

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, 2020 – March 31, 2021

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## 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, 2020 until March 31, 2021. The Farmington AQMS has been in operation since December 2017. Parameters monitored include continuous monitoring for Ozone (O<sub>3</sub>), Nitrogen Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Sulphur Dioxide (SO<sub>2</sub>), 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>, 2020 to March 31<sup>st</sup>, 2021 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 (2018-2020) are included.

Parameter	TRS	SO <sub>2</sub>	NO	NO <sub>2</sub>	NO <sub>x</sub>	O <sub>3</sub>
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>, 2020 to March 31<sup>st</sup>, 2021 monitoring period there were no exceedances of ambient air quality objectives except for
  - o One (1) exceedance of the 1-hour TRS objective.
  - o Ten (10) exceedances of the 24-hour TRS objective.
- Reported capture percentages for the previous periods (2018-2020) 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](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_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 (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 (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 (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 15<sup>th</sup>, 2020, August 3<sup>rd</sup>, 2020, December 1<sup>st</sup>, 2020 and March 4<sup>th</sup>, 2021
- BC Ministry of Environment Site Audits occurred on September 30<sup>th</sup>, 2020 and March 17<sup>th</sup>, 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.

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- 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.
  - Calibration periods were removed from the data capture percentage calculation.
  - TRS analyzer had a converter failure from October 6<sup>th</sup>, 2020 until Oct 17<sup>th</sup>, 2020 when a replacement converter was installed. Data was invalidated for this period.

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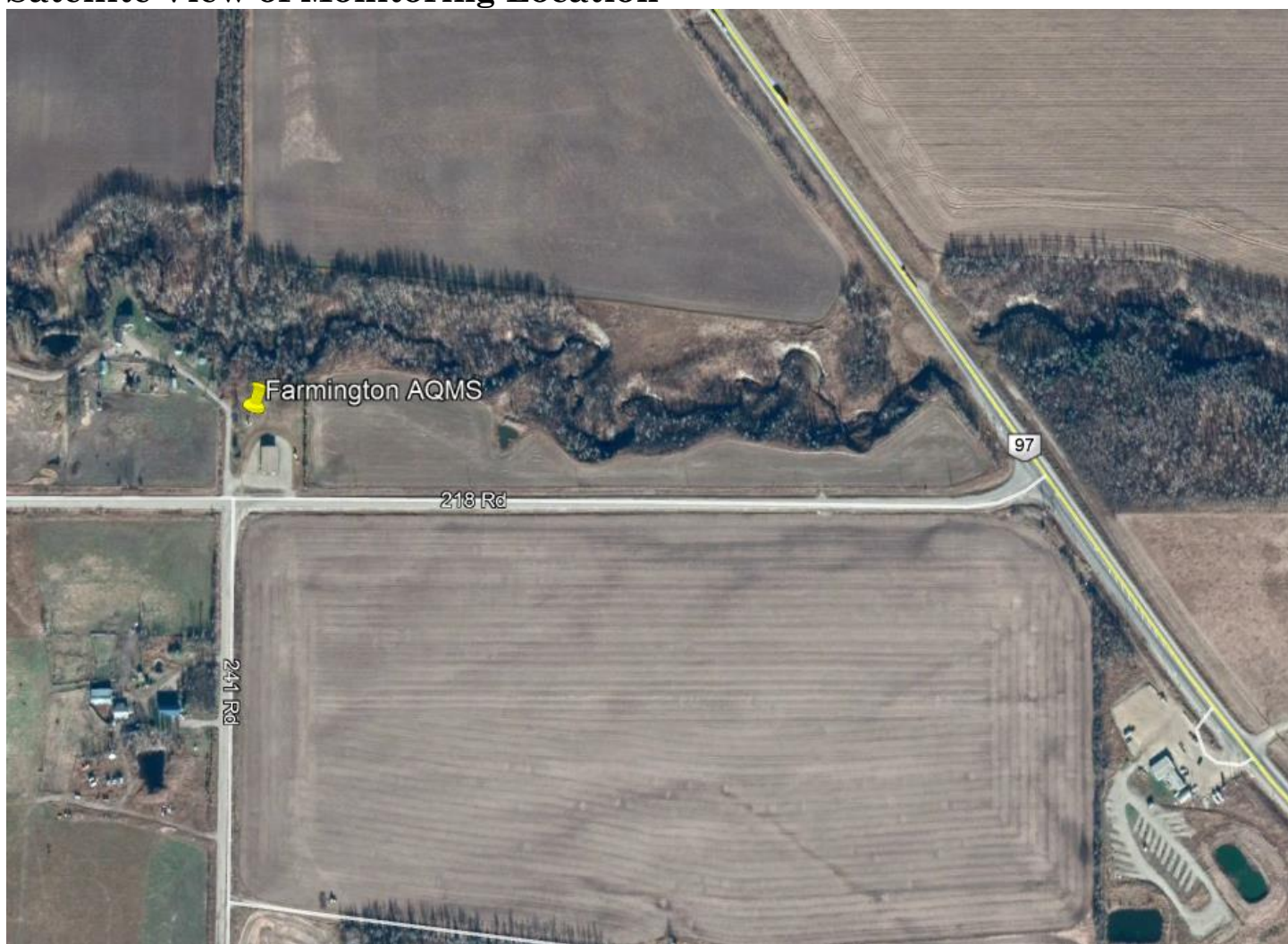
## MONITORING SITE LOCATION

