



Lakeland Industry & Community Association

DECEMBER 2021

Monthly Ambient Air Quality Monitoring Report

LICA-202112

Operation and Maintenance:

Bureau Veritas Canada

Data Validation and Report:

Lakeland Industry & Community Association

January 17, 2022

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January 17, 2022

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RE: LICA – December 2021 Monthly Ambient Air Quality Monitoring Report

Enclosed is the December 2021 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
Station ID		1174	1248	1250
Coordinates		54.41402,	54.604935,	54.215961,
		-110.23316	-110.452637	-111.503304
Continuous Monitoring Parameter	SO2	√	√	√
	TRS	√		
	H2S		√	√
	THC	√	√	√
	CH4	√	√	√
	NMHC	√	√	√
	NOX	√	√	√
	NO	√	√	√
	NO2	√	√	√
	O3	√		√
	PM2.5	√		√
	TPX	√	√	√
	RH	√	√	√
	BP		√	√
	PRECIPTATION		√	√
	WS	√	√	√
	WD	√	√	√
	STDWD	√	√	√
Integrated Sampling	VOCs	√		
	PAHs	√		
	Partisol	√		
	Passive	√		
	NMHC Canister			
	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

Monitoring Notes during the Month of December 2021

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.
- **TRS:**
 - Low ambient temperatures, particularly in the latter half of the month, had a marked effect on TRS span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid.
 - The analyzer failed the daily span check and repeat zero-span check from on December 22 to 24 as the sample pump was beginning to fail. The sample pump was repaired after a successful shut down calibration on December 24. As the analyzer passed the shut-down calibration, data collected between December 22 and 24 were considered valid. Eight hours of downtime were recorded due to the additional quality checks.
- **THC/CH4/NMHC:** Due to low and unstable station temperatures that occurred between December 22 and December 23, the HC analyzer showed multiple bad injections. One minute data were reviewed and discarded if data quality was affected by the bad injections. 1-hour data

were re-averaged based on the post-validation 1-minute data set. 1-hour data were discarded if it did not meet acceptability criteria (each 1-hour average must contain >75% valid 1-minute measurements). Data collected on December 20 hour 20 was invalidated for this event.

Tamarack (formerly Maskwa)

- 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.
- **H2S:** Low ambient temperatures, particularly in the latter half of the month, had a marked effect on H2S span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid.
- **NOx/NO/NO2:** The analyzer span results were either close or exceeding the check requirements between December 1 and December 7. Due to access issues, site visit was not possible, and the analyzer could not be checked. A successful monthly calibration was completed on December 8. As the analyzer passed the monthly calibration requirements, data collected between December 1 and 7 were considered valid.
- **WS/WD:** It was noticed the low wind speed values were recorded for several hours. A site visit was made to confirm the sensor's functionality on December 16. No issues were identified. Data were deemed correct.

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 THC/CH4/NMHC (89.7%).
AEP Reference #: 387068.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAQOs) and/or Alberta Ambient Air Quality Guidelines (AAQGs) where applicable.
- **All parameters:** A power outage occurred from December 31 hour 23 to January 1, 2022 hour 3. One hour of downtime was recorded in December due to this event.
- **H2S:**
 - A repeat zero-span check was completed on December 10 to investigate span drift. The results met the check requirements. Two hours of downtime were recorded due to this event.
 - Low ambient temperatures, particularly in the latter half of the month, had a marked effect on H2S span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid.
- **THC/CH4/NMHC:**

- Due to excessive NMHC noise, the Thermo 55i analyzer, s/n: 1180030034, was removed following by the successful shut down calibration, and the Thermo 55i analyzer, s/n: 1236656107, was installed on December 6. The analyzer was allowed time to stabilize overnight before an installation calibration was completed. Twenty-one hours of downtime were recorded due to this event.
- The Thermo 55i analyzer, s/n: 1236656107, started showing bad injections and had multiple flame-outs on December 13. A repeat multi-points calibration was completed on December 14 to correct the issues. One minute data were reviewed and discarded if data quality was affected by the bad injections and flame-outs. 1-hour data were discarded if it did not meet acceptability criteria (each 1-hour average must contain >75% of valid 1-minute measurements). No data were discarded. However, five hours of downtime were recorded due to the additional quality check.
- The Thermo 55i analyzer, s/n: 1236656107, failed on December 16 hour 13. In order to maintain the CH4 readings and no other spare analyzer that could be used, the Thermo 55i analyzer, s/n: 1180030034, was reinstalled on December 17 and was brought online on December 18. Although NMHC noise returned with the reinstallation of this analyzer, the analyzer passed the AMD calibration requirements. This analyzer will be replaced as soon as a spare becomes available, which should be in January 2022.

Integrated Sampling

All the integrated sampling analytical results are included in the December 2021 Integrated Sampling Report.

- **VOCs Sampling System:**
 - The VOC sampler is programed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: on December 6, 12, 18, 24 and 30.
- **PAHs Sampling System:**
 - The PAH sampler is programed to collect a 24-hour sample of air every sixth day as per the National Air Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: on December 6, 12, 18, 24 and 30.
- **Partisol Sampling System:**
 - The Partisol sampler is programed to collect a 24-hour sample of air every sixth day as per National Air Pollution Surveillance schedule (NAPS).
 - Five samples were collected this month: on December 6, 12, 18, 24 and 30.
- **Passive Sampling System:**
 - The passive sample filters were installed at the stations between November 30 and December 2, and were removed between December 29 and December 31.
 - A total of 9 duplicate samples were collected: 2 for H2S, 3 for SO2, 2 for NO2 and 2 for O3.
- **PAC Sampling System:**
 - The PAC sampling program began in December 2019, and is designed to collect a 2-month integrated sample.
 - The PAC sample medias for the November and December sampling period were removed on December 29. The sample medias for January and February 2022 sample period were also installed on December 29.

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 Mike Bisaga in accordance with Chapter 9 of the Air Monitoring Directive (AMD 2016).

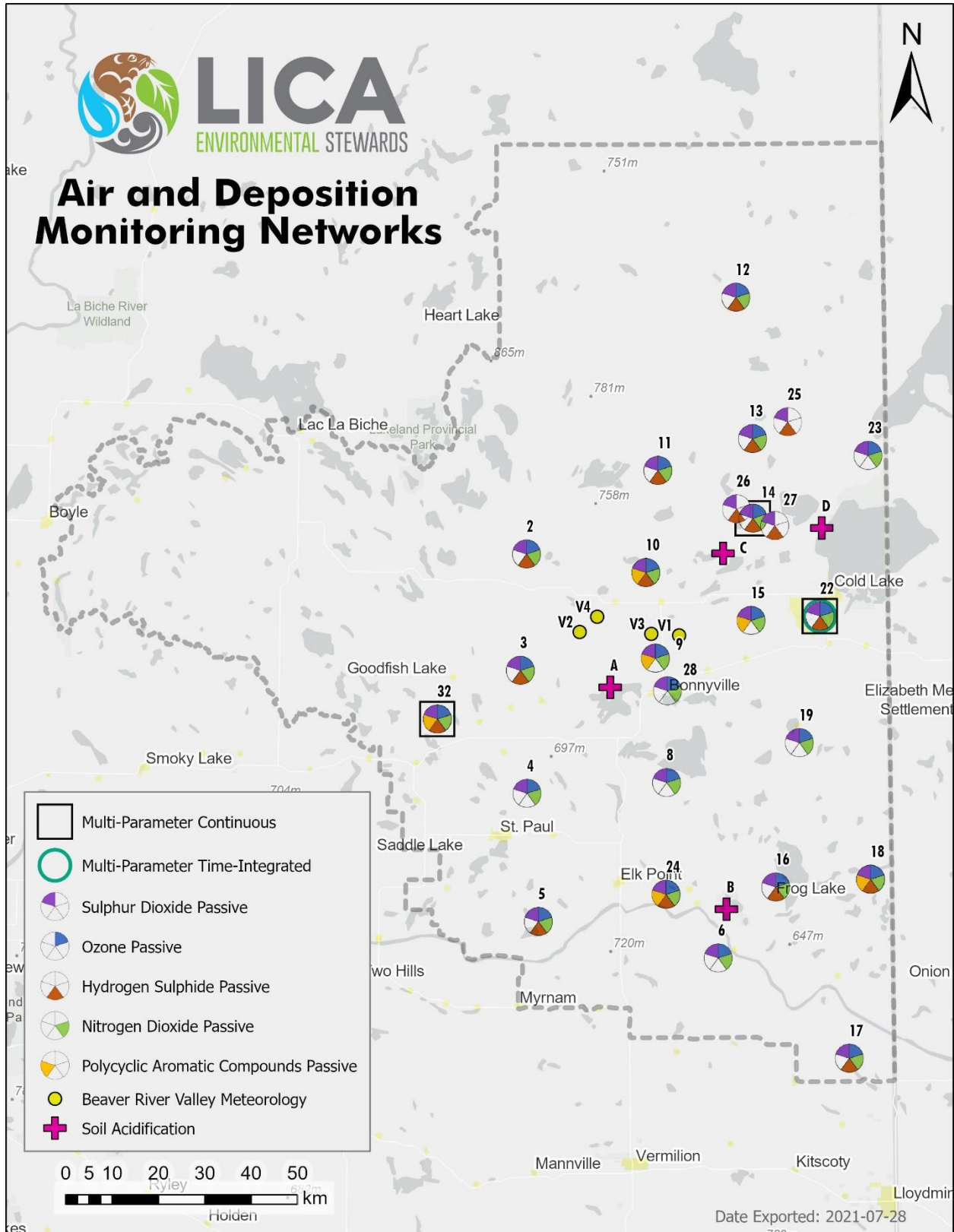
I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. I also certify that at the time of this report's submission, all air data have been electronically uploaded to Alberta's Ambient Air Quality Data Warehouse as required by the AMD, with the exception of electronic submission for the results of intermittent samples, Partisol samples and passive samples. Electronic submission for the intermittent sample, Partisol sample and passive sample results will be performed during the preparation of the December 2021 integrated sampling report. 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

January 17, 2022

Map of LICA Continuous Monitoring Network



CONTINUOUS NETWORK EQUIPMENT AND MONITORING RESULTS SUMMARY

Cold Lake South Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180260018	December 16, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Total Reduced Sulphur (TRS)	Thermo / 450i	812728560	December 24, 2021
<ul style="list-style-type: none"> A successfully monthly calibration was completed on December 16. The analyzer failed the daily span check and repeat zero-span check from on December 22 to 24 as the sample pump was beginning to fail. The sample pump was repaired after a successful shut down calibration on December 24. A post-repair calibration was completed after the maintenance. As the analyzer passed the shut-down calibration, data collected between December 22 and 24 were considered valid. Eight hours of downtime were recorded due to the additional quality checks. Low ambient temperatures, particularly in the latter half of the month, had a marked effect on TRS span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid. 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1180930025	December 24, 2021
<ul style="list-style-type: none"> Due to low and unstable station temperatures that occurred between December 22 and December 23, the HC analyzer showed multiple bad injections. One minute data were reviewed and discarded if data quality was affected by the bad injections. 1-hour data were re-averaged based on the post-validation 1-minute data set. 1-hour data were discarded if it did not meet acceptability criteria (each 1-hour average must contain >75% valid 1-minute measurements). Data collected on December 20 hour 20 was invalidated for this event. 			

Parameter	Make / Model	Serial Number	Calibration Date
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1505664393	December 16, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Ozone (O3)	Thermo / 49i	700419951	December 24, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Particulate Matter 2.5 (PM2.5)	Teledyne T640	575	December 24, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Parameter	Make / Model	Serial Number	System Check Date
Relative Humidity (RH)	Rotronic HC2A-S3	20257103	July 6, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Barometric Pressure (BP)	Met One / Part 092	Y23368	July 6, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Ambient Temperature (AT)	Rotronic HC2A-S3	20257103	July 6, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Station Temperature (ST)	BV-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young 05305AQ	177354	July 6, 2021
<ul style="list-style-type: none"> Wind direction data contained in this report represents where the wind is coming from. The last wind system calibration was completed on April 20, 2021. No issues were identified this month. 			

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	0.2	0	3	December 30 at hour 13	3.5	W	0.7	December 15	100.0	95.0
TRS (ppb)	-	-	-	-	-	-	0.1	0	1	December 3 at hour 21	3.3	SW	0.5	December 7	98.9	93.9
NOx (ppb)	-	-	-	-	-	-	8.2	0	48	December 7 at hour 10	0.5	W	22.3	December 7	100.0	94.7
NO (ppb)	-	-	-	-	-	-	1.1	0	25	December 7 at hour 10	0.5	W	7.3	December 7	100.0	94.7
NO2 (ppb)	159	-	-	0	-	-	7.1	0	27	December 16 at hour 7	1.7	WNW	15.1	December 7	100.0	94.7
O3 (ppb)	76	-	-	0	-	-	23.0	0.5	41.8	December 1 at hour 6	16.9	WNW	30.9	December 3	100.0	95.0
THC (ppm)	-	-	-	-	-	-	1.97	1.81	2.53	December 30 at hour 10	3.9	WSW	2.18	December 30	99.9	95.0
CH4 (ppm)	-	-	-	-	-	-	1.97	1.81	2.51	December 30 at hour 10	3.9	WSW	2.18	December 30	99.9	95.0
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.07	December 17 at hour 11	5.8	SW	0.00	December 18	99.9	95.0
PM2.5 (µg/m3)	80	29	-	0	0	-	6.0	1	31	December 5 at hour 20	7.1	SW	15.6	December 7	100.0	99.7
RH (%)	-	-	-	-	-	-	72.4	37	90	December 12 at hour 21	2.9	WSW	87.8	December 13	100.0	100.0
BP (millibar)	-	-	-	-	-	-	944	918	964	December 5 at hour 9	5	WNW	962	December 17	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-18.3	-39.5	5.9	December 1 at hour 6	16.9	WNW	0.2	December 1	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	21.4	9.7	22.7	December 24 at hour 12	10.5	WNW	22.1	December 25	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	2.2	0.0	18.9	December 2 at hour 16	18.9	W	9.7	December 14	100.0	100.0
WDV (sector)	-	-	-	-	-	-	269 (W)	-	-	-	-	-	-	-	100.0	100.0

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

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

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

Tamarack Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180930031	December 8, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Hydrogen Sulphide (H2S)	Thermo / 450i	CM17360005	December 8, 2021
<ul style="list-style-type: none"> Low ambient temperatures, particularly in the latter half of the month, had a marked effect on H2S span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid. 			
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1180930028	December 8, 2021
<ul style="list-style-type: none"> The analyzer span results were either close or exceeding the check requirements between December 1 and December 7. Due to access issues, site visit was not possible, and the analyzer could not be checked. A successful monthly calibration was completed on December 8. As the analyzer passed the monthly calibration requirements, data collected between December 1 and 7 were considered valid. 			
Ozone (O3)	Thermo 49iQ	1202068570	December 13, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1314057759	December 13, 2021
<ul style="list-style-type: none"> No issues were identified this month. The carrier (N2) gas cylinders were replaced on December 22. 			

Parameter	Make / Model	Serial Number	Calibration Date
Particulate Matter 2.5 (PM2.5)	Thermo / Sharp 5030	CM 2209	December 13, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Parameter	Make / Model	Serial Number	System Check Date
Relative Humidity (RH)	Rotronic / HC2A-S3	20433166	April 13, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Ambient Temperature (AT)	Rotronic / HC2A-S3	20433166	April 13, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Barometric Pressure (BP)	Met One / Part 090D	F4997	February 2, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Station Temperature (ST)	BV-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Precipitation (PRECIP)	Met One / Part 387	F4481	February 2, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	161465	September 20, 2021
<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 20, 2021. It was noticed the low wind speed values were recorded for several hours. A site visit was made to confirm the sensor's functionality on December 16. No issues were identified. Data were deemed correct. 			

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	1.5	0	25	December 30 at hour 18	6.2	WNW	6.1	December 19	100.0	95.1
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	December 1 at hour 0	2.3	S	0.2	December 1	100.0	95.1
NOx (ppb)	-	-	-	-	-	-	7.0	0	57	December 7 at hour 9	0.1	ESE	20.2	December 6	100.0	94.9
NO (ppb)	-	-	-	-	-	-	1.0	0	35	December 7 at hour 9	0.1	ESE	4.8	December 7	100.0	94.9
NO2 (ppb)	159	-	-	0	-	-	5.9	0	29	December 6 at hour 16	4.8	SSW	16.3	December 6	100.0	94.9
O3 (ppb)	76	-	-	0	-	-	23.9	1.4	42.2	December 2 at hour 14	15.8	W	33.6	December 3	100.0	95.0
THC (ppm)	-	-	-	-	-	-	1.99	1.88	2.38	December 28 at hour 6	3.2	SW	2.14	December 6	100.0	95.0
CH4 (ppm)	-	-	-	-	-	-	1.99	1.88	2.31	December 6 at hour 16	4.8	SSW	2.14	December 6	100.0	95.0
NMHC (ppm)	-	-	-	-	-	-	0.00	0.00	0.22	December 28 at hour 6	3.2	SW	0.02	December 28	100.0	95.0
PM2.5 (µg/m3)	80	29	-	0	0	-	3.8	0	41	December 6 at hour 7	1.5	SW	10.7	December 7	100.0	99.9
RH (%)	-	-	-	-	-	-	80.0	35	99	December 2 at hour 8	6	SSW	95.5	December 13	100.0	100.0
BP (millibar)	-	-	-	-	-	-	928	903	947	December 5 at hour 9	7.2	W	945	December 17	100.0	100.0
Ext. Temp. (°C)	-	-	-	-	-	-	-18.4	-36.7	5.4	December 1 at hour 4	18.4	WNW	-0.5	December 1	100.0	100.0
Stn. Temp. (°C)	-	-	-	-	-	-	22.4	21.1	23.8	December 13 at hour 14	4.5	NE	23.3	December 4	100.0	100.0
Precipitation (mm)*	-	-	-	-	-	-	9.3	0.0	1.0	December 8 at hour 12	2.5	SW	5.8	December 8	100.0	100.0
WSV (km/hr)	-	-	-	-	-	-	2.4	0.0	21.7	December 2 at hour 15	21.7	W	9.6	December 2	100.0	100.0
WDV (sector)	-	-	-	-	-	-	281 (W)	-	-	-	-	-	-	-	100.0	100.0

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 (AAAGs) Exceedances

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

St. Lina Station

Equipment Operation Summary

Parameter	Make / Model	Serial Number	Calibration Date
Sulphur Dioxide (SO2)	Thermo / 43i-TLE	1180930030	December 10, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Hydrogen Sulphide (H2S)	Thermo / 450i	CM18010058	December 07, 2021
<ul style="list-style-type: none"> A repeat zero-span check was completed on December 10 to investigate span drift. The results met the check requirements. Two hours of downtime were recorded due to this event. Low ambient temperatures, particularly in the latter half of the month, had a marked effect on H2S span results. This is a perennial problem when the moisture levels in sample air drop very low, causing TRS analyzer to respond more slowly due to the SO2 scrubber requiring a certain humidity to function optimally. Although daily span check results are often below the requirements, and the daily zero check results were occasionally close to or outside the allowable drift range (while low temperatures are occurring), experience indicates the analyzer's performance remains in compliance with AMD performance criteria, and collected data remain valid. 			
Total Hydrocarbons / Methane/ Non-methane Hydrocarbons (THC/CH4/NMHC)	Thermo / 55i	1180030034/1236656107/1180030034	December 18, 2021
<ul style="list-style-type: none"> Due to excessive NMHC noise, the Thermo 55i analyzer, s/n: 1180030034, was removed following by the successful shut down calibration, and the Thermo 55i analyzer, s/n: 1236656107, was installed on December 6. The analyzer was allowed time to stabilize overnight before an installation calibration was completed. Twenty-one hours of downtime were recorded due to this event. The Thermo 55i analyzer, s/n: 1236656107, started showing bad injections and had multiple flame-outs on December 13. A repeat multi-points calibration was completed on December 14 to correct the issues. One minute data were reviewed and discarded if data quality was affected by the bad injections and flameouts. 1-hour data were discarded if it did not meet acceptability criteria (each 1-hour average must contain >75% of valid 1-minute measurements). No data were discarded. However, five hours of downtime were recorded due to the additional quality check. The Thermo 55i analyzer, s/n: 1236656107, failed on December 16 hour 13. In order to maintain the CH4 readings and no other spare analyzer that could be used, the Thermo 55i analyzer, s/n: 1180030034, was reinstalled on December 17 and was brought online on December 18. Although NMHC noise returned with the reinstallation of this analyzer, the analyzer passed the AMD calibration requirements. This analyzer will be replaced as soon as a spare becomes available, which should be in January 2022. 			

Parameter	Make / Model	Serial Number	Calibration Date
Oxide of Nitrogen / Nitric Oxide/ Nitrogen Dioxide (NOx/NO/NO2)	Thermo / 42i	1180930029	December 10, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Ozone (O3)	Thermo / 49i	1002240371	December 10, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Particulate Matter 2.5 (PM2.5)	Thermo / Sharp 5030i	CM17091001	December 10, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Parameter	Make / Model	Serial Number	System Check Date
Relative Humidity (RH)	Campbell ScientificHC2-S3	20221366	September 20, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Ambient Temperature (AT)	Campbell ScientificHC2-S3	20221366	September 20, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			
Barometric Pressure (BP)	Met One / Part 090D	F4998	December 23, 2020
<ul style="list-style-type: none"> No issues were identified this month. 			
Station Temperature (ST)	BV-supplied	n/a	n/a
<ul style="list-style-type: none"> No issues were identified this month. 			
Precipitation (PRECIP)	Met One / Part 387D	A23775	September 3, 2021
<ul style="list-style-type: none"> No issues were identified this month. 			

Parameter	Make / Model	Serial Number	System Check Date
Wind Speed (WS) / Wind Direction (WD)/ Stand Deviation Wind Direction (STDWD)	RM Young / 05305VK	161466	March 16, 2021
<ul style="list-style-type: none"> • Wind direction data contained in this report represents where the wind is coming from. • The annual wind system calibration was completed on March 16, 2021. • No issues were identified this month. 			

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	0.2	0	3	December 16 at hour 8	6.7	ENE	1.3	December 16	99.9	94.7
H2S (ppb)	10	3	-	0	0	-	0.0	0	1	December 3 at hour 0	16.9	W	0.3	December 3	99.6	94.2
NOx (ppb)	-	-	-	-	-	-	3.6	0	27	December 20 at hour 19	13.8	WSW	12.5	December 7	99.9	94.6
NO (ppb)	-	-	-	-	-	-	0.2	0	7	December 27 at hour 16	5.2	SSW	1.1	December 7	99.9	94.6
NO2 (ppb)	159	-	-	0	-	-	3.4	0	27	December 20 at hour 19	13.8	WSW	11.2	December 7	99.9	94.6
O3 (ppb)	76	-	-	0	-	-	29.1	9.1	43.4	December 1 at hour 6	23.8	WNW	37.0	December 1	99.9	94.7
THC (ppm)	-	-	-	-	-	-	1.99	1.85	2.33	December 18 at hour 15	8.4	E	2.13	December 28	89.7	84.8
CH4 (ppm)	-	-	-	-	-	-	1.98	1.85	2.29	December 18 at hour 15	8.4	E	2.09	December 28	89.7	84.8
NMHC (ppm)	-	-	-	-	-	-	0.01	0.00	0.14	December 4 at hour 1	8.9	SSW	0.08	December 4	89.7	84.8
PM2.5 (µg/m3)	80	29	-	0	0	-	6.6	0	42	December 7 at hour 17	9.9	S	18.8	December 7	99.9	99.6
RH (%)	-	-	-	-	-	-	80.8	27	100	December 2 at hour 6	11	SW	97.0	December 22	99.9	99.9
BP (millibar)	-	-	-	-	-	-	912	887	931	December 5 at hour 11	16.7	NW	928	December 5	99.9	99.9
Ext. Temp. (°C)	-	-	-	-	-	-	-17.4	-37.6	6.7	December 1 at hour 4	27.8	WNW	2.2	December 1	99.9	99.9
Stn. Temp. (°C)	-	-	-	-	-	-	22.2	21.4	24.4	December 10 at hour 15	14.2	WSW	23.6	December 1	99.9	99.9
Precipitation (mm)*	-	-	-	-	-	-	14.9	0.0	1.7	December 8 at hour 11	9.4	WSW	5.0	December 8	99.9	99.9
WSV (km/hr)	-	-	-	-	-	-	5.2	1.3	27.8	December 1 at hour 4	27.8	WNW	15.2	December 22	99.9	99.9
WDV (sector)	-	-	-	-	-	-	278 (W)	-	-	-	-	-	-	-	99.9	99.9

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

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

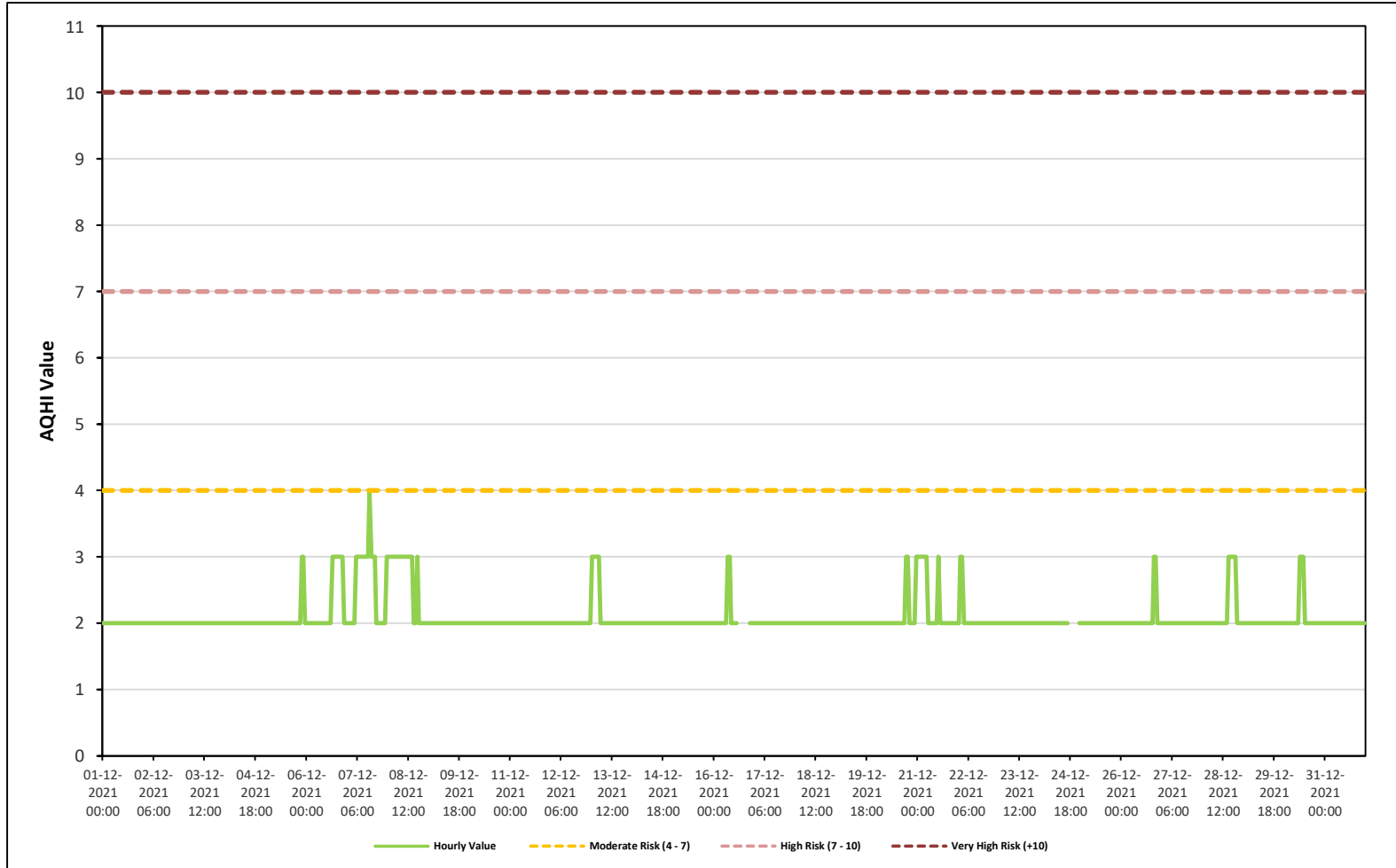
Alberta Ambient Air Quality Objectives (AAAQOs) and/or Alberta Ambient Air Quality Guidelines (AAAQGs) Exceedances

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

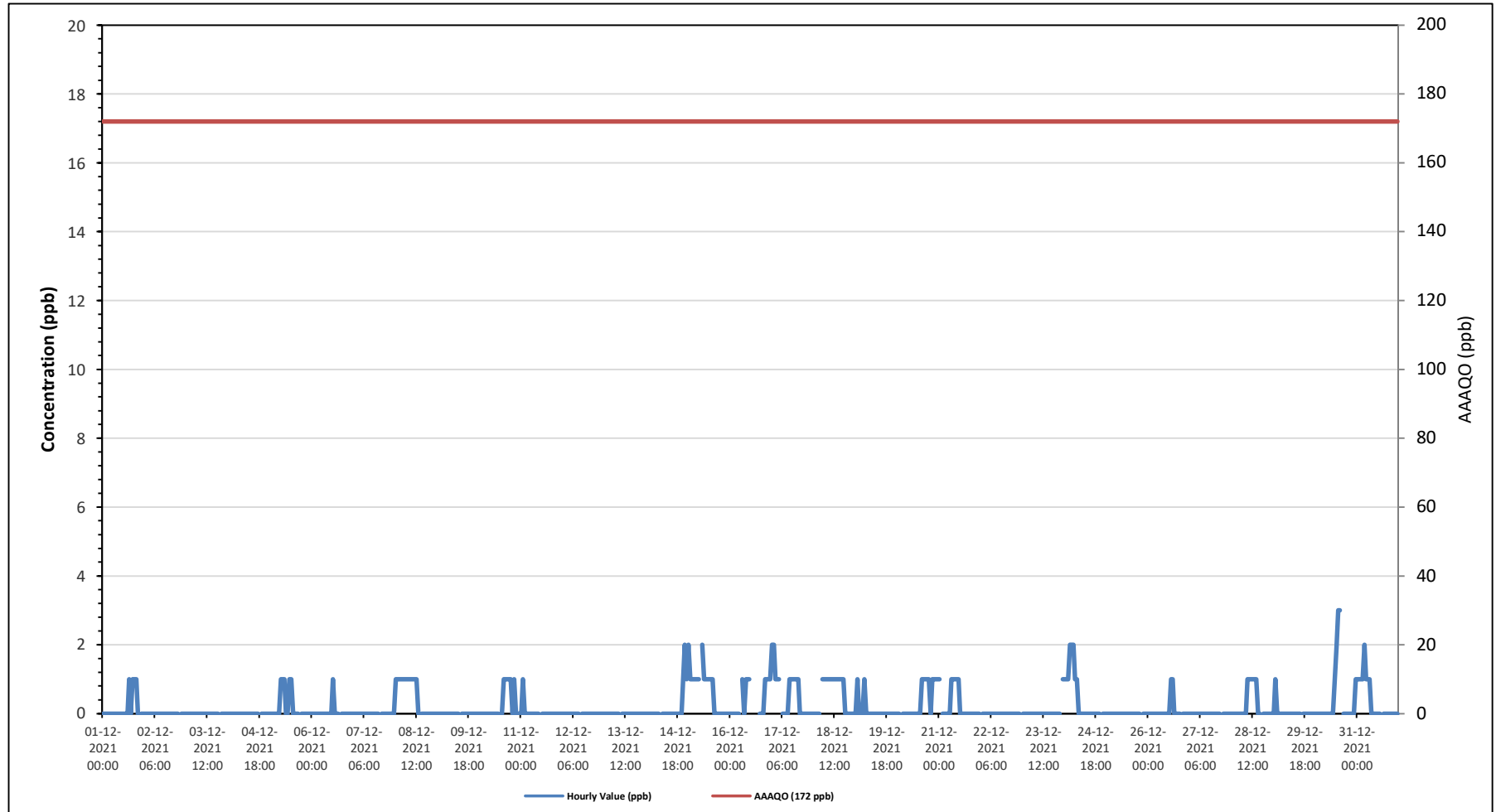
TABLES AND CHARTS

COLD LAKE SOUTH STATION

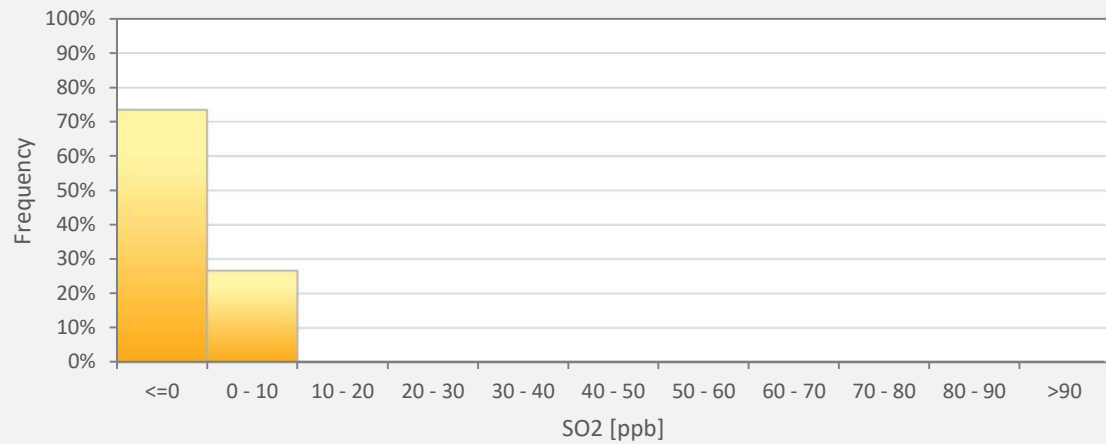
Timeseries Chart of Hourly Average for AQHI - Cold Lake South Station



Timeseries Chart of Hourly Average for SO₂ - Cold Lake South Station



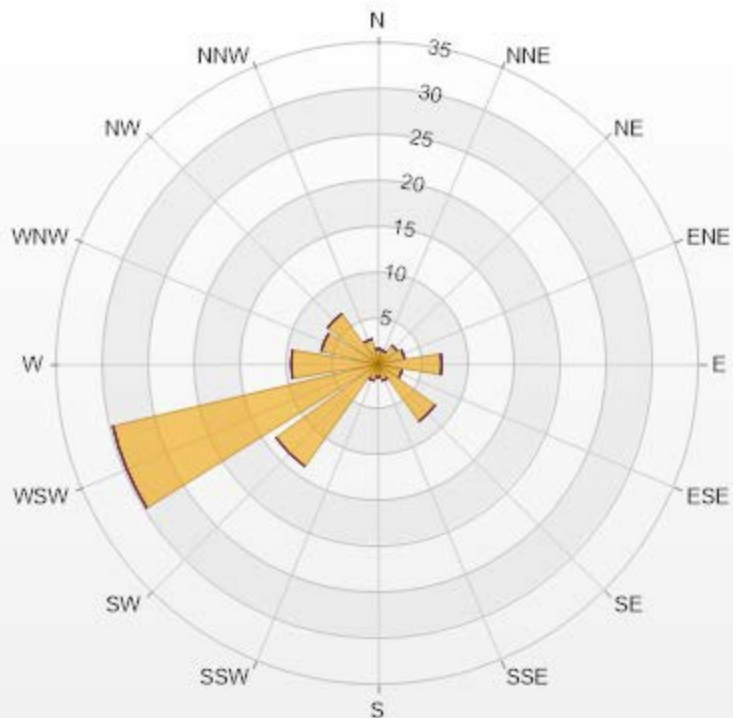
SO2[ppb] Histogram: Cold Lake South Monthly: 12-2021 1 Hr.



Classes	SO2
<=0	73.41%
0 - 10	26.59%
10 - 20	0.00%
20 - 30	0.00%
30 - 40	0.00%
40 - 50	0.00%
50 - 60	0.00%
60 - 70	0.00%
70 - 80	0.00%
80 - 90	0.00%
>90	0.00%

Wind: Cold Lake South Poll.: Cold Lake South-SO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	1.7	0	0	0	0	1.7
NNE	1.56	0	0	0	0	1.56
NE	2.55	0	0	0	0	2.55
ENE	2.97	0	0	0	0	2.97
E	6.93	0	0	0	0	6.93
ESE	2.69	0	0	0	0	2.69
SE	7.64	0	0	0	0	7.64
SSE	1.84	0	0	0	0	1.84
S	1.41	0	0	0	0	1.41
SSW	1.84	0	0	0	0	1.84
SW	13.72	0	0	0	0	13.72
WSW	29.7	0	0	0	0	29.7
W	9.48	0	0	0	0	9.48
WNW	6.36	0	0	0	0	6.36
NW	6.79	0	0	0	0	6.79
NNW	2.83	0	0	0	0	2.83
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100 0-10

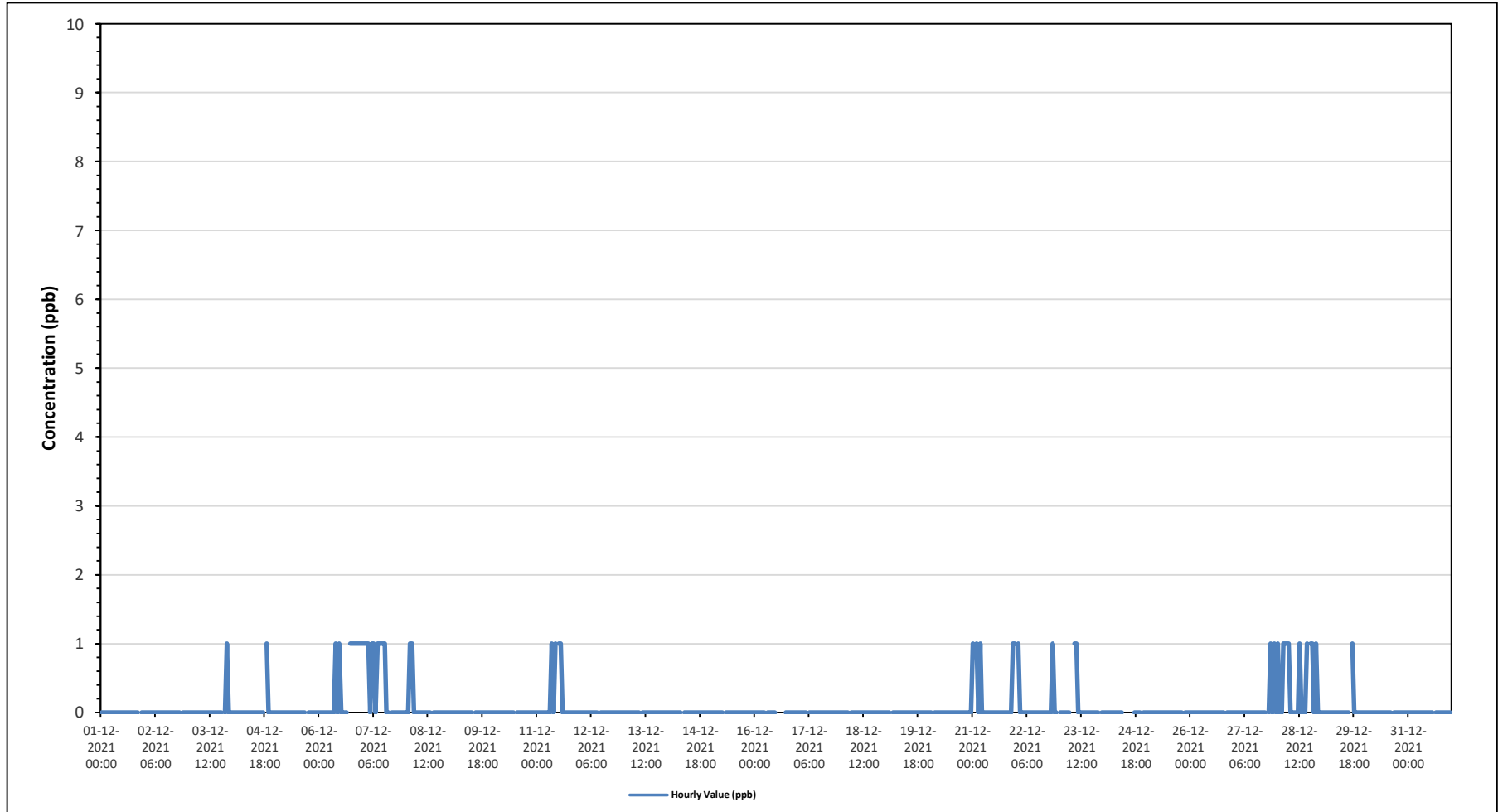
0 10-50

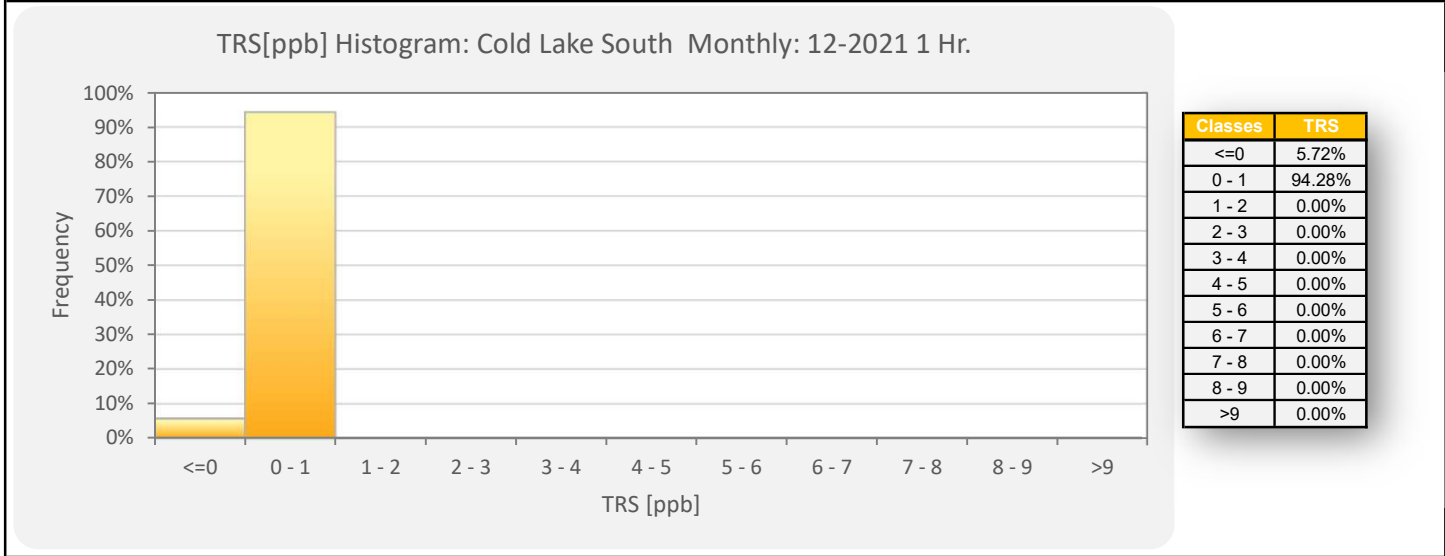
0 50-100

0 100-172

0 >172.0

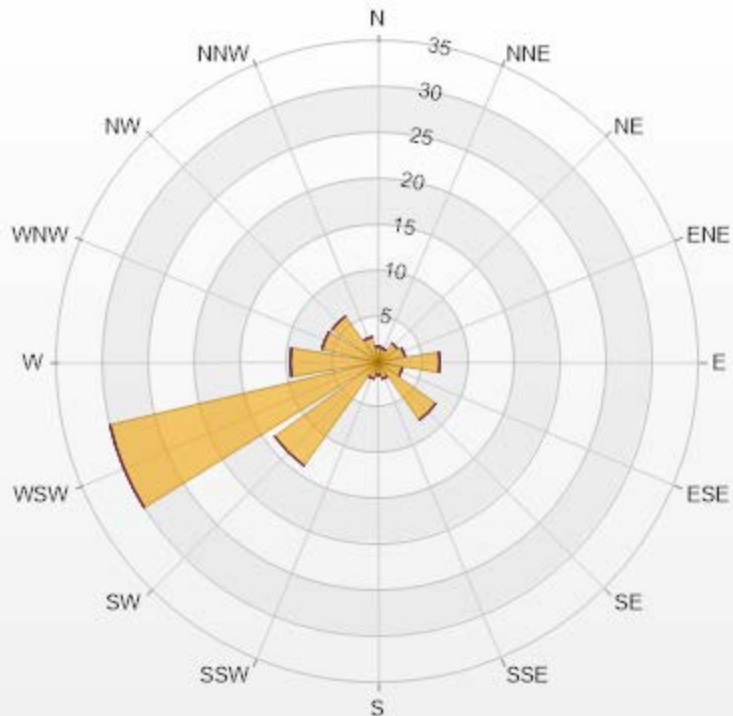
Timeseries Chart of Hourly Average for TRS - Cold Lake South Station





Wind: Cold Lake South Poll.: Cold Lake South-TRS[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.95% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	1.72	0	0	0	0	1.72
NNE	1.57	0	0	0	0	1.57
NE	2.58	0	0	0	0	2.58
ENE	3	0	0	0	0	3
E	6.72	0	0	0	0	6.72
ESE	2.72	0	0	0	0	2.72
SE	7.73	0	0	0	0	7.73
SSE	1.86	0	0	0	0	1.86
S	1.43	0	0	0	0	1.43
SSW	1.86	0	0	0	0	1.86
SW	13.88	0	0	0	0	13.88
WSW	30.04	0	0	0	0	30.04
W	9.59	0	0	0	0	9.59
WNW	6.29	0	0	0	0	6.29
NW	6.15	0	0	0	0	6.15
NNW	2.86	0	0	0	0	2.86
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100 0-2

0 2-5

0 5-10

0 10-50

0 >50.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

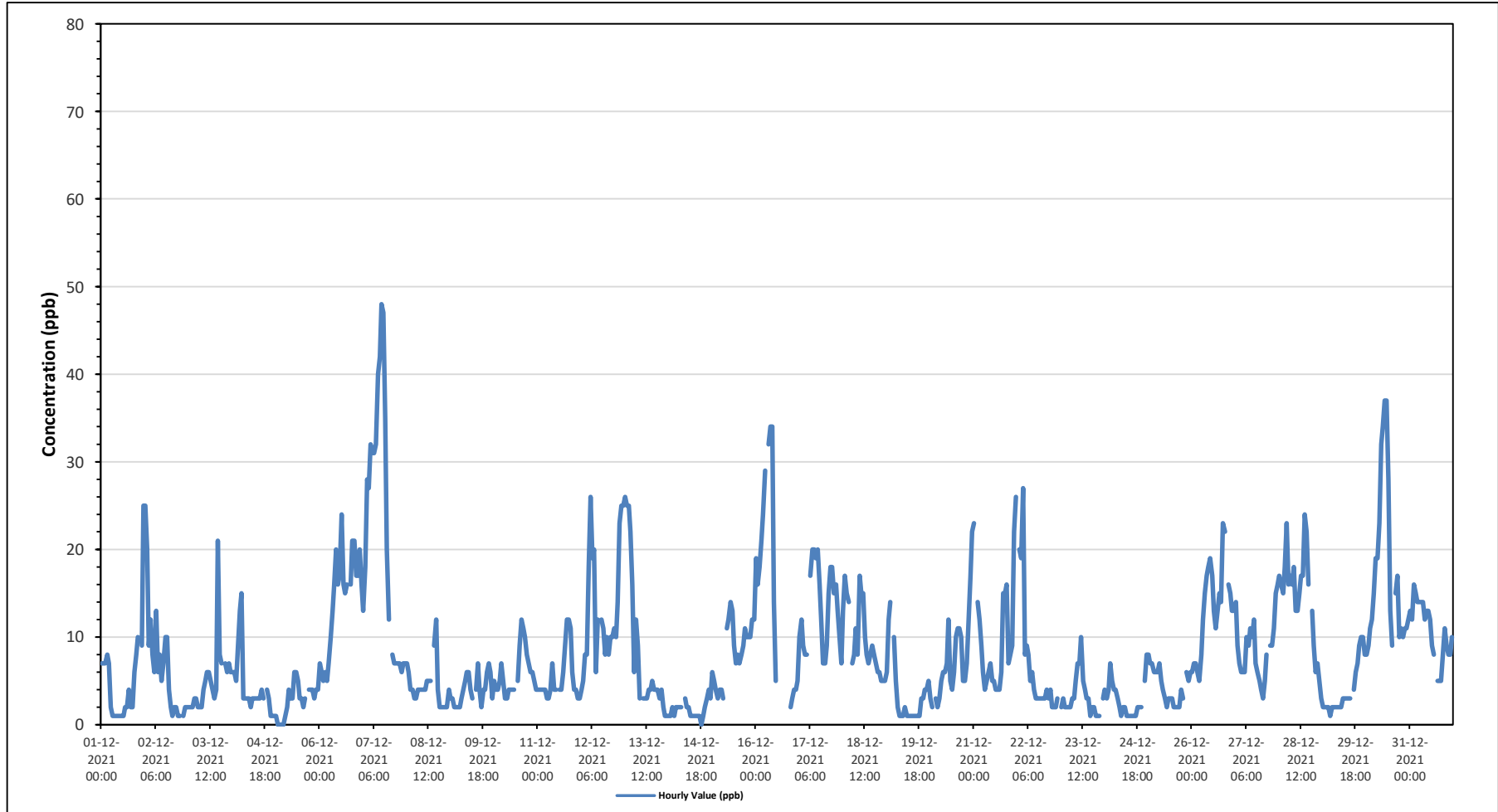
Maximum Hourly Value:	48 ppb on December 7 at hour 10	Hours in Service:	744
Maximum Daily Value:	22.3 ppb on December 7	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 5 at hour 1	Hours of Missing Data:	0
Minimum Daily Value:	1.7 ppb on December 14	Hours of Calibration:	39
Monthly Average:	8.2 ppb	Operational Uptime:	100.0

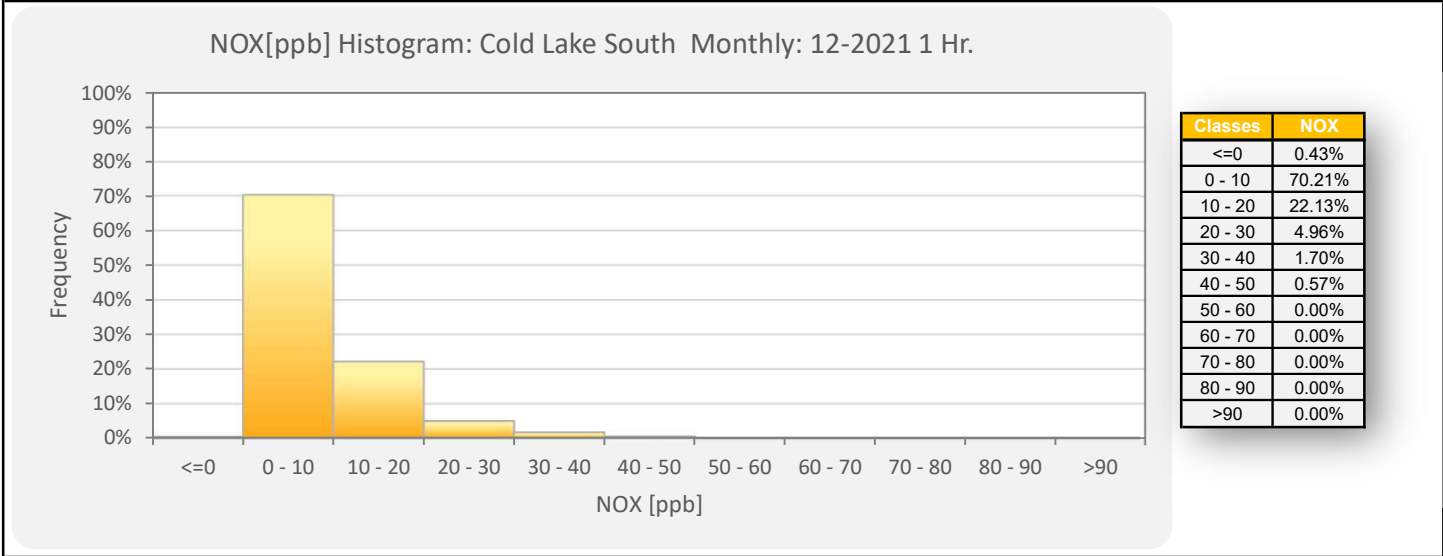
Day	Hourly Period Starting at (MST)																								Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Dec 1	7	7	7	8	7	2	1	1	1	1	1	1	1	2	2	4	2	2	6	8	10	S	9	25	1	25	5.0	
Dec 2	25	20	9	12	8	6	13	6	8	5	7	10	10	4	2	1	2	2	1	1	S	1	2	2	1	25	6.8	
Dec 3	2	2	2	3	3	2	2	2	4	5	6	6	5	4	3	4	21	8	7	S	7	6	7	6	2	21	5.1	
Dec 4	6	6	5	9	13	15	3	3	3	3	2	3	3	3	3	4	3	S	S	4	3	1	1	1	1	15	4.3	
Dec 5	1	0	0	0	0	1	2	4	3	3	3	6	6	5	3	3	2	3	S	4	4	4	3	4	4	0	6	2.8
Dec 6	7	6	5	6	5	7	10	13	16	20	16	17	24	16	15	16	S	16	21	21	17	17	20	16	5	24	14.2	
Dec 7	13	18	28	27	32	31	31	32	40	42	48	47	35	20	12	S	8	7	7	7	7	6	7	7	6	48	22.3	
Dec 8	7	6	4	4	3	3	4	4	4	4	4	5	5	5	S	9	12	4	2	2	2	2	2	4	2	12	4.4	
Dec 9	3	3	2	2	2	3	4	4	5	6	6	4	3	S	4	7	4	2	4	4	6	7	6	3	2	7	4.0	
Dec 10	5	4	4	5	7	5	3	3	4	4	4	4	4	S	5	9	12	11	10	8	7	6	6	5	4	3	12	5.9
Dec 11	4	4	4	4	4	3	3	4	7	4	4	S	4	4	6	9	12	12	11	6	4	4	3	3	3	12	5.3	
Dec 12	4	5	8	8	18	26	19	20	6	12	S	12	11	8	10	8	10	10	11	10	14	23	25	25	4	26	13.2	
Dec 13	26	25	25	22	16	6	12	9	3	S	3	3	3	4	4	5	4	4	4	3	4	2	1	1	1	26	8.2	
Dec 14	1	1	2	1	2	2	2	2	S	3	2	2	2	1	1	1	1	1	0	1	2	3	4	3	0	4	1.7	
Dec 15	6	5	4	3	4	4	3	S	11	12	14	13	9	7	8	7	8	9	11	10	10	12	12	12	3	14	8.3	
Dec 16	19	16	18	21	24	29	S	32	34	34	14	5	C	C	C	C	C	C	C	2	3	4	4	5	2	34	-	
Dec 17	10	12	9	8	8	S	17	20	20	19	20	16	12	7	7	9	15	18	18	15	16	13	10	7	7	20	13.3	
Dec 18	13	17	15	14	S	7	8	11	8	17	15	15	10	8	7	8	9	8	7	6	5	5	5	5	5	5	17	9.7
Dec 19	6	12	14	S	10	5	2	1	1	1	2	1	1	1	1	1	1	1	3	3	4	4	5	5	1	14	3.5	
Dec 20	3	2	S	3	2	3	5	6	6	7	12	5	4	6	10	11	11	10	5	5	7	12	17	22	2	22	7.6	
Dec 21	23	S	14	12	9	6	4	5	6	7	5	5	4	4	6	15	15	16	7	8	9	22	26	4	26	10.1		
Dec 22	S	20	19	27	8	9	8	5	6	4	3	3	3	3	3	4	3	4	2	2	2	2	3	S	2	27	6.5	
Dec 23	2	3	2	2	2	2	3	3	5	7	7	10	5	4	3	3	1	2	2	1	1	1	S	3	1	10	3.2	
Dec 24	4	3	4	7	5	4	4	3	2	1	2	2	1	1	1	1	1	2	2	2	2	S	5	8	1	8	2.9	
Dec 25	8	7	7	6	6	6	7	5	4	3	2	3	3	3	2	2	2	2	4	3	S	6	5	6	2	8	4.4	
Dec 26	6	7	7	6	5	8	12	15	17	18	19	17	13	11	13	15	14	23	22	S	16	15	13	13	5	23	13.3	
Dec 27	14	9	7	6	6	10	9	11	10	12	7	6	5	4	3	5	8	S	9	9	11	15	16	3	16	8.6		
Dec 28	17	16	15	18	23	16	17	16	18	13	13	15	17	17	24	22	16	S	13	9	6	7	5	3	3	24	14.6	
Dec 29	2	2	2	2	1	2	2	2	2	2	2	3	3	3	3	S	4	6	7	9	10	10	8	1	10	3.9		
Dec 30	8	9	11	12	15	19	19	23	32	34	37	37	28	13	9	S	15	17	10	11	10	11	11	12	8	37	17.5	
Dec 31	13	12	16	15	14	14	14	14	12	13	13	12	9	8	S	5	5	8	11	11	9	8	8	10	5	16	10.8	
Diurnal Maximum	26	25	28	27	32	31	31	32	40	42	48	47	35	20	24	22	21	23	22	21	17	23	25	26				
Diurnal Average	8.8	8.6	9.0	9.1	8.7	8.4	8.1	9.2	10.0	10.5	10.0	9.6	8.2	6.2	6.2	6.4	7.7	7.4	7.7	6.2	7.0	7.2	8.2	8.8				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

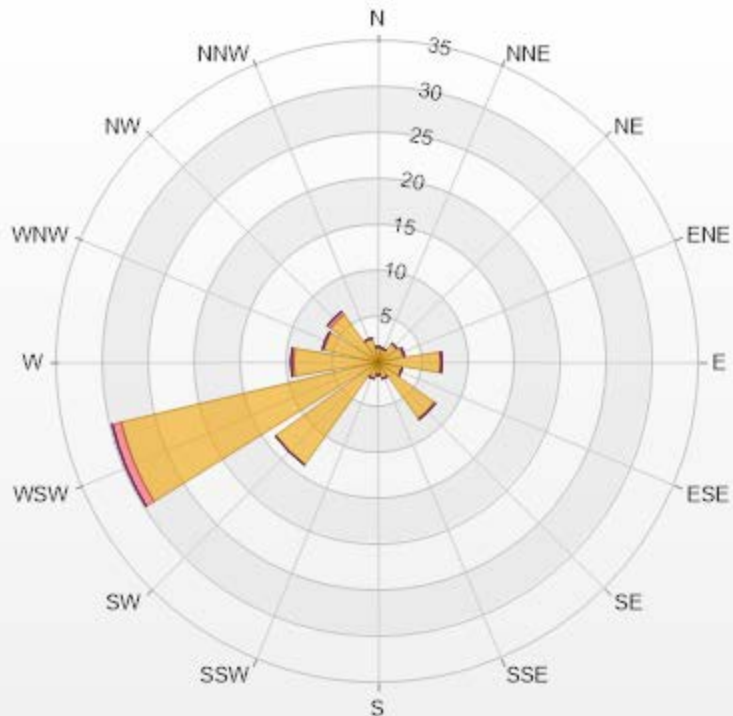
Timeseries Chart of Hourly Average for NOx - Cold Lake South Station





Wind: Cold Lake South Poll.: Cold Lake South-NOX[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.7	0	0	0	0	1.7
NNE	1.56	0	0	0	0	1.56
NE	2.55	0	0	0	0	2.55
ENE	2.84	0.14	0	0	0	2.98
E	6.81	0.14	0	0	0	6.95
ESE	2.7	0	0	0	0	2.7
SE	7.52	0.14	0	0	0	7.66
SSE	1.84	0	0	0	0	1.84
S	1.42	0	0	0	0	1.42
SSW	1.84	0	0	0	0	1.84
SW	13.76	0	0	0	0	13.76
WSW	28.79	0.99	0	0	0	29.78
W	9.22	0.28	0	0	0	9.5
WNW	6.1	0.14	0	0	0	6.24
NW	6.38	0.43	0	0	0	6.81
NNW	2.7	0	0	0	0	2.7
Summary	97.73	2.26	0	0	0	100



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% Icon Classes (ppb)

98 0-30

2 30-50

0 50-76

0 76-159

0 >159.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

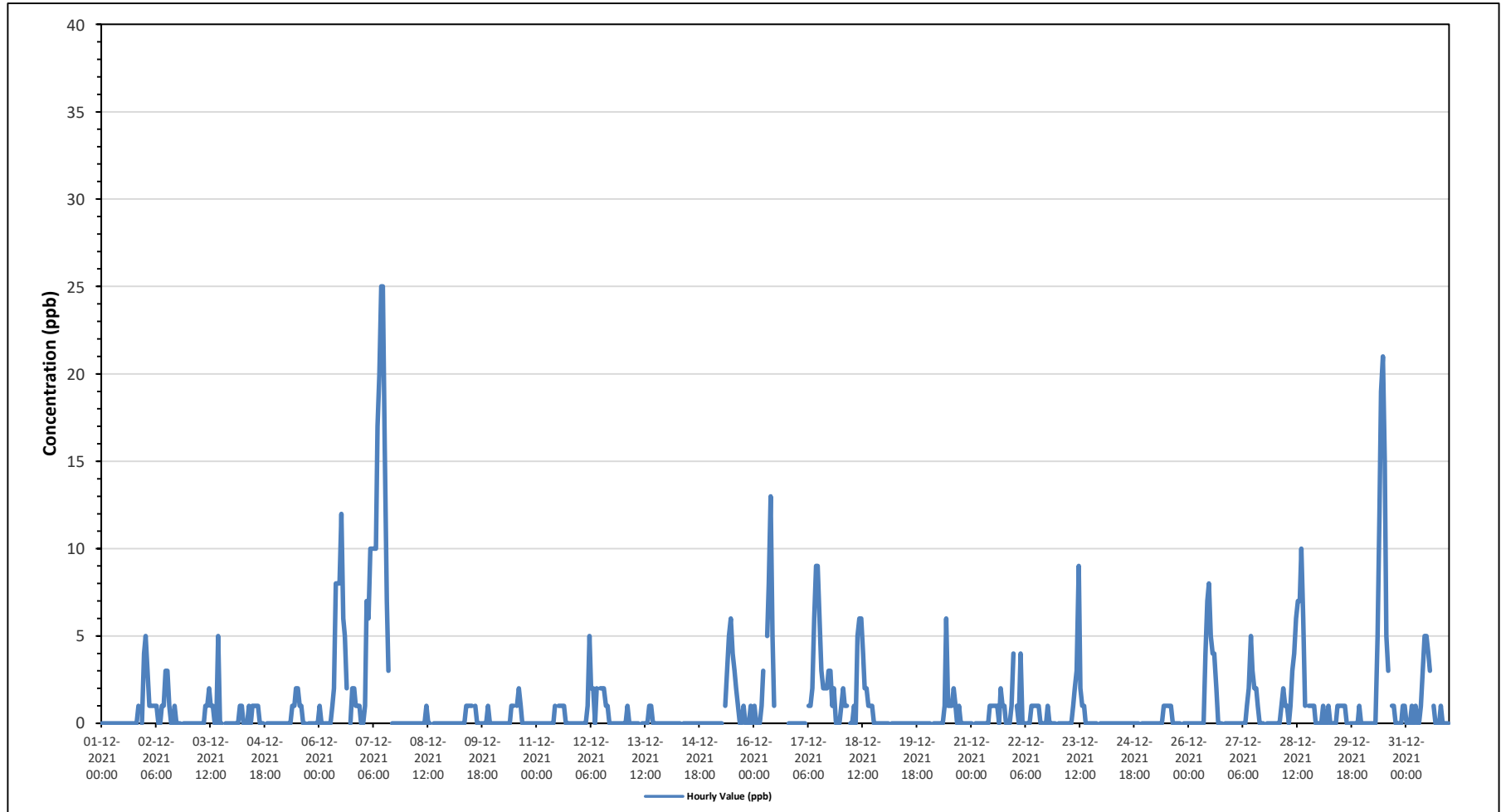
Maximum Hourly Value:	25 ppb on December 7 at hour 10	Hours in Service:	744
Maximum Daily Value:	7.3 ppb on December 7	Hours of Data:	705
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 14	Hours of Calibration:	39
Monthly Average:	1.1 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				
Dec 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0.2	
Dec 2	5	3	1	1	1	1	1	0	0	1	1	3	3	1	0	0	1	0	0	0	0	S	0	0	0	0	5	1.0
Dec 3	0	0	0	0	0	0	0	0	0	1	1	2	1	1	0	0	5	0	0	S	0	0	0	0	0	0	5	0.5
Dec 4	0	0	0	0	1	1	0	0	0	1	0	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	1	0.3
Dec 5	0	0	0	0	0	0	0	0	0	1	1	2	2	1	1	0	0	S	0	0	0	0	0	0	0	0	2	0.3
Dec 6	1	0	0	0	0	0	0	1	2	8	8	8	12	6	5	2	S	0	2	2	1	1	1	0	0	12	2.6	
Dec 7	0	1	7	6	10	10	10	10	17	20	25	25	16	7	3	S	0	0	0	0	0	0	0	0	0	25	7.3	
Dec 8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.0	
Dec 9	0	0	0	0	0	0	0	0	0	1	1	1	1	S	1	0	0	0	0	0	0	1	0	0	0	1	0.3	
Dec 10	0	0	0	0	0	0	0	0	0	0	1	1	S	1	2	1	0	0	0	0	0	0	0	0	0	2	0.3	
Dec 11	0	0	0	0	0	0	0	0	0	0	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.2	
Dec 12	0	0	0	0	1	5	2	2	0	2	S	2	2	2	1	1	0	0	0	0	0	0	0	0	0	5	0.9	
Dec 13	0	0	1	0	0	0	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0.1	
Dec 14	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	
Dec 15	0	0	0	0	0	0	0	S	1	3	5	6	4	3	2	1	0	0	1	0	0	0	1	0	0	6	1.2	
Dec 16	1	0	0	0	1	3	S	5	8	13	5	1	C	C	C	C	C	C	C	0	0	0	0	0	0	13	-	
Dec 17	0	0	0	0	0	S	1	1	2	6	9	9	6	3	2	2	2	3	3	1	2	0	0	0	0	9	2.3	
Dec 18	1	2	1	1	S	0	0	1	0	5	6	6	4	2	2	1	1	1	0	0	0	0	0	0	0	6	1.5	
Dec 19	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	
Dec 20	0	0	S	0	0	0	0	0	0	1	6	1	1	1	2	1	0	1	0	0	0	0	0	0	0	6	0.6	
Dec 21	0	S	0	0	0	0	0	0	0	0	1	1	1	1	1	0	2	1	1	1	0	0	0	1	4	0.6		
Dec 22	S	1	0	4	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	4	0.5	
Dec 23	0	0	0	0	0	0	0	0	1	2	3	9	2	1	1	0	0	0	0	0	0	0	0	0	0	9	0.8	
Dec 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	
Dec 25	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	1	0.2	
Dec 26	0	0	0	0	0	0	0	0	0	4	7	8	5	4	4	2	0	0	0	S	0	0	0	0	0	8	1.5	
Dec 27	0	0	0	0	0	0	0	0	1	2	5	3	2	2	1	0	0	0	S	0	0	0	0	0	0	5	0.7	
Dec 28	0	0	0	1	2	1	1	0	1	3	4	6	7	7	10	6	1	S	1	1	1	1	0	0	0	10	2.3	
Dec 29	0	0	1	0	0	1	0	0	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	1	0	1	0.3	
Dec 30	0	0	0	0	0	0	0	5	12	19	21	15	5	3	S	1	1	0	0	0	0	0	1	1	0	21	3.7	
Dec 31	0	0	0	1	0	1	0	0	1	3	5	4	3	S	1	0	0	0	1	0	0	0	0	0	0	5	1.1	
Diurnal Maximum	5	3	7	6	10	10	10	10	17	20	25	25	16	7	10	6	5	3	3	2	2	1	1	4				
Diurnal Average	0.3	0.2	0.4	0.5	0.5	0.8	0.5	0.7	1.3	3.0	3.9	4.2	3.2	1.9	1.6	0.7	0.5	0.3	0.3	0.2	0.2	0.1	0.2	0.3				

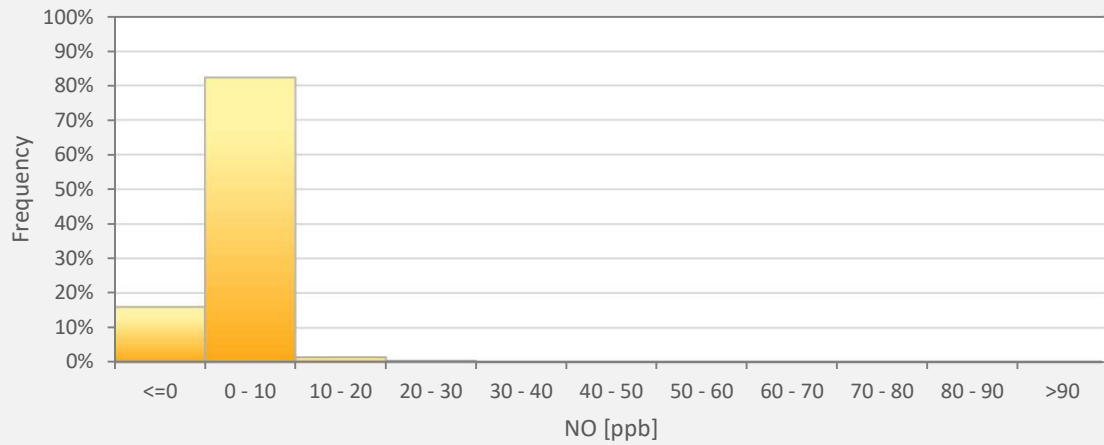
C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

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.

Timeseries Chart of Hourly Average for NO - Cold Lake South Station



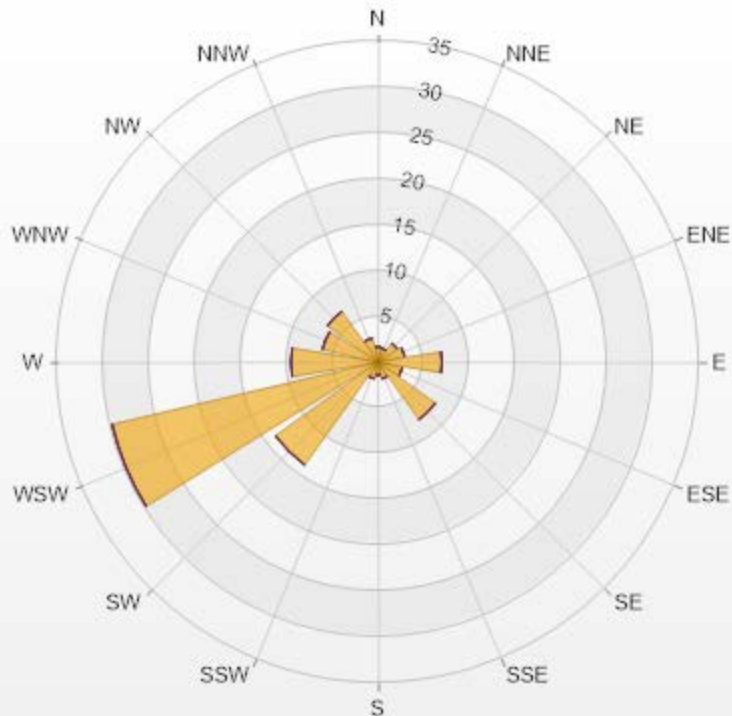
NO[ppb] Histogram: Cold Lake South Monthly: 12-2021 1 Hr.



Classes	NO
<=0	15.89%
0 - 10	82.27%
10 - 20	1.42%
20 - 30	0.43%
30 - 40	0.00%
40 - 50	0.00%
50 - 60	0.00%
60 - 70	0.00%
70 - 80	0.00%
80 - 90	0.00%
>90	0.00%

Wind: Cold Lake South Poll.: Cold Lake South-NO[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.7	0	0	0	0	1.7
NNE	1.56	0	0	0	0	1.56
NE	2.55	0	0	0	0	2.55
ENE	2.98	0	0	0	0	2.98
E	6.95	0	0	0	0	6.95
ESE	2.7	0	0	0	0	2.7
SE	7.66	0	0	0	0	7.66
SSE	1.84	0	0	0	0	1.84
S	1.42	0	0	0	0	1.42
SSW	1.84	0	0	0	0	1.84
SW	13.76	0	0	0	0	13.76
WSW	29.79	0	0	0	0	29.79
W	9.5	0	0	0	0	9.5
WNW	6.24	0	0	0	0	6.24
NW	6.81	0	0	0	0	6.81
NNW	2.7	0	0	0	0	2.7
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100 ■ 0-30

0 ■ 30-50

0 ■ 50-76

0 ■ 76-159

0 ■ >159.0



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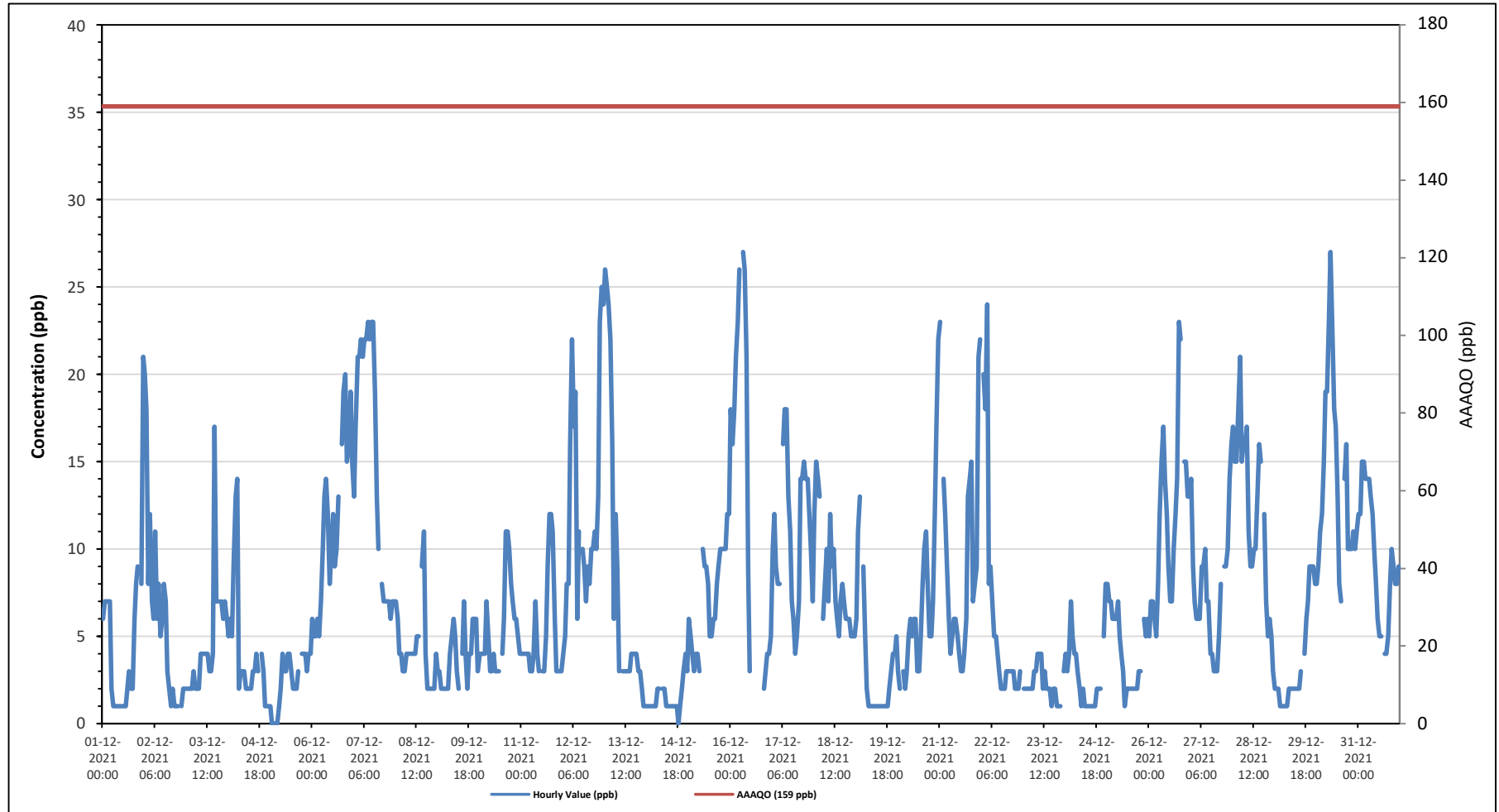
Cold Lake South Station - December 2021

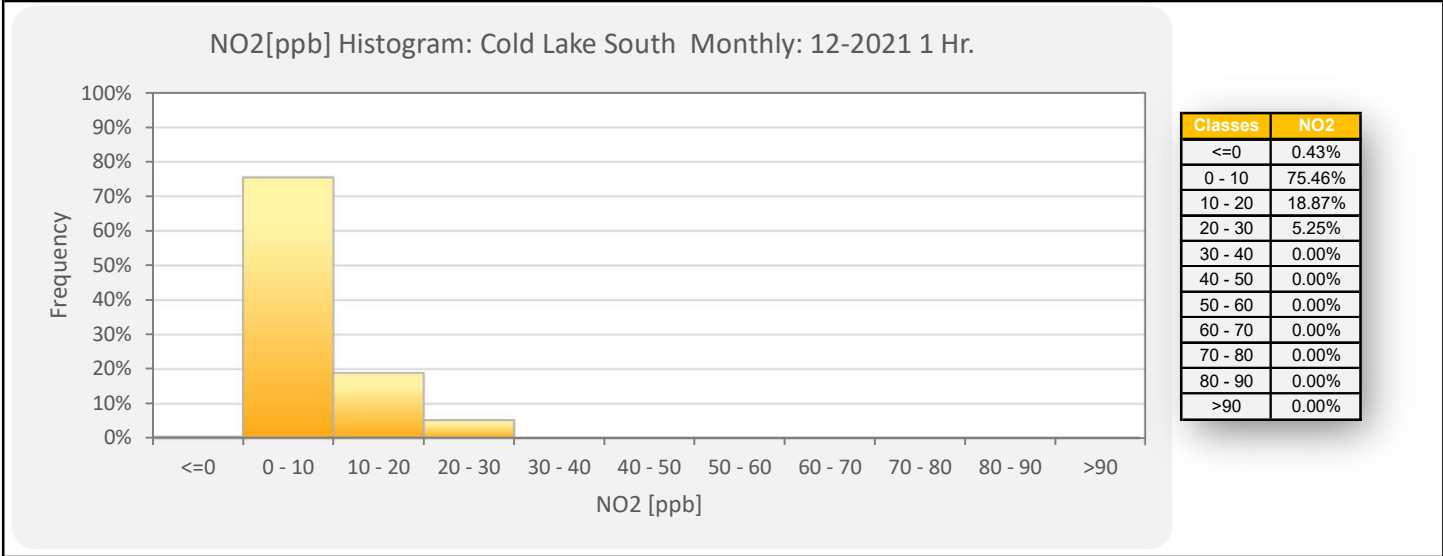
Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																															
Number of 1-Hour Exceedences: 0																															
Maximum Hourly Value: 27 ppb on December 16 at hour 7												Hours in Service: 744																			
Maximum Daily Value: 15.1 ppb on December 7												Hours of Data: 705																			
Minimum Hourly Value: 0 ppb on December 5 at hour 1												Hours of Missing Data: 0																			
Minimum Daily Value: 1.5 ppb on December 14												Hours of Calibration: 39																			
Monthly Average: 7.1 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							
Dec 1	6	7	7	7	7	2	1	1	1	1	1	1	1	1	2	3	2	2	6	8	9	S	8	21	1	21	4.6				
Dec 2	20	18	8	12	7	6	11	6	8	5	6	8	7	3	2	1	2	1	1	1	S	1	2	2	1	20	6.0				
Dec 3	2	2	2	2	3	2	2	2	4	4	4	4	4	3	3	4	17	7	7	S	7	6	7	6	2	17	4.5				
Dec 4	5	6	5	9	13	14	2	3	3	3	2	2	2	2	3	3	4	3	S	4	3	1	1	1	1	14	4.1				
Dec 5	1	0	0	0	0	1	2	4	3	3	4	4	3	2	2	3	3	S	4	4	4	3	4	4	0	4	2.5				
Dec 6	6	5	5	6	5	7	10	13	14	12	8	10	12	9	10	13	S	16	19	20	15	16	19	15	5	20	11.5				
Dec 7	13	17	21	21	22	21	22	22	23	22	23	23	19	13	10	S	8	7	7	7	7	6	7	7	6	23	15.1				
Dec 8	7	6	4	4	3	3	4	4	4	4	4	4	5	5	S	9	11	4	2	2	2	2	2	4	2	11	4.3				
Dec 9	3	3	2	2	2	2	2	4	5	6	5	3	2	S	4	7	4	2	4	4	6	6	6	3	2	7	3.8				
Dec 10	4	4	4	4	7	5	3	3	4	3	3	3	S	4	6	11	11	10	8	7	6	6	5	4	3	11	5.4				
Dec 11	4	4	4	4	4	3	3	4	7	4	3	S	3	3	5	9	12	12	11	6	3	3	3	3	3	12	5.1				
Dec 12	4	5	8	8	16	22	17	19	6	11	S	10	9	7	9	8	10	10	11	10	13	23	25	24	4	25	12.4				
Dec 13	26	25	24	22	16	6	12	9	3	S	3	3	3	3	3	4	4	4	4	3	3	2	1	1	1	26	8.0				
Dec 14	1	1	1	1	1	1	2	2	S	2	2	1	1	1	1	1	1	1	0	1	2	3	4	3	0	4	1.5				
Dec 15	6	5	4	3	4	4	3	S	10	9	9	8	5	5	6	6	8	9	10	10	10	12	12	3	12	7.3					
Dec 16	18	16	18	21	23	26	S	27	26	21	9	3	C	C	C	C	C	C	C	2	3	4	4	5	2	27	-				
Dec 17	10	12	9	8	8	S	16	18	18	13	11	7	6	4	5	7	14	14	15	14	14	12	10	7	4	18	11.0				
Dec 18	12	15	14	13	S	6	8	10	7	12	9	10	7	6	5	7	8	7	6	6	5	5	5	5	5	15	8.2				
Dec 19	6	11	13	S	9	5	2	1	1	1	1	1	1	1	1	1	1	1	1	2	3	4	4	5	1	13	3.3				
Dec 20	3	2	S	3	2	3	5	6	5	6	6	3	3	5	8	10	11	8	5	5	7	12	17	22	2	22	6.8				
Dec 21	23	S	14	12	9	6	4	5	6	6	5	4	3	3	4	6	13	14	15	7	8	9	21	22	3	23	9.5				
Dec 22	S	20	18	24	8	9	7	5	5	4	3	2	2	2	3	3	3	3	2	2	2	2	3	S	2	24	6.0				
Dec 23	2	2	2	2	2	2	3	3	4	4	4	2	3	2	2	2	1	2	2	1	1	1	S	3	1	4	2.3				
Dec 24	4	3	4	7	5	4	4	3	2	1	2	1	1	1	1	1	1	1	2	2	2	S	5	8	1	8	2.8				
Dec 25	8	7	7	6	6	6	7	5	4	3	1	2	2	2	2	2	2	2	3	3	S	6	5	6	1	8	4.2				
Dec 26	5	7	7	6	5	8	12	15	17	14	12	9	7	7	10	12	14	23	22	S	15	15	13	13	5	23	11.7				
Dec 27	14	9	7	6	6	6	9	9	10	7	7	4	4	3	3	5	8	S	9	9	10	14	16	3	16	7.7					
Dec 28	17	15	15	18	21	15	16	16	17	11	9	9	10	10	13	16	15	S	12	7	5	6	5	3	3	21	12.2				
Dec 29	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	3	S	4	6	7	9	9	9	8	1	9	3.5				
Dec 30	8	9	11	12	15	19	19	23	27	22	18	17	13	8	7	S	14	16	10	10	10	11	10	11	7	27	13.9				
Dec 31	12	12	15	15	14	14	13	12	10	8	6	5	5	S	4	4	5	8	10	9	8	8	9	4	15	9.6					
Diurnal Maximum	26	25	24	24	23	26	22	27	27	22	23	23	19	13	13	16	17	23	22	20	15	23	25	24							
Diurnal Average	8.4	8.3	8.5	8.6	8.1	7.6	7.4	8.5	8.6	7.5	6.1	5.5	5.0	4.2	4.7	5.6	7.3	7.0	7.3	6.0	6.7	7.0	8.0	8.4							
C	Monthly Calibration							S	Daily Zero-Span Check							Q	Quality Assurance														
K	Collection Error							N	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.																															

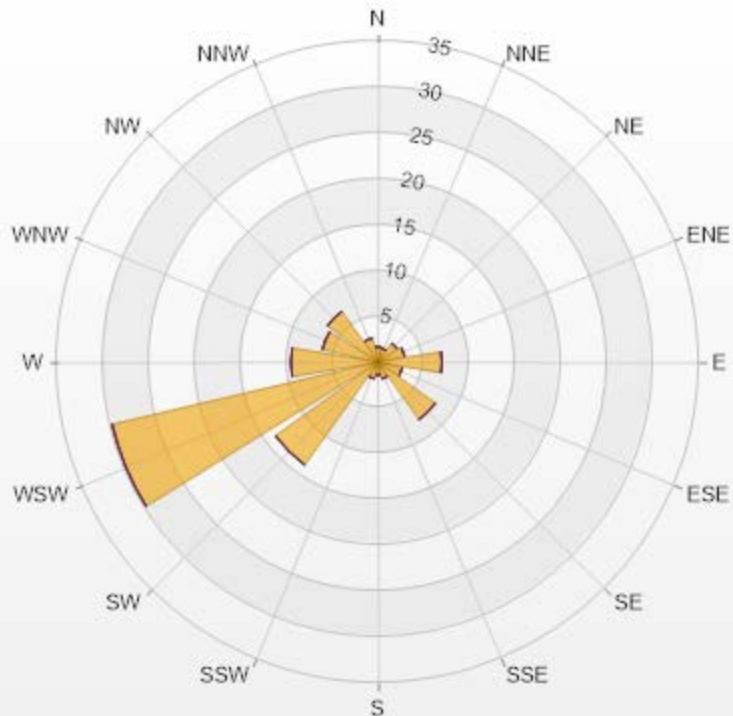
Timeseries Chart of Hourly Average for NO2 - Cold Lake South Station





Wind: Cold Lake South Poll.: Cold Lake South-NO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.7	0	0	0	0	1.7
NNE	1.56	0	0	0	0	1.56
NE	2.55	0	0	0	0	2.55
ENE	2.98	0	0	0	0	2.98
E	6.95	0	0	0	0	6.95
ESE	2.7	0	0	0	0	2.7
SE	7.66	0	0	0	0	7.66
SSE	1.84	0	0	0	0	1.84
S	1.42	0	0	0	0	1.42
SSW	1.84	0	0	0	0	1.84
SW	13.76	0	0	0	0	13.76
WSW	29.79	0	0	0	0	29.79
W	9.5	0	0	0	0	9.5
WNW	6.24	0	0	0	0	6.24
NW	6.81	0	0	0	0	6.81
NNW	2.7	0	0	0	0	2.7
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100  0-30

0  30-50

0  50-76

0  76-159

0  >159.0



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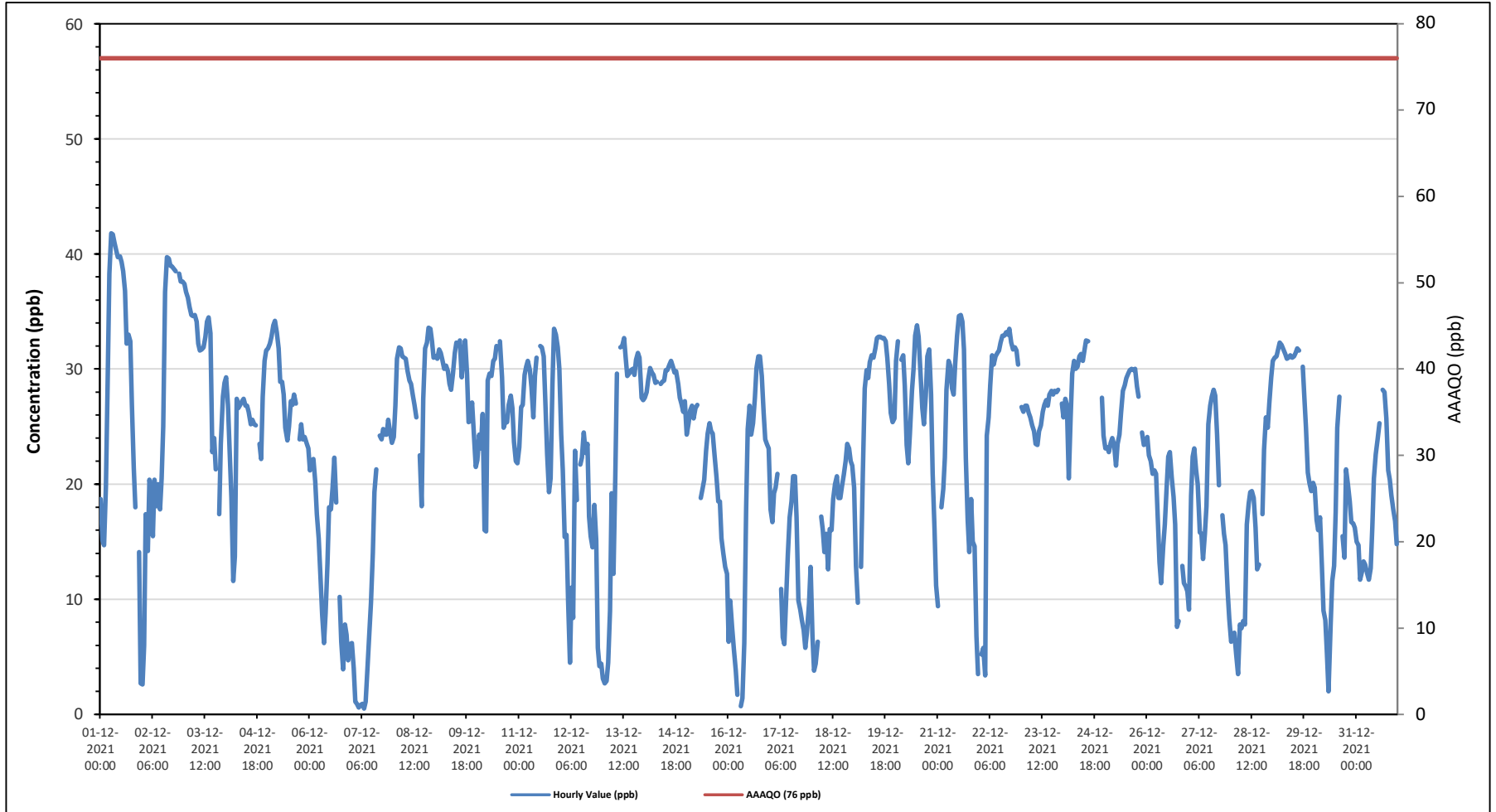
Cold Lake South Station - December 2021

Summary of Hourly Averages

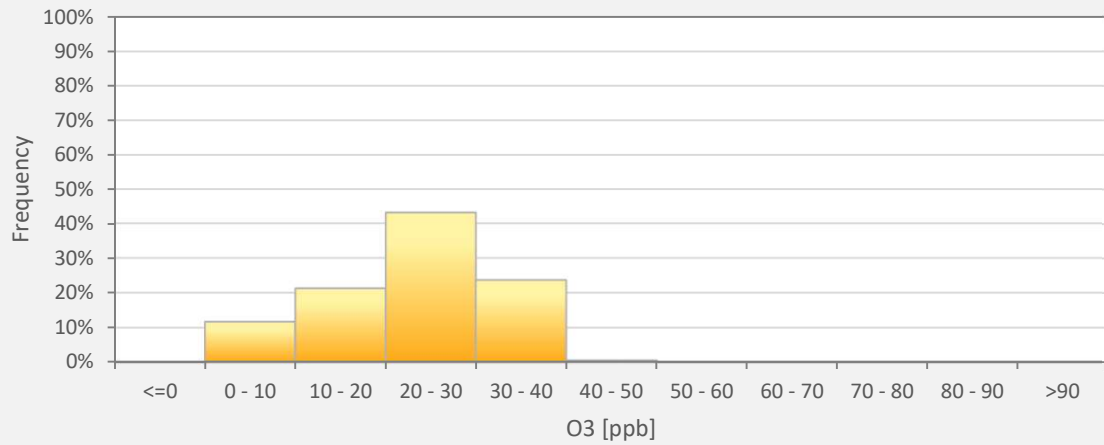
OZONE (O₃) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 76 ppb																																																																													
Number of 1-Hour Exceedences: 0																																																																													
Maximum Hourly Value: 41.8 ppb on December 1 at hour 6												Hours in Service: 744																																																																	
Maximum Daily Value: 30.9 ppb on December 3												Hours of Data: 707																																																																	
Minimum Hourly Value: 0.5 ppb on December 7 at hour 7												Hours of Missing Data: 0																																																																	
Minimum Daily Value: 12.4 ppb on December 7												Hours of Calibration: 37																																																																	
Monthly Average: 23.0 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																																																		
Dec 1	18.7	15.1	14.7	19.8	28.1	38.3	41.8	41.7	41	40.3	39.7	39.8	39.3	38.5	36.8	32.2	33	32.4	26.8	21.4	18	S	14.1	2.7	2.7	41.8	29.3																																																		
Dec 2	2.6	6	17.4	14.2	20.4	19.2	15.5	20.4	18.1	20	17.8	20.5	25	36.7	39.7	39.6	39	38.9	38.7	38.5	S	38.3	37.6	37.6	2.6	39.7	26.2																																																		
Dec 3	37.4	36.7	36.2	35.4	34.7	34.6	34.7	34.1	32.2	31.6	31.7	31.9	32.8	34.1	34.5	33.1	22.8	24	21.3	S	17.4	23.5	27.6	28.8	17.4	37.4	30.9																																																		
Dec 4	29.3	26.9	23.1	18.8	11.6	13.7	27.4	26.6	26.9	27.2	27.4	26.8	26.8	26.3	25.2	25.6	25.2	25.1	S	23.5	22.2	27.6	30.7	31.6	11.6	31.6	25.0																																																		
Dec 5	31.8	32.2	32.8	33.8	34.2	33.2	31.8	28.9	28.9	27.8	24.9	23.8	25	27.2	26.9	27.8	27	S	23.9	25.2	23.9	24.1	23.6	23.1	23.1	34.2	27.9																																																		
Dec 6	21.2	22	22.2	20.2	17.4	15.3	12.3	8.7	6.2	8.8	13.1	18	17.8	19.6	22.3	18.4	S	10.2	6.3	3.9	7.8	6.9	4.7	6.1	3.9	22.3	13.5																																																		
Dec 7	6.2	4	1.1	0.9	0.6	0.8	0.9	0.5	1.1	4.1	6.7	9.7	14	19.3	21.3	S	24.2	23.9	24.8	24.3	24.3	25.6	24.4	23.6	0.5	25.6	12.4																																																		
Dec 8	24.1	26.8	30.9	31.9	31.8	31.1	31	30.9	29.8	29	28.7	27.7	26.9	25.8	S	22.5	18.1	27.4	31.8	32.3	33.6	33.5	32.4	31	18.1	33.6	29.1																																																		
Dec 9	31.1	30.9	31.7	31.4	30.8	30	30.3	29.8	28.7	28.2	29.6	31.4	32.3	S	32.5	29.3	31.3	32.5	29.6	25.4	25.5	27.1	24.3	21.5	21.5	32.5	29.4																																																		
Dec 10	22.1	24.3	23.1	26.1	16	15.9	29	29.6	29.4	30.7	30.9	32	S	32.4	29.3	24.9	25.4	25.4	26.9	27.7	26.6	23.7	22	21.8	15.9	32.4	25.9																																																		
Dec 11	23.2	26.7	26.9	29.5	30.2	30.7	29.9	28.4	25.8	29.4	31	S	32	31.9	31.1	27.3	22.6	19.3	20.5	28.7	33.5	33	31.9	30	19.3	33.5	28.4																																																		
Dec 12	24.3	21.2	15.4	15.6	9.9	4.5	11	8.4	22.9	18.6	S	21.7	22.3	24.5	22.7	23.5	17.2	15.5	14.5	18.2	15.1	5.8	4.2	4.4	4.2	24.5	15.7																																																		
Dec 13	3.1	2.7	2.9	4.5	9	19.2	12.2	20.8	29.6	S	31.9	32	32.7	31	29.4	29.6	29.9	30	29.5	30.8	31.4	31	27.5	27.3	2.7	32.7	23.0																																																		
Dec 14	27.5	28	29.1	30.1	29.7	29.5	28.8	28.9	S	28.7	28.9	29	29.9	29.9	30.4	30.7	30.2	29.7	29.8	28.7	27.5	27	26.3	27.2	26.3	30.7	28.9																																																		
Dec 15	24.3	25.3	26.4	26.8	25.7	26.6	26.9	S	18.8	19.5	20.4	22.9	24.4	25.3	24.6	24.4	22.5	20.7	18.5	18.5	15.3	14	12.8	12.2	12.2	26.9	21.6																																																		
Dec 16	6.3	9.9	7.6	5.6	3.8	1.7	S	0.7	1.4	6.2	17.9	24.8	26.8	24.3	25.3	27.5	30.1	31.1	31.1	29.4	26.2	23.9	23.5	23.1	0.7	31.1	17.7																																																		
Dec 17	17.8	16.7	19.2	19.7	20.9	S	10.9	6.7	6.1	10.2	13.8	17.1	18.5	20.7	20.7	17.1	9.9	9.1	8.2	7.3	5.8	7.1	9.6	12.8	5.8	20.9	13.3																																																		
Dec 18	6.8	3.8	4.4	6.3	S	17.2	16	14.1	15.7	12.6	16.1	16	18.7	20	20.7	18.8	18.8	19.8	20.8	22	23.5	23.1	22	21.6	3.8	23.5	16.5																																																		
Dec 19	19.7	12.9	9.7	S	12.8	21.1	28.3	29.9	29.2	30.6	31.2	31	31.8	32.7	32.8	32.8	32.7	32.7	32.4	31	28.7	26.2	25.4	25.7	9.7	32.8	27.0																																																		
Dec 20	30.7	32.4	S	30.8	31.2	28.5	23.4	21.8	24.3	28.1	30	32.9	33.8	32.8	29.3	26.6	25.2	27.7	31.1	31.7	27.8	20.9	16.1	11.2	11.2	33.8	27.3																																																		
Dec 21	9.4	S	18	19.6	22.3	28.2	30.7	30.3	28.3	27.8	30.5	32.9	34.6	34.7	34.1	31.7	22.3	16.9	14.1	18.7	15	14.6	6.8	3.5	3.5	34.7	22.8																																																		
Dec 22	S	5.2	5.8	3.4	24.2	25.8	28.6	31.2	30.4	31.1	31.4	31.6	32.3	32.9	32.9	33.2	33	33.5	32.3	31.7	31.9	31.6	30.4	S	3.4	33.5	27.5																																																		
Dec 23	26.7	26.3	26.8	26.8	26.2	25.8	25.1	24.6	23.5	23.4	24.6	25.1	26.3	26.9	27.3	26.8	27.8	28.1	27.8	28.1	28	28.2	S	27	23.4	28.2	26.4																																																		
Dec 24	25.8	27.4	26.9	20.5	25.8	29.6	30.7	30	30.2	31.1	31.3	30.7	31.6	32.5	32.4	C	C	C	C	C	31.5	S	27.5	24.2	20.5	32.5	28.9																																																		
Dec 25	23.1	23.2	22.8	23.6	24	23.4	21.6	23.5	24.3	26.2	28.1	28.6	29.2	29.6	29.9	30	C	C	C	28.5	27.6	S	24.5	23.4	23.6	21.6	30.0	26.0																																																	
Dec 26	24.1	22.5	22	20.9	21.2	20.9	17.3	13.2	11.4	14.6	16.5	19.3	22.4	22.8	20.6	18.9	16.5	7.6	8.1	S	12.9	11.4	11.1	10.7	7.6	24.1	16.8																																																		
Dec 27	9.1	19	22.4	23.1	21.2	20	15.8	15.7	13.5	15.7	18.1	25.2	26.8	27.6	28.2	27.7	24.3	19.9	S	17.3	15.7	14.7	10.6	8.3	8.3	28.2	19.1																																																		
Dec 28	6.3	7	7.1	5.2	3.5	7.8	7.5	8.1	7.8	16.5	18.3	19.3	19.4	18.8	16.2	12.6	13	S	17.4	23	25.8	24.9	27.1	29.3	3.5	29.3	14.9																																																		
Dec 29	30.7	31	31.1	31.7	32.3	32.1	31.7	31.3	30.9	31	31.2	31	31.1	31.4	31.8	31.6	S	30.2	27.5	24.9	21	20.1	19.4	20.1	19.4	32.3	28.9																																																		
Dec 30	19.7	16.9	16	17.1	12.9	9	8.2	5.3	2	7.8	11.6	12.9	17.6	24.9	27.6	S	15.5	13.6	21.3	20	18.5	16.7	16.6	16.2	2.0	27.6	15.1																																																		
Dec 31	15	14.7	11.7	12.4	13.3	13	12.2	11.7	12.7	16.2	20.5	22.6	23.9	25.3	S	28.2	28	25.7	21.2	20.4	19	17.8	16.8	14.8	11.7	28.2	18.1																																																		
Diurnal Maximum	37	37	36	35	35	38	42	42	41	40	40	40	39	39	40	40	39	39	39	39	39	34	38	38	38																																																				
Diurnal Average	19.9	19.9	19.5	20.2	20.9	21.6	22.4	21.2	21.0	22.4	24.5	25.6	26.9	28.0	28.2	26.9	24.8	24.3	23.7	24.3	22.5	22.3	21.0	20.0																																																					
C	Monthly Calibration											S											Daily Zero-Span Check											Q											Quality Assurance																																
K	Collection Error											N											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.																																																																													

Timeseries Chart of Hourly Average for O3 - Cold Lake South Station



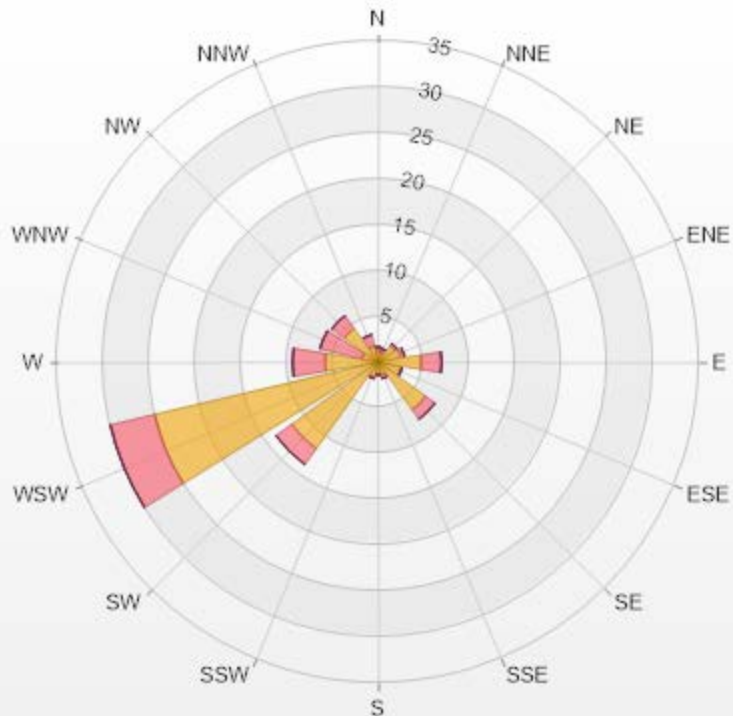
O3[ppb] Histogram: Cold Lake South Monthly: 12-2021 1 Hr.



Classes	O3
<=0	0.00%
0 - 10	11.60%
10 - 20	21.22%
20 - 30	43.00%
30 - 40	23.62%
40 - 50	0.57%
50 - 60	0.00%
60 - 70	0.00%
70 - 80	0.00%
80 - 90	0.00%
>90	0.00%

Wind: Cold Lake South Poll.: Cold Lake South-O3[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.27	0.42	0	0	0	1.69
NNE	1.13	0.42	0	0	0	1.55
NE	2.26	0.28	0	0	0	2.54
ENE	2.55	0.42	0	0	0	2.97
E	4.67	2.26	0	0	0	6.93
ESE	2.55	0.14	0	0	0	2.69
SE	6.36	1.27	0	0	0	7.63
SSE	1.41	0.42	0	0	0	1.83
S	1.27	0.14	0	0	0	1.41
SSW	1.7	0.14	0	0	0	1.84
SW	11.6	2.12	0	0	0	13.72
WSW	25.04	4.95	0	0	0	29.99
W	5.8	3.54	0	0	0	9.34
WNW	1.84	4.67	0	0	0	6.51
NW	4.53	1.7	0	0	0	6.23
NNW	1.84	1.27	0	0	0	3.11
Summary	75.82	24.16	0	0	0	100



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% Icon Classes (ppb)

76 0-30

24

30-50

0

50-76

0

76-159

0

>159.0



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Cold Lake South Station - December 2021

Summary of Hourly Averages

TOTAL HYDROCARBONS (THC) in ppm

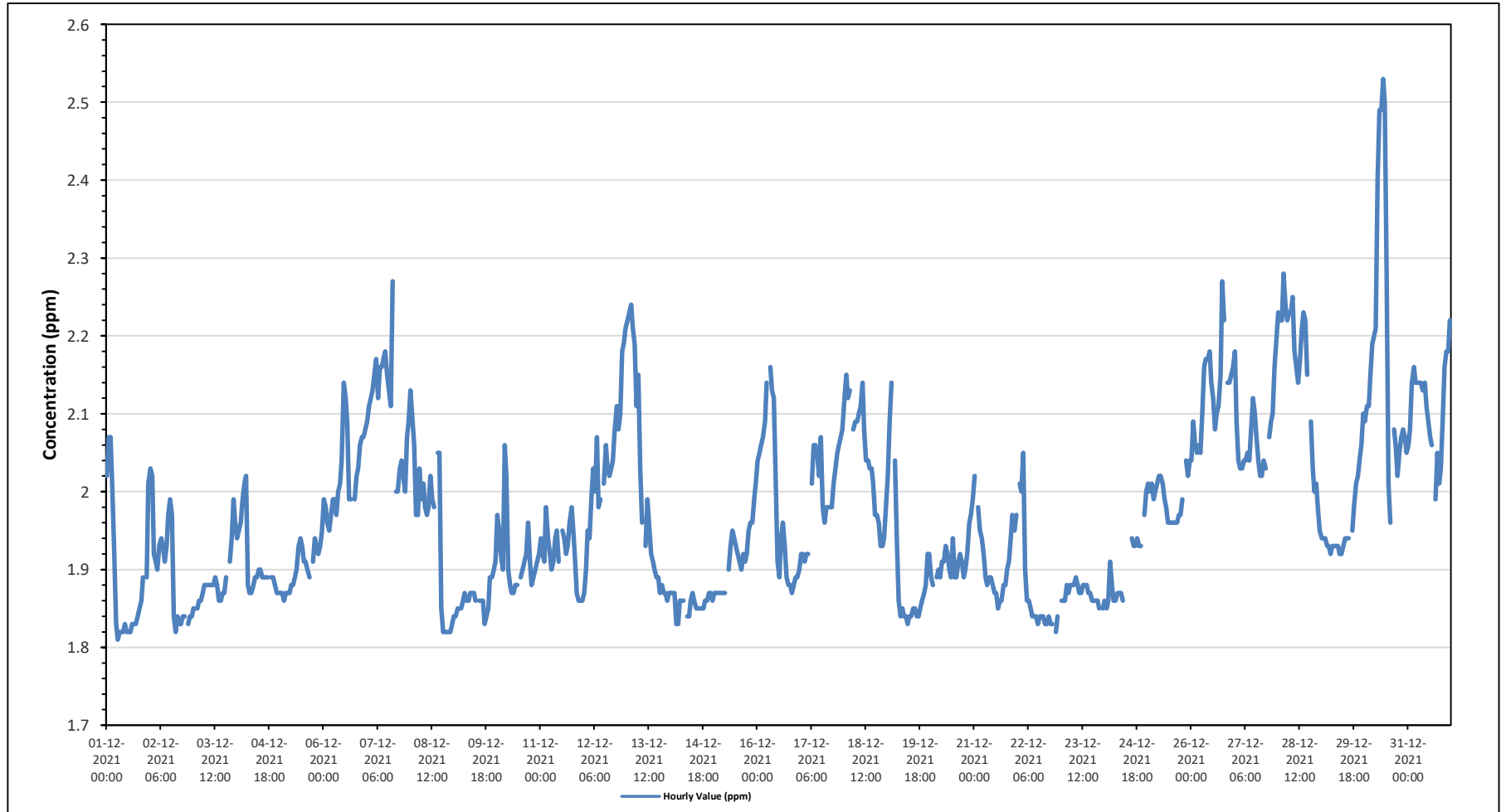
Maximum Hourly Value:	2.53 ppm on December 30 at hour 10	Hours in Service:	744
Maximum Daily Value:	2.18 ppm on December 30	Hours of Data:	707
Minimum Hourly Value:	1.81 ppm on December 1 at hour 6	Hours of Missing Data:	1
Minimum Daily Value:	1.86 ppm on December 14	Hours of Calibration:	36
Monthly Average:	1.97 ppm	Operational Uptime:	99.9

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	
Dec 1	2.02	2.07	2.07	2.01	1.93	1.83	1.81	1.82	1.82	1.82	1.83	1.82	1.82	1.82	1.83	1.83	1.83	1.84	1.85	1.86	1.89	S	1.89	2.01	1.81	2.07	1.88	
Dec 2	2.03	2.02	1.92	1.91	1.90	1.93	1.94	1.93	1.91	1.93	1.97	1.99	1.97	1.84	1.82	1.84	1.83	1.83	1.84	1.84	S	1.83	1.84	1.84	1.82	2.03	1.90	
Dec 3	1.85	1.85	1.85	1.86	1.86	1.87	1.88	1.88	1.88	1.88	1.88	1.88	1.89	1.88	1.86	1.86	1.87	1.87	1.89	S	1.91	1.94	1.99	1.96	1.85	1.99	1.88	
Dec 4	1.94	1.95	1.96	1.99	2.01	2.02	1.88	1.87	1.87	1.88	1.89	1.89	1.90	1.90	1.89	1.89	1.89	1.89	S	1.89	1.89	1.88	1.87	1.87	1.87	2.02	1.91	
Dec 5	1.87	1.87	1.86	1.87	1.87	1.87	1.88	1.88	1.89	1.90	1.93	1.94	1.93	1.91	1.91	1.90	1.89	S	1.91	1.94	1.93	1.92	1.93	1.95	1.86	1.95	1.90	
Dec 6	1.99	1.98	1.96	1.95	1.97	1.99	1.99	1.97	2.00	2.01	2.04	2.14	2.12	2.09	1.99	1.99	S	1.99	2.02	2.03	2.06	2.07	2.07	2.08	1.95	2.14	2.02	
Dec 7	2.09	2.11	2.12	2.13	2.15	2.17	2.12	2.16	2.16	2.17	2.18	2.15	2.13	2.11	2.27	S	2.00	2.00	2.03	2.04	2.02	2.00	2.07	2.09	2.00	2.27	2.11	
Dec 8	2.13	2.09	2.06	1.97	1.97	2.03	1.99	2.01	1.98	1.97	1.98	2.02	1.99	1.98	S	2.05	2.05	1.85	1.82	1.82	1.82	1.82	1.82	1.83	1.82	2.13	1.96	
Dec 9	1.84	1.84	1.85	1.85	1.85	1.86	1.87	1.86	1.86	1.87	1.87	1.87	1.86	S	1.86	1.86	1.86	1.83	1.84	1.85	1.89	1.89	1.90	1.91	1.83	1.91	1.86	
Dec 10	1.97	1.95	1.92	1.90	2.06	2.02	1.90	1.88	1.87	1.87	1.88	1.88	S	1.89	1.90	1.91	1.92	1.96	1.91	1.88	1.89	1.90	1.91	1.92	1.87	2.06	1.92	
Dec 11	1.94	1.92	1.91	1.98	1.94	1.92	1.90	1.91	1.94	1.95	1.91	S	1.95	1.94	1.92	1.93	1.96	1.98	1.95	1.91	1.87	1.86	1.86	1.86	1.86	1.98	1.92	
Dec 12	1.87	1.90	1.95	1.94	1.99	2.03	2.00	2.07	1.98	1.99	S	2.01	2.06	2.03	2.02	2.03	2.04	2.08	2.11	2.08	2.10	2.18	2.19	2.21	1.87	2.21	2.04	
Dec 13	2.22	2.23	2.24	2.21	2.19	2.11	2.15	2.03	1.96	S	1.93	1.99	1.96	1.92	1.91	1.90	1.89	1.89	1.87	1.88	1.87	1.87	1.86	1.87	1.86	1.86	2.24	2.00
Dec 14	1.87	1.87	1.87	1.83	1.83	1.86	1.86	1.86	S	1.84	1.84	1.86	1.87	1.86	1.85	1.85	1.85	1.85	1.85	1.86	1.86	1.87	1.87	1.86	1.83	1.87	1.86	
Dec 15	1.87	1.87	1.87	1.87	1.87	1.87	1.87	S	1.90	1.93	1.95	1.94	1.93	1.92	1.91	1.90	1.92	1.91	1.92	1.91	1.92	1.95	1.96	1.96	1.99	2.01	1.92	
Dec 16	2.04	2.05	2.06	2.07	2.09	2.14	S	2.16	2.13	2.12	2.00	1.91	1.89	1.94	1.96	1.93	1.89	1.88	1.88	1.87	1.88	1.89	1.89	1.90	1.87	2.16	1.98	
Dec 17	1.92	1.92	1.91	1.92	1.92	S	2.01	2.06	2.06	2.05	2.02	2.07	1.98	1.96	1.98	1.98	1.98	1.98	2.01	2.03	2.05	2.06	2.07	2.08	1.91	2.08	2.00	
Dec 18	2.12	2.15	2.12	2.13	S	2.08	2.09	2.09	2.10	2.11	2.14	2.08	2.04	2.04	2.03	2.01	1.97	1.97	1.96	1.93	1.93	1.94	1.94	1.98	1.93	2.15	2.05	
Dec 19	2.02	2.09	2.14	S	2.04	1.94	1.86	1.84	1.85	1.84	1.84	1.83	1.84	1.84	1.85	1.85	1.84	1.84	1.85	1.86	1.87	1.88	1.92	1.92	1.83	2.14	1.90	
Dec 20	1.89	1.88	S	1.89	1.90	1.89	1.91	1.91	1.93	1.92	1.90	1.89	1.94	1.89	1.89	1.91	1.92	1.91	1.89	1.90	1.92	1.96	1.97	1.99	1.88	1.99	1.91	
Dec 21	2.02	S	1.98	1.95	1.94	1.92	1.89	1.88	1.89	1.89	1.88	1.87	1.87	1.85	1.86	1.86	1.88	1.88	1.90	1.91	1.94	1.97	1.95	1.97	1.85	2.02	1.91	
Dec 22	S	2.01	2.00	2.05	1.90	1.86	1.86	1.85	1.84	1.84	1.84	1.83	1.84	1.84	1.84	1.83	1.84	1.83	1.83	1.83	X	1.82	1.84	S	1.82	2.05	1.87	
Dec 23	1.86	1.86	1.86	1.88	1.87	1.88	1.88	1.88	1.89	1.88	1.87	1.87	1.88	1.88	1.88	1.88	1.87	1.87	1.86	1.86	1.86	1.86	1.85	S	1.85	1.85	1.89	1.87
Dec 24	1.86	1.85	1.86	1.91	1.88	1.86	1.86	1.87	1.87	1.87	1.86	C	C	C	C	1.94	1.93	1.93	1.94	1.93	1.93	S	1.97	2.00	1.85	2.00	1.90	
Dec 25	2.01	2.00	2.01	1.99	2.00	2.01	2.02	2.02	2.01	1.99	1.98	1.96	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.99	S	2.04	2.02	2.04	1.96	2.04	1.99	
Dec 26	2.04	2.09	2.06	2.05	2.06	2.05	2.10	2.16	2.17	2.17	2.18	2.14	2.12	2.08	2.10	2.11	2.15	2.27	2.22	S	2.14	2.14	2.15	2.16	2.04	2.27	2.13	
Dec 27	2.18	2.09	2.04	2.03	2.03	2.04	2.04	2.05	2.04	2.08	2.12	2.10	2.07	2.04	2.02	2.02	2.04	2.03	S	2.07	2.09	2.10	2.16	2.20	2.02	2.20	2.07	
Dec 28	2.23	2.22	2.22	2.28	2.24	2.22	2.23	2.23	2.25	2.18	2.16	2.14	2.17	2.21	2.23	2.22	2.15	S	2.09	2.03	2.00	2.01	1.98	1.95	1.95	2.28	2.16	
Dec 29	1.94	1.94	1.94	1.93	1.93	1.92	1.93	1.93	1.93	1.93	1.92	1.92	1.93	1.94	1.94	1.94	S	1.95	1.98	2.01	2.02	2.04	2.06	2.10	1.92	2.10	1.96	
Dec 30	2.09	2.11	2.11	2.15	2.19	2.20	2.21	2.40	2.49	2.49	2.53	2.50	2.28	2.01	1.96	S	2.08	2.06	2.02	2.05	2.07	2.08	2.07	2.05	1.96	2.53	2.18	
Dec 31	2.06	2.08	2.14	2.16	2.14	2.14	2.14	2.14	2.13	2.14	2.11	2.09	2.07	2.06	S	1.99	2.05	2.01	2.03	2.09	2.16	2.18	2.18	2.22	1.99	2.22	2.11	
Diurnal Maximum	2.23	2.23	2.24	2.28	2.24	2.22	2.23	2.40	2.49	2.49	2.53	2.50	2.28	2.21	2.27	2.22	2.15	2.27	2.22	2.09	2.16	2.18	2.19	2.22				
Diurnal Average	1.99	2.00	2.00	1.99	1.98	1.98	1.97	1.99	1.99	1.98	1.98	1.99	1.97	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.96	1.96	1.97	1.99				

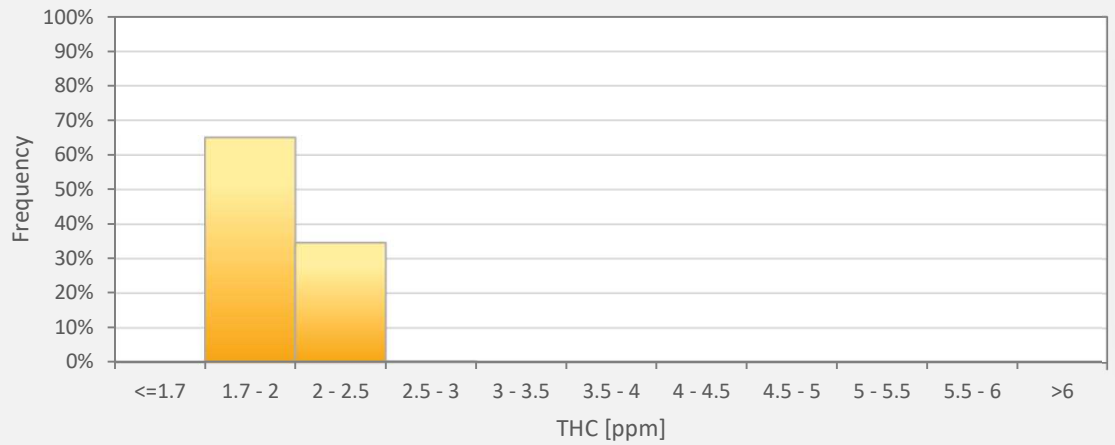
C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	No Data (Machine Not in Service)	Y	Routine Maintenance
X	InValid Data (Equipment Malfunction /Recovery)	NRM	UnitMaint (Repeat Calibration / Repeat Daily Zero-Span Check / Non-Routine Maintenance)	P	Power Failure

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.

