

# British Columbia Oil & Gas Research and Innovation Society

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## Farmington Air Quality Monitoring Station Site Report

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April 1, 2022 – March 31, 2023

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# AIR QUALITY REPORT SUMMARY

The following Air Quality Data report summarizes the monitoring results from the Farmington Air Quality Monitoring Station (AQMS) near Farmington, BC for the period of April 1, 2022, until March 31, 2023. The Farmington AQMS has been in operation since December 2017. Parameters monitored include continuous monitoring for Ozone ( $O_3$ ), Nitrogen Oxide (NO), Nitrogen Dioxide ( $NO_2$ ), Total Oxides of Nitrogen ( $NO_x$ ), Sulphur Dioxide ( $SO_2$ ), and Total Reduced Sulphur (TRS). The recorded (RAW) data is available from the BC Air Data Archive under the station name “Farmington Community Hall”. All recorded data has been validated by Tropospheric Measurement Systems Inc. (TMS). This report is based entirely on validated data.

Meteorological parameters for wind speed, direction, temperature, and humidity are also recorded at the Farmington AQMS and results are contained in the BC Ambient Air Quality Archive. This report does not include information for the meteorological parameters monitored.

For the Farmington AQMS Deployment, the following were the significant reporting and operational events for the monitoring stations.

## ***Operational times less than 90 percent***

- For the April 1<sup>st</sup>, 2022, to March 31<sup>st</sup>, 2023, monitoring period there were no operational times less than 90%. Capture percentages by instrument parameter are summarized below. Reported capture percentages for the previous periods (2018-2022) are included.

Parameter	TRS	$SO_2$	NO	$NO_2$	$NO_x$	$O_3$
Capture (%) (2022-2023)	94.5	98.8	99.0	99.0	99.0	99.1
Capture (%) (2021-2022)	92.6	93.4	93.6	93.6	93.6	93.6
Capture (%) (2020-2021)	92.9	95.1	95.1	95.1	95.1	95.1
Capture (%) (2019-2020)	92.1	94.1	95.4	95.4	95.4	94.8
Capture (%) (2018-2019)	99.4	89.8	97.7	97.7	97.7	70.6

### **Concentrations more than Ambient Air Quality Objectives**

- For the April 1<sup>st</sup>, 2022, to March 31<sup>st</sup>, 2023, monitoring period there were no exceedances of ambient air quality objectives for any of the monitored parameters
- Reported capture percentages for the previous periods (2018-2022) are included. Parameters measured with no associated objective have objective listed as “n/a”
- Complete list of objectives for British Columbia are available at.
  - o [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov\\_agq\\_fact\\_sheet.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_agq_fact_sheet.pdf)

Parameter	TRS (ppb)	SO <sub>2</sub> (ppb)	NO (ppb)	NO <sub>2</sub> (ppb)	NO <sub>x</sub> (ppb)	O <sub>3</sub> (ppb)
Max 1-hr (2022-2023)	1.3	6.9	58.7	28.0	81.7	58.6
Max 1-hr (2021-2022)	3.4	9.2	44.5	22.6	54.7	69.2
Max 1-hr (2020-2021)	36.9	16.7	70.4	24.2	68.3	55.6
Max 1-hr (2019-2020)	2.1	13.9	51.3	22.9	59.6	58.1
Max 1-hr (2018-2019)	2.4	44.5	58.3	47.2	91.5	63.9
1-hour Obj	5 (PCO)	70 (CAAQS)	n/a	60 (CAAQS)	n/a	82 (NAAQS)
Max 24-hr (2022-2023)	0.6	1.6	13.1	18.4	31.5	43.5
Max 24-hr (2021-2022)	3.1	1.8	8.3	13.2	18.6	43.8
Max 24-hr (2020-2021)	2.5	3.8	4.2	13.0	17.3	46.4
Max 24-hr (2019-2020)	1.9	1.5	10.5	11.0	14.5	47.8
Max 24-hr (2018-2019)	2.1	4.5	15.0	17.8	31.4	51.8
24-hour Obj	2 (PCO)	n/a	n/a	n/a	n/a	n/a
Max 8-hr (2022-2023)						55.2
Max 8-hr (2021-2022)						63.5
Max 8-hr (2020-2021)						52.1
Max 8-hr (2019-2020)						53.7
Max 8-hr (2018-2019)						60.4
8-hour Obj	n/a	n/a	n/a	n/a	n/a	62 (CAAQS)

### **Monitoring Notes**

- Site calibrations and station maintenance occurred on May 25<sup>th</sup>, 2022, August 26<sup>th</sup>, 2022, December 9<sup>th</sup>, 2022, and March 9<sup>th</sup>, 2023.
- The TRS analyzer had a thermal oxidizer failure from August 3<sup>rd</sup>, 2022, until August 18<sup>th</sup>, 2022. The station converter was repaired and brought back online.
- BC Ministry of Environment Site Audits occurred on May 19<sup>th</sup>, 2022, and October 27<sup>th</sup>, 2022. Audit results are available
  - o <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=43336>

### **Validation Notes**

- Validation is performed using both BC MOE and USEPA validation criteria. Validation is performed on 5-minute average values for each parameter and then used to calculate 1-hour, 24-hour and 8-hour rolling average periods.
- Internal instrument performance checks occur on 25-hour cycles. These checks include challenging the instrument against zero gas and a verified elevated target concentration. These performance checks are reviewed as part of regular data oversight to assure they are within specification for instrument operation.