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
<b>Avg (ppb)</b>	0.7	0.6	0.6	2.2	2.8	26.7
<b>Min (ppb)</b>	0.0	0.0	0.0	0.0	0.0	0.9
<b>Max (ppb)</b>	36.9	16.7	70.4	24.2	68.3	55.6
<b>Number #</b>	8141	8332	8331	8331	8331	8335
<b>Capture (%)</b>	92.9	95.1	95.1	95.1	95.1	95.1
<b>Std Dev.</b>	0.7	0.7	1.4	2.5	3.3	10.5
<b>T<sub>Min</sub></b>	12-1-2020 17:00	4-1-2020 21:00	3-6-2021 05:00	8-29-2020 11:00	3-6-2021 15:00	8-24-2020 04:00
<b>T<sub>Max</sub></b>	7-24-2020 20:00	2-12-2021 09:00	8-9-2020 10:00	2-14-2021 06:00	8-9-2020 10:00	4-24-2020 15:00

## 24-Hour Data Summary

Parameter	TRS	SO2	NO	NO2	NOx	O3
<b>Avg (ppb)</b>	0.7	0.6	0.6	2.2	2.8	26.7
<b>Min (ppb)</b>	0.0	0.0	0.0	0.3	0.4	9.4
<b>Max (ppb)</b>	2.5	3.8	4.2	13.0	17.3	46.4
<b>Number #</b>	350	358	358	358	358	359
<b>Capture (%)</b>	95.9	98.1	98.1	98.1	98.1	98.4
<b>Std Dev.</b>	0.6	0.5	0.6	1.8	2.2	8.3
<b>T<sub>Min</sub></b>	9-7-2020	3-10-2021	3-6-2021	6-15-2020	6-15-2020	1-30-2021
<b>T<sub>Max</sub></b>	2-21-2021	2-12-2021	1-30-2021	1-30-2021	1-30-2021	4-7-2020

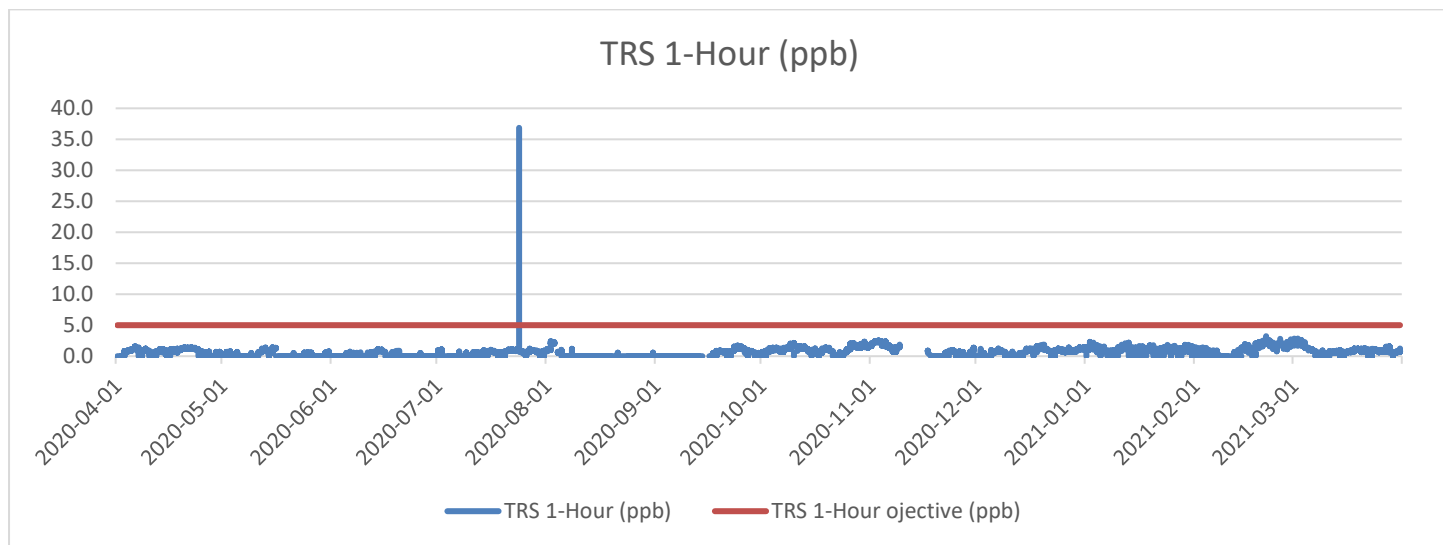
## 8-Hour Rolling Data Summary

Parameter	O3
<b>Avg (ppb)</b>	26.7
<b>Min (ppb)</b>	1.2
<b>Max (ppb)</b>	52.1
<b>Number #</b>	8645
<b>Capture (%)</b>	98.7
<b>Std Dev.</b>	9.7
<b>T<sub>Min</sub></b>	8-17-2020 05:00
<b>T<sub>Max</sub></b>	5-12-2019 18:00