Timeseries Chart of Hourly Average for THC - Cold Lake South Station



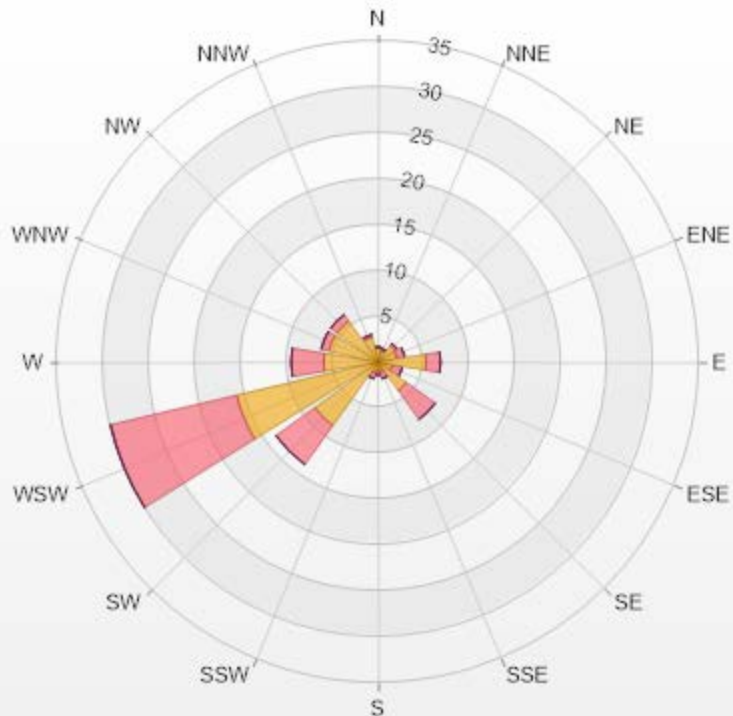
THC55[ppm] Histogram: Cold Lake South Monthly: 12-2021 1 Hr.



Classes	THC55
<=1.7	0.00%
1.7 - 2	65.06%
2 - 2.5	34.65%
2.5 - 3	0.28%
3 - 3.5	0.00%
3.5 - 4	0.00%
4 - 4.5	0.00%
4.5 - 5	0.00%
5 - 5.5	0.00%
5.5 - 6	0.00%
>6	0.00%

Wind: Cold Lake South Poll.: Cold Lake South-THC55[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	1.56	0.14	0	0	0	1.7
NNE	1.27	0.28	0	0	0	1.55
NE	2.26	0.28	0	0	0	2.54
ENE	2.12	0.85	0	0	0	2.97
E	5.23	1.56	0	0	0	6.79
ESE	1.56	1.13	0	0	0	2.69
SE	3.82	3.82	0	0	0	7.64
SSE	0.99	0.85	0	0	0	1.84
S	0.99	0.42	0	0	0	1.41
SSW	1.13	0.71	0	0	0	1.84
SW	8.49	5.23	0	0	0	13.72
WSW	15.84	14.14	0	0	0	29.98
W	5.94	3.54	0	0	0	9.48
WNW	5.52	0.85	0	0	0	6.37
NW	5.52	0.85	0	0	0	6.37
NNW	2.83	0.28	0	0	0	3.11
Summary	65.07	34.93	0	0	0	100



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% Icon Classes (ppm)

65 0-2

35 2-5

0 5-10

0 10-40

0 >40.0



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Cold Lake South Station - December 2021

Summary of Hourly Averages

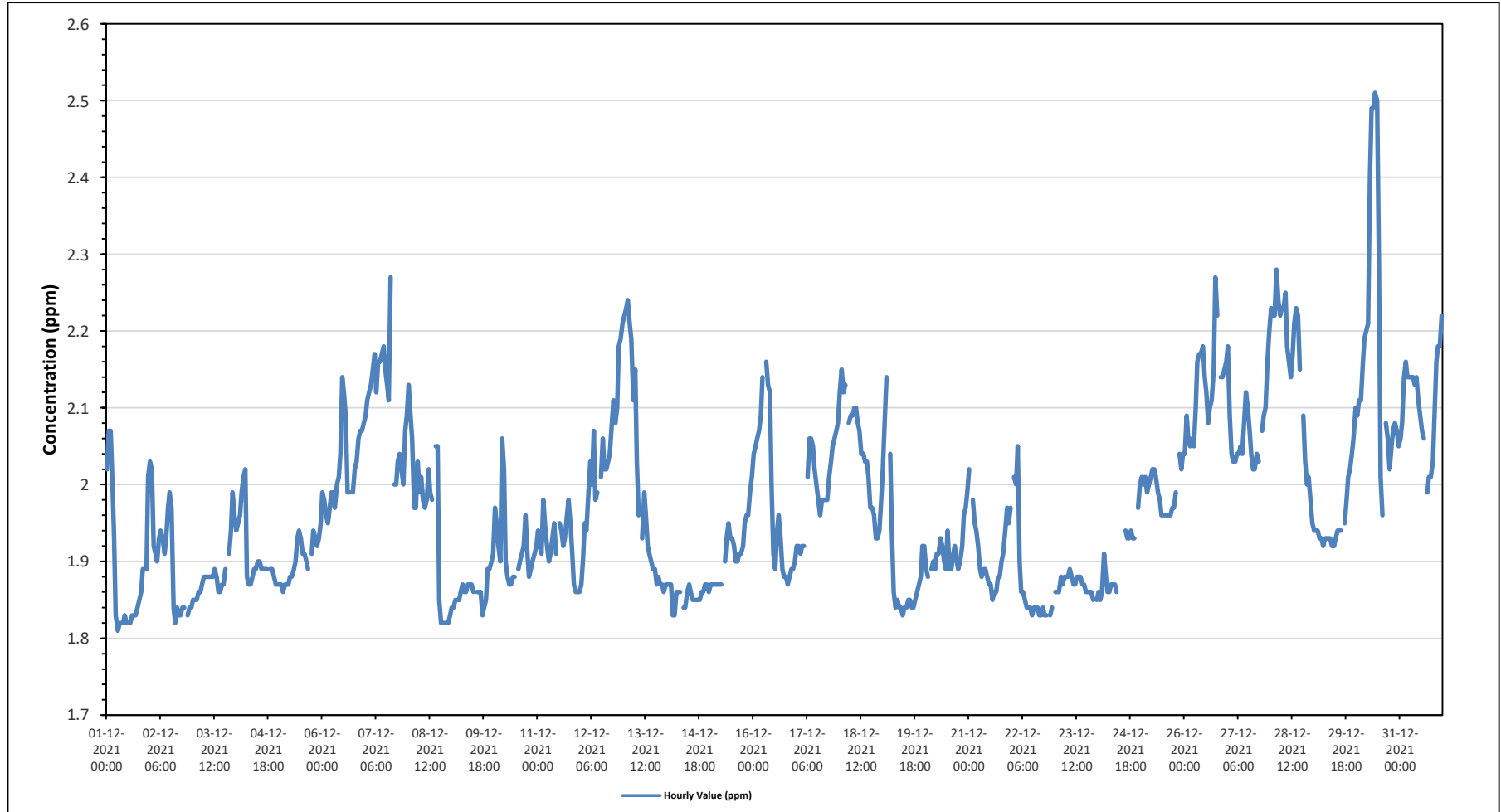
METHANE (CH4) in ppm

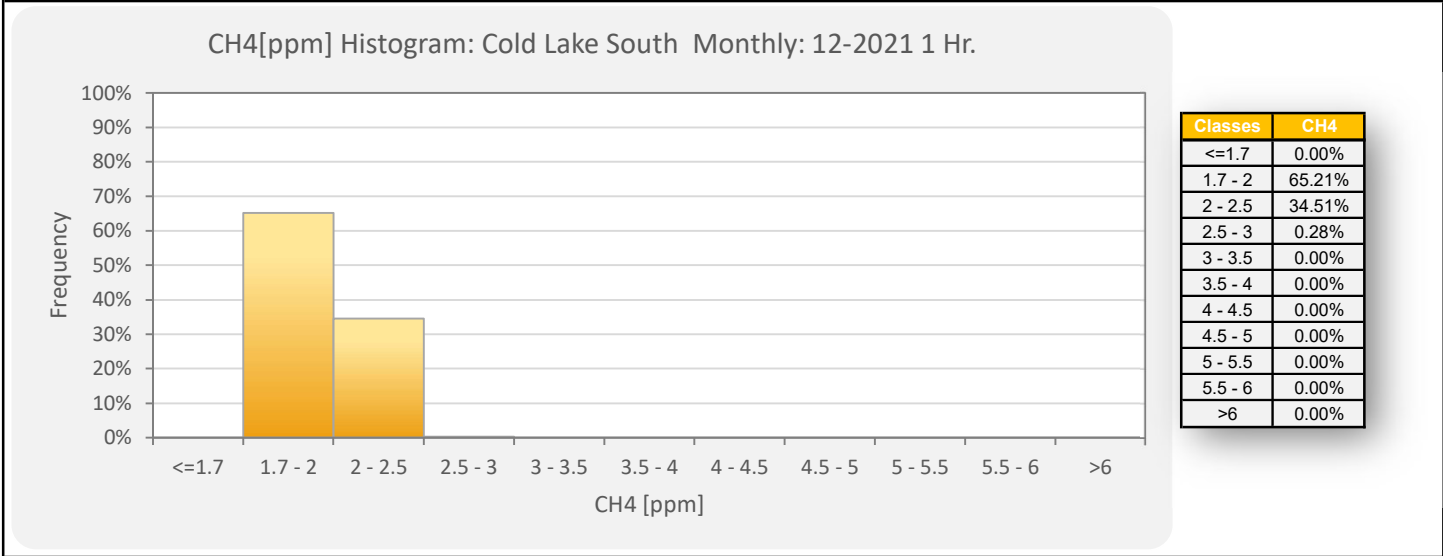
Maximum Hourly Value:	2.51 ppm on December 30 at hour 10	Hours in Service:	744
Maximum Daily Value:	2.18 ppm on December 30	Hours of Data:	707
Minimum Hourly Value:	1.81 ppm on December 1 at hour 6	Hours of Missing Data:	1
Minimum Daily Value:	1.86 ppm on December 14	Hours of Calibration:	36
Monthly Average:	1.97 ppm	Operational Uptime:	99.9

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																
Dec 1	2.02	2.07	2.07	2.01	1.93	1.83	1.81	1.82	1.82	1.82	1.83	1.82	1.82	1.82	1.83	1.83	1.83	1.84	1.85	1.86	1.89	S	1.89	2.01	1.81	2.07	1.88																
Dec 2	2.03	2.02	1.92	1.91	1.90	1.93	1.94	1.93	1.91	1.93	1.97	1.99	1.97	1.84	1.82	1.84	1.83	1.83	1.84	1.84	S	1.83	1.84	1.84	1.82	2.03	1.90																
Dec 3	1.85	1.85	1.85	1.86	1.86	1.87	1.88	1.88	1.88	1.88	1.88	1.88	1.89	1.88	1.86	1.86	1.87	1.87	1.89	S	1.91	1.94	1.99	1.96	1.85	1.99	1.88																
Dec 4	1.94	1.95	1.96	1.99	2.01	2.02	1.88	1.87	1.87	1.88	1.89	1.89	1.90	1.90	1.89	1.89	1.89	1.89	S	1.89	1.89	1.88	1.87	1.87	1.87	2.02	1.91																
Dec 5	1.87	1.87	1.86	1.87	1.87	1.87	1.88	1.88	1.89	1.90	1.93	1.94	1.93	1.91	1.91	1.90	1.89	S	1.91	1.94	1.93	1.92	1.93	1.95	1.86	1.95	1.90																
Dec 6	1.99	1.98	1.96	1.95	1.97	1.99	1.99	1.97	2.00	2.01	2.04	2.14	2.12	2.09	1.99	1.99	S	1.99	2.02	2.03	2.06	2.07	2.07	2.08	1.95	2.14	2.02																
Dec 7	2.09	2.11	2.12	2.13	2.15	2.17	2.12	2.16	2.16	2.17	2.18	2.15	2.13	2.11	2.27	S	2.00	2.00	2.03	2.04	2.02	2.00	2.07	2.09	2.00	2.27	2.11																
Dec 8	2.13	2.09	2.06	1.97	1.97	2.03	1.99	2.01	1.98	1.97	1.98	2.02	1.99	1.98	S	2.05	2.05	1.85	1.82	1.82	1.82	1.82	1.82	1.83	1.82	2.13	1.96																
Dec 9	1.84	1.84	1.85	1.85	1.85	1.86	1.87	1.86	1.86	1.87	1.87	1.87	1.86	S	1.86	1.86	1.86	1.83	1.84	1.85	1.89	1.89	1.90	1.91	1.83	1.91	1.86																
Dec 10	1.97	1.95	1.92	1.90	2.06	2.02	1.90	1.88	1.87	1.87	1.88	1.88	S	1.89	1.90	1.91	1.92	1.96	1.91	1.88	1.89	1.90	1.91	1.92	1.87	2.06	1.92																
Dec 11	1.94	1.92	1.91	1.98	1.94	1.92	1.90	1.91	1.93	1.95	1.91	S	1.95	1.94	1.92	1.93	1.96	1.98	1.95	1.91	1.87	1.86	1.86	1.86	1.86	1.98	1.92																
Dec 12	1.87	1.90	1.95	1.94	1.99	2.03	2.00	2.07	1.98	1.99	S	2.01	2.06	2.02	2.02	2.03	2.04	2.08	2.11	2.08	2.10	2.18	2.19	2.21	1.87	2.21	2.04																
Dec 13	2.22	2.23	2.24	2.21	2.19	2.11	2.15	2.03	1.96	S	1.93	1.99	1.96	1.92	1.91	1.90	1.89	1.89	1.87	1.88	1.87	1.87	1.86	1.87	1.86	1.86	2.24	2.00															
Dec 14	1.87	1.87	1.87	1.83	1.83	1.86	1.86	1.86	S	1.84	1.84	1.86	1.87	1.86	1.85	1.85	1.85	1.85	1.86	1.86	1.87	1.87	1.86	1.87	1.83	1.87	1.86																
Dec 15	1.87	1.87	1.87	1.87	1.87	1.87	1.87	S	1.90	1.93	1.95	1.93	1.93	1.92	1.90	1.90	1.91	1.91	1.92	1.95	1.96	1.96	1.99	2.01	1.87	2.01	1.92																
Dec 16	2.04	2.05	2.06	2.07	2.09	2.14	S	2.16	2.13	2.12	2.00	1.91	1.89	1.94	1.96	1.93	1.89	1.88	1.88	1.87	1.88	1.89	1.89	1.90	1.87	2.16	1.98																
Dec 17	1.92	1.92	1.91	1.92	1.92	S	2.01	2.06	2.06	2.05	2.02	2.00	1.98	1.96	1.98	1.98	1.98	1.98	2.01	2.03	2.05	2.06	2.07	2.08	1.91	2.08	2.00																
Dec 18	2.12	2.15	2.12	2.13	S	2.08	2.09	2.09	2.10	2.10	2.08	2.07	2.04	2.04	2.03	2.03	2.01	1.97	1.97	1.96	1.93	1.93	1.94	1.98	1.93	2.15	2.04																
Dec 19	2.02	2.09	2.14	S	2.04	1.94	1.86	1.84	1.85	1.84	1.84	1.83	1.84	1.84	1.85	1.85	1.84	1.84	1.85	1.86	1.87	1.88	1.92	1.92	1.83	2.14	1.90																
Dec 20	1.89	1.88	S	1.89	1.90	1.89	1.91	1.91	1.93	1.92	1.90	1.89	1.94	1.89	1.89	1.91	1.92	1.90	1.89	1.90	1.92	1.96	1.97	1.99	1.88	1.99	1.91																
Dec 21	2.02	S	1.98	1.95	1.94	1.92	1.89	1.88	1.89	1.89	1.88	1.87	1.87	1.85	1.86	1.86	1.88	1.88	1.90	1.91	1.94	1.97	1.95	1.97	1.85	2.02	1.91																
Dec 22	S	2.01	2.00	2.05	1.90	1.86	1.86	1.85	1.84	1.84	1.84	1.83	1.84	1.84	1.84	1.83	1.83	1.84	1.83	1.83	X	1.83	1.84	S	1.83	2.05	1.87																
Dec 23	1.86	1.86	1.86	1.88	1.87	1.88	1.88	1.88	1.89	1.88	1.87	1.87	1.88	1.88	1.88	1.88	1.87	1.87	1.86	1.86	1.86	1.86	1.85	S	1.85	1.85	1.89	1.87															
Dec 24	1.86	1.85	1.86	1.91	1.88	1.86	1.86	1.87	1.87	1.87	1.86	C	C	C	C	1.94	1.93	1.93	1.94	1.93	1.93	S	1.97	2.00	1.85	2.00	1.90																
Dec 25	2.01	2.00	2.01	1.99	2.00	2.01	2.02	2.02	2.01	1.99	1.98	1.96	1.96	1.96	1.96	1.96	1.96	1.97	1.97	1.99	S	2.04	2.02	2.04	1.96	2.04	1.99																
Dec 26	2.04	2.09	2.06	2.05	2.06	2.05	2.10	2.16	2.17	2.17	2.18	2.14	2.12	2.08	2.10	2.11	2.15	2.27	2.22	S	2.14	2.14	2.15	2.16	2.04	2.27	2.13																
Dec 27	2.18	2.09	2.04	2.03	2.03	2.04	2.04	2.05	2.04	2.08	2.12	2.10	2.07	2.04	2.02	2.02	2.04	2.03	S	2.07	2.09	2.10	2.16	2.20	2.02	2.20	2.07																
Dec 28	2.23	2.22	2.22	2.28	2.24	2.22	2.23	2.23	2.25	2.18	2.16	2.14	2.17	2.21	2.23	2.22	2.15	S	2.09	2.03	2.00	2.01	1.98	1.95	1.95	2.28	2.16																
Dec 29	1.94	1.94	1.94	1.93	1.93	1.92	1.93	1.93	1.93	1.93	1.92	1.92	1.93	1.94	1.94	1.94	S	1.95	1.98	2.01	2.02	2.04	2.06	2.10	1.92	2.10	1.96																
Dec 30	2.09	2.11	2.11	2.15	2.19	2.20	2.21	2.40	2.49	2.49	2.51	2.50	2.28	2.01	1.96	S	2.08	2.06	2.02	2.05	2.07	2.08	2.07	2.05	1.96	2.51	2.18																
Dec 31	2.06	2.08	2.14	2.16	2.14	2.14	2.14	2.14	2.13	2.14	2.11	2.09	2.07	2.06	S	1.99	2.01	2.01	2.03	2.09	2.16	2.18	2.18	2.22	1.99	2.22	2.11																
Diurnal Maximum	2.23	2.23	2.24	2.28	2.24	2.22	2.23	2.40	2.49	2.49	2.51	2.50	2.28	2.21	2.27	2.22	2.15	2.27	2.22	2.22	2.09	2.16	2.18	2.19	2.22																		
Diurnal Average	1.99	2.00	2.00	1.99	1.98	1.98	1.97	1.99	1.99	1.98	1.98	1.98	1.97	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.96	1.96	1.97	1.99																		
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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.

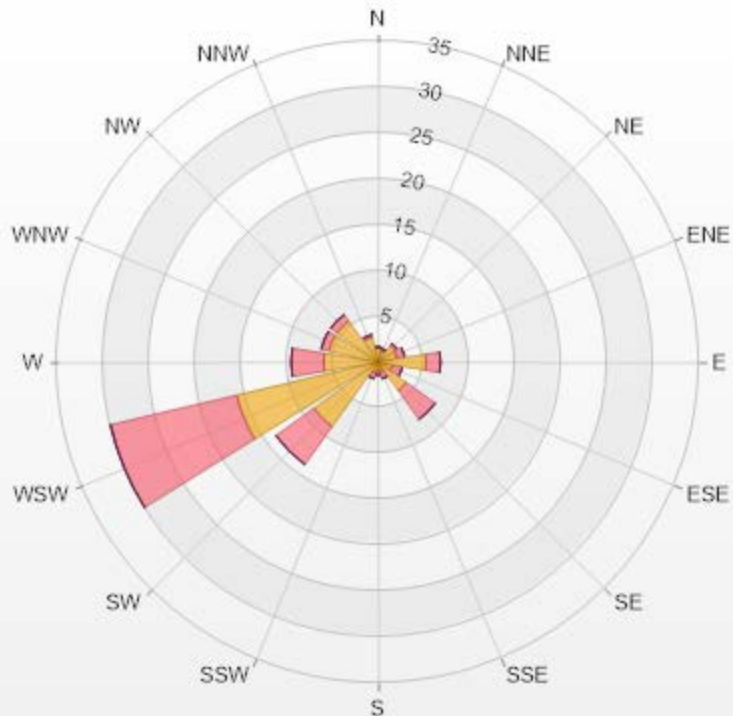
Timeseries Chart of Hourly Average for CH4 - Cold Lake South Station





Wind: Cold Lake South Poll.: Cold Lake South-CH4[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	1.56	0.14	0	0	0	1.7
NNE	1.27	0.28	0	0	0	1.55
NE	2.26	0.28	0	0	0	2.54
ENE	2.12	0.85	0	0	0	2.97
E	5.23	1.56	0	0	0	6.79
ESE	1.56	1.13	0	0	0	2.69
SE	3.82	3.82	0	0	0	7.64
SSE	0.99	0.85	0	0	0	1.84
S	0.99	0.42	0	0	0	1.41
SSW	1.13	0.71	0	0	0	1.84
SW	8.63	5.09	0	0	0	13.72
WSW	15.84	14.14	0	0	0	29.98
W	5.94	3.54	0	0	0	9.48
WNW	5.52	0.85	0	0	0	6.37
NW	5.52	0.85	0	0	0	6.37
NNW	2.83	0.28	0	0	0	3.11
Summary	65.21	34.79	0	0	0	100



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% Icon Classes (ppm)

65 0-2

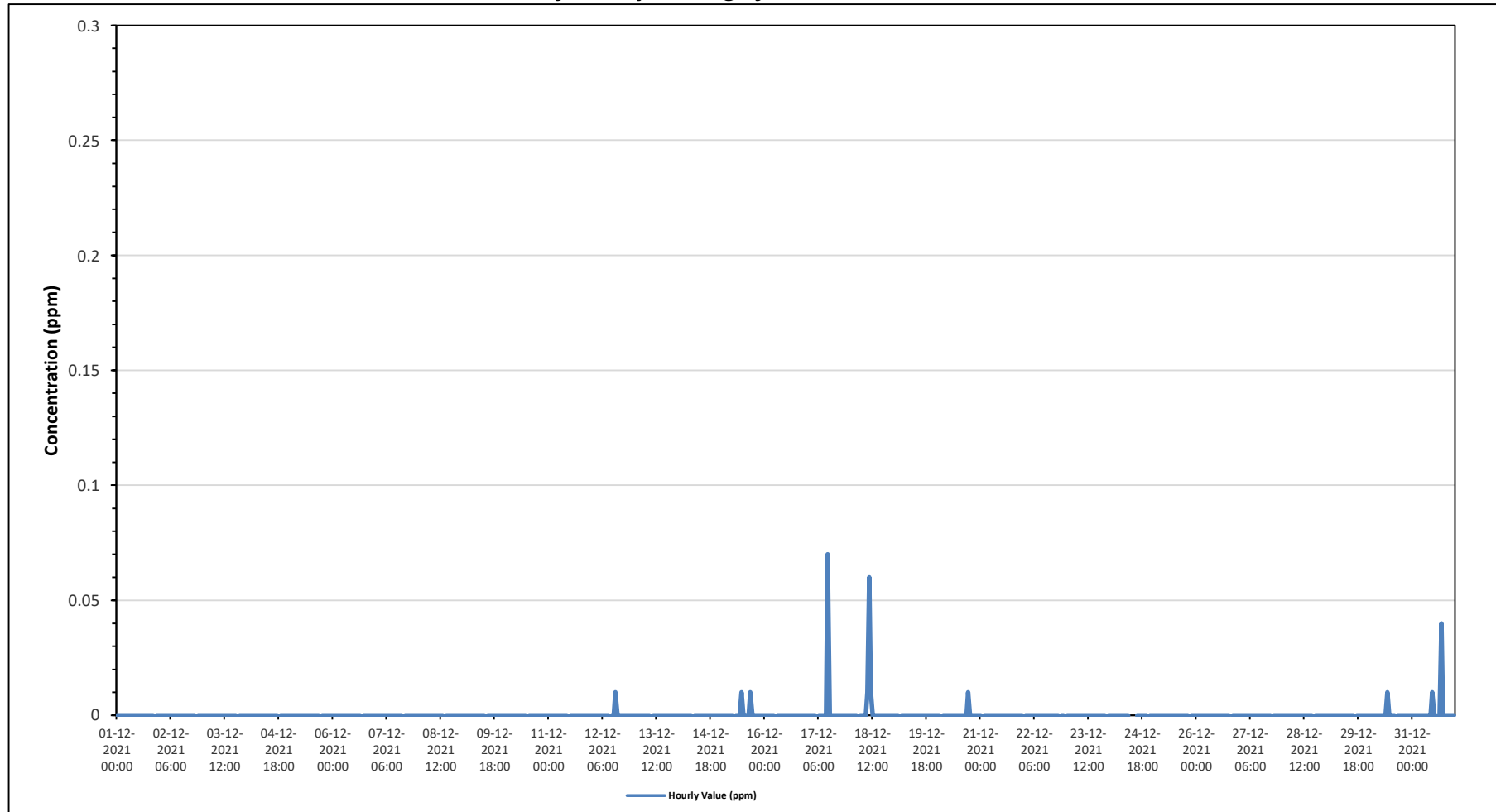
35 2-5

0 5-10

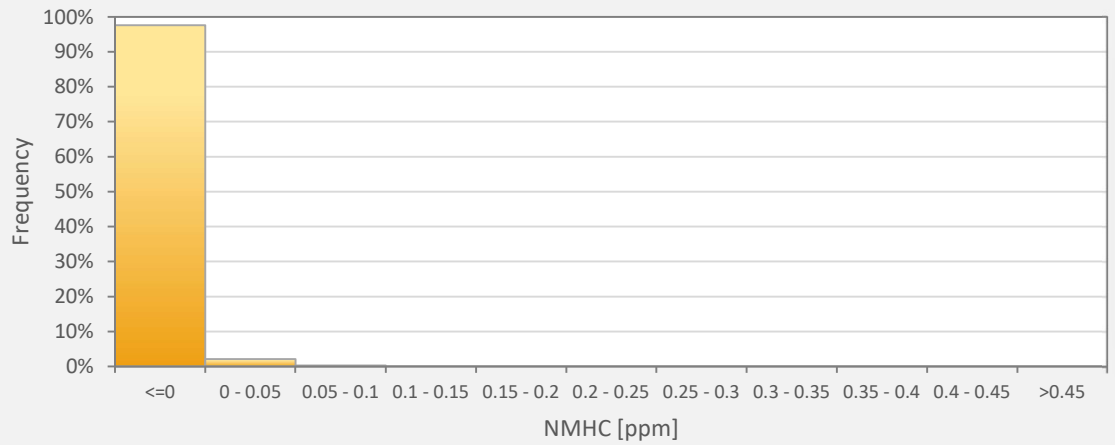
0 10-20

0 >20.0

Timeseries Chart of Hourly Average for NMHC - Cold Lake South Station



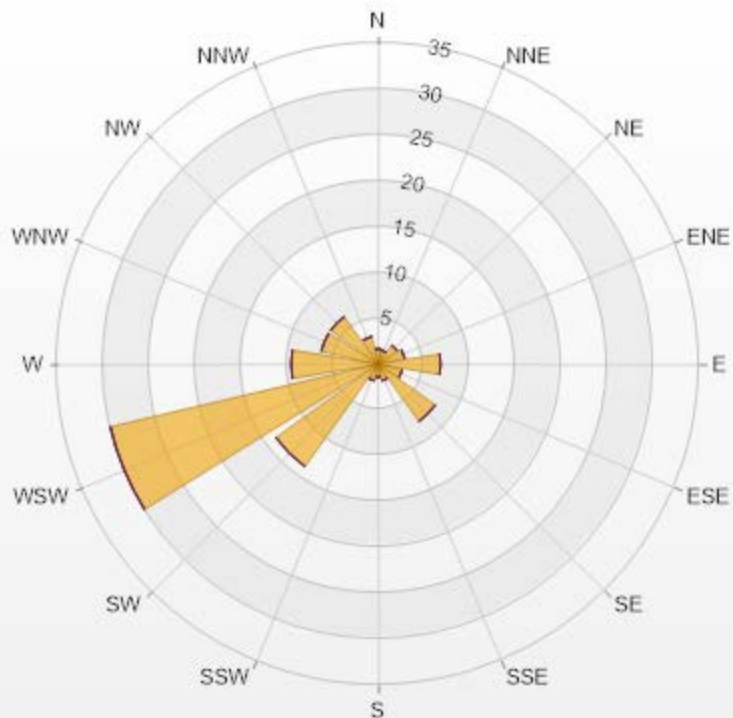
NMHC[ppm] Histogram: Cold Lake South Monthly: 12-2021 1 Hr.



Classes	NMHC
<=0	97.60%
0 - 0.05	2.12%
0.05 - 0.1	0.28%
0.1 - 0.15	0.00%
0.15 - 0.2	0.00%
0.2 - 0.25	0.00%
0.25 - 0.3	0.00%
0.3 - 0.35	0.00%
0.35 - 0.4	0.00%
0.4 - 0.45	0.00%
>0.45	0.00%

Wind: Cold Lake South Poll.: Cold Lake South-NMHC[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	1.7	0	0	0	0	1.7
NNE	1.56	0	0	0	0	1.56
NE	2.55	0	0	0	0	2.55
ENE	2.97	0	0	0	0	2.97
E	6.79	0	0	0	0	6.79
ESE	2.69	0	0	0	0	2.69
SE	7.64	0	0	0	0	7.64
SSE	1.84	0	0	0	0	1.84
S	1.41	0	0	0	0	1.41
SSW	1.84	0	0	0	0	1.84
SW	13.72	0	0	0	0	13.72
WSW	29.99	0	0	0	0	29.99
W	9.48	0	0	0	0	9.48
WNW	6.36	0	0	0	0	6.36
NW	6.36	0	0	0	0	6.36
NNW	3.11	0	0	0	0	3.11
Summary	100	0	0	0	0	100




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% Icon Classes (ppm)

100  0-0.1

0  0.1-0.3

0  0.3-0.9

0  0.9-2

0  >2.0



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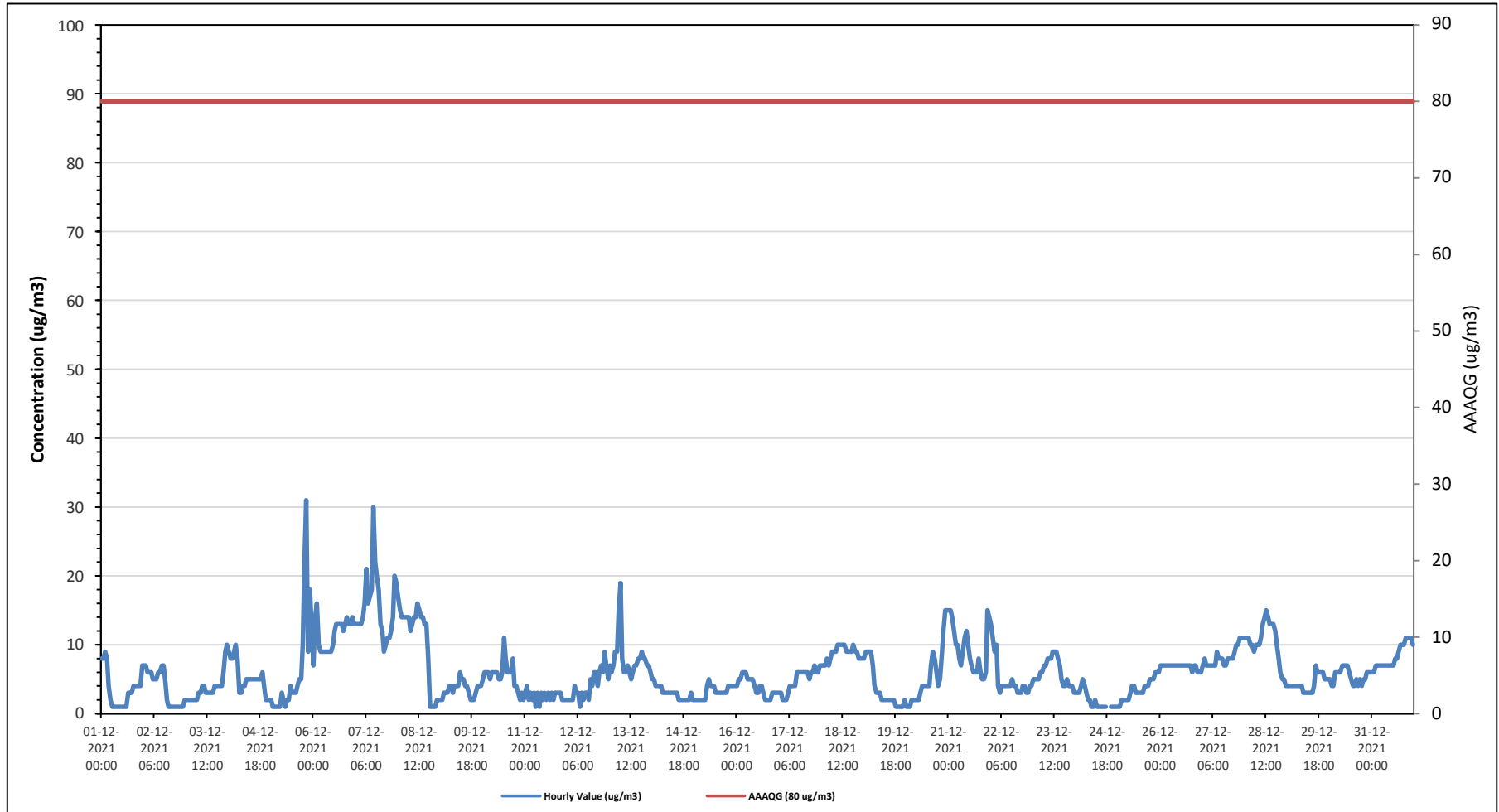
Cold Lake South Station - December 2021

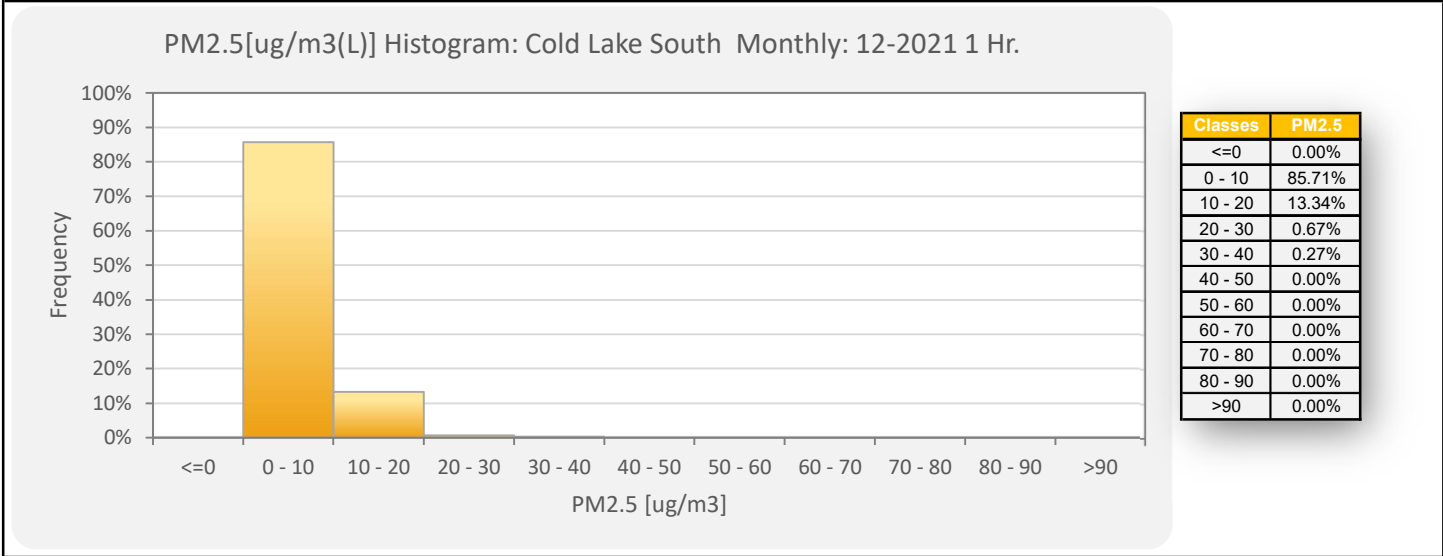
Summary of Hourly Averages

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

Alberta Ambient Air Quality Guideline (AAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAQO): 24-Hour 29 µg/m ³																																																			
Number of 1-Hour Exceedences: 0												Number of 24-Hour Exceedences: 0																																							
Maximum Hourly Value: 31 µg/m ³ on December 5 at hour 20												Hours in Service: 744																																							
Maximum Daily Value: 15.6 µg/m ³ on December 7												Hours of Data: 742																																							
Minimum Hourly Value: 1 µg/m ³ on December 1 at hour 6												Hours of Missing Data: 0																																							
Minimum Daily Value: 2 µg/m ³ on December 24												Hours of Calibration: 2																																							
Monthly Average: 6.0 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																								
Dec 1	8	8	9	8	4	2	1	1	1	1	1	1	1	1	1	3	3	3	4	4	4	4	7	1	9	3.5																									
Dec 2	7	7	6	6	6	5	5	5	6	6	7	7	5	2	1	1	1	1	1	1	1	1	2	1	7	3.8																									
Dec 3	2	2	2	2	2	2	2	3	3	4	4	3	3	3	3	4	4	4	4	4	6	9	10	2	10	3.7																									
Dec 4	9	8	8	9	10	8	3	3	4	4	5	5	5	5	5	5	5	5	5	6	4	2	2	2	10	5.3																									
Dec 5	2	1	1	1	1	1	3	2	1	2	2	4	3	3	4	5	5	10	23	31	9	18	12	1	31	6.1																									
Dec 6	7	14	16	10	9	9	9	9	9	9	9	10	12	13	13	13	13	12	13	14	13	13	14	13	7	16	11.5																								
Dec 7	13	13	13	13	14	16	21	16	17	18	30	22	20	18	13	12	9	10	11	11	12	14	20	19	9	30	15.6																								
Dec 8	17	15	14	14	14	14	14	12	13	14	14	16	15	14	14	13	13	8	1	1	1	1	2	2	1	17	10.7																								
Dec 9	2	2	3	3	3	4	4	3	4	4	4	6	5	5	4	4	3	2	2	3	4	4	4	2	6	3.5																									
Dec 10	5	6	6	6	5	6	6	6	6	5	5	6	11	8	6	6	6	8	4	4	3	2	3	2	2	11	5.5																								
Dec 11	3	4	2	3	2	3	1	3	1	3	2	3	2	3	2	3	2	3	3	3	3	2	2	2	1	4	2.5																								
Dec 12	2	2	2	2	4	3	3	1	3	2	3	3	2	5	4	6	6	4	6	7	6	9	7	5	1	9	4.0																								
Dec 13	7	6	7	9	9	15	19	8	6	6	7	6	5	6	7	7	8	8	9	8	8	7	7	6	5	19	8.0																								
Dec 14	5	5	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	2	2	5	3.0																								
Dec 15	2	2	2	2	2	2	2	4	5	4	4	4	3	3	3	3	3	3	4	4	4	4	4	4	2	5	3.2																								
Dec 16	4	5	5	6	6	6	5	5	5	5	4	3	3	4	4	3	2	2	2	2	3	3	3	3	2	6	3.9																								
Dec 17	3	3	2	2	2	3	4	4	4	4	6	6	6	6	6	6	6	5	6	6	7	6	6	7	2	7	4.8																								
Dec 18	7	7	7	8	7	8	9	9	9	10	10	10	10	10	9	9	9	9	10	9	9	8	8	8	7	10	8.7																								
Dec 19	8	9	9	9	9	7	4	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	2	1	9	3.6																								
Dec 20	1	1	1	2	2	2	2	2	3	4	4	4	4	4	7	9	8	6	4	5	8	12	15	15	1	15	5.2																								
Dec 21	15	15	14	12	10	10	8	7	9	11	12	10	8	7	6	6	6	8	6	5	6	15	14	5	15	9.4																									
Dec 22	13	11	9	10	4	3	4	4	4	4	4	4	5	4	4	3	3	3	4	4	3	3	4	4	3	13	4.9																								
Dec 23	5	5	5	5	6	6	7	7	8	8	8	9	9	9	8	7	5	4	4	5	4	4	4	3	3	9	6.0																								
Dec 24	3	3	3	4	5	4	3	2	2	1	1	2	1	1	1	1	1	1	C	C	1	1	1	1	1	5	2.0																								
Dec 25	1	1	2	2	2	2	2	3	4	4	3	3	3	3	4	4	4	5	5	5	6	6	6	6	1	6	3.5																								
Dec 26	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6	6	6	6	7	6.8																								
Dec 27	7	8	7	7	7	7	7	7	9	8	8	8	7	7	8	8	8	8	9	10	10	11	11	11	7	11	8.3																								
Dec 28	11	11	11	10	10	9	10	10	10	11	13	14	15	14	13	13	13	12	10	8	6	5	5	4	4	15	10.3																								
Dec 29	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	4	7	6	6	6	6	5	5	5	3	7	4.3																								
Dec 30	5	4	4	6	6	6	6	7	7	7	7	6	5	4	4	5	4	5	4	5	5	6	6	6	4	7	5.4																								
Dec 31	6	6	7	7	7	7	7	7	7	7	7	7	7	8	8	9	10	10	10	11	11	11	10	6	11	8.3																									
Diurnal Maximum	17	15	16	14	14	16	21	16	17	18	30	22	20	18	14	13	13	12	13	23	31	14	20	19																											
Daiurnal Average	6.2	6.3	6.2	6.2	5.9	6.0	6.0	5.4	5.7	5.9	6.4	6.4	6.1	6.0	5.6	5.8	5.7	5.5	5.5	6.1	6.1	5.6	6.7	6.4																											
C	Monthly Calibration												S	Daily Zero-Span Check												Q	Quality Assurance																								
K	Collection Error												N	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.																																																			

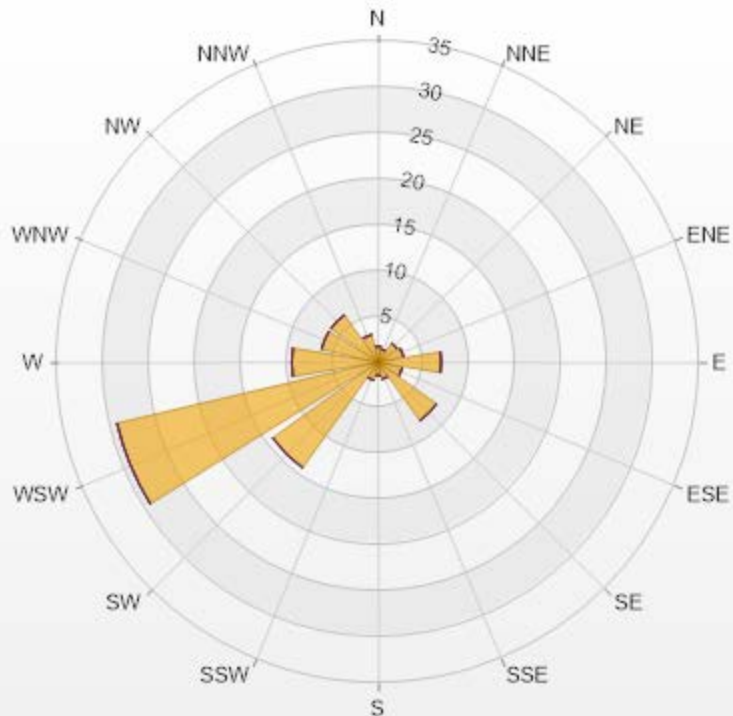
Timeseries Chart of Hourly Average for PM2.5 - Cold Lake South Station





Wind: Cold Lake South Poll.: Cold Lake South-PM2.5[ug/m3(L)] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.73% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	1.75	0	0	0	0	1.75
NNE	1.48	0	0	0	0	1.48
NE	2.56	0	0	0	0	2.56
ENE	2.83	0	0	0	0	2.83
E	6.87	0	0	0	0	6.87
ESE	2.7	0	0	0	0	2.7
SE	7.82	0	0	0	0	7.82
SSE	1.89	0	0	0	0	1.89
S	1.48	0	0	0	0	1.48
SSW	2.02	0	0	0	0	2.02
SW	14.15	0	0	0	0	14.15
WSW	29.25	0	0	0	0	29.25
W	9.43	0	0	0	0	9.43
WNW	6.33	0	0	0	0	6.33
NW	6.33	0	0	0	0	6.33
NNW	3.1	0	0	0	0	3.1
Summary	100	0	0	0	0	100



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% Icon Classes (ug/m3(L))

100 0-50

0 50-80

0 80-120

0 120-240

0 >240.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

RELATIVE HUMIDITY (RH) in %

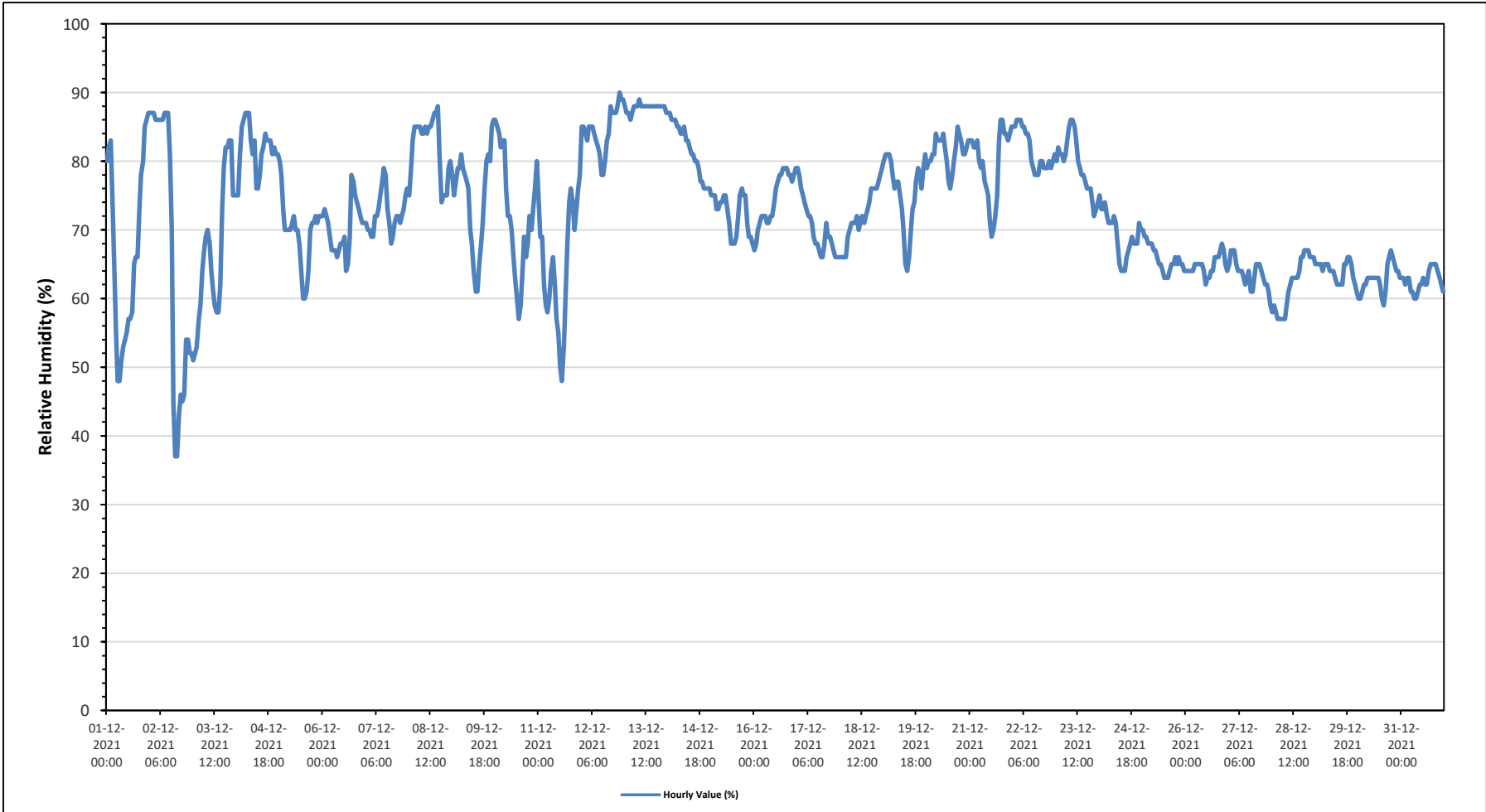
Maximum Hourly Value:	90 %	on December 12 at hour 21	Hours in Service:	744
Maximum Daily Value:	87.8 %	on December 13	Hours of Data:	744
Minimum Hourly Value:	37 %	on December 2 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	62.0 %	on December 28	Hours of Calibration:	0
Monthly Average:	72.4 %		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
Dec 1	80	82	83	75	65	55	48	48	51	53	54	55	57	57	58	65	66	66	73	78	80	85	86	87	48	87	67.0
Dec 2	87	87	87	86	86	86	86	86	87	87	87	81	70	45	37	37	43	46	45	46	54	54	52	52	37	87	67.3
Dec 3	51	52	53	57	59	64	67	69	70	68	64	61	59	58	58	62	73	79	82	82	83	83	75	75	51	83	66.8
Dec 4	75	75	81	85	86	87	87	87	83	81	83	76	76	78	81	82	84	83	83	83	81	82	81	81	75	87	81.7
Dec 5	80	78	73	70	70	70	70	71	72	70	70	68	64	60	60	61	64	70	71	71	72	71	72	72	60	80	69.6
Dec 6	72	73	72	71	69	67	67	67	66	67	68	68	69	64	65	69	78	77	75	74	73	72	71	71	64	78	70.2
Dec 7	71	70	70	69	69	72	72	73	75	77	79	78	73	71	68	69	71	72	72	71	72	73	75	76	68	79	72.4
Dec 8	75	79	83	85	85	85	85	84	84	85	84	85	85	86	87	87	88	81	74	75	75	75	79	80	74	88	82.1
Dec 9	78	75	77	79	79	81	79	78	77	76	70	68	64	61	61	65	68	71	76	80	81	80	85	86	61	86	74.8
Dec 10	86	85	84	82	83	83	76	72	72	70	66	63	60	57	59	64	69	66	68	72	70	73	76	80	57	86	72.3
Dec 11	75	69	69	62	59	58	60	64	66	62	57	55	50	48	53	60	68	74	76	74	70	73	76	78	48	78	64.8
Dec 12	85	85	84	83	85	85	85	84	83	82	81	78	78	80	83	84	88	87	87	87	88	90	89	89	78	90	84.6
Dec 13	88	87	87	86	87	88	88	88	89	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	86	89	87.8
Dec 14	87	87	86	86	86	85	85	84	84	85	83	83	82	81	81	80	80	79	77	77	76	76	76	76	76	87	81.8
Dec 15	75	75	75	73	73	74	74	75	75	75	73	71	68	68	68	69	72	75	76	75	75	71	69	69	68	76	72.3
Dec 16	67	68	70	71	72	72	72	71	71	72	72	74	76	77	78	78	79	79	79	78	78	77	78	79	67	79	74.5
Dec 17	79	78	76	75	74	73	72	72	71	69	68	68	67	66	66	68	71	69	69	68	67	66	66	66	66	79	70.2
Dec 18	66	66	66	66	69	70	71	71	71	72	70	71	72	71	72	73	74	76	76	76	76	77	78	79	66	79	72.0
Dec 19	80	81	81	81	80	78	76	77	77	75	73	70	65	64	66	70	73	74	77	79	78	76	79	81	64	81	75.5
Dec 20	79	80	80	81	81	84	83	83	83	84	82	80	77	76	78	80	82	85	84	83	81	81	82	83	76	85	81.3
Dec 21	83	83	82	82	83	80	79	80	77	76	75	71	69	70	72	75	83	86	86	84	84	83	84	85	69	86	79.7
Dec 22	85	85	86	86	86	85	85	84	84	83	80	79	78	78	80	80	79	79	79	80	80	79	80	81	78	86	81.6
Dec 23	80	82	81	81	80	81	83	85	86	86	85	83	80	79	78	78	77	76	76	76	74	72	73	74	72	86	79.4
Dec 24	75	73	73	74	72	71	71	71	72	71	68	65	64	64	64	66	67	68	69	68	68	68	71	70	64	75	69.3
Dec 25	70	69	69	68	68	68	67	67	66	65	65	64	63	63	63	64	65	65	66	65	66	65	65	64	63	70	65.8
Dec 26	64	64	64	64	64	65	65	65	65	65	64	62	63	63	64	64	66	66	66	66	67	68	67	65	62	68	64.8
Dec 27	65	67	67	67	65	64	64	64	63	62	63	64	61	61	63	65	65	65	64	63	62	62	61	59	59	67	63.6
Dec 28	58	59	58	57	57	57	57	57	59	61	62	63	63	63	63	64	66	66	67	67	67	66	66	66	57	67	62.0
Dec 29	65	65	65	65	64	65	65	65	64	64	64	63	62	62	62	62	65	65	66	66	65	63	62	61	61	66	64.0
Dec 30	60	60	61	62	62	63	63	63	63	63	63	63	62	60	59	61	65	66	67	66	65	64	64	63	59	67	62.8
Dec 31	63	63	62	63	63	61	61	60	60	61	62	62	63	62	62	64	65	65	65	65	64	63	62	61	60	65	62.6
Diurnal Maximum	88	87	87	86	87	88	88	88	89	88	88	88	88	88	88	88	88	88	88	88	88	90	89	89			
Diurnal Average	74.3	74.3	74.4	73.9	73.6	73.5	73.0	73.1	73.1	72.7	71.6	70.2	68.6	67.1	67.6	69.6	72.5	73.1	73.5	73.6	73.5	73.3	73.7	74.0			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for RH - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

BAROMETRIC PRESSURE (BP) in millibar

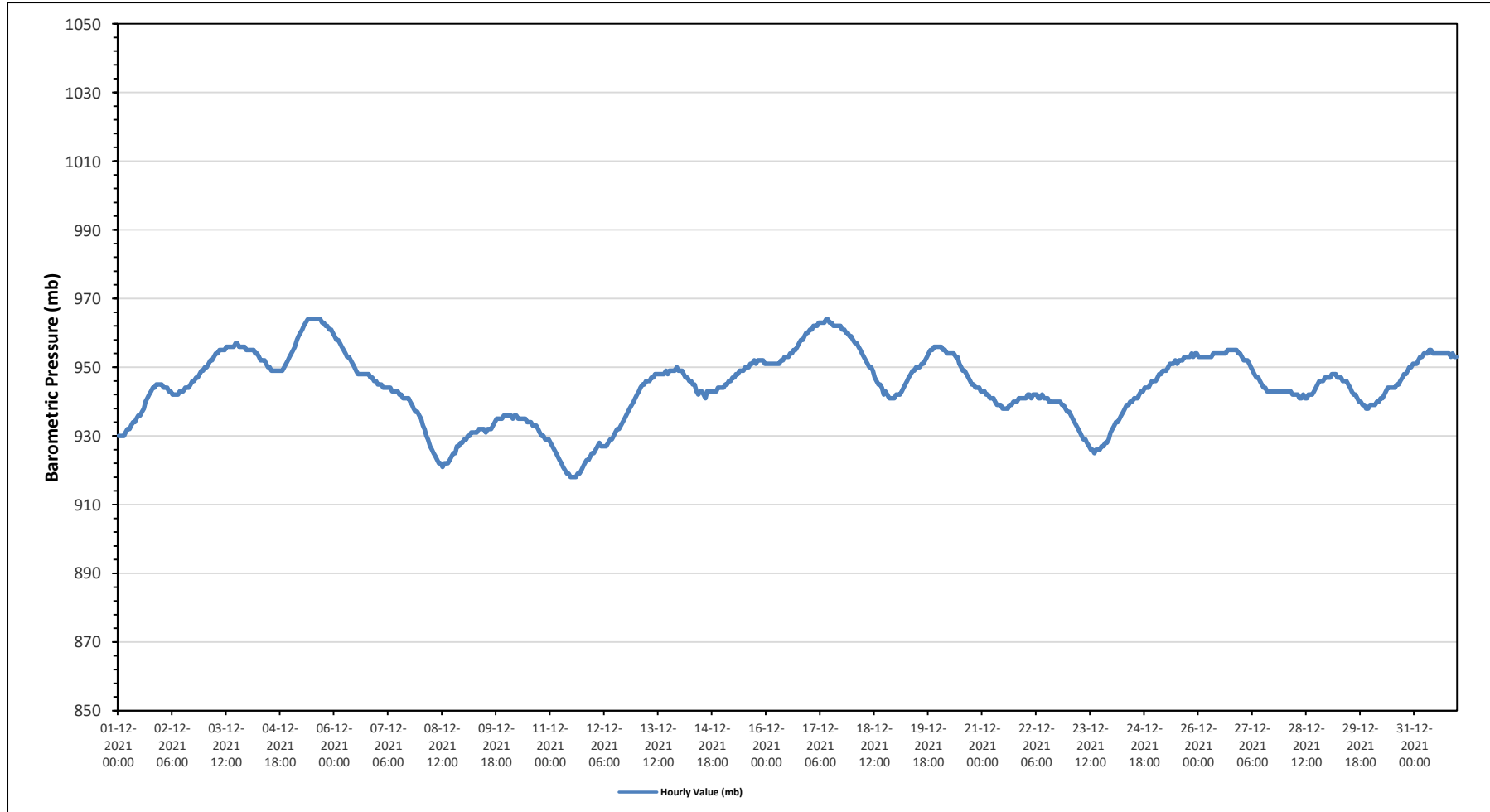
Maximum Hourly Value:	964 mb on December 5 at hour 9	Hours in Service:	744
Maximum Daily Value:	962 mb on December 17	Hours of Data:	744
Minimum Hourly Value:	918 mb on December 11 at hour 11	Hours of Missing Data:	0
Minimum Daily Value:	922 mb on December 11	Hours of Calibration:	0
Monthly Average:	944 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
Dec 1	930	930	930	930	931	932	932	933	934	934	935	936	936	937	938	940	941	942	943	944	945	945	945	930	945	937	
Dec 2	945	944	944	944	943	943	942	942	942	942	943	943	943	944	944	944	945	946	946	947	947	948	949	949	942	949	945
Dec 3	950	950	951	952	952	953	954	954	955	955	955	955	956	956	956	956	956	957	957	956	956	956	955	950	957	955	
Dec 4	955	955	955	955	954	954	953	952	952	952	951	950	950	949	949	949	949	949	949	949	950	951	952	953	949	955	952
Dec 5	954	955	956	958	959	960	961	962	963	964	964	964	964	964	964	964	964	963	963	962	962	961	961	960	954	964	961
Dec 6	959	958	958	957	956	955	954	953	953	952	951	950	949	948	948	948	948	948	948	947	947	946	946	946	946	959	951
Dec 7	945	945	945	944	944	944	944	944	943	943	943	943	942	942	941	941	941	941	940	939	938	937	936	936	945	942	
Dec 8	935	933	932	930	929	927	926	925	924	923	922	922	921	922	922	922	923	924	925	925	927	927	928	928	921	935	926
Dec 9	929	929	930	930	931	931	931	931	932	932	932	932	931	932	932	932	933	934	935	935	935	935	936	936	929	936	932
Dec 10	936	936	936	935	936	936	935	935	935	935	935	935	934	934	934	933	933	933	932	931	930	930	929	929	929	936	933
Dec 11	928	927	926	925	924	923	922	921	920	919	919	918	918	918	918	919	919	920	921	922	923	923	924	925	918	928	922
Dec 12	925	926	927	928	927	927	927	927	928	929	929	930	931	932	932	933	934	935	936	937	938	939	940	941	925	941	932
Dec 13	942	943	944	945	945	946	946	946	947	947	948	948	948	948	948	948	949	948	949	949	949	949	949	949	942	950	947
Dec 14	949	949	948	947	947	946	946	945	945	945	943	942	943	943	942	941	943	943	943	943	943	944	944	944	941	949	944
Dec 15	944	945	945	946	946	947	947	948	948	949	949	949	950	950	950	951	951	952	951	952	952	952	951	944	944	952	949
Dec 16	951	951	951	951	951	951	951	951	952	952	953	953	953	954	954	955	955	956	957	958	958	959	960	960	951	960	954
Dec 17	961	961	962	962	962	963	963	963	963	964	964	963	963	962	962	962	962	962	961	961	960	960	959	959	959	964	962
Dec 18	958	957	957	956	955	954	953	952	951	950	950	949	947	946	945	945	944	942	943	942	941	941	941	941	941	958	948
Dec 19	942	942	942	943	944	945	946	947	948	949	949	950	950	950	951	951	952	953	954	955	955	956	956	942	956	949	
Dec 20	956	956	955	955	954	954	954	954	954	953	953	951	950	949	949	948	947	946	945	945	944	944	944	943	943	956	950
Dec 21	943	943	942	942	941	941	941	940	939	939	939	938	938	938	938	939	939	940	940	940	940	941	941	941	938	943	940
Dec 22	941	942	942	941	942	942	942	941	941	942	941	941	941	940	940	940	940	940	940	940	939	939	938	937	937	942	941
Dec 23	937	936	935	934	933	932	931	930	929	929	928	927	926	926	925	926	926	926	927	927	928	928	929	931	925	937	929
Dec 24	932	933	934	934	935	936	937	938	939	939	940	940	941	941	941	942	943	943	944	944	944	945	946	946	932	946	940
Dec 25	946	947	948	948	949	949	949	950	951	951	951	952	951	952	952	952	953	953	953	953	954	954	954	946	954	951	
Dec 26	953	953	953	953	953	953	953	953	954	954	954	954	954	954	954	955	955	955	955	955	955	955	954	953	955	954	954
Dec 27	953	952	952	952	951	950	949	948	947	947	946	945	944	944	943	943	943	943	943	943	943	943	943	943	943	953	946
Dec 28	943	943	943	943	942	942	942	941	941	941	942	941	941	942	942	942	943	944	945	946	946	946	947	947	941	947	943
Dec 29	947	947	948	948	948	947	947	947	946	946	946	945	944	943	942	942	941	940	940	939	939	938	938	939	938	948	944
Dec 30	939	939	939	940	940	941	941	942	943	944	944	944	944	944	945	945	946	947	948	948	949	950	951	939	951	944	
Dec 31	951	951	952	953	953	954	954	954	955	955	954	954	954	954	954	954	954	954	954	954	953	953	953	951	955	954	954
Diurnal Maximum	961	961	962	962	962	963	963	963	963	964	964	964	964	964	964	964	964	963	963	962	962	961	961	960			
Diurnal Average	944	944	945	945	944	944	944	944	944	944	944	944	944	944	944	944	944	945	945	945	945	945	945	945			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for BP - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

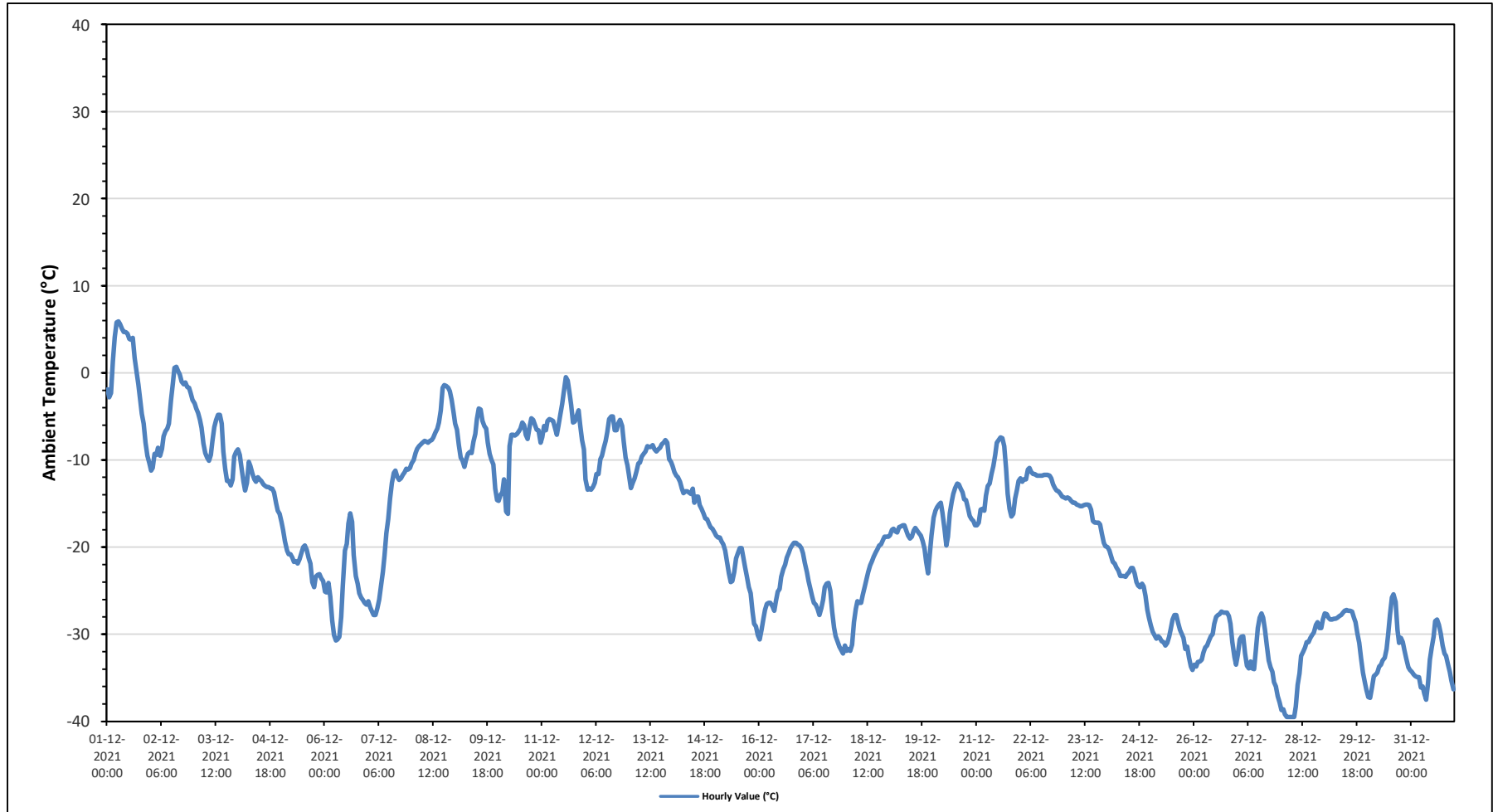
Summary of Hourly Averages

AMBIENT TEMPERATURE (AT) in Degree Celsius

Maximum Hourly Value:	5.9 °C	on December 1 at hour 6	Hours in Service:	744
Maximum Daily Value:	0.2 °C	on December 1	Hours of Data:	744
Minimum Hourly Value:	-39.5 °C	on December 28 at hour 3	Hours of Missing Data:	0
Minimum Daily Value:	-34.0 °C	on December 28	Hours of Calibration:	0
Monthly Average:	-18.3 °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
Dec 1	-1.9	-2.8	-2.3	1.3	4.1	5.8	5.9	5.6	5.1	4.7	4.7	4.5	3.9	3.8	4	1.7	0.2	-1.3	-3.1	-4.7	-5.8	-8	-9.5	-10.3	-10.3	5.9	0.2
Dec 2	-11.2	-10.9	-9.3	-9.4	-8.6	-9.5	-8.7	-7.3	-6.7	-6.4	-5.8	-3.1	-1.2	0.6	0.7	0.2	-0.2	-1	-1.3	-1.1	-1.6	-1.7	-2.3	-3.1	-11.2	0.7	-4.5
Dec 3	-3.5	-4.1	-4.6	-5.4	-6.3	-8.1	-9.2	-9.7	-10.1	-9.4	-7.8	-6.2	-5.4	-4.8	-4.8	-5.8	-9	-11	-12.4	-12.4	-12.9	-12.2	-9.6	-9.1	-12.9	-3.5	-8.1
Dec 4	-8.8	-9.4	-11	-12.5	-13.5	-12.6	-10.2	-10.7	-11.6	-12.2	-12.5	-12	-12.2	-12.4	-12.8	-13	-13.1	-13.1	-13.3	-13.3	-13.7	-15	-15.8	-16.2	-16.2	-8.8	-12.5
Dec 5	-17.1	-18	-19.3	-20.4	-20.8	-20.8	-21.2	-21.7	-21.6	-21.9	-21.4	-20.7	-20	-19.8	-20.3	-21.2	-21.9	-24	-24.6	-23.4	-23.2	-23.1	-23.6	-23.9	-24.6	-17.1	-21.4
Dec 6	-25.1	-25.2	-24.1	-25.7	-28.4	-30.1	-30.7	-30.6	-30.3	-28	-24.4	-20.4	-19.6	-17.3	-16.1	-17.1	-20.9	-23.3	-24.2	-25.3	-25.8	-26.1	-26.4	-26.6	-30.7	-16.1	-24.7
Dec 7	-26.2	-26.9	-27.4	-27.8	-27.8	-27	-26	-24.4	-22.8	-21	-18.4	-16.8	-14.4	-12.6	-11.5	-11.2	-11.9	-12.3	-12.1	-11.7	-11.4	-11	-11.1	-10.9	-27.8	-10.9	-18.1
Dec 8	-10.4	-10	-9.2	-8.7	-8.4	-8.2	-8	-7.8	-7.9	-8	-7.8	-7.7	-7.4	-6.9	-6.4	-5.7	-4.3	-1.7	-1.4	-1.5	-1.7	-2.1	-3.1	-4.5	-10.4	-1.4	-6.2
Dec 9	-5.8	-6.5	-8.3	-9.7	-10.1	-10.8	-10	-9.3	-9.1	-9.2	-7.9	-7	-5.3	-4.1	-4.2	-5.5	-6.1	-6.4	-8	-9.3	-10	-10.5	-13.3	-14.6	-14.6	-4.1	-8.4
Dec 10	-14.7	-14	-13.7	-12.2	-15.9	-16.2	-8.4	-7.1	-7.1	-7.2	-7	-6.7	-6.4	-5.7	-6	-7.1	-7.6	-6.1	-5.2	-5.4	-6	-6.5	-6.6	-8	-16.2	-5.2	-8.6
Dec 11	-7.4	-6.1	-6.6	-5.5	-5.3	-5.4	-5.5	-6.3	-7.1	-6.1	-4.8	-3.6	-2	-0.5	-0.9	-2.1	-3.7	-5.7	-5.6	-4.9	-4.3	-6	-7.7	-8.8	-8.8	-0.5	-5.1
Dec 12	-12.2	-13.4	-13.3	-13.4	-13.1	-12.6	-11.6	-11.6	-9.9	-9.5	-8.6	-7.8	-6.8	-5.3	-5	-5	-6.6	-6.6	-5.8	-5.4	-6.1	-7.9	-9.7	-10.6	-13.4	-5.0	-9.1
Dec 13	-11.8	-13.2	-12.6	-12.1	-11.3	-10.4	-10.3	-9.6	-9.3	-9	-8.4	-8.5	-8.5	-8.3	-8.8	-9	-8.8	-8.6	-8.2	-8	-7.7	-8	-9.9	-10.2	-13.2	-7.7	-9.6
Dec 14	-10.7	-11.4	-11.8	-12	-12.5	-13.3	-13.8	-13.6	-13.7	-13.9	-13.3	-14.9	-14.2	-14.2	-15.2	-15.6	-16.2	-16.7	-16.8	-17.3	-17.7	-17.9	-18.3	-18.3	-18.3	-10.7	-14.5
Dec 15	-18.7	-18.9	-18.9	-19.3	-19.7	-20.4	-21.7	-23	-24	-23.9	-22.9	-21.3	-20.7	-20.1	-21.1	-22.3	-23.4	-24.6	-25.3	-27.4	-28.8	-29.1	-30.1	-30.1	-30.1	-18.7	-22.7
Dec 16	-30.6	-29.5	-28.2	-27.2	-26.5	-26.4	-26.4	-26.8	-27.3	-26.2	-25.1	-24.8	-23.4	-22.5	-22	-21.2	-20.7	-20.1	-19.8	-19.5	-19.5	-19.7	-19.8	-20.1	-30.6	-19.5	-23.9
Dec 17	-20.7	-21.8	-22.9	-23.9	-24.8	-25.7	-26.4	-26.6	-27.1	-27.8	-27	-26	-24.6	-24.2	-24.1	-25	-27.4	-29.2	-30.2	-30.8	-31.4	-31.8	-32.2	-31.3	-32.2	-20.7	-26.8
Dec 18	-31.9	-31.7	-31.9	-31.2	-28.6	-27.1	-26.2	-26.4	-26.4	-25.5	-24.5	-23.6	-22.8	-22.1	-21.6	-21.1	-20.6	-20.2	-19.8	-19.7	-19.2	-18.8	-18.8	-18.8	-31.9	-18.8	-24.1
Dec 19	-18.6	-18	-17.9	-18.2	-18.3	-17.7	-17.6	-17.5	-17.5	-18.1	-18.7	-19	-18.8	-18.1	-17.8	-18.1	-18.4	-18.7	-19.3	-20.2	-21.7	-23	-20.7	-18.7	-23.0	-17.5	-18.8
Dec 20	-16.6	-15.8	-15.4	-15.1	-14.9	-16	-17.9	-19.8	-18.8	-16.1	-14.8	-13.9	-13.2	-12.7	-12.8	-13.3	-13.7	-14.5	-14.6	-15.6	-16.4	-16.8	-17	-17.5	-19.8	-12.7	-15.6
Dec 21	-17.5	-17.2	-15.7	-15.6	-15.8	-14.1	-13	-12.7	-11.6	-10.7	-9.4	-8	-7.7	-7.4	-7.5	-8.4	-11	-13.9	-15.6	-16.5	-16.2	-14.4	-13.4	-12.4	-17.5	-7.4	-12.7
Dec 22	-12.1	-12.5	-12.2	-12.2	-11.1	-10.9	-11.4	-11.6	-11.6	-11.8	-11.8	-11.8	-11.8	-11.7	-11.7	-11.7	-11.8	-12.1	-12.8	-13.2	-13.5	-13.6	-13.9	-14.2	-14.2	-10.9	-12.2
Dec 23	-14.3	-14.4	-14.3	-14.4	-14.7	-14.9	-14.9	-15.1	-15.2	-15.3	-15.3	-15.2	-15.1	-15.1	-15.2	-15.7	-17	-17.2	-17.2	-17.2	-17.4	-18.5	-19.5	-19.9	-19.9	-14.3	-16.0
Dec 24	-20	-20.4	-21	-21.7	-21.9	-22.3	-22.7	-23.3	-23.3	-23.4	-23.1	-22.9	-22.4	-22.4	-23	-24	-24.4	-24.6	-24.2	-24.5	-25.6	-27.2	-28.1	-28.1	-28.1	-20.0	-23.3
Dec 25	-29	-29.7	-30.1	-30.5	-30.2	-30.4	-30.8	-30.9	-31.3	-31	-30.3	-29.4	-28.3	-27.8	-27.8	-28.7	-29.5	-29.9	-30.4	-31.7	-31.4	-32.7	-33.7	-34.1	-34.1	-27.8	-30.4
Dec 26	-33.5	-33.7	-33.2	-33.1	-32.9	-32.1	-31.5	-31.3	-30.8	-30.2	-30	-28.8	-28	-27.8	-27.7	-27.4	-27.5	-27.5	-27.5	-27.9	-28.8	-30.9	-32.6	-33.5	-33.7	-27.4	-30.3
Dec 27	-32.3	-30.6	-30.3	-30.2	-32.2	-33.6	-33.9	-33.1	-33.9	-34	-31.7	-29.3	-28.1	-27.6	-28.1	-29.5	-31.3	-33	-33.8	-34.3	-35.5	-36	-37.1	-37.8	-37.8	-27.6	-32.4
Dec 28	-38.7	-38.6	-39.2	-39.5	-39.5	-39.5	-39.5	-39.5	-38.3	-35.8	-34.5	-32.5	-32	-31.5	-30.9	-30.9	-30.4	-30.1	-29.8	-28.9	-28.6	-29.3	-29.3	-28.3	-39.5	-28.3	-34.0
Dec 29	-27.6	-27.7	-28.1	-28.3	-28.2	-28.2	-28.1	-27.9	-27.8	-27.5	-27.3	-27.2	-27.3	-27.3	-27.4	-28.1	-28.6	-29.9	-31	-32.8	-34.4	-35.5	-36.4	-36.4	-27.2	-29.2	
Dec 30	-37.2	-37.3	-36.1	-34.8	-34.6	-34.4	-33.7	-33.5	-33	-32.7	-31.7	-30	-27.7	-25.8	-25.4	-26.3	-29.5	-31	-30.4	-30.9	-31.8	-32.8	-33.8	-34.1	-37.3	-25.4	-32.0
Dec 31	-34.3	-34.6	-34.8	-34.9	-34.9	-36.1	-36	-36.8	-37.5	-35.6	-32.9	-31.5	-30.3	-28.5	-28.3	-28.9	-29.9	-31.3	-32.2	-32.5	-34.3	-35.3	-36.3	-37.5	-28.3	-33.4	
Diurnal Maximum	-1.9	-2.8	-2.3	1.3	4.1	5.8	5.9	5.6	5.1	4.7	4.7	4.5	3.9	3.8	4.0	1.7	0.2	-1.0	-1.3	-1.1	-1.6	-1.7	-2.3	-3.1			
Diurnal Average	-19.4	-19.5	-19.5	-19.5	-19.6	-19.6	-19.3	-19.4	-19.3	-18.8	-17.9	-16.9	-16.2	-15.5	-15.4	-15.9	-16.9	-17.5	-17.9	-18.1	-18.6	-19.3	-19.9	-20.2			
C	Monthly Calibration						S	Daily Zero-Span Check						Q	Quality Assurance												
K	Collection Error						N	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.																											

Timeseries Chart of Hourly Average for AT - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

STATION TEMPERATURE (ST) in Degree Celsius

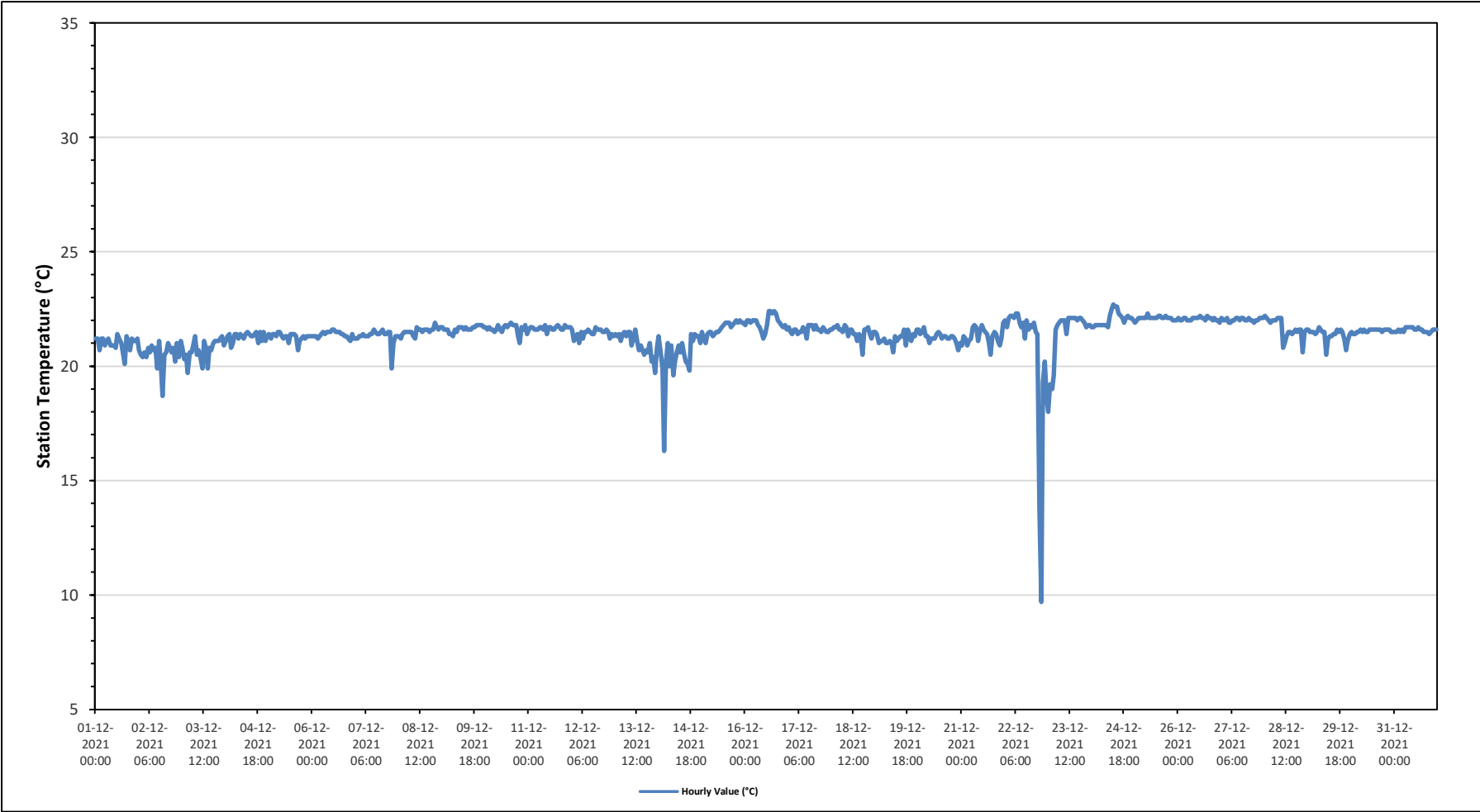
Maximum Hourly Value:	22.7 °C	on December 24 at hour 12	Hours in Service:	744
Maximum Daily Value:	22.1 °C	on December 25	Hours of Data:	744
Minimum Hourly Value:	9.7 °C	on December 22 at hour 20	Hours of Missing Data:	0
Minimum Daily Value:	20.5 °C	on December 14	Hours of Calibration:	0
Monthly Average:	21.4 °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
Dec 1	21.2	21.2	20.7	21.2	21.2	20.9	21.1	21.2	20.9	20.9	20.9	20.8	21.4	21.2	21.0	20.6	20.1	21.3	21.1	20.7	21.2	21.1	21.1	21.2	20.1	21.4	21.0
Dec 2	20.7	20.5	20.4	20.6	20.4	20.8	20.6	20.9	20.7	20.8	19.9	21.1	20.2	18.7	20.5	20.6	21.0	20.8	20.6	20.8	20.2	21.0	20.4	21.1	18.7	21.1	20.6
Dec 3	20.8	20.3	20.5	19.7	20.6	20.6	20.9	21.3	20.5	20.7	20.4	19.9	21.1	20.8	19.9	20.8	20.7	21.0	21.1	21.1	21.1	21.2	21.3	20.9	19.7	21.3	20.7
Dec 4	21.1	21.3	21.4	20.8	21.0	21.4	21.4	21.2	21.4	21.3	21.2	21.4	21.5	21.4	21.3	21.3	21.4	21.5	21.0	21.5	21.1	21.5	21.1	21.3	20.8	21.5	21.3
Dec 5	21.4	21.2	21.4	21.4	21.3	21.5	21.5	21.3	21.2	21.3	21.3	21.0	21.4	21.4	21.4	21.3	20.7	21.1	21.2	21.3	21.2	21.3	21.3	21.3	20.7	21.5	21.3
Dec 6	21.3	21.3	21.3	21.2	21.3	21.4	21.5	21.4	21.5	21.5	21.5	21.6	21.6	21.5	21.5	21.5	21.4	21.4	21.3	21.3	21.2	21.1	21.4	21.2	21.1	21.6	21.4
Dec 7	21.2	21.2	21.3	21.3	21.4	21.3	21.3	21.3	21.4	21.4	21.6	21.5	21.4	21.4	21.5	21.6	21.4	21.4	21.5	21.5	19.9	21.0	21.3	21.3	19.9	21.6	21.3
Dec 8	21.3	21.2	21.4	21.5	21.5	21.5	21.5	21.3	21.2	21.7	21.6	21.6	21.5	21.6	21.6	21.6	21.5	21.6	21.6	21.5	21.6	21.9	21.7	21.6	21.2	21.9	21.5
Dec 9	21.7	21.6	21.6	21.6	21.4	21.4	21.3	21.6	21.5	21.7	21.7	21.7	21.6	21.7	21.6	21.6	21.6	21.7	21.7	21.8	21.8	21.8	21.8	21.7	21.3	21.8	21.6
Dec 10	21.7	21.6	21.7	21.6	21.6	21.5	21.6	21.8	21.6	21.5	21.7	21.8	21.7	21.8	21.9	21.8	21.8	21.8	21.3	21.0	21.7	21.6	21.8	21.4	21.0	21.9	21.6
Dec 11	21.6	21.7	21.7	21.6	21.6	21.6	21.7	21.7	21.6	21.8	21.4	21.7	21.7	21.6	21.6	21.7	21.8	21.7	21.6	21.6	21.8	21.7	21.7	21.7	21.4	21.8	21.7
Dec 12	21.6	21.1	21.3	21.4	21.0	21.5	21.2	21.5	21.5	21.6	21.5	21.4	21.4	21.7	21.6	21.6	21.6	21.5	21.5	21.6	21.5	21.2	21.4	21.3	21.0	21.7	21.4
Dec 13	21.4	21.3	21.4	21.1	21.4	21.5	21.3	21.5	21.5	20.9	21.2	21.6	21.1	20.7	20.9	20.7	20.5	20.7	20.6	21.0	20.2	20.4	19.7	20.8	19.7	21.6	21.0
Dec 14	21.3	20.6	19.9	16.3	20.2	21.0	20.0	20.9	19.6	20.2	20.6	20.9	20.6	21.0	20.5	20.2	20.1	19.8	21.4	21.1	21.4	21.3	21.3	21.0	16.3	21.4	20.5
Dec 15	21.5	21.2	21.0	21.4	21.5	21.5	21.3	21.4	21.5	21.5	21.6	21.7	21.8	21.9	21.9	21.7	21.8	21.9	22.0	21.9	22.0	21.9	21.9	21.9	21.0	22.0	21.7
Dec 16	21.8	22.0	22.0	21.9	22.0	22.0	22.0	21.8	21.7	21.5	21.2	21.4	21.8	22.4	22.4	22.3	22.4	22.3	22.0	21.9	21.8	21.7	21.8	21.6	21.2	22.4	21.9
Dec 17	21.7	21.5	21.4	21.6	21.6	21.4	21.5	21.5	21.7	21.6	21.2	21.8	21.8	21.8	21.6	21.8	21.6	21.6	21.5	21.7	21.6	21.5	21.5	21.6	21.2	21.8	21.6
Dec 18	21.6	21.7	21.7	21.8	21.6	21.6	21.5	21.8	21.7	21.3	21.6	21.6	21.4	21.4	21.1	21.4	21.3	20.5	21.6	21.6	21.7	21.4	21.2	21.5	20.5	21.8	21.5
Dec 19	21.5	21.4	21.0	21.1	21.1	21.2	21.0	21.0	21.1	21.0	20.6	21.3	21.1	21.2	21.3	21.3	21.6	20.9	21.6	21.4	21.1	21.4	21.3	21.6	20.6	21.6	21.2
Dec 20	21.6	21.4	21.5	21.7	21.3	21.3	21.0	21.2	21.2	21.2	21.4	21.5	21.4	21.2	21.3	21.3	21.2	21.2	21.3	21.3	21.2	21.0	20.7	21.0	20.7	21.7	21.3
Dec 21	20.9	21.3	21.2	20.9	21.1	21.2	21.7	21.8	21.7	21.1	21.5	21.8	21.6	21.5	21.4	21.0	20.5	21.3	21.5	21.4	21.1	20.9	21.2	21.9	20.5	21.9	21.3
Dec 22	22.0	21.7	22.1	22.2	22.2	22.1	22.3	22.3	21.9	21.7	21.9	21.2	22.0	21.6	21.8	21.7	21.9	21.5	21.4	13.7	9.7	19.3	20.2	18.6	9.7	22.3	20.7
Dec 23	18.0	19.2	19.0	19.6	21.6	21.8	21.9	22.0	22.0	22.0	21.4	22.1	22.1	22.1	22.1	22.1	22.0	22.1	22.1	22.0	21.9	21.7	21.8	21.8	18.0	22.1	21.4
Dec 24	21.7	21.7	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.7	22.2	22.5	22.7	22.6	22.6	22.3	22.2	22.1	21.9	22.1	22.2	22.1	22.1	22.0	21.7	22.7	22.1
Dec 25	21.9	22.0	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.0	21.9	22.3	22.1
Dec 26	22.1	22.0	22.0	22.1	22.1	22.0	22.0	22.0	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.0	22.2	22.1	22.1	22.0	22.1	22.0	22.0	21.9	21.9	22.2	22.1
Dec 27	22.1	22.0	22.0	22.1	21.9	21.9	22.0	22.0	22.1	22.1	22.0	22.1	22.1	22.0	22.0	22.1	22.0	22.0	21.9	22.0	22.0	22.1	22.1	22.1	21.9	22.1	22.0
Dec 28	22.2	22.1	22.0	21.9	22.0	22.0	22.1	22.1	22.1	20.8	21.0	21.3	21.5	21.5	21.4	21.5	21.6	21.5	21.6	21.6	20.6	21.5	21.6	20.6	20.6	22.2	21.6
Dec 29	21.6	21.5	21.5	21.5	21.4	21.5	21.7	21.6	21.5	21.5	20.5	21.2	21.3	21.3	21.4	21.4	21.6	21.5	21.6	21.5	21.2	20.7	21.1	21.4	20.5	21.7	21.4
Dec 30	21.5	21.4	21.4	21.5	21.5	21.6	21.5	21.6	21.5	21.5	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.5	21.6	21.6	21.6	21.5	21.5	21.4	21.4	21.6	21.5
Dec 31	21.5	21.5	21.6	21.5	21.6	21.5	21.7	21.7	21.7	21.7	21.6	21.6	21.7	21.6	21.6	21.5	21.5	21.5	21.4	21.5	21.6	21.6	21.6	21.6	21.4	21.7	21.6
Diurnal Maximum	22.2	22.1	22.1	22.2	22.2	22.1	22.3	22.3	22.1	22.1	22.2	22.5	22.7	22.6	22.6	22.3	22.4	22.3	22.1	22.1	22.2	22.1	22.1	22.1	22.1	22.1	22.1
Diurnal Average	21.4	21.3	21.3	21.2	21.4	21.5	21.5	21.6	21.5	21.4	21.4	21.5	21.6	21.5	21.5	21.5	21.4	21.4	21.5	21.3	21.0	21.3	21.4	21.4	21.4	21.4	21.4

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for ST - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

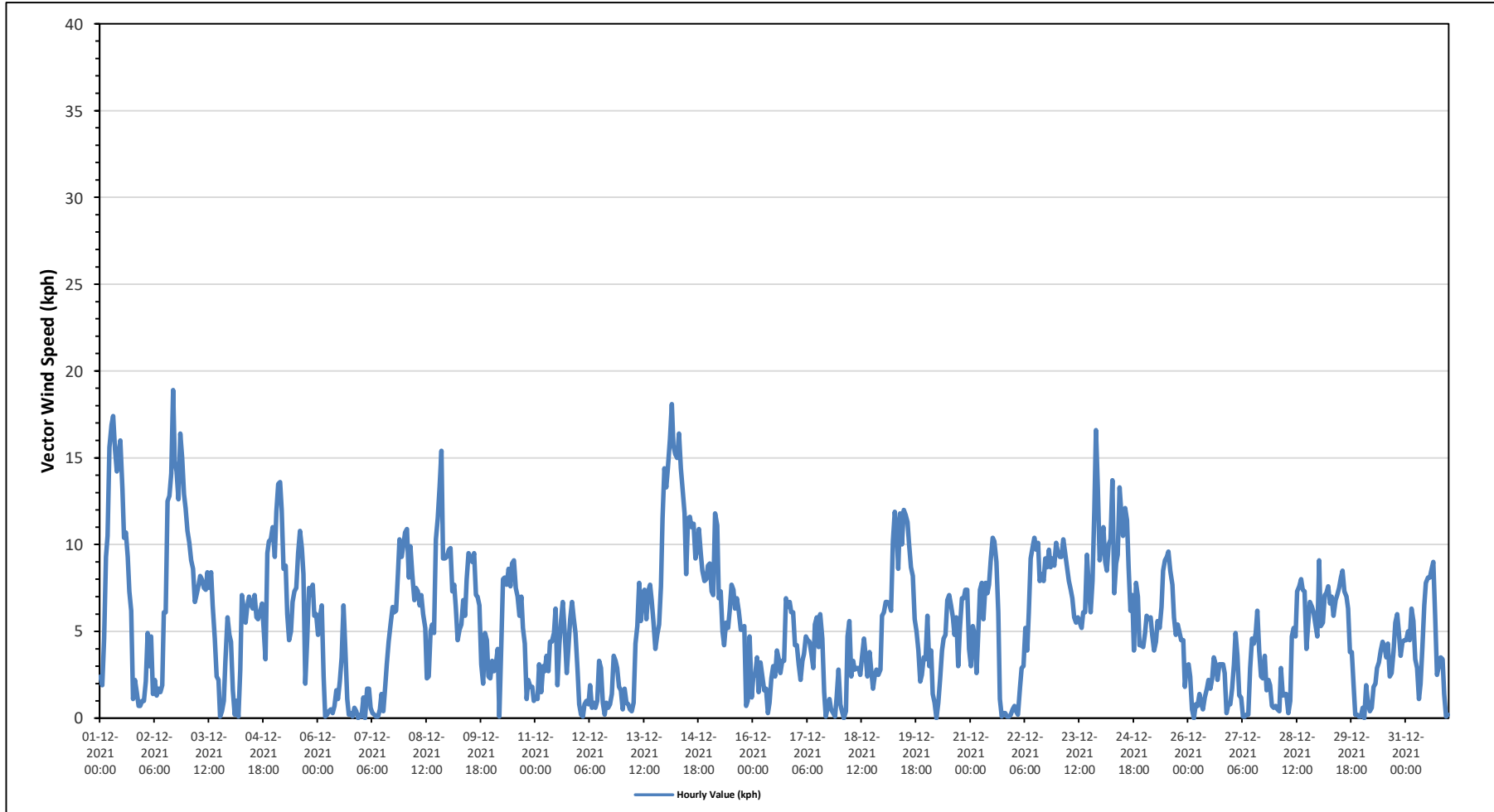
Maximum Hourly Value:	18.9 kph on December 2 at hour 16	Hours in Service:	744
Maximum Daily Value:	9.7 kph on December 14	Hours of Data:	744
Minimum Hourly Value:	0.0 kph on December 6 at hour 22	Hours of Missing Data:	0
Minimum Daily Value:	1.0 kph on December 12	Hours of Calibration:	0
Monthly Average:	2.2 kph	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
Dec 1	2.4	1.9	4.6	9.3	10.5	15.6	16.9	17.4	15.5	14.2	15.2	16.0	13.2	10.4	10.7	9.3	7.3	6.2	1.1	2.2	1.5	0.7	0.7	1.0	0.7	17.4	7.6
Dec 2	1.0	2.1	4.9	3.0	4.7	1.4	2.2	1.3	1.7	1.5	1.9	6.1	6.1	12.5	12.8	14.1	18.9	14.8	14.2	12.6	16.4	15.0	12.9	12.1	1.0	18.9	6.4
Dec 3	10.8	10.1	9.1	8.6	6.7	7.1	7.6	8.2	8.0	7.5	7.4	8.4	7.5	8.4	6.5	4.6	2.4	2.2	0.1	0.4	1.0	3.3	5.8	4.8	0.1	10.8	5.9
Dec 4	4.4	1.6	0.2	1.0	0.1	2.8	7.1	6.3	5.5	6.4	7.0	6.5	6.3	7.1	5.8	5.7	6.1	6.6	5.2	3.4	9.5	10.2	10.3	11.0	0.1	11.0	4.1
Dec 5	9.3	11.9	13.5	13.6	12.0	8.6	8.8	6.0	4.5	5.0	6.7	7.3	7.5	9.5	10.8	9.8	8.3	2.0	4.5	7.5	7.1	7.7	5.9	6.0	2.0	13.6	5.6
Dec 6	4.8	5.8	6.5	2.4	0.1	0.2	0.4	0.5	0.3	0.7	1.6	1.1	2.1	3.5	6.5	3.9	1.1	0.2	0.3	0.1	0.6	0.4	0.0	0.2	0.0	6.5	1.6
Dec 7	0.1	1.2	0.0	1.7	1.7	0.6	0.3	0.2	0.1	0.1	0.5	1.4	0.4	1.8	3.1	4.4	5.5	6.4	6.1	6.2	8.3	10.3	9.3	10.0	0.0	10.3	2.8
Dec 8	10.7	10.9	8.1	9.9	8.3	6.8	7.5	7.3	6.5	7.1	6.0	5.2	2.3	2.4	5.0	5.4	4.9	10.3	11.5	13.3	15.4	9.2	9.2	9.3	2.3	15.4	2.6
Dec 9	9.7	9.8	7.3	7.7	6.4	4.5	5.1	5.4	6.8	5.9	8.0	9.5	9.3	9.0	9.5	7.1	7.0	6.5	3.1	2.0	4.9	4.5	2.4	2.3	2.0	9.8	6.1
Dec 10	3.3	2.7	3.1	4.0	0.1	4.0	8.0	8.1	7.7	8.6	7.6	8.9	9.1	7.5	7.0	5.9	7.0	5.2	4.3	1.1	2.2	1.8	1.8	1.0	0.1	9.1	4.9
Dec 11	1.2	1.1	3.1	1.5	3.0	2.7	3.6	2.7	4.4	4.4	4.9	6.3	1.9	4.2	5.5	6.7	4.8	2.6	4.0	5.7	6.7	5.8	4.9	2.7	1.1	6.7	2.5
Dec 12	0.8	0.2	0.1	0.8	1.0	0.8	1.9	0.6	0.9	0.6	1.0	3.3	2.9	0.9	0.2	0.9	0.6	0.8	1.4	3.6	3.3	2.9	1.8	1.6	0.1	3.6	1.0
Dec 13	0.5	1.7	0.9	0.8	0.5	0.4	0.9	4.3	5.3	7.8	5.6	7.2	7.4	5.7	7.3	7.7	6.8	5.5	4.0	4.8	5.4	7.6	11.5	14.4	0.4	14.4	4.0
Dec 14	13.3	14.4	16.1	18.1	15.7	15.2	15.0	16.4	14.4	13.1	11.8	8.3	11.5	11.6	11.0	11.2	9.2	9.7	10.9	9.5	8.5	7.9	8.0	8.8	7.9	18.1	9.7
Dec 15	8.9	7.3	7.1	11.8	11.1	6.9	7.3	5.0	4.2	5.5	5.2	6.2	7.7	7.4	6.3	6.9	6.2	5.1	5.1	5.3	0.7	1.0	4.7	1.2	0.7	11.8	5.2
Dec 16	2.4	2.5	3.5	1.5	3.2	2.4	1.6	1.7	0.3	0.9	2.3	3.0	2.4	3.9	3.4	2.6	3.3	3.3	6.9	6.4	6.7	6.1	6.1	4.2	0.3	6.9	2.7
Dec 17	4.2	3.1	2.2	3.3	3.7	4.7	4.5	4.4	3.7	2.9	5.4	5.8	4.1	6.0	4.6	1.5	0.1	0.6	1.1	0.5	0.3	0.1	1.2	2.8	0.1	6.0	2.4
Dec 18	0.8	0.4	0.0	0.4	4.7	5.6	2.4	3.3	2.8	2.9	2.9	2.5	3.6	4.6	3.6	2.4	3.8	2.8	1.7	2.5	2.8	2.5	2.8	5.9	0.0	5.9	1.7
Dec 19	6.1	6.7	6.7	6.6	6.2	10.2	11.9	10.8	8.6	11.8	10.0	12.0	11.7	11.3	10.0	8.7	8.2	5.7	5.0	3.9	2.1	2.5	3.5	3.4	2.1	12.0	7.2
Dec 20	5.9	3.0	3.9	1.4	0.9	0.0	0.9	2.3	3.9	4.6	4.8	6.8	7.1	6.5	5.8	4.8	5.8	3.0	5.1	6.9	6.9	7.4	7.4	4.0	0.0	7.4	4.3
Dec 21	3.0	5.3	4.8	2.6	4.7	7.4	7.8	5.7	7.8	7.2	7.7	9.2	10.4	10.2	9.0	6.1	1.1	0.1	0.3	0.3	0.1	0.1	0.2	0.5	0.1	10.4	4.5
Dec 22	0.7	0.4	0.2	1.8	2.9	3.0	5.2	3.9	6.1	9.2	9.9	10.4	9.7	10.1	7.9	8.3	7.9	9.2	8.7	9.7	8.7	9.2	8.8	10.1	0.2	10.4	6.7
Dec 23	9.5	9.3	9.3	10.3	9.5	8.7	7.9	7.4	6.9	5.8	5.5	5.8	5.5	5.2	6.1	6.1	9.4	7.6	6.1	7.9	12.0	16.6	13.3	9.1	5.2	16.6	5.4
Dec 24	10.0	11.0	9.0	8.5	10.0	10.3	13.7	7.2	8.9	9.4	13.3	11.7	10.5	12.1	11.4	8.7	6.2	7.1	3.9	7.8	7.0	4.2	4.2	4.1	3.9	13.7	8.5
Dec 25	4.9	5.9	5.7	5.8	4.8	3.9	4.4	5.6	5.2	6.4	8.5	9.1	9.3	9.6	8.5	7.7	5.8	4.8	5.4	5.0	4.5	4.5	1.8	3.0	1.8	9.6	5.8
Dec 26	3.1	2.4	0.5	0.0	0.8	0.7	1.4	0.8	0.5	1.2	1.7	2.2	1.7	2.3	3.5	3.1	2.2	3.1	3.1	3.1	2.6	0.3	0.8	0.8	0.0	3.5	1.6
Dec 27	1.7	3.1	4.9	3.6	1.3	1.2	0.1	0.1	0.2	0.2	2.9	4.6	4.3	4.9	6.2	3.9	2.4	2.3	3.6	1.6	2.2	1.9	0.7	0.6	0.1	6.2	2.4
Dec 28	0.7	0.5	0.4	2.9	1.3	1.4	1.4	0.3	1.0	4.7	5.2	4.7	7.3	7.6	8.0	7.4	7.3	4.0	5.3	6.7	6.4	6.1	5.4	4.7	0.3	8.0	4.0
Dec 29	9.1	5.3	5.5	7.1	7.2	7.6	6.6	7.0	5.9	6.8	7.1	7.5	8.1	8.5	7.3	7.0	6.3	3.8	3.8	2.1	0.2	0.2	0.1	0.1	0.1	9.1	5.1
Dec 30	0.6	0.0	1.9	0.9	0.4	0.6	1.8	2.0	2.9	3.2	3.9	4.4	4.1	3.5	4.3	2.4	2.6	3.8	5.5	6.0	5.0	3.6	4.4	4.5	0.0	6.0	2.7
Dec 31	4.5	5.0	4.5	6.3	5.6	3.4	2.9	1.1	2.0	4.1	6.5	7.8	8.1	8.1	8.6	9.0	5.9	2.5	3.0	3.5	3.4	1.4	0.1	0.2	0.1	9.0	4.4
Diurnal Maximum	13	14	16	18	16	16	17	17	16	14	15	16	13	13	13	14	19	15	14	13	16	17	13	14			
Diurnal Average	4.8	4.7	4.8	5.1	4.8	4.8	5.4	4.9	4.9	5.5	6.1	6.7	6.6	7.0	7.0	6.2	5.6	4.8	4.7	4.9	5.2	5.0	4.8	4.7			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

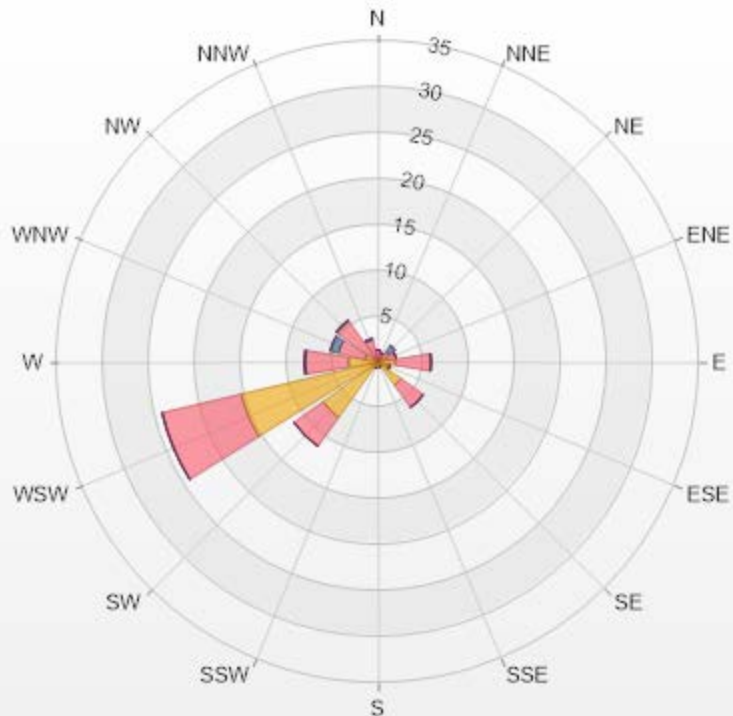
Timeseries Chart of Hourly Average for VWS - Cold Lake South Station



Wind: Cold Lake South Monitor: WDS [kph] Monthly: 12-2021 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.

