

**WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT  
FEBRUARY 2023  
REPORT HISTORY**

Original report release date: March 31, 2023

Revised report release date: August 30, 2023

**Revision 1 – Submission of H<sub>2</sub>S data and Revision of TRS data at Patricia McInnes.**

The Patricia McInnes air monitoring station (AMS06) collected H<sub>2</sub>S data from January 3, 2023, to June 12, 2023, but it was reported as TRS. On August 30, 2023, the data was resubmitted as H<sub>2</sub>S to the Electronic Transfer System (ETS) and the TRS data was revised. The monthly report cover letter, station summary, network summary, and calibration report contained within have been revised to reflect the change.



**WOOD BUFFALO  
ENVIRONMENTAL ASSOCIATION**

Unit 3 - 805 Memorial Drive  
Fort McMurray, AB T9K 0K4  
P: 780.799.4420 E: info@wbea.org  
[wbea.org](http://wbea.org)

Wood Buffalo Environmental Association

# FEBRUARY 2023

# MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

August 30, 2023

Revision 01

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS01 BERTHA GANTER - FORT MCKAY FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                 |
|-------------------|--------------------------|-----------------|-----------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01           |
| Calibration Date: | February 1, 2023         | Last Cal Date:  | January 5, 2023 |
| Start time (MST): | 10:45                    | End time (MST): | 14:21           |
| Reason:           | Routine                  |                 |                 |

### Calibration Standards

|                        |                   |     |                   |                   |
|------------------------|-------------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.19             | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #:    | CC486642          |     |                   |                   |
| Removed Cal Gas Conc:  | 49.19             | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                   |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3565              |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 5609              |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1501301448 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.998187     | 0.998801      | Backgd or Offset: | 19.1         | 19.0          |
| Calibration intercept: | -0.293417    | -0.333078     | Coeff or Slope:   | 0.891        | 0.891         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4918                          | 81.3                        | 799.9                               | 797.8                              | 1.003   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4918                          | 81.3                        | 799.9                               | 799.2                              | 1.001   |
| second point              | 4959                          | 40.7                        | 400.4                               | 398.5                              | 1.005   |
| third point               | 4979                          | 20.3                        | 199.7                               | 199.2                              | 1.003   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span              | 4918                          | 81.3                        | 799.9                               | 799.6                              | 1.000   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.003   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 797.70 | Previous response | 798.20 | *% change     | -0.1% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

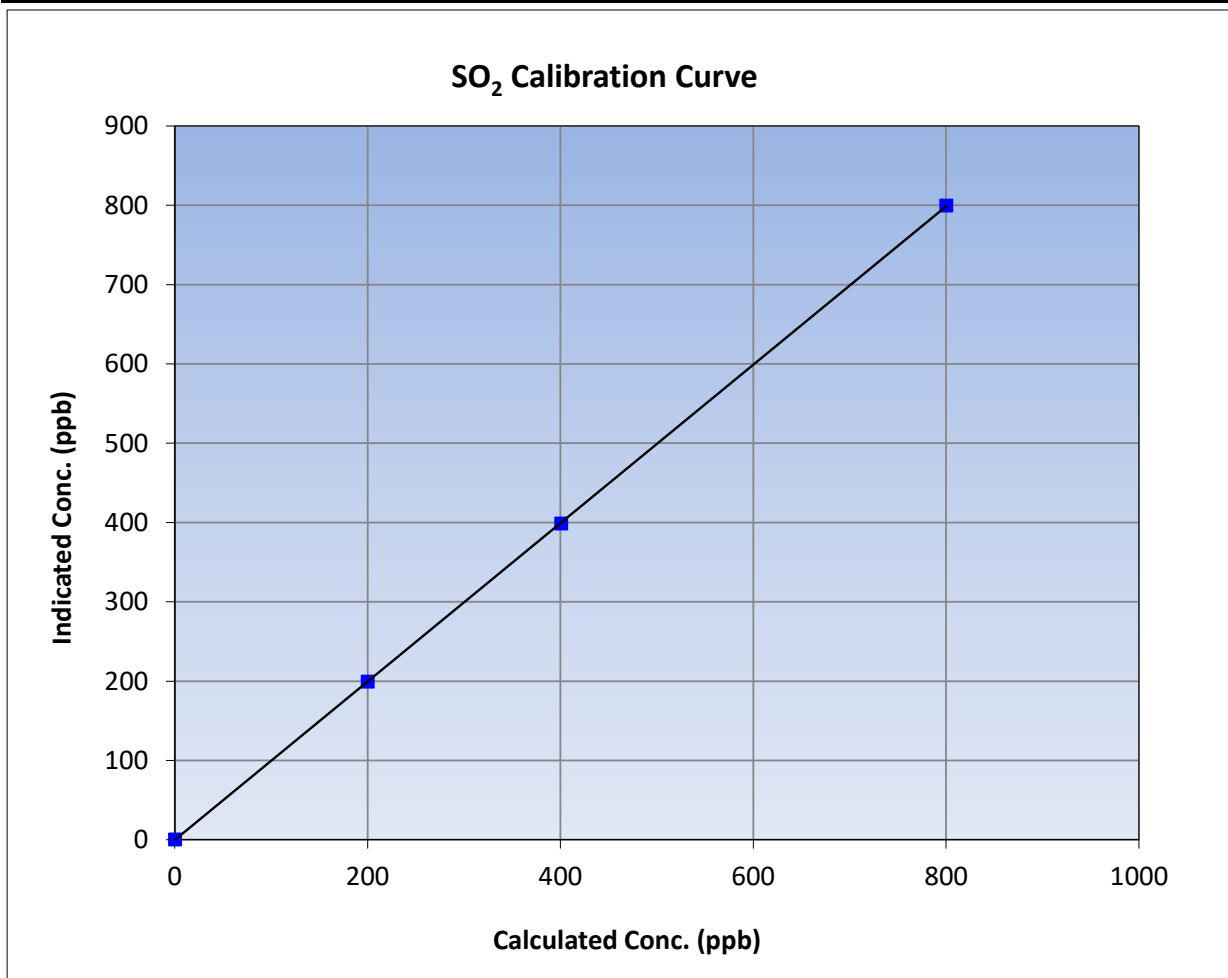
Version-01-2020

### Station Information

|                   |                          |                       |                 |
|-------------------|--------------------------|-----------------------|-----------------|
| Calibration Date: | February 1, 2023         | Previous Calibration: | January 5, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01           |
| Start Time (MST): | 10:45                    | End Time (MST):       | 14:21           |
| Analyzer make:    | Thermo 43i               | Analyzer serial #:    | JC1501301448    |

### Calibration Data

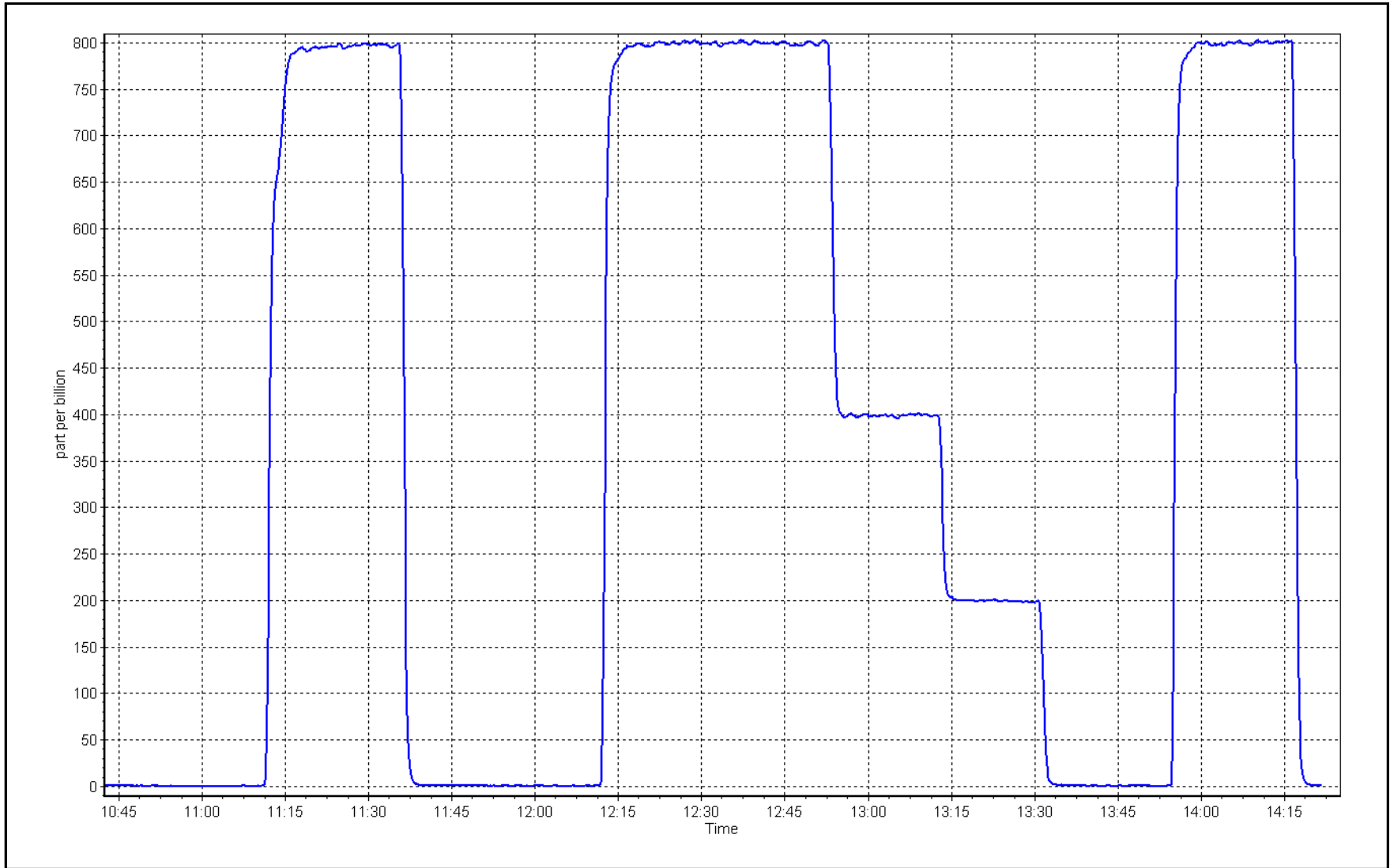
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999995      | ≥0.995      |
| 799.9                                  | 799.2                                 | 1.0009                       |                         |               |             |
| 400.4                                  | 398.5                                 | 1.0048                       | Slope                   | 0.998801      | 0.90 - 1.10 |
| 199.7                                  | 199.2                                 | 1.0027                       |                         |               |             |
|  |                                       |                              | Intercept               | -0.333078     | +/-30       |



SO2 Calibration Plot

Date: February 1, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Bertha Ganter-Fort McKay Station number: AMS01  
 Calibration Date: February 13, 2023 Last Cal Date: January 10, 2023  
 Start time (MST): 11:12 End time (MST): 17:19  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.10 ppm Cal Gas Exp Date: September 16, 2024  
 Cal Gas Cylinder #: CC511749  
 Removed Cal Gas Conc: 5.10 ppm Rem Gas Exp Date: N/A  
 Removed Gas Cyl #: N/A Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3565  
 ZAG Make/Model: Teledyne API T701 Serial Number: 5609

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1218153461  
 Converter make: CD Nova Converter serial #: 470  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.998364     | 0.995507      | Backgd or Offset: | 2.29         | 2.30          |
| Calibration intercept: | 0.059997     | 0.059999      | Coeff or Slope:   | 0.919        | 0.919         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4921                          | 78.4                        | 80.0                                | 79.6                               | 1.006  |
| as found 2nd point    | 4960                          | 39.2                        | 40.0                                | 39.8                               | 1.008  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 20.2                               | 0.995  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4921                          | 78.4                        | 80.0                                | 79.7                               | 1.004   |
| second point                            | 4960                          | 39.2                        | 40.0                                | 39.9                               | 1.002   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 19.9                               | 1.005   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4921                          | 78.4                        | 80.0                                | 79.6                               | 1.005   |
| SO2 Scrubber Check                      | 4919                          | 81.3                        | 813.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | December 17, 2021             |                             |                                     | Ave Corr Factor                    | 1.004   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

Baseline Corr As found: 79.5 Prev response: 79.92 \*% change: -0.5%  
 Baseline Corr 2nd AF pt: 39.7 AF Slope: 0.992792 AF Intercept: 0.180003  
 Baseline Corr 3rd AF pt: 20.1 AF Correlation: 0.999988

\* = > +/-5% change initiates investigation

Notes: Inlet filter change and scrubber check completed after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TRS Calibration Summary

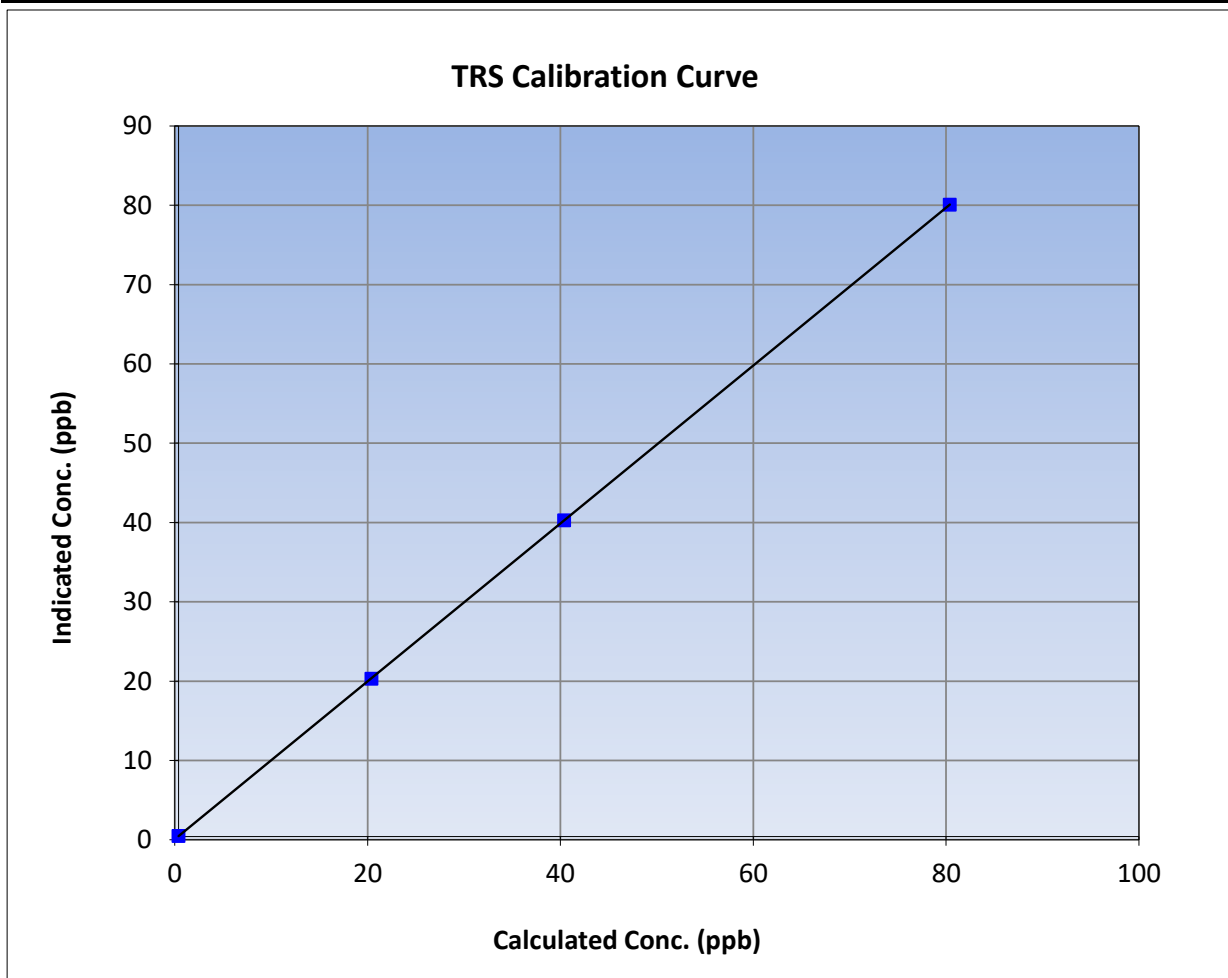
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023        | Previous Calibration: | January 10, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 17:19            |
| Analyzer make:    | Thermo 43i-TLE           | Analyzer serial #:    | 1218153461       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999998 | ≥0.995      |
| 80.0                                | 79.7                               | 1.0037                    |                         |          |             |
| 40.0                                | 39.9                               | 1.0025                    | Slope                   | 0.995507 | 0.90 - 1.10 |
| 20.0                                | 19.9                               | 1.0049                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.059999 | +/-3        |

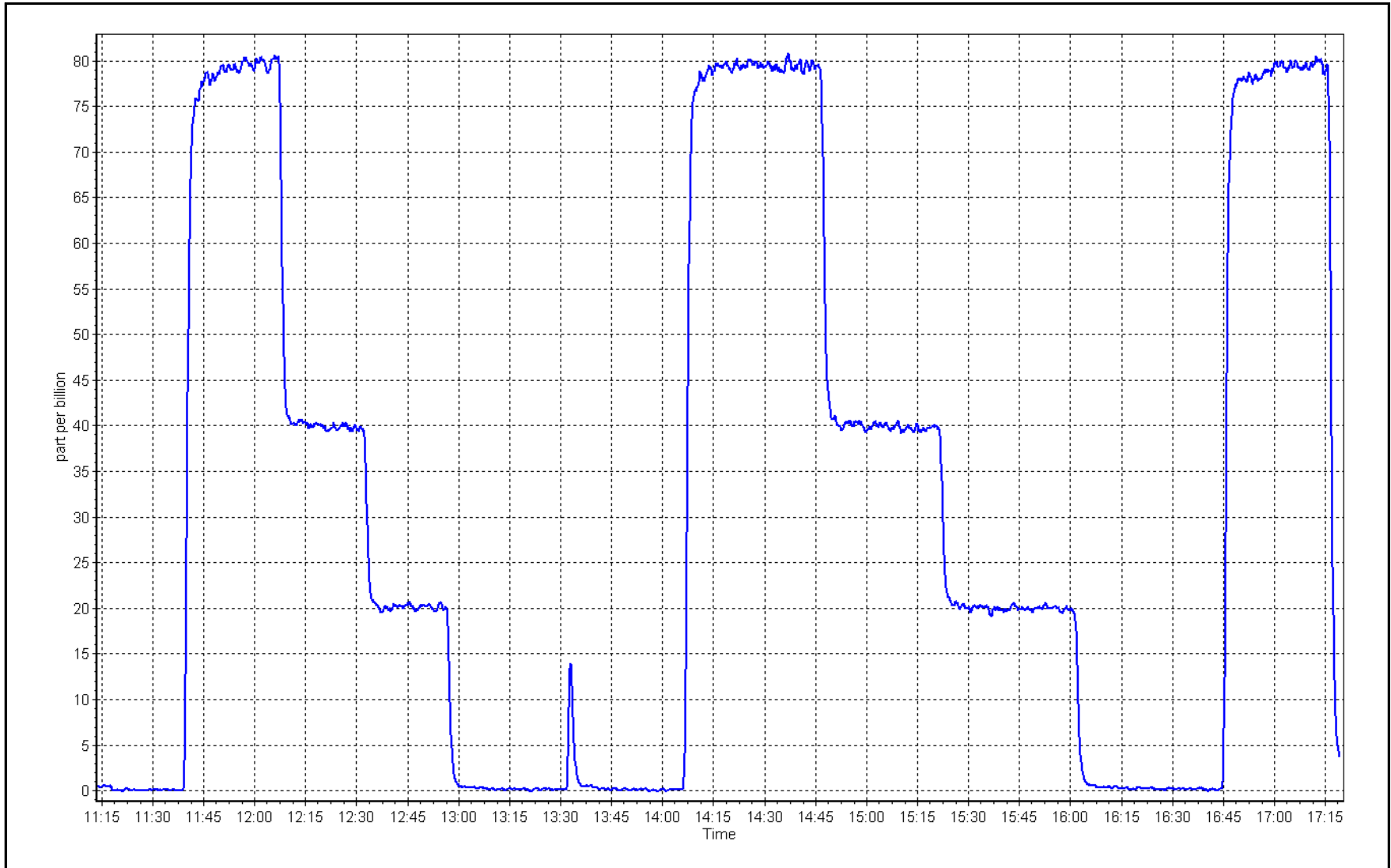




TRS Calibration Plot

Date: February 13, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
 Calibration Date: February 13, 2023      Last Cal Date: January 10, 2023  
 Start time (MST): 11:12      End time (MST): 17:19  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.10 ppm      Cal Gas Exp Date: September 16, 2024  
 Cal Gas Cylinder #: CC511749  
 Removed Cal Gas Conc: 5.10 ppm      Rem Gas Exp Date: N/A  
 Removed Gas Cyl #: N/A      Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 3565  
 ZAG Make/Model: Teledyne API T701      Serial Number: 5609

### Analyzer Information

Analyzer make: Thermo 43iQTL      Analyzer serial #: 1200326167  
 Converter make: Thermo Converter      Converter serial #: N/A  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.996946     | 0.996946      | Backgd or Offset: 1.94 | 1.95          |
| Calibration intercept: | 0.161599     | 0.361624      | Coeff or Slope: 1.014  | 1.014         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----   |
| as found span         | 4921                          | 78.4                        | 80.0                                | 80.0                               | 0.998  |
| as found 2nd point    | 4960                          | 39.2                        | 40.0                                | 40.3                               | 0.990  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 20.2                               | 0.985  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4921                          | 78.4                        | 80.0                                | 79.9                               | 1.001   |
| second point                            | 4961                          | 39.2                        | 40.0                                | 40.7                               | 0.983   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 20.2                               | 0.990   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4921                          | 78.4                        | 80.0                                | 78.7                               | 1.016   |
| SO2 Scrubber Check                      | 4919                          | 81.3                        | 813.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | March 21, 2022                |                             |                                     | Ave Corr Factor                    | 0.991   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 80.1      Prev response: 79.89      \*% change: 0.3%  
 Baseline Corr 2nd AF pt: 40.4      AF Slope: 1.000846      AF Intercept: 0.079998  
 Baseline Corr 3rd AF pt: 20.3      AF Correlation: 0.999972

\* = > +/-5% change initiates investigation

Notes: Inlet filter change and scrubber check completed after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

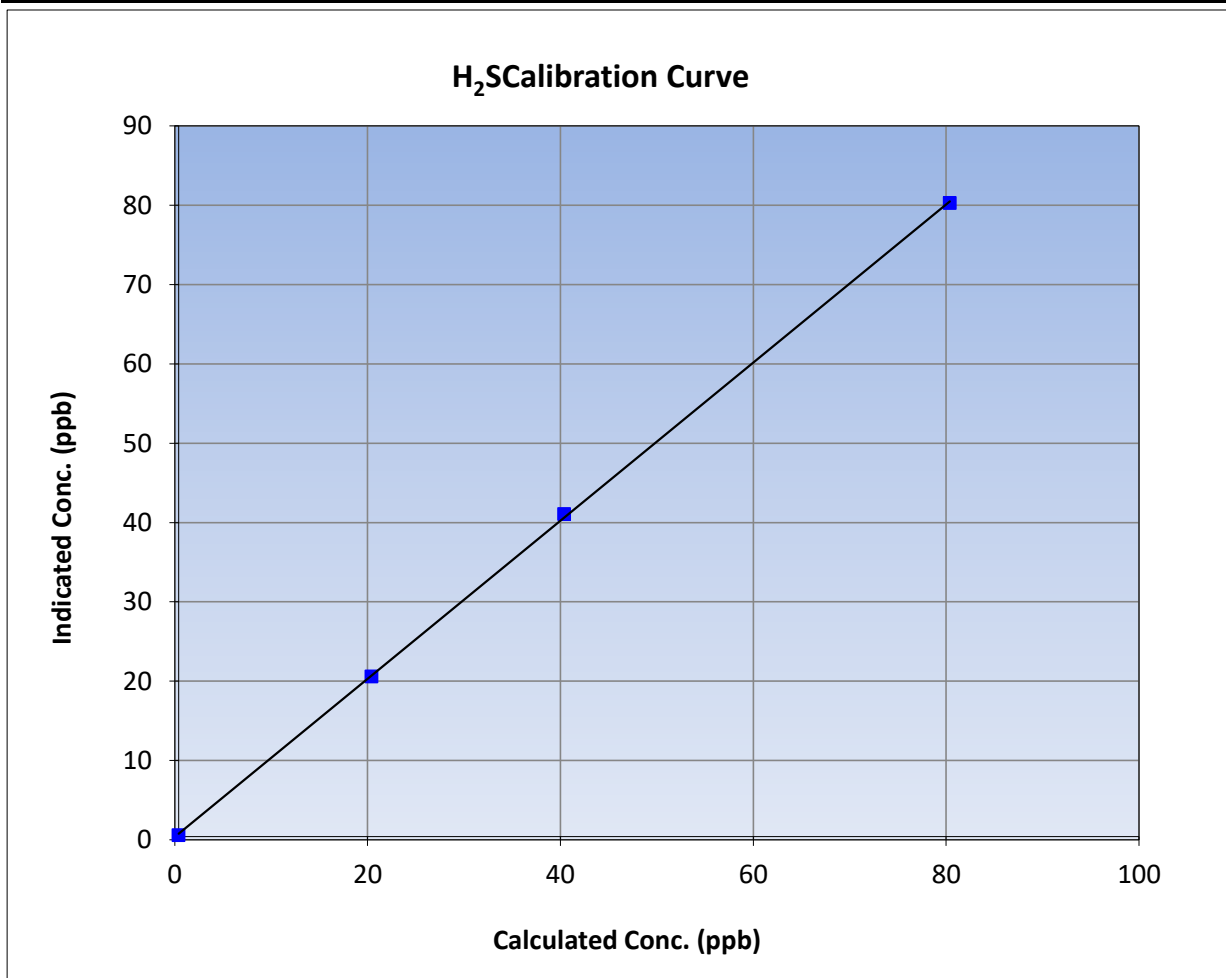
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023        | Previous Calibration: | January 10, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 17:19            |
| Analyzer make:    | Thermo 43iQTL            | Analyzer serial #:    | 1200326167       |

### Calibration Data

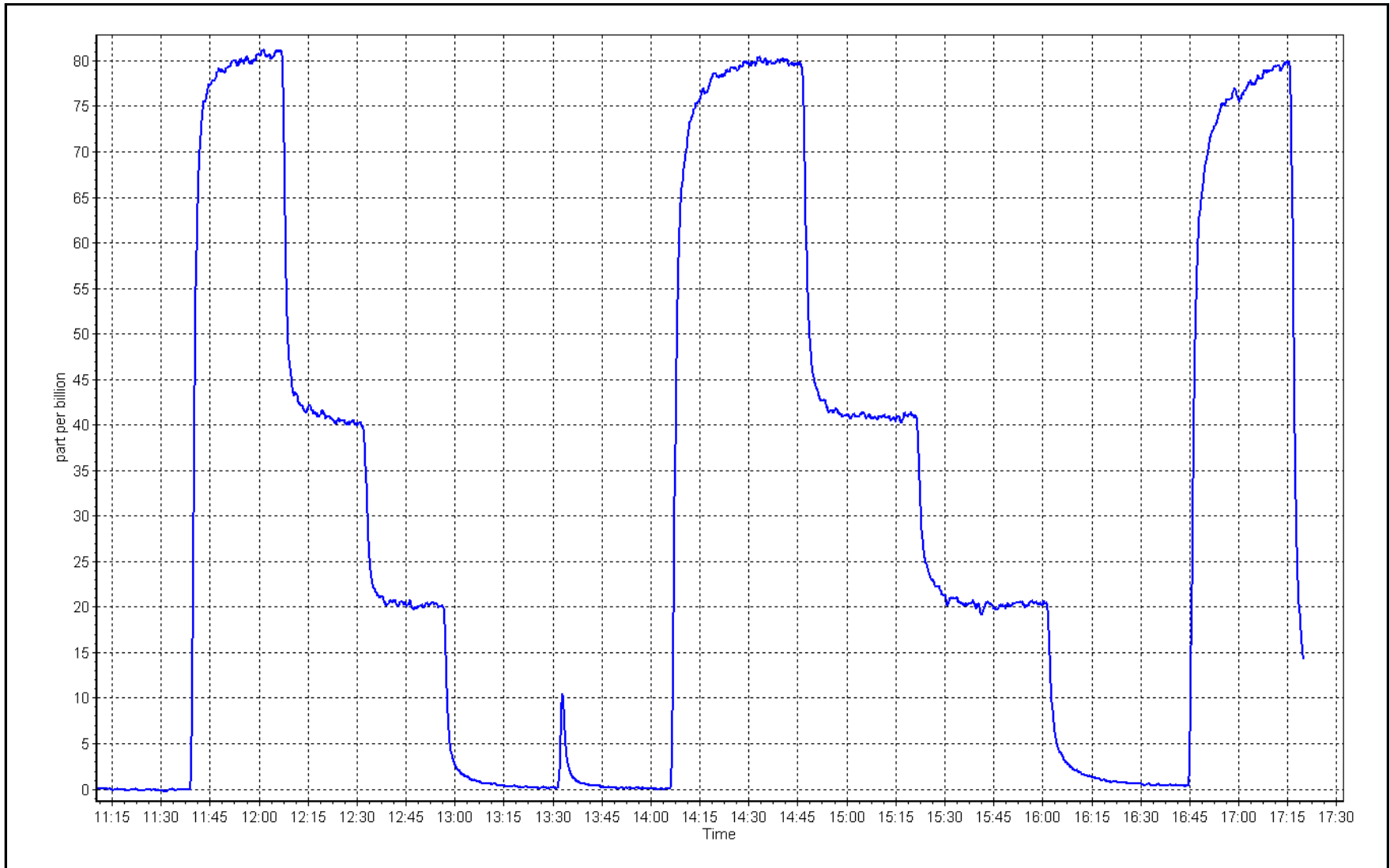
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999913 | ≥0.995      |
| 80.0                                | 79.9                               | 1.0012                    |                         |          |             |
| 40.0                                | 40.7                               | 0.9826                    | Slope                   | 0.996946 | 0.90 - 1.10 |
| 20.0                                | 20.2                               | 0.9900                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.361624 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 13, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | February 1, 2023         | Last Cal Date:  | January 24, 2023 |
| Start time (MST): | 10:45                    | End time (MST): | 14:21            |
| Reason:           | Routine                  |                 |                  |

### Calibration Standards

|   |                   |                             |                   |
|---|-------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC486642          | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.6 ppm         |                             |                   |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.6 ppm         | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 3565              |
| ZAG make/model:                             | Teledyne API T701 | Serial Number:              | 5609              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320040 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.54E-04     | 2.52E-04      | NMHC SP Ratio:  | 5.11E-05      |
| CH <sub>4</sub> Retention time: | 14.4         | 14.4          | NMHC Peak Area: | 179761        |
|                                 |              |               |                 | 181561        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4918              | 81.3                 | 17.29                | 17.25               | 1.002                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4918              | 81.3                 | 17.29                | 17.21               | 1.004                      |
| second point          | 4959              | 40.7                 | 8.65                 | 8.56                | 1.011                      |
| third point           | 4980              | 20.3                 | 4.32                 | 4.27                | 1.011                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4918              | 81.3                 | 17.29                | 17.10               | 1.011                      |

| Average Correction Factor |       |                 |       | 1.009                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.25 | Prev response   | 17.28 | *% change -0.2%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4918              | 81.3                 | 9.19                 | 9.22                                       | 0.998                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4918              | 81.3                 | 9.19                 | 9.15                                       | 1.005                      |
| second point              | 4959              | 40.7                 | 4.60                 | 4.56                                       | 1.010                      |
| third point               | 4980              | 20.3                 | 2.30                 | 2.28                                       | 1.009                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4918              | 81.3                 | 9.19                 | 9.07                                       | 1.014                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 9.22              | Prev response        | 9.20                 | *% change                                  | 0.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4918              | 81.3                 | 8.09                 | 8.03                                       | 1.008                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4918              | 81.3                 | 8.09                 | 8.06                                       | 1.004                      |
| second point              | 4959              | 40.7                 | 4.05                 | 4.00                                       | 1.012                      |
| third point               | 4980              | 20.3                 | 2.02                 | 1.99                                       | 1.014                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4918              | 81.3                 | 8.09                 | 8.03                                       | 1.007                      |
| Average Correction Factor |                   |                      |                      |  | 1.010                      |
| Baseline Corr AF:         | 8.03              | Prev response        | 8.09                 | *% change                                  | -0.7%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.999160     | 0.995861      |
| THC Cal Offset:             | 0.008295     | -0.022506     |
| CH <sub>4</sub> Cal Slope:  | 0.998842     | 0.996625      |
| CH <sub>4</sub> Cal Offset: | 0.003433     | -0.014967     |
| NMHC Cal Slope:             | 0.999663     | 0.994978      |
| NMHC Cal Offset:            | 0.004462     | -0.007938     |

Notes: Changed out the inlet filter and N2 cylinder after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## THC Calibration Summary

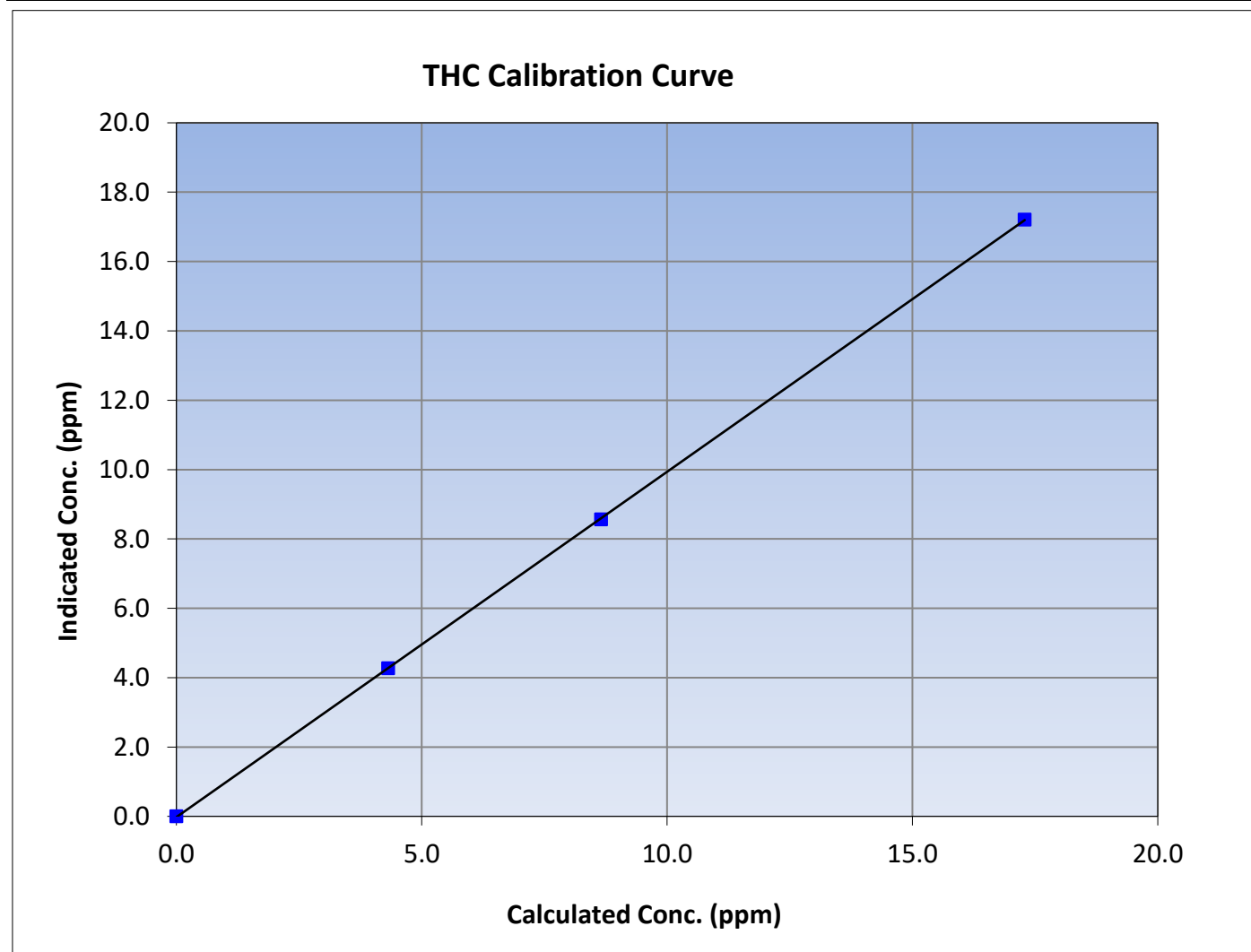
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023         | Previous Calibration: | January 24, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:45                    | End Time (MST):       | 14:21            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988  | $\geq 0.995$  |
| 17.29                               | 17.21                              | 1.0044                    |                         |           |               |
| 8.65                                | 8.56                               | 1.0107                    |                         |           |               |
| 4.32                                | 4.27                               | 1.0113                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.995861  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.022506 | +/-0.5        |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

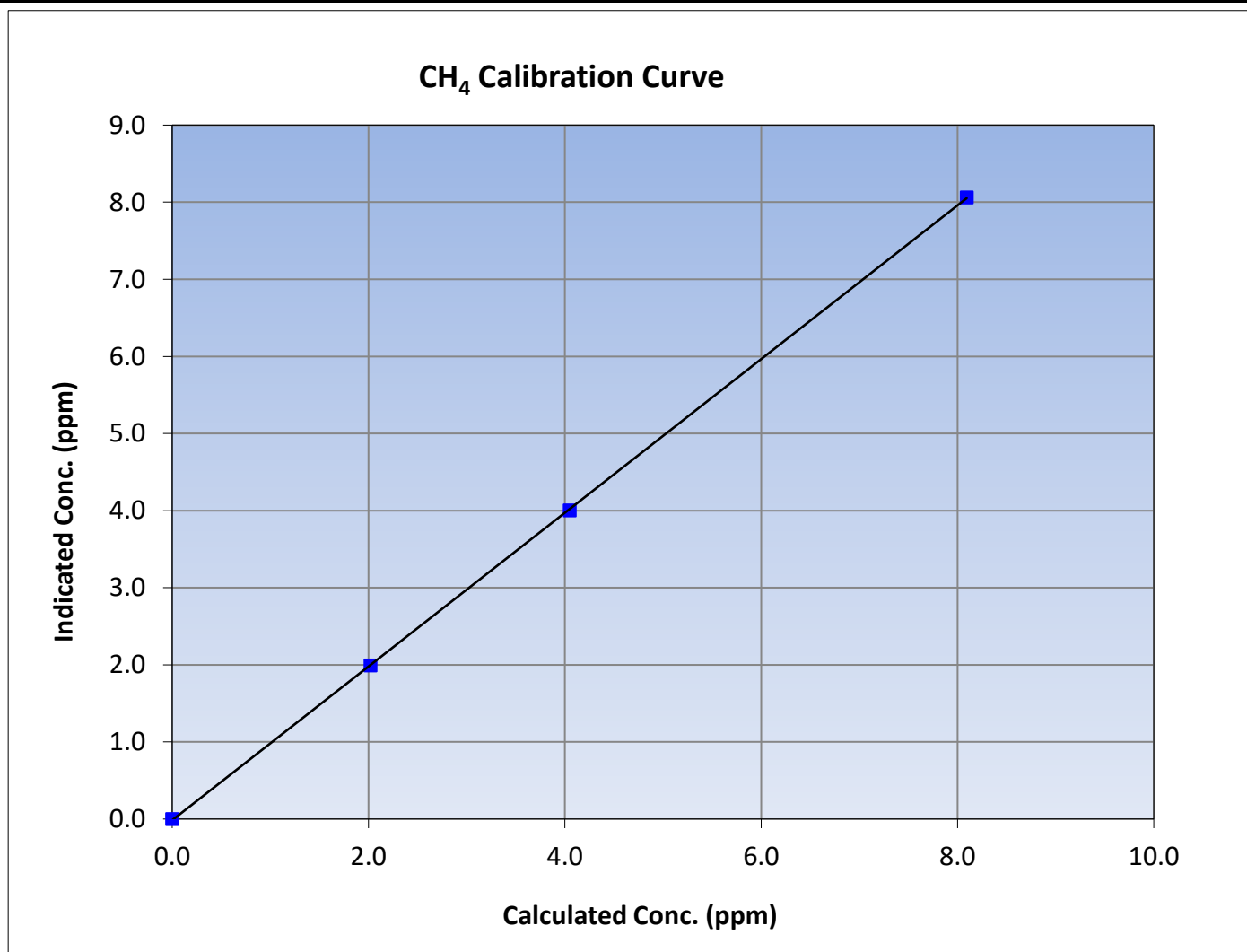
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023         | Previous Calibration: | January 24, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:45                    | End Time (MST):       | 14:21            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999978  | $\geq 0.995$  |
| 8.09                                | 8.06                               | 1.0038                    |                         |           |               |
| 4.05                                | 4.00                               | 1.0121                    |                         |           |               |
| 2.02                                | 1.99                               | 1.0144                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.996625  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.014967 | +/-0.5        |







# Wood Buffalo Environmental Association

## NMHC Calibration Summary

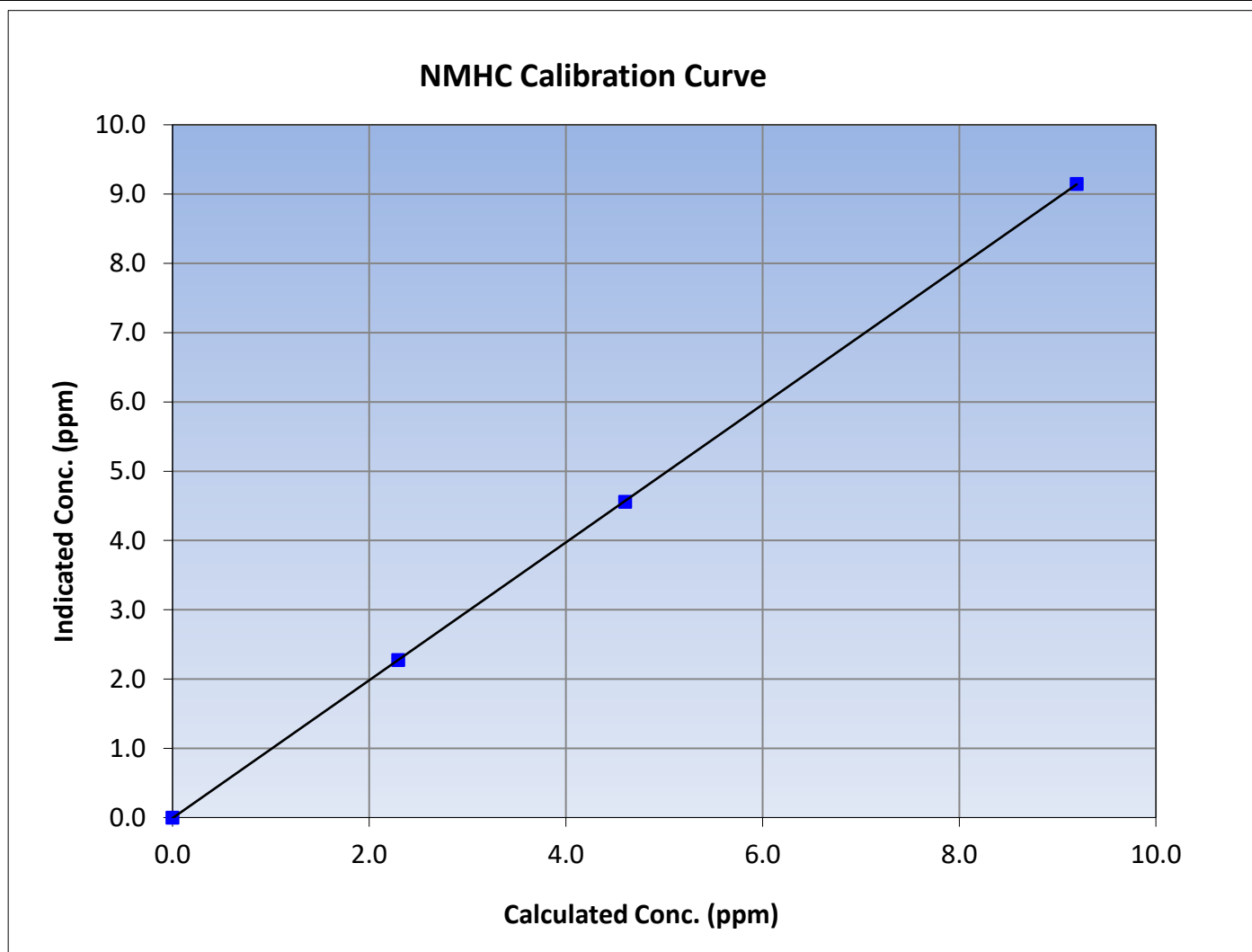
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023         | Previous Calibration: | January 24, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 10:45                    | End Time (MST):       | 14:21            |
| Analyzer make:    | Thermo 55i               | Analyzer serial #:    | 1180320040       |

### Calibration Data

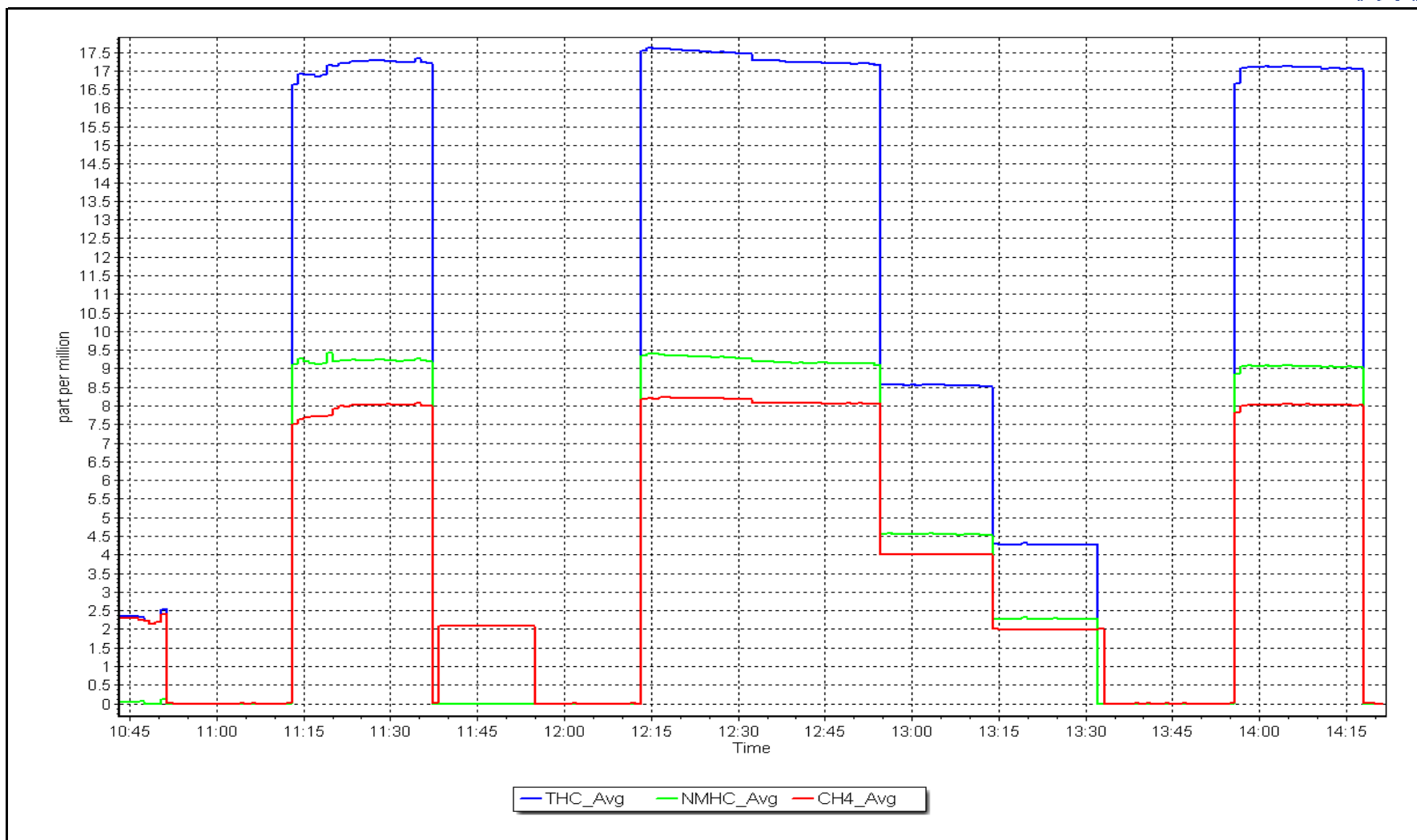
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999993  | $\geq 0.995$  |
| 9.19                                | 9.15                               | 1.0051                    |                         |           |               |
| 4.60                                | 4.56                               | 1.0100                    |                         |           |               |
| 2.30                                | 2.28                               | 1.0090                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.994978  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.007938 | +/-0.5        |



NMHC Calibration Plot

Date: February 1, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | February 21, 2023        | Last Cal Date:  | February 1, 2023 |
| Start time (MST): | 11:32                    | End time (MST): | 14:31            |
| Reason:           | Cylinder Change          |                 |                  |

### Calibration Standards

|   |                   |                             |                   |
|---|-------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC486642          | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.6 ppm         |                             |                   |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.7 ppm         | CH <sub>4</sub> Equiv Conc. | 1063.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.6 ppm         | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 3565              |
| ZAG make/model:                             | Teledyne API T701 | Serial Number:              | 5609              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320040 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.52E-04     | 2.52E-04      | NMHC SP Ratio:  | 5.06E-05      |
| CH <sub>4</sub> Retention time: | 14.4         | 14.4          | NMHC Peak Area: | 181561        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4918              | 81.3                 | 17.29                | 17.09               | 1.011                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       |                   |                      |                      |                     |                            |
| high point            |                   |                      |                      |                     |                            |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.01                | ----                       |
| as left span          | 4918              | 81.3                 | 17.29                | 16.93               | 1.021                      |

| Average Correction Factor |       |                 |       |  |       |
|---------------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:         | 17.09 | Prev response   | 17.19 | *% change                                  | -0.6% |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as found span                    | 4918              | 81.3                 | 9.19                 | 9.05   | 1.016                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as left span                     | 4918              | 81.3                 | 9.19                 | 8.95   | 1.028                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 9.05              | Prev response        | 9.14                 | *% change  | -1.0%                      |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span                    | 4918              | 81.3                 | 8.09                 | 8.04   | 1.007                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0.0                  | 0.00                 | 0.01   | ----                       |
| as left span                     | 4918              | 81.3                 | 8.09                 | 7.98   | 1.014                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 8.04              | Prev response        | 8.05                 | *% change  | -0.2%                      |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.995861     |               |
| THC Cal Offset:             | -0.022506    |               |
| CH <sub>4</sub> Cal Slope:  | 0.996625     |               |
| CH <sub>4</sub> Cal Offset: | -0.014967    |               |
| NMHC Cal Slope:             | 0.994978     |               |
| NMHC Cal Offset:            | -0.007938    |               |

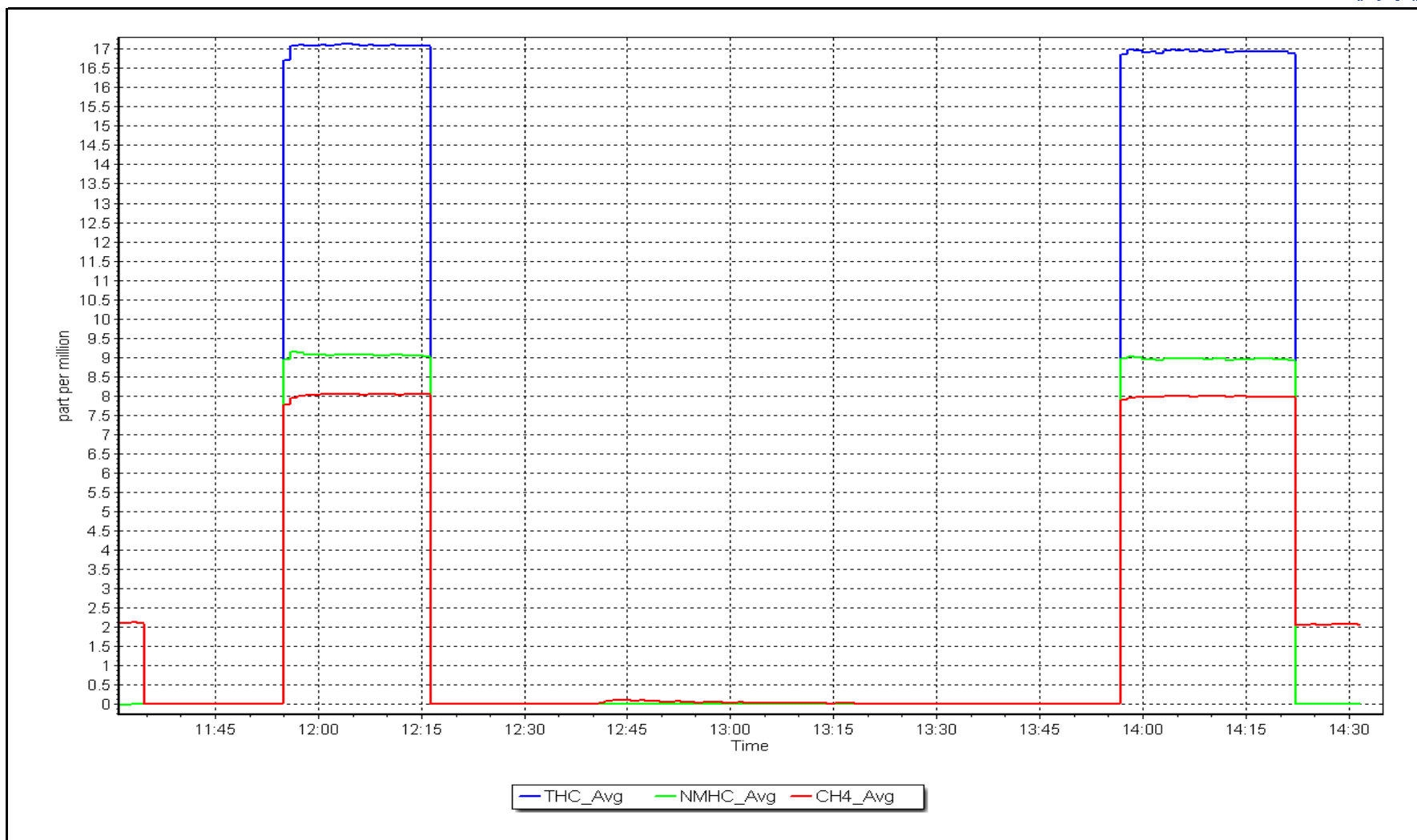
Notes: Changed out the H2 cylinder.

Calibration Performed By: Rene Chamberland

NMHC Calibration Plot

Date: February 21, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
Calibration Date: February 2, 2023      Last Cal Date: January 6, 2023  
Start time (MST): 11:23      End time (MST): 16:07  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2Y1P9L      Cal Gas Expiry Date: December 11, 2023  
NOX Cal Gas Conc: 50.84 ppm      NO Cal Gas Conc: 50.04 ppm  
Removed Cylinder #: NA      Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 50.84 ppm      Removed Gas NO Conc: 50.04 ppm  
NOX gas Diff:      NO gas Diff:  
Calibrator Model: Teledyne API T700      Serial Number: 3565  
ZAG make/model: Teledyne API T701      Serial Number: 5609

### Analyzer Information

Analyzer make: Thermo 42i      Analyzer serial #: 1218153357  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.453        | 1.440         | NO bkgnd or offset:  | 6.9          | 6.8           |
| NOX coeff or slope: | 0.990        | 0.990         | NOX bkgnd or offset: | 7.0          | 6.9           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 199.5        | 198.9         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.999269     | 0.997218      |
| NO <sub>x</sub> Cal Offset: | -0.220000    | 0.060000      |
| NO Cal Slope:               | 1.000842     | 0.998701      |
| NO Cal Offset:              | -0.900000    | -0.400000     |
| NO <sub>2</sub> Cal Slope:  | 0.996966     | 0.997388      |
| NO <sub>2</sub> Cal Offset: | -0.078101    | -0.442888     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.2                                   | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.4   | 800.6                                  | 12.8  | 821.9  | 806.2                                 | 15.7   | 0.9897  | 0.9931   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.3                                   | 0.0  | ----  | ----   |
| high point                | 4920                      | 80.0                        | 813.4   | 800.6                                  | 12.8  | 811.3  | 799.5                                 | 11.7   | 1.0026  | 1.0014   |
| second point              | 4960                      | 40.0                        | 406.7   | 400.3                                  | 6.4   | 405.7  | 399.2                                 | 6.5  | 1.0025  | 1.0028   |
| third point               | 4980                      | 20.0                        | 203.4   | 200.2                                  | 3.2   | 202.5  | 198.7                                 | 3.9  | 1.0042  | 1.0073   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.4  | 0.2                                   | 0.2  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.4   | 413.7                                  | 399.7   | 805.5  | 408.0                                 | 397.5  | 1.0099  | 1.0141   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0031  | 1.0039   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 821.7 ppb | NO = 806.0 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 1.1% |
| Previous Response    | NO <sub>x</sub> = 812.6 ppb | NO = 800.4 ppb |  | *Percent Change                  | NO = 0.7%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 793.8                                      | 406.9                                 | 399.7   | 398.5  | 1.0030   | 99.7%  |
| 2nd GPT point (200 ppb O3)       | 793.8                                      | 585.2                                 | 221.4   | 220.1  | 1.0059   | 99.4%  |
| 3rd GPT point (100 ppb O3)       | 793.8                                      | 689.3                                 | 117.3   | 116.1  | 1.0103   | 99.0%  |
| Average Correction Factor        |  |                                       |   |  | 1.0064   | 99.4%  |

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

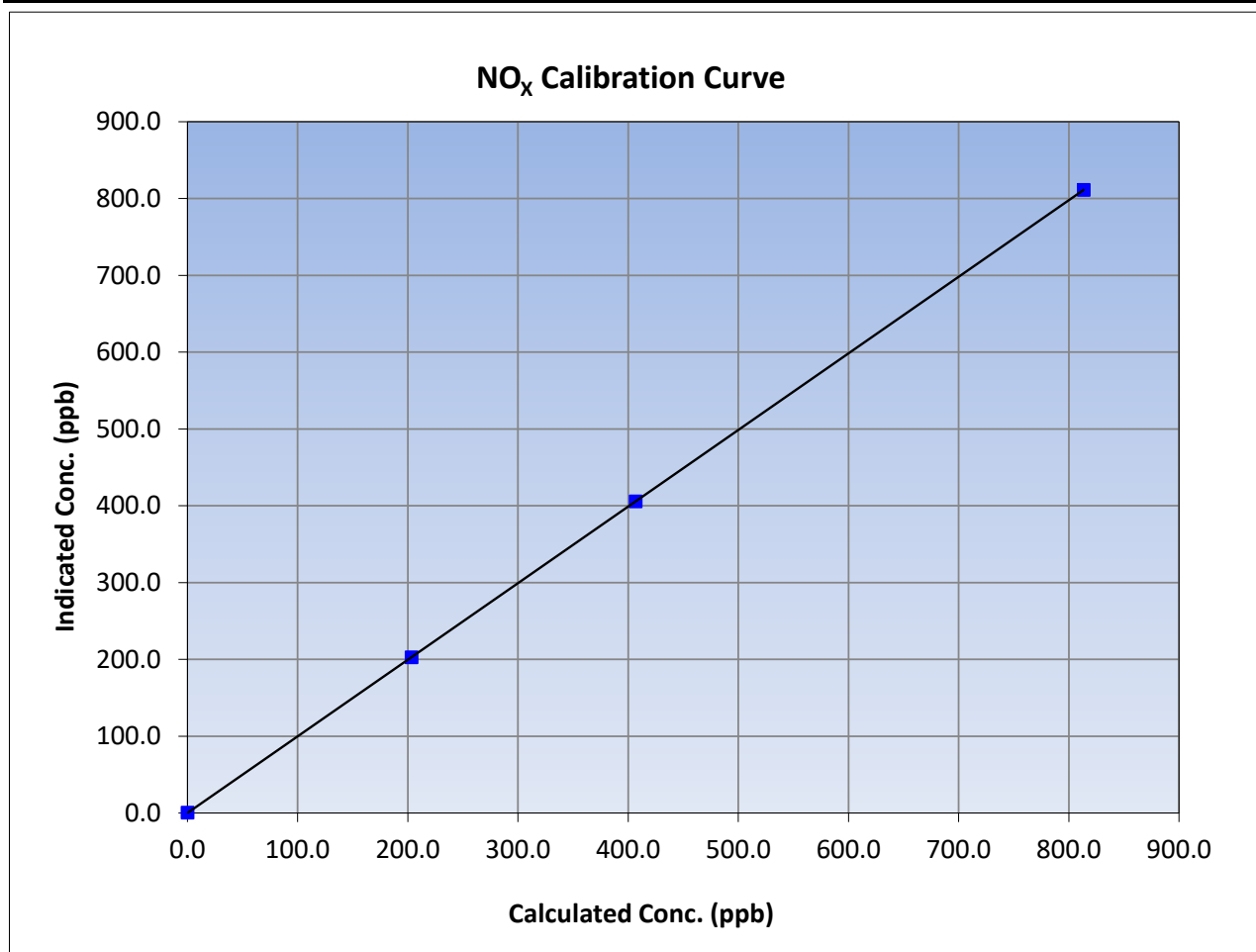
Version-04-2020

### Station Information

|                   |                          |                       |                 |
|-------------------|--------------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023         | Previous Calibration: | January 6, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01           |
| Start Time (MST): | 11:23                    | End Time (MST):       | 16:07           |
| Analyzer make:    | Thermo 42i               | Analyzer serial #:    | 1218153357      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 813.4                               | 811.3                              | 1.0026                    |                         |               |             |
| 406.7                               | 405.7                              | 1.0025                    |                         |               |             |
| 203.4                               | 202.5                              | 1.0042                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.997218      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.060000      | +/-20       |







# Wood Buffalo Environmental Association

## NO Calibration Summary

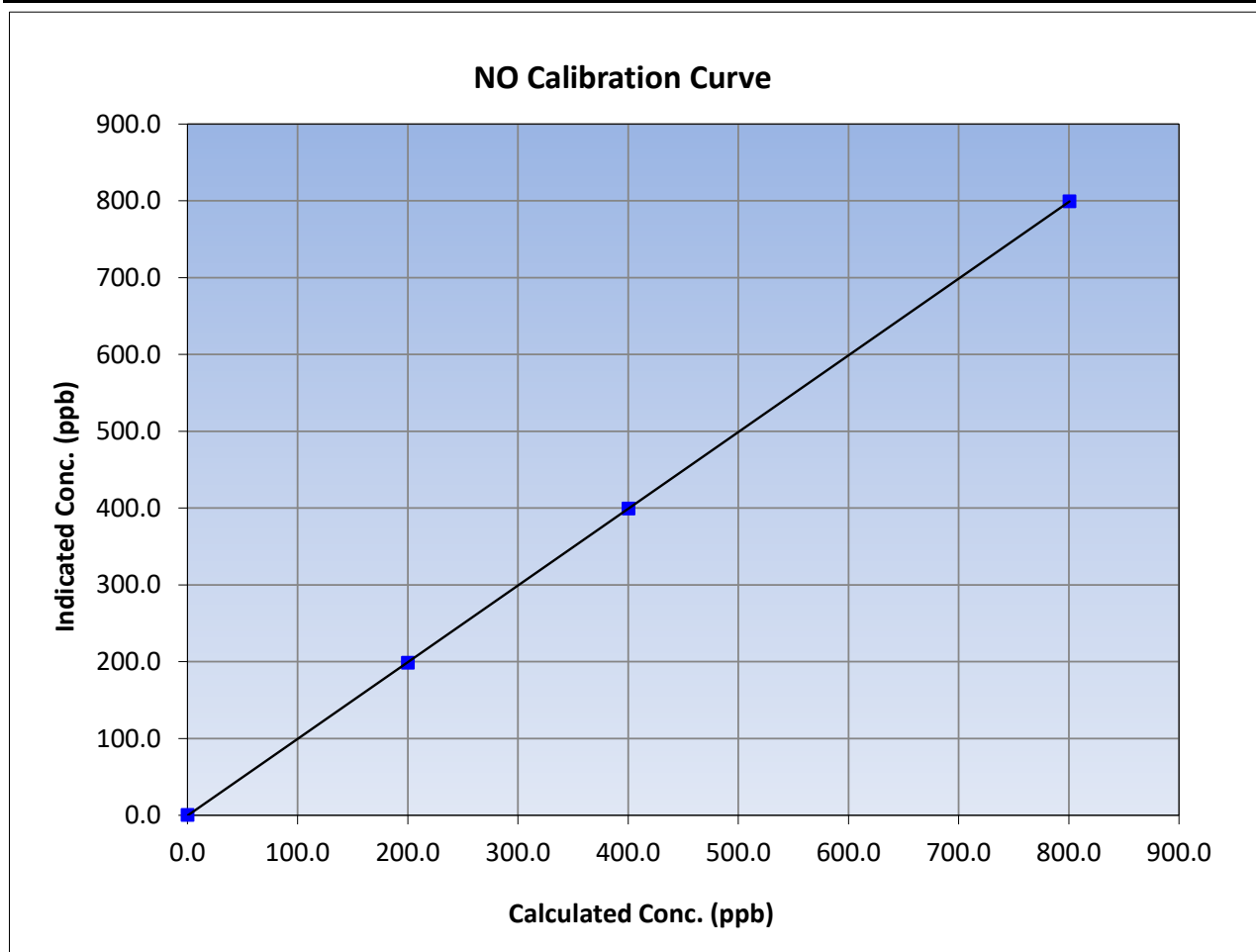
Version-04-2020

### Station Information

|                   |                          |                       |                 |
|-------------------|--------------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023         | Previous Calibration: | January 6, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01           |
| Start Time (MST): | 11:23                    | End Time (MST):       | 16:07           |
| Analyzer make:    | Thermo 42i               | Analyzer serial #:    | 1218153357      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.6                               | 799.5                              | 1.0014                    |   |                                |
| 400.3                               | 399.2                              | 1.0028                    |   |                                |
| 200.2                               | 198.7                              | 1.0073                    |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

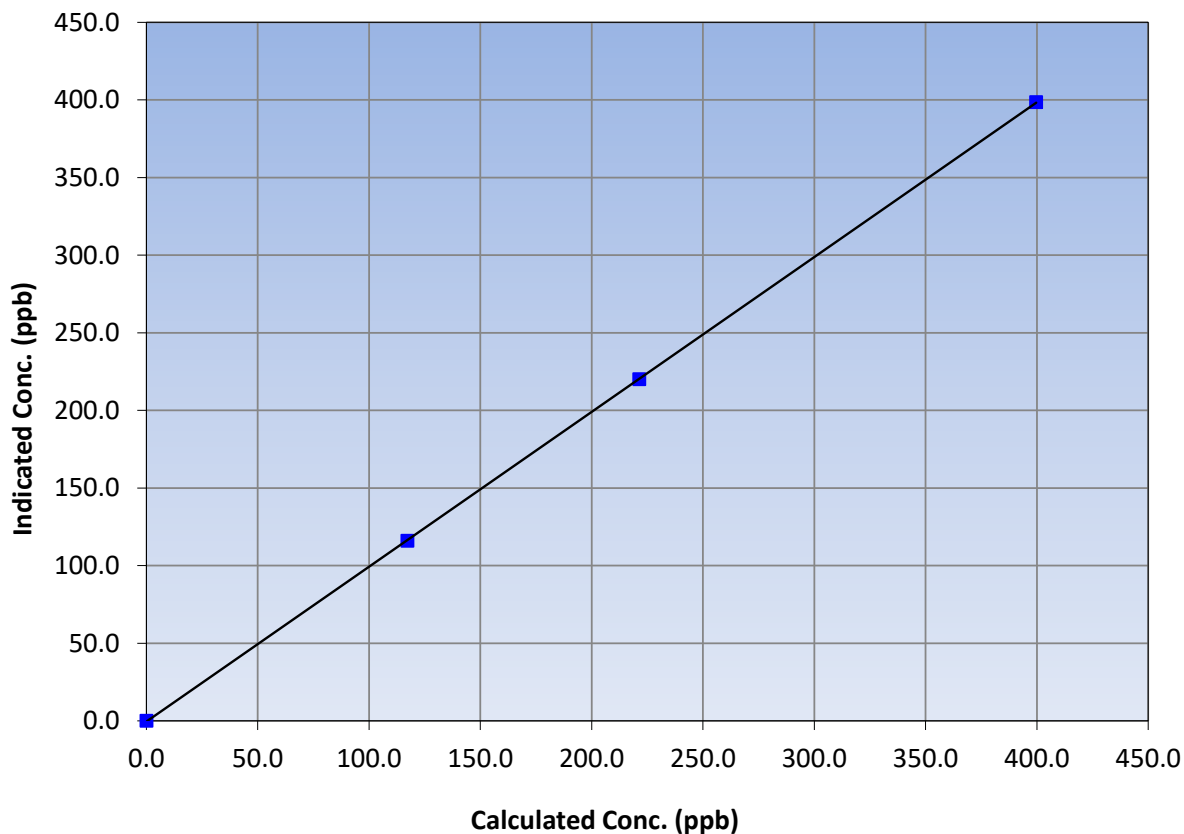
### Station Information

|                   |                          |                       |                 |
|-------------------|--------------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023         | Previous Calibration: | January 6, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01           |
| Start Time (MST): | 11:23                    | End Time (MST):       | 16:07           |
| Analyzer make:    | Thermo 42i               | Analyzer serial #:    | 1218153357      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |             |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |             |
| 399.7                               | 398.5                              | 1.0030                    |   |                                |             |
| 221.4                               | 220.1                              | 1.0059                    |   |                                |             |
| 117.3                               | 116.1                              | 1.0103                    |   |                                |             |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999993                       | ≥0.995      |
|                                     |                                    |                           | Slope   | 0.997388                       | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                                     | -0.442888                      | +/-20       |

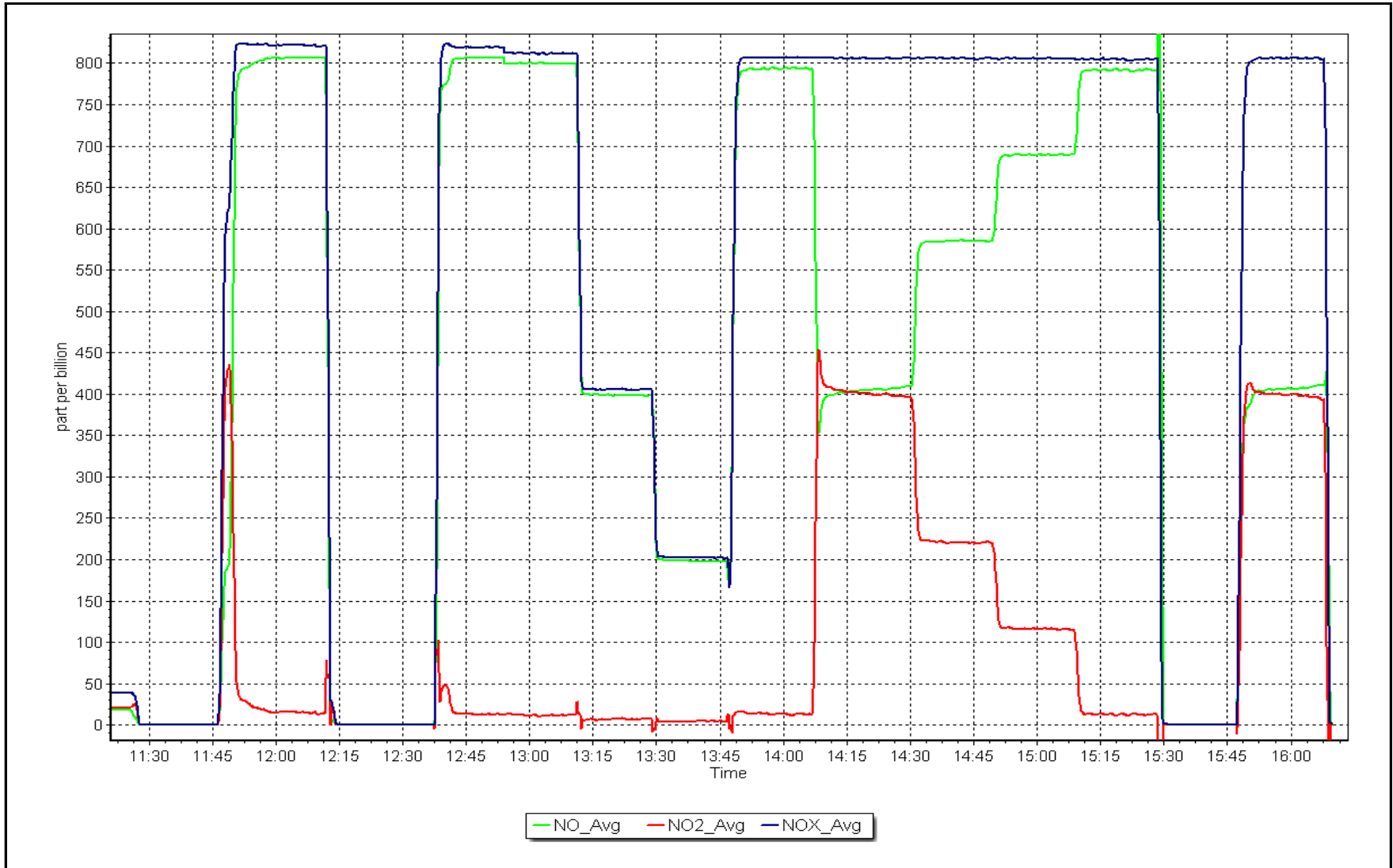
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 2, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
 Calibration Date: February 8, 2023      Last Cal Date: January 4, 2023  
 Start time (MST): 11:06      End time (MST): 14:30  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 3565  
 ZAG Make/Model: Teledyne API T701      Serial Number: 5609

### Analyzer Information

Analyzer make: Teledyne API T400      Analyzer serial #: 1107  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.001400     | 1.000086      | Backgd or Offset: | 2.9          | 2.4           |
| Calibration intercept: | 0.480000     | 0.760000      | Coeff or Slope:   | 1.011        | 1.016         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | -0.4                               | ----  |
| as found span             | 5000                       | 855.5                         | 400.0                               | 399.3                              | 1.002   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 0.5                                | ----  |
| high point                | 5000                       | 855.5                         | 400.0                               | 400.6                              | 0.999   |
| second point              | 5000                       | 738.6                         | 200.0                               | 201.1                              | 0.995   |
| third point               | 5000                       | 649.2                         | 100.0                               | 100.9                              | 0.991   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 0.3                                | ----  |
| as left span              | 5000                       | 855.5                         | 400.0                               | 402.8                              | 0.993   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.995   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 399.7 | Previous response | 401.0 | *% change     | -0.3% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as founds. Adjusted both zero and span.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

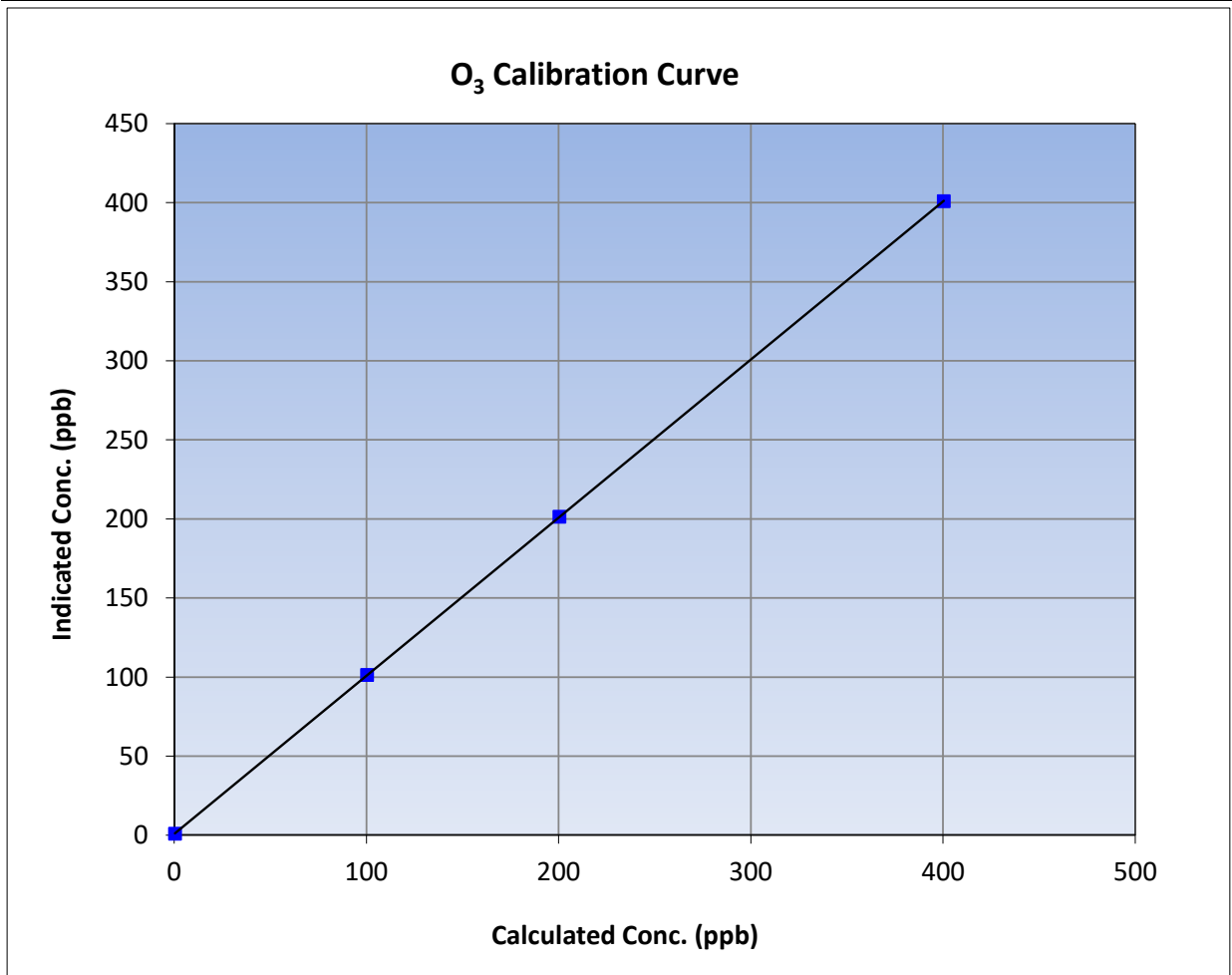
Version-01-2020

### Station Information

|                   |                          |                       |                 |
|-------------------|--------------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023         | Previous Calibration: | January 4, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01           |
| Start Time (MST): | 11:06                    | End Time (MST):       | 14:30           |
| Analyzer make:    | Teledyne API T400        | Analyzer serial #:    | 1107            |

### Calibration Data

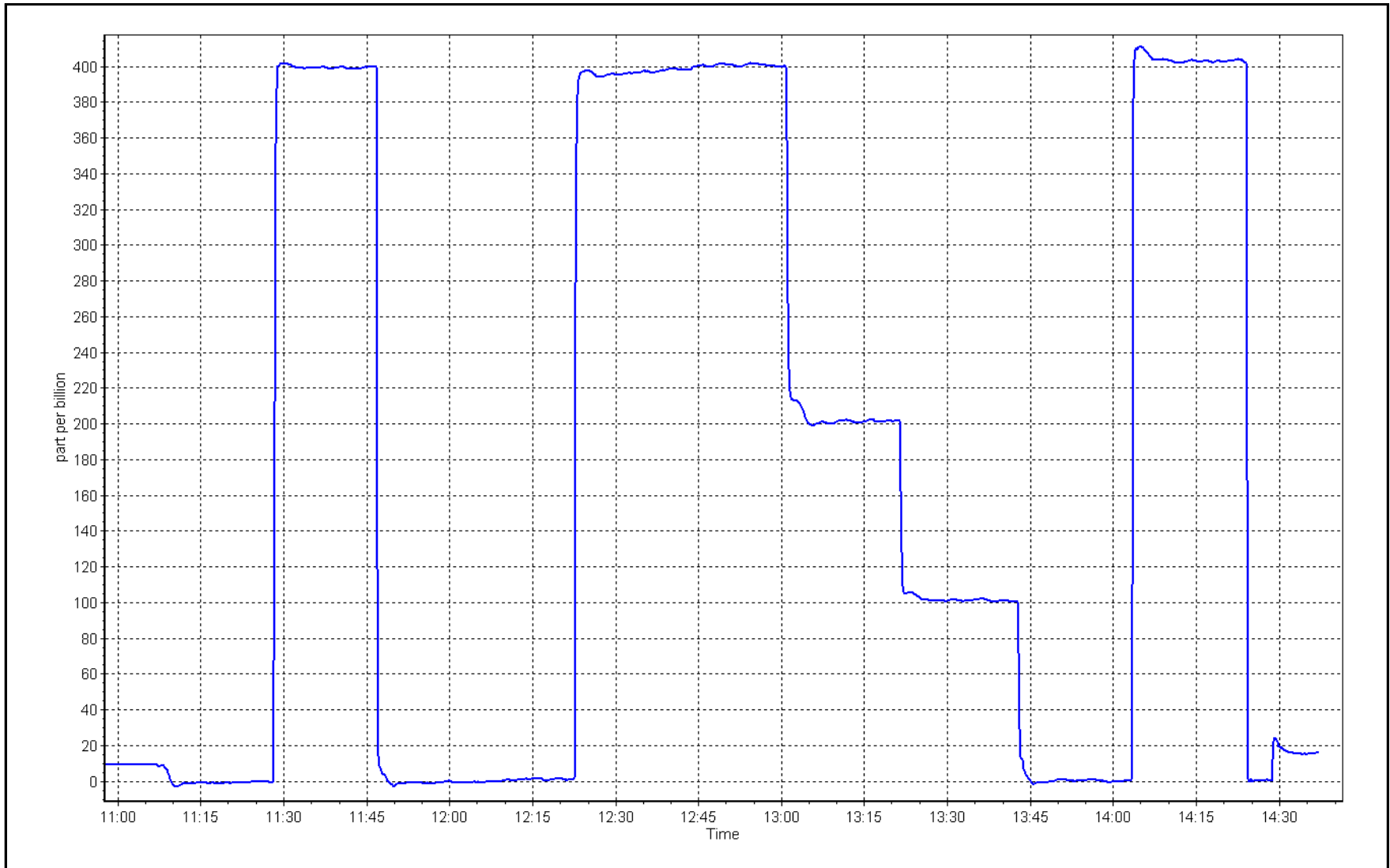
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999997 | ≥0.995      |
| 400.0                               | 400.6                              | 0.9985                    |                         |          |             |
| 200.0                               | 201.1                              | 0.9945                    | Slope                   | 1.000086 | 0.90 - 1.10 |
| 100.0                               | 100.9                              | 0.9911                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.760000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 8, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort McKay - Bertha Ganter      Station number: AMS 01  
 Calibration Date: February 16, 2023      Last Cal Date: January 23, 2023  
 Start time (MST): 12:45      End time (MST): 13:46

Analyzer Make: API T640      S/N: 306  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal      S/N: 1450  
 Temp/RH standard: Delta Cal      S/N: 1450

### Monthly Calibration Test

| Parameter  | As found                                | Measured                               | As left                 | Adjusted                 | (Limits)     |
|------------|---|--|-------------------------|--------------------------|--------------|
| T (°C)     | -7.6                                    | -8.2                                   | -7.6                    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 724.1                                   | 723.2                                  | 724.1                   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.00                                    | 5.03                                   | 5.00                    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>February 16, 2023</u> | Last Cal Date: <u>January 24, 2023</u> | PM w/o HEPA: <u>7.5</u> | PM w/ HEPA: <u>0</u>     | <0.2 ug/m3   |

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance         | As left        | Adjusted                 | (Limits)     |
|-------------------------------|----------|--------------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 |          |                          |                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: _____       | w/ HEPA: _____ |                          | <0.2 ug/m3   |
| Date Optical Chamber Cleaned: |          | <u>December 19, 2022</u> |                |                          |              |
| Disposable Filter Changed:    |          | <u>December 19, 2022</u> |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: August 31, 2022  
 Date RH/T Sensor Cleaned: December 19, 2022

Notes: Flow, temperature and pressure verified. Leak check passed.

Calibration by: Rene Chamberland



# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| NOX Cal Date:     | February 16, 2023        | Last Cal Date:  | January 26, 2023 |
| Start time (MST): | 11:12                    | End time (MST): | 15:18            |
| NH3 Cal Date:     | February 16, 2023        | Last Cal Date:  | January 26, 2023 |
| Start time (MST): | 15:50                    | End time (MST): | 18:20            |
| Reason:           | Removal                  |                 |                  |

### Calibration Standards

|                   |                   |     |                     |                   |
|-------------------|-------------------|-----|---------------------|-------------------|
| NOX Cal Gas Conc: | 50.84             | ppm | NO Gas Cylinder #:  | T2Y1P9L           |
| NO Cal Gas Conc:  | 50.04             | ppm | NO Cal Gas Expiry:  | March 3, 2028     |
| Removed NOX Conc: | 50.84             | ppm | Removed Cylinder #: | NA                |
| Removed NO Conc:  | 50.04             | ppm | Removed cyl Expiry: | NA                |
| NOX gas Diff:     |                   |     | NO gas Diff:        |                   |
| NH3 Cal Gas Conc: | 72.93             | ppm | NH3 Gas Cylinder #: | CC281298          |
|                   |                   |     | NH3 Cal Gas Expiry: | February 28, 2023 |
| Removed NH3 Conc: | 72.93             | ppm | Removed Cylinder #: | NA                |
| NH3 gas Diff:     |                   |     | Removed cyl Expiry: | NA                |
| Calibrator Model: | Teledyne API T700 |     | Serial Number:      | 3565              |
| ZAG make/model:   | Teledyne API T701 |     | Serial Number:      | 5609              |

### Analyzer Information

|                  |                    |                      |      |
|------------------|--------------------|----------------------|------|
| Analyzer model:  | Teledyne API T201E | Analyzer serial #:   | 56   |
| Converter model: | Teledyne API T501  | Converter serial #:  | 217  |
| NH3 Range (ppb): | 0 - 2000 ppb       | Reaction cell Press: | 4.90 |
| NOX Range (ppb): | 0 - 1000 ppb       | Sample Flow:         | 541  |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  | 0.793        |               | TN coefficient: | 0.806        |               |
| NOX coefficient: | 0.804        |               | NO bkgnd:       | -1.500       |               |
| NO2 coefficient: | 1.000        |               | NOX bkgnd:      | -0.400       |               |
| NH3 coefficient: | 0.919        |               | TN bkgnd:       | 3.100        |               |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.001644     | 0.986302      |
| NO <sub>x</sub> Cal Offset: | -0.440000    | -0.180000     |
| NO Cal Slope:               | 1.001856     | 0.988309      |
| NO Cal Offset:              | -1.080000    | -0.560000     |
| NO <sub>2</sub> Cal Slope:  | 0.999297     | 0.982947      |
| NO <sub>2</sub> Cal Offset: | 0.756159     | -0.400969     |
| NH3 Cal Slope:              | 0.988888     | 1.009740      |
| NH3 Cal Offset:             | 14.116543    | 1.383893      |
| TN Cal Slope:               | 0.996806     | 1.017473      |
| TN Cal Offset:              | 16.482567    | 1.877552      |





# Wood Buffalo Environmental Association

## TN - NOX - NH<sub>3</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                        | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NOX concentration (ppb) (Cc) | Calculated NH3 concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NOX concentration (ppb) (Ic) | Indicated NH3 concentration (ppb) (Ic) | TN Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NH3 Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|
| as found zero                    |                           |                             |  |   |   |                                       |  |  |  |   |
| as found NO                      |                           |                             |  |   |   |                                       |  |  |  |   |
| calibrator zero                  | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | 0.1                                   | 0.8                                    | -0.8                                   | ----   | ----  |
| high NO point                    | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 802.5                                 | 802.8                                  | -0.2                                   | 1.014  | ----  |
| NO/O3 point                      |                           |                             |  |   |   |                                       |  |  |  |   |
| as found NH3                     |                           |                             |  |   |   |                                       |  |  |  |   |
| new NH3 cyl rp                   |                           |                             |  |   |   |                                       |  | ----                                   |  |   |
| first NH3                        | 3413                      | 86.4                        | 1800.6                                 | ----                                    | 1800.6                                  | 1839.0                                | ----                                   | 1824.3                                 | 0.979  | 0.987   |
| second NH3                       | 3452                      | 48.0                        | 1000.2                                 | ----                                    | 1000.2                                  | 1004.7                                | ----                                   | 996.8                                  | 0.996  | 1.003   |
| third NH3                        | 3476                      | 24.0                        | 500.1                                  | ----                                    | 500.1                                   | 522.3                                 | ----                                   | 518.3                                  | 0.957  | 0.965   |
| <b>Average Correction Factor</b> |                           |                             |  |   |   |                                       |  |  | <b>1.0136</b>  | <b>0.9851</b>   |

Corrected As found TN = NA ppb NO<sub>x</sub> = NA ppb NH3 = NA ppb  
 Previous Response TN = NA ppb NO<sub>x</sub> = NA ppb NH3 = NA ppb

\*Percent Change TN = NA  
 \*Percent Change NO<sub>x</sub> = NA  
 \*Percent Change NH3 = NA

NH3 Previous Converter Efficiency = 91.9%

NH3 Current Converter Efficiency =

\* = > +/-5% change initiates investigation





# Wood Buffalo Environmental Association

## TN Calibration Summary

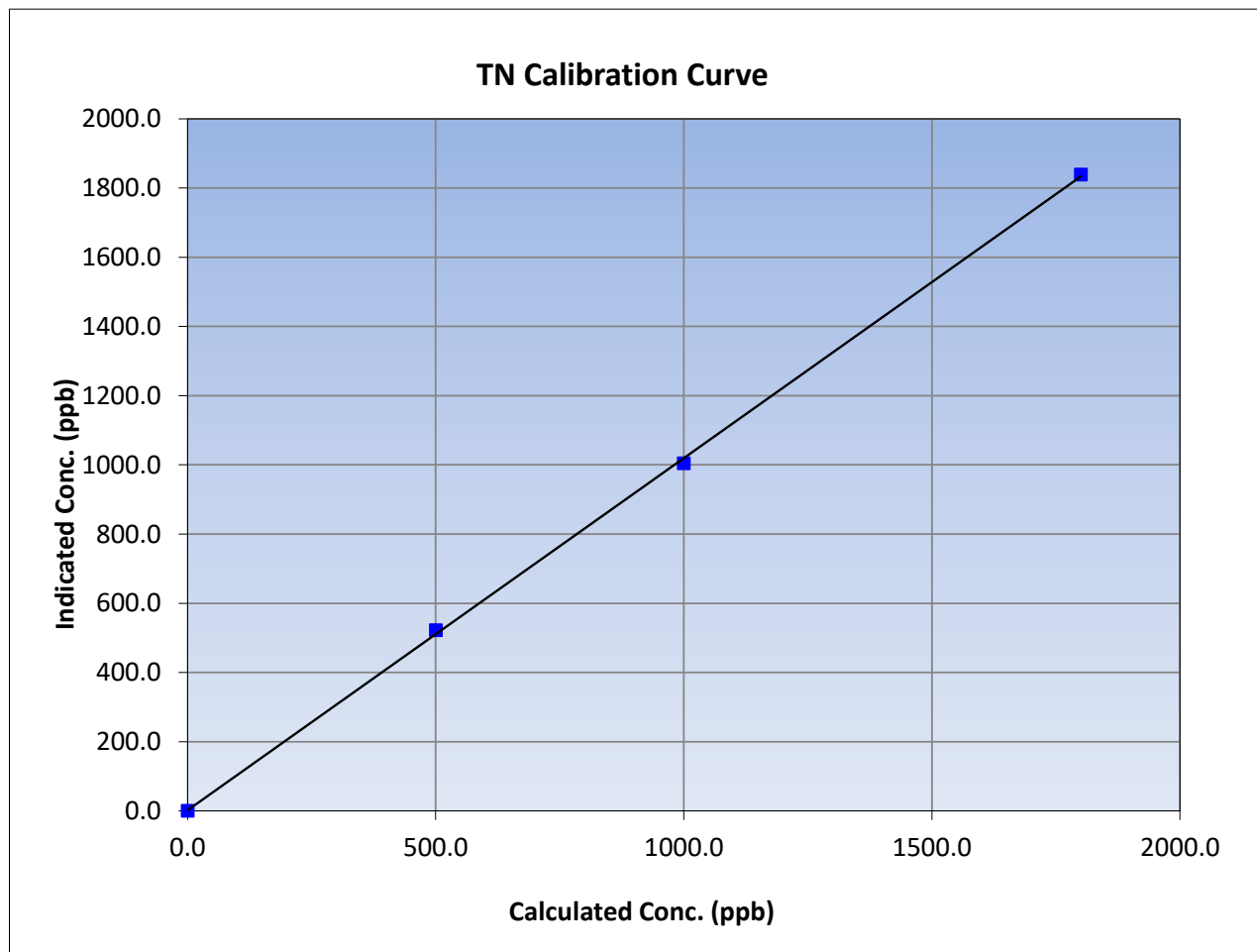
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023        | Previous Calibration: | January 26, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 15:18            |
| Analyzer make:    | Teledyne API T201E       | Analyzer serial #:    | 56               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 1800.6                              | 1839.0                             | 0.9791                    |                         |          |             |
| 1000.2                              | 1004.7                             | 0.9955                    |                         |          |             |
| 500.1                               | 522.3                              | 0.9575                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 1.017473 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.877552 | +/-20       |





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

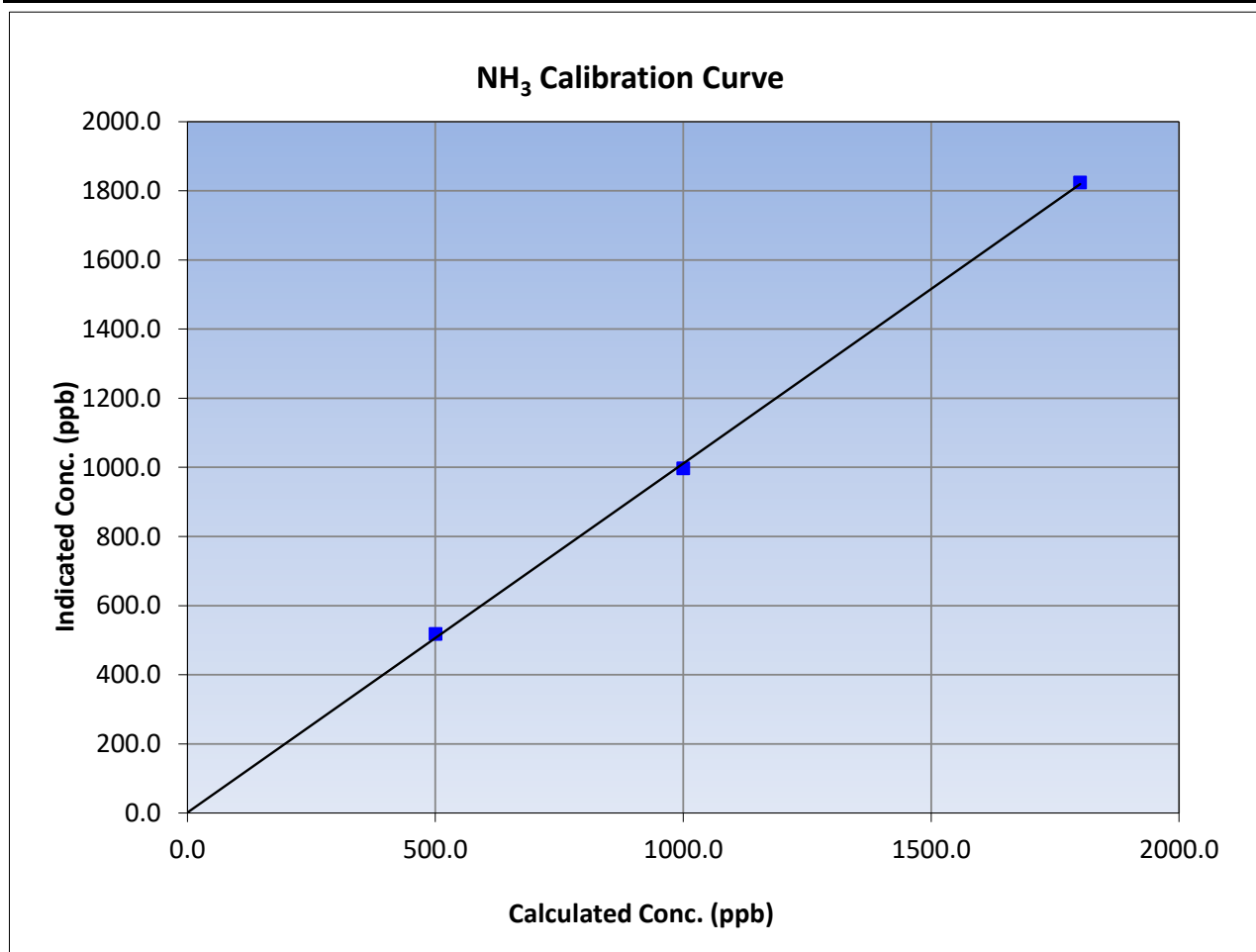
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023        | Previous Calibration: | January 26, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 15:18            |
| Analyzer make:    | Teledyne API T201E       | Analyzer serial #:    | 56               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.8                               | ----                      | Correlation Coefficient | 0.999789      | ≥0.995      |
| 1800.6                              | 1824.3                             | 0.9870                    |                         |               |             |
| 1000.2                              | 996.8                              | 1.0034                    | Slope                   | 1.009740      | 0.90 - 1.10 |
| 500.1                               | 518.3                              | 0.9649                    |                         |               |             |
|                                     |                                    |                           | Intercept               | 1.383893      | +/-20       |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

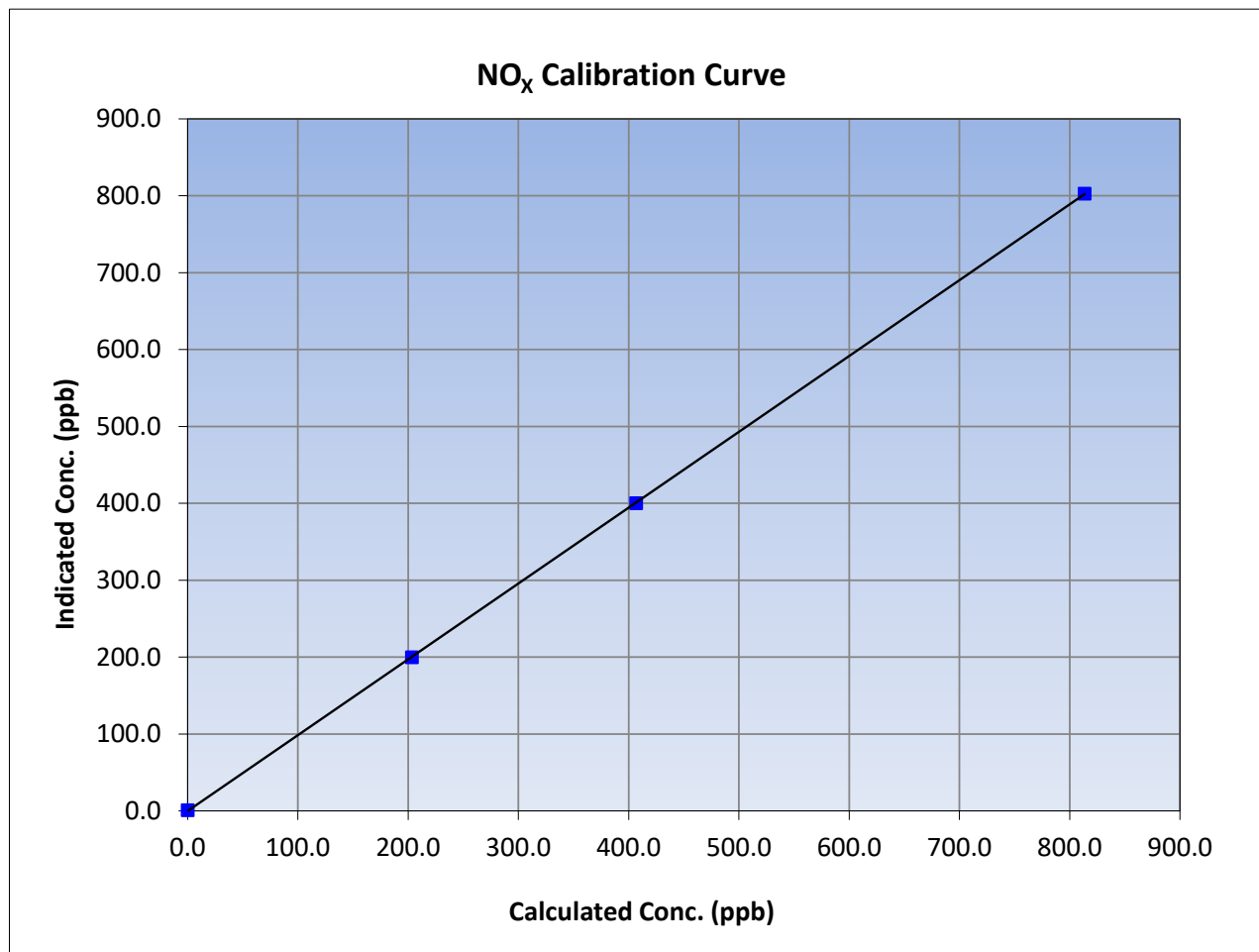
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023        | Previous Calibration: | January 26, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 15:18            |
| Analyzer make:    | Teledyne API T201E       | Analyzer serial #:    | 56               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.8                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 813.4                               | 802.8                              | 1.0133                    |                         |               |             |
| 406.7                               | 399.9                              | 1.0171                    |                         |               |             |
| 203.4                               | 199.8                              | 1.0178                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.986302      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.180000     | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

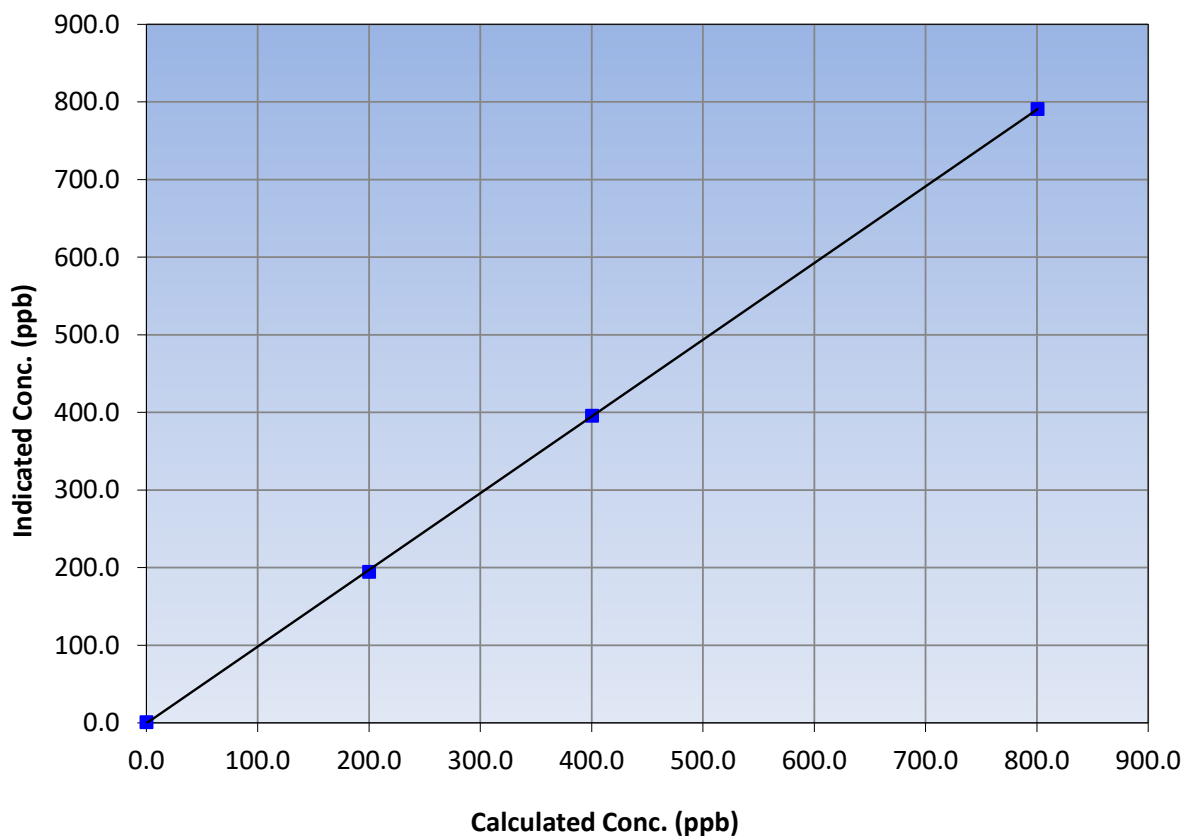
### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023        | Previous Calibration: | January 26, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 15:18            |
| Analyzer make:    | Teledyne API T201E       | Analyzer serial #:    | 56               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 1.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 800.6                               | 791.0                              | 1.0122                    |                         |               |             |
| 400.3                               | 395.8                              | 1.0114                    |                         |               |             |
| 200.2                               | 194.7                              | 1.0280                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.988309      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.560000     | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

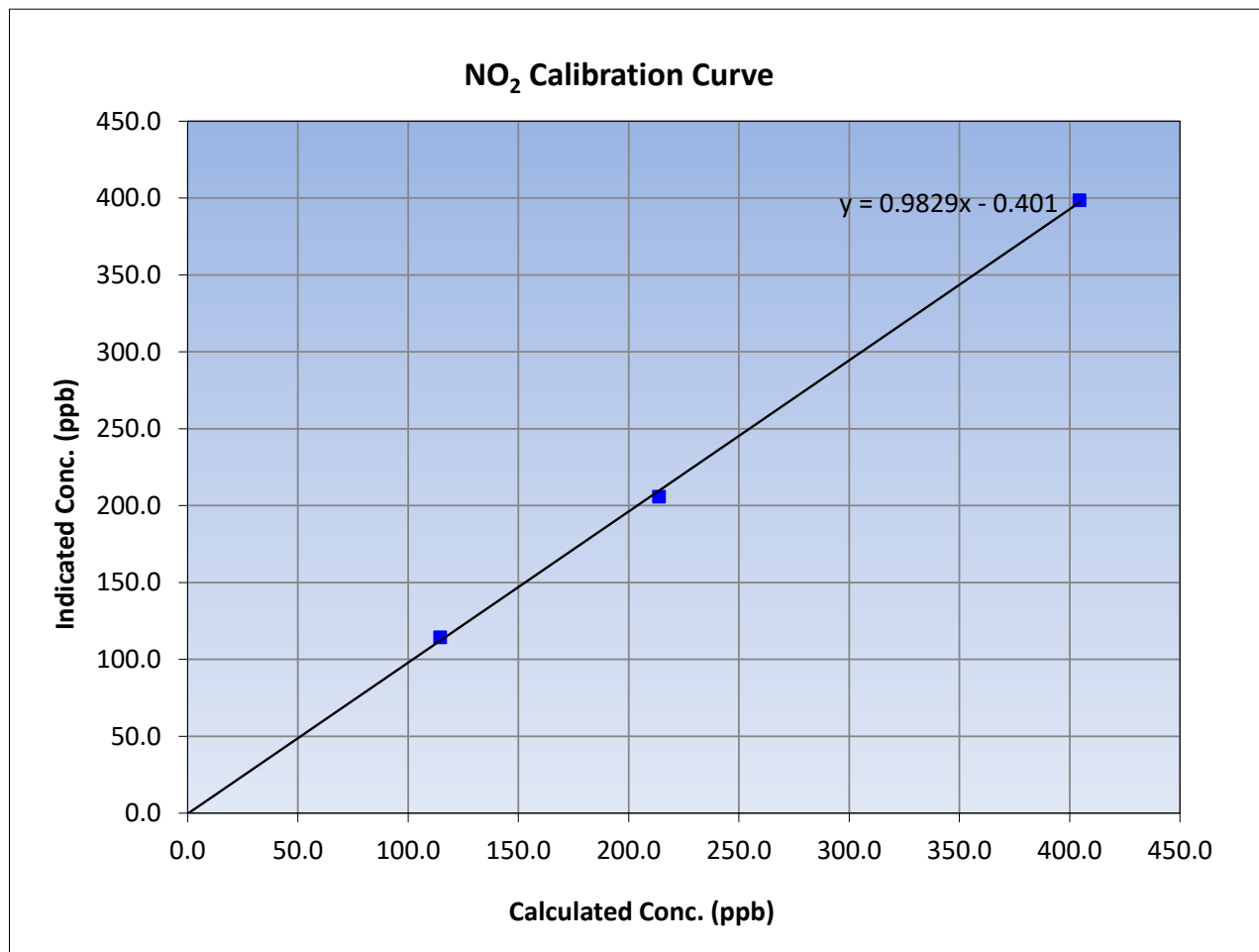
Version-11-2021

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023        | Previous Calibration: | January 26, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:12                    | End Time (MST):       | 15:18            |
| Analyzer make:    | Teledyne API T201E       | Analyzer serial #:    | 56               |

### Calibration Data

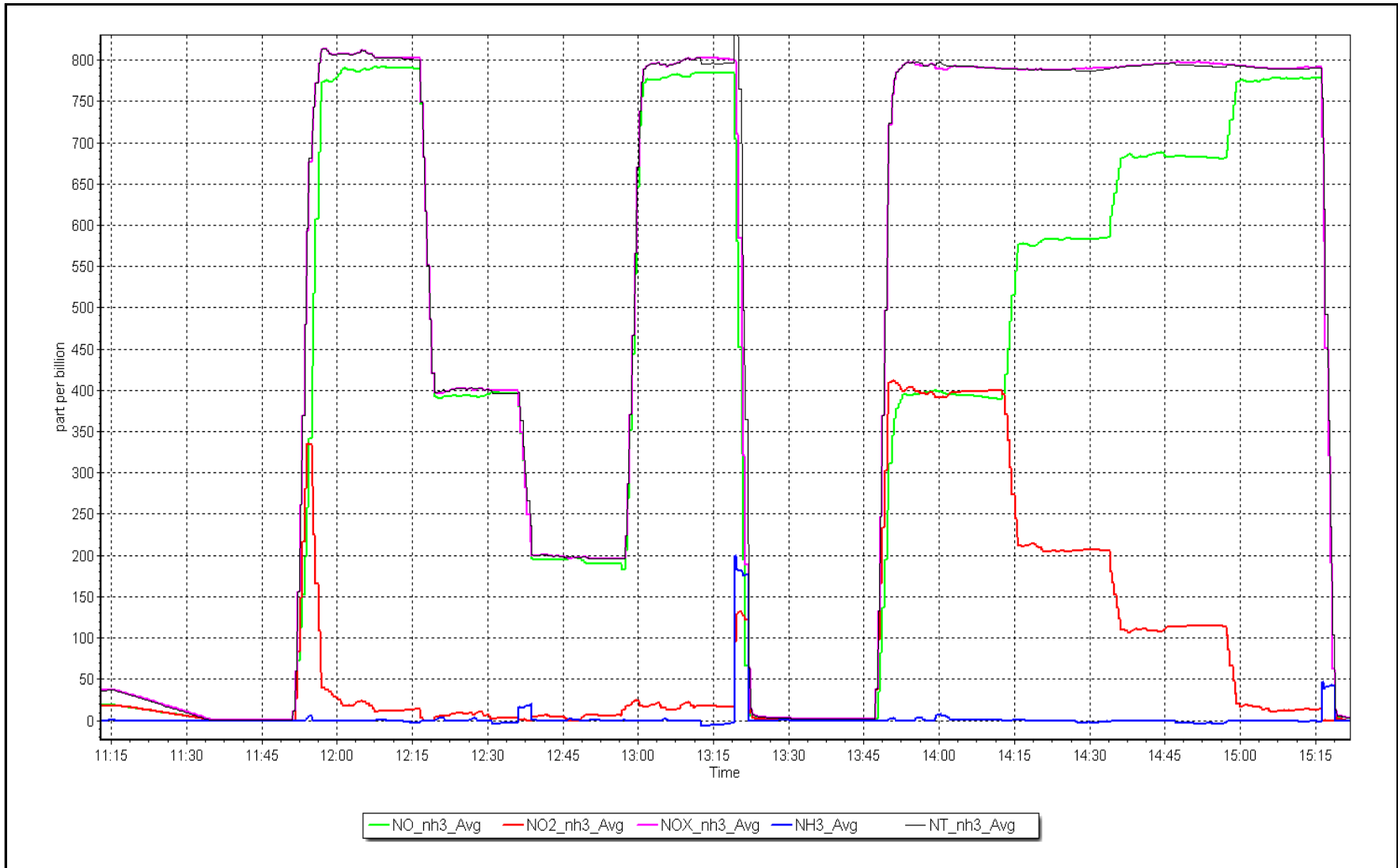
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 404.5                               | 398.6                              | 1.0148                    |                         |               |             |
| 213.8                               | 205.9                              | 1.0384                    |                         |               |             |
| 114.5                               | 114.4                              | 1.0009                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.982947      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.400969     | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: February 16, 2023

Location: Bertha Ganter-Fort McKay

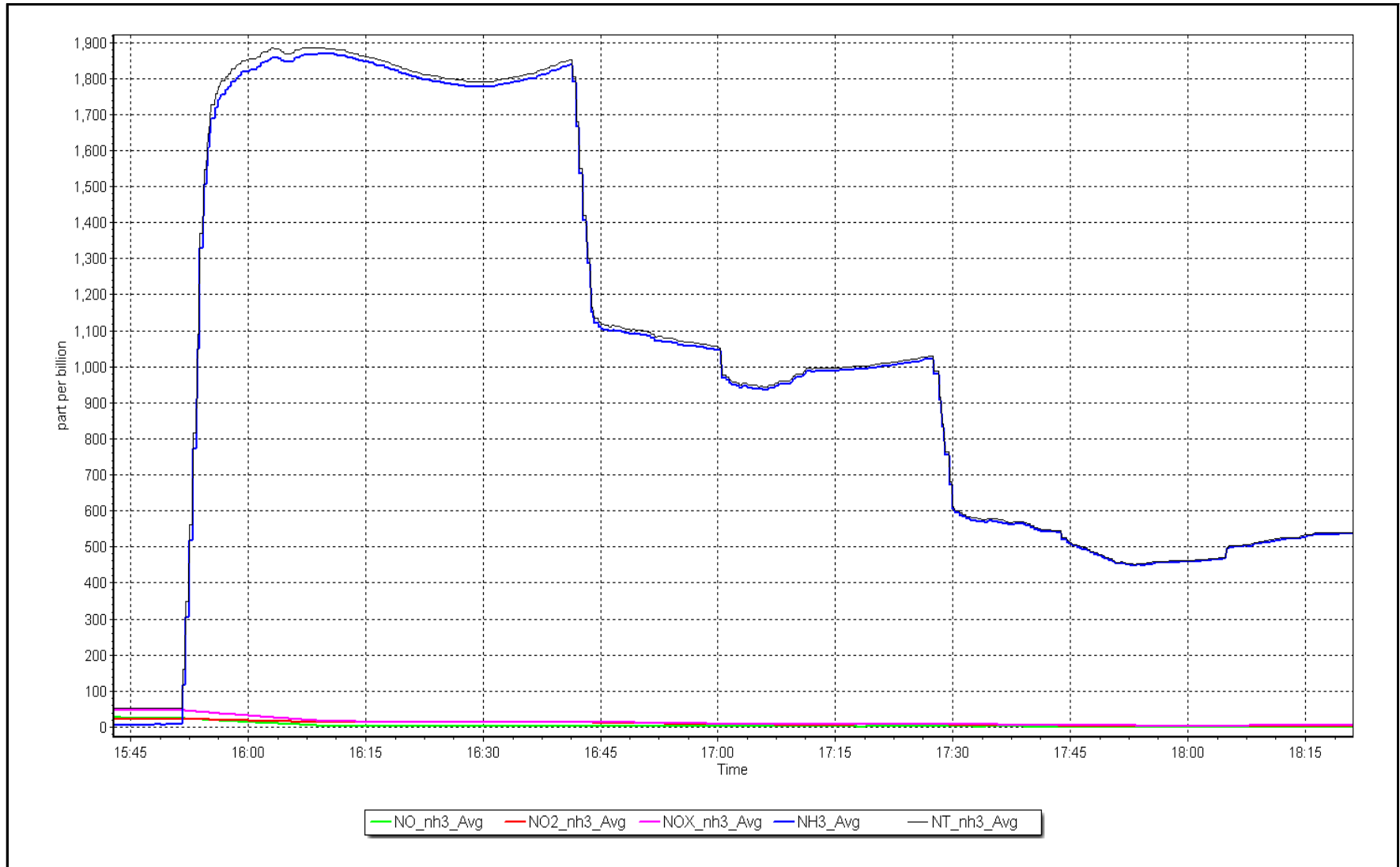




# NH<sub>3</sub> Calibration Plot

Date: February 16, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                          |                 |       |
|-------------------|--------------------------|-----------------|-------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01 |
| NOX Cal Date:     | February 17, 2023        | Last Cal Date:  | NA    |
| Start time (MST): | 11:32                    | End time (MST): | 15:30 |
| NH3 Cal Date:     | February 17, 2023        | Last Cal Date:  | NA    |
| Start time (MST): | 15:50                    | End time (MST): | 18:15 |
| Reason:           | Install                  |                 |       |

### Calibration Standards

|                   |                   |     |                     |                   |
|-------------------|-------------------|-----|---------------------|-------------------|
| NOX Cal Gas Conc: | 50.84             | ppm | NO Gas Cylinder #:  | T2Y1P9L           |
| NO Cal Gas Conc:  | 50.04             | ppm | NO Cal Gas Expiry:  | March 3, 2028     |
| Removed NOX Conc: | 50.84             | ppm | Removed Cylinder #: | NA                |
| Removed NO Conc:  | 50.04             | ppm | Removed cyl Expiry: | NA                |
| NOX gas Diff:     |                   |     | NO gas Diff:        |                   |
| NH3 Cal Gas Conc: | 72.93             | ppm | NH3 Gas Cylinder #: | CC281298          |
|                   |                   |     | NH3 Cal Gas Expiry: | February 28, 2023 |
| Removed NH3 Conc: | 72.93             | ppm | Removed Cylinder #: | NA                |
| NH3 gas Diff:     |                   |     | Removed cyl Expiry: | NA                |
| Calibrator Model: | Teledyne API T700 |     | Serial Number:      | 3565              |
| ZAG make/model:   | Teledyne API T701 |     | Serial Number:      | 5609              |

### Analyzer Information

|                  |                   |                      |      |
|------------------|-------------------|----------------------|------|
| Analyzer model:  | Teledyne API T201 | Analyzer serial #:   | 808  |
| Converter model: | Teledyne API T501 | Converter serial #:  | 824  |
| NH3 Range (ppb): | 0 - 2000 ppb      | Reaction cell Press: | 5.10 |
| NOX Range (ppb): | 0 - 1000 ppb      | Sample Flow:         | 470  |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  |              | 0.833         | TN coefficient: |              | 0.828         |
| NOX coefficient: |              | 0.834         | NO bkgnd:       |              | -11.017       |
| NO2 coefficient: |              | 1.000         | NOX bkgnd:      |              | -10.278       |
| NH3 coefficient: |              | 0.854         | TN bkgnd:       |              | -4.631        |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  |              | 1.000885      |
| NO <sub>x</sub> Cal Offset: |              | 0.380000      |
| NO Cal Slope:               |              | 0.999215      |
| NO Cal Offset:              |              | -0.780000     |
| NO <sub>2</sub> Cal Slope:  |              | 0.999881      |
| NO <sub>2</sub> Cal Offset: |              | 0.372129      |
| NH3 Cal Slope:              |              | 1.010718      |
| NH3 Cal Offset:             |              | -8.022555     |
| TN Cal Slope:               |              | 1.015098      |
| TN Cal Offset:              |              | -7.787324     |



# Wood Buffalo Environmental Association

## TN - NOX - NH<sub>3</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point       | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NOX concentration (ppb) (Cc) | Calculated NH3 concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NOX concentration (ppb) (Ic) | Indicated NH3 concentration (ppb) (Ic) | TN Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NH3 Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |        |
|-----------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|--------|
| as found zero   |                           |                             |  |   |   |                                       |  |  |  |   |        |
| as found NO     |                           |                             |  |   |   |                                       |  |  |  |   |        |
| calibrator zero | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | -0.1                                  | 0.0                                    | -0.1                                   | ----   | ----  |        |
| high NO point   | 4920                      | 80.0                        | 813.4                                  | 813.4                                   | ----                                    | 812.9                                 | 814.6                                  | -1.9                                   | 1.001  | ----  |        |
| NO/O3 point     |                           |                             |  |   |   |                                       |  |  |  |   |        |
| as found NH3    |                           |                             |  |   |   |                                       |  |  |  |   |        |
| new NH3 cyl rp  |                           |                             |  |   |   |                                       |  | ----                                   |  |   |        |
| first NH3       | 3413                      | 86.4                        | 1800.6                                 | ----                                    | 1800.6                                  | 1817.8                                | ----                                   | 1809.8                                 | 0.991  | 0.995   |        |
| second NH3      | 3452                      | 48.0                        | 1000.2                                 | ----                                    | 1000.2                                  | 1021.0                                | ----                                   | 1016.3                                 | 0.980  | 0.984   |        |
| third NH3       | 3476                      | 24.0                        | 500.1                                  | ----                                    | 500.1                                   | 480.9                                 | ----                                   | 478.2                                  | 1.040  | 1.046   |        |
|                 |                           |                             |  |   |   |                                       |  |  | Average Correction Factor                                | 1.0007  | 1.0083 |

Corrected As found TN = NA ppb NO<sub>x</sub> = NA ppb NH3 = NA ppb  
 Previous Response TN = NA ppb NO<sub>x</sub> = NA ppb NH3 = NA ppb

\*Percent Change TN = NA  
 \*Percent Change NO<sub>x</sub> = NA  
 \*Percent Change NH3 = NA  
 \* = > +/-5% change initiates investigation

NH3 Previous Converter Efficiency =  
 NH3 Current Converter Efficiency = 85.4%



# Wood Buffalo Environmental Association

## NO<sub>x</sub> - NO - NO<sub>2</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                        | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated TN concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated TN concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|---|--|--|--|---------------------------------------|---------------------------------------|---|--|
| as found zero                    |                           |                             |   |  |  |  |                                       |                                       |   |  |
| as found span                    |                           |                             |   |  |  |  |                                       |                                       |   |  |
| new NO cyl rp                    |                           |                             |   |  |  |  |                                       |                                       |   |  |
| calibrator zero                  | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0                                    | 0.0  | -0.1                                  | -0.1                                  | ----  | ----   |
| high point                       | 4920                      | 80.0                        | 813.4   | 800.6                                  | 813.4                                  | 814.6  | 799.8                                 | 812.9                                 | 0.9986  | 1.0011   |
| second point                     | 4960                      | 40.0                        | 406.7   | 400.3                                  | 406.7                                  | 406.9  | 398.2                                 | 406.9                                 | 0.9996  | 1.0053   |
| third point                      | 4980                      | 20.0                        | 203.4   | 200.2                                  | 203.4                                  | 204.8  | 199.0                                 | 204.0                                 | 0.9930  | 1.0058   |
| <b>Average Correction Factor</b> |                           |                             |   |  |  |  |                                       |                                       | <b>0.9970</b>   | <b>1.0041</b>  |

|                      |      |    |     |                   |    |     |      |    |     |                 |                   |    |
|----------------------|------|----|-----|-------------------|----|-----|------|----|-----|-----------------|-------------------|----|
| Baseline Corr As fnd | TN = | NA | ppb | NO <sub>x</sub> = | NA | ppb | NO = | NA | ppb | *Percent Change | TN =              | NA |
| Previous Response    | TN = | NA | ppb | NO <sub>x</sub> = | NA | ppb | NO = | NA | ppb | *Percent Change | NO <sub>x</sub> = | NA |
|                      |      |    |     |                   |    |     |      |    |     | *Percent Change | NO =              | NA |

\* = > +/-5% change initiates investigation

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found zero                    |  |                                       |   |  |  |  |
| calibration zero                 | ----                                       | ----                                  | 0.0   | 0.1  | ----   | ----   |
| 1st GPT point (400 ppb O3)       | 795.6                                      | 393.9                                 | 414.5   | 414.9  | 0.9990   | 100.1%   |
| 2nd GPT point (200 ppb O3)       | 795.6                                      | 594.5                                 | 213.9   | 213.7  | 1.0009   | 99.9%  |
| 3rd GPT point (100 ppb O3)       | 795.6                                      | 693.9                                 | 114.5   | 115.6  | 0.9905   | 101.0%   |
| <b>Average Correction Factor</b> |  |                                       |   |  | <b>0.9968</b>  | <b>100.3%</b>  |

Notes: Installing a new NH<sub>3</sub> analyzer/converter. Changed the inlet filter. Adjusted both zero and span. Used the 2nd GPT point. Adjusted the NH<sub>3</sub> span.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TN Calibration Summary

Version-11-2021

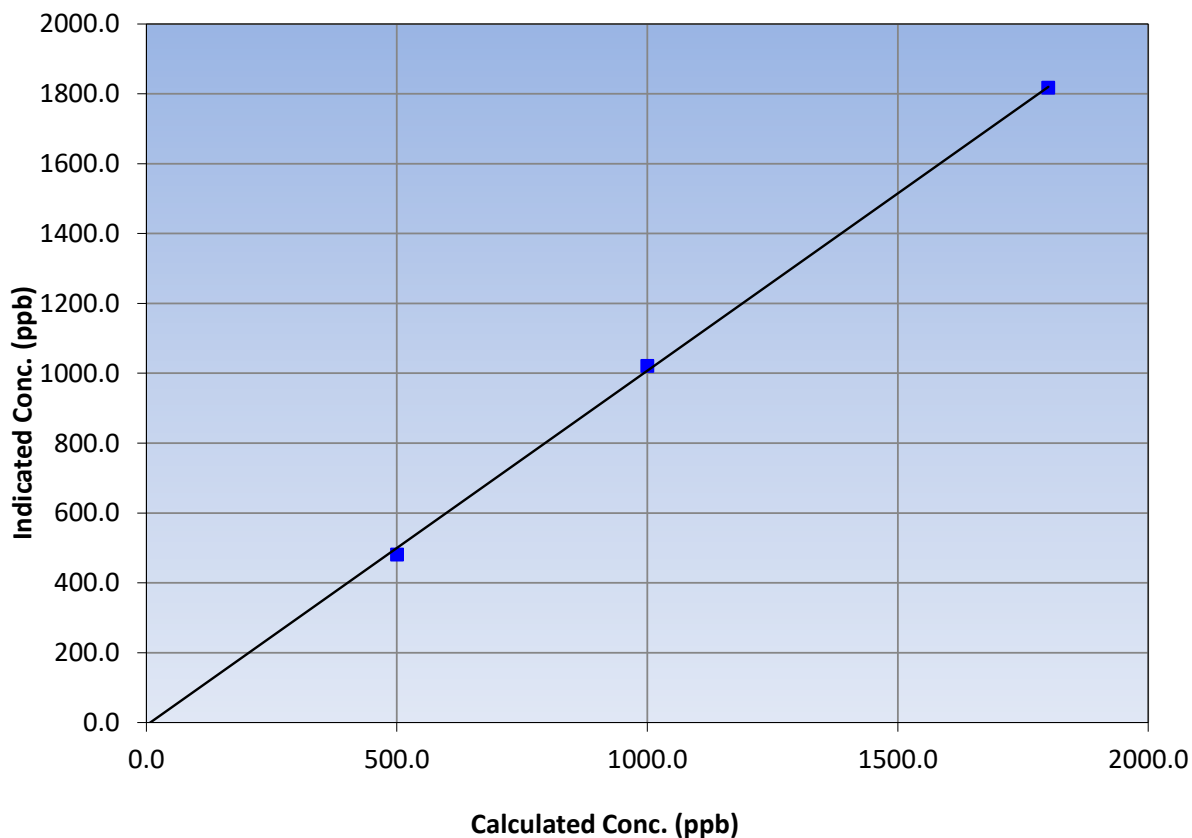
### Station Information

|                   |                          |                       |       |
|-------------------|--------------------------|-----------------------|-------|
| Calibration Date: | February 17, 2023        | Previous Calibration: | NA    |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01 |
| Start Time (MST): | 11:32                    | End Time (MST):       | 15:30 |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808   |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                                      |
|-------------------------------------|------------------------------------|---------------------------|---|--|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br><i>0.90 - 1.10</i><br><i>+/-20</i> |
| 1800.6                              | 1817.8                             | 0.9906                    |   |  |
| 1000.2                              | 1021.0                             | 0.9796                    |   |  |
| 500.1                               | 480.9                              | 1.0399                    |   |  |
|                                     |                                    |                           |   |  |

**TN Calibration Curve**





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

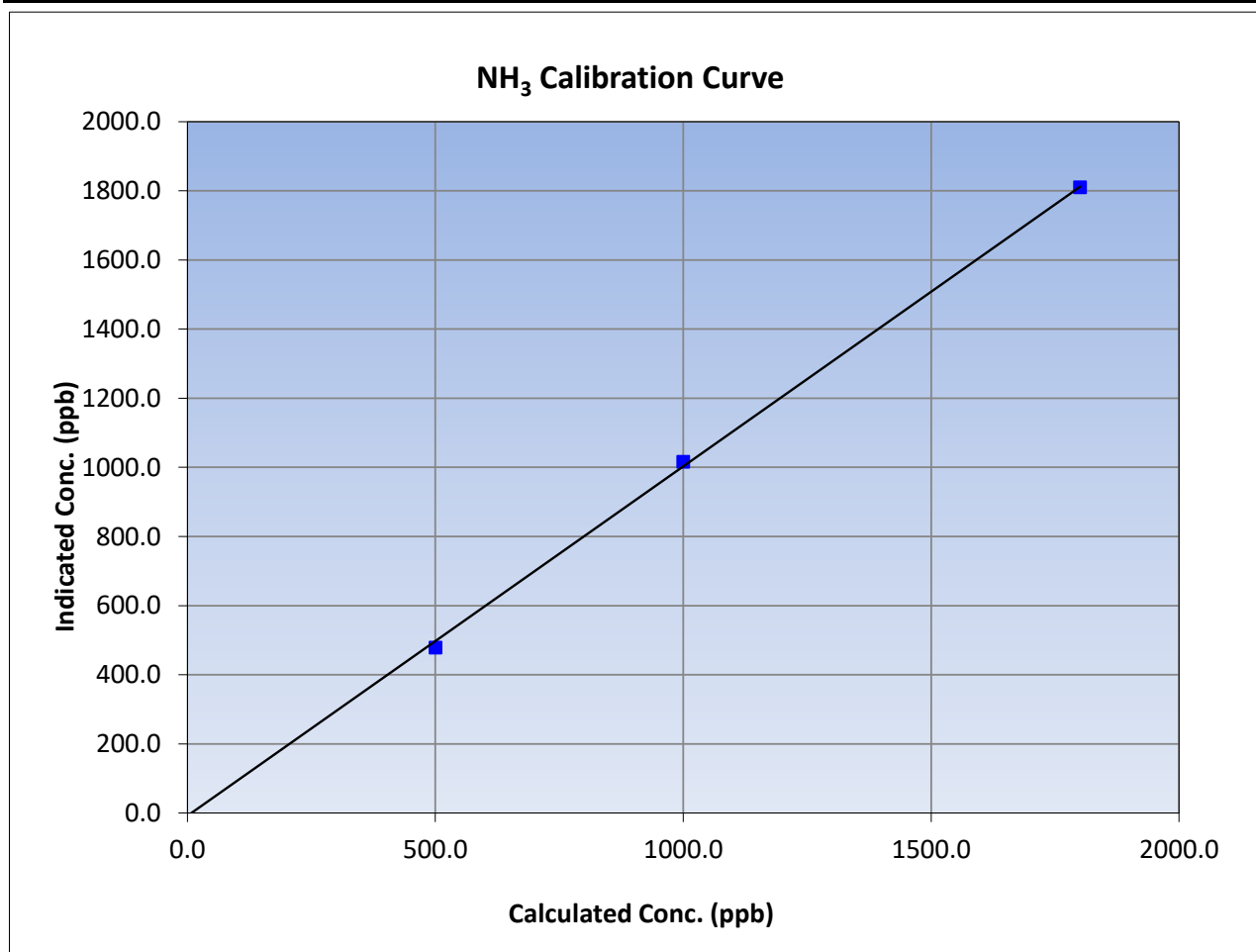
Version-11-2021

### Station Information

|                   |                          |                       |       |
|-------------------|--------------------------|-----------------------|-------|
| Calibration Date: | February 17, 2023        | Previous Calibration: | NA    |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01 |
| Start Time (MST): | 11:32                    | End Time (MST):       | 15:30 |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808   |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 1800.6                              | 1809.8                             | 0.9949                    |   |                                |
| 1000.2                              | 1016.3                             | 0.9841                    |   |                                |
| 500.1                               | 478.2                              | 1.0458                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

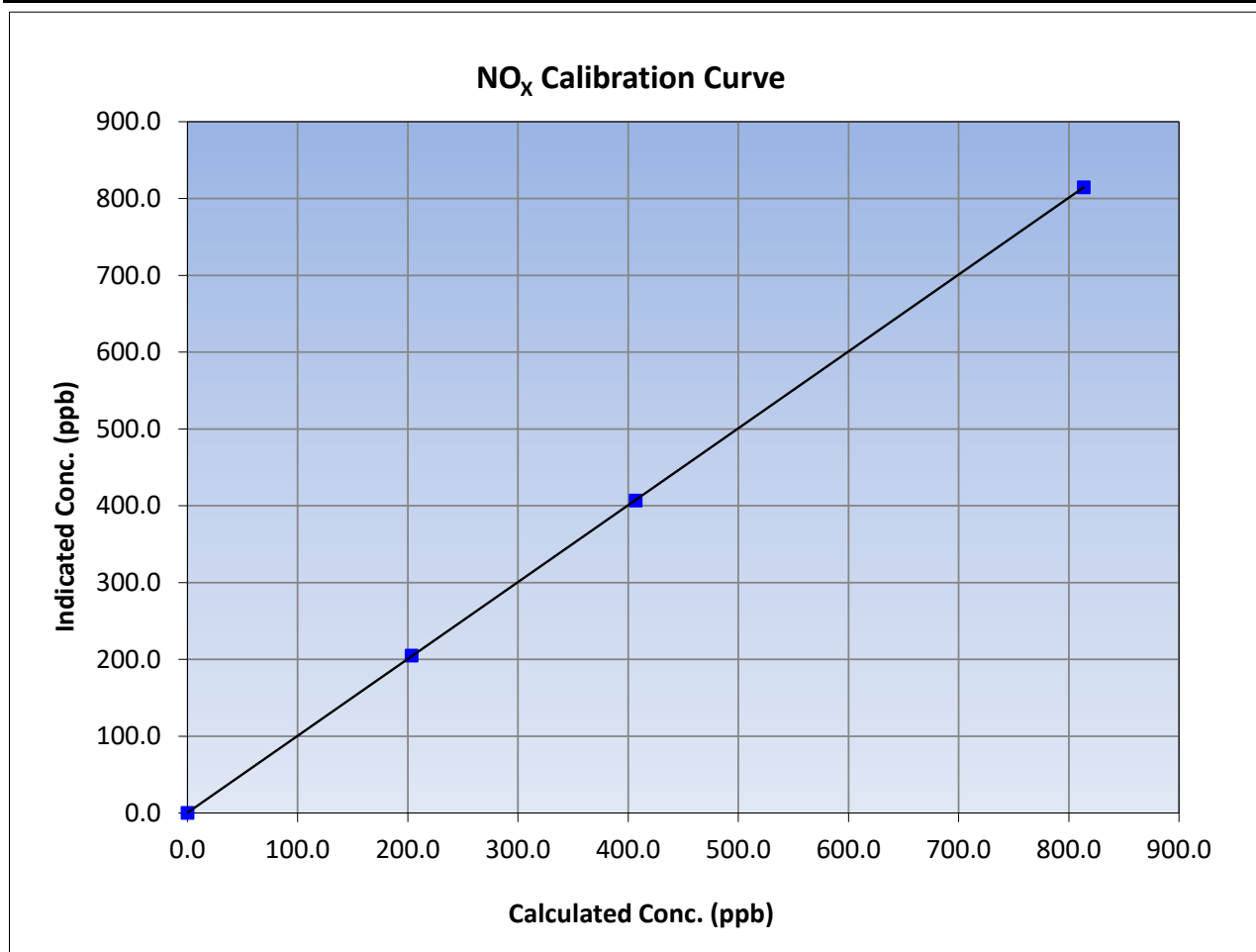
Version-11-2021

### Station Information

|                   |                          |                       |       |
|-------------------|--------------------------|-----------------------|-------|
| Calibration Date: | February 17, 2023        | Previous Calibration: | NA    |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01 |
| Start Time (MST): | 11:32                    | End Time (MST):       | 15:30 |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808   |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 813.4                               | 814.6                              | 0.9986                    |                         |               |             |
| 406.7                               | 406.9                              | 0.9996                    |                         |               |             |
| 203.4                               | 204.8                              | 0.9930                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.000885      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.380000      | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

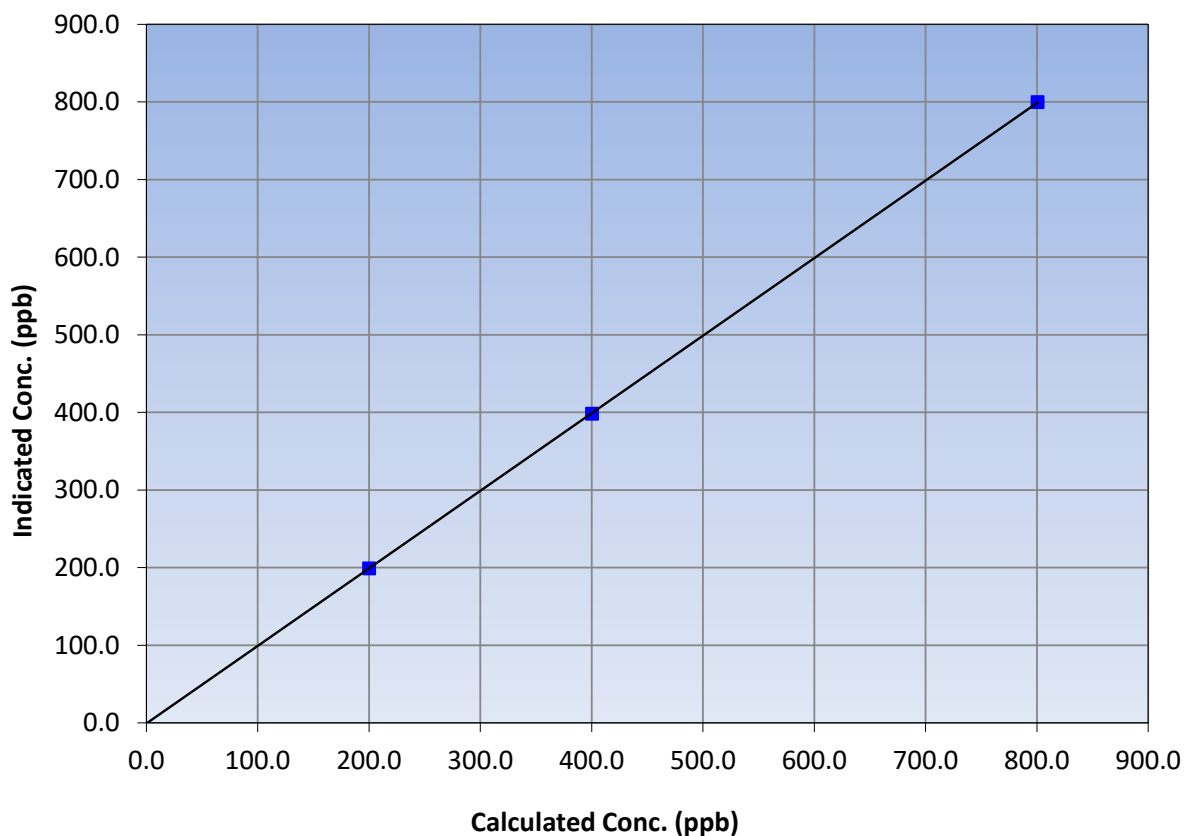
### Station Information

|                   |                          |                       |       |
|-------------------|--------------------------|-----------------------|-------|
| Calibration Date: | February 17, 2023        | Previous Calibration: | NA    |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01 |
| Start Time (MST): | 11:32                    | End Time (MST):       | 15:30 |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808   |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999995      | ≥0.995      |
| 800.6                               | 799.8                              | 1.0011                    |                         |               |             |
| 400.3                               | 398.2                              | 1.0053                    | Slope                   | 0.999215      | 0.90 - 1.10 |
| 200.2                               | 199.0                              | 1.0058                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -0.780000     | +/-20       |

**NO Calibration Curve**







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-11-2021

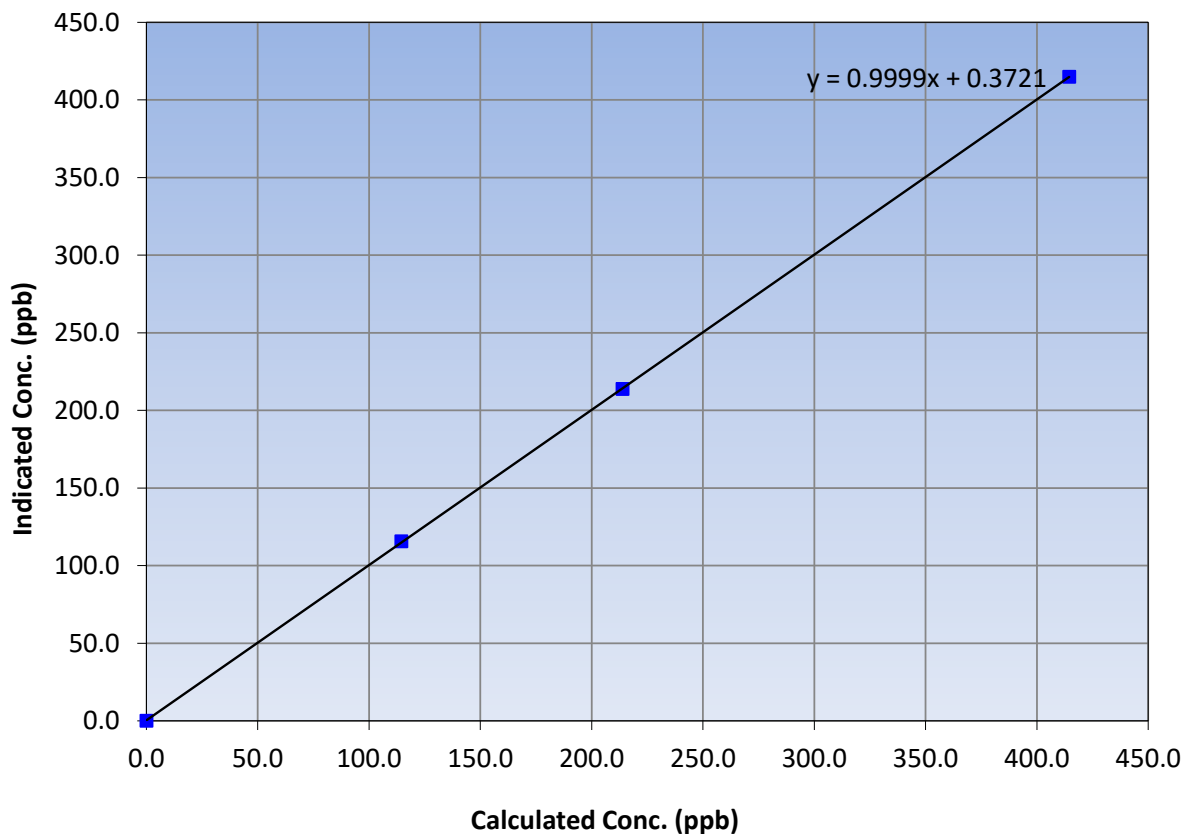
### Station Information

|                   |                          |                       |       |
|-------------------|--------------------------|-----------------------|-------|
| Calibration Date: | February 17, 2023        | Previous Calibration: | NA    |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01 |
| Start Time (MST): | 11:32                    | End Time (MST):       | 15:30 |
| Analyzer make:    | Teledyne API T201        | Analyzer serial #:    | 808   |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |             |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |             |
| 414.5                               | 414.9                              | 0.9990                    |   |                                |             |
| 213.9                               | 213.7                              | 1.0009                    |   |                                |             |
| 114.5                               | 115.6                              | 0.9905                    |   |                                |             |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999990                       | ≥0.995      |
|                                     |                                    |                           | Slope   | 0.999881                       | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                                     | 0.372129                       | +/-20       |

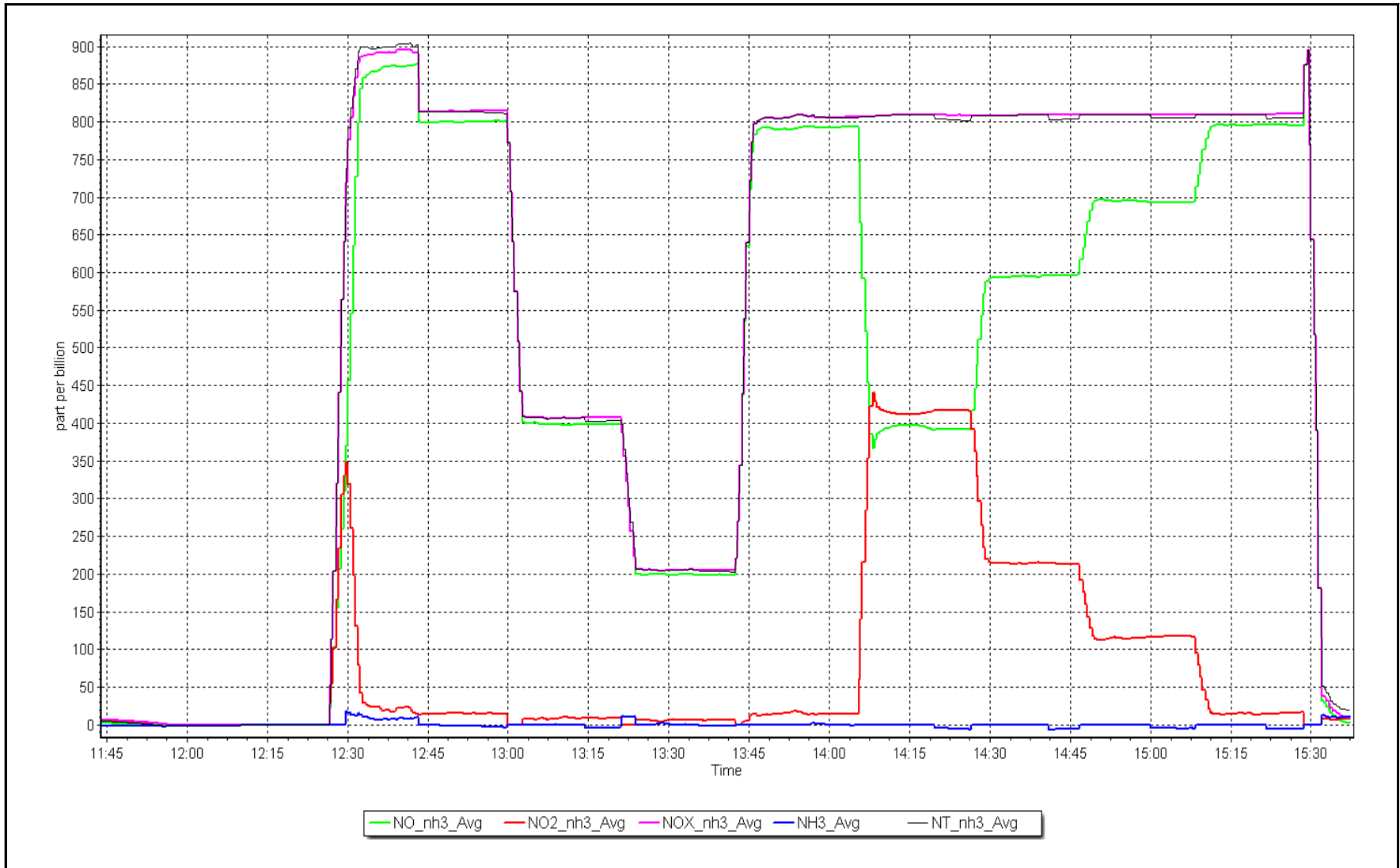
**NO<sub>2</sub> Calibration Curve**



# NO<sub>x</sub> Calibration Plot

Date: February 17, 2023

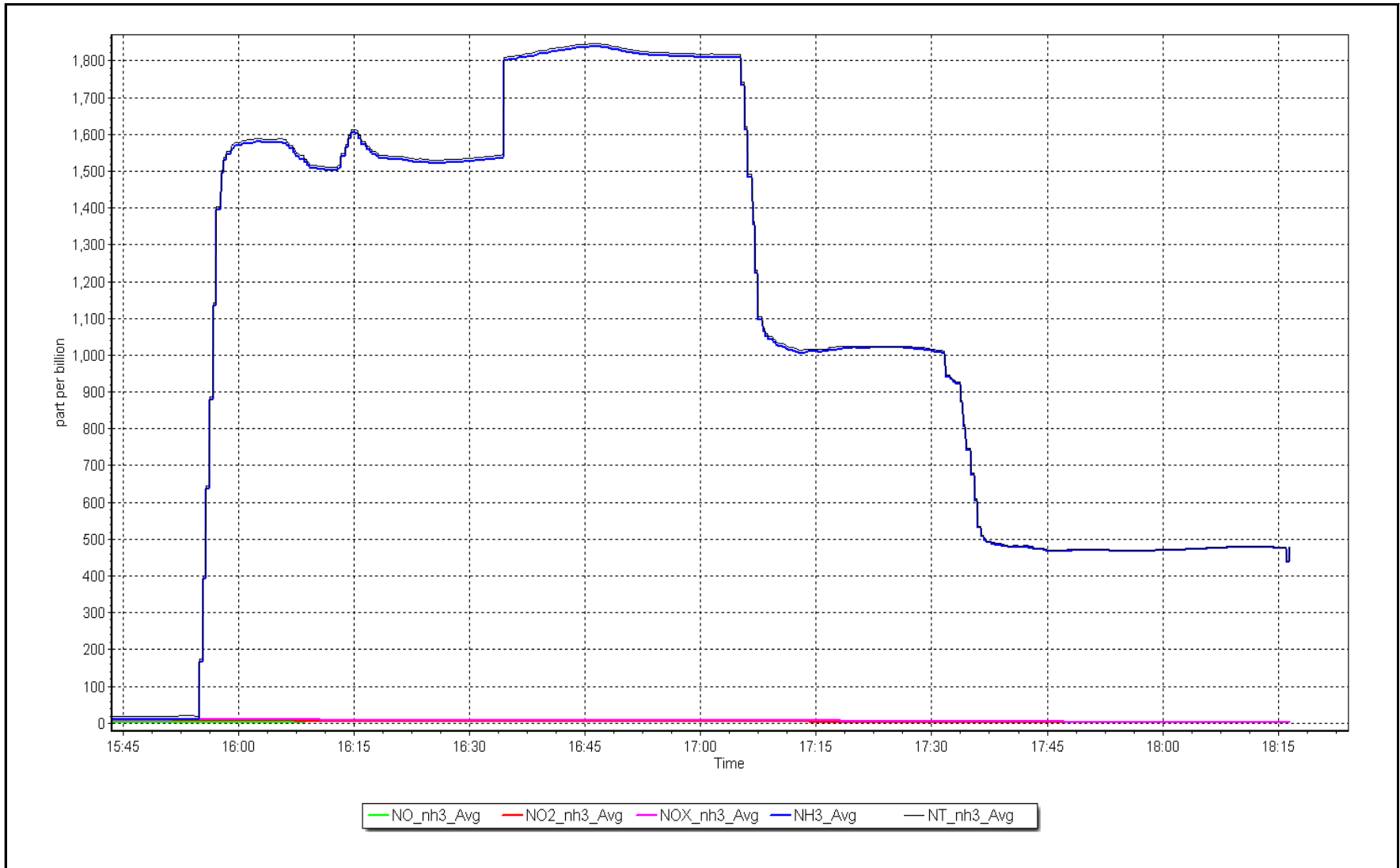
Location: Bertha Ganter-Fort McKay



# NH<sub>3</sub> Calibration Plot

Date: February 17, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

Station Name: Bertha Ganter-Fort McKay      Station number: AMS01  
 Calibration Date: February 15, 2023      Last Cal Date: January 11, 2023  
 Start time (MST): 11:15      End time (MST): 15:35  
 Reason: Maintenance

### Calibration Standards

Cal Gas Concentration: 3040 ppm      Cal Gas Exp Date: December 1, 2028  
 Cal Gas Cylinder #: ALM042207  
 Removed Cal Gas Conc: 3040 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 3565  
 ZAG Make/Model: Teledyne API T701      Serial Number: 5609

### Analyzer Information

Analyzer make: Teledyne API T300      Analyzer serial #: 3520  
 Analyzer Range: 0 - 50 ppm

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.999735     | 1.001201      | Backgd or Offset: | -0.012       | -0.012        |
| Calibration intercept: | 0.169836     | 0.093816      | Coeff or Slope:   | 0.989        | 0.991         |

### CO Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| as found span             | 4933                          | 66.7                        | 40.6                                | 40.2                               | 1.008   |
| as found 2nd point        | 4966                          | 33.3                        | 20.2                                | 20.4                               | 0.991   |
| as found 3rd point        | 4983                          | 16.7                        | 10.2                                | 10.1                               | 1.010   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                | 4933                          | 66.7                        | 40.6                                | 40.6                               | 0.999   |
| second point              | 4966                          | 33.3                        | 20.2                                | 20.6                               | 0.982   |
| third point               | 4983                          | 16.7                        | 10.2                                | 10.3                               | 0.991   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 2960                          | 40.0                        | 40.5                                | 40.2                               | 1.010   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.991   |

|                          |       |                 |          |               |           |
|--------------------------|-------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 40.36 | Prev response:  | 40.72    | *% change:    | -0.9%     |
| Baseline Corr 2nd AF pt: | 20.6  | AF Slope:       | 0.995619 | AF Intercept: | -0.022146 |
| Baseline Corr 3rd AF pt: | 10.2  | AF Correlation: | 0.999867 |               |           |

\* = > +/-5% change initiates investigation

Notes: Changed inlet filter and pump after as founds. Adjusted both zero and span.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## CO Calibration Summary

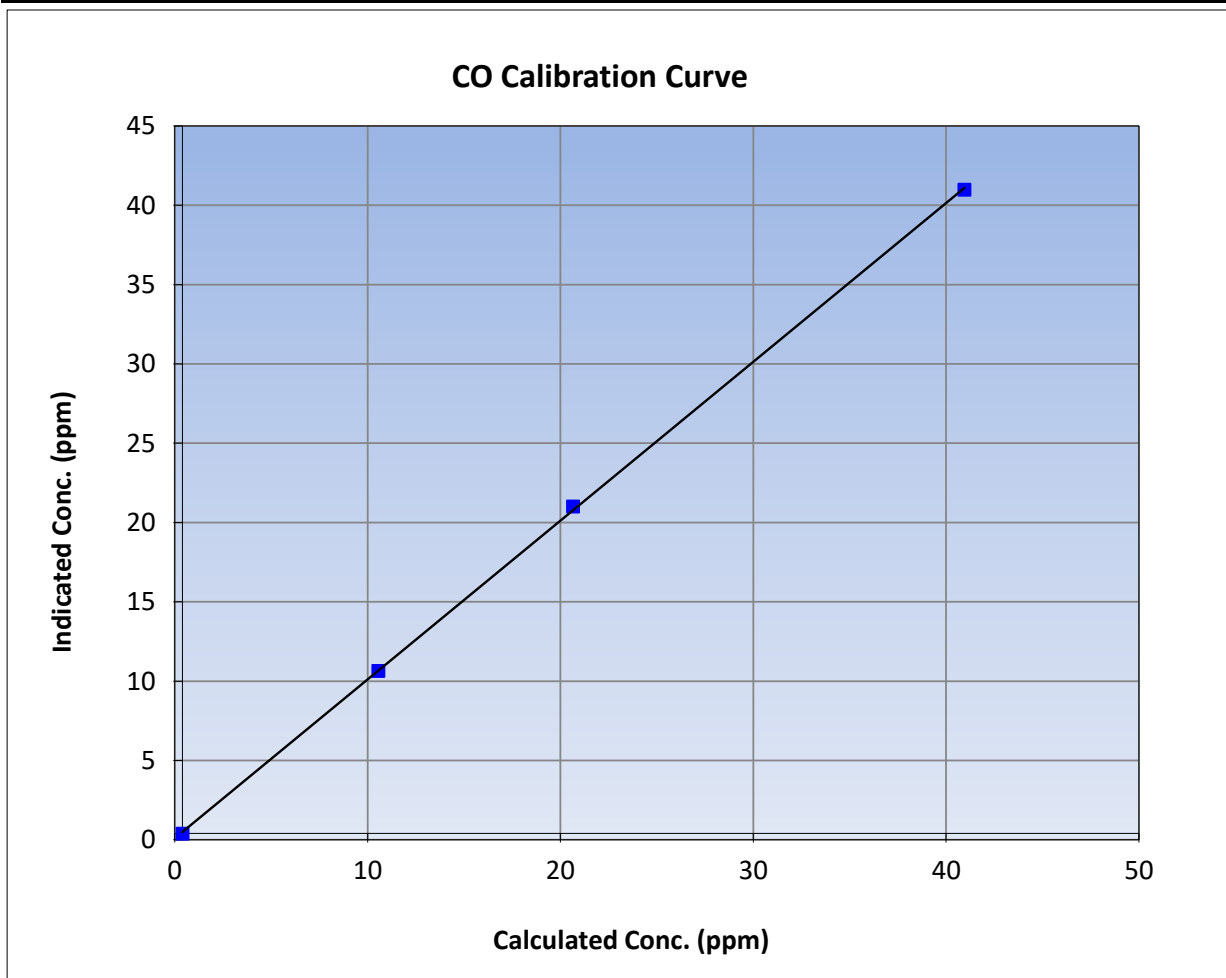
Version-01-2020

### Station Information

|                   |                          |                       |                  |
|-------------------|--------------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023        | Previous Calibration: | January 11, 2023 |
| Station Name:     | Bertha Ganter-Fort McKay | Station Number:       | AMS01            |
| Start Time (MST): | 11:15                    | End Time (MST):       | 15:35            |
| Analyzer make:    | Teledyne API T300        | Analyzer serial #:    | 3520             |

### Calibration Data

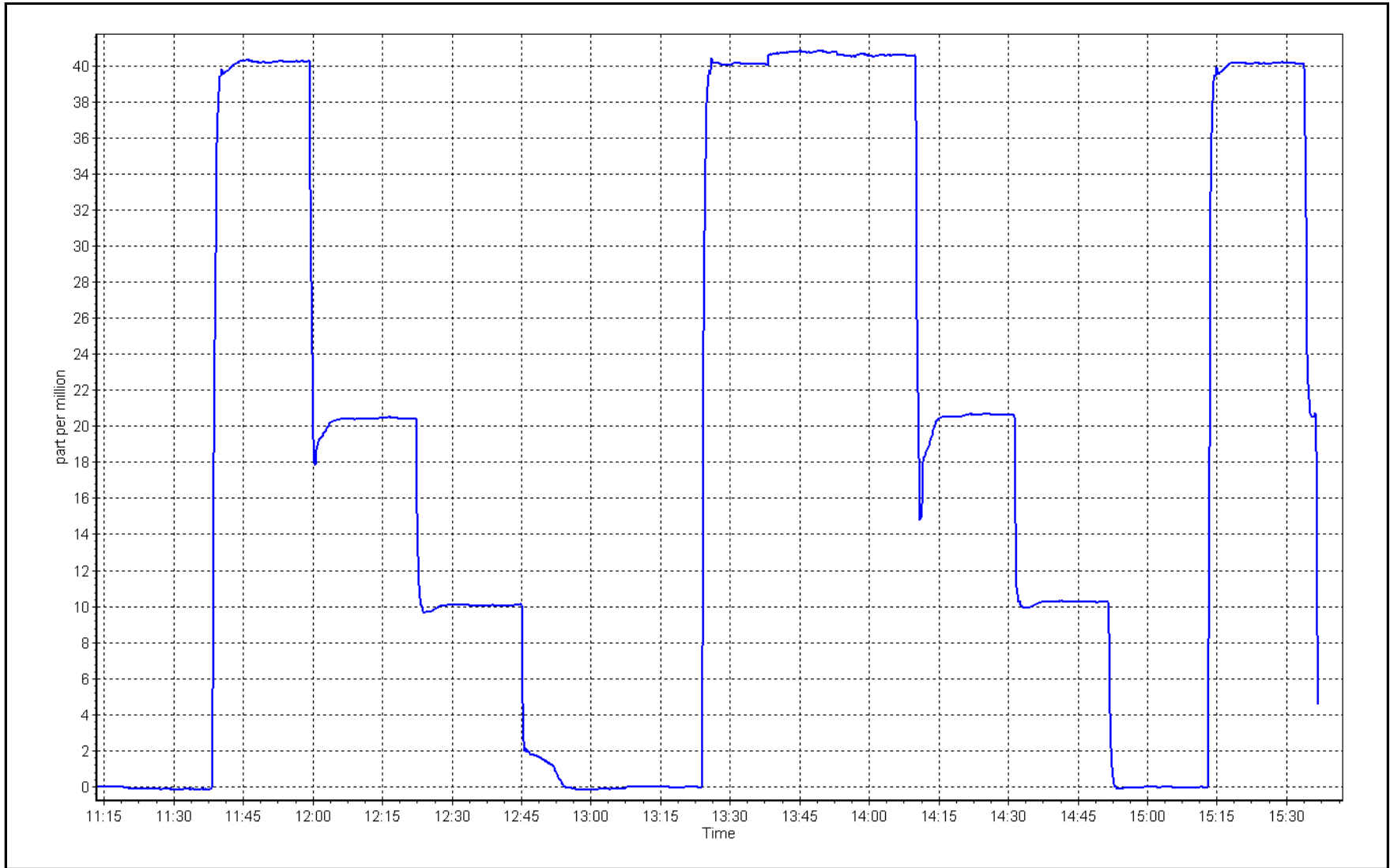
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999905 |             |
| 40.6                                | 40.6                               | 0.9994                    |                         |          | ≥0.995      |
| 20.2                                | 20.6                               | 0.9825                    | Slope                   | 1.001201 |             |
| 10.2                                | 10.3                               | 0.9907                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.093816 | +/-1.5      |



CO Calibration Plot

Date: February 15, 2023

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                          |                 |                  |
|-------------------|--------------------------|-----------------|------------------|
| Station Name:     | Bertha Ganter-Fort McKay | Station number: | AMS01            |
| Calibration Date: | February 7, 2023         | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 10:46                    | End time (MST): | 14:02            |
| Reason:           | Routine                  |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,200            | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | <u>ALM042207</u>  |     |                   |                  |
| Removed Cal Gas Conc:  | <u>60,200</u>     | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | <u>NA</u>         |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3565             |
| N2 Gen Make/Model:     | Peak Sci NG5000   |     | Serial Number:    | 7220900034       |

### Analyzer Information

|                                 |                        |
|---------------------------------|------------------------|
| Analyzer make: Teledyne API 360 | Analyzer serial #: 442 |
| Analyzer Range 0 - 2,000 ppm    |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.002131     | 0.999874      | Backgd or Offset: | 0.037        | 0.037         |
| Calibration intercept: | -6.480000    | -5.820000     | Coeff or Slope:   | 0.883        | 0.883         |

### CO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | -0.4                               | ----  |
| as found span             | 2920                          | 80.0                        | 1605.3                              | 1601.0                             | 1.003   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                | 2920                          | 80.0                        | 1605.3                              | 1602.5                             | 1.002   |
| second point              | 2960                          | 40.0                        | 802.7                               | 792.9                              | 1.012   |
| third point               | 2980                          | 20.0                        | 401.3                               | 390.4                              | 1.028   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | -0.4                               | ----  |
| as left span              | 2960                          | 40.0                        | 802.7                               | 780.8                              | 1.028   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.014   |

|                          |         |                 |         |               |       |
|--------------------------|---------|-----------------|---------|---------------|-------|
| Baseline Corr As found:  | 1601.40 | Prev response:  | 1602.27 | *% change:    | -0.1% |
| Baseline Corr 2nd AF pt: | NA      | AF Slope:       |         | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA      | AF Correlation: |         |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

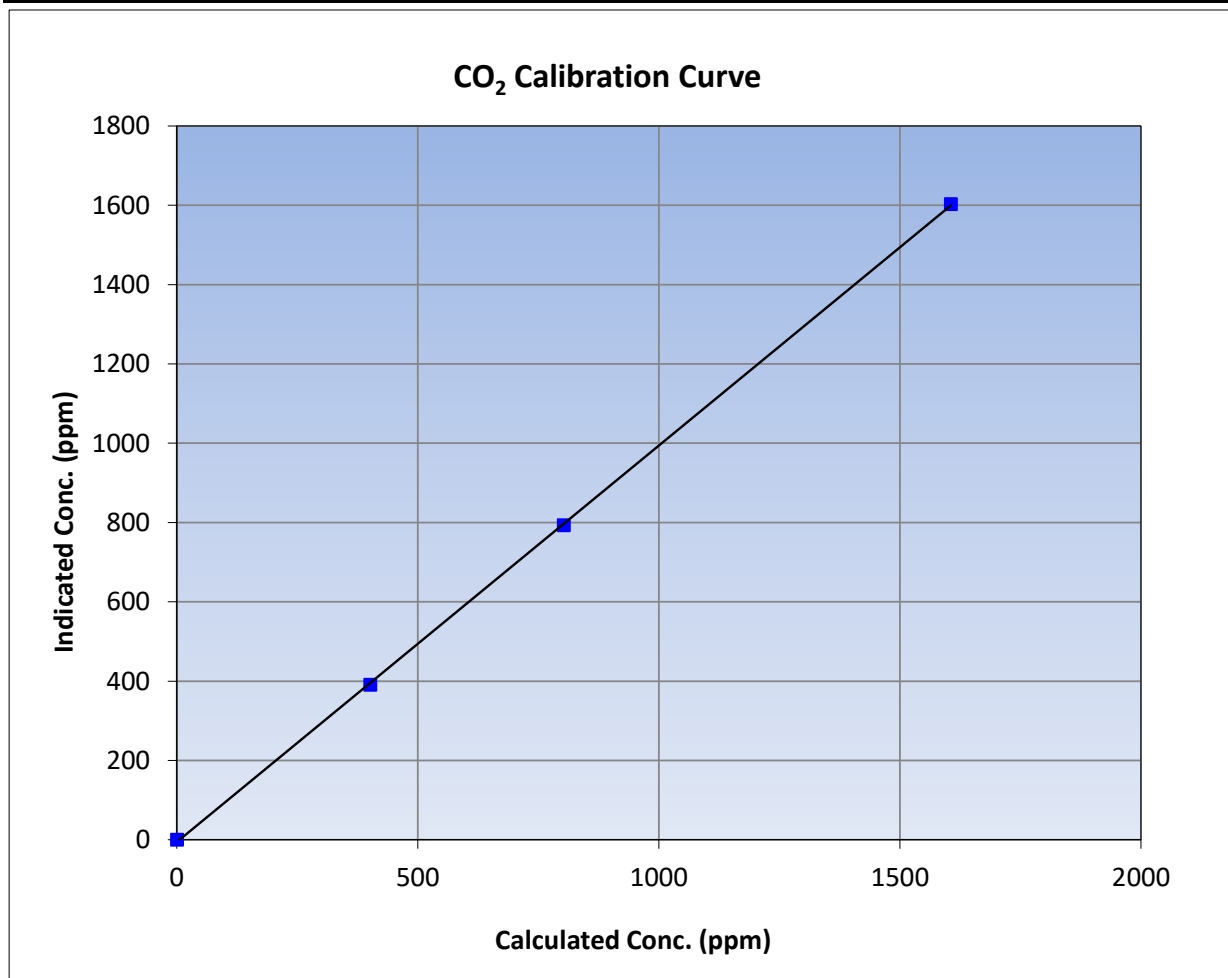
Version-01-2020

### Station Information

|                  |                          |                      |                  |
|------------------|--------------------------|----------------------|------------------|
| Calibration Date | February 7, 2023         | Previous Calibration | January 16, 2023 |
| Station Name     | Bertha Ganter-Fort McKay | Station Number       | AMS01            |
| Start Time (MST) | 10:46                    | End Time (MST)       | 14:02            |
| Analyzer make    | Teledyne API 360         | Analyzer serial #    | 442              |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999941  | ≥0.995      |
| 1605.3                              | 1602.5                             | 1.0018                    |                         |           |             |
| 802.7                               | 792.9                              | 1.0123                    | Slope                   | 0.999874  | 0.90 - 1.10 |
| 401.3                               | 390.4                              | 1.0280                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -5.820000 | +/-10       |

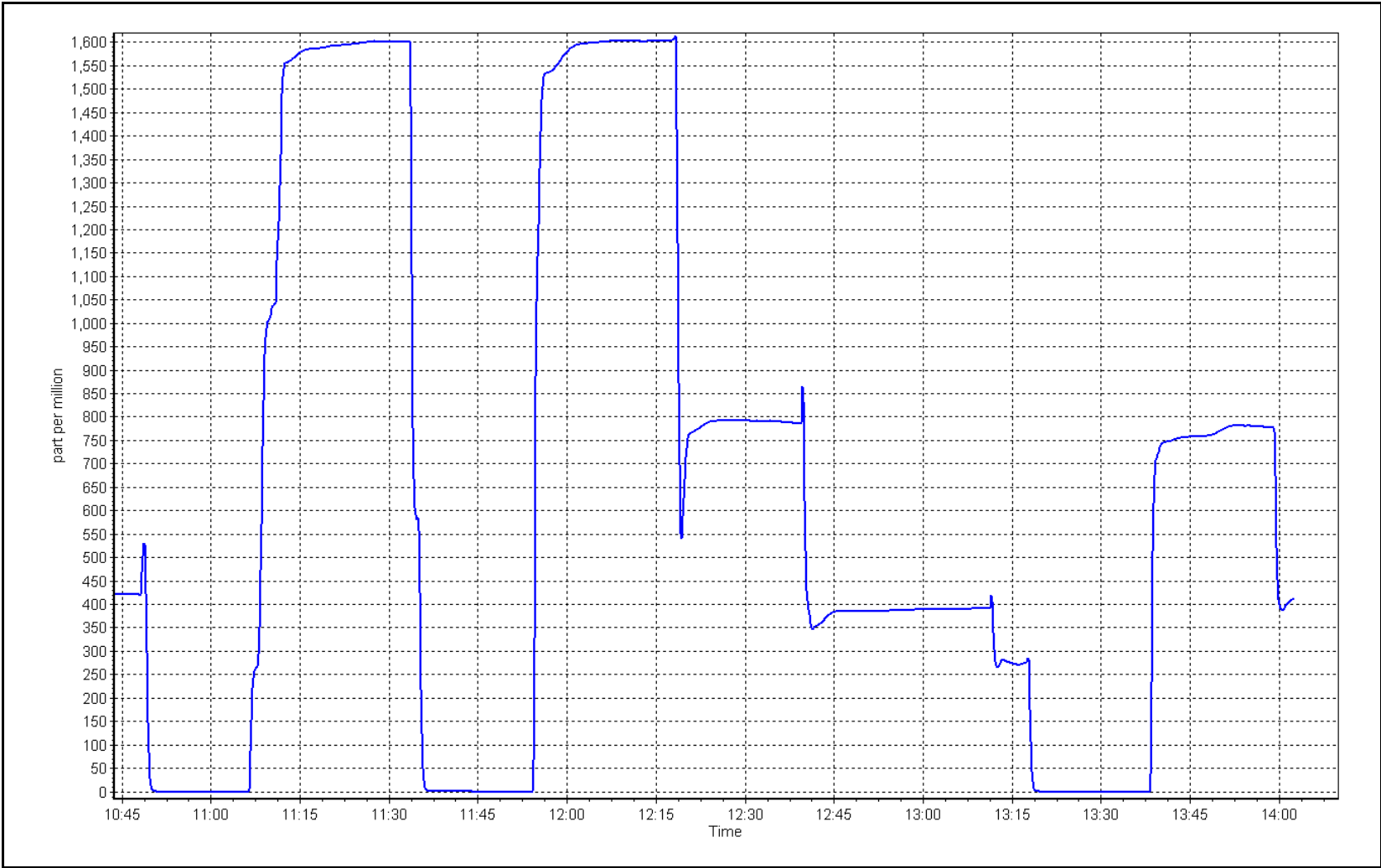




CO<sub>2</sub> Calibration Plot

Date: February 7, 2023

Location: Bertha Ganter-Fort McKay





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS02 MILDRED LAKE FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                 |
|-------------------|------------------|-----------------|-----------------|
| Station Name:     | Mildred Lake     | Station number: | AMS02           |
| Calibration Date: | February 8, 2023 | Last Cal Date:  | January 3, 2023 |
| Start time (MST): | 9:57 AM          | End time (MST): | 13:07           |
| Reason:           | Routine          |                 |                 |

