

British Columbia
Oil & Gas Research and Innovation Society



Farmington Air Quality Monitoring Station
Site Report

April 1, 2021 – March 31, 2022

PROJECT CONTACT INFORMATION

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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, 2021, until March 31, 2022. The Farmington AQMS has been in operation since December 2017. Parameters monitored include continuous monitoring for Ozone (O₃), Nitrogen Oxide (NO), Nitrogen Dioxide (NO₂), Total Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂), 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 1st, 2021, to March 31st, 2022 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 (2018-2021) are included.

Parameter	TRS	SO ₂	NO	NO ₂	NO _x	O ₃
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 1st, 2021 to March 31st, 2022 monitoring period there were no exceedances of ambient air quality objectives except for
 - o Four (4) exceedance of the 1-hour TRS objective (5.0 ppb).
 - 2021-08-23 07:40 5.6 ppb
 - 2021-08-23 07:35 5.5 ppb
 - 2021-08-23 07:45 5.5 ppb
 - 2021-08-23 07:30 5.2 ppb
 - o Six (6) exceedances of the 24-hour TRS objective (2.0ppb).
 - 2021-12-11 3.1 ppb
 - 2021-09-13 2.8 ppb
 - 2021-12-10 2.6 ppb
 - 2021-12-08 2.5 ppb
 - 2021-12-12 2.2 ppb
 - 2021-12-09 2.2 ppb
 - 2021-11-30 2.2 ppb
 - o Two (2) exceedances of the 8-hour Ozone Objective (62 ppb)
 - 2021-07-31 63.5 ppb
 - 2021-07-31 62.7 ppb
- Reported capture percentages for the previous periods (2018-2021) 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_aqo_fact_sheet.pdf

Parameter	TRS (ppb)	SO ₂ (ppb)	NO (ppb)	NO ₂ (ppb)	NO _x (ppb)	O ₃ (ppb)
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 (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 (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 31st, 2021, September 14th, 2021, December 19th, 2021 and March 29th, 2022
- BC Ministry of Environment Site Audits occurred on June 24th, 2021 and October 28th, 2021. Audit results are available <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=43336>
 - o All instruments passed site audits.

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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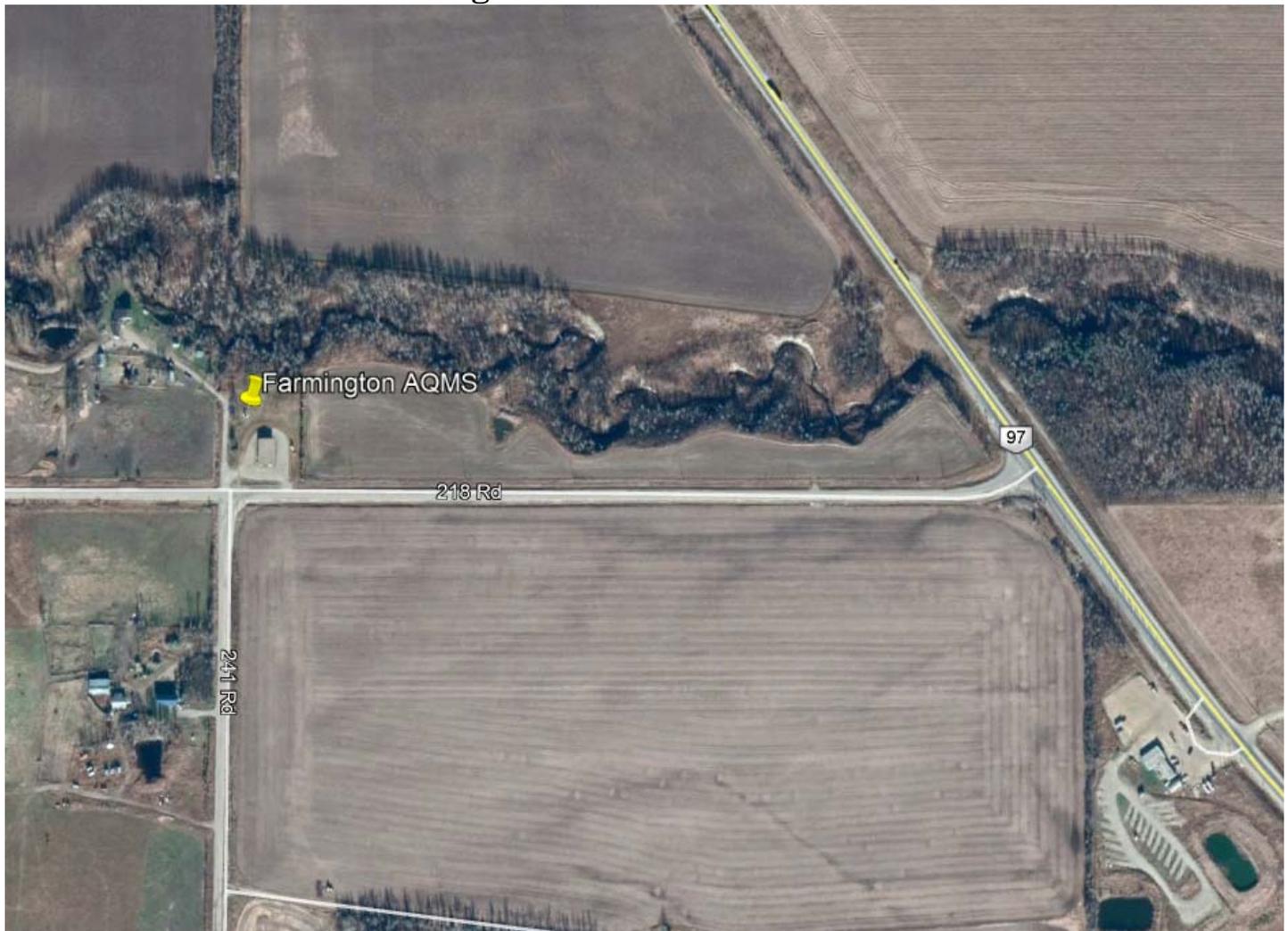
MONITORING SITE LOCATION