Calm: 21.64% 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	1.08	0	0	0	1.35
NNE	0.13	0.94	0	0	0	1.07
NE	0.4	1.08	0.81	0	0	2.29
ENE	1.08	0.94	0	0	0	2.02
E	1.88	3.9	0	0	0	5.78
ESE	1.08	0.27	0	0	0	1.35
SE	3.09	2.96	0	0	0	6.05
SSE	0.54	0	0	0	0	0.54
S	0	0	0	0	0	0
SSW	0.67	0	0	0	0	0.67
SW	7.39	3.9	0	0	0	11.29
WSW	15.32	8.87	0	0	0	24.19
W	3.23	4.7	0.13	0	0	8.06
WNW	1.48	2.96	0.94	0	0	5.38
NW	0.13	5.38	0.13	0	0	5.64
NNW	0.54	2.02	0.13	0	0	2.69
Summary	37.23	39	2.14	0	0	78.37



LICA-202112



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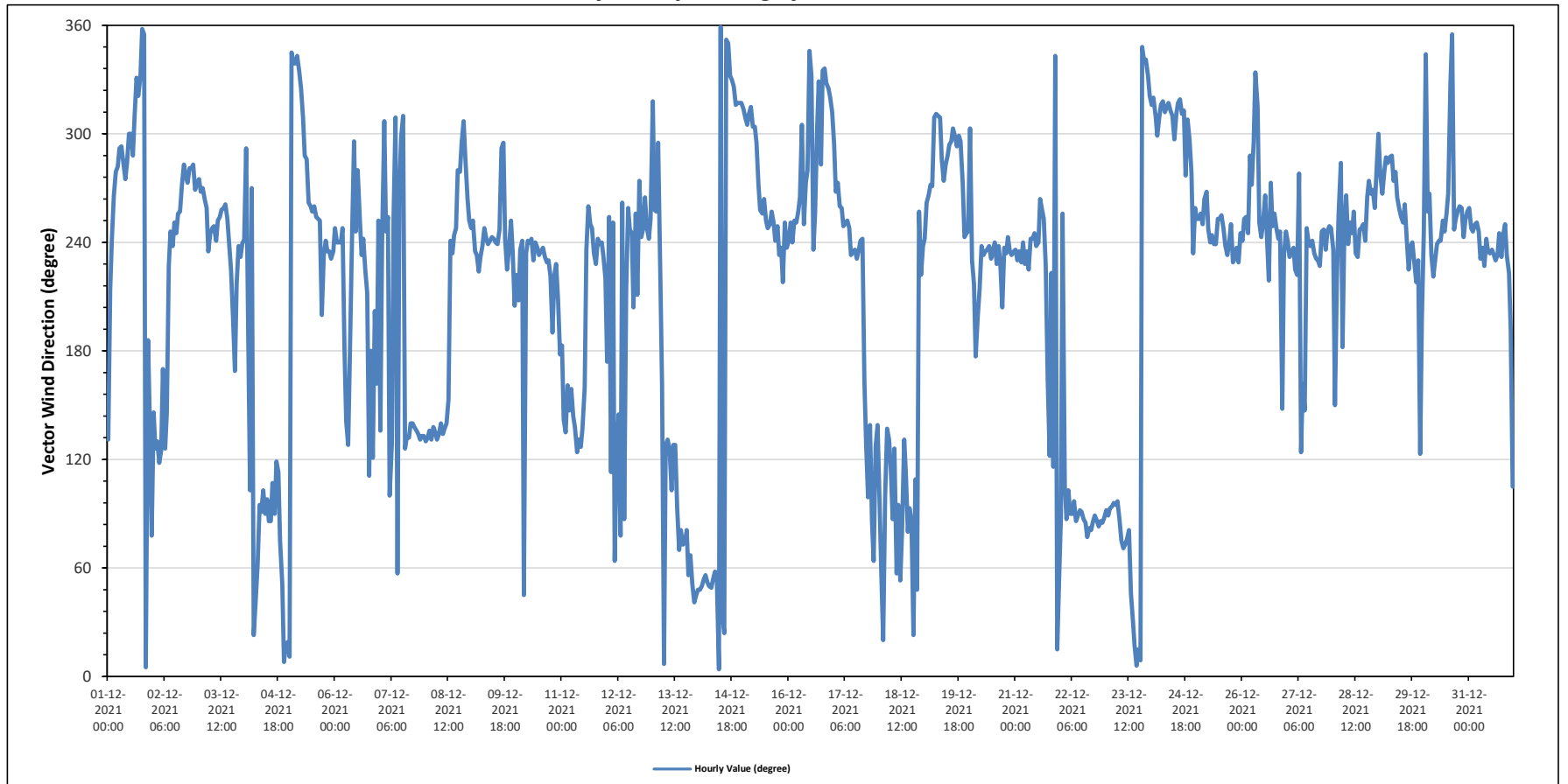
Cold Lake South Station - December 2021

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average: 269 (W) degree										Hours in 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	
Dec 1	SE	SSW	WSW	W	W	W	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	NW	NNW	NW	NNW	N	N	N	S	SE	ENE	292	WNW	
Dec 2	SE	SE	SE	ESE	SE	SSE	SE	SE	SW	WSW	SW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	W	266	W	
Dec 3	W	W	W	W	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	SW	SSW	SSE	SW	SW	SW	WSW	254	WSW	
Dec 4	WSW	WNW	SSW	ESE	W	NNE	NE	ENE	E	E	ESE	E	E	E	ESE	E	ESE	ESE	ENE	NE	N	NNE	NNE	68	ENE		
Dec 5	NNE	NNW	NNW	NNW	NNW	NNW	NW	NW	WNW	WNW	W	WSW	WSW	WSW	WSW	WSW	SSW	SW	WSW	SW	SW	SW	SW	SW	288	WNW	
Dec 6	WSW	WSW	WSW	WSW	WSW	S	SE	SE	S	WSW	WNW	WSW	W	WSW	SW	WSW	SW	SSW	ESE	S	ESE	SSW	SSE	WSW	242	WSW	
Dec 7	SE	WSW	NW	WSW	WSW	E	SE	WSW	NW	ENE	W	WNW	NW	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	138	SE	
Dec 8	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	WSW	SW	WSW	WSW	W	W	WNW	NW	WNW	W	WSW	198	SSW	
Dec 9	WSW	WSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WNW	WNW	WSW	SW	SW	WSW	SW	SSW	244	WSW	
Dec 10	SW	SSW	SW	WSW	NE	SW	WSW	WSW	WSW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	S	SW	SW	SSW	S	233	SW		
Dec 11	S	SE	SE	SSE	SE	SSE	SE	SE	ESE	SE	SE	SE	SSE	SW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SW	SW	200	SSW	
Dec 12	S	WSW	ESE	WSW	ENE	ESE	SE	ENE	W	E	SSW	WSW	WSW	WSW	SSW	WSW	SSW	W	WSW	WSW	W	WSW	WSW	WSW	242	WSW	
Dec 13	NW	WSW	WSW	WNW	SW	SSE	N	SE	SE	ESE	SE	E	ENE	E	ENE	E	ENE	ENE	E	NE	ENE	NE	NE	NE	81	E	
Dec 14	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	N	N	NNE	NNE	N	N	NNW	NNW	NW	NW	NW	NW	NW	25	NNE	
Dec 15	NW	NW	WNW	NW	NW	WNW	WNW	WNW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	SW	277	W	
Dec 16	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	WSW	W	W	NNW	NNW	SW	WSW	WNW	NNW	W	NNW	NNW	NW	NW	NW	NW	300	WNW	
Dec 17	WNW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	WSW	SSE	SE	E	SE	E	ENE	SE	SE	SE	243	WSW	
Dec 18	E	ENE	NNE	E	SE	SE	ESE	E	SE	ENE	E	NE	ENE	SE	ESE	E	E	E	NNE	ESE	NE	WSW	SW	SW	109	ESE	
Dec 19	WSW	W	W	W	W	NW	NW	NW	NW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	WSW	WSW	WSW	288	WNW	
Dec 20	WNW	SW	SW	S	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	SSW	SW	SW	WSW	SW	SW	SW	236	SW	
Dec 21	SW	SW	SW	SW	WSW	SW	SW	SW	WSW	WSW	WSW	SW	WSW	W	WSW	WSW	SW	SSE	ESE	SW	ESE	NNW	NNE	NE	242	WSW	
Dec 22	E	WSW	ESE	E	ESE	E	E	E	E	E	E	E	E	E	ENE	E	E	E	E	E	E	E	E	E	87	E	
Dec 23	E	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	E	NE	NNE	NNE	N	NNE	N	NNW	NNW	NNW	NNW	NW	43	NE	
Dec 24	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NW	NW	W	NW	WNW	W	SW	WSW	308	NW		
Dec 25	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SW	SW	SW	WSW	246	WSW	
Dec 26	WSW	WSW	WSW	WSW	WNW	W	WNW	NNW	NW	WSW	WSW	WSW	W	WSW	SW	W	WSW	WSW	WSW	WSW	WSW	SE	SW	WSW	252	WSW	
Dec 27	WSW	SW	SW	SW	SW	SW	W	ESE	SSE	SE	WSW	WSW	SW	WSW	SW	SW	SW	WSW	WSW	SW	WSW	SW	WSW	WSW	237	SW	
Dec 28	SW	SSE	SW	WSW	WNW	S	WSW	W	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	W	W	W	W	W	WSW	W	253	WSW		
Dec 29	WNW	W	W	W	WNW	WNW	WNW	W	W	W	WSW	WSW	WSW	W	WSW	SW	SW	WSW	SW	SW	SW	SW	ESE	SSW	267	W	
Dec 30	WSW	NNW	WSW	W	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	NNW	N	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	258	WSW	
Dec 31	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	SW	SW	S	ESE	239	WSW	
C	Monthly Calibration						S	Daily Zero-Span Check						Q	Quality Assurance												
K	Collection Error						N	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.																											

Timeseries Chart of Hourly Average for VWD - Cold Lake South Station





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED																												
Maximum Hourly Value:		18.9 kph on December 2 at hour 16										Hours in Service:		744														
Maximum Daily Value:		9.7 kph on December 14										Hours of Data:		744														
Minimum Hourly Value:		0.0 kph on December 6 at hour 22										Hours of Missing Data:		0														
Minimum Daily Value:		1.0 kph on December 12										Hours of Calibration:		0														
Monthly Average:		2.2 kph										Operational Uptime:		100														
WIND DIRECTION																												
Monthly Average:		269 (W) degree																										
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	
Dec 1	2.4	1.9	4.6	9.3	10.5	15.6	16.9	17.4	15.5	14.2	15.2	16.0	13.2	10.4	10.7	9.3	7.3	6.2	1.1	2.2	1.5	0.7	0.7	1.0	0.7	17.4	7.6	
	SE	SSW	WSW	W	W	W	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	NW	NNW	NNW	N	N	N	S	ENE						
Dec 2	1.0	2.1	4.9	3.0	4.7	1.4	2.2	1.3	1.7	1.5	1.9	6.1	6.1	12.5	12.8	14.1	18.9	14.8	14.2	12.6	16.4	15.0	12.9	12.1	1.0	18.9	6.4	
	SE	SE	SE	ESE	SE	SSE	SE	SE	SW	WSW	SW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	
Dec 3	10.8	10.1	9.1	8.6	6.7	7.1	7.6	8.2	8.0	7.5	7.4	8.4	7.5	8.4	6.5	4.6	2.4	2.2	0.1	0.4	1.0	3.3	5.8	4.8	0.1	10.8	5.9	
	W	W	W	W	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	SW	SSW	SSE	SW	SW	SW	WSW	WSW	WSW	WSW	
Dec 4	4.4	1.6	0.2	1.0	0.1	2.8	7.1	6.3	5.5	6.4	7.0	6.5	6.3	7.1	5.8	5.7	6.1	6.6	5.2	3.4	9.5	10.2	10.3	11.0	0.1	11.0	4.1	
	WSW	WNW	SSW	ESE	W	NNE	NE	ENE	E	ESE	E	E	E	E	ESE	E	ESE	ESE	ENE	NE	N	NNE	NNE					
Dec 5	9.3	11.9	13.5	13.6	12.0	8.6	8.8	6.0	4.5	5.0	6.7	7.3	7.5	9.5	10.8	9.8	8.3	2.0	4.5	7.5	7.1	7.7	5.9	6.0	2.0	13.6	5.6	
	NNE	NNW	NNW	NNW	NNW	NNW	NW	NW	WNW	WNW	W	WSW	WSW	WSW	WSW	WSW	WSW	SSW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	
Dec 6	4.8	5.8	6.5	2.4	0.1	0.2	0.4	0.5	0.3	0.7	1.6	1.1	2.1	3.5	6.5	3.9	1.1	0.2	0.3	0.1	0.6	0.4	0.0	0.2	0.0	6.5	1.6	
	WSW	WSW	WSW	WSW	WSW	S	SE	SE	S	WSW	WNW	WSW	W	WSW	SW	WSW	SW	SSW	ESE	S	ESE	SSW	SSE	WSW	WSW	WSW	WSW	
Dec 7	0.1	1.2	0.0	1.7	1.7	0.6	0.3	0.2	0.1	0.1	0.5	1.4	0.4	1.8	3.1	4.4	5.5	6.4	6.1	6.2	8.3	10.3	9.3	10.0	0.0	10.3	2.8	
	SE	WSW	NW	WSW	WSW	E	SE	WSW	NW	ENE	W	WNW	NW	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	
Dec 8	10.7	10.9	8.1	9.9	8.3	6.8	7.5	7.3	6.5	7.1	6.0	5.2	2.3	2.4	5.0	5.4	4.9	10.3	11.5	13.3	15.4	9.2	9.2	9.3	2.3	15.4	2.6	
	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	WSW	SW	WSW	WSW	W	W	WNW	NW	WNW	W	WSW	WSW	WSW	
Dec 9	9.7	9.8	7.3	7.7	6.4	4.5	5.1	5.4	6.8	5.9	8.0	9.5	9.3	9.0	9.5	7.1	7.0	6.5	3.1	2.0	4.9	4.5	2.4	2.3	2.0	9.8	6.1	
	WSW	WSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WNW	WNW	WSW	SW	WSW	SW	SSW	SSW	SSW	SSW	SSW	
Dec 10	3.3	2.7	3.1	4.0	0.1	4.0	8.0	8.1	7.7	8.6	7.6	8.9	9.1	7.5	7.0	5.9	7.0	5.2	4.3	1.1	2.2	1.8	1.8	1.0	0.1	9.1	4.9	
	SW	SSW	SW	WSW	NE	SW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	S	SW	SW	SSW	S					
Dec 11	1.2	1.1	3.1	1.5	3.0	2.7	3.6	2.7	4.4	4.4	4.9	6.3	1.9	4.2	5.5	6.7	4.8	2.6	4.0	5.7	6.7	5.8	4.9	2.7	1.1	6.7	2.5	
	S	SE	SE	SSE	SE	SSE	SE	ESE	SE	SE	SE	SSE	SW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	
Dec 12	0.8	0.2	0.1	0.8	1.0	0.8	1.9	0.6	0.9	0.6	1.0	3.3	2.9	0.9	0.2	0.9	0.6	0.8	1.4	3.6	3.3	2.9	1.8	1.6	0.1	3.6	1.0	
	S	WSW	ESE	WSW	ENE	ESE	SE	ENE	W	E	SSW	WSW	WSW	WSW	SSW	WSW	SSW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	
Dec 13	0.5	1.7	0.9	0.8	0.5	0.4	0.9	4.3	5.3	7.8	5.6	7.2	7.4	5.7	7.3	7.7	6.8	5.5	4.0	4.8	5.4	7.6	11.5	14.4	0.4	14.4	4.0	
	NW	WSW	WSW	WNW	SW	SSE	N	SE	SE	ESE	SE	SE	E	ENE	E	ENE	E	ENE	ENE	E	NE	ENE	NE	NE	NE	NE	NE	
Dec 14	13.3	14.4	16.1	18.1	15.7	15.2	15.0	16.4	14.4	13.1	11.8	8.3	11.5	11.6	11.0	11.2	9.2	9.7	10.9	9.5	8.5	7.9	8.0	8.8	7.9	18.1	9.7	
	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	N	NNE	NNE	N	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	
Dec 15	8.9	7.3	7.1	11.8	11.1	6.9	7.3	5.0	4.2	5.5	5.2	6.2	7.7	7.4	6.3	6.9	6.2	5.1	5.1	5.3	0.7	1.0	4.7	1.2	0.7	11.8	5.2	
	NW	NW	WNW	NW	NW	WNW	WNW	WNW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	SW	SW	SW	SW
Dec 16	2.4	2.5	3.5	1.5	3.2	2.4	1.6	1.7	0.3	0.9	2.3	3.0	2.4	3.9	3.4	2.6	3.3	3.3	6.9	6.4	6.7	6.1	6.1	4.2	0.3	6.9	2.7	
	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	WSW	W	NNW	NNW	SW	WSW	WSW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW
Dec 17	4.2	3.1	2.2	3.3	3.7	4.7	4.5	4.4	3.7	2.9	5.4	5.8	4.1	6.0	4.6	1.5	0.1	0.6	1.1	0.5	0.3	0.1	1.2	2.8	0.1	6.0	2.4	
	WNW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	WSW	SSE	SE	E	SE	E	ENE	SE	SE	SE	SE	SE	
Dec 18	0.8	0.4	0.0	0.4	4.7	5.6	2.4	3.3	2.8	2.9	2.9	2.5	3.6	4.6	3.6	2.4	3.8	2.8	1.7	2.5	2.8	2.5	2.8	5.9	0.0	5.9	1.7	
	E	ENE	NNE	E	SE	ESE	E	SE	ENE	E	NE	ENE	SE	ESE	E	E	E	NNE	ESE	NE	WSW	SW	SW	SW	SW	SW	SW	
Dec 19	6.1	6.7	6.7	6.6	6.2	10.2	11.9	10.8	8.6	11.8	10.0	12.0	11.7	11.3	10.0	8.7	8.2	5.7	5.0	3.9	2.1	2.5	3.5	3.4	2.1	12.0	7.2	
	WSW	W	W	W	W	NW	NW	NW	NW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WSW	WSW	WSW	WSW	WSW
Dec 20	5.9	3.0	3.9	1.4	0.9	0.0	0.9	2.3	3.9	4.6	4.8	6.8	7.1	6.5	5.8	4.8	5.8	3.0	5.1	6.9	6.9	7.4	7.4	4.0	0.0	7.4	4.3	
	WNW	SW	SW	S	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	SW



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED		Maximum Hourly Value: 18.9 kph on December 2 at hour 16		Hours in Service: 744																																								
WIND DIRECTION		Maximum Daily Value: 9.7 kph on December 14		Hours of Data: 744																																								
		Minimum Hourly Value: 0.0 kph on December 6 at hour 22		Hours of Missing Data: 0																																								
		Minimum Daily Value: 1.0 kph on December 12		Hours of Calibration: 0																																								
		Monthly Average: 2.2 kph		Operational Uptime: 100																																								
Monthly Average: 269 (W) degree																																												
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																	
Dec 21	3.0	5.3	4.8	2.6	4.7	7.4	7.8	5.7	7.8	7.2	7.7	9.2	10.4	10.2	9.0	6.1	1.1	0.1	0.3	0.3	0.1	0.1	0.2	0.5	0.1	10.4	4.5																	
Dec 22	0.7	0.4	0.2	1.8	2.9	3.0	5.2	3.9	6.1	9.2	9.9	10.4	9.7	10.1	7.9	8.3	7.9	9.2	8.7	9.7	8.7	9.2	8.8	10.1	0.2	10.4	6.7																	
Dec 23	9.5	9.3	9.3	10.3	9.5	8.7	7.9	7.4	6.9	5.8	5.5	5.8	5.5	5.2	6.1	6.1	9.4	7.6	6.1	7.9	12.0	16.6	13.3	9.1	5.2	16.6	5.4																	
Dec 24	10.0	11.0	9.0	8.5	10.0	10.3	13.7	7.2	8.9	9.4	13.3	11.7	10.5	12.1	11.4	8.7	6.2	7.1	3.9	7.8	7.0	4.2	4.2	4.1	3.9	13.7	8.5																	
Dec 25	4.9	5.9	5.7	5.8	4.8	3.9	4.4	5.6	5.2	6.4	8.5	9.1	9.3	9.6	8.5	7.7	5.8	4.8	5.4	5.0	4.5	4.5	1.8	3.0	1.8	9.6	5.8																	
Dec 26	3.1	2.4	0.5	0.0	0.8	0.7	1.4	0.8	0.5	1.2	1.7	2.2	1.7	2.3	3.5	3.1	2.2	3.1	3.1	3.1	2.6	0.3	0.8	0.8	0.0	3.5	1.6																	
Dec 27	1.7	3.1	4.9	3.6	1.3	1.2	0.1	0.1	0.2	0.2	2.9	4.6	4.3	4.9	6.2	3.9	2.4	2.3	3.6	1.6	2.2	1.9	0.7	0.6	0.1	6.2	2.4																	
Dec 28	0.7	0.5	0.4	2.9	1.3	1.4	1.4	0.3	1.0	4.7	5.2	4.7	7.3	7.6	8.0	7.4	7.3	4.0	5.3	6.7	6.4	6.1	5.4	4.7	0.3	8.0	4.0																	
Dec 29	9.1	5.3	5.5	7.1	7.2	7.6	6.6	7.0	5.9	6.8	7.1	7.5	8.1	8.5	7.3	7.0	6.3	3.8	3.8	2.1	0.2	0.2	0.1	0.1	0.1	9.1	5.1																	
Dec 30	0.6	0.0	1.9	0.9	0.4	0.6	1.8	2.0	2.9	3.2	3.9	4.4	4.1	3.5	4.3	2.4	2.6	3.8	5.5	6.0	5.0	3.6	4.4	4.5	0.0	6.0	2.7																	
Dec 31	4.5	5.0	4.5	6.3	5.6	3.4	2.9	1.1	2.0	4.1	6.5	7.8	8.1	8.1	8.6	9.0	5.9	2.5	3.0	3.5	3.4	1.4	0.1	0.2	0.1	9.0	4.4																	
	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW																				
	SW	SW	SW	SW	WSW	SW	SW	SW	WSW	WSW	WSW	SW	WSW	W	WSW	WSW	SW	SSE	ESE	SW	ESE	NNW	NNE	NE																				
	E	WSW	ESE	E	ESE	E	E	E	E	E	E	E	E	E	ENE	E	E	E	E	E	E	E	E	E																				
	E	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	E	NE	NNE	NNE	N	NNE	N	NNW	NNW	NNW	NNW	NW																				
	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	W	NW	WNW	W	SW	WSW																				
	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SW	SW	SW	WSW																				
	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SW	SW	SW	WSW																				
	WSW	WSW	WSW	WSW	WNW	W	WNW	NNW	NW	WSW	WSW	WSW	W	WSW	SW	W	WSW	WSW	WSW	WSW	WSW	SE	SW	WSW																				
	WSW	SW	SW	SW	SW	W	ESE	SSE	SE	WSW	WSW	SW	WSW	SW	SW	SW	SW	SW	WSW	WSW	SW	WSW	WSW	WSW																				
	SW	SSE	SW	WSW	WNW	S	WSW	W	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	W	W	W	W	WSW	W																				
	WNW	W	W	W	WNW	WNW	WNW	WNW	W	W	W	WSW	WSW	WSW	W	WSW	SW	SW	WSW	SW	SW	SW	ESE	SSW																				
	WSW	NNW	WSW	W	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	NNW	N	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW																				
	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	WSW	SW	WSW	WSW	WSW	SW	S	ESE																				
	C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
	K	Collection Error										N	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.



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Station - December 2021

Summary of Hour Standard Deviations

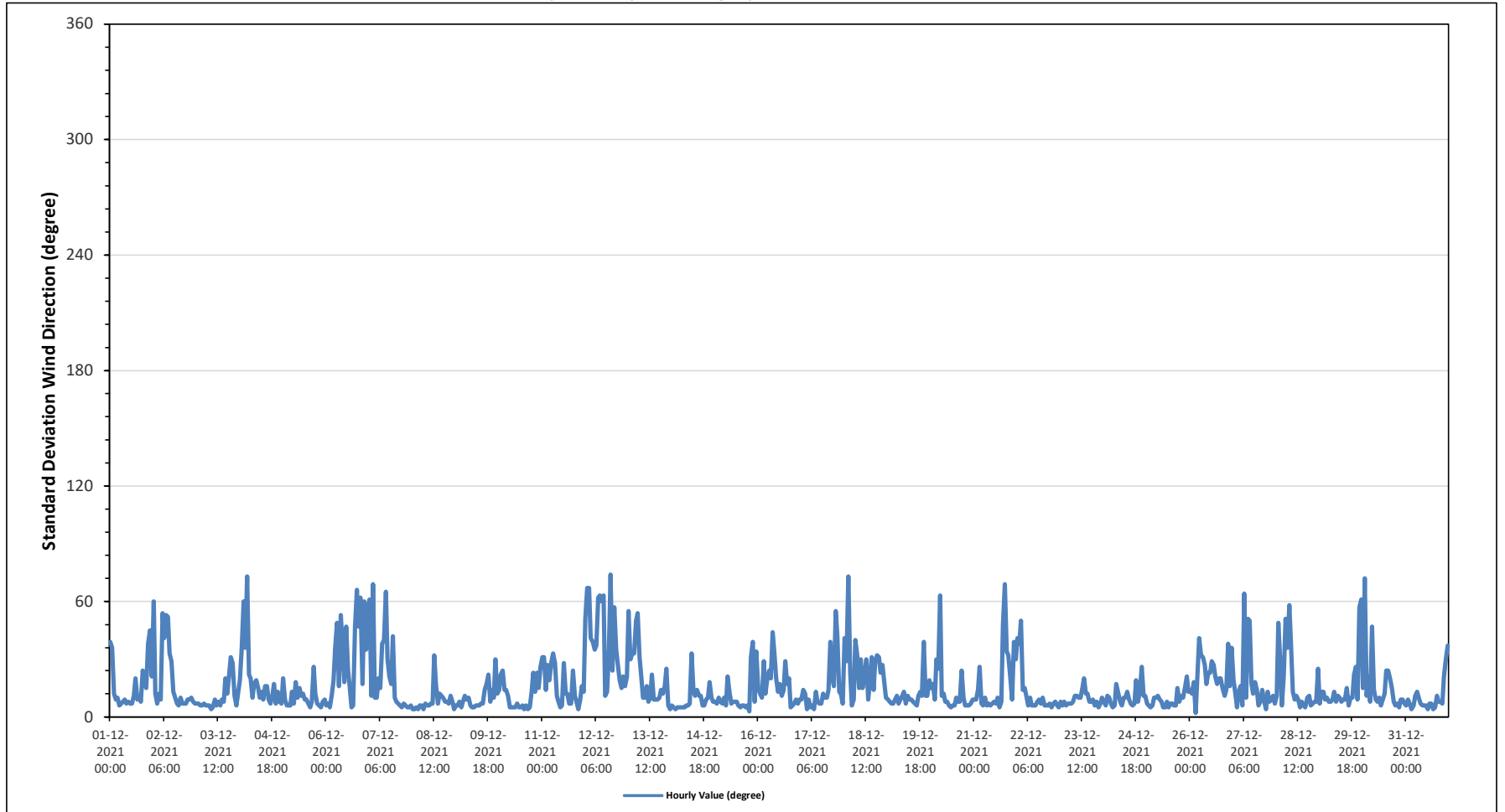
STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:	74 degree on December 12 at hour 14	Hours in Service:	744
Minimum Hourly Value:	2 degree on December 26 at hour 3	Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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																	
Dec 1	39	36	12	9	10	6	7	8	9	7	8	7	7	11	20	9	11	8	24	18	15	38	45	21	6	45																	
Dec 2	60	12	7	12	9	54	41	53	52	33	29	13	10	7	6	10	7	7	7	9	10	8	7	6	60																		
Dec 3	7	7	6	6	7	6	6	6	4	5	9	6	8	6	9	8	20	12	22	31	28	11	6	13	4	31																	
Dec 4	19	36	60	36	73	22	20	10	17	19	15	10	13	9	16	16	9	7	11	17	7	13	8	7	7	73																	
Dec 5	20	9	6	6	6	13	7	18	10	15	11	12	9	9	7	5	8	26	12	7	6	5	8	9	5	26																	
Dec 6	6	7	5	11	19	36	49	16	53	35	18	47	24	16	5	6	47	66	47	62	17	60	35	57	5	66																	
Dec 7	61	11	69	10	10	20	15	38	40	65	30	21	17	42	10	8	7	6	5	7	6	5	5	6	5	69																	
Dec 8	4	4	5	4	6	6	4	7	6	6	7	7	32	16	7	12	11	10	8	8	7	11	8	4	4	32																	
Dec 9	6	6	8	5	8	11	9	10	6	5	5	6	6	6	7	7	14	17	22	8	14	10	30	12	5	30																	
Dec 10	14	22	24	14	14	11	5	5	5	5	7	5	5	6	4	6	4	5	13	23	13	23	15	26	4	26																	
Dec 11	31	31	14	27	19	29	33	28	11	8	5	6	28	12	12	7	7	24	11	8	4	9	16	13	4	33																	
Dec 12	51	67	67	41	39	35	37	62	63	60	63	11	13	35	74	24	57	35	26	19	15	21	16	21	11	74																	
Dec 13	55	30	33	33	50	54	31	20	10	10	16	8	10	22	9	9	9	10	14	12	16	25	6	4	4	55																	
Dec 14	6	5	4	5	5	5	5	6	6	6	7	33	13	11	14	11	6	6	9	10	18	10	8	4	4	33																	
Dec 15	8	7	10	8	7	10	6	21	13	7	8	8	8	6	5	6	6	5	6	3	31	39	8	34	3	39																	
Dec 16	15	12	10	29	12	20	24	20	44	32	20	13	17	11	14	29	17	20	5	6	7	9	7	9	5	44																	
Dec 17	9	14	12	4	9	5	6	4	13	8	7	7	12	10	10	14	39	21	16	55	42	13	12	7	4	55																	
Dec 18	41	29	73	23	6	9	40	32	15	30	15	22	30	9	18	31	14	29	32	31	23	27	19	10	6	73																	
Dec 19	9	8	7	7	9	11	7	9	11	13	7	11	9	9	8	7	6	11	13	11	39	11	11	19	6	39																	
Dec 20	15	17	9	30	25	63	11	12	8	8	6	5	6	6	10	8	8	24	10	6	6	6	7	9	5	63																	
Dec 21	9	9	14	26	7	6	10	6	7	6	7	8	7	10	5	8	48	69	34	32	21	9	39	30	5	69																	
Dec 22	41	38	50	14	15	11	6	10	6	6	6	8	9	7	10	6	6	6	7	5	7	8	6	5	5	50																	
Dec 23	8	6	8	6	7	7	7	8	11	11	10	10	15	20	12	12	8	8	9	6	8	5	7	10	5	20																	
Dec 24	8	6	11	10	7	5	6	17	12	8	6	10	10	13	9	7	6	7	19	8	13	26	11	11	5	26																	
Dec 25	7	6	5	6	10	10	11	9	8	5	5	8	5	7	7	6	6	15	8	11	10	15	21	13	5	21																	
Dec 26	14	12	18	2	20	41	32	31	27	17	23	23	29	27	21	17	20	20	15	11	14	38	16	36	2	41																	
Dec 27	19	13	5	13	16	6	64	10	51	50	17	12	18	14	6	8	14	9	4	13	8	9	11	7	4	64																	
Dec 28	11	49	29	6	21	51	36	58	38	13	9	11	9	5	8	6	5	10	11	6	7	8	8	25	5	58																	
Dec 29	7	13	13	9	10	8	8	9	13	8	11	10	8	9	9	15	6	10	10	22	26	9	57	61	6	61																	
Dec 30	15	72	11	21	8	47	14	9	8	10	6	9	12	24	24	20	15	8	6	7	5	9	7	5	72																		
Dec 31	6	9	7	4	6	11	13	10	7	6	6	6	4	7	7	4	5	11	8	8	7	21	30	37	4	37																	
Diurnal Minimum	4	4	4	2	5	5	4	4	4	5	5	5	4	5	4	4	4	5	4	3	4	5	5	4																			
Diurnal Maximum	61	72	73	41	73	63	64	62	63	65	63	47	32	42	74	31	57	69	47	62	42	60	57	61																			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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)																															

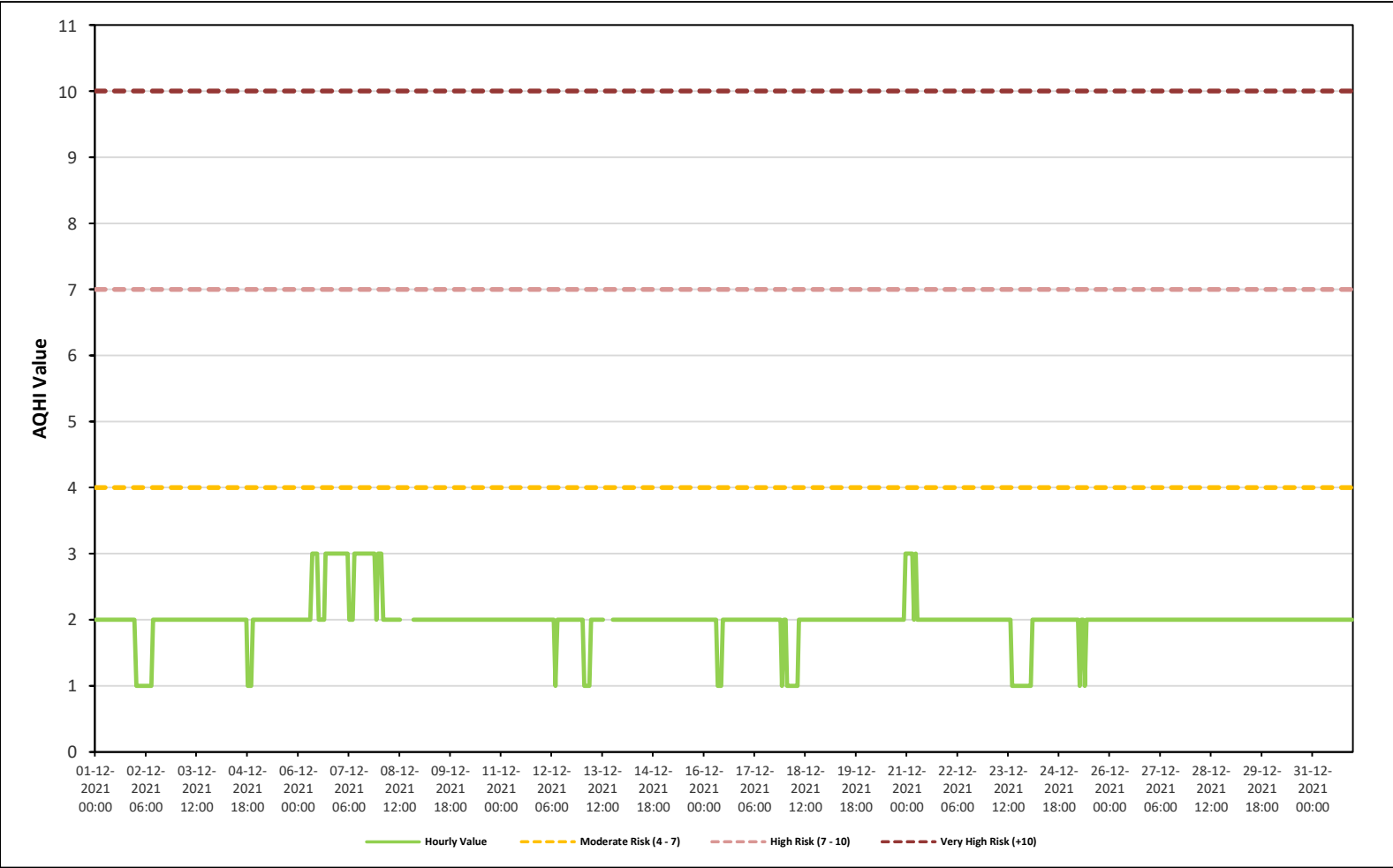
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - Cold Lake South Station



TAMARACK STATION

Timeseries Chart of Hourly Average for AQHI - Tamarack Site





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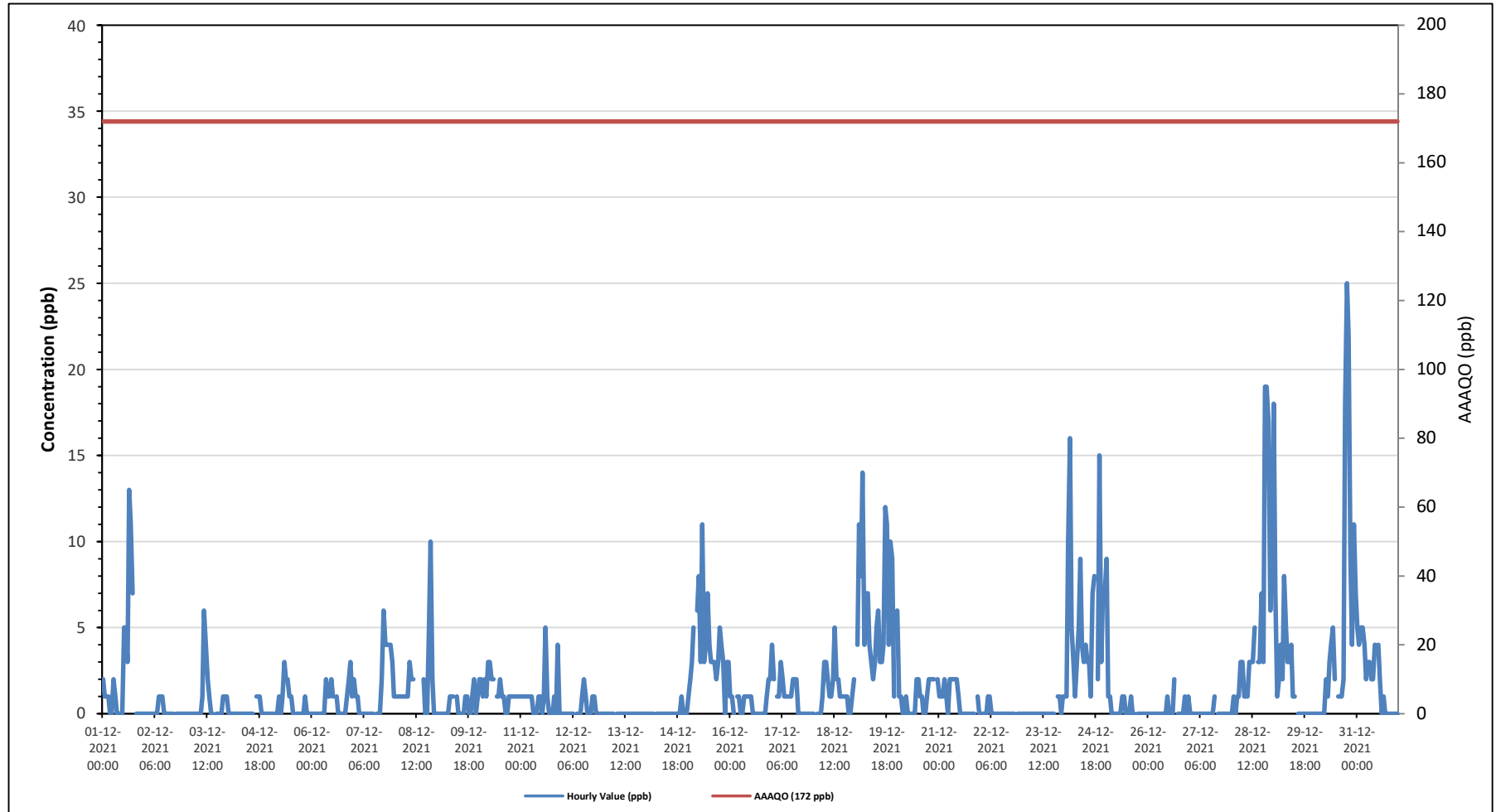
Tamarack Site - December 2021

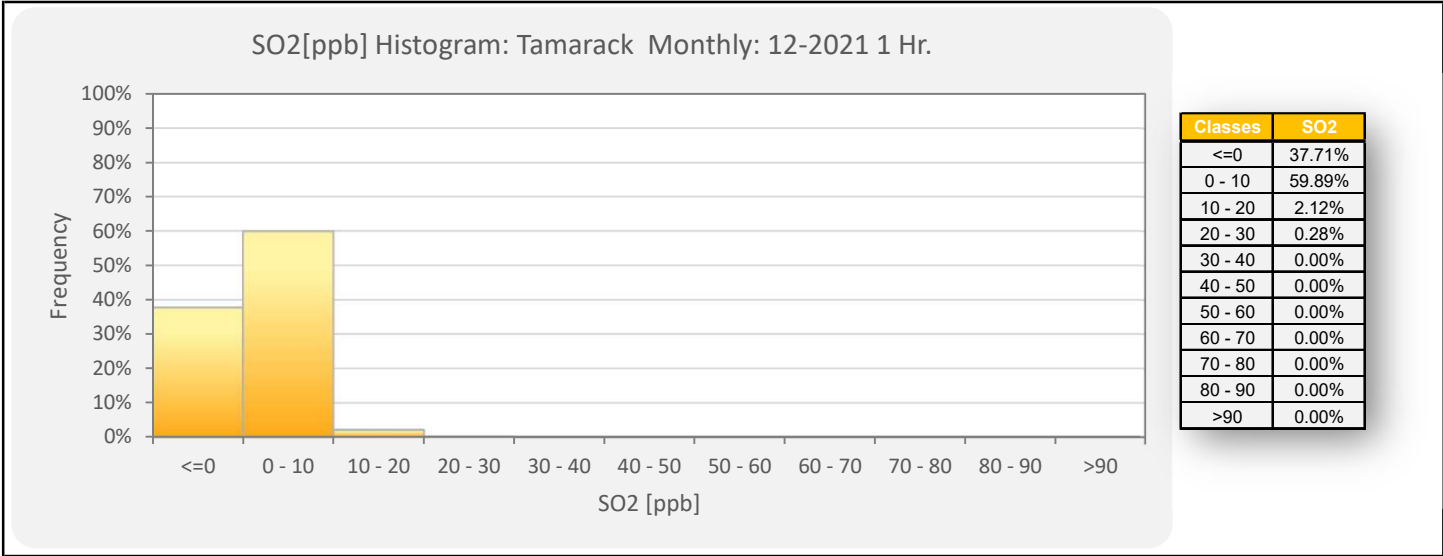
Summary of Hourly Averages

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 Exceedences: 0					Number of 24-Hour Exceedences: 0					30-Day Exceedence: 0																														
Maximum Hourly Value: 25 ppb on December 30 at hour 18										Hours in Service: 744																														
Maximum Daily Value: 6.1 ppb on December 19										Hours of Data: 708																														
Minimum Hourly Value: 0 ppb on December 1 at hour 4										Hours of Missing Data: 0																														
Minimum Daily Value: 0.0 ppb on December 13										Hours of Calibration: 36																														
Monthly Average: 1.5 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																
Dec 1	2	1	1	1	0	0	2	1	0	0	0	0	5	5	3	13	11	7	S	0	0	0	0	0	0	0	13	2.3												
Dec 2	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0.1												
Dec 3	0	0	0	0	0	0	0	0	0	1	6	4	2	1	0	0	S	0	0	0	0	1	1	1	1	0	6	0.7												
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	0	0	0	0	0	0	0	1	0.1												
Dec 5	0	0	0	0	0	1	0	1	3	2	2	1	1	0	S	0	0	0	0	0	1	0	0	0	0	0	3	0.5												
Dec 6	0	0	0	0	0	0	0	0	2	1	1	2	1	S	1	0	0	0	0	0	1	2	3	1	0	3	0.7													
Dec 7	2	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	2	6	4	4	4	4	3	1	0	6	1.4													
Dec 8	1	1	1	1	1	1	1	1	3	2	2	S	C	C	C	C	2	0	0	5	10	2	0	0	0	10	1.8													
Dec 9	0	0	0	0	0	0	0	1	1	1	S	1	0	0	0	0	1	1	0	0	1	2	0	1	0	2	0.4													
Dec 10	2	2	1	2	1	3	3	2	2	S	1	1	2	1	1	0	0	1	1	1	1	1	1	1	1	0	3	1.3												
Dec 11	1	1	1	1	1	1	1	0	S	0	1	1	0	1	5	1	0	0	0	1	0	4	0	0	0	5	0.9													
Dec 12	0	0	0	0	0	0	0	S	0	0	0	1	2	1	0	0	0	1	1	0	0	0	0	0	0	2	0.3													
Dec 13	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0												
Dec 14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.0													
Dec 15	1	2	3	5	S	6	8	3	11	3	4	7	4	3	3	3	2	3	5	4	3	0	3	3	0	11	3.9													
Dec 16	1	1	0	S	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	2	2	0	2	0.6													
Dec 17	4	2	S	1	1	3	2	1	1	1	1	1	2	2	2	0	0	0	0	0	0	0	0	0	0	4	1.0													
Dec 18	0	S	0	0	0	1	3	3	2	1	1	2	5	2	2	1	1	1	1	1	0	0	1	2	0	5	1.3													
Dec 19	S	4	11	8	14	4	7	7	4	3	2	3	5	6	3	3	4	12	11	4	10	9	1	S	1	14	6.1													
Dec 20	6	1	1	0	0	1	0	0	0	0	0	2	2	1	1	0	0	1	2	2	2	2	S	2	0	6	1.1													
Dec 21	1	1	1	2	1	0	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	S	1	0	0	2	0.8													
Dec 22	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0.1													
Dec 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	1	0	1	0.1													
Dec 24	1	1	10	16	5	3	1	3	5	9	4	3	4	3	3	1	7	8	S	2	15	3	7	7	1	16	5.3													
Dec 25	9	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	S	0	0	0	0	0	0	0	9	0.6													
Dec 26	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	S	0	0	0	0	1	0	1	0	2	0.2													
Dec 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	1	0.0													
Dec 28	0	1	0	1	1	3	3	1	1	3	3	3	5	S	3	7	3	19	19	17	6	9	0	0	19	4.9														
Dec 29	18	7	1	2	4	2	8	5	3	3	4	1	1	S	0	0	0	0	0	0	0	0	0	0	0	18	2.6													
Dec 30	0	0	0	0	0	0	2	1	3	4	5	2	S	1	1	1	2	18	25	22	9	4	11	7	0	25	5.1													
Dec 31	5	4	5	5	4	2	3	3	2	2	4	S	4	2	0	1	0	0	0	0	0	0	0	0	0	5	2.0													
Diurnal Maximum	18	7	11	16	14	6	8	7	11	9	6	7	5	6	5	13	11	18	25	22	19	17	11	9																
Diurnal Average	1.8	1.0	1.3	1.5	1.2	1.1	1.5	1.2	1.6	1.3	1.5	1.3	1.6	1.2	1.0	1.0	1.2	2.3	1.9	2.2	2.6	1.8	1.3	1.3																
C	Monthly Calibration										S					Daily Zero-Span Check					Q					Quality Assurance														
K	Collection Error										N					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.																																								

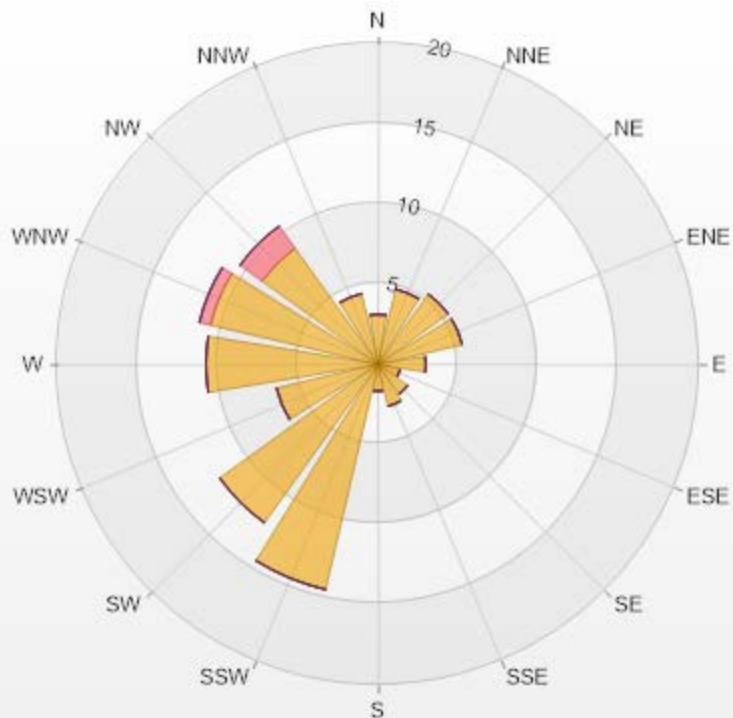
Timeseries Chart of Hourly Average for SO2 - Tamarack Site





Wind: Tamarack Poll.: Tamarack-SO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.16% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	3.11	0	0	0	0	3.11
NNE	4.8	0	0	0	0	4.8
NE	5.37	0	0	0	0	5.37
ENE	5.37	0	0	0	0	5.37
E	2.97	0	0	0	0	2.97
ESE	1.41	0	0	0	0	1.41
SE	2.26	0	0	0	0	2.26
SSE	2.68	0	0	0	0	2.68
S	1.69	0	0	0	0	1.69
SSW	14.41	0	0	0	0	14.41
SW	12.15	0	0	0	0	12.15
WSW	6.5	0	0	0	0	6.5
W	10.73	0	0	0	0	10.73
WNW	10.73	0.71	0	0	0	11.44
NW	8.9	1.69	0	0	0	10.59
NNW	4.52	0	0	0	0	4.52
Summary	97.6	2.4	0	0	0	100



LICA-202112

% Icon Classes (ppb)

98

0-10

2

10-50

0

50-100

0

100-172

0

>172.0



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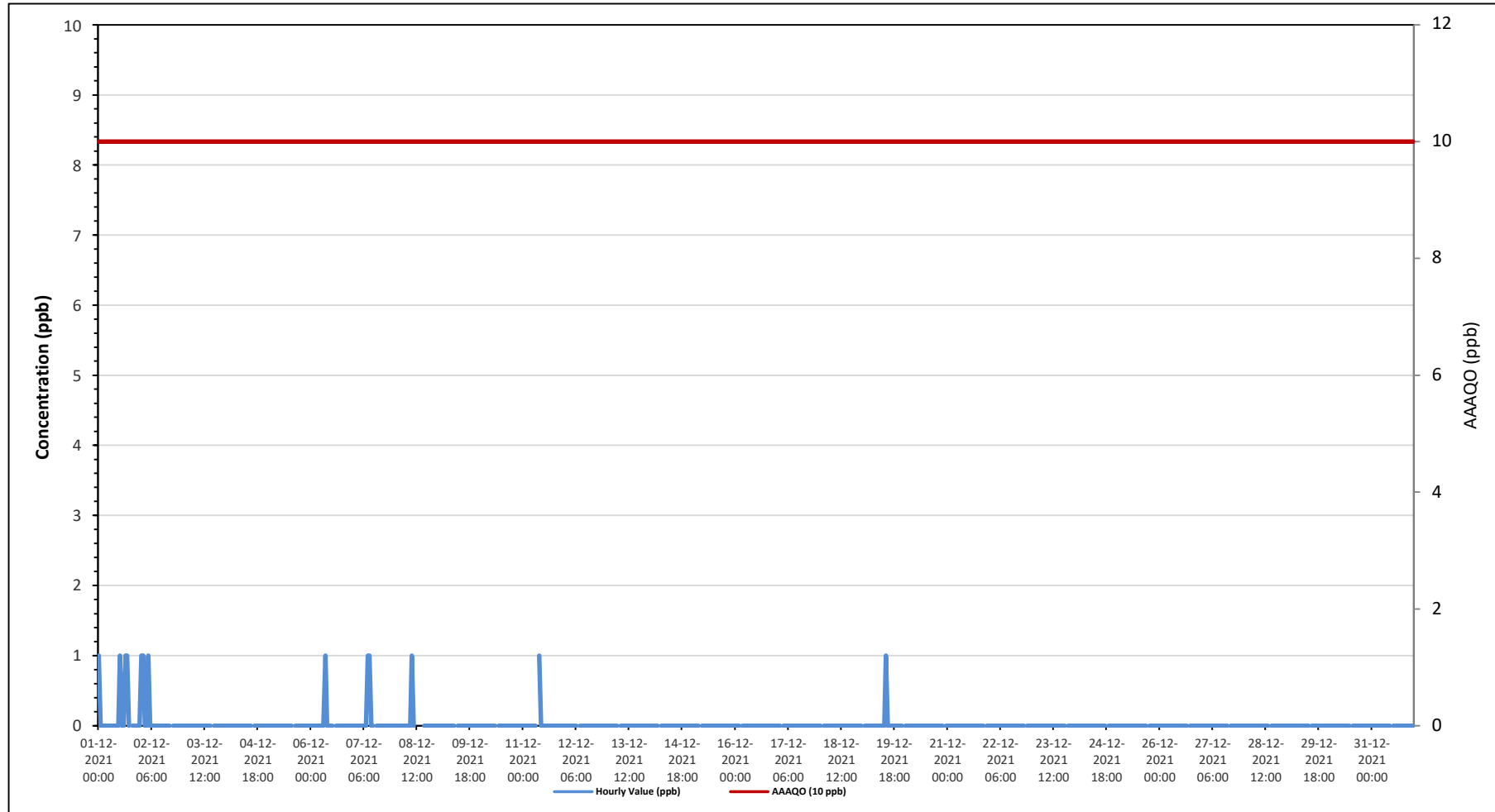
Tamarack Site - December 2021

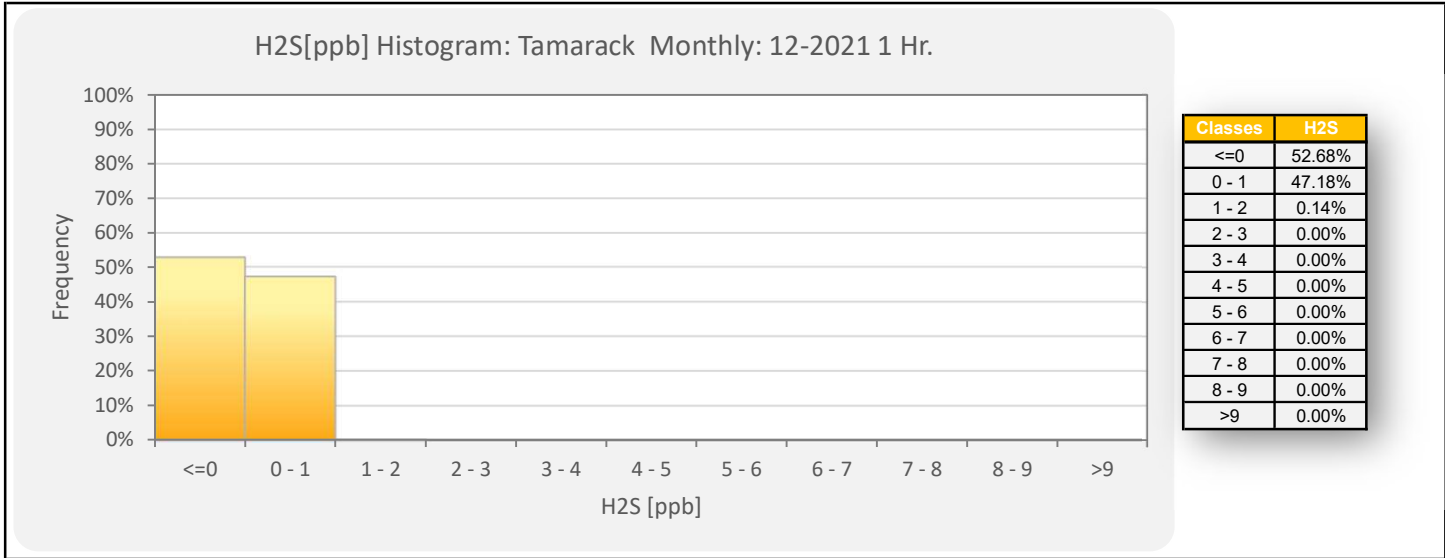
Summary of Hourly Averages

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: 1 ppb on December 1 at hour 0												Hours in Service: 744																
Maximum Daily Value: 0.2 ppb on December 1												Hours of Data: 708																
Minimum Hourly Value: 0 ppb on December 1 at hour 1												Hours of Missing Data: 0																
Minimum Daily Value: 0.0 ppb on December 3												Hours of Calibration: 36																
Monthly Average: 0.0 ppb												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	
Dec 1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	S	0	0	0	0	0	0	0	1	0.2
Dec 2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0.1
Dec 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.0
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 6	0	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Dec 7	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 8	0	0	0	0	0	0	0	0	0	1	0	S	C	C	C	C	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 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	0.0
Dec 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	0.0
Dec 11	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Dec 12	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
Dec 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	0.0
Dec 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
Dec 15	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	0	0.0
Dec 16	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 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
Dec 19	S	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0.0
Dec 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
Dec 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Dec 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Dec 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0.0
Dec 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0
Dec 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0
Dec 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	0.0
Dec 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 28	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
Dec 29	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 30	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 31	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Diurnal Maximum	1	1	0	0	1	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Diurnal Average	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	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						N	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.																												

Timeseries Chart of Hourly Average for H2S - Tamarack Site

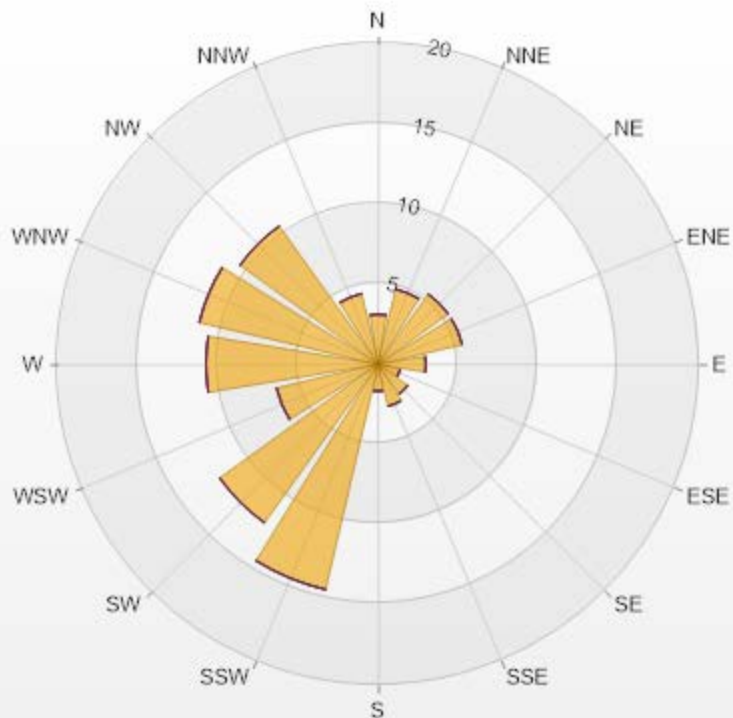




Wind: Tamarack Poll.: Tamarack-H2S[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.

Calm: 0.00% Valid Data: 95.16% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	3.11	0	0	0	0	3.11
NNE	4.8	0	0	0	0	4.8
NE	5.37	0	0	0	0	5.37
ENE	5.37	0	0	0	0	5.37
E	2.97	0	0	0	0	2.97
ESE	1.41	0	0	0	0	1.41
SE	2.26	0	0	0	0	2.26
SSE	2.68	0	0	0	0	2.68
S	1.69	0	0	0	0	1.69
SSW	14.41	0	0	0	0	14.41
SW	12.15	0	0	0	0	12.15
WSW	6.5	0	0	0	0	6.5
W	10.73	0	0	0	0	10.73
WNW	11.44	0	0	0	0	11.44
NW	10.59	0	0	0	0	10.59
NNW	4.52	0	0	0	0	4.52
Summary	100	0	0	0	0	100



LICA-202112

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% Icon Classes (ppb)

100 0-2

0 2-5

0 5-10

0 10-50

0 >50.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

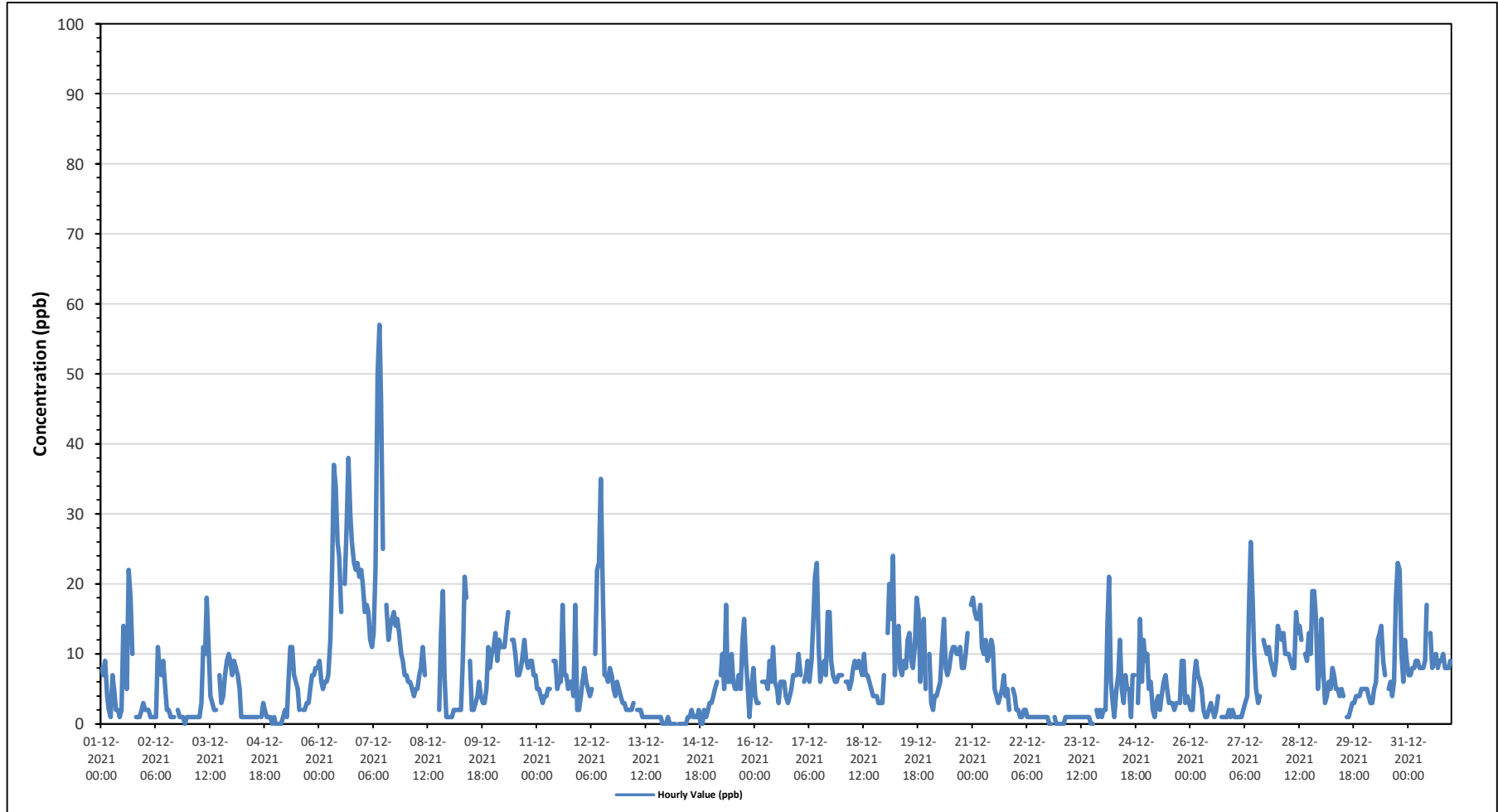
Maximum Hourly Value:	57 ppb on December 7 at hour 9	Hours in Service:	744
Maximum Daily Value:	20.2 ppb on December 6	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 2 at hour 22	Hours of Missing Data:	0
Minimum Daily Value:	0.8 ppb on December 14	Hours of Calibration:	38
Monthly Average:	7.0 ppb	Operational Uptime:	100.0

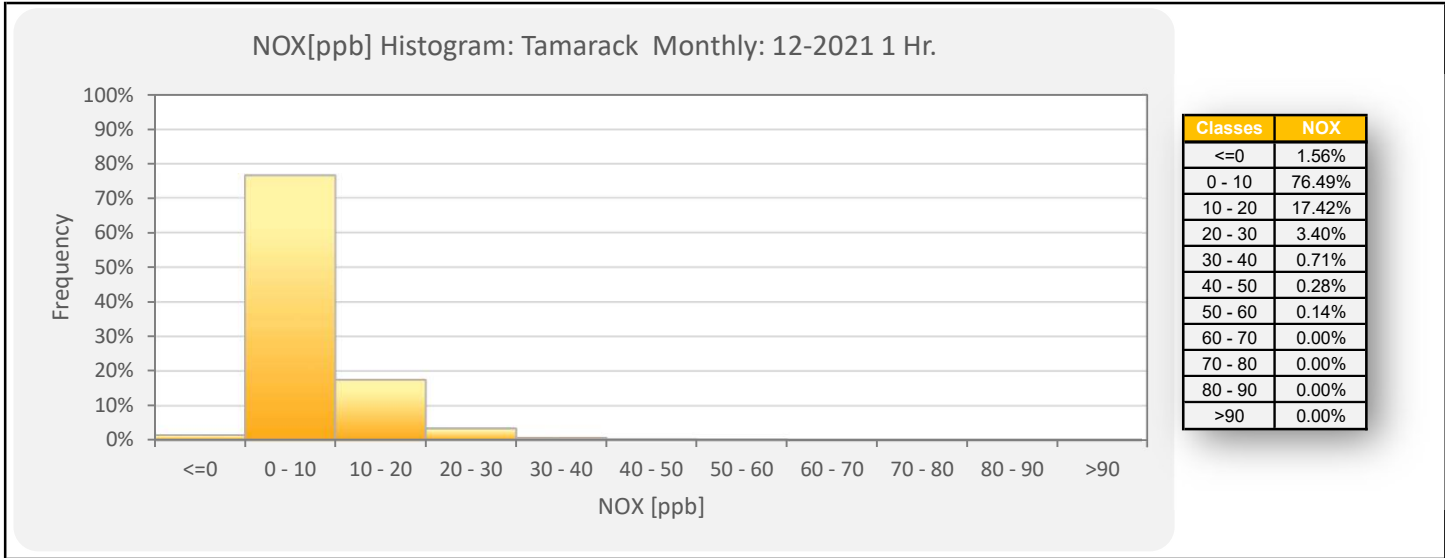
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	8	7	9	4	2	1	7	5	2	2	1	2	14	9	5	22	18	10	S	1	1	1	2	3	1	22	5.9	
Dec 2	2	2	2	1	1	1	1	11	8	7	9	5	2	2	1	1	1	S	2	1	1	1	0	1	0	11	2.7	
Dec 3	1	1	1	1	1	1	1	3	11	10	18	11	4	3	2	2	S	7	3	4	7	9	10	9	1	18	5.2	
Dec 4	7	9	8	7	5	1	1	1	1	1	1	1	1	1	1	S	1	3	2	1	1	1	0	1	0	9	2.4	
Dec 5	0	0	0	0	1	2	1	6	11	11	7	6	5	2	S	2	3	3	5	7	7	8	8	0	11	4.2		
Dec 6	9	6	5	6	6	7	12	23	37	34	26	24	16	S	20	28	38	30	26	23	22	23	21	22	5	38	20.2	
Dec 7	20	16	17	16	12	11	13	22	50	57	46	25	S	17	12	14	15	16	14	15	13	10	9	7	7	57	19.4	
Dec 8	7	6	6	5	4	5	5	7	8	11	7	S	C	C	C	C	C	C	2	13	19	7	1	1	1	19	-	
Dec 9	1	1	2	2	2	2	2	9	21	18	S	9	2	2	3	4	6	4	3	3	5	11	8	10	1	21	5.7	
Dec 10	11	13	9	12	11	11	11	14	16	S	12	12	10	7	7	8	10	12	9	8	9	9	7	7	7	16	10.2	
Dec 11	5	5	4	3	4	4	5	5	S	9	9	5	6	6	17	7	7	5	6	6	4	17	2	2	2	17	6.2	
Dec 12	4	6	8	6	5	4	5	S	10	22	23	35	20	7	7	6	8	7	5	4	6	5	4	3	3	35	9.1	
Dec 13	3	2	2	2	2	3	S	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	3	1.3	
Dec 14	1	0	0	0	0	S	0	0	0	0	0	1	1	2	1	1	1	2	0	0	2	1	2	3	0	3	0.8	
Dec 15	3	4	5	6	S	7	10	5	17	6	6	10	6	5	5	7	5	12	15	9	5	1	5	8	1	17	7.0	
Dec 16	4	3	3	S	6	6	6	6	5	9	6	11	6	5	3	6	6	6	4	3	4	5	7	7	7	3	11	5.6
Dec 17	10	7	S	6	7	9	6	9	15	21	23	11	6	8	9	7	16	16	9	7	6	6	7	7	6	23	9.9	
Dec 18	7	S	6	6	5	6	8	9	8	9	8	7	10	7	7	6	5	4	4	4	3	3	3	7	3	10	6.2	
Dec 19	S	13	20	15	24	7	13	14	8	7	9	8	12	13	9	8	11	18	16	6	12	15	5	S	5	24	12.0	
Dec 20	10	3	2	4	4	5	6	11	15	8	7	8	10	11	11	10	10	11	8	8	10	13	S	17	2	17	8.8	
Dec 21	18	16	15	15	17	11	10	12	9	10	12	11	5	4	3	4	5	7	4	5	2	S	5	4	2	18	8.9	
Dec 22	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	1	0	0	0	2	1.0	
Dec 23	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	2	1	2	1	0	2	0.9	
Dec 24	2	2	14	21	6	3	1	5	7	12	5	3	7	5	5	1	7	7	S	3	15	6	12	9	1	21	6.9	
Dec 25	10	5	6	2	1	3	4	2	4	6	7	5	3	3	3	2	3	S	3	9	9	3	4	3	1	10	4.3	
Dec 26	2	2	7	9	7	6	5	2	1	1	2	3	2	1	2	4	S	1	1	1	1	2	1	2	1	9	2.8	
Dec 27	1	1	1	1	1	2	3	4	16	26	18	10	5	3	4	S	12	11	10	11	9	8	7	9	1	26	7.5	
Dec 28	14	13	12	13	10	10	9	8	8	16	13	14	12	S	10	9	13	10	19	19	15	5	8	5	19	11.7		
Dec 29	15	8	3	4	6	5	8	7	5	5	4	5	4	S	1	1	2	3	3	4	4	4	5	5	1	15	4.8	
Dec 30	5	5	4	3	3	5	6	12	13	14	9	7	S	5	6	4	6	18	23	22	10	6	12	9	3	23	9.0	
Dec 31	7	7	8	8	9	9	8	8	8	9	17	S	13	8	9	10	8	9	9	10	8	8	8	9	7	17	9.0	
Diurnal Maximum	20	16	20	21	24	11	13	23	50	57	46	35	20	17	20	28	38	30	26	23	22	23	21	22				
Diurnal Average	6.3	5.5	6.0	6.0	5.5	5.0	5.7	7.5	10.7	11.1	10.5	8.5	6.6	5.3	5.7	6.4	7.7	8.4	6.7	6.9	7.3	6.7	5.4	6.1				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

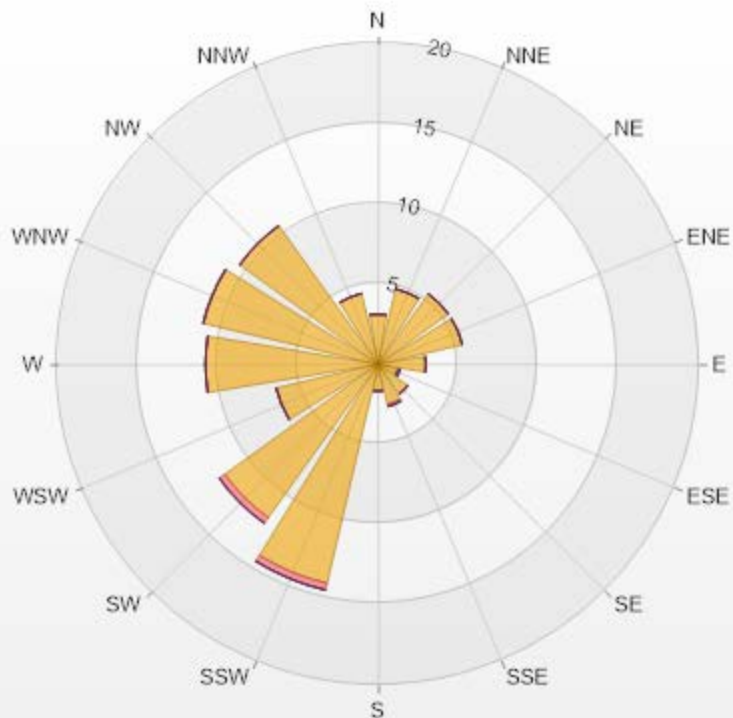
Timeseries Chart of Hourly Average for NOx - Tamarack Site





Wind: Tamarack Poll.: Tamarack-NOX[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.12	0	0	0	0	3.12
NNE	4.82	0	0	0	0	4.82
NE	5.38	0	0	0	0	5.38
ENE	5.38	0	0	0	0	5.38
E	2.97	0	0	0	0	2.97
ESE	1.27	0	0.14	0	0	1.41
SE	2.27	0	0	0	0	2.27
SSE	2.55	0.14	0	0	0	2.69
S	1.7	0	0	0	0	1.7
SSW	14.02	0.42	0	0	0	14.44
SW	11.76	0.42	0	0	0	12.18
WSW	6.52	0	0	0	0	6.52
W	10.76	0	0	0	0	10.76
WNW	11.19	0	0	0	0	11.19
NW	10.62	0	0	0	0	10.62
NNW	4.53	0	0	0	0	4.53
Summary	98.86	0.98	0.14	0	0	100



LICA-202112

% Icon Classes (ppb)	99	0-30	1	30-50	0	50-76	0	76-159	0	>159.0



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Tamarack Site - December 2021

Summary of Hourly Averages

NITRIC OXIDE (NO) in ppb

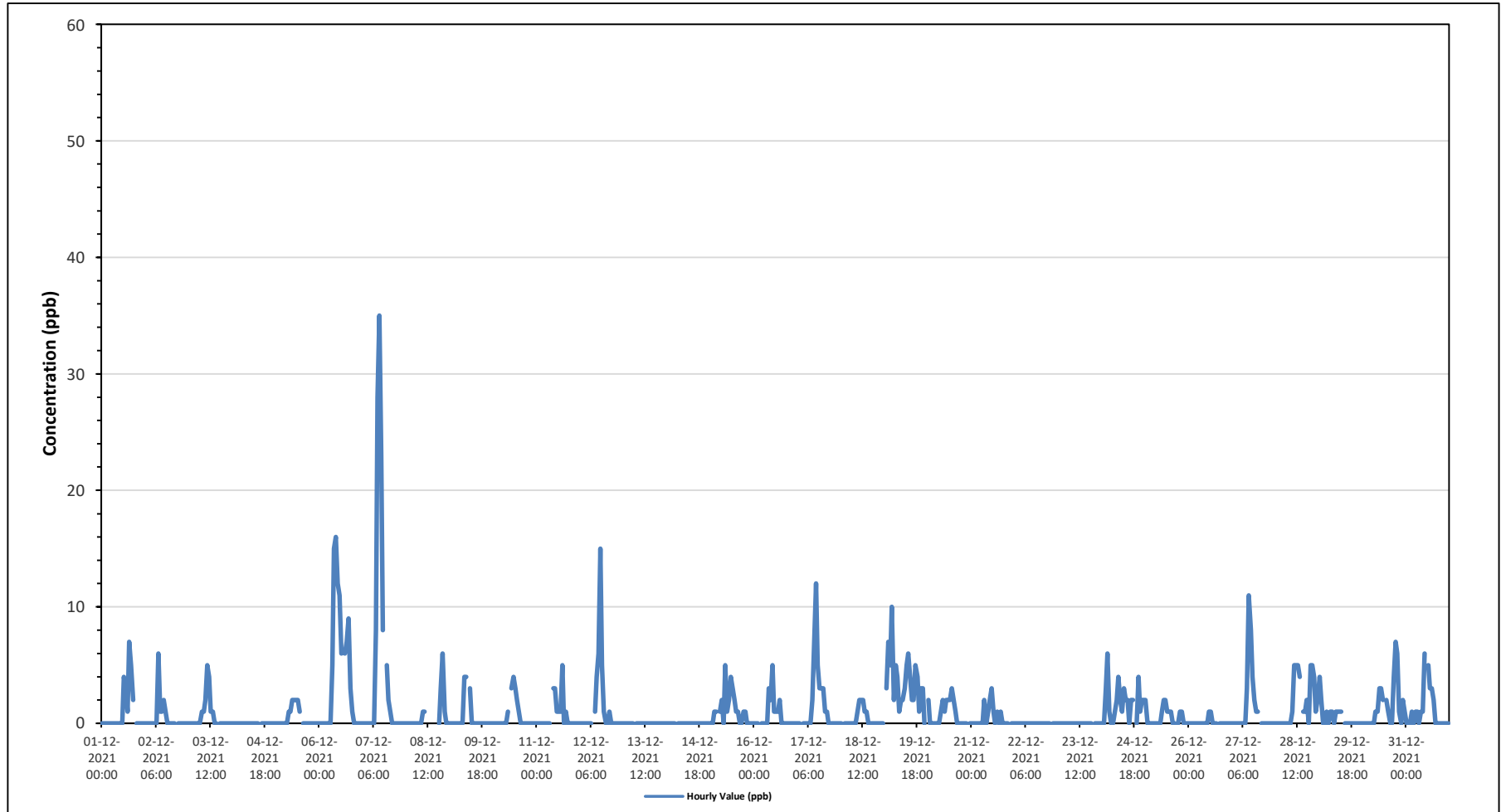
Maximum Hourly Value:	35 ppb on December 7 at hour 9	Hours in Service:	744
Maximum Daily Value:	4.8 ppb on December 7	Hours of Data:	706
Minimum Hourly Value:	0 ppb on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 ppb on December 4	Hours of Calibration:	38
Monthly Average:	1.0 ppb	Operational Uptime:	100.0

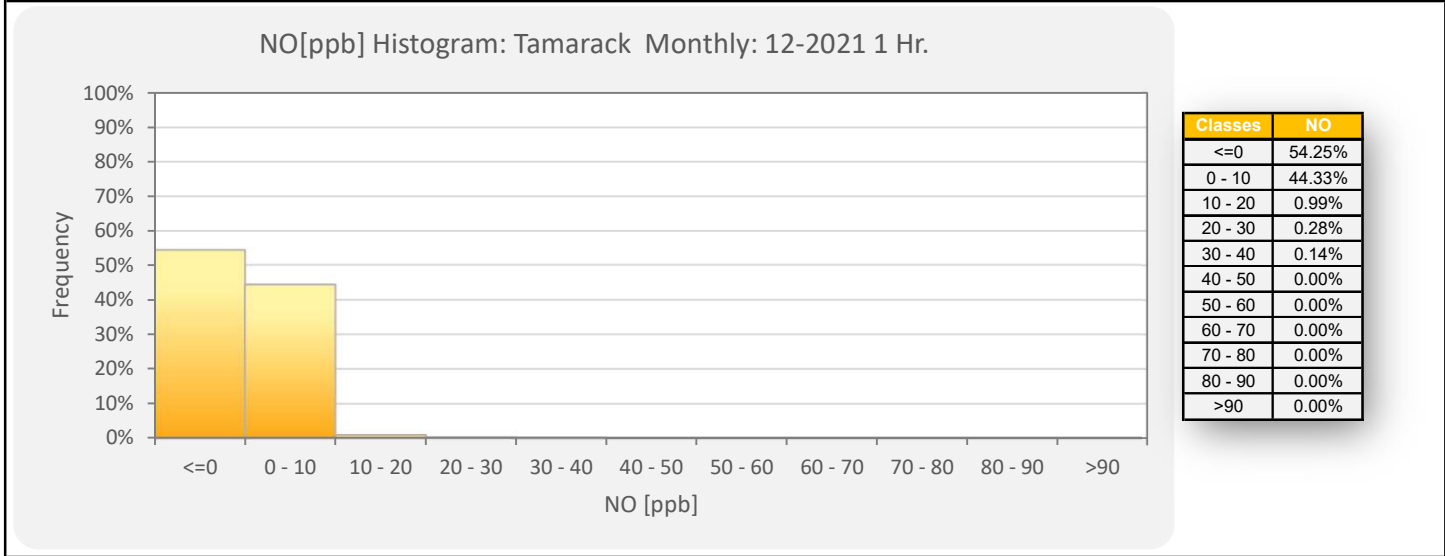
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23			
Dec 1	0	0	0	0	0	0	0	0	0	0	0	0	4	3	1	7	5	2	S	0	0	0	0	0	0	0	0	0	7	1.0
Dec 2	0	0	0	0	0	0	0	0	6	1	1	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	6	0.5
Dec 3	0	0	0	0	0	0	0	1	1	2	5	4	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	5	0.7
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 5	0	0	0	0	0	0	0	1	2	2	2	2	2	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.5
Dec 6	0	0	0	0	0	0	0	5	15	16	12	11	6	S	6	7	9	3	1	0	0	0	0	0	0	0	0	0	16	4.0
Dec 7	0	0	0	0	0	0	0	8	28	35	23	8	S	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	35	4.8
Dec 8	0	0	0	0	0	0	0	0	0	1	1	S	C	C	C	C	C	C	C	0	3	6	1	0	0	0	0	6	-	
Dec 9	0	0	0	0	0	0	0	0	4	4	S	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.5
Dec 10	0	0	0	0	0	0	0	0	1	S	3	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.6
Dec 11	0	0	0	0	0	0	0	0	S	3	3	1	1	1	5	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0.7
Dec 12	0	0	0	0	0	0	0	S	1	4	6	15	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	15	1.4
Dec 13	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 15	0	0	1	1	S	1	2	0	5	1	2	4	3	2	1	1	0	0	1	1	0	0	0	0	0	0	0	0	5	1.1
Dec 16	0	0	0	S	0	0	0	0	3	2	5	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.7
Dec 17	0	0	S	0	0	0	0	0	2	7	12	5	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	12	1.6
Dec 18	0	S	0	0	0	0	0	0	0	1	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.4
Dec 19	S	3	7	5	10	2	5	4	1	2	2	3	5	6	4	2	2	5	4	1	3	3	0	S	0	0	0	10	3.6	
Dec 20	2	0	0	0	0	0	0	1	2	1	2	2	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	3	0.8	
Dec 21	0	0	0	0	0	0	0	2	0	1	2	3	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0.5	
Dec 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0.0
Dec 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0.0
Dec 24	0	0	3	6	1	0	0	1	2	4	2	1	3	2	1	0	2	S	0	4	1	2	2	0	0	0	0	6	1.7	
Dec 25	2	0	0	0	0	0	0	0	0	1	2	2	1	1	1	0	0	S	0	1	1	0	0	0	0	0	0	2	0.5	
Dec 26	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.1	
Dec 27	0	0	0	0	0	0	0	3	11	8	4	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	11	1.3	
Dec 28	0	0	0	0	0	0	0	0	1	5	5	5	4	S	1	1	2	0	5	5	4	1	2	0	0	0	0	5	1.8	
Dec 29	4	2	0	0	1	0	1	1	0	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.6	
Dec 30	0	0	0	0	0	0	0	1	1	3	3	2	S	2	1	0	0	4	7	6	1	0	2	1	0	0	7	1.5		
Dec 31	0	0	0	1	0	1	1	0	1	1	6	S	5	3	3	2	0	0	0	0	0	0	0	0	0	0	0	6	1.0	
Diurnal Maximum	4	3	7	6	10	2	5	8	28	35	23	15	6	6	6	7	9	5	7	6	6	4	2	2						
Daiurnal Average	0.3	0.2	0.4	0.4	0.4	0.1	0.3	1.0	2.4	3.5	3.7	2.9	2.0	1.5	1.3	0.8	0.8	0.6	0.4	0.6	0.7	0.3	0.2	0.2						

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

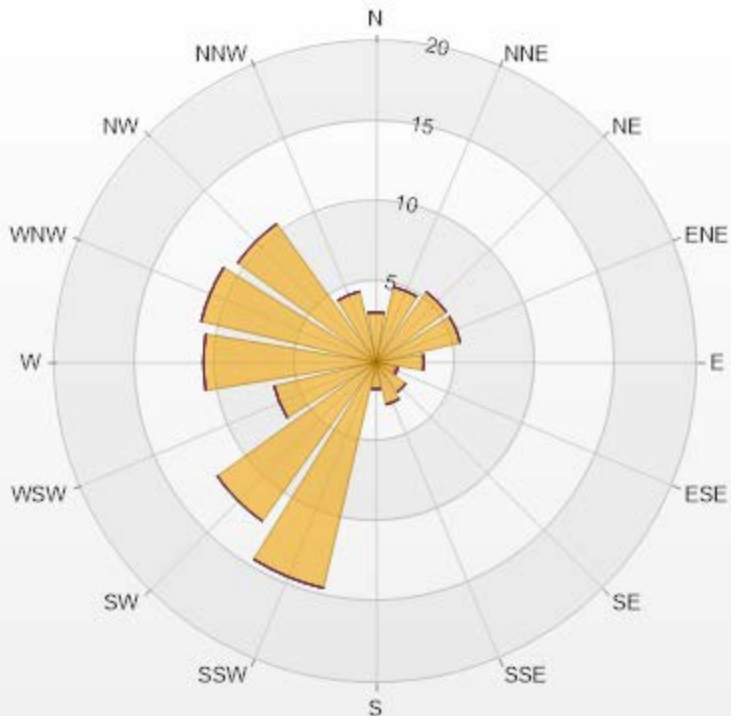
Timeseries Chart of Hourly Average for NO - Tamarack Site





Wind: Tamarack Poll.: Tamarack-NO[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.12	0	0	0	0	3.12
NNE	4.82	0	0	0	0	4.82
NE	5.38	0	0	0	0	5.38
ENE	5.38	0	0	0	0	5.38
E	2.97	0	0	0	0	2.97
ESE	1.27	0.14	0	0	0	1.41
SE	2.27	0	0	0	0	2.27
SSE	2.69	0	0	0	0	2.69
S	1.7	0	0	0	0	1.7
SSW	14.45	0	0	0	0	14.45
SW	12.18	0	0	0	0	12.18
WSW	6.52	0	0	0	0	6.52
W	10.76	0	0	0	0	10.76
WNW	11.19	0	0	0	0	11.19
NW	10.62	0	0	0	0	10.62
NNW	4.53	0	0	0	0	4.53
Summary	100	0.14	0	0	0	100



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% Icon Classes (ppb)

100

0-30

0

30-50

0

50-76

0

76-159

0

>159.0



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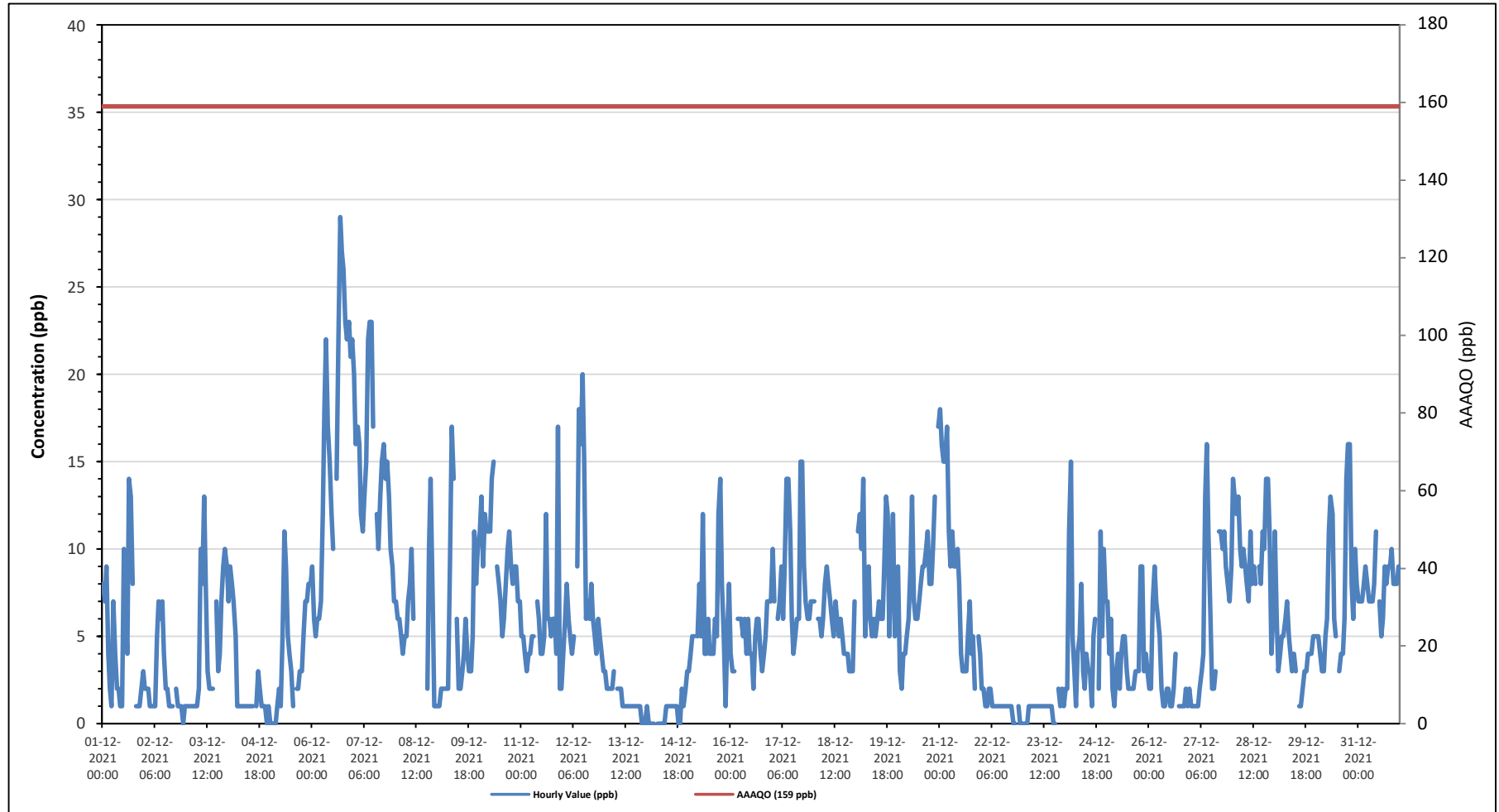
Tamarack Site - December 2021

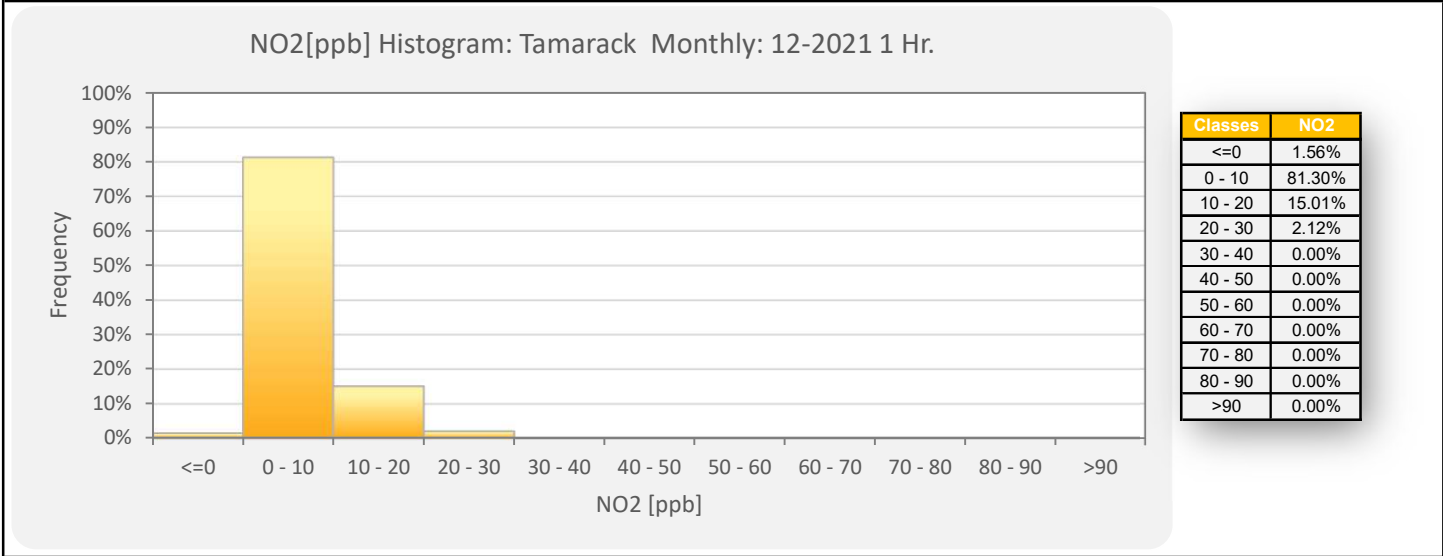
Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																																	
Number of 1-Hour Exceedences: 0																																	
Maximum Hourly Value: 29 ppb on December 6 at hour 16												Hours in Service: 744																					
Maximum Daily Value: 16.3 ppb on December 6												Hours of Data: 706																					
Minimum Hourly Value: 0 ppb on December 2 at hour 22												Hours of Missing Data: 0																					
Minimum Daily Value: 0.7 ppb on December 14												Hours of Calibration: 38																					
Monthly Average: 5.9 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									
Dec 1	8	7	9	4	2	1	7	4	2	2	1	1	10	6	4	14	13	8	S	1	1	1	1	2	3	1	14	4.8					
Dec 2	2	2	2	1	1	1	1	5	7	6	7	4	2	2	1	1	1	1	S	2	1	1	1	0	1	0	7	2.3					
Dec 3	1	1	1	1	1	1	1	2	10	8	13	8	3	2	2	2	S	7	3	4	7	9	10	9	1	13	4.6						
Dec 4	7	9	8	7	5	1	1	1	1	1	1	1	1	1	S	1	3	2	1	1	1	0	1	0	9	2.4							
Dec 5	0	0	0	0	1	2	1	5	11	9	5	4	3	1	S	2	2	3	3	5	7	7	8	8	0	11	3.8						
Dec 6	9	6	5	6	6	7	12	18	22	17	15	12	10	S	14	22	29	27	26	23	22	23	21	22	5	29	16.3						
Dec 7	20	16	17	16	12	11	13	15	22	23	23	17	S	12	10	13	15	16	14	15	13	10	9	7	7	23	14.7						
Dec 8	7	6	6	5	4	5	5	7	8	10	6	S	C	C	C	C	C	C	2	10	14	7	1	1	1	14	-						
Dec 9	1	1	2	2	2	2	2	9	17	14	S	6	2	2	2	3	4	6	4	3	3	5	11	8	10	1	17	5.2					
Dec 10	11	13	9	12	11	11	11	14	15	S	9	8	7	5	6	8	10	11	9	8	9	9	7	7	5	15	9.6						
Dec 11	5	5	4	3	4	4	5	5	S	7	6	4	4	5	12	6	6	5	6	6	4	17	2	2	2	17	5.5						
Dec 12	4	6	8	6	5	4	5	S	9	18	16	20	15	6	7	6	8	6	5	4	6	5	4	3	3	20	7.7						
Dec 13	3	2	2	2	2	3	S	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	3	1.3						
Dec 14	1	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	1	0	0	2	1	2	3	0	3	0.7						
Dec 15	3	4	5	5	S	5	8	5	12	4	4	6	4	4	6	5	12	14	8	5	1	5	8	1	14	6.0							
Dec 16	4	3	3	S	6	6	6	5	6	4	6	4	4	2	5	6	6	4	3	4	5	7	7	7	2	7	4.9						
Dec 17	10	7	S	6	7	9	6	9	14	14	11	6	4	5	6	6	15	15	9	7	6	6	7	7	4	15	8.3						
Dec 18	7	S	6	6	5	6	8	9	8	7	6	5	7	6	5	6	5	4	4	4	3	3	3	7	3	9	5.7						
Dec 19	S	11	12	10	14	5	8	9	6	5	6	5	6	7	6	6	9	13	12	5	9	12	5	S	5	14	8.2						
Dec 20	9	3	2	4	4	5	6	9	13	7	6	6	7	8	9	9	10	11	8	8	10	13	S	17	2	17	8.0						
Dec 21	18	16	15	15	17	11	9	11	9	9	10	8	4	3	3	3	5	7	4	5	2	S	5	4	2	18	8.4						
Dec 22	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	1	0	0	0	2	1.0						
Dec 23	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	2	1	2	1	0	2	0.9						
Dec 24	2	2	11	15	5	3	1	4	5	8	3	2	4	3	3	1	5	6	S	2	11	5	10	7	1	15	5.1						
Dec 25	7	4	6	2	1	3	4	2	4	5	5	3	2	2	2	2	3	S	3	9	9	3	4	3	1	9	3.8						
Dec 26	2	2	7	9	7	6	5	2	1	1	2	2	1	1	2	4	S	1	1	1	1	2	1	2	1	9	2.7						
Dec 27	1	1	1	1	1	2	3	4	13	16	11	6	2	2	3	S	11	11	10	11	9	8	7	9	1	16	6.2						
Dec 28	14	13	12	13	10	9	10	9	8	7	11	8	9	8	S	9	8	11	10	14	14	11	4	6	4	14	9.9						
Dec 29	11	6	3	4	5	5	6	7	5	4	3	4	3	S	1	1	2	3	3	4	4	4	5	5	1	11	4.3						
Dec 30	5	5	4	3	3	5	6	11	13	12	6	5	S	3	4	4	6	14	16	16	8	6	10	8	3	16	7.5						
Dec 31	7	7	7	8	9	8	7	7	7	8	11	S	7	5	6	9	8	9	9	10	8	8	8	9	5	11	7.9						
Diurnal Maximum	20	16	17	16	17	11	13	18	22	23	23	20	15	12	14	22	29	27	26	23	22	23	21	22									
Diurnal Average	6.0	5.3	5.6	5.6	5.1	4.8	5.3	6.4	8.4	7.7	6.9	5.5	4.5	3.8	4.4	5.5	6.9	7.6	6.3	6.3	6.6	6.4	5.2	5.9									
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance										
K	Collection Error										N	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.																																	

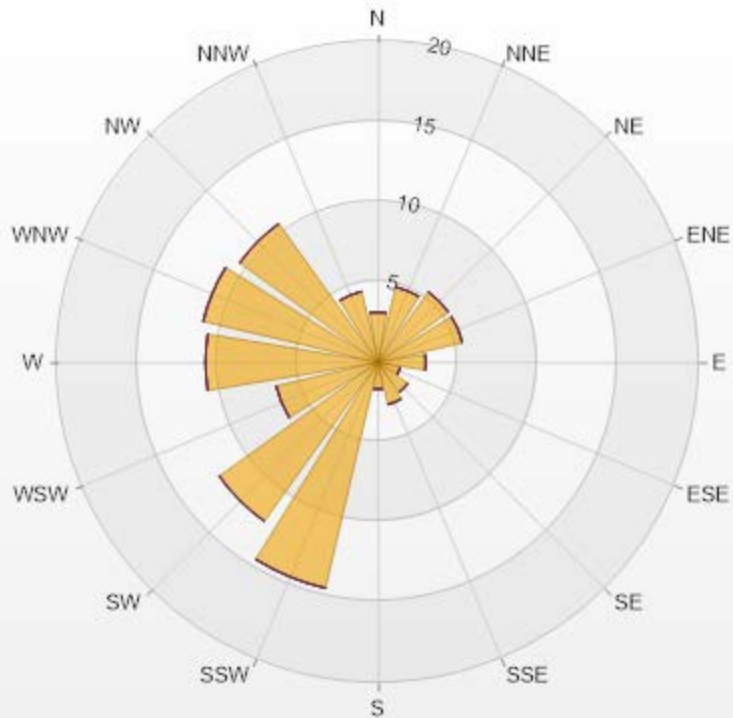
Timeseries Chart of Hourly Average for NO2 - Tamarack Site





Wind: Tamarack Poll.: Tamarack-NO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	3.12	0	0	0	0	3.12
NNE	4.82	0	0	0	0	4.82
NE	5.38	0	0	0	0	5.38
ENE	5.38	0	0	0	0	5.38
E	2.97	0	0	0	0	2.97
ESE	1.42	0	0	0	0	1.42
SE	2.27	0	0	0	0	2.27
SSE	2.69	0	0	0	0	2.69
S	1.7	0	0	0	0	1.7
SSW	14.45	0	0	0	0	14.45
SW	12.18	0	0	0	0	12.18
WSW	6.52	0	0	0	0	6.52
W	10.76	0	0	0	0	10.76
WNW	11.19	0	0	0	0	11.19
NW	10.62	0	0	0	0	10.62
NNW	4.53	0	0	0	0	4.53
Summary	100	0	0	0	0	100



LICA-202112

% Icon Classes (ppb)

100  0-30

0  30-50

0  50-76

0  76-159

0  >159.0



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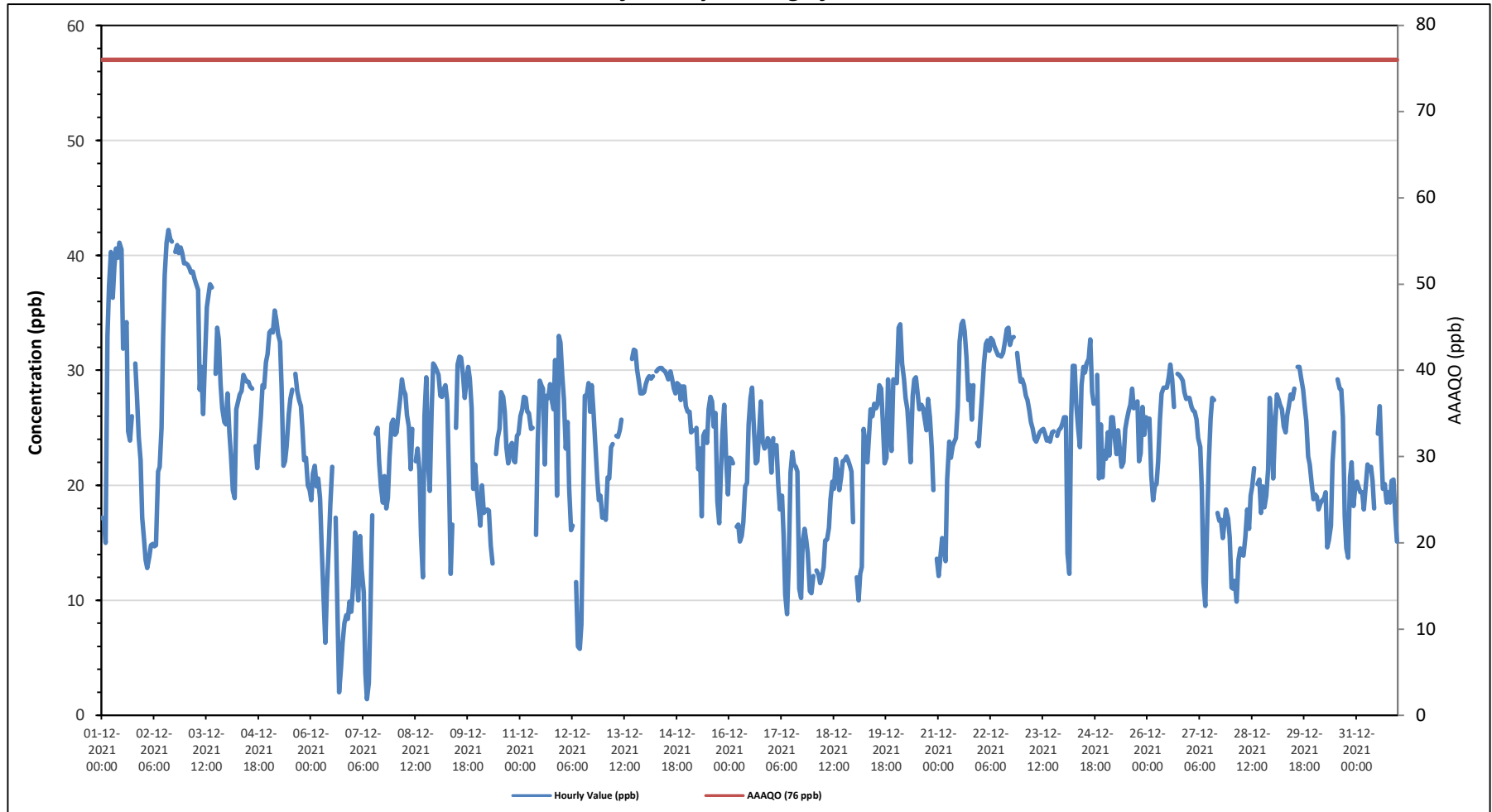
Tamarack Site - December 2021

Summary of Hourly Averages

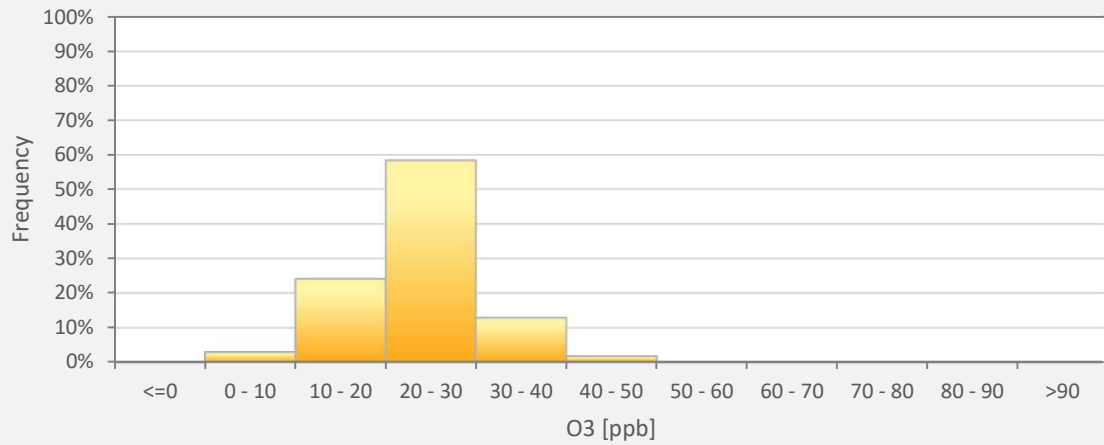
OZONE (O3) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 76 ppb																															
Number of 1-Hour Exceedences: 0																															
Maximum Hourly Value: 42.2 ppb on December 2 at hour 14															Hours in Service: 744																
Maximum Daily Value: 33.6 ppb on December 3															Hours of Data: 707																
Minimum Hourly Value: 1.4 ppb on December 7 at hour 8															Hours of Missing Data: 0																
Minimum Daily Value: 13.1 ppb on December 6															Hours of Calibration: 37																
Monthly Average: 23.9 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				
Dec 1	17.2	17	15	33	37.4	40.3	36.3	39	40.6	39.8	41.1	40.5	31.9	33.4	34.2	24.7	23.9	26	S	30.6	27.9	24.2	22.2	17.2	15.0	41.1	30.1				
Dec 2	15.3	13.5	12.8	13.8	14.8	14.9	14.7	14.8	21.2	21.6	25	32.9	38.3	41.1	42.2	41.4	41.2	S	40.3	40.9	40.2	40.7	40.2	39.3	12.8	42.2	28.7				
Dec 3	39.3	39.2	38.9	38.5	38.6	38	37.5	37	28.3	30.3	26.2	31	35.5	36.5	37.5	37.2	S	29.7	33.7	32.7	28.7	26.7	25.5	25.3	25.3	39.3	33.6				
Dec 4	28	24.6	22.6	19.6	18.9	26.6	27.3	27.9	28.2	29.6	29.3	29	29	28.6	28.4	S	23.4	21.5	23.6	26.1	28.7	28.5	30.7	31.4	18.9	31.4	26.6				
Dec 5	33.3	33.5	33.3	35.2	34.4	33.1	32.5	28.5	21.7	22.1	23.4	26.2	27.5	28.3	S	29.7	28.2	27.4	26.9	24.8	22.2	22.4	20	19.6	19.6	35.2	27.6				
Dec 6	18.7	21	21.7	19.9	20.6	18.9	14.8	10.4	6.3	11	14.8	18.4	21.6	S	17.2	8.7	2	4.1	6.3	8	8.7	8.4	9.9	9	2.0	21.7	13.1				
Dec 7	11.3	15.9	12.7	10	15.6	12.7	10.7	3.7	1.4	2.8	8.9	17.4	S	24.5	25	22	19.8	18.5	20.8	18	18.9	22.4	25.4	25.7	1.4	25.7	15.8				
Dec 8	24.4	24.6	26	27.7	29.2	28.3	27.9	26.1	25.1	21.4	24.9	S	22.1	23.2	21.3	15.6	12	26	29.4	21.7	19.5	26.5	30.6	30.4	12.0	30.6	24.5				
Dec 9	30	29.6	27.8	27.7	28.3	28.7	27.3	20.2	12.3	16.6	S	25	30.5	31.2	31.1	29.7	27.6	29.1	30.3	29.3	26.7	19.7	21.8	19.5	12.3	31.2	26.1				
Dec 10	18.2	16.5	20	17.6	17.8	17.9	17.8	14.8	13.2	S	22.7	24.1	24.9	28.1	27.7	26.4	23.3	21.9	23.3	23.7	22.2	22	24.3	24.5	13.2	28.1	21.4				
Dec 11	26	26.6	27.7	27.6	26.4	26.3	24.9	25	S	15.7	23.6	29.1	28.7	28.4	21.8	27.8	27.6	28.8	27.4	26.6	30.9	19.1	33	32.4	15.7	33.0	26.6				
Dec 12	29.5	27.5	23.2	25.5	19.7	16.1	16.5	S	11.6	6	5.8	7.9	17.1	27.8	27.8	28.9	26.4	28.7	26.3	23.4	20.5	18.7	19.1	17.2	5.8	29.5	20.5				
Dec 13	17.7	17	20.7	20.6	23.3	23.6	S	24.3	24.2	24.8	25.7	C	C	C	C	C	C	31	31.8	31.7	30.1	29	28	28	28.1	17.0	31.8	25.5			
Dec 14	28.8	29.3	29.5	29.3	29.5	S	29.9	30.1	30.2	30.2	30	29.9	29.6	29.2	29.9	29.3	28.4	28	28.9	28.7	27.4	28.6	26.9	26.9	26.9	30.2	29.1				
Dec 15	26.4	26.4	24.6	24.8	S	25	21.4	23.2	17.3	24.3	24.7	23.7	26.6	27.7	27.3	25.1	26.3	18.6	16.7	20.9	24.5	27	22.4	19.2	16.7	27.7	23.7				
Dec 16	22.4	22.3	21.9	S	16.4	16.6	15.1	15.6	16.8	19.9	20.2	25.3	27.6	28.5	24.9	21.9	22.1	24.8	27.3	23.8	23.2	23.4	24.1	23.8	15.1	28.5	22.1				
Dec 17	21.1	24.1	S	23.5	20	17.9	19.1	15.6	10.5	8.8	13	21.1	22.9	21.8	21.6	21.2	11	10.2	15.1	16.2	15.3	14.1	10.8	10.6	8.8	24.1	16.8				
Dec 18	12.1	S	12.6	12.2	11.5	12.1	12.9	15.2	15.3	16.3	18.8	20.3	19.7	22.3	21.3	19.6	20.7	22.1	22.2	22.5	22.2	21.7	21.2	16.8	11.5	22.5	17.9				
Dec 19	S	12	10	12.3	12.9	24.9	23.6	22	24.2	26.6	26	27.1	26.7	27.1	28.7	28.4	25.7	21.9	22.4	29.2	25.2	23	29.2	S	10.0	29.2	23.1				
Dec 20	28.9	33.7	34	30.6	29.3	27.6	26.6	24.5	22	27.8	29.2	29.4	27.9	26.6	27	26.7	25.8	24.8	27.5	25.9	23.2	19.6	S	13.6	13.6	34.0	26.6				
Dec 21	12.1	13.9	15.4	14.8	13.4	20.5	23.8	22.4	23.4	23.8	24.1	26.8	32.5	34	34.3	33.4	31.1	27.4	28.7	25.7	28.7	S	23.7	23.4	12.1	34.3	24.2				
Dec 22	25.9	28	30.6	32.3	32.6	31.7	32.8	32.6	32.1	31.7	31.3	31.3	31.2	31.5	32.5	33.6	33.7	32.2	32.8	32.9	S	31.5	30.2	29	25.9	33.7	31.5				
Dec 23	29.2	28.7	27.8	27.4	26.5	25.5	24.9	24	23.8	24.2	24.6	24.8	24.9	24.5	23.9	24.1	23.8	24.6	24.7	S	24.3	24.8	25	25.4	23.8	29.2	25.3				
Dec 24	25.9	25.9	14.1	12.3	26	30.4	30.4	27.1	25	23.3	28.7	30.3	29.8	30.6	31	32.7	28.1	27.1	S	29.6	20.6	25.3	20.7	23	12.3	32.7	26.0				
Dec 25	22.3	24.6	22.6	25.9	25.9	24.2	22.7	24.8	23	21.6	22	24.9	25.7	26.5	27	28.4	26.7	S	27.3	22.1	22.8	26.8	24.4	25.9	21.6	28.4	24.7				
Dec 26	25.3	25.8	20.9	18.7	20	20.1	22.1	25.8	28	28.5	28.5	28.5	29.4	30.5	29.2	26.8	S	29.7	29.6	29.4	29.1	28.1	27.5	27.6	18.7	30.5	26.5				
Dec 27	27.6	26.8	26.5	26.4	25.7	24.1	23.3	19.5	11.6	9.5	15.9	21.9	25.8	27.6	27.4	S	17.6	16.9	17	15.4	16.7	17.9	17.1	15.5	9.5	27.6	20.6				
Dec 28	11.1	11	11.7	9.9	13.5	14.5	14	13.9	15.5	17.9	16.2	19.1	19.9	21.5	S	20.1	20.5	17.6	19.9	18.1	19.1	21.4	27.6	25.4	9.9	27.6	17.4				
Dec 29	20.6	25	27.9	27.5	27	26.6	25.1	24.6	26.1	26.9	27.9	27.5	28.4	S	30.3	30.3	29.4	28.3	26.9	25.6	22.5	21.8	20.2	18.8	18.8	30.3	25.9				
Dec 30	19.2	19	17.9	18.4	18.7	18.8	19.4	14.6	15.2	16.5	22	24.6	S	29.2	28.4	28.3	25.9	17.3	14.5	13.7	20.7	22	18.2	19.7	13.7	29.2	20.1				
Dec 31	20.3	19.8	19.4	19.4	17.9	19.6	21.8	21.3	21.6	20.4	18	S	24.5	26.9	23	19.7	20.1	18.5	19.4	18.5	20.4	20.5	17.2	15.1	15.1	26.9	20.1				
Diurnal Maximum	39	39	39	39	39	40	38	39	41	40	41	41	38	41	42	41	41	32	40	41	40	41	40	39							
Diurnal Average	22.9	23.4	22.3	22.7	23.1	23.5	23.2	22.3	20.5	21.3	23.1	25.6	27.2	28.5	27.9	26.5	24.3	23.6	24.9	24.5	23.7	23.5	24.0	22.6							
C	Monthly Calibration							S	Daily Zero-Span Check							Q	Quality Assurance														
K	Collection Error							N	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.																															