### Calibration Standards

|                        |          |     |                   |                 |
|------------------------|----------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 49.98    | ppm | Cal Gas Exp Date: | August 12, 2024 |
| Cal Gas Cylinder #:    | CC501209 |     |                   |                 |
| Removed Cal Gas Conc:  | 49.98    | ppm | Rem Gas Exp Date: | NA              |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                 |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 1185            |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 5608            |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1404901075 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.996082     | 1.002695      | Backgd or Offset: | 17.8         | 17.9          |
| Calibration intercept: | -0.526045    | -0.144667     | Coeff or Slope:   | 0.816        | 0.827         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as found span             | 4920                          | 80.2                        | 801.6                               | 793.0                              | 1.011   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4920                          | 80.2                        | 801.6                               | 803.7                              | 0.997   |
| second point              | 4960                          | 40.1                        | 400.8                               | 402.0                              | 0.997   |
| third point               | 4980                          | 20.0                        | 199.9                               | 199.7                              | 1.001   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span              | 4920                          | 80.2                        | 801.6                               | 807.8                              | 0.992   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.999   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 793.00 | Previous response | 797.98 | *% change     | -0.6% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as founds. Adjusted span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

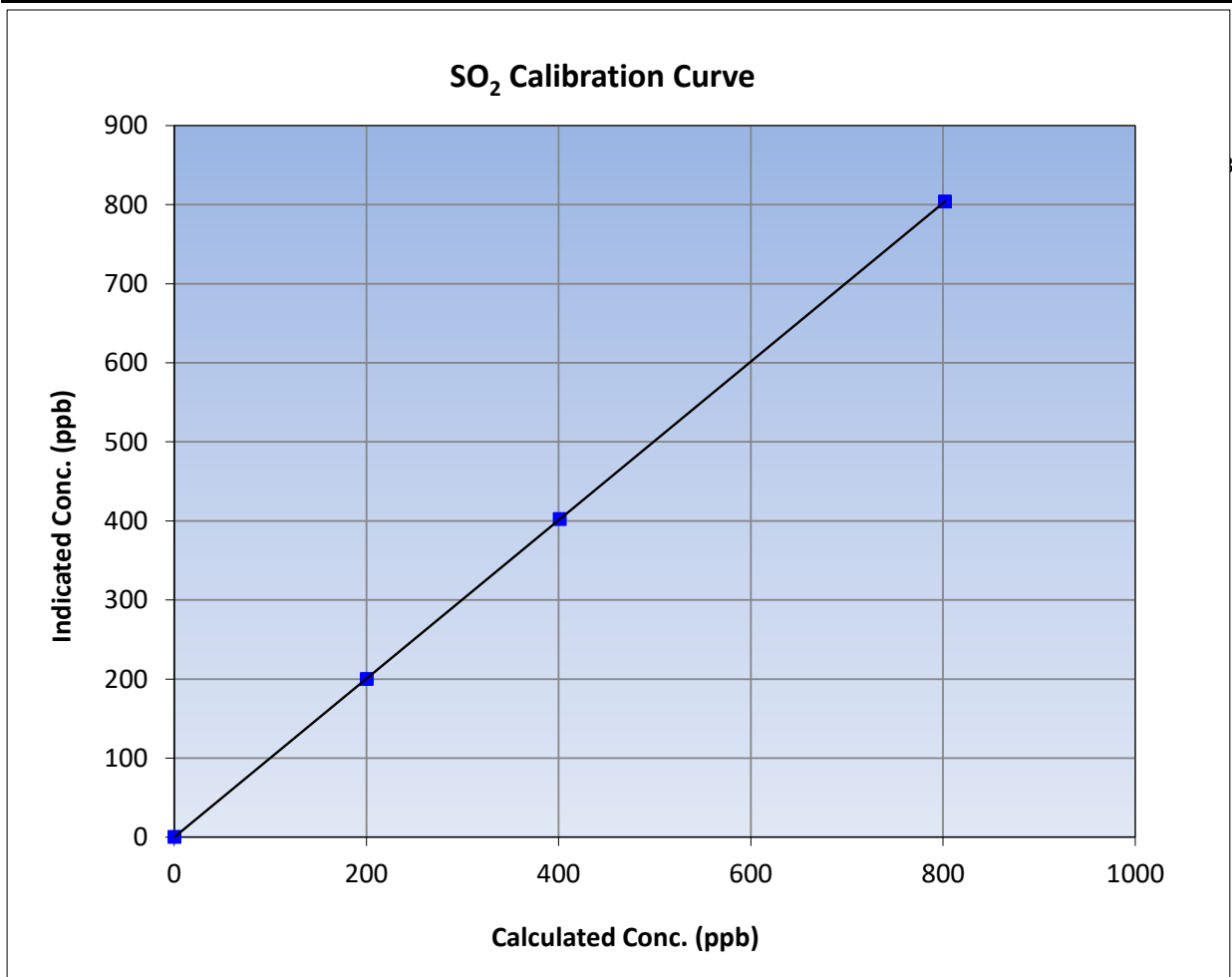
Version-01-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Mildred Lake     | Station Number:       | AMS02           |
| Start Time (MST): | 9:57             | End Time (MST):       | 13:07           |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | JC1404901075    |

### Calibration Data

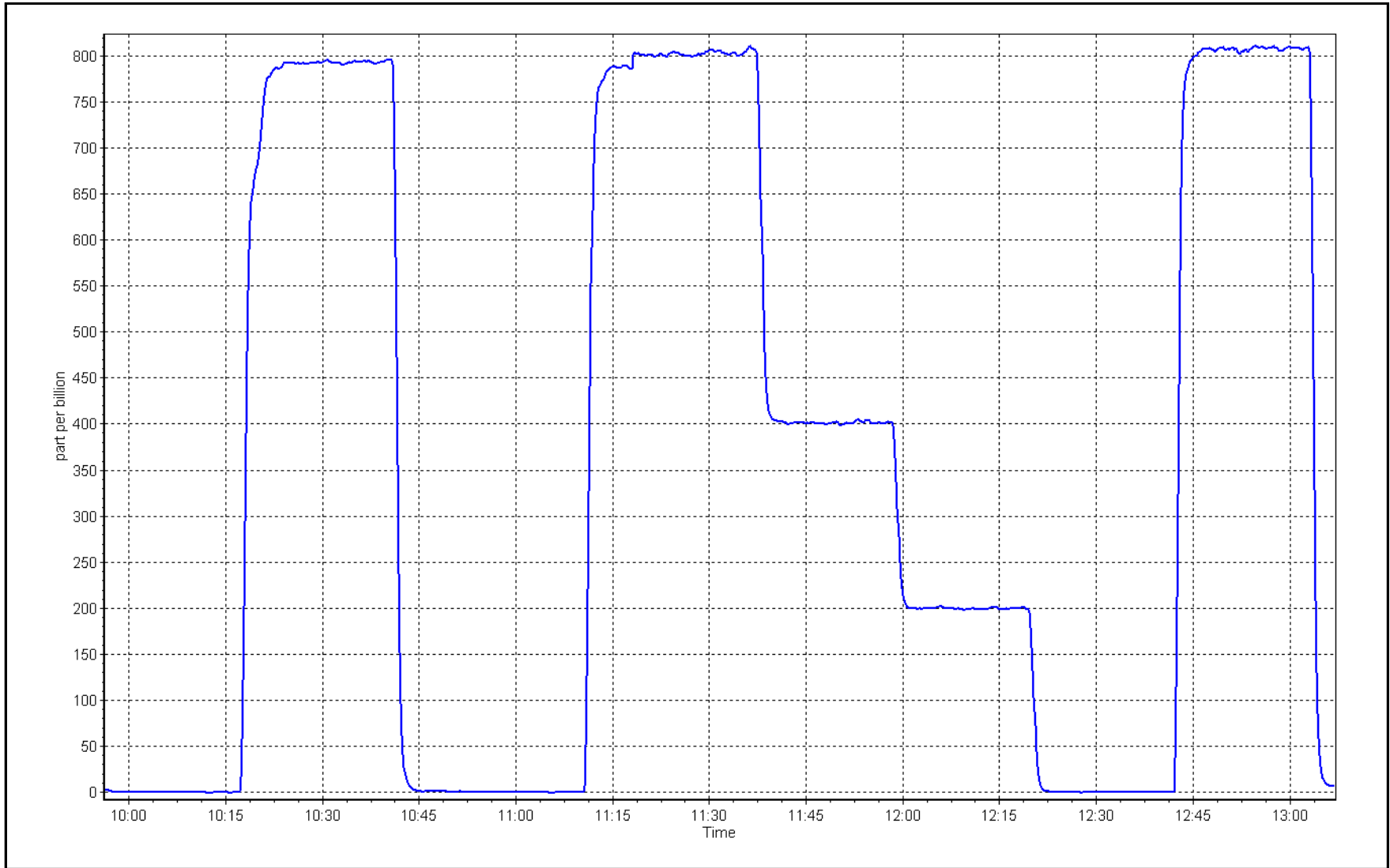
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995      |
| 801.6                               | 803.7                              | 0.9974                    |                         |             |
| 400.8                               | 402.0                              | 0.9971                    | Slope                   | 0.90 - 1.10 |
| 199.9                               | 199.7                              | 1.0011                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-30       |



SO2 Calibration Plot

Date: February 8, 2023

Location: Mildred Lake





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Mildred Lake      Station number: AMS02  
 Calibration Date: February 6, 2023      Last Cal Date: January 17, 2023  
 Start time (MST): 10:07      End time (MST): 14:25  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.29 ppm      Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC345191  
 Removed Cal Gas Conc: 5.29 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 1185  
 ZAG Make/Model: API T701      Serial Number: 5608

### Analyzer Information

Analyzer make: Thermo 43iQTL      Analyzer serial #: 12113311966  
 Converter make: Global G150      Converter serial #: 2022-198  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.010965     | 0.993964      | Backgd or Offset: 1.83 | 1.83          |
| Calibration intercept: | -0.179192    | -0.059204     | Coeff or Slope: 0.844  | 0.844         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----   |
| as found span         | 4924                          | 75.6                        | 80.0                                | 79.7                               | 1.002  |
| as found 2nd point    | 4962                          | 37.8                        | 40.0                                | 40.1                               | 0.995  |
| as found 3rd point    | 4981                          | 18.9                        | 20.0                                | 19.8                               | 1.005  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4924                          | 75.6                        | 80.0                                | 79.4                               | 1.007   |
| second point                            | 4962                          | 37.8                        | 40.0                                | 39.9                               | 1.002   |
| third point                             | 4981                          | 18.9                        | 20.0                                | 19.6                               | 1.020   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4924                          | 75.6                        | 80.0                                | 79.9                               | 1.001   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | 0.0                                | ----  |
| Date of last scrubber change:           |                               | 12-Sep-22                   |                                     | Ave Corr Factor                    | 1.010   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 79.8      Prev response: 80.69      \*% change: -1.1%  
 Baseline Corr 2nd AF pt: 40.2      AF Slope: 0.998250      AF Intercept: -0.059199  
 Baseline Corr 3rd AF pt: 19.9      AF Correlation: 0.999978

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. Ran a SO2 scrubber check after calibrator zero. No adjustment made.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

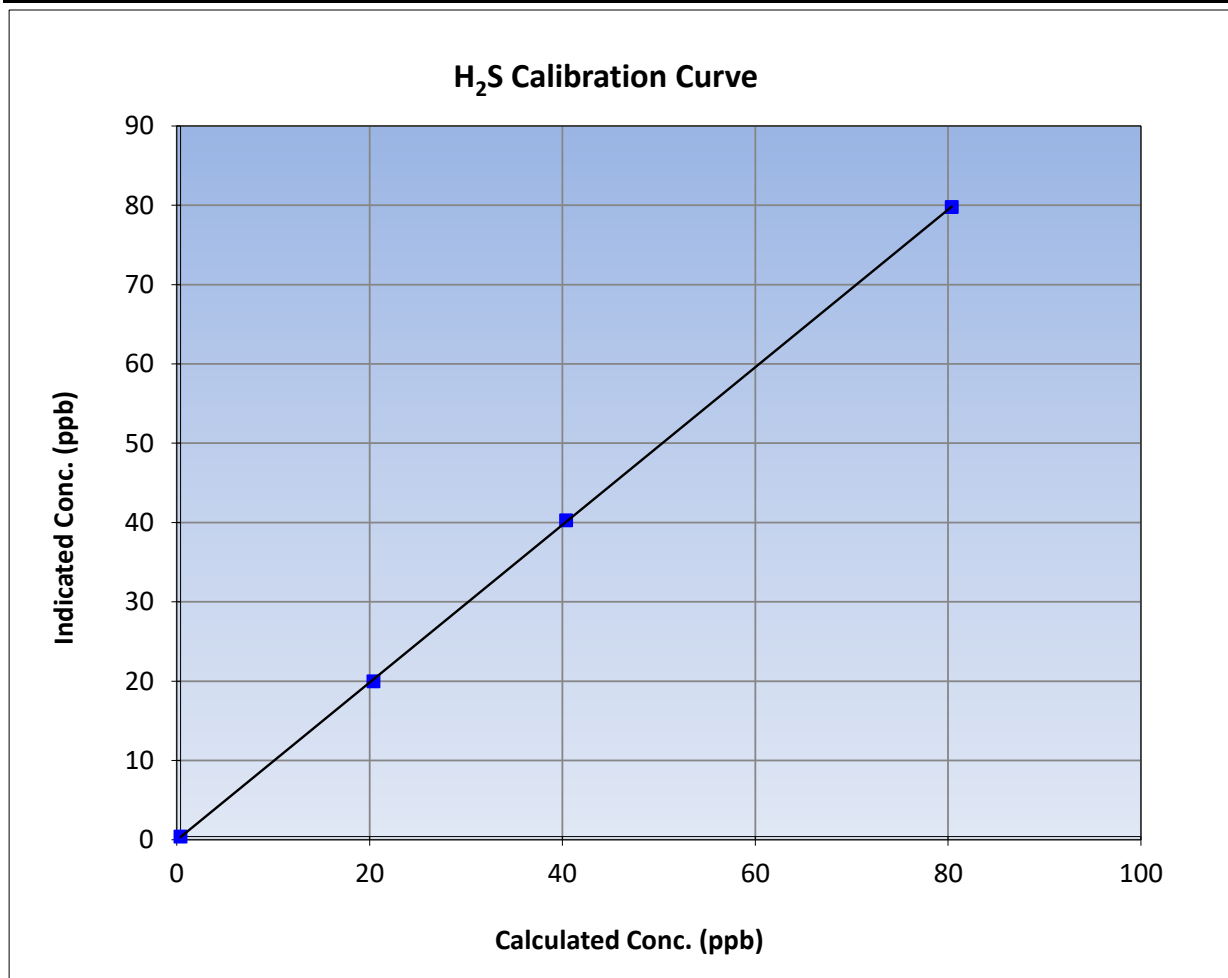
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Mildred Lake     | Station Number:       | AMS02            |
| Start Time (MST): | 10:07            | End Time (MST):       | 14:25            |
| Analyzer make:    | API T700         | Analyzer serial #:    | 1185             |

### Calibration Data

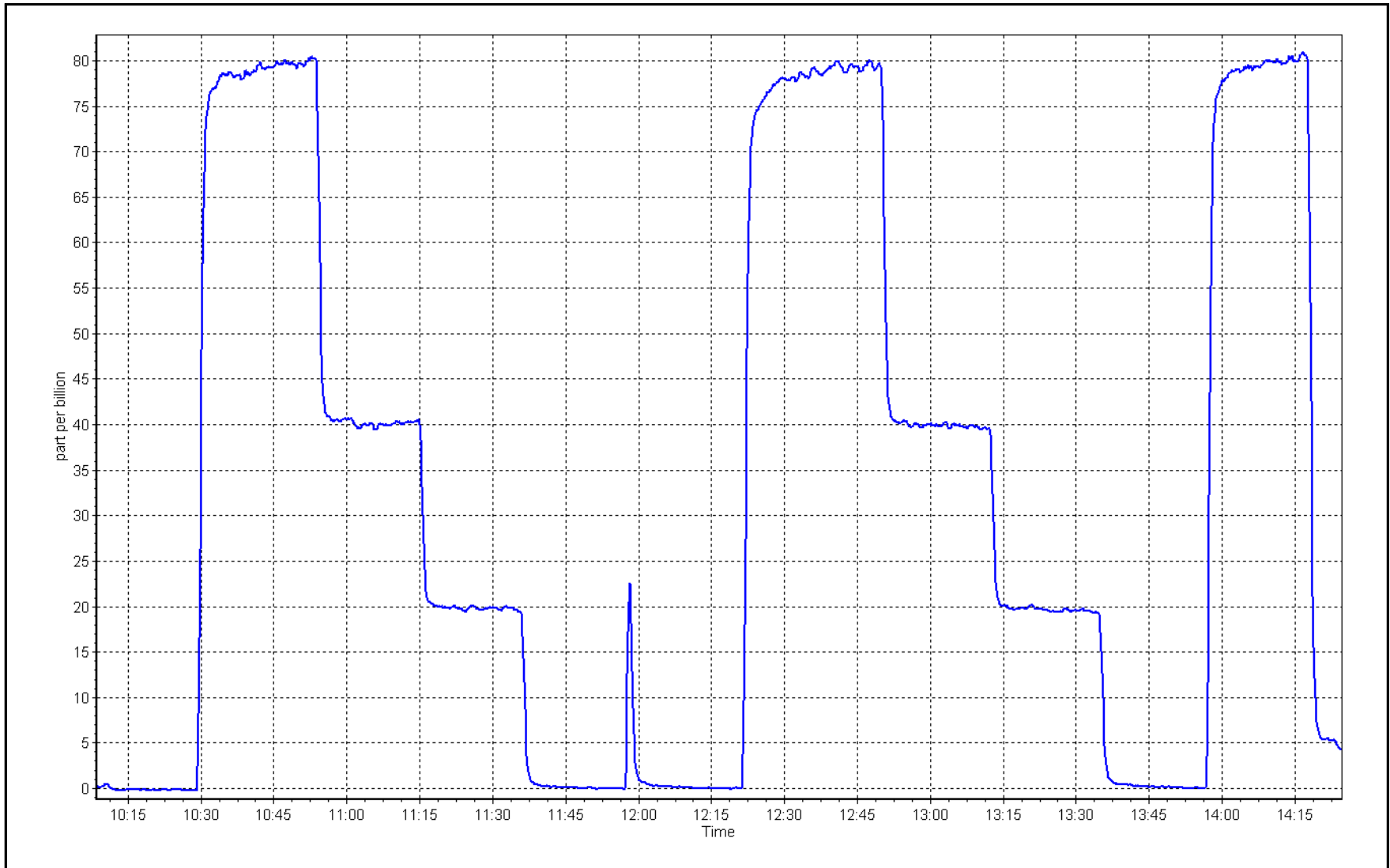
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999972      | ≥0.995      |
| 80.0                                | 79.4                               | 1.0074                    |                         |               |             |
| 40.0                                | 39.9                               | 1.0024                    | Slope                   | 0.993964      | 0.90 - 1.10 |
| 20.0                                | 19.6                               | 1.0202                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -0.059204     | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 6, 2023

Location: Mildred Lake







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### Station Information

|                   |                  |                 |                 |
|-------------------|------------------|-----------------|-----------------|
| Station Name:     | Mildred Lake     | Station number: | AMS02           |
| Calibration Date: | February 8, 2023 | Last Cal Date:  | January 3, 2023 |
| Start time (MST): | 9:57             | End time (MST): | 13:07           |
| Reason:           | Routine          |                 |                 |

### Calibration Standards

|   |                   |                             |                 |
|---|-------------------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC501209          | Cal Gas Expiry Date:        | August 12, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.2 ppm         | CH <sub>4</sub> Equiv Conc. | 1048.6 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 199.4 ppm         |                             |                 |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         |                 |
| Removed CH <sub>4</sub> Conc.               | 500.2 ppm         | CH <sub>4</sub> Equiv Conc. | 1048.6 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 199.4 ppm         | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 1185            |
| ZAG make/model:                             | Teledyne API T701 | Serial Number:              | 5608            |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320038 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.87E-04     | 2.80E-04      | NMHC SP Ratio:  | 4.52E-04      |
| CH <sub>4</sub> Retention time: | 14.6         | 14.4          | NMHC Peak Area: | 194883        |
| Zero Chromatogram:              | ON           | ON            | Flat Baseline:  | OFF           |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span             | 4920              | 80.2                 | 16.82                | 17.13               | 0.982                      |
| as found 2nd point        |                   |                      |                      |                     |                            |
| as found 3rd point        |                   |                      |                      |                     |                            |
| new cylinder response     |                   |                      |                      |                     |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point                | 4920              | 80.2                 | 16.82                | 16.80               | 1.001                      |
| second point              | 4960              | 40.1                 | 8.41                 | 8.36                | 1.005                      |
| third point               | 4980              | 20.0                 | 4.19                 | 4.15                | 1.011                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span              | 4920              | 80.2                 | 16.82                | 16.81               | 1.000                      |
| Average Correction Factor |                   |                      |                      |                     | 1.006                      |

|                       |       |                 |       |  |      |
|-----------------------|-------|-----------------|-------|--|------|
| Baseline Corr AF:     | 17.13 | Prev response   | 16.85 | *% change                                | 1.6% |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                            |      |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = +/-5% change initiates investigation |      |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 8.80                 | 8.98                                       | 0.979                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 8.80                 | 8.80                                       | 1.000                      |
| second point              | 4960              | 40.1                 | 4.40                 | 4.40                                       | 1.000                      |
| third point               | 4980              | 20.0                 | 2.19                 | 2.19                                       | 1.001                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 8.80                 | 8.84                                       | 0.995                      |
| Average Correction Factor |                   |                      |                      |  | 1.000                      |
| Baseline Corr AF:         | 8.98              | Prev response        | 8.79                 | *% change                                  | 2.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 8.02                 | 8.15                                       | 0.985                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 8.02                 | 8.01                                       | 1.002                      |
| second point              | 4960              | 40.1                 | 4.01                 | 3.97                                       | 1.012                      |
| third point               | 4980              | 20.0                 | 2.00                 | 1.96                                       | 1.021                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 8.02                 | 7.97                                       | 1.007                      |
| Average Correction Factor |                   |                      |                      |  | 1.011                      |
| Baseline Corr AF:         | 8.15              | Prev response        | 8.06                 | *% change                                  | 1.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.003029     | 0.999735      |
| THC Cal Offset:             | -0.014898    | -0.023917     |
| CH <sub>4</sub> Cal Slope:  | 1.006623     | 0.999431      |
| CH <sub>4</sub> Cal Offset: | -0.017040    | -0.023056     |
| NMHC Cal Slope:             | 0.999387     | 1.000064      |
| NMHC Cal Offset:            | 0.002541     | -0.001060     |

Notes: Changed inlet filter and N<sub>2</sub> cylinder after as founds. Adjusted span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## THC Calibration Summary

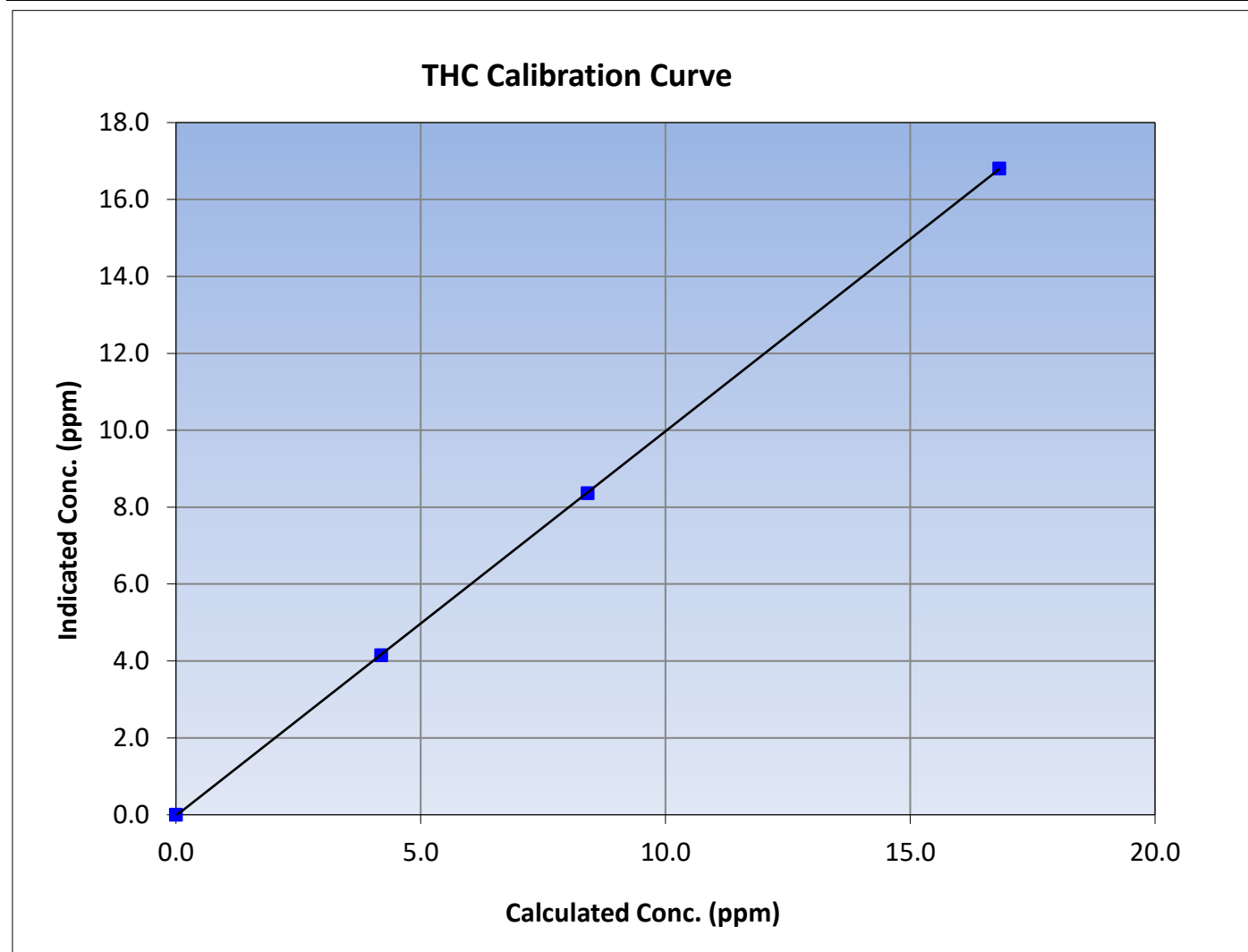
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Mildred Lake     | Station Number:       | AMS02           |
| Start Time (MST): | 9:57             | End Time (MST):       | 13:07           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320038      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999990  | $\geq 0.995$  |       |          |             |
| 16.82                               | 16.80                              | 1.0008                    |                         |           |               |       |          |             |
| 8.41                                | 8.36                               | 1.0054                    |                         |           |               | Slope | 0.999735 | 0.90 - 1.10 |
| 4.19                                | 4.15                               | 1.0107                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.023917 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

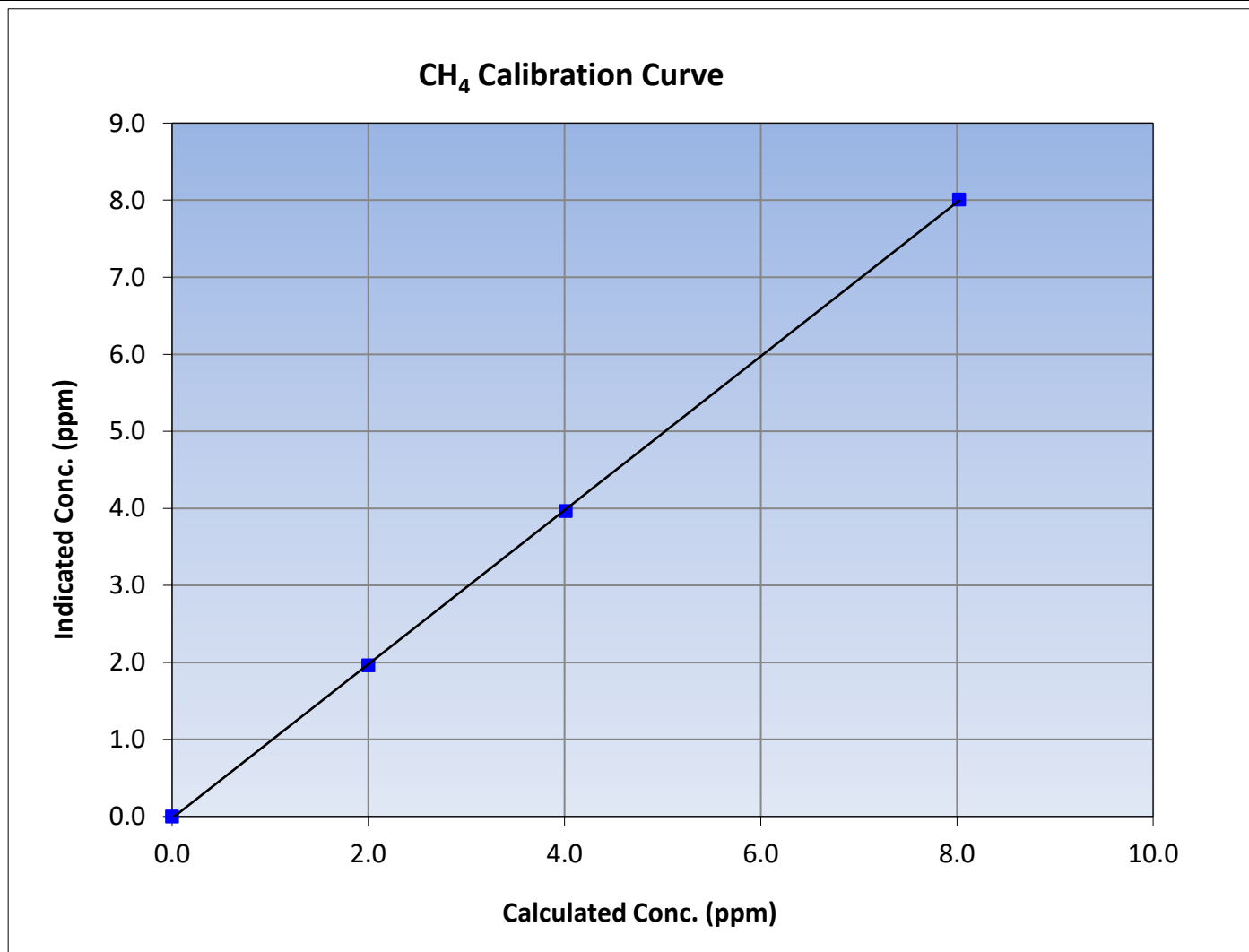
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Mildred Lake     | Station Number:       | AMS02           |
| Start Time (MST): | 9:57             | End Time (MST):       | 13:07           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320038      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999958  | $\geq 0.995$  |       |          |             |
| 8.02                                | 8.01                               | 1.0016                    |                         |           |               |       |          |             |
| 4.01                                | 3.97                               | 1.0117                    |                         |           |               | Slope | 0.999431 | 0.90 - 1.10 |
| 2.00                                | 1.96                               | 1.0208                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.023056 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

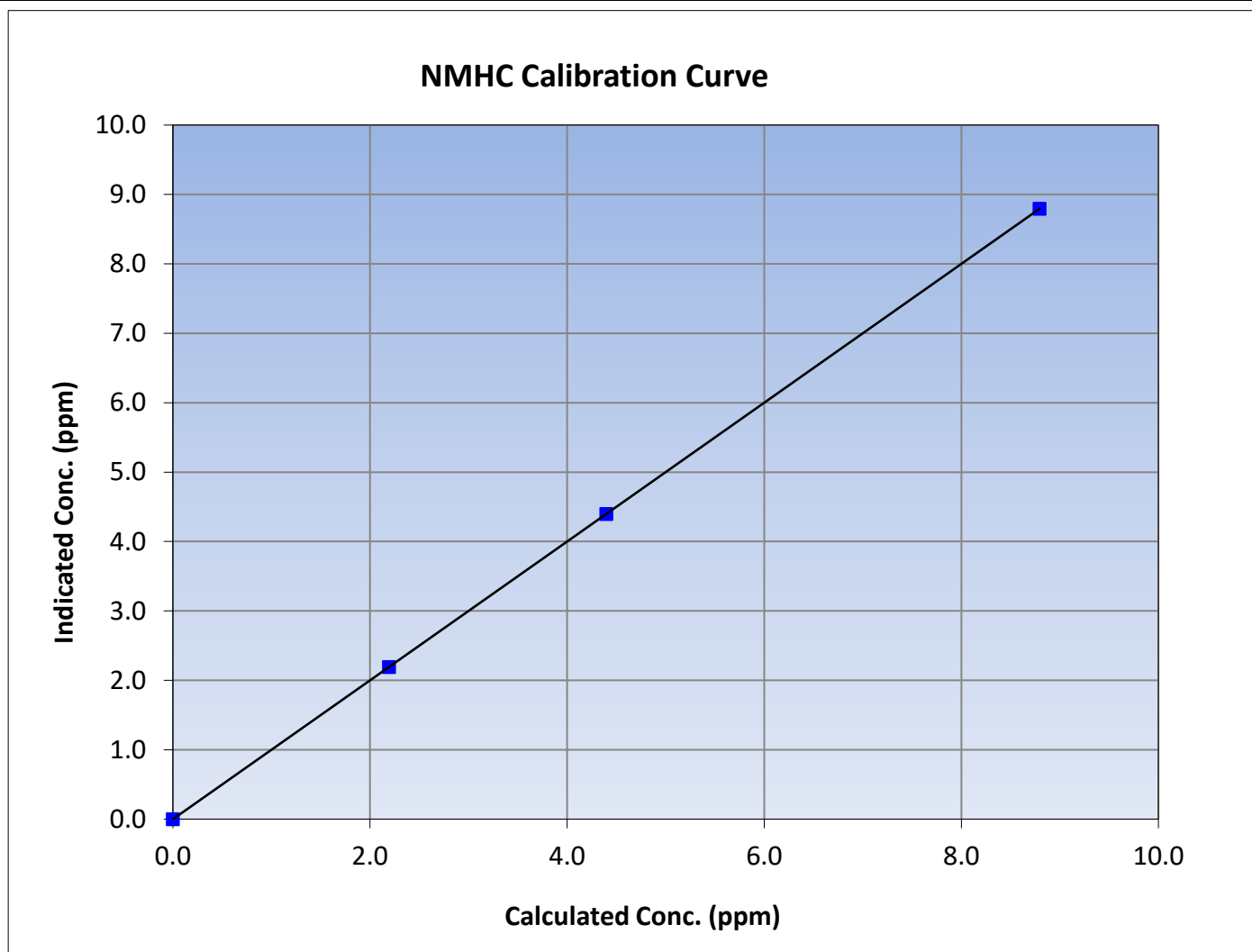
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Mildred Lake     | Station Number:       | AMS02           |
| Start Time (MST): | 9:57             | End Time (MST):       | 13:07           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1180320038      |

### Calibration Data

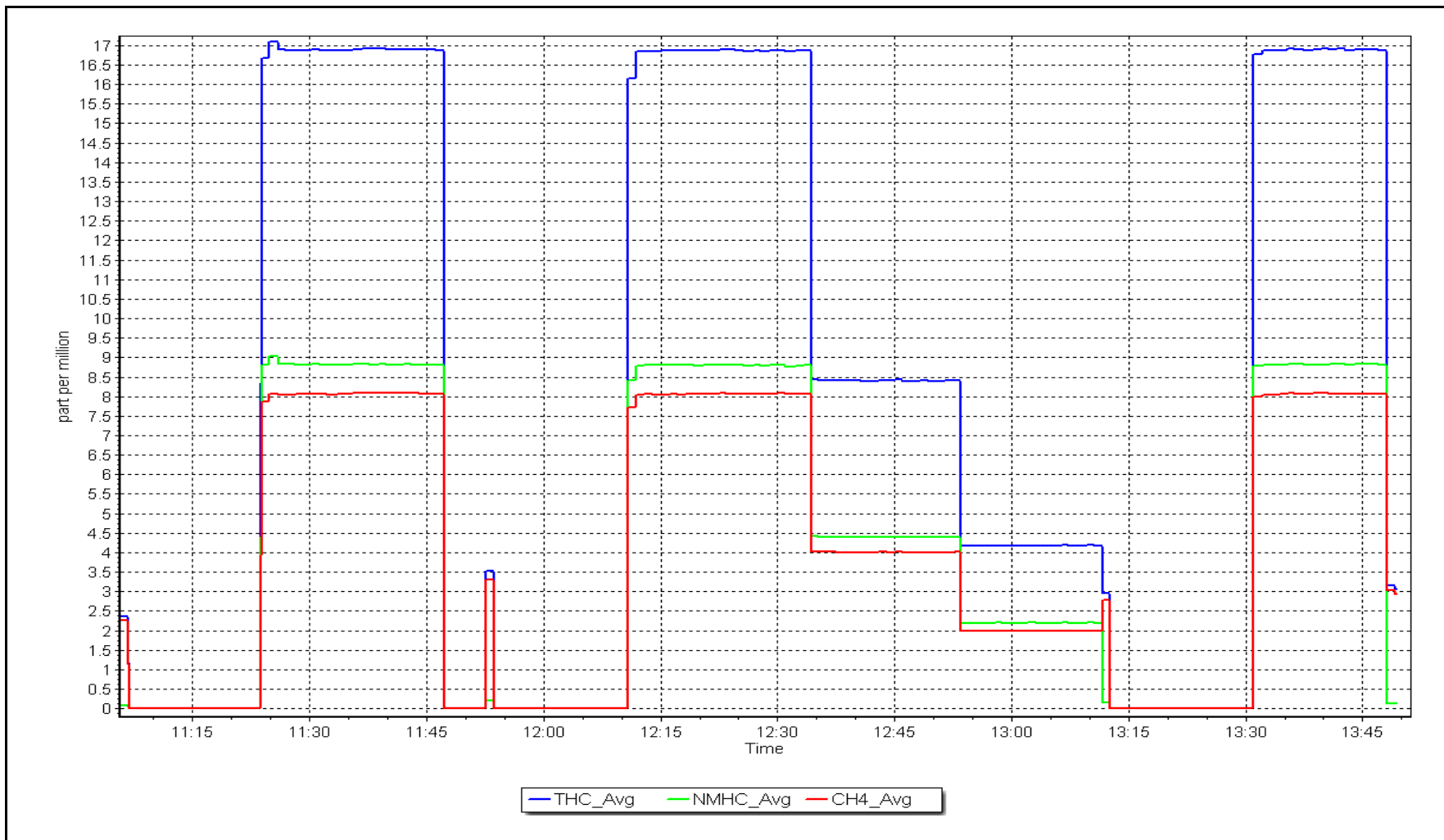
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 1.000000  | $\geq 0.995$  |       |          |             |
| 8.80                                | 8.80                               | 1.0000                    |                         |           |               |       |          |             |
| 4.40                                | 4.40                               | 1.0002                    |                         |           |               | Slope | 1.000064 | 0.90 - 1.10 |
| 2.19                                | 2.19                               | 1.0011                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.001060 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 8, 2023

Location: Mildred Lake





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS04 BUFFALO VIEWPOINT FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04            |
| Calibration Date: | February 10, 2023 | Last Cal Date:  | January 12, 2023 |
| Start time (MST): | 7:18              | End time (MST): | 10:59            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |          |     |                   |                   |
|------------------------|----------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 50.02    | ppm | Cal Gas Exp Date: | September 9, 2028 |
| Cal Gas Cylinder #:    | CC470284 |     |                   |                   |
| Removed Cal Gas Conc:  | 50.02    | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 2445              |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 5611              |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1327300932 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.998800     | 0.998701      | Backgd or Offset: | 21.5         | 21.5          |
| Calibration intercept: | 0.680000     | 1.140000      | Coeff or Slope:   | 0.869        | 0.869         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.7                                | ----  |
| as found span             | 4920                          | 80.0                        | 800.3                               | 763.8                              | 1.048   |
| as found 2nd point        | 4960                          | 40.0                        | 400.2                               | 374.0                              | 1.070   |
| as found 3rd point        | 4980                          | 20.0                        | 200.1                               | 188.0                              | 1.064   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.9                                | ----  |
| high point                | 4920                          | 80.0                        | 800.3                               | 800.2                              | 1.000   |
| second point              | 4960                          | 40.0                        | 400.2                               | 401.2                              | 0.997   |
| third point               | 4980                          | 20.0                        | 200.1                               | 201.0                              | 0.995   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.8                                | ----  |
| as left span              | 4920                          | 80.0                        | 800.3                               | 798.5                              | 1.002   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.998   |

|                          |        |                   |          |               |           |
|--------------------------|--------|-------------------|----------|---------------|-----------|
| Baseline Corr As found:  | 763.10 | Previous response | 800.04   | *% change     | -4.8%     |
| Baseline Corr 2nd AF pt: | 373.30 | AF Slope:         | 0.953804 | AF Intercept: | -2.340000 |
| Baseline Corr 3rd AF pt: | 187.30 | AF Correlation:   | 0.999856 |               |           |

\* = > +/-5% change initiates investigation

Notes: As found Span is low, nightly spans around 800ppb. After filter change spans around 800ppb. No Maintenance or adjustments done.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

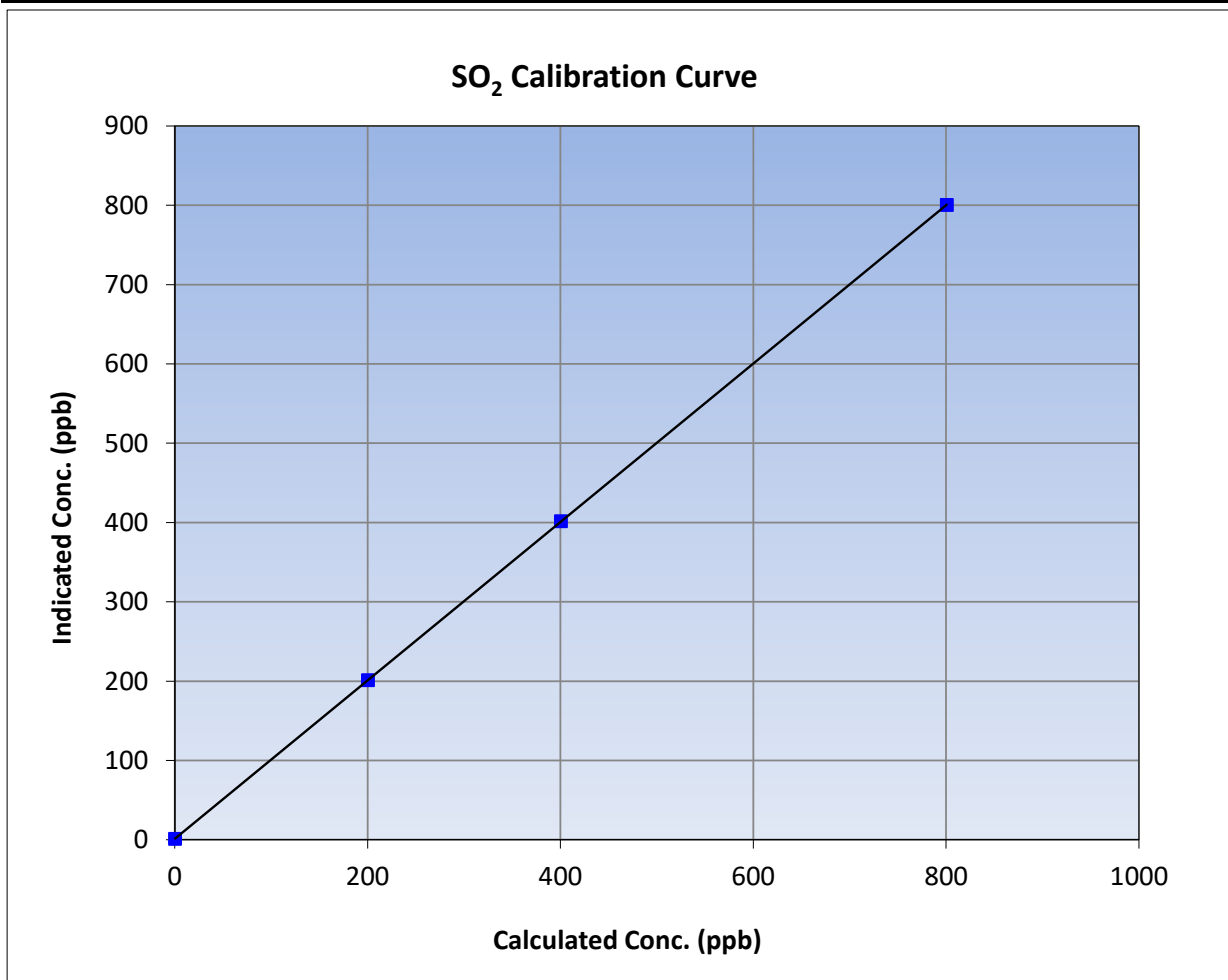
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 7:45              | End Time (MST):       | 10:59            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | JC1327300932     |

### Calibration Data

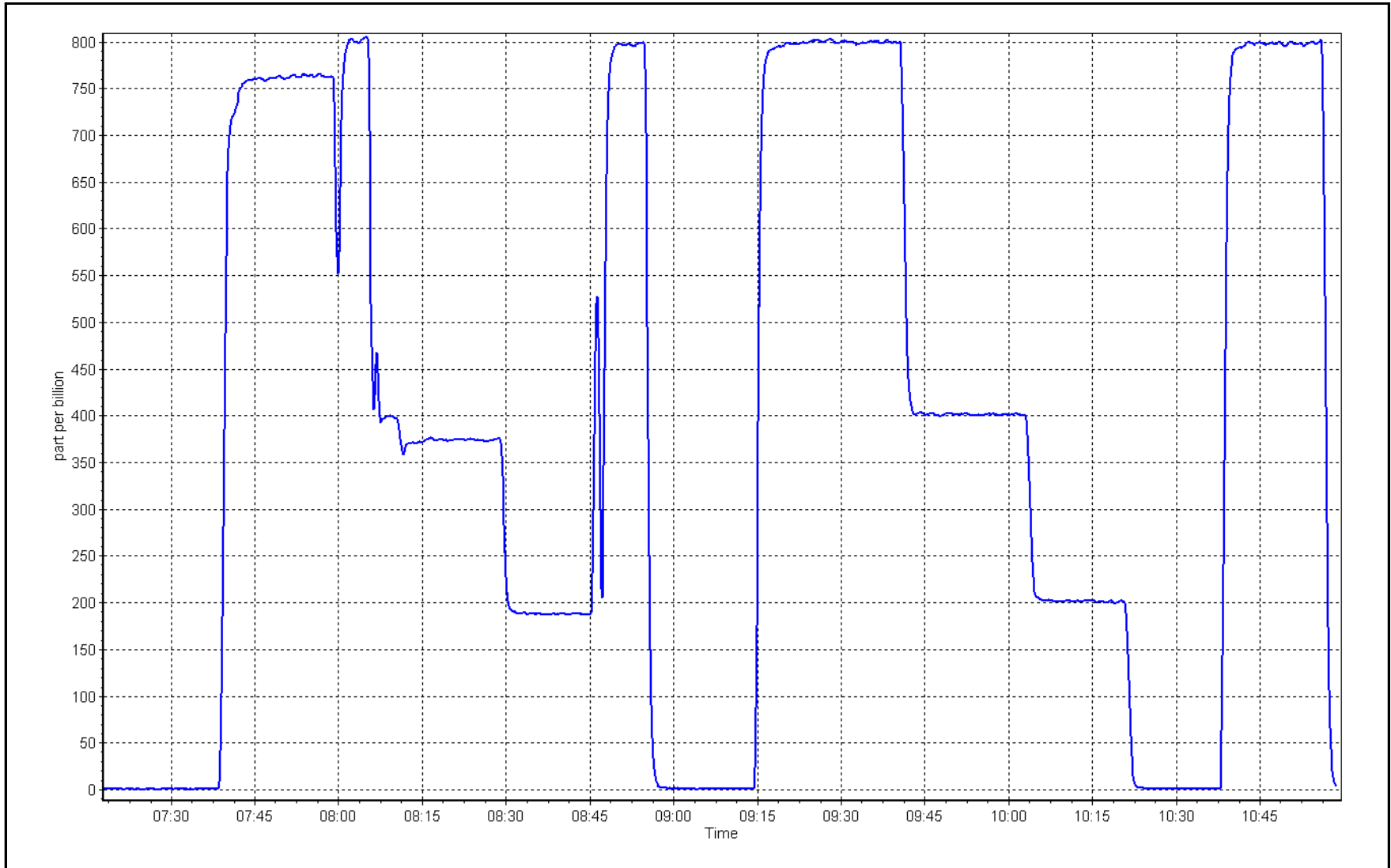
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.9                                | ----                      | Correlation Coefficient | 0.999999 | ≥0.995      |
| 800.3                               | 800.2                              | 1.0001                    |                         |          |             |
| 400.2                               | 401.2                              | 0.9974                    | Slope                   | 0.998701 | 0.90 - 1.10 |
| 200.1                               | 201.0                              | 0.9954                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.140000 | +/-30       |



SO2 Calibration Plot

Date: February 10, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04            |
| Calibration Date: | February 15, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 7:20              | End time (MST): | 11:19            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |           |     |                   |                 |
|------------------------|-----------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 5.42      | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #:    | CC345266  |     |                   |                 |
| Removed Cal Gas Conc:  | 5.42      | ppm | Rem Gas Exp Date: | January 4, 2025 |
| Removed Gas Cyl #:     | CC345266  |     | Diff between cyl: |                 |
| Calibrator Make/Model: | API T700  |     | Serial Number:    | 3060            |
| ZAG Make/Model:        | API T701H |     | Serial Number:    | 362             |

### Analyzer Information

|                 |             |                     |            |
|-----------------|-------------|---------------------|------------|
| Analyzer make:  | Thermo 450i | Analyzer serial #:  | 1336160094 |
| Converter make: | NA          | Converter serial #: | NA         |
| Analyzer Range  | 0 - 100 ppb |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 1.000770     | 1.001200      | Backgd or Offset: | 20.1          |
| Calibration intercept: | 0.002271     | 0.162167      | Coeff or Slope:   | 1.119         |
|                        |              |               |                   | 18.7          |
|                        |              |               |                   | 1.080         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.4                               | ----   |
| as found span         | 4926                          | 74.1                        | 80.3                                | 82.9                               | 0.964  |
| as found 2nd point    | 4963                          | 37.0                        | 40.1                                | 41.5                               | 0.957  |
| as found 3rd point    | 4982                          | 18.5                        | 20.1                                | 20.6                               | 0.955  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4926                          | 74.1                        | 80.3                                | 80.6                               | 0.997   |
| second point                            | 4963                          | 37.0                        | 40.1                                | 40.3                               | 0.995   |
| third point                             | 4982                          | 18.5                        | 20.1                                | 20.2                               | 0.993   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span                            | 4926                          | 74.1                        | 80.3                                | 80.6                               | 0.997   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | -0.2                               | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.995   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 83.3 | Prev response:  | 80.39    | *% change:    | 3.5%      |
| Baseline Corr 2nd AF pt: | 41.9 | AF Slope:       | 1.036623 | AF Intercept: | -0.256912 |
| Baseline Corr 3rd AF pt: | 21.0 | AF Correlation: | 0.999982 |               |           |

\* = > +/-5% change initiates investigation

Notes: Sox scrubber checked after the calibrator zero. Zero and span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

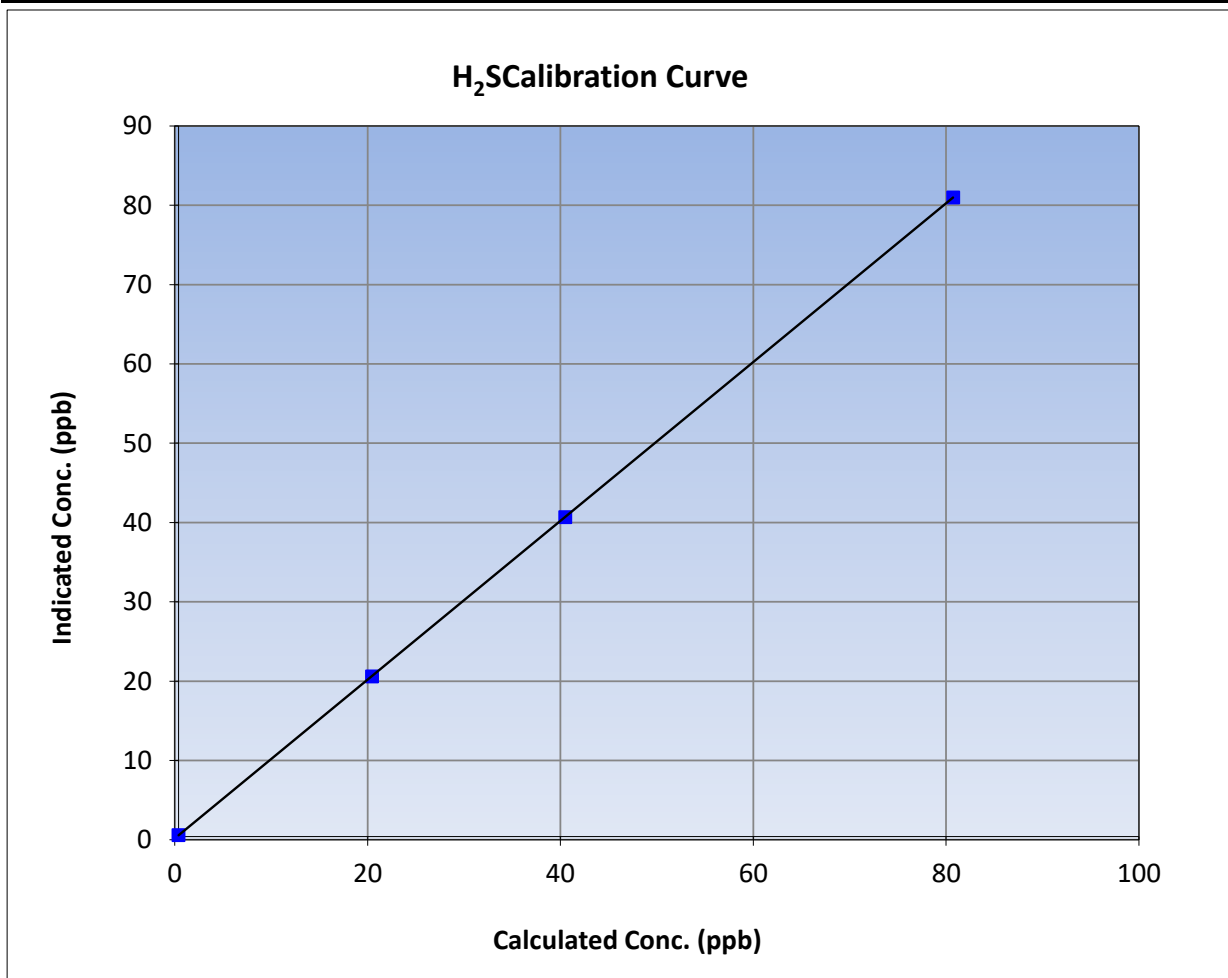
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 7:20              | End Time (MST):       | 11:19            |
| Analyzer make:    | Thermo 450i       | Analyzer serial #:    | 1336160094       |

### Calibration Data

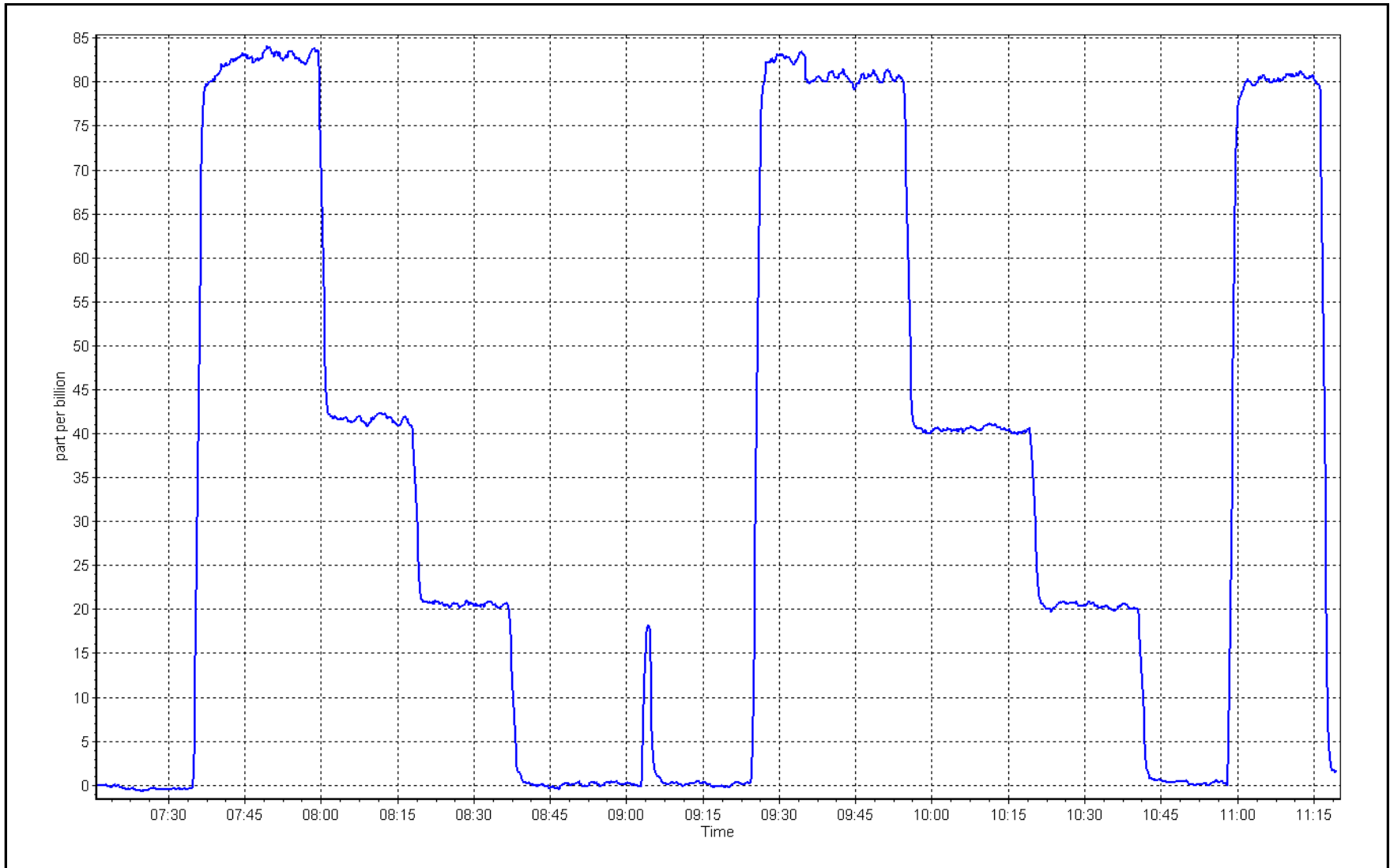
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999999 |             |
| 80.3                                | 80.6                               | 0.9966                    |                         |          | ≥0.995      |
| 40.1                                | 40.3                               | 0.9952                    | Slope                   | 1.001200 |             |
| 20.1                                | 20.2                               | 0.9927                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.162167 | +/-3        |



# H<sub>2</sub>S Calibration Plot

Date: February 15, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Buffalo Viewpoint | Station number: | AMS04            |
| Calibration Date: | February 10, 2023 | Last Cal Date:  | January 12, 2023 |
| Start time (MST): | 7:18              | End time (MST): | 10:58            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC470284  | Cal Gas Expiry Date:        | September 9, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.5 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 497.8 ppm | CH <sub>4</sub> Equiv Conc. | 1062.9 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.5 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2445              |
| ZAG make/model:                             | API T701  | Serial Number:              | 362               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1426262594 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.070E-04    | 3.070E-04     | NMHC SP Ratio:  | 6.120E-05     |
| CH <sub>4</sub> Retention time: | 13.6         | 13.6          | NMHC Peak Area: | 147690        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.0                 | 17.01                | 16.86               | 1.009                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.0                 | 17.01                | 17.07               | 0.996                      |
| second point          | 4960              | 40.0                 | 8.50                 | 8.35                | 1.018                      |
| third point           | 4980              | 20.0                 | 4.25                 | 4.16                | 1.022                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.0                 | 17.01                | 17.06               | 0.997                      |

| Average Correction Factor |       |                 |       | 1.012                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 16.86 | Prev response   | 17.03 | *% change -1.0%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       |                            |
| as found span             | 4920              | 80.0                 | 9.04                 | 8.87                                       | 1.019                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.0                 | 9.04                 | 9.04                                       | 1.000                      |
| second point              | 4960              | 40.0                 | 4.52                 | 4.49                                       | 1.007                      |
| third point               | 4980              | 20.0                 | 2.26                 | 2.26                                       | 1.000                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.0                 | 9.04                 | 9.03                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 1.002                      |
| Baseline Corr AF:         | 8.87              | Prev response        | 9.05                 | *% change                                  | -2.0%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.0                 | 7.96                 | 7.99                                       | 0.997                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.0                 | 7.96                 | 8.04                                       | 0.991                      |
| second point              | 4960              | 40.0                 | 3.98                 | 3.87                                       | 1.029                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.91                                       | 1.043                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.0                 | 7.96                 | 8.03                                       | 0.992                      |
| Average Correction Factor |                   |                      |                      |  | 1.021                      |
| Baseline Corr AF:         | 7.99              | Prev response        | 7.99                 | *% change                                  | -0.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.005648     | 1.004640      |
| THC Cal Offset:             | -0.070000    | -0.080000     |
| CH <sub>4</sub> Cal Slope:  | 1.011450     | 1.011594      |
| CH <sub>4</sub> Cal Offset: | -0.062000    | -0.070000     |
| NMHC Cal Slope:             | 1.001675     | 0.999400      |
| NMHC Cal Offset:            | -0.010000    | -0.006000     |

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay





# Wood Buffalo Environmental Association

## THC Calibration Summary

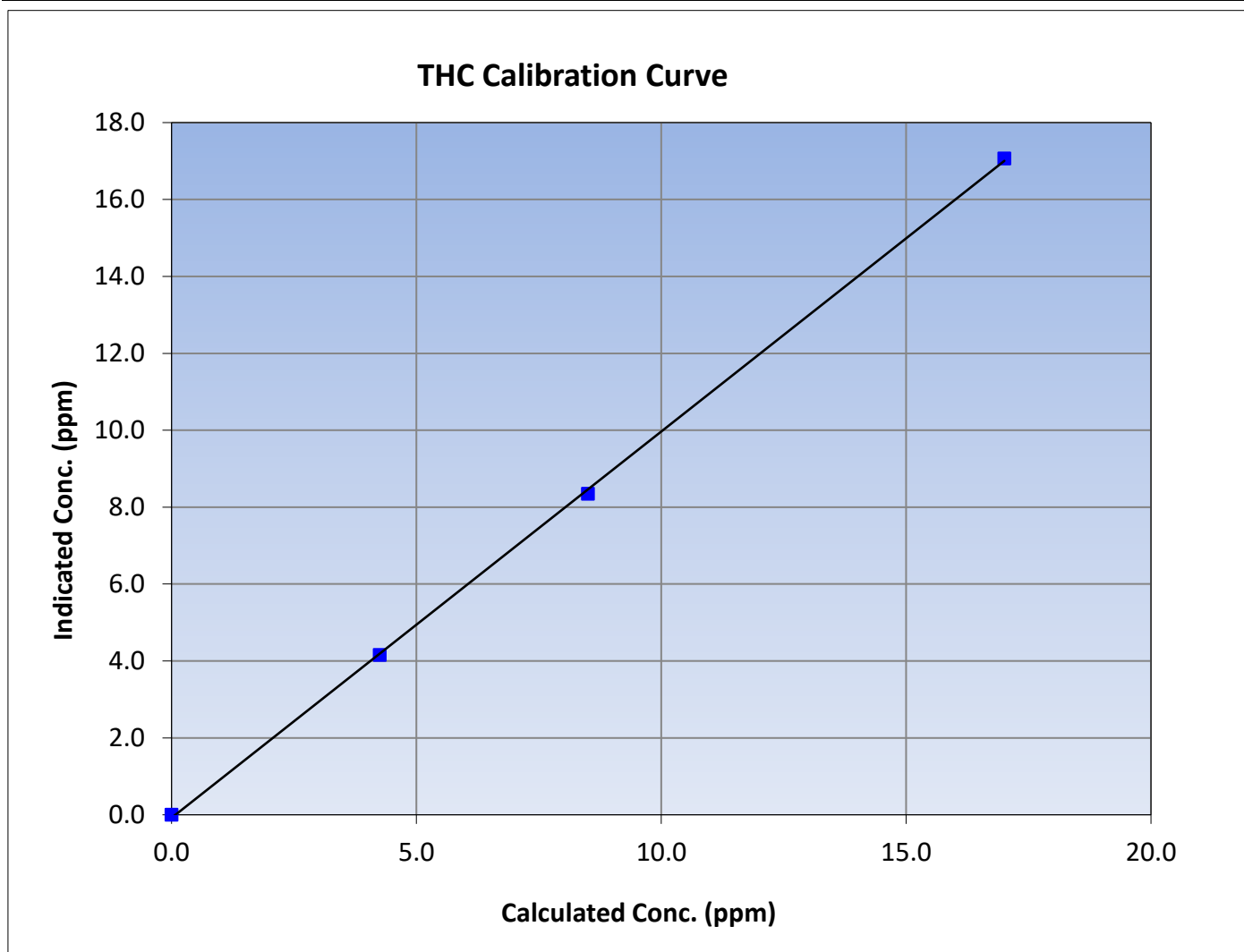
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 7:18              | End Time (MST):       | 10:58            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999848  | $\geq 0.995$  |       |          |             |
| 17.01                               | 17.07                              | 0.9963                    |                         |           |               |       |          |             |
| 8.50                                | 8.35                               | 1.0184                    |                         |           |               | Slope | 1.004640 | 0.90 - 1.10 |
| 4.25                                | 4.16                               | 1.0220                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.080000 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

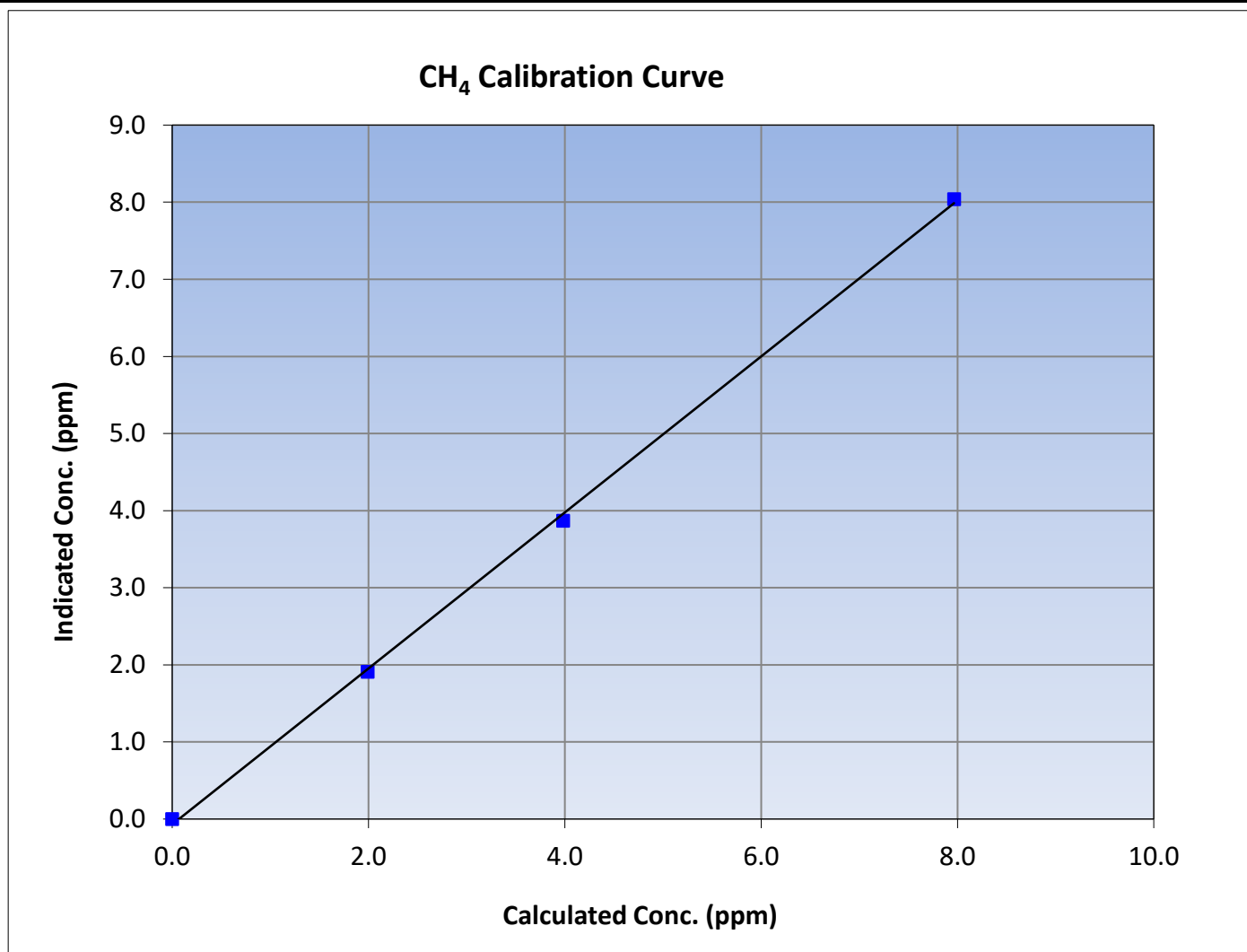
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 7:18              | End Time (MST):       | 10:58            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999529  | $\geq 0.995$  |
| 7.96                                | 8.04                               | 0.9906                    |                         |           |               |
| 3.98                                | 3.87                               | 1.0290                    |                         |           |               |
| 1.99                                | 1.91                               | 1.0425                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.011594  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.070000 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

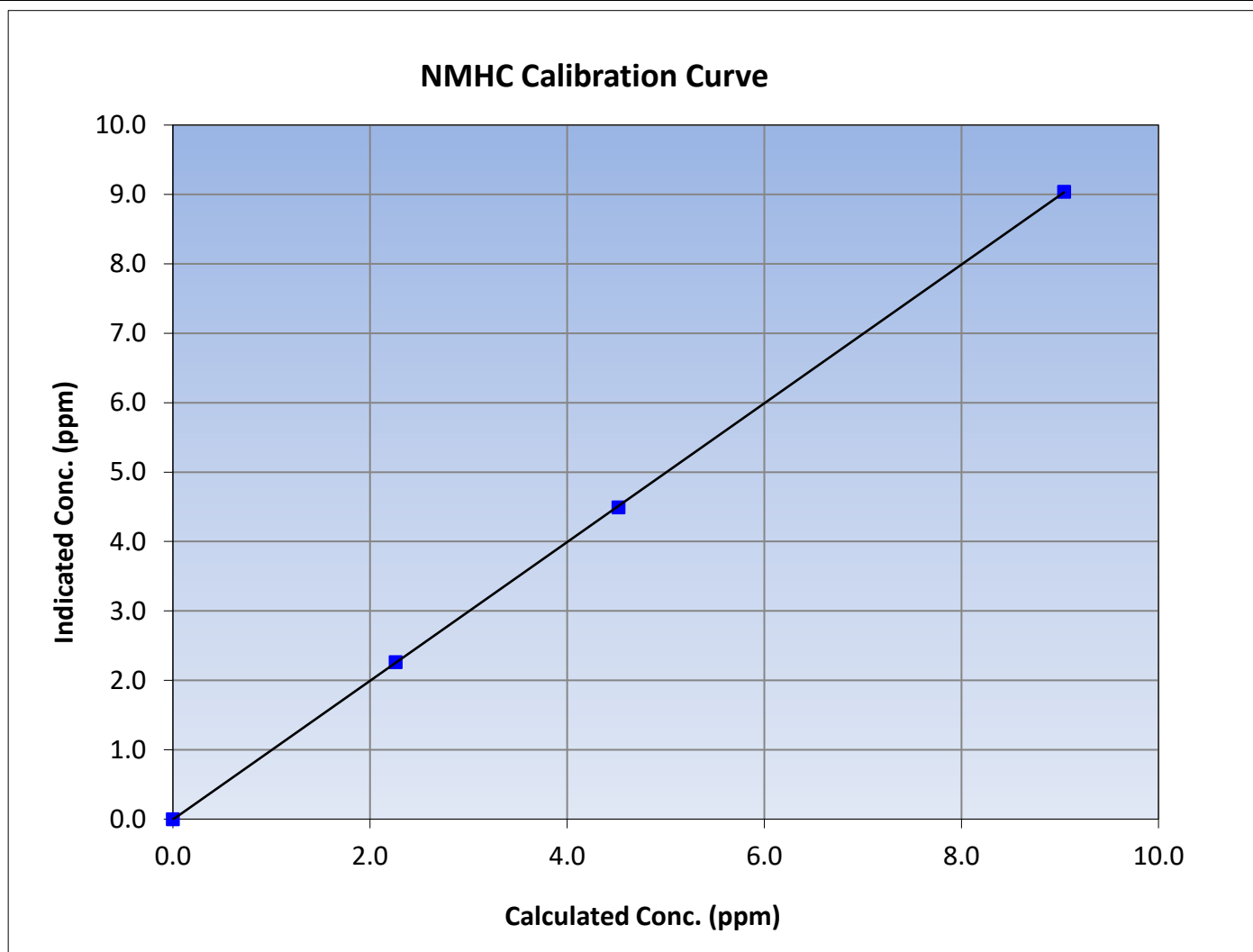
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 7:18              | End Time (MST):       | 10:58            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1426262594       |

### Calibration Data

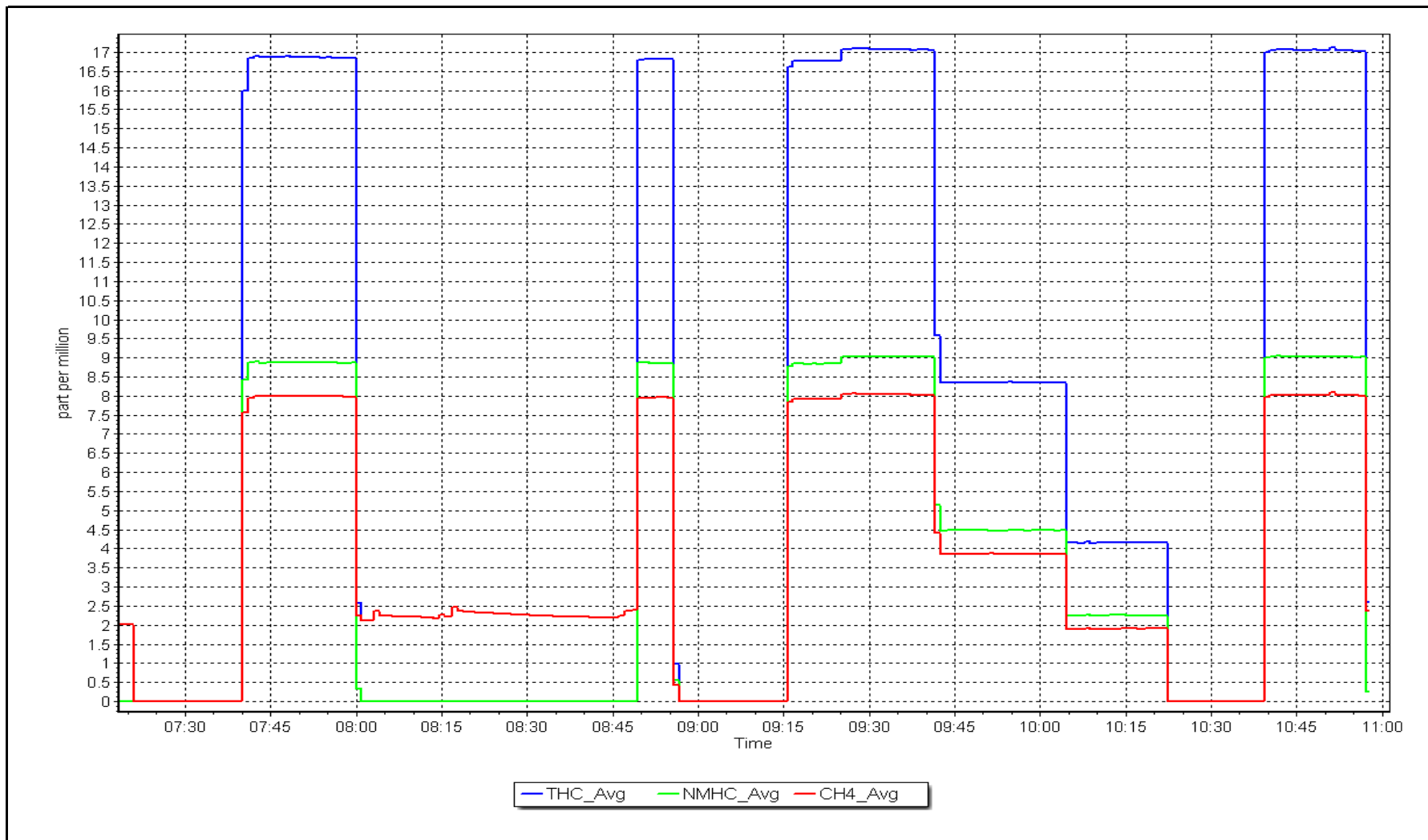
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999985  | $\geq 0.995$  |       |          |             |
| 9.04                                | 9.04                               | 1.0002                    |                         |           |               |       |          |             |
| 4.52                                | 4.49                               | 1.0069                    |                         |           |               | Slope | 0.999400 | 0.90 - 1.10 |
| 2.26                                | 2.26                               | 1.0002                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.006000 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 10, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

Station Name: Buffalo Viewpoint Station number: AMS04  
 Calibration Date: February 16, 2023 Last Cal Date: February 10, 2023  
 Start time (MST): 11:25 End time (MST): 12:44  
 Reason: Cylinder Change Nitrogen Cylinder Change

### Calibration Standards

Gas Cert Reference: CC470284 Cal Gas Expiry Date: September 9, 2028  
 CH<sub>4</sub> Cal Gas Conc. 497.8 ppm CH<sub>4</sub> Equiv Conc. 1062.9 ppm  
 C<sub>3</sub>H<sub>8</sub> Cal Gas Conc. 205.5 ppm  
 Removed Gas Cert: NA Removed Gas Expiry: NA  
 Removed CH<sub>4</sub> Conc. 497.8 ppm CH<sub>4</sub> Equiv Conc. 1062.9 ppm  
 Removed C<sub>3</sub>H<sub>8</sub> Conc. 205.5 ppm  
 Diff between cyl (CH<sub>4</sub>): Diff between cyl (NM):  
 Calibrator Model: API T700 Serial Number: 2445  
 ZAG make/model: API T701 Serial Number: 362

### Analyzer Information

Analyzer make: Thermo 55i Analyzer serial #: 1426262594  
 THC Range (ppm): 0 - 20 ppm  
 NMHC Range (ppm): 0 - 10 ppm CH<sub>4</sub> Range (ppm): 0 - 10 ppm

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.070E-04    | 3.070E-04     | NMHC SP Ratio:  | 6.120E-05     |
| CH <sub>4</sub> Retention time: | 13.6         | 13.6          | NMHC Peak Area: | 147690        |
|                                 |              |               |                 | 147690        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.0                 | 17.01                | 17.11               | 0.994                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.0                 | 17.01                | 17.03               | 0.999                      |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          |                   |                      |                      |                     |                            |
| as left span          |                   |                      |                      |                     |                            |

|                       |       |                 |       | Average Correction Factor                  | 0.999 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 17.11 | Prev response   | 17.01 | *% change                                  | 0.6%  |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00   |                            |
| as found span         | 4920              | 80.0                 | 9.04                 | 9.04   | 1.000                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.0                 | 9.04                 | 9.00   | 1.005                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 1.005                      |
| Baseline Corr AF:     | 9.04              | Prev response        | 9.03                 | *% change  | 0.1%                       |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span         | 4920              | 80.0                 | 7.96                 | 8.06   | 0.988                      |
| as found 2nd point    |                   |                      |                      |  |                            |
| as found 3rd point    |                   |                      |                      |  |                            |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point            | 4920              | 80.0                 | 7.96                 | 8.03   | 0.992                      |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                            | 0.992                      |
| Baseline Corr AF:     | 8.06              | Prev response        | 7.99                 | *% change  | 0.9%                       |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004640     | 1.001364      |
| THC Cal Offset:             | -0.080000    | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 1.011594     | 1.008186      |
| CH <sub>4</sub> Cal Offset: | -0.070000    | 0.000000      |
| NMHC Cal Slope:             | 0.999400     | 0.995355      |
| NMHC Cal Offset:            | -0.006000    | 0.000000      |

Notes:

Nitrogen Cylinder Change

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot

Date: February 16, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Buffalo Viewpoint  
Calibration Date: February 13, 2023  
Start time (MST): 8:00  
Reason: As Found  
Station number: AMS04  
Last Cal Date: January 13, 2023  
End time (MST): 11:00

### Calibration Standards

NO Gas Cylinder #: T36RH1F  
NOX Cal Gas Conc: 51.16 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 51.16 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701  
Cal Gas Expiry Date: August 18, 2023  
NO Cal Gas Conc: 50.91 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 50.91 ppm  
NO gas Diff:  
Serial Number: 2445  
Serial Number: 362

### Analyzer Information

Analyzer make: API T200  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 723

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.204        | 1.204         | NO bkgnd or offset:  | -0.3         | -0.3          |
| NOX coeff or slope: | 1.203        | 1.203         | NOX bkgnd or offset: | -0.1         | -0.1          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 6.4          | 6.4           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000402     |               |
| NO <sub>x</sub> Cal Offset: | 0.466890     |               |
| NO Cal Slope:               | 1.001422     |               |
| NO Cal Offset:              | -0.653871    |               |
| NO <sub>2</sub> Cal Slope:  | 1.000220     |               |
| NO <sub>2</sub> Cal Offset: | 1.229528     |               |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point       | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero   | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.9  | 0.4                                   | 0.6  | ----  | ----   |
| as found span   | 4922                      | 78.1                        | 799.1   | 795.2                                  | 3.9   | 772.1  | 767.9                                 | 4.2  | 1.0350  | 1.0355   |
| as found 2nd    | 4961                      | 39.1                        | 400.1   | 398.1                                  | 2.0   | 385.8  | 382.6                                 | 3.2  | 1.0370  | 1.0405   |
| as found 3rd    | 4981                      | 19.5                        | 199.5   | 198.5                                  | 1.0   | 193.9  | 189.5                                 | 4.4  | 1.0289  | 1.0476   |
| new cyl resp    |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero |                           |                             |   |  |   |  |                                       |  |   |  |
| high point      |                           |                             |   |  |   |  |                                       |  |   |  |
| second point    |                           |                             |   |  |   |  |                                       |  |   |  |
| third point     |                           |                             |   |  |   |  |                                       |  |   |  |
| as left zero    |                           |                             |   |  |   |  |                                       |  |   |  |
| as left span    |                           |                             |   |  |   |  |                                       |  |   |  |

### Average Correction Factor

|                      |                             |                |  |   |                              |                            |
|----------------------|-----------------------------|----------------|--|---|------------------------------|----------------------------|
| Corrected As found   | NO <sub>x</sub> = 771.2 ppb | NO = 767.5 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |   | *Percent Change              | NO <sub>x</sub> = -3.7%    |
| Previous Response    | NO <sub>x</sub> = 799.9 ppb | NO = 795.7 ppb |  |   | *Percent Change              | NO = -3.7%                 |
| Baseline Corr 2nd pt | NO <sub>x</sub> = 384.9 ppb | NO = 382.2 ppb | As found   | NO <sub>x</sub> r <sup>2</sup> : 0.999996 | Nx SI: 0.964711              | Nx Int: 0.847              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = 193.0 ppb | NO = 189.1 ppb | As found   | NO r <sup>2</sup> : 0.999984              | NO SI: 0.965958              | NO Int: -1.014             |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : 0.999972 | NO <sub>2</sub> SI: 0.994883 | NO <sub>2</sub> Int: 1.558 |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             | ----                                       | ----                                  | 0.0   | 0.6  | ----   | ----   |
| as found GPT point (400 ppb NO <sub>2</sub> ) | 765.7                                      | 353.5                                 | 416.1   | 414.9  | 1.0029   | 99.7%  |
| as found GPT point (200 ppb NO <sub>2</sub> ) | 765.7                                      | 559.6                                 | 210.0   | 211.4  | 0.9934   | 100.7%   |
| as found GPT point (100 ppb NO <sub>2</sub> ) | 765.7                                      | 663.2                                 | 106.4   | 108.1  | 0.9843   | 101.6%   |
| 1st GPT point (400 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |
| 2nd GPT point (200 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |
| 3rd GPT point (100 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |

### Average Correction Factor

Notes:

As Finds for Cleaning Reaction Cell and replacing critical flow orifices.

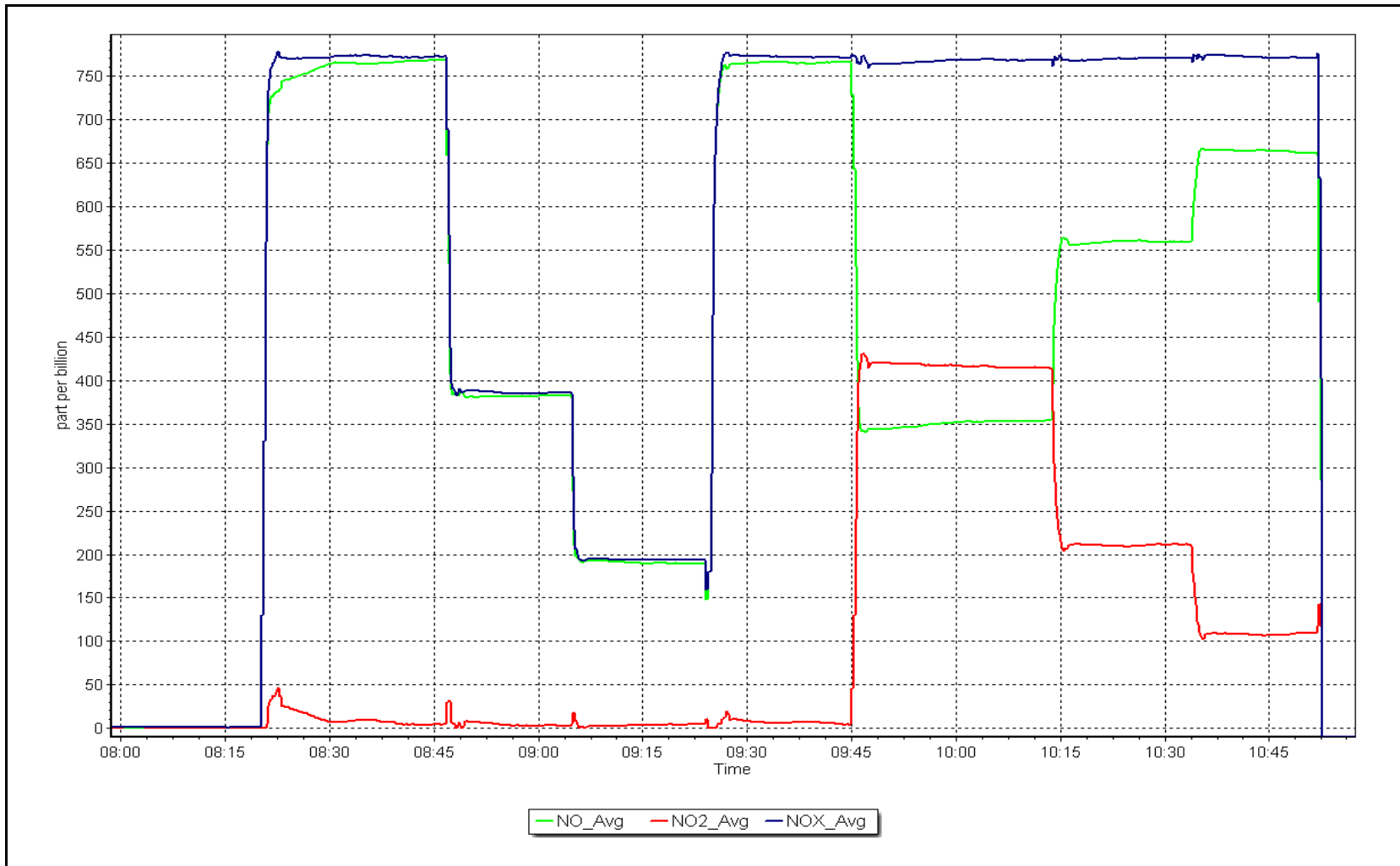
Calibration Performed By:

Melissa Lemay

NO<sub>x</sub> Calibration Plot

Date: February 13, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Buffalo Viewpoint  
Calibration Date: February 14, 2023  
Start time (MST): 7:40  
Reason: Routine  
Station number: AMS04  
Last Cal Date: February 13, 2023  
End time (MST): 11:16

### Calibration Standards

NO Gas Cylinder #: T36RH1F  
NOX Cal Gas Conc: 51.16 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 51.16 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701  
Cal Gas Expiry Date: August 18, 2023  
NO Cal Gas Conc: 50.91 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 50.91 ppm  
NO gas Diff:  
Serial Number: 2445  
Serial Number: 362

### Analyzer Information

Analyzer make: API T200  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 723

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.204        | 0.993         | NO bkgnd or offset:  | -0.3         | -9.0          |
| NOX coeff or slope: | 1.203        | 0.988         | NOX bkgnd or offset: | -0.1         | -9.0          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 7.6          | 7.6           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000402     | 1.000759      |
| NO <sub>x</sub> Cal Offset: | 0.466890     | 0.966826      |
| NO Cal Slope:               | 1.001422     | 1.004151      |
| NO Cal Offset:              | -0.653871    | -0.053156     |
| NO <sub>2</sub> Cal Slope:  | 1.000220     | 0.994427      |
| NO <sub>2</sub> Cal Offset: | 1.229528     | -0.612933     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             |                           |                             |   |  |   |  |                                       |  |   |  |
| as found span             |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.4  | 0.4                                   | 0.1  | ----  | ----   |
| high point                | 4922                      | 78.1                        | 799.1   | 795.2                                  | 3.9   | 800.6  | 798.9                                 | 1.7  | 0.9981  | 0.9954   |
| second point              | 4961                      | 39.1                        | 400.1   | 398.1                                  | 2.0   | 401.0  | 398.8                                 | 2.2  | 0.9977  | 0.9983   |
| third point               | 4981                      | 19.5                        | 199.5   | 198.5                                  | 1.0   | 201.6  | 199.3                                 | 2.3  | 0.9896  | 0.9961   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | -0.3                                  | 0.0  | ----  | ----   |
| as left span              | 4922                      | 78.1                        | 799.1   | 358.0                                  | 441.1   | 795.5  | 357.8                                 | 437.8  | 1.0045  | 1.0006   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9951  | 0.9966   |

|                      |                      |     |         |     |  |                                  |                     |                      |
|----------------------|----------------------|-----|---------|-----|--|----------------------------------|---------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = NA | ppb | NO = NA | ppb | <i>* = &gt; +/-5% change initiates investigation</i> |                                  | *Percent Change     | NO <sub>x</sub> = NA |
| Previous Response    | NO <sub>x</sub> = NA | ppb | NO = NA | ppb |  |                                  | *Percent Change     | NO = NA              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA | ppb | NO = NA | ppb | As found   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:              | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA | ppb | NO = NA | ppb | As found   | NO r <sup>2</sup> :              | NO SI:              | NO Int:              |
|                      |                      |     |         |     | As found   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 796.0                                      | 358.8                                 | 441.1   | 438.1  | 1.0069   | 99.3%  |
| 2nd GPT point (200 ppb O3)       | 796.0                                      | 574.5                                 | 225.4   | 224.1  | 1.0058   | 99.4%  |
| 3rd GPT point (100 ppb O3)       | 796.0                                      | 683.5                                 | 116.4   | 113.8  | 1.0229   | 97.8%  |
| Average Correction Factor        |  |                                       |   |  | 1.0119   | 98.8%  |

Notes: Calibration after Cleaning Reaction Cell and replacing critical flow orifices. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

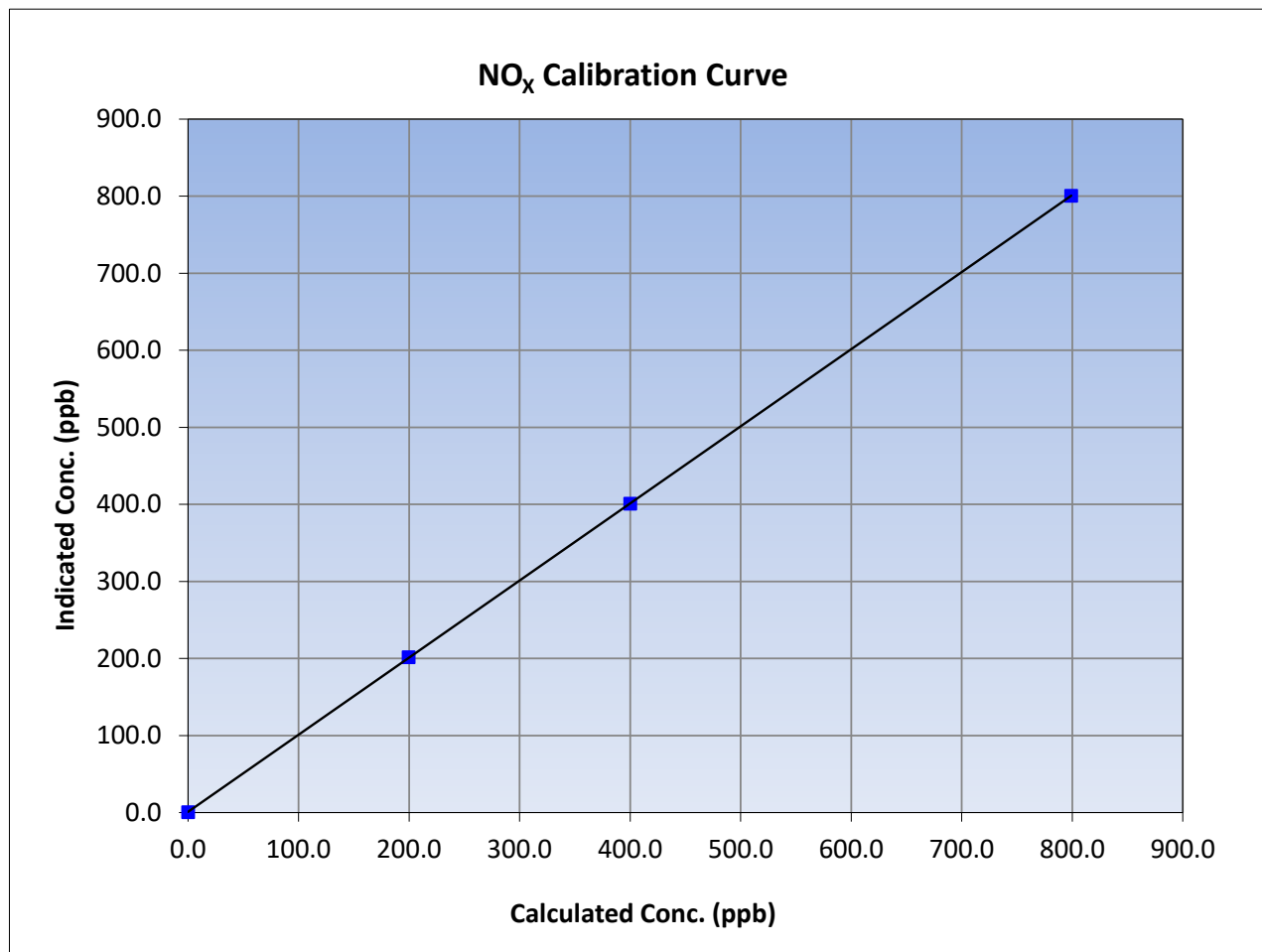
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | February 13, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 7:40              | End Time (MST):       | 11:16             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 799.1                               | 800.6                              | 0.9981                    |                         |          |             |
| 400.1                               | 401.0                              | 0.9977                    |                         |          |             |
| 199.5                               | 201.6                              | 0.9896                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 1.000759 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.966826 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

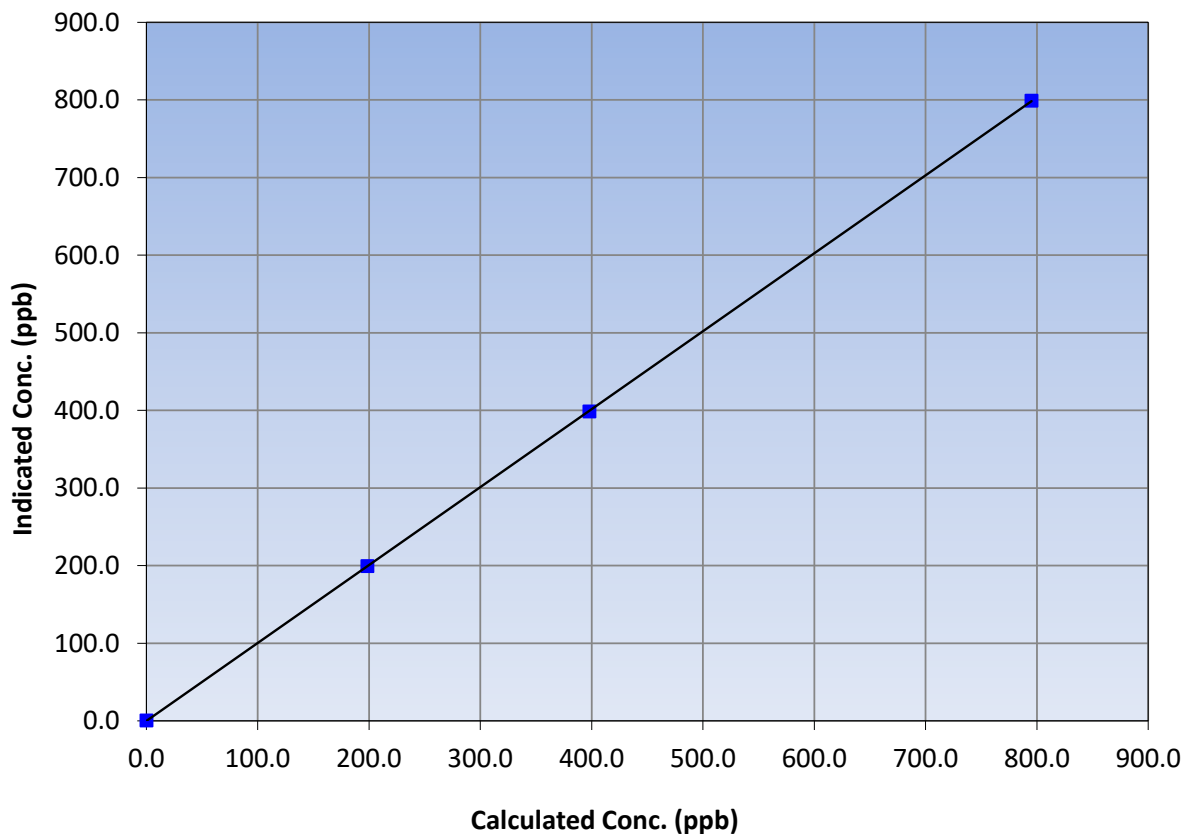
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | February 13, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 7:40              | End Time (MST):       | 11:16             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 795.2                               | 798.9                              | 0.9954                    |                         |               |             |
| 398.1                               | 398.8                              | 0.9983                    |                         |               |             |
| 198.5                               | 199.3                              | 0.9961                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.004151      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.053156     | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

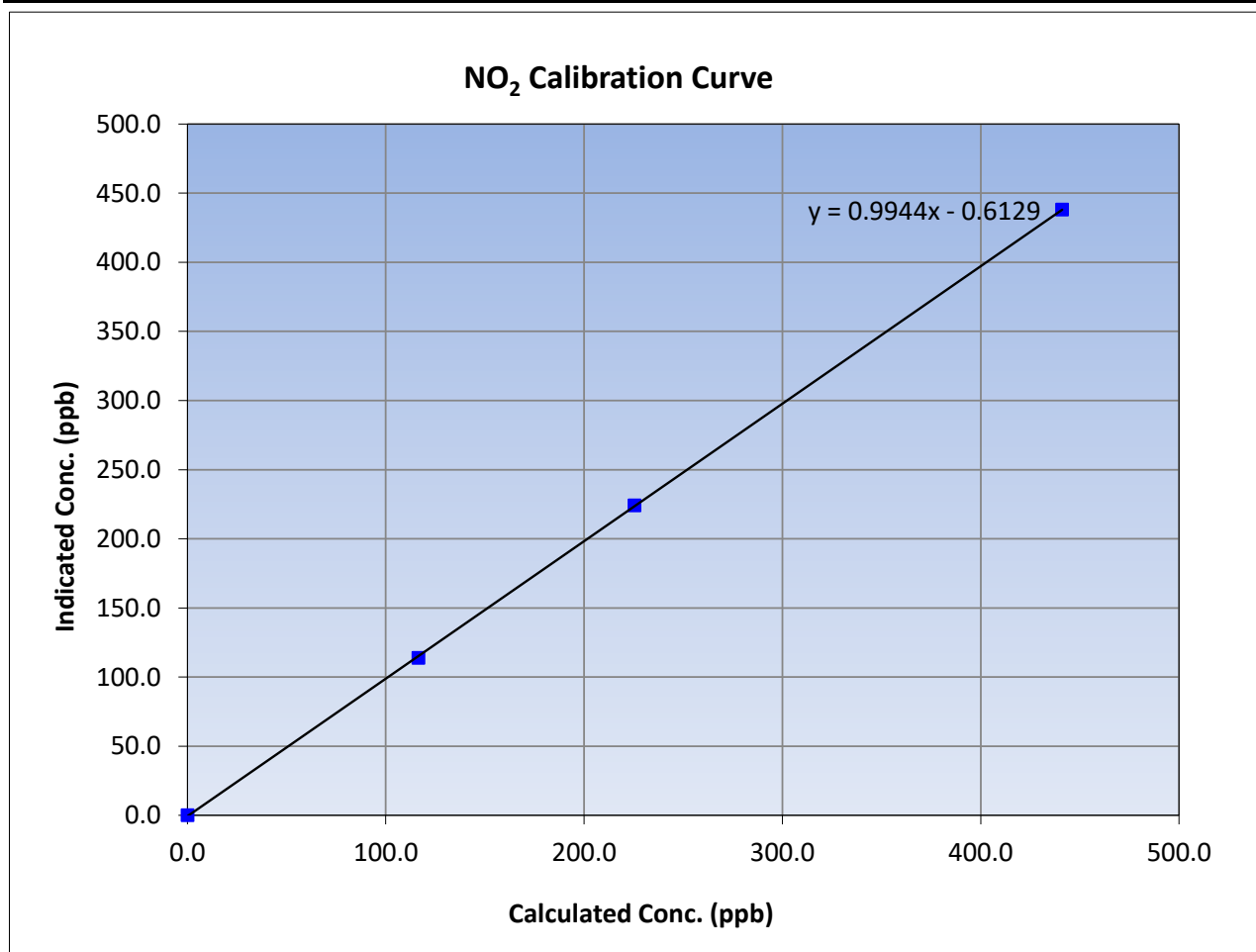
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | February 13, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04             |
| Start Time (MST): | 7:40              | End Time (MST):       | 11:16             |
| Analyzer make:    | API T200          | Analyzer serial #:    | 723               |

### Calibration Data

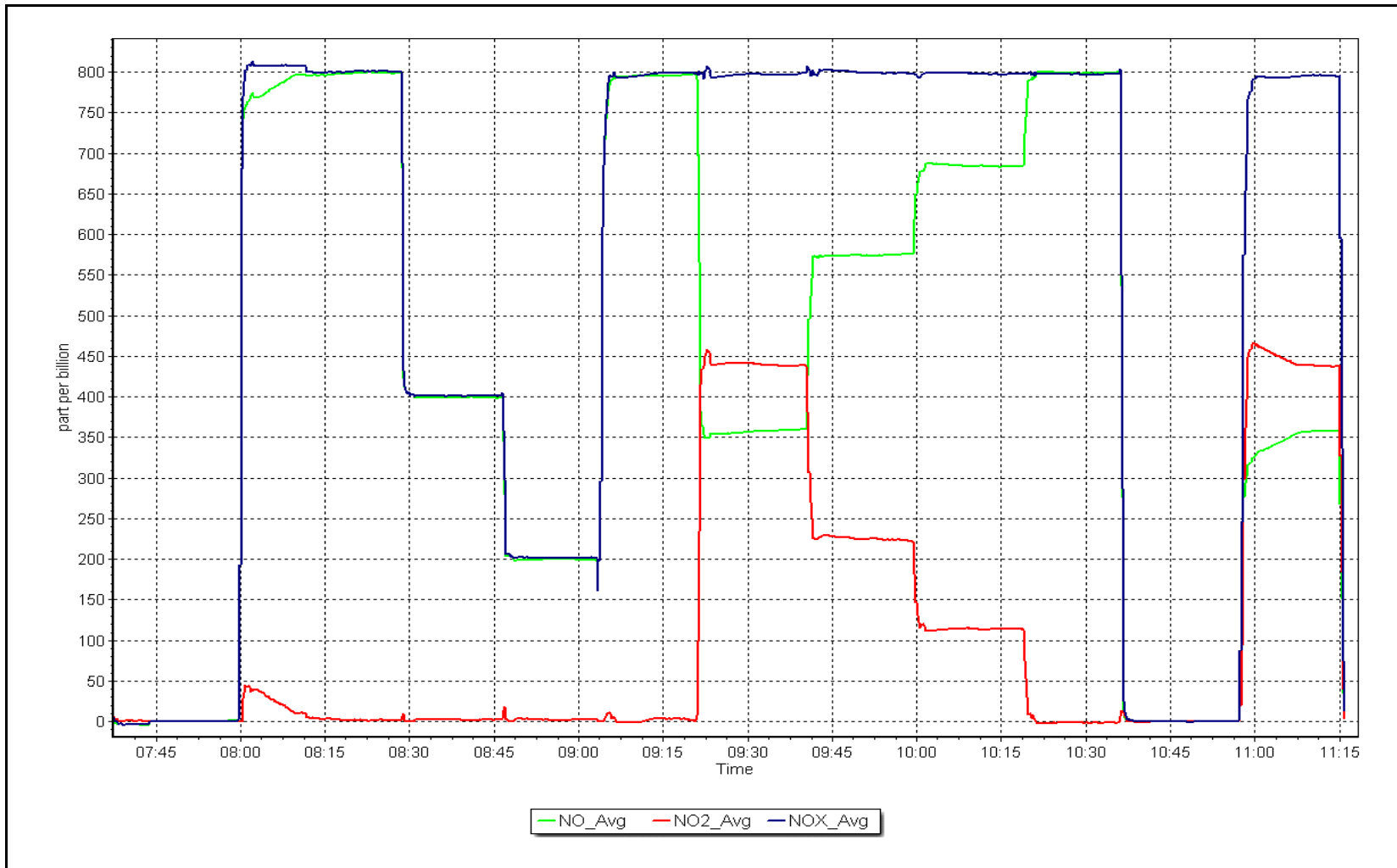
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 441.1                               | 438.1                              | 1.0069                    |   |                                |
| 225.4                               | 224.1                              | 1.0058                    |   |                                |
| 116.4                               | 113.8                              | 1.0229                    |   |                                |
|                                     |                                    |                           |   |                                |



NO<sub>x</sub> Calibration Plot

Date: February 14, 2023

Location: Buffalo Viewpoint







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Buffalo Viewpoint      Station number: AMS04  
 Calibration Date: February 10, 2023      Last Cal Date: January 12, 2023  
 Start time (MST): 10:55      End time (MST): 13:26  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: API T700      Serial Number: 2445  
 ZAG Make/Model: API T701      Serial Number: 362

### Analyzer Information

Analyzer make: API T400      Analyzer serial #: 2961  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.992571     | 0.988657      | Backgd or Offset: | -3.3         | -3.3          |
| Calibration intercept: | 2.700000     | 3.560000      | Coeff or Slope:   | 1.065        | 1.065         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | 0.5                                | ----  |
| as found span             | 5000                       | 1160.2                        | 400.0                               | 398.3                              | 1.004   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 1.2                                | ----  |
| high point                | 5000                       | 1161.4                        | 400.0                               | 397.8                              | 1.006   |
| second point              | 5000                       | 919.0                         | 200.0                               | 202.6                              | 0.987   |
| third point               | 5000                       | 788.4                         | 100.0                               | 104.7                              | 0.955   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 1.1                                | ----  |
| as left span              | 5000                       | 1159.5                        | 400.0                               | 397.2                              | 1.007   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.983   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 397.8 | Previous response | 399.7 | *% change     | -0.5% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

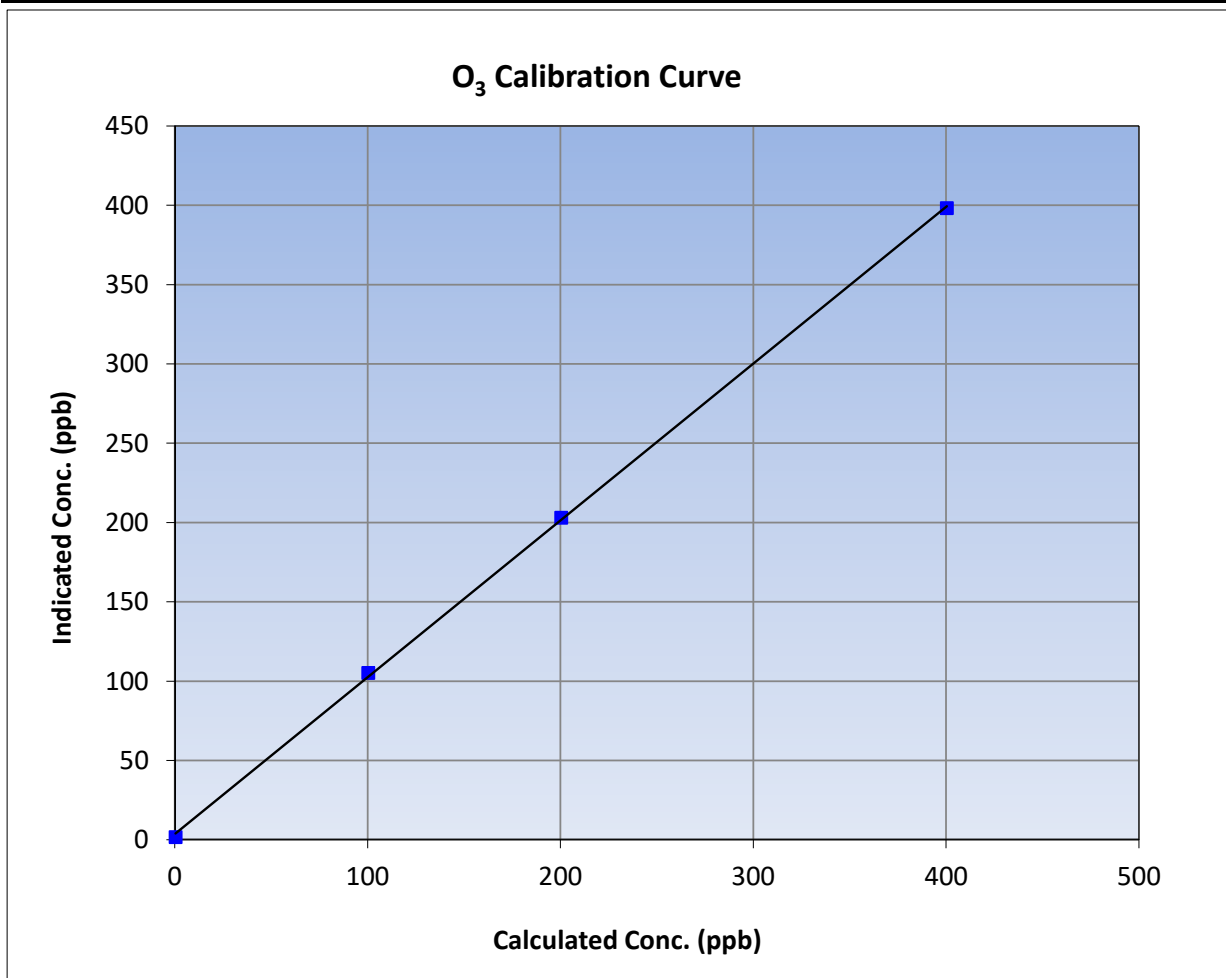
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Buffalo Viewpoint | Station Number:       | AMS04            |
| Start Time (MST): | 10:55             | End Time (MST):       | 13:26            |
| Analyzer make:    | API T400          | Analyzer serial #:    | 2961             |

### Calibration Data

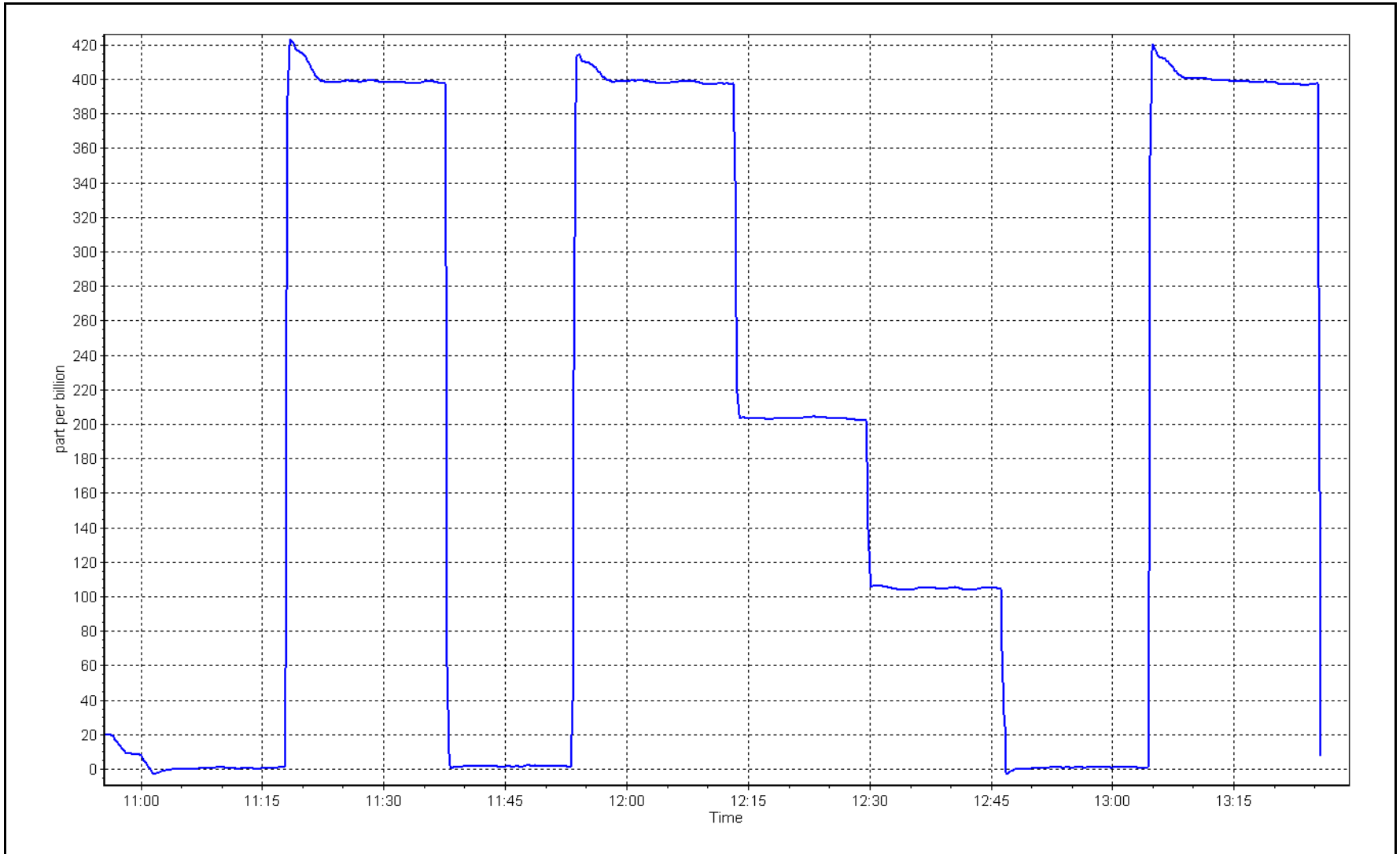
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 1.2                                | ----                      | Correlation Coefficient | 0.999837 |             |
| 400.0                               | 397.8                              | 1.0055                    |                         |          | ≥0.995      |
| 200.0                               | 202.6                              | 0.9872                    | Slope                   | 0.988657 |             |
| 100.0                               | 104.7                              | 0.9551                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 3.560000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 10, 2023

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-09-2020

### Station Information

Station Name: Buffalo Viewpoint Station number: AMS 04  
Calibration Date: February 15, 2023 Last Cal Date: January 16, 2023  
Start time (MST): 9:46 End time (MST): 10:15

Analyzer Make: API T640 S/N: 844  
Particulate Fraction: PM2.5

Flow Meter Make/Model: AliCat S/N: 228085  
Temp/RH standard: AliCat S/N: 228085

### Monthly Calibration Test

| <u>Parameter</u> | <u>As found</u> | <u>Measured</u> | <u>As left</u> | <u>Adjusted</u>                     | <b>(Limits)</b> |
|------------------|-----------------|-----------------|----------------|-------------------------------------|-----------------|
| T (°C)           | -19.1           | -18.8           | -19.1          | <input type="checkbox"/>            | +/- 2 °C        |
| P (mmHg)         | 734.8           | 736.6           | 734.8          | <input type="checkbox"/>            | +/- 10 mmHg     |
| flow (LPM)       | 5               | 4.80            | 5              | <input checked="" type="checkbox"/> | +/- 0.25 LPM    |

Leak Test: Date of check: February 15, 2023 Last Cal Date: January 16, 2023  
PM w/o HEPA: 5.1 PM w/ HEPA: 0

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| <u>Parameter</u> | <u>As found</u> | <u>Measured</u> | <u>As left</u> | <u>Adjusted</u>          | <b>(Limits)</b> |
|------------------|-----------------|-----------------|----------------|--------------------------|-----------------|
| PMT Peak Test    |                 | ----            |                | <input type="checkbox"/> | 10.9 +/- 0.5    |

Date Optical Chamber Cleaned: December 13, 2022  
Disposable Filter Changed: December 13, 2022

### Annual Maintenance

Date Sample Tube Cleaned: September 15, 2022  
Date RH/T Sensor Cleaned: September 15, 2022

Notes: No adjustments done. Inlet head cleaned.

Calibration by: Melissa Lemay



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS05  
MANNIX  
FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

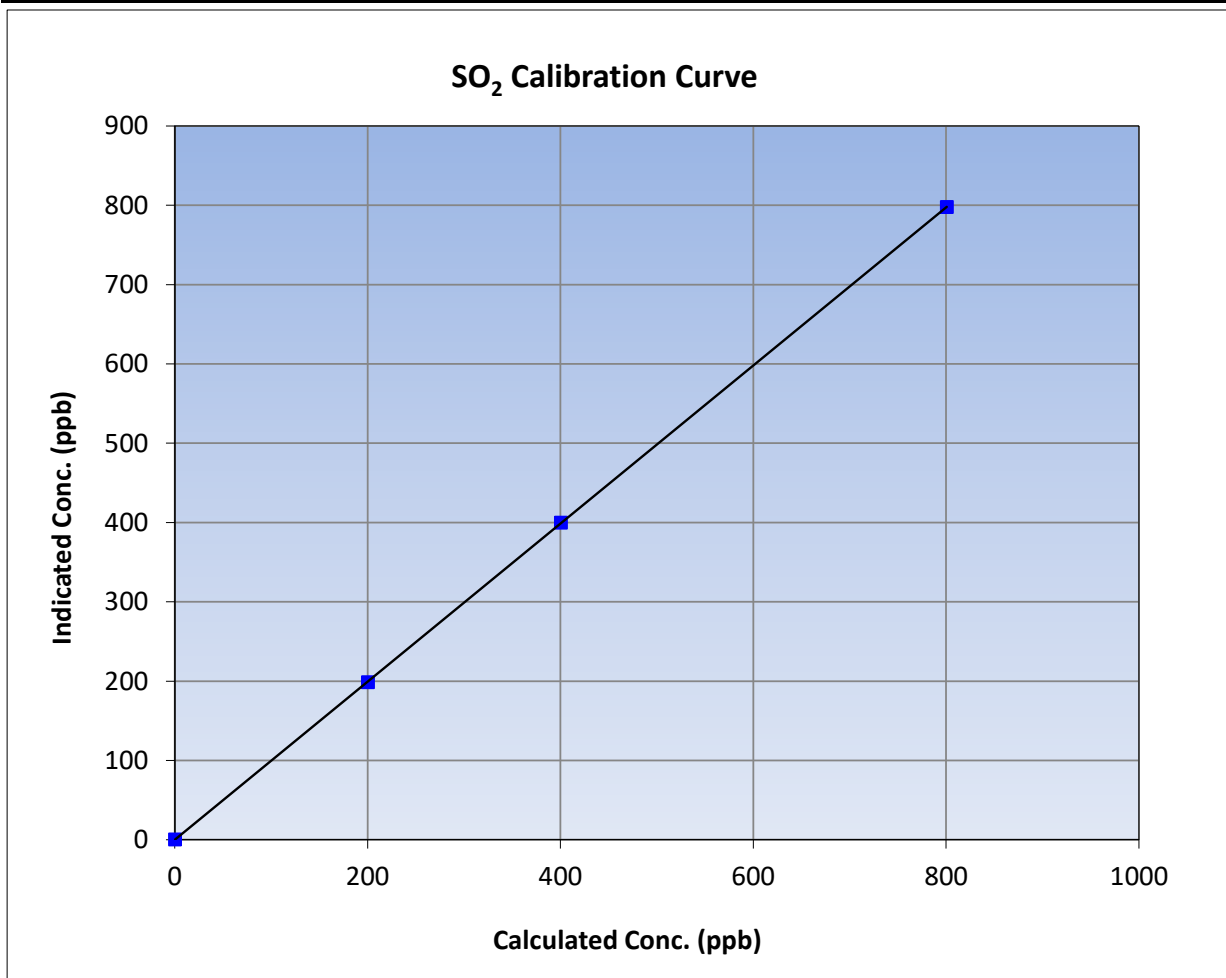
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Mannix            | Station Number:       | AMS05            |
| Start Time (MST): | 10:52             | End Time (MST):       | 13:57            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1008841399       |

### Calibration Data

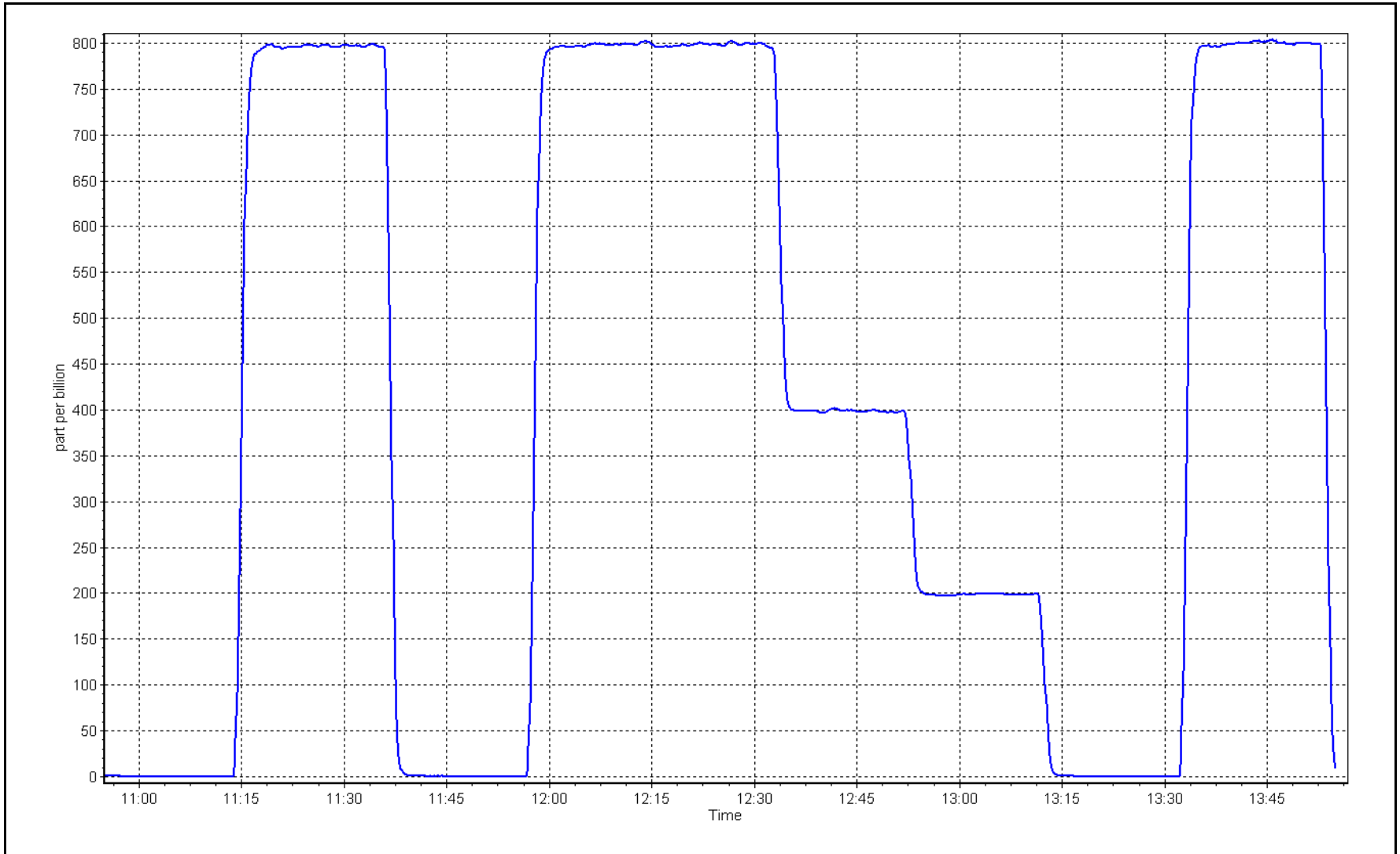
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999996  | ≥0.995      |
| 800.3                               | 797.5                              | 1.0035                    |                         |           |             |
| 400.2                               | 399.5                              | 1.0017                    | Slope                   | 0.996758  | 0.90 - 1.10 |
| 200.1                               | 198.5                              | 1.0080                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.080000 | +/-30       |



SO2 Calibration Plot

Date: February 21, 2023

Location: Mannix







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Mannix Station number: AMS05  
 Calibration Date: February 7, 2023 Last Cal Date: January 3, 2023  
 Start time (MST): 10:35 End time (MST): 15:10  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.92 ppm Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002433  
 Removed Cal Gas Conc: 4.92 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 1845  
 ZAG Make/Model: API T701H Serial Number: 832

### Analyzer Information

Analyzer make: Thermo 43iQTL Analyzer serial #: 1203169745  
 Converter make: Global Converter serial #: 2022-196  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.998045     | 0.998613      | Backgd or Offset: 2.09 | 2.09          |
| Calibration intercept: | 0.340531     | 0.220652      | Coeff or Slope: 0.822  | 0.822         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4919                          | 81.3                        | 80.0                                | 80.7                               | 0.994  |
| as found 2nd point    | 4960                          | 40.7                        | 40.0                                | 40.8                               | 0.986  |
| as found 3rd point    | 4980                          | 20.3                        | 20.0                                | 20.4                               | 0.989  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4919                          | 81.3                        | 80.0                                | 80.1                               | 0.999   |
| second point                            | 4960                          | 40.7                        | 40.0                                | 40.2                               | 0.996   |
| third point                             | 4980                          | 20.3                        | 20.0                                | 20.2                               | 0.989   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| as left span                            | 4919                          | 81.3                        | 80.0                                | 78.8                               | 1.015   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | 0.0                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.995   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 80.5 Prev response: 80.18 \*% change: 0.4%  
 Baseline Corr 2nd AF pt: 40.6 AF Slope: 1.006329 AF Intercept: 0.300551  
 Baseline Corr 3rd AF pt: 20.2 AF Correlation: 0.999983

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Scrubber check completed after calibrator zero. No adjustments made.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

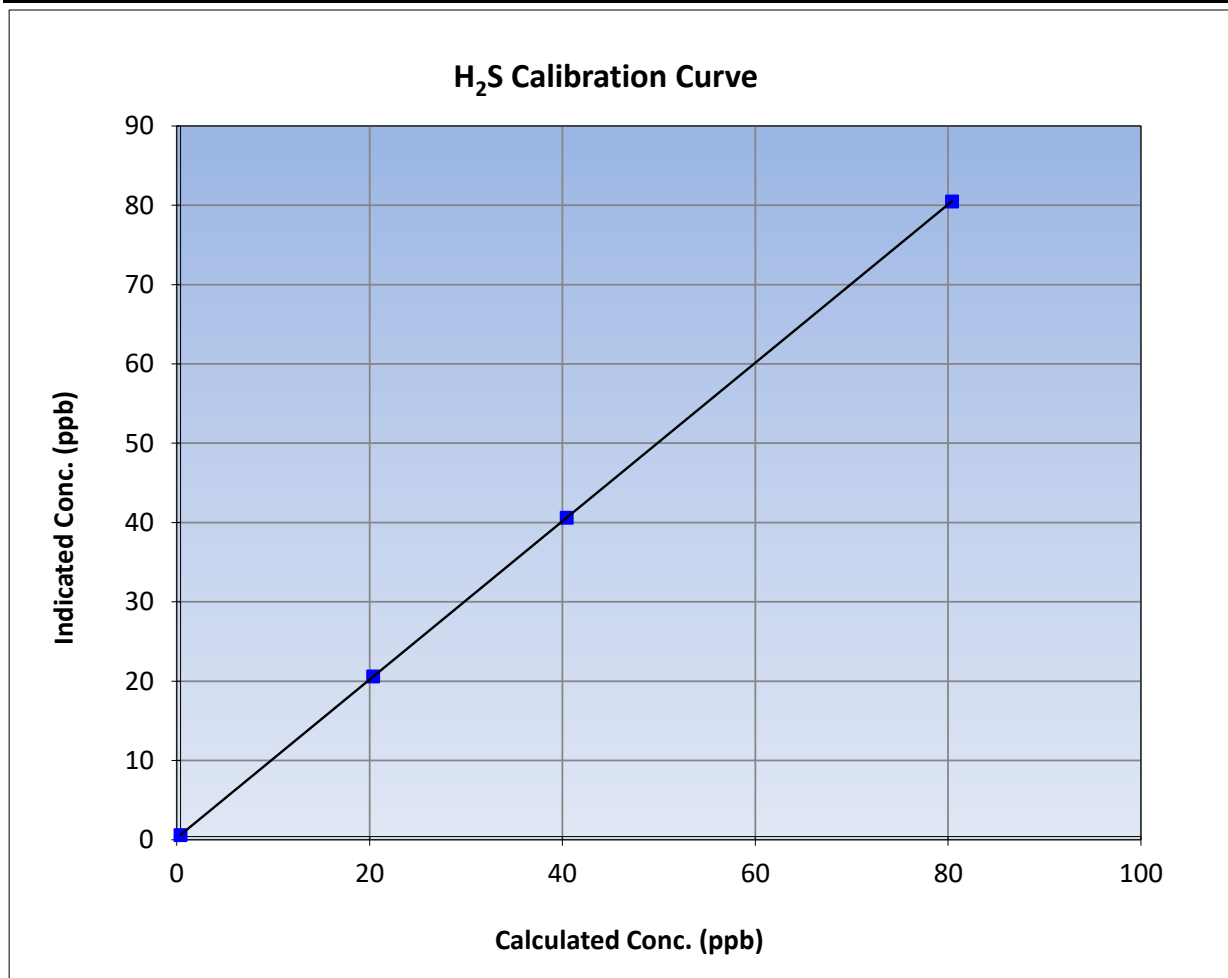
Version-11-2021

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Mannix           | Station Number:       | AMS05           |
| Start Time (MST): | 10:35            | End Time (MST):       | 15:10           |
| Analyzer make:    | Thermo 43iQTL    | Analyzer serial #:    | 1203169745      |

### Calibration Data

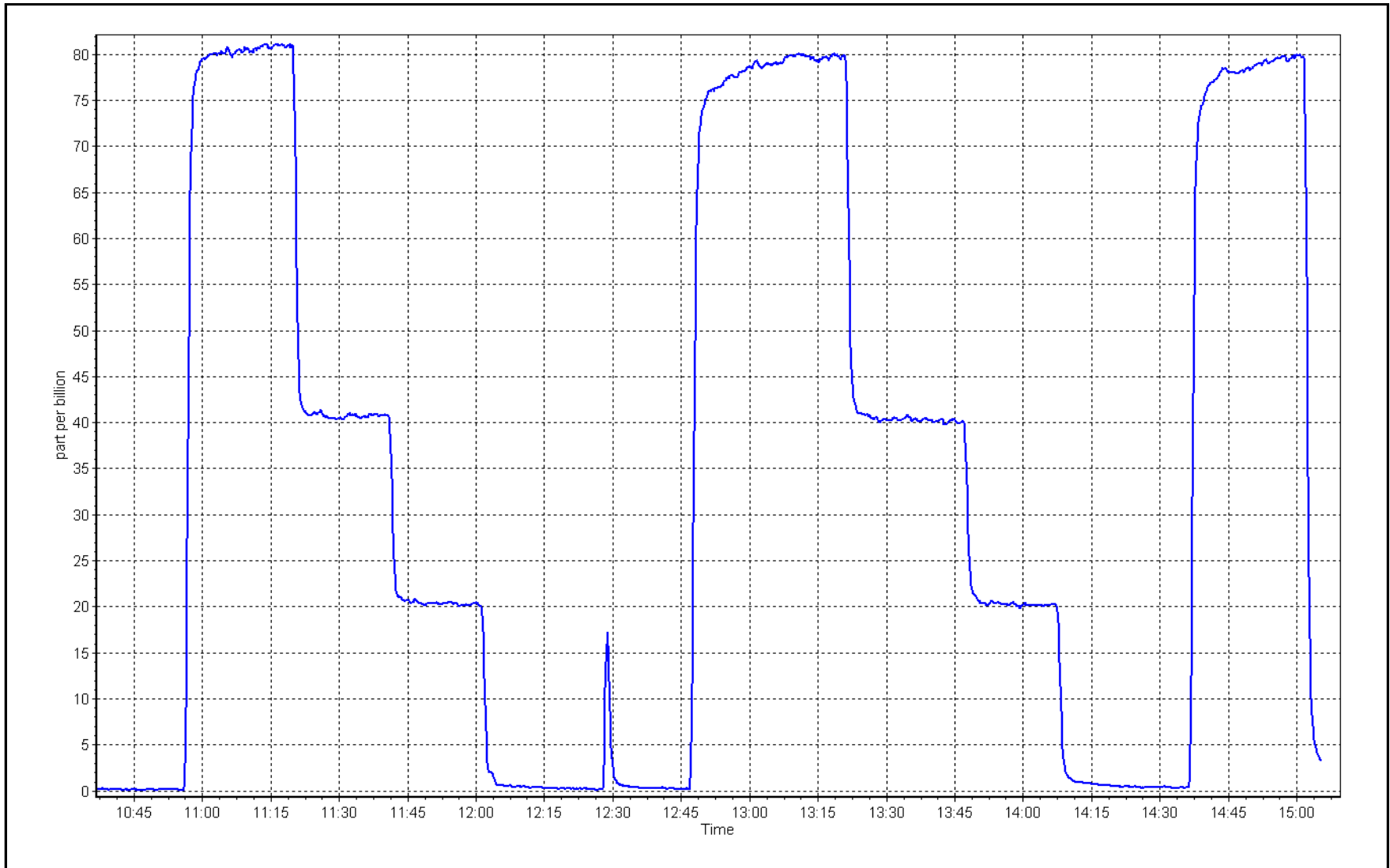
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 1.000000 |             |
| 80.0                                | 80.1                               | 0.9987                    |                         |          | ≥0.995      |
| 40.0                                | 40.2                               | 0.9961                    | Slope                   | 0.998613 |             |
| 20.0                                | 20.2                               | 0.9888                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.220652 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 7, 2023

Location: Mannix





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Mannix            | Station number: | AMS05            |
| Calibration Date: | February 21, 2023 | Last Cal Date:  | January 20, 2023 |
| Start time (MST): | 10:52             | End time (MST): | 13:57            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|   |           |                             |                  |
|---|-----------|-----------------------------|------------------|
| Gas Cert Reference:                         | XCO268098 | Cal Gas Expiry Date:        | January 12, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.9 ppm |                             |                  |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         |                  |
| Removed CH <sub>4</sub> Conc.               | 504.9 ppm | CH <sub>4</sub> Equiv Conc. | 1076.6 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.9 ppm | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                  |
| Calibrator Model:                           | API T700  | Serial Number:              | 621              |
| ZAG make/model:                             | API T701H | Serial Number:              | 832              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430011 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.57E-04     | 2.56E-04      | NMHC SP Ratio:  | 4.41E-05      |
| CH <sub>4</sub> Retention time: | 15.00        | 15.00         | NMHC Peak Area: | 207495        |
|                                 |              |               |                 | 209913        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.0                 | 17.23                | 17.56               | 0.981                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.0                 | 17.23                | 17.18               | 1.003                      |
| second point          | 4960              | 40.0                 | 8.61                 | 8.58                | 1.004                      |
| third point           | 4980              | 20.0                 | 4.31                 | 4.27                | 1.008                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.0                 | 17.23                | 17.27               | 0.998                      |

| Average Correction Factor |       |                 |       | 1.005                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.56 | Prev response   | 17.27 | *% change 1.7%                             |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as found span             | 4920              | 80                   | 9.15                 | 9.34   | 0.979                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| high point                | 4920              | 80                   | 9.15                 | 9.12   | 1.003                      |
| second point              | 4960              | 40                   | 4.57                 | 4.57   | 1.002                      |
| third point               | 4980              | 20                   | 2.29                 | 2.28   | 1.004                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as left span              | 4920              | 80                   | 9.15                 | 9.18   | 0.996                      |
| Average Correction Factor |                   |                      |                      |  | 1.003                      |
| Baseline Corr AF:         | 9.34              | Prev response        | 9.17                 | *% change  | 1.9%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4920              | 80.0                 | 8.08                 | 8.23   | 0.982                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point                | 4920              | 80.0                 | 8.08                 | 8.06   | 1.003                      |
| second point              | 4960              | 40.0                 | 4.04                 | 4.01   | 1.008                      |
| third point               | 4980              | 20.0                 | 2.02                 | 2.00   | 1.012                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span              | 4920              | 80.0                 | 8.08                 | 8.09   | 0.999                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 8.23              | Prev response        | 8.10                 | *% change  | 1.5%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004873     | 0.997356      |
| THC Cal Offset:             | -0.040600    | -0.010200     |
| CH <sub>4</sub> Cal Slope:  | 1.006140     | 0.997864      |
| CH <sub>4</sub> Cal Offset: | -0.026000    | -0.012000     |
| NMHC Cal Slope:             | 1.003542     | 0.997020      |
| NMHC Cal Offset:            | -0.015000    | 0.000600      |

Notes: Sample inlet filter changed after as founds. Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## THC Calibration Summary

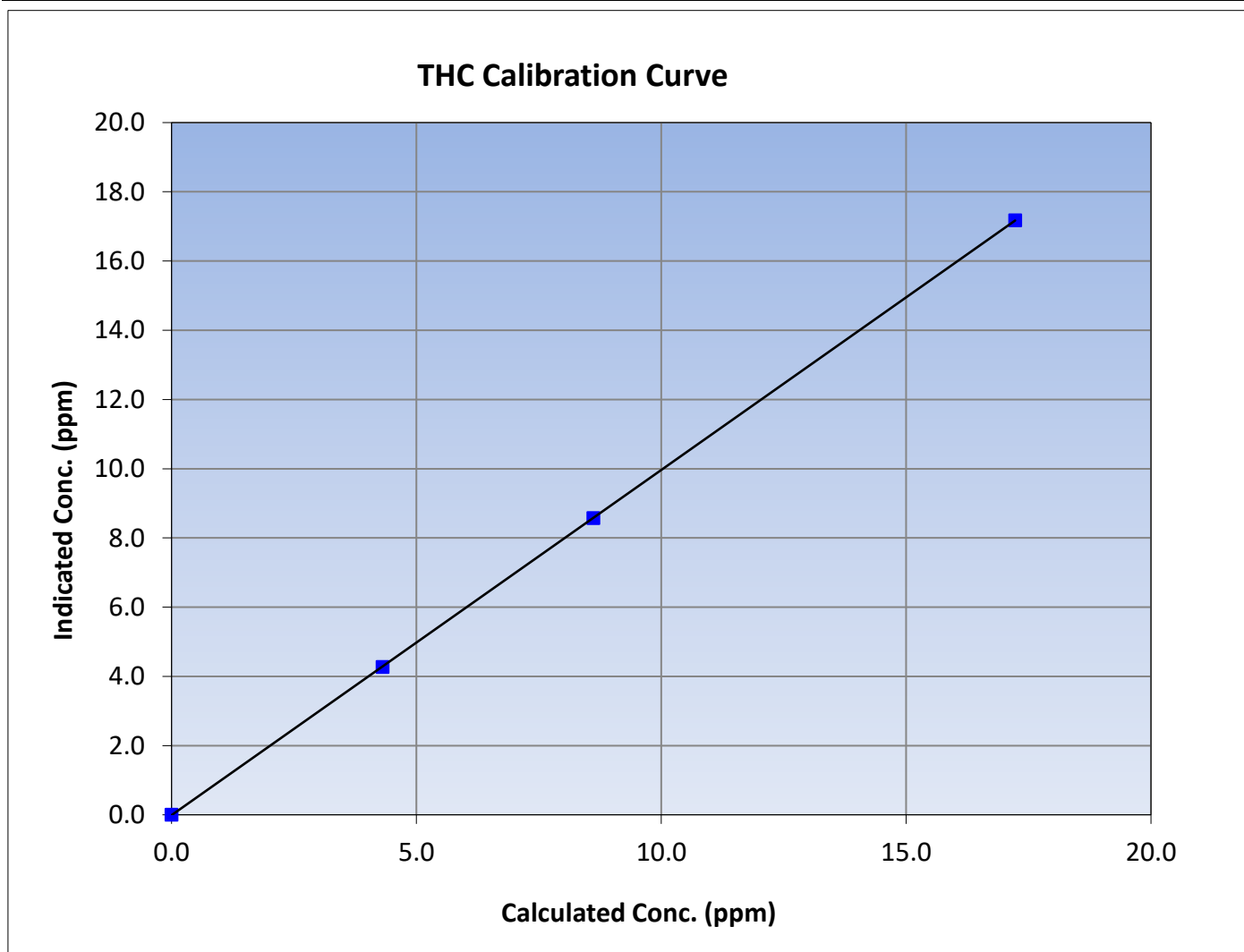
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Mannix            | Station Number:       | AMS05            |
| Start Time (MST): | 10:52             | End Time (MST):       | 13:57            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1152430011       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999998  | $\geq 0.995$  |       |          |             |
| 17.23                               | 17.18                              | 1.0030                    |                         |           |               |       |          |             |
| 8.61                                | 8.58                               | 1.0043                    |                         |           |               | Slope | 0.997356 | 0.90 - 1.10 |
| 4.31                                | 4.27                               | 1.0076                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.010200 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

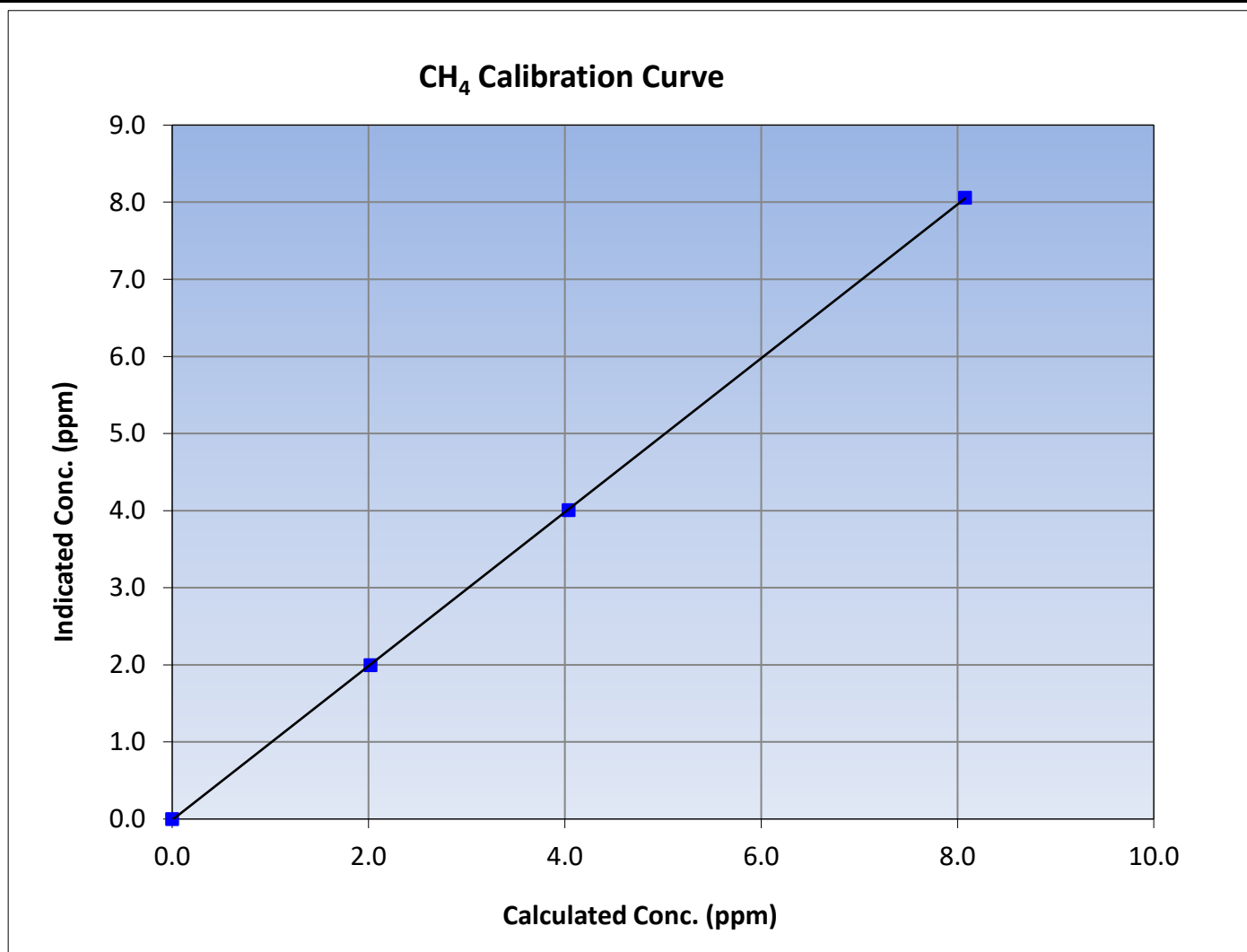
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Mannix            | Station Number:       | AMS05            |
| Start Time (MST): | 10:52             | End Time (MST):       | 13:57            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1152430011       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999989  | $\geq 0.995$  |       |          |             |
| 8.08                                | 8.06                               | 1.0027                    |                         |           |               |       |          |             |
| 4.04                                | 4.01                               | 1.0080                    |                         |           |               | Slope | 0.997864 | 0.90 - 1.10 |
| 2.02                                | 2.00                               | 1.0123                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.012000 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

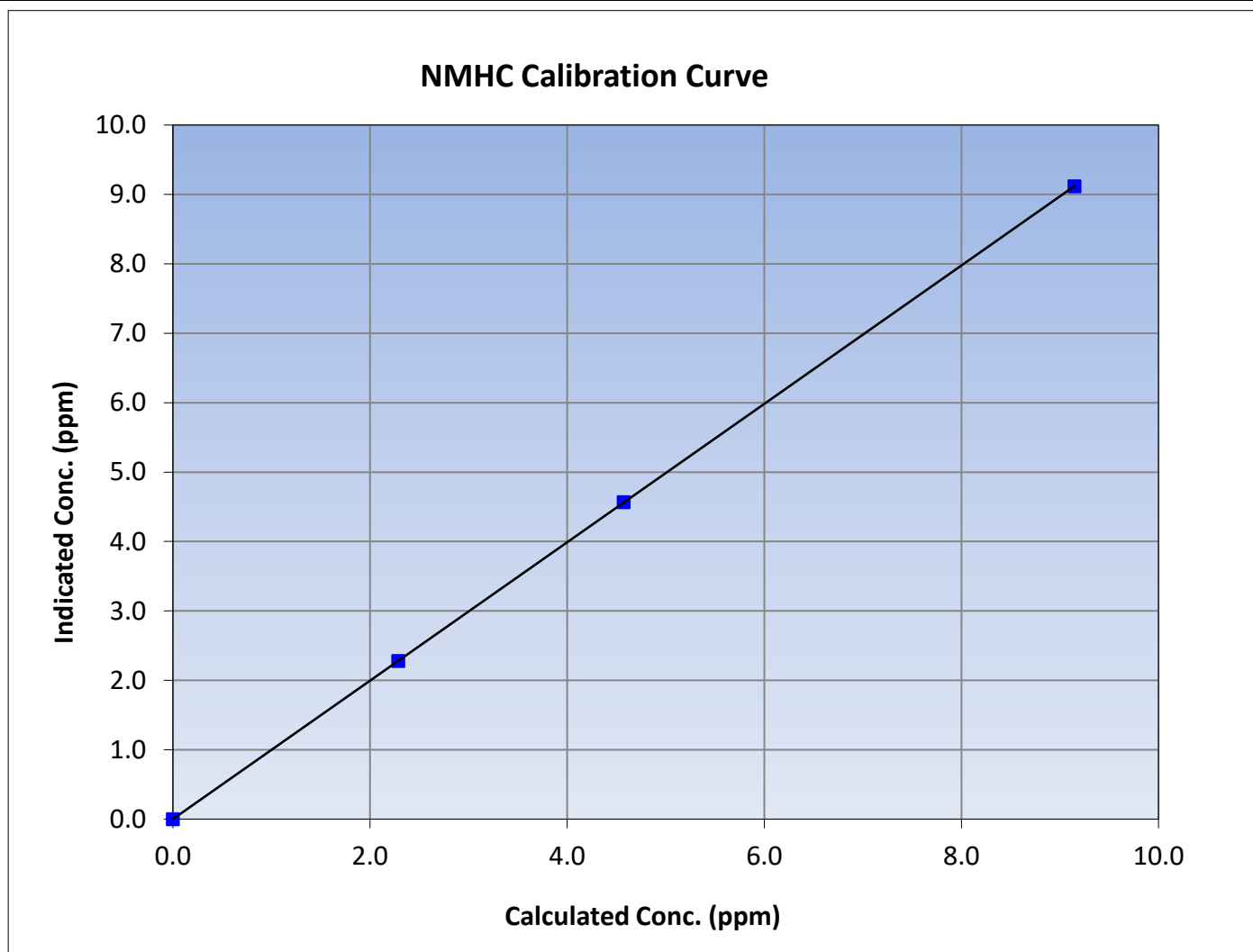
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Mannix            | Station Number:       | AMS05            |
| Start Time (MST): | 10:52             | End Time (MST):       | 13:57            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1152430011       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999 | $\geq 0.995$  |       |          |             |
| 9.15                                | 9.12                               | 1.0031                    |                         |          |               |       |          |             |
| 4.57                                | 4.57                               | 1.0017                    |                         |          |               | Slope | 0.997020 | 0.90 - 1.10 |
| 2.29                                | 2.28                               | 1.0039                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.000600 | $\pm 0.5$     |       |          |             |

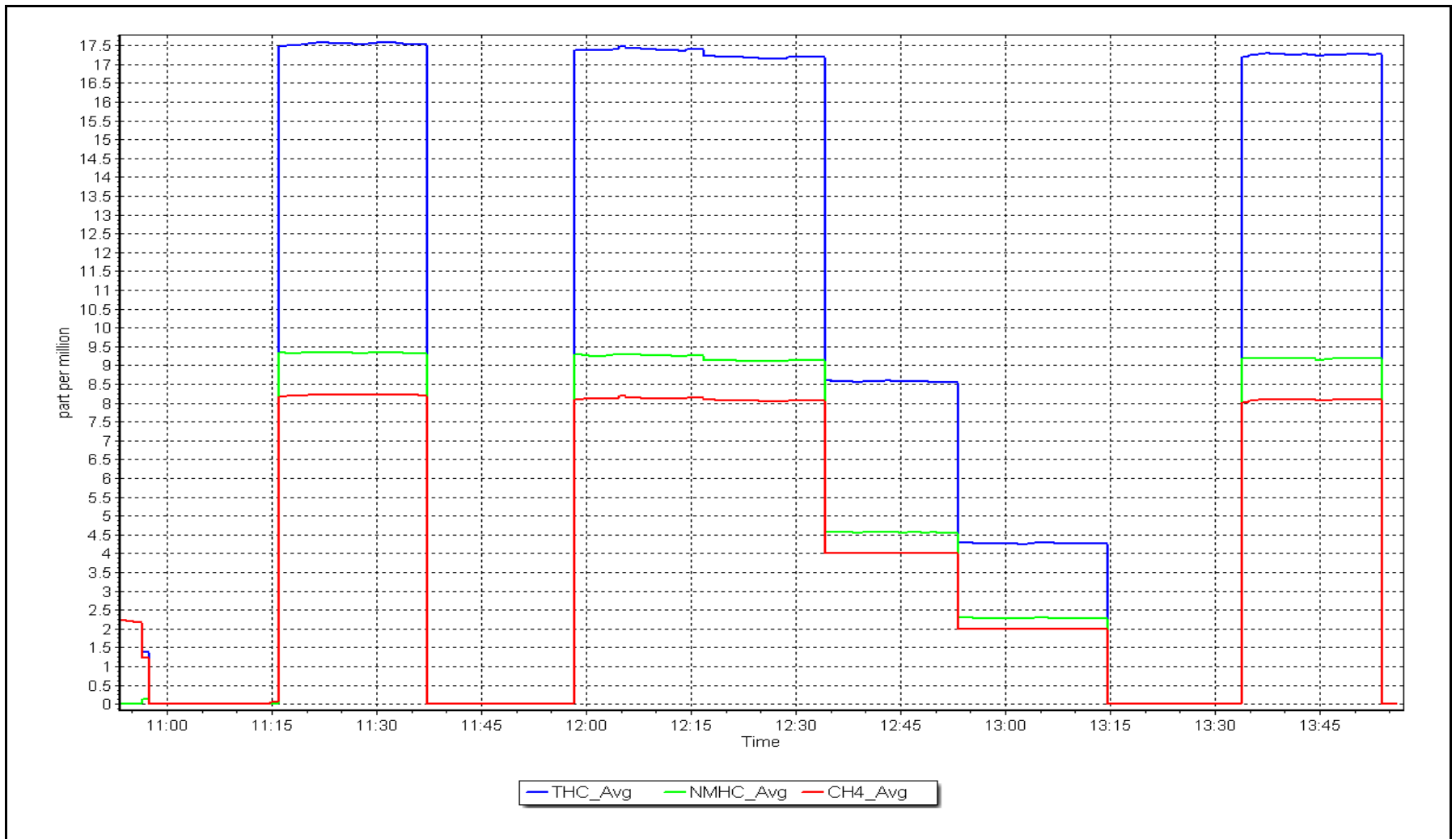




NMHC Calibration Plot

Date: February 21, 2023

Location: Mannix





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS06**  
**PATRICIA MCINNES**  
**FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

August 30, 2023

Revision 01



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Patricia McInnes  | Station number: | AMS06           |
| Calibration Date: | February 16, 2023 | Last Cal Date:  | January 9, 2023 |
| Start time (MST): | 10:16             | End time (MST): | 13:48           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|                        |           |     |                   |                   |
|------------------------|-----------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.78     | ppm | Cal Gas Exp Date: | September 9, 2024 |
| Cal Gas Cylinder #:    | AAL070632 |     |                   |                   |
| Removed Cal Gas Conc:  | 49.78     | ppm | Rem Gas Exp Date: | N/A               |
| Removed Gas Cyl #:     | N/A       |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700  |     | Serial Number:    | 689               |
| ZAG Make/Model:        | API T701  |     | Serial Number:    | 3566              |

### Analyzer Information

|                |              |                    |            |
|----------------|--------------|--------------------|------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | 1160290013 |
| Analyzer Range | 0 - 1000 ppb |                    |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.992084     | 0.993085      | Backgd or Offset: | 17.2         | 17.2          |
| Calibration intercept: | 1.741680     | 1.541481      | Coeff or Slope:   | 0.907        | 0.907         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | -0.3                               | ----  |
| as found span             | 4920                          | 80.3                        | 799.5                               | 794.3                              | 1.007   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                | 4920                          | 80.3                        | 799.5                               | 794.7                              | 1.006   |
| second point              | 4960                          | 40.2                        | 400.2                               | 399.8                              | 1.001   |
| third point               | 4980                          | 20.1                        | 200.1                               | 201.8                              | 0.992   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| as left span              | 4920                          | 80.3                        | 799.5                               | 795.6                              | 1.005   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.000   |

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 794.60 | Previous response | 794.88 | *% change     | 0.0% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

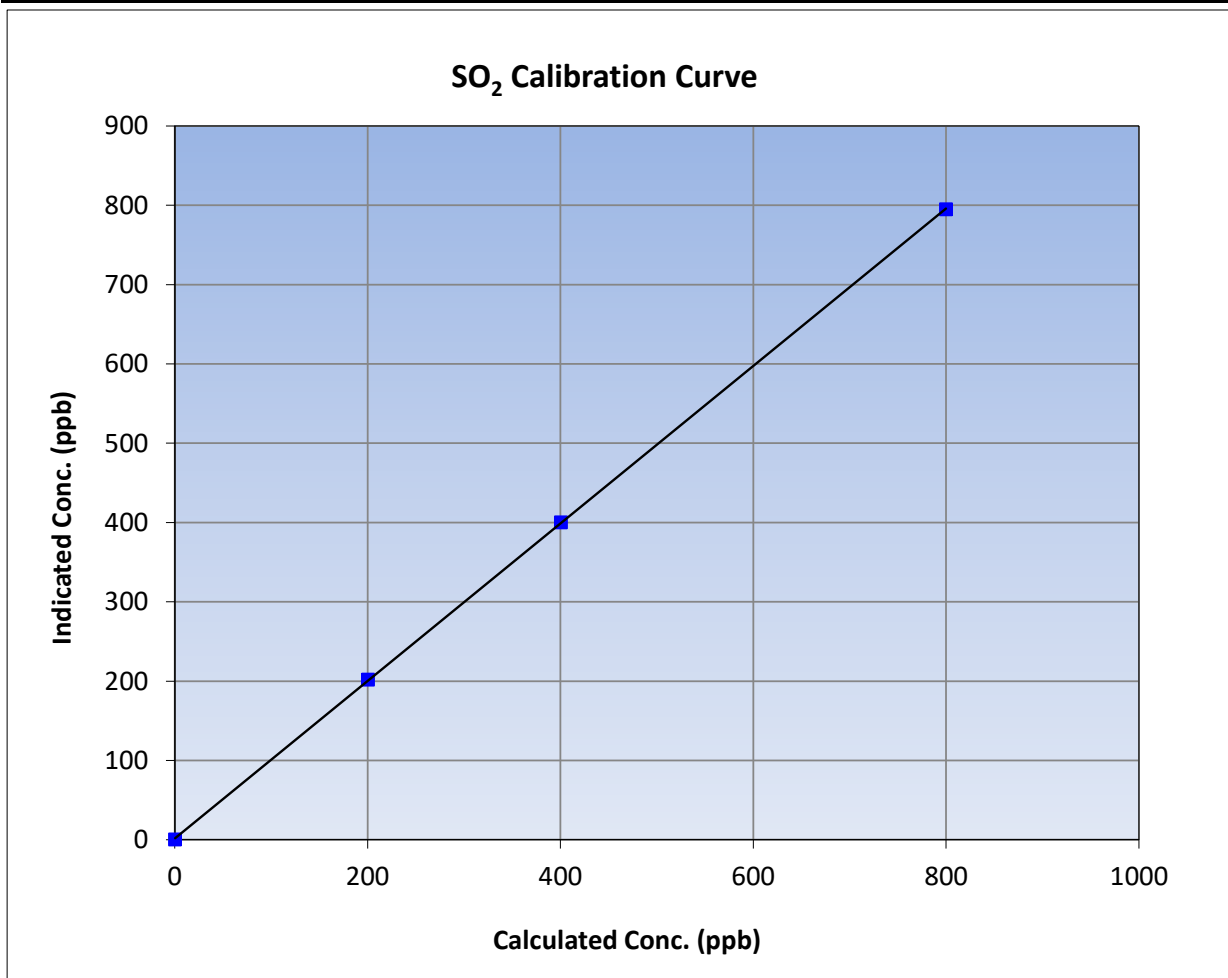
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06           |
| Start Time (MST): | 10:16             | End Time (MST):       | 13:48           |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1160290013      |

### Calibration Data

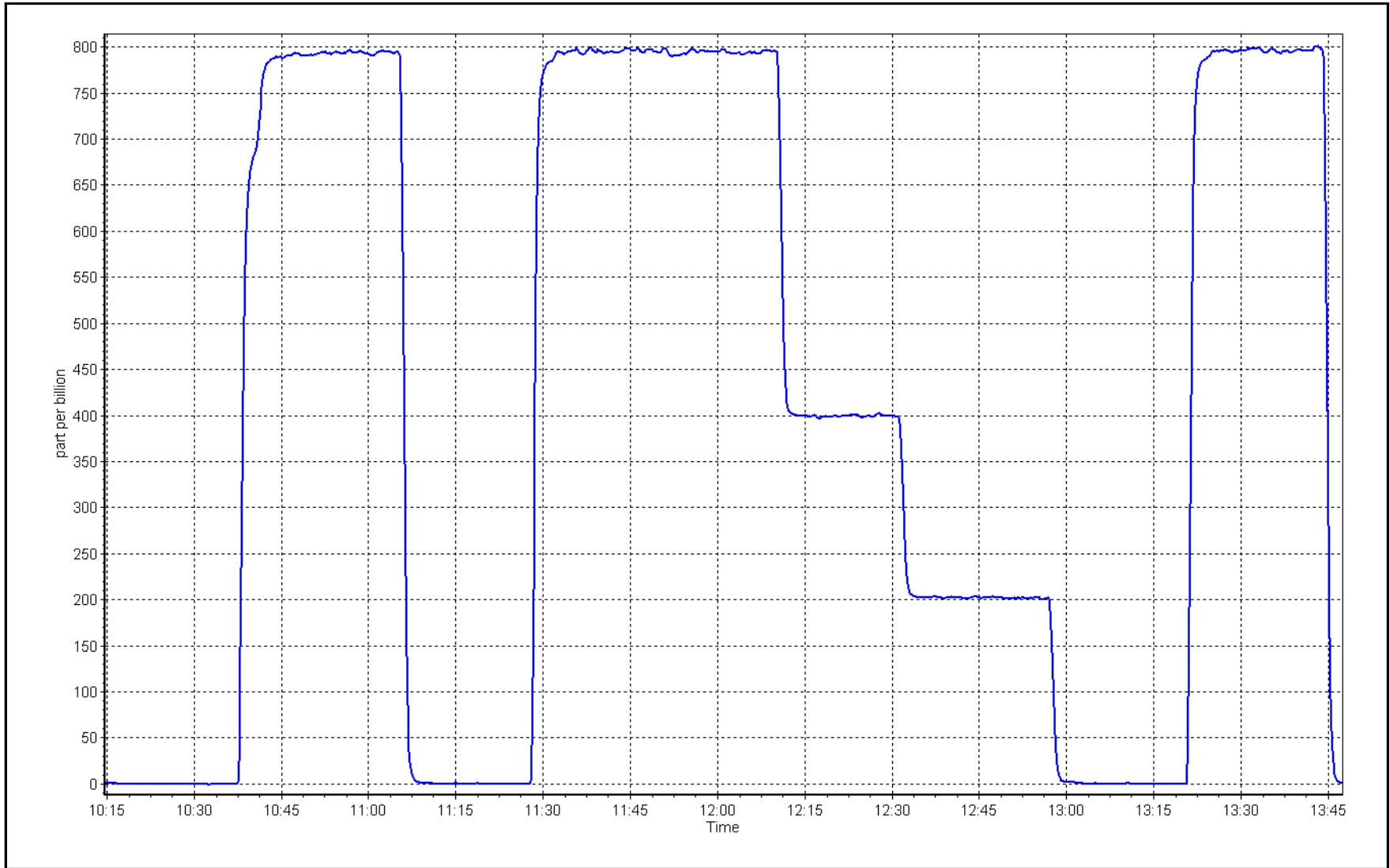
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.0                                   | ----                         | Correlation Coefficient | 0.999983      |             |
| 799.5                                  | 794.7                                 | 1.0060                       |                         |               | ≥0.995      |
| 400.2                                  | 399.8                                 | 1.0011                       | Slope                   | 0.993085      |             |
| 200.1                                  | 201.8                                 | 0.9917                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 1.541481      | +/-30       |



SO2 Calibration Plot

Date: February 16, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## H2S Calibration Report

Version-11-2021

### Station Information

|                   |                  |                 |                 |
|-------------------|------------------|-----------------|-----------------|
| Station Name:     | Patricia McInnes | Station number: | AMS 06          |
| Calibration Date: | February 6, 2023 | Last Cal Date:  | January 3, 2023 |
| Start time (MST): | 10:23            | End time (MST): | 14:43           |
| Reason:           | Routine          |                 |                 |

### Calibration Standards

|                        |            |     |                   |               |
|------------------------|------------|-----|-------------------|---------------|
| Cal Gas Concentration: | 5.38       | ppm | Cal Gas Exp Date: | March 2, 2023 |
| Cal Gas Cylinder #:    | EY0000809  |     |                   |               |
| Removed Cal Gas Conc:  | 5.38       | ppm | Rem Gas Exp Date: | N/A           |
| Removed Gas Cyl #:     | N/A        |     | Diff between cyl: |               |
| Calibrator Make/Model: | API T700   |     | Serial Number:    | 3566          |
| ZAG Make/Model:        | API T701 H |     | Serial Number:    | 689           |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i TLE | Analyzer serial #:  | 1218153358 |
| Converter make: | Global G150    | Converter serial #: | 2022-195   |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 0.997488     | 0.990341      | Backgd or Offset: | 1.97          |
| Calibration intercept: | 0.117191     | 0.217319      | Coeff or Slope:   | 1.155         |
|                        |              |               |                   | 1.82          |
|                        |              |               |                   | 1.049         |

### H2S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.6                               | ----   |
| as found span         | 4926                          | 74.3                        | 79.9                                | 78.5                               | 1.011  |
| as found 2nd point    | 4963                          | 37.2                        | 40.0                                | 39.4                               | 1.001  |
| as found 3rd point    | 4981                          | 18.6                        | 20.0                                | 19.5                               | 0.996  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H2S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4926                          | 74.3                        | 79.9                                | 79.3                               | 1.008   |
| second point                            | 4963                          | 37.2                        | 40.0                                | 39.9                               | 1.003   |
| third point                             | 4981                          | 18.6                        | 20.0                                | 20.3                               | 0.986   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4926                          | 74.3                        | 79.9                                | 79.4                               | 1.007   |
| SO2 Scrubber Check                      | 4920                          | 80.3                        | 803.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | December 20, 2021             |                             |                                     | Ave Corr Factor                    | 0.999   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 79.1 | Prev response:  | 79.86    | *% change:    | -1.0%     |
| Baseline Corr 2nd AF pt: | 40.0 | AF Slope:       | 0.988770 | AF Intercept: | -0.402701 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999964 |               |           |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. Ran a SO2 scrubber check after the calibrator zero. Adjusted the zero only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## H2S Calibration Summary

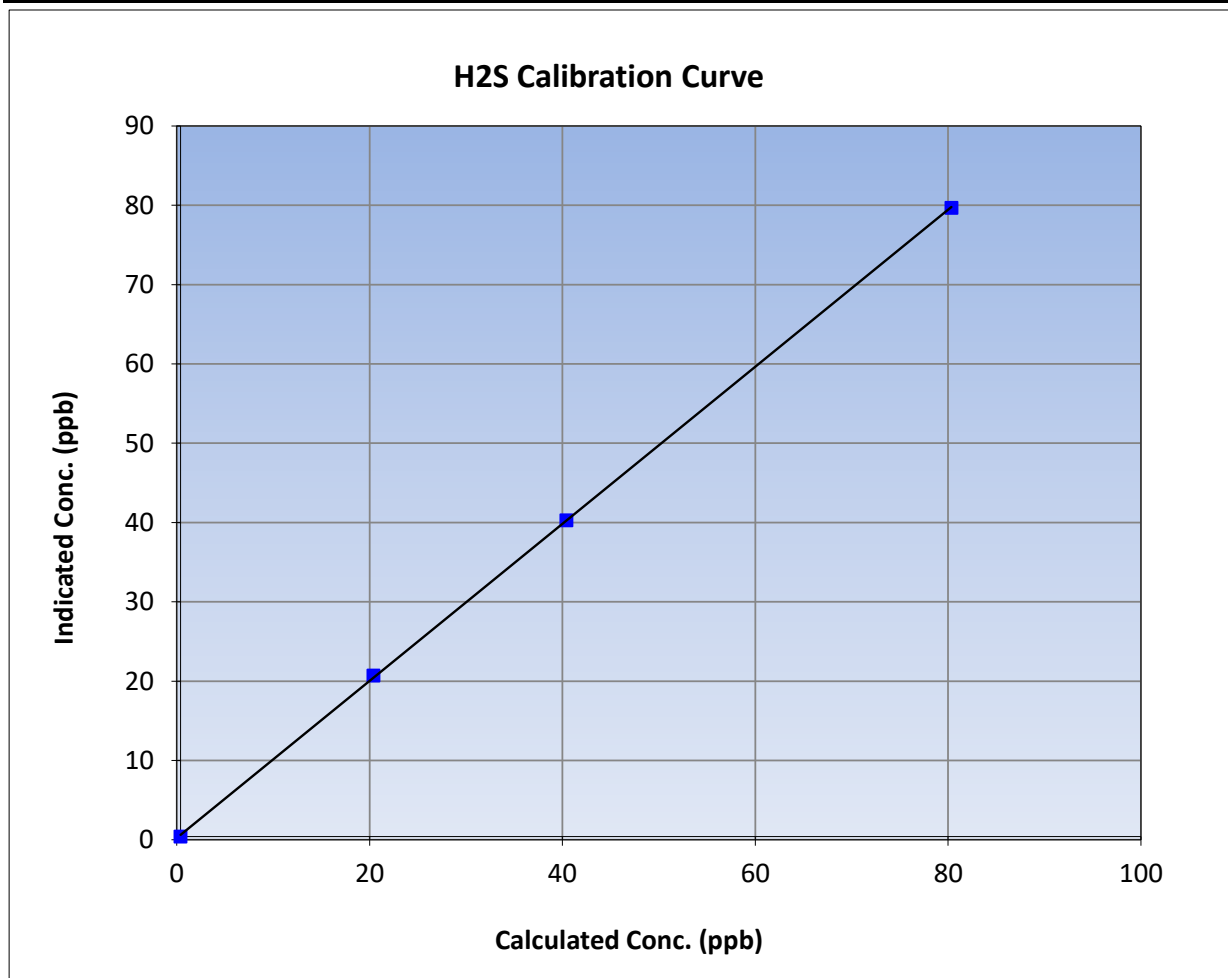
Version-11-2021

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06          |
| Start Time (MST): | 10:23            | End Time (MST):       | 14:43           |
| Analyzer make:    | Thermo 43i TLE   | Analyzer serial #:    | 1218153358      |