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)	0.6	0.1	0.4	2.3	2.7	26.5
Min (ppb)	0.0	0.0	0.0	0.0	0.0	0.0
Max (ppb)	3.4	9.2	44.5	22.6	54.7	69.2
Number #	8115	8182	8197	8197	8197	8197
Capture (%)	92.6	93.4	93.6	93.6	93.6	93.6
Std Dev.	0.6	0.5	2.2	2.6	3.9	11.1
T _{Min}	5-5-2021 14:00	10-6-2021 13:00	6-1-2021 16:00	3-30-2022 15:00	6-1-2021 16:00	6-29-2021 20:00
T _{Max}	12-11-2021 03:00	4-28-2021 19:00	6-27-2021 02:00	12-31-2021 19:00	1-19-2022 12:00	7-31-2021 16:00

24-Hour Data Summary

Parameter	TRS	SO2	NO	NO2	NOx	O3
Avg (ppb)	0.6	0.1	0.4	2.3	2.8	26.4
Min (ppb)	0.0	0.0	0.0	0.0	0.0	2.4
Max (ppb)	3.1	1.8	8.3	13.2	18.6	43.8
Number #	346	347	350	350	350	349
Capture (%)	94.8	95.1	95.9	95.9	95.9	95.6
Std Dev.	0.6	0.4	1.0	1.6	2.3	7.9
T _{Min}	2022-01-04	2021-10-06	2021-06-03	2022-03-31	2021-06-06	2021-10-23
T _{Max}	2021-12-11	2021-04-28	2021-06-27	2022-01-19	2022-01-19	2022-02-10

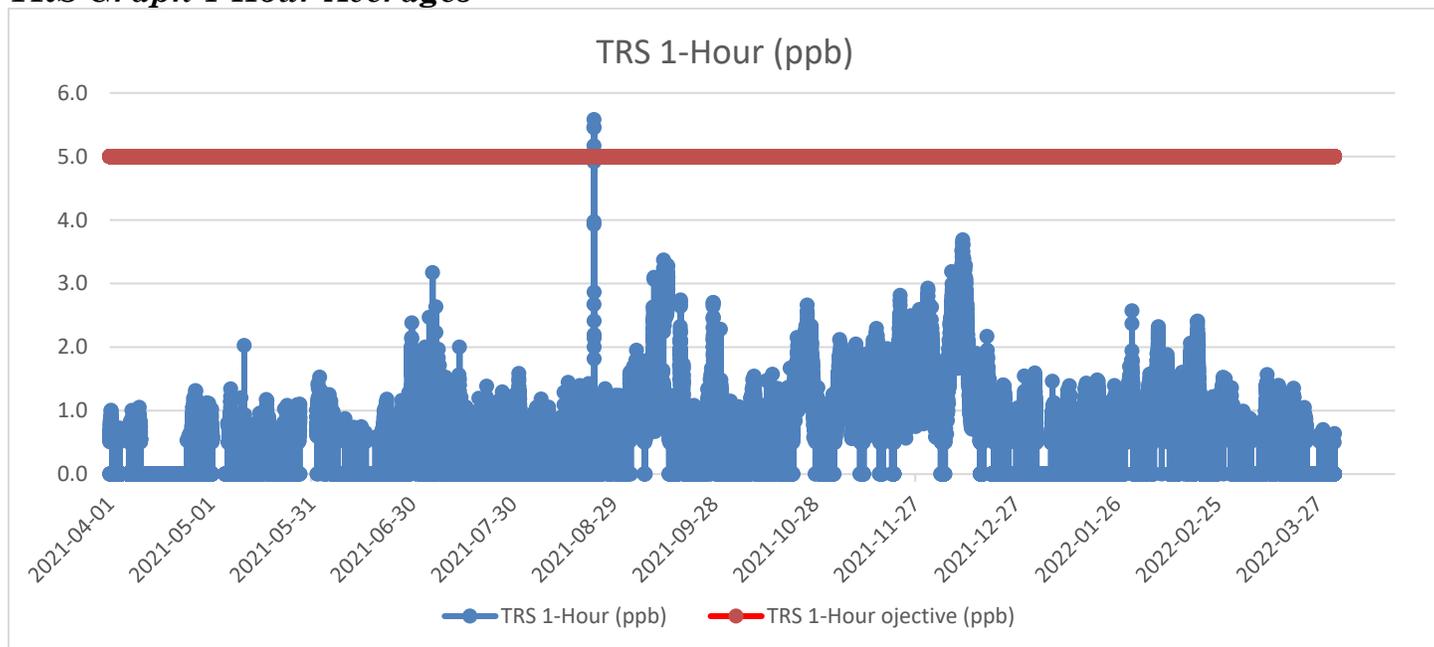
8-Hour Rolling Data Summary

Parameter	O3
Avg (ppb)	26.5
Min (ppb)	0.0
Max (ppb)	63.5
Number #	8497
Capture (%)	97.0
Std Dev.	10.0
T _{Min}	6-30-2021 03:00
T _{Max}	7-31-2021 18:00