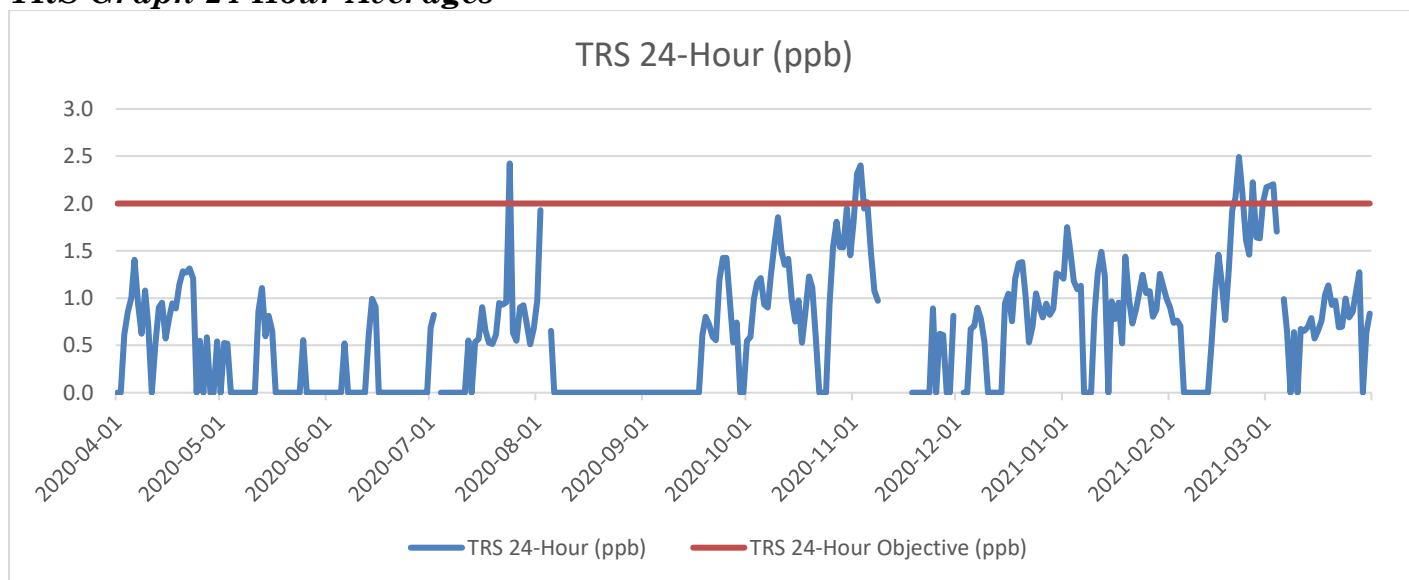
# PARAMETER TREND GRAPHS

## Total Reduced Sulphur (TRS)

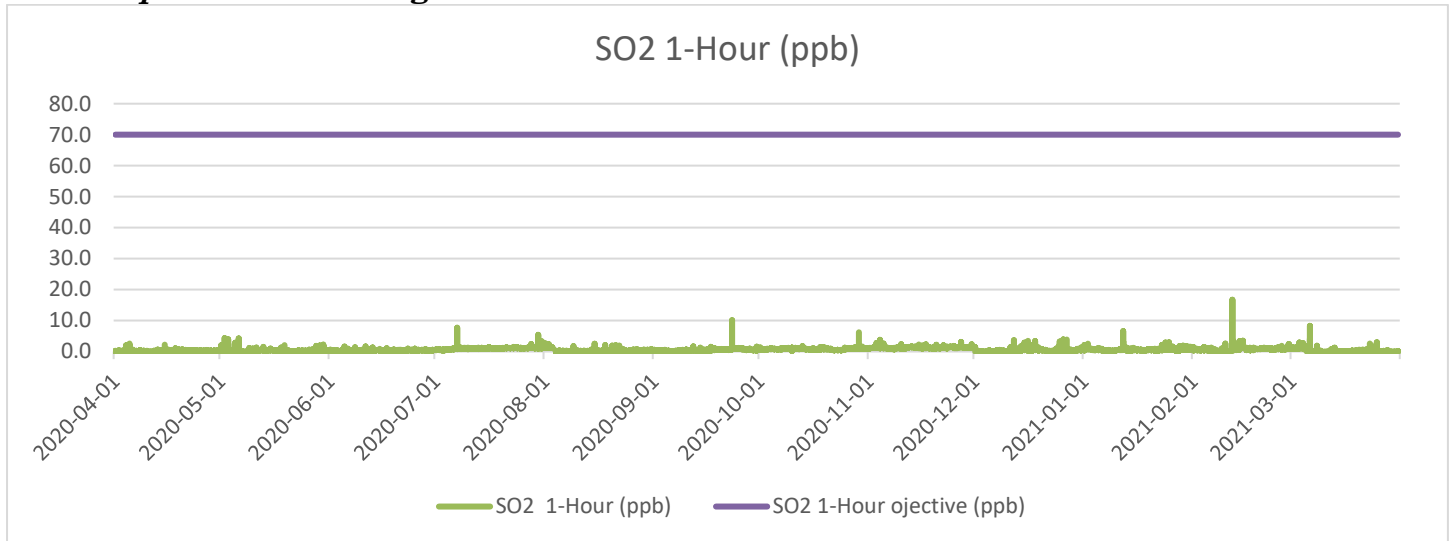