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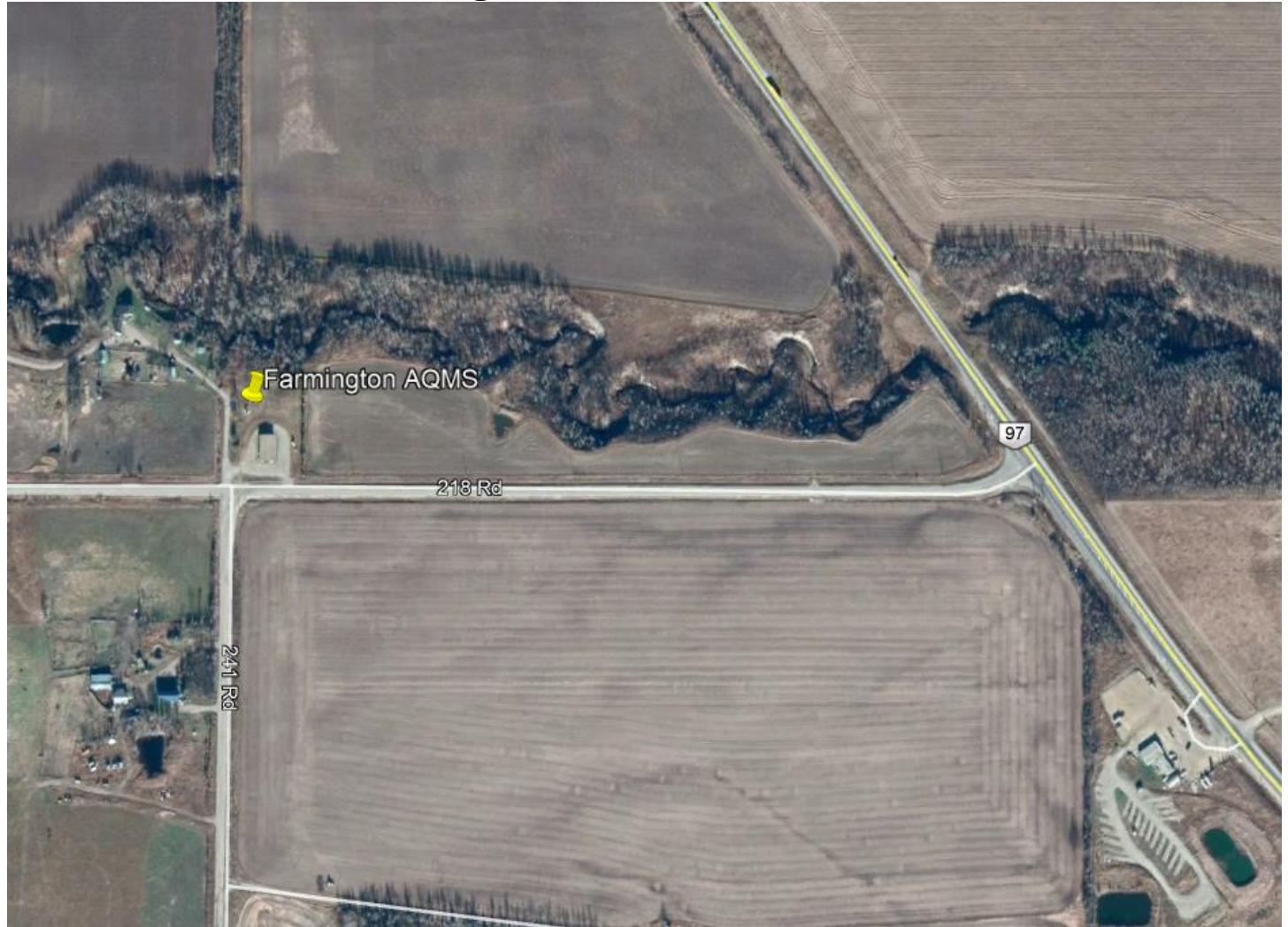
## MONITORING SITE LOCATION

The monitoring site location is near the Farmington Community Hall located near Farmington, BC.

The site elevation is approximately 698m, the location is approximately.

55.913292°, -120.531641°

### Satellite View of Monitoring Location



## Site View Images



Panoramic



South View



South-East View



East View



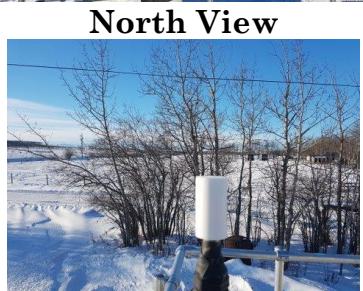
North-East View



North View



North-West View



West View



South-West View

# MONITORING DATA SUMMARIES

## 1-Hour Data Summary

Parameter	TRS	SO2	NO	NO2	NOx	O3
Avg (ppb)	0.0	0.2	0.8	2.5	3.3	25.5
Min (ppb)	0.0	0.0	0.0	0.0	0.0	0.0
Max (ppb)	1.3	6.9	58.7	28.0	81.7	58.6
Number #	8280	8654	8669	8669	8669	8679
Capture (%)	94.5	98.8	99.0	99.0	99.0	99.1
Std Dev.	0.0	0.4	2.2	3.5	5.0	11.3
T <sub>Min</sub>	3-9-2023 14:00	5-6-2022 14:00	6-16-2022 18:00	5-4-2022 13:00	8-28-2022 16:00	12-23-2022 06:00
T <sub>Max</sub>	9-30-2022 06:00	6-2-2022 07:00	12-30-2022 12:00	1-5-2023 18:00	12-30-2022 12:00	8-19-2022 14:00

