



Lakeland Industry & Community Association

OCTOBER 2023

Monthly Ambient Air Quality Monitoring Report

LICA-202310

Operation and Maintenance:

Bureau Veritas Canada

Data Validation and Report:

Lakeland Industry & Community Association

November 22, 2023

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November 22, 2023

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RE: LICA – October 2023 Monthly Ambient Air Quality Monitoring Report

Enclosed is the October 2023 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

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This report has been reviewed by Michael Bisaga of the LICA Airshed.

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LIST OF ACRONYMS

AAAQOs	Alberta Ambient Air Quality Objectives
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
AT	Ambient Temperature
BP	Barometric Pressure
CH ₄	Methane
EPEA	Environmental Protection and Enhancement Act
H ₂ S	Hydrogen Sulphide
kph	kilometers per hour
LICA	Lakeland Industry & Community Association
mb	millibar
mm	millimeter
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxide of Nitrogen
PAC	Polycyclic Aromatic Compounds
ppb	parts per billion
ppm	parts per million
RH	Relative Humidity
SO ₂	Sulphur Dioxide
ST	Station Temperature
STDWD	Standard Deviation Wind Direction
THC	Total Hydrocarbons
TRS	Total Reduced Sulphur
VWD	Vector Wind Direction
VWS	Vector Wind Speed
WD	Wind Direction
WS	Wind Speed
°C	Degrees Celsius

NETWORK STATION SUMMARY

Listing of Continuous Monitoring Stations and Integrated Sampling Stations

Station Name		Cold Lake South	Tamarack	St. Lina	Lac La Biche
Station ID		1174	1248	1250	1690
Coordinates		54.41402	54.604935	54.215961	54.76516
		-110.23316	-110.452637	-111.503304	-111.9714490
Continuous Monitoring Parameter	SO2	√	√	√	√
	H2S		√	√	√
	TRS	√			
	NOX	√	√	√	√
	NOX	√	√	√	√
	NO2	√	√	√	√
	O3	√	√	√	√
	THC	√	√	√	√
	CH4	√	√	√	√
	NMHC	√	√	√	√
	RH	√	√	√	√
	BP	√	√	√	√
	AT	√	√	√	√
	ST	√	√	√	√
	PRECEIPITATION		√	√	
	WS	√	√	√	√
	WD	√	√	√	√
STDWD	√	√	√	√	
Integrated Sampling	VOCs	√			
	PAHs	√			
	Partisol	√			
	Passive	√			√
	NMHC Canister				√
	PAC			√	

List of Contractors performing air monitoring activities

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Prepared By	Electronic Submission Conducted By
Continuous Monitoring Station	Bureau Veritas Canada	Bureau Veritas Canada	LICA / Bureau Veritas Canada	LICA
Intermittent (VOCs/PAHs)	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	LICA
Partisol	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	LICA
Passive	Bureau Veritas Canada	Bureau Veritas Canada	Bureau Veritas Canada	LICA
PAC	Bureau Veritas Canada	ECCC	AEP	Not Applicable
NMHC Canister	Bureau Veritas Canada	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

Monitoring Notes during the Month of October 2023

Cold Lake South

- 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) and/or Alberta Ambient Air Quality Guidelines (AAAQGs) where applicable.
- **O3:** The Thermo 49i analyzer, s/n: 1002240371, was removed following a successful shut-down calibration on October 15. The Thermo 49iQ analyzer, s/n: 12208316585, was installed afterwards. This analyzer swap was to address the span drift issues, which occurred between October 11 and October 15. One hour of downtime was recorded due to this event.

Tamarack

- 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) and/or Alberta Ambient Air Quality Guidelines (AAAQGs) where applicable, except PM2.5. Two 1-hour PM2.5 exceedances were recorded this month. The exceedances of the PM2.5 guideline on October 16 is believed to be the result of low wind speeds and an active excavation near the station.

Date	Time (MST)	Parameter	Average Period	Concentration ($\mu\text{g}/\text{m}^3$)	Wind speed (km/hr)	Wind Direction	Reference #
16-Oct	7	PM2.5	1-Hour	100	0.1	233°(SW)	422410
16-Oct	8	PM2.5	1-Hour	93	1.3	221°(SW)	422410

- THC/CH4/NMHC:** LICA's Thermo 55i analyzer, s/n: 1180030034, was removed following a successful shut-down calibration on October 19. BV's Thermo 55i analyzer, s/n: 1505664392, was installed. The analyzer was allowed time to stabilize overnight (column conditioning was being performed). A successful installation calibration was completed on October 20. This analyzer swap was to address the NMHC noise issue. Eighteen hours of downtime were recorded.

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, except SO₂ (87.8%) and H₂S (85.8%). **DINC0002453** and **DINC0002455**, respectively.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAQOs) and/or Alberta Ambient Air Quality Guidelines (AAQGs) where applicable.
- SO₂:** LICA's Thermo 43i-TL analyzer, s/n: 1180930030, failed on October 8 hour 2. On October 10, the analyzer was removed, and BV's Thermo 43i analyzer, s/n: 1226154720, was installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on October 11. Eight-one hours of downtime were recorded due to this event.
- H₂S:**
 - The analyzer failed the October 10 shut-down calibration due to an abrupt change in UV lamp performance. Troubleshooting was performed, and a successful-post-repair calibration was completed on October 11. Based on the diagnostic data, the failure occurred on October 10 hour 9. Data were invalidated back to the point of failure. Twenty-five hours of downtime were recorded due to this event.
 - The analyzer failed the October 12 and 13's daily span checks, October 13's repeat zero-span check, and October 14's as-found points check. The cause was due to UV lamp voltage drift. The issue was corrected following by a successful post-repair calibration on October 14. Data were invalidated back to the last valid calibration check, which was October 11. Sixty-eight hours of downtime were recorded.

Lac La Biche 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 (AAQOs) and/or Alberta Ambient Air Quality Guidelines (AAQGs) where applicable.
- No major events were identified this month.

Integrated Sampling

All the integrated sampling analytical results are included in the October 2023 Integrated Sampling Report.

- **VOCs Sampling System:**
 - The VOC sampler is programmed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS).
 - Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
 - The Xonteck unit verification/audit was completed on October 7. The unit passed the check requirements.
 - Five samples were collected this month: on October 3, 9, 15, 21 and 27.
- **PAHs Sampling System:**
 - The PUF sampler is programmed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS).
 - The TISCH PUF PLUS sampler verification/audit was completed on October 7. The unit passed the check requirements.
 - Five samples were collected this month: on October 3, 9, 15, 21 and 27.
- **Partisol Sampling System:**
 - The Partisol sampler is programmed to collect a 24-hour sample of air every sixth day as per National Air Pollution Surveillance schedule (NAPS).
 - Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
 - The Partisol 2000i-D verification/audit was completed on October 7. The unit passed the check requirements.
 - Five samples were collected this month: on October 3, 9, 15, 21 and 27.
- **Passive Sampling System:**
 - There were no exceedances of the AAAQOs for all monitored parameters at any of the passive stations during this month.
 - The passive sample filters were installed at the stations between September 28 and October 2, and were removed between October 29 and November 3.
 - A total of 13 duplicate samples were collected: 2 for H₂S, 3 for SO₂, 2 for NO₂, 2 for O₃, 2 for HNO₃ and 2 for NH₃.
- **PAC Sampling System:**
 - The PAC sampling program began in December 2019, and is designed to collect a 2-month integrated sample.
 - The media for the September/October monitoring period were installed between August 31 and September 3. The media were removed between October 29 and November 3.
 - The media for the November/December monitoring period were installed between October 29 and November 3. The media are scheduled to be removed by the end December.
- **NMHC canister Sampling System:**
 - The canister sampling program collects a 1-hour sample of air when the continuously non-methane hydrocarbon (NMHC) concentration reaches a specified trigger point. The current trigger point is 0.3 ppm and is based on real-time monitoring data that are averaged over a 5-minute period.
 - One canister event was recorded this month; on October 3 at 07:05, at NMHC concentration of 0.63ppm.

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

No deviations from authorized monitoring methods were recorded this month.

Disclaimer

Baseline correction were performed on the 1-minute data. 5-minute and hourly data were calculated based on the post-baseline correction 1-minute data set. Data verification/validation were then performed on the 5-minute and hourly data. Hourly data that are included in this report are the post-validation hourly data set.

Equipment calibration / maintenance records were provided by Bureau Veritas Canada.

Certification

This report was prepared and submitted by Lily Lin in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).



Lily Lin, Data & Reporting Specialist, LICA Airshed

This report was reviewed by Michael Bisaga in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

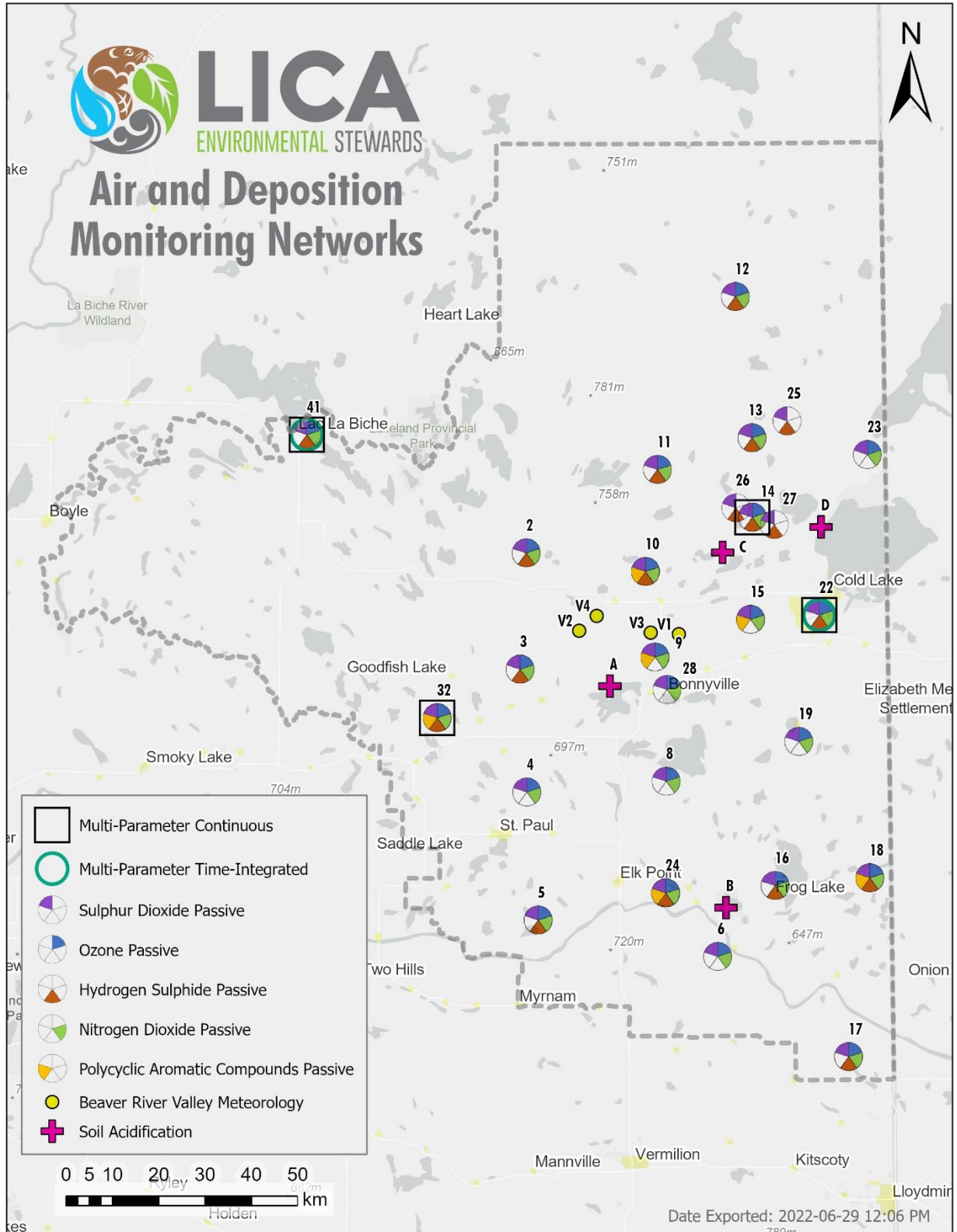
I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all air data have been electronically uploaded to Alberta's Ambient Air Quality Data Warehouse as required by the AMD. Uploading of VOC data from the canister sampling program was not required at the time of completing this report.



Michael Bisaga, Monitoring Programs Manager, LICA Airshed

November 22, 2023

Map of LICA Continuous Monitoring Network



CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY

Cold Lake South Station

Equipment Operation Summary

Parameter	Calibration Date	Equipment Operational Summary
SO2 Thermo 43i-TLE #1180260018	October 18, 2023	<ul style="list-style-type: none"> • No operational issues were identified. • Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
TRS Thermo 450i #812728560 TRS convertor CD Nova CDN-101 #501	October 18, 2023	<ul style="list-style-type: none"> • No operational issues were identified. • Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
NOx/NO/NO2 Thermo 42i #1505664393	October 18, 2023	<ul style="list-style-type: none"> • Due to an unknown error, the daily zero-span check failed to complete correctly on October 11. This issue was self-corrected on October 12. Data quality was not affected. • Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
O3 Thermo 49i #1002240371 Thermo 49iQ #12208316585	October 15, 2023	<ul style="list-style-type: none"> • Beginning with the October 11's daily zero-span checks, the analyzer showed unstable flowrate and output. The analyzer was reset on October 12 hour 9. However, the span check results remained above the upper acceptable limit. • To address the span drift issues, the Thermo 49i analyzer, s/n: 1002240371, was removed following a successful shut-down calibration on October 15. The Thermo 49iQ analyzer, s/n: 12208316585, was installed afterwards. As the analyzer passed the shut-down calibration, no data were discarded. However, one hour of downtime was recorded due to the analyzer swap activity. • Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
PM2.5 Teledyne T640 #575	October 28, 2023	<ul style="list-style-type: none"> • Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance. • A new sample pump was installed on October 28.

Parameter	Calibration Date	Equipment Operational Summary
THC/CH4/NMHC Thermo 55i #1180930025 H2 Generator HG300 #210567071	October 18, 2023	<ul style="list-style-type: none"> The hydrogen generator maintenance was performed on October 15 hour 17. One hour of downtime was recorded due to this event. Following the H2 generator maintenance, some bad injections were recorded. Data collected between October 15 and October 18 were reviewed. Hourly data collected on October 16 hour 6 and hour 8 were discarded as data quality was affected by bad injections. The injection issues were corrected during the monthly calibration on October 18. A new span gas cylinder was installed on October 18. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
Parameter	Verification Date	Equipment Operational Summary
RH Rotronic HC2A-S3 #20257103	October 28, 2023	<ul style="list-style-type: none"> No operational issues were identified. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
BP Met One 092 #Y23368	October 28, 2023	<ul style="list-style-type: none"> No operational issues were identified. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
AT Rotronic HC2A-S3 #20257103	October 28, 2023	<ul style="list-style-type: none"> No operational issues were identified. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
ST COMET #NA	October 28, 2023	<ul style="list-style-type: none"> No operational issues were identified. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.
WS/WD/STDWD RM Young 05305AQ #177354	October 28, 2023	<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. An annual wind system calibration was completed on July 6, 2022. No operational issues were identified. Both Ultimate software and Windows OS on the datalogger were updated on October 25. Two hours of downtime were recorded due to this maintenance.

Monitored Data Summary for Cold Lake South Station

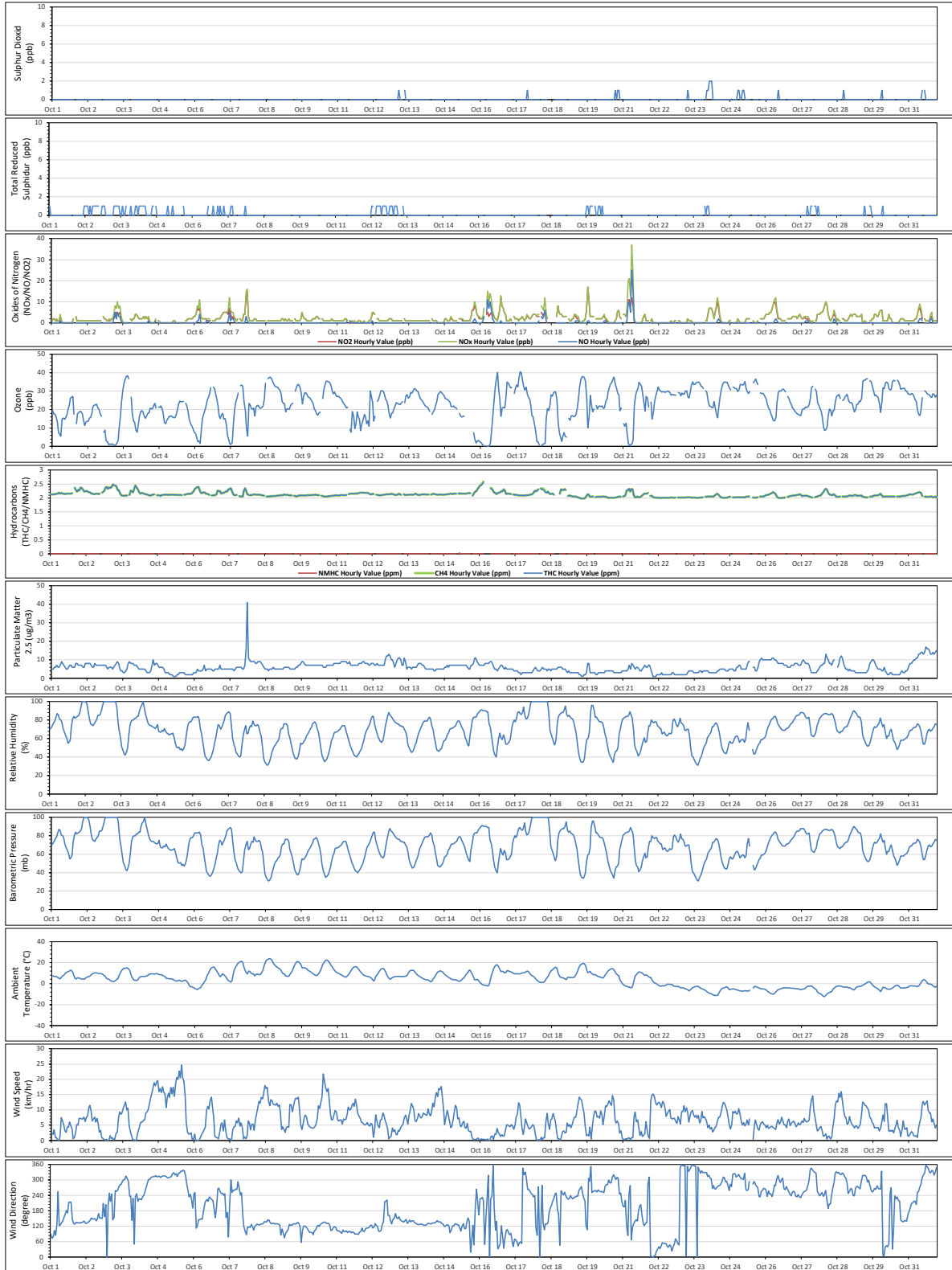
Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.0	0	2	Oct 24 at hr 0	5	NW	0.3	Oct 24	99.7	94.7
TRS (ppb)	-	-	-	-	-	-	0.1	0	1	Oct 1 at hr 0	2.5	E	0.6	Oct 2	99.7	94.7
NOx (ppb)	-	-	-	-	-	-	2.3	0	37	Oct 21 at hr 7	1	ENE	6.3	Oct 21	99.7	94.5
NO (ppb)	-	-	-	-	-	-	0.3	0	25	Oct 21 at hr 7	1	ENE	2.9	Oct 21	99.7	94.5
NO2 (ppb)	159	-	-	0	-	-	2.0	0	17	Oct 19 at hr 18	1.8	ESE	4.0	Oct 7	99.7	94.5
O3 (ppb)	76	-	-	0	-	-	22.7	0.0	40.5	Oct 17 at hr 9	11.6	NE	31.7	Oct 25	99.6	94.5
THC (ppm)	-	-	-	-	-	-	2.12	1.98	2.63	Oct 16 at hr 5	0.1	SSE	2.31	Oct 16	99.3	94.5
CH4 (ppm)	-	-	-	-	-	-	2.12	1.98	2.65	Oct 16 at hr 5	0.1	SSE	2.32	Oct 16	99.3	94.5
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.03	Oct 15 at hr 7	4.8	ESE	0.00	Oct 15	99.3	94.5
PM2.5 (µg/m3)	80	29	-	0	0	-	5.9	1	41	Oct 7 at hr 20	1.6	E	12.5	Oct 31	99.7	99.5
RH (%)	-	-	-	-	-	-	68.6	31	100	Oct 2 at hr 3	7.7	SE	89.0	Oct 2	99.7	99.7
BP (millibar)	-	-	-	-	-	-	952	935	966	Oct 5 at hr 3	14.1	NW	961	Oct 5	99.7	99.7
Ext. Temp. (°C)	-	-	-	-	-	-	4.4	-12.2	23.8	Oct 8 at hr 15	11.3	SE	15.2	Oct 8	99.7	99.7
Stn. Temp. (°C)	-	-	-	-	-	-	23.9	22.2	25.2	Oct 2 at hr 8	11.5	SE	24.8	Oct 17	99.7	99.7
WSV (km/hr)	-	-	-	-	-	-	0.3	0.0	24.7	Oct 5 at hr 13	24.7	NNW	13.2	Oct 5	99.7	99.7
WDV (sector)	-	-	-	-	-	-	267 (W)	-	-	-	-	-	-	-	99.7	99.7

1- Date/ Time given is the first minimum and maximum value that was recorded

Alberta Ambient Air Quality Objectives (AAQOs) Exceedances

The measured ambient air quality was within the AAQOs for all monitored parameters.

Timeseries Chart of Hourly Average for the month of Oct 2023 - Cold Lake South Station



Tamarack Station

Equipment Operation Summary

Parameter	Calibration Date	Equipment Operational Summary
SO2 Thermo 43i-TLE #1180930031	October 19, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
H2S Thermo 450i #CM17360005	October 19, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event. A repeat zero-span check was initiated on October 25 hour 6 to assess the span drift. One hour of downtime was recorded as a result.
NOx/NO/NO2 Thermo 42i #1180930028	October 19, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
O3 Thermo 49iQ #1202068570	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
THC/CH4/NMHC Thermo 55i #1180030034 #1505664392	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event. NMHC noise was recorded after the Thermo 55i analyzer, #1180030034, was installed on September 17. On October 19, LICA's Thermo 55i analyzer, s/n: 1180030034, was removed following a successful shut-down calibration. BV's Thermo 55i analyzer, s/n: 1505664392, was installed. The analyzer was allowed time to stabilize overnight (column conditioning was being performed). A successful installation calibration was completed on October 20. Eighteen hours of downtime were recorded. As the Thermo 55i analyzer, #1180030034, passed the daily zero-span check each day and October 19's shut-down calibration check, data collected between September 17 and October 19 were considered valid. A new N2 cylinder was installed on October 20.

Parameter	Calibration Date	Equipment Operational Summary
PM2.5 Thermo Sharp 5030 #CM2209	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
Parameter	Verification Date	Equipment Operational Summary
RH Rotronic HC2A-S3 #20433166	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
BP Met One 090D #F4497	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
AT Rotronic HC2A-S3 #20433166	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
ST COMET #NA	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
Precipitation MetOne 387 #C13580	October 20, 2023	<ul style="list-style-type: none"> Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.
WS/WD/STDWD RM Young 05305VK #161465	October 20, 2023	<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. An annual wind system calibration was completed on September 17, 2023. Data collected on October 18 between hour 9 and hour 20 were lost due to datalogger error. Datalogger was remotely reset on October 18. Twelve hours of downtime were recorded due to this event.

Monitored Data Summary for Tamarack Site

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	1.0	0	13	Oct 28 at hr 18	6.3	NW	4.6	Oct 4	98.4	93.2
H2S (ppb)	10	3	-	0	0	-	0.2	0	8	Oct 9 at hr 0	7.4	ESE	2.0	Oct 9	98.3	93.1
NOx (ppb)	-	-	-	-	-	-	3.9	0	56	Oct 21 at hr 7	1.2	N	10.9	Oct 4	98.4	93.0
NO (ppb)	-	-	-	-	-	-	0.7	0	47	Oct 21 at hr 7	1.2	N	4.2	Oct 4	98.4	93.0
NO2 (ppb)	159	-	-	0	-	-	3.1	0	19	Oct 29 at hr 21	6.1	WNW	6.9	Oct 28	98.4	93.0
O3 (ppb)	76	-	-	0	-	-	23.9	2.1	39.8	Oct 19 at hr 15	8.1	WSW	29.8	Oct 25	98.4	93.4
THC (ppm)	-	-	-	-	-	-	2.11	1.99	2.40	Oct 3 at hr 7	3.4	WSW	2.24	Oct 16	96.0	90.8
CH4 (ppm)	-	-	-	-	-	-	2.11	1.99	2.38	Oct 3 at hr 7	3.4	WSW	2.23	Oct 16	96.0	90.8
NMHC (ppm)	-	-	-	-	-	-	0.01	0.00	0.24	Oct 29 at hr 21	6.1	WNW	0.03	Oct 4	96.0	90.8
PM2.5 (µg/m3)	80	29	-	2	0	-	4.9	1	100	Oct 16 at hr 7	0.1	SW	18.2	Oct 16	98.4	98.1
RH (%)	-	-	-	-	-	-	74.1	27	100	Oct 2 at hr 5	6.4	S	95.0	Oct 2	98.4	98.4
BP (millibar)	-	-	-	-	-	-	938	923	951	Oct 5 at hr 17	4.4	NW	947	Oct 13	98.4	98.4
Ext. Temp. (°C)	-	-	-	-	-	-	3.8	-12.5	23.1	Oct 8 at hr 14	14.2	SSE	14.5	Oct 8	98.4	98.4
Stn. Temp. (°C)	-	-	-	-	-	-	21.9	20.5	23.0	Oct 19 at hr 12	14.9	W	22.4	Oct 22	98.4	98.4
Precipitation (mm)*	-	-	-	-	-	-	3.7	0.0	1.0	Oct 19 at hr 20	3.1	N	1.5	Oct 19	98.4	98.3
WSV (km/hr)	-	-	-	-	-	-	0.9	0.1	14.9	Oct 19 at hr 12	14.9	W	10.5	Oct 14	98.4	98.4
WDV (sector)	-	-	-	-	-	-	224 (SW)	-	-	-	-	-	-	-	98.4	98.4

1- Date/ Time given is the first minimum and maximum value that was recorded

* Data represents the total (sum) for the indicated time frame

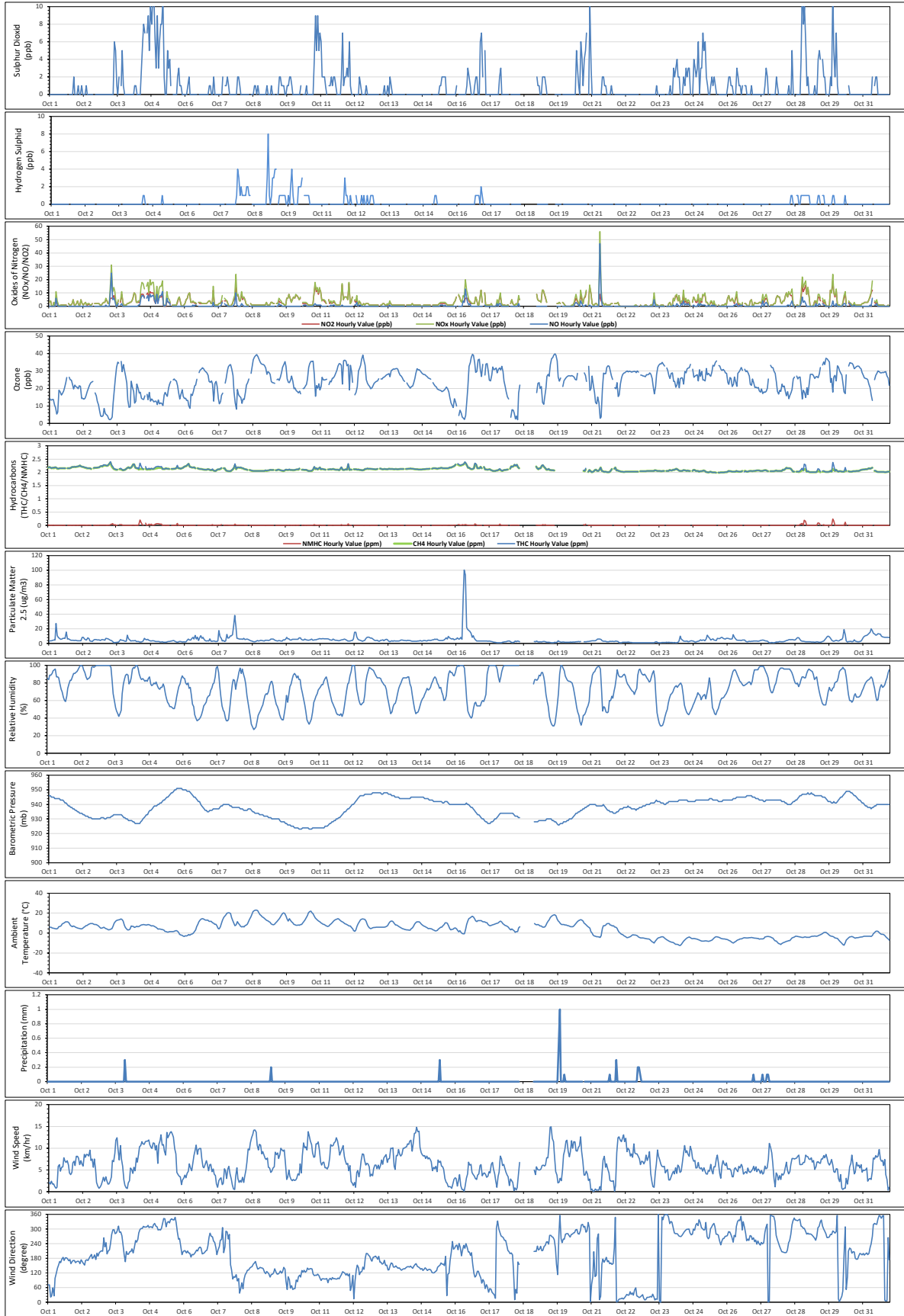
Alberta Ambient Air Quality Objectives (AAAQOs) and/or Alberta Ambient Air Quality Guidelines (AAAQGs) Exceedances

The following exceedances of AAAQG were observed at the Tamarack Site.

Date	Time (MST)	Parameter	Average Period	AAAQOs / AAAQGs	Concentration	Wind speed	Wind Direction	Reference #
Oct 16	7	PM2.5	1-Hour	80 µg/m3	100 µg/m3	0.1 km/hr	233° (SW)	422410
Oct 16	8	PM2.5	1-Hour	80 µg/m3	93 µg/m3	1.3 km/hr	221° (SW)	422410

The exceedances of the PM2.5 guideline on October 16 is believed to be the result of low wind speeds and an active excavation near the station.

Timeseries Chart of Hourly Average for the month of Oct 2023 - Tamarack Site



St. Lina Station

Equipment Operation Summary

Parameter	Calibration Date	Equipment Operational Summary
<p>SO2</p> <p>Thermo 43i-TLE #1180930030</p> <p>Thermo 43i #1226154720</p>	<p>October 24, 2023</p>	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event. LICA's Thermo 43i-TL analyzer, s/n: 1180930030, failed on October 8 hour 2. On October 10, the analyzer was removed, and BV's Thermo 43i analyzer, s/n: 1226154720, was installed. The analyzer was allowed time to stabilize overnight. A successful installation calibration was completed on October 11. Eight-one hours of downtime were recorded due to this event. A repeat multi-point calibration was performed on October 24 as a QC check following the analyzer installation earlier in the month. Four hours of downtime were recorded due to this event.
<p>H2S</p> <p>Teledyne T100 #1014</p>	<p>October 14, 2023</p>	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event. The analyzer failed the October 10 shut-down calibration due to an abrupt change in UV lamp performance. Troubleshooting was performed, and a successful-post-repair calibration was completed on October 11. Based on the diagnostic data, the failure occurred on October 10 hour 9. Data were invalidated back to the point of failure. Twenty-five hours of downtime were recorded due to this event. The analyzer failed the October 12 and 13's daily span checks, October 13's repeat zero-span check, and October 14's as-found points check. The cause was due to UV lamp voltage drift. The issue was corrected following by a successful post-repair calibration on October 14. Data were invalidated back to the last valid calibration check, which was October 11. Sixty-eight hours of downtime were recorded. The analyzer failed both scheduled and repeat span check on October 25 due to issues from datalogger. The datalogger was rebooted following by a successful repeat zero-span check. Three hours of downtime were recorded due to this event.

Parameter	Calibration Date	Equipment Operational Summary
NOx/NO/NO2 Thermo 42i #1180930029	October 11, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event. No operational issues were identified this month.
THC/CH4/NMHC Thermo 55i #1236656107	October 10, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event. Bad injections were noted, starting October 5. Problem was traced to the H2 generator. The H2 generator maintenance was completed prior to the monthly calibration on October 10 to correct the issue. Data collected between October 5 and October 10 were reviewed. Fourteen hours of data were invalidated as data quality was affected by injection issues. Another two hours of downtime were recorded due to maintenance performed on the H2 generator.
Parameter	Calibration Date	Equipment Operational Summary
O3 Thermo 49iQ #12208316586	October 11, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event. A successful as-found points check was completed to demonstrate stable calibrator performance before/after Oct 11's calibration on October 14. The reason for this verification was due to potential issue found during recent calibrator audit. Two hours of downtime were recorded due to the additional quality check. The analyzer started recording noise on October 23. Troubleshooting was performed on October 27. The cause could not be identified. A successful repeat zero-span check was completed afterwards. Data will be monitored, and the analyzer will be closely-check during the November visit. Two hours of downtime were recorded due to this event.
PM2.5 Thermo Sharp 5030i #CM17091001	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.

Parameter	Verification Date	Equipment Operational Summary
RH Rotronic HC2A-S3 #20404750	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.
BP Met One 090D #F4498	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.
AT Rotronic HC2A-S3 #20404750	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.
ST COMET #NA	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.
Precipitation MetOne 387D #A23775	October 14, 2023	<ul style="list-style-type: none"> As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.
WS/WD/STDWD RM Young 05305VK #161466	October 14, 2023	<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. An annual wind system calibration was completed on July 22, 2022. As the datalogger failed Windows update on September 30, no data were collected. The problem was corrected on October 1. Six hours of downtime were recorded in October due to this event.

Monitored Data Summary for St. Lina Site

Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.0	0	2	Oct 23 at hr 9	8.8	ENE	0.3	Oct 18	87.8	83.3
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	Oct 10 at hr 8	11	SE	0.0	Oct 2	85.8	81.3
NOx (ppb)	-	-	-	-	-	-	1.5	0	11	Oct 16 at hr 10	7.8	SSW	3.4	Oct 16	99.2	93.9
NO (ppb)	-	-	-	-	-	-	0.1	0	4	Oct 16 at hr 8	7.4	SW	0.4	Oct 16	99.2	93.9
NO2 (ppb)	159	-	-	0	-	-	1.5	0	9	Oct 28 at hr 6	9.4	WSW	3.0	Oct 16	99.2	93.9
O3 (ppb)	76	-	-	0	-	-	27.9	11.1	42.0	Oct 17 at hr 15	7	WNW	35.2	Oct 29	98.7	93.8
THC (ppm)	-	-	-	-	-	-	2.02	1.82	2.26	Oct 1 at hr 19	10.7	S	2.16	Oct 2	97.0	92.2
CH4 (ppm)	-	-	-	-	-	-	2.03	1.82	2.26	Oct 1 at hr 19	10.7	S	2.16	Oct 2	97.0	92.2
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.00	Oct 1 at hr 6	6.2	ESE	0.00	Oct 2	97.0	92.2
PM2.5 (µg/m3)	80	29	-	0	0	-	4.3	0	23	Oct 30 at hr 21	13.5	SSW	15.1	Oct 31	99.2	98.9
RH (%)	-	-	-	-	-	-	69.0	23	99	Oct 18 at hr 0	9.9	SSW	85.4	Oct 27	99.2	99.2
BP (millibar)	-	-	-	-	-	-	921	905	934	Oct 5 at hr 17	12.7	NNW	930	Oct 5	99.2	99.2
Ext. Temp. (°C)	-	-	-	-	-	-	4.7	-11.7	24.3	Oct 8 at hr 15	17	S	16.0	Oct 8	99.2	99.2
Stn. Temp. (°C)	-	-	-	-	-	-	21.9	18.8	23.8	Oct 12 at hr 3	11.1	E	23.1	Oct 12	99.2	99.2
Precipitation (mm)*	-	-	-	-	-	-	6.5	0.0	2.0	Oct 19 at hr 19	17.6	NW	2.2	Oct 19	99.1	99.1
WSV (km/hr)	-	-	-	-	-	-	2.4	3.5	25.9	Oct 5 at hr 10	25.9	NNW	16.5	Oct 14	99.2	99.2
WDV (sector)	-	-	-	-	-	-	232 (SW)	-	-	-	-	-	-	-	99.2	99.2

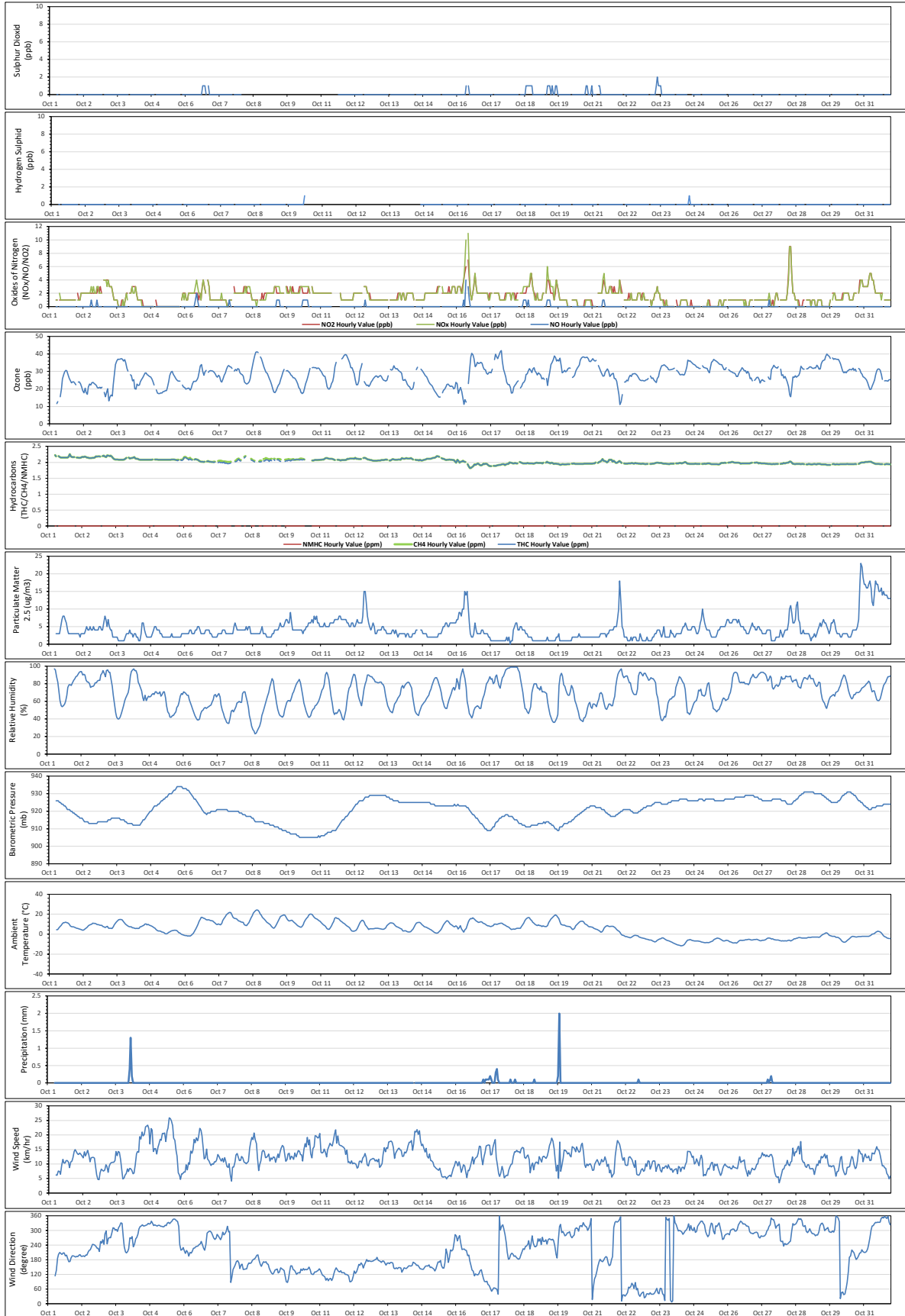
1- Date/ Time given is the first minimum and maximum value that was recorded

* Data represents the total (sum) for the indicated time frame

Alberta Ambient Air Quality Objectives (AAAQOs) Exceedances

The measured ambient air quality was within the AAAQOs for all monitored parameters.

Timeseries Chart of Hourly Average for the month of Oct 2023 - St. Lina Site



Lac La Biche Station

Equipment Operation Summary

Parameter	Calibration Date	Equipment Operational Summary
SO2 Thermo 43i-TLE #1180320043	October 4, 2023	<ul style="list-style-type: none"> No operational issues were identified this month.
H2S Thermo 450i #CM17360002	October 4, 2023	<ul style="list-style-type: none"> A repeat zero-span check was completed on October 25 hour 15 to assess zero-drift. The check result was back to the acceptable limit. No further actions were required. One hour of downtime was recorded.
NOx/NO/NO2 Thermo 42i #1180930027	October 4, 2023	<ul style="list-style-type: none"> No operational issues were identified this month.
O3 Thermo 49i #1002240372	October 3, 2023	<ul style="list-style-type: none"> The analyzer failed the daily span check on September 24 and continued to October. The zero-span pump was rebuilt on September 26 following by a repeat zero-span check. The analyzer passed the October 3's monthly calibration. Because the analyzer passed the multi-point calibration check requirements, data collected between September 24 and October 3 were considered valid. No data were discarded as a result. The scheduled zero-span check failed to trigger correctly on October 8. A successful repeat zero-span check was completed on October 9. One hour of downtime was recorded due to the additional quality check.
THC/CH4/NMHC Thermo 55i #1180030044	October 3, 2023	<ul style="list-style-type: none"> Bad injections started to be noting due to depleted carrier gas on October 20 hour 5. The cylinder was replaced on October 20 hour 9. Five hours of downtime were recorded due to this event.
PM2.5 Thermo Sharp 5030i #CM17071016	October 4, 2023	<ul style="list-style-type: none"> No operational issues were identified this month.
Parameter	Verification Date	Equipment Operational Summary
RH Rotronic HC2A-S3 #0020357518	October 4, 2023	<ul style="list-style-type: none"> No operational issues were recorded this month.

Parameter	Verification Date	Equipment Operational Summary
BP Met One 092 #Y23360	October 4, 2023	<ul style="list-style-type: none"> No operational issues were recorded this month.
AT Rotronic HC2A-S3 #0020357518	October 4, 2023	<ul style="list-style-type: none"> No operational issues were recorded this month.
ST COMET #NA	October 4, 2023	<ul style="list-style-type: none"> No operational issues were recorded this month.
WS/WD/STDWD RM Young 05305VK #56778	October 4, 2023	<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. The last annual wind system calibration was completed on September 15, 2023. No operational issues were recorded this month.

Monitored Data Summary for Lac La Biche Station

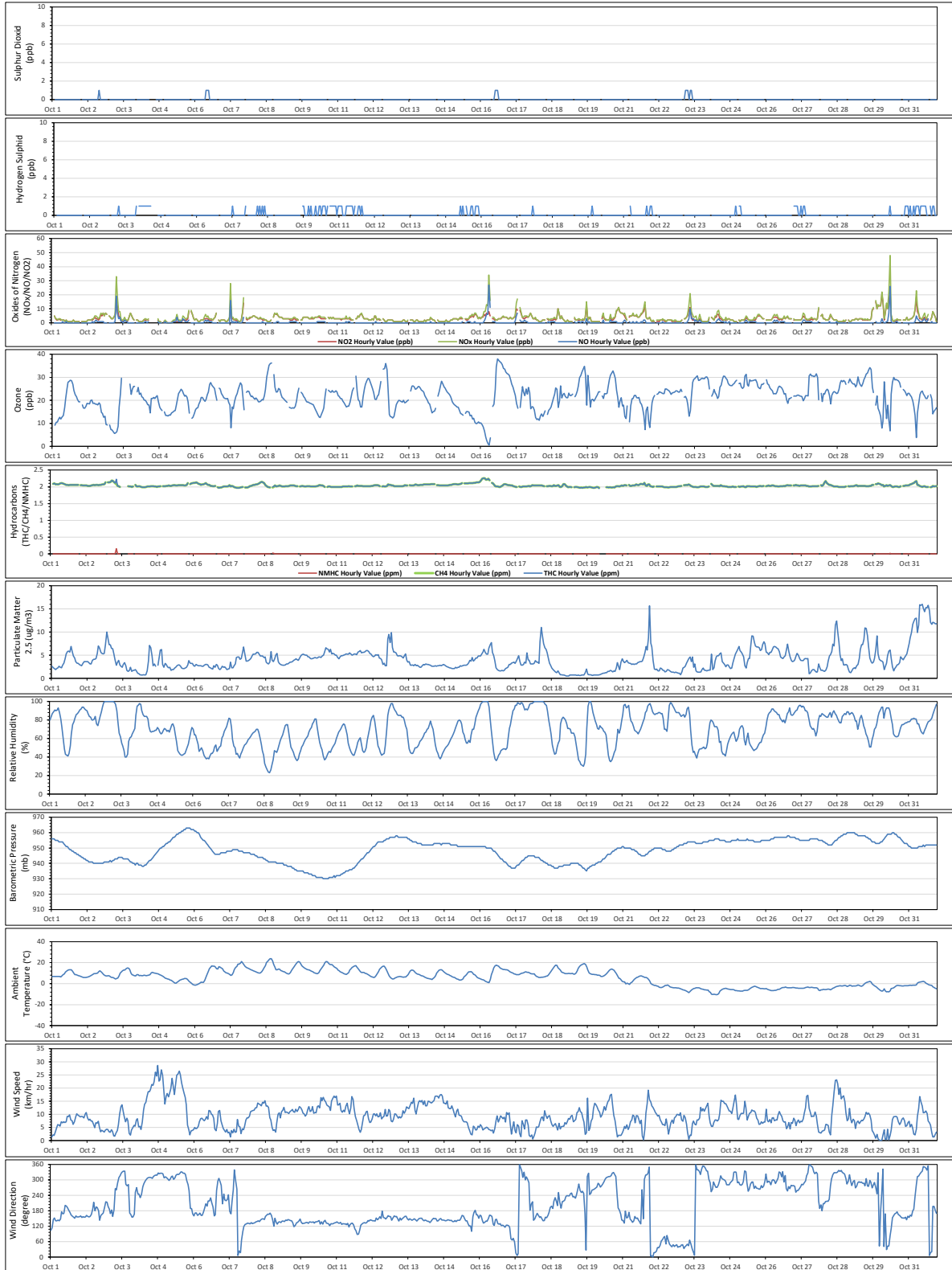
Parameter	Objectives/Guidelines			Exceedances			Monthly Avg.	Min. 1-hr	Max. 1-hr	Date/Time	VWS (km/hr)	VWD (sector)	Max. 24-hr	Date	Operational Uptime (%)	Valid Data (%)
	1-hr	24-hr	30-day	1-hr	24-hr	30-day										
SO2 (ppb)	172	48	11	0	0	0	0.0	0	1	Oct 2 at hr 15	7.3	S	0.2	Oct 23	100.0	94.9
H2S (ppb)	10	3	-	0	0	-	0.1	0	1	Oct 3 at hr 6	2.9	W	1.0	Oct 4	99.9	94.7
NOx (ppb)	-	-	-	-	-	-	3.7	0	48	Oct 30 at hr 8	1.9	E	8.2	Oct 30	100.0	94.6
NO (ppb)	-	-	-	-	-	-	0.6	0	27	Oct 16 at hr 7	4.2	SSE	2.5	Oct 16	100.0	94.6
NO2 (ppb)	159	-	-	0	-	-	3.1	0	22	Oct 30 at hr 8	1.9	E	6.4	Oct 30	100.0	94.6
O3 (ppb)	76	-	-	0	-	-	21.7	0.5	38.0	Oct 16 at hr 14	9.4	SE	27.5	Oct 25	99.9	94.6
THC (ppm)	-	-	-	-	-	-	2.04	1.95	2.26	Oct 16 at hr 3	4.4	SE	2.11	Oct 16	99.3	94.2
CH4 (ppm)	-	-	-	-	-	-	2.04	1.97	2.26	Oct 16 at hr 3	4.4	SE	2.11	Oct 16	99.3	94.2
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.15	Oct 3 at hr 7	3.8	W	0.00	Oct 8	99.3	94.2
PM2.5 (µg/m3)	80	29	-	0	0	-	4.0	1	16	Oct 31 at hr 11	13.1	NNW	12.8	Oct 31	100.0	99.9
RH (%)	-	-	-	-	-	-	69.6	23	100	Oct 2 at hr 22	4.3	SSW	92.0	Oct 17	100.0	100.0
BP (millibar)	-	-	-	-	-	-	948	930	963	Oct 5 at hr 17	13.7	NW	959	Oct 5	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	5.3	-10.6	23.8	Oct 8 at hr 15	8.7	SSE	15.3	Oct 8	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	22.5	18.6	24.9	Oct 23 at hr 1	7.8	NE	24.3	Oct 27	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	1.3	0.0	28.7	Oct 4 at hr 17	28.7	NW	17.5	Oct 4	100.0	100.0
WDV (sector)	-	-	-	-	-	-	203 (SSW)	-	-	-	-	-	-	-	100.0	100.0

1- Date/ Time given is the first minimum and maximum value that was recorded

Alberta Ambient Air Quality Objectives (AAQOs) Exceedances

The measured ambient air quality was within the AAQOs for all monitored parameters.

Timeseries Chart of Hourly Average for the month of Oct 2023 - Lac La Biche Station



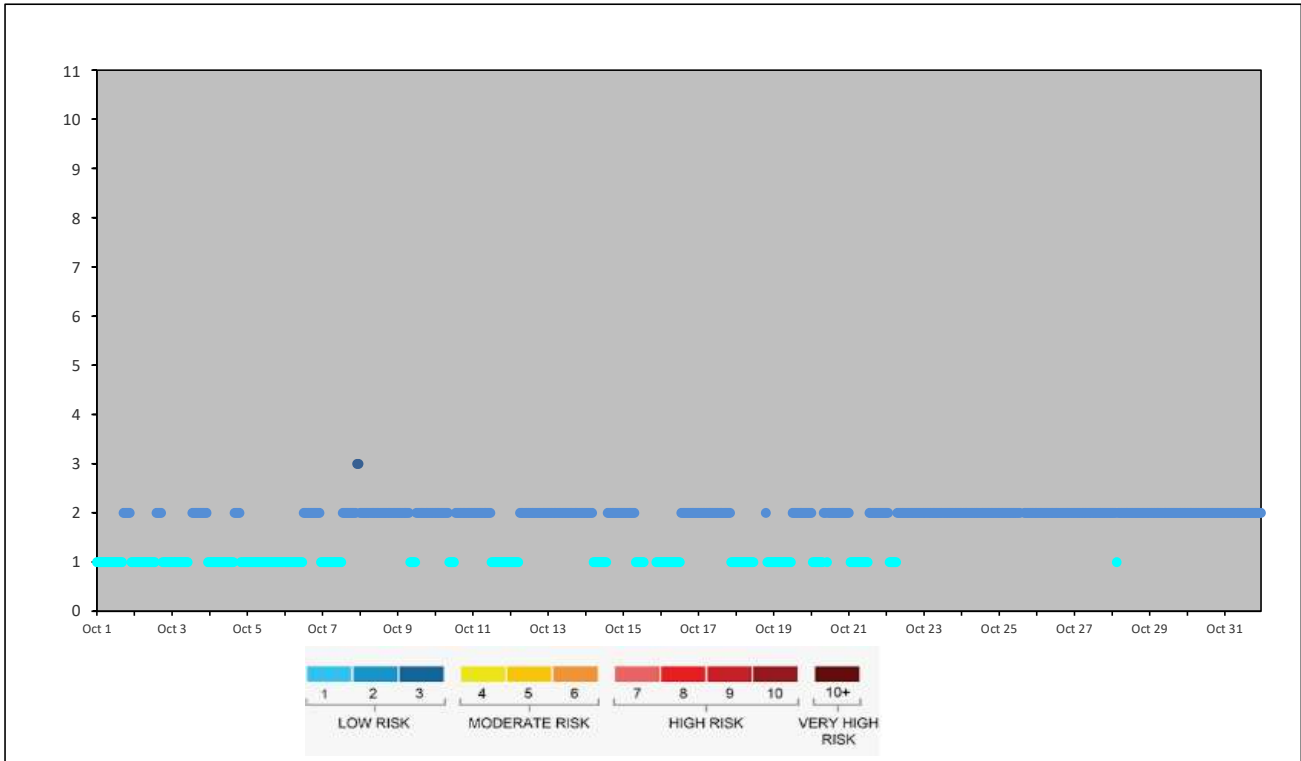
TABLES AND CHARTS

COLD LAKE SOUTH STATION

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Station - October 2023

AIR QUALITY HEALTH INDEX

Day	Hourly Period Starting at (MST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Oct 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1
Oct 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1
Oct 3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1
Oct 4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1
Oct 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
Oct 6	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1
Oct 7	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3
Oct 8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 9	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Oct 10	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 11	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
Oct 12	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 14	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 15	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 16	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Oct 18	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1
Oct 19	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Oct 20	2	1	1	1	1	1	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 21	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 22	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 23	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 25	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 28	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 31	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2



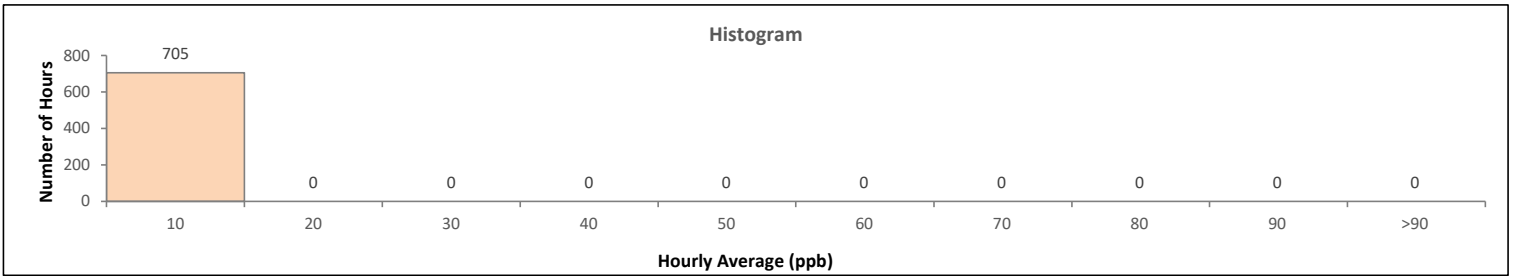
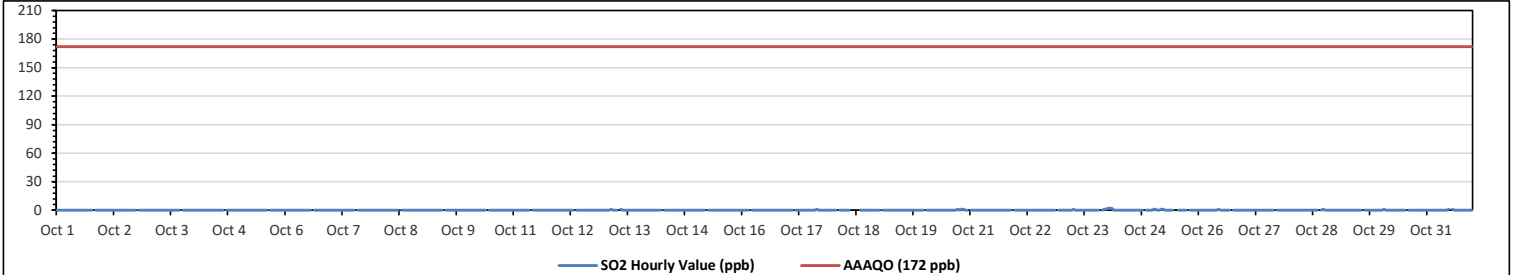
Lakeland Industry & Community Association

Cold Lake South Station - October 2023

Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																																															
Number of 1-Hour Exceedances:								0								Number of 24-Hour Exceedances:								0								30-Day Exceedence:								0							
Maximum Hourly Value:								2 ppb on Oct 24 at hr 0								Hours in Service:								744																							
Maximum Daily Value:								0.3 ppb on Oct 24								Hours of Data:								705																							
Minimum Hourly Value:								0 ppb on Oct 1 at hr 0								Hours of Missing Data:								2																							
Minimum Daily Value:								0.0 ppb on Oct 1								Hours of Calibration:								37																							
Monthly Average:								0.0 ppb								Operational Uptime:								99.7																							
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
Oct 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0																				
Oct 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																				
Oct 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0																				
Oct 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0																				
Oct 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 7	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 9	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																				
Oct 10	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 11	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 12	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 13	0	0	0	1	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 0.1																				
Oct 14	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																				
Oct 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																				
Oct 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																				
Oct 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																				
Oct 18	0	0	S	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 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																				
Oct 20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	S	0	0	1	1 0.1																				
Oct 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																				
Oct 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0.0																				
Oct 23	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	1	1 0.1																				
Oct 24	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	2	2	0.3																				
Oct 25	1	1	0	0	1	1	0	0	0	0	0	Y	Y	0	0	0	0	0	S	0	0	0	0	0	0	1	1 0.2																				
Oct 26	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0.0																				
Oct 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0																				
Oct 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	1 0.0																				
Oct 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0																				
Oct 30	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0.0																				
Oct 31	0	0	0	0	0	0	0	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1																				
Diurnal Maximum	2	2	2	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	1	0	1	1																							
Diurnal Average	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0																							

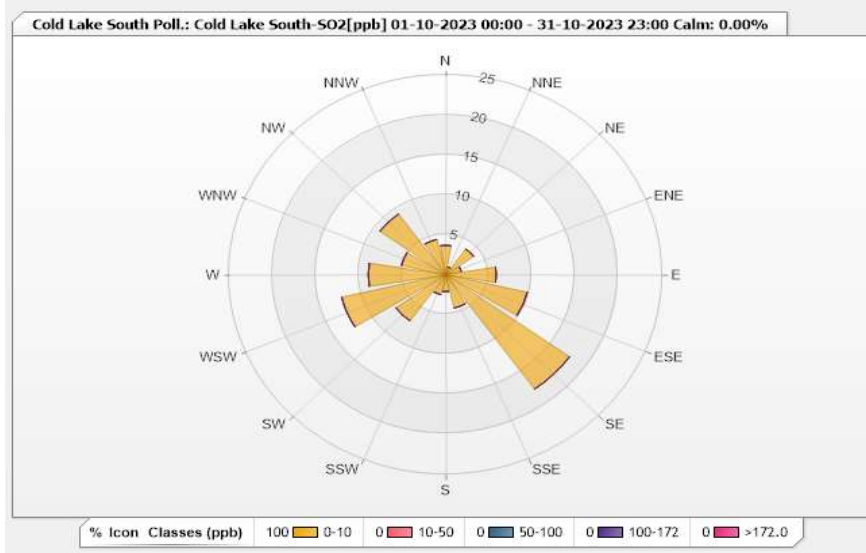


Station: Cold Lake South Poll.: Cold Lake South-SO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppm]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	3.69	0	0	0	0	3.69
NNE	0.99	0	0	0	0	0.99
NE	3.97	0	0	0	0	3.97
ENE	1.84	0	0	0	0	1.84
E	5.82	0	0	0	0	5.82
ESE	9.65	0	0	0	0	9.65
SE	17.59	0	0	0	0	17.59
SSE	4.26	0	0	0	0	4.26
S	2.13	0	0	0	0	2.13
SSW	2.55	0	0	0	0	2.55
SW	7.09	0	0	0	0	7.09
WSW	12.34	0	0	0	0	12.34
W	8.94	0	0	0	0	8.94
WNW	5.25	0	0	0	0	5.25
NW	9.36	0	0	0	0	9.36
NNW	4.54	0	0	0	0	4.54
Summary	100	0	0	0	0	100

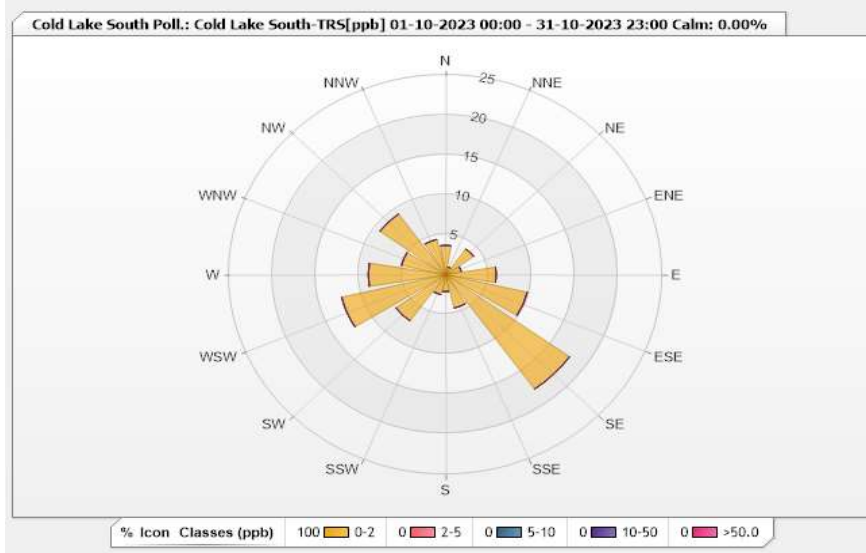


Station: Cold Lake South Poll.: Cold Lake South-TRS[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	3.69	0	0	0	0	3.69
NNE	0.99	0	0	0	0	0.99
NE	3.97	0	0	0	0	3.97
ENE	1.84	0	0	0	0	1.84
E	5.82	0	0	0	0	5.82
ESE	9.65	0	0	0	0	9.65
SE	17.59	0	0	0	0	17.59
SSE	4.26	0	0	0	0	4.26
S	2.13	0	0	0	0	2.13
SSW	2.55	0	0	0	0	2.55
SW	7.09	0	0	0	0	7.09
WSW	12.34	0	0	0	0	12.34
W	8.94	0	0	0	0	8.94
WNW	5.25	0	0	0	0	5.25
NW	9.36	0	0	0	0	9.36
NNW	4.54	0	0	0	0	4.54
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

Cold Lake South Station - October 2023

Summary of Hourly Averages

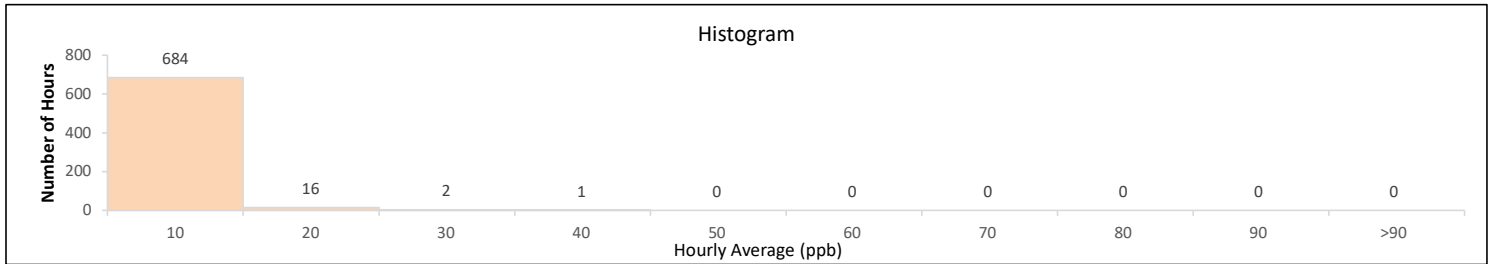
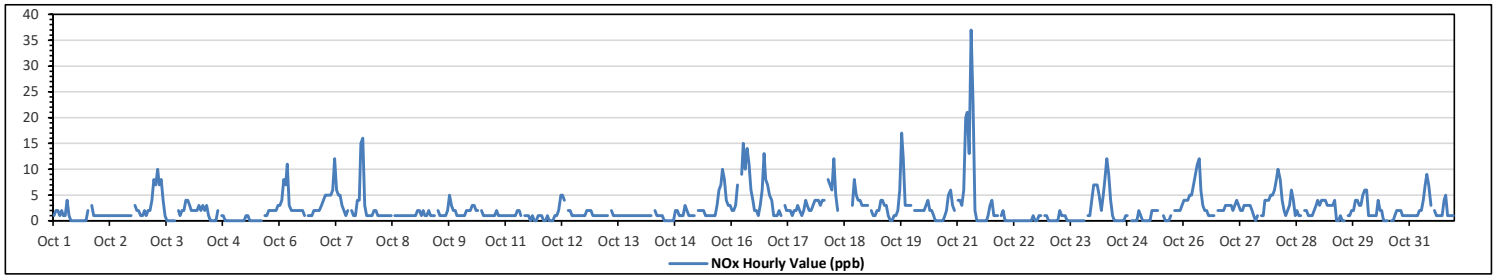
OXIDES OF NITROGEN (NOx) in ppb

Maximum Hourly Value:	37 ppb	on Oct 21 at hr 7	Hours in Service:	744
Maximum Daily Value:	6.3 ppb	on Oct 21	Hours of Data:	703
Minimum Hourly Value:	0 ppb	on Oct 1 at hr 9	Hours of Missing Data:	2
Minimum Daily Value:	0.3 ppb	on Oct 22	Hours of Calibration:	39
Monthly Average:	2.3 ppb		Operational Uptime:	99.7

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Oct 1	1	2	2	1	2	1	1	4	1	0	0	0	0	0	0	0	0	0	2	S	3	1	1	1	0	4	1.0	
Oct 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	3	2	2	1	1	1	3	1.2
Oct 3	2	1	2	2	4	8	7	10	7	8	4	1	0	0	0	0	0	S	2	1	2	2	4	4	0	10	3.1	
Oct 4	3	2	2	2	2	3	2	3	2	3	1	0	0	0	0	2	S	1	1	0	0	0	0	0	0	0	3	1.3
Oct 5	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	1	1	2	2	2	2	2	2	3	0	3	0.7
Oct 6	3	4	8	7	11	3	2	2	2	2	2	2	2	S	1	1	1	2	2	2	2	2	3	4	1	11	3.0	
Oct 7	5	5	5	5	6	12	6	5	5	3	2	1	2	S	2	1	1	4	4	15	16	3	1	1	1	16	4.8	
Oct 8	1	1	2	2	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1	
Oct 9	1	2	2	1	2	1	1	2	1	1	S	2	1	1	1	1	2	5	3	2	2	1	1	1	1	5	1.6	
Oct 10	1	1	1	2	2	2	3	3	2	2	S	2	1	1	1	1	1	1	1	2	1	1	1	1	1	3	1.5	
Oct 11	1	1	1	1	1	1	2	2	1	2	S	1	2	1	0	1	0	1	1	1	0	0	1	0	0	2	0.8	
Oct 12	0	0	1	1	2	5	5	4	S	2	2	1	1	1	1	1	1	1	1	2	2	2	1	1	0	5	1.7	
Oct 13	1	1	1	1	1	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.0	
Oct 14	1	1	1	1	1	1	S	2	1	1	1	1	0	0	0	0	0	0	2	2	1	1	1	3	0	3	1.0	
Oct 15	2	1	1	1	1	S	2	2	2	2	1	1	1	1	1	3	6	7	10	8	4	3	3	1	10	2.8		
Oct 16	2	2	3	7	S	9	15	10	14	11	6	4	2	2	1	3	6	13	8	7	5	4	1	1	1	15	5.9	
Oct 17	1	2	1	S	3	2	2	2	1	2	2	3	2	1	2	4	3	2	2	3	4	4	4	3	1	4	2.4	
Oct 18	4	4	S	S	8	7	6	12	5	2	C	C	C	C	C	C	8	5	4	4	3	3	3	2	12	NA		
Oct 19	3	S	2	1	1	2	2	4	4	3	3	1	0	0	1	1	2	6	17	12	3	3	3	3	0	17	3.3	
Oct 20	S	2	2	2	2	2	3	4	2	2	1	0	0	0	0	0	1	2	5	6	3	2	S	0	6	2.0		
Oct 21	4	4	3	6	20	21	13	37	23	2	0	0	0	0	0	0	1	3	4	1	1	1	S	1	0	37	6.3	
Oct 22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	S	1	1	0	2	0.3	
Oct 23	0	0	0	0	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	S	1	1	4	0	4	0.5	
Oct 24	7	7	7	5	2	5	8	12	9	4	1	0	0	0	0	0	1	1	S	0	0	0	0	0	0	12	3.0	
Oct 25	2	1	0	0	0	0	0	2	2	2	2	Y	Y	1	0	0	0	1	S	2	2	2	2	3	0	3	1.1	
Oct 26	4	4	4	5	5	7	9	11	12	6	3	2	2	1	1	1	1	S	2	2	2	2	3	3	1	12	4.0	
Oct 27	3	3	2	3	4	3	2	2	3	3	3	3	2	1	0	1	S	1	1	4	4	4	5	5	0	5	2.7	
Oct 28	6	8	10	8	4	2	1	2	3	6	4	1	2	1	1	S	2	2	1	1	1	2	3	4	1	10	3.3	
Oct 29	3	4	4	4	3	3	3	3	4	0	0	1	0	0	S	1	1	2	2	4	4	3	3	5	0	5	2.5	
Oct 30	6	6	1	1	1	1	1	4	2	2	0	0	0	S	0	0	1	2	2	2	1	1	1	1	0	6	1.6	
Oct 31	1	1	1	1	1	2	2	4	7	9	7	3	S	2	1	1	1	1	4	5	1	1	1	1	1	9	2.5	
Diurnal Maximum	7	8	10	8	20	21	15	37	23	11	7	4	2	2	2	4	6	13	17	15	16	4	5	5				
Diurnal Average	2.4	2.4	2.3	2.6	3.0	3.5	3.6	4.8	4.0	2.8	1.8	1.1	0.8	0.6	0.6	0.8	1.2	2.2	2.9	3.4	2.7	1.9	1.8	2.1				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

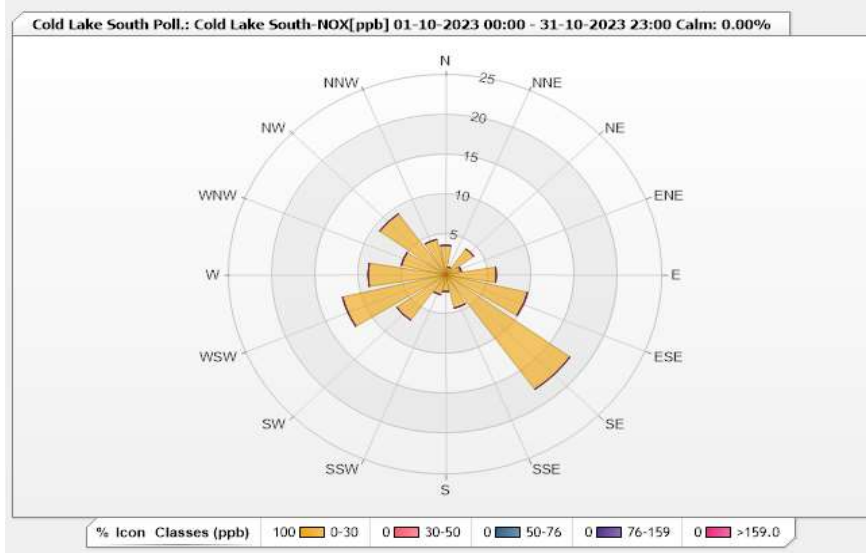


Station: Cold Lake South Poll.: Cold Lake South-NOX[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.7	0	0	0	0	3.7
NNE	1	0	0	0	0	1
NE	3.98	0	0	0	0	3.98
ENE	1.71	0.14	0	0	0	1.85
E	5.83	0	0	0	0	5.83
ESE	9.67	0	0	0	0	9.67
SE	17.64	0	0	0	0	17.64
SSE	4.27	0	0	0	0	4.27
S	2.13	0	0	0	0	2.13
SSW	2.56	0	0	0	0	2.56
SW	6.97	0	0	0	0	6.97
WSW	12.23	0	0	0	0	12.23
W	8.96	0	0	0	0	8.96
WNW	5.26	0	0	0	0	5.26
NW	9.39	0	0	0	0	9.39
NNW	4.55	0	0	0	0	4.55
Summary	100	0.14	0	0	0	100



Lakeland Industry & Community Association
Cold Lake South Station - October 2023
Summary of Hourly Averages

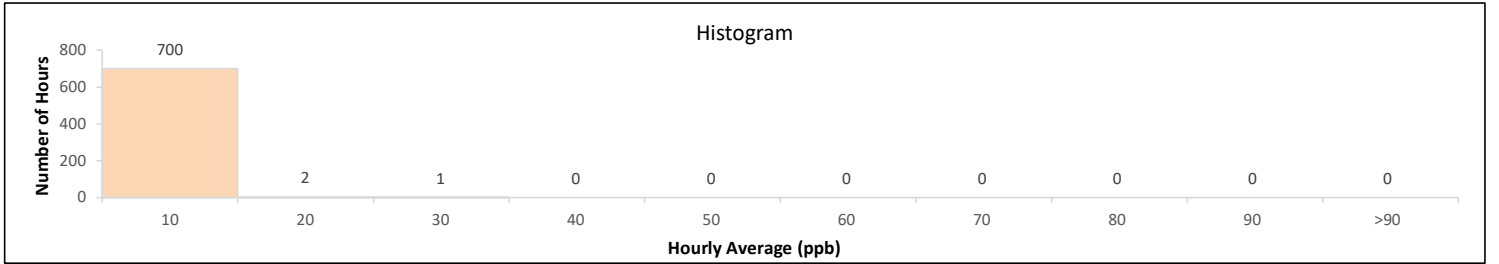
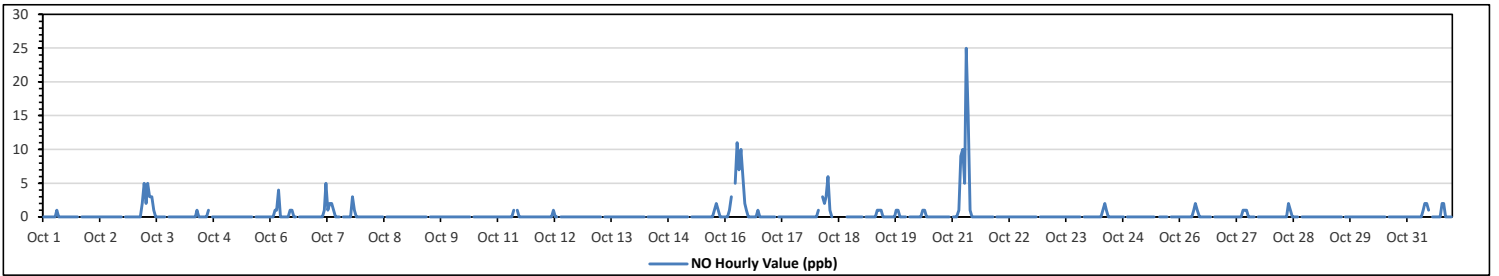
NITRIC OXIDE (NO) in ppb

Maximum Hourly Value:	25 ppb on Oct 21 at hr 7	Hours in Service:	744
Maximum Daily Value:	2.9 ppb on Oct 21	Hours of Data:	703
Minimum Hourly Value:	0 ppb on Oct 1 at hr 0	Hours of Missing Data:	2
Minimum Daily Value:	0.0 ppb on Oct 2	Hours of Calibration:	39
Monthly Average:	0.3 ppb	Operational Uptime:	99.7

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
Oct 1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Oct 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	0
Oct 3	0	0	0	0	2	5	2	5	3	3	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0
Oct 4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0
Oct 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	0
Oct 6	0	0	1	1	4	0	0	0	0	1	1	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 7	0	0	0	0	1	5	1	2	2	1	0	0	0	S	S	0	0	0	0	0	0	0	3	1	0	0	0	0	
Oct 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 10	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 11	0	0	0	0	0	0	0	0	1	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 12	0	0	0	0	0	1	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 13	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 14	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
Oct 15	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 16	0	0	1	3	S	5	11	7	10	6	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Oct 17	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 18	0	1	S	3	2	3	6	1	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 19	0	S	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Oct 20	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 21	0	0	0	1	9	10	5	25	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 23	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
Oct 24	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0
Oct 25	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
Oct 26	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0
Oct 27	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 28	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0
Oct 29	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
Oct 30	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
Oct 31	0	0	1	0	0	0	0	1	2	2	1	S	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
Diurnal Maximum	0	1	1	3	9	10	11	25	15	6	2	1	0	0	0	0	1	0	1	2	3	1	0	0	0	0	0	0	0
Diurnal Average	0.0	0.0	0.1	0.3	0.6	1.0	0.8	1.4	1.3	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

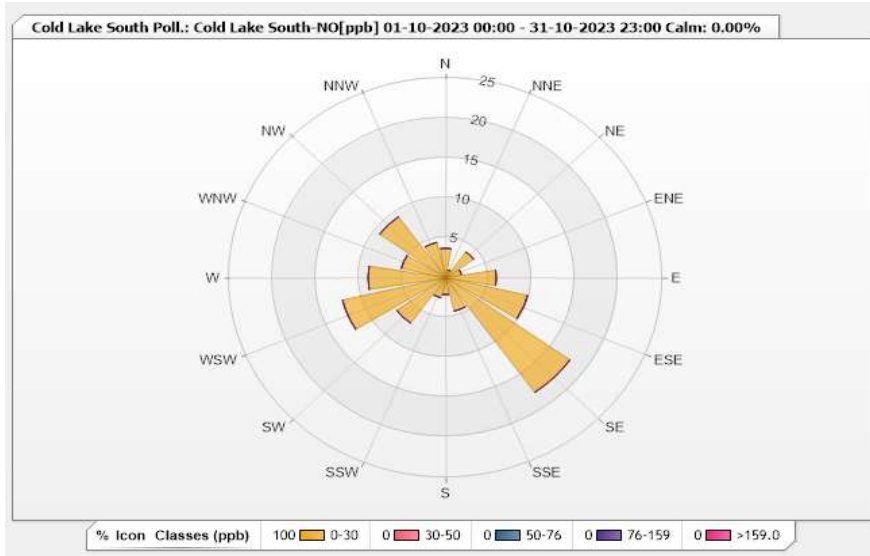


Station: Cold Lake South Poll.: Cold Lake South-NO[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