### *TRS Graph 1-Hour Averages*



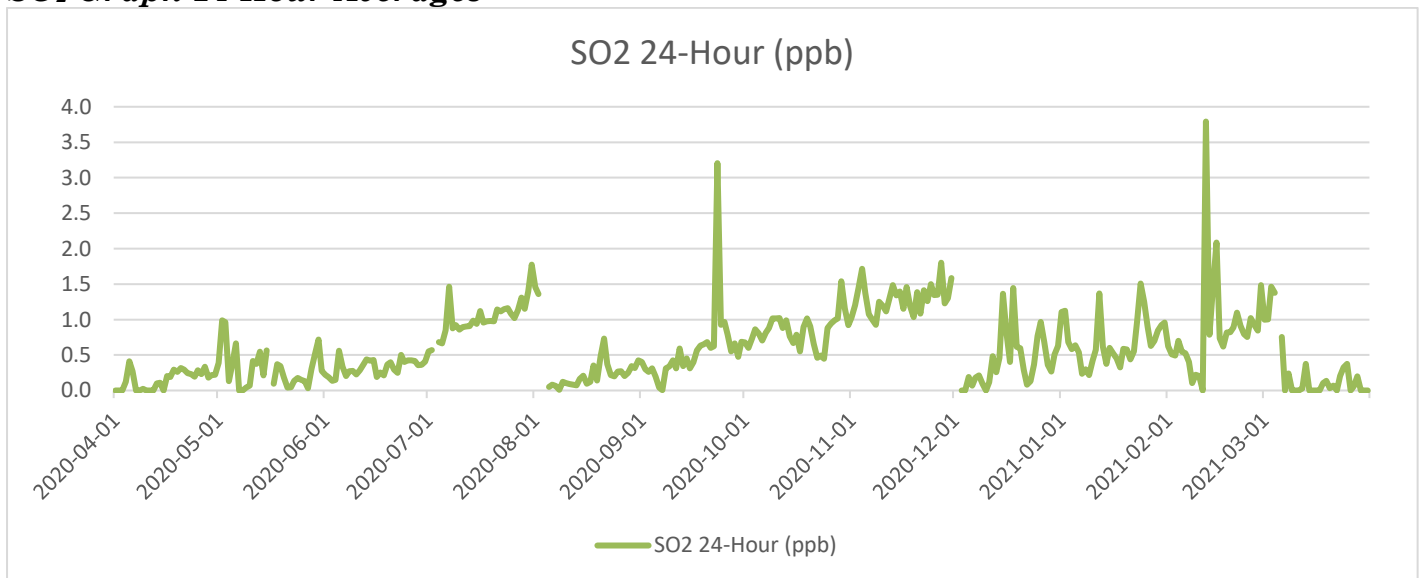
### *TRS Graph 24-Hour Averages*



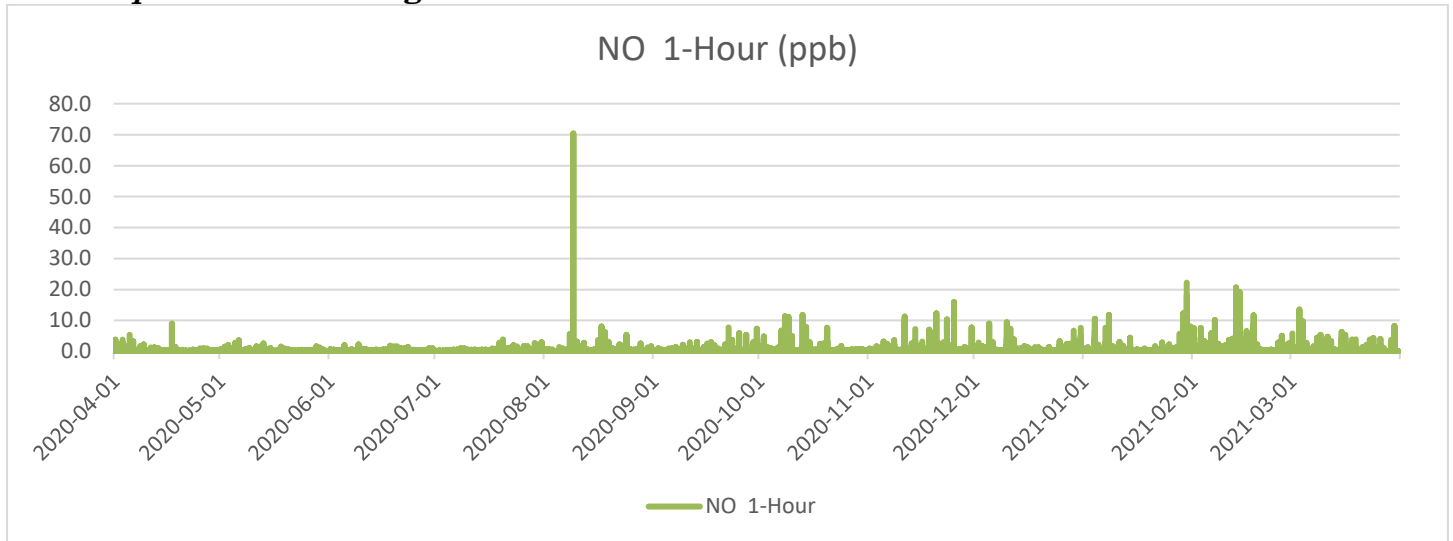
