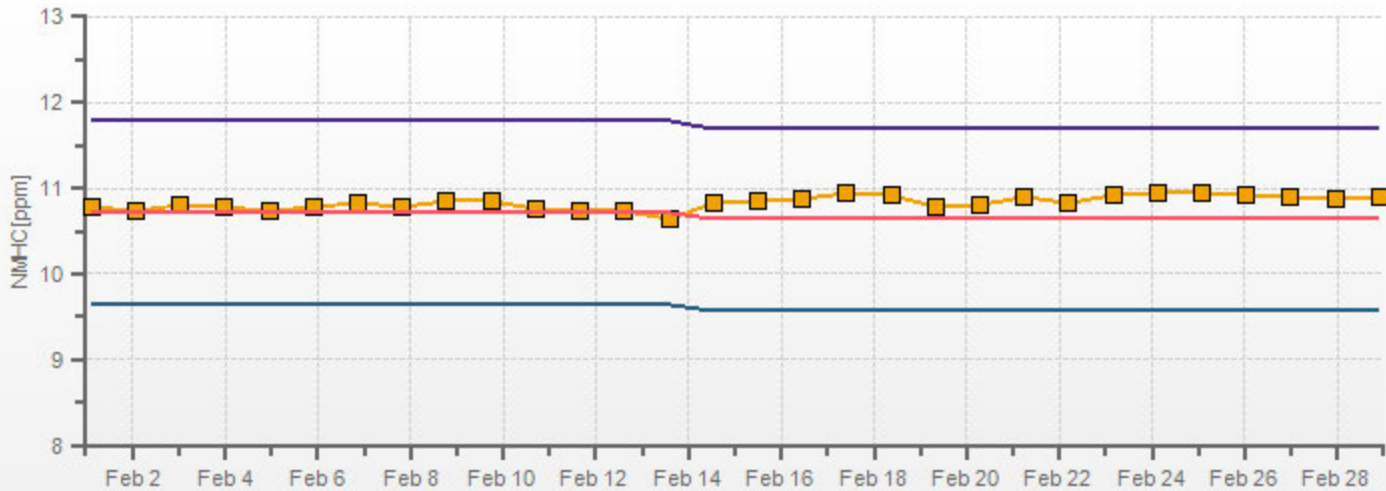
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250

NMHC[ppm] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	February 12, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	926	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Start/End Time 24 hr. (mst):	12:13 / 18:42	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:		Correction Factors:			
Serial Number/Owner:	1180930029 LICA	NO =	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date:	January 21, 2019	NO ₂ =	1.000	0.997	1.000
Range ppb:	1000	NOx =	1.000	0.997	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			
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	777.0	779.0	0.997	0.997	
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	377.0	1.007	1.009	
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	1.008

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	776.0	0.0	0.0	0.0	
as found high NO2	4958	75.74	5034	500.0	276.0	776.0	500.0	500.0	500.0	1.000
gpt mid	4958	75.74	5034	275.0	503.0	776.0	273.0	273.0	273.0	1.000
gpt low	4958	75.74	5034	100.0	675.0	776.0	101.0	101.0	101.0	1.000
									Average NO ₂ C.F.=	1.000

Linear Regression/Calibration Results:				LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04
Correlation Coefficient =	NO	NOx	NO ₂	
Slope =	1.000	1.000	1.000	
b (Intercept as % of full scale) =	-0.14%	-0.16%	0.00%	
% change in C.F. from last cal =	0.28%	0.34%	0.00%	
NO ₂ converter efficiency	1.00			

As found:		As left:	
NO Bkg:	5.2	NO Bkg:	5.2
NOx Bkg:	5.4	NOx Bkg:	5.4
NO Coef:	1.151	NO Coef:	1.150
NO2 Coef:	0.999	NO2 Coef:	0.999
NOx Coef:	1.000	NOx Coef:	1.000
PMT:	-824.0	PMT:	-824.0
Internal:	29.9	Internal:	30.0
Chamber:	50.4	Chamber:	50.2
Cooler:	-2.8	Cooler:	-2.6
NO2 Converter:	324.2	NO2 Converter:	326.8
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	44.99	Perm Oven Gas:	45.00
Perm Oven Heater:	44.15	Perm Oven Heater:	44.16
Pressure:	257.2	Pressure:	256.6
Flow:	0.530	Flow:	0.530
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	3	Expected Value NO:	3
Expected Value NO ₂ :	390	Expected Value NO ₂ :	392
Expected Value NOx:	393	Expected Value NOx:	395

Comments:

The analyzer sample inlet filter was changed. The converter cooling fan filter was cleaned.

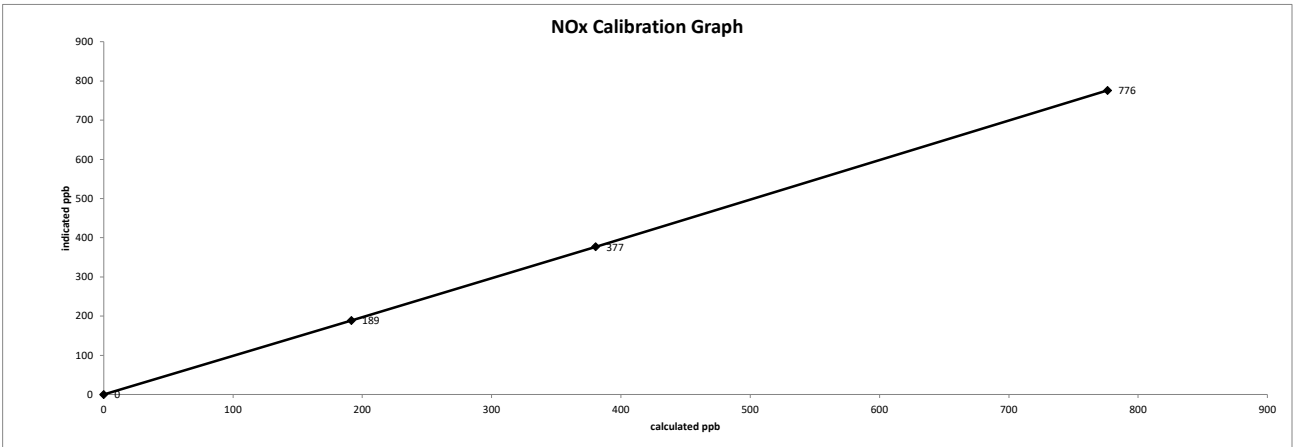
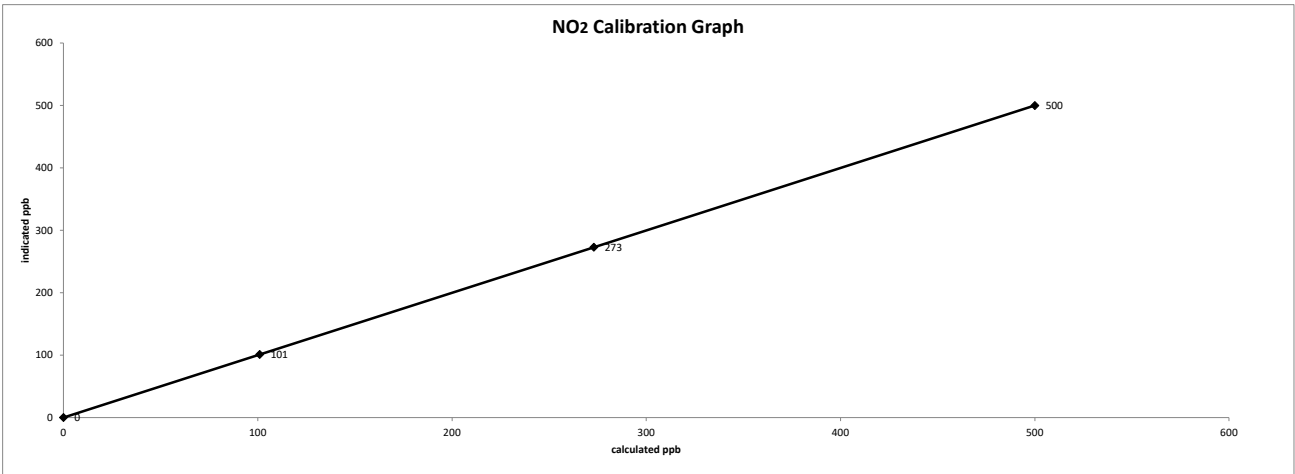
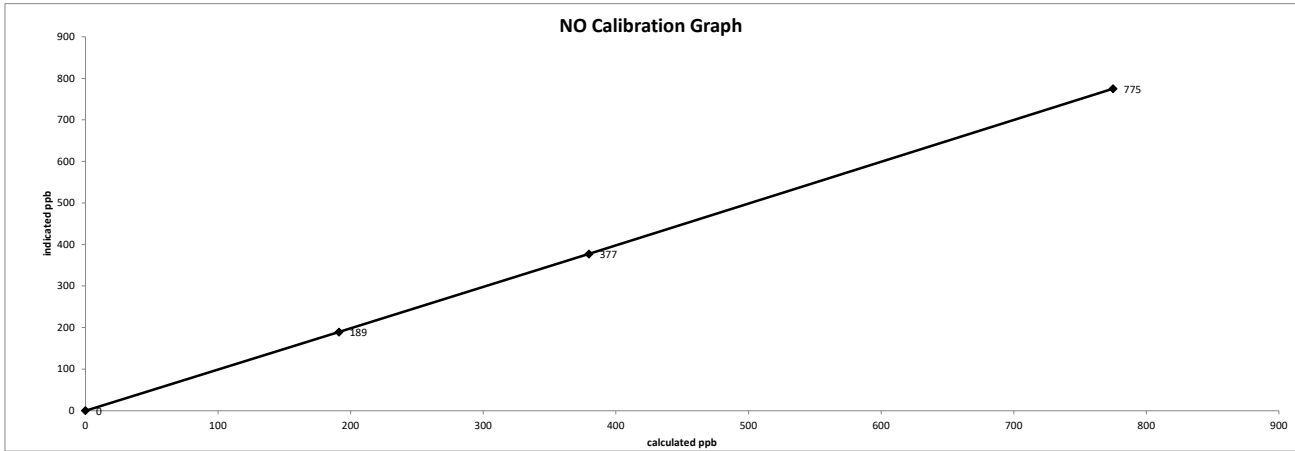
The manifold blower was found to be working normally. No high point NO2 adjustment was required/made.

The analyzer cooling fan filter(s) were cleaned.

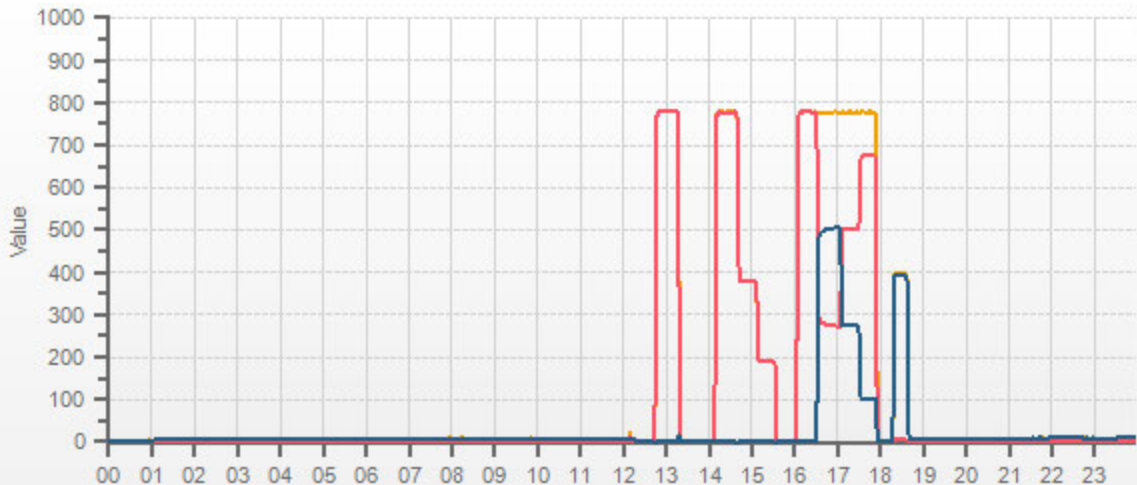
Date: February 12, 2019
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 12:13 / 18:42
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