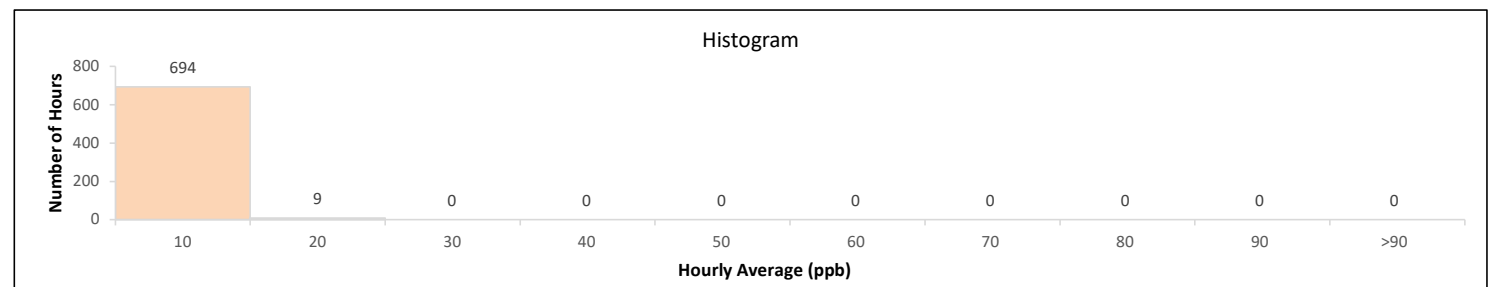
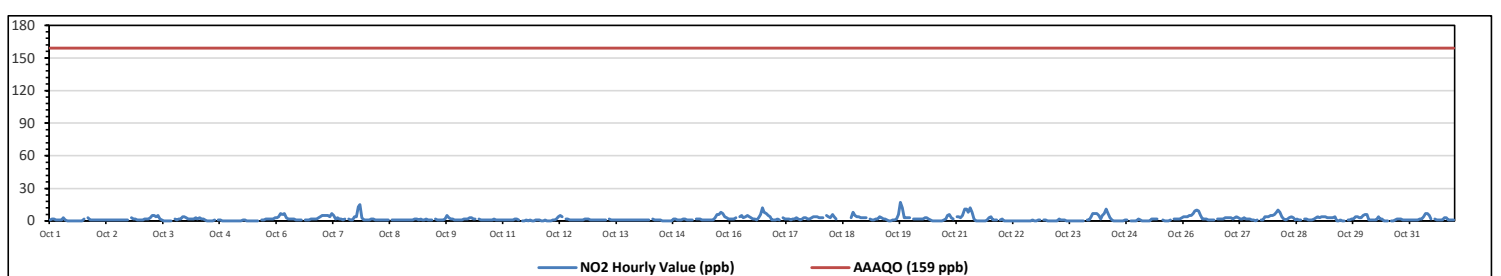
Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.7	0	0	0	0	3.7
NNE	1	0	0	0	0	1
NE	3.98	0	0	0	0	3.98
ENE	1.85	0	0	0	0	1.85
E	5.83	0	0	0	0	5.83
ESE	9.67	0	0	0	0	9.67
SE	17.64	0	0	0	0	17.64
SSE	4.27	0	0	0	0	4.27
S	2.13	0	0	0	0	2.13
SSW	2.56	0	0	0	0	2.56
SW	6.97	0	0	0	0	6.97
WSW	12.23	0	0	0	0	12.23
W	8.96	0	0	0	0	8.96
WNW	5.26	0	0	0	0	5.26
NW	9.39	0	0	0	0	9.39
NNW	4.55	0	0	0	0	4.55
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association
Cold Lake South Station - October 2023
Summary of Hourly Averages
NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																										
Number of 1-Hour Exceedances: 0																										
Maximum Hourly Value: 17 ppb on Oct 19 at hr 18												Hours in Service: 744														
Maximum Daily Value: 4.0 ppb on Oct 7												Hours of Data: 703														
Minimum Hourly Value: 0 ppb on Oct 1 at hr 9												Hours of Missing Data: 2														
Minimum Daily Value: 0.3 ppb on Oct 22												Hours of Calibration: 39														
Monthly Average: 2.0 ppb												Operational Uptime: 99.7														
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			
Oct 1	1	2	2	1	1	1	1	3	1	0	0	0	0	0	0	0	0	2	S	3	1	1	1	0	3	0.9
Oct 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	3	2	2	1	1	1	1.2
Oct 3	1	1	2	2	2	3	5	5	4	5	2	1	0	0	0	0	0	S	2	1	2	2	4	4	2.1	
Oct 4	3	2	2	2	2	3	2	3	2	2	1	0	0	0	0	0	0	S	1	1	0	0	0	0	1.2	
Oct 5	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	S	1	1	2	2	2	3	0.7	
Oct 6	3	4	7	6	7	3	2	2	2	2	1	1	1	1	S	1	1	1	2	2	2	2	3	4	2.6	
Oct 7	5	5	5	5	4	7	5	2	3	2	2	1	2	S	2	1	4	4	13	15	3	1	1	1	4.0	
Oct 8	1	1	2	2	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1.1	
Oct 9	1	2	2	1	2	1	1	2	1	1	1	S	2	1	1	1	1	2	5	3	2	2	1	1	1.6	
Oct 10	1	1	1	2	2	2	3	3	2	2	S	2	1	1	1	1	1	1	2	1	1	1	1	1	1.5	
Oct 11	1	1	1	1	1	1	2	2	1	S	0	0	1	0	1	0	0	1	1	1	0	0	1	0	0.7	
Oct 12	0	0	1	1	2	4	5	4	S	2	2	1	1	1	1	1	1	1	2	2	2	1	1	0	1.6	
Oct 13	1	1	1	1	1	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
Oct 14	1	1	1	1	1	1	S	2	1	1	1	1	0	0	0	0	0	2	2	1	1	1	2	0	0.9	
Oct 15	2	1	1	1	1	S	2	2	2	1	1	1	1	1	1	1	3	6	8	7	4	3	2	1	2.5	
Oct 16	2	2	2	3	S	4	5	3	4	5	4	3	2	2	1	3	6	12	8	7	5	4	1	1	3.9	
Oct 17	1	2	1	S	3	2	2	2	1	2	2	3	2	1	2	3	3	2	2	3	4	4	4	3	2.3	
Oct 18	3	3	S	5	4	3	6	4	2	C	C	C	C	C	C	C	3	8	5	4	4	3	3	3	NA	
Oct 19	3	S	2	1	1	2	2	4	3	2	2	1	0	0	1	1	2	6	17	12	3	3	3	3	3.2	
Oct 20	S	2	2	2	2	2	2	3	3	2	1	0	0	0	0	0	0	1	2	5	6	3	2	S	1.8	
Oct 21	4	4	3	5	11	11	8	12	8	2	0	0	0	0	0	0	1	3	4	1	1	1	S	1	3.5	
Oct 22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	S	1	1	0	0.3	
Oct 23	0	0	0	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	1	1	4	0.5	
Oct 24	7	7	7	5	2	5	7	11	7	3	1	0	0	0	0	0	0	1	1	S	0	0	0	0	2.8	
Oct 25	2	1	0	0	0	0	0	2	2	2	2	Y	Y	1	0	0	0	1	S	2	2	2	2	3	1.1	
Oct 26	4	4	4	5	5	7	9	10	9	5	2	2	2	1	1	1	1	S	2	2	2	2	3	3	3.7	
Oct 27	3	3	2	3	4	3	2	2	3	2	2	1	1	0	1	S	1	1	4	4	4	5	5	5	2.5	
Oct 28	6	8	10	8	4	2	1	2	3	4	3	1	2	1	1	S	2	2	1	1	1	2	3	4	3.1	
Oct 29	3	4	4	4	3	3	3	4	0	0	1	0	0	0	S	1	1	2	2	4	4	3	3	5	2.5	
Oct 30	6	6	1	1	1	1	1	4	2	2	0	0	0	0	S	0	0	1	2	2	2	1	1	1	1.6	
Oct 31	1	1	1	1	1	2	2	4	7	5	2	S	2	1	1	1	1	3	3	1	1	1	1	1	2.2	
Diurnal Maximum	7	8	10	8	11	11	9	12	9	7	5	3	2	2	3	6	12	17	13	15	4	5	5			
Diurnal Average	2.3	2.3	2.3	2.3	2.5	2.8	3.3	2.7	2.1	1.3	0.9	0.7	0.6	0.6	0.8	1.2	2.2	2.8	3.2	2.7	1.9	1.8	2.0			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

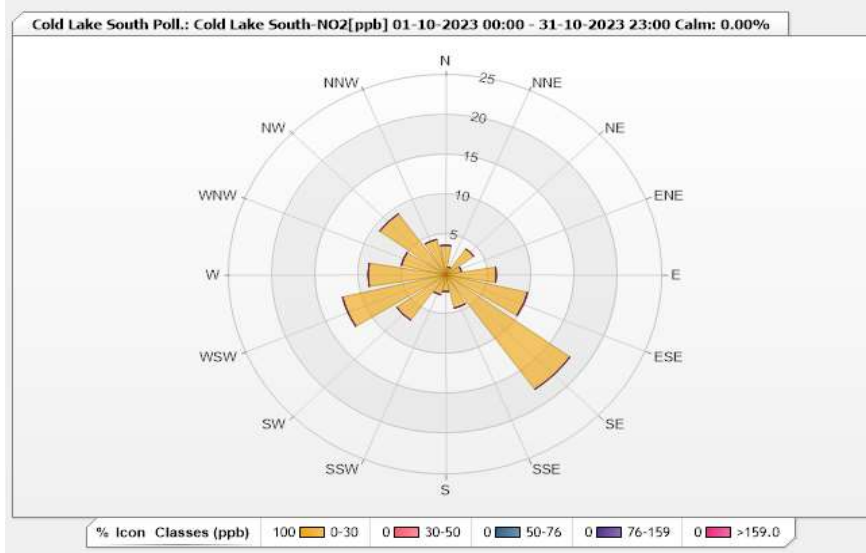


Station: Cold Lake South Poll.: Cold Lake South-NO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.7	0	0	0	0	3.7
NNE	1	0	0	0	0	1
NE	3.98	0	0	0	0	3.98
ENE	1.85	0	0	0	0	1.85
E	5.83	0	0	0	0	5.83
ESE	9.67	0	0	0	0	9.67
SE	17.64	0	0	0	0	17.64
SSE	4.27	0	0	0	0	4.27
S	2.13	0	0	0	0	2.13
SSW	2.56	0	0	0	0	2.56
SW	6.97	0	0	0	0	6.97
WSW	12.23	0	0	0	0	12.23
W	8.96	0	0	0	0	8.96
WNW	5.26	0	0	0	0	5.26
NW	9.39	0	0	0	0	9.39
NNW	4.55	0	0	0	0	4.55
Summary	100	0	0	0	0	100

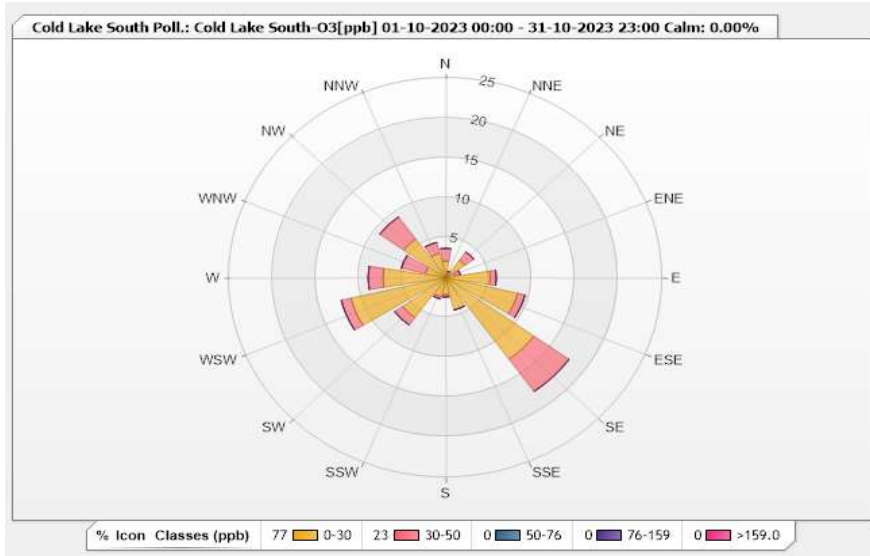


Station: Cold Lake South Poll.: Cold Lake South-O3[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.13	1.56	0	0	0	3.69
NNE	0.28	0.57	0	0	0	0.85
NE	2.7	1.28	0	0	0	3.98
ENE	1.14	0.57	0	0	0	1.71
E	5.12	0.71	0	0	0	5.83
ESE	8.53	0.85	0	0	0	9.38
SE	12.52	4.98	0	0	0	17.5
SSE	4.13	0	0	0	0	4.13
S	2.13	0.28	0	0	0	2.41
SSW	2.42	0.28	0	0	0	2.7
SW	6.12	1.14	0	0	0	7.26
WSW	11.24	1.14	0	0	0	12.38
W	7.25	1.71	0	0	0	8.96
WNW	2.42	2.84	0	0	0	5.26
NW	5.97	3.41	0	0	0	9.38
NNW	3.13	1.42	0	0	0	4.55
Summary	77.23	22.74	0	0	0	100

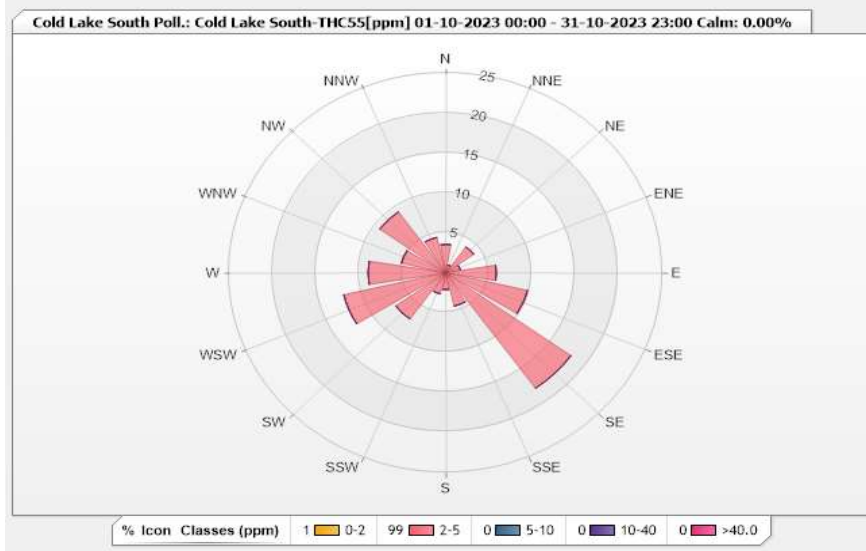


Station: Cold Lake South Poll.: Cold Lake South-THC55[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0	3.56	0	0	0	3.56
NNE	0	1	0	0	0	1
NE	0	3.98	0	0	0	3.98
ENE	0	1.71	0	0	0	1.71
E	0	5.83	0	0	0	5.83
ESE	0	9.67	0	0	0	9.67
SE	0	17.78	0	0	0	17.78
SSE	0	4.27	0	0	0	4.27
S	0	2.13	0	0	0	2.13
SSW	0	2.7	0	0	0	2.7
SW	0.28	6.83	0	0	0	7.11
WSW	0.14	11.95	0	0	0	12.09
W	0.28	8.68	0	0	0	8.96
WNW	0.14	5.12	0	0	0	5.26
NW	0	9.39	0	0	0	9.39
NNW	0	4.55	0	0	0	4.55
Summary	0.84	99.15	0	0	0	100

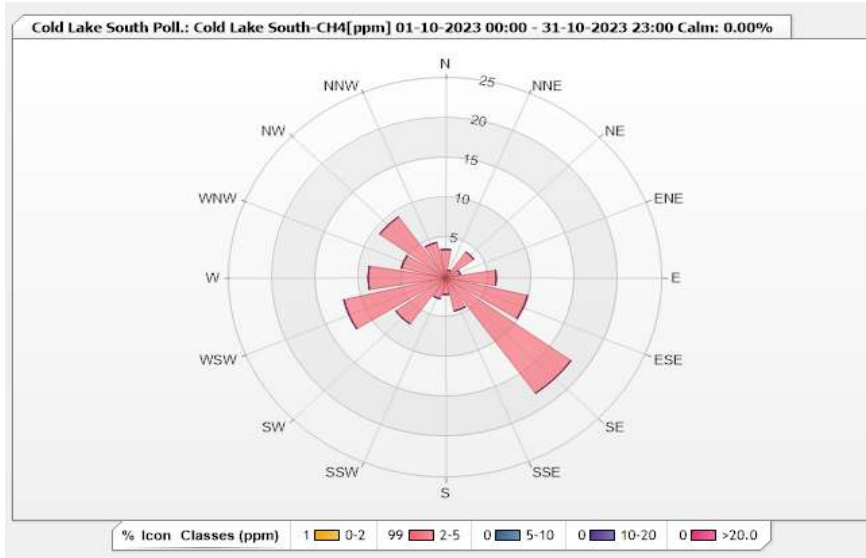


Station: Cold Lake South Poll.: Cold Lake South-CH4[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0	3.56	0	0	0	3.56
NNE	0	1	0	0	0	1
NE	0	3.98	0	0	0	3.98
ENE	0	1.71	0	0	0	1.71
E	0	5.83	0	0	0	5.83
ESE	0	9.67	0	0	0	9.67
SE	0	17.78	0	0	0	17.78
SSE	0	4.27	0	0	0	4.27
S	0	2.13	0	0	0	2.13
SSW	0	2.7	0	0	0	2.7
SW	0.28	6.83	0	0	0	7.11
WSW	0.14	11.95	0	0	0	12.09
W	0.28	8.68	0	0	0	8.96
WNW	0.14	5.12	0	0	0	5.26
NW	0	9.39	0	0	0	9.39
NNW	0	4.55	0	0	0	4.55
Summary	0.84	99.15	0	0	0	100

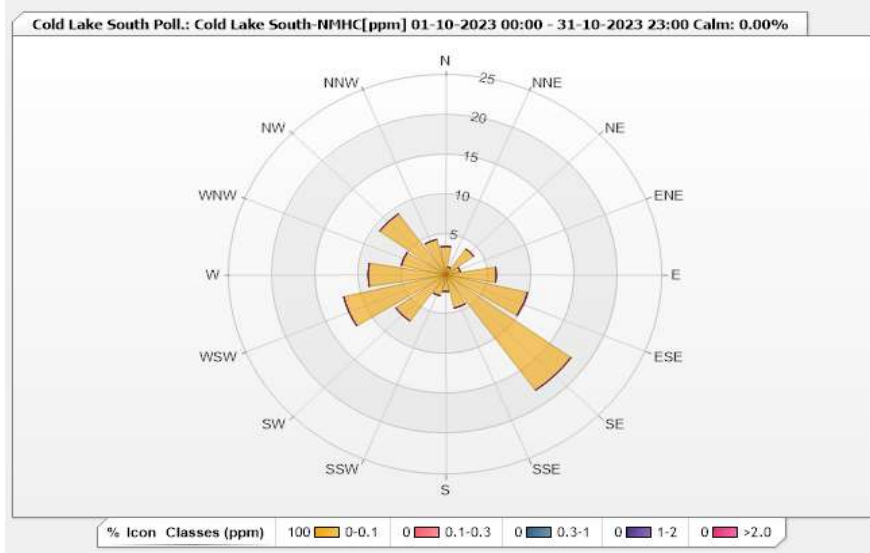


Station: Cold Lake South Poll.: Cold Lake South-NMHC[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppm]

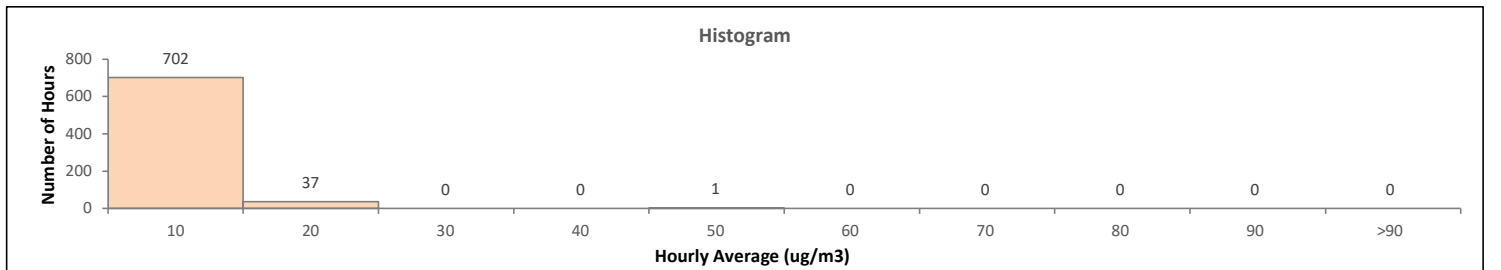
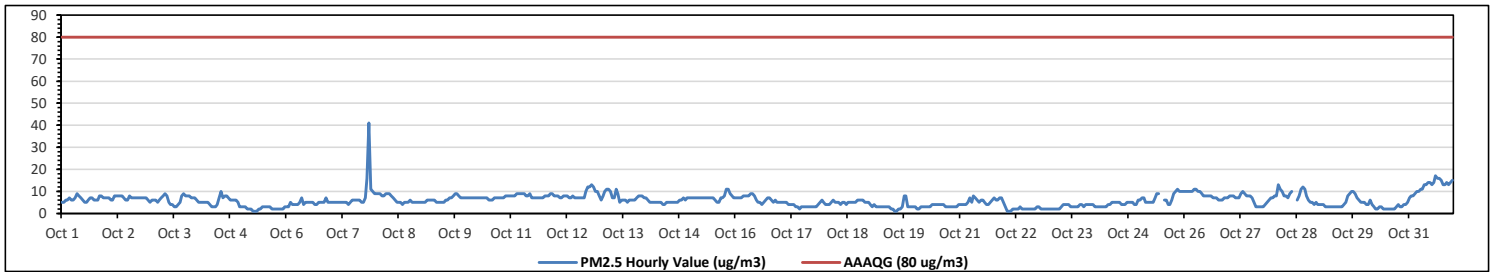
Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	3.56	0	0	0	0	3.56
NNE	1	0	0	0	0	1
NE	3.98	0	0	0	0	3.98
ENE	1.71	0	0	0	0	1.71
E	5.83	0	0	0	0	5.83
ESE	9.67	0	0	0	0	9.67
SE	17.78	0	0	0	0	17.78
SSE	4.27	0	0	0	0	4.27
S	2.13	0	0	0	0	2.13
SSW	2.7	0	0	0	0	2.7
SW	7.11	0	0	0	0	7.11
WSW	12.09	0	0	0	0	12.09
W	8.96	0	0	0	0	8.96
WNW	5.26	0	0	0	0	5.26
NW	9.39	0	0	0	0	9.39
NNW	4.55	0	0	0	0	4.55
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association
Cold Lake South Station - October 2023
Summary of Hourly Averages
PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Guideline (AAAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAAQO): 24-Hour 29 µg/m ³																																															
Number of 1-Hour Exceedances: 0												Number of 24-Hour Exceedances: 0																																			
Maximum Hourly Value: 41 µg/m ³ on Oct 7 at hr 20												Hours in Service: 744																																			
Maximum Daily Value: 12.5 µg/m ³ on Oct 31												Hours of Data: 740																																			
Minimum Hourly Value: 1 µg/m ³ on Oct 5 at hr 6												Hours of Missing Data: 2																																			
Minimum Daily Value: 2 µg/m ³ on Oct 22												Hours of Calibration: 2																																			
Monthly Average: 5.9 µg/m ³												Operational Uptime: 99.7																																			
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23																				
Oct 1	5	5	6	6	7	6	6	7	9	8	7	6	5	5	6	7	7	6	6	6	8	8	7	7	5	9	6.5																				
Oct 2	7	7	6	6	8	8	8	8	8	7	6	6	8	7	7	7	7	7	7	7	7	7	6	5	5	8	7.0																				
Oct 3	6	6	6	5	6	7	8	9	8	5	4	4	3	3	4	5	8	9	8	8	8	7	7	7	3	9	6.3																				
Oct 4	6	5	5	5	5	5	5	4	3	3	3	4	7	10	7	8	8	7	6	6	6	6	5	3	3	10	5.5																				
Oct 5	3	3	3	2	2	2	1	1	1	2	2	3	3	3	3	2	2	2	2	2	2	2	2	3	1	3	2.3																				
Oct 6	3	3	5	4	4	4	4	5	7	4	5	5	5	5	3	4	4	5	5	5	5	7	5	5	3	7	4.7																				
Oct 7	5	5	5	5	5	5	5	5	5	4	5	6	6	6	6	6	5	5	5	6	6	16	41	11	10	9	4	41	7.8																		
Oct 8	9	9	9	8	8	9	9	9	8	7	6	5	5	5	4	5	5	5	6	5	5	5	5	5	4	9	6.5																				
Oct 9	5	5	5	6	6	6	6	6	5	5	5	5	5	6	6	7	7	8	9	9	8	7	7	7	5	9	6.3																				
Oct 10	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	7	7	7	7	7	7	8	8	8	6	8	7.0																				
Oct 11	8	8	8	9	9	9	9	9	8	8	9	7	7	7	7	7	7	8	8	8	9	9	8	7	9	8.0																					
Oct 12	8	8	7	7	8	8	8	7	7	8	7	7	7	7	7	10	12	12	13	12	10	10	8	7	13	8.5																					
Oct 13	6	8	10	11	11	10	7	7	11	9	5	6	6	6	5	6	6	6	7	8	8	8	7	5	11	7.5																					
Oct 14	7	6	5	5	5	5	5	5	4	4	4	5	5	5	5	5	5	6	6	7	6	7	7	4	7	5.4																					
Oct 15	7	7	7	7	7	7	7	7	7	7	7	6	5	5	5	5	7	8	11	11	9	8	7	5	11	7.3																					
Oct 16	7	7	7	7	8	8	8	8	9	9	8	6	5	5	4	5	6	7	7	6	5	6	5	4	9	6.6																					
Oct 17	5	5	5	5	4	4	4	4	3	3	2	3	3	3	3	3	3	3	3	3	4	5	6	2	6	3.8																					
Oct 18	4	4	4	5	6	5	5	5	4	5	5	4	5	5	5	5	6	6	6	6	5	5	5	4	6	5.0																					
Oct 19	4	3	4	3	3	3	3	3	3	3	3	2	2	1	1	2	2	3	8	8	3	3	3	1	8	3.2																					
Oct 20	3	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3	4	2	4	3.3																					
Oct 21	4	4	4	4	5	7	5	8	7	6	5	6	6	5	4	5	6	7	6	6	7	7	5	4	8	5.5																					
Oct 22	3	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	1	3	2.0																					
Oct 23	2	2	2	2	2	2	3	4	4	4	4	3	3	3	3	4	4	3	4	4	4	4	4	2	4	3.2																					
Oct 24	3	3	3	3	3	3	3	4	4	5	5	5	5	4	4	4	5	5	5	5	4	4	6	3	6	4.2																					
Oct 25	6	7	7	5	5	5	5	5	7	9	9	Y	Y	Y	6	6	4	4	6	9	10	11	10	10	10	4	11	7.1																			
Oct 26	10	10	10	10	10	11	11	10	10	9	8	8	8	8	8	7	7	7	6	6	6	7	7	7	6	11	8.4																				
Oct 27	8	8	8	7	7	7	9	10	9	8	8	7	5	3	3	3	3	3	4	5	6	7	7	3	10	6.4																					
Oct 28	8	8	13	11	10	8	8	7	9	10	C	C	6	8	11	12	11	8	6	5	5	4	5	4	13	8.0																					
Oct 29	4	4	4	3	3	3	3	3	3	3	3	3	3	4	5	8	9	10	9	7	6	5	5	3	10	5.0																					
Oct 30	5	4	4	6	4	3	2	2	3	3	2	2	2	2	2	2	2	3	4	3	3	4	4	2	6	3.2																					
Oct 31	7	8	8	9	10	10	11	11	13	13	14	14	13	14	17	16	16	15	13	13	14	13	14	15	7	17	12.5																				
Diurnal Maximum	10	10	13	11	11	11	11	11	13	13	14	14	13	14	17	16	16	15	13	16	41	13	14	15																							
Diurnal Average	5.6	5.5	5.8	5.7	5.9	5.9	5.8	6.0	6.2	5.9	5.5	5.3	5.3	5.4	5.3	5.6	5.8	6.1	6.4	6.7	7.5	6.4	6.3	6.1																							
C	Monthly Calibration											S	Daily Zero-Span Check											Q	Quality Assurance																						
K	Collection Error											ND	No Data (Machine Not in Service)											Y	Routine Maintenance											P	Power Failure										
X	Invalid Data (Equipment Malfunction /Recovery)											NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																																		

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

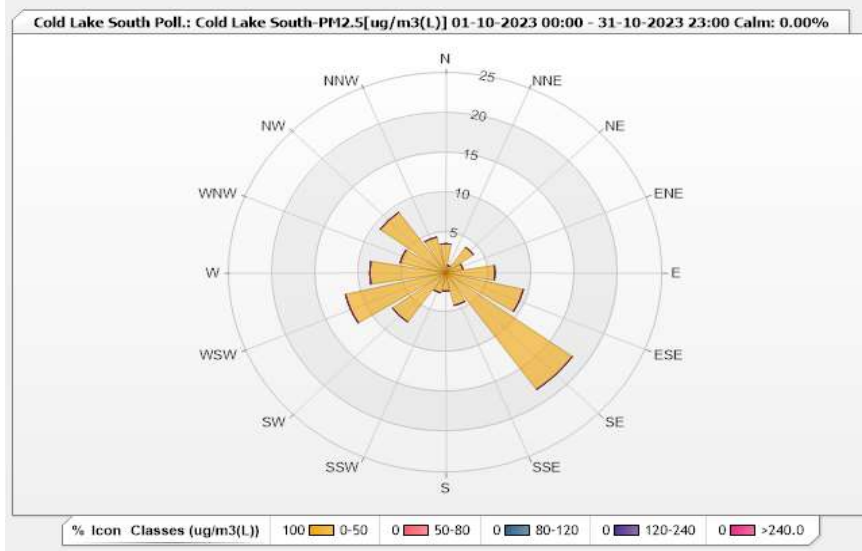


Station: Cold Lake South Poll.: Cold Lake South-PM2.5[ug/m3(L)] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 99.46% Calm Avg: 0.00 [ppm]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	3.65	0	0	0	0	3.65
NNE	0.95	0	0	0	0	0.95
NE	3.92	0	0	0	0	3.92
ENE	2.03	0	0	0	0	2.03
E	5.68	0	0	0	0	5.68
ESE	9.19	0	0	0	0	9.19
SE	17.97	0	0	0	0	17.97
SSE	4.19	0	0	0	0	4.19
S	2.3	0	0	0	0	2.3
SSW	2.57	0	0	0	0	2.57
SW	7.57	0	0	0	0	7.57
WSW	11.89	0	0	0	0	11.89
W	8.78	0	0	0	0	8.78
WNW	5.41	0	0	0	0	5.41
NW	9.32	0	0	0	0	9.32
NNW	4.59	0	0	0	0	4.59
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

Cold Lake South Station - October 2023

Summary of Hourly Averages

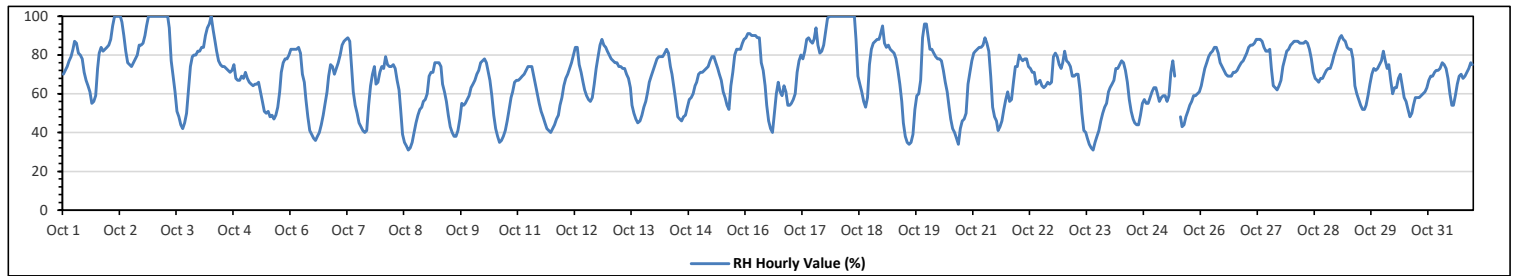
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	100 %	on Oct 2 at hr 3	Hours in Service:	744
Maximum Daily Value:	89.0 %	on Oct 2	Hours of Data:	742
Minimum Hourly Value:	31 %	on Oct 8 at hr 14	Hours of Missing Data:	2
Minimum Daily Value:	53.9 %	on Oct 23	Hours of Calibration:	0
Monthly Average:	68.6 %		Operational Uptime:	99.7

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Oct 1	70	72	74	77	79	83	87	86	81	80	78	71	67	64	61	55	56	59	73	81	84	82	83	84	55	87	74.5
Oct 2	85	88	95	100	100	100	100	97	90	82	76	75	74	76	78	80	85	85	86	90	95	100	100	100	74	100	89.0
Oct 3	100	100	100	100	100	100	100	100	94	77	69	61	51	48	44	42	45	50	62	74	79	80	80	82	42	100	76.6
Oct 4	82	84	84	90	94	96	100	93	87	82	77	75	74	74	73	72	71	72	75	68	67	67	69	68	67	100	78.9
Oct 5	71	68	66	65	64	65	65	66	61	56	51	50	51	48	49	47	49	53	61	71	76	78	78	80	47	80	62.0
Oct 6	83	83	83	83	84	81	70	66	57	48	41	39	37	36	38	40	44	49	55	61	69	75	74	70	36	84	61.1
Oct 7	73	76	80	85	87	88	89	87	73	61	54	50	45	43	41	40	41	54	64	70	74	65	66	71	40	89	65.7
Oct 8	74	73	79	75	74	74	75	73	67	62	52	39	35	33	31	32	35	40	45	49	52	53	56	57	31	79	55.6
Oct 9	60	69	71	71	76	76	76	74	65	61	56	49	43	40	38	38	41	47	55	54	55	57	59	63	38	76	58.1
Oct 10	65	67	70	72	76	77	78	76	71	67	59	49	42	38	35	36	38	41	46	52	58	61	66	67	35	78	58.6
Oct 11	67	68	69	70	72	74	74	74	69	64	60	55	51	48	45	42	41	40	42	44	47	49	54	58	40	74	57.4
Oct 12	64	68	70	73	76	80	84	84	75	71	66	62	59	57	56	58	65	73	79	85	88	85	84	82	56	88	72.7
Oct 13	80	78	77	76	76	74	74	73	73	70	68	63	54	50	47	45	46	49	53	56	61	66	69	72	45	80	64.6
Oct 14	75	78	79	79	79	81	83	81	74	70	63	56	48	47	46	48	49	53	57	58	60	64	66	70	46	83	65.2
Oct 15	71	71	72	73	74	77	79	79	76	73	70	67	61	58	54	52	64	71	80	83	83	83	86	88	52	88	72.7
Oct 16	89	91	91	90	90	90	89	89	76	72	64	54	46	42	40	50	60	66	61	59	64	61	54	54	40	91	68.4
Oct 17	55	57	60	71	77	80	78	82	88	89	87	86	88	94	85	81	82	85	92	99	100	100	100	100	55	100	84.0
Oct 18	100	100	100	100	100	100	100	100	100	100	88	69	65	61	56	53	58	75	83	86	87	88	88	91	53	100	85.3
Oct 19	95	86	84	85	83	82	81	78	72	65	56	45	38	35	34	35	39	52	59	60	67	89	96	96	34	96	67.2
Oct 20	90	83	83	81	79	78	78	77	72	66	61	53	47	42	40	37	34	42	46	47	50	65	71	77	34	90	62.5
Oct 21	81	82	83	84	84	85	89	86	82	69	53	48	46	41	43	46	52	57	61	56	57	66	74	74	41	89	66.6
Oct 22	80	78	77	78	78	74	73	71	71	65	66	67	64	63	64	66	65	66	79	81	79	75	73	76	63	81	72.0
Oct 23	82	77	76	74	69	69	70	70	62	50	41	40	37	34	32	31	35	38	41	46	50	53	55	61	31	82	53.9
Oct 24	63	65	67	73	73	75	77	76	72	66	57	51	47	45	44	44	49	55	57	55	55	58	61	63	44	77	60.3
Oct 25	63	60	56	58	59	59	56	59	71	77	69	Y	Y	48	43	44	48	51	54	56	59	59	60	61	43	77	57.7
Oct 26	64	69	73	76	79	81	82	84	84	81	76	74	72	70	69	69	69	71	71	72	74	76	77	79	64	84	74.7
Oct 27	81	84	85	85	86	88	88	88	87	84	82	82	83	73	64	63	62	64	67	74	78	82	83	85	62	88	79.1
Oct 28	86	87	87	87	86	86	86	87	86	83	78	71	68	67	66	68	68	70	72	73	73	76	80	83	66	87	78.1
Oct 29	86	89	90	88	87	84	83	83	78	64	60	57	54	52	52	54	59	65	70	73	72	73	75	77	52	90	71.9
Oct 30	82	77	73	75	67	60	63	63	68	70	64	58	56	52	48	50	54	58	58	58	59	60	61	63	48	82	62.4
Oct 31	67	69	69	71	72	72	73	76	75	73	68	60	54	54	59	65	69	70	68	69	71	73	76	75	54	76	68.7
Diurnal Maximum	100	100	100	100	100	100	100	100	100	100	88	86	88	94	85	81	85	85	92	99	100	100	100	100			
Diurnal Average	76.9	77.3	78.2	79.5	80.0	80.3	80.6	79.9	76.0	70.9	64.8	59.2	55.2	52.7	50.8	51.1	54.0	58.7	63.6	66.5	69.1	71.6	73.4	75.1			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

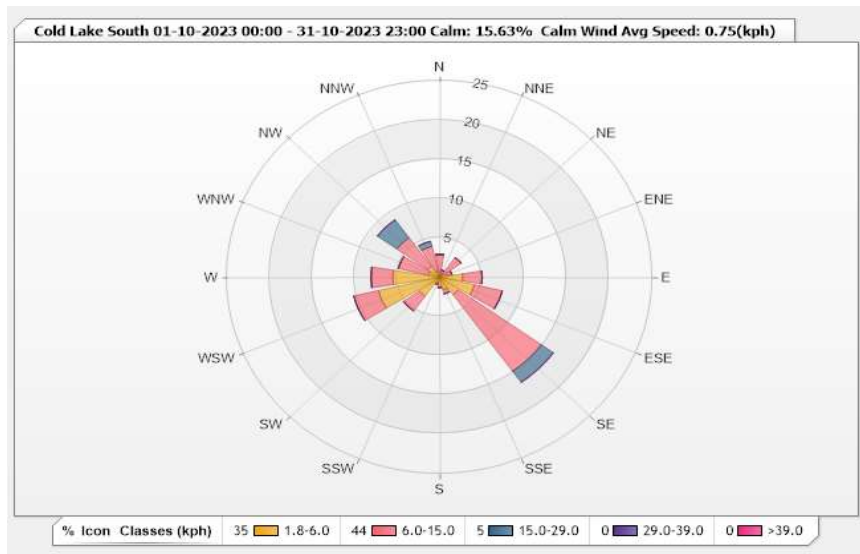


Station: Cold Lake South Monitor: WDS [kph] Monthly: 10-2023

Type: Wind Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm (WS<1.8kph): 15.63% Valid Data: 99.73%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	0	2.83	0.13	0	0	2.96
NNE	0.4	0.54	0	0	0	0.94
NE	0.54	2.56	0	0	0	3.1
ENE	0.94	0.54	0	0	0	1.48
E	2.7	2.29	0	0	0	4.99
ESE	4.18	3.37	0	0	0	7.55
SE	2.7	11.99	1.75	0	0	16.44
SSE	1.62	0.54	0	0	0	2.16
S	1.21	0.13	0	0	0	1.34
SSW	0.67	0.27	0	0	0	0.94
SW	2.96	2.29	0	0	0	5.25
WSW	7.41	2.96	0	0	0	10.37
W	5.53	2.56	0	0	0	8.09
WNW	1.35	3.64	0	0	0	4.99
NW	1.75	4.45	2.83	0	0	9.03
NNW	0.81	3.23	0.67	0	0	4.71
Summary	34.77	44.19	5.38	0	0	84.34



Lakeland Industry & Community Association

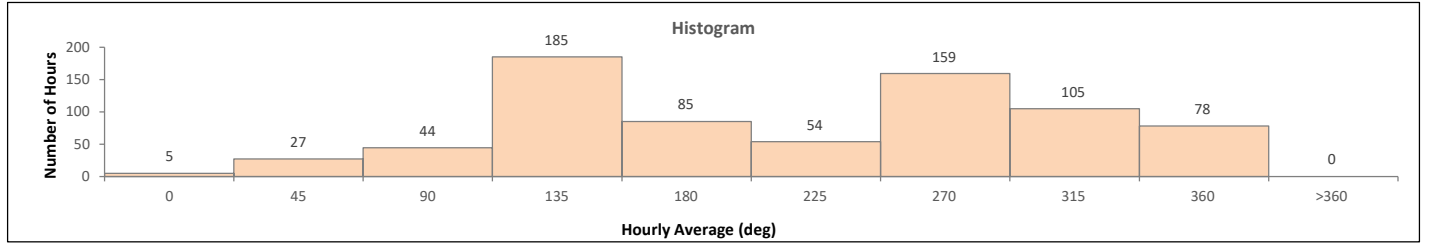
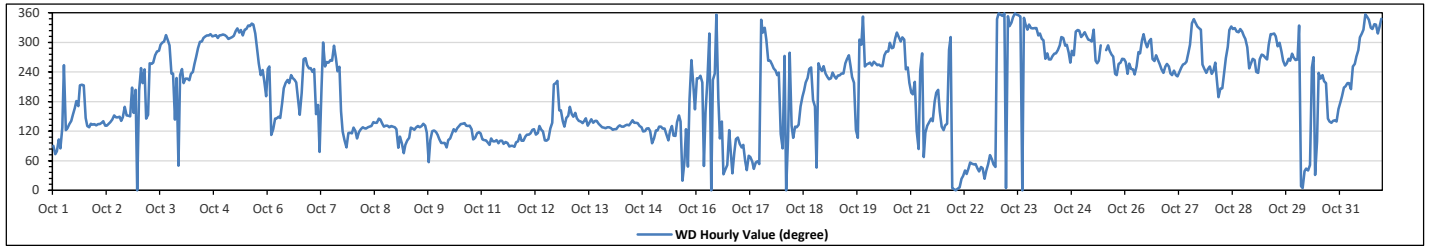
Cold Lake South Station - October 2023

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average:		267 (W) degree																	Hours in Service:	744																																																			
																			Hours of Data:	742																																																			
																			Hours of Missing Data:	2																																																			
																			Hours of Calibration:	0																																																			
																			Operational Uptime:	99.7																																																			
Day	Hourly Period Starting at (MST)																							Daily Average																																															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant																																													
Oct 1	E	ENE	ENE	ESE	E	SE	WSW	ESE	SE	SE	SE	SSE	SSE	S	S	SSW	SSW	SSW	SE	SE	SE	SE	SE	SE	147	SE																																													
Oct 2	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SE	SE	SSE	SE	SE	SSE	SSE	SSE	SSW	SSE	SSW	N	141	SE																																													
Oct 3	SSW	WSW	SW	WSW	SE	SSE	WSW	WSW	WSW	W	W	W	WNW	WNW	WNW	NW	NW	WNW	SW	SW	SE	SW	NE	SW	287	WNW																																													
Oct 4	WSW	SW	SW	SW	SW	WSW	WSW	W	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	300	WNW																																													
Oct 5	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NW	WNW	WSW	SW	WSW	SW	S	321	NW																																													
Oct 6	WSW	WSW	ESE	ESE	SE	SE	SSE	SE	S	SSW	SW	SW	SW	SW	SW	SW	S	SSE	SSW	W	W	WSW	WSW	SW	222	SW																																													
Oct 7	WSW	WSW	WSW	SSE	S	ENE	SSW	WNW	WSW	WSW	WSW	W	W	WNW	W	WSW	WSW	SSE	ESE	E	E	ESE	ESE	ESE	241	WSW																																													
Oct 8	SE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	131	SE																																													
Oct 9	ESE	E	ESE	E	ENE	E	E	ESE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	ESE	ENE	E	ESE	ESE	ESE	ESE	120	ESE																																													
Oct 10	ESE	E	E	E	E	E	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	123	ESE																																													
Oct 11	ESE	E	E	E	E	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	97	E																																													
Oct 12	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	ESE	ESE	E	E	ESE	SE	SE	SSW	SW	SW	SSE	SSE	SE	SE	SE	129	SE																																													
Oct 13	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	138	SE																																													
Oct 14	SE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	SE	SE	ESE	E	130	SE																																													
Oct 15	ESE	ESE	ESE	SE	SE	SE	ESE	E	ESE	SE	ESE	ESE	SE	SSE	SE	NNE	ENE	ENE	ENE	SE	W	SW	SSE	122	ESE																																														
Oct 16	SW	SW	SW	SW	NE	SSE	SW	NW	N	SW	N	S	ESE	SE	NNE	NE	NE	ESE	ENE	NE	ENE	ESE	ESE	103	ESE																																														
Oct 17	E	E	E	ENE	NE	ENE	ENE	ENE	NE	ENE	NE	NNW	NNW	NNW	NW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	ESE	36	NE																																													
Oct 18	E	W	N	ESE	W	SE	ESE	SE	SE	SE	SSE	S	SSW	SW	SW	WSW	WSW	S	SSE	NE	WSW	WSW	WSW	195	SSW																																														
Oct 19	SW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	W	W	WSW	SW	SW	ESE	ESE	NW	WNW	N	WSW	WSW	245	WSW																																													
Oct 20	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	W	W	W	WNW	WNW	WNW	NW	NW	NW	NW	WNW	NW	NW	WSW	WSW	280	W																																													
Oct 21	SSW	SSW	SW	ESE	E	WSW	W	ENE	ESE	SE	SE	S	SSW	SSW	SSE	SE	ESE	SE	SE	WNW	NW	N	134	SE																																															
Oct 22	N	N	N	N	NNE	NNE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	ENE	ENE	NE	35	NE																																														
Oct 23	NNW	N	N	N	N	N	N	NNW	NNW	N	N	N	N	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	347	NNW																																													
Oct 24	NW	NW	WNW	W	W	W	W	W	W	W	WNW	WNW	NW	NW	WNW	WNW	W	WSW	W	W	NW	NW	NW	296	WNW																																														
Oct 25	NW	NW	NW	NW	WNW	WNW	NW	W	WSW	W	WNW	Y	Y	WNW	WNW	W	W	SW	SW	WSW	WSW	W	W	285	WNW																																														
Oct 26	WSW	SW	WSW	WSW	WSW	SW	WSW	W	W	WNW	NW	WNW	WNW	WNW	NW	W	W	W	W	WSW	WSW	SW	WSW	WSW	269	W																																													
Oct 27	WSW	SW	SW	WSW	SW	SW	WSW	WSW	WSW	W	W	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	284	WNW																																													
Oct 28	SW	WSW	WSW	SW	S	SSW	SSW	WSW	W	WNW	NW	NNW	NW	NNW	NW	NW	NW	NW	NW	WNW	WSW	WSW	W	308	NW																																														
Oct 29	W	WSW	SW	W	W	W	W	WNW	NW	NW	NW	WNW	WNW	W	W	WSW	WSW	W	W	W	W	W	W	285	WNW																																														
Oct 30	W	NNW	N	N	NE	NE	NE	NE	WSW	W	NNE	E	SW	SW	SW	SW	SE	SE	SE	SE	SE	SE	SSE	47	NE																																														
Oct 31	S	S	SSW	SSW	SW	SW	SSW	WSW	W	WNW	NW	NW	NW	N	N	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	320	NW																																													
C	Monthly Calibration																	S	Daily Zero-Span Check																	Q	Quality Assurance																																		
K	Collection Error																	ND	No Data (Machine Not in Service)																	Y	Routine Maintenance																	P	Power Failure																
X	Invalid Data (Machine Malfunction/Recovery)																	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																																																				

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association
Cold Lake South Station - October 2023
Summary of Hour Standard Deviations

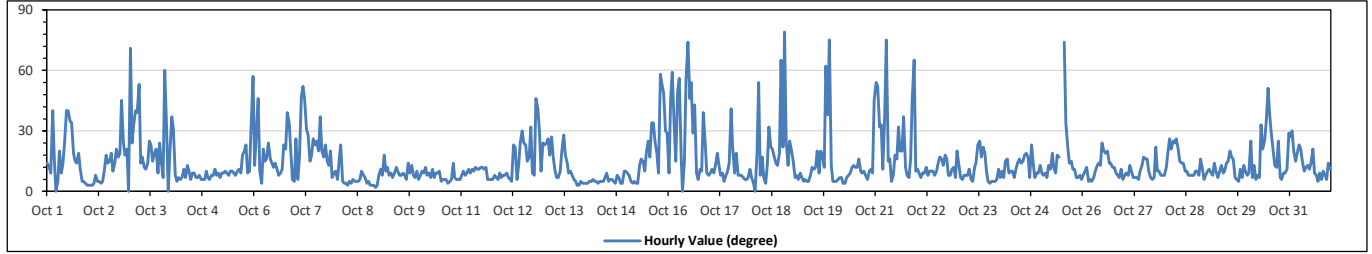
STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:		79 degree on Oct 18 at hr 19										Hours in Service:		744	
Minimum Hourly Value:		0 degree on Oct 1 at hr 5										Hours of Data:		742	
												Hours of Missing Data:		2	
												Hours of Calibration:		0	
												Operational Uptime:		99.7	

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Oct 1	14	12	9	40	16	0	5	20	9	14	24	40	40	35	34	19	15	14	19	11	5	5	4	3	0	40
Oct 2	3	3	3	4	8	5	5	4	5	10	18	14	15	19	10	14	21	17	19	45	24	18	21	0	0	45
Oct 3	71	24	33	40	39	53	14	17	12	11	14	25	23	15	19	21	9	24	15	7	60	31	0	19	0	71
Oct 4	37	31	8	5	7	6	7	11	7	13	10	6	9	9	7	7	8	6	6	6	10	7	6	8	5	37
Oct 5	8	11	8	9	7	9	9	10	9	8	10	10	9	8	10	11	9	18	20	23	9	10	32	57	7	57
Oct 6	13	28	46	10	4	21	15	16	24	16	14	12	14	11	8	9	11	23	21	39	34	20	6	5	4	46
Oct 7	26	6	17	47	52	46	31	28	15	18	26	23	25	20	37	20	17	23	15	13	20	7	9	10	6	52
Oct 8	6	17	23	5	4	4	3	5	4	6	5	5	5	6	10	8	7	4	5	3	3	3	2	3	2	23
Oct 9	8	11	8	18	10	12	8	9	7	9	12	10	8	8	9	8	6	14	9	13	8	7	10	6	6	18
Oct 10	8	10	9	12	8	9	7	11	7	9	9	10	5	6	6	6	4	5	6	14	7	6	6	6	4	14
Oct 11	8	10	8	9	11	9	11	10	12	11	11	12	12	11	12	6	6	6	6	8	7	6	9	7	6	12
Oct 12	8	8	9	7	6	5	23	22	6	13	24	30	24	23	15	17	32	9	8	46	41	30	10	24	5	46
Oct 13	23	24	26	18	27	17	10	7	7	10	20	28	18	14	9	10	8	6	5	3	3	5	4	4	3	28
Oct 14	4	4	5	5	6	5	5	4	5	5	5	7	9	5	6	5	4	8	7	4	4	10	10	4	10	4
Oct 15	9	8	5	4	5	4	4	13	16	15	10	19	25	17	34	34	25	19	9	58	53	49	30	29	4	58
Oct 16	9	46	59	33	15	50	56	17	0	15	55	74	46	54	29	43	9	6	11	10	39	24	9	8	0	74
Oct 17	9	11	9	13	19	13	8	9	5	8	10	14	41	21	9	19	8	8	8	7	6	6	7	11	5	41
Oct 18	7	4	0	19	54	8	17	7	4	13	32	22	21	17	14	13	19	65	22	79	25	13	25	20	0	79
Oct 19	15	7	8	6	9	7	5	6	5	8	12	11	12	20	9	20	18	12	62	38	75	13	5	5	75	
Oct 20	5	5	6	7	7	4	4	7	8	9	12	13	12	12	16	10	9	10	8	6	10	11	9	45	4	45
Oct 21	54	52	32	33	11	38	75	15	16	5	8	18	16	32	20	20	37	12	8	7	16	46	65	10	5	75
Oct 22	11	9	7	9	9	12	8	10	10	10	8	10	14	17	16	13	18	16	8	8	11	12	7	20	7	20
Oct 23	13	7	6	8	8	8	11	6	5	12	14	23	25	17	22	19	10	5	4	5	5	6	11	4	25	25
Oct 24	7	10	7	15	16	9	10	10	7	11	14	16	14	15	18	19	17	7	23	14	7	9	9	13	7	23
Oct 25	9	8	9	7	13	11	19	12	9	18	17	Y	Y	74	34	22	14	15	11	11	7	7	8	6	6	74
Oct 26	8	10	12	5	6	5	7	10	13	14	13	24	20	19	20	14	14	12	12	9	8	7	11	6	5	24
Oct 27	8	9	8	13	10	7	7	7	6	10	13	17	16	16	10	7	6	7	22	10	10	8	8	8	6	22
Oct 28	12	18	26	21	25	24	26	21	15	14	14	10	10	8	8	8	8	10	10	8	16	11	6	8	6	26
Oct 29	10	11	9	8	14	10	7	10	13	9	10	14	15	20	17	16	7	6	5	11	7	13	10	8	5	20
Oct 30	9	25	7	13	6	8	7	33	21	25	34	51	38	29	20	13	12	25	7	6	9	9	11	29	6	51
Oct 31	27	30	20	15	19	23	21	15	10	12	13	11	14	21	9	8	5	9	6	10	8	6	14	11	5	30
Diurnal Minimum	3	3	0	4	4	0	3	4	0	5	5	5	5	5	5	6	6	4	4	4	3	3	0	0	0	0
Diurnal Maximum	71	52	59	47	54	53	75	33	24	25	55	74	46	74	37	43	37	65	23	79	60	75	65	57	57	

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Machine Malfunction/Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



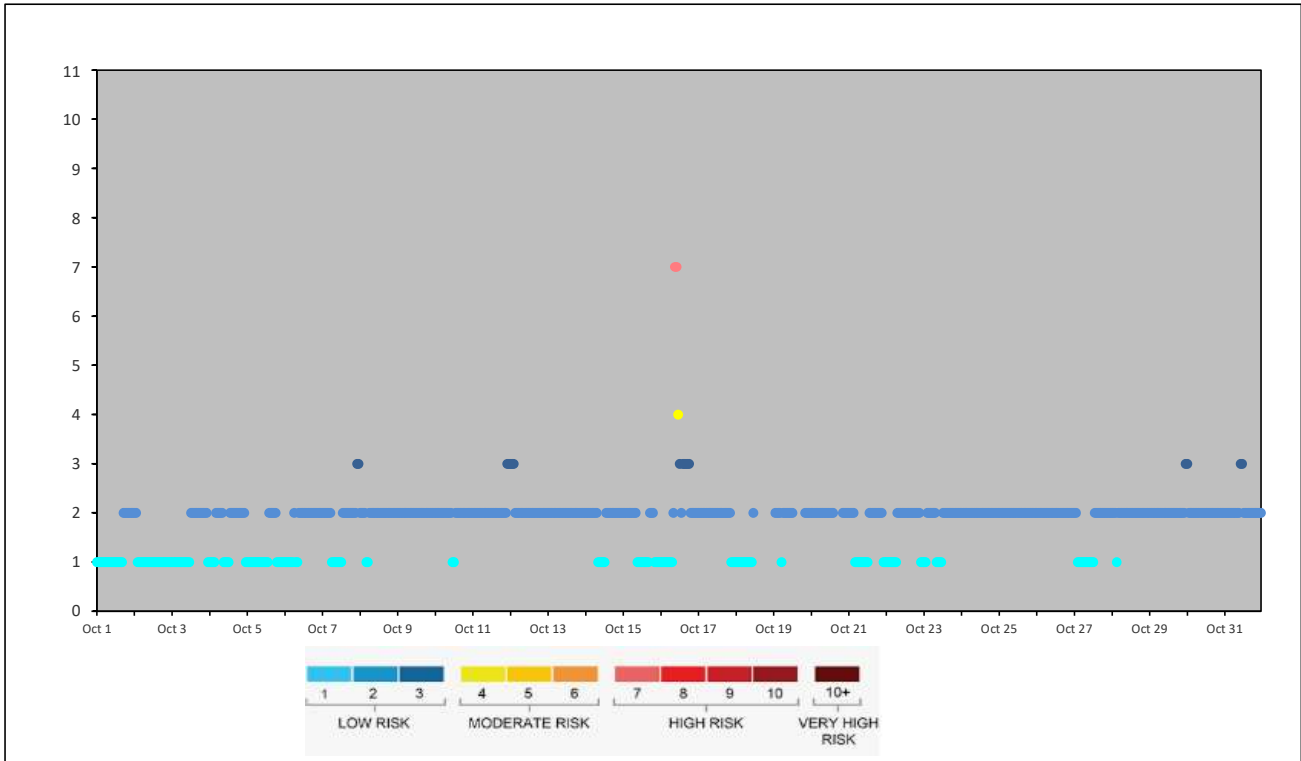
TAMARACK STATION

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - October 2023

AIR QUALITY HEALTH INDEX

Day	Hourly Period Starting at (MST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Oct 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Oct 2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Oct 3	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1
Oct 4	1	1	1	1	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1
Oct 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Oct 6	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Oct 7	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3
Oct 8	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 10	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Oct 12	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 14	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 15	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1
Oct 16	1	1	1	1	1	1	1	1	2	7	7	4	3	2	3	3	3	3	3	2	2	2	2	2
Oct 17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
Oct 18	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 19	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 21	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1
Oct 22	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Oct 23	1	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Oct 24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 25	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 27	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 28	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Oct 30	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 31	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2



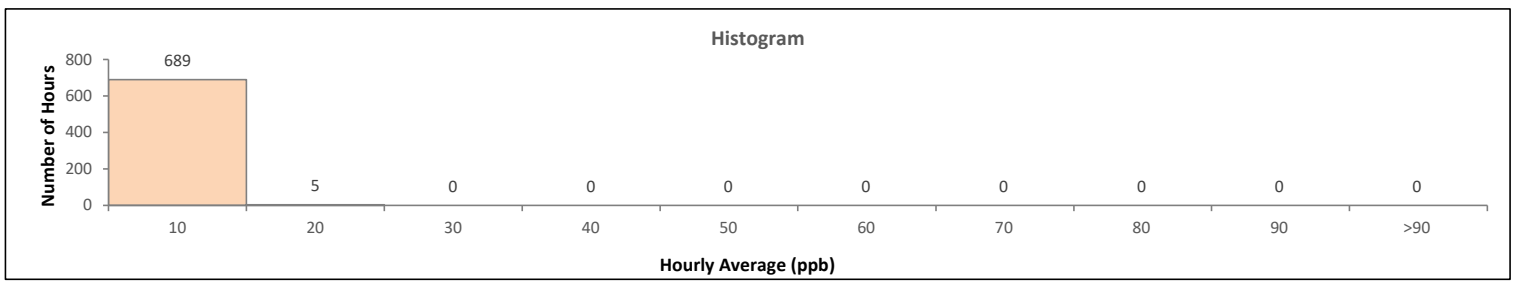
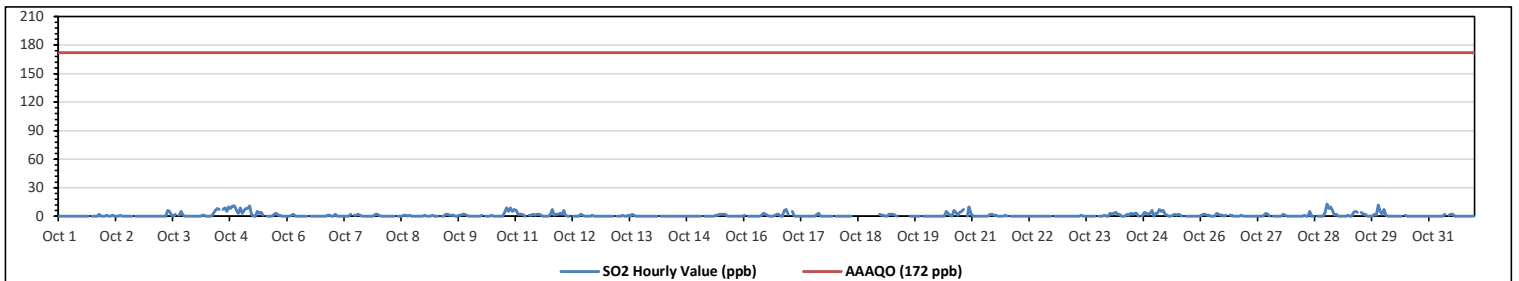
Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																												
Number of 1-Hour Exceedances:								Number of 24-Hour Exceedances:								30-Day Exceedence:												
0								0								0												
Maximum Hourly Value:		13 ppb	on Oct 28 at hr 18																			Hours in Service:		744				
Maximum Daily Value:		4.6 ppb	on Oct 4																			Hours of Data:		694				
Minimum Hourly Value:		0 ppb	on Oct 1 at hr 0																			Hours of Missing Data:		12				
Minimum Daily Value:		0.0 ppb	on Oct 14																			Hours of Calibration:		38				
Monthly Average:		1.0 ppb																				Operational Uptime:		98.4				
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Oct 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	2	0.1
Oct 2	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Oct 3	0	0	0	0	0	0	0	0	0	0	6	5	1	0	2	S	1	5	1	0	0	0	0	0	0	0	6	0.9
Oct 4	0	0	0	1	1	0	0	0	0	0	3	6	8	7	S	7	9	5	10	8	11	11	6	3	9	0	11	4.6
Oct 5	3	6	8	8	11	2	0	0	0	5	3	4	1	S	0	0	0	0	2	3	1	1	0	0	0	0	11	2.5
Oct 6	0	0	1	2	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	0	2	0.2
Oct 7	0	2	0	0	0	0	0	0	0	0	2	S	1	1	2	1	0	0	0	0	0	0	2	2	2	0	2	0.6
Oct 8	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0.2
Oct 9	1	0	0	0	1	0	0	0	0	0	S	0	0	0	2	2	1	1	1	0	0	1	1	2	2	0	2	0.7
Oct 10	0	0	0	0	0	0	1	S	0	0	0	0	1	0	0	0	0	0	0	4	9	5	9	5	7	0	9	1.8
Oct 11	6	2	2	2	1	0	0	S	1	1	2	1	2	2	1	0	0	0	0	2	7	1	2	2	3	0	7	1.7
Oct 12	2	6	1	0	0	0	S	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	6	0.6
Oct 13	0	0	0	0	0	0	S	0	0	0	1	0	0	1	0	0	2	1	0	0	0	0	0	0	0	0	2	0.2
Oct 14	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Oct 15	0	0	S	0	0	0	0	0	0	0	1	1	2	2	2	2	0	0	0	0	0	0	0	0	0	0	2	0.4
Oct 16	1	S	0	0	0	0	0	0	0	0	1	3	2	1	0	0	2	3	0	1	2	2	0	0	6	7	7	1.2
Oct 17	S	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	5	0.5
Oct 18	0	0	0	0	0	0	0	0	0	0	0	K	K	K	K	K	K	K	K	K	K	K	K	K	1	2	2	NA
Oct 19	1	1	0	0	2	2	2	1	0	0	C	C	C	C	C	C	0	0	0	0	0	0	S	0	0	0	2	NA
Oct 20	0	0	0	0	0	0	0	0	0	0	0	5	3	1	0	6	4	1	4	5	7	S	0	10	3	0	10	2.1
Oct 21	0	0	0	0	0	0	0	0	0	0	2	2	1	1	0	0	0	0	1	0	0	S	0	0	0	0	2	0.3
Oct 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.0
Oct 23	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	1	0.1
Oct 24	3	2	3	4	2	2	0	0	0	0	2	1	3	2	3	3	0	0	0	4	3	2	3	6	0	0	6	2.1
Oct 25	3	3	7	5	6	2	1	0	0	0	1	2	1	2	1	0	S	0	0	0	0	0	0	0	0	0	7	1.5
Oct 26	1	2	2	1	1	0	0	0	3	2	1	1	0	1	0	S	1	1	0	0	0	0	1	0	0	0	3	0.8
Oct 27	0	0	0	0	0	0	0	0	0	1	3	2	0	S	0	0	0	0	0	0	2	1	0	0	0	0	3	0.4
Oct 28	0	0	0	0	0	0	1	0	0	0	5	0	0	S	0	0	0	0	4	13	8	10	6	1	2	0	13	2.2
Oct 29	0	0	0	0	0	1	0	0	4	5	4	S	4	2	2	0	0	0	0	2	1	12	5	2	0	0	12	1.9
Oct 30	7	1	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0.4
Oct 31	0	0	0	0	0	0	0	0	2	S	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3
Diurnal Maximum	7	6	8	8	11	2	2	1	5	6	6	8	7	3	7	9	5	10	13	11	11	12	10	9				
Diurnal Average	1.0	1.0	0.8	0.8	0.9	0.3	0.2	0.1	0.6	1.4	1.5	1.3	1.0	0.7	1.0	0.7	0.5	0.8	1.4	1.8	1.2	1.7	1.4	1.1				

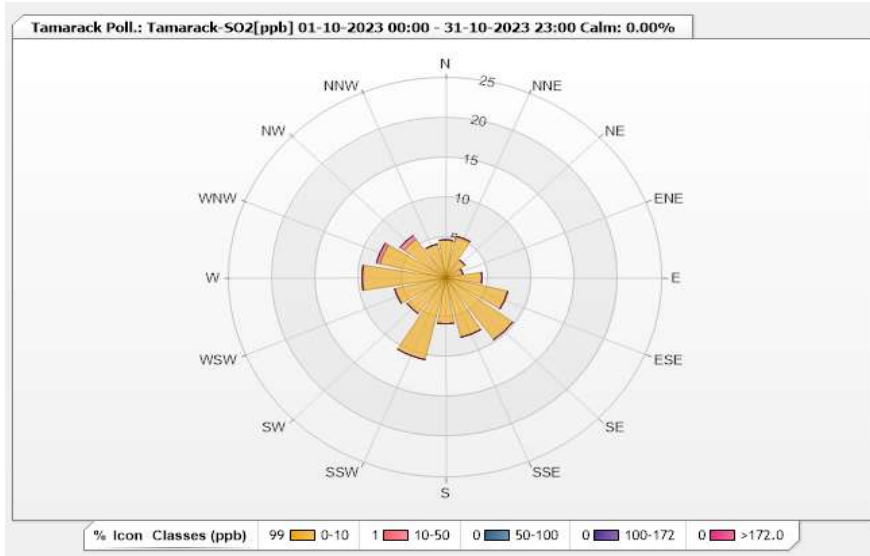


Station: Tamarack Poll.: Tamarack-SO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.28% Calm Avg: 0.00 [ppm]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	4.76	0	0	0	0	4.76
NNE	5.33	0	0	0	0	5.33
NE	2.74	0	0	0	0	2.74
ENE	2.02	0	0	0	0	2.02
E	4.18	0	0	0	0	4.18
ESE	7.35	0	0	0	0	7.35
SE	9.51	0	0	0	0	9.51
SSE	7.64	0	0	0	0	7.64
S	5.76	0	0	0	0	5.76
SSW	10.52	0	0	0	0	10.52
SW	5.48	0	0	0	0	5.48
WSW	6.05	0	0	0	0	6.05
W	9.65	0	0	0	0	9.65
WNW	7.78	0.43	0	0	0	8.21
NW	5.91	0.58	0	0	0	6.49
NNW	4.32	0	0	0	0	4.32
Summary	99	1.01	0	0	0	100



Lakeland Industry & Community Association

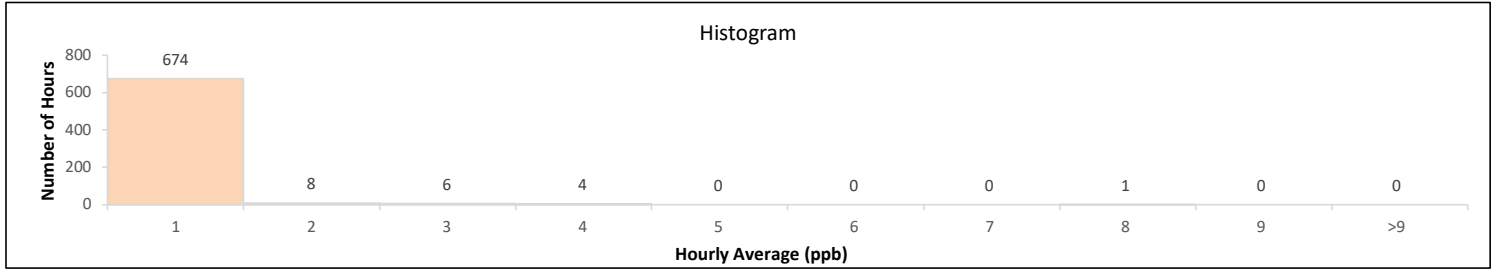
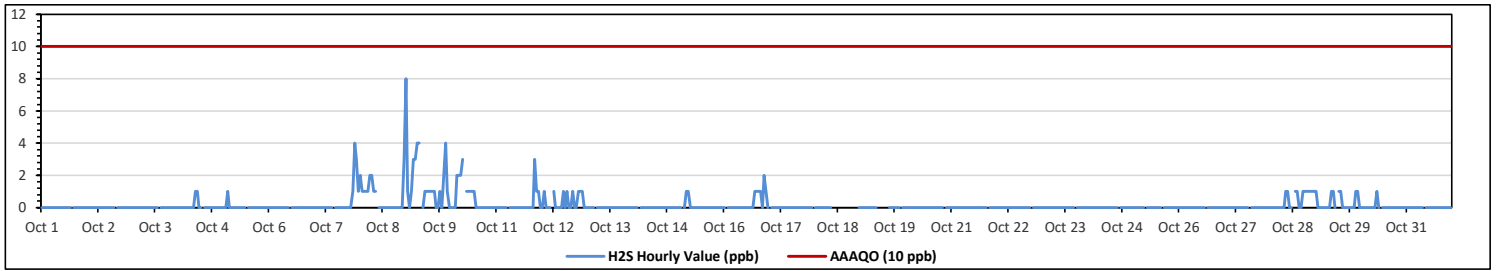
Tamarack Site - October 2023

Summary of Hourly Averages

HYDROGEN SULPHIDE (H₂S) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 10 ppb, 24-Hour 3 ppb																											
Number of 1-Hour Exceedances: 0												Number of 24-Hour Exceedances: 0															
Maximum Hourly Value: 8 ppb on Oct 9 at hr 0						Hours in Service: 744																					
Maximum Daily Value: 2.0 ppb on Oct 9						Hours of Data: 693																					
Minimum Hourly Value: 0 ppb on Oct 1 at hr 0						Hours of Missing Data: 13																					
Minimum Daily Value: 0.0 ppb on Oct 1						Hours of Calibration: 38																					
Monthly Average: 0.2 ppb						Operational Uptime: 98.3																					
Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average
Oct 1	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
Oct 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
Oct 3	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
Oct 4	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	1	0.0
Oct 5	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Oct 6	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
Oct 7	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
Oct 8	2	1	1	1	1	2	2	1	1	S	0	0	0	0	0	0	0	0	0	0	1	4	3	1	0	4	0.0
Oct 9	8	1	0	1	3	3	4	4	S	0	1	1	1	1	1	1	0	0	1	0	2	4	1	0	0	8	2.0
Oct 10	0	0	0	2	2	2	3	S	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1.0
Oct 11	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	1	0	0	3	0.0
Oct 12	0	1	0	0	0	S	1	0	0	0	1	0	1	0	1	0	1	0	0	1	1	1	0	0	0	1	0.0
Oct 13	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
Oct 14	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Oct 15	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Oct 16	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	2	1	0	0	2	0.0
Oct 17	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
Oct 18	0	0	0	0	0	0	0	0	0	K	K	K	K	K	K	K	K	K	K	K	K	0	S	0	0	0	-
Oct 19	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	S	0	0	0	0	-
Oct 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
Oct 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
Oct 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
Oct 23	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
Oct 24	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
Oct 25	0	0	0	0	0	0	NRM	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.0
Oct 26	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
Oct 27	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
Oct 28	0	0	0	0	0	0	0	0	1	1	0	0	S	1	1	0	0	1	1	1	1	1	1	0	0	1	0.0
Oct 29	1	0	0	0	0	0	0	0	0	1	1	0	S	1	1	0	0	0	0	0	0	1	1	0	0	1	0.0
Oct 30	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Oct 31	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
Diurnal Maximum	8	1	1	2	3	3	4	4	1	1	1	1	1	1	1	1	1	1	1	1	3	4	3	3			
Diurnal Average	0.4	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.5	0.3	0.2			
C	Monthly Calibration						S	Daily Zero-Span Check						Q	Quality Assurance												
K	Collection Error						ND	No Data (Machine Not in Service)						Y	Routine Maintenance						P	Power Failure					
X	Invalid Data (Equipment Malfunction/Recovery)						NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

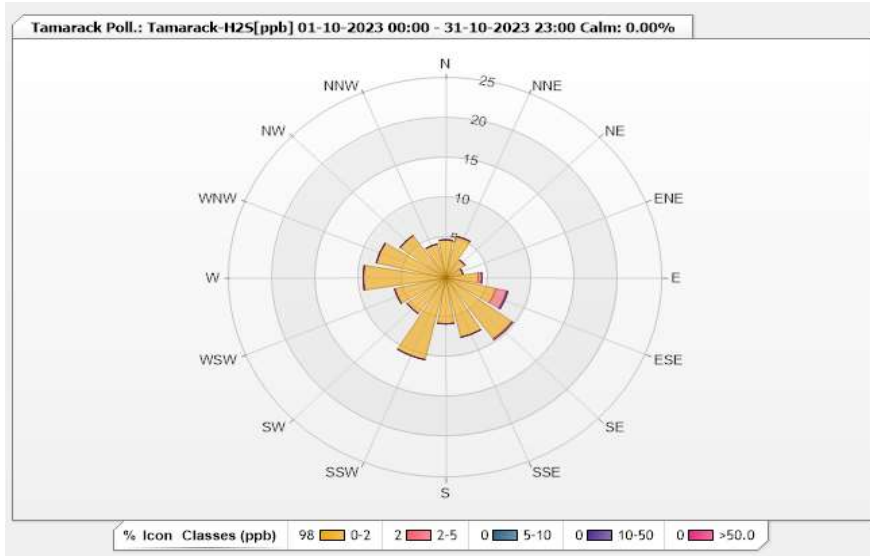


Station: Tamarack Poll.: Tamarack-H2S[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.15% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	4.76	0	0	0	0	4.76
NNE	5.34	0	0	0	0	5.34
NE	2.74	0	0	0	0	2.74
ENE	2.02	0	0	0	0	2.02
E	3.75	0.43	0	0	0	4.18
ESE	5.92	1.3	0.14	0	0	7.36
SE	9.38	0.14	0	0	0	9.52
SSE	7.65	0	0	0	0	7.65
S	5.77	0	0	0	0	5.77
SSW	10.53	0	0	0	0	10.53
SW	5.48	0	0	0	0	5.48
WSW	6.06	0	0	0	0	6.06
W	9.52	0	0	0	0	9.52
WNW	8.23	0	0	0	0	8.23
NW	6.49	0	0	0	0	6.49
NNW	4.33	0	0	0	0	4.33
Summary	97.97	1.87	0.14	0	0	100



Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

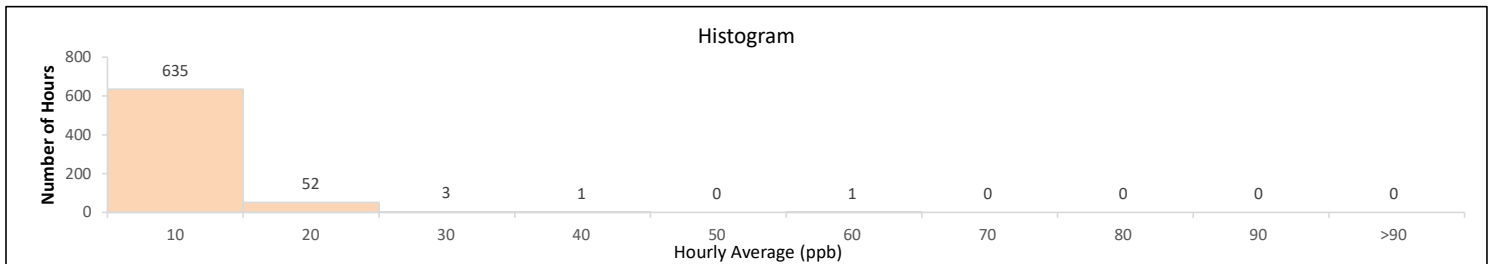
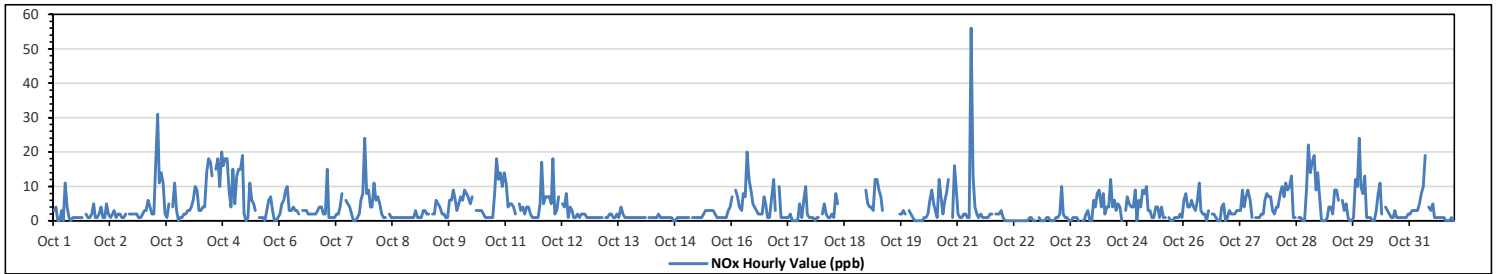
Maximum Hourly Value:	56 ppb	on Oct 21 at hr 7	Hours in Service:	744
Maximum Daily Value:	10.9 ppb	on Oct 4	Hours of Data:	692
Minimum Hourly Value:	0 ppb	on Oct 1 at hr 2	Hours of Missing Data:	12
Minimum Daily Value:	0.2 ppb	on Oct 22	Hours of Calibration:	40
Monthly Average:	3.9 ppb		Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Oct 1	3	4	0	0	3	0	11	4	1	0	1	1	1	1	1	1	S	2	1	1	2	5	1	1	0	11	2.0	
Oct 2	2	4	1	1	5	2	1	2	3	1	2	2	1	1	2	S	2	2	2	2	2	1	1	2	1	5	1.9	
Oct 3	3	3	6	4	2	2	17	31	11	14	11	2	1	5	S	4	11	3	0	1	1	2	2	3	0	31	6.0	
Oct 4	3	4	6	10	9	3	3	4	4	14	18	17	13	S	15	18	10	20	16	18	18	9	4	15	3	20	10.9	
Oct 5	5	13	15	15	19	2	0	1	11	6	5	3	S	1	1	1	0	3	6	7	3	0	0	1	0	19	5.1	
Oct 6	2	5	6	9	10	3	3	4	3	3	2	S	3	3	2	2	2	2	2	2	3	4	4	2	2	10	3.6	
Oct 7	2	15	1	1	1	1	2	2	4	8	S	6	5	4	2	0	0	1	2	6	8	24	8	9	0	24	4.9	
Oct 8	4	4	11	6	7	5	2	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	2.4	
Oct 9	3	1	1	1	3	3	2	2	S	2	2	6	5	4	2	2	1	1	6	6	9	6	3	5	1	9	3.3	
Oct 10	7	6	9	8	7	5	7	S	3	3	3	3	2	1	1	1	1	1	8	18	12	14	10	14	1	18	6.3	
Oct 11	11	4	5	5	4	2	S	5	3	4	2	4	2	1	1	1	1	1	5	17	5	7	7	7	1	17	4.7	
Oct 12	5	18	2	3	7	S	5	4	8	1	4	3	1	1	2	1	2	2	2	1	1	1	1	1	1	18	3.3	
Oct 13	1	1	1	1	S	1	1	2	2	1	1	2	1	4	2	1	1	1	1	1	1	1	1	1	1	4	1.3	
Oct 14	1	1	1	S	1	1	1	1	1	2	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	2	1.0	
Oct 15	1	1	S	1	1	1	1	1	1	1	2	3	3	3	3	2	1	1	1	1	1	1	3	4	1	4	1.7	
Oct 16	7	S	9	7	4	3	8	7	20	12	9	5	4	3	2	2	2	7	5	1	1	7	12	3	1	20	6.1	
Oct 17	S	10	1	1	1	1	1	2	0	0	0	5	1	6	10	2	1	1	1	0	1	1	S	0	10	2.1		
Oct 18	2	5	2	1	1	2	1	8	5	K	K	K	K	K	K	K	K	K	K	K	K	S	S	9	1	9	NA	
Oct 19	5	4	4	3	12	12	9	7	3	C	C	C	C	C	C	C	C	2	2	3	2	S	3	2	2	12	NA	
Oct 20	1	0	0	0	0	0	1	1	2	6	9	5	3	1	12	7	2	6	8	12	S	1	16	10	0	16	4.5	
Oct 21	2	1	1	2	2	1	1	56	13	4	2	1	2	1	1	1	1	2	2	S	2	2	2	3	1	56	4.6	
Oct 22	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	1	0	0	0	1	0	1	0.2	
Oct 23	1	0	0	0	1	1	2	10	2	1	1	0	0	1	1	1	0	S	0	0	2	3	0	0	0	0	10	1.2
Oct 24	6	4	8	9	4	8	2	4	4	12	4	6	3	5	4	0	S	3	7	5	4	4	9	0	0	12	5.0	
Oct 25	6	4	9	8	10	3	3	1	4	4	1	4	1	4	1	S	1	0	0	1	1	1	2	1	0	10	2.9	
Oct 26	6	8	4	4	6	4	3	6	11	3	2	2	0	3	S	2	2	1	0	0	4	5	0	1	0	11	3.3	
Oct 27	3	2	2	2	3	3	3	9	4	7	9	6	1	S	1	1	1	2	2	6	8	7	7	3	1	9	4.0	
Oct 28	2	4	4	8	10	7	11	9	10	13	1	1	S	1	1	0	0	9	22	14	17	19	9	14	0	22	8.1	
Oct 29	7	0	0	0	1	4	4	2	9	9	6	S	6	3	5	1	0	0	1	12	10	24	10	8	0	24	5.3	
Oct 30	13	1	1	1	0	0	3	8	11	2	S	4	3	2	1	1	3	1	1	1	1	1	1	2	0	13	2.7	
Oct 31	2	3	3	3	3	5	8	10	19	S	4	3	5	1	1	1	1	1	1	0	0	0	1	0	0	19	3.3	
Diurnal Maximum	13	18	15	15	19	12	17	56	20	14	18	17	13	5	15	18	11	20	22	18	18	24	16	15				
Diurnal Average	3.9	4.3	3.8	3.8	4.6	2.8	3.9	6.8	5.7	5.0	4.0	3.3	2.9	2.0	2.7	2.4	1.8	2.6	3.6	4.8	4.1	5.3	4.0	4.1				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