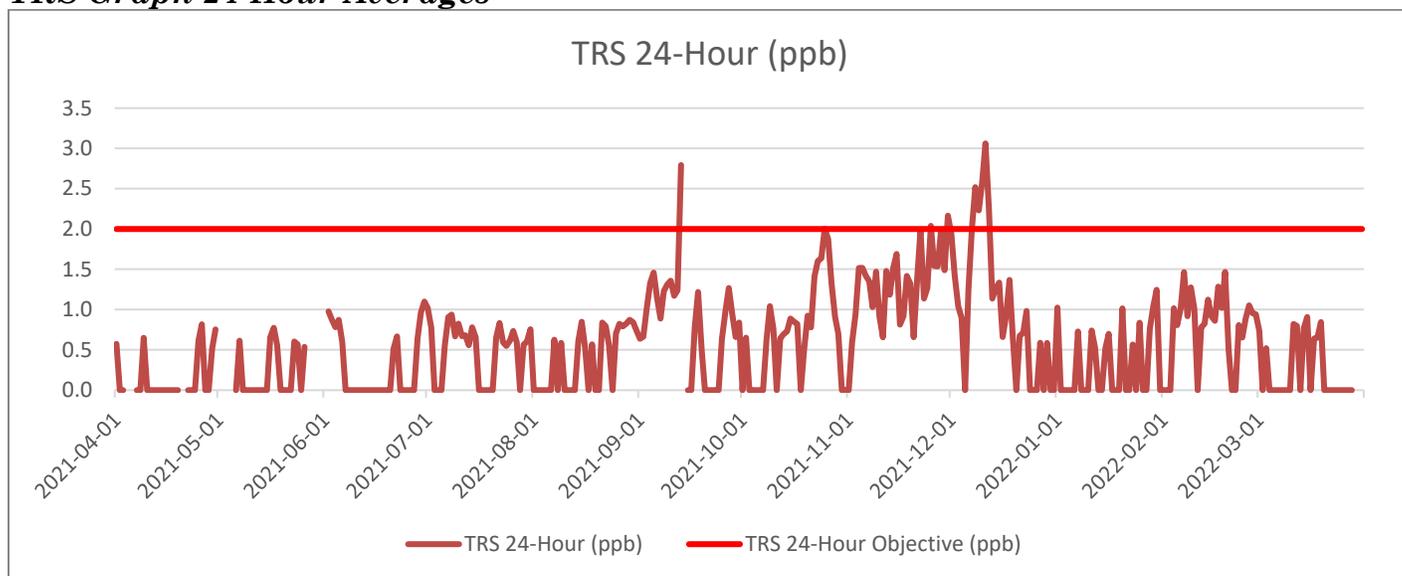
PARAMETER TREND GRAPHS

Total Reduced Sulphur (TRS)