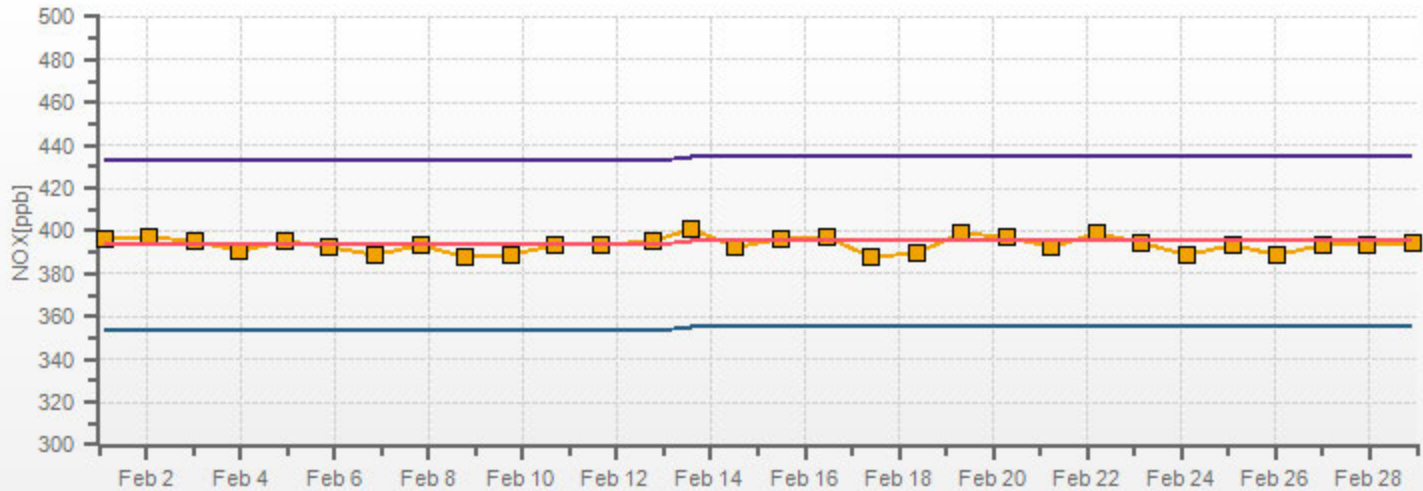
— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201902-01250

NOX[ppb] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

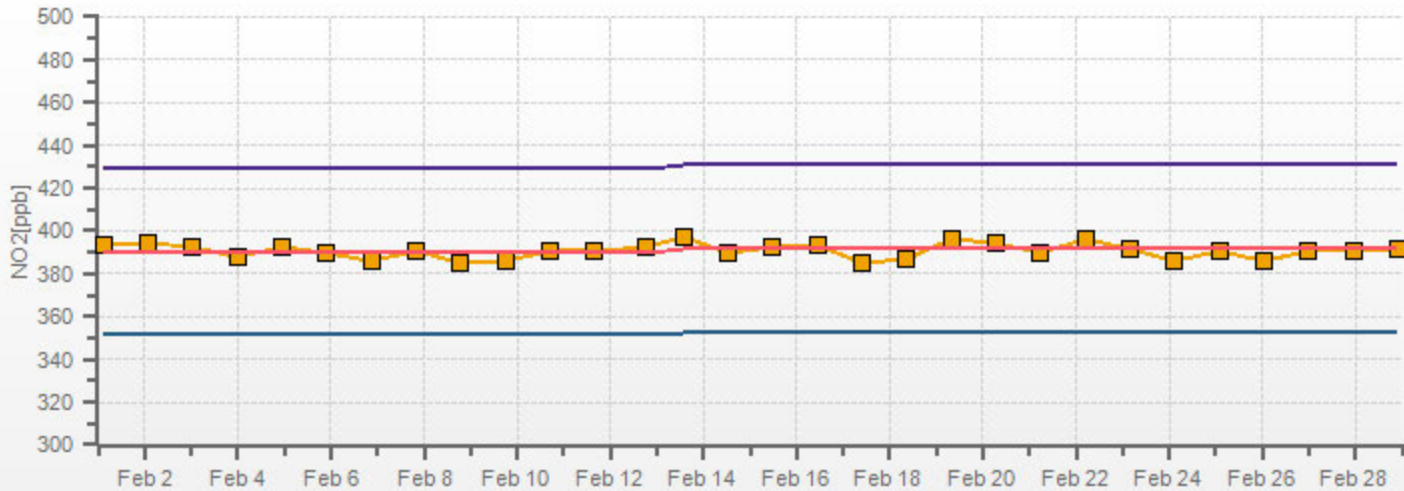
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250

NO2[ppb] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250



Thermo 49i Ozone Analyzer Calibration

Date: February 13, 2019 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 10:42 / 16:57 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power Analyzer: Serial Number/Owner: 10022540371 LICA Last Calibration Date: January 18, 2019 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 917 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny 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.: 0.988 New C.F.: 1.000
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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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

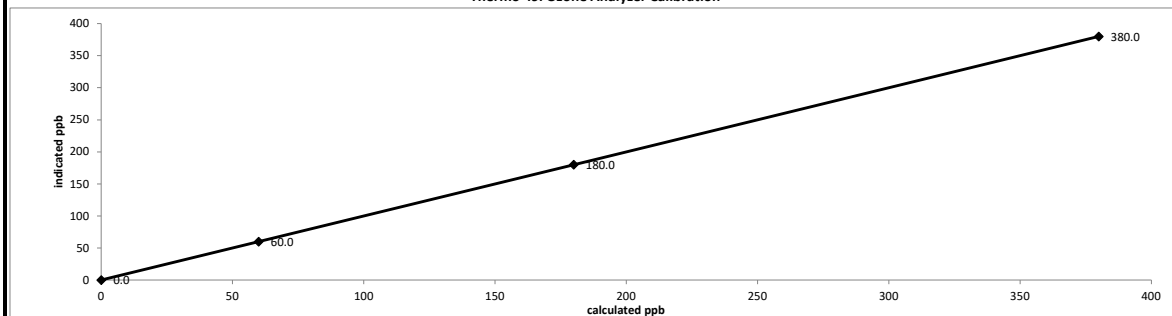
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	-0.8	n/a
as found high	5000	5000	380.0	380.0	384.0	0.988
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.00%</u>	0.95-1.05
% change in C.F. from last cal = <u>1.25%</u>	± 3% F.S.
	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	-0.8
O3 Coef:	1.020
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	29.6
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	673.5
Cell A lpm:	0.726
Cell B lpm:	0.770
O3 ppb:	-4.6
Cell A ppb:	-1.2
Cell B ppb:	-8.0
Cell A int (Hz):	71373
Cell B int (Hz):	90757
Expected Value:	388.0

As left:

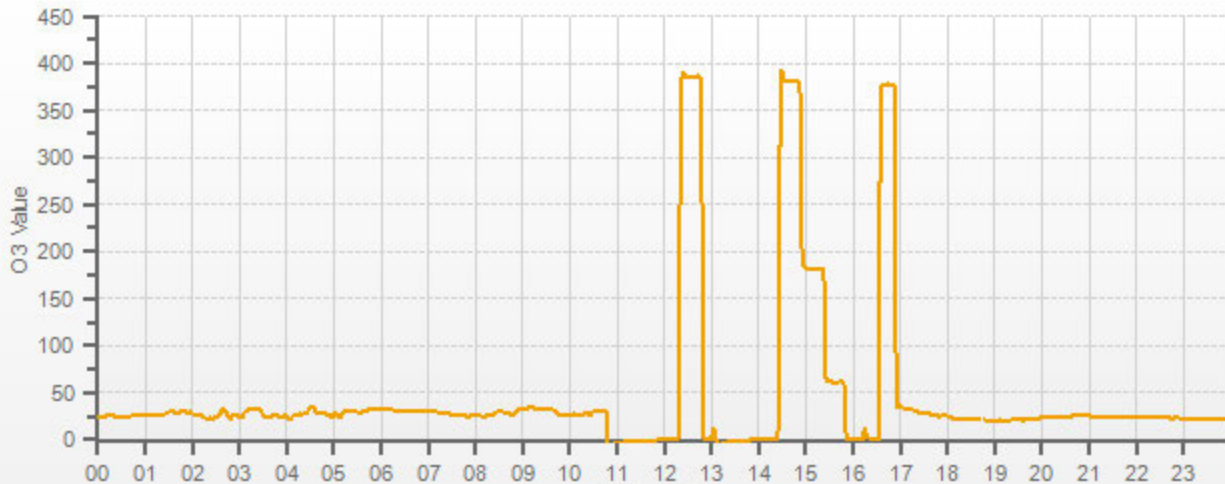
O3 Bkg:	-0.4
O3 Coef:	1.008
Photo Lamp:	10.7
O3 Lamp:	5.7
Bench:	29.5
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	672.9
Cell A lpm:	0.726
Cell B lpm:	0.772
O3 ppb:	0.7
Cell A ppb:	0.7
Cell B ppb:	-0.1
Cell A int (Hz):	71381
Cell B int (Hz):	90749
Expected Value:	377.0

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.

A scheduled ZS check interfered with the calibration at 13:00. The ADJUSTED ZERO point was restarted.

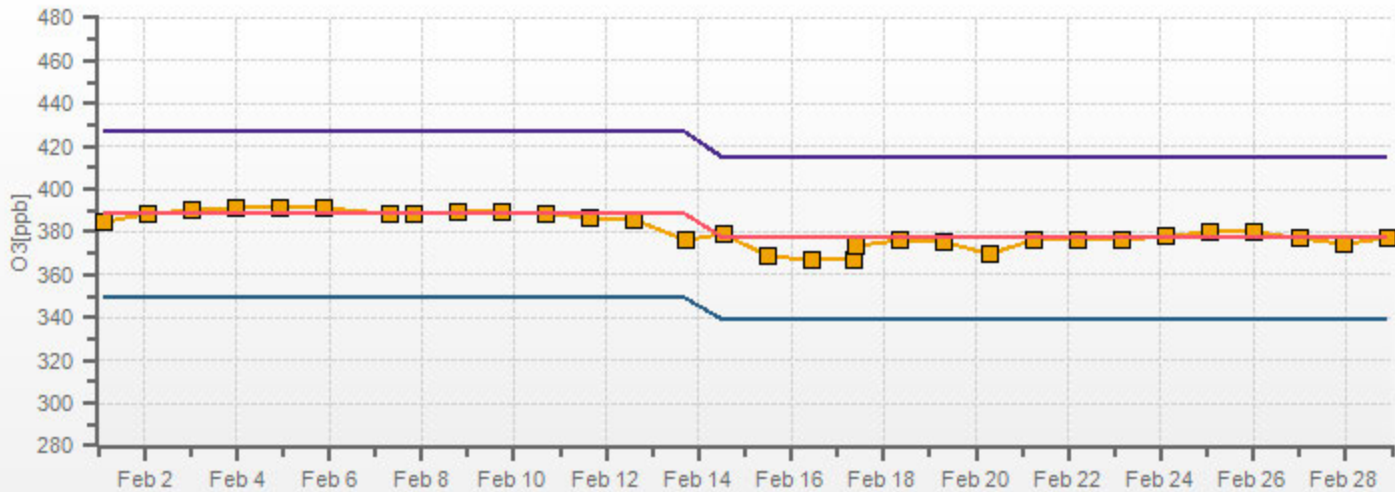
O3[ppb]



CAL-LICA-201902-01250

O3[ppb] Calibration: LICA ST. LINA Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01250

Thermo 5030i SHARP Monitor Calibration

Date: February 13, 2019	Performed By/Reviewer: Alex Yakupov Rob Fisher
Company: LICA	Start Time (mst): 16:20
Station Name/Location: St. Lina	End Time (mst): 18:39
Previous Audit Date: January 29, 2019	Calibration Purpose: Quarterly
Parameter: PM 2.5	Weather Conditions: Mainly sunny

SHARP 5030i Information and Status:		
Serial Number: CM 17091001	Filter Tape Counter	382

Reference Standards: Air Flow						
	Manometer		Orifice		Pressure:	
Make:	Dwyer	Chinook	Fisher Scientific	Fisher Scientific	Temp / RH:	
Model:	475 Mk. III	CHN0901	FB61291	11-661-7A	11745843	
Serial Number:	#3	#2	130168457	170286131		
Expiry Date:	January 17, 2020	April 24, 2019	January 17, 2020	April 19, 2019		