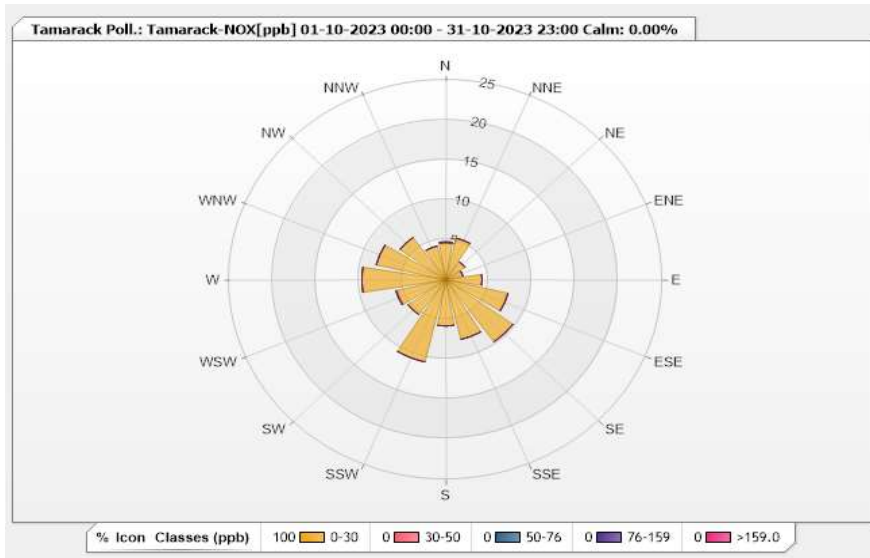


Station: Tamarack Poll.: Tamarack-NOX[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.01% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	4.62	0	0.14	0	0	4.76
NNE	5.35	0	0	0	0	5.35
NE	2.75	0	0	0	0	2.75
ENE	2.02	0	0	0	0	2.02
E	4.19	0	0	0	0	4.19
ESE	7.37	0	0	0	0	7.37
SE	9.54	0	0	0	0	9.54
SSE	7.66	0	0	0	0	7.66
S	5.78	0	0	0	0	5.78
SSW	10.55	0	0	0	0	10.55
SW	5.35	0	0	0	0	5.35
WSW	5.78	0.14	0	0	0	5.92
W	9.68	0	0	0	0	9.68
WNW	8.24	0	0	0	0	8.24
NW	6.5	0	0	0	0	6.5
NNW	4.34	0	0	0	0	4.34
Summary	100	0.14	0.14	0	0	100



Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

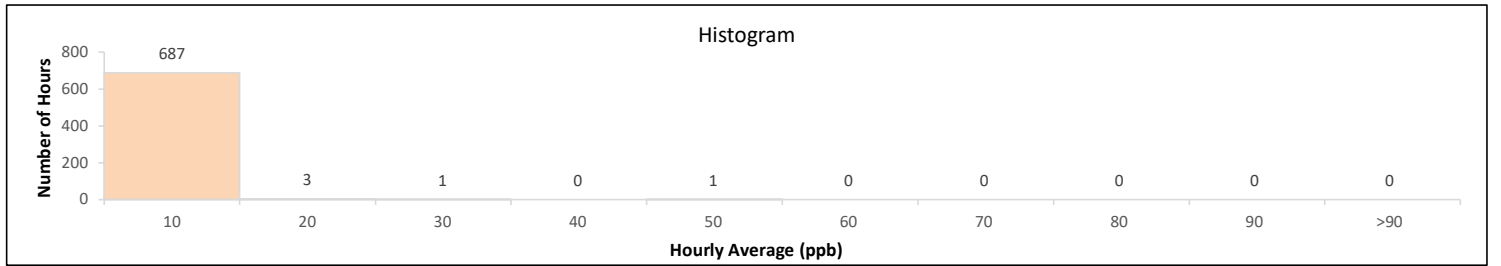
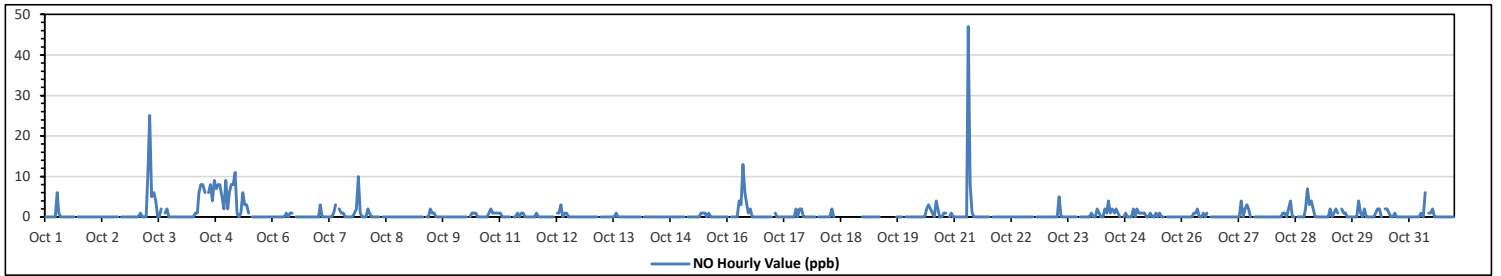
NITRIC OXIDE (NO) in ppb

Maximum Hourly Value:	47	ppb	on Oct 21 at hr 7	Hours in Service:	744
Maximum Daily Value:	4.2	ppb	on Oct 4	Hours of Data:	692
Minimum Hourly Value:	0	ppb	on Oct 1 at hr 0	Hours of Missing Data:	12
Minimum Daily Value:	0.0	ppb	on Oct 2	Hours of Calibration:	40
Monthly Average:	0.7	ppb		Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
Oct 1	0	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0.3
Oct 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
Oct 3	0	0	1	0	0	0	12	25	5	6	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2.5	
Oct 4	0	0	0	0	0	0	0	1	1	5	6	8	8	6	6	0	0	0	0	0	0	0	0	0	0	0	0	9	4.2	
Oct 5	2	6	8	8	11	1	0	1	6	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2.2	
Oct 6	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	
Oct 7	0	3	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1.1		
Oct 8	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1		
Oct 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	2	0.2		
Oct 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	2	0.4		
Oct 11	1	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	0.2		
Oct 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	3	0.3		
Oct 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	1	0.0		
Oct 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	
Oct 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	1	0.2	
Oct 16	0	0	0	0	0	0	0	4	3	13	6	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1.4	
Oct 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	2	0.3	
Oct 18	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	NA	
Oct 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	NA	
Oct 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	4	0.7	
Oct 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	47	2.4	
Oct 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	
Oct 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.2	
Oct 24	1	0	0	2	1	0	0	2	1	4	1	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	2	4	0.9	
Oct 25	2	1	1	1	1	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.4	
Oct 26	0	0	0	0	0	0	1	1	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3	
Oct 27	0	0	0	0	0	0	0	4	0	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.5	
Oct 28	0	0	0	0	0	1	1	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1.1		
Oct 29	0	0	0	0	0	0	2	0	1	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0.7		
Oct 30	2	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.6		
Oct 31	0	0	0	0	0	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.5		
Diurnal Maximum	2	6	8	8	11	1	12	47	13	6	8	6	2	6	8	4	9	7	8	8	10	2	9							
Diurnal Average	0.3	0.4	0.4	0.4	0.4	0.1	1.0	3.2	1.7	1.6	1.2	1.0	0.9	0.4	0.6	0.5	0.3	0.4	0.6	0.6	0.5	0.7	0.3	0.3						

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

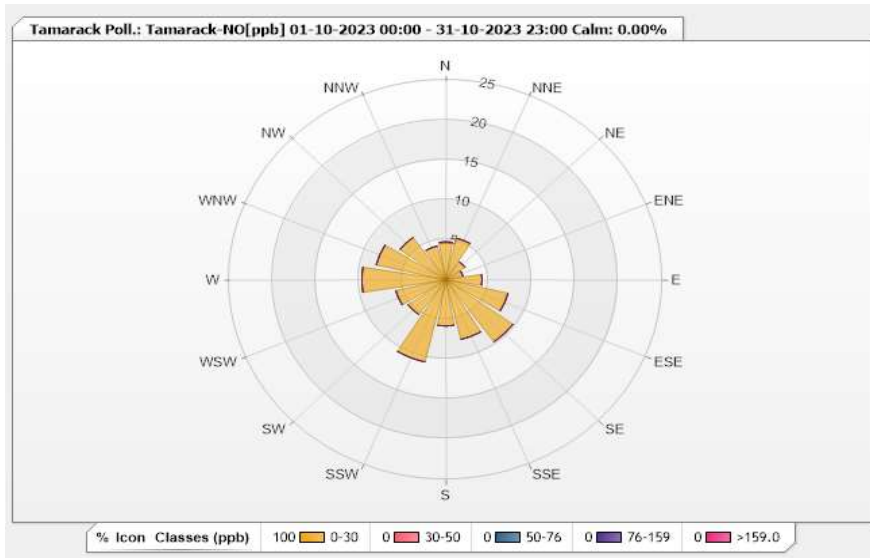


Station: Tamarack Poll.: Tamarack-NO[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.01% Calm Avg: 0.00 [ppm]

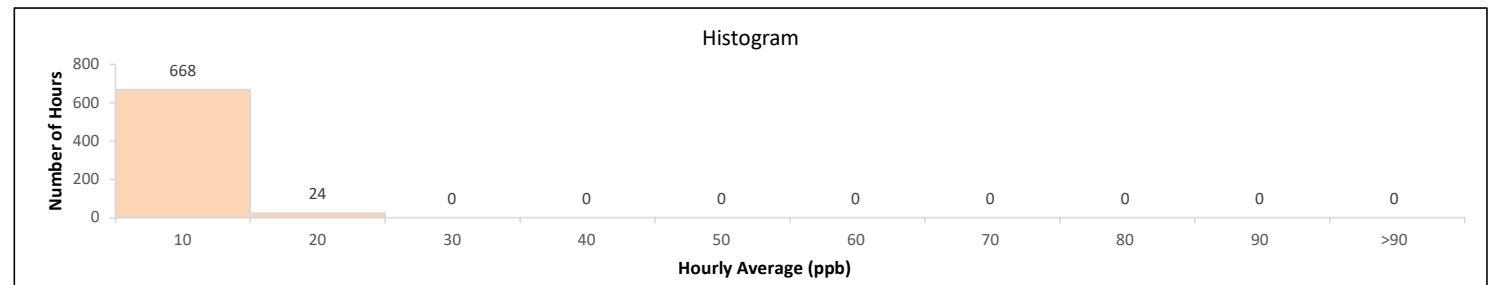
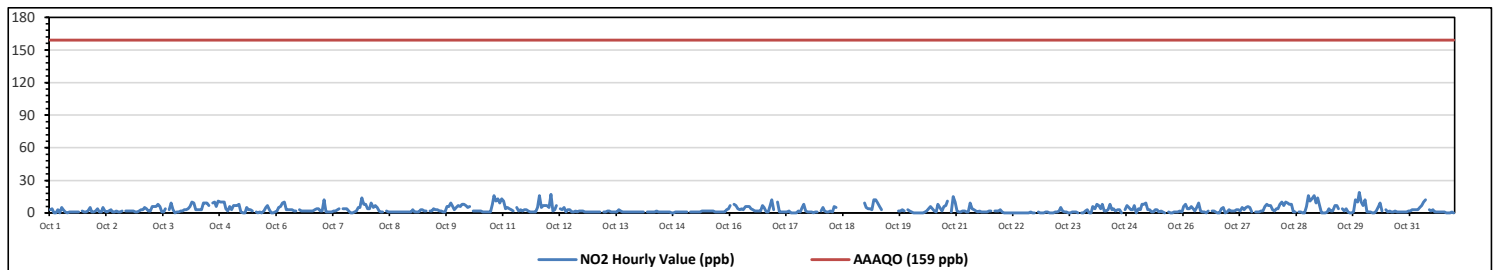
Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	4.62	0.14	0	0	0	4.76
NNE	5.35	0	0	0	0	5.35
NE	2.75	0	0	0	0	2.75
ENE	2.02	0	0	0	0	2.02
E	4.19	0	0	0	0	4.19
ESE	7.37	0	0	0	0	7.37
SE	9.54	0	0	0	0	9.54
SSE	7.66	0	0	0	0	7.66
S	5.78	0	0	0	0	5.78
SSW	10.55	0	0	0	0	10.55
SW	5.35	0	0	0	0	5.35
WSW	5.92	0	0	0	0	5.92
W	9.68	0	0	0	0	9.68
WNW	8.24	0	0	0	0	8.24
NW	6.5	0	0	0	0	6.5
NNW	4.34	0	0	0	0	4.34
Summary	100	0.14	0	0	0	100



Lakeland Industry & Community Association
Tamarack Site - October 2023
Summary of Hourly Averages
NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																																			
Number of 1-Hour Exceedances: 0																																			
Maximum Hourly Value: 19 ppb on Oct 29 at hr 21												Hours in Service: 744																							
Maximum Daily Value: 6.9 ppb on Oct 28												Hours of Data: 692																							
Minimum Hourly Value: 0 ppb on Oct 1 at hr 2												Hours of Missing Data: 12																							
Minimum Daily Value: 0.2 ppb on Oct 22												Hours of Calibration: 40																							
Monthly Average: 3.1 ppb												Operational Uptime: 98.4																							
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
Oct 1	3	4	0	0	3	0	5	3	1	0	1	1	1	1	1	1	S	2	1	1	2	5	1	1	0	5	1.7								
Oct 2	2	4	1	1	5	2	1	2	3	1	1	2	1	1	2	S	2	2	2	2	2	1	1	2	1	5	1.9								
Oct 3	3	3	5	4	2	2	6	6	6	8	6	1	1	4	S	3	9	3	0	1	1	2	2	3	0	9	3.5								
Oct 4	3	4	6	10	9	3	3	3	3	9	9	9	7	S	9	10	6	11	10	10	10	4	2	6	2	11	6.8								
Oct 5	3	7	7	7	8	1	0	0	5	3	2	S	S	1	0	1	0	2	5	7	3	0	0	1	0	8	2.9								
Oct 6	2	5	6	9	10	3	3	3	3	2	2	S	S	3	2	2	2	2	2	2	3	4	4	2	2	10	3.4								
Oct 7	2	12	1	1	1	1	2	2	3	4	S	S	4	4	4	2	0	0	1	2	5	5	14	8	8	0	14	3.7							
Oct 8	4	4	9	5	7	5	2	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	2.3							
Oct 9	3	1	1	1	3	3	2	2	S	S	2	2	4	3	3	2	2	1	1	6	6	9	6	3	5	1	9	3.1							
Oct 10	7	6	8	8	7	5	6	S	S	2	2	2	2	2	1	1	1	1	8	16	11	13	9	13	1	16	5.7								
Oct 11	11	4	5	4	3	2	S	S	5	2	3	2	3	3	2	1	1	1	5	16	5	7	7	7	1	16	4.3								
Oct 12	5	17	2	3	7	S	S	4	3	5	1	3	3	1	1	2	1	2	2	2	1	1	1	1	1	17	3.0								
Oct 13	1	1	1	1	S	1	1	1	2	2	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	1	3	1.2							
Oct 14	1	1	1	S	1	1	1	1	1	1	2	1	1	1	1	1	0	0	1	1	1	1	1	1	0	2	1.0								
Oct 15	1	1	S	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	3	4	1	4	1.5							
Oct 16	7	S	S	8	7	4	3	4	3	6	6	6	4	3	2	2	2	7	5	1	1	7	12	3	1	12	4.6								
Oct 17	S	10	1	1	1	1	1	2	0	0	0	0	2	1	5	8	2	1	1	1	0	1	1	S	0	10	1.8								
Oct 18	2	5	2	1	1	2	1	6	5	K	K	K	K	K	K	K	K	K	K	K	K	7	S	9	1	9	NA								
Oct 19	5	4	4	3	12	12	9	6	3	C	C	C	C	C	C	C	C	2	2	3	2	S	3	2	2	12	NA								
Oct 20	1	0	0	0	0	0	1	2	4	6	4	2	1	8	5	2	6	7	11	S	1	15	10	0	15	3.7									
Oct 21	2	1	1	2	2	1	1	9	4	3	2	1	2	1	1	1	2	2	S	S	2	2	2	3	1	9	2.1								
Oct 22	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	1	0	0	0	1	0	1	0.2								
Oct 23	1	0	0	0	1	1	2	5	2	1	1	0	0	1	1	1	0	S	0	0	2	3	0	0	0	5	1.0								
Oct 24	6	4	8	7	4	8	2	2	3	8	3	4	2	3	3	0	S	3	7	5	3	3	7	0	0	8	4.1								
Oct 25	4	3	8	8	9	3	3	1	1	3	3	1	2	1	0	S	1	0	0	1	1	1	2	1	0	9	2.5								
Oct 26	6	8	4	4	6	4	2	5	9	2	1	1	0	2	S	2	2	1	0	0	4	5	0	1	0	9	3.0								
Oct 27	3	2	2	2	3	3	2	5	3	5	6	5	1	S	1	1	1	2	2	6	8	7	7	3	1	8	3.5								
Oct 28	2	4	4	8	10	7	10	9	8	8	1	1	S	1	1	0	0	6	16	11	13	16	9	14	0	16	6.9								
Oct 29	7	0	0	0	1	4	2	2	7	7	4	S	4	2	4	1	0	0	1	12	10	19	10	7	0	19	4.5								
Oct 30	12	1	1	1	0	0	2	6	9	2	S	S	3	1	2	1	1	2	1	1	1	1	1	2	0	12	2.3								
Oct 31	2	3	3	3	3	5	7	10	12	S	3	2	3	1	1	1	1	1	1	0	0	0	1	0	0	12	2.7								
Diurnal Maximum	12	17	9	10	12	12	10	10	12	9	9	9	7	4	9	10	9	11	16	16	13	19	15	14											
Diurnal Average	3.7	4.0	3.3	3.4	4.1	2.8	2.8	3.5	3.7	3.3	2.7	2.3	2.0	1.7	2.1	1.9	1.6	2.2	3.1	4.3	3.6	4.5	3.8	3.7											
C	Monthly Calibration											S	Daily Zero-Span Check											Q	Quality Assurance										
K	Collection Error											ND	No Data (Machine Not in Service)											Y	Routine Maintenance										
X	Invalid Data (Equipment Malfunction /Recovery)											NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)											P	Power Failure										

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

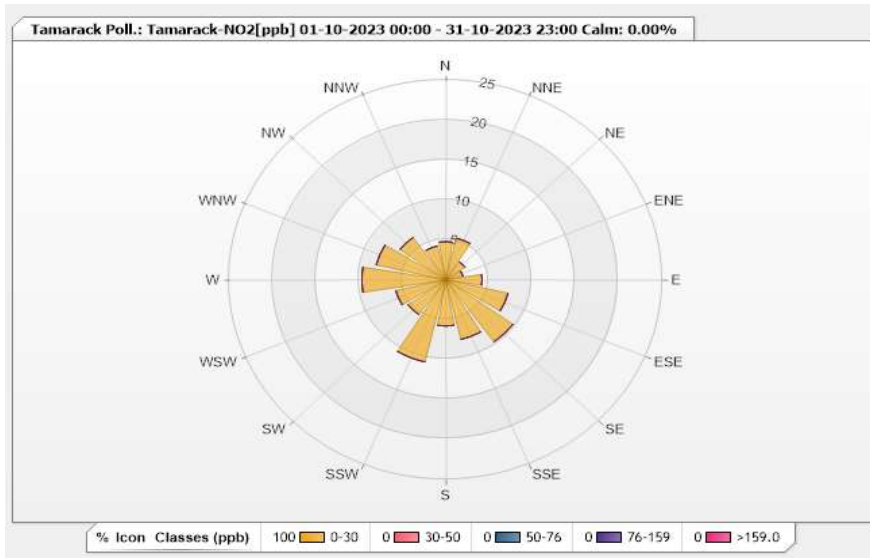


Station: Tamarack Poll.: Tamarack-NO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.01% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	4.77	0	0	0	0	4.77
NNE	5.35	0	0	0	0	5.35
NE	2.75	0	0	0	0	2.75
ENE	2.02	0	0	0	0	2.02
E	4.19	0	0	0	0	4.19
ESE	7.37	0	0	0	0	7.37
SE	9.54	0	0	0	0	9.54
SSE	7.66	0	0	0	0	7.66
S	5.78	0	0	0	0	5.78
SSW	10.55	0	0	0	0	10.55
SW	5.35	0	0	0	0	5.35
WSW	5.92	0	0	0	0	5.92
W	9.68	0	0	0	0	9.68
WNW	8.24	0	0	0	0	8.24
NW	6.5	0	0	0	0	6.5
NNW	4.34	0	0	0	0	4.34
Summary	100	0	0	0	0	100

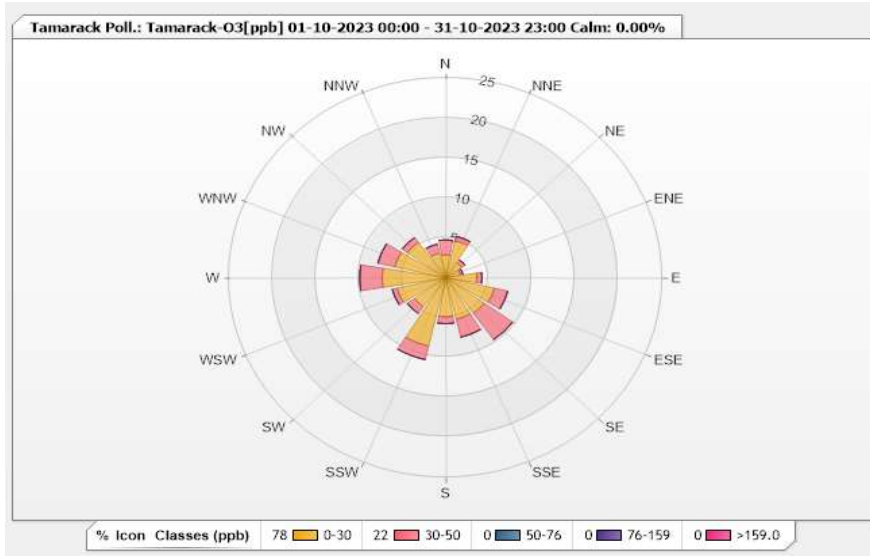


Station: Tamarack Poll.: Tamarack-O3[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.41% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.88	1.87	0	0	0	4.75
NNE	4.75	0.58	0	0	0	5.33
NE	2.3	0.43	0	0	0	2.73
ENE	1.73	0.29	0	0	0	2.02
E	3.6	0.58	0	0	0	4.18
ESE	5.76	1.58	0	0	0	7.34
SE	5.47	4.03	0	0	0	9.5
SSE	5.32	2.3	0	0	0	7.62
S	4.89	0.86	0	0	0	5.75
SSW	8.78	1.73	0	0	0	10.51
SW	4.46	1.01	0	0	0	5.47
WSW	5.76	0.58	0	0	0	6.34
W	7.34	2.59	0	0	0	9.93
WNW	6.04	2.01	0	0	0	8.05
NW	5.47	0.72	0	0	0	6.19
NNW	3.17	1.15	0	0	0	4.32
Summary	77.72	22.31	0	0	0	100

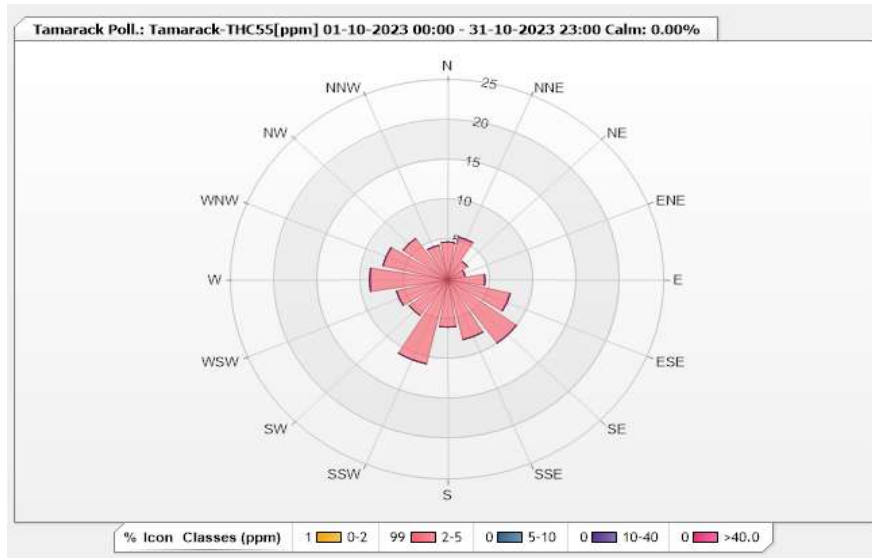


Station: Tamarack Poll.: Tamarack-THC55[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 90.86% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0	4.73	0	0	0	4.73
NNE	0	5.47	0	0	0	5.47
NE	0	2.81	0	0	0	2.81
ENE	0	2.07	0	0	0	2.07
E	0	4.29	0	0	0	4.29
ESE	0	7.4	0	0	0	7.4
SE	0	9.76	0	0	0	9.76
SSE	0	7.69	0	0	0	7.69
S	0	5.92	0	0	0	5.92
SSW	0	10.8	0	0	0	10.8
SW	0.15	5.33	0	0	0	5.48
WSW	0.15	5.92	0	0	0	6.07
W	0.44	8.58	0	0	0	9.02
WNW	0	7.69	0	0	0	7.69
NW	0.44	5.92	0	0	0	6.36
NNW	0	4.44	0	0	0	4.44
Summary	1.18	98.82	0	0	0	100

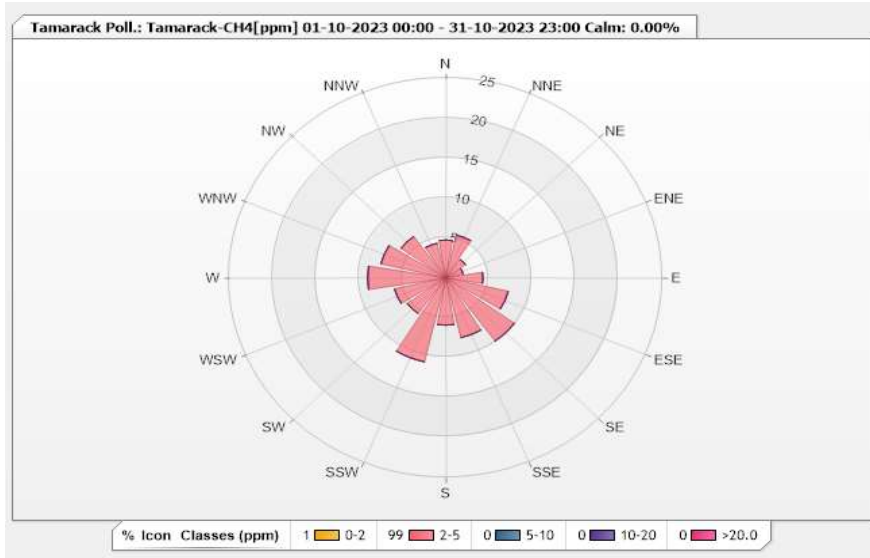


Station: Tamarack Poll.: Tamarack-CH4[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 90.86% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0	4.73	0	0	0	4.73
NNE	0	5.47	0	0	0	5.47
NE	0	2.81	0	0	0	2.81
ENE	0	2.07	0	0	0	2.07
E	0	4.29	0	0	0	4.29
ESE	0	7.4	0	0	0	7.4
SE	0	9.76	0	0	0	9.76
SSE	0	7.69	0	0	0	7.69
S	0	5.92	0	0	0	5.92
SSW	0	10.8	0	0	0	10.8
SW	0.15	5.33	0	0	0	5.48
WSW	0.15	5.92	0	0	0	6.07
W	0.44	8.58	0	0	0	9.02
WNW	0	7.69	0	0	0	7.69
NW	0.44	5.92	0	0	0	6.36
NNW	0	4.44	0	0	0	4.44
Summary	1.18	98.82	0	0	0	100

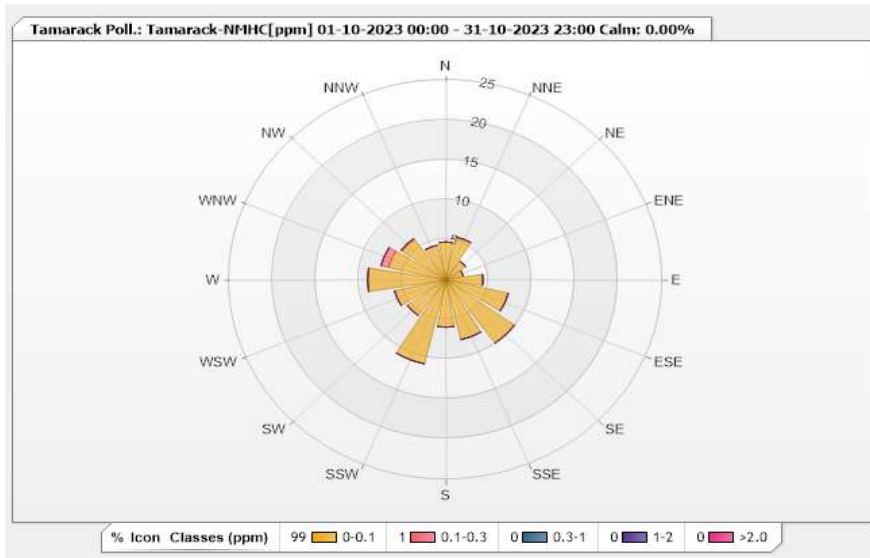


Station: Tamarack Poll.: Tamarack-NMHC[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 90.86% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	4.73	0	0	0	0	4.73
NNE	5.47	0	0	0	0	5.47
NE	2.81	0	0	0	0	2.81
ENE	2.07	0	0	0	0	2.07
E	4.29	0	0	0	0	4.29
ESE	7.4	0	0	0	0	7.4
SE	9.76	0	0	0	0	9.76
SSE	7.69	0	0	0	0	7.69
S	5.92	0	0	0	0	5.92
SSW	10.8	0	0	0	0	10.8
SW	5.47	0	0	0	0	5.47
WSW	6.07	0	0	0	0	6.07
W	9.02	0	0	0	0	9.02
WNW	6.8	0.89	0	0	0	7.69
NW	6.21	0.15	0	0	0	6.36
NNW	4.44	0	0	0	0	4.44
Summary	98.95	1.04	0	0	0	100



Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

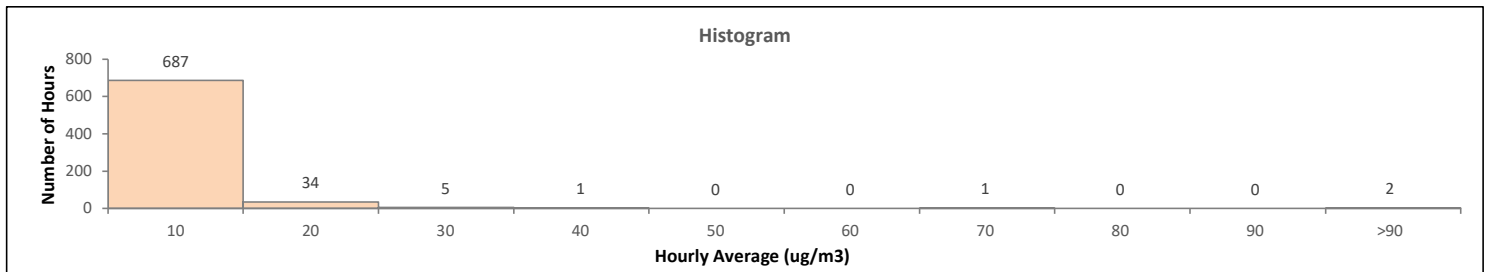
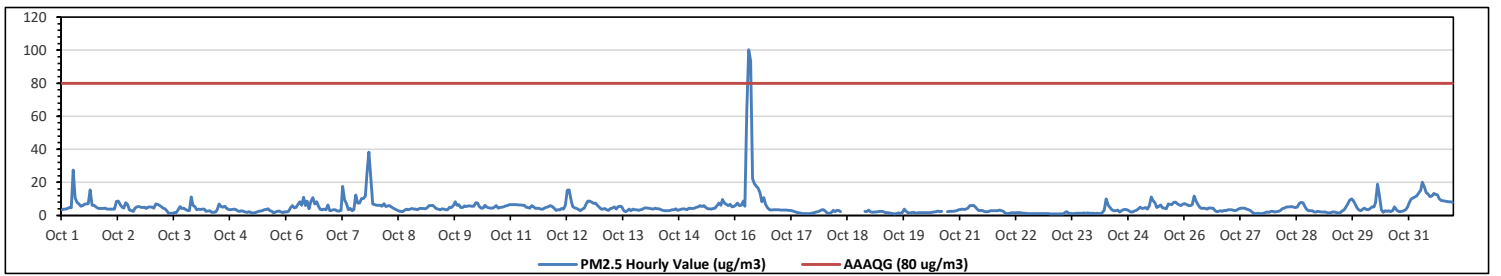
PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Guideline (AAAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAAQO): 24-Hour 29 µg/m ³			
Number of 1-Hour Exceedances:	2	Number of 24-Hour Exceedances:	0
Maximum Hourly Value:	100 µg/m ³ on Oct 16 at hr 7	Hours in Service:	744
Maximum Daily Value:	18.2 µg/m ³ on Oct 16	Hours of Data:	730
Minimum Hourly Value:	1 µg/m ³ on Oct 23 at hr 2	Hours of Missing Data:	12
Minimum Daily Value:	1 µg/m ³ on Oct 23	Hours of Calibration:	2
Monthly Average:	4.9 µg/m ³	Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Oct 1	3	4	4	4	4	5	5	27	11	8	7	6	7	7	7	16	6	6	5	4	4	4	4	4	3	27	6.8	
Oct 2	4	4	4	4	4	8	9	6	5	5	8	7	3	3	3	4	5	5	5	5	5	4	5	5	3	9	4.9	
Oct 3	5	4	7	7	6	5	4	4	3	1	1	1	2	2	3	5	4	4	3	3	11	6	5	1	11	4.2		
Oct 4	4	4	4	4	4	3	3	3	2	2	2	4	7	6	5	6	4	4	3	4	4	3	3	3	2	7	3.6	
Oct 5	3	3	2	2	2	2	2	2	2	3	3	4	4	4	3	2	2	2	3	3	2	2	2	2	2	4	2.4	
Oct 6	2	2	5	6	5	5	7	8	6	11	6	9	4	9	11	7	8	5	4	3	4	3	6	3	2	11	5.7	
Oct 7	3	4	3	3	3	3	18	9	7	3	4	3	4	12	7	8	10	10	12	25	38	23	7	7	3	38	9.4	
Oct 8	6	6	6	6	7	5	6	6	5	5	4	3	3	2	2	3	4	3	4	4	4	4	4	4	2	7	4.4	
Oct 9	4	4	4	5	6	6	6	5	4	4	3	4	4	3	3	5	5	6	8	6	6	5	5	6	3	8	4.9	
Oct 10	6	6	6	6	6	8	8	6	5	5	6	5	5	4	5	5	6	4	5	5	5	6	6	7	4	8	5.4	
Oct 11	6	6	7	6	6	6	6	6	5	5	4	6	5	4	4	4	4	4	5	5	5	6	5	4	4	7	5.3	
Oct 12	3	3	3	4	4	6	15	15	9	6	5	4	4	3	4	4	7	9	9	8	7	7	6	5	3	15	6.3	
Oct 13	4	4	4	3	3	4	4	5	4	5	6	5	3	2	3	4	3	4	4	3	3	4	4	5	2	6	3.8	
Oct 14	5	4	4	4	4	4	4	4	4	3	3	3	3	3	3	4	4	3	3	4	4	4	3	4	3	5	3.7	
Oct 15	4	4	4	5	5	6	5	6	5	4	4	4	4	5	6	8	6	10	8	7	6	7	5	6	4	10	5.5	
Oct 16	6	8	6	6	9	6	64	100	93	22	19	18	17	14	8	11	7	5	3	3	3	3	3	3	3	3	100	18.2
Oct 17	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	1	3	2.2	
Oct 18	2	1	1	2	3	2	3	3	2	K	K	K	K	K	K	K	K	K	K	K	K	K	K	1	3	NA		
Oct 19	2	2	2	2	2	3	3	2	2	2	1	1	1	1	2	1	2	4	3	2	2	2	2	1	4	1.9		
Oct 20	2	2	2	2	2	2	2	2	2	2	2	3	2	3	C	C	2	2	2	3	3	3	3	2	3	2.1		
Oct 21	4	4	4	4	5	6	6	6	5	4	3	3	3	2	2	3	3	3	3	3	3	3	3	2	6	3.5		
Oct 22	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.2	
Oct 23	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	2	1.2	
Oct 24	1	1	1	1	2	3	10	6	5	4	3	3	3	2	3	4	4	4	3	2	2	3	3	4	1	10	3.1	
Oct 25	5	4	5	5	4	6	11	9	7	5	5	6	5	4	7	7	7	8	8	7	6	6	7	4	11	6.1		
Oct 26	7	7	6	6	6	12	9	7	5	4	4	4	4	5	5	5	3	2	2	3	3	3	3	2	12	4.8		
Oct 27	4	4	3	3	3	4	4	5	4	4	3	3	2	1	1	1	1	1	2	2	2	2	3	2	1	5	2.6	
Oct 28	2	2	3	3	4	4	5	5	5	5	5	5	5	7	8	8	6	4	3	3	3	2	2	2	8	4.2		
Oct 29	2	2	2	2	2	2	2	2	2	2	3	3	3	5	7	9	10	9	7	5	3	3	4	2	10	3.7		
Oct 30	4	4	3	4	5	5	8	19	12	3	2	3	3	3	2	3	5	4	3	2	2	3	5	2	19	4.6		
Oct 31	8	10	11	11	12	14	15	20	17	14	13	11	12	13	13	13	10	9	9	8	8	8	8	8	8	20	11.5	
Diurnal Maximum	8	10	11	11	12	14	15	20	17	14	13	11	12	13	13	13	10	9	9	8	8	8	8	8	8	20	11.5	
Diurnal Average	3.7	3.8	3.8	4.0	4.3	4.8	8.7	9.2	7.7	4.7	4.4	4.0	4.3	4.3	5.1	4.7	4.5	4.4	4.7	4.9	4.6	3.9	4.0	4.0	4.0	4.0	4.0	

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	Invalid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

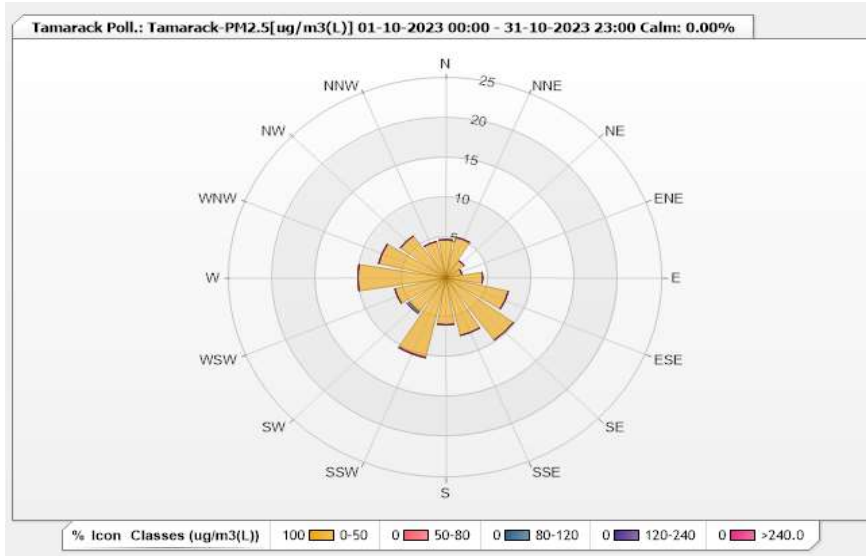


Station: Tamarack Poll.: Tamarack-PM2.5[ug/m3(L)] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 98.12% Calm Avg: 0.00 [ppm]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	4.79	0	0	0	0	4.79
NNE	5.21	0	0	0	0	5.21
NE	2.6	0	0	0	0	2.6
ENE	1.92	0	0	0	0	1.92
E	4.25	0	0	0	0	4.25
ESE	7.4	0	0	0	0	7.4
SE	9.59	0	0	0	0	9.59
SSE	7.4	0	0	0	0	7.4
S	5.89	0	0	0	0	5.89
SSW	10.14	0.14	0	0	0	10.28
SW	5.21	0	0.27	0	0	5.48
WSW	6.03	0	0	0	0	6.03
W	10.14	0	0	0	0	10.14
WNW	7.95	0	0	0	0	7.95
NW	6.44	0	0	0	0	6.44
NNW	4.66	0	0	0	0	4.66
Summary	100	0.14	0.27	0	0	100



Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

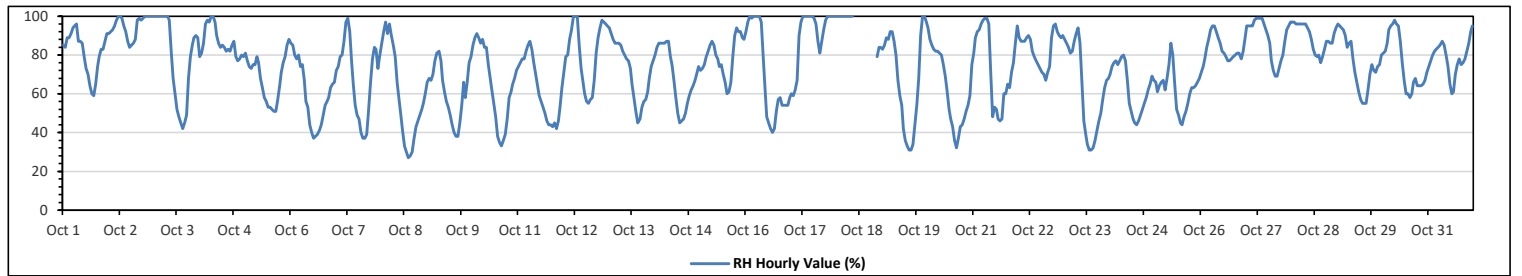
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	100	%	on Oct 2 at hr 5	Hours in Service:	744
Maximum Daily Value:	95.0	%	on Oct 2	Hours of Data:	732
Minimum Hourly Value:	27	%	on Oct 8 at hr 14	Hours of Missing Data:	12
Minimum Daily Value:	59.2	%	on Oct 8	Hours of Calibration:	0
Monthly Average:	74.1	%		Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23		
Oct 1	85	84	89	89	91	94	95	96	87	87	86	79	73	70	64	60	59	65	74	79	83	83	87	91	59	96	81.3		
Oct 2	91	92	93	95	98	100	100	99	95	92	87	84	85	86	88	98	99	98	99	100	100	100	100	100	84	100	95.0		
Oct 3	100	100	100	100	100	100	100	100	98	82	68	60	52	48	45	42	45	49	68	79	85	89	90	89	42	100	78.7		
Oct 4	79	81	86	96	98	97	100	100	97	90	86	84	85	84	82	83	82	85	87	79	77	78	80	79	77	100	86.5		
Oct 5	81	77	74	73	75	75	79	76	68	63	58	56	53	53	52	51	57	64	71	76	79	85	88	51	88	68.1			
Oct 6	86	85	80	78	80	74	75	67	56	53	44	40	37	38	39	41	44	49	54	56	58	63	65	66	37	86	59.5		
Oct 7	72	74	79	80	87	97	99	92	76	65	54	49	47	40	37	37	39	52	66	78	84	83	73	80	37	99	68.3		
Oct 8	86	92	97	91	96	90	85	79	66	57	50	41	33	30	27	28	30	37	43	46	49	52	55	60	27	97	59.2		
Oct 9	66	68	67	70	77	81	82	77	67	61	56	53	49	44	40	38	38	45	54	66	58	66	76	79	38	82	61.6		
Oct 10	85	89	91	89	86	88	84	84	75	69	62	55	48	38	35	33	36	39	47	58	61	65	68	72	33	91	64.9		
Oct 11	74	76	78	78	82	85	87	83	76	70	65	59	56	53	50	46	44	44	43	45	42	46	53	63	42	87	62.4		
Oct 12	71	79	80	88	93	100	100	100	85	73	66	60	56	55	57	58	67	81	89	94	98	97	96	95	55	100	80.8		
Oct 13	94	91	88	86	86	86	85	82	80	78	77	73	65	58	51	45	47	53	56	57	61	68	74	77	45	94	71.6		
Oct 14	80	84	86	86	86	86	87	87	79	75	67	58	50	45	46	47	50	55	59	62	64	67	70	74	45	87	68.8		
Oct 15	72	73	75	79	82	85	87	85	80	78	74	75	70	66	60	61	66	79	90	94	92	92	89	88	60	94	78.8		
Oct 16	92	97	100	99	100	100	100	100	97	79	62	48	45	42	40	42	51	57	58	54	54	54	54	58	40	100	70.1		
Oct 17	60	59	62	67	90	97	100	100	100	100	100	100	99	96	87	81	87	93	98	100	100	100	100	100	59	100	90.7		
Oct 18	100	100	100	100	100	100	100	100	100	K	K	K	K	K	K	K	K	K	K	K	K	K	K	79	84	84	79	100	NA
Oct 19	83	85	89	88	92	92	87	80	67	59	54	42	36	33	31	31	34	44	54	68	90	100	100	97	31	100	68.2		
Oct 20	94	88	85	83	82	82	81	80	75	69	61	52	47	43	36	32	37	43	44	47	51	54	59	75	32	94	62.5		
Oct 21	81	89	92	93	96	98	99	99	96	71	48	53	52	47	46	47	60	60	65	63	71	76	86	95	46	99	74.3		
Oct 22	89	87	87	87	89	90	88	82	79	77	75	73	71	70	67	71	74	89	95	96	92	90	89	90	67	96	83.2		
Oct 23	88	86	84	81	82	87	91	94	86	66	46	39	34	31	31	32	36	41	46	50	57	63	67	68	31	94	61.9		
Oct 24	70	74	76	77	75	77	79	80	77	67	55	51	47	45	44	46	49	52	55	58	62	65	69	67	44	80	63.2		
Oct 25	66	61	64	66	67	62	68	75	86	80	65	52	49	45	44	48	51	55	60	63	63	64	66	68	44	86	62.0		
Oct 26	71	74	78	84	88	93	95	95	92	89	86	82	81	79	77	77	78	79	80	81	81	78	82	89	71	95	82.9		
Oct 27	95	95	95	95	98	99	99	99	99	96	93	90	86	77	72	69	69	73	77	80	87	93	95	97	69	99	88.7		
Oct 28	97	97	96	96	96	96	96	94	92	88	83	80	79	80	76	79	83	87	87	86	86	91	94	76	97	89.0			
Oct 29	96	95	94	93	90	84	86	87	78	71	66	61	57	55	55	62	70	75	72	71	74	75	80	55	96	75.1			
Oct 30	81	82	86	93	95	96	98	96	95	87	76	67	60	60	58	60	66	68	64	64	64	65	67	71	58	98	75.8		
Oct 31	74	77	80	82	83	84	85	87	85	80	74	65	60	61	70	75	78	75	76	78	82	86	92	95	60	95	78.5		
Diurnal Maximum	100	100	100	100	100	100	100	100	100	100	100	100	99	96	88	98	99	98	99	100	100	100	100	100	100	100	100	100	
Diurnal Average	82.5	83.6	84.9	85.9	88.4	89.5	90.2	88.9	83.6	75.9	68.3	62.8	58.8	55.7	53.7	53.7	56.9	62.3	67.6	70.8	73.3	76.0	78.6	81.6					

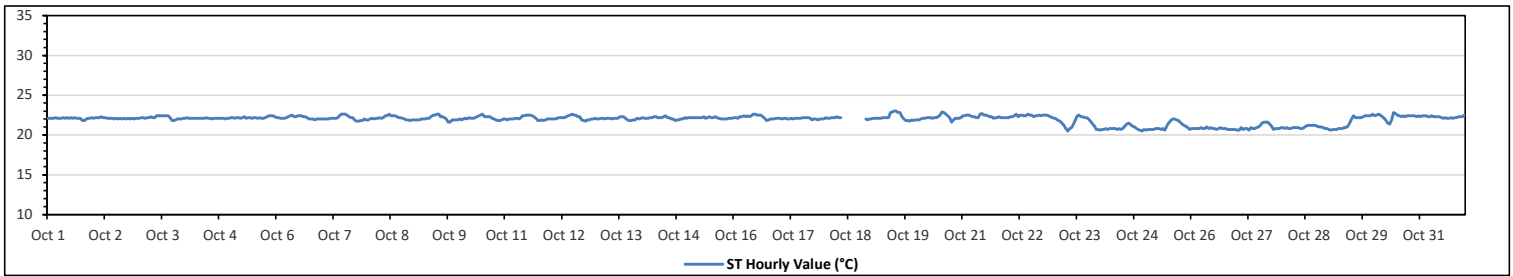
C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association
Tamarack Site - October 2023
Summary of Hourly Averages
STATION TEMPERATURE (ST) in Degree Celsius

Summary table of hourly temperature data for October 2023, including maximum and minimum hourly values, monthly averages, and a legend for data quality indicators (e.g., Calibration, No Data, Quality Assurance).



Lakeland Industry & Community Association

Tamarack Site - October 2023

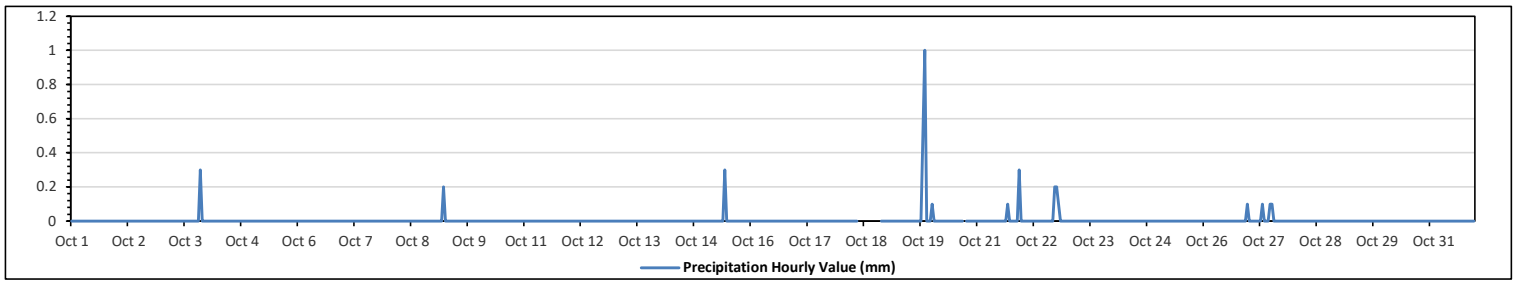
Summary of Hourly Averages

PRECIPITATION in mm

Maximum Hourly Value:		1.0 mm on Oct 19 at hr 20	Hours in Service:	744
Maximum Daily Value:		1.5 mm on Oct 19	Hours of Data:	731
Minimum Hourly Value:		0.0 mm on Oct 1 at hr 0	Hours of Missing Data:	12
Minimum Daily Value:		0.0 mm on Oct 1	Hours of Calibration:	1
Monthly Total:		3.7 mm	Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																								Daily	Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Total	
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 9	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 15	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 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
Oct 18	0	0	0	0	0	0	0	0	0	0	K	K	K	K	K	K	K	K	K	K	K	K	K	0	0	0	0	NA
Oct 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	0	0	0	0	0	1
Oct 20	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	0	0	0	0	0	0	0	0	0	0.1
Oct 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Oct 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	0.1	0	0	0	0	0	0	0
Oct 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 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
Oct 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
Oct 27	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal Maximum	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.5	1.0	0.0	0.3	0.1				
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

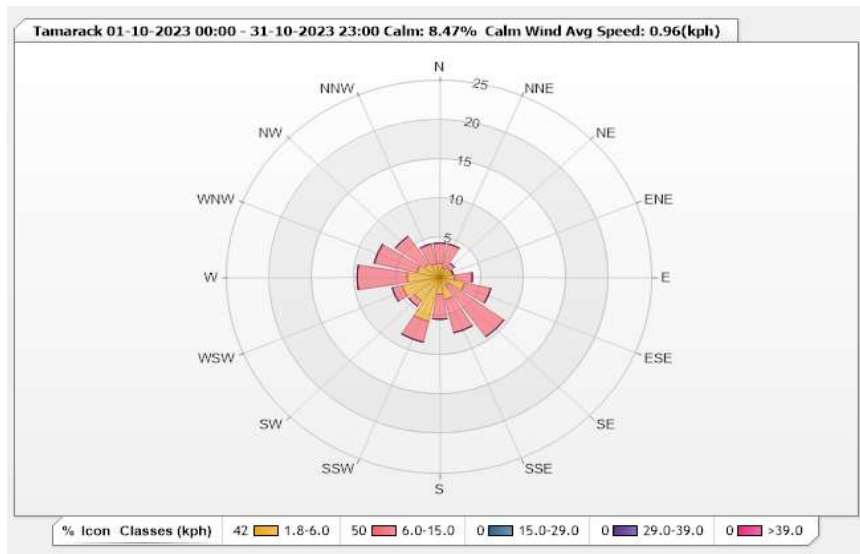


Station: Tamarack Monitor: WDS [kph] Monthly: 10-2023

Type: Wind Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm (WS<1.8kph): 8.47% Valid Data: 98.39%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	1.78	2.6	0	0	0	4.38
NNE	1.23	3.14	0	0	0	4.37
NE	1.5	0.68	0	0	0	2.18
ENE	1.5	0.14	0	0	0	1.64
E	1.78	2.05	0	0	0	3.83
ESE	3.01	3.14	0	0	0	6.15
SE	1.23	8.06	0	0	0	9.29
SSE	2.87	4.37	0	0	0	7.24
S	2.19	3.14	0	0	0	5.33
SSW	5.74	2.73	0	0	0	8.47
SW	3.69	0.82	0	0	0	4.51
WSW	4.51	1.23	0	0	0	5.74
W	3.83	5.87	0	0	0	9.7
WNW	2.73	5.19	0	0	0	7.92
NW	2.19	4.23	0	0	0	6.42
NNW	1.78	2.6	0	0	0	4.38
Summary	41.56	49.99	0	0	0	91.55



Lakeland Industry & Community Association

Tamarack Site - October 2023

Summary of Hourly Averages

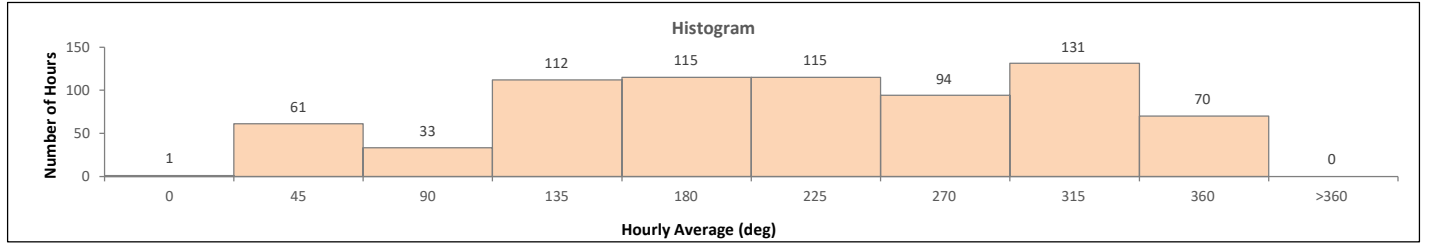
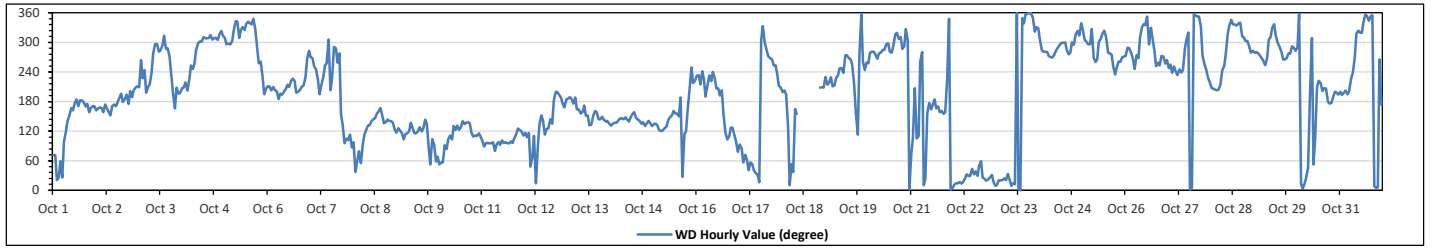
WIND DIRECTION (VWD) in sector

Monthly Average:	224 (SW) degree	Hours in Service:	744
		Hours of Data:	732
		Hours of Missing Data:	12
		Hours of Calibration:	0
		Operational Uptime:	98.4

Day	Hourly Period Starting at (MST)																							Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant	
Oct 1	ENE	ENE	NNE	NNE	ENE	NNE	E	ESE	SE	SSE	SSE	SSE	S	S	S	S	S	SSE	S	SSE	SSE	S	S	163	SSE		
Oct 2	SSE	SSE	SSE	SSE	SSE	S	SSE	SSE	SSE	S	S	S	S	S	S	S	S	SSE	S	SSE	S	SSE	SSE	174	S		
Oct 3	SSW	W	SW	WSW	SSW	SSW	SSW	WSW	W	WNW	WNW	W	WNW	WNW	NW	WNW	WNW	W	SW	SSW	SSE	SSW	SSW	273	W		
Oct 4	SSW	SSW	SW	SSW	SW	WSW	WSW	WSW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	294	WNW		
Oct 5	NW	WNW	WNW	WNW	WNW	NW	NNW	NNW	NW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NW	WNW	WSW	W	SW	SSW	319	NW		
Oct 6	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	W	W	213	SSW
Oct 7	W	W	WSW	WSW	SW	SSW	SSW	SW	WSW	WSW	NW	SSW	SW	WNW	WNW	WSW	W	SSE	SE	E	ESE	E	ESE	E	239	WSW	
Oct 8	E	NE	ENE	ENE	NE	E	ESE	ESE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	ESE	139	SE	
Oct 9	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	ESE	ESE	SE	SE	SE	SE	SE	E	NE	ESE	E	ENE	ESE	118	ESE	
Oct 10	NE	NE	NE	E	E	ESE	ESE	ESE	SE	ESE	SE	ESE	SE	SE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	120	ESE	
Oct 11	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	SE	ESE	ESE	101	E
Oct 12	ESE	ESE	ESE	NE	ENE	ESE	NNE	E	SE	SSE	SE	ESE	ESE	SE	SE	SE	S	SSW	SSW	S	S	S	SSE	S	146	SE	
Oct 13	S	S	S	S	S	SSE	SSE	SSE	SSE	S	SSE	SSE	SE	SE	SSE	SSE	SSE	SE	SE	SSE	SE	SE	SE	SE	SE	155	SSE
Oct 14	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	142	SE
Oct 15	SE	SE	SE	ESE	ESE	ESE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	S	NNE	ESE	ESE	SSE	SSW	SSW	SSW	SSW	SSW	144	SE	
Oct 16	SW	SW	SSW	WSW	SW	S	SSW	SW	WSW	WSW	SSW	SSW	S	SSW	SSE	ESE	ESE	ESE	SE	SE	ESE	E	ENE	E	172	S	
Oct 17	E	E	NE	ENE	ENE	NE	NE	NE	NE	NNE	NNE	WNW	NNW	WNW	WNW	W	W	WSW	WSW	SSW	SSW	SSW	SSW	SSW	342	NNW	
Oct 18	SSW	SSW	SSW	SE	N	NE	NE	SSE	SSE	K	K	K	K	K	K	K	K	K	K	K	K	K	K	SSW	SSW	NA	NA
Oct 19	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	247	WSW
Oct 20	WSW	W	W	W	W	W	W	W	W	WNW	WNW	WNW	W	W	WNW	NW	NW	NW	NW	WNW	WNW	NW	WNW	N	287	WNW	
Oct 21	ENE	ESE	SSW	ESE	ESE	W	N	NNE	SSE	S	SSE	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSW	NNW	N	N	154	SSE		
Oct 22	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	NE	NNE	NE	ENE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	25	NNE
Oct 23	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNW	NNW	N	N	N	N	N	N	N	N	4	N	
Oct 24	NW	WNW	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	292	WNW	
Oct 25	NW	WNW	WNW	WNW	WNW	NW	W	WSW	W	WNW	NW	NW	NW	W	W	WSW	SW	WSW	W	W	W	W	W	W	284	WNW	
Oct 26	W	WNW	WNW	W	W	WSW	W	W	NW	NNW	NNW	NNW	N	WNW	NNW	NW	W	WSW	WSW	WSW	W	W	WSW	W	288	WNW	
Oct 27	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	295	WNW
Oct 28	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	296	WNW
Oct 29	W	W	W	W	W	WSW	W	WNW	NW	NNW	NNW	NW	WNW	WNW	W	W	W	W	W	W	W	W	W	W	285	WNW	
Oct 30	WNW	N	NNE	N	NNE	NNE	NE	SSW	NW	NE	ESE	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	SSW	SSW	SSW	204	SSW	
Oct 31	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	321	NW	

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Machine Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association
Tamarack Site - October 2023
Summary of Hour Standard Deviations

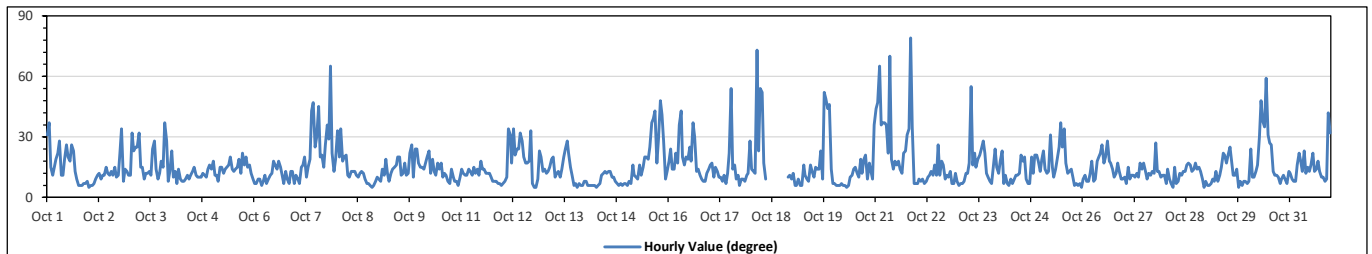
STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value: 79 degree on Oct 21 at hr 20		Hours in Service: 744	
Minimum Hourly Value: 5 degree on Oct 2 at hr 0		Hours of Data: 732	
		Hours of Missing Data: 12	
		Hours of Calibration: 0	
		Operational Uptime: 98.4	

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			23		
Oct 1	31	37	15	11	15	19	22	28	11	11	19	26	20	18	26	23	13	9	6	6	6	7	7	8	6	37		
Oct 2	5	6	6	7	9	11	12	9	11	11	15	12	11	13	11	15	10	11	22	34	8	14	13	11	5	34		
Oct 3	11	32	23	25	25	32	15	15	9	12	12	13	11	24	28	14	9	12	18	15	37	28	8	13	8	37		
Oct 4	23	10	13	7	14	9	8	8	9	11	9	11	13	15	11	10	10	10	12	11	10	14	16	14	7	23		
Oct 5	18	11	11	8	15	15	12	14	15	16	20	14	13	14	15	19	12	22	16	20	15	16	12	9	8	22		
Oct 6	7	7	9	9	6	8	11	7	9	11	12	18	16	14	18	15	11	7	13	9	7	13	13	7	6	18		
Oct 7	11	9	7	15	16	20	10	15	19	43	47	25	30	45	20	21	15	26	36	29	65	22	13	19	7	65		
Oct 8	33	20	34	18	20	21	11	10	13	13	13	11	10	12	13	12	9	7	7	6	5	6	8	10	5	34		
Oct 9	9	8	14	11	19	12	8	12	14	15	16	20	20	11	12	17	11	12	22	26	10	24	24	17	8	26		
Oct 10	15	15	14	17	20	23	12	19	13	11	17	14	17	10	12	11	8	7	14	10	8	8	6	10	6	23		
Oct 11	14	12	11	11	14	13	11	15	12	14	11	18	14	14	12	12	12	10	8	8	8	7	7	6	6	18		
Oct 12	7	8	10	34	31	17	34	21	24	24	32	28	20	17	17	18	33	7	5	5	9	23	20	13	5	34		
Oct 13	14	12	13	15	19	20	10	12	13	10	14	20	24	28	22	15	11	6	7	5	7	6	6	6	5	28		
Oct 14	8	6	6	6	6	6	5	6	7	11	12	13	12	13	13	10	10	8	7	6	7	6	7	7	5	13		
Oct 15	6	8	7	16	11	10	9	16	11	15	20	20	19	25	37	39	43	17	29	48	41	28	9	13	6	48		
Oct 16	18	24	14	14	22	17	36	43	20	16	20	19	25	18	37	30	13	14	11	9	8	8	12	14	8	43		
Oct 17	16	17	10	15	13	10	10	8	11	7	12	22	54	14	16	9	11	6	9	9	8	11	12	28	6	54		
Oct 18	14	13	12	73	23	54	52	17	9	K	K	K	K	K	K	K	K	K	K	K	K	K	K	10	11	9	9	73
Oct 19	12	6	6	9	6	6	16	11	9	8	16	13	10	15	14	14	23	9	52	49	44	46	14	7	6	52		
Oct 20	7	6	6	6	7	6	6	5	6	10	11	14	15	12	10	19	12	19	21	9	17	13	9	36	5	36		
Oct 21	44	47	65	36	37	37	36	22	70	19	14	18	16	18	14	12	22	23	31	34	79	35	7	7	7	79		
Oct 22	7	9	8	9	7	8	10	11	13	11	16	11	26	11	18	16	9	11	10	13	7	7	12	8	7	26		
Oct 23	6	7	7	8	12	12	17	55	16	22	15	19	21	24	28	22	12	10	8	7	16	24	15	12	6	55		
Oct 24	18	23	7	11	7	6	9	7	9	11	11	12	21	18	20	9	7	7	20	12	21	21	18	13	6	23		
Oct 25	19	23	14	12	13	31	15	10	14	19	25	37	25	34	17	12	13	14	10	6	7	6	7	5	5	37		
Oct 26	9	11	8	8	12	18	8	9	18	20	22	26	17	20	28	18	17	14	10	12	17	13	9	9	8	28		
Oct 27	10	7	15	9	11	11	10	12	10	17	14	17	13	9	12	11	13	12	27	13	13	10	11	11	7	27		
Oct 28	7	14	9	7	5	15	7	8	12	11	13	13	16	17	16	13	14	17	14	15	13	9	5	8	5	17		
Oct 29	6	6	7	9	8	13	8	11	15	22	21	17	21	25	18	11	11	14	5	8	6	8	8	7	5	25		
Oct 30	8	24	10	10	13	16	30	48	38	35	59	31	27	26	13	11	11	10	7	9	11	9	7	13	7	59		
Oct 31	12	9	8	8	16	22	18	13	23	12	15	13	16	22	13	14	18	13	10	10	8	9	42	32	8	42		
Diurnal Minimum	5	6	6	6	5	6	5	5	6	7	9	11	10	9	10	9	7	6	5	5	5	6	5	5	5	5		
Diurnal Maximum	44	47	65	73	37	54	52	55	70	43	59	37	54	45	37	39	43	26	52	49	79	46	42	36	36			

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Machine Malfunction/Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



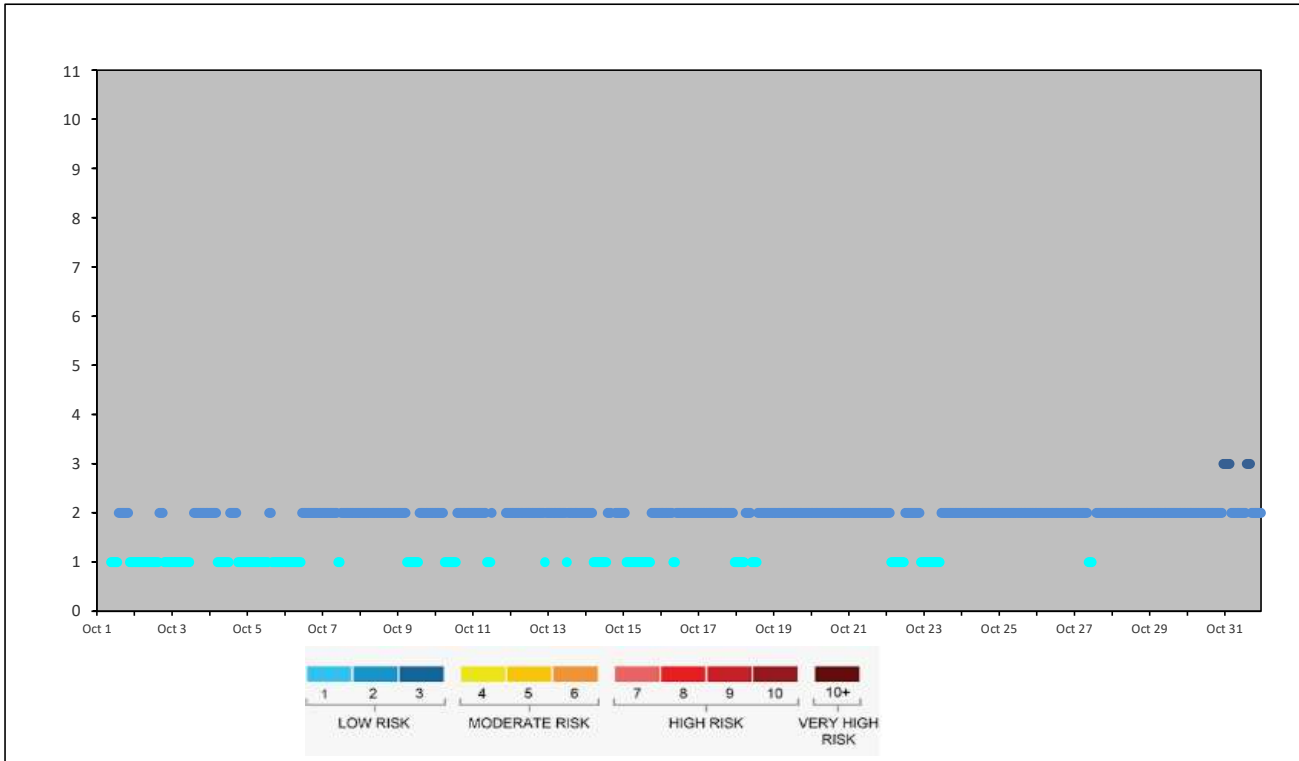
ST. LINA STATION

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - October 2023

AIR QUALITY HEALTH INDEX

Day	Hourly Period Starting at (MST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Oct 1										1	1	1	1	1	2	2	2	2	2	2	2	1	1	1
Oct 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1
Oct 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 4	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Oct 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1
Oct 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1
Oct 7	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 9	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 10	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 11	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Oct 13	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
Oct 14	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 15	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Oct 16	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Oct 18	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2
Oct 19	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 21	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 22	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1
Oct 23	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Oct 24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 25	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 27	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Oct 28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Oct 31	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2



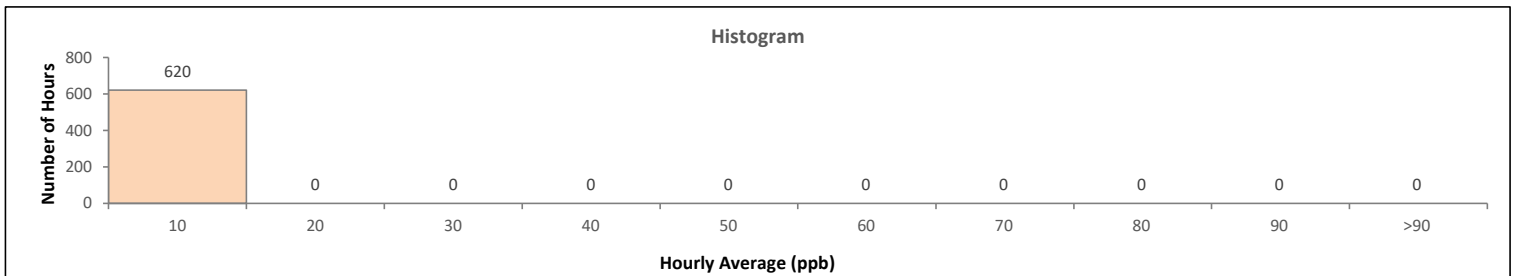
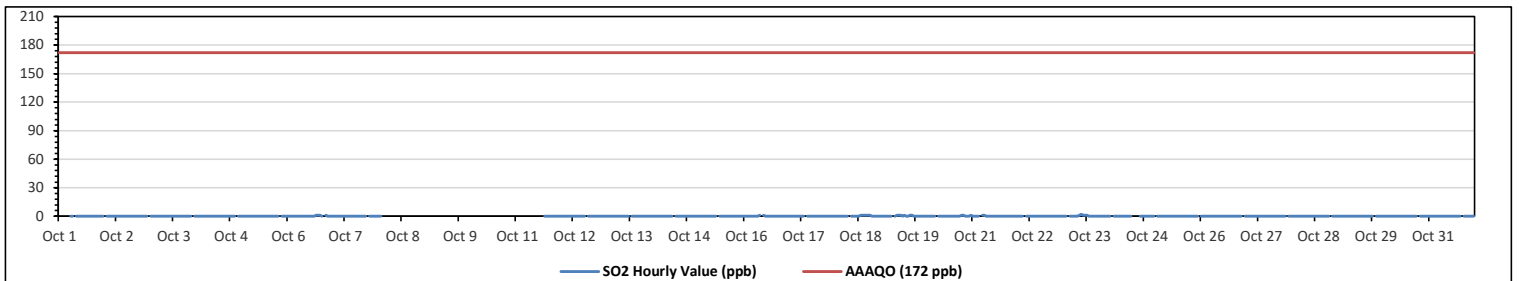
Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																													
Number of 1-Hour Exceedances:					0					Number of 24-Hour Exceedances:					0					30-Day Exceedence:					0				
Maximum Hourly Value:					2 ppb on Oct 23 at hr 9					Hours in Service:					744														
Maximum Daily Value:					0.3 ppb on Oct 18					Hours of Data:					620														
Minimum Hourly Value:					0 ppb on Oct 1 at hr 6					Hours of Missing Data:					91														
Minimum Daily Value:					0.0 ppb on Oct 2					Hours of Calibration:					33														
Monthly Average:					0.0 ppb					Operational Uptime:					87.8														
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
Oct 1	ND	ND	ND	ND	ND	ND	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA	
Oct 2	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	
Oct 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0.0	
Oct 4	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	
Oct 5	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	
Oct 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	S	1	0	0	0	0	1	0.2	
Oct 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	
Oct 8	0	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	NA	
Oct 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	
Oct 10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	
Oct 11	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	NA	
Oct 12	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Oct 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	
Oct 14	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Oct 15	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Oct 16	0	0	0	0	0	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	
Oct 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	
Oct 18	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	0.3	
Oct 19	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	
Oct 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0.1	
Oct 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	1	0.1	
Oct 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	
Oct 23	0	0	0	S	0	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3	
Oct 24	0	S	S	0	0	0	0	0	0	0	0	0	0	0	NRM	NRM	NRM	NRM	0	0	0	0	0	0	0	0	0	0.0	
Oct 25	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Oct 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	
Oct 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	
Oct 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	
Oct 29	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	
Oct 30	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	
Oct 31	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	
Diurnal Maximum																								0	0	0			
Diurnal Average																								0.0	0.0	0.0			

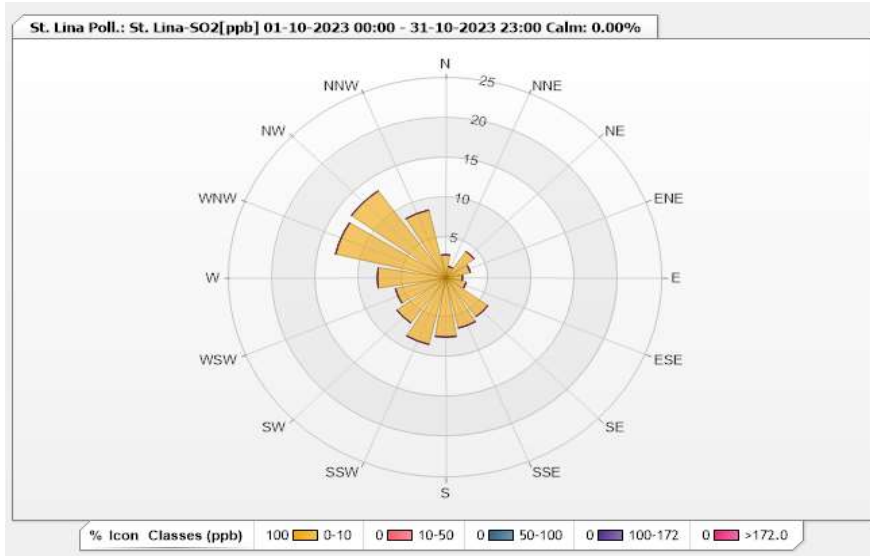


Station: St. Lina Poll.: St. Lina-SO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 83.33% Calm Avg: 0.00 [ppm]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	2.9	0	0	0	0	2.9
NNE	1.45	0	0	0	0	1.45
NE	4.03	0	0	0	0	4.03
ENE	2.9	0	0	0	0	2.9
E	1.94	0	0	0	0	1.94
ESE	2.42	0	0	0	0	2.42
SE	5.97	0	0	0	0	5.97
SSE	6.45	0	0	0	0	6.45
S	7.42	0	0	0	0	7.42
SSW	8.55	0	0	0	0	8.55
SW	6.94	0	0	0	0	6.94
WSW	5.97	0	0	0	0	5.97
W	7.9	0	0	0	0	7.9
WNW	13.06	0	0	0	0	13.06
NW	13.39	0	0	0	0	13.39
NNW	8.71	0	0	0	0	8.71
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

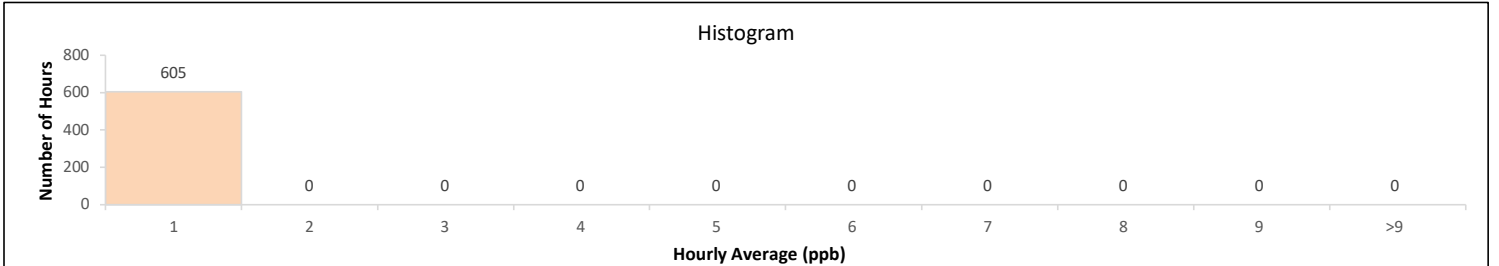
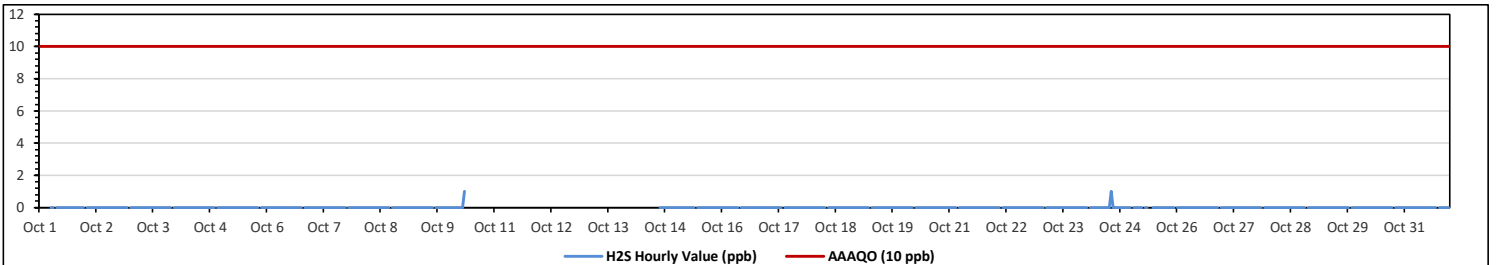
HYDROGEN SULPHIDE (H₂S) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 10 ppb, 24-Hour 3 ppb																							
Number of 1-Hour Exceedances:												Number of 24-Hour Exceedances:											
Maximum Hourly Value:												Hours in Service:											
Maximum Daily Value:												Hours of Data:											
Minimum Hourly Value:												Hours of Missing Data:											
Minimum Daily Value:												Hours of Calibration:											
Monthly Average:												Operational Uptime:											