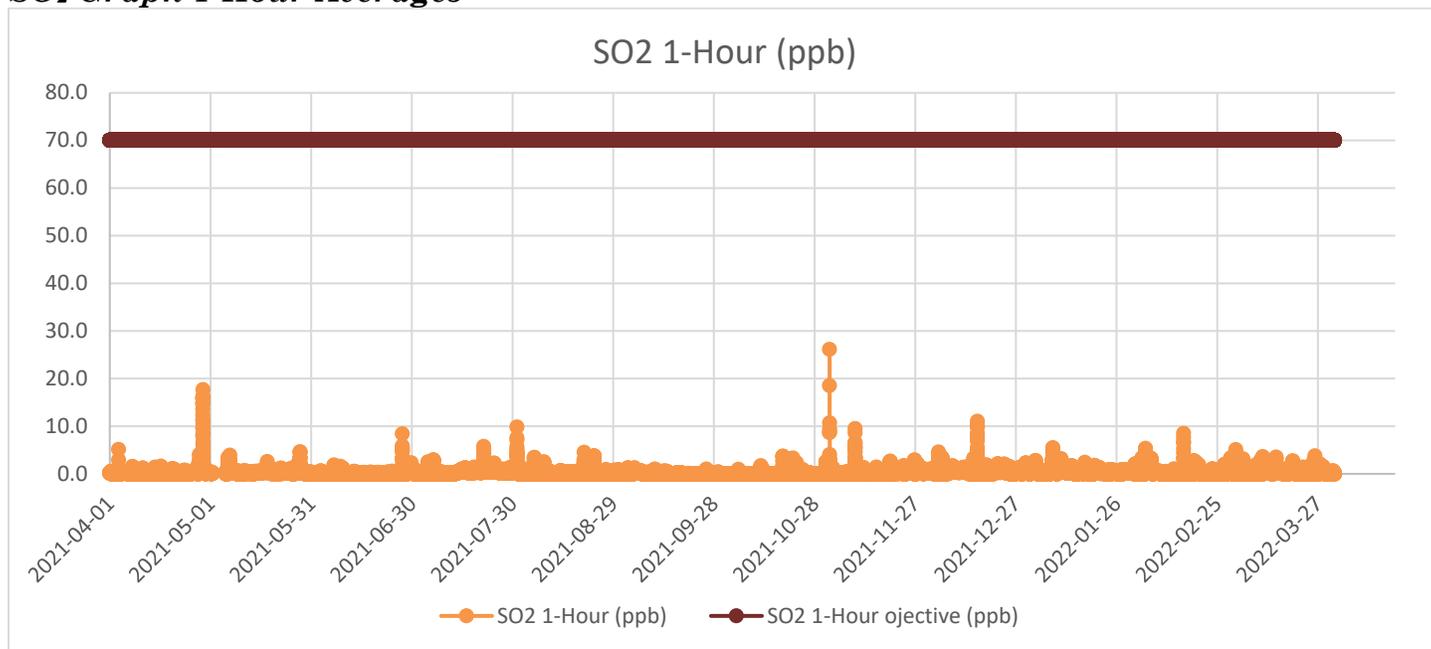
TRS Graph 1-Hour Averages



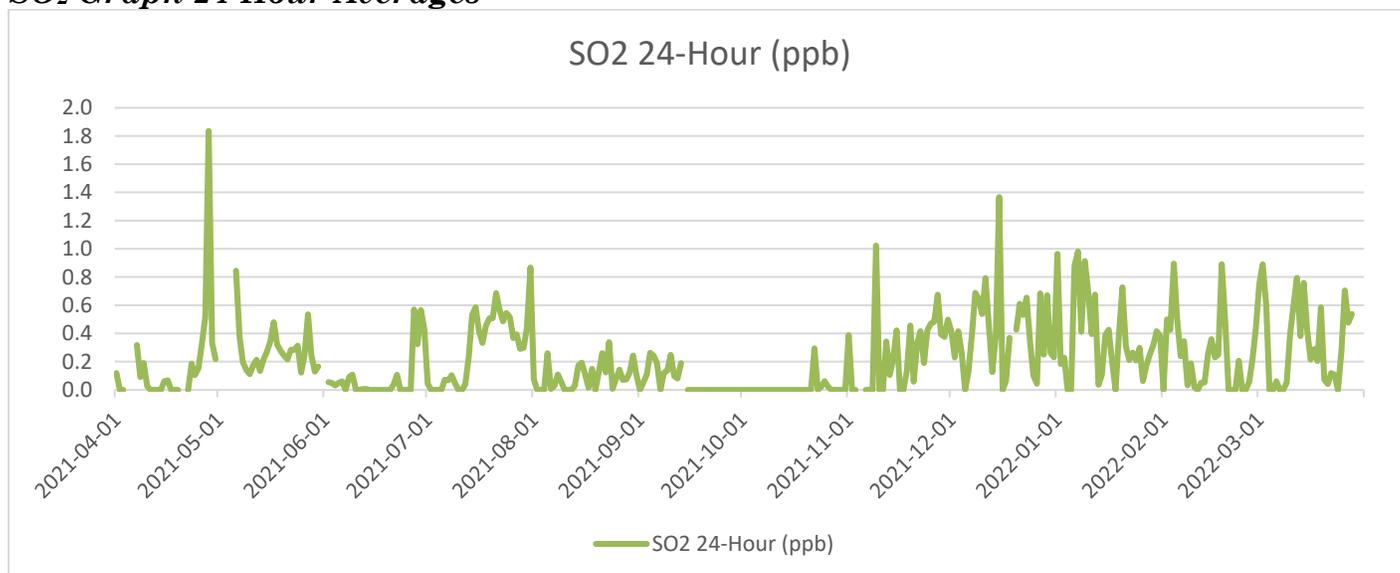