Timeseries Chart of Hourly Average for O3 - Tamarack Site



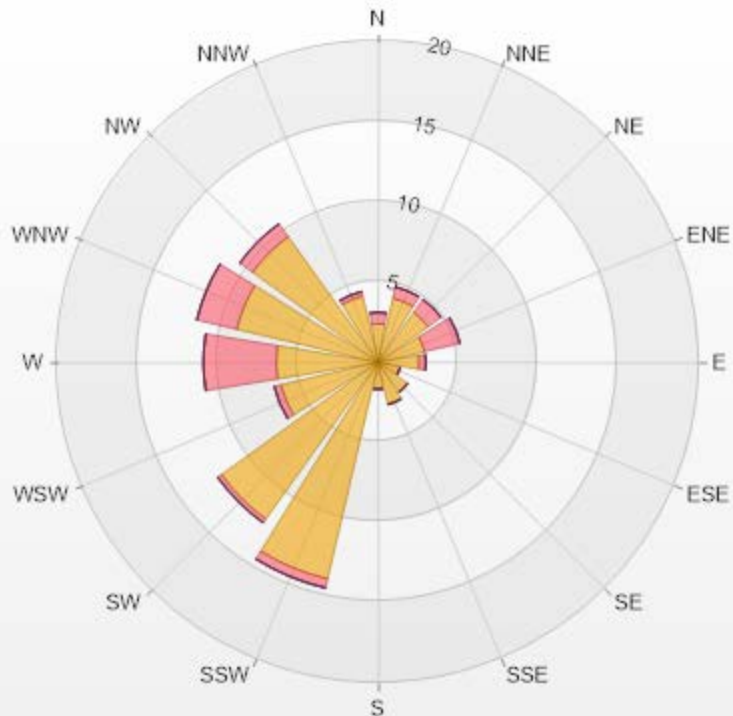
O3[ppb] Histogram: Tamarack Monthly: 12-2021 1 Hr.



Classes	O3
<=0	0.00%
0 - 10	2.97%
10 - 20	24.05%
20 - 30	58.27%
30 - 40	12.87%
40 - 50	1.84%
50 - 60	0.00%
60 - 70	0.00%
70 - 80	0.00%
80 - 90	0.00%
>90	0.00%

Wind: Tamarack Poll.: Tamarack-O3[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.4	0.71	0	0	0	3.11
NNE	4.1	0.71	0	0	0	4.81
NE	3.82	0.99	0	0	0	4.81
ENE	2.97	2.26	0	0	0	5.23
E	2.55	0.42	0	0	0	2.97
ESE	1.41	0	0	0	0	1.41
SE	2.26	0	0	0	0	2.26
SSE	2.69	0	0	0	0	2.69
S	1.7	0	0	0	0	1.7
SSW	13.86	0.57	0	0	0	14.43
SW	12.02	0.28	0	0	0	12.3
WSW	6.22	0.42	0	0	0	6.64
W	6.36	4.53	0	0	0	10.89
WNW	9.05	2.55	0	0	0	11.6
NW	9.62	0.99	0	0	0	10.61
NNW	4.24	0.28	0	0	0	4.52
Summary	85.27	14.71	0	0	0	100



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% Icon Classes (ppb)

85 0-30

15 30-50

0 50-76

0 76-159

0 >159.0



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Tamarack Site - December 2021

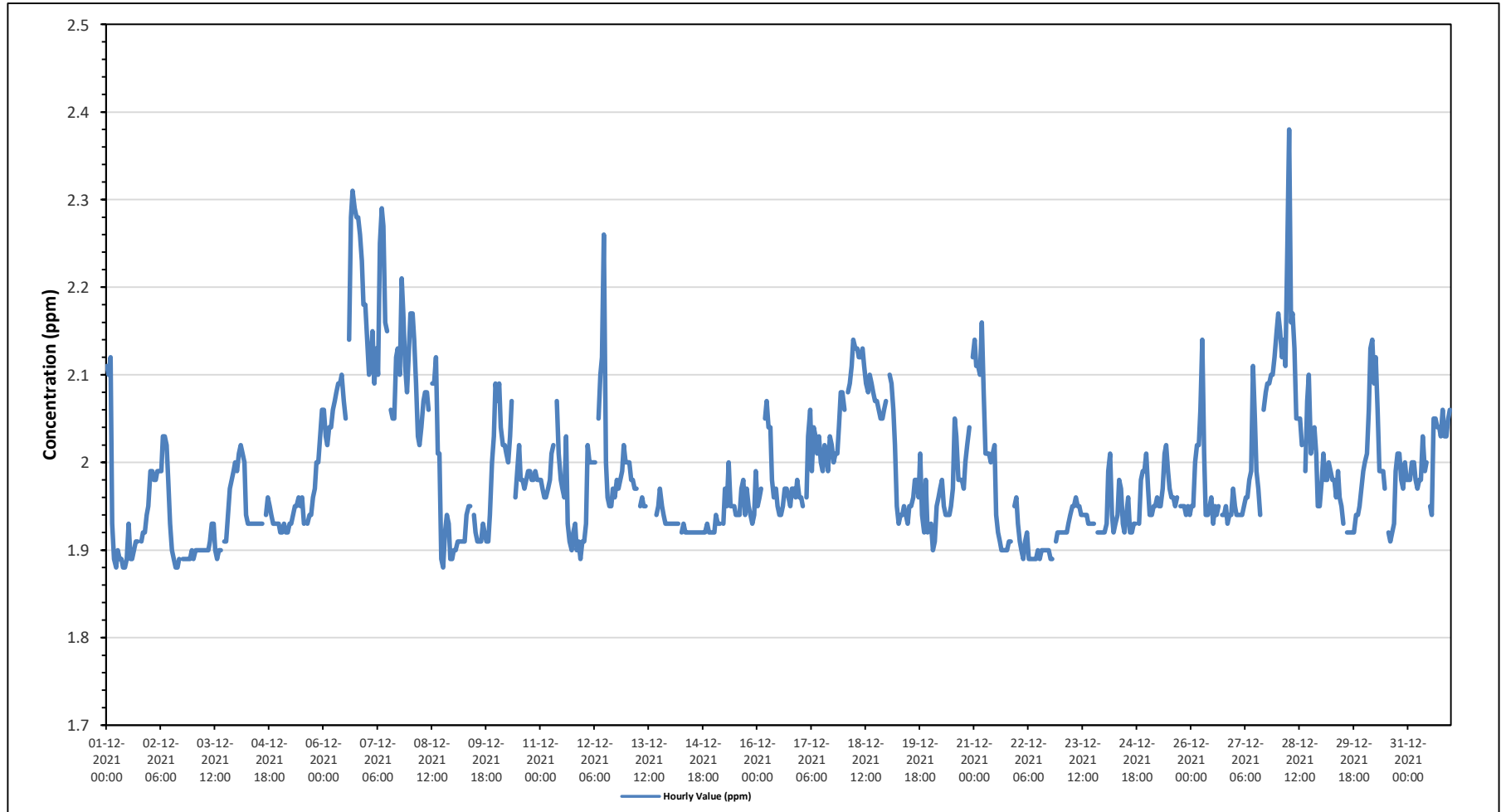
Summary of Hourly Averages

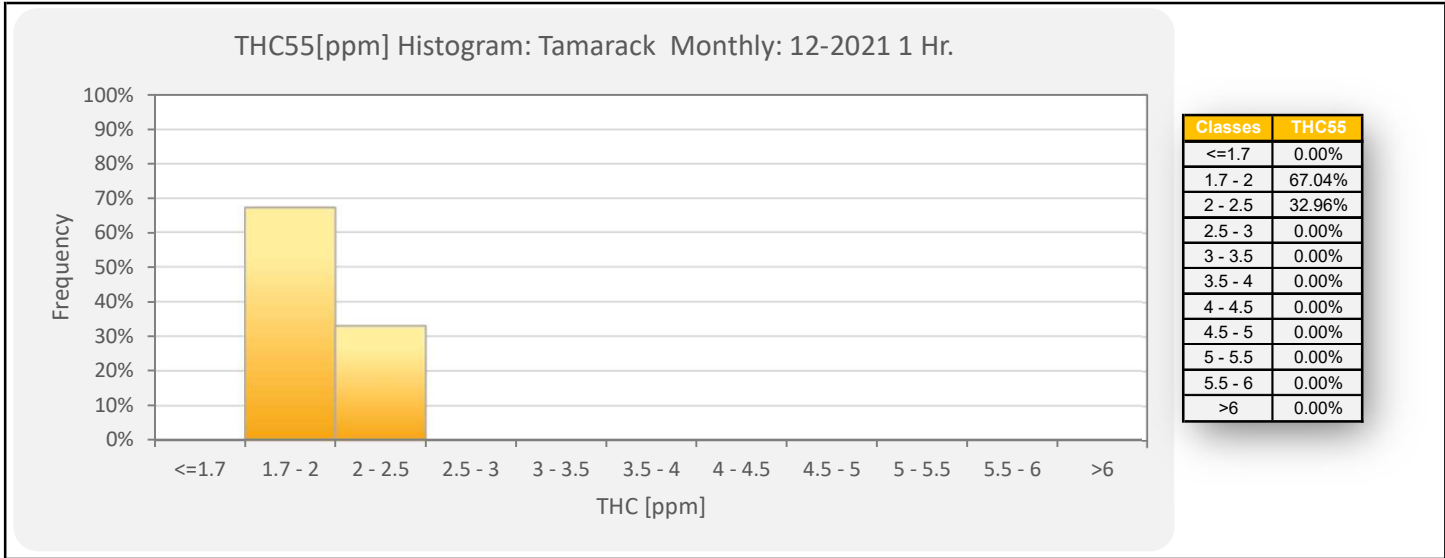
TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	2.38 ppm on December 28 at hour 6	Hours in Service:	744
Maximum Daily Value:	2.14 ppm on December 6	Hours of Data:	707
Minimum Hourly Value:	1.88 ppm on December 1 at hour 5	Hours of Missing Data:	0
Minimum Daily Value:	1.90 ppm on December 22	Hours of Calibration:	37
Monthly Average:	1.99 ppm	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
Dec 1	2.11	2.10	2.12	1.93	1.89	1.88	1.90	1.89	1.89	1.88	1.88	1.89	1.93	1.89	1.89	1.90	1.91	1.91	S	1.91	1.92	1.92	1.94	1.95	1.88	2.12	1.93
Dec 2	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.03	2.03	2.02	1.98	1.93	1.90	1.89	1.88	1.88	1.89	S	1.89	1.89	1.89	1.89	1.89	1.90	1.88	2.03	1.94
Dec 3	1.89	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.91	1.93	1.93	1.90	1.89	1.90	1.90	S	1.91	1.91	1.94	1.97	1.98	1.99	2.00	1.89	2.00	1.92
Dec 4	1.99	2.01	2.02	2.01	2.00	1.94	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	S	1.94	1.96	1.95	1.94	1.93	1.93	1.93	1.93	1.93	2.02	1.95
Dec 5	1.92	1.92	1.93	1.92	1.92	1.93	1.93	1.94	1.95	1.95	1.96	1.95	1.96	1.93	S	1.93	1.94	1.94	1.96	1.97	2.00	2.00	2.03	2.06	1.92	2.06	1.95
Dec 6	2.06	2.03	2.02	2.04	2.04	2.06	2.07	2.08	2.09	2.09	2.10	2.07	2.05	S	2.14	2.28	2.31	2.29	2.28	2.28	2.26	2.23	2.18	2.18	2.02	2.31	2.14
Dec 7	2.14	2.10	2.12	2.15	2.09	2.13	2.10	2.25	2.29	2.27	2.16	2.15	S	2.06	2.05	2.05	2.12	2.13	2.10	2.21	2.17	2.11	2.08	2.12	2.05	2.29	2.14
Dec 8	2.17	2.17	2.14	2.09	2.03	2.02	2.04	2.07	2.08	2.08	2.06	S	2.09	2.09	2.12	2.01	2.01	1.89	1.88	1.92	1.94	1.93	1.89	1.89	1.88	2.17	2.03
Dec 9	1.90	1.90	1.91	1.91	1.91	1.91	2.01	1.94	1.94	1.95	1.95	S	1.94	1.92	1.91	1.91	1.93	1.92	1.91	1.91	1.94	2.00	2.03	2.09	1.90	2.09	1.94
Dec 10	2.07	2.09	2.04	2.02	2.02	2.01	2.00	2.03	2.07	S	1.96	1.99	2.02	1.98	1.98	1.97	1.98	1.99	1.99	1.98	1.98	1.99	1.98	1.98	1.96	2.09	2.01
Dec 11	1.98	1.97	1.96	1.96	1.97	1.98	2.01	2.02	S	2.07	2.01	1.98	1.97	1.96	2.03	1.93	1.91	1.90	1.92	1.93	1.90	1.89	1.91	1.89	1.89	2.07	1.96
Dec 12	1.91	1.93	2.02	2.00	2.00	2.00	2.00	S	2.05	2.10	2.12	2.26	2.00	1.96	1.95	1.95	1.97	1.96	1.98	1.97	1.98	1.99	2.02	2.00	1.91	2.26	2.01
Dec 13	2.00	2.00	1.98	1.98	1.97	1.97	S	1.95	1.96	1.95	1.95	C	C	C	C	C	C	1.94	1.95	1.97	1.95	1.94	1.93	1.93	1.93	2.00	1.96
Dec 14	1.93	1.93	1.93	1.93	1.93	S	1.92	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.93	1.92	1.92	1.92	1.92	1.93	1.92
Dec 15	1.92	1.94	1.93	1.93	S	1.93	1.97	1.95	2.00	1.95	1.95	1.95	1.94	1.94	1.94	1.97	1.98	1.94	1.97	1.95	1.94	1.93	1.94	1.99	1.92	2.00	1.95
Dec 16	1.95	1.96	1.97	S	2.05	2.07	2.04	2.04	1.98	1.96	1.97	1.95	1.94	1.94	1.95	1.97	1.97	1.96	1.95	1.97	1.97	1.96	1.98	1.96	1.94	2.07	1.98
Dec 17	1.96	1.95	S	1.96	2.03	2.06	1.99	2.04	2.03	2.01	2.03	2.00	1.99	2.02	2.01	1.99	2.03	2.02	2.00	2.01	2.01	2.04	2.08	2.08	1.95	2.08	2.01
Dec 18	2.06	S	2.08	2.09	2.11	2.14	2.13	2.13	2.12	2.12	2.13	2.11	2.09	2.08	2.10	2.09	2.08	2.07	2.07	2.06	2.05	2.05	2.06	2.07	2.05	2.14	2.09
Dec 19	S	2.10	2.09	2.06	2.02	1.95	1.93	1.94	1.94	1.95	1.94	1.93	1.95	1.95	1.96	1.98	1.98	1.96	2.01	1.94	1.92	1.98	1.92	S	1.92	2.10	1.97
Dec 20	1.93	1.90	1.91	1.95	1.96	1.97	1.98	1.95	1.94	1.94	1.94	1.95	1.97	2.05	2.03	1.98	1.98	1.98	1.97	2.00	2.02	2.04	S	2.12	1.90	2.12	1.98
Dec 21	2.14	2.11	2.11	2.10	2.16	2.08	2.01	2.01	2.01	2.00	2.01	2.02	1.94	1.92	1.91	1.90	1.90	1.90	1.90	1.91	1.91	S	1.95	1.96	1.90	2.16	1.99
Dec 22	1.93	1.91	1.90	1.89	1.91	1.92	1.89	1.89	1.89	1.89	1.89	1.90	1.89	1.90	1.90	1.90	1.90	1.89	1.89	S	1.91	1.92	1.92	1.92	1.89	1.93	1.90
Dec 23	1.92	1.92	1.92	1.92	1.93	1.94	1.95	1.95	1.96	1.95	1.95	1.94	1.94	1.94	1.94	1.94	1.93	1.93	1.93	S	1.92	1.92	1.92	1.92	1.92	1.96	1.93
Dec 24	1.92	1.93	1.99	2.01	1.94	1.92	1.93	1.94	1.98	1.97	1.93	1.92	1.94	1.96	1.92	1.93	1.93	S	1.93	1.93	1.98	1.99	1.99	2.01	1.92	2.01	1.95
Dec 25	1.97	1.94	1.94	1.95	1.95	1.96	1.95	1.95	1.97	2.01	2.02	1.99	1.97	1.96	1.96	1.95	1.96	S	1.95	1.95	1.95	1.94	1.95	1.94	1.94	2.02	1.96
Dec 26	1.95	1.95	2.00	2.02	2.02	2.06	2.14	2.01	1.94	1.94	1.95	1.96	1.93	1.95	1.94	1.95	S	1.94	1.94	1.95	1.93	1.94	1.94	1.97	1.93	2.14	1.97
Dec 27	1.95	1.94	1.94	1.94	1.94	1.95	1.96	1.96	1.98	1.99	2.11	2.05	1.99	1.97	1.94	S	2.06	2.08	2.09	2.09	2.10	2.10	2.12	2.15	1.94	2.15	2.02
Dec 28	2.17	2.15	2.12	2.14	2.11	2.24	2.38	2.16	2.17	2.13	2.05	2.05	2.05	2.02	S	1.99	2.07	2.10	2.01	2.03	2.04	2.01	1.95	1.95	1.95	2.38	2.09
Dec 29	1.98	2.01	1.98	1.98	2.00	1.99	1.98	1.98	1.96	1.99	1.96	1.95	1.93	S	1.92	1.92	1.92	1.92	1.92	1.94	1.94	1.95	1.97	1.99	1.92	2.01	1.96
Dec 30	2.00	2.01	2.06	2.13	2.14	2.09	2.12	2.06	1.99	1.99	1.99	1.97	S	1.92	1.91	1.92	1.93	1.99	2.01	2.01	1.98	1.97	2.00	1.98	1.91	2.14	2.01
Dec 31	1.98	1.98	2.00	2.00	1.98	1.97	1.98	1.98	2.03	1.99	2.00	S	1.95	1.94	2.05	2.05	2.04	2.04	2.03	2.06	2.03	2.03	2.05	2.06	1.94	2.06	2.01
Diurnal Maximum	2.17	2.17	2.14	2.15	2.16	2.24	2.38	2.25	2.29	2.27	2.16	2.26	2.09	2.09	2.14	2.28	2.31	2.29	2.28	2.28	2.26	2.23	2.18	2.18			
Diurnal Average	1.99	1.99	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.99	1.99	1.96	1.96	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.98	1.98	2.00			
C	Monthly Calibration					S	Daily Zero-Span Check					Q	Quality Assurance														
K	Collection Error					N	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.																											

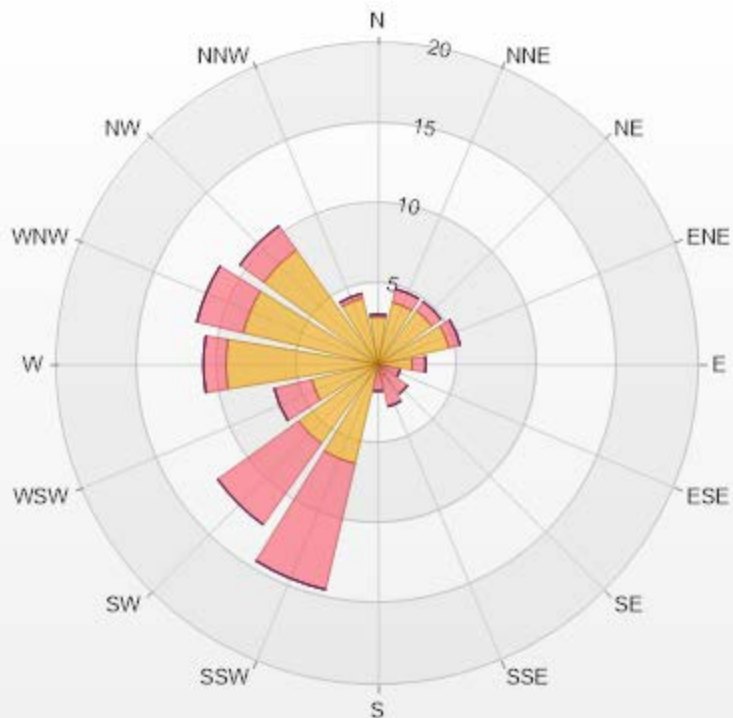
Timeseries Chart of Hourly Average for THC - Tamarack Site





Wind: Tamarack Poll.: Tamarack-THC55[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	2.97	0.14	0	0	0	3.11
NNE	3.96	0.85	0	0	0	4.81
NE	4.1	0.71	0	0	0	4.81
ENE	4.53	0.71	0	0	0	5.24
E	2.12	0.85	0	0	0	2.97
ESE	0.14	1.27	0	0	0	1.41
SE	0.14	2.12	0	0	0	2.26
SSE	0.71	1.98	0	0	0	2.69
S	0.42	1.27	0	0	0	1.69
SSW	6.36	8.06	0	0	0	14.42
SW	6.08	6.22	0	0	0	12.3
WSW	4.24	2.4	0	0	0	6.64
W	9.48	1.41	0	0	0	10.89
WNW	8.63	2.97	0	0	0	11.6
NW	8.77	1.84	0	0	0	10.61
NNW	4.24	0.28	0	0	0	4.52
Summary	66.89	33.08	0	0	0	100



LICA-202112

% Icon Classes (ppm)

67 0-2

33 2-5

0 5-10

0 10-40

0 >40.0



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Tamarack Site - December 2021

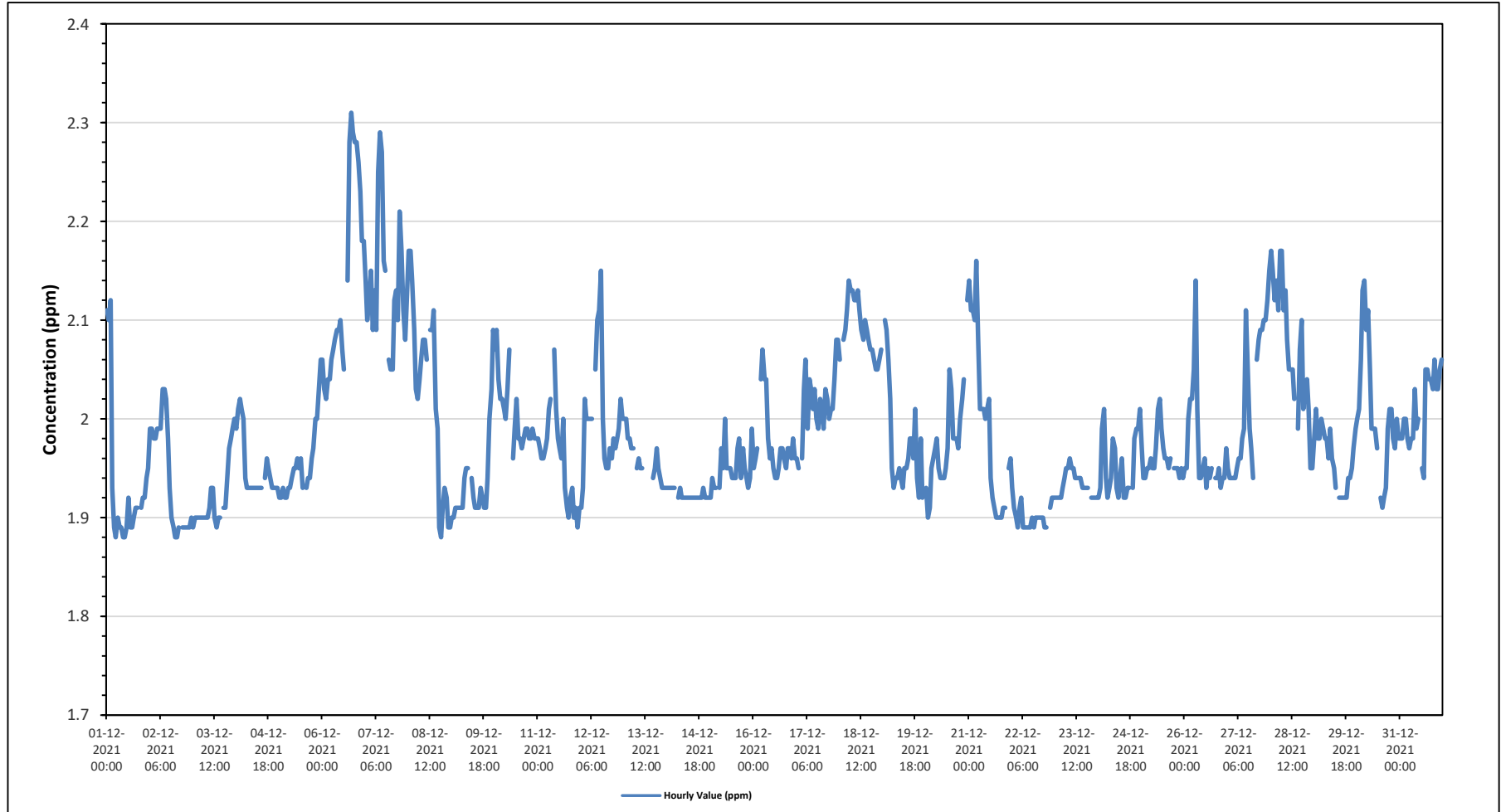
Summary of Hourly Averages

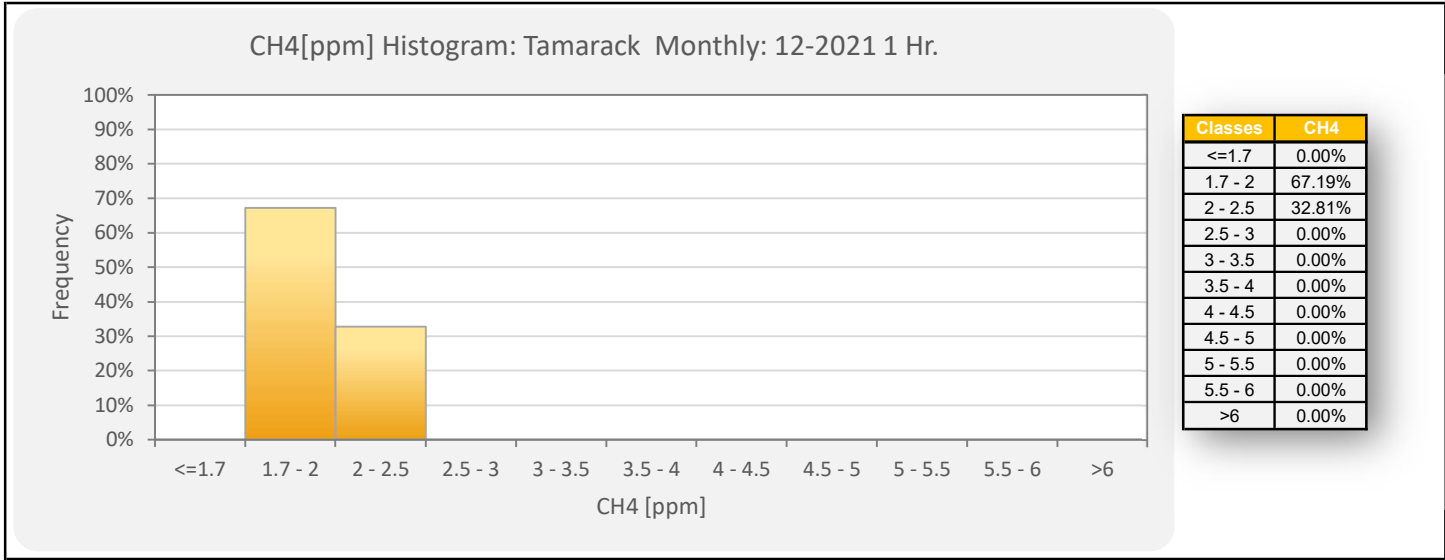
METHANE (CH4) in ppm

Maximum Hourly Value:	2.31 ppm	on December 6 at hour 16	Hours in Service:	744
Maximum Daily Value:	2.14 ppm	on December 6	Hours of Data:	707
Minimum Hourly Value:	1.88 ppm	on December 1 at hour 5	Hours of Missing Data:	0
Minimum Daily Value:	1.90 ppm	on December 22	Hours of Calibration:	37
Monthly Average:	1.99 ppm		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
Dec 1	2.11	2.10	2.12	1.93	1.89	1.88	1.90	1.89	1.89	1.88	1.88	1.89	1.92	1.89	1.89	1.90	1.91	1.91	S	1.91	1.92	1.92	1.94	1.95	1.88	2.12	1.93
Dec 2	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.03	2.03	2.02	1.98	1.93	1.90	1.89	1.88	1.88	1.89	S	1.89	1.89	1.89	1.89	1.89	1.90	1.88	2.03	1.94
Dec 3	1.89	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.91	1.93	1.93	1.90	1.89	1.90	1.90	S	1.91	1.91	1.94	1.97	1.98	1.99	2.00	1.89	2.00	1.92
Dec 4	1.99	2.01	2.02	2.01	2.00	1.94	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	S	1.94	1.96	1.95	1.94	1.93	1.93	1.93	1.93	1.93	2.02	1.95
Dec 5	1.92	1.92	1.93	1.92	1.92	1.93	1.93	1.94	1.95	1.95	1.96	1.95	1.96	1.93	S	1.93	1.94	1.94	1.96	1.97	2.00	2.00	2.03	2.06	1.92	2.06	1.95
Dec 6	2.06	2.03	2.02	2.04	2.04	2.06	2.07	2.08	2.09	2.09	2.10	2.07	2.05	S	2.14	2.28	2.31	2.29	2.28	2.28	2.26	2.23	2.18	2.18	2.02	2.31	2.14
Dec 7	2.14	2.10	2.12	2.15	2.09	2.13	2.09	2.25	2.29	2.27	2.16	2.15	S	2.06	2.05	2.05	2.12	2.13	2.10	2.21	2.17	2.11	2.08	2.12	2.05	2.29	2.14
Dec 8	2.17	2.17	2.14	2.09	2.03	2.02	2.04	2.06	2.08	2.08	2.06	S	2.09	2.09	2.11	2.01	1.99	1.89	1.88	1.91	1.93	1.92	1.89	1.89	1.88	2.17	2.02
Dec 9	1.90	1.90	1.91	1.91	1.91	1.91	2.01	1.94	1.94	1.95	1.95	S	1.94	1.92	1.91	1.91	1.93	1.92	1.91	1.91	1.94	2.00	2.03	2.09	1.90	2.09	1.94
Dec 10	2.07	2.09	2.04	2.02	2.02	2.01	2.00	2.03	2.07	S	1.96	1.99	2.02	1.98	1.98	1.97	1.98	1.99	1.99	1.98	1.98	1.99	1.98	1.98	1.96	2.09	2.01
Dec 11	1.98	1.97	1.96	1.96	1.97	1.98	2.01	2.02	S	2.07	2.01	1.98	1.97	1.96	2.00	1.93	1.91	1.90	1.92	1.93	1.90	1.89	1.89	1.91	1.89	2.07	1.96
Dec 12	1.91	1.93	2.02	2.00	2.00	2.00	2.00	S	2.05	2.10	2.11	2.15	2.00	1.96	1.95	1.95	1.97	1.96	1.98	1.97	1.98	1.99	2.02	2.00	1.91	2.15	2.00
Dec 13	2.00	2.00	1.98	1.98	1.97	1.97	S	1.95	1.96	1.95	1.95	C	C	C	C	C	1.94	1.95	1.97	1.95	1.94	1.93	1.93	1.93	1.93	2.00	1.96
Dec 14	1.93	1.93	1.93	1.93	1.93	S	1.92	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.93	1.92	1.92	1.92	1.93	1.92
Dec 15	1.92	1.94	1.93	1.93	S	1.93	1.97	1.95	2.00	1.95	1.95	1.95	1.94	1.94	1.94	1.97	1.98	1.94	1.97	1.95	1.94	1.93	1.94	1.99	1.92	2.00	1.95
Dec 16	1.95	1.96	1.97	S	2.04	2.07	2.04	2.04	1.98	1.96	1.97	1.95	1.94	1.94	1.95	1.97	1.97	1.96	1.95	1.97	1.97	1.96	1.98	1.96	1.94	2.07	1.98
Dec 17	1.96	1.95	S	1.96	2.03	2.06	1.99	2.04	2.03	2.01	2.03	2.00	1.99	2.02	2.01	1.99	2.03	2.02	2.00	2.01	2.01	2.04	2.08	2.08	1.95	2.08	2.01
Dec 18	2.06	S	2.08	2.09	2.11	2.14	2.13	2.13	2.12	2.12	2.13	2.11	2.09	2.08	2.10	2.09	2.08	2.07	2.07	2.06	2.05	2.05	2.06	2.07	2.05	2.14	2.09
Dec 19	S	2.10	2.09	2.06	2.02	1.95	1.93	1.94	1.94	1.95	1.94	1.93	1.95	1.95	1.96	1.98	1.98	1.96	2.01	1.94	1.92	1.98	1.92	S	1.92	2.10	1.97
Dec 20	1.93	1.90	1.91	1.95	1.96	1.97	1.98	1.95	1.94	1.94	1.94	1.95	1.97	2.05	2.03	1.98	1.98	1.98	1.97	2.00	2.02	2.04	S	2.12	1.90	2.12	1.98
Dec 21	2.14	2.11	2.11	2.10	2.16	2.08	2.01	2.01	2.01	2.00	2.01	2.02	1.94	1.92	1.91	1.90	1.90	1.90	1.90	1.91	1.91	S	1.95	1.96	1.90	2.16	1.99
Dec 22	1.93	1.91	1.90	1.89	1.91	1.92	1.89	1.89	1.89	1.89	1.89	1.90	1.89	1.90	1.90	1.90	1.90	1.89	1.89	S	1.91	1.92	1.92	1.92	1.89	1.93	1.90
Dec 23	1.92	1.92	1.92	1.92	1.93	1.94	1.95	1.95	1.96	1.95	1.95	1.94	1.94	1.94	1.94	1.93	1.93	1.93	1.93	S	1.92	1.92	1.92	1.92	1.92	1.96	1.93
Dec 24	1.92	1.93	1.99	2.01	1.94	1.92	1.93	1.94	1.98	1.97	1.93	1.92	1.94	1.96	1.92	1.93	1.93	S	1.93	1.93	1.98	1.99	1.99	2.01	1.92	2.01	1.95
Dec 25	1.97	1.94	1.94	1.95	1.95	1.96	1.95	1.95	1.97	2.01	2.02	1.99	1.97	1.96	1.96	1.95	1.96	S	1.95	1.95	1.95	1.94	1.95	1.94	1.94	2.02	1.96
Dec 26	1.95	1.95	2.00	2.02	2.02	2.05	2.14	2.01	1.94	1.94	1.95	1.96	1.93	1.95	1.94	1.95	S	1.94	1.94	1.95	1.93	1.94	1.94	1.97	1.93	2.14	1.97
Dec 27	1.95	1.94	1.94	1.94	1.94	1.95	1.96	1.96	1.98	1.99	2.11	2.05	1.99	1.97	1.94	S	2.06	2.08	2.09	2.09	2.10	2.10	2.12	2.15	1.94	2.15	2.02
Dec 28	2.17	2.15	2.12	2.14	2.11	2.17	2.17	2.11	2.13	2.08	2.05	2.05	2.05	2.02	S	1.99	2.07	2.10	2.01	2.03	2.04	2.01	1.95	1.95	1.95	2.17	2.07
Dec 29	1.98	2.01	1.98	1.98	2.00	1.99	1.98	1.98	1.96	1.99	1.96	1.95	1.93	S	1.92	1.92	1.92	1.92	1.94	1.94	1.95	1.97	1.99	1.92	2.01	1.96	
Dec 30	2.00	2.01	2.06	2.13	2.14	2.09	2.11	2.05	1.99	1.99	1.99	1.97	S	1.92	1.91	1.92	1.93	1.99	2.01	2.01	1.98	1.97	2.00	1.98	1.91	2.14	2.01
Dec 31	1.98	1.98	2.00	2.00	1.98	1.97	1.98	1.98	2.03	1.99	2.00	S	1.95	1.94	2.05	2.05	2.04	2.04	2.03	2.06	2.03	2.03	2.05	2.06	1.94	2.06	2.01
Diurnal Maximum	2.17	2.17	2.14	2.15	2.16	2.17	2.17	2.25	2.29	2.27	2.16	2.15	2.09	2.09	2.14	2.28	2.31	2.29	2.28	2.28	2.26	2.23	2.18	2.18			
Daily Average	1.99	1.99	2.00	2.00	2.00	2.00	1.99	1.99	2.00	2.00	1.99	1.98	1.96	1.96	1.97	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	2.00			
C	Monthly Calibration						S	Daily Zero-Span Check						Q	Quality Assurance												
K	Collection Error						N	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.																											

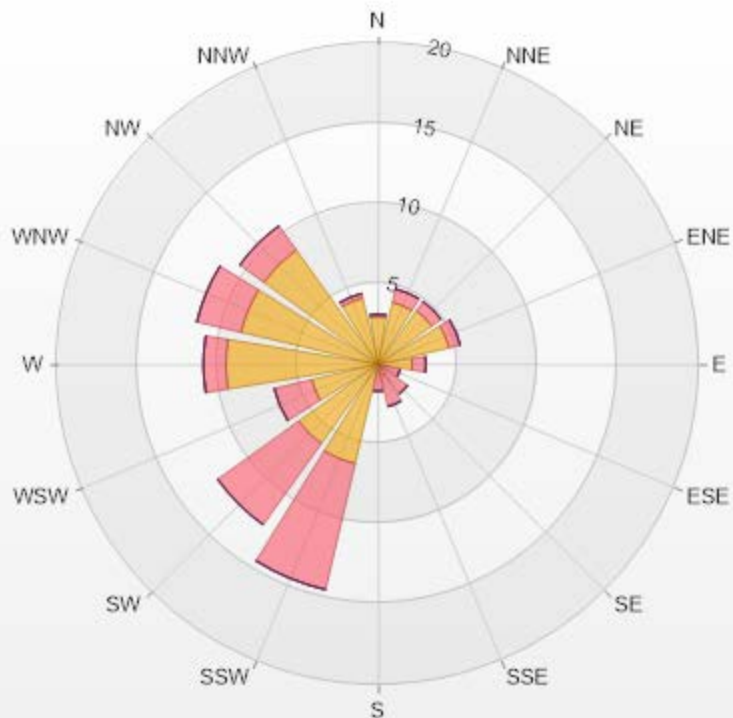
Timeseries Chart of Hourly Average for CH4 - Tamarack Site





Wind: Tamarack Poll.: Tamarack-CH4[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	2.97	0.14	0	0	0	3.11
NNE	3.96	0.85	0	0	0	4.81
NE	4.1	0.71	0	0	0	4.81
ENE	4.53	0.71	0	0	0	5.24
E	2.12	0.85	0	0	0	2.97
ESE	0.14	1.27	0	0	0	1.41
SE	0.14	2.12	0	0	0	2.26
SSE	0.71	1.98	0	0	0	2.69
S	0.42	1.27	0	0	0	1.69
SSW	6.36	8.06	0	0	0	14.42
SW	6.08	6.22	0	0	0	12.3
WSW	4.24	2.4	0	0	0	6.64
W	9.48	1.41	0	0	0	10.89
WNW	8.77	2.83	0	0	0	11.6
NW	8.77	1.84	0	0	0	10.61
NNW	4.24	0.28	0	0	0	4.52
Summary	67.03	32.94	0	0	0	100



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% Icon Classes (ppm)

67 0-2

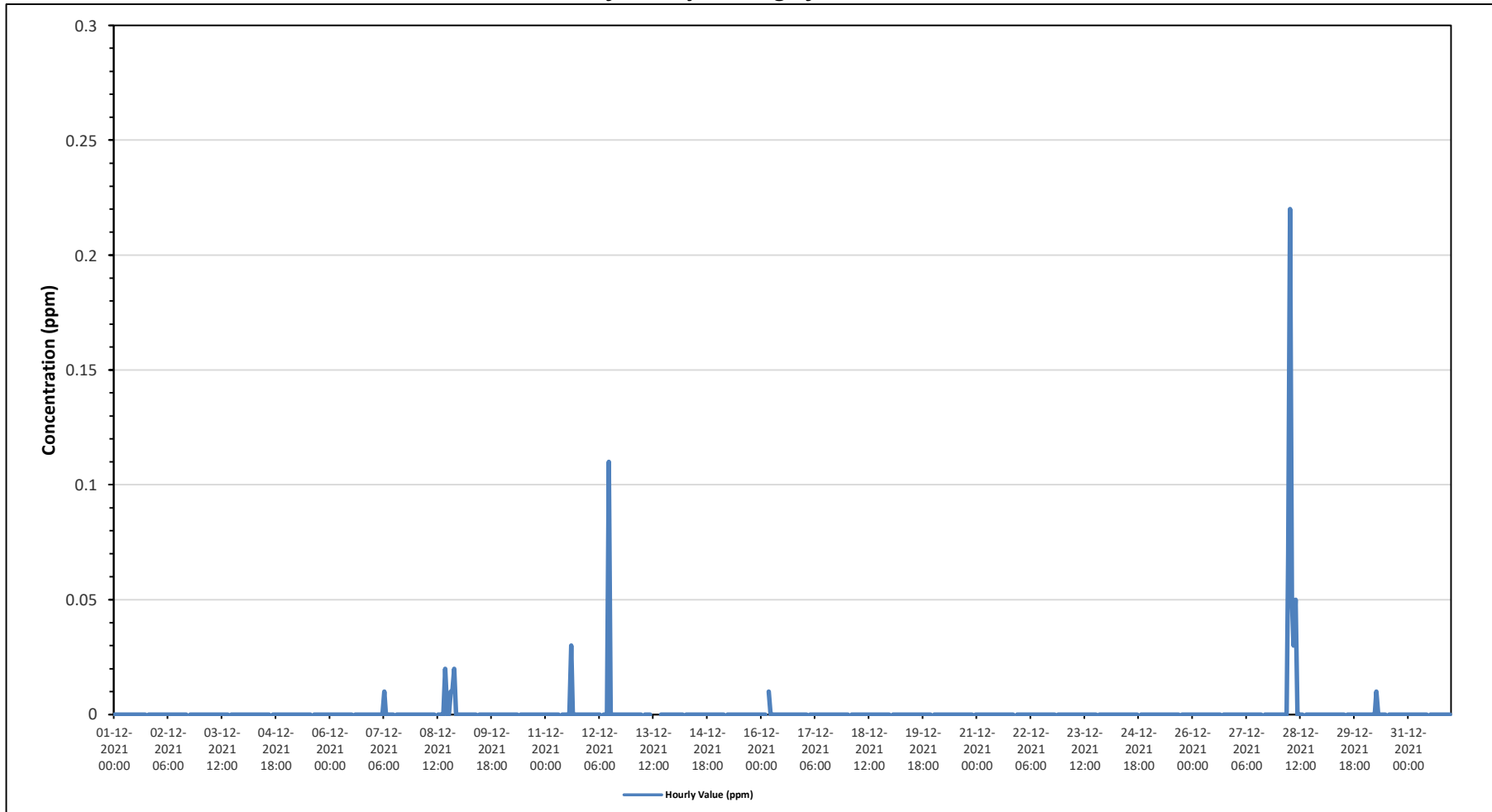
33 2-5

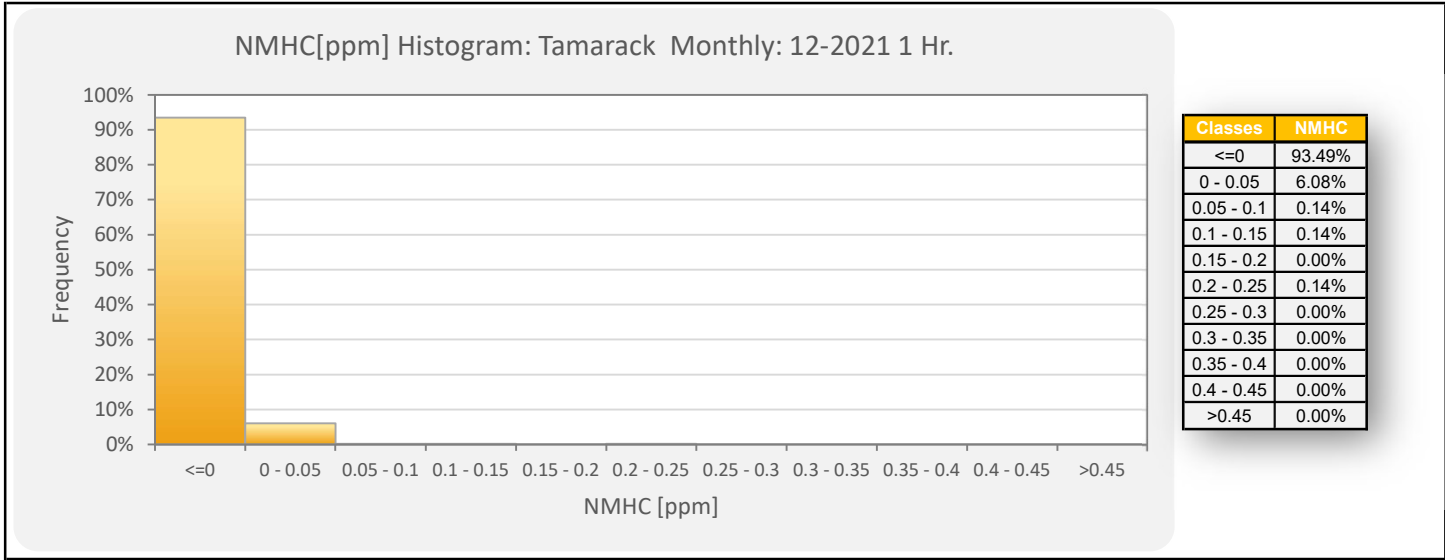
0 5-10

0 10-20

0 >20.0

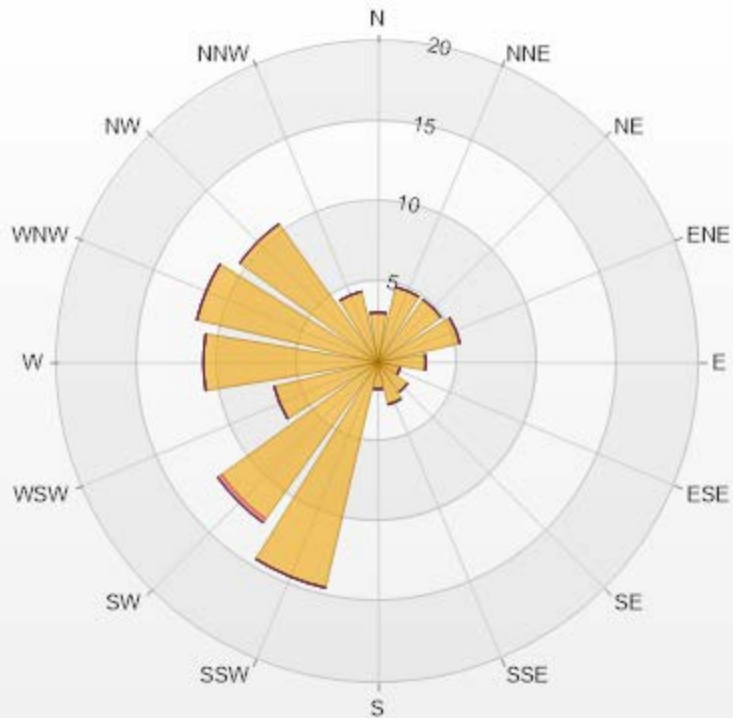
Timeseries Chart of Hourly Average for NMHC - Tamarack Site





Wind: Tamarack Poll.: Tamarack-NMHC[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	3.11	0	0	0	0	3.11
NNE	4.81	0	0	0	0	4.81
NE	4.81	0	0	0	0	4.81
ENE	5.23	0	0	0	0	5.23
E	2.97	0	0	0	0	2.97
ESE	1.41	0	0	0	0	1.41
SE	2.26	0	0	0	0	2.26
SSE	2.69	0	0	0	0	2.69
S	1.7	0	0	0	0	1.7
SSW	14.43	0	0	0	0	14.43
SW	12.02	0.28	0	0	0	12.3
WSW	6.65	0	0	0	0	6.65
W	10.89	0	0	0	0	10.89
WNW	11.6	0	0	0	0	11.6
NW	10.61	0	0	0	0	10.61
NNW	4.53	0	0	0	0	4.53
Summary	100	0.28	0	0	0	100




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% Icon Classes (ppm)

100  0-0.1

0  0.1-0.3

0  0.3-0.9

0  0.9-2

0  >2.0



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Tamarack Site - December 2021

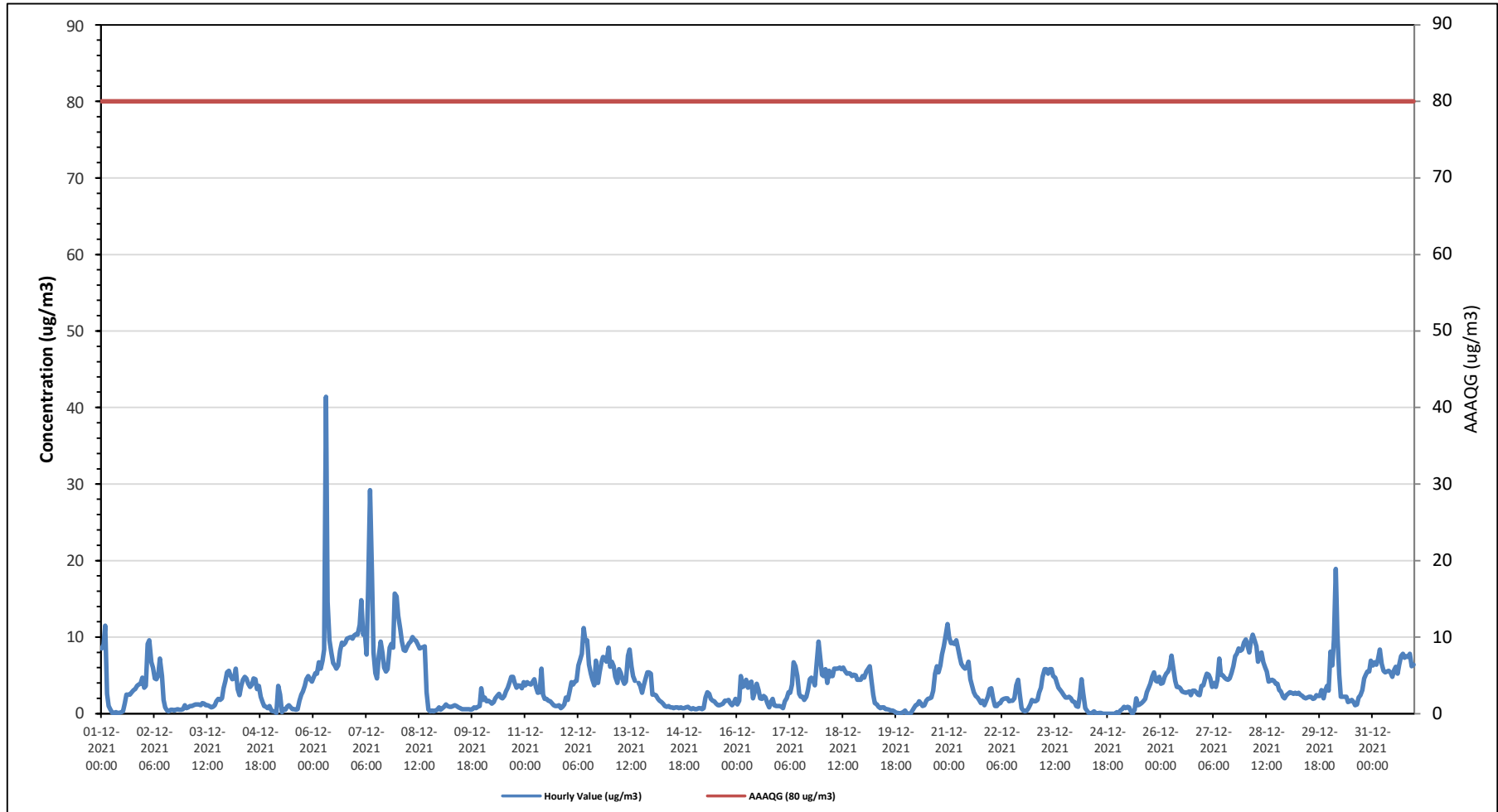
Summary of Hourly Averages

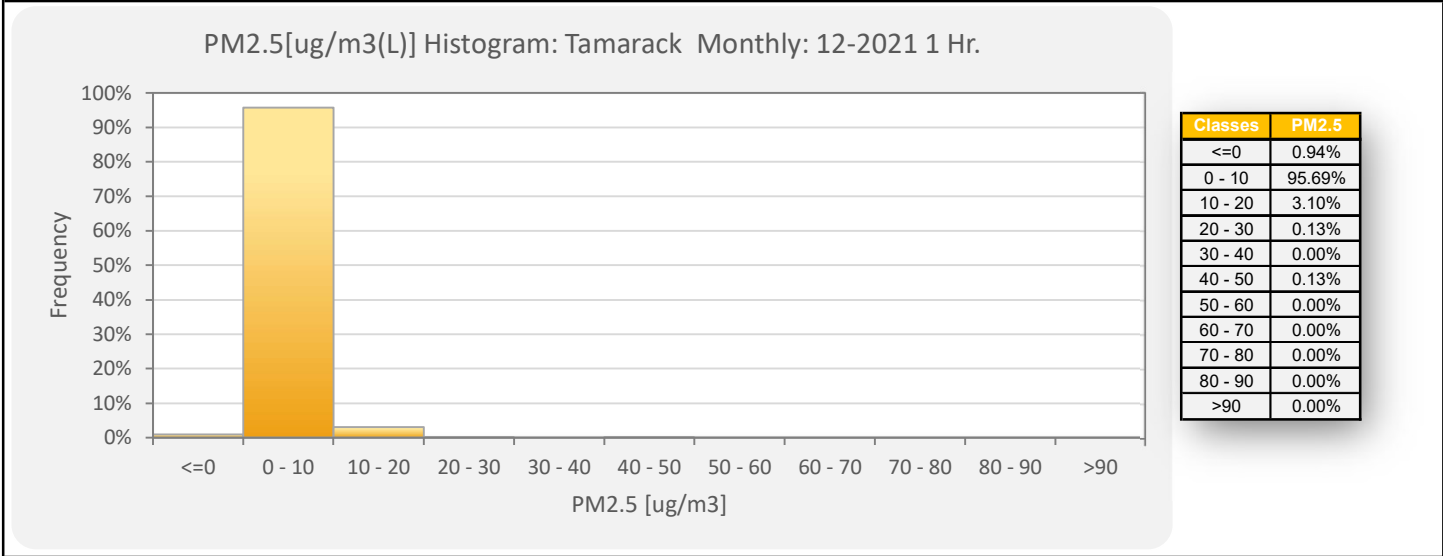
PARTICULATE MATTER 2.5 (PM_{2.5}) in µg/m³

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 Exceedences: 0										Number of 24-Hour Exceedences: 0																					
Maximum Hourly Value: 41 µg/m ³ on December 6 at hour 7										Hours in Service: 744																					
Maximum Daily Value: 10.7 µg/m ³ on December 7										Hours of Data: 743																					
Minimum Hourly Value: 0 µg/m ³ on December 19 at hour 20										Hours of Missing Data: 0																					
Minimum Daily Value: 1 µg/m ³ on December 24										Hours of Calibration: 1																					
Monthly Average: 3.8 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				
Dec 1	9	9	12	3	1	1	0	0	0	0	0	0	0	1	3	3	3	3	3	3	4	4	4	5	0	12	2.8				
Dec 2	3	4	9	10	7	6	5	5	5	7	5	2	1	0	0	1	1	0	1	1	1	1	1	1	0	10	3.0				
Dec 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	4	5	1	5	1.6				
Dec 4	6	5	5	5	6	3	2	4	4	5	5	4	4	4	5	5	3	4	2	2	1	1	1	1	1	6	3.5				
Dec 5	0	0	0	0	4	3	0	1	1	1	1	1	1	1	1	2	3	3	3	4	5	5	5	4	0	5	1.8				
Dec 6	5	5	5	7	6	7	8	41	15	10	8	7	6	6	8	9	9	9	10	10	10	10	10	10	5	41	9.5				
Dec 7	10	10	12	15	10	11	8	17	29	19	8	5	5	8	9	8	6	6	6	9	9	9	16	15	5	29	10.7				
Dec 8	13	11	9	8	8	9	9	9	10	10	10	9	9	9	9	3	1	0	0	0	0	1	1	1	0	13	6.5				
Dec 9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	0.9				
Dec 10	2	2	2	2	2	1	2	2	2	3	2	2	2	3	3	4	5	5	4	3	4	4	3	4	1	5	2.8				
Dec 11	4	4	4	4	4	5	4	3	3	6	3	2	2	2	2	1	1	1	1	1	1	1	1	2	1	6	2.5				
Dec 12	2	3	4	4	4	4	6	7	8	11	10	10	6	5	4	7	4	5	7	7	7	7	9	2	11	6.1					
Dec 13	6	7	6	5	4	6	5	5	4	4	8	8	6	5	4	C	4	4	3	4	4	5	5	5	3	8	5.1				
Dec 14	3	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1.1				
Dec 15	1	1	1	1	1	1	2	3	3	2	2	2	1	1	1	1	2	2	2	2	1	1	1	2	1	3	1.4				
Dec 16	1	2	5	4	4	4	3	4	4	2	3	4	3	2	2	2	2	1	1	2	2	1	1	1	1	5	2.5				
Dec 17	1	1	1	2	2	3	3	4	7	6	5	3	2	2	2	2	3	5	5	4	4	7	9	7	1	9	3.7				
Dec 18	5	5	6	4	6	5	5	6	6	6	6	6	6	6	5	5	5	5	5	5	4	4	4	5	4	6	5.2				
Dec 19	5	6	6	6	4	3	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	6	1.6				
Dec 20	0	0	0	0	1	1	1	2	1	1	1	2	2	2	2	3	5	6	5	6	8	9	10	12	0	12	3.4				
Dec 21	10	9	9	9	10	9	7	7	6	6	6	7	5	4	3	2	2	2	1	2	1	2	2	3	1	10	5.1				
Dec 22	3	2	1	1	1	1	2	2	2	2	2	2	2	2	4	4	3	1	0	0	0	1	1	2	0	4	1.7				
Dec 23	2	2	2	3	3	5	6	6	5	6	6	5	5	4	3	3	3	2	2	2	2	2	2	2	2	6	3.4				
Dec 24	1	1	2	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.6				
Dec 25	0	0	1	1	1	1	1	0	0	1	2	1	1	1	2	2	3	3	4	5	5	4	4	5	0	5	2.0				
Dec 26	4	4	5	5	6	6	8	6	4	4	4	3	3	3	3	3	2	3	3	3	3	3	2	4	2	8	3.8				
Dec 27	4	5	5	5	5	4	4	4	4	7	5	5	5	5	4	5	5	6	8	8	9	8	8	9	4	9	5.6				
Dec 28	10	9	8	9	10	10	9	7	8	8	7	6	6	4	4	4	4	4	4	3	3	2	2	2	2	10	6.0				
Dec 29	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	3	2	3	4	3	2	4	2.5				
Dec 30	8	6	10	19	10	5	2	2	2	2	2	2	2	2	1	1	2	2	3	5	5	6	6	7	1	19	4.6				
Dec 31	6	7	6	7	8	7	6	5	6	6	5	5	6	6	5	6	8	8	7	8	7	8	6	6	5	8	6.5				
Diurnal Maximum	13	11	12	19	10	11	9	41	29	19	10	10	9	9	9	9	9	9	9	10	10	16	15								
Diurnal Average	4.1	4.0	4.6	4.8	4.4	4.0	3.7	5.0	4.7	4.5	3.8	3.4	3.0	2.9	3.0	3.1	3.1	3.0	3.0	3.3	3.4	3.6	3.9	4.4							
C	Monthly Calibration							S	Daily Zero-Span Check							Q	Quality Assurance														
K	Collection Error							N	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.

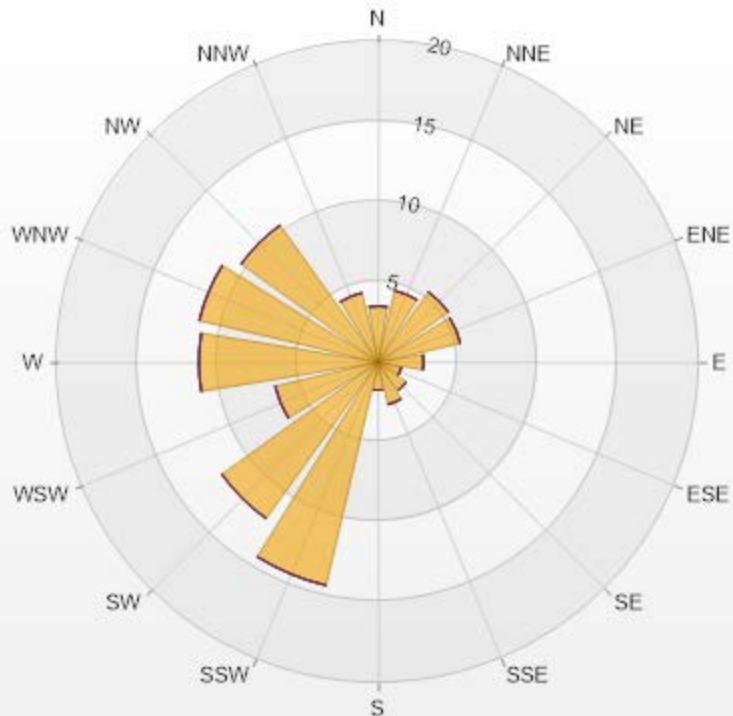
Timeseries Chart of Hourly Average for PM2.5 - Tamarack Site





Wind: Tamarack Poll.: Tamarack-PM2.5[ug/m3(L)] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.87% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	3.5	0	0	0	0	3.5
NNE	4.58	0	0	0	0	4.58
NE	5.38	0	0	0	0	5.38
ENE	5.25	0	0	0	0	5.25
E	2.83	0	0	0	0	2.83
ESE	1.48	0	0	0	0	1.48
SE	2.15	0	0	0	0	2.15
SSE	2.69	0	0	0	0	2.69
S	1.75	0	0	0	0	1.75
SSW	14.27	0	0	0	0	14.27
SW	11.98	0	0	0	0	11.98
WSW	6.59	0	0	0	0	6.59
W	11.17	0	0	0	0	11.17
WNW	11.44	0	0	0	0	11.44
NW	10.5	0	0	0	0	10.5
NNW	4.44	0	0	0	0	4.44
Summary	100	0	0	0	0	100




LICA-202112


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% Icon Classes (ug/m3(L))

100  0-50

0  50-80

0  80-120

0  120-240

0  >240.0



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	99 %	on December 2 at hour 8	Hours in Service:	744
Maximum Daily Value:	95.5 %	on December 13	Hours of Data:	744
Minimum Hourly Value:	35 %	on December 2 at hour 14	Hours of Missing Data:	0
Minimum Daily Value:	69.7 %	on December 30	Hours of Calibration:	0
Monthly Average:	80.0 %		Operational Uptime:	100.0

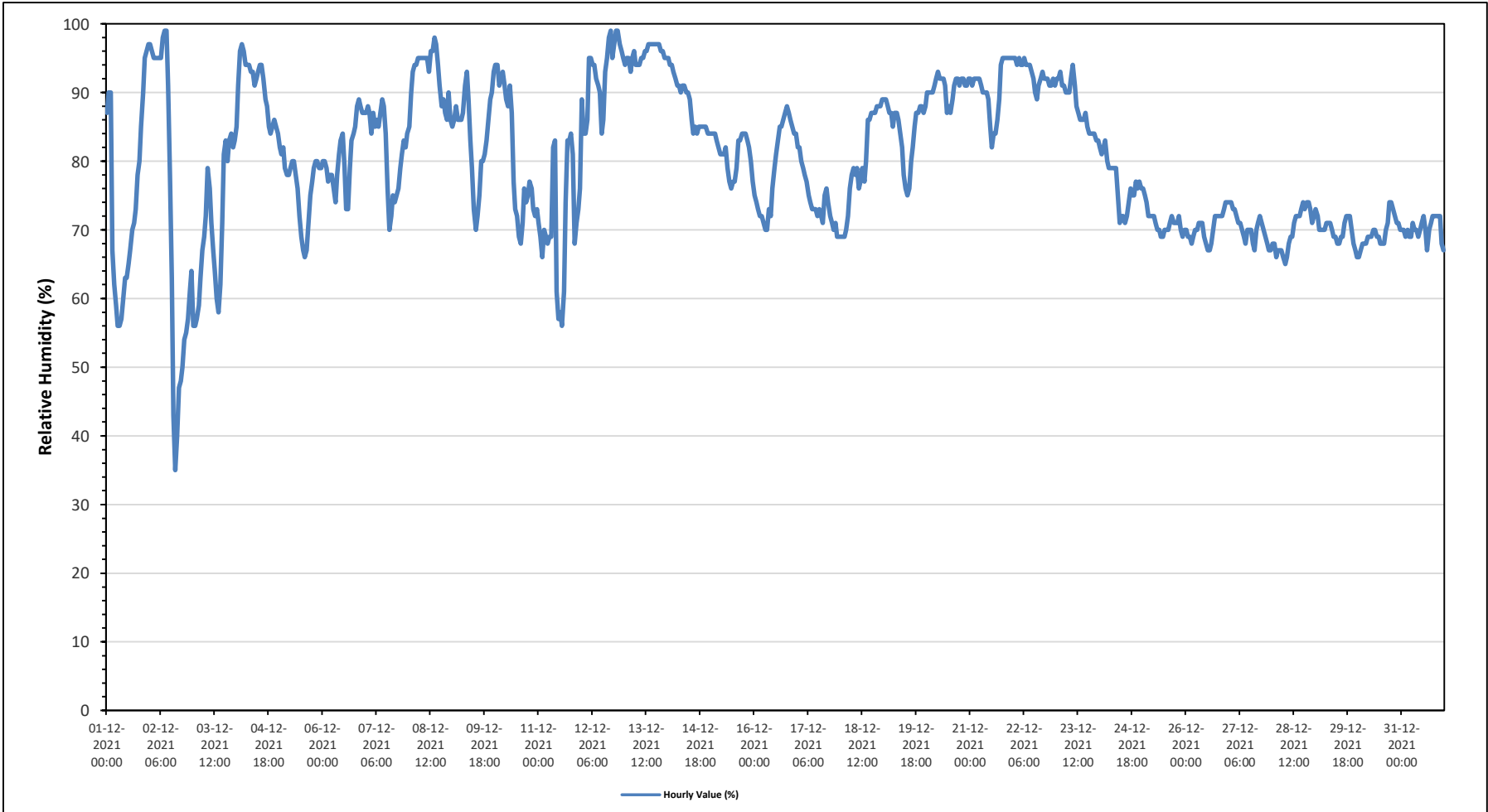
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	87	90	90	67	62	59	56	56	57	60	63	63	65	67	70	71	73	78	80	85	90	95	96	97	56	97	74.0
Dec 2	97	96	95	95	95	95	95	98	99	99	91	78	63	43	35	40	47	48	50	54	55	57	61	64	35	99	72.9
Dec 3	56	56	57	59	63	67	69	72	79	76	71	67	64	60	58	62	71	81	83	80	83	84	82	83	56	84	70.1
Dec 4	85	91	96	97	96	94	94	94	93	93	91	92	93	94	94	92	89	88	85	84	85	86	85	84	84	97	90.6
Dec 5	82	81	82	79	78	78	79	80	80	78	76	72	69	67	66	67	71	75	77	79	80	80	79	79	66	82	76.4
Dec 6	80	80	79	77	78	78	76	74	78	81	83	84	79	73	73	79	83	84	85	88	89	88	87	87	73	89	81.0
Dec 7	87	88	87	84	87	85	86	85	87	89	88	84	76	70	72	75	74	75	76	79	81	83	82	84	70	89	81.8
Dec 8	85	90	93	94	94	95	95	95	95	95	95	93	96	96	98	97	94	91	88	89	87	86	90	86	85	98	92.4
Dec 9	85	86	88	86	86	86	87	91	93	89	83	79	73	70	72	75	80	80	81	83	86	89	90	93	70	93	83.8
Dec 10	94	94	91	92	93	91	89	88	91	87	77	73	72	69	68	71	76	74	75	77	76	73	72	73	68	94	80.7
Dec 11	71	69	66	70	69	68	69	69	82	83	61	57	58	56	61	74	83	83	84	81	68	71	73	76	56	84	70.9
Dec 12	89	84	84	86	95	95	94	94	92	91	90	84	86	93	95	98	99	95	97	99	99	97	96	95	84	99	92.8
Dec 13	94	95	95	93	95	96	94	94	94	95	95	96	96	97	97	97	97	97	97	97	96	96	95	95	93	97	95.5
Dec 14	95	94	94	93	92	91	91	90	91	91	90	90	89	86	84	85	84	85	85	85	85	84	84	84	84	95	88.5
Dec 15	84	84	84	83	82	81	81	81	82	79	77	76	77	79	79	83	83	84	84	84	83	82	80	77	76	84	81.1
Dec 16	75	74	73	72	72	71	70	70	73	72	76	79	81	83	85	85	86	87	88	87	86	85	84	84	70	88	79.1
Dec 17	82	82	80	79	78	77	75	74	73	73	73	72	73	72	71	75	76	74	72	71	70	71	69	69	69	82	74.2
Dec 18	69	69	69	70	72	76	78	79	78	79	76	77	79	77	80	86	86	87	87	87	88	88	88	89	69	89	79.8
Dec 19	89	89	88	87	87	85	87	87	86	84	82	78	76	75	76	80	82	85	87	87	88	88	87	88	75	89	84.5
Dec 20	90	90	90	90	91	92	93	92	92	92	91	87	88	87	89	91	92	92	91	92	92	91	91	92	87	93	90.8
Dec 21	92	91	92	92	92	92	91	90	90	89	85	82	84	84	86	89	94	95	95	95	95	95	95	95	82	95	90.6
Dec 22	95	95	94	95	94	94	95	94	94	94	93	92	90	89	91	92	93	92	92	92	91	91	92	91	89	95	92.7
Dec 23	92	92	93	91	91	90	90	90	92	94	91	88	87	86	86	86	87	85	84	84	84	83	83	83	83	94	88.0
Dec 24	82	81	82	83	80	79	79	79	79	79	75	71	72	72	71	72	74	76	75	75	77	76	77	76	71	83	76.8
Dec 25	76	75	74	72	72	72	72	71	70	70	69	69	70	70	70	71	72	71	71	71	72	70	69	70	69	76	71.2
Dec 26	70	69	69	68	69	70	70	71	71	71	69	68	67	67	68	70	72	72	72	72	72	73	74	74	67	74	70.3
Dec 27	74	74	73	73	72	71	71	70	69	68	70	70	68	67	70	71	72	71	70	69	68	67	67	67	67	74	70.2
Dec 28	68	68	66	67	67	66	65	66	68	68	69	69	71	72	72	73	74	73	74	74	73	71	72	72	65	74	69.9
Dec 29	73	72	70	70	70	70	71	71	71	70	69	69	68	68	69	69	71	72	72	72	70	68	67	66	66	73	69.9
Dec 30	66	67	68	68	68	69	69	69	70	70	69	69	68	68	68	70	71	74	74	73	72	71	71	70	66	74	69.7
Dec 31	70	70	69	70	69	69	71	70	70	69	70	71	72	70	67	70	71	72	72	72	72	68	67	67	67	72	70.1
Diurnal Maximum	97	96	96	97	96	96	95	98	99	99	95	96	96	97	98	98	99	97	97	99	99	97	96	97			
Diurnal Average	81.7	81.8	81.6	80.7	80.9	80.7	80.7	80.7	81.8	81.6	79.4	77.5	76.5	75.0	75.4	77.8	79.7	80.5	80.7	81.2	81.1	81.2	80.8	81.0			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for RH - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

BAROMETRIC PRESSURE (BP) in millibar

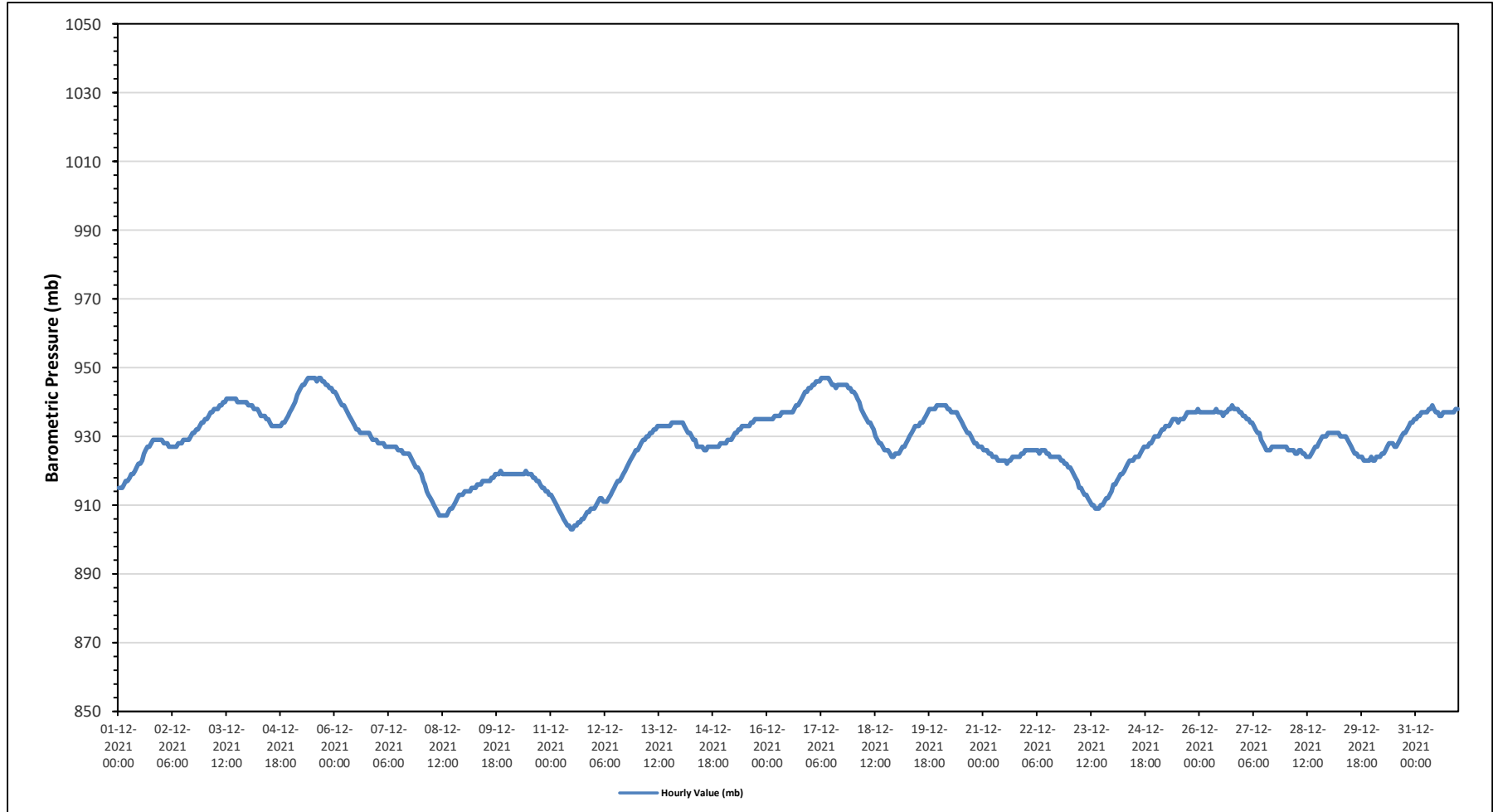
Maximum Hourly Value:	947 mb on December 5 at hour 9	Hours in Service:	744
Maximum Daily Value:	945 mb on December 17	Hours of Data:	744
Minimum Hourly Value:	903 mb on December 11 at hour 11	Hours of Missing Data:	0
Minimum Daily Value:	907 mb on December 11	Hours of Calibration:	0
Monthly Average:	928 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	
Dec 1	915	915	915	916	917	917	918	919	919	920	921	922	922	923	925	926	927	927	928	929	929	929	929	929	915	929	922	
Dec 2	929	928	928	928	927	927	927	927	927	928	928	928	928	929	929	929	929	930	931	931	932	932	933	934	934	927	934	929
Dec 3	935	935	936	937	937	938	938	938	939	939	940	940	941	941	941	941	941	941	940	940	940	940	940	940	935	941	939	
Dec 4	939	939	939	938	938	938	937	936	936	936	936	935	935	934	933	933	933	933	933	934	935	936	937	933	939	936		
Dec 5	938	939	940	942	943	944	945	945	946	947	947	947	947	947	946	947	947	946	946	945	944	944	943	938	947	945		
Dec 6	943	942	941	940	939	939	938	937	936	935	934	933	932	932	931	931	931	931	931	930	929	929	929	929	929	943	934	
Dec 7	928	928	928	928	927	927	927	927	927	927	927	926	926	926	925	925	925	925	924	923	922	921	921	920	920	928	925	
Dec 8	919	917	916	914	913	912	911	910	909	908	907	907	907	907	907	908	909	909	910	911	912	913	913	913	907	919	911	
Dec 9	914	914	914	914	915	915	915	916	916	916	917	917	917	917	917	918	918	919	919	920	920	920	920	919	914	920	917	
Dec 10	919	919	919	919	919	919	919	919	919	919	920	919	919	919	918	918	917	917	916	915	915	914	914	913	913	920	918	
Dec 11	913	912	911	910	909	908	907	906	905	904	904	903	903	904	904	905	905	906	906	907	908	908	909	909	903	913	907	
Dec 12	909	910	911	912	912	911	911	911	912	913	914	915	916	917	917	918	919	920	921	922	923	924	925	926	909	926	916	
Dec 13	926	927	928	929	929	930	930	931	931	932	932	933	933	933	933	933	933	933	933	933	934	934	934	934	926	934	932	
Dec 14	934	934	933	932	931	931	930	929	929	927	927	927	927	926	926	927	927	927	927	927	927	927	928	928	926	934	929	
Dec 15	928	928	929	929	929	930	931	931	932	932	933	933	933	933	933	934	934	935	935	935	935	935	935	928	935	932		
Dec 16	935	935	935	935	936	936	936	936	937	937	937	937	937	937	937	938	939	939	940	941	942	943	943	935	944	938		
Dec 17	944	945	945	946	946	946	947	947	947	947	947	946	945	945	944	945	945	945	945	945	944	944	943	943	947	945		
Dec 18	943	942	941	940	938	937	936	935	934	934	933	932	930	929	928	928	927	926	926	926	925	924	924	925	924	943	932	
Dec 19	925	925	926	927	927	928	929	930	931	932	933	933	933	934	934	935	936	937	938	938	938	938	939	939	925	939	933	
Dec 20	939	939	939	939	938	938	937	937	937	937	936	935	934	933	932	931	931	930	929	928	928	927	927	927	927	939	934	
Dec 21	926	926	926	925	925	924	924	924	923	923	923	923	923	922	923	923	924	924	924	924	924	925	925	926	922	926	924	
Dec 22	926	926	926	926	926	926	926	925	926	926	926	926	925	925	924	924	924	924	924	923	923	922	922	921	921	926	925	
Dec 23	921	920	919	918	917	915	915	914	913	913	912	911	910	910	909	909	909	910	910	911	912	912	913	914	909	921	913	
Dec 24	916	916	917	918	919	919	920	921	922	923	923	923	924	924	924	925	926	927	927	927	928	928	929	930	916	930	923	
Dec 25	930	930	931	932	932	933	933	933	934	935	935	935	934	935	935	936	937	937	937	937	937	937	937	938	930	938	935	
Dec 26	937	937	937	937	937	937	937	937	937	938	937	937	937	936	937	937	938	938	939	938	938	938	937	937	936	939	937	
Dec 27	936	936	935	935	934	934	933	932	931	931	929	928	927	926	926	927	927	927	927	927	927	927	927	927	926	936	930	
Dec 28	927	926	926	926	926	925	925	926	925	925	925	924	924	924	925	926	927	927	928	929	930	930	931	924	931	927		
Dec 29	931	931	931	931	931	931	930	930	930	929	928	927	926	925	925	924	924	924	923	923	923	923	924	923	923	931	927	
Dec 30	923	923	924	924	924	925	925	926	927	928	928	928	927	927	928	929	930	931	931	932	933	934	935	923	935	928		
Dec 31	935	936	936	937	937	937	938	938	939	938	937	937	936	936	937	937	937	937	937	937	937	938	938	935	939	937		
Diurnal Maximum	944	945	945	946	946	946	947	947	947	947	947	947	947	947	946	947	947	946	946	945	945	944	944	944				
Diurnal Average	928	928	928	929	928	928	928	928	928	928	928	928	928	928	927	928	928	928	929	929	929	929	929	929				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for BP - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

AMBIENT TEMPERATURE (AT) in Degree Celsius

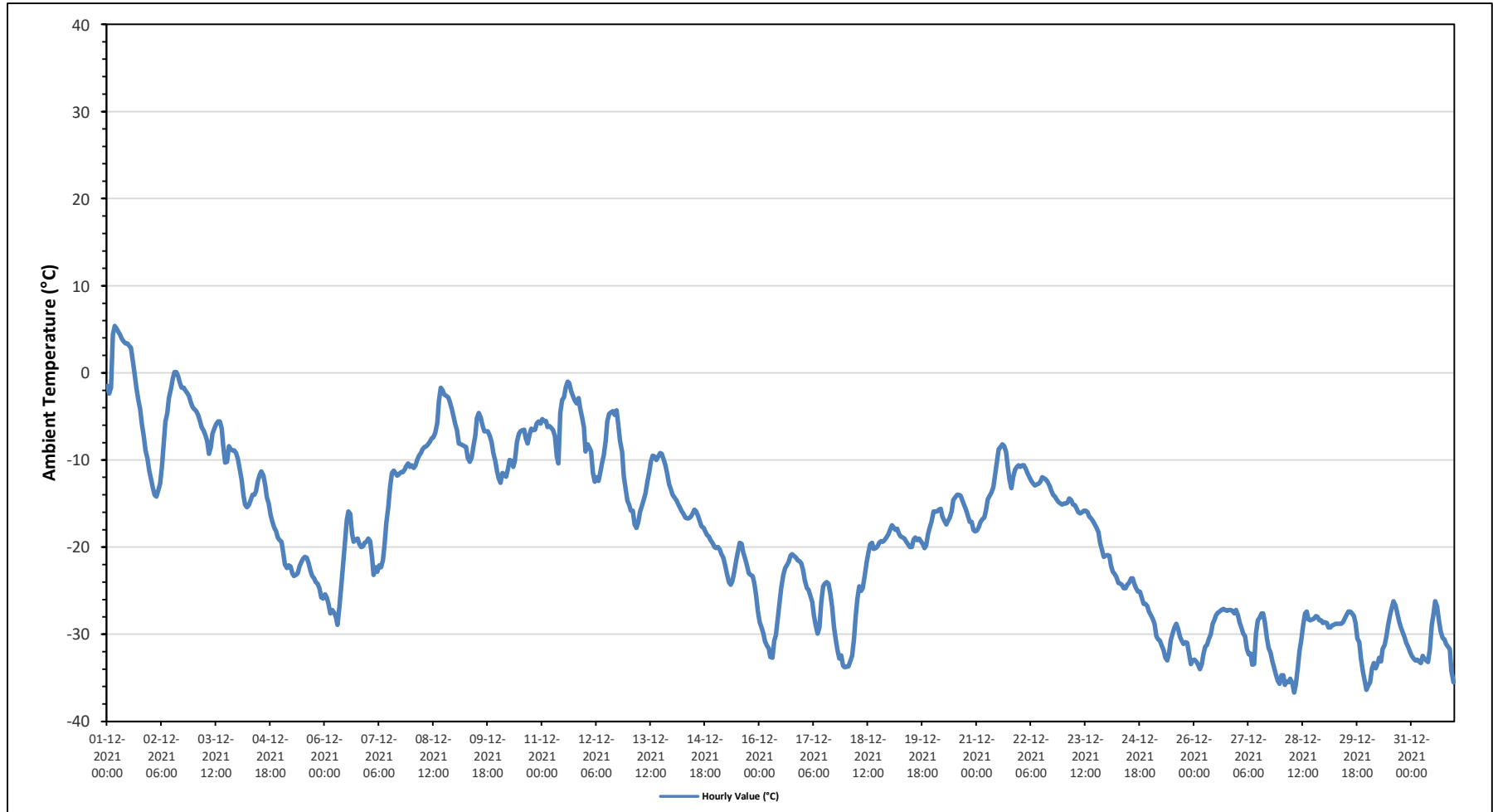
Maximum Hourly Value:	5.4 °C on December 1 at hour 4	Hours in Service:	744
Maximum Daily Value:	-0.5 °C on December 1	Hours of Data:	744
Minimum Hourly Value:	-36.7 °C on December 28 at hour 7	Hours of Missing Data:	0
Minimum Daily Value:	-31.4 °C on December 28	Hours of Calibration:	0
Monthly Average:	-18.4 °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
Dec 1	-1.5	-2.4	-1.7	4.4	5.4	5.1	4.7	4.4	3.9	3.6	3.4	3.4	3.1	2.9	1.4	-0.1	-1.8	-3.1	-4.2	-5.8	-7.2	-8.9	-9.8	-11.2	-11.2	5.4	-0.5
Dec 2	-12.2	-13.1	-14	-14.2	-13.6	-12.7	-10.7	-8.3	-5.6	-4.6	-2.9	-1.8	-0.6	0.1	0.1	-0.4	-1.1	-1.7	-1.7	-2	-2.3	-2.7	-3.3	-3.9	-14.2	0.1	-5.6
Dec 3	-4.2	-4.4	-4.8	-5.5	-6.2	-6.6	-7.1	-7.8	-9.3	-8.5	-7	-6.4	-5.9	-5.6	-5.6	-6.4	-8.5	-10.3	-10.2	-8.4	-8.8	-8.9	-8.9	-9.2	-10.3	-4.2	-7.3
Dec 4	-9.9	-11.1	-12.3	-14.1	-15.1	-15.4	-15.2	-14.7	-14	-14	-13.6	-12.4	-11.7	-11.3	-11.8	-12.9	-14.3	-15	-16.3	-17	-17.7	-18.2	-18.9	-19.2	-19.2	-9.9	-14.4
Dec 5	-19.4	-20.5	-22	-22.4	-22.1	-22.2	-23	-23.3	-23.2	-23	-22.2	-21.7	-21.3	-21.1	-21.2	-21.8	-22.7	-23.3	-23.6	-24	-24.2	-24.7	-25.8	-25.9	-25.9	-19.4	-22.7
Dec 6	-25.4	-25.7	-26.5	-27.6	-27.2	-27.5	-28	-28.9	-26.9	-24.5	-22.4	-19.5	-16.9	-15.9	-16.2	-18.5	-19.4	-19.1	-19	-19.6	-20	-19.9	-19.5	-19.4	-28.9	-15.9	-22.2
Dec 7	-19	-19.3	-21.1	-23.2	-22.3	-22.8	-22.1	-22.3	-21.5	-19.8	-17.2	-15.5	-13.1	-11.5	-11.2	-11.5	-11.8	-11.6	-11.4	-11.4	-11.1	-10.7	-10.4	-10.8	-23.2	-10.4	-15.9
Dec 8	-10.6	-10.9	-10.6	-10	-9.5	-9.2	-8.8	-8.5	-8.4	-8.2	-7.9	-7.5	-7.4	-6.9	-5.7	-3.2	-1.7	-2	-2.5	-2.6	-2.8	-3.3	-4.1	-5	-10.9	-1.7	-6.6
Dec 9	-5.8	-6.6	-8.1	-8.2	-8.3	-8.4	-8.5	-9.8	-10.2	-9.7	-8.4	-7.2	-5.2	-4.6	-5.1	-6	-6.7	-6.7	-7.2	-7.9	-9.2	-10.1	-11.3	-11.3	-4.6	-7.7	
Dec 10	-12.1	-12.6	-11.5	-11.6	-11.9	-11	-10	-10.1	-10.8	-10.1	-7.9	-7	-6.7	-6.6	-6.5	-7.5	-8.1	-7	-6.4	-6.6	-6.5	-5.8	-5.6	-5.8	-12.6	-5.6	-8.6
Dec 11	-5.3	-5.5	-5.5	-6.2	-6.1	-6.3	-6.6	-7.3	-9.6	-10.4	-4.6	-3.1	-2.8	-1.6	-1	-1.2	-2.1	-2.7	-3.5	-2.9	-4.1	-5.1	-6.2	-10.4	-1.0	-4.7	
Dec 12	-9	-8.2	-8.6	-9	-11.5	-12.5	-12	-12.4	-11.4	-10.4	-9.4	-7.8	-5.6	-4.7	-4.5	-4.4	-4.8	-4.3	-5.8	-7.8	-9.1	-11.8	-13.3	-14.7	-14.7	-4.3	-8.9
Dec 13	-15.1	-15.8	-15.8	-17.4	-17.8	-17.1	-16	-15.3	-14.6	-13.8	-12.5	-11.4	-10.2	-9.5	-9.6	-10	-9.6	-9.2	-9.3	-9.9	-10.6	-11.6	-12.8	-13.4	-17.8	-9.2	-12.8
Dec 14	-14	-14.3	-14.6	-15	-15.5	-15.9	-16.2	-16.6	-16.7	-16.5	-16.1	-15.7	-15.9	-16.4	-17	-17.6	-17.8	-18.2	-18.6	-18.8	-19.2	-19.5	-20	-20.0	-14.0	-16.8	
Dec 15	-20.1	-20	-20.3	-20.8	-21.2	-22.1	-23.1	-24	-24.3	-23.9	-22.9	-21.6	-20.5	-19.5	-19.6	-20.6	-21.3	-23	-23.2	-23.3	-24	-25.4	-27.3	-27.3	-19.5	-22.3	
Dec 16	-28.6	-29.2	-29.9	-30.8	-31.3	-31.6	-32.6	-32.7	-30.7	-30.1	-28.2	-26.3	-24.7	-23.2	-22.4	-22.1	-21.7	-22.1	-20.8	-21	-21.2	-21.5	-21.6	-21.9	-32.7	-20.8	-26.0
Dec 17	-22.6	-23.8	-24.7	-24.9	-25.6	-26.3	-27.8	-29	-29.9	-29.2	-26.3	-24.5	-24.2	-24	-24.2	-25.3	-26.9	-29.2	-30.5	-31.8	-32.8	-32.4	-33.6	-33.8	-33.8	-22.6	-27.6
Dec 18	-33.7	-33.7	-33.1	-32.5	-30.6	-27.8	-25.9	-24.5	-25	-24.7	-23.2	-21.7	-20.7	-19.7	-19.5	-20.2	-20.1	-19.9	-19.5	-19.3	-19.4	-19.2	-18.9	-18.5	-33.7	-18.5	-23.8
Dec 19	-18	-17.5	-17.7	-18	-17.9	-18.5	-18.8	-18.9	-19	-19.4	-19.7	-20	-20	-19.1	-18.9	-19.2	-19	-19.3	-19.6	-20.1	-19.8	-18.5	-17.7	-17.1	-20.1	-17.1	-18.8
Dec 20	-15.9	-15.9	-15.9	-15.7	-15.6	-16.5	-17	-17.4	-17	-16.6	-15.9	-14.6	-14.3	-14	-14	-14.1	-14.7	-15.2	-15.7	-16.5	-17.1	-17.1	-18	-18.2	-18.2	-14.0	-16.0
Dec 21	-18.1	-17.7	-17.1	-16.8	-16.6	-15.8	-14.5	-14.1	-13.7	-13.1	-11.6	-10.3	-8.8	-8.5	-8.2	-8.4	-9.1	-10.7	-12.3	-13.2	-11.9	-11.1	-10.8	-10.6	-18.1	-8.2	-12.6
Dec 22	-10.8	-10.6	-10.6	-11.1	-11.6	-12	-12.4	-12.7	-12.9	-12.8	-12.7	-12.5	-12	-12.1	-12.2	-12.5	-13	-13.5	-14	-14.2	-14.5	-14.8	-15	-15.1	-15.1	-10.6	-12.7
Dec 23	-15	-15	-14.9	-14.4	-14.6	-15.1	-15.2	-15.6	-16	-16.1	-16	-15.8	-15.8	-16	-16.5	-16.7	-17	-17.4	-17.8	-18.3	-19.5	-20.3	-21.1	-21	-21.1	-14.4	-16.7
Dec 24	-20.9	-21	-22.1	-22.8	-23.1	-23.4	-24.1	-24.2	-24.3	-24.7	-24.7	-24.3	-24.1	-23.6	-23.6	-24.3	-24.8	-25.1	-25.1	-25.9	-26.5	-26.5	-26.8	-27.4	-27.4	-20.9	-24.3
Dec 25	-27.8	-28.2	-28.8	-30.2	-30.6	-30.7	-31.3	-31.8	-32.7	-33	-32.1	-30.7	-29.9	-29.2	-28.8	-29.4	-30.3	-30.7	-31.1	-30.9	-31	-32.2	-33.4	-33	-33.4	-27.8	-30.7
Dec 26	-32.9	-33.1	-33.4	-34	-33.4	-32.3	-31.4	-31.2	-30.6	-30	-28.8	-28.4	-27.8	-27.5	-27.4	-27.2	-27.1	-27.2	-27.3	-27.2	-27.2	-27.3	-27.6	-27.2	-34.0	-27.1	-29.5
Dec 27	-27.8	-28.7	-29.2	-29.9	-30.2	-31.7	-32.3	-32.2	-33.5	-33.4	-29.9	-28.4	-28.1	-27.6	-27.6	-28.7	-30.4	-31.6	-32.1	-33.1	-33.8	-34.6	-35.3	-35.7	-35.7	-27.6	-31.1
Dec 28	-34.7	-34.7	-35.8	-35.4	-35.5	-35.1	-35.6	-36.7	-35.8	-34	-31.9	-30.8	-28.9	-27.6	-27.4	-28.3	-28.4	-28.3	-28.2	-27.9	-28	-28.4	-28.4	-28.7	-36.7	-27.4	-31.4
Dec 29	-28.6	-28.7	-29.2	-29.2	-29	-28.9	-28.8	-28.8	-28.8	-28.8	-28.6	-28.2	-27.8	-27.4	-27.4	-27.6	-27.9	-28.7	-30.5	-30.9	-32.9	-34.3	-35.4	-36.4	-36.4	-27.4	-29.7
Dec 30	-35.9	-35.5	-33.9	-33.3	-33.9	-33.4	-32.7	-33.1	-31.7	-31.2	-30.1	-28.9	-27.8	-26.9	-26.2	-26.7	-27.7	-28.5	-29.2	-29.8	-30.3	-31	-31.5	-32	-35.9	-26.2	-30.9
Dec 31	-32.5	-32.8	-33	-32.9	-33.1	-33.3	-32.5	-32.8	-31.3	-33.2	-31.7	-29	-27.6	-26.2	-26.8	-28.4	-29.7	-30.4	-30.6	-31.1	-31.4	-31.7	-34.2	-35.5	-35.5	-26.2	-31.4
Diurnal Maximum	-1.5	-2.4	-1.7	4.4	5.4	5.1	4.7	4.4	3.9	3.6	3.4	3.4	3.1	2.9	1.4	-0.1	-1.1	-1.7	-1.7	-2.0	-2.3	-2.7	-3.3	-3.9			
Diurnal Average	-18.9	-19.2	-19.6	-19.8	-19.9	-19.9	-19.9	-20.0	-19.9	-19.5	-18.2	-17.1	-16.2	-15.6	-15.6	-16.1	-16.8	-17.2	-17.6	-18.0	-18.4	-18.8	-19.4	-19.9			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for AT - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

STATION TEMPERATURE (ST) in Degree Celsius

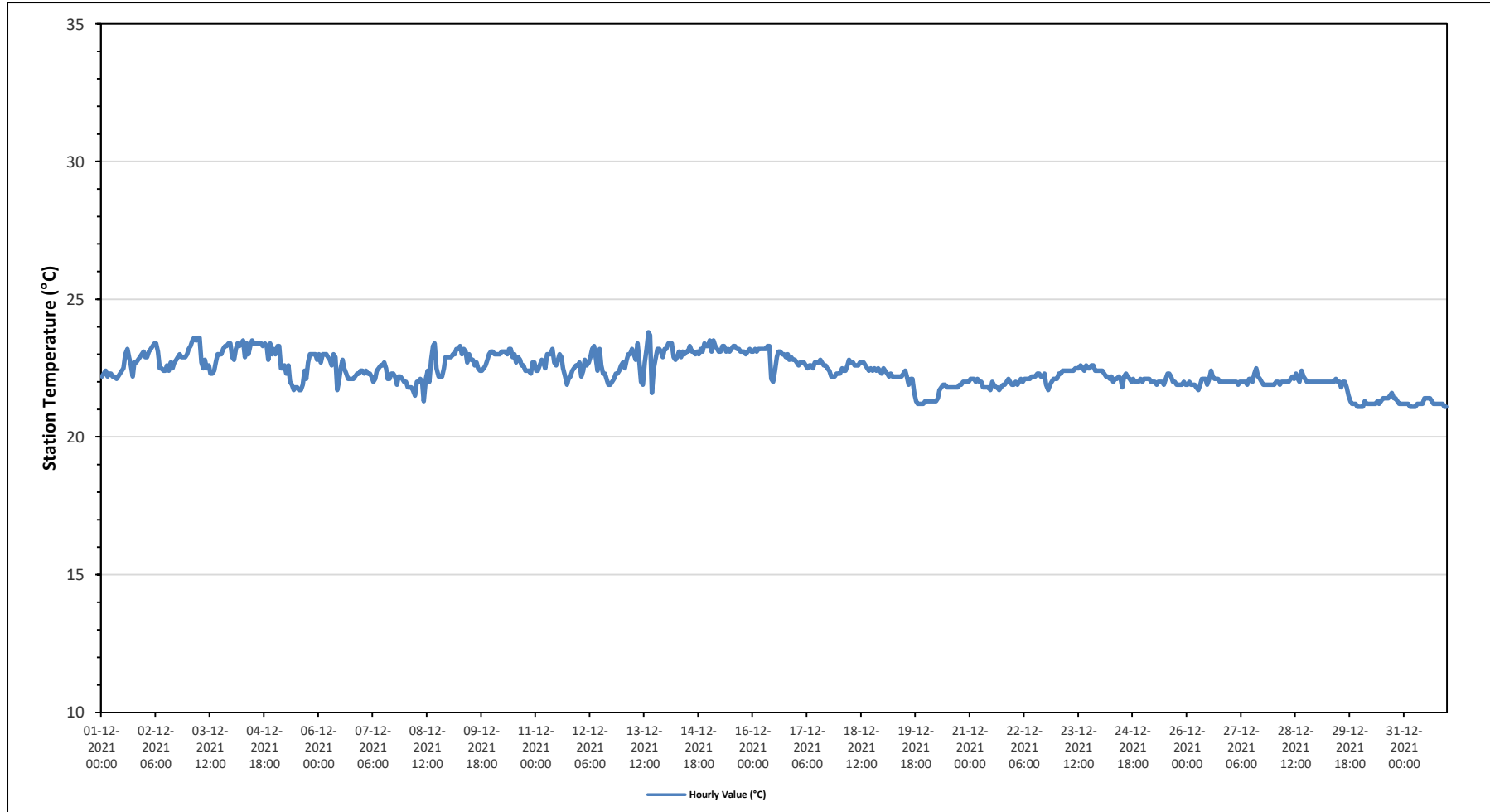
Maximum Hourly Value:	23.8 °C	on December 13 at hour 14	Hours in Service:	744
Maximum Daily Value:	23.3 °C	on December 4	Hours of Data:	744
Minimum Hourly Value:	21.1 °C	on December 29 at hour 22	Hours of Missing Data:	0
Minimum Daily Value:	21.2 °C	on December 31	Hours of Calibration:	0
Monthly Average:	22.4 °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		
Dec 1	22.2	22.3	22.4	22.2	22.3	22.3	23.4	23.4	23.1	22.5	22.5	22.4	22.4	22.6	22.4	22.7	22.5	22.7	22.8	22.9	23.0	22.9	22.9	23.0	22.1	23.2	22.5		
Dec 2	22.9	22.9	23.1	23.2	23.3	23.4	23.4	23.1	22.5	22.5	22.4	22.4	22.6	22.4	22.7	22.5	22.7	22.8	22.9	23.0	22.9	22.9	22.9	23.0	22.4	23.4	22.9		
Dec 3	23.2	23.3	23.5	23.6	23.5	23.6	23.6	22.7	22.5	22.8	22.5	22.6	22.3	22.3	22.4	22.7	23.0	23.0	23.0	23.2	23.3	23.3	23.4	23.4	22.3	23.6	23.0		
Dec 4	22.9	22.8	23.2	23.4	23.3	23.4	23.5	22.9	23.4	23.0	23.3	23.5	23.4	23.4	23.4	23.4	23.3	23.4	23.3	22.8	23.4	23.0	23.2	22.8	23.5	23.3			
Dec 5	23.0	23.3	23.3	22.5	22.5	22.6	22.3	22.6	22.0	21.9	21.7	21.8	21.8	21.7	21.7	21.9	22.4	22.1	22.7	23.0	23.0	23.0	23.0	22.8	21.7	23.3	22.4		
Dec 6	23.0	22.7	23.0	23.0	23.0	22.9	22.8	22.6	23.0	22.9	21.7	22.0	22.5	22.8	22.5	22.3	22.1	22.1	22.1	22.1	22.2	22.3	22.3	22.4	21.7	23.0	22.5		
Dec 7	22.4	22.3	22.4	22.3	22.3	22.2	22.0	22.1	22.4	22.5	22.6	22.6	22.7	22.5	22.1	22.1	22.3	22.3	22.2	21.9	22.2	22.2	22.1	22.0	21.9	22.7	22.3		
Dec 8	22.0	21.8	21.8	21.8	21.7	21.5	22.0	22.0	22.1	22.0	21.3	22.1	22.4	22.0	22.8	23.3	23.4	22.5	22.2	22.2	22.5	22.9	22.9	21.3	23.4	22.2			
Dec 9	22.9	22.9	23.0	23.0	23.2	23.2	23.3	23.0	23.2	23.1	22.7	23.0	22.8	22.8	22.6	22.7	22.5	22.4	22.4	22.5	22.6	22.8	23.0	23.1	22.4	23.3	22.9		
Dec 10	23.1	23.0	23.0	23.0	23.0	23.1	23.1	23.1	23.0	23.2	23.2	22.9	23.0	22.7	22.9	22.8	22.6	22.6	22.4	22.4	22.3	22.7	22.7	22.3	23.2	22.8			
Dec 11	22.4	22.4	22.6	22.8	22.7	22.5	23.0	23.0	23.0	23.2	22.7	22.6	22.8	23.0	22.9	22.5	22.2	21.9	22.1	22.2	22.4	22.5	22.6	22.6	21.9	23.2	22.6		
Dec 12	22.7	22.2	22.4	22.8	22.6	22.7	22.9	23.2	23.3	22.9	22.4	23.2	22.6	22.3	22.3	22.1	21.9	21.9	22.0	22.1	22.3	22.3	22.4	22.6	21.9	23.3	22.5		
Dec 13	22.7	22.5	22.8	23.0	23.0	23.2	23.0	22.8	23.4	22.8	22.0	21.9	22.7	23.2	23.8	23.7	21.6	22.5	22.8	23.2	23.2	23.1	22.9	23.2	21.6	23.8	22.9		
Dec 14	23.2	23.4	23.4	23.4	22.9	22.8	22.9	23.1	22.9	23.1	23.0	23.1	23.1	23.3	23.1	23.1	23.0	23.1	23.0	23.1	23.0	23.2	23.1	23.4	23.3	23.3	22.8	23.4	23.1
Dec 15	23.5	23.1	23.5	23.3	23.2	23.1	23.1	23.3	23.3	23.1	23.2	23.1	23.2	23.3	23.3	23.2	23.2	23.1	23.1	23.1	23.0	23.1	23.2	23.1	23.0	23.5	23.2		
Dec 16	23.1	23.2	23.1	23.2	23.2	23.2	23.2	23.2	23.3	23.3	22.1	22.0	22.4	22.9	23.1	23.1	23.0	23.0	22.9	23.0	22.8	22.9	22.8	22.8	22.0	23.3	23.0		
Dec 17	22.7	22.6	22.7	22.7	22.7	22.6	22.5	22.6	22.6	22.5	22.7	22.7	22.7	22.8	22.7	22.6	22.5	22.4	22.2	22.2	22.2	22.3	22.3	22.2	22.8	22.8	22.5		
Dec 18	22.3	22.5	22.4	22.4	22.6	22.8	22.7	22.7	22.6	22.6	22.6	22.7	22.7	22.7	22.6	22.5	22.4	22.5	22.4	22.5	22.4	22.5	22.4	22.3	22.3	22.8	22.5		
Dec 19	22.5	22.4	22.3	22.2	22.3	22.2	22.2	22.2	22.2	22.2	22.2	22.3	22.4	22.2	21.9	22.1	22.1	21.6	21.3	21.2	21.2	21.2	21.2	21.3	21.2	22.5	22.0		
Dec 20	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.7	21.8	21.9	21.9	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.9	21.9	22.0	22.0	22.0	22.0	21.3	22.0	21.7		
Dec 21	22.1	22.1	22.1	22.0	22.1	22.0	22.0	21.8	21.8	21.8	21.8	21.7	22.0	21.9	21.8	21.8	21.7	21.8	21.9	21.9	22.0	22.1	22.0	21.9	21.7	22.1	21.9		
Dec 22	21.9	22.0	21.9	22.0	22.1	22.0	22.1	22.1	22.1	22.1	22.2	22.2	22.2	22.3	22.3	22.2	22.2	22.3	21.9	21.7	21.9	22.0	22.1	22.1	21.7	22.3	22.1		
Dec 23	22.1	22.3	22.3	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.5	22.5	22.5	22.6	22.5	22.4	22.6	22.5	22.5	22.6	22.6	22.4	22.4	22.4	22.1	22.6	22.4		
Dec 24	22.4	22.4	22.3	22.2	22.2	22.1	22.2	22.0	22.1	22.1	22.2	22.1	21.8	22.2	22.3	22.2	22.1	22.0	22.1	22.0	22.0	22.1	22.0	21.8	22.4	22.1			
Dec 25	22.1	22.1	22.1	22.1	22.0	22.0	22.0	21.9	22.0	22.0	22.0	22.0	21.9	22.1	22.3	22.3	22.2	22.0	21.9	21.9	21.9	21.9	22.0	21.9	21.9	22.3	22.0		
Dec 26	21.9	22.0	21.9	21.9	21.9	21.8	21.7	21.9	22.1	22.1	22.1	21.9	22.1	22.4	22.2	22.1	22.1	22.1	22.0	22.0	22.0	22.0	22.0	21.7	22.4	22.0			
Dec 27	22.0	22.0	22.0	22.0	21.9	22.0	22.0	22.0	22.0	21.9	22.1	22.1	22.0	22.3	22.5	22.2	22.1	22.0	21.9	21.9	21.9	21.9	21.9	21.9	21.9	22.5	22.0		
Dec 28	21.9	22.0	22.0	21.9	22.0	22.0	22.0	22.0	22.0	22.1	22.2	22.1	22.3	22.1	22.0	22.4	22.2	22.1	22.0	22.0	22.0	22.0	22.0	21.9	22.4	22.1			
Dec 29	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.1	22.0	22.0	21.8	22.0	22.0	21.8	21.5	21.3	21.2	21.2	21.2	21.1	21.1	21.1	22.1	21.8		
Dec 30	21.1	21.1	21.3	21.2	21.2	21.2	21.2	21.2	21.2	21.3	21.2	21.3	21.4	21.4	21.4	21.4	21.5	21.6	21.4	21.4	21.3	21.2	21.2	21.1	21.1	21.6	21.3		
Dec 31	21.2	21.2	21.2	21.1	21.1	21.1	21.1	21.2	21.2	21.2	21.2	21.4	21.4	21.4	21.4	21.3	21.2	21.2	21.2	21.2	21.2	21.2	21.1	21.1	21.1	21.4	21.2		
Diurnal Maximum	23.5	23.4	23.5	23.6	23.5	23.6	23.6	23.3	23.4	23.3	23.3	23.5	23.4	23.4	23.8	23.7	23.4	23.3	23.4	23.3	23.3	23.4	23.4	23.4	23.4	23.4	23.4		
Diurnal Average	22.4	22.4	22.5	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.3	22.3	22.4	22.4	22.5	22.4	22.3	22.3	22.3	22.3	22.3	22.3	22.4	22.4	22.4	22.4	22.4		