## 24-Hour Data Summary

Parameter	TRS	SO2	NO	NO2	NOx	O3
Avg (ppb)	0.0	0.2	0.8	2.5	3.3	25.6
Min (ppb)	0.0	0.0	0.2	0.0	0.3	2.5
Max (ppb)	0.6	1.6	13.1	18.4	31.5	43.5
Number #	346	362	362	362	362	364
Capture (%)	94.8	99.2	99.2	99.2	99.2	99.7
Std Dev.	0.0	0.3	1.3	2.9	4.0	8.4
T <sub>Min</sub>	2022-05-22	2022-05-20	2022-11-20	2022-08-07	2022-05-17	2023-01-17
T <sub>Max</sub>	2022-10-06	2023-01-12	2022-12-30	2022-12-30	2022-12-30	2023-03-22

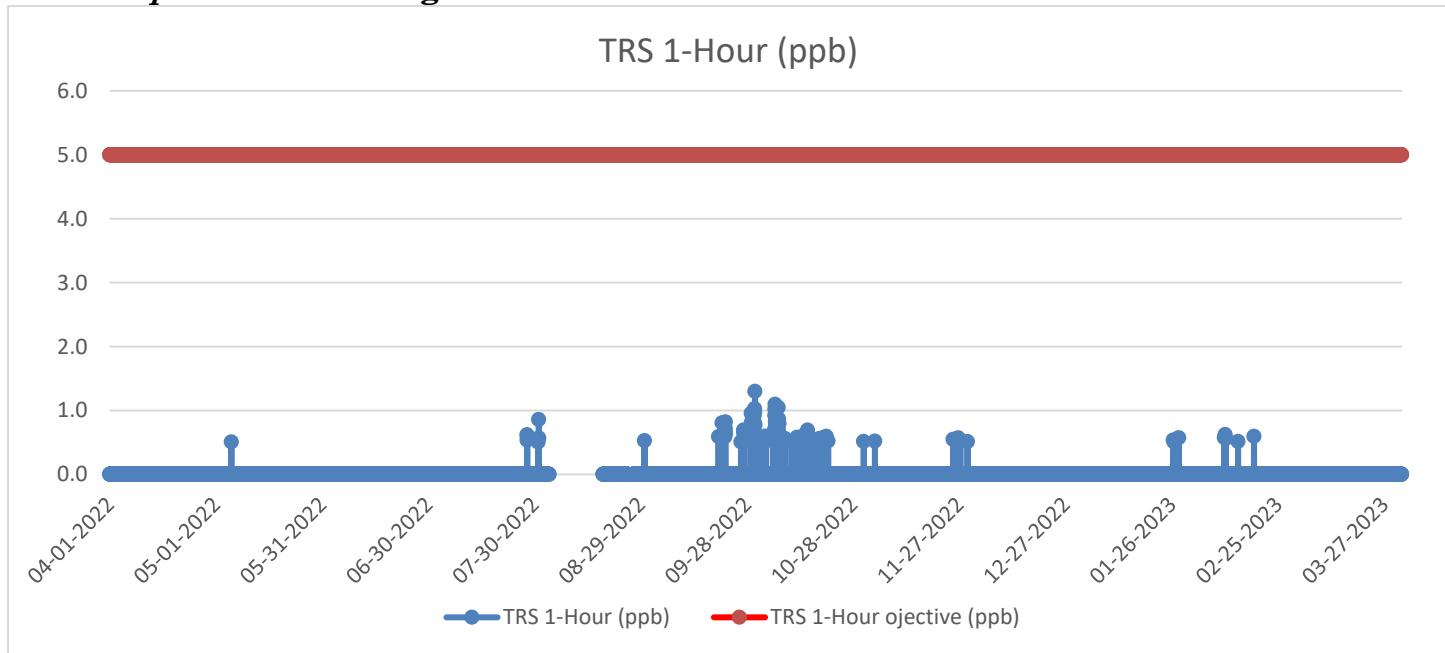
## 8-Hour Rolling Data Summary

Parameter	O3
Avg (ppb)	25.5
Min (ppb)	0.0
Max (ppb)	55.2
Number #	8717
Capture (%)	99.5
Std Dev.	10.3
T <sub>Min</sub>	1-17-2023 07:00
T <sub>Max</sub>	6-3-2022 19:00