TRS Graph 24-Hour Averages



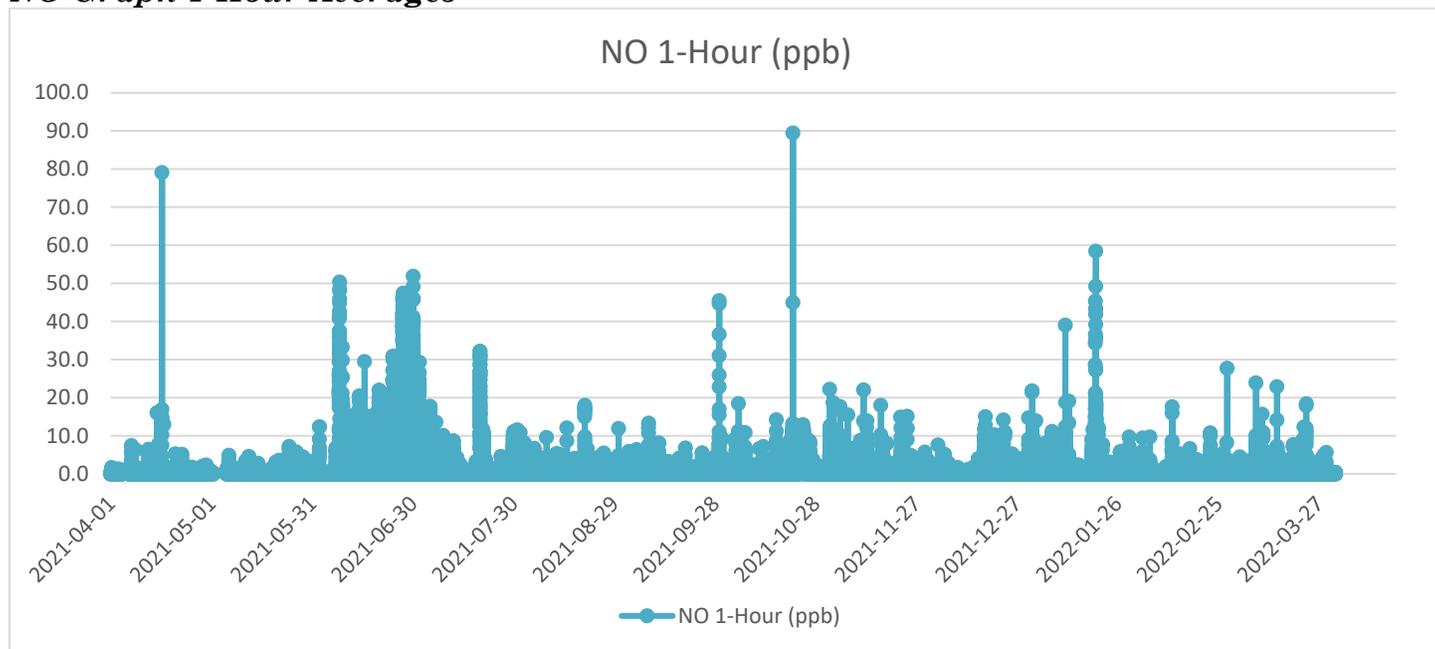
Sulphur Dioxide (SO₂)
SO₂ Graph 1-Hour Averages