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23									
Oct 1	ND	ND	ND	ND	ND	ND	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				
Oct 2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Oct 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				
Oct 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			
Oct 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			
Oct 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		
Oct 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	
Oct 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	
Oct 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	
Oct 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	
Oct 11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	
Oct 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	
Oct 13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	
Oct 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	
Oct 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 25	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 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
Oct 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
Oct 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
Oct 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction /Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

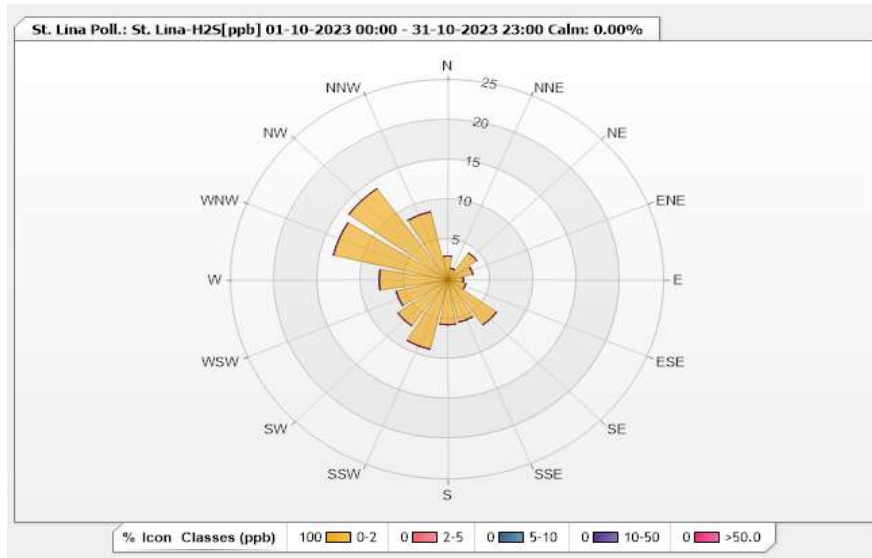


Station: St. Lina Poll.: St. Lina-H2S[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 81.32% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	2.98	0	0	0	0	2.98
NNE	1.49	0	0	0	0	1.49
NE	4.13	0	0	0	0	4.13
ENE	2.98	0	0	0	0	2.98
E	1.82	0	0	0	0	1.82
ESE	2.15	0	0	0	0	2.15
SE	6.94	0	0	0	0	6.94
SSE	5.45	0	0	0	0	5.45
S	5.62	0	0	0	0	5.62
SSW	8.93	0	0	0	0	8.93
SW	7.11	0	0	0	0	7.11
WSW	6.12	0	0	0	0	6.12
W	7.93	0	0	0	0	7.93
WNW	13.55	0	0	0	0	13.55
NW	14.05	0	0	0	0	14.05
NNW	8.76	0	0	0	0	8.76
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

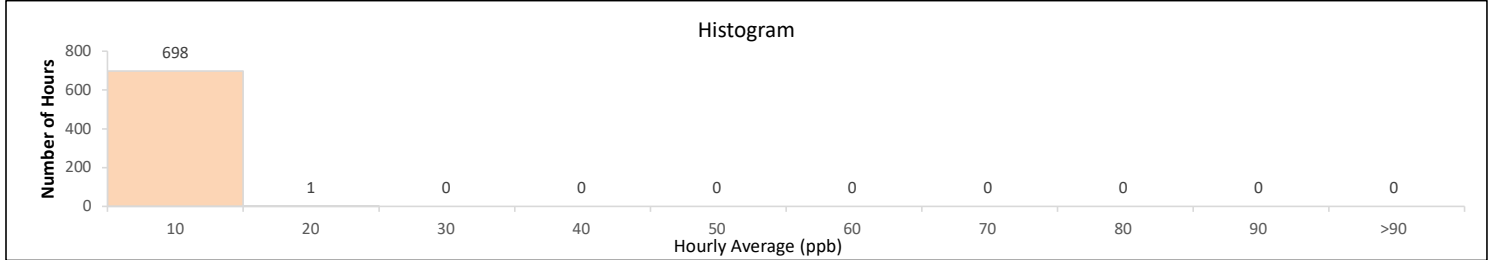
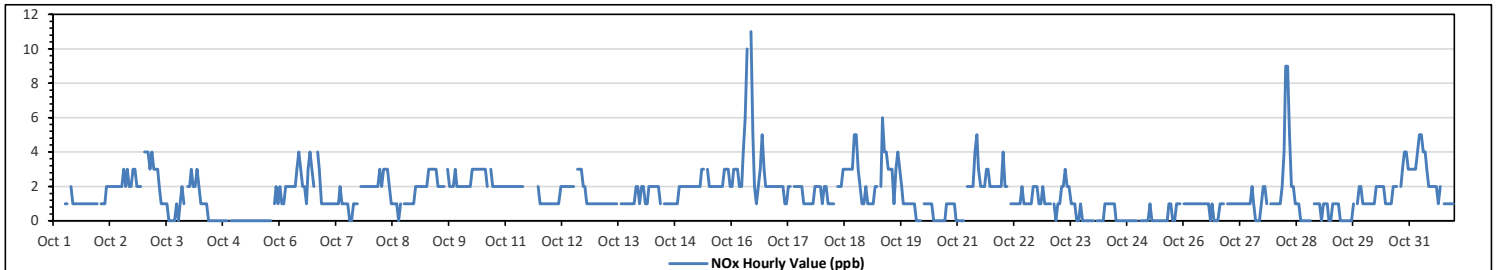
OXIDES OF NITROGEN (NOx) in ppb

Maximum Hourly Value:	11 ppb	on Oct 16 at hr 10	Hours in Service:	744
Maximum Daily Value:	3.4 ppb	on Oct 16	Hours of Data:	699
Minimum Hourly Value:	0 ppb	on Oct 3 at hr 13	Hours of Missing Data:	6
Minimum Daily Value:	0.2 ppb	on Oct 5	Hours of Calibration:	39
Monthly Average:	1.5 ppb		Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			
Oct 1	ND	ND	ND	ND	ND	ND	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Oct 2	S	1	1	1	2	2	2	2	2	2	2	2	3	2	3	2	2	3	2	2	2	2	2	S	2	2
Oct 3	4	4	4	3	4	3	3	3	2	1	1	1	1	0	0	0	0	1	0	1	2	1	S	S	2	0
Oct 4	2	3	2	2	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0
Oct 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	2	1	0
Oct 6	2	1	1	2	2	2	2	2	2	3	4	3	2	2	1	3	4	3	2	S	S	4	3	1	1	1
Oct 7	1	1	1	1	1	1	1	1	2	1	1	1	1	0	1	1	1	1	S	2	2	2	2	2	2	0
Oct 8	2	2	2	2	2	3	2	3	3	3	3	2	1	1	1	0	1	S	1	1	1	1	1	1	1	0
Oct 9	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	S	3	2	2	2	3	2	2	2	2
Oct 10	2	2	2	2	2	2	3	3	3	3	3	3	3	2	S	3	2	2	2	2	2	2	2	2	2	2
Oct 11	2	2	2	2	2	2	2	2	2	2	2	2	2	C	C	C	C	C	C	C	2	1	1	1	1	1
Oct 12	1	1	1	1	1	2	2	2	2	2	2	2	S	3	3	3	3	2	2	1	1	1	1	1	1	1
Oct 13	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
Oct 14	2	2	1	1	2	2	2	2	2	2	2	1	S	1	1	1	1	1	1	1	1	1	2	2	2	1
Oct 15	2	2	2	2	2	2	2	2	2	3	3	S	3	2	2	2	2	2	2	2	2	3	3	3	2	2
Oct 16	2	3	3	3	2	2	4	6	10	S	11	5	2	1	2	3	5	3	2	2	2	2	2	2	2	1
Oct 17	2	2	2	2	1	1	2	2	S	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1
Oct 18	1	2	2	1	1	1	1	S	2	2	2	3	3	3	3	3	3	5	5	3	2	2	1	1	2	1
Oct 19	1	1	1	1	2	2	S	2	6	4	4	3	3	3	1	3	4	3	2	1	1	1	1	1	1	1
Oct 20	1	1	0	0	0	S	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0
Oct 21	0	0	0	0	S	2	2	2	2	4	5	3	2	2	2	3	3	2	2	2	2	2	2	2	2	2
Oct 22	4	2	2	S	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2	2	1	1	1	1
Oct 23	1	1	S	1	0	1	1	2	2	3	2	2	1	1	1	0	0	1	0	0	0	0	0	0	0	0
Oct 24	0	S	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct 25	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0
Oct 26	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	S	1	1	0
Oct 27	1	1	1	1	1	1	1	1	1	1	1	2	1	0	0	0	0	1	2	2	1	S	1	1	1	0
Oct 28	1	1	1	1	2	4	9	9	5	2	2	1	1	1	0	0	0	0	0	0	S	1	1	1	1	0
Oct 29	1	0	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	S	1	2	2	1	0
Oct 30	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	2	2	2	S	2	3	4	4	3	1	1
Oct 31	3	3	3	3	4	5	5	4	4	3	2	2	2	2	2	1	2	S	1	1	1	1	1	1	1	1
Diurnal Maximum	4	4	4	3	4	5	9	9	10	4	11	5	3	3	3	5	5	5	3	4	4	4	4	3	3	3
Diurnal Average	1.5	1.5	1.4	1.3	1.5	1.7	1.9	2.1	2.3	1.9	2.1	1.6	1.3	1.2	1.0	1.2	1.4	1.4	1.3	1.2	1.5	1.6	1.4	1.3	1.3	1.3

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

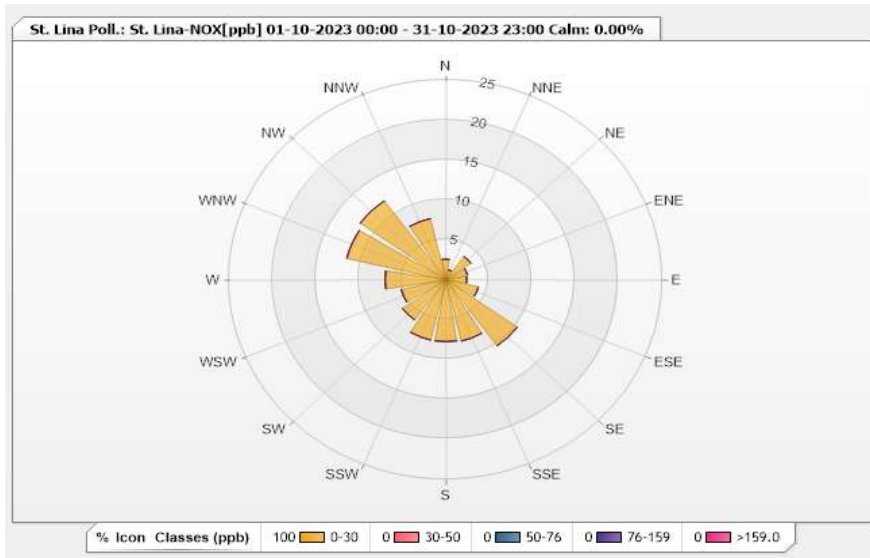


Station: St. Lina Poll.: St. Lina-NOX[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.95% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.58	0	0	0	0	2.58
NNE	1.29	0	0	0	0	1.29
NE	3.58	0	0	0	0	3.58
ENE	2.58	0	0	0	0	2.58
E	2.43	0	0	0	0	2.43
ESE	3.86	0	0	0	0	3.86
SE	10.16	0	0	0	0	10.16
SSE	7.87	0	0	0	0	7.87
S	7.73	0	0	0	0	7.73
SSW	7.73	0	0	0	0	7.73
SW	6.15	0	0	0	0	6.15
WSW	5.29	0	0	0	0	5.29
W	7.01	0	0	0	0	7.01
WNW	11.73	0	0	0	0	11.73
NW	12.16	0	0	0	0	12.16
NNW	7.87	0	0	0	0	7.87
Summary	100	0	0	0	0	100

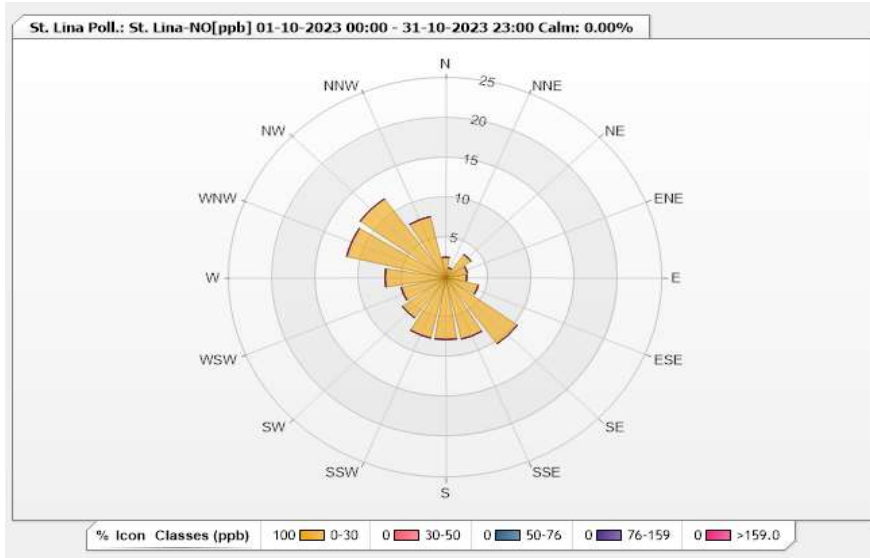


Station: St. Lina Poll.: St. Lina-NO[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.95% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.58	0	0	0	0	2.58
NNE	1.29	0	0	0	0	1.29
NE	3.58	0	0	0	0	3.58
ENE	2.58	0	0	0	0	2.58
E	2.43	0	0	0	0	2.43
ESE	3.86	0	0	0	0	3.86
SE	10.16	0	0	0	0	10.16
SSE	7.87	0	0	0	0	7.87
S	7.73	0	0	0	0	7.73
SSW	7.73	0	0	0	0	7.73
SW	6.15	0	0	0	0	6.15
WSW	5.29	0	0	0	0	5.29
W	7.01	0	0	0	0	7.01
WNW	11.73	0	0	0	0	11.73
NW	12.16	0	0	0	0	12.16
NNW	7.87	0	0	0	0	7.87
Summary	100	0	0	0	0	100



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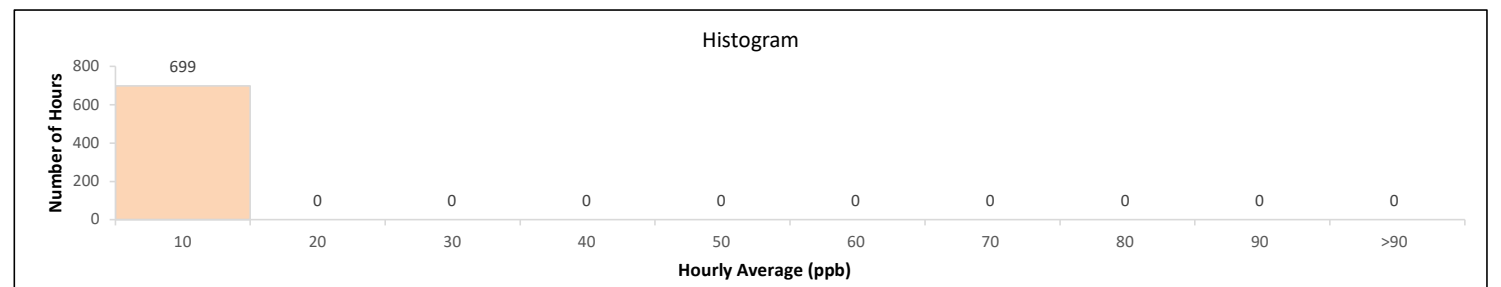
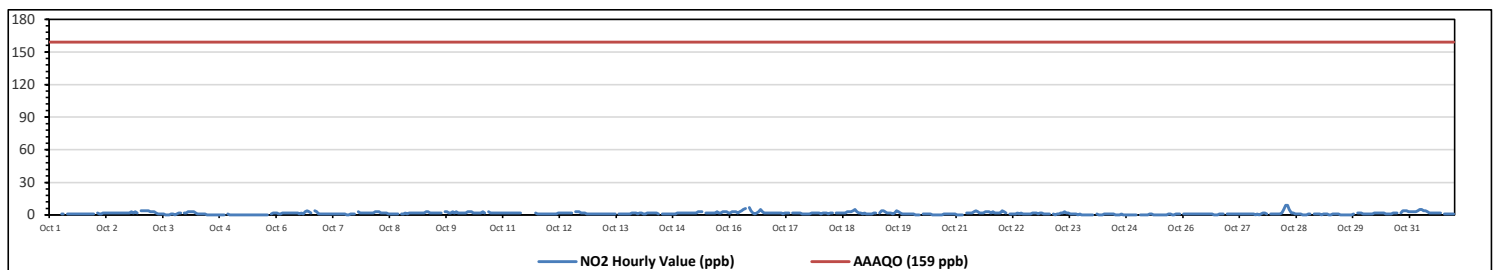
St. Lina Site - October 2023

Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																												
Number of 1-Hour Exceedances: 0																												
Maximum Hourly Value: 9 ppb on Oct 28 at hr 6												Hours in Service: 744																
Maximum Daily Value: 3.0 ppb on Oct 16												Hours of Data: 699																
Minimum Hourly Value: 0 ppb on Oct 3 at hr 13												Hours of Missing Data: 6																
Minimum Daily Value: 0.2 ppb on Oct 5												Hours of Calibration: 39																
Monthly Average: 1.5 ppb												Operational Uptime: 99.2																
Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average	
Oct 1	ND	ND	ND	ND	ND	ND	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	NA
Oct 2	S	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	S	1	3	2.0	
Oct 3	4	4	4	4	4	3	3	3	2	1	1	1	1	0	0	1	1	0	1	2	2	S	S	2	0	4	1.9	
Oct 4	2	3	3	3	3	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	S	S	1	0	3	1.0	
Oct 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	1	2	2	0	2	0.2
Oct 6	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	3	4	3	2	S	4	3	1	1	1	4	2.0	
Oct 7	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	S	S	3	2	2	2	2	0	3	1.2	
Oct 8	2	2	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1	S	1	1	2	1	2	2	1	3	1.7	
Oct 9	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	S	3	3	2	2	3	2	3	2	3	2.3	
Oct 10	2	2	2	2	2	3	3	3	2	2	2	2	2	2	S	3	2	2	2	2	2	2	2	2	2	3	2.2	
Oct 11	2	2	2	2	2	2	2	2	2	2	C	C	C	C	C	C	C	2	1	1	1	1	1	1	1	2	NA	
Oct 12	1	1	1	1	1	2	2	2	2	2	2	2	S	3	3	3	2	2	2	1	1	1	1	1	1	3	1.7	
Oct 13	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	2	2	2	1	1	2	1.1	
Oct 14	2	2	1	1	2	2	2	2	2	2	1	S	1	1	1	1	1	1	1	1	2	2	2	2	1	2	1.5	
Oct 15	2	2	2	2	2	2	2	3	3	S	2	2	2	2	2	2	3	2	2	3	3	3	2	2	2	3	2.3	
Oct 16	2	3	3	3	2	3	4	5	6	S	7	4	2	1	2	3	5	3	2	2	2	2	2	2	1	7	3.0	
Oct 17	2	2	2	2	1	2	2	2	S	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	1	2	1.7	
Oct 18	1	2	2	2	1	2	2	S	2	2	2	2	2	2	3	3	3	4	5	3	2	2	1	2	1	5	2.3	
Oct 19	1	1	1	1	2	2	S	2	4	4	3	2	2	2	2	4	3	2	1	1	1	1	1	1	1	4	1.9	
Oct 20	1	1	0	0	0	S	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0.6	
Oct 21	0	0	0	0	0	S	2	2	2	2	3	4	3	2	2	3	3	3	2	3	2	2	2	2	0	4	2.0	
Oct 22	4	3	2	S	1	1	1	1	2	1	2	1	1	1	1	2	2	2	2	1	2	2	1	1	1	4	1.6	
Oct 23	1	1	S	1	0	1	1	2	2	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	3	0.9	
Oct 24	0	S	1	0	0	0	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.3	
Oct 25	S	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	S	0	1	0.3	
Oct 26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	S	1	0	1	0.9	
Oct 27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	2	2	1	S	1	1	0	2	1.0	
Oct 28	1	1	1	1	2	5	9	9	5	2	2	1	1	1	1	0	0	0	1	1	S	1	1	1	0	9	2.0	
Oct 29	1	0	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	S	2	2	2	1	0	2	0.7	
Oct 30	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	S	2	4	4	4	3	1	4	1.9
Oct 31	3	3	3	3	4	5	5	4	4	3	2	2	2	2	2	2	2	S	1	1	1	1	1	1	1	5	2.5	
Diurnal Maximum	4	4	4	4	4	5	9	9	6	4	7	4	2	3	3	3	5	4	5	3	4	4	4	4	3			
Diurnal Average	1.5	1.6	1.4	1.4	1.5	1.9	2.0	2.1	2.0	1.7	1.8	1.4	1.2	1.1	1.1	1.3	1.5	1.5	1.3	1.4	1.7	1.7	1.5	1.4				
C Monthly Calibration											S Daily Zero-Span Check											Q Quality Assurance						
K Collection Error											ND No Data (Machine Not in Service)											Y Routine Maintenance						
X InValid Data (Equipment Malfunction /Recovery)											NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)											P Power Failure						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

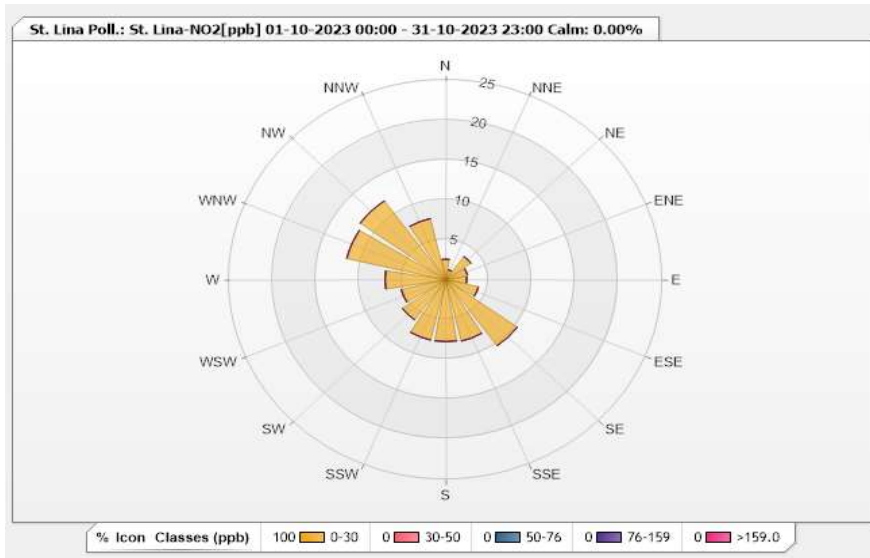


Station: St. Lina Poll.: St. Lina-NO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.95% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.58	0	0	0	0	2.58
NNE	1.29	0	0	0	0	1.29
NE	3.58	0	0	0	0	3.58
ENE	2.58	0	0	0	0	2.58
E	2.43	0	0	0	0	2.43
ESE	3.86	0	0	0	0	3.86
SE	10.16	0	0	0	0	10.16
SSE	7.87	0	0	0	0	7.87
S	7.73	0	0	0	0	7.73
SSW	7.73	0	0	0	0	7.73
SW	6.15	0	0	0	0	6.15
WSW	5.29	0	0	0	0	5.29
W	7.01	0	0	0	0	7.01
WNW	11.73	0	0	0	0	11.73
NW	12.16	0	0	0	0	12.16
NNW	7.87	0	0	0	0	7.87
Summary	100	0	0	0	0	100

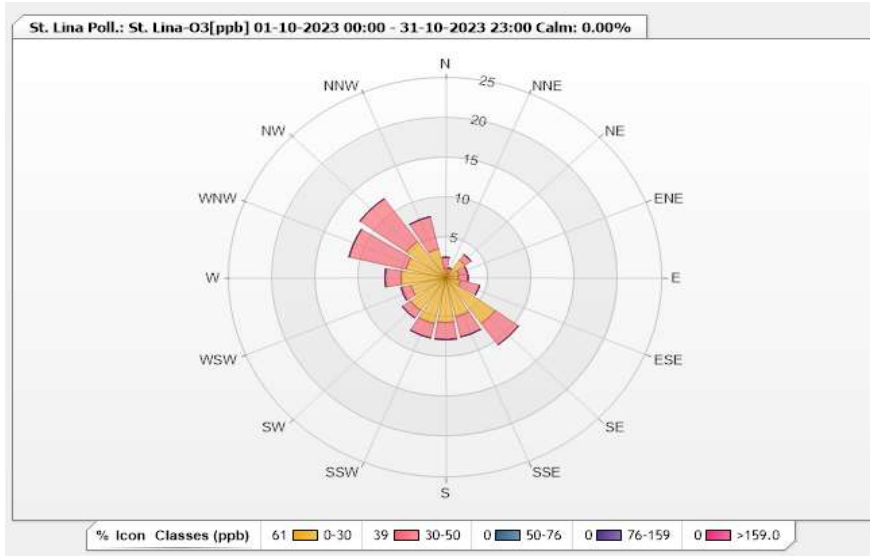


Station: St. Lina Poll.: St. Lina-O3[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 93.82% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.15	1.43	0	0	0	2.58
NNE	0.57	0.72	0	0	0	1.29
NE	2.72	0.86	0	0	0	3.58
ENE	1.58	1	0	0	0	2.58
E	1.43	1.15	0	0	0	2.58
ESE	1.72	2.29	0	0	0	4.01
SE	7.02	3.3	0	0	0	10.32
SSE	5.01	2.58	0	0	0	7.59
S	5.59	2.15	0	0	0	7.74
SSW	5.87	1.86	0	0	0	7.73
SW	5.01	1.15	0	0	0	6.16
WSW	4.15	1.15	0	0	0	5.3
W	5.16	1.86	0	0	0	7.02
WNW	4.73	6.73	0	0	0	11.46
NW	5.59	6.59	0	0	0	12.18
NNW	3.72	4.15	0	0	0	7.87
Summary	61.02	38.97	0	0	0	100

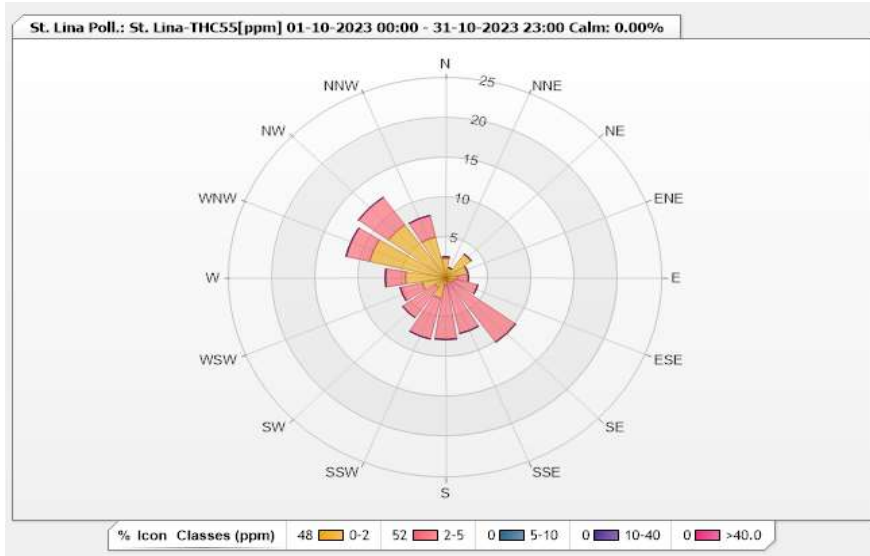


Station: St. Lina Poll.: St. Lina-THC55[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 92.20% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	2.48	0.15	0	0	0	2.63
NNE	1.31	0	0	0	0	1.31
NE	3.64	0	0	0	0	3.64
ENE	2.62	0	0	0	0	2.62
E	1.31	1.31	0	0	0	2.62
ESE	1.02	2.77	0	0	0	3.79
SE	0.73	9.18	0	0	0	9.91
SSE	0.29	6.85	0	0	0	7.14
S	1.02	6.71	0	0	0	7.73
SSW	2.62	5.25	0	0	0	7.87
SW	1.46	4.66	0	0	0	6.12
WSW	2.77	2.62	0	0	0	5.39
W	4.66	2.33	0	0	0	6.99
WNW	9.04	2.77	0	0	0	11.81
NW	8.16	4.23	0	0	0	12.39
NNW	5.25	2.77	0	0	0	8.02
Summary	48.38	51.6	0	0	0	100

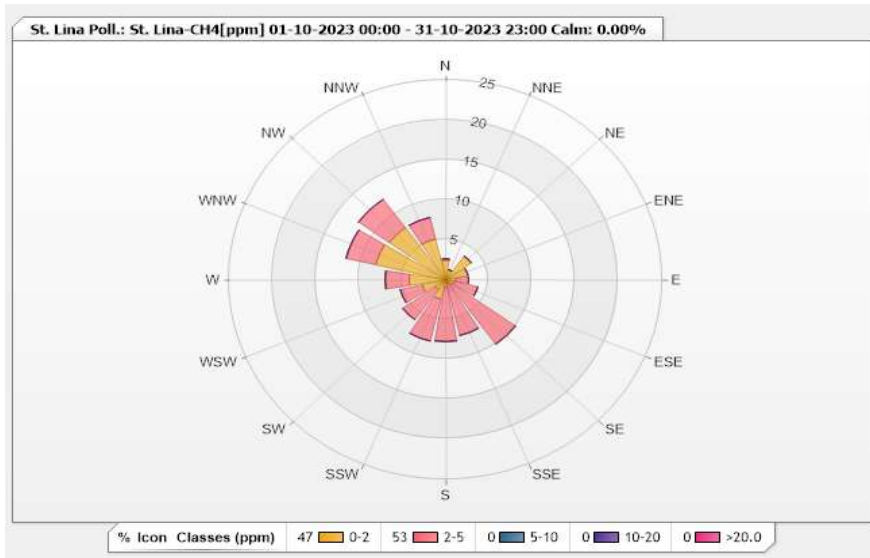


Station: St. Lina Poll.: St. Lina-CH4[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 92.20% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	2.48	0.15	0	0	0	2.63
NNE	1.31	0	0	0	0	1.31
NE	3.64	0	0	0	0	3.64
ENE	2.62	0	0	0	0	2.62
E	1.17	1.46	0	0	0	2.63
ESE	1.02	2.77	0	0	0	3.79
SE	0.73	9.18	0	0	0	9.91
SSE	0.29	6.85	0	0	0	7.14
S	1.02	6.71	0	0	0	7.73
SSW	2.48	5.39	0	0	0	7.87
SW	1.46	4.66	0	0	0	6.12
WSW	2.77	2.62	0	0	0	5.39
W	4.23	2.77	0	0	0	7
WNW	8.31	3.5	0	0	0	11.81
NW	8.02	4.37	0	0	0	12.39
NNW	5.25	2.77	0	0	0	8.02
Summary	46.8	53.2	0	0	0	100

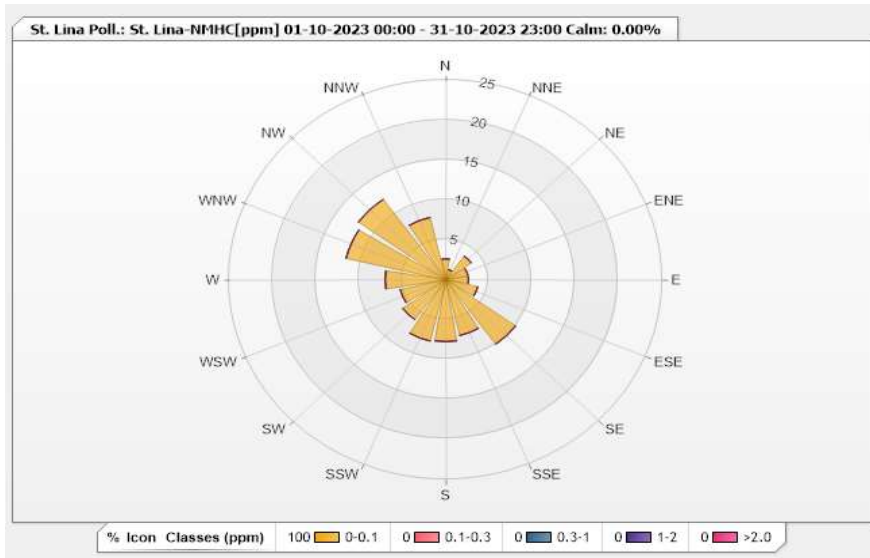


Station: St. Lina Poll.: St. Lina-NMHC[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 92.20% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	2.62	0	0	0	0	2.62
NNE	1.31	0	0	0	0	1.31
NE	3.64	0	0	0	0	3.64
ENE	2.62	0	0	0	0	2.62
E	2.62	0	0	0	0	2.62
ESE	3.79	0	0	0	0	3.79
SE	9.91	0	0	0	0	9.91
SSE	7.14	0	0	0	0	7.14
S	7.73	0	0	0	0	7.73
SSW	7.87	0	0	0	0	7.87
SW	6.12	0	0	0	0	6.12
WSW	5.39	0	0	0	0	5.39
W	7	0	0	0	0	7
WNW	11.81	0	0	0	0	11.81
NW	12.39	0	0	0	0	12.39
NNW	8.02	0	0	0	0	8.02
Summary	100	0	0	0	0	100



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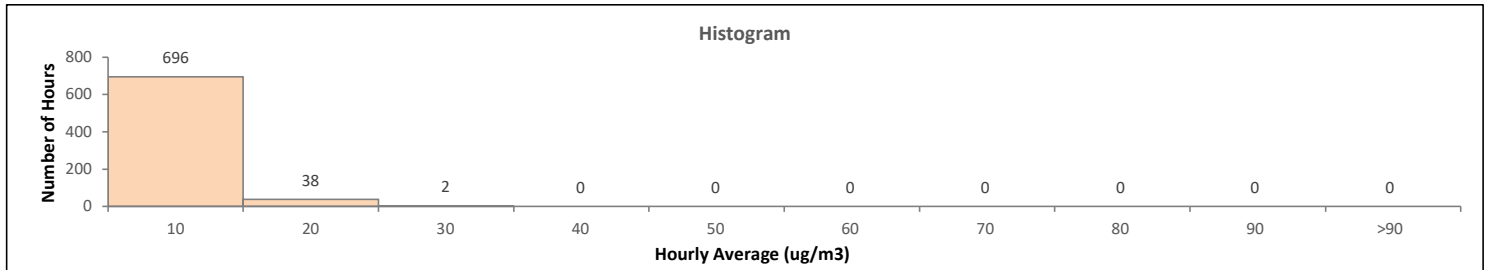
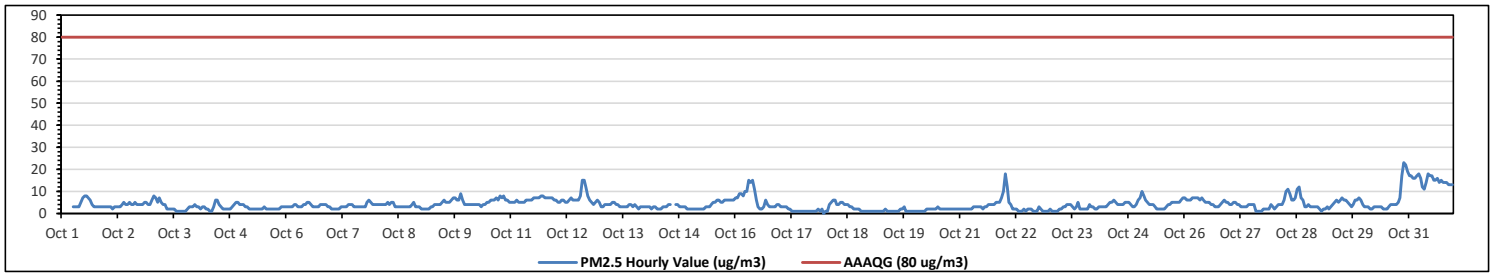
St. Lina Site - October 2023

Summary of Hourly Averages

PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Guideline (AAAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAAO): 24-Hour 29 µg/m ³																																															
Number of 1-Hour Exceedances: 0												Number of 24-Hour Exceedances: 0																																			
Maximum Hourly Value: 23 µg/m ³ on Oct 30 at hr 21												Hours in Service: 744																																			
Maximum Daily Value: 15.1 µg/m ³ on Oct 31												Hours of Data: 736																																			
Minimum Hourly Value: 0 µg/m ³ on Oct 17 at hr 23												Hours of Missing Data: 6																																			
Minimum Daily Value: 1 µg/m ³ on Oct 19												Hours of Calibration: 2																																			
Monthly Average: 4.3 µg/m ³												Operational Uptime: 99.2																																			
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
Oct 1	ND	ND	ND	ND	ND	ND	3	3	3	3	5	7	8	8	7	6	4	3	3	3	3	3	3	3	3	3	3	8	4.3																		
Oct 2	3	3	3	2	3	3	3	3	4	5	4	4	5	4	4	5	4	4	4	4	5	5	4	4	4	2	5	3.8																			
Oct 3	6	8	7	5	7	5	4	4	2	2	2	2	2	1	1	1	1	1	1	2	3	3	3	3	4	1	8	3.2																			
Oct 4	3	3	2	3	3	2	2	1	1	3	6	6	4	3	2	2	2	2	2	3	4	5	5	4	1	6	3.0																				
Oct 5	4	4	3	3	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	3	3	3	3	2	4	2.4																				
Oct 6	3	3	3	3	4	4	3	3	3	4	4	5	5	4	3	3	3	3	3	4	4	4	4	3	3	3	5	3.5																			
Oct 7	2	2	2	2	2	3	3	3	3	4	4	4	3	3	3	3	3	3	3	5	6	5	4	4	2	6	3.3																				
Oct 8	4	4	4	4	4	4	5	4	5	5	3	3	3	3	3	3	3	3	3	4	5	3	3	3	3	5	3.7																				
Oct 9	2	2	2	2	2	3	3	4	4	4	4	5	6	5	5	5	6	7	7	6	6	9	6	4	2	9	4.5																				
Oct 10	4	4	4	4	4	4	4	4	3	4	4	5	5	6	6	6	7	6	8	7	8	6	6	5	3	8	5.2																				
Oct 11	5	5	5	6	5	5	5	5	6	6	6	6	7	7	7	8	8	7	7	7	7	7	7	6	5	8	6.3																				
Oct 12	6	5	5	6	6	5	5	6	7	6	6	6	6	8	15	15	12	8	6	5	4	5	6	5	4	15	6.8																				
Oct 13	3	3	4	4	4	4	5	5	4	4	3	3	3	3	3	4	4	3	4	3	2	3	3	3	2	5	3.5																				
Oct 14	3	3	3	2	3	3	2	2	2	3	3	3	4	4	C	C	4	4	3	3	3	3	2	2	2	4	2.9																				
Oct 15	2	2	2	2	2	2	2	2	3	3	3	4	5	5	6	6	5	5	6	6	6	6	6	6	2	6	4.0																				
Oct 16	7	7	9	9	8	10	10	15	14	15	11	6	3	2	2	3	6	4	3	3	3	3	4	4	2	15	6.7																				
Oct 17	3	3	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	0	0	3	1.5																				
Oct 18	1	1	4	5	6	6	4	4	5	5	4	4	4	3	3	2	2	2	2	1	1	1	1	1	1	6	3.0																				
Oct 19	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	3	1	1	1	1	1	1	1	3	1.2																				
Oct 20	1	1	1	1	1	1	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	3	1.8																				
Oct 21	2	2	2	2	2	2	2	3	3	3	3	3	2	3	3	4	4	4	4	5	5	5	7	10	2	10	3.5																				
Oct 22	18	12	5	4	2	2	2	1	1	1	2	1	2	2	2	1	1	1	3	2	1	1	1	1	1	1	18	2.9																			
Oct 23	2	1	1	1	1	2	2	3	3	4	4	4	3	2	3	5	2	2	2	2	2	4	3	3	1	5	2.5																				
Oct 24	2	2	3	3	3	3	3	4	5	5	6	5	4	4	4	5	5	5	4	3	3	4	6	2	6	4.0																					
Oct 25	7	10	8	6	5	4	4	4	3	2	2	2	2	2	3	4	4	5	5	5	5	6	7	2	10	4.6																					
Oct 26	7	6	6	6	7	7	7	7	6	7	6	5	5	5	4	4	3	3	3	4	5	6	5	3	7	5.4																					
Oct 27	4	4	5	5	4	4	3	3	3	3	4	4	4	4	1	1	1	1	2	2	2	2	4	3	1	5	3.0																				
Oct 28	2	3	4	4	4	6	10	11	9	6	6	7	11	12	7	6	3	3	4	3	3	3	3	3	2	12	5.5																				
Oct 29	2	1	2	2	3	2	3	4	5	6	5	6	7	6	6	5	4	3	4	6	6	7	6	4	1	7	4.4																				
Oct 30	3	3	3	2	2	3	3	3	3	3	2	2	2	2	3	4	4	4	5	7	17	23	22	19	2	23	6.1																				
Oct 31	17	17	16	16	17	18	16	12	11	14	18	17	17	15	15	16	14	15	14	14	14	13	13	13	11	18	15.1																				
Diurnal Maximum	18	17	16	16	17	18	16	15	14	15	18	17	17	15	15	16	14	15	14	14	17	23	22	19																							
Diurnal Average	4.3	4.2	4.1	3.9	4.0	4.1	4.0	4.2	4.1	4.4	4.4	4.4	4.5	4.3	4.3	4.4	4.1	3.8	4.0	4.1	4.5	4.8	4.8	4.5																							
C	Monthly Calibration											S	Daily Zero-Span Check											Q	Quality Assurance																						
K	Collection Error											ND	No Data (Machine Not in Service)											Y	Routine Maintenance											P	Power Failure										
X	Invalid Data (Equipment Malfunction /Recovery)											NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																																		

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

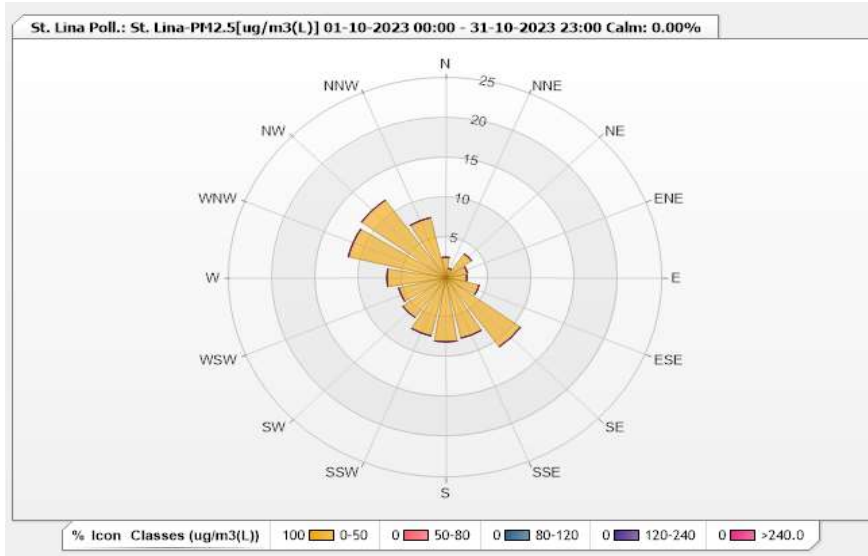


Station: St. Lina Poll.: St. Lina-PM2.5[ug/m3(L)] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 98.92% Calm Avg: 0.00 [ppm]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	2.58	0	0	0	0	2.58
NNE	1.22	0	0	0	0	1.22
NE	3.67	0	0	0	0	3.67
ENE	2.58	0	0	0	0	2.58
E	2.45	0	0	0	0	2.45
ESE	3.94	0	0	0	0	3.94
SE	10.6	0	0	0	0	10.6
SSE	7.74	0	0	0	0	7.74
S	8.02	0	0	0	0	8.02
SSW	7.47	0	0	0	0	7.47
SW	6.11	0	0	0	0	6.11
WSW	5.57	0	0	0	0	5.57
W	6.79	0	0	0	0	6.79
WNW	11.55	0	0	0	0	11.55
NW	11.96	0	0	0	0	11.96
NNW	7.74	0	0	0	0	7.74
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

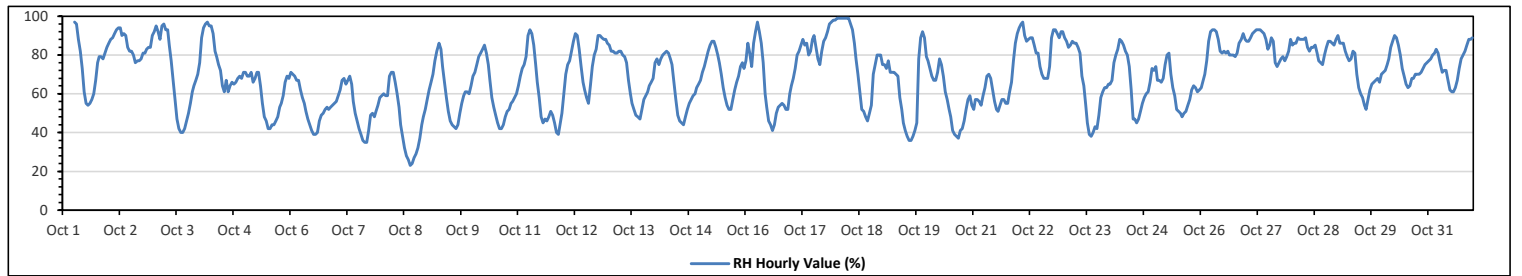
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	99 %	on Oct 18 at hr 0	Hours in Service:	744
Maximum Daily Value:	85.4 %	on Oct 27	Hours of Data:	738
Minimum Hourly Value:	23 %	on Oct 8 at hr 15	Hours of Missing Data:	6
Minimum Daily Value:	46.3 %	on Oct 8	Hours of Calibration:	0
Monthly Average:	69.0 %		Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																																																																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23																																																																				
Oct 1	ND	ND	ND	ND	ND	ND	97	96	88	82	73	61	55	54	55	57	60	67	76	79	79	78	81	84	54	97	73.4																																																																				
Oct 2	86	88	89	91	93	94	94	90	91	90	84	82	82	80	76	77	77	78	81	81	83	84	84	90	76	94	85.2																																																																				
Oct 3	92	95	92	88	95	96	93	93	85	77	67	57	47	42	40	40	42	46	50	55	61	64	67	70	40	96	68.9																																																																				
Oct 4	76	89	94	96	97	95	95	91	82	79	75	72	64	61	67	61	64	66	65	66	68	69	68	71	61	97	76.3																																																																				
Oct 5	71	69	69	71	66	68	71	71	64	55	48	46	42	42	44	44	46	48	53	55	59	66	69	68	42	71	58.5																																																																				
Oct 6	71	70	69	67	67	62	58	55	51	47	44	41	39	39	40	46	49	50	52	53	52	53	54	55	39	71	53.5																																																																				
Oct 7	56	59	62	67	68	65	67	69	65	56	50	46	42	39	36	35	35	41	49	50	48	51	54	58	35	69	52.8																																																																				
Oct 8	59	60	59	59	69	71	71	66	60	53	44	38	32	28	26	23	24	27	29	32	37	44	48	52	23	71	46.3																																																																				
Oct 9	57	62	66	70	77	82	86	83	74	66	58	51	46	44	43	42	44	50	55	59	61	61	60	64	42	86	60.9																																																																				
Oct 10	69	71	75	79	81	83	85	81	75	67	58	53	49	45	42	42	44	48	51	52	55	56	58	60	42	85	61.6																																																																				
Oct 11	64	69	73	75	79	90	93	91	85	75	66	58	48	45	47	46	48	51	49	45	40	39	44	50	39	93	61.3																																																																				
Oct 12	60	70	75	77	82	87	91	90	83	74	66	62	58	55	64	74	80	83	90	90	89	88	88	86	55	91	77.6																																																																				
Oct 13	85	82	82	81	81	82	82	80	79	76	67	60	55	52	49	48	47	52	57	59	61	64	66	68	47	85	67.3																																																																				
Oct 14	76	78	75	78	80	81	82	81	78	75	66	57	49	46	45	44	48	52	55	57	59	60	63	65	44	82	64.6																																																																				
Oct 15	67	71	74	78	82	85	87	87	84	80	76	70	63	58	54	52	52	57	62	66	69	74	76	73	52	87	70.7																																																																				
Oct 16	77	86	81	74	86	92	97	92	86	76	60	53	46	44	41	44	50	53	54	55	54	52	52	60	41	97	65.2																																																																				
Oct 17	64	68	73	80	82	85	88	85	86	80	82	88	90	84	78	75	82	87	89	92	96	97	98	98	64	98	84.5																																																																				
Oct 18	99	99	99	99	99	99	99	96	93	86	78	70	61	52	51	48	46	50	54	70	75	80	80	80	46	99	77.6																																																																				
Oct 19	75	75	73	77	71	71	71	70	69	58	52	45	41	38	36	36	38	41	45	78	89	92	89	79	36	92	62.9																																																																				
Oct 20	77	73	69	67	67	71	78	75	69	61	57	52	48	41	39	38	37	41	42	46	52	57	59	54	37	78	57.1																																																																				
Oct 21	52	57	57	56	54	59	63	69	70	68	62	56	52	51	54	57	57	55	55	61	66	77	86	91	51	91	61.9																																																																				
Oct 22	94	96	97	90	87	88	89	89	85	81	81	74	70	68	68	68	74	89	93	93	91	89	92	92	68	97	84.9																																																																				
Oct 23	89	87	84	85	87	86	86	84	81	69	64	54	45	39	38	40	43	42	49	58	61	63	63	65	38	89	65.1																																																																				
Oct 24	65	67	76	80	83	88	87	85	82	80	74	62	47	47	45	47	51	55	58	60	61	66	73	72	45	88	67.1																																																																				
Oct 25	74	67	67	66	68	75	80	81	70	63	59	52	51	50	48	50	51	54	57	62	64	63	61	62	48	81	62.3																																																																				
Oct 26	63	67	70	77	87	92	93	93	92	88	82	81	82	81	82	80	80	80	79	81	86	88	91	88	63	93	82.6																																																																				
Oct 27	87	87	89	91	92	93	93	93	92	91	88	83	85	89	87	76	74	76	78	79	77	79	82	88	74	93	85.4																																																																				
Oct 28	85	86	86	89	88	88	88	89	84	82	84	84	85	81	77	76	75	80	84	87	87	86	85	88	75	89	84.3																																																																				
Oct 29	90	86	86	86	82	79	77	78	82	81	70	63	60	58	54	52	57	62	65	66	67	68	66	70	52	90	74.0																																																																				
Oct 30	71	72	75	78	84	87	90	89	85	80	73	69	65	63	64	68	68	70	70	70	71	73	75	76	63	90	74.4																																																																				
Oct 31	77	78	80	81	83	81	76	71	72	72	67	62	61	61	63	67	73	78	80	82	85	88	88	89	61	89	75.6																																																																				
Diurnal Maximum	99	99	99	99	99	99	99	96	93	91	88	88	90	89	87	80	82	89	93	93	96	97	98	98																																																																							
Diurnal Average	74.3	76.1	77.2	78.4	80.6	82.5	84.1	82.7	78.8	73.2	66.9	61.4	56.8	54.1	53.3	53.3	55.4	59.0	62.1	65.8	67.8	70.0	71.6	73.1																																																																							
C	Monthly Calibration																							S	Daily Zero-Span Check																							Q	Quality Assurance																																														
K	Collection Error																							ND	No Data (Machine Not in Service)																							Y	Routine Maintenance																							P	Power Failure																						
X	Invalid Data (Equipment Malfunction /Recovery)																							NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																																																																						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

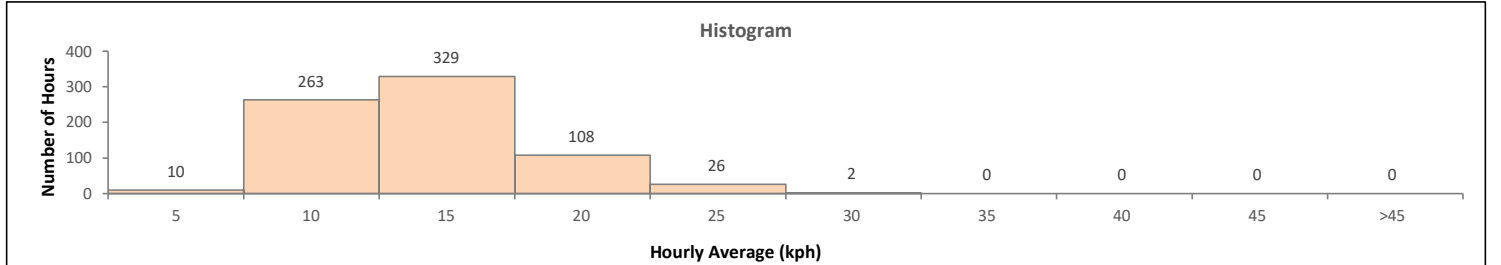
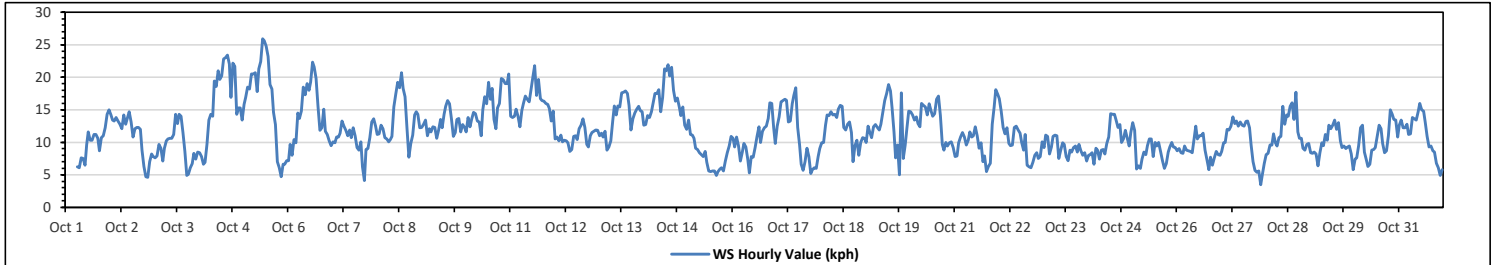
VECTOR WIND SPEED (VWS) in km/hr

Maximum Hourly Value:	25.9 kph	on Oct 5 at hr 10	Hours in Service:	744
Maximum Daily Value:	16.5 kph	on Oct 14	Hours of Data:	738
Minimum Hourly Value:	3.5 kph	on Oct 27 at hr 21	Hours of Missing Data:	6
Minimum Daily Value:	7.9 kph	on Oct 15	Hours of Calibration:	0
Monthly Average:	2.4 kph		Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Oct 1	ND	ND	ND	ND	ND	ND	6.2	6.1	7.6	7.5	6.5	9.6	11.6	10.3	10.3	11.2	11.2	10.6	8.7	10.7	11.0	12.2	14.3	15.0	6.1	15.0	10.0
Oct 2	14.2	13.4	13.3	13.8	13.3	12.8	12.1	14.2	12.8	13.7	14.7	13.1	10.8	12.1	12.3	12.3	12.0	8.8	6.3	4.7	4.6	7.0	8.2	7.8	4.6	14.7	11.2
Oct 3	7.6	7.9	9.7	9.1	7.1	9.1	10.2	10.5	10.6	10.6	11.2	14.3	12.9	14.3	14.0	11.5	8.6	4.9	5.1	6.1	6.7	8.3	7.4	8.5	4.9	14.3	9.4
Oct 4	8.4	7.8	6.6	6.9	9.7	13.4	14.3	14.0	19.4	18.6	21.0	19.7	20.2	22.8	23.0	23.4	22.0	16.9	22.2	21.7	14.3	15.3	15.3	13.4	6.6	23.4	16.3
Oct 5	15.8	16.9	18.5	18.2	20.5	20.5	20.7	17.8	21.3	22.4	25.9	25.6	24.8	23.2	18.9	18.2	14.6	12.7	7.0	6.1	4.7	6.6	6.6	7.2	4.7	25.9	16.4
Oct 6	7.2	9.7	8.0	10.4	9.9	14.5	13.7	14.8	18.5	17.3	19.0	18.0	19.3	22.3	21.6	19.8	15.5	11.8	12.2	15.1	11.7	11.2	10.2	9.5	7.2	22.3	14.2
Oct 7	10.1	9.9	10.8	10.8	11.4	13.3	12.5	11.8	11.0	11.9	10.7	12.2	11.0	9.2	8.8	10.1	6.2	4.1	8.9	9.0	10.7	13.1	13.6	12.5	4.1	13.6	10.6
Oct 8	11.2	11.3	12.6	12.1	10.7	10.5	10.1	10.4	10.9	15.4	17.4	19.2	18.4	20.7	18.3	17.0	12.2	7.7	9.8	11.1	14.2	14.7	14.3	12.2	7.7	20.7	13.4
Oct 9	12.3	12.8	13.4	11.0	12.1	11.6	12.4	12.3	10.6	11.9	13.5	12.2	14.3	15.5	16.4	15.9	13.6	10.9	11.5	13.5	13.7	11.6	12.7	12.3	10.6	16.4	12.8
Oct 10	11.6	13.8	12.4	13.5	14.6	14.4	13.3	13.1	11.0	15.0	17.0	15.9	19.2	16.6	18.3	13.5	12.1	15.3	16.0	19.8	19.6	19.0	19.0	20.5	11.0	20.5	15.6
Oct 11	14.0	13.8	14.0	15.1	14.0	12.4	14.9	16.0	17.1	16.6	16.2	18.2	20.2	21.8	17.2	19.7	16.7	16.4	16.3	16.0	15.8	15.2	13.3	14.8	12.4	21.8	16.1
Oct 12	10.5	10.8	10.2	11.1	10.1	10.3	10.2	9.9	8.6	8.9	10.9	11.0	10.4	12.1	12.6	13.6	12.3	9.7	9.3	11.0	11.5	11.7	11.9	11.8	8.6	13.6	10.9
Oct 13	11.0	11.4	10.8	11.7	8.8	9.3	10.2	13.3	15.6	14.2	15.6	15.4	17.6	17.7	17.9	17.5	15.7	11.9	13.6	14.5	15.1	15.5	14.9	14.7	8.8	17.9	13.9
Oct 14	12.6	12.7	14.1	13.8	14.7	16.2	17.5	17.5	18.1	14.7	16.9	21.3	21.0	21.9	20.2	21.5	18.0	16.3	16.8	15.4	14.1	15.4	12.6	12.0	12.0	21.9	16.5
Oct 15	13.4	11.2	11.1	10.6	9.1	8.9	8.4	8.1	7.8	8.6	6.9	5.6	5.5	5.6	5.6	4.9	5.5	5.9	6.1	5.6	7.1	8.4	9.4	10.9	4.9	13.4	7.9
Oct 16	10.6	9.3	10.8	9.5	7.1	8.5	9.8	9.3	7.4	5.3	7.8	7.7	9.2	10.9	12.4	10.0	11.7	12.2	12.5	13.7	16.1	16.0	12.2	9.8	5.3	16.1	10.4
Oct 17	12.5	13.9	16.2	16.4	16.6	16.5	13.1	13.3	15.9	17.2	18.4	12.3	9.6	6.6	5.7	7.0	9.1	7.8	5.2	5.8	6.1	6.0	7.8	9.0	5.2	18.4	11.2
Oct 18	9.9	10.0	12.6	14.2	14.1	14.7	14.2	14.3	13.8	15.1	15.7	15.5	12.3	11.9	12.8	13.1	11.5	7.0	9.5	10.3	8.0	10.0	10.7	10.6	7.0	15.7	12.2
Oct 19	10.0	12.5	11.6	10.7	12.4	12.7	13.3	11.9	12.8	14.6	16.4	17.5	18.9	17.9	15.3	11.6	7.6	9.6	5.0	17.6	7.5	9.6	12.0	14.8	5.0	18.9	12.6
Oct 20	14.7	14.2	13.4	13.9	12.9	12.4	16.0	15.7	15.4	14.2	15.9	14.8	14.0	14.4	16.6	17.1	14.1	9.7	8.8	10.0	9.4	9.9	10.1	9.2	8.8	17.1	13.2
Oct 21	7.8	7.9	9.9	10.8	11.5	10.8	9.6	10.3	11.6	10.8	11.0	12.4	11.0	9.1	9.9	7.0	7.9	5.5	6.3	6.8	12.8	15.4	18.1	17.4	5.5	18.1	10.5
Oct 22	16.7	14.8	12.3	11.3	12.2	9.8	9.5	9.6	12.3	12.5	11.9	11.4	10.0	8.8	11.2	6.5	6.2	6.1	6.9	8.0	8.4	7.5	7.8	10.1	6.1	16.7	10.1
Oct 23	9.2	11.1	10.9	8.2	9.3	10.9	11.1	11.0	7.5	8.8	9.9	9.7	7.8	7.2	8.8	8.5	9.2	9.4	8.5	9.7	8.7	8.0	8.4	7.1	7.1	11.1	9.1
Oct 24	8.0	8.1	8.4	6.6	9.1	8.8	7.4	8.8	8.9	8.2	9.8	10.8	14.4	14.3	14.3	13.4	12.3	12.7	10.0	10.5	11.8	10.6	9.4	11.5	6.6	14.4	10.3
Oct 25	13.0	11.8	5.9	6.4	6.0	7.4	8.5	8.1	9.5	10.5	10.5	7.8	10.0	9.4	10.0	8.6	7.2	6.0	6.7	8.5	9.3	10.0	9.3	9.2	5.9	13.0	8.7
Oct 26	8.7	9.0	8.4	8.3	9.4	8.8	8.7	8.6	8.4	10.6	12.5	10.5	11.0	11.0	11.4	8.8	7.3	5.8	7.7	6.5	7.6	8.6	8.1	8.0	5.8	12.5	8.9
Oct 27	8.6	9.9	10.0	12.0	11.9	12.5	13.9	12.9	13.3	12.5	13.1	12.6	12.5	13.2	13.3	12.2	9.6	7.0	5.7	5.4	5.6	3.5	5.0	6.7	3.5	13.9	10.1
Oct 28	8.1	8.3	9.6	9.6	11.3	9.9	9.4	10.7	10.9	15.5	12.8	14.2	14.0	15.5	16.1	13.5	17.7	11.6	10.6	10.6	9.1	8.8	9.7	9.8	8.1	17.7	11.6
Oct 29	8.4	8.3	8.5	8.2	6.4	8.4	9.9	9.5	11.2	10.3	12.6	12.1	12.6	13.4	12.0	13.0	10.2	9.2	9.4	9.0	9.3	9.4	8.2	5.8	5.8	13.4	9.8
Oct 30	7.4	7.6	9.5	12.2	12.6	8.5	7.3	6.3	6.6	8.8	8.9	9.2	10.9	12.6	12.1	9.8	8.4	8.7	11.0	15.0	14.3	13.5	13.4	10.8	6.3	15.0	10.2
Oct 31	12.6	13.4	12.2	12.2	12.8	11.2	11.3	13.8	13.6	13.4	14.7	16.0	15.0	14.8	13.1	10.9	9.3	9.4	8.7	8.5	6.8	6.1	4.9	5.8	4.9	16.0	11.3
Diurnal Maximum	16.7	16.9	18.5	18.2	20.5	20.5	20.7	17.8	21.3	22.4	25.9	25.6	24.8	23.2	23.0	23.4	22.0	16.9	22.2	21.7	19.6	19.0	19.0	20.5			
Diurnal Average	10.9	11.1	11.2	11.3	11.4	11.6	11.6	11.7	12.3	12.8	13.7	13.7	13.9	14.1	13.9	12.9	11.5	9.7	9.8	10.8	10.5	10.9	10.9	10.9			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

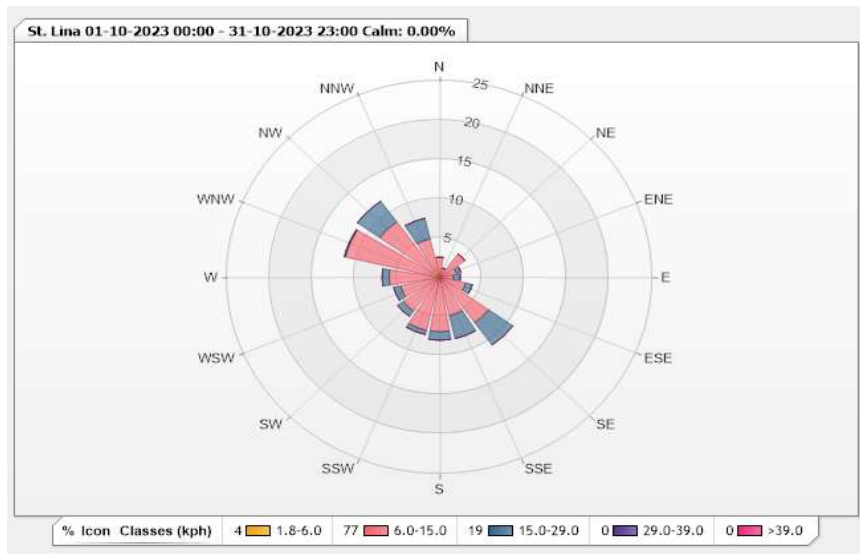


Station: St. Lina Monitor: WDS [kph] Monthly: 10-2023

Type: Wind Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm (WS<1.8kph): 0.00% Valid Data: 99.19%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	0.27	2.3	0	0	0	2.57
NNE	0	1.22	0	0	0	1.22
NE	0	3.66	0	0	0	3.66
ENE	0	2.03	0.54	0	0	2.57
E	0.14	1.49	0.81	0	0	2.44
ESE	0	3.12	0.81	0	0	3.93
SE	0.27	6.78	3.52	0	0	10.57
SSE	0.27	4.74	2.98	0	0	7.99
S	0.27	6.64	1.08	0	0	7.99
SSW	0.14	6.78	0.54	0	0	7.46
SW	0.68	4.61	0.81	0	0	6.1
WSW	0.27	4.47	0.81	0	0	5.55
W	0.27	5.69	0.81	0	0	6.77
WNW	0.27	11.11	0.14	0	0	11.52
NW	1.08	7.59	3.25	0	0	11.92
NNW	0.41	4.61	2.71	0	0	7.73
Summary	4.34	76.84	18.81	0	0	100



Lakeland Industry & Community Association

St. Lina Site - October 2023

Summary of Hourly Averages

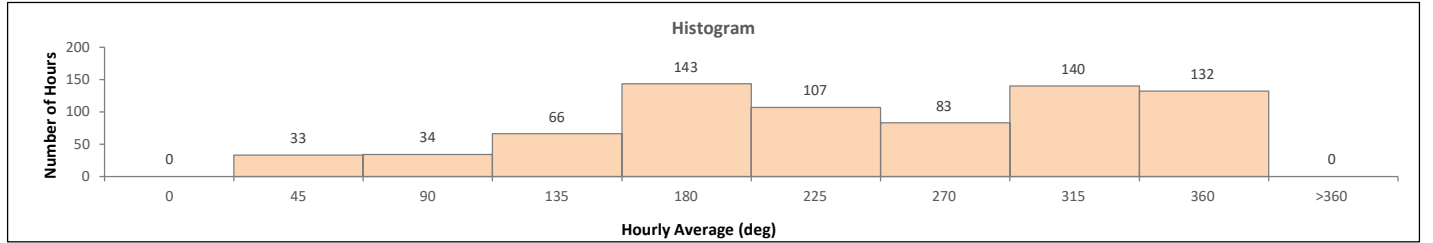
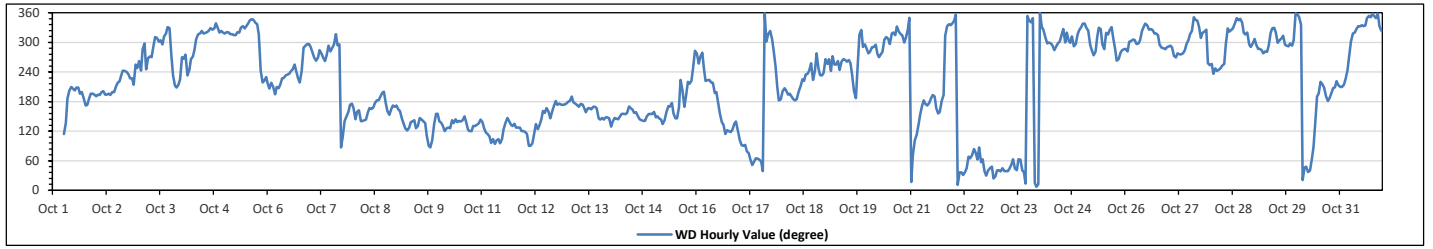
WIND DIRECTION (VWD) in sector

Monthly Average:	232 (SW) degree	Hours in Service:	744
		Hours of Data:	738
		Hours of Missing Data:	6
		Hours of Calibration:	0
		Operational Uptime:	99.2

Day	Hourly Period Starting at (MST)																							Daily Average				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant		
Oct 1	ND	ND	ND	ND	ND	ND	ESE	SE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	SSW	SSW	SSW	191	S			
Oct 2	S	SSW	S	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	211	SSW	
Oct 3	W	WSW	WNW	WNW	WSW	W	W	W	WNW	NW	NW	WNW	WNW	WNW	NW	NW	NNW	NNW	W	SW	SSW	SSW	SSW	SSW	SSW	282	W	
Oct 4	W	W	W	SW	WSW	W	W	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NW	NW	NW	NW	NW	312	NW
Oct 5	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	WSW	SW	SW	SW	SW	SW	324	NW
Oct 6	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WNW	WNW	WNW	WNW	WNW	WNW	236	SW
Oct 7	WNW	W	W	W	W	WNW	W	W	W	W	WNW	W	WNW	W	WNW	W	WNW	W	ESE	ESE	SE	SSE	SSE	S	S	261	W	
Oct 8	SSE	SE	SSE	SSE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	S	S	S	S	SSW	SSW	S	SSE	SSE	SSE	S	SSE	SSE	167	SSE	
Oct 9	S	SSE	SSE	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	E	E	E	SE	SSE	SSE	SSE	135	SE	
Oct 10	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	134	SE	
Oct 11	SE	SE	ESE	ESE	ESE	E	ESE	E	E	ESE	E	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	120	ESE	
Oct 12	ESE	ESE	E	E	E	ESE	SE	ESE	SE	SE	SSE	SSE	SSE	SSE	SE	SSE	S	S	S	S	S	S	S	S	S	148	SE	
Oct 13	S	S	S	S	S	S	SSE	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	163	SSE
Oct 14	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	152	SSE	
Oct 15	SSE	SE	SSE	SE	SE	SE	SSE	S	SSE	S	SSE	S	SSE	SW	SSW	SSE	S	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	174	S	
Oct 16	W	WSW	W	W	WSW	SW	SW	SW	SW	SSW	SSW	S	SSE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	ESE	169	SSE	
Oct 17	E	E	E	E	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	NE	N	WNW	NW	NW	W	WSW	SSW	S	S	67	ENE	ENE	ENE	
Oct 18	SSW	SSW	SSW	SSW	SSW	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	217	SSW	
Oct 19	W	WSW	W	WSW	W	WSW	WSW	W	WSW	W	W	W	W	WSW	SW	SSW	S	WSW	NW	NW	WNW	WNW	WNW	WNW	WNW	264	W	
Oct 20	W	W	WNW	WNW	WNW	W	W	W	W	NW	NW	NW	WNW	NW	NW	NNW	NW	NW	NNW	NW	NW	NNW	NW	NW	NW	302	WNW	
Oct 21	NNW	ENE	E	ESE	SE	SSE	S	S	S	S	S	S	SSE	SSE	SSE	S	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	167	SSE	
Oct 22	NNW	N	NNE	NE	NE	NNE	NE	NE	ENE	ENE	ENE	E	ENE	ENE	E	ENE	ENE	NE	NNE	NE	NE	NE	NE	NE	NE	43	NE	
Oct 23	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	ENE	ENE	NE	NNE	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	31	NNE	
Oct 24	N	NNW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	WNW	NW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	309	NW	
Oct 25	NNW	NNW	NNW	NW	WNW	WNW	W	W	NW	NNW	NW	WNW	NNW	NW	NW	NNW	NW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	304	WNW	
Oct 26	WNW	W	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	309	NW	
Oct 27	WNW	WNW	WNW	W	W	W	W	W	WNW	WNW	WNW	NW	NW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	299	WNW	
Oct 28	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	306	NW	
Oct 29	NW	WNW	WNW	WNW	WNW	W	W	W	WNW	NNW	NW	WNW	NNW	NW	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	302	WNW	
Oct 30	N	N	NNW	NNE	NE	NE	NE	NE	ENE	E	SE	S	SSW	SW	SSW	SSW	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	192	S	
Oct 31	SSW	SSW	SSW	SW	WSW	W	WNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	NNW	N	NNW	NW	NW	NW	314	NW	

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Machine Malfunction/Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



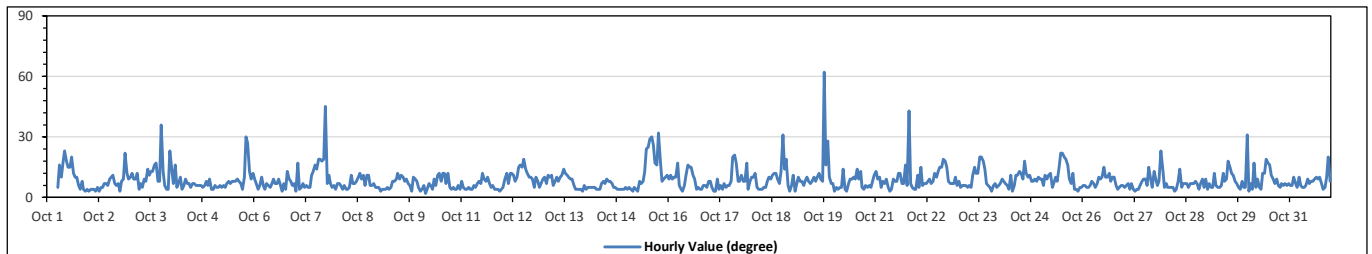
Lakeland Industry & Community Association
St. Lina Site - October 2023

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:		62 degree on Oct 19 at hr 18										Hours in Service:		744													
Minimum Hourly Value:		2 degree on Oct 10 at hr 3										Hours of Data:		738													
												Hours of Missing Data:		6													
												Hours of Calibration:		0													
												Operational Uptime:		99.2													
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			23	
Oct 1	ND	ND	ND	ND	ND	ND	5	16	10	17	23	18	15	15	20	12	10	10	6	4	8	4	3	4	3	23	
Oct 2	3	4	4	4	3	5	3	5	5	7	7	6	9	10	11	7	6	7	3	8	9	22	12	9	3	22	
Oct 3	10	12	9	9	12	4	7	5	9	8	14	11	13	13	16	17	8	8	36	13	6	4	4	23	4	36	
Oct 4	14	7	16	5	7	10	4	6	9	7	7	5	7	7	6	6	6	6	5	6	8	6	9	4	4	16	
Oct 5	4	6	5	5	6	5	6	5	7	8	7	8	8	8	9	8	7	4	10	30	27	13	9	12	4	30	
Oct 6	9	7	4	6	10	6	4	7	6	5	7	9	7	7	9	6	3	7	4	13	9	8	6	7	3	13	
Oct 7	3	17	4	5	7	5	6	5	5	11	13	16	14	19	18	19	45	7	11	7	5	6	4	3	45	4	
Oct 8	7	7	6	4	6	4	4	5	11	7	7	8	10	12	9	11	6	11	11	6	6	7	5	5	4	12	
Oct 9	5	3	4	4	4	5	4	5	8	8	9	12	9	11	10	8	9	7	6	3	10	9	8	5	3	12	
Oct 10	3	4	6	2	4	7	6	4	9	6	11	12	8	12	12	7	12	5	4	5	4	4	6	4	2	12	
Oct 11	8	5	4	4	5	4	4	6	5	7	8	7	12	9	8	10	7	5	6	4	4	4	3	4	3	12	
Oct 12	5	9	12	7	12	12	11	8	10	15	16	15	19	14	12	10	10	9	5	10	8	5	7	9	5	19	
Oct 13	10	7	11	10	11	6	8	10	8	10	11	14	12	11	10	9	9	6	4	4	4	4	3	6	3	14	
Oct 14	4	5	5	5	5	5	4	4	4	7	8	7	9	8	8	7	5	5	4	4	4	4	4	5	4	9	
Oct 15	4	5	4	3	5	4	3	8	7	8	13	24	25	29	30	26	17	16	32	18	8	9	10	11	3	32	
Oct 16	9	11	9	10	10	17	6	4	3	6	11	16	15	15	11	9	4	5	4	4	6	6	5	8	3	17	
Oct 17	8	5	3	3	9	4	6	4	7	5	6	6	6	8	20	21	17	8	8	11	8	8	17	4	8	3	21
Oct 18	10	10	12	5	4	4	4	5	5	8	10	9	11	12	12	9	7	13	31	14	19	6	3	6	3	31	
Oct 19	11	3	6	10	8	8	6	8	10	8	7	8	10	8	10	12	9	8	62	16	28	10	7	7	3	62	
Oct 20	3	5	4	5	5	14	4	3	7	9	9	10	9	14	9	13	5	4	6	5	6	5	8	11	3	14	
Oct 21	13	9	10	5	8	7	9	5	3	4	9	8	8	12	12	7	7	16	6	43	7	5	4	4	3	43	
Oct 22	11	5	15	6	7	7	8	9	7	8	12	10	13	15	15	19	18	15	8	7	7	7	10	6	5	19	
Oct 23	8	5	6	6	6	5	6	5	11	15	12	12	20	20	18	14	7	6	5	3	6	7	5	6	3	20	
Oct 24	7	9	8	7	6	4	11	3	6	11	11	13	12	22	9	18	12	10	11	8	8	9	8	10	9	18	
Oct 25	9	6	11	9	11	12	5	7	10	8	15	22	22	20	19	16	9	7	12	4	4	3	5	5	3	22	
Oct 26	6	6	5	5	6	8	7	5	7	10	9	10	15	10	10	12	8	10	10	6	4	5	6	6	4	15	
Oct 27	5	6	7	4	7	4	3	4	4	6	8	9	9	6	15	9	5	13	9	6	8	23	14	5	3	23	
Oct 28	7	5	5	5	5	3	4	8	14	5	7	7	7	5	7	7	7	8	7	4	7	9	5	9	3	14	
Oct 29	4	7	5	5	12	6	5	5	6	12	8	9	18	15	12	11	8	7	5	4	8	5	5	31	4	31	
Oct 30	3	7	4	17	5	9	5	4	12	12	19	17	16	11	9	7	9	6	5	7	6	7	6	7	3	19	
Oct 31	6	6	10	7	5	10	6	5	5	6	9	7	8	8	9	10	9	10	7	4	5	10	20	8	4	20	
Diurnal Minimum	3	3	3	2	3	3	3	3	3	3	4	6	5	7	5	6	6	3	4	3	3	4	3	3	4	4	
Diurnal Maximum	14	17	16	17	12	17	11	16	14	17	23	24	25	29	30	26	19	45	62	43	28	23	20	31	31	31	
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance				
K	Collection Error										ND	No Data (Machine Not in Service)										Y	Routine Maintenance		P	Power Failure	
X	Invalid Data (Machine Malfunction/Recovery)										NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)															

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



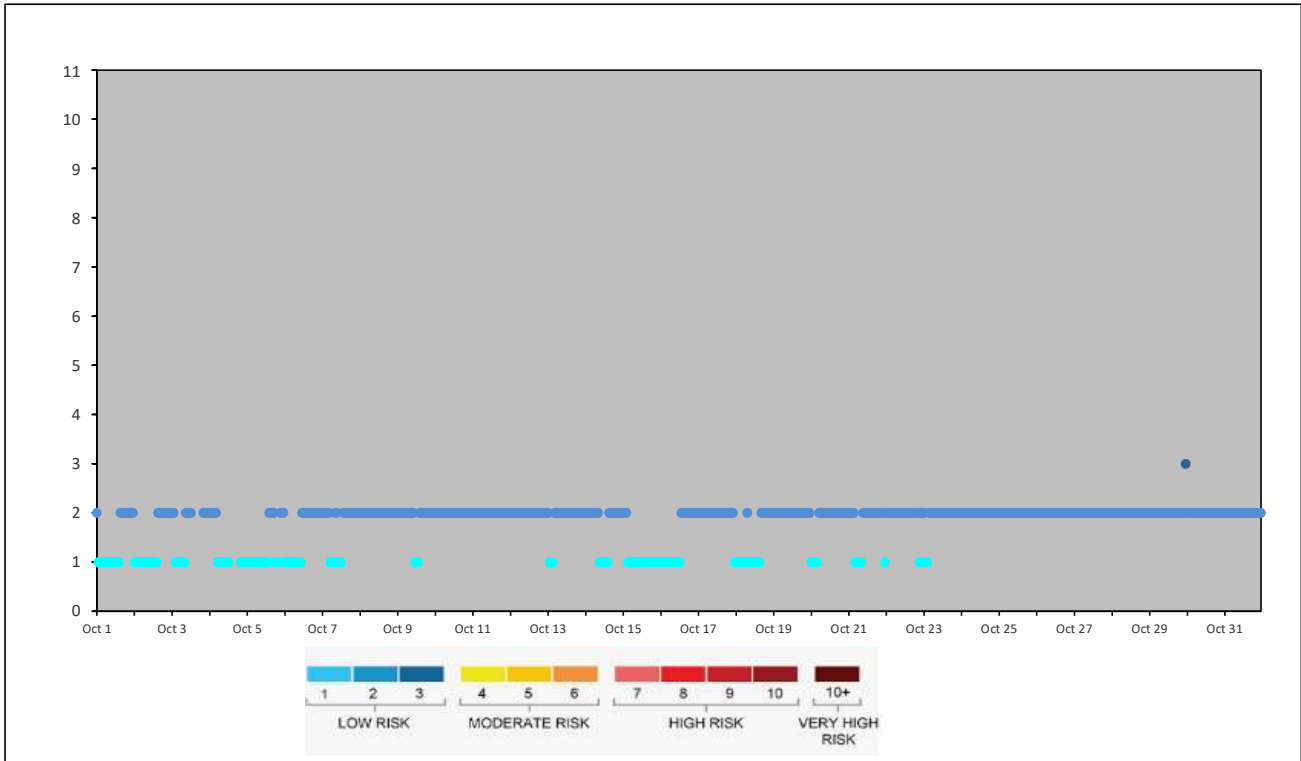
LAC LA BICHE STATION

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Lac La Biche Station - October 2023