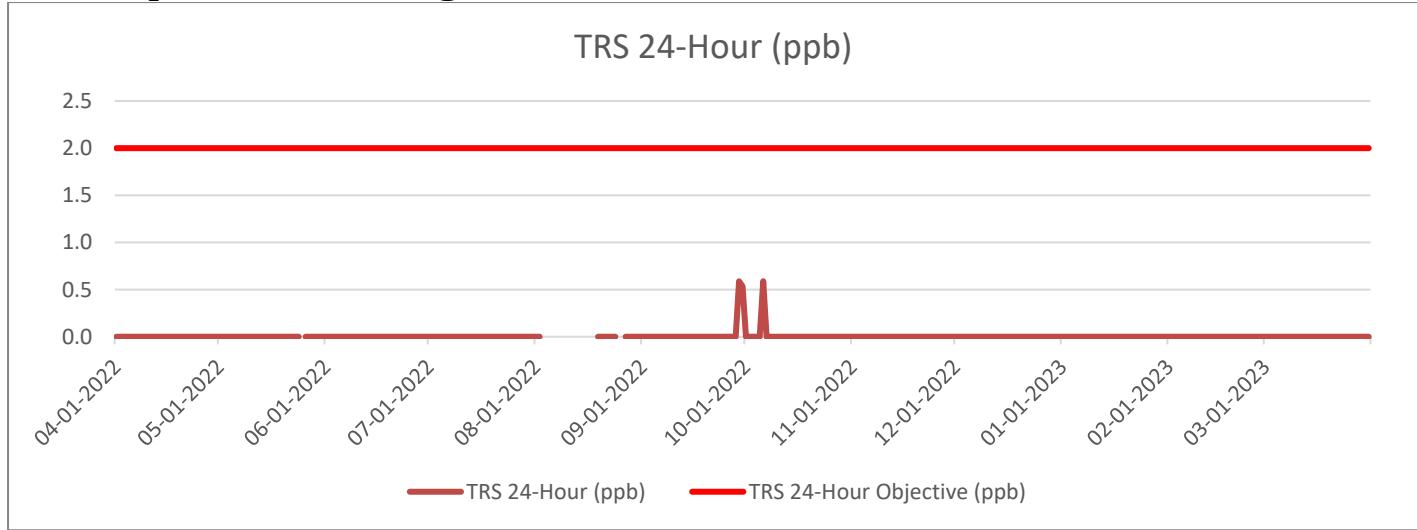
## PARAMETER TREND GRAPHS

### Total Reduced Sulphur (TRS)

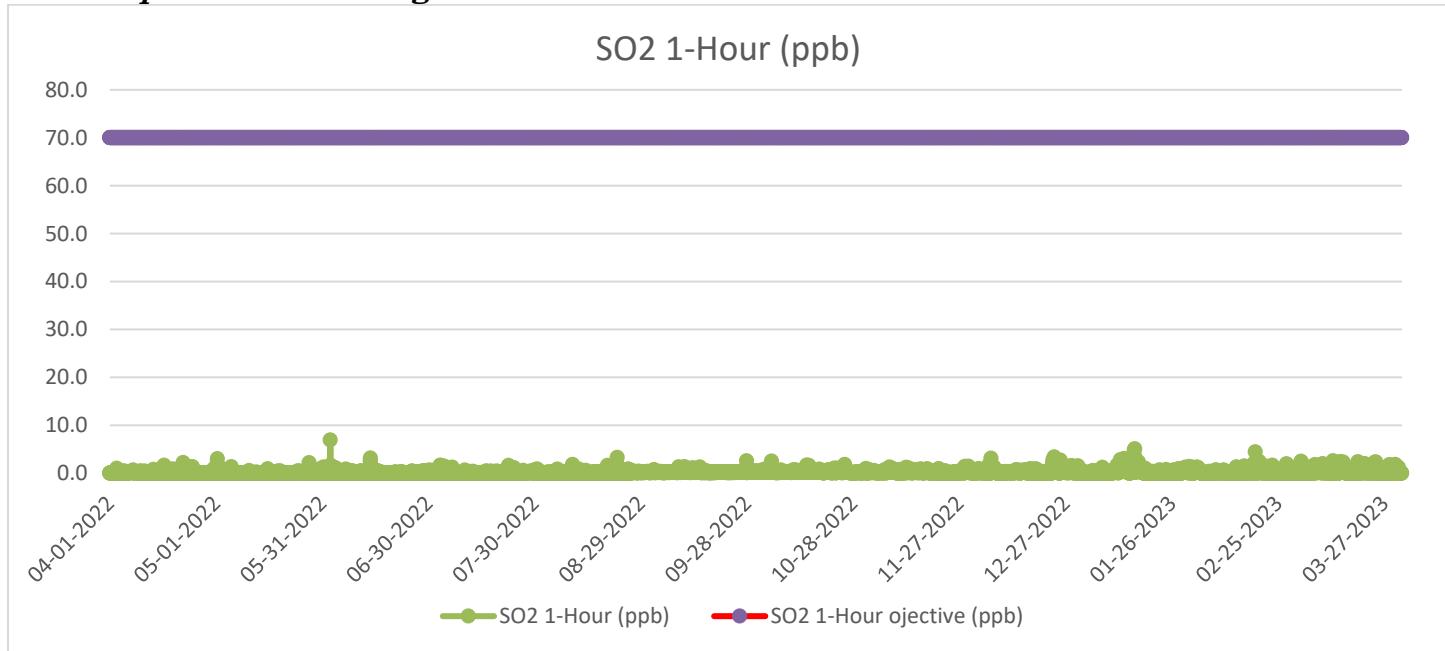
#### *TRS Graph 1-Hour Averages*



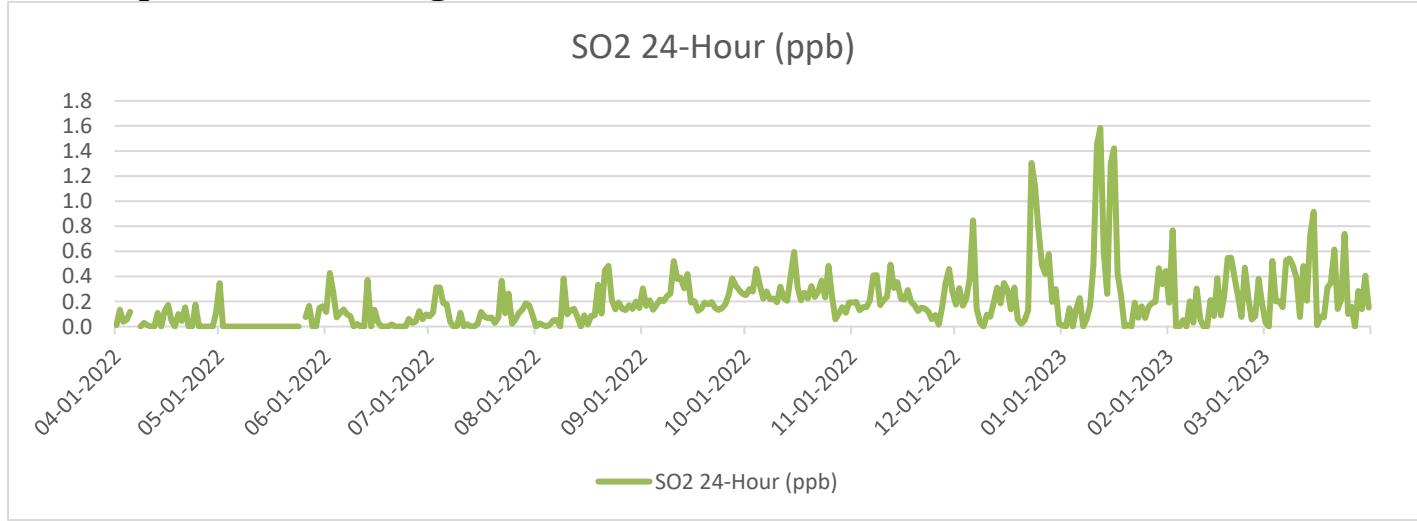