### Calibration Data

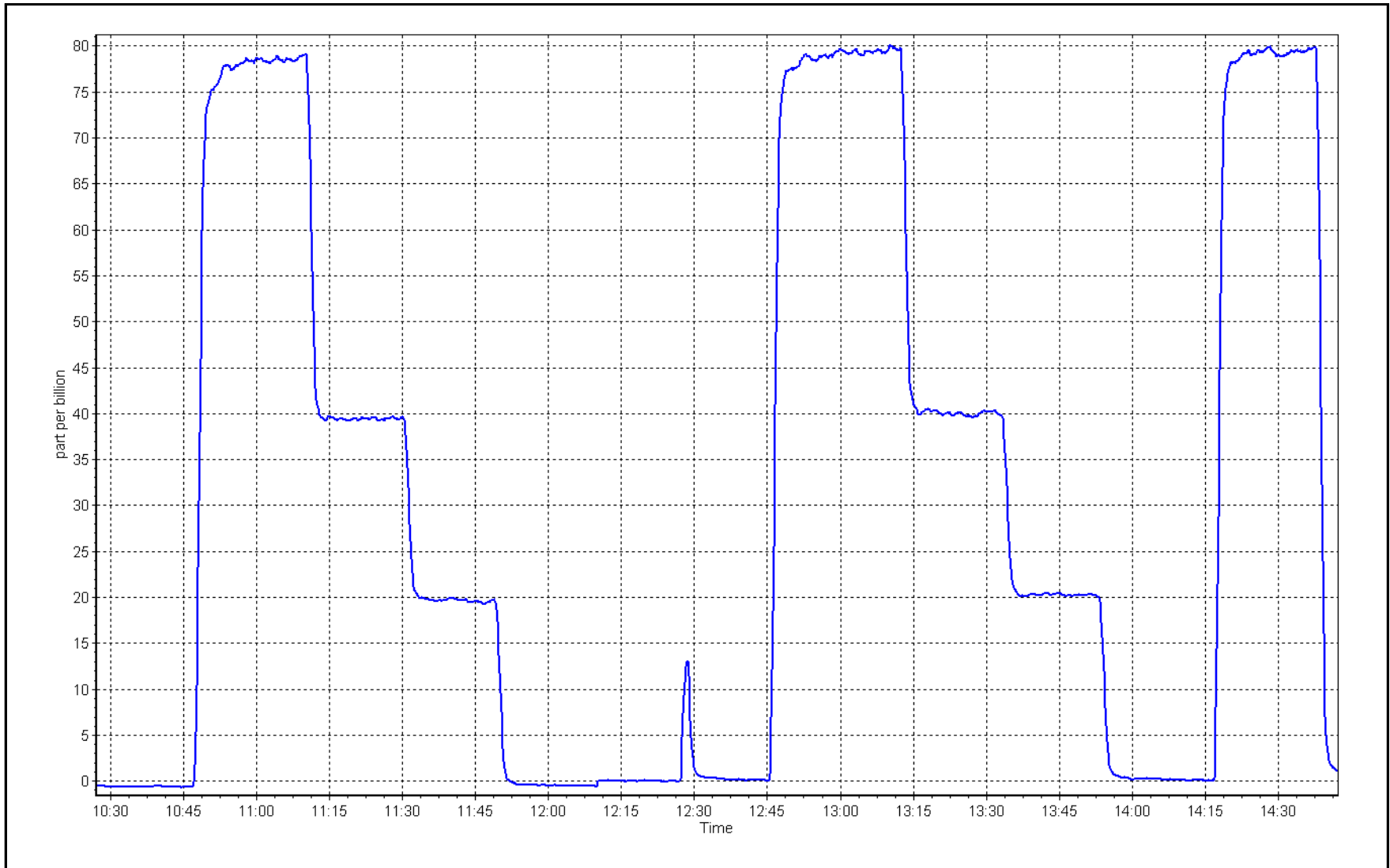
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999964 | ≥0.995      |
| 79.9                                | 79.3                               | 1.0081                    |                         |          |             |
| 40.0                                | 39.9                               | 1.0031                    | Slope                   | 0.990341 | 0.90 - 1.10 |
| 20.0                                | 20.3                               | 0.9860                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.217319 | +/-3        |



H2S Calibration Plot

Date: February 6, 2023

Location: Patricia McInnes







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Patricia McInnes  | Station number: | AMS06           |
| Calibration Date: | February 16, 2023 | Last Cal Date:  | January 9, 2023 |
| Start time (MST): | 10:17             | End time (MST): | 13:49           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | AAL070632 | Cal Gas Expiry Date:        | September 9, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.3 ppm |                             |                   |
| Removed Gas Ref.                            | N/A       | Removed Gas Expiry:         | N/A               |
| Removed CH <sub>4</sub> Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.3 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 689               |
| ZAG make/model:                             | API T701  | Serial Number:              | 3566              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320037 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.19E-04     | 3.19E-04      | NMHC SP Ratio:  | 5.63E-05      |
| CH <sub>4</sub> Retention time: | 13.8         | 13.8          | NMHC Peak Area: | 161210        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.3                 | 17.12                | 16.74               | 1.023                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.3                 | 17.12                | 17.14               | 0.999                      |
| second point          | 4960              | 40.2                 | 8.57                 | 8.56                | 1.001                      |
| third point           | 4980              | 20.1                 | 4.29                 | 4.32                | 0.992                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.3                 | 17.12                | 17.14               | 0.999                      |

|                           |       |
|---------------------------|-------|
| Average Correction Factor | 0.997 |
|---------------------------|-------|

|                       |       |                 |       |  |       |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 16.74 | Prev response   | 17.12 | *% change                                  | -2.3% |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 9.07                 | 8.85                                       | 1.025                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 9.07                 | 9.08                                       | 0.999                      |
| second point              | 4960              | 40.2                 | 4.54                 | 4.55                                       | 0.999                      |
| third point               | 4980              | 20.1                 | 2.27                 | 2.29                                       | 0.989                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 9.07                 | 9.09                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 0.995                      |
| Baseline Corr AF:         | 8.85              | Prev response        | 9.06                 | *% change                                  | -2.4%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 8.06                 | 7.89                                       | 1.021                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 8.06                 | 8.06                                       | 1.000                      |
| second point              | 4960              | 40.2                 | 4.03                 | 4.02                                       | 1.004                      |
| third point               | 4980              | 20.1                 | 2.02                 | 2.03                                       | 0.994                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 8.06                 | 8.06                                       | 1.000                      |
| Average Correction Factor |                   |                      |                      |  | 1.000                      |
| Baseline Corr AF:         | 7.89              | Prev response        | 8.06                 | *% change                                  | -2.2%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000499     | 1.000113      |
| THC Cal Offset:             | -0.007453    | 0.008939      |
| CH <sub>4</sub> Cal Slope:  | 1.001107     | 0.999419      |
| CH <sub>4</sub> Cal Offset: | -0.004401    | 0.000800      |
| NMHC Cal Slope:             | 1.000174     | 1.000630      |
| NMHC Cal Offset:            | -0.003652    | 0.008539      |

Notes: Changed the inlet filter after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## THC Calibration Summary

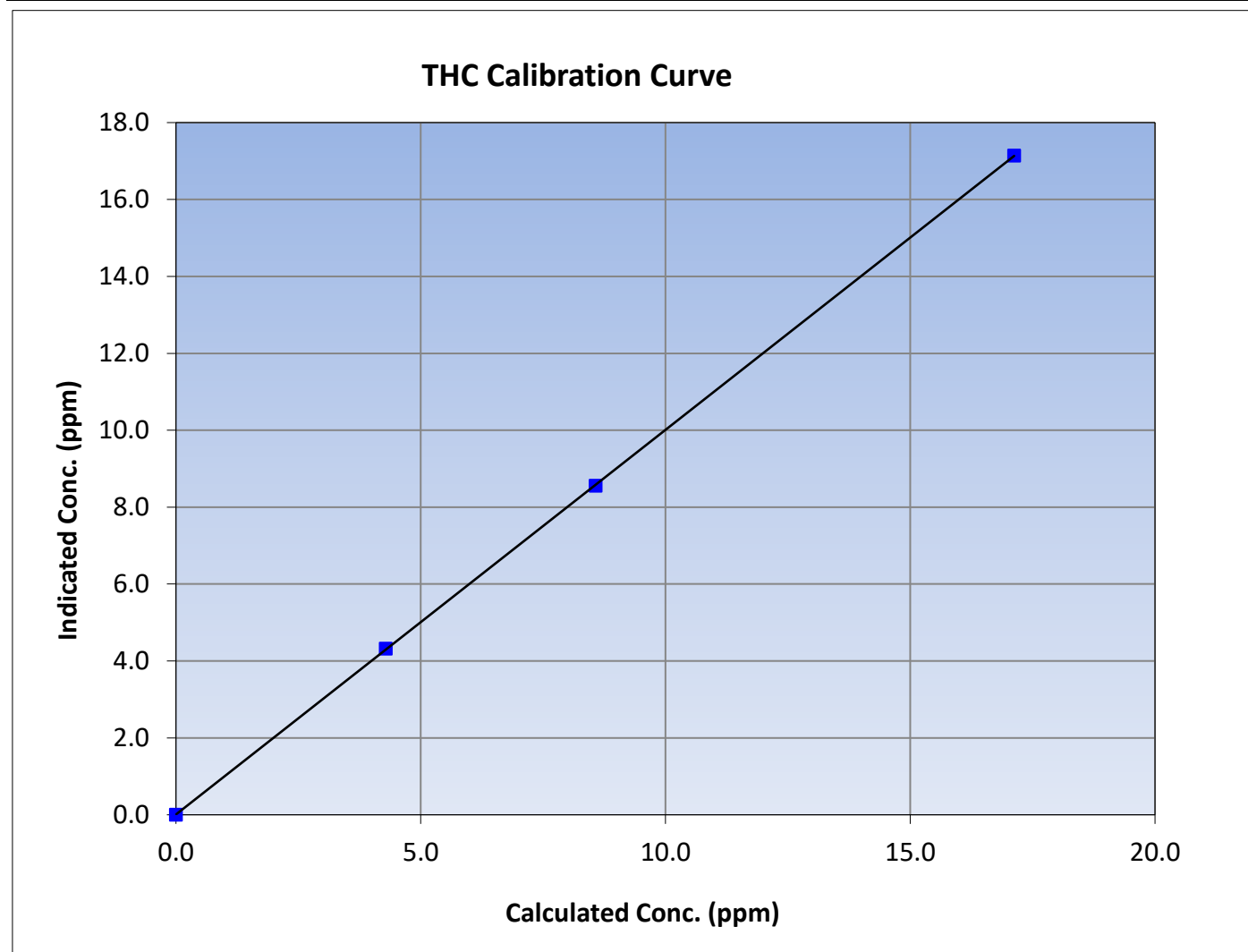
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06           |
| Start Time (MST): | 10:17             | End Time (MST):       | 13:49           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999992 | $\geq 0.995$  |
| 17.12                               | 17.14                              | 0.9991                    |                         |          |               |
| 8.57                                | 8.56                               | 1.0014                    |                         |          |               |
| 4.29                                | 4.32                               | 0.9917                    |                         |          |               |
|                                     |                                    |                           | Slope                   | 1.000113 | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | 0.008939 | +/-0.5        |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

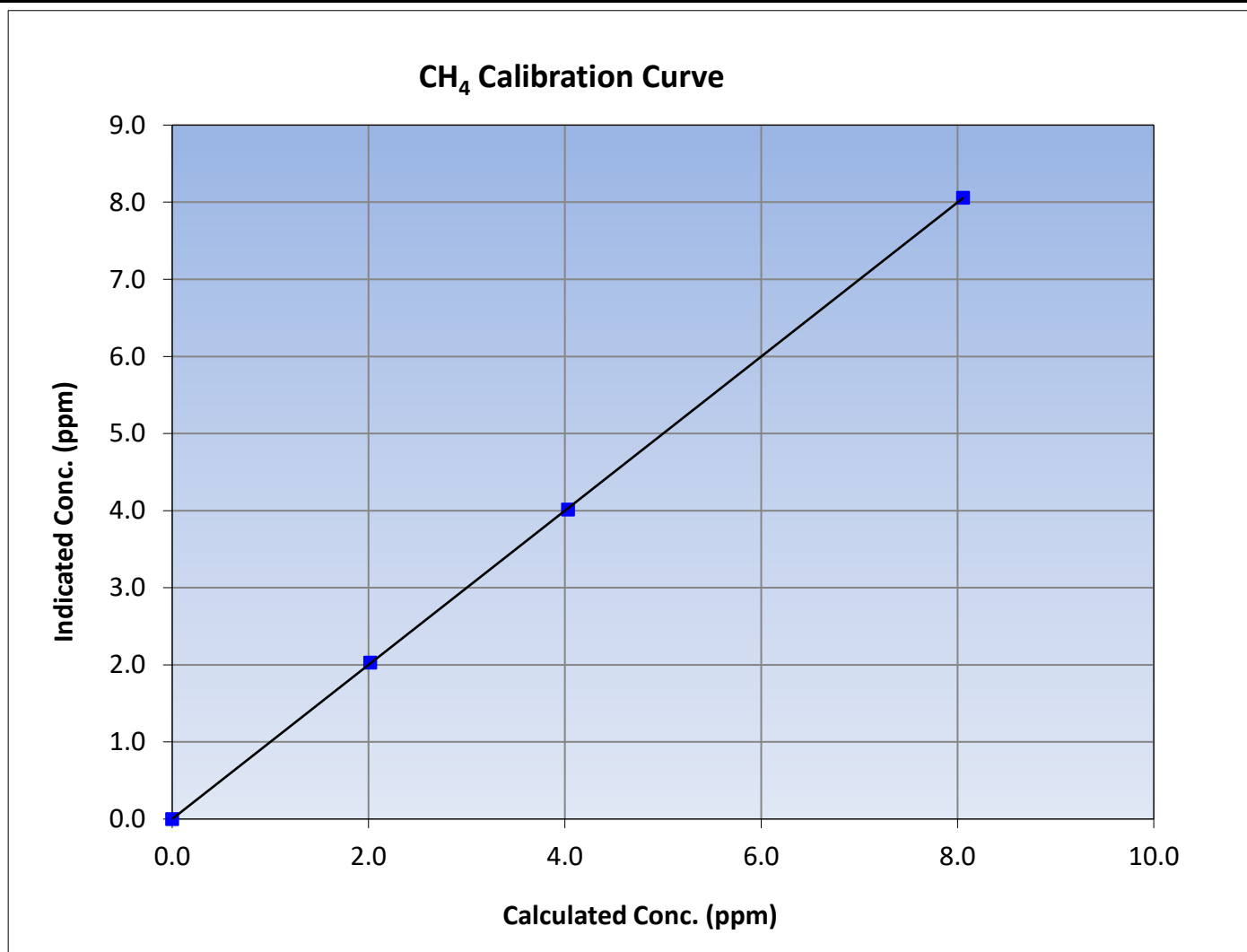
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06           |
| Start Time (MST): | 10:17             | End Time (MST):       | 13:49           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988 | ≥0.995        |       |          |             |
| 8.06                                | 8.06                               | 0.9998                    |                         |          |               |       |          |             |
| 4.03                                | 4.02                               | 1.0044                    |                         |          |               | Slope | 0.999419 | 0.90 - 1.10 |
| 2.02                                | 2.03                               | 0.9943                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.000800 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

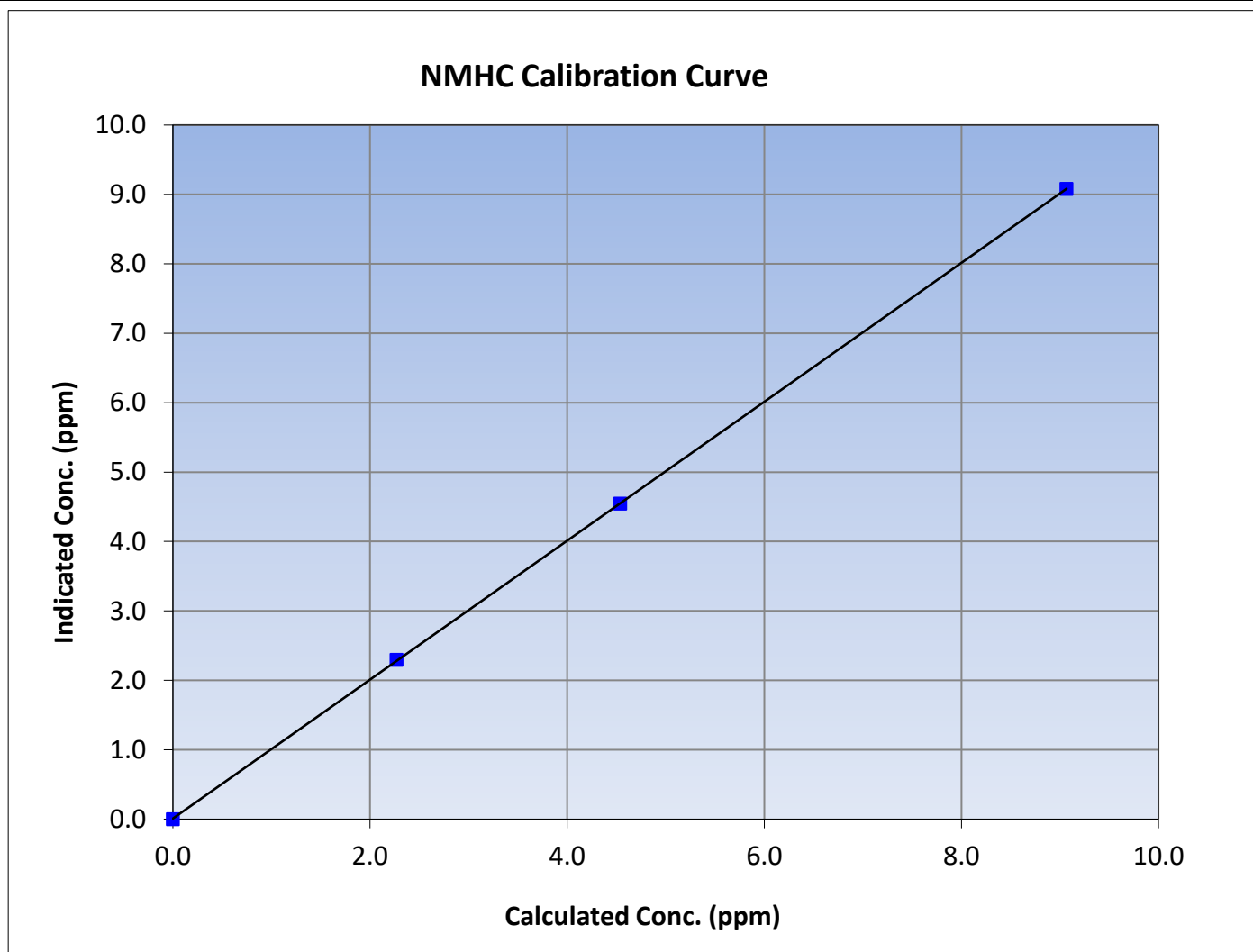
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06           |
| Start Time (MST): | 10:17             | End Time (MST):       | 13:49           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037      |

### Calibration Data

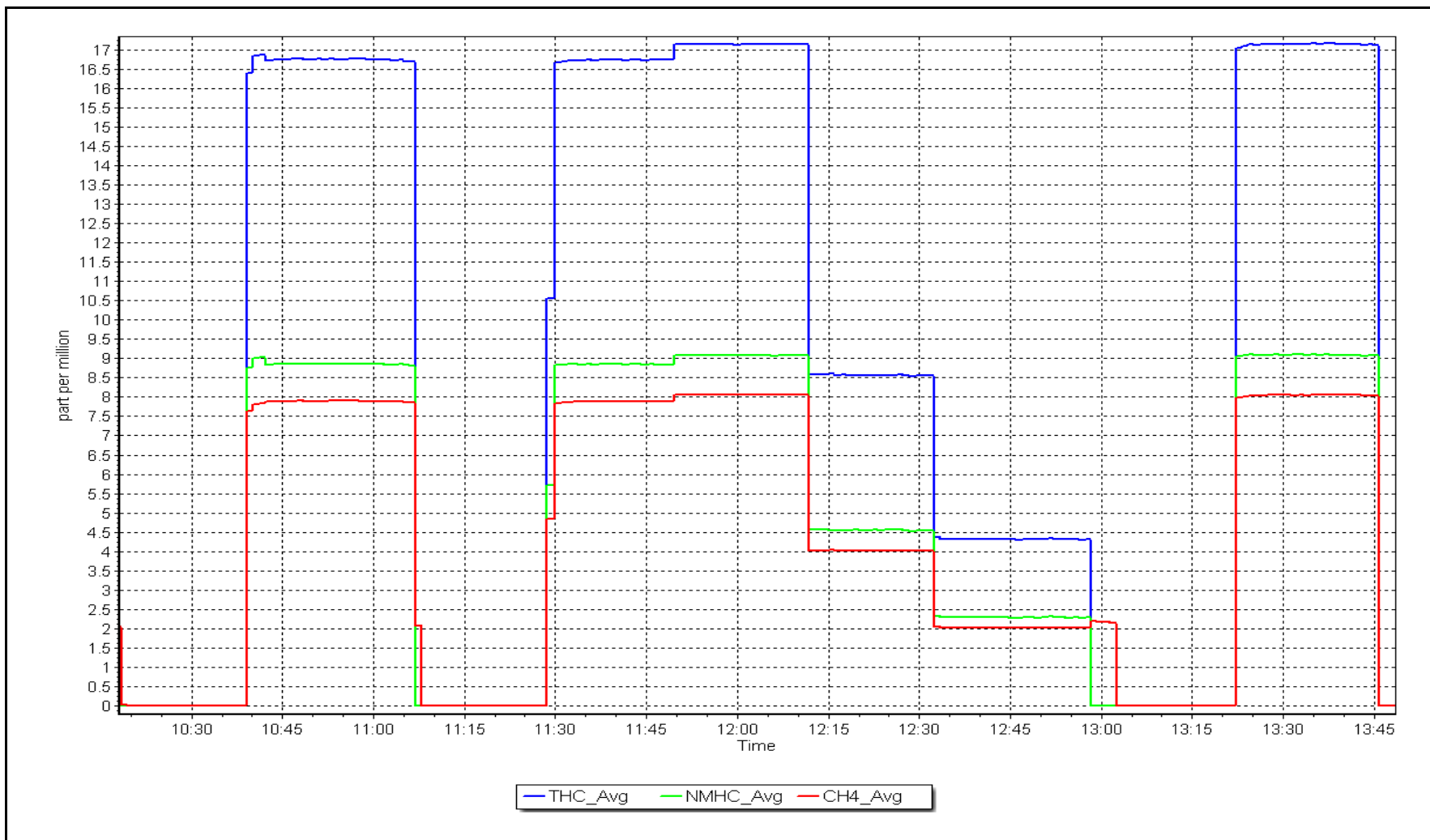
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999993 | $\geq 0.995$  |       |          |             |
| 9.07                                | 9.08                               | 0.9986                    |                         |          |               |       |          |             |
| 4.54                                | 4.55                               | 0.9985                    |                         |          |               | Slope | 1.000630 | 0.90 - 1.10 |
| 2.27                                | 2.29                               | 0.9894                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.008539 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 16, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Patricia McInnes  | Station number: | AMS06             |
| Calibration Date: | February 25, 2023 | Last Cal Date:  | February 16, 2023 |
| Start time (MST): | 10:52             | End time (MST): | 17:04             |
| Reason:           | Maintenance       |                 |                   |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | AAL070632 | Cal Gas Expiry Date:        | September 9, 2024 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.3 ppm |                             |                   |
| Removed Gas Ref.                            | N/A       | Removed Gas Expiry:         | N/A               |
| Removed CH <sub>4</sub> Conc.               | 501.6 ppm | CH <sub>4</sub> Equiv Conc. | 1066.2 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.3 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3566              |
| ZAG make/model:                             | API T701  | Serial Number:              | 261               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320037 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.19E-04     | 3.26E-04      | NMHC SP Ratio:  | 5.63E-05      |
| CH <sub>4</sub> Retention time: | 13.8         | 14.0          | NMHC Peak Area: | 161210        |
|                                 |              |               |                 | 5.79E-05      |
|                                 |              |               |                 | 156880        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.3                 | 17.12                | 14.77               | 1.159                      |
| as found 2nd point    | 4960              | 40.2                 | 8.57                 | 7.37                | 1.163                      |
| as found 3rd point    | 4980              | 20.1                 | 4.29                 | 3.70                | 1.158                      |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.3                 | 17.12                | 17.14               | 0.999                      |
| second point          | 4960              | 40.2                 | 8.57                 | 8.54                | 1.004                      |
| third point           | 4980              | 20.1                 | 4.29                 | 4.29                | 0.999                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.3                 | 17.12                | 17.09               | 1.002                      |

|                           |       |
|---------------------------|-------|
| Average Correction Factor | 1.000 |
|---------------------------|-------|

|                       |       |                 |          |  |           |
|-----------------------|-------|-----------------|----------|--|-----------|
| Baseline Corr AF:     | 14.77 | Prev response   | 17.13    | % change                                   | -16.0%    |
| Baseline Corr 2nd AF: | 7.4   | AF Slope:       | 0.862320 | AF Intercept:                              | -0.003271 |
| Baseline Corr 3rd AF: | 3.7   | AF Correlation: | 0.999996 | * = > +/-5% change initiates investigation |           |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 9.07                 | 7.58                                       | 1.196                      |
| as found 2nd point        | 4960              | 40.2                 | 4.54                 | 3.79                                       | 1.199                      |
| as found 3rd point        | 4980              | 20.1                 | 2.27                 | 1.90                                       | 1.196                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 9.07                 | 9.08                                       | 0.999                      |
| second point              | 4960              | 40.2                 | 4.54                 | 4.54                                       | 1.001                      |
| third point               | 4980              | 20.1                 | 2.27                 | 2.28                                       | 0.996                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 9.07                 | 9.06                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 0.998                      |
| Baseline Corr AF:         | 7.58              | Prev response        | 9.08                 | *% change                                  | -19.8%                     |
| Baseline Corr 2nd AF:     | 3.8               | AF Slope:            | 0.836122             | AF Intercept:                              | -0.002285                  |
| Baseline Corr 3rd AF:     | 1.9               | AF Correlation:      | 0.999998             | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 8.06                 | 7.19                                       | 1.121                      |
| as found 2nd point        | 4960              | 40.2                 | 4.03                 | 3.59                                       | 1.125                      |
| as found 3rd point        | 4980              | 20.1                 | 2.02                 | 1.80                                       | 1.118                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 8.06                 | 8.06                                       | 0.999                      |
| second point              | 4960              | 40.2                 | 4.03                 | 4.00                                       | 1.007                      |
| third point               | 4980              | 20.1                 | 2.02                 | 2.01                                       | 1.002                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 8.06                 | 8.03                                       | 1.003                      |
| Average Correction Factor |                   |                      |                      |  | 1.003                      |
| Baseline Corr AF:         | 7.19              | Prev response        | 8.05                 | *% change                                  | -12.0%                     |
| Baseline Corr 2nd AF:     | 3.59              | AF Slope:            | 0.891680             | AF Intercept:                              | -0.000785                  |
| Baseline Corr 3rd AF:     | 1.80              | AF Correlation:      | 0.999995             | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000113     | 1.000813      |
| THC Cal Offset:             | 0.008939     | -0.008055     |
| CH <sub>4</sub> Cal Slope:  | 0.999419     | 1.000524      |
| CH <sub>4</sub> Cal Offset: | 0.000800     | -0.008597     |
| NMHC Cal Slope:             | 1.000630     | 1.001070      |
| NMHC Cal Offset:            | 0.008539     | 0.000542      |

Notes: Changed pump after MAF's. Adjusted span only.

Calibration Performed By: Mohammed Kashif





# Wood Buffalo Environmental Association

## THC Calibration Summary

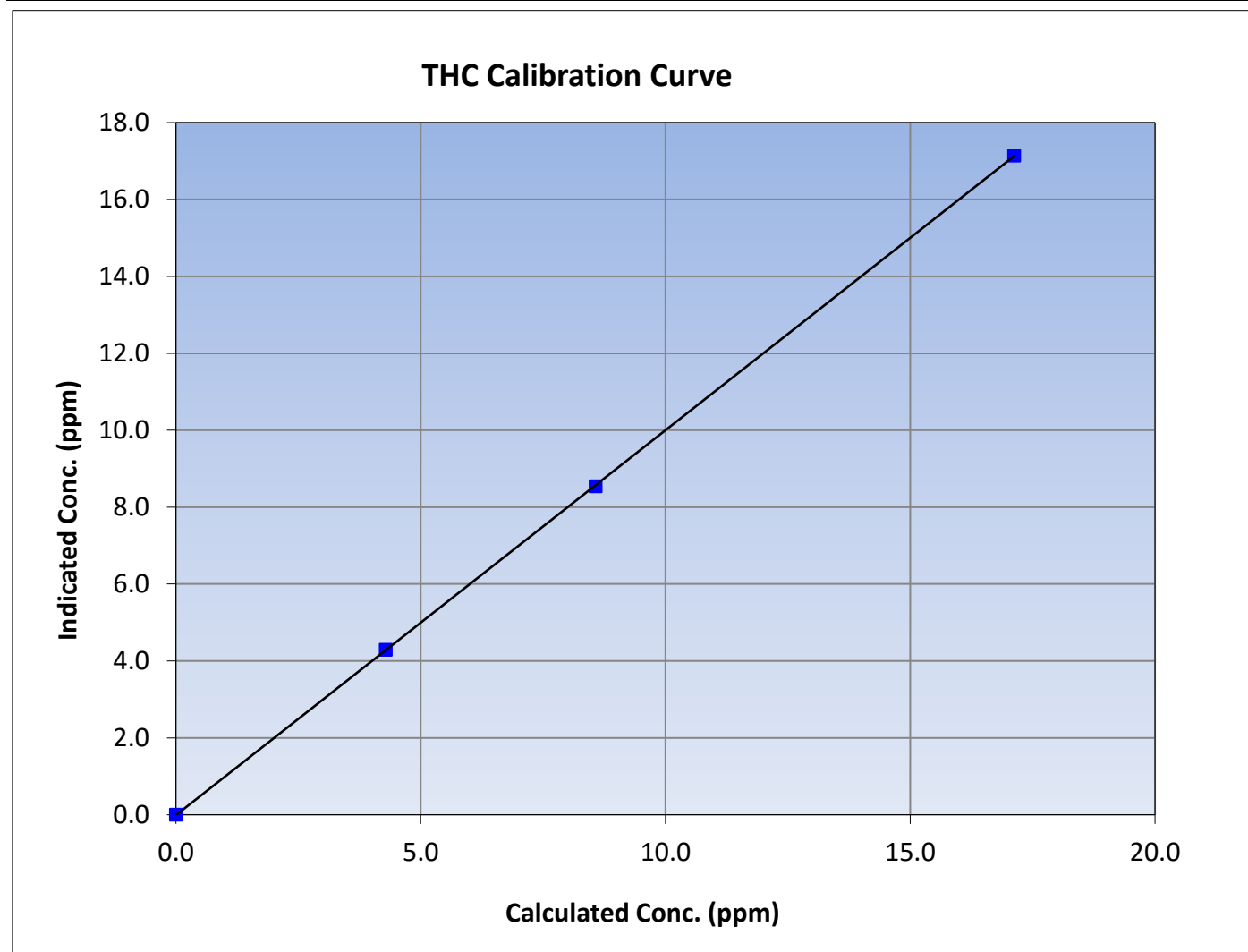
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 25, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06             |
| Start Time (MST): | 10:52             | End Time (MST):       | 17:04             |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999991  | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.14                              | 0.9989                    |                         |           |               |       |          |             |
| 8.57                                | 8.54                               | 1.0039                    |                         |           |               | Slope | 1.000813 | 0.90 - 1.10 |
| 4.29                                | 4.29                               | 0.9986                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.008055 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

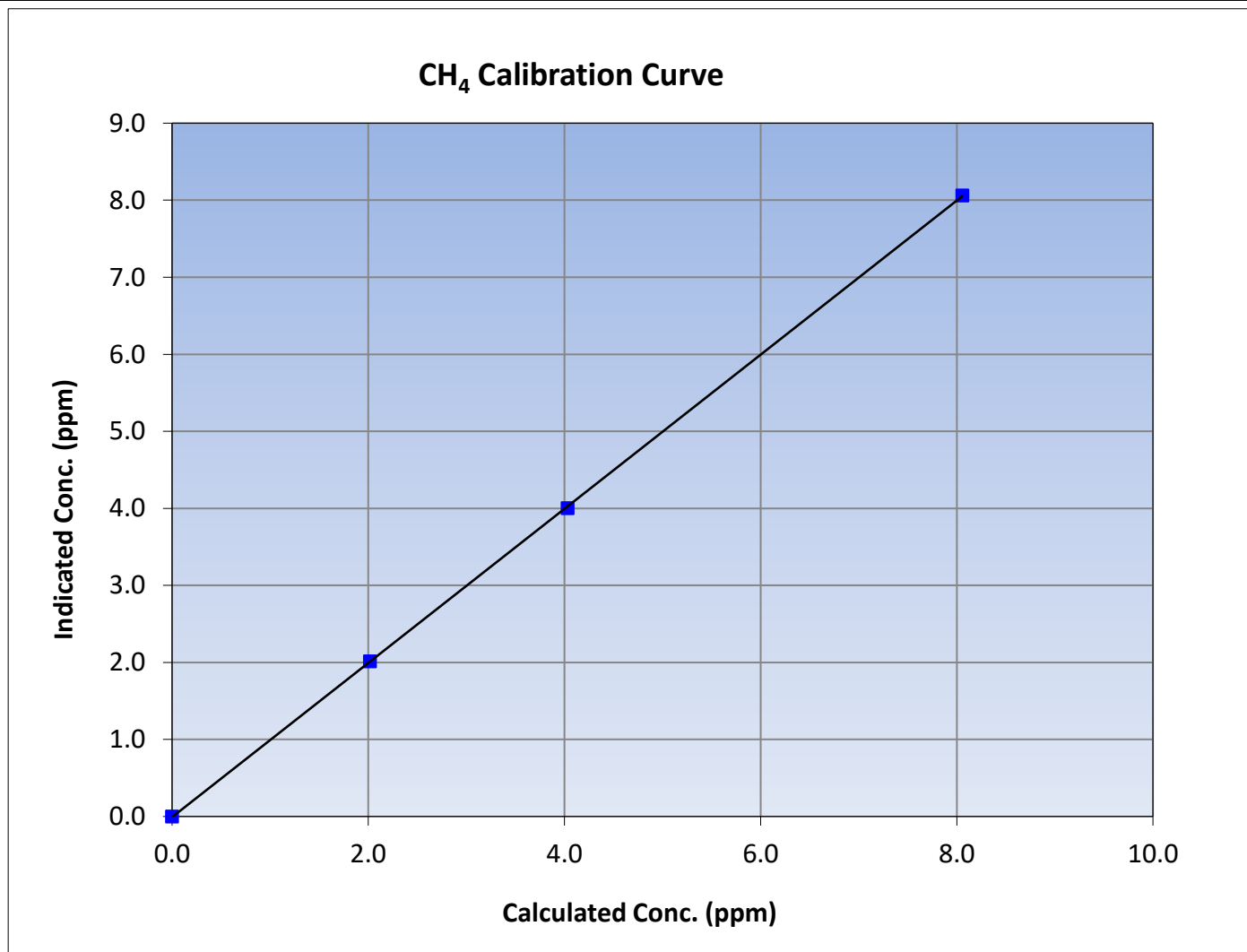
Version-01-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 25, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06             |
| Start Time (MST): | 10:52             | End Time (MST):       | 17:04             |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999979  | $\geq 0.995$  |
| 8.06                                | 8.06                               | 0.9992                    |                         |           |               |
| 4.03                                | 4.00                               | 1.0075                    |                         |           |               |
| 2.02                                | 2.01                               | 1.0017                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.000524  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.008597 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

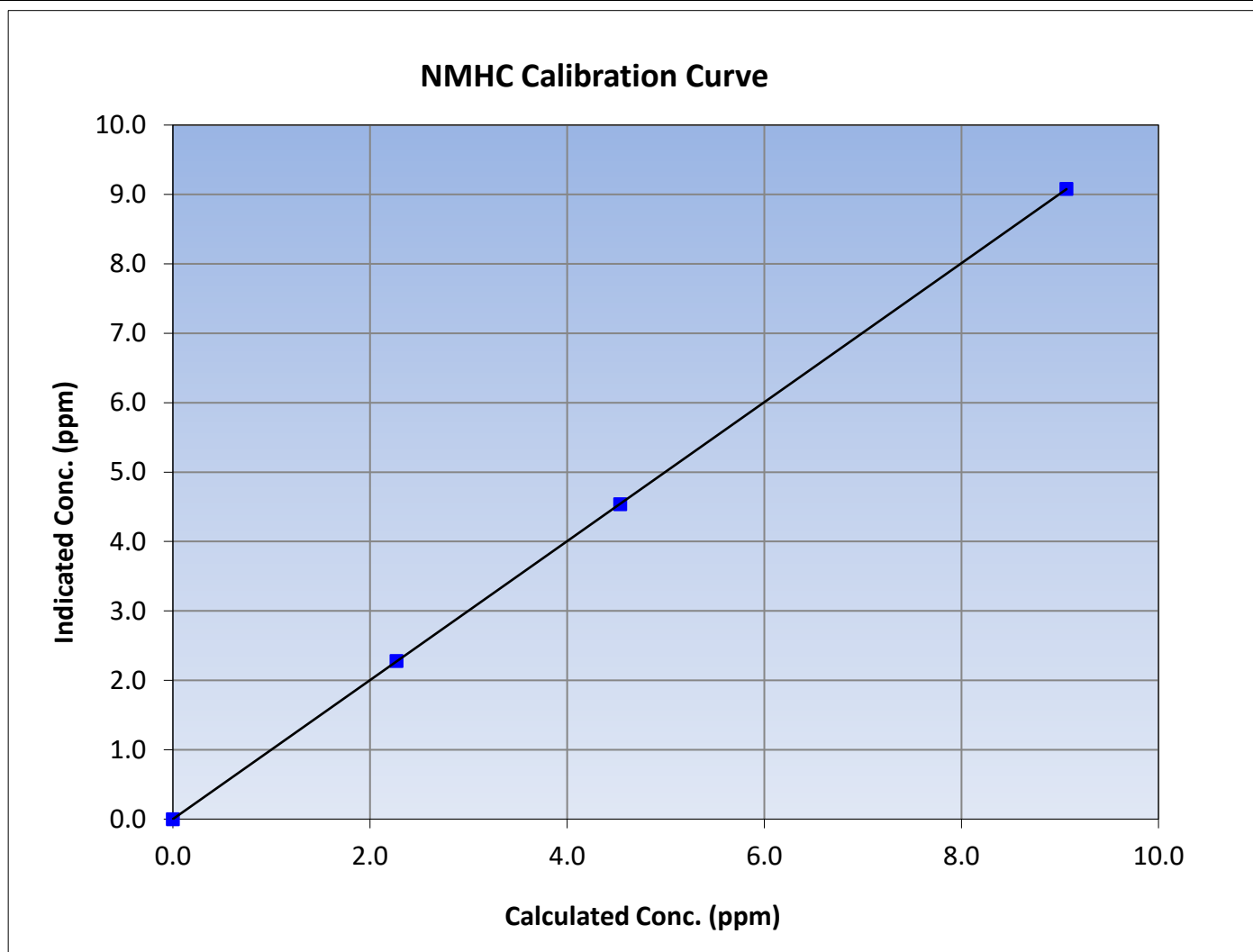
Version-01-2020

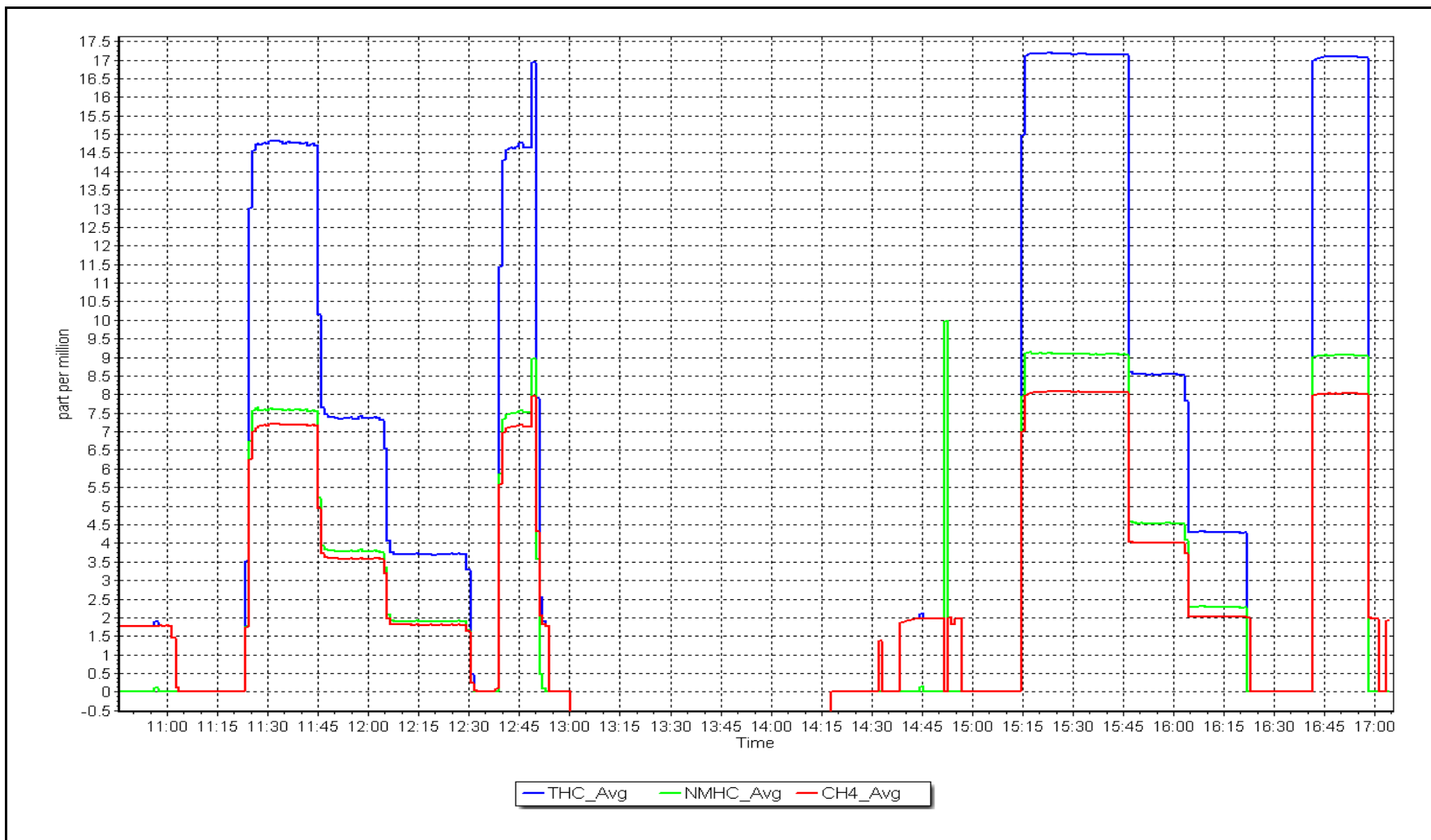
### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 25, 2023 | Previous Calibration: | February 16, 2023 |
| Station Name:     | Patricia McInnes  | Station Number:       | AMS06             |
| Start Time (MST): | 10:52             | End Time (MST):       | 17:04             |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320037        |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999997 | $\geq 0.995$  |       |          |             |
| 9.07                                | 9.08                               | 0.9986                    |                         |          |               |       |          |             |
| 4.54                                | 4.54                               | 1.0007                    |                         |          |               | Slope | 1.001070 | 0.90 - 1.10 |
| 2.27                                | 2.28                               | 0.9959                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.000542 | $\pm 0.5$     |       |          |             |







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Patricia McInnes  
Calibration Date: February 2, 2023  
Start time (MST): 9:39  
Reason: Routine  
Station number: AMS06  
Last Cal Date: January 5, 2023  
End time (MST): 14:14

### Calibration Standards

NO Gas Cylinder #: T26D9MR  
NOX Cal Gas Conc: 52.51 ppm  
Removed Cylinder #: N/A  
Removed Gas NOX Conc: 52.51 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: August 18, 2023  
NO Cal Gas Conc: 51.98 ppm  
Removed Gas Exp Date: N/A  
Removed Gas NO Conc: 51.98 ppm  
NO gas Diff:  
Serial Number: 3566  
Serial Number: 689

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1172750022

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 0.818        | 0.818         | NO bkgnd or offset:  | 3.2          | 3.2           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 3.8          | 3.8           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 154.2        | 155.1         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000715     | 1.004307      |
| NO <sub>x</sub> Cal Offset: | 2.680164     | 2.260596      |
| NO Cal Slope:               | 0.999284     | 1.003971      |
| NO Cal Offset:              | 1.700041     | 1.260503      |
| NO <sub>2</sub> Cal Slope:  | 1.007019     | 1.009891      |
| NO <sub>2</sub> Cal Offset: | 0.124373     | 0.497022      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | 0.1                                   | -0.3   | ----  | ----   |
| as found span             | 4923                      | 76.9                        | 807.6   | 799.5                                  | 8.2   | 815.2  | 802.4                                 | 12.8   | 0.9907  | 0.9963   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.2                                   | -0.2   | ----  | ----   |
| high point                | 4923                      | 76.9                        | 807.6   | 799.5                                  | 8.2   | 812.5  | 803.6                                 | 8.9  | 0.9940  | 0.9948   |
| second point              | 4962                      | 38.5                        | 404.3   | 400.2                                  | 4.1   | 408.6  | 402.9                                 | 5.7  | 0.9895  | 0.9934   |
| third point               | 4981                      | 19.2                        | 201.6   | 199.6                                  | 2.0   | 207.6  | 203.2                                 | 4.4  | 0.9713  | 0.9823   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | 0.2                                   | -0.3   | ----  | ----   |
| as left span              | 4923                      | 76.9                        | 807.6   | 388.2                                  | 419.5   | 810.2  | 389.2                                 | 421.0  | 0.9968  | 0.9973   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9849  | 0.9902   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 815.5 ppb | NO = 802.3 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.6% |
| Previous Response    | NO <sub>x</sub> = 810.9 ppb | NO = 800.6 ppb |  | *Percent Change                  | NO = 0.2%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 799.4                                      | 388.1                                 | 419.5   | 423.7  | 0.9900   | 101.0%   |
| 2nd GPT point (200 ppb O3)       | 799.4                                      | 594.2                                 | 213.4   | 216.4  | 0.9859   | 101.4%   |
| 3rd GPT point (100 ppb O3)       | 799.4                                      | 696.5                                 | 111.1   | 113.3  | 0.9802   | 102.0%   |
| Average Correction Factor        |  |                                       |   |  | 0.9853   | 101.5%   |

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

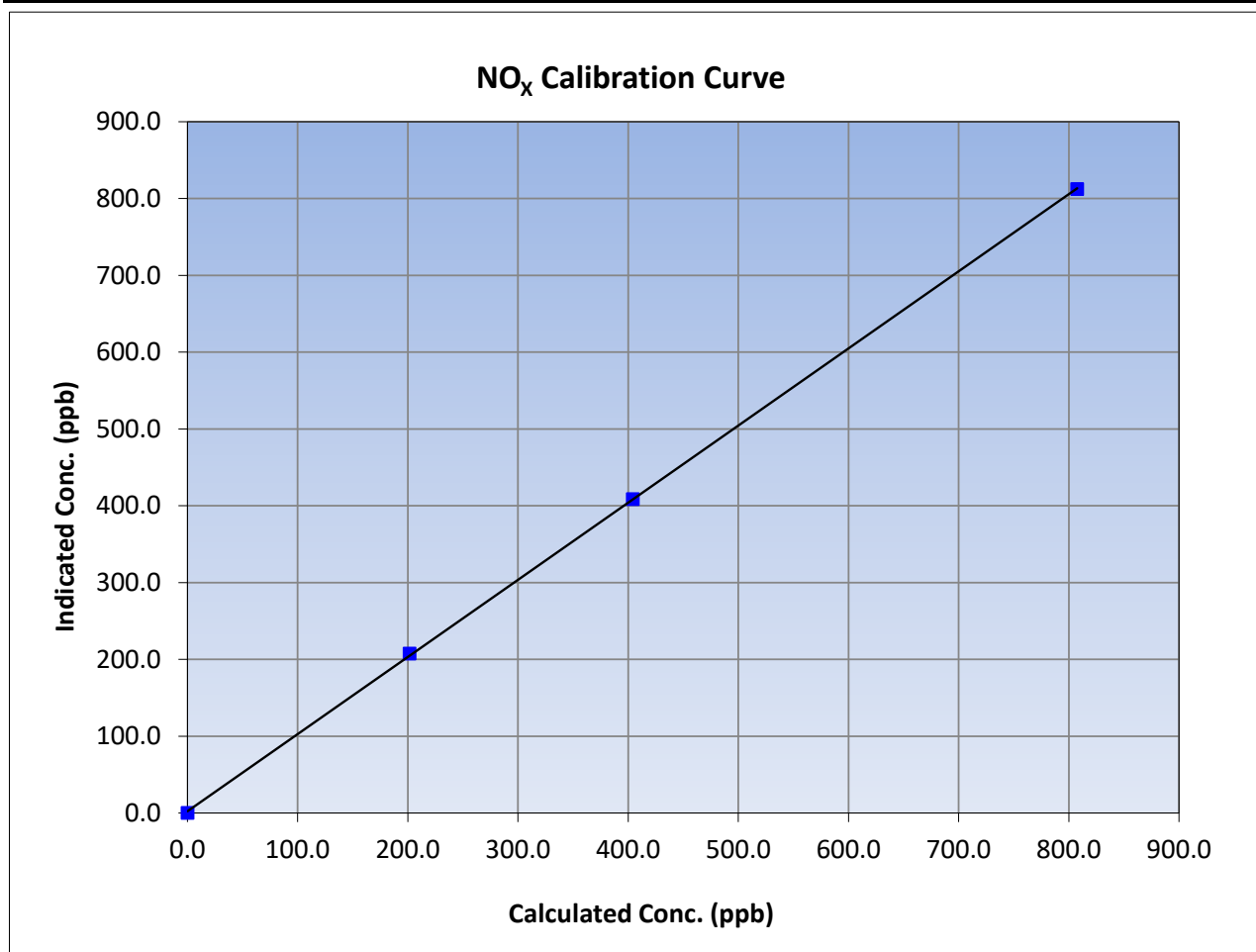
Version-04-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 5, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06           |
| Start Time (MST): | 9:39             | End Time (MST):       | 14:14           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1172750022      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |             |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |             |
| 807.6                               | 812.5                              | 0.9940                    |   |                                |             |
| 404.3                               | 408.6                              | 0.9895                    |   |                                |             |
| 201.6                               | 207.6                              | 0.9713                    |   |                                |             |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999961                       | ≥0.995      |
|                                     |                                    |                           | Slope   | 1.004307                       | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                                     | 2.260596                       | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

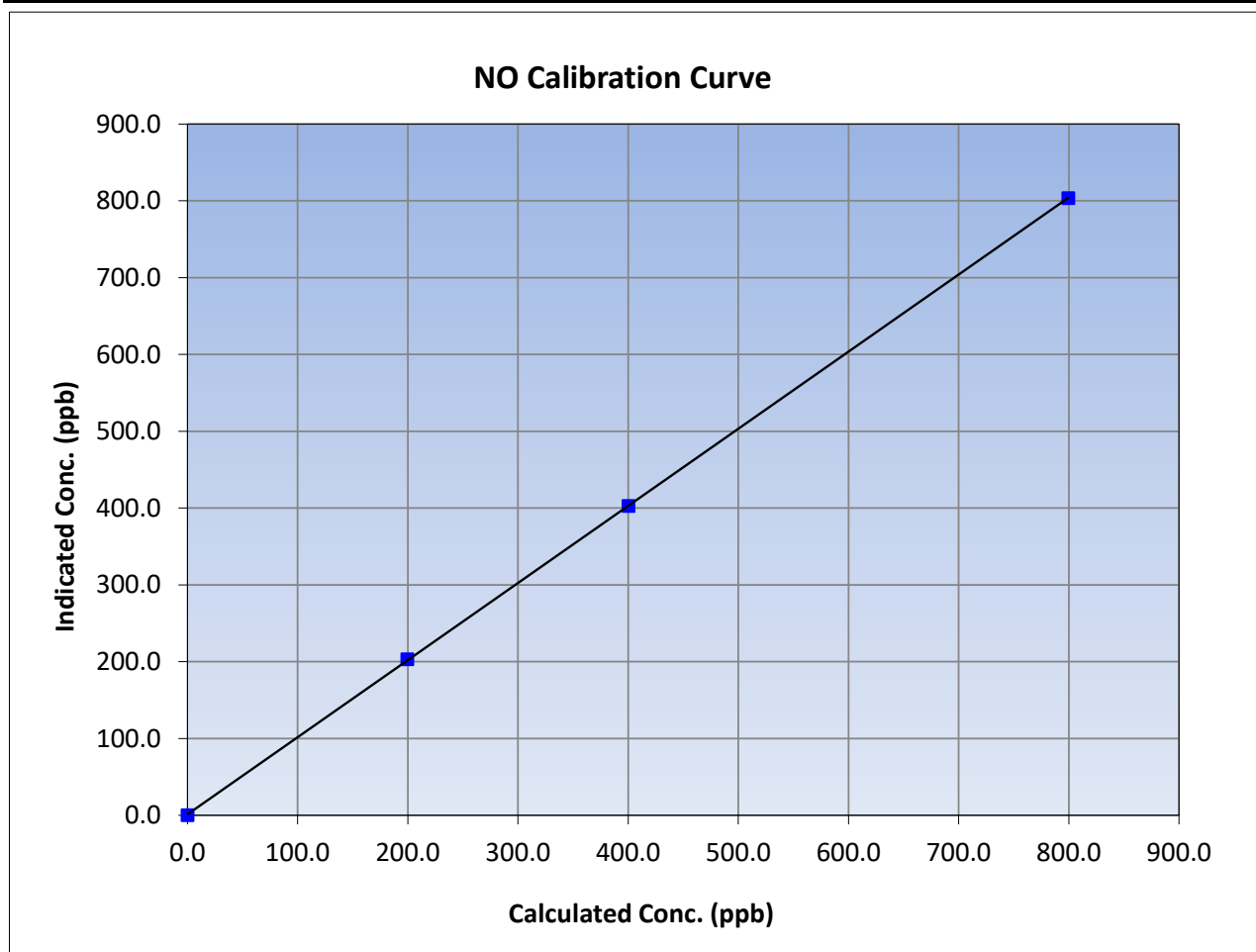
Version-04-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 5, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06           |
| Start Time (MST): | 9:39             | End Time (MST):       | 14:14           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1172750022      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.5                               | 803.6                              | 0.9948                    |   |                                |
| 400.2                               | 402.9                              | 0.9934                    |   |                                |
| 199.6                               | 203.2                              | 0.9823                    |   |                                |
|                                     |                                    |                           |   |                                |







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

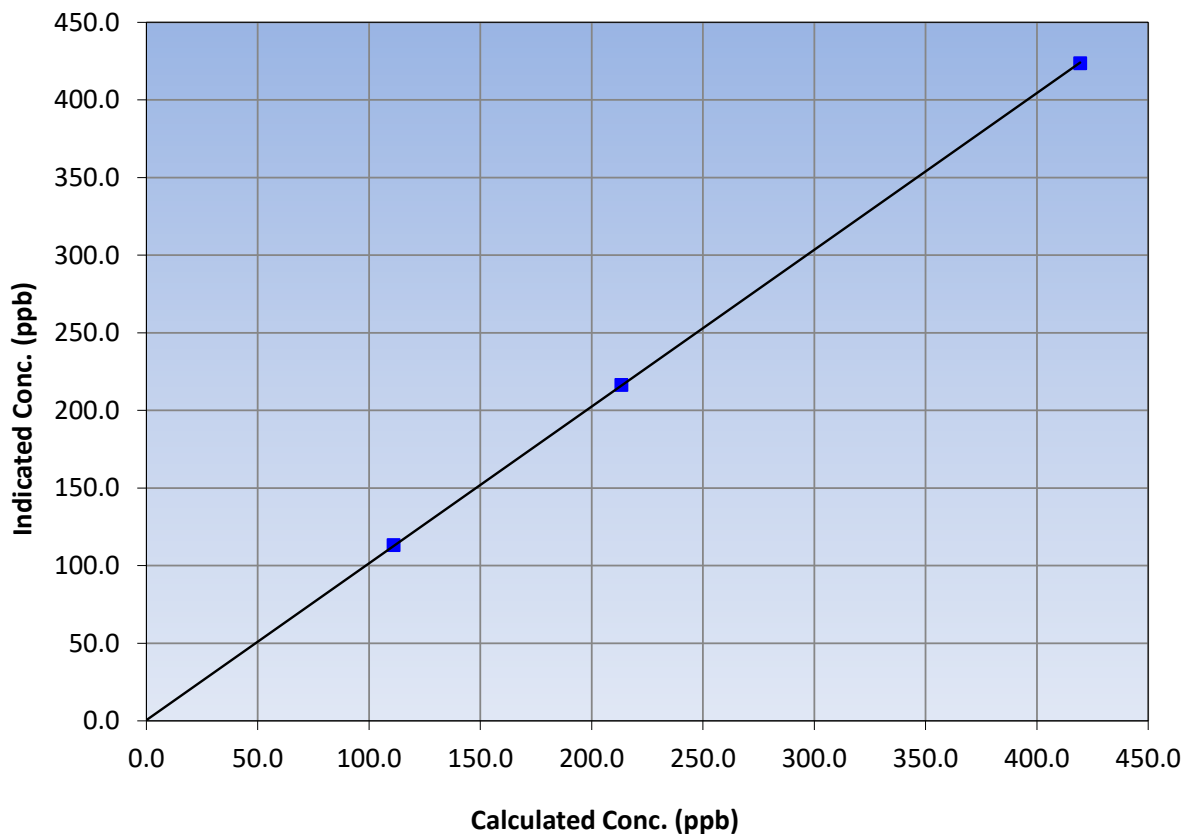
### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 5, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06           |
| Start Time (MST): | 9:39             | End Time (MST):       | 14:14           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1172750022      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 419.5                               | 423.7                              | 0.9900                    |                         |               |             |
| 213.4                               | 216.4                              | 0.9859                    |                         |               |             |
| 111.1                               | 113.3                              | 0.9802                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.009891      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.497022      | +/-20       |

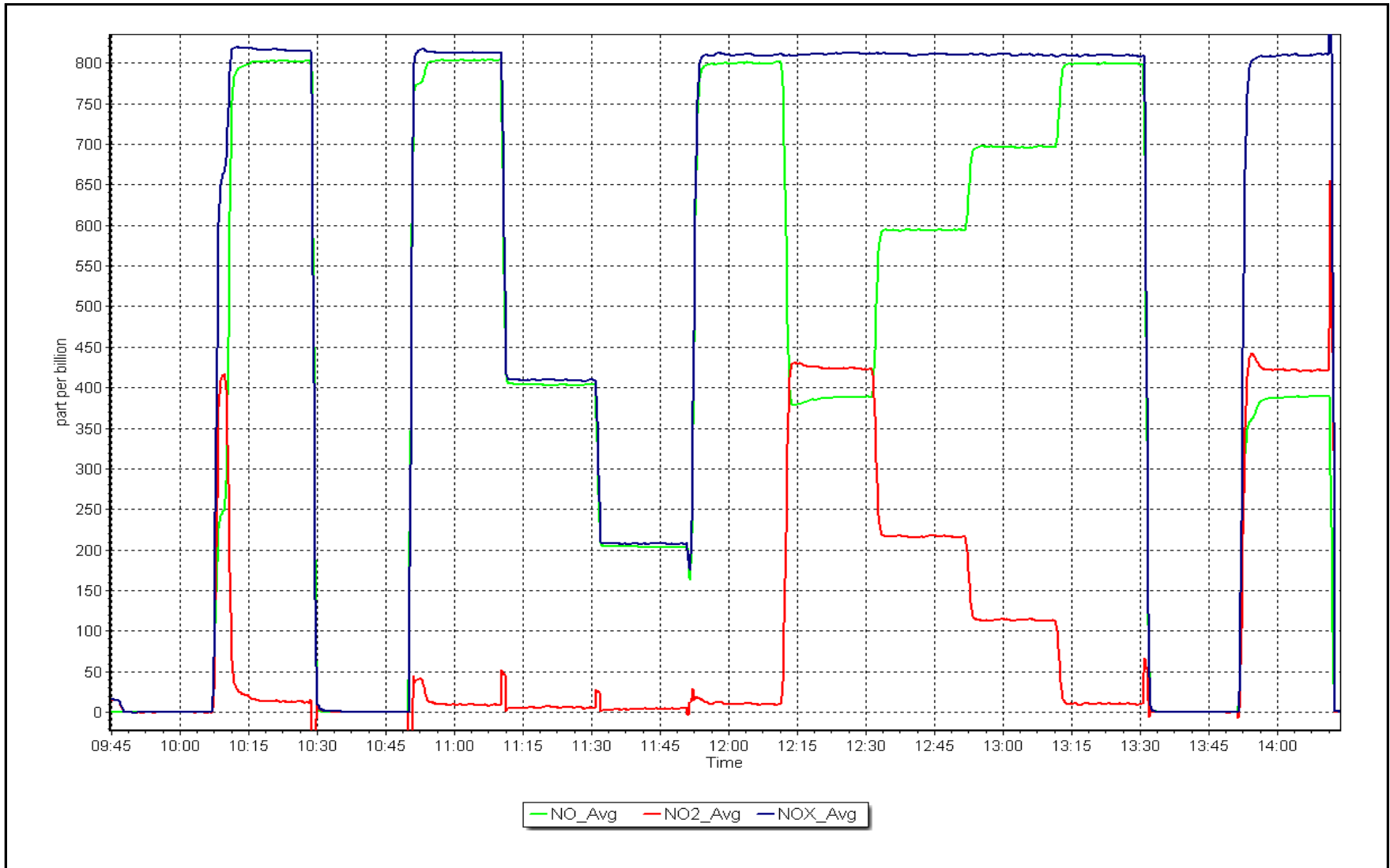
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 2, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Patricia McInnes      Station number: AMS06  
 Calibration Date: February 8, 2023      Last Cal Date: January 12, 2023  
 Start time (MST): 10:19      End time (MST): 13:52  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: API T700      Serial Number: 3566  
 ZAG Make/Model: API T701H      Serial Number: 689

### Analyzer Information

Analyzer make: Thermo 49i      Analyzer serial #: 1300156234  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.004914     | 1.005057      | Backgd or Offset: | -1.2         | -1.2          |
| Calibration intercept: | 1.440000     | 1.240000      | Coeff or Slope:   | 1.019        | 1.019         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 800.0                         | 0.0                                 | 0.4                                | ----  |
| as found span             | 5000                       | 1303.0                        | 400.0                               | 403.3                              | 0.992   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 800.0                         | 0.0                                 | 0.6                                | ----  |
| high point                | 5000                       | 1303.0                        | 400.0                               | 402.8                              | 0.993   |
| second point              | 5000                       | 966.5                         | 200.0                               | 203.0                              | 0.985   |
| third point               | 5000                       | 794.3                         | 100.0                               | 102.1                              | 0.979   |
| as left zero              | 5000                       | 800.0                         | 0.0                                 | 0.9                                | ----  |
| as left span              | 5000                       | 1303.0                        | 400.0                               | 405.4                              | 0.987   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.986   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 402.9 | Previous response | 403.4 | *% change     | -0.1% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

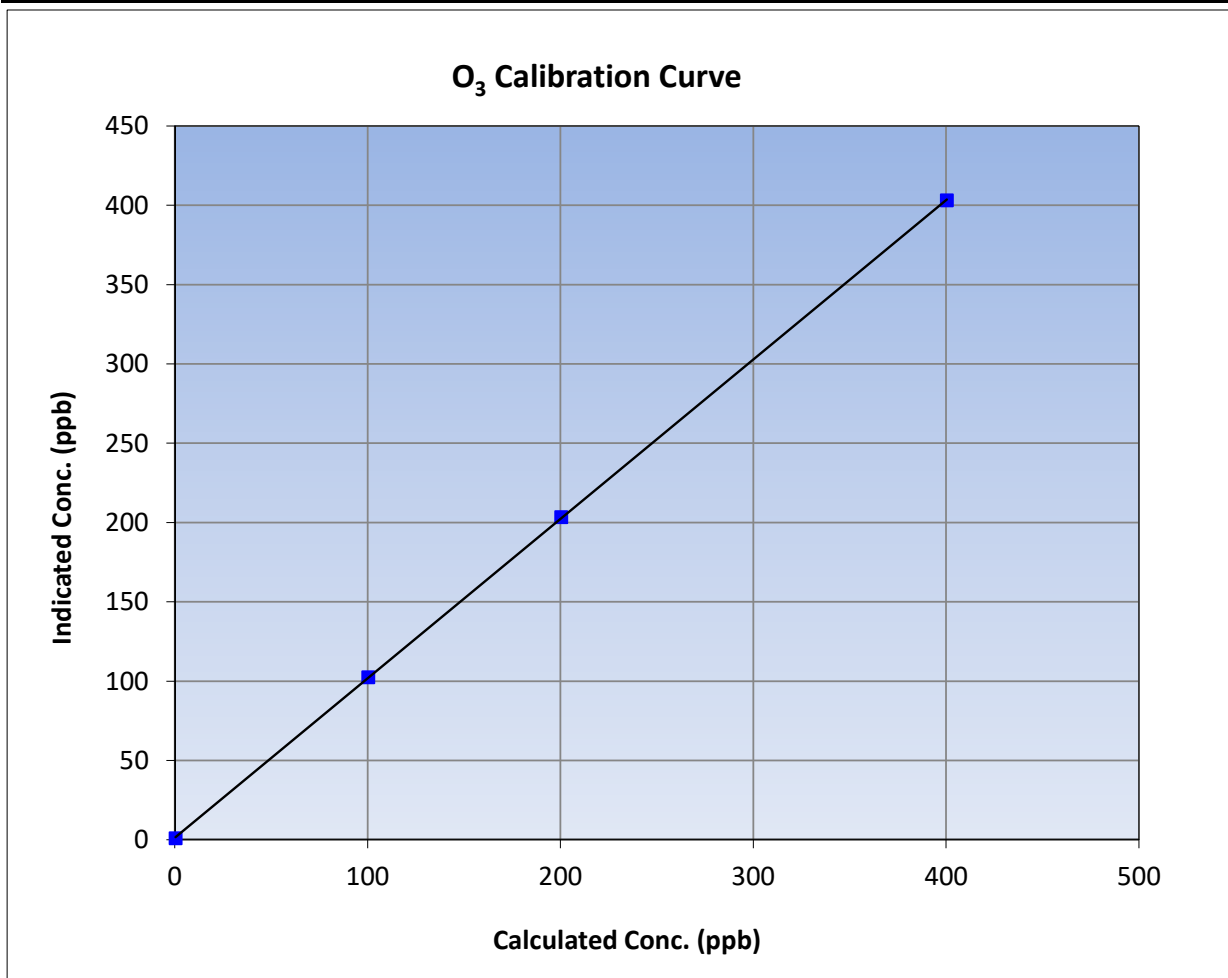
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS06            |
| Start Time (MST): | 10:19            | End Time (MST):       | 13:52            |
| Analyzer make:    | Thermo 49i       | Analyzer serial #:    | 1300156234       |

### Calibration Data

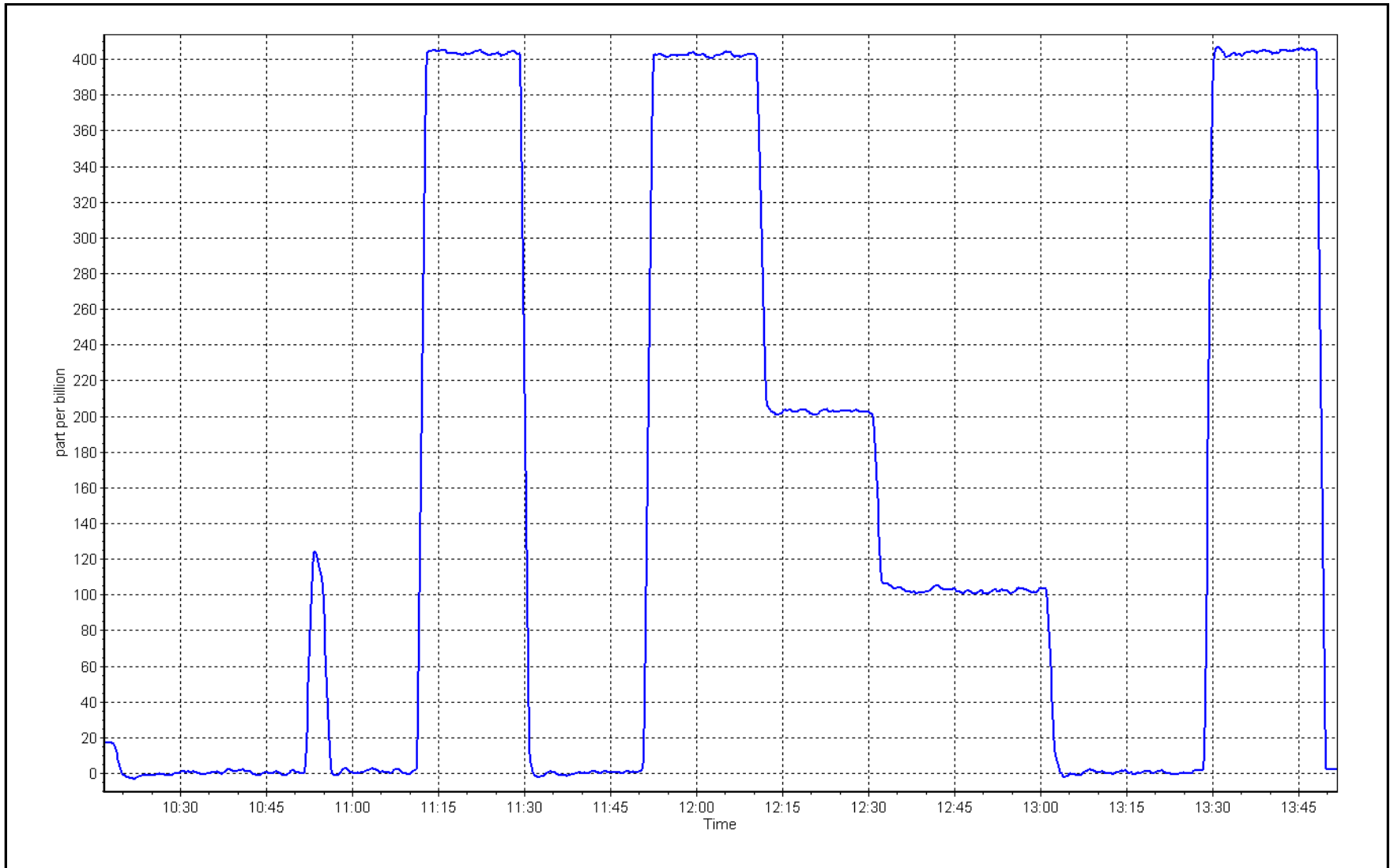
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.6                                | ----                      | Correlation Coefficient | 0.999985 |             |
| 400.0                               | 402.8                              | 0.9930                    |                         |          | ≥0.995      |
| 200.0                               | 203.0                              | 0.9852                    | Slope                   | 1.005057 |             |
| 100.0                               | 102.1                              | 0.9794                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.240000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 8, 2023

Location: Patricia McInnes





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Patricia McInnes Station number: AMS 06  
 Calibration Date: February 16, 2023 Last Cal Date: January 9, 2023  
 Start time (MST): 14:29 End time (MST): 15:08

Analyzer Make: API T640 S/N: 766  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 628  
 Temp/RH standard: Delta Cal S/N: 628

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -6.5     | -7.2     | -6.5    | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 715.9    | 713.3    | 715.9   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.02     | 5.1      | 5.02    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 16, 2023 Last Cal Date: January 9, 2023  
 PM w/o HEPA: 9.1 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: January 9, 2023 <0.2 ug/m3  
 Disposable Filter Changed: January 9, 2023

### Annual Maintenance

Date Sample Tube Cleaned: August 28, 2020  
 Date RH/T Sensor Cleaned: August 28, 2020

Notes: PMT Peak test completed last month. Leak check passed. No adjustments made.

Calibration by: Max Farrell



# Wood Buffalo Environmental Association

## TN - NO<sub>x</sub> - NH<sub>3</sub> Calibration Report

Version-11-2021

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Patricia McInnes | Station number: | AMS 06           |
| NOX Cal Date:     | February 7, 2023 | Last Cal Date:  | January 11, 2023 |
| Start time (MST): | 9:09             | End time (MST): | 13:20            |
| NH3 Cal Date:     | February 7, 2023 | Last Cal Date:  | January 11, 2023 |
| Start time (MST): | 13:21            | End time (MST): | 15:25            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                   |          |     |                     |                 |
|-------------------|----------|-----|---------------------|-----------------|
| NOX Cal Gas Conc: | 52.51    | ppm | NO Gas Cylinder #:  | T26D9MR         |
| NO Cal Gas Conc:  | 51.98    | ppm | NO Cal Gas Expiry:  | August 18, 2023 |
| Removed NOX Conc: | 52.51    | ppm | Removed Cylinder #: | N/A             |
| Removed NO Conc:  | 51.98    | ppm | Removed cyl Expiry: | N/A             |
| NOX gas Diff:     |          |     | NO gas Diff:        |                 |
| NH3 Cal Gas Conc: | 73.9     | ppm | NH3 Gas Cylinder #: | CC430800        |
| Removed NH3 Conc: | 73.9     | ppm | NH3 Cal Gas Expiry: | January 7, 2023 |
| NH3 gas Diff:     |          |     | Removed Cylinder #: |                 |
| Calibrator Model: | API T700 |     | Removed cyl Expiry: |                 |
| ZAG make/model:   | API T701 |     | Serial Number:      | 3566            |
|                   |          |     | Serial Number:      | 689             |

### Analyzer Information

|                  |              |                      |      |
|------------------|--------------|----------------------|------|
| Analyzer model:  | API T201     | Analyzer serial #:   | 152  |
| Converter model: | API T501     | Converter serial #:  | 147  |
| NH3 Range (ppb): | 0 - 2000 ppb | Reaction cell Press: | 5.70 |
| NOX Range (ppb): | 0 - 1000 ppb | Sample Flow:         | 531  |

|                  | <u>Start</u> | <u>Finish</u> |                 | <u>Start</u> | <u>Finish</u> |
|------------------|--------------|---------------|-----------------|--------------|---------------|
| NO coefficient:  | 0.839        | 0.853         | TN coefficient: | 0.843        | 0.851         |
| NOX coefficient: | 0.840        | 0.855         | NO bkgnd:       | -0.1         | -0.1          |
| NO2 coefficient: | 1.000        | 1.000         | NOX bkgnd:      | 0.0          | 0.0           |
| NH3 coefficient: | 0.951        | 0.951         | TN bkgnd:       | 0.0          | 0.0           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.996497     | 0.994899      |
| NO <sub>x</sub> Cal Offset: | 1.220653     | 2.960281      |
| NO Cal Slope:               | 1.002531     | 0.994939      |
| NO Cal Offset:              | -0.260924    | 1.319966      |
| NO <sub>2</sub> Cal Slope:  | 1.003819     | 0.993439      |
| NO <sub>2</sub> Cal Offset: | 1.157200     | 1.205483      |
| NH3 Cal Slope:              | 0.998364     | 0.998917      |
| NH3 Cal Offset:             | 7.107284     | 8.375709      |
| TN Cal Slope:               | 1.003901     | 1.004451      |
| TN Cal Offset:              | 5.611013     | 8.831802      |



# Wood Buffalo Environmental Association

## TN - NOX - NH<sub>3</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                        | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated TN concentration (ppb) (Cc) | Calculated NOX concentration (ppb) (Cc) | Calculated NH3 concentration (ppb) (Cc) | Indicated TN concentration (ppb) (Ic) | Indicated NOX concentration (ppb) (Ic) | Indicated NH3 concentration (ppb) (Ic) | TN Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NH3 Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|----------------------------------|---------------------------|-----------------------------|--|---|---|---------------------------------------|--|--|--|---|
| as found zero                    | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | 0.4                                   | -0.3                                   | 0.7                                    | ----   | ----  |
| as found NO                      | 4923                      | 76.9                        | 807.6                                  | 807.6                                   | ----                                    | 796.1                                 | 790.1                                  | 5.9                                    | 1.014  | ----  |
| calibrator zero                  | 5000                      | 0.0                         | 0.0                                    | 0.0                                     | 0.0                                     | 0.6                                   | 0.4                                    | 0.2                                    | ----   | ----  |
| high NO point                    | 4923                      | 76.9                        | 807.6                                  | 807.6                                   | ----                                    | 802.1                                 | 805.3                                  | -3.2                                   | 1.007  | ----  |
| NO/O3 point                      | 4923                      | 76.9                        | 807.6                                  | 807.6                                   | ----                                    | 803.5                                 | 802.8                                  | 0.7                                    | 1.005  | ----  |
| as found NH3                     | 3415                      | 85.3                        | 1801.0                                 | ----                                    | 1801.0                                  | 1813.5                                | ----                                   | 1803.1                                 | 0.993  | 0.999   |
| new NH3 cyl rp                   |                           |                             |  |   |   |                                       | ----                                   |  |  |   |
| first NH3                        | 3415                      | 85.3                        | 1801.0                                 | ----                                    | 1801.0                                  | 1813.5                                | ----                                   | 1803.1                                 | 0.993  | 0.999   |
| second NH3                       | 3453                      | 47.4                        | 1000.8                                 | ----                                    | 1000.8                                  | 1017.3                                | ----                                   | 1011.3                                 | 0.984  | 0.990   |
| third NH3                        | 3476                      | 23.7                        | 500.4                                  | ----                                    | 500.4                                   | 520.9                                 | ----                                   | 517.6                                  | 0.961  | 0.967   |
| <b>Average Correction Factor</b> |                           |                             |  |   |   |                                       |  |  | <b>1.0060</b>  | <b>0.9851</b>   |

Corrected As found    TN = 795.7 ppb    NO<sub>x</sub> = 790.4 ppb    NH3 = 1802.4 ppb

Previous Response    TN = 816.4 ppb    NO<sub>x</sub> = 806.0 ppb    NH3 = 1805.2 ppb

NH3 Previous Converter Efficiency = 95.1%

NH3 Current Converter Efficiency = 95.1%

\*Percent Change    TN = -2.6%

\*Percent Change    NO<sub>x</sub> = -2.0%

\*Percent Change    NH3 = -0.2%

\* = > +/-5% change initiates investigation





# Wood Buffalo Environmental Association

## NO<sub>x</sub> - NO - NO<sub>2</sub> Calibration Report

Version-11-2021

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated TN concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated TN concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|--|--|---------------------------------------|---------------------------------------|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0                                    | -0.3   | 0.4                                   | 0.4                                   | ----  | ----   |
| as found span             | 4923                      | 76.9                        | 807.6   | 799.5                                  | 807.6                                  | 790.1  | 782.9                                 | 796.1                                 | 1.0222  | 1.0211   |
| new NO cyl rp             |                           |                             |   |  |  |  |                                       |                                       |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0                                    | 0.4  | 0.3                                   | 0.6                                   | ----  | ----   |
| high point                | 4923                      | 76.9                        | 807.6   | 799.5                                  | 807.6                                  | 805.3  | 796.2                                 | 802.1                                 | 1.0029  | 1.0041   |
| second point              | 4962                      | 38.5                        | 404.3   | 400.2                                  | 404.3                                  | 406.1  | 400.1                                 | 405.0                                 | 0.9956  | 1.0004   |
| third point               | 4981                      | 19.2                        | 201.6   | 199.6                                  | 201.6                                  | 206.4  | 200.9                                 | 205.1                                 | 0.9769  | 0.9935   |
| Average Correction Factor |                           |                             |   |  |  |  |                                       |                                       | 0.9918  | 0.9993   |

|                      |                |                             |                |                 |                         |
|----------------------|----------------|-----------------------------|----------------|-----------------|-------------------------|
| Baseline Corr As fnd | TN = 795.7 ppb | NO <sub>x</sub> = 790.4 ppb | NO = 782.5 ppb | *Percent Change | TN = -2.6%              |
| Previous Response    | TN = 816.4 ppb | NO <sub>x</sub> = 806.0 ppb | NO = 801.2 ppb | *Percent Change | NO <sub>x</sub> = -2.0% |
|                      |                |                             |                | *Percent Change | NO = -2.4%              |

\* = > +/-5% change initiates investigation

### GPT Calibration Data

| O3 Setpoint (ppb)          | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------|--|---------------------------------------|---|--|--|--|
| as found zero              | ----                                       | ----                                  | 0.0   | -0.7   | ----   | ----   |
| calibration zero           | ----                                       | ----                                  | 0.0   | 0.1  | ----   | ----   |
| 1st GPT point (400 ppb O3) | 796.9                                      | 385.8                                 | 419.3   | 416.9  | 1.0056   | 99.4%  |
| 2nd GPT point (200 ppb O3) | 796.9                                      | 592.6                                 | 212.5   | 213.5  | 0.9951   | 100.5%   |
| 3rd GPT point (100 ppb O3) | 796.9                                      | 693.5                                 | 111.6   | 112.7  | 0.9898   | 101.0%   |
| Average Correction Factor  |  |                                       |   |  | 0.9968   | 100.3%   |

Notes:

Changed the inlet filter after as founds. Adjusted the NO<sub>x</sub> span only.

Calibration Performed By:

Max Farrell



# Wood Buffalo Environmental Association

## TN Calibration Summary

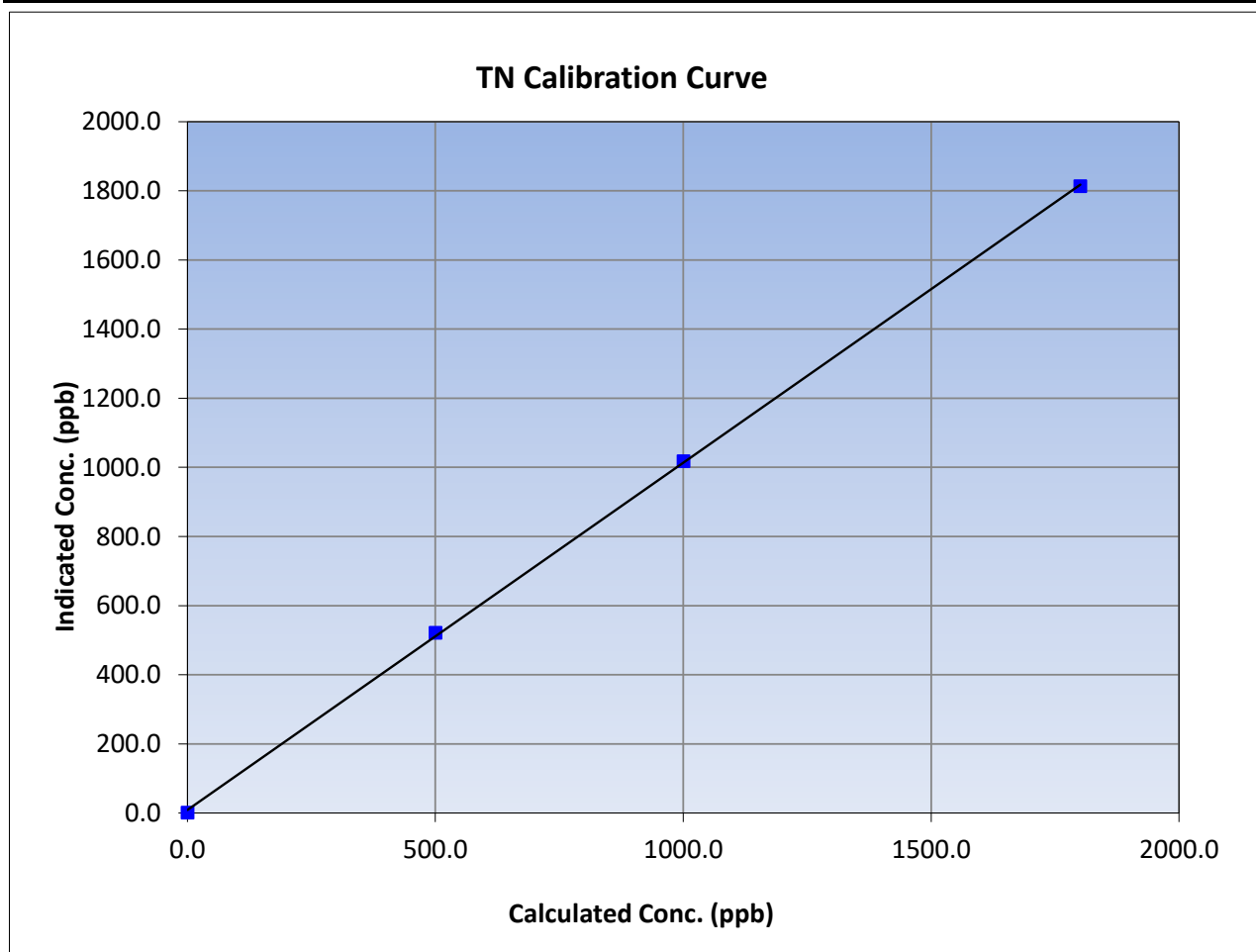
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:09             | End Time (MST):       | 13:20            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.6                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 1801.0                              | 1813.5                             | 0.9931                    |                         |               |             |
| 1000.8                              | 1017.3                             | 0.9838                    |                         |               |             |
| 500.4                               | 520.9                              | 0.9607                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.004451      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 8.831802      | +/-20       |





# Wood Buffalo Environmental Association

## NH<sub>3</sub> Calibration Summary

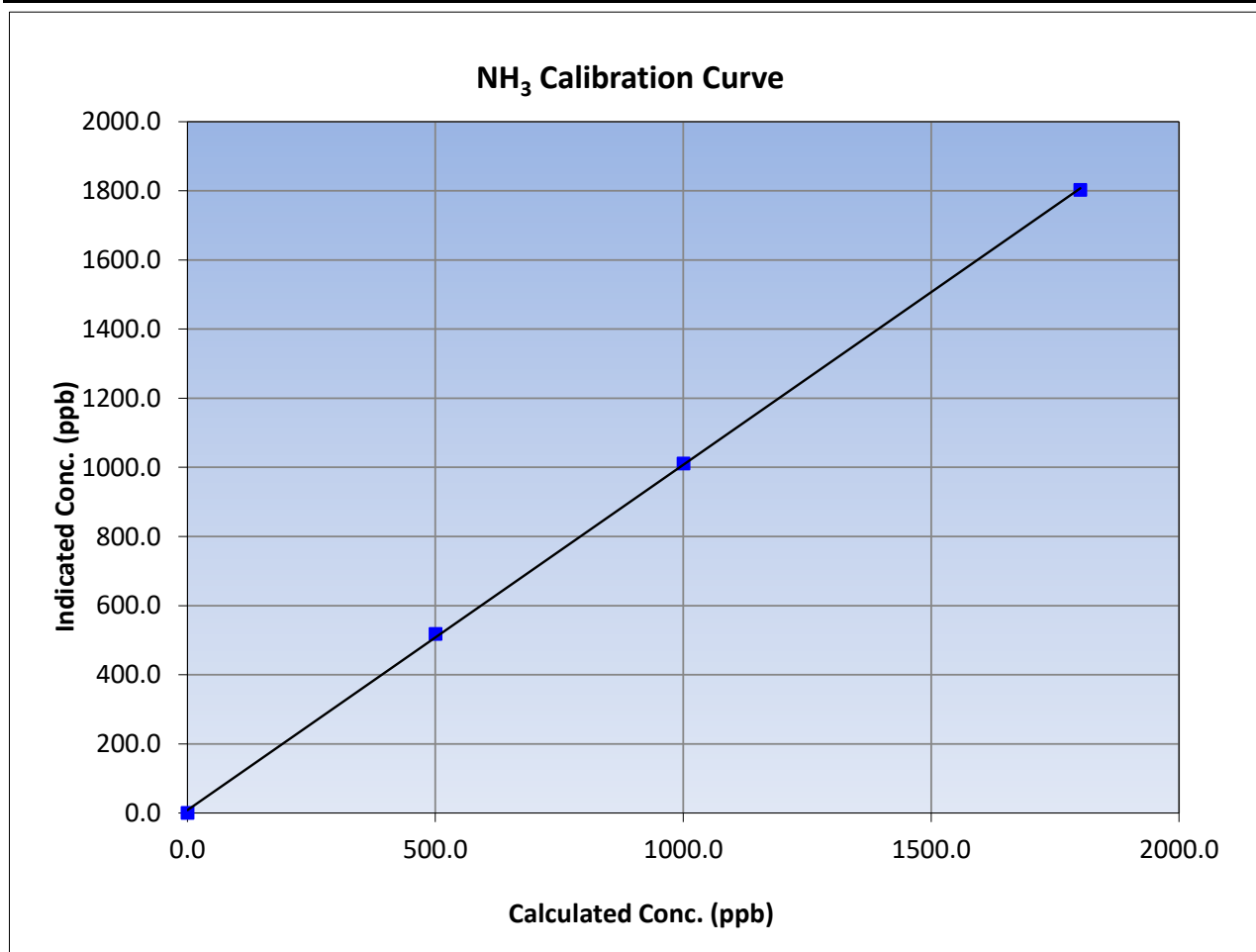
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:09             | End Time (MST):       | 13:20            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 1801.0                              | 1803.1                             | 0.9989                    |   |                                |
| 1000.8                              | 1011.3                             | 0.9896                    |   |                                |
| 500.4                               | 517.6                              | 0.9668                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

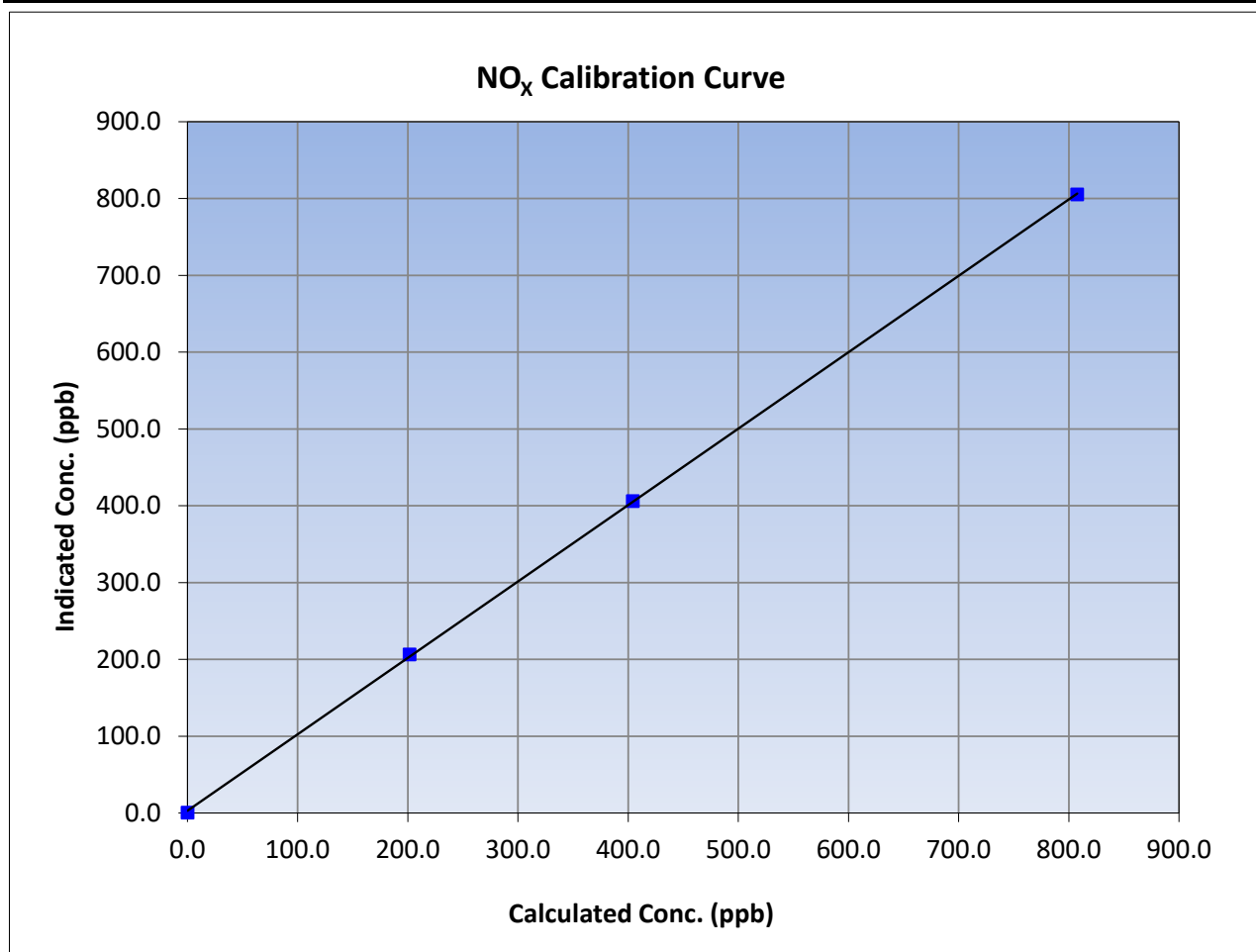
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:09             | End Time (MST):       | 13:20            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 807.6                               | 805.3                              | 1.0029                    |                         |               |             |
| 404.3                               | 406.1                              | 0.9956                    |                         |               |             |
| 201.6                               | 206.4                              | 0.9769                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.994899      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 2.960281      | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-11-2021

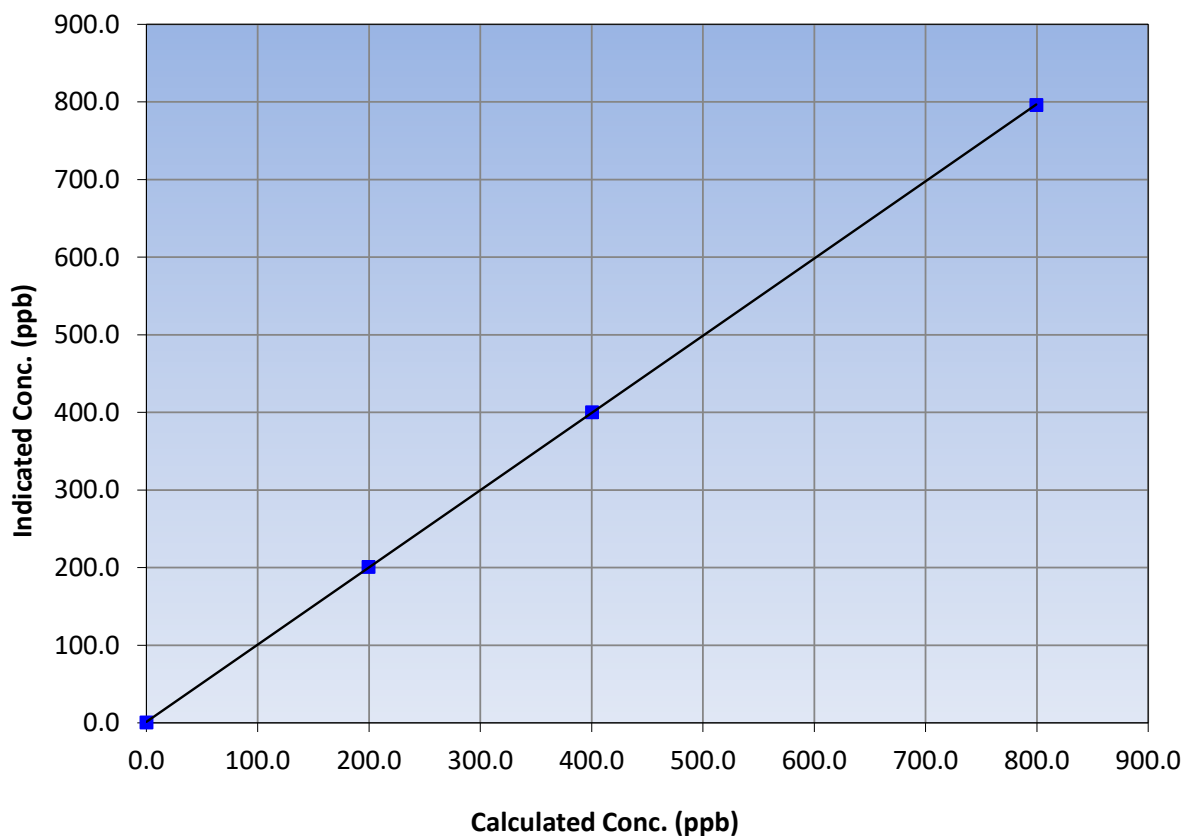
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:09             | End Time (MST):       | 13:20            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 799.5                               | 796.2                              | 1.0041                    |                         |               |             |
| 400.2                               | 400.1                              | 1.0004                    |                         |               |             |
| 199.6                               | 200.9                              | 0.9935                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.994939      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.319966      | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

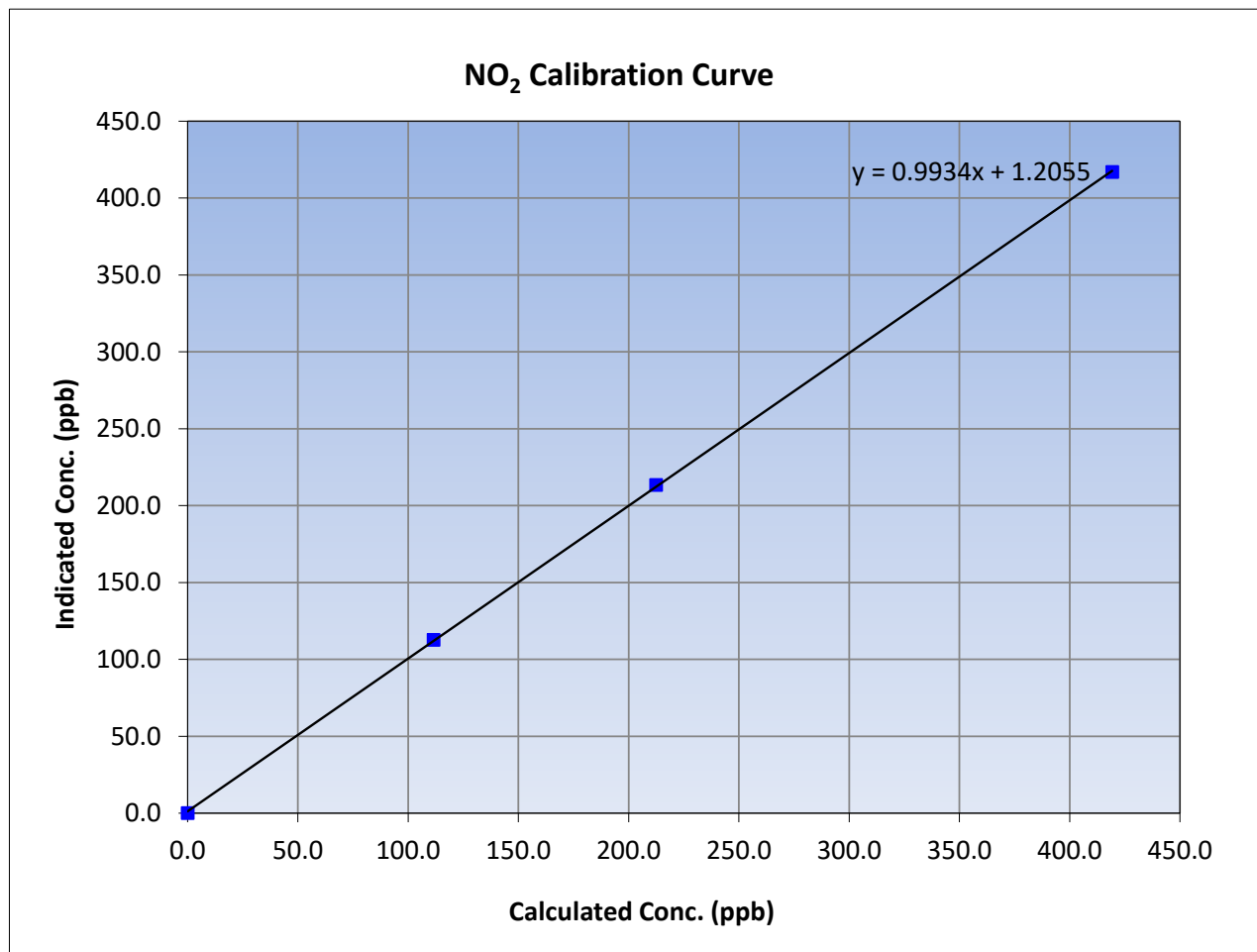
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Patricia McInnes | Station Number:       | AMS 06           |
| Start Time (MST): | 9:09             | End Time (MST):       | 13:20            |
| Analyzer make:    | API T201         | Analyzer serial #:    | 152              |

### Calibration Data

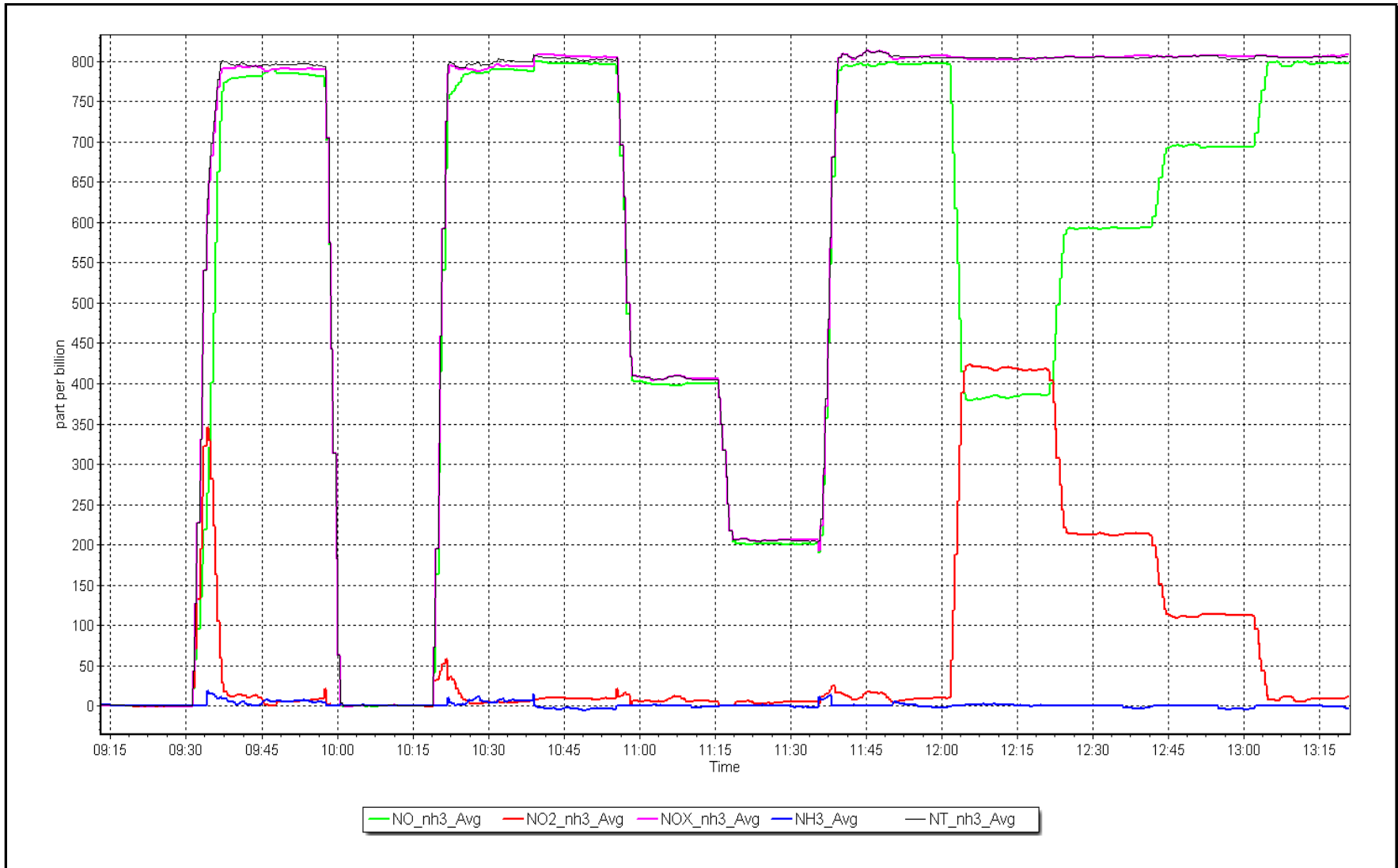
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 419.3                               | 416.9                              | 1.0056                    |                         |          |             |
| 212.5                               | 213.5                              | 0.9951                    |                         |          |             |
| 111.6                               | 112.7                              | 0.9898                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.993439 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 1.205483 | +/-20       |



# NO<sub>x</sub> Calibration Plot

Date: February 7, 2023

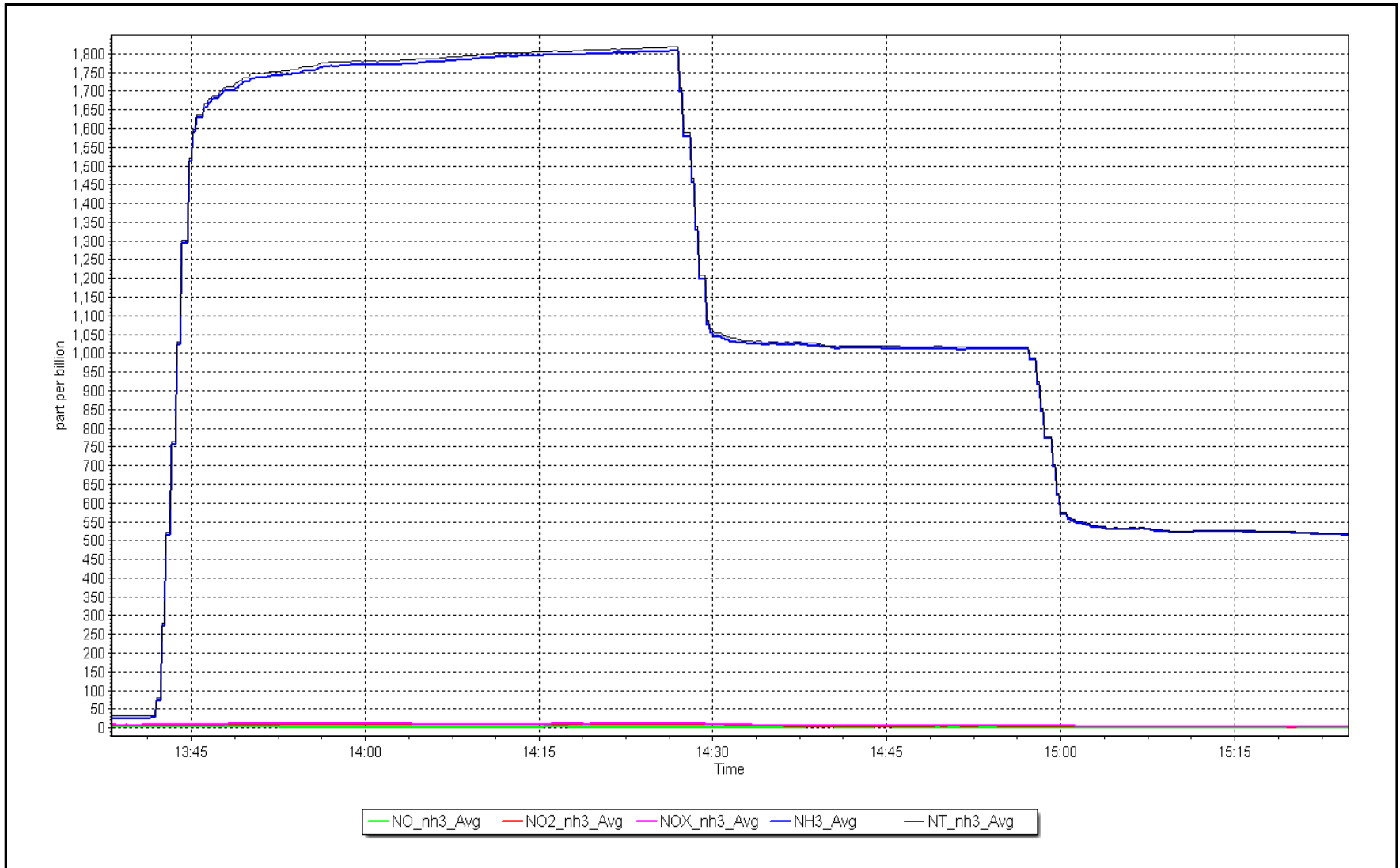
Location: Patricia McInnes



# NH<sub>3</sub> Calibration Plot

Date: February 7, 2023

Location: Patricia McInnes







## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS07 ATHABASCA VALLEY FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

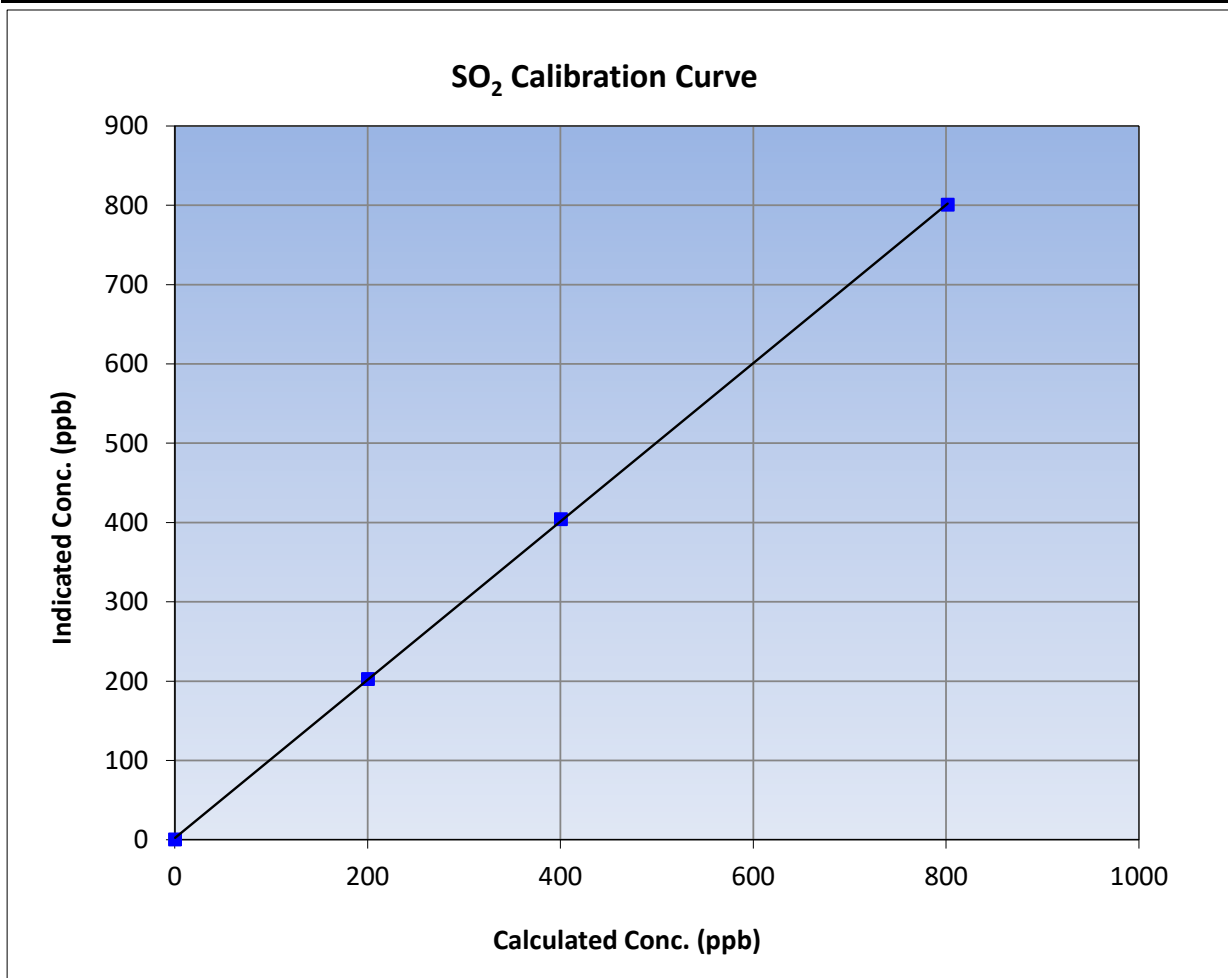
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:20             | End Time (MST):       | 10:22            |
| Analyzer make:    | Thermo 43i-LTE   | Analyzer serial #:    | 1507864683       |

### Calibration Data

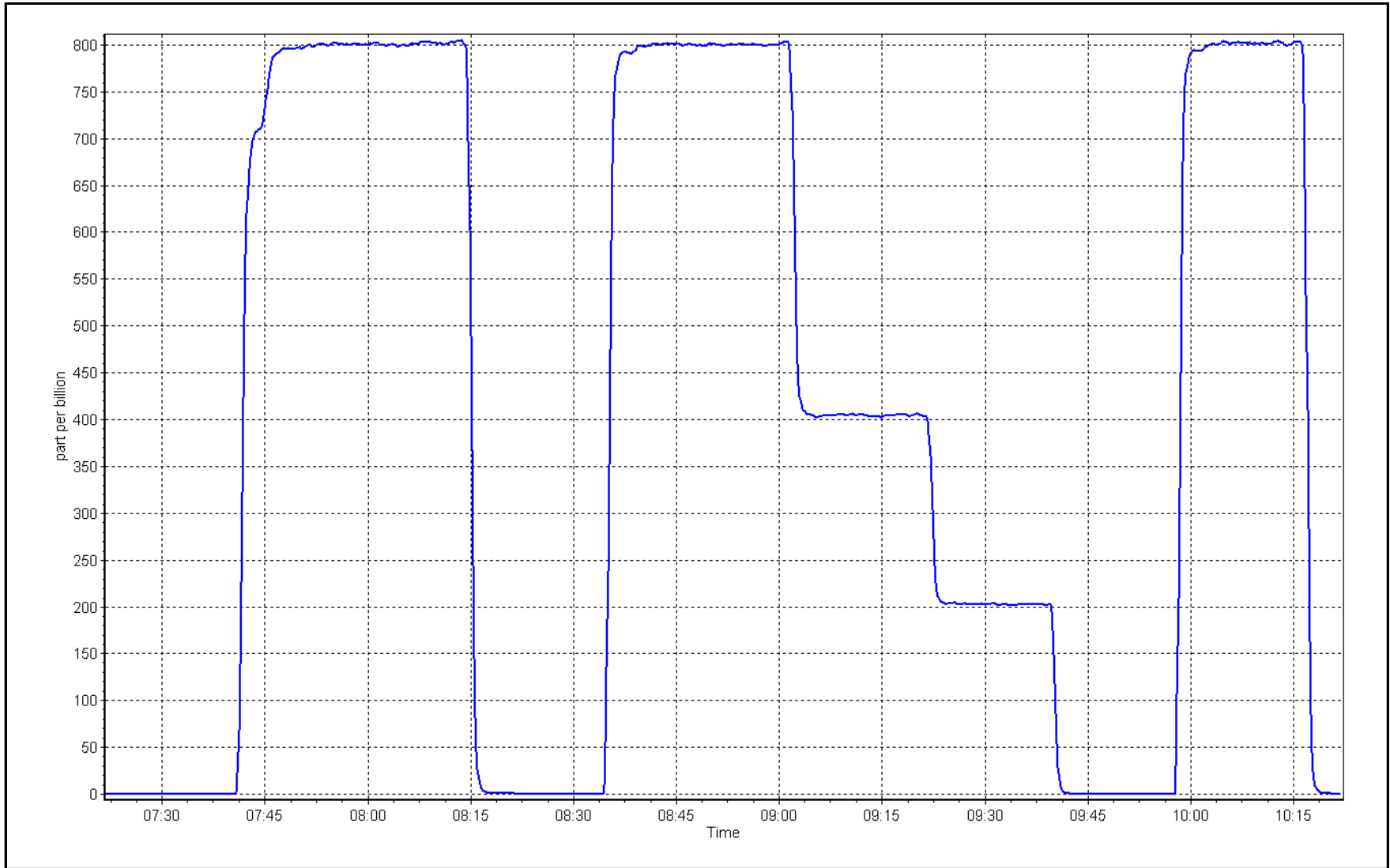
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999966 | ≥0.995      |
| 801.2                               | 800.3                              | 1.0011                    |                         |          |             |
| 400.2                               | 403.9                              | 0.9907                    | Slope                   | 0.998179 | 0.90 - 1.10 |
| 200.1                               | 202.4                              | 0.9885                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.983813 | +/-30       |



SO2 Calibration Plot

Date: February 1, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Athabasca Valley Station number: AMS07  
 Calibration Date: February 6, 2023 Last Cal Date: January 17, 2023  
 Start time (MST): 8:15 End time (MST): 14:20  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.94 ppm Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002277  
 Removed Cal Gas Conc: 4.94 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 3805  
 ZAG Make/Model: API T701H Serial Number: 198

### Analyzer Information

Analyzer make: Thermo 43i LTE Analyzer serial #: 1180540018  
 Converter make: CDN-101 Converter serial #: 551  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.987815     | 0.988807      | Backgd or Offset: 2.18 | 2.33          |
| Calibration intercept: | 0.181600     | 0.421592      | Coeff or Slope: 0.834  | 0.886         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4918                          | 81.6                        | 80.6                                | 78.6                               | 1.026  |
| as found 2nd point    | 4959                          | 40.8                        | 40.3                                | 39.2                               | 1.028  |
| as found 3rd point    | 4980                          | 20.4                        | 20.2                                | 19.4                               | 1.039  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                              | 4918                          | 81.6                        | 80.6                                | 80.2                               | 1.005   |
| second point                            | 4959                          | 40.8                        | 40.3                                | 40.2                               | 1.003   |
| third point                             | 4980                          | 20.4                        | 20.2                                | 20.3                               | 0.993   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4918                          | 81.6                        | 80.6                                | 79.5                               | 1.014   |
| SO2 Scrubber Check                      | 4921                          | 79.2                        | 800.2                               | -0.4                               | ----  |
| Date of last scrubber change:           | 25-Feb-22                     |                             | Ave Corr Factor                     |                                    | 1.000   |
| Date of last converter efficiency test: | April 22, 2022                |                             | 98.5% efficiency                    |                                    |   |

Baseline Corr As found: 78.6 Prev response: 79.83 \*% change: -1.6%  
 Baseline Corr 2nd AF pt: 39.2 AF Slope: 0.975767 AF Intercept: -0.118432  
 Baseline Corr 3rd AF pt: 19.4 AF Correlation: 0.999989

\* = > +/-5% change initiates investigation

Notes: Sox scrubber failed and Beads replaced. Sox scrubber hydrated for 20mins. Sox scrubber passed after replacing beads. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## TRS Calibration Summary

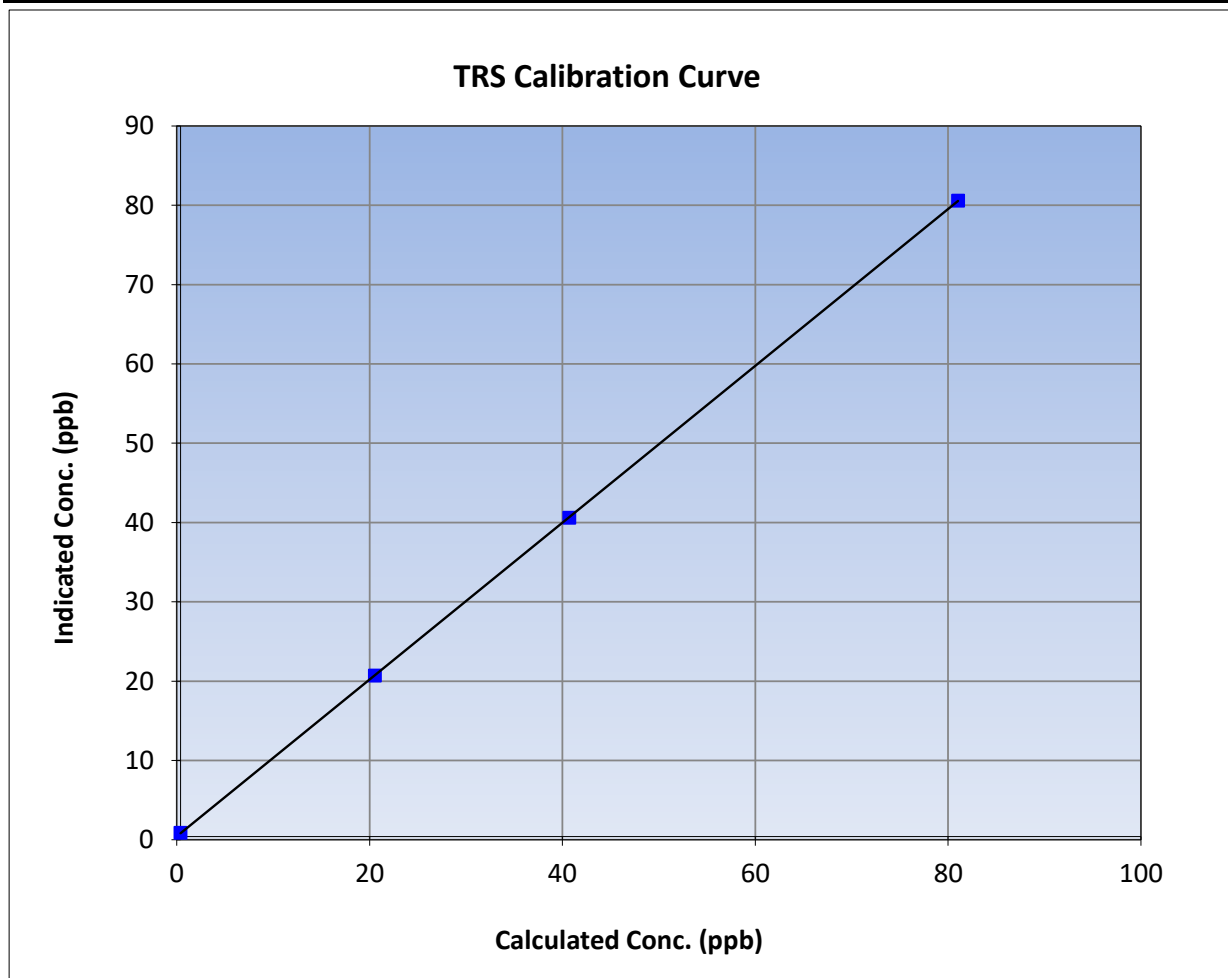
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 8:15             | End Time (MST):       | 14:20            |
| Analyzer make:    | CDN-101          | Analyzer serial #:    | 551              |

### Calibration Data

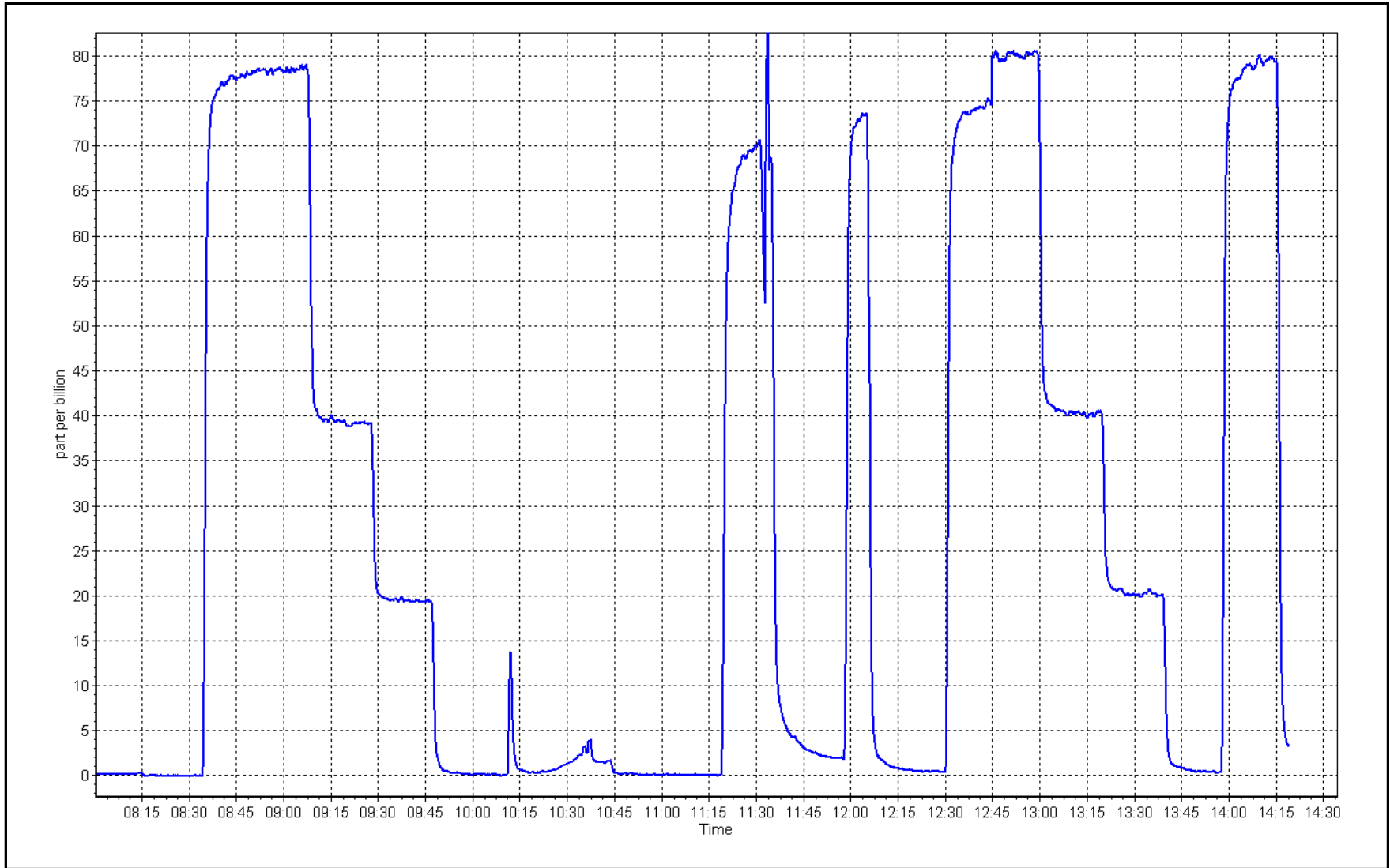
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999995 |             |
| 80.6                                | 80.2                               | 1.0053                    |                         |          | ≥0.995      |
| 40.3                                | 40.2                               | 1.0028                    | Slope                   | 0.988807 |             |
| 20.2                                | 20.3                               | 0.9928                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.421592 | +/-3        |



TRS Calibration Plot

Date: February 6, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Athabasca Valley | Station number: | AMS07            |
| Calibration Date: | February 1, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 7:20             | End time (MST): | 10:21            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC282115  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 501.2 ppm | CH <sub>4</sub> Equiv Conc. | 1075.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 501.2 ppm | CH <sub>4</sub> Equiv Conc. | 1075.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3805              |
| ZAG make/model:                             | API 701H  | Serial Number:              | 198               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1317958219 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>            | <u>Finish</u> |
|---------------------------------|--------------|---------------|-------------------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 0.000270     | 0.000270      | NMHC SP Ratio: 4.42E-05 | 4.42E-05      |
| CH <sub>4</sub> Retention time: | 13.4         | 13.4          | NMHC Peak Area:         | 205840        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.3                 | 17.05                | 17.08               | 0.998                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4921              | 79.3                 | 17.05                | 17.15               | 0.994                      |
| second point          | 4960              | 39.6                 | 8.52                 | 8.58                | 0.993                      |
| third point           | 4980              | 19.8                 | 4.26                 | 4.33                | 0.983                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.2                 | 17.03                | 17.14               | 0.994                      |

| Average Correction Factor |       |                 |       | 0.990                                     |
|---------------------------|-------|-----------------|-------|---|
| Baseline Corr AF:         | 17.08 | Prev response   | 16.97 | *% change 0.6%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                             |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * => +/-5% change initiates investigation |





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.3                 | 9.10                 | 9.14                                       | 0.996                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.3                 | 9.10                 | 9.15                                       | 0.995                      |
| second point              | 4960              | 39.6                 | 4.55                 | 4.59                                       | 0.990                      |
| third point               | 4980              | 19.8                 | 2.27                 | 2.32                                       | 0.980                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 9.09                 | 9.15                                       | 0.994                      |
| Average Correction Factor |                   |                      |                      |  | 0.988                      |
| Baseline Corr AF:         | 9.14              | Prev response        | 9.04                 | *% change                                  | 1.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.3                 | 7.95                 | 7.94                                       | 1.001                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.3                 | 7.95                 | 8.00                                       | 0.994                      |
| second point              | 4960              | 39.6                 | 3.97                 | 3.99                                       | 0.995                      |
| third point               | 4980              | 19.8                 | 1.98                 | 2.00                                       | 0.992                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 7.94                 | 8.00                                       | 0.992                      |
| Average Correction Factor |                   |                      |                      |  | 0.994                      |
| Baseline Corr AF:         | 7.94              | Prev response        | 7.94                 | *% change                                  | 0.0%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.994820     | 1.004980      |
| THC Cal Offset:             | 0.009674     | 0.021918      |
| CH <sub>4</sub> Cal Slope:  | 0.998255     | 1.006293      |
| CH <sub>4</sub> Cal Offset: | 0.002012     | -0.000176     |
| NMHC Cal Slope:             | 0.992058     | 1.004211      |
| NMHC Cal Offset:            | 0.007463     | 0.018094      |

Notes: Hydrogen and Nitrogen Changed. No adjustments done.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

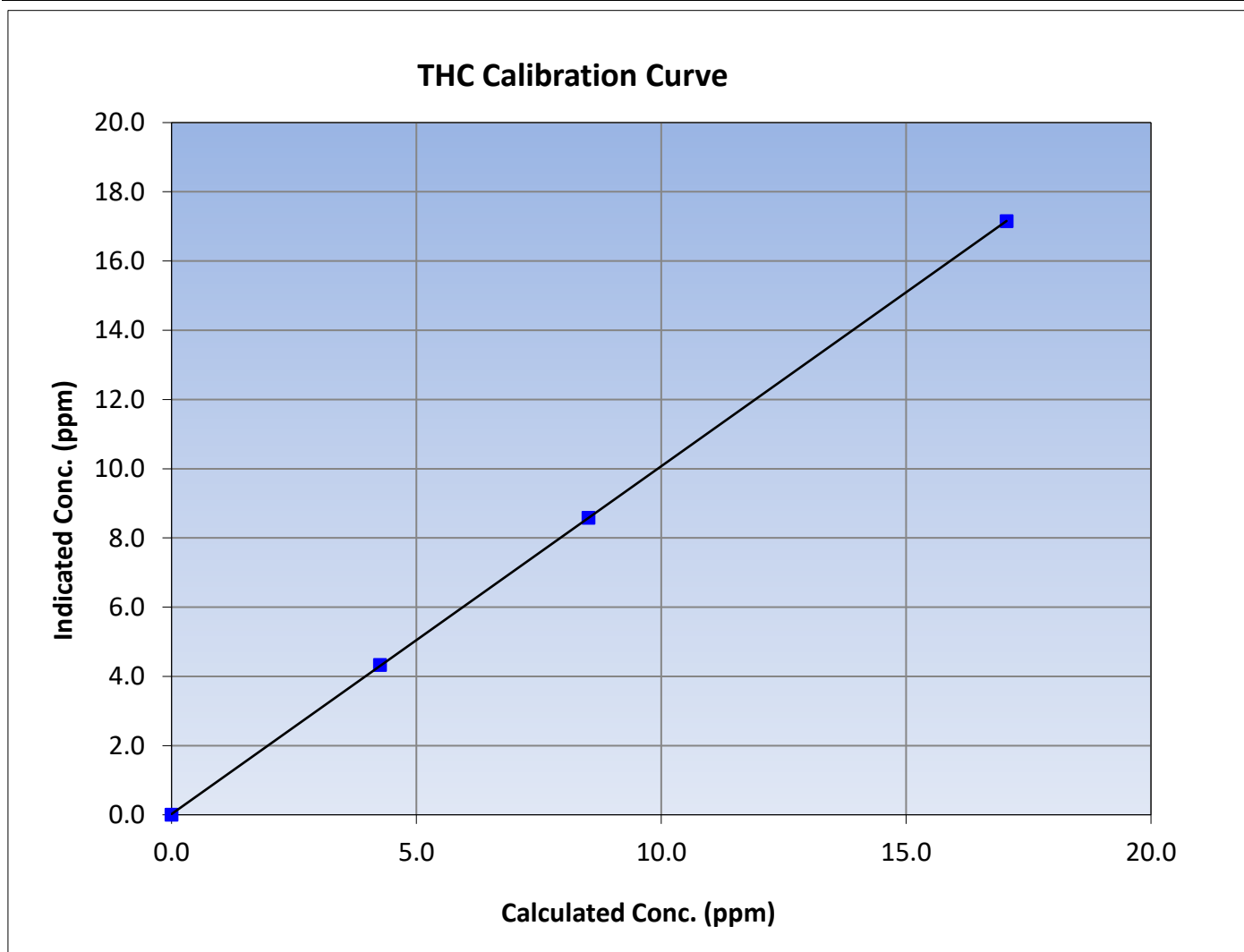
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:20             | End Time (MST):       | 10:21            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999991 | $\geq 0.995$  |       |          |             |
| 17.05                               | 17.15                              | 0.9942                    |                         |          |               |       |          |             |
| 8.52                                | 8.58                               | 0.9925                    |                         |          |               | Slope | 1.004980 | 0.90 - 1.10 |
| 4.26                                | 4.33                               | 0.9833                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.021918 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

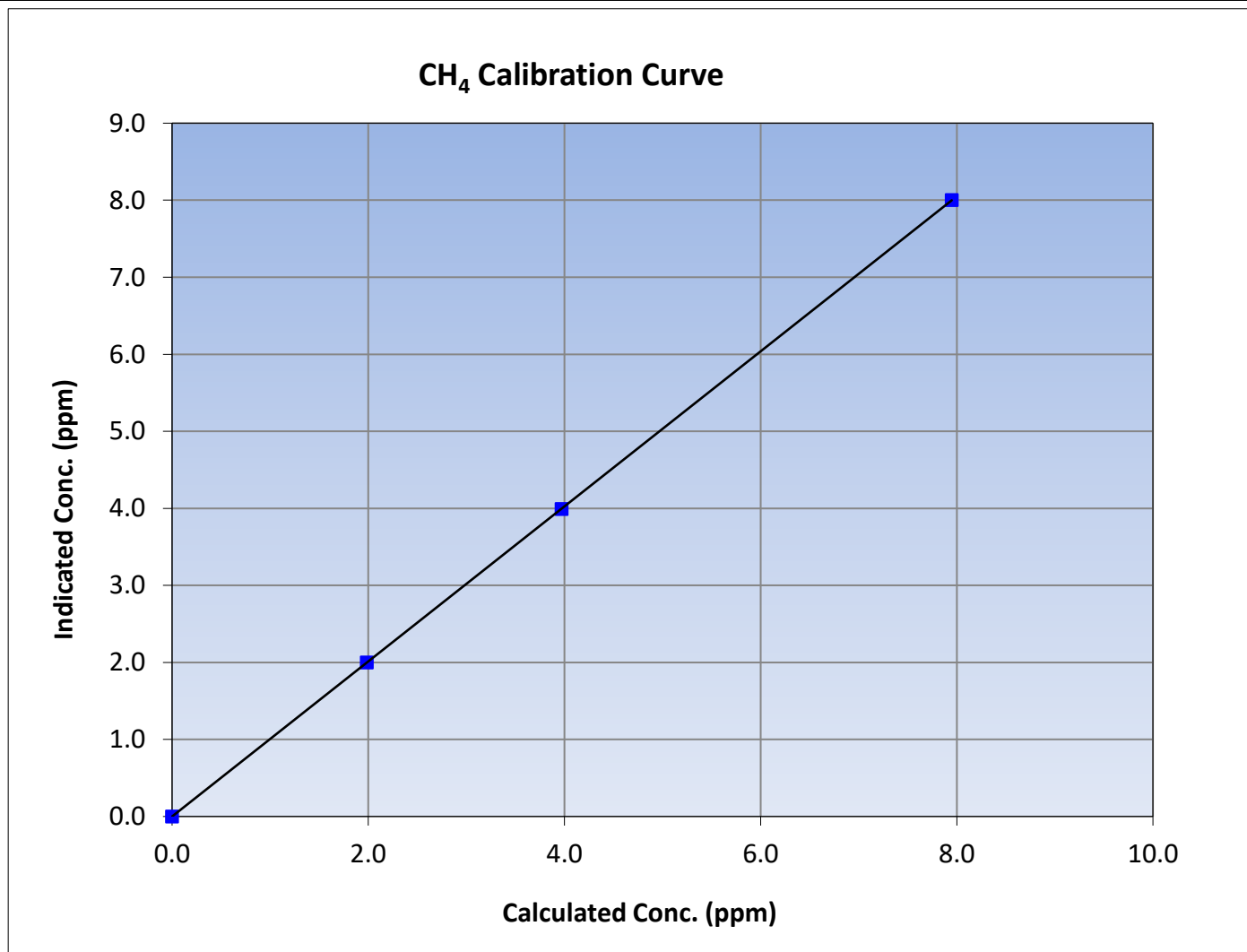
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:20             | End Time (MST):       | 10:21            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999  | ≥0.995        |
| 7.95                                | 8.00                               | 0.9936                    |                         |           |               |
| 3.97                                | 3.99                               | 0.9949                    |                         |           |               |
| 1.98                                | 2.00                               | 0.9924                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.006293  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.000176 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

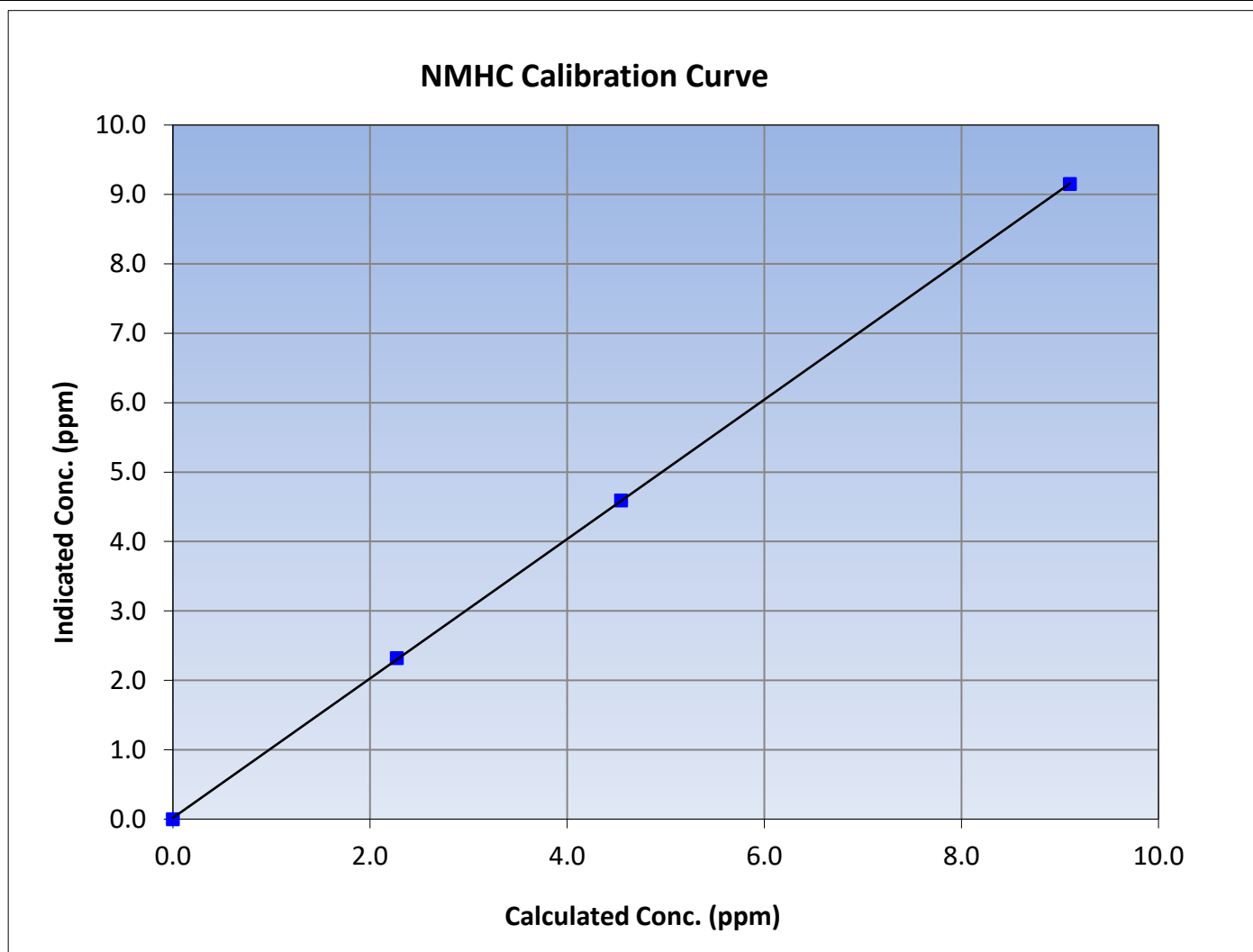
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:20             | End Time (MST):       | 10:21            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1317958219       |

### Calibration Data

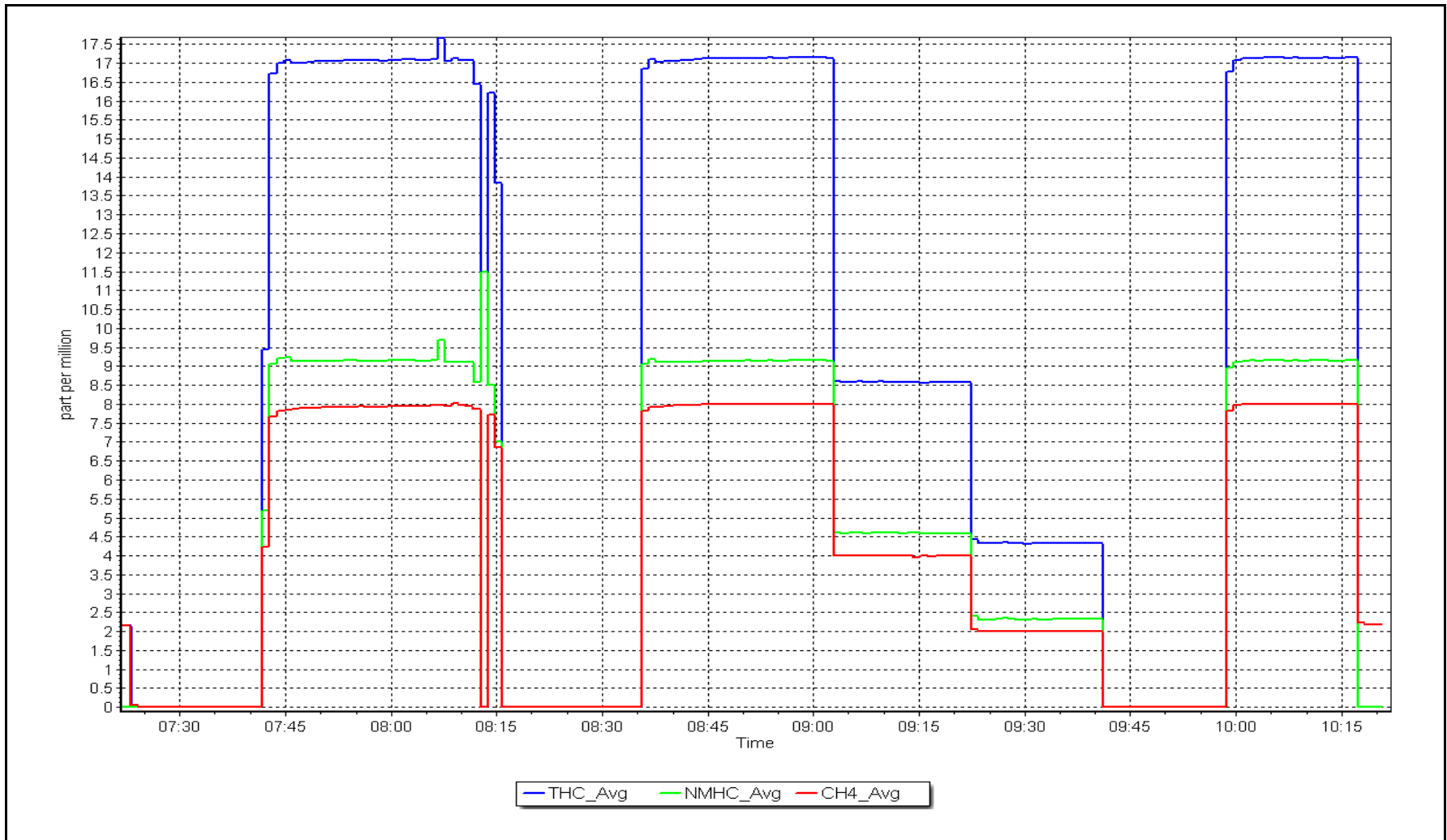
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999982 | $\geq 0.995$  |       |          |             |
| 9.10                                | 9.15                               | 0.9947                    |                         |          |               |       |          |             |
| 4.55                                | 4.59                               | 0.9904                    |                         |          |               | Slope | 1.004211 | 0.90 - 1.10 |
| 2.27                                | 2.32                               | 0.9797                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.018094 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 1, 2023

Location: Athabasca Valley







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as found span             | 4920                      | 80.2                        | 816.7   | 800.7                                  | 16.0  | 808.6  | 791.4                                 | 17.1   | 1.0100  | 1.0117   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.0                                   | 0.2  | ----  | ----   |
| high point                | 4920                      | 80.2                        | 816.7   | 800.7                                  | 16.0  | 809.8  | 793.6                                 | 16.2   | 1.0086  | 1.0089   |
| second point              | 4960                      | 40.1                        | 408.4   | 400.4                                  | 8.0   | 407.2  | 399.3                                 | 7.9  | 1.0029  | 1.0026   |
| third point               | 4980                      | 20.0                        | 203.7   | 199.7                                  | 4.0   | 203.4  | 199.0                                 | 4.4  | 1.0014  | 1.0034   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as left span              | 4920                      | 80.2                        | 816.7   | 399.5                                  | 417.2   | 811.5  | 390.9                                 | 420.6  | 1.0064  | 1.0220   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0043  | 1.0050   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 808.6 ppb | NO = 791.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.3% |                      |
| Previous Response    | NO <sub>x</sub> = 810.9 ppb | NO = 794.6 ppb |  | *Percent Change                  | NO = -0.4%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       | 791.9                                      | 390.7                                 | 417.2   | 417.7  | 0.9989   | 100.1%   |
| 2nd GPT point (200 ppb O <sub>3</sub> )       | 791.9                                      | 595.5                                 | 212.4   | 213.7  | 0.9941   | 100.6%   |
| 3rd GPT point (100 ppb O <sub>3</sub> )       | 791.9                                      | 694.2                                 | 113.7   | 114.2  | 0.9960   | 100.4%   |
| Average Correction Factor                     |  |                                       |   |  | 0.9963   | 100.4%   |

Notes:

No maintenance or adjustments done.

Calibration Performed By:

Melissa Lemay



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

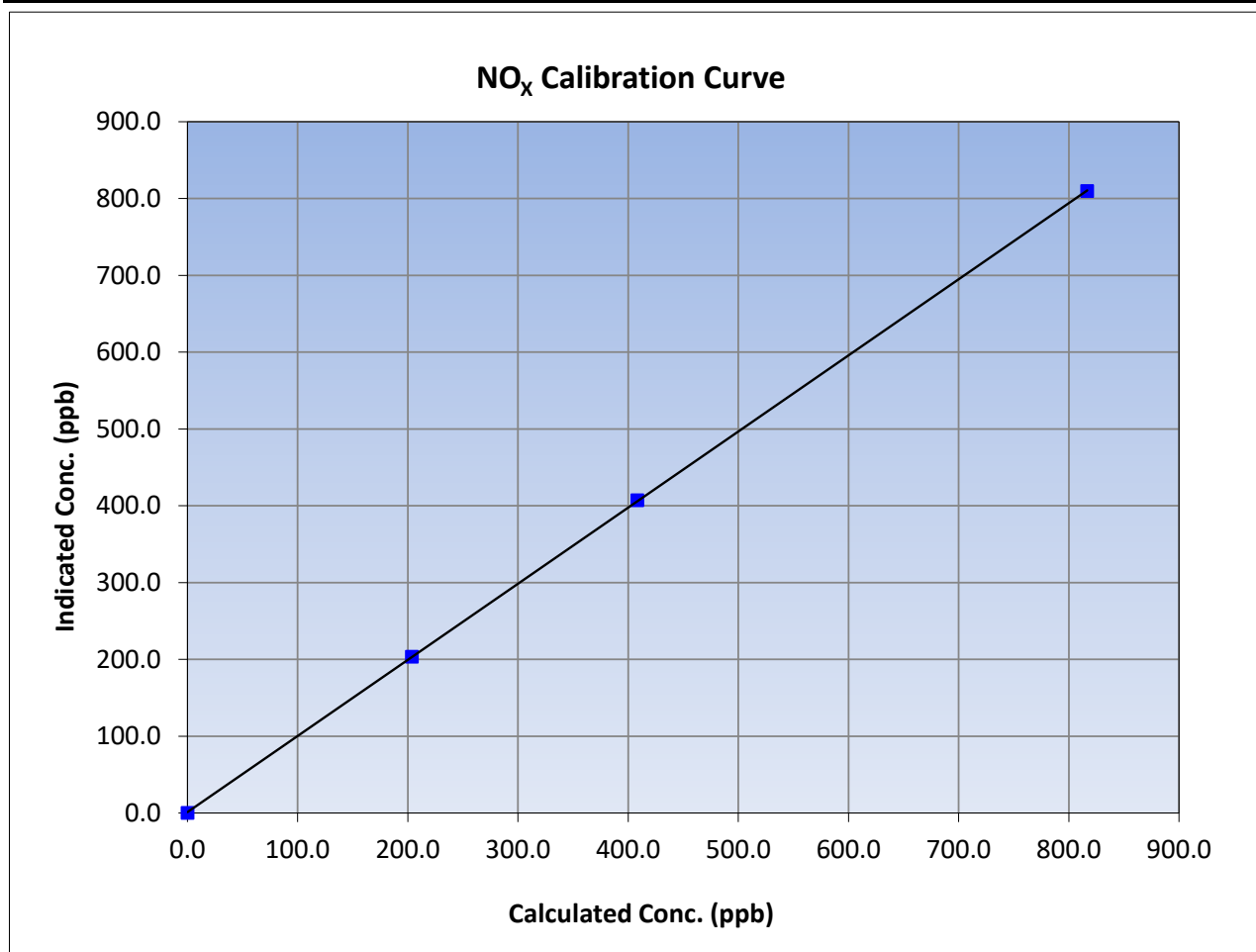
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:22             | End Time (MST):       | 11:41            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1160120024       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 816.7                               | 809.8                              | 1.0086                    |   |                                |
| 408.4                               | 407.2                              | 1.0029                    |   |                                |
| 203.7                               | 203.4                              | 1.0014                    |   |                                |
|                                     |                                    |                           |   |                                |







# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

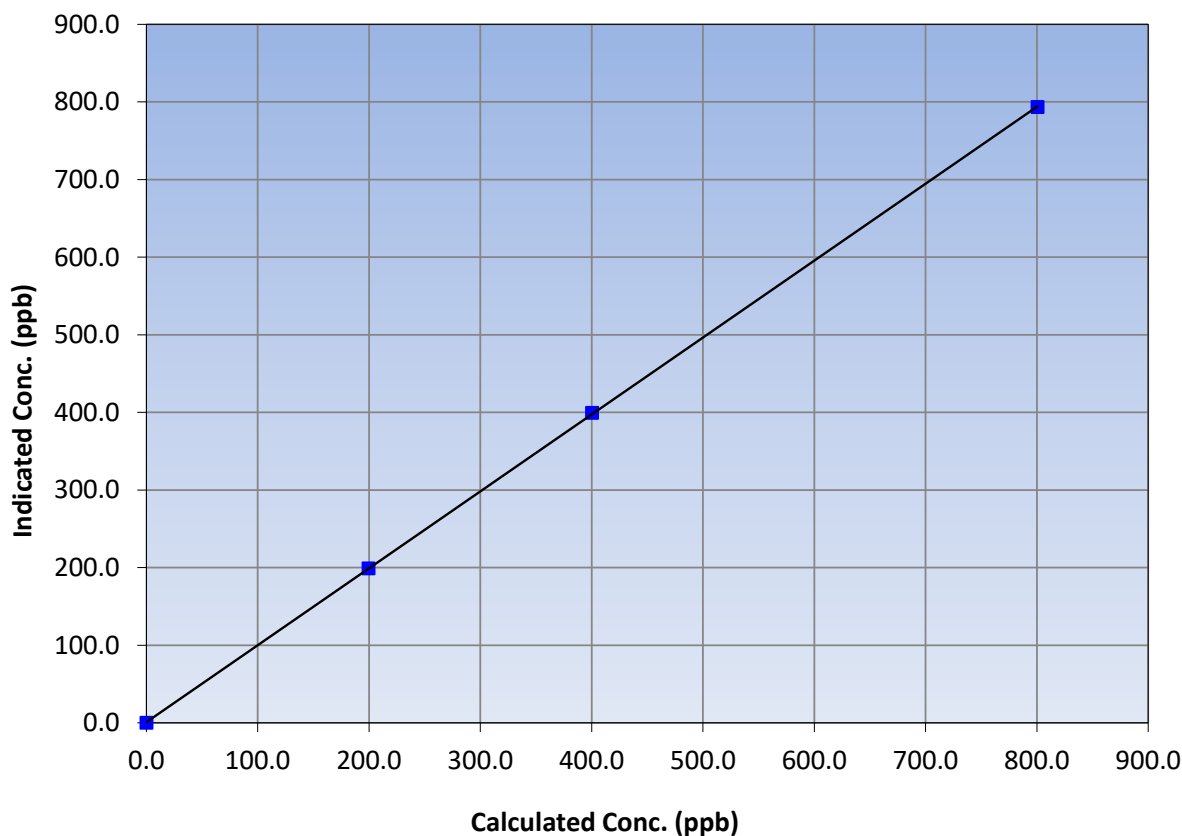
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:22             | End Time (MST):       | 11:41            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1160120024       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 800.7                               | 793.6                              | 1.0089                    |                         |          |             |
| 400.4                               | 399.3                              | 1.0026                    |                         |          |             |
| 199.7                               | 199.0                              | 1.0034                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 0.991042 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.933204 | +/-20       |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

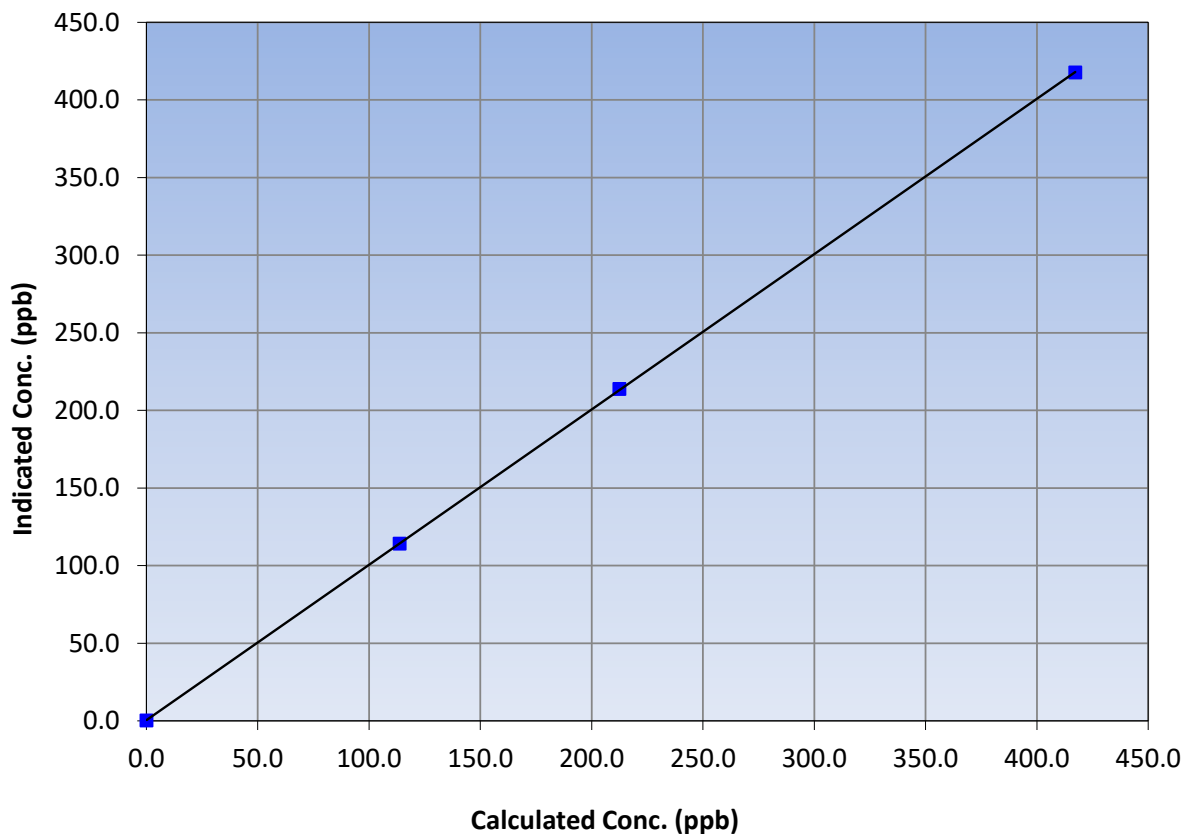
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:22             | End Time (MST):       | 11:41            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1160120024       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 417.2                               | 417.7                              | 0.9989                    |   |                                |
| 212.4                               | 213.7                              | 0.9941                    |   |                                |
| 113.7                               | 114.2                              | 0.9960                    |   |                                |
|                                     |                                    |                           | 0.999994                                      |                                |
|                                     |                                    |                           | 1.000742                                      |                                |
|                                     |                                    |                           | 0.457636                                      |                                |

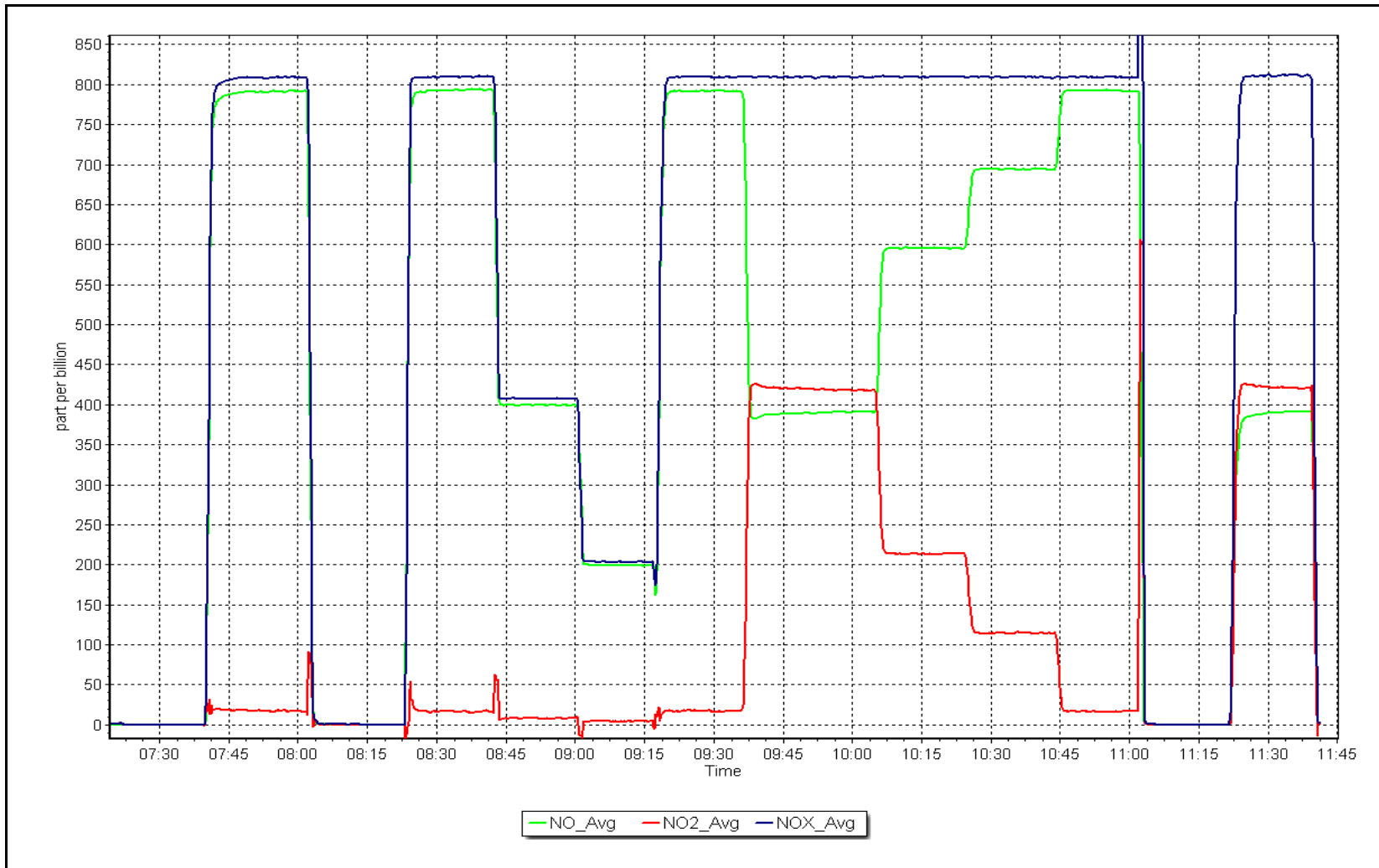
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 7, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Athabasca Valley      Station number: AMS07  
 Calibration Date: February 8, 2023      Last Cal Date: January 20, 2023  
 Start time (MST): 7:45      End time (MST): 10:52  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: T700      Serial Number: 3805  
 ZAG Make/Model: T701H      Serial Number: 198

### Analyzer Information

Analyzer make: Thermo 49i      Analyzer serial #: 1507964700  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.995429     | 0.995429      | Backgd or Offset: | -0.6         | -0.6          |
| Calibration intercept: | 1.500000     | 1.600000      | Coeff or Slope:   | 1.102        | 1.119         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | -0.3                               | ----  |
| as found span             | 5000                       | 1378.0                        | 400.0                               | 397.5                              | 1.006   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | 0.4                                | ----  |
| high point                | 5000                       | 1378.4                        | 400.0                               | 399.1                              | 1.002   |
| second point              | 5000                       | 1022.6                        | 200.0                               | 201.5                              | 0.993   |
| third point               | 5000                       | 844.7                         | 100.0                               | 102.2                              | 0.978   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 0.4                                | ----  |
| as left span              | 5000                       | 1374.5                        | 400.0                               | 392.6                              | 1.019   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.991   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 397.8 | Previous response | 399.7 | *% change     | -0.5% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: No Maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

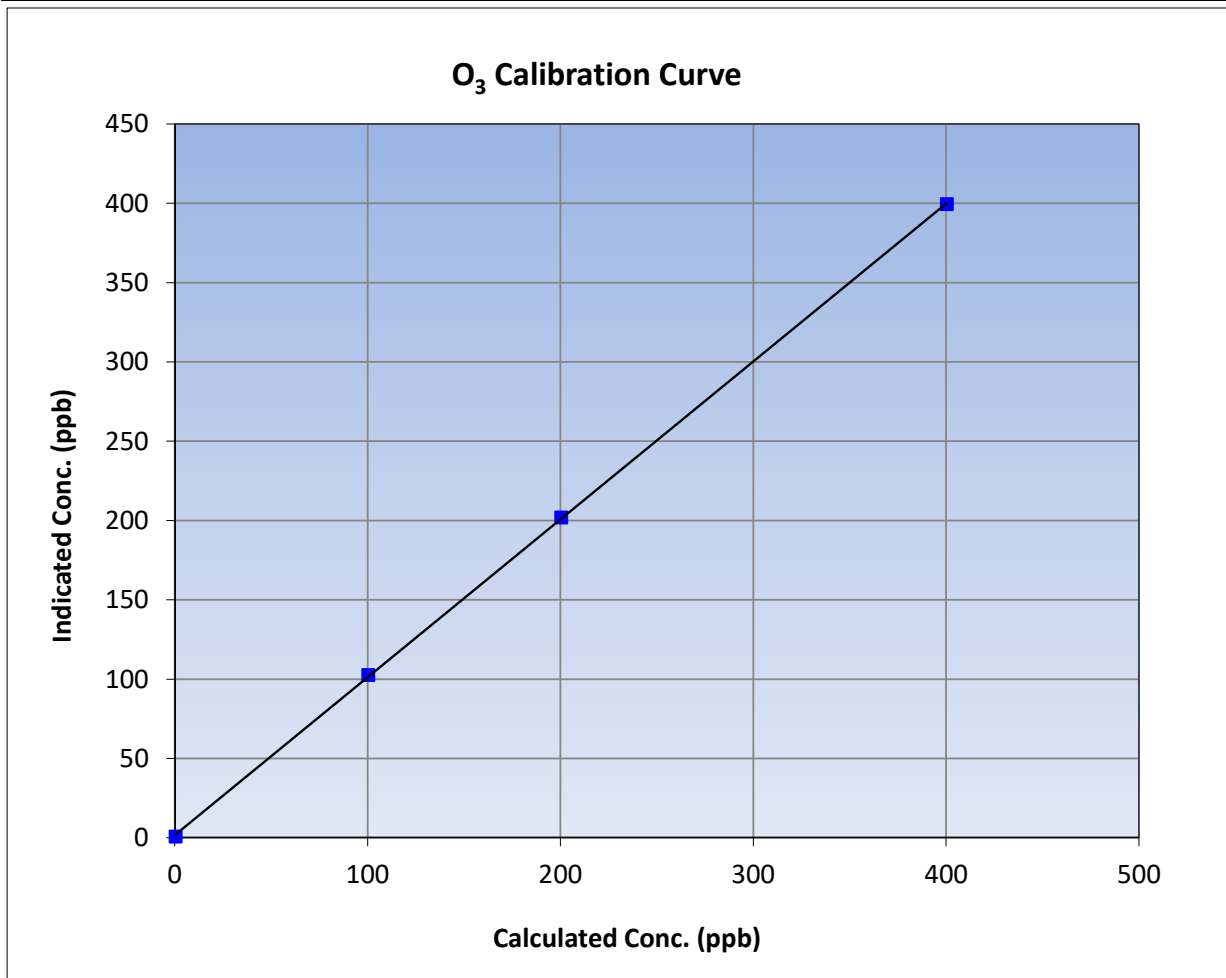
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 7:45             | End Time (MST):       | 10:52            |
| Analyzer make:    | Thermo 49i       | Analyzer serial #:    | 1507964700       |

### Calibration Data

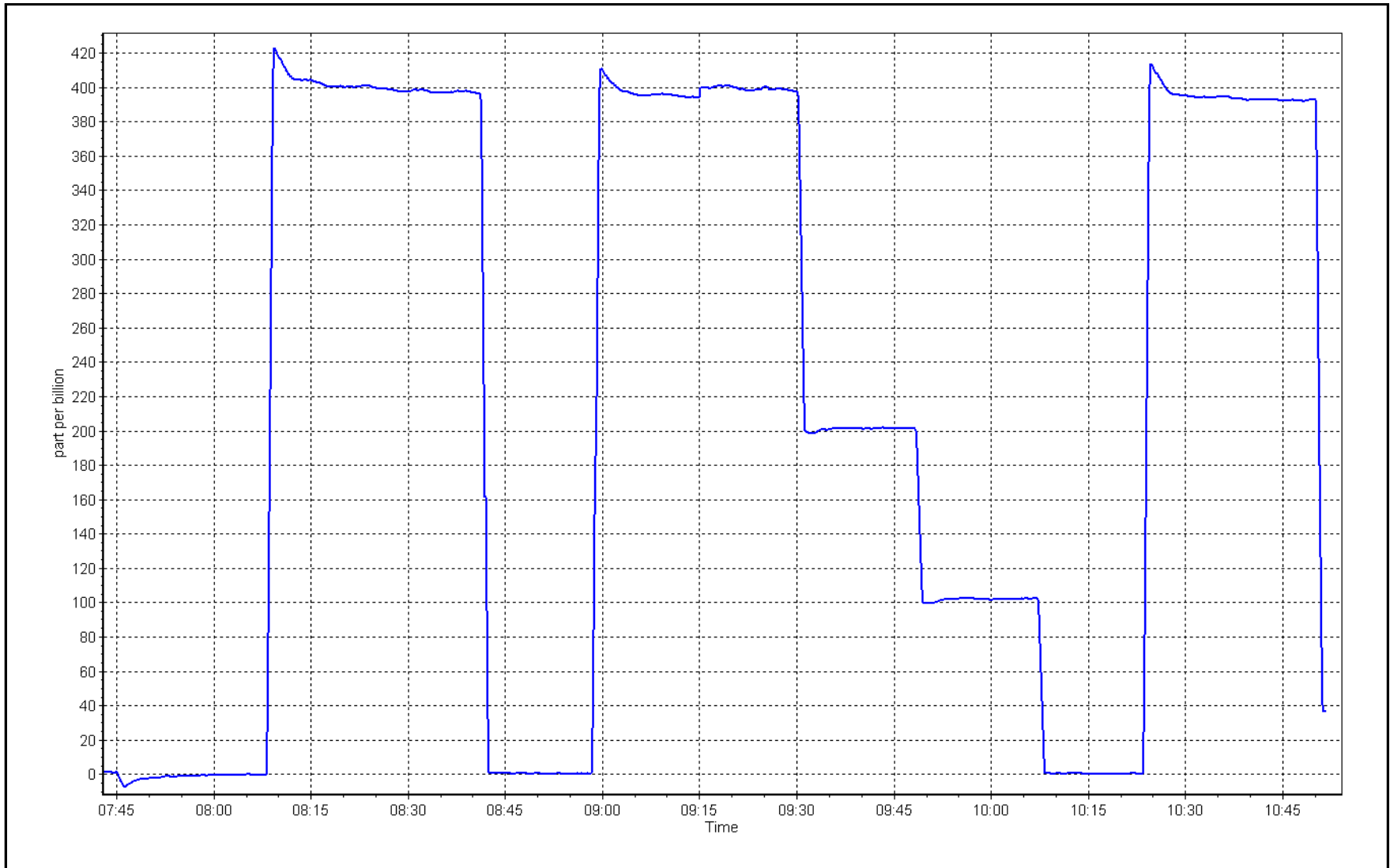
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999958 | ≥0.995      |
| 400.0                               | 399.1                              | 1.0023                    |                         |          |             |
| 200.0                               | 201.5                              | 0.9926                    | Slope                   | 0.995429 | 0.90 - 1.10 |
| 100.0                               | 102.2                              | 0.9785                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.600000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 8, 2023

Location: Athabasca Valley





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Athabasca Valley Station number: AMS 07  
 Calibration Date: February 1, 2023 Last Cal Date: January 19, 2023  
 Start time (MST): 10:25 End time (MST): 11:48

Analyzer Make: API T640 S/N: 326  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388753  
 Temp/RH standard: Alicat FP-25BT S/N: 388753

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -24      | -24.4    | -24     | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 746      | 747.7    | 746     | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5        | 5.1      | 5       | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 1, 2023 Last Cal Date: January 19, 2023  
 PM w/o HEPA: 4.1 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test | 10.6     | N/A              | 10.6    | <input type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: December 5, 2022 <0.2 ug/m3  
 Disposable Filter Changed: December 5, 2022

### Annual Maintenance

Date Sample Tube Cleaned: December 5, 2022  
 Date RH/T Sensor Cleaned: December 5, 2022

Notes: Removal Calibration done. Original AMU T640 being put back in.