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for ST - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

PRECIPITATION in mm

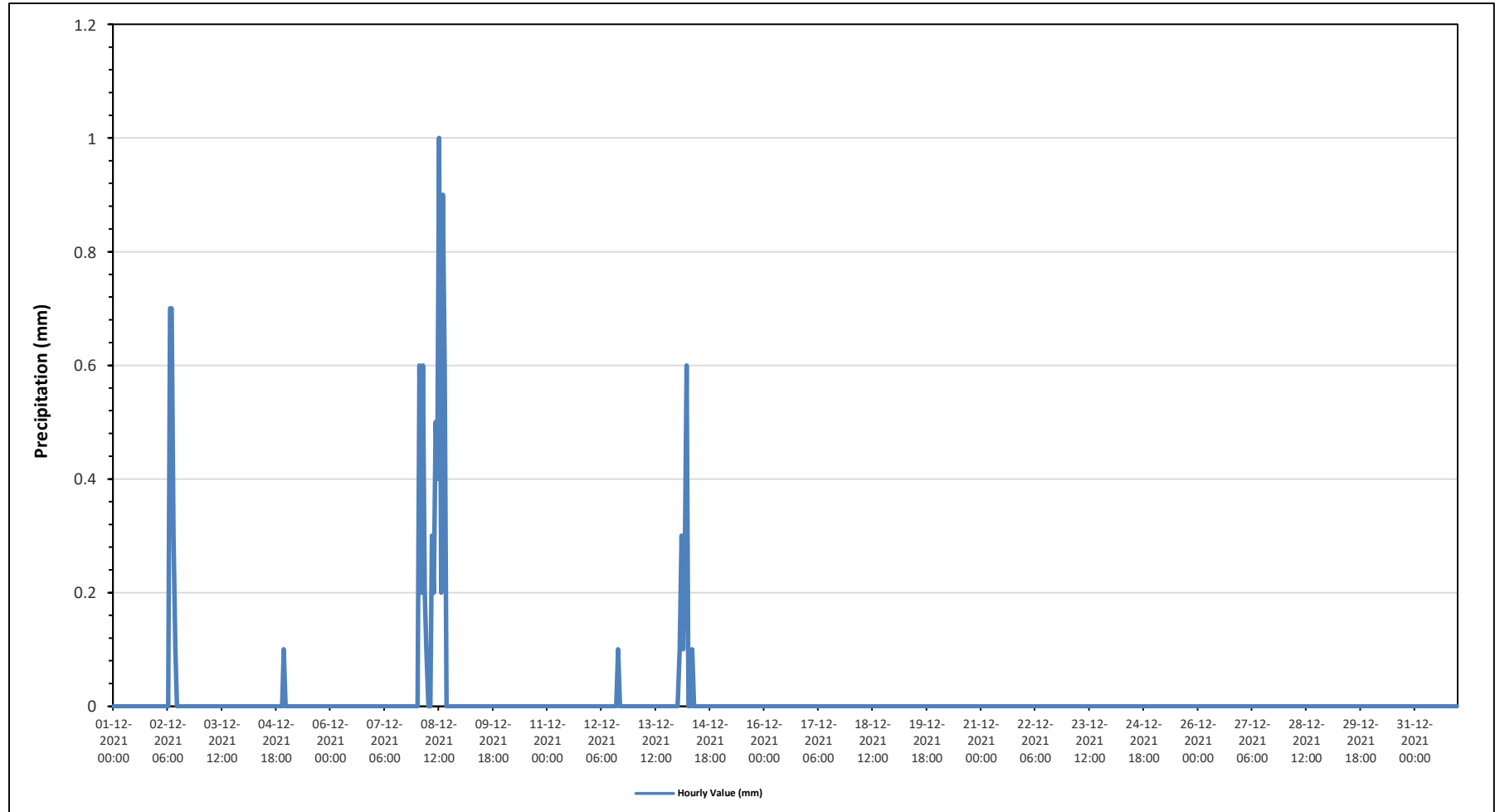
Maximum Hourly Value:	1.0 mm on December 8 at hour 12	Hours in Service:	744
Maximum Daily Value:	5.8 mm on December 8	Hours of Data:	744
Minimum Hourly Value:	0.0 mm on December 1 at hour 0	Hours of Missing Data:	0
Minimum Daily Value:	0.0 mm on December 1	Hours of Calibration:	0
Monthly Total:	9.3 mm	Operational Uptime:	100.0

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Total		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 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	
Dec 2	0	0	0	0	0	0	0	0	0.7	0.7	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.7	1.8
Dec 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	
Dec 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.0	0.1	0.1
Dec 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
Dec 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
Dec 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
Dec 8	0	0.6	0.2	0.6	0.2	0.1	0	0	0.3	0.2	0.5	0.4	1.0	0.2	0.9	0.6	0	0	0	0	0	0	0	0	0	0.0	1.0	5.8
Dec 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
Dec 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
Dec 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
Dec 12	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	0.1	0.1
Dec 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
Dec 14	0	0.1	0.3	0.1	0.3	0.6	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.6	1.5
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Dec 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
Diurnal Maximum	0.0	0.6	0.3	0.6	0.3	0.6	0.0	0.7	0.7	0.3	0.5	0.4	1.0	0.2	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for Precipitation - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

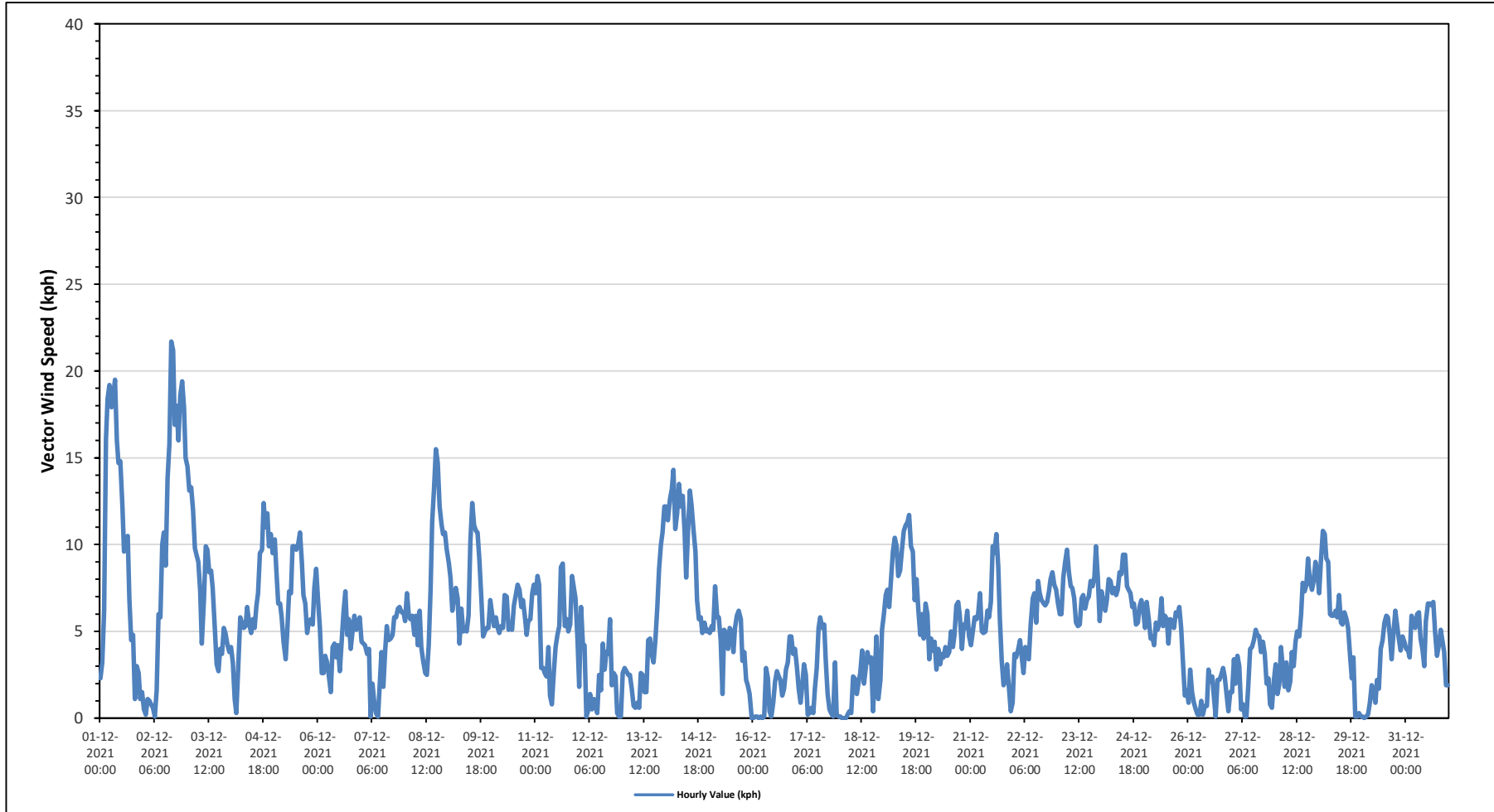
Maximum Hourly Value:	21.7 kph	on December 2 at hour 15	Hours in Service:	744
Maximum Daily Value:	9.6 kph	on December 2	Hours of Data:	744
Minimum Hourly Value:	0.0 kph	on December 15 at hour 23	Hours of Missing Data:	0
Minimum Daily Value:	1.0 kph	on December 18	Hours of Calibration:	0
Monthly Average:	2.4 kph		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	
Dec 1	2.3	3.2	6.2	16.1	18.4	19.2	17.9	18.5	19.5	16.0	14.7	14.8	12.2	9.6	10.3	10.5	6.9	4.5	4.8	1.1	3.0	2.6	1.1	1.5	1.1	19.5	8.4	
Dec 2	0.5	0.2	1.1	1.0	0.8	0.6	0.1	1.6	6.0	5.8	10.0	10.7	8.8	13.8	15.8	21.7	21.2	16.9	18.0	16.0	18.6	19.4	17.9	15.0	0.1	21.7	9.6	
Dec 3	14.5	13.1	13.3	12.0	9.8	9.4	9.0	7.3	4.3	6.8	9.9	9.7	8.4	8.5	7.5	5.2	3.1	2.7	4.0	3.7	5.2	4.9	4.2	3.8	2.7	14.5	6.8	
Dec 4	4.1	3.2	1.1	0.3	3.2	5.8	5.5	5.2	5.3	6.4	5.5	4.9	5.7	5.2	6.5	7.2	9.5	9.7	12.4	11.0	11.8	9.9	10.6	9.5	0.3	12.4	5.7	
Dec 5	10.3	8.5	6.6	6.6	5.8	4.4	3.4	5.0	7.3	7.2	9.9	9.9	9.7	10.0	10.7	9.0	7.1	6.6	4.9	5.6	5.7	5.4	7.5	8.6	3.4	10.7	4.8	
Dec 6	6.8	5.2	2.6	2.6	3.6	3.2	2.4	1.5	4.1	4.3	3.5	4.2	2.7	4.4	6.1	7.3	4.8	5.7	4.0	5.0	5.9	5.1	5.5	5.8	1.5	7.3	4.3	
Dec 7	4.4	4.3	4.2	3.7	4.0	0.1	2.0	0.9	0.3	0.1	2.1	3.8	1.8	3.9	5.3	4.5	4.6	4.8	5.8	5.8	6.3	6.4	6.1	6.1	0.1	6.4	3.1	
Dec 8	5.6	7.2	5.9	5.7	5.9	4.8	5.9	4.2	6.2	4.1	3.3	2.6	2.5	4.2	7.4	11.3	13.2	15.5	14.7	12.2	11.2	10.6	10.7	9.7	2.5	15.5	3.4	
Dec 9	8.9	8.1	6.2	7.0	7.5	6.9	4.3	6.3	5.0	5.1	5.0	5.9	10.2	12.4	11.1	10.8	10.7	9.1	7.0	4.7	5.0	5.2	5.2	6.8	4.3	12.4	6.5	
Dec 10	6.0	5.3	5.8	5.2	4.9	5.3	5.2	7.1	7.0	5.1	5.4	5.1	6.5	7.1	7.7	7.4	6.4	6.8	5.9	4.8	5.6	5.7	7.2	7.7	4.8	7.7	6.0	
Dec 11	7.2	8.2	7.7	2.9	2.9	2.6	2.4	4.1	1.3	0.8	2.8	4.1	4.8	5.3	8.7	8.9	5.3	5.7	5.0	5.4	8.2	7.6	6.9	4.4	0.8	8.9	3.7	
Dec 12	1.8	6.4	4.2	4.2	0.1	0.5	1.4	0.5	1.1	0.7	0.3	2.5	1.6	4.3	2.8	3.8	3.7	5.7	1.9	2.6	2.4	0.3	0.1	0.1	0.1	6.4	1.7	
Dec 13	2.6	2.9	2.7	2.5	2.5	1.7	0.7	0.6	0.9	0.6	2.6	2.5	1.5	1.5	4.5	4.6	3.7	3.2	4.5	6.3	8.6	10.0	10.7	12.2	0.6	12.2	3.8	
Dec 14	12.2	11.4	12.6	13.2	14.3	10.9	11.8	13.5	12.2	12.8	10.8	8.1	10.8	13.1	12.3	10.8	9.6	6.8	5.7	5.8	4.9	5.5	5.0	5.1	4.9	5.0	14.3	9.3
Dec 15	4.9	5.3	5.1	7.6	5.8	5.8	4.5	1.4	5.1	4.9	4.0	5.2	5.0	3.8	5.2	5.9	6.2	5.7	3.3	3.8	2.2	1.9	1.4	0.0	0.0	7.6	4.2	
Dec 16	0.0	0.1	0.1	0.0	0.1	0.0	0.1	2.9	2.3	0.4	0.1	0.9	2.1	2.7	2.4	2.2	1.3	1.7	2.8	3.2	4.7	4.7	3.7	4.0	0.0	4.7	1.6	
Dec 17	3.0	1.7	0.9	2.0	3.1	2.5	0.2	0.3	0.6	0.3	1.7	2.9	5.2	5.8	5.2	5.4	3.3	1.4	0.5	0.3	0.1	3.2	0.2	0.1	0.1	5.8	1.4	
Dec 18	0.1	0.0	0.0	0.0	0.2	0.4	0.3	2.4	2.3	1.4	2.1	2.6	3.9	2.0	2.8	3.8	3.2	3.5	0.4	2.6	4.7	1.1	2.2	5.1	0.0	5.1	1.0	
Dec 19	6.0	7.1	7.4	6.4	8.0	9.6	10.4	9.9	8.2	8.5	9.7	10.8	11.1	11.3	11.7	9.9	9.6	6.8	8.0	6.2	4.8	6.0	4.6	6.6	4.6	11.7	8.0	
Dec 20	6.0	3.4	4.6	3.9	4.4	2.8	4.0	3.1	3.7	3.5	4.1	3.6	3.8	5.0	4.1	4.8	6.5	6.7	5.9	4.0	5.4	5.2	6.2	4.7	2.8	6.7	4.3	
Dec 21	4.2	5.0	5.8	5.7	6.0	7.2	5.0	4.9	5.0	6.2	5.8	6.7	9.9	9.5	10.6	8.7	5.7	3.3	1.9	2.2	3.1	1.6	0.4	0.9	0.4	10.6	4.6	
Dec 22	3.7	3.5	3.9	4.5	3.6	2.6	4.1	3.5	3.4	5.4	6.9	7.2	5.5	7.9	7.2	6.8	6.6	6.5	6.7	7.3	8.0	8.4	7.7	7.4	2.6	8.4	5.7	
Dec 23	6.6	6.0	6.0	8.1	9.0	9.7	8.4	7.6	7.5	6.9	5.5	5.3	5.4	6.9	7.1	6.3	6.8	7.0	7.9	7.6	8.1	9.9	8.1	5.6	5.3	9.9	5.4	
Dec 24	7.3	6.7	6.2	6.8	8.0	7.9	7.2	7.5	7.1	7.4	8.4	8.3	9.4	9.4	7.6	7.4	7.2	6.4	6.6	5.4	5.5	6.4	6.8	6.2	5.4	9.4	7.1	
Dec 25	5.2	6.7	5.7	4.6	4.7	4.2	5.5	5.1	5.5	6.9	5.3	5.9	5.7	4.3	5.7	5.6	5.2	6.1	5.9	6.4	5.2	2.9	1.3	1.6	1.3	6.9	4.6	
Dec 26	0.9	2.8	1.5	0.9	0.5	0.2	0.2	1.0	0.2	0.7	0.7	2.8	2.1	2.4	1.3	0.1	2.2	2.2	2.5	2.9	2.4	1.4	0.4	1.5	0.1	2.9	1.0	
Dec 27	1.5	3.4	2.0	3.6	3.0	0.5	0.8	0.1	0.1	1.9	4.0	4.1	4.5	5.1	4.8	4.7	3.8	4.4	3.7	2.0	2.3	0.8	0.6	2.1	0.1	5.1	2.5	
Dec 28	3.1	1.4	2.0	4.1	2.9	1.8	3.2	1.6	2.1	3.8	3.0	4.4	5.0	4.7	6.0	7.8	7.3	7.7	9.2	7.9	7.4	7.9	9.0	8.4	1.4	9.2	4.6	
Dec 29	7.2	8.9	10.8	10.6	9.2	9.0	6.0	5.9	5.9	6.2	5.8	7.1	5.5	5.4	6.1	5.7	5.2	3.7	2.3	3.5	0.1	0.1	0.3	0.1	0.1	10.8	5.1	
Dec 30	0.1	0.0	0.1	0.2	0.9	1.9	1.5	0.9	2.2	1.7	4.0	4.5	5.5	5.9	5.8	4.8	3.4	4.9	6.2	5.3	4.6	3.9	4.7	4.4	0.0	6.2	3.0	
Dec 31	4.0	3.9	3.5	5.9	5.5	5.2	6.0	6.1	4.6	4.0	3.0	5.6	6.6	6.6	6.5	6.7	4.9	3.6	4.2	5.1	4.4	3.8	1.9	1.9	1.9	6.7	3.7	
Diurnal Maximum	15	13	13	16	18	19	18	19	20	16	15	15	12	14	16	22	21	17	18	16	19	19	18	15				
Diurnal Average	4.9	4.9	4.7	5.1	5.1	4.7	4.5	4.5	4.7	4.7	5.2	5.7	5.9	6.5	7.0	7.1	6.4	6.0	5.7	5.3	5.7	5.4	5.1	5.1				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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

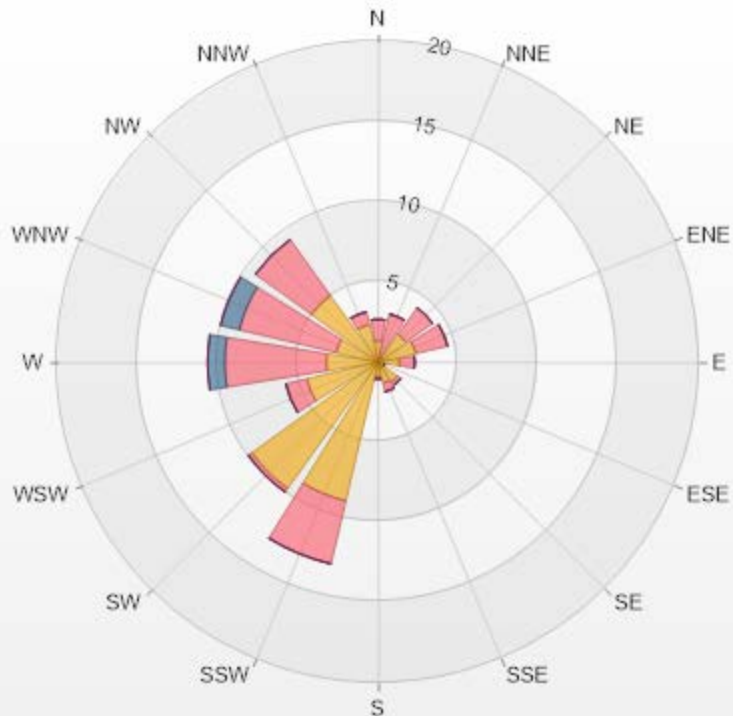
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for VWS - Tamarack Site



Wind: Tamarack Monitor: WDS [kph] Monthly: 12-2021 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 16.13% 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	1.34	1.34	0	0	0	2.68
NNE	0.27	2.82	0	0	0	3.09
NE	2.15	2.02	0	0	0	4.17
ENE	2.42	2.02	0	0	0	4.44
E	1.34	0.94	0	0	0	2.28
ESE	0.4	0	0	0	0	0.4
SE	1.48	0.27	0	0	0	1.75
SSE	1.34	0.54	0	0	0	1.88
S	0.94	0.13	0	0	0	1.07
SSW	8.87	4.03	0	0	0	12.9
SW	9.68	0.27	0	0	0	9.95
WSW	4.57	1.34	0	0	0	5.91
W	3.23	6.32	1.08	0	0	10.63
WNW	2.69	6.18	1.21	0	0	10.08
NW	5.11	4.3	0	0	0	9.41
NNW	2.42	0.81	0	0	0	3.23
Summary	48.25	33.33	2.29	0	0	83.87



LICA-202112

% Icon Classes (kph)	48	1.8-6.0	33	6.0-15.0	2	15.0-29.0	0	29.0-39.0	0	>39.0
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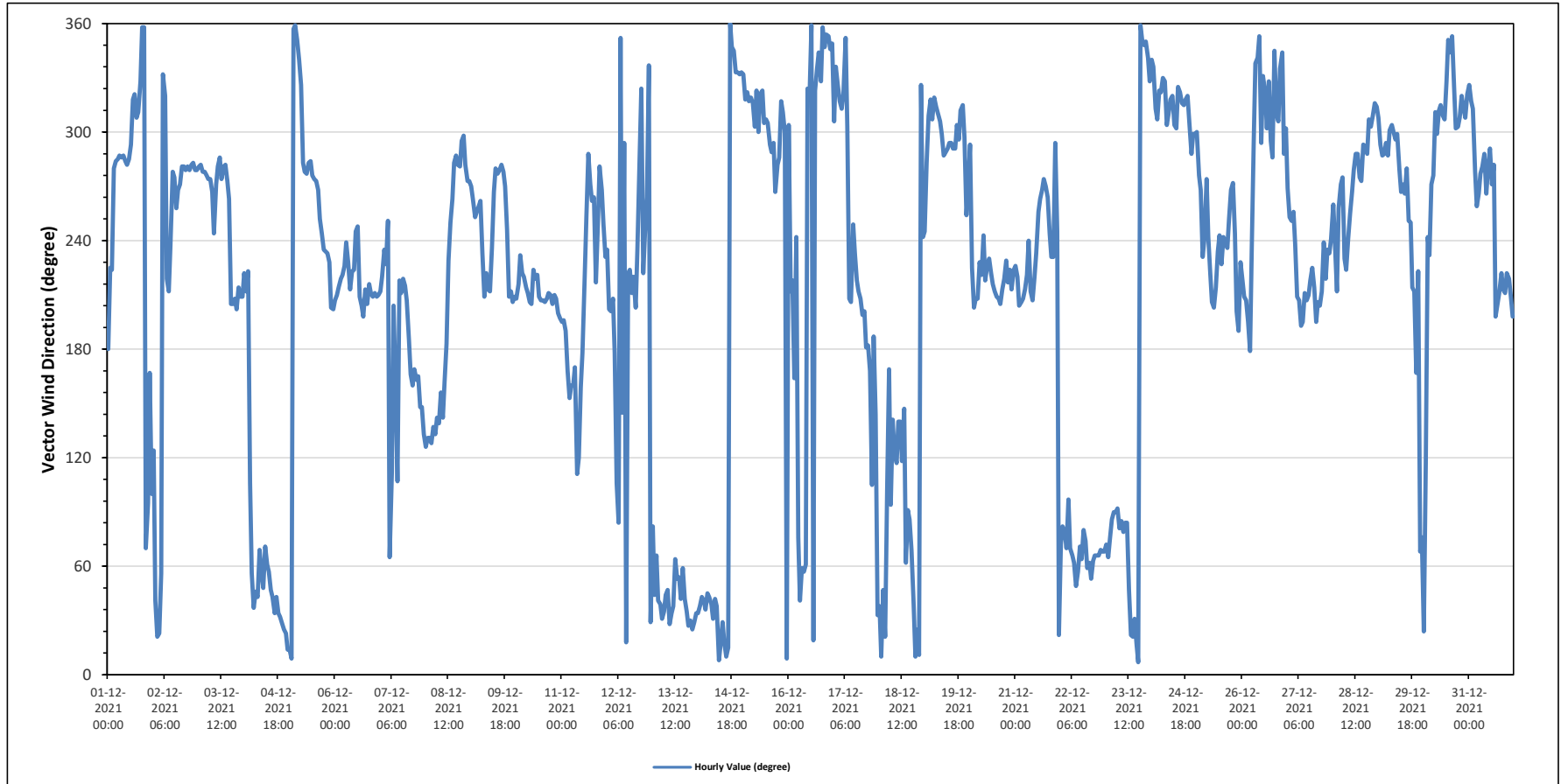
Tamarack Site - December 2021

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average: 281 (W) degree										Hours in 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																	
Dec 1	S	SW	SW	W	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	NW	NW	NW	NW	N	N	ENE	E	SSE	E	290	WNW																		
Dec 2	ESE	NE	NNE	NNE	NE	NNW	NW	SW	SSW	SW	W	W	WSW	W	W	W	W	W	W	W	W	W	W	276	W																		
Dec 3	W	W	W	W	W	W	W	W	WSW	W	W	WNW	W	W	W	W	W	SSW	SSW	SSW	SSW	SSW	SSW	267	W																		
Dec 4	SW	SSW	SW	ESE	NE	NE	NE	NE	ENE	ENE	NE	ENE	ENE	ENE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	40	NE																			
Dec 5	NNE	N	N	N	N	NNW	NW	W	W	W	W	WNW	W	W	W	W	WSW	WSW	SW	SW	SW	SSW	280	W																			
Dec 6	SSW	SSW	SSW	SW	SW	SW	WSW	SW	SSW	SW	SW	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	214	SSW																			
Dec 7	SSW	SW	SW	SW	WSW	ENE	ESE	SSW	SSE	ESE	SW	SSW	SW	SSW	S	SSE	SSE	SSE	SSE	SSE	SE	SE	183	S																			
Dec 8	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SE	SSE	S	SW	WSW	W	W	WNW	W	W	WNW	WNW	W	254	WSW																			
Dec 9	W	W	WSW	WSW	WSW	W	SW	SSW	SW	SSW	SSW	SW	W	W	W	W	W	W	WSW	SSW	SSW	SSW	254	WSW																			
Dec 10	SSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	211	SSW																			
Dec 11	SSW	SSW	S	SSE	SSE	SSE	SSE	SSE	ESE	ESE	SSE	S	SW	WSW	WNW	W	W	SW	WSW	W	W	WSW	230	SW																			
Dec 12	SW	SSW	SSW	SSW	S	ESE	E	N	SE	WNW	NNE	SW	SW	SSW	SW	SSW	SW	NW	SW	WSW	W	NNW	224	SW																			
Dec 13	E	NE	ENE	NE	NE	NNE	NE	NE	NE	NNE	NE	NE	ENE	NE	NE	ENE	NE	NE	NNE	NNE	NNE	NNE	38	NE																			
Dec 14	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	N	NNE	NNE	NNE	N	NNE	N	NNW	NNW	NNW	NNW	24	NNE																			
Dec 15	NNW	NW	NW	NW	NW	NW	WNW	NW	WNW	NW	NW	WNW	NW	WNW	WNW	WNW	WNW	W	WNW	NW	NW	WNW	306	NW																			
Dec 16	WNW	SSW	SW	SSE	WSW	ENE	NE	ENE	ENE	ENE	NW	NW	N	NNE	NW	NNW	NNW	N	NNW	N	N	NNW	357	N																			
Dec 17	NW	NNW	NW	NW	NW	NW	N	WNW	SSW	SSW	WSW	SW	SW	SSW	SSW	SSW	SSW	S	S	SSE	ESE	S	231	SW																			
Dec 18	NE	N	NE	NNE	E	SSE	E	SE	ESE	ESE	SE	SE	ESE	SE	ENE	E	E	ENE	NE	N	NNE	NNE	92	E																			
Dec 19	WSW	W	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	297	WNW																			
Dec 20	WNW	SW	SSW	SSW	SSW	SW	SW	WSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	220	SW																			
Dec 21	SW	SW	SSW	SSW	SSW	SSW	SW	WSW	SSW	SSW	SW	SW	WSW	W	W	W	W	WSW	SW	SW	WNW	WSW	238	SW																			
Dec 22	ENE	E	ENE	ENE	E	ENE	ENE	ENE	NE	ENE	ENE	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	67	ENE																			
Dec 23	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	ENE	E	E	NE	NNE	NNE	NNE	N	N	N	44	NE																			
Dec 24	NNW	NNW	NW	NW	NW	NW	NNW	NNW	WNW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	WNW	WNW	WNW	315	NW																			
Dec 25	WNW	W	W	WSW	W	WSW	SW	SSW	SSW	SSW	SSW	SW	WSW	SW	WSW	WSW	WSW	WSW	W	W	WSW	SSW	243	WSW																			
Dec 26	SW	SSW	SSW	SSW	S	SW	WNW	NNW	NNW	N	WNW	NNW	NW	WNW	NNW	WNW	WNW	NNW	NW	NW	NNW	NNW	303	WNW																			
Dec 27	W	WSW	WSW	WSW	SW	SSW	S	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	WSW	SW	SW	221	SW																			
Dec 28	WSW	SW	SSW	WSW	W	W	SW	SW	WSW	WSW	W	W	WNW	WNW	W	W	WNW	WNW	WNW	WNW	NW	NW	286	WNW																			
Dec 29	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	WSW	WSW	SSW	SSW	SSE	SW	ENE	284	WNW																			
Dec 30	NNE	ESE	WSW	SW	W	W	NW	WNW	NW	NW	NW	NNW	N	NNW	N	NW	WNW	WNW	NW	NW	NW	NW	319	NW																			
Dec 31	NW	NW	NW	W	WSW	W	W	W	WNW	W	W	WNW	W	W	SSW	SSW	SSW	SSW	SW	SW	SSW	SSW	256	WSW																			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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.																																											

Timeseries Chart of Hourly Average for VWD - Tamarack Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED																												
Maximum Hourly Value:		21.7 kph on December 2 at hour 15											Hours in Service:		744													
Maximum Daily Value:		9.6 kph on December 2											Hours of Data:		744													
Minimum Hourly Value:		0.0 kph on December 15 at hour 23											Hours of Missing Data:		0													
Minimum Daily Value:		1.0 kph on December 18											Hours of Calibration:		0													
Monthly Average:		2.4 kph											Operational Uptime:		100													
WIND DIRECTION																												
Monthly Average:		281 (W) degree																										
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	
Dec 1	2.3	3.2	6.2	16.1	18.4	19.2	17.9	18.5	19.5	16.0	14.7	14.8	12.2	9.6	10.3	10.5	6.9	4.5	4.8	1.1	3.0	2.6	1.1	1.5	1.1	19.5	8.4	
S	SW	SW	W	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	NW	NW	NW	NW	NNW	N	N	ENE	E	SSE	E					
Dec 2	0.5	0.2	1.1	1.0	0.8	0.6	0.1	1.6	6.0	5.8	10.0	10.7	8.8	13.8	15.8	21.7	21.2	16.9	18.0	16.0	18.6	19.4	17.9	15.0	0.1	21.7	9.6	
ESE	NE	NNE	NNE	NE	NNW	NW	SW	SSW	SW	W	WSW	W	W	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	
Dec 3	14.5	13.1	13.3	12.0	9.8	9.4	9.0	7.3	4.3	6.8	9.9	9.7	8.4	8.5	7.5	5.2	3.1	2.7	4.0	3.7	5.2	4.9	4.2	3.8	2.7	14.5	6.8	
W	W	W	W	W	W	W	W	WSW	W	WNW	W	W	W	W	W	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	
Dec 4	4.1	3.2	1.1	0.3	3.2	5.8	5.5	5.2	5.3	6.4	5.5	4.9	5.7	5.2	6.5	7.2	9.5	9.7	12.4	11.0	11.8	9.9	10.6	9.5	0.3	12.4	5.7	
SW	SSW	SW	ESE	NE	NE	NE	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE				
Dec 5	10.3	8.5	6.6	6.6	5.8	4.4	3.4	5.0	7.3	7.2	9.9	9.9	9.7	10.0	10.7	9.0	7.1	6.6	4.9	5.6	5.7	5.4	7.5	8.6	3.4	10.7	4.8	
NNE	N	N	N	N	NNW	NW	W	W	W	WNW	W	W	W	W	W	WSW	WSW	SW	SW	SW	SW	SW	SSW	SSW				
Dec 6	6.8	5.2	2.6	2.6	3.6	3.2	2.4	1.5	4.1	4.3	3.5	4.2	2.7	4.4	6.1	7.3	4.8	5.7	4.0	5.0	5.9	5.1	5.5	5.8	1.5	7.3	4.3	
SSW	SSW	SSW	SW	SW	WSW	SW	SSW	SW	SW	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW			
Dec 7	4.4	4.3	4.2	3.7	4.0	0.1	2.0	0.9	0.3	0.1	2.1	3.8	1.8	3.9	5.3	4.5	4.6	4.8	5.8	5.8	6.3	6.4	6.1	6.1	0.1	6.4	3.1	
SSW	SW	SW	SW	WSW	ENE	ESE	SSW	SSE	ESE	SW	SSW	SW	SSW	SSW	S	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE				
Dec 8	5.6	7.2	5.9	5.7	5.9	4.8	5.9	4.2	6.2	4.1	3.3	2.6	2.5	4.2	7.4	11.3	13.2	15.5	14.7	12.2	11.2	10.6	10.7	9.7	2.5	15.5	3.4	
SE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	S	SW	WSW	W	W	WNW	W	W	WNW	WNW	W	WNW	WNW	W	W				
Dec 9	8.9	8.1	6.2	7.0	7.5	6.9	4.3	6.3	5.0	5.1	5.0	5.9	10.2	12.4	11.1	10.8	10.7	9.1	7.0	4.7	5.0	5.2	5.2	6.8	4.3	12.4	6.5	
W	W	WSW	WSW	WSW	W	SW	SSW	SW	SSW	SW	SSW	SW	W	W	W	W	W	W	WSW	SSW	SSW	SSW	SSW	SSW				
Dec 10	6.0	5.3	5.8	5.2	4.9	5.3	5.2	7.1	7.0	5.1	5.4	5.1	6.5	7.1	7.7	7.4	6.4	6.8	5.9	4.8	5.6	5.7	7.2	7.7	4.8	7.7	6.0	
SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW			
Dec 11	7.2	8.2	7.7	2.9	2.9	2.6	2.4	4.1	1.3	0.8	2.8	4.1	4.8	5.3	8.7	8.9	5.3	5.7	5.0	5.4	8.2	7.6	6.9	4.4	0.8	8.9	3.7	
SSW	SSW	S	SSE	SSE	SSE	SSE	SSE	ESE	ESE	SSE	S	SW	WSW	WNW	W	W	W	SSW	W	W	WSW	W	W	WSW	SW			
Dec 12	1.8	6.4	4.2	4.2	0.1	0.5	1.4	0.5	1.1	0.7	0.3	2.5	1.6	4.3	2.8	3.8	3.7	5.7	1.9	2.6	2.4	0.3	0.1	0.1	0.1	0.1	6.4	1.7
SW	SSW	SSW	SSW	S	ESE	E	N	SE	WNW	NNE	SW	SW	SSW	SW	SSW	SW	W	NW	SW	WSW	W	NNW	NNE					
Dec 13	2.6	2.9	2.7	2.5	2.5	1.7	0.7	0.6	0.9	0.6	2.6	2.5	1.5	1.5	4.5	4.6	3.7	3.2	4.5	6.3	8.6	10.0	10.7	12.2	0.6	12.2	3.8	
E	NE	ENE	NE	NE	NNE	NE	NE	NNE	NE	NE	NE	NE	ENE	NE	NE	ENE	NE	NE	NNE	NNE	NNE	NNE	NNE	NE				
Dec 14	12.2	11.4	12.6	13.2	14.3	10.9	11.8	13.5	12.2	12.8	10.8	8.1	10.8	13.1	12.3	10.8	9.6	6.8	5.7	5.8	4.9	5.5	5.0	5.1	4.9	14.3	9.3	
NE	NE	NE	NE	NE	NE	NE	NE	NNE	NE	NE	NNE	NE	NNE	NNE	NNE	N	NNE	N	NNW	NNW	NNW	NNW	NNW	NNW				
Dec 15	4.9	5.3	5.1	7.6	5.8	5.8	4.5	1.4	5.1	4.9	4.0	5.2	5.0	3.8	5.2	5.9	6.2	5.7	3.3	3.8	2.2	1.9	1.4	0.0	0.0	7.6	4.2	
NNW	NW	NW	NW	NW	NW	WNW	NW	WNW	NW	NW	WNW	NW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	NW	NW	WNW	N				
Dec 16	0.0	0.1	0.1	0.0	0.1	0.0	0.1	2.9	2.3	0.4	0.1	0.9	2.1	2.7	2.4	2.2	1.3	1.7	2.8	3.2	4.7	4.7	3.7	4.0	0.0	4.7	1.6	
WNW	SSW	SW	SSE	WSW	ENE	NE	ENE	ENE	NE	NW	N	NNE	NW	NNW	NNW	NNW	N	NNW	N	NNW	N	NNW	NNW	NNW				
Dec 17	3.0	1.7	0.9	2.0	3.1	2.5	0.2	0.3	0.6	0.3	1.7	2.9	5.2	5.8	5.2	5.4	3.3	1.4	0.5	0.3	0.1	3.2	0.2	0.1	0.1	5.8	1.4	
NW	NNW	NW	NW	NW	NW	N	WNW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	ESE	S	SE	NNE	NNE					
Dec 18	0.1	0.0	0.0	0.0	0.2	0.4	0.3	2.4	2.3	1.4	2.1	2.6	3.9	2.0	2.8	3.8	3.2	3.5	0.4	2.6	4.7	1.1	2.2	5.1	0.0	5.1	1.0	
NE	N	NE	NNE	E	SSE	E	SE	ESE	ESE	SE	ESE	SE	ESE	SE	ESE	E	E	ENE	NE	NNE	NNE	NW	WSW					
Dec 19	6.0	7.1	7.4	6.4	8.0	9.6	10.4	9.9	8.2	8.5	9.7	10.8	11.1	11.3	11.7	9.9	9.6	6.8	8.0	6.2	4.8	6.0	4.6	6.6	4.6	11.7	8.0	
WSW	W	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NNW	WSW	W				
Dec 20	6.0	3.4	4.6	3.9	4.4	2.8	4.0	3.1	3.7	3.5	4.1	3.6	3.8	5.0	4.1	4.8	6.5	6.7	5.9	4.0	5.4	5.2	6.2	4.7	2.8	6.7	4.3	
WNW	SW	SSW	SSW	SSW	SW	SW	WSW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SW				



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Tamarack Site - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED		Maximum Hourly Value:		21.7 kph on December 2 at hour 15		Hours in Service:		744																																
WIND DIRECTION		Maximum Daily Value:		9.6 kph on December 2		Hours of Data:		744																																
		Minimum Hourly Value:		0.0 kph on December 15 at hour 23		Hours of Missing Data:		0																																
		Minimum Daily Value:		1.0 kph on December 18		Hours of Calibration:		0																																
		Monthly Average:		2.4 kph		Operational Uptime:		100																																
		Monthly Average:		281 (W) degree																																				
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																
Dec 21	4.2	5.0	5.8	5.7	6.0	7.2	5.0	4.9	5.0	6.2	5.8	6.7	9.9	9.5	10.6	8.7	5.7	3.3	1.9	2.2	3.1	1.6	0.4	0.9	0.4	10.6	4.6													
	SW	SW	SSW	SSW	SSW	SSW	SW	WSW	SSW	SSW	SW	SW	WSW	W	W	W	W	WSW	SW	SW	WNW	WSW	NNE																	
Dec 22	3.7	3.5	3.9	4.5	3.6	2.6	4.1	3.5	3.4	5.4	6.9	7.2	5.5	7.9	7.2	6.8	6.6	6.5	6.7	7.3	8.0	8.4	7.7	7.4	2.6	8.4	5.7													
	ENE	E	ENE	ENE	E	ENE	ENE	ENE	NE	ENE	ENE	ENE	E	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE																
Dec 23	6.6	6.0	6.0	8.1	9.0	9.7	8.4	7.6	7.5	6.9	5.5	5.3	5.4	6.9	7.1	6.3	6.8	7.0	7.9	7.6	8.1	9.9	8.1	5.6	5.3	9.9	5.4													
	ENE	ENE	ENE	E	E	E	E	E	E	ENE	E	E	NE	NNE	NNE	NNE	NNE	N	N	N	NNW	N	NNW	NNW																
Dec 24	7.3	6.7	6.2	6.8	8.0	7.9	7.2	7.5	7.1	7.4	8.4	8.3	9.4	9.4	7.6	7.4	7.2	6.4	6.6	5.4	5.5	6.4	6.8	6.2	5.4	9.4	7.1													
	NNW	NNW	NW	NW	NW	NNW	NNW	NNW	NNW	NW	NW	NW	NNW	NNW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW																
Dec 25	5.2	6.7	5.7	4.6	4.7	4.2	5.5	5.1	5.5	6.9	5.3	5.9	5.7	4.3	5.7	5.6	5.2	6.1	5.9	6.4	5.2	2.9	1.3	1.6	1.3	6.9	4.6													
	WNW	W	W	SW	WSW	W	WSW	SW	SSW	SSW	SSW	SW	WSW	SW	WSW	WSW	SW	WSW	W	W	WSW	SSW	S	SW																
Dec 26	0.9	2.8	1.5	0.9	0.5	0.2	0.2	1.0	0.2	0.7	0.7	2.8	2.1	2.4	1.3	0.1	2.2	2.2	2.5	2.9	2.4	1.4	0.4	1.5	0.1	2.9	1.0													
	SW	SSW	SSW	SSW	S	SW	WNW	NNW	NNW	N	WNW	NNW	NW	NNW	NNW	WNW	WNW	NNW	NW	NW	NNW	NNW	NNW	NNW																
Dec 27	1.5	3.4	2.0	3.6	3.0	0.5	0.8	0.1	0.1	1.9	4.0	4.1	4.5	5.1	4.8	4.7	3.8	4.4	3.7	2.0	2.3	0.8	0.6	2.1	0.1	5.1	2.5													
	W	WSW	WSW	WSW	SW	SSW	S	SSW	SSW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW																
Dec 28	3.1	1.4	2.0	4.1	2.9	1.8	3.2	1.6	2.1	3.8	3.0	4.4	5.0	4.7	6.0	7.8	7.3	7.7	9.2	7.9	7.4	7.9	9.0	8.4	1.4	9.2	4.6													
	WSW	SW	SSW	WSW	W	W	SW	SW	WSW	WSW	W	W	WNW	WNW	W	W	WNW	WNW	WNW	NW	WNW	NW	NW	NW																
Dec 29	7.2	8.9	10.8	10.6	9.2	9.0	6.0	5.9	5.9	6.2	5.8	7.1	5.5	5.4	6.1	5.7	5.2	3.7	2.3	3.5	0.1	0.1	0.3	0.1	0.1	10.8	5.1													
	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	WSW	WSW	SSW	SSW	SSE	SW	ENE	ENE																
Dec 30	0.1	0.0	0.1	0.2	0.9	1.9	1.5	0.9	2.2	1.7	4.0	4.5	5.5	5.9	5.8	4.8	3.4	4.9	6.2	5.3	4.6	3.9	4.7	4.4	0.0	6.2	3.0													
	NNE	ESE	WSW	SW	W	W	NW	WNW	NW	NW	NW	NW	NNW	N	NNW	N	NW	WNW	WNW	NW	NW	NW	NW	NW																
Dec 31	4.0	3.9	3.5	5.9	5.5	5.2	6.0	6.1	4.6	4.0	3.0	5.6	6.6	6.6	6.5	6.7	4.9	3.6	4.2	5.1	4.4	3.8	1.9	1.9	1.9	6.7	3.7													
	NW	NW	NW	W	WSW	W	W	W	WNW	W	W	WNW	W	W	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW																
C	Monthly Calibration										S Daily Zero-Span Check										Q Quality Assurance																			
K	Collection Error										N 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.



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Tamarack Site - December 2021

Summary of Hour Standard Deviations

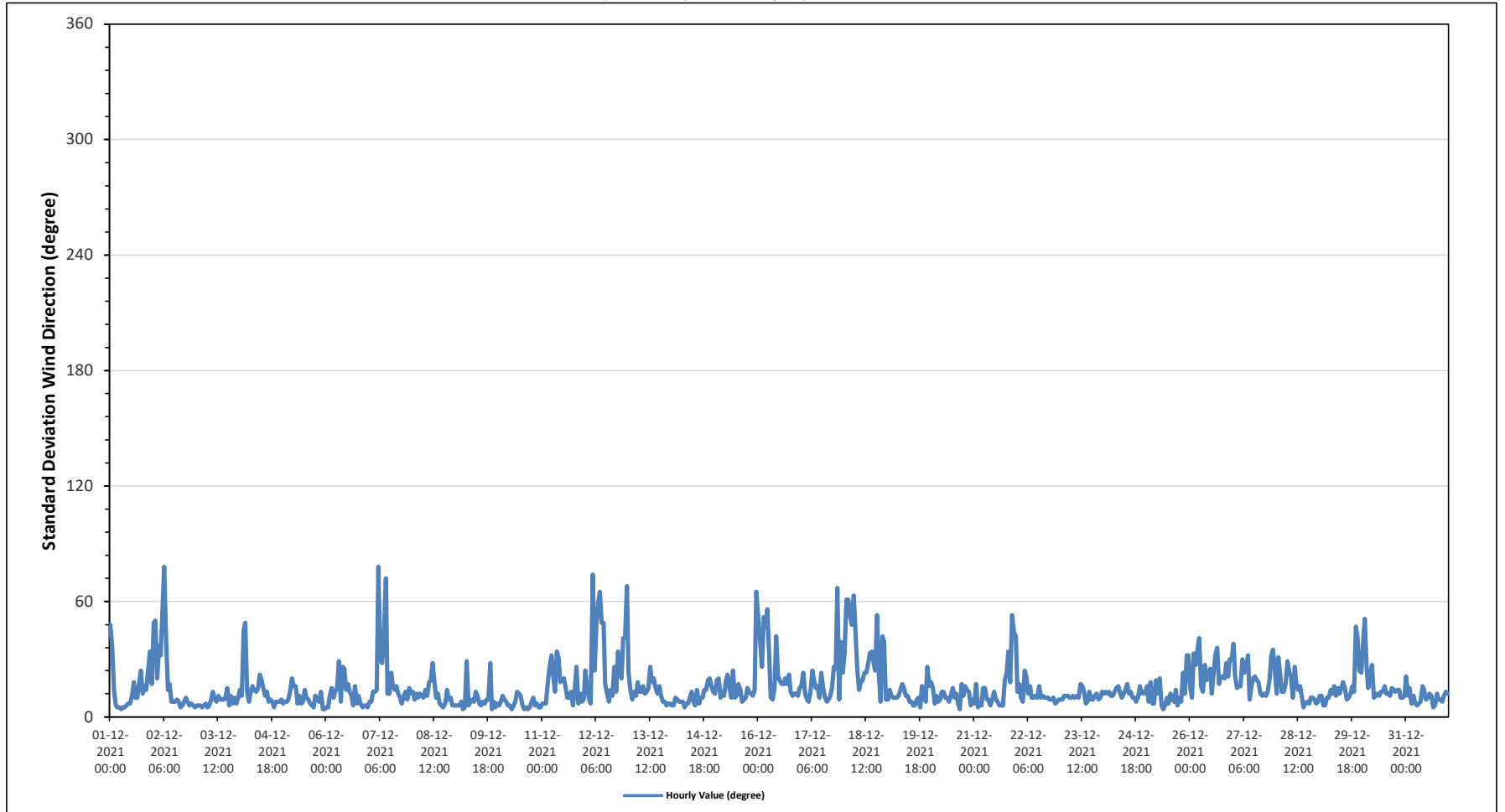
STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:	78 degree on December 2 at hour 6	Hours in Service:	744
Minimum Hourly Value:	4 degree on December 1 at hour 6	Hours of Data:	744
		Hours of Missing Data:	0
		Hours of Calibration:	0
		Operational Uptime:	100.0

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																	
Dec 1	48	37	14	6	5	5	4	5	5	6	7	7	11	18	10	10	18	24	12	16	14	24	34	17	4	48																	
Dec 2	49	50	20	37	32	57	78	41	14	17	8	8	8	9	8	5	6	8	10	8	6	7	6	5	5	78																	
Dec 3	6	6	6	5	6	7	5	6	9	13	9	8	11	9	9	9	10	15	6	11	7	10	7	10	5	15																	
Dec 4	14	11	45	49	13	8	13	16	14	13	15	22	19	15	11	13	8	9	8	5	8	8	8	9	5	49																	
Dec 5	7	8	8	9	14	20	16	16	7	11	7	8	14	10	9	7	6	5	11	9	8	13	4	4	4	20																	
Dec 6	5	5	11	15	10	13	15	29	8	26	25	14	17	13	11	6	16	7	11	7	5	6	6	5	5	29																	
Dec 7	8	8	13	13	14	78	30	28	44	72	12	12	23	16	14	16	12	10	7	11	13	9	15	12	7	78																	
Dec 8	13	9	12	10	12	11	10	14	11	18	19	28	19	10	12	7	6	5	7	14	9	10	6	6	5	28																	
Dec 9	6	6	6	8	4	5	29	6	8	9	8	13	11	7	6	8	7	9	9	28	4	8	5	7	4	29																	
Dec 10	6	8	11	9	8	6	6	4	6	8	13	12	11	6	4	5	4	5	8	10	6	7	5	5	4	13																	
Dec 11	7	7	7	16	25	32	22	13	34	31	18	19	20	15	10	10	13	6	15	26	7	12	8	9	6	34																	
Dec 12	24	15	9	7	74	24	48	59	65	49	49	17	12	8	14	11	26	13	34	23	20	41	41	68	7	74																	
Dec 13	23	14	9	13	11	18	13	13	16	12	13	15	26	18	20	15	12	16	11	8	8	6	7	7	6	26																	
Dec 14	6	6	10	9	8	8	8	5	7	7	10	13	8	6	14	7	10	10	14	14	19	20	16	13	5	20																	
Dec 15	12	19	20	10	13	11	19	22	15	10	24	10	11	17	14	8	9	10	15	13	12	11	14	65	8	65																	
Dec 16	52	40	26	52	47	56	32	10	9	15	42	21	19	17	17	20	17	22	13	11	12	12	11	15	9	56																	
Dec 17	16	23	12	9	8	13	24	19	15	16	10	23	15	10	8	9	11	15	26	25	67	9	39	23	8	67																	
Dec 18	33	61	61	52	48	63	46	25	14	18	19	23	23	28	33	34	28	24	53	21	8	42	39	9	8	63																	
Dec 19	9	14	11	10	10	10	11	14	17	15	11	11	8	8	6	6	9	10	5	16	15	8	26	16	5	26																	
Dec 20	18	15	7	11	8	9	13	13	10	10	8	11	15	10	12	7	4	17	11	16	14	13	6	9	4	18																	
Dec 21	7	17	5	7	6	15	15	9	9	6	9	13	9	8	6	6	6	19	23	34	18	53	44	42	5	53																	
Dec 22	13	17	10	8	24	21	12	16	10	10	11	10	16	10	11	10	10	10	9	9	10	7	8	9	7	24																	
Dec 23	9	9	11	11	11	10	10	11	10	11	10	17	16	13	7	8	13	9	9	11	12	9	10	13	7	17																	
Dec 24	12	13	12	13	11	11	13	15	16	12	10	12	14	17	12	13	10	10	8	10	16	12	13	12	8	17																	
Dec 25	16	8	18	7	7	19	12	20	6	4	6	10	7	12	10	8	14	6	10	8	23	12	32	32	4	32																	
Dec 26	15	10	33	27	34	41	16	13	27	19	22	25	12	23	32	36	17	21	21	20	28	21	30	30	10	41																	
Dec 27	38	21	15	16	16	30	23	25	32	9	16	20	21	19	18	12	11	12	11	13	19	32	35	24	9	38																	
Dec 28	12	31	22	13	13	17	29	23	21	10	26	17	14	16	11	5	7	8	7	10	10	9	7	8	5	31																	
Dec 29	11	11	6	6	10	10	14	12	16	11	15	12	15	18	15	9	10	12	16	13	47	41	24	23	6	47																	
Dec 30	37	51	25	15	23	27	10	11	12	11	13	13	16	12	12	11	15	14	13	14	14	10	10	11	10	51																	
Dec 31	21	11	15	7	11	7	6	7	8	16	14	9	10	12	11	5	6	12	9	9	8	11	13	12	5	21																	
Diurnal Minimum	5	5	5	5	4	5	4	4	5	4	6	7	7	6	4	5	4	5	5	5	4	6	4	4																			
Daiurnal Maximum	52	61	61	52	74	78	78	59	65	72	49	28	26	28	33	36	28	24	53	34	67	53	44	68																			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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)																															

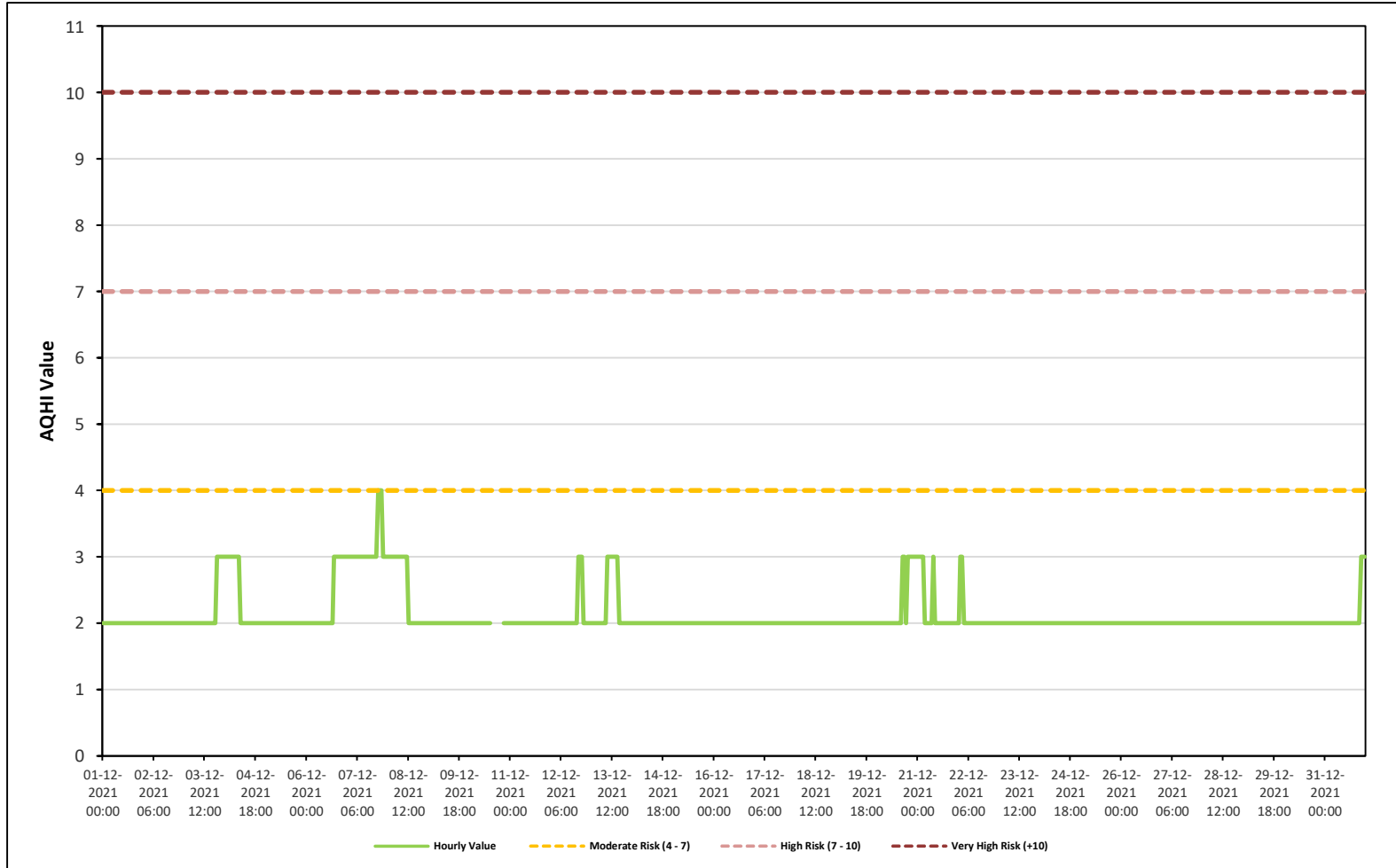
Daily Average is shown "-" if minimum data completeness criteria of 75% or 18 hours per day is not met.
Monthly Average is shown "-" if minimum data completeness criteria of 75% of days per month is not met.

Timeseries Chart of Hourly Average for STDWD - Tamarack Site



ST. LINA STATION

Timeseries Chart of Hourly Average for AQHI - St. Lina Site





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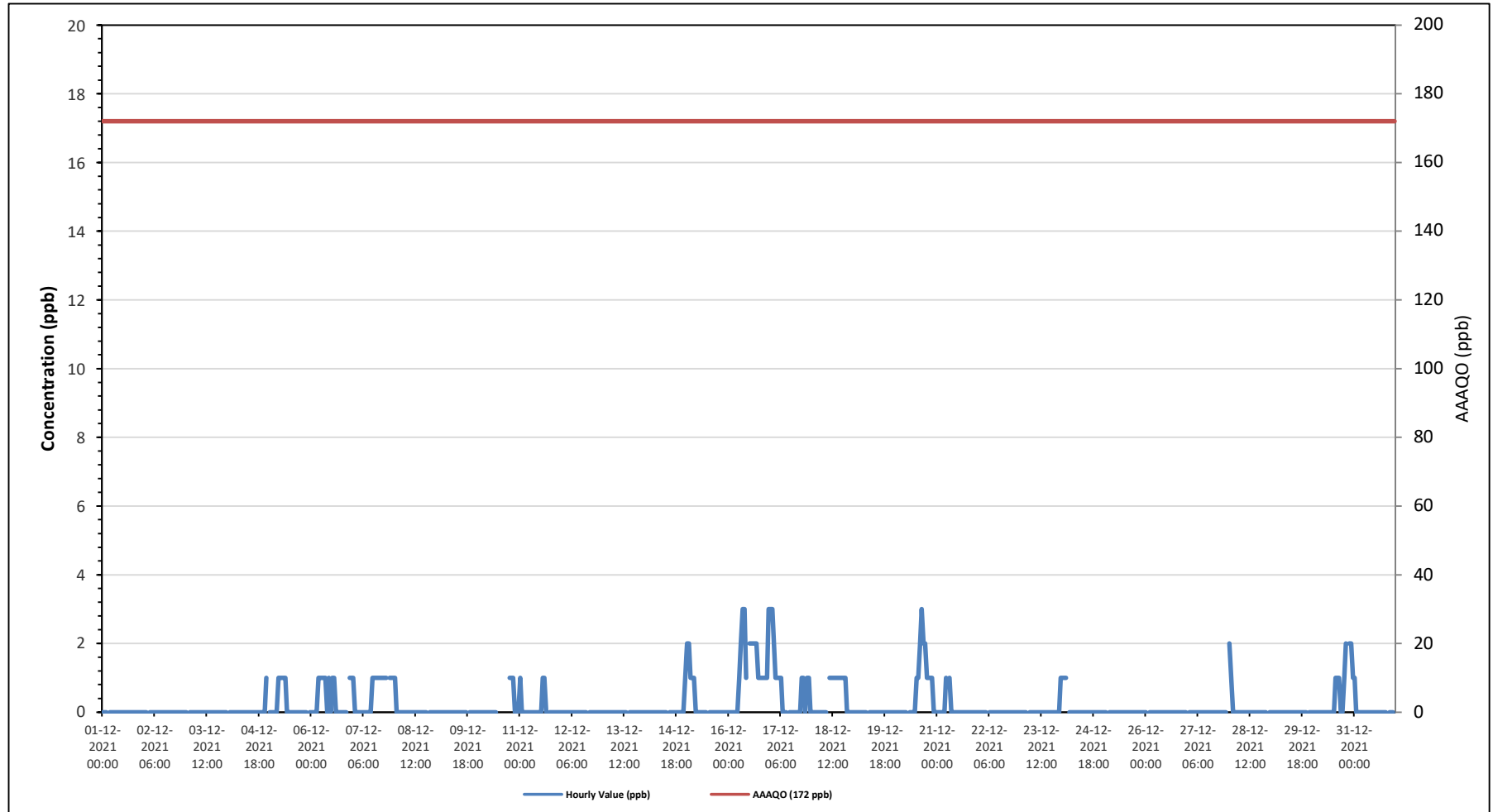
St. Lina Site - December 2021

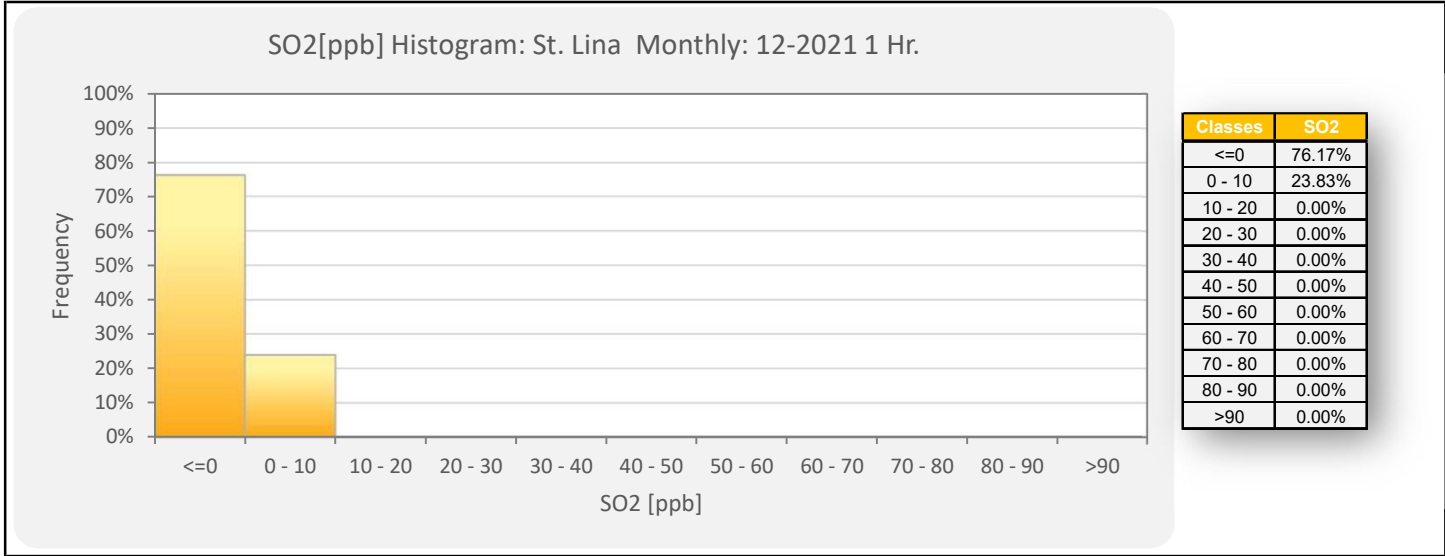
Summary of Hourly Averages

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 Exceedences: 0					Number of 24-Hour Exceedences: 0					30-Day Exceedence: 0																		
Maximum Hourly Value: 3 ppb on December 16 at hour 8										Hours in Service: 744																		
Maximum Daily Value: 1.3 ppb on December 16										Hours of Data: 705																		
Minimum Hourly Value: 0 ppb on December 1 at hour 0										Hours of Missing Data: 1																		
Minimum Daily Value: 0.0 ppb on December 1										Hours of Calibration: 38																		
Monthly Average: 0.2 ppb										Operational Uptime: 99.9																		
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				
Dec 1	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
Dec 2	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 3	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 4	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	1	0.0
Dec 5	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0.2
Dec 6	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	S	1	1	0	1	0.4
Dec 7	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	1	0.6
Dec 8	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	1	0.0
Dec 9	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
Dec 10	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	1	S	1	1	1	0	0	0	0	0	1	0.2
Dec 11	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0.1
Dec 12	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
Dec 13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 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	1	0	0.0
Dec 15	2	2	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3
Dec 16	0	0	0	0	0	0	1	2	3	3	1	S	2	2	2	2	2	1	1	1	1	1	1	1	3	0	3	1.3
Dec 17	3	3	2	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	3	0.7
Dec 18	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0.4
Dec 19	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 20	0	0	0	0	0	0	0	S	0	0	0	0	1	1	2	3	2	2	1	1	1	1	0	0	0	0	3	0.7
Dec 21	0	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 22	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 23	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.0
Dec 24	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Dec 25	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 26	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dec 27	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0.0
Dec 28	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0.1
Dec 29	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
Dec 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	2	S	2	2	1	0	2	0.5
Dec 31	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	P	0	1	0.0
Diurnal Maximum	3	3	2	1	1	1	1	2	3	3	1	1	2	2	2	3	2	2	1	2	1	2	2	3				
Diurnal Average	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.1	0.2	0.2	0.3				
C	Monthly Calibration										S	Daily Zero-Span Check					Q	Quality Assurance										
K	Collection Error										N	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.																												

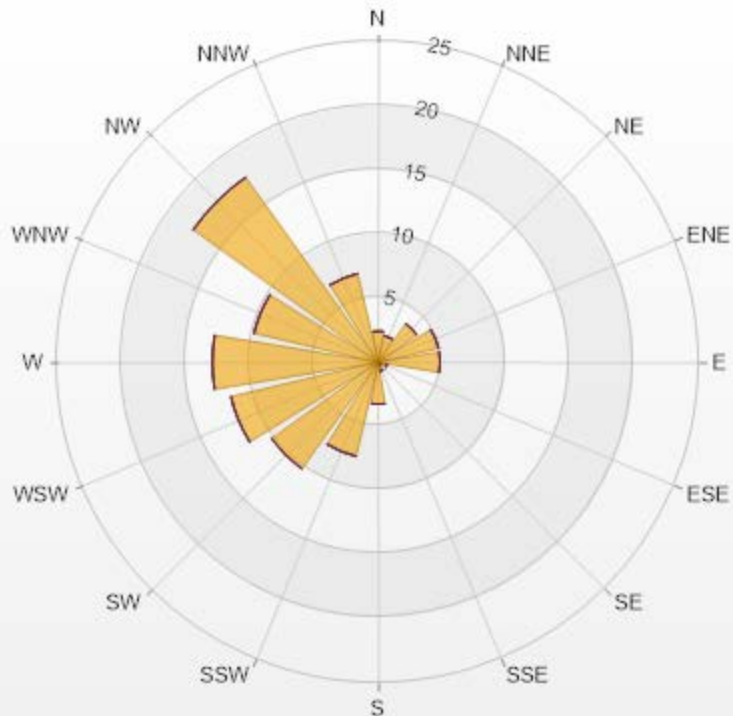
Timeseries Chart of Hourly Average for SO2 - St. Lina Site





Wind: St. Lina Poll.: St. Lina-SO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0-10	10-50	50-100	100-172	>172.0	Total
N	2.41	0	0	0	0	2.41
NNE	2.13	0	0	0	0	2.13
NE	3.69	0	0	0	0	3.69
ENE	4.82	0	0	0	0	4.82
E	4.82	0	0	0	0	4.82
ESE	0.71	0	0	0	0	0.71
SE	0.28	0	0	0	0	0.28
SSE	0.71	0	0	0	0	0.71
S	3.26	0	0	0	0	3.26
SSW	7.52	0	0	0	0	7.52
SW	10.21	0	0	0	0	10.21
WSW	11.77	0	0	0	0	11.77
W	12.91	0	0	0	0	12.91
WNW	9.93	0	0	0	0	9.93
NW	17.73	0	0	0	0	17.73
NNW	7.09	0	0	0	0	7.09
Summary	100	0	0	0	0	100



LICA-202112

% Icon Classes (ppb)

100 0-10

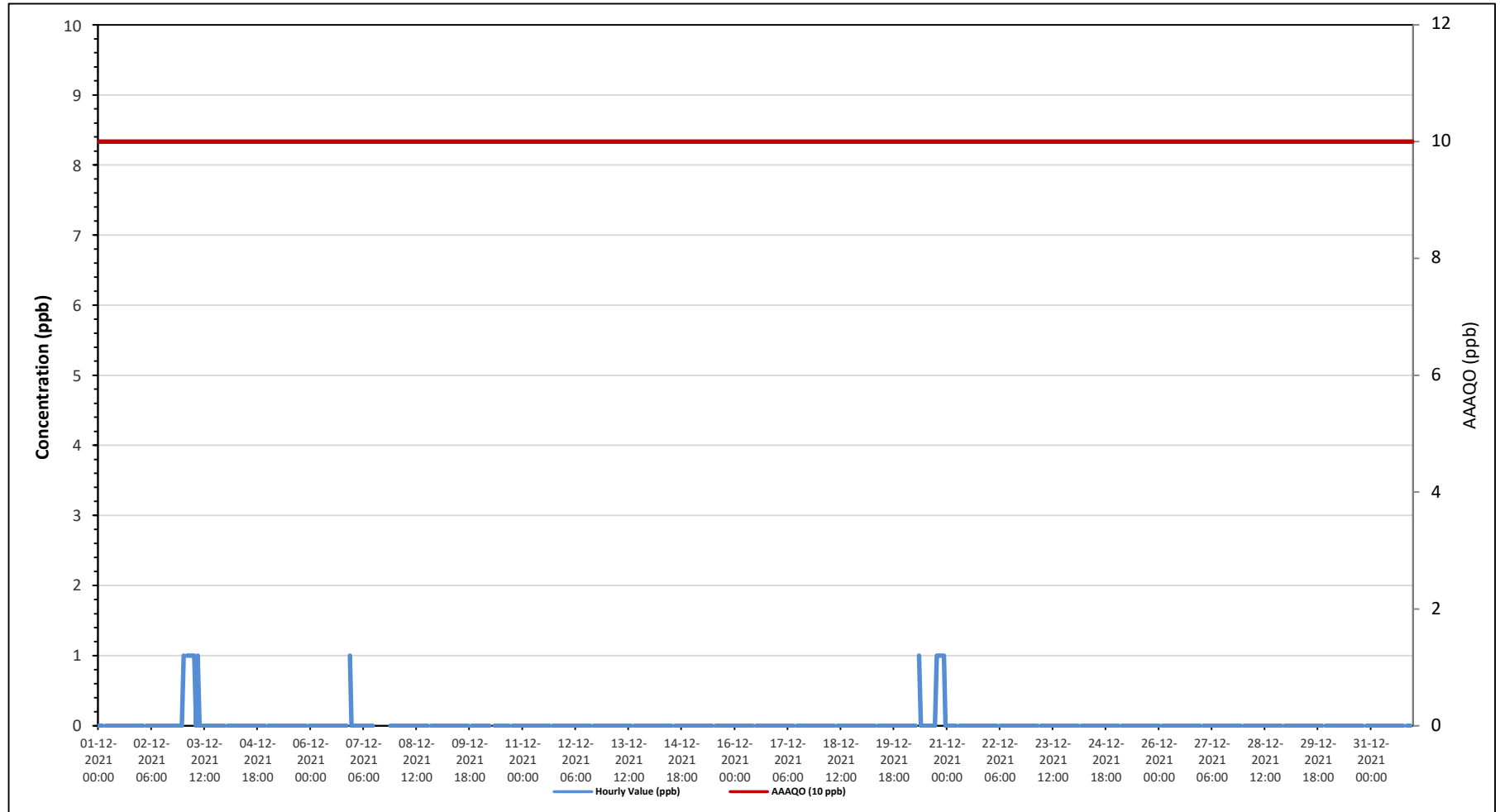
0 10-50

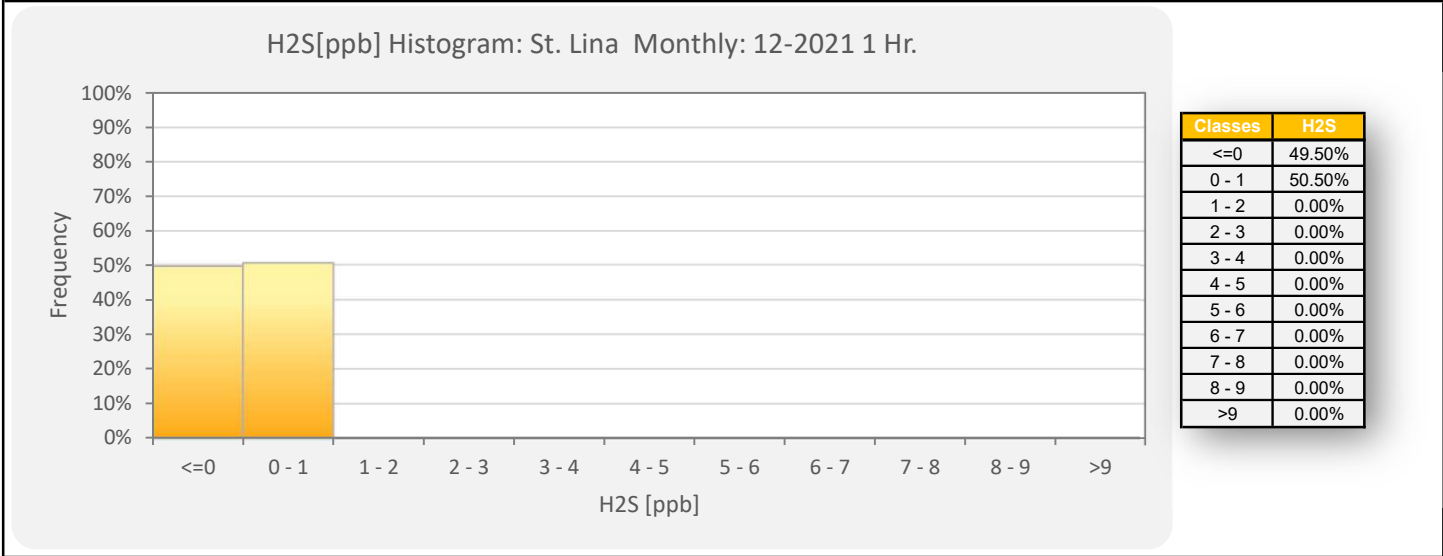
0 50-100

0 100-172

0 >172.0

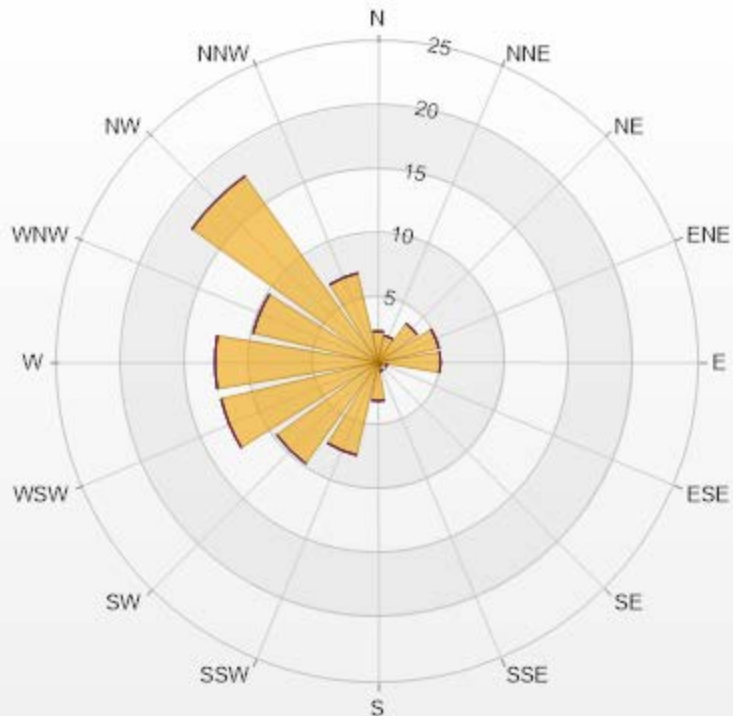
Timeseries Chart of Hourly Average for H2S - St. Lina Site





Wind: St. Lina Poll.: St. Lina-H2S[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0-2	2-5	5-10	10-50	>50.0	Total
N	2.43	0	0	0	0	2.43
NNE	2.14	0	0	0	0	2.14
NE	3.71	0	0	0	0	3.71
ENE	4.85	0	0	0	0	4.85
E	4.85	0	0	0	0	4.85
ESE	0.71	0	0	0	0	0.71
SE	0.29	0	0	0	0	0.29
SSE	0.71	0	0	0	0	0.71
S	3	0	0	0	0	3
SSW	7.42	0	0	0	0	7.42
SW	9.7	0	0	0	0	9.7
WSW	12.55	0	0	0	0	12.55
W	12.7	0	0	0	0	12.7
WNW	9.99	0	0	0	0	9.99
NW	17.83	0	0	0	0	17.83
NNW	7.13	0	0	0	0	7.13
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100 0-2

0 2-5

0 5-10

0 10-50

0 >50.0



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St. Lina Site - December 2021

Summary of Hourly Averages

OXIDES OF NITROGEN (NOx) in ppb

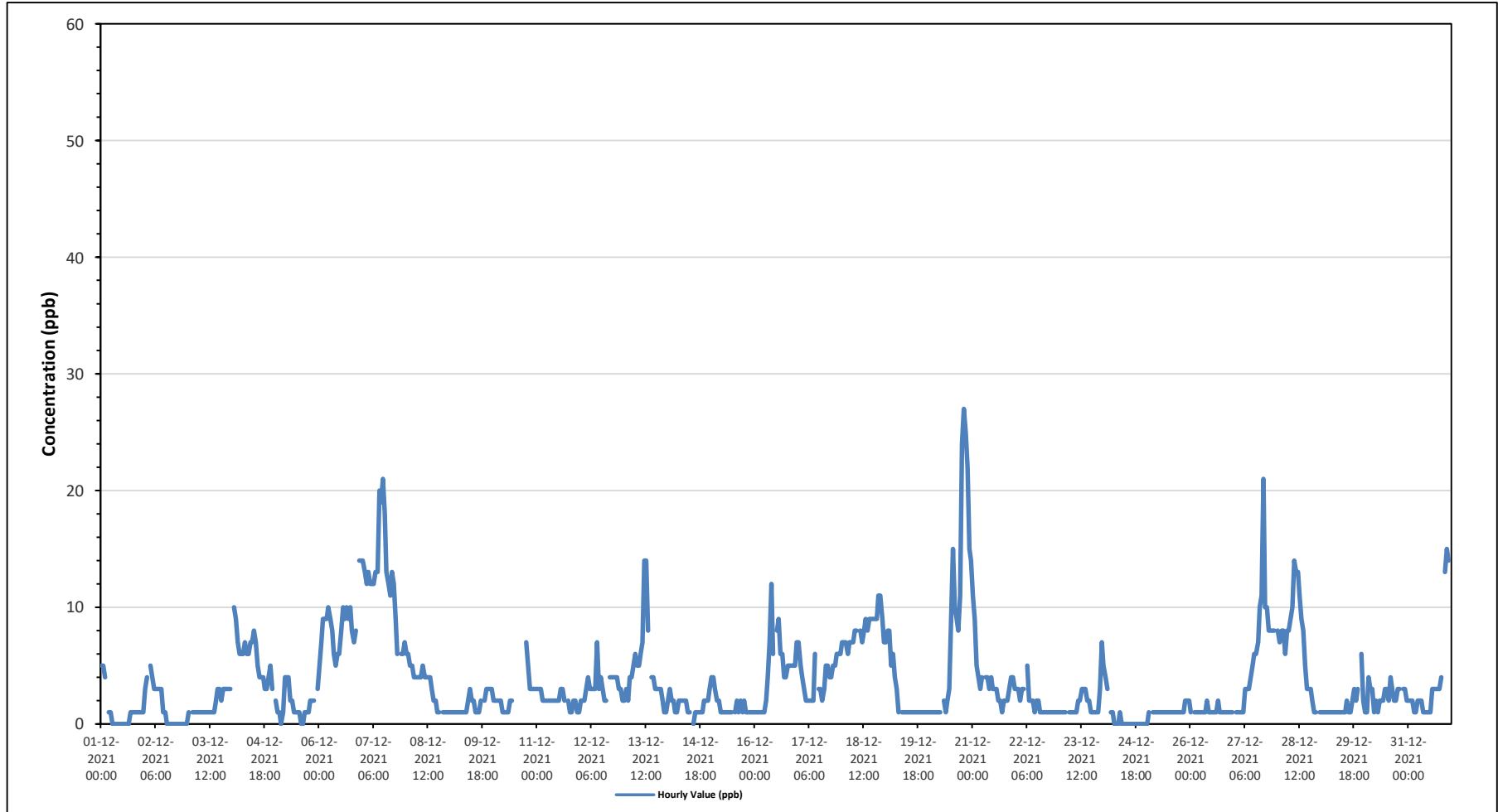
Maximum Hourly Value:	27 ppb on December 20 at hour 19	Hours in Service:	744
Maximum Daily Value:	12.5 ppb on December 7	Hours of Data:	704
Minimum Hourly Value:	0 ppb on December 1 at hour 6	Hours of Missing Data:	1
Minimum Daily Value:	0.7 ppb on December 24	Hours of Calibration:	39
Monthly Average:	3.6 ppb	Operational Uptime:	99.9

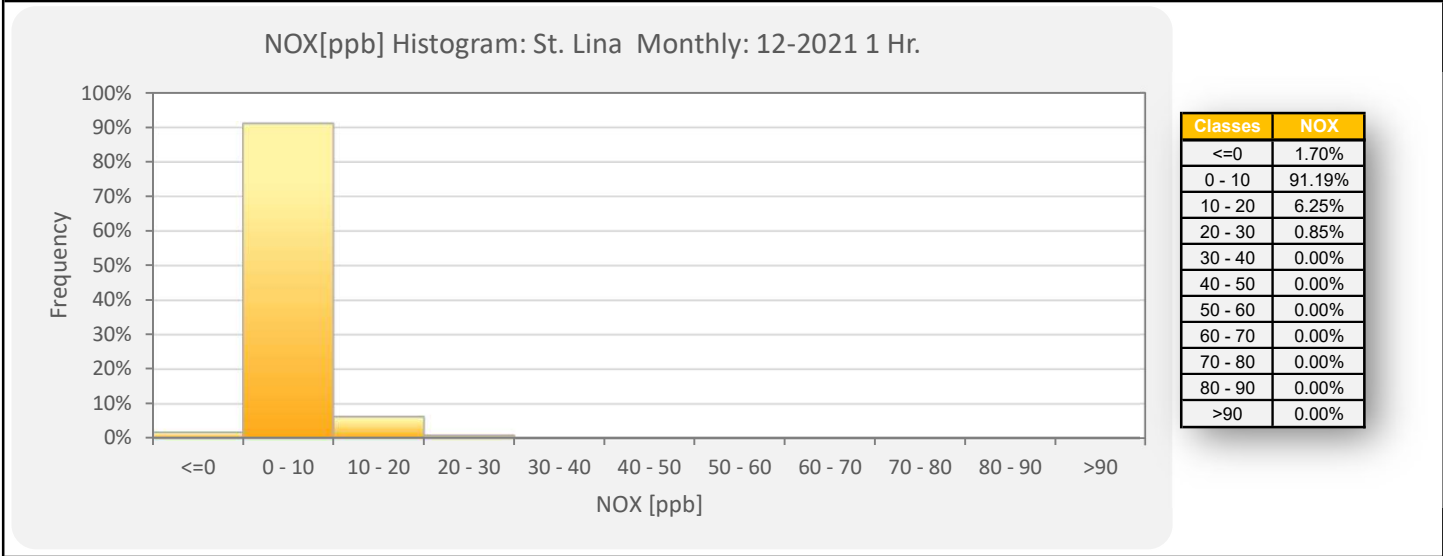
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23	
Dec 1	5	5	4	S	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	5	1.0		
Dec 2	3	4	S	5	4	3	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1.4	
Dec 3	1	S	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	2	3	3	3	3	3	3	1	3	1.7	
Dec 4	S	10	9	7	6	6	6	7	6	6	7	8	7	5	4	4	4	3	3	4	5	3	S	3	10	5.8		
Dec 5	2	1	1	0	1	4	4	4	2	2	1	1	1	0	0	1	1	1	2	2	2	S	3	0	4	1.6		
Dec 6	5	7	9	9	9	10	9	8	6	5	6	6	8	10	9	10	9	10	8	7	8	S	14	14	5	14	8.5	
Dec 7	14	13	12	13	12	12	12	13	13	20	19	21	18	13	12	11	13	12	9	6	S	6	6	7	6	21	12.5	
Dec 8	6	6	5	5	4	4	4	4	4	5	4	4	4	3	2	2	1	1	S	1	1	1	1	1	1	6	3.3	
Dec 9	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	1	2	S	2	3	3	3	3	3	1	3	1.7	
Dec 10	2	2	2	2	2	1	1	1	1	2	2	C	C	C	C	C	C	C	7	5	3	3	3	3	1	7	-	
Dec 11	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	2	S	2	1	1	2	2	1	1	1	3	2.0	
Dec 12	2	2	2	3	4	3	3	3	3	7	3	4	3	2	2	S	4	4	4	4	3	3	2	2	2	7	3.2	
Dec 13	2	3	2	4	4	5	6	5	5	6	7	14	14	8	S	4	4	3	3	3	3	2	1	1	1	14	4.7	
Dec 14	2	3	2	2	1	1	2	2	2	2	2	1	1	S	0	1	1	1	1	1	2	2	2	3	0	3	1.6	
Dec 15	4	4	3	2	2	1	1	1	1	1	1	1	S	1	2	1	2	1	2	1	1	1	1	1	1	4	1.6	
Dec 16	1	1	1	1	1	1	2	4	7	12	6	S	8	9	6	6	4	4	5	5	5	5	5	7	1	12	4.6	
Dec 17	7	5	4	3	2	2	2	2	2	6	S	3	3	2	3	5	5	4	4	5	5	6	6	6	2	7	4.0	
Dec 18	7	7	7	6	7	7	7	8	8	S	8	7	8	9	8	9	9	9	9	9	9	11	11	9	7	6	11	8.1
Dec 19	7	8	8	5	6	4	3	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	2.5	
Dec 20	1	1	1	1	1	1	1	S	2	1	2	3	9	15	10	9	8	11	24	27	25	22	15	14	1	27	8.9	
Dec 21	11	9	5	4	3	4	S	4	4	3	4	3	3	3	2	2	1	2	2	2	3	4	4	3	1	11	3.7	
Dec 22	3	3	2	3	3	S	5	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	5	1.8	
Dec 23	1	1	1	1	S	1	1	1	1	1	2	2	3	3	3	2	2	1	1	1	1	1	3	7	1	7	1.8	
Dec 24	5	4	3	S	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.7	
Dec 25	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	0	2	1.1	
Dec 26	1	S	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1.1	
Dec 27	S	1	1	1	1	1	3	3	3	4	5	6	6	7	10	11	21	10	10	8	8	8	8	S	1	21	6.2	
Dec 28	8	7	8	8	6	8	8	9	10	14	13	13	11	9	8	5	3	3	2	1	1	S	1	1	1	14	6.9	
Dec 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	3	2	3	S	6	2	1	6	1.6	
Dec 30	1	1	4	3	3	1	2	1	2	2	2	3	3	2	4	3	2	2	3	3	S	3	3	2	1	4	2.4	
Dec 31	2	2	2	1	1	2	2	2	1	1	1	1	3	3	3	3	3	3	4	S	13	15	14	P	1	15	3.6	
Diurnal Maximum	14	13	12	13	12	12	12	13	13	20	19	21	18	15	12	11	21	12	24	27	25	22	15	14				
Diurnal Average	3.7	4.0	3.6	3.3	3.1	3.0	3.1	3.2	3.2	3.8	3.5	3.9	4.2	4.1	3.5	3.4	3.7	3.3	3.8	3.7	4.0	4.0	4.1	3.5				

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

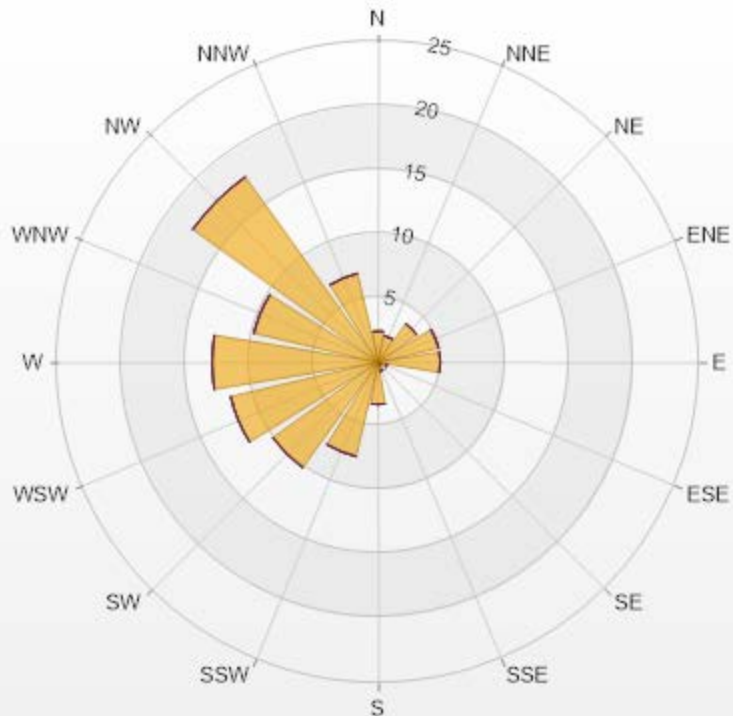
Timeseries Chart of Hourly Average for NOx - St. Lina Site





Wind: St. Lina Poll.: St. Lina-NOX[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.41	0	0	0	0	2.41
NNE	2.13	0	0	0	0	2.13
NE	3.69	0	0	0	0	3.69
ENE	4.83	0	0	0	0	4.83
E	4.83	0	0	0	0	4.83
ESE	0.71	0	0	0	0	0.71
SE	0.28	0	0	0	0	0.28
SSE	0.71	0	0	0	0	0.71
S	3.27	0	0	0	0	3.27
SSW	7.53	0	0	0	0	7.53
SW	10.09	0	0	0	0	10.09
WSW	11.79	0	0	0	0	11.79
W	12.93	0	0	0	0	12.93
WNW	9.94	0	0	0	0	9.94
NW	17.76	0	0	0	0	17.76
NNW	7.1	0	0	0	0	7.1
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100

0-30

0

30-50

0

50-76

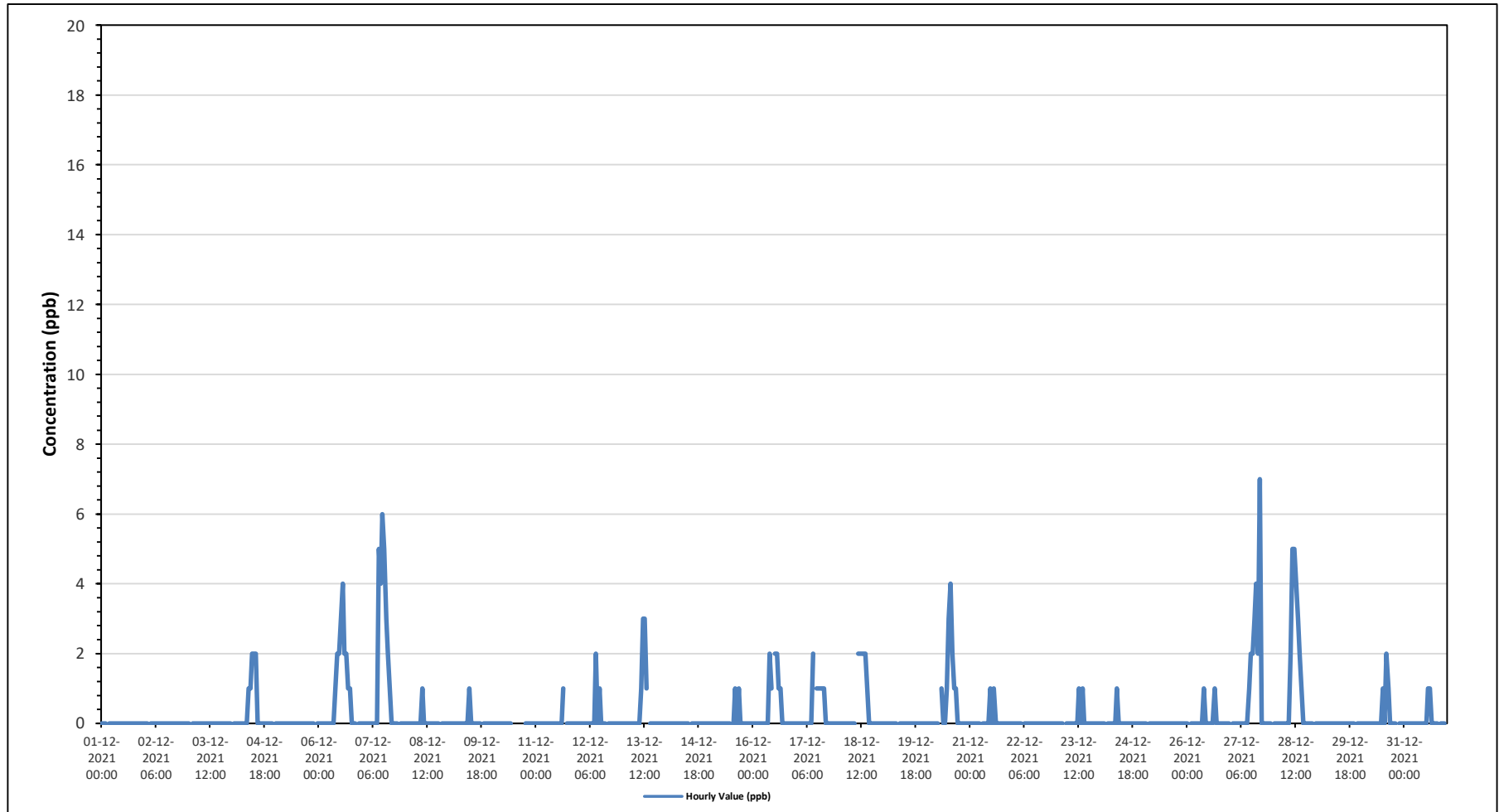
0

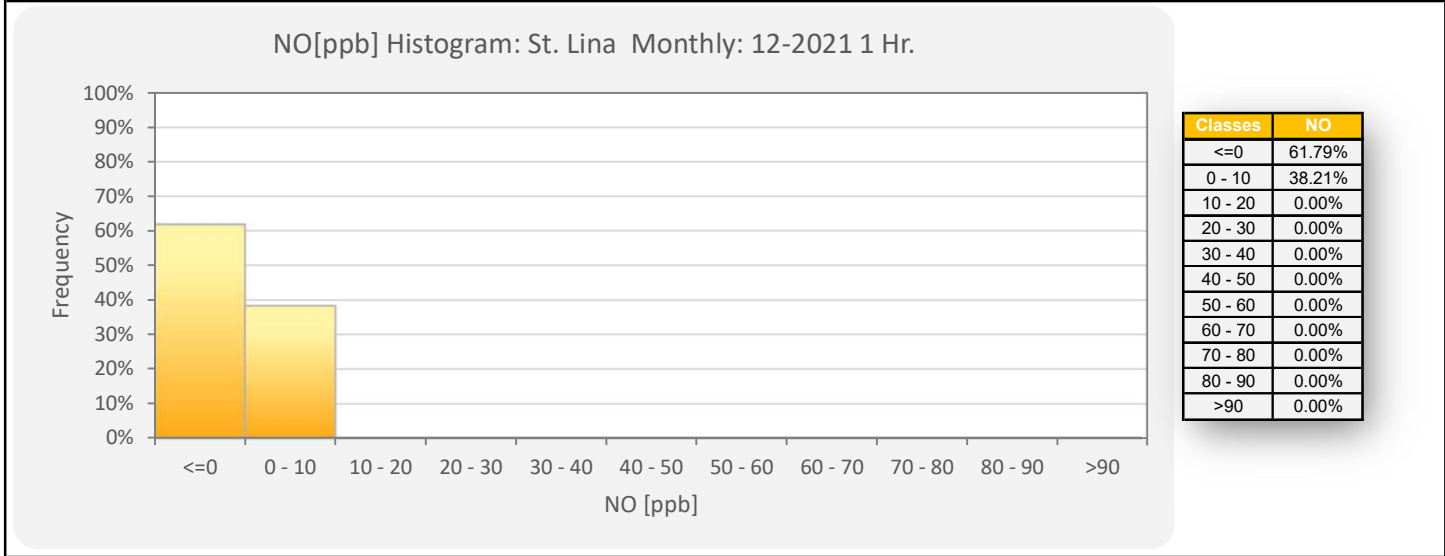
76-159

0

>159.0

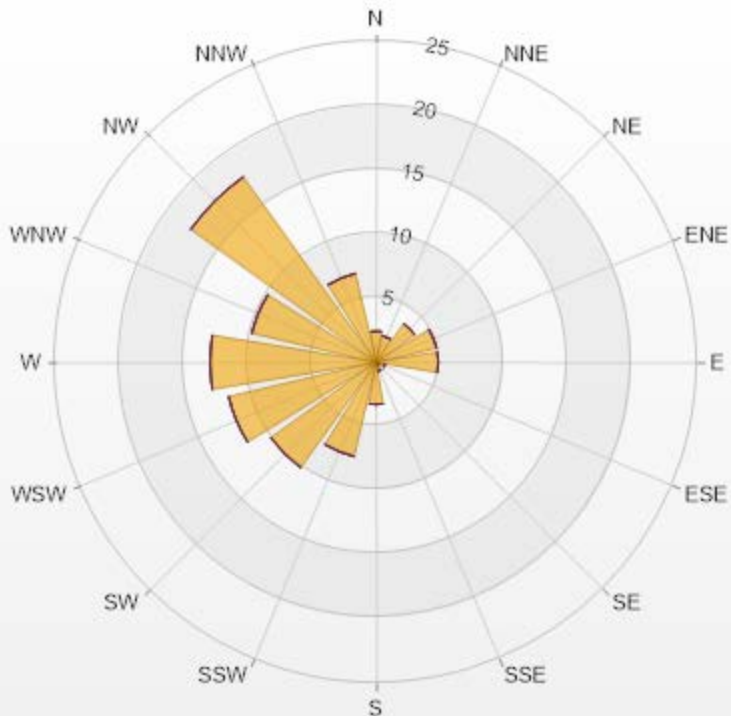
Timeseries Chart of Hourly Average for NO - St. Lina Site





Wind: St. Lina Poll.: St. Lina-NO[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.41	0	0	0	0	2.41
NNE	2.13	0	0	0	0	2.13
NE	3.69	0	0	0	0	3.69
ENE	4.83	0	0	0	0	4.83
E	4.83	0	0	0	0	4.83
ESE	0.71	0	0	0	0	0.71
SE	0.28	0	0	0	0	0.28
SSE	0.71	0	0	0	0	0.71
S	3.27	0	0	0	0	3.27
SSW	7.53	0	0	0	0	7.53
SW	10.09	0	0	0	0	10.09
WSW	11.79	0	0	0	0	11.79
W	12.93	0	0	0	0	12.93
WNW	9.94	0	0	0	0	9.94
NW	17.76	0	0	0	0	17.76
NNW	7.1	0	0	0	0	7.1
Summary	100	0	0	0	0	100



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% Icon Classes (ppb)

100

0-30

0

30-50

0

50-76

0

76-159

0

>159.0



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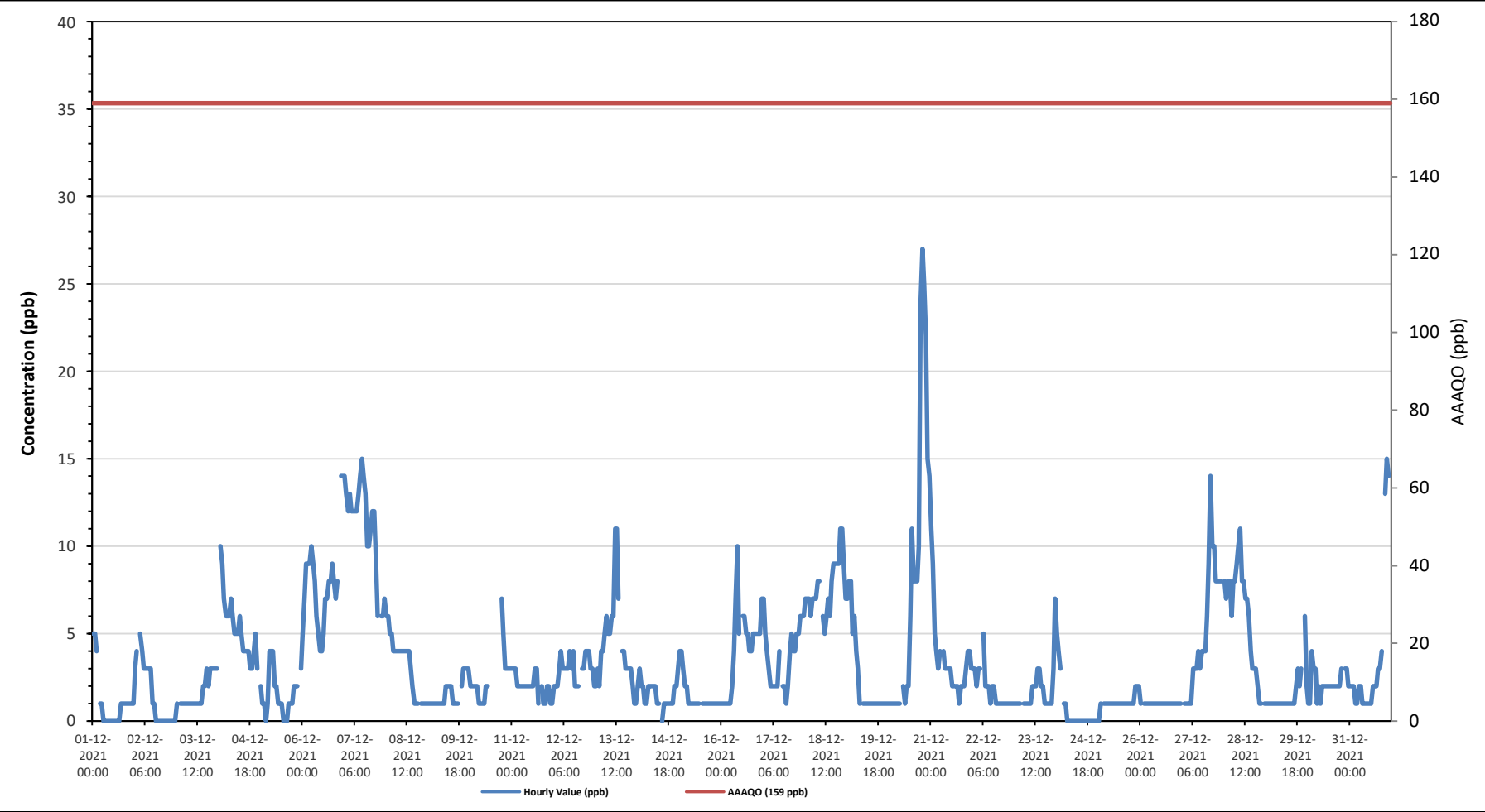
St. Lina Site - December 2021

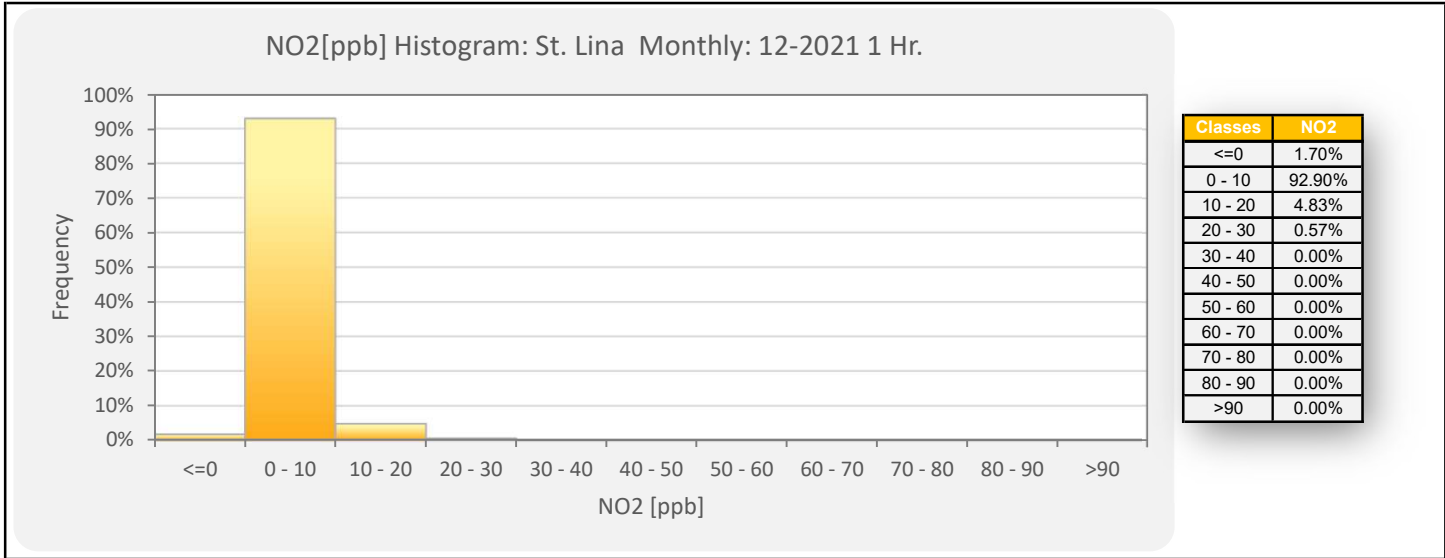
Summary of Hourly Averages

NITROGEN DIOXIDE (NO₂) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 159 ppb																											
Number of 1-Hour Exceedences: 0																											
Maximum Hourly Value: 27 ppb on December 20 at hour 19												Hours in Service: 744															
Maximum Daily Value: 11.2 ppb on December 7												Hours of Data: 704															
Minimum Hourly Value: 0 ppb on December 1 at hour 6												Hours of Missing Data: 1															
Minimum Daily Value: 0.6 ppb on December 24												Hours of Calibration: 39															
Monthly Average: 3.4 ppb												Operational Uptime: 99.9															
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
Dec 1	5	5	4	S	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	5	1.0	
Dec 2	3	4	S	5	4	3	3	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1.4
Dec 3	1	S	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	3	3	3	3	1.7
Dec 4	S	10	9	7	6	6	6	7	6	5	5	5	6	5	4	4	4	3	3	4	5	3	S	3	10	5.3	
Dec 5	2	1	1	0	1	4	4	4	2	2	1	1	1	0	0	1	1	1	2	2	2	S	S	3	0	4	1.6
Dec 6	5	7	9	9	9	10	9	8	6	5	4	4	5	7	8	8	9	8	7	8	S	14	14	4	14	7.8	
Dec 7	14	13	12	13	12	12	12	12	13	14	15	14	13	10	10	11	12	12	9	6	S	6	6	7	6	15	11.2
Dec 8	6	6	5	5	4	4	4	4	4	4	4	4	4	3	2	1	1	1	S	1	1	1	1	1	1	6	3.2
Dec 9	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	S	2	3	3	3	3	1	3	1.6
Dec 10	2	2	2	2	2	1	1	1	1	2	2	C	C	C	C	C	C	C	7	5	3	3	3	3	1	7	-
Dec 11	3	3	3	2	2	2	2	2	2	2	2	2	3	3	1	S	2	1	1	2	2	1	1	1	1	3	2.0
Dec 12	2	2	2	3	4	3	3	3	3	4	3	4	2	2	2	S	3	3	4	4	4	3	3	2	2	4	3.0
Dec 13	2	3	2	4	4	5	6	5	5	6	6	11	11	7	S	4	4	3	3	3	3	2	1	1	1	11	4.4
Dec 14	2	3	2	2	1	1	2	2	2	2	2	1	1	S	0	1	1	1	1	1	1	2	2	3	0	3	1.6
Dec 15	4	4	3	2	2	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	4	1.4
Dec 16	1	1	1	1	1	1	2	4	7	10	5	S	6	6	5	5	4	4	5	5	5	5	5	7	1	10	4.2
Dec 17	7	5	4	3	2	2	2	2	2	4	S	2	2	1	2	4	5	4	4	5	5	6	6	6	1	7	3.7
Dec 18	7	7	7	6	7	7	7	8	8	S	6	5	6	7	6	8	9	9	9	9	11	11	9	7	5	11	7.7
Dec 19	7	8	8	5	6	4	3	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	2.5
Dec 20	1	1	1	1	1	1	1	S	2	1	2	2	6	11	8	8	8	10	24	27	25	22	15	14	1	27	8.3
Dec 21	11	9	5	4	3	4	S	4	3	3	3	2	2	2	2	1	2	2	2	3	4	4	3	1	11	3.5	
Dec 22	3	3	2	3	3	S	5	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	5	1.8
Dec 23	1	1	1	1	S	1	1	1	1	1	2	2	2	3	3	2	2	1	1	1	1	1	3	7	1	7	1.7
Dec 24	5	4	3	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.6
Dec 25	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	0	2	1.1
Dec 26	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0
Dec 27	S	1	1	1	1	1	3	3	3	4	3	4	4	4	6	9	14	10	10	8	8	8	8	S	1	14	5.2
Dec 28	8	7	8	8	6	8	8	9	10	11	8	8	7	7	6	4	3	3	3	2	1	1	S	1	1	11	6.0
Dec 29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	3	S	6	2	1	6	1.5	
Dec 30	1	1	4	3	3	1	2	1	2	2	2	2	2	2	2	2	2	2	2	3	S	3	3	2	1	4	2.1
Dec 31	2	2	2	1	1	2	2	1	1	1	1	1	2	2	2	3	3	4	S	13	15	14	P	1	15	3.5	
Diurnal Maximum	14	13	12	13	12	12	12	12	13	14	15	14	13	11	10	11	14	12	24	27	25	22	15	14			
Diurnal Average	3.7	4.0	3.6	3.3	3.1	3.0	3.1	3.1	3.1	3.2	2.9	3.0	3.2	3.2	2.7	3.0	3.3	3.2	3.8	3.7	4.0	4.0	4.1	3.5			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance				
K	Collection Error										N	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.																											