## Sulphur Dioxide (SO<sub>2</sub>) SO<sub>2</sub> Graph 1-Hour Averages



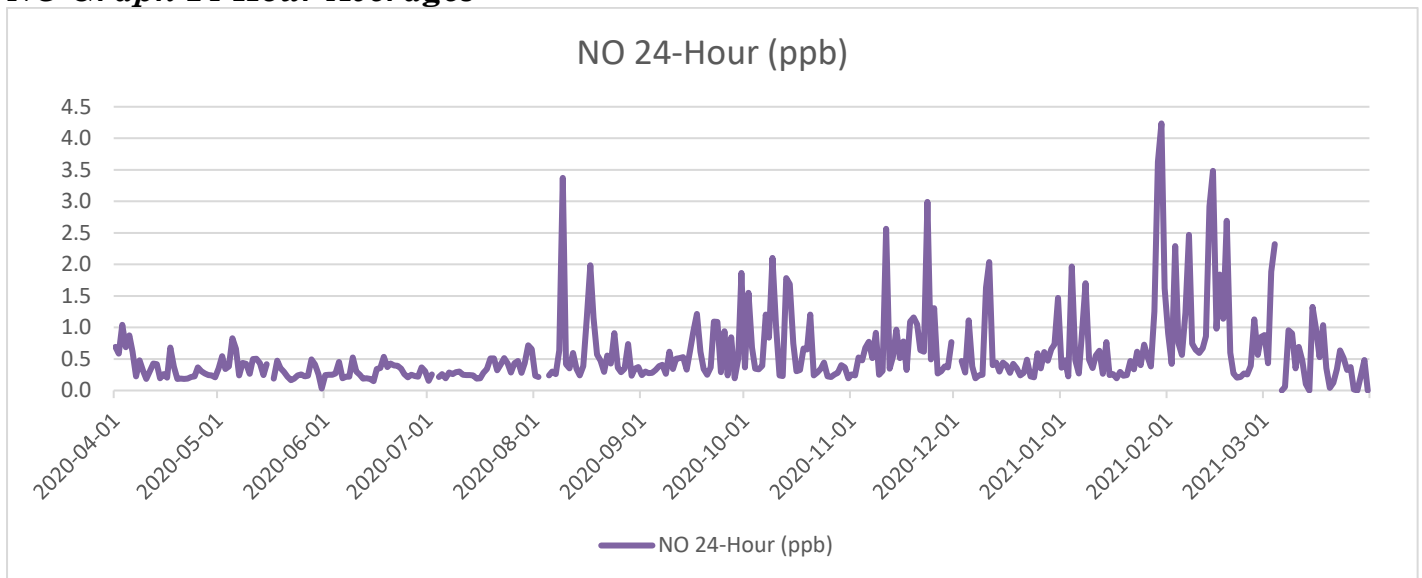
## SO<sub>2</sub> Graph 24-Hour Averages