Calibration by: Melissa Lemay



# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Athabasca Valley Station number: AMS 07  
 Calibration Date: February 1, 2023 Last Cal Date:  
 Start time (MST): 10:25 End time (MST): 11:48

Analyzer Make: API T640 S/N: 645  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388753  
 Temp/RH standard: Alicat FP-25BT S/N: 388753

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -21.9    | -22      | -21.9   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 748.9    | 747.7    | 748.9   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5        | 5.1      | 5       | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 1, 2023 Last Cal Date: \_\_\_\_\_  
 PM w/o HEPA: 1.2 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                            | (Limits)     |
|---------------|----------|------------------|---------|-------------------------------------|--------------|
| PMT Peak Test | 9        | 10.9             | 10.9    | <input checked="" type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: \_\_\_\_\_ <0.2 ug/m3  
 Disposable Filter Changed: \_\_\_\_\_

### Annual Maintenance

Date Sample Tube Cleaned: December 5, 2022  
 Date RH/T Sensor Cleaned: December 5, 2022

Notes: Install Calibration. AMU T640 being put back into station.

Calibration by: Melissa Lemay





# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Athabasca Valley | Station number: | AMS07            |
| Calibration Date: | February 8, 2023 | Last Cal Date:  | January 20, 2023 |
| Start time (MST): | 10:50            | End time (MST): | 13:39            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |          |     |                   |                   |
|------------------------|----------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 3,000    | ppm | Cal Gas Exp Date: | December 12, 2026 |
| Cal Gas Cylinder #:    | LL66942  |     |                   |                   |
| Removed Cal Gas Conc:  | 3,000    | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 3805              |
| ZAG Make/Model:        | API 700H |     | Serial Number:    | 198               |

### Analyzer Information

|                 |                |                    |            |
|-----------------|----------------|--------------------|------------|
| Analyzer make:  | Thermo 48i-LTE | Analyzer serial #: | 1408761381 |
| Analyzer Range: | 0 - 50 ppm     |                    |            |

|                        |                     |                      |                   |                     |                      |
|------------------------|---------------------|----------------------|-------------------|---------------------|----------------------|
|                        | <b><u>Start</u></b> | <b><u>Finish</u></b> |                   | <b><u>Start</u></b> | <b><u>Finish</u></b> |
| Calibration slope:     | 0.999713            | 0.997345             | Backgd or Offset: | 3.600               | 3.651                |
| Calibration intercept: | 0.044565            | 0.018531             | Coeff or Slope:   | 1.079               | 1.079                |

### CO Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4933                          | 66.7                        | 40.0                                | 40.1                               | 0.998   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                | 4933                          | 66.7                        | 40.0                                | 39.9                               | 1.003   |
| second point              | 4967                          | 33.3                        | 20.0                                | 20.0                               | 0.998   |
| third point               | 4983                          | 16.7                        | 10.0                                | 10.0                               | 1.002   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 4933                          | 66.7                        | 40.0                                | 39.9                               | 1.003   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.001   |

|                          |       |                 |       |               |      |
|--------------------------|-------|-----------------|-------|---------------|------|
| Baseline Corr As found:  | 40.05 | Prev response:  | 40.06 | *% change:    | 0.0% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:       |       | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation: |       |               |      |

\* = > +/-5% change initiates investigation

Notes: No Maintenance done. Zero adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## CO Calibration Summary

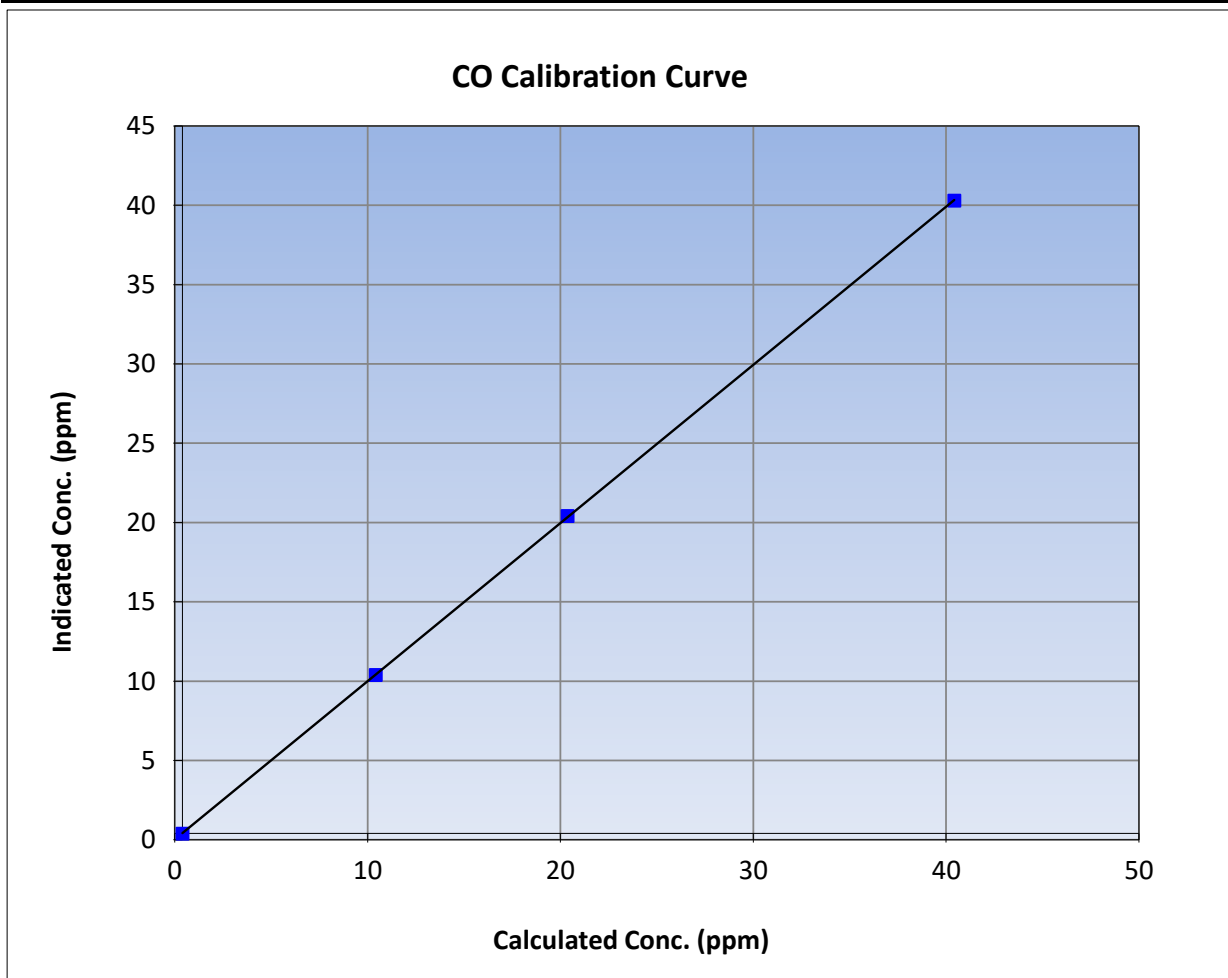
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Athabasca Valley | Station Number:       | AMS07            |
| Start Time (MST): | 10:50            | End Time (MST):       | 13:39            |
| Analyzer make:    | Thermo 48i-LTE   | Analyzer serial #:    | 1408761381       |

### Calibration Data

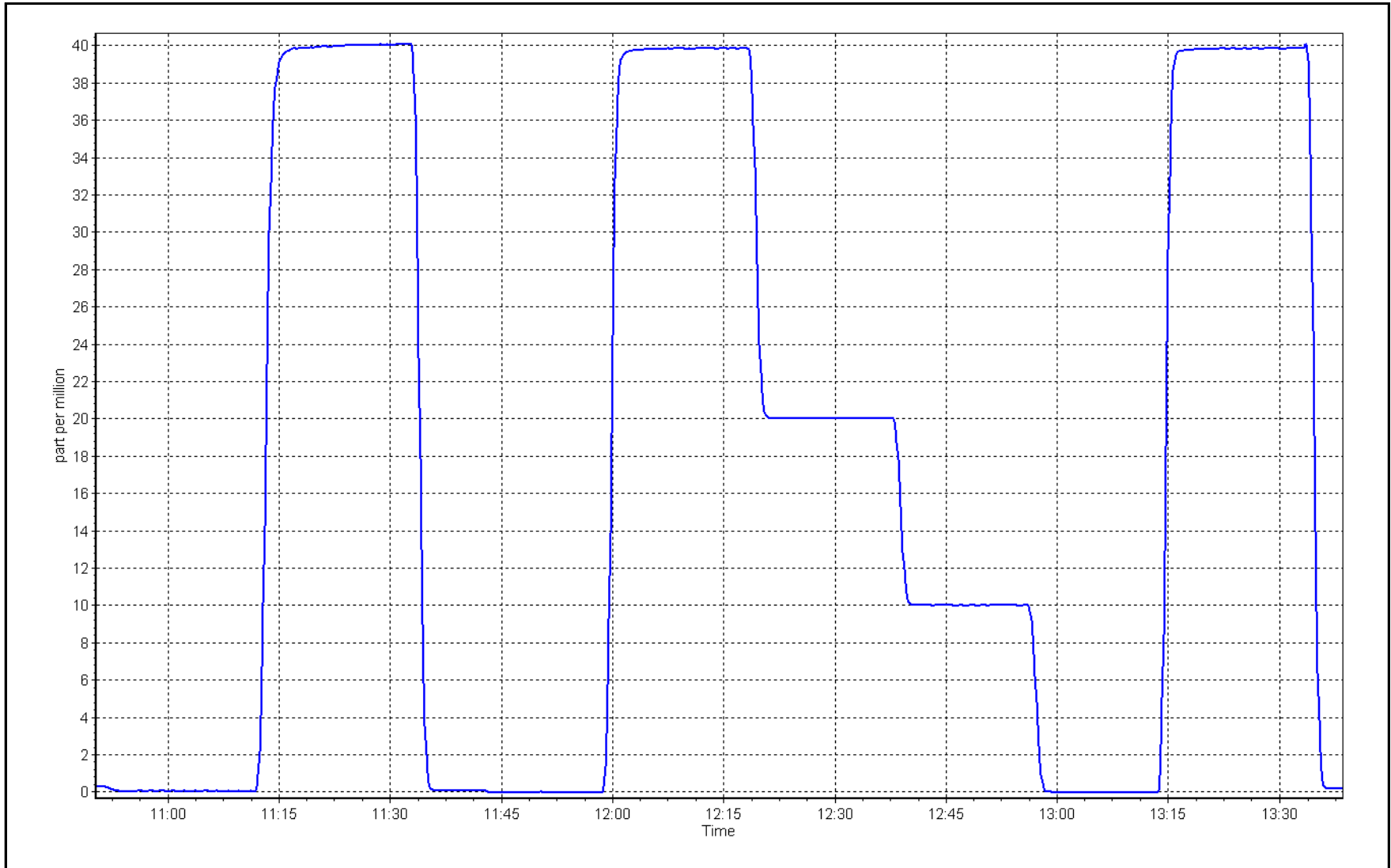
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999991 |             |
| 40.0                                | 39.9                               | 1.0031                    |                         |          | ≥0.995      |
| 20.0                                | 20.0                               | 0.9979                    | Slope                   | 0.997345 |             |
| 10.0                                | 10.0                               | 1.0021                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.018531 | +/-1.5      |



CO Calibration Plot

Date: February 8, 2023

Location: Athabasca Valley





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS08 FORT CHIPEWYAN FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Fort Chipewyan    | Station number: | AMS08            |
| Calibration Date: | February 10, 2023 | Last Cal Date:  | January 11, 2023 |
| Start time (MST): | 14:06             | End time (MST): | 4:42 PM          |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                 |
|------------------------|-------------------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 49.84             | ppm | Cal Gas Exp Date: | January 6, 2030 |
| Cal Gas Cylinder #:    | CC196697          |     |                   |                 |
| Removed Cal Gas Conc:  | 49.84             | ppm | Rem Gas Exp Date: | NA              |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                 |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3252            |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 260             |

### Analyzer Information

|                |                |                    |            |
|----------------|----------------|--------------------|------------|
| Analyzer make: | Thermo 43i-TLE | Analyzer serial #: | 1136451241 |
| Analyzer Range | 0 - 1000 ppb   |                    |            |

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.000787     | 0.996661      | Backgd or Offset: | 1.32         | 1.32          |
| Calibration intercept: | 0.415954     | 1.336570      | Coeff or Slope:   | 1.006        | 1.006         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4920                          | 80.3                        | 800.4                               | 795.6                              | 1.006   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4920                          | 80.3                        | 800.4                               | 799.1                              | 1.002   |
| second point              | 4960                          | 40.2                        | 400.7                               | 399.4                              | 1.003   |
| third point               | 4980                          | 20.1                        | 200.4                               | 203.4                              | 0.985   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span              | 4920                          | 80.3                        | 800.4                               | 800.1                              | 1.000   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.997   |

|                         |        |                   |        |           |       |
|-------------------------|--------|-------------------|--------|-----------|-------|
| Baseline Corr As found: | 795.50 | Previous response | 801.43 | *% change | -0.7% |
|-------------------------|--------|-------------------|--------|-----------|-------|

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. No adjustments needed.

Calibration Performed By: Morgan Voyageur & Matthew Courtoreille



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

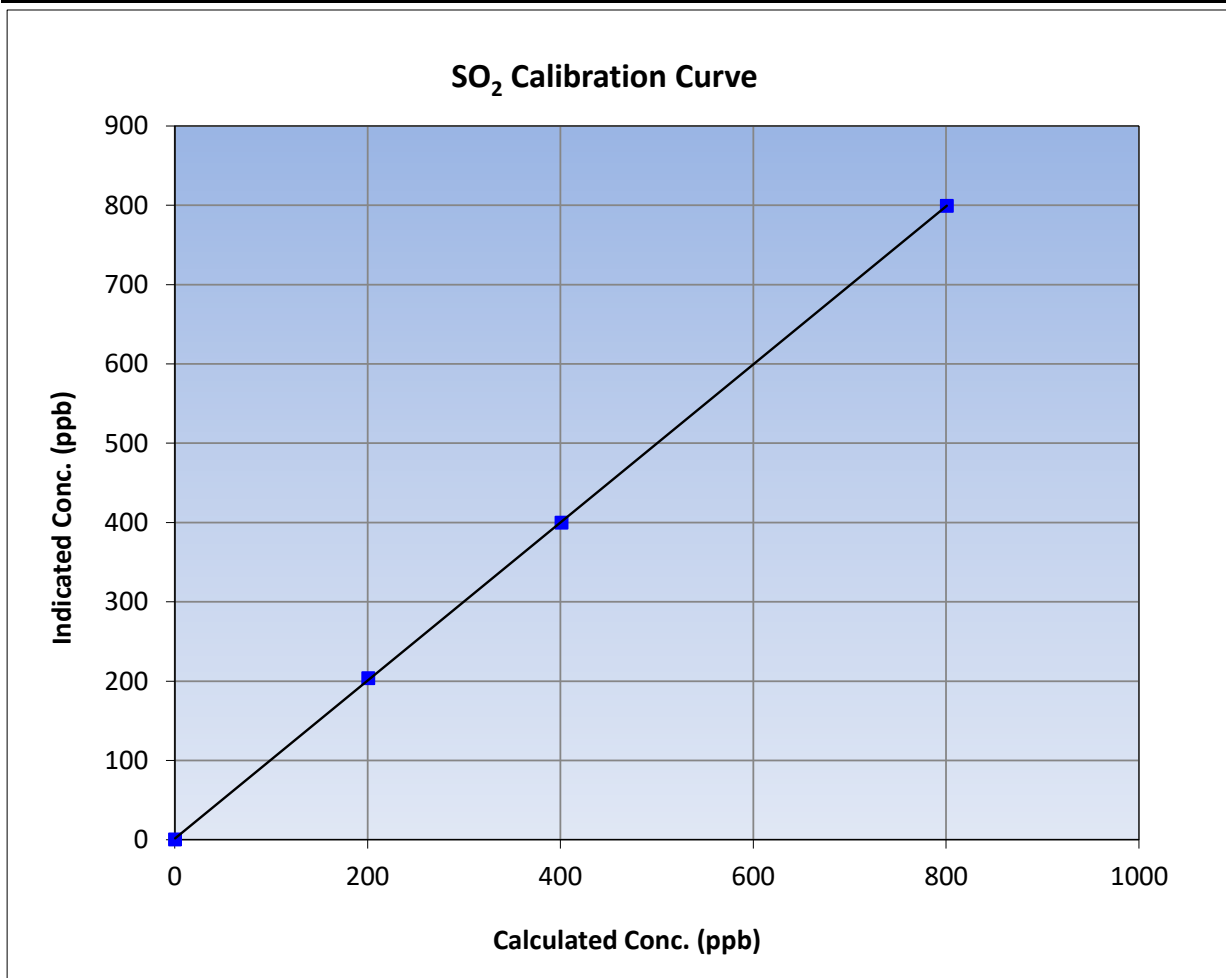
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Fort Chipewyan    | Station Number:       | AMS08            |
| Start Time (MST): | 14:06             | End Time (MST):       | 16:42            |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1136451241       |

### Calibration Data

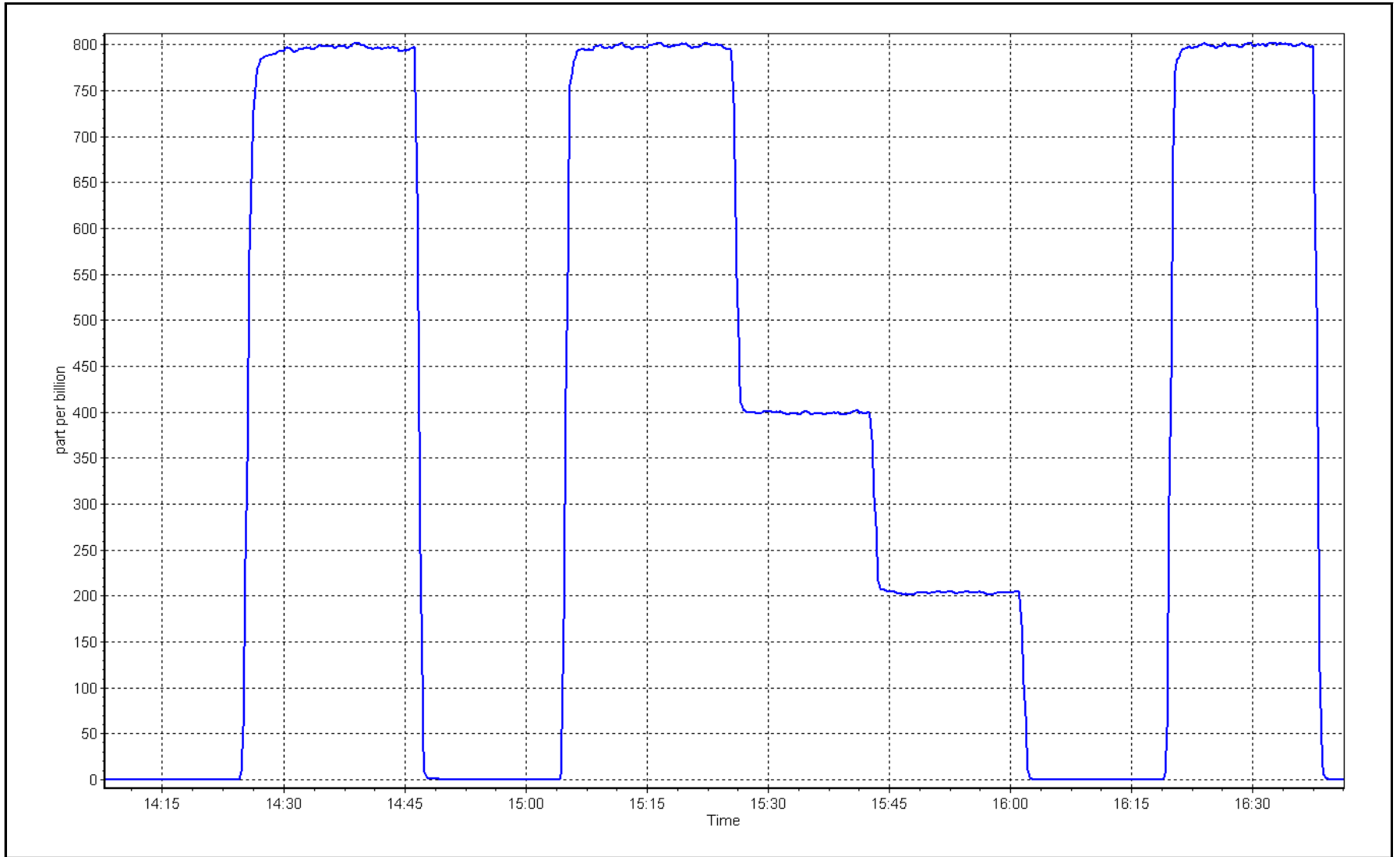
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999975 | ≥0.995      |
| 800.4                               | 799.1                              | 1.0016                    |                         |          |             |
| 400.7                               | 399.4                              | 1.0032                    | Slope                   | 0.996661 | 0.90 - 1.10 |
| 200.4                               | 203.4                              | 0.9850                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.336570 | +/-30       |



SO2 Calibration Plot

Date: February 10, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Fort Chipewyan Station number: AMS08  
 Calibration Date: February 10, 2023 Last Cal Date: January 11, 2023  
 Start time (MST): 9:24 End time (MST): 13:29  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.97 ppm Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002276  
 Removed Cal Gas Conc: 4.97 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3252  
 ZAG Make/Model: Teledyne API T701 Serial Number: 260

### Analyzer Information

Analyzer make: Thermo 43iQ-TL Analyzer serial #: 1203169744  
 Converter make: CDN-101 Converter serial #: 14639  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.999140     | 1.000139      | Backgd or Offset: 1.42 | 1.43          |
| Calibration intercept: | 0.018799     | 0.058837      | Coeff or Slope: 0.743  | 0.743         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4920                          | 80.5                        | 80.0                                | 79.8                               | 1.003  |
| as found 2nd point    | 4960                          | 40.2                        | 40.0                                | 40.1                               | 0.996  |
| as found 3rd point    | 4980                          | 20.1                        | 20.0                                | 19.9                               | 1.004  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4920                          | 80.5                        | 80.0                                | 80.0                               | 1.000   |
| second point                            | 4960                          | 40.2                        | 40.0                                | 40.2                               | 0.994   |
| third point                             | 4980                          | 20.1                        | 20.0                                | 20.0                               | 0.999   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4920                          | 80.5                        | 80.0                                | 80.2                               | 0.998   |
| SO2 Scrubber Check                      | 4919.7                        | 80.3                        | 803.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | March 7, 2022                 |                             |                                     | Ave Corr Factor                    | 0.998   |
| Date of last converter efficiency test: | March 15, 2022                |                             |                                     | 100.7% efficiency                  |   |

Baseline Corr As found: 79.8 Prev response: 79.96 \*% change: -0.2%  
 Baseline Corr 2nd AF pt: 40.1 AF Slope: 0.997854 AF Intercept: 0.038791  
 Baseline Corr 3rd AF pt: 19.9 AF Correlation: 0.999986

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Scrubber check passed. No adjustments made.

Calibration Performed By: Morgan Voyageur & Matthew Courtoreille





# Wood Buffalo Environmental Association

## TRS Calibration Summary

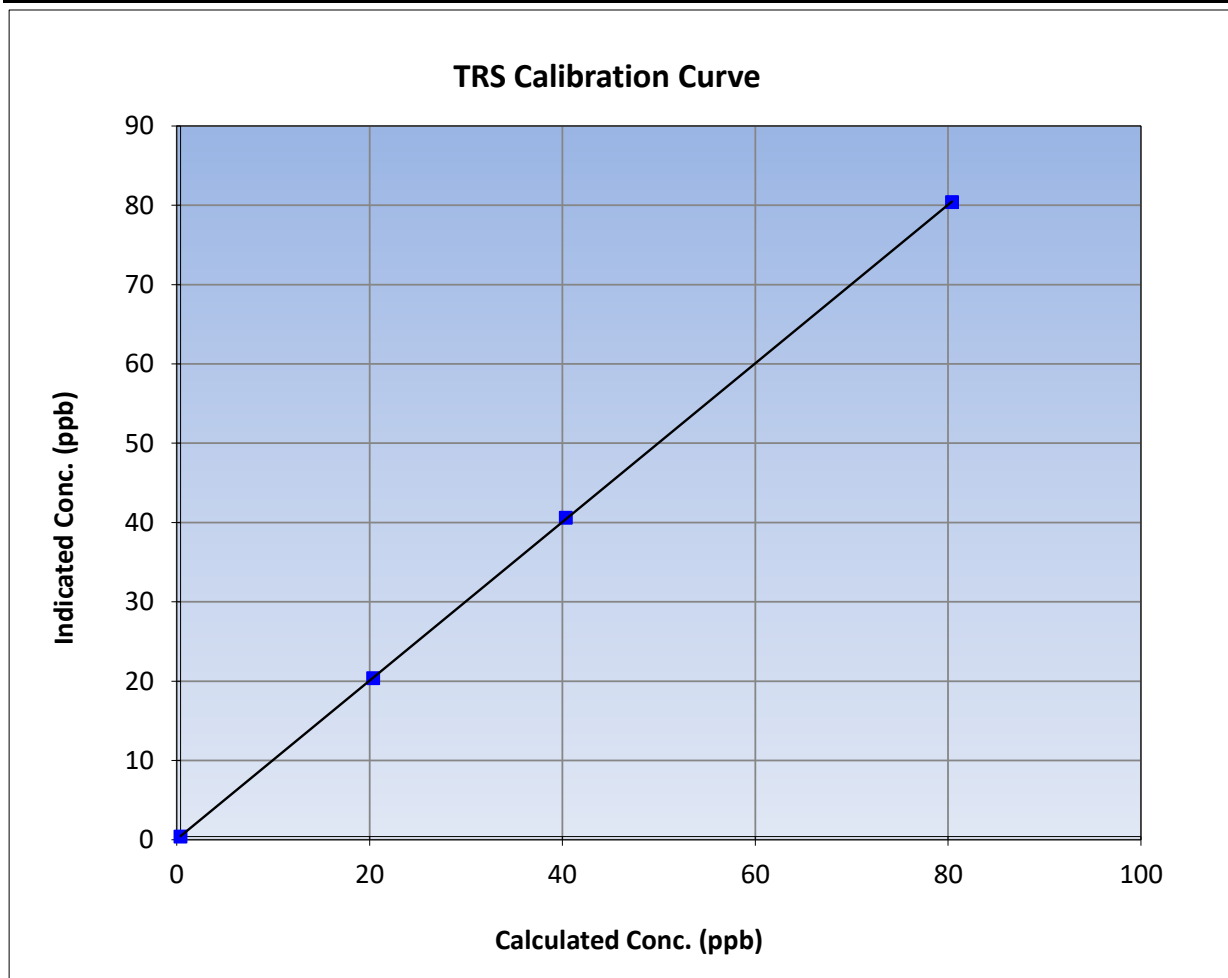
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Fort Chipewyan    | Station Number:       | AMS08            |
| Start Time (MST): | 9:24              | End Time (MST):       | 13:29            |
| Analyzer make:    | Thermo 43iQ-TL    | Analyzer serial #:    | 1203169744       |

### Calibration Data

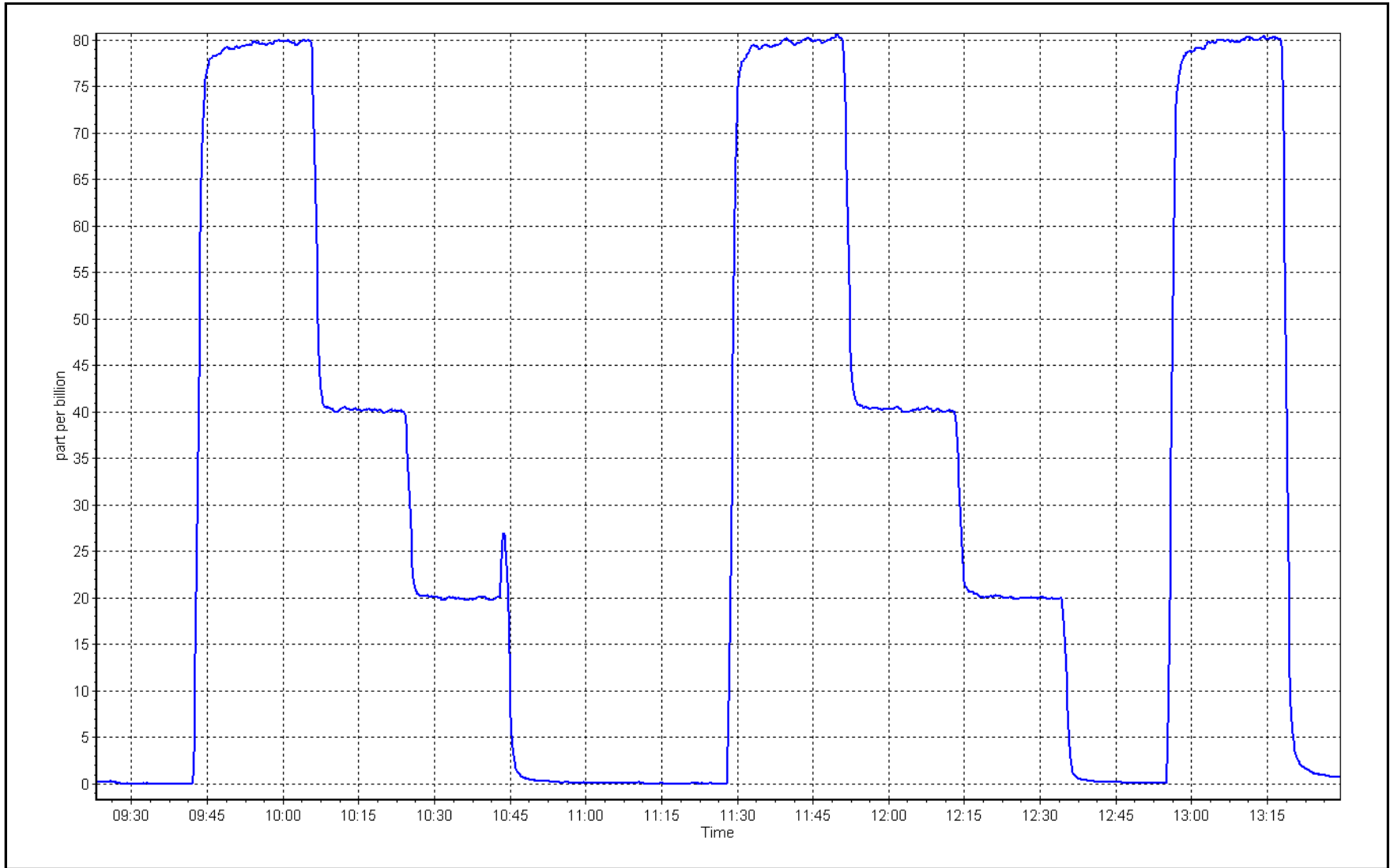
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999988 | ≥0.995      |
| 80.0                                | 80.0                               | 1.0001                    |                         |          |             |
| 40.0                                | 40.2                               | 0.9940                    | Slope                   | 1.000139 | 0.90 - 1.10 |
| 20.0                                | 20.0                               | 0.9990                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.058837 | +/-3        |



TRS Calibration Plot

Date: February 10, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort Chipewyan  
Calibration Date: February 6, 2023  
Start time (MST): 10:03  
Reason: Routine  
Station number: AMS08  
Last Cal Date: January 10, 2023  
End time (MST): 14:19

### Calibration Standards

NO Gas Cylinder #: CC363447  
NOX Cal Gas Conc: 48.80 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 48.80 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701H  
Cal Gas Expiry Date: February 2, 2024  
NO Cal Gas Conc: 48.80 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 48.80 ppm  
NO gas Diff:  
Serial Number: 3252  
Serial Number: 260

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1426262592

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.844        | 1.844         | NO bkgnd or offset:  | 6.9          | 6.9           |
| NOX coeff or slope: | 0.993        | 0.993         | NOX bkgnd or offset: | 6.9          | 6.9           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 252.6        | 252.6         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.995345     | 0.986463      |
| NO <sub>x</sub> Cal Offset: | 0.840000     | 2.200000      |
| NO Cal Slope:               | 0.998815     | 0.990518      |
| NO Cal Offset:              | -0.200000    | 1.180000      |
| NO <sub>2</sub> Cal Slope:  | 0.991767     | 0.996180      |
| NO <sub>2</sub> Cal Offset: | -0.832054    | -1.402288     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 1.4  | 1.4                                   | 0.0  | ----  | ----   |
| as found span             | 4918                      | 82.0                        | 800.3   | 800.3                                  | 0.0   | 799.5  | 798.1                                 | 1.2  | 1.0010  | 1.0028   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 1.3  | 1.3                                   | 0.0  | ----  | ----   |
| high point                | 4918                      | 82.0                        | 800.3   | 800.3                                  | 0.0   | 791.6  | 794.4                                 | -2.9   | 1.0110  | 1.0075   |
| second point              | 4959                      | 41.0                        | 400.2   | 400.2                                  | 0.0   | 396.3  | 396.2                                 | 0.1  | 1.0097  | 1.0100   |
| third point               | 4980                      | 20.5                        | 200.1   | 200.1                                  | 0.0   | 201.2  | 200.1                                 | 1.1  | 0.9944  | 0.9999   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 1.4  | 1.4                                   | 0.0  | ----  | ----   |
| as left span              | 4918                      | 82.0                        | 800.3   | 407.8                                  | 392.5   | 793.8  | 405.3                                 | 388.5  | 1.0082  | 1.0062   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0051  | 1.0058   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 798.1 ppb | NO = 796.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.1% |
| Previous Response    | NO <sub>x</sub> = 797.4 ppb | NO = 799.2 ppb |  | *Percent Change                  | NO = -0.3%             |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 792.2                                      | 399.7                                 | 392.5   | 390.0  | 1.0064   | 99.4%  |
| 2nd GPT point (200 ppb O3)       | 792.2                                      | 600.9                                 | 191.3   | 189.3  | 1.0106   | 99.0%  |
| 3rd GPT point (100 ppb O3)       | 792.2                                      | 697.7                                 | 94.5  | 90.8   | 1.0407   | 96.1%  |
| Average Correction Factor        |  |                                       |   |  | 1.0192   | 98.1%  |

Notes: Sample inlet filter changed after as founds. No Adjustments made.

Calibration Performed By: Morgan Voyageur, Matthew Courtoreille



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

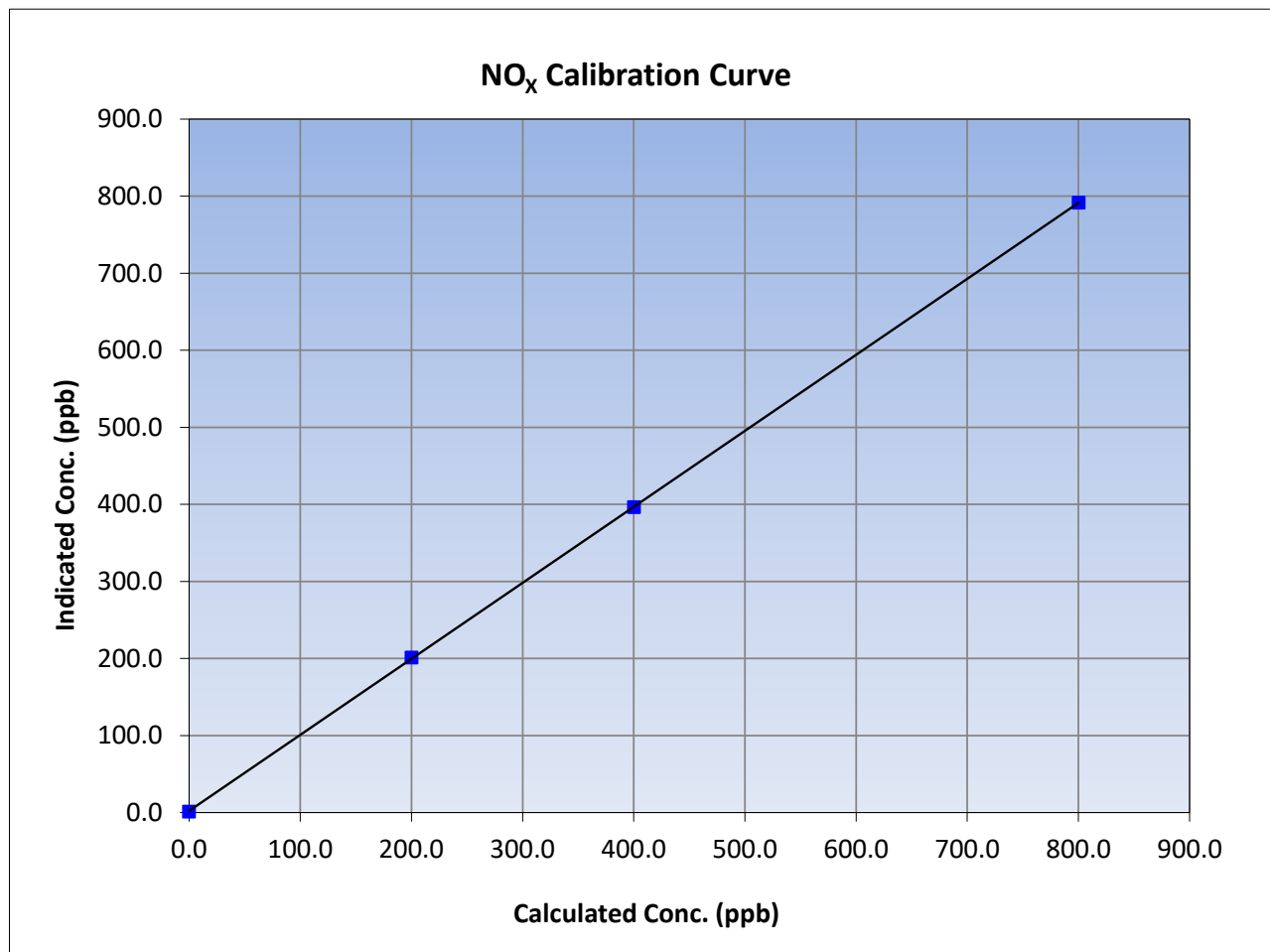
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Fort Chipewyan   | Station Number:       | AMS08            |
| Start Time (MST): | 10:03            | End Time (MST):       | 14:19            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                           |             |
|-------------------------------------|------------------------------------|---------------------------|---|----------------------------------|-------------|
| 0.0                                 | 1.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | 0.999989<br>0.986463<br>2.200000 |             |
| 800.3                               | 791.6                              | 1.0110                    |   |                                  | ≥0.995      |
| 400.2                               | 396.3                              | 1.0097                    |   |                                  | 0.90 - 1.10 |
| 200.1                               | 201.2                              | 0.9944                    |   |                                  | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

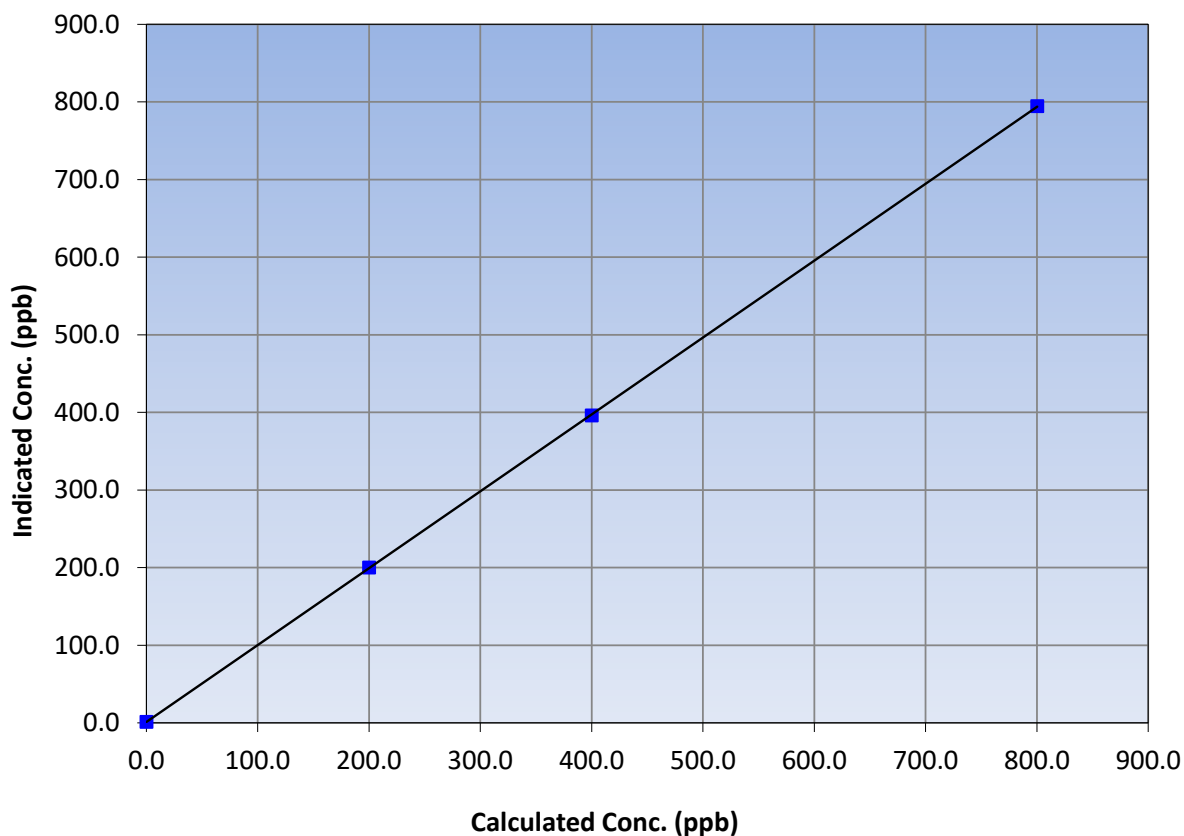
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Fort Chipewyan   | Station Number:       | AMS08            |
| Start Time (MST): | 10:03            | End Time (MST):       | 14:19            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                                      |
|-------------------------------------|------------------------------------|---------------------------|---|--|
| 0.0                                 | 1.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br><i>0.90 - 1.10</i><br><i>+/-20</i> |
| 800.3                               | 794.4                              | 1.0075                    |   |  |
| 400.2                               | 396.2                              | 1.0100                    |   |  |
| 200.1                               | 200.1                              | 0.9999                    |   |  |
|                                     |                                    |                           |   |  |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

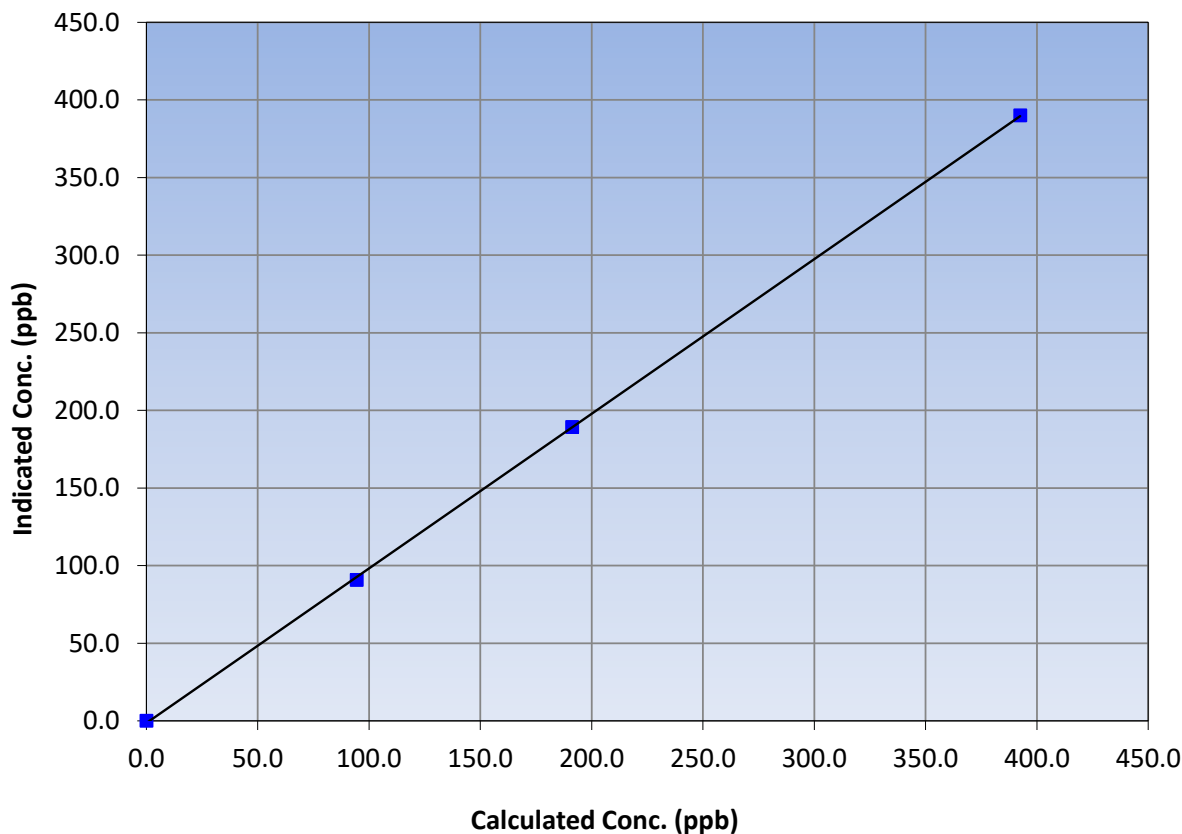
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Fort Chipewyan   | Station Number:       | AMS08            |
| Start Time (MST): | 10:03            | End Time (MST):       | 14:19            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 392.5                               | 390.0                              | 1.0064                    |   |                                |
| 191.3                               | 189.3                              | 1.0106                    |   |                                |
| 94.5                                | 90.8                               | 1.0407                    |   |                                |
|                                     |                                    |                           |   |                                |

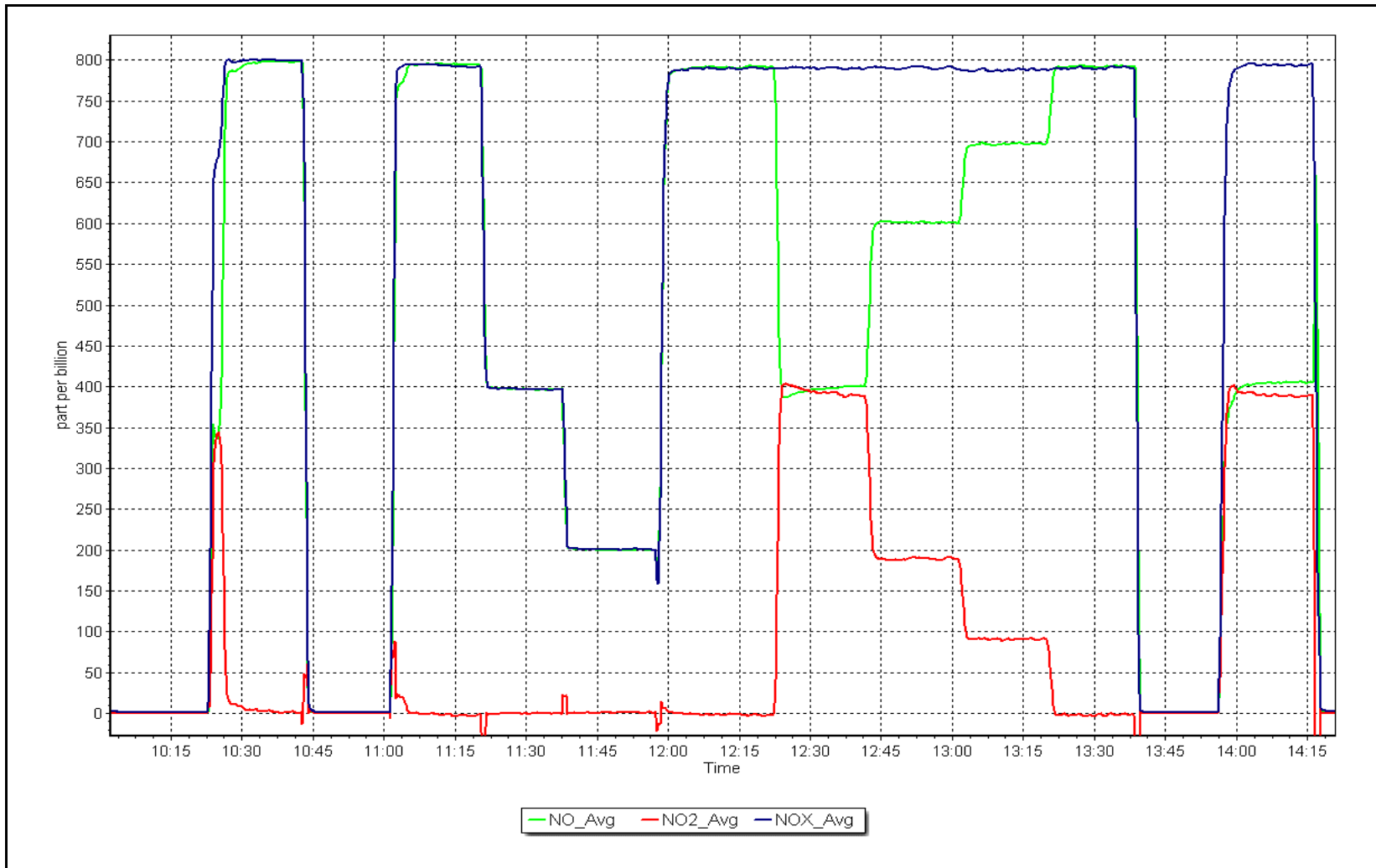
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 6, 2023

Location: Fort Chipewyan







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Fort Chipewyan Station number: AMS08  
 Calibration Date: February 6, 2023 Last Cal Date: January 10, 2023  
 Start time (MST): 14:22 End time (MST): 16:49  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3252  
 ZAG Make/Model: Teledyne API T701 Serial Number: 260

### Analyzer Information

Analyzer make: Teledyne API T400 Analyzer serial #: 3872  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.011486     | 1.007143      | Backgd or Offset: | -2.0         | -2.0          |
| Calibration intercept: | -0.960000    | -0.600000     | Coeff or Slope:   | 1.036        | 1.036         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | NA                            | 0.0                                 | 0.1                                | ----  |
| as found span             | 5000                       | 963.6                         | 400.0                               | 402.8                              | 0.993   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | NA                            | 0.0                                 | 0.7                                | ----  |
| high point                | 5000                       | 961.7                         | 400.0                               | 402.8                              | 0.993   |
| second point              | 5000                       | 810.3                         | 200.0                               | 200.5                              | 0.998   |
| third point               | 5000                       | 701.3                         | 100.0                               | 98.6                               | 1.014   |
| as left zero              | 5000                       | NA                            | 0.0                                 | 0.5                                | ----  |
| as left span              | 5000                       | 963.3                         | 400.0                               | 404.4                              | 0.989   |
| Average Correction Factor |                            |                               |                                     |                                    | 1.002   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 402.7 | Previous response | 403.6 | *% change     | -0.2% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Morgan Voyageur, Matthew Courtoreille



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

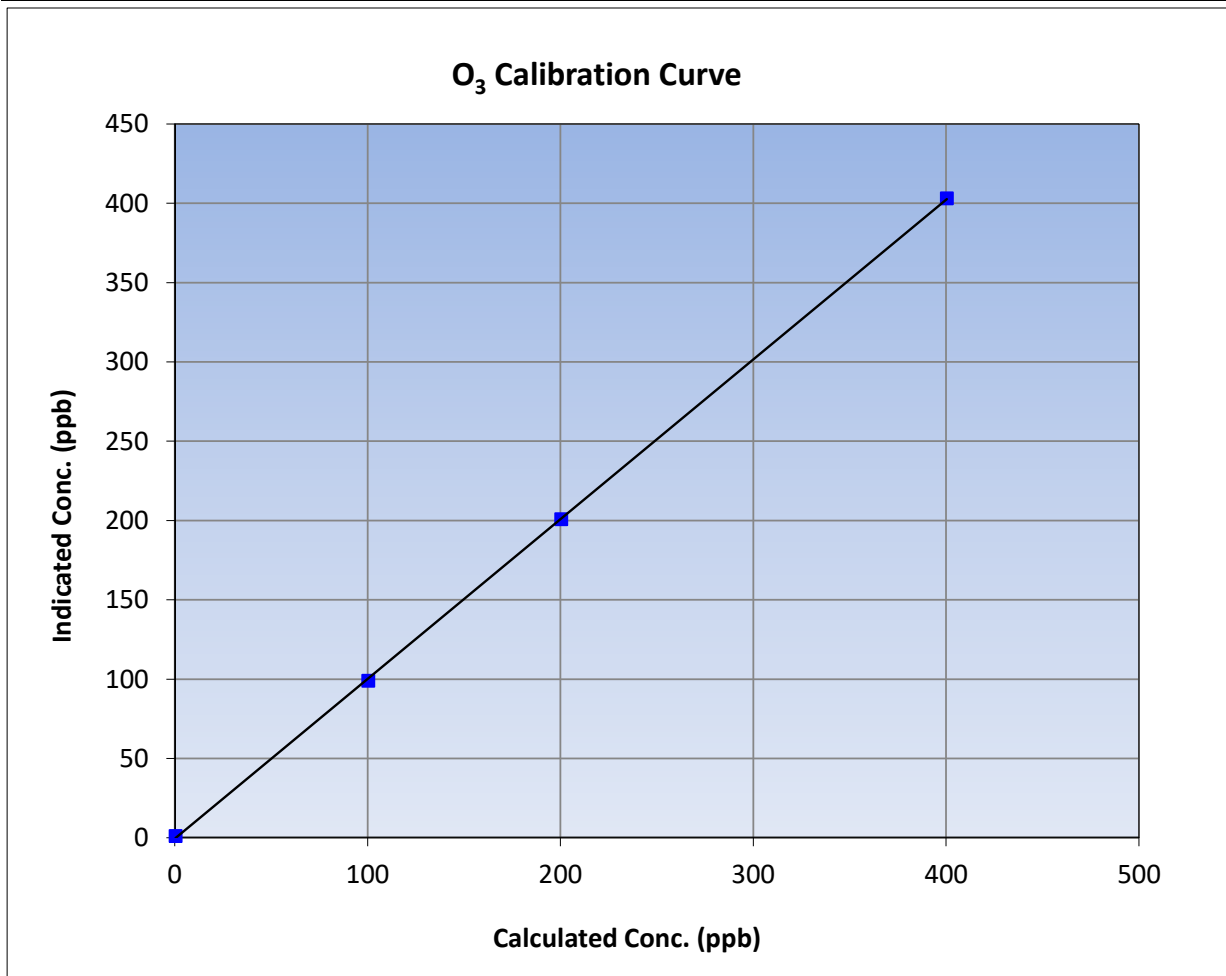
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023  | Previous Calibration: | January 10, 2023 |
| Station Name:     | Fort Chipewyan    | Station Number:       | AMS08            |
| Start Time (MST): | 14:22             | End Time (MST):       | 16:49            |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3872             |

### Calibration Data

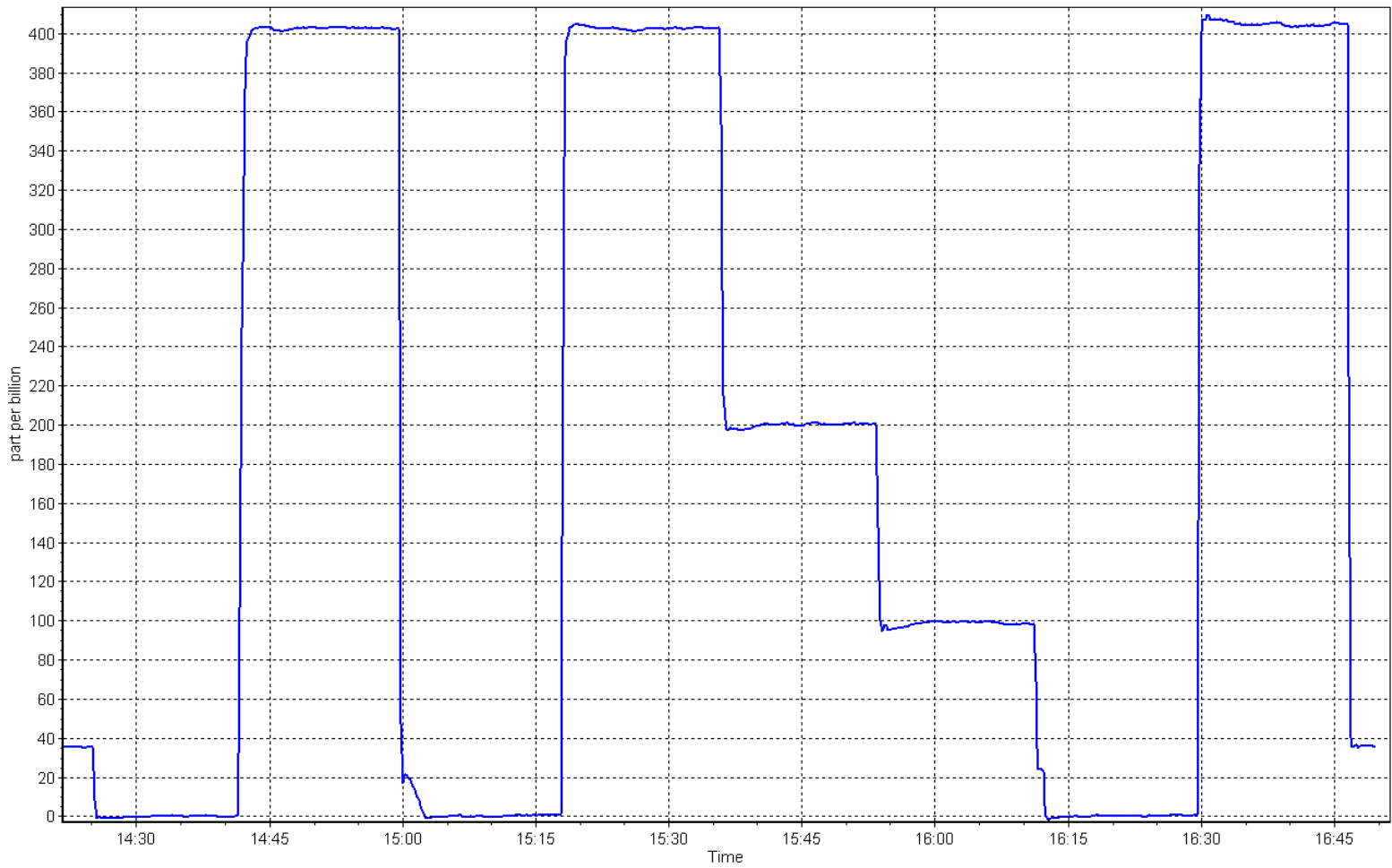
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.7                                | ----                      | Correlation Coefficient | 0.999951  |             |
| 400.0                               | 402.8                              | 0.9930                    |                         |           | ≥0.995      |
| 200.0                               | 200.5                              | 0.9975                    | Slope                   | 1.007143  |             |
| 100.0                               | 98.6                               | 1.0142                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.600000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 6, 2023

Location: Fort Chipewyan



\



# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort Chipewyan Station number: AMS 08  
 Calibration Date: February 15, 2023 Last Cal Date: January 11, 2023  
 Start time (MST): 13:07 End time (MST): 14:30

Analyzer Make: S/N: 216  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1212  
 Temp/RH standard: Delta Cal S/N: 1212

### Monthly Calibration Test

| Parameter  | As found                         | Measured                        | As left | Adjusted                 | (Limits)     |
|------------|----------------------------------|---------------------------------|---------|--------------------------|--------------|
| T (°C)     | -21.2                            | -21.2                           | -21.2   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 743.2                            | 733.8                           | 743.2   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.00                             | 4.89                            | 5.00    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: February 15, 2023 | Last Cal Date: January 11, 2023 |         |                          |              |
|            | PM w/o HEPA: 1.6                 | PM w/ HEPA: 0.0                 |         |                          | <0.2 ug/m3   |

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance | As left  | Adjusted                 | (Limits)     |
|-------------------------------|----------|------------------|----------|--------------------------|--------------|
| PMT Peak Test                 |          |                  |          | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA:     | w/ HEPA: |                          |              |
| Date Optical Chamber Cleaned: |          | December 5, 2022 |          |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | December 5, 2022 |          |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: July 14, 2022  
 Date RH/T Sensor Cleaned: July 14, 2022

Notes: No adjustment needed.

Calibration by: Morgan Voyageur



# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort Chipewyan   | Station number: | AMS08            |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 11:11            | End time (MST): | 13:45            |
| Reason:           | Maintenance      |                 |                  |

### Calibration Standards

|                        |           |     |                   |                  |
|------------------------|-----------|-----|-------------------|------------------|
| Cal Gas Concentration: | 3,030     | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM014846 |     |                   |                  |
| Removed Cal Gas Conc:  | 3,030     | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA        |     | Diff between cyl: |                  |
| Calibrator Make/Model: | API T700  |     | Serial Number:    | 5272             |
| ZAG Make/Model:        | API T701H |     | Serial Number:    | 197              |

### Analyzer Information

|                 |            |                    |      |
|-----------------|------------|--------------------|------|
| Analyzer make:  | API T300   | Analyzer serial #: | 3505 |
| Analyzer Range: | 0 - 50 ppm |                    |      |

|                        |              |               |                   |               |
|------------------------|--------------|---------------|-------------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
| Calibration slope:     | 0.995217     |               | Backgd or Offset: | -0.013        |
| Calibration intercept: | 0.070924     |               | Coeff or Slope:   | 0.999         |
|                        |              |               |                   | NA            |
|                        |              |               |                   | NA            |

### CO Calibration Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero         |                               |                             |                                     |                                    |   |
| as found span         |                               |                             |                                     |                                    |   |
| as found 2nd point    |                               |                             |                                     |                                    |   |
| as found 3rd point    |                               |                             |                                     |                                    |   |
| new cylinder response |                               |                             |                                     |                                    |   |
| calibrator zero       |                               |                             |                                     |                                    |   |
| high point            |                               |                             |                                     |                                    |   |
| second point          |                               |                             |                                     |                                    |   |
| third point           |                               |                             |                                     |                                    |   |
| as left zero          | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span          | 2960                          | 40.0                        | 40.4                                | 40.6                               | 0.995   |

#### Average Correction Factor

|                          |    |                 |    |               |    |
|--------------------------|----|-----------------|----|---------------|----|
| Baseline Corr As found:  | NA | Prev response:  | NA | *% change:    | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope:       |    | AF Intercept: |    |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: |    |               |    |

\* = > +/-5% change initiates investigation

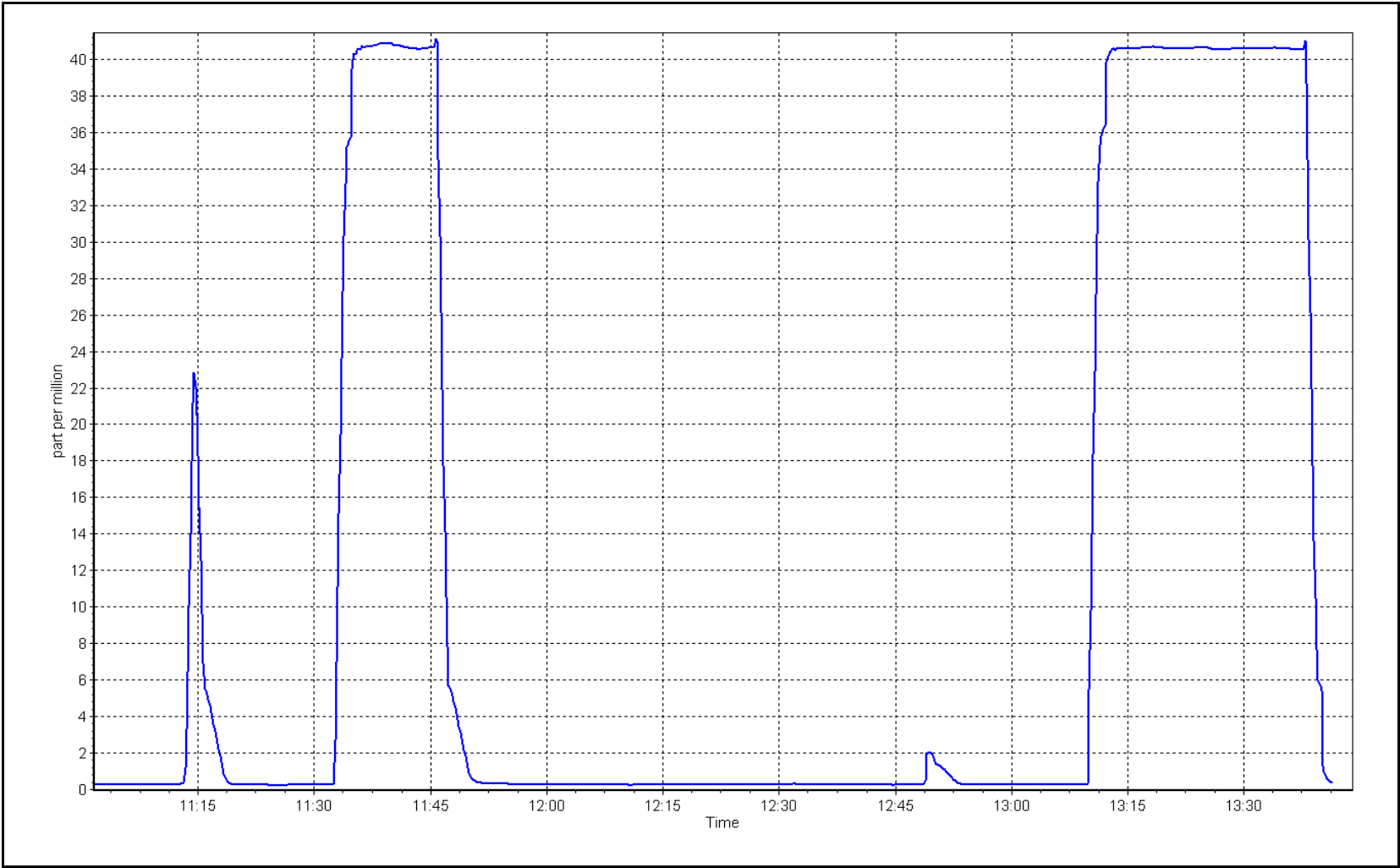
Notes: Unable to complete as founds due to pressure warnings on calibrator. Changed out the flow controller in the Nitrogen generator.

Calibration Performed By: Karan Pandit

CO Calibration Plot

Date: February 3, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Fort Chipewyan    | Station number: | AMS08            |
| Calibration Date: | February 14, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 9:20              | End time (MST): | 12:49            |
| Reason:           | Maintenance       |                 |                  |

### Calibration Standards

|                        |           |     |                   |                  |
|------------------------|-----------|-----|-------------------|------------------|
| Cal Gas Concentration: | 3,030     | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM014846 |     |                   |                  |
| Removed Cal Gas Conc:  | 3,030     | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA        |     | Diff between cyl: |                  |
| Calibrator Make/Model: | API T700  |     | Serial Number:    | 5272             |
| ZAG Make/Model:        | API T701H |     | Serial Number:    | 197              |

### Analyzer Information

|                 |            |                    |      |
|-----------------|------------|--------------------|------|
| Analyzer make:  | API T300   | Analyzer serial #: | 3505 |
| Analyzer Range: | 0 - 50 ppm |                    |      |

|                        |                     |                      |                   |                     |                      |
|------------------------|---------------------|----------------------|-------------------|---------------------|----------------------|
|                        | <b><u>Start</u></b> | <b><u>Finish</u></b> |                   | <b><u>Start</u></b> | <b><u>Finish</u></b> |
| Calibration slope:     | 0.995217            | 0.983508             | Backgd or Offset: | -0.013              | -0.013               |
| Calibration intercept: | 0.070924            | 0.322926             | Coeff or Slope:   | 0.999               | 0.987                |

### CO Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.19                               | ----  |
| as found span             | 4933                          | 66.7                        | 40.4                                | 40.6                               | 0.996   |
| as found 2nd point        | 4967                          | 33.3                        | 20.2                                | 20.5                               | 0.983   |
| as found 3rd point        | 4983                          | 16.7                        | 10.1                                | 10.5                               | 0.968   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4934                          | 66.7                        | 40.4                                | 40.0                               | 1.010   |
| second point              | 4967                          | 33.3                        | 20.2                                | 20.3                               | 0.995   |
| third point               | 4983                          | 16.7                        | 10.1                                | 10.3                               | 0.979   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span              | 2960                          | 40.0                        | 40.4                                | 39.8                               | 1.015   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.995   |

|                          |       |                 |          |               |          |
|--------------------------|-------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 40.41 | Prev response:  | 40.30    | *% change:    | 0.3%     |
| Baseline Corr 2nd AF pt: | 20.3  | AF Slope:       | 0.998924 | AF Intercept: | 0.278520 |
| Baseline Corr 3rd AF pt: | 10.3  | AF Correlation: | 0.999975 |               |          |

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Replaced the pump. Adjusted the span only.

Calibration Performed By: Matthew Courtoreille & Morgan V



# Wood Buffalo Environmental Association

## CO Calibration Summary

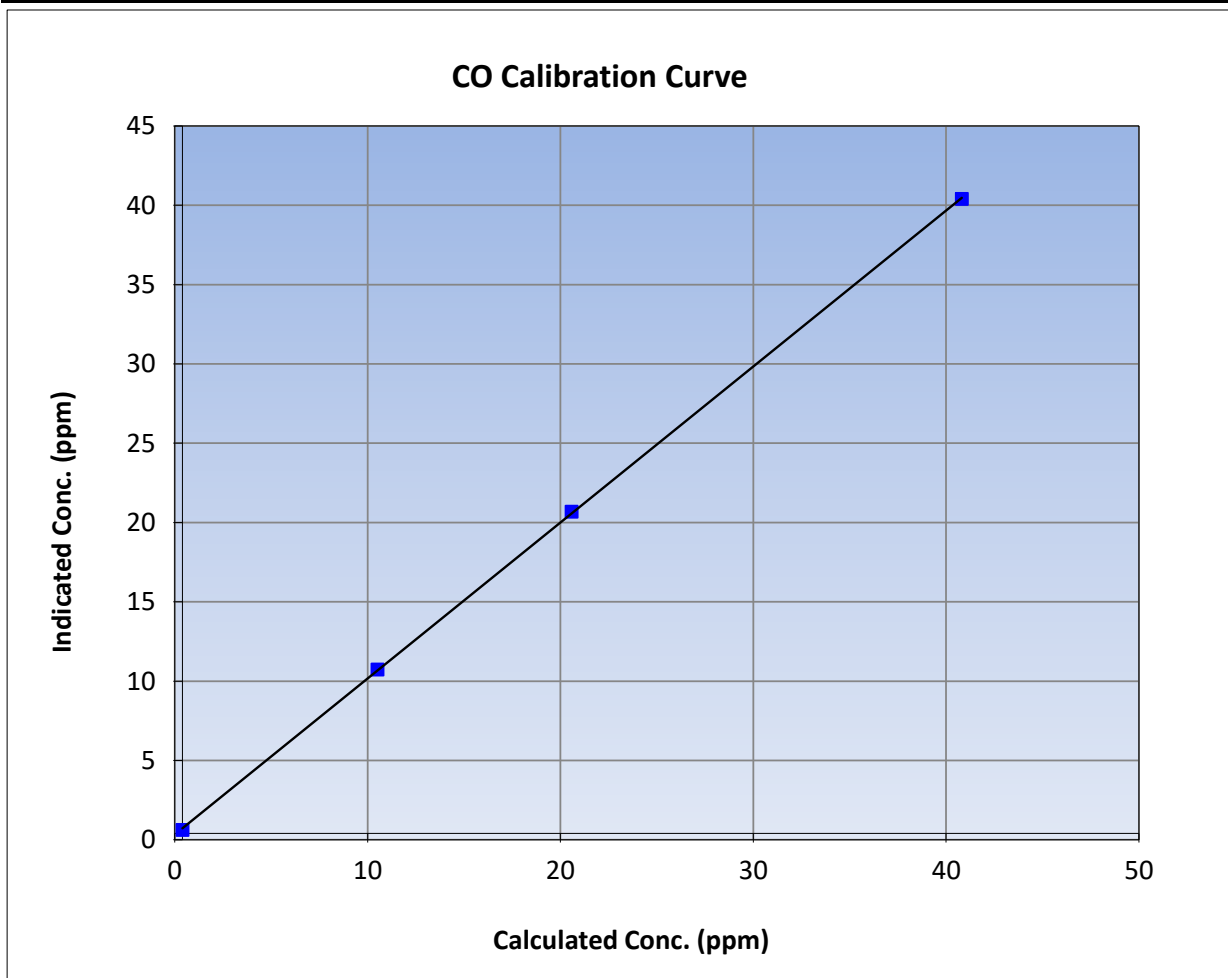
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Fort Chipewyan    | Station Number:       | AMS08            |
| Start Time (MST): | 9:20              | End Time (MST):       | 12:49            |
| Analyzer make:    | API T300          | Analyzer serial #:    | 3505             |

### Calibration Data

| Calculated concentration<br>(ppm) (Cc) | Indicated concentration<br>(ppm) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999963      |
| 40.4                                   | 40.0                                  | 1.0104                       |                         |               |
| 20.2                                   | 20.3                                  | 0.9951                       | Slope                   | 0.983508      |
| 10.1                                   | 10.3                                  | 0.9787                       |                         |               |
|  |                                       |                              | Intercept               | 0.322926      |
|  |                                       |                              |                         | <i>+/-1.5</i> |

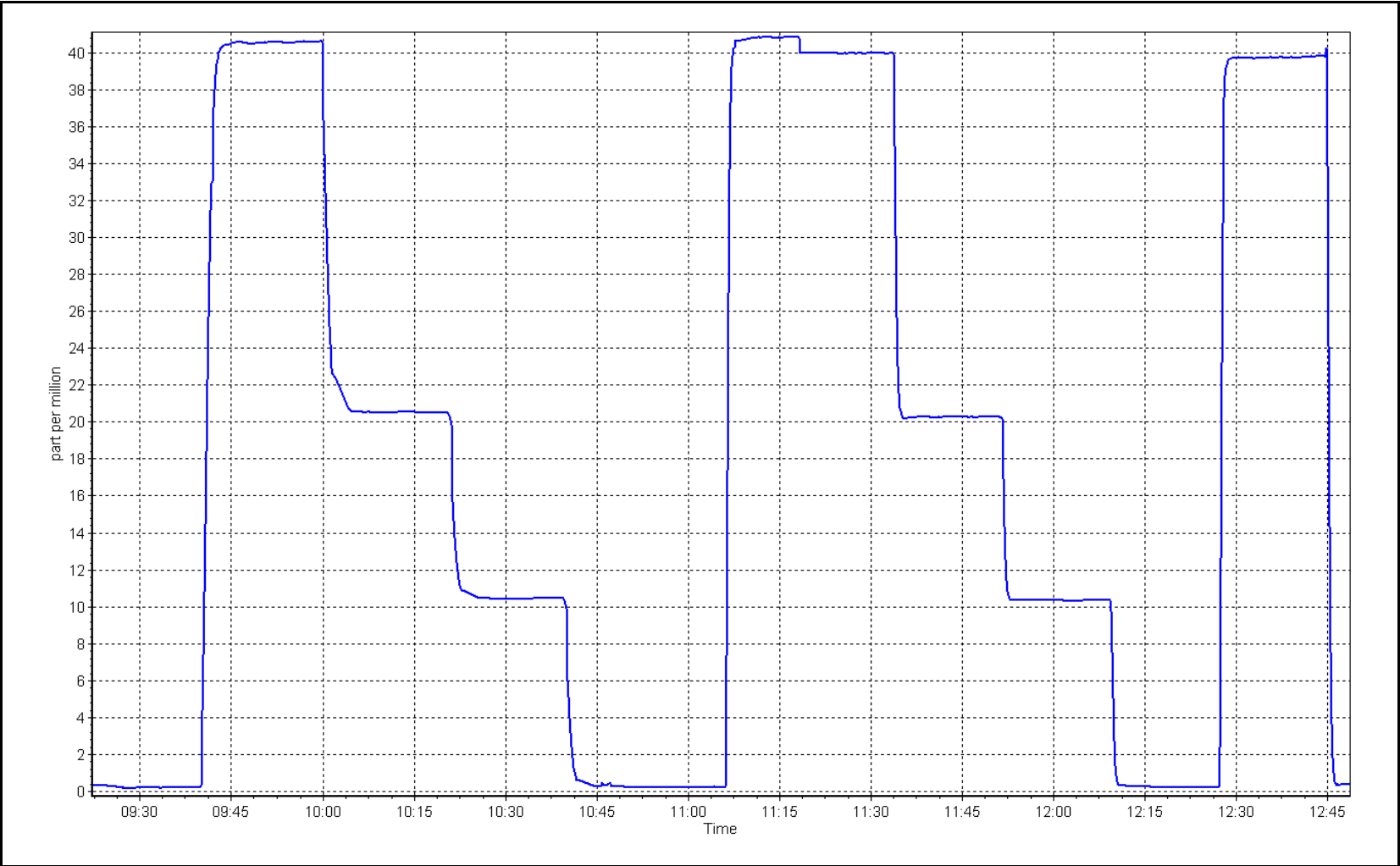




CO Calibration Plot

Date: February 14, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort Chipewyan   | Station number: | AMS08            |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 11:11            | End time (MST): | 13:45            |
| Reason:           | Maintenance      |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,220            | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM014846         |     |                   |                  |
| Removed Cal Gas Conc:  | 60,220            | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 5272             |
| N2 Gen Make/Model:     | NG 5000           |     | Serial Number:    | 771048318        |

### Analyzer Information

|                                  |                        |
|----------------------------------|------------------------|
| Analyzer make: Teledyne API T360 | Analyzer serial #: 289 |
| Analyzer Range 0 - 2,000 ppm     |                        |

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.998112     |               | Backgd or Offset: | 0.019        | NA            |
| Calibration intercept: | -5.540000    |               | Coeff or Slope:   | 1.011        | NA            |

### CO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             |                               |                             |                                     |                                    |   |
| as found span             |                               |                             |                                     |                                    |   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           |                               |                             |                                     |                                    |   |
| high point                |                               |                             |                                     |                                    |   |
| second point              |                               |                             |                                     |                                    |   |
| third point               |                               |                             |                                     |                                    |   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span              | 2960                          | 40.0                        | 802.9                               | 788.8                              | 1.018   |
| Average Correction Factor |                               |                             |                                     |                                    |   |

|                          |    |                 |    |               |    |
|--------------------------|----|-----------------|----|---------------|----|
| Baseline Corr As found:  | NA | Prev response:  | NA | *% change:    | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope:       |    | AF Intercept: |    |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: |    |               |    |

\* = > +/-5% change initiates investigation

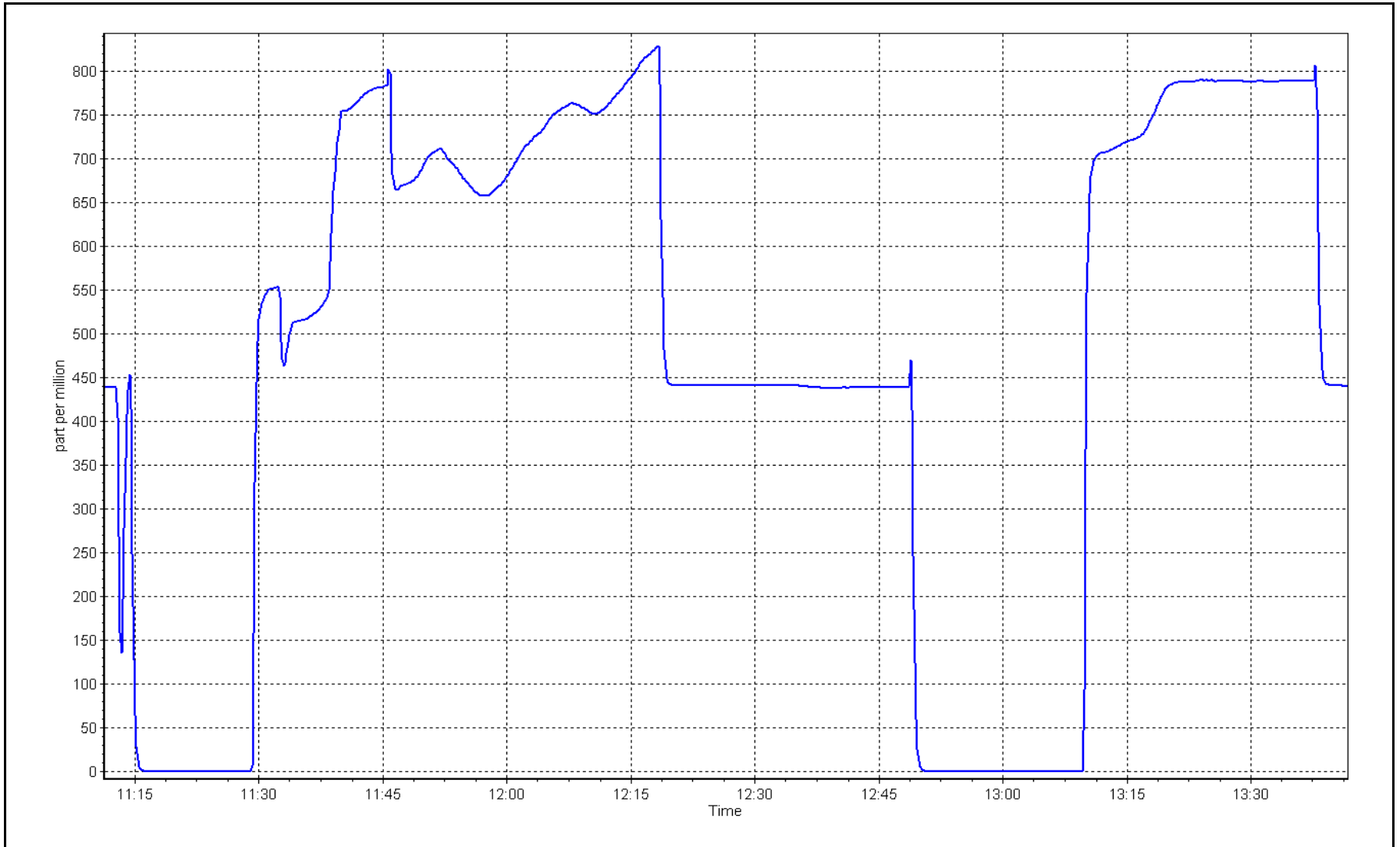
Notes: Unable to complete as founds due to pressure warnings on calibrator. Changed out the flow controller in the Nitrogen generator.

Calibration Performed By: Karan Pandit

CO<sub>2</sub> Calibration Plot

Date: February 3, 2023

Location: Fort Chipewyan





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Fort Chipewyan    | Station number: | AMS08            |
| Calibration Date: | February 15, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 9:02              | End time (MST): | 12:12            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,220            | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM014846         |     |                   |                  |
| Removed Cal Gas Conc:  | 60,220            | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 5272             |
| N2 Gen Make/Model:     | NG 5000           |     | Serial Number:    | 771048318        |

### Analyzer Information

|                                  |                        |
|----------------------------------|------------------------|
| Analyzer make: Teledyne API T360 | Analyzer serial #: 289 |
| Analyzer Range 0 - 2,000 ppm     |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.998112     | 1.006830      | Backgd or Offset: | 0.019        | 0.019         |
| Calibration intercept: | -5.540000    | -1.740000     | Coeff or Slope:   | 1.011        | 1.011         |

### CO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as found span             | 2920                          | 80.0                        | 1605.9                              | 1617.8                             | 0.993   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | 1.0                                | ----  |
| high point                | 2920                          | 80.0                        | 1605.9                              | 1620.1                             | 0.991   |
| second point              | 2960                          | 40.0                        | 802.9                               | 794.4                              | 1.011   |
| third point               | 2980                          | 20.0                        | 401.5                               | 407.0                              | 0.986   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | 0.8                                | ----  |
| as left span              | 2960                          | 40.0                        | 802.9                               | 791.8                              | 1.014   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.996   |

|                          |         |                 |         |               |      |
|--------------------------|---------|-----------------|---------|---------------|------|
| Baseline Corr As found:  | 1617.20 | Prev response:  | 1597.29 | *% change:    | 1.2% |
| Baseline Corr 2nd AF pt: | NA      | AF Slope:       |         | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA      | AF Correlation: |         |               |      |

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Matthew Courtoreille & Morgan Voyageur



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

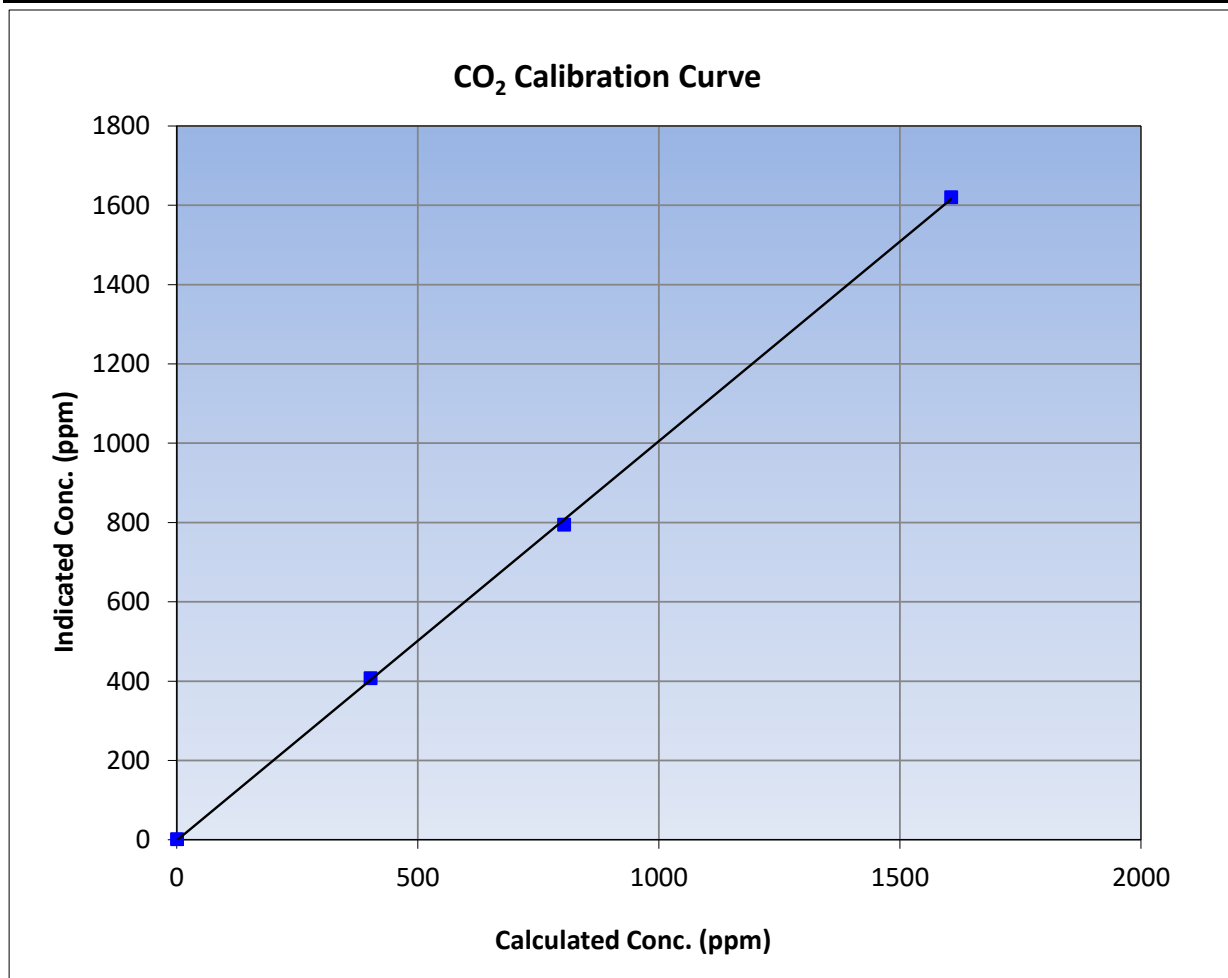
Version-01-2020

### Station Information

|                  |                   |                      |                  |
|------------------|-------------------|----------------------|------------------|
| Calibration Date | February 15, 2023 | Previous Calibration | January 13, 2023 |
| Station Name     | Fort Chipewyan    | Station Number       | AMS08            |
| Start Time (MST) | 9:02              | End Time (MST)       | 12:12            |
| Analyzer make    | Teledyne API T360 | Analyzer serial #    | 289              |

### Calibration Data

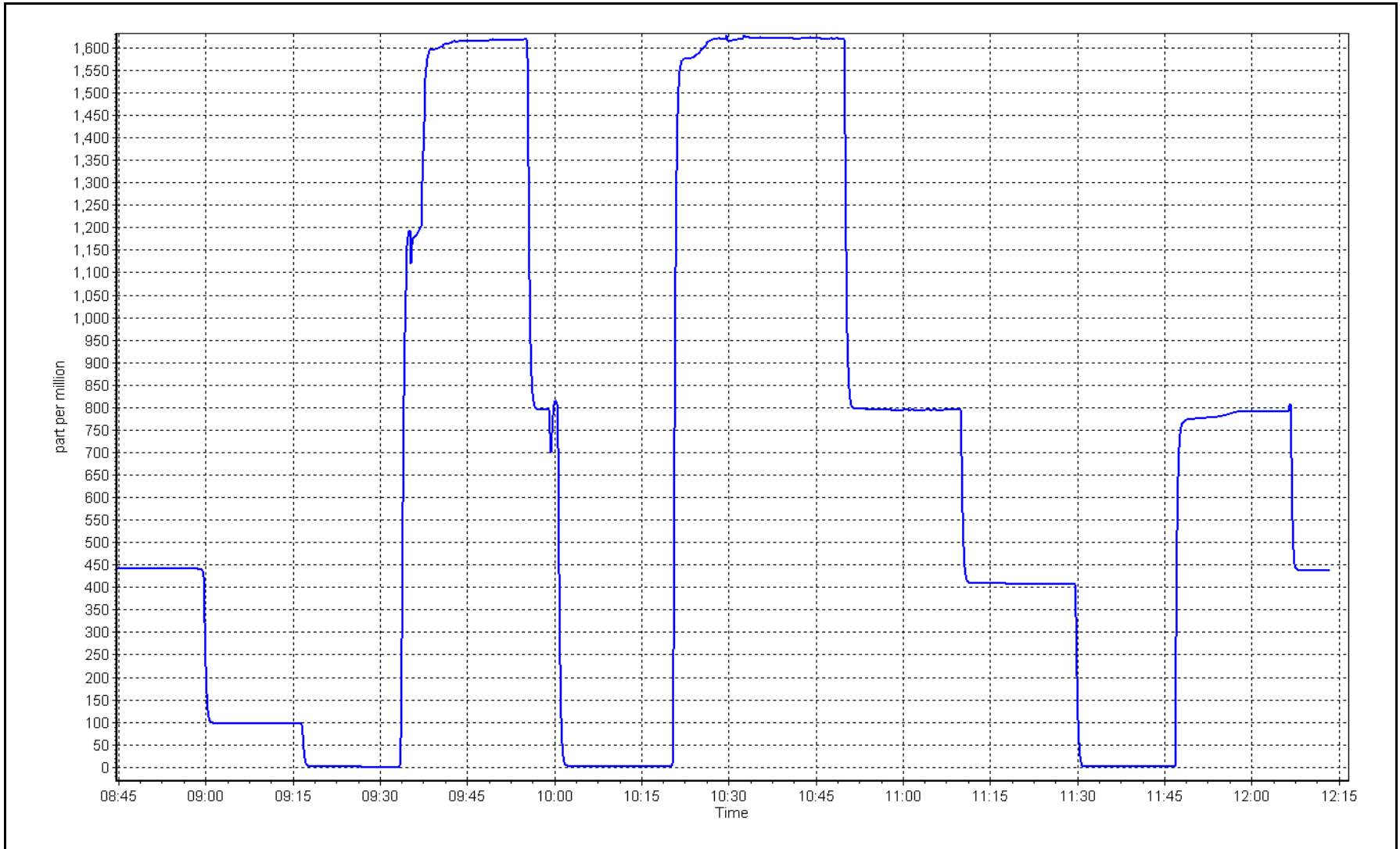
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 1.0                                | ----                      | Correlation Coefficient | 0.999857      | ≥0.995      |
| 1605.9                              | 1620.1                             | 0.9912                    |                         |               |             |
| 802.9                               | 794.4                              | 1.0107                    | Slope                   | 1.006830      | 0.90 - 1.10 |
| 401.5                               | 407.0                              | 0.9864                    |                         |               |             |
|                                     |                                    |                           | Intercept               | -1.740000     | +/-20       |



CO<sub>2</sub> Calibration Plot

Date: February 15, 2023

Location: Fort Chipewyan





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS09 BARGE LANDING FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Barge Landing    | Station number: | AMS09            |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 10:20            | End time (MST): | 13:38            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |          |     |                   |                 |
|------------------------|----------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 49.96    | ppm | Cal Gas Exp Date: | January 5, 2025 |
| Cal Gas Cylinder #:    | CC151285 |     |                   |                 |
| Removed Cal Gas Conc:  | 49.96    | ppm | Rem Gas Exp Date: | NA              |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                 |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 3812            |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 4888            |

### Analyzer Information

|                |              |                    |            |
|----------------|--------------|--------------------|------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | 1118148498 |
| Analyzer Range | 0 - 1000 ppb |                    |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.994624     | 1.002493      | Backgd or Offset: | 9.8          | 9.8           |
| Calibration intercept: | -0.310040    | 0.431711      | Coeff or Slope:   | 0.986        | 0.986         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4919                          | 80.2                        | 801.5                               | 803.0                              | 0.998   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point                | 4919                          | 80.2                        | 801.5                               | 804.0                              | 0.997   |
| second point              | 4959                          | 40.1                        | 400.8                               | 401.9                              | 0.997   |
| third point               | 4980                          | 20.0                        | 199.8                               | 201.0                              | 0.994   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span              | 4919                          | 80.2                        | 801.5                               | 804.0                              | 0.997   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.996   |

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 802.90 | Previous response | 796.87 | *% change     | 0.8% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Braiden Boutilier





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

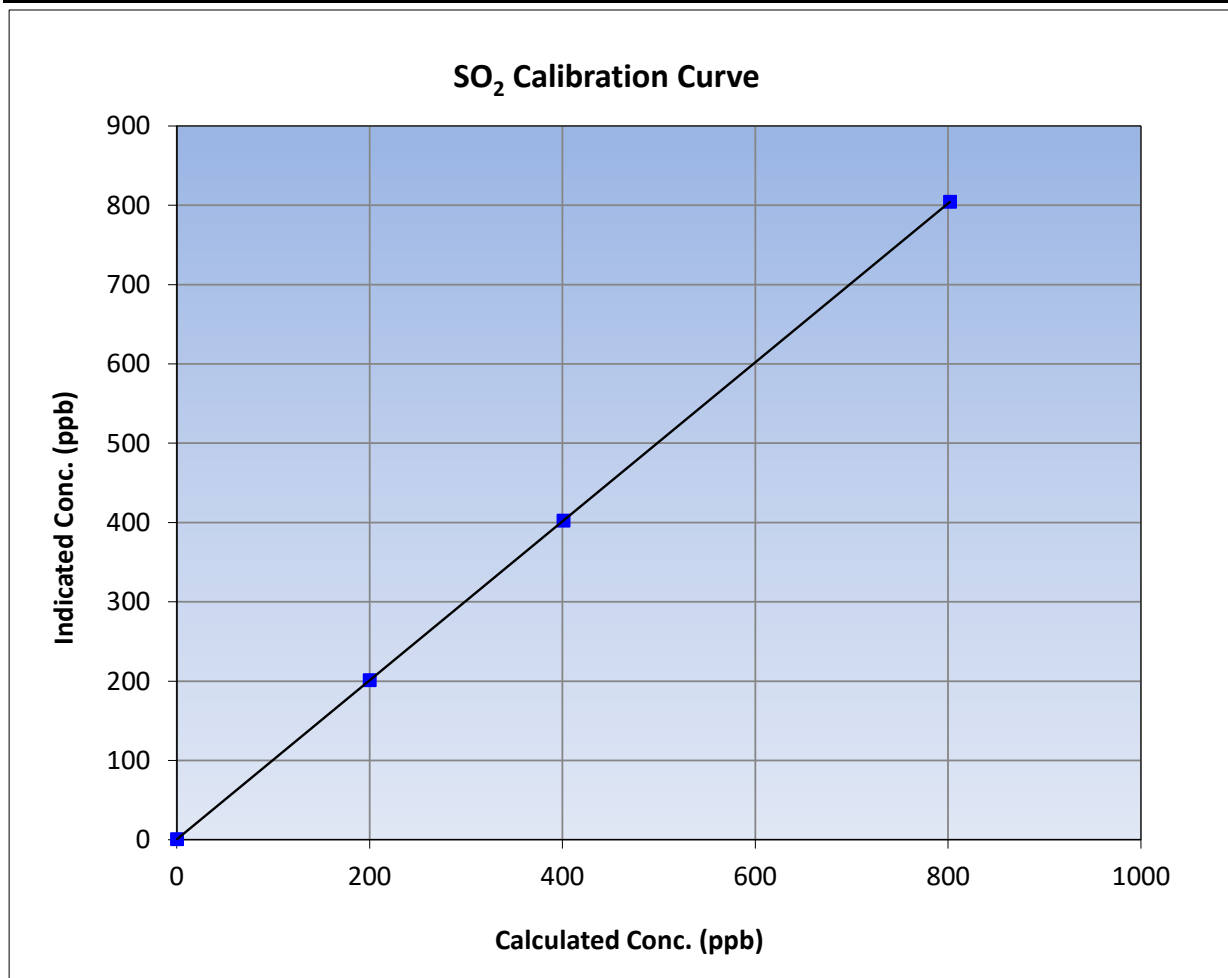
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Barge Landing    | Station Number:       | AMS09            |
| Start Time (MST): | 10:20            | End Time (MST):       | 13:38            |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1118148498       |

### Calibration Data

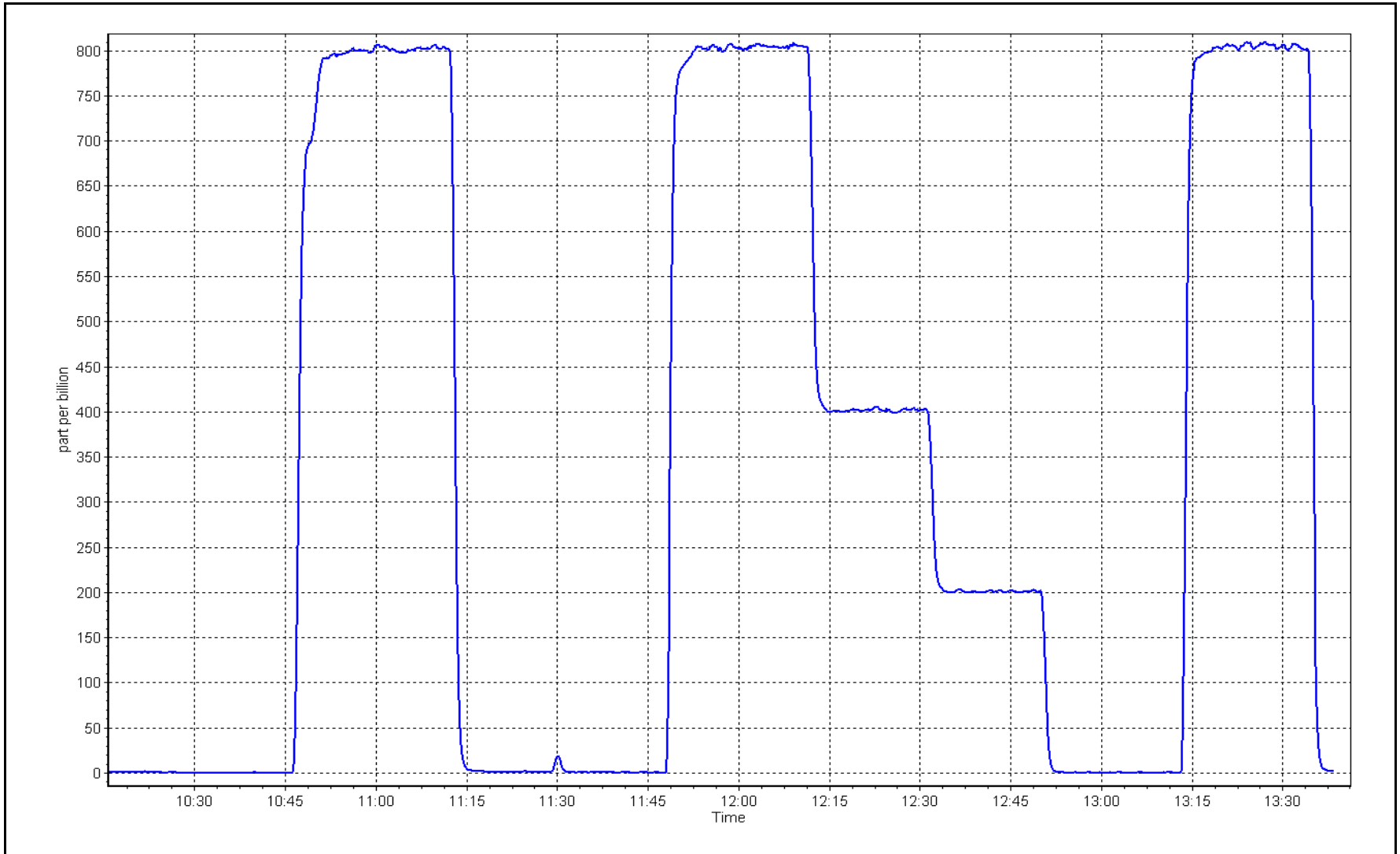
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 1.000000 | ≥0.995      |
| 801.5                               | 804.0                              | 0.9969                    |                         |          |             |
| 400.8                               | 401.9                              | 0.9971                    | Slope                   | 1.002493 | 0.90 - 1.10 |
| 199.8                               | 201.0                              | 0.9942                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.431711 | +/-30       |



SO2 Calibration Plot

Date: February 3, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Barge Landing      Station number: AMS09  
 Calibration Date: February 28, 2023      Last Cal Date: January 23, 2023  
 Start time (MST): 10:44      End time (MST): 19:03  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.87 ppm      Cal Gas Exp Date: September 2, 2024  
 Cal Gas Cylinder #: EY0002346  
 Removed Cal Gas Conc: 4.87 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 3812  
 ZAG Make/Model: API T701      Serial Number: 4888

### Analyzer Information

Analyzer make: Thermo 43i-TLE      Analyzer serial #: 1331259320  
 Converter make: CDN-101      Converter serial #: 519  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.003148     | 1.003148      | Backgd or Offset: 2.52 | 2.65          |
| Calibration intercept: | -0.000990    | -0.000990     | Coeff or Slope: 1.091  | 1.094         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4918                          | 82.1                        | 80.0                                | 79.9                               | 1.002  |
| as found 2nd point    | 4959                          | 41.1                        | 40.0                                | 40.1                               | 1.001  |
| as found 3rd point    | 4979                          | 20.5                        | 20.0                                | 20.1                               | 0.998  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4918                          | 82.1                        | 80.0                                | 80.2                               | 0.997   |
| second point                            | 4959                          | 41.1                        | 40.0                                | 40.2                               | 0.996   |
| third point                             | 4979                          | 20.5                        | 20.0                                | 20.0                               | 0.998   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4918                          | 82.1                        | 80.0                                | 80.4                               | 0.995   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | 28-Feb-23                     |                             |                                     | Ave Corr Factor                    | 0.997   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 79.8 | Prev response:  | 80.21    | *% change:    | -0.5%    |
| Baseline Corr 2nd AF pt: | 40.0 | AF Slope:       | 0.997717 | AF Intercept: | 0.139041 |
| Baseline Corr 3rd AF pt: | 20.0 | AF Correlation: | 0.999999 |               |          |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. Changed scrubber beads after elevated 40ppb cal point. Second scrubber check passed. Adjusted zero and span.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## TRS Calibration Summary

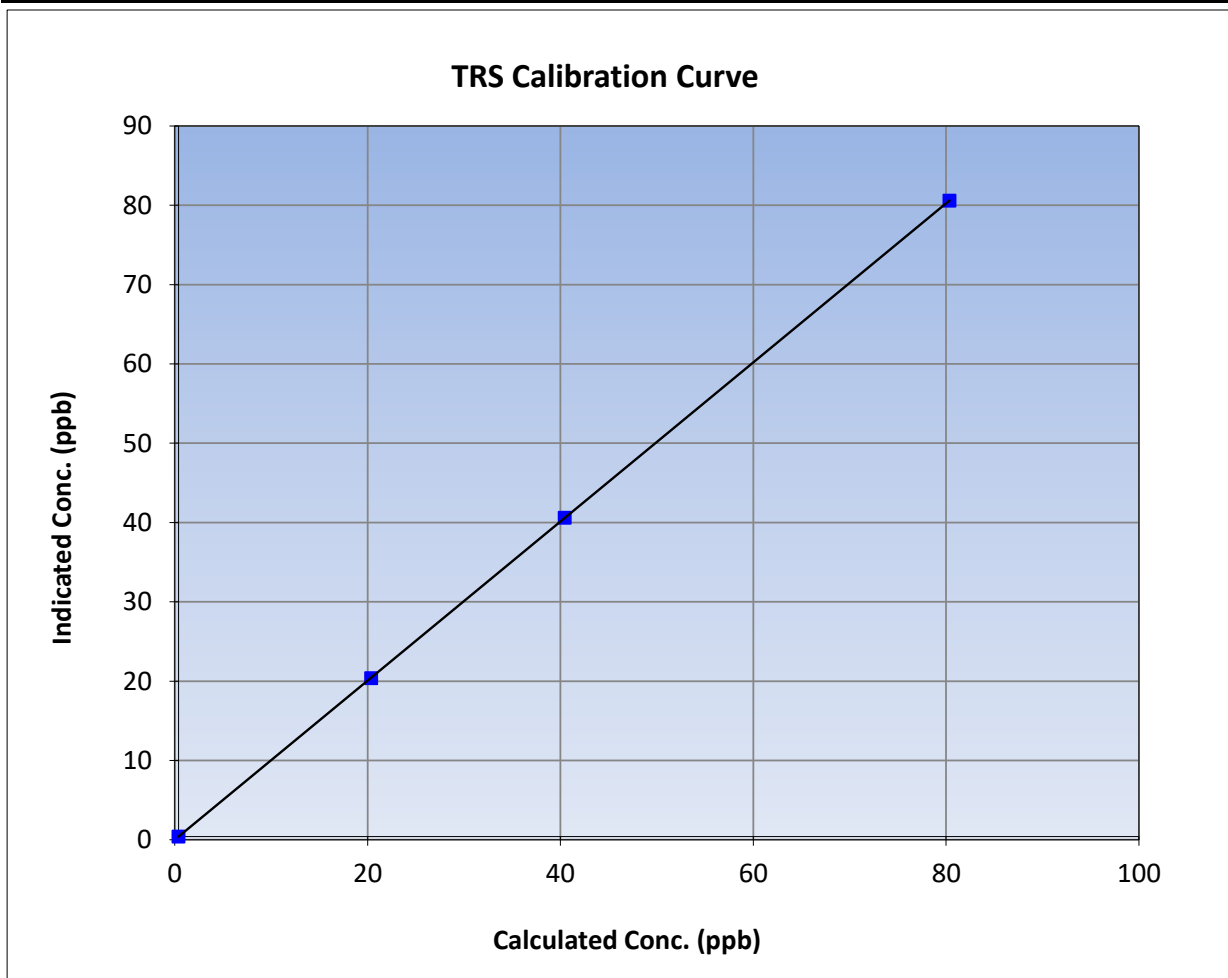
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 28, 2023 | Previous Calibration: | January 23, 2023 |
| Station Name:     | Barge Landing     | Station Number:       | AMS09            |
| Start Time (MST): | 10:44             | End Time (MST):       | 19:03            |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1331259320       |

### Calibration Data

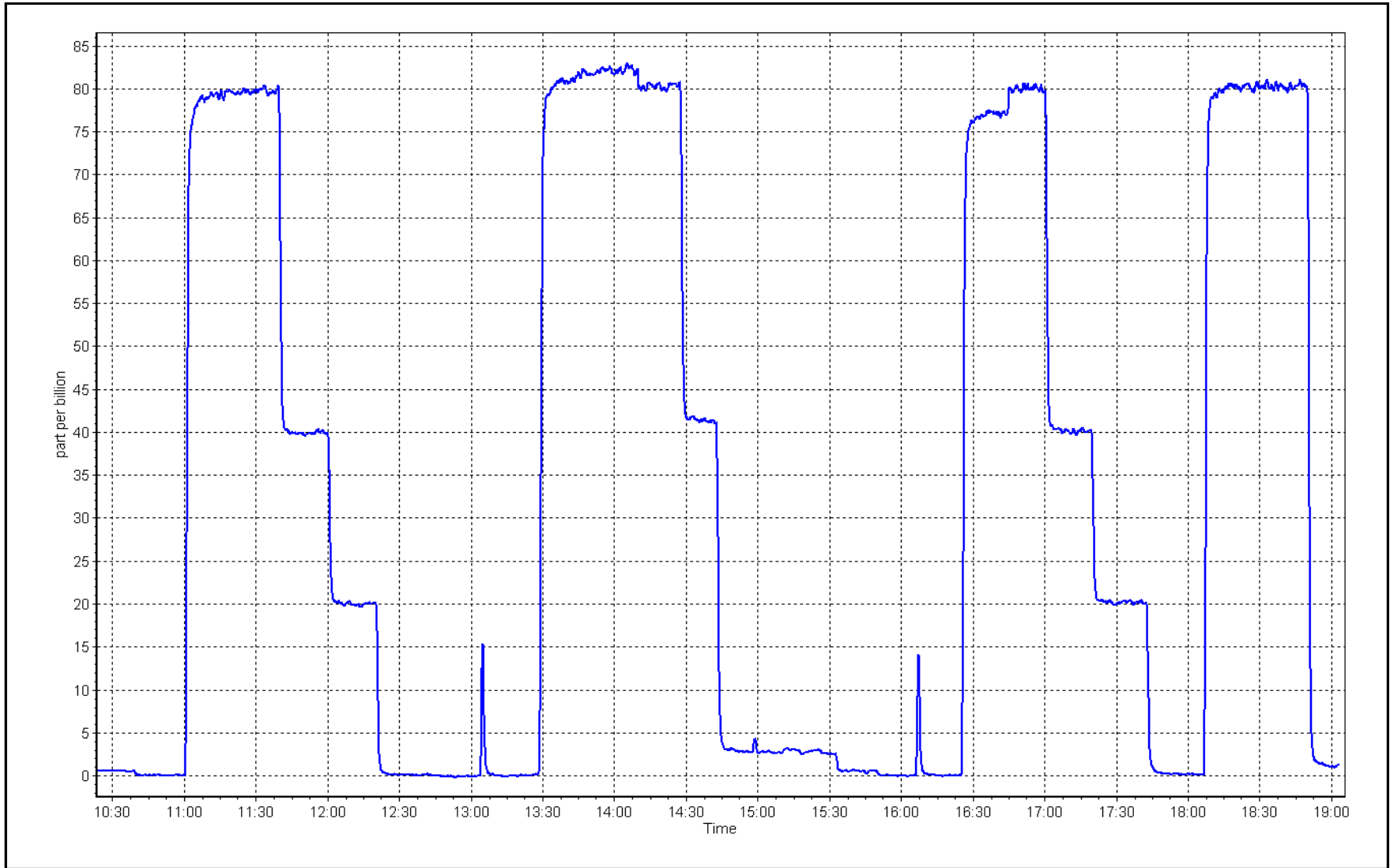
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995      |
| 80.0                                | 80.2                               | 0.9971                    |                         |             |
| 40.0                                | 40.2                               | 0.9958                    | Slope                   | 0.90 - 1.10 |
| 20.0                                | 20.0                               | 0.9984                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-3        |



TRS Calibration Plot

Date: February 28, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Barge Landing    | Station number: | AMS09            |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 13, 2023 |
| Start time (MST): | 10:20            | End time (MST): | 13:38            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC151285  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.6 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | API T700  | Serial Number:              | 3812            |
| ZAG make/model:                             | API T701  | Serial Number:              | 4888            |

### Analyzer Information

|                   |             |                              |            |
|-------------------|-------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i  | Analyzer serial #:           | 1170050131 |
| THC Range (ppm):  | 0 - 100 ppm |                              |            |
| NMHC Range (ppm): | 0 - 50 ppm  | CH <sub>4</sub> Range (ppm): | 0 - 50 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 1.99E-04     | 1.99E-04      | NMHC SP Ratio:  | 4.28E-05      |
| CH <sub>4</sub> Retention time: | 12.2         | 12.2          | NMHC Peak Area: | 213327        |
|                                 |              |               |                 | 213327        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 80.2                 | 17.12                | 17.07               | 1.003                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 80.2                 | 17.12                | 17.13               | 0.999                      |
| second point          | 4960              | 40.1                 | 8.56                 | 8.48                | 1.009                      |
| third point           | 4980              | 20.0                 | 4.27                 | 4.20                | 1.016                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 80.2                 | 17.12                | 17.10               | 1.001                      |

| Average Correction Factor |       |                 |       | 1.008                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.07 | Prev response   | 17.11 | *% change -0.2%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.0  | ----                       |
| as found span             | 4919              | 80.2                 | 9.14                 | 9.08                                       | 1.006                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 80.2                 | 9.14                 | 9.09                                       | 1.005                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.51                                       | 1.013                      |
| third point               | 4980              | 20                   | 2.28                 | 2.22                                       | 1.025                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 9.14                 | 9.07                                       | 1.007                      |
| Average Correction Factor |                   |                      |                      |  | 1.014                      |
| Baseline Corr AF:         | 9.08              | Prev response        | 9.15                 | *% change                                  | -0.8%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 80.2                 | 7.98                 | 7.99                                       | 0.999                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 80.2                 | 7.98                 | 8.04                                       | 0.993                      |
| second point              | 4960              | 40.1                 | 3.99                 | 3.97                                       | 1.006                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.98                                       | 1.005                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 80.2                 | 7.98                 | 8.03                                       | 0.994                      |
| Average Correction Factor |                   |                      |                      |  | 1.001                      |
| Baseline Corr AF:         | 7.99              | Prev response        | 7.95                 | *% change                                  | 0.5%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.002709     | 1.001427      |
| THC Cal Offset:             | -0.059558    | -0.043961     |
| CH <sub>4</sub> Cal Slope:  | 1.000454     | 1.007423      |
| CH <sub>4</sub> Cal Offset: | -0.035549    | -0.020126     |
| NMHC Cal Slope:             | 1.004517     | 0.996127      |
| NMHC Cal Offset:            | -0.024610    | -0.024834     |

Notes: Changed sample inlet filter after as founds. Changed out Nitrogen cylinder. No adjustments made.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## THC Calibration Summary

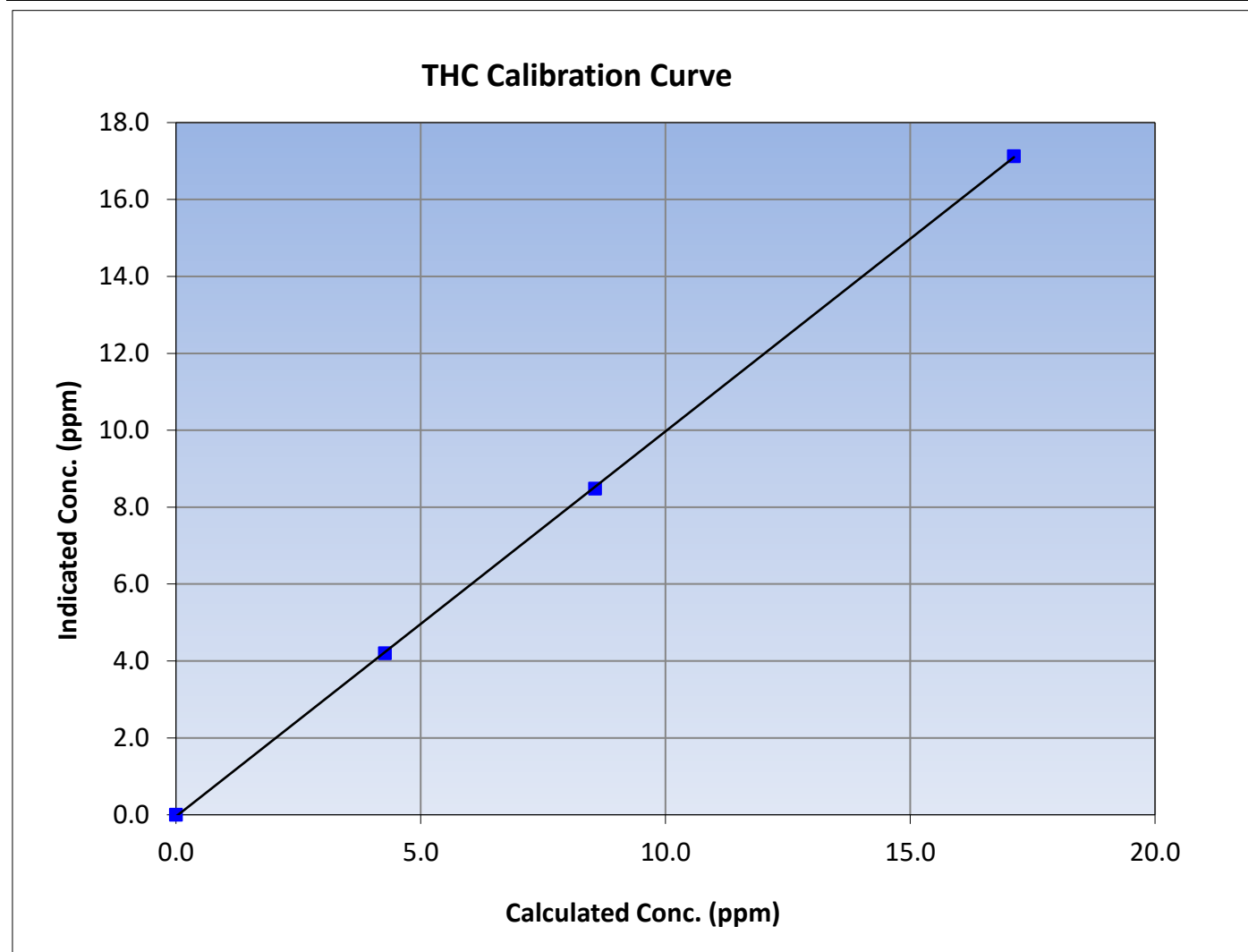
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Barge Landing    | Station Number:       | AMS09            |
| Start Time (MST): | 10:20            | End Time (MST):       | 13:38            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050131       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999964  | $\geq 0.995$  |       |          |             |
| 17.12                               | 17.13                              | 0.9994                    |                         |           |               |       |          |             |
| 8.56                                | 8.48                               | 1.0092                    |                         |           |               | Slope | 1.001427 | 0.90 - 1.10 |
| 4.27                                | 4.20                               | 1.0156                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.043961 | $\pm 0.5$     |       |          |             |







# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

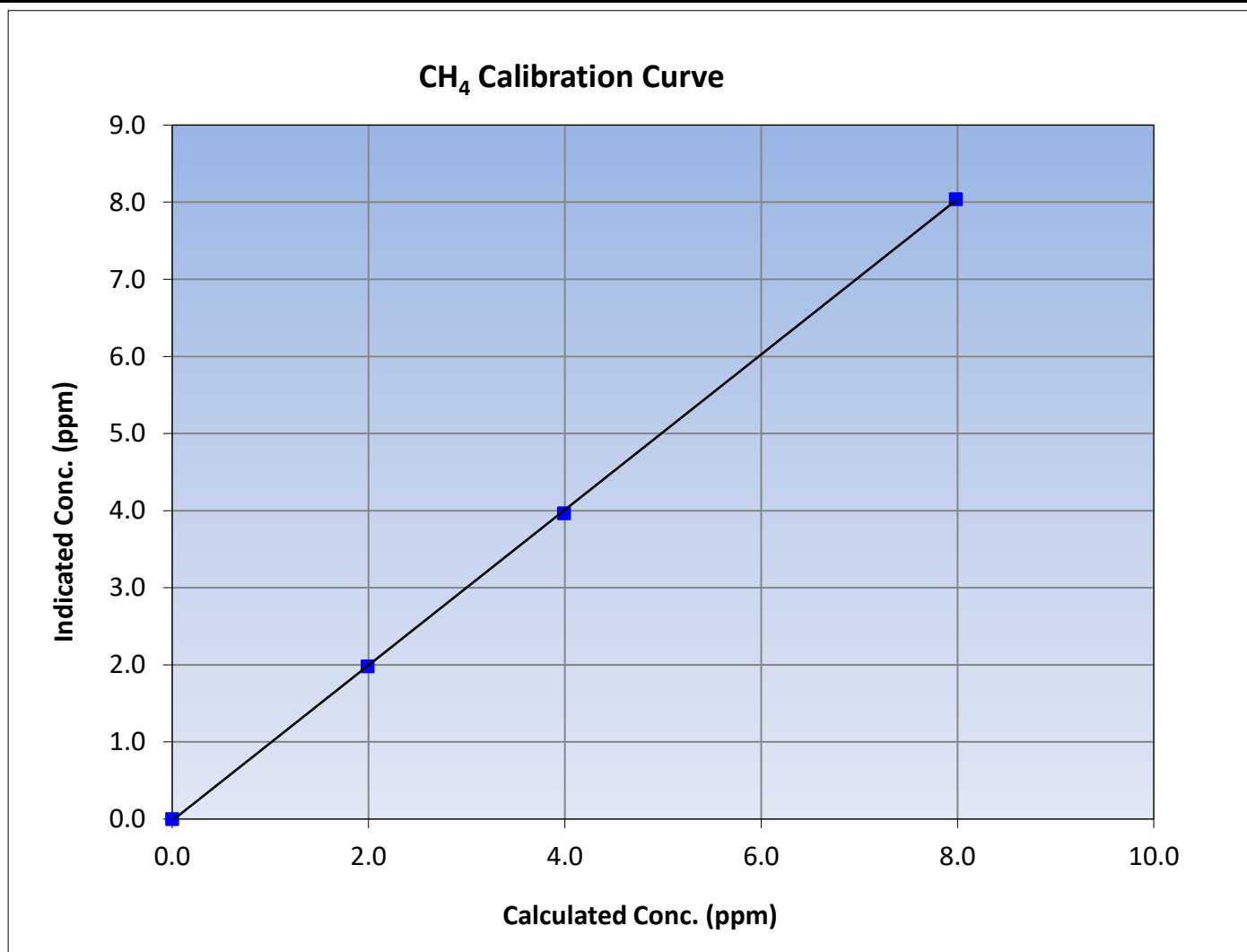
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Barge Landing    | Station Number:       | AMS09            |
| Start Time (MST): | 10:20            | End Time (MST):       | 13:38            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050131       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999946  | $\geq 0.995$  |       |          |             |
| 7.98                                | 8.04                               | 0.9929                    |                         |           |               |       |          |             |
| 3.99                                | 3.97                               | 1.0062                    |                         |           |               | Slope | 1.007423 | 0.90 - 1.10 |
| 1.99                                | 1.98                               | 1.0047                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.020126 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

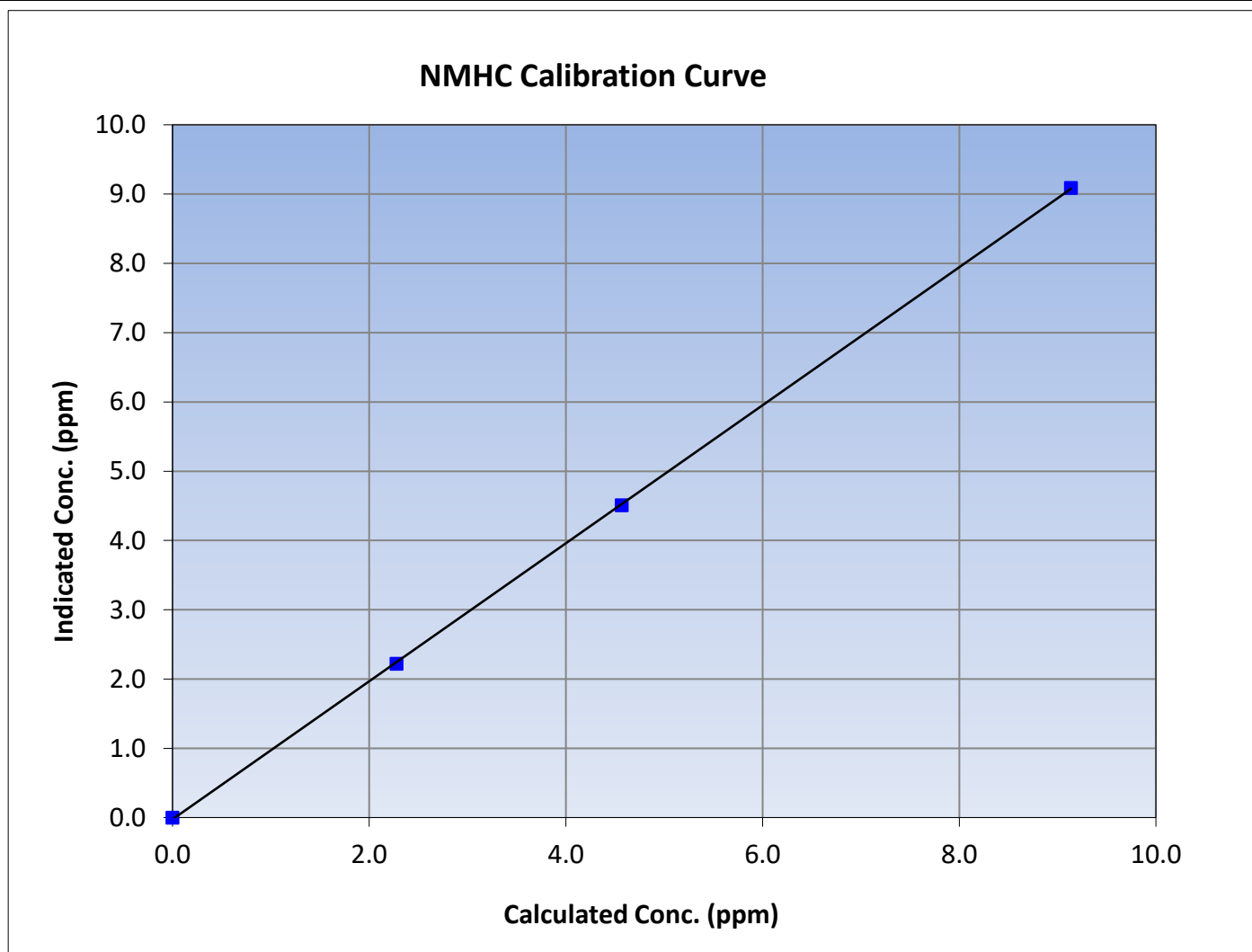
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Barge Landing    | Station Number:       | AMS09            |
| Start Time (MST): | 10:20            | End Time (MST):       | 13:38            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1170050131       |

### Calibration Data

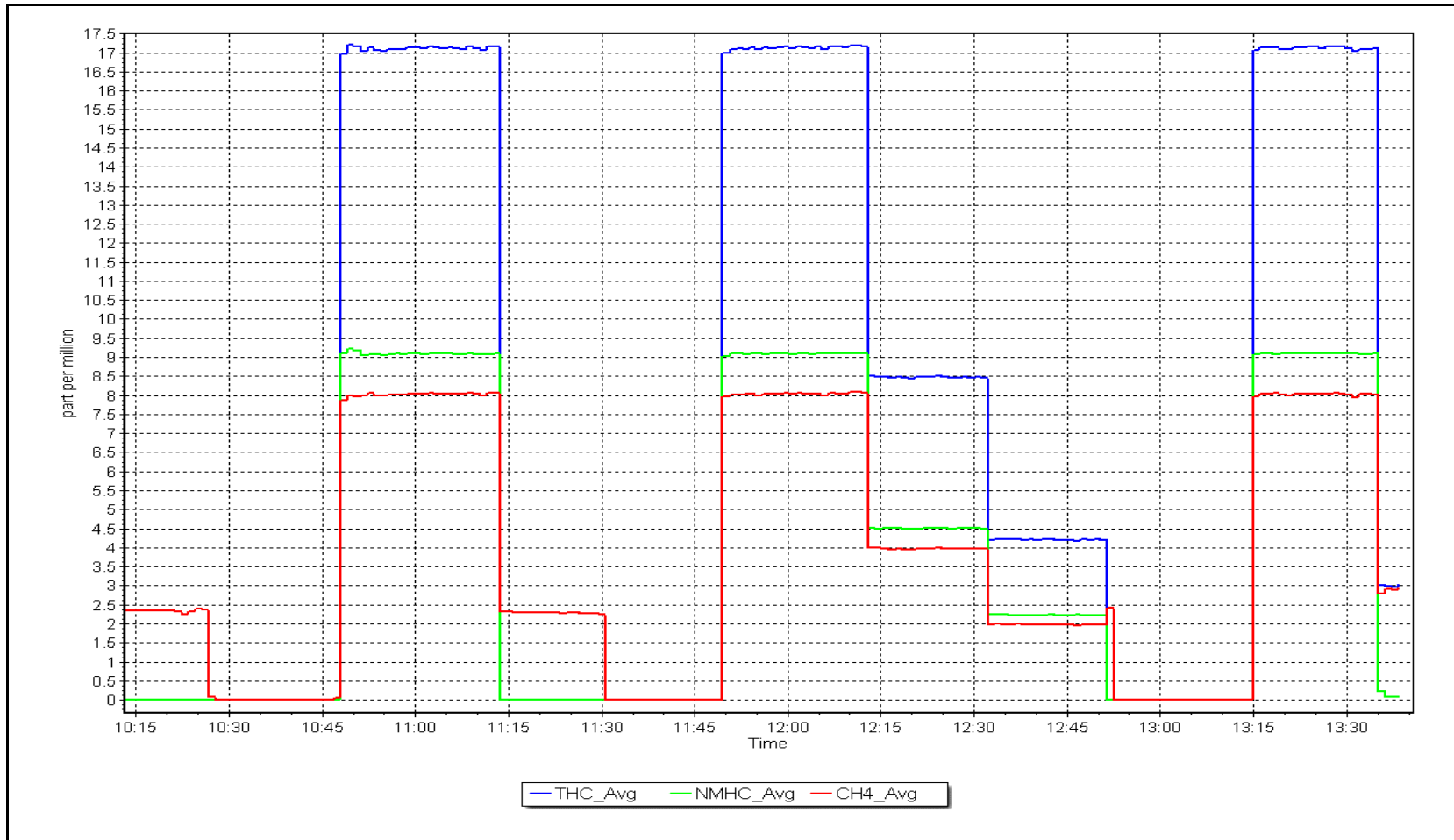
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999966  | $\geq 0.995$  |
| 9.14                                | 9.09                               | 1.0051                    |                         |           |               |
| 4.57                                | 4.51                               | 1.0130                    |                         |           |               |
| 2.28                                | 2.22                               | 1.0252                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.996127  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.024834 | +/-0.5        |



NMHC Calibration Plot

Date: February 3, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Barge Landing     | Station number: | AMS09            |
| Calibration Date: | February 22, 2023 | Last Cal Date:  | January 20, 2023 |
| Start time (MST): | 9:55              | End time (MST): | 14:48            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                       |           |                       |                  |
|-----------------------|-----------|-----------------------|------------------|
| NO Gas Cylinder #:    | DT0036634 | Cal Gas Expiry Date:  | January 28, 2024 |
| NOX Cal Gas Conc:     | 50.00 ppm | NO Cal Gas Conc:      | 49.70 ppm        |
| Removed Cylinder #:   | NA        | Removed Gas Exp Date: | NA               |
| Removed Gas NOX Conc: | 50.00 ppm | Removed Gas NO Conc:  | 49.70 ppm        |
| NOX gas Diff:         |           | NO gas Diff:          |                  |
| Calibrator Model:     | API T700  | Serial Number:        | 3812             |
| ZAG make/model:       | API T701  | Serial Number:        | 4888             |

### Analyzer Information

|                  |              |                    |            |
|------------------|--------------|--------------------|------------|
| Analyzer make:   | Thermo 42i   | Analyzer serial #: | 1426262593 |
| NOX Range (ppb): | 0 - 1000 ppb |                    |            |

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.182        | 1.146         | NO bkgnd or offset:  | 10.6         | 10.3          |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 10.6         | 10.3          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 172.5        | 179.2         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.998369     | 0.998455      |
| NO <sub>x</sub> Cal Offset: | 0.728922     | 0.648644      |
| NO Cal Slope:               | 0.997899     | 1.000928      |
| NO Cal Offset:              | -0.272767    | -0.732611     |
| NO <sub>2</sub> Cal Slope:  | 1.000917     | 1.000063      |
| NO <sub>2</sub> Cal Offset: | 0.473394     | -1.156786     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as found span             | 4919                      | 80.5                        | 805.1   | 800.3                                  | 4.8   | 834.7  | 826.6                                 | 8.2  | 0.965   | 0.968  |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.1                                   | 0.1  | ----  | ----   |
| high point                | 4919                      | 80.5                        | 805.1   | 800.3                                  | 4.8   | 804.3  | 800.7                                 | 3.5  | 1.001   | 0.999  |
| second point              | 4959                      | 40.2                        | 402.1   | 399.7                                  | 2.4   | 402.3  | 398.8                                 | 3.5  | 0.999   | 1.002  |
| third point               | 4979                      | 20.1                        | 201.0   | 199.8                                  | 1.2   | 201.7  | 198.5                                 | 3.2  | 0.997   | 1.007  |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as left span              | 4919                      | 80.5                        | 805.1   | 444.9                                  | 360.2   | 796.7  | 440.0                                 | 356.7  | 1.011   | 1.011  |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.999   | 1.003  |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 834.7 ppb | NO = 826.6 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 3.6% |
| Previous Response    | NO <sub>x</sub> = 804.5 ppb | NO = 798.3 ppb |  | *Percent Change                  | NO = 3.4%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 794.9                                      | 439.5                                 | 360.2   | 359.5  | 1.002  | 99.8%  |
| 2nd GPT point (200 ppb O3)       | 794.9                                      | 662.8                                 | 136.9   | 135.4  | 1.011  | 98.9%  |
| 3rd GPT point (100 ppb O3)       | 794.9                                      | 726.9                                 | 72.8  | 70.4   | 1.035  | 96.7%  |
| Average Correction Factor        |  |                                       |   |  | 1.016  | 98.4%  |

Notes: Changed the inlet filter after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

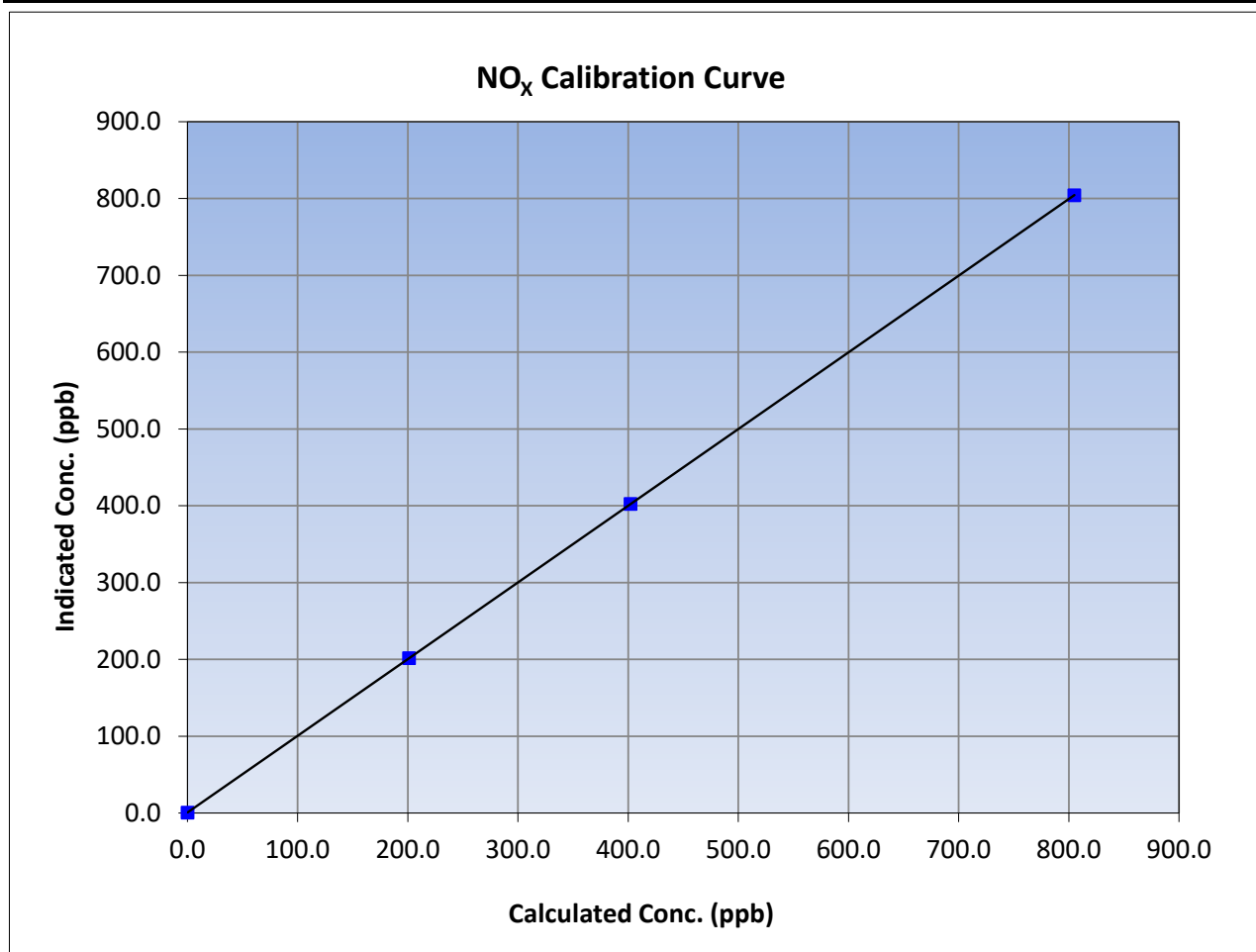
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Barge Landing     | Station Number:       | AMS09            |
| Start Time (MST): | 9:55              | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1426262593       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 805.1                               | 804.3                              | 1.0010                    |                         |               |             |
| 402.1                               | 402.3                              | 0.9994                    |                         |               |             |
| 201.0                               | 201.7                              | 0.9967                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.998455      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.648644      | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

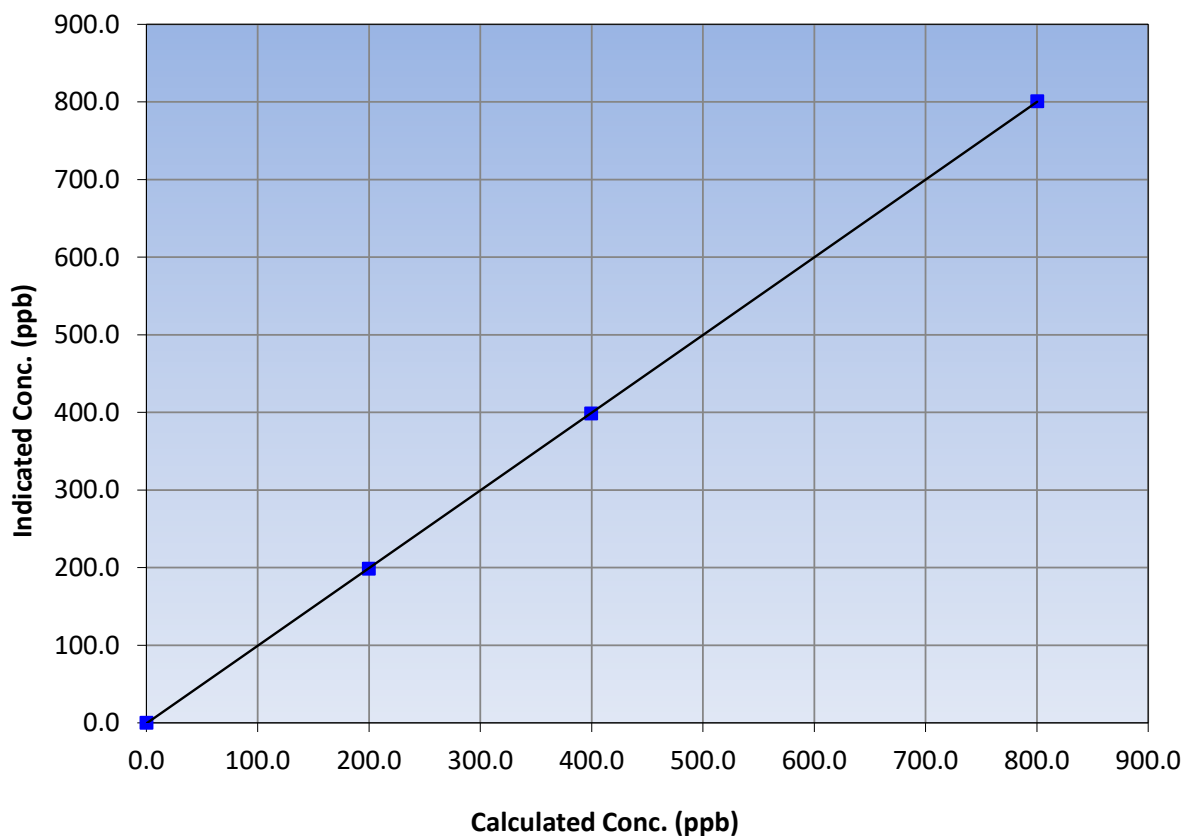
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Barge Landing     | Station Number:       | AMS09            |
| Start Time (MST): | 9:55              | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1426262593       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.3                               | 800.7                              | 0.9994                    |   |                                |
| 399.7                               | 398.8                              | 1.0021                    |   |                                |
| 199.8                               | 198.5                              | 1.0067                    |   |                                |
|                                     |                                    |                           | 0.999995                                      |                                |
|                                     |                                    |                           | 1.000928                                      |                                |
|                                     |                                    |                           | -0.732611                                     |                                |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

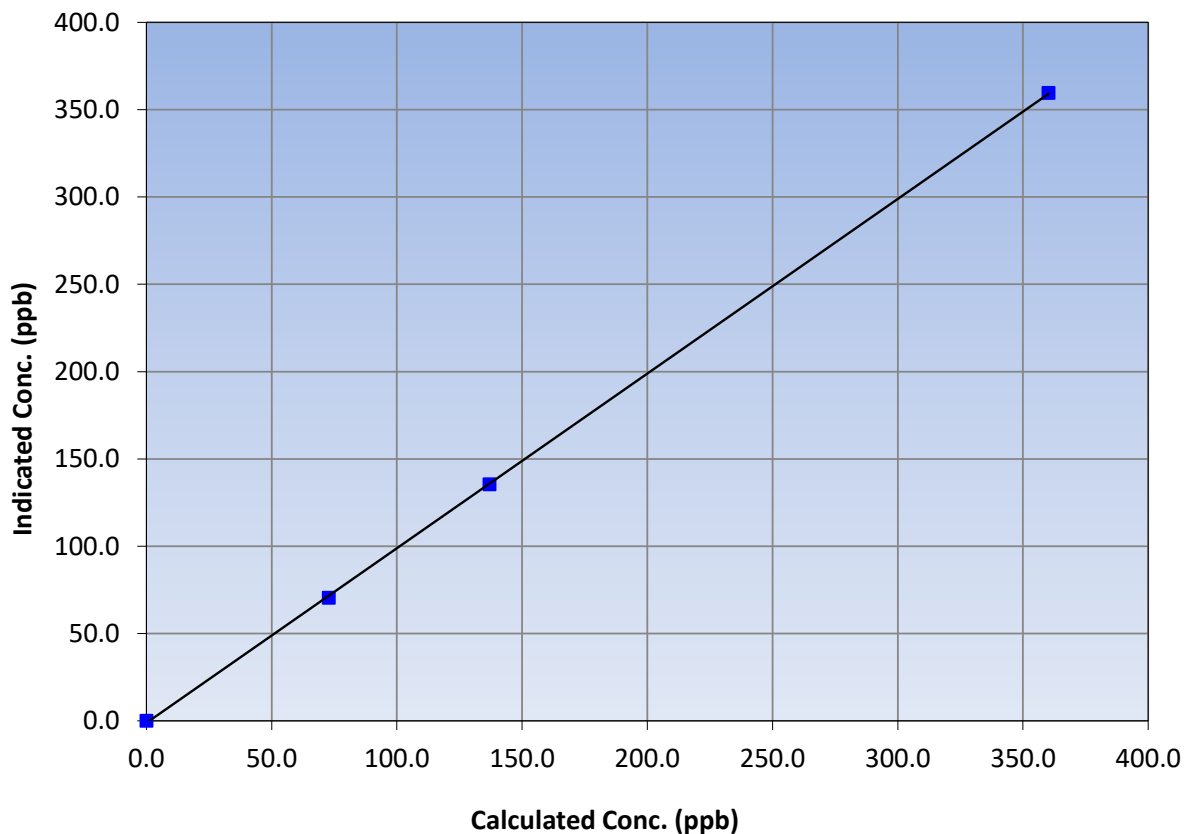
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Barge Landing     | Station Number:       | AMS09            |
| Start Time (MST): | 9:55              | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1426262593       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 360.2                               | 359.5                              | 1.0020                    |   |                                |
| 136.9                               | 135.4                              | 1.0113                    |   |                                |
| 72.8                                | 70.4                               | 1.0345                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO<sub>2</sub> Calibration Curve**

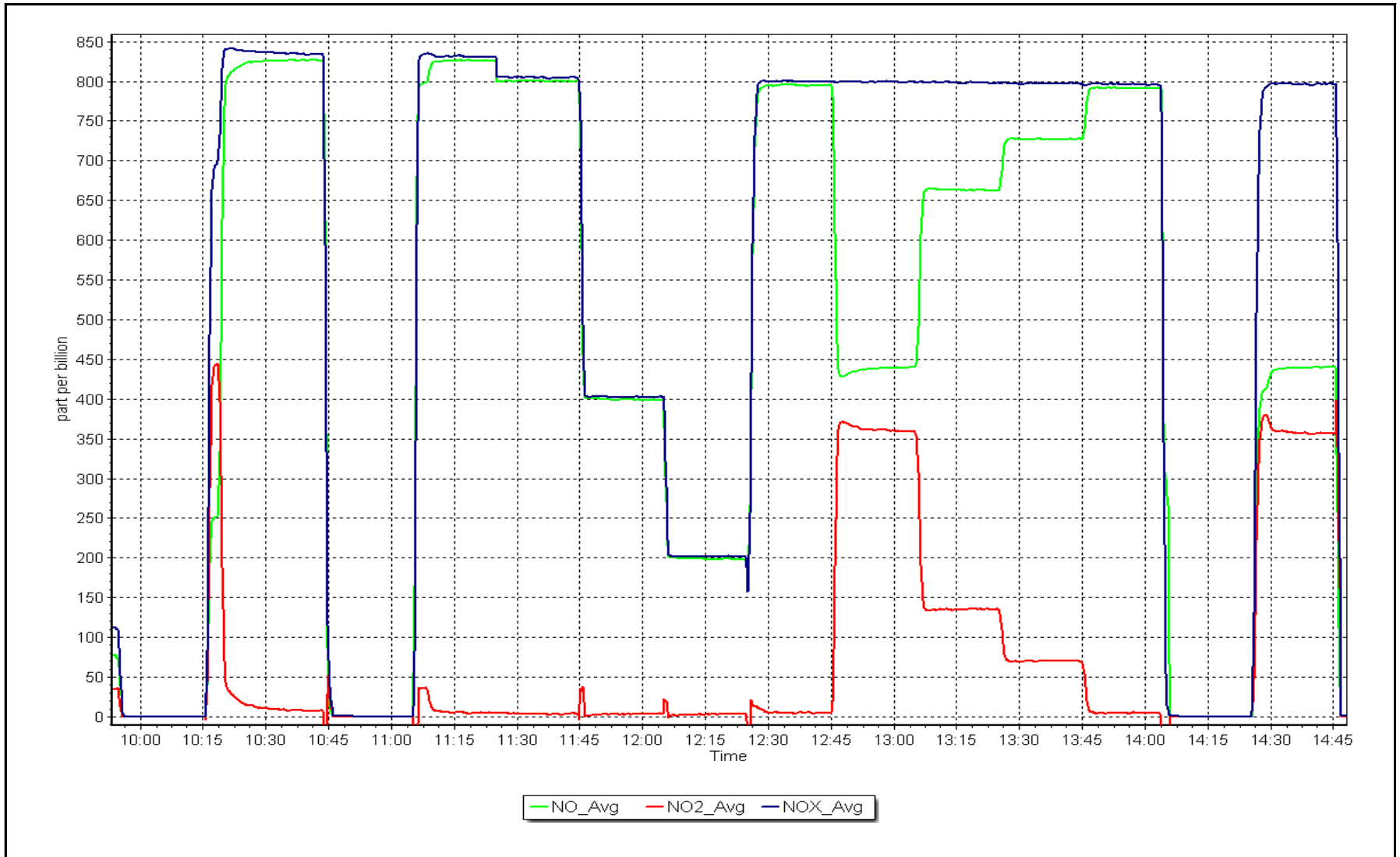




NO<sub>x</sub> Calibration Plot

Date: February 22, 2023

Location: Barge Landing





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Barge Landing Station number: AMS 09  
 Calibration Date: February 28, 2023 Last Cal Date: January 27, 2023  
 Start time (MST): 10:46 End time (MST): 12:56

Analyzer Make: API T640 S/N: 321  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25BT S/N: 388753  
 Temp/RH standard: Alicat FP-25BT S/N: 388753

### Monthly Calibration Test

| Parameter  | As found                                | Measured                               | As left | Adjusted                 | (Limits)     |
|------------|---|--|---------|--------------------------|--------------|
| T (°C)     | -15.7                                   | -16.3                                  | -15.7   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 733.1                                   | 734.6                                  | 733.1   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 4.99                                    | 5.16                                   | 4.99    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>February 28, 2023</u> | Last Cal Date: <u>January 27, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>5.7</u>                 | PM w/ HEPA: <u>0.2</u>                 |         |                          | <0.2 ug/m3   |

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance         | As left             | Adjusted                 | (Limits)     |
|-------------------------------|----------|--------------------------|---------------------|--------------------------|--------------|
| PMT Peak Test                 | 6.0      | 11.0                     | 11.0                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: <u>5.7</u>  | w/ HEPA: <u>0.0</u> |                          |              |
| Date Optical Chamber Cleaned: |          | <u>February 28, 2023</u> |                     |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>February 28, 2023</u> |                     |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: November 15, 2022  
 Date RH/T Sensor Cleaned: November 15, 2022

Notes: Initial leak check failed. PMT test was low before cleaning. Leak check after cleaning passed, PMT peak test passed after cleaning. No adjustments made.