Ambient Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	-18.31	-18.8	0.5	-18.31	-18.8	0.5
#2	-18.24	-18.8	0.6	-18.24	-18.8	0.6
#3	-18.39	-18.8	0.4	-18.39	-18.8	0.4
Average	-18.3	-18.8	0.5	-18.3	-18.8	0.5
Temp Limit: ± 2°C						

Ambient Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)
#1	73.30	74.4	-1.1	73.36	73.3	0.1
#2	73.34	74.4	-1.1	73.40	73.3	0.1
#3	73.28	74.3	-1.0	73.38	73.3	0.1
Average	73.3	74.4	-1.1	73.4	73.3	0.1
RH Limit: ± 2 %RH						

Flow Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	22.84	22.2	0.6	22.84	22.2	0.6
#2	22.91	22.2	0.7	22.91	22.2	0.7
#3	23.00	22.3	0.7	23.00	22.3	0.7
Average	22.9	22.2	0.7	22.9	22.2	0.7
Temp Limit: ± 2°C						

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	691.5	692.0	-0.5	691.5	692.0	-0.5
BP Limit: ± 2 mmHg						

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	9.05	10.0	-0.9	9.05	10.0	-0.9
RH Limit: ± 2 %RH						

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	21.54	21.3	0.2	21.54	21.3	0.2
Temp Limit: ± 2°C						

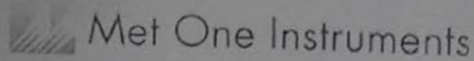
Nephelometer Source Level						
As Found:			As Left: (same as found if acceptable)			
	Variable	Value	Variable	Value		
	IRE D	65	IRE D	65	IRE D Limit (as found): 60-70 mA Adjusted IRE D Limit (as left): 65 mA	
	SRC LEVEL	47	SRC LEVEL	47		

Detector Calibration (Auto)						
Detector Auto Calibration Completed:			As Left:			
YES			Variable	Value		
			HIGH VOLT	1340		
			BETA REF TH	240		
			ALPHA TH	630		
			DIFF HV	1		

Mass Coefficient (Auto)						
Zero			Span			
	Variable	Value	Variable	Value		
	MASS COEF	7031.5	MASS COEF	7107.5	Foil Set: CM1597	
	FOIL VALUE	0	FOIL VALUE	1045		
	Beta Avg	9064	Beta Avg	7825		
	difference	n/a	difference	1.1		

Flow Calibration (L/min)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.67	-0.02	16.65	16.67	-0.02
#2	16.65	16.68	-0.03	16.65	16.68	-0.03
#3	16.65	16.66	-0.01	16.65	16.66	-0.01
Average	16.65	16.67	-0.02	16.65	16.67	-0.02
Flow Limit: 16.67 ± 0.33 L/min						

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.66	-0.01	16.61	16.64	-0.03
						Leak Limit: 0.08 L/min
						LEAK RATE: -0.02



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



Meteorological System Checklist

Date:	February 21, 2019		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Rotronic	HC2A-S3	20257103
Barometric Pressure Sensor:	Met One - BP sensor	Part 090D	F4498
Relative Humidity Sensor:	Rotronic	HC2A-S3	20257103
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	September 21, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	-12.6		
Station - Ambient Temperature (°C):	-12.5		
Temperature Difference (°C):	-0.1		
BAROMETRIC PRESSURE SENSOR CHECK			
Previous check date:	February 13, 2018		
Reference Barometer ID:	F.S. 05544 expires January 16, 2020		
Reference Pressure - Units/Reading:	millibar	928	
Station Pressure - Units/Reading:	millibar	927.9	
Pressure Tolerance +/- 15% of error:	789 - 1067	0.01%	
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	September 21, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	65.31		
Station Hygrometer % RH- Reading:	65.40		
RH Tolerance +/- 15% of difference:	55.51 - 75.11	-0.1%	

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.

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

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 Date: August 22, 2018
 Operator Signature: [Signature] Location: McIntyre Center Edmonton



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	0.01594	126.136	47.9
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: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2019-393CGA

Company: Maxxam **Operators name:** Alex

Cylinder #: LL29687 Conc CH₄ (PPM) 598/198 Tolerance (%) 1 Certified By: Praxair

Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 2092</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>January 14, 2019</u>			Temp. °C	<u>23.8 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>05604875</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: 2221

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

Last Calibration: Date: Jan 14/19 C.F. 1.000 Done By: Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
5000	0.0	0.00	0.00	0.02	51.48	603	209
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						597	209

<u>CH₄</u>	<u>C₃H₈</u>
Previous Stated Concentration PPM: <u>598</u>	<u>198</u>
Percent variance from Stated: <u>0</u>	<u>6</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: January 15, 2019

Operator 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



Lakeland Industry & Community Association

FEBRUARY 2019
Ambient Air Monitoring Calibration Report
- BONNYVILLE EAST STATION-
CAL-LICA-201902-01608

Station Operation and Maintenance:
Maxxam Analytics

Data Validation and Report:
Maxxam Analytics

April 2, 2019

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

April 2, 2019

Subject:

February 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Bonnyville East Station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Bonnyville East AQM Station in the month of February 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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


Respectfully,



Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
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Lily Lin
Data & Reporting Specialist
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FEBRUARY 1 - 28, 2019

MONTHLY CALIBRATION REPORT

Project #: 2833-2019-02-39-C

LICA-201902

Prepared for:

Lakeland Industry & Community Association

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Monitoring Station

**Bonnyville East Continuous Monitoring
Station**

Date of Report Issuance: March 22, 2019



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

CAL-LICA-201902-01608



Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date:	February 6, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	959	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name:	Bonnyville - East	Weather Conditions:	Mix of sun and clouds		
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):	15:09	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:	January 10, 2019	As Found C.F.:	1.001		
Previous 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: 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								

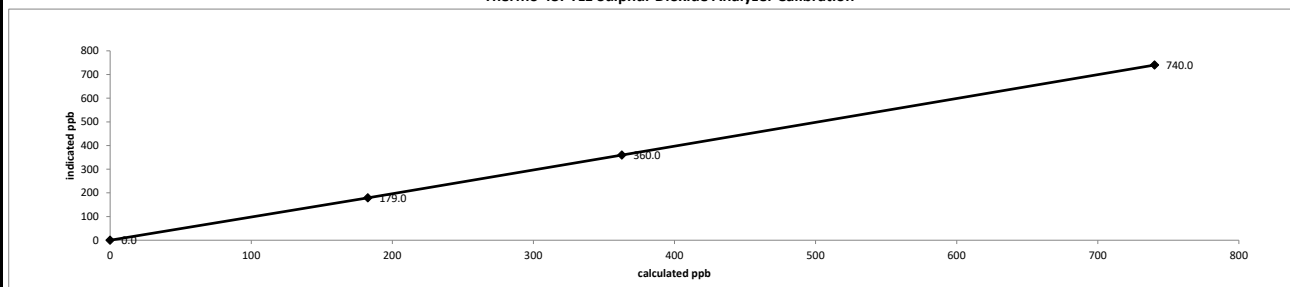
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5037	0.00	5037	0.0	0.2	n/a
as found high	4958	75.74	5034	740.2	740	1.001
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	179	1.020
calibrator zero	5037	0.00	5037	0.0	0	n/a
Average C.F. =						1.009

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) =	0.20%		± 3% F.S.
% change in C.F. from last cal =	-0.06%		± 10%

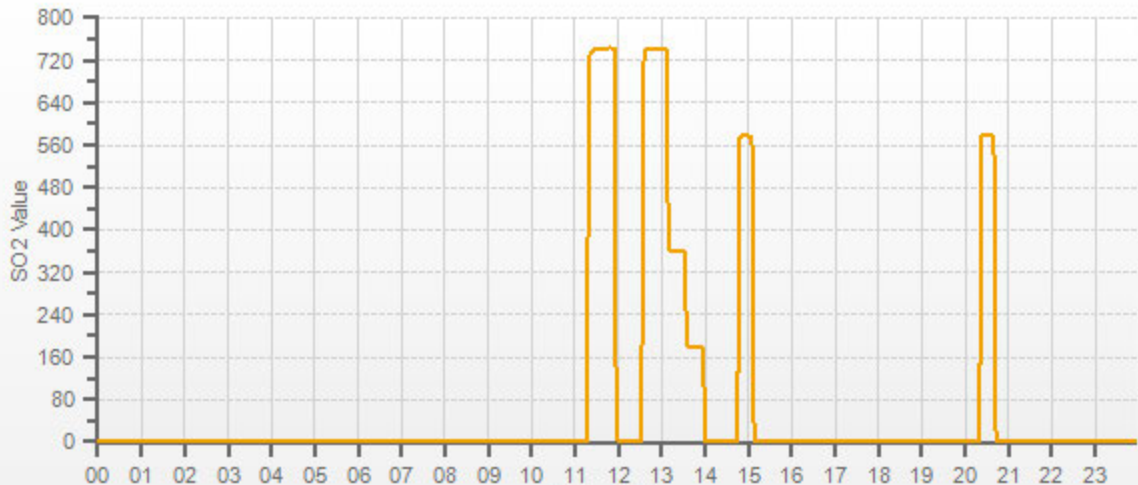
Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	4.53	Bkg:	4.84
Coef:	0.971	Coef:	0.968
Pmt:	-677.1	Pmt:	-677.5
Flash:	1117	Flash:	1117
Internal:	32.7	Internal:	32.9
Chamber:	45.0	Chamber:	45.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.25	Perm Oven Heater:	44.25
Pressure:	691.4	Pressure:	691.6
Sample Flow:	0.464	Sample Flow:	0.464
Lamp Intensity:	89	Lamp Intensity:	89
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	589.0	Expected Value:	576.0

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.

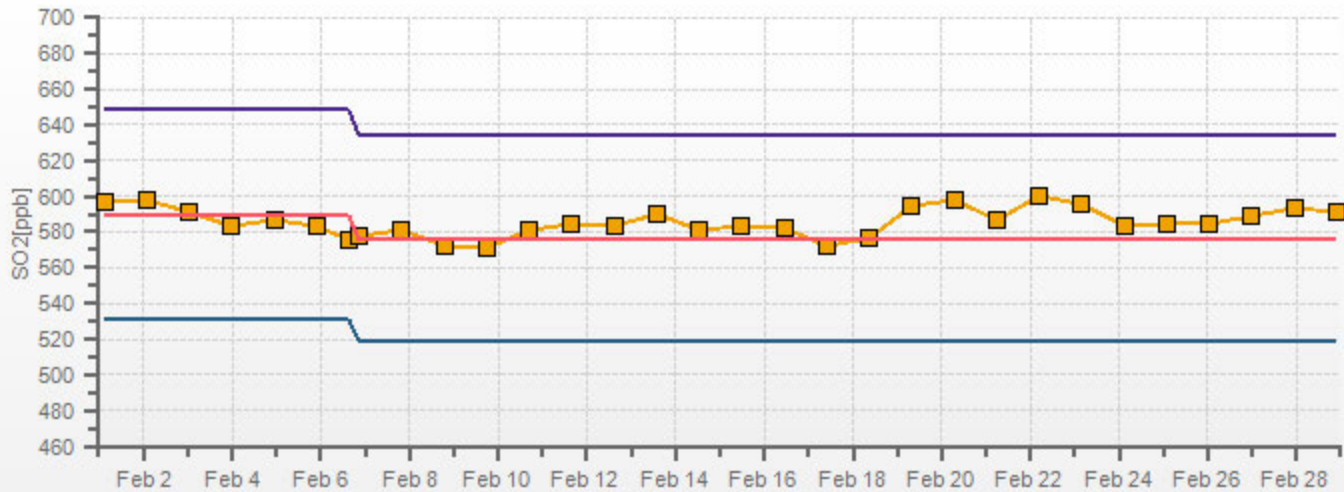
SO2[ppb]



CAL-LICA-201902-01608

SO2[ppb] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date: February 4, 2019	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020	951	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name: Bonnyville - East	Weather Conditions: Light snow		
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 13:49	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst): 19:37	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: Jan 10, 2019	As Found C.F.: 1.047		
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" 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.: 13:55 / 14:11 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.4 Analyzer Response: (ppb): 0.4 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