AIR QUALITY HEALTH INDEX

Day	Hourly Period Starting at (MST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Oct 1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Oct 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Oct 3	2	2	1	1	1	1	1	1	1	2	2	2	2								2	2	2	2
Oct 4	2	2	2	2	2	1	1	1	1	1	1	1	1								1	1	1	1
Oct 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	2	2
Oct 6	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1
Oct 7	2	2	2	2	2	1	1	1	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Oct 8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 9	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 13	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 14	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Oct 15	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Oct 16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Oct 17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Oct 18	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Oct 19	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 20	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 21	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Oct 22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
Oct 23	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 25	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Oct 30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Oct 31	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

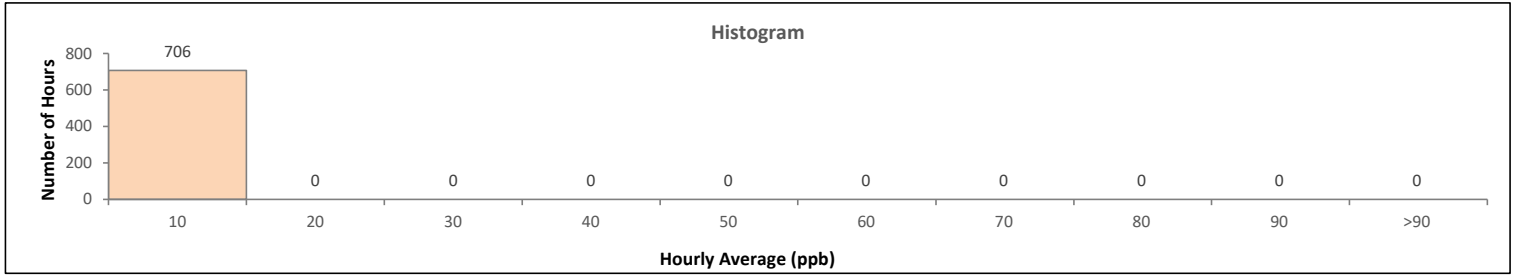
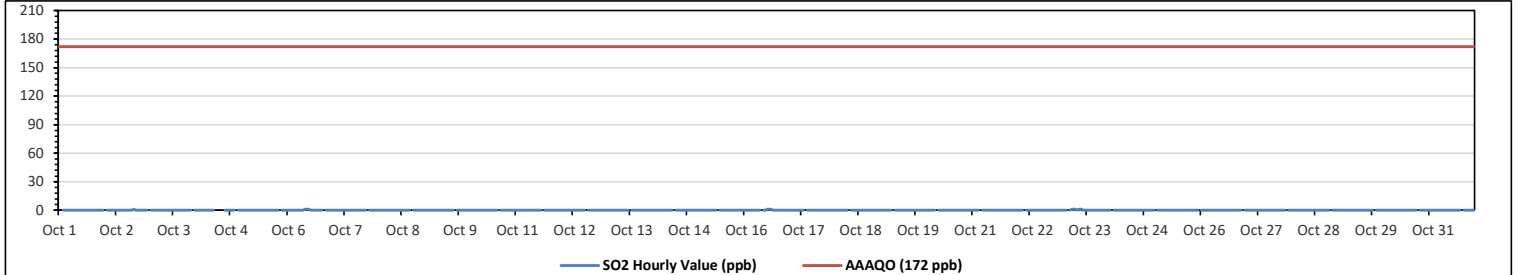
Summary of Hourly Averages

SULPHUR DIOXIDE (SO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 172 ppb, 24-Hour 48 ppb, 30-Day 11 ppb																																
Number of 1-Hour Exceedances:					0					Number of 24-Hour Exceedances:					0					30-Day Exceedence:					0							
Maximum Hourly Value:										1 ppb on Oct 2 at hr 15										Hours in Service:					744							
Maximum Daily Value:										0.2 ppb on Oct 23										Hours of Data:					706							
Minimum Hourly Value:										0 ppb on Oct 1 at hr 0										Hours of Missing Data:					0							
Minimum Daily Value:										0.0 ppb on Oct 1										Hours of Calibration:					38							
Monthly Average:										0.0 ppb										Operational Uptime:					100.0							
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average						
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
Oct 1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.0	
Oct 2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	0.0	0.0
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Oct 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
Oct 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
Oct 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
Oct 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
Oct 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
Oct 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Oct 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Oct 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Diurnal Maximum	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

C Monthly Calibration **S** Daily Zero-Span Check **Q** Quality Assurance
K Collection Error **ND** No Data (Machine Not in Service) **Y** Routine Maintenance
X InValid Data (Equipment Malfunction /Recovery) **NRM** UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance) **P** Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

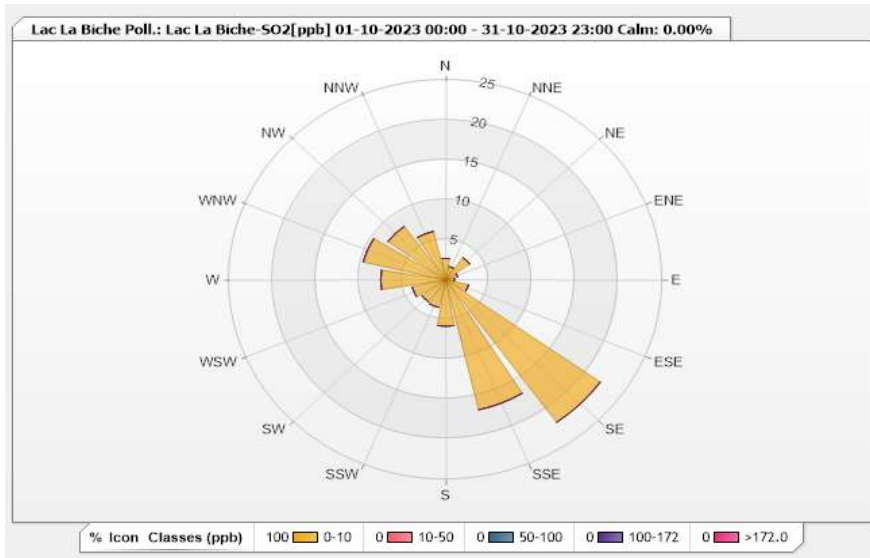


Station: Lac La Biche Poll.: Lac La Biche-SO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppm]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	2.69	0	0	0	0	2.69
NNE	1.7	0	0	0	0	1.7
NE	3.4	0	0	0	0	3.4
ENE	1.42	0	0	0	0	1.42
E	0.99	0	0	0	0	0.99
ESE	2.69	0	0	0	0	2.69
SE	21.95	0	0	0	0	21.95
SSE	16.71	0	0	0	0	16.71
S	5.81	0	0	0	0	5.81
SSW	3.54	0	0	0	0	3.54
SW	3.4	0	0	0	0	3.4
WSW	3.97	0	0	0	0	3.97
W	7.51	0	0	0	0	7.51
WNW	9.77	0	0	0	0	9.77
NW	8.22	0	0	0	0	8.22
NNW	6.23	0	0	0	0	6.23
Summary	100	0	0	0	0	100

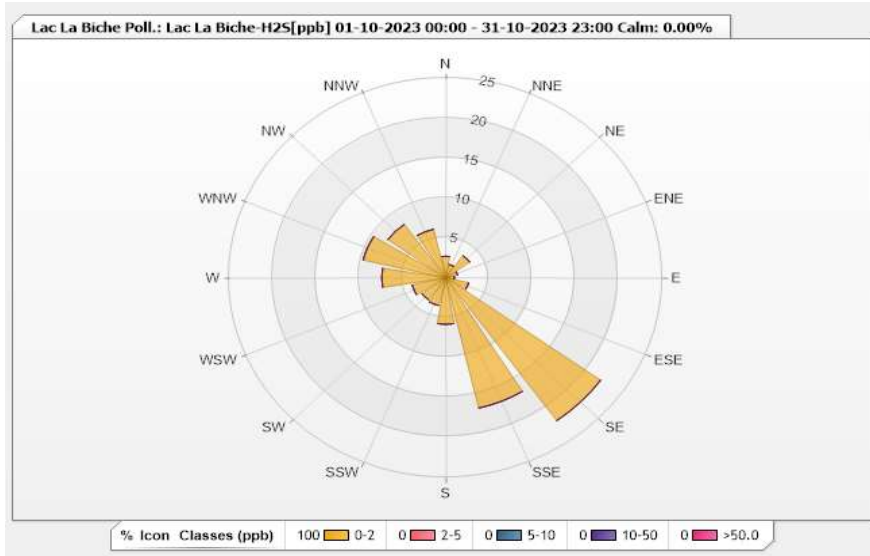


Station: Lac La Biche Poll.: Lac La Biche-H2S[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	2.7	0	0	0	0	2.7
NNE	1.7	0	0	0	0	1.7
NE	3.4	0	0	0	0	3.4
ENE	1.42	0	0	0	0	1.42
E	0.99	0	0	0	0	0.99
ESE	2.7	0	0	0	0	2.7
SE	21.99	0	0	0	0	21.99
SSE	16.74	0	0	0	0	16.74
S	5.82	0	0	0	0	5.82
SSW	3.55	0	0	0	0	3.55
SW	3.4	0	0	0	0	3.4
WSW	3.97	0	0	0	0	3.97
W	7.38	0	0	0	0	7.38
WNW	9.79	0	0	0	0	9.79
NW	8.23	0	0	0	0	8.23
NNW	6.24	0	0	0	0	6.24
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

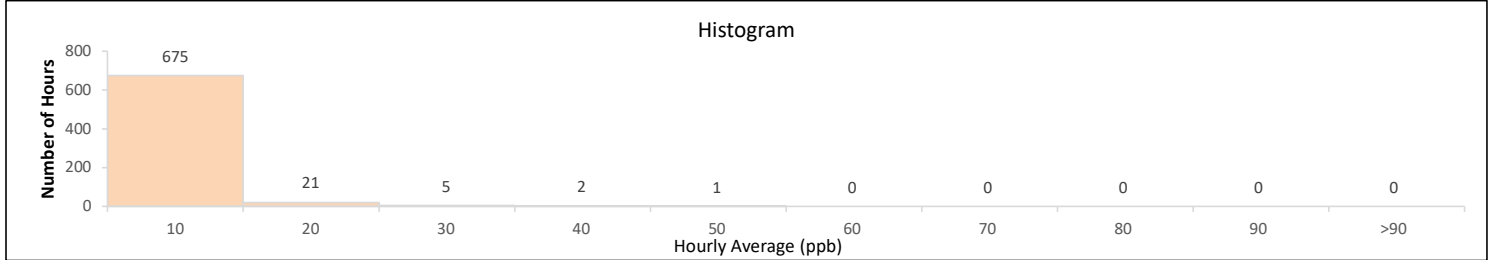
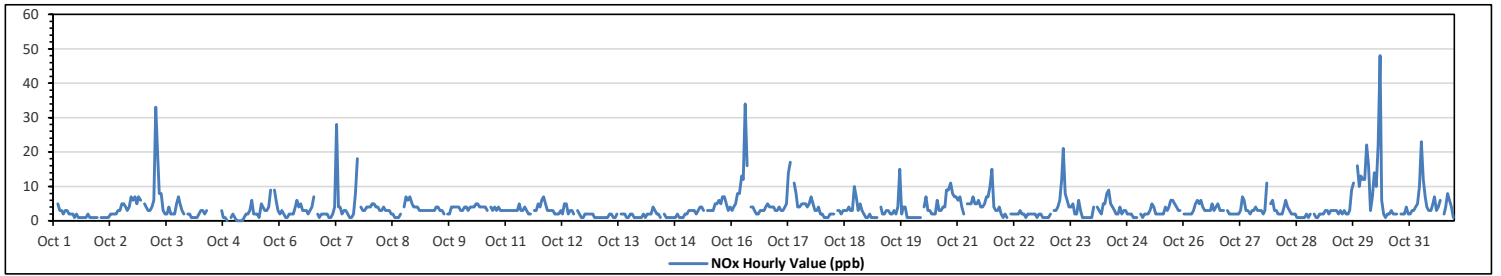
Maximum Hourly Value:	48 ppb	on Oct 30 at hr 8	Hours in Service:	744
Maximum Daily Value:	8.2 ppb	on Oct 30	Hours of Data:	704
Minimum Hourly Value:	0 ppb	on Oct 4 at hr 20	Hours of Missing Data:	0
Minimum Daily Value:	1.3 ppb	on Oct 13	Hours of Calibration:	40
Monthly Average:	3.7 ppb		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Oct 1	3	S	5	3	3	2	3	3	2	2	2	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	5	1.9
Oct 2	S	1	1	1	1	1	2	2	2	2	3	3	5	5	4	3	4	7	6	7	5	7	6	S	2	2	7	3.5
Oct 3	5	4	3	3	4	6	33	19	8	8	3	2	2	4	2	2	2	5	7	5	3	2	S	2	2	33	5.8	
Oct 4	2	1	1	1	1	2	3	3	2	3	C	C	C	C	C	C	C	3	1	1	0	S	1	2	0	3	NA	
Oct 5	1	0	0	0	0	1	2	2	3	6	2	2	2	1	5	4	3	3	4	9	S	9	6	3	0	9	3.0	
Oct 6	2	3	2	1	1	2	2	2	4	6	4	5	3	3	3	2	3	4	7	S	2	1	2	2	1	7	2.9	
Oct 7	2	2	1	1	2	4	28	4	4	2	3	3	2	1	2	8	18	S	4	3	3	4	4	1	28	4.6		
Oct 8	4	5	5	4	4	3	3	4	3	3	3	2	2	1	1	1	2	S	4	7	6	7	5	4	1	7	3.6	
Oct 9	4	4	3	3	3	3	3	3	3	3	3	4	4	3	3	2	S	2	2	4	4	4	4	4	2	4	3.3	
Oct 10	3	3	4	4	3	4	4	4	5	5	4	4	4	4	3	S	4	3	4	3	4	3	3	3	3	5	3.7	
Oct 11	3	3	3	3	3	3	3	5	3	3	4	3	2	2	S	3	3	5	4	6	7	5	3	3	2	7	3.6	
Oct 12	3	3	2	2	2	3	2	5	5	2	3	3	2	S	3	2	1	1	2	2	2	2	2	1	1	5	2.4	
Oct 13	1	1	1	1	1	1	2	2	1	1	2	S	2	2	2	1	1	2	2	1	1	1	1	1	1	2	1.3	
Oct 14	1	2	1	2	2	2	4	3	2	2	1	S	2	1	1	1	1	1	1	2	1	1	1	1	1	4	1.6	
Oct 15	2	3	3	3	3	2	3	4	4	3	S	3	3	3	3	5	6	5	7	7	5	3	4	2	7	3.9		
Oct 16	3	4	5	8	8	13	12	34	16	S	4	4	3	2	2	3	3	4	5	4	4	4	4	3	2	34	6.6	
Oct 17	3	4	3	3	4	5	14	17	S	11	8	4	4	5	5	5	4	5	7	5	3	3	4	2	2	17	5.6	
Oct 18	2	1	1	1	2	2	2	S	3	3	2	3	3	3	4	3	10	7	3	5	3	2	1	1	10	3.0		
Oct 19	1	2	1	1	1	1	S	4	2	2	3	3	2	2	3	2	4	15	2	4	4	1	1	1	1	15	2.7	
Oct 20	1	1	1	1	1	S	4	7	3	3	2	2	2	6	3	3	4	4	9	9	11	8	7	7	2	11	4.3	
Oct 21	6	7	4	2	S	5	5	5	7	5	5	6	4	4	5	7	10	15	4	3	3	4	2	2	2	15	5.4	
Oct 22	1	2	1	S	2	2	2	2	2	3	2	2	1	2	2	2	2	2	2	2	2	1	1	1	1	3	1.7	
Oct 23	1	2	S	3	3	4	6	12	21	8	6	4	4	5	2	2	6	3	1	1	1	1	1	1	1	21	4.3	
Oct 24	4	S	4	3	2	5	5	8	9	5	4	3	2	2	4	2	3	3	2	2	2	1	1	1	1	9	3.3	
Oct 25	S	2	1	2	2	2	3	5	4	2	2	2	2	2	4	3	4	6	6	5	4	3	3	S	1	6	3.1	
Oct 26	2	2	2	2	2	3	5	6	5	6	4	3	3	3	5	3	4	5	3	3	3	S	3	2	6	3.5		
Oct 27	2	2	2	2	2	2	3	7	6	3	3	2	3	3	4	3	3	2	3	11	S	5	6	2	11	3.6		
Oct 28	3	3	2	2	2	4	6	4	3	2	2	1	1	1	1	1	2	1	2	2	S	2	1	1	1	6	2.1	
Oct 29	2	2	2	3	3	2	3	3	3	2	3	2	3	2	2	2	3	9	11	S	16	10	13	12	2	16	5.0	
Oct 30	12	22	16	3	7	14	10	22	48	6	2	1	2	2	3	2	2	2	S	2	2	2	4	2	1	48	8.2	
Oct 31	2	3	3	4	5	10	23	12	7	4	3	3	5	7	3	4	6	S	2	4	8	6	4	1	1	23	5.6	
Diurnal Maximum	12	22	16	8	8	14	33	34	48	11	8	6	5	7	5	7	8	18	15	9	16	10	13	12				
Diurnal Average	2.8	3.2	2.8	2.4	2.6	3.8	6.6	7.1	6.4	3.9	3.1	2.9	2.7	2.9	2.8	2.7	3.3	4.9	4.3	3.9	4.3	3.5	3.3	2.8				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	ND	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.

Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

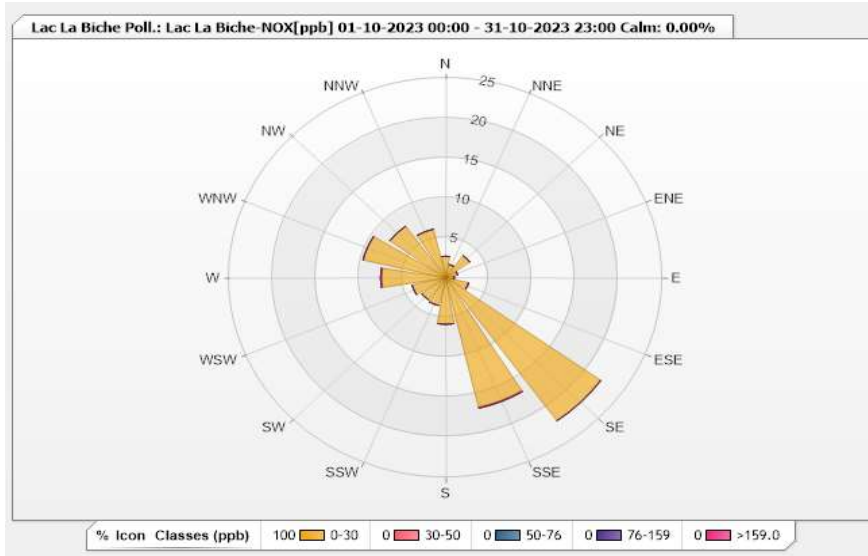


Station: Lac La Biche Poll.: Lac La Biche-NOX[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.7	0	0	0	0	2.7
NNE	1.7	0	0	0	0	1.7
NE	3.41	0	0	0	0	3.41
ENE	1.42	0	0	0	0	1.42
E	0.85	0.14	0	0	0	0.99
ESE	2.7	0	0	0	0	2.7
SE	22.02	0	0	0	0	22.02
SSE	16.62	0.14	0	0	0	16.76
S	5.82	0	0	0	0	5.82
SSW	3.55	0	0	0	0	3.55
SW	3.41	0	0	0	0	3.41
WSW	3.98	0	0	0	0	3.98
W	7.39	0.14	0	0	0	7.53
WNW	9.8	0	0	0	0	9.8
NW	7.95	0	0	0	0	7.95
NNW	6.25	0	0	0	0	6.25
Summary	100	0.42	0	0	0	100



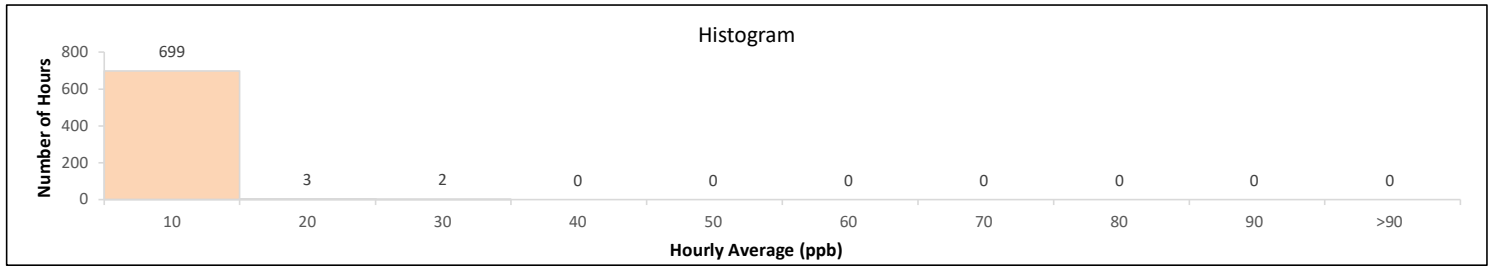
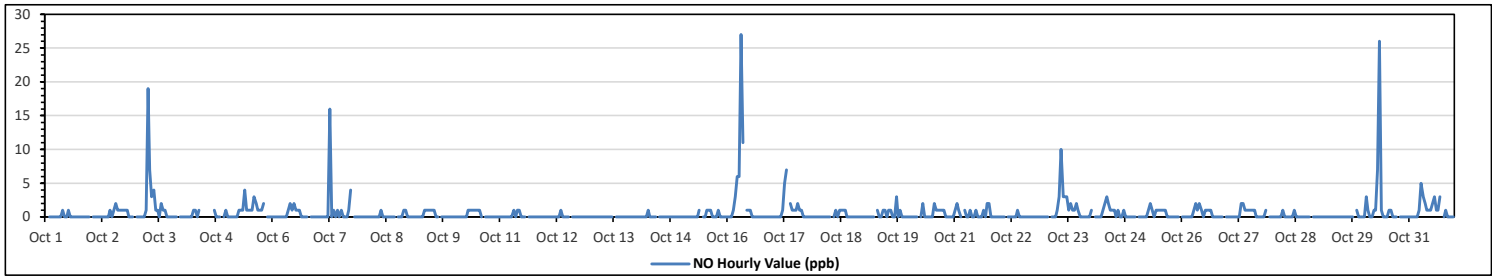
Lakeland Industry & Community Association
Lac La Biche Station - October 2023
Summary of Hourly Averages
NITRIC OXIDE (NO) in ppb

Maximum Hourly Value:	27	ppb	on Oct 16 at hr 7	Hours in Service:	744
Maximum Daily Value:	2.5	ppb	on Oct 16	Hours of Data:	704
Minimum Hourly Value:	0	ppb	on Oct 1 at hr 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0	ppb	on Oct 13	Hours of Calibration:	40
Monthly Average:	0.6	ppb		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23			
Oct 1	0	S	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.1
Oct 2	S	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	1	1	1	1	1	0	0	0	0	S	0	2	0.5	
Oct 3	0	0	0	0	0	0	1	19	7	3	4	1	1	0	2	1	1	0	0	0	0	0	0	0	0	S	0	19	1.7	
Oct 4	0	0	0	0	0	0	1	1	0	1	C	C	C	C	C	C	C	C	1	0	0	0	0	S	0	1	1	NA		
Oct 5	0	0	0	0	0	0	1	1	1	4	1	1	1	1	3	2	1	1	1	2	S	0	0	0	0	0	4	0.9		
Oct 6	0	0	0	0	0	0	0	0	1	2	1	2	1	1	1	0	0	0	0	0	S	0	0	0	0	0	2	0.4		
Oct 7	0	0	0	0	0	0	16	0	1	0	1	0	1	0	0	0	0	0	1	4	S	0	0	0	0	0	16	1.0		
Oct 8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	1	1	0	1	0.1		
Oct 9	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	1	0.3		
Oct 10	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	1	0.3		
Oct 11	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.1		
Oct 12	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.0		
Oct 13	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		
Oct 14	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.0		
Oct 15	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0.2	
Oct 16	0	0	0	1	3	6	6	27	11	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	27	2.5		
Oct 17	0	0	0	0	0	1	5	7	S	S	2	1	1	1	1	2	1	1	1	0	0	0	0	0	0	0	7	1.0		
Oct 18	0	0	0	0	0	0	0	S	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.2		
Oct 19	0	0	0	0	0	0	S	1	0	0	1	1	0	1	1	0	0	0	3	0	1	0	0	0	0	0	3	0.4		
Oct 20	0	0	0	0	0	0	S	0	2	0	0	0	0	0	0	2	1	1	1	1	1	0	0	0	0	0	2	0.4		
Oct 21	1	2	1	0	S	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	2	2	0	0	0	0	2	0.5		
Oct 22	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0		
Oct 23	0	0	S	0	0	0	1	3	10	3	3	3	1	2	1	1	2	1	0	0	0	0	0	0	0	0	10	1.3		
Oct 24	1	S	0	0	0	0	1	2	3	2	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0.6		
Oct 25	S	0	0	0	0	0	1	2	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0.5		
Oct 26	0	0	0	0	0	0	1	2	1	2	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0.5		
Oct 27	0	0	0	0	0	0	0	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0.5		
Oct 28	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1		
Oct 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0		
Oct 30	0	3	1	0	0	1	1	7	26	1	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	0	26	1.8		
Oct 31	0	0	0	0	0	1	5	3	2	1	1	1	2	3	1	1	3	S	0	1	0	0	0	0	0	0	5	1.1		
Diurnal Maximum	1	3	1	1	3	6	19	27	26	4	3	3	2	3	3	2	3	3	2	4	2	2	1	1	1	1	5			
Diurnal Average	0.1	0.2	0.1	0.0	0.1	0.4	2.0	2.3	2.2	1.0	0.7	0.7	0.6	0.8	0.6	0.4	0.3	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	2.5			

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction/Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% per month is not met.

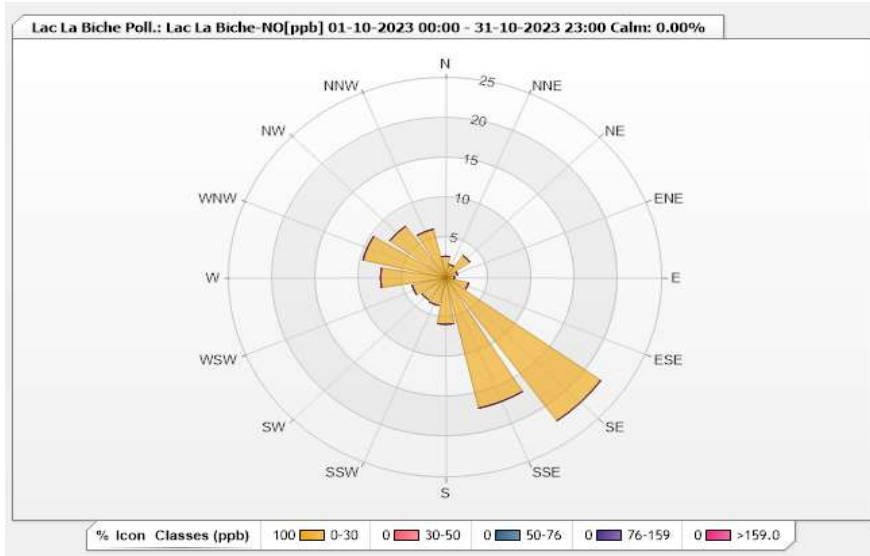


Station: Lac La Biche Poll.: Lac La Biche-NO[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.7	0	0	0	0	2.7
NNE	1.7	0	0	0	0	1.7
NE	3.41	0	0	0	0	3.41
ENE	1.42	0	0	0	0	1.42
E	0.99	0	0	0	0	0.99
ESE	2.7	0	0	0	0	2.7
SE	22.02	0	0	0	0	22.02
SSE	16.76	0	0	0	0	16.76
S	5.82	0	0	0	0	5.82
SSW	3.55	0	0	0	0	3.55
SW	3.41	0	0	0	0	3.41
WSW	3.98	0	0	0	0	3.98
W	7.53	0	0	0	0	7.53
WNW	9.8	0	0	0	0	9.8
NW	7.95	0	0	0	0	7.95
NNW	6.25	0	0	0	0	6.25
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

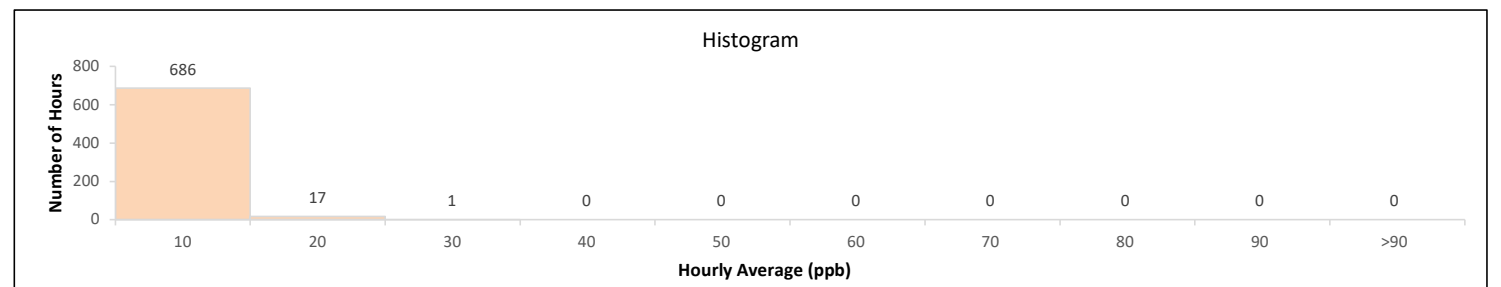
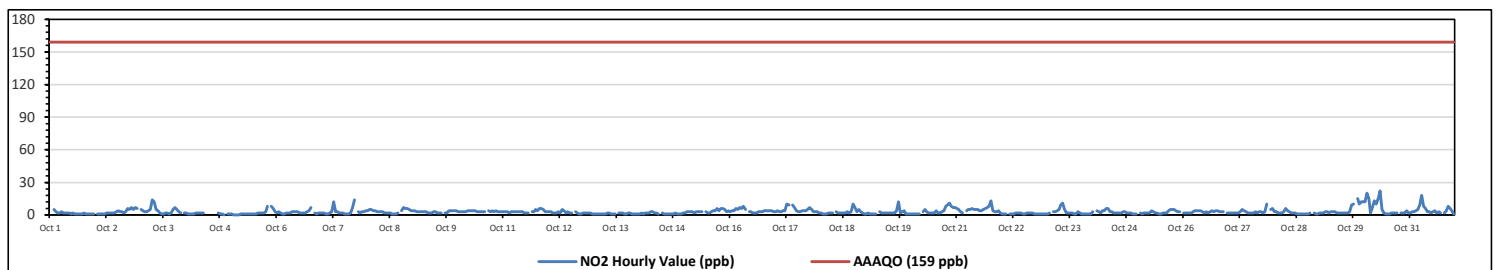
Lac La Biche Station - October 2023

Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																																															
Number of 1-Hour Exceedances: 0																																															
Maximum Hourly Value: 22 ppb on Oct 30 at hr 8												Hours in Service: 744																																			
Maximum Daily Value: 6.4 ppb on Oct 30												Hours of Data: 704																																			
Minimum Hourly Value: 0 ppb on Oct 4 at hr 20												Hours of Missing Data: 0																																			
Minimum Daily Value: 1.3 ppb on Oct 13												Hours of Calibration: 40																																			
Monthly Average: 3.1 ppb												Operational Uptime: 100.0																																			
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
Oct 1	3	S	5	3	2	2	3	2	2	2	2	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	5	1.8																			
Oct 2	S	1	1	1	1	1	2	2	2	2	3	4	3	3	2	3	6	5	7	5	7	6	S	S	1	7	3.1																				
Oct 3	5	4	3	3	4	5	14	12	5	4	2	1	1	2	2	1	2	5	7	5	3	2	S	2	1	14	4.1																				
Oct 4	2	1	1	1	1	2	2	2	2	2	C	C	C	C	C	C	C	2	1	1	0	S	1	1	0	2	NA																				
Oct 5	1	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	3	8	S	8	6	3	3	0	8	2.0																				
Oct 6	2	3	2	1	1	2	2	2	3	3	3	3	2	2	2	2	3	4	7	S	2	1	2	2	1	7	2.4																				
Oct 7	2	2	1	1	2	3	12	3	3	2	2	2	1	1	1	2	7	14	S	3	2	3	3	4	1	14	3.3																				
Oct 8	4	5	5	4	4	3	3	3	3	2	2	2	2	1	1	1	2	S	4	7	6	6	5	4	1	7	3.4																				
Oct 9	4	4	3	3	3	3	3	3	2	2	2	3	3	2	2	S	S	2	2	4	4	4	4	4	2	4	3.0																				
Oct 10	3	3	3	3	3	4	4	4	4	4	3	3	3	3	S	4	3	4	3	4	3	3	3	3	3	4	3.3																				
Oct 11	3	3	3	2	3	3	3	3	3	3	2	2	2	S	S	3	5	4	6	6	5	3	3	2	6	3.3																					
Oct 12	3	3	2	2	3	2	5	4	2	3	2	2	S	3	2	1	1	2	2	2	2	2	1	1	1	5	2.3																				
Oct 13	1	1	1	1	1	1	2	2	1	1	1	S	2	2	2	1	1	2	2	1	1	1	1	1	1	2	1.3																				
Oct 14	1	2	1	2	2	2	3	3	2	2	1	S	2	1	1	1	1	1	1	2	1	1	1	2	1	3	1.6																				
Oct 15	2	3	3	3	3	2	3	3	3	3	S	3	2	2	3	4	4	6	4	6	6	5	3	4	2	6	3.5																				
Oct 16	3	4	4	6	5	7	6	8	5	S	3	3	2	2	3	3	3	4	4	4	4	4	4	3	2	8	4.0																				
Oct 17	3	4	3	3	4	4	10	9	S	9	7	4	3	3	4	4	4	5	7	5	3	3	3	2	2	10	4.6																				
Oct 18	2	1	1	1	2	2	2	S	3	2	2	2	2	2	3	2	3	10	7	3	5	3	2	1	1	10	2.7																				
Oct 19	1	2	1	1	1	1	S	3	2	2	2	2	2	2	2	2	4	12	2	3	4	1	1	1	1	12	2.3																				
Oct 20	1	1	1	1	1	S	3	5	3	2	2	2	2	4	2	2	3	4	8	9	11	8	7	7	1	11	3.9																				
Oct 21	6	5	3	2	S	4	5	5	6	5	5	4	4	5	6	7	8	13	4	3	3	4	2	2	13	5.0																					
Oct 22	1	1	1	S	1	1	1	2	2	2	2	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	1.3																				
Oct 23	1	2	S	3	3	4	5	9	11	5	2	2	2	2	1	1	3	2	1	1	1	1	1	1	1	11	2.8																				
Oct 24	3	S	4	3	2	4	4	6	6	3	3	2	2	2	2	2	3	3	2	2	2	1	1	1	1	6	2.7																				
Oct 25	S	2	1	2	2	2	2	4	3	2	2	1	1	2	2	2	4	5	5	5	4	3	3	S	1	5	2.7																				
Oct 26	2	2	2	2	2	3	4	4	4	4	3	2	3	2	3	4	3	4	4	3	3	S	S	2	2	4	3.0																				
Oct 27	2	2	2	2	2	2	3	5	4	3	2	2	2	2	3	2	3	3	2	3	10	S	5	6	2	10	3.1																				
Oct 28	3	3	2	2	2	3	6	4	3	2	2	2	1	1	1	1	1	1	1	2	S	2	1	1	1	6	2.0																				
Oct 29	2	2	2	3	2	3	3	3	3	2	2	2	2	2	2	3	9	10	S	15	10	12	12	2	15	4.7																					
Oct 30	12	20	15	2	7	13	10	16	22	5	2	1	1	1	2	2	2	2	S	2	2	4	2	1	22	6.4																					
Oct 31	2	3	3	4	5	9	18	8	6	3	3	2	3	4	2	3	2	S	2	4	8	6	4	1	1	18	4.6																				
Diurnal Maximum	12	20	15	6	7	13	18	16	22	9	7	5	4	4	5	6	7	14	13	9	15	10	12	12																							
Diurnal Average	2.8	3.1	2.6	2.2	2.5	3.3	4.7	4.7	4.1	2.9	2.4	2.1	2.1	2.1	2.2	2.2	2.9	4.3	4.0	3.7	4.1	3.4	3.2	2.7																							
C	Monthly Calibration											S	Daily Zero-Span Check											Q	Quality Assurance																						
K	Collection Error											ND	No Data (Machine Not in Service)											Y	Routine Maintenance											P	Power Failure										
X	Invalid Data (Equipment Malfunction /Recovery)											NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																																		

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

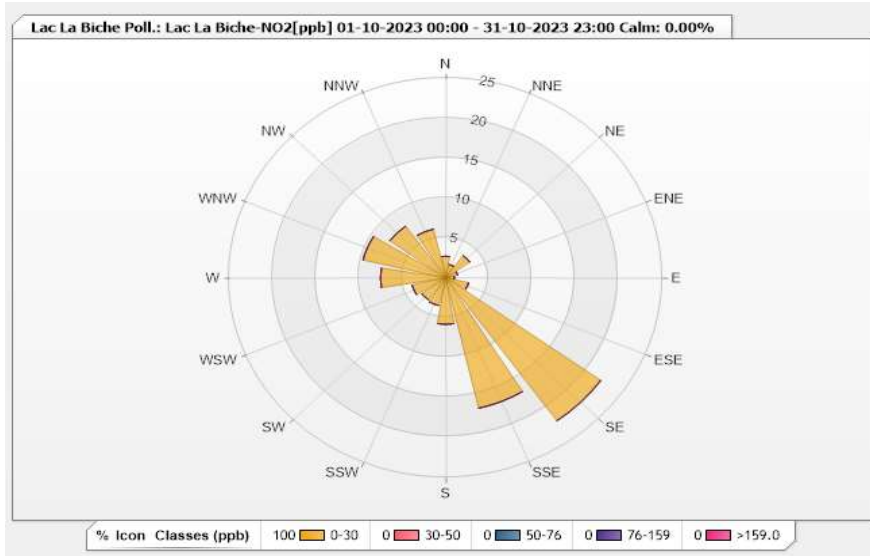


Station: Lac La Biche Poll.: Lac La Biche-NO2[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.7	0	0	0	0	2.7
NNE	1.7	0	0	0	0	1.7
NE	3.41	0	0	0	0	3.41
ENE	1.42	0	0	0	0	1.42
E	0.99	0	0	0	0	0.99
ESE	2.7	0	0	0	0	2.7
SE	22.02	0	0	0	0	22.02
SSE	16.76	0	0	0	0	16.76
S	5.82	0	0	0	0	5.82
SSW	3.55	0	0	0	0	3.55
SW	3.41	0	0	0	0	3.41
WSW	3.98	0	0	0	0	3.98
W	7.53	0	0	0	0	7.53
WNW	9.8	0	0	0	0	9.8
NW	7.95	0	0	0	0	7.95
NNW	6.25	0	0	0	0	6.25
Summary	100	0	0	0	0	100

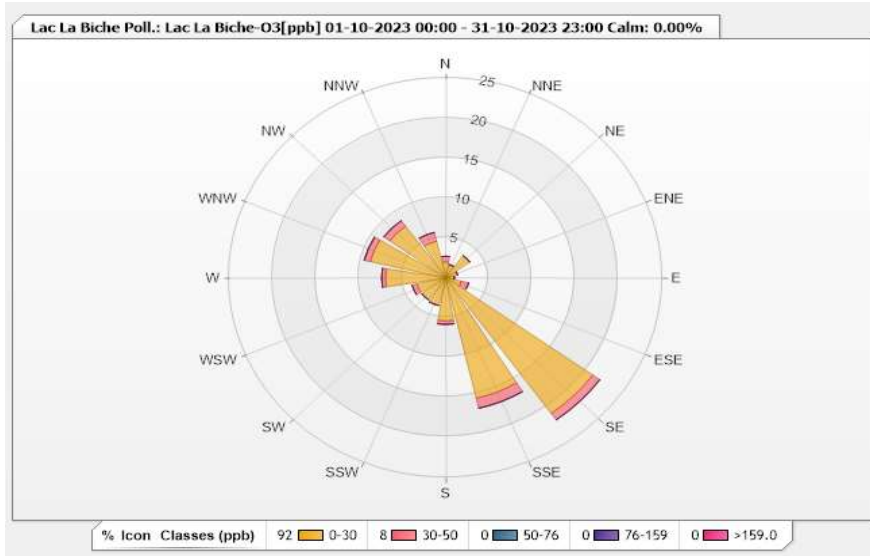


Station: Lac La Biche Poll.: Lac La Biche-O3[ppb] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppm]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.99	0.71	0	0	0	2.7
NNE	1.7	0	0	0	0	1.7
NE	3.41	0	0	0	0	3.41
ENE	1.42	0	0	0	0	1.42
E	0.99	0	0	0	0	0.99
ESE	1.85	0.85	0	0	0	2.7
SE	20.88	0.99	0	0	0	21.87
SSE	15.48	1.28	0	0	0	16.76
S	5.4	0.43	0	0	0	5.83
SSW	3.55	0	0	0	0	3.55
SW	3.41	0	0	0	0	3.41
WSW	3.41	0.57	0	0	0	3.98
W	6.96	0.43	0	0	0	7.39
WNW	8.95	0.71	0	0	0	9.66
NW	7.95	0.85	0	0	0	8.8
NNW	4.69	1.14	0	0	0	5.83
Summary	92.04	7.96	0	0	0	100

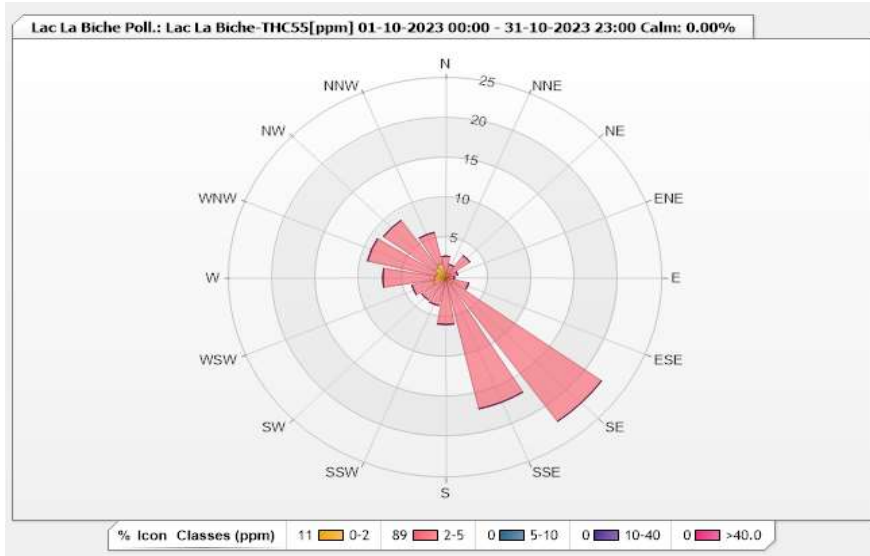


Station: Lac La Biche Poll.: Lac La Biche-THC55[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	0.57	2.14	0	0	0	2.71
NNE	0.57	1.14	0	0	0	1.71
NE	0.57	2.85	0	0	0	3.42
ENE	0.29	1.14	0	0	0	1.43
E	0.29	0.71	0	0	0	1
ESE	0	2.71	0	0	0	2.71
SE	1	21.11	0	0	0	22.11
SSE	0.29	16.55	0	0	0	16.84
S	0.29	5.56	0	0	0	5.85
SSW	0.14	3.42	0	0	0	3.56
SW	0.14	3.28	0	0	0	3.42
WSW	1.43	2.57	0	0	0	4
W	1.28	5.99	0	0	0	7.27
WNW	1.14	8.13	0	0	0	9.27
NW	1.57	7.28	0	0	0	8.85
NNW	1.85	3.99	0	0	0	5.84
Summary	11.42	88.57	0	0	0	100



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

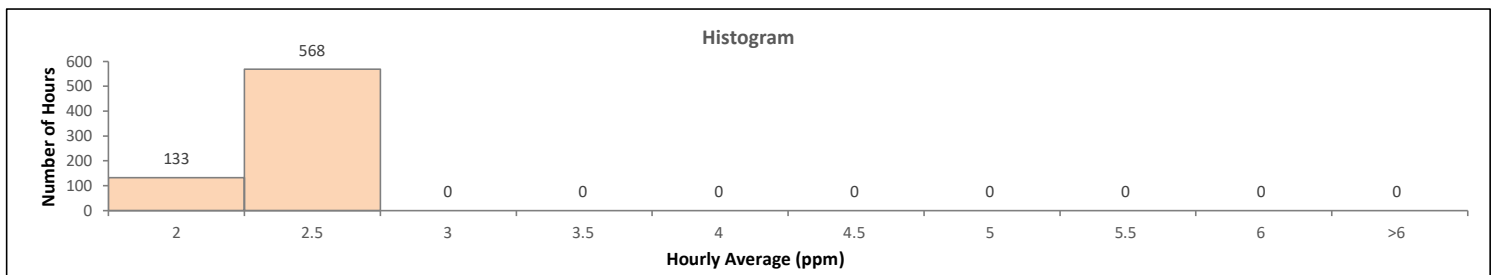
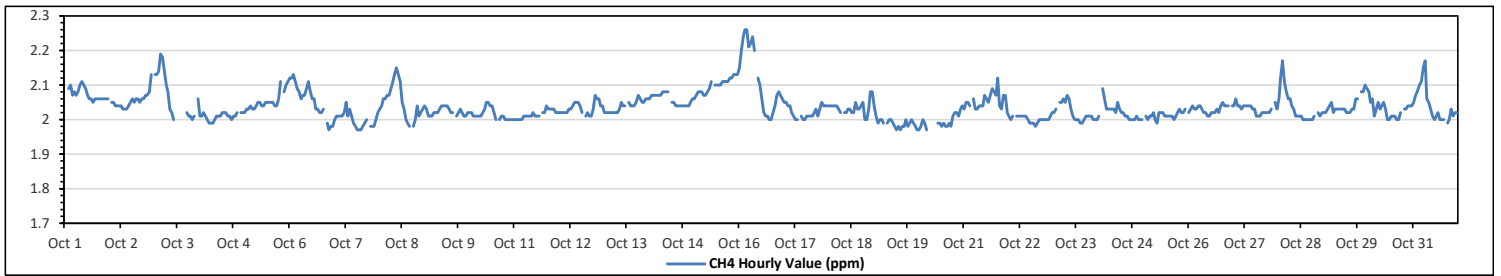
METHANE (CH4) in ppm

Summary statistics table for Methane (CH4) in ppm. It includes Maximum Hourly Value (2.26 ppm on Oct 16 at hr 3), Maximum Daily Value (2.11 ppm on Oct 16), Minimum Hourly Value (1.97 ppm on Oct 6 at hr 21), Minimum Daily Value (1.99 ppm on Oct 19), and Monthly Average (2.04 ppm). It also lists Hours in Service (744), Hours of Data (701), Hours of Missing Data (5), Hours of Calibration (38), and Operational Uptime (99.3).

Main data table showing hourly Methane (CH4) concentrations in ppm for each day from Oct 1 to Oct 31. The table has columns for 'Day', 'Hourly Period Starting at (MST)' (0-23), 'Daily Minimum', 'Daily Maximum', and 'Daily Average'. Values are mostly between 2.0 and 2.1 ppm, with several 'S' (Daily Zero-Span Check) and 'C' (Monthly Calibration) markers.

Legend table for data quality markers. It defines 'C' as Monthly Calibration, 'K' as Collection Error, 'X' as InValid Data, 'S' as Daily Zero-Span Check, 'ND' as No Data, 'NRM' as Unit/Maint, 'Q' as Quality Assurance, 'Y' as Routine Maintenance, and 'P' as Power Failure.

Additional notes: 'Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met. Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.'

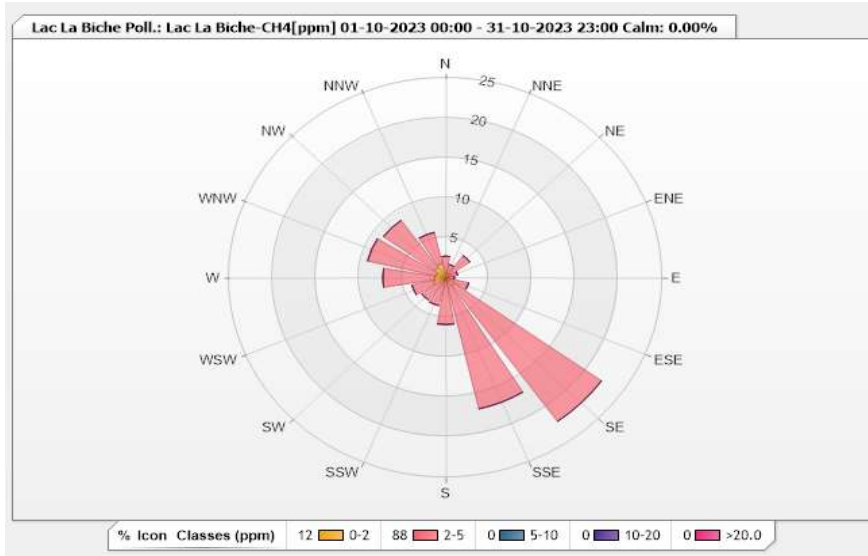


Station: Lac La Biche Poll.: Lac La Biche-CH4[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	0.57	2.14	0	0	0	2.71
NNE	0.57	1.14	0	0	0	1.71
NE	0.57	2.85	0	0	0	3.42
ENE	0.29	1.14	0	0	0	1.43
E	0.29	0.71	0	0	0	1
ESE	0.14	2.57	0	0	0	2.71
SE	1.14	20.97	0	0	0	22.11
SSE	0.29	16.55	0	0	0	16.84
S	0.29	5.56	0	0	0	5.85
SSW	0.14	3.42	0	0	0	3.56
SW	0.14	3.28	0	0	0	3.42
WSW	1.43	2.57	0	0	0	4
W	1.28	5.99	0	0	0	7.27
WNW	1.14	8.13	0	0	0	9.27
NW	1.57	7.28	0	0	0	8.85
NNW	1.85	3.99	0	0	0	5.84
Summary	11.7	88.29	0	0	0	100

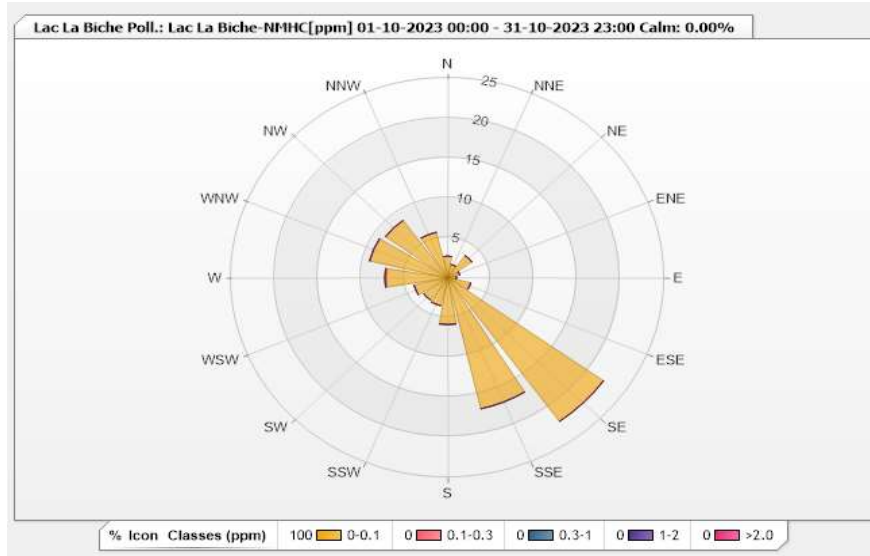


Station: Lac La Biche Poll.: Lac La Biche-NMHC[ppm] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	2.71	0	0	0	0	2.71
NNE	1.71	0	0	0	0	1.71
NE	3.42	0	0	0	0	3.42
ENE	1.43	0	0	0	0	1.43
E	1	0	0	0	0	1
ESE	2.71	0	0	0	0	2.71
SE	22.11	0	0	0	0	22.11
SSE	16.83	0	0	0	0	16.83
S	5.85	0	0	0	0	5.85
SSW	3.57	0	0	0	0	3.57
SW	3.42	0	0	0	0	3.42
WSW	3.99	0	0	0	0	3.99
W	7.13	0.14	0	0	0	7.27
WNW	9.27	0	0	0	0	9.27
NW	8.84	0	0	0	0	8.84
NNW	5.85	0	0	0	0	5.85
Summary	100	0.14	0	0	0	100



Lakeland Industry & Community Association

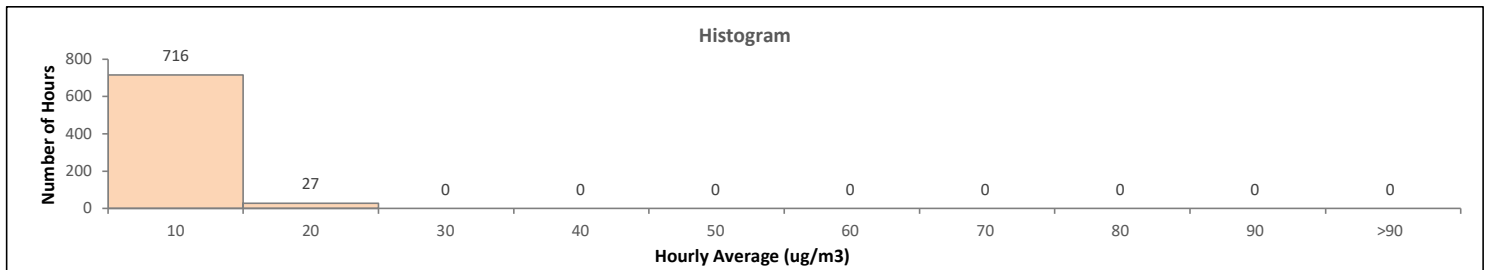
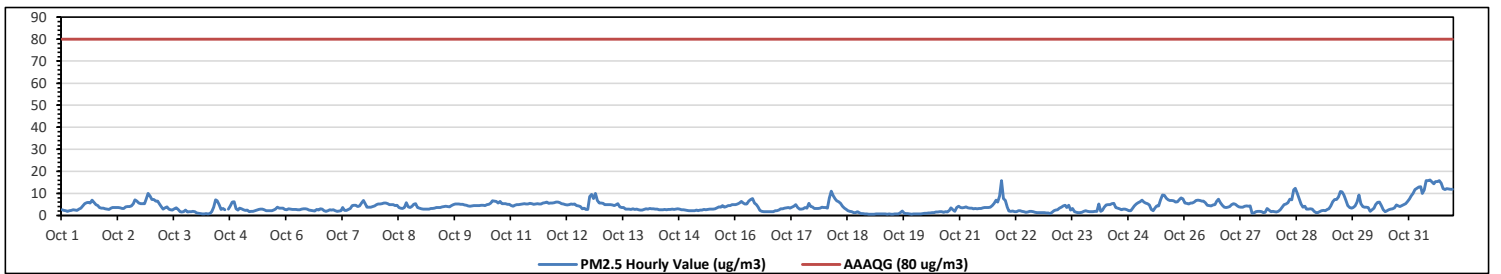
Lac La Biche Station - October 2023

Summary of Hourly Averages

PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

Alberta Ambient Air Quality Guideline (AAAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAAQO): 24-Hour 29 µg/m ³																																											
Number of 1-Hour Exceedances:	0	Number of 24-Hour Exceedances:	0																																								
Maximum Hourly Value:	16 µg/m ³ on Oct 31 at hr 11	Hours in Service:	744																																								
Maximum Daily Value:	12.8 µg/m ³ on Oct 31	Hours of Data:	743																																								
Minimum Hourly Value:	1 µg/m ³ on Oct 19 at hr 0	Hours of Missing Data:	0																																								
Minimum Daily Value:	1 µg/m ³ on Oct 19	Hours of Calibration:	1																																								
Monthly Average:	4.0 µg/m ³	Operational Uptime:	100.0																																								
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average																	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																			
Oct 1	3	2	2	2	2	2	3	2	2	3	3	4	5	6	6	7	6	5	4	4	3	3	3	3	2	7	3.7																
Oct 2	3	3	3	4	4	4	4	3	3	3	4	4	4	4	5	7	7	6	5	5	7	10	9	3	10	4.8																	
Oct 3	7	7	7	6	5	4	3	3	4	3	3	2	3	4	2	2	2	2	2	2	2	2	2	2	2	7	3.3																
Oct 4	1	1	1	1	1	1	1	1	2	4	7	7	5	3	3	3	C	3	4	6	6	3	2	3	1	7	2.9																
Oct 5	3	3	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	3	4	3	3	3	3	2	4	2.6																	
Oct 6	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	2	3	3	2	2	2	3	2	3	2.6																	
Oct 7	2	3	2	2	2	2	4	2	2	3	3	5	5	5	4	4	6	7	5	4	4	4	4	2	7	3.6																	
Oct 8	5	5	5	6	6	5	5	5	5	5	5	5	4	3	3	4	6	4	4	4	5	5	4	3	6	4.5																	
Oct 9	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	3	5	3.9																	
Oct 10	5	4	4	4	4	5	4	4	5	5	5	5	6	7	6	6	6	6	6	5	5	5	5	4	7	5.1																	
Oct 11	5	4	5	5	5	5	5	5	5	5	6	5	5	5	5	5	6	6	6	6	6	6	6	4	6	5.2																	
Oct 12	6	6	6	5	5	5	5	5	5	5	4	4	4	4	3	3	3	3	9	10	8	10	7	6	3	5.4																	
Oct 13	6	6	5	5	5	5	5	4	5	4	4	4	3	3	3	3	3	3	3	3	2	2	3	2	6	3.8																	
Oct 14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	2.7																	
Oct 15	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	5	4	4	4	4	5	2	5	3.2																	
Oct 16	5	5	6	6	6	5	5	7	7	8	6	5	4	2	2	2	2	2	2	2	2	2	2	2	2	8	3.9																
Oct 17	3	3	3	3	4	3	4	4	5	4	3	3	3	4	3	6	4	4	3	3	3	3	3	4	3	3.5																	
Oct 18	4	3	8	11	9	8	7	6	6	4	3	3	2	2	2	1	1	2	1	1	1	1	1	1	1	11	3.6																
Oct 19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	0.8																	
Oct 20	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	2	4	4	1	4	1.6																	
Oct 21	4	3	4	4	3	3	3	3	3	3	3	3	3	4	4	4	5	6	7	6	9	16	8	3	16	4.7																	
Oct 22	7	4	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	1	7	1.9																	
Oct 23	1	1	2	2	3	3	4	4	5	4	5	2	3	2	1	1	1	1	2	2	2	2	2	1	5	2.4																	
Oct 24	2	2	5	2	2	4	5	5	5	6	4	3	3	3	3	3	3	2	2	3	4	5	6	2	6	3.6																	
Oct 25	6	7	6	6	5	5	3	2	3	4	4	7	9	9	8	7	7	7	6	6	7	8	8	2	9	6.1																	
Oct 26	6	6	5	6	6	6	7	7	7	7	6	6	5	4	4	5	5	6	7	6	5	4	4	4	7	5.5																	
Oct 27	4	5	5	5	4	4	4	4	4	4	4	1	1	2	2	2	2	1	1	3	2	2	2	1	5	3.0																	
Oct 28	2	2	2	3	4	5	5	6	7	7	12	12	10	8	5	4	4	3	3	3	3	2	1	1	12	4.7																	
Oct 29	2	2	2	2	3	3	4	6	7	7	8	11	11	9	7	4	4	3	4	4	6	9	5	4	11	5.4																	
Oct 30	4	4	4	2	3	3	5	6	6	4	3	2	2	3	3	3	3	5	4	4	5	5	6	2	6	3.8																	
Oct 31	8	9	10	12	12	13	13	10	12	16	16	16	15	14	15	15	16	15	12	12	12	12	12	12	8	16	12.8																
Diurnal Maximum	8	9	10	12	12	13	13	10	12	16	16	16	15	14	15	15	16	15	12	12	12	12	12	12	16	12																	
Diurnal Average	3.6	3.6	3.8	3.8	3.8	3.8	3.9	4.0	4.3	4.4	4.5	4.5	4.3	4.0	3.8	3.8	4.0	3.9	4.0	4.1	4.0	4.2	4.3	4.0																			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										ND	No Data (Machine Not in Service)										Y	Routine Maintenance										P	Power Failure									
X	Invalid Data (Equipment Malfunction /Recovery)										NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																															

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

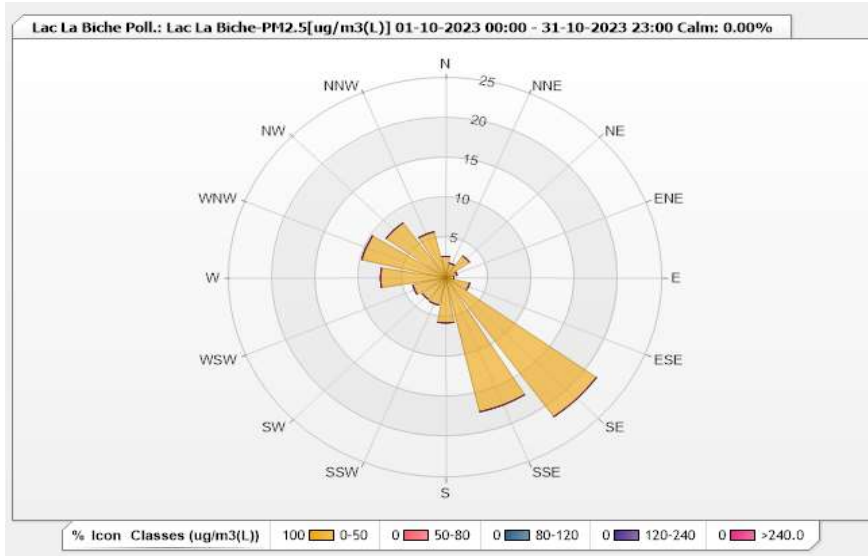


Station: Lac La Biche Poll.: Lac La Biche-PM2.5[ug/m3(L)] Monthly: 10-2023

Type: Pollution Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm: 0.00% Valid Data: 99.87% Calm Avg: 0.00 [ppm]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	2.69	0	0	0	0	2.69
NNE	1.88	0	0	0	0	1.88
NE	3.36	0	0	0	0	3.36
ENE	1.35	0	0	0	0	1.35
E	0.94	0	0	0	0	0.94
ESE	2.83	0	0	0	0	2.83
SE	21.4	0	0	0	0	21.4
SSE	17.23	0	0	0	0	17.23
S	5.65	0	0	0	0	5.65
SSW	3.5	0	0	0	0	3.5
SW	3.36	0	0	0	0	3.36
WSW	3.9	0	0	0	0	3.9
W	7.54	0	0	0	0	7.54
WNW	9.96	0	0	0	0	9.96
NW	8.48	0	0	0	0	8.48
NNW	5.92	0	0	0	0	5.92
Summary	100	0	0	0	0	100



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

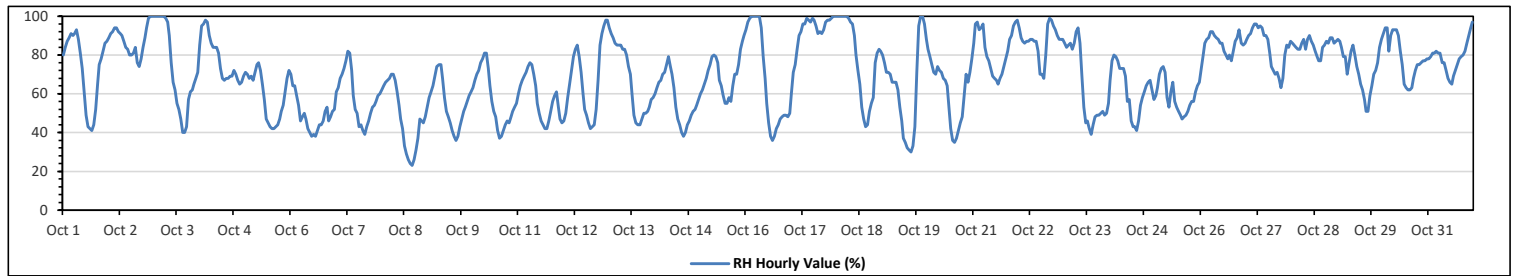
RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	100 %	on Oct 2 at hr 22	Hours in Service:	744
Maximum Daily Value:	92.0 %	on Oct 17	Hours of Data:	744
Minimum Hourly Value:	23 %	on Oct 8 at hr 16	Hours of Missing Data:	0
Minimum Daily Value:	48.0 %	on Oct 8	Hours of Calibration:	0
Monthly Average:	69.6 %		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Oct 1	80	84	87	89	91	90	91	93	88	81	73	61	49	43	42	41	44	52	65	75	78	82	86	87	41	93	73.0
Oct 2	89	91	92	94	94	92	91	90	87	84	83	80	80	81	84	76	74	78	84	89	94	99	100	100	74	100	87.8
Oct 3	100	100	100	100	100	100	99	97	90	76	66	62	55	52	47	40	40	43	57	61	62	65	68	71	40	100	73.0
Oct 4	85	95	96	98	97	90	86	84	84	84	81	73	68	67	68	68	69	69	72	70	67	65	66	69	65	98	78.0
Oct 5	71	70	68	69	67	71	75	76	72	65	57	47	45	43	42	43	44	47	51	54	61	68	72	42	76	59.2	
Oct 6	70	64	64	59	54	46	48	50	47	42	40	38	39	38	41	44	44	46	51	53	46	48	51	52	38	70	49.0
Oct 7	61	63	68	70	73	77	82	81	72	59	52	50	43	44	41	39	43	46	50	53	54	56	59	60	39	82	58.2
Oct 8	62	64	66	67	68	70	70	67	61	54	47	42	33	29	26	24	23	26	31	37	47	46	45	48	23	70	48.0
Oct 9	53	58	61	64	69	74	75	75	68	58	51	48	45	41	38	36	38	43	47	51	53	56	59	61	36	75	55.1
Oct 10	63	67	70	72	76	78	81	81	73	64	56	51	48	41	37	38	41	44	46	45	48	51	53	55	37	81	57.5
Oct 11	60	64	67	69	71	74	76	75	70	64	55	50	46	44	42	42	46	51	56	59	61	53	47	45	42	76	57.8
Oct 12	46	50	58	65	72	79	83	85	79	71	60	52	49	45	42	43	44	52	67	85	91	95	98	98	42	98	67.0
Oct 13	94	91	89	86	85	85	85	83	83	80	74	70	60	49	45	44	44	47	50	50	51	53	57	58	44	94	67.2
Oct 14	60	63	66	67	70	71	75	79	74	70	63	53	47	44	40	38	40	44	46	49	51	52	54	57	38	79	57.2
Oct 15	60	62	65	68	72	75	79	80	79	76	67	64	59	55	55	58	56	64	70	70	75	83	87	90	55	90	69.5
Oct 16	93	97	99	100	100	100	100	100	94	79	68	55	45	38	36	38	42	44	47	48	49	49	48	50	36	100	67.5
Oct 17	60	71	75	83	90	92	96	96	99	98	97	99	98	95	91	92	91	93	97	98	98	99	100	100	60	100	92.0
Oct 18	100	100	100	100	100	100	99	97	96	90	80	72	65	53	47	43	44	51	55	58	76	81	83	82	43	100	78.0
Oct 19	80	76	71	71	70	66	66	66	62	53	46	37	35	32	31	30	33	43	71	95	100	100	96	88	30	100	63.3
Oct 20	83	79	75	71	70	74	72	71	68	67	64	52	42	36	35	37	41	45	48	59	70	66	71	78	35	83	61.4
Oct 21	86	96	97	93	94	96	84	79	77	73	69	68	67	65	68	70	74	78	82	88	90	95	97	98	65	98	82.7
Oct 22	94	89	87	86	87	87	88	88	87	87	82	70	70	68	80	96	99	98	95	93	90	88	88	88	68	99	86.9
Oct 23	86	84	85	86	83	86	92	94	86	69	53	45	46	42	39	44	48	49	49	50	51	49	50	55	39	94	63.4
Oct 24	67	77	80	79	77	73	73	73	69	56	57	46	43	43	41	46	54	58	61	64	66	67	62	57	41	80	62.0
Oct 25	59	63	70	73	74	71	58	53	61	66	56	53	51	49	47	48	49	51	54	56	56	61	64	66	47	74	58.7
Oct 26	73	80	86	88	88	92	92	90	89	88	86	86	82	80	78	80	77	82	87	89	93	86	85	86	73	93	85.2
Oct 27	88	90	91	94	96	96	94	95	94	90	90	88	81	74	72	70	71	68	63	68	80	85	84	87	63	96	83.7
Oct 28	86	85	84	83	83	86	88	83	88	90	87	85	82	79	77	77	84	85	87	86	89	89	86	87	77	90	84.8
Oct 29	88	87	84	79	79	70	76	82	85	80	74	70	65	62	57	51	51	59	64	70	72	76	84	88	51	88	73.0
Oct 30	91	94	94	82	90	93	93	93	90	82	75	65	63	62	62	63	68	72	75	75	76	77	77	78	62	94	78.8
Oct 31	78	79	81	81	82	81	81	76	76	72	68	66	65	69	72	75	78	79	80	82	86	90	94	97	65	97	78.7
Diurnal Maximum	100	100	100	100	100	100	100	99	98	97	99	98	95	91	96	99	98	97	98	100	100	100	100	100			
Diurnal Average	76.3	78.5	79.9	80.2	81.4	81.8	82.2	81.7	79.0	73.2	67.0	61.2	57.0	53.6	52.4	52.7	54.6	58.2	63.0	67.0	70.1	71.7	73.1	74.5			

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction /Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

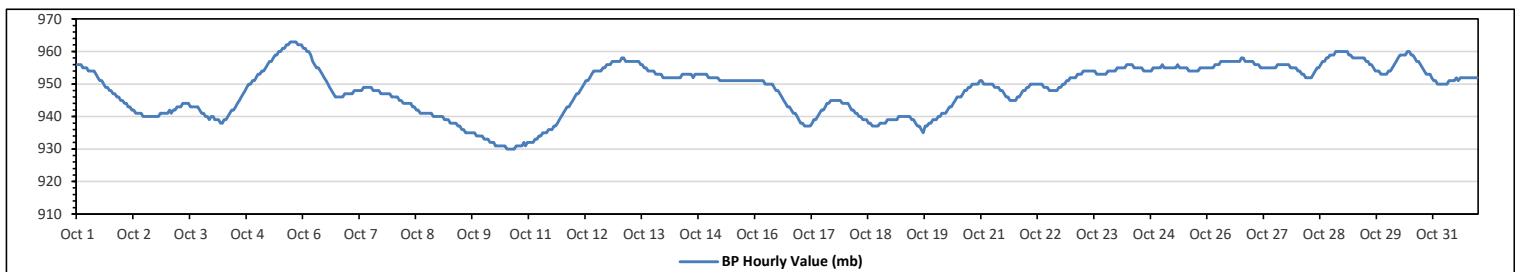
BAROMETRIC PRESSURE (BP) in millibar

Maximum Hourly Value:	963 mb on Oct 5 at hr 17	Hours in Service:	744
Maximum Daily Value:	959 mb on Oct 5	Hours of Data:	744
Minimum Hourly Value:	930 mb on Oct 10 at hr 12	Hours of Missing Data:	0
Minimum Daily Value:	931 mb on Oct 10	Hours of Calibration:	0
Monthly Average:	948 mb	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Oct 1	956	956	956	955	955	955	954	954	954	954	953	952	951	951	950	949	949	948	948	947	947	946	946	945	945	956	956	951
Oct 2	945	944	944	943	943	942	942	941	941	941	941	940	940	940	940	940	940	940	940	941	941	941	941	941	941	940	945	941
Oct 3	941	942	941	942	942	943	943	943	944	944	944	944	943	943	943	943	943	943	942	941	941	940	940	939	940	939	944	942
Oct 4	940	939	939	939	938	938	939	939	940	941	942	942	943	944	945	946	947	948	949	950	950	951	951	952	952	938	952	944
Oct 5	953	953	954	954	955	956	957	957	958	959	959	960	960	961	961	962	962	963	963	963	963	962	962	962	953	963	959	
Oct 6	961	961	960	960	959	957	956	955	955	954	953	952	951	950	949	948	947	946	946	946	946	946	947	947	946	961	952	
Oct 7	947	947	947	948	948	948	948	949	949	949	949	949	948	948	948	948	947	947	947	947	947	947	947	947	946	949	948	
Oct 8	946	946	946	945	945	944	944	944	944	944	943	943	942	942	941	941	941	941	941	941	941	941	940	940	940	946	943	
Oct 9	940	940	940	939	939	939	938	938	938	938	937	937	936	936	935	935	935	935	935	935	934	934	934	934	934	934	940	937
Oct 10	933	933	933	932	932	932	931	931	931	931	931	931	930	930	930	930	930	931	931	931	931	932	932	932	931	933	931	
Oct 11	932	932	932	933	933	934	934	935	935	935	936	936	936	937	937	938	939	940	941	942	943	943	944	945	932	945	937	
Oct 12	946	947	947	948	949	950	951	951	952	953	954	954	954	954	954	955	955	956	956	957	957	957	957	957	957	946	957	953
Oct 13	957	958	958	957	957	957	957	957	957	957	956	956	955	955	955	954	954	954	954	953	953	953	953	953	952	952	958	955
Oct 14	952	952	952	952	952	952	952	952	952	953	953	953	953	953	952	952	953	953	953	953	953	953	953	953	952	952	953	953
Oct 15	952	952	952	952	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	951	952	951
Oct 16	951	951	951	951	951	950	950	950	950	950	949	948	948	947	946	945	944	943	943	942	941	941	941	940	939	939	951	947
Oct 17	938	938	937	937	937	937	938	939	939	940	941	942	942	943	944	944	945	945	945	945	945	945	944	944	944	937	945	941
Oct 18	944	944	943	942	942	941	941	940	940	939	939	938	938	937	937	937	937	938	938	938	938	938	938	939	939	937	944	940
Oct 19	939	939	939	939	940	940	940	940	940	940	940	939	939	938	937	937	936	935	937	937	938	938	939	939	939	935	940	939
Oct 20	939	940	940	941	941	941	942	943	943	944	945	946	946	946	947	948	948	949	949	950	950	950	951	951	939	951	945	
Oct 21	951	950	950	950	950	950	949	949	949	948	948	947	946	946	945	945	945	945	945	946	946	947	948	948	945	951	948	
Oct 22	949	949	950	950	950	950	950	950	949	949	949	949	948	948	948	948	948	949	949	950	950	951	951	952	948	952	949	
Oct 23	952	952	952	953	953	953	954	954	954	954	954	954	953	953	953	953	953	953	953	954	954	954	954	954	952	954	953	
Oct 24	955	955	955	955	955	956	956	956	956	955	955	955	955	955	954	954	954	954	954	955	955	955	955	955	954	956	955	
Oct 25	956	955	955	955	955	955	955	955	956	955	955	955	955	955	954	954	954	954	954	954	954	955	955	955	954	956	955	
Oct 26	955	955	955	955	956	956	956	957	957	957	957	957	957	957	957	957	957	957	958	958	957	957	957	957	955	958	957	
Oct 27	957	956	956	956	955	955	955	955	955	955	955	955	956	956	956	956	956	956	956	956	956	955	955	955	955	955	956	
Oct 28	954	954	953	953	952	952	952	953	954	955	955	956	957	957	957	958	958	959	959	959	960	960	960	960	952	960	956	
Oct 29	960	960	960	959	959	958	958	958	958	958	958	957	957	957	956	956	955	954	954	954	953	953	953	953	953	953	960	957
Oct 30	954	954	955	956	957	958	959	959	959	959	960	960	959	959	958	957	957	956	955	954	953	953	953	952	952	960	957	
Oct 31	951	951	950	950	950	950	950	951	951	951	951	951	952	951	952	952	952	952	952	952	952	952	952	952	952	952	952	951
Diurnal Maximum	961	961	960	960	959	958	959	959	959	959	960	960	960	961	961	962	962	963	963	963	963	962	962	962	962	962	962	962
Diurnal Average	949	949	948	948	948	948	948	948	949	949	949	949	948	948	948	948	948	948	948	948	948	948	948	948	948	948	948	948

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction /Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



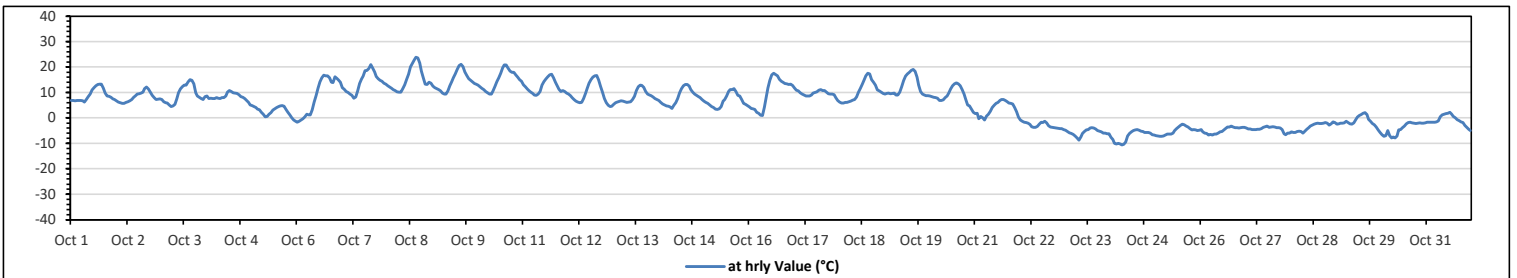
Lakeland Industry & Community Association
Lac La Biche Station - October 2023
Summary of Hourly Averages
AMBIENT TEMPERATURE (AT) in Degree Celsius