Calibration by: Braiden Boutilier



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS11 LOWER CAMP FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Lower Camp       | Station number: | AMS11            |
| Calibration Date: | February 7, 2023 | Last Cal Date:  | January 20, 2023 |
| Start time (MST): | 9:53             | End time (MST): | 13:19            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                   |
|------------------------|-------------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.25             | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #:    | CC2216            |     |                   |                   |
| Removed Cal Gas Conc:  | 49.25             | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                   |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3807              |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 196               |

### Analyzer Information

Analyzer make: Thermo 43i  
 Analyzer Range 0 - 1000 ppb  
 Analyzer serial #: 100841398

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.996844     | 0.992304      | Backgd or Offset: | 14.2         | 14.3          |
| Calibration intercept: | -0.548951    | -0.508143     | Coeff or Slope:   | 1.051        | 1.051         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4919                          | 81.3                        | 800.8                               | 795.0                              | 1.007   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4919                          | 81.3                        | 800.8                               | 795.1                              | 1.007   |
| second point              | 4959                          | 40.7                        | 400.9                               | 395.0                              | 1.015   |
| third point               | 4980                          | 20.3                        | 199.9                               | 198.5                              | 1.007   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span              | 4919                          | 81.3                        | 800.8                               | 795.7                              | 1.006   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.010   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 794.90 | Previous response | 797.68 | *% change     | -0.3% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter and N2 cylinder after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

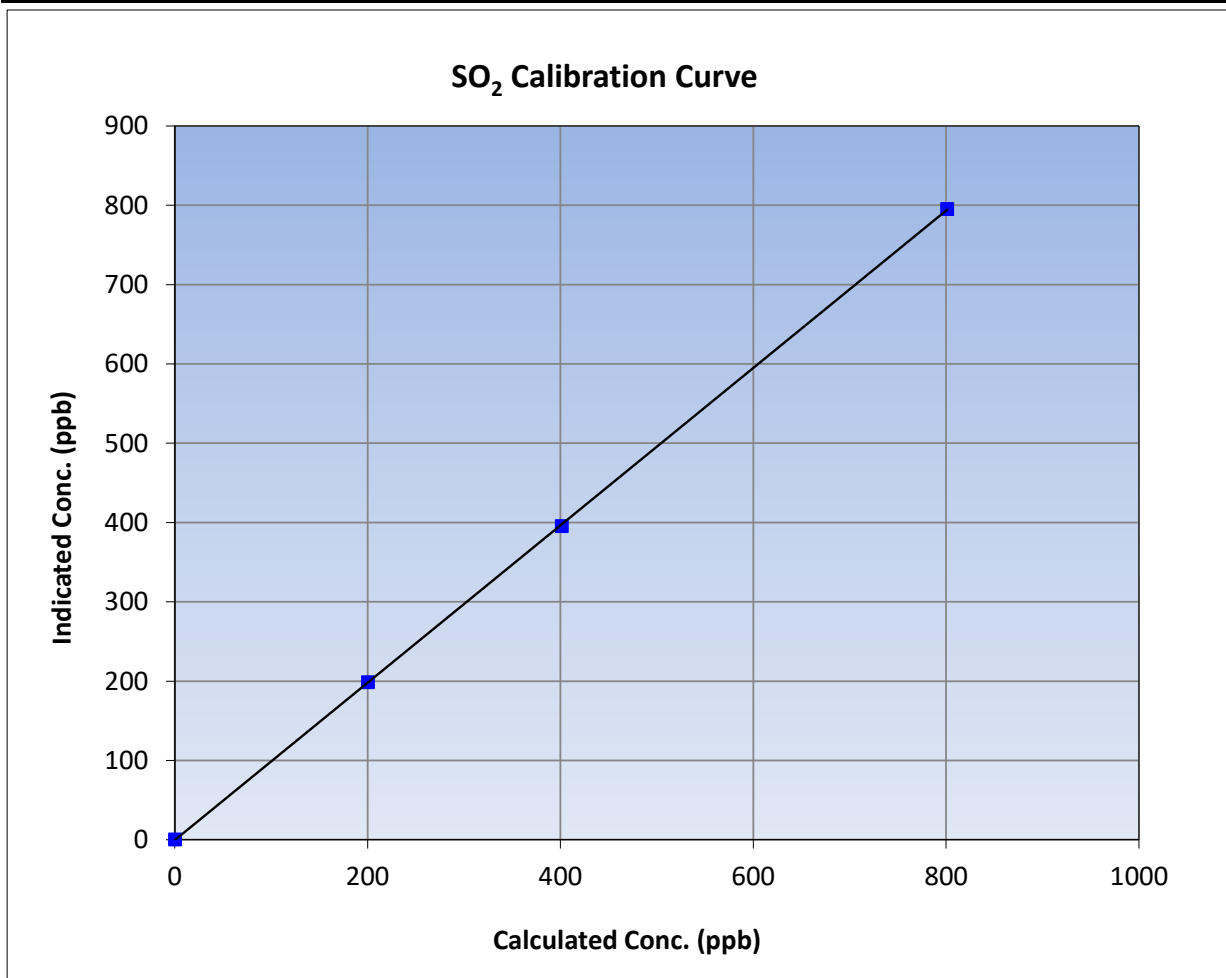
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Lower Camp       | Station Number:       | AMS11            |
| Start Time (MST): | 9:53             | End Time (MST):       | 13:19            |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 100841398        |

### Calibration Data

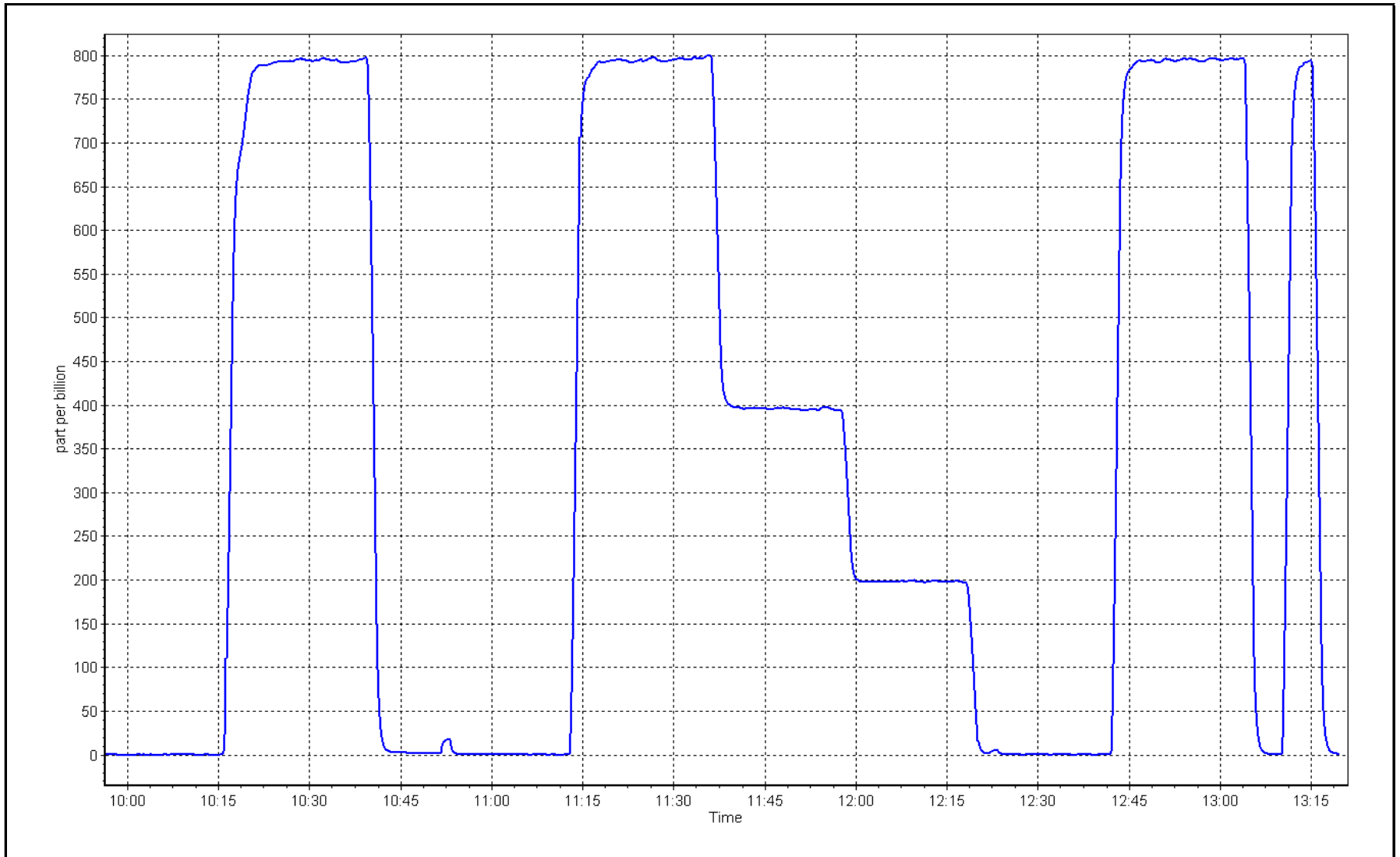
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999979      | ≥0.995      |
| 800.8                                  | 795.1                                 | 1.0071                       |                         |               |             |
| 400.9                                  | 395.0                                 | 1.0150                       | Slope                   | 0.992304      | 0.90 - 1.10 |
| 199.9                                  | 198.5                                 | 1.0073                       |                         |               |             |
|  |                                       |                              | Intercept               | -0.508143     | +/-30       |



SO2 Calibration Plot

Date: February 7, 2023

Location: Lower Camp





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Lower Camp Station number: AMS11  
 Calibration Date: February 8, 2023 Last Cal Date: January 19, 2023  
 Start time (MST): 10:06 End time (MST): 14:47  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.429 ppm Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC501097  
 Removed Cal Gas Conc: 5.429 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 3807  
 ZAG Make/Model: API T701H Serial Number: 196

### Analyzer Information

Analyzer make: Thermo 450iQ Analyzer serial #: CM20080003  
 Converter make: NA Converter serial #: NA  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.000040     | 0.997193      | Backgd or Offset: 13.9 | 14.0          |
| Calibration intercept: | 0.055163     | 0.454865      | Coeff or Slope: 1.043  | 1.043         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4926                          | 73.6                        | 79.9                                | 80.1                               | 1.000  |
| as found 2nd point    | 4963                          | 36.8                        | 40.0                                | 39.9                               | 1.007  |
| as found 3rd point    | 4982                          | 18.6                        | 20.2                                | 19.9                               | 1.025  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4926                          | 73.6                        | 79.9                                | 79.9                               | 1.000   |
| second point                            | 4963                          | 36.8                        | 40.0                                | 40.7                               | 0.982   |
| third point                             | 4982                          | 18.6                        | 20.2                                | 20.8                               | 0.971   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.8                                | ----  |
| as left span                            | 4926                          | 73.6                        | 79.9                                | 80.4                               | 0.994   |
| SO2 Scrubber Check                      | 4919                          | 81.1                        | 811.0                               | 0.4                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.984   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 79.9 Prev response: 79.98 \*% change: -0.1%  
 Baseline Corr 2nd AF pt: 39.7 AF Slope: 1.001457 AF Intercept: -0.044467  
 Baseline Corr 3rd AF pt: 19.7 AF Correlation: 0.999956

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. Completed a SO2 scrubber check after calibrator zero. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

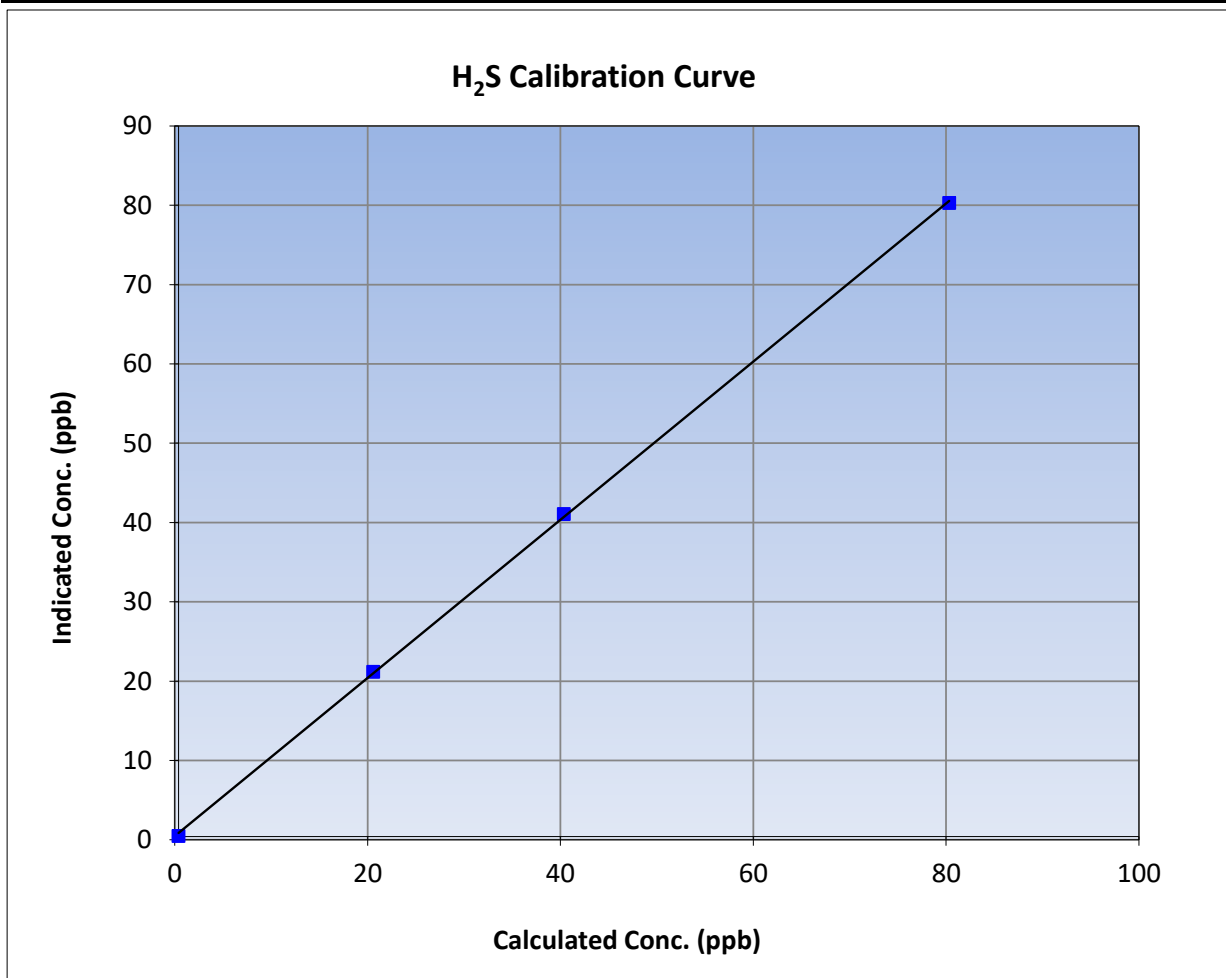
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Lower Camp       | Station Number:       | AMS11            |
| Start Time (MST): | 10:06            | End Time (MST):       | 14:47            |
| Analyzer make:    | Thermo 450iQ     | Analyzer serial #:    | CM20080003       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999887 | ≥0.995      |
| 79.9                                | 79.9                               | 1.0003                    |                         |          |             |
| 40.0                                | 40.7                               | 0.9818                    | Slope                   | 0.997193 | 0.90 - 1.10 |
| 20.2                                | 20.8                               | 0.9708                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.454865 | +/-3        |

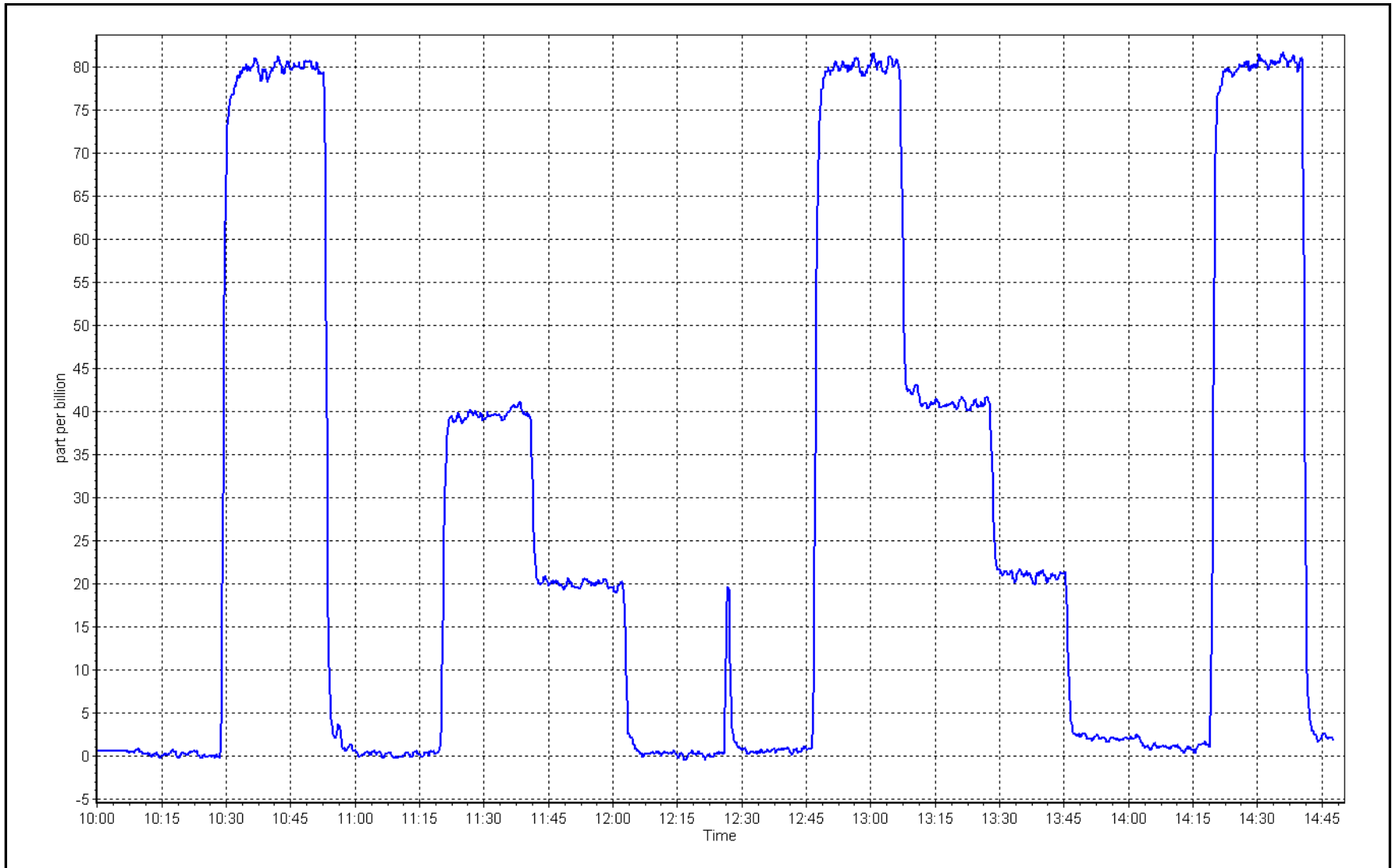




H<sub>2</sub>S Calibration Plot

Date: February 8, 2023

Location: Lower Camp





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Lower Camp       | Station number: | AMS11            |
| Calibration Date: | February 7, 2023 | Last Cal Date:  | January 20, 2023 |
| Start time (MST): | 9:53             | End time (MST): | 13:19            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC2216    | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 502.0 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.5 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 502.0 ppm | CH <sub>4</sub> Equiv Conc. | 1067.1 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.5 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3807              |
| ZAG make/model:                             | API T701  | Serial Number:              | 196               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1505164381 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.09E-04     | 3.09E-04      | NMHC SP Ratio:  | 5.97E-05      |
| CH <sub>4</sub> Retention time: | 14.0         | 14.0          | NMHC Peak Area: | 153551        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 81.3                 | 17.35                | 17.40               | 0.997                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 81.3                 | 17.35                | 17.44               | 0.995                      |
| second point          | 4959              | 40.7                 | 8.69                 | 8.67                | 1.003                      |
| third point           | 4980              | 20.3                 | 4.33                 | 4.33                | 1.001                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 81.3                 | 17.35                | 17.49               | 0.992                      |

| Average Correction Factor |       |                 |       | 1.000                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.40 | Prev response   | 17.40 | *% change 0.0%                             |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.3                 | 9.19                 | 9.18                                       | 1.001                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.3                 | 9.19                 | 9.20                                       | 0.999                      |
| second point              | 4959              | 40.7                 | 4.60                 | 4.58                                       | 1.004                      |
| third point               | 4980              | 20.3                 | 2.29                 | 2.29                                       | 1.001                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81.3                 | 9.19                 | 9.25                                       | 0.994                      |
| Average Correction Factor |                   |                      |                      |  | 1.002                      |
| Baseline Corr AF:         | 9.18              | Prev response        | 9.19                 | *% change                                  | -0.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.3                 | 8.16                 | 8.23                                       | 0.992                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.3                 | 8.16                 | 8.23                                       | 0.992                      |
| second point              | 4959              | 40.7                 | 4.09                 | 4.09                                       | 1.000                      |
| third point               | 4980              | 20.3                 | 2.04                 | 2.04                                       | 1.000                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81.3                 | 8.16                 | 8.24                                       | 0.990                      |
| Average Correction Factor |                   |                      |                      |  | 0.997                      |
| Baseline Corr AF:         | 8.23              | Prev response        | 8.21                 | *% change                                  | 0.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.004292     | 1.004951      |
| THC Cal Offset:             | -0.024989    | -0.022988     |
| CH <sub>4</sub> Cal Slope:  | 1.007657     | 1.008833      |
| CH <sub>4</sub> Cal Offset: | -0.016486    | -0.014688     |
| NMHC Cal Slope:             | 1.001092     | 1.001278      |
| NMHC Cal Offset:            | -0.007903    | -0.007900     |

Notes: Changed sample inlet filter and N2 cylinder after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## THC Calibration Summary

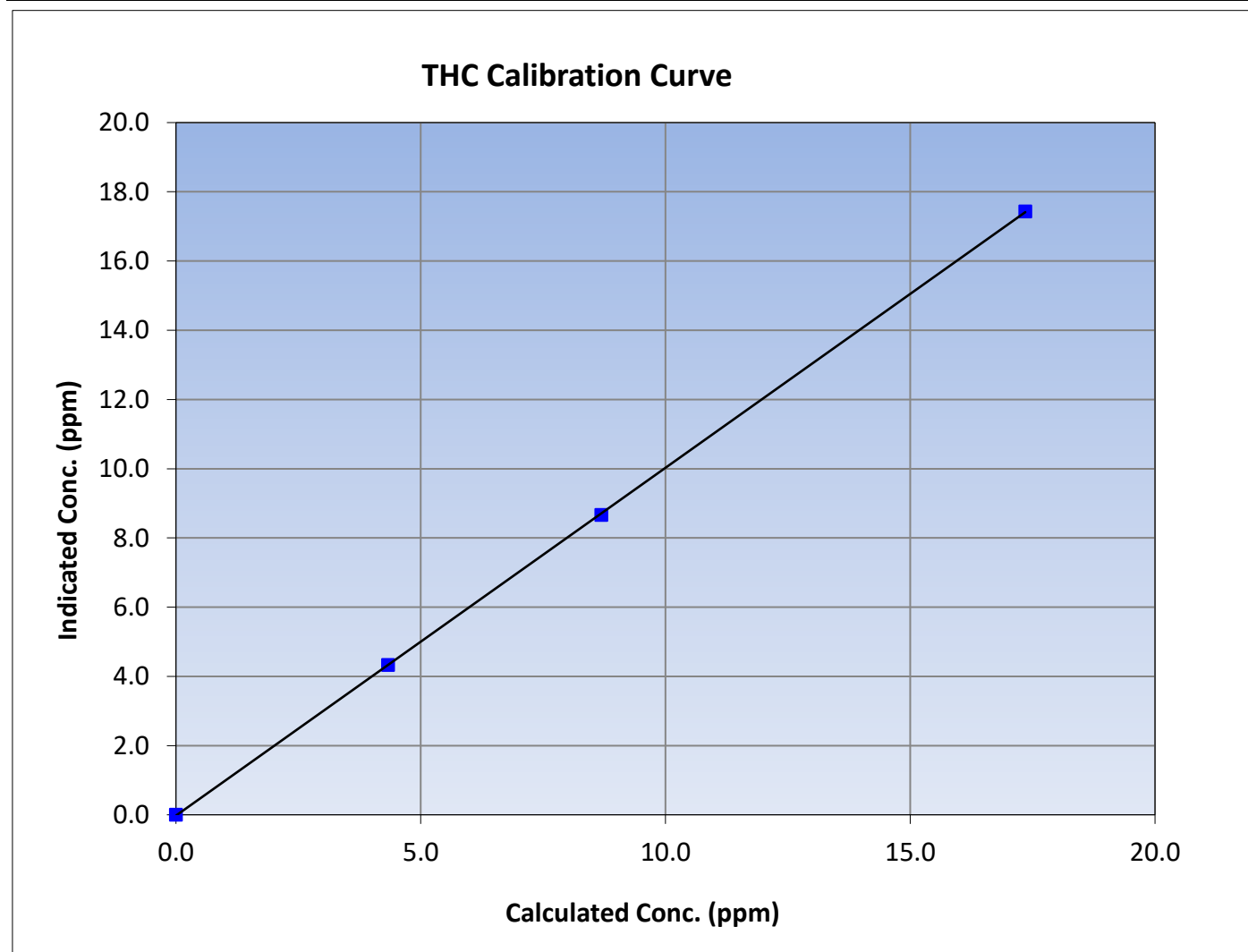
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Lower Camp       | Station Number:       | AMS11            |
| Start Time (MST): | 9:53             | End Time (MST):       | 13:19            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1505164381       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999983  | $\geq 0.995$  |       |          |             |
| 17.35                               | 17.44                              | 0.9951                    |                         |           |               |       |          |             |
| 8.69                                | 8.67                               | 1.0025                    |                         |           |               | Slope | 1.004951 | 0.90 - 1.10 |
| 4.33                                | 4.33                               | 1.0010                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.022988 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

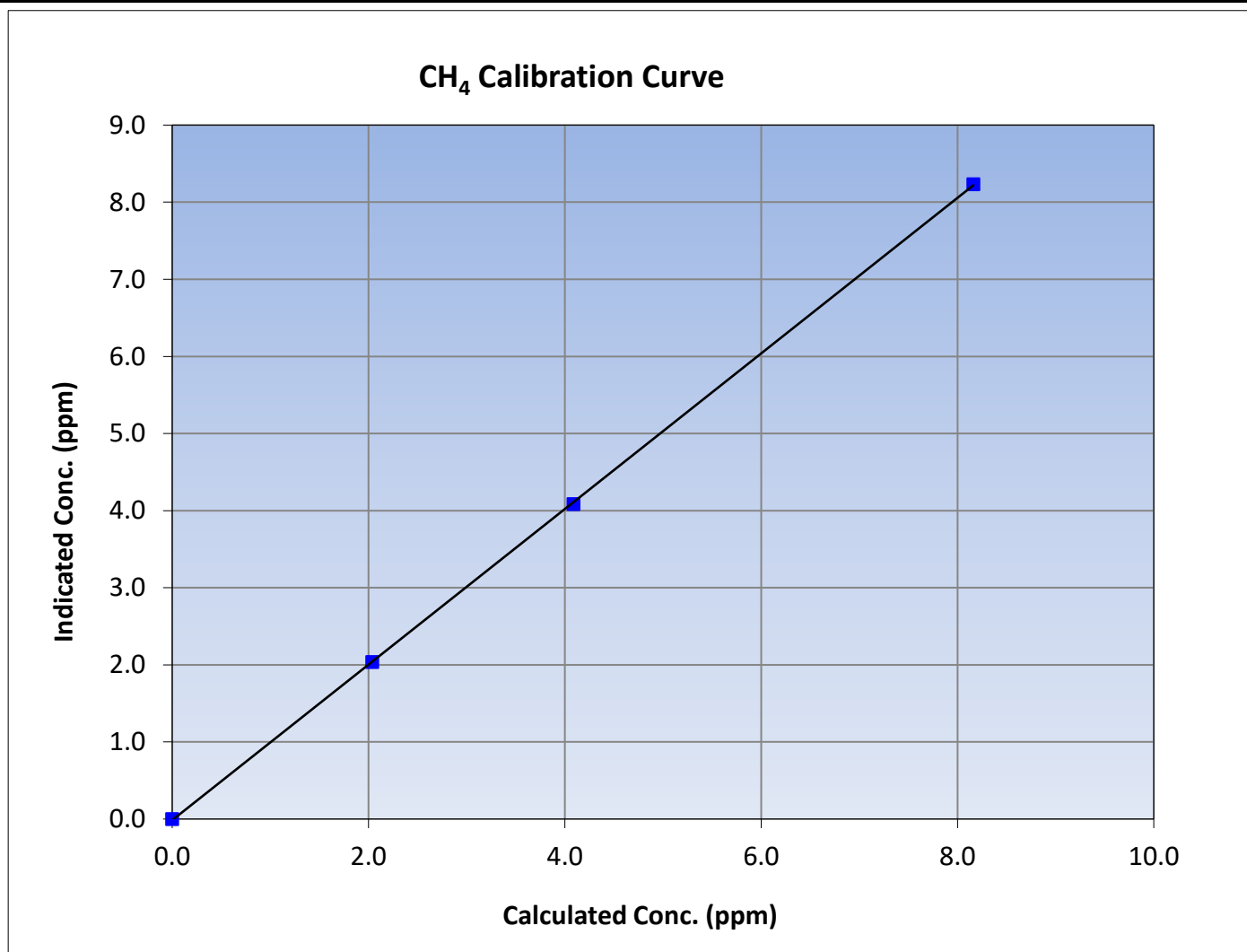
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Lower Camp       | Station Number:       | AMS11            |
| Start Time (MST): | 9:53             | End Time (MST):       | 13:19            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1505164381       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999975  | ≥0.995        |       |          |             |
| 8.16                                | 8.23                               | 0.9915                    |                         |           |               |       |          |             |
| 4.09                                | 4.09                               | 1.0004                    |                         |           |               | Slope | 1.008833 | 0.90 - 1.10 |
| 2.04                                | 2.04                               | 1.0005                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.014688 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

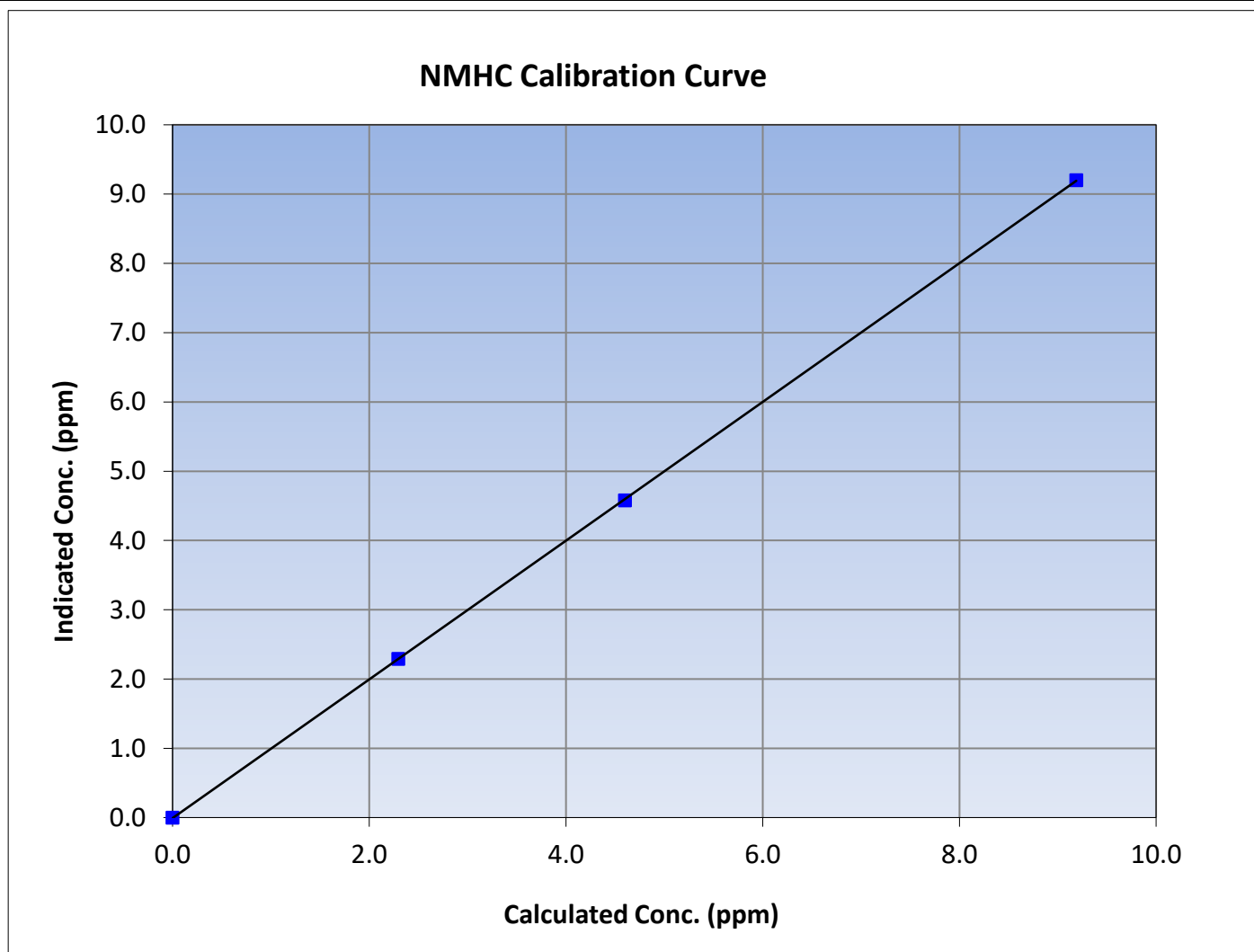
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Lower Camp       | Station Number:       | AMS11            |
| Start Time (MST): | 9:53             | End Time (MST):       | 13:19            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1505164381       |

### Calibration Data

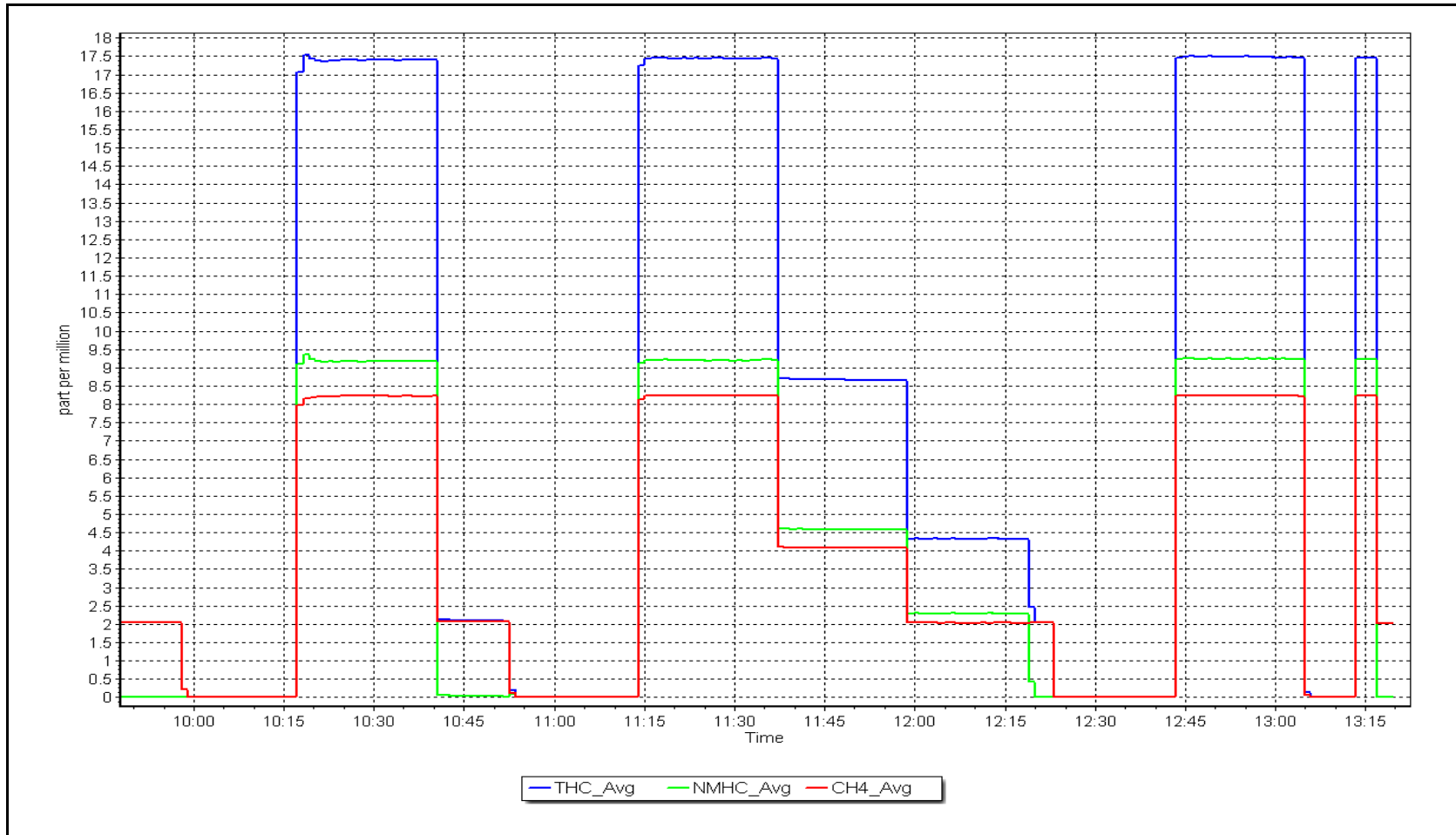
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999990  | $\geq 0.995$  |       |          |             |
| 9.19                                | 9.20                               | 0.9986                    |                         |           |               |       |          |             |
| 4.60                                | 4.58                               | 1.0045                    |                         |           |               | Slope | 1.001278 | 0.90 - 1.10 |
| 2.29                                | 2.29                               | 1.0014                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.007900 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 7, 2023

Location: Lower Camp





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS13 FORT MCKAY SOUTH FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort McKay South | Station number: | AMS13            |
| Calibration Date: | February 2, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 9:48             | End time (MST): | 12:50            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |          |     |                   |                   |
|------------------------|----------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 50.55    | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #:    | CC260812 |     |                   |                   |
| Removed Cal Gas Conc:  | 50.55    | ppm | Rem Gas Exp Date: | N/A               |
| Removed Gas Cyl #:     | N/A      |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 2448              |
| ZAG Make/Model:        | API 701  |     | Serial Number:    | 1117              |

### Analyzer Information

|                |              |                    |     |
|----------------|--------------|--------------------|-----|
| Analyzer make: | API T100     | Analyzer serial #: | 599 |
| Analyzer Range | 0 - 1000 ppb |                    |     |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.003886     | 1.001413      | Backgd or Offset: | 79.7         | 77.5          |
| Calibration intercept: | -3.178199    | -2.738219     | Coeff or Slope:   | 0.733        | 0.735         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | -0.9                               | ----  |
| as found span             | 4921                          | 79.1                        | 799.7                               | 796.3                              | 1.004   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                | 4921                          | 79.1                        | 799.7                               | 799.4                              | 1.000   |
| second point              | 4961                          | 39.5                        | 399.3                               | 396.0                              | 1.008   |
| third point               | 4980                          | 19.8                        | 200.2                               | 194.7                              | 1.028   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span              | 4921                          | 79.1                        | 799.7                               | 798.9                              | 1.001   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.012   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 797.20 | Previous response | 799.61 | *% change     | -0.3% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. Adjusted zero and span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

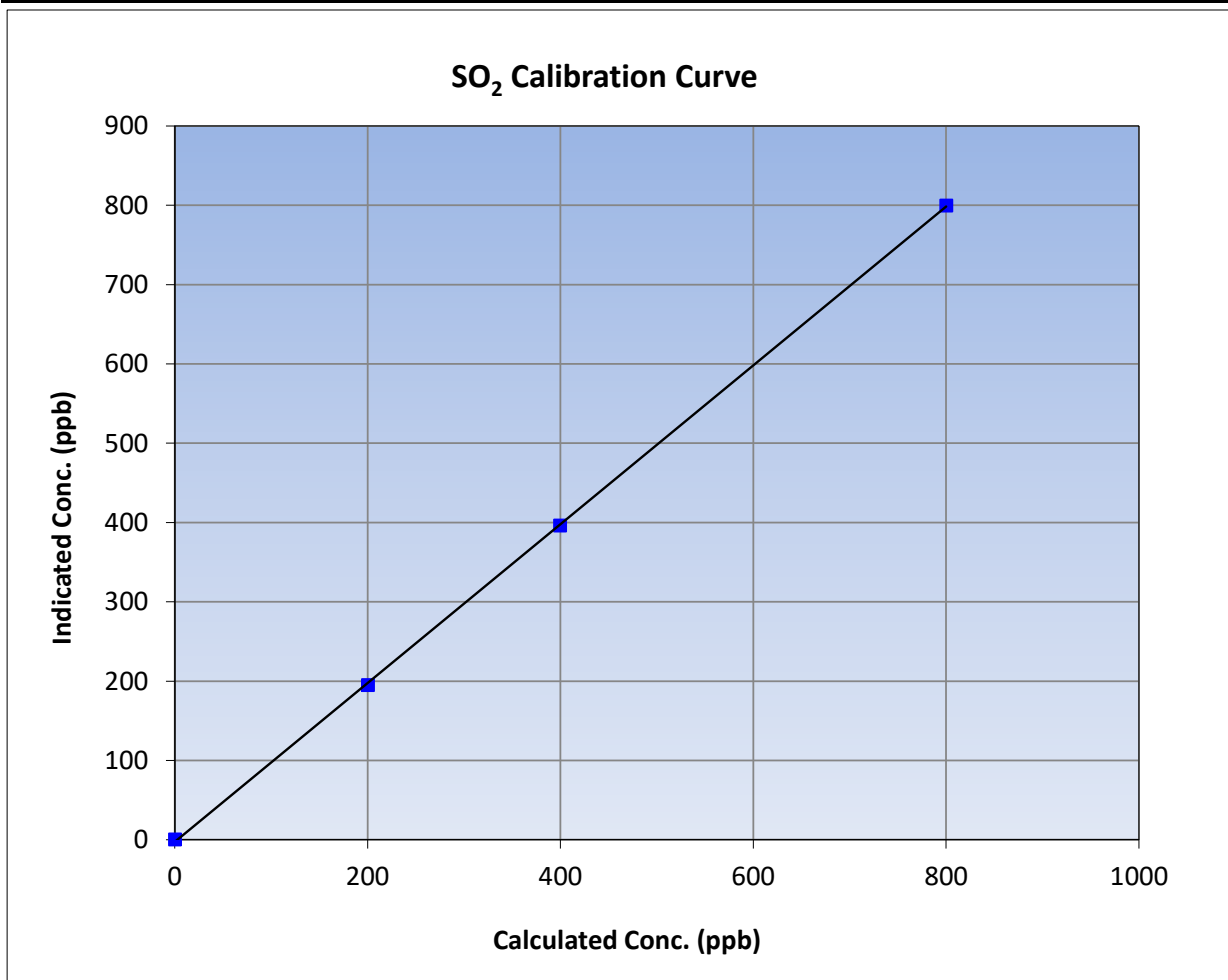
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:48             | End Time (MST):       | 12:50            |
| Analyzer make:    | API T100         | Analyzer serial #:    | 599              |

### Calibration Data

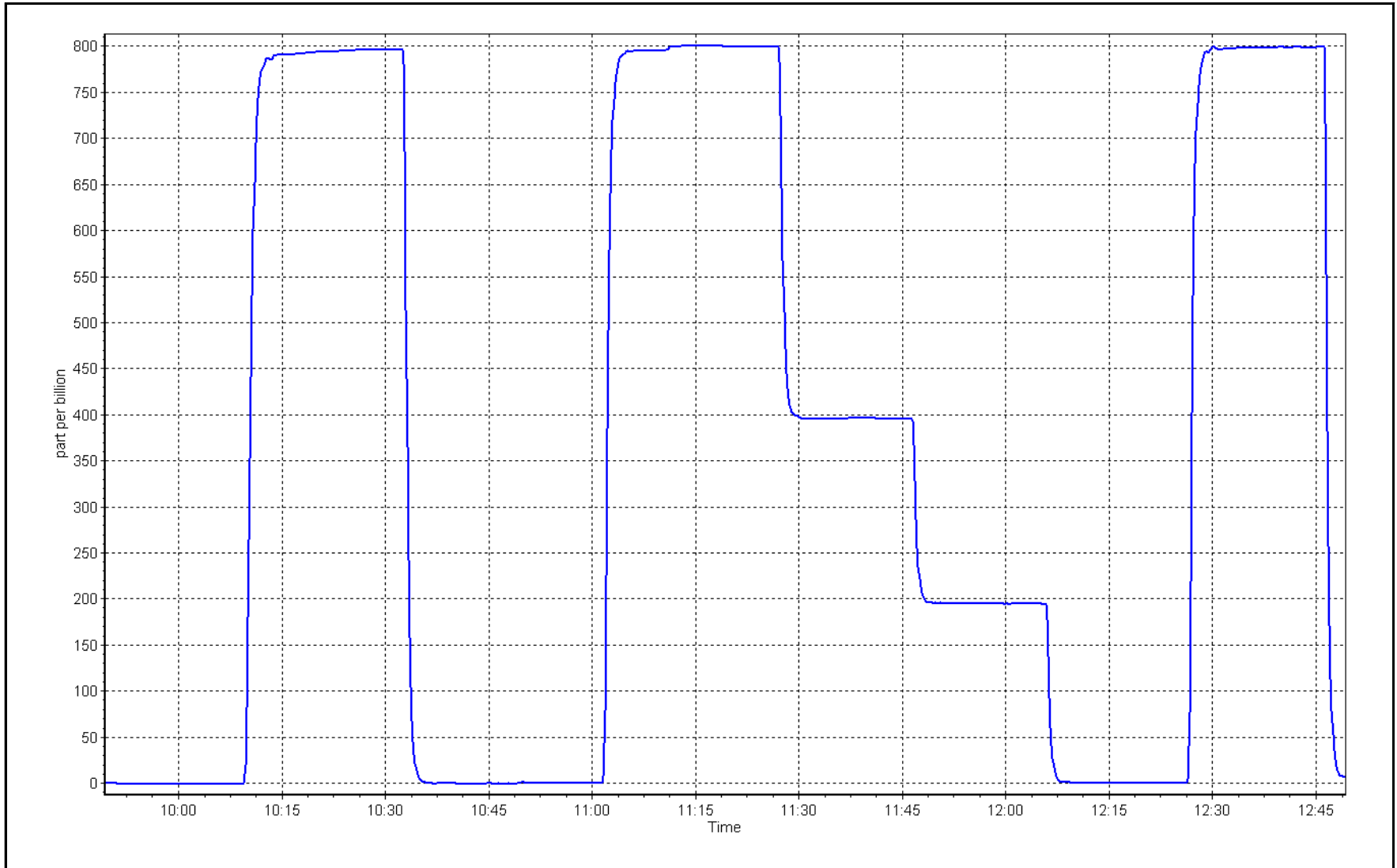
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999942  |             |
| 799.7                               | 799.4                              | 1.0004                    |                         |           | ≥0.995      |
| 399.3                               | 396.0                              | 1.0083                    | Slope                   | 1.001413  |             |
| 200.2                               | 194.7                              | 1.0282                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.738219 | +/-30       |



SO2 Calibration Plot

Date: February 2, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort McKay South | Station number: | AMS13            |
| Calibration Date: | February 7, 2023 | Last Cal Date:  | January 17, 2023 |
| Start time (MST): | 9:31             | End time (MST): | 14:05            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                 |
|------------------------|-------------------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 5.34              | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #:    | CC500241          |     |                   |                 |
| Removed Cal Gas Conc:  | 5.34              | ppm | Rem Gas Exp Date: |                 |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                 |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 2448            |
| ZAG Make/Model:        | Teledyne API 701  |     | Serial Number:    | 1117            |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i TLE | Analyzer serial #:  | 1180540017 |
| Converter make: | CDN-101        | Converter serial #: | 521        |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 0.999228     | 1.002489      | Backgd or Offset: | 3.69          |
| Calibration intercept: | -0.042157    | -0.082182     | Coeff or Slope:   | 1.120         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4925                          | 75.5                        | 80.6                                | 80.6                               | 1.002  |
| as found 2nd point    | 4962                          | 37.7                        | 40.3                                | 40.0                               | 1.009  |
| as found 3rd point    | 4981                          | 18.9                        | 20.2                                | 19.6                               | 1.035  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4925                          | 75.5                        | 80.6                                | 80.8                               | 0.998   |
| second point                            | 4962                          | 37.7                        | 40.3                                | 40.3                               | 0.999   |
| third point                             | 4981                          | 18.9                        | 20.2                                | 19.9                               | 1.014   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span                            | 4925                          | 75.5                        | 80.6                                | 80.7                               | 0.999   |
| SO2 Scrubber Check                      | 4921                          | 79.1                        | 791.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | 20-Mar-20                     |                             | Ave Corr Factor                     |                                    | 1.004   |
| Date of last converter efficiency test: | NA                            |                             | efficiency                          |                                    |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 80.5 | Prev response:  | 80.52    | *% change:    | 0.0%      |
| Baseline Corr 2nd AF pt: | 39.9 | AF Slope:       | 1.000788 | AF Intercept: | -0.222185 |
| Baseline Corr 3rd AF pt: | 19.5 | AF Correlation: | 0.999924 |               |           |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. Completed a SO2 scrubber check after calibrator zero. No adjustment made.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## TRS Calibration Summary

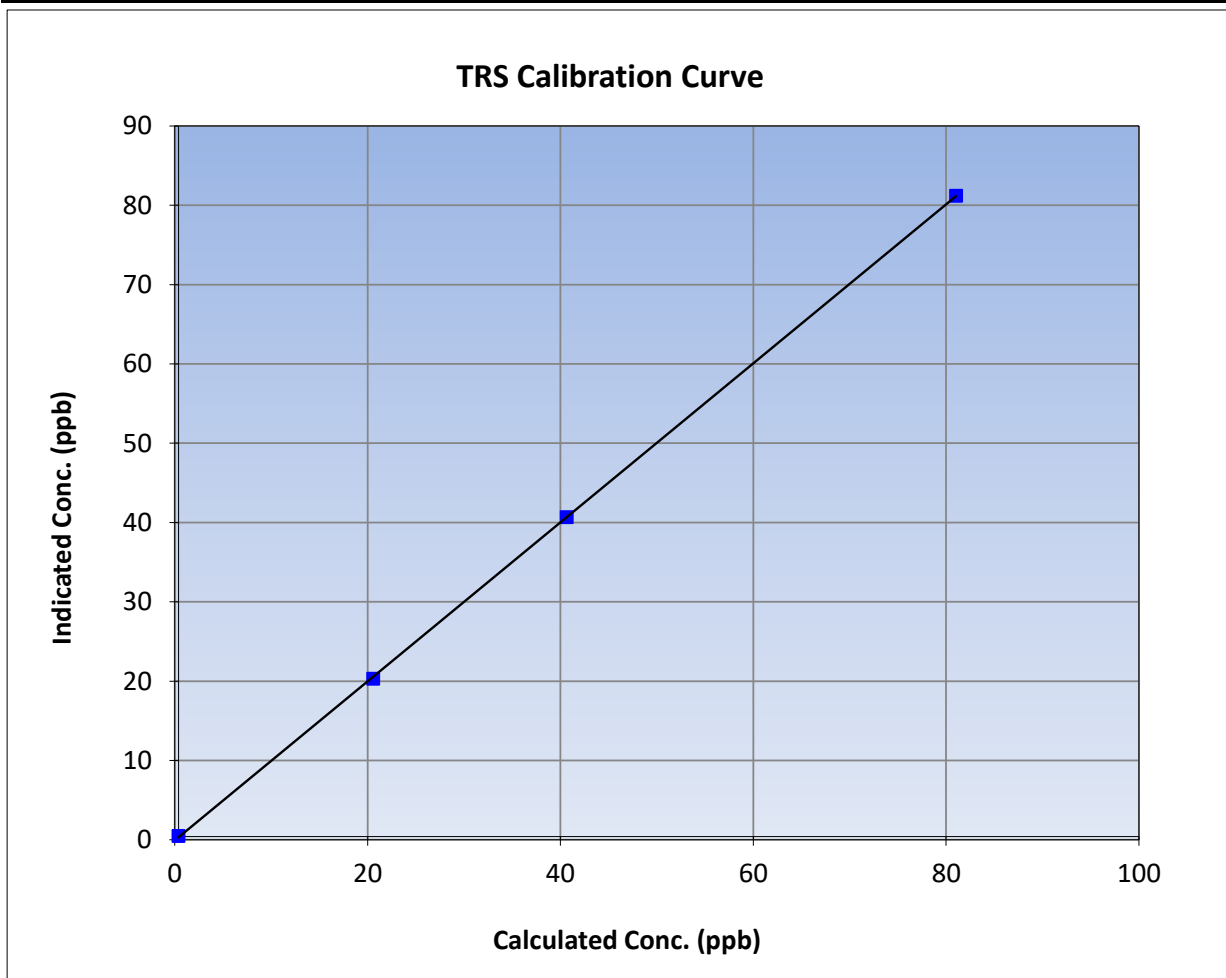
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:31             | End Time (MST):       | 13:36            |
| Analyzer make:    | Thermo 43i TLE   | Analyzer serial #:    | 1180540017       |

### Calibration Data

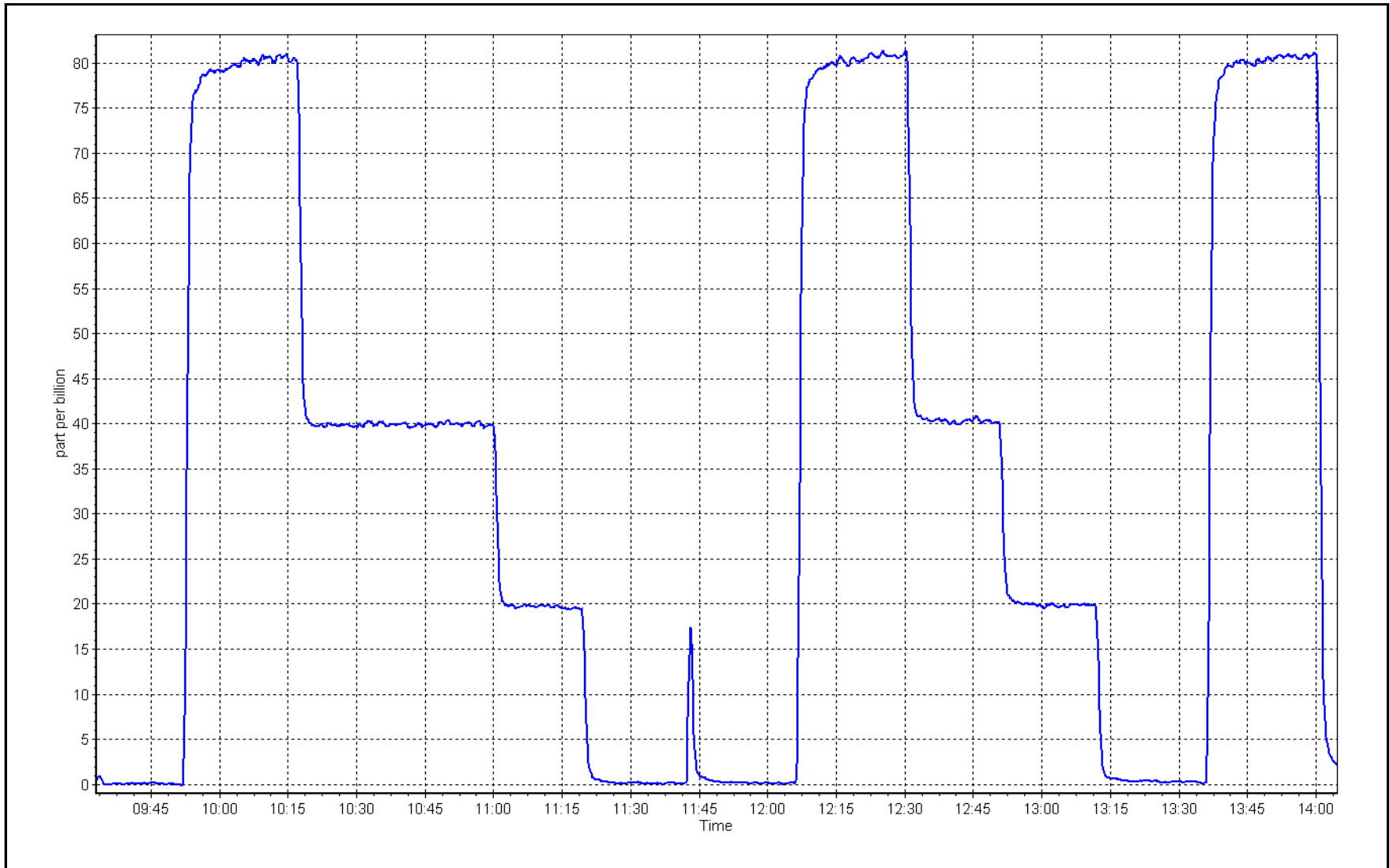
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | ≥0.995        |
| 80.6                                   | 80.8                                  | 0.9978                       |                         |               |
| 40.3                                   | 40.3                                  | 0.9992                       | Slope                   | 0.90 - 1.10   |
| 20.2                                   | 19.9                                  | 1.0144                       |                         |               |
|  |                                       |                              | Intercept               | +/-3          |



TRS Calibration Plot

Date: February 7, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort McKay South | Station number: | AMS13            |
| Calibration Date: | February 2, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 9:48             | End time (MST): | 12:50            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC260812  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2448              |
| ZAG make/model:                             | API 701   | Serial Number:              | 1117              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430012 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 |              |               |                 |               |
|---------------------------------|--------------|---------------|-----------------|---------------|
|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
| CH <sub>4</sub> SP Ratio:       | 2.38E-04     | 2.39E-04      | NMHC SP Ratio:  | 4.74E-05      |
| CH <sub>4</sub> Retention time: | 12.0         | 12.0          | NMHC Peak Area: | 191456        |
|                                 |              |               |                 | 193720        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.1                 | 17.05                | 17.14               | 0.994                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4921              | 79.1                 | 17.05                | 17.04               | 1.001                      |
| second point          | 4961              | 39.5                 | 8.51                 | 8.35                | 1.019                      |
| third point           | 4980              | 19.8                 | 4.27                 | 4.08                | 1.046                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.1                 | 17.05                | 17.09               | 0.998                      |

|                           |       |
|---------------------------|-------|
| Average Correction Factor | 1.022 |
|---------------------------|-------|

|                       |       |                 |       |  |      |
|-----------------------|-------|-----------------|-------|--|------|
| Baseline Corr AF:     | 17.14 | Prev response   | 17.02 | *% change                                  | 0.7% |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                              |      |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |      |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.1                 | 9.08                 | 9.20                                       | 0.987                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.1                 | 9.08                 | 9.06                                       | 1.002                      |
| second point              | 4961              | 39.5                 | 4.53                 | 4.46                                       | 1.016                      |
| third point               | 4980              | 19.8                 | 2.27                 | 2.18                                       | 1.042                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.1                 | 9.08                 | 9.07                                       | 1.001                      |
| Average Correction Factor |                   |                      |                      |  | 1.020                      |
| Baseline Corr AF:         | 9.20              | Prev response        | 9.08                 | *% change                                  | 1.3%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.1                 | 7.97                 | 7.95                                       | 1.002                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.1                 | 7.97                 | 7.97                                       | 0.999                      |
| second point              | 4961              | 39.5                 | 3.98                 | 3.89                                       | 1.022                      |
| third point               | 4980              | 19.8                 | 1.99                 | 1.90                                       | 1.050                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.1                 | 7.97                 | 8.01                                       | 0.995                      |
| Average Correction Factor |                   |                      |                      |  | 1.024                      |
| Baseline Corr AF:         | 7.95              | Prev response        | 7.94                 | *% change                                  | 0.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000765     | 1.002074      |
| THC Cal Offset:             | -0.043424    | -0.104181     |
| CH <sub>4</sub> Cal Slope:  | 1.000366     | 1.003774      |
| CH <sub>4</sub> Cal Offset: | -0.031817    | -0.056196     |
| NMHC Cal Slope:             | 1.001015     | 1.000594      |
| NMHC Cal Offset:            | -0.011206    | -0.047785     |

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Sean Bala





# Wood Buffalo Environmental Association

## THC Calibration Summary

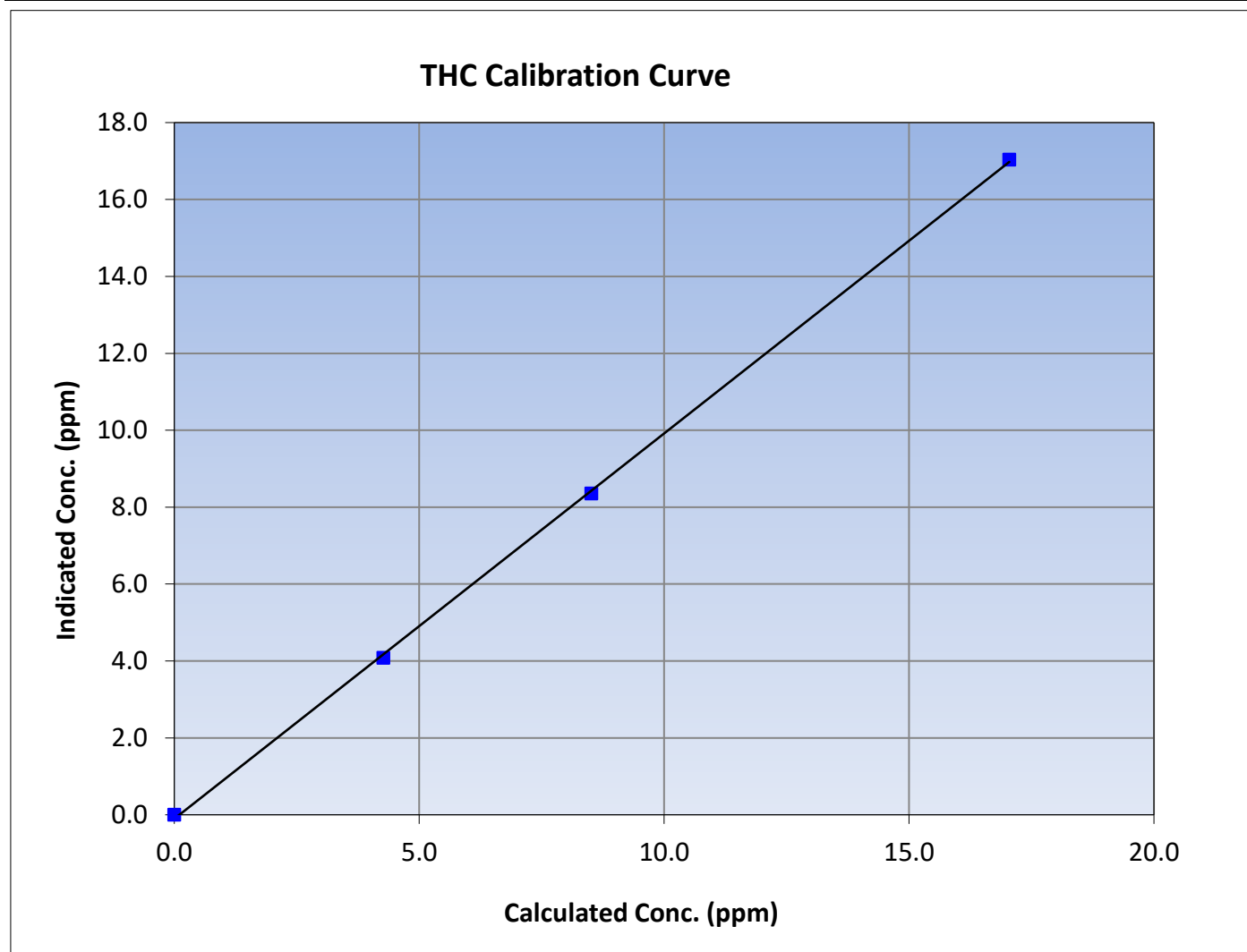
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:48             | End Time (MST):       | 12:50            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999826  | $\geq 0.995$  |
| 17.05                               | 17.04                              | 1.0006                    |                         |           |               |
| 8.51                                | 8.35                               | 1.0190                    | Slope                   | 1.002074  | 0.90 - 1.10   |
| 4.27                                | 4.08                               | 1.0456                    |                         |           |               |
|                                     |                                    |                           | Intercept               | -0.104181 | $\pm 0.5$     |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

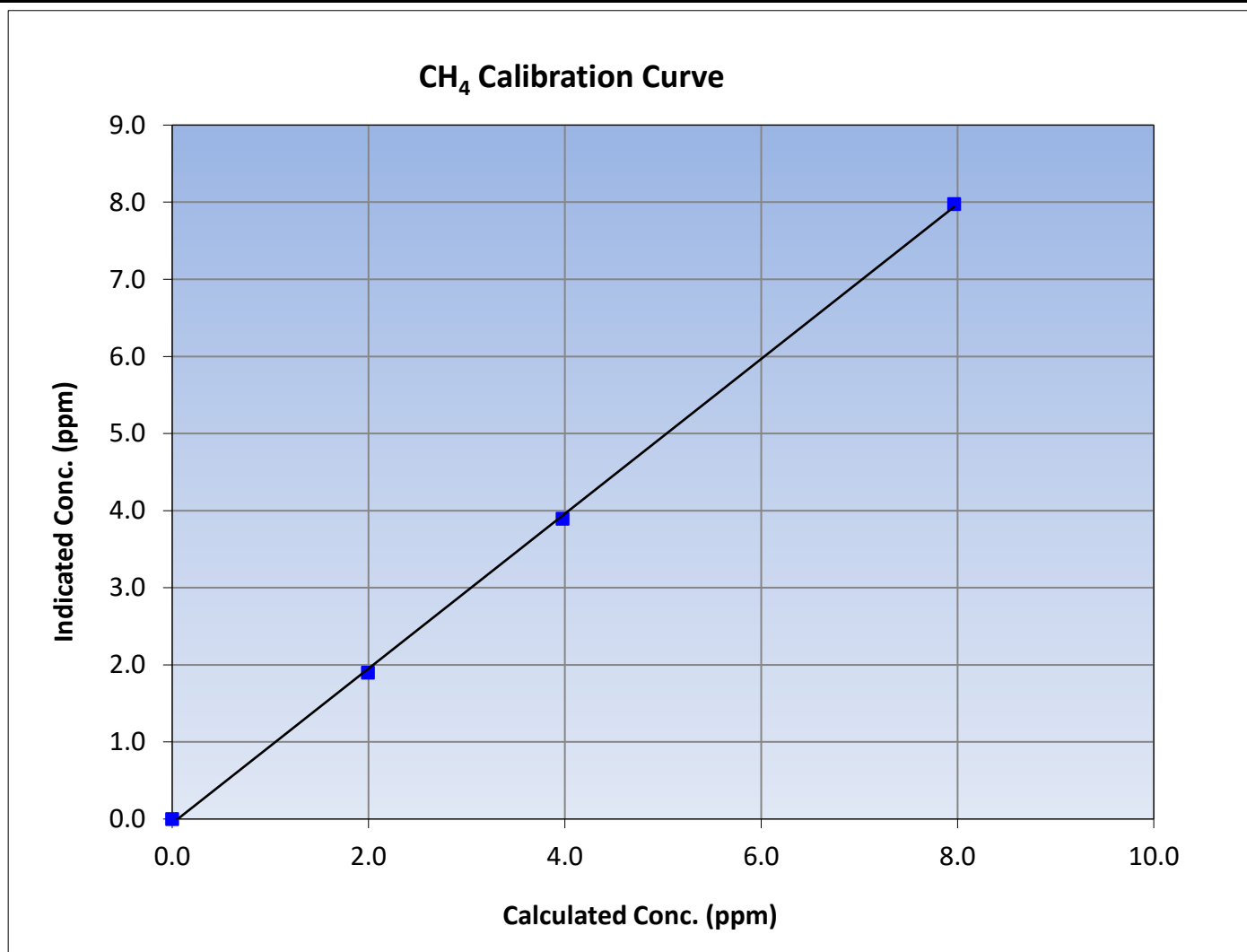
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:48             | End Time (MST):       | 12:50            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u>      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|--------------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999763  | <b>≥0.995</b>      |
| 7.97                                | 7.97                               | 0.9991                    |                         |           |                    |
| 3.98                                | 3.89                               | 1.0218                    |                         |           |                    |
| 1.99                                | 1.90                               | 1.0497                    |                         |           |                    |
|                                     |                                    |                           | Slope                   | 1.003774  | <b>0.90 - 1.10</b> |
|                                     |                                    |                           | Intercept               | -0.056196 | <b>+/-0.5</b>      |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

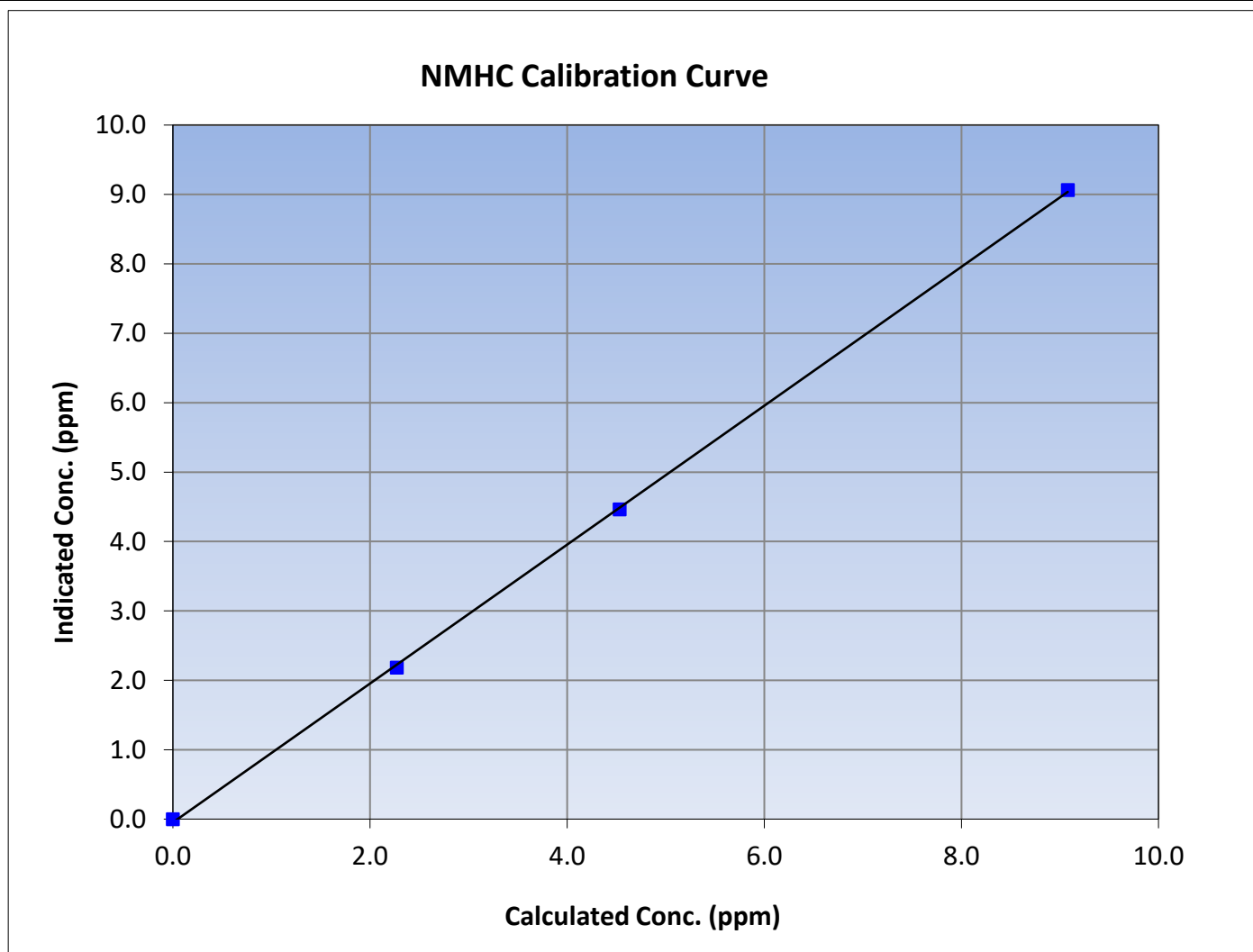
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Fort McKay South | Station Number:       | AMS13            |
| Start Time (MST): | 9:48             | End Time (MST):       | 12:50            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1152430012       |

### Calibration Data

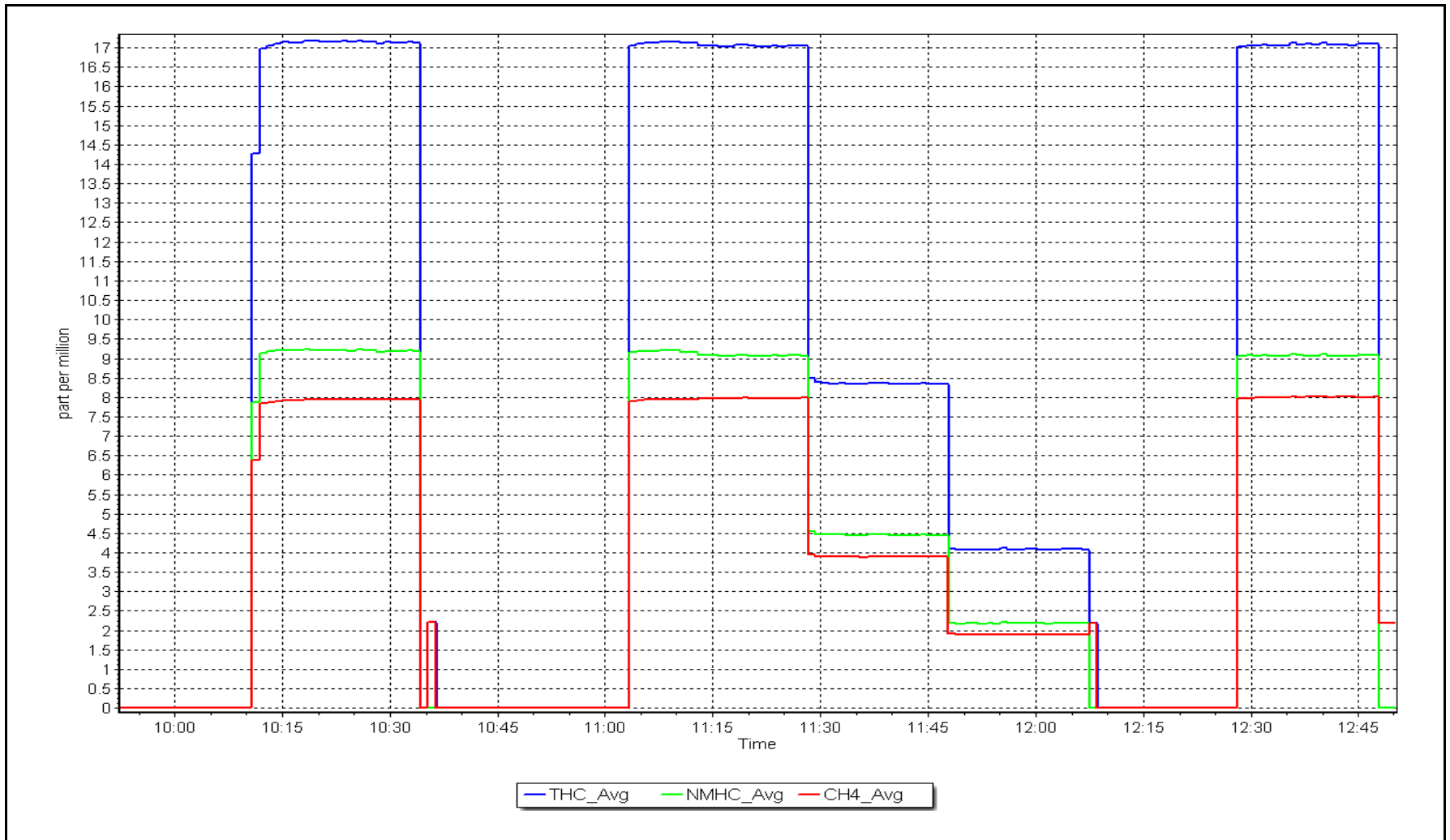
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999873  | $\geq 0.995$  |       |          |             |
| 9.08                                | 9.06                               | 1.0019                    |                         |           |               |       |          |             |
| 4.53                                | 4.46                               | 1.0163                    |                         |           |               | Slope | 1.000594 | 0.90 - 1.10 |
| 2.27                                | 2.18                               | 1.0421                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.047785 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 2, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort McKay South | Station number: | AMS13            |
| Calibration Date: | February 2, 2023 | Last Cal Date:  | February 2, 2023 |
| Start time (MST): | 10:10            | End time (MST): | 11:37            |
| Reason:           | Cylinder Change  |                 |                  |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC260812  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.7 ppm |                             |                   |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 503.6 ppm | CH <sub>4</sub> Equiv Conc. | 1077.5 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.7 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 2448              |
| ZAG make/model:                             | API 701   | Serial Number:              | 1117              |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1152430012 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.39E-04     | 2.39E-04      | NMHC SP Ratio:  | 4.69E-05      |
| CH <sub>4</sub> Retention time: | 12.0         | 12.0          | NMHC Peak Area: | 193720        |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4921              | 79.1                 | 17.05                | 16.97  | 1.005                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point                | 4921              | 79.1                 | 17.05                | 16.95  | 1.005                      |
| second point              |                   |                      |                      |  |                            |
| third point               |                   |                      |                      |  |                            |
| as left zero              |                   |                      |                      |  |                            |
| as left span              |                   |                      |                      |  |                            |
| Average Correction Factor |                   |                      |                      |  | 1.005                      |
| Baseline Corr AF:         | 16.97             | Prev response        | 16.98                | *% change  | -0.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF Limit= 0.95-1.05 |
|-----------------------|-------------------|----------------------|----------------------|--|---------------------|
| as found zero         | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| as found span         | 4921              | 79.1                 | 9.08                 | 8.99                                       | 1.010               |
| as found 2nd point    |                   |                      |                      |  |                     |
| as found 3rd point    |                   |                      |                      |  |                     |
| new cylinder response |                   |                      |                      |  |                     |
| calibrator zero       | 5000              | 0                    | 0.00                 | 0.00                                       | ----                |
| high point            | 4921              | 79.1                 | 9.08                 | 8.97                                       | 1.012               |
| second point          |                   |                      |                      |  |                     |
| third point           |                   |                      |                      |  |                     |
| as left zero          |                   |                      |                      |  |                     |
| as left span          |                   | 79.1                 |                      |  |                     |
|                       |                   |                      |                      | Average Correction Factor                  | 1.012               |
| Baseline Corr AF:     | 8.99              | Prev response        | 9.04                 | *% change                                  | -0.5%               |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                     |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                     |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF Limit= 0.95-1.05 |
|-----------------------|-------------------|----------------------|----------------------|--|---------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| as found span         | 4921              | 79.1                 | 7.97                 | 7.98                                       | 0.999               |
| as found 2nd point    |                   |                      |                      |  |                     |
| as found 3rd point    |                   |                      |                      |  |                     |
| new cylinder response |                   |                      |                      |  |                     |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                |
| high point            | 4921              | 79.1                 | 7.97                 | 7.98                                       | 0.998               |
| second point          |                   |                      |                      |  |                     |
| third point           |                   |                      |                      |  |                     |
| as left zero          |                   |                      |                      |  |                     |
| as left span          |                   | 79.1                 |                      |  |                     |
|                       |                   |                      |                      | Average Correction Factor                  | 0.998               |
| Baseline Corr AF:     | 7.98              | Prev response        | 7.94                 | *% change                                  | 0.5%                |
| Baseline Corr 2nd AF: | NA                | AF Slope:            |                      | AF Intercept:                              |                     |
| Baseline Corr 3rd AF: | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                     |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.002074     | 0.994538      |
| THC Cal Offset:             | -0.104181    | 0.000000      |
| CH <sub>4</sub> Cal Slope:  | 1.003774     | 1.001783      |
| CH <sub>4</sub> Cal Offset: | -0.056196    | 0.000000      |
| NMHC Cal Slope:             | 1.000594     | 0.988070      |
| NMHC Cal Offset:            | -0.047785    | 0.000000      |

Notes:

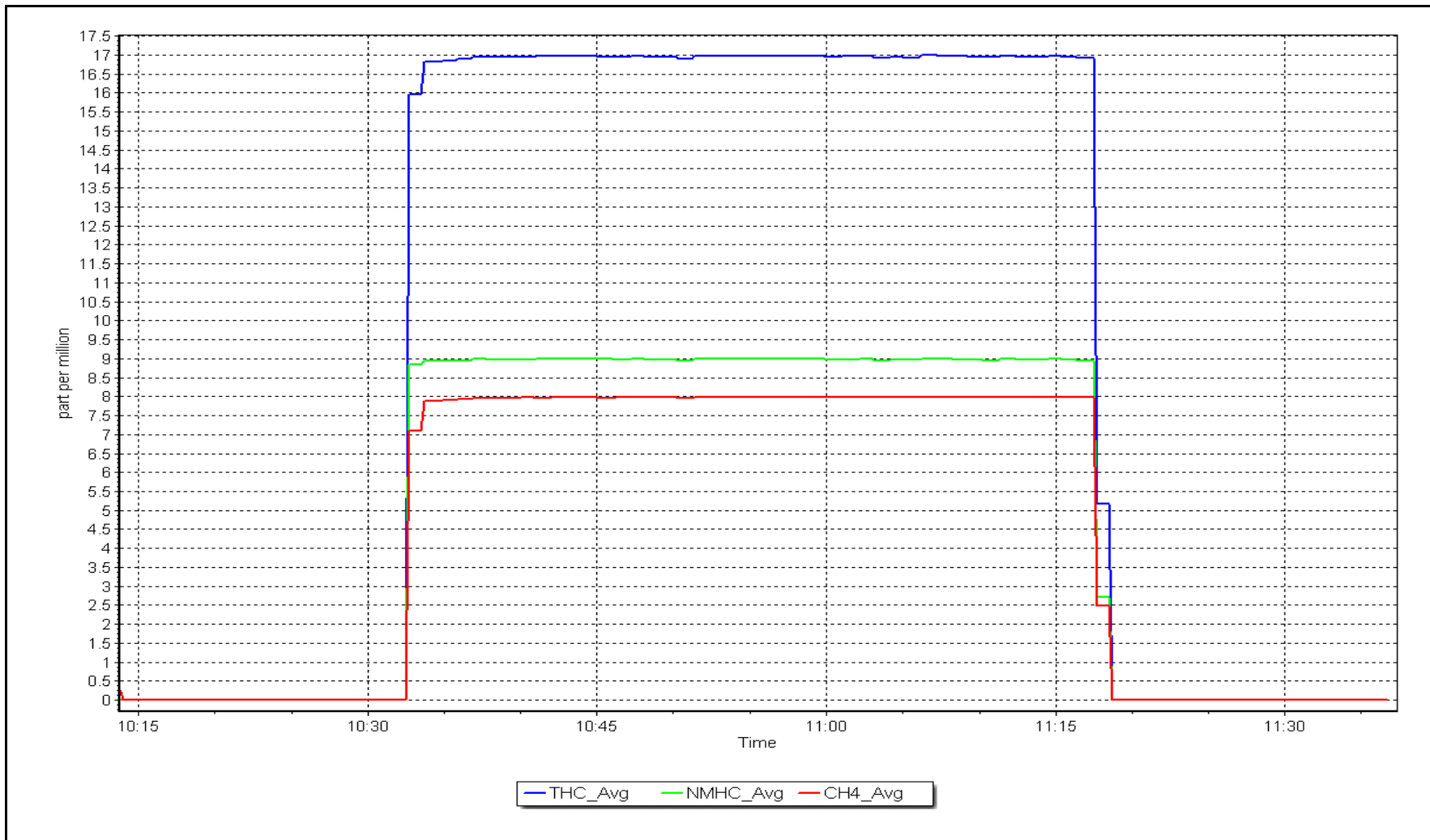
Changed N2 cylinder after as founds.

Calibration Performed By: Sean Bala

NMHC Calibration Plot

Date: February 2, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort McKay South  
Calibration Date: February 10, 2023  
Start time (MST): 10:16  
Reason: Routine  
Station number: AMS 13  
Last Cal Date: January 19, 2023  
End time (MST): 14:37

### Calibration Standards

NO Gas Cylinder #: T2Y1P76  
NOX Cal Gas Conc: 50.98 ppm  
Removed Cylinder #: N/A  
Removed Gas NOX Conc: 50.98 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 49.32 ppm  
Removed Gas Exp Date: N/A  
Removed Gas NO Conc: 49.32 ppm  
NO gas Diff:  
Serial Number: 2448  
Serial Number: 1117

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1410661329

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.200        | 1.204         | NO bkgnd or offset:  | 9.6          | 9.5           |
| NOX coeff or slope: | 0.992        | 0.992         | NOX bkgnd or offset: | 9.6          | 9.6           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 194.1        | 192.6         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.999594     | 0.999138      |
| NO <sub>x</sub> Cal Offset: | -2.291272    | -2.151243     |
| NO Cal Slope:               | 1.002005     | 1.002334      |
| NO Cal Offset:              | -3.105090    | -3.145082     |
| NO <sub>2</sub> Cal Slope:  | 1.006533     | 0.996233      |
| NO <sub>2</sub> Cal Offset: | -0.433464    | -0.877794     |





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4919                      | 81.1                        | 826.9   | 800.0                                  | 26.9  | 824.2  | 797.8                                 | 26.3   | 1.0033  | 1.0027   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| high point                | 4919                      | 81.1                        | 826.9   | 800.0                                  | 26.9  | 825.0  | 800.2                                 | 24.8   | 1.0023  | 0.9997   |
| second point              | 4960                      | 40.6                        | 413.9   | 400.4                                  | 13.5  | 410.5  | 396.7                                 | 13.7   | 1.0083  | 1.0094   |
| third point               | 4980                      | 20.3                        | 207.0   | 200.2                                  | 6.7   | 202.5  | 194.5                                 | 8.0  | 1.0221  | 1.0294   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.0  | ----  | ----   |
| as left span              | 4919                      | 81.1                        | 826.9   | 383.2                                  | 443.7   | 835.9  | 386.1                                 | 449.7  | 0.9892  | 0.9924   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0109  | 1.0128   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 824.4 ppb | NO = 798.0 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.0% |
| Previous Response    | NO <sub>x</sub> = 824.3 ppb | NO = 798.5 ppb |  | *Percent Change                  | NO = -0.1%             |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 797.2                                      | 380.4                                 | 443.7   | 441.6  | 1.0048   | 99.5%  |
| 2nd GPT point (200 ppb O3)       | 797.2                                      | 587.2                                 | 236.9   | 235.0  | 1.0082   | 99.2%  |
| 3rd GPT point (100 ppb O3)       | 797.2                                      | 691.8                                 | 132.3   | 129.8  | 1.0195   | 98.1%  |
| Average Correction Factor        |  |                                       |   |  | 1.0108   | 98.9%  |

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

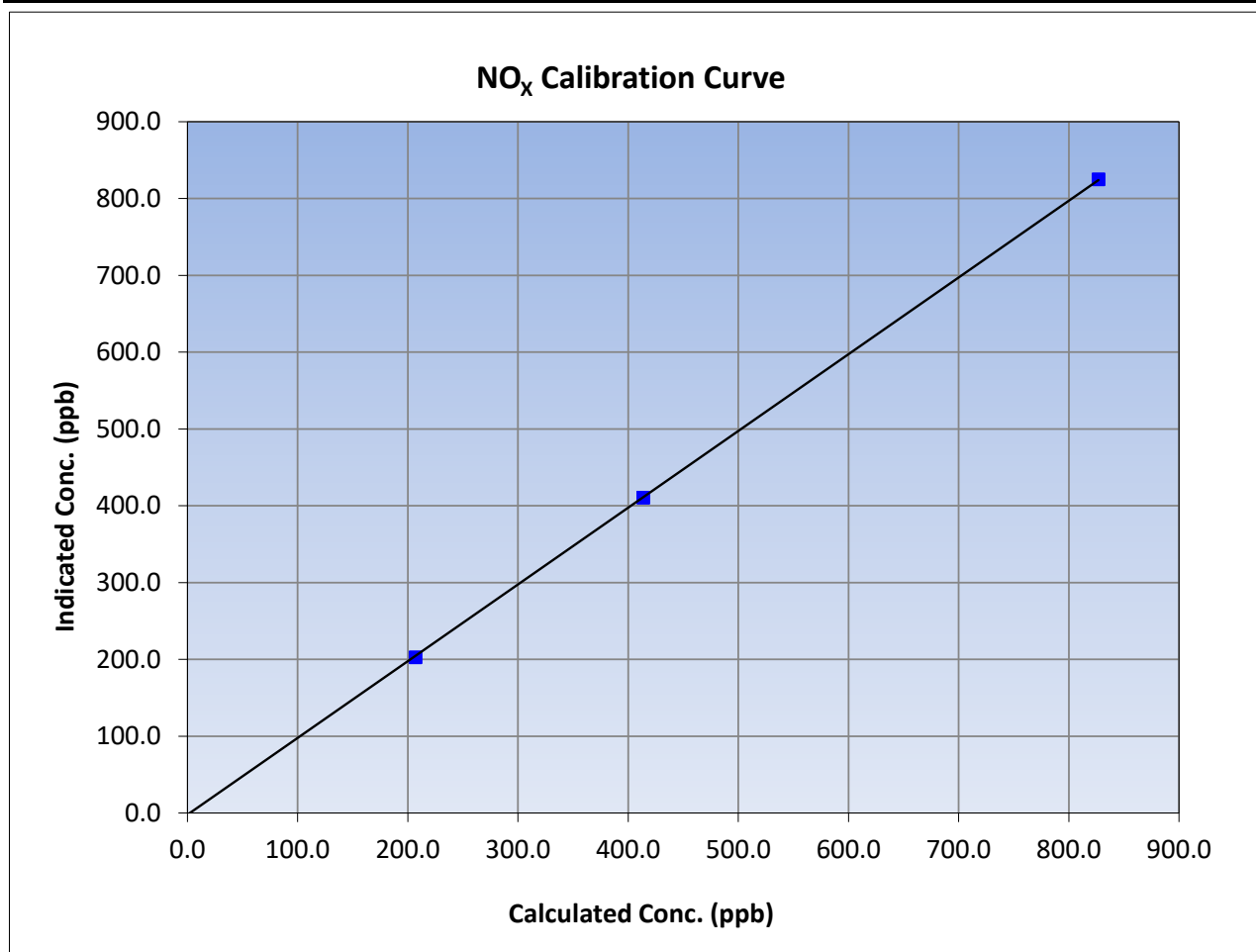
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Fort McKay South  | Station Number:       | AMS 13           |
| Start Time (MST): | 10:16             | End Time (MST):       | 14:37            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1410661329       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995    |             |
| 826.9                               | 825.0                              | 1.0023                    |                         |           |             |
| 413.9                               | 410.5                              | 1.0083                    |                         |           |             |
| 207.0                               | 202.5                              | 1.0221                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.999138  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.151243 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

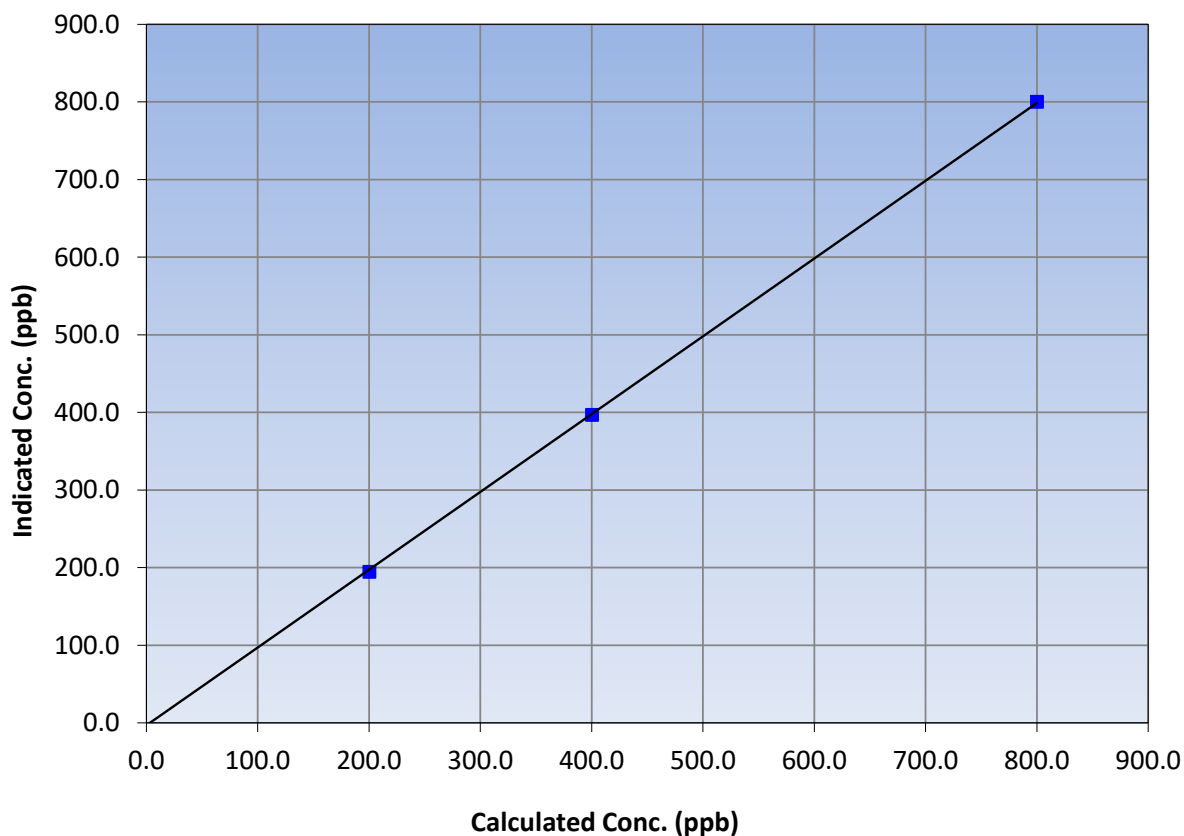
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Fort McKay South  | Station Number:       | AMS 13           |
| Start Time (MST): | 10:16             | End Time (MST):       | 14:37            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1410661329       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999934  | ≥0.995      |
| 800.0                               | 800.2                              | 0.9997                    |                         |           |             |
| 400.4                               | 396.7                              | 1.0094                    | Slope                   | 1.002334  | 0.90 - 1.10 |
| 200.2                               | 194.5                              | 1.0294                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -3.145082 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

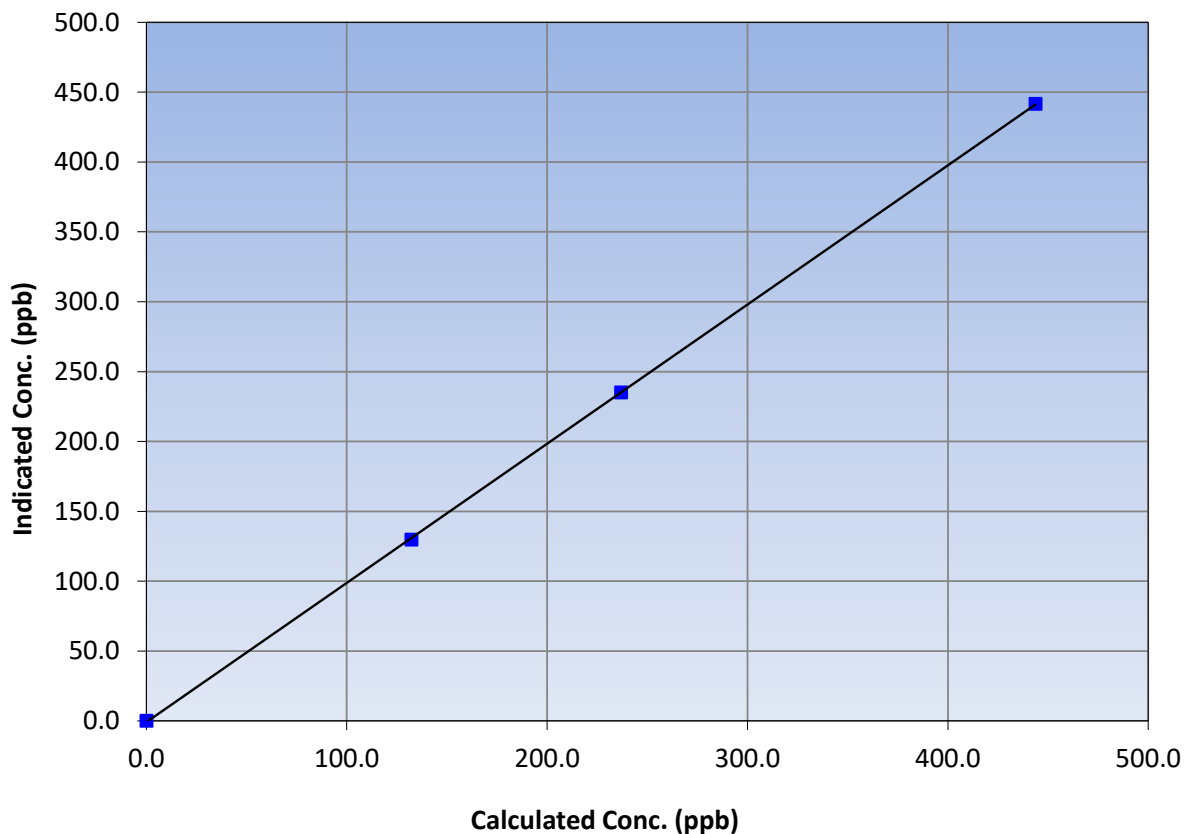
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Fort McKay South  | Station Number:       | AMS 13           |
| Start Time (MST): | 10:16             | End Time (MST):       | 14:37            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1410661329       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 443.7                               | 441.6                              | 1.0048                    |   |                                |
| 236.9                               | 235.0                              | 1.0082                    |   |                                |
| 132.3                               | 129.8                              | 1.0195                    |   |                                |
|                                     |                                    |                           | 0.999978                                      |                                |
|                                     |                                    |                           | 0.996233                                      |                                |
|                                     |                                    |                           | -0.877794                                     |                                |

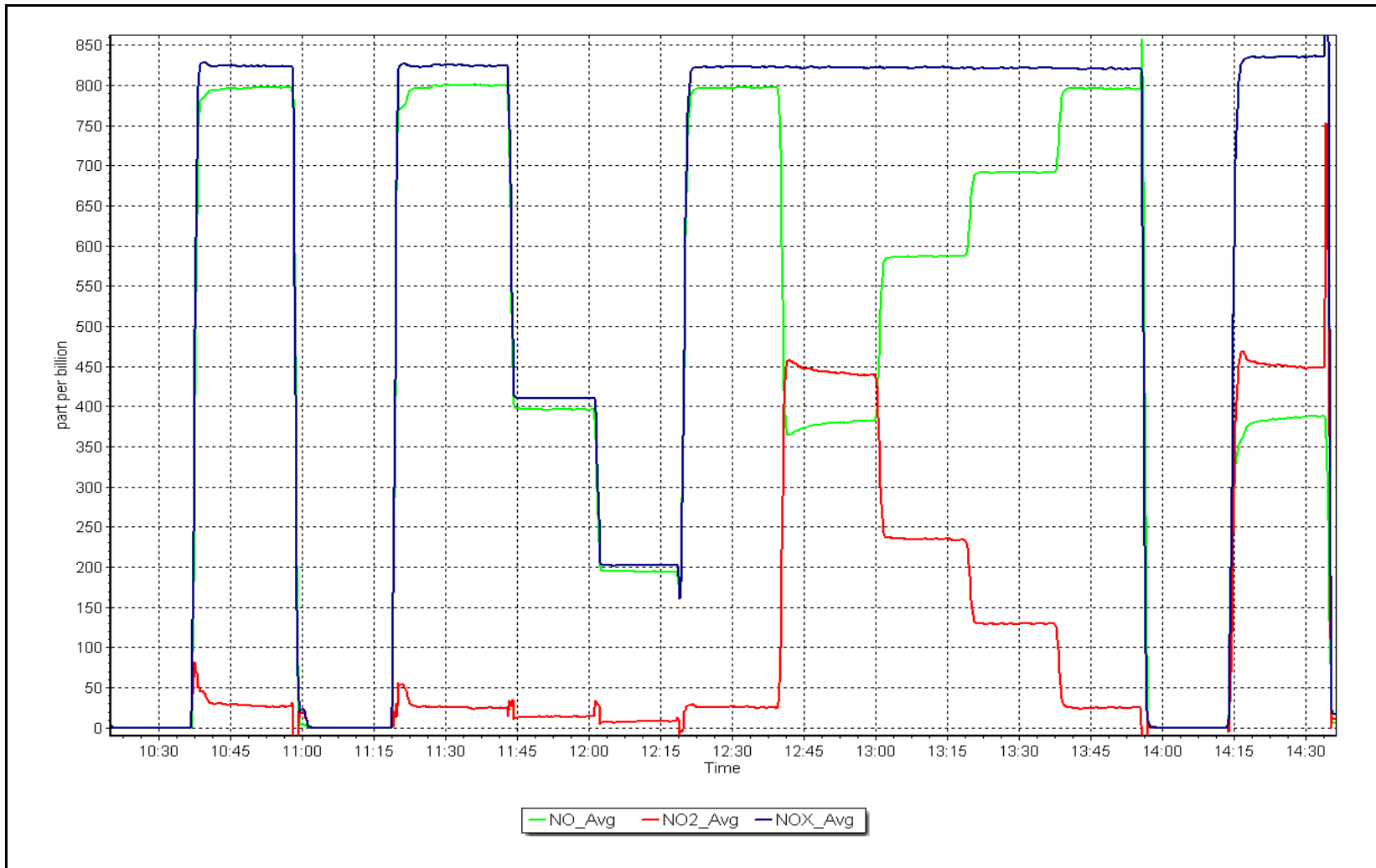
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 10, 2023

Location: Fort McKay South





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Fort McKay South      Station number: AMS13  
 Calibration Date: February 3, 2023      Last Cal Date: January 18, 2023  
 Start time (MST): 9:56      End time (MST): 12:50  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 2448  
 ZAG Make/Model: Teledyne API T701      Serial Number: 1117

### Analyzer Information

Analyzer make: Teledyne API T400      Analyzer serial #: 3871  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.996143     | 0.997629      | Backgd or Offset: | 2.7          | 2.7           |
| Calibration intercept: | 1.300000     | 1.040000      | Coeff or Slope:   | 0.962        | 0.962         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 0.0                           | 0.0                                 | -0.1                               | ----  |
| as found span             | 5000                       | 969.9                         | 400.0                               | 399.7                              | 1.001   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 0.0                           | 0.0                                 | -0.2                               | ----  |
| high point                | 5000                       | 980.6                         | 400.0                               | 399.4                              | 1.002   |
| second point              | 5000                       | 838.0                         | 200.0                               | 201.4                              | 0.993   |
| third point               | 5000                       | 735.3                         | 100.0                               | 101.9                              | 0.981   |
| as left zero              | 5000                       | 0.0                           | 0.0                                 | 0.1                                | ----  |
| as left span              | 5000                       | 979.1                         | 400.0                               | 401.7                              | 0.996   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.992   |

|                          |       |                   |       |               |      |
|--------------------------|-------|-------------------|-------|---------------|------|
| Baseline Corr As found:  | 399.8 | Previous response | 399.8 | *% change     | 0.0% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |      |

\* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

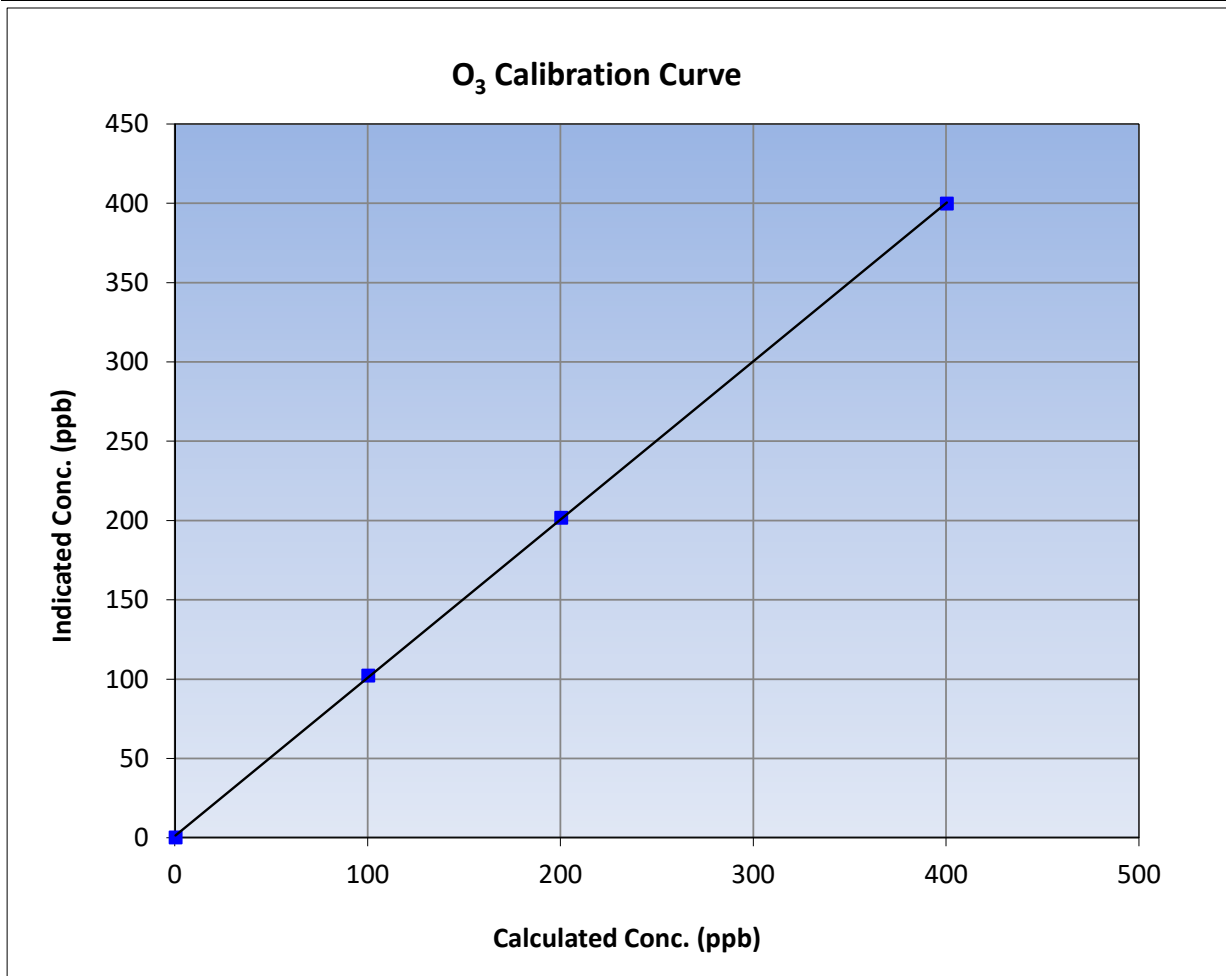
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023  | Previous Calibration: | January 18, 2023 |
| Station Name:     | Fort McKay South  | Station Number:       | AMS13            |
| Start Time (MST): | 9:56              | End Time (MST):       | 12:50            |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3871             |

### Calibration Data

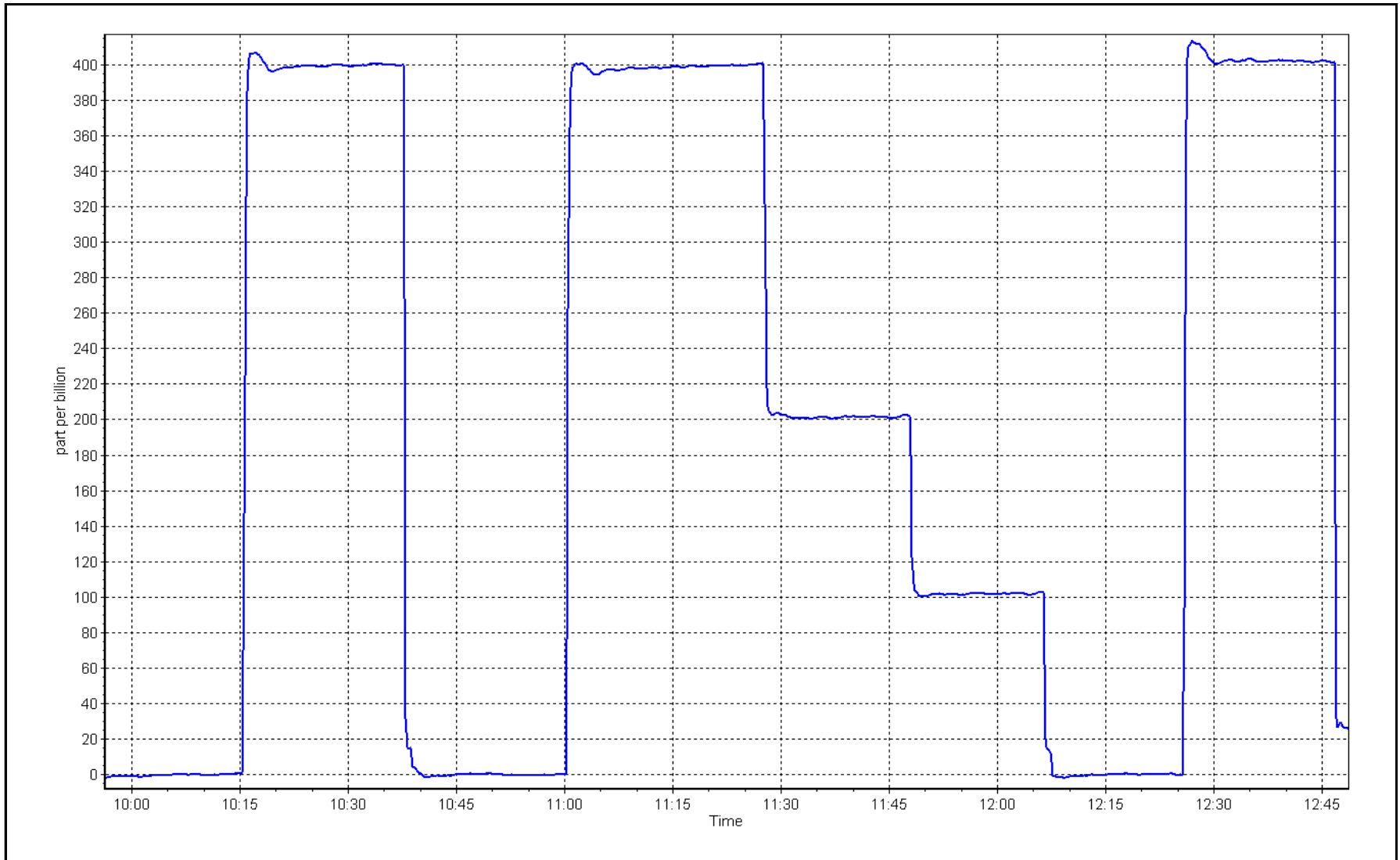
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | 0.999955 | ≥0.995      |
| 400.0                               | 399.4                              | 1.0015                    |                         |          |             |
| 200.0                               | 201.4                              | 0.9930                    | Slope                   | 0.997629 | 0.90 - 1.10 |
| 100.0                               | 101.9                              | 0.9814                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.040000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 3, 2023

Location: Fort McKay South







# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort McKay South      Station number: AMS 13  
 Calibration Date: February 16, 2023      Last Cal Date: January 19, 2023  
 Start time (MST): 11:37      End time (MST): 11:53

Analyzer Make: API T640      S/N: 319  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal      S/N: 141229  
 Temp/RH standard: Delta Cal      S/N: 141229

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -10.0    | -9.4     | -10.0   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 726.1    | 725.6    | 726.1   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01     | 5.04     | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test:      Date of check: February 16, 2023      Last Cal Date: January 19, 2023  
 PM w/o HEPA: 11.0      PM w/ HEPA: 0.0      <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning :      Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 10.9 +/- 0.5 |

Post-maintenance leak check:      PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned:      December 13, 2022      <0.2 ug/m3  
 Disposable Filter Changed:      December 13, 2022

### Annual Maintenance

Date Sample Tube Cleaned:      June 29, 2022  
 Date RH/T Sensor Cleaned:      June 29, 2022

Notes:      No adjustment made. Leak check passed. Built up of snow on the inlet head and clean it.

Calibration by:      Sean Bala



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS14  
ANZAC  
FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

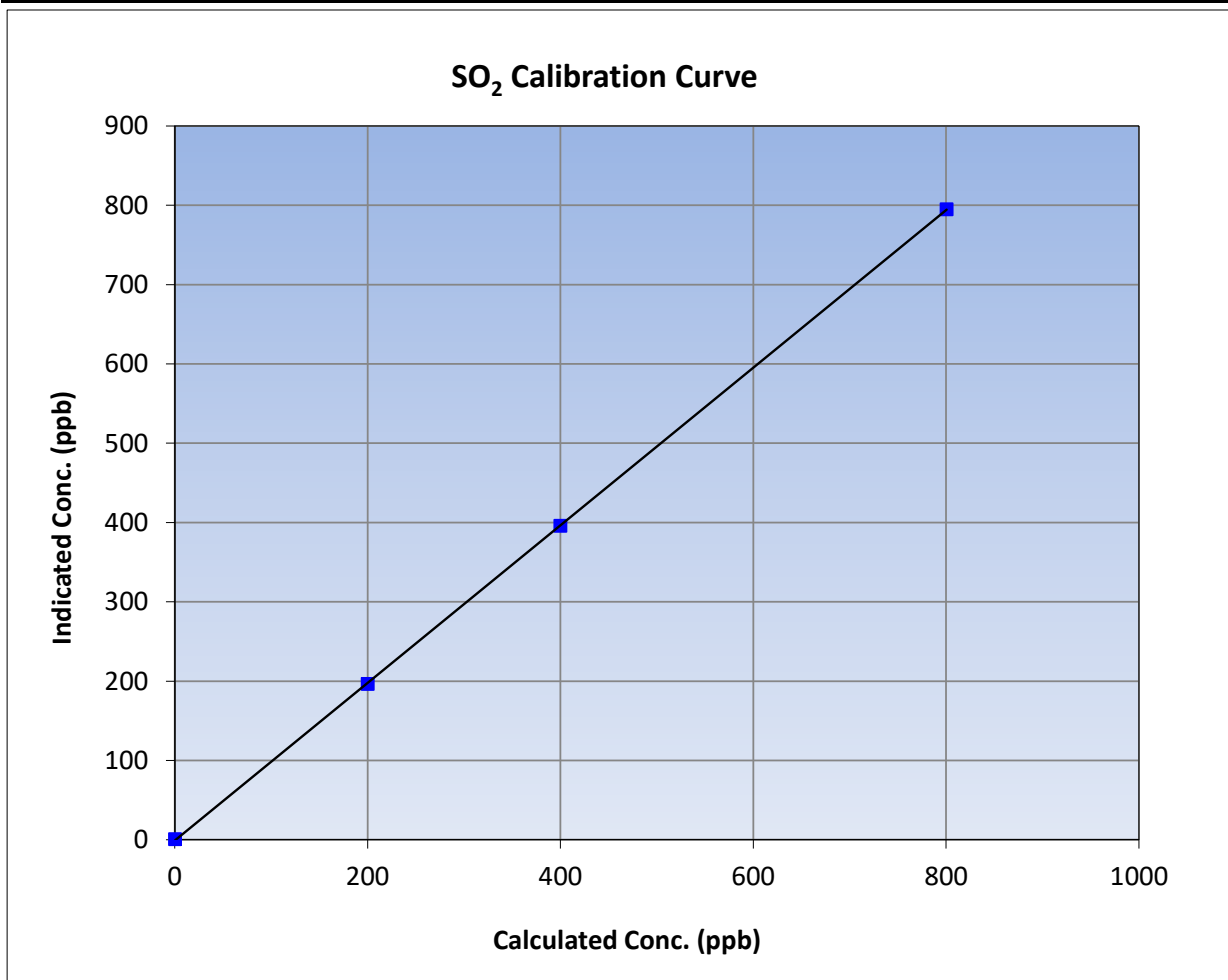
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Anzac             | Station Number:       | AMS 14           |
| Start Time (MST): | 10:28             | End Time (MST):       | 13:02            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 0710321322       |

### Calibration Data

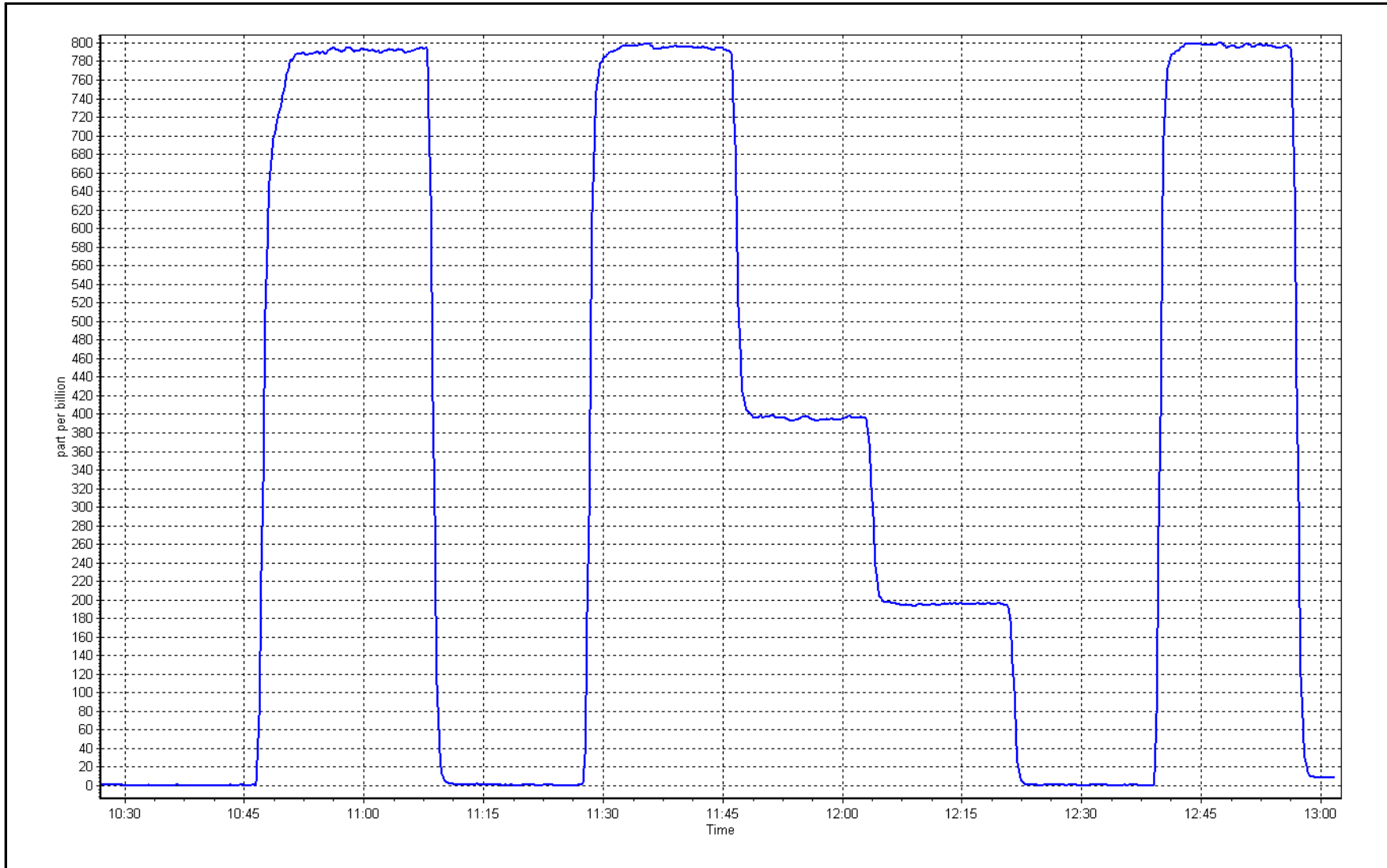
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999985  |             |
| 800.2                               | 794.8                              | 1.0068                    |                         |           | ≥0.995      |
| 399.6                               | 395.4                              | 1.0106                    | Slope                   | 0.993711  |             |
| 199.8                               | 196.0                              | 1.0194                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.045321 | +/-30       |



SO2 Calibration Plot

Date: February 21, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Anzac Station number: AMS14  
 Calibration Date: February 3, 2023 Last Cal Date: January 6, 2023  
 Start time (MST): 7:55 End time (MST): 12:20  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.38 ppm Cal Gas Exp Date: February 3, 2023  
 Cal Gas Cylinder #: EY0000859  
 Removed Cal Gas Conc: 5.38 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 5252  
 ZAG Make/Model: API 701H Serial Number: 357

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1180540019  
 Converter make: CD Nova CDN-101 Converter serial #: 503  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 1.003842     | 1.004840      | Backgd or Offset: | 5.54 5.66     |
| Calibration intercept: | 0.038815     | -0.021121     | Coeff or Slope:   | 0.990 1.008   |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4925                          | 74.3                        | 80.0                                | 78.3                               | 1.024  |
| as found 2nd point    | 4962                          | 37.2                        | 40.0                                | 39.3                               | 1.024  |
| as found 3rd point    | 4981                          | 18.6                        | 20.0                                | 19.2                               | 1.053  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point                              | 4925                          | 74.3                        | 80.0                                | 80.5                               | 0.993   |
| second point                            | 4962                          | 37.2                        | 40.0                                | 40.1                               | 0.998   |
| third point                             | 4981                          | 18.6                        | 20.0                                | 19.6                               | 1.021   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| as left span                            | 4925                          | 74.3                        | 80.0                                | 79.9                               | 1.001   |
| SO2 Scrubber Check                      | 4920                          | 80.0                        | 800.0                               | 0.0                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 1.004   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 78.1 Prev response: 80.30 \*% change: -2.8%  
 Baseline Corr 2nd AF pt: 39.1 AF Slope: 0.979116 AF Intercept: -0.020730  
 Baseline Corr 3rd AF pt: 19.0 AF Correlation: 0.999938

\* = > +/-5% change initiates investigation

Notes: Scrubber checked after the calibrator zero. No maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## TRS Calibration Summary

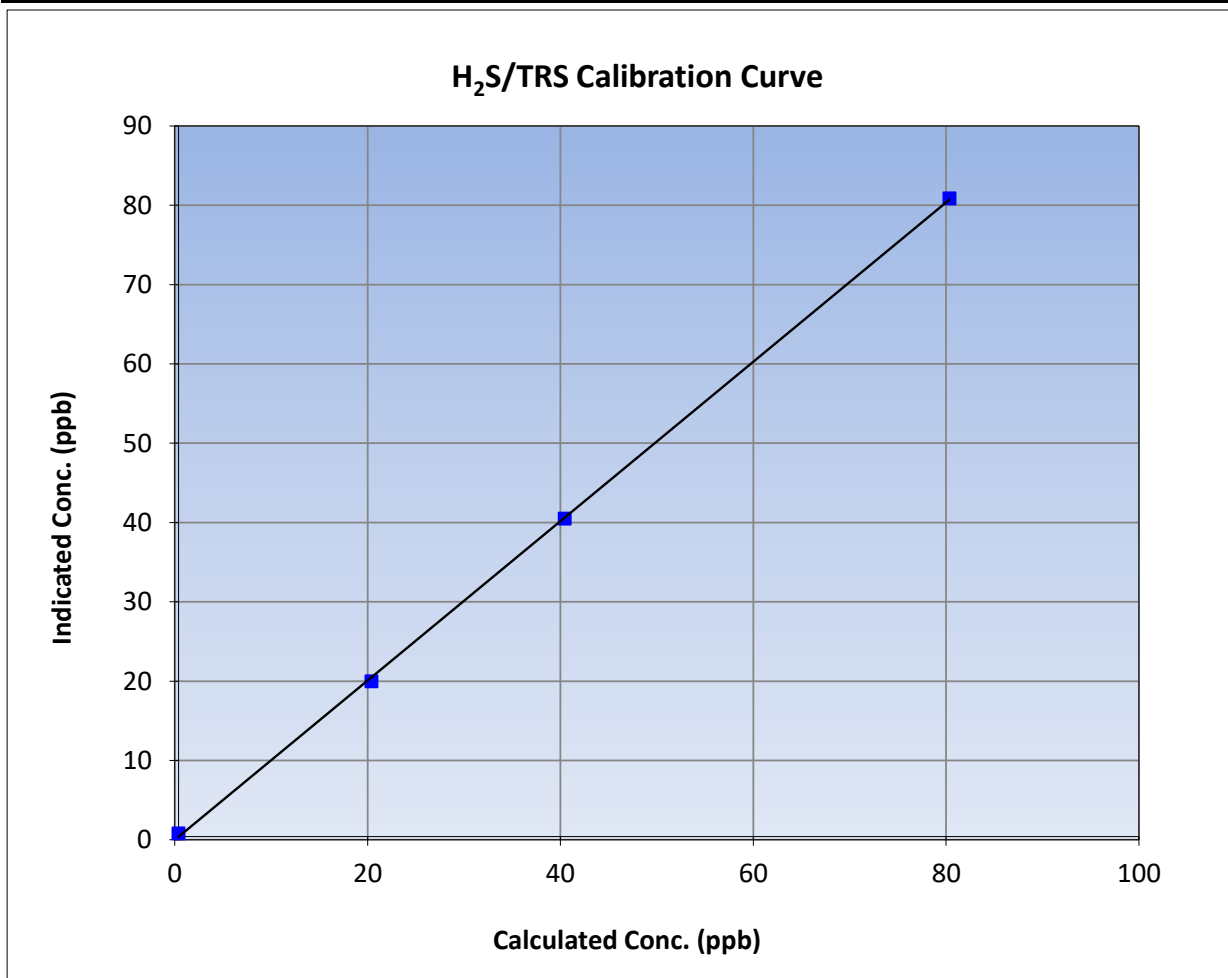
Version-11-2021

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 6, 2023 |
| Station Name:     | Anzac            | Station Number:       | AMS14           |
| Start Time (MST): | 7:55             | End Time (MST):       | 12:20           |
| Analyzer make:    | Thermo 43i-TLE   | Analyzer serial #:    | 1180540019      |

### Calibration Data

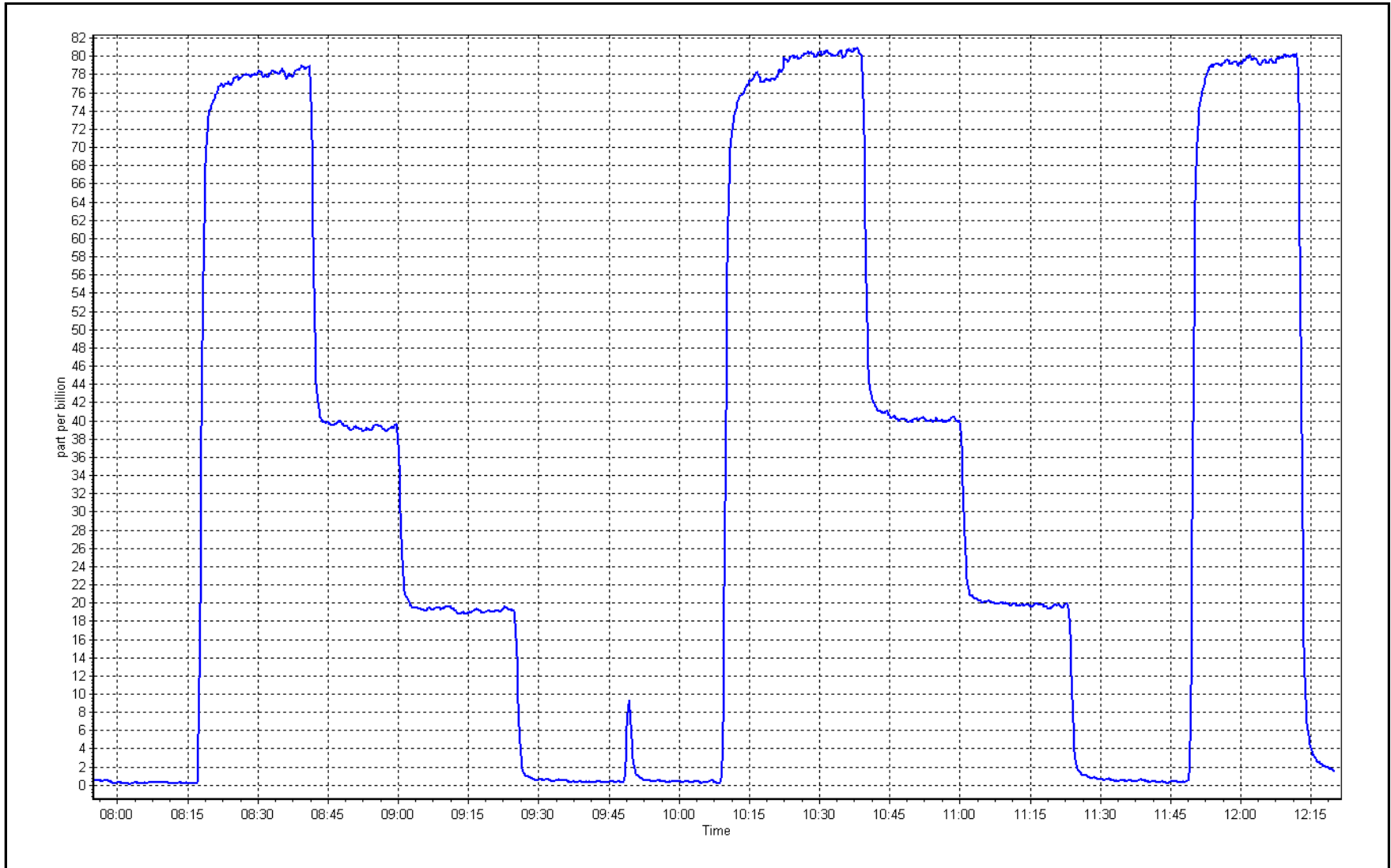
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999870  |             |
| 80.0                                | 80.5                               | 0.9933                    |                         |           | ≥0.995      |
| 40.0                                | 40.1                               | 0.9983                    | Slope                   | 1.004840  |             |
| 20.0                                | 19.6                               | 1.0212                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.021121 | +/-3        |



TRS Calibration Plot

Date: February 3, 2023

Location: Anzac







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Anzac             | Station number: | AMS 14           |
| Calibration Date: | February 21, 2023 | Last Cal Date:  | January 23, 2023 |
| Start time (MST): | 10:28             | End time (MST): | 13:01            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC279389  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.1 ppm |                             |                 |
| Removed Gas Cert:                           | NA        | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 499.3 ppm | CH <sub>4</sub> Equiv Conc. | 1068.8 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.1 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | API T700  | Serial Number:              | 5252            |
| ZAG make/model:                             | API 701H  | Serial Number:              | 357             |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1118148494 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.85E-04     | 3.85E-04      | NMHC SP Ratio:  | 4.46E-05      |
| CH <sub>4</sub> Retention time: | 12.00        | 12.00         | NMHC Peak Area: | 204554        |
|                                 |              |               |                 | 204554        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.1                 | 17.12                | 16.95               | 1.010                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.1                 | 17.12                | 16.92               | 1.012                      |
| second point          | 4960              | 40.0                 | 8.55                 | 8.45                | 1.012                      |
| third point           | 4980              | 20.0                 | 4.28                 | 4.19                | 1.020                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.1                 | 17.12                | 17.03               | 1.005                      |

| Average Correction Factor |       |                 |       | 1.015                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 16.95 | Prev response   | 17.13 | *% change -1.1%                            |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.1                 | 9.12                 | 9.04                                       | 1.009                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.1                 | 9.12                 | 9.02                                       | 1.011                      |
| second point              | 4960              | 40.0                 | 4.56                 | 4.49                                       | 1.015                      |
| third point               | 4980              | 20.0                 | 2.28                 | 2.22                                       | 1.026                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.1                 | 9.12                 | 9.08                                       | 1.005                      |
| Average Correction Factor |                   |                      |                      |  | 1.017                      |
| Baseline Corr AF:         | 9.04              | Prev response        | 9.03                 | *% change                                  | 0.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.1                 | 8.00                 | 7.91                                       | 1.011                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.1                 | 8.00                 | 7.99                                       | 1.001                      |
| second point              | 4960              | 40.0                 | 3.99                 | 3.96                                       | 1.009                      |
| third point               | 4980              | 20.0                 | 2.00                 | 1.97                                       | 1.014                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.1                 | 8.00                 | 7.95                                       | 1.006                      |
| Average Correction Factor |                   |                      |                      |  | 1.008                      |
| Baseline Corr AF:         | 7.91              | Prev response        | 8.10                 | *% change                                  | -2.4%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.001116     | 0.988889      |
| THC Cal Offset:             | -0.010387    | -0.013842     |
| CH <sub>4</sub> Cal Slope:  | 1.012466     | 0.999568      |
| CH <sub>4</sub> Cal Offset: | 0.001594     | -0.016046     |
| NMHC Cal Slope:             | 0.991290     | 0.989676      |
| NMHC Cal Offset:            | -0.011980    | -0.015788     |

Notes: No Maintenance or adjustments done.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## THC Calibration Summary

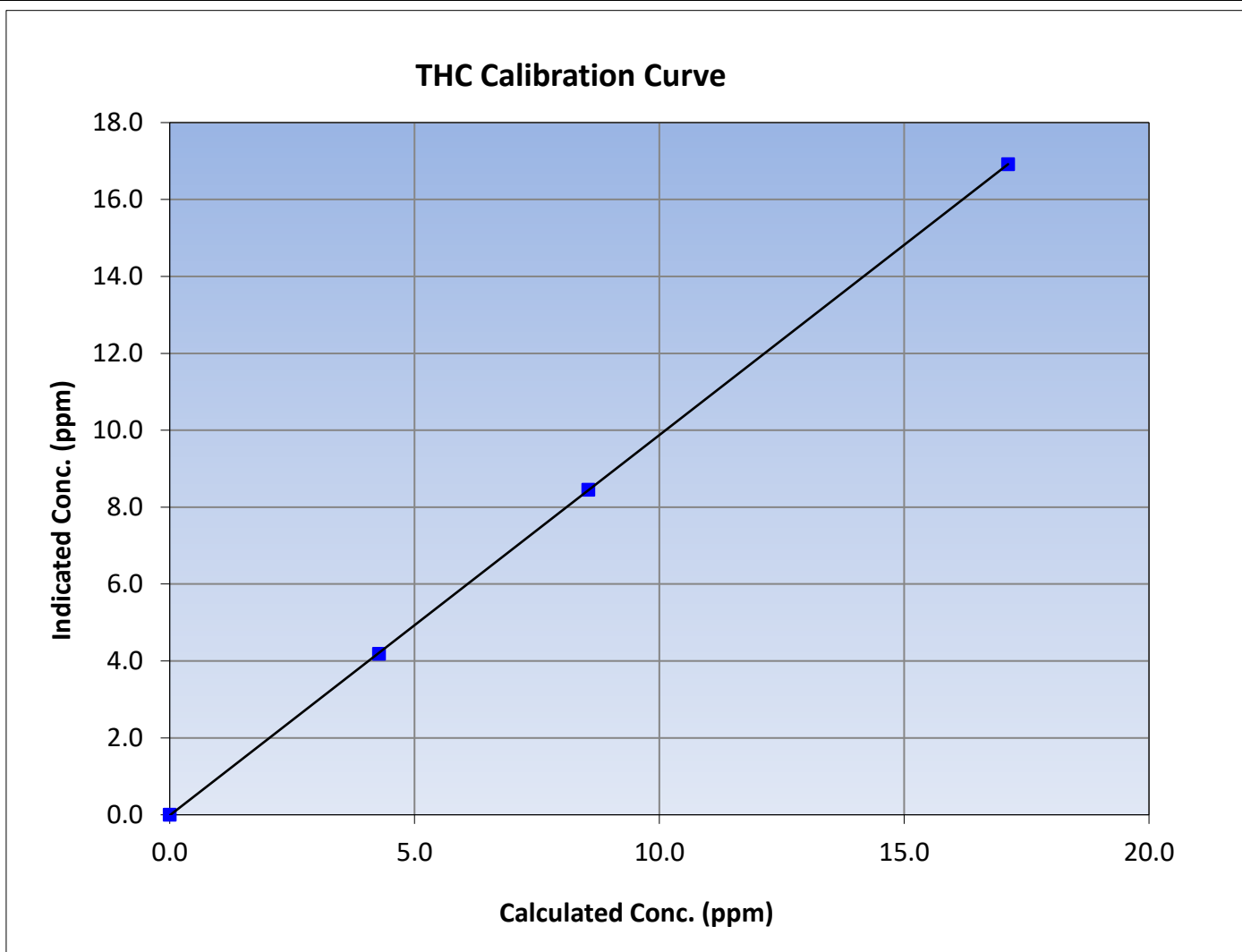
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 23, 2023 |
| Station Name:     | Anzac             | Station Number:       | AMS 14           |
| Start Time (MST): | 10:28             | End Time (MST):       | 13:01            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1118148494       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995  | $\geq 0.995$  |       |          |             |
| 17.12                               | 16.92                              | 1.0120                    |                         |           |               |       |          |             |
| 8.55                                | 8.45                               | 1.0119                    |                         |           |               | Slope | 0.988889 | 0.90 - 1.10 |
| 4.28                                | 4.19                               | 1.0204                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.013842 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

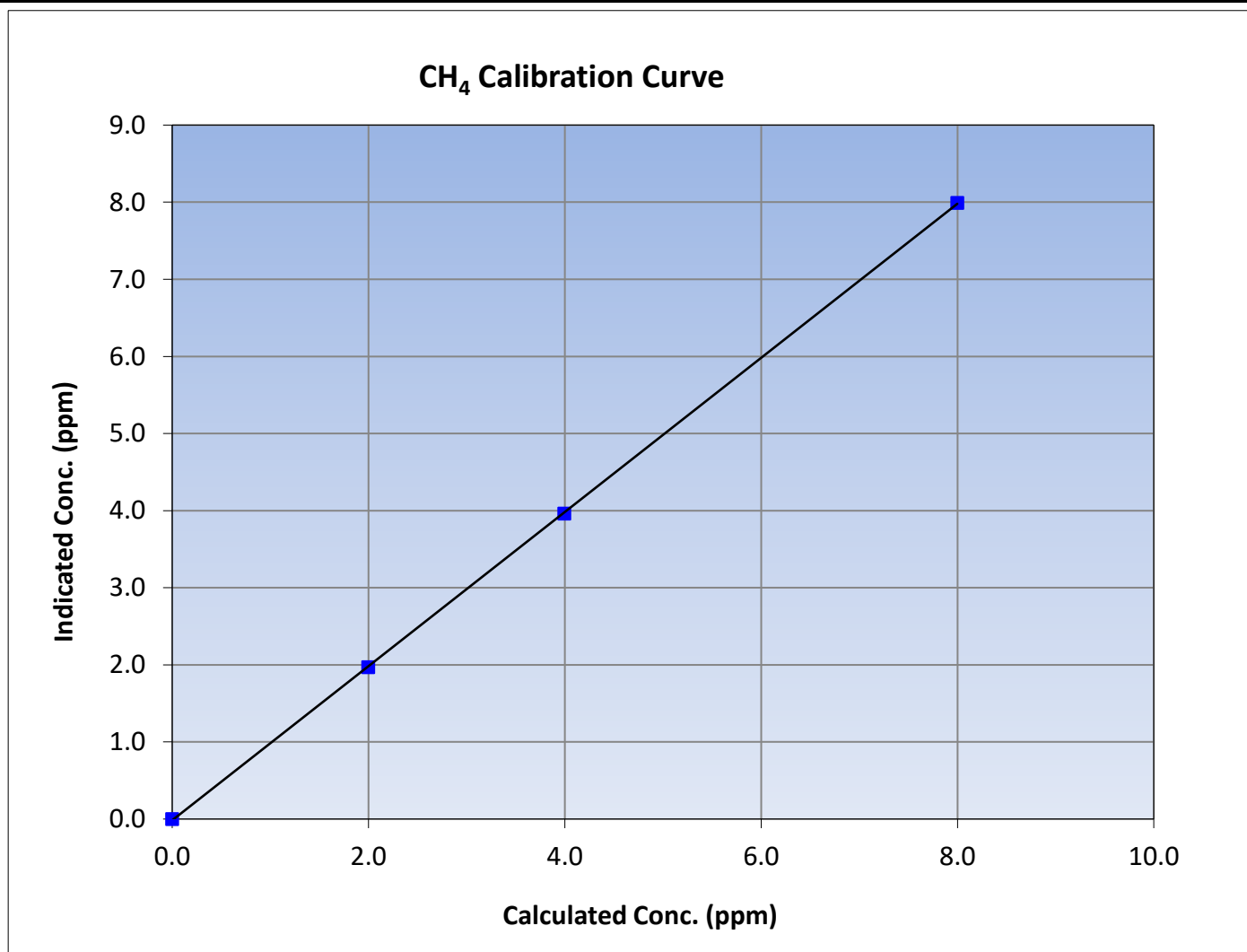
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 23, 2023 |
| Station Name:     | Anzac             | Station Number:       | AMS 14           |
| Start Time (MST): | 10:28             | End Time (MST):       | 13:01            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1118148494       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999978  | ≥0.995        |
| 8.00                                | 7.99                               | 1.0011                    |                         |           |               |
| 3.99                                | 3.96                               | 1.0087                    |                         |           |               |
| 2.00                                | 1.97                               | 1.0138                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.999568  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.016046 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

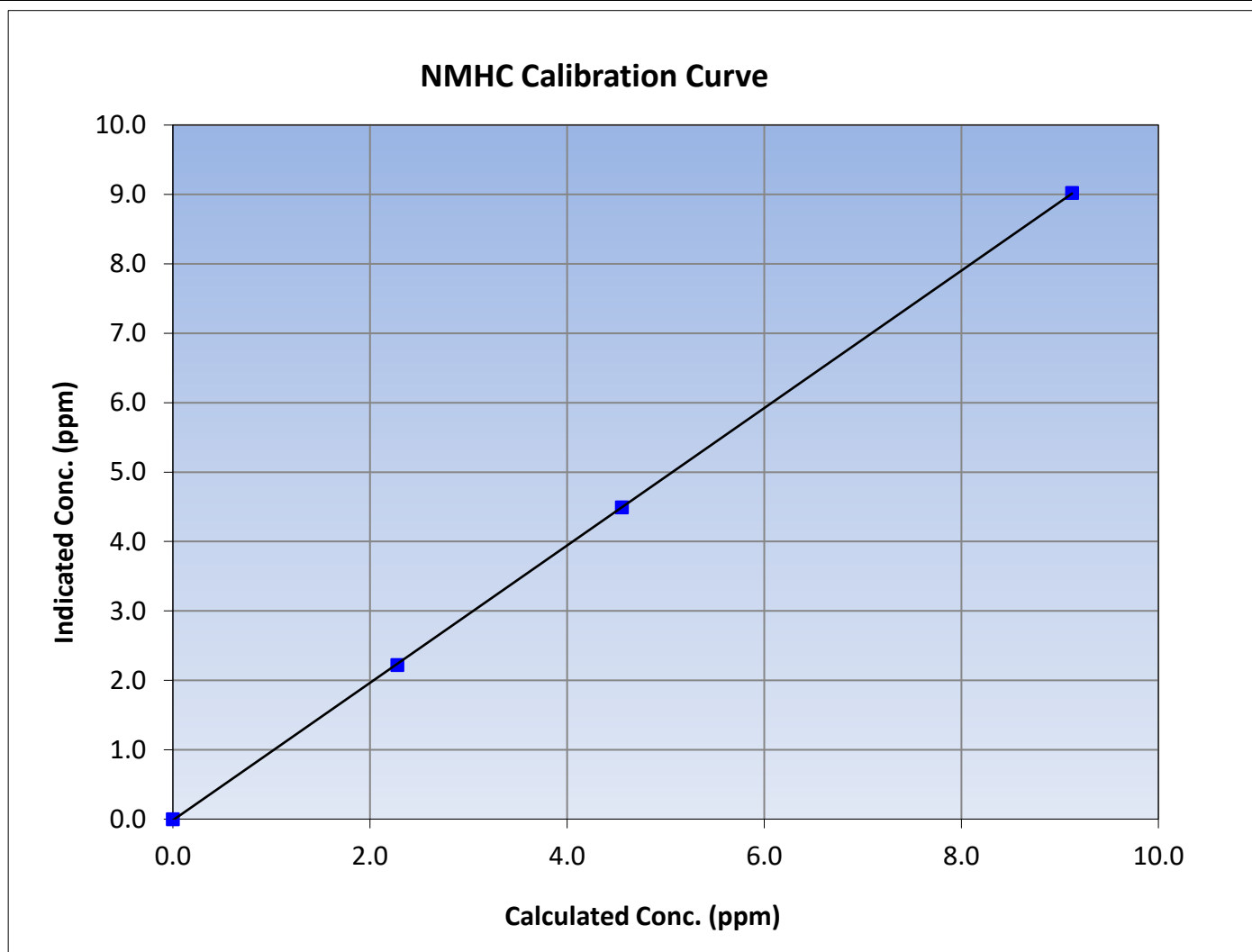
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 23, 2023 |
| Station Name:     | Anzac             | Station Number:       | AMS 14           |
| Start Time (MST): | 10:28             | End Time (MST):       | 13:01            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1118148494       |

### Calibration Data

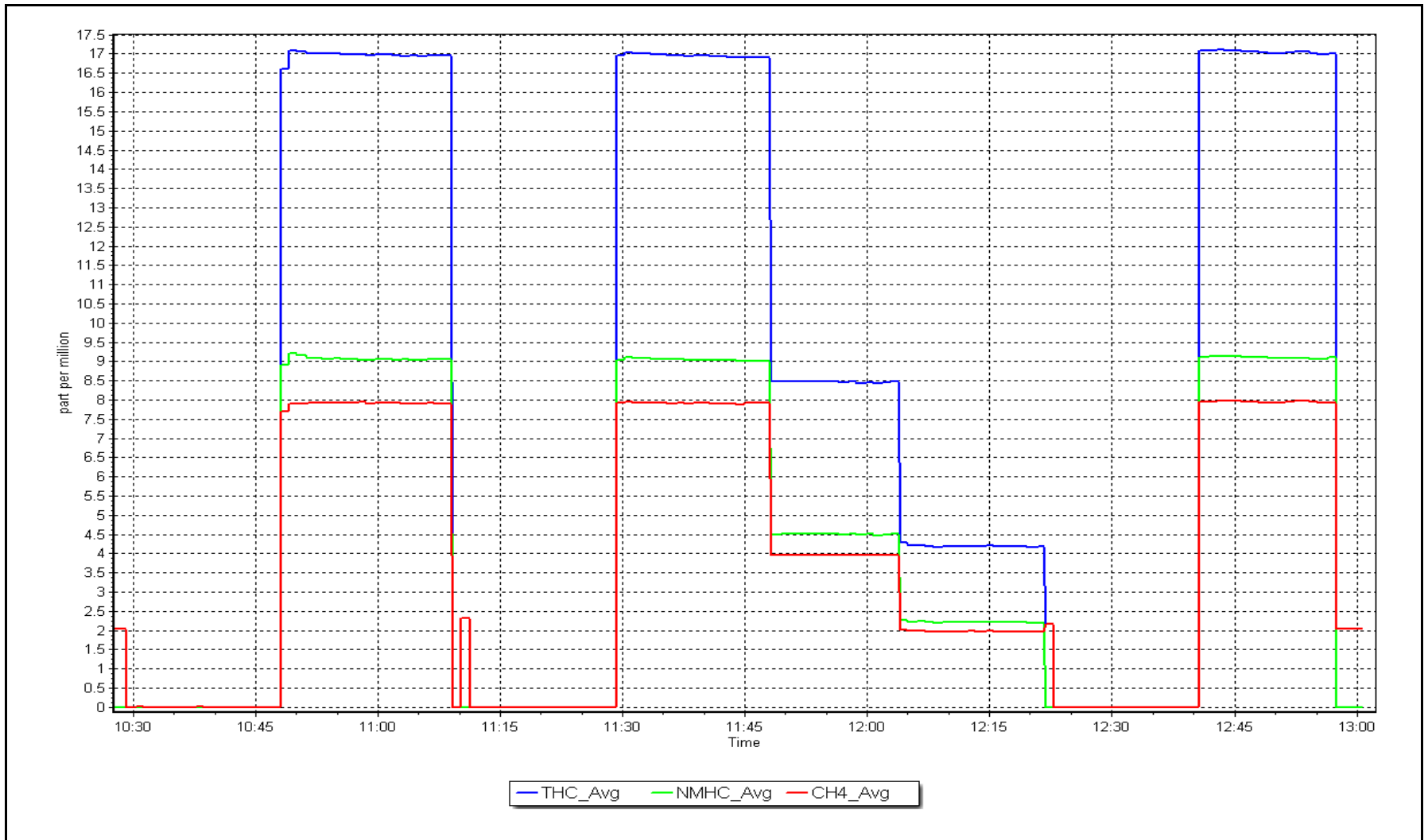
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999985  | $\geq 0.995$  |       |          |             |
| 9.12                                | 9.02                               | 1.0115                    |                         |           |               |       |          |             |
| 4.56                                | 4.49                               | 1.0147                    |                         |           |               | Slope | 0.989676 | 0.90 - 1.10 |
| 2.28                                | 2.22                               | 1.0262                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.015788 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 21, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Anzac  
Calibration Date: February 2, 2023  
Start time (MST): 7:45  
Reason: Routine  
Station number: AMS 14  
Last Cal Date: January 4, 2023  
End time (MST): 12:33

### Calibration Standards

NO Gas Cylinder #: T2Y1P8D  
NOX Cal Gas Conc: 50.92 ppm  
Removed Cylinder #: NA  
Removed Gas NOX Conc: 50.92 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API 701H  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 50.05 ppm  
Removed Gas Exp Date: NA  
Removed Gas NO Conc: 50.05 ppm  
NO gas Diff:  
Serial Number: 5239  
Serial Number: 357

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1426262592

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.361        | 1.361         | NO bkgnd or offset:  | 3.7          | 3.7           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 3.7          | 3.7           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 164.2        | 163.3         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.999876     | 1.011937      |
| NO <sub>x</sub> Cal Offset: | -0.745750    | -0.743109     |
| NO Cal Slope:               | 1.001401     | 1.013337      |
| NO Cal Offset:              | -1.789671    | -1.947043     |
| NO <sub>2</sub> Cal Slope:  | 1.002246     | 1.000011      |
| NO <sub>2</sub> Cal Offset: | 0.204305     | 0.089892      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.1  | ----  | ----   |
| as found span             | 4921                      | 78.6                        | 800.5   | 786.8                                  | 13.7  | 811.8  | 796.3                                 | 15.5   | 0.9861  | 0.9881   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4921                      | 78.6                        | 800.5   | 786.8                                  | 13.7  | 809.5  | 796.2                                 | 13.4   | 0.9889  | 0.9883   |
| second point              | 4961                      | 39.3                        | 400.2   | 393.4                                  | 6.8   | 404.5  | 396.1                                 | 8.4  | 0.9894  | 0.9931   |
| third point               | 4980                      | 19.6                        | 199.6   | 196.2                                  | 3.4   | 200.1  | 194.8                                 | 5.3  | 0.9976  | 1.0072   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | -0.1                                  | 0.1  | ----  | ----   |
| as left span              | 4921                      | 78.6                        | 800.5   | 389.3                                  | 411.2   | 806.2  | 395.5                                 | 410.7  | 0.9930  | 0.9844   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9920  | 0.9962   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 812.0 ppb | NO = 796.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 1.5% |
| Previous Response    | NO <sub>x</sub> = 799.7 ppb | NO = 786.2 ppb |  | *Percent Change                  | NO = 1.3%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 790.4                                      | 392.9                                 | 411.2   | 411.3  | 0.9997   | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 790.4                                      | 584.6                                 | 219.5   | 219.5  | 0.9999   | 100.0%   |
| 3rd GPT point (100 ppb O3)       | 790.4                                      | 686.5                                 | 117.6   | 117.7  | 0.9990   | 100.1%   |
| Average Correction Factor        |  |                                       |   |  | 0.9995   | 100.0%   |

Notes:

No maintenance or adjustments done.

Melissa Lemay





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

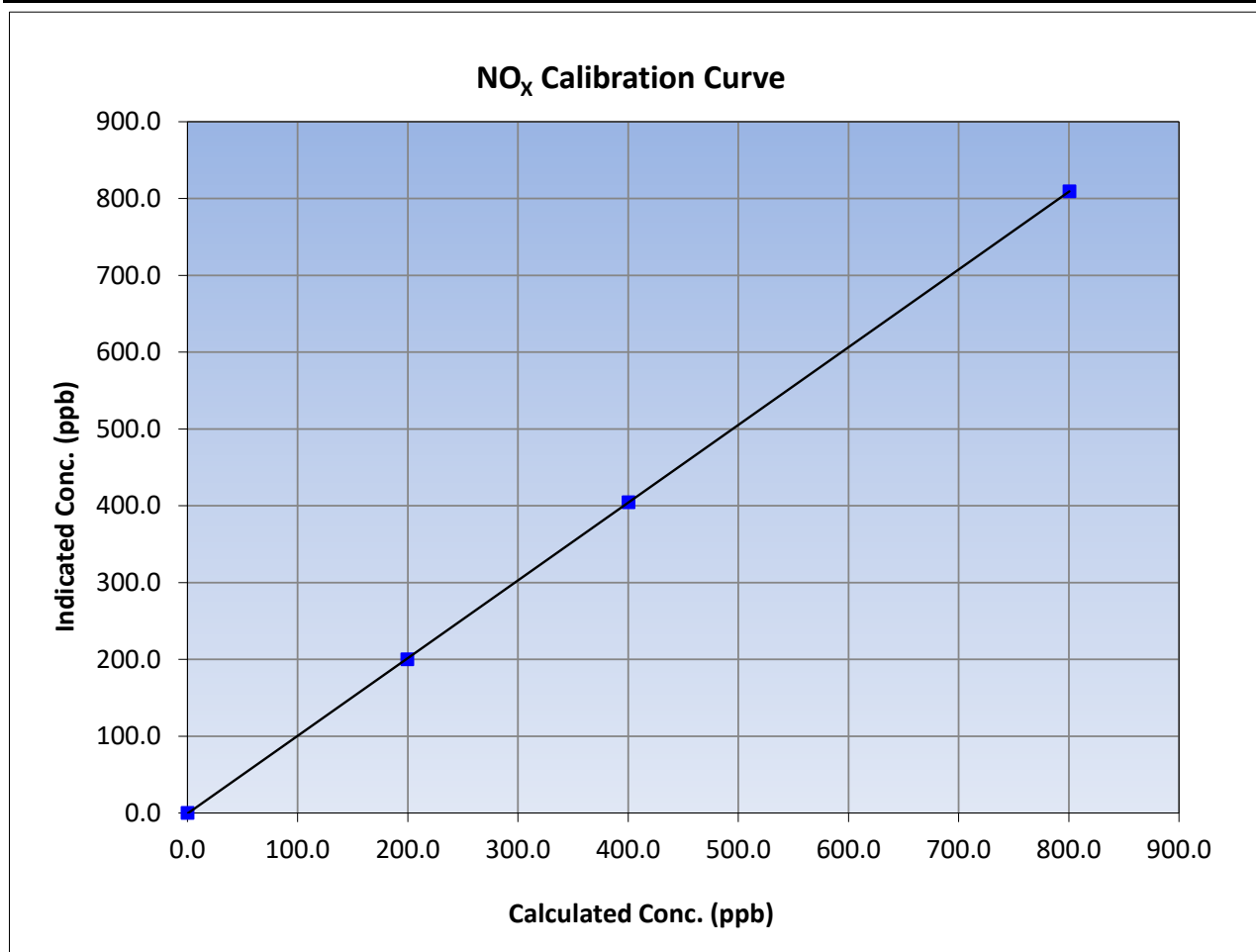
Version-04-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Anzac            | Station Number:       | AMS 14          |
| Start Time (MST): | 7:45             | End Time (MST):       | 12:33           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.5                               | 809.5                              | 0.9889                    |   |                                |
| 400.2                               | 404.5                              | 0.9894                    |   |                                |
| 199.6                               | 200.1                              | 0.9976                    |   |                                |
|                                     |                                    |                           | 0.999994                                      |                                |
|                                     |                                    |                           | 1.011937                                      |                                |
|                                     |                                    |                           | -0.743109                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

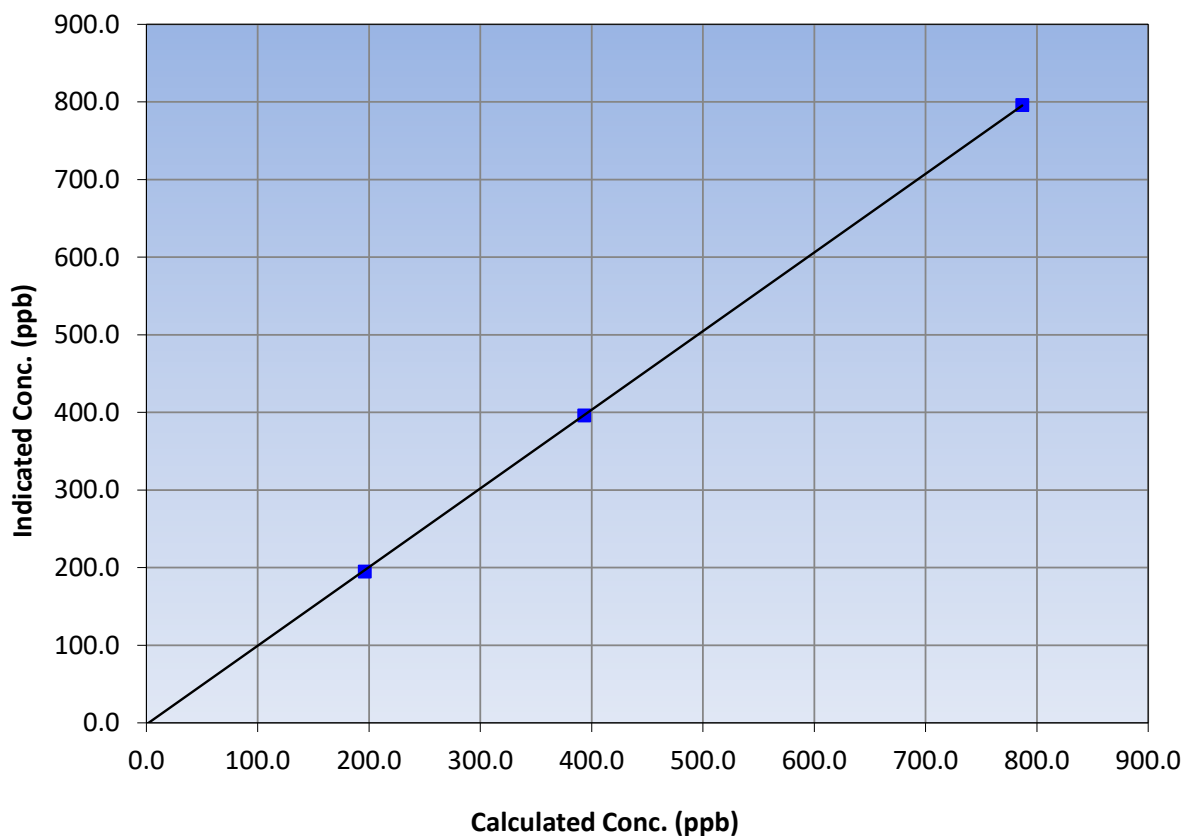
### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Anzac            | Station Number:       | AMS 14          |
| Start Time (MST): | 7:45             | End Time (MST):       | 12:33           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995    |             |
| 786.8                               | 796.2                              | 0.9883                    |                         |           |             |
| 393.4                               | 396.1                              | 0.9931                    |                         |           |             |
| 196.2                               | 194.8                              | 1.0072                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 1.013337  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.947043 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

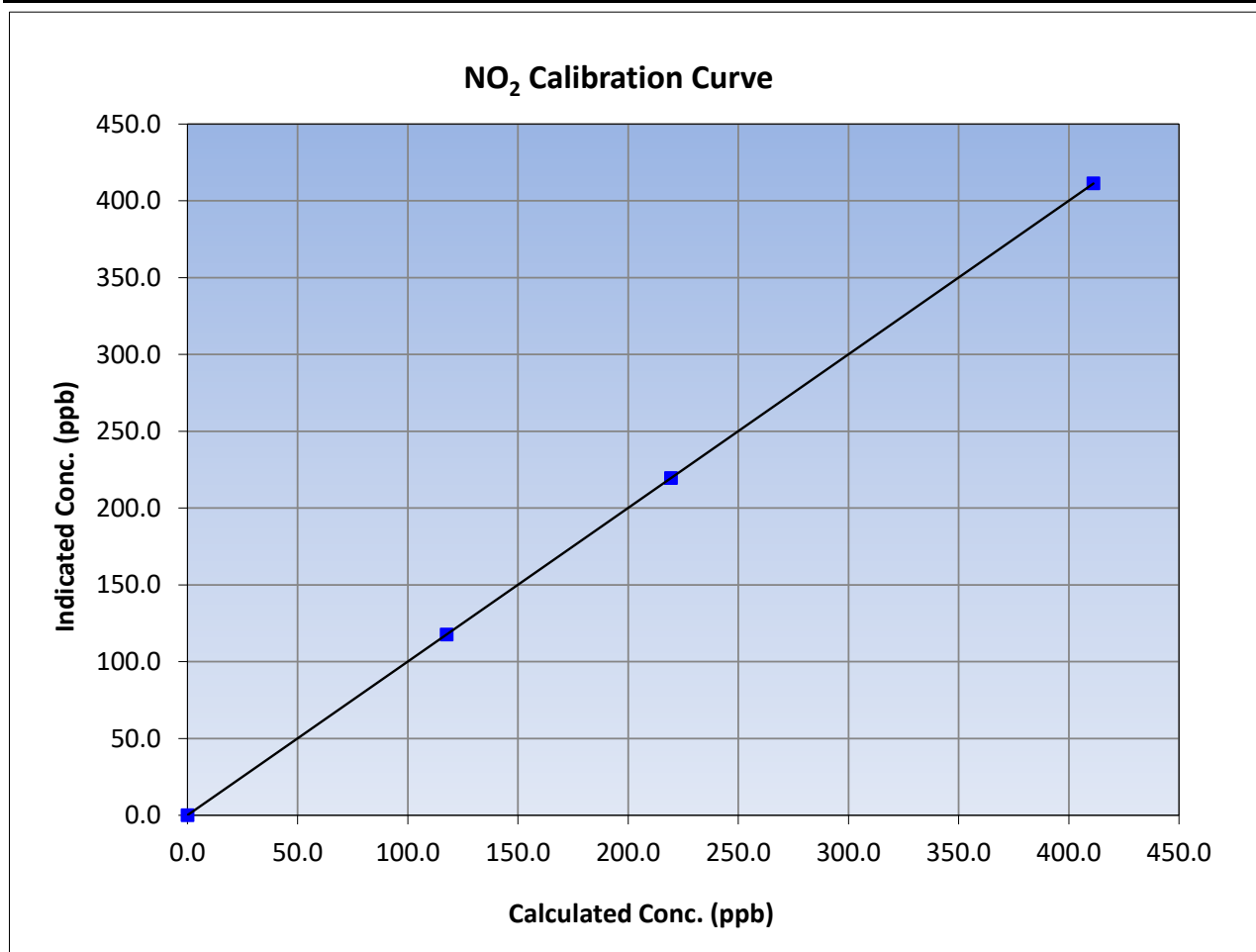
Version-04-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Anzac            | Station Number:       | AMS 14          |
| Start Time (MST): | 7:45             | End Time (MST):       | 12:33           |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1426262592      |

### Calibration Data

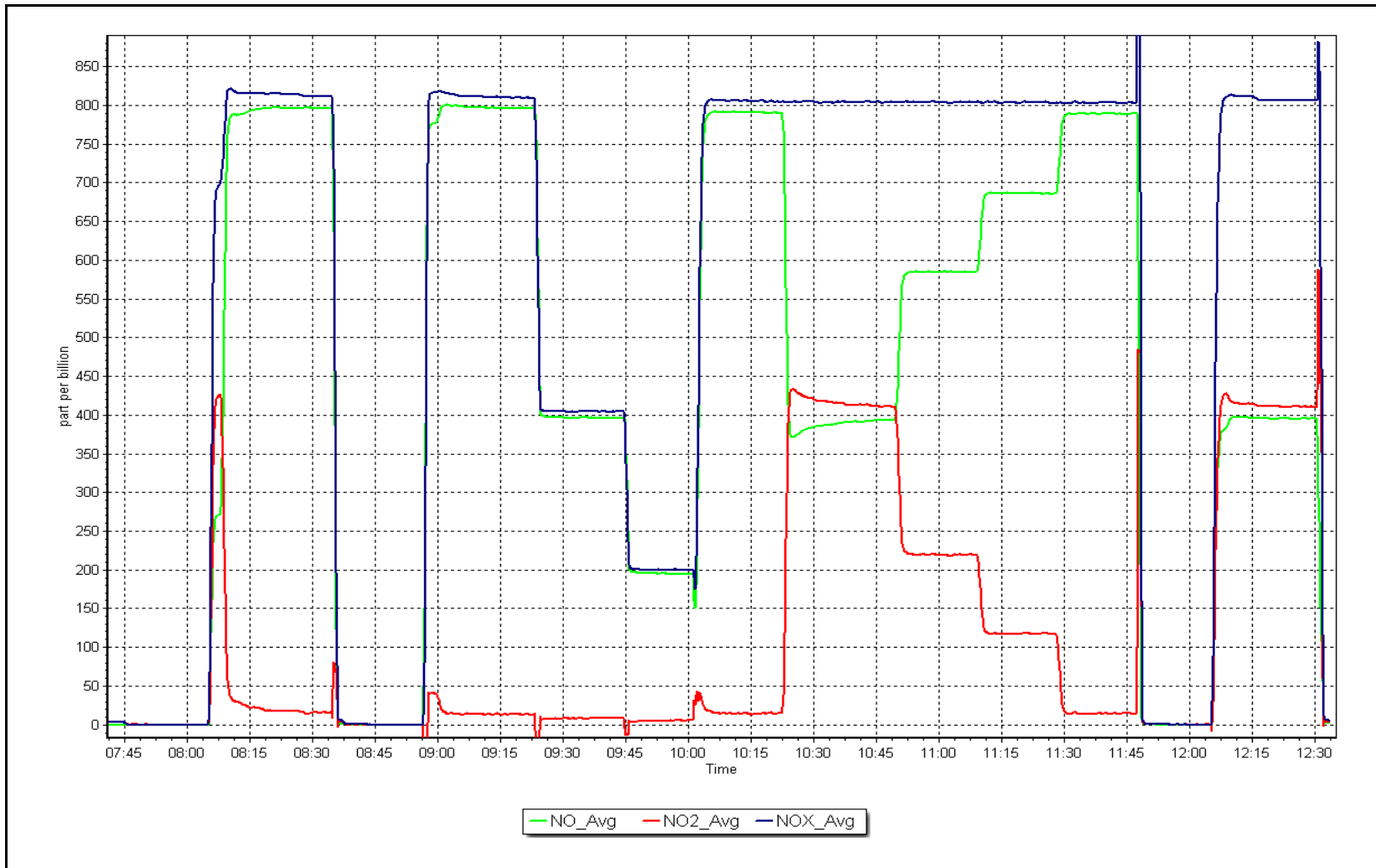
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 411.2                               | 411.3                              | 0.9997                    |                         |               |             |
| 219.5                               | 219.5                              | 0.9999                    |                         |               |             |
| 117.6                               | 117.7                              | 0.9990                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 1.000011      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.089892      | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: February 2, 2023

Location: Anzac







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

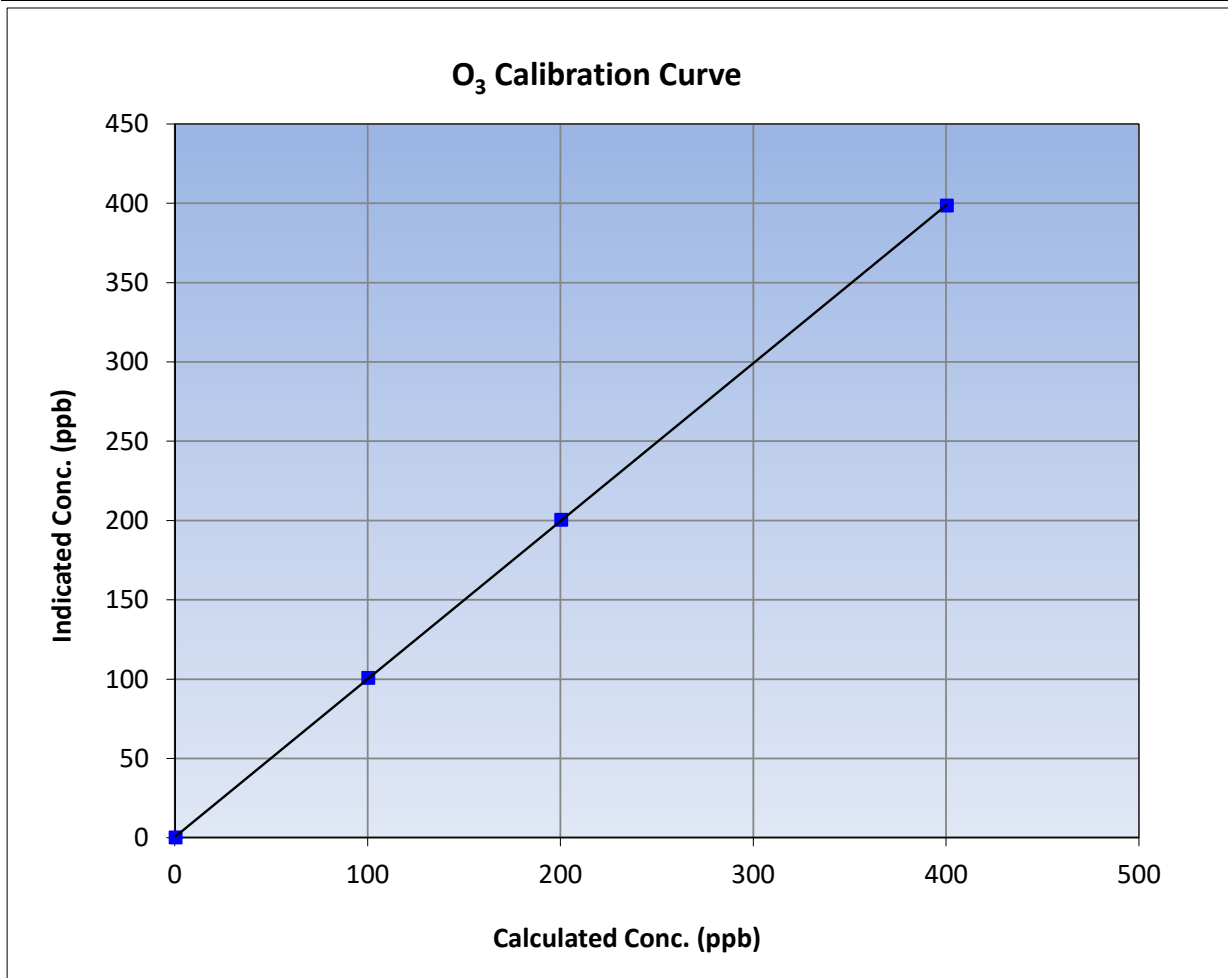
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 21, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Anzac             | Station Number:       | AMS14            |
| Start Time (MST): | 7:44              | End Time (MST):       | 10:30            |
| Analyzer make:    | Thermo 49i        | Analyzer serial #:    | 1426262595       |

### Calibration Data

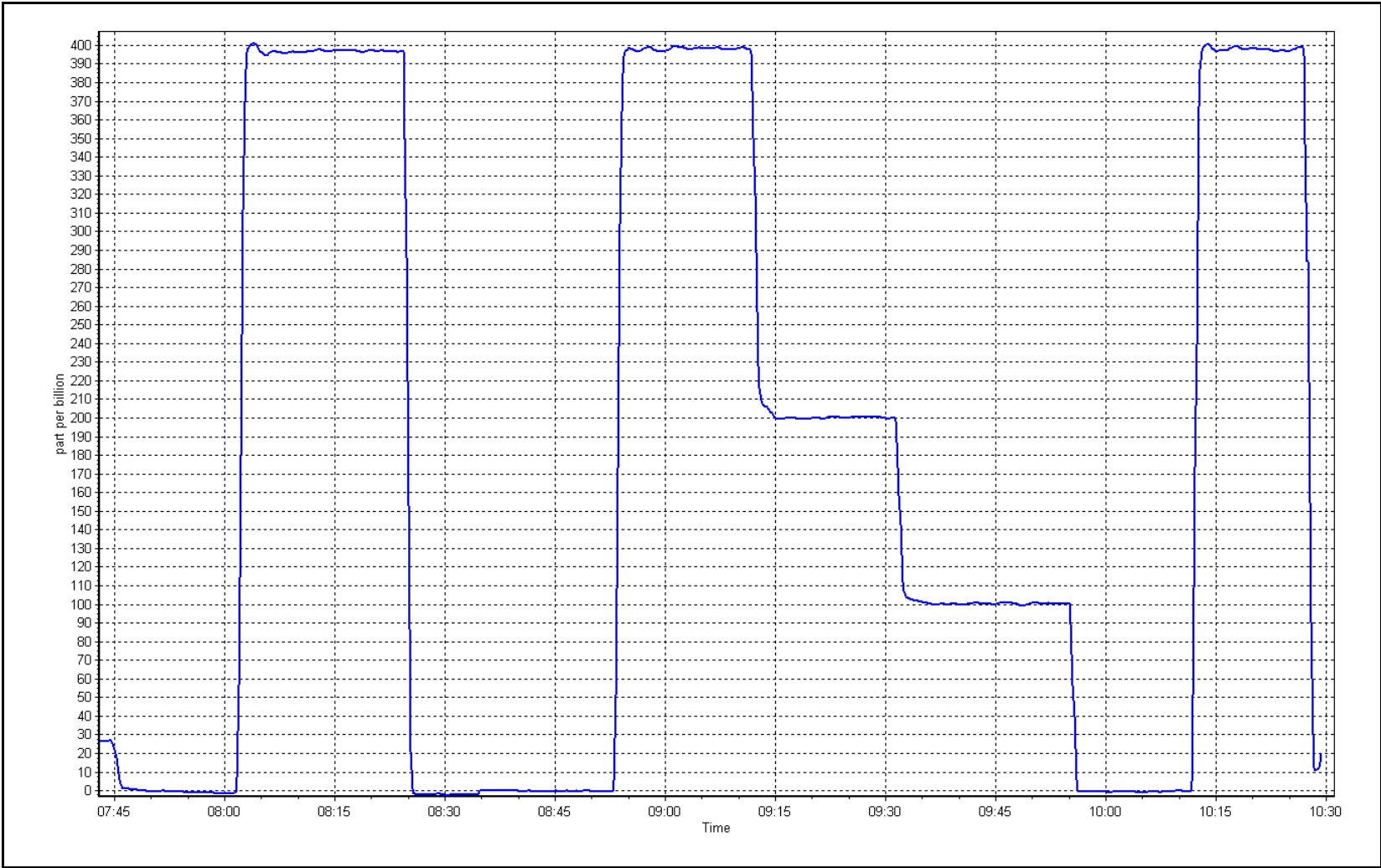
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | 0.999987 | ≥0.995      |
| 400.0                               | 398.3                              | 1.0043                    |                         |          |             |
| 200.0                               | 200.2                              | 0.9990                    | Slope                   | 0.995743 | 0.90 - 1.10 |
| 100.0                               | 100.4                              | 0.9960                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.420000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 21, 2023

Location: Anzac





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Anzac Station number: AMS 14  
 Calibration Date: February 22, 2023 Last Cal Date: January 24, 2023  
 Start time (MST): 8:48 End time (MST): 9:15

Analyzer Make: API T640 S/N: 825  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Alicat FP-25 S/N: 388753  
 Temp/RH standard: Alicat FP-25 S/N: 388753

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -25.3    | -25.6    | -25.3   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 727.7    | 728.7    | 727.7   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5        | 5.2      | 5       | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 22, 2023 Last Cal Date: January 24, 2023  
 PM w/o HEPA: 3.4 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: December 14, 2022 <0.2 ug/m3  
 Disposable Filter Changed: December 14, 2022

### Annual Maintenance

Date Sample Tube Cleaned: June 21, 2022  
 Date RH/T Sensor Cleaned: June 21, 2022

Notes: No adjustments done. Inlet Head cleaned.

Calibration by: Melissa Lemay





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS17  
WAPASU  
FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

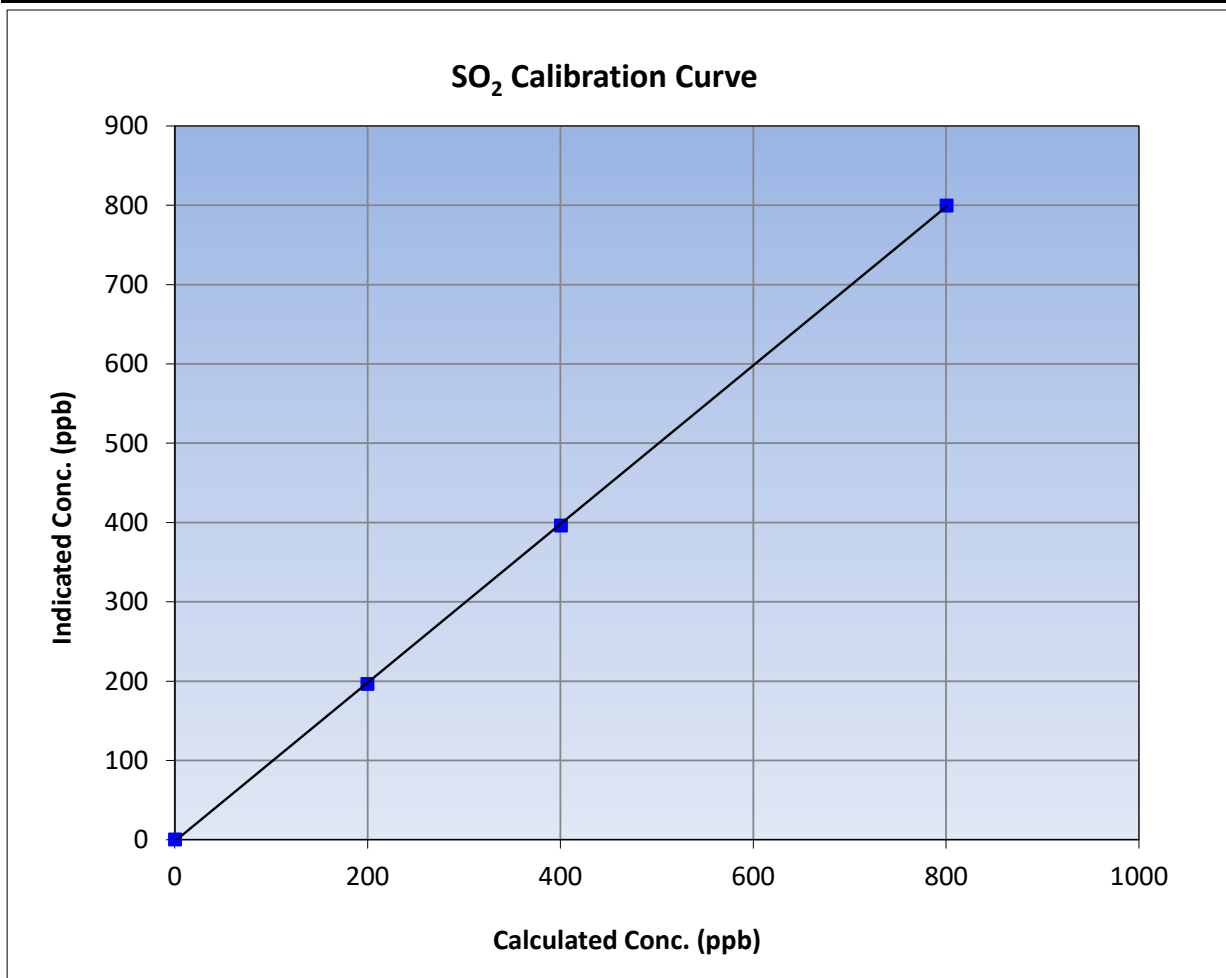
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17            |
| Start Time (MST): | 11:04             | End Time (MST):       | 14:08            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1218153459       |

### Calibration Data

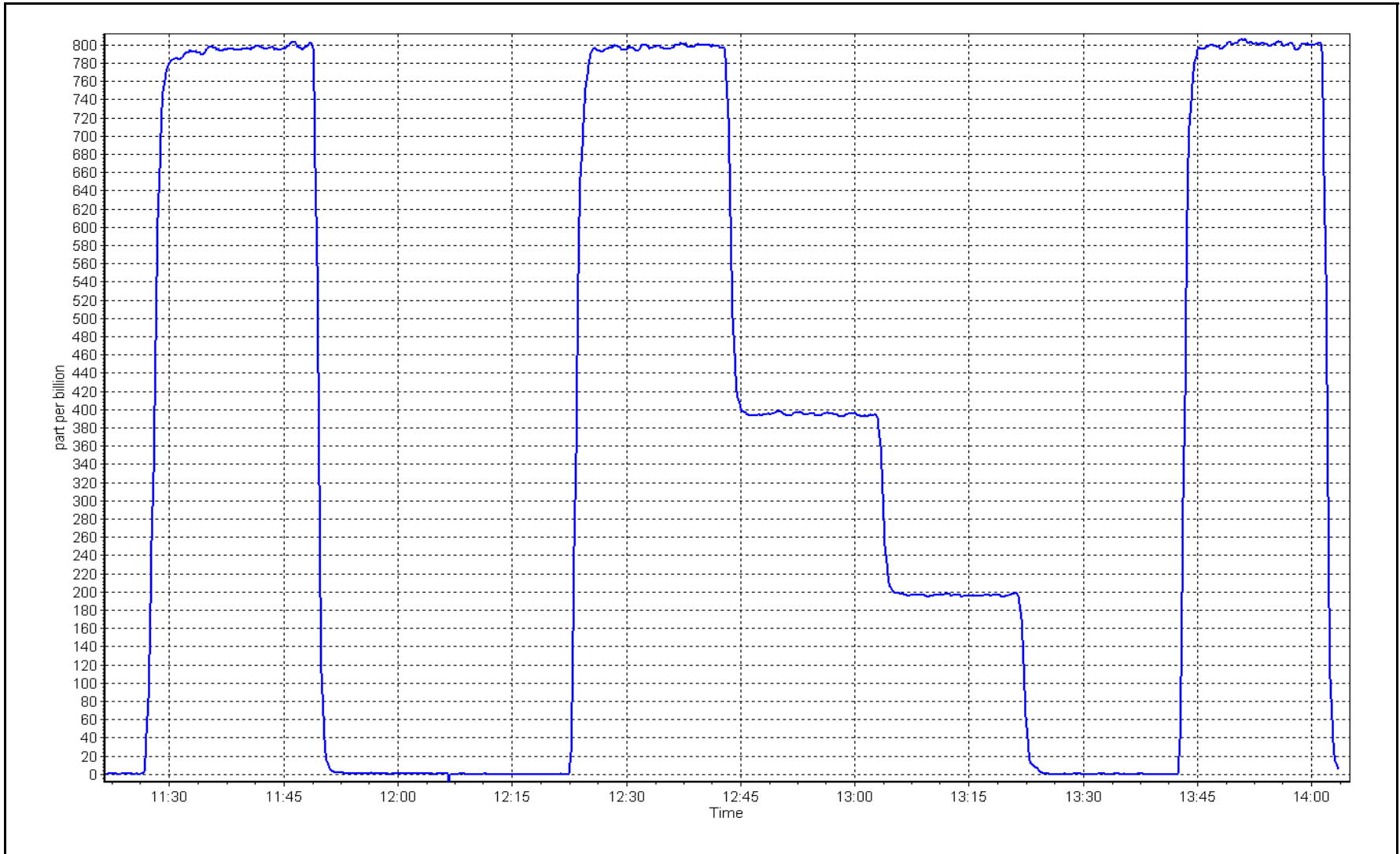
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999962      |             |
| 800.0                                  | 799.5                                 | 1.0006                       |                         |               | ≥0.995      |
| 400.0                                  | 395.8                                 | 1.0107                       | Slope                   | 1.000068      |             |
| 199.5                                  | 196.3                                 | 1.0164                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -1.979730     | +/-30       |



SO2 Calibration Plot

Date: February 14, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Wapasu Station number: AMS17  
 Calibration Date: February 16, 2023 Last Cal Date: January 5, 2023  
 Start time (MST): 10:28 End time (MST): 14:50  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.076 ppm Cal Gas Exp Date: September 16, 2024  
 Cal Gas Cylinder #: CC511852  
 Removed Cal Gas Conc: 5.076 ppm Rem Gas Exp Date: n/a  
 Removed Gas Cyl #: n/a Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 2449  
 ZAG Make/Model: API T701H Serial Number: 359

### Analyzer Information

Analyzer make: Thermo 450i Analyzer serial #: 1218153583  
 Converter make: n/a Converter serial #: n/a  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 1.002282     | 0.995568      | Backgd or Offset: | 12.9 13.0     |
| Calibration intercept: | 0.320801     | 0.080792      | Coeff or Slope:   | 1.085 1.085   |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----   |
| as found span         | 4921                          | 78.8                        | 80.0                                | 80.4                               | 0.999  |
| as found 2nd point    | 4961                          | 39.4                        | 40.0                                | 40.1                               | 1.005  |
| as found 3rd point    | 4980                          | 19.7                        | 20.0                                | 20.1                               | 1.010  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4921                          | 78.8                        | 80.0                                | 79.8                               | 1.003   |
| second point                            | 4961                          | 39.4                        | 40.0                                | 39.8                               | 1.005   |
| third point                             | 4980                          | 19.7                        | 20.0                                | 19.9                               | 1.005   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| as left span                            | 4921                          | 78.8                        | 80.0                                | 79.3                               | 1.009   |
| SO2 Scrubber Check                      | 4921                          | 79.4                        | 800.0                               | -0.1                               | ----  |
| Date of last scrubber change:           | n/a                           |                             |                                     | Ave Corr Factor                    | 1.004   |
| Date of last converter efficiency test: | n/a                           |                             |                                     |                                    | efficiency  |

Baseline Corr As found: 80.1 Prev response: 80.50 \*% change: -0.5%  
 Baseline Corr 2nd AF pt: 39.8 AF Slope: 1.001854 AF Intercept: 0.160796  
 Baseline Corr 3rd AF pt: 19.8 AF Correlation: 0.999985

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

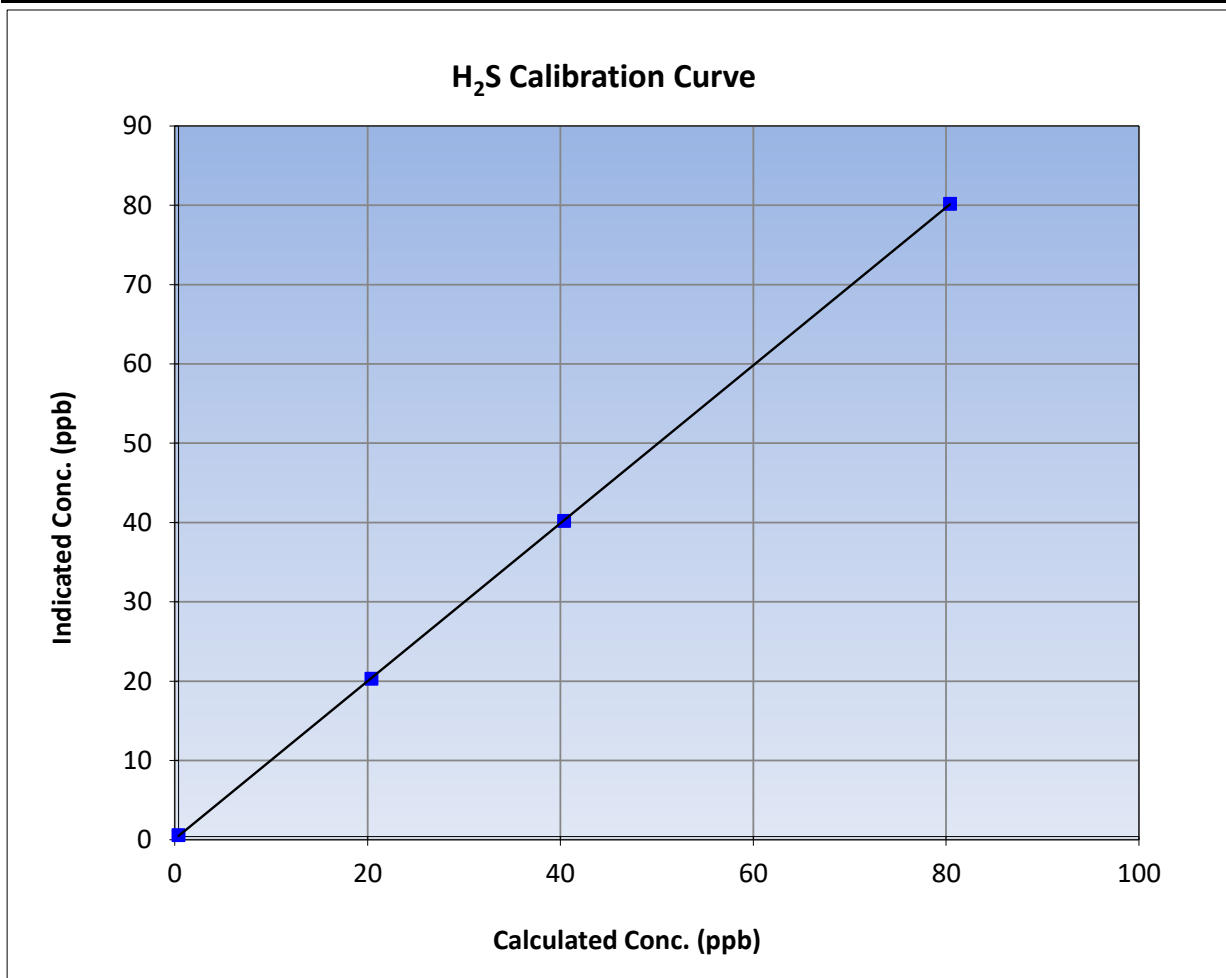
Version-11-2021

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 5, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17           |
| Start Time (MST): | 10:28             | End Time (MST):       | 14:50           |
| Analyzer make:    | Thermo 450i       | Analyzer serial #:    | 1218153583      |

### Calibration Data

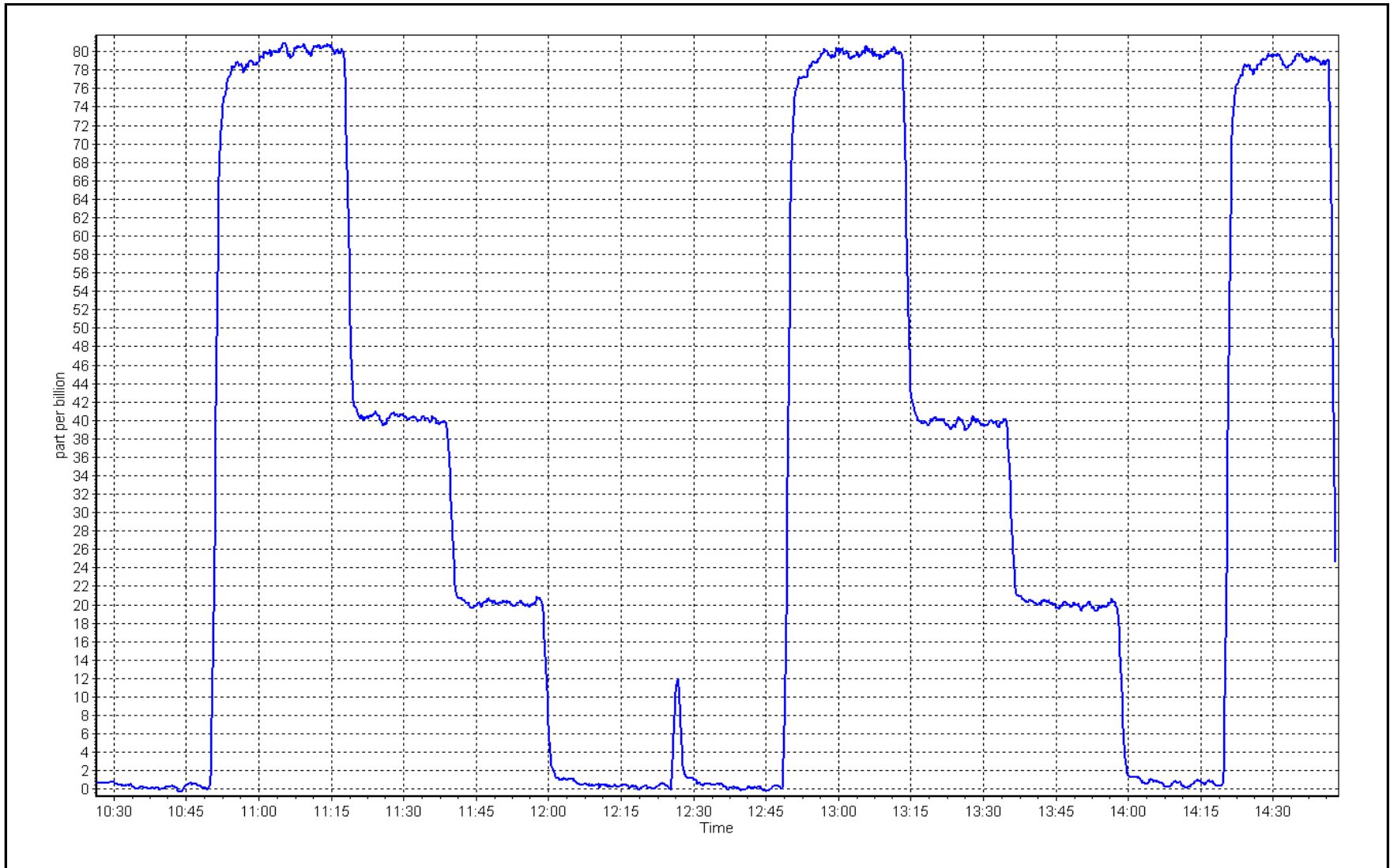
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999989 | ≥0.995      |
| 80.0                                | 79.8                               | 1.0025                    |                         |          |             |
| 40.0                                | 39.8                               | 1.0049                    | Slope                   | 0.995568 | 0.90 - 1.10 |
| 20.0                                | 19.9                               | 1.0051                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.080792 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 16, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Wapasu            | Station number: | AMS17            |
| Calibration Date: | February 14, 2023 | Last Cal Date:  | January 10, 2023 |
| Start time (MST): | 11:04             | End time (MST): | 14:08            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |                  |                      |                  |
|------------------------|------------------|----------------------|------------------|
| Gas Cert Reference:    | ALM066507        | Cal Gas Expiry Date: | January 12, 2029 |
| CH4 Cal Gas Conc.      | <u>503.5</u> ppm | CH4 Equiv Conc.      | 1076.3 ppm       |
| C3H8 Cal Gas Conc.     | <u>208.3</u> ppm |                      |                  |
| Removed Gas Cert:      | n/a              | Removed Gas Expiry:  | n/a              |
| Removed CH4 Conc.      | <u>503.5</u> ppm | CH4 Equiv Conc.      | 1076.3 ppm       |
| Removed C3H8 Conc.     | <u>208.3</u> ppm | Diff between cyl:    |                  |
| Calibrator Make/Model: | API T700         | Serial Number:       | 2449             |
| ZAG Make/Model:        | API 701H         | Serial Number:       | 359              |

### Analyzer Information

Analyzer make: Thermo 51i-LT                      Analyzer serial #: 1218153352  
 Analyzer Range: 0 - 20 ppm

|                        |              |               |              |              |               |
|------------------------|--------------|---------------|--------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |              | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.003975     | 1.011424      | Background:  | 2.950        | 3.090         |
| Calibration intercept: | 0.033881     | -0.037301     | Coefficient: | 4.292        | 4.324         |

### THC Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.00                                | 0.11                               | ----  |
| as found span             | 4921                          | 79.4                        | 17.09                               | 17.30                              | 0.988   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.00                                | 0.01                               | ----  |
| high point                | 4921                          | 79.4                        | 17.09                               | 17.29                              | 0.989   |
| second point              | 4960                          | 39.7                        | 8.55                                | 8.54                               | 1.000   |
| third point               | 4980                          | 19.8                        | 4.26                                | 4.25                               | 1.002   |
| as left zero              | 5000                          | 0.0                         | 0.00                                | -0.01                              | ----  |
| as left span              | 4920                          | 79.4                        | 17.09                               | 17.36                              | 0.985   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.997   |
| Baseline Corr As found:   | 17.20                         | Previous response           | 17.19                               | *% change                          | 0.0%  |
| Baseline Corr 2nd AF pt:  | NA                            | AF Slope:                   |                                     | AF Intercept:                      |   |
| Baseline Corr 3rd AF pt:  | NA                            | AF Correlation:             |                                     |                                    |   |

\* = > +/-5% change initiates investigation

Notes:    Sample inlet filter changed after as founds. Adjusted the zero only.