#### *TRS Graph 24-Hour Averages*



## **Sulphur Dioxide (SO<sub>2</sub>)** ***SO<sub>2</sub> Graph 1-Hour Averages***

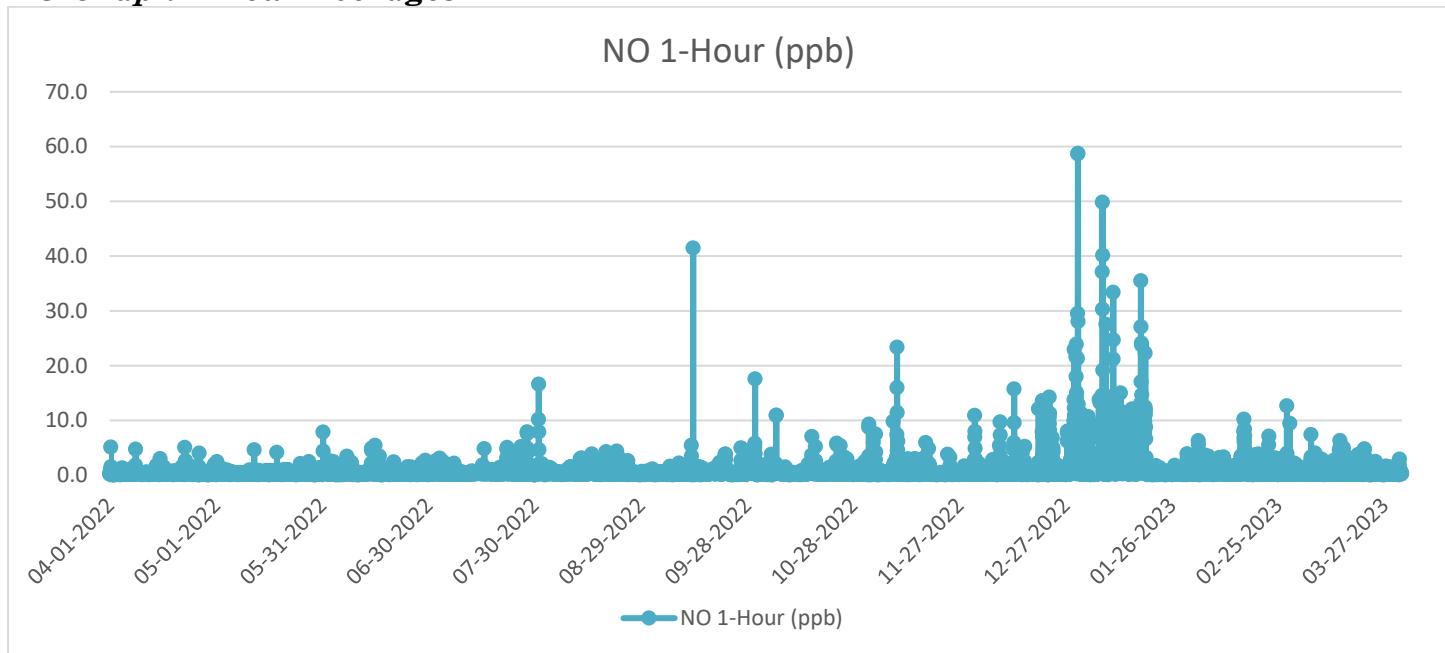


## ***SO<sub>2</sub> Graph 24-Hour Averages***