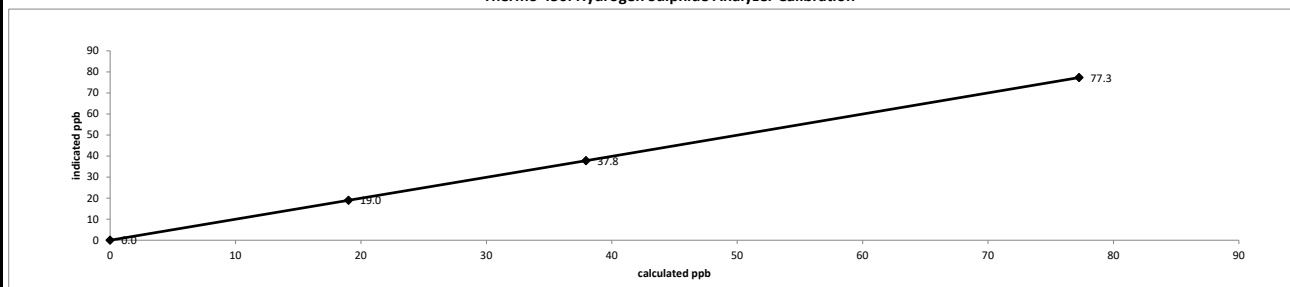
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.4	n/a
as found high	7479	61.00	7540	77.3	74.2	1.047
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7479	61.00	7540	77.3	77.3	0.999
mid	7420	29.60	7450	37.9	37.8	1.004
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	0.0	0	n/a
Average C.F. =						1.001

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 =	-4.79%		± 10%

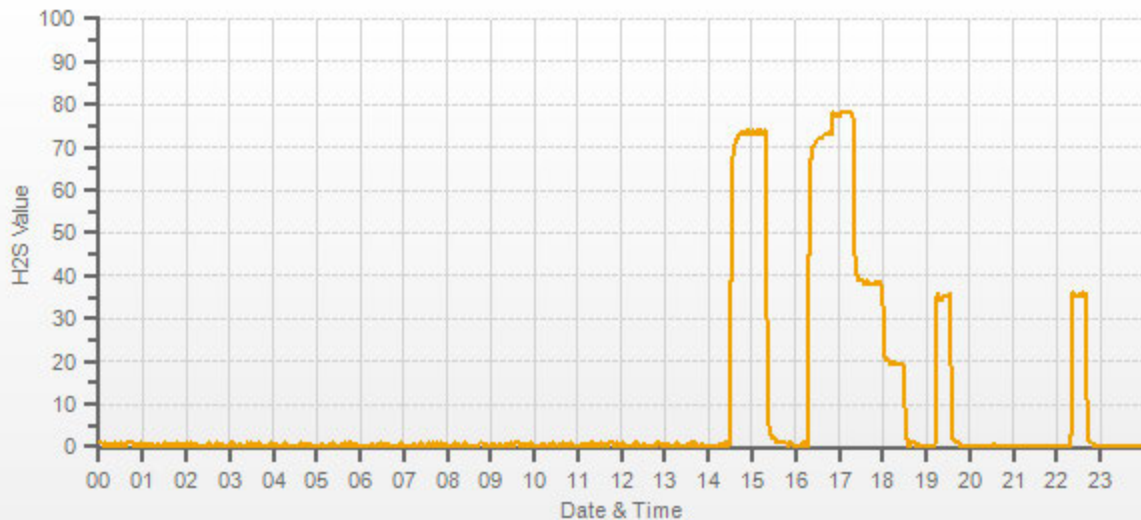
Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found: Bkg: 17.5 Coef: 1.145 Pmt: -639.7 Flash: 777 Internal: 33.0 Chamber: 45.00 Converter Temp: 327.0 Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Htr: 43.92 Pressure: 563.4 Sample Flow: 0.954 Lamp Intensity: 91 Averaging Time: 120 Expected Value: 42.9	As left: Bkg: 19.2 Coef: 1.217 Pmt: -639.0 Flash: 777 Internal: 33.3 Chamber: 45.1 Converter Temp: 326.0 Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Htr: 43.93 Pressure: 564.3 Sample Flow: 0.955 Lamp Intensity: 91 Averaging Time: 120 Expected Value: 35.8
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Comments:

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



CAL-LICA-201902-01608

— H2S[ppb]
Page 8 of 36



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date: February 19, 2019 Company/Airshed: LICA Location/Station Name: Bonnyville - East Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 14:28 End Time 24 hr. (mst): 17:56 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2019 935 millibars Thermometer/Station Temp: F.S. 170286131, expires April 19, 2019 22 °C Weather Conditions: Cloudy/Overcast Calibration Purpose: repeat Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 20, 2020 Converter Model & s/n (if applicable): n/a
Analzer: Serial Number/Owner: CM 17360002 LICA Last Calibration Date: February 4, 2019 Previous C.F.: 0.999	Range ppb: 100 As Found C.F.: 0.973 New C.F.: 0.999

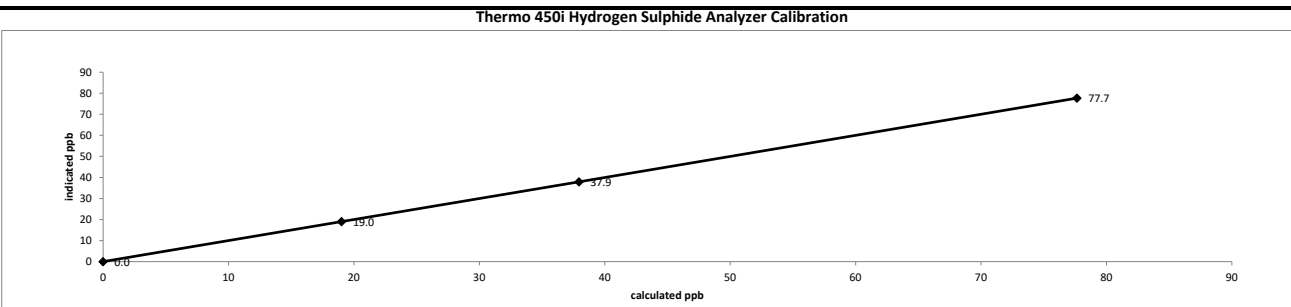
Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <caption>Standard Calibration Points for Ranges</caption> <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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0	n/a
as found high	7441	61.00	7502	77.7	79.8	0.973
adjusted high	7441	61.00	7502	77.7	77.7	0.999
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	0.0	0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.02%</u>	0.95-1.05
% change in C.F. from last cal = <u>2.59%</u>	± 3% F.S.
	± 10%

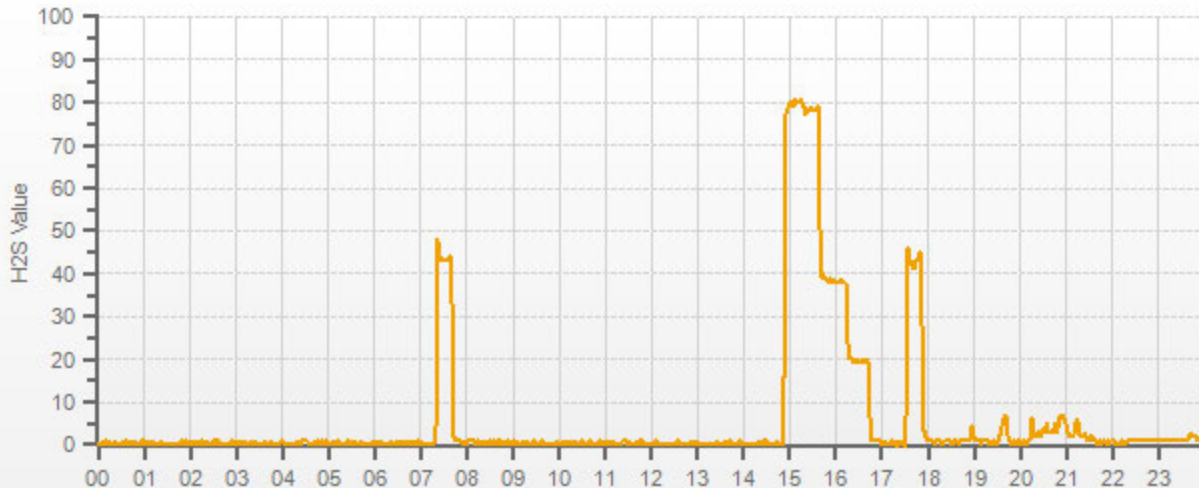


As found: Bkg: <u>19.4</u> Coef: <u>1.217</u> Pmt: <u>-638.6</u> Flash: <u>781</u> Internal: <u>34.2</u> Chamber: <u>45.0</u> Converter Temp: <u>326.5</u> Converter Set: <u>325.0</u> Perm Oven Gas: <u>45.00</u> Perm Oven Htr: <u>43.92</u> Pressure: <u>553.5</u> Sample Flow: <u>0.940</u> Lamp Intensity: <u>91</u> Averaging Time: <u>120</u> Expected Value: <u>35.8</u>	As left: Bkg: <u>18.8</u> Coef: <u>1.183</u> Pmt: <u>-639.4</u> Flash: <u>780</u> Internal: <u>34.6</u> Chamber: <u>45.0</u> Converter Temp: <u>323.6</u> Converter Set: <u>325.0</u> Perm Oven Gas: <u>45.01</u> Perm Oven Htr: <u>43.93</u> Pressure: <u>551.4</u> Sample Flow: <u>0.940</u> Lamp Intensity: <u>91</u> Averaging Time: <u>120</u> Expected Value: <u>43.8</u>
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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 completed to correct the span drift. SO2 scrubber was tested during monthly calibration.

H2S[ppb]



CAL-LICA-201902-01608

H2S[ppb] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 5, 2019	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 951 millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 20 °C
Location/Station Name: Bonnyville - East	Weather Conditions: A few clouds
Parameter: CH4 / NMHC / THC	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 13:17 / 17:14	Performed By/Reviewer: Alex Yakupov Rob Fisher
Calibration Method: Gas Dilution	Cal Gas Expiry Date: August 1, 2026

Analyzer:	Correction Factors:												
Serial Number/Owner: 1236656107 LICA	Previous C.F.:												
Measured Flow: 1.112	As Found C.F.:												
Last Calibration Date: Jan 11, 2019	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>1.026</td> <td>1.000</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.938</td> <td>1.000</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>0.982</td> <td>1.000</td> </tr> </table>	CH ₄ =	1.000	1.026	1.000	NMHC =	1.000	0.938	1.000	THC =	1.000	0.982	1.000
CH ₄ =	1.000	1.026	1.000										
NMHC =	1.000	0.938	1.000										
THC =	1.000	0.982	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 29687
 CH4 Cylinder Conc.: 598.0 198.0 =C₂H₆ Cylinder Conc.
 CH₄ expressed as C₂H₆: 544.5 1142.5 =total CH₄ equivalent

Point	CH4	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	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	2503	56.70	2560	13.24	12.06	25.30	12.91	12.86	25.77	1.026	0.938	0.982
adjusted high	2503	56.70	2560	13.24	12.06	25.30	13.24	12.06	25.30	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.40	6.65	14.06	1.002	1.015	1.008
low	2486	14.00	2500	3.35	3.05	6.40	3.39	3.01	6.40	0.988	1.013	1.000
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. =										0.997	1.009	1.002

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	1.000	0.999	0.95-1.05
b (Intercept as % of full scale) =	0.08%	-0.16%	-0.04%	± 3% F.S.
% change in C.F. from last cal =	-2.59%	6.22%	1.81%	± 10%

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply: -292.6	Calibration History cnt'd: NM Peak Area: 82822
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: 31.5	NMHC Start: n/a
Cylinder Pressures/reg.:	Carrier: 2300 50	NMHC End: n/a
	Fuel: 300 50	Date: Feb 5, 2019
	Span Gas: 400 22	Time: 13:31
	Zero Air Generator: 50	CH ₄ PK HT: 0
Internal Pressures:	Carrier: 31.0	CH ₄ RT: 8.0
	Fuel: 40.3	CH ₄ Baseline: 2473
	Air: 32.0	CH ₄ LOD: 30
	Status: LIT	CH ₄ SD: 10
FID Status:	Counts: 28529	CH ₄ CONC: 0.00
	Flame: 364.5	NM PK HT: 0
	Det Base: 175.0	NM Peak Area: 0
	Last Power On: Oct 18, 2018 / 11:03	NM CONC: 0.00
Flame and Power Stats:	Flameouts: 1	NM Base Start: 2346
	Det Oven at Start: 23.1	NM Base End: 2355
	Col Oven at Start: 22.3	NM LOD: 14
	Time: Jan 11, 2019 / 12:13	NM Start IDX: 16
Calibration History:	Type: SPAN	NM End IDX: 35
	Status: GOOD	NM Max Slope: 5.1e-01
	Check/Adjust: ADJUST	NM Min Slope: -4.7e-01
	CH ₄ Span Conc: 13.30	NM PT Count: 0
	CH ₄ SP Ratio: 0.00082	Expected Values: Previous CH ₄ : 10.32
	CH ₄ RT: 14.0	Previous NMHC: 11.32
	CH ₄ PK IDX: 30	Previous THC: 21.65
	CH ₄ PK HT: 16216	New CH ₄ : 10.10
	NM Span Conc: 12.64	New NMHC: 10.65
	NM SP Ratio: 0.000153	New THC: 20.74

Comments:

The analyzer sample inlet filter was changed.