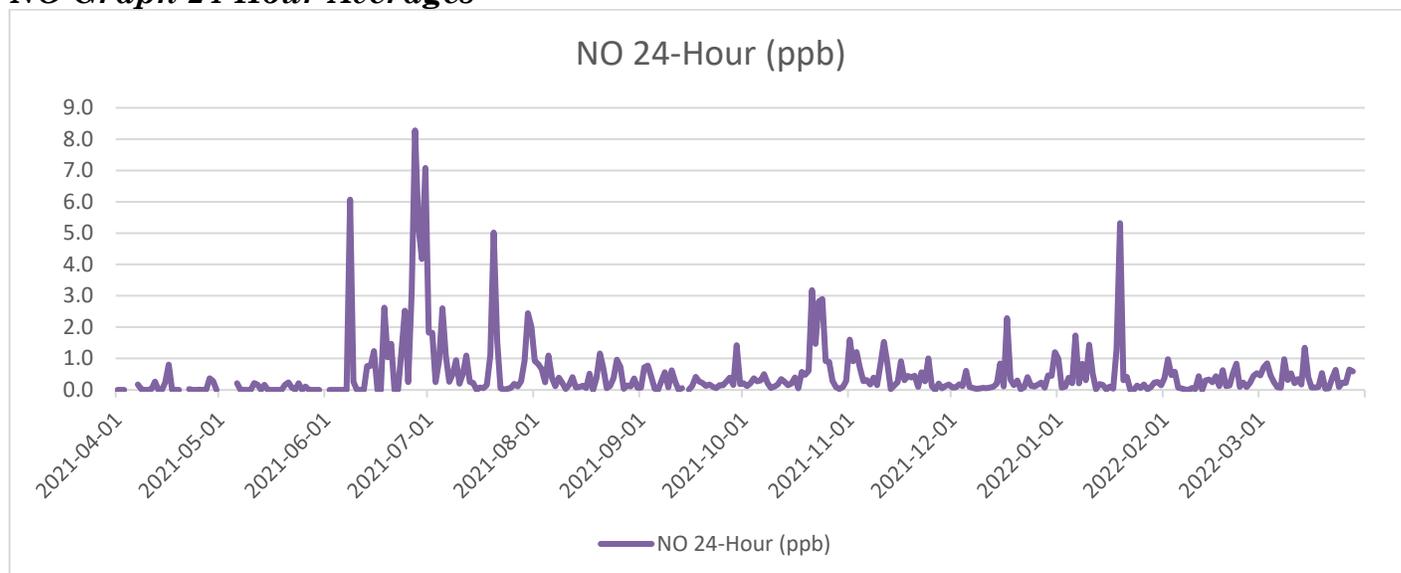
SO₂ Graph 24-Hour Averages



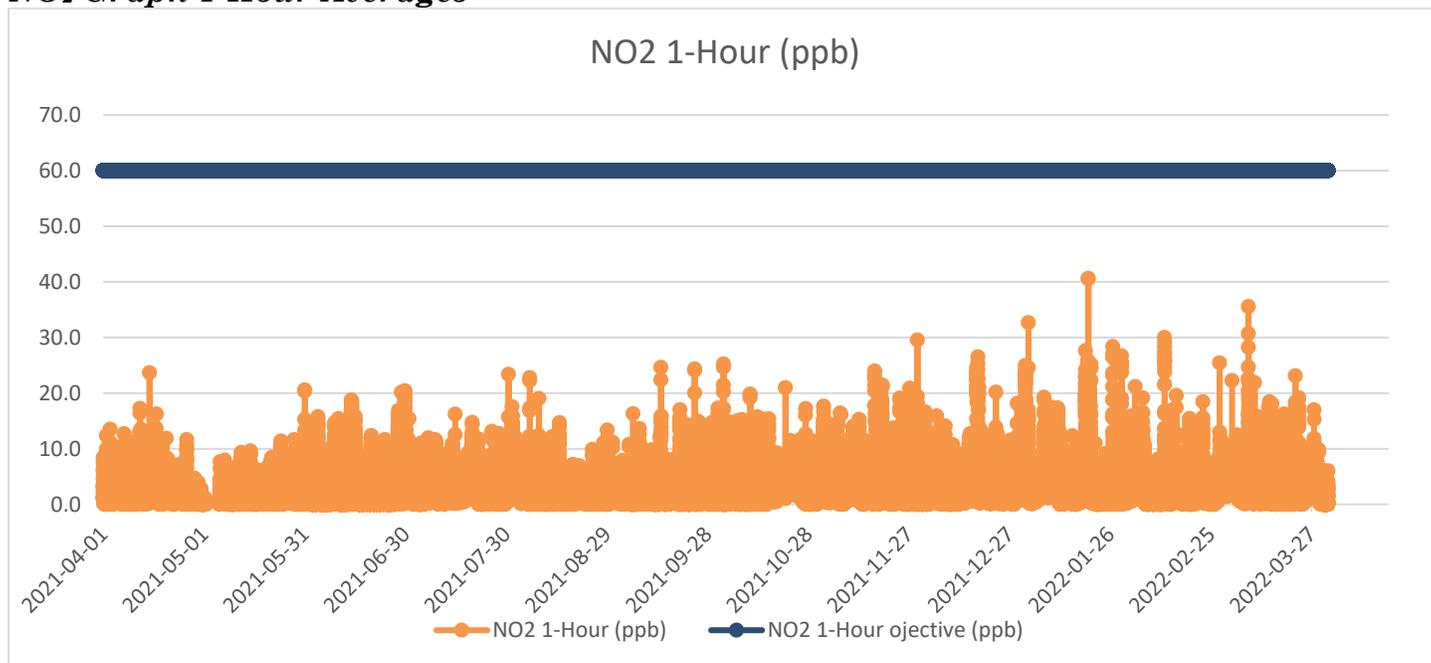
Nitrogen Oxide (NO) NO Graph 1-Hour Averages