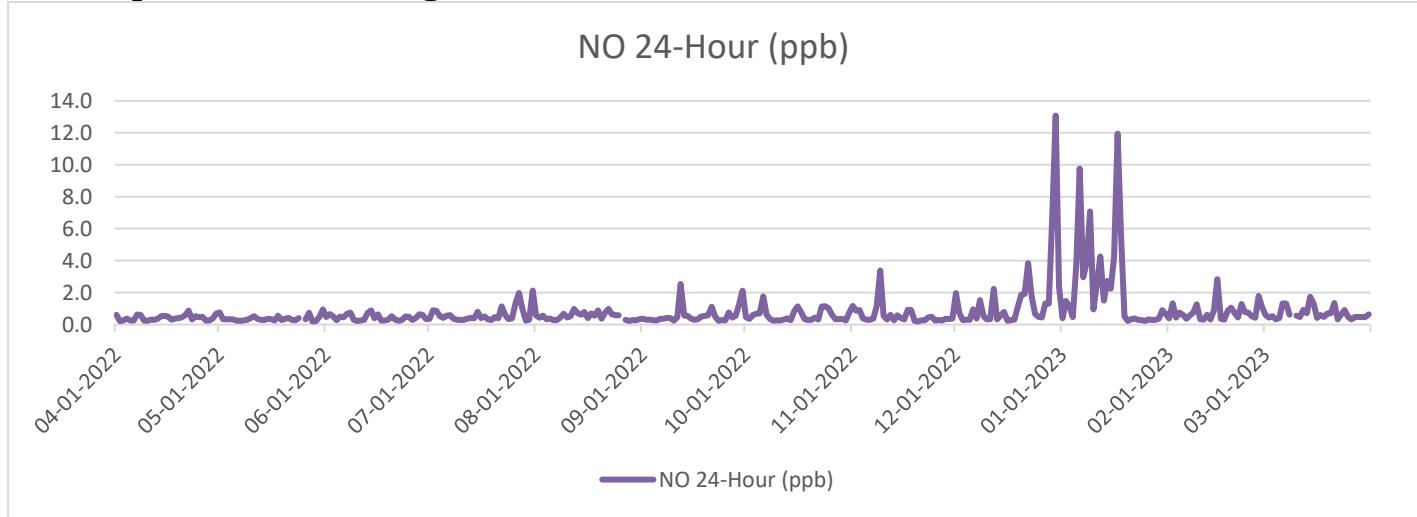


## Nitrogen Oxide (NO)

### NO Graph 1-Hour Averages

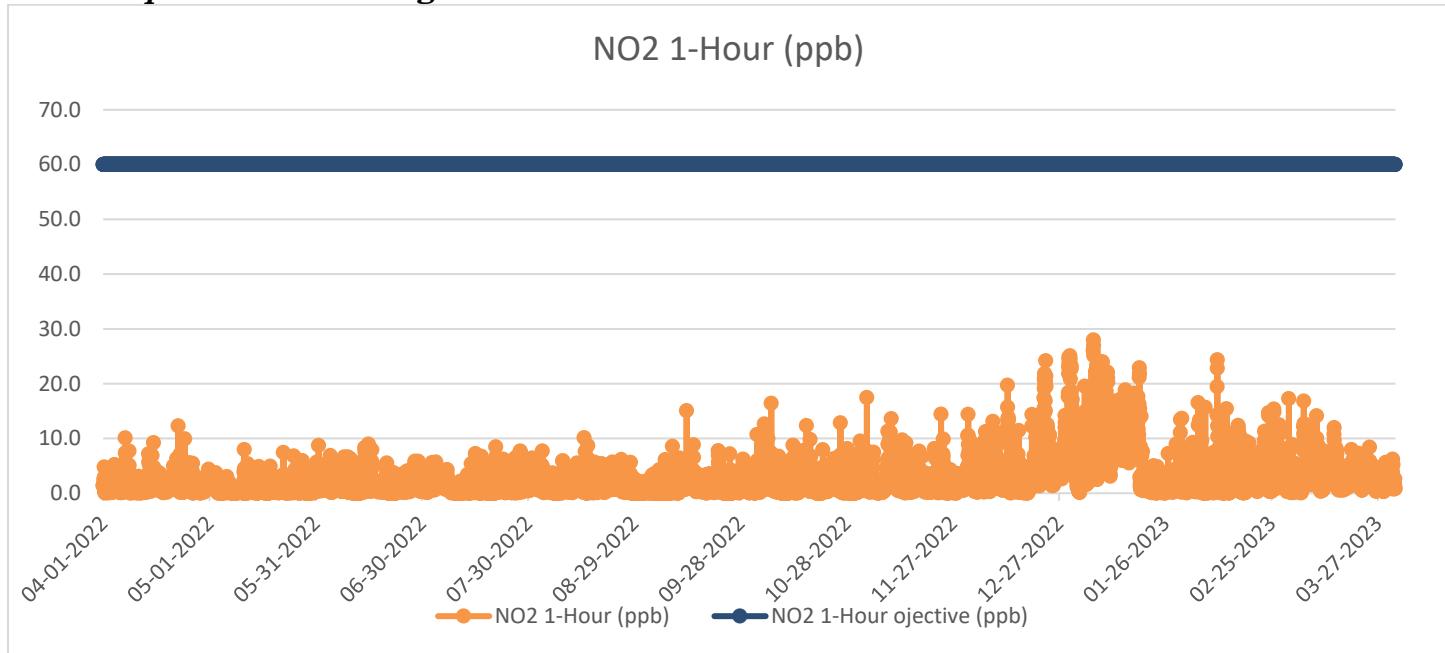


### NO Graph 24-Hour Averages

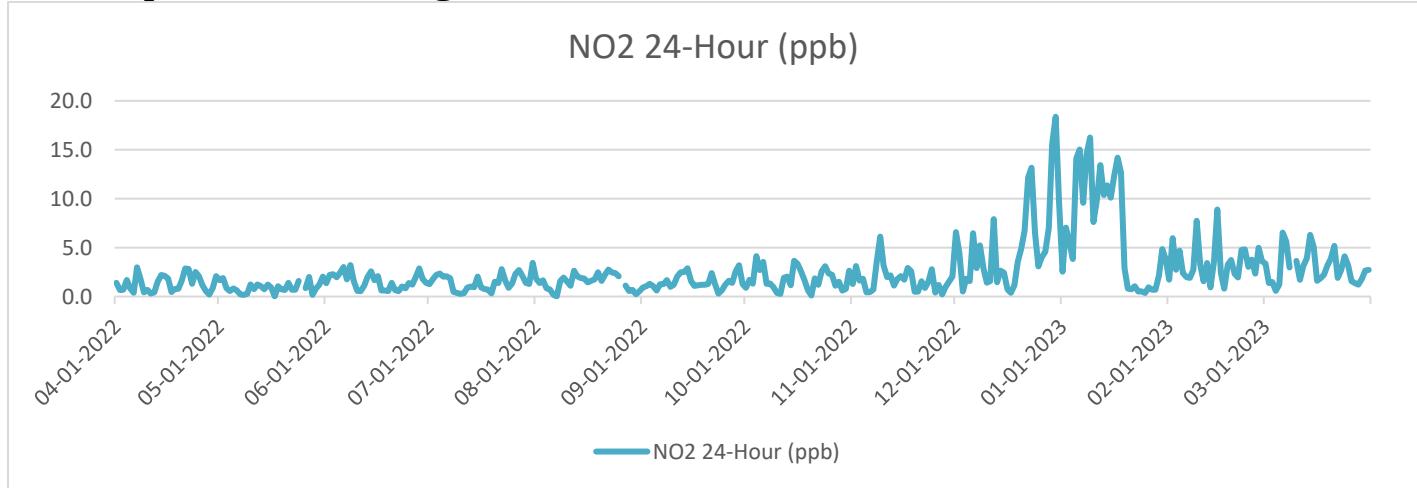