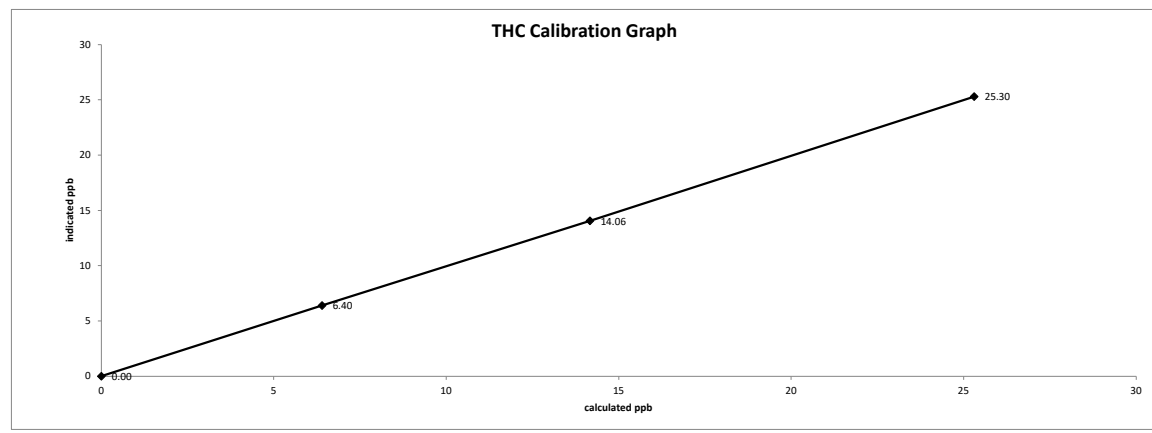
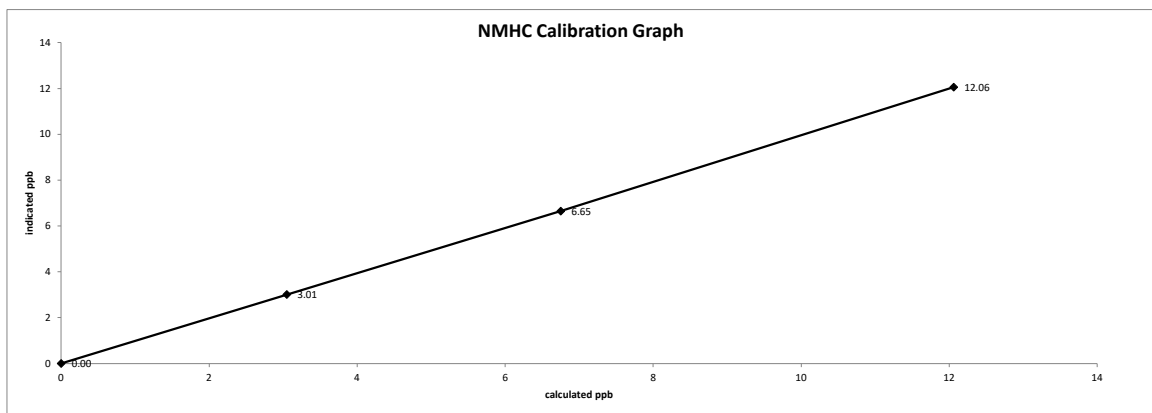
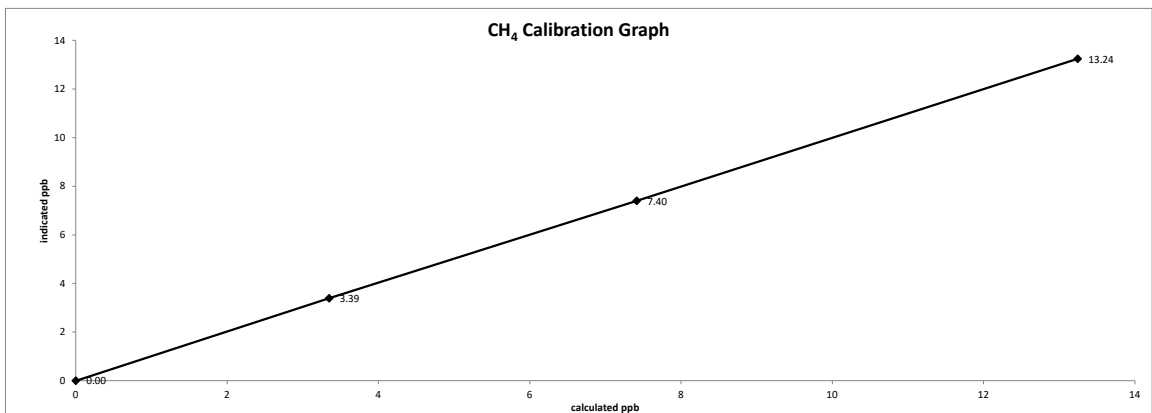
No zero adjustment was required/made.

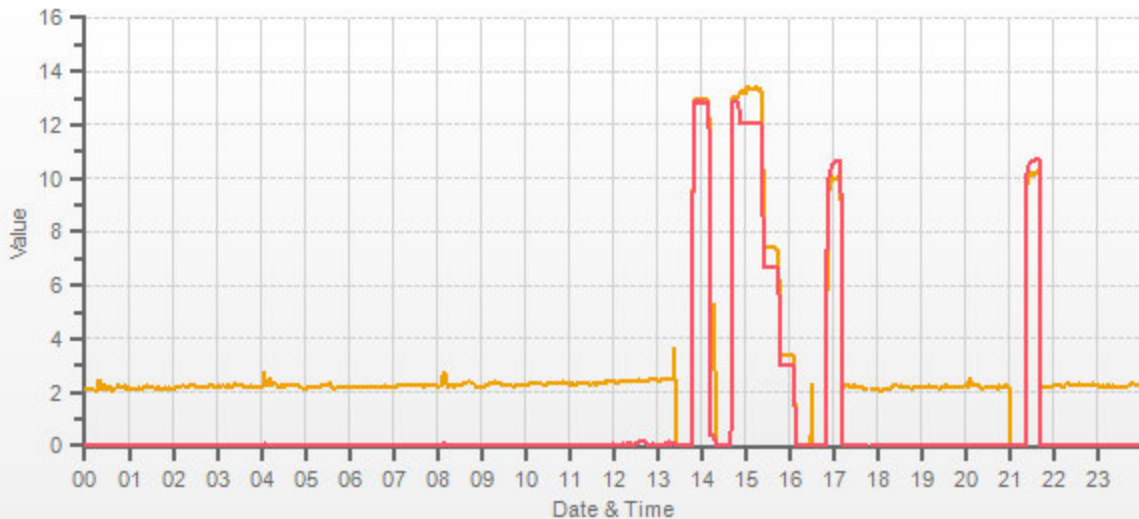
The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

Date: February 5, 2019
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 13:17 / 17:14
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution





CAL-LICA-201902-01608

— CH4[ppm] — NMHC[ppm]



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 23, 2019 Company/Airshed: LICA Location/Station Name: Bonnyville - East Parameter: CH4 / NMHC / THC Start/End Time 24 hr. (mst): 13:44 / 18:35 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. #05544, expires Jan 17, 2020 951 millibars Thermometer/Station Temp: F.S. #170286131, expires April 19, 2019 22 °C Weather Conditions: A few clouds Calibration Purpose: installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: August 1, 2026
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Analyzer: Serial Number/Owner: 1180320044 LICA Measured Flow: 1.147 Last Calibration Date: n/a Range ppm: 20 CH4/20 NMHC/40 THC	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>CH₄ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NMHC =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>THC =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	n/a	n/a	1.000	NMHC =	n/a	n/a	1.000	THC =	n/a	n/a	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	n/a	n/a	1.000														
NMHC =	n/a	n/a	1.000														
THC =	n/a	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 29687 CH4 Cylinder Conc. = 598.0 198.0 =C ₂ H ₆ Cylinder Conc. CH₄ expressed as C₂H₆ = 544.5 1142.5 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH4</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH4	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH4	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
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	2469	57.64	2527	13.64	12.42	26.06	13.64	12.42	26.06	1.000	1.000	1.000
mid	2469	31.00	2500	7.42	6.75	14.17	7.43	6.77	14.20	0.998	0.997	0.998
low	2486	14.00	2500	3.35	3.05	6.40	3.34	3.09	6.44	1.003	0.987	0.993
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	0.995	0.997

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.000	0.95-1.05
b (Intercept as % of full scale) =	-0.01%	0.10%	0.06%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a

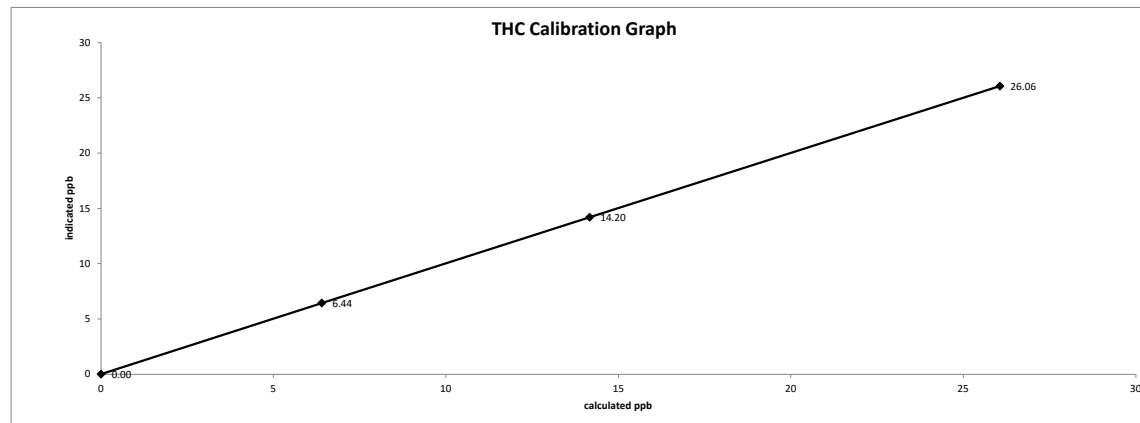
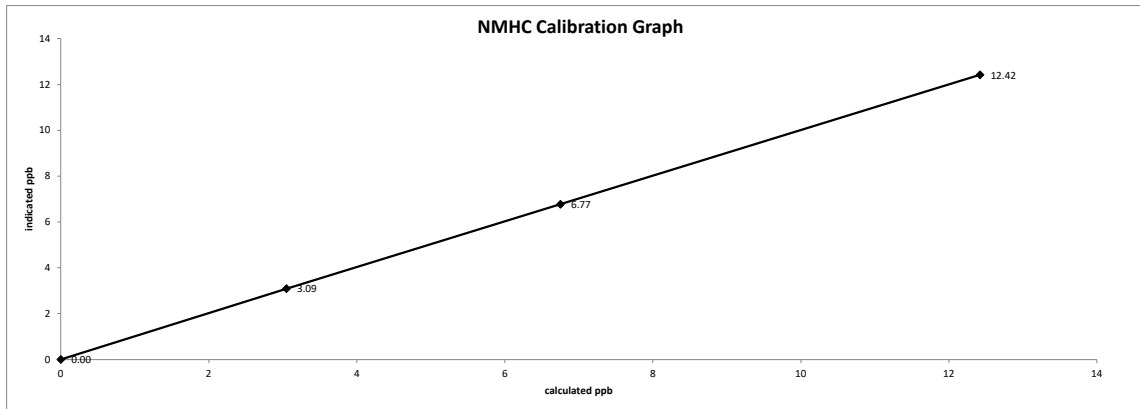
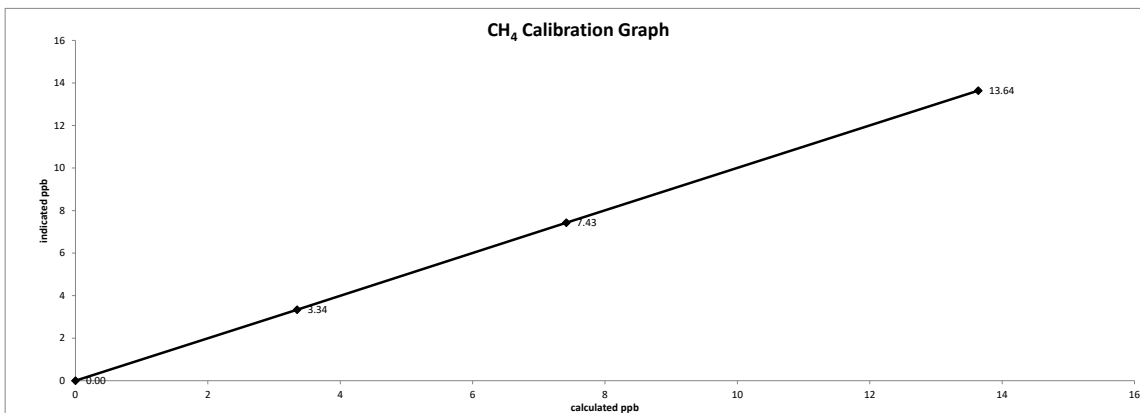
Interface Board Voltages: Bias Supply: -295.5 Temperatures: Detector Oven: 175.0 Filter: 175.0 Column Oven: 75.0 Internal: 29.0 Cylinder Pressures/reg.: Carrier: 1800 50 Fuel: 1000 50 Span Gas: 2000 22 Zero Air Generator: 50 Internal Pressures: Carrier: 29.4 Fuel: 44.2 Air: 30.2 FID Status: Status: LIT Counts: 29357 Flame: 334.2 Det Base: 175.2 Flame and Power Stats: Last Power On: Feb 23, 2019 / 14:49 Flameouts: 1 Det Oven at Start: 17.3 Col Oven at Start: 20.1 Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH ₄ Span Conc: n/a CH ₄ SP Ratio: n/a CH ₄ RT: n/a CH ₄ PK IDX: n/a CH ₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a	Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: Feb 23, 2019 Time: 15:45 CH ₄ PK HT: 0 CH ₄ RT: 12.6 CH ₄ Baseline: 2512 CH ₄ LOD: 36 CH ₄ SD: 12 CH ₄ CONC: 0.00 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2504 NM Base End: 2553 NM LOD: 14 NM Start IDX: 7 NM End IDX: 59 NM Max Slope: 1.6e+00 NM Min Slope: -1.7e-01 NM PT Count: 0 Expected Values: Previous CH ₄ : n/a Previous NMHC: n/a Previous THC: n/a New CH ₄ : 10.14 New NMHC: 10.86 New THC: 21.00
---	---