Calibration Performed By:                      Karan Pandit





# Wood Buffalo Environmental Association

## THC Calibration Summary

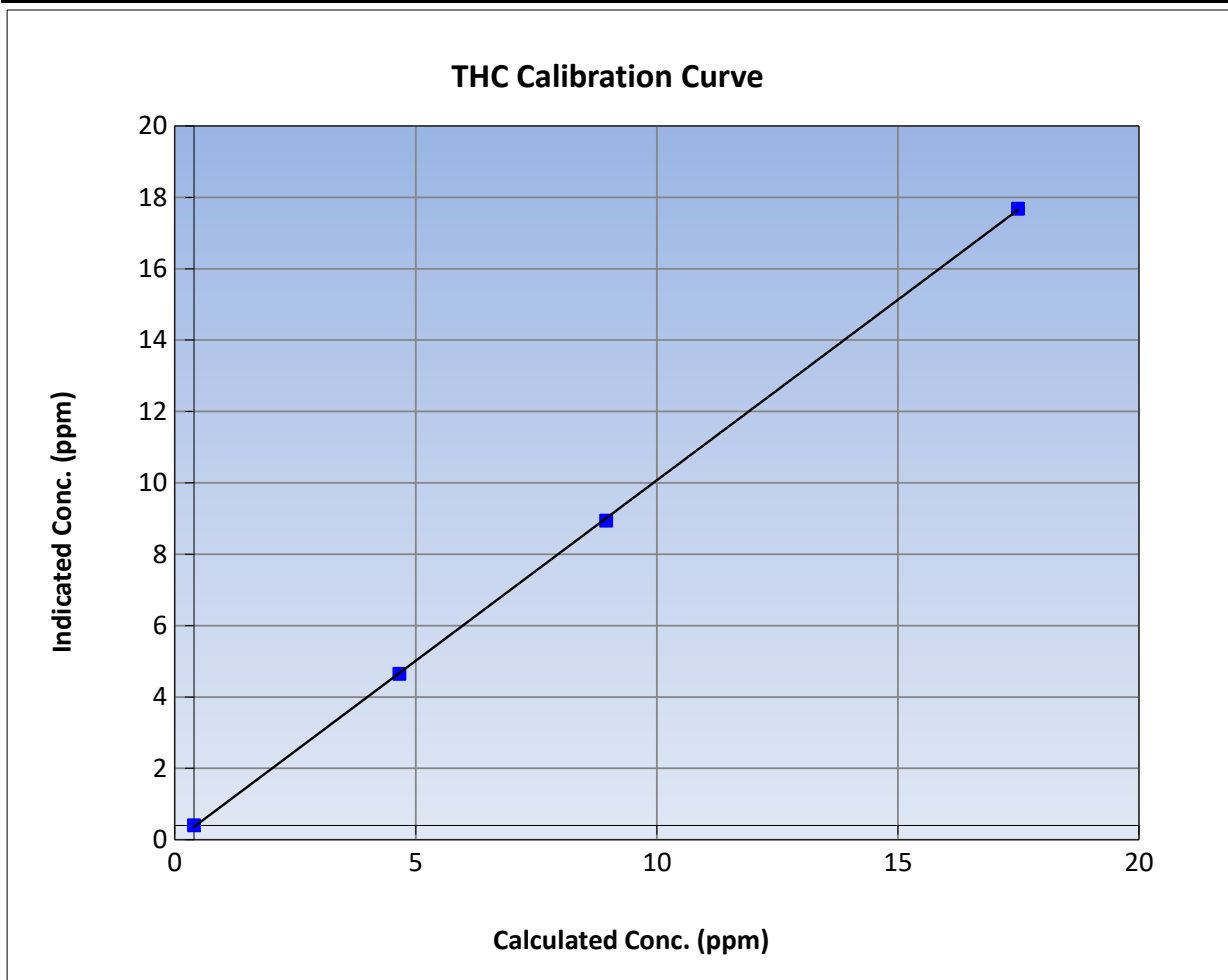
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17            |
| Start Time (MST): | 11:04             | End Time (MST):       | 14:08            |
| Analyzer make:    | Thermo 51i-LT     | Analyzer serial #:    | 1218153352       |

### Calibration Data

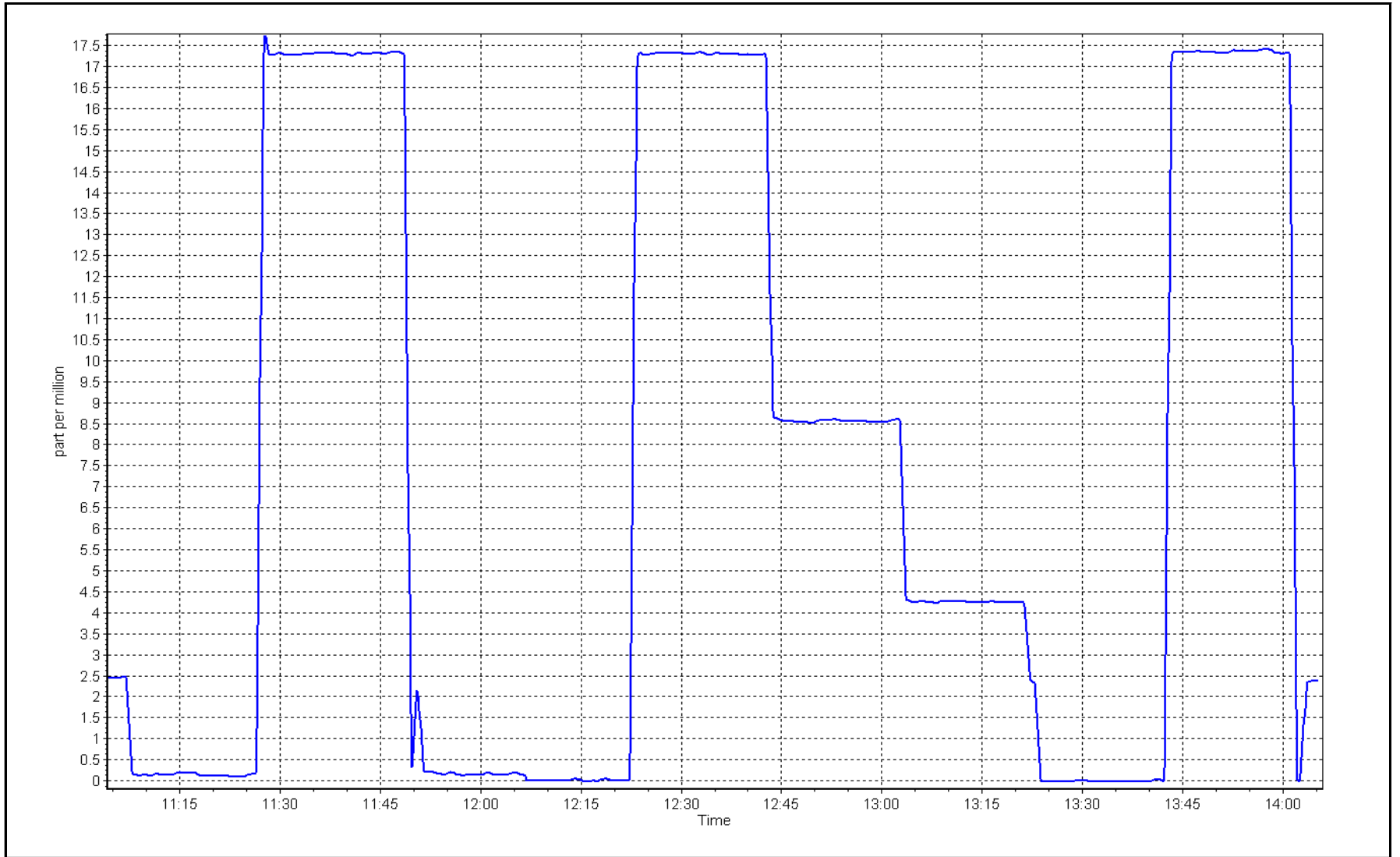
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.00                                | 0.01                               | ----                      | Correlation Coefficient | 0.999952  | ≥0.995      |
| 17.09                               | 17.29                              | 0.9888                    |                         |           |             |
| 8.55                                | 8.54                               | 1.0003                    | Slope                   | 1.011424  | 0.90 - 1.10 |
| 4.26                                | 4.25                               | 1.0020                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.037301 | +/-1.5      |



THC Calibration Plot

Date: February 14, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Wapasu  
Calibration Date: February 23, 2023  
Start time (MST): 11:33  
Reason: Routine  
Station number: AMS17  
Last Cal Date: January 19, 2023  
End time (MST): 15:52

### Calibration Standards

NO Gas Cylinder #: T375YK8  
NOX Cal Gas Conc: 49.11 ppm  
Removed Cylinder #: T375YK8  
Removed Gas NOX Conc: 49.11 ppm  
NOX gas Diff:  
Calibrator Model: API T700  
ZAG make/model: API T701H  
Cal Gas Expiry Date: April 13, 2025  
NO Cal Gas Conc: 48.07 ppm  
Removed Gas Exp Date:  
Removed Gas NO Conc: 48.07 ppm  
NO gas Diff:  
Serial Number: 2449  
Serial Number: 359

### Analyzer Information

Analyzer make: Teledyne API T200  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 833

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 0.820        | 0.820         | NO bkgnd or offset:  | 0.1          | 0.1           |
| NOX coeff or slope: | 0.812        | 0.812         | NOX bkgnd or offset: | -0.4         | -0.4          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 4.4          | 4.5           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.999578     | 0.989719      |
| NO <sub>x</sub> Cal Offset: | -1.120000    | -1.420000     |
| NO Cal Slope:               | 1.000973     | 0.990300      |
| NO Cal Offset:              | -2.440000    | -1.880000     |
| NO <sub>2</sub> Cal Slope:  | 0.996862     | 0.986936      |
| NO <sub>2</sub> Cal Offset: | -0.247483    | -0.501997     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | -0.1                                  | 0.2  | ----  | ----   |
| as found span             | 4917                      | 83.2                        | 817.2   | 799.9                                  | 17.3  | 805.7  | 790.7                                 | 15.0   | 1.0143  | 1.0116   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.5  | 0.2                                   | 0.3  | ----  | ----   |
| high point                | 4917                      | 83.2                        | 817.2   | 799.9                                  | 17.3  | 808.6  | 791.4                                 | 17.3   | 1.0106  | 1.0107   |
| second point              | 4958                      | 41.6                        | 408.6   | 399.9                                  | 8.7   | 401.2  | 392.8                                 | 8.5  | 1.0184  | 1.0182   |
| third point               | 4979                      | 20.8                        | 204.3   | 200.0                                  | 4.3   | 199.4  | 194.3                                 | 5.1  | 1.0246  | 1.0292   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.1                                   | 0.2  | ----  | ----   |
| as left span              | 4917                      | 83.2                        | 817.2   | 403.5                                  | 413.7   | 797.3  | 389.7                                 | 407.5  | 1.0249  | 1.0354   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0179  | 1.0194   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 805.6 ppb | NO = 790.8 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.3% |
| Previous Response    | NO <sub>x</sub> = 815.7 ppb | NO = 798.2 ppb |  | *Percent Change                  | NO = -0.9%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 790.5                                      | 394.1                                 | 413.7   | 408.2  | 1.0135   | 98.7%  |
| 2nd GPT point (200 ppb O3)       | 790.5                                      | 588.5                                 | 219.3   | 215.7  | 1.0167   | 98.4%  |
| 3rd GPT point (100 ppb O3)       | 790.5                                      | 690.0                                 | 117.8   | 114.8  | 1.0262   | 97.4%  |
| Average Correction Factor        |  |                                       |   |  | 1.0188   | 98.2%  |

Notes: Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

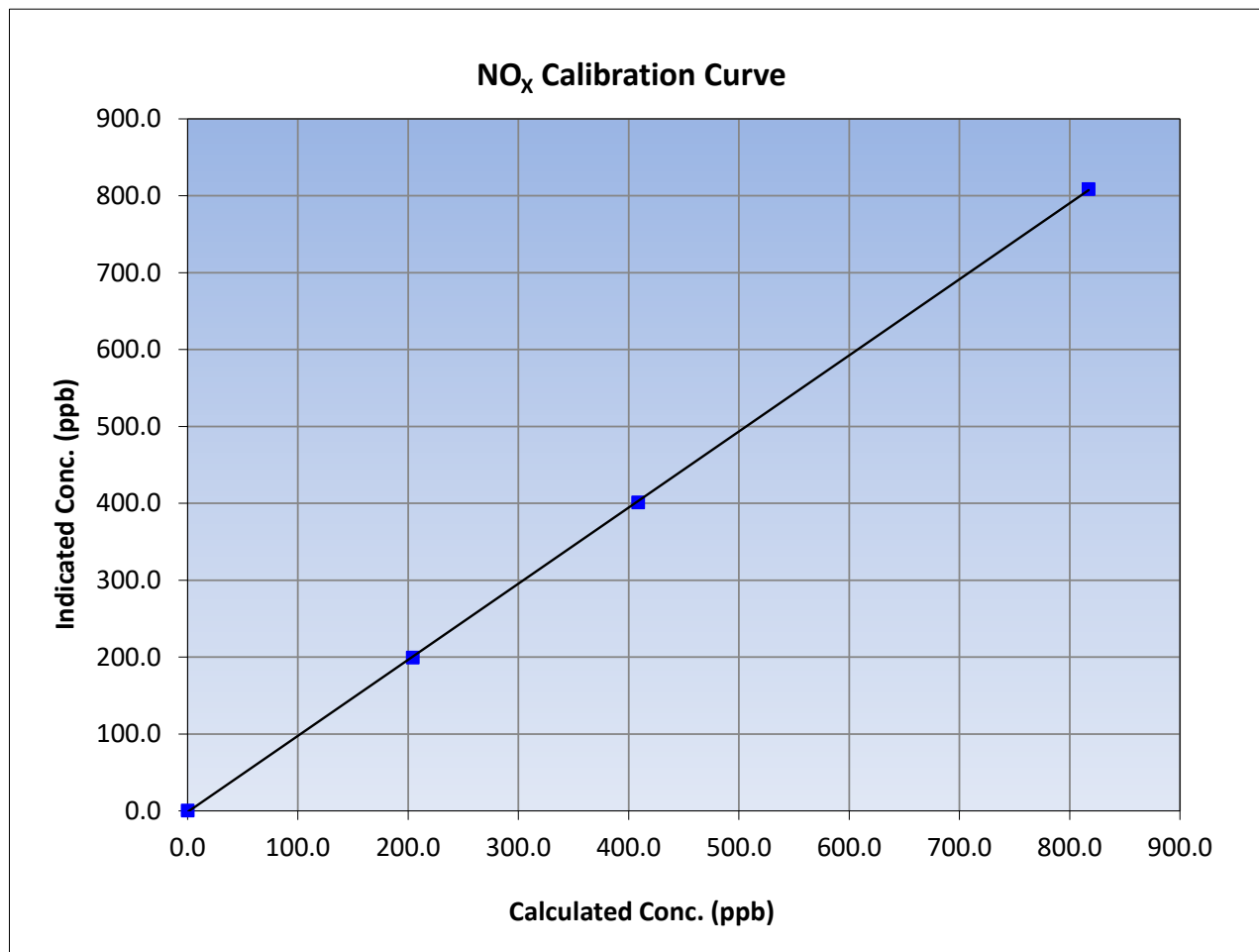
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17            |
| Start Time (MST): | 11:33             | End Time (MST):       | 15:52            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 833              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 817.2                               | 808.6                              | 1.0106                    |                         |           |             |
| 408.6                               | 401.2                              | 1.0184                    |                         |           |             |
| 204.3                               | 199.4                              | 1.0246                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.989719  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.420000 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

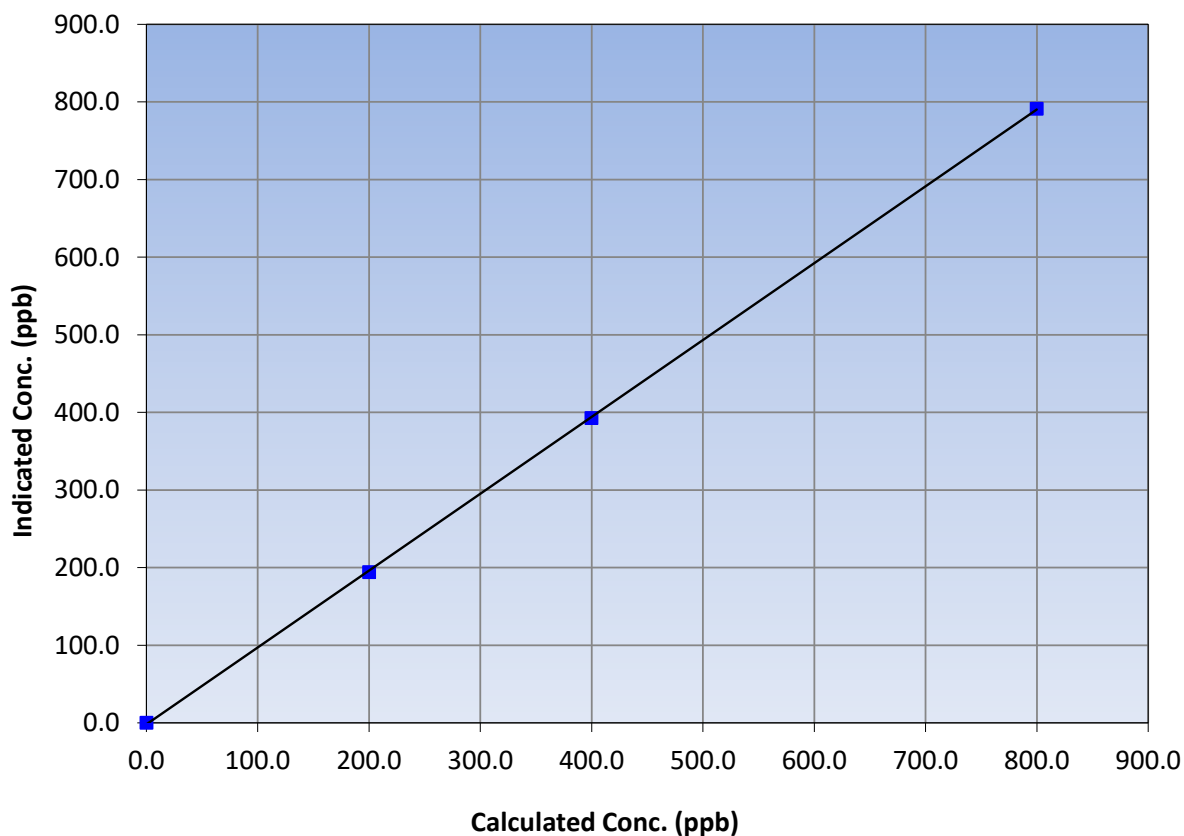
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17            |
| Start Time (MST): | 11:33             | End Time (MST):       | 15:52            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 833              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 799.9                               | 791.4                              | 1.0107                    |                         |           |             |
| 399.9                               | 392.8                              | 1.0182                    |                         |           |             |
| 200.0                               | 194.3                              | 1.0292                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.990300  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.880000 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

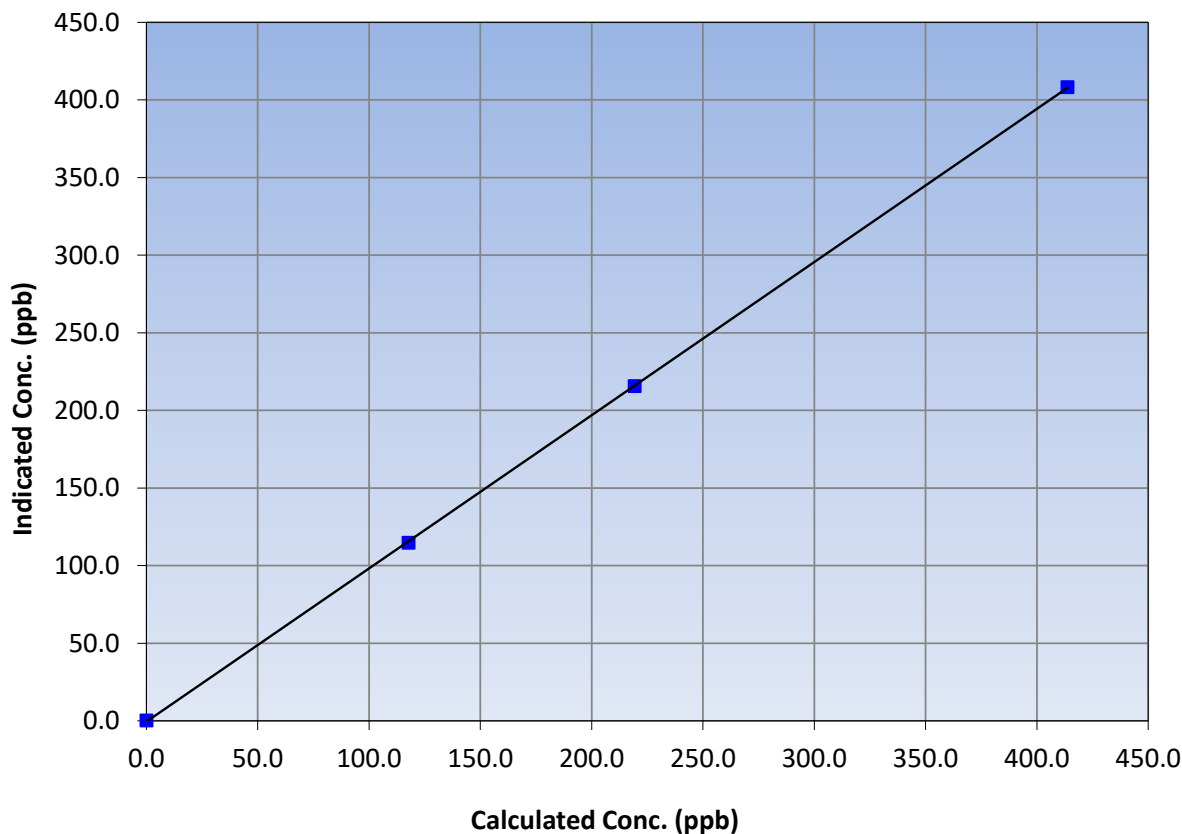
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Wapasu            | Station Number:       | AMS17            |
| Start Time (MST): | 11:33             | End Time (MST):       | 15:52            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 833              |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 413.7                               | 408.2                              | 1.0135                    |   |                                |
| 219.3                               | 215.7                              | 1.0167                    |   |                                |
| 117.8                               | 114.8                              | 1.0262                    |   |                                |
|                                     |                                    |                           |   |                                |

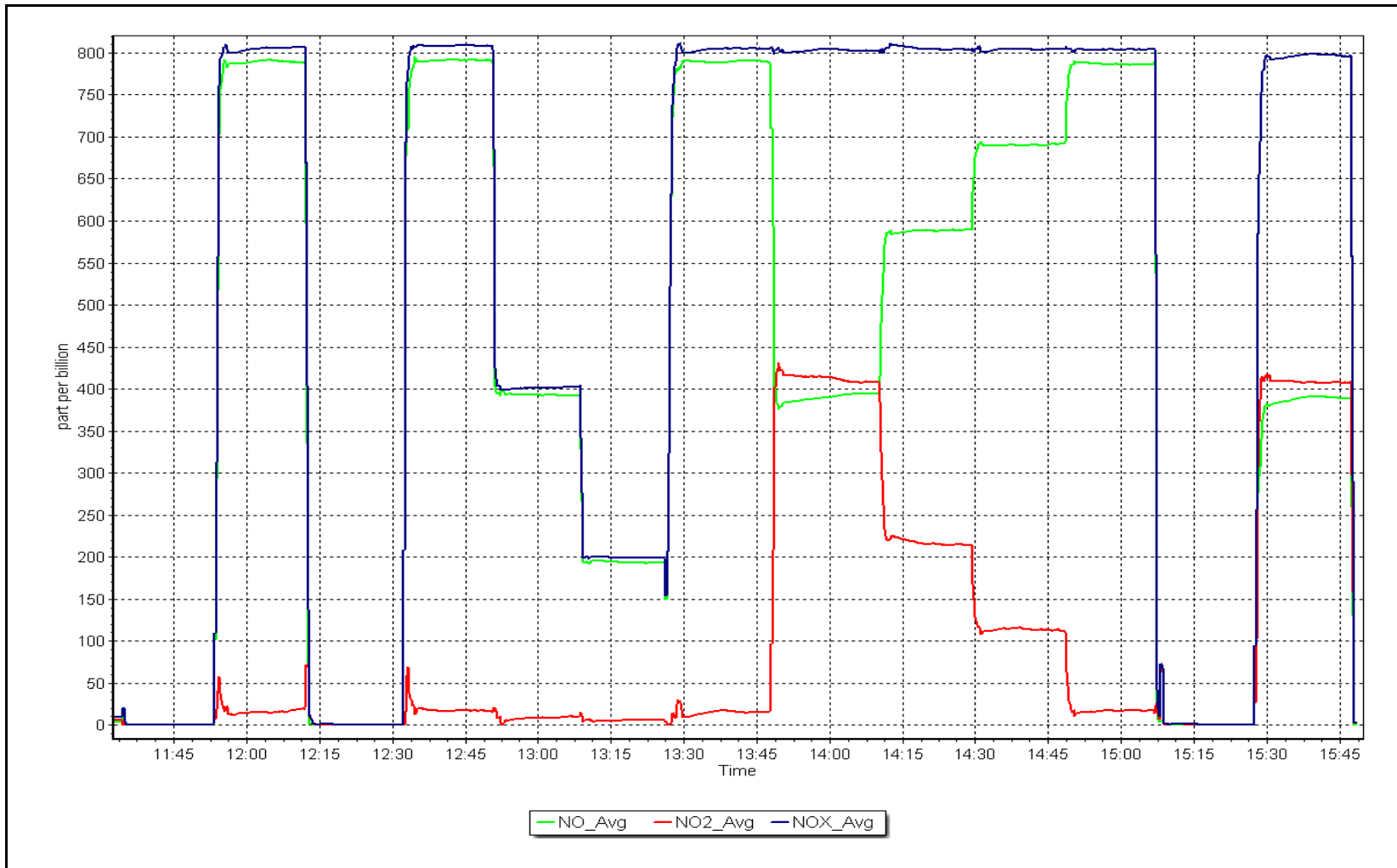
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 23, 2023

Location: Wapasu









# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

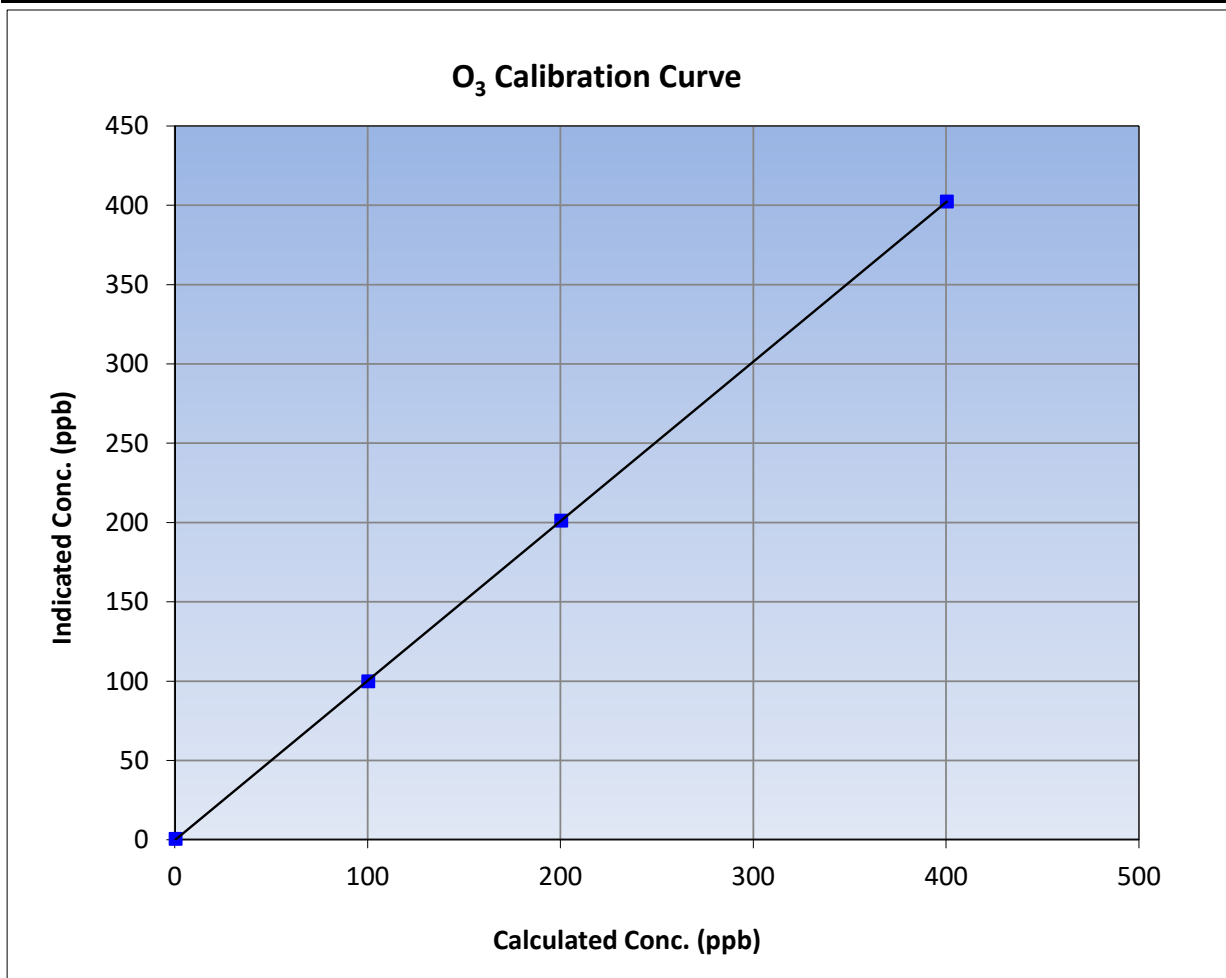
Version-01-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Wapasu           | Station Number:       | AMS17           |
| Start Time (MST): | 11:05            | End Time (MST):       | 13:58           |
| Analyzer make:    | API T400         | Analyzer serial #:    | 3870            |

### Calibration Data

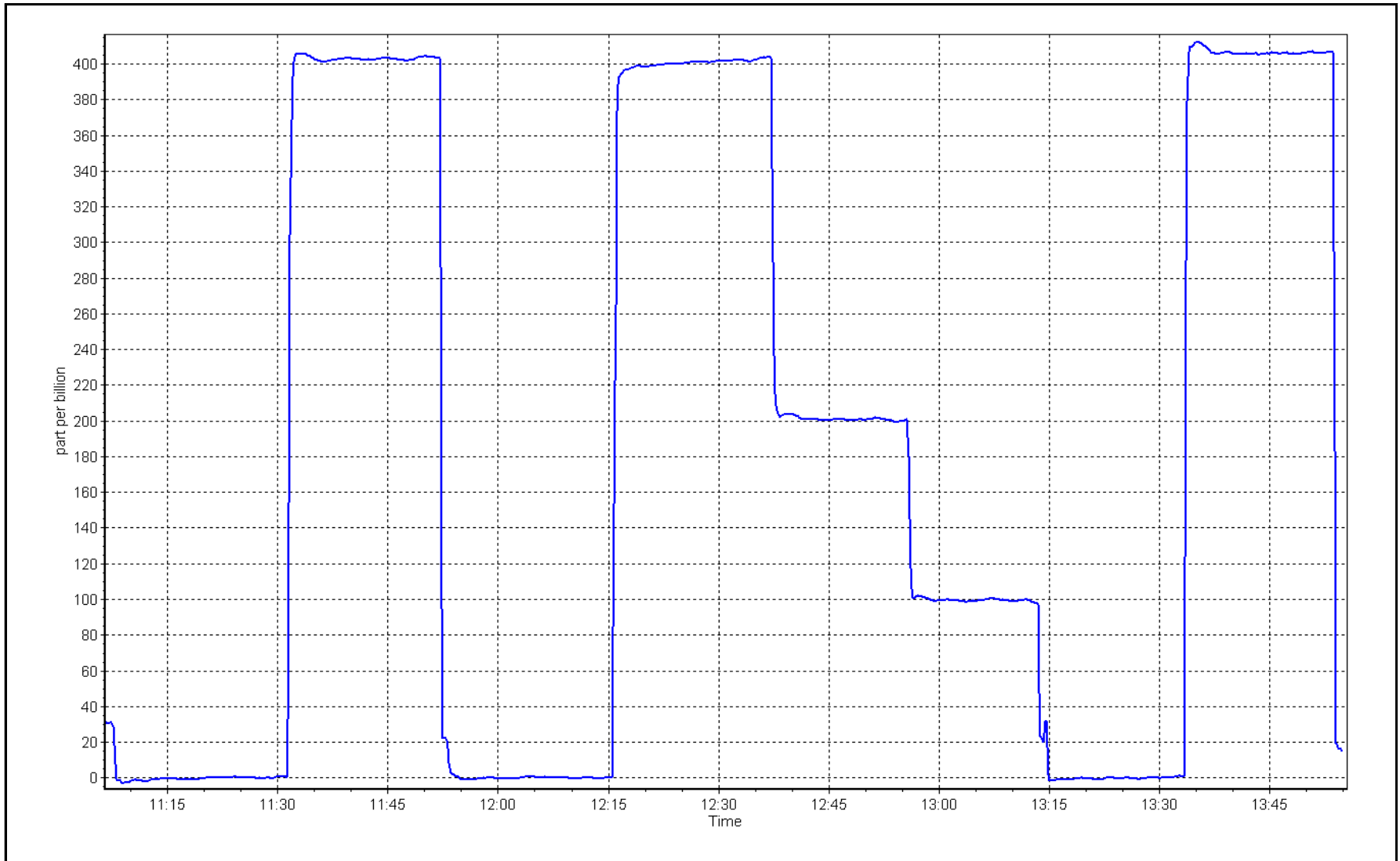
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999990  | ≥0.995      |
| 400.0                               | 402.1                              | 0.9948                    |                         |           |             |
| 200.0                               | 200.9                              | 0.9955                    | Slope                   | 1.005686  | 0.90 - 1.10 |
| 100.0                               | 99.5                               | 1.0050                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.320000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 6, 2023

Location: Wapasu





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Wapasu Station number: AMS 17  
 Calibration Date: February 23, 2023 Last Cal Date: January 19, 2023  
 Start time (MST): 12:16 End time (MST): 12:47

Analyzer Make: API T640 S/N: 1183  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1102  
 Temp/RH standard: Delta Cal S/N: 1102

### Monthly Calibration Test

| Parameter  | As found                                | Measured                               | As left | Adjusted                 | (Limits)     |
|------------|---|--|---------|--------------------------|--------------|
| T (°C)     | -21.8                                   | -22.3                                  | -21.8   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 730.2                                   | 730.9                                  | 730.2   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.02                                    | 4.98                                   | 5.02    | <input type="checkbox"/> | +/- 0.25 LPM |
| Leak Test: | Date of check: <u>February 23, 2023</u> | Last Cal Date: <u>January 19, 2023</u> |         |                          |              |
|            | PM w/o HEPA: <u>3.6</u>                 | PM w/ HEPA: <u>0.0</u>                 |         |                          | <0.2 ug/m3   |

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter                     | As found | Post maintenance         | As left        | Adjusted                 | (Limits)     |
|-------------------------------|----------|--------------------------|----------------|--------------------------|--------------|
| PMT Peak Test                 |          |                          |                | <input type="checkbox"/> | 11.3 +/- 0.5 |
| Post-maintenance leak check:  |          | PM w/o HEPA: _____       | w/ HEPA: _____ |                          |              |
| Date Optical Chamber Cleaned: |          | <u>December 15, 2022</u> |                |                          | <0.2 ug/m3   |
| Disposable Filter Changed:    |          | <u>December 15, 2022</u> |                |                          |              |

### Annual Maintenance

Date Sample Tube Cleaned: \_\_\_\_\_  
 Date RH/T Sensor Cleaned: \_\_\_\_\_

Notes: No adjustments made. Leak check passed.

Calibration by: Karan Pandit



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS18 STONY MOUNTAIN FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Stony Mountain   | Station number: | AMS 18           |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 10:55            | End time (MST): | 12:12            |
| Reason:           | As Found         |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                   |
|------------------------|-------------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.40             | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #:    | CC463851          |     |                   |                   |
| Removed Cal Gas Conc:  | 49.40             | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                   |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 2658              |
| ZAG Make/Model:        | Teledyne API 701H |     | Serial Number:    | 360               |

### Analyzer Information

|                |              |                    |              |
|----------------|--------------|--------------------|--------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | JC1501301453 |
| Analyzer Range | 0 - 1000 ppb |                    |              |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.003075     |               | Backgd or Offset: | 23.0         | 23.0          |
| Calibration intercept: | -1.143339    |               | Coeff or Slope:   | 0.817        | 0.817         |

### SO<sub>2</sub> Calibration Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero         | 5009                          | 0.0                         | 0.0                                 | -0.6                               | ----  |
| as found span         | 4919                          | 81.0                        | 800.3                               | 804.9                              | 0.994   |
| as found 2nd point    |                               |                             |                                     |                                    |   |
| as found 3rd point    |                               |                             |                                     |                                    |   |
| new cylinder response |                               |                             |                                     |                                    |   |
| calibrator zero       | 5009                          | 0.0                         | 0.0                                 | -0.5                               | ----  |
| high point            |                               |                             |                                     |                                    |   |
| second point          |                               |                             |                                     |                                    |   |
| third point           |                               |                             |                                     |                                    |   |
| as left zero          |                               |                             |                                     |                                    |   |
| as left span          |                               |                             |                                     |                                    |   |

Average Correction Factor

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 805.50 | Previous response | 801.60 | *% change     | 0.5% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

\* = > +/-5% change initiates investigation

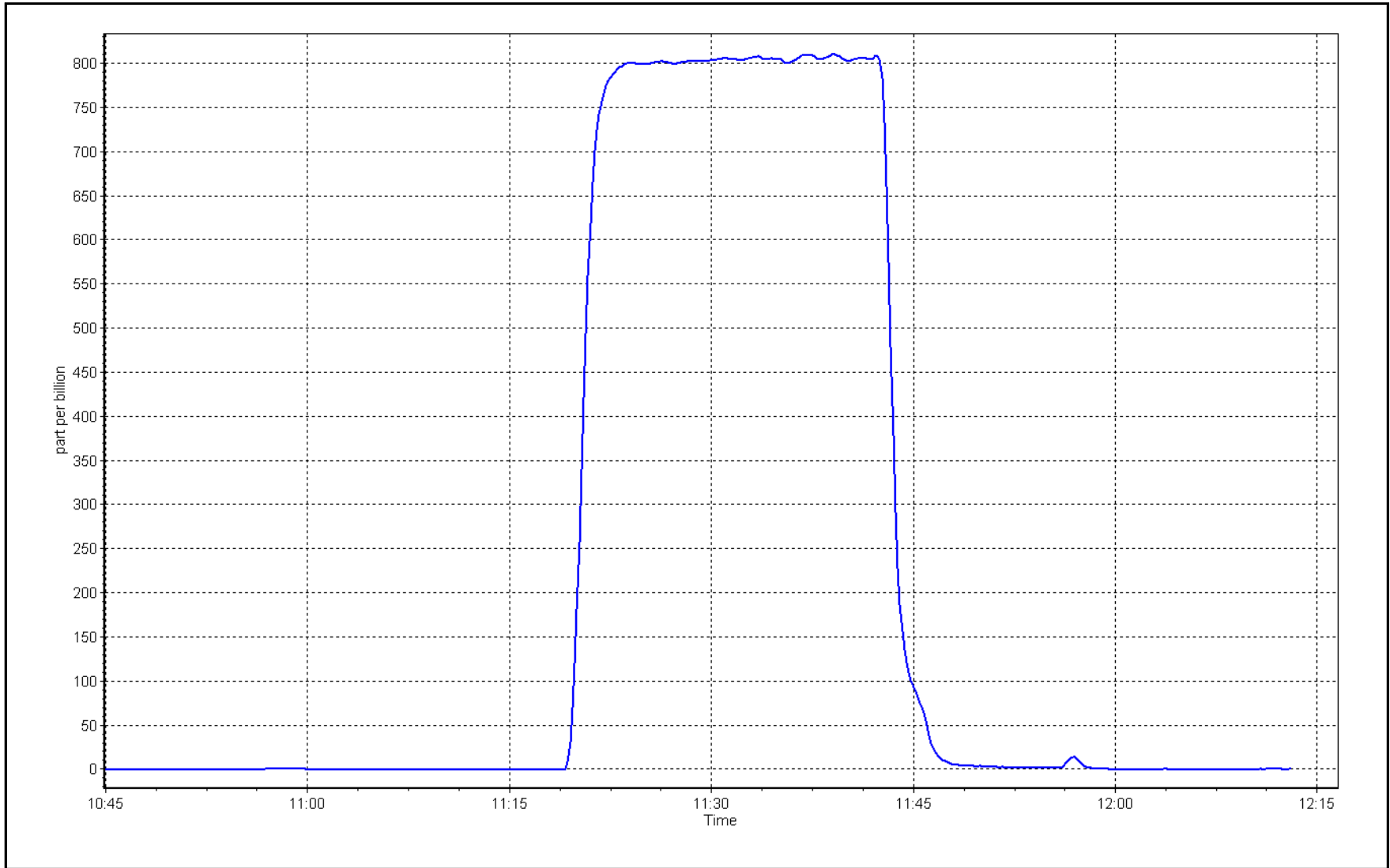
Notes: No changes/adjustments made.

Calibration Performed By: Mohammed Kashif

SO2 Calibration Plot

Date: February 3, 2023

Location: Stony Mountain









# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

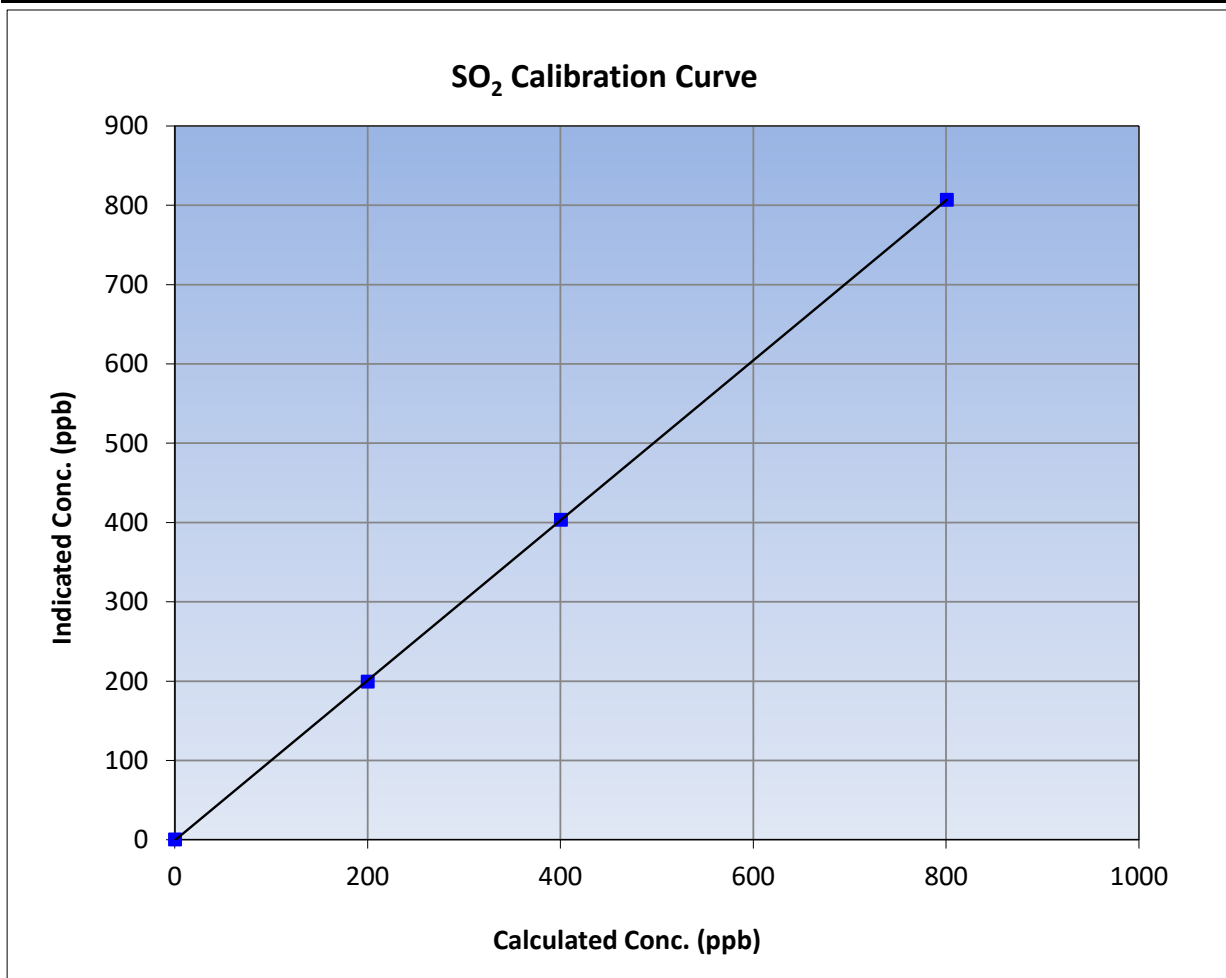
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 10:55             | End Time (MST):       | 13:59            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | JC1501301453     |

### Calibration Data

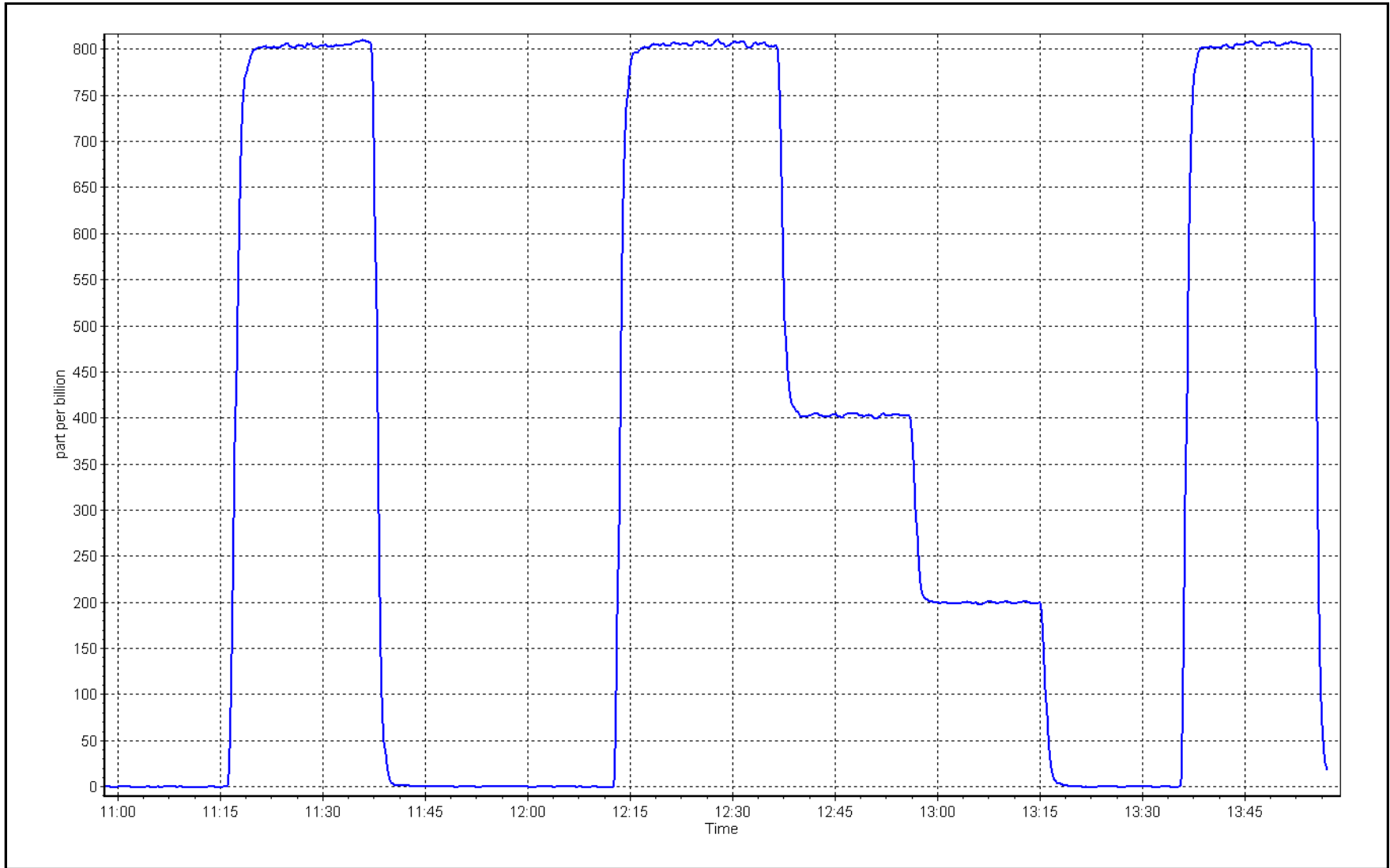
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | -0.1                                  | ----                         | Correlation Coefficient | ≥0.995        |
| 800.3                                  | 806.6                                 | 0.9922                       |                         |               |
| 400.2                                  | 403.2                                 | 0.9925                       | Slope                   | 0.90 - 1.10   |
| 199.6                                  | 199.2                                 | 1.0020                       |                         |               |
|  |                                       |                              | Intercept               | +/-30         |



SO2 Calibration Plot

Date: February 17, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Stony Mountain Station number: AMS18  
 Calibration Date: February 13, 2023 Last Cal Date: January 18, 2023  
 Start time (MST): 11:14 End time (MST): 15:35  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.479 ppm Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC500395  
 Removed Cal Gas Conc: 5.479 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 2658  
 ZAG Make/Model: Teledyne API T701 Serial Number: 360

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1218153359  
 Converter make: CD Nova CDN-101 Converter serial #: 555  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.989724     | 1.000870      | Backgd or Offset: 2.55 | 2.63          |
| Calibration intercept: | 0.201244     | 0.161019      | Coeff or Slope: 1.129  | 1.151         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4927                          | 73.0                        | 80.0                                | 76.6                               | 1.046  |
| as found 2nd point    | 4964                          | 36.5                        | 40.0                                | 38.1                               | 1.052  |
| as found 3rd point    | 4983                          | 18.3                        | 20.0                                | 18.9                               | 1.066  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point          | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point         | 4927                          | 73.0                        | 80.0                                | 80.2                               | 0.997   |
| second point       | 4964                          | 36.5                        | 40.0                                | 40.3                               | 0.992   |
| third point        | 4983                          | 18.3                        | 20.0                                | 20.1                               | 0.997   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span       | 4927                          | 73.0                        | 80.0                                | 79.7                               | 1.004   |
| SO2 Scrubber Check | 4923                          | 77.1                        | 771.0                               | -0.1                               | ----  |

|   |           |                 |       |
|---|-----------|-----------------|-------|
| Date of last scrubber change:           | 17-Dec-21 | Ave Corr Factor | 0.996 |
| Date of last converter efficiency test: |           | efficiency      |       |

Baseline Corr As found: 76.5 Prev response: 79.37 \*% change: -3.8%  
 Baseline Corr 2nd AF pt: 38.0 AF Slope: 0.957571 AF Intercept: -0.098129  
 Baseline Corr 3rd AF pt: 18.8 AF Correlation: 0.999969

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Scrubber check completed after calibrator zero.  
 Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## TRS Calibration Summary

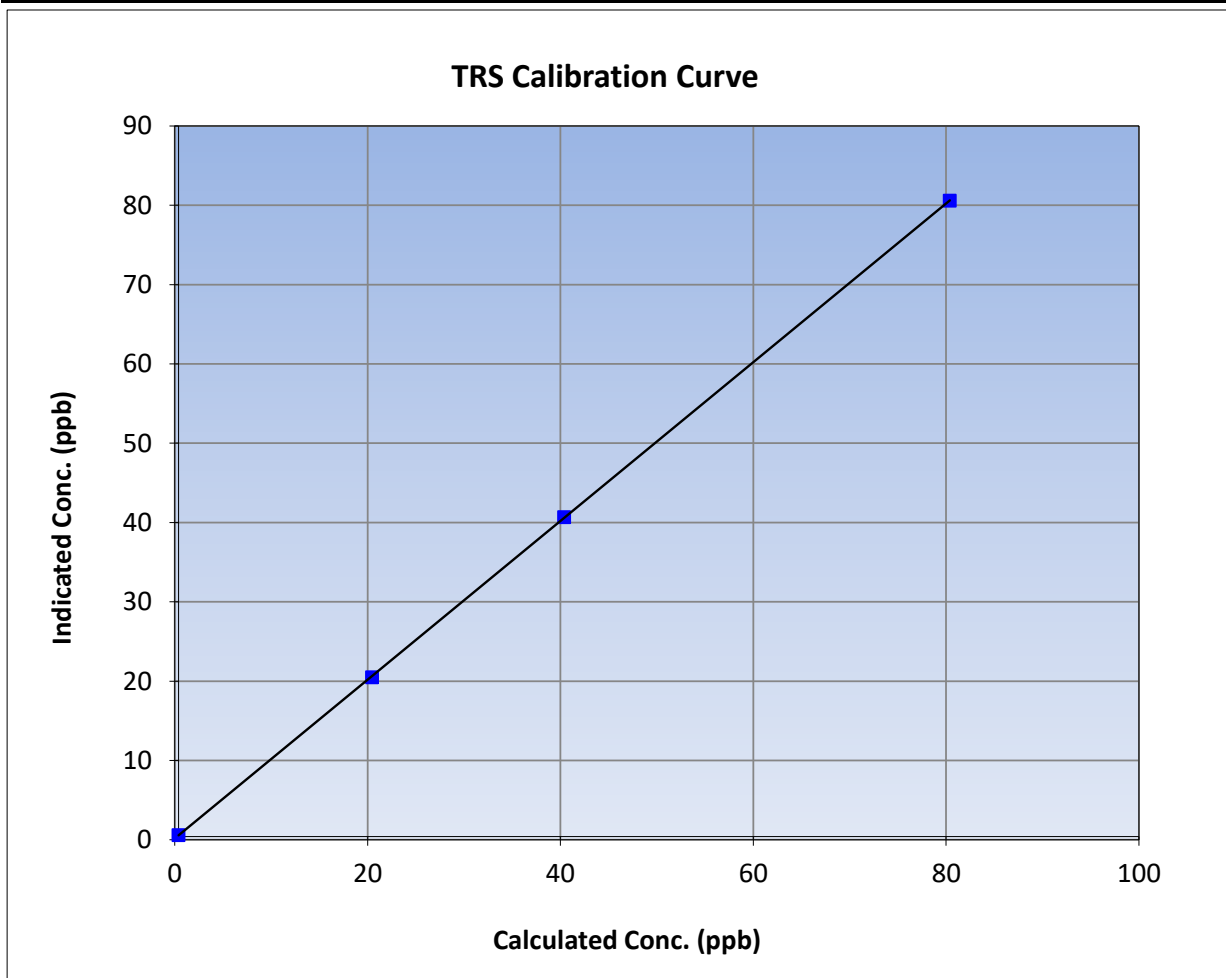
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS18            |
| Start Time (MST): | 11:14             | End Time (MST):       | 15:35            |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1218153359       |

### Calibration Data

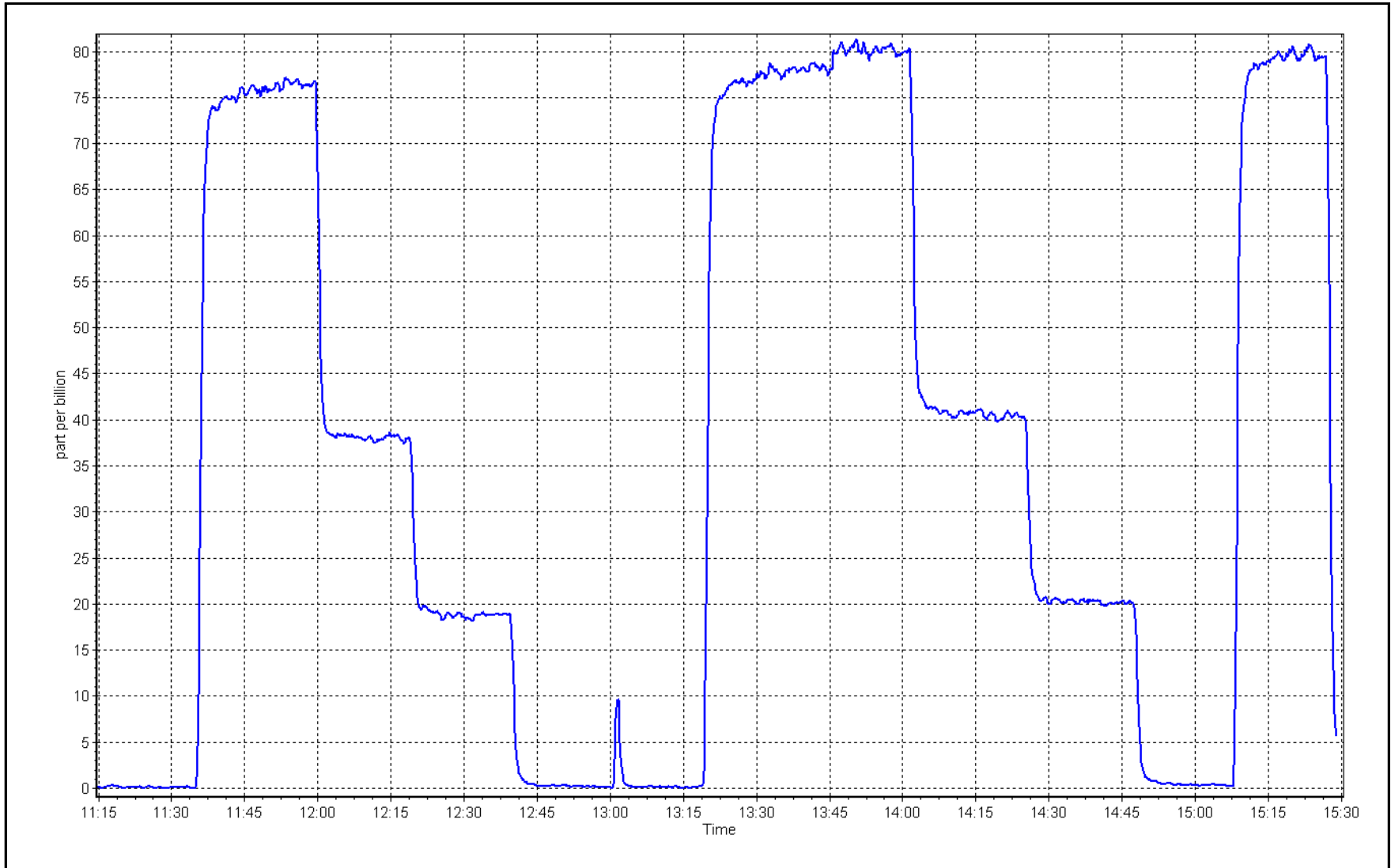
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999991 | ≥0.995      |
| 80.0                                | 80.2                               | 0.9974                    |                         |          |             |
| 40.0                                | 40.3                               | 0.9924                    | Slope                   | 1.000870 | 0.90 - 1.10 |
| 20.0                                | 20.1                               | 0.9974                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.161019 | +/-3        |



TRS Calibration Plot

Date: February 13, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Stony Mountain   | Station number: | AMS 18           |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 10:55            | End time (MST): | 12:43            |
| Reason:           | Cylinder Change  |                 |                  |

### Calibration Standards

|   |                    |                             |                   |
|---|--------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC463851           | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.8 ppm          |                             |                   |
| Removed Gas Cert:                           | NA                 | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.8 ppm          | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                    | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | Teledyne API T700  | Serial Number:              | 2658              |
| ZAG make/model:                             | Teledyne API T701H | Serial Number:              | 360               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320039 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.06E-04     | 3.06E-04      | NMHC SP Ratio:  | 5.66E-05      |
| CH <sub>4</sub> Retention time: | 14.60        | 14.60         | NMHC Peak Area: | 162130        |
|                                 |              |               |                 | 162130        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 81.0                 | 17.28                | 17.22               | 1.004                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       |                   |                      |                      |                     |                            |
| high point            |                   |                      |                      |                     |                            |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 81.0                 | 17.28                | 17.23               | 1.003                      |

| Average Correction Factor |       |                 |       |  |       |
|---------------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:         | 17.22 | Prev response   | 17.24 | *% change                                  | -0.2% |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as found span                    | 4919              | 81.0                 | 9.17                 | 9.10   | 1.007                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as left span                     | 4919              | 81                   | 9.17                 | 9.11   | 1.006                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 9.10              | Prev response        | 9.14                 | *% change  | -0.4%                      |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                        | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|----------------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero                    | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span                    | 4919              | 81.0                 | 8.11                 | 8.11   | 1.000                      |
| as found 2nd point               |                   |                      |                      |  |                            |
| as found 3rd point               |                   |                      |                      |  |                            |
| new cylinder response            |                   |                      |                      |  |                            |
| calibrator zero                  |                   |                      |                      |  |                            |
| high point                       |                   |                      |                      |  |                            |
| second point                     |                   |                      |                      |  |                            |
| third point                      |                   |                      |                      |  |                            |
| as left zero                     | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span                     | 4919              | 81.0                 | 8.11                 | 8.12   | 0.999                      |
| <b>Average Correction Factor</b> |                   |                      |                      |  |                            |
| Baseline Corr AF:                | 8.11              | Prev response        | 8.10                 | *% change  | 0.2%                       |
| Baseline Corr 2nd AF:            | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:            | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.998211     |               |
| THC Cal Offset:             | -0.008790    |               |
| CH <sub>4</sub> Cal Slope:  | 0.999750     |               |
| CH <sub>4</sub> Cal Offset: | -0.013212    |               |
| NMHC Cal Slope:             | 0.996638     |               |
| NMHC Cal Offset:            | 0.005021     |               |

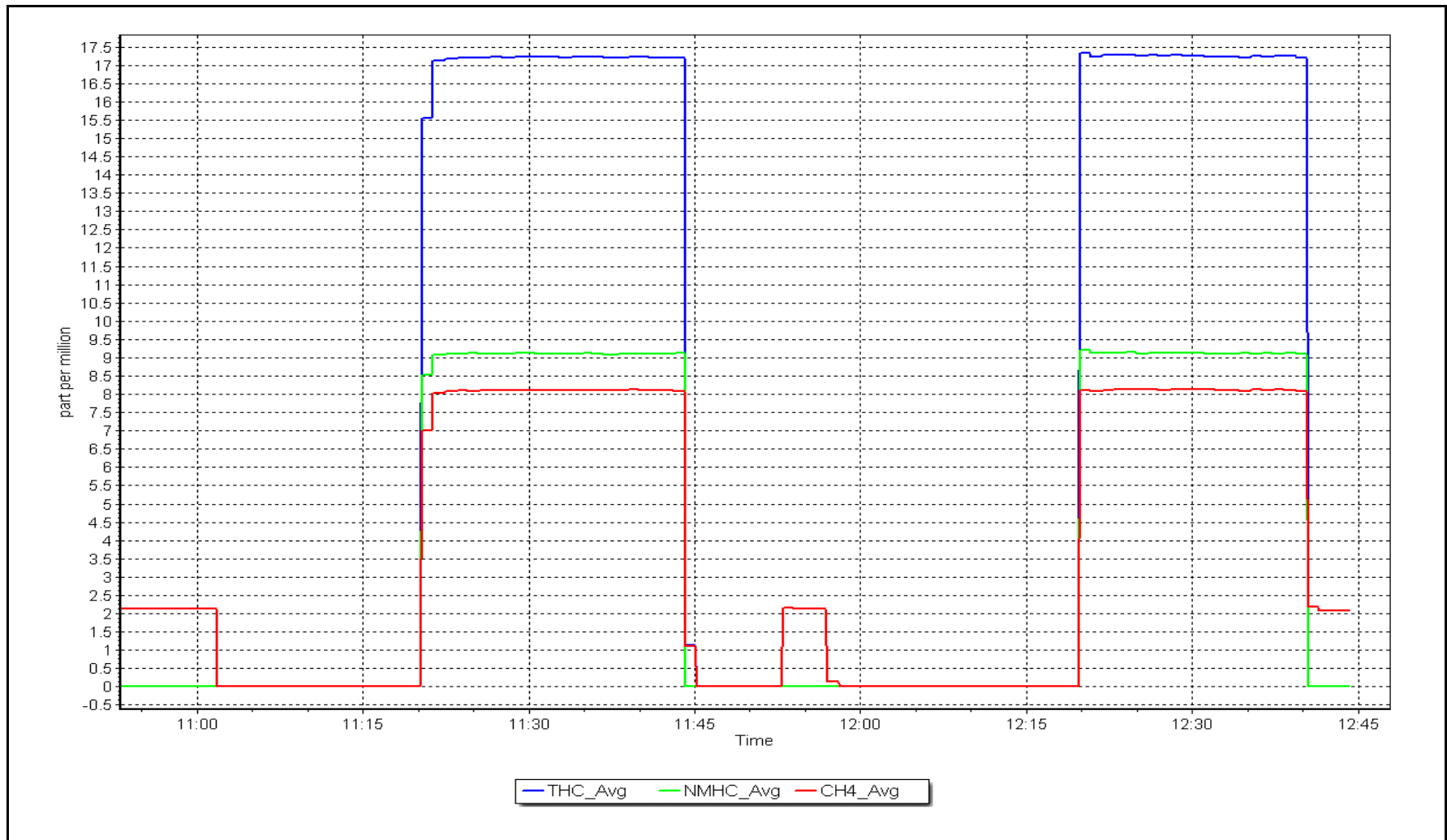
Notes: Changed the N2 cylinder after as founds.

Calibration Performed By: Mohammed Kashif

NMHC Calibration Plot

Date: February 3, 2023

Location: Stony Mountain







# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Stony Mountain    | Station number: | AMS 18           |
| Calibration Date: | February 17, 2023 | Last Cal Date:  | January 16, 2023 |
| Start time (MST): | 11:55             | End time (MST): | 13:59            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|   |                    |                             |                   |
|---|--------------------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC463851           | Cal Gas Expiry Date:        | February 23, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 205.8 ppm          |                             |                   |
| Removed Gas Cert:                           | NA                 | Removed Gas Expiry:         | NA                |
| Removed CH <sub>4</sub> Conc.               | 500.8 ppm          | CH <sub>4</sub> Equiv Conc. | 1066.8 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 205.8 ppm          | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |                    | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | Teledyne API T700  | Serial Number:              | 2658              |
| ZAG make/model:                             | Teledyne API T701H | Serial Number:              | 360               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1180320039 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 3.06E-04     | 3.06E-04      | NMHC SP Ratio:  | 5.66E-05      |
| CH <sub>4</sub> Retention time: | 14.60        | 14.60         | NMHC Peak Area: | 162130        |
|                                 |              |               |                 | 162130        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4919              | 81.0                 | 17.28                | 17.31               | 0.998                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4919              | 81.0                 | 17.28                | 17.32               | 0.998                      |
| second point          | 4959              | 40.5                 | 8.64                 | 8.65                | 0.999                      |
| third point           | 4979              | 20.2                 | 4.31                 | 4.30                | 1.002                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4919              | 81.0                 | 17.28                | 17.32               | 0.998                      |

| Average Correction Factor |       |                 |       | 1.000                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.31 | Prev response   | 17.24 | *% change 0.4%                             |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.0                 | 9.17                 | 9.16                                       | 1.001                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.0                 | 9.17                 | 9.16                                       | 1.001                      |
| second point              | 4959              | 40.5                 | 4.58                 | 4.60                                       | 0.997                      |
| third point               | 4979              | 20.2                 | 2.29                 | 2.30                                       | 0.994                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81                   | 9.17                 | 9.17                                       | 1.000                      |
| Average Correction Factor |                   |                      |                      |  | 0.997                      |
| Baseline Corr AF:         | 9.16              | Prev response        | 9.14                 | *% change                                  | 0.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4919              | 81.0                 | 8.11                 | 8.15                                       | 0.995                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4919              | 81.0                 | 8.11                 | 8.17                                       | 0.994                      |
| second point              | 4959              | 40.5                 | 4.06                 | 4.06                                       | 1.000                      |
| third point               | 4979              | 20.2                 | 2.02                 | 2.00                                       | 1.012                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4919              | 81.0                 | 8.11                 | 8.15                                       | 0.995                      |
| Average Correction Factor |                   |                      |                      |  | 1.002                      |
| Baseline Corr AF:         | 8.15              | Prev response        | 8.10                 | *% change                                  | 0.7%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.998211     | 1.002575      |
| THC Cal Offset:             | -0.008790    | -0.009777     |
| CH <sub>4</sub> Cal Slope:  | 0.999750     | 1.007610      |
| CH <sub>4</sub> Cal Offset: | -0.013212    | -0.020602     |
| NMHC Cal Slope:             | 0.996638     | 0.998345      |
| NMHC Cal Offset:            | 0.005021     | 0.010426      |

Notes: Sample inlet filter and hydrogen cylinder changed after as founds. No adjustments were made

Calibration Performed By: Karan Pandit and Karina Fenwick



# Wood Buffalo Environmental Association

## THC Calibration Summary

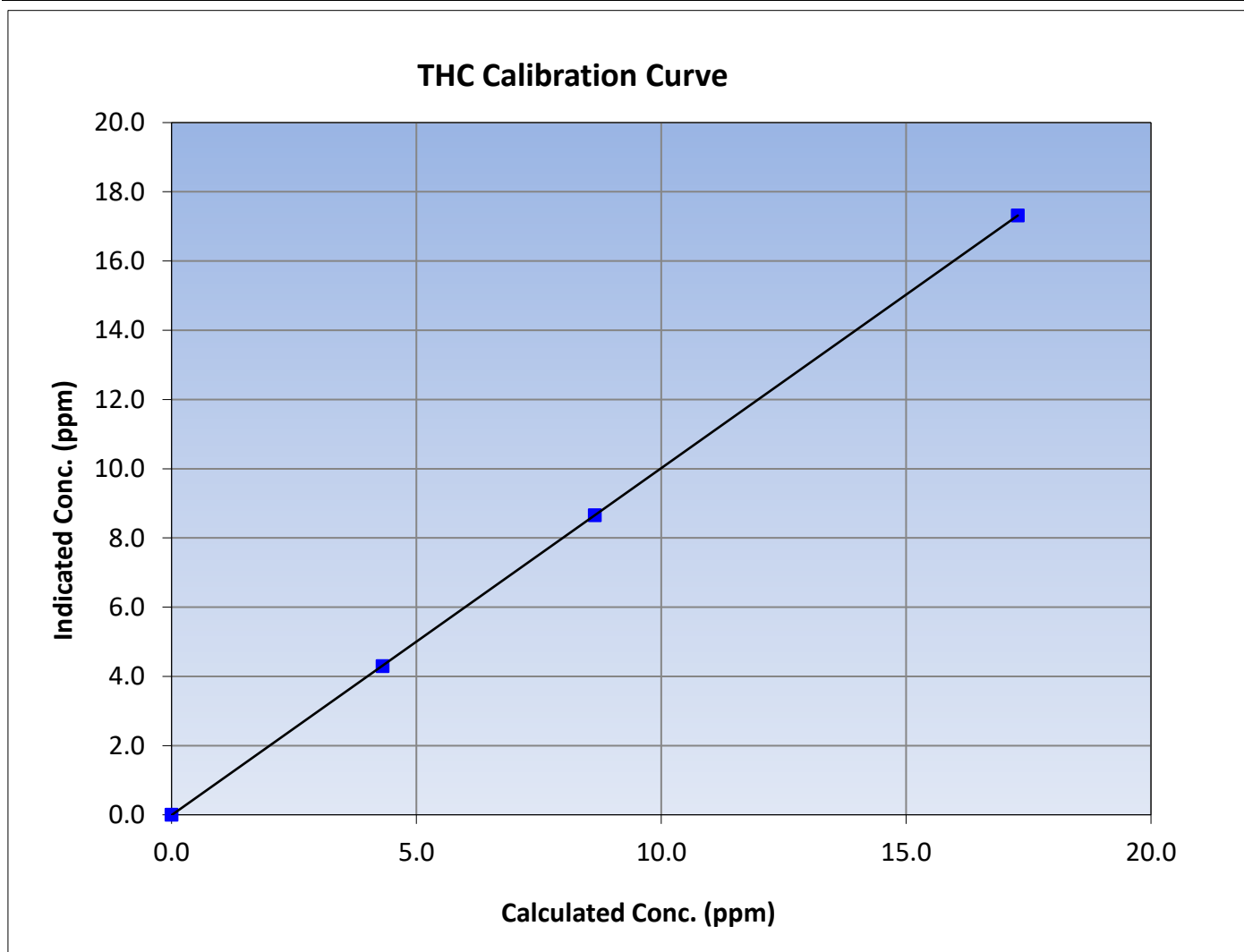
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 11:55             | End Time (MST):       | 13:59            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320039       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999998  | $\geq 0.995$  |       |          |             |
| 17.28                               | 17.32                              | 0.9978                    |                         |           |               |       |          |             |
| 8.64                                | 8.65                               | 0.9988                    |                         |           |               | Slope | 1.002575 | 0.90 - 1.10 |
| 4.31                                | 4.30                               | 1.0024                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.009777 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

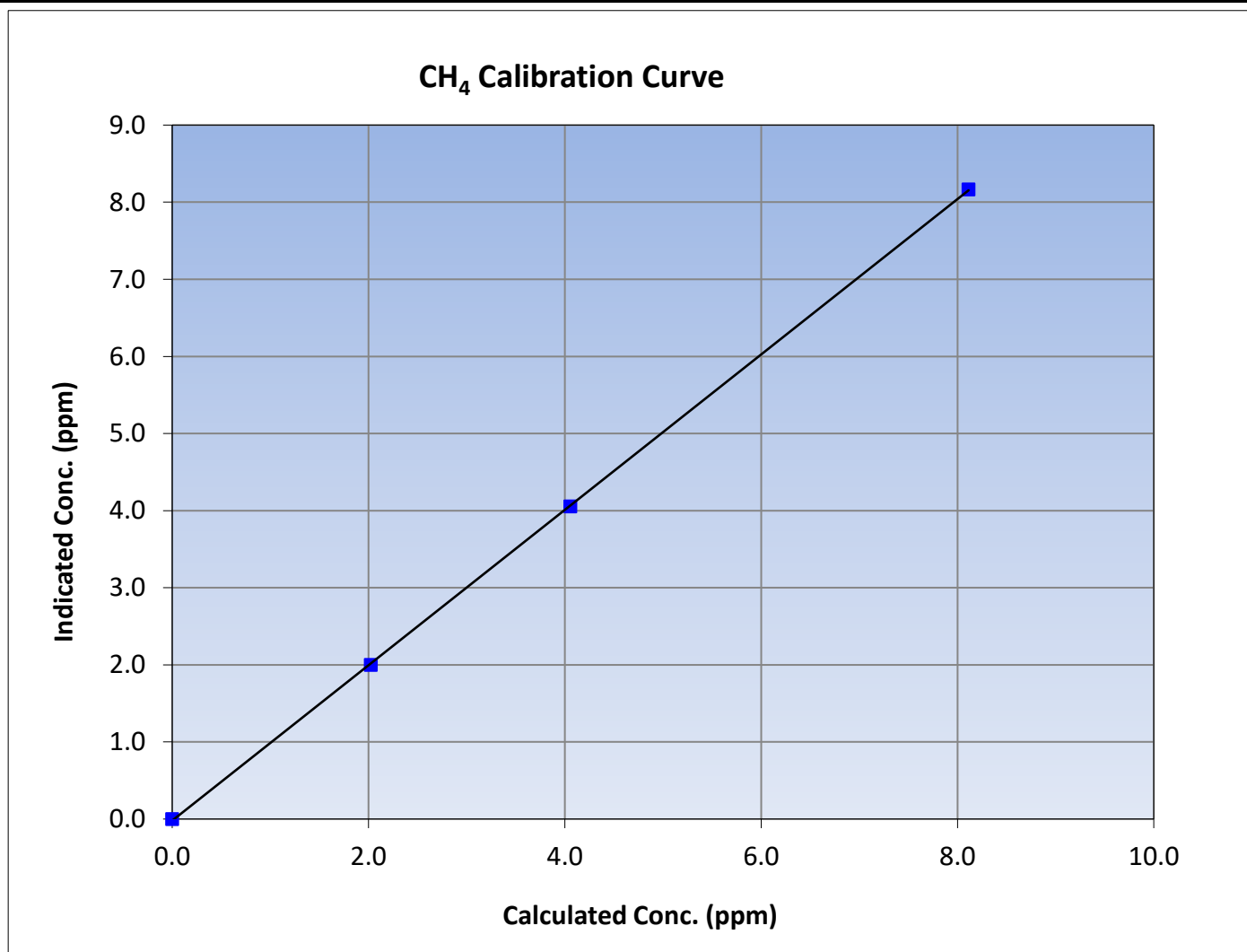
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 11:55             | End Time (MST):       | 13:59            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320039       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999971  | ≥0.995        |       |          |             |
| 8.11                                | 8.17                               | 0.9936                    |                         |           |               |       |          |             |
| 4.06                                | 4.06                               | 1.0005                    |                         |           |               | Slope | 1.007610 | 0.90 - 1.10 |
| 2.02                                | 2.00                               | 1.0123                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.020602 | +/-0.5        |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

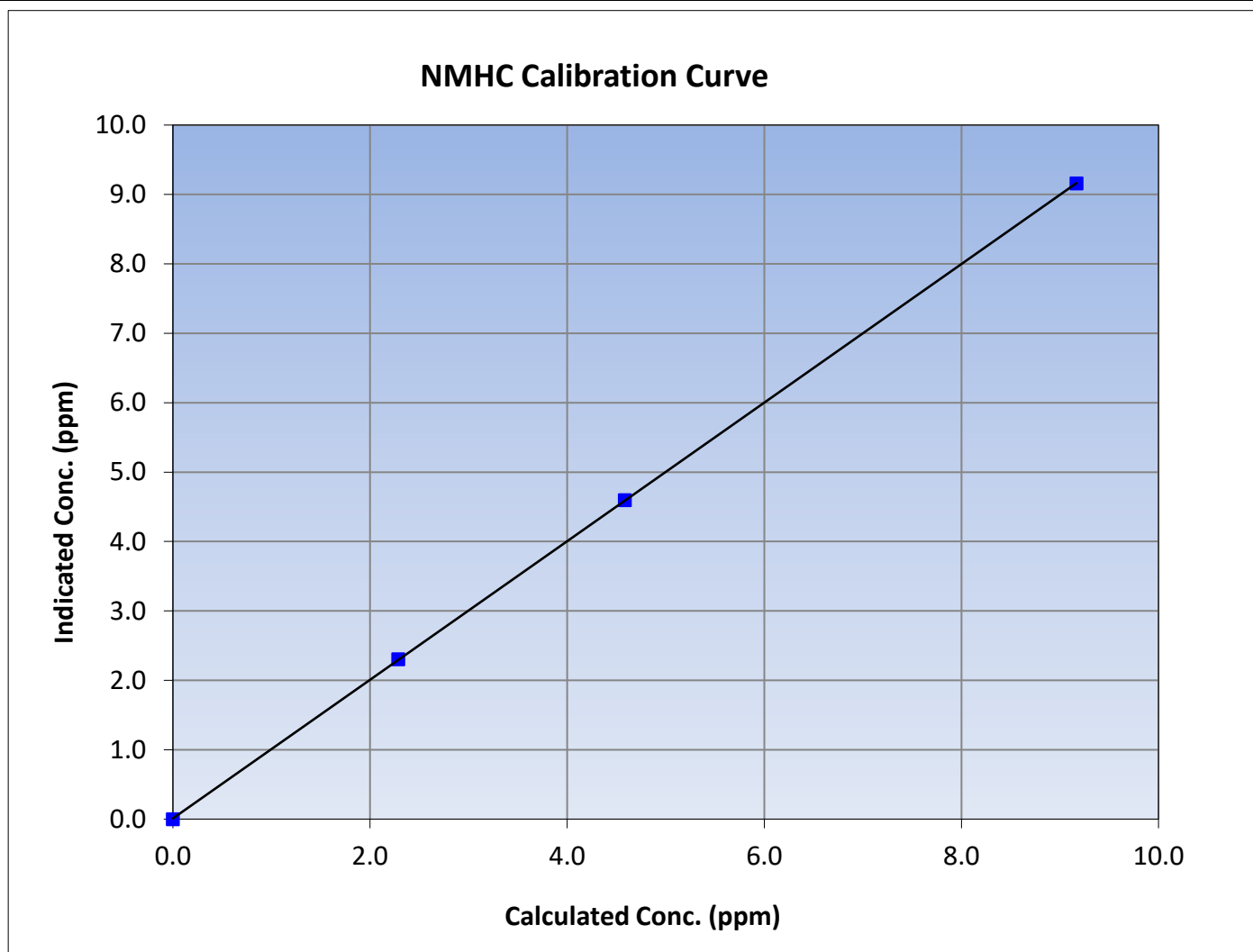
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 16, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 11:55             | End Time (MST):       | 13:59            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1180320039       |

### Calibration Data

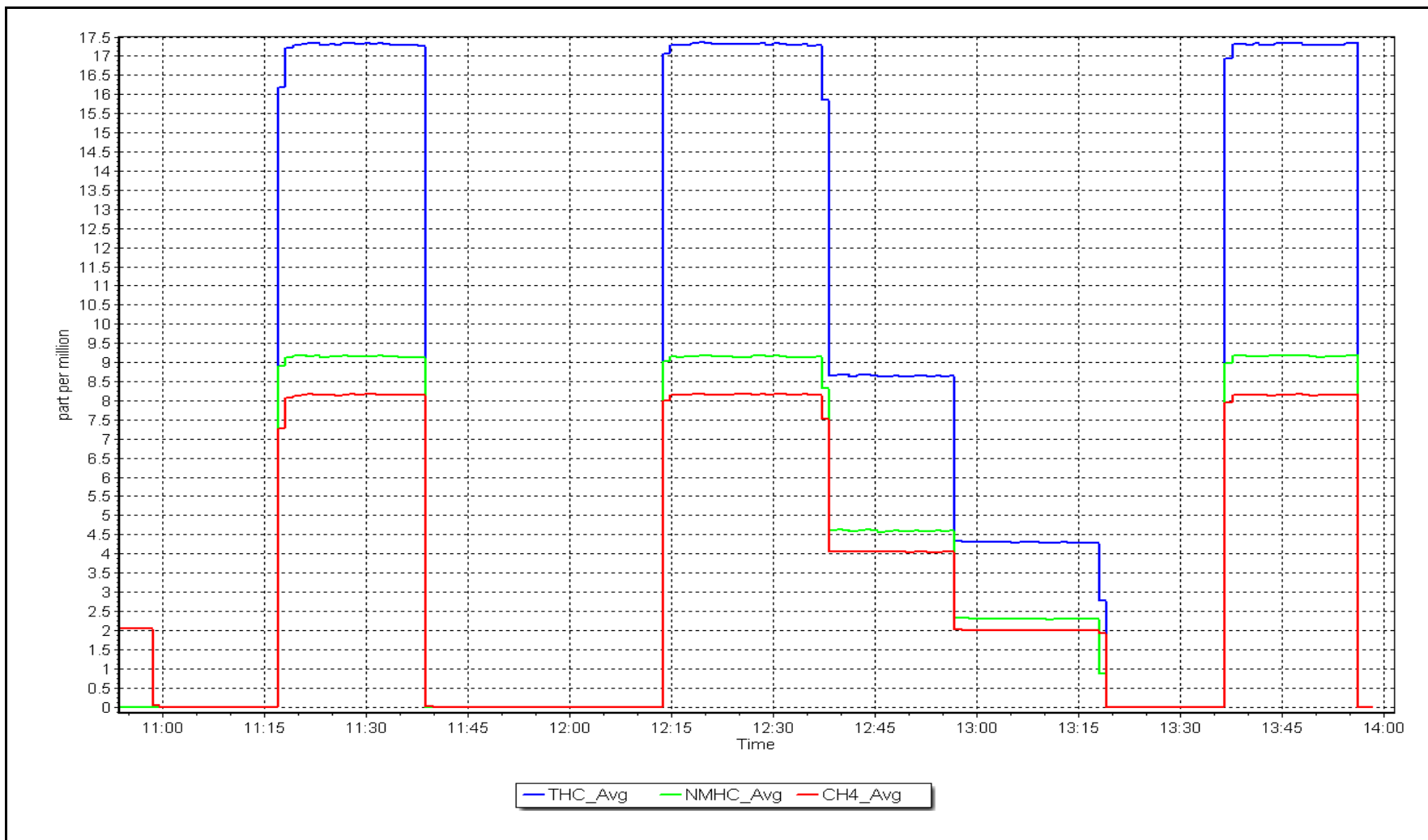
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999993 | $\geq 0.995$  |       |          |             |
| 9.17                                | 9.16                               | 1.0012                    |                         |          |               |       |          |             |
| 4.58                                | 4.60                               | 0.9973                    |                         |          |               | Slope | 0.998345 | 0.90 - 1.10 |
| 2.29                                | 2.30                               | 0.9938                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.010426 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 17, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Stony Mountain Station number: AMS 18  
Calibration Date: February 22, 2023 Last Cal Date: January 24, 2023  
Start time (MST): 10:55 End time (MST): 15:25  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2XX7ME Cal Gas Expiry Date: January 14, 2024  
NOX Cal Gas Conc: 50.48 ppm NO Cal Gas Conc: 49.22 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 50.48 ppm Removed Gas NO Conc: 49.22 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T700 Serial Number: 2658  
ZAG make/model: Teledyne API 701H Serial Number: 360

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 1336160088  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.043        | 1.043         | NO bkgnd or offset:  | 2.9          | 2.9           |
| NOX coeff or slope: | 0.987        | 0.987         | NOX bkgnd or offset: | 2.9          | 2.9           |
| NO2 coeff or slope: | 0.999        | 0.999         | Reaction cell Press: | 218.6        | 222.7         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000554     | 1.002587      |
| NO <sub>x</sub> Cal Offset: | 0.069933     | 0.289742      |
| NO Cal Slope:               | 1.001394     | 1.003123      |
| NO Cal Offset:              | -0.829546    | -0.910073     |
| NO <sub>2</sub> Cal Slope:  | 1.001873     | 0.999064      |
| NO <sub>2</sub> Cal Offset: | 0.315702     | 0.020158      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.0  | ----  | ----   |
| as found span             | 4919                      | 81.3                        | 820.8   | 800.3                                  | 20.5  | 824.5  | 801.4                                 | 23.2   | 0.9955  | 0.9986   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.1  | ----  | ----   |
| high point                | 4919                      | 81.3                        | 820.8   | 800.3                                  | 20.5  | 822.9  | 802.1                                 | 20.9   | 0.9974  | 0.9977   |
| second point              | 4959                      | 40.7                        | 410.9   | 400.7                                  | 10.3  | 412.9  | 401.2                                 | 11.8   | 0.9952  | 0.9987   |
| third point               | 4980                      | 20.3                        | 204.9   | 199.8                                  | 5.1   | 205.6  | 198.2                                 | 7.4  | 0.9968  | 1.0082   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4919                      | 81.3                        | 820.8   | 388.1                                  | 432.7   | 826.3  | 390.3                                 | 436.0  | 0.9933  | 0.9943   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9965  | 1.0015   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 824.5 ppb | NO = 801.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.4% |
| Previous Response    | NO <sub>x</sub> = 821.3 ppb | NO = 800.6 ppb |  | *Percent Change                  | NO = 0.1%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 802.7                                      | 390.5                                 | 432.7   | 432.4  | 1.0007   | 99.9%  |
| 2nd GPT point (200 ppb O3)       | 802.7                                      | 591.0                                 | 232.2   | 231.8  | 1.0017   | 99.8%  |
| 3rd GPT point (100 ppb O3)       | 802.7                                      | 697.5                                 | 125.7   | 125.6  | 1.0007   | 99.9%  |
| Average Correction Factor        |  |                                       |   |  | 1.0010   | 99.9%  |

Notes:

Sample inlet filter changed after as founds. No adjustments made.

Calibration Performed By:

Karan Pandit





# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

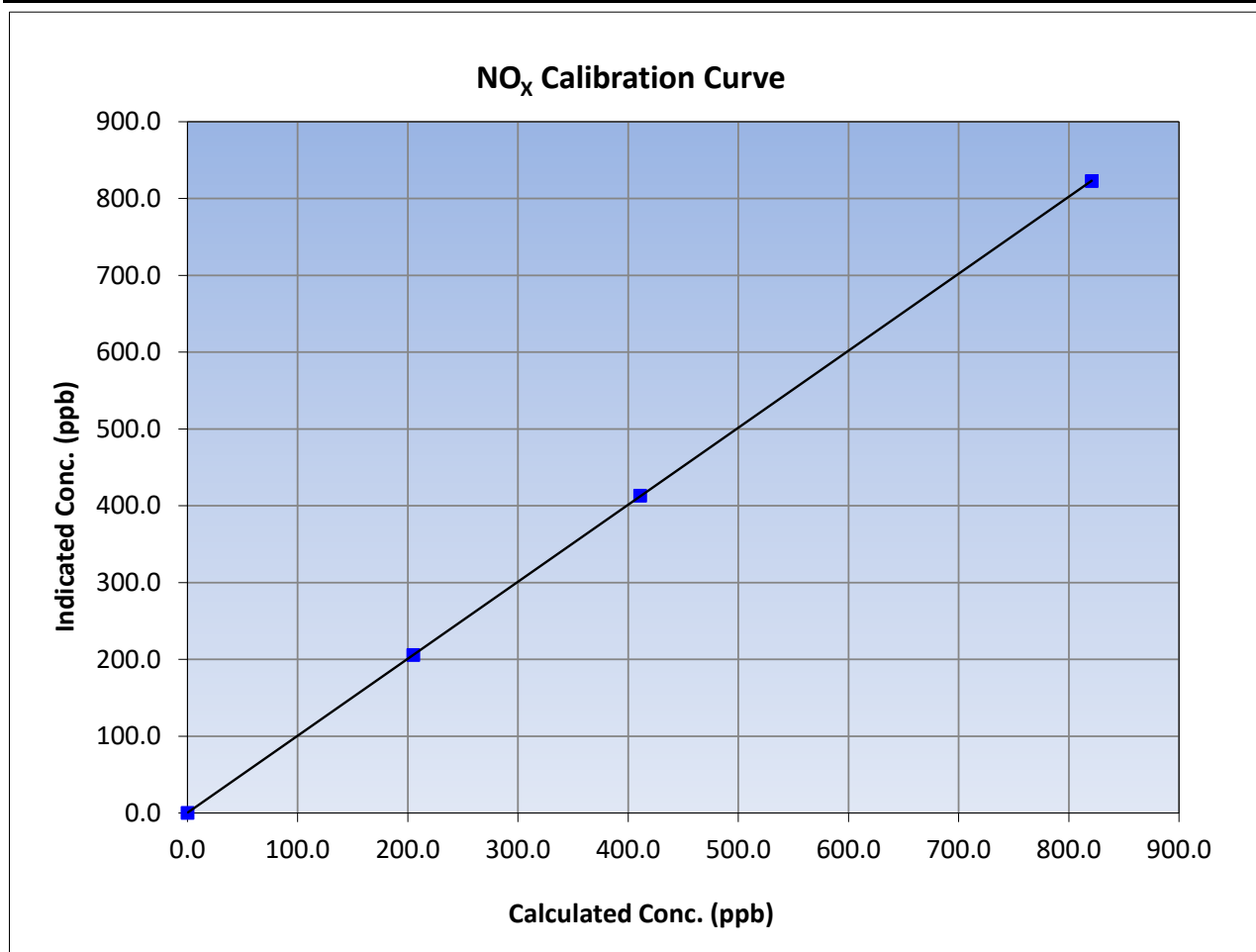
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 10:55             | End Time (MST):       | 15:25            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1336160088       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995   |             |
| 820.8                               | 822.9                              | 0.9974                    |                         |          |             |
| 410.9                               | 412.9                              | 0.9952                    |                         |          |             |
| 204.9                               | 205.6                              | 0.9968                    |                         |          |             |
|                                     |                                    |                           | Slope                   | 1.002587 | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.289742 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

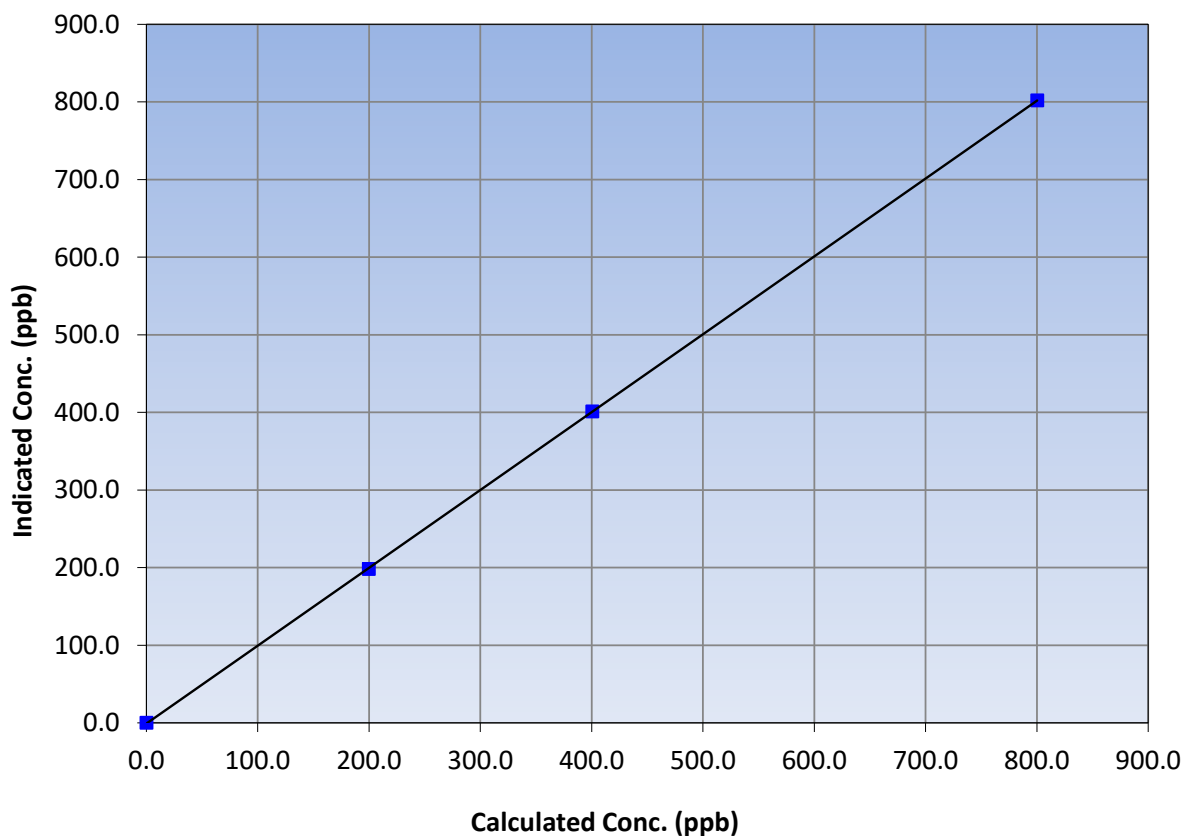
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 10:55             | End Time (MST):       | 15:25            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1336160088       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                                    |
|-------------------------------------|------------------------------------|---------------------------|---|---|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br>$0.90 - 1.10$<br>$\pm 20$ |
| 800.3                               | 802.1                              | 0.9977                    |   |   |
| 400.7                               | 401.2                              | 0.9987                    |   |   |
| 199.8                               | 198.2                              | 1.0082                    |   |   |
|                                     |                                    |                           | 0.999992                                      |   |
|                                     |                                    |                           | 1.003123                                      |   |
|                                     |                                    |                           | -0.910073                                     |   |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

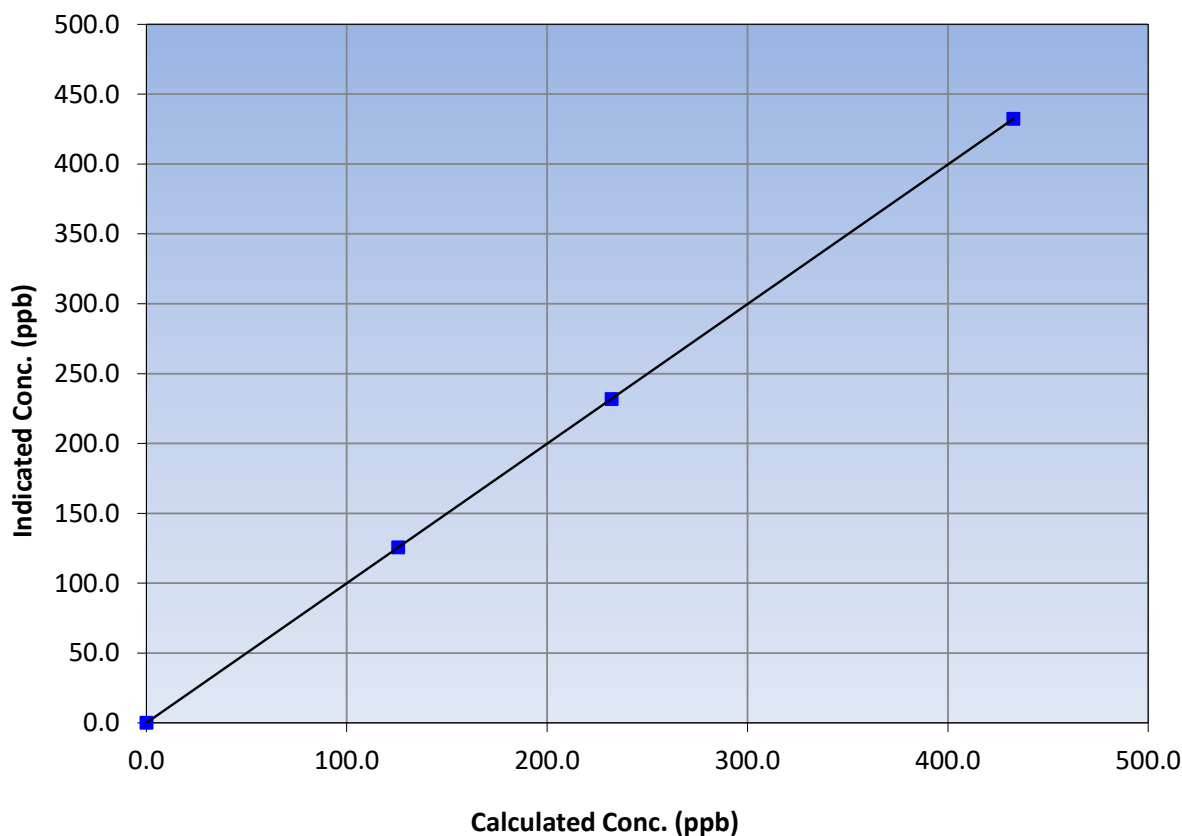
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18           |
| Start Time (MST): | 10:55             | End Time (MST):       | 15:25            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1336160088       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 432.7                               | 432.4                              | 1.0007                    |   |                                |
| 232.2                               | 231.8                              | 1.0017                    |   |                                |
| 125.7                               | 125.6                              | 1.0007                    |   |                                |
|                                     |                                    |                           | 0.999999                                      |                                |
|                                     |                                    |                           | 0.999064                                      |                                |
|                                     |                                    |                           | 0.020158                                      |                                |

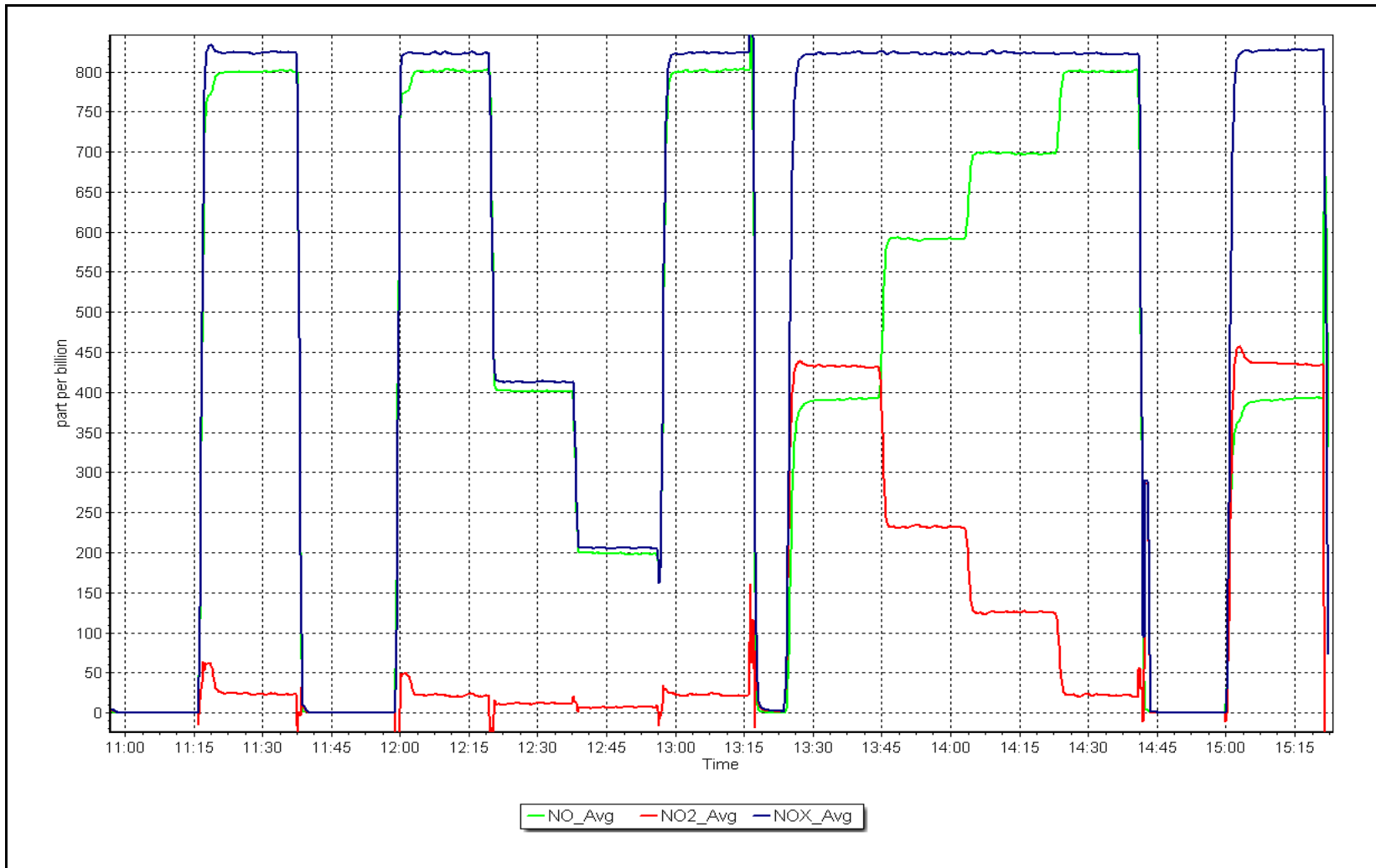
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 22, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Stony Mountain      Station number: AMS18  
 Calibration Date: February 15, 2023      Last Cal Date: January 9, 2023  
 Start time (MST): 10:34      End time (MST): 13:34  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700      Serial Number: 2658  
 ZAG Make/Model: Teledyne API T701H      Serial Number: 360

### Analyzer Information

Analyzer make: API T400      Analyzer serial #: 825  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.993114     | 1.001514      | Backgd or Offset: | 1.000        | 1.000         |
| Calibration intercept: | -0.320000    | -0.040000     | Coeff or Slope:   | 0.976        | 0.993         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 800.0                         | 0.0                                 | -0.3                               | ----  |
| as found span             | 4888                       | 1096.9                        | 400.0                               | 395.5                              | 1.011   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 800.0                         | 0.0                                 | -0.2                               | ----  |
| high point                | 4888                       | 1101.7                        | 400.0                               | 400.4                              | 0.999   |
| second point              | 4888                       | 863.9                         | 200.0                               | 200.6                              | 0.997   |
| third point               | 4888                       | 741.4                         | 100.0                               | 100.1                              | 0.999   |
| as left zero              | 5000                       | 800.0                         | 0.0                                 | 0.2                                | ----  |
| as left span              | 4812                       | 1097.9                        | 400.0                               | 402.7                              | 0.993   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.998   |

|                          |       |                   |       |               |       |
|--------------------------|-------|-------------------|-------|---------------|-------|
| Baseline Corr As found:  | 395.8 | Previous response | 396.9 | *% change     | -0.3% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |       |

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

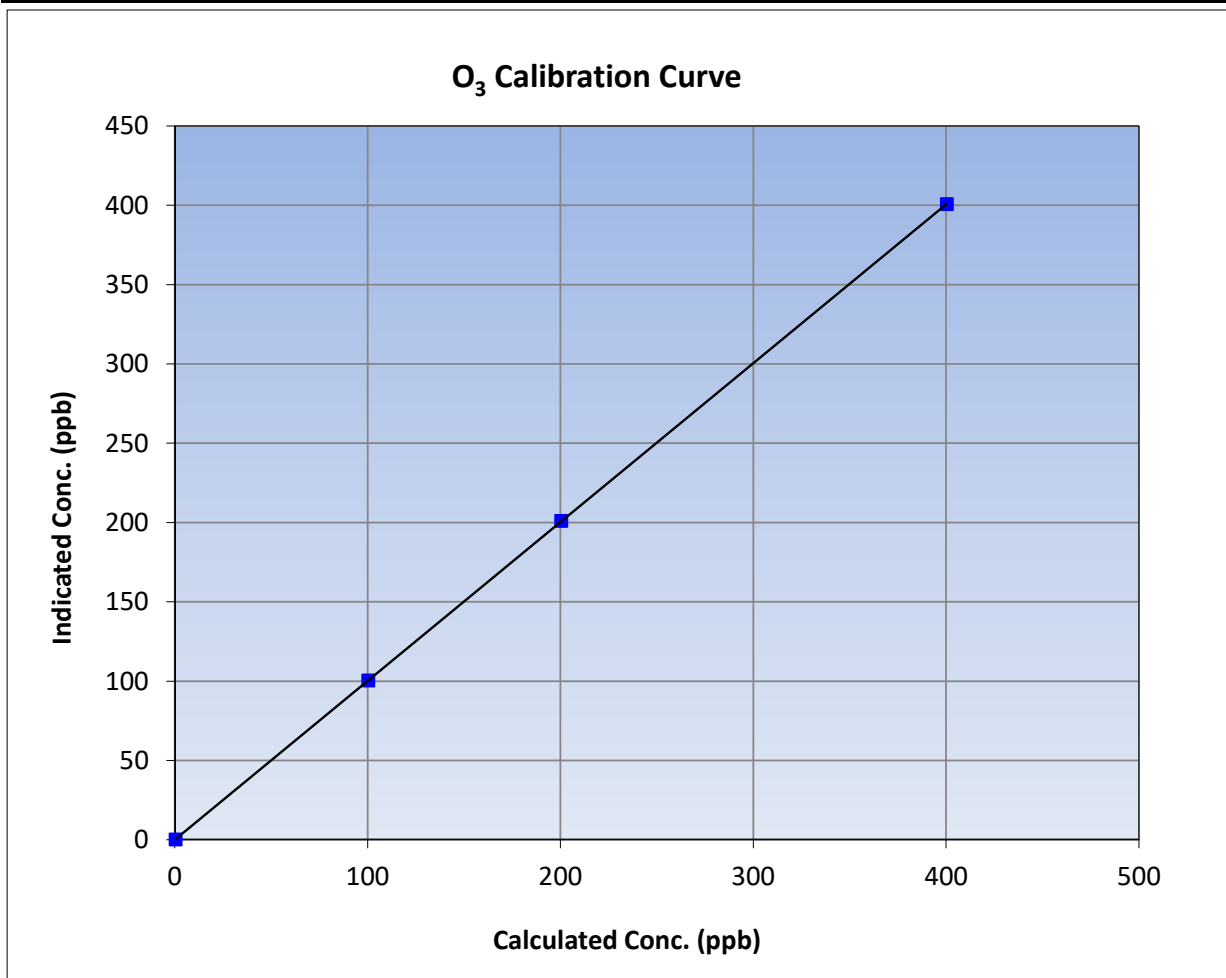
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS18           |
| Start Time (MST): | 10:34             | End Time (MST):       | 13:34           |
| Analyzer make:    | API T400          | Analyzer serial #:    | 825             |

### Calibration Data

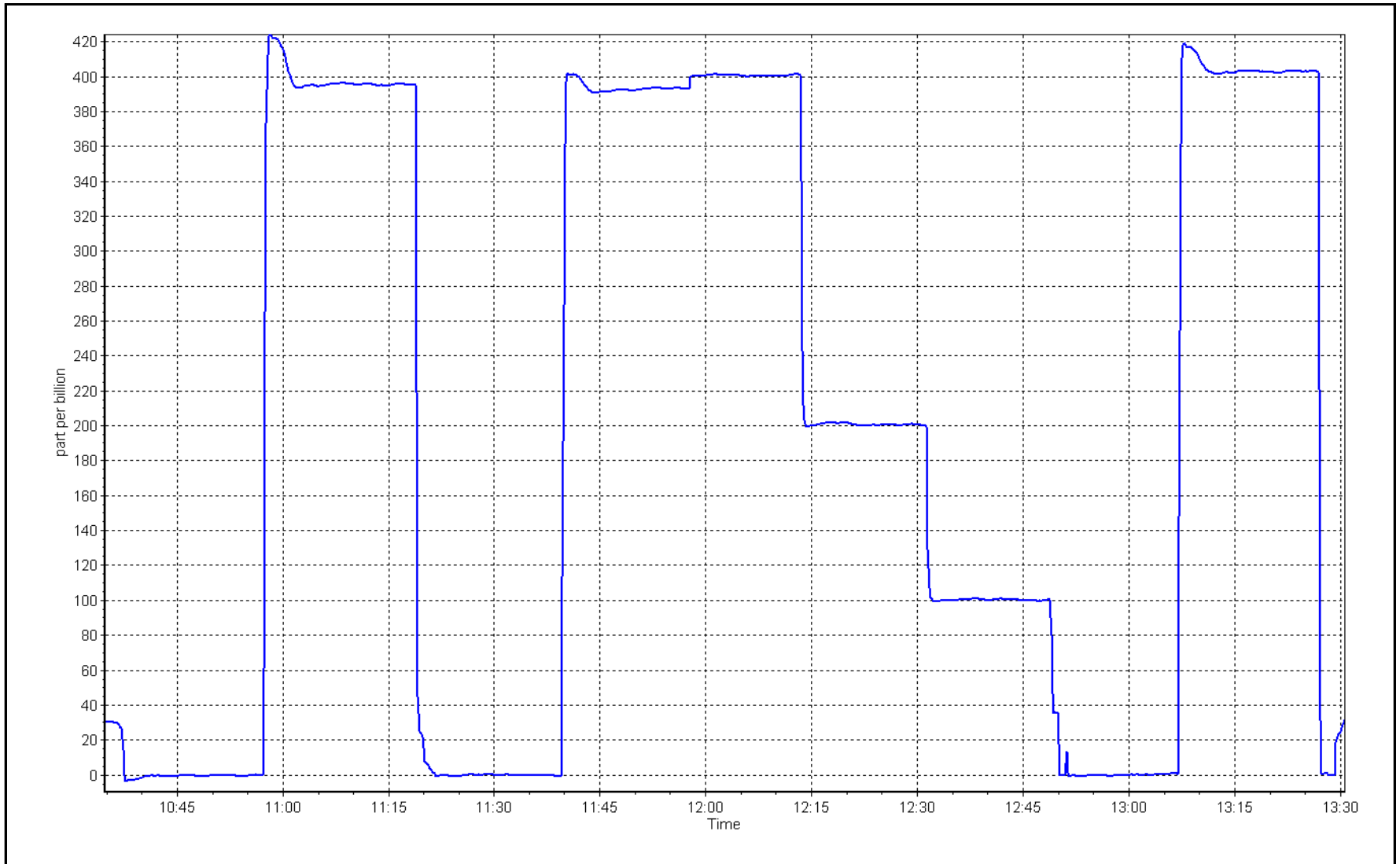
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | 0.999998  | ≥0.995      |
| 400.0                               | 400.4                              | 0.9990                    |                         |           |             |
| 200.0                               | 200.6                              | 0.9970                    | Slope                   | 1.001514  | 0.90 - 1.10 |
| 100.0                               | 100.1                              | 0.9990                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.040000 | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 15, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Stony Mountain Station number: AMS 18  
 Calibration Date: February 24, 2023 Last Cal Date: January 24, 2023  
 Start time (MST): 12:02 End time (MST): 12:24

Analyzer Make: API T640 S/N: 1335  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1102  
 Temp/RH standard: Delta Cal S/N: 1102

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -17.9    | -18.3    | -17.9   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 698.8    | 699.6    | 698.8   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.02     | 4.98     | 5.02    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 24, 2023 Last Cal Date: January 24, 2023  
 PM w/o HEPA: 2.2 PM w/ HEPA: 0.0 **<0.2 ug/m3**

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: November 16, 2022 **<0.2 ug/m3**  
 Disposable Filter Changed: November 16, 2022

### Annual Maintenance

Date Sample Tube Cleaned: August 30, 2022  
 Date RH/T Sensor Cleaned: August 30, 2022

Notes: No adjustments made to temperature, pressure or flow. Leak check passed.

Calibration by: Karan Pandit





# Wood Buffalo Environmental Association

## CO Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Stony Mountain    | Station number: | AMS 18          |
| Calibration Date: | February 24, 2023 | Last Cal Date:  | January 6, 2023 |
| Start time (MST): | 11:05             | End time (MST): | 13:53           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 3,050             | ppm | Cal Gas Exp Date: | December 1, 2028 |
| Cal Gas Cylinder #:    | ALM063503         |     |                   |                  |
| Removed Cal Gas Conc:  | 3,050             | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 2658             |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 360              |

### Analyzer Information

|                 |            |                    |      |
|-----------------|------------|--------------------|------|
| Analyzer make:  | API T300   | Analyzer serial #: | 3504 |
| Analyzer Range: | 0 - 50 ppm |                    |      |

|                        |                     |                      |                   |                     |                      |
|------------------------|---------------------|----------------------|-------------------|---------------------|----------------------|
|                        | <b><u>Start</u></b> | <b><u>Finish</u></b> |                   | <b><u>Start</u></b> | <b><u>Finish</u></b> |
| Calibration slope:     | 1.018233            | 0.997892             | Backgd or Offset: | -0.009              | -0.009               |
| Calibration intercept: | 0.009764            | 0.161801             | Coeff or Slope:   | 0.916               | 0.904                |

### CO Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as found span             | 4933                          | 66.7                        | 40.7                                | 41.7                               | 0.976   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                | 4933                          | 66.7                        | 40.7                                | 40.7                               | 1.000   |
| second point              | 4966                          | 33.3                        | 20.3                                | 20.6                               | 0.985   |
| third point               | 4983                          | 16.7                        | 10.2                                | 10.3                               | 0.991   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 2960                          | 40.0                        | 40.7                                | 41.0                               | 0.993   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.992   |

|                          |       |                 |       |               |      |
|--------------------------|-------|-----------------|-------|---------------|------|
| Baseline Corr As found:  | 41.59 | Prev response:  | 41.44 | *% change:    | 0.4% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:       |       | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation: |       |               |      |

\* = > +/-5% change initiates investigation

Notes: Sample inlet filter changed after as founds. Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## CO Calibration Summary

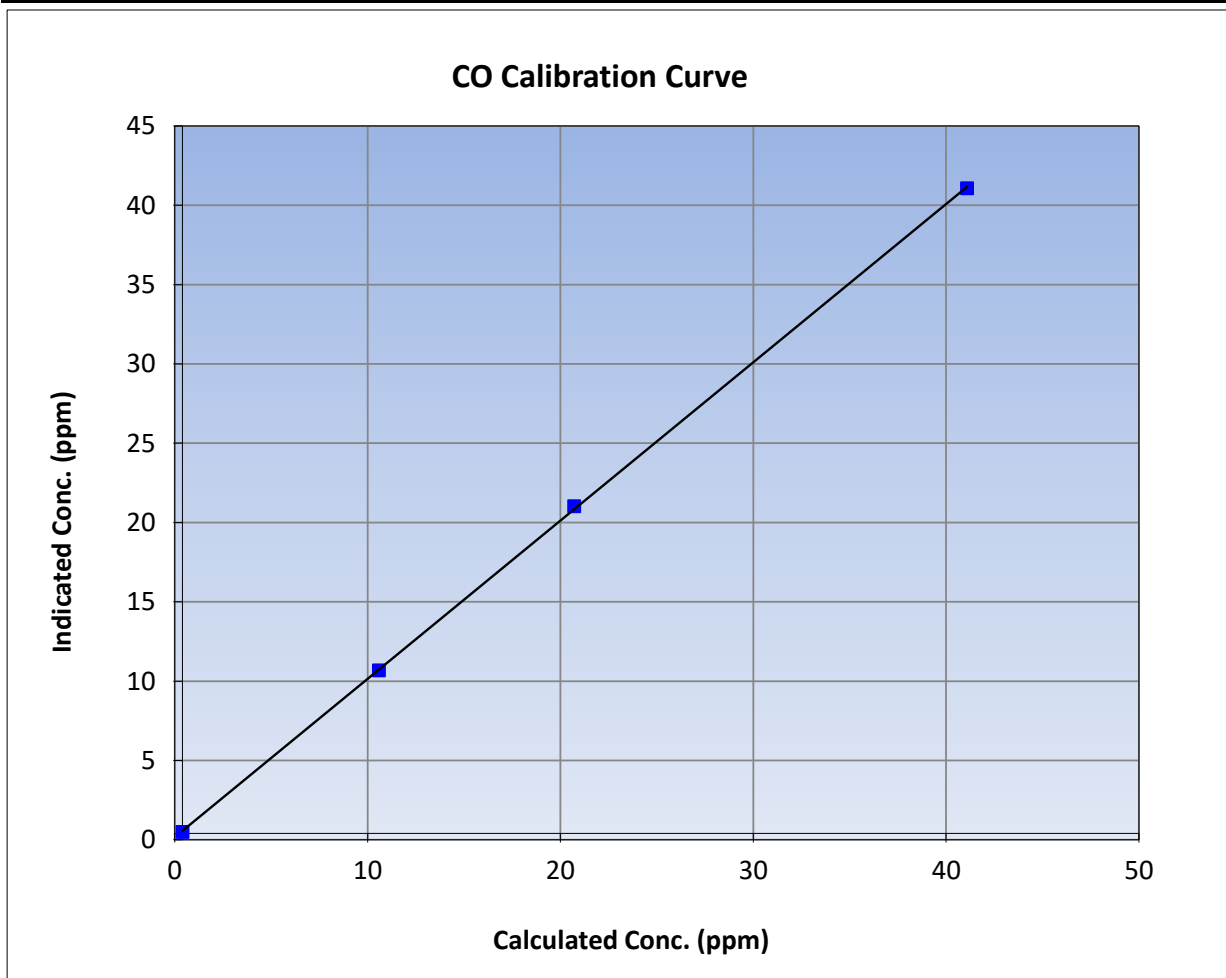
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | January 6, 2023 |
| Station Name:     | Stony Mountain    | Station Number:       | AMS 18          |
| Start Time (MST): | 11:05             | End Time (MST):       | 13:53           |
| Analyzer make:    | API T300          | Analyzer serial #:    | 3504            |

### Calibration Data

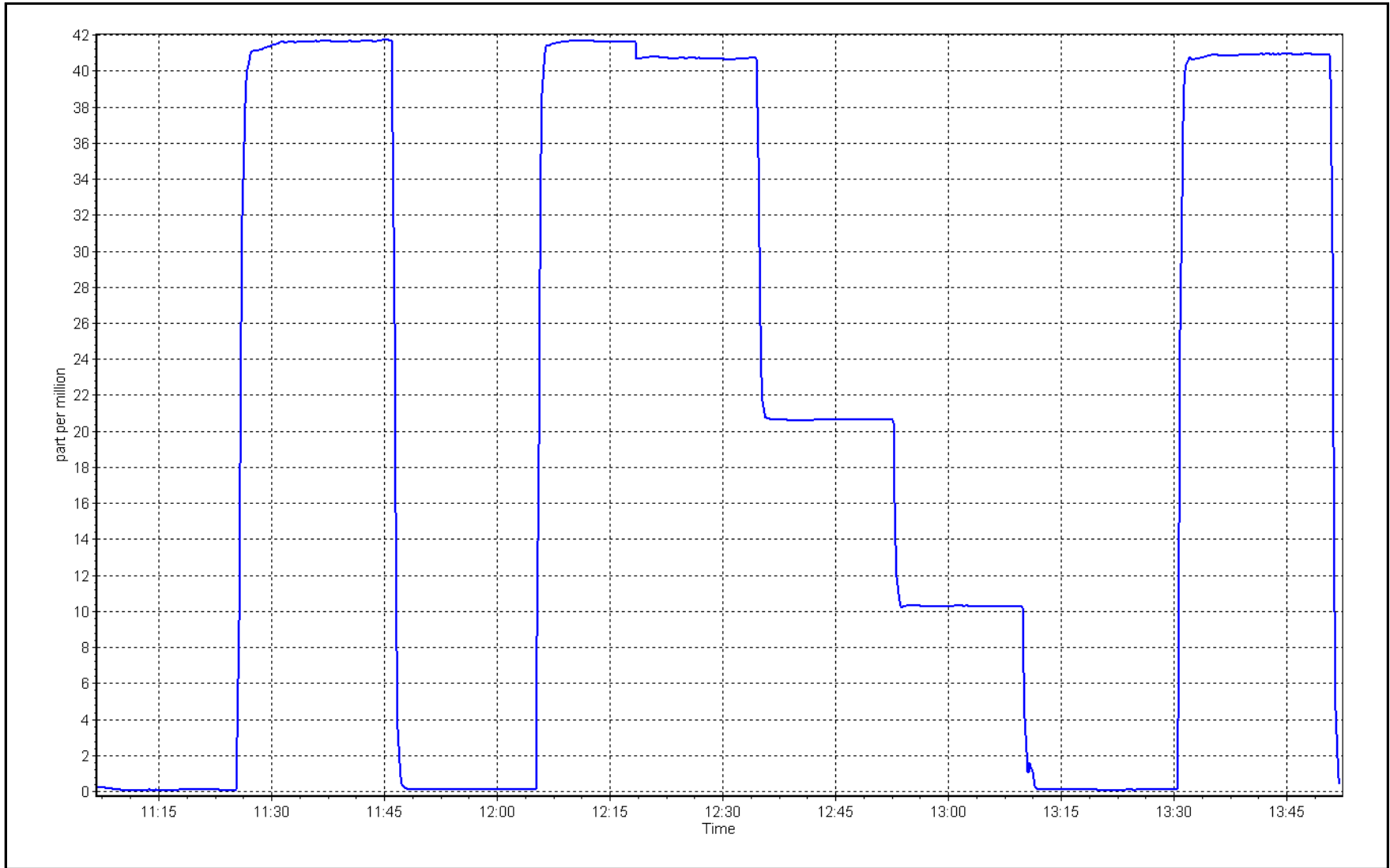
| Calculated concentration<br>(ppm) (Cc) | Indicated concentration<br>(ppm) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |               |
|--|---------------------------------------|------------------------------|-------------------------|---------------|---------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | 0.999943      |               |
| 40.7                                   | 40.7                                  | 1.0002                       |                         |               | $\geq 0.995$  |
| 20.3                                   | 20.6                                  | 0.9848                       | Slope                   | 0.997892      |               |
| 10.2                                   | 10.3                                  | 0.9910                       |                         |               | $0.90 - 1.10$ |
|  |                                       |                              | Intercept               | 0.161801      | $\pm 1.5$     |



CO Calibration Plot

Date: February 24, 2023

Location: Stony Mountain





# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Stony Mountain   | Station number: | AMS 18           |
| Calibration Date: | February 8, 2023 | Last Cal Date:  | January 12, 2023 |
| Start time (MST): | 11:15            | End time (MST): | 16:07            |
| Reason:           | Maintenance      |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 60,220            | ppm | Cal Gas Exp Date: | December 1, 2026 |
| Cal Gas Cylinder #:    | ALM063503         |     |                   |                  |
| Removed Cal Gas Conc:  | 60,220            | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | NA                |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 2658             |
| N2 Gen Make/Model:     | Peak Scientific   |     | Serial Number:    | 771048317        |

### Analyzer Information

|                              |                        |
|------------------------------|------------------------|
| Analyzer make: API T360      | Analyzer serial #: 283 |
| Analyzer Range 0 - 2,000 ppm |                        |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.000425     | 0.999561      | Backgd or Offset: | -0.045       | -0.059        |
| Calibration intercept: | 5.520000     | 1.700000      | Coeff or Slope:   | 1.051        | 1.066         |

### CO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 3000                          | 0.0                         | 0.0                                 | 1.7                                | ----  |
| as found span             | 2930                          | 80.0                        | 1600.5                              | 1583.5                             | 1.011   |
| as found 2nd point        | 2970                          | 40.0                        | 800.3                               | 803.8                              | 0.996   |
| as found 3rd point        | 2990                          | 20.0                        | 400.1                               | 401.8                              | 0.996   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 3000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                | 2930                          | 80.0                        | 1600.5                              | 1598.4                             | 1.001   |
| second point              | 2970                          | 40.0                        | 800.3                               | 809.2                              | 0.989   |
| third point               | 2990                          | 20.0                        | 400.1                               | 399.0                              | 1.003   |
| as left zero              | 3000                          | 0.0                         | 0.0                                 | -0.3                               | ----  |
| as left span              | 2930                          | 80.0                        | 1600.5                              | 1606.2                             | 0.996   |
| Average Correction Factor |                               |                             |                                     |                                    | 0.998   |

|                          |         |                 |          |               |          |
|--------------------------|---------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 1581.80 | Prev response:  | 1606.73  | *% change:    | -1.6%    |
| Baseline Corr 2nd AF pt: | 802.1   | AF Slope:       | 0.988100 | AF Intercept: | 5.800000 |
| Baseline Corr 3rd AF pt: | 400.1   | AF Correlation: | 0.999938 |               |          |

\* = > +/-5% change initiates investigation

Notes: Sample pump started to fail. Completed multipoint as founds. Changed the pump and sample inlet filter. Adjusted the zero only.

Calibration Performed By: Karan Pandit and Karina Fenwick



# Wood Buffalo Environmental Association

## CO<sub>2</sub> Calibration Summary

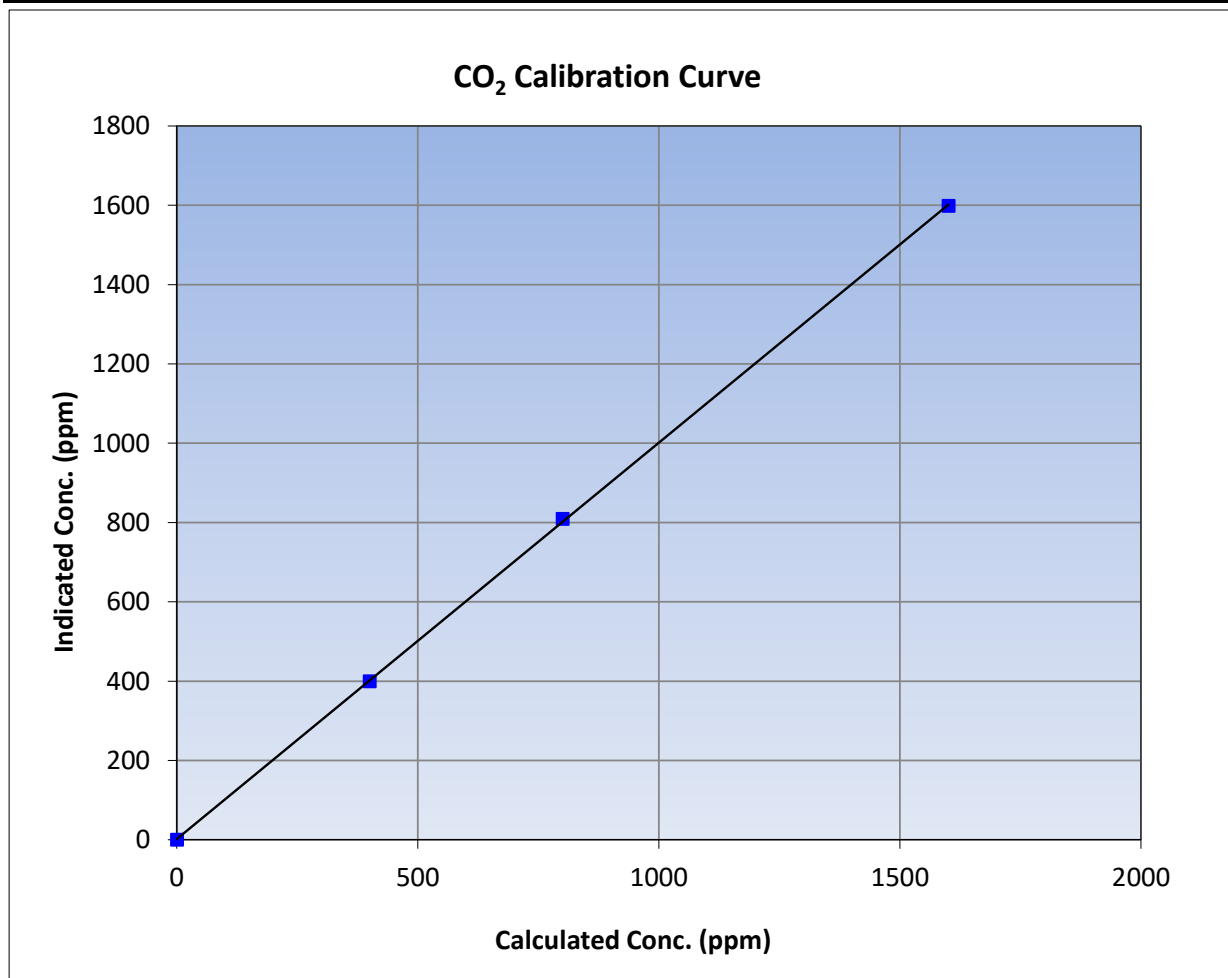
Version-01-2020

### Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | February 8, 2023 | Previous Calibration | January 12, 2023 |
| Station Name     | Stony Mountain   | Station Number       | AMS 18           |
| Start Time (MST) | 11:15            | End Time (MST)       | 16:07            |
| Analyzer make    | API T360         | Analyzer serial #    | 283              |

### Calibration Data

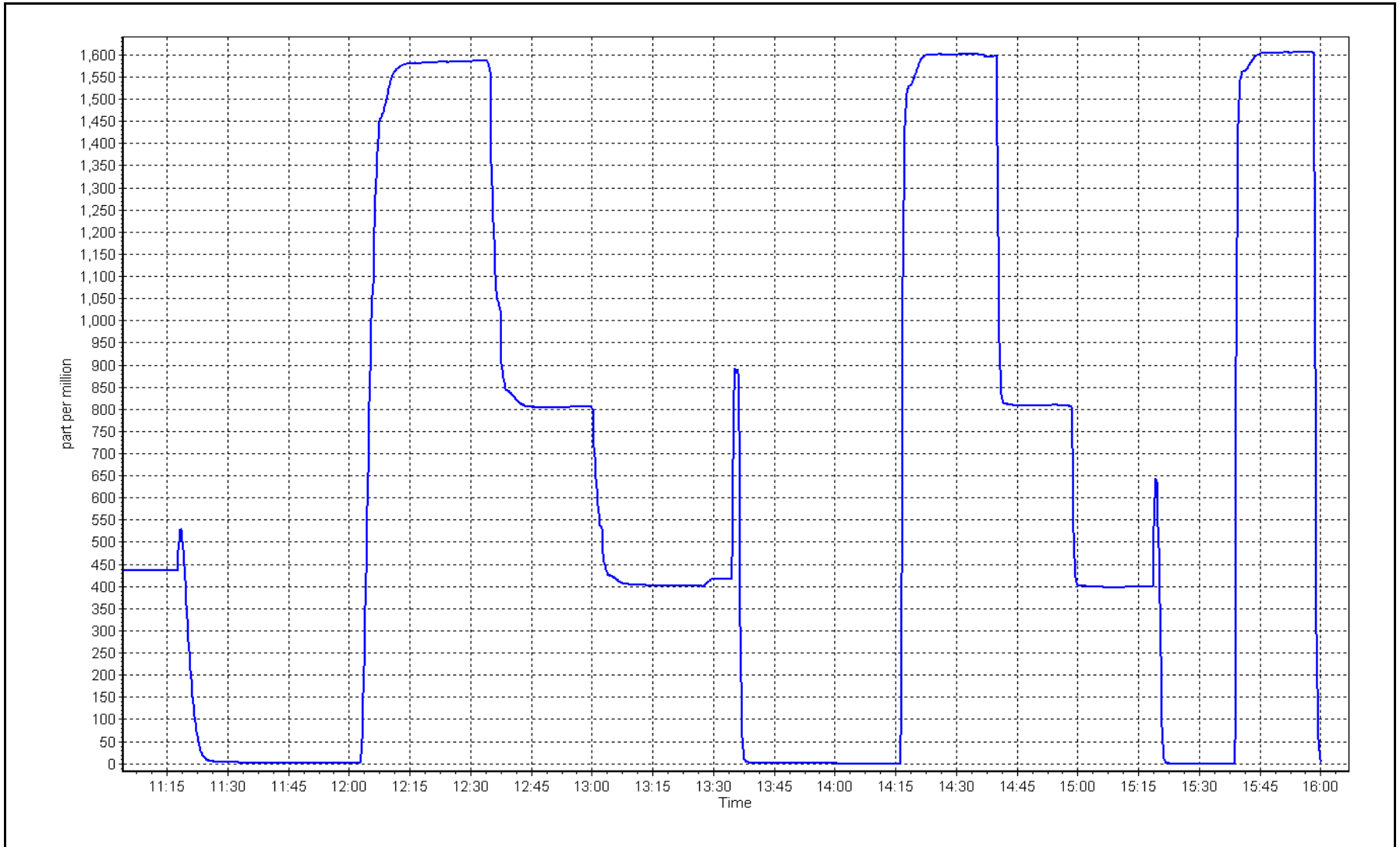
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999945 | ≥0.995      |
| 1600.5                              | 1598.4                             | 1.0013                    |                         |          |             |
| 800.3                               | 809.2                              | 0.9890                    | Slope                   | 0.999561 | 0.90 - 1.10 |
| 400.1                               | 399.0                              | 1.0028                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 1.700000 | +/-10       |



CO<sub>2</sub> Calibration Plot

Date: February 8, 2023

Location: Stony Mountain





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS19 FIREBAG FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023









# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

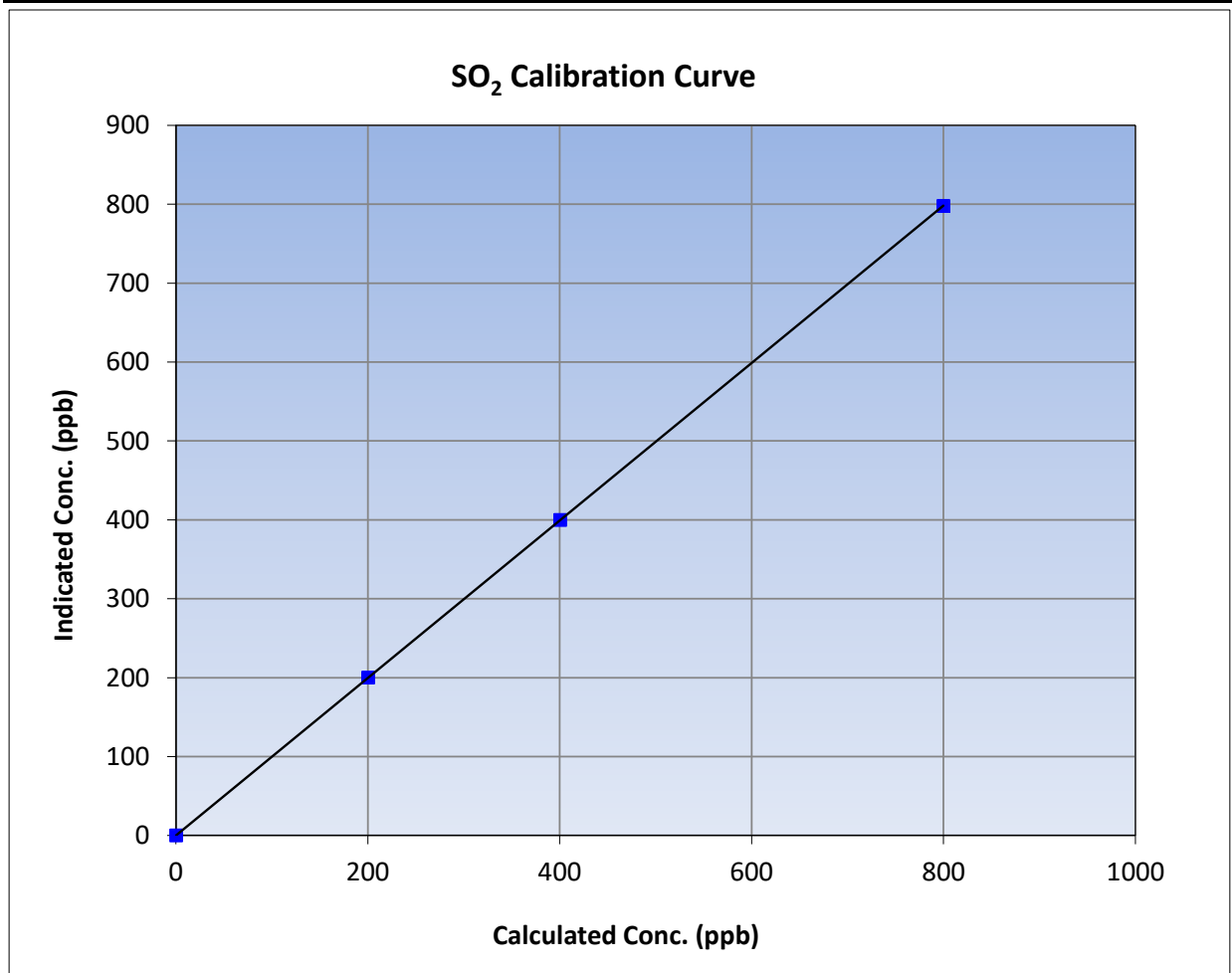
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 26, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS 19           |
| Start Time (MST): | 11:41            | End Time (MST):       | 14:46            |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1410661308       |

### Calibration Data

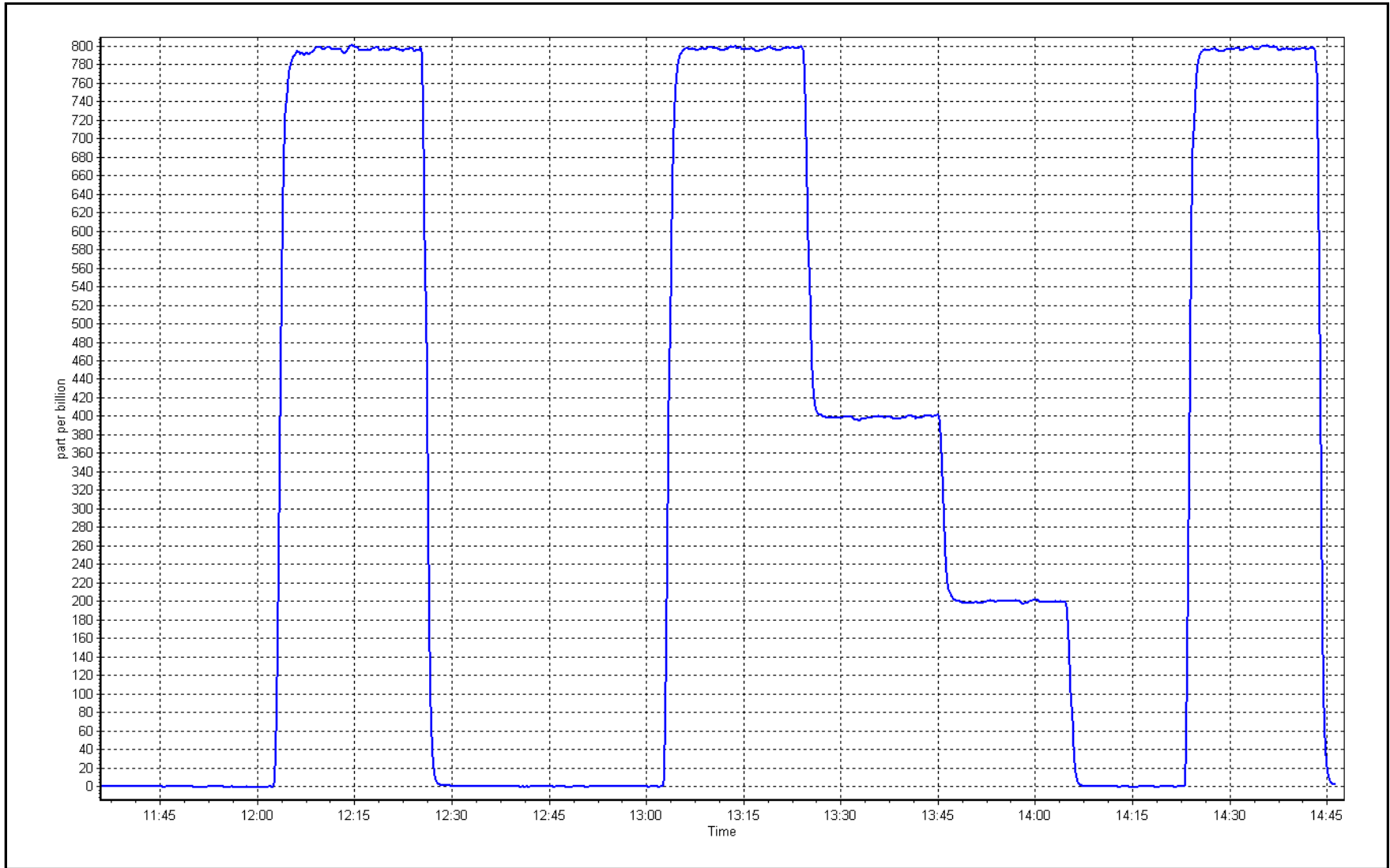
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.3                               | ----                      | Correlation Coefficient | 1.000000  | ≥0.995      |
| 799.5                               | 797.7                              | 1.0022                    |                         |           |             |
| 400.3                               | 399.6                              | 1.0017                    | Slope                   | 0.998105  | 0.90 - 1.10 |
| 200.1                               | 199.7                              | 1.0020                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.121714 | +/-30       |



SO2 Calibration Plot

Date: February 7, 2023

Location: Firebag





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Firebag          | Station number: | AMS19            |
| Calibration Date: | February 6, 2023 | Last Cal Date:  | January 18, 2023 |
| Start time (MST): | 11:02            | End time (MST): | 15:18            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|                        |                   |     |                   |                  |
|------------------------|-------------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 5.114             | ppm | Cal Gas Exp Date: | February 5, 2024 |
| Cal Gas Cylinder #:    | CC517427          |     |                   |                  |
| Removed Cal Gas Conc:  | 5.114             | ppm | Rem Gas Exp Date: | n/a              |
| Removed Gas Cyl #:     | n/a               |     | Diff between cyl: |                  |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 1607             |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 1118             |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i-TLE | Analyzer serial #:  | 1336160090 |
| Converter make: | Global         | Converter serial #: | 2022-222   |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 0.998910     | 0.997909      | Backgd or Offset: | 2.88          |
| Calibration intercept: | 0.058437     | 0.118481      | Coeff or Slope:   | 0.955         |
|                        |              |               |                   | 2.96          |
|                        |              |               |                   | 0.979         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4922                          | 78.2                        | 80.0                                | 78.2                               | 1.024  |
| as found 2nd point    | 4961                          | 39.1                        | 40.0                                | 39.0                               | 1.028  |
| as found 3rd point    | 4980                          | 19.6                        | 20.0                                | 19.5                               | 1.033  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4922                          | 78.2                        | 80.0                                | 79.9                               | 1.001   |
| second point                            | 4961                          | 39.1                        | 40.0                                | 40.1                               | 0.997   |
| third point                             | 4980                          | 19.6                        | 20.0                                | 20.1                               | 0.997   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4922                          | 78.2                        | 80.0                                | 79.8                               | 1.002   |
| SO2 Scrubber Check                      | 4922                          | 78.3                        | 800.2                               | 0.0                                | ----  |
| Date of last scrubber change:           | December 9, 2021              |                             |                                     | Ave Corr Factor                    | 0.999   |
| Date of last converter efficiency test: | n/a                           |                             |                                     | efficiency                         |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 78.1 | Prev response:  | 79.95    | *% change:    | -2.4%     |
| Baseline Corr 2nd AF pt: | 38.9 | AF Slope:       | 0.977040 | AF Intercept: | -0.001035 |
| Baseline Corr 3rd AF pt: | 19.4 | AF Correlation: | 0.999992 |               |           |

\* = > +/-5% change initiates investigation

Notes: SOx scrubber check done after calibrator zero. Adjusted span. Changed sample inlet filter after MPAF's.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

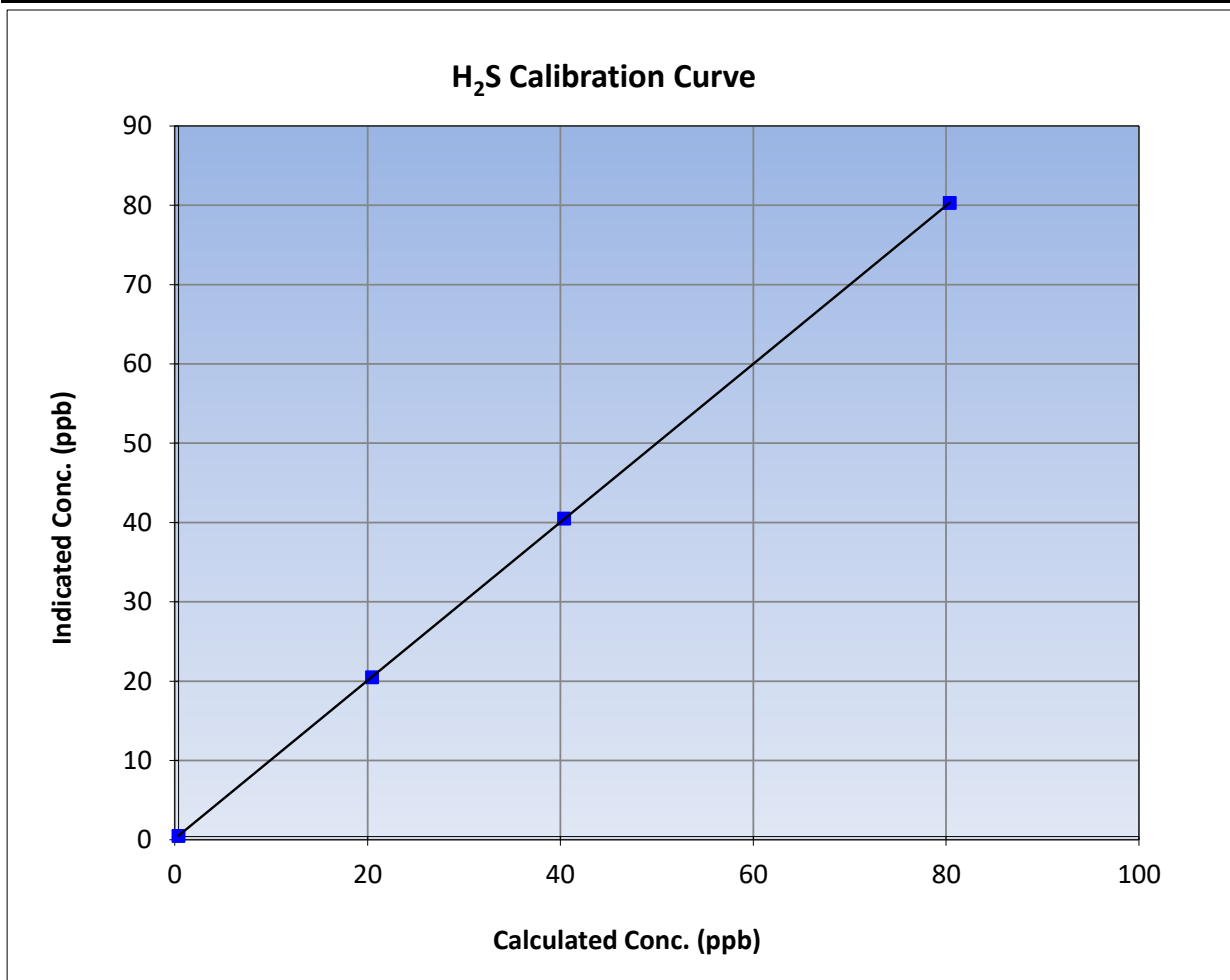
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS19            |
| Start Time (MST): | 11:02            | End Time (MST):       | 15:18            |
| Analyzer make:    | Thermo 43i-TLE   | Analyzer serial #:    | 1336160090       |

### Calibration Data

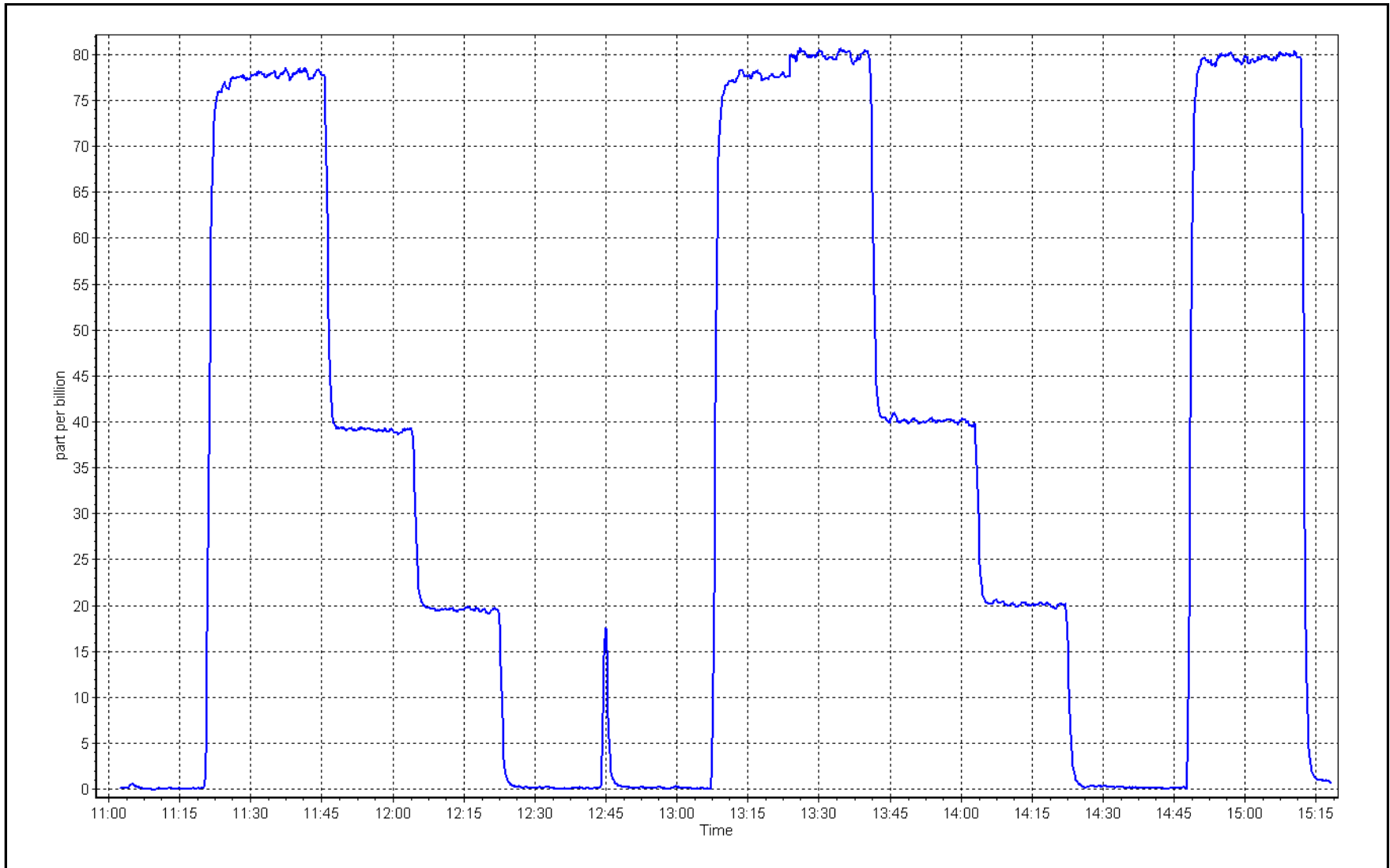
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999998 | ≥0.995      |
| 80.0                                | 79.9                               | 1.0010                    |                         |          |             |
| 40.0                                | 40.1                               | 0.9973                    | Slope                   | 0.997909 | 0.90 - 1.10 |
| 20.0                                | 20.1                               | 0.9974                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.118481 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 6, 2023

Location: Firebag







# Wood Buffalo Environmental Association

## THC Calibration Summary

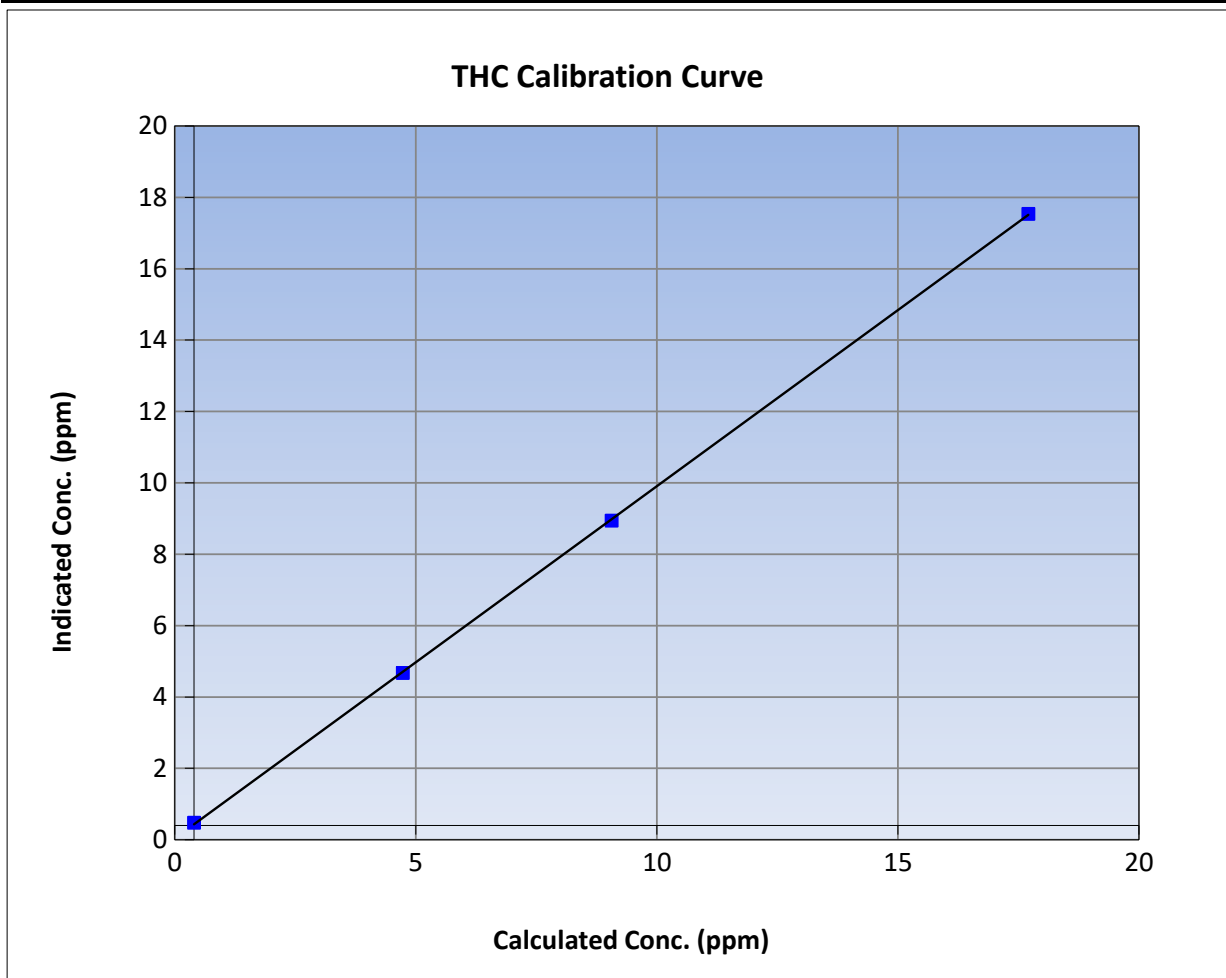
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 26, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS 19           |
| Start Time (MST): | 11:41            | End Time (MST):       | 14:46            |
| Analyzer make:    | Thermo 51i-LT    | Analyzer serial #:    | 1336160089       |

### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.00                                | 0.08                               | ----                      | Correlation Coefficient | 0.999961      | ≥0.995      |
| 17.31                               | 17.14                              | 1.0096                    |                         |               |             |
| 8.66                                | 8.54                               | 1.0145                    | Slope                   | 0.986792      | 0.90 - 1.10 |
| 4.33                                | 4.27                               | 1.0139                    |                         |               |             |
|                                     |                                    |                           | Intercept               | 0.033117      | +/-1.5      |

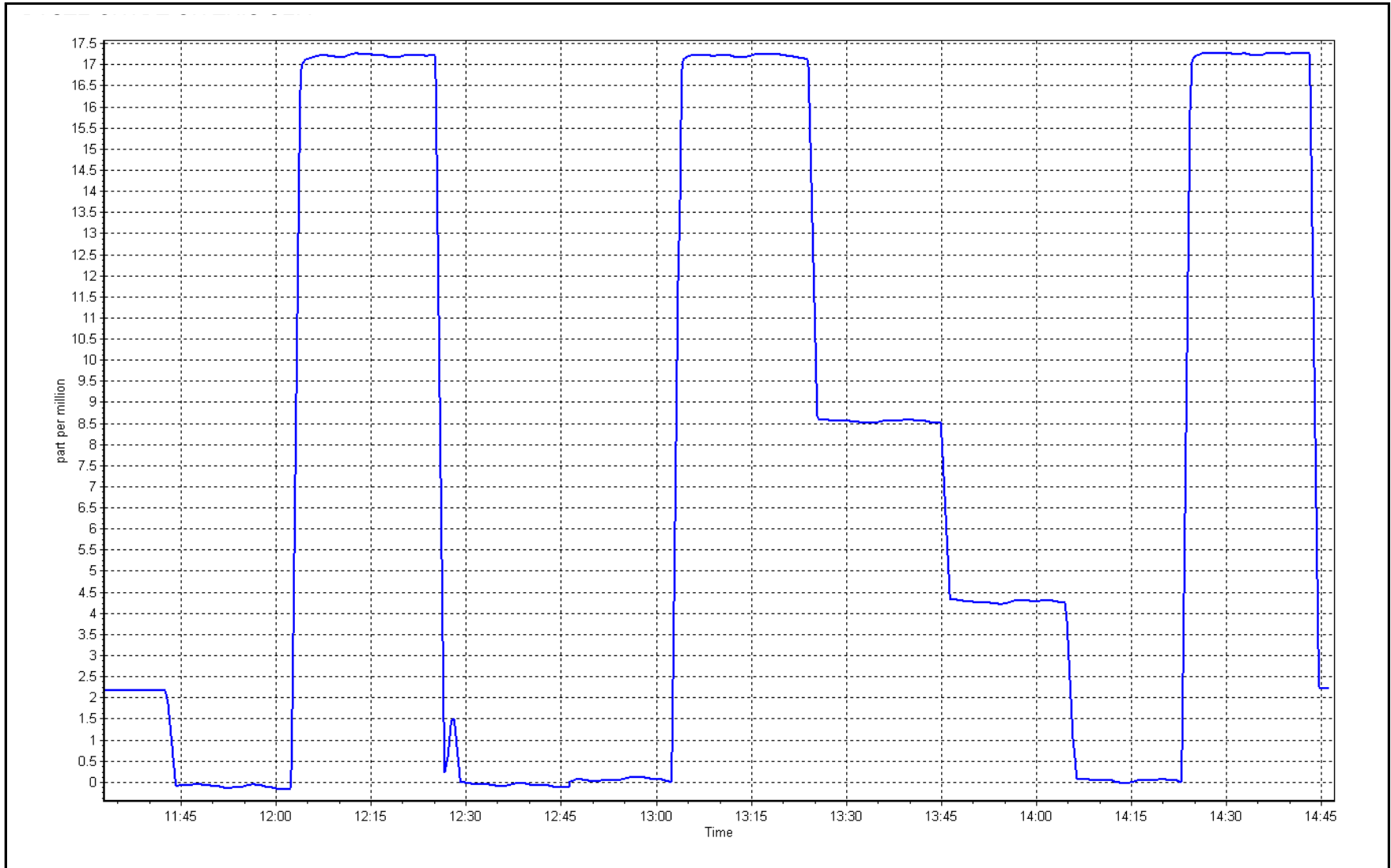




THC Calibration Plot

Date: February 7, 2023

Location: Firebag





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Firebag  
Calibration Date: February 8, 2023  
Start time (MST): 10:48  
Reason: Routine  
Station number: AMS 19  
Last Cal Date: January 19, 2023  
End time (MST): 15:35

### Calibration Standards

NO Gas Cylinder #: T2Y1K63  
NOX Cal Gas Conc: 51.12 ppm  
Removed Cylinder #: n/a  
Removed Gas NOX Conc: 51.12 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T700  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: November 30, 2023  
NO Cal Gas Conc: 49.40 ppm  
Removed Gas Exp Date: n/a  
Removed Gas NO Conc: 49.40 ppm  
NO gas Diff:  
Serial Number: 1607  
Serial Number: 1118

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1410661309

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.041        | 1.041         | NO bkgnd or offset:  | 7.2          | 7.3           |
| NOX coeff or slope: | 0.996        | 0.996         | NOX bkgnd or offset: | 7.3          | 7.3           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 207.8        | 210.9         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.990896     | 0.997423      |
| NO <sub>x</sub> Cal Offset: | 0.574492     | 0.135510      |
| NO Cal Slope:               | 0.991188     | 0.998470      |
| NO Cal Offset:              | 0.047030     | -0.351682     |
| NO <sub>2</sub> Cal Slope:  | 1.003489     | 0.999864      |
| NO <sub>2</sub> Cal Offset: | -1.311603    | -0.568980     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.2                                  | 0.1  | ----  | ----   |
| as found span             | 4919                      | 81.0                        | 828.1   | 800.3                                  | 27.9  | 830.0  | 799.7                                 | 30.7   | 0.9978  | 1.0007   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4919                      | 81.0                        | 828.1   | 800.3                                  | 27.9  | 826.0  | 798.8                                 | 27.4   | 1.0026  | 1.0019   |
| second point              | 4960                      | 40.5                        | 414.0   | 400.1                                  | 13.9  | 413.4  | 399.1                                 | 14.3   | 1.0015  | 1.0025   |
| third point               | 4980                      | 20.2                        | 206.5   | 199.6                                  | 6.9   | 206.1  | 198.6                                 | 7.6  | 1.0020  | 1.0049   |
| as left zero              | 4999                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as left span              | 4919                      | 81.0                        | 828.1   | 359.5                                  | 468.7   | 819.0  | 350.5                                 | 468.8  | 1.0112  | 1.0256   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0020  | 1.0031   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 830.1 ppb | NO = 799.9 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 1.1% |
| Previous Response    | NO <sub>x</sub> = 821.2 ppb | NO = 793.3 ppb |  | *Percent Change                  | NO = 0.8%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 791.4                                      | 350.6                                 | 468.7   | 468.4  | 1.0006   | 99.9%  |
| 2nd GPT point (200 ppb O3)       | 791.4                                      | 570.2                                 | 249.1   | 248.2  | 1.0035   | 99.7%  |
| 3rd GPT point (100 ppb O3)       | 791.4                                      | 680.6                                 | 138.7   | 137.3  | 1.0099   | 99.0%  |
| Average Correction Factor        |  |                                       |   |  | 1.0047   | 99.5%  |

Notes: No adjustments made. Changed sample inlet filter after as founds.