Maximum Hourly Value:	23.8 °C	on Oct 8 at hr 15	Hours in Service:	744
Maximum Daily Value:	15.3 °C	on Oct 8	Hours of Data:	744
Minimum Hourly Value:	-10.6 °C	on Oct 24 at hr 6	Hours of Missing Data:	0
Minimum Daily Value:	-7.1 °C	on Oct 24	Hours of Calibration:	0
Monthly Average:	5.3 °C		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Oct 1	6.9	6.8	6.7	6.9	6.9	6.9	6.7	6.3	7.3	8.4	9.3	11	11.9	12.7	13.2	13.3	13.3	11.8	9.8	8.7	8.5	8.1	7.5	7.3	6.3	13.3	9.0
Oct 2	6.7	6.3	6	5.7	5.7	6.1	6.4	6.7	7.3	8.1	8.8	9.4	9.5	9.8	10.1	11.6	12.1	11.4	10.2	8.9	7.9	7.2	7.4	7.5	5.7	12.1	8.2
Oct 3	7.2	6.4	6	5.9	5.2	4.5	4.8	5.3	7.7	9.9	11.4	12.2	12.9	13	14.2	15	14.7	13.4	9.9	8.7	8.1	7.6	7.2	8.4	4.5	15.0	9.2
Oct 4	8.7	7.7	7.8	7.7	7.6	8	7.8	7.7	7.9	8	8.7	10.2	10.7	10.4	9.9	9.8	9.6	9.2	8.4	8.1	7.7	6.8	6.2	5.2	5.2	10.7	8.3
Oct 5	4.9	4.5	4.1	3.5	3.2	2.3	1.4	0.4	0.6	1.5	2.1	3.1	3.6	4.1	4.5	4.8	4.9	4.6	3.4	2.3	1.2	0.1	-0.8	-1.4	-1.4	4.9	2.6
Oct 6	-1.6	-1.3	-0.8	-0.3	0.4	1.4	1.2	1.2	3.2	6.3	8.8	11.7	14.2	15.8	16.8	16.5	16.5	15.9	14.1	13.9	16.1	15.6	14.9	14.1	-1.6	16.8	8.9
Oct 7	11.9	11.3	10.4	10	9.4	8.9	7.8	8.3	10.6	13.5	15.3	16.4	18.6	18.7	19.5	21	19.6	18.1	16.3	15.4	14.8	14.4	13.7	13.3	7.8	21.0	14.1
Oct 8	12.7	12.1	11.7	11.2	10.7	10.3	10.1	10.2	11.5	13.1	15.2	17.2	20	21.4	22.8	23.8	23.6	21.5	18.5	15.8	13.3	13.2	14	13.6	10.1	23.8	15.3
Oct 9	12.5	11.9	11.5	11.1	10.6	9.8	9.3	9.3	10.6	12.6	14.3	15.9	17.3	19	20.6	21.1	20.2	18.1	16.7	15.5	14.7	14.2	13.5	13.3	9.3	21.1	14.3
Oct 10	13	12.3	11.7	11.2	10.4	9.9	9.4	10.6	12.4	14.3	15.9	17.5	19.8	20.9	20.8	19.6	18.5	18	18	16.9	16	15.1	14.4	9.4	20.9	14.8	
Oct 11	13.1	12.2	11.4	10.7	10.2	9.6	9	8.9	9.4	10.5	12.9	14.3	15.3	16.2	16.9	17.2	15.8	14.1	12.5	11.3	10.5	10.7	10.5	9.8	8.9	17.2	12.2
Oct 12	9.4	8.8	8	7.3	6.6	6.3	6	6.1	7.7	9.6	11.6	13.7	15	16	16.6	16.7	14.9	12.4	10.2	7.7	6	5	4.5	4.6	4.5	16.7	9.6
Oct 13	5.3	6	6.3	6.5	6.7	6.6	6.4	6.1	6.3	6.4	7.3	8.5	10.8	12.3	12.9	12.8	12	10.5	9.4	9.1	8.8	8.3	7.6	7.2	5.3	12.9	8.3
Oct 14	6.8	6.1	5.5	5.2	4.8	4.6	4.3	3.8	5	6	7.7	9.9	11.6	12.6	13.2	13.2	12.5	11.1	10.2	9.4	8.9	8.4	7.9	7.3	3.8	13.2	8.2
Oct 15	6.6	6.2	5.7	5.1	4.5	4.1	3.5	3.4	3.7	4.5	6.6	7.3	8.6	10.4	11.1	11.1	11.6	10.5	8.9	8.6	7.2	5.8	5.3	4.9	3.4	11.6	6.9
Oct 16	4.3	3.8	3.6	3.3	2.2	1.8	1.1	1	4.2	8.4	11.8	14.8	16.9	17.5	17.1	16.5	15.2	14.5	14	13.5	13.4	13.2	13.3	12.8	1.0	17.5	9.9
Oct 17	11.8	10.9	10.6	9.9	9.3	9.1	8.7	8.7	8.7	9	9.8	10	10.3	10.9	11.1	10.8	10.7	10.2	9.5	9.3	9.3	9.2	7.9	6.9	6.9	11.8	9.7
Oct 18	6.3	5.9	5.9	6.1	6.1	6.4	6.6	7	7.3	8.3	10.1	11.7	13.3	15	16.5	17.6	17.3	15.1	14	12.9	11	10.6	10.1	9.6	5.9	17.6	10.4
Oct 19	9.4	9.6	9.7	9.5	9.6	9.8	9.1	9	10.1	12.3	14.6	16.4	17.3	18	18.7	19.1	18.4	16	13	10.4	9.4	9	8.8	8.8	8.8	19.1	12.3
Oct 20	8.7	8.4	8.1	8	7.8	6.9	6.9	7.1	7.9	8.6	9.8	11.4	12.6	13.4	13.8	13.4	12.6	11.1	9.4	7.4	5.2	4.8	3.5	2.3	2.3	13.8	8.7
Oct 21	1.7	1.8	-0.2	0.6	0	-0.8	0.7	1.4	2.6	4.1	5	5.7	6.2	6.9	7.2	7.3	6.9	6.4	5.9	5.7	5.4	4.1	2.5	0.3	-0.8	7.3	3.6
Oct 22	-0.8	-1.3	-1.7	-1.8	-2.1	-2.6	-3.4	-3.7	-3.7	-3.3	-2.5	-1.7	-1.8	-1.4	-1.9	-3	-3.5	-3.7	-3.8	-4	-4.1	-4.2	-4.2	-4.5	-4.5	-0.8	-2.9
Oct 23	-4.8	-5.3	-5.8	-6.1	-6.5	-7.1	-7.9	-8.7	-7.4	-6.1	-5.3	-4.7	-4.5	-4	-3.9	-4	-4.3	-5	-5.2	-5.5	-6	-6	-6.2	-6.2	-8.7	-3.9	-5.7
Oct 24	-7.6	-8.4	-10	-10.2	-10	-10.2	-10.6	-10.4	-9.5	-7.1	-6.1	-5.5	-5	-4.7	-4.5	-4.8	-5.2	-5.4	-5.6	-5.6	-5.7	-6	-6.6	-6.7	-10.6	-4.5	-7.1
Oct 25	-6.9	-7	-7.2	-7.2	-7.1	-6.8	-6.4	-6.3	-6.4	-6	-4.9	-4.2	-3.5	-2.9	-2.4	-2.7	-3.1	-3.6	-4.2	-4.7	-4.6	-4.7	-4.9	-4.8	-7.2	-2.4	-5.1
Oct 26	-4.6	-5.5	-6	-6.1	-6.8	-6.5	-6.7	-6.4	-6.3	-6	-5.5	-5.3	-4.7	-4.1	-3.6	-3.6	-3.1	-3.6	-3.8	-3.9	-4	-3.8	-3.7	-3.7	-6.8	-3.1	-4.9
Oct 27	-4	-4.3	-4.3	-4.5	-4.5	-4.4	-4.4	-4.2	-3.7	-3.4	-3.1	-3.7	-3.6	-3.4	-3.6	-3.8	-3.9	-4	-4.5	-6.2	-6.6	-6	-5.9	-6.6	-3.1	-4.4	
Oct 28	-5.5	-5.7	-5.6	-5.4	-5.2	-5.3	-5.9	-5.2	-4.4	-3.9	-3.2	-2.8	-2.5	-2.2	-2	-2.2	-2.2	-2	-1.8	-2	-2.8	-2.3	-1.5	-1.8	-5.9	-1.5	-3.5
Oct 29	-2.4	-2.3	-2.1	-2.1	-1.9	-1.4	-1.8	-2.3	-2.5	-1.9	-0.7	0.3	1	1.3	1.8	2.1	1.3	-0.5	-1.4	-2.2	-2.7	-3.6	-4.7	-5.6	-5.6	2.1	-1.4
Oct 30	-6.6	-7.2	-6.9	-4.9	-6.9	-7.9	-7.5	-7.9	-7	-4.7	-4.5	-3.9	-3.1	-2.3	-1.8	-1.7	-1.9	-2	-2.2	-2.1	-1.9	-2	-2	-1.9	-7.9	-1.7	-4.2
Oct 31	-1.7	-1.6	-1.7	-1.6	-1.6	-1.5	-1.2	0.5	1.2	1.5	1.7	1.9	2.2	1.6	0.6	0	-0.7	-1.1	-1.5	-1.8	-2.9	-3.7	-4.4	-5	-5.0	2.2	-0.9
Diurnal Maximum	13.1	12.3	11.7	11.2	10.7	10.3	10.1	10.2	11.5	13.5	15.3	17.2	20.0	21.4	22.8	23.8	23.6	21.5	18.5	18.0	16.9	16.0	15.1	14.4			
Diurnal Average	3.9	3.5	3.2	3.1	2.8	2.5	2.3	2.3	3.2	4.5	5.8	7.0	8.0	8.8	9.2	9.4	8.9	7.9	6.7	5.9	5.3	4.8	4.4	4.0			

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction /Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

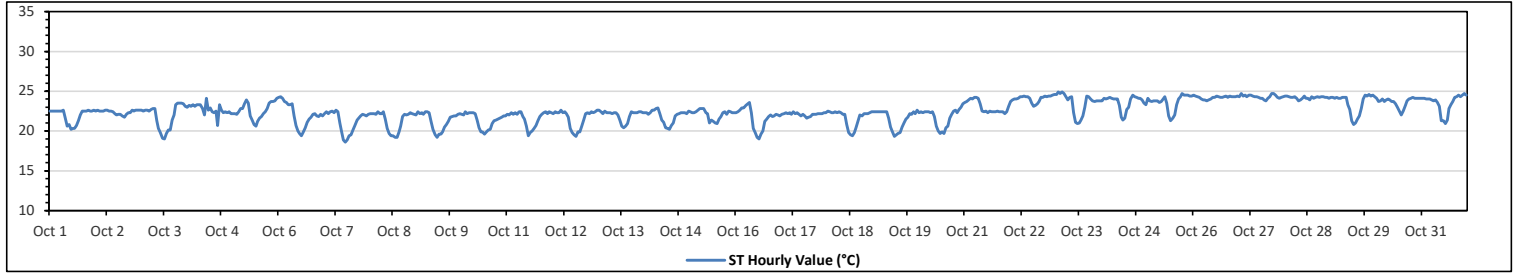


Lakeland Industry & Community Association
Lac La Biche Station - October 2023
Summary of Hourly Averages
STATION TEMPERATURE (ST) in Degree Celsius

Maximum Hourly Value:	24.9 °C	on Oct 23 at hr 1	Hours in Service:	744
Maximum Daily Value:	24.3 °C	on Oct 27	Hours of Data:	744
Minimum Hourly Value:	18.6 °C	on Oct 7 at hr 11	Hours of Missing Data:	0
Minimum Daily Value:	21.2 °C	on Oct 7	Hours of Calibration:	0
Monthly Average:	22.5 °C		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average																				
Oct 1	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.6	21.6	20.6	20.8	20.2	20.3	20.3	20.7	21.3	22.0	22.5	22.5	22.6	22.5	22.5	22.6	20.2	22.6	21.9																					
Oct 2	22.5	22.6	22.5	22.5	22.5	22.6	22.6	22.5	22.5	22.4	22.2	22.0	22.1	22.1	21.9	21.7	22.1	22.3	22.3	22.6	22.5	22.6	22.6	21.7	22.6	22.4																					
Oct 3	22.6	22.5	22.6	22.6	22.5	22.7	22.8	22.8	21.3	20.3	19.8	19.1	19.0	19.7	20.1	20.1	21.4	22.0	23.3	23.5	23.5	23.5	23.4	19.0	23.5	21.8																					
Oct 4	23.0	23.2	23.1	23.3	23.1	23.3	23.3	23.3	22.8	22.0	24.1	22.6	22.9	22.4	22.3	22.5	20.7	23.3	22.6	22.3	22.4	22.3	22.4	20.7	24.1	22.7																					
Oct 5	22.2	22.2	22.1	22.4	22.8	22.8	23.4	23.9	23.5	21.9	21.4	20.8	20.6	21.2	21.6	21.8	22.2	22.4	22.8	23.5	23.7	23.7	23.8	20.6	24.1	22.5																					
Oct 6	24.2	24.3	24.1	23.7	23.6	23.3	23.3	23.4	21.9	20.7	20.0	19.7	19.4	19.9	20.4	21.1	21.5	21.7	22.1	22.2	21.9	21.8	22.1	19.4	24.3	22.0																					
Oct 7	22.2	22.4	22.2	22.4	22.5	22.3	22.6	22.4	21.0	20.0	18.9	18.6	18.9	19.4	19.5	20.1	20.7	21.4	21.6	21.9	22.1	22.0	21.9	22.1	18.6	22.6	21.2																				
Oct 8	22.2	22.2	22.2	22.1	22.4	22.2	22.2	22.4	21.5	20.3	19.7	19.4	19.4	19.2	19.2	19.9	20.6	21.8	22.1	22.0	22.1	22.3	22.2	19.2	22.4	21.3																					
Oct 9	22.0	22.4	22.2	22.3	22.1	22.4	22.4	22.3	21.2	20.2	19.5	19.2	19.6	19.6	19.9	20.5	20.8	21.2	21.7	21.8	21.9	21.9	22.1	19.2	22.4	21.3																					
Oct 10	22.1	22.0	22.4	22.2	22.3	22.3	22.2	21.4	20.4	19.9	19.9	19.9	19.6	19.9	20.1	20.2	20.9	21.3	21.4	21.5	21.6	21.7	19.9	19.6	22.4	21.3																					
Oct 11	22.1	22.0	22.3	22.1	22.3	22.1	22.4	22.4	21.8	21.5	20.6	19.4	19.8	20.0	20.3	20.7	21.3	21.8	22.1	22.3	22.4	22.2	19.4	22.4	21.6																						
Oct 12	22.2	22.4	22.3	22.3	22.6	22.3	22.4	22.2	21.7	20.3	19.8	19.5	19.3	19.9	19.9	20.6	21.4	22.2	22.3	22.2	22.4	22.3	19.3	22.6	21.6																						
Oct 13	22.6	22.4	22.2	22.5	22.3	22.3	22.2	22.3	22.3	22.0	21.4	20.6	20.4	20.6	20.9	21.8	22.4	22.2	22.3	22.3	22.4	22.4	20.4	22.6	22.0																						
Oct 14	22.3	22.3	22.1	22.3	22.6	22.6	22.8	22.9	22.2	21.4	21.1	20.4	20.3	20.2	20.7	21.0	21.9	22.1	22.2	22.3	22.3	22.2	20.2	22.9	21.9																						
Oct 15	22.4	22.3	22.3	22.4	22.6	22.8	22.8	22.8	22.3	22.2	21.0	21.4	21.2	21.0	20.9	21.5	21.8	22.3	22.4	22.1	22.5	22.4	20.9	22.8	22.1																						
Oct 16	22.3	22.4	22.6	22.9	22.9	23.2	23.4	23.6	22.3	20.3	19.8	19.2	19.0	19.6	20.0	21.2	21.5	21.8	22.0	21.8	21.9	22.1	19.0	23.6	21.7																						
Oct 17	22.1	22.2	22.3	22.2	22.3	22.1	22.4	22.2	22.3	22.1	21.9	22.1	21.9	21.6	21.7	21.8	22.1	22.1	22.2	22.2	22.2	22.3	22.3	21.6	22.4	22.1																					
Oct 18	22.5	22.4	22.3	22.3	22.4	22.3	22.4	22.3	22.1	22.1	20.8	19.8	19.5	19.4	19.8	20.4	21.2	22.0	21.9	22.2	22.2	22.3	19.4	22.5	21.6																						
Oct 19	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	21.6	20.5	19.9	19.3	19.5	19.7	19.8	20.5	21.0	21.5	21.7	22.2	22.1	22.4	19.3	22.6	21.5																						
Oct 20	22.3	22.4	22.3	22.4	22.4	22.4	22.3	22.4	21.8	20.6	20.0	19.7	19.9	19.7	20.4	20.6	21.6	22.1	22.5	22.6	22.3	22.7	19.7	23.4	21.7																						
Oct 21	23.6	23.7	23.9	24.1	24.0	24.2	24.2	24.1	23.4	22.5	22.4	22.5	22.3	22.5	22.4	22.4	22.4	22.5	22.4	22.4	22.2	22.4	22.2	24.2	23.0																						
Oct 22	23.7	23.9	24.0	24.0	24.1	24.3	24.3	24.4	24.3	24.3	24.1	23.5	23.1	23.2	23.4	23.7	24.2	24.2	24.4	24.3	24.4	24.4	24.5	24.6	24.1																						
Oct 23	24.6	24.9	24.7	24.9	24.7	24.3	23.9	24.2	24.3	22.3	21.1	20.9	21.0	21.4	21.9	23.0	24.4	24.3	24.0	23.8	23.7	23.8	20.9	24.9	23.5																						
Oct 24	23.8	24.1	24.0	24.1	24.2	24.1	24.0	24.0	24.0	23.2	21.7	21.4	21.6	22.7	23.0	24.0	24.5	24.3	24.2	24.1	24.1	23.9	23.5	23.3	21.4	24.5	23.6																				
Oct 25	24.1	23.8	23.7	23.8	23.8	23.8	23.6	23.7	24.0	24.3	23.5	21.9	21.3	21.6	22.0	23.3	24.0	24.3	24.7	24.5	24.5	24.4	21.3	24.7	23.6																						
Oct 26	24.5	24.4	24.3	24.2	24.0	23.9	23.9	23.8	23.9	24.0	24.2	24.2	24.4	24.3	24.2	24.2	24.3	24.4	24.2	24.4	24.3	24.3	23.8	24.5	24.2																						
Oct 27	24.3	24.7	24.4	24.5	24.3	24.5	24.5	24.4	24.3	24.3	24.2	24.1	24.1	23.9	23.8	24.1	24.3	24.7	24.7	24.5	24.2	24.1	24.2	24.3	24.3																						
Oct 28	24.4	24.4	24.3	24.2	24.2	24.3	24.1	23.8	23.9	24.1	24.4	24.1	24.1	23.9	24.3	24.1	24.2	24.3	24.2	24.3	24.3	24.2	23.8	24.4	24.2																						
Oct 29	24.2	24.2	24.1	24.2	24.1	24.1	24.2	24.2	24.2	23.3	22.7	21.3	20.8	21.0	21.5	21.9	22.8	24.0	24.5	24.4	24.6	24.4	20.8	24.6	23.5																						
Oct 30	24.1	23.7	23.8	24.0	23.7	23.9	24.0	23.9	23.7	23.7	23.4	23.0	22.5	22.0	22.5	23.2	23.8	24.0	24.1	24.2	24.1	24.1	22.0	24.2	23.7																						
Oct 31	24.1	24.1	24.0	24.0	24.0	23.9	23.8	23.9	23.6	23.1	21.3	21.3	20.9	21.4	22.8	23.3	23.7	24.2	24.3	24.5	24.3	24.5	20.9	24.7	23.5																						
Diurnal Maximum	24.6	24.9	24.7	24.9	24.7	24.5	24.5	24.4	24.3	24.3	24.4	24.2	24.4	24.3	24.3	24.2	24.5	24.7	24.7	24.5	24.6	24.5	24.7	24.6	24.6																						
Diurnal Average	23.0	23.1	23.0	23.1	23.1	23.1	23.1	22.7	22.0	21.5	21.0	20.9	21.1	21.3	21.8	22.3	22.8	22.9	22.9	23.0	23.0	23.0	23.0	23.0	23.0																						
C	Monthly Calibration											S	Daily Zero-Span Check											Q	Quality Assurance																						
K	Collection Error											ND	No Data (Machine Not in Service)											Y	Routine Maintenance											P	Power Failure										
X	Invalid Data (Equipment Malfunction /Recovery)																							NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																						

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per days is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

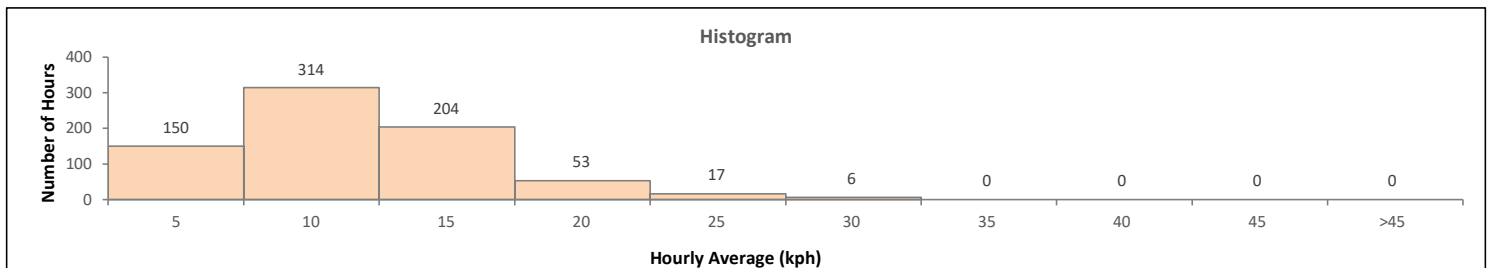
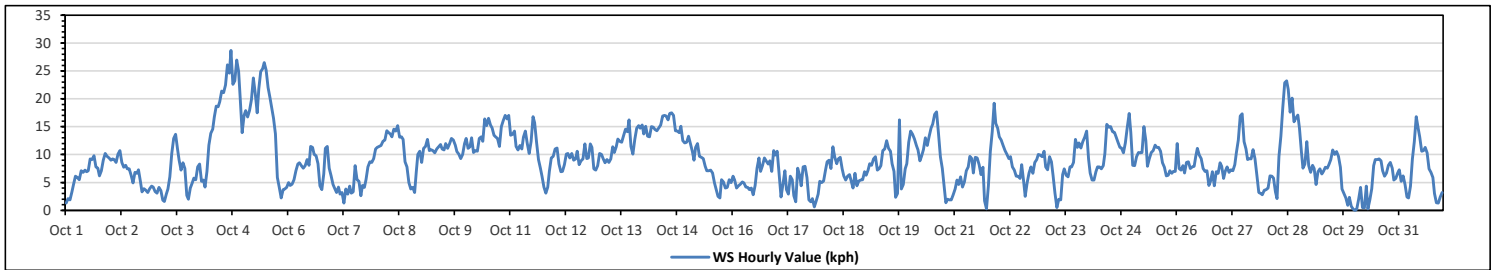
VECTOR WIND SPEED (VWS) in km/hr

Maximum Hourly Value:	28.7	kph	on Oct 4 at hr 17	Hours in Service:	744
Maximum Daily Value:	17.5	kph	on Oct 4	Hours of Data:	744
Minimum Hourly Value:	0.0	kph	on Oct 30 at hr 0	Hours of Missing Data:	0
Minimum Daily Value:	4.6	kph	on Oct 17	Hours of Calibration:	0
Monthly Average:	1.3	kph		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily	Daily	Daily	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Minimum	Maximum	Average
Oct 1	1.3	2.1	1.9	3.3	4.6	6.1	5.9	5.5	7.1	6.8	7.2	6.9	7.1	9.2	9.1	9.8	7.8	7.6	6.2	7.1	9.0	10.2	9.7	9.4	1.3	10.2	6.7
Oct 2	9.0	9.2	9.1	8.6	10.1	10.7	8.6	7.7	8.1	7.4	7.4	6.3	4.9	6.8	6.6	7.3	5.2	3.3	3.9	3.6	3.2	3.9	4.3	4.2	3.2	10.7	6.6
Oct 3	3.4	3.1	4.1	3.5	1.8	1.6	2.9	3.8	6.0	10.2	12.9	13.6	11.0	9.0	7.2	8.5	7.5	2.7	2.0	4.0	4.9	5.8	5.5	7.8	1.6	13.6	6.0
Oct 4	8.3	5.2	5.4	4.2	7.0	11.7	13.8	14.6	16.7	18.7	18.6	19.5	21.4	21.1	22.5	26.1	24.6	28.7	22.6	23.2	27.0	24.9	20.0	13.9	4.2	28.7	17.5
Oct 5	17.0	17.9	16.7	17.9	19.8	23.7	20.9	17.5	21.8	24.9	25.4	26.5	25.1	22.0	20.2	18.2	16.5	13.7	5.9	4.1	2.2	3.7	3.8	4.1	2.2	26.5	16.2
Oct 6	5.0	4.5	4.7	5.5	7.1	8.3	8.5	8.0	7.6	8.0	9.1	8.1	11.5	11.3	10.0	9.8	8.4	4.4	3.7	6.5	11.1	11.5	7.6	6.2	3.7	11.5	7.8
Oct 7	4.6	3.8	3.2	4.2	2.9	3.2	1.3	3.8	2.9	4.3	3.1	3.3	8.0	5.5	5.2	2.6	4.5	4.1	5.5	7.8	8.7	8.6	9.3	11.0	1.3	11.0	5.1
Oct 8	11.3	11.5	11.6	12.4	12.6	14.3	13.9	13.7	13.2	14.6	14.2	15.2	13.1	13.2	12.7	8.7	7.8	5.0	3.8	4.1	3.2	6.8	10.0	10.6	3.2	15.2	10.7
Oct 9	8.6	11.1	11.5	12.7	10.7	10.9	10.7	10.3	11.0	11.4	11.8	11.0	10.8	12.0	11.1	11.9	12.9	12.6	11.7	10.5	10.1	9.3	10.0	12.0	8.6	12.9	11.1
Oct 10	12.9	11.1	11.4	13.0	10.4	10.7	10.6	12.9	13.2	12.4	16.4	15.2	16.5	15.3	14.8	13.5	13.1	12.9	11.5	15.0	16.1	17.0	16.4	17.0	10.4	17.0	13.7
Oct 11	13.5	13.6	14.2	11.5	10.8	11.6	11.0	13.1	14.2	12.0	10.2	12.4	16.8	15.7	12.2	9.1	7.6	6.1	4.2	3.1	4.2	7.0	9.4	9.7	3.1	16.8	10.6
Oct 12	11.0	11.2	8.3	6.9	7.0	8.2	10.1	10.2	9.4	10.2	9.0	9.2	10.6	8.2	8.9	9.2	11.9	9.3	9.4	11.9	11.3	7.4	7.2	8.0	6.9	11.9	9.3
Oct 13	10.2	10.0	9.3	8.5	9.1	8.6	9.2	11.4	10.4	11.4	12.8	12.4	12.2	13.4	14.6	14.1	16.2	11.5	10.1	12.7	14.7	15.2	14.7	15.3	8.5	16.2	12.0
Oct 14	13.7	15.1	13.3	13.2	15.0	14.9	14.5	14.3	14.8	15.3	16.9	17.0	16.9	16.2	17.4	17.5	17.0	14.3	14.2	13.9	15.1	12.5	12.1	12.2	12.1	17.5	14.9
Oct 15	13.3	11.9	10.5	9.0	11.3	12.0	9.7	9.5	9.3	7.9	7.1	7.1	7.2	6.7	4.9	3.6	2.5	2.2	5.5	5.1	4.0	4.1	5.5	5.0	2.2	13.3	7.3
Oct 16	6.1	5.4	4.0	4.4	4.7	5.1	4.9	4.2	4.1	3.7	4.0	2.8	4.5	7.6	9.4	7.0	8.0	9.4	8.8	8.3	8.9	7.0	10.7	9.9	2.8	10.7	6.4
Oct 17	10.6	6.5	2.4	4.7	7.1	3.7	2.9	6.1	5.5	2.6	1.5	7.6	6.3	4.4	7.8	7.9	5.9	1.9	1.5	2.1	0.6	1.7	2.9	5.2	0.6	10.6	4.6
Oct 18	5.0	5.3	7.2	8.7	9.0	7.5	11.4	9.5	8.4	9.2	9.5	7.4	6.2	5.4	6.1	6.4	5.1	4.0	6.6	4.4	5.3	5.4	5.5	6.9	4.0	11.4	6.9
Oct 19	6.3	7.2	8.4	8.1	9.2	9.6	7.2	7.5	8.0	10.7	11.0	12.5	11.1	10.6	8.4	7.0	2.3	3.0	16.2	3.8	4.6	7.4	8.4	12.2	2.3	16.2	8.4
Oct 20	14.2	13.6	12.8	11.6	10.8	8.9	9.7	10.9	13.0	11.6	13.3	14.8	15.5	17.2	17.7	13.8	9.6	7.5	4.7	1.4	2.0	1.9	1.9	2.8	1.4	17.7	10.1
Oct 21	3.8	5.4	4.6	6.0	4.2	5.1	7.1	7.8	9.7	9.3	6.7	9.5	9.4	8.2	6.4	7.7	1.7	0.3	4.4	10.5	14.1	19.2	15.6	14.7	0.3	19.2	8.0
Oct 22	13.2	12.6	11.6	10.7	10.0	9.3	9.6	7.8	7.2	6.1	6.1	5.7	8.2	5.3	2.5	4.9	6.7	7.8	6.6	8.6	9.1	10.0	9.9	9.6	2.5	13.2	8.3
Oct 23	10.6	7.8	7.3	9.6	8.7	6.3	3.1	0.5	2.0	1.9	6.4	7.4	6.3	6.0	7.8	7.8	8.6	12.7	11.3	12.1	11.2	12.3	13.1	14.2	0.5	14.2	8.1
Oct 24	9.2	6.7	5.4	5.4	6.9	7.8	7.8	7.4	8.0	10.2	15.4	14.9	15.0	14.1	14.0	13.2	12.2	11.3	11.2	10.3	12.1	14.9	17.4	14.0	5.4	17.4	11.0
Oct 25	8.1	8.0	9.6	10.4	10.3	10.4	15.0	12.5	7.9	9.3	10.4	10.7	11.7	11.3	11.3	10.6	8.5	7.7	6.2	6.3	7.1	6.6	7.0	7.0	6.2	15.0	9.3
Oct 26	12.0	7.5	7.2	8.0	6.7	8.6	8.7	7.5	7.8	7.9	9.7	11.1	9.9	9.3	7.5	7.0	7.1	4.5	5.2	6.9	4.4	6.9	6.6	8.5	4.4	12.0	7.8
Oct 27	7.9	5.7	7.0	7.8	6.8	7.3	7.1	8.2	10.4	12.6	16.9	17.3	12.3	11.0	9.1	9.3	9.2	10.9	9.3	6.3	3.2	3.0	2.8	3.6	2.8	17.3	8.5
Oct 28	3.7	4.0	6.2	6.1	5.8	3.3	2.1	9.7	13.3	18.5	22.9	23.2	21.7	17.6	20.1	15.9	16.6	17.1	14.8	10.6	7.6	8.3	12.3	8.0	2.1	23.2	12.1
Oct 29	6.8	8.1	7.5	4.6	6.9	7.4	6.5	7.0	7.7	7.6	8.2	9.1	10.8	10.0	10.5	9.7	7.7	3.8	3.0	2.2	0.9	2.3	0.7	0.2	0.2	10.8	6.2
Oct 30	0.0	0.2	2.0	4.1	0.5	0.4	4.3	0.3	1.9	3.9	8.0	9.1	9.1	9.2	8.9	7.1	6.1	6.7	8.1	8.6	7.6	5.4	5.7	6.7	0.0	9.2	5.2
Oct 31	7.3	5.2	6.2	4.6	2.4	2.2	4.3	9.2	12.3	16.8	14.7	13.1	10.6	10.7	11.3	10.3	7.4	6.8	5.9	3.0	1.4	1.3	2.4	3.2	1.3	16.8	7.2
Diurnal Maximum	17.0	17.9	16.7	17.9	19.8	23.7	20.9	17.5	21.8	24.9	25.4	26.5	25.1	22.0	22.5	26.1	24.6	28.7	22.6	23.2	27.0	24.9	20.0	17.0			
Diurnal Average	8.6	8.1	7.9	8.0	8.1	8.4	8.5	8.8	9.4	10.2	11.2	11.6	11.7	11.1	10.8	10.2	9.2	8.2	7.9	7.7	7.9	8.4	8.7	8.8			

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Equipment Malfunction/Recovery)	NRM Unit/Maint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

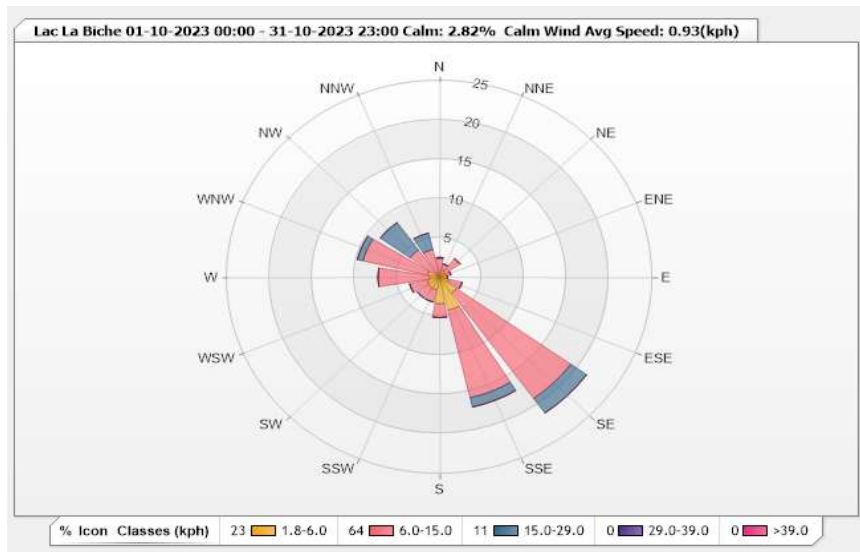


Station: Lac La Biche Monitor: WDS [kph] Monthly: 10-2023

Type: Wind Rose
 Direction: Blowing From (Wind Frequency)
 Time Base: 1 - Hour

Calm (WS<1.8kph): 2.82% Valid Data: 100.00%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	0.27	2.15	0.13	0	0	2.55
NNE	0.94	0.81	0	0	0	1.75
NE	0.67	2.28	0	0	0	2.95
ENE	0.81	0.54	0	0	0	1.35
E	0.81	0.13	0	0	0	0.94
ESE	1.08	1.61	0	0	0	2.69
SE	2.42	16.53	2.28	0	0	21.23
SSE	4.3	11.42	1.21	0	0	16.93
S	3.36	1.75	0	0	0	5.11
SSW	1.61	1.61	0	0	0	3.22
SW	1.61	1.61	0	0	0	3.22
WSW	1.48	2.15	0	0	0	3.63
W	1.21	6.05	0	0	0	7.26
WNW	1.48	7.8	0.67	0	0	9.95
NW	0.27	4.03	4.3	0	0	8.6
NNW	0.4	3.23	2.15	0	0	5.78
Summary	22.72	63.7	10.74	0	0	97.16



Lakeland Industry & Community Association

Lac La Biche Station - October 2023

Summary of Hourly Averages

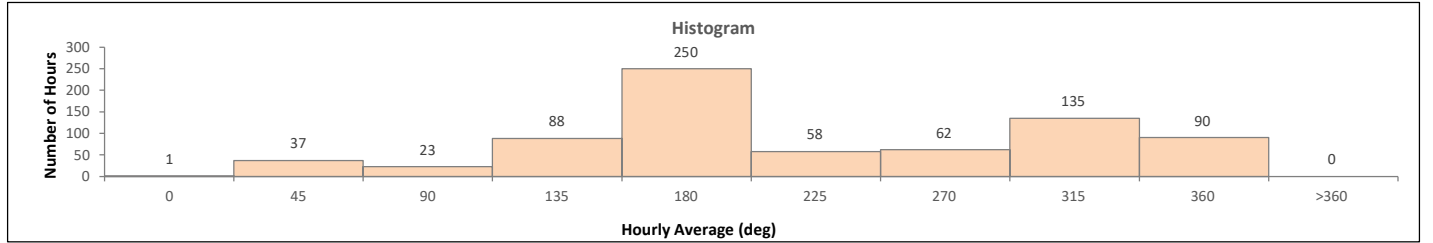
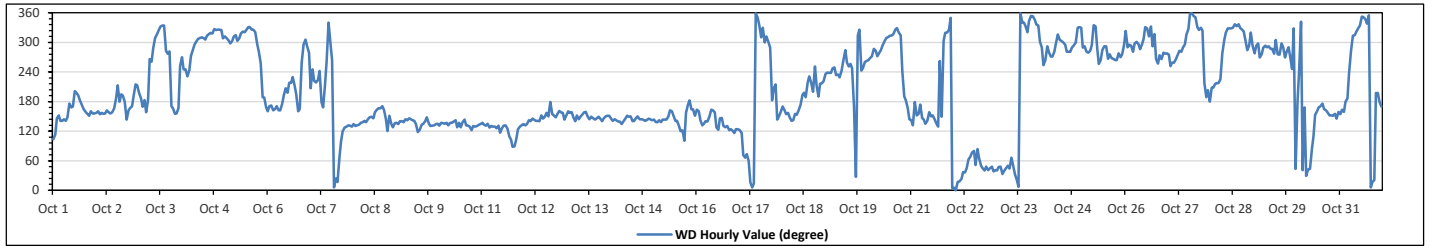
WIND DIRECTION (VWD) in sector

Monthly Average:	203 (SSW) degree	Hours of Service:	744
		Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Average			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Degree	Quadrant	
Oct 1	ESE	ESE	SE	SSE	SE	SE	SE	SE	SE	S	SSE	SSE	SSW	SSW	S	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	164	SSE	
Oct 2	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSW	S	SSW	S	S	SE	SSE	SSE	S	S	SSW	SSW	169	SSE
Oct 3	SSW	S	SSE	S	SSE	S	W	W	WNW	NW	NW	NW	NNW	NNW	W	W	W	S	SSE	SSE	SSE	SSE	WSW	WSW	283	W	
Oct 4	W	WSW	WSW	SW	WSW	W	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	309	NW
Oct 5	NW	NW	WNW	WNW	WNW	NW	NW	WNW	NW	NW	NW	NW	NNW	NNW	NW	NW	NW	NW	NW	NW	WSW	S	S	SSE	314	NW	
Oct 6	SSE	S	S	SSE	SSE	S	SSE	SSE	S	S	SSW	SSW	SW	SW	SSW	SSW	SSE	SSE	WSW	WNW	NW	WNW	W	207	SSW		
Oct 7	SSW	WSW	SW	SW	SW	WSW	S	SSE	SSW	W	NNW	WNW	W	N	NNE	NNE	ENE	E	ESE	SE	SE	SE	SE	SE	153	SSE	
Oct 8	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	SE	ESE	SSE	SE	SE	SE	145	SE	
Oct 9	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	137	SE	
Oct 10	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	SE	SE	SE	SE	SE	133	SE	
Oct 11	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	SE	SE	SE	SE	ESE	ESE	E	E	E	ESE	SE	SE	SE	126	SE	
Oct 12	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SE	SSE	SSE	SSE	S	SSE	SSE	SE	SSE	SSE	SSE	SSE	SSE	149	SSE	
Oct 13	SSE	SSE	SSE	SE	SE	SSE	SE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SSE	SE	SE	SE	SE	SE	SE	SE	149	SSE	
Oct 14	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SE	SE	SE	SSE	SE	SE	SE	SE	SE	SE	SE	144	SE	
Oct 15	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SE	SE	SE	ESE	ESE	E	SSE	S	S	SSE	SSE	146	SE	
Oct 16	SSE	SSE	SE	SE	SE	SE	SSE	SSE	SSE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	135	SE	
Oct 17	ESE	ESE	ENE	ENE	ENE	ENE	NNE	N	NNE	N	NNW	NW	NNW	WNW	NW	WNW	WNW	WNW	S	SSW	SSW	SE	SSE	SSE	13	NNE	
Oct 18	SSE	SSE	SSE	SSE	SE	SE	SE	SSE	SSE	S	S	SSW	S	SW	SW	SW	SSW	WSW	SSW	S	SW	SW	SW	SW	180	S	
Oct 19	SW	WSW	SW	SW	WSW	WSW	SW	SW	WSW	W	WNW	WSW	WSW	WSW	WSW	WSW	SSE	NNE	NW	NW	WSW	WSW	WSW	W	256	WSW	
Oct 20	W	W	W	WNW	W	W	W	WNW	WNW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	WSW	S	S	SSE	SE	296	WNW		
Oct 21	SE	SE	S	SSE	SSE	S	SE	SE	SE	SSE	SSE	SSE	SE	SE	SE	W	SSE	WNW	NW	NW	NW	N	N	133	SE		
Oct 22	N	N	NNE	NNE	NNE	NE	NE	ENE	ENE	ENE	E	NE	E	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	39	NE	
Oct 23	NE	NE	NE	NNE	NE	NE	NE	ENE	ENE	ENE	NNE	N	N	NNW	NNW	NNW	NNW	N	N	NNW	NNW	NNW	NNW	NNW	3	N	
Oct 24	WNW	WNW	WSW	W	WNW	W	W	W	WNW	NW	WNW	WNW	WNW	WNW	W	W	W	WNW	WNW	WNW	WNW	NNW	NNW	NNW	298	WNW	
Oct 25	WNW	WNW	W	W	W	WNW	NNW	NNW	WNW	WSW	W	WNW	WNW	W	W	W	W	W	W	W	W	W	W	W	285	WNW	
Oct 26	NW	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	NW	NNW	NNW	NW	NNW	WNW	NW	W	WSW	W	W	W	W	W	298	WNW	
Oct 27	W	WSW	WSW	WSW	W	W	W	WNW	WNW	NW	NW	N	N	N	N	NNW	NW	NNW	NW	SW	S	SSW	S	307	NW		
Oct 28	SSW	SSW	SW	SW	SW	W	WNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	316	NW	
Oct 29	W	WNW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	W	WNW	W	W	WNW	WNW	W	W	WNW	W	WSW	NNW	NE	286	WNW		
Oct 30	S	WSW	NNW	NE	SSE	NNE	NE	NE	E	ESE	SSE	SSE	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SSE	153	SSE		
Oct 31	SSE	SSE	SSE	S	S	SW	W	NW	NW	NNW	NNW	N	N	NNW	NNW	N	N	NNE	NNE	SSW	SSW	S	SSE	332	NNW		

C Monthly Calibration	S Daily Zero-Span Check	Q Quality Assurance
K Collection Error	ND No Data (Machine Not in Service)	Y Routine Maintenance
X InValid Data (Machine Malfunction/Recovery)	NRM UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P Power Failure

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



Lakeland Industry & Community Association

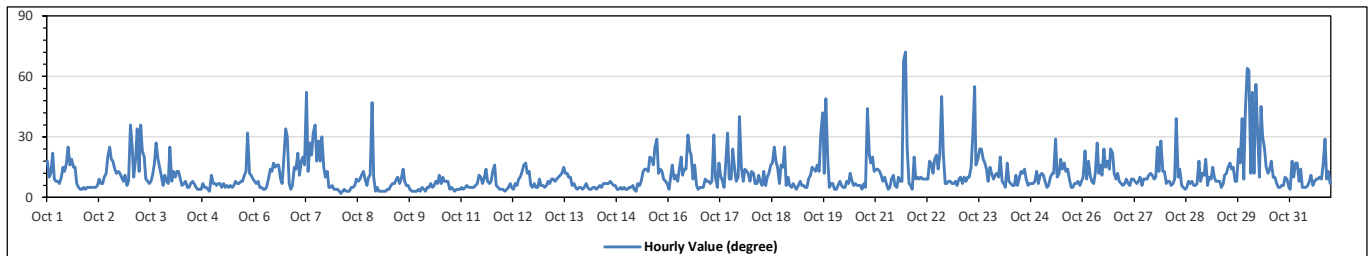
Lac La Biche Station - October 2023

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:		72 degree on Oct 21 at hr 17										Hours in Service:		744																										
Minimum Hourly Value:		2 degree on Oct 8 at hr 2										Hours of Data:		744																										
												Hours of Missing Data:		0																										
												Hours of Calibration:		0																										
												Operational Uptime:		100.0																										
Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Daily Minimum	Daily Maximum														
Oct 1	18	10	12	22	9	8	8	7	10	15	13	17	25	16	19	15	15	7	5	4	4	5	4	5	4	25														
Oct 2	5	5	5	5	5	6	9	7	7	10	12	20	25	19	18	14	12	13	12	10	8	11	6	8	5	25														
Oct 3	36	26	10	19	34	13	36	23	20	9	8	7	8	11	17	27	19	15	11	6	11	8	7	25	6	36														
Oct 4	8	13	10	13	13	9	6	7	8	5	5	7	8	7	5	4	4	4	7	5	5	4	3	11	3	13														
Oct 5	7	7	6	7	7	5	7	5	6	5	6	5	6	8	7	7	8	8	11	13	32	12	11	9	5	32														
Oct 6	8	7	8	5	5	4	4	5	9	14	13	17	15	16	16	9	7	19	34	30	7	4	6	15	4	34														
Oct 7	14	22	11	18	20	16	52	13	27	21	32	36	18	28	18	30	15	10	13	5	5	6	4	4	4	52														
Oct 8	4	3	2	3	4	3	3	3	5	5	6	9	8	9	11	13	9	6	10	11	47	10	3	5	2	47														
Oct 9	3	3	3	3	3	4	4	6	7	7	9	10	7	9	14	8	6	6	4	3	3	3	3	4	3	14														
Oct 10	3	5	4	3	5	5	7	5	6	8	7	11	7	10	8	8	8	4	5	4	3	4	4	4	3	11														
Oct 11	5	4	5	6	5	5	5	5	6	7	11	10	7	9	14	8	7	8	13	16	6	5	4	4	4	16														
Oct 12	4	3	4	5	7	5	4	7	6	9	10	13	16	17	12	13	6	5	7	5	5	9	6	6	3	17														
Oct 13	5	6	8	7	9	9	8	9	10	11	12	15	12	12	10	10	6	7	5	4	5	5	4	5	4	15														
Oct 14	7	5	4	4	5	5	4	5	6	5	7	7	7	7	8	7	6	6	4	4	5	4	5	4	4	8														
Oct 15	4	5	5	6	4	3	7	6	8	13	14	14	13	20	19	16	25	29	12	14	13	9	8	7	3	29														
Oct 16	4	10	16	9	11	8	14	20	11	14	14	31	23	21	9	16	6	4	5	5	5	9	8	8	4	31														
Oct 17	7	8	31	10	5	17	11	8	5	19	32	9	9	24	14	8	10	40	15	8	14	13	12	8	5	40														
Oct 18	13	12	7	7	11	8	6	13	6	10	12	16	17	25	18	15	7	16	15	25	6	10	6	5	5	25														
Oct 19	7	5	4	6	8	6	6	5	5	9	11	15	14	13	16	13	31	42	12	49	19	5	7	7	4	49														
Oct 20	4	4	6	8	6	5	5	8	7	12	8	6	7	6	6	6	4	7	5	44	21	17	20	13	4	44														
Oct 21	14	14	13	11	8	10	7	4	5	9	11	6	5	10	8	8	68	72	25	7	6	4	20	9	4	72														
Oct 22	10	9	10	9	9	9	9	18	17	12	19	21	14	21	50	22	7	7	8	8	7	7	8	6	6	50														
Oct 23	9	10	7	10	8	10	10	15	30	55	16	19	24	24	19	17	14	8	15	12	9	11	12	10	7	55														
Oct 24	20	8	7	5	17	8	7	6	6	11	6	10	13	12	14	9	6	7	7	7	8	13	7	11	5	20														
Oct 25	12	11	8	5	6	10	12	12	29	10	12	19	14	17	13	14	9	5	5	7	7	8	6	8	5	29														
Oct 26	10	23	9	18	11	8	7	12	27	12	16	11	24	15	18	14	24	22	12	9	12	8	7	6	6	27														
Oct 27	7	9	7	6	9	9	8	7	8	10	6	9	9	9	11	12	11	9	10	25	13	28	13	13	6	28														
Oct 28	7	8	8	6	7	9	39	10	14	6	5	4	5	8	7	8	6	6	7	18	8	12	11	19	4	39														
Oct 29	6	10	9	15	10	8	8	8	5	7	11	12	15	17	14	15	8	8	24	17	39	9	43	64	5	64														
Oct 30	63	12	52	12	56	34	10	45	30	24	15	12	14	18	10	10	7	5	5	6	6	10	9	5	5	63														
Oct 31	4	18	10	17	17	8	14	5	5	5	6	8	11	6	8	9	9	10	9	16	29	9	13	7	4	29														
Diurnal Minimum	3	3	2	3	3	3	3	3	3	5	5	4	5	6	5	4	4	4	4	4	3	3	3	4																
Diurnal Maximum	63	26	52	22	56	34	52	45	30	55	32	36	25	28	50	30	68	72	34	49	47	28	43	64																
C	Monthly Calibration										S										Daily Zero-Span Check				Q				Quality Assurance											
K	Collection Error										ND										No Data (Machine Not in Service)				Y				Routine Maintenance				P				Power Failure			
X	InValid Data (Machine Malfunction/Recovery)										NRM										UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)																			

Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
 Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.



END OF REPORT

This page, 158 of 158 ends the October 2023 Monthly Ambient Air Quality Monitoring Report.



Lakeland Industry & Community Association

OCTOBER 2023

Ambient Air Monitoring Calibration Report

- COLD LAKE SOUTH STATION-

CAL-LICA-202310-01174

Station Operation and Maintenance:

Bureau Veritas Canada

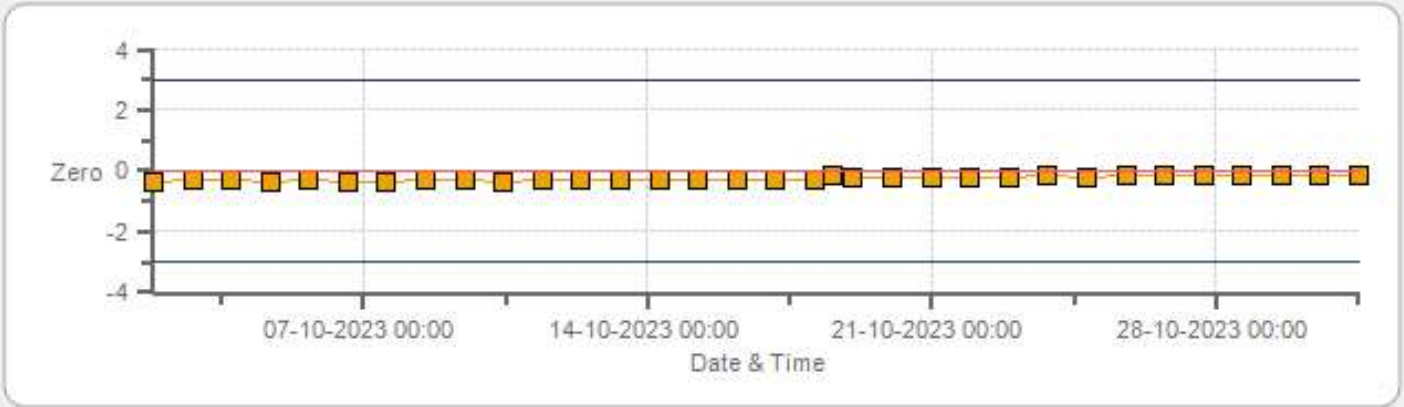
Data Validation and Report:

LICA / Bureau Veritas Canada

November 20, 2023

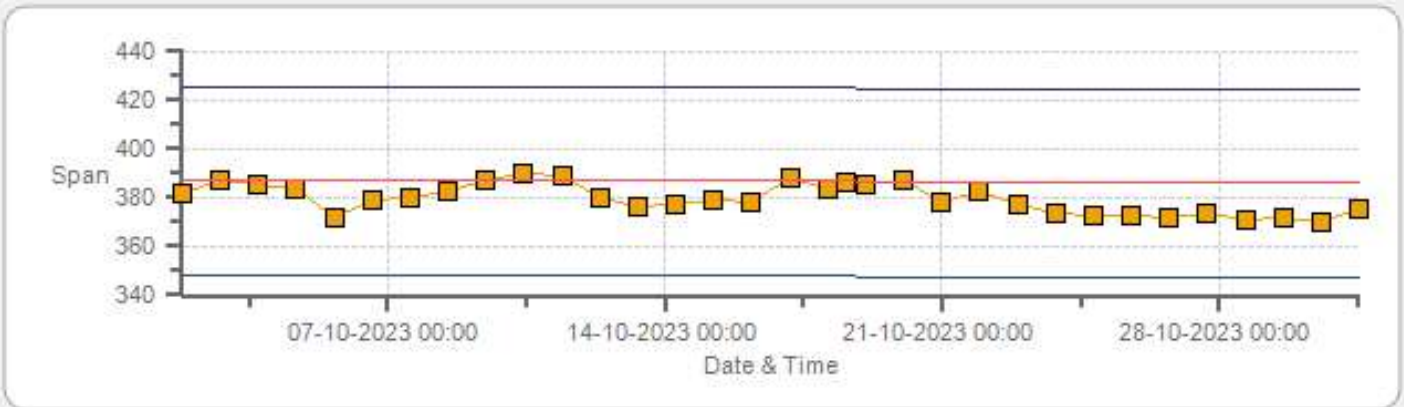
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



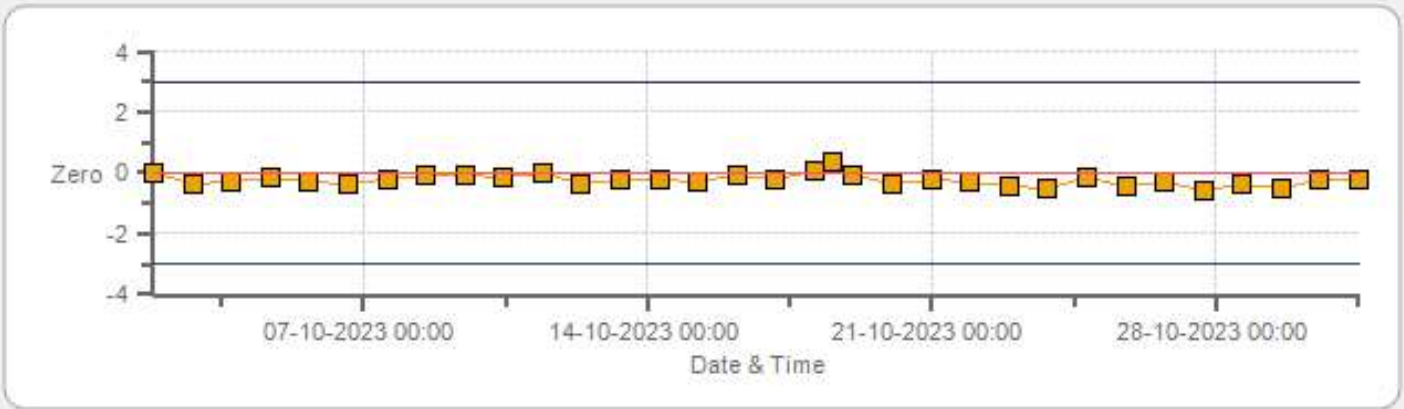
Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

TRS[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



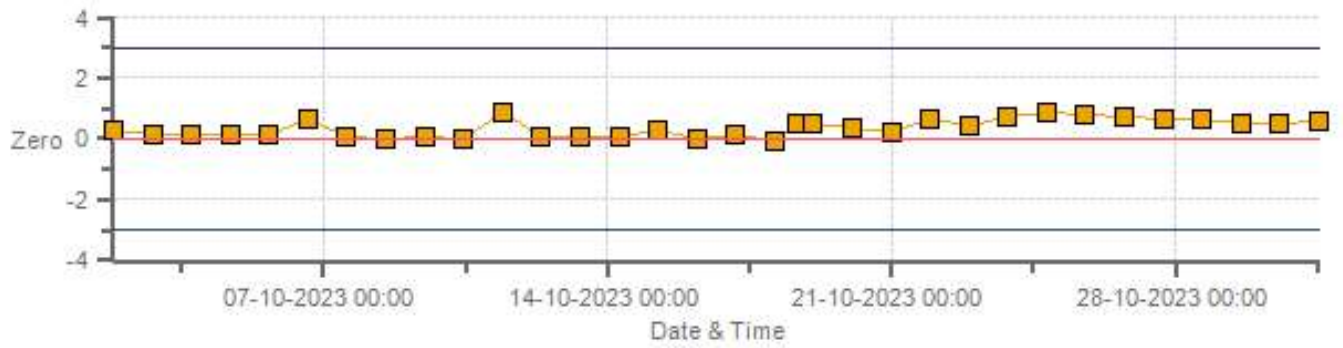
Zero Zero Ref Zero Low Zero High

TRS[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



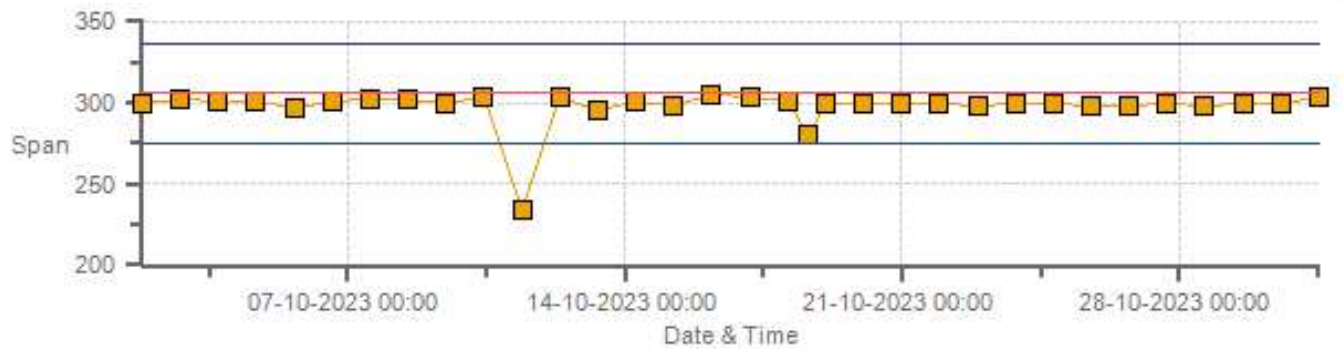
Span SpanRef Span Low Span High

NOX[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



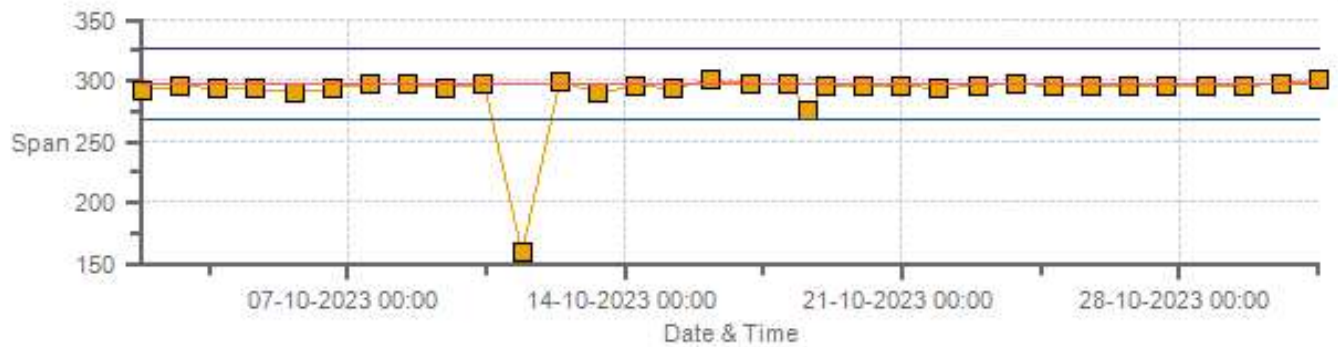
Span SpanRef Span Low Span High

NO2[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



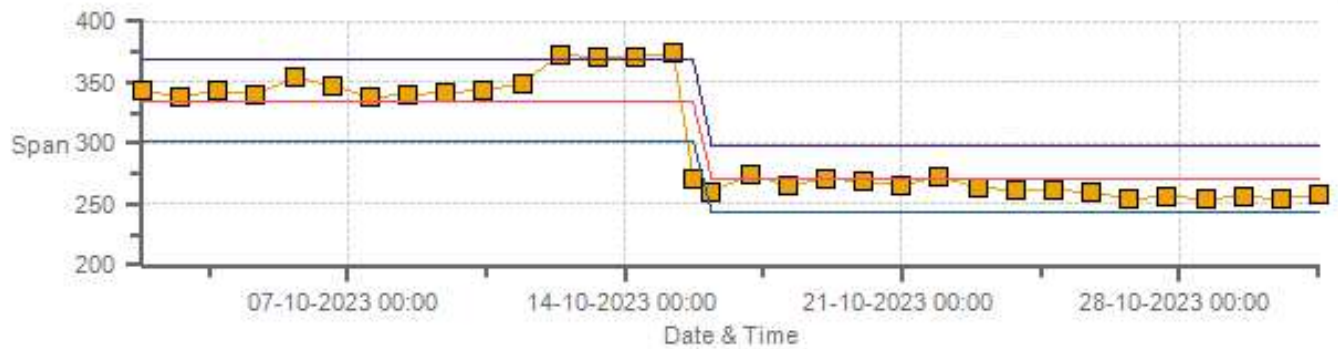
Span SpanRef Span Low Span High

O3[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



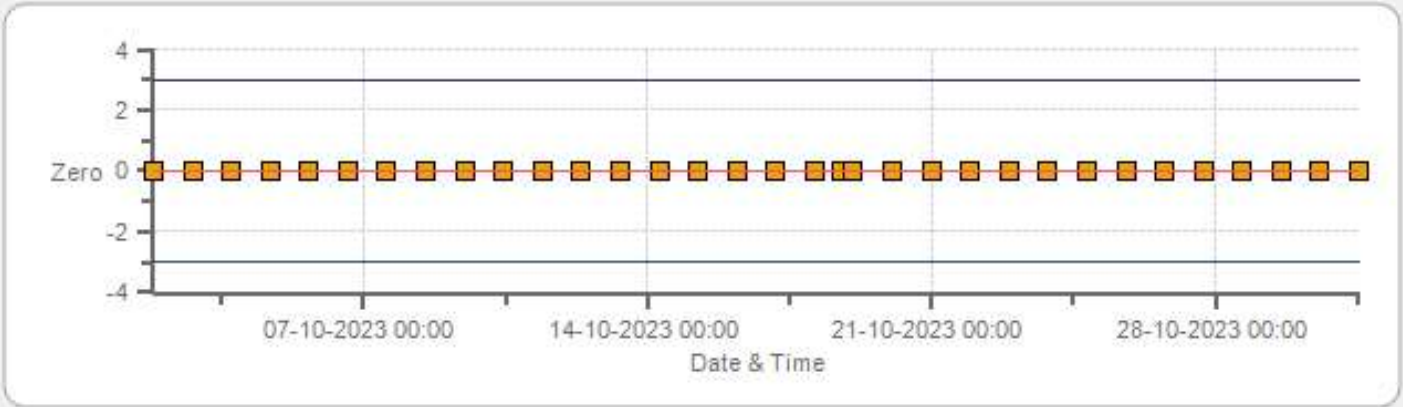
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span

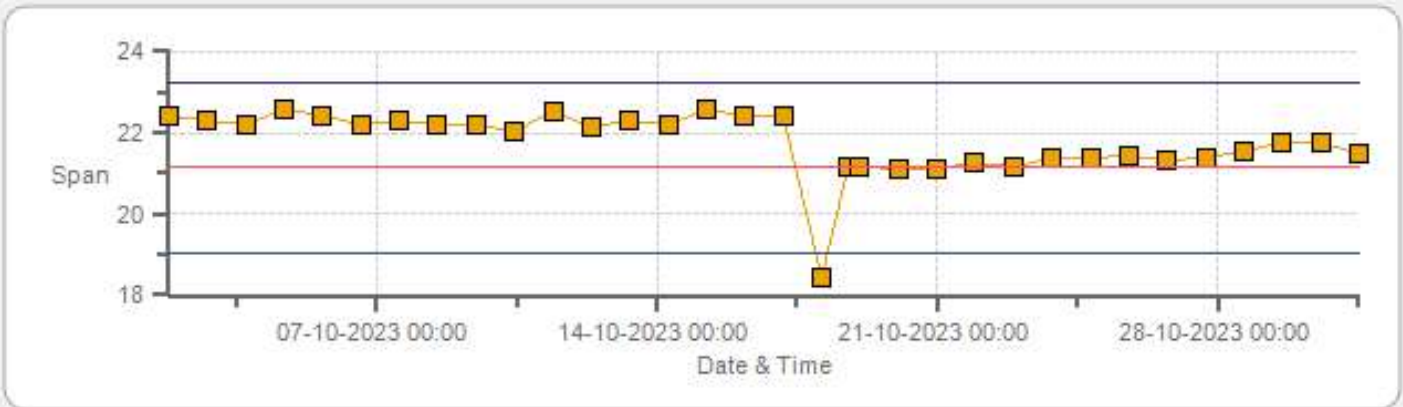


Span SpanRef Span Low Span High

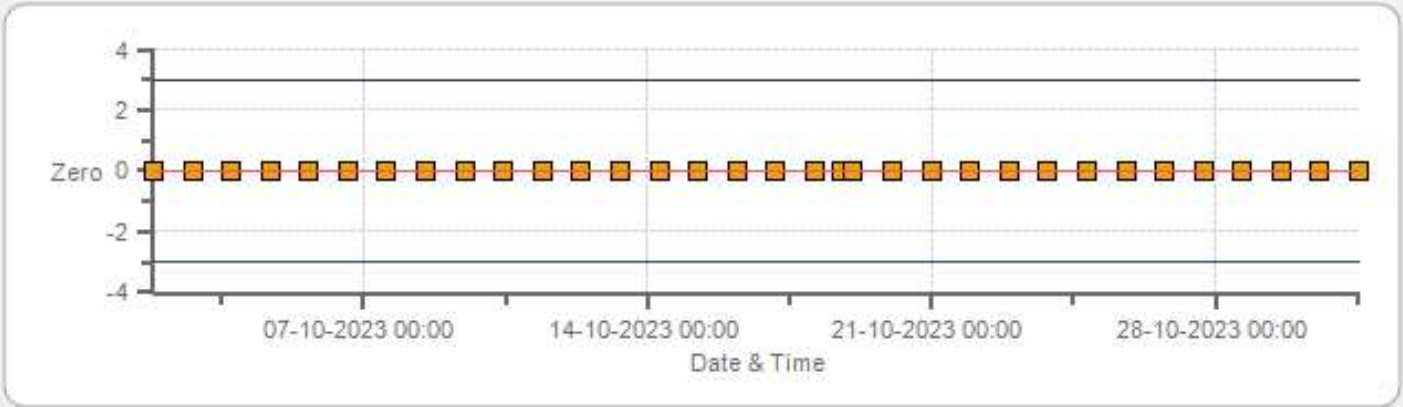
THC55[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



THC55[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span

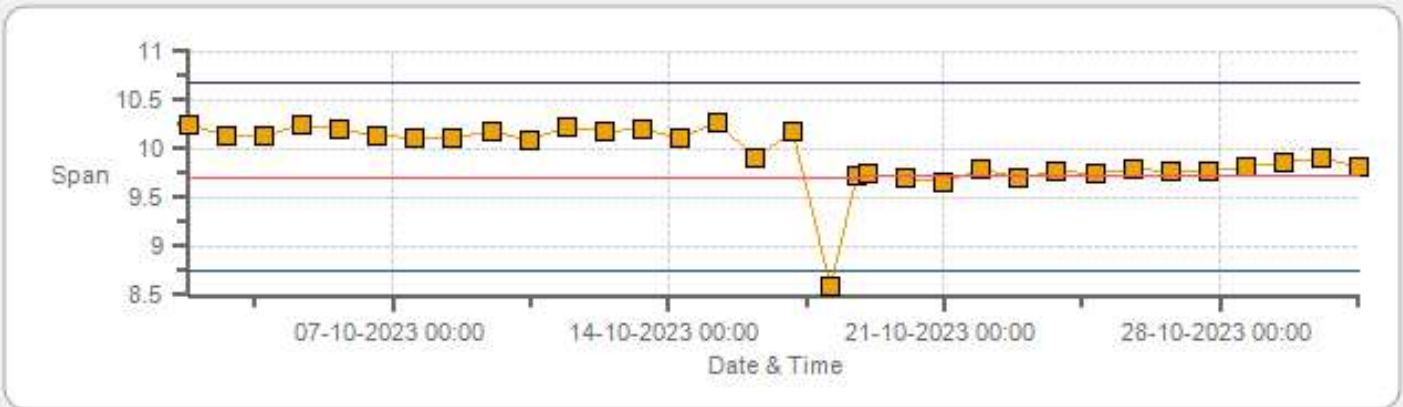


CH4[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



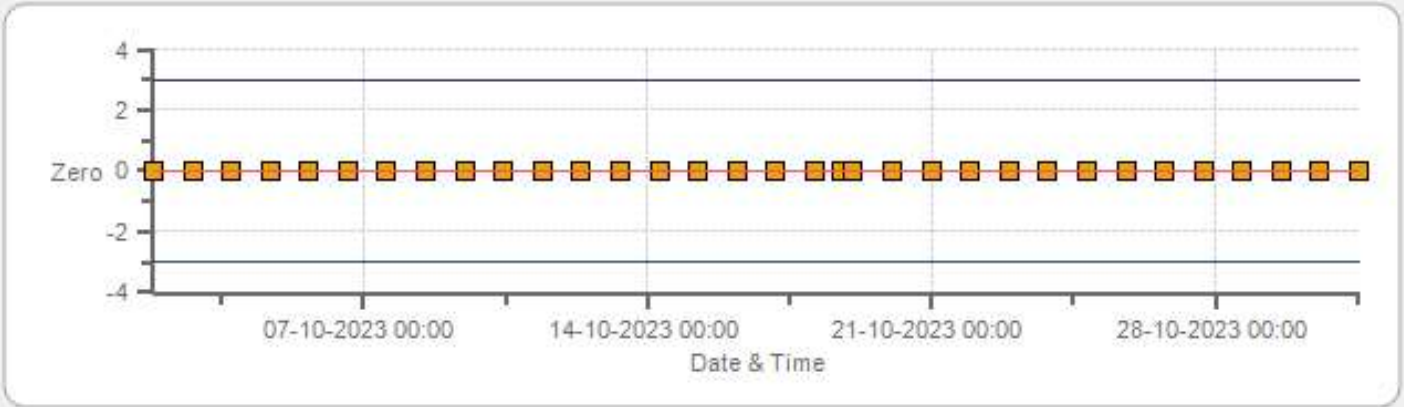
Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



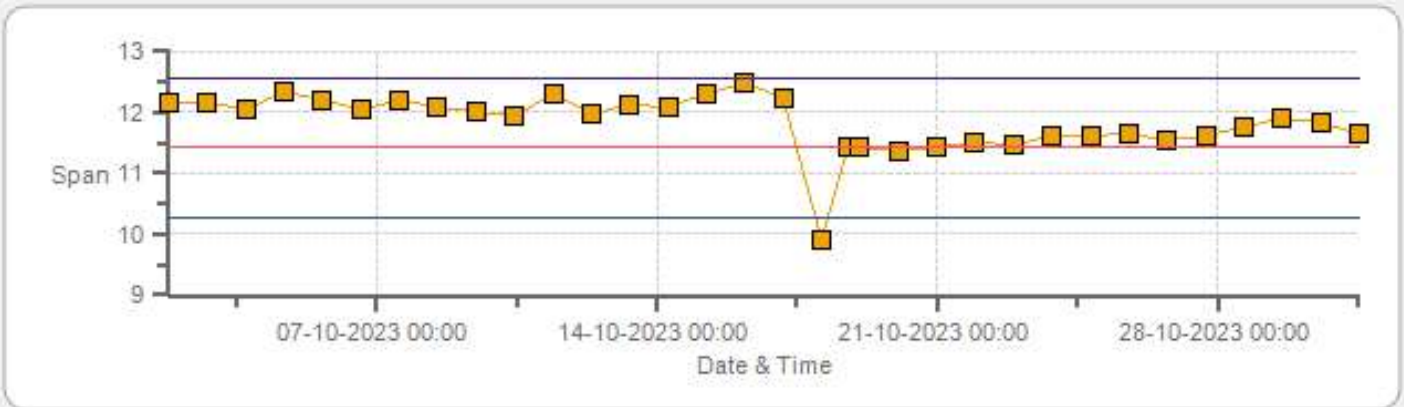
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: Cold Lake South Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	18-Oct-2023	PREVIOUS CALIBRATION DATE:	06-Sep-2023
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	0.999
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	944
PURPOSE:	Routine	START TIME (MST):	09:05
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:44

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180260018	FLOW (mL/min)	437
INITIAL		FINAL	
BKG/OFFSET	2.45	BKG/OFFSET	2.38
COEF/SLOPE	0.989	COEF/SLOPE	0.986
Expected (reference) Value	387	Expected (reference) Value	386

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	17100415	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 127895	HIGH ID	n/a
CONC (ppm):	50.40	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	27-Oct-2030	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.20	5000	0.00	-0.2	0	1.009	1.003
4961	37.20	4998	375.13	371.7	374.1	1.009	1.003
4982	17.60	5000	177.41	n/a	176.7	n/a	1.004
4990	8.80	4999	88.72	n/a	87.7	n/a	1.012

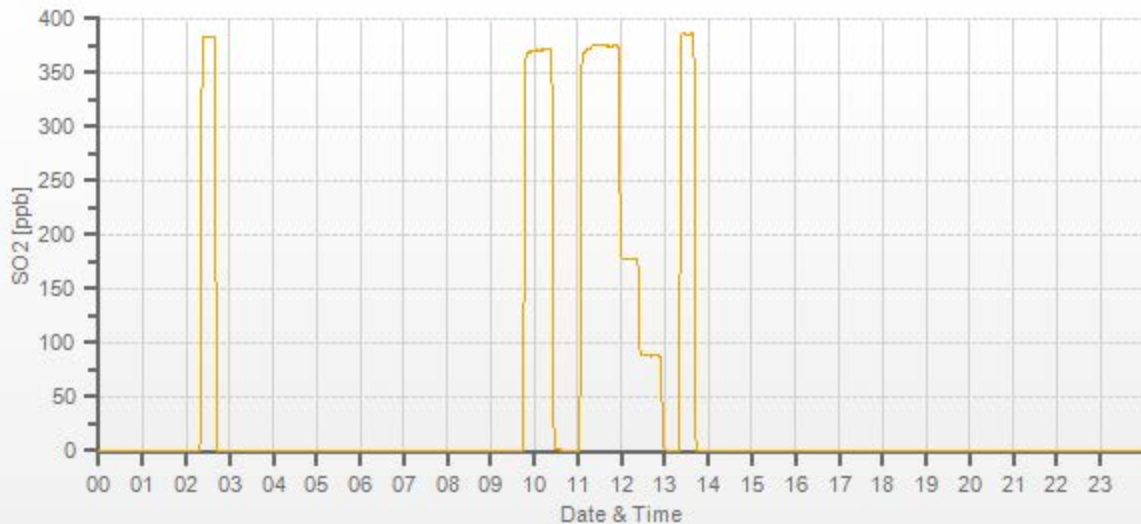
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.998	-0.1%

COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Cold Lake South Daily: 18-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01174

TRS Analyzer Calibration by Dilution



DATE:	18-Oct-2023	PREVIOUS CALIBRATION DATE:	06-Sep-2023
PARAMETER:	TRS	PREVIOUS CORRECTION FACTOR:	0.997
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	944
PURPOSE:	Routine	START TIME (MST):	09:06
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:44

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	490
INITIAL		FINAL	
BKG/OFFSET	27.4	BKG/OFFSET	28
COEF/SLOPE	1.173	COEF/SLOPE	1.187
Expected (reference) Value	42.4	Expected (reference) Value	42.5

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0002287	HIGH ID	n/a
CONC (ppm):	10.10	EXPIRY DATE	n/a
CYLINDER (psi):	300	LOW ID	n/a
EXPIRY DATE	14-Sep-2024	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	09:11	SO2 Conc (ppb)	380
END TIME:	09:26	Analyzer Response (ppb)	0.0

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	0	0	1.000	1.000
7442	57.90	7500	77.97	76.4	78	1.021	1.000
7472	28.20	7500	37.98	n/a	37.9	n/a	1.002
7486	14.10	7500	18.99	n/a	19.1	n/a	0.994

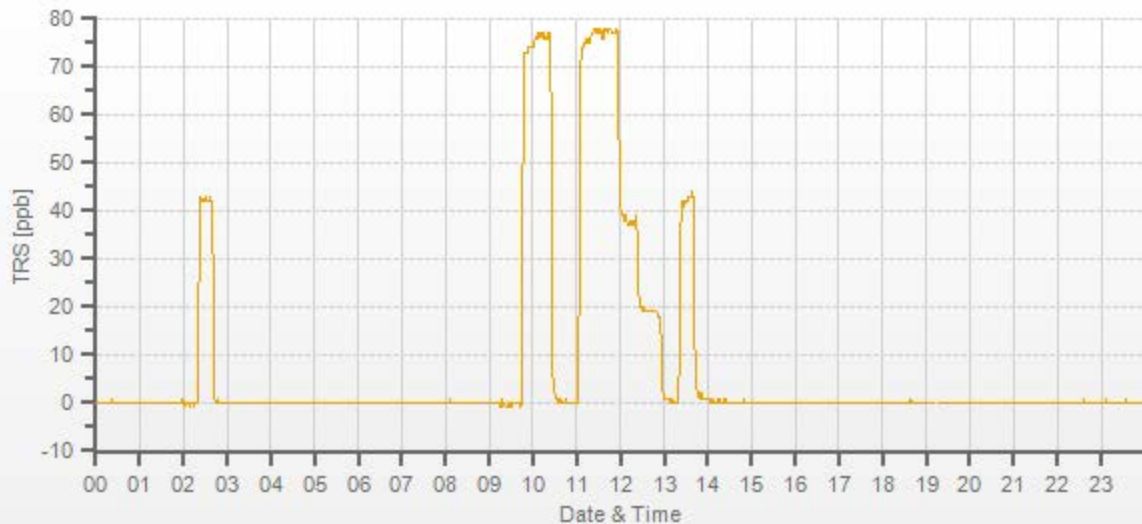
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.
Converter: CDN-101 #501

TRS[ppb] Station: Cold Lake South Daily: 18-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01174

NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	18-Oct-2023	PREVIOUS CALIBRATION DATE:	06-Sep-2023	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1505664393	NOx	1.003
LOCATION:	CLS	BAROMETRIC (mBar):	944	FLOW (mL/min)	677	NO	1.002
PURPOSE:	Routine	START TIME (MST):	09:04	RANGE (ppb)	500	NO2	1.001
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:34	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 127895	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	51.1 51.6	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	18-Oct-2023	OXIDIZER ID:	n/a	EXPIRY DATE	27-Oct-2030	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	5.2	5	n/a	BKG/OFFSET:	5	4.9	n/a
SLOPE/COEF/CE:	1.007	1.072	0.999	SLOPE/COEF/CE:	1.006	1.064	0.999

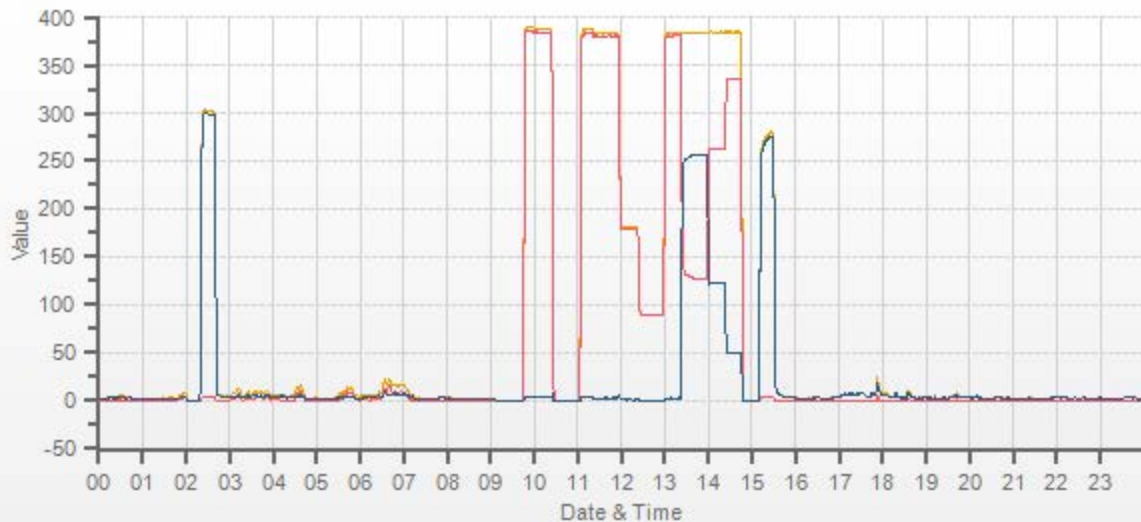
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	306.0	10.4	297.0		306.0	10.4	297.0

POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	380	250	230-265	n/a
MID	180	125	115-150	n/a
LOW	90	45	40-55	n/a
EXTRA 1	n/a	n/a	n/a	n/a

FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	37.20	5000	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.991	0.990	0.999	1.000	1.001	1.001
4961	37.20	4998	380.3	384.1	3.7	383.7	387.8	4.0	380.5	383.7	3.1	0.991	0.990	0.999	1.000	1.001	1.001
4982	17.60	5000	179.9	181.6	1.8	n/a	n/a	n/a	180.1	181.4	1.2	n/a	n/a	0.999	1.001	1.001	1.001
4990	8.80	4999	90.0	90.8	0.9	n/a	n/a	n/a	89.7	90.4	0.7	n/a	n/a	1.003	1.005	1.005	1.005

Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	37.20	4998	0	380.7	384.0	3.3	253	253.3	0.999	100.12%
AS-FOUND HIGH	37.20	4998	235	127.7	384.3	256.6	253	253.3	0.999	100.12%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	37.20	4998	110	262.2	384.9	122.7	118.5	119.4	0.992	100.76%
LOW	37.20	4998	40	335.0	384.8	49.8	45.7	46.5	0.983	101.75%
NO2 adjustment not required.									AVERAGE:	100.88%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.001	-0.02%	
NOx	1.000	0.999	-0.03%	
NO2	1.000	0.997	0.21%	



CAL-LICA-202310-01174

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	15-Oct-2023	PREVIOUS CALIBRATION DATE:	05-Sep-2023
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.008
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	955
PURPOSE:	Removal/Shut-down	START TIME (MST):	11:00
PERFORMED BY:	Alex Yakupov	END TIME (MST):	12:51

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240371	FLOW (mL/min)	1511
INITIAL		FINAL	
BKG/OFFSET	0.2	BKG/OFFSET	n/a
COEF/SLOPE	1.006	COEF/SLOPE	n/a
Expected (reference) Value	335	Expected (reference) Value	n/a

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.0	0.0	n/a	 	
5000	 	5000	378.0	375.8	n/a	1.006	n/a
5000	 	5000	180.0	179.5	n/a	1.003	n/a
5000	 	5000	61.0	61.0	n/a	1.000	n/a

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.994	0.1%

COMMENTS:

Shutdown calibration to swap with LICA analyzer Thermo 49 IQ #12208316585

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	15-Oct-2023	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	955
PURPOSE:	Install/Post-Repair	START TIME (MST):	14:17
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:29

ANALYZER:

MAKE/MODEL	Thermo 49iQ	RANGE	500 ppb
SERIAL #	12208316585	FLOW (mL/min)	1.31
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	0.4
COEF/SLOPE	n/a	COEF/SLOPE	1.03
Expected (reference) Value	n/a	Expected (reference) Value	271

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.0	n/a	0.0	 	
5000	 	5000	378.0	n/a	377.0	n/a	1.003
5000	 	5000	180.0	n/a	179.9	n/a	1.001
5000	 	5000	60.0	n/a	60.3	n/a	0.995

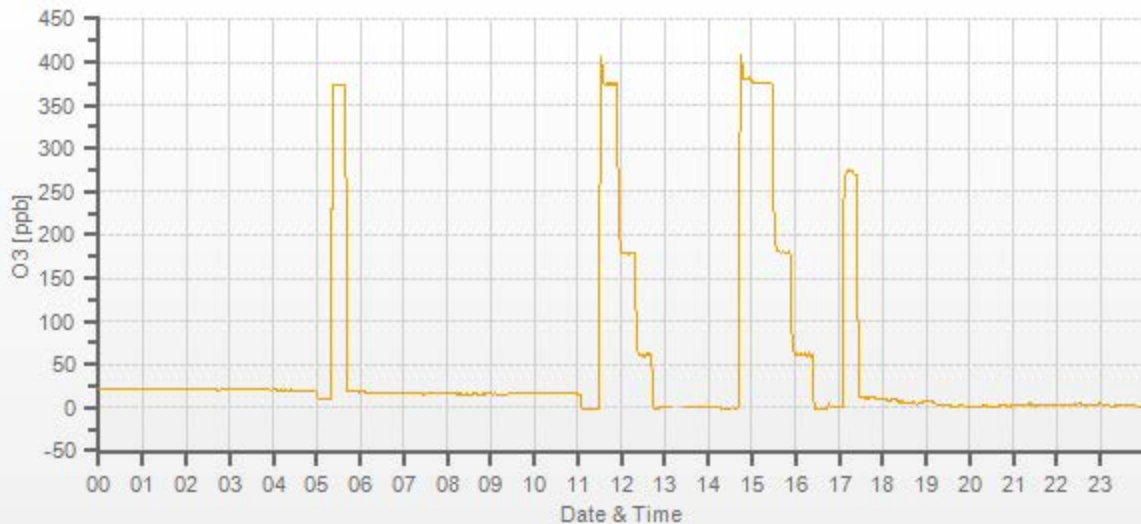
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.997	0.1%

COMMENTS:

Sample inlet filter was changed.