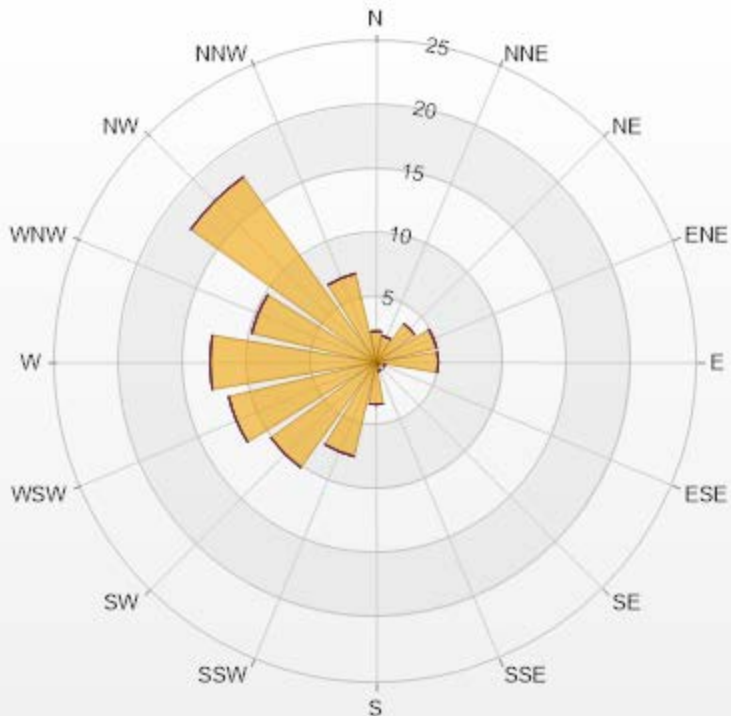
Timeseries Chart of Hourly Average for NO2 - St. Lina Site





Wind: St. Lina Poll.: St. Lina-NO2[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.62% Calm Avg: 0.00 [ppb]


Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	2.41	0	0	0	0	2.41
NNE	2.13	0	0	0	0	2.13
NE	3.69	0	0	0	0	3.69
ENE	4.83	0	0	0	0	4.83
E	4.83	0	0	0	0	4.83
ESE	0.71	0	0	0	0	0.71
SE	0.28	0	0	0	0	0.28
SSE	0.71	0	0	0	0	0.71
S	3.27	0	0	0	0	3.27
SSW	7.53	0	0	0	0	7.53
SW	10.09	0	0	0	0	10.09
WSW	11.79	0	0	0	0	11.79
W	12.93	0	0	0	0	12.93
WNW	9.94	0	0	0	0	9.94
NW	17.76	0	0	0	0	17.76
NNW	7.1	0	0	0	0	7.1
Summary	100	0	0	0	0	100



LICA-202112

% Icon Classes (ppb)

100  0-30

0  30-50

0  50-76

0  76-159

0  >159.0



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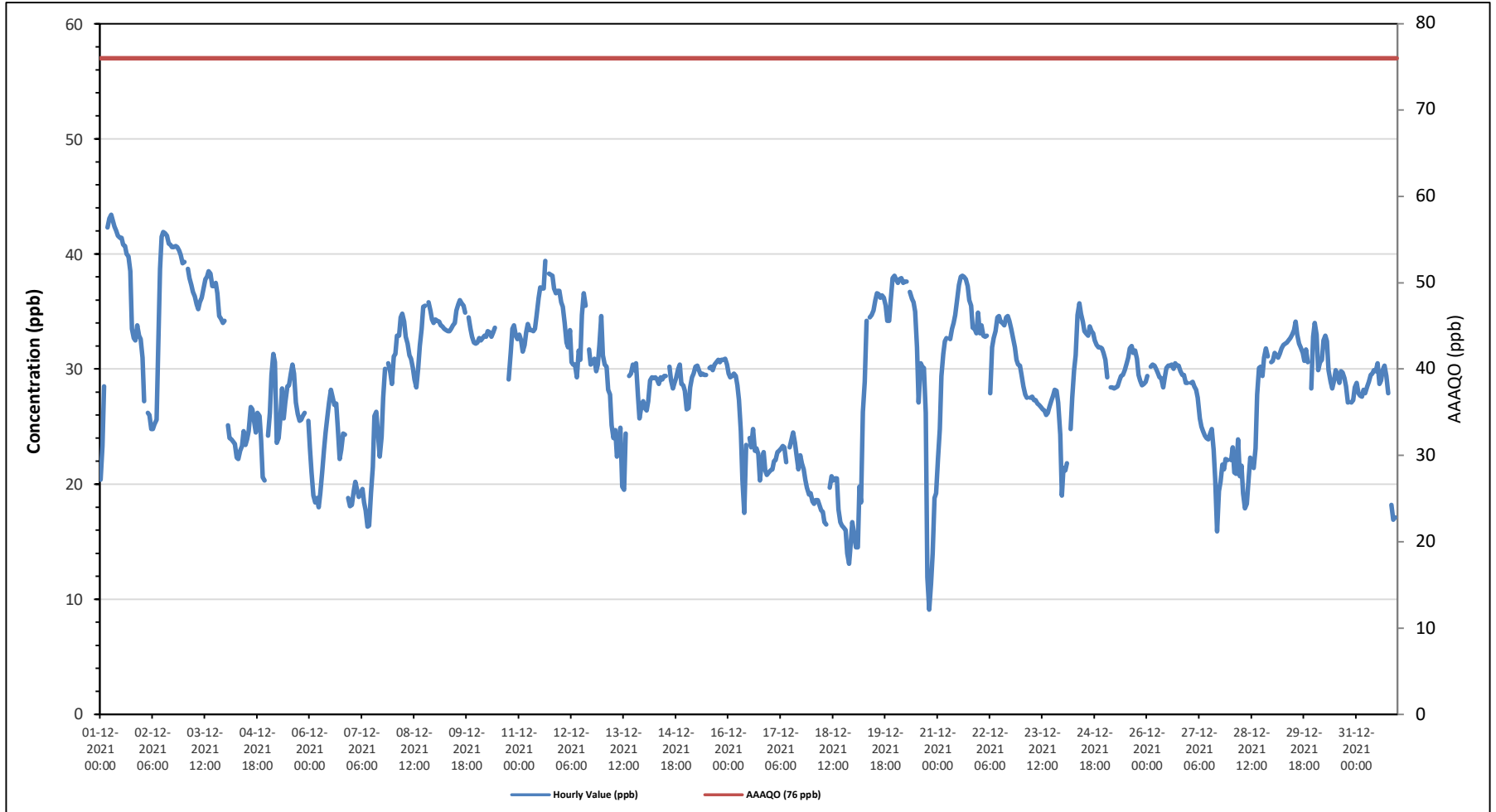
St. Lina Site - December 2021

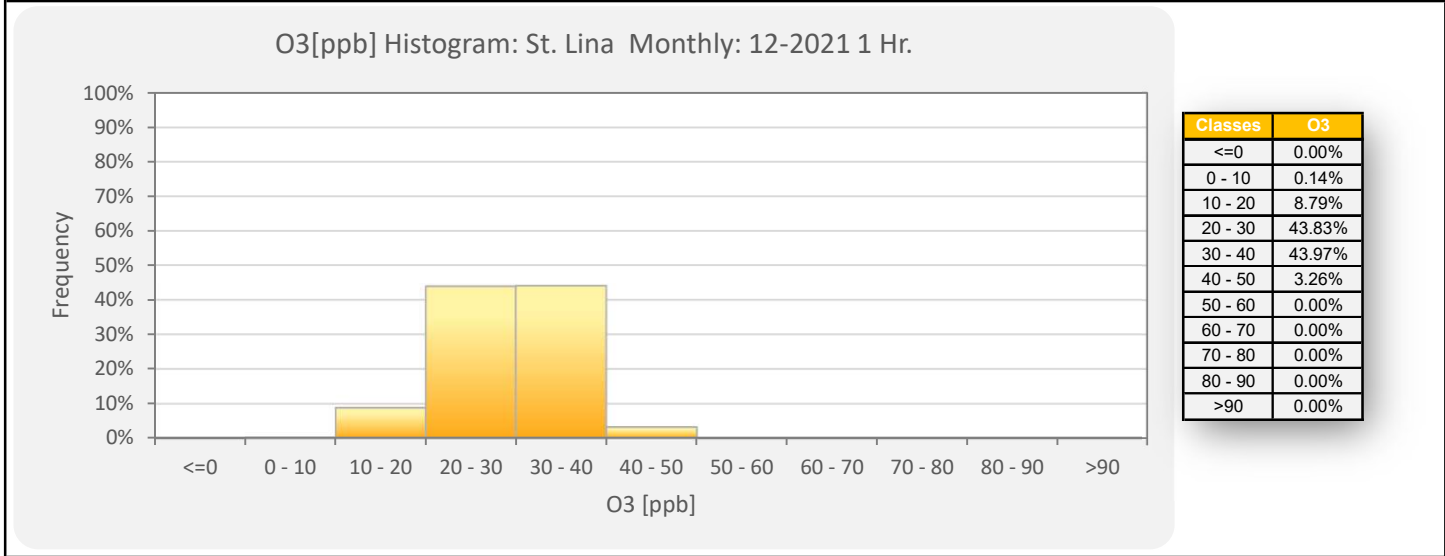
Summary of Hourly Averages

OZONE (O₃) in ppb

Alberta Ambient Air Quality Objectives (AAAQO): 1-Hour 76 ppb																																																																													
Number of 1-Hour Exceedences: 0																																																																													
Maximum Hourly Value: 43.4 ppb on December 1 at hour 6												Hours in Service: 744																																																																	
Maximum Daily Value: 37.0 ppb on December 1												Hours of Data: 705																																																																	
Minimum Hourly Value: 9.1 ppb on December 20 at hour 19												Hours of Missing Data: 1																																																																	
Minimum Daily Value: 17.6 ppb on December 18												Hours of Calibration: 38																																																																	
Monthly Average: 29.1 ppb												Operational Uptime: 99.9																																																																	
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																																																					
Dec 1	20.4	23.3	28.5	S	42.3	43.1	43.4	42.9	42.4	42	41.6	41.4	41.4	40.8	40.7	40	39.8	38.5	33.5	32.7	32.5	33.8	32.9	32.6	20.4	43.4	37.0																																																		
Dec 2	31	27.2	S	26.2	26	24.8	24.8	25.2	25.6	31.7	38.7	41.5	41.9	41.8	41.6	40.9	40.8	40.6	40.7	40.6	40.3	39.9	39.2	24.8	41.9	35.3																																																			
Dec 3	39.3	S	38.7	37.9	37.3	36.7	36.3	35.6	35.2	35.8	36.2	37	37.8	38	38.5	38.3	37.2	37.2	37.5	36.6	34.6	34.4	34	34.2	34.0	39.3	36.7																																																		
Dec 4	S	25.1	24	23.9	23.7	23.5	22.3	22.2	22.9	23.3	24.6	23.4	23.9	24.6	26.7	26.5	25.4	24.5	26.2	25.9	23.8	20.6	20.3	S	20.3	26.7	24.0																																																		
Dec 5	24.2	26.2	29.5	31.3	30.6	23.6	24	25.6	28.3	25.7	27.1	28.5	28.6	29.6	30.4	29.6	27.1	26.1	25.5	25.6	25.9	26.2	S	25.5	23.6	31.3	27.2																																																		
Dec 6	23.1	21	19	18.4	18.8	18	19.2	21	23	24.5	25.9	27.1	28.2	27.6	26.9	27	24.9	22.2	23	24.4	24.3	S	18.8	18.1	18.0	28.2	22.8																																																		
Dec 7	18.2	19.4	20.2	19.6	18.9	19.1	19.6	18.4	17.7	16.3	16.4	19.2	21.5	25.9	26.3	24.5	22.4	24.1	27.5	30	S	30.5	29.7	28.7	16.3	30.5	22.4																																																		
Dec 8	31.1	31.3	32.9	32.9	34.5	34.8	34.1	32.8	32.2	31.2	30.9	30.1	29.1	28.4	30.1	32	33.5	35.4	35.5	S	35.8	35.1	34.3	34	28.4	35.8	32.7																																																		
Dec 9	34.3	34.2	34.1	33.8	33.7	33.5	33.4	33.3	33.3	33.5	33.8	34	35.1	35.6	36	35.7	35.5	34.9	S	34.5	33.5	32.8	32.3	32.2	32.2	36.0	34.0																																																		
Dec 10	32.3	32.7	32.5	32.7	32.9	32.8	33.3	33.2	32.8	33.2	33.6	C	C	C	C	C	27.8	S	29.1	31.5	33.5	33.8	32.9	32.6	27.8	33.8	32.4																																																		
Dec 11	33	32.5	31.5	32.1	33.2	33.9	33.4	33.4	33.3	33.5	34.6	36.2	37.1	37	37	39.4	S	38.3	38.2	38.1	37	36.6	36.8	36.8	31.5	39.4	35.3																																																		
Dec 12	35.8	35.4	34	32.3	31.9	33.4	30.6	30.4	30.4	29.3	31.6	30.8	34.7	36.6	35.5	S	31.7	30.4	30.6	30.9	29.8	30.4	32.1	34.6	29.3	36.6	32.3																																																		
Dec 13	31.2	30.4	30.2	28.2	27.8	25.1	24	24.7	22.4	23.1	24.9	19.8	19.5	24.4	S	29.4	29.6	30.4	29.9	30.5	27.8	25.7	26.9	27.2	19.5	31.2	26.7																																																		
Dec 14	26.6	26.4	27.2	29	29.3	29.2	29.3	29.1	28.7	29.3	29.1	29.4	29.4	S	30.2	29	28.3	28.8	29.2	30	30.4	28.7	28.6	28.1	26.4	30.4	28.8																																																		
Dec 15	26.5	26.6	28.4	29.3	29.6	30.2	30.3	29.9	29.5	29.6	29.5	29.5	S	30.1	30.2	29.9	30.4	30.6	30.8	30.6	30.8	30.8	30.9	30.4	26.5	30.9	29.8																																																		
Dec 16	29.6	29.3	29.4	29.6	29.4	28.6	27.3	24.6	20.4	17.5	23.4	S	24	23.2	24.8	22.9	23.1	22.6	20.3	22	22.8	21.2	20.8	21	17.5	29.6	24.3																																																		
Dec 17	21.2	21.3	22	22.1	22.8	22.9	23.1	23.3	23.2	21.9	S	23.2	23.9	24.5	23.6	22.5	21.3	22.5	21.8	21.3	20.4	19.7	19.1	19.2	19.1	24.5	22.0																																																		
Dec 18	18.5	18.3	18.6	18.6	18.2	17.7	17.6	16.7	16.5	S	19.7	20.7	20.3	20.5	20.5	17.8	16.7	16.4	16.2	16	14	13.1	14.8	16.7	13.1	20.7	17.6																																																		
Dec 19	15.7	14.5	14.5	19.8	18.4	26.3	28.9	34.2	S	34.5	34.7	35.1	36	36.6	36.5	36.2	36.4	36.2	35.5	34.2	34.2	36	37.9	38.1	14.5	38.1	30.9																																																		
Dec 20	37.8	37.5	37.8	37.9	37.5	37.6	37.6	S	36.7	36.1	35.8	35	31.9	27.1	30.5	30.2	30.1	26.2	11.9	9.1	11.4	14	18.8	19.2	9.1	37.9	29.0																																																		
Dec 21	22.2	24.8	29.4	31.3	32.4	32.7	S	32.6	33.5	34	34.7	36	37.3	38	38.1	38	37.8	37.2	36	35.5	33.6	33.5	33.1	34.9	22.2	38.1	33.8																																																		
Dec 22	33.1	33.8	32.9	32.8	32.9	S	27.9	31.9	32.7	33.3	34.5	34.6	34.1	34	33.8	34.5	34.6	34.2	33.5	32.7	31.9	30.8	30.4	30.3	27.9	34.6	32.8																																																		
Dec 23	29.5	28.5	27.8	27.5	S	27.5	27.6	27.3	27.3	27	26.9	26.7	26.5	26.4	26	26.2	26.7	27.3	27.7	28.2	28.1	27.1	24.3	19	19.0	29.5	26.8																																																		
Dec 24	21.4	21.2	21.8	S	24.8	27.5	29.9	31.2	34.7	35.7	34.8	34.1	33.3	33.1	32.9	33.7	33.3	33.1	32.5	32.1	31.9	31.9	31.8	31.4	21.2	35.7	30.8																																																		
Dec 25	30.8	29.3	S	28.4	28.4	28.3	28.4	28.5	29	29.4	29.5	29.9	30.4	31	31.8	32	31.4	31.6	30.9	29.5	29	28.6	28.7	28.9	28.3	32.0	29.7																																																		
Dec 26	29.4	S	30.2	30.4	30.3	30	29.7	29.3	29.2	28.4	29.3	30.1	30.3	30.3	30.4	30	30.5	30.3	30.3	29.8	29.5	29.5	28.8	28.8	28.4	30.5	29.8																																																		
Dec 27	S	28.8	28.9	28.5	28.2	27.5	25.7	25	24.6	24.2	24	23.9	24.4	24.8	23	20.4	15.9	19.4	20.2	21.7	21.3	22.2	22.1	S	15.9	28.9	23.9																																																		
Dec 28	22.1	23.2	21	20.9	23.9	20.7	21.6	19.2	17.9	18.3	20.5	22.3	21.7	21.4	23.1	27.8	30.1	30.2	29.4	31	31.8	31.1	S	30.6	17.9	31.8	24.3																																																		
Dec 29	30.7	31.4	31.2	31	31.3	31.8	32.1	32.2	32.3	32.5	32.7	33	33.4	34.1	33	32.2	31.9	31.4	30.7	31.7	30.6	S	28.3	32.8	28.3	34.1	31.8																																																		
Dec 30	34	33	29.9	30.6	30.8	32.5	32.9	32.4	29.9	28.9	28.3	29	29.9	29.5	28.8	29.8	29.7	29.2	28.5	27.1	S	27.1	27.3	28.4	27.1	34.0	29.9																																																		
Dec 31	28.8	27.9	27.7	27.6	28.2	27.9	28.5	28.9	29.5	29.6	29.9	29.8	30.5	28.7	29	29.9	30.3	29.4	27.9	S	18.2	16.9	17.1	P	16.9	30.5	27.4																																																		
Diurnal Maximum	39	38	39	38	42	43	43	43	42	42	42	42	42	42	42	41	41	41	41	41	41	40	40	39																																																					
Diurnal Average	28.0	27.4	28.1	28.4	28.9	28.7	28.6	28.5	28.5	29.1	29.9	30.0	30.2	30.5	30.9	30.6	29.8	30.0	29.0	29.1	28.6	28.4	28.1	29.1																																																					
C	Monthly Calibration											S											Daily Zero-Span Check											Q											Quality Assurance																																
K	Collection Error											N											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.																																																																													

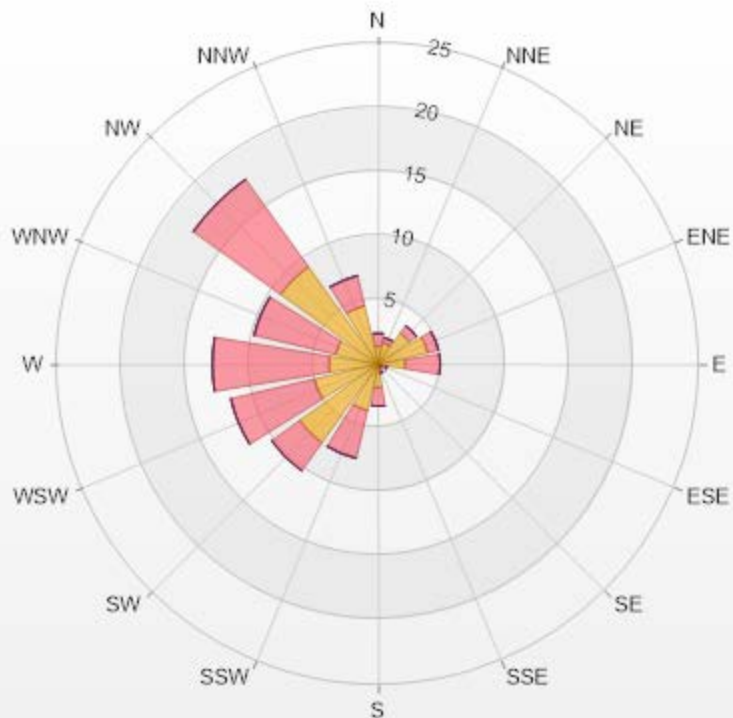
Timeseries Chart of Hourly Average for O3 - St. Lina Site





Wind: St. Lina Poll.: St. Lina-O3[ppb] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0-30	30-50	50-76	76-159	>159.0	Total
N	1.42	0.99	0	0	0	2.41
NNE	1.7	0.43	0	0	0	2.13
NE	2.98	0.71	0	0	0	3.69
ENE	3.97	0.85	0	0	0	4.82
E	2.13	2.7	0	0	0	4.83
ESE	0.43	0.28	0	0	0	0.71
SE	0.28	0	0	0	0	0.28
SSE	0.43	0.28	0	0	0	0.71
S	1.84	1.42	0	0	0	3.26
SSW	3.69	3.83	0	0	0	7.52
SW	7.52	2.7	0	0	0	10.22
WSW	5.11	6.67	0	0	0	11.78
W	3.83	9.08	0	0	0	12.91
WNW	3.4	6.52	0	0	0	9.92
NW	9.36	8.37	0	0	0	17.73
NNW	4.68	2.41	0	0	0	7.09
Summary	52.77	47.24	0	0	0	100



LICA-202112

% Icon Classes (ppb)	53	0-30	47	30-50	0	50-76	0	76-159	0	>159.0
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LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

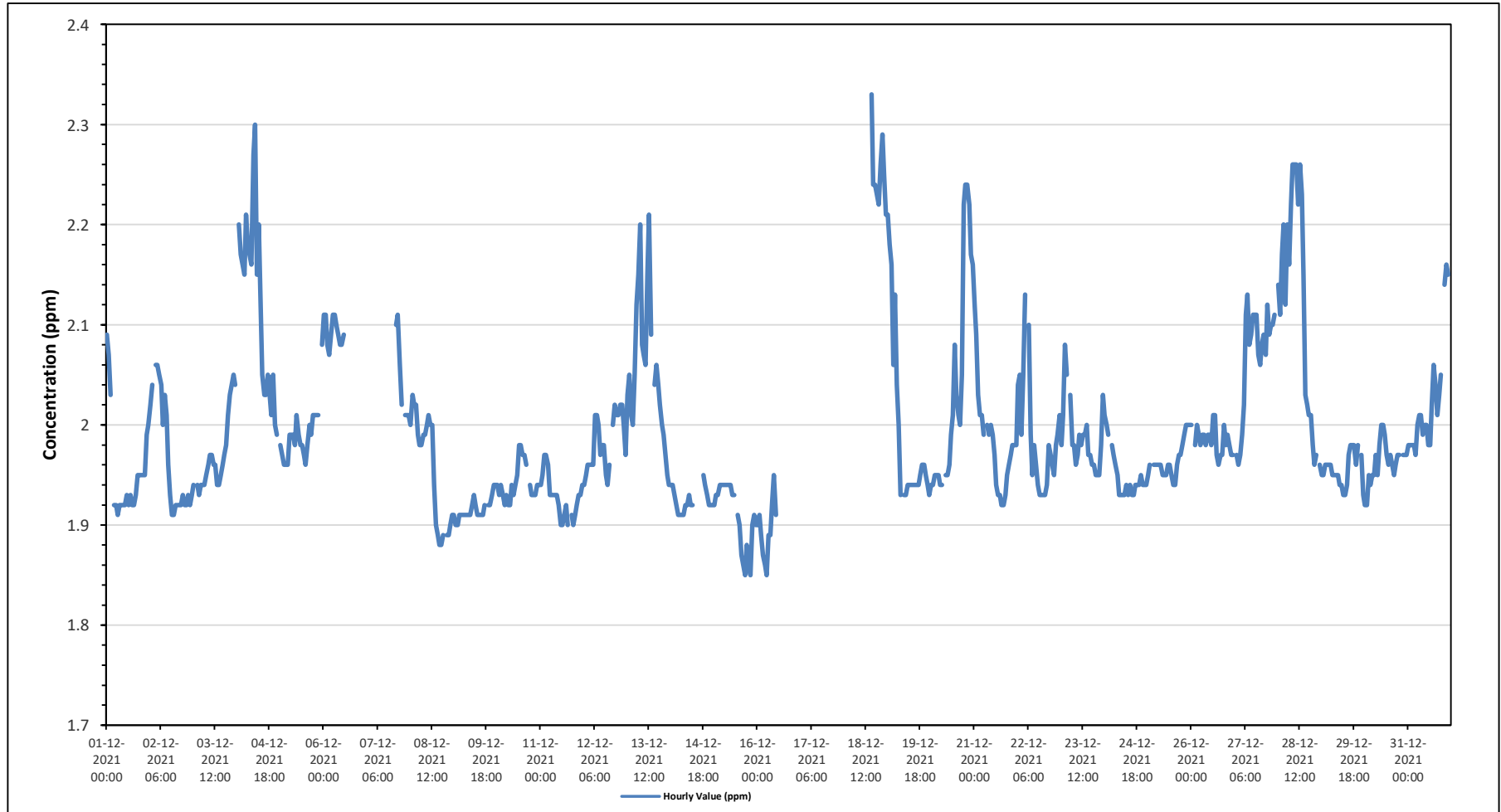
Summary of Hourly Averages

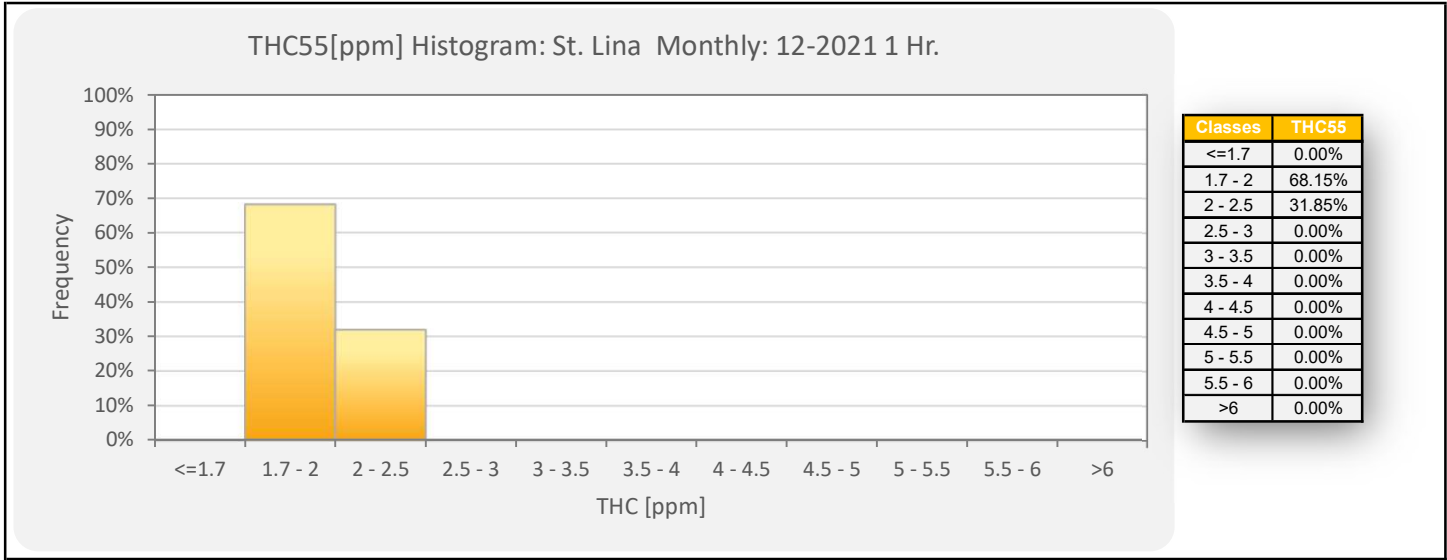
TOTAL HYDROCARBONS (THC) in ppm

Maximum Hourly Value:	2.33 ppm on December 18 at hour 15	Hours in Service:	744
Maximum Daily Value:	2.13 ppm on December 28	Hours of Data:	631
Minimum Hourly Value:	1.85 ppm on December 15 at hour 17	Hours of Missing Data:	77
Minimum Daily Value:	1.91 ppm on December 15	Hours of Calibration:	36
Monthly Average:	1.99 ppm	Operational Uptime:	89.7

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																												
Dec 1	2.09	2.07	2.03	S	1.92	1.92	1.91	1.92	1.92	1.92	1.92	1.93	1.92	1.93	1.92	1.92	1.93	1.95	1.95	1.95	1.95	1.99	2.00	1.91	2.09	1.95																													
Dec 2	2.02	2.04	S	2.06	2.06	2.05	2.04	2.00	2.03	2.01	1.96	1.93	1.91	1.91	1.92	1.92	1.92	1.92	1.93	1.92	1.92	1.93	1.92	1.93	1.91	2.06	1.97																												
Dec 3	1.94	S	1.94	1.93	1.94	1.94	1.94	1.95	1.96	1.97	1.97	1.96	1.96	1.94	1.94	1.95	1.96	1.97	1.98	2.01	2.03	2.04	2.05	2.04	1.93	2.05	1.97																												
Dec 4	S	2.20	2.17	2.16	2.15	2.21	2.18	2.17	2.16	2.27	2.30	2.15	2.20	2.13	2.05	2.03	2.03	2.05	2.03	2.01	2.05	2.00	1.99	S	1.99	2.30	2.12																												
Dec 5	1.98	1.97	1.96	1.96	1.96	1.99	1.99	1.99	1.98	2.01	1.99	1.98	1.98	1.97	1.96	1.98	2.00	1.99	2.01	2.01	2.01	2.01	S	2.08	1.96	2.08	1.99																												
Dec 6	2.11	2.11	2.08	2.07	2.09	2.11	2.11	2.10	2.09	2.08	2.08	2.09	C	C	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	2.07	2.11	-																												
Dec 7	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	C	C	C	C	C	2.10	2.11	2.06	2.02	S	2.01	2.01	2.01	2.01	2.11	-																												
Dec 8	2.00	2.03	2.02	2.02	1.99	1.98	1.98	1.99	1.99	2.00	2.01	2.00	2.00	1.94	1.90	1.89	1.88	1.88	1.89	S	1.89	1.89	1.90	1.91	1.88	2.03	1.96																												
Dec 9	1.91	1.90	1.90	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.93	1.92	1.91	1.91	1.91	1.91	1.92	S	1.92	1.92	1.93	1.94	1.94	1.90	1.94	1.92																												
Dec 10	1.94	1.93	1.94	1.93	1.92	1.93	1.92	1.92	1.94	1.93	1.94	1.95	1.98	1.98	1.97	1.97	1.96	S	1.94	1.93	1.93	1.93	1.94	1.94	1.92	1.98	1.94																												
Dec 11	1.94	1.95	1.97	1.97	1.96	1.93	1.93	1.93	1.93	1.93	1.92	1.90	1.90	1.91	1.92	1.90	S	1.91	1.90	1.91	1.92	1.93	1.93	1.94	1.90	1.97	1.93																												
Dec 12	1.94	1.95	1.96	1.96	1.96	1.96	2.01	2.01	2.00	1.97	1.98	1.98	1.95	1.94	1.96	S	2.00	2.02	2.01	2.01	2.02	2.02	2.00	1.97	1.94	2.02	1.98																												
Dec 13	2.03	2.05	2.01	2.00	2.05	2.12	2.15	2.20	2.08	2.07	2.06	2.15	2.21	2.09	S	2.04	2.06	2.04	2.02	2.00	1.99	1.97	1.95	1.94	1.94	2.21	2.06																												
Dec 14	1.94	1.94	1.93	1.92	1.91	1.91	1.91	1.91	1.92	1.92	1.93	1.92	1.92	NRM	NRM	NRM	NRM	NRM	1.95	1.94	1.93	1.92	1.92	1.92	1.91	1.95	1.92																												
Dec 15	1.92	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.93	S	1.91	1.90	1.87	1.86	1.85	1.88	1.86	1.85	1.90	1.91	1.90	1.85	1.94	1.91																												
Dec 16	1.90	1.91	1.89	1.87	1.86	1.85	1.89	1.89	1.92	1.95	1.91	S	1.86	X	X	X	X	X	X	X	X	X	X	X	1.85	1.95	-																												
Dec 17	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																												
Dec 18	X	X	X	X	X	X	X	X	X	X	X	NRM	NRM	NRM	2.33	2.24	2.24	2.23	2.22	2.22	2.26	2.29	2.25	2.21	2.21	2.33	-																												
Dec 19	2.21	2.18	2.16	2.06	2.13	2.04	2.00	1.93	S	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.96	1.96	1.95	1.94	1.93	1.93	2.21	2.21	1.99																												
Dec 20	1.94	1.94	1.95	1.95	1.95	1.94	1.94	S	1.95	1.95	1.96	1.99	2.01	2.08	2.03	2.01	2.00	2.05	2.22	2.24	2.24	2.22	2.17	2.16	1.94	2.24	2.04																												
Dec 21	2.12	2.09	2.03	2.01	2.01	1.99	S	2.00	1.99	2.00	1.99	1.97	1.94	1.93	1.93	1.92	1.92	1.93	1.95	1.96	1.97	1.98	1.98	1.98	1.92	2.12	1.98																												
Dec 22	2.04	2.05	1.99	2.05	2.13	S	2.10	1.99	1.95	1.98	1.96	1.94	1.93	1.93	1.93	1.93	1.94	1.98	1.97	1.96	1.95	1.98	1.99	2.01	1.93	2.13	1.99																												
Dec 23	1.98	2.01	2.08	2.05	S	2.03	1.98	1.98	1.96	1.97	1.99	1.98	1.99	1.99	2.00	1.97	1.97	1.96	1.96	1.95	1.95	1.95	1.98	2.03	1.95	2.08	1.99																												
Dec 24	2.01	2.00	1.99	S	1.98	1.97	1.96	1.95	1.93	1.93	1.93	1.93	1.94	1.93	1.94	1.93	1.94	1.94	1.94	1.95	1.94	1.94	1.94	1.93	2.01	1.95	1.95																												
Dec 25	1.95	1.96	S	1.96	1.96	1.96	1.96	1.96	1.95	1.95	1.95	1.96	1.96	1.95	1.94	1.94	1.96	1.97	1.97	1.98	1.99	2.00	2.00	2.00	1.94	2.00	1.96																												
Dec 26	2.00	S	1.98	2.00	1.99	1.98	1.99	1.99	1.98	1.99	1.99	1.98	2.01	2.01	1.97	1.96	1.97	1.97	2.00	1.98	1.99	1.98	1.97	1.97	1.96	2.01	1.98																												
Dec 27	S	1.97	1.96	1.97	1.99	2.02	2.11	2.13	2.08	2.09	2.11	2.11	2.11	2.07	2.06	2.08	2.09	2.07	2.12	2.09	2.10	2.10	2.11	S	1.96	2.13	2.07																												
Dec 28	2.14	2.11	2.17	2.20	2.12	2.20	2.16	2.22	2.26	2.26	2.22	2.26	2.22	2.23	2.15	2.03	2.02	2.01	2.01	1.98	1.96	1.97	S	1.96	1.96	2.26	2.13																												
Dec 29	1.95	1.95	1.96	1.96	1.96	1.96	1.95	1.95	1.95	1.95	1.94	1.94	1.93	1.93	1.94	1.97	1.98	1.98	1.98	1.96	1.98	S	1.97	1.93	1.93	1.98	1.96																												
Dec 30	1.92	1.92	1.95	1.94	1.95	1.95	1.97	1.95	1.98	2.00	2.00	1.99	1.97	1.96	1.97	1.96	1.95	1.96	1.97	1.97	S	1.97	1.97	1.97	1.92	2.00	1.96																												
Dec 31	1.98	1.98	1.98	1.98	1.97	2.00	2.01	2.01	1.99	2.00	2.00	1.98	1.98	2.02	2.06	2.04	2.01	2.03	2.05	S	2.14	2.16	2.15	P	1.97	2.16	2.02																												
Diurnal Maximum	2.21	2.20	2.17	2.20	2.15	2.21	2.18	2.22	2.26	2.27	2.30	2.22	2.26	2.23	2.15	2.33	2.24	2.24	2.23	2.24	2.26	2.29	2.25	2.21																															
Diurnal Average	2.00	2.01	2.00	1.99	1.99	2.00	2.00	2.00	1.99	2.00	1.99	1.99	1.99	1.99	1.98	1.97	1.98	1.99	2.00	1.99	1.99	2.00	2.00	1.98																															
C	Monthly Calibration											S											Daily Zero-Span Check											Q											Quality Assurance										
K	Collection Error											N											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.																																																							

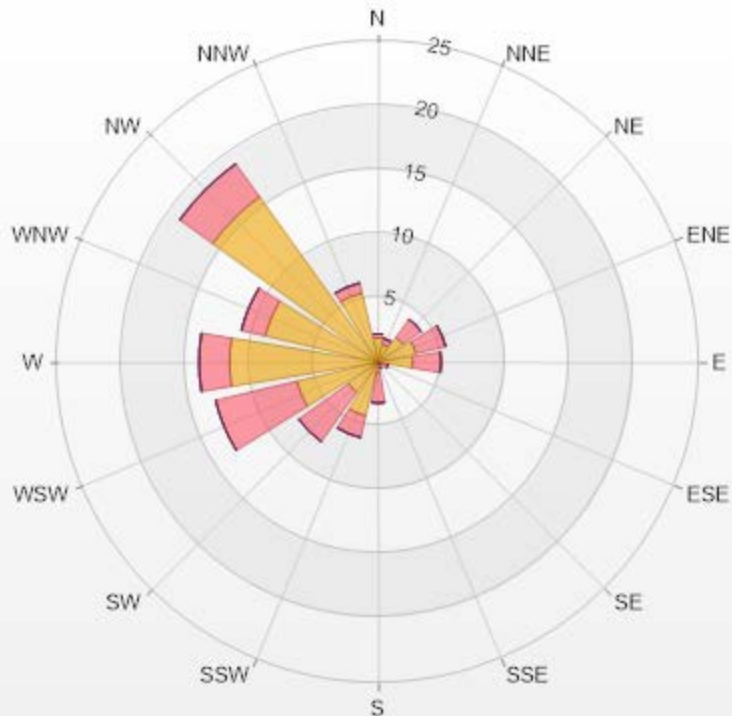
Timeseries Chart of Hourly Average for THC - St. Lina Site





Wind: St. Lina Poll.: St. Lina-THC55[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 84.81% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-40	>40.0	Total
N	1.9	0.32	0	0	0	2.22
NNE	1.43	0.48	0	0	0	1.91
NE	2.38	1.74	0	0	0	4.12
ENE	3.01	2.38	0	0	0	5.39
E	2.69	2.22	0	0	0	4.91
ESE	0.32	0.48	0	0	0	0.8
SE	0	0.16	0	0	0	0.16
SSE	0	0.48	0	0	0	0.48
S	0.79	2.38	0	0	0	3.17
SSW	4.28	1.74	0	0	0	6.02
SW	2.85	4.75	0	0	0	7.6
WSW	6.5	6.5	0	0	0	13
W	11.57	2.38	0	0	0	13.95
WNW	9.03	1.9	0	0	0	10.93
NW	15.85	3.17	0	0	0	19.02
NNW	5.55	0.79	0	0	0	6.34
Summary	68.15	31.87	0	0	0	100



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% Icon Classes (ppm)

68

0-2

32

2-5

0

5-10

0

10-40

0

>40.0



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St. Lina Site - December 2021

Summary of Hourly Averages

METHANE (CH4) in ppm

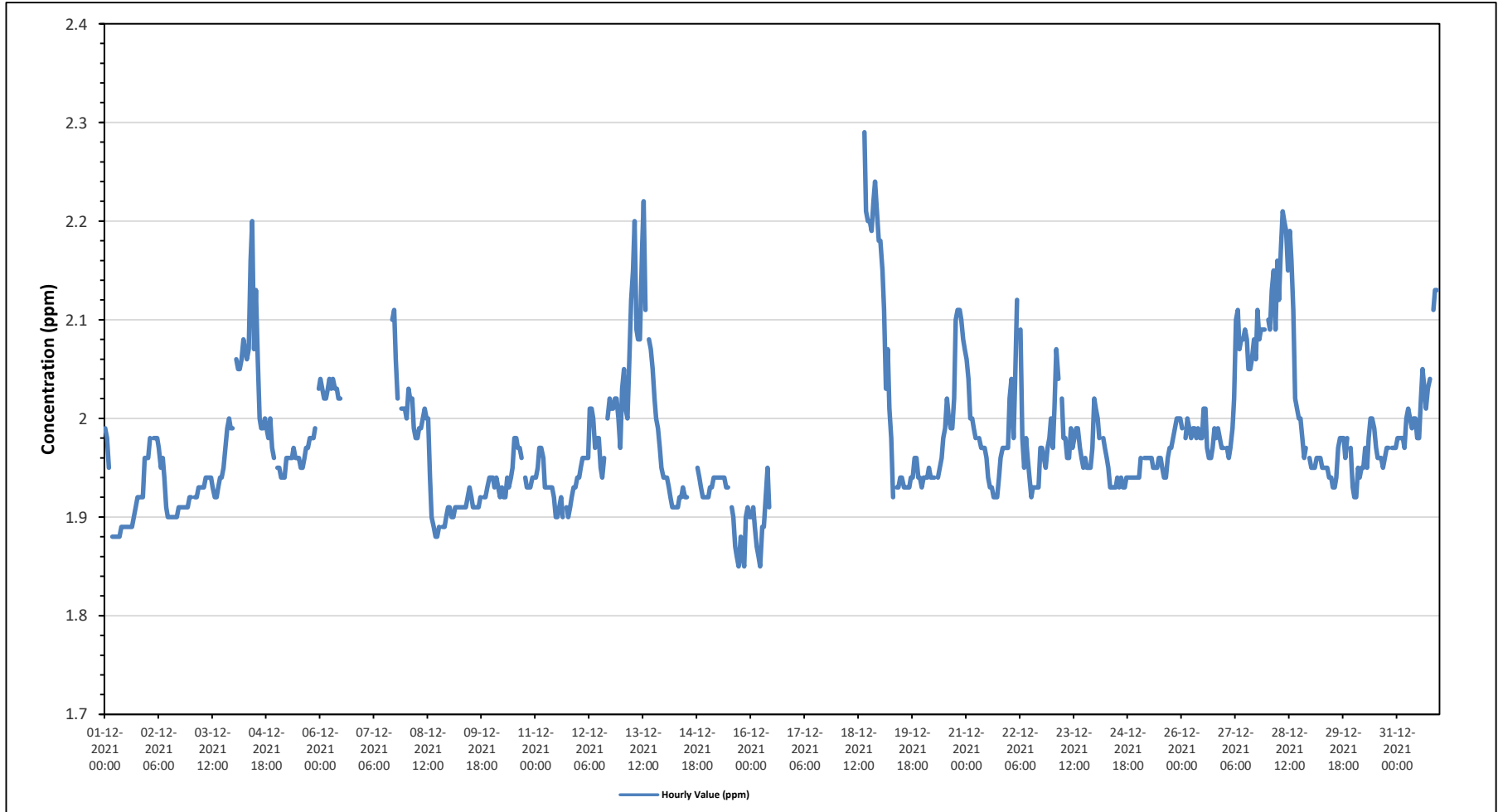
Maximum Hourly Value:	2.29 ppm on December 18 at hour 15	Hours in Service:	744
Maximum Daily Value:	2.09 ppm on December 28	Hours of Data:	631
Minimum Hourly Value:	1.85 ppm on December 15 at hour 17	Hours of Missing Data:	77
Minimum Daily Value:	1.91 ppm on December 15	Hours of Calibration:	36
Monthly Average:	1.98 ppm	Operational Uptime:	89.7

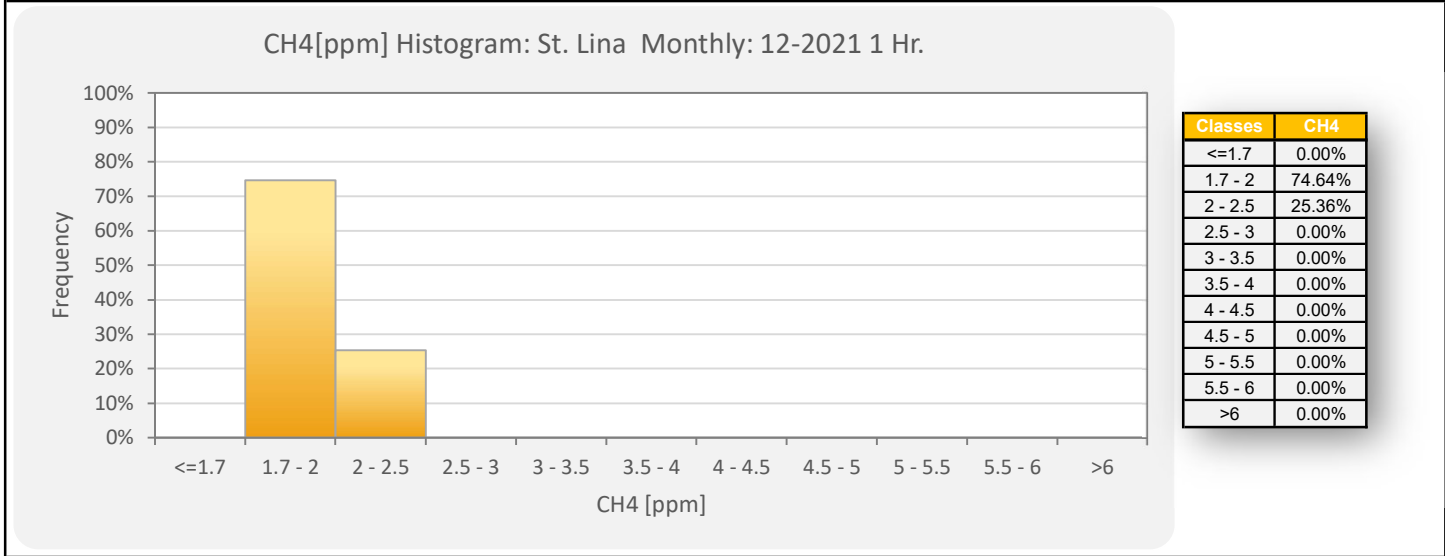
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23
Dec 1	1.99	1.98	1.95	S	1.88	1.88	1.88	1.88	1.88	1.89	1.89	1.89	1.89	1.89	1.89	1.90	1.91	1.92	1.92	1.92	1.92	1.96	1.96	1.88	1.99	1.91	
Dec 2	1.96	1.98	S	1.98	1.98	1.98	1.97	1.95	1.96	1.94	1.91	1.90	1.90	1.90	1.90	1.90	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.90	1.98	1.93	
Dec 3	1.92	S	1.92	1.92	1.93	1.93	1.93	1.93	1.94	1.94	1.94	1.94	1.93	1.92	1.92	1.93	1.94	1.94	1.95	1.97	1.99	2.00	1.99	1.99	1.92	2.00	1.94
Dec 4	S	2.06	2.05	2.05	2.06	2.08	2.07	2.06	2.07	2.16	2.20	2.07	2.13	2.06	2.00	1.99	1.99	2.00	1.99	1.98	2.00	1.97	1.96	S	1.96	2.20	2.05
Dec 5	1.95	1.95	1.94	1.94	1.94	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.96	1.95	1.95	1.96	1.97	1.97	1.98	1.98	1.98	1.99	S	1.96	1.94	2.03	1.96
Dec 6	2.04	2.03	2.02	2.02	2.03	2.04	2.03	2.04	2.03	2.03	2.02	2.02	C	C	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	2.02	2.04	-
Dec 7	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	NRM	C	C	C	C	C	2.10	2.11	2.06	2.02	S	2.01	2.01	2.01	2.01	2.11	-
Dec 8	2.00	2.03	2.02	2.02	1.99	1.98	1.98	1.99	1.99	2.00	2.01	2.00	2.00	1.94	1.90	1.89	1.88	1.88	1.89	S	1.89	1.89	1.90	1.91	1.88	2.03	1.96
Dec 9	1.91	1.90	1.90	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.93	1.92	1.91	1.91	1.91	1.91	1.92	1.92	S	1.92	1.92	1.93	1.94	1.94	1.90	1.92
Dec 10	1.94	1.93	1.94	1.93	1.92	1.93	1.92	1.92	1.94	1.93	1.94	1.95	1.98	1.98	1.97	1.97	1.96	S	1.94	1.93	1.93	1.93	1.94	1.94	1.92	1.98	1.94
Dec 11	1.94	1.95	1.97	1.97	1.96	1.93	1.93	1.93	1.93	1.93	1.92	1.90	1.90	1.91	1.92	1.90	S	1.91	1.90	1.91	1.92	1.93	1.93	1.94	1.90	1.97	1.93
Dec 12	1.94	1.95	1.96	1.96	1.96	1.96	2.01	2.01	2.00	1.97	1.98	1.98	1.95	1.94	1.96	S	2.00	2.02	2.01	2.01	2.02	2.02	2.00	1.97	1.94	2.02	1.98
Dec 13	2.03	2.05	2.01	2.00	2.05	2.12	2.15	2.20	2.09	2.08	2.08	2.17	2.22	2.11	S	2.08	2.07	2.05	2.02	2.00	1.99	1.97	1.95	1.94	1.94	2.22	2.06
Dec 14	1.94	1.94	1.93	1.92	1.91	1.91	1.91	1.91	1.92	1.92	1.93	1.92	1.92	NRM	NRM	NRM	NRM	NRM	1.95	1.94	1.93	1.92	1.92	1.92	1.91	1.95	1.92
Dec 15	1.92	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.93	S	1.91	1.90	1.87	1.86	1.85	1.88	1.86	1.85	1.90	1.91	1.90	1.85	1.94	1.91
Dec 16	1.90	1.91	1.89	1.87	1.86	1.85	1.89	1.89	1.92	1.95	1.91	S	1.86	X	X	X	X	X	X	X	X	X	X	X	1.85	1.95	-
Dec 17	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
Dec 18	X	X	X	X	X	X	X	X	X	X	X	NRM	NRM	NRM	2.29	2.21	2.20	2.20	2.19	2.22	2.24	2.21	2.18	2.18	2.18	2.29	-
Dec 19	2.18	2.15	2.11	2.03	2.07	2.01	1.98	1.92	S	1.93	1.93	1.94	1.94	1.93	1.93	1.93	1.93	1.94	1.94	1.96	1.96	1.94	1.94	1.93	1.92	2.18	1.98
Dec 20	1.94	1.94	1.94	1.95	1.94	1.94	1.94	S	1.94	1.95	1.96	1.98	1.99	2.02	2.00	1.99	1.99	2.02	2.10	2.11	2.11	2.10	2.08	2.07	1.94	2.11	2.00
Dec 21	2.06	2.04	2.00	2.00	1.99	1.98	S	1.98	1.97	1.97	1.97	1.96	1.94	1.93	1.93	1.92	1.92	1.92	1.94	1.96	1.97	1.97	1.97	1.97	1.92	2.06	1.97
Dec 22	2.02	2.04	1.98	2.04	2.12	S	2.09	1.98	1.95	1.98	1.96	1.94	1.92	1.93	1.93	1.93	1.93	1.97	1.97	1.96	1.95	1.97	1.98	2.00	1.92	2.12	1.98
Dec 23	1.97	2.01	2.07	2.04	S	2.02	1.98	1.98	1.96	1.96	1.99	1.97	1.98	1.99	1.99	1.97	1.96	1.95	1.96	1.95	1.95	1.95	1.97	2.02	1.95	2.07	1.98
Dec 24	2.01	2.00	1.98	S	1.98	1.97	1.96	1.95	1.93	1.93	1.93	1.93	1.94	1.93	1.94	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.93	2.01	1.95
Dec 25	1.94	1.96	S	1.96	1.96	1.96	1.96	1.96	1.95	1.95	1.95	1.95	1.96	1.96	1.95	1.94	1.94	1.96	1.97	1.97	1.98	1.99	2.00	2.00	1.94	2.00	1.96
Dec 26	1.99	S	1.98	2.00	1.99	1.98	1.99	1.99	1.98	1.99	1.98	1.98	2.01	2.01	1.97	1.96	1.96	1.97	1.99	1.98	1.99	1.98	1.97	1.97	1.96	2.01	1.98
Dec 27	S	1.97	1.96	1.97	1.99	2.02	2.10	2.11	2.07	2.08	2.08	2.09	2.08	2.05	2.05	2.06	2.08	2.06	2.11	2.08	2.09	2.09	2.09	S	1.96	2.11	2.06
Dec 28	2.10	2.09	2.13	2.15	2.09	2.16	2.12	2.17	2.21	2.20	2.19	2.15	2.19	2.16	2.11	2.02	2.01	2.00	1.98	1.96	1.97	S	1.97	S	1.96	1.96	2.09
Dec 29	1.95	1.95	1.95	1.96	1.96	1.96	1.95	1.95	1.95	1.95	1.94	1.94	1.93	1.93	1.94	1.97	1.98	1.98	1.98	1.96	1.98	S	1.97	1.93	1.93	1.98	1.95
Dec 30	1.92	1.92	1.95	1.94	1.95	1.95	1.97	1.95	1.98	2.00	2.00	1.99	1.97	1.96	1.96	1.95	1.96	1.97	1.97	S	1.97	1.97	1.97	1.97	1.92	2.00	1.96
Dec 31	1.98	1.98	1.98	1.98	1.97	2.00	2.01	2.00	1.99	2.00	2.00	1.98	1.98	2.02	2.05	2.03	2.01	2.03	2.04	S	2.11	2.13	2.13	P	1.97	2.13	2.02
Diurnal Maximum	2.18	2.15	2.13	2.15	2.12	2.16	2.15	2.20	2.21	2.20	2.20	2.17	2.22	2.16	2.11	2.29	2.21	2.20	2.20	2.19	2.22	2.24	2.21	2.18	2.18	2.18	2.18
Diurnal Average	1.98	1.99	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.97	1.96	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.97

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

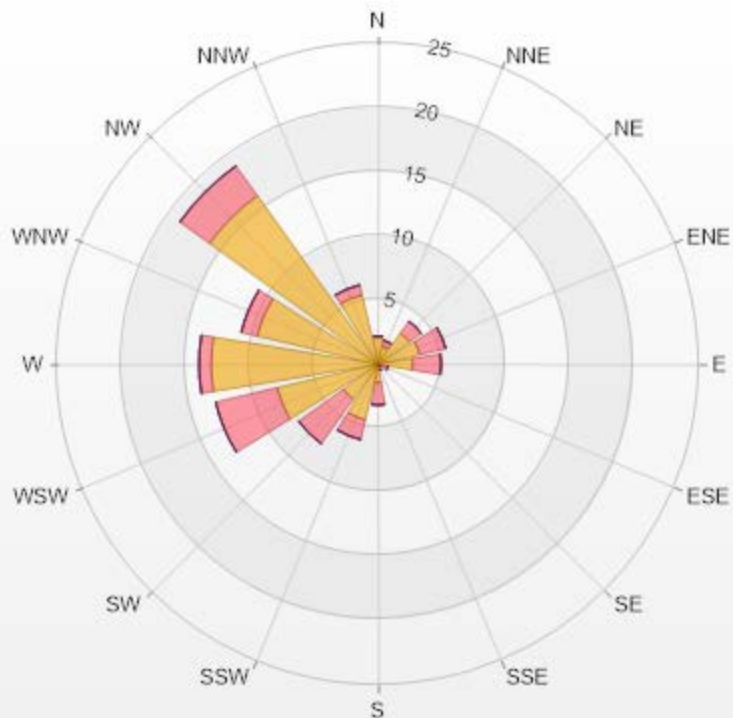
Timeseries Chart of Hourly Average for CH4 - St. Lina Site





Wind: St. Lina Poll.: St. Lina-CH4[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 84.81% Calm Avg: 0.00 [ppm]

Direction	0-2	2-5	5-10	10-20	>20.0	Total
N	2.06	0.16	0	0	0	2.22
NNE	1.43	0.48	0	0	0	1.91
NE	3.01	1.11	0	0	0	4.12
ENE	3.33	2.06	0	0	0	5.39
E	2.69	2.22	0	0	0	4.91
ESE	0.32	0.48	0	0	0	0.8
SE	0	0.16	0	0	0	0.16
SSE	0.16	0.32	0	0	0	0.48
S	1.43	1.74	0	0	0	3.17
SSW	4.44	1.58	0	0	0	6.02
SW	3.33	4.28	0	0	0	7.61
WSW	8.08	4.91	0	0	0	12.99
W	13	0.95	0	0	0	13.95
WNW	9.67	1.27	0	0	0	10.94
NW	16.16	2.85	0	0	0	19.01
NNW	5.55	0.79	0	0	0	6.34
Summary	74.66	25.36	0	0	0	100



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% Icon Classes (ppm)

75 0-2

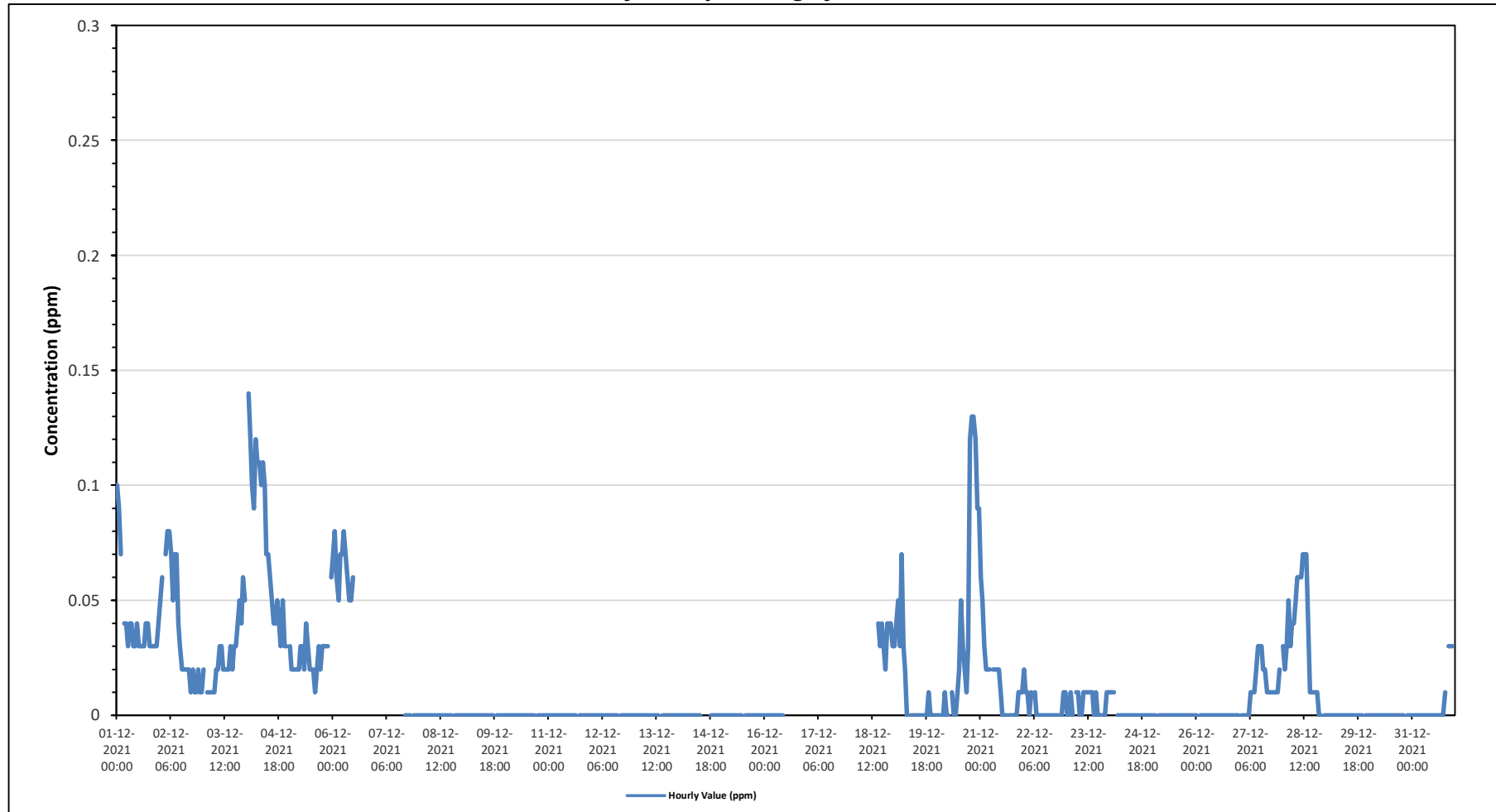
25 2-5

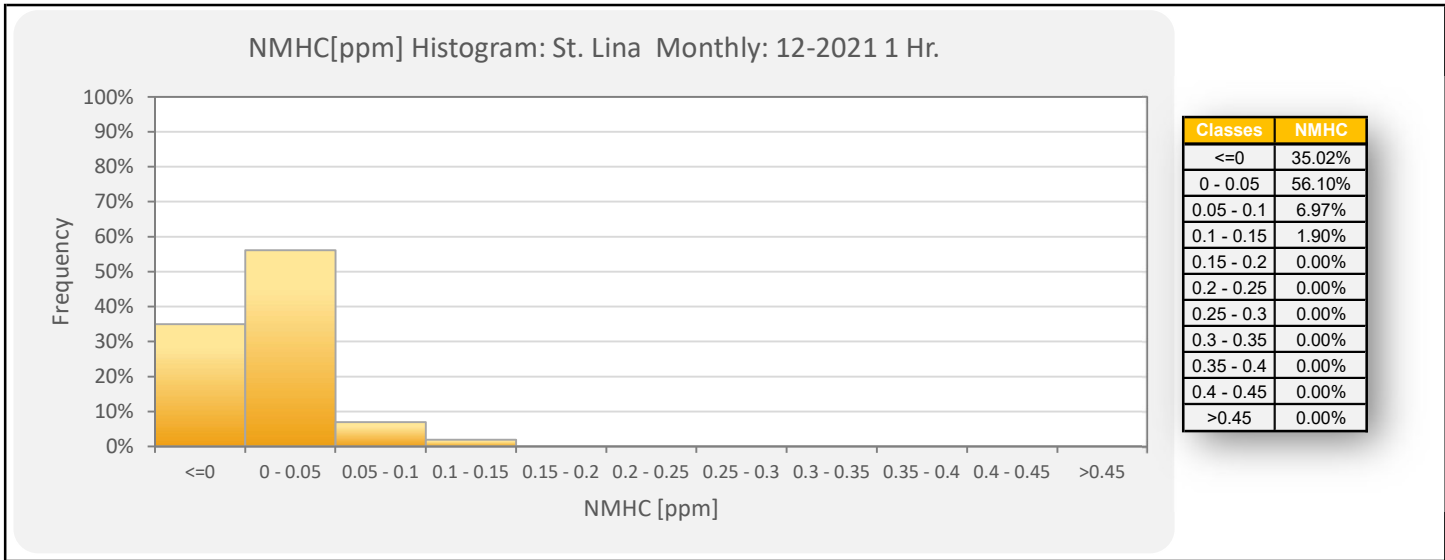
0 5-10

0 10-20

0 >20.0

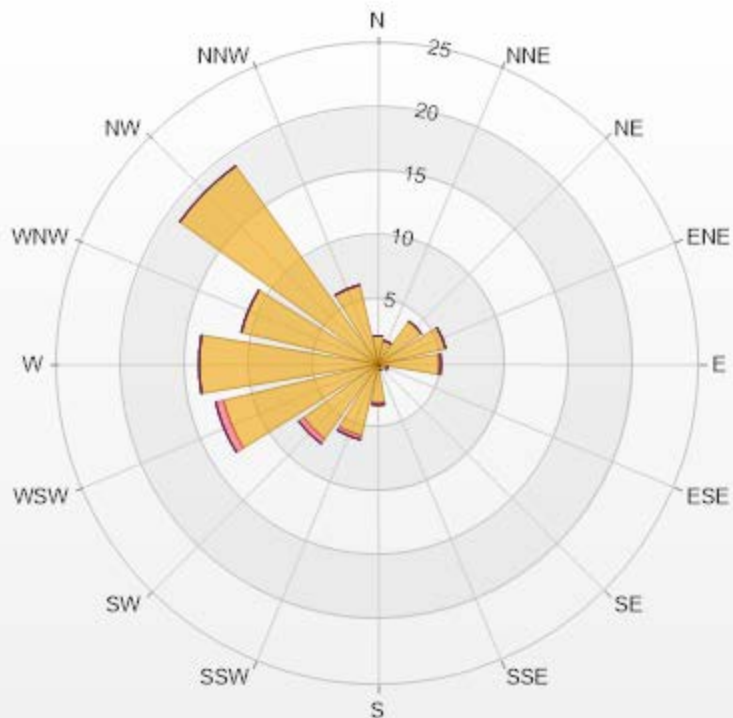
Timeseries Chart of Hourly Average for NMHC - St. Lina Site





Wind: St. Lina Poll.: St. Lina-NMHC[ppm] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 84.81% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-0.9	0.9-2	>2.0	Total
N	2.22	0	0	0	0	2.22
NNE	1.9	0	0	0	0	1.9
NE	4.12	0	0	0	0	4.12
ENE	5.39	0	0	0	0	5.39
E	4.75	0.16	0	0	0	4.91
ESE	0.63	0.16	0	0	0	0.79
SE	0.16	0	0	0	0	0.16
SSE	0.48	0	0	0	0	0.48
S	3.01	0.16	0	0	0	3.17
SSW	5.71	0.32	0	0	0	6.03
SW	7.13	0.48	0	0	0	7.61
WSW	12.36	0.63	0	0	0	12.99
W	13.95	0	0	0	0	13.95
WNW	10.94	0	0	0	0	10.94
NW	19.02	0	0	0	0	19.02
NNW	6.34	0	0	0	0	6.34
Summary	98.11	1.91	0	0	0	100



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% Icon Classes (ppm)	98	0-0.1	2	0.1-0.3	0	0.3-0.9	0	0.9-2	0	>2.0
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LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

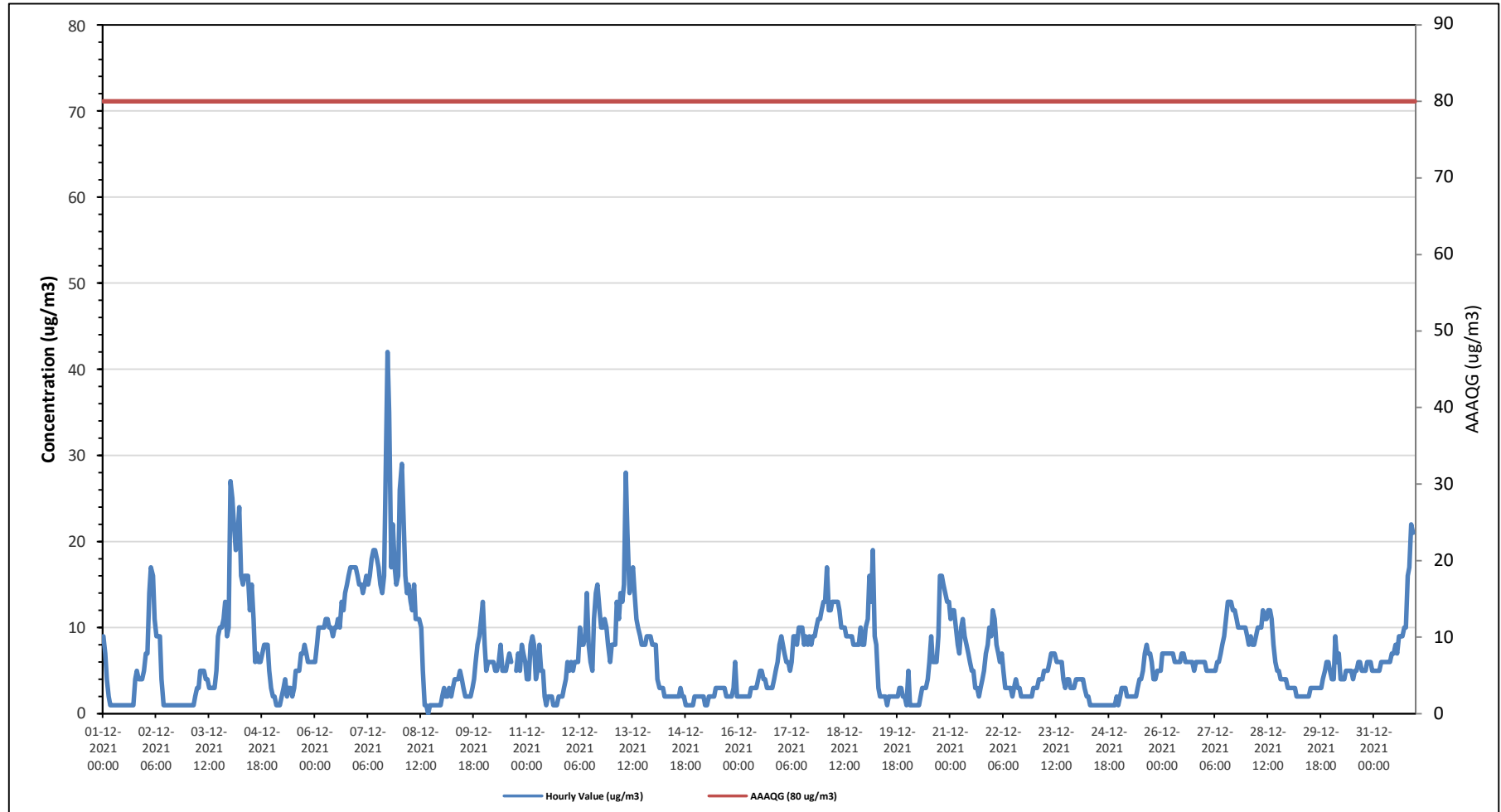
Summary of Hourly Averages

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

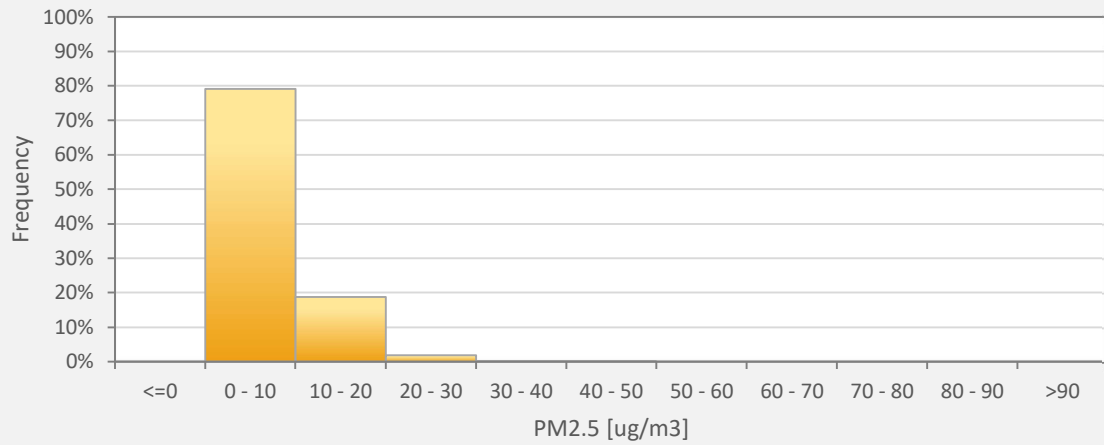
Alberta Ambient Air Quality Guideline (AAAQG): 1-Hour 80 µg/m ³ , Alberta Ambient Air Quality Objective (AAAQO): 24-Hour 29 µg/m ³																															
Number of 1-Hour Exceedences: 0					Number of 24-Hour Exceedences: 0																										
Maximum Hourly Value: 42 µg/m ³ on December 7 at hour 17					Hours in Service: 744																										
Maximum Daily Value: 18.8 µg/m ³ on December 7					Hours of Data: 741																										
Minimum Hourly Value: 0 µg/m ³ on December 8 at hour 16					Hours of Missing Data: 1																										
Minimum Daily Value: 2 µg/m ³ on December 24					Hours of Calibration: 2																										
Monthly Average: 6.6 µg/m ³					Operational Uptime: 99.9																										
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				
Dec 1	9	7	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	5	4	4	4	5	1	9	2.6				
Dec 2	7	7	14	17	16	11	9	9	9	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	4.9			
Dec 3	1	1	1	1	2	3	3	5	5	5	4	4	3	3	3	3	5	9	10	10	11	13	9	10	1	13	5.2				
Dec 4	27	25	22	19	20	24	16	15	16	16	16	12	15	11	6	7	6	6	7	8	8	8	5	3	3	27	13.3				
Dec 5	2	2	1	1	1	2	3	4	2	3	3	2	3	5	5	7	7	8	7	6	6	6	6	6	1	8	4.0				
Dec 6	6	8	10	10	10	10	11	11	10	10	9	10	10	11	10	13	12	14	15	16	17	17	17	17	6	17	11.8				
Dec 7	16	15	15	14	15	16	15	16	18	19	19	18	17	15	14	16	28	42	35	17	22	17	15	16	14	42	18.8				
Dec 8	26	29	23	16	14	15	13	12	15	11	11	11	10	5	1	0	1	1	1	1	1	1	1	1	0	29	9.2				
Dec 9	2	3	2	2	3	2	3	4	4	4	5	4	3	2	2	2	2	3	4	6	8	9	11	13	2	13	4.3				
Dec 10	8	5	6	6	6	6	5	5	6	8	5	5	5	6	7	6	C	C	5	7	5	8	7	6	5	8	6.0				
Dec 11	4	4	8	9	8	4	5	8	5	5	2	1	2	2	2	1	1	1	2	2	3	4	6	1	9	3.8					
Dec 12	5	6	5	6	6	6	10	8	8	9	14	8	6	5	11	14	15	12	10	10	11	10	8	6	5	15	8.7				
Dec 13	8	8	8	13	11	14	13	15	28	21	14	16	17	14	11	10	9	8	8	8	9	9	9	8	8	28	12.0				
Dec 14	8	8	4	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2	1	1	1	1	1	2	1	8	2.5				
Dec 15	2	2	2	2	2	1	1	2	2	2	2	3	3	3	3	3	2	2	2	2	2	3	6	2	1	6	2.4				
Dec 16	2	2	2	2	2	2	2	3	3	3	3	4	5	4	4	3	3	3	3	4	5	6	8	2	8	3.5					
Dec 17	9	8	7	6	6	5	6	9	9	8	10	10	10	8	9	8	9	8	9	9	10	11	11	12	5	12	8.6				
Dec 18	13	13	17	12	12	13	13	13	13	12	10	10	10	9	9	9	8	8	8	8	8	10	8	8	8	17	10.6				
Dec 19	10	11	16	13	19	9	8	3	2	2	2	2	1	2	2	2	2	2	2	3	3	2	2	1	1	19	5.0				
Dec 20	5	1	1	1	1	1	1	2	3	3	3	4	6	9	6	6	9	16	16	15	14	13	13	1	16	6.5					
Dec 21	11	12	12	10	8	7	10	11	9	8	7	6	5	5	3	3	2	3	4	5	7	8	10	9	2	12	7.3				
Dec 22	12	11	8	7	6	7	5	3	3	3	3	2	3	4	3	3	2	2	2	2	2	2	3	2	2	12	4.2				
Dec 23	3	3	4	4	4	5	5	5	6	7	7	7	6	6	6	6	4	3	4	4	3	3	3	4	3	7	4.7				
Dec 24	4	4	4	4	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	4	1.7				
Dec 25	2	3	3	3	2	2	2	2	2	3	4	4	5	7	8	7	7	6	4	4	5	5	5	2	8	4.0					
Dec 26	7	7	7	7	7	7	7	6	6	6	6	7	7	6	6	6	6	5	6	6	6	6	6	5	7	6.3					
Dec 27	6	5	5	5	5	5	5	6	6	7	8	9	11	13	13	13	12	12	11	10	10	10	10	10	5	13	8.6				
Dec 28	9	8	9	8	8	9	10	10	10	12	11	11	12	12	11	8	6	5	5	4	4	4	4	3	3	12	8.0				
Dec 29	3	3	3	3	2	2	2	2	2	2	2	2	3	3	3	3	3	3	4	5	6	6	5	2	6	3.1					
Dec 30	4	4	9	6	7	4	4	4	5	5	5	5	4	5	5	6	6	5	5	5	6	6	6	5	4	9	5.3				
Dec 31	5	5	5	5	6	6	6	6	6	6	7	7	8	7	9	9	10	10	16	17	22	21	17	P	5	22	9.0				
Diurnal Maximum	27	29	23	19	20	24	16	16	28	21	19	18	17	15	14	16	28	42	35	17	22	22	21	17							
Diurnal Average	7.6	7.4	7.6	7.0	7.0	6.6	6.4	6.5	7.0	6.7	6.3	6.1	6.3	6.0	5.7	5.8	6.0	6.5	6.7	6.5	6.9	7.3	7.1	6.5							
C	Monthly Calibration					S	Daily Zero-Span Check					Q	Quality Assurance																		
K	Collection Error					N	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.

Timeseries Chart of Hourly Average for PM2.5 - St. Lina Site



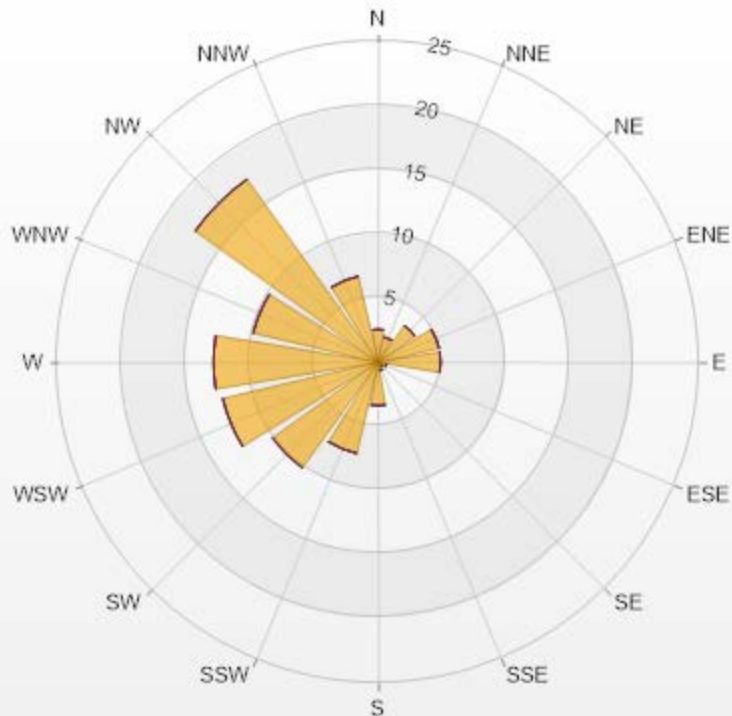
PM2.5[ug/m3(L)] Histogram: St. Lina Monthly: 12-2021 1 Hr.



Classes	PM2.5
<=0	0.00%
0 - 10	79.08%
10 - 20	18.76%
20 - 30	1.89%
30 - 40	0.13%
40 - 50	0.13%
50 - 60	0.00%
60 - 70	0.00%
70 - 80	0.00%
80 - 90	0.00%
>90	0.00%

Wind: St. Lina Poll.: St. Lina-PM2.5[ug/m3(L)] Monthly: 12-2021 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.60% Calm Avg: 0.00 [ug/m3(L)]

Direction	0-50	50-80	80-120	120-240	>240.0	Total
N	2.56	0	0	0	0	2.56
NNE	2.02	0	0	0	0	2.02
NE	3.51	0	0	0	0	3.51
ENE	4.86	0	0	0	0	4.86
E	4.86	0	0	0	0	4.86
ESE	0.67	0	0	0	0	0.67
SE	0.4	0	0	0	0	0.4
SSE	0.67	0	0	0	0	0.67
S	3.37	0	0	0	0	3.37
SSW	7.29	0	0	0	0	7.29
SW	10.12	0	0	0	0	10.12
WSW	12.42	0	0	0	0	12.42
W	12.82	0	0	0	0	12.82
WNW	9.99	0	0	0	0	9.99
NW	17.54	0	0	0	0	17.54
NNW	6.88	0	0	0	0	6.88
Summary	100	0	0	0	0	100




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% Icon Classes (ug/m3(L))

100  0-50

0  50-80

0  80-120

0  120-240

0  >240.0



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St. Lina Site - December 2021

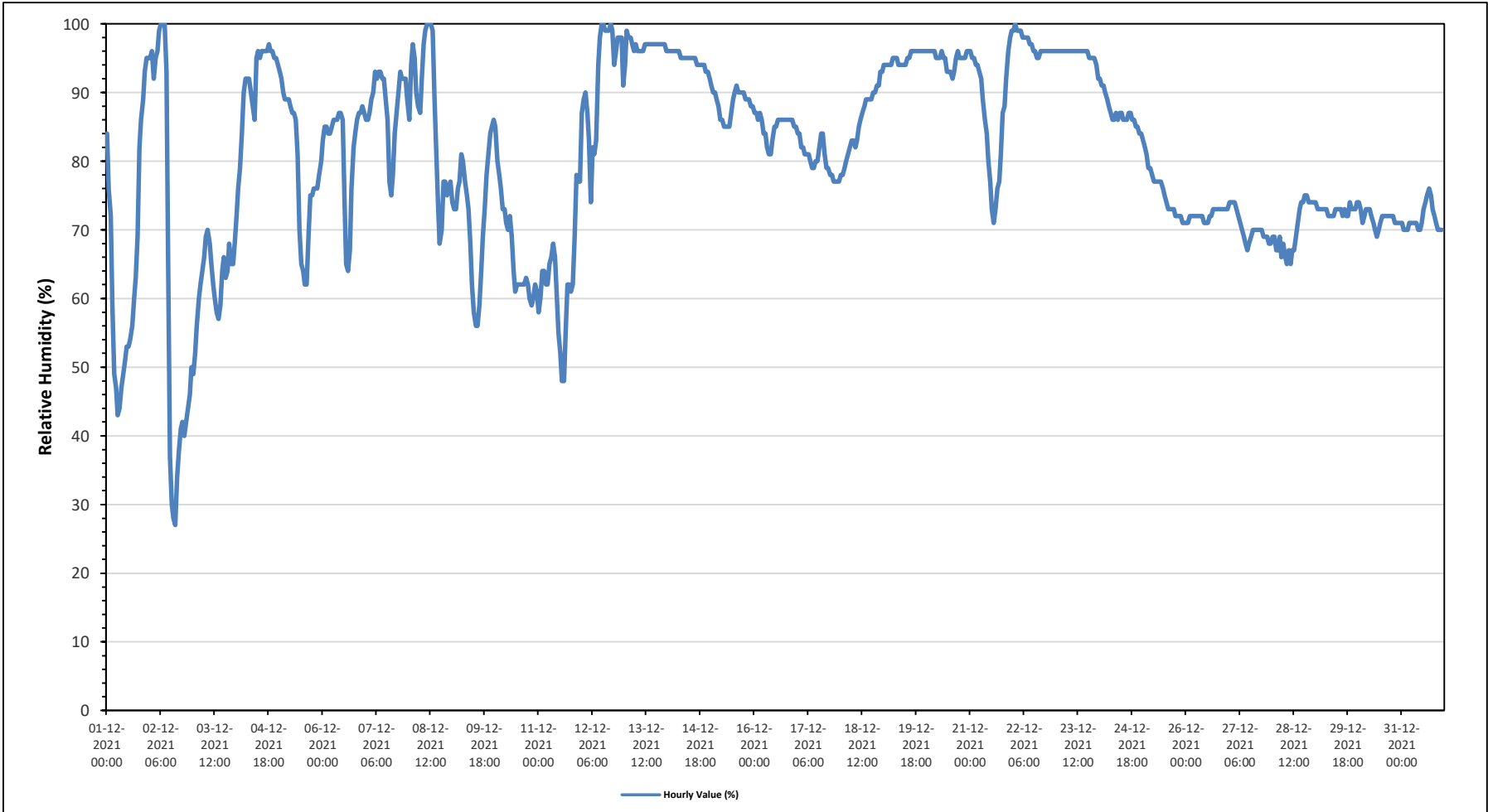
Summary of Hourly Averages

RELATIVE HUMIDITY (RH) in %

Maximum Hourly Value:	100 %	on December 2 at hour 6	Hours in Service:	744
Maximum Daily Value:	97.0 %	on December 22	Hours of Data:	743
Minimum Hourly Value:	27 %	on December 2 at hour 14	Hours of Missing Data:	1
Minimum Daily Value:	62.5 %	on December 3	Hours of Calibration:	0
Monthly Average:	80.8 %		Operational Uptime:	99.9

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	
Dec 1	84	76	72	59	49	47	43	44	47	49	51	53	53	54	56	60	63	69	82	86	89	93	95	95	43	95	65.4	
Dec 2	95	96	92	95	96	99	100	100	100	93	66	37	30	28	27	34	38	41	42	40	42	44	46	50	27	100	63.8	
Dec 3	49	52	56	60	62	64	66	69	70	68	65	62	60	58	57	59	64	66	63	64	68	65	65	68	49	70	62.5	
Dec 4	72	76	79	84	90	92	92	92	90	88	86	95	96	95	96	96	96	97	96	96	95	95	94	72	97	91.0		
Dec 5	93	92	90	89	89	89	88	87	87	86	81	70	65	64	62	62	69	75	75	76	76	78	80	62	93	79.1		
Dec 6	83	85	85	84	84	85	86	86	86	87	87	86	74	65	64	67	76	82	84	86	87	87	88	87	64	88	82.1	
Dec 7	86	86	87	89	90	93	92	93	93	92	92	89	86	77	75	78	84	87	90	93	92	92	92	89	75	93	88.2	
Dec 8	86	94	97	95	90	88	87	92	97	99	100	100	100	99	89	82	74	68	70	77	77	75	76	77	68	100	87.0	
Dec 9	74	73	73	76	77	81	80	77	75	73	68	62	58	56	56	59	64	69	73	78	81	84	85	86	56	86	72.4	
Dec 10	85	80	78	76	73	73	71	70	72	69	64	61	62	62	62	62	62	63	62	60	59	60	62	61	59	85	67.0	
Dec 11	58	60	64	64	62	62	65	66	68	66	61	55	52	48	48	55	62	62	61	62	69	78	77	77	48	78	62.6	
Dec 12	87	89	90	87	83	74	82	81	83	94	98	100	100	99	99	99	100	99	94	96	98	98	98	91	74	100	92.5	
Dec 13	94	99	98	98	97	96	97	96	96	96	96	97	97	97	97	97	97	97	97	97	97	97	97	96	94	99	96.8	
Dec 14	96	96	96	96	96	96	96	95	95	95	95	95	95	95	95	94	94	94	94	94	93	93	92	92	92	96	94.8	
Dec 15	91	90	90	89	88	86	86	85	85	85	85	85	87	89	90	91	90	90	90	89	89	88	88	88	85	91	88.3	
Dec 16	87	87	86	87	86	84	84	82	81	81	83	85	85	86	86	86	86	86	86	86	86	86	85	85	81	87	85.1	
Dec 17	84	84	82	82	81	81	81	80	79	79	80	80	82	84	84	81	79	79	78	78	77	77	77	77	77	84	80.3	
Dec 18	78	78	79	80	81	82	83	83	82	83	85	86	87	88	89	89	89	89	90	90	91	91	93	93	78	93	85.8	
Dec 19	94	94	94	94	94	95	95	95	94	94	94	94	94	94	95	95	96	96	96	96	96	96	96	96	94	96	95.0	
Dec 20	96	96	96	96	96	95	95	95	96	95	95	93	93	93	92	93	95	96	95	95	95	95	96	96	92	96	94.9	
Dec 21	96	95	95	94	94	93	92	89	86	84	80	77	73	71	73	76	77	81	87	88	92	96	98	99	71	99	86.9	
Dec 22	99	100	99	99	99	98	98	98	98	97	97	96	96	95	95	96	96	96	96	96	96	96	96	96	95	100	97.0	
Dec 23	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	95	95	95	94	92	92	96	95.6	
Dec 24	92	91	91	90	89	88	87	86	86	87	86	87	87	86	86	86	87	87	86	86	85	85	84	84	84	92	87.0	
Dec 25	83	82	81	79	79	78	77	77	77	77	77	76	75	74	73	73	73	73	72	72	72	72	71	71	71	83	75.6	
Dec 26	71	71	72	72	72	72	72	72	72	72	71	71	71	72	72	73	73	73	73	73	73	73	73	73	71	73	72.2	
Dec 27	74	74	74	74	73	72	71	70	69	68	67	68	69	70	70	70	70	70	70	69	69	69	68	68	67	74	70.3	
Dec 28	69	69	67	67	69	66	68	66	65	67	65	67	67	69	71	73	74	74	75	75	74	74	74	74	65	75	70.0	
Dec 29	74	73	73	73	73	73	73	72	72	72	72	73	73	73	73	72	73	72	72	74	73	73	74	74	72	74	72.8	
Dec 30	74	73	71	72	73	73	73	72	71	70	69	70	71	72	72	72	72	72	72	71	71	71	71	71	69	74	71.7	
Dec 31	71	70	70	70	71	71	71	71	71	70	70	71	73	74	75	76	75	73	72	71	70	70	70	70	70	70	76	71.6
Diurnal Maximum	99	100	99	99	99	100	100	100	99	100	100	100	99	99	99	100	99	97	97	98	98	98	99	99	99	99	99	
Diurnal Average	82.9	83.1	83.0	82.8	82.3	82.0	82.2	81.8	81.9	81.7	80.1	78.7	77.7	76.9	76.6	77.5	78.8	79.7	80.3	81.0	81.6	82.1	82.4	82.7	82.7	82.7	82.7	
C	Monthly Calibration						S	Daily Zero-Span Check						Q	Quality Assurance													
K	Collection Error						N	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.																												

Timeseries Chart of Hourly Average for RH - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

BAROMETRIC PRESSURE (BP) in millibar

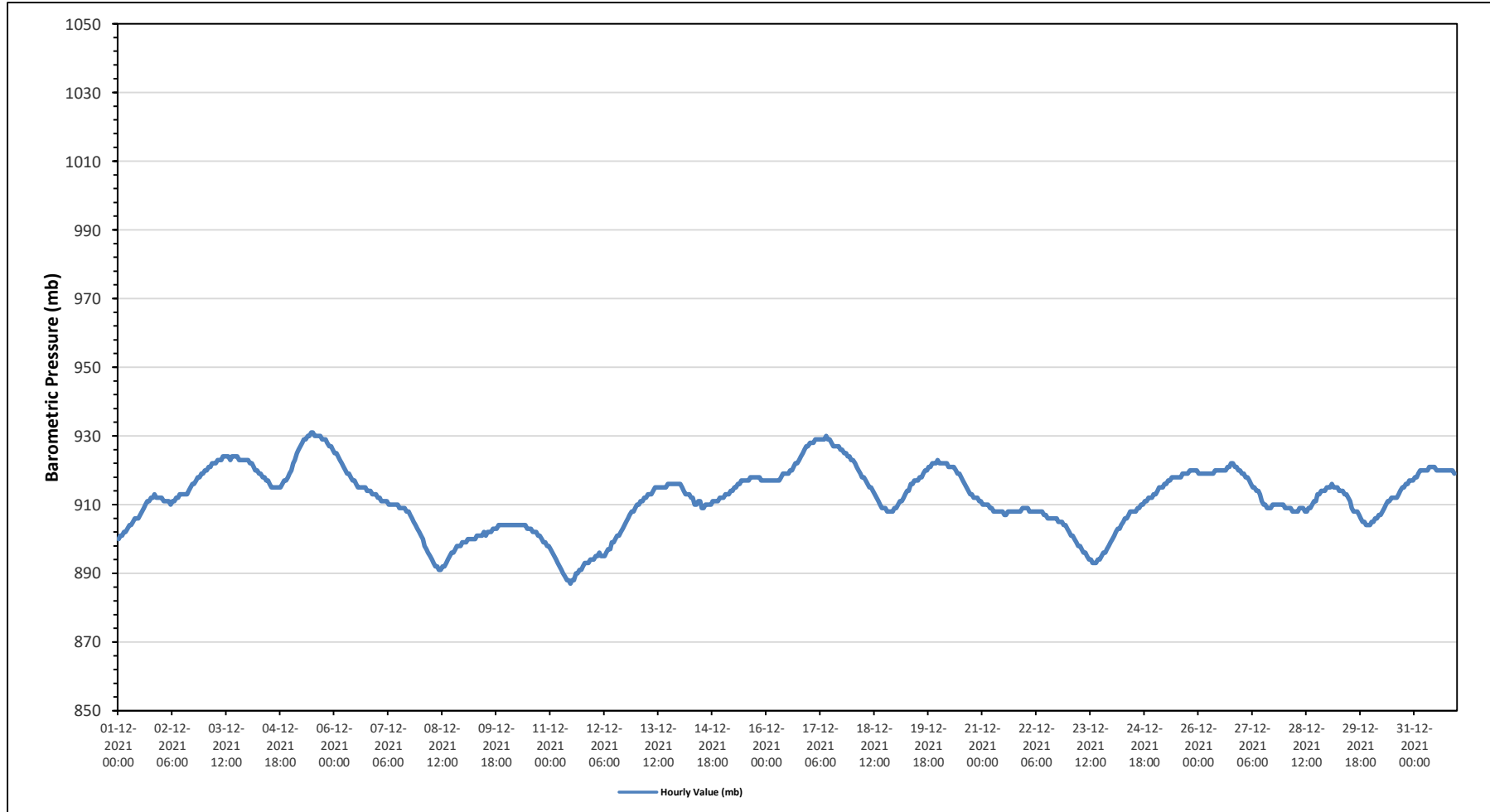
Maximum Hourly Value:	931 mb on December 5 at hour 11	Hours in Service:	744
Maximum Daily Value:	928 mb on December 5	Hours of Data:	743
Minimum Hourly Value:	887 mb on December 11 at hour 11	Hours of Missing Data:	1
Minimum Daily Value:	892 mb on December 11	Hours of Calibration:	0
Monthly Average:	912 mb	Operational Uptime:	99.9

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
Dec 1	900	901	901	902	902	903	904	904	905	906	906	906	907	908	909	910	911	911	912	912	913	912	912	912	900	913	907
Dec 2	912	911	911	911	911	910	911	911	912	912	913	913	913	913	913	914	915	916	916	917	918	918	919	919	910	919	914
Dec 3	920	920	921	921	922	922	922	923	923	923	924	924	924	924	923	924	924	924	924	923	923	923	923	923	920	924	923
Dec 4	923	922	922	921	920	920	919	919	918	918	917	917	916	915	915	915	915	915	915	916	917	917	918	919	915	923	918
Dec 5	920	922	923	925	926	927	928	929	929	930	930	931	931	930	930	930	930	929	929	929	929	927	926	920	931	928	
Dec 6	925	925	924	923	922	921	920	919	919	918	917	917	916	915	915	915	915	915	914	914	914	913	913	913	913	925	918
Dec 7	912	912	911	911	911	910	910	910	910	910	910	909	909	909	909	909	908	908	907	906	905	904	903	902	902	912	909
Dec 8	901	900	898	897	896	895	894	893	892	892	891	891	892	892	893	894	895	896	896	897	898	898	898	899	891	901	895
Dec 9	899	899	900	900	900	900	900	901	901	901	901	902	901	902	902	902	903	903	903	904	904	904	904	904	899	904	902
Dec 10	904	904	904	904	904	904	904	904	904	904	904	903	903	903	902	902	902	901	901	900	899	899	898	898	898	904	902
Dec 11	897	896	895	894	893	892	891	889	888	888	887	888	888	890	890	891	891	892	893	893	893	894	894	887	897	892	
Dec 12	894	895	895	896	895	895	895	896	897	897	899	899	900	901	901	902	903	904	905	906	907	908	908	909	894	909	900
Dec 13	910	910	911	911	912	912	913	913	913	914	915	915	915	915	915	915	915	916	916	916	916	916	916	910	916	914	
Dec 14	916	915	914	913	913	913	912	912	910	910	911	911	909	909	910	910	910	911	911	911	911	911	912	912	909	916	912
Dec 15	912	913	913	913	914	914	915	915	916	916	917	917	917	917	917	918	918	918	918	918	918	917	917	912	918	916	
Dec 16	917	917	917	917	917	917	917	917	918	919	919	919	919	920	920	921	922	922	923	924	925	926	927	927	917	927	920
Dec 17	928	928	928	929	929	929	929	929	929	930	929	929	928	927	927	927	926	926	925	925	924	924	923	923	923	930	927
Dec 18	923	922	921	920	919	918	918	917	916	915	915	914	913	912	911	910	909	909	909	908	908	908	908	909	908	923	914
Dec 19	909	910	911	911	912	913	914	914	916	916	917	917	917	918	918	919	920	920	921	921	922	922	922	923	909	923	917
Dec 20	922	922	922	922	922	921	921	921	920	919	919	918	917	916	915	914	913	913	912	912	912	911	911	911	911	922	917
Dec 21	910	910	910	910	909	909	908	908	908	908	908	908	907	907	908	908	908	908	908	908	908	908	909	909	907	910	908
Dec 22	909	909	908	908	908	908	908	908	908	908	907	907	906	906	906	906	906	905	905	905	905	904	904	903	903	909	907
Dec 23	902	901	901	900	899	898	898	897	896	896	895	894	894	893	893	893	894	894	895	896	896	897	898	899	893	902	897
Dec 24	900	901	902	903	903	904	905	906	906	907	908	908	908	908	909	909	910	910	911	911	912	912	913	900	913	907	
Dec 25	913	914	915	915	915	916	916	917	917	918	918	918	918	918	918	919	919	919	920	920	920	920	920	913	920	918	
Dec 26	919	919	919	919	919	919	919	919	919	920	920	920	920	920	920	920	921	921	922	922	921	921	920	919	922	920	
Dec 27	919	919	918	918	917	916	915	915	914	914	913	911	910	910	909	909	909	910	910	910	910	910	910	909	919	913	
Dec 28	909	909	909	908	908	908	908	909	909	909	909	908	908	909	910	911	911	913	913	914	914	914	915	908	915	910	
Dec 29	915	915	916	915	915	915	914	914	914	913	913	912	911	909	908	908	907	906	905	905	904	904	904	904	904	916	910
Dec 30	905	905	906	906	907	907	908	909	910	911	911	912	912	912	912	913	914	915	915	916	916	917	917	905	917	911	
Dec 31	918	918	919	920	920	920	920	921	921	921	921	920	920	920	920	920	920	920	920	920	920	919	P	918	921	920	
Diurnal Maximum	928	928	928	929	929	929	929	929	929	930	930	931	931	930	930	930	930	929	929	929	928	927	927	927	927	927	
Diurnal Average	912	912	912	912	912	912	911	912	912	912	912	911	911	911	911	912	912	912	912	912	912	912	912	912	912	912	

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for BP - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

AMBIENT TEMPERATURE (AT) in Degree Celsius

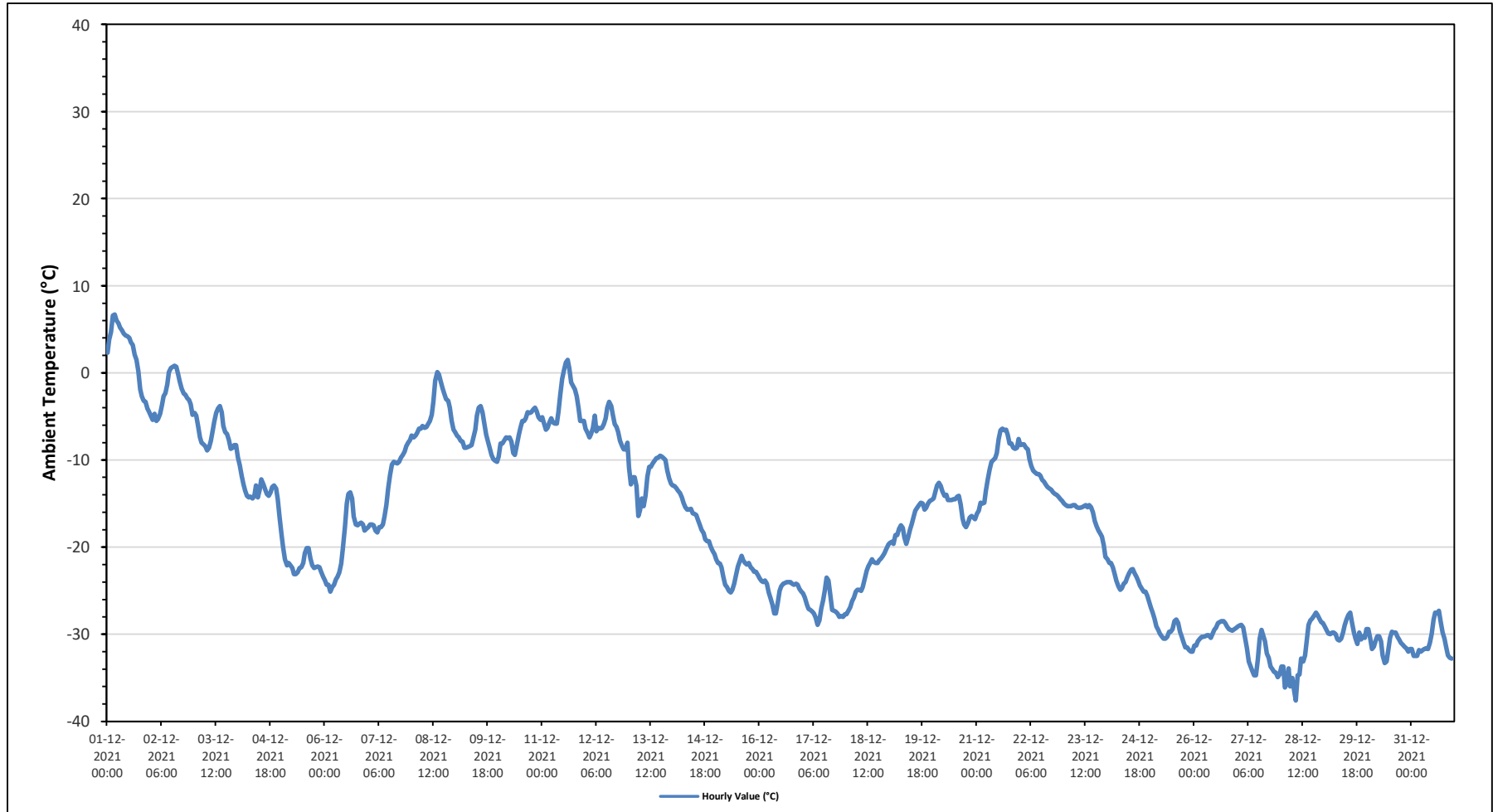
Maximum Hourly Value:	6.7 °C	on December 1 at hour 4	Hours in Service:	744
Maximum Daily Value:	2.2 °C	on December 1	Hours of Data:	743
Minimum Hourly Value:	-37.6 °C	on December 28 at hour 8	Hours of Missing Data:	1
Minimum Daily Value:	-32.2 °C	on December 27	Hours of Calibration:	0
Monthly Average:	-17.4 °C		Operational Uptime:	99.9

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
Dec 1	2.3	3.8	4.7	6.6	6.7	6	5.7	5.2	4.9	4.5	4.3	4.2	4	3.5	3.2	2.1	1.5	0.2	-1.9	-2.7	-3.2	-3.3	-4.1	-4.5	-4.5	6.7	2.2
Dec 2	-5	-5.4	-4.7	-5.5	-5.3	-4.7	-3.7	-2.7	-2.3	-1.3	0.1	0.6	0.7	0.8	0.7	-0.2	-1	-1.8	-2.4	-2.5	-2.9	-3.1	-3.6	-4.8	-5.5	0.8	-2.5
Dec 3	-4.6	-4.9	-6.1	-7.4	-8	-8.2	-8.4	-8.9	-8.6	-7.8	-6.8	-5.6	-4.6	-4.1	-3.8	-4.5	-6.1	-6.8	-7	-7.7	-8.7	-8.6	-8.3	-8.3	-8.9	-3.8	-6.8
Dec 4	-9.7	-10.6	-11.8	-12.8	-13.5	-14.1	-14.3	-14.2	-14.4	-14.1	-12.9	-14.3	-13.4	-12.2	-12.8	-13.4	-13.9	-14.1	-13.7	-13.1	-12.9	-13.3	-14.5	-16.6	-16.6	-9.7	-13.4
Dec 5	-18.5	-20	-21.4	-22.1	-21.8	-22.1	-22.4	-23.1	-22.9	-22.4	-22.3	-21.8	-20.7	-20.1	-20.1	-21.3	-22.1	-22.4	-22.3	-22.2	-22.3	-22.9	-23.4	-23.4	-23.4	-18.5	-21.8
Dec 6	-23.8	-24.3	-24.3	-25.1	-24.6	-24.3	-23.7	-23.4	-22.9	-21.9	-20.2	-17.7	-15	-13.9	-13.7	-14.4	-16.5	-17.4	-17.5	-17.3	-17.2	-17.4	-18.1	-17.9	-25.1	-13.7	-19.7
Dec 7	-17.7	-17.4	-17.4	-17.5	-18.1	-18.3	-17.7	-17.7	-17.4	-16.5	-15.2	-13.2	-11.7	-10.5	-10.2	-10.3	-10.4	-10.2	-9.7	-9.4	-9	-8.4	-8	-7.7	-18.3	-7.7	-13.3
Dec 8	-7.2	-7.4	-7.2	-6.9	-6.4	-6.4	-6.1	-6.3	-6.2	-5.9	-5.5	-4.8	-3.3	-0.9	0.1	-0.2	-1	-1.8	-2.4	-3	-3.2	-4	-5.5	-6.5	-7.4	0.1	-4.5
Dec 9	-6.8	-7.2	-7.4	-7.8	-7.9	-8.6	-8.6	-8.5	-8.4	-8.3	-7.4	-6.5	-4.9	-4	-3.8	-4.5	-5.8	-7.1	-7.8	-8.6	-9.4	-9.9	-10.1	-10.2	-10.2	-3.8	-7.5
Dec 10	-9.6	-8.1	-8.1	-7.8	-7.4	-7.5	-7.4	-7.9	-9.2	-9.4	-8.2	-7.1	-6.3	-5.5	-5.5	-5.2	-4.5	-4.6	-4.5	-4.2	-4	-4.4	-5.1	-5.4	-9.6	-4.0	-6.5
Dec 11	-5.1	-5.8	-6.5	-6.3	-5.7	-5.2	-5.7	-5.8	-5.8	-4.5	-2.5	-0.7	0.3	1.2	1.5	0.5	-1.1	-1.5	-1.9	-2.7	-4.1	-5.5	-5.5	-5.5	-6.5	1.5	-3.5
Dec 12	-6.4	-6.9	-7.4	-7	-6.3	-4.9	-6.7	-6.3	-6.4	-6.3	-5.9	-5.2	-4	-3.3	-3.8	-4.8	-5.9	-6.2	-6.8	-7.8	-8.4	-8.8	-8.8	-8	-8.8	-3.3	-6.3
Dec 13	-10.9	-12.8	-12	-12	-13	-16.4	-15.8	-14.4	-15.3	-14.1	-11.9	-10.8	-10.8	-10.4	-10.1	-9.8	-9.7	-9.5	-9.6	-9.8	-10	-11.2	-12.1	-12.7	-16.4	-9.5	-11.9
Dec 14	-12.9	-13	-13.2	-13.5	-13.8	-14.3	-14.9	-15.4	-15.7	-15.7	-15.6	-16.1	-16.2	-16.3	-16.9	-17.4	-18	-18.4	-19.1	-19.3	-19.3	-19.9	-20.4	-20.8	-20.8	-12.9	-16.5
Dec 15	-21.4	-21.8	-21.9	-22.3	-23.4	-24.3	-24.6	-25	-25.2	-24.9	-24.2	-23.2	-22.2	-21.6	-21	-21.5	-21.8	-22	-21.8	-22.3	-22.5	-22.8	-22.8	-23.2	-25.2	-21.0	-22.8
Dec 16	-23.6	-23.9	-24	-23.8	-24.2	-25.2	-25.8	-26.6	-27.6	-27.6	-26.4	-25	-24.5	-24.2	-24.1	-24	-24	-24	-24.2	-24.3	-24.2	-24.3	-24.8	-25.1	-27.6	-23.6	-24.8
Dec 17	-25.3	-25.8	-26.6	-27.1	-27.2	-27.4	-27.6	-28.1	-28.9	-28.4	-27	-26.1	-25	-23.5	-23.8	-25.5	-27.2	-27.3	-27.4	-27.6	-28	-27.9	-28	-27.7	-28.9	-23.5	-26.9
Dec 18	-27.7	-27.3	-26.9	-26.2	-25.8	-25.1	-24.9	-24.9	-25	-24.6	-23.6	-22.7	-22.2	-21.8	-21.4	-21.7	-21.8	-21.8	-21.5	-21.3	-21	-20.7	-20.2	-19.7	-27.7	-19.7	-23.3
Dec 19	-19.5	-19.4	-19.6	-18.6	-18.6	-17.9	-17.5	-17.8	-18.9	-19.6	-18.9	-18	-17.3	-16.5	-15.8	-15.5	-15.2	-14.9	-15	-15.7	-15.5	-15	-14.7	-14.6	-19.6	-14.6	-17.1
Dec 20	-14.4	-13.6	-12.9	-12.6	-13	-13.6	-14.1	-14	-14.6	-14.6	-14.6	-14.5	-14.5	-14.2	-14.1	-15.1	-16.7	-17.4	-17.7	-17.2	-16.6	-16.4	-16.6	-16.8	-17.7	-12.6	-15.0
Dec 21	-16.2	-15.8	-14.9	-15	-14.9	-13.5	-12.2	-11.1	-10.2	-10	-9.8	-9.2	-7.6	-6.6	-6.4	-6.6	-6.5	-7.1	-8.1	-8.1	-8.6	-8.7	-8.6	-7.6	-16.2	-6.4	-10.1
Dec 22	-8.3	-8.2	-8.2	-8.6	-8.8	-9.9	-10.7	-11.2	-11.4	-11.6	-11.6	-11.8	-12.3	-12.5	-12.8	-13.1	-13.3	-13.4	-13.7	-13.9	-14	-14.2	-14.5	-14.7	-14.7	-8.2	-11.8
Dec 23	-15	-15.2	-15.3	-15.3	-15.3	-15.2	-15.2	-15.4	-15.5	-15.4	-15.3	-15.2	-15.4	-15.2	-15.4	-16	-17	-17.6	-18.1	-18.4	-18.8	-19.8	-21.1	-21.1	-21.1	-15.0	-16.3
Dec 24	-21.4	-21.8	-21.8	-22.3	-23.1	-23.8	-24.5	-24.9	-24.7	-24.2	-24	-23.5	-23	-22.6	-22.5	-23	-23.4	-23.8	-24.4	-24.8	-25.1	-25.1	-25.6	-26.2	-26.2	-21.4	-23.7
Dec 25	-26.9	-27.5	-28.2	-29.1	-29.5	-29.9	-30.2	-30.5	-30.3	-29.7	-29.7	-29.4	-28.5	-28.3	-28.7	-29.7	-30.2	-30.9	-31.5	-31.5	-31.8	-32	-32	-32.0	-26.9	-29.9	
Dec 26	-31.3	-31.3	-30.8	-30.5	-30.3	-30.3	-30.2	-30.1	-30.1	-30.4	-29.9	-29.5	-29.2	-28.7	-28.6	-28.5	-28.5	-28.7	-29.1	-29.4	-29.5	-29.6	-29.4	-29.3	-31.3	-28.5	-29.7
Dec 27	-29.1	-29	-28.9	-29.2	-30.4	-31.6	-33.1	-33.7	-34.2	-34.7	-34.7	-32.9	-30.5	-29.5	-30.1	-30.8	-32.2	-32.7	-33.7	-34	-34.3	-34.4	-34.9	-34.6	-34.9	-28.9	-32.2
Dec 28	-33.7	-33.7	-36.1	-35.7	-33.9	-36	-35	-36.5	-37.6	-34.7	-34.6	-32.8	-33.1	-32.4	-30.8	-28.9	-28.4	-28.2	-27.9	-27.5	-27.8	-28.2	-28.6	-28.7	-37.6	-27.5	-32.1
Dec 29	-29.1	-29.6	-29.9	-30	-29.8	-30	-30.6	-30.7	-30.5	-29.8	-29	-28.3	-27.8	-27.5	-28.7	-29.8	-30.5	-31.1	-29.8	-30.6	-30.2	-30.4	-29.4	-31.1	-29.7	-27.5	-29.7
Dec 30	-29.4	-30.4	-31.7	-31.4	-30.7	-30.2	-30.2	-30.8	-32.4	-33.3	-33.1	-31.9	-30.4	-29.7	-29.8	-29.8	-30.3	-30.6	-31	-31.2	-31.4	-31.6	-32	-31.7	-33.3	-29.4	-31.0
Dec 31	-31.7	-32.5	-32.5	-32.5	-31.8	-32	-31.8	-31.7	-31.6	-31.7	-31	-29.9	-28.3	-27.5	-27.6	-27.3	-28.6	-29.8	-30.5	-31.4	-32.4	-32.7	-32.8	P	-32.8	-27.3	-30.9
Diurnal Maximum	2.3	3.8	4.7	6.6	6.7	6.0	5.7	5.2	4.9	4.5	4.3	4.2	4.0	3.5	3.2	2.1	1.5	0.2	-1.9	-2.5	-2.9	-3.1	-3.6	-4.5			
Diurnal Average	-17.4	-17.6	-17.8	-17.9	-17.9	-18.2	-18.3	-18.5	-18.7	-18.4	-17.7	-16.9	-16.1	-15.5	-15.3	-15.7	-16.4	-16.8	-17.2	-17.4	-17.6	-17.8	-18.2	-17.8			

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for AT - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

STATION TEMPERATURE (ST) in Degree Celsius

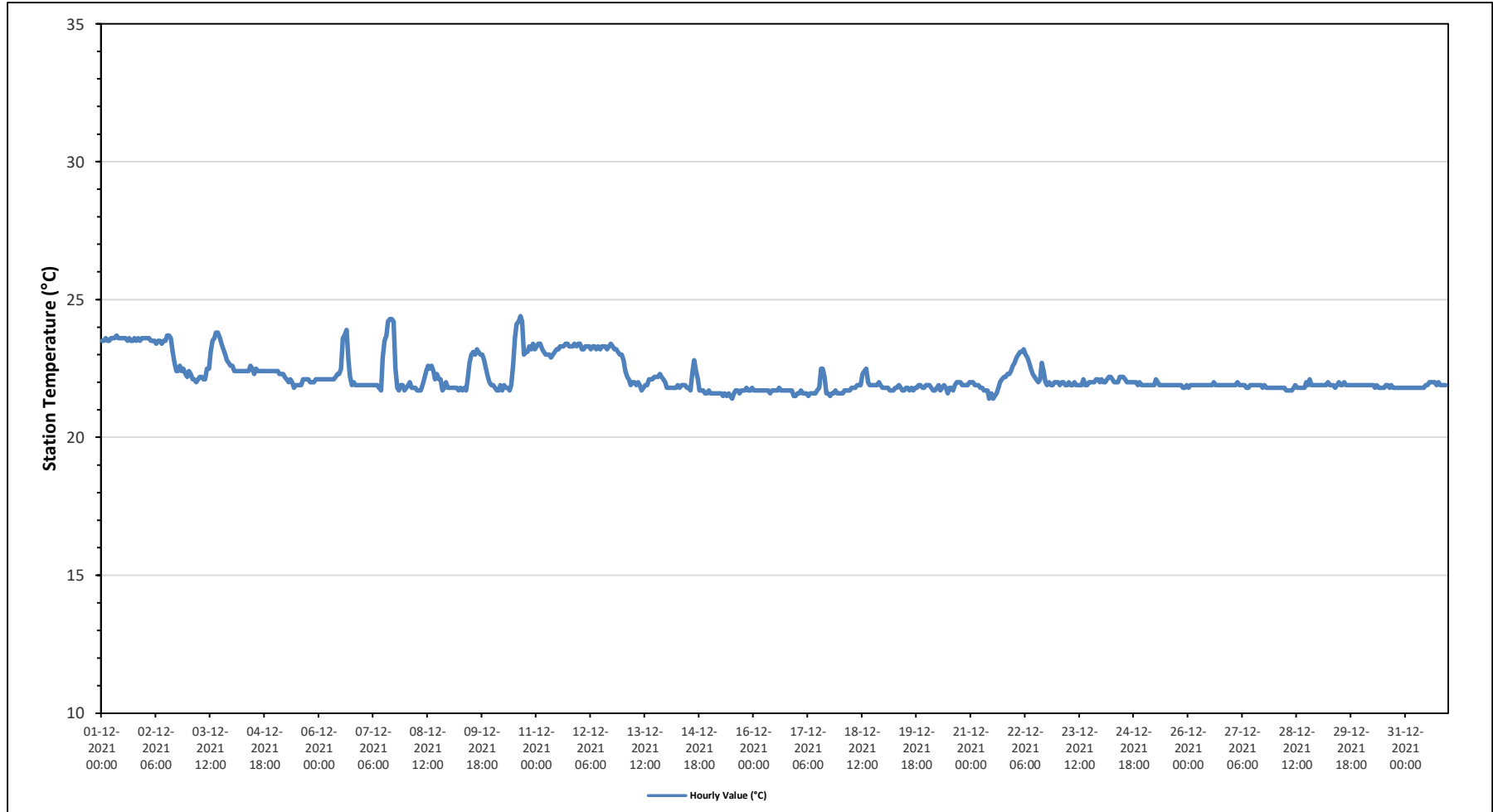
Maximum Hourly Value:	24.4 °C	on December 10 at hour 15	Hours in Service:	744
Maximum Daily Value:	23.6 °C	on December 1	Hours of Data:	743
Minimum Hourly Value:	21.4 °C	on December 15 at hour 12	Hours of Missing Data:	1
Minimum Daily Value:	21.6 °C	on December 15	Hours of Calibration:	0
Monthly Average:	22.2 °C		Operational Uptime:	99.9

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					
Dec 1	23.5	23.5	23.6	23.5	23.5	23.6	23.6	23.6	23.7	23.6	23.6	23.6	23.6	23.5	23.6	23.5	23.5	23.6	23.5	23.6	23.5	23.6	23.6	23.5	23.7	23.6	23.5	23.6	23.6	23.5	23.7	23.2
Dec 2	23.6	23.6	23.6	23.5	23.5	23.5	23.4	23.5	23.5	23.4	23.5	23.5	23.7	23.7	23.6	23.1	22.7	22.4	22.4	22.6	22.4	22.5	22.3	22.2	22.2	22.2	23.7	23.2	22.2	22.2	23.2	
Dec 3	22.4	22.3	22.1	22.1	22.0	22.1	22.2	22.2	22.1	22.1	22.5	22.5	23.1	23.5	23.6	23.8	23.8	23.6	23.4	23.2	23.0	22.8	22.7	22.6	22.0	23.8	22.7	22.6	22.0	22.7	22.7	
Dec 4	22.6	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.6	22.5	22.3	22.5	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.3	22.6	22.4	22.4	22.3	22.6	22.4	
Dec 5	22.4	22.4	22.3	22.3	22.3	22.2	22.1	22.0	22.1	22.0	21.8	21.9	21.9	21.9	21.9	22.1	22.1	22.1	22.1	22.0	22.0	22.0	22.1	22.1	21.8	22.4	22.1	22.1	21.8	22.4	22.1	
Dec 6	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.2	22.3	22.3	22.5	23.6	23.7	23.9	22.8	22.2	21.9	22.0	21.9	21.9	21.9	21.9	21.9	21.9	23.9	22.3	21.9	21.9	22.3	
Dec 7	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.7	22.9	23.5	23.7	24.2	24.3	24.3	24.2	22.5	21.8	21.7	21.9	21.9	21.7	21.7	24.3	22.5	21.7	21.9	21.7	22.5	
Dec 8	21.8	21.9	22.0	21.8	21.8	21.8	21.7	21.7	21.7	21.9	22.1	22.4	22.6	22.5	22.6	22.4	22.1	22.3	22.1	22.1	21.7	21.8	22.0	21.8	21.7	22.6	22.0	21.7	22.6	22.0	22.0	
Dec 9	21.8	21.8	21.8	21.8	21.8	21.7	21.8	21.7	21.8	21.7	22.1	22.7	23.0	23.1	23.0	23.2	23.1	23.0	22.8	22.5	22.2	22.0	21.9	21.9	21.7	23.2	22.3	21.7	23.2	22.3	22.3	
Dec 10	21.9	21.8	21.7	21.7	21.9	21.7	21.9	21.8	21.8	21.7	21.9	22.6	23.6	24.1	24.2	24.4	24.2	23.0	23.1	23.1	23.3	23.2	23.4	23.2	21.7	24.4	22.7	21.7	24.4	22.7	22.7	
Dec 11	23.3	23.4	23.4	23.2	23.1	23.0	23.0	23.0	23.0	23.1	23.2	23.2	23.3	23.3	23.3	23.3	23.4	23.3	23.3	23.3	23.4	23.3	23.3	23.4	22.9	23.4	23.2	22.9	23.4	23.2	23.2	
Dec 12	23.4	23.2	23.2	23.3	23.3	23.3	23.2	23.3	23.3	23.2	23.3	23.2	23.3	23.3	23.3	23.2	23.3	23.3	23.2	23.3	23.2	23.1	23.0	23.0	23.0	23.0	23.4	23.2	23.0	23.4	23.2	23.2
Dec 13	22.8	22.4	22.2	22.1	21.9	22.0	22.0	21.9	22.0	21.9	21.7	21.8	21.9	21.9	22.1	22.1	22.1	22.2	22.2	22.2	22.2	22.3	22.2	22.1	21.7	22.8	22.1	21.7	22.8	22.1	22.1	
Dec 14	21.8	21.8	21.8	21.8	21.8	21.8	21.9	21.8	21.9	21.9	21.9	21.8	21.8	21.7	22.4	22.8	22.4	22.1	21.7	21.7	21.7	21.6	21.6	21.7	21.6	22.8	21.9	21.6	22.8	21.9	21.9	
Dec 15	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.5	21.6	21.5	21.6	21.5	21.4	21.6	21.7	21.6	21.7	21.7	21.7	21.7	21.8	21.7	21.7	21.8	21.4	21.8	21.6	21.4	21.8	21.6	21.6	
Dec 16	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.6	21.7	21.7	21.7	21.7	21.8	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.5	21.5	21.5	21.8	21.5	21.8	21.7	21.7	
Dec 17	21.6	21.6	21.7	21.6	21.6	21.6	21.5	21.6	21.6	21.6	21.6	21.7	21.8	22.5	22.5	22.2	21.6	21.6	21.5	21.6	21.6	21.7	21.6	21.5	21.5	22.5	21.7	21.6	21.6	21.6	21.7	
Dec 18	21.6	21.6	21.7	21.7	21.7	21.7	21.8	21.8	21.8	21.9	21.9	21.9	22.3	22.4	22.5	22.0	21.9	21.9	21.9	21.9	21.9	22.0	21.9	21.8	21.6	22.5	21.9	21.6	22.5	21.9	21.9	
Dec 19	21.8	21.8	21.8	21.7	21.7	21.7	21.8	21.8	21.9	21.8	21.7	21.7	21.8	21.8	21.7	21.8	21.7	21.8	21.8	21.8	21.9	21.9	21.8	21.8	21.7	21.8	21.9	21.7	21.9	21.8	21.8	
Dec 20	21.9	21.9	21.8	21.7	21.7	21.8	21.9	21.7	21.8	21.9	21.8	21.6	21.8	21.8	21.7	21.9	22.0	22.0	22.0	22.0	21.9	21.9	21.9	22.0	21.6	22.0	21.9	21.6	22.0	21.8	21.8	
Dec 21	22.0	22.0	21.9	21.9	21.9	21.8	21.8	21.7	21.7	21.7	21.4	21.6	21.4	21.5	21.6	21.8	22.0	22.1	22.2	22.2	22.2	22.3	22.4	22.6	21.4	22.6	21.9	22.6	21.9	21.9	21.9	
Dec 22	22.7	22.9	23.0	23.1	23.1	23.2	23.0	22.9	22.7	22.5	22.3	22.2	22.1	22.0	22.1	22.7	22.4	22.0	21.9	22.0	21.9	22.0	22.0	21.9	21.9	23.2	22.0	21.9	23.2	22.4	22.4	
Dec 23	22.0	21.9	22.0	22.0	21.9	21.9	22.0	21.9	21.9	22.0	21.9	21.9	21.9	21.9	22.1	21.9	21.9	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.9	22.1	22.0	21.9	22.1	22.0	22.0	
Dec 24	22.1	22.0	22.0	22.1	22.2	22.2	22.1	22.0	22.0	22.0	22.2	22.2	22.2	22.1	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.9	22.2	22.0	21.9	22.2	22.0	22.0	
Dec 25	21.9	21.9	21.9	21.9	21.9	21.9	22.1	22.0	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.8	21.9	21.8	21.8	22.1	21.9	21.9	
Dec 26	21.8	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	22.0	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	22.0	21.9	21.8	22.0	21.9	21.9	
Dec 27	21.9	21.9	21.9	22.0	21.9	21.9	21.9	21.9	21.9	21.8	21.8	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.9	21.8	21.8	21.8	21.8	21.8	21.8	22.0	21.9	21.8	22.0	21.9	21.9	
Dec 28	21.8	21.8	21.8	21.8	21.8	21.8	21.7	21.7	21.7	21.8	21.9	21.8	21.8	21.8	21.8	21.8	21.8	22.0	21.9	22.1	21.9	21.9	21.9	21.9	21.7	22.1	21.8	22.1	21.8	21.8	21.8	
Dec 29	21.9	21.9	21.9	21.9	21.9	22.0	21.9	21.9	21.9	21.8	21.9	22.0	21.9	21.9	22.0	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	22.0	21.9	21.8	22.0	21.9	21.9	
Dec 30	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.8	21.9	21.8	21.8	21.8	21.9	21.9	21.8	21.9	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.9	21.8	21.9	21.8	21.8	
Dec 31	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.9	21.9	22.0	22.0	22.0	22.0	21.9	22.0	21.9	21.9	21.9	21.9	21.8	21.8	22.0	21.9	21.9	21.9	21.9	21.9	
Diurnal Maximum	23.6	23.6	23.6	23.5	23.5	23.6	23.6	23.6	23.7	23.6	23.6	23.6	23.7	24.1	24.2	24.4	24.3	24.2	23.6	23.5	23.6	23.5	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6		
Diurnal Average	22.2	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.2	22.3	22.4	22.5	22.5	22.4	22.3	22.2	22.2	22.2	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1		

C	Monthly Calibration	S	Daily Zero-Span Check	Q	Quality Assurance
K	Collection Error	N	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.