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

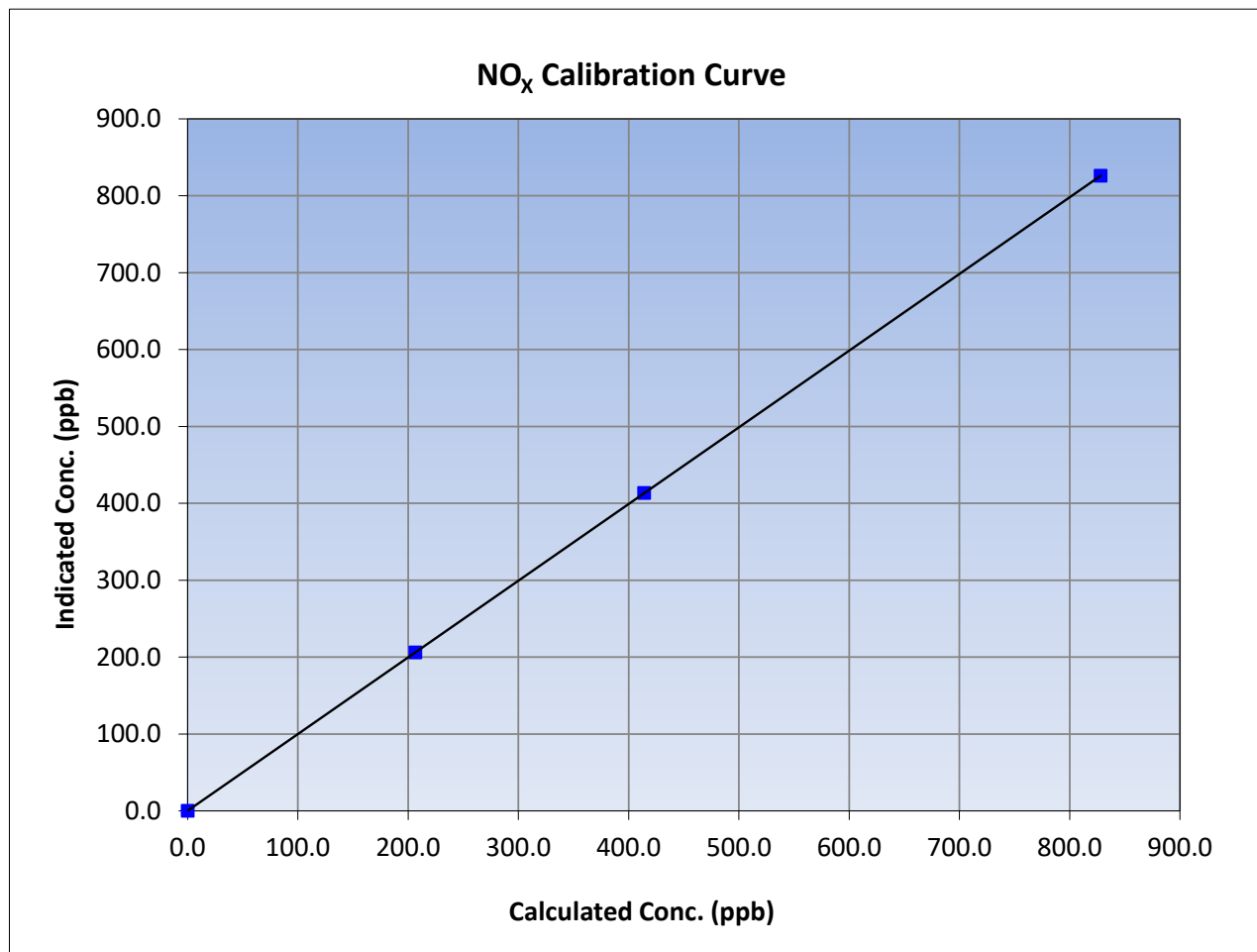
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS 19           |
| Start Time (MST): | 10:48            | End Time (MST):       | 15:35            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 828.1                               | 826.0                              | 1.0026                    |   |                                |
| 414.0                               | 413.4                              | 1.0015                    |   |                                |
| 206.5                               | 206.1                              | 1.0020                    |   |                                |
|                                     |                                    |                           | 1.000000                                      |                                |
|                                     |                                    |                           | 0.997423                                      |                                |
|                                     |                                    |                           | 0.135510                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

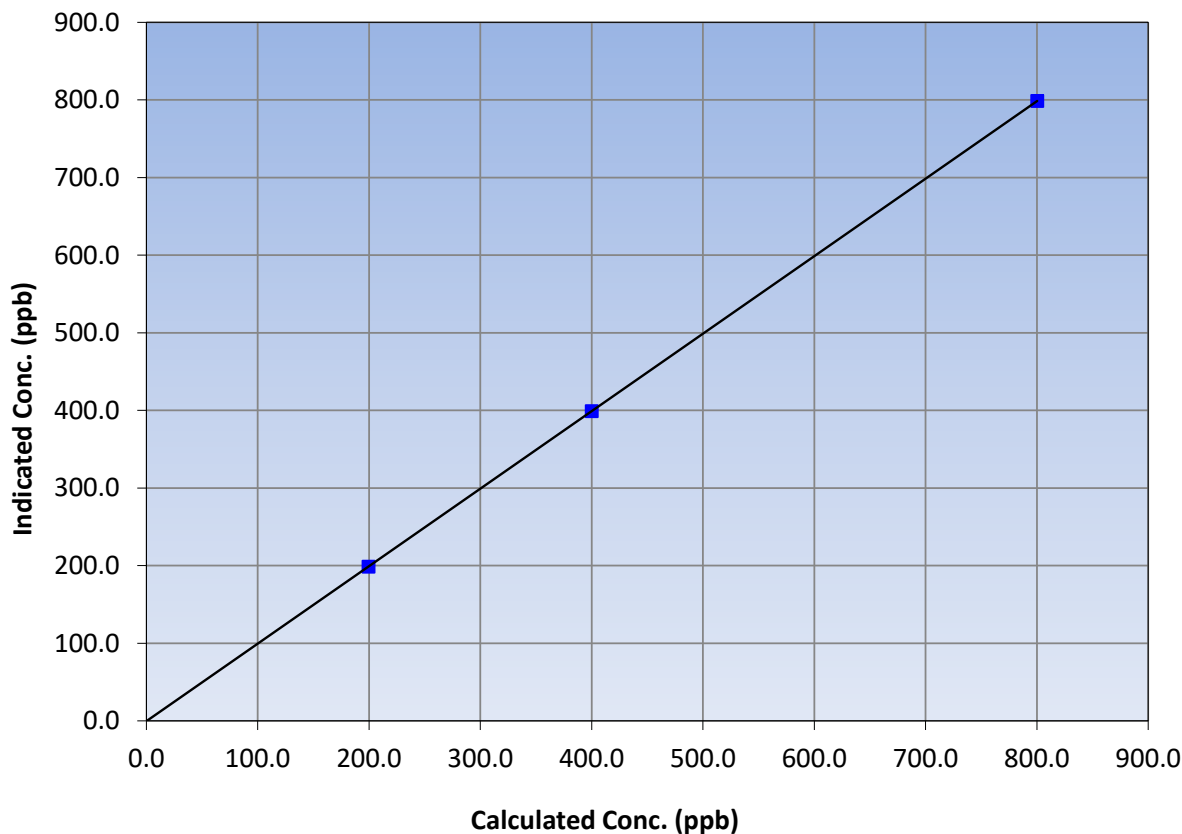
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS 19           |
| Start Time (MST): | 10:48            | End Time (MST):       | 15:35            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995    |             |
| 800.3                               | 798.8                              | 1.0019                    |                         |           |             |
| 400.1                               | 399.1                              | 1.0025                    |                         |           |             |
| 199.6                               | 198.6                              | 1.0049                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.998470  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.351682 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

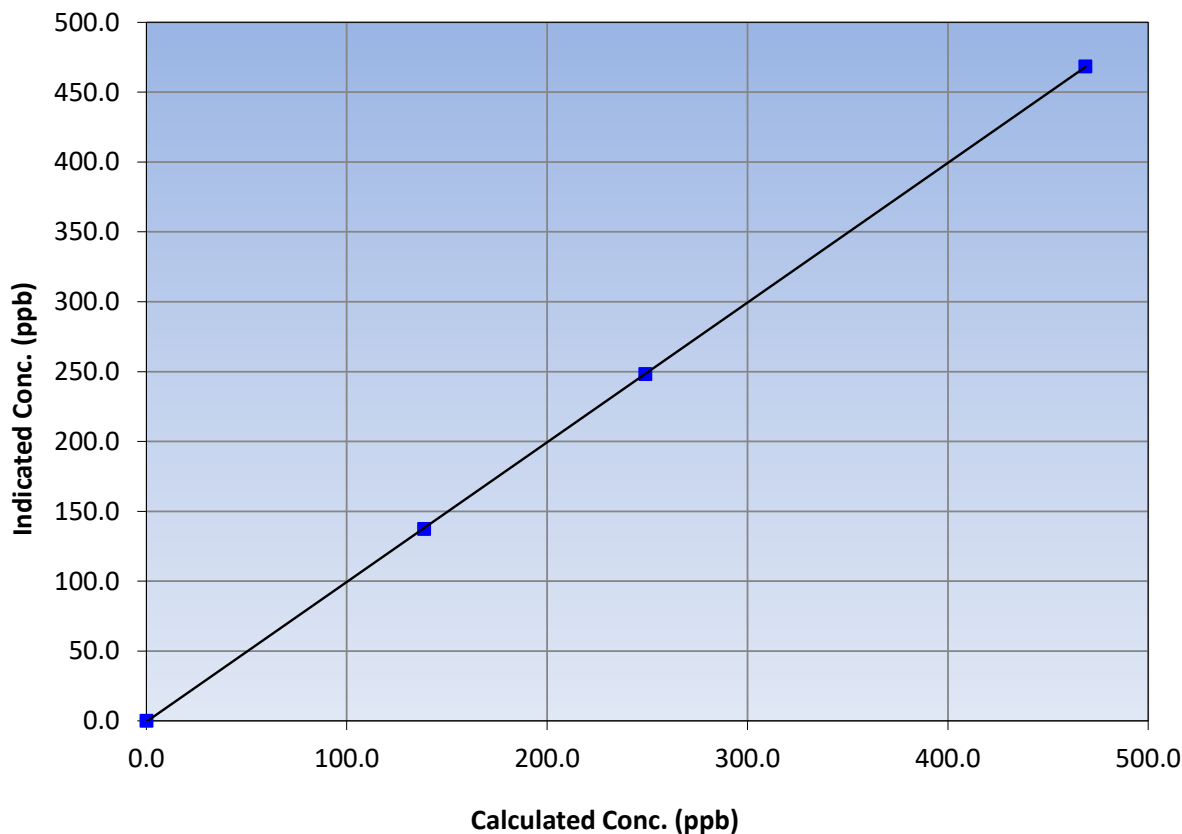
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Firebag          | Station Number:       | AMS 19           |
| Start Time (MST): | 10:48            | End Time (MST):       | 15:35            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1410661309       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <u>Limits</u>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 468.7                               | 468.4                              | 1.0006                    |   |                                |
| 249.1                               | 248.2                              | 1.0035                    |   |                                |
| 138.7                               | 137.3                              | 1.0099                    |   |                                |
|                                     |                                    |                           |   |                                |

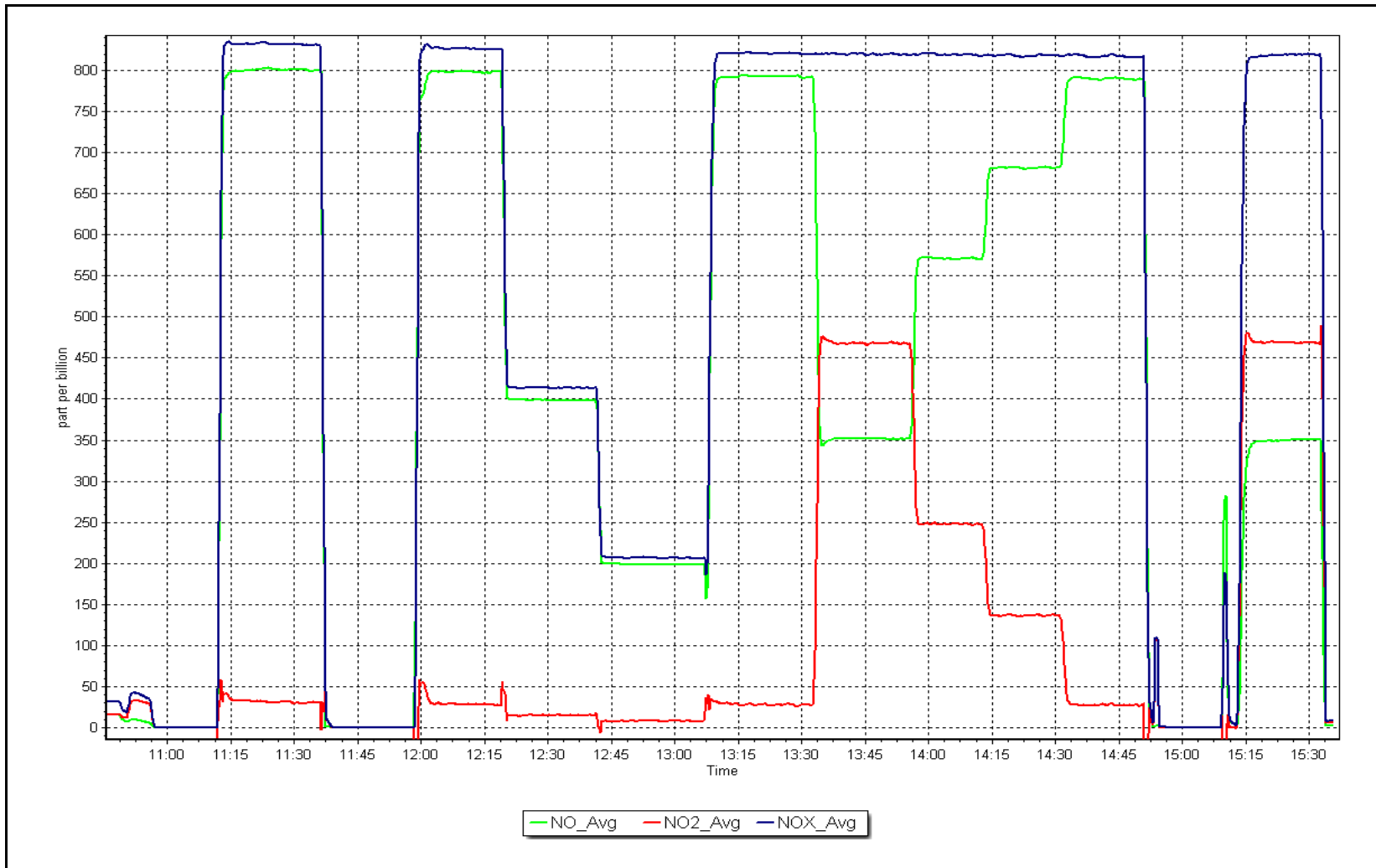
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 8, 2023

Location: Firebag





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS20 MACKAY RIVER FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

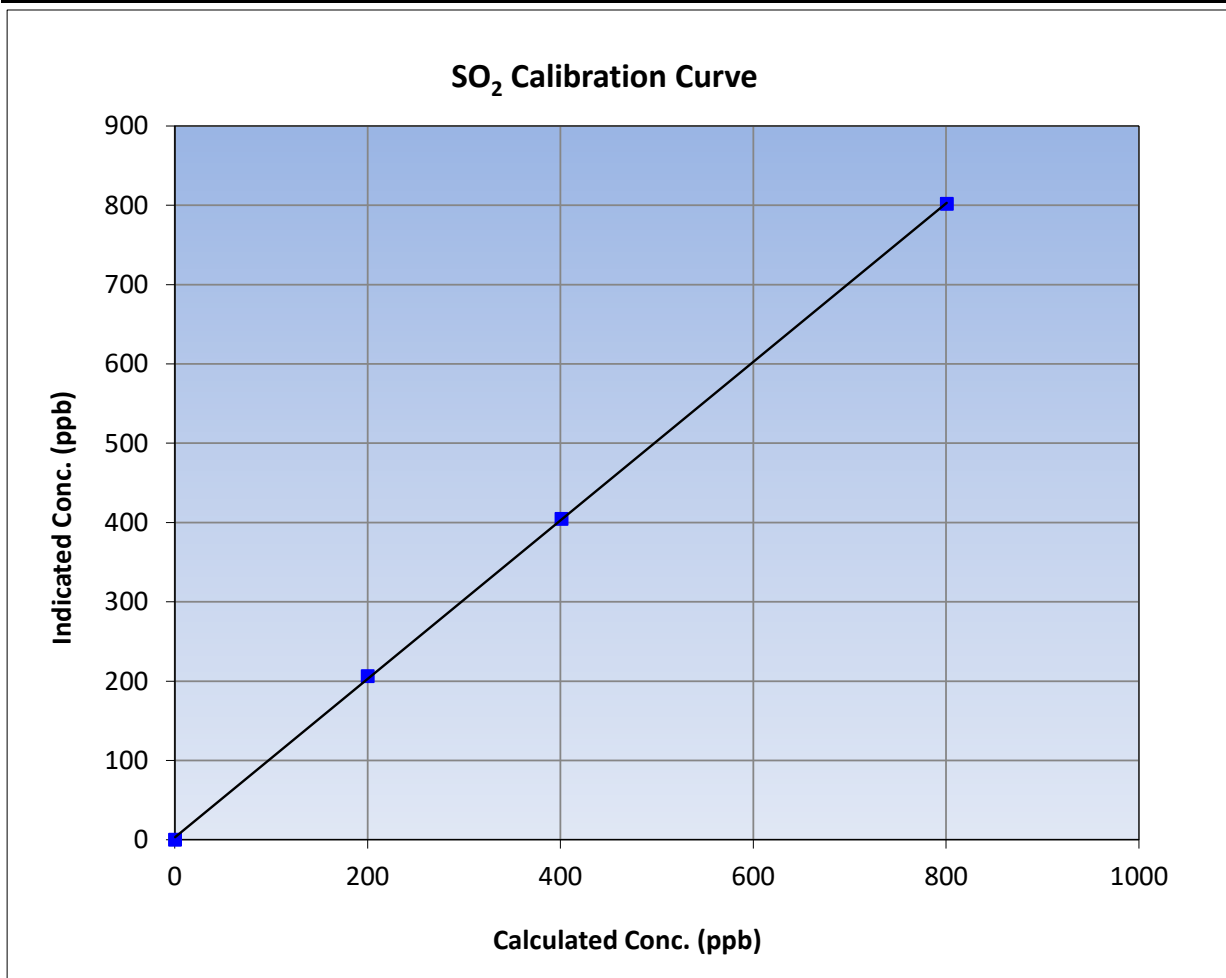
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | MacKay River     | Station Number:       | AMS20            |
| Start Time (MST): | 10:09            | End Time (MST):       | 13:52            |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1501301450       |

### Calibration Data

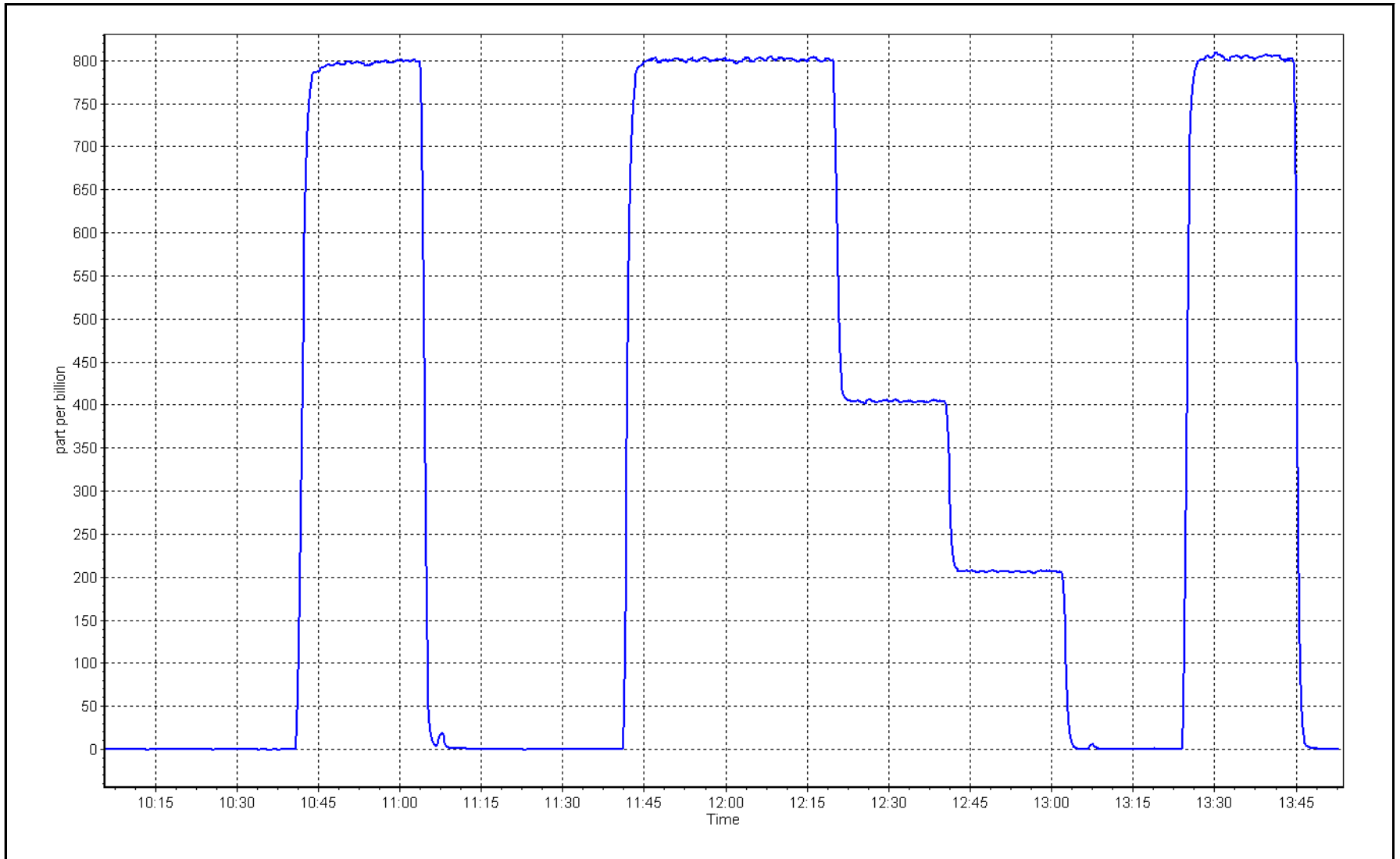
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.2                                  | ----                         | Correlation Coefficient | 0.999931      | ≥0.995      |
| 800.3                                  | 801.4                                 | 0.9986                       |                         |               |             |
| 400.7                                  | 404.1                                 | 0.9915                       | Slope                   | 0.999451      | 0.90 - 1.10 |
| 199.8                                  | 206.1                                 | 0.9695                       |                         |               |             |
|  |                                       |                              | Intercept               | 2.850831      | +/-30       |



SO2 Calibration Plot

Date: February 1, 2023

Location: MacKay River





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: MacKay River Station number: AMS20  
 Calibration Date: February 13, 2023 Last Cal Date: January 23, 2023  
 Start time (MST): 10:56 End time (MST): 16:00  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.87 ppm Cal Gas Exp Date: May 5, 2023  
 Cal Gas Cylinder #: EY0001922  
 Removed Cal Gas Conc: 4.87 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 1220  
 ZAG Make/Model: Teledyne API 701 Serial Number: 4522

### Analyzer Information

Analyzer make: Teledyne API T101 Analyzer serial #: 196  
 Converter make: Internal Converter serial #: NA  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 0.999429     | 0.990859      | Backgd or Offset: | 46.3          |
| Calibration intercept: | 0.379115     | 0.878999      | Coeff or Slope:   | 0.981         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----   |
| as found span         | 4918                          | 82.1                        | 80.0                                | 81.5                               | 0.988  |
| as found 2nd point    | 4959                          | 41.1                        | 40.0                                | 41.2                               | 0.986  |
| as found 3rd point    | 4979                          | 20.5                        | 20.0                                | 21.2                               | 0.969  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                              | 4918                          | 82.1                        | 80.0                                | 79.9                               | 1.001   |
| second point                            | 4959                          | 41.1                        | 40.0                                | 40.8                               | 0.981   |
| third point                             | 4979                          | 20.5                        | 20.0                                | 21.0                               | 0.951   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| as left span                            | 4918                          | 82.1                        | 80.0                                | 79.1                               | 1.011   |
| SO2 Scrubber Check                      | 4919                          | 80.0                        | 800.2                               | 0.1                                | ----  |
| Date of last scrubber change:           | December 15, 2020             |                             |                                     | Ave Corr Factor                    | 0.978   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

Baseline Corr As found: 80.9 Prev response: 80.30 \*% change: 0.7%  
 Baseline Corr 2nd AF pt: 40.6 AF Slope: 1.010147 AF Intercept: 0.779094  
 Baseline Corr 3rd AF pt: 20.6 AF Correlation: 0.999973

\* = > +/-5% change initiates investigation

Notes: Changed inlet filter after multi point as founds. Scrubber test after calibrator zero. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

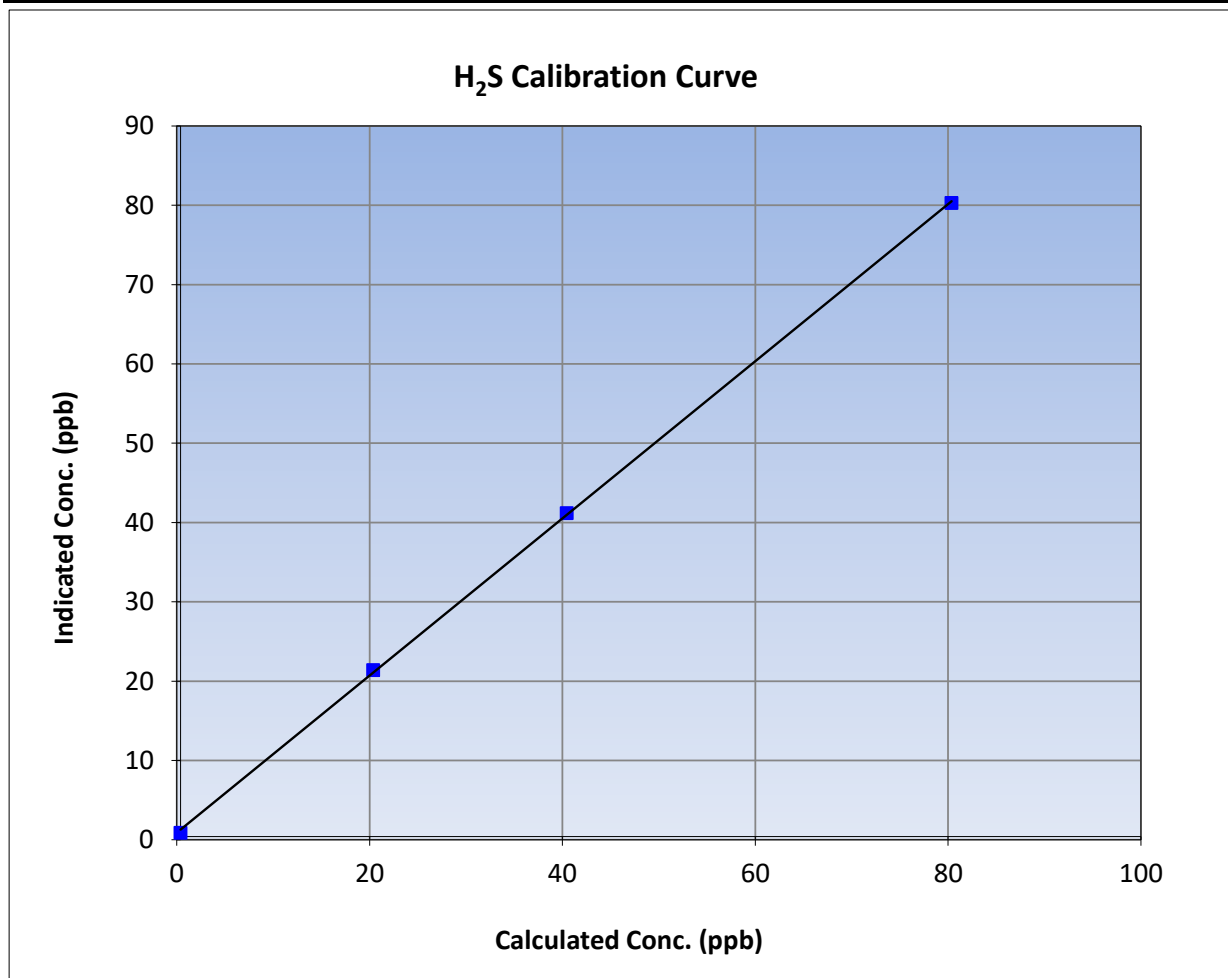
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | January 23, 2023 |
| Station Name:     | MacKay River      | Station Number:       | AMS20            |
| Start Time (MST): | 10:56             | End Time (MST):       | 16:00            |
| Analyzer make:    | Teledyne API T101 | Analyzer serial #:    | 196              |

### Calibration Data

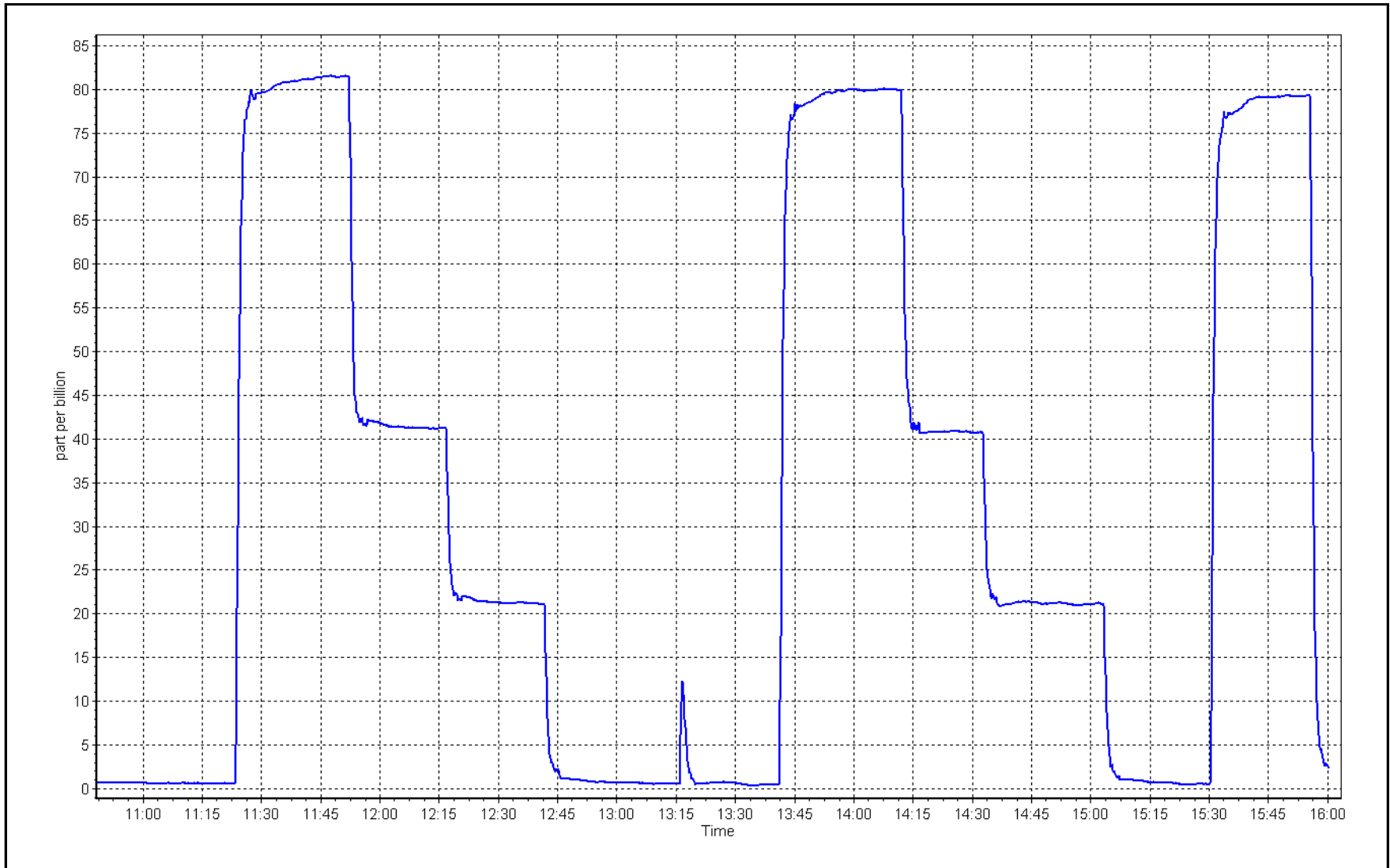
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999893 |             |
| 80.0                                | 79.9                               | 1.0008                    |                         |          | ≥0.995      |
| 40.0                                | 40.8                               | 0.9811                    | Slope                   | 0.990859 |             |
| 20.0                                | 21.0                               | 0.9509                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.878999 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 13, 2023

Location: MacKay River







# Wood Buffalo Environmental Association

## THC Calibration Summary

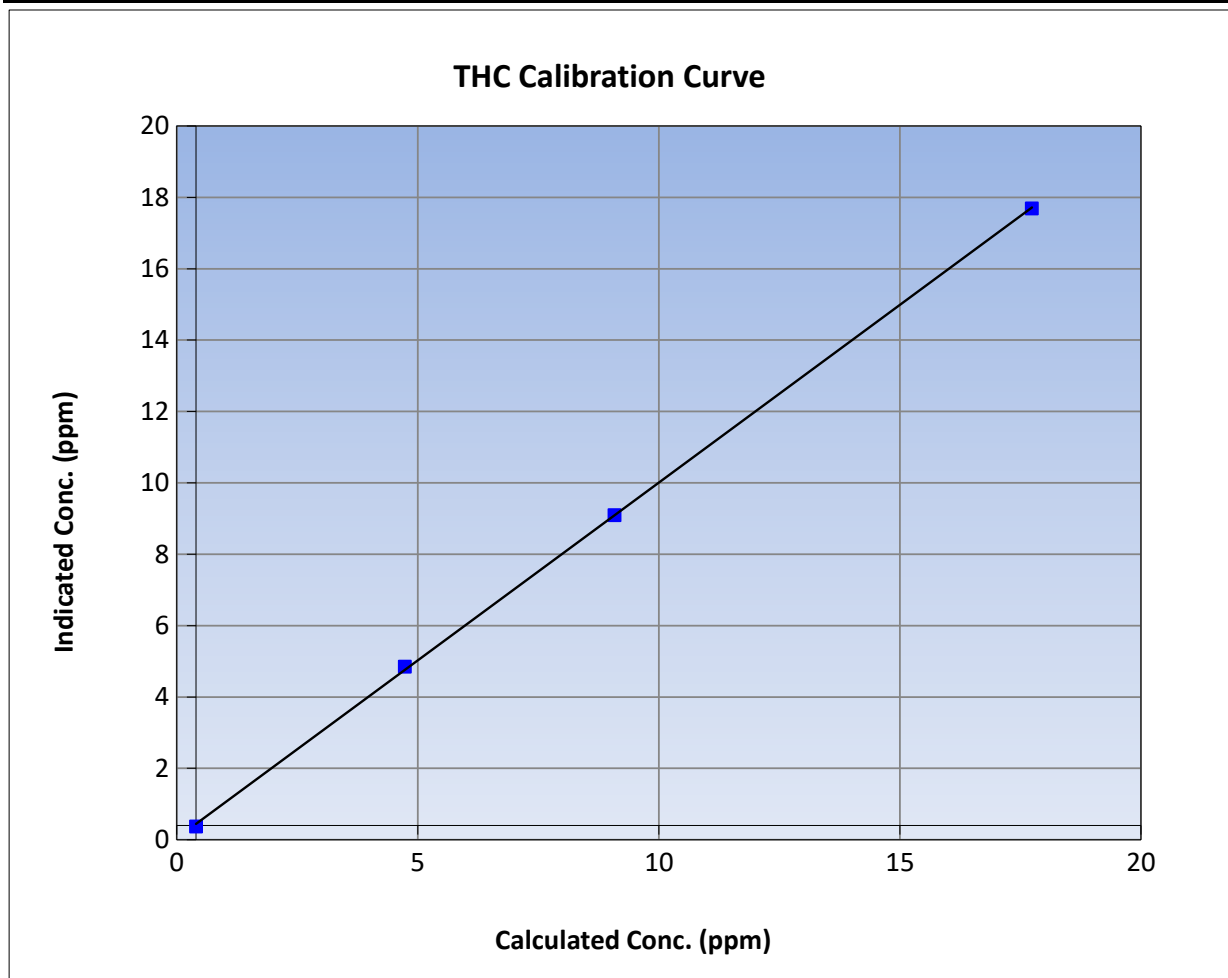
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | MacKay River     | Station Number:       | AMS20            |
| Start Time (MST): | 10:09            | End Time (MST):       | 13:52            |
| Analyzer make:    | Thermo 51i-LT    | Analyzer serial #:    | 1501663727       |

### Calibration Data

| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.00                                | -0.03                              | ----                      | Correlation Coefficient | 0.999913 | ≥0.995      |
| 17.34                               | 17.29                              | 1.0027                    |                         |          |             |
| 8.68                                | 8.70                               | 0.9982                    | Slope                   | 0.996170 | 0.90 - 1.10 |
| 4.33                                | 4.45                               | 0.9731                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.044213 | +/-1.5      |

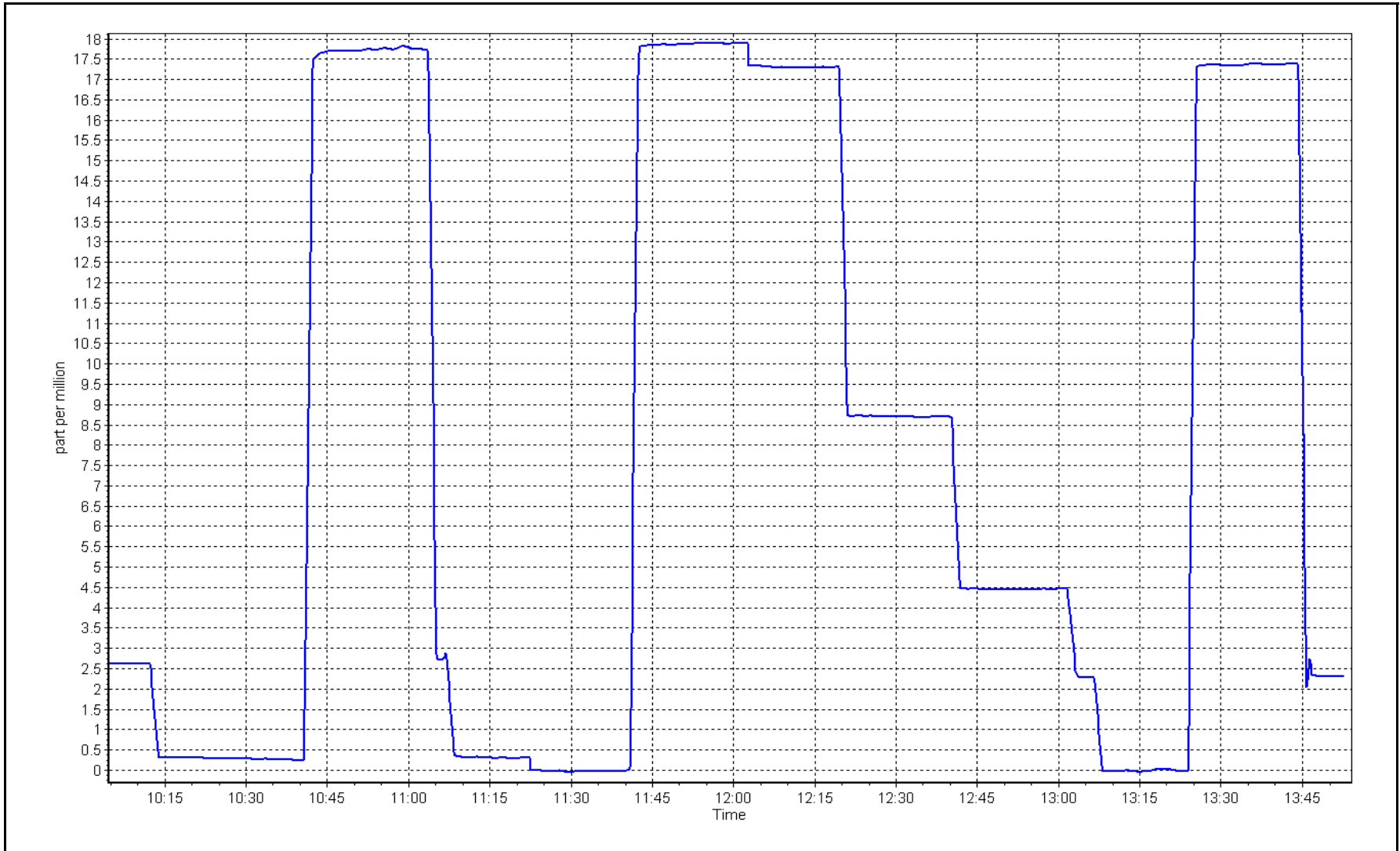




THC Calibration Plot

Date: February 1, 2023

Location: MacKay River





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: MacKay River Station number: AMS20  
Calibration Date: February 2, 2023 Last Cal Date: January 24, 2023  
Start time (MST): 10:20 End time (MST): 15:53  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T376265 Cal Gas Expiry Date: April 13, 2025  
NOX Cal Gas Conc: 49.19 ppm NO Cal Gas Conc: 48.04 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 49.19 ppm Removed Gas NO Conc: 48.04 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T700 Serial Number: 1220  
ZAG make/model: Teledyne API 701 Serial Number: 4766

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 1505164379  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.409        | 1.364         | NO bkgnd or offset:  | 3.9          | 3.8           |
| NOX coeff or slope: | 0.995        | 0.990         | NOX bkgnd or offset: | 3.9          | 3.8           |
| NO2 coeff or slope: | 0.995        | 0.995         | Reaction cell Press: | 175.0        | 176.8         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.996925     | 0.993580      |
| NO <sub>x</sub> Cal Offset: | 2.570800     | 3.070250      |
| NO Cal Slope:               | 0.998231     | 0.997347      |
| NO Cal Offset:              | 1.372065     | 1.531522      |
| NO <sub>2</sub> Cal Slope:  | 1.007507     | 0.998061      |
| NO <sub>2</sub> Cal Offset: | -1.673176    | -1.818500     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4917                      | 83.3                        | 819.5   | 800.3                                  | 19.2  | 854.9  | 831.8                                 | 23.0   | 0.9585  | 0.9621   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4917                      | 83.3                        | 819.5   | 800.3                                  | 19.2  | 816.2  | 799.4                                 | 16.6   | 1.0040  | 1.0011   |
| second point              | 4956                      | 41.7                        | 410.4   | 400.8                                  | 9.6   | 411.0  | 400.6                                 | 10.4   | 0.9986  | 1.0006   |
| third point               | 4979                      | 20.8                        | 204.6   | 199.9                                  | 4.8   | 210.4  | 203.5                                 | 6.9  | 0.9726  | 0.9821   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.0                                   | 0.1  | ----  | ----   |
| as left span              | 4917                      | 83.3                        | 819.5   | 458.8                                  | 360.7   | 811.3  | 451.9                                 | 359.5  | 1.0101  | 1.0153   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9917  | 0.9946   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 855.0 ppb | NO = 832.0 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 4.2% |
| Previous Response    | NO <sub>x</sub> = 819.5 ppb | NO = 800.3 ppb |  | *Percent Change                  | NO = 3.8%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 791.8                                      | 450.3                                 | 360.7   | 359.2  | 1.0041   | 99.6%  |
| 2nd GPT point (200 ppb O3)       | 791.8                                      | 614.0                                 | 197.0   | 194.2  | 1.0142   | 98.6%  |
| 3rd GPT point (100 ppb O3)       | 791.8                                      | 698.4                                 | 112.6   | 108.1  | 1.0412   | 96.0%  |
| Average Correction Factor        |  |                                       |   |  | 1.0198   | 98.1%  |

Notes:

Adjusted the span only.

Calibration Performed By:

Mohammed Kashif



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

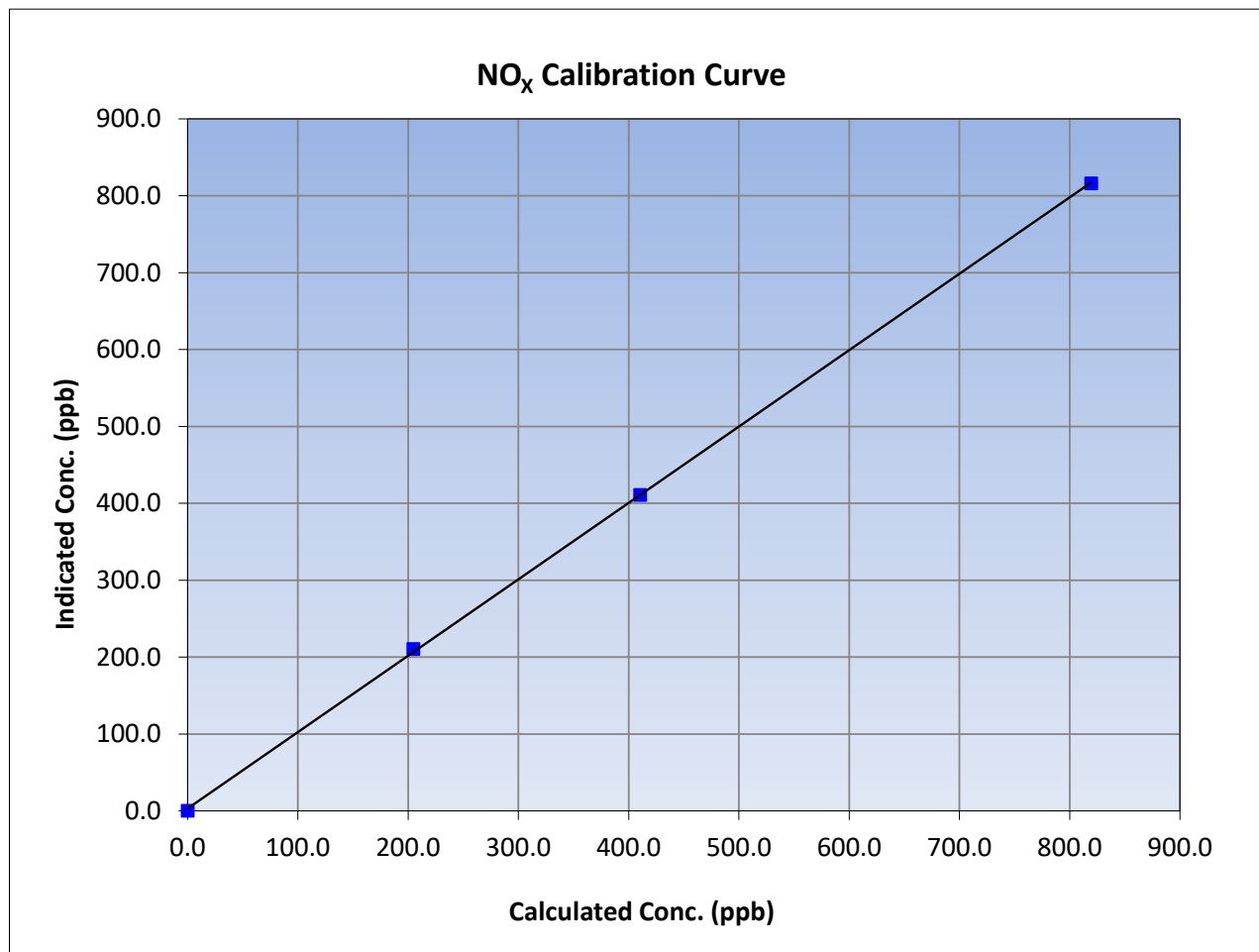
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Mackay River     | Station Number:       | AMS20            |
| Start Time (MST): | 10:20            | End Time (MST):       | 15:53            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1505164379       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 819.5                               | 816.2                              | 1.0040                    |   |                                |
| 410.4                               | 411.0                              | 0.9986                    |   |                                |
| 204.6                               | 210.4                              | 0.9726                    |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

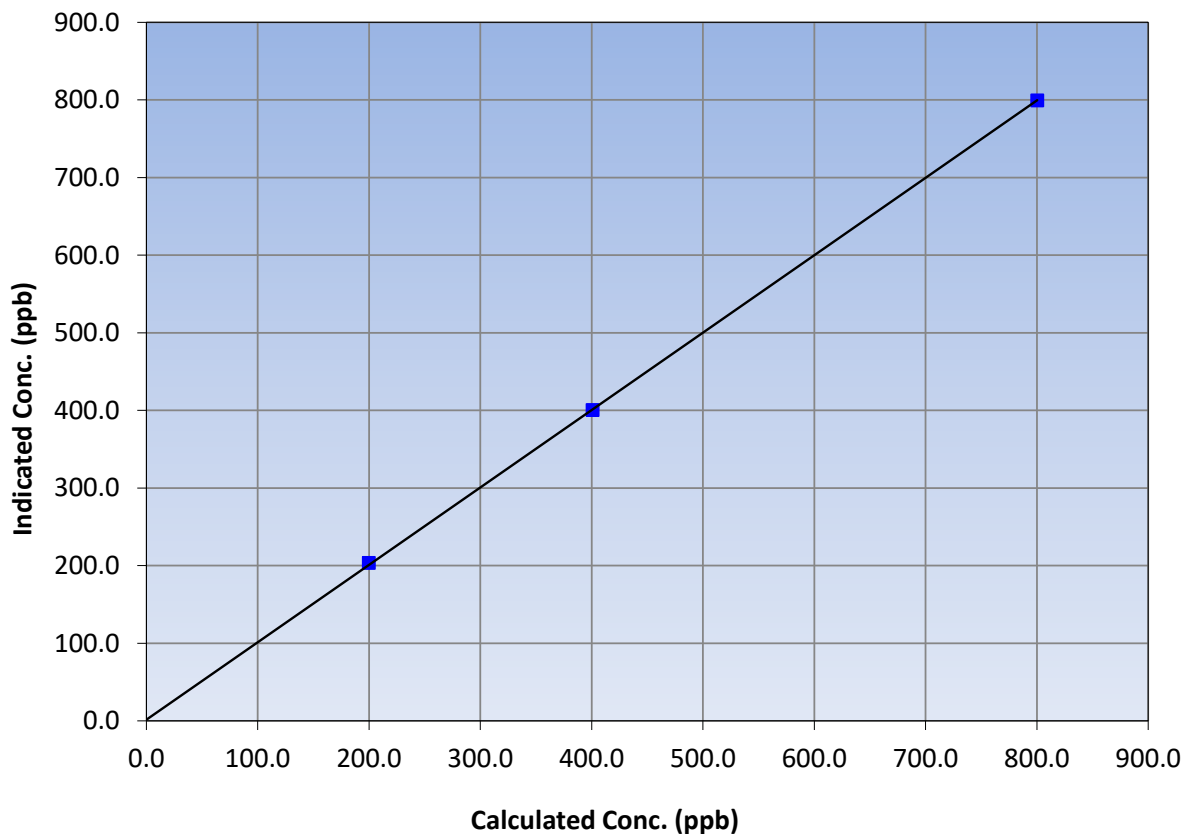
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Mackay River     | Station Number:       | AMS20            |
| Start Time (MST): | 10:20            | End Time (MST):       | 15:53            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1505164379       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits   |
|-------------------------------------|------------------------------------|---------------------------|---|--|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br><i>0.90 - 1.10</i><br><i>+/-20</i> |
| 800.3                               | 799.4                              | 1.0011                    |   |  |
| 400.8                               | 400.6                              | 1.0006                    |   |  |
| 199.9                               | 203.5                              | 0.9821                    |   |  |
|                                     |                                    |                           |   |  |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

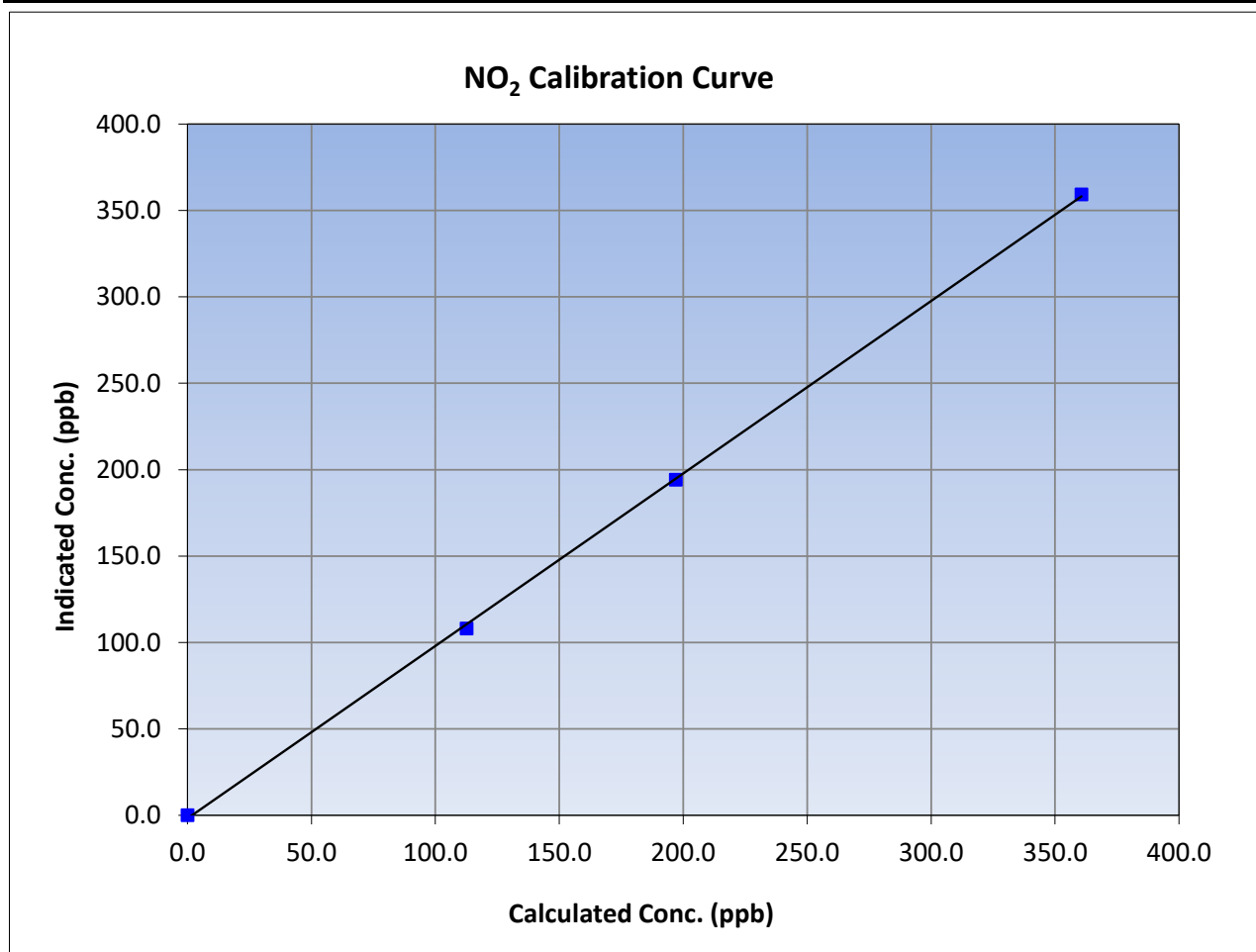
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | MacKay River     | Station Number:       | AMS20            |
| Start Time (MST): | 10:20            | End Time (MST):       | 15:53            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 1505164379       |

### Calibration Data

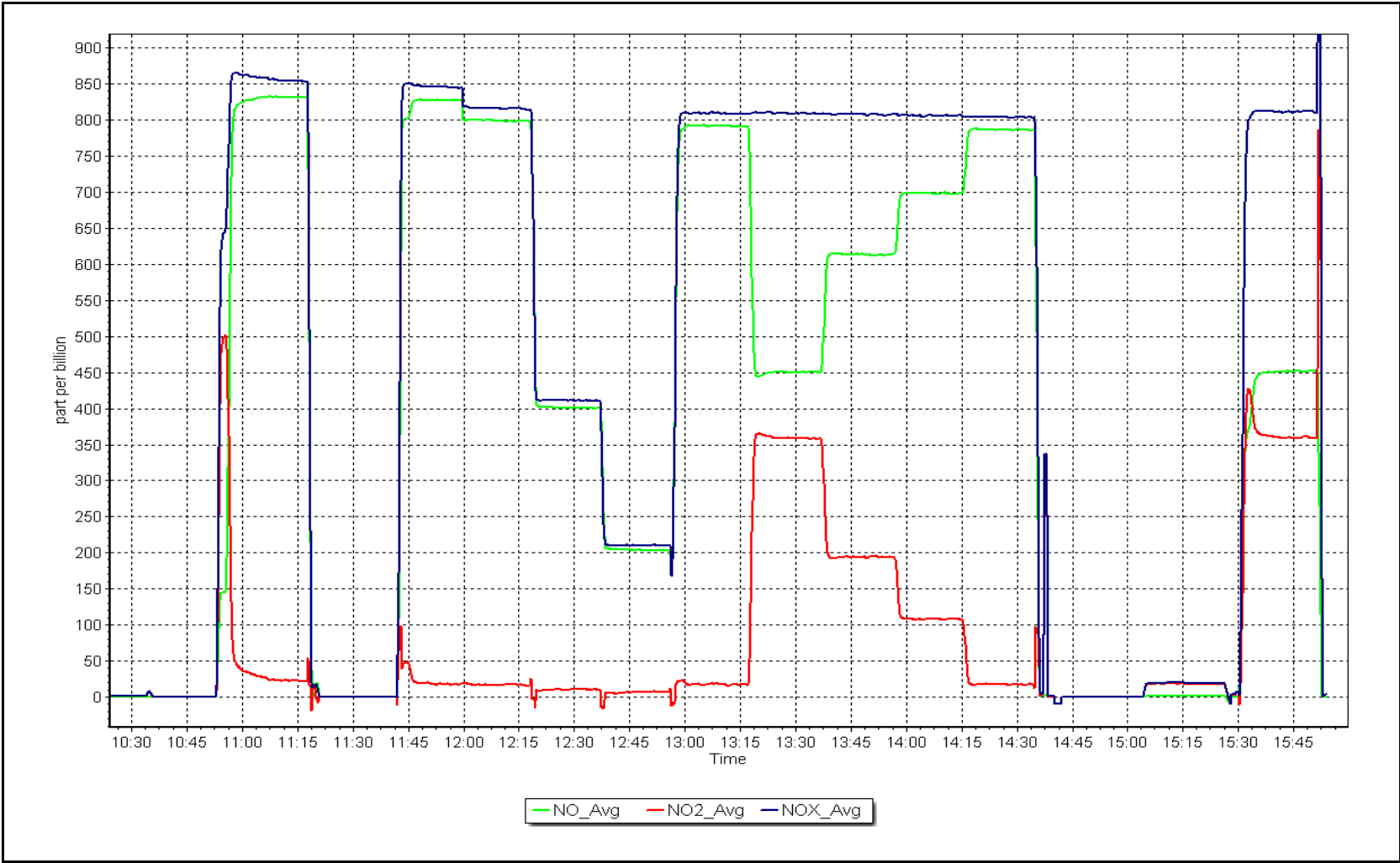
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 360.7                               | 359.2                              | 1.0041                    |                         |           |             |
| 197.0                               | 194.2                              | 1.0142                    |                         |           |             |
| 112.6                               | 108.1                              | 1.0412                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.998061  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.818500 | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: February 2, 2023

Location: MacKay River





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS21  
CONKLIN  
FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

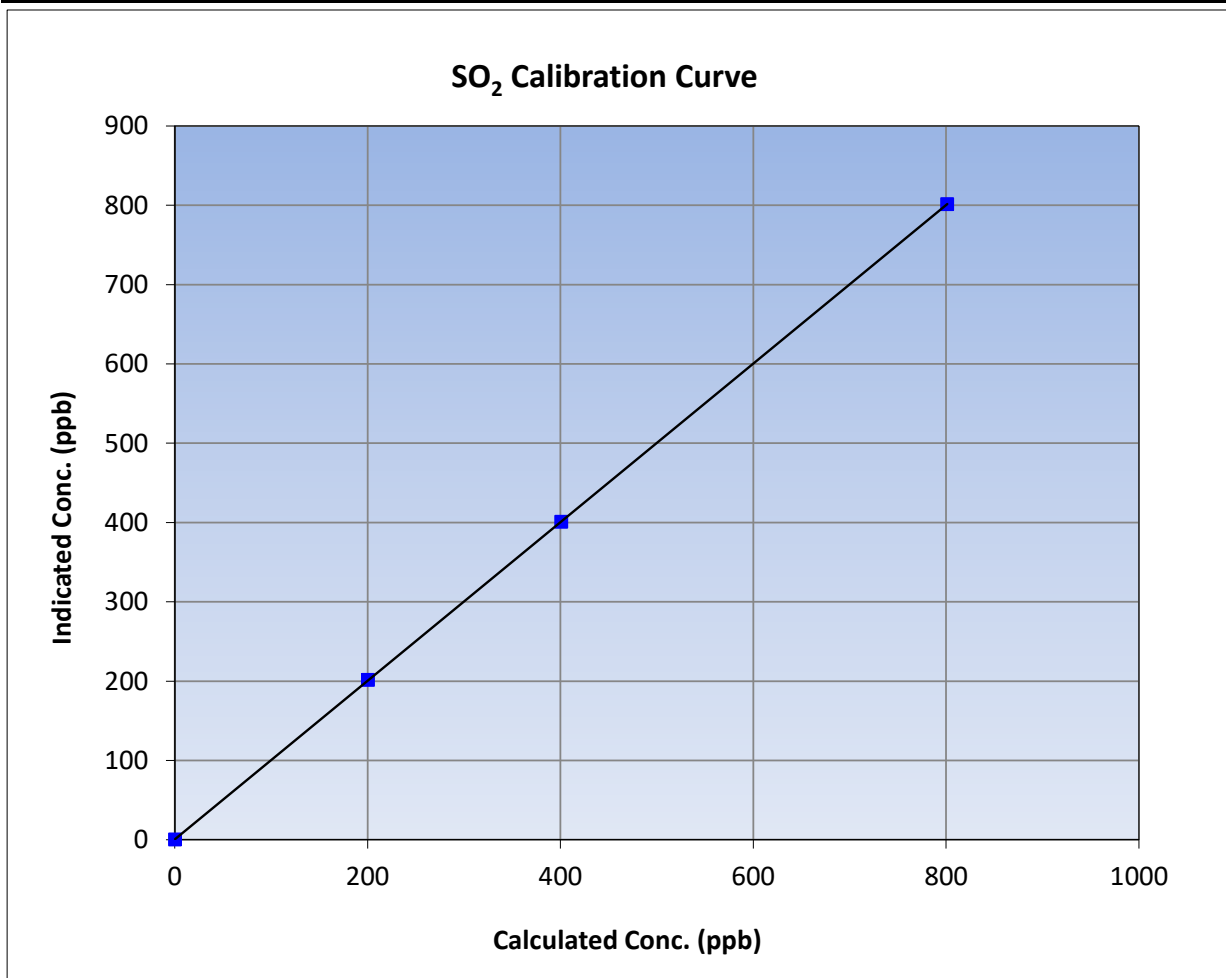
Version-01-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 6, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21           |
| Start Time (MST): | 10:51            | End Time (MST):       | 13:30           |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1428701363      |

### Calibration Data

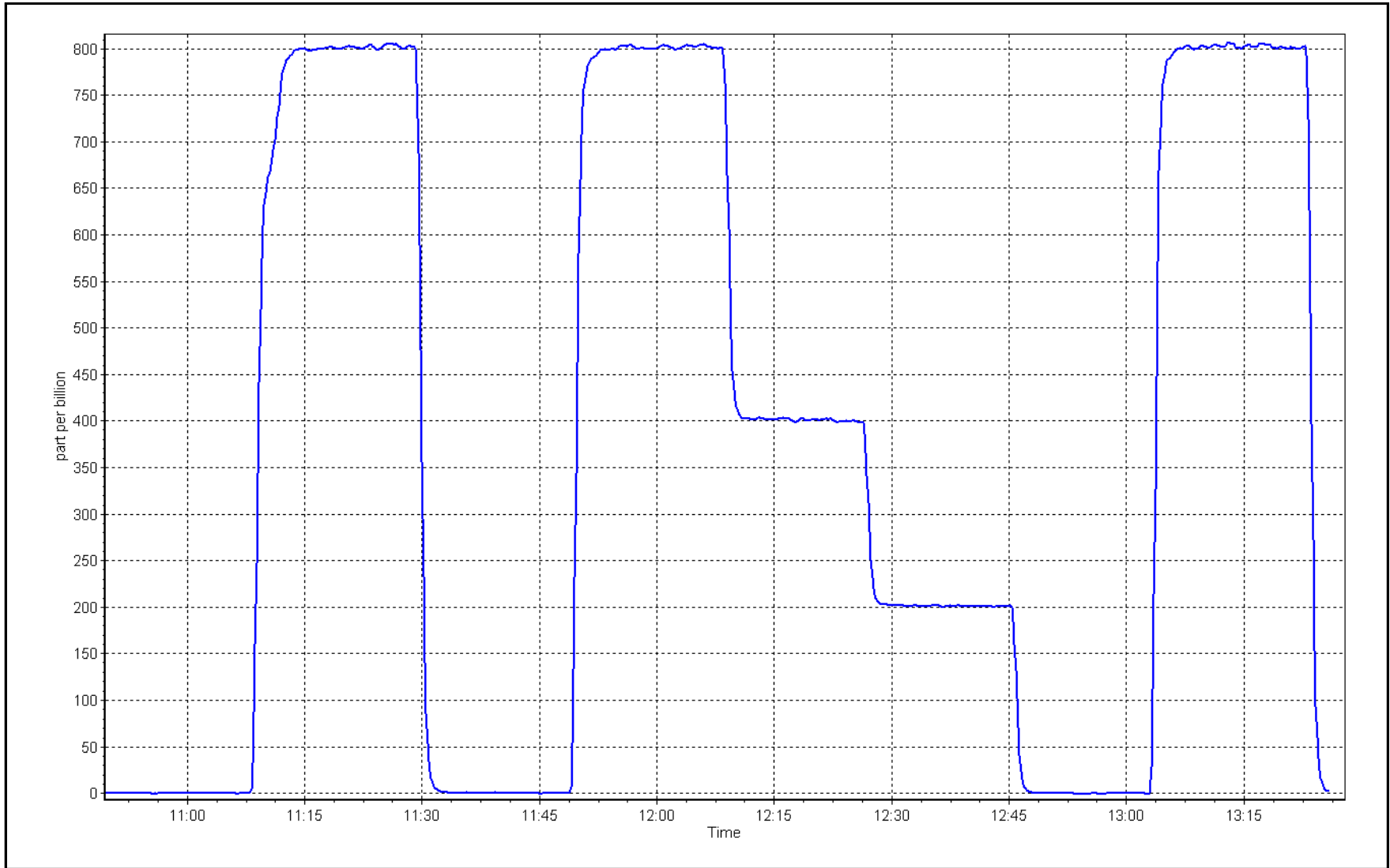
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.0                                   | ----                         | Correlation Coefficient | 0.999998      | ≥0.995      |
| 800.8                                  | 801.1                                 | 0.9997                       |                         |               |             |
| 400.4                                  | 400.6                                 | 0.9996                       | Slope                   | 0.999888      | 0.90 - 1.10 |
| 200.1                                  | 201.2                                 | 0.9946                       |                         |               |             |
|  |                                       |                              | Intercept               | 0.415841      | +/-30       |



SO2 Calibration Plot

Date: February 6, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Conklin Station number: AMS21  
 Calibration Date: February 8, 2023 Last Cal Date: January 9, 2023  
 Start time (MST): 9:02 End time (MST): 12:55  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.03 ppm Cal Gas Exp Date: April 16, 2022  
 Cal Gas Cylinder #: CC505493  
 Removed Cal Gas Conc: 5.03 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 3810  
 ZAG Make/Model: API 701 Serial Number: 263

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1236656116  
 Converter make: CD-Nova 101 Converter serial #: NA  
 Analyzer Range 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.005143     | 0.983711      | Backgd or Offset: | 2.8          | 2.8           |
| Calibration intercept: | -0.162334    | 0.237934      | Coeff or Slope:   | 0.951        | 0.951         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.4                               | ----   |
| as found span         | 4921                          | 79.5                        | 80.0                                | 78.5                               | 1.014  |
| as found 2nd point    | 4960                          | 39.8                        | 40.0                                | 39.5                               | 1.004  |
| as found 3rd point    | 4980                          | 19.9                        | 20.0                                | 19.8                               | 0.991  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4921                          | 79.5                        | 80.0                                | 78.7                               | 1.016   |
| second point                            | 4960                          | 39.8                        | 40.0                                | 40.0                               | 1.001   |
| third point                             | 4980                          | 19.9                        | 20.0                                | 20.0                               | 1.001   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4921                          | 79.5                        | 80.0                                | 78.6                               | 1.017   |
| SO2 Scrubber Check                      | 4920                          | 80.2                        | 802.0                               | -0.2                               | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 1.006   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 78.9 Prev response: 80.2 \*% change: -1.7%  
 Baseline Corr 2nd AF pt: 39.9 AF Slope: 0.985281 AF Intercept: -0.142040  
 Baseline Corr 3rd AF pt: 20.2 AF Correlation: 0.999949

\* = > +/-5% change initiates investigation

Notes: No adjustments made.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## TRS Calibration Summary

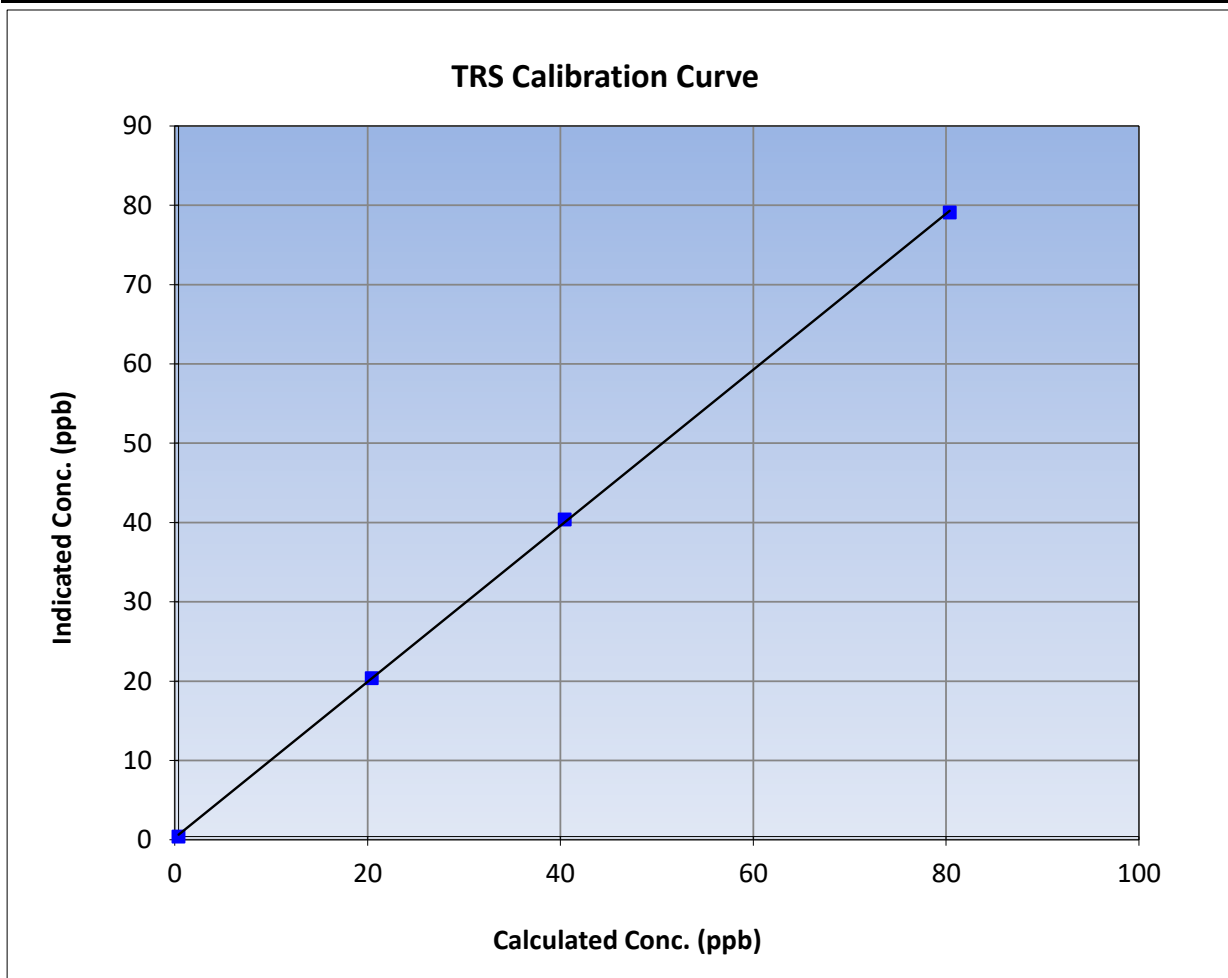
Version-11-2021

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 8, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21           |
| Start Time (MST): | 9:02             | End Time (MST):       | 12:55           |
| Analyzer make:    | Thermo 43i-TLE   | Analyzer serial #:    | 1236656116      |

### Calibration Data

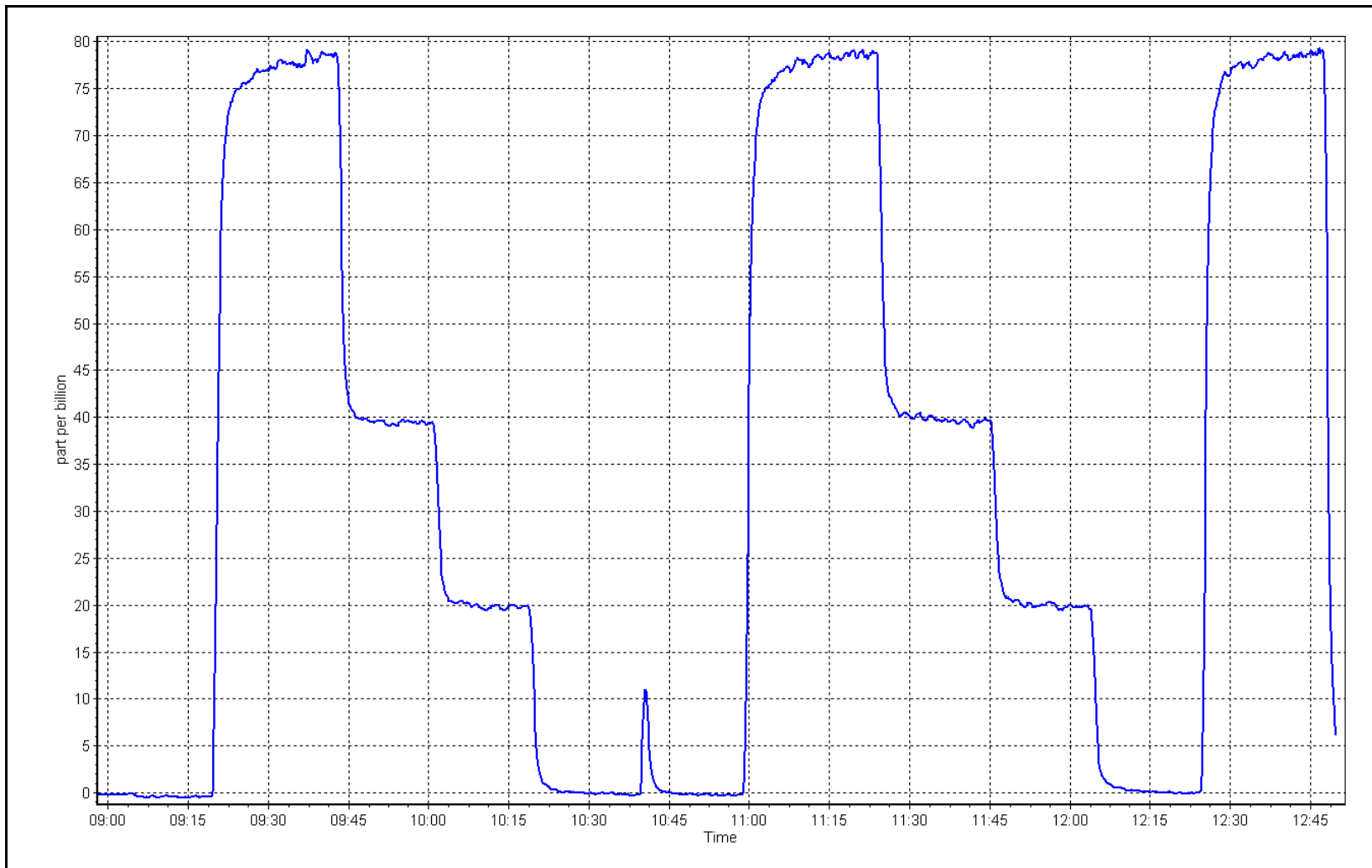
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999928 |             |
| 80.0                                | 78.7                               | 1.0161                    |                         |          | ≥0.995      |
| 40.0                                | 40.0                               | 1.0010                    | Slope                   | 0.983711 |             |
| 20.0                                | 20.0                               | 1.0010                    |                         |          | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.237934 | +/-3        |



TRS Calibration Plot

Date: February 8, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### Station Information

|                   |                  |                 |                 |
|-------------------|------------------|-----------------|-----------------|
| Station Name:     | Conklin          | Station number: | AMS21           |
| Calibration Date: | February 3, 2023 | Last Cal Date:  | January 4, 2023 |
| Start time (MST): | 12:08            | End time (MST): | 17:16           |
| Reason:           | Routine          |                 |                 |

### Calibration Standards

|   |                   |                             |                 |
|---|-------------------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC259455          | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 497.9 ppm         | CH <sub>4</sub> Equiv Conc. | 1067.7 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.2 ppm         |                             |                 |
| Removed Gas Cert:                           | NA                | Removed Gas Expiry:         | NA              |
| Removed CH <sub>4</sub> Conc.               | 497.9 ppm         | CH <sub>4</sub> Equiv Conc. | 1067.7 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.2 ppm         | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |                   | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | Teledyne API T700 | Serial Number:              | 3810            |
| ZAG make/model:                             | Teledyne API 701  | Serial Number:              | 691             |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 118148495  |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 1.85E-04     | 1.86E-04      | NMHC SP Ratio:  | 4.66E-05      |
| CH <sub>4</sub> Retention time: | 12.20        | 12.60         | NMHC Peak Area: | 196117        |
|                                 |              |               |                 | 200658        |

### THC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 17.13                | 17.31                                      | 0.989                      |
| as found 2nd point        | 4960              | 40.1                 | 8.56                 | 8.65                                       | 0.989                      |
| as found 3rd point        | 4980              | 20.0                 | 4.27                 | 4.35                                       | 0.982                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 17.13                | 17.13                                      | 0.999                      |
| second point              | 4960              | 40.1                 | 8.56                 | 8.57                                       | 0.999                      |
| third point               | 4980              | 20.0                 | 4.27                 | 4.35                                       | 0.982                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 17.13                | 16.95                                      | 1.011                      |
| Average Correction Factor |                   |                      |                      |  | 0.994                      |
| Baseline Corr AF:         | 17.31             | Prev response        | 17.12                | *% change                                  | 1.1%                       |
| Baseline Corr 2nd AF:     | 8.7               | AF Slope:            | 1.010198             | AF Intercept:                              | 0.012422                   |
| Baseline Corr 3rd AF:     | 4.3               | AF Correlation:      | 0.999996             | * = > +/-5% change initiates investigation |                            |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-06-2022

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 9.14                 | 9.36                                       | 0.976                      |
| as found 2nd point        | 4960              | 40.1                 | 4.57                 | 4.67                                       | 0.978                      |
| as found 3rd point        | 4980              | 20.0                 | 2.28                 | 2.36                                       | 0.968                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 9.14                 | 9.13                                       | 1.001                      |
| second point              | 4960              | 40.1                 | 4.57                 | 4.58                                       | 0.999                      |
| third point               | 4980              | 20.0                 | 2.28                 | 2.36                                       | 0.968                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 9.14                 | 9.03                                       | 1.012                      |
| Average Correction Factor |                   |                      |                      |  | 0.989                      |
| Baseline Corr AF:         | 9.36              | Prev response        | 9.14                 | *% change                                  | 2.4%                       |
| Baseline Corr 2nd AF:     | 4.7               | AF Slope:            | 1.023526             | AF Intercept:                              | 0.006684                   |
| Baseline Corr 3rd AF:     | 2.4               | AF Correlation:      | 0.999992             | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.2                 | 7.99                 | 7.95                                       | 1.005                      |
| as found 2nd point        | 4960              | 40.1                 | 3.99                 | 3.98                                       | 1.004                      |
| as found 3rd point        | 4980              | 20.0                 | 1.99                 | 1.99                                       | 0.999                      |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.2                 | 7.99                 | 8.00                                       | 0.998                      |
| second point              | 4960              | 40.1                 | 3.99                 | 3.99                                       | 1.001                      |
| third point               | 4980              | 20.0                 | 1.99                 | 1.99                                       | 0.999                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.2                 | 7.99                 | 7.92                                       | 1.009                      |
| Average Correction Factor |                   |                      |                      |  | 0.999                      |
| Baseline Corr AF:         | 7.95              | Prev response        | 7.99                 | *% change                                  | -0.6%                      |
| Baseline Corr 2nd AF:     | 3.98              | AF Slope:            | 0.994544             | AF Intercept:                              | 0.006137                   |
| Baseline Corr 3rd AF:     | 1.99              | AF Correlation:      | 0.999997             | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.999155     | 0.998993      |
| THC Cal Offset:             | 0.013380     | 0.030589      |
| CH <sub>4</sub> Cal Slope:  | 1.000338     | 1.001541      |
| CH <sub>4</sub> Cal Offset: | 0.001151     | -0.002053     |
| NMHC Cal Slope:             | 0.998171     | 0.996416      |
| NMHC Cal Offset:            | 0.013029     | 0.033041      |

Notes: Changed sample inlet filter after as founds. Adjusted span only.

Calibration Performed By: Denny Ray Estador and Mohammed Kashif





# Wood Buffalo Environmental Association

## THC Calibration Summary

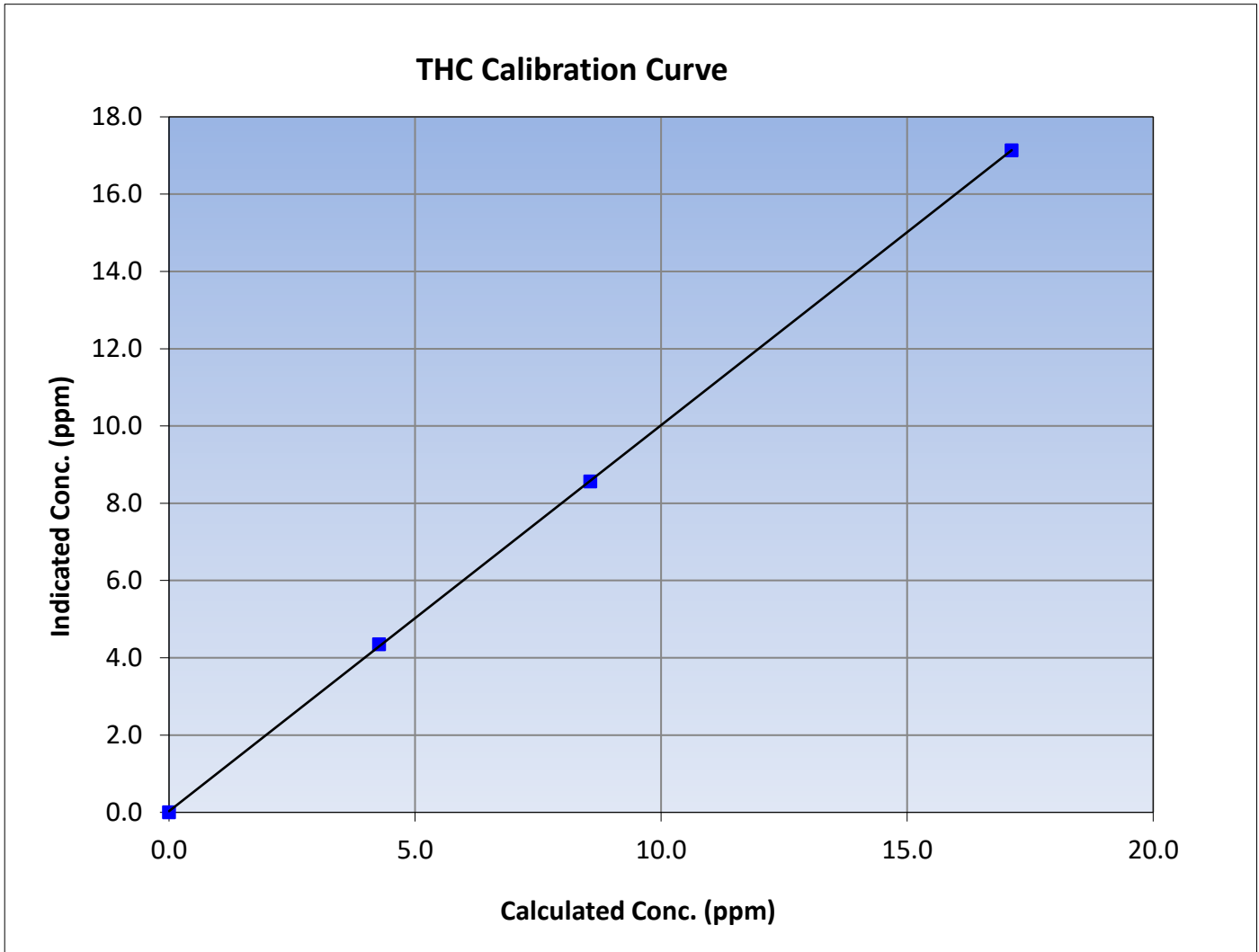
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21           |
| Start Time (MST): | 12:08            | End Time (MST):       | 17:16           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 118148495       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999975 | $\geq 0.995$  |       |          |             |
| 17.13                               | 17.13                              | 0.9995                    |                         |          |               |       |          |             |
| 8.56                                | 8.57                               | 0.9994                    |                         |          |               | Slope | 0.998993 | 0.90 - 1.10 |
| 4.27                                | 4.35                               | 0.9820                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.030589 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

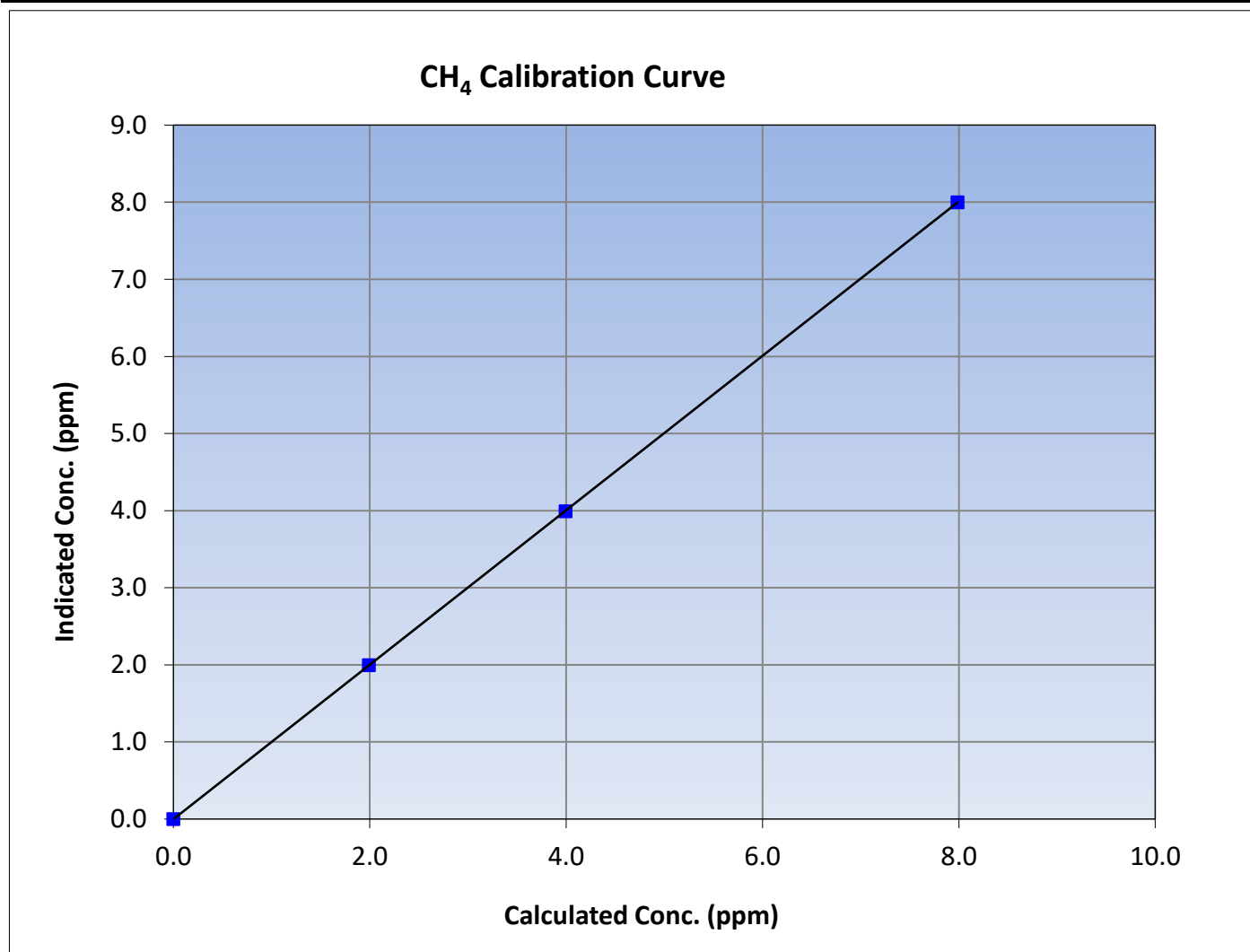
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21           |
| Start Time (MST): | 12:08            | End Time (MST):       | 17:16           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 118148495       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999999  | $\geq 0.995$  |       |          |             |
| 7.99                                | 8.00                               | 0.9984                    |                         |           |               |       |          |             |
| 3.99                                | 3.99                               | 1.0005                    |                         |           |               | Slope | 1.001541 | 0.90 - 1.10 |
| 1.99                                | 1.99                               | 0.9988                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.002053 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

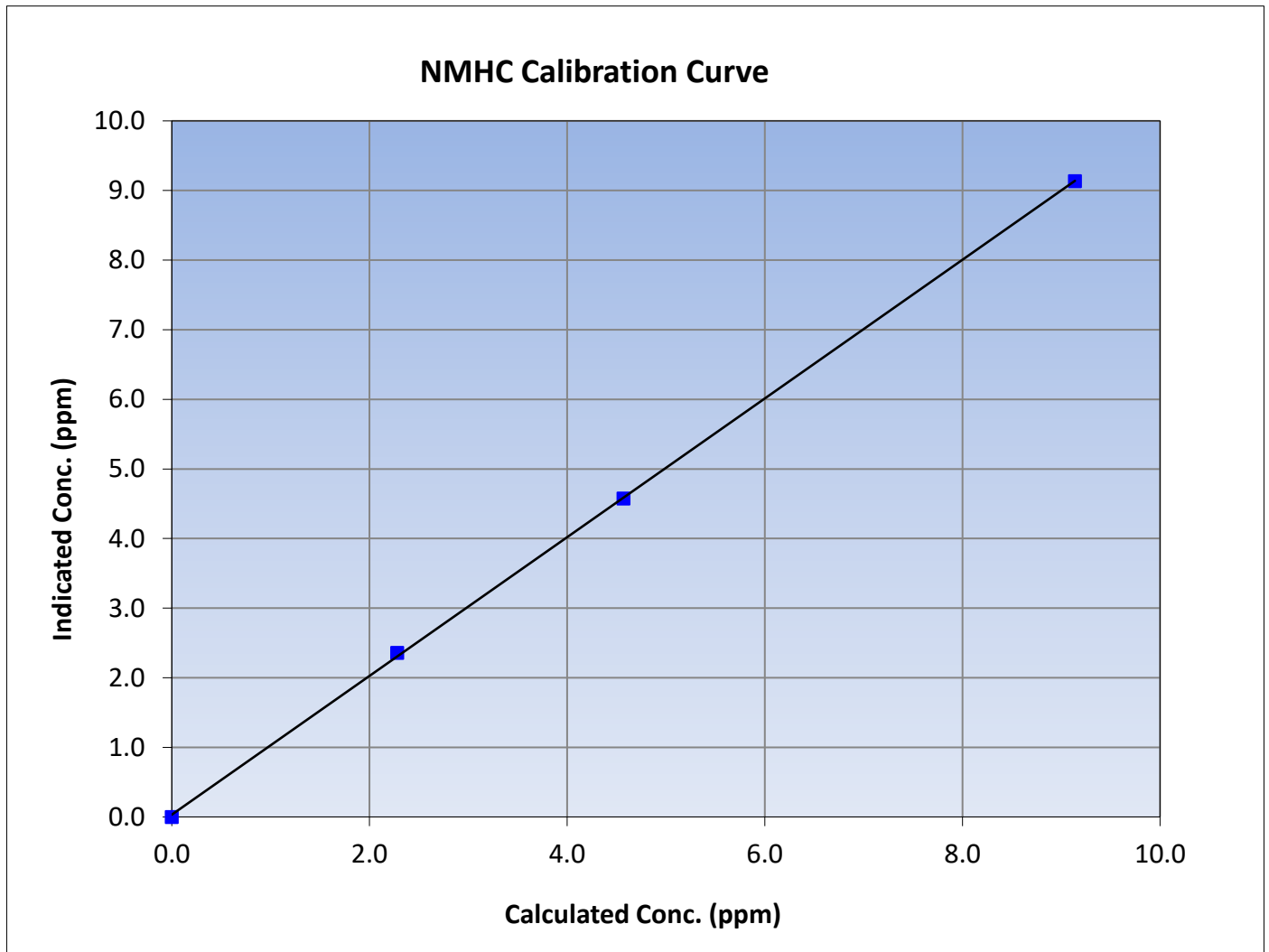
Version-06-2022

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21           |
| Start Time (MST): | 12:08            | End Time (MST):       | 17:16           |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 118148495       |

### Calibration Data

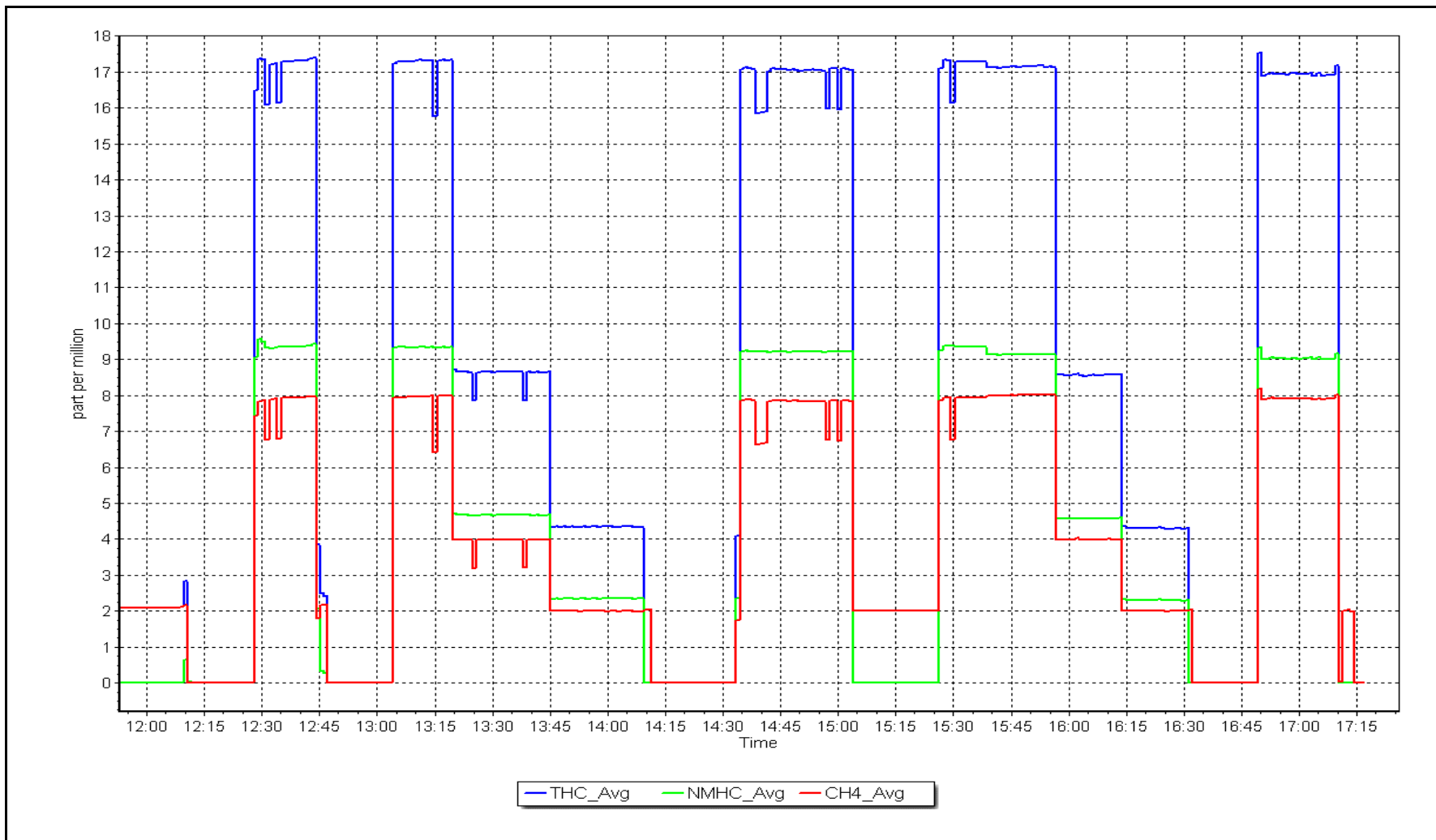
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999915 | $\geq 0.995$  |       |          |             |
| 9.14                                | 9.13                               | 1.0008                    |                         |          |               |       |          |             |
| 4.57                                | 4.58                               | 0.9986                    |                         |          |               | Slope | 0.996416 | 0.90 - 1.10 |
| 2.28                                | 2.36                               | 0.9678                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.033041 | +/-0.5        |       |          |             |



NMHC Calibration Plot

Date: February 3, 2023

Location: Conklin





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Conklin  
Calibration Date: February 24, 2023  
Start time (MST): 9:10  
Reason: Routine  
Station number: AMS21  
Last Cal Date: January 17, 2023  
End time (MST): 13:05

### Calibration Standards

NO Gas Cylinder #: T2Y1P1H  
NOX Cal Gas Conc: 51.09 ppm  
Removed Cylinder #: n/a  
Removed Gas NOX Conc: 51.09 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T750  
ZAG make/model: Teledyne API T701  
Cal Gas Expiry Date: December 11, 2023  
NO Cal Gas Conc: 50.39 ppm  
Removed Gas Exp Date: n/a  
Removed Gas NO Conc: 50.39 ppm  
NO gas Diff:  
Serial Number: 282  
Serial Number: 361

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1501663731

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.144        | 1.144         | NO bkgnd or offset:  | 11.7         | 11.6          |
| NOX coeff or slope: | 1.001        | 1.001         | NOX bkgnd or offset: | 11.9         | 11.8          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 226.7        | 224.3         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.001997     | 1.004927      |
| NO <sub>x</sub> Cal Offset: | 1.704503     | 1.765059      |
| NO Cal Slope:               | 0.998723     | 1.004393      |
| NO Cal Offset:              | 1.321276     | 0.961963      |
| NO <sub>2</sub> Cal Slope:  | 0.999769     | 1.001583      |
| NO <sub>2</sub> Cal Offset: | -0.317822    | -0.384496     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | -0.2                                  | -0.1   | ----  | ----   |
| as found span             | 4921                      | 79.4                        | 811.2   | 800.1                                  | 11.1  | 818.3  | 804.8                                 | 13.5   | 0.9914  | 0.9942   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | -0.1   | ----  | ----   |
| high point                | 4921                      | 79.4                        | 811.2   | 800.1                                  | 11.1  | 816.2  | 804.1                                 | 12.1   | 0.9939  | 0.9951   |
| second point              | 4960                      | 39.7                        | 405.7   | 400.1                                  | 5.6   | 410.1  | 403.4                                 | 6.7  | 0.9892  | 0.9919   |
| third point               | 4980                      | 19.8                        | 202.3   | 199.6                                  | 2.8   | 207.0  | 202.3                                 | 4.7  | 0.9774  | 0.9864   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as left span              | 4921                      | 79.4                        | 811.2   | 381.6                                  | 429.6   | 814.0  | 388.4                                 | 425.6  | 0.9966  | 0.9826   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9869  | 0.9911   |

|                      |                             |                |  |                                  |                        |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 818.6 ppb | NO = 805.0 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.5% |                      |
| Previous Response    | NO <sub>x</sub> = 814.6 ppb | NO = 800.4 ppb |  | *Percent Change                  | NO = 0.6%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: ;  | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 800.8                                      | 382.3                                 | 429.6   | 430.0  | 0.9991   | 100.1%   |
| 2nd GPT point (200 ppb O3)       | 800.8                                      | 599.8                                 | 212.1   | 212.1  | 1.0001   | 100.0%   |
| 3rd GPT point (100 ppb O3)       | 800.8                                      | 700.3                                 | 111.6   | 111.0  | 1.0055   | 99.4%  |
| Average Correction Factor        |  |                                       |   |  | 1.0016   | 99.8%  |

Notes:

No adjustments required.

Calibration Performed By:

Denny Ray Estador



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

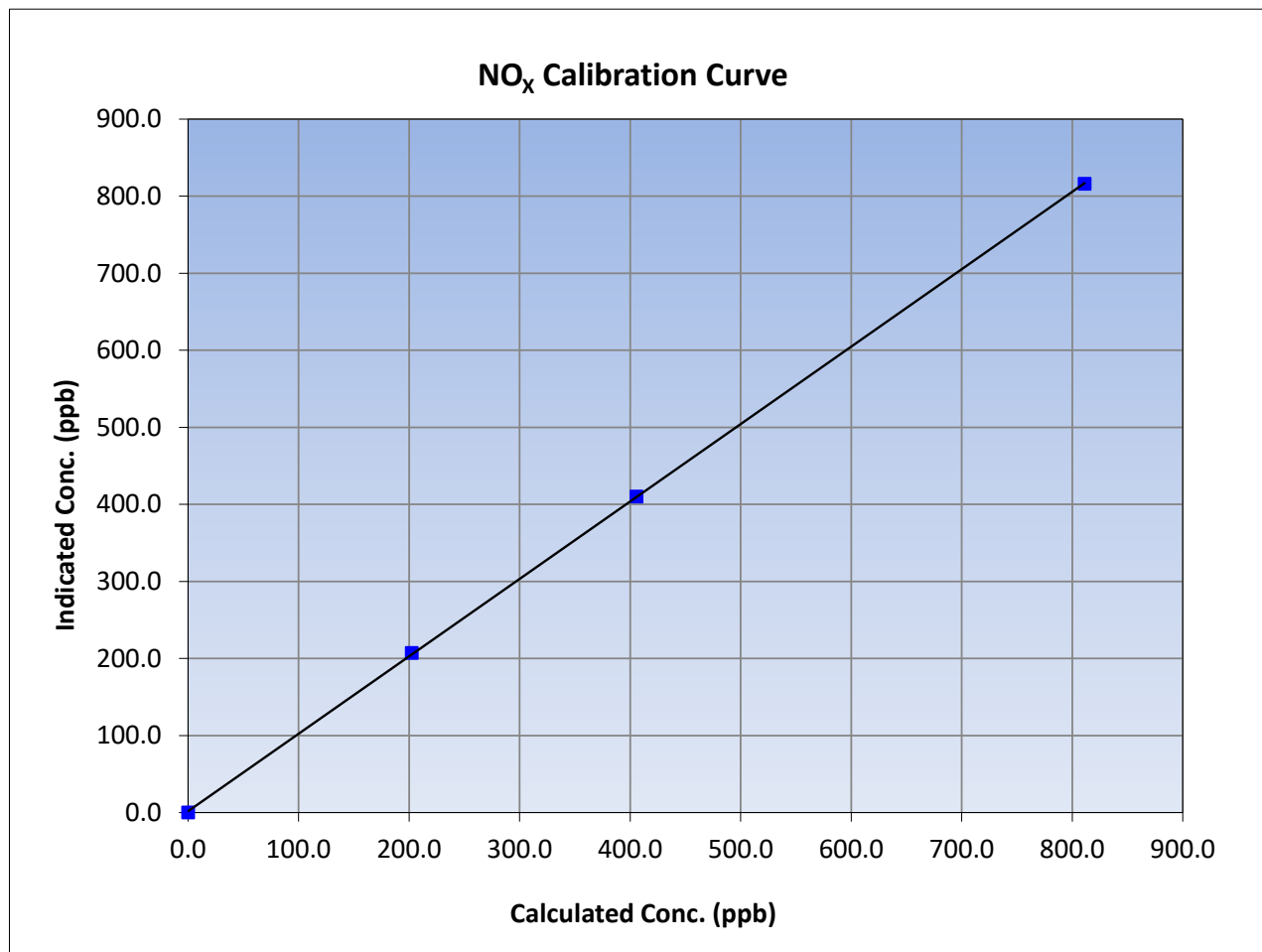
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Conklin           | Station Number:       | AMS21            |
| Start Time (MST): | 9:10              | End Time (MST):       | 13:05            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1501663731       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 811.2                               | 816.2                              | 0.9939                    |   |                                |
| 405.7                               | 410.1                              | 0.9892                    |   |                                |
| 202.3                               | 207.0                              | 0.9774                    |   |                                |
|                                     |                                    |                           | 0.999978                                      |                                |
|                                     |                                    |                           | 1.004927                                      |                                |
|                                     |                                    |                           | 1.765059                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

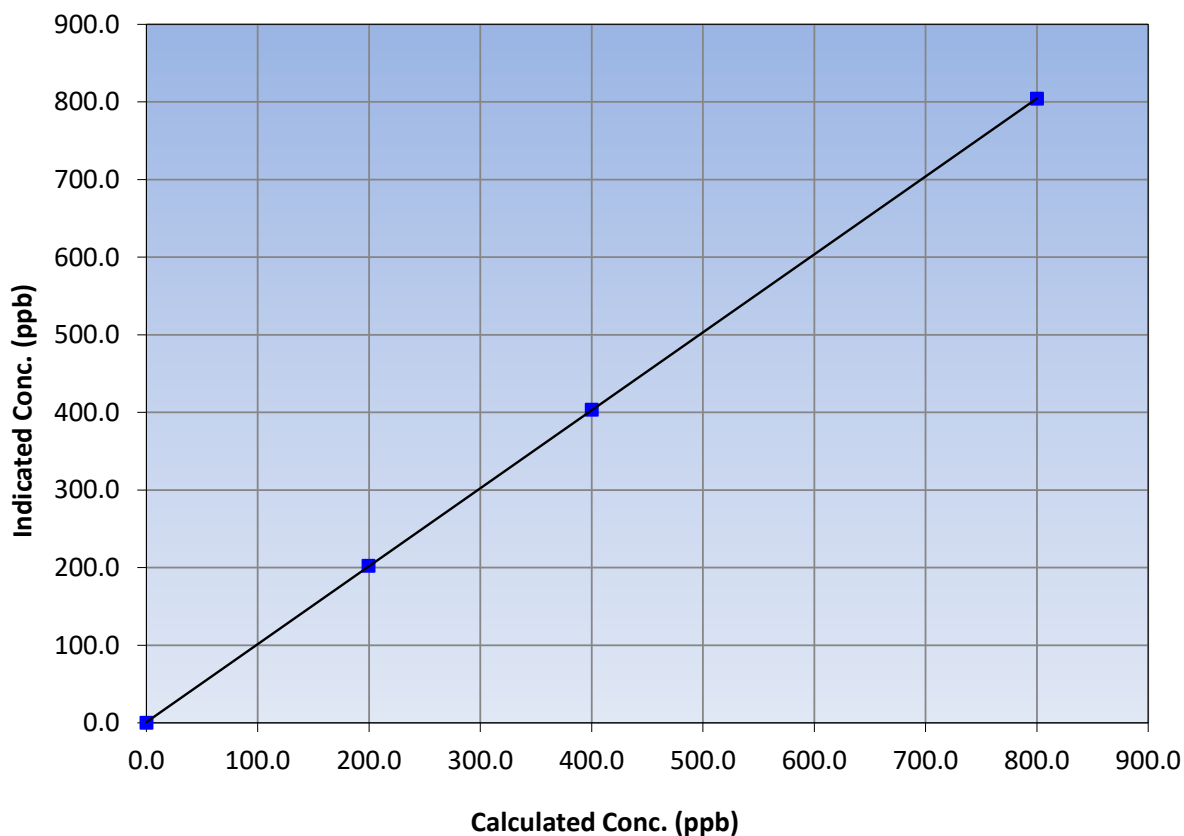
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Conklin           | Station Number:       | AMS21            |
| Start Time (MST): | 9:10              | End Time (MST):       | 13:05            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1501663731       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                                    |
|-------------------------------------|------------------------------------|---------------------------|---|---|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | $\geq 0.995$<br>$0.90 - 1.10$<br>$\pm 20$ |
| 800.1                               | 804.1                              | 0.9951                    |   |   |
| 400.1                               | 403.4                              | 0.9919                    |   |   |
| 199.6                               | 202.3                              | 0.9864                    |   |   |
|                                     |                                    |                           |   |   |

**NO Calibration Curve**







# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

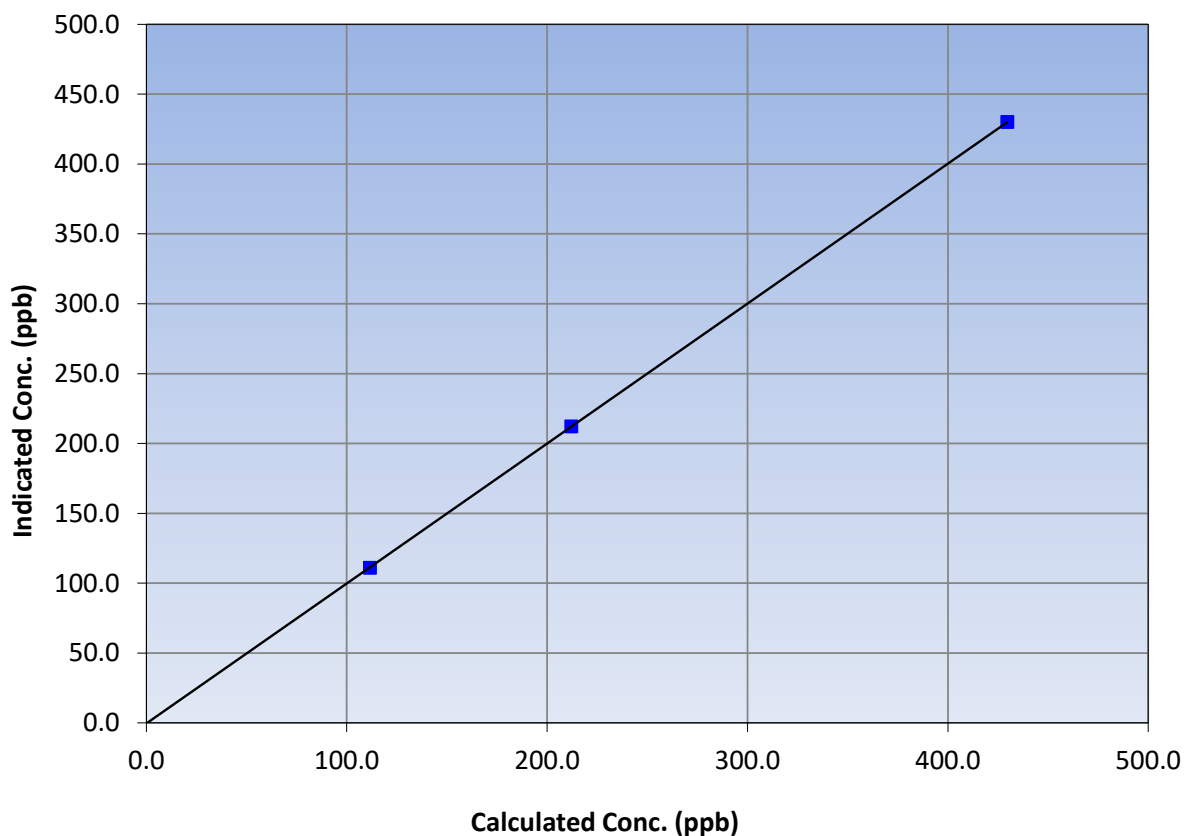
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Conklin           | Station Number:       | AMS21            |
| Start Time (MST): | 9:10              | End Time (MST):       | 13:05            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1501663731       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 429.6                               | 430.0                              | 0.9991                    |   |                                |
| 212.1                               | 212.1                              | 1.0001                    |   |                                |
| 111.6                               | 111.0                              | 1.0055                    |   |                                |
|                                     |                                    |                           | 0.999997                                      |                                |
|                                     |                                    |                           | 1.001583                                      |                                |
|                                     |                                    |                           | -0.384496                                     |                                |

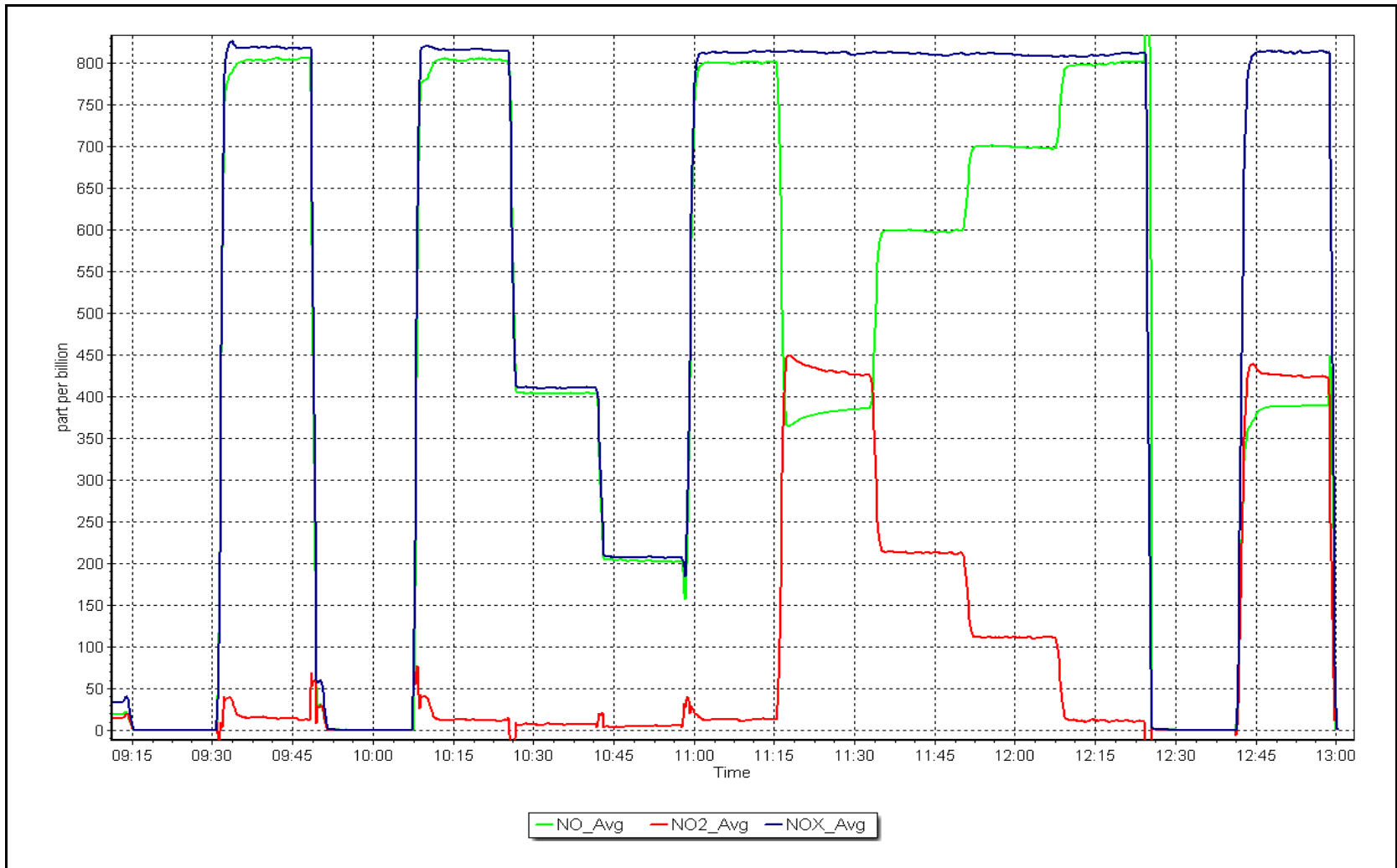
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 24, 2023

Location: Conklin







# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

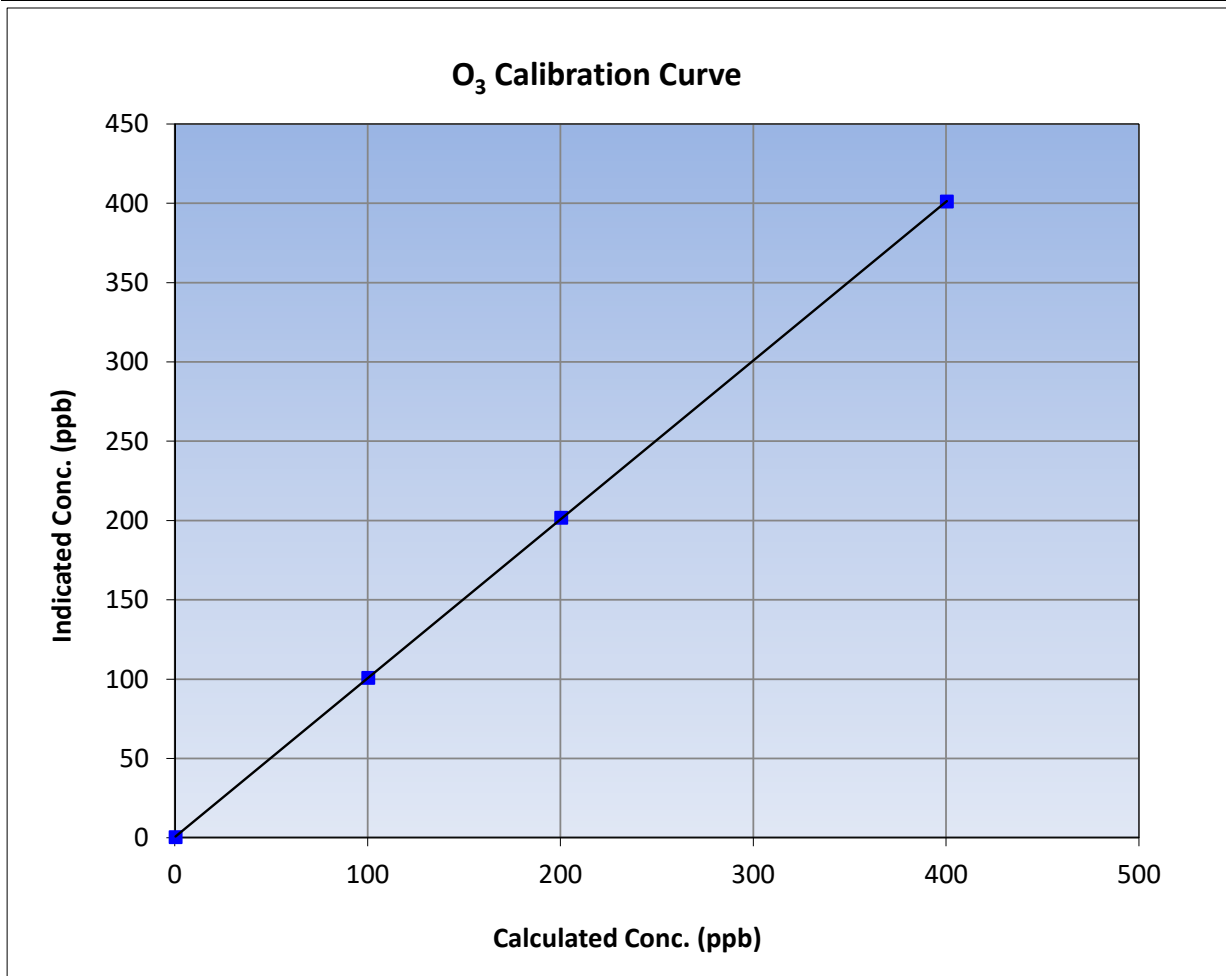
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 3, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Conklin          | Station Number:       | AMS21            |
| Start Time (MST): | 8:56             | End Time (MST):       | 12:15            |
| Analyzer make:    | Thermo 49i       | Analyzer serial #:    | 1501663734       |

### Calibration Data

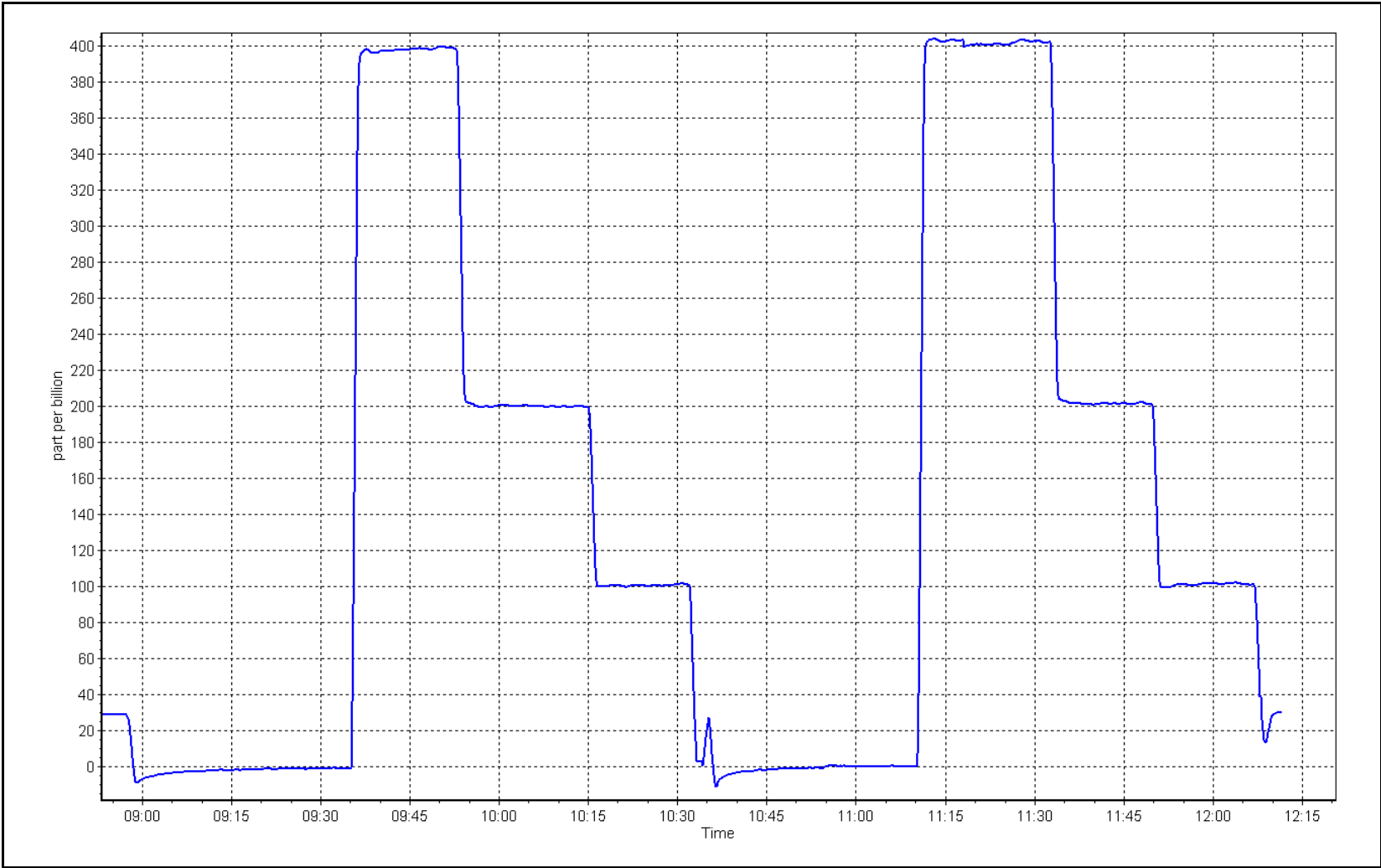
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999994      |             |
| 400.0                               | 400.7                              | 0.9983                    |                         |               | ≥0.995      |
| 200.0                               | 201.3                              | 0.9935                    | Slope                   | 1.001543      |             |
| 100.0                               | 100.5                              | 0.9950                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.380000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 3, 2023

Location: Conklin







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS22  
JANVIER  
FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

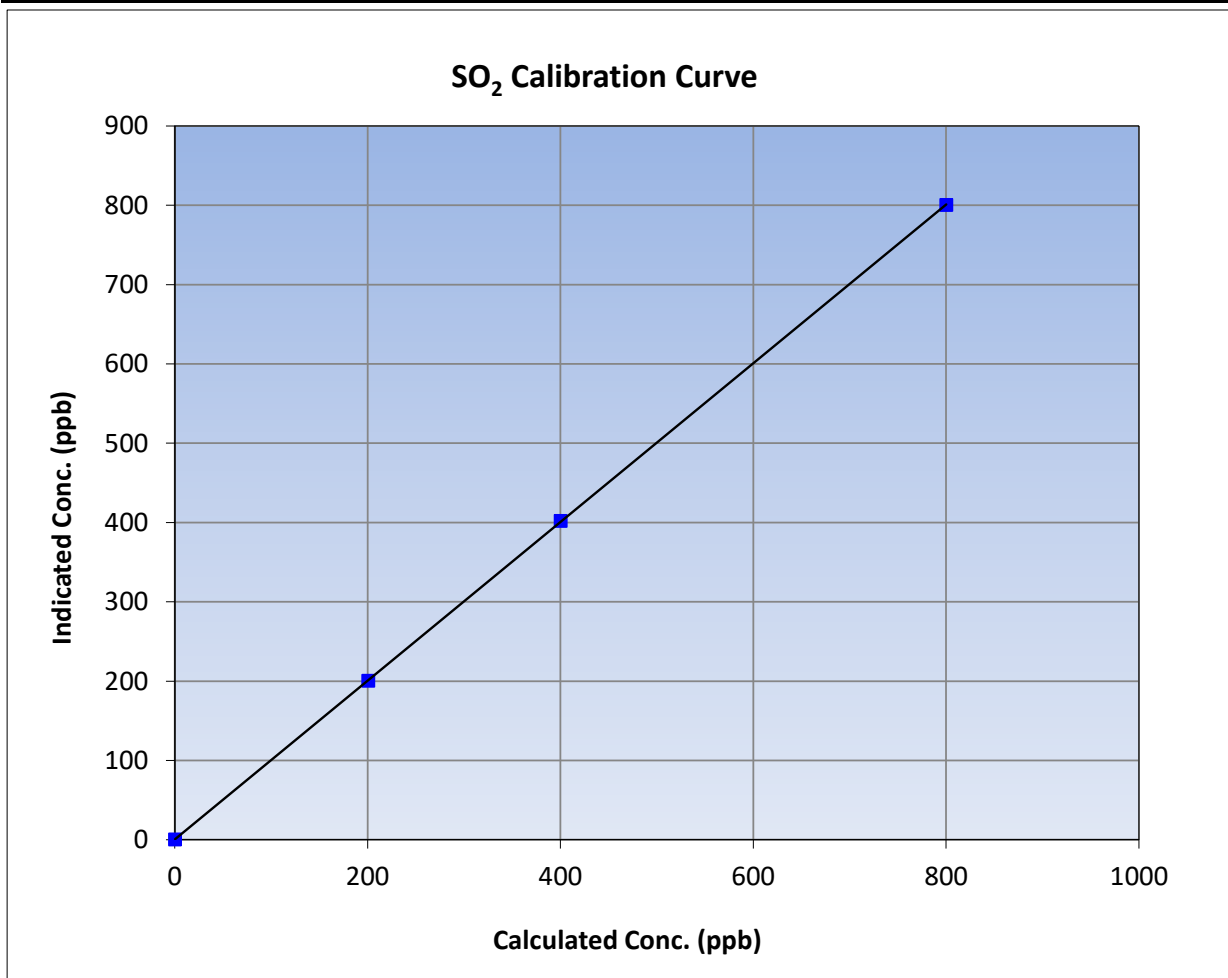
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:33             | End Time (MST):       | 16:31            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1152430006       |

### Calibration Data

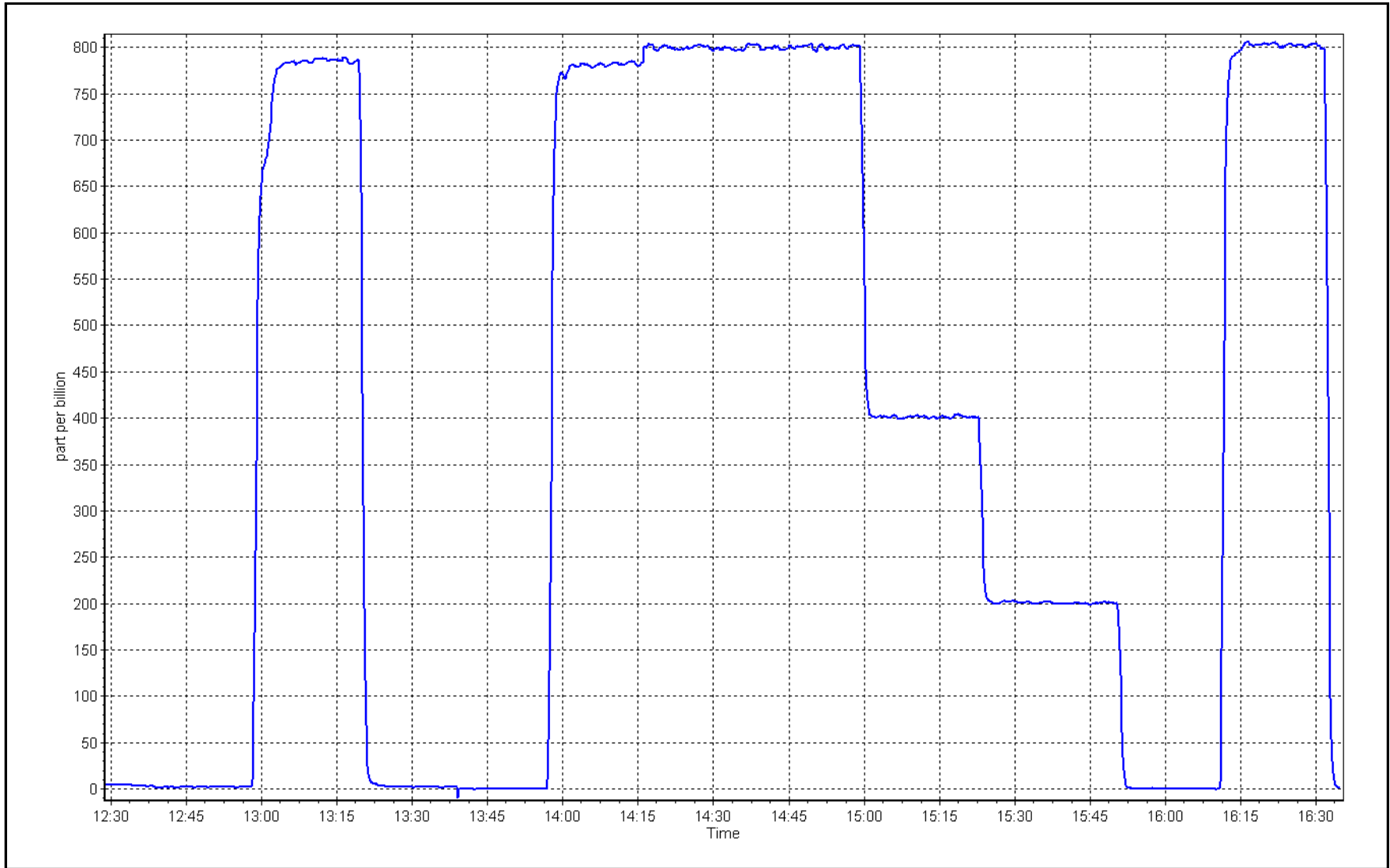
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999993      |             |
| 799.8                                  | 800.2                                 | 0.9995                       |                         |               | ≥0.995      |
| 399.9                                  | 401.8                                 | 0.9952                       | Slope                   | 1.000663      |             |
| 200.4                                  | 200.3                                 | 1.0007                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | 0.364554      | +/-30       |



SO2 Calibration Plot

Date: February 22, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Janvier Station number: AMS22  
 Calibration Date: February 24, 2023 Last Cal Date: January 20, 2023  
 Start time (MST): 12:12 End time (MST): 17:09  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.03 ppm Cal Gas Exp Date: April 16, 2022  
 Cal Gas Cylinder #: DT0018680  
 Removed Cal Gas Conc: 5.03 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3806  
 ZAG Make/Model: Teledyne API T701 Serial Number: 4890

### Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1151680031  
 Converter make: CDN-101 Converter serial #: 587  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | 1.005365     | 1.002650      | Backgd or Offset: | 3.42 3.56     |
| Calibration intercept: | 0.000881     | 0.120931      | Coeff or Slope:   | 1.239 1.239   |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----   |
| as found span         | 4920                          | 79.5                        | 80.0                                | 80.2                               | 1.001  |
| as found 2nd point    | 4960                          | 39.8                        | 40.0                                | 40.3                               | 1.001  |
| as found 3rd point    | 4980                          | 19.9                        | 20.0                                | 19.0                               | 1.071  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4920                          | 79.5                        | 80.0                                | 80.3                               | 0.996   |
| second point                            | 4960                          | 39.8                        | 40.0                                | 40.4                               | 0.991   |
| third point                             | 4980                          | 19.9                        | 20.0                                | 20.0                               | 1.001   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.3                                | ----  |
| as left span                            | 4920                          | 79.5                        | 80.0                                | 80.4                               | 0.995   |
| SO2 Scrubber Check                      | 4920                          | 79.8                        | 798.0                               | 0.1                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 0.996   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 79.9 Prev response: 80.41 \*% change: -0.6%  
 Baseline Corr 2nd AF pt: 40.0 AF Slope: 1.004505 AF Intercept: -0.219019  
 Baseline Corr 3rd AF pt: 18.7 AF Correlation: 0.999672

\* = > +/-5% change initiates investigation

Notes: Changed out the inlet filter after as founds. Scrubber check passed. Increased the converter temperature to 860C. Adjusted zero only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## TRS Calibration Summary

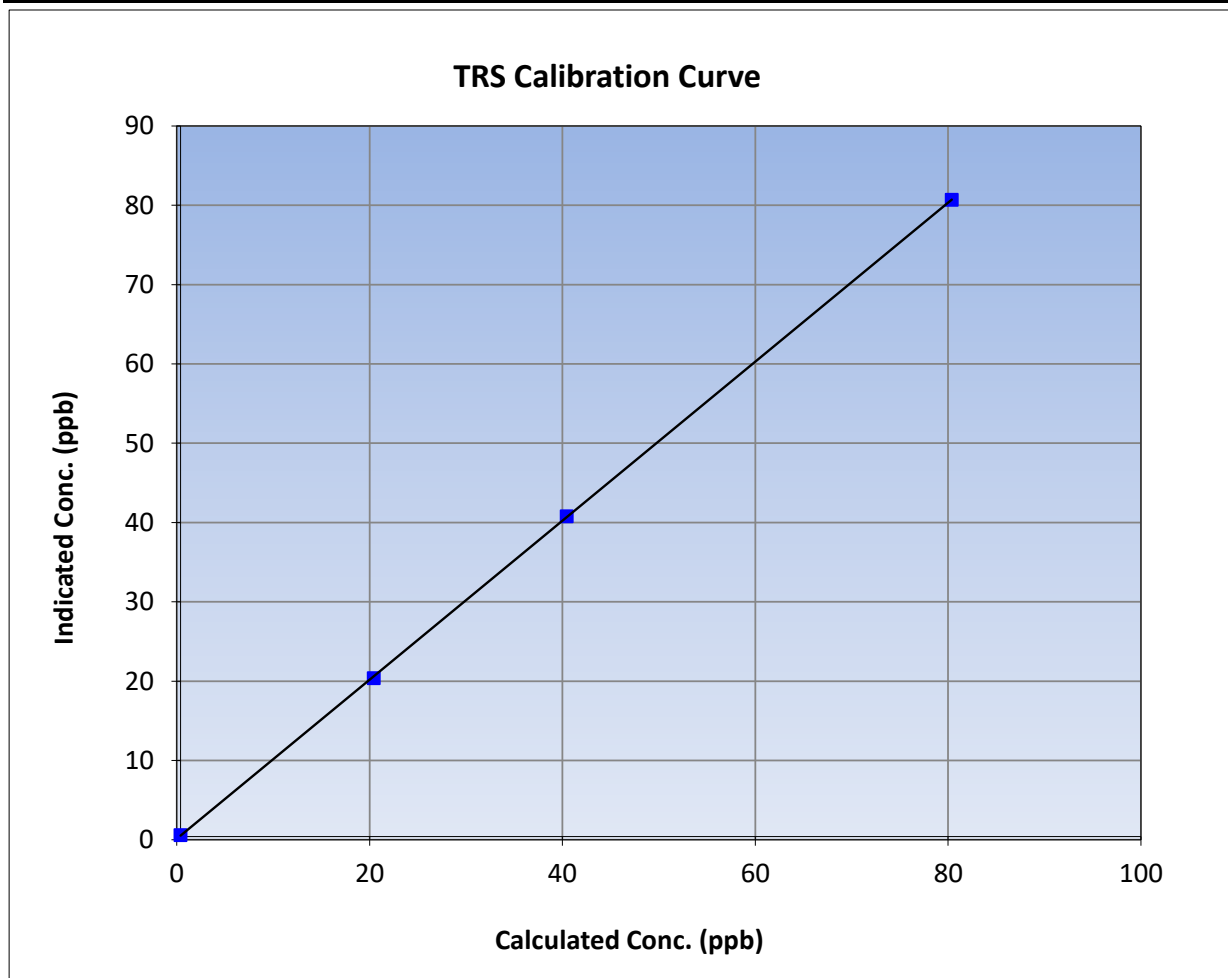
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS22            |
| Start Time (MST): | 12:12             | End Time (MST):       | 17:09            |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1151680031       |

### Calibration Data

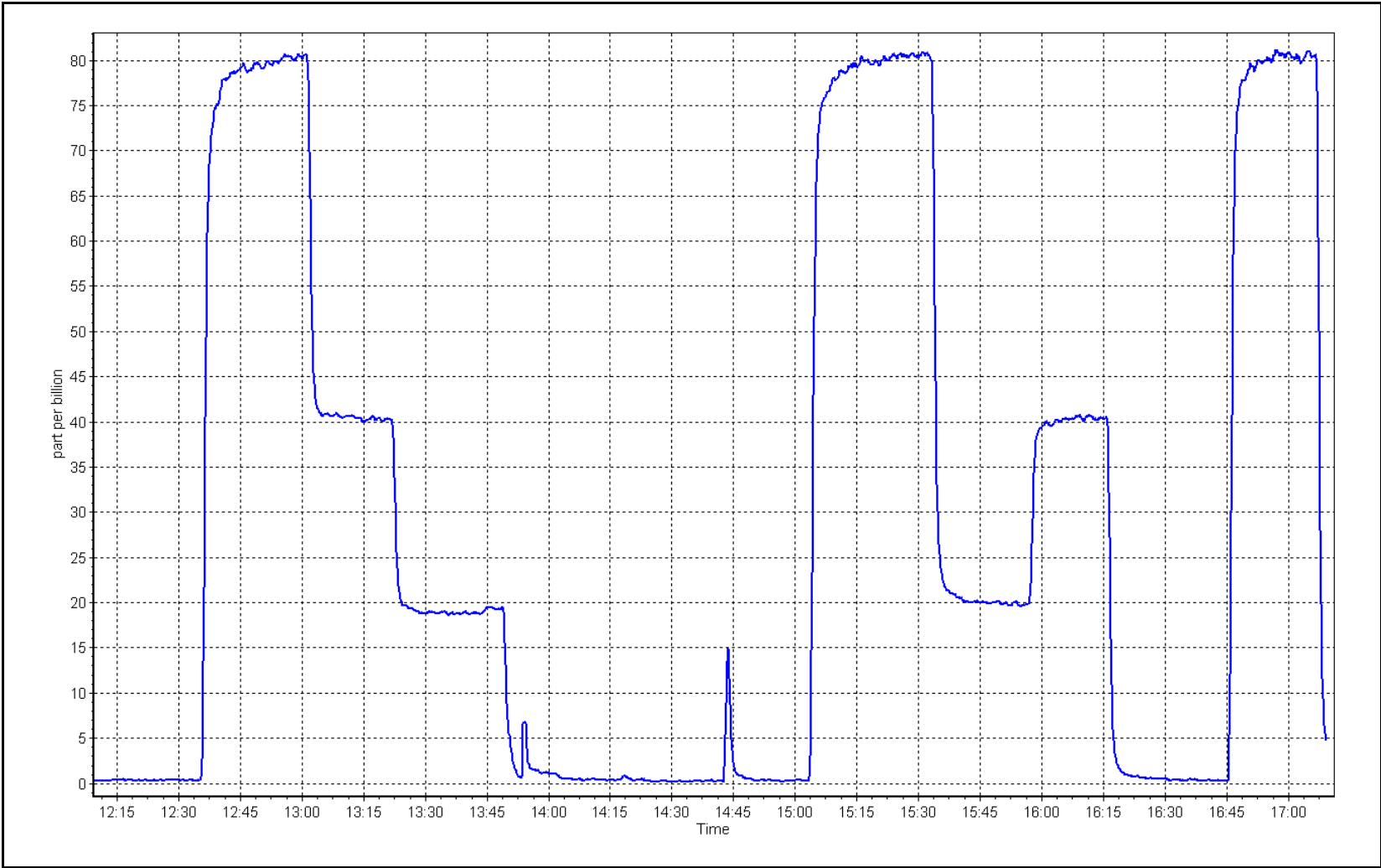
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999982 | ≥0.995      |
| 80.0                                | 80.3                               | 0.9961                    |                         |          |             |
| 40.0                                | 40.4                               | 0.9911                    | Slope                   | 1.002650 | 0.90 - 1.10 |
| 20.0                                | 20.0                               | 1.0010                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.120931 | +/-3        |



TRS Calibration Plot

Date: February 24, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Janvier           | Station number: | AMS 22           |
| Calibration Date: | February 22, 2023 | Last Cal Date:  | January 17, 2023 |
| Start time (MST): | 12:33             | End time (MST): | 16:31            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|   |                  |                             |                  |
|---|------------------|-----------------------------|------------------|
| Gas Cert Reference:                         | CC281519         | Cal Gas Expiry Date:        | January 18, 2029 |
| CH <sub>4</sub> Cal Gas Conc.               | 502.8 ppm        | CH <sub>4</sub> Equiv Conc. | 1075.9 ppm       |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 208.4 ppm        |                             |                  |
| Removed Gas Cert:                           | N/A              | Removed Gas Expiry:         | N/A              |
| Removed CH <sub>4</sub> Conc.               | 502.8 ppm        | CH <sub>4</sub> Equiv Conc. | 1075.9 ppm       |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 208.4 ppm        | Diff between cyl (THC):     |                  |
| Diff between cyl (CH <sub>4</sub> ):        |                  | Diff between cyl (NM):      |                  |
| Calibrator Model:                           | Teledyne API 700 | Serial Number:              | 3806             |
| ZAG make/model:                             | Teledyne API 701 | Serial Number:              | 4890             |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1172750023 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.180E-04    | 2.180E-04     | NMHC SP Ratio:  | 4.69E-05      |
| CH <sub>4</sub> Retention time: | 13.00        | 13.20         | NMHC Peak Area: | 195272        |
|                                 |              |               |                 | 203120        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 79.8                 | 17.17                | 17.43               | 0.985                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 79.8                 | 17.17                | 17.23               | 0.997                      |
| second point          | 4960              | 39.9                 | 8.59                 | 8.57                | 1.002                      |
| third point           | 4980              | 20.0                 | 4.30                 | 4.27                | 1.008                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 79.8                 | 17.17                | 17.33               | 0.991                      |

|                       |       |                 |       | Average Correction Factor                  | 1.002 |
|-----------------------|-------|-----------------|-------|--|-------|
| Baseline Corr AF:     | 17.43 | Prev response   | 17.12 | *% change                                  | 1.8%  |
| Baseline Corr 2nd AF: | NA    | AF Slope:       |       | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |       |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as found span             | 4920              | 79.8                 | 9.15                 | 9.40   | 0.974                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| high point                | 4920              | 79.8                 | 9.15                 | 9.17   | 0.997                      |
| second point              | 4960              | 39.9                 | 4.57                 | 4.58   | 0.999                      |
| third point               | 4980              | 20.0                 | 2.29                 | 2.28   | 1.005                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00   | ----                       |
| as left span              | 4920              | 79.8                 | 9.15                 | 9.25   | 0.989                      |
| Average Correction Factor |                   |                      |                      |  | 1.001                      |
| Baseline Corr AF:         | 9.40              | Prev response        | 9.10                 | *% change  | 3.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                                  | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as found span             | 4920              | 79.8                 | 8.03                 | 8.04   | 0.999                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| high point                | 4920              | 79.8                 | 8.03                 | 8.06   | 0.996                      |
| second point              | 4960              | 39.9                 | 4.01                 | 4.00   | 1.004                      |
| third point               | 4980              | 20.0                 | 2.01                 | 1.99   | 1.010                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00   | ----                       |
| as left span              | 4920              | 79.8                 | 8.03                 | 8.08   | 0.994                      |
| Average Correction Factor |                   |                      |                      |  | 1.004                      |
| Baseline Corr AF:         | 8.04              | Prev response        | 8.02                 | *% change  | 0.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:  |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | <i>* = &gt; +/-5% change initiates investigation</i> |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.999594     | 1.003856      |
| THC Cal Offset:             | -0.041578    | -0.027606     |
| CH <sub>4</sub> Cal Slope:  | 1.001935     | 1.004586      |
| CH <sub>4</sub> Cal Offset: | -0.020955    | -0.017766     |
| NMHC Cal Slope:             | 0.997466     | 1.003078      |
| NMHC Cal Offset:            | -0.020822    | -0.009039     |

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## THC Calibration Summary

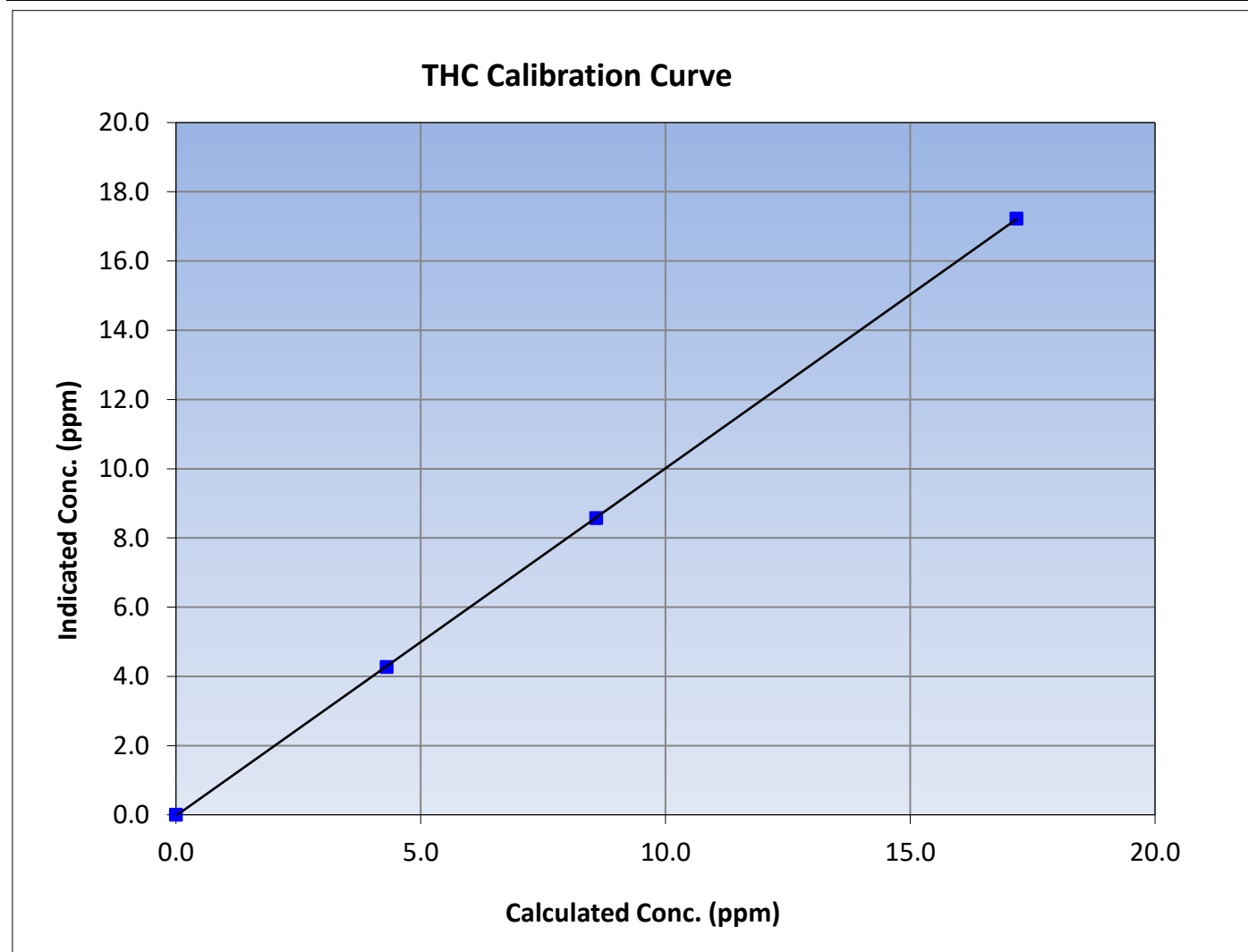
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:33             | End Time (MST):       | 16:31            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1172750023       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999988  | $\geq 0.995$  |       |          |             |
| 17.17                               | 17.23                              | 0.9968                    |                         |           |               |       |          |             |
| 8.59                                | 8.57                               | 1.0018                    |                         |           |               | Slope | 1.003856 | 0.90 - 1.10 |
| 4.30                                | 4.27                               | 1.0079                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.027606 | $\pm 0.5$     |       |          |             |







# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

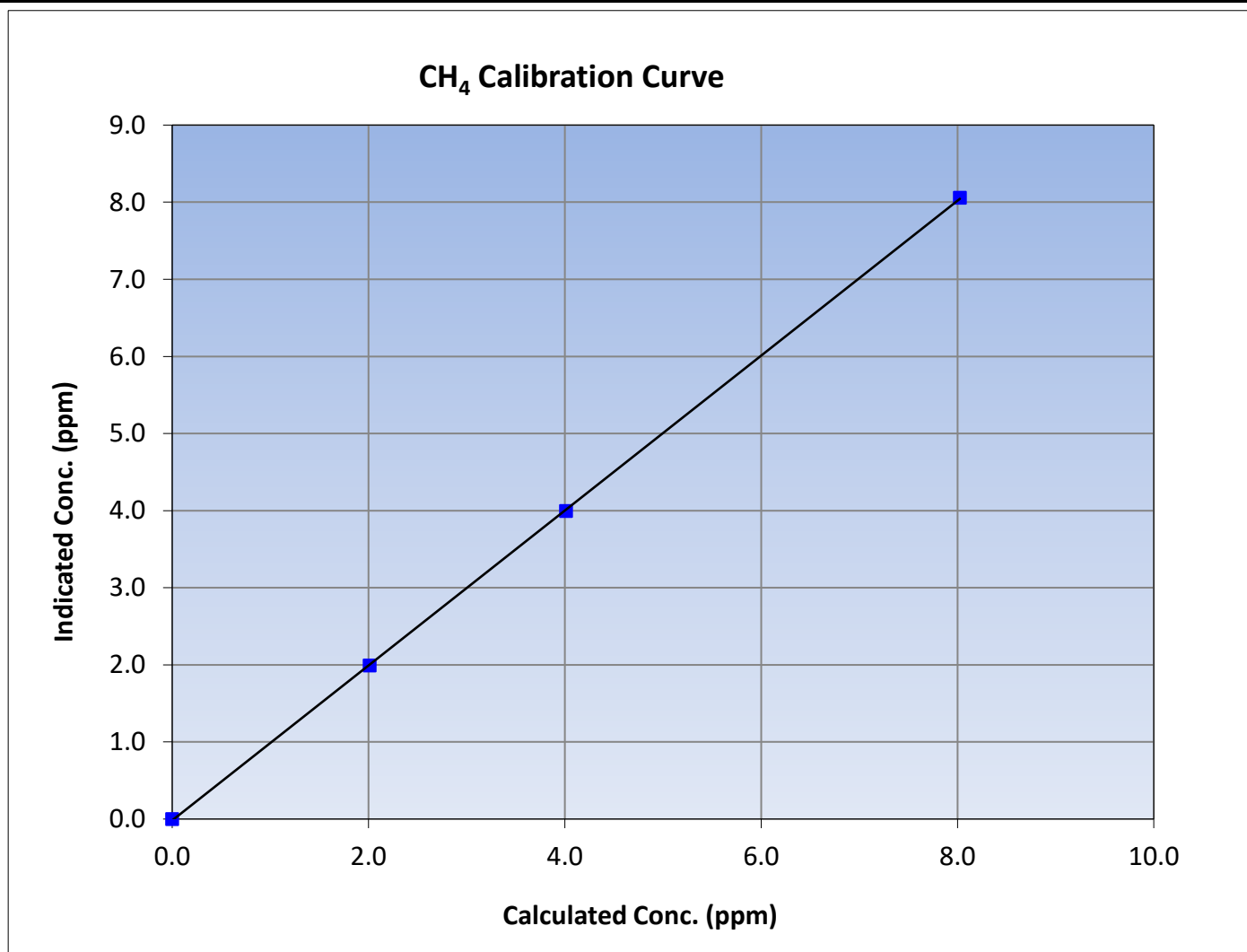
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:33             | End Time (MST):       | 16:31            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1172750023       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999974  | $\geq 0.995$  |       |          |             |
| 8.03                                | 8.06                               | 0.9962                    |                         |           |               |       |          |             |
| 4.01                                | 4.00                               | 1.0044                    |                         |           |               | Slope | 1.004586 | 0.90 - 1.10 |
| 2.01                                | 1.99                               | 1.0101                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.017766 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

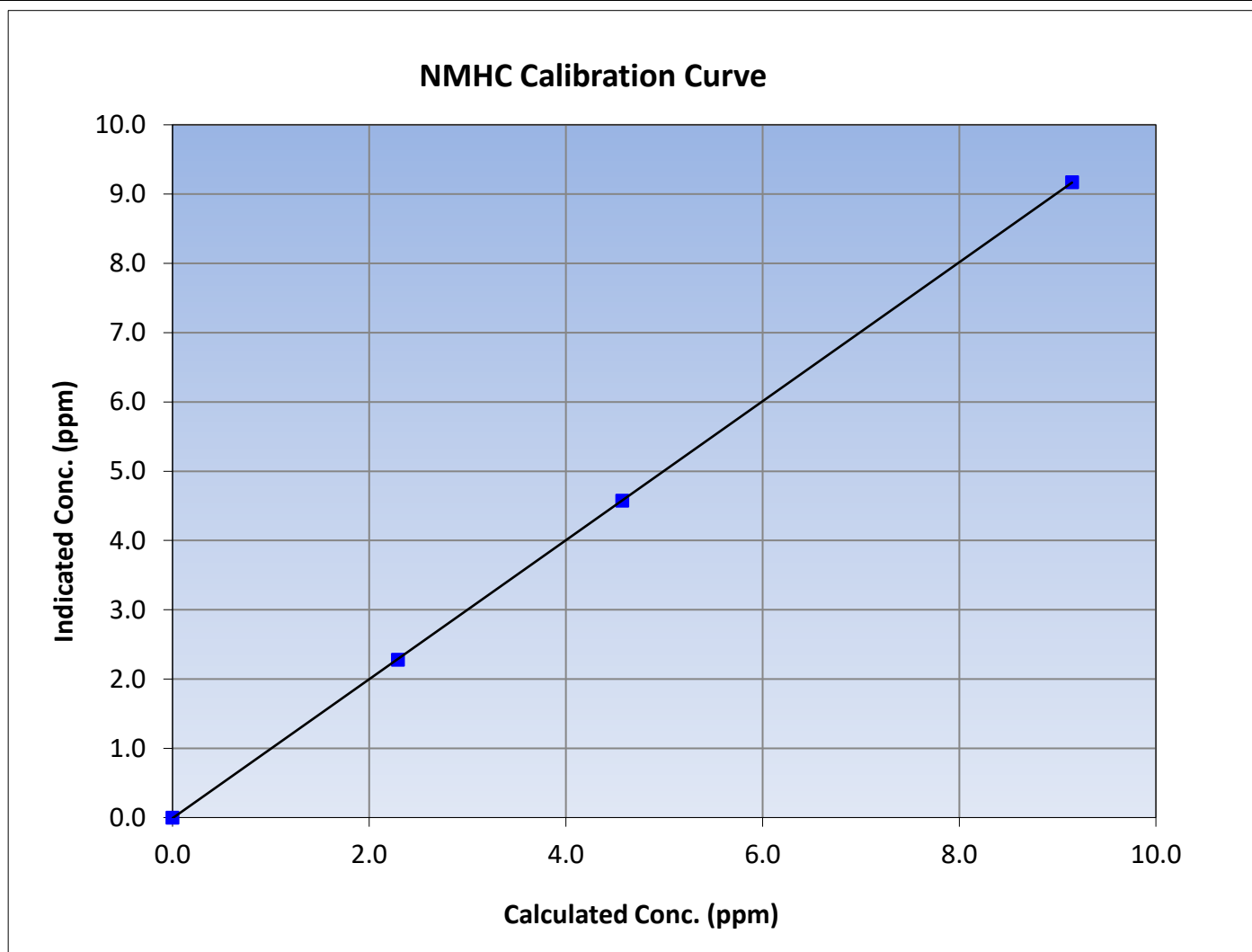
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 17, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:33             | End Time (MST):       | 16:31            |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1172750023       |

### Calibration Data

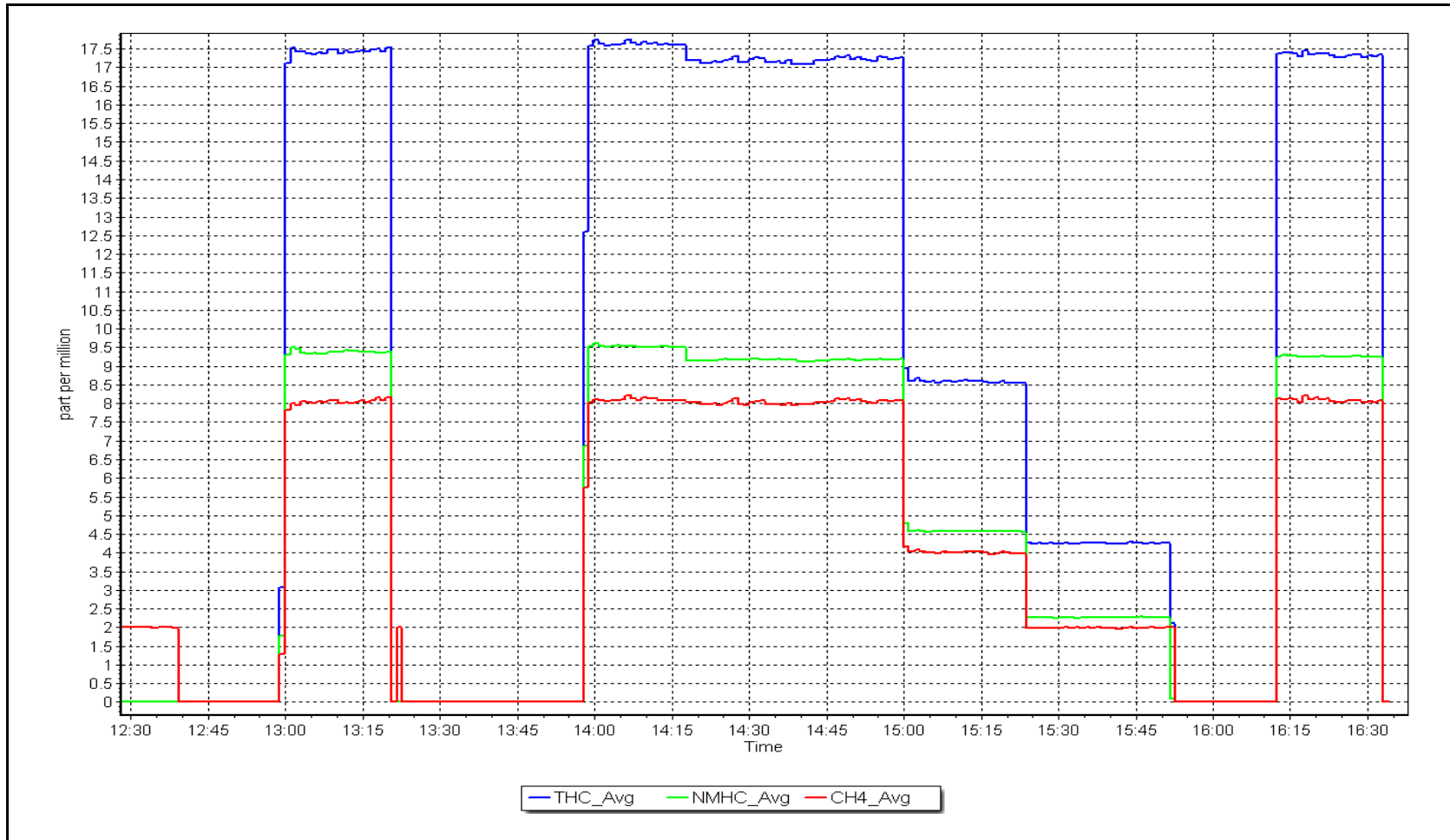
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999995  | $\geq 0.995$  |       |          |             |
| 9.15                                | 9.17                               | 0.9975                    |                         |           |               |       |          |             |
| 4.57                                | 4.58                               | 0.9994                    |                         |           |               | Slope | 1.003078 | 0.90 - 1.10 |
| 2.29                                | 2.28                               | 1.0054                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.009039 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 22, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Janvier Station number: AMS 22  
Calibration Date: February 23, 2023 Last Cal Date: January 26, 2023  
Start time (MST): 12:21 End time (MST): 17:33  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: CC424183 Cal Gas Expiry Date: April 16, 2023  
NOX Cal Gas Conc: 48.60 ppm NO Cal Gas Conc: 48.60 ppm  
Removed Cylinder #: NA Removed Gas Exp Date: NA  
Removed Gas NOX Conc: 48.60 ppm Removed Gas NO Conc: 48.60 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T700 Serial Number: 3806  
ZAG make/model: Teledyne API T701 Serial Number: 4890

### Analyzer Information

Analyzer make: Teledyne API T200 Analyzer serial #: 7117  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.015        | 1.019         | NO bkgnd or offset:  | -0.3         | -0.3          |
| NOX coeff or slope: | 1.004        | 1.009         | NOX bkgnd or offset: | 0.4          | 0.4           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 5.1          | 5.1           |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.004514     | 1.000016      |
| NO <sub>x</sub> Cal Offset: | -0.271695    | 0.328470      |
| NO Cal Slope:               | 1.003357     | 0.999486      |
| NO Cal Offset:              | -0.891348    | -0.011076     |
| NO <sub>2</sub> Cal Slope:  | 1.001018     | 0.999574      |
| NO <sub>2</sub> Cal Offset: | 0.153243     | 0.324675      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | -0.1                                  | -0.3   | ----  | ----   |
| as found span             | 4918                      | 82.3                        | 799.9   | 799.9                                  | 0.0   | 794.3  | 790.8                                 | 3.5  | 1.0071  | 1.0115   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | 0.1                                   | -0.2   | ----  | ----   |
| high point                | 4918                      | 82.3                        | 799.9   | 799.9                                  | 0.0   | 799.9  | 799.5                                 | 0.5  | 1.0000  | 1.0005   |
| second point              | 4959                      | 41.2                        | 400.4   | 400.4                                  | 0.0   | 401.4  | 400.3                                 | 1.0  | 0.9976  | 1.0004   |
| third point               | 4980                      | 20.6                        | 200.2   | 200.2                                  | 0.0   | 200.7  | 199.9                                 | 0.8  | 0.9975  | 1.0015   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.2                                   | -0.2   | ----  | ----   |
| as left span              | 4918                      | 82.3                        | 799.9   | 395.8                                  | 404.1   | 797.4  | 402.1                                 | 395.3  | 1.0031  | 0.9844   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9984  | 1.0008   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 794.6 ppb | NO = 790.9 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.1% |
| Previous Response    | NO <sub>x</sub> = 803.2 ppb | NO = 801.7 ppb |  | *Percent Change                  | NO = -1.4%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 798.0                                      | 393.9                                 | 404.1   | 403.9  | 1.0005   | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 798.0                                      | 599.3                                 | 198.7   | 199.5  | 0.9960   | 100.4%   |
| 3rd GPT point (100 ppb O3)       | 798.0                                      | 699.7                                 | 98.3  | 98.9   | 0.9939   | 100.6%   |
| Average Correction Factor        |  |                                       |   |  | 0.9968   | 100.3%   |

Notes: Changed the inlet filter after as founds. Adjusted span only.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

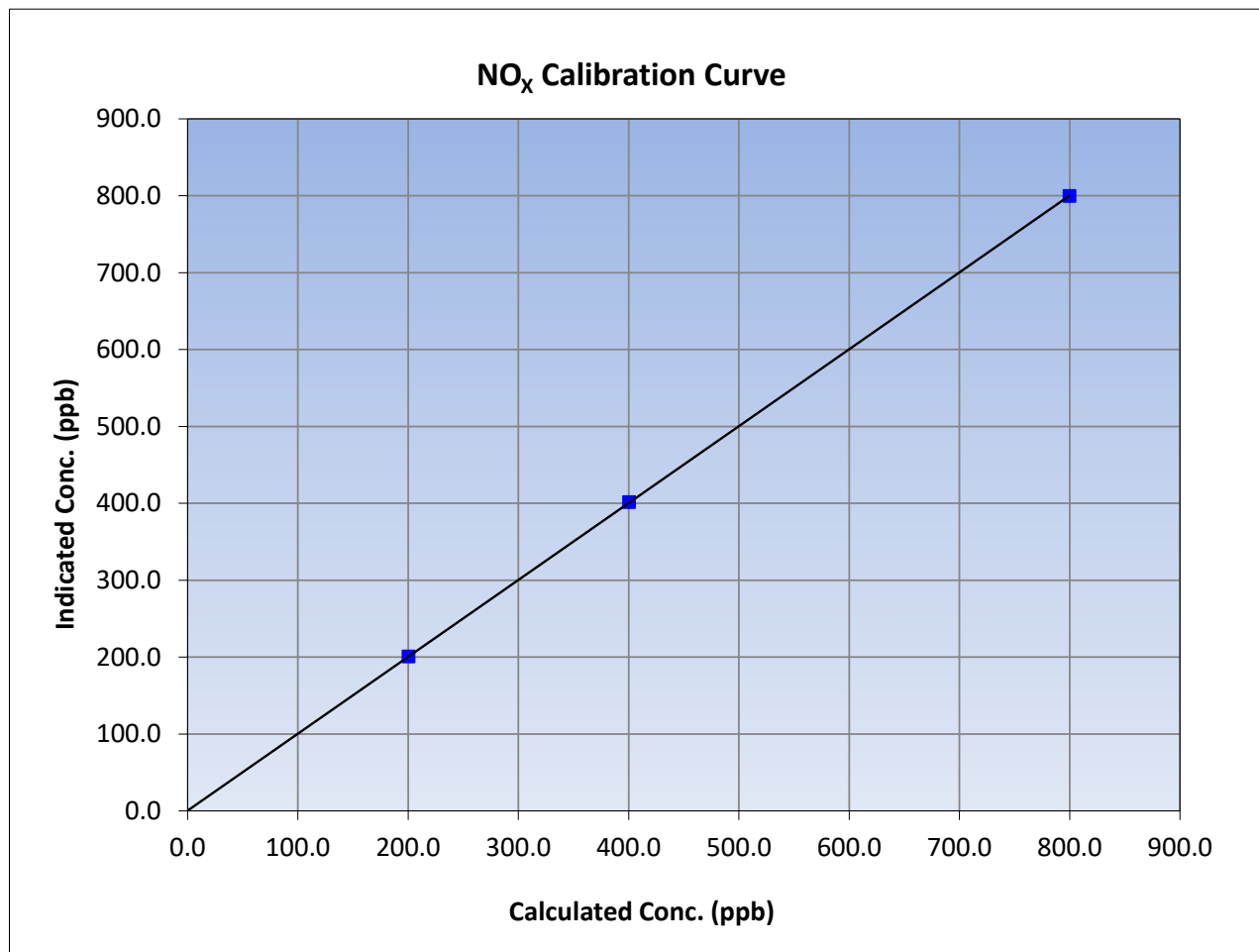
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 26, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:21             | End Time (MST):       | 17:33            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.9                               | 799.9                              | 1.0000                    |   |                                |
| 400.4                               | 401.4                              | 0.9976                    |   |                                |
| 200.2                               | 200.7                              | 0.9975                    |   |                                |
|                                     |                                    |                           | 0.999998                                      |                                |
|                                     |                                    |                           | 1.000016                                      |                                |
|                                     |                                    |                           | 0.328470                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

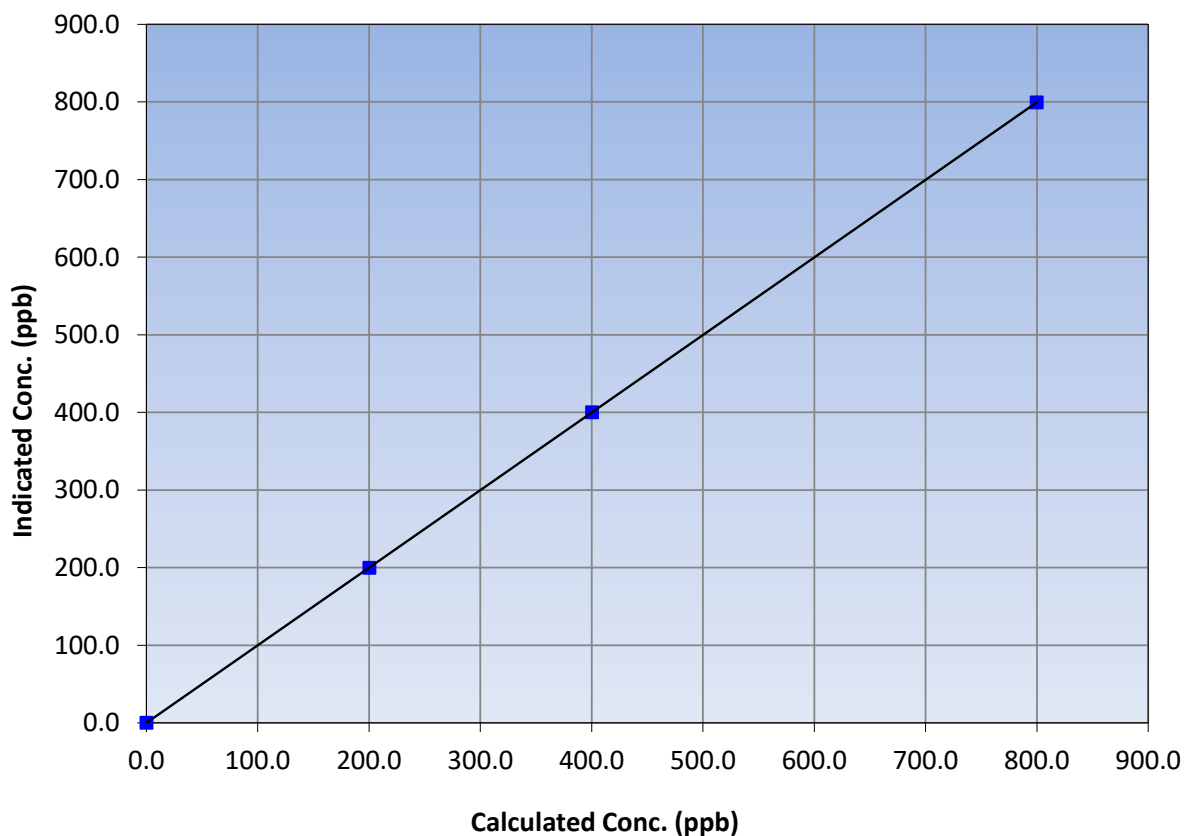
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 26, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:21             | End Time (MST):       | 17:33            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 799.9                               | 799.5                              | 1.0005                    |                         |           |             |
| 400.4                               | 400.3                              | 1.0004                    |                         |           |             |
| 200.2                               | 199.9                              | 1.0015                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.999486  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.011076 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

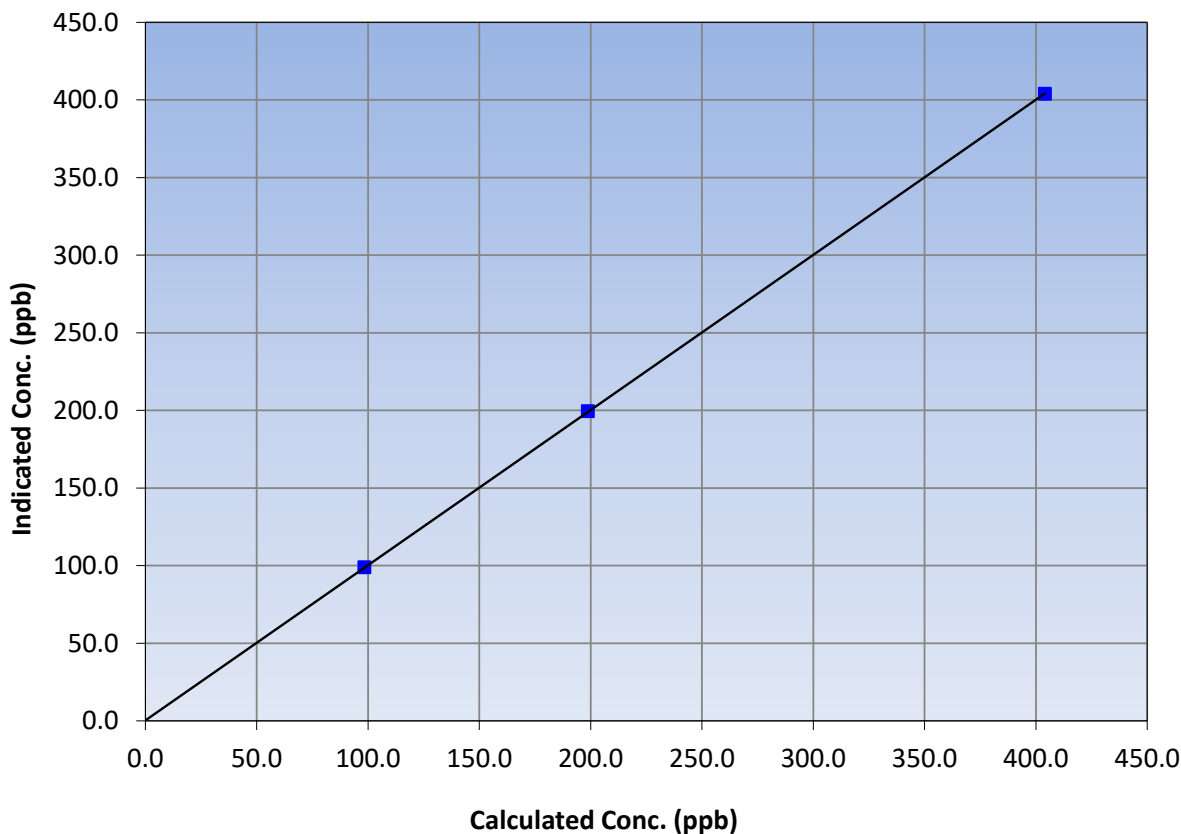
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | January 26, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 12:21             | End Time (MST):       | 17:33            |
| Analyzer make:    | Teledyne API T200 | Analyzer serial #:    | 7117             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 404.1                               | 403.9                              | 1.0005                    |                         |               |             |
| 198.7                               | 199.5                              | 0.9960                    |                         |               |             |
| 98.3                                | 98.9                               | 0.9939                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.999574      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | 0.324675      | +/-20       |

**NO<sub>2</sub> Calibration Curve**

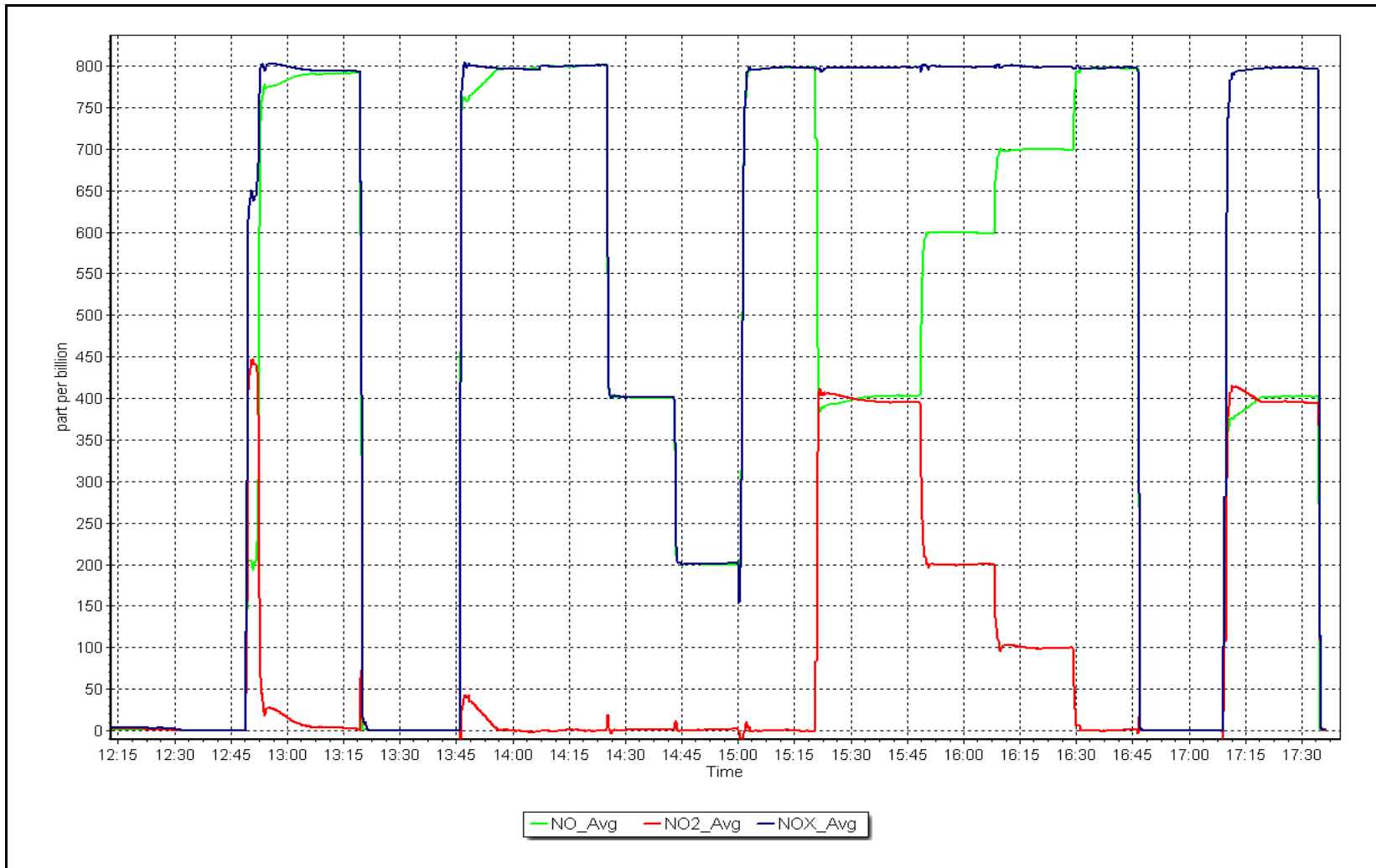




NO<sub>x</sub> Calibration Plot

Date: February 23, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Report

Version-01-2020

### Station Information

Station Name: Janvier Station number: AMS 22  
 Calibration Date: February 14, 2023 Last Cal Date: January 25, 2023  
 Start time (MST): 11:15 End time (MST): 14:07  
 Reason: Routine

### Calibration Standards

O3 generation mode: Photometer  
 Calibrator Make/Model: Teledyne API T700 Serial Number: 3806  
 ZAG Make/Model: Teledyne API T701 Serial Number: 201

### Analyzer Information

Analyzer make: Teledyne API T400 Analyzer serial #: 3869  
 Analyzer Range 0 - 500 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.998486     | 1.000057      | Backgd or Offset: | -2.0         | -2.0          |
| Calibration intercept: | 0.240000     | 0.440000      | Coeff or Slope:   | 1.011        | 1.011         |

### O<sub>3</sub> Calibration Data

| Set Point                 | Total air flow rate (sccm) | Calibrator Lamp Voltage Drive | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|----------------------------|-------------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                       | 800.0                         | 0.0                                 | -0.3                               | ----  |
| as found span             | 4893                       | 897.4                         | 400.0                               | 400.5                              | 0.999   |
| as found 2nd point        |                            |                               |                                     |                                    |   |
| as found 3rd point        |                            |                               |                                     |                                    |   |
| calibrator zero           | 5000                       | 800.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4893                       | 897.4                         | 400.0                               | 400.3                              | 0.999   |
| second point              | 4893                       | 752.6                         | 200.0                               | 200.7                              | 0.997   |
| third point               | 4893                       | 653.0                         | 100.0                               | 100.6                              | 0.994   |
| as left zero              | 5000                       | 800.0                         | 0.0                                 | 0.4                                | ----  |
| as left span              | 4816                       | 897.4                         | 400.0                               | 402.0                              | 0.995   |
| Average Correction Factor |                            |                               |                                     |                                    | 0.997   |

|                          |       |                   |       |               |      |
|--------------------------|-------|-------------------|-------|---------------|------|
| Baseline Corr As found:  | 400.8 | Previous response | 399.6 | *% change     | 0.3% |
| Baseline Corr 2nd AF pt: | NA    | AF Slope:         |       | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA    | AF Correlation:   |       |               |      |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Rene Chamberland



# Wood Buffalo Environmental Association

## O<sub>3</sub> Calibration Summary

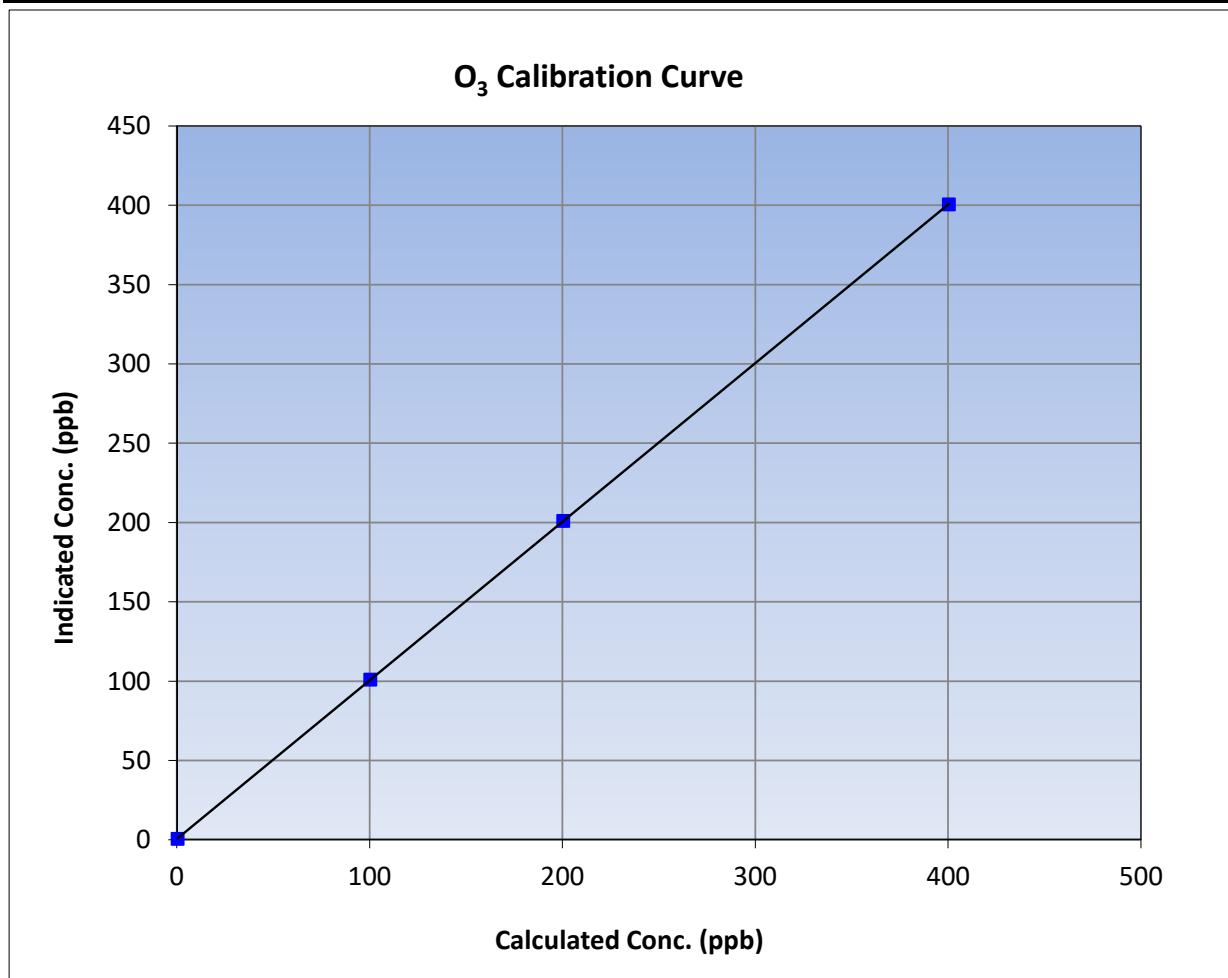
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Janvier           | Station Number:       | AMS 22           |
| Start Time (MST): | 11:15             | End Time (MST):       | 14:07            |
| Analyzer make:    | Teledyne API T400 | Analyzer serial #:    | 3869             |

### Calibration Data

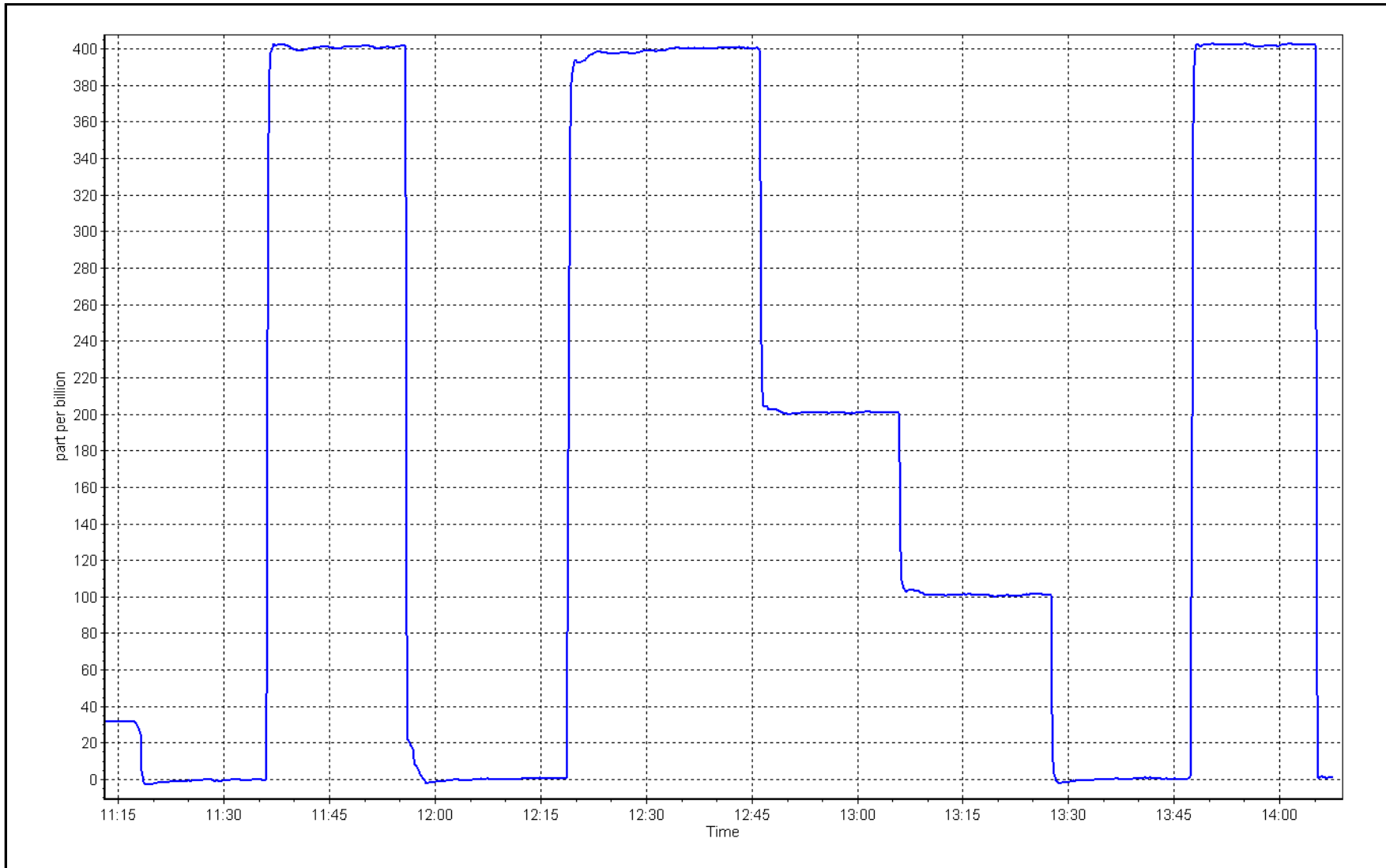
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999998      | ≥0.995      |
| 400.0                               | 400.3                              | 0.9993                    |                         |               |             |
| 200.0                               | 200.7                              | 0.9965                    | Slope                   | 1.000057      | 0.90 - 1.10 |
| 100.0                               | 100.6                              | 0.9940                    |                         |               |             |
|                                     |                                    |                           | Intercept               | 0.440000      | +/- 5       |



O<sub>3</sub> Calibration Plot

Date: February 14, 2023

Location: Janvier





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Janvier Station number: AMS 22  
 Calibration Date: February 24, 2023 Last Cal Date: January 26, 2023  
 Start time (MST): 14:17 End time (MST): 16:09

Analyzer Make: Teledyne API T640 S/N: 325  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 1450  
 Temp/RH standard: Delta Cal S/N: 1450

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -14.4    | -14.7    | -14.4   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 716.4    | 714.2    | 716.4   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01     | 5.07     | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 24, 2023 Last Cal Date: January 26, 2023  
 PM w/o HEPA: 2.6 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: January 26, 2023 <0.2 ug/m3  
 Disposable Filter Changed: January 26, 2023

### Annual Maintenance

Date Sample Tube Cleaned: October 6, 2022  
 Date RH/T Sensor Cleaned: October 6, 2022

Notes: Verified flow, temperature, and pressure. Leak test passed.