O3[ppb] Station: Cold Lake South Daily: 15-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01174

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	18-Oct-2023	PREVIOUS CALIBRATION DATE:	07-Sep-2023	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1100
LOCATION:	CLS	BAROMETRIC (mBar):	941	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Routine	START TIME (MST):	15:14	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	18:40	PREVIOUS CF:	1.002	0.999	1.000

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 23593	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	603.0 204.0	HIGH EXPIRY:	n/a
ID:	17100415	ID:	134	CYLINDER (psi):	1000	LOW ID:	n/a
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a	EXPIRY DATE	18-Aug-2029	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		561.0
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1164.0

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	9.71	11.42	21.14		9.72	11.43	21.14

CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3100	X	3100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
3025	74.60	3100	14.51	13.50	28.01	15.02	14.08	29.11	14.52	13.47	27.99	0.966	0.959	0.962	0.999	1.002	1.001
3063	37.30	3100	7.26	6.75	14.01	n/a	n/a	n/a	7.22	6.84	14.06	n/a	n/a	n/a	1.005	0.987	0.996
3081	18.60	3100	3.62	3.37	6.98	n/a	n/a	n/a	3.59	3.49	7.10	n/a	n/a	n/a	1.008	0.964	0.984

LINEAR REGRESSION ANALYSIS:

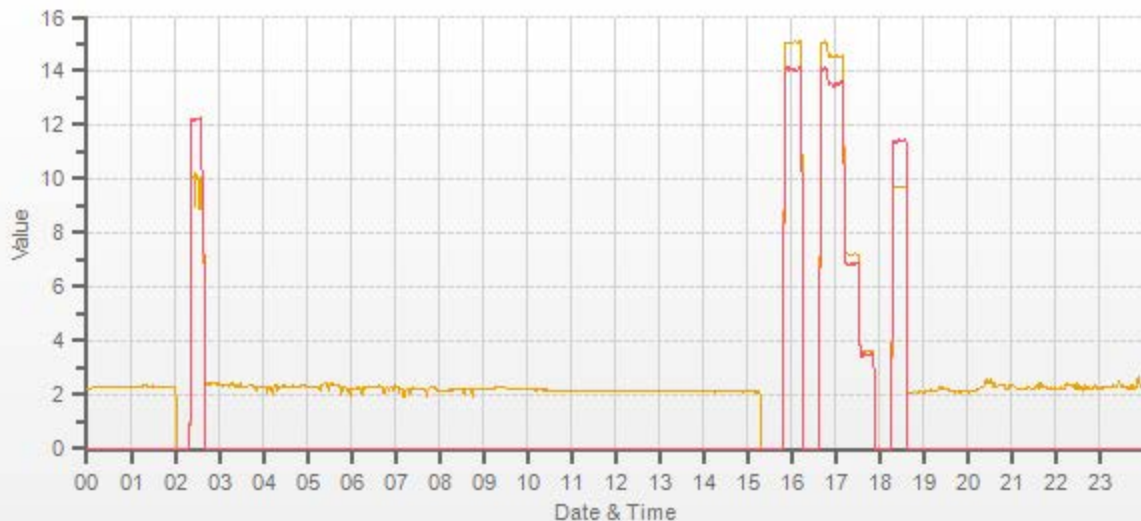
	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	1.001	-0.1%
NMHC	1.000	0.995	0.4%
THC	1.000	0.998	0.2%

Comments:

Sample inlet filter was changed. A new CH₄/C₃H₈ gas cylinder was connected.

Use Zero Chrom?

Yes





Teledyne T640 Audit/Calibration

Date/Previous Audit Date:	October 28, 2023	September 25, 2023	Weather Conditions:	A few clouds	
Company:	LICA		Start Time (mst):	10:45	
Station:	Cold Lake South		End Time (mst):	12:11	
Parameter:	PM 2.5		Performed By/Reviewer:	Alex Yakupov	Chris Wesson
Instrument Data:					
Make/Model:	Teledyne T640		Serial Number:	575	
Owner:	LICA		Alarms (detail in comments):	No	
Reference Standards/L.D./Expiry Date:					
Flow Standard: DeltaCal DC-1/#201587 / Dec 12, 2023			Temperature: Vaisala / HM70 / #T1640130/ Jun 26, 2024		
Digital Manometer: DeltaCal DC-1/#201587 / Dec 12, 2023			Pressure: Fisher / FB 61291/ #130168457/ Mar 20, 2024		
DIAGNOSTICS:					
Ambient Pressure (mmHg)	716.2	Ambient Temp (°C)	-2.7	ASC Heater Duty (%)	0.0
Box Temp (°C)	27.9	Current PMT HV (V)	1429	LED Temp (°C)	37.09
P3 Value	31	PMT Setting (V)	1432	Pump PWM (%)	46
Sample Flow (L/min)	5.02	Sample RH (%RH)	11.8	Sample Temp (°C)	25.1
Monthly Audit/Calibration:					
Item:	As-found		As-left		Tolerance
	Reference	T640x	Reference	T640x	
Zero Test (Leak Check)	PM10	0.0	PM10	0.0	0.0 to 0.2
	PM2.5	0.0	PM2.5	0.0	
Ambient Pressure (mmHg)	716.3	716.2	716.3	716.2	+/- 10 mm Hg
Ambient Temperature (°C)	-2.90	-2.6	n/a		+/- 2°C
Sample Flow (L/min)	5.00	5.02	5.00	5	+/-5% of T640x (e.g., 4.75 – 5.25 lpm)
Additional Monthly Maintenance :					Completed
				Inlet cleaned?	Yes
				Sample tubing inspected (inner and outer)?	Yes
Quarterly Audit/Calibration:					
SpanDust™ Standard	Peak at Channel		Lot No:	Expiry:	
	10.9		100128-050-046	31-Jan-2025	
Additional Checks and Maintenance:					Completed
Every 6 Months	1. Clean Optical Chamber				Yes
	2. Clean RH Sensor				Yes
	3. Clean Temp Sensor				Yes
Every 12 months <small>(or if valve or pump PWM value approaches 80%)</small>	1. New internal Disposable Filter Unit (DFU) [inside front panel]				Yes
Comments:					
A new sample pump was installed. As Found Pump PWT = 97%, As Left Pump PWT = 46%					

Meteorological System Checklist



Date:		October 28, 2023	
Technician:		Alex Yakupov	
Station:		Cold Lake South	
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Rotronic	HC2A-S3	20257103
Barometric Pressure Sensor:	MetOne	92	Y23368
Relative Humidity Sensor:	Rotronic	HC2A-S3	20257103
Anemometer:	RM Young	05305AQ	177354
AMBIENT TEMPERATURE SENSOR CHECK			
Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Vaisala / HM70 / #T1640130/ Jun 26, 2024		
Reference Temperature (°C):	-2.2		
Station - Ambient Temperature (°C):	-2.5		
Temperature Difference (°C):	0.3		
BAROMETRIC PRESSURE SENSOR CHECK			
Reference Barometer ID:	Fisher / FB 61291/ #130168457/ Mar 20, 2024		
Reference Pressure - Units/Reading:	millibar	956	
Station Pressure - Units/Reading:	millibar	957	
Pressure Tolerance +/- 15% of error:	813 - 1099	-0.10%	
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Reference Hygrometer ID:	Vaisala / HM70 / #T1640130/ Jun 26, 2024		
Reference Hygrometer % RH- Reading:	62.10		
Station Hygrometer % RH- Reading:	69.60		
RH Tolerance +/- 15% of difference:	52.79 - 71.42	-12.1%	
ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK			
WIND SPEED		WIND DIRECTION	
Previous check date:	September 25, 2023	Previous check date:	September 25, 2023
Wind Speed Observed (kph):	10 - 20	Wind Direction Observed:	N
Wind speed on Data Logger (kph):	18.3	Wind Direction on Data Logger:	N
	Annual audit: Jul 6, 2022	Wind Direction Pass/Fail?:	Pass

Comments

Station (Trailer) temperature vs Reference gauge: 23.1 vs 23.0, Difference = 0.1 degrees. Passed. Wind system: Model 05305AQ. Signal box # 32400



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA
 Audit Location: Cold Lake South
 Audit Date: July 6, 2022
 Calibration Purpose: routine annual

Performed By: Alex Yakupov
 Reviewed By: Chris Wesson
 Start/End Time (mst): 15:54 / 17:48
 Weather Conditions: A few clouds

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	n/a
Sensor Model:	05305AQ	Velocity Unit Output Range:	0-200
Serial #:	177354	Direction Voltage Output Range:	n/a
Previous Cal/Audit Date:	April 20, 2021	Direction Unit Output Range:	0-360

Wind Calibrator Information

Calibrator I.D. and Expiry Date: RM Young 18802 id# CA4744 expires Aug 6, 2022

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	18.2	18.2	1.013
2000	36.9	36.6	36.6	1.007
3000	55.3	55.1	55.1	1.003
4000	73.7	73.5	73.5	1.003
5000	92.2	92.1	92.0	1.001
6000	110.6	110.4	110.3	1.002
7000	129.0	128.8	128.8	1.002
8000	147.4	147.3	147.3	1.001
9000	165.9	165.6	165.6	1.002
10000	184.3	184.2	184.2	1.001
The audit meets AMD requirements.			Average Correction Factor=	1.003

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	0.1	0.0	0.1
30	330	27	329	2.7	1.4	2.0
60	300	58	298	2.4	1.9	2.1
90	270	89	268	1.1	2.1	1.6
120	240	119	239	0.9	1.1	1.0
150	210	148	208	1.6	2.1	1.8
180	180	178	180	2.4	-0.2	1.3
210	150	208	149	2.3	1.1	1.7
240	120	239	119	1.3	0.6	1.0
270	90	268	91	2.2	-1.2	1.7
300	60	298	58	2.3	1.9	2.1
330	30	329	28	1.3	2.5	1.9
355	0	355	0	-0.1	0.1	0.1
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.4

Comments:

Output via RMY32400 Serial Interface

End of Report



Lakeland Industry & Community Association

OCTOBER 2023

Ambient Air Monitoring Calibration Report

- TAMARACK STATION-

CAL-LICA-202310-01248

Station Operation and Maintenance:

Bureau Veritas Canada

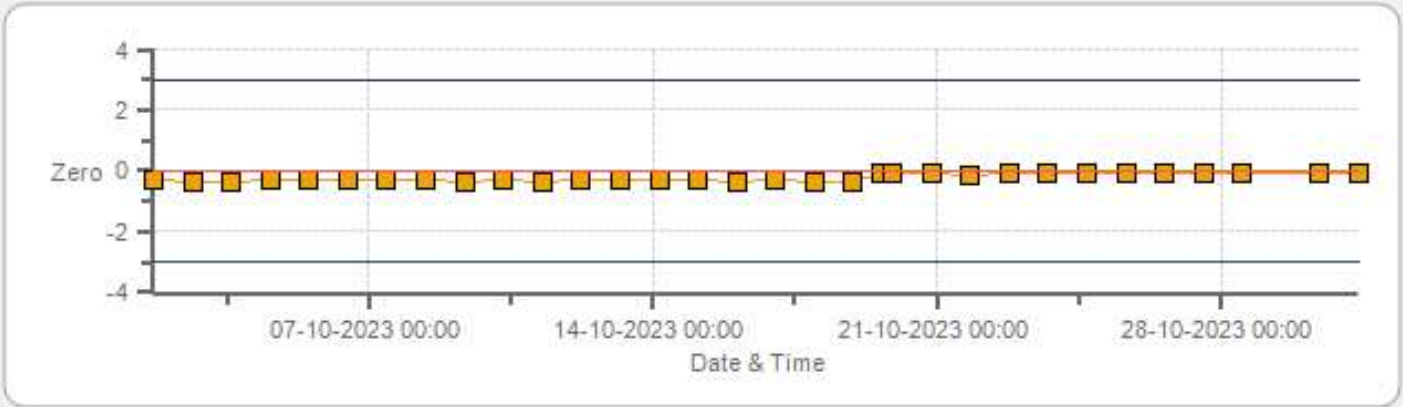
Data Validation and Report:

LICA / Bureau Veritas Canada

November 20, 2023

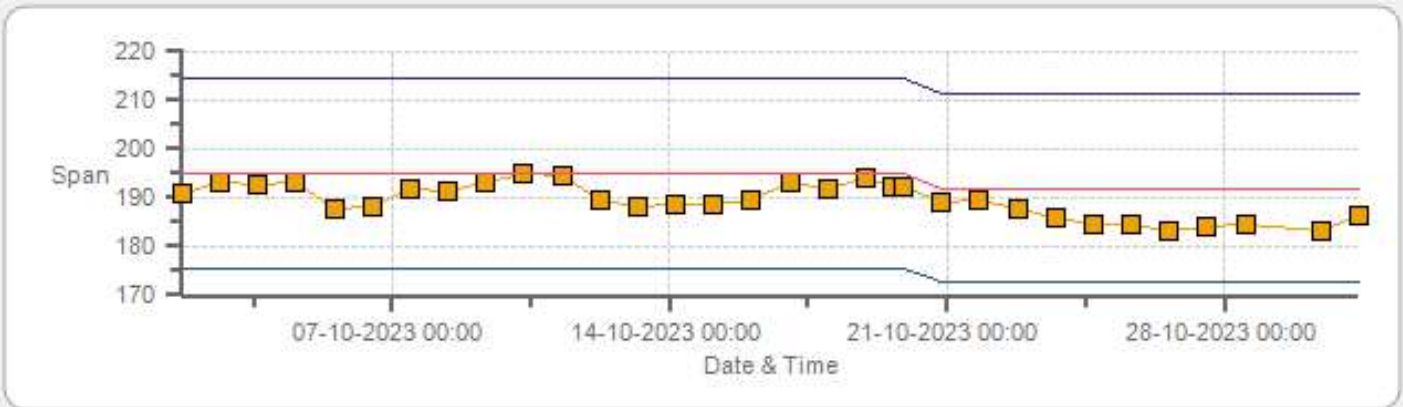
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



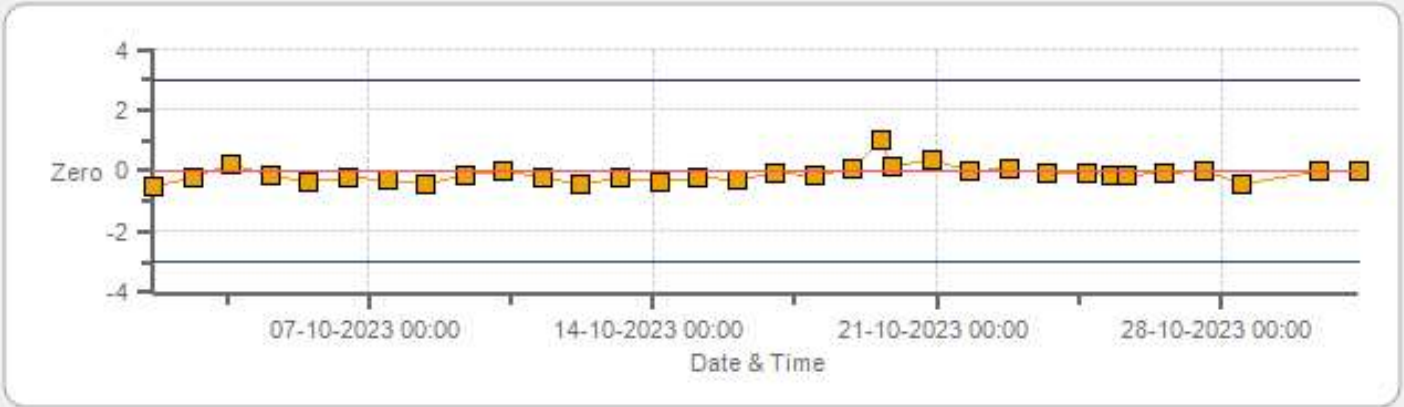
Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



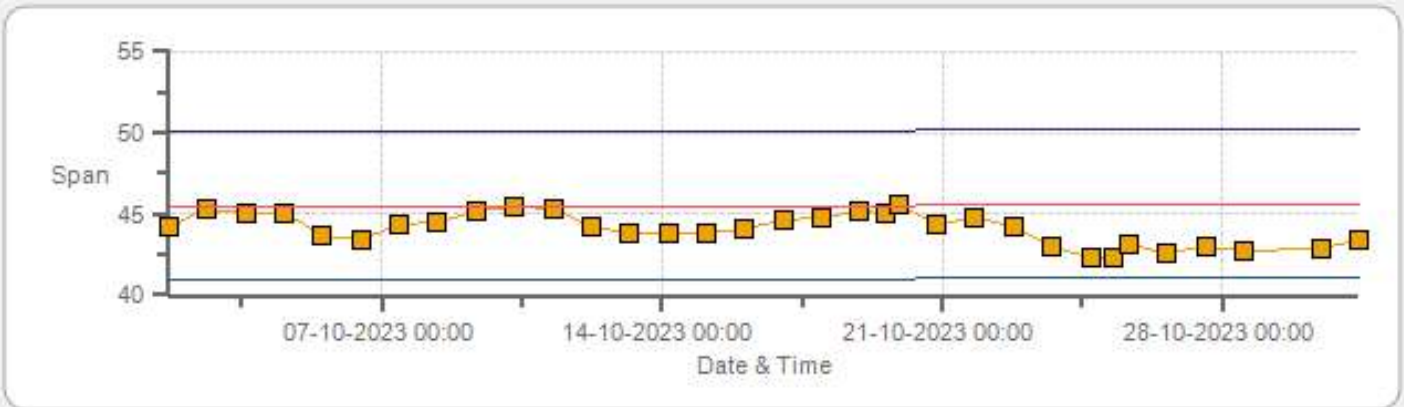
Span SpanRef Span Low Span High

H2S[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



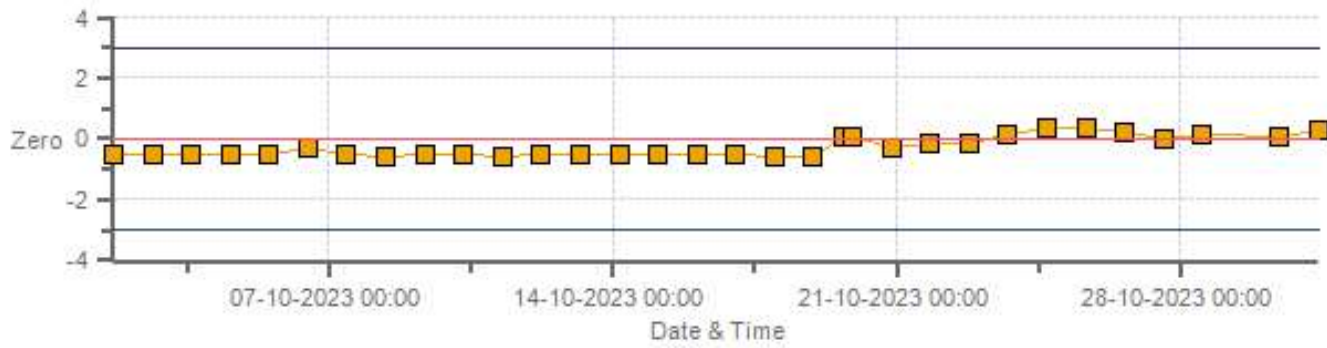
Zero Zero Ref Zero Low Zero High

H2S[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



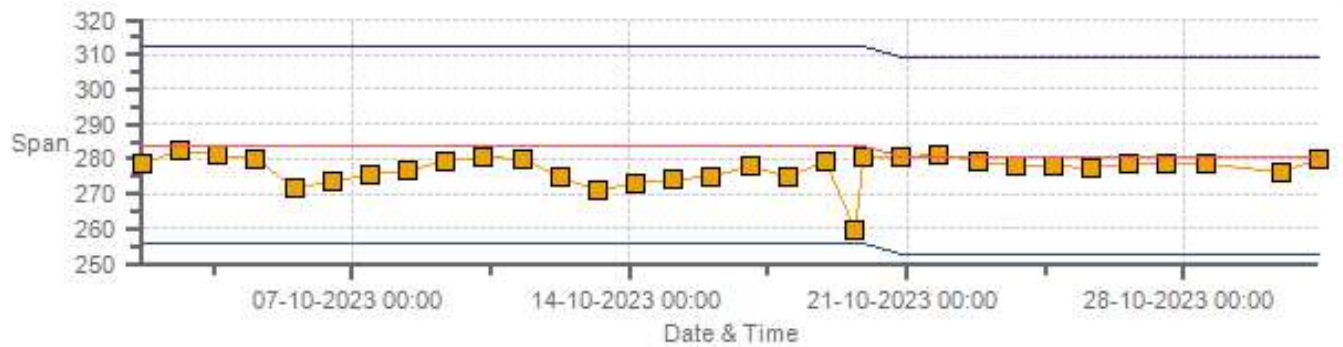
Span SpanRef Span Low Span High

NOX[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



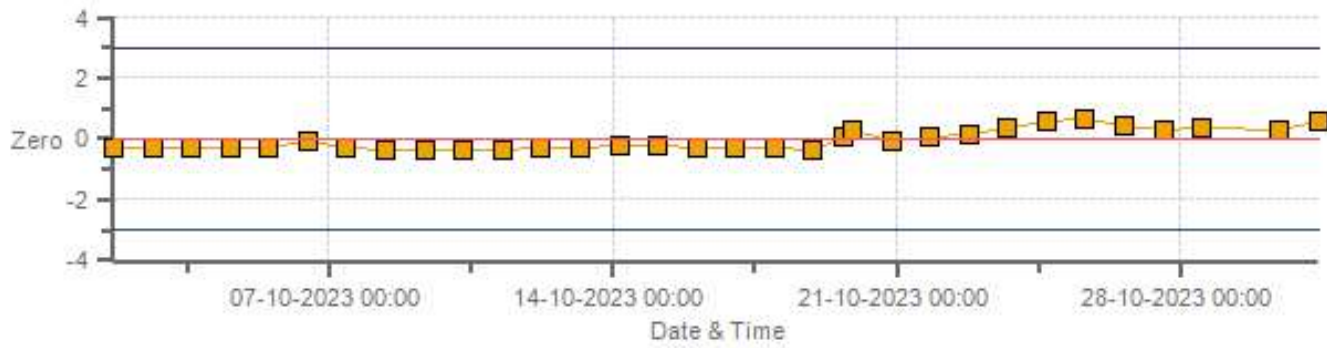
Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



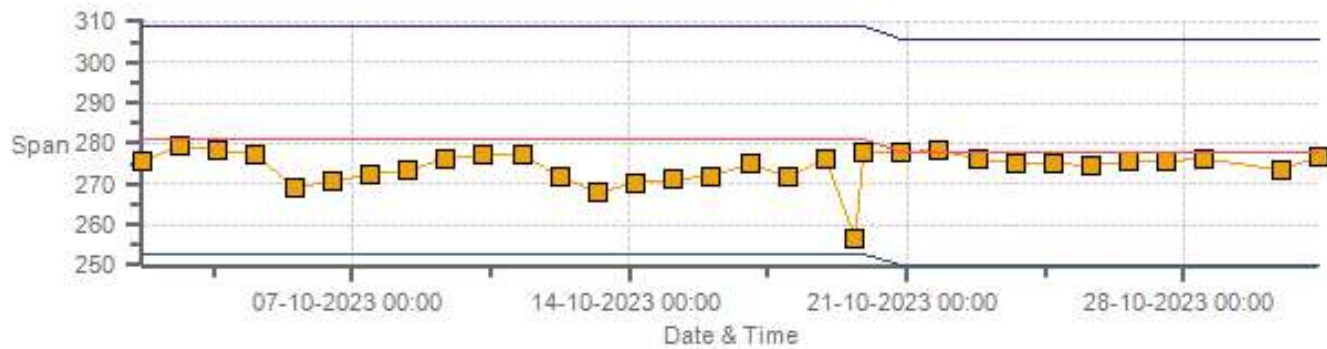
Span SpanRef Span Low Span High

NO2[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



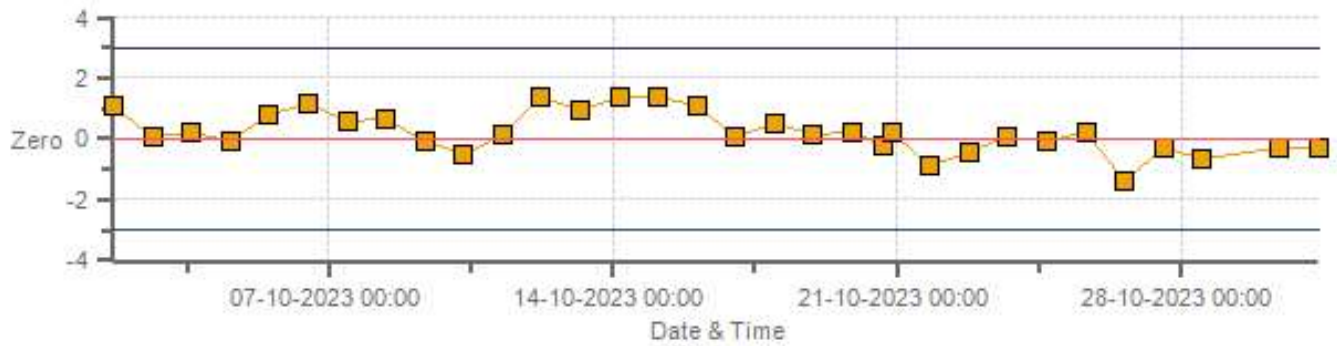
Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



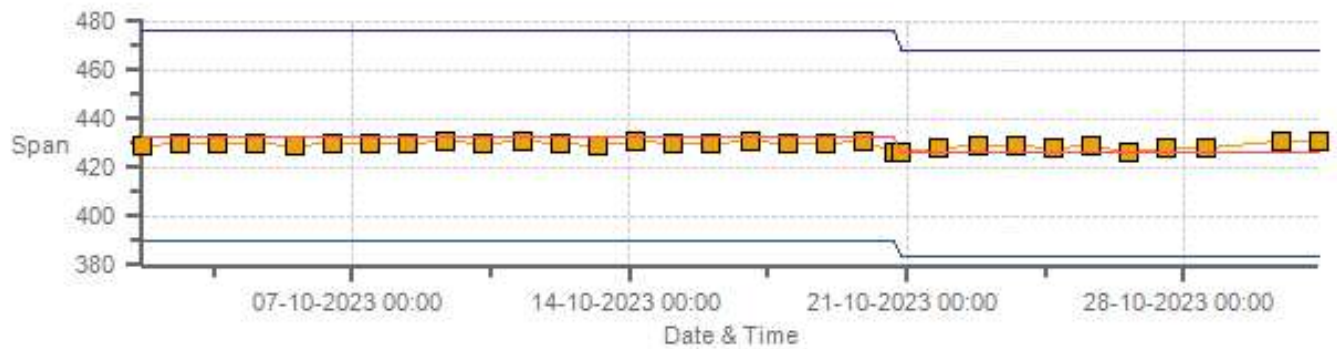
Span SpanRef Span Low Span High

O3[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



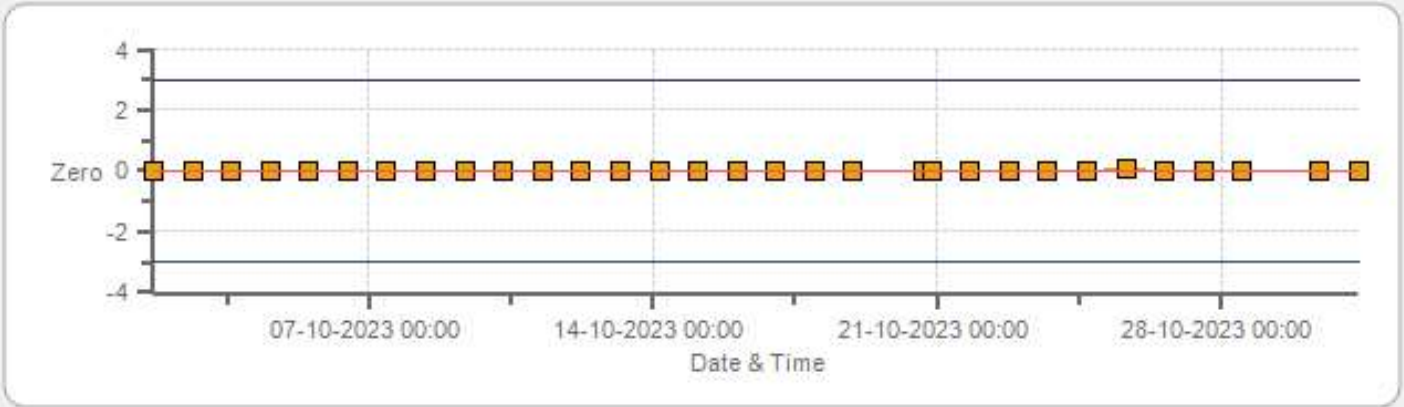
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



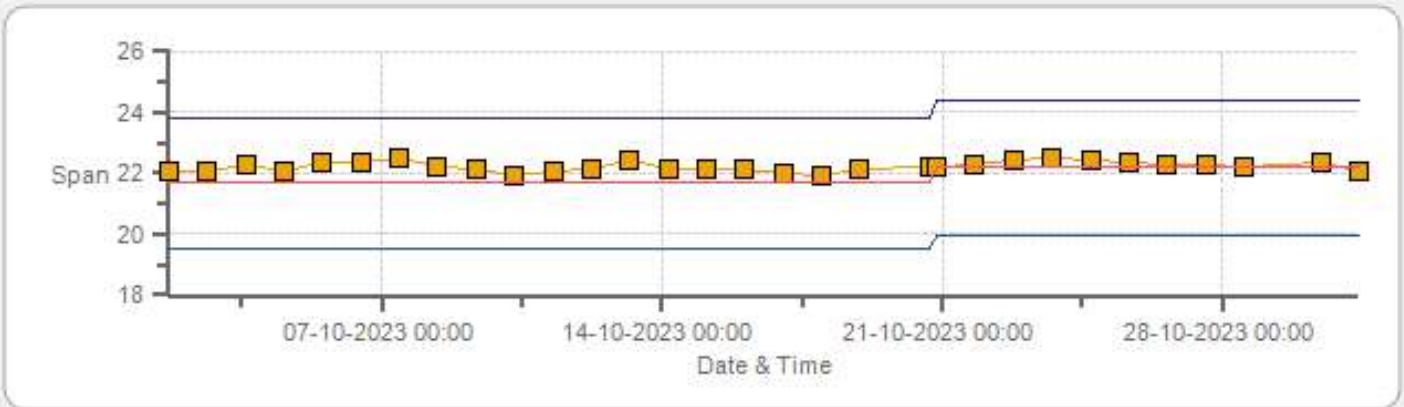
Span SpanRef Span Low Span High

THC55[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



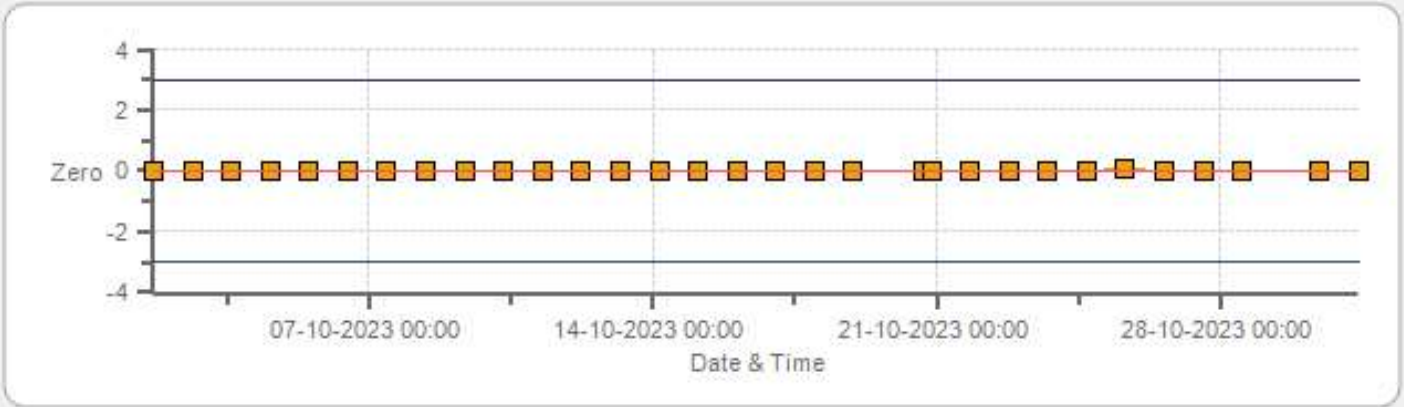
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



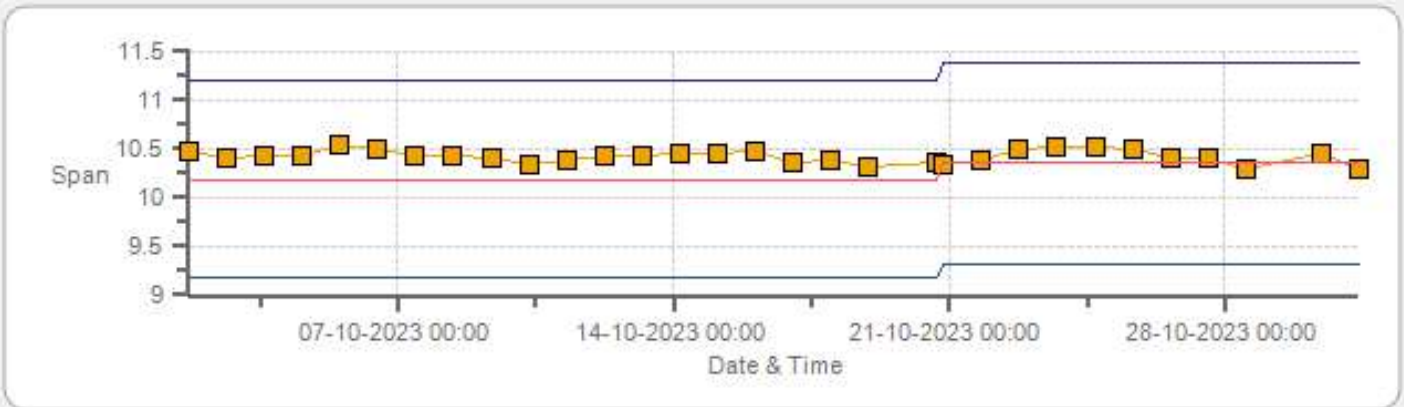
Span SpanRef Span Low Span High

CH4[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



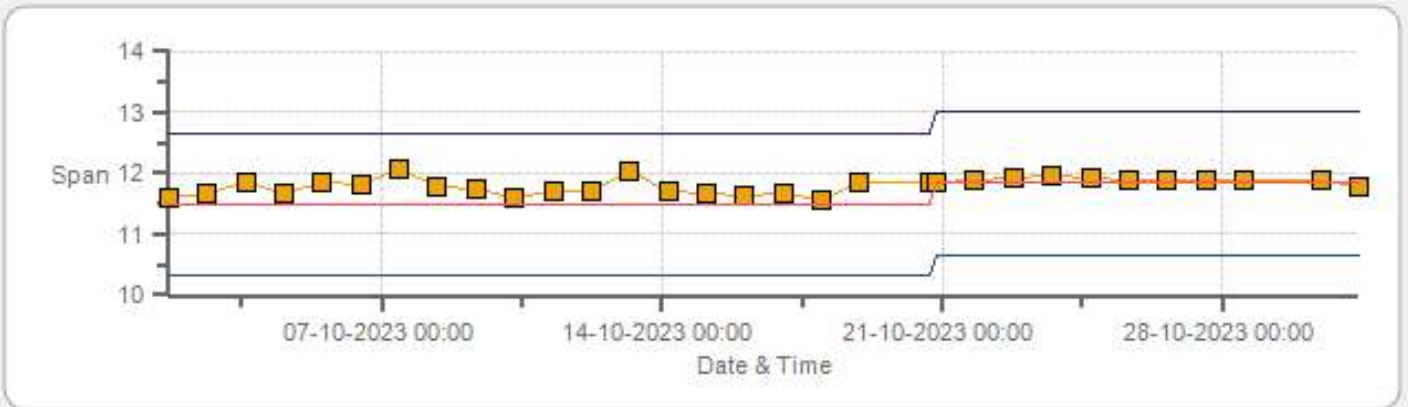
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: Tamarack Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	19-Oct-2023	PREVIOUS CALIBRATION DATE:	16-Sep-2023
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	0.999
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	930
PURPOSE:	Routine	START TIME (MST):	09:47
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:47

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180930031	FLOW (mL/min)	0
INITIAL		FINAL	
BKG/OFFSET	3.08	BKG/OFFSET	2.88
COEF/SLOPE	1.029	COEF/SLOPE	1.02
Expected (reference) Value	195	Expected (reference) Value	192

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	17100415	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 127895	HIGH ID	n/a
CONC (ppm):	50.40	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	27-Oct-2030	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.20	5000	0.00	-0.3	0	0.995	1.002
4961	37.20	4998	375.13	376.7	374.5	0.995	1.002
4982	17.60	5000	177.41	n/a	176.6	n/a	1.005
4990	8.80	4999	88.72	n/a	87.6	n/a	1.013

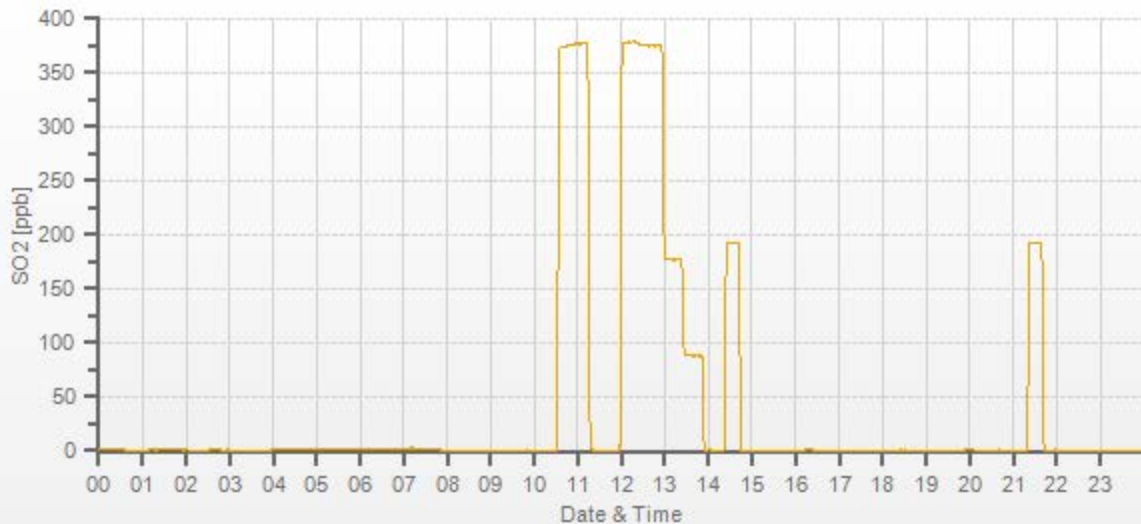
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	-0.1%

COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Tamarack Daily: 19-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01248

H2S Analyzer Calibration by Dilution



DATE:	19-Oct-2023	PREVIOUS CALIBRATION DATE:	16-Sep-2023
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.006
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	930
PURPOSE:	Routine	START TIME (MST):	09:47
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:47

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360005	FLOW (mL/min)	898
INITIAL		FINAL	
BKG/OFFSET	37.2	BKG/OFFSET	37.2
COEF/SLOPE	0.82	COEF/SLOPE	0.82
Expected (reference) Value	45.5	Expected (reference) Value	45.6

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	134
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0002287	HIGH ID	n/a
CONC (ppm):	10.10	EXPIRY DATE	n/a
CYLINDER (psi):	300	LOW ID	n/a
EXPIRY DATE	14-Sep-2024	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	09:48	SO2 Conc (ppb)	380
END TIME:	10:03	Analyzer Response (ppb)	0.0

CALIBRATION:

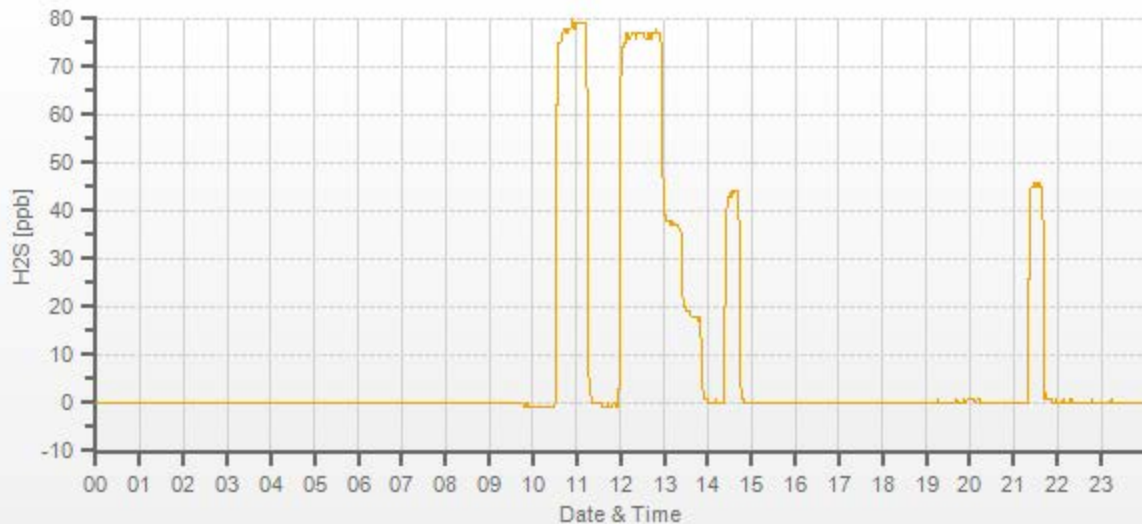
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	-0.4	0	0.970	1.000
7442	57.90	7500	77.97	80	78	0.970	1.000
7472	28.20	7500	37.98	n/a	38	n/a	0.999
7486	14.10	7500	18.99	n/a	18.9	n/a	1.005

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.001	0.0%

COMMENTS:

Sample inlet filter was changed.



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	19-Oct-2023	PREVIOUS CALIBRATION DATE:	16-Sep-2023	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930028	NOx	0.999
LOCATION:	Tamarack	BAROMETRIC (mBar):	930	FLOW (mL/min)	728	NO	0.998
PURPOSE:	Routine	START TIME (MST):	09:45	RANGE (ppb)	500	NO2	0.999
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:54	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 127895	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	51.1 51.6	HIGH EXPIRY:	n/a
ID:	17100415	ID:	134	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a	EXPIRY DATE	27-Oct-2030	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	2.6	2.2	n/a	BKG/OFFSET:	2.4	2.2	n/a
SLOPE/COEF/CE:	1.009	1.153	0.998	SLOPE/COEF/CE:	0.998	1.172	1.01

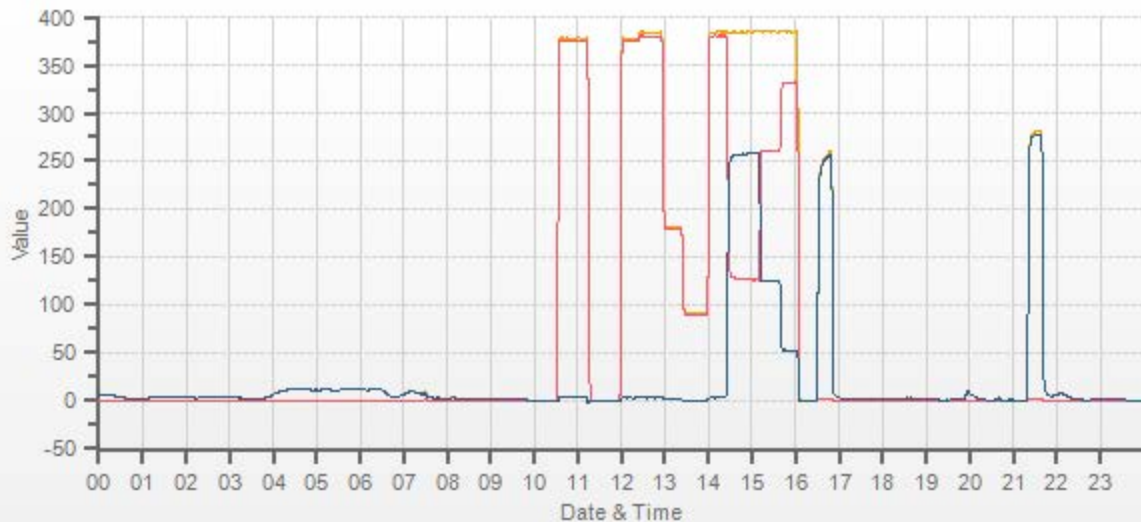
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	284.0	3.2	281.0		280.8	3.0	277.9

CALIBRATION PARAMETERS:		NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
POINT					
HIGH		380	250	230-265	n/a
MID		180	125	115-150	n/a
LOW		90	45	40-55	n/a
EXTRA 1		n/a	n/a	n/a	n/a

FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	37.10	5000	0.0	0.0	0.0	-0.1	-0.4	-0.3	0.0	0.0	0.0	1.014	1.013	0.998	0.998	0.999	0.999
4961	37.10	4998	379.3	383.0	3.7	373.9	377.8	3.8	380.0	383.9	3.8	1.014	1.013	0.998	0.998	0.999	0.999
4982	17.60	5000	179.9	181.6	1.8	n/a	n/a	n/a	180.0	181.9	2.0	n/a	n/a	0.999	0.999	1.003	1.001
4990	8.80	4999	90.0	90.8	0.9	n/a	n/a	n/a	89.7	90.7	1.0	n/a	n/a	1.003	1.001		

GPT CALIBRATION:										
Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	37.10	4997	0	380.4	384.6	4.2	253.6	253.4	1.001	99.92%
AS-FOUND HIGH	37.10	4997	235	126.8	384.4	257.6	253.6	253.4	1.001	99.92%
ADJUSTED HIGH	37.10	4997	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	37.10	4997	110	260.3	384.6	124.3	120.1	120.1	1.000	100.00%
LOW	37.10	4997	40	332.1	384.6	52.5	48.3	48.3	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	99.97%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.002	-0.04%	
NOx	1.000	1.003	-0.03%	
NO2	1.000	0.999	0.02%	



CAL-LICA-202310-01248

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	20-Oct-2023	PREVIOUS CALIBRATION DATE:	17-Sep-2023
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.001
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	935
PURPOSE:	Routine	START TIME (MST):	12:01
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:18

ANALYZER:

MAKE/MODEL	Thermo 49iQ	RANGE	500 ppb
SERIAL #	1202068570	FLOW (mL/min)	1350
INITIAL		FINAL	
BKG/OFFSET	3.3	BKG/OFFSET	4.4
COEF/SLOPE	1.03	COEF/SLOPE	1.027
Expected (reference) Value	433	Expected (reference) Value	426

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	134
MFC CALIBRATION DATE:	20-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

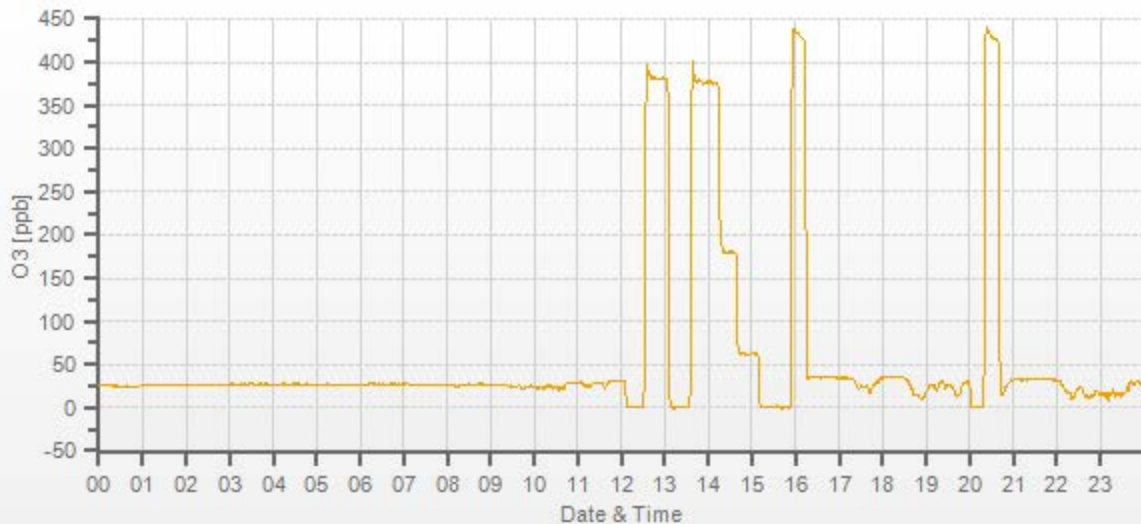
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.0	1.7	0.0	 	
5000	 	5000	378.0	380.2	376.9	0.999	1.003
5000	 	5000	180.0	n/a	179.7	n/a	1.002
5000	 	5000	61.0	n/a	61.2	n/a	0.997

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.997	0.0%

COMMENTS:

Sample inlet filter was changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	19-Oct-2023	PREVIOUS CALIBRATION DATE:	17-Sep-2023	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180030034	1190
LOCATION:	Tamarack	BAROMETRIC (mBar):	930	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Removal/Shut-down	START TIME (MST):	16:13	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:57	PREVIOUS CF:	0.999	0.998	0.999

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 23593	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	603.0 204.0	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	1000	LOW ID:	n/a
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	115	EXPIRY DATE	18-Aug-2029	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		561.0
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1164.0

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	10.19	11.49	21.68		n/a	n/a	n/a

CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3100	X	3100	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	X	X	X	X	X	X
3025	74.60	3100	14.51	13.50	28.01	14.76	13.69	28.45	n/a	n/a	n/a	0.983	0.986	0.985	n/a	n/a	n/a
3063	37.30	3100	7.26	6.75	14.01	7.41	6.72	14.13	n/a	n/a	n/a	0.979	1.004	0.991	n/a	n/a	n/a
3081	18.60	3100	3.62	3.37	6.98	3.72	3.40	7.12	n/a	n/a	n/a	0.973	0.990	0.981	n/a	n/a	n/a

LINEAR REGRESSION ANALYSIS:

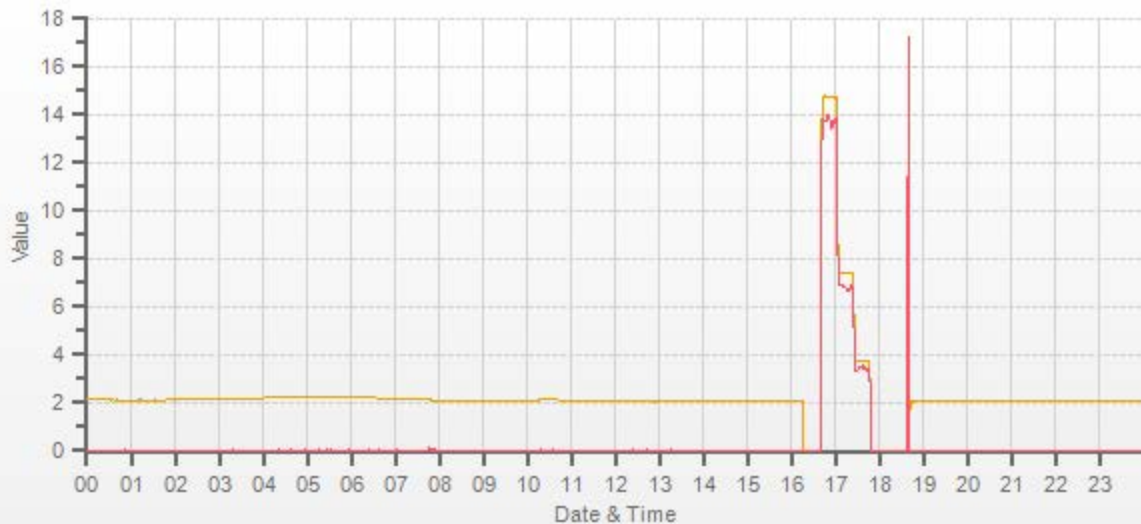
	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	1.016	0.1%
NMHC	1.000	1.013	-0.2%
THC	1.000	1.015	0.0%

Comments:

Shutdown calibration was completed to remove the analyzer for repair.
Reason: Noisy NMHC channel

Use Zero Chrom?

Yes



CAL-LICA-202310-01248

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	20-Oct-2023	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1505664392	1200
LOCATION:	Tamarack	BAROMETRIC (mBar):	935	PARAMETER:	CH4	NMHC	THC
PURPOSE:	Install/Post-Repair	START TIME (MST):	12:02	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:17	PREVIOUS CF:	n/a	n/a	n/a

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 23593	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	603.0 204.0	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	1000	LOW ID:	n/a
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	115	EXPIRY DATE	18-Aug-2029	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		561.0
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1164.0

EXPECTED (REFERENCE) VALUE:

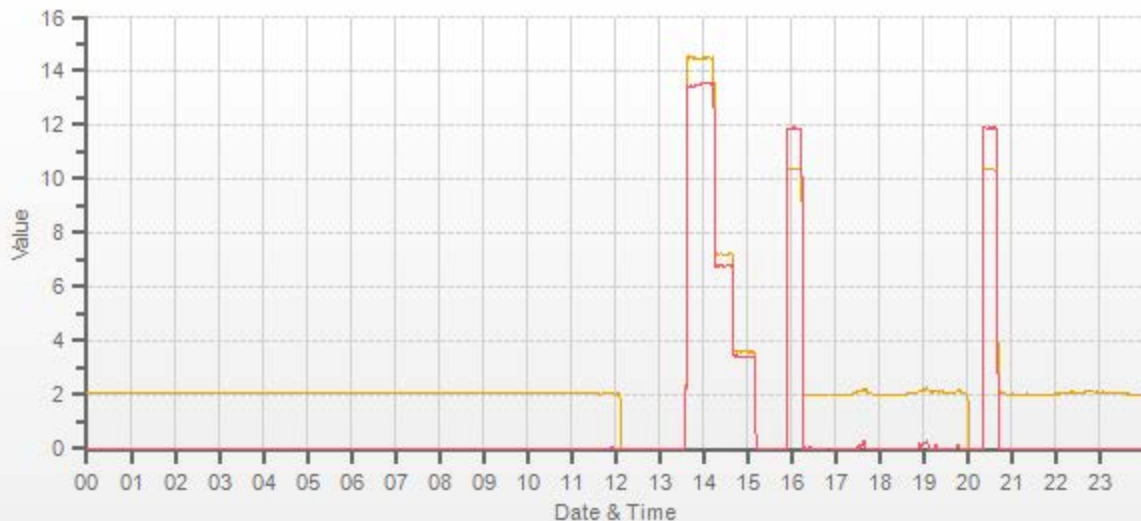
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	n/a	n/a	n/a		n/a	10.36	11.85

CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3100	X	3100	0.00	0.00	0.00	n/a	n/a	n/a	0.00	0.00	0.00	X	X	X	X	X	X
3025	74.60	3100	14.51	13.50	28.01	n/a	n/a	n/a	14.49	13.55	28.04	n/a	n/a	n/a	1.001	0.996	0.999
3063	37.30	3100	7.26	6.75	14.01	n/a	n/a	n/a	7.20	6.80	14.00	n/a	n/a	n/a	1.008	0.993	1.000
3081	18.60	3100	3.62	3.37	6.98	n/a	n/a	n/a	3.60	3.42	7.02	n/a	n/a	n/a	1.005	0.984	0.995

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:	
CH ₄	1.000	0.999	-0.1%	Sample inlet filter was changed. A new N ₂ gas cylinder was connected. BV analyzer	
NMHC	1.000	1.003	0.1%		
THC	1.000	1.001	0.0%		
				Use Zero Chrom?	Yes



CAL-LICA-202310-01248

Thermo 5030 SHARP Monitor Monthly Check

Date: <u>October 20, 2023</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Chris Wesson</u>
Company: <u>LICA</u>	Start Time (mst): <u>15:41</u>
Station Name/Location: <u>Tamarack</u>	End Time (mst): <u>16:44</u>
Previous Audit Date: <u>September 25, 2023</u>	Calibration Purpose: <u>routine monthly</u>
Parameter: <u>PM 2.5</u>	Weather Conditions: <u>Mainly sunny</u>

SHARP Information and Status:

Serial Number: <u>CM-2209</u>	Status: <u>0.00</u>
Approx Tape remaining: <u>7/10</u>	Error Code: <u>0.00</u>

Reference Standards: Air Flow

	Manometer	Orifice	Pressure:	Temperature:
Make:	Delta Cal	Delta Cal	Fisher	Vaisala
Model:	DC-1	DC-1	FB61291	HM70
Serial Number:	#201587	#201587	130168457	T1640130
Calibration Expiration Date:	December 12, 2023	December 12, 2023	March 20, 2024	June 26, 2024

As found temperature and pressure:

Tolerance +/- 4°C	Tolerance +/- 13.33 hPa
SHARP T1 °C: <u>13.0</u>	SHARP P3 (hPa): <u>939.000</u>
Reference °C: <u>13.2</u>	Reference (hPa): <u>938.000</u>
Difference °C: <u>0.2</u>	Difference (hPa) : <u>1.000</u>

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

Tolerance +/- 4°C	Tolerance +/- 13.33 hPa
SHARP T1 °C: <u>19.7</u>	SHARP P3 (hPa): <u>939.000</u>
Reference °C: <u>19.0</u>	Reference (hPa): <u>938.000</u>
Difference °C: <u>-0.7</u>	Difference : <u>1.000</u>

As found flows:

Targets: 1000 l/hr / <90%	Flow Tolerance 16.67 lpm +/- 0.67 lpm
SHARP AirFlow l/hr: <u>1000.00</u>	SHARP Airflow (l/min): <u>16.67</u>
Pump Voltage (%): <u>48.90</u>	Reference AirFlow (l/min): <u>16.71</u>
	Difference (l/min): <u>0.04</u>

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

Targets: 1000 l/hr / <90%	Flow Tolerance 16.67 lpm +/- 0.67 lpm
SHARP AirFlow l/hr: <u>1000.00</u>	SHARP Airflow (l/min): <u>16.67</u>
Pump Voltage (%): <u>47.60</u>	Reference AirFlow (l/min): <u>16.71</u>
	Difference (l/min): <u>0.04</u>

Inlet Assembly:

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

Comments:

Leak check: 16.71 vs 16.62, 0.09 < 0.80 lpm, passed.

Meteorological System Checklist



Date:	October 20, 2023		
Technician:	Alex Yakupov		
Station:	Tamarack / Audit time: 16:51 - 17:34		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	Met One	387 D	C 13580
Temperature Sensor:	Rotronic	HC2A-S3	20433166
Barometric Pressure Sensor:	MetOne	Part 090D	F4497
Relative Humidity Sensor:	Rotronic	HC2A-S3	20433166
Anemometer:	RM Young	05305VK	161465

PRECIPITATION SENSOR CHECK

Checklist:	Reply:	Comments:
Is the sensor Level?	yes	
Is the heater operating properly?	yes	
Are the bucket drain holes clean?	yes	
Is the screen on the housing? (screen should be on between July and September)	no	16:57 - water test. Response is timely and accurate. (1.1 mm for 11 water tips)
Is the housing clean?	yes	
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 mm)

# of Tips	Data Logger Response (mm):	Manual Specification = +/- 0.2 mm
10	1.00	0.00

AMBIENT TEMPERATURE SENSOR CHECK

Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Vaisala HMP76B #T1640130, Exp. Date: Jun 26, 2024		
Reference Temperature (°C):	22.5		
Station - Ambient Temperature (°C):	22.0		
Temperature Difference (°C):	0.5		

BAROMETRIC PRESSURE SENSOR CHECK

Reference Barometer ID:	Fisher / FB 61291/ #130168457/ Mar 20, 2024		
Reference Pressure - Units/Reading:	millibar	928	
Station Pressure - Units/Reading:	millibar	927	
Pressure Tolerance +/- 15% of error:	789 - 1067	0.11%	

RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK

Reference Hygrometer ID:	Vaisala HMP76B #T1640130, Exp. Date: Jun 26, 2024		
Reference Hygrometer % RH- Reading:	44.60		
Station Hygrometer % RH- Reading:	44.00		
RH Tolerance +/- 15% of difference:	37.91 - 51.29	1.3%	

ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK

WIND SPEED		WIND DIRECTION	
Previous check date:	September 17, 2023	Previous check date:	September 17, 2023
Wind Speed Observed (kph):	0 to 10	Wind Direction Observed:	N
Wind speed on Data Logger (kph):	4.9	Wind Direction on Data Logger:	N
	Annual audit: Sep 17, 2023	Wind Direction Pass/Fail?:	Pass

Comments

Station (Trailer) temperature vs Reference gauge temperature: 21.8 vs 21.5 degrees, difference = 0.3 => Passed.



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA Performed By: Alex Yakupov
 Audit Location: Tamarack Reviewed By: Chris Wesson
 Audit Date: September 17, 2023 Start/End Time (mst): 15:01 / 17:09
 Calibration Purpose: routine annual Weather Conditions: Mainly sunny

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200
Serial #:	161465	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	July 26, 2022	Direction Unit Output Range:	0-360

Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744, expires - Oct 18, 2024

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	0.996
2000	36.9	37.0	36.9	0.998
3000	55.3	55.4	55.4	0.998
4000	73.7	73.9	73.9	0.998
5000	92.2	92.5	92.5	0.996
6000	110.6	111.0	111.0	0.996
7000	129.0	129.6	129.6	0.995
8000	147.4	148.1	148.1	0.996
9000	165.9	166.7	166.7	0.995
10000	184.3	185.2	185.2	0.995
The audit meets AMD requirements.			Average Correction Factor=	0.996

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	354	0.3	0.8	0.6
30	330	31	331	-0.8	-0.7	0.7
60	300	61	301	-1.4	-0.8	1.1
90	270	94	271	-3.5	-1.0	2.3
120	240	123	242	-2.8	-1.5	2.2
150	210	152	212	-2.3	-2.4	2.4
180	180	182	183	-1.9	-3.4	2.7
210	150	212	155	-2.2	-4.5	3.3
240	120	241	124	-0.7	-4.1	2.4
270	90	270	95	-0.4	-4.8	2.6
300	60	301	64	-0.5	-3.6	2.1
330	30	329	34	0.7	-3.5	2.1
355	0	354	0	0.8	0.4	0.6
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.9

Comments:

n/a

End of Report



Lakeland Industry & Community Association

OCTOBER 2023

Ambient Air Monitoring Calibration Report

- ST. LINA STATION-

CAL-LICA-202310-01250

Station Operation and Maintenance:

Bureau Veritas Canada

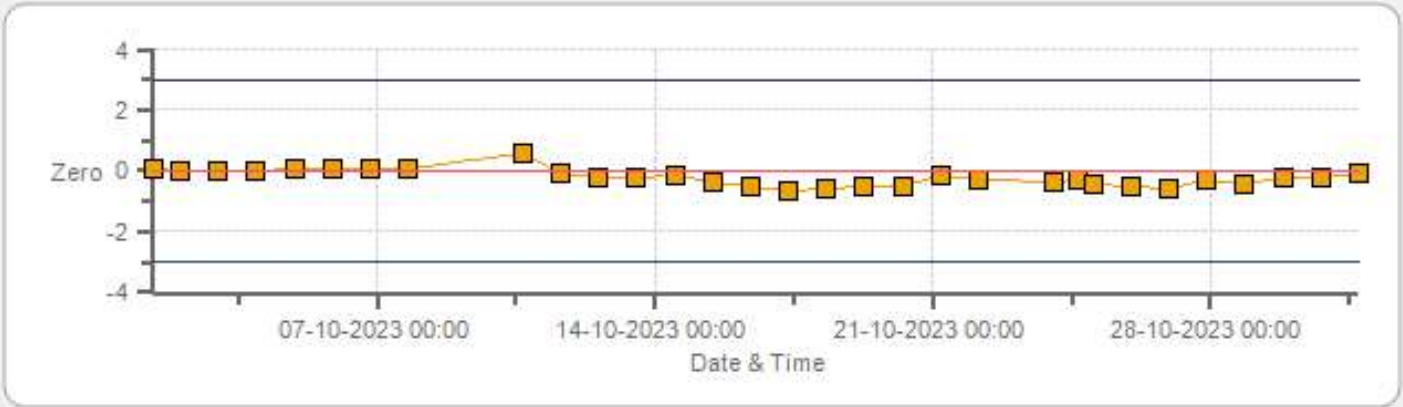
Data Validation and Report:

LICA / Bureau Veritas Canada

November 20, 2023

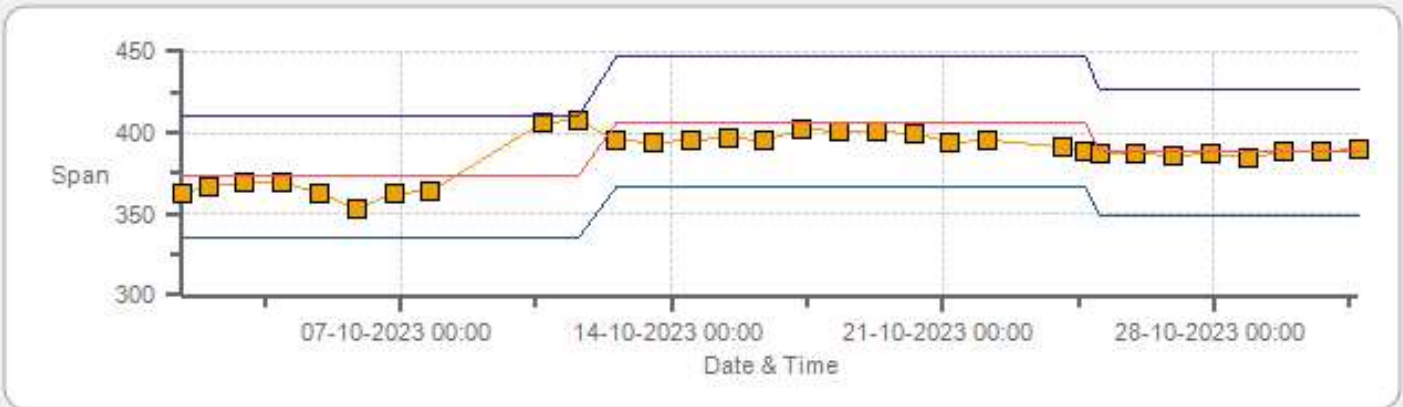
DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



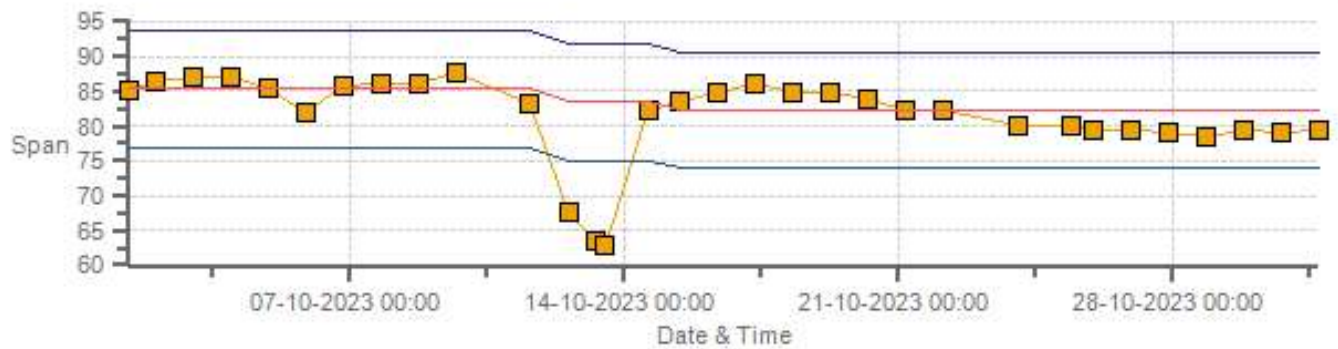
Span SpanRef Span Low Span High

H2S[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



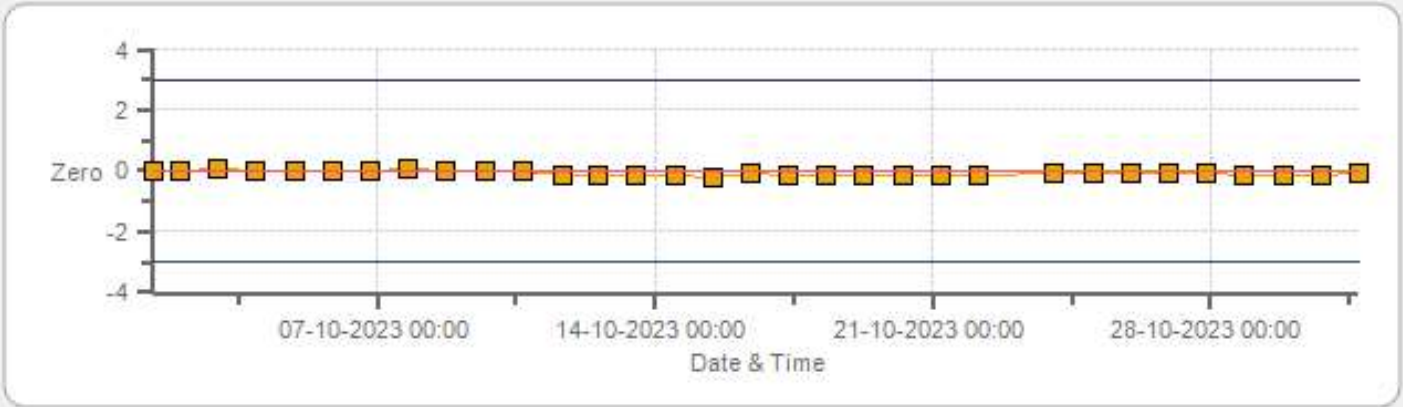
Zero Zero Ref Zero Low Zero High

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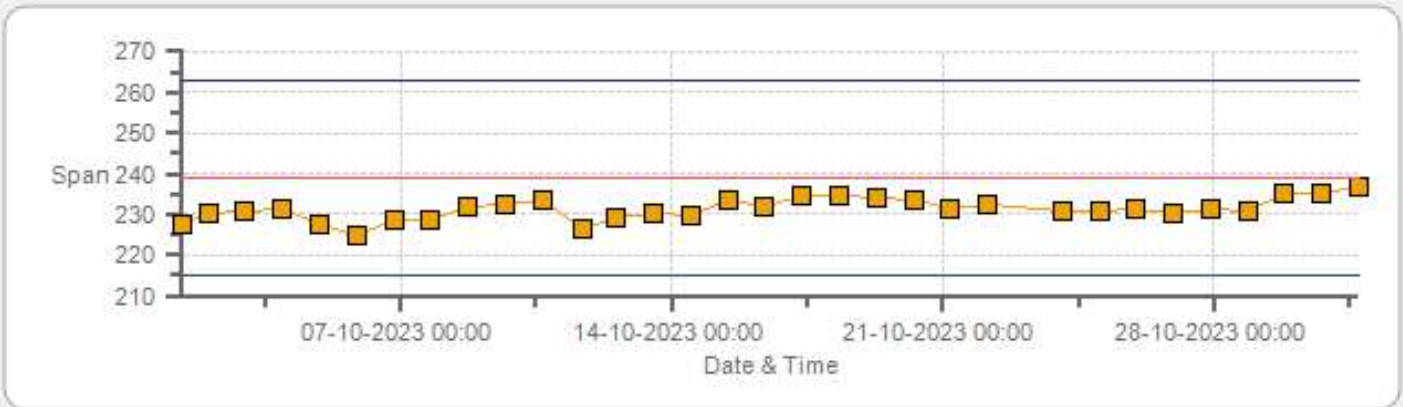
Span SpanRef Span Low Span High

NO2[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

O3[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



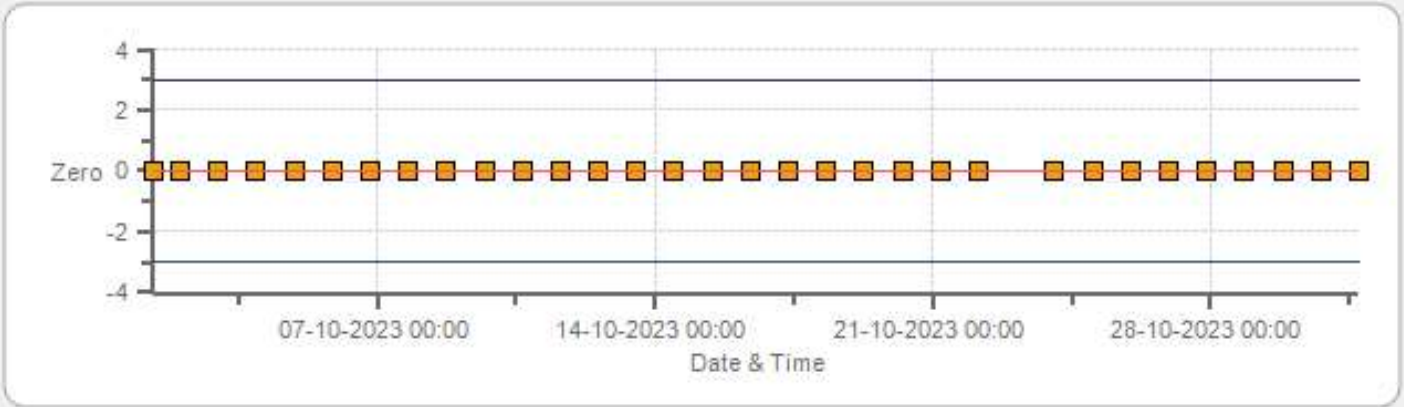
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



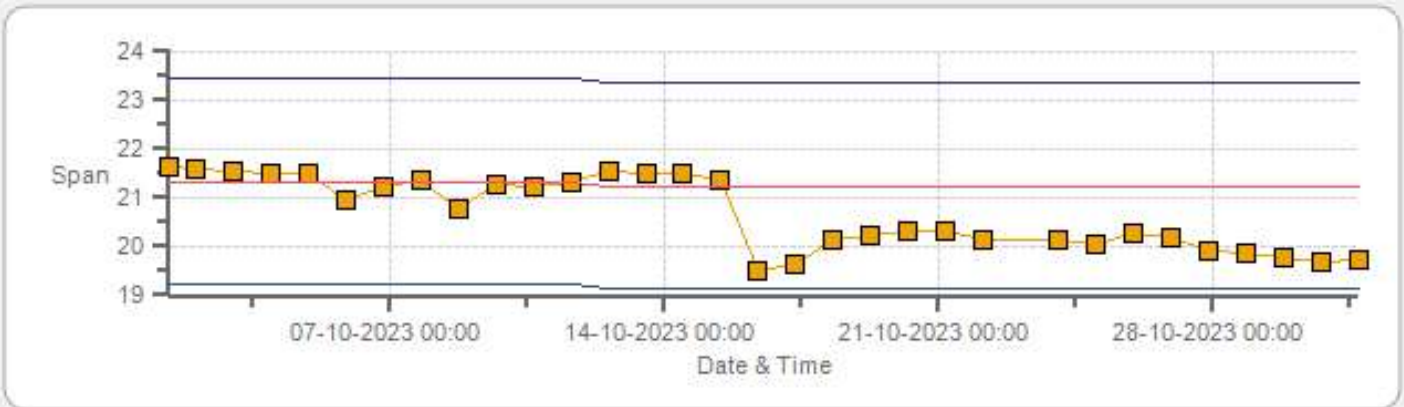
Span SpanRef Span Low Span High

THC55[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



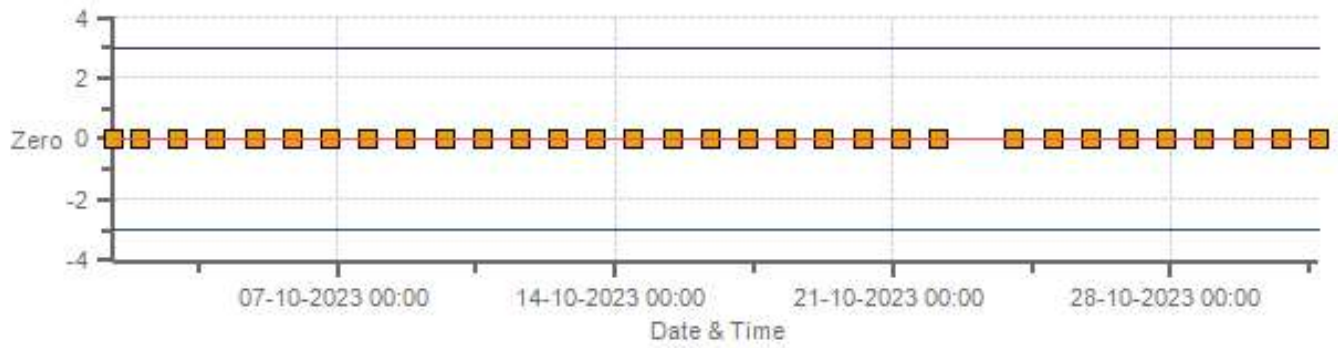
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