Comments:
 A new span gas cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.
 No zero adjustment was required/made.

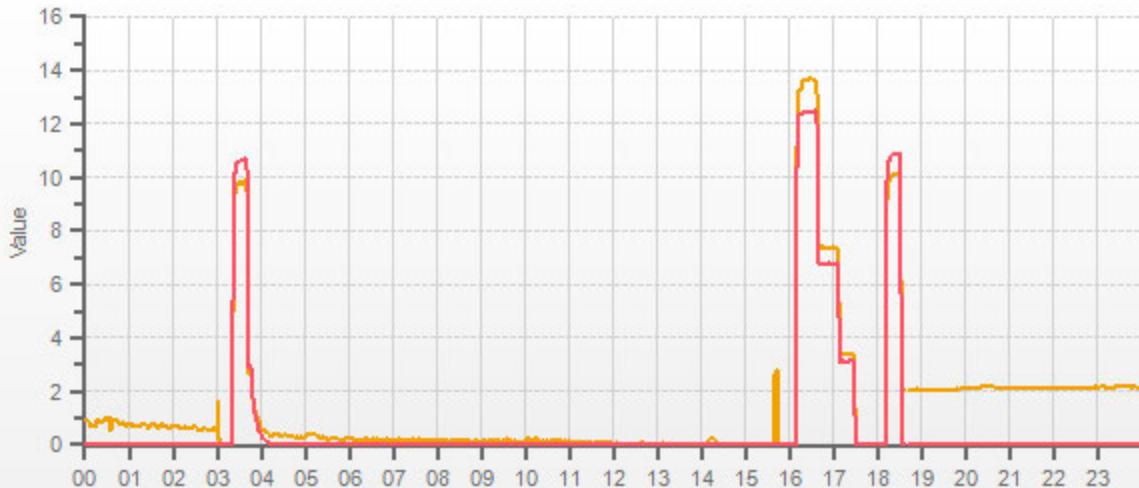
This spare LICA analyzer was installed to replace a failed LICA analyzer #1236656107. A shutdown calibration was not possible due to the analyzer failure.

Date: February 23, 2019
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 13:44 / 18:35
Calibration Purpose: installation
Calibration Method: Gas Dilution



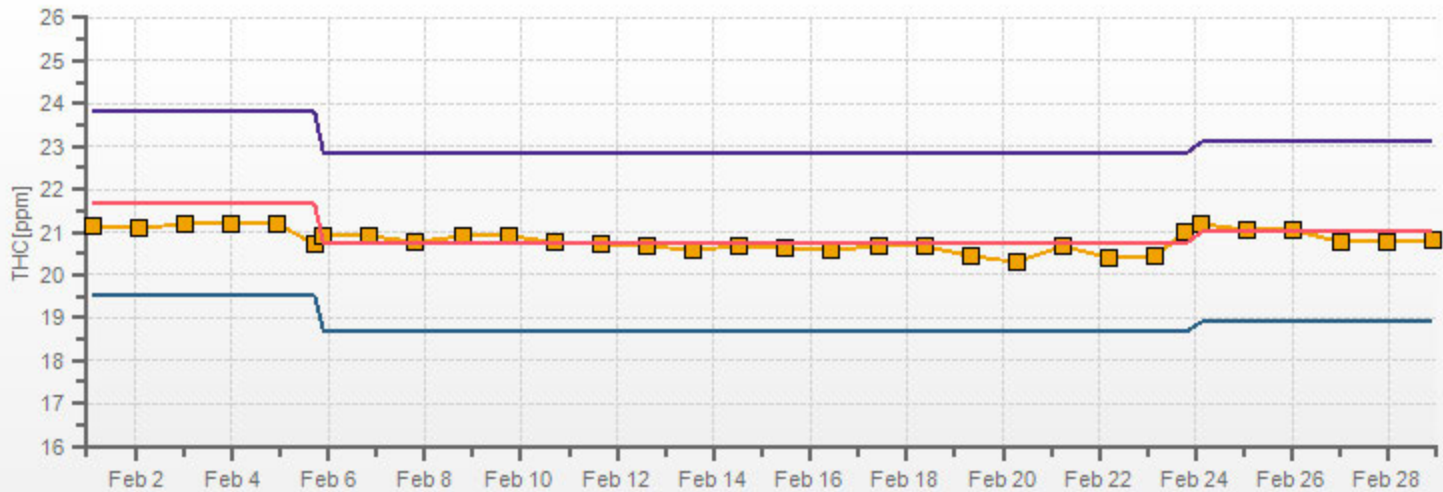
CH4[ppm] NMHC[ppm]



CAL-LICA-201902-01608

THC[ppm] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

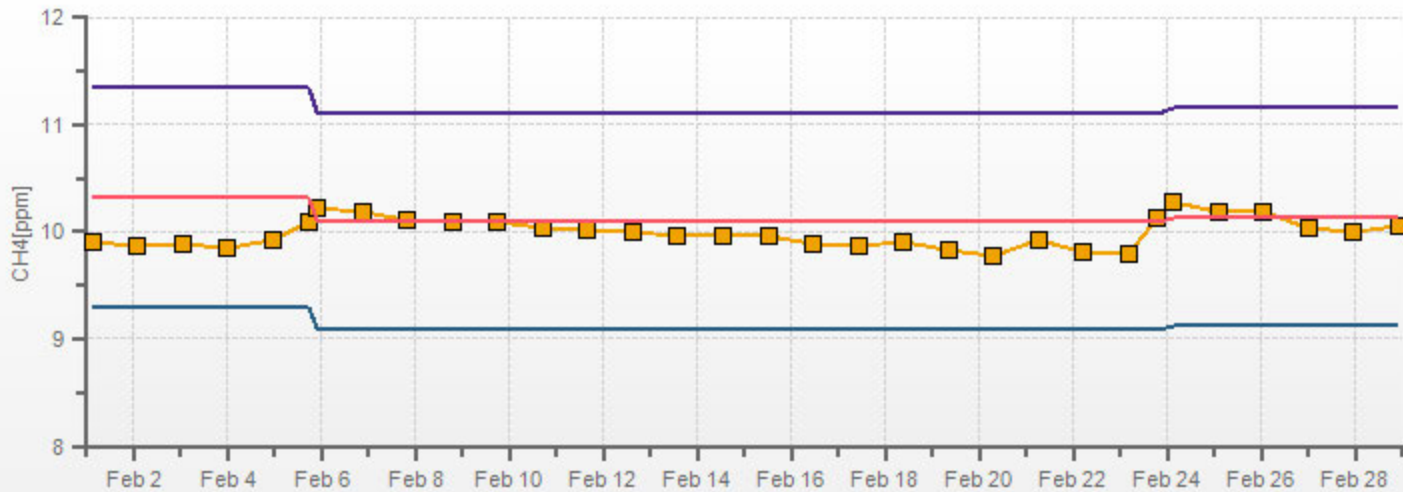
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608

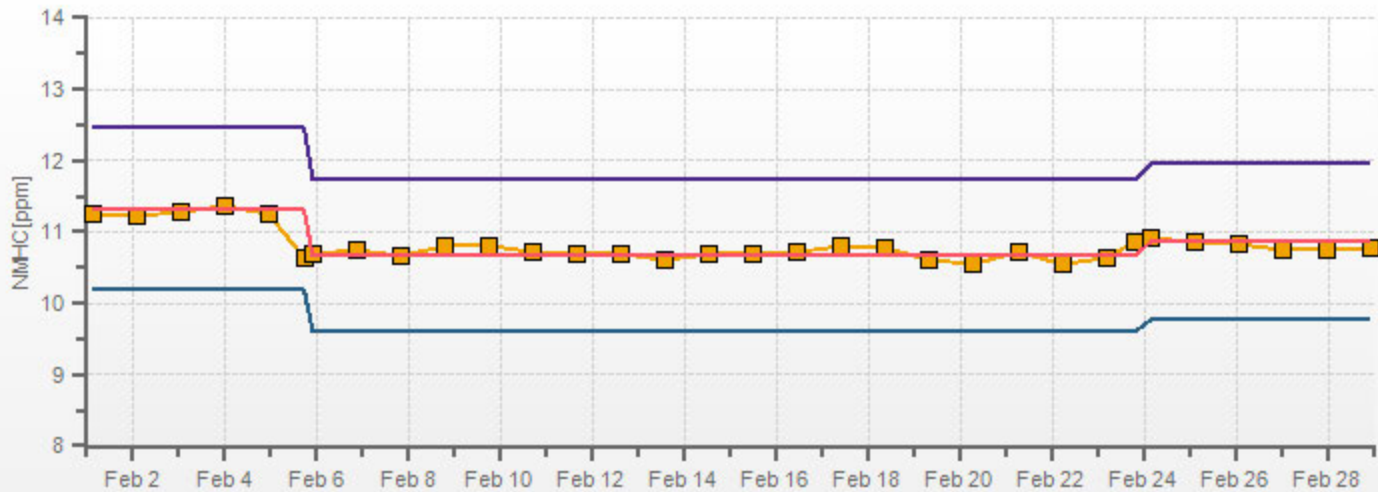
CH4[ppm] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	February 6, 2019	Barometer/B.P./units:	F.S. #05544 expires Jan 17, 2020	959	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name:	Bonnyville - East	Weather Conditions:	Mix of sun and clouds		
Start/End Time 24 hr. (mst):	10:26 / 17:14	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:		Correction Factors:	
Serial Number/Owner:	1180930027 LICA	Previous C.F.:	As Found C.F.:
Last Calibration Date:	January 10, 2019	NO =	NO ₂ =
Range ppb:	1000	NO _x =	