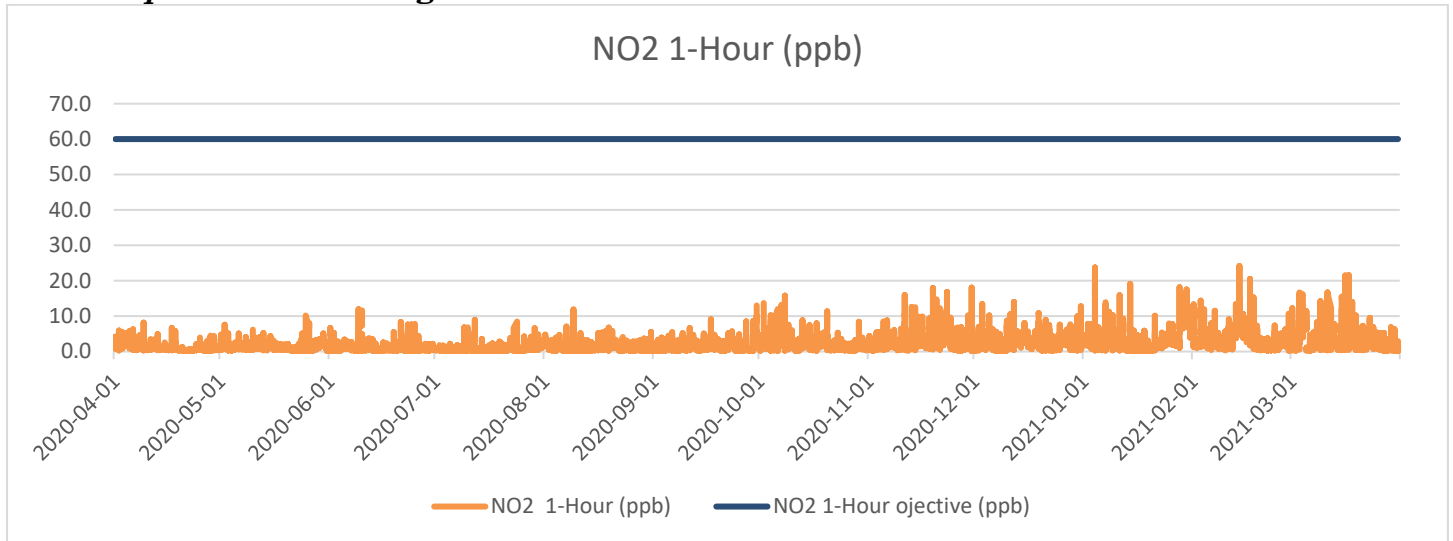
**Nitrogen Oxide (NO)**  
***NO Graph 1-Hour Averages***