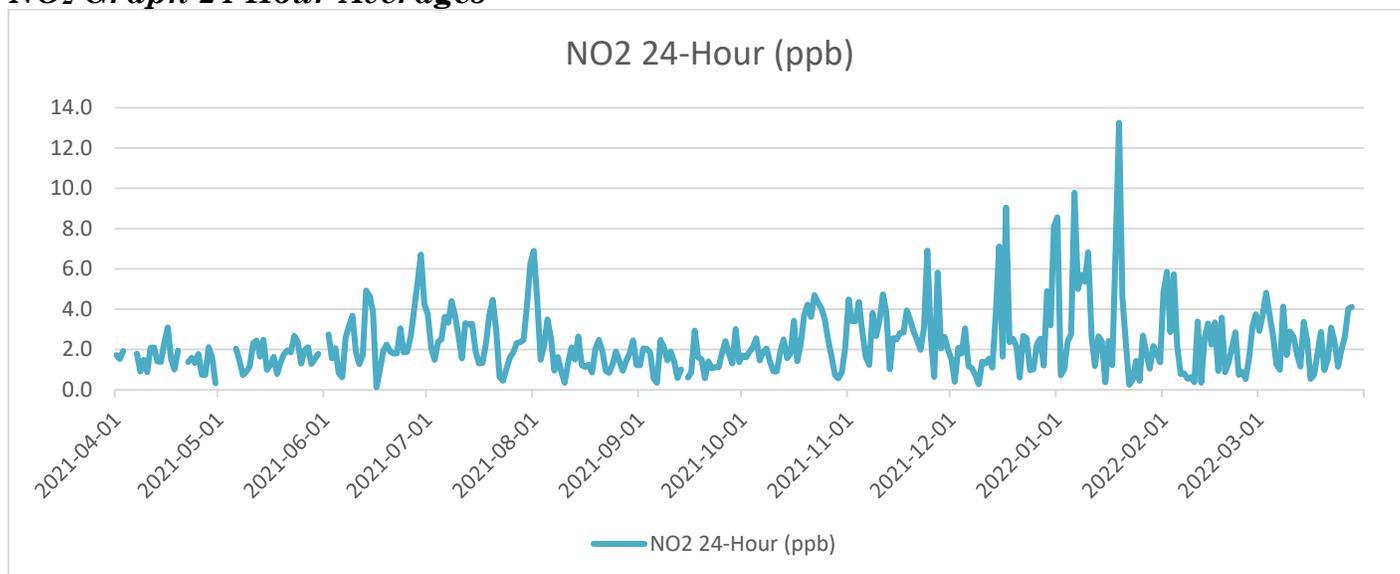
NO Graph 24-Hour Averages



Nitrogen Dioxide (NO₂) NO₂ Graph 1-Hour Averages

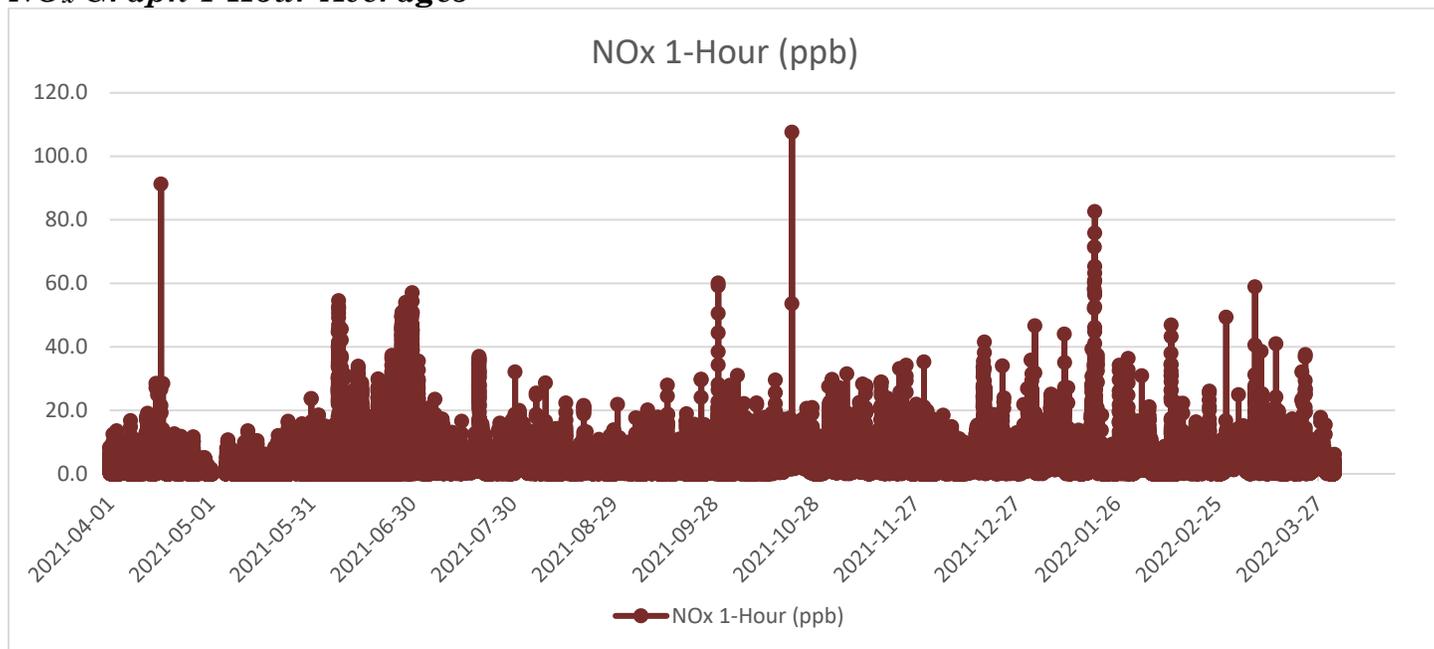


NO₂ Graph 24-Hour Averages

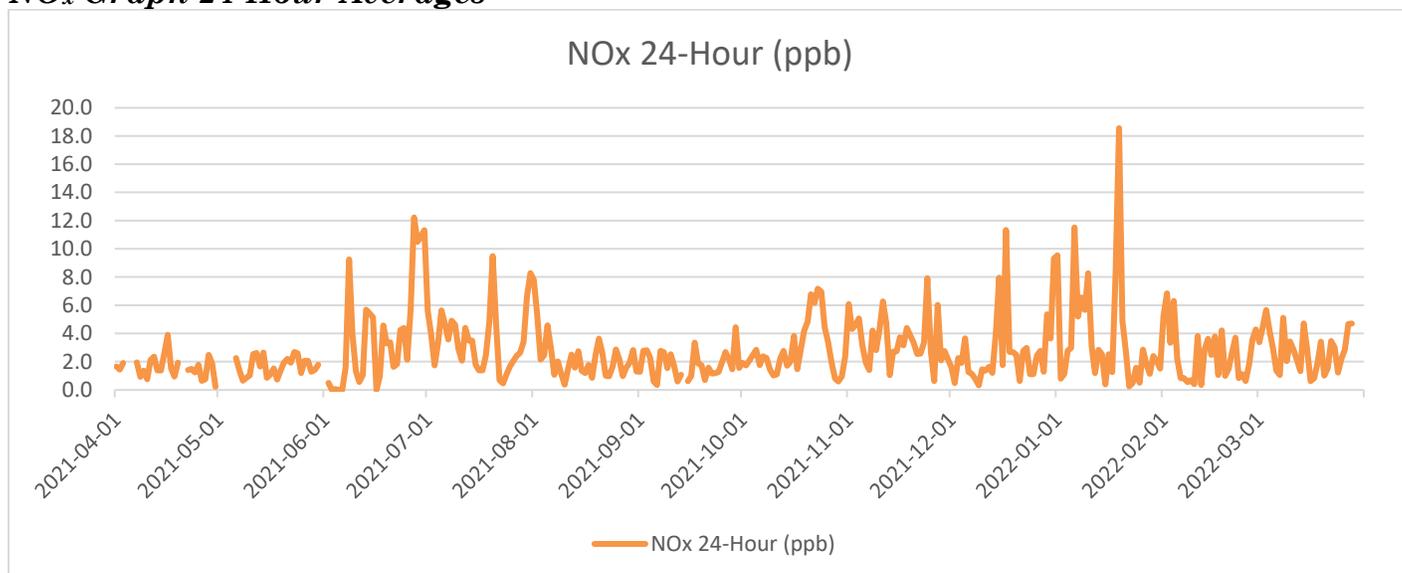


Oxides of Nitrogen (NO_x)