## Nitrogen Dioxide (NO<sub>2</sub>)

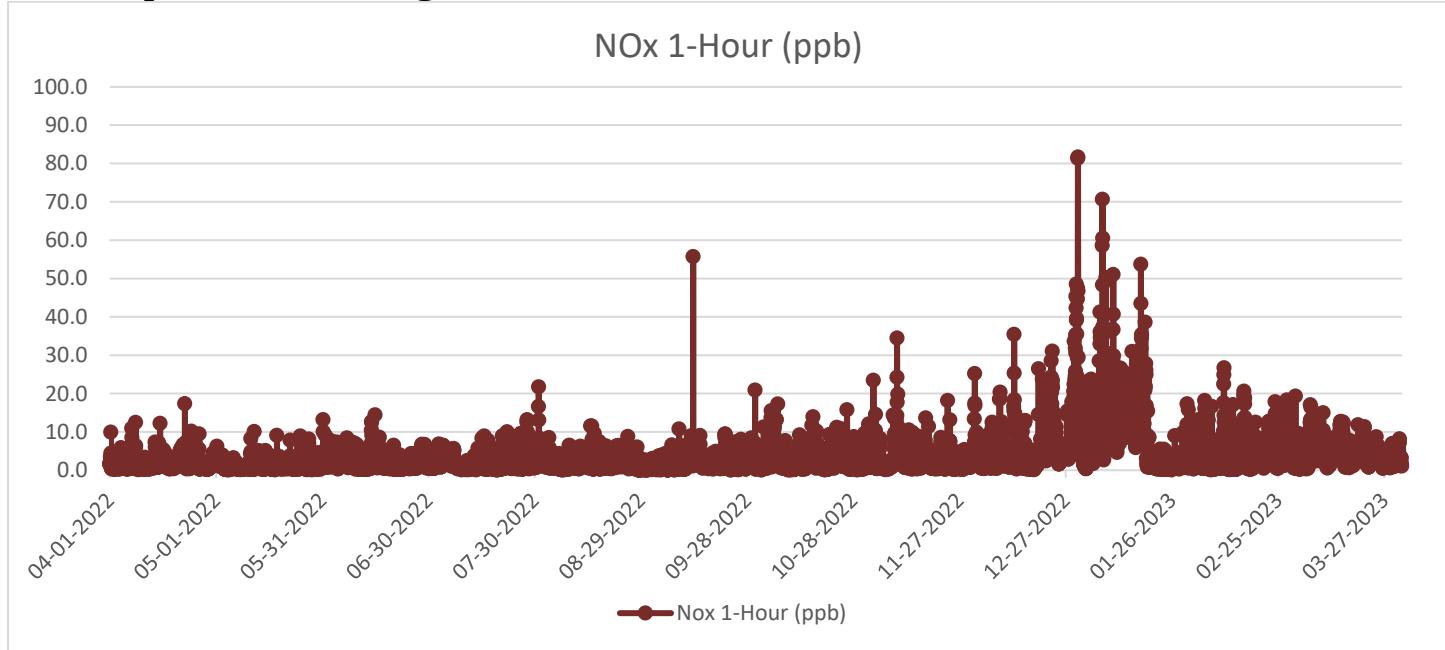
### NO<sub>2</sub> Graph 1-Hour Averages



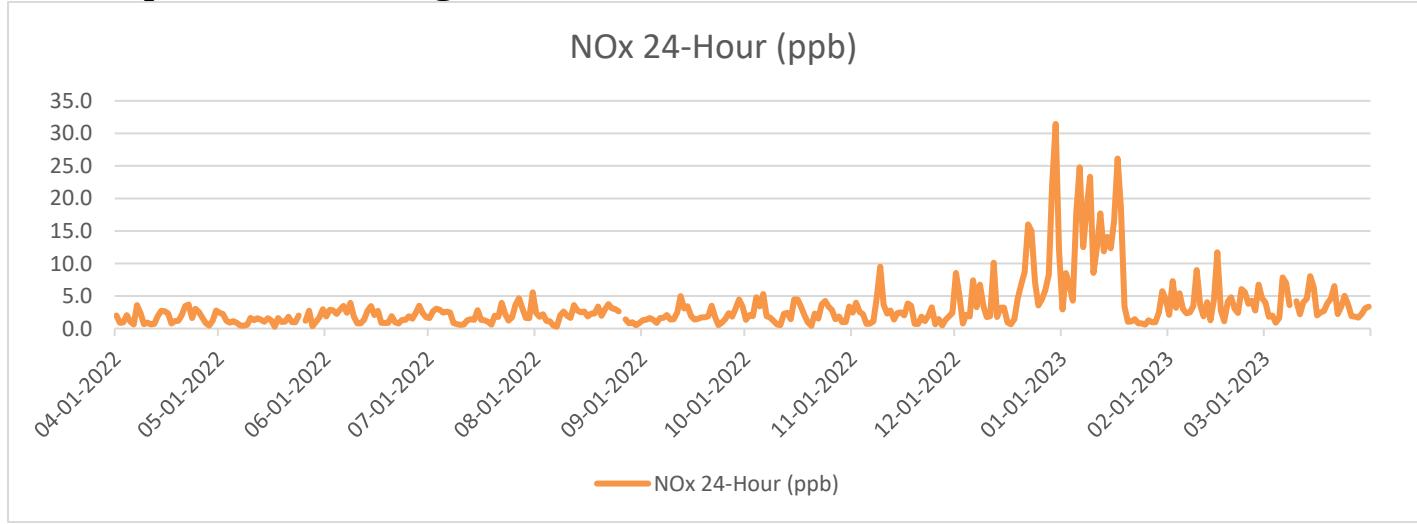
### NO<sub>2</sub> Graph 24-Hour Averages