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;"> <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> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	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	
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	NO C.F.	NO _x C.F.
as found zero	5037	0.0	5037	0	0	0.2	0.3	n/a	n/a		
as found high	4958	75.7	5034	774.9	776.4	787.0	787.0	0.985	0.987		
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	376.0	377.0	1.010	1.009		
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.=										1.007	1.008

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	
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	NO drop	NO ₂ gain
NO _x reference	4958	75.74	5034	0.0	775.0	776.0	1.0	0.0	1.0		
as found high NO ₂	4958	75.74	5034	500.0	274.0	276.0	502.0	501.0	501.0		1.000
gpt mid	4958	75.74	5034	270.0	505.0	776.0	271.0	270.0	270.0		1.000
gpt low	4958	75.74	5034	100.0	673.0	776.0	103.0	102.0	102.0		1.000
Average NO ₂ C.F.=										1.000	

Linear Regression/Calibration Results:			Average NO ₂ C.F.=	
	NO	NO _x	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.000	1.002	0.95-1.05
b (Intercept as % of full scale)=	-0.17%	-0.16%	0.06%	± 3% F.S.
% change in C.F. from last cal=	1.52%	1.31%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	6.7	NO Bkg:	6.7
NO _x Bkg:	6.8	NO _x Bkg:	6.9
NO Coef:	0.853	NO Coef:	0.843
NO ₂ Coef:	0.995	NO ₂ Coef:	0.995
NO _x Coef:	0.999	NO _x Coef:	0.999
PMT:	-906.1	PMT:	-906.1
Internal:	29.6	Internal:	29.5
Chamber:	50.1	Chamber:	50.2
Cooler:	-3.0	Cooler:	-2.7
NO ₂ Converter:	325.8	NO ₂ Converter:	326.0
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:	44.23
Pressure:	206.4	Pressure:	206.4
Flow:	0.712	Flow:	0.713
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	3	Expected Value NO:	3
Expected Value NO ₂ :	352	Expected Value NO ₂ :	353
Expected Value NO _x :	356	Expected Value NO _x :	356

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.

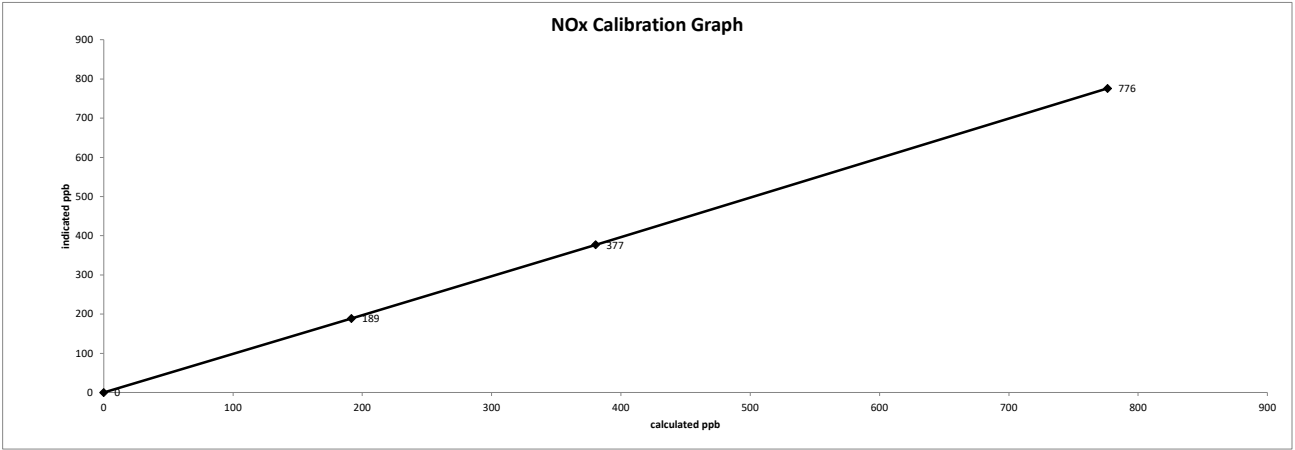
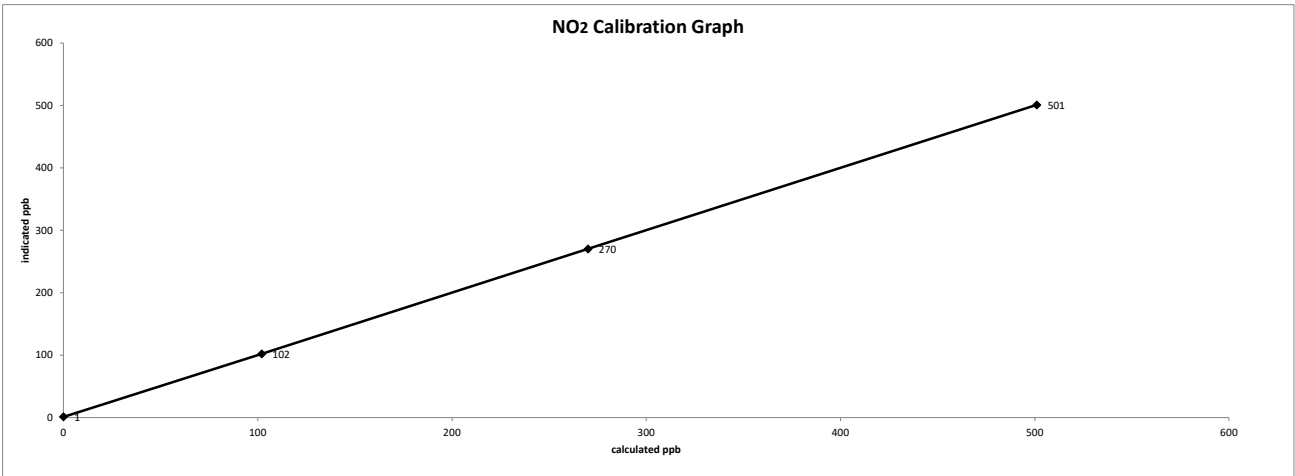
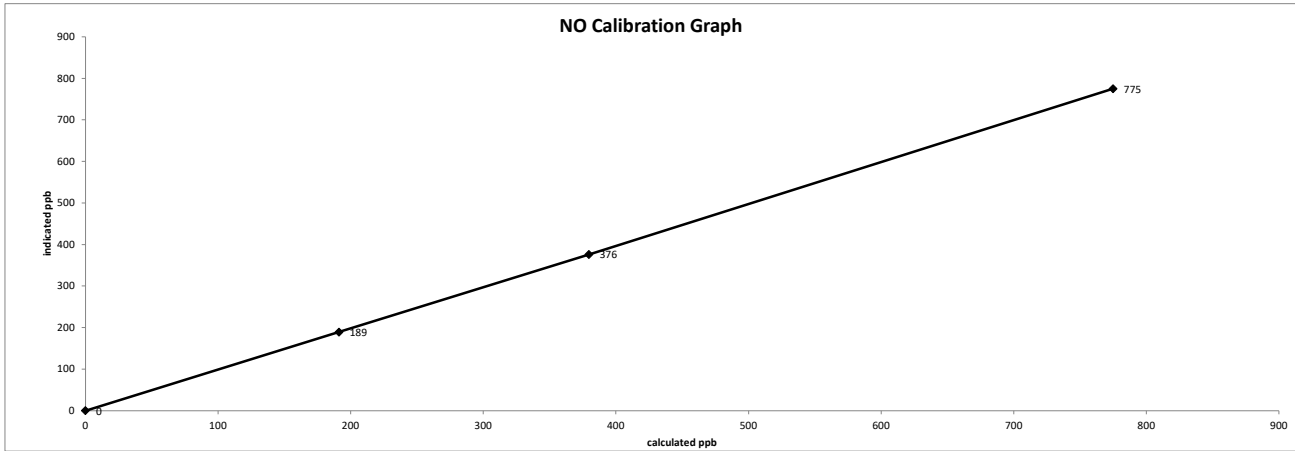
The converter cooling fan filter was cleaned.

No high point NO₂ adjustment was required/made.

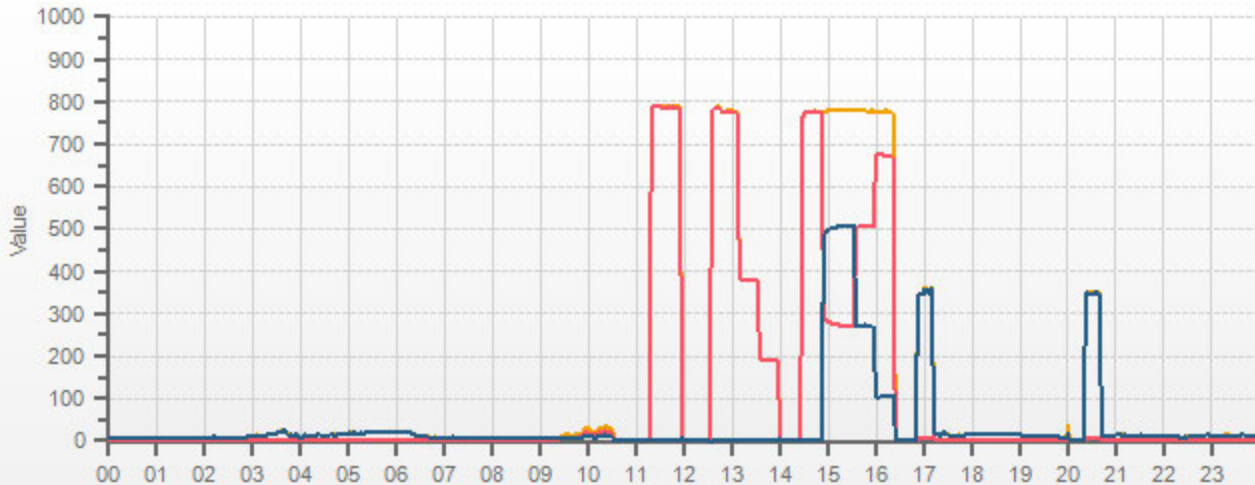
Date: February 6, 2019
Company/Airshed: LICA
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 10:26 / 17:14
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



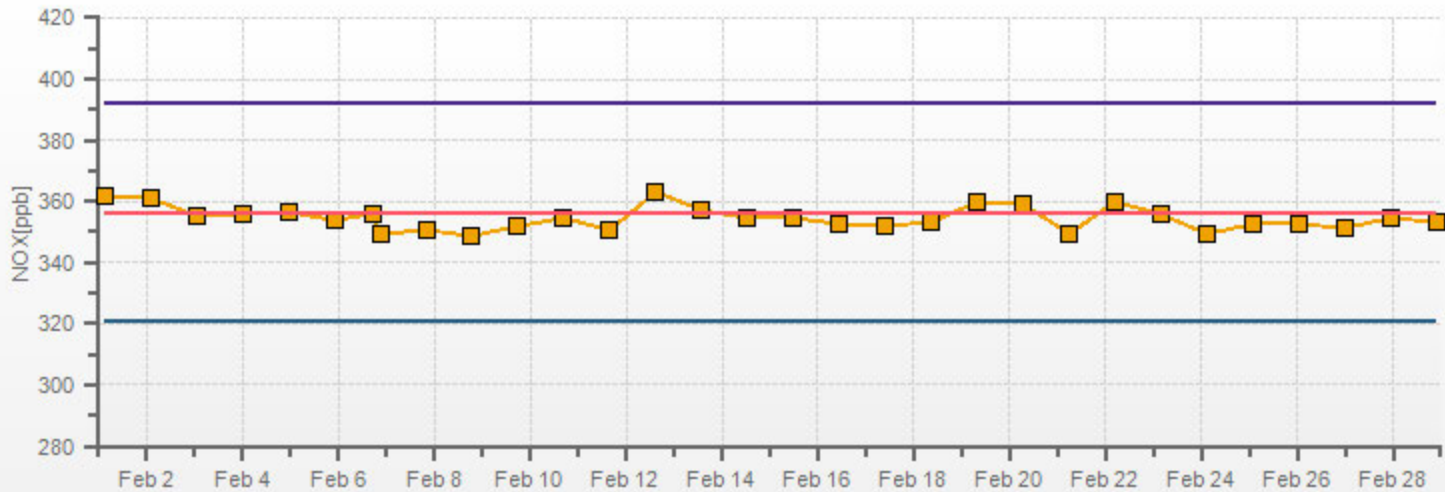
— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201902-01608