NO_x Graph 1-Hour Averages



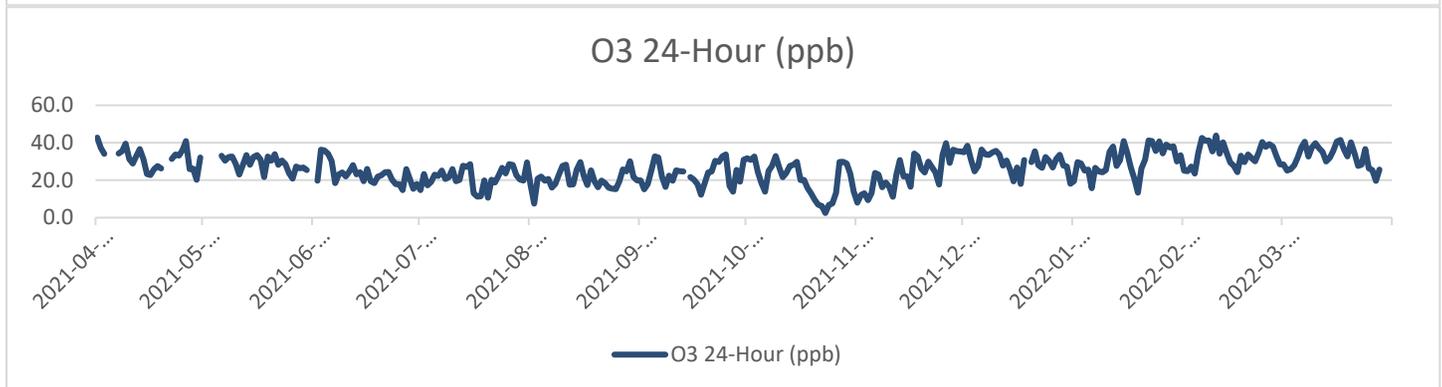
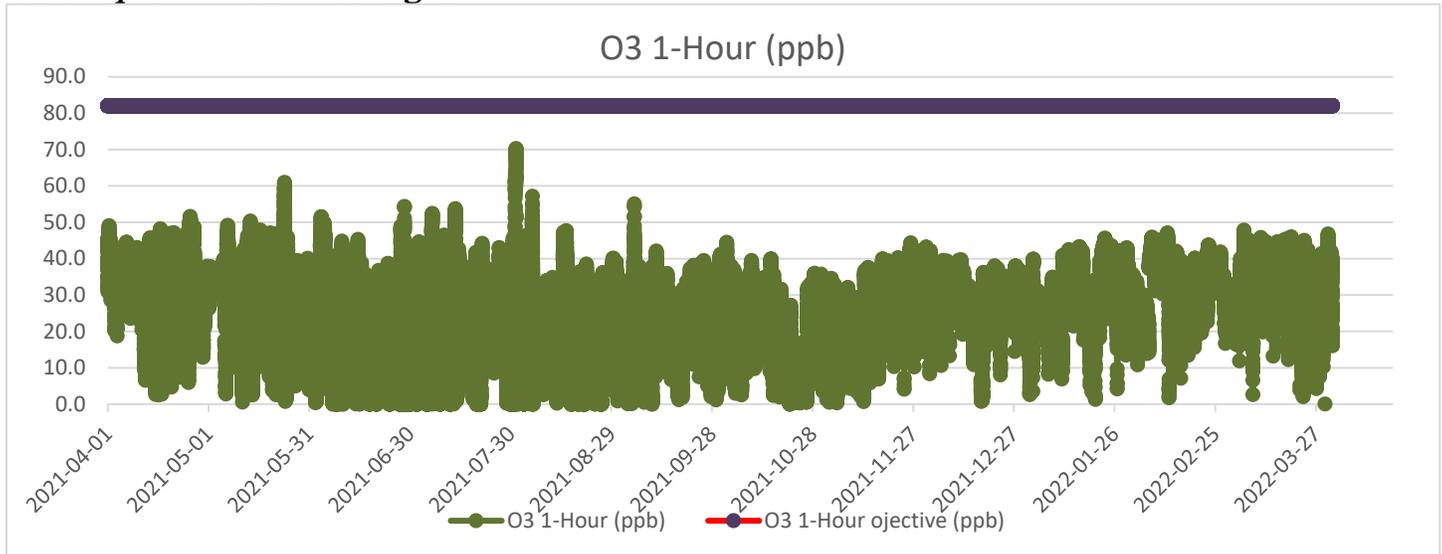
NO_x Graph 24-Hour Averages



Ozone (O₃)

O₃ Graph 1-Hour Averages

O₃ Graph 24-Hour Averages



O₃ Graph 8-Hour Rolling Averages