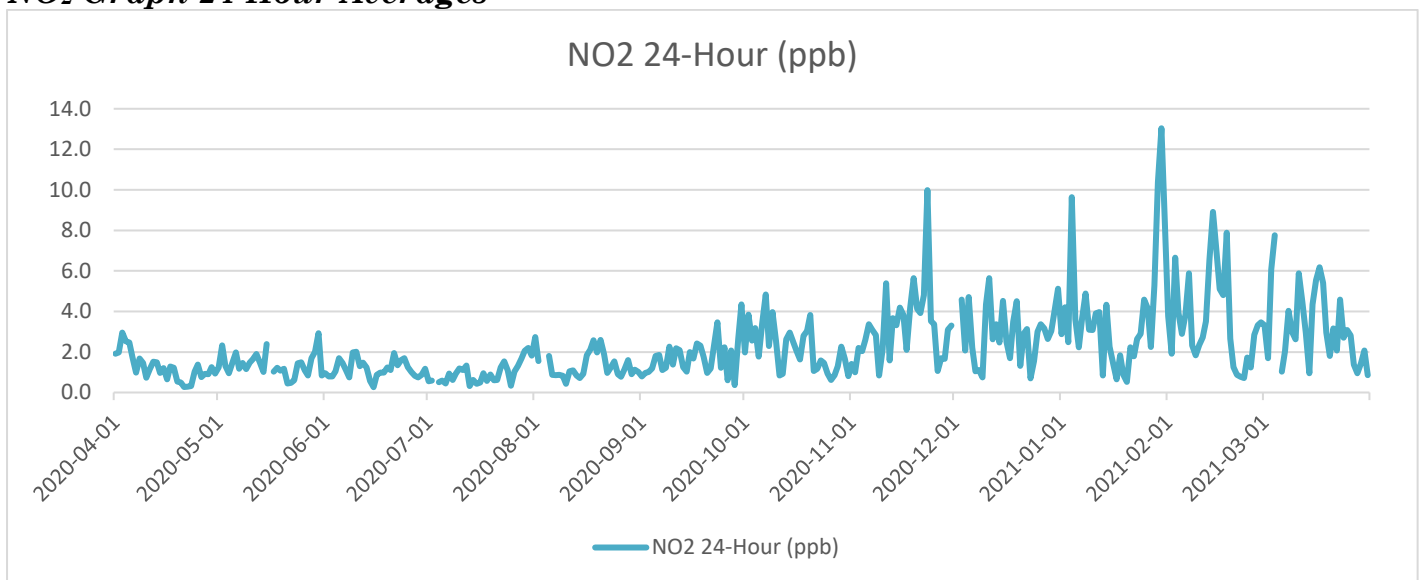
***NO Graph 24-Hour Averages***



## Nitrogen Dioxide (NO<sub>2</sub>) NO<sub>2</sub> Graph 1-Hour Averages

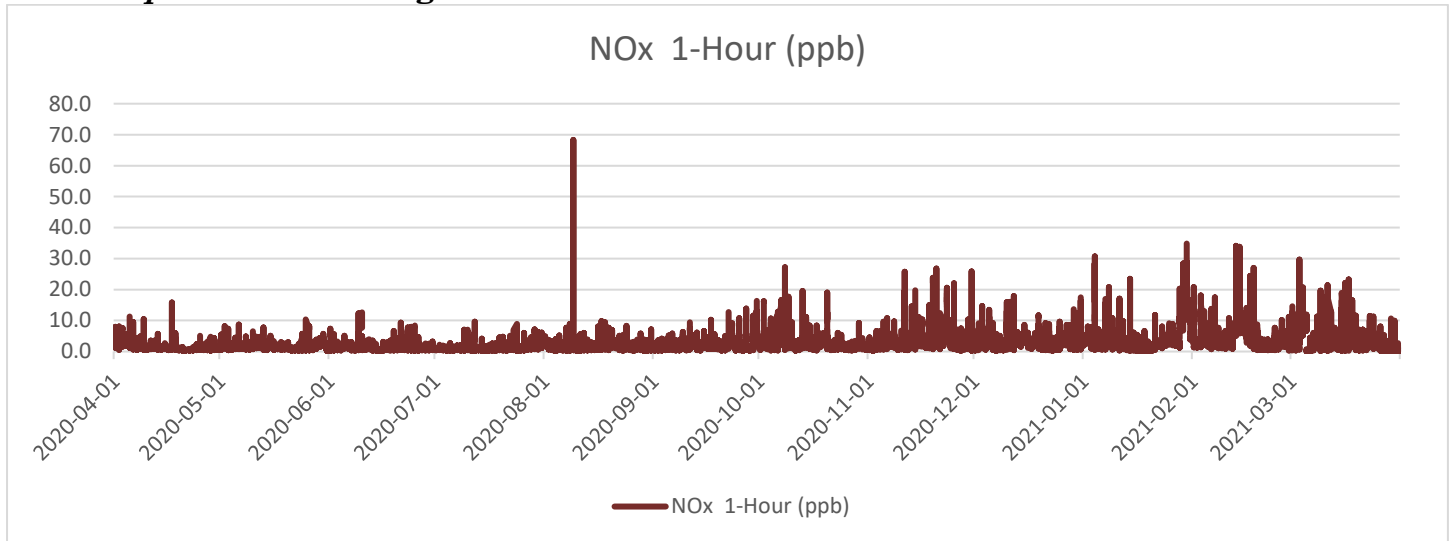


## NO<sub>2</sub> Graph 24-Hour Averages

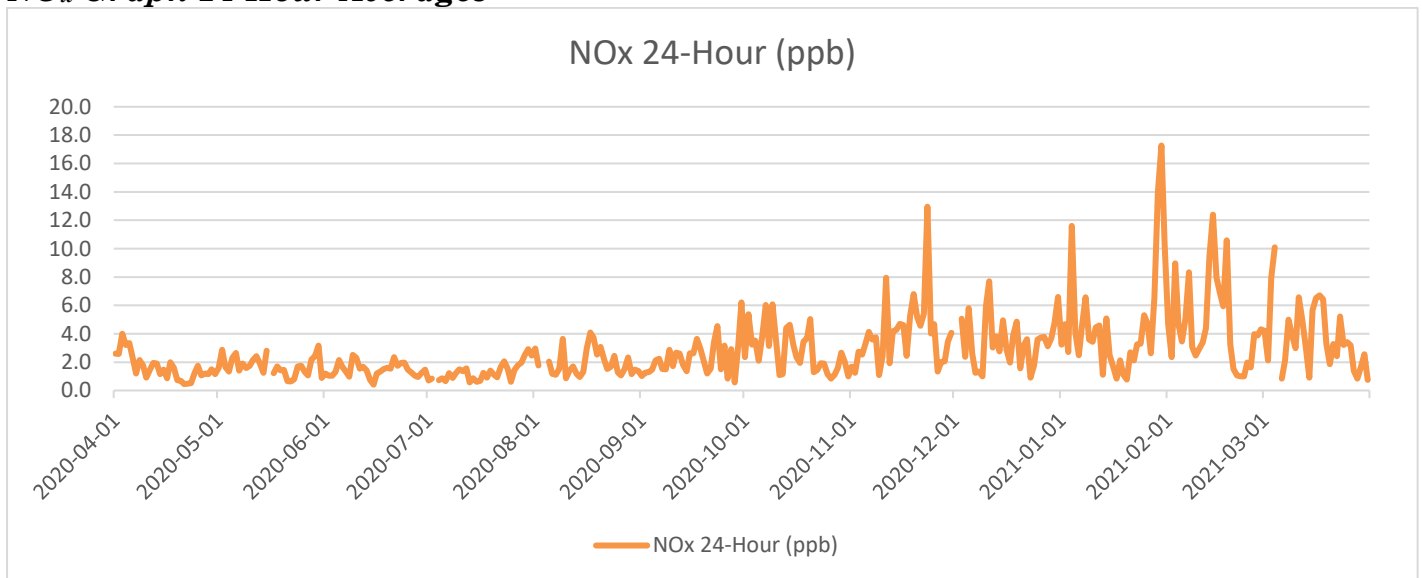