## **Oxides of Nitrogen (NO<sub>x</sub>)** ***NO<sub>x</sub> Graph 1-Hour Averages***

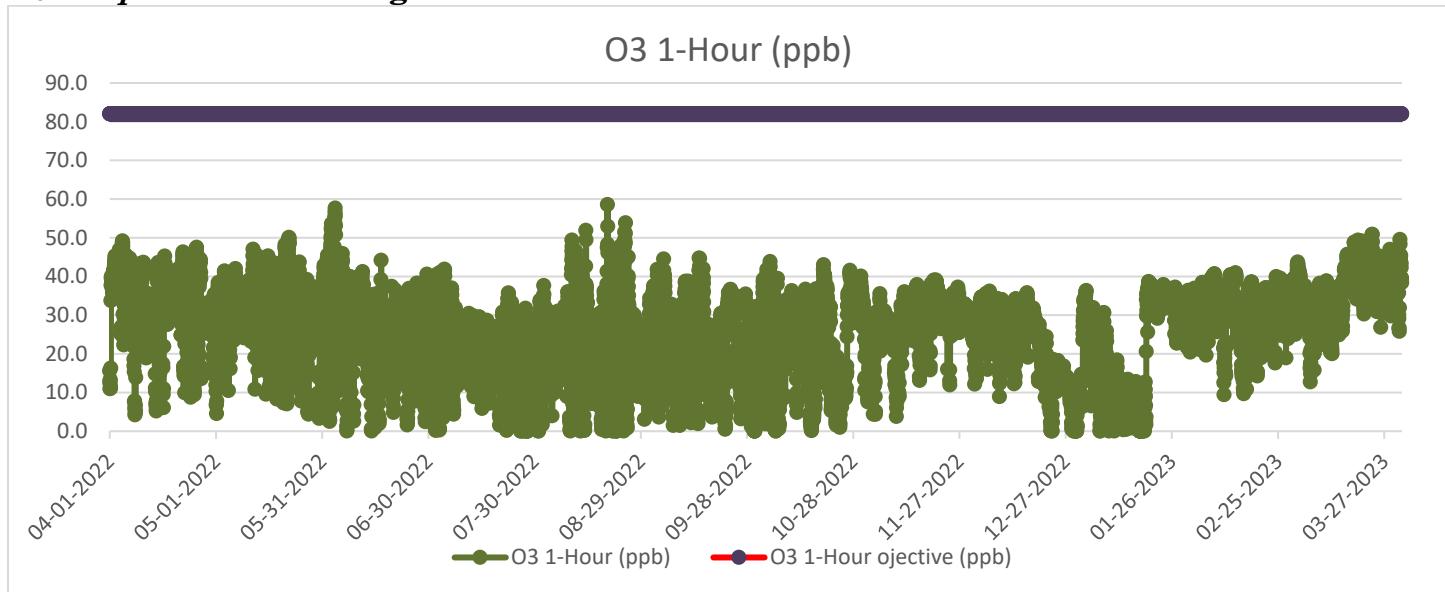


## ***NO<sub>x</sub> Graph 24-Hour Averages***

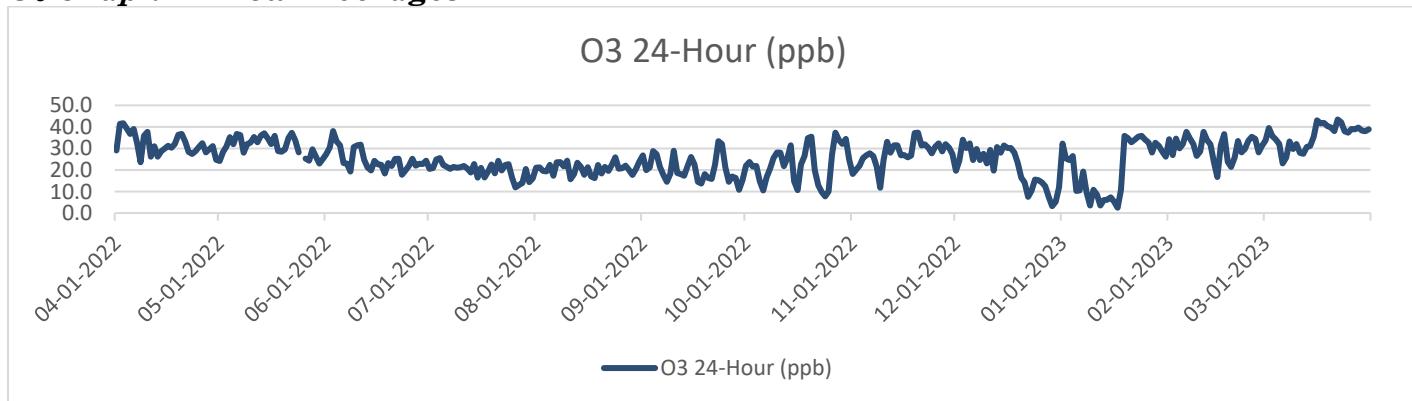


## Ozone ( $O_3$ )

### ***O<sub>3</sub> Graph 1-Hour Averages***



### ***O<sub>3</sub> Graph 24-Hour Averages***



### ***O<sub>3</sub> Graph 8-Hour Rolling Averages***