Timeseries Chart of Hourly Average for ST - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

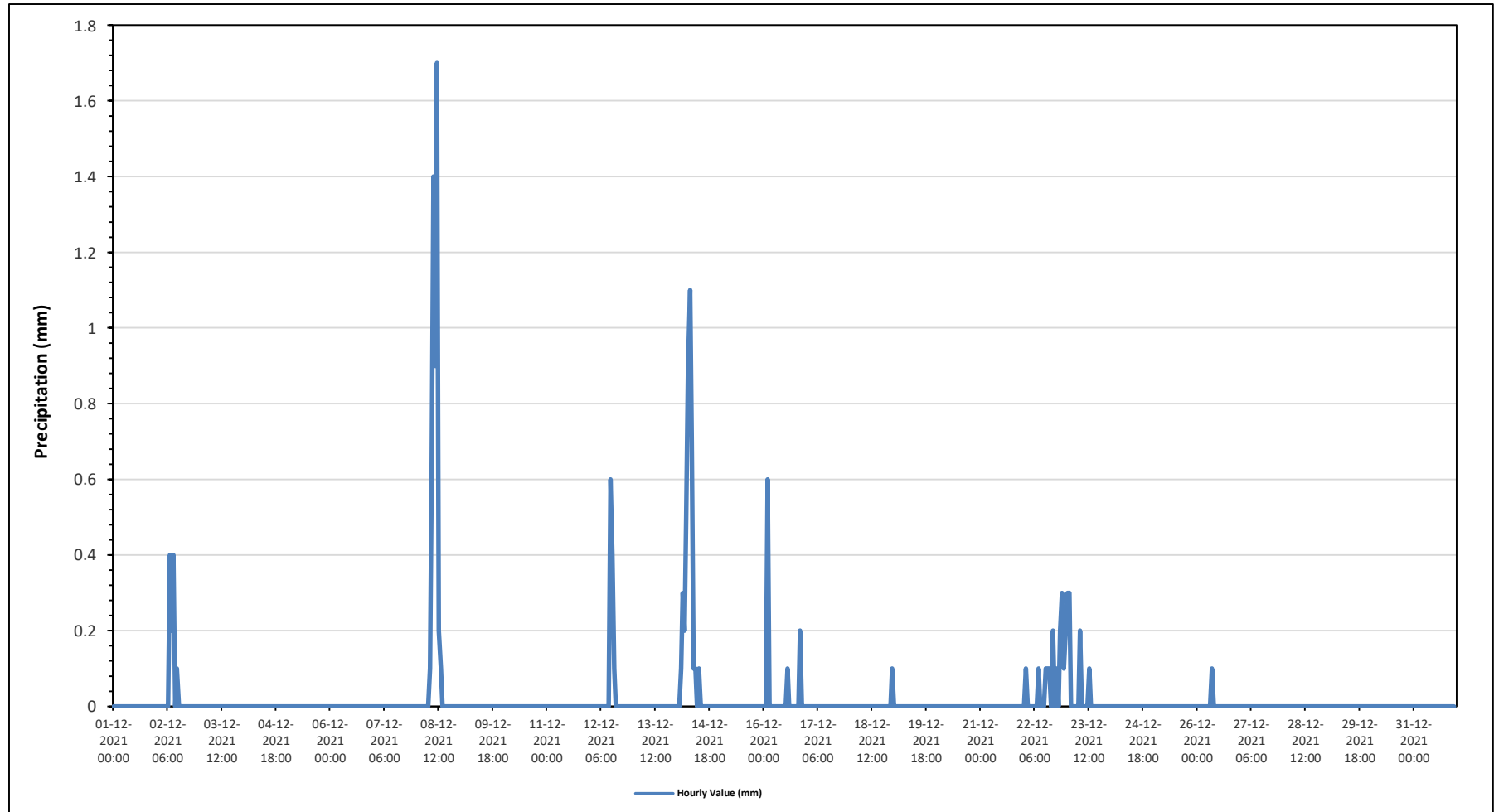
PRECIPITATION in mm

Maximum Hourly Value:	1.7 mm on December 8 at hour 11	Hours in Service:	744
Maximum Daily Value:	5.0 mm on December 8	Hours of Data:	743
Minimum Hourly Value:	0.0 mm on December 1 at hour 0	Hours of Missing Data:	1
Minimum Daily Value:	0.0 mm on December 1	Hours of Calibration:	0
Monthly Total:	14.9 mm	Operational Uptime:	99.9

Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Total					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23				
Dec 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				
Dec 2	0	0	0	0	0	0	0	0.4	0.2	0.4	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.4	1.1				
Dec 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				
Dec 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				
Dec 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				
Dec 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				
Dec 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				
Dec 8	0	0	0	0	0	0	0	0.1	0.6	1.4	0.9	1.7	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0.0	1.7	5.0				
Dec 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				
Dec 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				
Dec 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				
Dec 12	0	0	0	0	0	0	0	0	0	0	0	0.6	0.4	0.1	0	0	0	0	0	0	0	0	0	0	0.0	0.6	1.1				
Dec 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				
Dec 14	0	0	0.1	0.3	0.2	0.5	0.9	1.1	0.7	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.0	1.1	4.1				
Dec 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				
Dec 16	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.2	0	0	0.0	0.6	0.9				
Dec 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				
Dec 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0.1	0.1				
Dec 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				
Dec 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				
Dec 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				
Dec 22	0	0.1	0	0	0	0	0	0	0.1	0	0	0	0.1	0.1	0.1	0	0.2	0	0.1	0	0.2	0.3	0.1	0.2	0.0	0.3	1.6				
Dec 23	0.3	0.3	0	0	0	0	0	0.2	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0.0	0.3	0.9				
Dec 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				
Dec 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				
Dec 26	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	0.1	0.1				
Dec 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				
Dec 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				
Dec 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				
Dec 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				
Dec 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0.0	0.0	0.0				
Diurnal Maximum	0.3	0.3	0.6	0.3	0.2	0.5	0.9	1.1	0.7	1.4	0.9	1.7	0.4	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.2	0.3	0.1	0.2							
Diurnal Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	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							
C	Monthly Calibration							S	Daily Zero-Span Check							Q	Quality Assurance														
K	Collection Error							N	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.

Timeseries Chart of Hourly Average for Precipitation - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

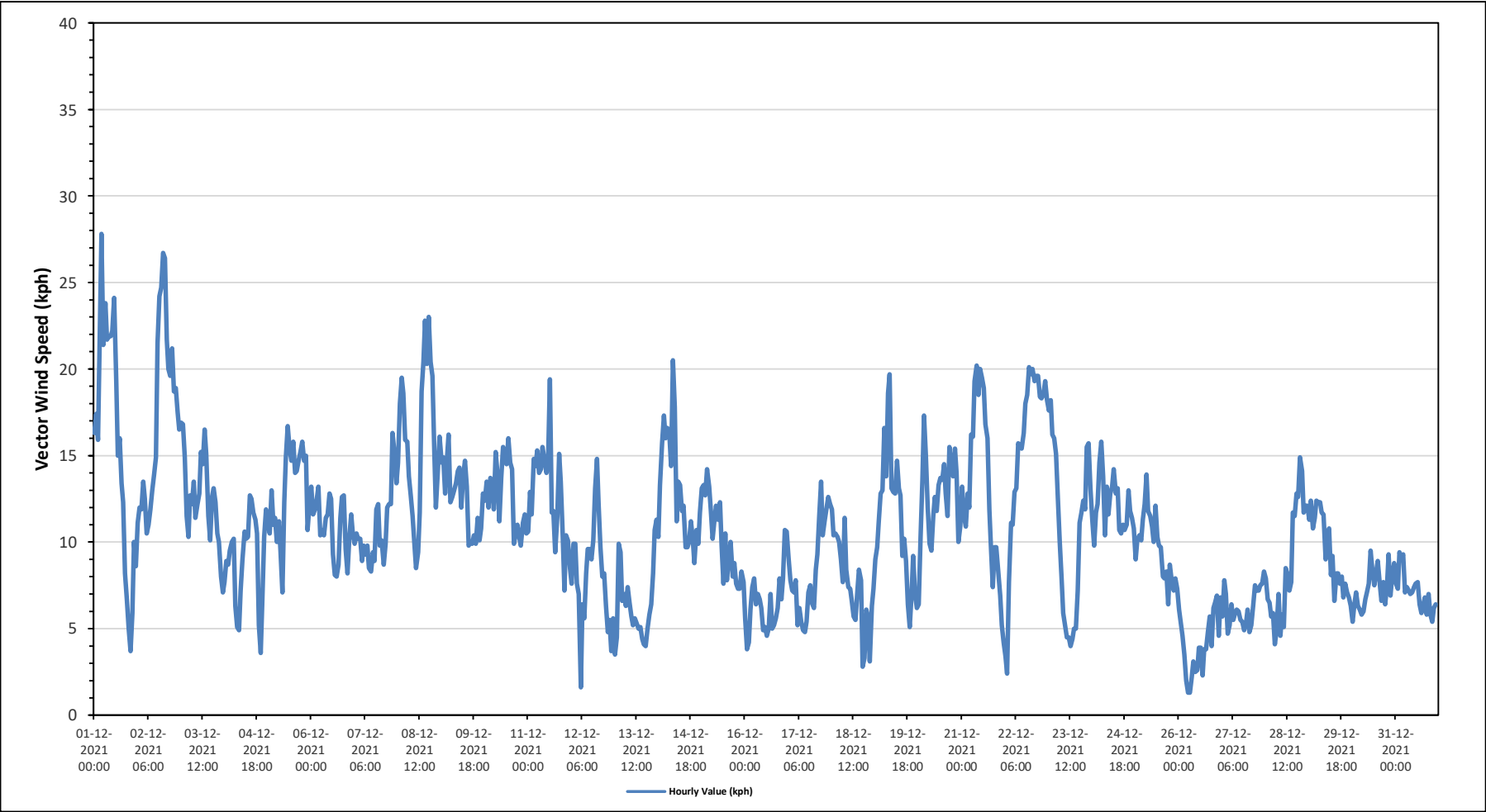
Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr

Maximum Hourly Value:	27.8 kph on December 1 at hour 4	Hours in Service:	744
Maximum Daily Value:	15.2 kph on December 22	Hours of Data:	743
Minimum Hourly Value:	1.3 kph on December 26 at hour 5	Hours of Missing Data:	1
Minimum Daily Value:	3.3 kph on December 4	Hours of Calibration:	0
Monthly Average:	5.2 kph	Operational Uptime:	99.9

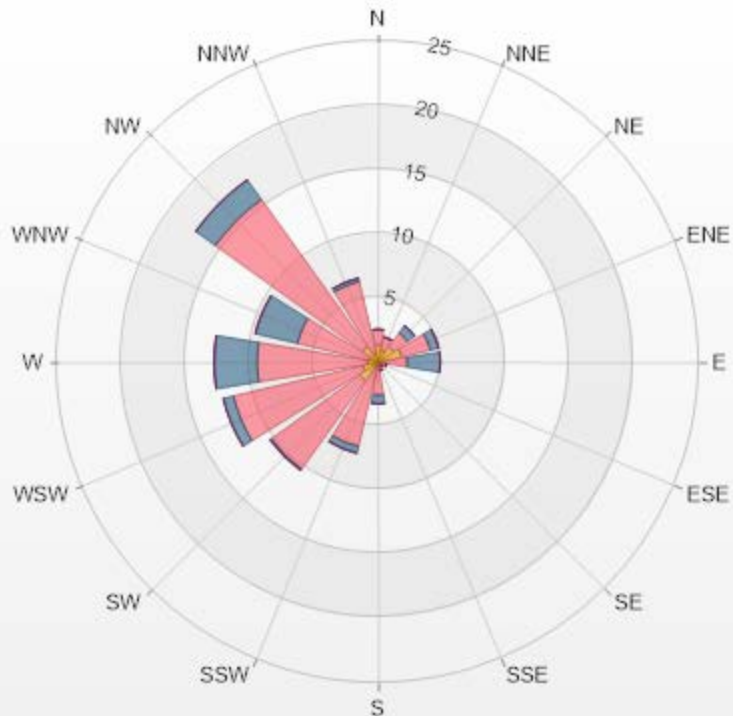
Day	Hourly Period Starting at (MST)																							Daily Minimum	Daily Maximum	Daily Average					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				23				
Dec 1	16.3	17.4	15.9	22.3	27.8	21.4	23.8	21.7	21.9	21.9	22.2	24.1	19.3	15.0	16.0	13.4	12.3	8.2	6.7	5.0	3.7	5.9	10.0	8.6	3.7	27.8	13.6				
Dec 2	11.1	12.0	11.9	13.5	12.5	10.5	11.0	11.9	13.0	13.9	14.9	21.5	24.2	24.7	26.7	26.4	21.7	20.0	19.6	21.2	18.7	18.9	17.5	16.5	10.5	26.7	13.6				
Dec 3	16.9	16.8	14.9	11.5	10.3	12.7	12.2	13.5	11.4	12.2	12.8	15.2	14.5	16.5	15.1	11.5	10.1	12.6	13.1	12.3	10.5	10.0	8.0	7.1	7.1	16.9	12.4				
Dec 4	7.7	8.9	8.7	9.5	10.0	10.2	6.3	5.1	4.9	7.2	9.0	10.6	10.2	10.3	12.7	12.5	11.7	11.3	10.5	5.2	3.6	6.6	10.3	11.9	3.6	12.7	3.3				
Dec 5	11.0	10.5	13.0	11.0	11.4	10.0	11.2	9.4	7.1	12.3	14.9	16.7	15.4	14.7	15.8	14.0	14.1	14.7	15.2	15.8	14.7	15.0	10.7	12.1	7.1	16.7	10.9				
Dec 6	13.2	11.6	11.9	12.5	13.2	10.4	10.7	10.4	11.4	11.6	12.8	12.5	9.3	8.1	8.0	8.7	11.4	12.6	12.7	9.6	8.2	10.3	11.6	10.5	8.0	13.2	10.8				
Dec 7	9.9	10.5	10.2	10.2	8.9	9.8	9.3	9.8	8.5	8.3	9.4	8.9	11.9	12.2	9.8	10.1	8.7	9.9	12.0	12.2	12.2	16.3	15.1	13.4	8.3	16.3	9.5				
Dec 8	14.6	18.0	19.5	18.6	15.9	15.8	13.8	12.7	11.5	10.1	8.5	9.4	11.7	18.7	20.4	22.8	20.3	23.0	20.4	19.6	15.3	12.0	14.0	16.1	8.5	23.0	9.9				
Dec 9	14.6	14.9	12.8	14.8	16.2	12.3	12.6	13.0	13.4	14.1	14.3	12.0	13.8	14.7	13.2	9.8	10.0	9.9	10.4	9.9	11.4	10.1	10.8	12.8	9.8	16.2	12.4				
Dec 10	12.4	13.5	12.0	13.7	13.5	11.9	15.2	14.1	11.2	13.7	15.5	15.1	14.5	16.0	14.6	14.2	9.9	10.4	11.0	10.3	9.8	11.1	11.6	10.5	9.8	16.0	12.1				
Dec 11	10.6	12.9	11.6	14.8	14.4	15.3	14.0	14.2	15.5	14.8	14.0	14.6	19.4	11.7	11.8	9.4	11.5	15.1	13.5	10.6	7.2	10.4	10.1	8.5	7.2	19.4	10.6				
Dec 12	7.6	9.9	9.9	7.6	7.0	1.6	6.4	5.6	8.2	9.6	9.6	9.0	10.1	13.1	14.8	12.2	9.7	8.0	8.2	6.3	4.8	5.5	3.7	5.6	1.6	14.8	5.8				
Dec 13	3.5	4.5	9.9	9.4	6.6	7.0	6.3	7.4	6.5	5.7	5.2	5.6	5.3	5.0	5.1	4.4	4.1	4.0	5.0	5.8	6.4	8.2	10.7	11.3	3.5	11.3	5.3				
Dec 14	10.3	13.3	15.7	17.3	16.0	16.6	16.4	14.4	20.5	17.8	11.2	13.5	13.3	11.8	12.1	9.7	9.7	10.0	11.2	10.2	8.8	10.7	9.9	11.7	8.8	20.5	10.4				
Dec 15	13.1	13.3	12.7	14.2	13.2	11.9	10.2	11.3	20.1	11.3	12.3	9.8	7.6	10.5	7.8	9.0	10.0	8.0	8.8	7.6	7.3	7.3	8.3	7.7	7.3	14.2	9.7				
Dec 16	5.6	3.8	4.2	6.1	7.4	7.9	6.4	7.0	6.7	6.2	4.9	5.1	4.6	5.0	7.0	5.0	5.2	5.6	6.2	7.9	6.7	7.9	10.7	10.6	3.8	10.7	4.7				
Dec 17	9.1	7.8	7.2	7.1	7.8	5.2	6.2	5.4	4.9	4.8	5.4	7.1	7.5	6.5	6.2	8.4	9.3	11.5	13.5	10.4	11.3	12.0	12.6	12.2	4.8	13.5	5.3				
Dec 18	11.9	10.4	10.5	10.3	10.0	9.0	7.7	11.4	8.4	7.4	7.3	6.6	5.7	5.5	6.9	8.4	7.8	2.8	3.3	6.1	5.7	3.1	6.3	7.3	2.8	11.9	3.4				
Dec 19	9.0	9.7	11.2	12.8	13.0	16.6	13.8	18.6	19.7	13.1	12.9	12.8	14.7	13.1	12.7	9.2	10.2	8.9	6.4	5.1	7.0	9.2	7.0	6.2	5.1	19.7	11.1				
Dec 20	6.4	10.3	13.6	17.3	15.0	12.0	9.9	9.5	11.5	12.6	11.8	13.3	13.7	13.6	14.5	12.8	11.5	15.5	14.7	13.8	15.4	14.0	10.0	10.9	6.4	17.3	12.4				
Dec 21	13.2	11.5	10.9	12.8	12.0	16.2	16.1	19.3	20.2	18.5	20.0	19.5	18.9	16.8	16.0	11.9	9.7	7.4	9.7	9.7	8.4	6.9	5.2	4.2	4.2	20.2	12.6				
Dec 22	3.4	2.4	7.7	11.1	11.0	12.9	13.1	15.7	15.5	15.4	16.3	18.0	18.5	20.1	19.7	20.0	19.3	19.6	19.6	18.4	18.3	18.5	19.3	18.2	2.4	20.1	15.2				
Dec 23	17.6	18.2	16.2	16.0	15.1	12.5	10.0	7.9	5.9	5.2	4.5	4.5	4.0	4.4	5.0	5.0	7.2	11.1	11.7	12.4	11.9	15.5	15.7	13.1	4.0	18.2	6.3				
Dec 24	11.3	9.8	11.7	12.2	14.6	15.8	13.8	10.4	13.2	11.6	12.8	13.2	14.2	12.8	13.1	10.7	10.5	11.0	10.7	11.0	13.0	11.8	11.4	10.8	9.8	15.8	12.0				
Dec 25	9.0	10.1	10.4	10.1	11.3	12.2	13.9	11.8	11.5	10.9	10.0	12.1	10.3	9.8	9.7	8.0	7.9	8.3	6.4	8.7	7.8	7.2	7.9	7.3	6.4	13.9	9.4				
Dec 26	6.1	5.4	4.6	3.5	2.0	1.3	1.3	2.2	3.1	2.5	2.6	3.9	3.9	2.3	3.8	3.8	4.8	5.7	4.0	6.2	6.5	6.9	4.6	6.8	1.3	6.9	3.8				
Dec 27	5.7	7.8	7.0	4.7	5.2	6.4	5.5	5.9	6.1	6.0	5.5	5.4	4.9	5.3	6.1	4.8	5.2	6.3	7.5	7.2	7.2	7.5	7.6	8.3	4.7	8.3	5.8				
Dec 28	7.9	6.7	6.5	5.7	5.9	4.1	4.8	7.0	4.6	5.8	5.1	8.5	8.2	7.2	7.7	11.7	11.5	12.8	12.6	14.9	14.1	11.7	12.1	12.1	4.1	14.9	7.9				
Dec 29	11.3	12.4	10.8	11.4	12.4	12.3	12.3	11.7	11.6	9.0	10.5	10.8	8.1	9.2	6.6	8.2	8.2	7.6	8.0	6.8	7.6	7.1	6.8	6.3	6.3	12.4	6.5				
Dec 30	5.4	6.3	7.1	6.3	6.1	5.8	6.0	6.7	7.1	7.6	9.5	8.3	7.5	8.3	8.9	7.7	6.6	7.7	6.4	7.5	9.3	6.9	8.1	8.8	5.4	9.5	5.8				
Dec 31	7.6	7.3	9.4	9.0	9.3	7.1	7.4	7.2	7.0	7.1	7.4	7.6	7.7	6.4	5.9	6.3	6.8	5.8	7.0	5.8	5.4	6.2	6.4	P	5.4	9.4	5.4				
Diurnal Maximum	18	18	20	22	28	21	24	22	22	22	22	24	24	25	27	26	22	23	20	21	19	19	19	18							
Diurnal Average	10.1	10.6	11.0	11.5	11.5	10.8	10.6	10.7	10.8	10.6	10.7	11.5	11.4	11.3	11.4	10.6	10.2	10.5	10.5	10.1	9.6	10.0	10.1	10.2							
C	Monthly Calibration							S	Daily Zero-Span Check							Q	Quality Assurance														
K	Collection Error							N	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.																															

Timeseries Chart of Hourly Average for VWS - St. Lina Site



Wind: St. Lina Monitor: WDS [kph] Monthly: 12-2021 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.40% Valid Data: 99.87%

Direction	1.8-6.0	6.0-15.0	15.0-29.0	29.0-39.0	>39.0	Total
N	1.35	1.21	0	0	0	2.56
NNE	0.94	1.08	0	0	0	2.02
NE	1.48	1.35	0.67	0	0	3.5
ENE	1.88	2.29	0.67	0	0	4.84
E	0.4	1.88	2.56	0	0	4.84
ESE	0.13	0.54	0	0	0	0.67
SE	0	0.4	0	0	0	0.4
SSE	0.27	0.4	0	0	0	0.67
S	0.27	2.29	0.67	0	0	3.23
SSW	0.27	6.46	0.54	0	0	7.27
SW	1.75	8.48	0.13	0	0	10.36
WSW	1.21	10.36	0.81	0	0	12.38
W	0.81	8.61	3.36	0	0	12.78
WNW	0.67	5.79	3.36	0	0	9.82
NW	1.48	14.13	1.88	0	0	17.49
NNW	0.67	5.79	0.27	0	0	6.73
Summary	13.58	71.06	14.92	0	0	100



LICA-202112

% Icon Classes (kph)	14	1.8-6.0	71	6.0-15.0	15	15.0-29.0	0	29.0-39.0	0	>39.0
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LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

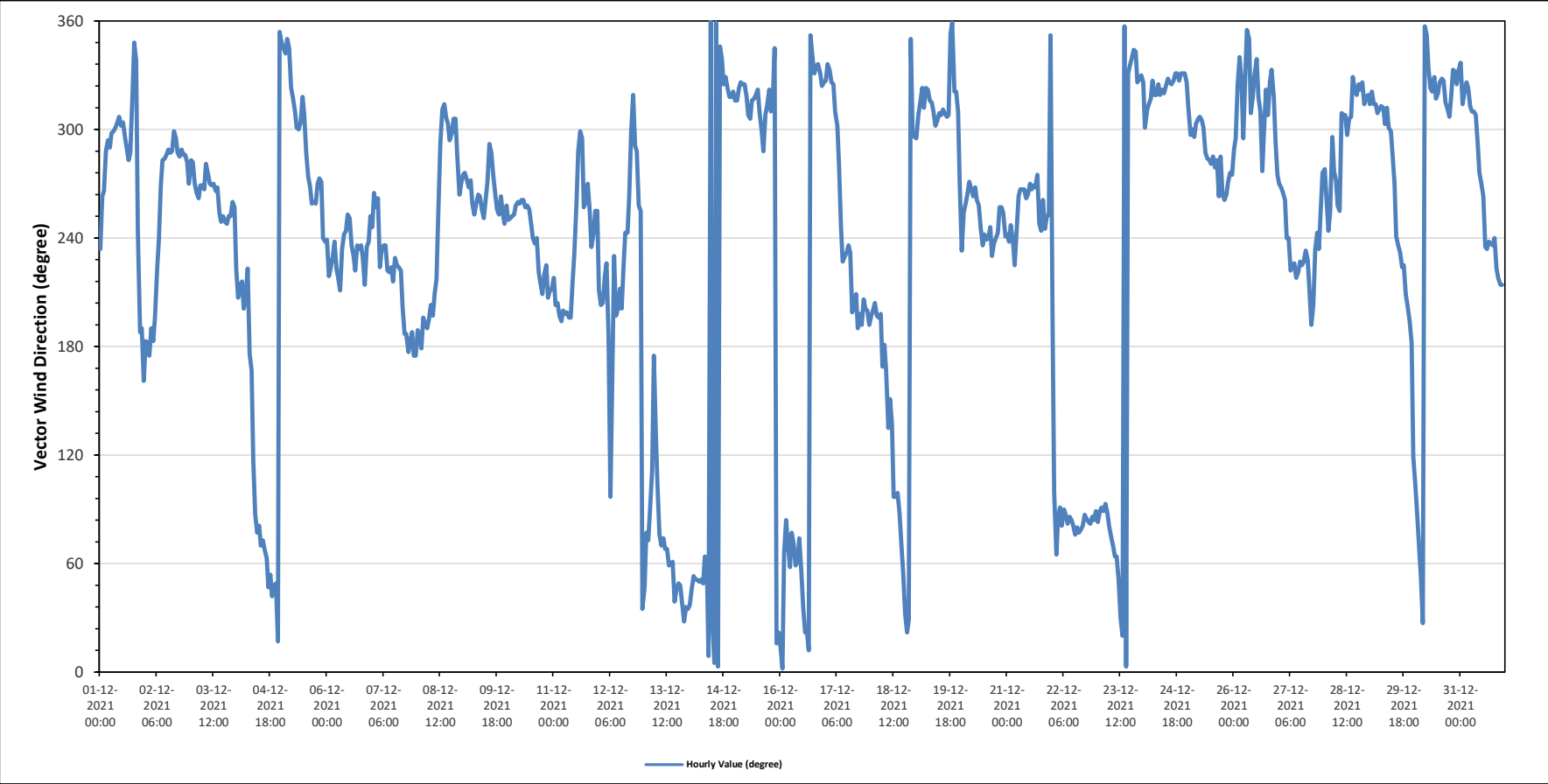
St. Lina Site - December 2021

Summary of Hourly Averages

WIND DIRECTION (VWD) in sector

Monthly Average: 278 (W) degree										Hours in Service: 744																																	
										Hours of Data: 743																																	
										Hours of Missing Data: 1																																	
										Hours of Calibration: 0																																	
										Operational Uptime: 99.9																																	
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																	
Dec 1	SW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	W	WNW	NW	NNW	NNW	WSW	S	S	SSE	289	WNW																	
Dec 2	S	S	S	S	S	SSW	SW	WSW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	271	W																	
Dec 3	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	265	W																	
Dec 4	SW	SSW	SSW	SW	SSW	SSW	SW	S	SSE	ESE	E	ENE	E	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	N	88	E																	
Dec 5	NNW	NNW	NNW	N	NNW	NW	NW	NW	WNW	WNW	WNW	NW	NW	WNW	W	WSW	WSW	WSW	W	W	W	WSW	SW	293	WNW																		
Dec 6	WSW	SW	SW	SW	SW	SW	SW	SSW	SW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	WSW	233	SW																	
Dec 7	WSW	W	WSW	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	S	S	S	S	S	S	S	214	SSW																	
Dec 8	S	S	S	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	256	SSW																	
Dec 9	W	W	W	W	W	WSW	WSW	WSW	W	W	WSW	WSW	W	W	WNW	WNW	W	W	WSW	WSW	W	WSW	WSW	WSW	265	W																	
Dec 10	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	242	WSW																	
Dec 11	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	231	SW																	
Dec 12	SSW	SSW	SSW	SW	SW	S	E	SSE	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	230	SW																	
Dec 13	NE	ENE	ENE	E	ESE	S	SE	ESE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NNE	NE	NE	67	ENE																	
Dec 14	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	N	NNE	N	N	NNE	N	N	NNW	NNW	NW	NNW	NW	NW	NW	21	NNE																	
Dec 15	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NNW	NNE	NNE	320	NW																	
Dec 16	NNE	N	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NNE	NNE	N	NNW	NNW	NW	20	NNE																	
Dec 17	NW	NNW	NNW	NW	NW	NW	WNW	W	WSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	S	SSW	S	SSW	SSW	SSW	S	230	SW																	
Dec 18	SSW	SSW	SSW	SSW	SSW	SSW	SSE	S	SSE	SE	SSE	SE	SE	SE	E	E	E	ENE	NE	NNE	NNE	N	WNW	WNW	161	SSE																	
Dec 19	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	NW	N	N	NW	NW	W	313	NW																	
Dec 20	SW	WSW	WSW	W	W	W	W	W	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	250	WSW																	
Dec 21	WSW	SW	WSW	SW	SW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	WSW	WSW	W	WSW	WSW	N	258	WSW																	
Dec 22	SSW	E	ENE	E	E	E	E	E	E	E	E	E	E	ENE	E	ENE	ENE	E	E	E	E	E	E	E	83	E																	
Dec 23	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	NE	NNE	NNE	N	N	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW	37	NE																	
Dec 24	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	NW	NNW	NNW	NW	NNW	NNW	NW	323	NW																	
Dec 25	NW	WNW	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	W	W	W	WNW	W	W	W	W	W	W	288	WNW																	
Dec 26	WNW	WNW	NW	NNW	NW	WNW	NNW	N	N	NW	NW	NNW	NNW	NW	NW	W	WNW	NW	NW	NW	NNW	NW	WNW	W	314	NW																	
Dec 27	W	W	W	W	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	SSW	SW	WSW	SW	WSW	W	236	SW																		
Dec 28	W	W	WSW	WSW	WNW	W	W	WSW	WSW	NW	NW	NW	WNW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	305	WNW																	
Dec 29	NW	NW	NW	NW	NW	NW	NW	NW	WNW	NW	WNW	WNW	WNW	W	WSW	SW	SW	SSW	SSW	SSW	S	ESE	283	W																			
Dec 30	ESE	E	ENE	NE	NNE	N	N	NNW	NW	NNW	NW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	338	NNW																	
Dec 31	NNW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	W	W	W	SW	SW	SW	SW	SW	WSW	SW	SSW	SSW	P	277	W																		
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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.																																											

Timeseries Chart of Hourly Average for VWD - St. Lina Site





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED																												
Maximum Hourly Value:		27.8 kph on December 1 at hour 4										Hours in Service:		744														
Maximum Daily Value:		15.2 kph on December 22										Hours of Data:		743														
Minimum Hourly Value:		1.3 kph on December 26 at hour 5										Hours of Missing Data:		1														
Minimum Daily Value:		3.3 kph on December 4										Hours of Calibration:		0														
Monthly Average:		5.2 kph										Operational Uptime:		99.9														
WIND DIRECTION																												
Monthly Average:		278 (W) degree																										
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	
Dec 1	16.3	17.4	15.9	22.3	27.8	21.4	23.8	21.7	21.9	21.9	22.2	24.1	19.3	15.0	16.0	13.4	12.3	8.2	6.7	5.0	3.7	5.9	10.0	8.6	3.7	27.8	13.6	
SW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	W	WNW	NW	NNW	NNW	WSW	S	S	SSE				
Dec 2	11.1	12.0	11.9	13.5	12.5	10.5	11.0	11.9	13.0	13.9	14.9	21.5	24.2	24.7	26.7	26.4	21.7	20.0	19.6	21.2	18.7	18.9	17.5	16.5	10.5	26.7	13.6	
S	S	S	S	S	SSW	SW	WSW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W			
Dec 3	16.9	16.8	14.9	11.5	10.3	12.7	12.2	13.5	11.4	12.2	12.8	15.2	14.5	16.5	15.1	11.5	10.1	12.6	13.1	12.3	10.5	10.0	8.0	7.1	7.1	16.9	12.4	
W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW				
Dec 4	7.7	8.9	8.7	9.5	10.0	10.2	6.3	5.1	4.9	7.2	9.0	10.6	10.2	10.3	12.7	12.5	11.7	11.3	10.5	5.2	3.6	6.6	10.3	11.9	3.6	12.7	3.3	
SW	SSW	SSW	SW	SSW	SSW	SW	S	SSE	ESE	E	ENE	E	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	N					
Dec 5	11.0	10.5	13.0	11.0	11.4	10.0	11.2	9.4	7.1	12.3	14.9	16.7	15.4	14.7	15.8	14.0	14.1	14.7	15.2	15.8	14.7	15.0	10.7	12.1	7.1	16.7	10.9	
NNW	NNW	NNW	N	NNW	NW	NW	NW	WNW	WNW	WNW	NW	NW	WNW	W	W	WSW	WSW	WSW	W	W	W	WSW	SW					
Dec 6	13.2	11.6	11.9	12.5	13.2	10.4	10.7	10.4	11.4	11.6	12.8	12.5	9.3	8.1	8.0	8.7	11.4	12.6	12.7	9.6	8.2	10.3	11.6	10.5	8.0	13.2	10.8	
WSW	SW	SW	SW	SW	SW	SSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	WSW				
Dec 7	9.9	10.5	10.2	10.2	8.9	9.8	9.3	9.8	8.5	8.3	9.4	8.9	11.9	12.2	9.8	10.1	8.7	9.9	12.0	12.2	12.2	16.3	15.1	13.4	8.3	16.3	9.5	
WSW	W	WSW	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	S	S	S	S	S	S				
Dec 8	14.6	18.0	19.5	18.6	15.9	15.8	13.8	12.7	11.5	10.1	8.5	9.4	11.7	18.7	20.4	22.8	20.3	23.0	20.4	19.6	15.3	12.0	14.0	16.1	8.5	23.0	9.9	
S	S	S	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	WNW	NW	NW	NW	WNW	WNW	WNW	NW	NW	WNW	W	W				
Dec 9	14.6	14.9	12.8	14.8	16.2	12.3	12.6	13.0	13.4	14.1	14.3	12.0	13.8	14.7	13.2	9.8	10.0	9.9	10.4	9.9	11.4	10.1	10.8	12.8	9.8	16.2	12.4	
W	W	W	W	W	WSW	WSW	WSW	W	W	WSW	WSW	W	W	WNW	WNW	W	W	WSW	WSW	W	WSW	WSW	WSW	WSW				
Dec 10	12.4	13.5	12.0	13.7	13.5	11.9	15.2	14.1	11.2	13.7	15.5	15.1	14.5	16.0	14.6	14.2	9.9	10.4	11.0	10.3	9.8	11.1	11.6	10.5	9.8	16.0	12.1	
WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW				
Dec 11	10.6	12.9	11.6	14.8	14.4	15.3	14.0	14.2	15.5	14.8	14.0	14.6	19.4	11.7	11.8	9.4	11.5	15.1	13.5	10.6	7.2	10.4	10.1	8.5	7.2	19.4	10.6	
SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	WSW	WNW	WNW	WNW	WSW	WSW	W	WSW	SW	WSW	WSW	WSW				
Dec 12	7.6	9.9	9.9	7.6	7.0	1.6	6.4	5.6	8.2	9.6	9.0	10.1	13.1	14.8	12.2	9.7	8.0	8.2	6.3	4.8	5.5	3.7	5.6	1.6	14.8	5.8		
SSW	SSW	SSW	SW	SW	S	E	SSE	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	W	WNW	NW	WNW	WNW	WSW	WSW	NE					
Dec 13	3.5	4.5	9.9	9.4	6.6	7.0	6.3	7.4	6.5	5.7	5.2	5.6	5.3	5.0	5.1	4.4	4.1	4.0	5.0	5.8	6.4	8.2	10.7	11.3	3.5	11.3	5.3	
NE	ENE	ENE	E	ESE	S	SE	ESE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	NE	NE				
Dec 14	10.3	13.3	15.7	17.3	16.0	16.6	16.4	14.4	20.5	17.8	11.2	13.5	13.3	11.8	12.1	9.7	9.7	10.0	11.2	10.2	8.8	10.7	9.9	11.7	8.8	20.5	10.4	
NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	N	N	NNE	N	N	N	NNW	NNW	NW	NNW	NW	NW	NW	NW	NW				
Dec 15	13.1	13.3	12.7	14.2	13.2	11.9	10.2	11.3	12.1	11.3	12.3	9.8	7.6	10.5	7.8	9.0	10.0	8.0	8.8	7.6	7.3	7.3	8.3	7.7	7.3	14.2	9.7	
NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	NNW	NNE				
Dec 16	5.6	3.8	4.2	6.1	7.4	7.9	6.4	7.0	6.7	6.2	4.9	5.1	4.6	5.0	7.0	5.0	5.2	5.6	6.2	7.9	6.7	7.9	10.7	10.6	3.8	10.7	4.7	
NNE	N	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NNE	NNE	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW			
Dec 17	9.1	7.8	7.2	7.1	7.8	5.2	6.2	5.4	4.9	4.8	5.4	7.1	7.5	6.5	6.2	8.4	9.3	11.5	13.5	10.4	11.3	12.0	12.6	12.2	4.8	13.5	5.3	
NW	NNW	NNW	NW	NW	NW	WNW	W	WSW	SW	SW	SW	SW	SW	SSW	SSW	S	SSW	S	SSW	SSW	SSW	SSW	S					
Dec 18	11.9	10.4	10.5	10.3	10.0	9.0	7.7	11.4	8.4	7.4	7.3	6.6	5.7	5.5	6.9	8.4	7.8	2.8	3.3	6.1	5.7	3.1	6.3	7.3	2.8	11.9	3.4	
SSW	SSW	SSW	SSW	SSW	SSW	SSE	S	SSE	SE	SSE	SE	E	E	E	E	ENE	NE	NNE	NNE	NNE	N	WNW	WNW					
Dec 19	9.0	9.7	11.2	12.8	13.0	16.6	13.8	18.6	19.7	13.1	12.9	12.8	14.7	13.1	12.7	9.2	10.2	8.9	6.4	5.1	7.0	9.2	7.0	6.2	5.1	19.7	11.1	
WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	N	N	NW	NW	NW	W				
Dec 20	6.4	10.3	13.6	17.3	15.0	12.0	9.9	9.5	11.5	12.6	11.8	13.3	13.7	13.6	14.5	12.8	11.5	15.5	14.7	13.8	15.4	14.0	10.0	10.9	6.4	17.3	12.4	
SW	WSW	WSW	W	W	W	W	W	W	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW				



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - December 2021

Summary of Hourly Averages

VECTOR WIND SPEED (VWS) in km/hr & WIND DIRECTION (VWD) in sector

WIND SPEED		Maximum Hourly Value: 27.8 kph on December 1 at hour 4		Hours in Service: 744																																							
		Maximum Daily Value: 15.2 kph on December 22		Hours of Data: 743																																							
		Minimum Hourly Value: 1.3 kph on December 26 at hour 5		Hours of Missing Data: 1																																							
		Minimum Daily Value: 3.3 kph on December 4		Hours of Calibration: 0																																							
		Monthly Average: 5.2 kph		Operational Uptime: 99.9																																							
WIND DIRECTION		Monthly Average: 278 (W) degree																																									
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																			
Dec 21	13.2	11.5	10.9	12.8	12.0	16.2	16.1	19.3	20.2	18.5	20.0	19.5	18.9	16.8	16.0	11.9	9.7	7.4	9.7	9.7	8.4	6.9	5.2	4.2	4.2	20.2	12.6																
	WSW	SW	WSW	SW	SW	WSW	W	W	W	W	W	W	W	W	W	W	WSW	WSW	W	WSW	WSW	WSW	N																				
Dec 22	3.4	2.4	7.7	11.1	11.0	12.9	13.1	15.7	15.5	15.4	16.3	18.0	18.5	20.1	19.7	20.0	19.3	19.6	19.6	18.4	18.3	18.5	19.3	18.2	2.4	20.1	15.2																
	SSW	E	ENE	E	E	E	E	E	E	E	E	E	ENE	E	ENE	ENE	E	E	E	E	E	E	E																				
Dec 23	17.6	18.2	16.2	16.0	15.1	12.5	10.0	7.9	5.9	5.2	4.5	4.5	4.0	4.4	5.0	5.0	7.2	11.1	11.7	12.4	11.9	15.5	15.7	13.1	4.0	18.2	6.3																
	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	NE	NNE	NNE	N	N	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW																			
Dec 24	11.3	9.8	11.7	12.2	14.6	15.8	13.8	10.4	13.2	11.6	12.8	13.2	14.2	12.8	13.1	10.7	10.5	11.0	10.7	11.0	13.0	11.8	11.4	10.8	9.8	15.8	12.0																
	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NW	NNW	NNW	NW																			
Dec 25	9.0	10.1	10.4	10.1	11.3	12.2	13.9	11.8	11.5	10.9	10.0	12.1	10.3	9.8	9.7	8.0	7.9	8.3	6.4	8.7	7.8	7.2	7.9	7.3	6.4	13.9	9.4																
	NW	WNW	WNW	WNW	WNW	NW	NW	WNW	WNW	WNW	WNW	W	W	WNW	W	W	W	WNW	W	W	W	W	W	W																			
Dec 26	6.1	5.4	4.6	3.5	2.0	1.3	1.3	2.2	3.1	2.5	2.6	3.9	3.9	2.3	3.8	3.8	4.8	5.7	4.0	6.2	6.5	6.9	4.6	6.8	1.3	6.9	3.8																
	WNW	WNW	NW	NNW	NW	WNW	NNW	N	N	NW	NW	NNW	NNW	NW	NW	W	WNW	NW	NW	NW	NNW	NW	WNW	W																			
Dec 27	5.7	7.8	7.0	4.7	5.2	6.4	5.5	5.9	6.1	6.0	5.5	5.4	4.9	5.3	6.1	4.8	5.2	6.3	7.5	7.2	7.2	7.5	7.6	8.3	4.7	8.3	5.8																
	W	W	W	W	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	SSW	SW	WSW	SW	WSW	W																				
Dec 28	7.9	6.7	6.5	5.7	5.9	4.1	4.8	7.0	4.6	5.8	5.1	8.5	8.2	7.2	7.7	11.7	11.5	12.8	12.6	14.9	14.1	11.7	12.1	12.1	4.1	14.9	7.9																
	W	W	WSW	WSW	WNW	W	W	WSW	WSW	NW	NW	NW	WNW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NW	NW																			
Dec 29	11.3	12.4	10.8	11.4	12.4	12.3	12.3	11.7	11.6	9.0	10.5	10.8	8.1	9.2	6.6	8.2	8.2	7.6	8.0	6.8	7.6	7.1	6.8	6.3	6.3	12.4	6.5																
	NW	NW	NW	NW	NW	NW	NW	WNW	NW	WNW	NW	WNW	WNW	W	WSW	SW	SW	SW	SSW	SSW	SSW	S	ESE																				
Dec 30	5.4	6.3	7.1	6.3	6.1	5.8	6.0	6.7	7.1	7.6	9.5	8.3	7.5	8.3	8.9	7.7	6.6	7.7	6.4	7.5	9.3	6.9	8.1	8.8	5.4	9.5	5.8																
	ESE	E	ENE	NE	NNE	N	N	NNW	NW	NW	NNW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NNW	NNW	NW	NNW																			
Dec 31	7.6	7.3	9.4	9.0	9.3	7.1	7.4	7.2	7.0	7.1	7.4	7.6	7.7	6.4	5.9	6.3	6.8	5.8	7.0	5.8	5.4	6.2	6.4	5.4	5.4	9.4	5.4																
	NNW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	W	W	W	SW	SW	SW	SW	WSW	SW	SW	SSW	SSW	SSW	P																			
																								P																			
C	Monthly Calibration										S	Daily Zero-Span Check										Q	Quality Assurance																				
K	Collection Error										N	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.



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

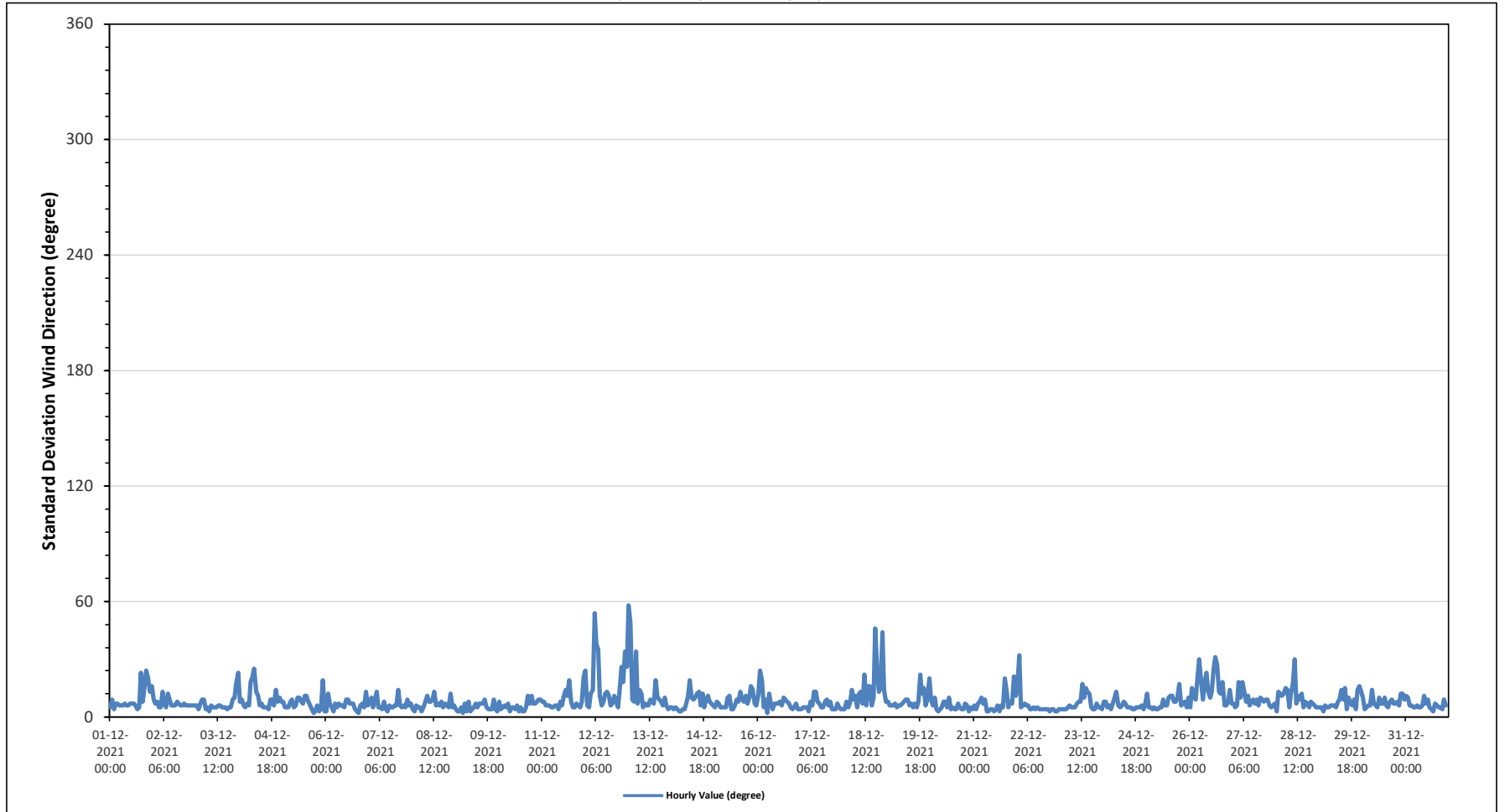
St. Lina Site - December 2021

Summary of Hour Standard Deviations

STANDARD DEVIATION WIND DIRECTION (STDWD) in Degree

Maximum Hourly Value:	58 degree on December 13 at hour 0															Hours in Service:	744																
Minimum Hourly Value:	2 degree on December 5 at hour 17															Hours of Data:	743																
																Hours of Missing Data:	1																
																Hours of Calibration:	0																
																Operational Uptime:	99.9																
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									
Dec 1	5	9	4	7	7	6	6	6	7	6	6	7	7	7	6	4	5	23	8	16	24	20	13	16	4	24							
Dec 2	9	7	8	5	5	13	7	5	12	9	6	6	6	8	7	6	6	7	6	6	6	6	6	6	5	13							
Dec 3	6	4	7	9	9	4	5	3	6	5	5	5	6	6	5	5	5	4	5	5	9	10	18	23	3	23							
Dec 4	8	9	6	5	7	6	18	21	25	13	11	6	7	5	5	5	4	9	9	6	14	8	10	8	4	25							
Dec 5	8	5	5	5	8	9	5	6	10	10	8	7	11	11	8	6	4	2	3	6	3	4	19	3	2	19							
Dec 6	3	12	7	5	3	7	5	7	6	6	5	9	9	7	7	7	4	3	2	6	7	5	13	6	2	13							
Dec 7	7	10	5	9	13	5	5	4	8	4	3	6	5	5	6	6	14	6	5	6	5	9	6	7	3	14							
Dec 8	4	3	6	5	5	3	5	8	11	8	8	9	13	6	7	6	8	5	7	6	5	12	5	6	3	13							
Dec 9	4	3	3	5	2	7	3	8	3	4	5	7	5	7	7	7	9	5	4	4	4	9	4	3	2	9							
Dec 10	8	4	5	6	5	7	3	5	5	4	6	3	5	3	3	5	11	7	11	7	7	8	9	9	3	11							
Dec 11	8	8	6	6	6	5	5	6	6	4	8	6	11	14	11	19	8	5	5	7	6	5	8	21	4	21							
Dec 12	24	6	5	12	14	54	38	35	11	6	8	12	13	11	6	7	11	8	5	14	26	18	34	26	5	54							
Dec 13	58	49	9	8	34	7	14	12	5	7	6	6	9	8	7	19	10	9	8	6	10	6	4	5	4	58							
Dec 14	5	4	5	4	3	3	4	4	7	11	19	10	9	10	12	13	6	12	5	9	11	8	7	6	3	19							
Dec 15	5	8	7	5	5	5	5	10	11	4	4	6	9	8	13	9	8	11	7	10	16	14	7	6	4	16							
Dec 16	11	24	19	5	9	2	12	7	4	7	7	7	8	6	10	9	8	7	5	4	5	7	4	4	2	24							
Dec 17	4	5	5	5	3	8	6	13	13	8	7	5	5	8	9	6	8	4	4	4	7	5	4	4	3	13							
Dec 18	4	8	5	8	14	9	11	5	12	13	7	22	6	16	16	6	10	46	25	13	15	44	14	8	4	46							
Dec 19	8	6	6	6	7	5	6	6	7	8	9	9	6	7	5	7	5	8	22	12	15	6	9	20	5	22							
Dec 20	9	6	10	4	3	4	5	8	8	5	10	4	5	4	4	7	5	4	4	7	6	3	5	4	3	10							
Dec 21	6	4	7	8	10	7	9	3	3	4	4	3	4	6	3	6	5	20	13	5	8	7	21	11	3	21							
Dec 22	17	32	5	6	7	6	6	4	4	5	4	5	4	4	4	4	4	4	3	4	4	3	3	4	3	32							
Dec 23	4	4	4	4	5	6	5	5	5	7	8	8	17	10	15	13	12	5	4	4	7	5	5	4	4	17							
Dec 24	8	8	5	6	4	7	10	13	6	5	6	8	7	5	5	5	4	4	5	5	5	6	4	7	4	13							
Dec 25	12	5	5	4	5	4	4	5	5	9	6	6	10	11	11	8	8	10	17	6	7	8	5	10	4	17							
Dec 26	5	15	12	9	19	30	19	9	18	23	13	10	13	25	31	27	13	12	18	6	6	8	14	7	5	31							
Dec 27	7	5	6	18	10	18	13	8	11	6	8	9	7	9	6	10	9	8	9	9	6	5	6	7	5	18							
Dec 28	3	13	12	11	12	15	14	5	12	17	30	7	11	9	12	5	8	7	5	8	7	6	5	5	3	30							
Dec 29	5	5	3	6	5	5	6	6	6	5	8	9	14	9	15	4	10	7	6	9	4	14	16	13	3	16							
Dec 30	10	4	5	6	6	14	7	6	5	10	7	7	10	6	5	8	9	7	7	8	6	12	12	9	4	14							
Dec 31	11	10	6	6	5	5	6	5	5	6	11	7	9	5	4	3	7	6	5	5	4	9	6	P	3	11							
Diurnal Minimum	3	3	3	4	2	2	3	3	3	4	3	3	4	3	3	3	4	2	2	4	3	3	3	3	3	3							
Diurnal Maximum	58	49	19	18	34	54	38	35	25	23	30	22	17	25	31	27	14	46	25	16	26	44	34	26									
C	Monthly Calibration															S	Daily Zero-Span Check					Q	Quality Assurance										
K	Collection Error															N	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.																																	

Timeseries Chart of Hourly Average for STDWD - St. Lina Site



END OF REPORT

This page, 238 of 238, ends the December 2021 Monthly Ambient Air Quality Monitoring Report.



Lakeland Industry & Community Association

DECEMBER 2021

Ambient Air Monitoring Calibration Report

- COLD LAKE SOUTH STATION-

CAL-LICA-202112-01174

Station Operation and Maintenance:

Bureau Veritas Canada

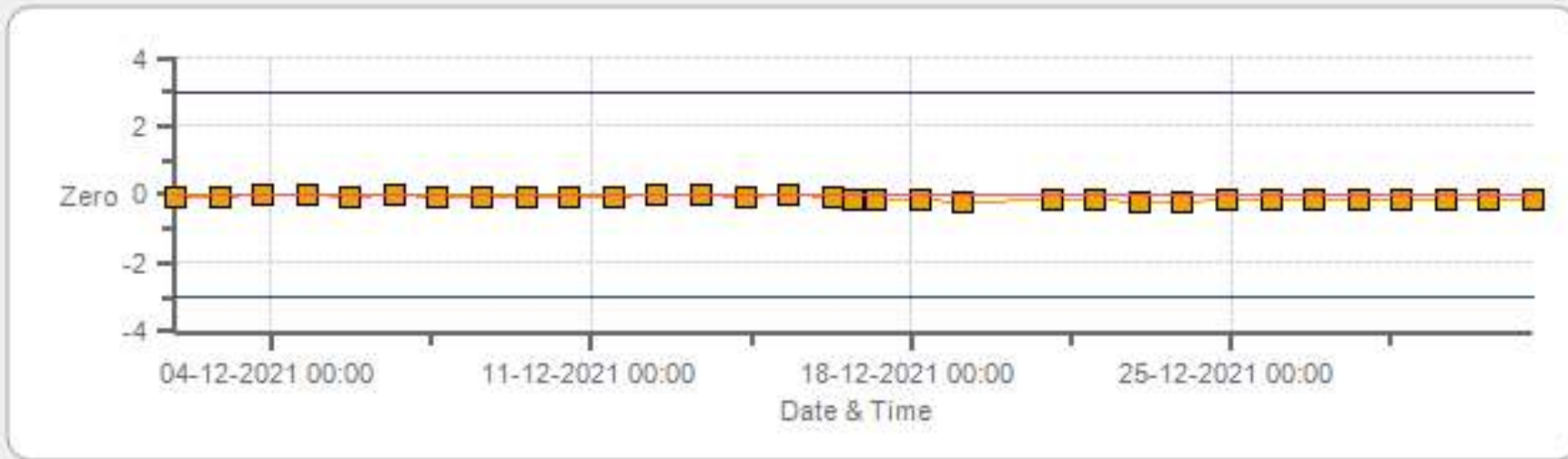
Data Validation and Report:

LICA / Bureau Veritas Canada

January 14, 2022

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



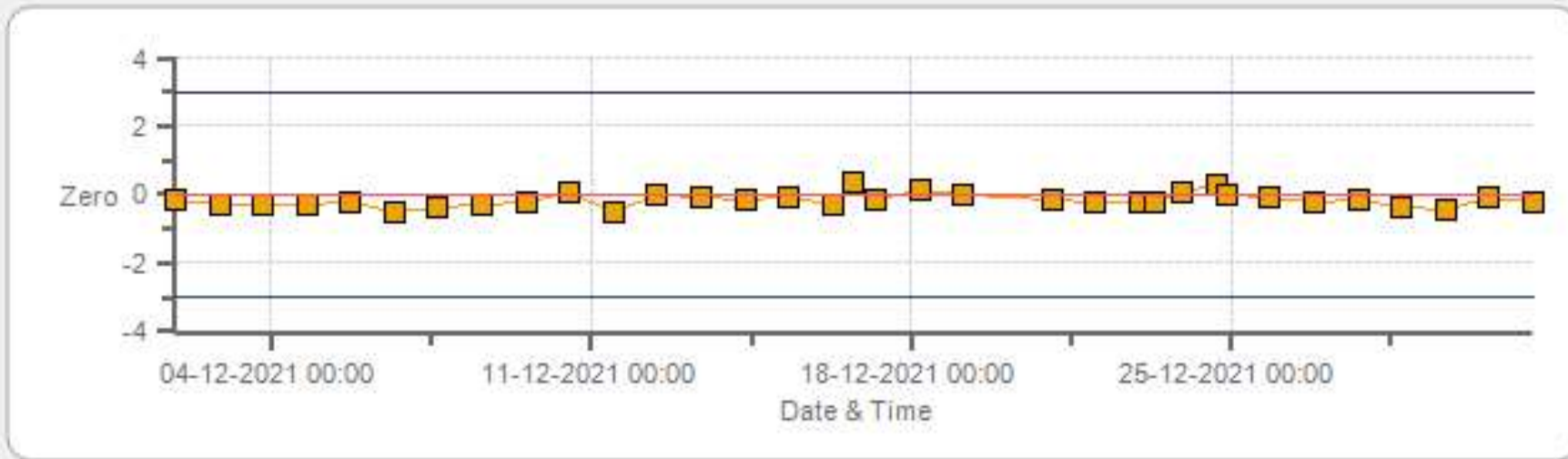
■ Zero
 — Zero Ref
 — Zero Low
 — Zero High

SO2[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



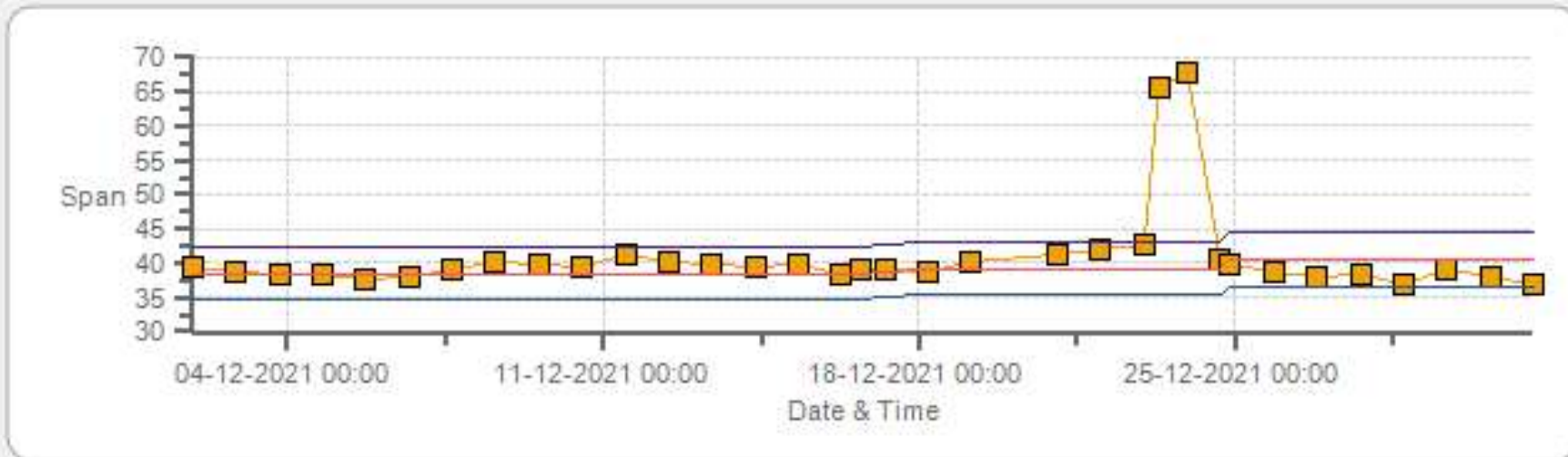
■ Span
 — SpanRef
 — Span Low
 — Span High

TRS[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



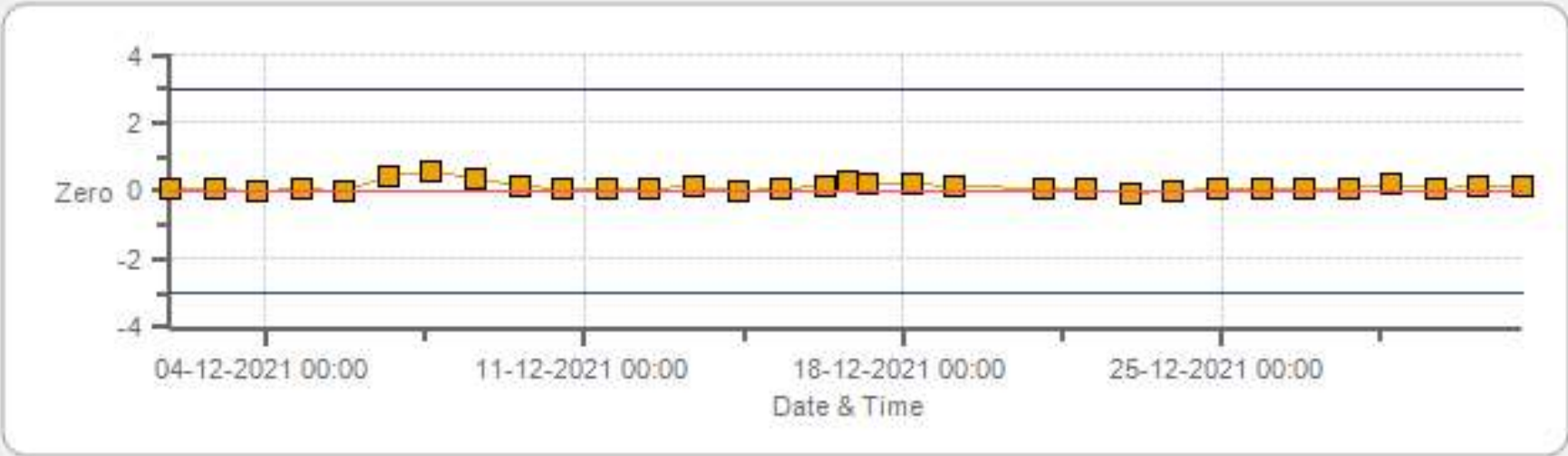
Zero Zero Ref Zero Low Zero High

TRS[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NOX[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



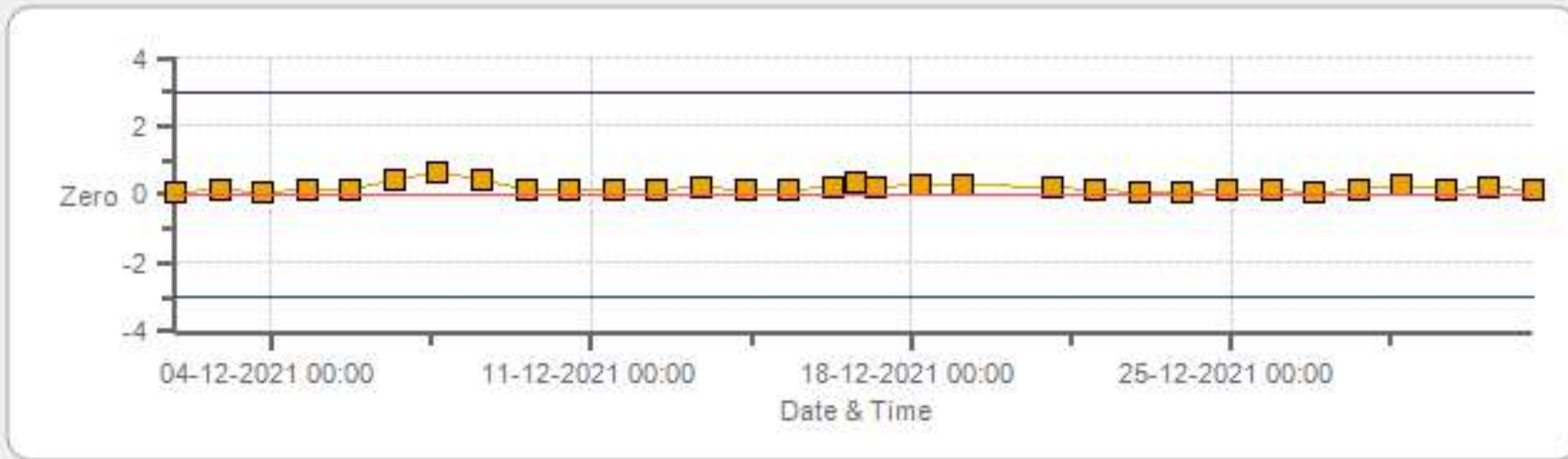
Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NO2[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



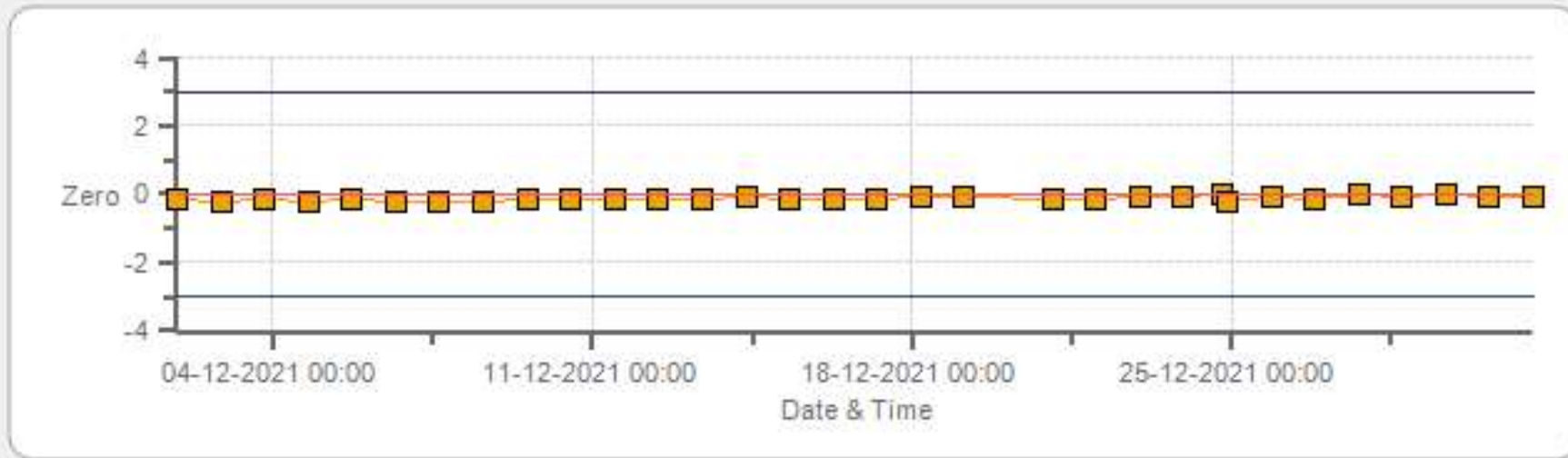
Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



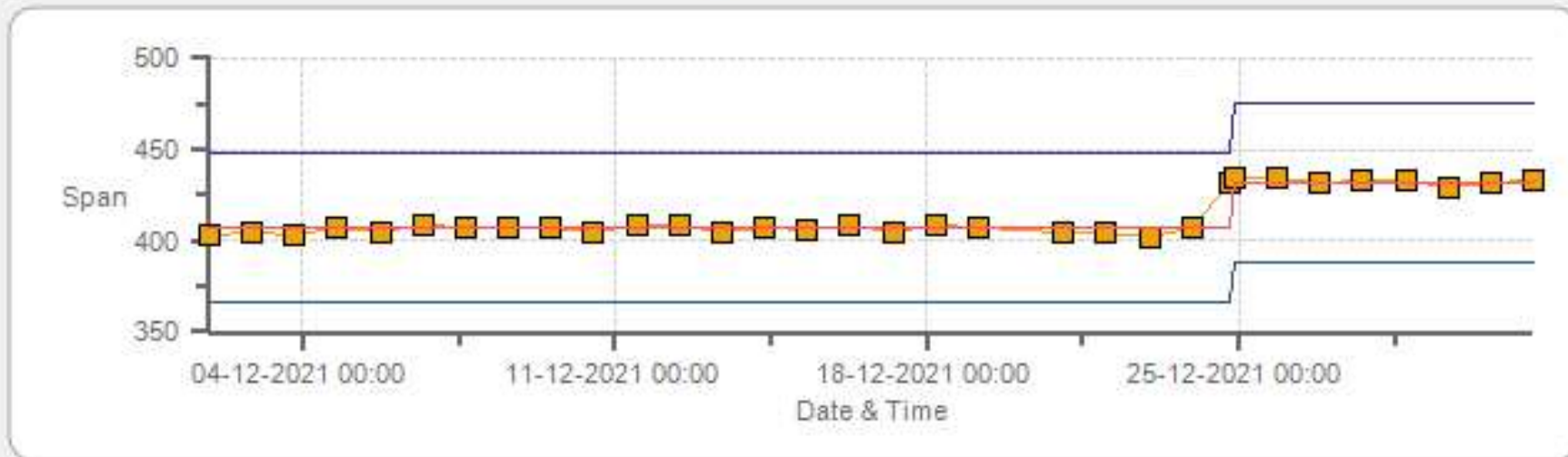
Span SpanRef Span Low Span High

O3[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



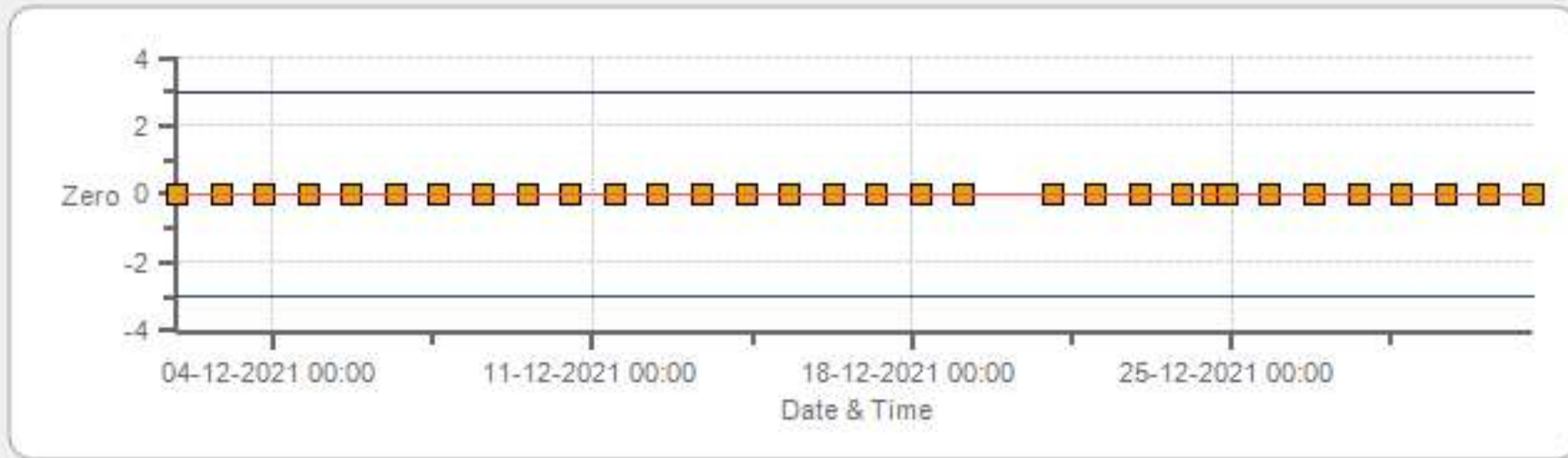
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



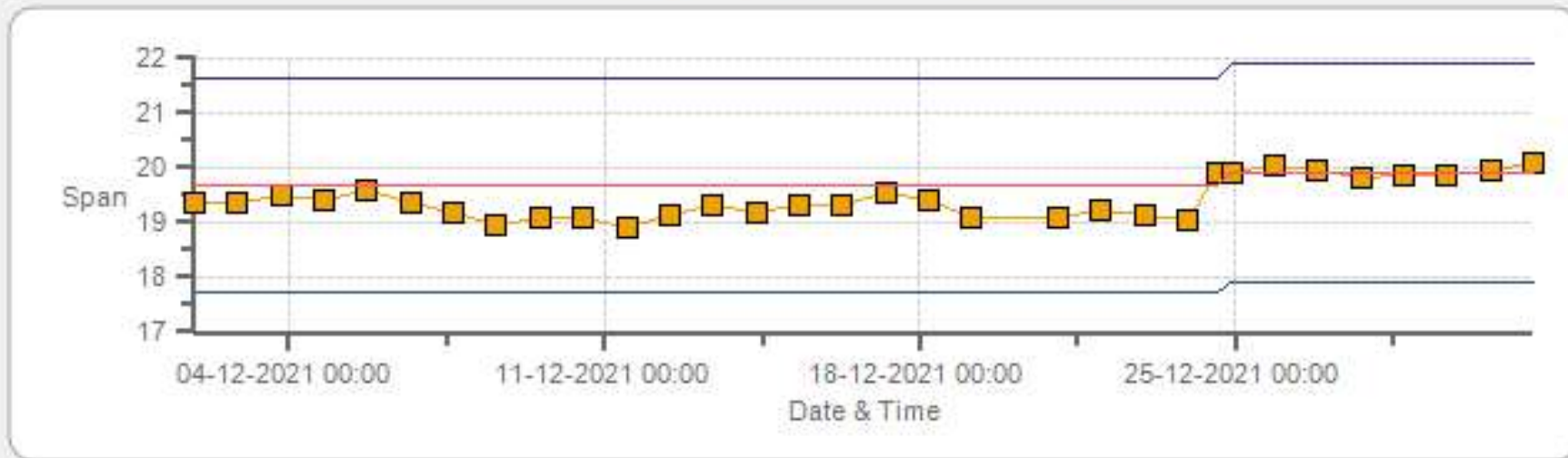
Span SpanRef Span Low Span High

THC55[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



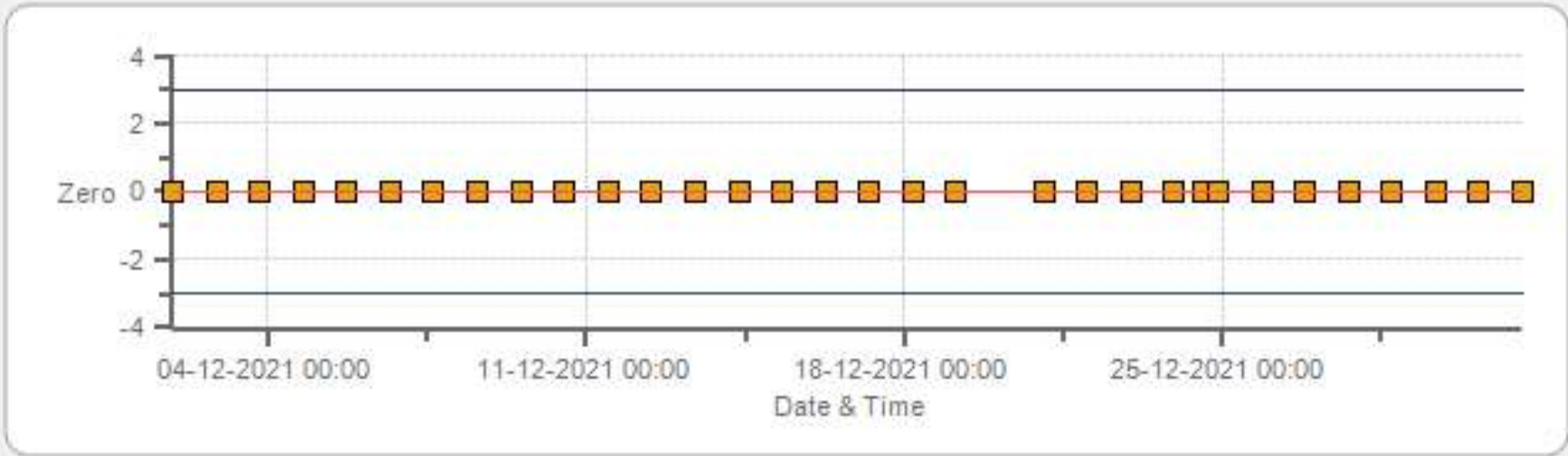
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



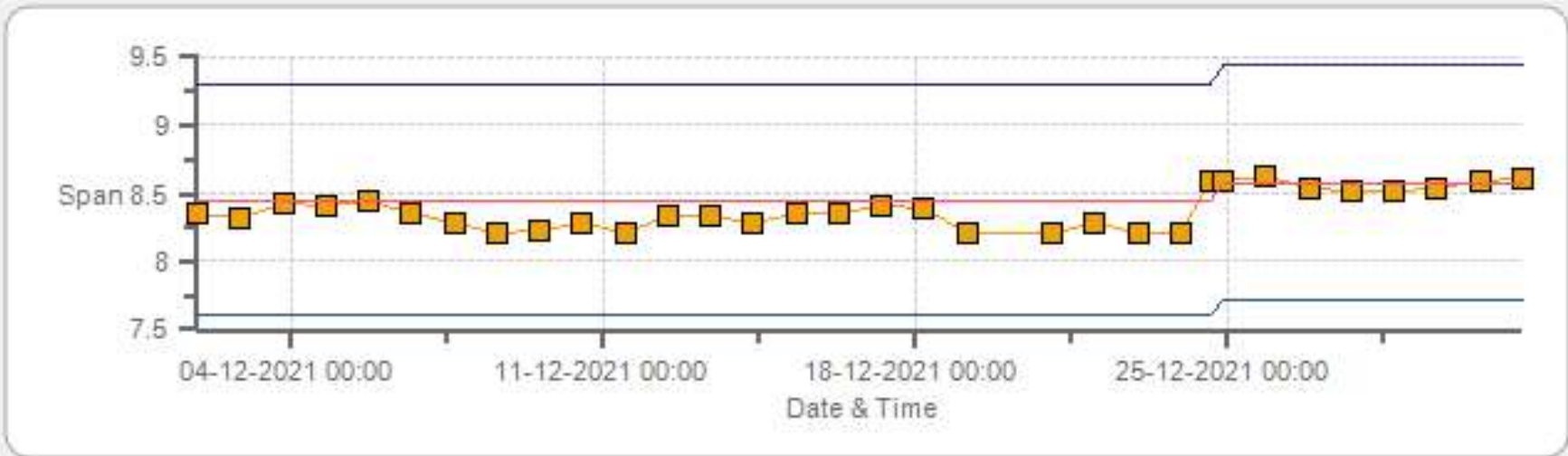
Span SpanRef Span Low Span High

CH4[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



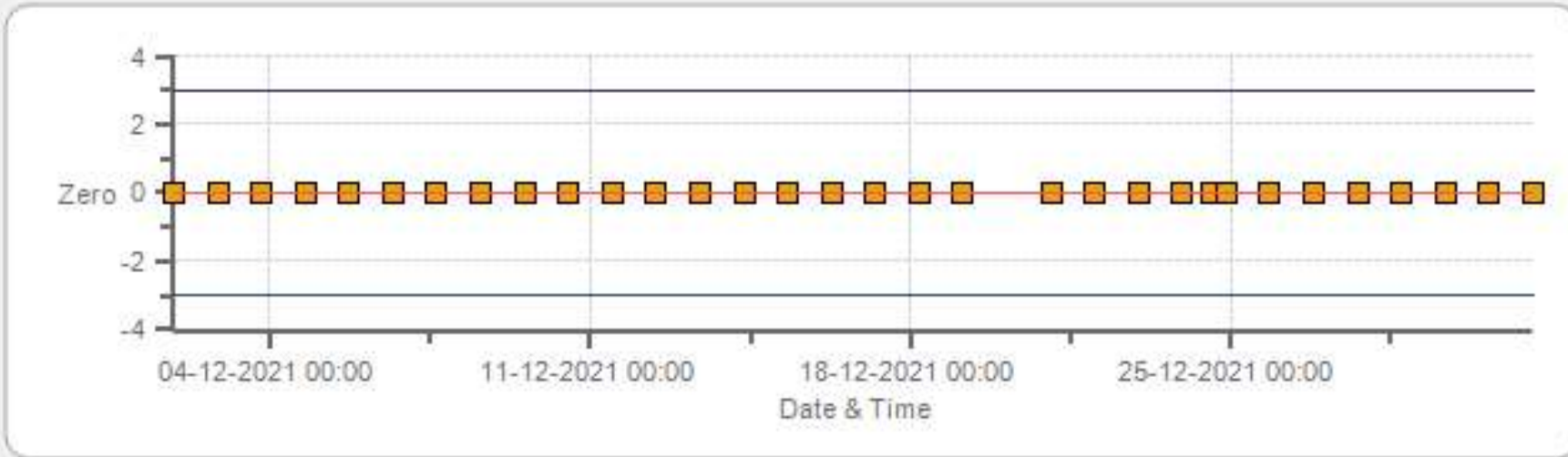
Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



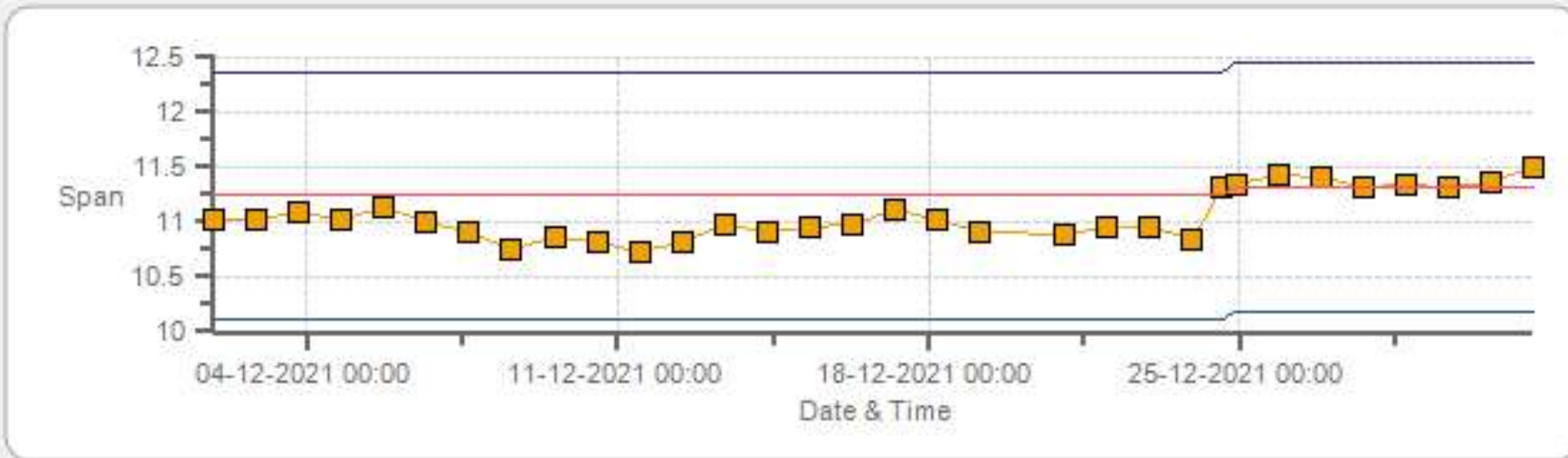
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: Cold Lake South Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	16-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Nov-2021
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	953
PURPOSE:	Routine	START TIME (MST):	12:40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:11

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180260018	FLOW (mL/min)	445
INITIAL		FINAL	
BKG/OFFSET	2.13	BKG/OFFSET	2.25
COEF/SLOPE	0.985	COEF/SLOPE	0.983
Expected (reference) Value	271	Expected (reference) Value	258.8

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	26801218	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 105146	HIGH ID	n/a
CONC (ppm):	50.80	EXPIRY DATE	n/a
CYLINDER (psi):	1500	LOW ID	n/a
EXPIRY DATE	09-Jun-2029	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	38.50	5000	0.00	0	0	1.006	1.000
4962	38.50	5000	391.16	388.8	391.3	1.006	1.000
4982	18.00	5000	182.88	n/a	183.1	n/a	0.999
4991	9.00	5000	91.44	n/a	91.5	n/a	0.999

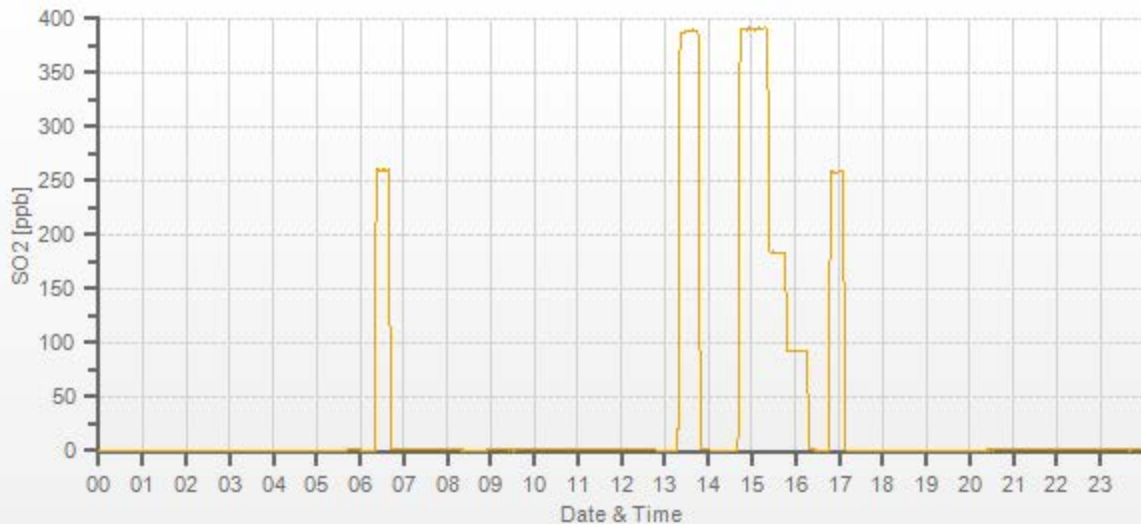
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.0%

COMMENTS:

Sample inlet filter was changed.

SO2[ppb] Station: Cold Lake South Daily: 16-12-2021 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202112-01174

TRS Analyzer Calibration by Dilution



DATE:	16-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Nov-2021
PARAMETER:	TRS	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	953
PURPOSE:	Routine	START TIME (MST):	12:38
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:11

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	493
INITIAL		FINAL	
BKG/OFFSET	21.7	BKG/OFFSET	21.5
COEF/SLOPE	1.039	COEF/SLOPE	1.04
Expected (reference) Value	38.5	Expected (reference) Value	38.9

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0000644	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	700	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	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:	12:37	SO2 Conc (ppb)	380
END TIME:	12:52	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	1.000	1.000
7442	58.50	7500	78.00	77.2	78.5	1.005	0.994
7472	28.50	7500	38.00	n/a	38.4	n/a	0.990
7486	14.20	7500	18.93	n/a	18.8	n/a	1.007

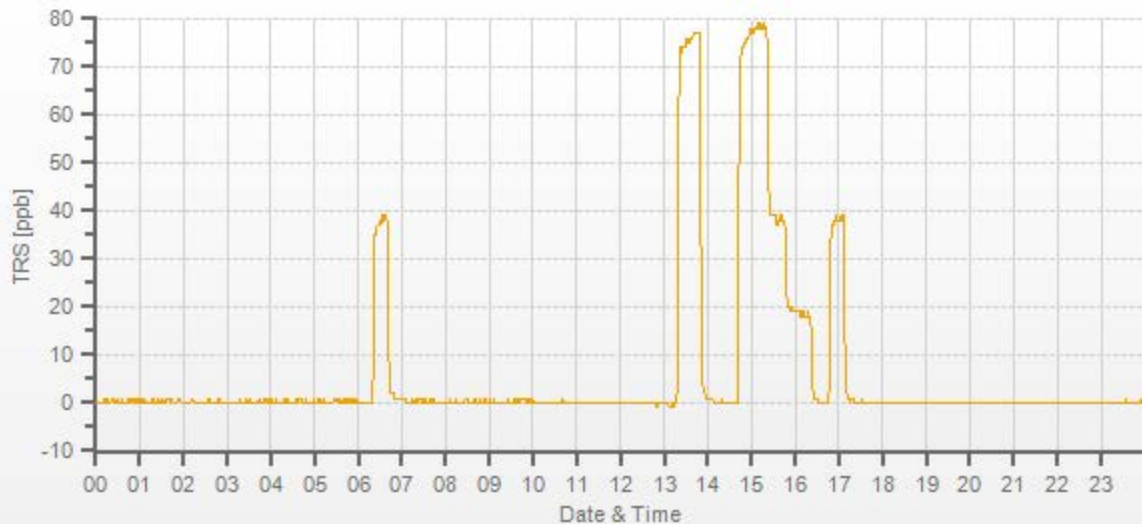
LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.008	-0.1%

COMMENTS:

Sample inlet filter was changed.

TRS[ppb] Station: Cold Lake South Daily: 16-12-2021 Type: AVG 1 Min. [1 Min.]



CAL-LICA-202112-01174

TRS Analyzer Calibration by Dilution



DATE:	24-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Dec-2021
PARAMETER:	TRS	PREVIOUS CORRECTION FACTOR:	0.994
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	940
PURPOSE:	Removal/Shut-down	START TIME (MST):	10:56
PERFORMED BY:	Alex Yakupov	END TIME (MST):	13:02

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	260
INITIAL		FINAL	
BKG/OFFSET	21.5	BKG/OFFSET	n/a
COEF/SLOPE	1.04	COEF/SLOPE	n/a
Expected (reference) Value	38.9	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:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0000644	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	600	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	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:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

FLOW RATES			CONCENTRATION (ppb)			CORRECTION FACTOR	
(mL/min)			ACTUAL	INDICATED		Initial	Final
DILUENT	GAS	TOTAL		Initial	Final		
7500	7500	7500	0.00	0.1	n/a	0.994	n/a
7442	58.50	7500	78.00	82.7	n/a	0.944	n/a
7472	28.50	7500	38.00	40.5	n/a	0.941	n/a
7486	14.20	7500	18.93	20.5	n/a	0.928	n/a

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.058	0.3%

COMMENTS:

Shutdown calibration was completed to shutdown the analyzer for the sample pump repair.

TRS Analyzer Calibration by Dilution



DATE:	24-Dec-2021	PREVIOUS CALIBRATION DATE:	n/a
PARAMETER:	TRS	PREVIOUS CORRECTION FACTOR:	n/a
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	940
PURPOSE:	Install/Post-Repair	START TIME (MST):	13:14
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:17

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	812728560	FLOW (mL/min)	489
INITIAL		FINAL	
BKG/OFFSET	n/a	BKG/OFFSET	22.5
COEF/SLOPE	n/a	COEF/SLOPE	1.08
Expected (reference) Value	n/a	Expected (reference) Value	40.5

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0000644	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	600	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	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:	n/a	SO2 Conc (ppb)	n/a
END TIME:	n/a	Analyzer Response (ppb)	n/a

CALIBRATION:

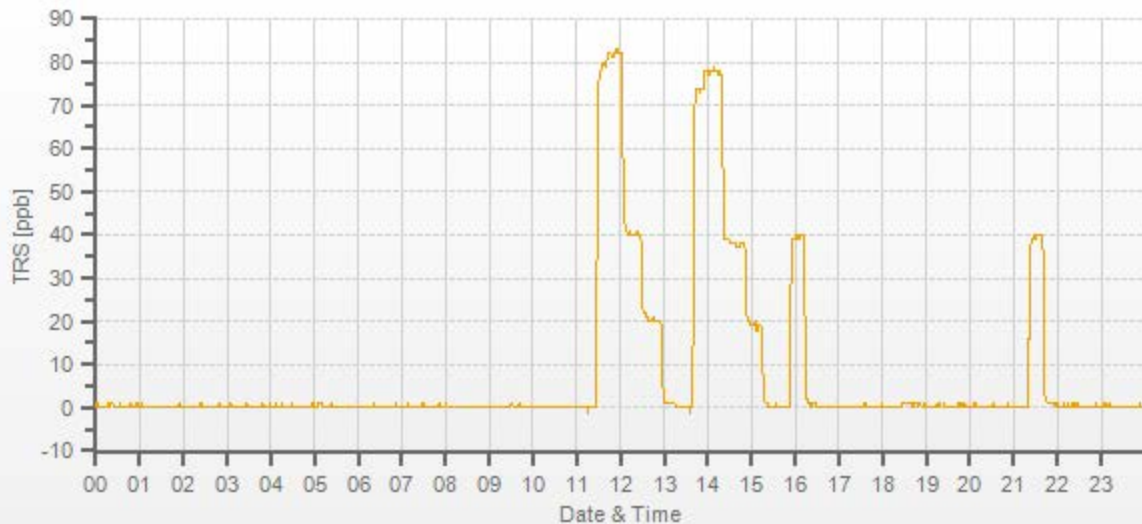
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	n/a	0	n/a	n/a
7442	58.50	7500	78.00	n/a	77.8	n/a	1.003
7472	28.50	7500	38.00	n/a	38.1	n/a	0.997
7486	14.20	7500	18.93	n/a	19.1	n/a	0.991

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.997	0.1%

COMMENTS:

Post-repair calibration was completed after the sample pump was repaired.