## Oxides of Nitrogen (NO<sub>x</sub>)

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

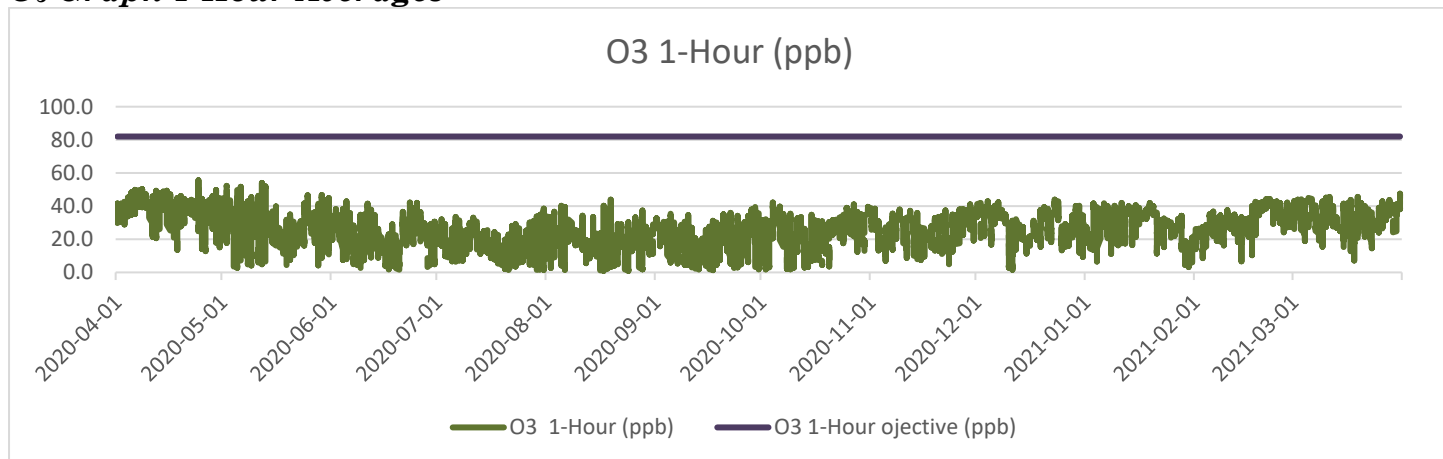


### NO<sub>x</sub> Graph 24-Hour Averages

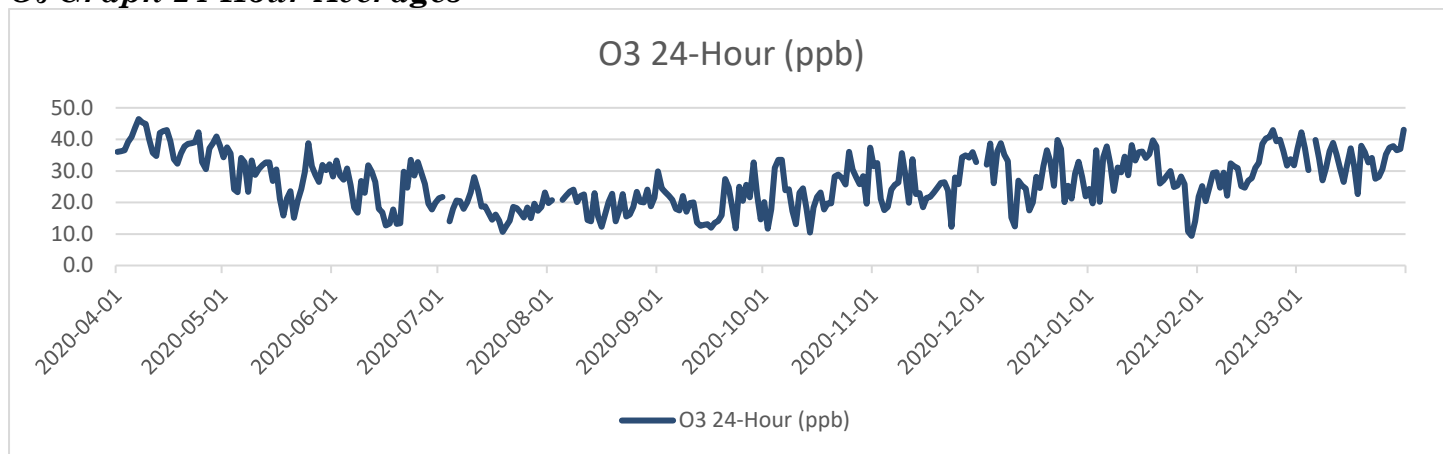


## Ozone (O<sub>3</sub>)

### 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