NOX[ppb] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

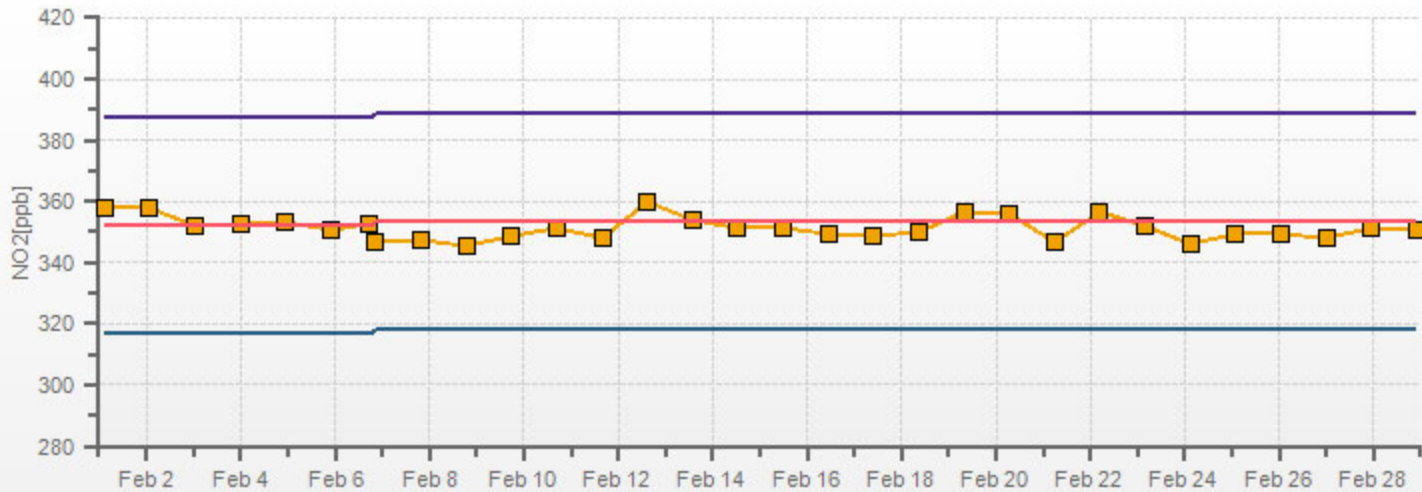
Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608

NO2[ppb] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608



Thermo 49i Ozone Analyzer Calibration

Date: February 5, 2019 Company/Airshed: LICA Location/Station Name: Bonnyville - East Start/End Time 24 hr. (mst): 13:17 / 17:39 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power Analyzer: Serial Number/Owner: 1002240372 LICA Last Calibration Date: January 11, 2019 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. #05544 expires Jan 17, 2020 951 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 20 °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.: 0.994 New C.F.: 1.000
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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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

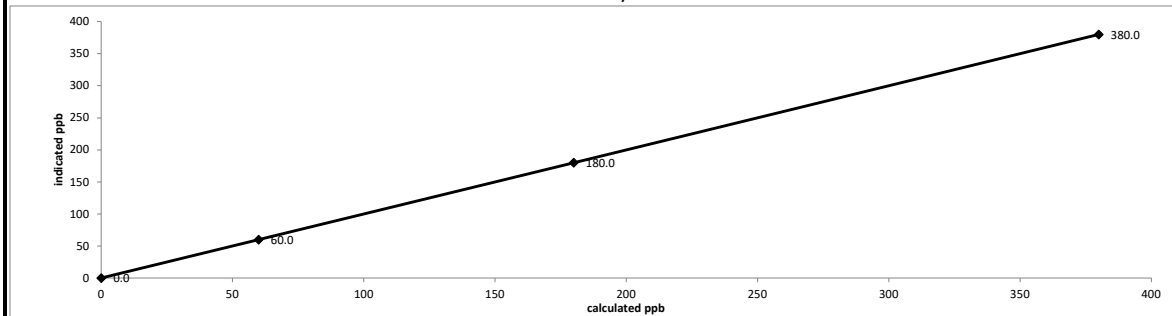
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	-0.4	n/a
as found high	5000	5000	380.0	380.0	382.0	0.994
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

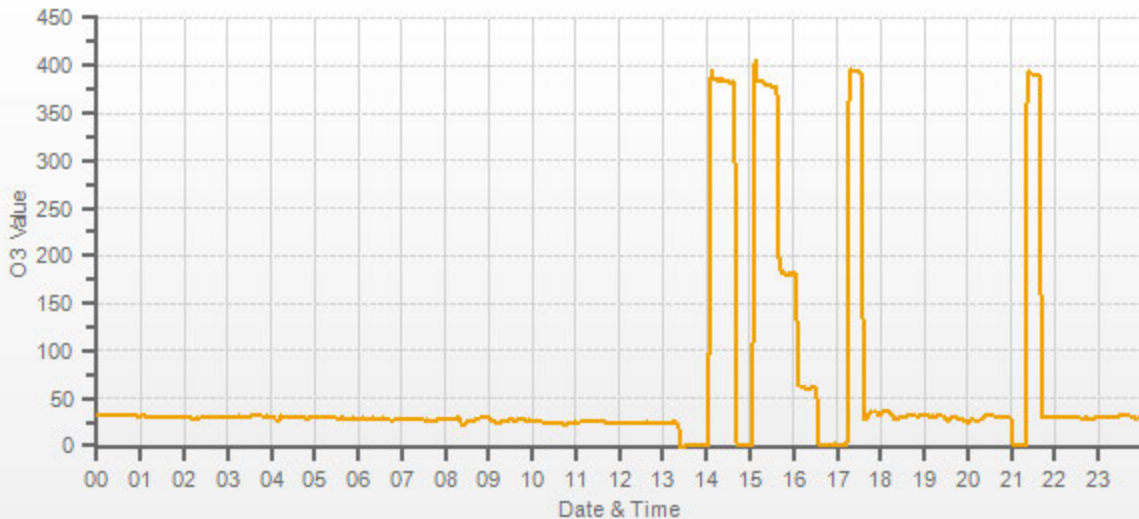
Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.000</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.00%</u>	± 3% F.S.
% change in C.F. from last cal = <u>0.63%</u>	± 10%

Thermo 49i Ozone Analyzer Calibration



As found: O3 Bkg: <u>0.1</u> O3 Coef: <u>1.040</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.3</u> Bench: <u>29.9</u> Bench Lamp: <u>54.0</u> O3 Lamp: <u>68.0</u> Pressure: <u>701.5</u> Cell A lpm: <u>0.761</u> Cell B lpm: <u>0.766</u> O3 ppb: <u>-0.8</u> Cell A ppb: <u>0.4</u> Cell B ppb: <u>-1.9</u> Cell A int (Hz): <u>75488</u> Cell B int (Hz): <u>76638</u> Expected Value: <u>370.0</u>	As left: O3 Bkg: <u>-0.3</u> O3 Coef: <u>1.031</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.3</u> Bench: <u>31.0</u> Bench Lamp: <u>54.0</u> O3 Lamp: <u>68.0</u> Pressure: <u>702.4</u> Cell A lpm: <u>0.761</u> Cell B lpm: <u>0.766</u> O3 ppb: <u>0.3</u> Cell A ppb: <u>-2.1</u> Cell B ppb: <u>2.6</u> Cell A int (Hz): <u>75423</u> Cell B int (Hz): <u>76525</u> Expected Value: <u>392.0</u>
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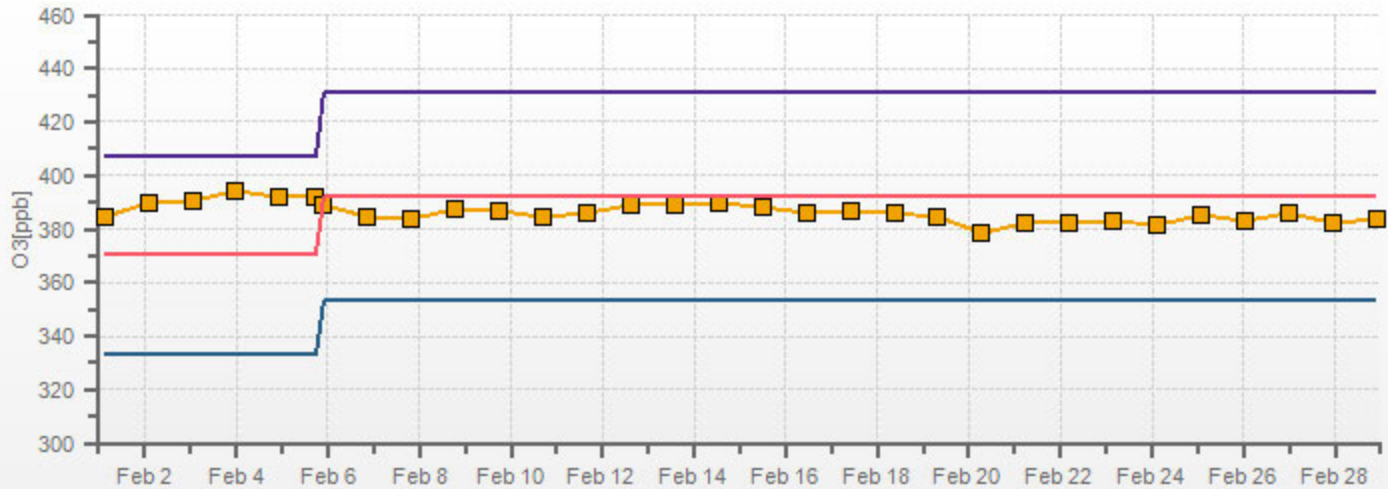
Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.



CAL-LICA-201902-01608

O3[ppb] Calibration: LICA Bonnyville East Monthly: 19/02 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201902-01608

Thermo 5030i SHARP Monitor Monthly Check

Date: February 6, 2019
Company: LICA
Station Name/Location: Bonnyville - East
Previous Audit Date: January 24, 2019
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher
Start Time (mst): 16:31
End Time (mst): 17:20
Calibration Purpose: routine monthly
Weather Conditions: Mix of sun and clouds

SHARP 5030i Information and Status:						
Serial Number: CM117461021		Filter Tape Counter		69		
Reference Standards:						
Air Flow						
	Manometer	Orifice	Pressure:		Temp / RH:	
Make:	Dwyer	chinook	Fisher Scientific		Fisher Scientific	
Model:	475 Mk. III	CHN0901	FB61291		11-661-7A	
Serial Number:	#3	#2	130168457		170286131 11745843	
Calibration Expiration Date:	January 17, 2020	April 24, 2019	January 17, 2020		April 19, 2019	
Ambient Temperature (°C)						
				Range	Action	
	Reference	SHARP	Difference	< ± 2°C	OK	
#1	-28.95	-28.9	-0.1	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	57.02	58.4	-1.4	> 5 %RH	Fail	
Barometric Pressure (mmHg)						
				Range	Action	
As Found:				< ± 10 mmHg	OK	
	Reference	SHARP	Difference	10-12 mmHg	Recalibrate	
#1	719.5	719.8	-0.3	> 12 mmHg	Fail	
Flow Audit (L/min)						
				Range	Action	
As Found:				< ± 4%	OK	
	Reference	SHARP		4-5%	Recalibrate	
#1	16.64	16.66	% Difference	>5%	Fail	
#2	16.65	16.66				
#3	16.65	16.67				
Average	16.65	16.66				
Leak Check (L/min)						
	Without Leak Check Adapter			With Leak Check Adapter		
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.66	-0.01	16.62	16.64	-0.02
						<i>Leak Limit: 0.80 L/min</i>
				LEAK RATE:	-0.01	



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:

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)

O₃	LIMITS
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 Date: August 22, 2018
 Operator Signature: Location: McIntyre Center Edmonton



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			
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
 Operator Signature: *Al Clark*

Date: January 18, 2018
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2019-393CGA

Company: Maxxam **Operators name:** Alex
Cylinder #: LL29687 **Conc CH₄ (PPM)** 598/198 **Tolerance (%)** 1 **Certified By:** Praxair
Expiry Date: August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 2092</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>January 14, 2019</u>			Temp. °C	<u>23.8 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>05604875</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: 2221
 Instrument Settings Zero: N/A Span: N/A Range: 20.0
 Last Calibration: Date: Jan 14/19 C.F. 1.000 Done By: Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
5000	0.0	0.00	0.00				
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						597	209

<u>CH₄</u>	<u>C₃H₈</u>
Previous Stated Concentration PPM: <u>598</u>	<u>198</u>
Percent variance from Stated: <u>0</u>	<u>6</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: January 15, 2019
 Operator 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