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	16-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Nov-2021	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1505664393	NOx	0.999
LOCATION:	CLS	BAROMETRIC (mBar):	953	FLOW (mL/min)	797	NO	1.000
PURPOSE:	Routine	START TIME (MST):	12:41	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	18:55	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 105146	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	50.0 50.1	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	1500	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a	EXPIRY DATE	09-Jun-2029	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	4.5	4.3	n/a	BKG/OFFSET:	4.3	4.2	n/a
SLOPE/COEF/CE:	1.003	0.979	0.999	SLOPE/COEF/CE:	1.001	0.944	0.999

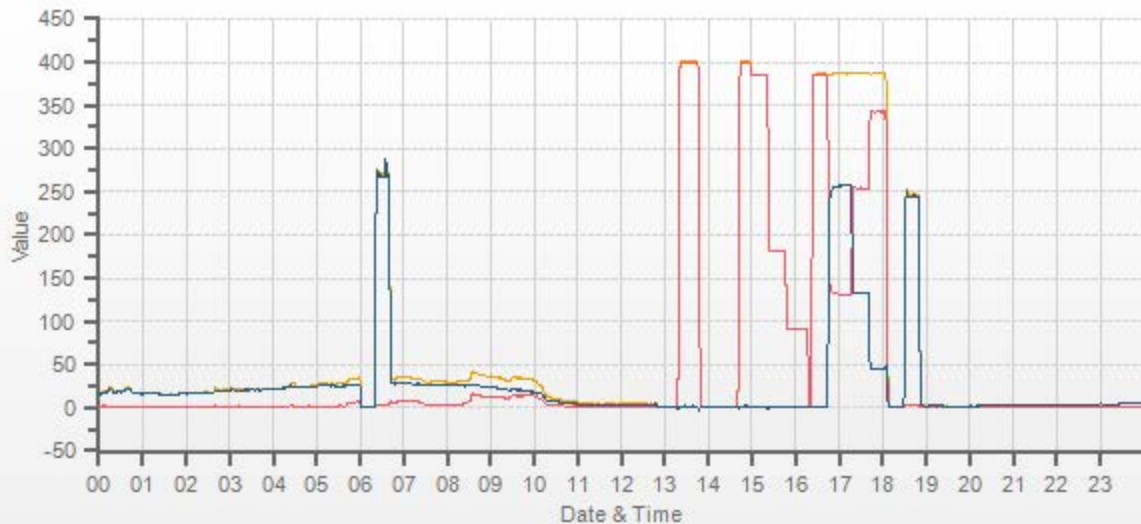
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	270.2	2.7	267.5		247.7	2.5	244.7

CALIBRATION PARAMETERS:				
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	38.50	5000	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.965	0.962	n/a	0.999	0.999	n/a
4962	38.50	5000	385.0	385.8	0.8	398.8	401.1	2.3	385.4	386.1	0.7	0.965	0.962	n/a	0.999	0.999	n/a
4982	18.00	5000	180.0	180.4	0.4	n/a	n/a	n/a	180.7	181.3	0.7	n/a	n/a	n/a	0.996	0.995	n/a
4991	9.00	5000	90.0	90.2	0.2	n/a	n/a	n/a	90.8	91.2	0.5	n/a	n/a	n/a	0.991	0.989	n/a

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	38.50	5000	0	383.2	386.8	3.6	n/a	n/a	n/a	n/a
AS-FOUND HIGH	38.50	5000	240	130.4	387.0	256.6	252.8	253	0.999	100.08%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	38.50	5000	125	254.4	387.2	132.8	128.8	129.2	0.997	100.31%
LOW	38.50	5000	45	342.5	387.3	44.8	40.7	41.2	0.988	101.23%
NO2 adjustment not required.									AVERAGE:	100.54%

LINEAR REGRESSION ANALYSIS:				COMMENTS: Sample inlet filter was changed.
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.001	0.08%	
NOx	1.000	1.000	0.11%	
NO2	1.000	0.999	0.11%	



CAL-LICA-202112-01174

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	24-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Nov-2021
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.001
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	CLS	BAROMETRIC (mBar):	940
PURPOSE:	Routine	START TIME (MST):	15:33
PERFORMED BY:	Alex Yakupov	END TIME (MST):	19:15

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	700419951	FLOW (mL/min)	1456
INITIAL		FINAL	
BKG/OFFSET	0	BKG/OFFSET	0
COEF/SLOPE	1.032	COEF/SLOPE	1.098
Expected (reference) Value	407.8	Expected (reference) Value	432

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	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:

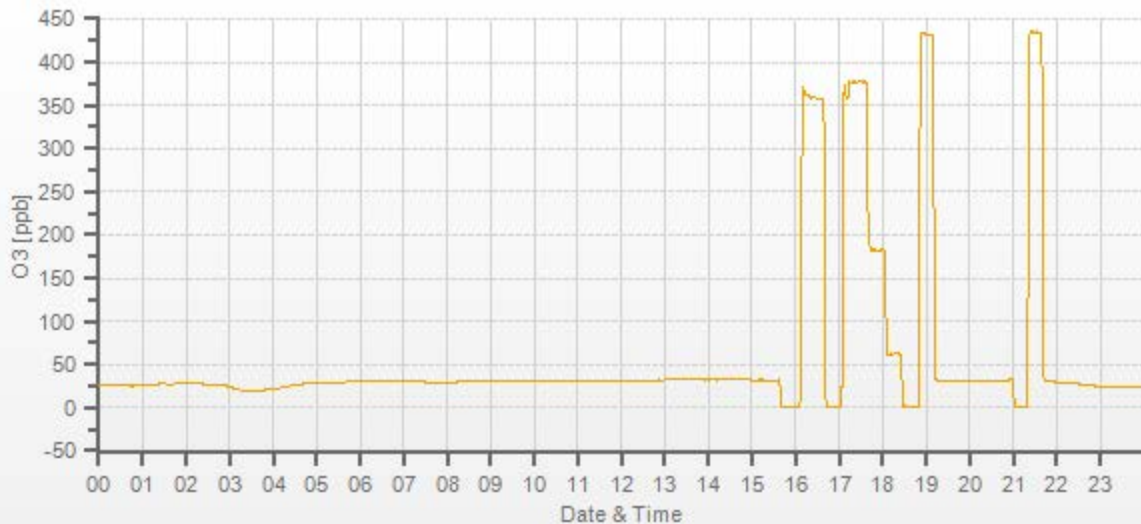
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	XXXX	5000	0.0	0.0	0.0	XXXX	XXXX
5000	XXXX	5000	378.0	357.5	378.0	1.057	1.000
5000	XXXX	5000	181.0	n/a	182.1	n/a	0.994
5000	XXXX	5000	61.0	n/a	62.7	n/a	0.973

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.998	0.2%

COMMENTS:

Sample inlet filter was changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	24-Dec-2021	PREVIOUS CALIBRATION DATE:	16-Nov-2021	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180930025	1168
LOCATION:	CLS	BAROMETRIC (mBar):	940	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	10:58	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:31	PREVIOUS CF:	0.996	0.999	0.997

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

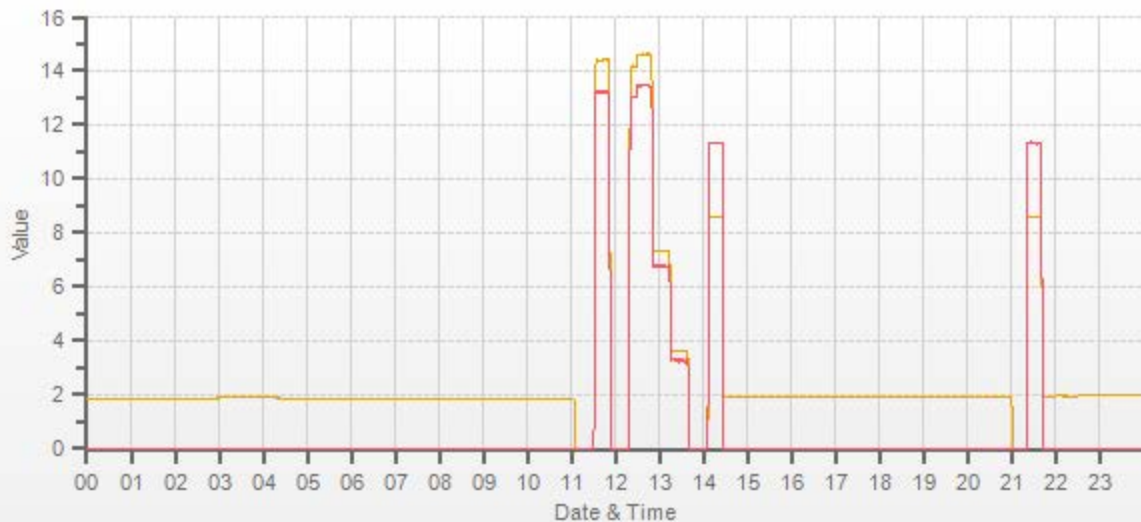
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	8.45	11.24	19.69		8.58	11.32	19.90

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
3051	49.40	3100	14.57	13.45	28.02	14.41	13.22	27.63	14.63	13.45	28.08	1.011	1.018	1.014	0.996	1.000	0.998
3075	24.70	3100	7.28	6.73	14.01	n/a	n/a	n/a	7.32	6.77	14.10	n/a	n/a	n/a	0.995	0.994	0.994
3088	12.40	3100	3.66	3.38	7.03	n/a	n/a	n/a	3.62	3.29	6.92	n/a	n/a	n/a	1.010	1.026	1.016

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:	
CH ₄	1.000	1.006	-0.1%	Sample inlet filter was changed.	
NMHC	1.000	1.002	-0.1%		
THC	1.000	1.004	-0.1%		
				Use Zero Chrom?	Yes



CAL-LICA-202112-01174



Teledyne T640 Audit/Calibration

Date/Previous Audit Date:	December 24, 2021	November 24, 2021	Weather Conditions:	Light snow	
Company:	LICA		Start Time (mst):	18:20	
Station:	Cold Lake South		End Time (mst):	19:18	
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/I.D./Expiry Date:					
Flow Standard: DeltaCal DC1 S/N177246 / Jul 12, 2022			Temperature: VAISALA HMP76B / SN: T1640130 / Apr 22, 2022		
Digital Manometer: DeltaCal DC1 S/N177246 / Jul 12, 2022			Pressure: FS FB61291 / SN: 130168457 / Feb 17, 2022		
DIAGNOSTICS:					
Ambient Pressure (mmHg)	705.9	Ambient Temp (°C)	-23.8	ASC Heater Duty (%)	0.0
Box Temp (°C)	26.2	Current PMT HV (V)	1435	LED Temp (°C)	30.93
P3 Value	45	PMT Setting (V)	1444	Pump PWM (%)	71
Sample Flow (L/min)	5.03	Sample RH (%RH)	1.9	Sample Temp (°C)	22.7
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)	707.0	706.0	710	709.5	+/- 10 mm Hg
Ambient Temperature (°C)	-24.40	-23.8	n/a		+/- 2°C
Sample Flow (L/min)	5.08	5.03	5.08	5.03	+/-5% of T640x (e.g., 4.75 – 5.25 lpm)
Additional Monthly Maintenance :					Completed
Inlet cleaned?					Yes
Sample tubing inspected (inner and outer)?					Yes
Comments:					
n/a					



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA
 Audit Location: Cold Lake South
 Audit Date: April 20, 2021
 Calibration Purpose: installation

Performed By: Alex Yakupov
 Reviewed By: Chris Wesson
 Start/End Time (mst): 10:19 / 14:44
 Weather Conditions: Mix of sun and 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:	0-180
Serial #:	177354	Direction Voltage Output Range:	n/a
Previous Cal/Audit Date:	September 25, 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	92.0	92.0	1.002
6000	110.6	110.4	110.4	1.002
7000	129.0	128.8	128.8	1.002
8000	147.4	147.3	147.3	1.001
9000	165.9	165.7	165.7	1.001
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	28	328	1.6	1.7	1.7
60	300	58	299	1.6	1.5	1.6
90	270	89	267	0.6	3.0	1.8
120	240	120	237	0.5	3.3	1.9
150	210	148	207	1.6	3.2	2.4
180	180	177	179	2.9	1.4	2.2
210	150	206	149	3.8	1.3	2.6
240	120	237	119	3.1	0.7	1.9
270	90	267	89	2.8	0.7	1.8
300	60	297	58	2.8	1.7	2.3
330	30	328	28	1.7	2.0	1.8
355	0	355	0	0.0	0.1	0.1
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.7

Comments:

Bearing Torque was also tested. Still at minimum threshold (like new) = No problem.

End of Report



Lakeland Industry & Community Association

DECEMBER 2021

Ambient Air Monitoring Calibration Report

- TAMARACK STATION-

(Formerly Maskwa Station)

CAL-LICA-202112-01248

Station Operation and Maintenance:

Bureau Veritas Canada

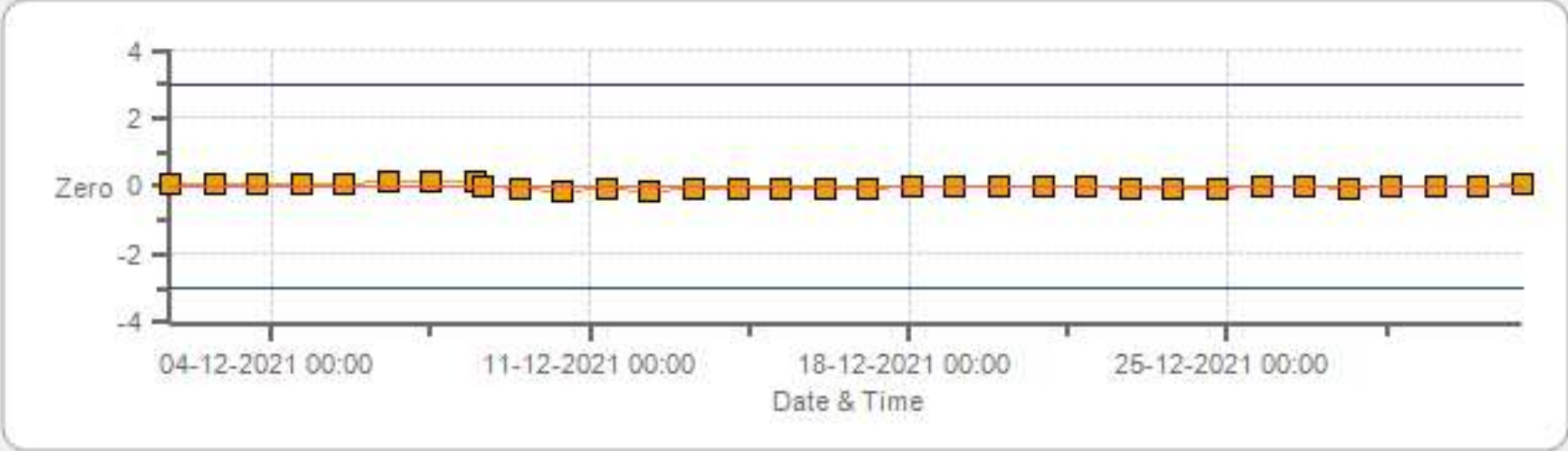
Data Validation and Report:

LICA / Bureau Veritas Canada

January 14, 2022

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



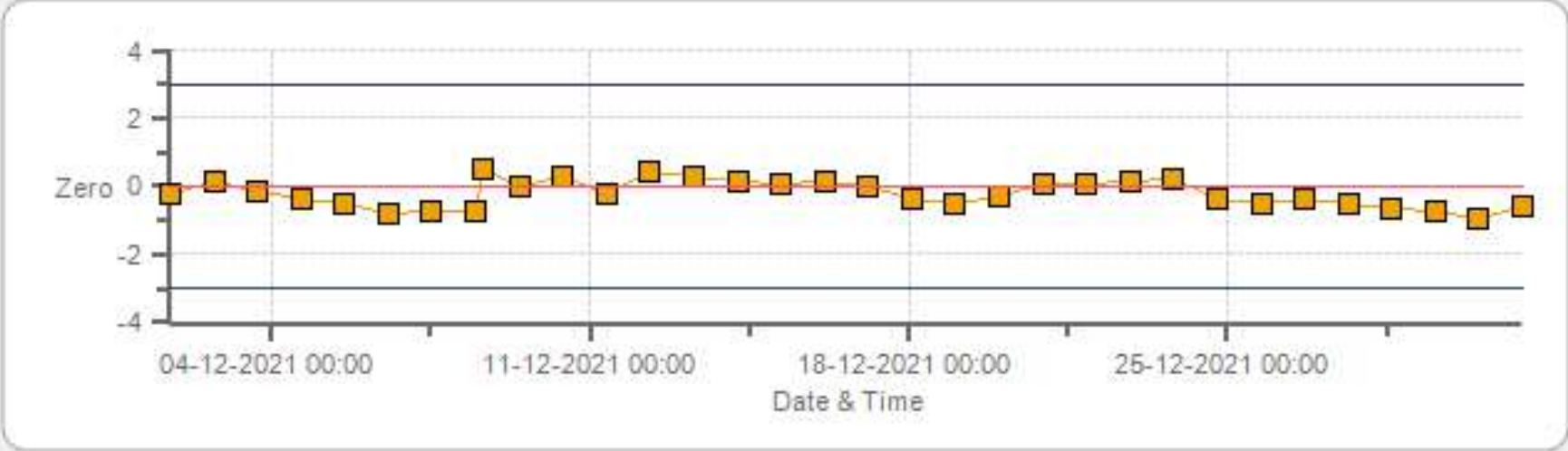
Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



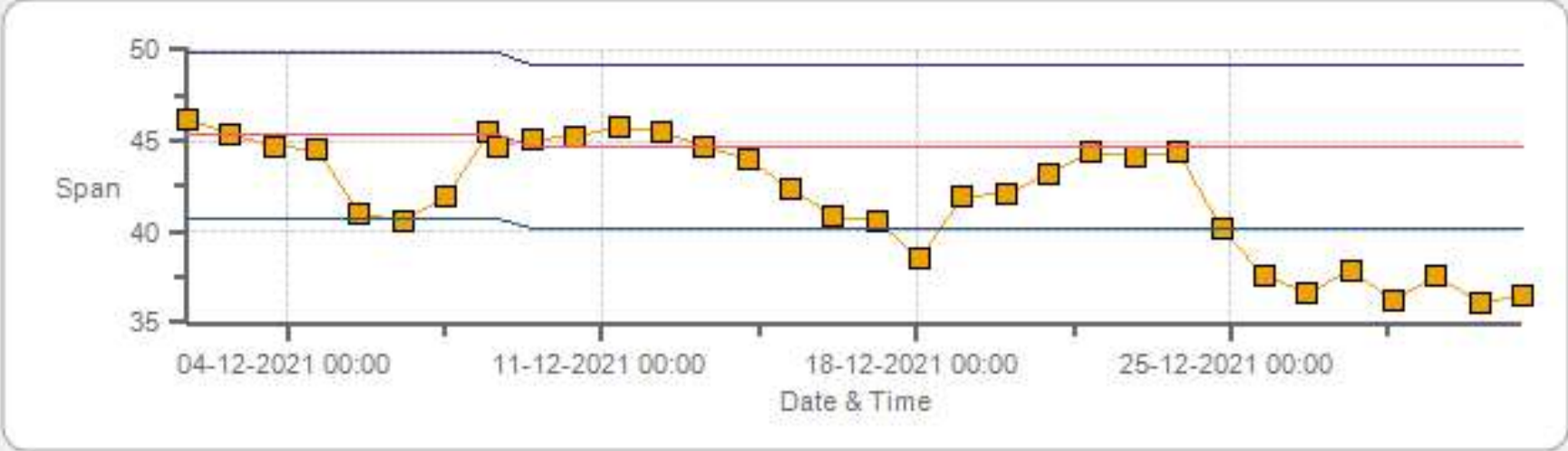
Span Span Ref Span Low Span High

H2S[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



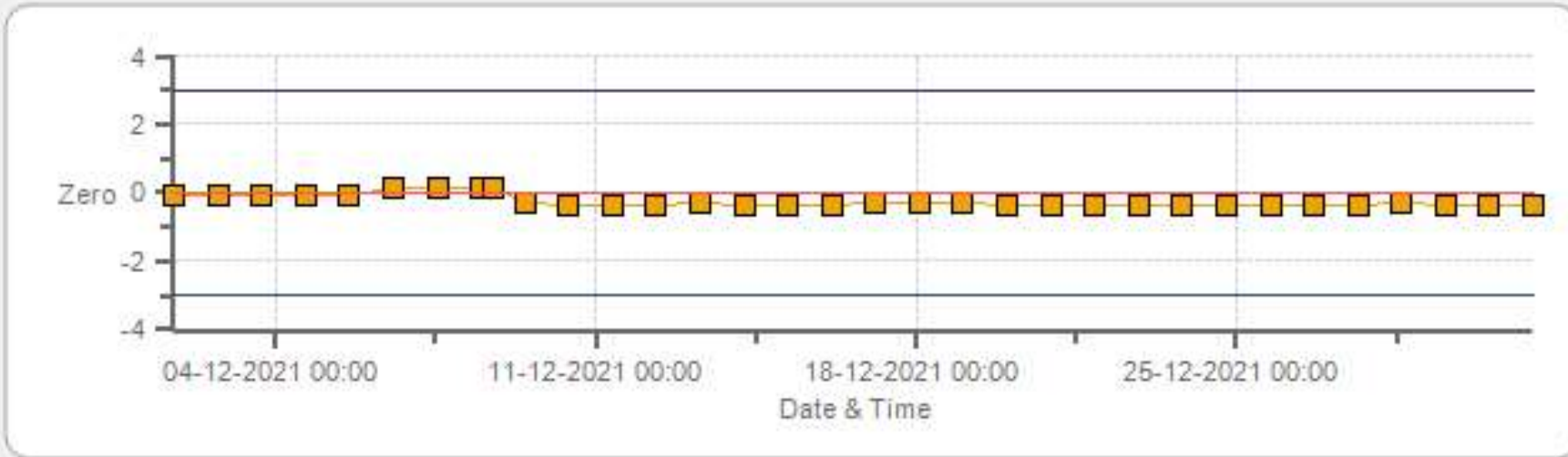
Zero Zero Ref Zero Low Zero High

H2S[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



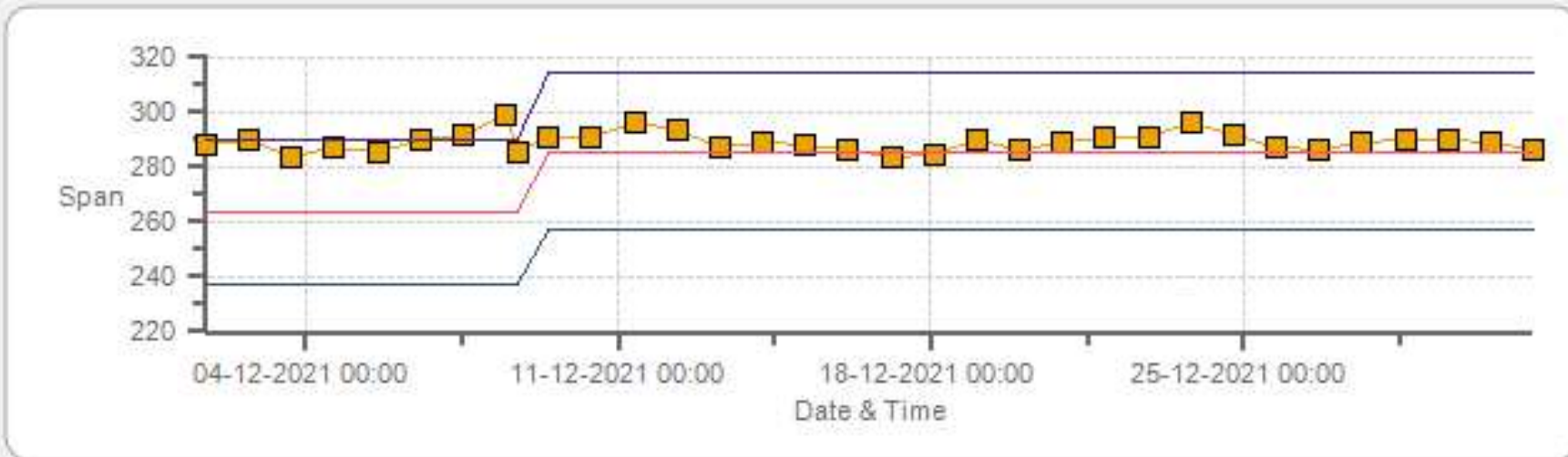
Span SpanRef Span Low Span High

NOX[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



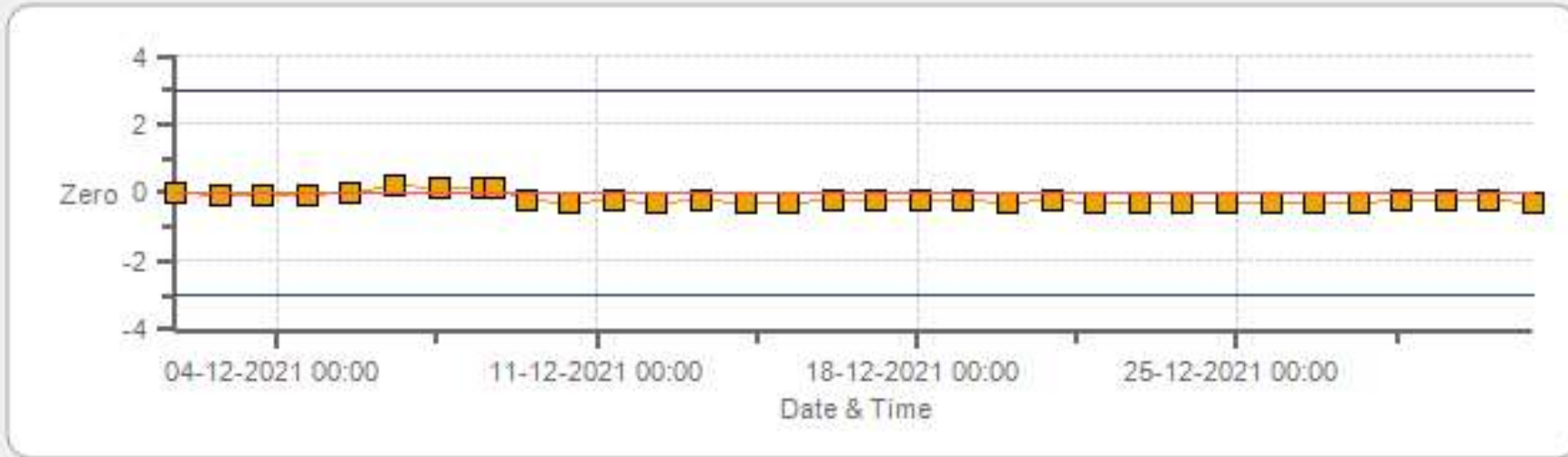
Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



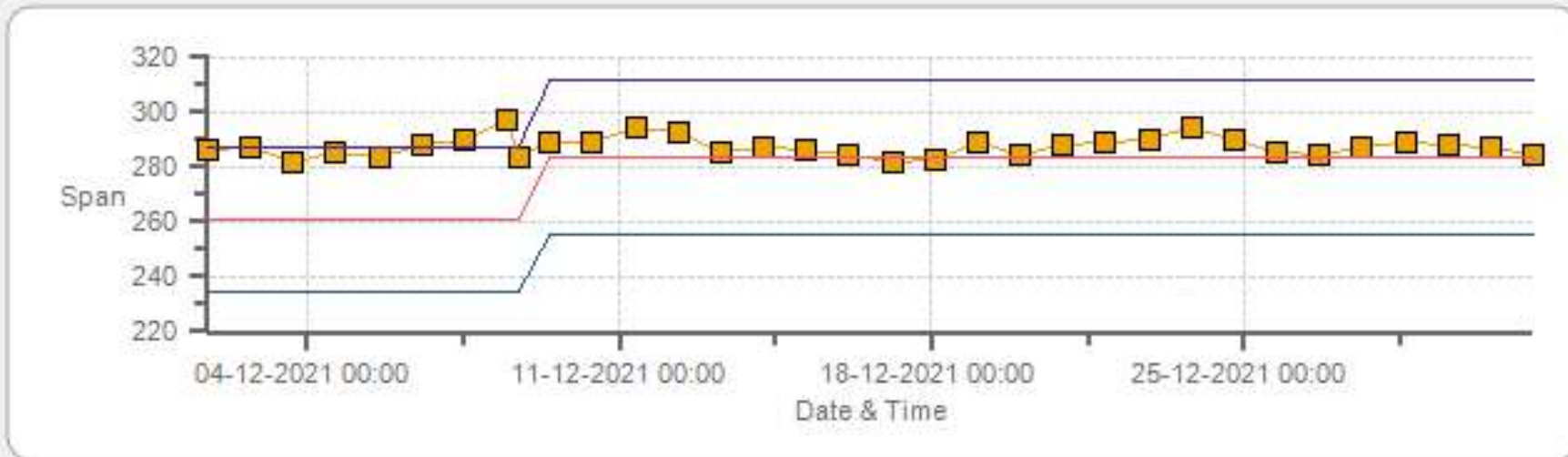
Span Span Ref Span Low Span High

NO2[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



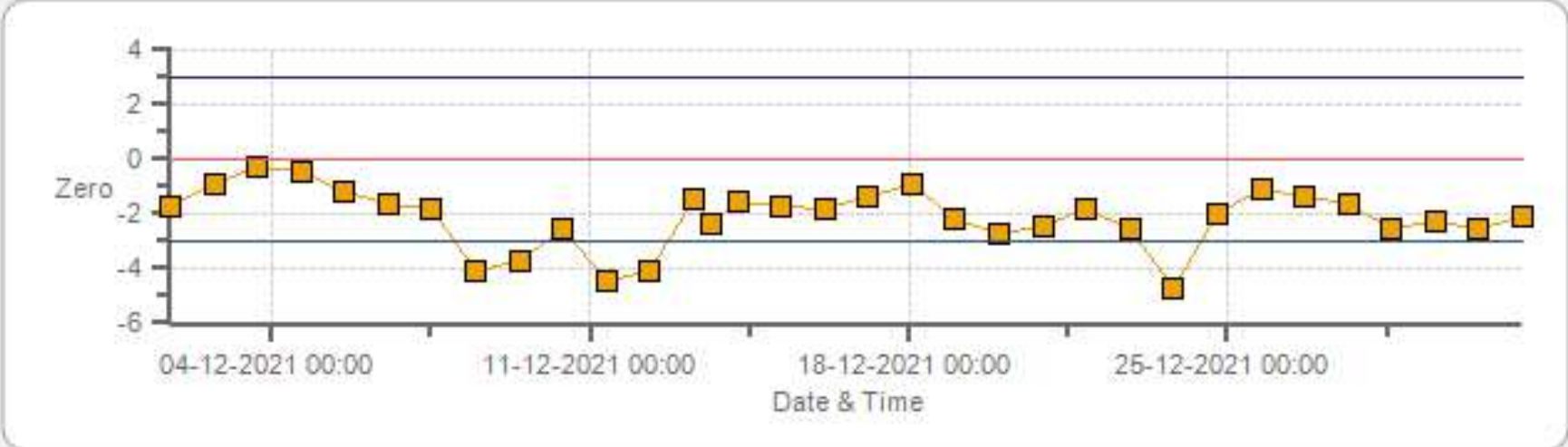
Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

O3[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



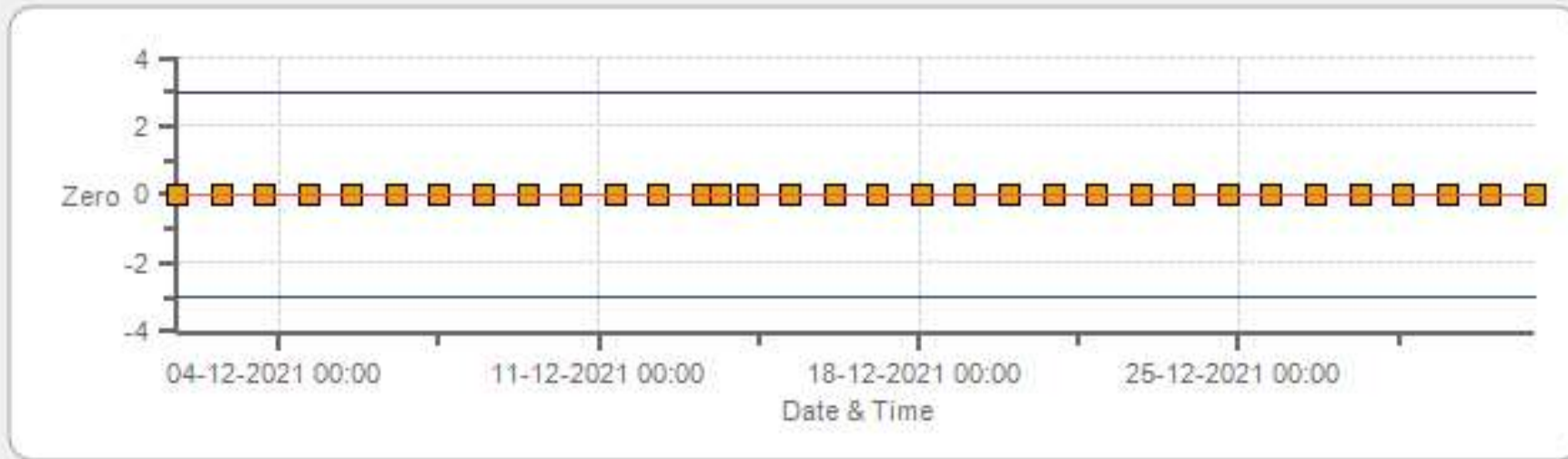
Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



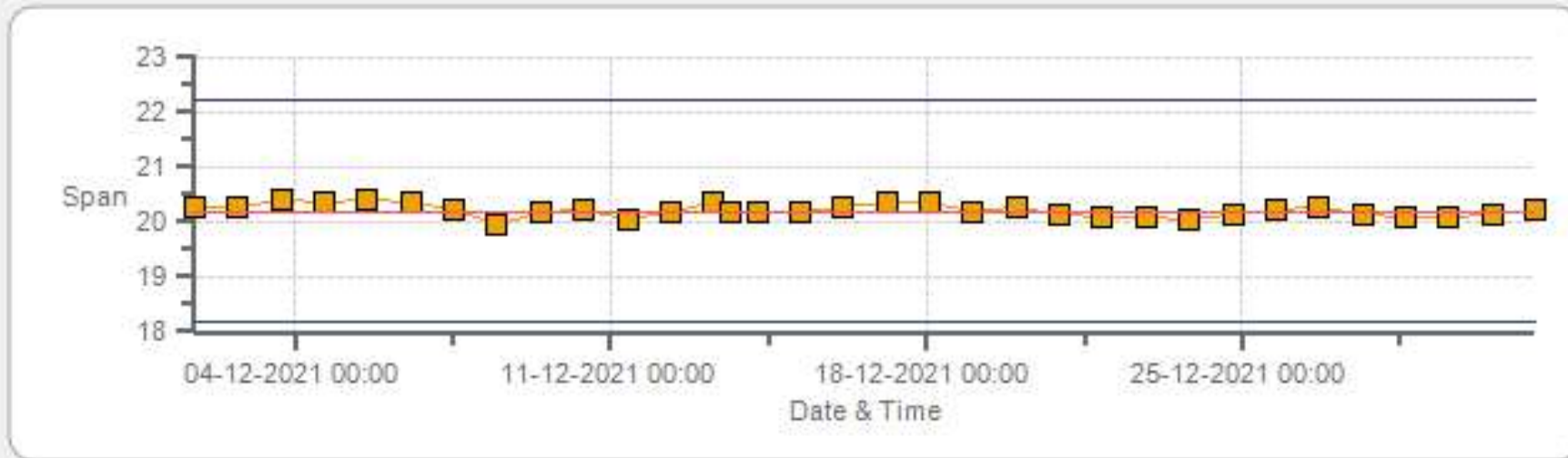
Span SpanRef Span Low Span High

THC55[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



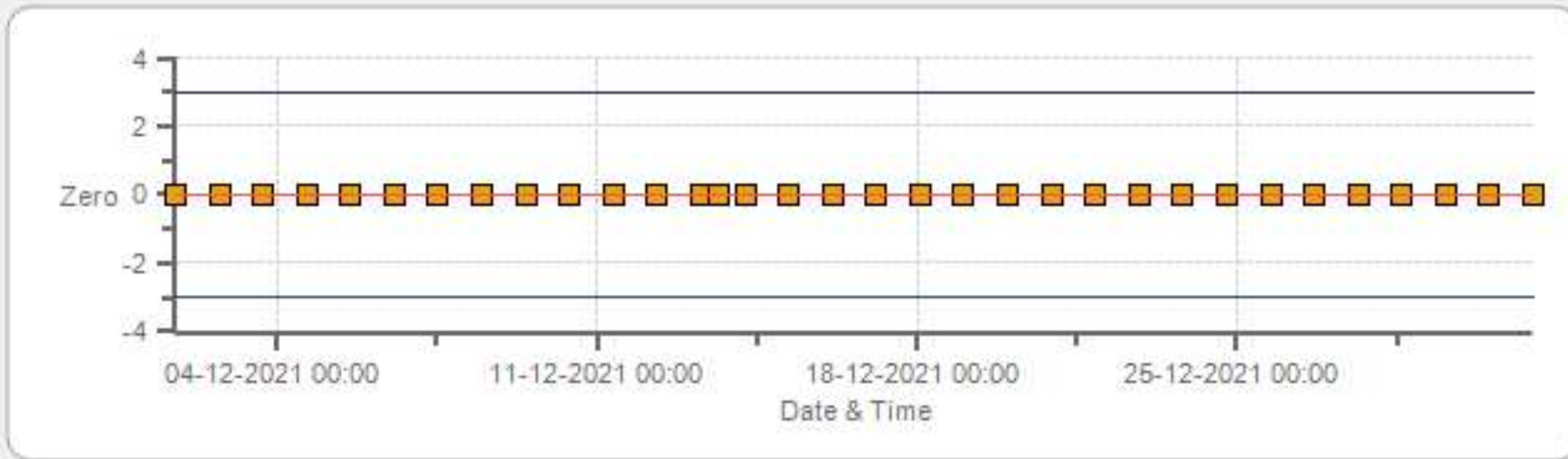
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



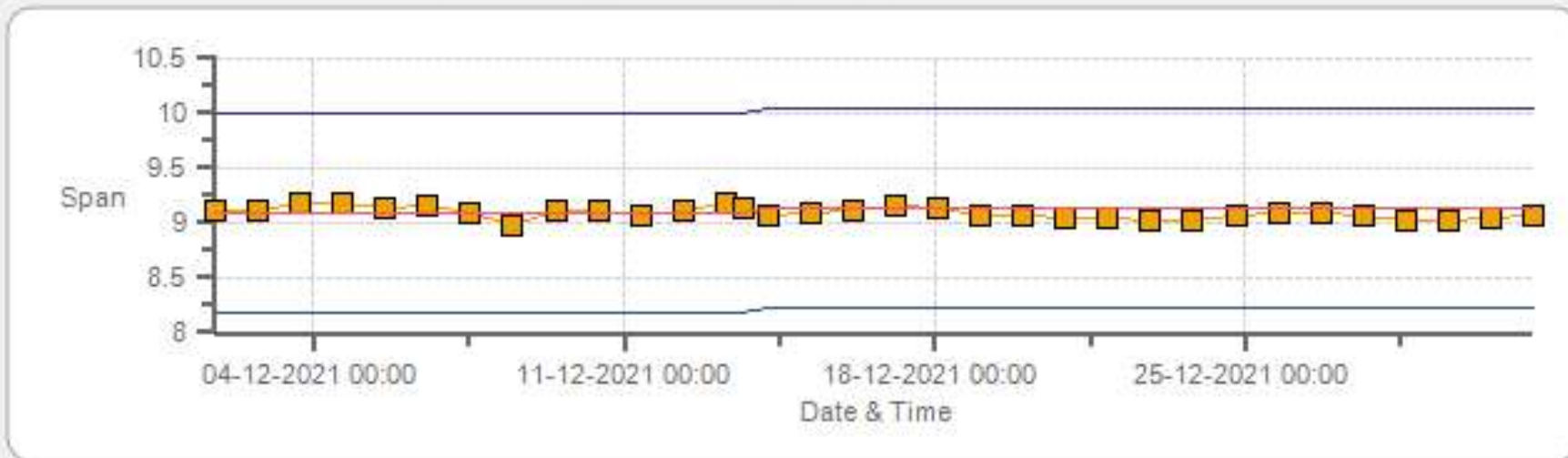
Span Span Ref Span Low Span High

CH4[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



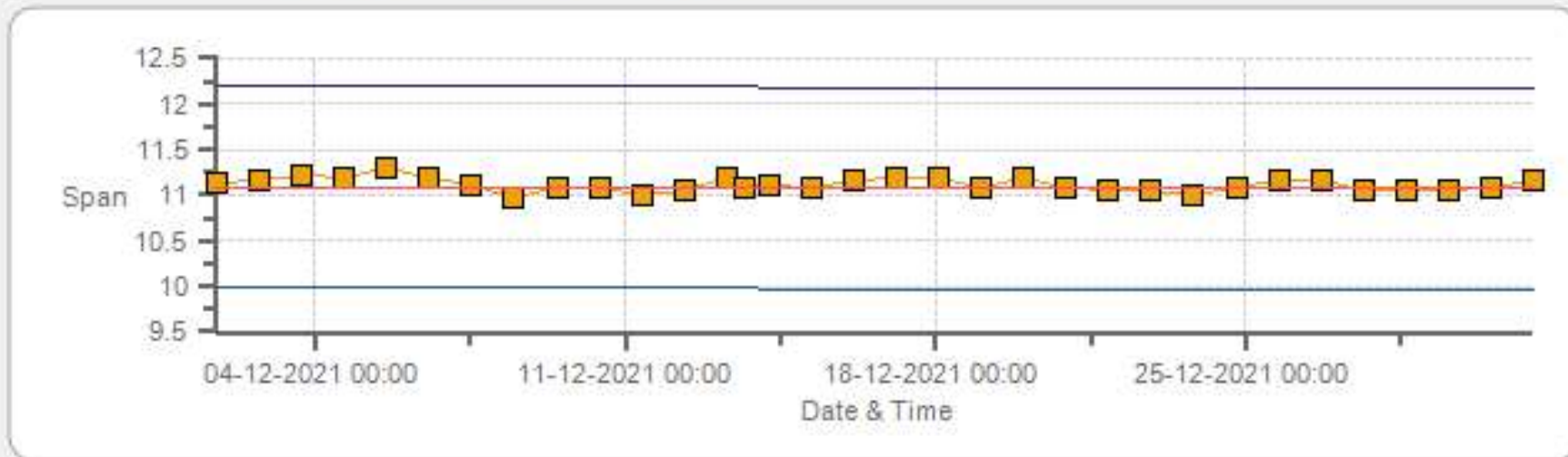
Span SpanRef Span Low Span High

NMHC[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: Tamarack Monthly: 12-2021 Type: SpanAndZero - Span



Span Span Ref Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	08-Dec-2021	PREVIOUS CALIBRATION DATE:	05-Nov-2021
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	0.999
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	907
PURPOSE:	Routine	START TIME (MST):	11:51
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:00

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180930031	FLOW (mL/min)	437
INITIAL		FINAL	
BKG/OFFSET	2.47	BKG/OFFSET	2.72
COEF/SLOPE	0.969	COEF/SLOPE	0.99
Expected (reference) Value	192.2	Expected (reference) Value	197

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	26801218	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 105146	HIGH ID	n/a
CONC (ppm):	50.80	EXPIRY DATE	n/a
CYLINDER (psi):	1500	LOW ID	n/a
EXPIRY DATE	09-Jun-2029	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:

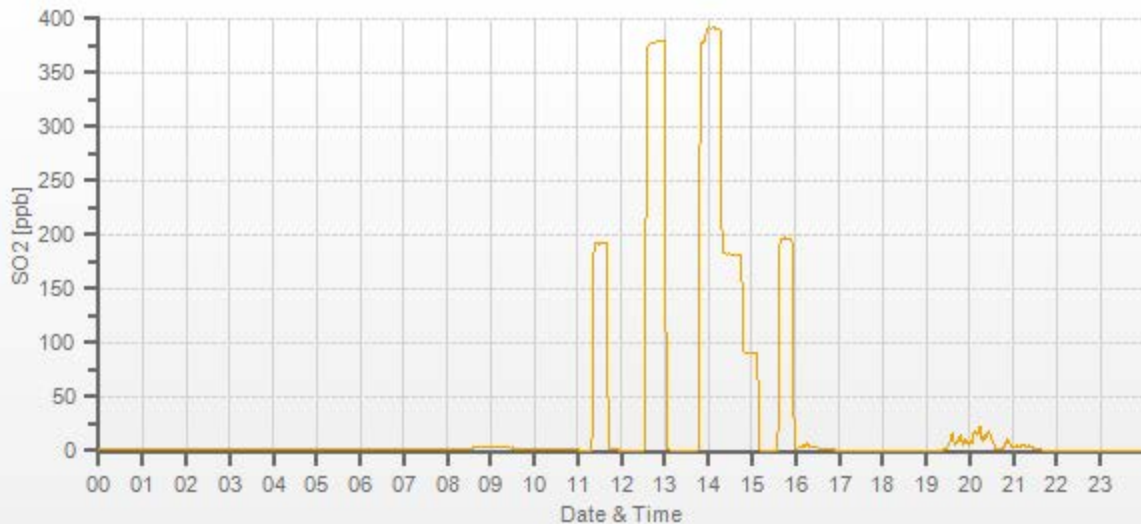
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	38.50	5000	0.00	0.1	0	1.031	1.000
4962	38.50	5000	391.16	379.4	391	1.031	1.000
4982	18.00	5000	182.88	n/a	182	n/a	1.005
4991	9.00	5000	91.44	n/a	90.9	n/a	1.006

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	-0.1%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	08-Dec-2021	PREVIOUS CALIBRATION DATE:	05-Nov-2021
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	0.999
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	907
PURPOSE:	Routine	START TIME (MST):	11:52
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:01

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 17360005	FLOW (mL/min)	913
INITIAL		FINAL	
BKG/OFFSET	30.3	BKG/OFFSET	30.2
COEF/SLOPE	0.825	COEF/SLOPE	0.822
Expected (reference) Value	45.3	Expected (reference) Value	44.7

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0000644	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	700	LOW ID	n/a
EXPIRY DATE	16-Jun-2022	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:	11:56	SO2 Conc (ppb)	380
END TIME:	12:11	Analyzer Response (ppb)	0.0

CALIBRATION:

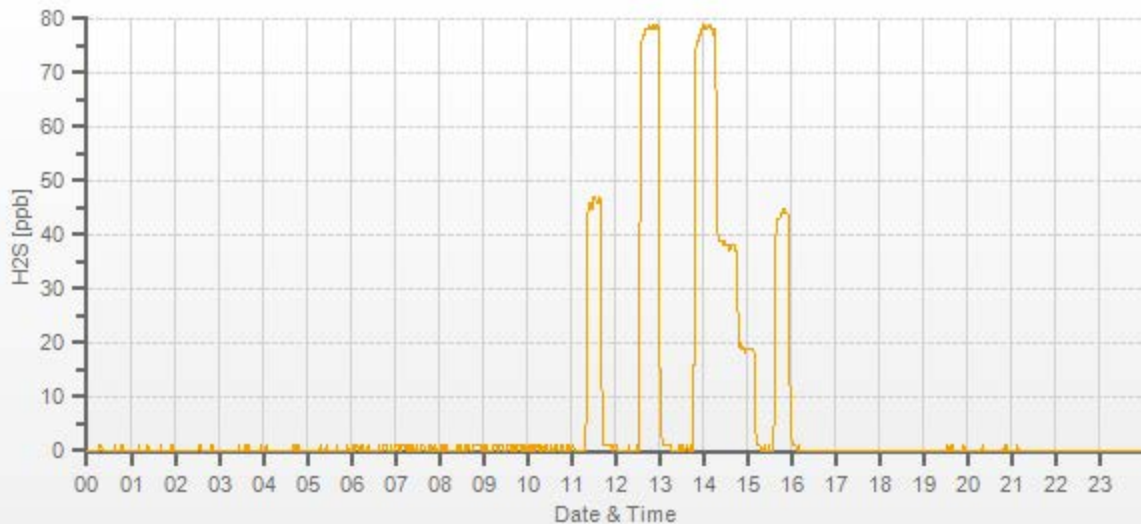
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	-0.4	0	0.995	1.001
7442	58.50	7500	78.00	78	77.9	0.995	1.001
7472	28.50	7500	38.00	n/a	37.9	n/a	1.003
7486	14.20	7500	18.93	n/a	19	n/a	0.996

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	0.998	0.0%

COMMENTS:

Sample inlet filter was changed.



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	08-Dec-2021	PREVIOUS CALIBRATION DATE:	05-Nov-2021	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930028	NOx	0.999
LOCATION:	Tamarack	BAROMETRIC (mBar):	907	FLOW (mL/min)	838	NO	0.999
PURPOSE:	Routine	START TIME (MST):	11:49	RANGE (ppb)	500	NO2	1.004
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:50	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 105146	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	50.0 50.1	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	1500	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a	EXPIRY DATE	09-Jun-2029	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	1.7	1.5	n/a	BKG/OFFSET:	2	1.6	n/a
SLOPE/COEF/CE:	1.002	0.989	1.005	SLOPE/COEF/CE:	1.002	0.978	1.005

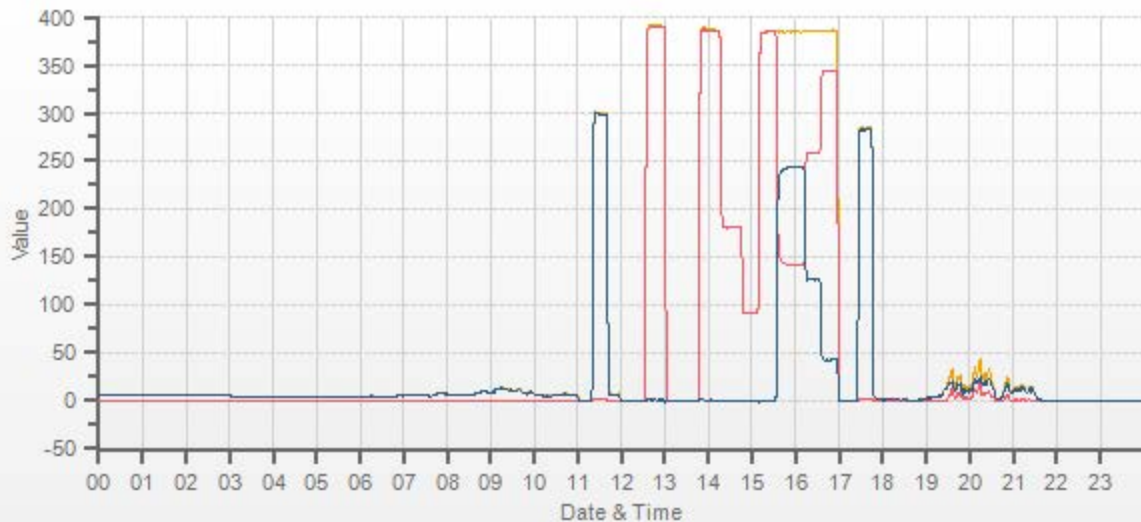
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	263.4	2.3	261.1		285.7	1.8	283.8

CALIBRATION PARAMETERS:				
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 (mL/min)			CONCENTRATION (ppb)									CORRECTION FACTOR (CF.)					
			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	38.50	5000	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.989	0.989	0.989	1.000	0.999	0.999
4962	38.50	5000	385.0	385.8	0.8	389.1	390.5	1.5	385.1	386.1	0.9	0.989	0.989	0.989	1.000	0.999	0.999
4982	18.00	5000	180.0	180.4	0.4	n/a	n/a	n/a	180.7	181.0	0.3	n/a	n/a	n/a	0.996	0.996	0.996
4991	9.00	5000	90.0	90.2	0.2	n/a	n/a	n/a	90.7	90.9	0.3	n/a	n/a	n/a	0.992	0.992	0.992

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	38.50	5000	0	385.3	385.8	0.5	244.2	243.1	1.005	99.55%	
AS-FOUND HIGH	38.50	5000	240	141.1	384.8	243.6	244.2	243.1	1.005	99.55%	
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
MID	38.50	5000	125	258.6	385.5	126.9	126.7	126.4	1.002	99.76%	
LOW	38.50	5000	45	343.4	386.3	42.8	41.9	42.3	0.991	100.95%	
NO2 adjustment not required.									AVERAGE:	100.09%	

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	1.000	0.08%	
NOx	1.000	1.000	0.07%	
NO2	1.000	0.993	0.14%	



CAL-LICA-202112-01248

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	13-Dec-2021	PREVIOUS CALIBRATION DATE:	04-Nov-2021
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	0.999
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	Tamarack	BAROMETRIC (mBar):	933
PURPOSE:	Routine	START TIME (MST):	11:29
PERFORMED BY:	Alex Yakupov	END TIME (MST):	16:13

ANALYZER:

MAKE/MODEL	Thermo 49iQ	RANGE	500 ppb
SERIAL #	1202068570	FLOW (mL/min)	1340
INITIAL		FINAL	
BKG/OFFSET	3.6	BKG/OFFSET	4.4
COEF/SLOPE	1.028	COEF/SLOPE	1.032
Expected (reference) Value	408.6	Expected (reference) Value	404.6

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	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:

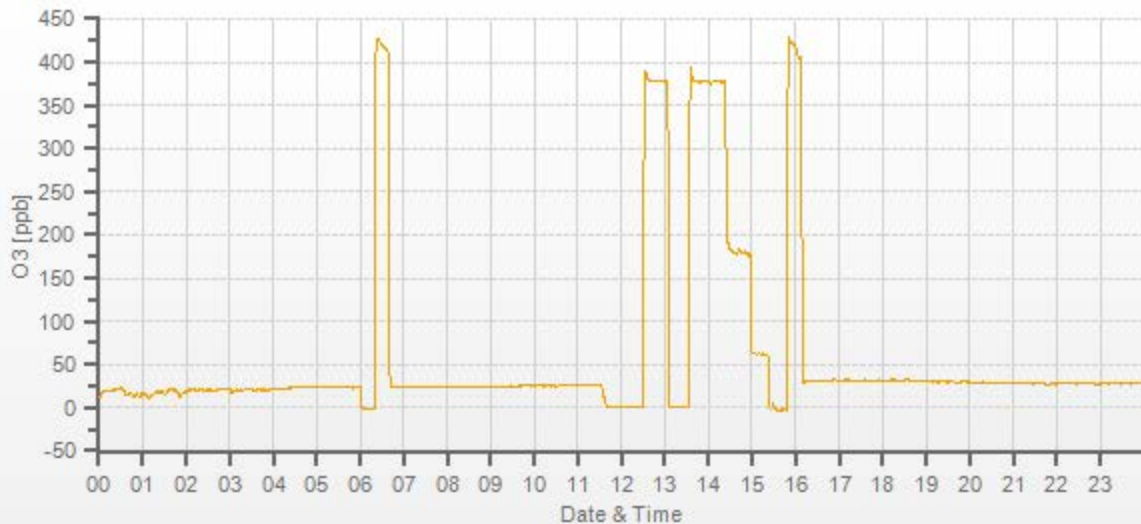
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	XXXX	5000	0.0	0.8	0.0	XXXX	XXXX
5000	XXXX	5000	378.0	378.0	378.4	1.002	0.999
5000	XXXX	5000	180.0	n/a	180.2	n/a	0.999
5000	XXXX	5000	61.0	n/a	61.5	n/a	0.992

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.001	0.0%

COMMENTS:

Sample inlet filter ws changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	13-Dec-2021	PREVIOUS CALIBRATION DATE:	04-Nov-2021	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1314057759	1010
LOCATION:	Tamarack	BAROMETRIC (mBar):	933	PARAMETER:	CH4	NMHC	THC
PURPOSE	Routine	START TIME (MST):	11:31	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:52	PREVIOUS CF:	1.000	1.002	1.001

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	800	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

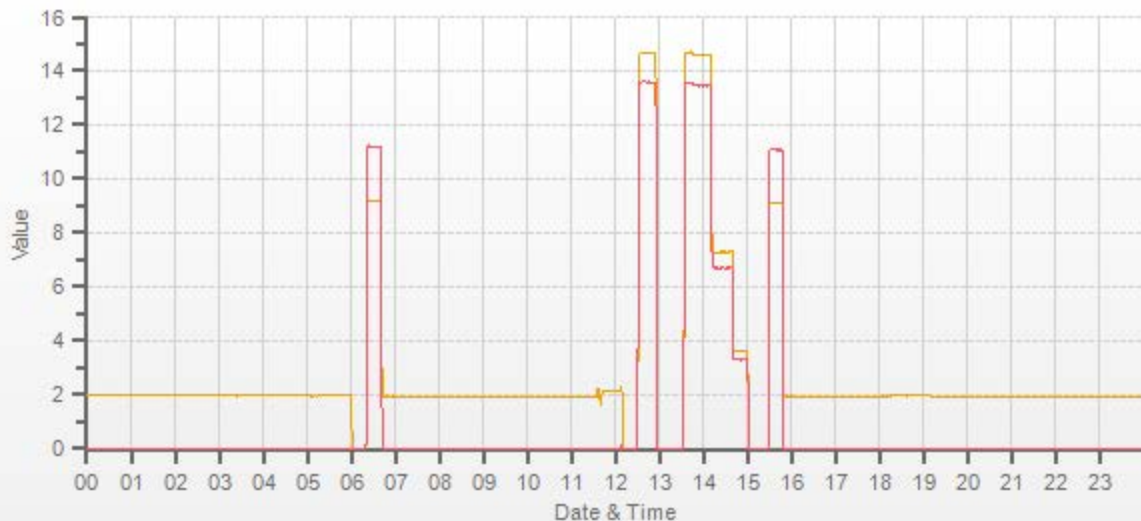
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	9.10	11.09	20.20		9.13	11.07	20.20

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
3051	49.40	3100	14.57	13.45	28.02	14.67	13.58	28.25	14.60	13.46	28.07	0.993	0.991	0.992	0.998	1.000	0.998
3075	24.70	3100	7.28	6.73	14.01	n/a	n/a	n/a	7.28	6.70	13.98	n/a	n/a	n/a	1.000	1.004	1.002
3088	12.40	3100	3.66	3.38	7.03	n/a	n/a	n/a	3.62	3.33	6.95	n/a	n/a	n/a	1.010	1.014	1.012

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:	
CH ₄	1.000	1.003	-0.1%	Sample inlet filter was changed.	
NMHC	1.000	1.001	-0.1%		
THC	1.000	1.003	-0.1%		
				Use Zero Chrom?	Yes



CAL-LICA-202112-01248



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA
 Audit Location: Tamarack
 Audit Date: September 20, 2021
 Calibration Purpose: routine annual

Performed By: Alex Yakupov
 Reviewed By: Chris Wesson
 Start/End Time (mst): 14:10 / 15:19
 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:	September 10, 2020	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	37.0	37.0	0.996
3000	55.3	55.5	55.5	0.996
4000	73.7	74.0	74.0	0.996
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	148.2	148.1	0.995
9000	165.9	166.8	166.8	0.994
10000	184.3	185.3	185.4	0.994
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	0.4	0.9	0.6
30	330	32	330	-1.6	0.2	0.9
60	300	63	300	-3.1	0.1	1.6
90	270	93	270	-3.4	0.0	1.7
120	240	123	241	-3.4	-1.3	2.4
150	210	153	212	-2.8	-2.3	2.6
180	180	181	183	-1.1	-2.9	2.0
210	150	212	153	-2.3	-3.4	2.9
240	120	241	124	-1.2	-3.8	2.5
270	90	269	94	0.6	-4.0	2.3
300	60	299	64	0.6	-3.9	2.3
330	30	329	33	0.6	-2.7	1.7
355	0	354	1	0.9	0.7	0.8
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.9

Comments:

n/a

End of Report



Lakeland Industry & Community Association

DECEMBER 2021

Ambient Air Monitoring Calibration Report

- ST. LINA STATION-

CAL-LICA-202112-01250

Station Operation and Maintenance:

Bureau Veritas Canada

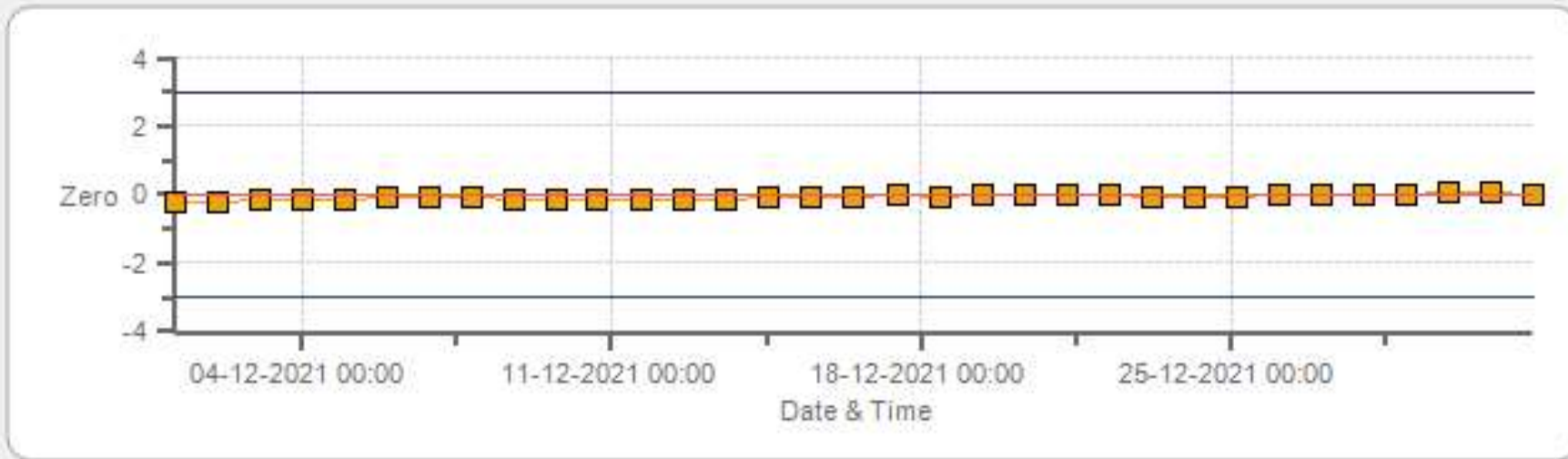
Data Validation and Report:

LICA / Bureau Veritas Canada

January 14, 2022

DAILY INTERNAL ZERO-SPAN CALIBRATION RECORDS

SO2[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



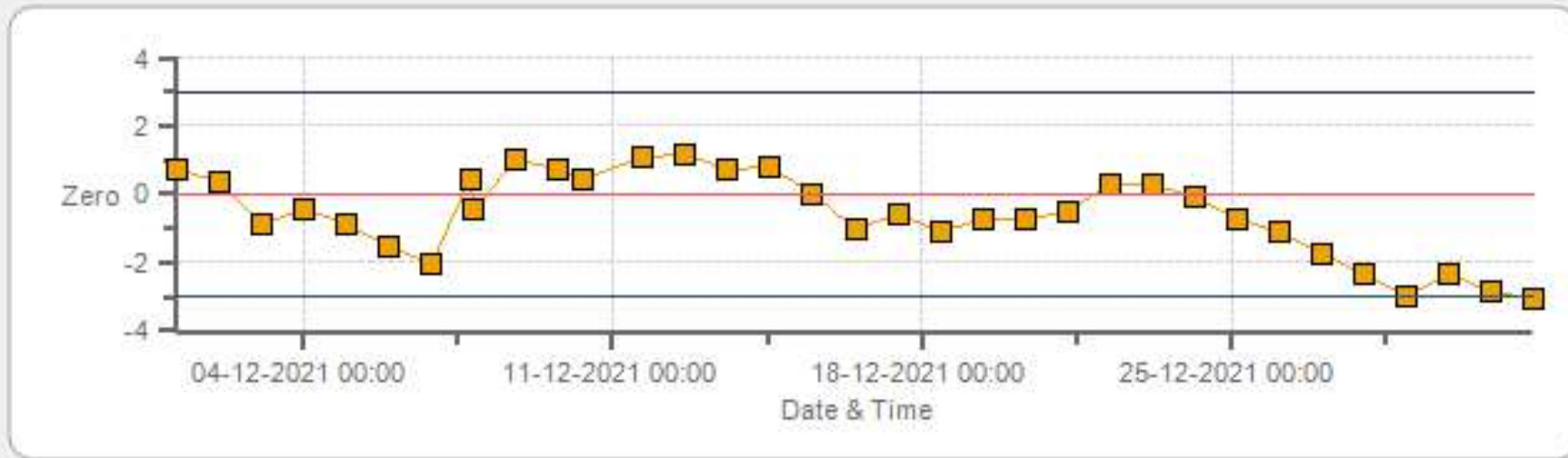
Zero Zero Ref Zero Low Zero High

SO2[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



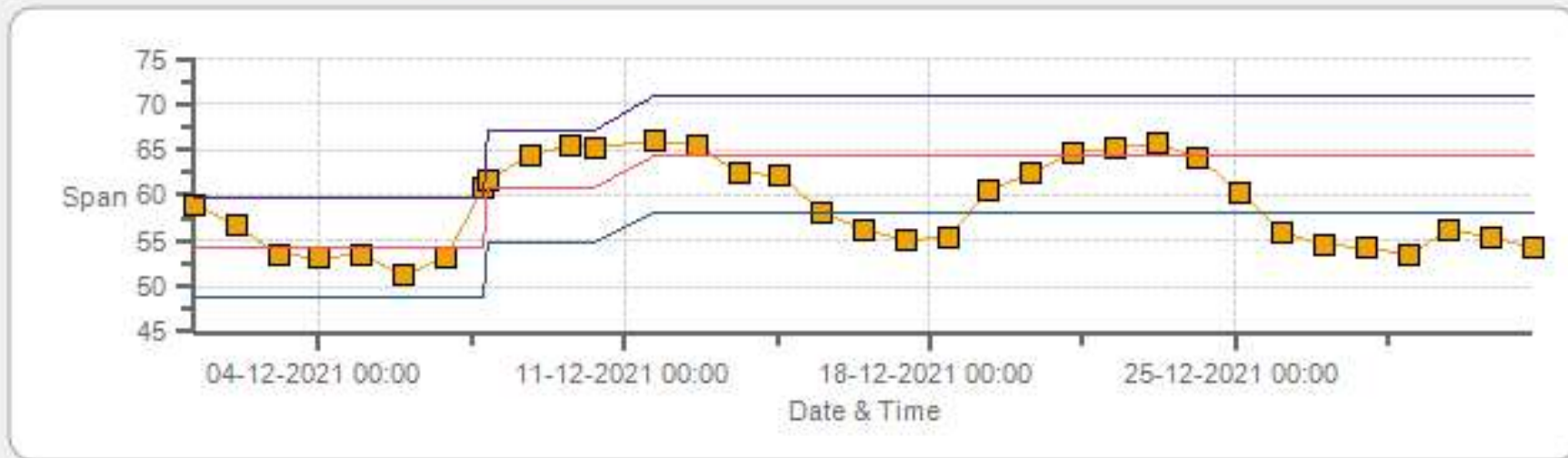
Span SpanRef Span Low Span High

H2S[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



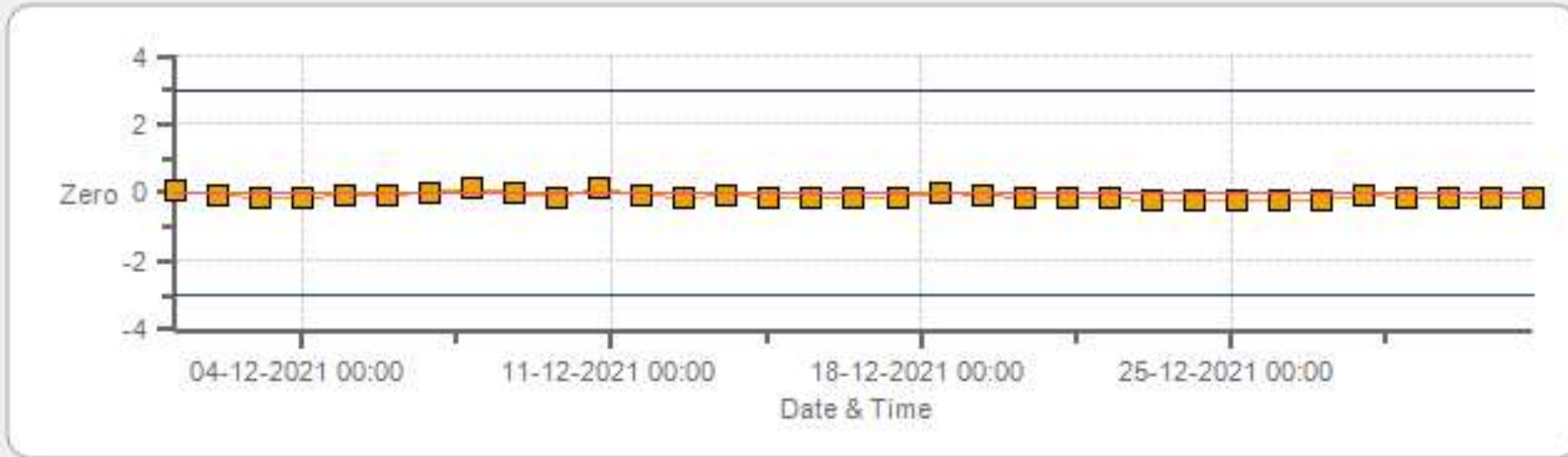
Zero Zero Ref Zero Low Zero High

H2S[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NOX[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



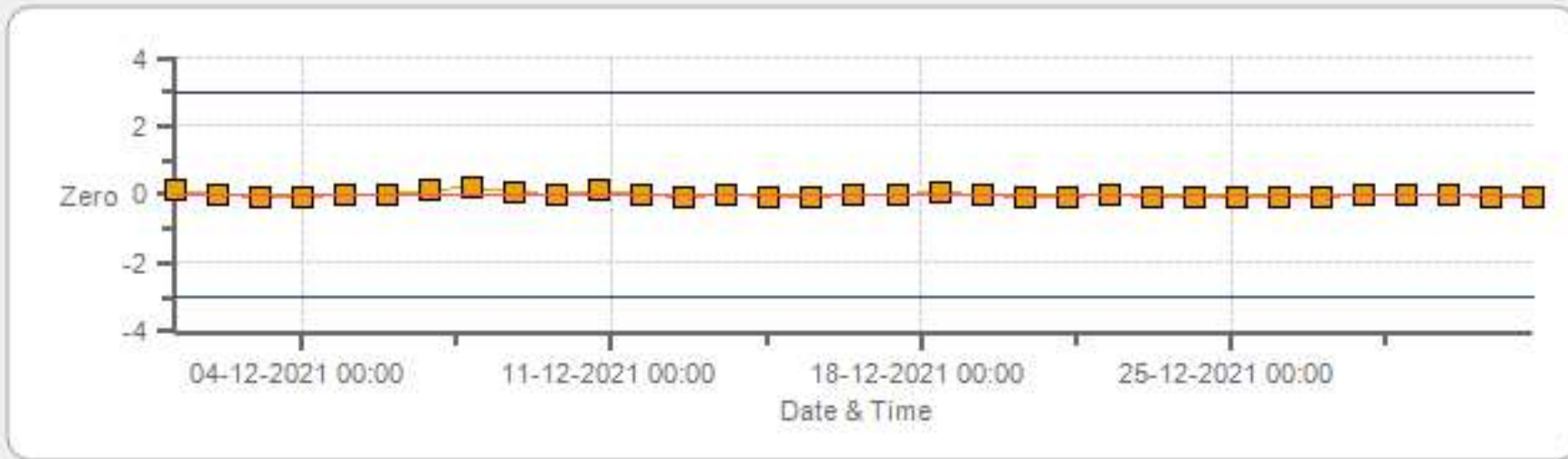
Zero Zero Ref Zero Low Zero High

NOX[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

NO2[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



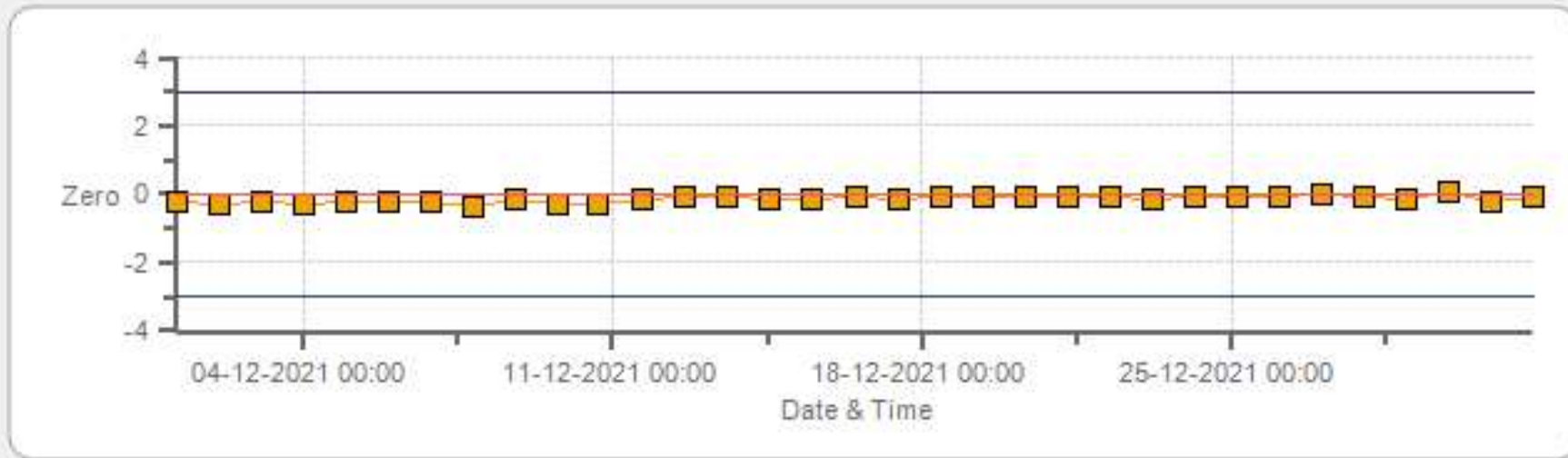
Zero Zero Ref Zero Low Zero High

NO2[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



Span Span Ref Span Low Span High

O3[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

O3[ppb] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



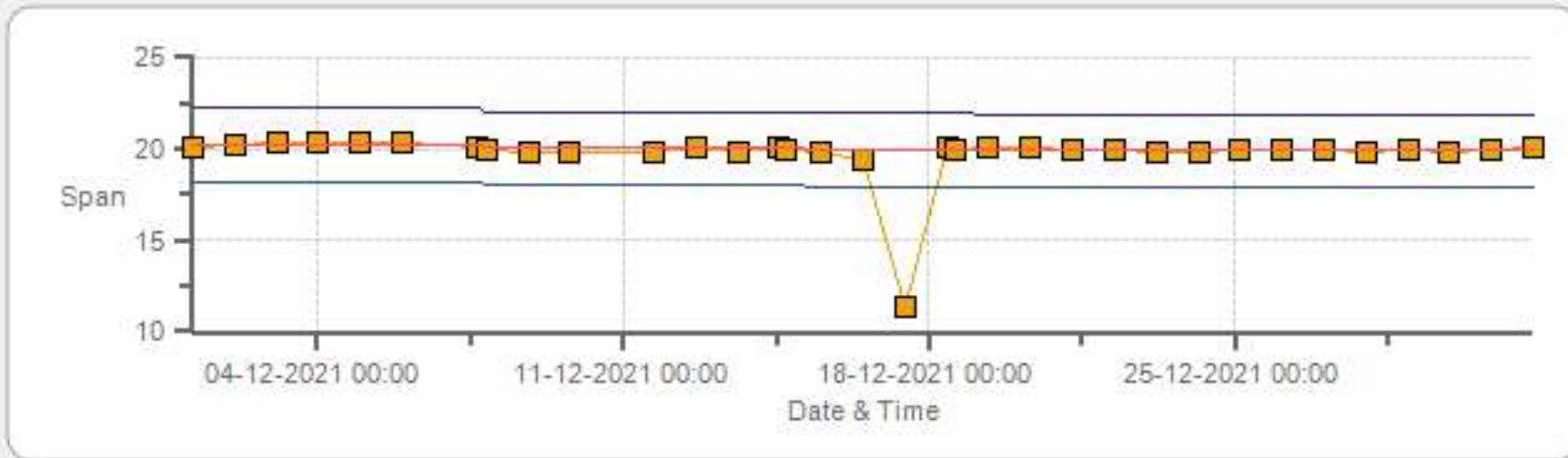
Span SpanRef Span Low Span High

THC55[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



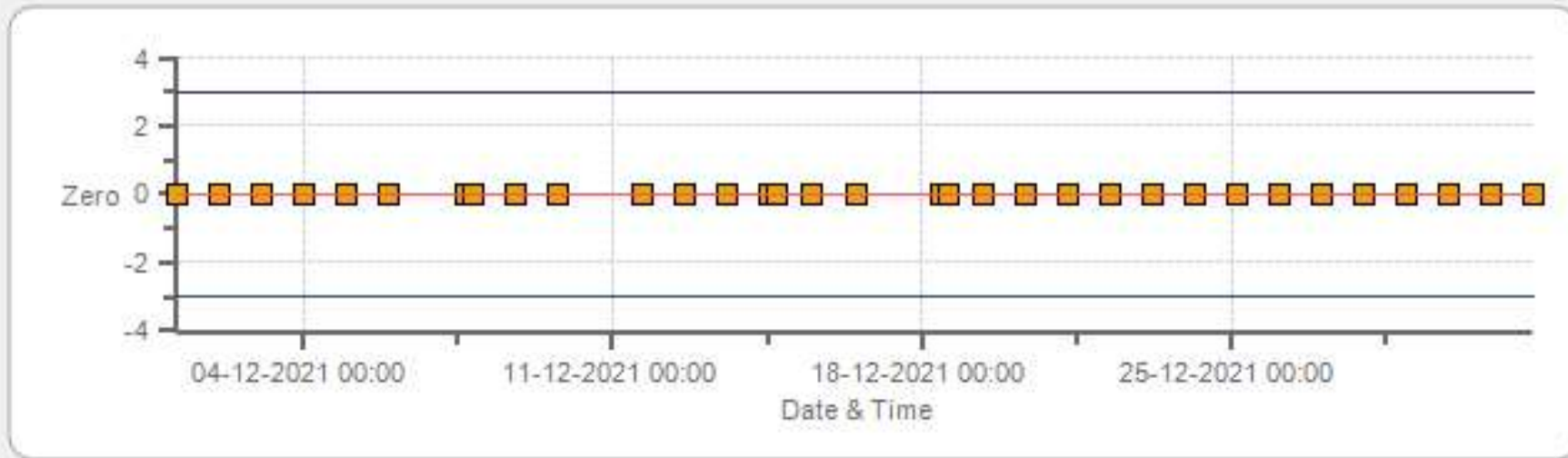
Zero Zero Ref Zero Low Zero High

THC55[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

CH4[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



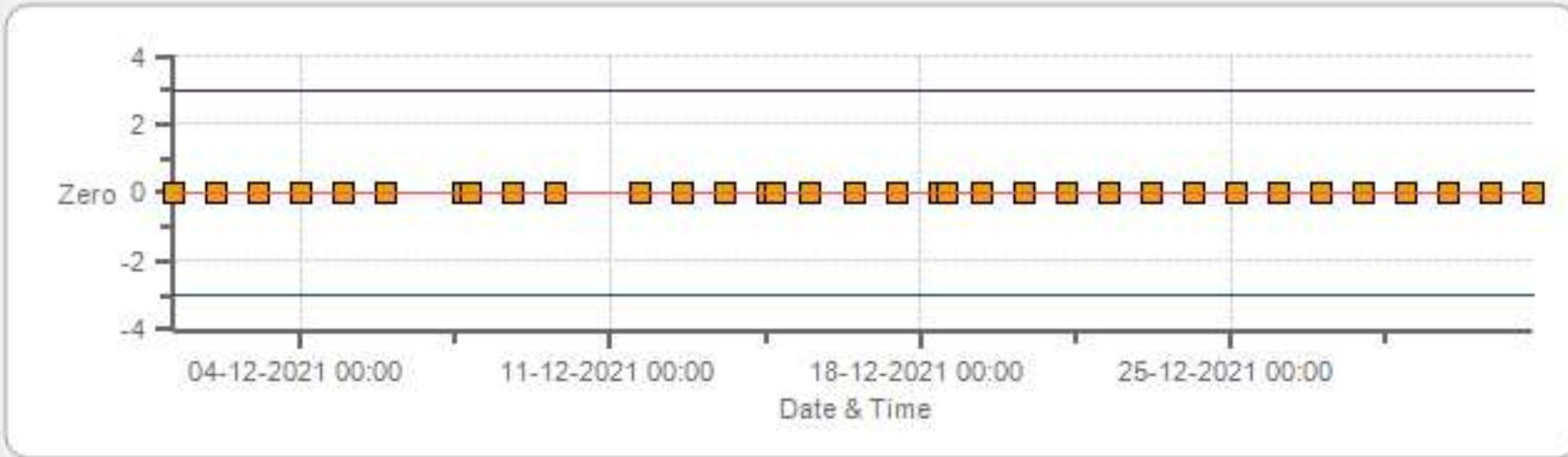
Zero Zero Ref Zero Low Zero High

CH4[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



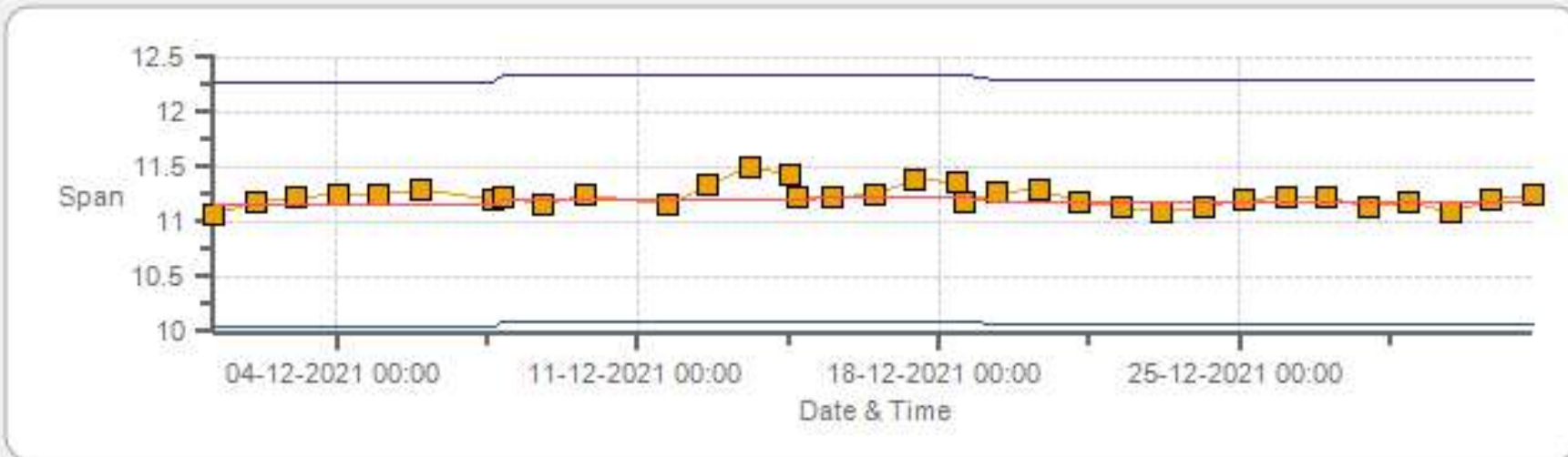
Span Span Ref Span Low Span High

NMHC[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Zero



Zero Zero Ref Zero Low Zero High

NMHC[ppm] Calibration: St. Lina Monthly: 12-2021 Type: SpanAndZero - Span



Span SpanRef Span Low Span High

MULTI-POINT CALIBRATION RECORDS

SO2 Analyzer Calibration by Dilution



DATE:	10-Dec-2021	PREVIOUS CALIBRATION DATE:	17-Nov-2021
PARAMETER:	SO2	PREVIOUS CORRECTION FACTOR:	0.998
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	913
PURPOSE:	Routine	START TIME (MST):	11:40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:45

ANALYZER:

MAKE/MODEL	Thermo 43I-TLE	RANGE	500 ppb
SERIAL #	1180930030	FLOW (mL/min)	428
INITIAL		FINAL	
BKG/OFFSET	4.67	BKG/OFFSET	4.69
COEF/SLOPE	1.172	COEF/SLOPE	1.161
Expected (reference) Value	368.5	Expected (reference) Value	370

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010	MODEL:	T701
ID:	26801218	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	LL 105146	HIGH ID	n/a
CONC (ppm):	50.80	EXPIRY DATE	n/a
CYLINDER (psi):	1300	LOW ID	n/a
EXPIRY DATE	09-Jun-2029	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:

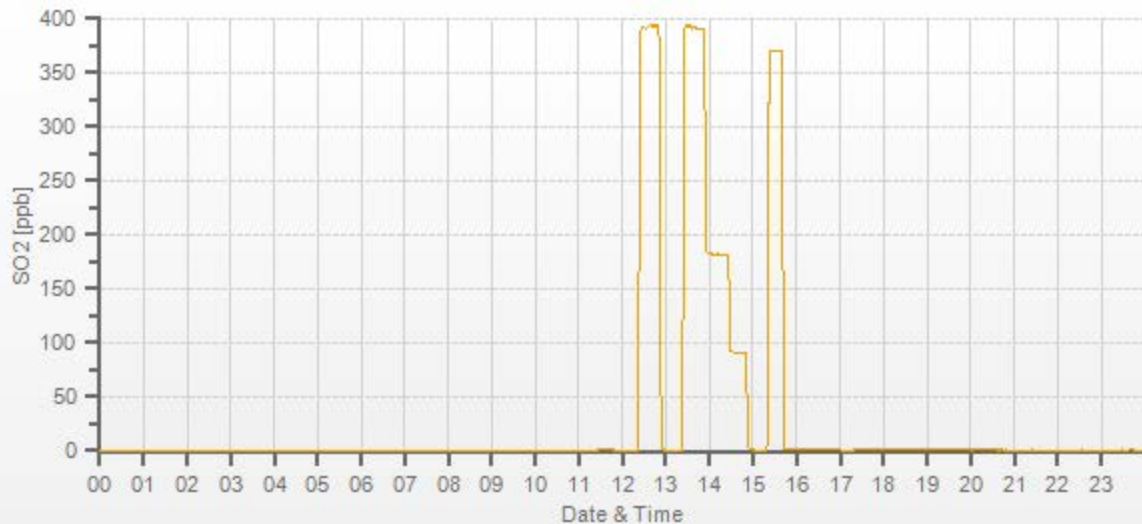
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	 	5000	0.00	-0.1	0	 	
4959	38.50	4997	391.39	393.1	391.2	0.995	1.000
4981	18.00	4999	182.92	n/a	182.2	n/a	1.004
4990	9.00	4999	91.46	n/a	91.1	n/a	1.004

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	-0.1%

COMMENTS:

Sample inlet filter was changed.



H2S Analyzer Calibration by Dilution



DATE:	07-Dec-2021	PREVIOUS CALIBRATION DATE:	17-Nov-2021
PARAMETER:	H2S	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	910
PURPOSE:	Routine	START TIME (MST):	12:57
PERFORMED BY:	Alex Yakupov	END TIME (MST):	18:35

ANALYZER:

MAKE/MODEL	Thermo 450i	RANGE	100 ppb
SERIAL #	CM 18010058	FLOW (mL/min)	804
INITIAL		FINAL	
BKG/OFFSET	52.4	BKG/OFFSET	56.8
COEF/SLOPE	0.861	COEF/SLOPE	0.906
Expected (reference) Value	54.2	Expected (reference) Value	60.9

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a
CALIBRATION GAS:		FLOWMETERS (if applicable):	
CYLINDER ID:	EY 0000644	HIGH ID	n/a
CONC (ppm):	10.00	EXPIRY DATE	n/a
CYLINDER (psi):	600	LOW ID	n/a
EXPIRY DATE	16-Jul-2022	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:	12:57	SO2 Conc (ppb)	380
END TIME:	13:13	Analyzer Response (ppb)	0.0

CALIBRATION:

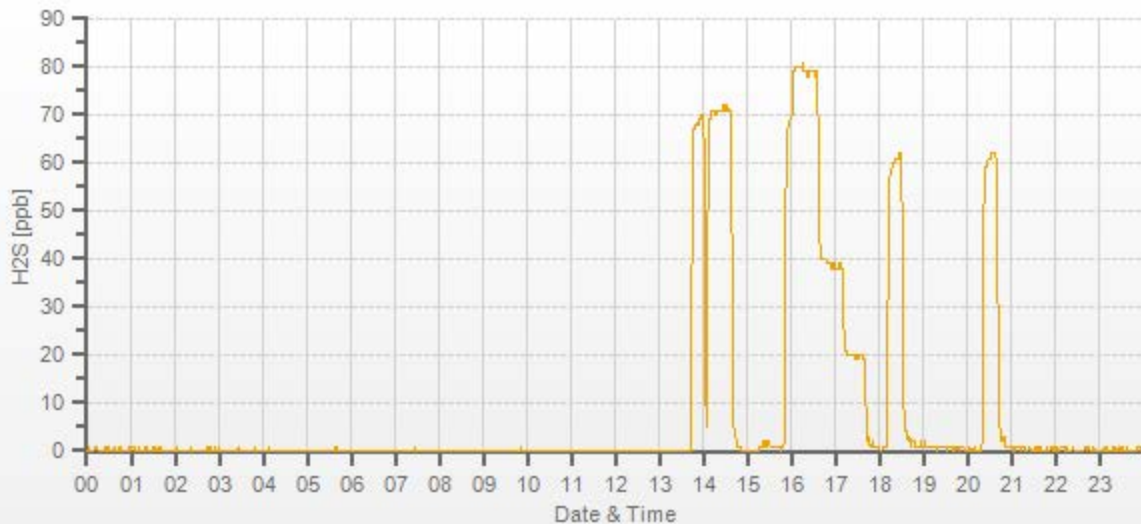
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
7500	7500	7500	0.00	-1.6	0	1.000	1.000
7442	58.50	7500	78.00	70.6	78	1.080	1.000
7472	28.50	7500	38.00	n/a	37.5	n/a	1.013
7486	14.30	7500	19.07	n/a	19	n/a	1.004

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	-0.1%

COMMENTS:

Sample inlet filter was changed.
12:09 - 12:57 calibration paused whilst work completed on zero air; restarted from beginning.
14:01 - 14:05 Calibration system was checked due to slow response and As-found high restarted.



NOx Calibration by Dilution/Gas-Phase Titration



CALIBRATION:				ANALYZER:			
DATE:	10-Dec-2021	PREVIOUS CALIBRATION DATE:	17-Nov-2021	MAKE/MODEL:	Thermo 42i	PREVIOUS CF.	
CLIENT:	LICA	TEMPERATURE (°C):	22.0	SERIAL #:	1180930029	NOx	0.999
LOCATION:	St. Lina	BAROMETRIC (mBar):	913	FLOW (mL/min)	814	NO	1.000
PURPOSE:	Routine	START TIME (MST):	11:42	RANGE (ppb)	500	NO2	1.000
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:15	GPT FOR O3?		No	

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 105146	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	NO/NOx (PPM):	50.0 50.1	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	1300	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	n/a	EXPIRY DATE	09-Jun-2029	LOW EXPIRY:	n/a

CALIBRATION SETTINGS:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
BKG/OFFSET:	4.2	4	n/a	BKG/OFFSET:	4.1	3.9	n/a
SLOPE/COEF/CE:	1.005	0.868	0.995	SLOPE/COEF/CE:	1.001	0.847	0.995

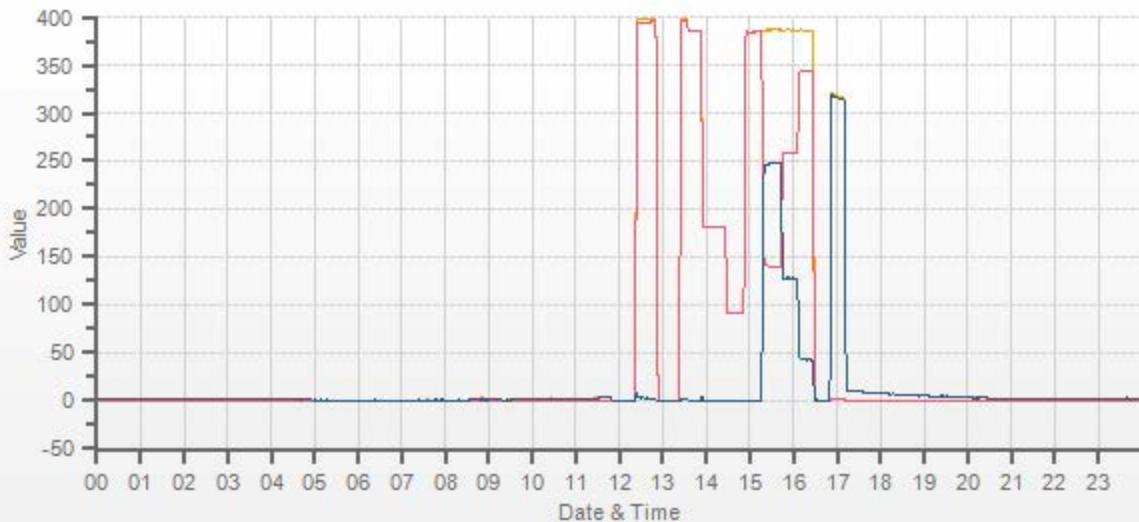
EXPECTED (REFERENCE) VALUE:							
INITIAL	NOx	NO	NO2	FINAL	NOx	NO	NO2
	291.7	3.0	288.7		316.3	1.9	312.7

CALIBRATION PARAMETERS:				
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	38.50	5000	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.977	0.971	0.995	0.995	0.994	0.989
4959	38.50	4997	385.2	386.0	0.8	394.2	397.5	3.3	385.1	385.9	0.8	0.977	0.971	0.995	1.000	1.000	0.989
4981	18.00	4999	180.0	180.4	0.4	n/a	n/a	n/a	180.9	181.5	0.5	n/a	n/a	0.995	0.995	0.994	0.989
4990	9.00	4999	90.0	90.2	0.2	n/a	n/a	n/a	90.9	91.2	0.3	n/a	n/a	0.995	0.990	0.989	0.989

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	38.50	4997	0	385.7	386.2	0.5	246.4	247.2	0.997	100.32%
AS-FOUND HIGH	38.50	4997	240	139.3	387.0	247.7	246.4	247.2	0.997	100.32%
ADJUSTED HIGH	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MID	38.50	4997	125	258.2	386.6	128.5	127.5	128	0.996	100.39%
LOW	38.50	4997	45	343.1	385.8	42.7	42.6	42.2	1.009	99.06%
NO2 adjustment not required.									AVERAGE:	99.93%

LINEAR REGRESSION ANALYSIS:				COMMENTS:
	CORRELATION	SLOPE	INTERCEPT	
NO	1.000	0.999	0.11%	
NOx	1.000	0.999	0.13%	
NO2	1.000	1.006	-0.10%	



CAL-LICA-202112-01250

Ozone Calibration by Photometer (Varying UV Lamp)



DATE:	10-Dec-2021	PREVIOUS CALIBRATION DATE:	17-Nov-2021
PARAMETER:	O3	PREVIOUS CORRECTION FACTOR:	1.000
CLIENT:	LICA	TEMPERATURE (°C):	22.0
LOCATION:	St. Lina	BAROMETRIC (mBar):	913
PURPOSE:	Routine	START TIME (MST):	11:41
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:45

ANALYZER:

MAKE/MODEL	Thermo 49i	RANGE	500 ppb
SERIAL #	1002240371	FLOW (mL/min)	1476
INITIAL		FINAL	
BKG/OFFSET	0.3	BKG/OFFSET	0.1
COEF/SLOPE	1.006	COEF/SLOPE	1.005
Expected (reference) Value	223.1	Expected (reference) Value	226.3

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:	
MAKE:	SABIO	MAKE:	Teledyne
MODEL:	2010 D	MODEL:	T701
ID:	11900613	ID:	132
MFC CALIBRATION DATE:	19-Oct-2021	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:

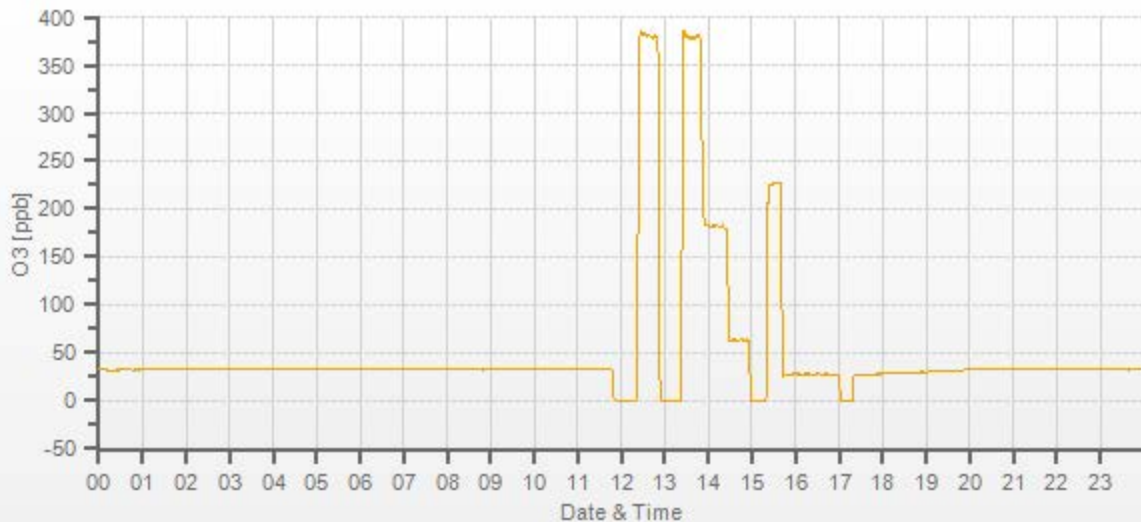
FLOW RATES (mL/min)			CONCENTRATION (ppb)			CORRECTION FACTOR	
DILUENT	GAS	TOTAL	ACTUAL	INDICATED		Initial	Final
				Initial	Final		
5000	XXXX	5000	0.0	0.1	0.0	XXXX	XXXX
5000	XXXX	5000	378.0	379.4	378.3	0.997	0.999
5000	XXXX	5000	180.0	n/a	182.1	n/a	0.988
5000	XXXX	5000	61.0	n/a	62.7	n/a	0.973

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT
VALUE	1.000	1.000	0.2%

COMMENTS:

Sampe inlet filter was changed.



Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	06-Dec-2021	PREVIOUS CALIBRATION DATE:	18-Nov-2021	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180030034	1100
LOCATION:	St. Lina	BAROMETRIC (mBar):	915	PARAMETER:	CH4	NMHC	THC
PURPOSE	Removal/Shut-down	START TIME (MST):	12:34	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	14:21	PREVIOUS CF:	1.000	1.000	1.000

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

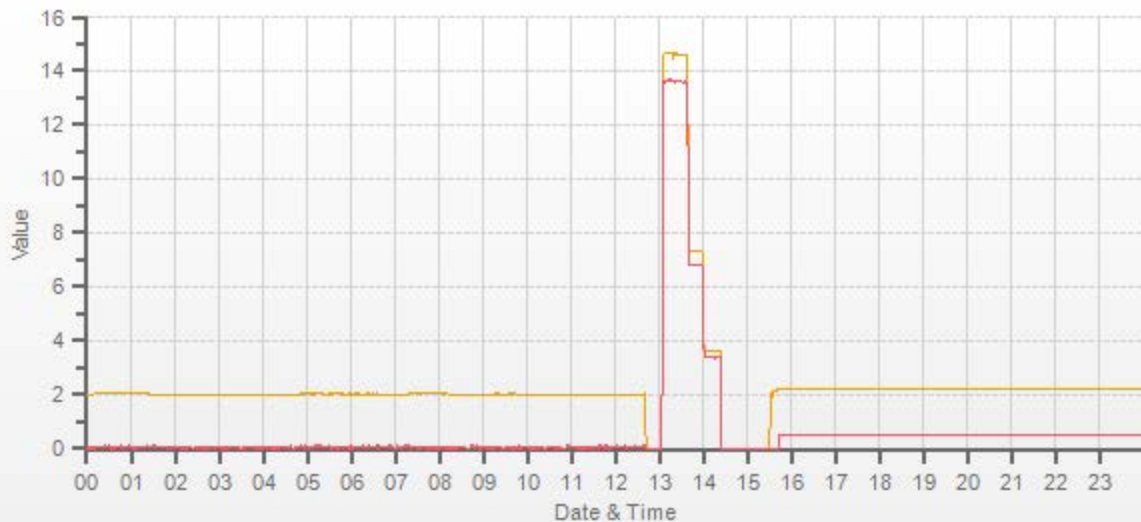
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	9.06	11.15	20.21		n/a	n/a	n/a

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
3051	49.40	3100	14.57	13.45	28.02	14.60	13.59	28.20	n/a	n/a	n/a	0.998	0.990	0.994	n/a	n/a	n/a
3075	24.70	3100	7.28	6.73	14.01	7.30	6.81	14.12	n/a	n/a	n/a	0.998	0.988	0.992	n/a	n/a	n/a
3088	12.40	3100	3.66	3.38	7.03	3.65	3.40	7.05	n/a	n/a	n/a	1.002	0.993	0.998	n/a	n/a	n/a

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:
CH ₄	1.000	1.003	0.0%	Shutdown calibration was completed to remove the analyzer. Reason - noisy readings
NMHC	1.000	1.011	0.0%	
THC	1.000	1.007	0.0%	
				Use Zero Chrom? Yes



CAL-LICA-202112-01250

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	07-Dec-2021	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656107	1201
LOCATION:	St. Lina	BAROMETRIC (mBar):	910	PARAMETER:	CH4	NMHC	THC
PURPOSE	Install/Post-Repair	START TIME (MST):	11:10	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:55	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 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

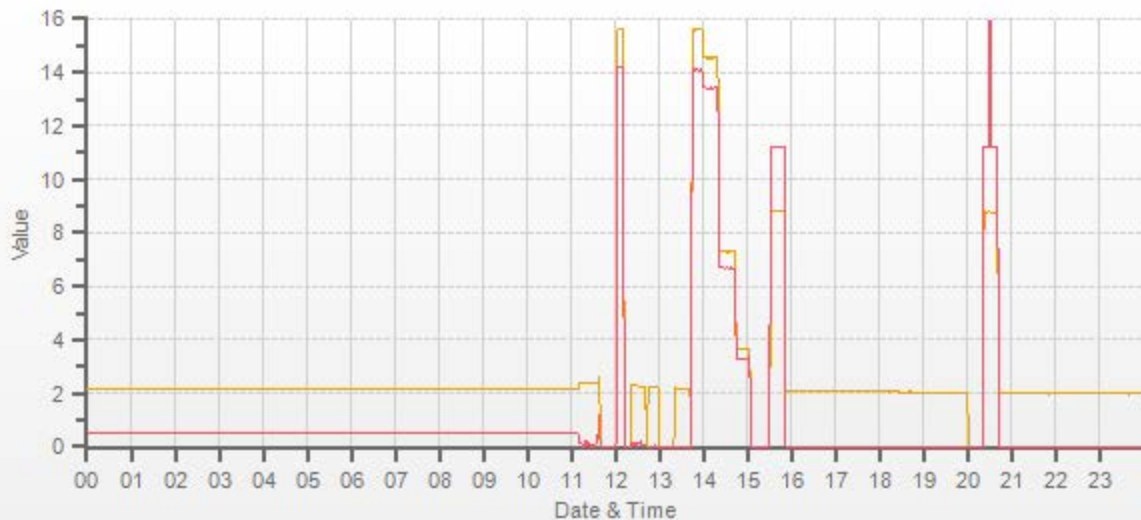
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	n/a	n/a	n/a		n/a	8.83	11.21

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
3051	49.40	3100	14.57	13.45	28.02	n/a	n/a	n/a	14.55	13.41	27.96	n/a	n/a	n/a	1.001	1.003	1.002
3075	24.70	3100	7.28	6.73	14.01	n/a	n/a	n/a	7.29	6.70	14.00	n/a	n/a	n/a	0.999	1.004	1.001
3088	12.40	3100	3.66	3.38	7.03	n/a	n/a	n/a	3.64	3.30	6.93	n/a	n/a	n/a	1.004	1.023	1.015

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:
CH ₄	1.000	0.999	0.0%	Sample inlet filter was changed. A new span gas cylinder was connected. 12:09-12:57 calibration paused to check the station's zero air
NMHC	1.000	0.998	-0.1%	
THC	1.000	0.999	-0.1%	
				Use Zero Chrom? Yes



CAL-LICA-202112-01250

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	14-Dec-2021	PREVIOUS CALIBRATION DATE:	07-Dec-2021	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1236656107	1200
LOCATION:	St. Lina	BAROMETRIC (mBar):	909	PARAMETER:	CH4	NMHC	THC
PURPOSE	Repeat	START TIME (MST):	13:50	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	17:18	PREVIOUS CF:	1.001	1.003	1.002

CALIBRATION SYSTEM:

CALIBRATOR:		ZERO AIR:		CALIBRATION GAS:		FLOWMETERS (if applicable):	
MAKE:	SABIO	MAKE:	Teledyne	CYLINDER ID:	LL 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	8.83	11.21	20.04		8.74	11.22	19.96

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
3051	49.40	3100	14.57	13.45	28.02	14.37	13.81	28.18	14.57	13.46	28.04	1.014	0.974	0.994	1.000	1.000	0.999
3075	24.70	3100	7.28	6.73	14.01	n/a	n/a	n/a	7.33	6.69	14.01	n/a	n/a	n/a	0.994	1.005	1.000
3088	12.40	3100	3.66	3.38	7.03	n/a	n/a	n/a	3.67	3.30	6.98	n/a	n/a	n/a	0.996	1.023	1.008

LINEAR REGRESSION ANALYSIS:

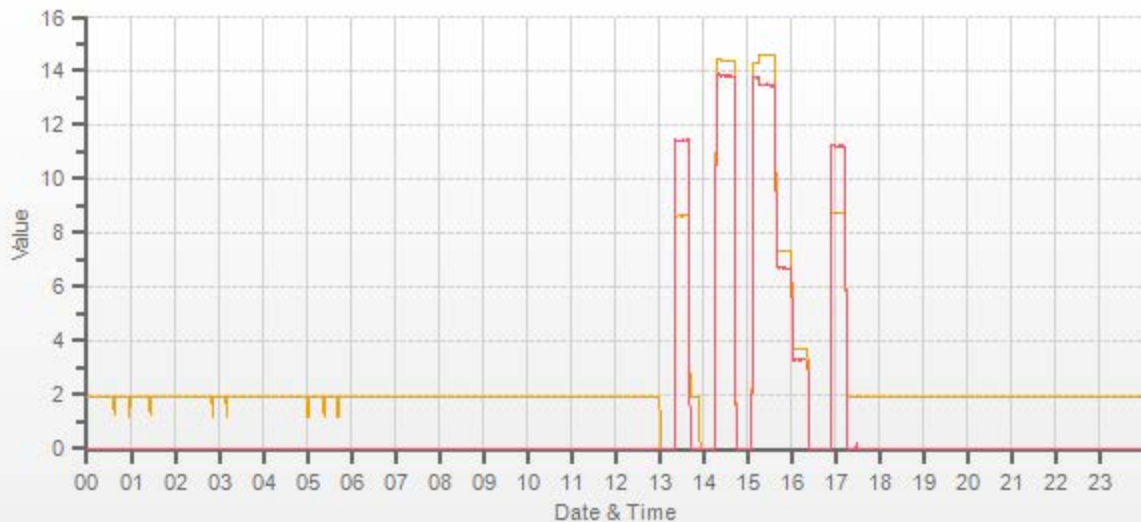
	CORRELATION	SLOPE	INTERCEPT
CH ₄	1.000	1.000	0.1%
NMHC	1.000	1.002	-0.2%
THC	1.000	1.001	-0.1%

Comments:

Repeat calibration was completed to fix a frequent bad injection issue

Use Zero Chrom?

Yes



CAL-LICA-202112-01250

Methane/Non-Methane Analyzer Calibration by Dilution



CALIBRATION:				ANALYZER:			
DATE:	18-Dec-2021	PREVIOUS CALIBRATION DATE:	n/a	VALUE	MAKE/MODEL	SERIAL	FLOW (mL/min)
CLIENT:	LICA	TEMPERATURE (°C):	22.0		Thermo 55i	1180030034	1153
LOCATION:	St. Lina	BAROMETRIC (mBar):	913	PARAMETER:	CH4	NMHC	THC
PURPOSE	Repeat	START TIME (MST):	12:06	RANGE (ppm):	20	20	40
PERFORMED BY:	Alex Yakupov	END TIME (MST):	15:01	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 168375	HIGH ID:	n/a
MODEL:	2010	MODEL:	T701	CH ₄ /C ₃ H ₈ (ppm):	914.0 307.0	HIGH EXPIRY:	n/a
ID:	26801218	ID:	132	CYLINDER (psi):	700	LOW ID:	n/a
MFC CALIBRATION DATE:	19-Oct-2021	OXIDIZER ID:	115	EXPIRY DATE	21-Jan-2028	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	844.3
RANGE	12 - 16	6 - 8	2 - 4	THC as CH ₄	1758.3

EXPECTED (REFERENCE) VALUE:

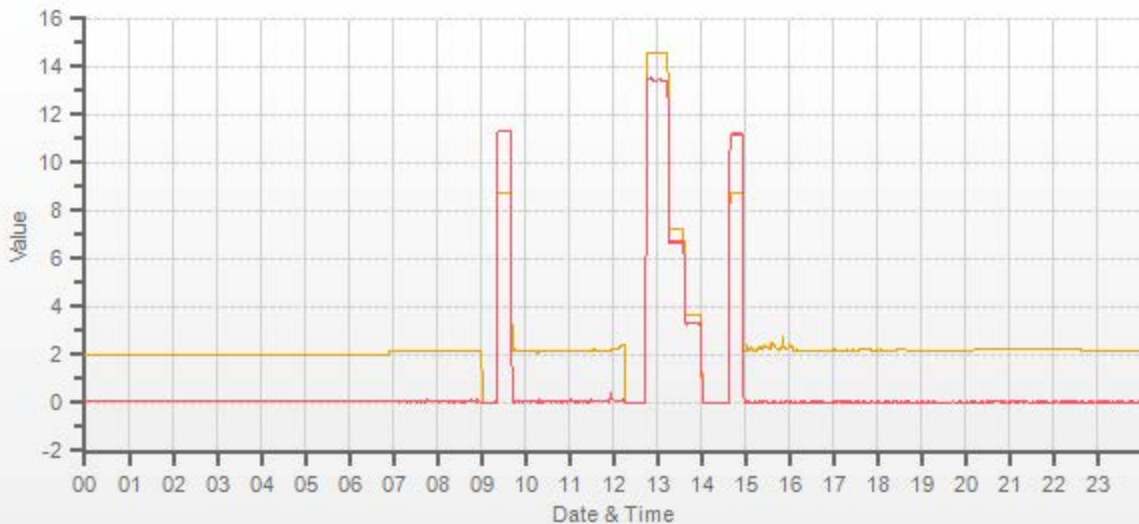
INITIAL	CH ₄	NMHC	THC	FINAL	CH ₄	NMHC	THC
	n/a	n/a	n/a		8.72	11.18	19.90

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
3051	49.40	3100	14.57	13.45	28.02	n/a	n/a	n/a	14.56	13.45	28.00	n/a	n/a	n/a	1.000	1.000	1.001
3075	24.70	3100	7.28	6.73	14.01	n/a	n/a	n/a	7.28	6.70	13.97	n/a	n/a	n/a	1.000	1.004	1.003
3088	12.40	3100	3.66	3.38	7.03	n/a	n/a	n/a	3.64	3.33	6.97	n/a	n/a	n/a	1.004	1.014	1.009

LINEAR REGRESSION ANALYSIS:

	CORRELATION	SLOPE	INTERCEPT	Comments:
CH ₄	1.000	1.000	0.0%	Installation calibration was completed to remove the failed analyzer #1236656107.
NMHC	1.000	1.001	-0.1%	
THC	1.000	1.000	-0.1%	
				Use Zero Chrom? Yes



CAL-LICA-202112-01250

Thermo 5030i SHARP Monitor Monthly Check

Date: December 10, 2021
Company: LICA
Station Name/Location: St. Lina
Previous Audit Date: November 29, 2021
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Chris Wesson
Start Time (mst): 16:31
End Time (mst): 17:14
Calibration Purpose: routine monthly
Weather Conditions: Mainly sunny

SHARP 5030i Information and Status:

Serial Number: CM 17091001 **Filter Tape Counter:** 149

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:	Temp / RH:
Make:	Delta Cal	Delta Cal	Fisher Scientific	VAISALA
Model:	DC1	DC1	FB61291	HMP76B
Serial Number:	177246	177246	130168457	T1640130
Calibration Expiration Date:	July 12, 2022	July 12, 2022	February 17, 2022	April 22, 2022

Ambient Temperature (°C)

	Reference	SHARP	Difference	Range	Action
#1	-5.40	-5.2	-0.2	< ± 2°C	OK
				2-3 °C	Recalibrate
				> 3°C	Fail

Ambient Relative Humidity (%RH)

	Reference	SHARP	Difference	Range	Action
#1	62.50	63.6	-1.1	< ± 2 %RH	OK
				2-5 %RH	Recalibrate
				> 5 %RH	Fail

Barometric Pressure (mmHg)

	Reference	SHARP	Difference	Range	Action
#1	685.0	685.0	0.0	< ± 10 mmHg	OK
				10-12 mmHg	Recalibrate
				> 12 mmHg	Fail

Flow Audit (L/min)

	Reference	SHARP	% Difference	Range	Action
#1	16.65	16.67	0.12%	< ± 4%	OK
#2	16.64	16.67		4-5%	Recalibrate
#3	16.65	16.66		>5%	Fail
Average	16.65	16.67			

Leak Check (L/min)

	Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference	
#1	16.65	16.67	-0.02	16.61	16.64	-0.03	<i>Leak Limit: 0.80 L/min</i>
						LEAK RATE: -0.01	



Meteorological Sensor Audit/Calibration

Location Information

Company: LICA
 Audit Location: St. Lina
 Audit Date: March 16, 2021
 Calibration Purpose: routine annual

Performed By: Alex Yakupov
 Reviewed By: Chris Wesson
 Start/End Time (mst): 12:17 / 14:32
 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 #:	161466	Direction Voltage Output Range:	0-1
Previous Cal/Audit Date:	February 26, 2020	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	37.0	37.0	0.996
3000	55.3	55.5	55.5	0.996
4000	73.7	74.0	74.1	0.996
5000	92.2	92.6	92.6	0.995
6000	110.6	111.2	111.2	0.994
7000	129.0	129.7	129.7	0.995
8000	147.4	148.3	148.3	0.994
9000	165.9	167.0	167.0	0.993
10000	184.3	185.6	185.6	0.993
The audit meets AMD requirements.			Average Correction Factor=	0.995

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	0.8	0.0	0.4
30	330	31	331	-0.6	-0.9	0.7
60	300	61	300	-1.4	-0.4	0.9
90	270	93	270	-2.8	0.0	1.4
120	240	123	242	-3.2	-1.8	2.5
150	210	153	212	-2.7	-2.3	2.5
180	180	183	183	-2.6	-2.9	2.8
210	150	212	154	-1.7	-3.8	2.8
240	120	241	124	-1.2	-4.1	2.6
270	90	270	94	-0.1	-4.0	2.1
300	60	301	64	-0.6	-3.6	2.1
330	30	330	32	0.3	-2.2	1.3
355	0	355	1	0.0	1.3	0.7
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.7

Comments:

n/a

End of Report