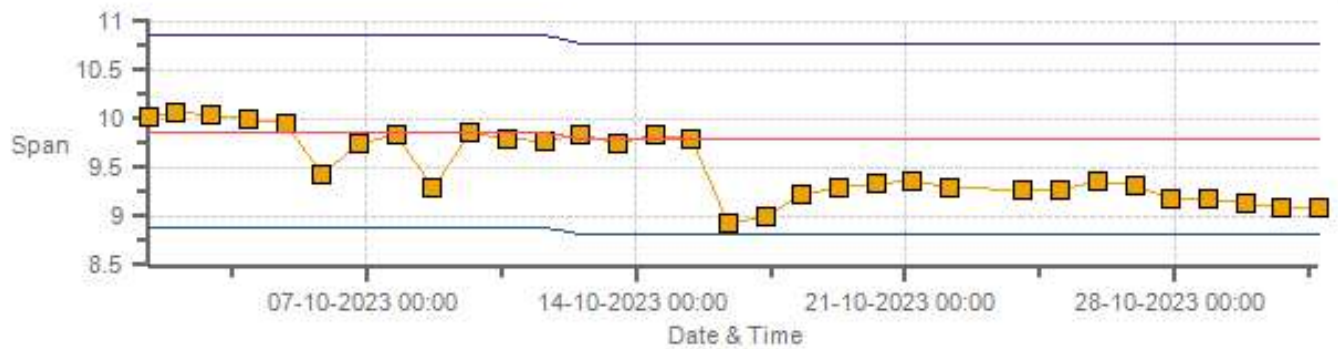
Span SpanRef Span Low Span High

CH4[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



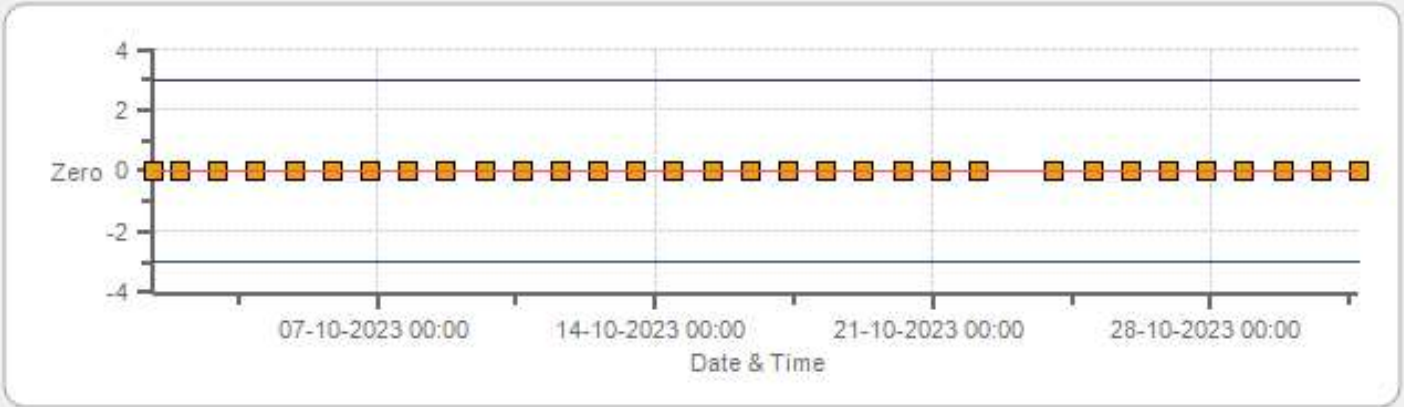
Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



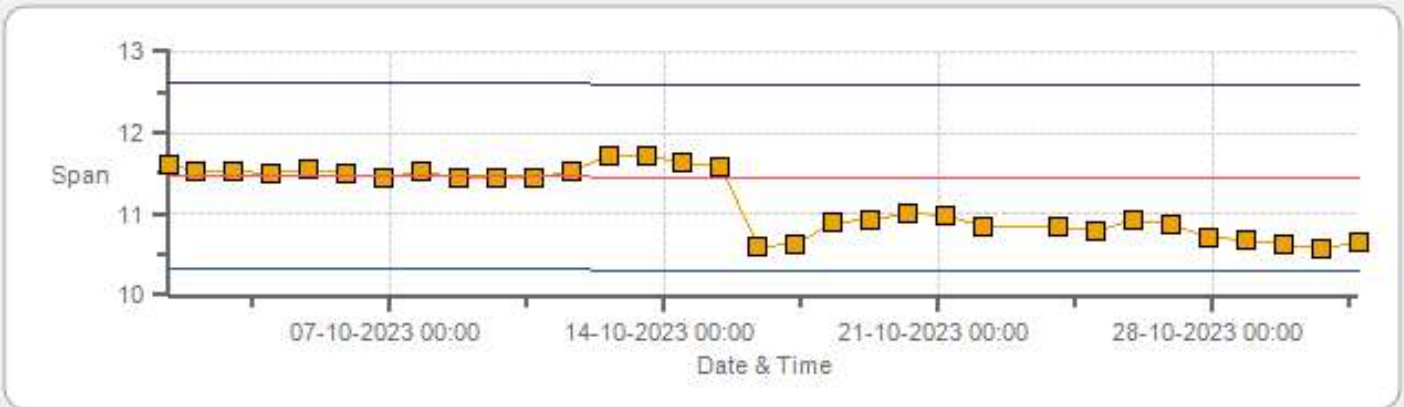
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: St. Lina Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	11-Oct-2023	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	909
PURPOSE:	Install/Post-Repair	START TIME (MST):	11:15
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:15

ANALYZER:

MAKE/MODEL	Thermo 43i	RANGE	500 ppb
SERIAL #	1226154720	FLOW (mL/min)	408
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	16.6
COEF/SLOPE	n/a	COEF/SLOPE	1.026
Expected (reference) Value	n/a	Expected (reference) Value	407

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	17100415	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 127895	HIGH ID	n/a
CONC (ppm):	50.40	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	27-Oct-2030	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

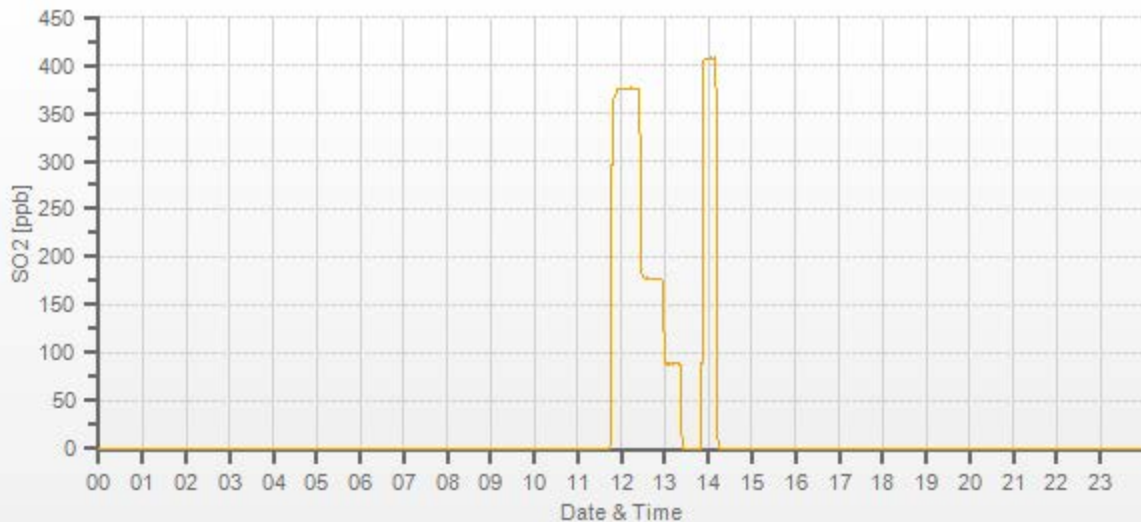
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.20	5000	0.00	n/a	0	n/a	0.998
4961	37.20	4998	375.13	n/a	375.8	n/a	0.998
4982	17.60	5000	177.41	n/a	177.4	n/a	1.000
4990	8.80	4999	88.72	n/a	88.8	n/a	0.999

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.002	0.0%

COMMENTS:

Sample inlet filter was changed.
This BV analyzer installed to replace failed Thermo 43i-LTE #1180930030



SO2 Analyzer Calibration by Dilution



DATE:	24-Oct-2023	PREVIOUS CALIBRATION DATE:	11-Oct-2023
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	0.998
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	926
PURPOSE:	Repeat	START TIME (MST):	12:17
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:08

ANALYZER:

MAKE/MODEL	Thermo 43i	RANGE	500 ppb
SERIAL #	1226154720	FLOW (mL/min)	416
INITIAL		FINAL	
BKG/OFFSET	16.6	BKG/OFFSET	16.2
COEF/SLOPE	1.026	COEF/SLOPE	1.018
Expected (reference) Value	407	Expected (reference) Value	388

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	17100415	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 127895	HIGH ID	n/a
CONC (ppm):	50.40	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	27-Oct-2030	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.20	5000	0.00	-0.3	0	0.989	1.001
4961	37.20	4998	375.13	378.9	374.9	0.989	1.001
4982	17.60	5000	177.41	n/a	177.2	n/a	1.001
4990	8.80	4999	88.72	n/a	87.9	n/a	1.009

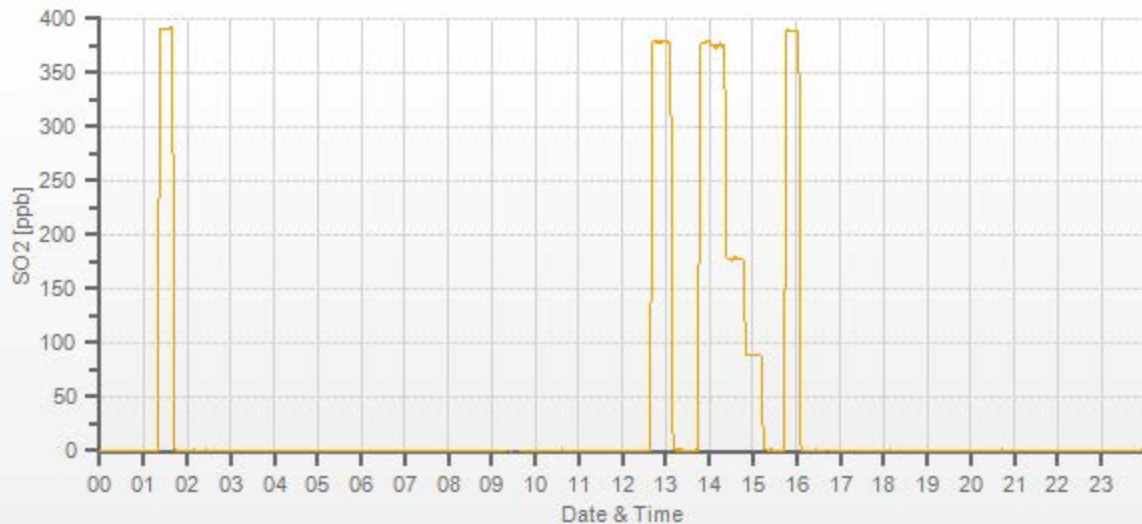
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	-0.1%

COMMENTS:

Repeat calibration was completed as a Quality Control calibration following the installation of the analyzer

SO2[ppb] Station: St. Lina Daily: 24-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01250

H2S Analyzer Calibration by Dilution



DATE:	11-Oct-2023	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	909
PURPOSE:	Install/Post-Repair	START TIME (MST):	10:13
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:15

ANALYZER:

MAKE/MODEL	Teledyne T100	RANGE	100 ppb
SERIAL #	1014	FLOW (mL/min)	505
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	9.9
COEF/SLOPE	n/a	COEF/SLOPE	1.164
Expected (reference) Value	n/a	Expected (reference) Value	83.4

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0002287	HIGH ID	n/a
CONC (ppm):	10.10	EXPIRY DATE	n/a
CYLINDER (psi):	300	LOW ID	n/a
EXPIRY DATE	14-Sep-2024	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:16	SO2 Conc (ppb)	380
END TIME:	10:31	Analyzer Response (ppb)	0.0

CALIBRATION:

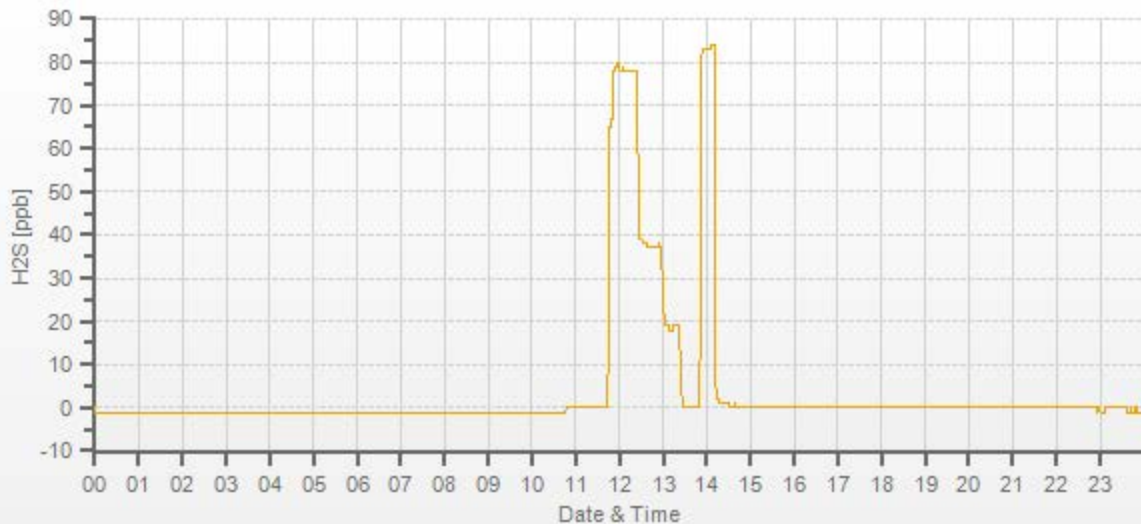
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	n/a	0	n/a	n/a
7442	57.90	7500	77.97	n/a	78.2	n/a	0.997
7472	28.20	7500	37.98	n/a	37	n/a	1.026
7486	14.10	7500	18.99	n/a	18.2	n/a	1.043

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.005	-0.6%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	14-Oct-2023	PREVIOUS CALIBRATION DATE:	11-Oct-2023
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	0.997
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	925
PURPOSE:	Repeat	START TIME (MST):	10:34
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:39

ANALYZER:

MAKE/MODEL	Teledyne T100	RANGE	100 ppb
SERIAL #	1014	FLOW (mL/min)	505
INITIAL		FINAL	
BKG/OFFSET	9.9	BKG/OFFSET	7.7
COEF/SLOPE	1.164	COEF/SLOPE	1.547
Expected (reference) Value	83.4	Expected (reference) Value	82.2

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0002287	HIGH ID	n/a
CONC (ppm):	10.10	EXPIRY DATE	n/a
CYLINDER (psi):	300	LOW ID	n/a
EXPIRY DATE	14-Sep-2024	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:36	SO2 Conc (ppb)	380
END TIME:	10:51	Analyzer Response (ppb)	0.0

CALIBRATION:

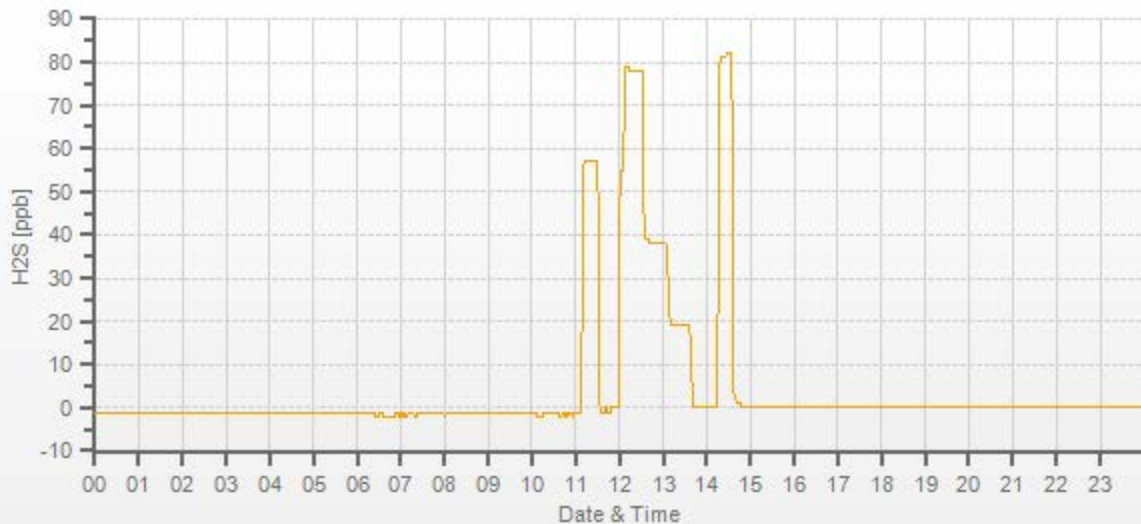
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	-1	0	1.340	0.998
7442	57.90	7500	77.97	57.2	78.1	1.340	0.998
7472	28.20	7500	37.98	n/a	38.1	n/a	0.997
7486	14.10	7500	18.99	n/a	19	n/a	0.999

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.002	0.0%

COMMENTS:

Repeat calibration was completed to correct analyzer because of UV lamp voltage drift



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	11-Oct-2023	PREVIOUS CALIBRATION DATE:	10-Sep-2023	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930029	NOx	1.000
LOCATION:	St. Lina	BAROMETRIC (mBar):	909	FLOW (mL/min)	800	NO	1.000
PURPOSE:	Routine	START TIME (MST):	10:12	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:25	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 127895	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	51.1 51.6	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a	EXPIRY DATE	27-Oct-2030	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	4.5	4.4	n/a	BKG/OFFSET:	4.8	4.5	n/a
SLOPE/COEF/CE:	1.009	0.894	1	SLOPE/COEF/CE:	1.011	0.912	0.997

EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	240.6	1.7	238.9		240.6	1.7	238.9

POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	380	250	230-265	n/a
MID	180	125	115-150	n/a
LOW	90	45	40-55	n/a
EXTRA 1	n/a	n/a	n/a	n/a

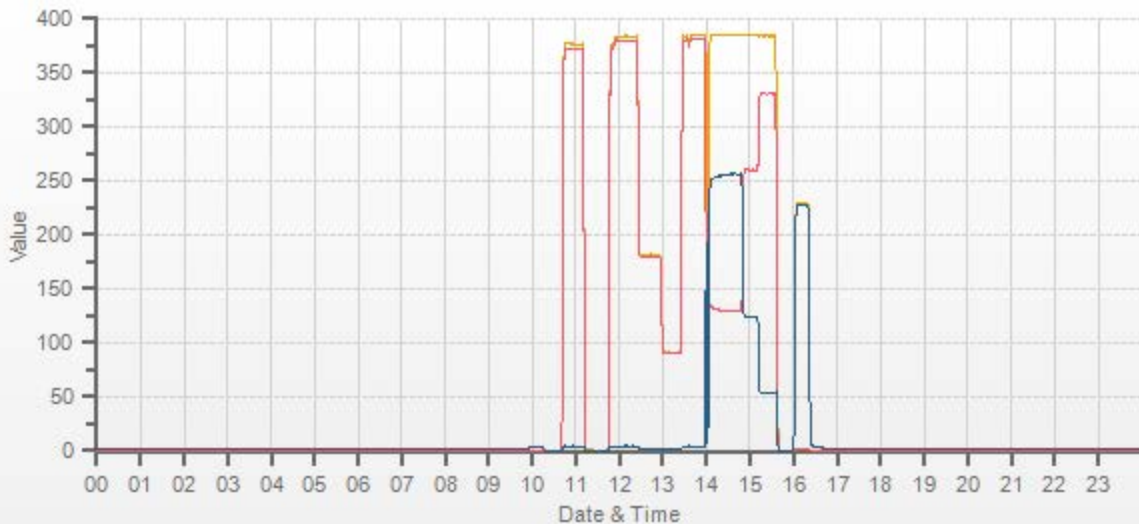
FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	37.20	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.022	1.022	0.998	1.001	1.001	0.997
4961	37.20	4998	380.3	384.1	3.7	372.2	375.9	3.7	380.0	383.6	3.6	1.022	1.022	0.998	1.001	1.001	0.997
4982	17.60	5000	179.9	181.6	1.8	n/a	n/a	n/a	179.9	182.0	2.1	n/a	n/a	0.998	1.000	0.998	0.997
4990	8.80	4999	90.0	90.8	0.9	n/a	n/a	n/a	90.2	91.1	0.9	n/a	n/a	0.998	0.997	0.997	0.997

Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	37.20	4998	0	381.3	385.1	3.9	251.6	251.2	1.002	99.84%
AS-FOUND HIGH	37.20	4998	240	129.7	384.8	255.1	251.6	251.2	1.002	99.84%
ADJUSTED HIGH	37.20	4998	240	129.3	385.3	256.0	252	252.1	1.000	100.04%
MID	37.20	4998	125	260.7	384.9	124.2	120.6	120.3	1.002	99.75%
LOW	37.20	4998	45	330.7	384.2	53.5	50.6	49.6	1.020	98.02%
NO2 COEF/CONVERTER EFFICIENCY ADJUSTED									AVERAGE:	99.27%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	0.999	0.03%	
NOx	1.000	0.999	0.05%	
NO2	1.000	1.005	-0.23%	

Sample inlet filter was changed.
14:00 = daily ZS. GPT high restarted

Station: St. Lina Daily: 11-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01250

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

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	11-Oct-2023	PREVIOUS CALIBRATION DATE:	11-Sep-2023
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	909
PURPOSE:	Routine	START TIME (MST):	13:57
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:59

ANALYZER:

MAKE/MODEL	Thermo 49iQ	RANGE	500 ppb
SERIAL #	12208316586	FLOW (mL/min)	1320
INITIAL		FINAL	
BKG/OFFSET	0.4	BKG/OFFSET	-0.5
COEF/SLOPE	1.017	COEF/SLOPE	1.011
Expected (reference) Value	254	Expected (reference) Value	251

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.0	0.3	0.0	 	
5000	 	5000	378.0	380.2	377.4	0.995	1.002
5000	 	5000	180.0	n/a	181.2	n/a	0.993
5000	 	5000	61.0	n/a	60.6	n/a	1.007

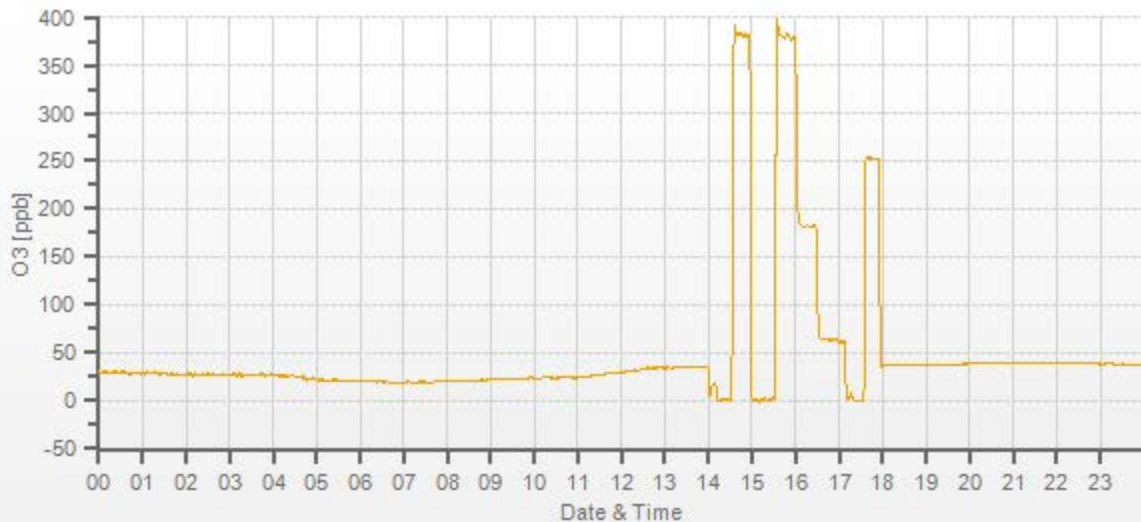
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.0%

COMMENTS:

Sampe inlet filter was changed.
14:00 = daily ZS. As Found zero restarted.

O3[ppb] Station: St. Lina Daily: 11-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01250

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	14-Oct-2023	PREVIOUS CALIBRATION DATE:	11-Oct-2023
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.002
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	925
PURPOSE:	As-Found	START TIME (MST):	13:56
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:28

ANALYZER:

MAKE/MODEL	Thermo 49iQ	RANGE	500 ppb
SERIAL #	12208316586	FLOW (mL/min)	1320
INITIAL		FINAL	
BKG/OFFSET	0.4	BKG/OFFSET	0.4
COEF/SLOPE	1.017	COEF/SLOPE	1.017
Expected (reference) Value	254	Expected (reference) Value	254

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	13-Oct-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	5000	5000	0.0	0.9	n/a	1.004	n/a
5000	5000	5000	378.0	377.4	n/a	1.004	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

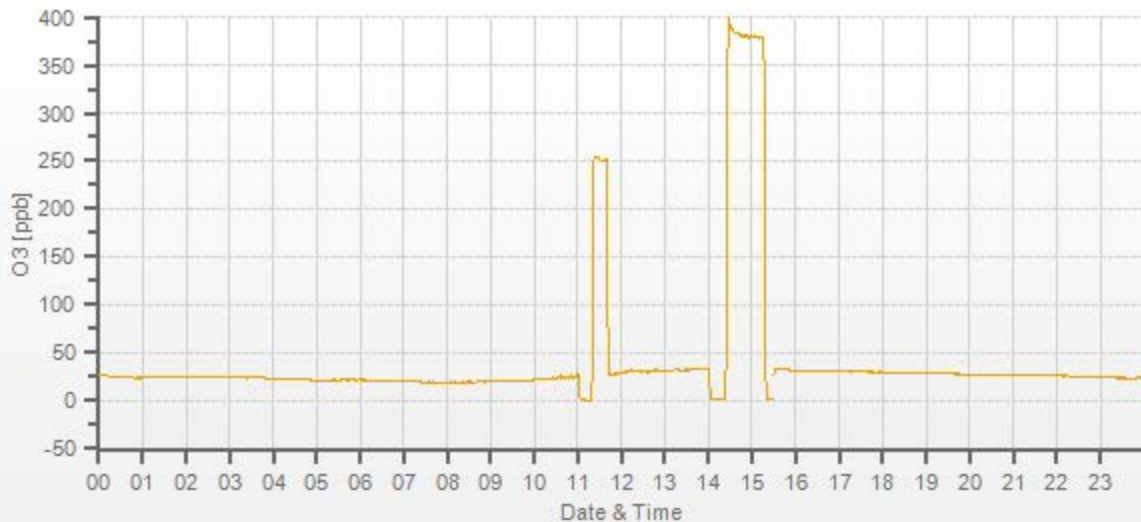
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	n/a	n/a	n/a

COMMENTS:

As Found calibration to confirm previous calibration (due to potential issue found during recent calibrator audit).

O3[ppb] Station: St. Lina Daily: 14-10-2023 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202310-01250

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	10-Oct-2023	PREVIOUS CALIBRATION DATE:	11-Sep-2023	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656107	1180
LOCATION:	St. Lina	BAROMETRIC (mBar):	905	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	12:47	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:18	PREVIOUS CF:	1.003	1.001	1.002

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 23593	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	603.0 204.0	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	1000	LOW ID:	n/a
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	115	EXPIRY DATE	18-Aug-2029	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE	
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄	561.0
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1164.0

EXPECTED (REFERENCE) VALUE:

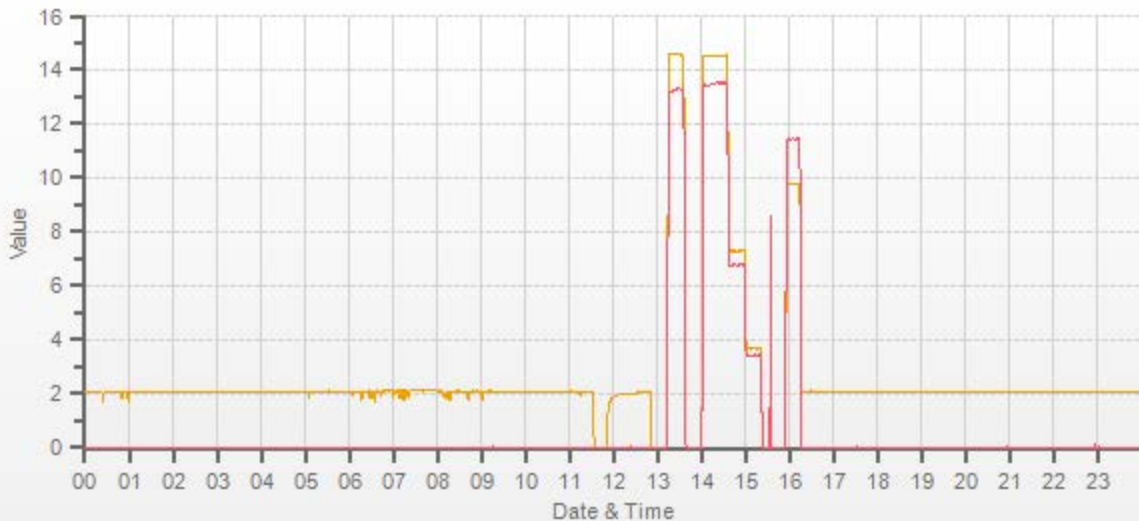
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	9.87	11.47	21.34		9.79	11.44	21.24

CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3100	X	3100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
3025	74.60	3100	14.51	13.50	28.01	14.59	13.29	27.88	14.51	13.50	28.01	0.995	1.016	1.005	1.000	1.000	1.000
3063	37.30	3100	7.26	6.75	14.01	n/a	n/a	n/a	7.29	6.78	14.07	n/a	n/a	n/a	0.995	0.996	0.995
3081	18.60	3100	3.62	3.37	6.98	n/a	n/a	n/a	3.67	3.41	7.08	n/a	n/a	n/a	0.986	0.987	0.986

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:	
CH ₄	1.000	0.999	0.1%	Sample inlet filter was changed. H ₂ generator maintenance prior to calibration.	
NMHC	1.000	0.999	0.1%		
THC	1.000	0.999	0.1%		
				Use Zero Chrom?	Yes



CAL-LICA-202310-01250

Thermo 5030i SHARP Monitor Monthly Check

Date: <u>October 14, 2023</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Chris Wesson</u>
Company: <u>LICA</u>	Start Time (mst): <u>14:35</u>
Station Name/Location: <u>St. Lina</u>	End Time (mst): <u>15:28</u>
Previous Audit Date: <u>September 26, 2023</u>	Calibration Purpose: <u>routine monthly</u>
Parameter: <u>PM 2.5</u>	Weather Conditions: <u>A few clouds</u>

SHARP 5030i Information and Status:			
Serial Number:	<u>CM 17091001</u>	Filter Tape Counter	<u>353</u>

Reference Standards:				
Air Flow				
	Manometer	Orifice	Pressure:	Temp / RH:
Make:	<u>Delta Cal</u>	<u>Delta Cal</u>	<u>Fisher</u>	<u>Vaisala HMP76B</u>
Model:	<u>DC1</u>	<u>DC1</u>	<u>FB61291</u>	<u>HMP 76B</u>
Serial Number:	<u>201587</u>	<u>201587</u>	<u>130168457</u>	<u>T1640130</u>
Calibration Expiration Date:	<u>December 12, 2023</u>	<u>December 12, 2023</u>	<u>March 20, 2024</u>	<u>June 26, 2024</u>

Ambient Temperature (°C)				Range	Action
	Reference	SHARP	Difference	<u>< ± 2°C</u>	<u>OK</u>
#1	<u>12.60</u>	<u>12.2</u>	<u>0.4</u>	<u>2-3 °C</u>	<u>Recalibrate</u>
				<u>> 3°C</u>	<u>Fail</u>

Ambient Relative Humidity (%RH)				Range	Action
As Found:				<u>< ± 2 %RH</u>	<u>OK</u>
	Reference	SHARP	Difference	<u>2-5 %RH</u>	<u>Recalibrate</u>
#1	<u>47.20</u>	<u>48.4</u>	<u>-1.2</u>	<u>> 5 %RH</u>	<u>Fail</u>

Barometric Pressure (mmHg)				Range	Action
As Found:				<u>< ± 10 mmHg</u>	<u>OK</u>
	Reference	SHARP	Difference	<u>10-12 mmHg</u>	<u>Recalibrate</u>
#1	<u>703.0</u>	<u>703.0</u>	<u>0.0</u>	<u>> 12 mmHg</u>	<u>Fail</u>

Flow Audit (L/min)						
As Found:						
	Reference	SHARP			Range	Action
#1	<u>16.69</u>	<u>16.67</u>	% Difference	<u>-0.14%</u>	<u>< ± 4%</u>	<u>OK</u>
#2	<u>16.69</u>	<u>16.66</u>			<u>4-5%</u>	<u>Recalibrate</u>
#3	<u>16.69</u>	<u>16.67</u>			<u>>5%</u>	<u>Fail</u>
Average	<u>16.69</u>	<u>16.67</u>				

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	<u>16.69</u>	<u>16.67</u>	<u>0.02</u>	<u>16.51</u>	<u>16.63</u>	<u>-0.12</u>
				LEAK RATE:		<u>-0.14</u>
						<i>Leak Limit: 0.80 L/min</i>

Meteorological System Checklist



Date:	October 14, 2023
Technician:	Alex Yakupov / Audit time: 11:21 - 12:16
Reviewer:	Chris Wesson
Station:	St. Lina

Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Rotronic	HC2-S3	20404750
Barometric Pressure Sensor:	Met One	O90D	F4498
Relative Humidity Sensor:	Rotronic	HC2-S3	20404750
Anemometer:	RM Young	05305VK	161466

PRECIPITATION SENSOR CHECK

Checklist:	Reply:	Comments:
Is the sensor Level?	yes	
Is the heater operating properly?	yes	
Are the bucket drain holes clean?	yes	
Is the screen on the housing? (screen should be on between July and September)	no	11:27 - test with water (reading 1.1 mm for 11 tips)
Is the housing clean?	yes	No issues. Response is timely and accurate.
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 mm)

# of Tips	Data Logger Response (mm):	Manual Specification = +/- 0.2 mm
10	1.00	TRUE

AMBIENT TEMPERATURE SENSOR CHECK

Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Vaisala / HM70 / #T1640130, Exp. Date: Jun 26, 2024		
Reference Temperature (°C):	10.3		
Station - Ambient Temperature (°C):	9.1		
Temperature Difference (°C):	1.2		

BAROMETRIC PRESSURE SENSOR CHECK

Reference Barometer ID:	Fisher / FB 61291/ #130168457/ Mar 20, 2024		
Reference Pressure - Units/Reading:	millibar	937	
Station Pressure - Units/Reading:	millibar	925	
Pressure Tolerance +/- 15% of error:	796 - 1078	1.28%	

RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK

Reference Hygrometer ID:	Vaisala / HM70 / #T1640130, Exp. Date: Jun 26, 2024		
Reference Hygrometer % RH- Reading:	55.80		
Station Hygrometer % RH- Reading:	57.60		
RH Tolerance +/- 15% of difference:	47.43 - 64.17	-3.2%	

ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK

WIND SPEED		WIND DIRECTION	
Previous check date:	September 11, 2023	Previous check date:	September 11, 2023
Wind Speed Observed (kph):	10-20	Wind Direction Observed:	S
Wind speed on Data Logger (kph):	15.2	Wind Direction on Data Logger:	S
	Annual audit: Jul 22, 2022	Wind Direction Pass/Fail?:	Pass

Comments

Station (Trailer) temperature vs Reference gauge temperature: 21.2 vs 21.4. Difference: 0.2 degrees. Passed



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA
 Audit Location: St. Lina
 Audit Date: July 22, 2022
 Calibration Purpose: routine annual

Performed By: Alex Yakupov
 Reviewed By: Chris Wesson
 Start/End Time (mst): 15:07 / 16:23
 Weather Conditions: A few clouds

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200
Serial #:	161466	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	March 16, 2021	Direction Unit Output Range:	0-360

Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744, expires - Aug 6, 2022

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	0.996
2000	36.9	36.9	37.0	0.998
3000	55.3	55.4	55.5	0.997
4000	73.7	74.1	74.1	0.995
5000	92.2	92.5	92.4	0.997
6000	110.6	111.0	111.0	0.996
7000	129.0	129.4	129.4	0.997
8000	147.4	148.1	148.1	0.996
9000	165.9	166.6	166.6	0.996
10000	184.3	185.1	185.1	0.996
The audit meets AMD requirements.			Average Correction Factor=	0.996

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	0.4	0.0	0.2
30	330	31	331	-0.6	-0.8	0.7
60	300	62	301	-2.1	-0.6	1.4
90	270	93	270	-2.7	-0.1	1.4
120	240	123	241	-2.9	-1.2	2.1
150	210	152	212	-2.1	-2.1	2.1
180	180	182	183	-2.0	-2.9	2.5
210	150	211	153	-1.2	-2.8	2.0
240	120	241	123	-0.8	-3.1	2.0
270	90	270	93	-0.3	-3.0	1.7
300	60	301	62	-0.8	-2.3	1.6
330	30	331	30	-0.5	-0.4	0.4
355	0	355	1	0.0	0.5	0.3
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.4

Comments:

n/a

End of Report



Lakeland Industry & Community Association

OCTOBER 2023

Ambient Air Monitoring Calibration Report

- LAC LA BICHE STATION-

CAL-LICA-202310-01690

Station Operation and Maintenance:

Bureau Veritas Canada

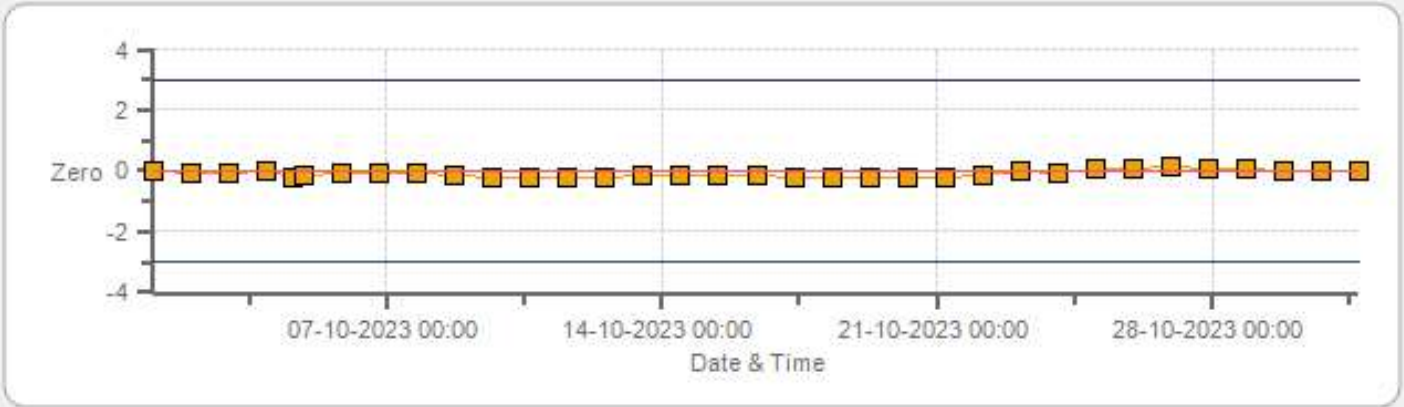
Data Validation and Report:

LICA / Bureau Veritas Canada

November 20, 2023

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



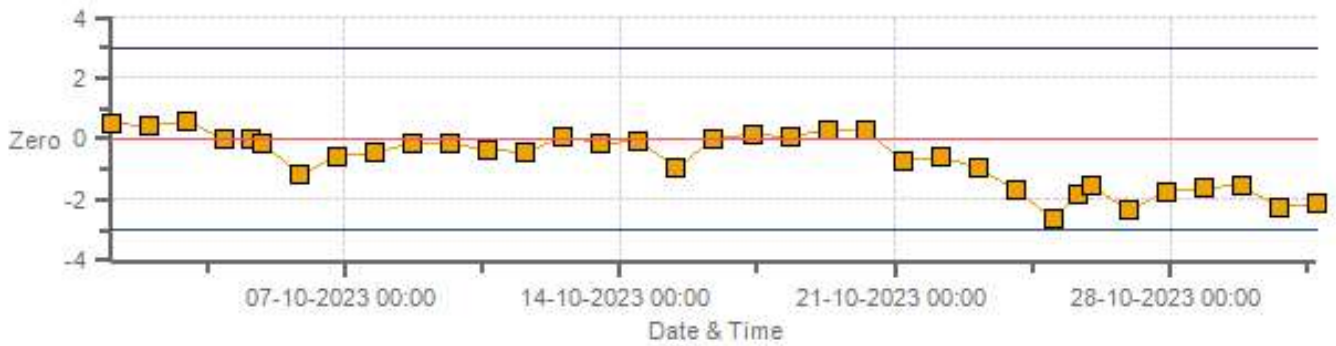
Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

H2S[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



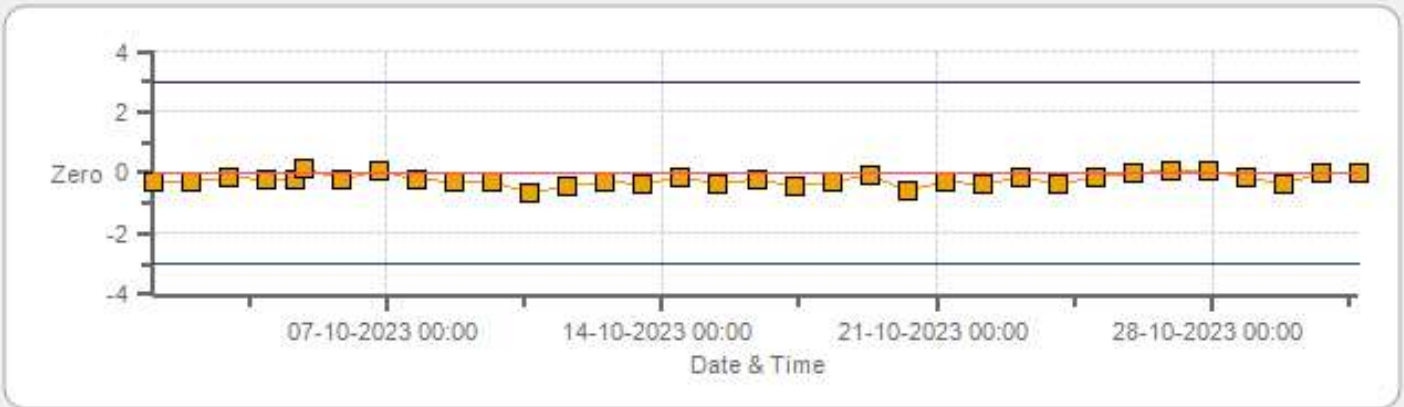
Zero Zero Ref Zero Low Zero High

H2S[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NOX[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



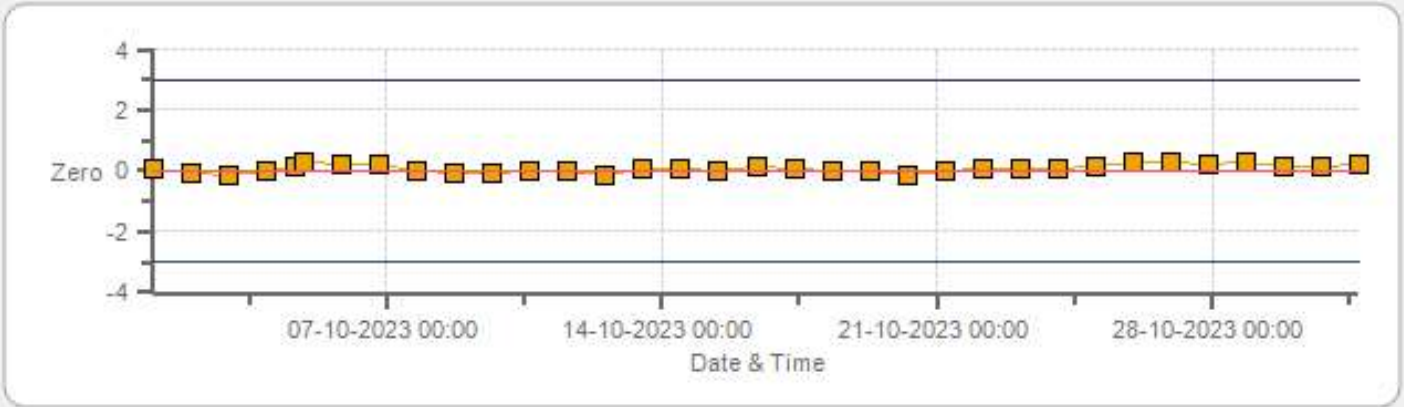
Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NO2[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



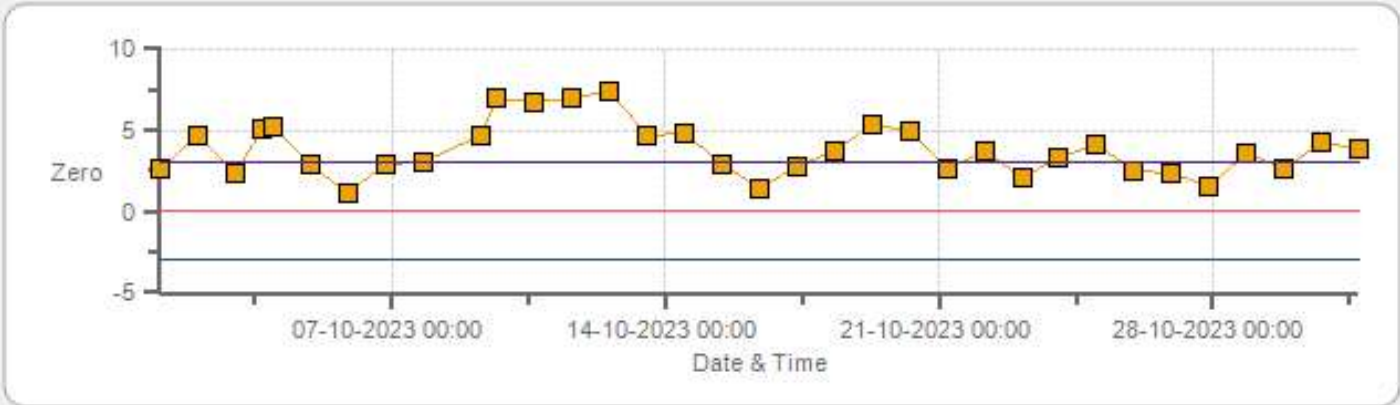
Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



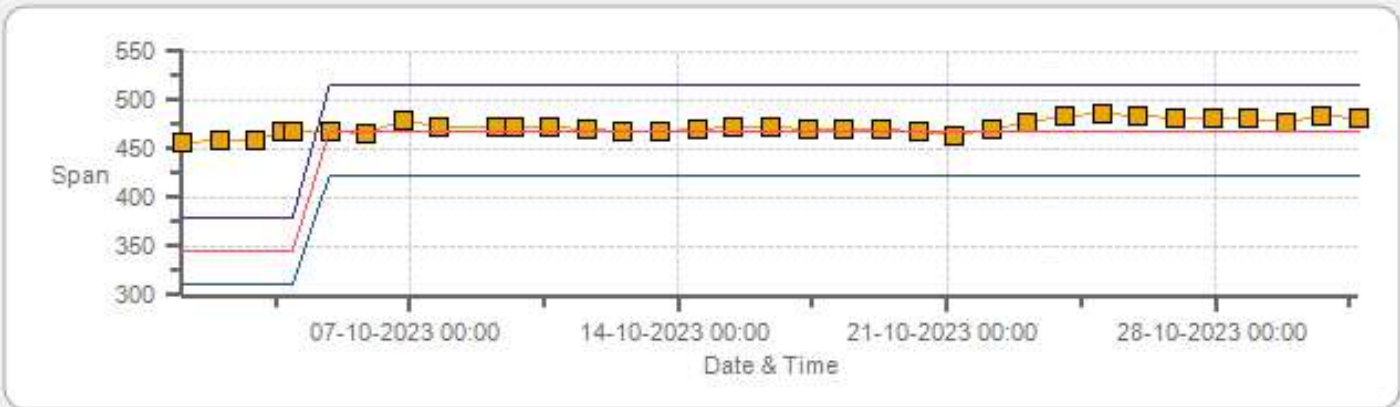
Span SpanRef Span Low Span High

O3[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



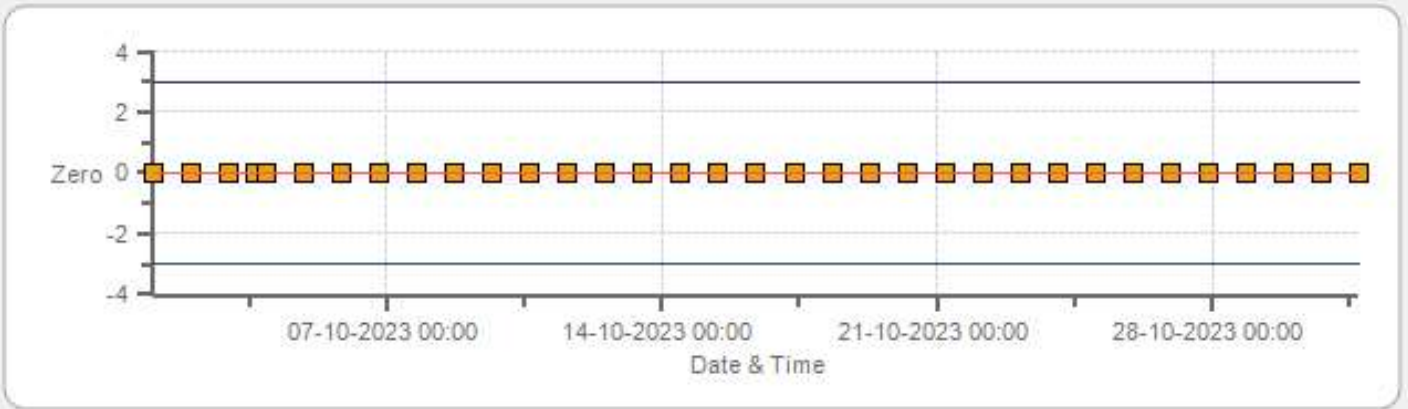
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



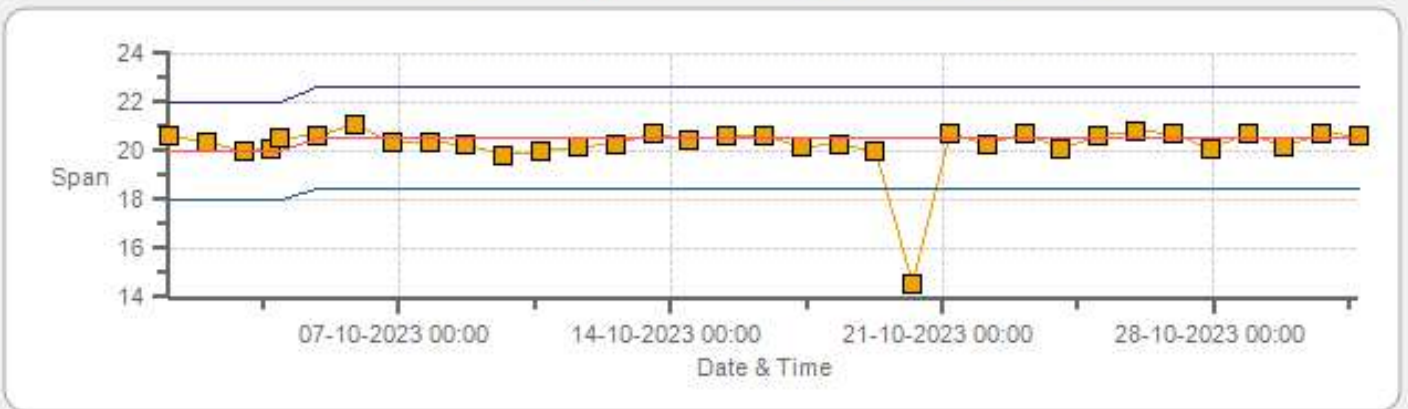
Span SpanRef Span Low Span High

THC55[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



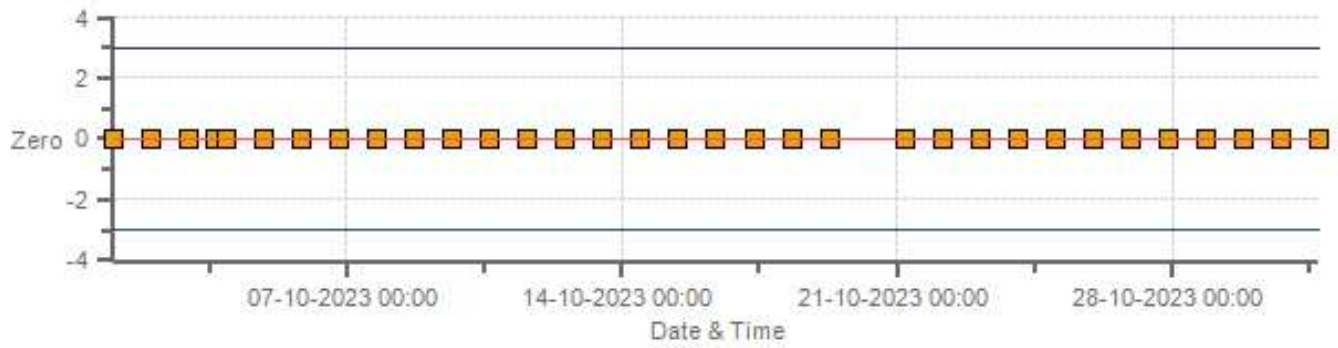
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

CH4[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



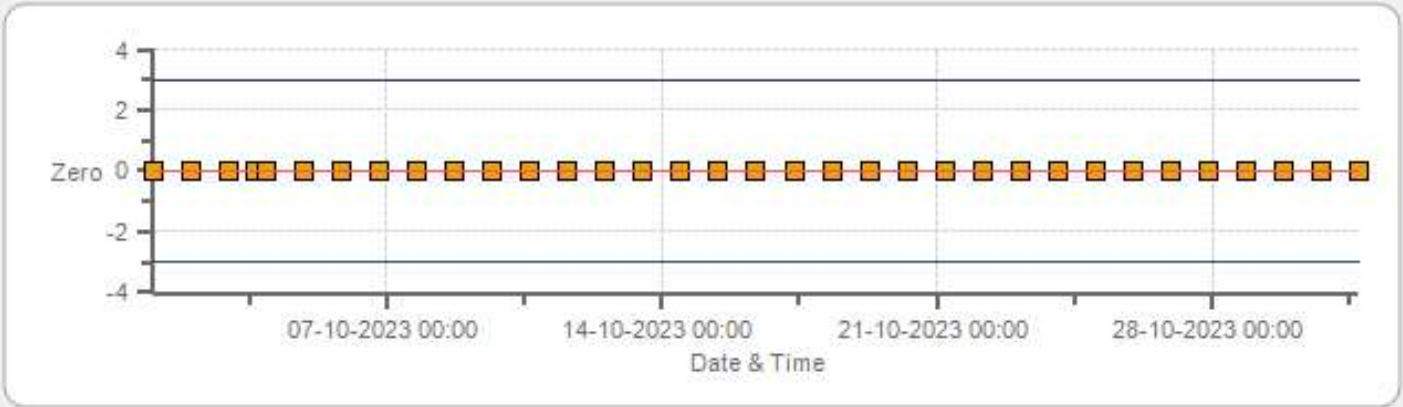
Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



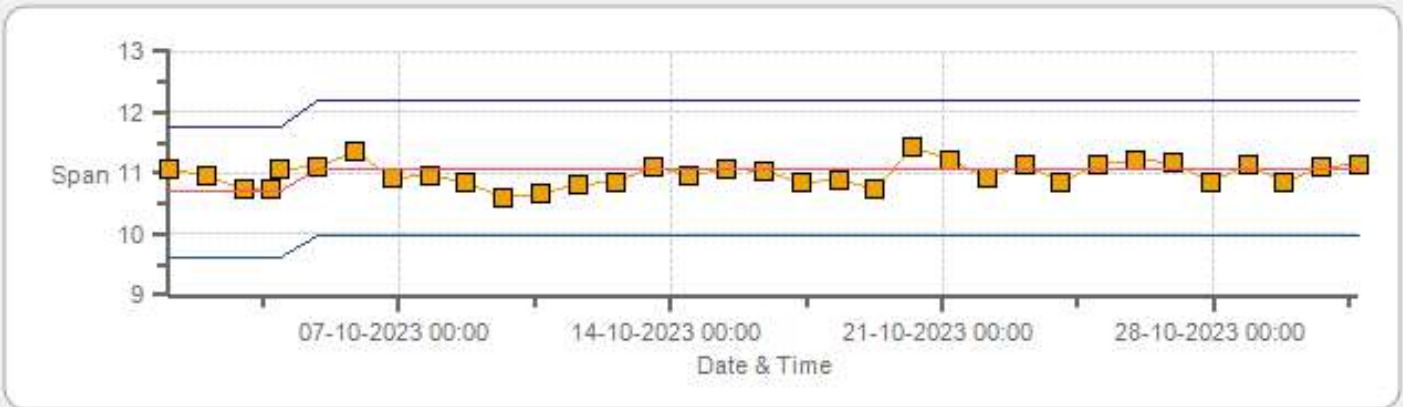
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: Lac La Biche Monthly: 10-2023 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	04-Oct-2023	PREVIOUS CALIBRATION DATE:	14-Sep-2023
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Lac La Biche	BAROMETRIC (mBar):	938
PURPOSE:	Routine	START TIME (MST):	10:27
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:44

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180320043	FLOW (mL/min)	453
INITIAL		FINAL	
BKG/OFFSET	6.76	BKG/OFFSET	6.94
COEF/SLOPE	1.396	COEF/SLOPE	1.403
Expected (reference) Value	445.4	Expected (reference) Value	448

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	17100415	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 127895	HIGH ID	n/a
CONC (ppm):	50.40	EXPIRY DATE	n/a
CYLINDER (psi):	800	LOW ID	n/a
EXPIRY DATE	27-Oct-2030	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	390	190	95
RANGE	300 - 400	150 - 200	50 - 100

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

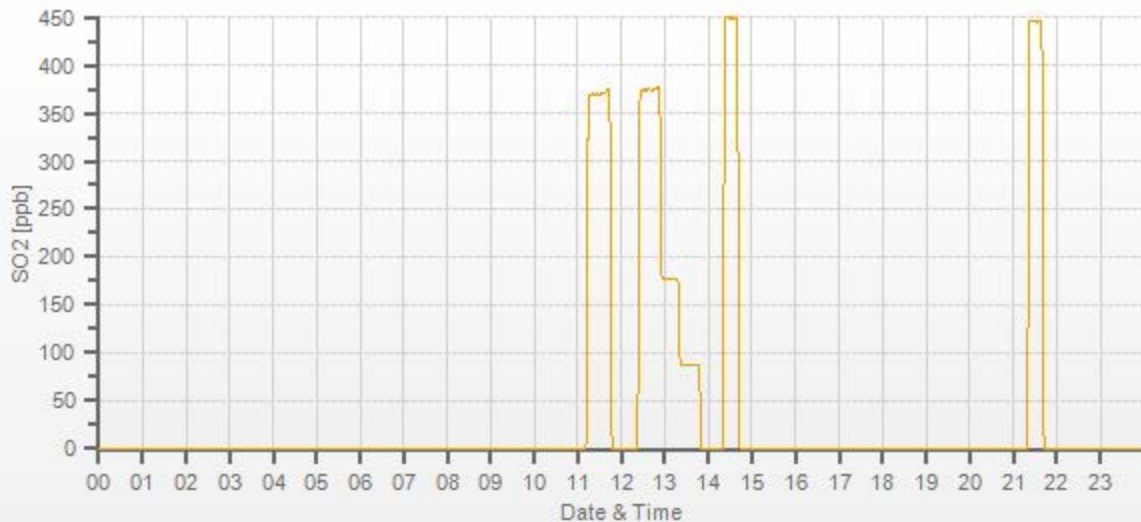
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	37.20	5000	0.00	-0.05	0	1.012	0.998
4961	37.20	4998	375.13	370.79	375.77	1.012	0.998
4982	17.60	5000	177.41	n/a	176.55	n/a	1.005
4990	8.80	4999	88.72	n/a	87.83	n/a	1.010

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.002	-0.1%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	04-Oct-2023	PREVIOUS CALIBRATION DATE:	14-Sep-2023
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	0.997
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Lac La Biche	BAROMETRIC (mBar):	938
PURPOSE:	Routine	START TIME (MST):	10:28
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:44

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM17360002	FLOW (mL/min)	924
INITIAL		FINAL	
BKG/OFFSET	84.6	BKG/OFFSET	85.7
COEF/SLOPE	1.013	COEF/SLOPE	1.028
Expected (reference) Value	53.5	Expected (reference) Value	53.2

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0002287	HIGH ID	n/a
CONC (ppm):	10.10	EXPIRY DATE	n/a
CYLINDER (psi):	300	LOW ID	n/a
EXPIRY DATE	14-Sep-2024	EXPIRY DATE	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
TARGET	78	38	19
RANGE	60 - 80	30 - 40	10 - 20

SCRUBBER CHECK (15 MINS; TRS/H2S ONLY):

START TIME:	10:31	SO2 Conc (ppb)	380
END TIME:	10:46	Analyzer Response (ppb)	0.0

CALIBRATION:

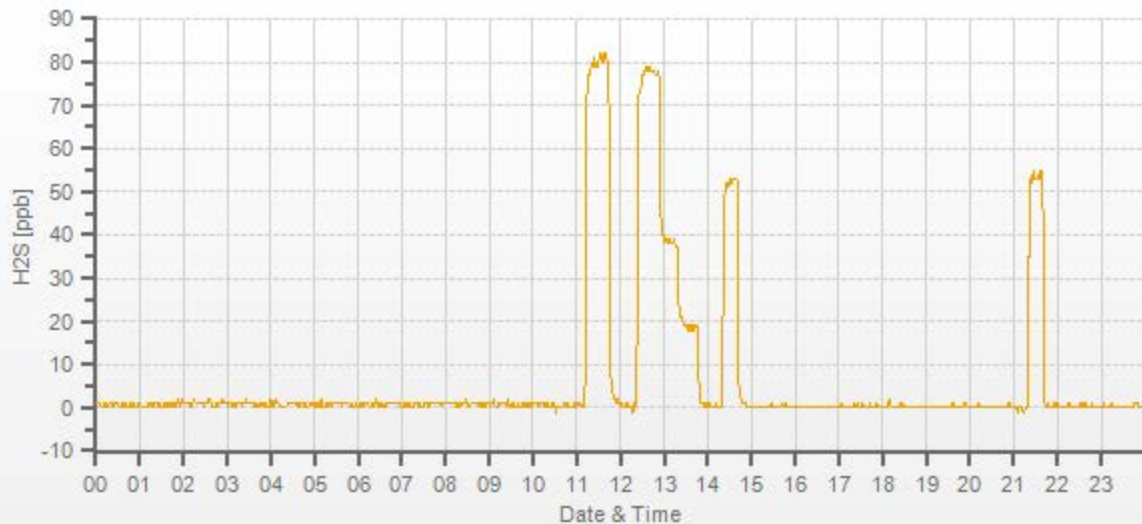
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	0.7	0	0.997	1.004
7442	57.90	7500	77.97	80.9	77.7	0.972	1.004
7472	28.20	7500	37.98	n/a	38.5	n/a	0.986
7486	14.10	7500	18.99	n/a	18.5	n/a	1.026

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.0%

COMMENTS:

Sample inlet filter was changed.



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	04-Oct-2023	PREVIOUS CALIBRATION DATE:	14-Sep-2023	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930027	NOx	0.999
LOCATION:	Lac La Biche	BAROMETRIC (mBar):	938	FLOW (mL/min)	755	NO	1.001
PURPOSE:	Routine	START TIME (MST):	10:26	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:29	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 127895	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	51.1 51.6	HIGH EXPIRY:	n/a
ID:	17100415	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a	EXPIRY DATE	27-Oct-2030	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	8.9	8.6	n/a	BKG/OFFSET:	9	8.7	n/a
SLOPE/COEF/CE:	1.007	0.844	0.998	SLOPE/COEF/CE:	1.008	0.839	0.998

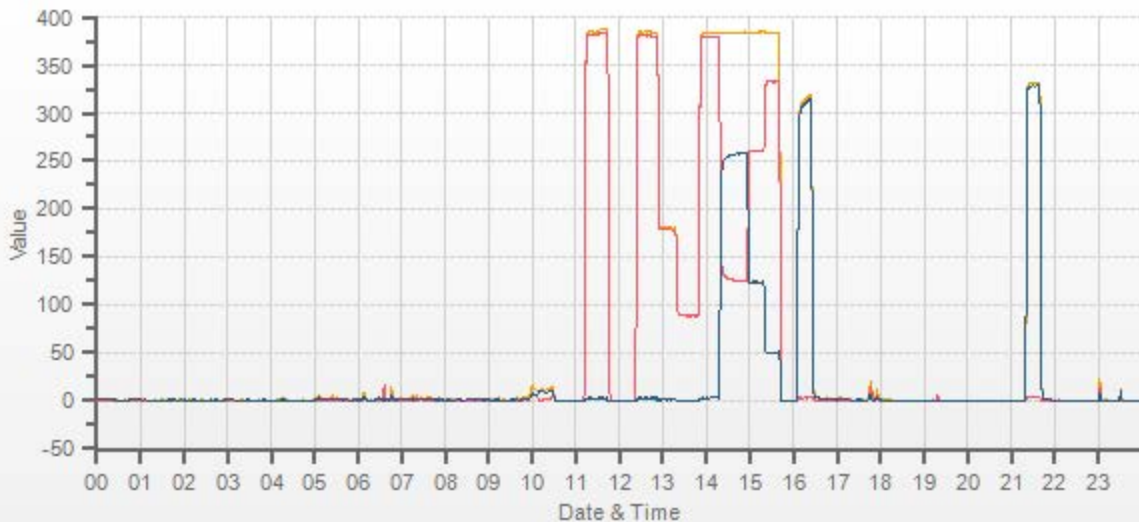
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	326.0	3.8	322.0		326.0	3.8	322.0

POINT	NO TARGET (PPB)	NO2 TARGET (PPB)	NO2 RANGE	O3 POINT
HIGH	380	250	230-265	n/a
MID	180	125	115-150	n/a
LOW	90	45	40-55	n/a
EXTRA 1	n/a	n/a	n/a	n/a

FLOW RATE			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2	NO	NOx	NO2
5000	37.20	5000	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.0	0.991	0.992	1.001	1.002	1.005	1.005
4961	37.20	4998	380.3	384.1	3.7	383.9	387.2	3.3	379.9	383.4	3.6	0.991	0.992	1.001	1.002	1.005	1.005
4982	17.60	5000	179.9	181.6	1.8	n/a	n/a	n/a	179.0	180.7	1.7	n/a	n/a	1.005	1.005	1.016	1.016
4990	8.80	4999	90.0	90.8	0.9	n/a	n/a	n/a	88.5	89.5	1.0	n/a	n/a	1.016	1.015	1.015	1.015

Point	CALIBRATOR			INDICATED (ppb)			NO DROP / O3 Conc (ppb)	NO2 GAIN (ppb)	NO2 Corr. FACTOR	CONV. EFFICIENCY
	GAS	TOTAL	O3 SETPOINT	NO	NOx	NO2				
REFERENCE	37.20	4998	0	379.9	383.5	3.6	254.2	254.6	0.998	100.16%
AS-FOUND HIGH	37.20	4998	235	125.7	383.9	258.2	254.2	254.6	0.998	100.16%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	37.20	4998	110	260.7	384.0	123.3	119.2	119.7	0.996	100.42%
LOW	37.20	4998	40	332.7	383.5	50.8	47.2	47.2	1.000	100.00%
NO2 adjustment not required.									AVERAGE:	100.19%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	-0.14%	
NOx	1.000	0.999	-0.12%	
NO2	1.000	1.002	0.02%	



CAL-LICA-202310-01690

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	03-Oct-2023	PREVIOUS CALIBRATION DATE:	15-Sep-2023
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	0.998
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Lac La Biche	BAROMETRIC (mBar):	940
PURPOSE:	Routine	START TIME (MST):	11:45
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:30

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240372	FLOW (mL/min)	1426
INITIAL		FINAL	
BKG/OFFSET	0	BKG/OFFSET	0
COEF/SLOPE	1.027	COEF/SLOPE	1.039
Expected (reference) Value	346	Expected (reference) Value	469

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a
CALIBRATION METHOD:		Photometer (Varying UV Lamp)	
GPT DATE:	n/a	GPT END TIME:	n/a

CALIBRATION PARAMETERS:

POINT	HIGH	MID	LOW
RANGE	300 - 400	150 - 200	50 - 100

CALIBRATION:

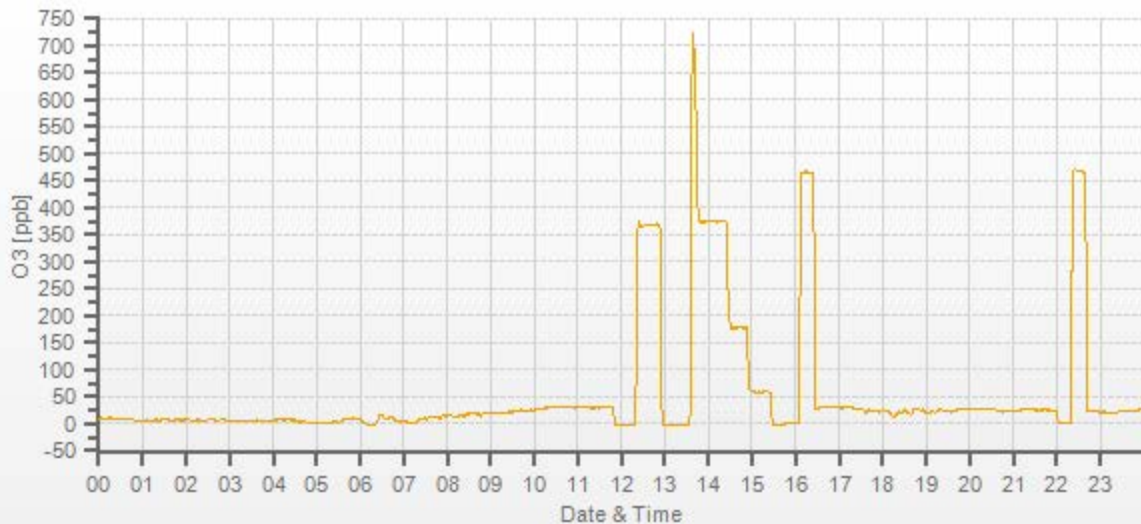
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	5000	5000	0.0	0.2	0.0	1.022	1.001
5000	5000	5000	378.0	369.9	377.6	1.022	1.001
5000	5000	5000	180.0	n/a	181.3	n/a	0.993
5000	5000	5000	61.0	n/a	61.6	n/a	0.990

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.999	0.1%

COMMENTS:

Sample inlet filter was changed.
13:38 = operator error. Adjusted high starts at 13:48



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	03-Oct-2023	PREVIOUS CALIBRATION DATE:	15-Sep-2023	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180320044	1018
LOCATION:	Lac La Biche	BAROMETRIC (mBar):	940	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	11:47	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:29	PREVIOUS CF:	0.999	0.997	0.998

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 23593	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	603.0 204.0	HIGH EXPIRY:	n/a
ID:	17100415	ID:	134	CYLINDER (psi):	900	LOW ID:	n/a
MFC CALIBRATION DATE:	12-Apr-2023	OXIDIZER ID:	n/a	EXPIRY DATE	18-Aug-2029	LOW EXPIRY:	n/a

CALIBRATION PARAMETERS:

POINT (CH ₄ /NMHC)	HIGH	MID	LOW	CH ₄ EQUIVILANCE		
TARGET	14	7	3.5	C ₃ H ₈ as CH ₄		561.0
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄		1164.0

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	9.34	10.70	20.04		9.45	11.09	20.55

CALIBRATION:

FLOW RATE			CONCENTRATION (PPM)									CORRECTION FACTOR (CF.)					
(mL/min)			CALCULATED			INITIAL INDICATED			FINAL INDICATED			INITIAL			FINAL		
DILUENT	GAS	TOTAL	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC	CH ₄	NMHC	THC
3100	X	3100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X
3025	74.60	3100	14.51	13.50	28.01	14.38	13.40	27.79	14.50	13.58	28.08	1.009	1.007	1.008	1.001	0.994	0.998
3063	37.30	3100	7.26	6.75	14.01	n/a	n/a	n/a	7.22	6.78	14.00	n/a	n/a	n/a	1.005	0.996	1.000
3081	18.60	3100	3.62	3.37	6.98	n/a	n/a	n/a	3.60	3.39	6.99	n/a	n/a	n/a	1.005	0.993	0.999

LINEAR REGRESSION ANALYSIS:

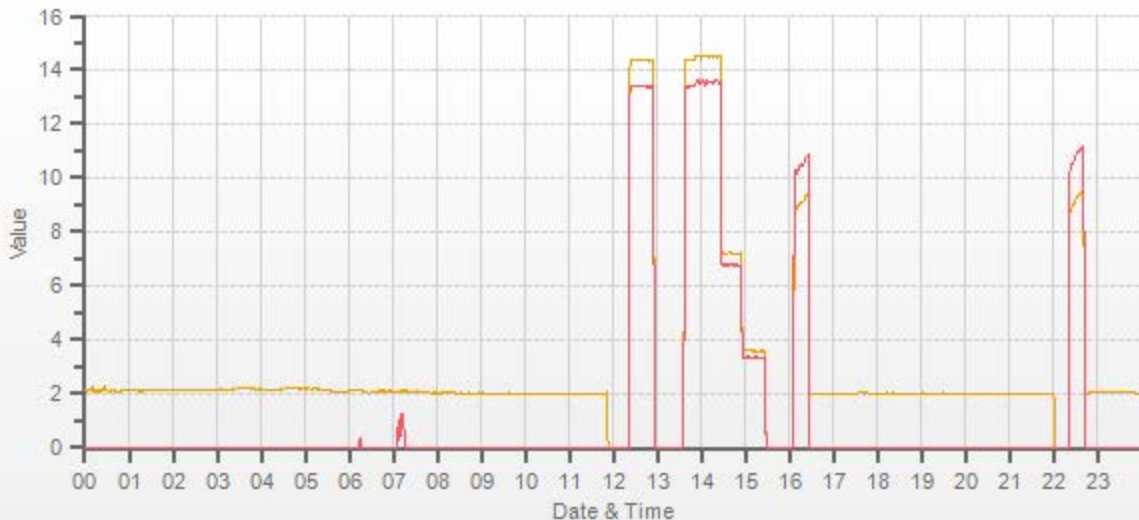
	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	0.999	-0.1%
NMHC	1.000	1.006	0.0%
THC	1.000	1.002	0.0%

Comments:

Sample inlet filter was changed.

Use Zero Chrom?

Yes



CAL-LICA-202310-01690

Thermo 5030i SHARP Monitor Monthly Check

Date: October 4, 2023	Performed By/Reviewer: Alex Yakupov Chris Wesson
Company: LICA	Start Time (mst): 15:46
Station Name/Location: Lac La Biche	End Time (mst): 16:39
Previous Audit Date: September 26, 2023	Calibration Purpose: routine monthly
Parameter: PM 2.5	Weather Conditions: A few clouds

SHARP 5030i Information and Status:

Serial Number: CM 17071016	Filter Tape Counter 491
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Reference Standards:

Air Flow				
	Manometer	Orifice	Pressure:	Temp / RH:
Make:	Delta Cal	Delta Cal	Fisher Scientific	Vaisala HMP76B
Model:	DC1	DC1	FB 61291	HMP 76B
Serial Number:	201587	201587	130168457	T1640130
Calibration Expiration Date:	December 12, 2023	December 12, 2023	March 20, 2024	June 26, 2024

Ambient Temperature (°C)				Range	Action
	Reference	SHARP	Difference	$< \pm 2^{\circ}\text{C}$	OK
#1	9.50	9.7	-0.2	$2\text{-}3^{\circ}\text{C}$	Recalibrate
				$> 3^{\circ}\text{C}$	Fail

Ambient Relative Humidity (%RH)				Range	Action
As Found:				$< \pm 2\% \text{RH}$	OK
	Reference	SHARP	Difference	$2\text{-}5\% \text{RH}$	Recalibrate
#1	66.90	67.5	-0.6	$> 5\% \text{RH}$	Fail

Barometric Pressure (mmHg)				Range	Action
As Found:				$< \pm 10\text{ mmHg}$	OK
	Reference	SHARP	Difference	$10\text{-}12\text{ mmHg}$	Recalibrate
#1	708.0	708.0	0.0	$> 12\text{ mmHg}$	Fail

Flow Audit (L/min)						Range	Action
As Found:						$< \pm 4\%$	OK
	Reference	SHARP		% Difference	-0.12%	$4\text{-}5\%$	Recalibrate
#1	16.69	16.67				$> 5\%$	Fail
#2	16.69	16.67					
#3	16.69	16.67					
Average	16.69	16.67					

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.69	16.67	0.02	16.57	16.64	-0.07
				LEAK RATE:		-0.09

Leak Limit: 0.80 L/min

Meteorological System Checklist



Date:		October 4, 2023	
Technician:		Alex Yakupov	
Station:		Lac La Biche	
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Rotronic	HC2A-S3	20357518
Barometric Pressure Sensor:	MetOne	92	Y23360
Relative Humidity Sensor:	Rotronic	HC2A-S3	20357518
Anemometer:	RM Young	05305VK	56778
AMBIENT TEMPERATURE SENSOR CHECK			
Parameter:	Temperature @ 2 metres		
Reference Thermometer ID:	Vaisala / HM70 / #T1640130/ Jun 26, 2024		
Reference Temperature (°C):	10.4		
Station - Ambient Temperature (°C):	9.4		
Temperature Difference (°C):	1.0		
BAROMETRIC PRESSURE SENSOR CHECK			
Reference Barometer ID:	Fisher Scientific / FB 61291 / #130168457/ Mar 20, 2024		
Reference Pressure - Units/Reading:	millibar	939	
Station Pressure - Units/Reading:	millibar	942	
Pressure Tolerance +/- 15% of error:	798 - 1080	-0.32%	
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Reference Hygrometer ID:	Vaisala / HM70 / #T1640130/ Jun 26, 2024		
Reference Hygrometer % RH- Reading:	73.80		
Station Hygrometer % RH- Reading:	76.40		
RH Tolerance +/- 15% of difference:	62.73 - 84.87	-3.5%	
ANEMOMETER - WIND SPEED & WIND DIRECTION SENSOR CHECK			
WIND SPEED		WIND DIRECTION	
Previous check date:	September 15, 2023	Previous check date:	September 15, 2023
Wind Speed Observed (kph):	10-20	Wind Direction Observed:	NW
Wind speed on Data Logger (kph):	18.7	Wind Direction on Data Logger:	NW
	Annual audit: Sep 15, 2023	Wind Direction Pass/Fail?:	Pass

Comments

Station (Trailer) temperature vs Reference gauge: 24.1 vs 24.3 - passed.



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA Performed By: Alex Yakupov
 Audit Location: Lac La Biche Reviewed By: Chris Wesson
 Audit Date: September 15, 2023 Start/End Time (mst): 16:41 / 18:22
 Calibration Purpose: routine annual Weather Conditions: Mainly sunny

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200
Serial #:	56778	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	May 9, 2022	Direction Unit Output Range:	0-360

Wind Calibrator Information

Calibrator I.D. and Expiry Date: RM Young 18802 id# CA 4744 expires October 18, 2024

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	18.4	18.4	1.002
2000	36.9	36.9	36.9	0.999
3000	55.3	55.4	55.4	0.998
4000	73.7	73.8	73.8	0.999
5000	92.2	92.2	92.3	0.999
6000	110.6	110.7	110.7	0.999
7000	129.0	129.2	129.2	0.999
8000	147.4	147.7	147.7	0.998
9000	165.9	166.1	166.1	0.999
10000	184.3	184.6	184.6	0.998
The audit meets AMD requirements.			Average Correction Factor=	0.999

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	1	355	1.0	-0.1	0.6
30	330	31	331	-1.4	-0.9	1.1
60	300	63	301	-3.3	-1.1	2.2
90	270	93	272	-3.2	-1.9	2.5
120	240	123	242	-3.4	-2.0	2.7
150	210	154	212	-3.9	-1.6	2.8
180	180	182	183	-2.4	-2.9	2.7
210	150	212	152	-2.3	-2.2	2.3
240	120	242	124	-1.6	-4.1	2.8
270	90	270	94	-0.3	-3.9	2.1
300	60	300	64	0.0	-4.2	2.1
330	30	330	33	0.0	-2.7	1.4
355	0	355	2	-0.1	1.6	0.9
The audit meets AMD requirements.				Average Absolute Degrees Difference=		2.0

Comments:

No issues.

End of Report

Parameter	Method & Procedure
SULPHUR DIOXIDE (SO₂)	Bureau Veritas EMS SOP-00209: Ambient Sulphur Monitoring
HYDROGEN SULPHIDE (H₂S)	Bureau Veritas EMS SOP-00209: Ambient Sulphur Monitoring
TOTAL HYDROCARBONS (THC), METHANE (CH₄), NON-METHANE(NMHC)	Bureau Veritas EMS SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO₂)	Bureau Veritas EMS SOP-00213: Ambient NO/NO₂/NO_x Monitoring
OZONE (O₃)	Bureau Veritas EMS SOP-00212: Ambient O₃ Monitoring
PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})	Bureau Veritas EMS SOP-00010: Thermo Model 5030 SHARP Monitor & EMS SOP-00015: Teledyne API PM Monitor Model T640
WIND SPEED (WS) & WIND DIRECTION (WD)	Bureau Veritas EMS SOP-00013: RM Young Wind Monitor Calibration
RELATIVE HUMIDITY (RH)	Operation Manual
BAROMETRIC PRESSURE (BP)	Operation Manual
AMBIENT TEMPERATURE (AmbTPX)	Operation Manual
STATION TEMPERATURE (StnTPX)	Operation Manual
PRECIPITATION	Bureau Veritas EMS SOP-00242: Precipitation Collector Installation / Maintenance