Calibration by: Rene Chamberland



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS23 FORT HILLS FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                 |
|-------------------|------------------|-----------------|-----------------|
| Station Name:     | Fort Hills       | Station number: | AMS23           |
| Calibration Date: | February 1, 2023 | Last Cal Date:  | January 4, 2023 |
| Start time (MST): | 10:42            | End time (MST): | 13:41           |
| Reason:           | Routine          |                 |                 |

### Calibration Standards

|                        |          |     |                   |                 |
|------------------------|----------|-----|-------------------|-----------------|
| Cal Gas Concentration: | 49.76    | ppm | Cal Gas Exp Date: | January 5, 2025 |
| Cal Gas Cylinder #:    | CC281425 |     |                   |                 |
| Removed Cal Gas Conc:  | 49.76    | ppm | Rem Gas Exp Date: | N/A             |
| Removed Gas Cyl #:     | N/A      |     | Diff between cyl: |                 |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 451             |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 5611            |

### Analyzer Information

|                |              |                    |            |
|----------------|--------------|--------------------|------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | 1160290012 |
| Analyzer Range | 0 - 1000 ppb |                    |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.999236     | 0.997162      | Backgd or Offset: | 18.1         | 18.1          |
| Calibration intercept: | -0.603450    | -0.103174     | Coeff or Slope:   | 1.048        | 1.048         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| as found span             | 4920                          | 80.3                        | 799.1                               | 797.8                              | 1.002   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4920                          | 80.3                        | 799.1                               | 796.8                              | 1.003   |
| second point              | 4960                          | 40.2                        | 400.1                               | 398.9                              | 1.003   |
| third point               | 4980                          | 20.1                        | 200.0                               | 198.9                              | 1.006   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span              | 4920                          | 80.3                        | 799.1                               | 800.1                              | 0.999   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.004   |

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 797.90 | Previous response | 797.88 | *% change     | 0.0% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds. No adjustments made.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

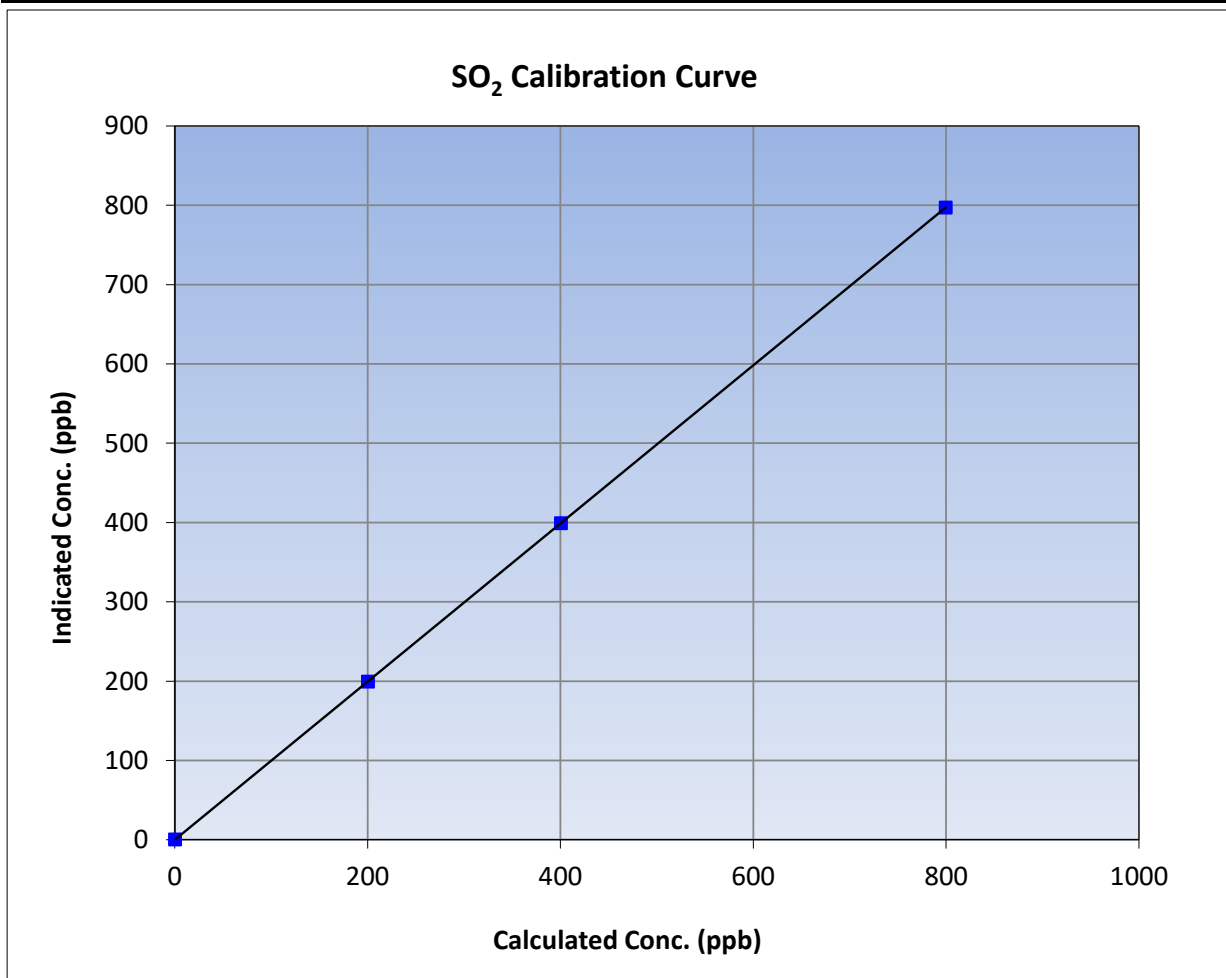
Version-01-2020

### Station Information

|                   |                  |                       |                 |
|-------------------|------------------|-----------------------|-----------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 4, 2023 |
| Station Name:     | Fort Hills       | Station Number:       | AMS23           |
| Start Time (MST): | 10:42            | End Time (MST):       | 13:41           |
| Analyzer make:    | Thermo 43i       | Analyzer serial #:    | 1160290012      |

### Calibration Data

| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999999      |             |
| 799.1                                  | 796.8                                 | 1.0029                       |                         |               | ≥0.995      |
| 400.1                                  | 398.9                                 | 1.0029                       | Slope                   | 0.997162      |             |
| 200.0                                  | 198.9                                 | 1.0057                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -0.103174     | +/-30       |

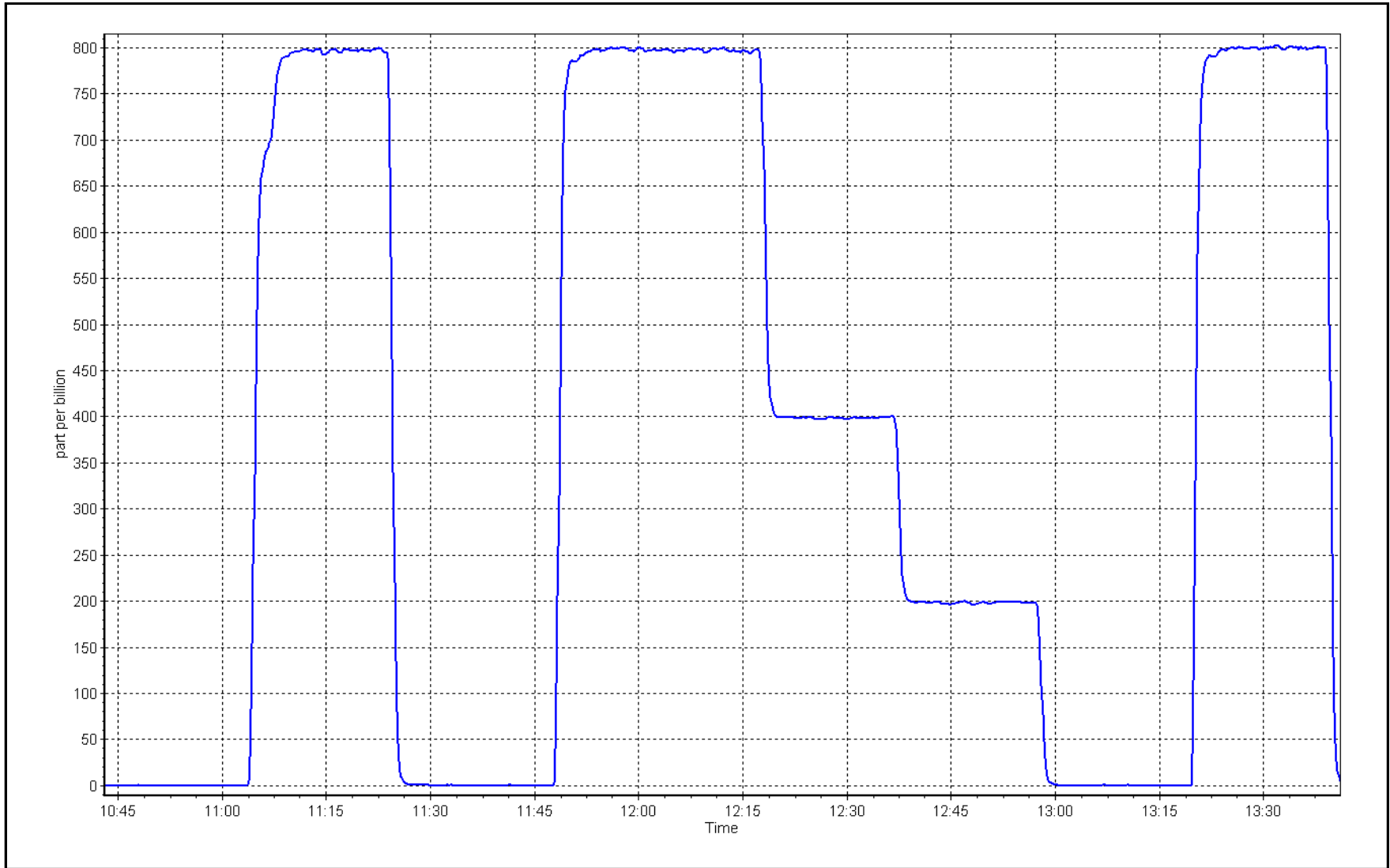




SO2 Calibration Plot

Date: February 1, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Fort Hills Station number: AMS23  
 Calibration Date: February 13, 2023 Last Cal Date: January 10, 2023  
 Start time (MST): 10:36 End time (MST): 14:30  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.20 ppm Cal Gas Exp Date: February 5, 2024  
 Cal Gas Cylinder #: CC517372  
 Removed Cal Gas Conc: 5.20 ppm Rem Gas Exp Date: N/A  
 Removed Gas Cyl #: N/A Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 451  
 ZAG Make/Model: API T701 Serial Number: 5611

### Analyzer Information

Analyzer make: Thermo 43iQ TLE Analyzer serial #: 12113311965  
 Converter make: CDN-101 Converter serial #: 594  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 0.988739     | 0.998176      | Backgd or Offset: | 0.96         | 0.96          |
| Calibration intercept: | 0.581876     | -0.098303     | Coeff or Slope:   | 0.714        | 0.714         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4923                          | 77.0                        | 80.0                                | 79.6                               | 1.006  |
| as found 2nd point    | 4962                          | 38.5                        | 40.0                                | 39.6                               | 1.013  |
| as found 3rd point    | 4981                          | 19.2                        | 19.9                                | 20.1                               | 0.997  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point          | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point         | 4923                          | 77.0                        | 80.0                                | 79.8                               | 1.003   |
| second point       | 4962                          | 38.5                        | 40.0                                | 39.9                               | 1.002   |
| third point        | 4981                          | 19.2                        | 19.9                                | 19.5                               | 1.023   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span       | 4923                          | 77.0                        | 80.0                                | 80.1                               | 0.999   |
| SO2 Scrubber Check | 4922                          | 78.3                        | 783.0                               | 0.0                                | ----  |

|   |                 |       |
|---|-----------------|-------|
| Date of last scrubber change:           | Ave Corr Factor | 1.009 |
| Date of last converter efficiency test: | efficiency      |       |

Baseline Corr As found: 79.5 Prev response: 79.68 \*% change: -0.2%  
 Baseline Corr 2nd AF pt: 39.5 AF Slope: 0.992599 AF Intercept: 0.121822  
 Baseline Corr 3rd AF pt: 20.0 AF Correlation: 0.999975

\* = > +/-5% change initiates investigation

Notes: Changed the inlet filter after as founds, ran a SO2 scrubber check after calibrator zero. No adjustments made. There are random spikes that are occurring, suspecting a problem with the calibrator, the dilution reading goes up during the spikes.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## TRS Calibration Summary

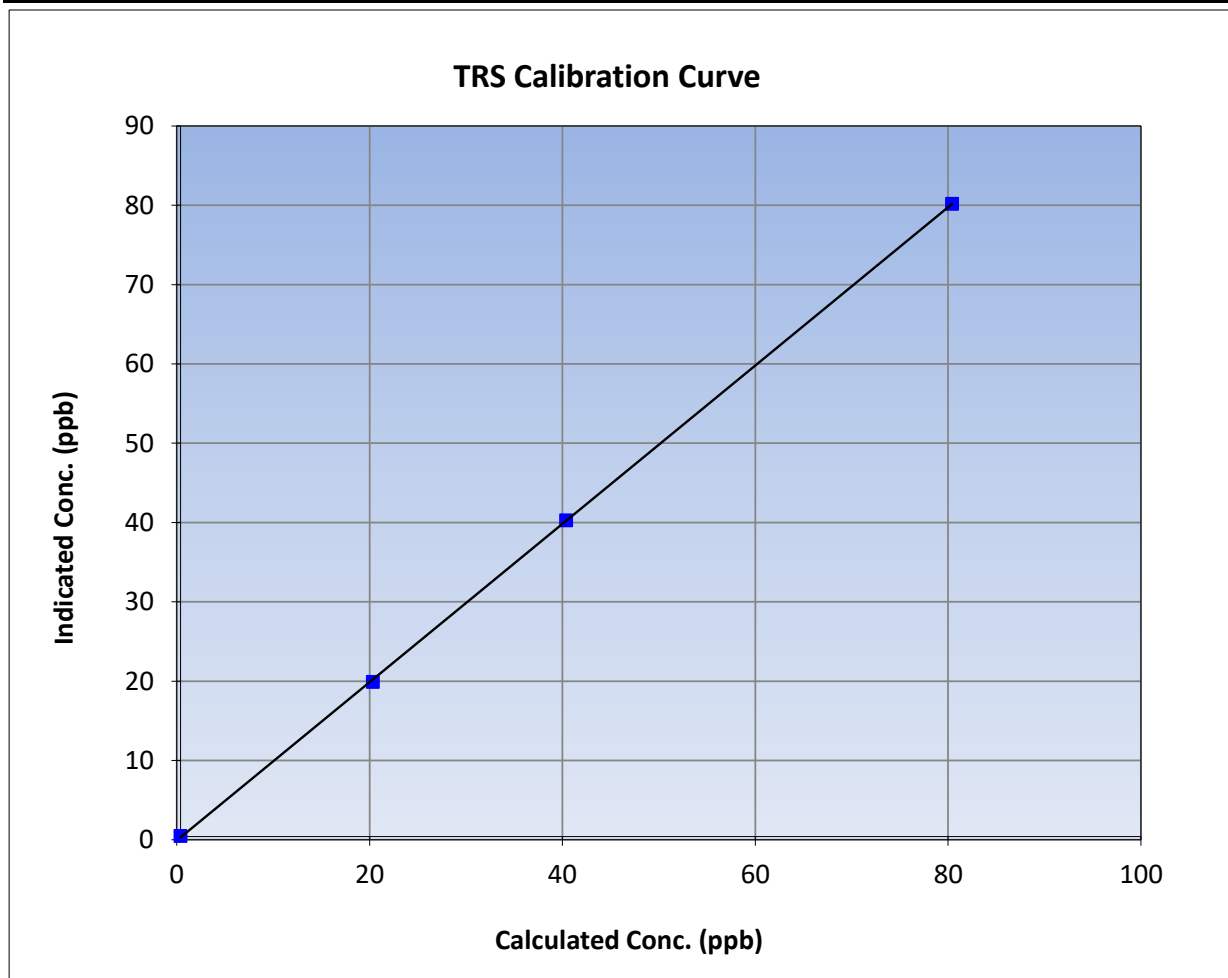
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23            |
| Start Time (MST): | 10:36             | End Time (MST):       | 14:30            |
| Analyzer make:    | Thermo 43iQ TLE   | Analyzer serial #:    | 12113311965      |

### Calibration Data

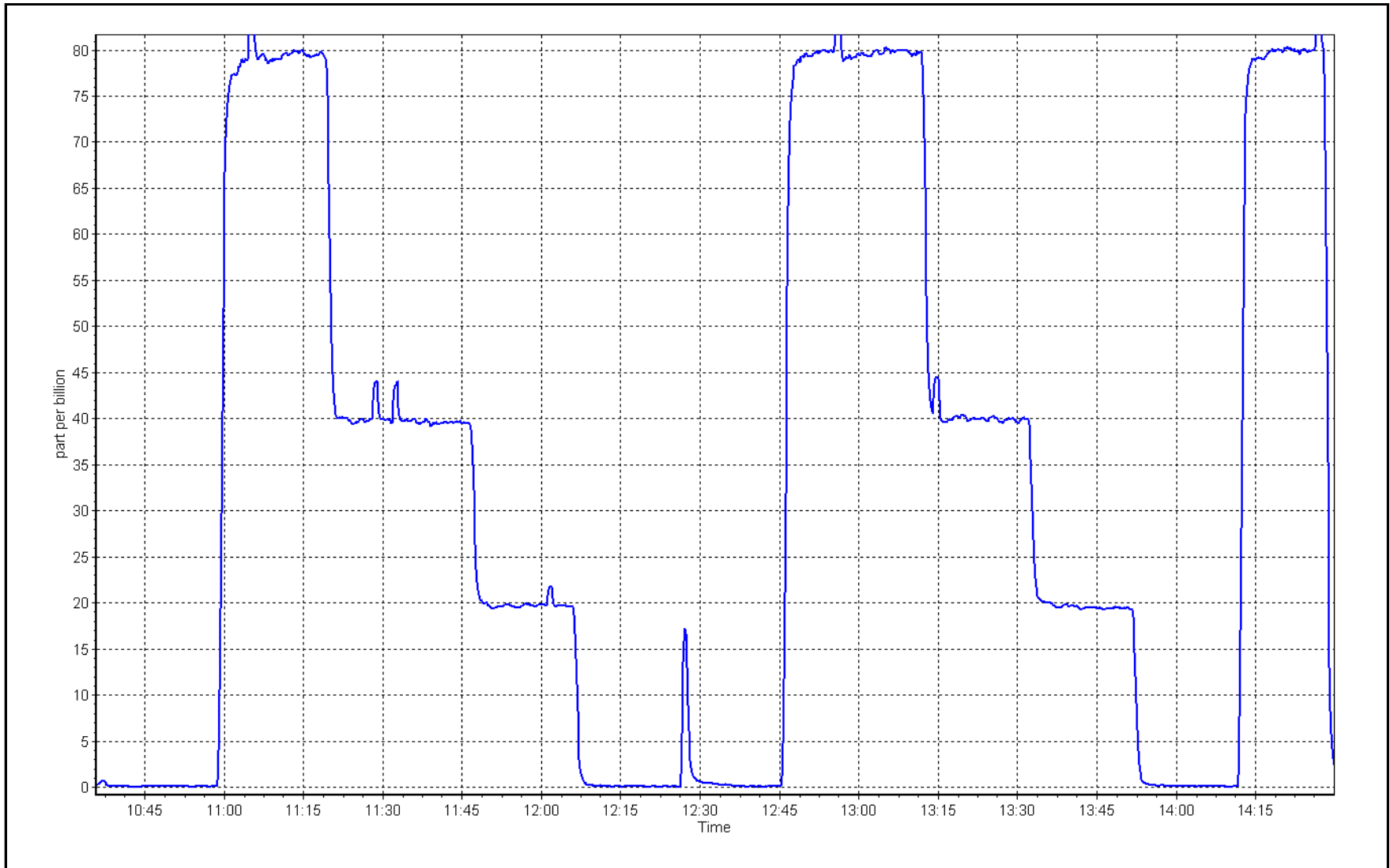
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999959  |             |
| 80.0                                | 79.8                               | 1.0025                    |                         |           | ≥0.995      |
| 40.0                                | 39.9                               | 1.0024                    | Slope                   | 0.998176  |             |
| 19.9                                | 19.5                               | 1.0230                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.098303 | +/-3        |



TRS Calibration Plot

Date: February 13, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

Station Name: Fort Hills Station number: AMS23  
 Calibration Date: February 14, 2023 Last Cal Date: February 13, 2023  
 Start time (MST): 13:00 End time (MST): 16:23  
 Reason: Maintenance

### Calibration Standards

Cal Gas Concentration: 5.20 ppm Cal Gas Exp Date: February 5, 2024  
 Cal Gas Cylinder #: CC517372  
 Removed Cal Gas Conc: 5.20 ppm Rem Gas Exp Date: N/A  
 Removed Gas Cyl #: N/A Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 451  
 ZAG Make/Model: API T701 Serial Number: 5611

### Analyzer Information

Analyzer make: Thermo 43iQ TLE Analyzer serial #: 12113311965  
 Converter make: CDN-101 Converter serial #: 594  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.998176     | 1.004890      | Backgd or Offset: 0.96 | 0.96          |
| Calibration intercept: | -0.098303    | -0.158196     | Coeff or Slope: 0.714  | 0.714         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4923                          | 77.0                        | 80.0                                | 80.3                               | 0.999  |
| as found 2nd point    | 4962                          | 38.5                        | 40.0                                | 40.0                               | 1.005  |
| as found 3rd point    | 4981                          | 19.2                        | 19.9                                | 19.6                               | 1.028  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point          | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point         | 4923                          | 77.0                        | 80.0                                | 80.3                               | 0.996   |
| second point       | 4962                          | 38.5                        | 40.0                                | 40.1                               | 0.997   |
| third point        | 4981                          | 19.2                        | 19.9                                | 19.5                               | 1.023   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span       | 4923                          | 77.0                        | 80.0                                | 80.0                               | 1.000   |
| SO2 Scrubber Check | 4922                          | 78.3                        | 783.0                               | 0.0                                | ----  |

|   |                 |       |
|---|-----------------|-------|
| Date of last scrubber change:           | Ave Corr Factor | 1.006 |
| Date of last converter efficiency test: | efficiency      |       |

Baseline Corr As found: 80.1 Prev response: 79.76 \*% change: 0.4%  
 Baseline Corr 2nd AF pt: 39.8 AF Slope: 1.003318 AF Intercept: -0.078208  
 Baseline Corr 3rd AF pt: 19.4 AF Correlation: 0.999942

\* = > +/-5% change initiates investigation

Notes: Internal pump randomly drops in flow, turned off the internal pump and hooked up an external pump after multipoint as founds. No adjustments made. More spikes detected on the third point, will monitor the instrument.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## TRS Calibration Summary

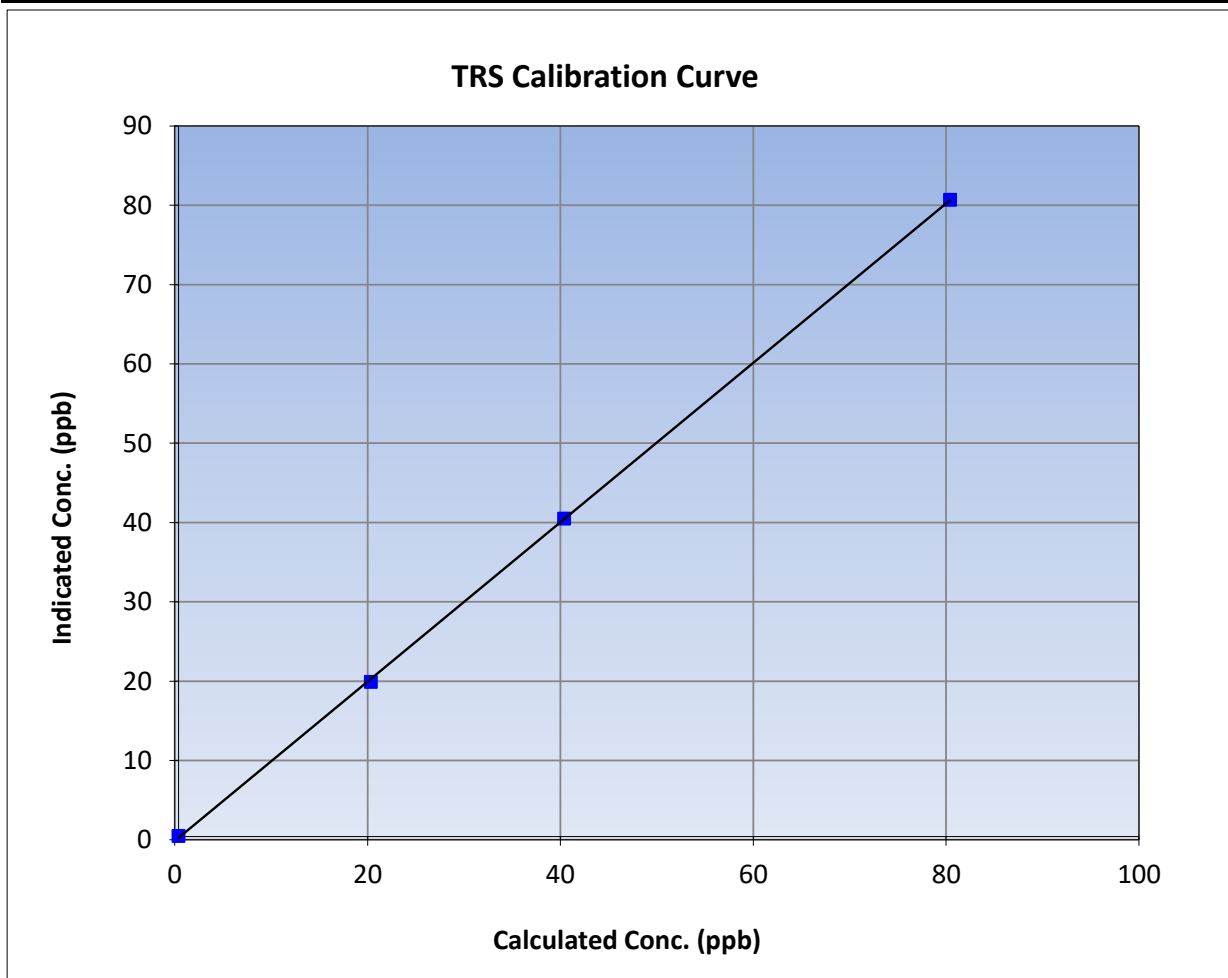
Version-11-2021

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | February 13, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23             |
| Start Time (MST): | 13:00             | End Time (MST):       | 16:23             |
| Analyzer make:    | Thermo 43iQ TLE   | Analyzer serial #:    | 12113311965       |

### Calibration Data

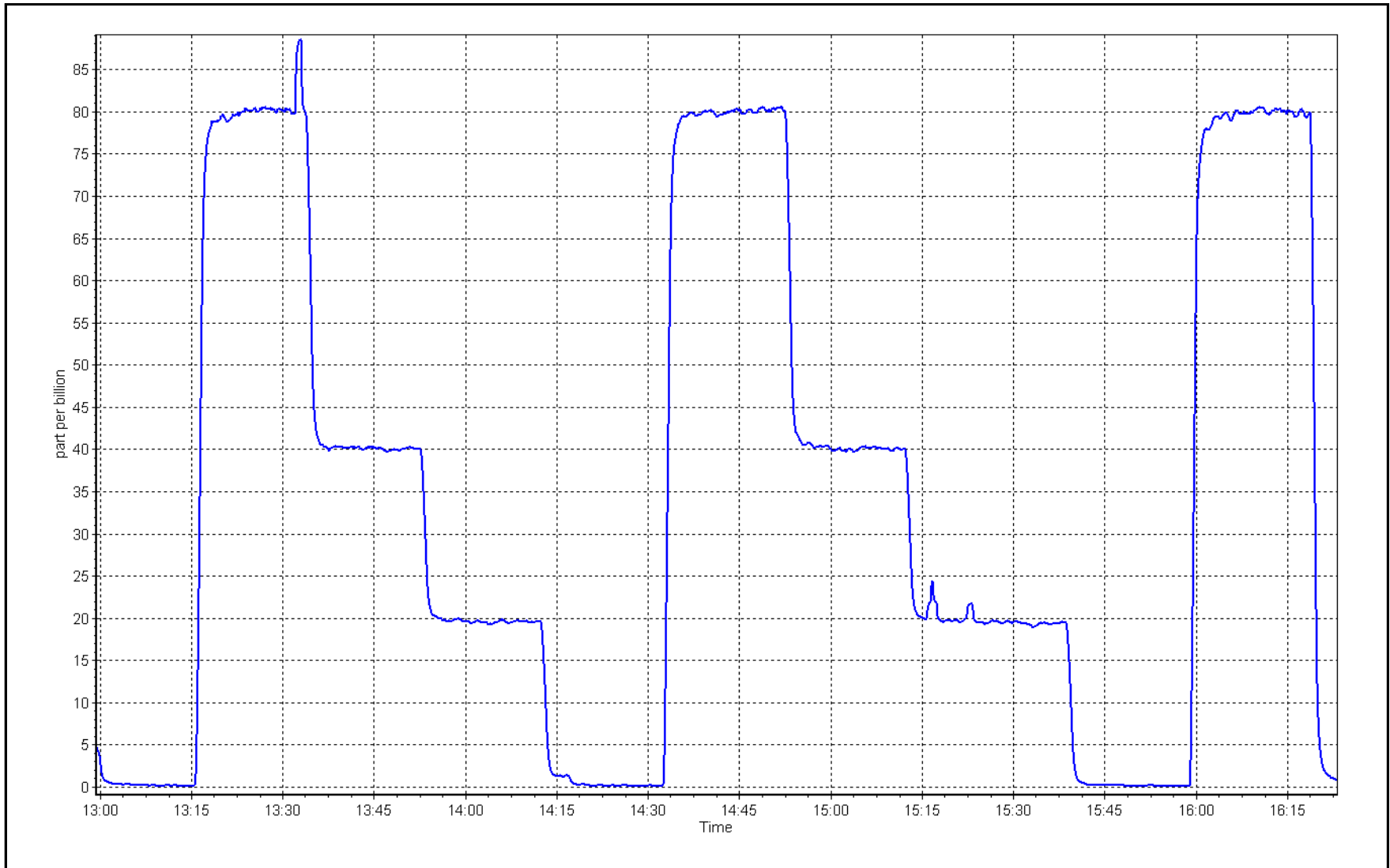
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995      |
| 80.0                                | 80.3                               | 0.9963                    |                         |             |
| 40.0                                | 40.1                               | 0.9974                    | Slope                   | 0.90 - 1.10 |
| 19.9                                | 19.5                               | 1.0230                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-3        |



TRS Calibration Plot

Date: February 14, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                  |                 |                  |
|-------------------|------------------|-----------------|------------------|
| Station Name:     | Fort Hills       | Station number: | AMS23            |
| Calibration Date: | February 1, 2023 | Last Cal Date:  | January 18, 2023 |
| Start time (MST): | 10:42            | End time (MST): | 13:41            |
| Reason:           | Routine          |                 |                  |

### Calibration Standards

|   |           |                             |                 |
|---|-----------|-----------------------------|-----------------|
| Gas Cert Reference:                         | CC281425  | Cal Gas Expiry Date:        | January 5, 2025 |
| CH <sub>4</sub> Cal Gas Conc.               | 500.2 ppm | CH <sub>4</sub> Equiv Conc. | 1070.6 ppm      |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 207.4 ppm |                             |                 |
| Removed Gas Cert:                           | N/A       | Removed Gas Expiry:         | N/A             |
| Removed CH <sub>4</sub> Conc.               | 500.2 ppm | CH <sub>4</sub> Equiv Conc. | 1070.6 ppm      |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 207.4 ppm | Diff between cyl (THC):     |                 |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                 |
| Calibrator Model:                           | API T700  | Serial Number:              | 451             |
| ZAG make/model:                             | API T701  | Serial Number:              | 5611            |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1193585648 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 2.33E-04     | 2.28E-04      | NMHC SP Ratio:  | 5.01E-05      |
| CH <sub>4</sub> Retention time: | 13.0         | 13.0          | NMHC Peak Area: | 180258        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4920              | 80.3                 | 17.19                | 17.65               | 0.974                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4920              | 80.3                 | 17.19                | 17.29               | 0.995                      |
| second point          | 4960              | 40.2                 | 8.61                 | 8.60                | 1.000                      |
| third point           | 4980              | 20.1                 | 4.30                 | 4.32                | 0.996                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4920              | 80.3                 | 17.19                | 17.33               | 0.992                      |

| Average Correction Factor |       |                 |       | 0.997                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.65 | Prev response   | 17.18 | *% change 2.7%                             |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 9.16                 | 9.36                                       | 0.979                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 9.16                 | 9.20                                       | 0.996                      |
| second point              | 4960              | 40.2                 | 4.59                 | 4.62                                       | 0.993                      |
| third point               | 4980              | 20.1                 | 2.29                 | 2.34                                       | 0.980                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 9.16                 | 9.18                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 0.990                      |
| Baseline Corr AF:         | 9.36              | Prev response        | 9.15                 | *% change                                  | 2.2%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4920              | 80.3                 | 8.03                 | 8.29                                       | 0.969                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4920              | 80.3                 | 8.03                 | 8.08                                       | 0.994                      |
| second point              | 4960              | 40.2                 | 4.02                 | 3.99                                       | 1.009                      |
| third point               | 4980              | 20.1                 | 2.01                 | 1.98                                       | 1.015                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4920              | 80.3                 | 8.03                 | 8.14                                       | 0.987                      |
| Average Correction Factor |                   |                      |                      |  | 1.006                      |
| Baseline Corr AF:         | 8.29              | Prev response        | 8.03                 | *% change                                  | 3.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 0.998822     | 1.005188      |
| THC Cal Offset:             | 0.006016     | -0.012392     |
| CH <sub>4</sub> Cal Slope:  | 1.001922     | 1.007325      |
| CH <sub>4</sub> Cal Offset: | -0.016245    | -0.029242     |
| NMHC Cal Slope:             | 0.996115     | 1.003089      |
| NMHC Cal Offset:            | 0.022460     | 0.017251      |

Notes: Changed the inlet filter after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## THC Calibration Summary

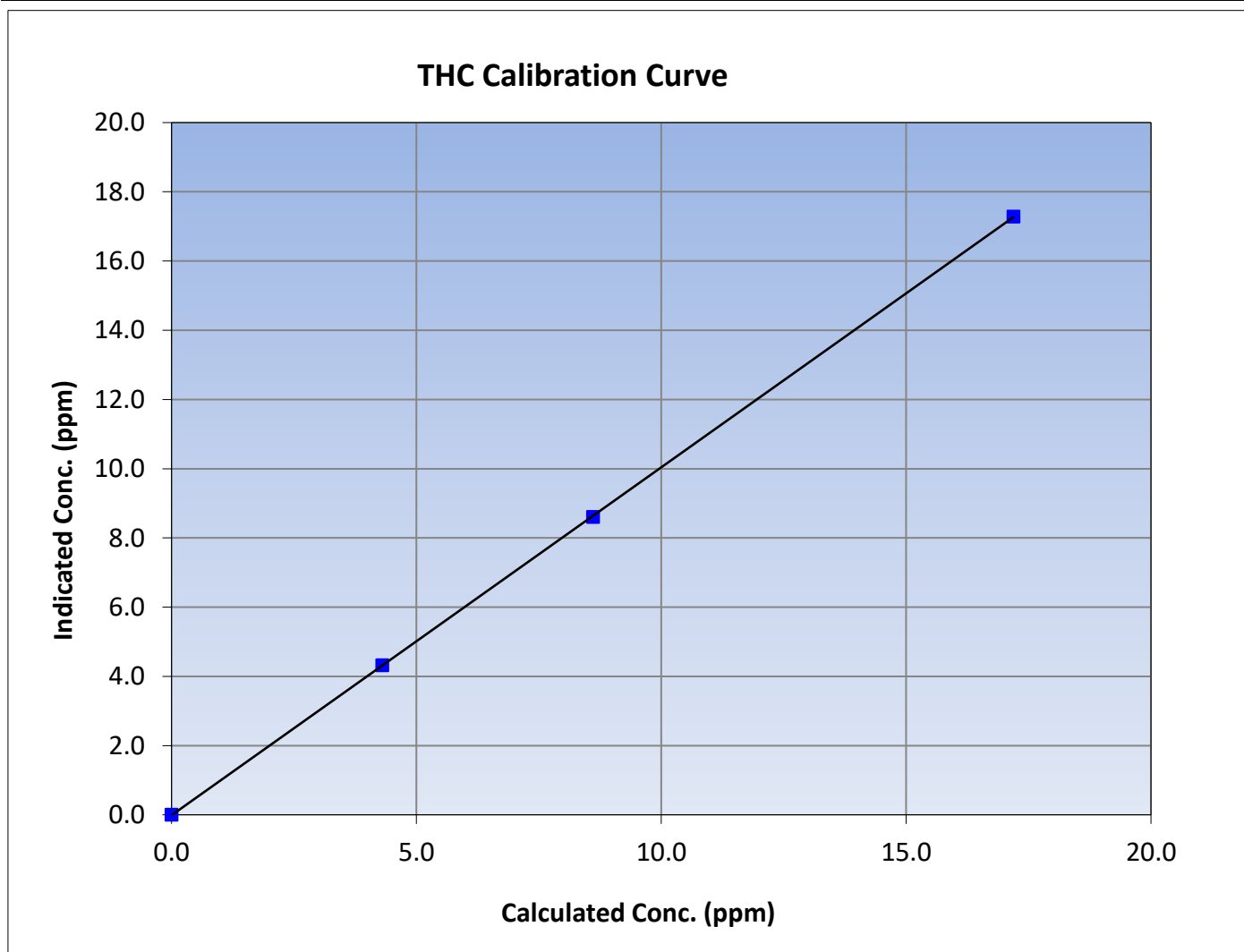
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Fort Hills       | Station Number:       | AMS23            |
| Start Time (MST): | 10:42            | End Time (MST):       | 13:41            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1193585648       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999989  | $\geq 0.995$  |       |          |             |
| 17.19                               | 17.29                              | 0.9946                    |                         |           |               |       |          |             |
| 8.61                                | 8.60                               | 1.0005                    |                         |           |               | Slope | 1.005188 | 0.90 - 1.10 |
| 4.30                                | 4.32                               | 0.9960                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.012392 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

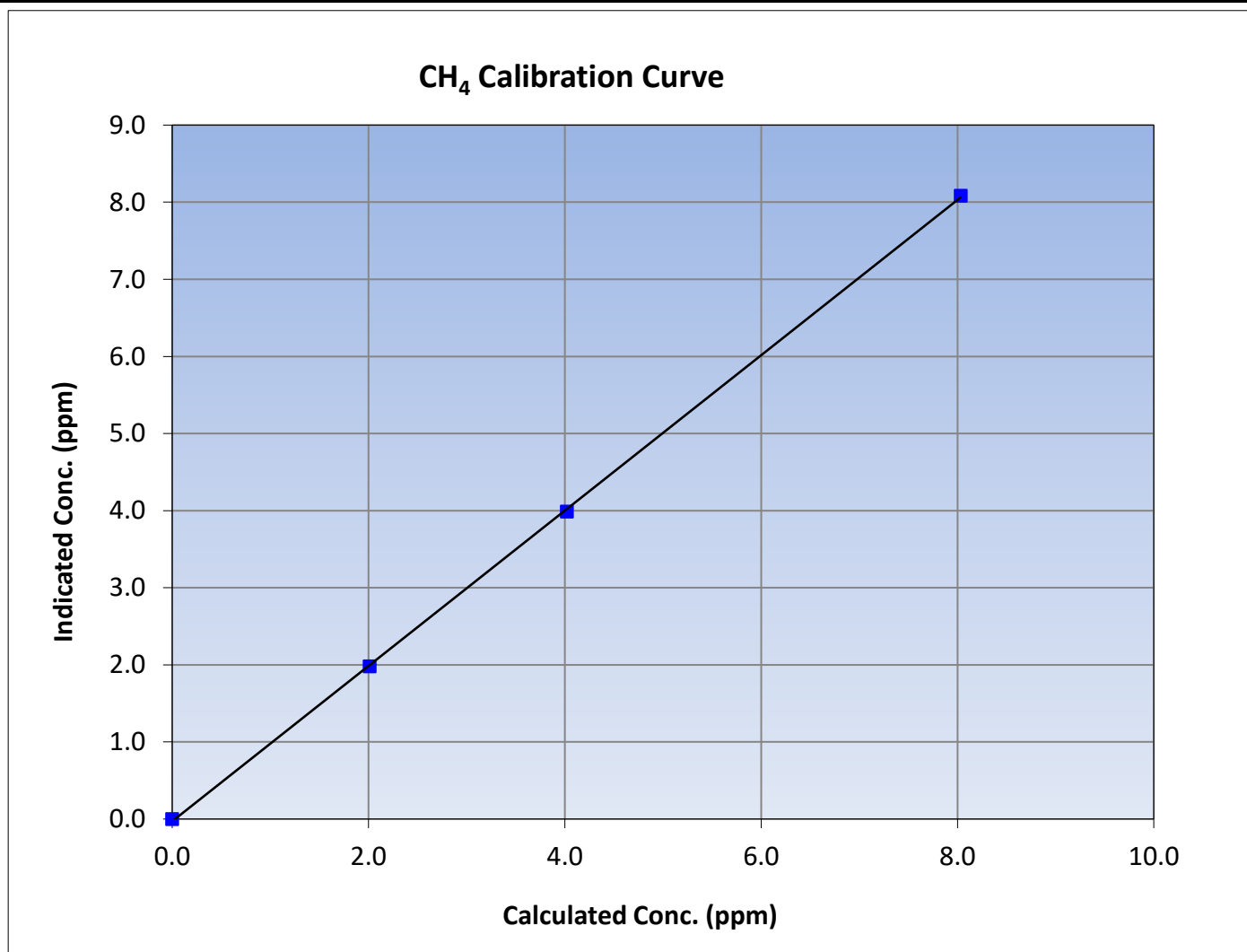
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Fort Hills       | Station Number:       | AMS23            |
| Start Time (MST): | 10:42            | End Time (MST):       | 13:41            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1193585648       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999921  | $\geq 0.995$  |
| 8.03                                | 8.08                               | 0.9937                    |                         |           |               |
| 4.02                                | 3.99                               | 1.0089                    |                         |           |               |
| 2.01                                | 1.98                               | 1.0150                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.007325  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.029242 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

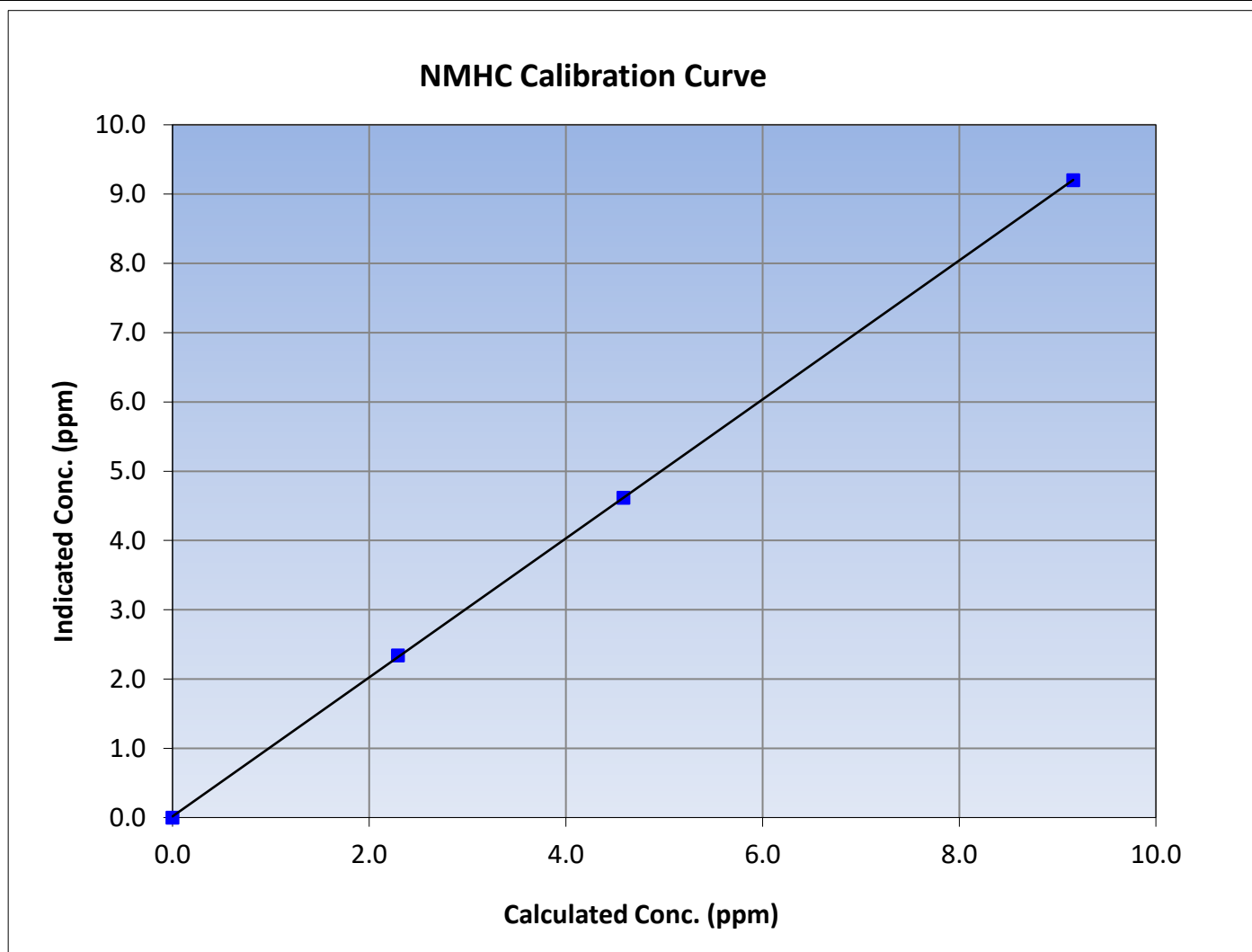
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Fort Hills       | Station Number:       | AMS23            |
| Start Time (MST): | 10:42            | End Time (MST):       | 13:41            |
| Analyzer make:    | Thermo 55i       | Analyzer serial #:    | 1193585648       |

### Calibration Data

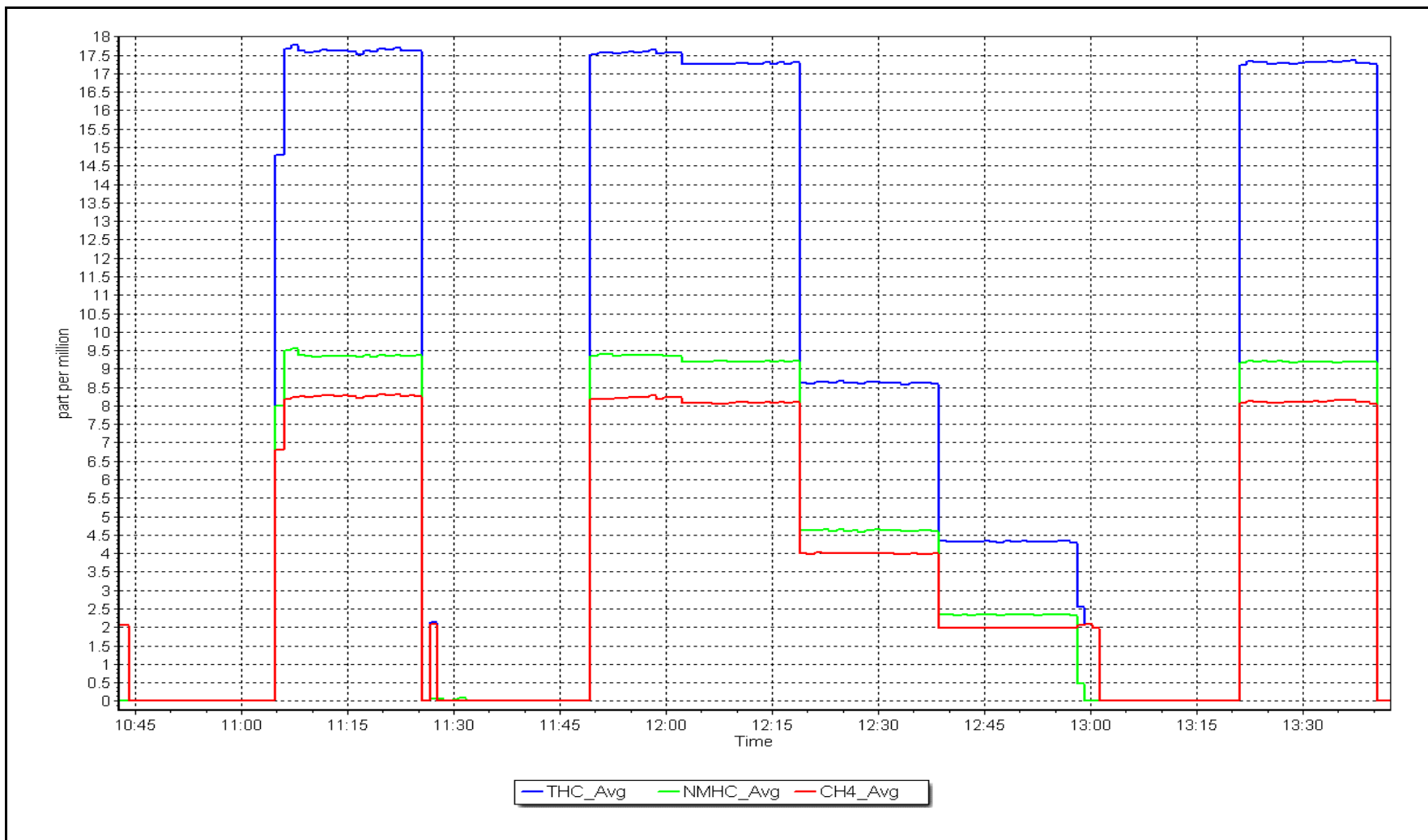
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999981 | $\geq 0.995$  |       |          |             |
| 9.16                                | 9.20                               | 0.9957                    |                         |          |               |       |          |             |
| 4.59                                | 4.62                               | 0.9932                    |                         |          |               | Slope | 1.003089 | 0.90 - 1.10 |
| 2.29                                | 2.34                               | 0.9798                    |                         |          |               |       |          |             |
|                                     |                                    |                           | Intercept               | 0.017251 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 1, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort Hills  
Calibration Date: February 17, 2023  
Start time (MST): 10:01  
Reason: Routine  
Station number: AMS23  
Last Cal Date: January 24, 2023  
End time (MST): 14:49

### Calibration Standards

NO Gas Cylinder #: CC332703  
NOX Cal Gas Conc: 49.7 ppm  
Removed Cylinder #: N/A  
Removed Gas NOX Conc: 49.7 ppm  
NOX gas Diff:  
Calibrator Model: Teledyne API T750  
ZAG make/model: Teledyne API T751H  
Cal Gas Expiry Date: January 28, 2024  
NO Cal Gas Conc: 49.7 ppm  
Removed Gas Exp Date: N/A  
Removed Gas NO Conc: 49.7 ppm  
NO gas Diff:  
Serial Number: 275  
Serial Number: 307

### Analyzer Information

Analyzer make: Thermo 42i  
NOX Range (ppb): 0 - 1000 ppb  
Analyzer serial #: 1152430007

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.527        | 1.565         | NO bkgnd or offset:  | 4.3          | 4.4           |
| NOX coeff or slope: | 0.997        | 0.997         | NOX bkgnd or offset: | 4.7          | 4.8           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 225.4        | 230.3         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.999637     | 1.000236      |
| NO <sub>x</sub> Cal Offset: | 0.644160     | 0.184305      |
| NO Cal Slope:               | 0.999282     | 0.999895      |
| NO Cal Offset:              | -0.256715    | -0.496226     |
| NO <sub>2</sub> Cal Slope:  | 1.001046     | 0.995394      |
| NO <sub>2</sub> Cal Offset: | 0.284247     | -0.512082     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | 0.0                                   | -0.3   | ----  | ----   |
| as found span             | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 781.1  | 777.7                                 | 3.4  | 1.024   | 1.029  |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | 0.0                                   | -0.3   | ----  | ----   |
| high point                | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 799.9  | 799.4                                 | 0.5  | 1.000   | 1.001  |
| second point              | 4960                      | 40.2                        | 399.6   | 399.6                                  | 0.0   | 401.3  | 400.1                                 | 1.2  | 0.996   | 0.999  |
| third point               | 4980                      | 20.1                        | 199.8   | 199.8                                  | 0.0   | 199.7  | 197.9                                 | 1.8  | 1.000   | 1.010  |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.5   | -0.2                                  | -0.3   | ----  | ----   |
| as left span              | 4920                      | 80.5                        | 800.2   | 435.3                                  | 364.9   | 799.7  | 435.1                                 | 364.5  | 1.001   | 1.000  |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.999   | 1.003  |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 781.4 ppb | NO = 777.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -2.4% |
| Previous Response    | NO <sub>x</sub> = 800.5 ppb | NO = 799.3 ppb |  | *Percent Change                  | NO = -2.8%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 798.3                                      | 433.4                                 | 364.9   | 362.7  | 1.006  | 99.4%  |
| 2nd GPT point (200 ppb O3)       | 798.3                                      | 616.5                                 | 181.8   | 180.7  | 1.006  | 99.4%  |
| 3rd GPT point (100 ppb O3)       | 798.3                                      | 704.2                                 | 94.1  | 92.7   | 1.015  | 98.5%  |
| Average Correction Factor        |  |                                       |   |  | 1.009  | 99.1%  |

Notes: Changed the inlet filter after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

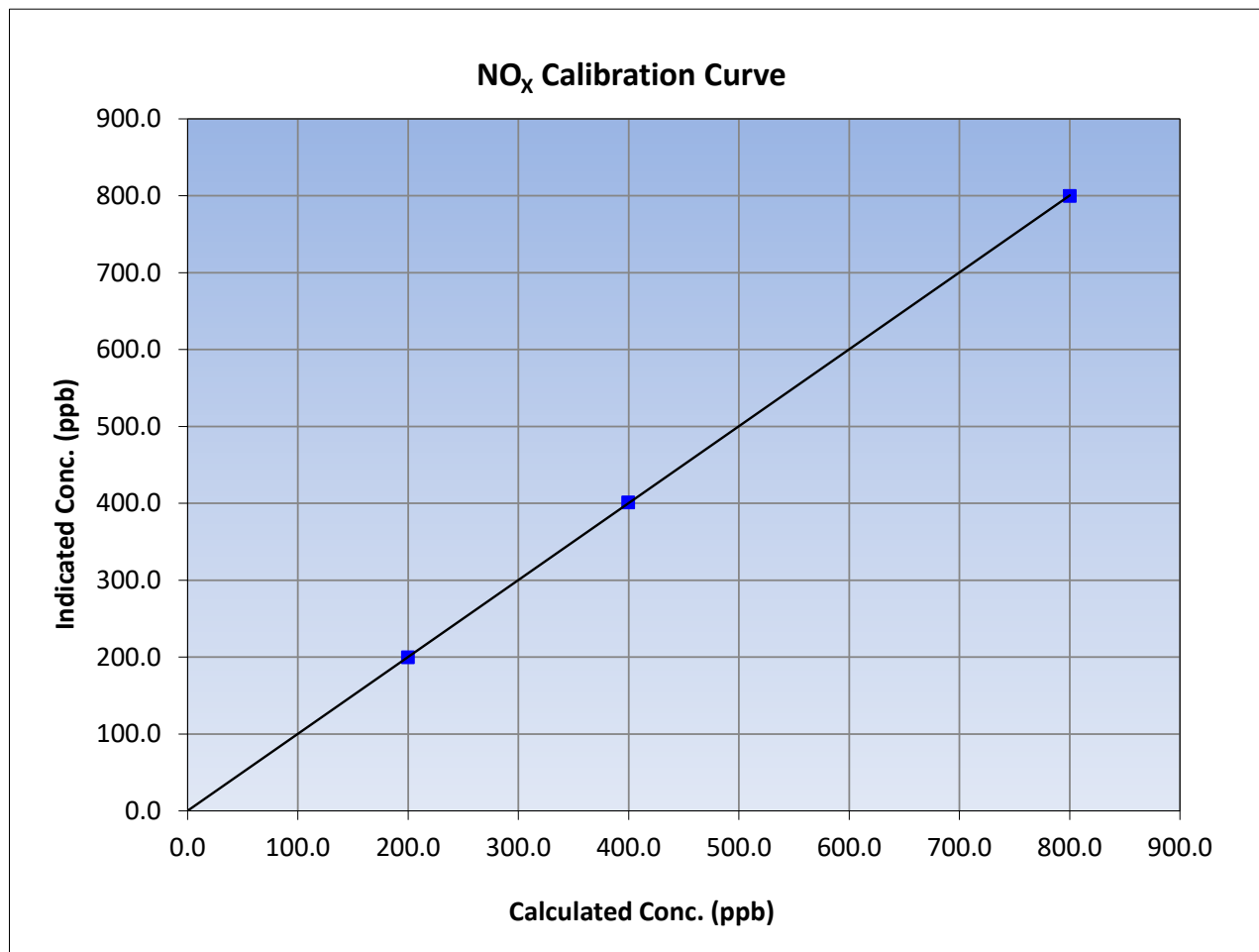
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23            |
| Start Time (MST): | 10:01             | End Time (MST):       | 14:49            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.3                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.2                               | 799.9                              | 1.0003                    |   |                                |
| 399.6                               | 401.3                              | 0.9957                    |   |                                |
| 199.8                               | 199.7                              | 1.0005                    |   |                                |
|                                     |                                    |                           |   |                                |







# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

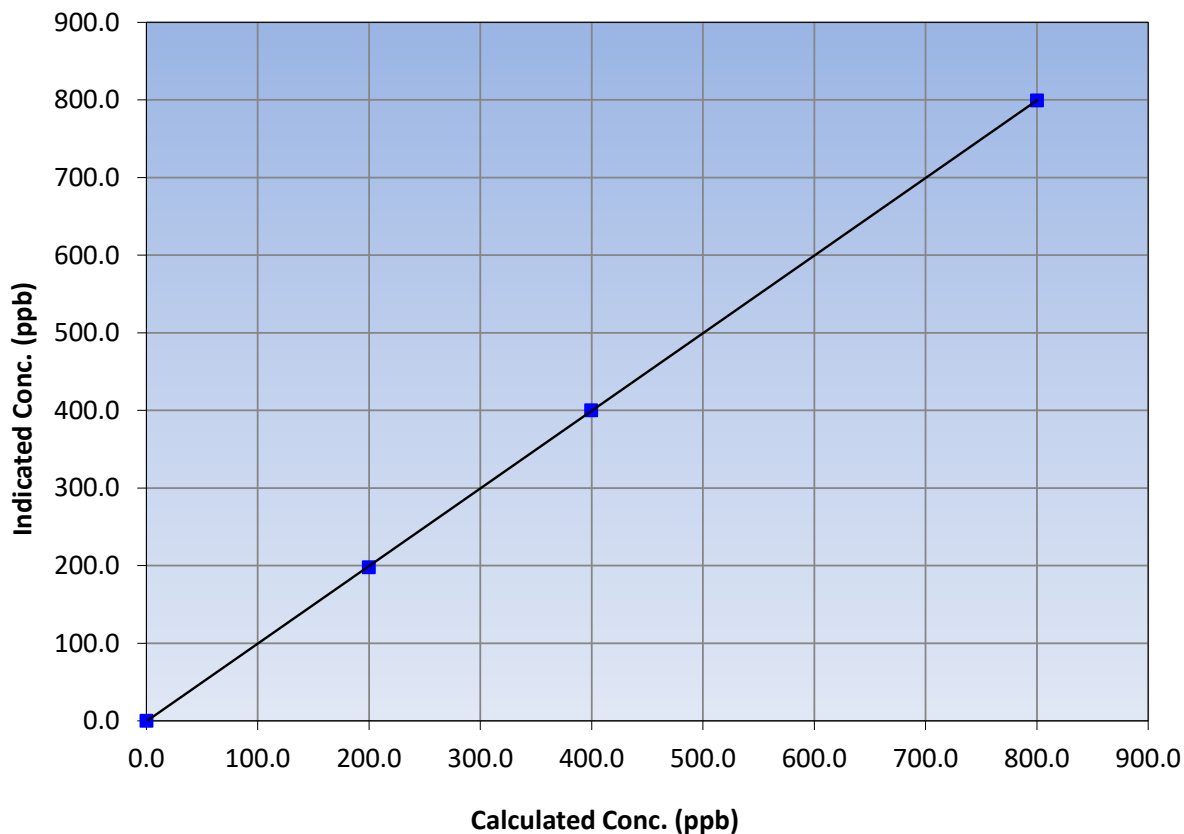
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23            |
| Start Time (MST): | 10:01             | End Time (MST):       | 14:49            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.2                               | 799.4                              | 1.0010                    |   |                                |
| 399.6                               | 400.1                              | 0.9987                    |   |                                |
| 199.8                               | 197.9                              | 1.0096                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

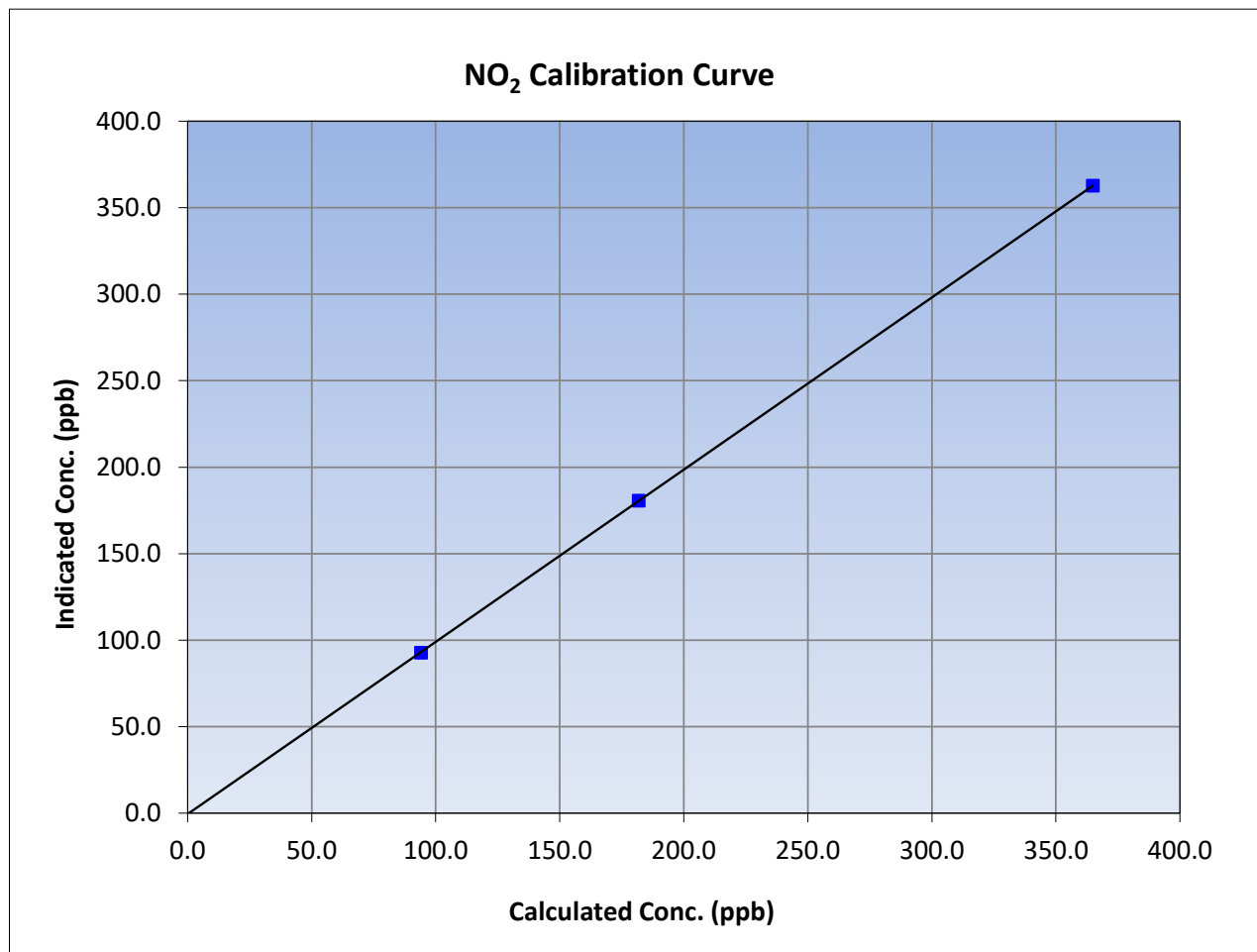
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 17, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23            |
| Start Time (MST): | 10:01             | End Time (MST):       | 14:49            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007       |

### Calibration Data

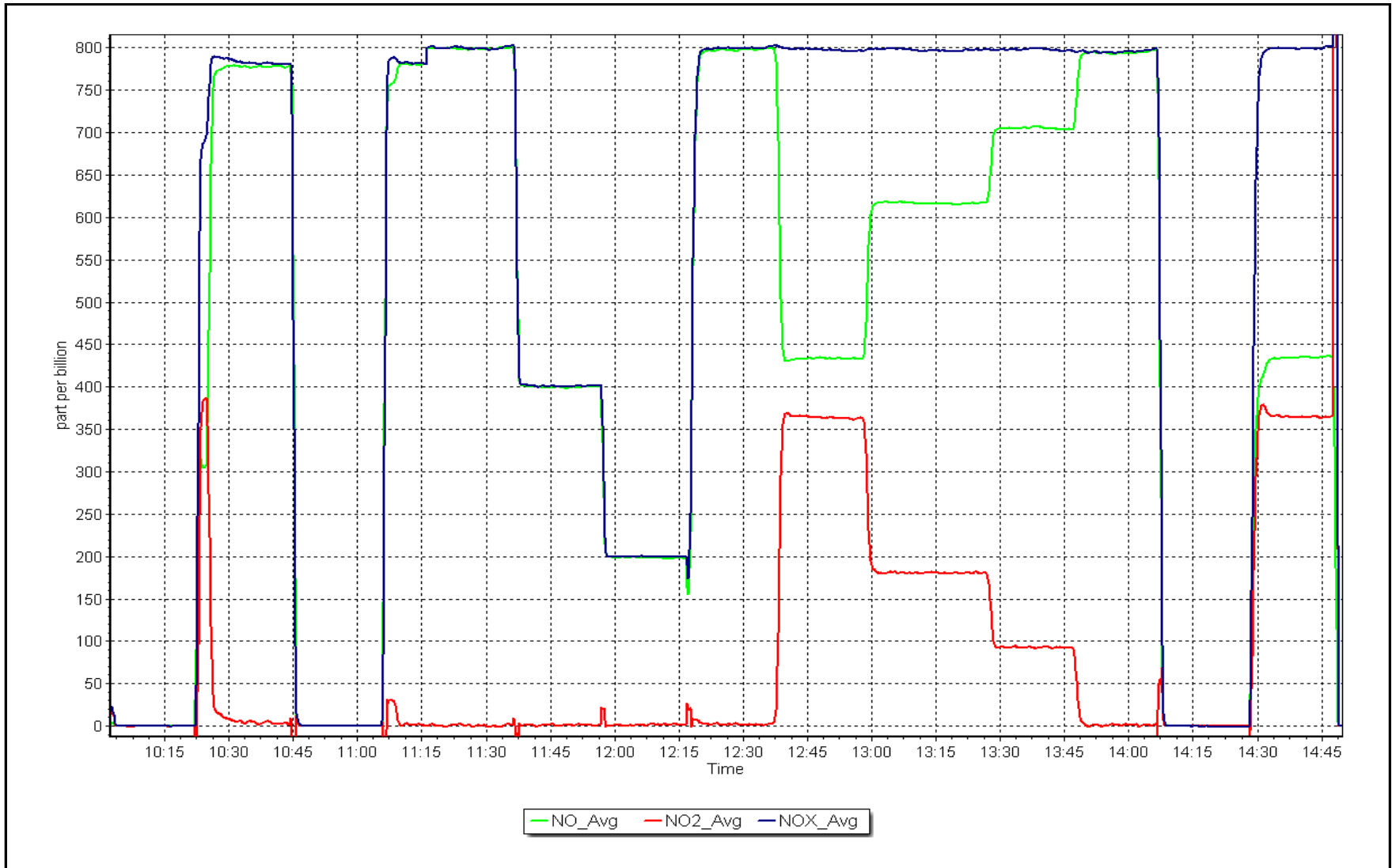
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.3                               | ----                      | Correlation Coefficient | 0.999996  | ≥0.995      |
| 364.9                               | 362.7                              | 1.0061                    |                         |           |             |
| 181.8                               | 180.7                              | 1.0061                    |                         |           |             |
| 94.1                                | 92.7                               | 1.0151                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.995394  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.512082 | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: February 17, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Fort Hills Station number: AMS23  
Calibration Date: February 23, 2023 Last Cal Date: February 17, 2023  
Start time (MST): 10:56 End time (MST): 17:40  
Reason: Maintenance Pump change

### Calibration Standards

NO Gas Cylinder #: CC332703 Cal Gas Expiry Date: January 28, 2024  
NOX Cal Gas Conc: 49.7 ppm NO Cal Gas Conc: 49.7 ppm  
Removed Cylinder #: N/A Removed Gas Exp Date: N/A  
Removed Gas NOX Conc: 49.7 ppm Removed Gas NO Conc: 49.7 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: Teledyne API T750 Serial Number: 275  
ZAG make/model: Teledyne API T751H Serial Number: 307

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 1152430007  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.565        | 1.815         | NO bkgnd or offset:  | 4.4          | 5.1           |
| NOX coeff or slope: | 0.997        | 0.996         | NOX bkgnd or offset: | 4.8          | 5.6           |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 266.6        | 266.3         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 1.000236     | 1.004364      |
| NO <sub>x</sub> Cal Offset: | 0.184305     | 0.065025      |
| NO Cal Slope:               | 0.999895     | 1.005722      |
| NO Cal Offset:              | -0.496226    | -0.434914     |
| NO <sub>2</sub> Cal Slope:  | 0.995394     | 0.999767      |
| NO <sub>2</sub> Cal Offset: | -0.512082    | -0.637319     |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | 0.0                                   | -0.2   | ----  | ----   |
| as found span             | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 699.4  | 697.6                                 | 1.8  | <b>1.144</b>  | <b>1.147</b>   |
| as found 2nd              | 4960                      | 40.2                        | 399.6   | 399.6                                  | 0.0   | 350.2  | 347.6                                 | 2.6  | 1.1410  | 1.1495   |
| as found 3rd              | 4980                      | 20.1                        | 199.8   | 199.8                                  | 0.0   | 174.3  | 172.2                                 | 2.2  | 1.1462  | 1.1602   |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.4   | -0.2                                  | -0.2   | ----  | ----   |
| high point                | 4920                      | 80.5                        | 800.2   | 800.2                                  | 0.0   | 803.2  | 804.0                                 | -0.9   | 0.996   | 0.995  |
| second point              | 4960                      | 40.2                        | 399.6   | 399.6                                  | 0.0   | 402.5  | 402.6                                 | -0.1   | 0.993   | 0.992  |
| third point               | 4980                      | 20.1                        | 199.8   | 199.8                                  | 0.0   | 200.6  | 199.4                                 | 1.2  | 0.996   | 1.002  |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.5   | -0.3                                  | -0.2   | ----  | ----   |
| as left span              | 4920                      | 80.5                        | 800.2   | 430.6                                  | 369.6   | 801.8  | 432.1                                 | 369.8  | 0.998   | 0.996  |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.995   | 0.997  |

|                      |                             |                |  |   |                              |                             |
|----------------------|-----------------------------|----------------|--|---|------------------------------|-----------------------------|
| Corrected As found   | NO <sub>x</sub> = 699.6 ppb | NO = 697.6 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |   | *Percent Change              | NO <sub>x</sub> = -14.4%    |
| Previous Response    | NO <sub>x</sub> = 800.5 ppb | NO = 799.6 ppb |  |   | *Percent Change              | NO = -14.6%                 |
| Baseline Corr 2nd pt | NO <sub>x</sub> = 350.4 ppb | NO = 347.6 ppb | As found   | NO <sub>x</sub> r <sup>2</sup> : 0.999997 | Nx SI: 0.874540              | Nx Int: -0.062              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = 174.5 ppb | NO = 172.2 ppb | As found   | NO r <sup>2</sup> : 0.999991              | NO SI: 0.872557              | NO Int: -0.943              |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : 1.000000 | NO <sub>2</sub> SI: 1.003430 | NO <sub>2</sub> Int: -0.200 |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             | ----                                       | ----                                  | 0.0   | -0.2   | ----   | ----   |
| as found GPT point (400 ppb NO <sub>2</sub> ) | 694.7                                      | 374.0                                 | 320.7   | 321.6  | 0.9972   | 100.3%   |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       | 800.5                                      | 430.9                                 | 369.6   | 369.0  | 1.002  | 99.8%  |
| 2nd GPT point (200 ppb O <sub>3</sub> )       | 800.5                                      | 617.0                                 | 183.5   | 182.9  | 1.003  | 99.7%  |
| 3rd GPT point (100 ppb O <sub>3</sub> )       | 800.5                                      | 706.4                                 | 94.1  | 92.8   | 1.014  | 98.6%  |
| Average Correction Factor                     |  |                                       |   |  | 1.006  | 99.4%  |

Notes: Daily span is 13% low and pump flow went down since yesterday. Swapped out the pump after multi-point as founds. Chamber pressure stayed the same with the new pump. There is possibly a leak somewhere inside the instrument. Adjusted the span only. Check Doctit for more info.

Calibration Performed By: Max Farrell



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

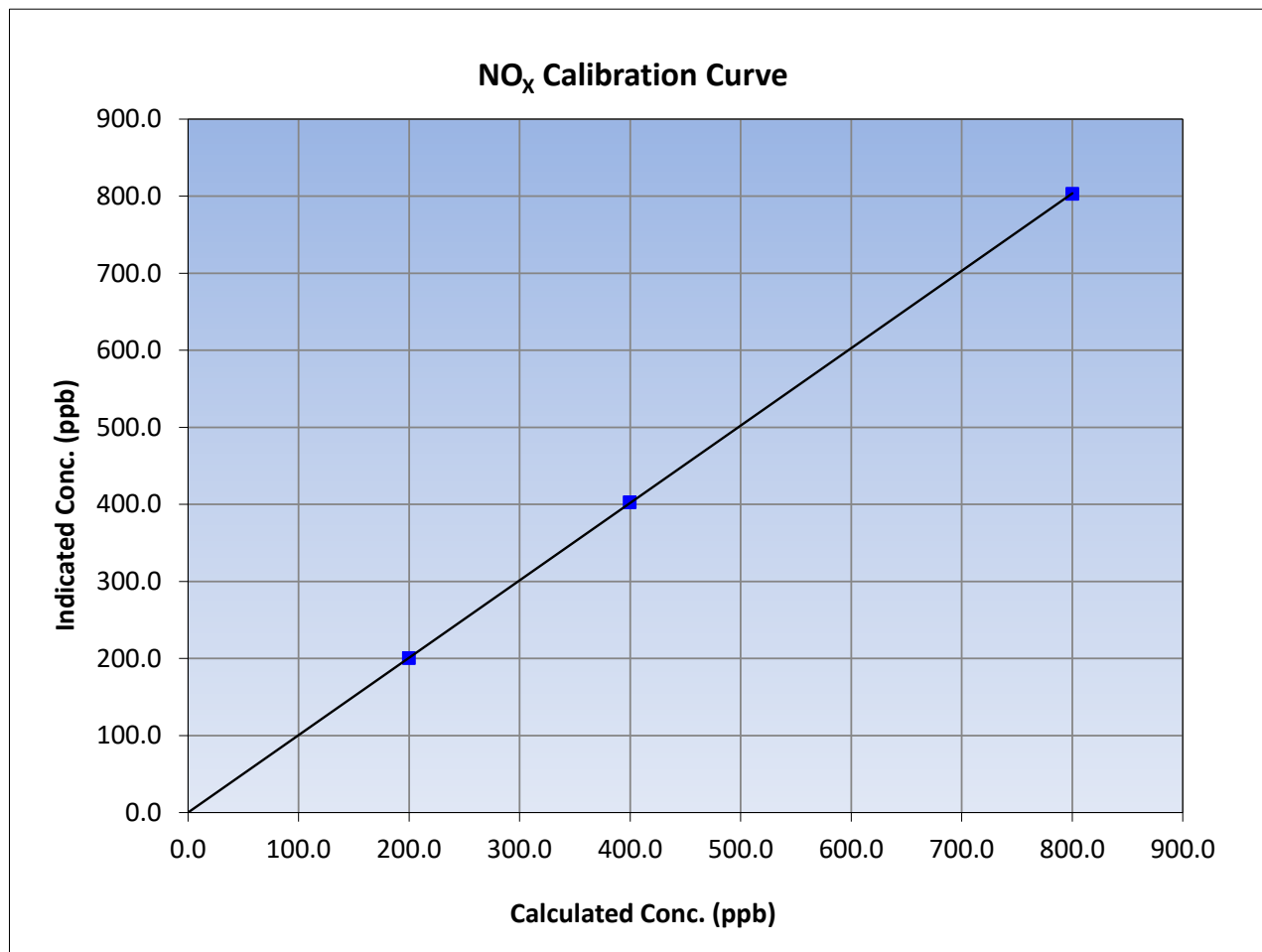
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23             |
| Start Time (MST): | 10:56             | End Time (MST):       | 17:40             |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |             |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|-------------|
| 0.0                                 | -0.4                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |             |
| 800.2                               | 803.2                              | 0.9962                    |   |                                |             |
| 399.6                               | 402.5                              | 0.9927                    |   |                                |             |
| 199.8                               | 200.6                              | 0.9960                    |   |                                |             |
|                                     |                                    |                           | Correlation Coefficient                       | 0.999995                       | ≥0.995      |
|                                     |                                    |                           | Slope   | 1.004364                       | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                                     | 0.065025                       | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

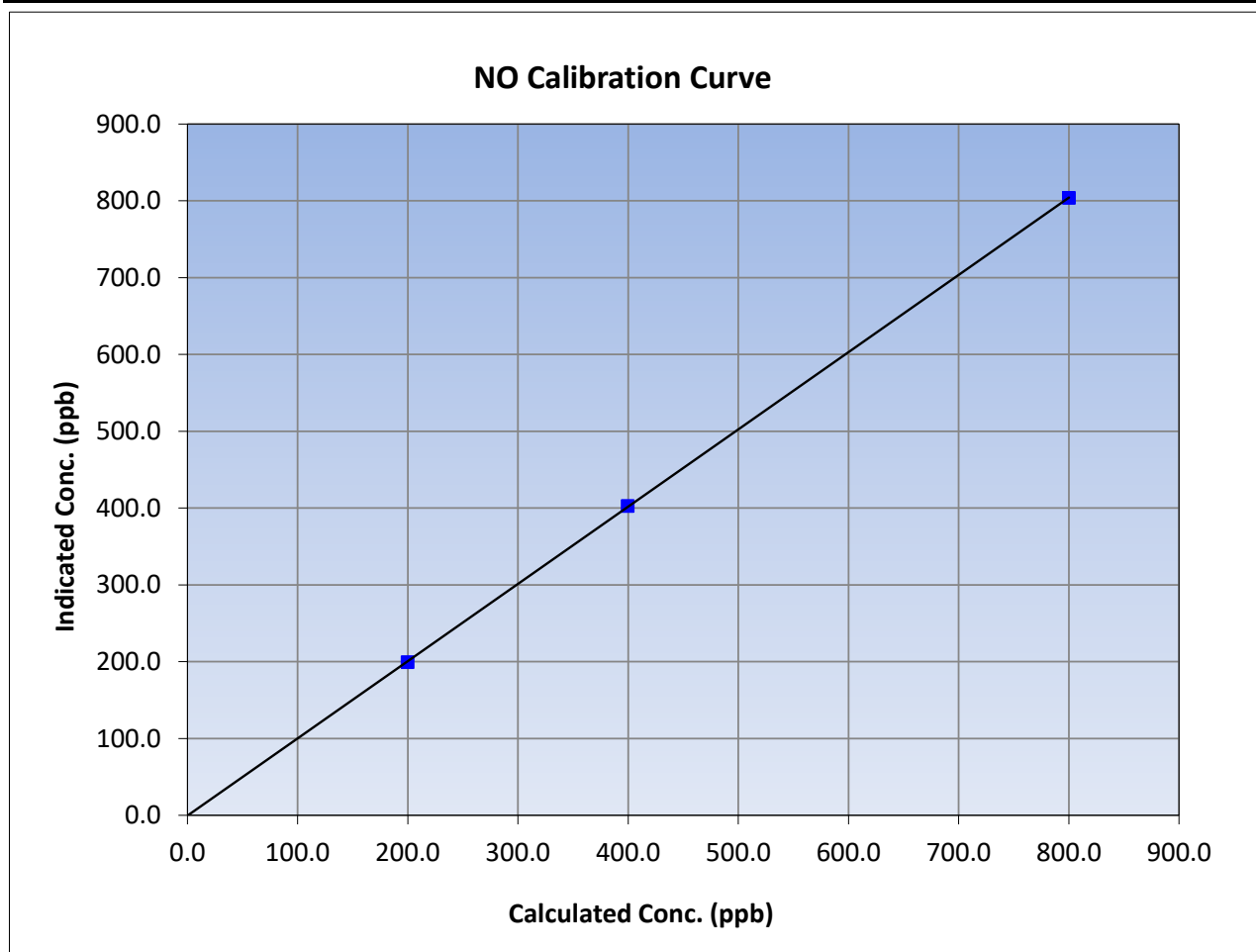
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23             |
| Start Time (MST): | 10:56             | End Time (MST):       | 17:40             |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 800.2                               | 804.0                              | 0.9952                    |   |                                |
| 399.6                               | 402.6                              | 0.9925                    |   |                                |
| 199.8                               | 199.4                              | 1.0020                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

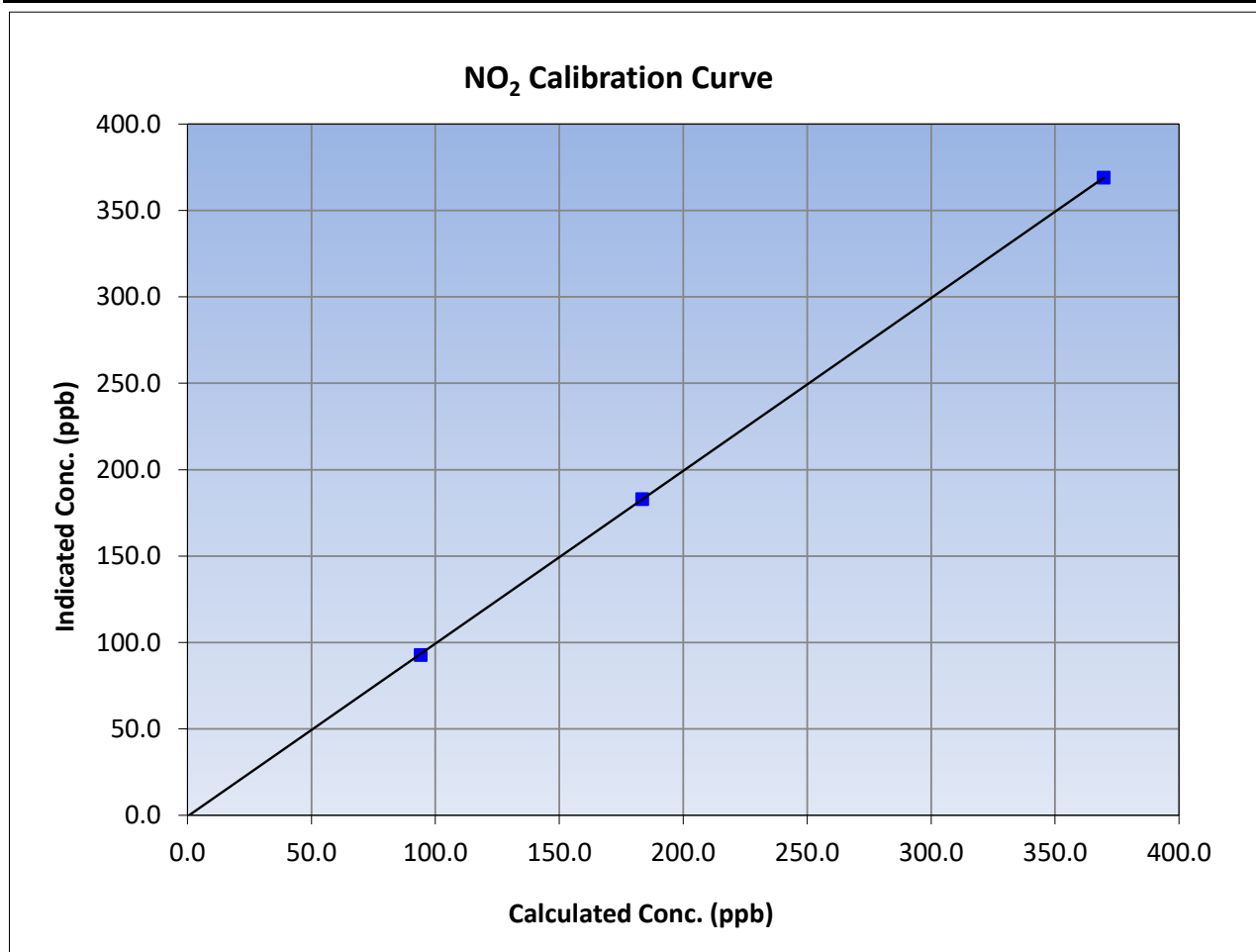
Version-04-2020

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 23, 2023 | Previous Calibration: | February 17, 2023 |
| Station Name:     | Fort Hills        | Station Number:       | AMS23             |
| Start Time (MST): | 10:56             | End Time (MST):       | 17:40             |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1152430007        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <i>Limits</i> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | -0.2                               | ----                      | Correlation Coefficient | ≥0.995        |             |
| 369.6                               | 369.0                              | 1.0016                    |                         |               |             |
| 183.5                               | 182.9                              | 1.0033                    |                         |               |             |
| 94.1                                | 92.8                               | 1.0140                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.999767      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.637319     | +/-20       |

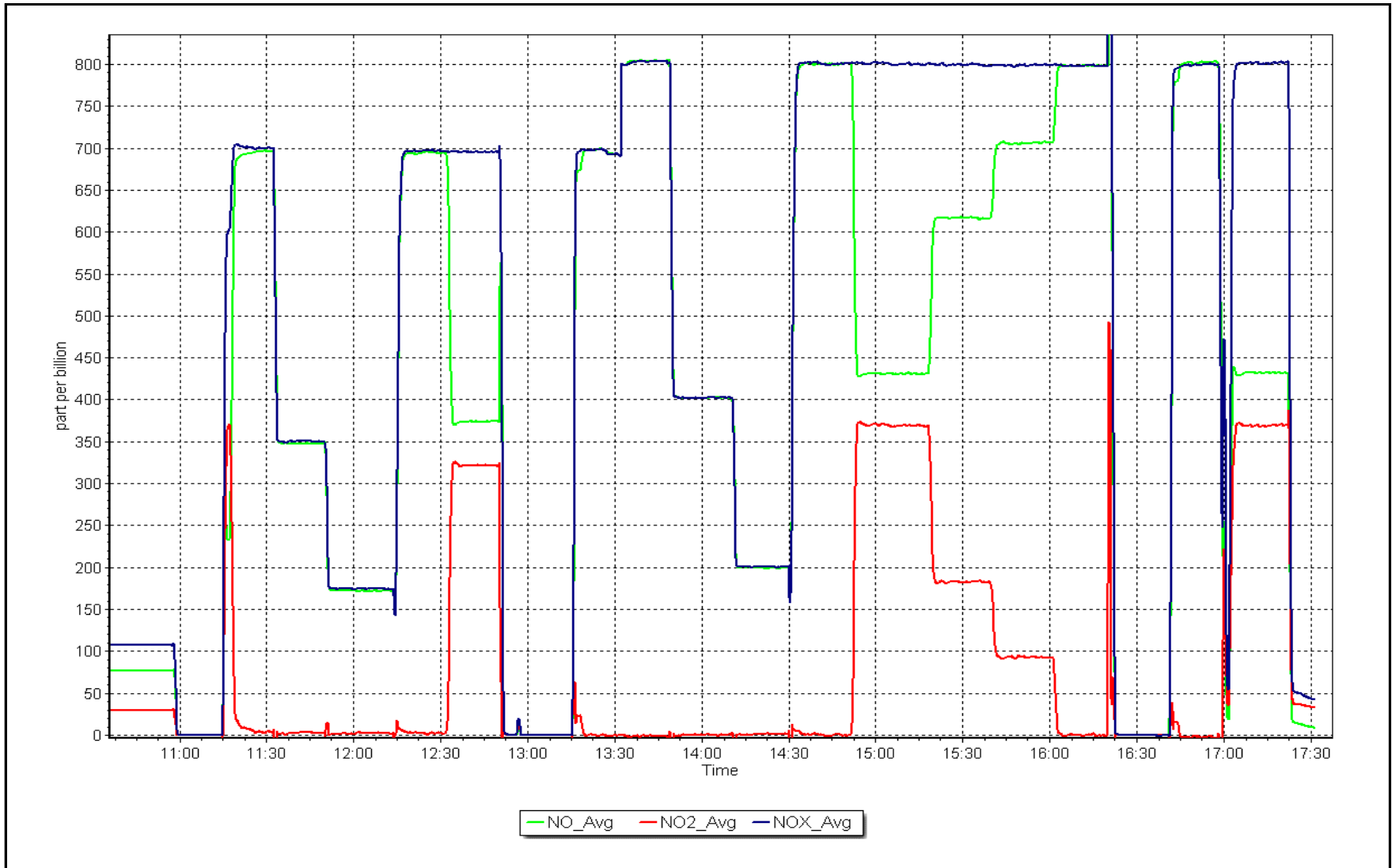




NO<sub>x</sub> Calibration Plot

Date: February 23, 2023

Location: Fort Hills





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Fort Hills Station number: AMS 23  
 Calibration Date: February 17, 2023 Last Cal Date: January 18, 2023  
 Start time (MST): 10:40 End time (MST): 11:14

Analyzer Make: API T640 S/N: 1162  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: DeltaCal S/N: 141229  
 Temp/RH standard: DeltaCal S/N: 141229

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -17.5    | -17.5    | -17.5   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 734.5    | 728.4    | 734.5   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.02     | 4.95     | 5.02    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 17, 2023 Last Cal Date: January 18, 2023  
 PM w/o HEPA: 9.2 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: December 8, 2022 <0.2 ug/m3  
 Disposable Filter Changed: December 8, 2022

### Annual Maintenance

Date Sample Tube Cleaned: September 26, 2022  
 Date RH/T Sensor Cleaned: September 26, 2022

Notes: Quarterly calibration completed in December. No adjustments made. Leak check passed.

Calibration by: Max Farrell



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS25 WASKŌW OHCI PIMÂTISIWIN FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

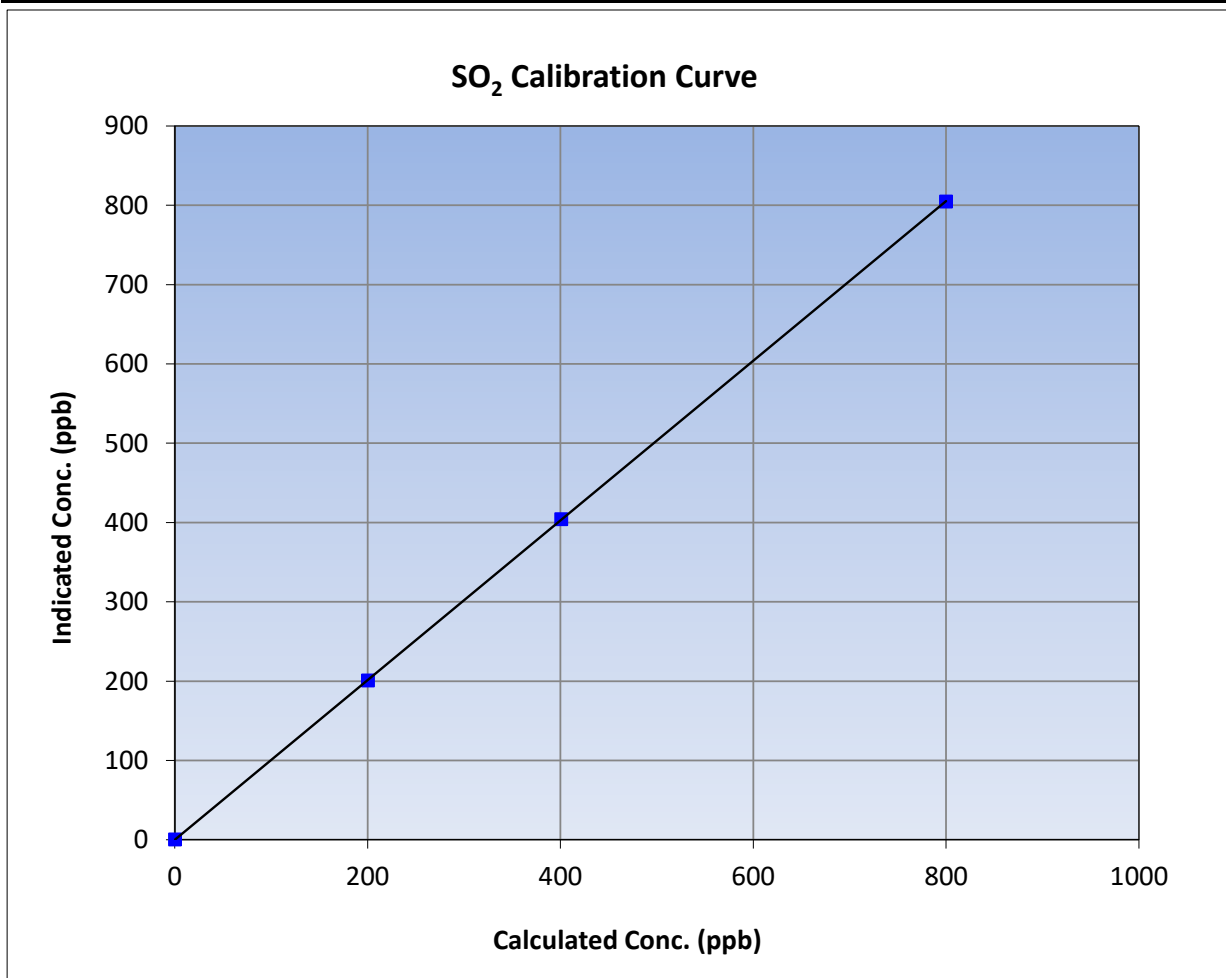
Version-01-2020

### Station Information

|                   |                         |                       |                 |
|-------------------|-------------------------|-----------------------|-----------------|
| Calibration Date: | March 15, 2023          | Previous Calibration: | January 3, 2023 |
| Station Name:     | Waskow ohci Pimatisiwin | Station Number:       | AMS25           |
| Start Time (MST): | 10:00                   | End Time (MST):       | 12:12           |
| Analyzer make:    | Thermo 43i              | Analyzer serial #:    | 1118148497      |

### Calibration Data

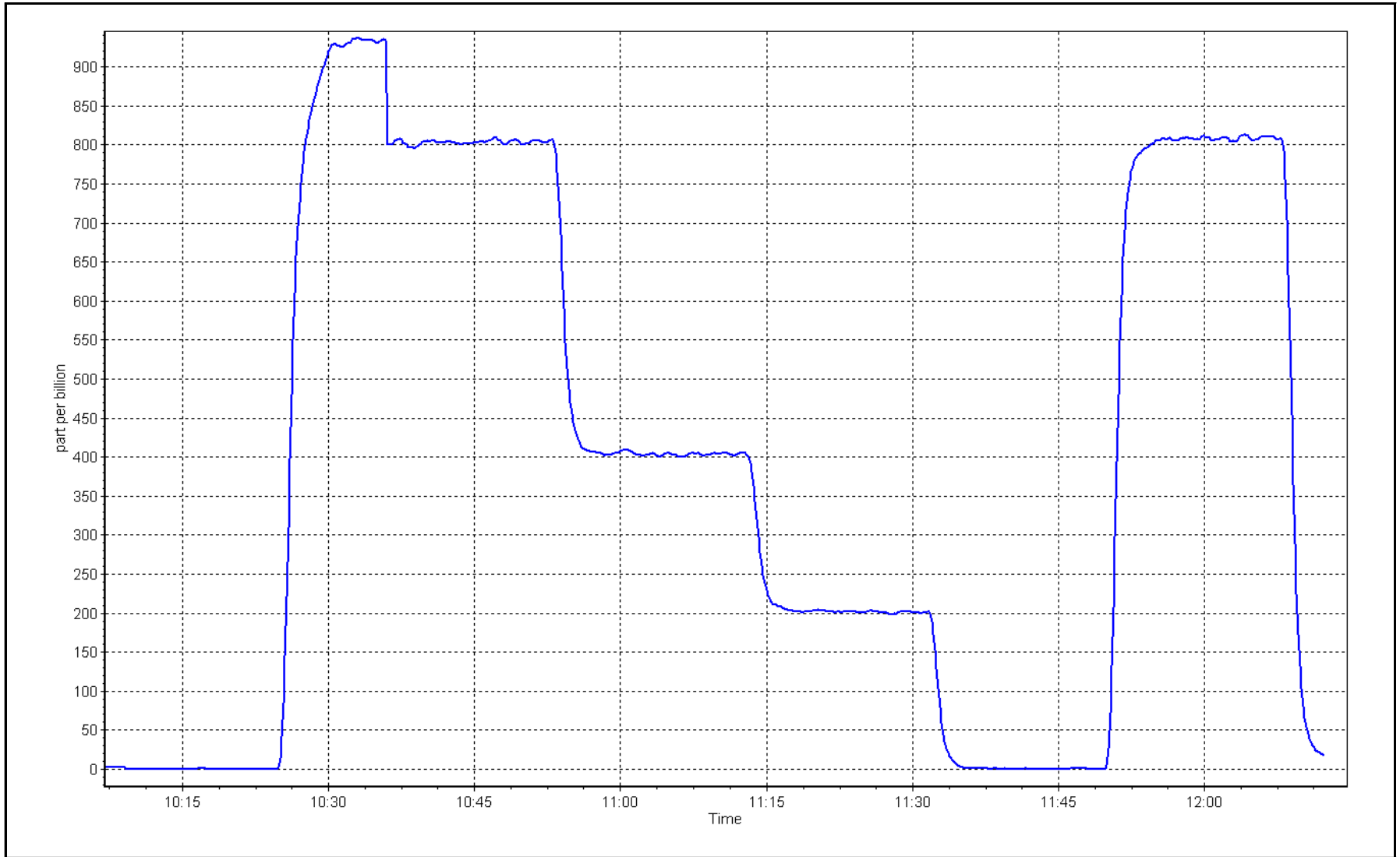
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999995  |             |
| 799.6                               | 804.6                              | 0.9938                    |                         |           | ≥0.995      |
| 400.3                               | 403.9                              | 0.9911                    | Slope                   | 1.006789  |             |
| 200.2                               | 200.6                              | 0.9978                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.116149 | +/-30       |



SO2 Calibration Plot

Date: March 15, 2023

Location: Waskow ohci Pimatisiwin





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                         |                 |                  |
|-------------------|-------------------------|-----------------|------------------|
| Station Name:     | Waskow ohci Pimatisiwin | Station number: | AMS25            |
| Calibration Date: | March 16, 2023          | Last Cal Date:  | January 11, 2023 |
| Start time (MST): | 7:20                    | End time (MST): | 10:14            |
| Reason:           | Install                 |                 |                  |

### Calibration Standards

|                        |          |     |                   |             |
|------------------------|----------|-----|-------------------|-------------|
| Cal Gas Concentration: | 4.90     | ppm | Cal Gas Exp Date: | May 5, 2023 |
| Cal Gas Cylinder #:    | LL119538 |     |                   |             |
| Removed Cal Gas Conc:  | 4.90     | ppm | Rem Gas Exp Date: | NA          |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |             |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 747         |
| ZAG Make/Model:        | API T701 |     | Serial Number:    | 261         |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i-LTE | Analyzer serial #:  | 1170050146 |
| Converter make: | Thermo 43C     | Converter serial #: | 328702539  |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.002738     | 1.003738      | Backgd or Offset: | 3.3          | 3.3           |
| Calibration intercept: | 0.341605     | 0.281608      | Coeff or Slope:   | 1.085        | 1.085         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         |                               |                             |                                     |                                    |  |
| as found span         |                               |                             |                                     |                                    |  |
| as found 2nd point    |                               |                             |                                     |                                    |  |
| as found 3rd point    |                               |                             |                                     |                                    |  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                              | 4918                          | 81.6                        | 80.0                                | 80.5                               | 0.993   |
| second point                            | 4959                          | 40.8                        | 40.0                                | 40.5                               | 0.987   |
| third point                             | 4980                          | 20.4                        | 20.0                                | 20.4                               | 0.980   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span                            | 4912                          | 88.3                        | 800.0                               | 803.0                              | 0.996   |
| SO2 Scrubber Check                      | 4924                          | 76.3                        | 800.0                               | 0.2                                | ----  |
| Date of last scrubber change:           | 19-Jul-10                     |                             |                                     | Ave Corr Factor                    | 0.987   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |    |                 |    |               |    |
|--------------------------|----|-----------------|----|---------------|----|
| Baseline Corr As found:  | NA | Prev response:  | NA | *% change:    | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope:       | NA | AF Intercept: | NA |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | NA |               |    |

\* = > +/-5% change initiates investigation

Notes: Sox scrubber checked after the calibrator zero. No adjustments done. Install Calibration after power put back on.

Calibration Performed By: Melissa Lemay



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

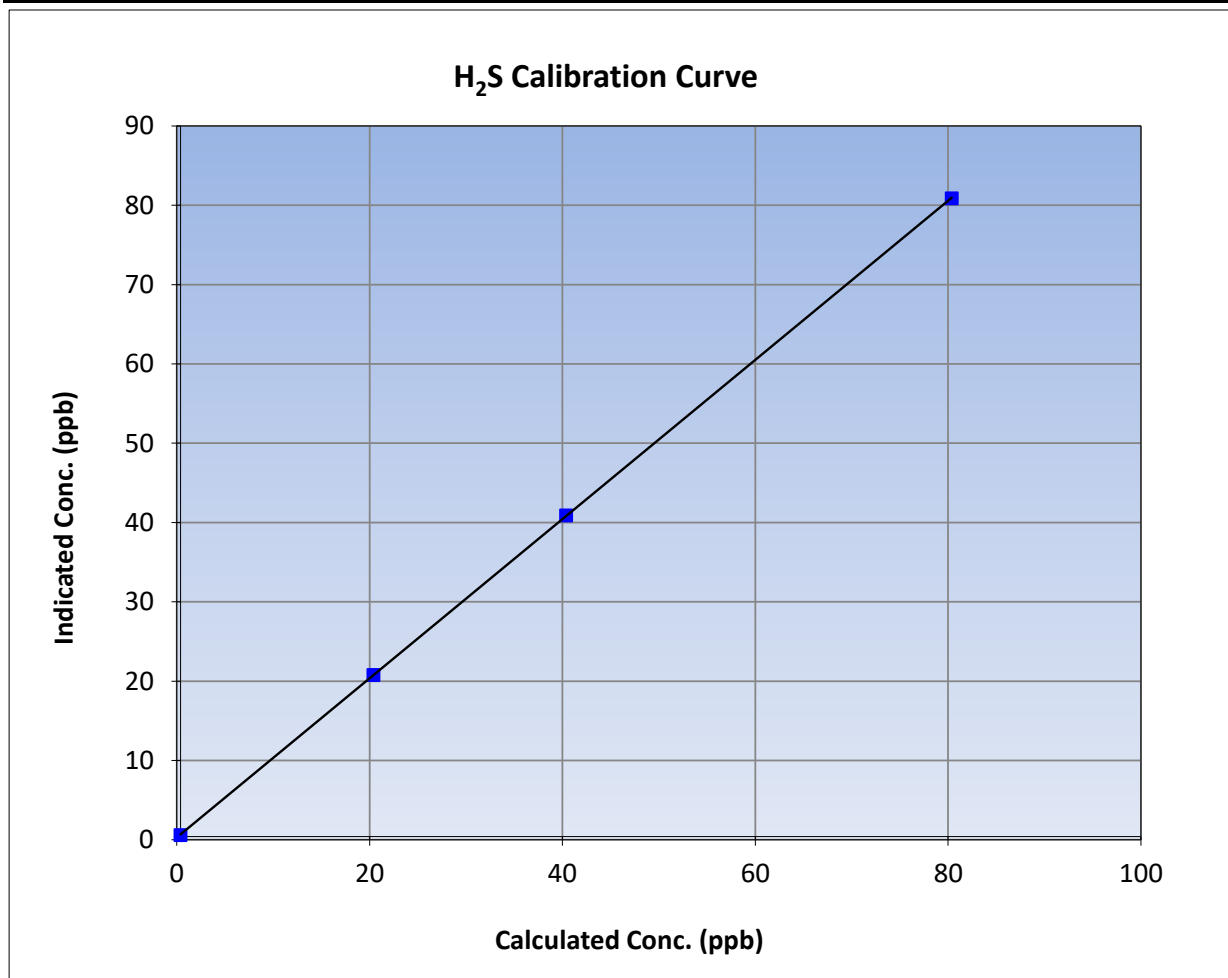
Version-11-2021

### Station Information

|                   |                         |                       |                  |
|-------------------|-------------------------|-----------------------|------------------|
| Calibration Date: | March 16, 2023          | Previous Calibration: | January 11, 2023 |
| Station Name:     | Waskow ohci Pimatisiwin | Station Number:       | AMS25            |
| Start Time (MST): | 7:20                    | End Time (MST):       | 10:14            |
| Analyzer make:    | Thermo 43i-LTE          | Analyzer serial #:    | 1170050146       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999994 | ≥0.995      |
| 80.0                                | 80.5                               | 0.9935                    |                         |          |             |
| 40.0                                | 40.5                               | 0.9873                    | Slope                   | 1.003738 | 0.90 - 1.10 |
| 20.0                                | 20.4                               | 0.9799                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.281608 | +/-3        |

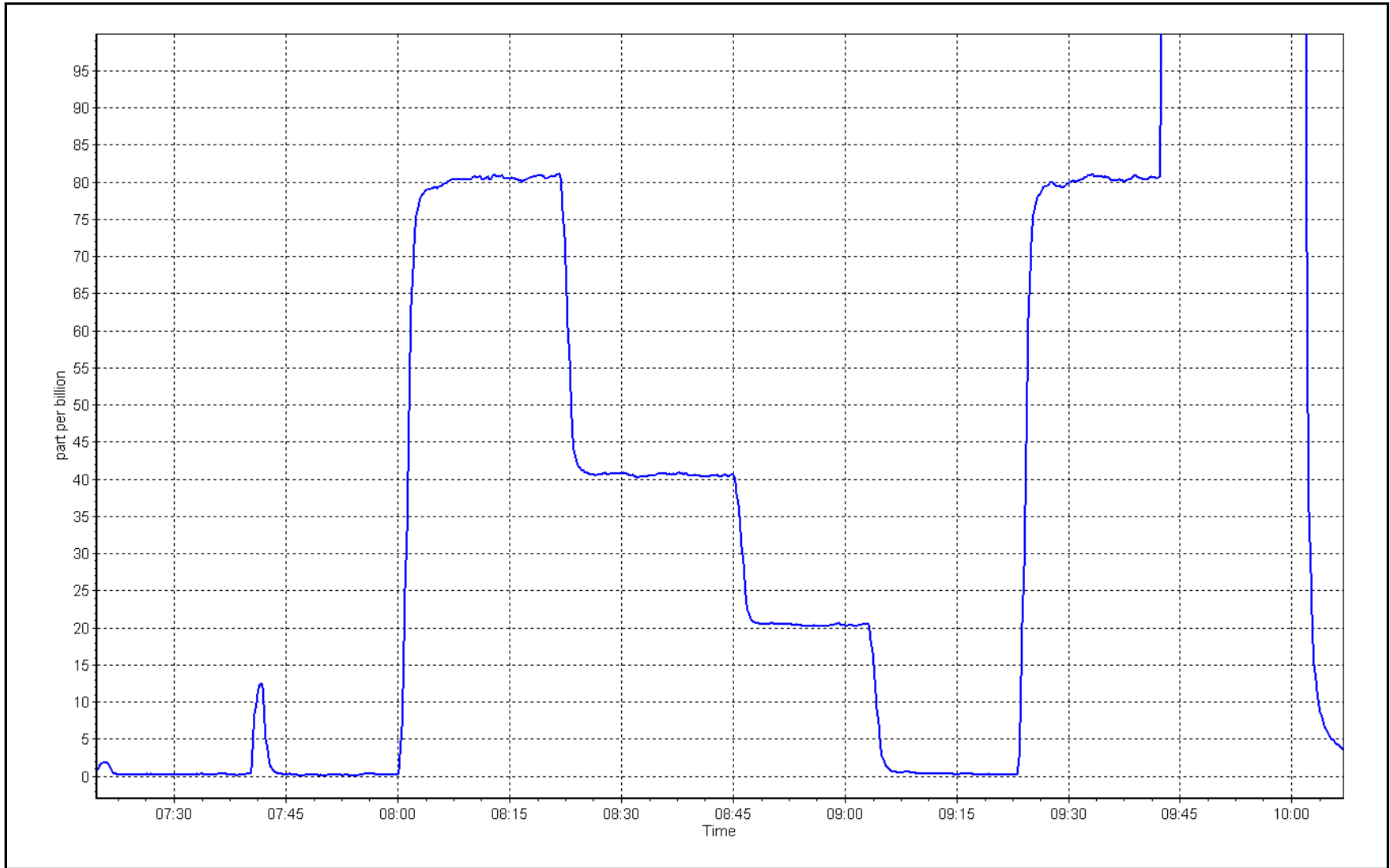




H<sub>2</sub>S Calibration Plot

Date: March 16, 2023

Location: Waskow ohci Pimatisiwin





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS26 CHRISTINA LAKE FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Christina Lake    | Station number: | AMS 26           |
| Calibration Date: | February 14, 2023 | Last Cal Date:  | January 25, 2023 |
| Start time (MST): | 13:41             | End time (MST): | 16:38            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |                 |     |                   |                   |
|------------------------|-----------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 49.56           | ppm | Cal Gas Exp Date: | February 23, 2025 |
| Cal Gas Cylinder #:    | <u>CC362134</u> |     |                   |                   |
| Removed Cal Gas Conc:  | 49.56           | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | <u>NA</u>       |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700        |     | Serial Number:    | 2447              |
| ZAG Make/Model:        | API T701        |     | Serial Number:    | 953               |

### Analyzer Information

|                |              |                    |            |
|----------------|--------------|--------------------|------------|
| Analyzer make: | Thermo 43i   | Analyzer serial #: | 1173410001 |
| Analyzer Range | 0 - 1000 ppb |                    |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.000779     | 0.994255      | Backgd or Offset: | 16.4         | 16.4          |
| Calibration intercept: | -2.876133    | -2.695113     | Coeff or Slope:   | 0.929        | 0.929         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as found span             | 4919                          | 80.6                        | 799.0                               | 789.6                              | 1.012   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| high point                | 4919                          | 80.6                        | 799.0                               | 793.1                              | 1.007   |
| second point              | 4960                          | 40.3                        | 399.4                               | 393.1                              | 1.016   |
| third point               | 4980                          | 20.2                        | 200.2                               | 193.4                              | 1.035   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----  |
| as left span              | 4919                          | 80.6                        | 799.0                               | 795.9                              | 1.004   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.020   |

|                          |        |                   |        |               |       |
|--------------------------|--------|-------------------|--------|---------------|-------|
| Baseline Corr As found:  | 789.60 | Previous response | 796.72 | *% change     | -0.9% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |       |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |       |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. No adjustments made.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

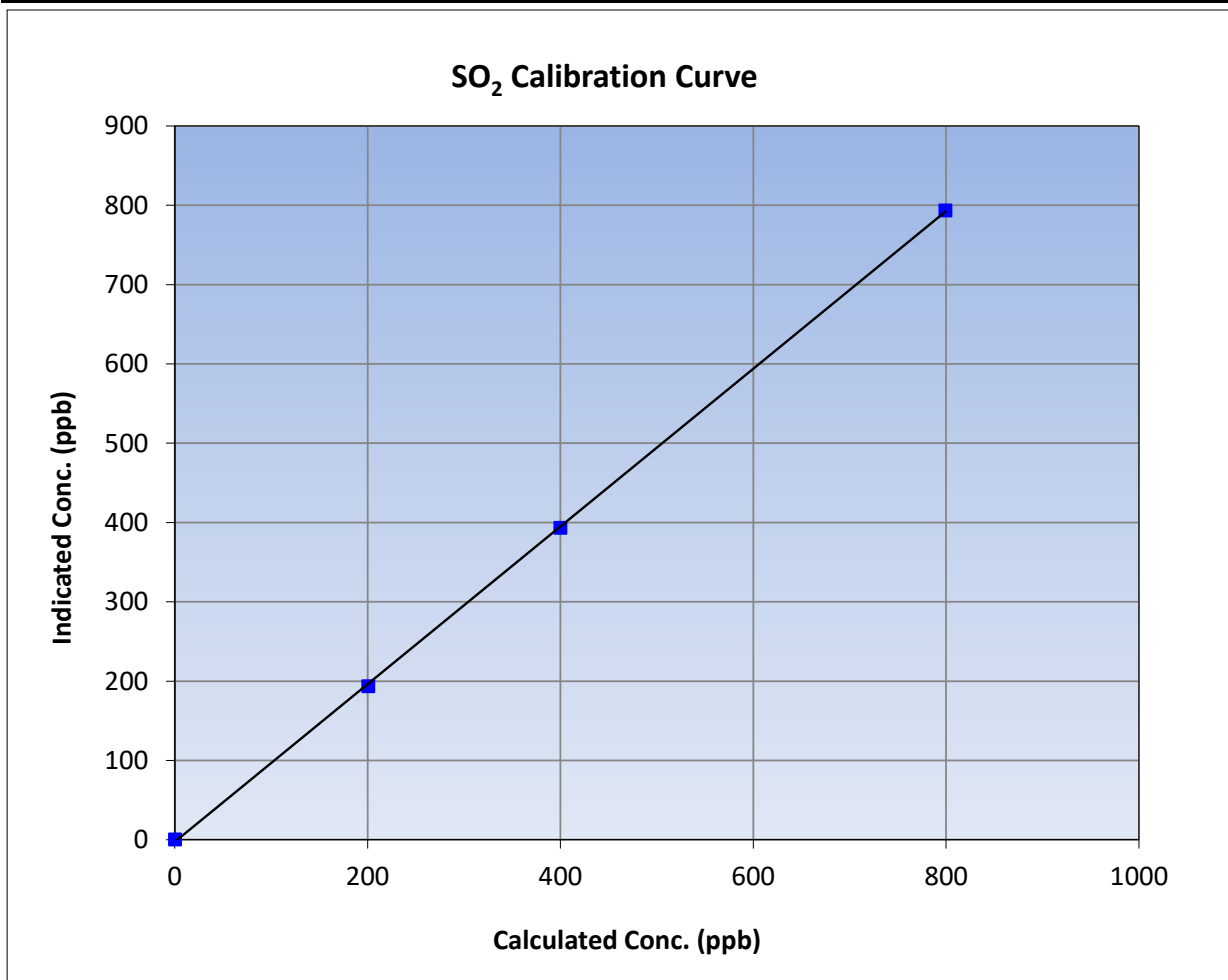
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Christina Lake    | Station Number:       | AMS 26           |
| Start Time (MST): | 13:41             | End Time (MST):       | 16:38            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1173410001       |

### Calibration Data

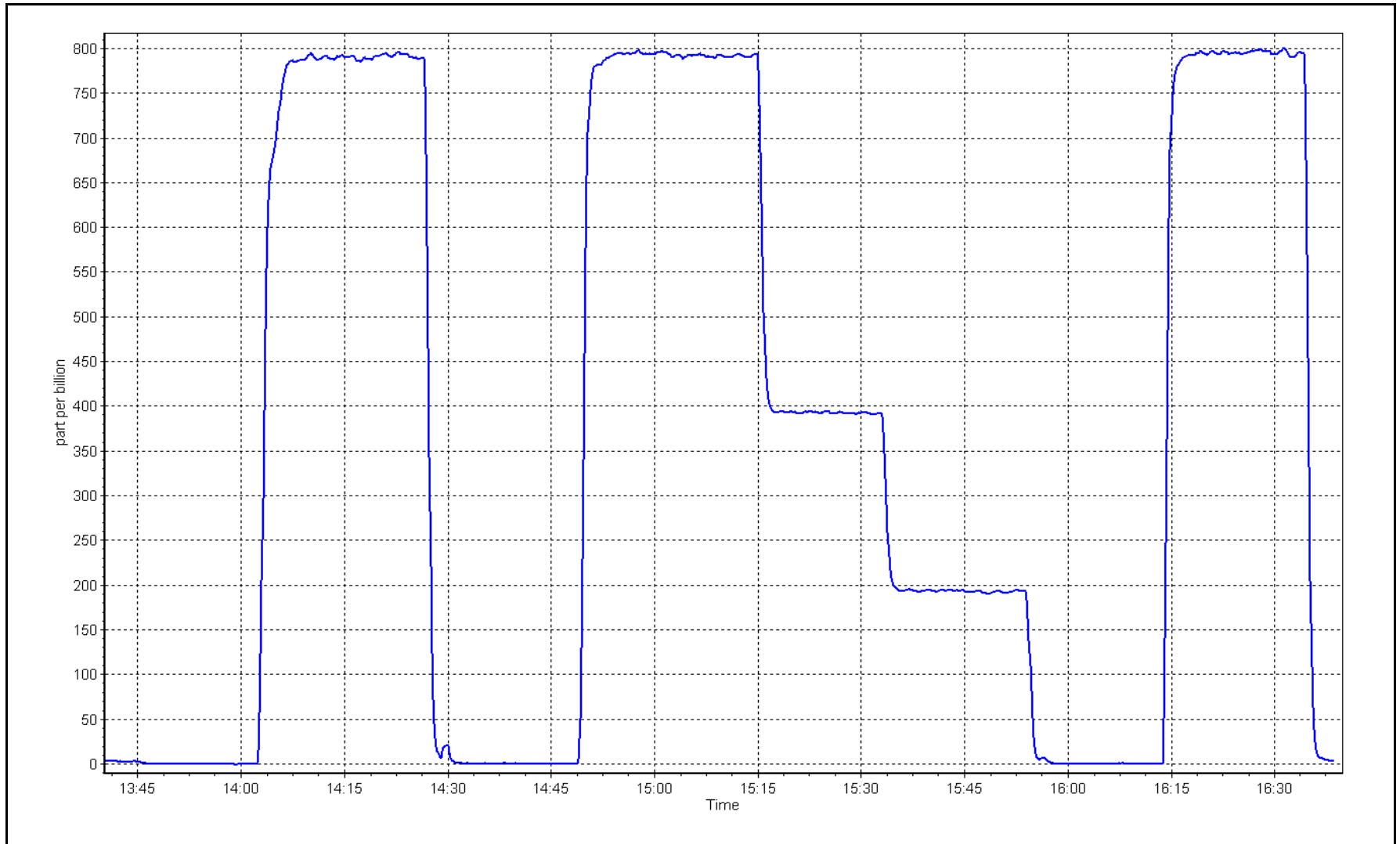
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.2                                   | ----                         | Correlation Coefficient | 0.999939      |             |
| 799.0                                  | 793.1                                 | 1.0074                       |                         |               | ≥0.995      |
| 399.4                                  | 393.1                                 | 1.0161                       | Slope                   | 0.994255      |             |
| 200.2                                  | 193.4                                 | 1.0352                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -2.695113     | +/-30       |



SO2 Calibration Plot

Date: February 14, 2023

Location: Christina Lake





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Christina Lake      Station number: AMS26  
 Calibration Date: February 15, 2023      Last Cal Date: January 25, 2023  
 Start time (MST): 11:04      End time (MST): 15:50  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 4.89 ppm      Cal Gas Exp Date: February 9, 2024  
 Cal Gas Cylinder #: EY0002466  
 Removed Cal Gas Conc: 4.89 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T750      Serial Number: 282  
 ZAG Make/Model: API T751H      Serial Number: 322

### Analyzer Information

Analyzer make: Thermo 450i      Analyzer serial #: 1180030032  
 Converter make: NA      Converter serial #: NA  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u>    |
|------------------------|--------------|---------------|-------------------|------------------|
| Calibration slope:     | 1.010037     | 0.996758      | Backgd or Offset: | 33.3      33.6   |
| Calibration intercept: | 0.159267     | 0.098881      | Coeff or Slope:   | 1.113      1.125 |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4918                          | 81.8                        | 80.0                                | 78.5                               | 1.020  |
| as found 2nd point    | 4959                          | 40.9                        | 40.0                                | 39.6                               | 1.013  |
| as found 3rd point    | 4979                          | 20.4                        | 20.0                                | 19.4                               | 1.034  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----  |
| high point                              | 4918                          | 81.8                        | 80.0                                | 80.1                               | 0.999   |
| second point                            | 4959                          | 40.9                        | 40.0                                | 39.6                               | 1.010   |
| third point                             | 4979                          | 20.4                        | 20.0                                | 19.7                               | 1.013   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as left span                            | 4918                          | 81.8                        | 80.0                                | 79.9                               | 1.001   |
| SO2 Scrubber Check                      | 4919                          | 80.6                        | 806.1                               | 0.2                                | ----  |
| Date of last scrubber change:           | 27-Feb-19                     |                             |                                     | Ave Corr Factor                    | 1.007   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

Baseline Corr As found: 78.4      Prev response: 80.97      \*% change: -3.3%  
 Baseline Corr 2nd AF pt: 39.5      AF Slope: 0.981475      AF Intercept: 0.058616  
 Baseline Corr 3rd AF pt: 19.3      AF Correlation: 0.999957

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after MAF's, ran scrubber check after calibrator span. Adjusted span only.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

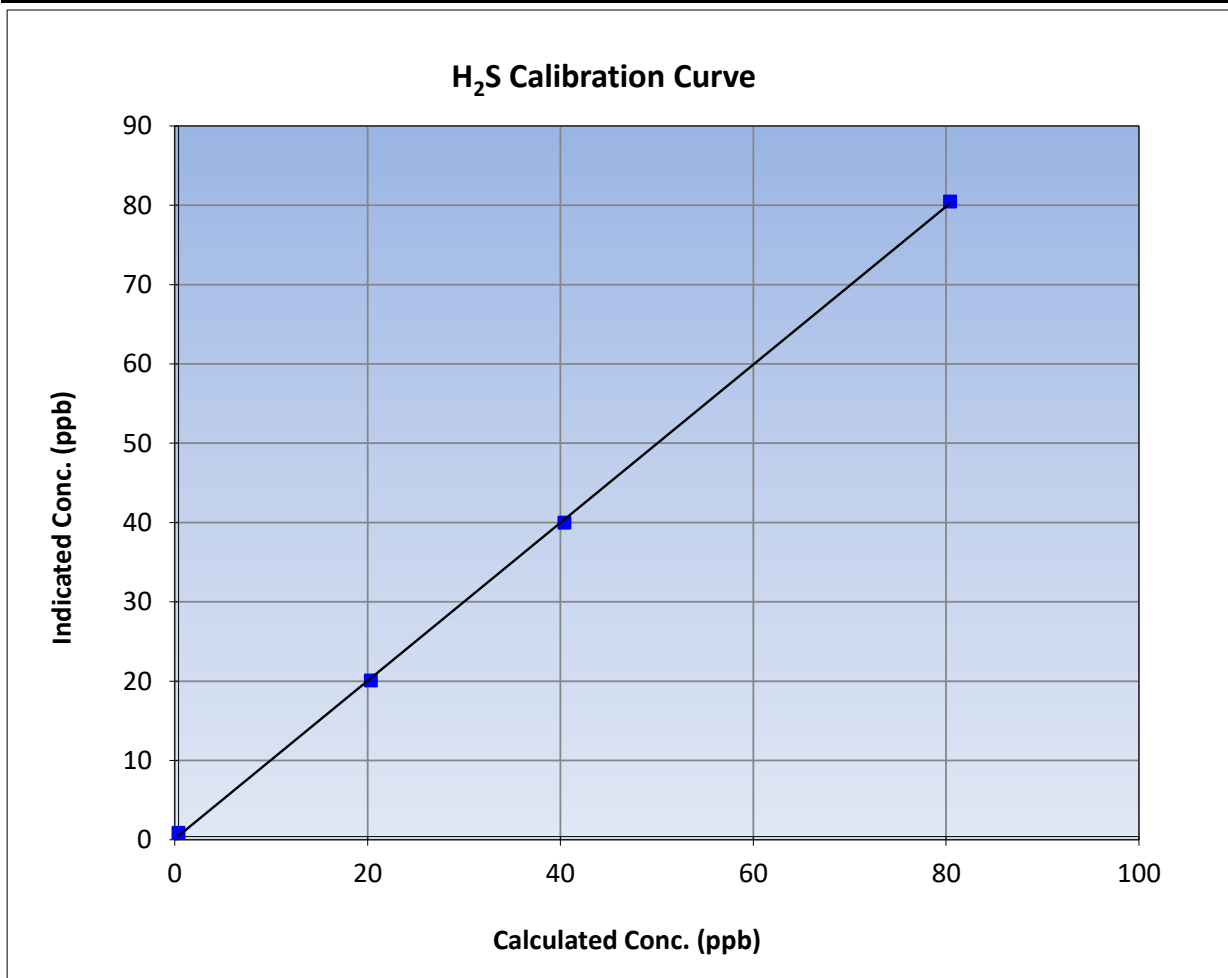
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Christina Lake    | Station Number:       | AMS26            |
| Start Time (MST): | 11:04             | End Time (MST):       | 15:50            |
| Analyzer make:    | Thermo 450i       | Analyzer serial #:    | 1180030032       |

### Calibration Data

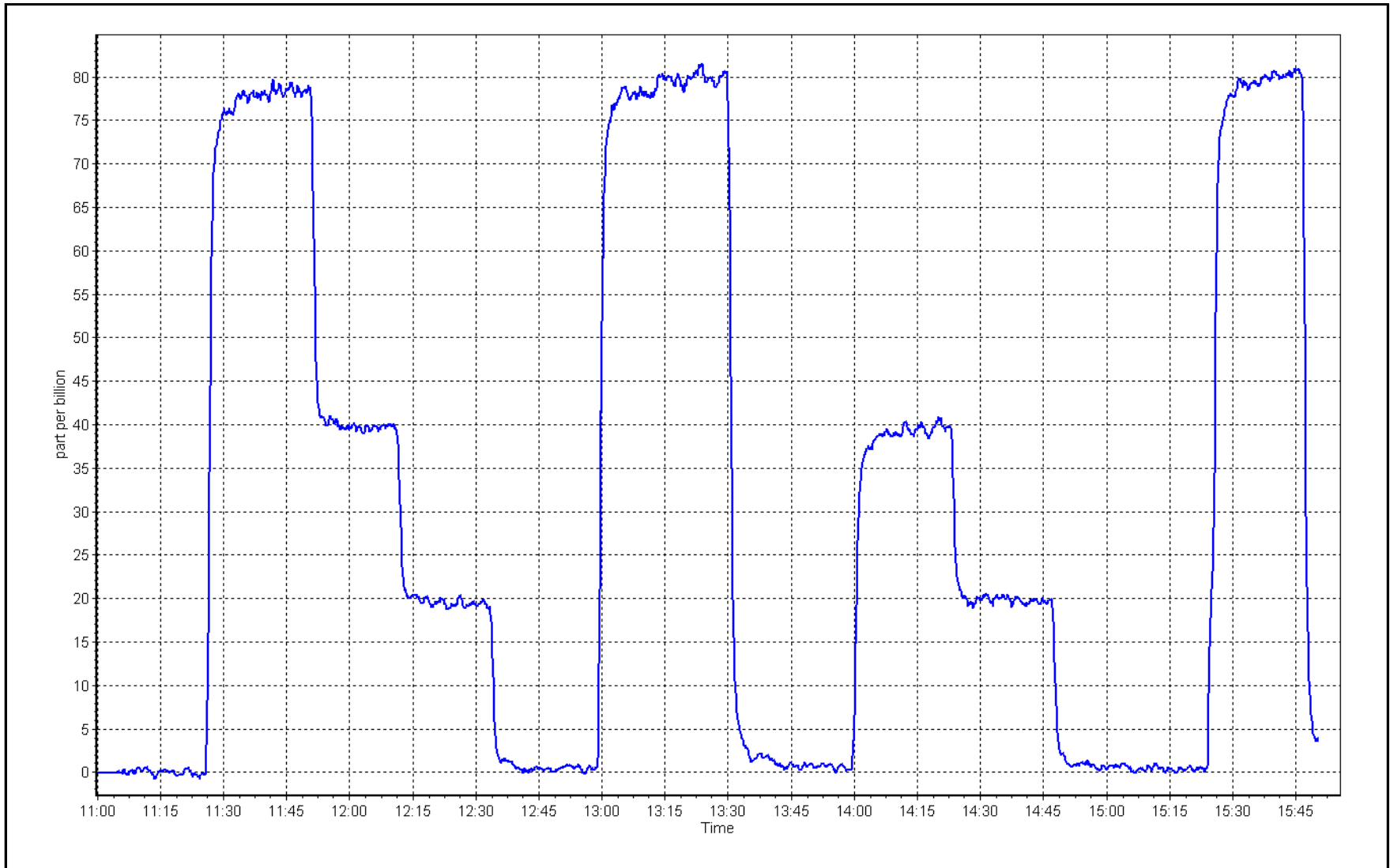
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.5                                | ----                      | Correlation Coefficient | 0.999872 | ≥0.995      |
| 80.0                                | 80.1                               | 0.9988                    |                         |          |             |
| 40.0                                | 39.6                               | 1.0101                    | Slope                   | 0.996758 | 0.90 - 1.10 |
| 20.0                                | 19.7                               | 1.0129                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.098881 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 15, 2023

Location: Christina Lake









# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | -0.1                                  | 0.2  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.1   | 800.3                                  | 12.8  | 782.3  | 768.4                                 | 13.9   | 1.0394  | 1.0415   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.4  | 0.2                                   | 0.2  | ----  | ----   |
| high point                | 4920                      | 80.0                        | 813.1   | 800.3                                  | 12.8  | 813.1  | 799.3                                 | 13.8   | 1.0000  | 1.0013   |
| second point              | 4960                      | 40.0                        | 406.6   | 400.2                                  | 6.4   | 404.4  | 397.3                                 | 7.0  | 1.0053  | 1.0072   |
| third point               | 4980                      | 20.0                        | 203.3   | 200.1                                  | 3.2   | 200.0  | 195.5                                 | 4.5  | 1.0164  | 1.0234   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.2  | 0.1                                   | 0.1  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.1   | 389.5                                  | 423.6   | 815.6  | 392.2                                 | 423.5  | 0.9970  | 0.9932   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0073  | 1.0106   |

|                      |                             |                |  |                                  |                         |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|
| Corrected As found   | NO <sub>x</sub> = 782.1 ppb | NO = 768.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -3.7% |
| Previous Response    | NO <sub>x</sub> = 810.7 ppb | NO = 797.8 ppb |  | *Percent Change                  | NO = -3.8%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 799.6                                      | 388.8                                 | 423.6   | 424.9  | 0.9969   | 100.3%   |
| 2nd GPT point (200 ppb O3)       | 799.6                                      | 600.5                                 | 211.9   | 212.7  | 0.9962   | 100.4%   |
| 3rd GPT point (100 ppb O3)       | 799.6                                      | 704.7                                 | 107.7   | 107.6  | 1.0009   | 99.9%  |
| Average Correction Factor        |  |                                       |   |  | 0.9980   | 100.2%   |

Notes: Changed sample inlet filter after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

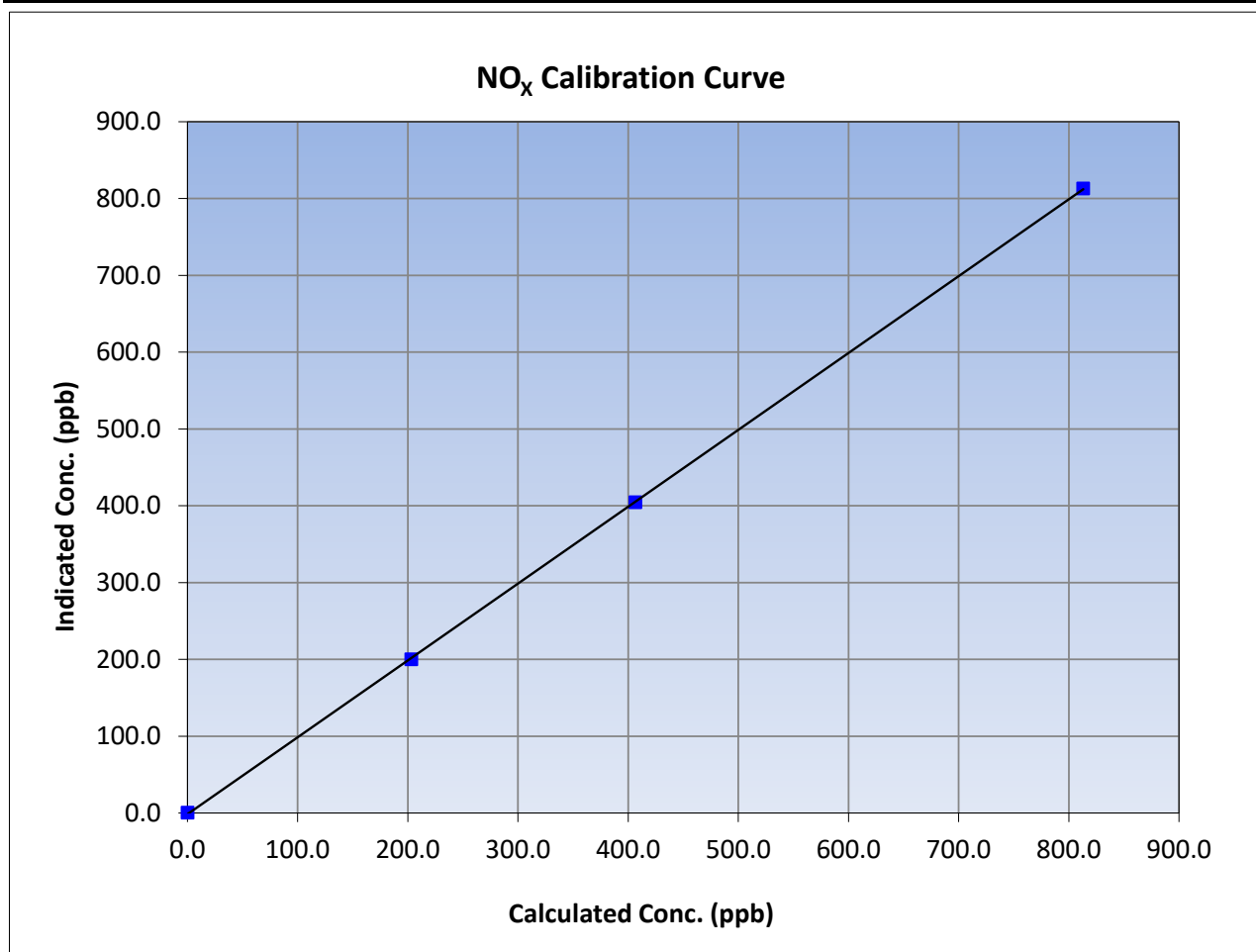
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Christina Lake    | Station Number:       | AMS 26           |
| Start Time (MST): | 10:27             | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 14:00            |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 813.1                               | 813.1                              | 1.0000                    |   |                                |
| 406.6                               | 404.4                              | 1.0053                    |   |                                |
| 203.3                               | 200.0                              | 1.0164                    |   |                                |
|                                     |                                    |                           | 0.999975                                      |                                |
|                                     |                                    |                           | 1.000661                                      |                                |
|                                     |                                    |                           | -1.500000                                     |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

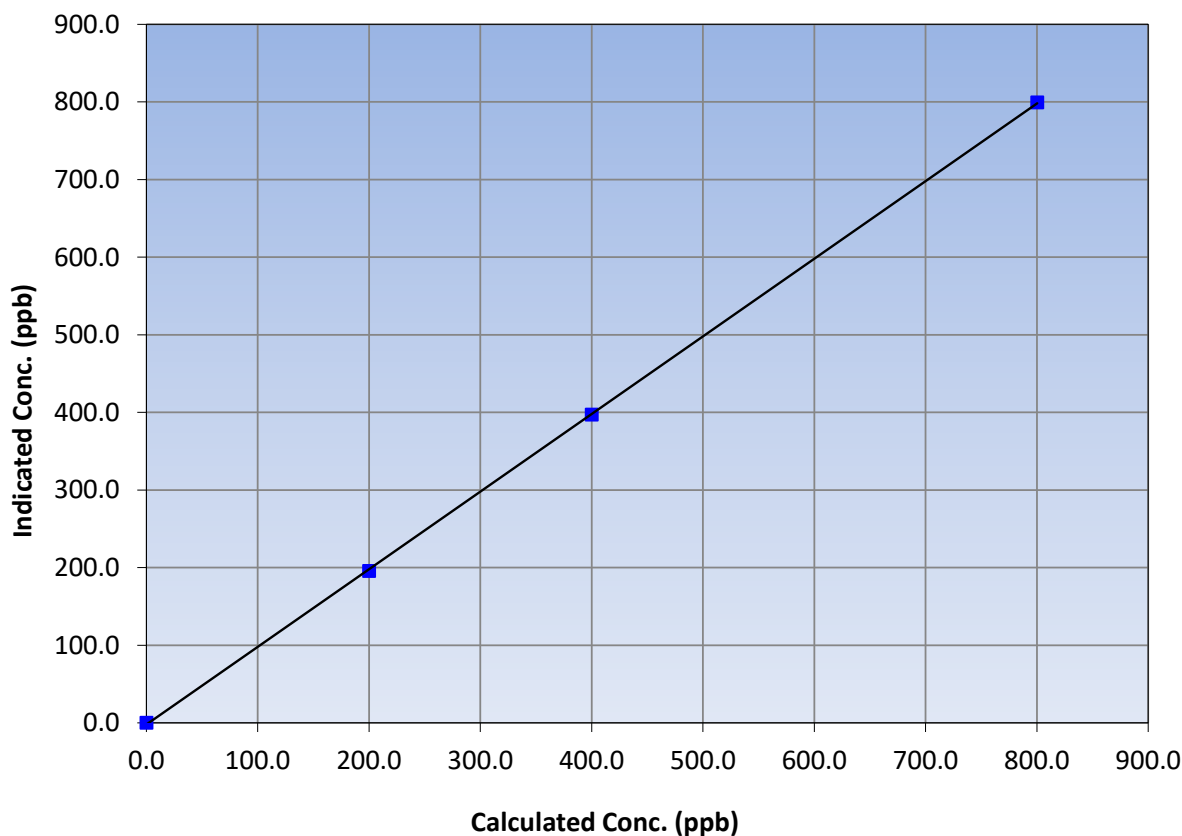
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Christina Lake    | Station Number:       | AMS 26           |
| Start Time (MST): | 10:27             | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 14:00            |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation              | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------------------|-----------|-------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>0.999962 | ≥0.995    |             |
| 800.3                               | 799.3                              | 1.0013                    |                                     |           |             |
| 400.2                               | 397.3                              | 1.0072                    |                                     |           |             |
| 200.1                               | 195.5                              | 1.0234                    |                                     |           |             |
|                                     |                                    |                           | Slope                               | 1.000043  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept                           | -2.080000 | +/-20       |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

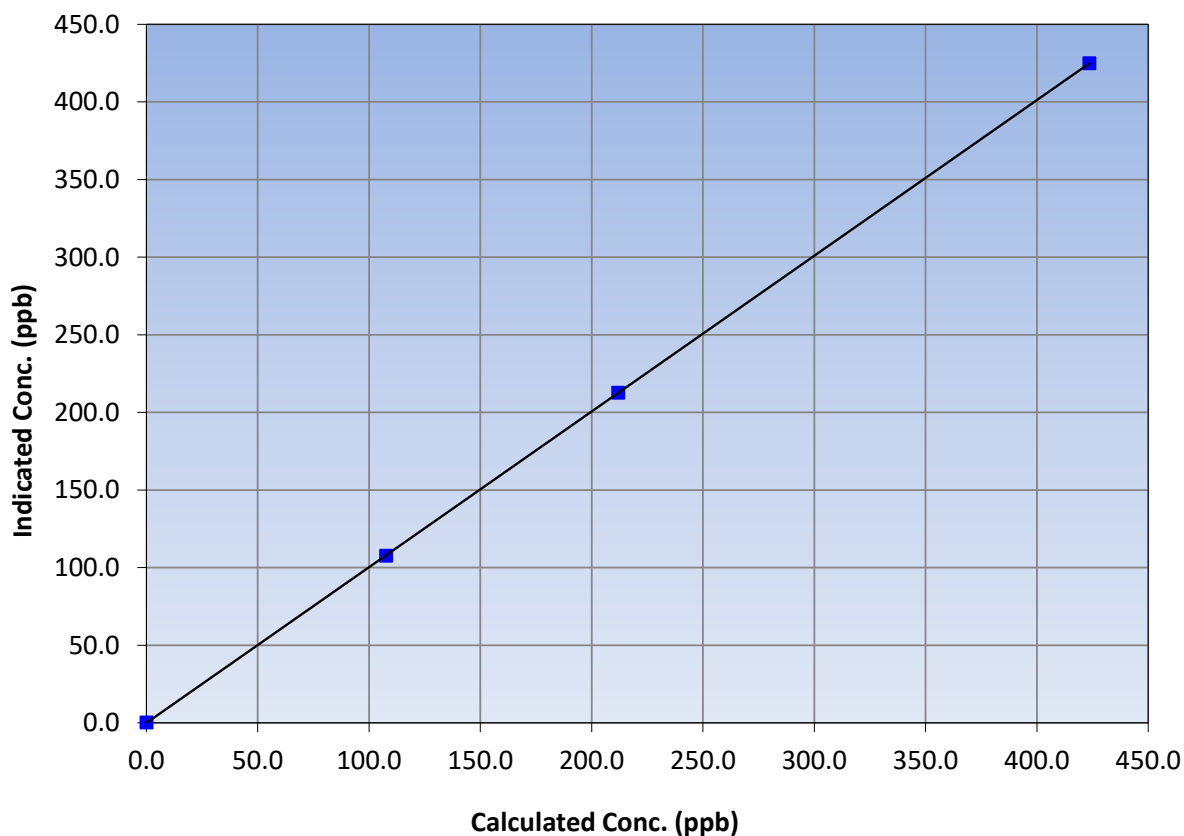
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Christina Lake    | Station Number:       | AMS 26           |
| Start Time (MST): | 10:27             | End Time (MST):       | 14:48            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 14:00            |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation   | Limits                                 |
|-------------------------------------|------------------------------------|---------------------------|--|--|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>0.999998<br><br>Slope<br>1.003073<br><br>Intercept<br>-0.020912 | ≥0.995<br><br>0.90 - 1.10<br><br>+/-20 |
| 423.6                               | 424.9                              | 0.9969                    |  |  |
| 211.9                               | 212.7                              | 0.9962                    |  |  |
| 107.7                               | 107.6                              | 1.0009                    |  |  |

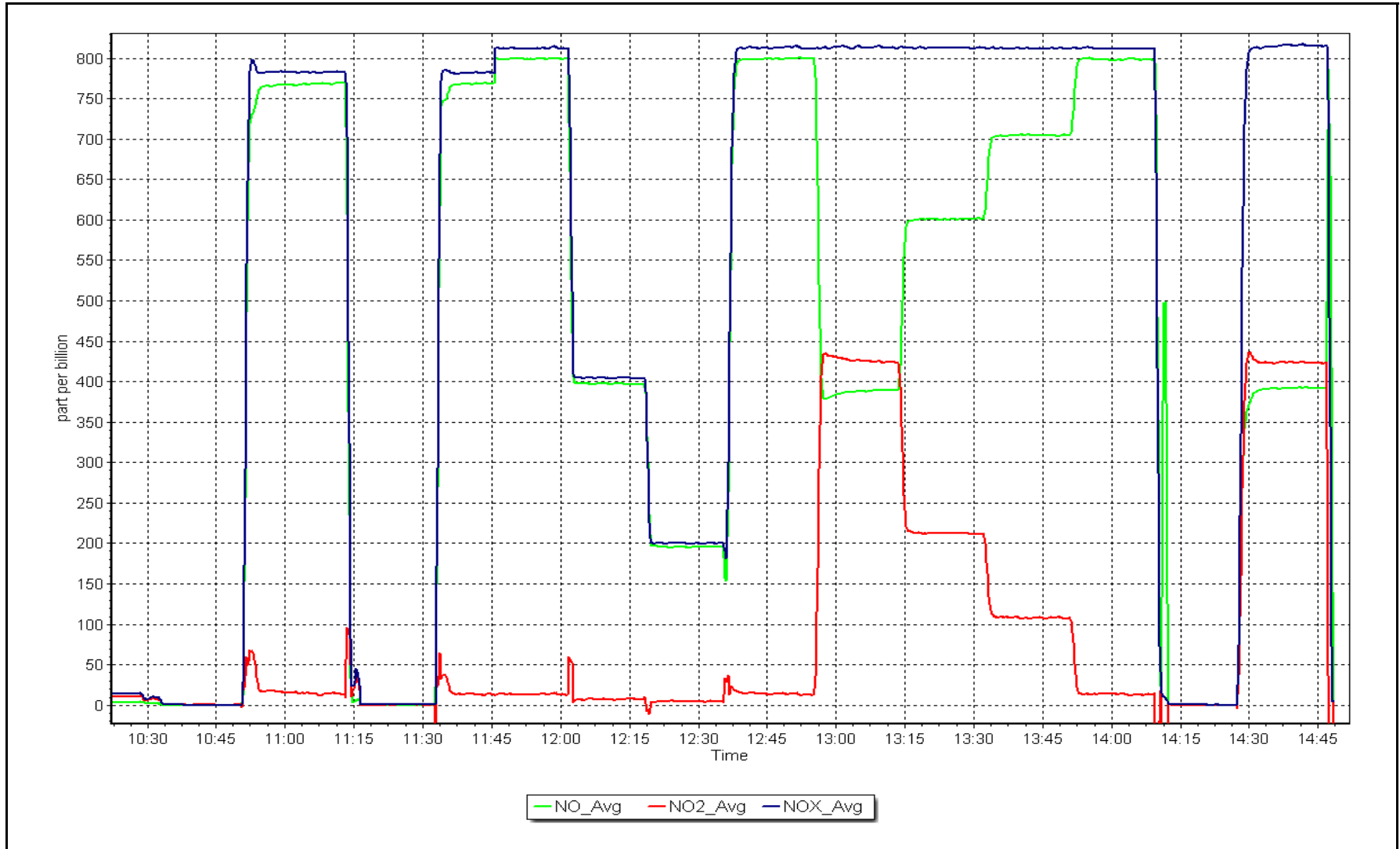
**NO<sub>2</sub> Calibration Curve**



NO<sub>x</sub> Calibration Plot

Date: February 16, 2023

Location: Christina Lake





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS27**  
**JACKFISH 2/3**  
**FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023



# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                  |
|-------------------|-------------------|-----------------|------------------|
| Station Name:     | Jackfish 2/3      | Station number: | AMS 27           |
| Calibration Date: | February 14, 2023 | Last Cal Date:  | January 19, 2023 |
| Start time (MST): | 10:57             | End time (MST): | 13:40            |
| Reason:           | Routine           |                 |                  |

### Calibration Standards

|                        |                     |     |                   |                   |
|------------------------|---------------------|-----|-------------------|-------------------|
| Cal Gas Concentration: | 50.58               | ppm | Cal Gas Exp Date: | December 29, 2028 |
| Cal Gas Cylinder #:    | <u>SG9133974BAL</u> |     |                   |                   |
| Removed Cal Gas Conc:  | 50.58               | ppm | Rem Gas Exp Date: | NA                |
| Removed Gas Cyl #:     | <u>NA</u>           |     | Diff between cyl: |                   |
| Calibrator Make/Model: | API T700            |     | Serial Number:    | 3811              |
| ZAG Make/Model:        | API 701             |     | Serial Number:    | 364               |

### Analyzer Information

|                |              |                    |             |
|----------------|--------------|--------------------|-------------|
| Analyzer make: | Thero 43iQ   | Analyzer serial #: | 12124313138 |
| Analyzer Range | 0 - 1000 ppb |                    |             |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.001858     | 1.001161      | Backgd or Offset: | 7.4          | 7.4           |
| Calibration intercept: | -1.876897    | -1.757862     | Coeff or Slope:   | 0.979        | 0.979         |

### SO<sub>2</sub> Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as found span             | 4921                          | 79.1                        | 800.2                               | 800.0                              | 1.000   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                | 4921                          | 79.1                        | 800.2                               | 800.0                              | 1.000   |
| second point              | 4961                          | 39.5                        | 399.5                               | 398.1                              | 1.004   |
| third point               | 4980                          | 19.8                        | 200.3                               | 196.4                              | 1.020   |
| as left zero              | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span              | 4921                          | 79.1                        | 800.2                               | 805.0                              | 0.994   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.008   |

|                          |        |                   |        |               |      |
|--------------------------|--------|-------------------|--------|---------------|------|
| Baseline Corr As found:  | 800.00 | Previous response | 799.77 | *% change     | 0.0% |
| Baseline Corr 2nd AF pt: | NA     | AF Slope:         |        | AF Intercept: |      |
| Baseline Corr 3rd AF pt: | NA     | AF Correlation:   |        |               |      |

\* = > +/-5% change initiates investigation

Notes: No adjustments have been made.

Calibration Performed By: Denny Ray Estador





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

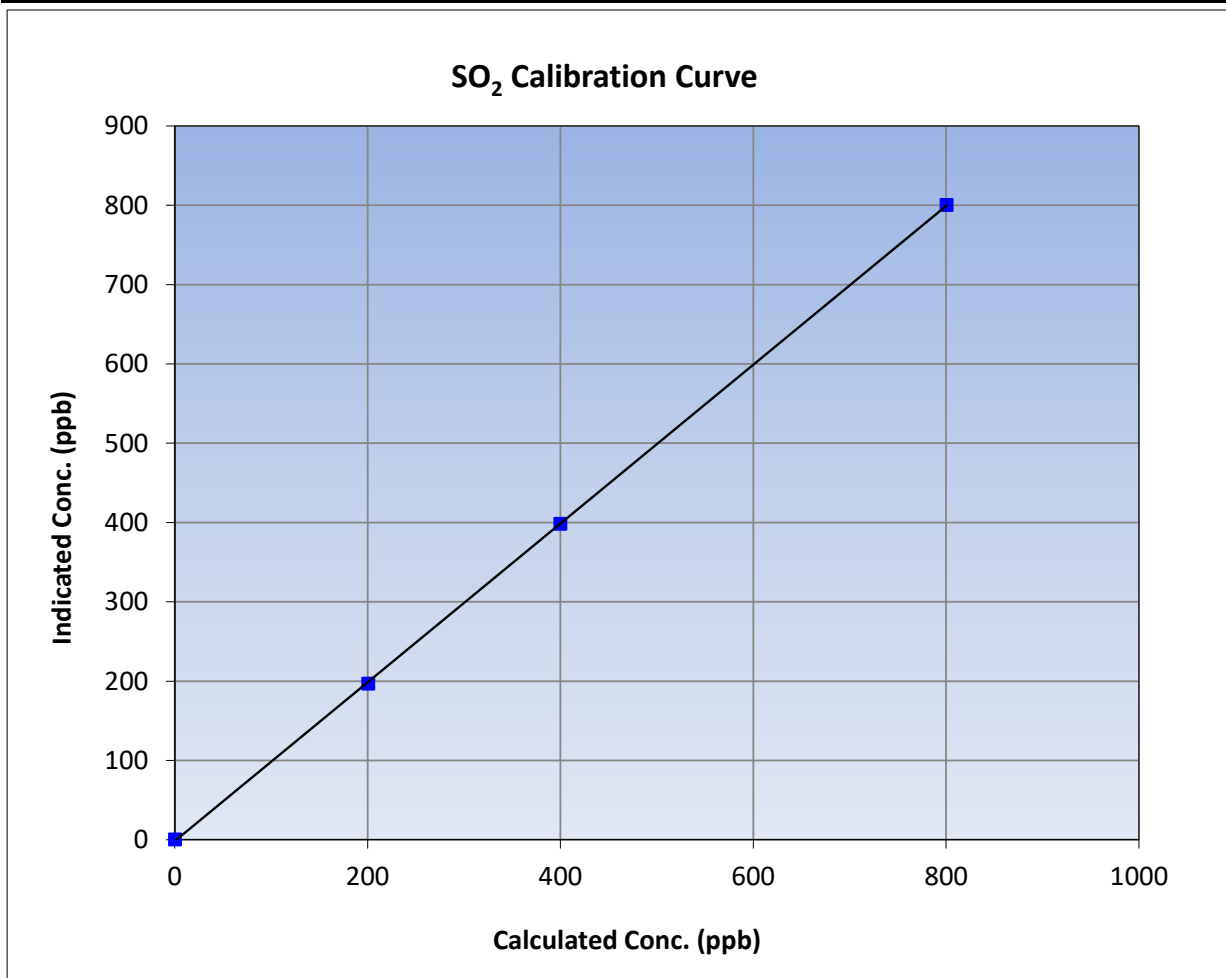
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 19, 2023 |
| Station Name:     | Jackfish 2/3      | Station Number:       | AMS 27           |
| Start Time (MST): | 10:57             | End Time (MST):       | 13:40            |
| Analyzer make:    | Thero 43iQ        | Analyzer serial #:    | 12124313138      |

### Calibration Data

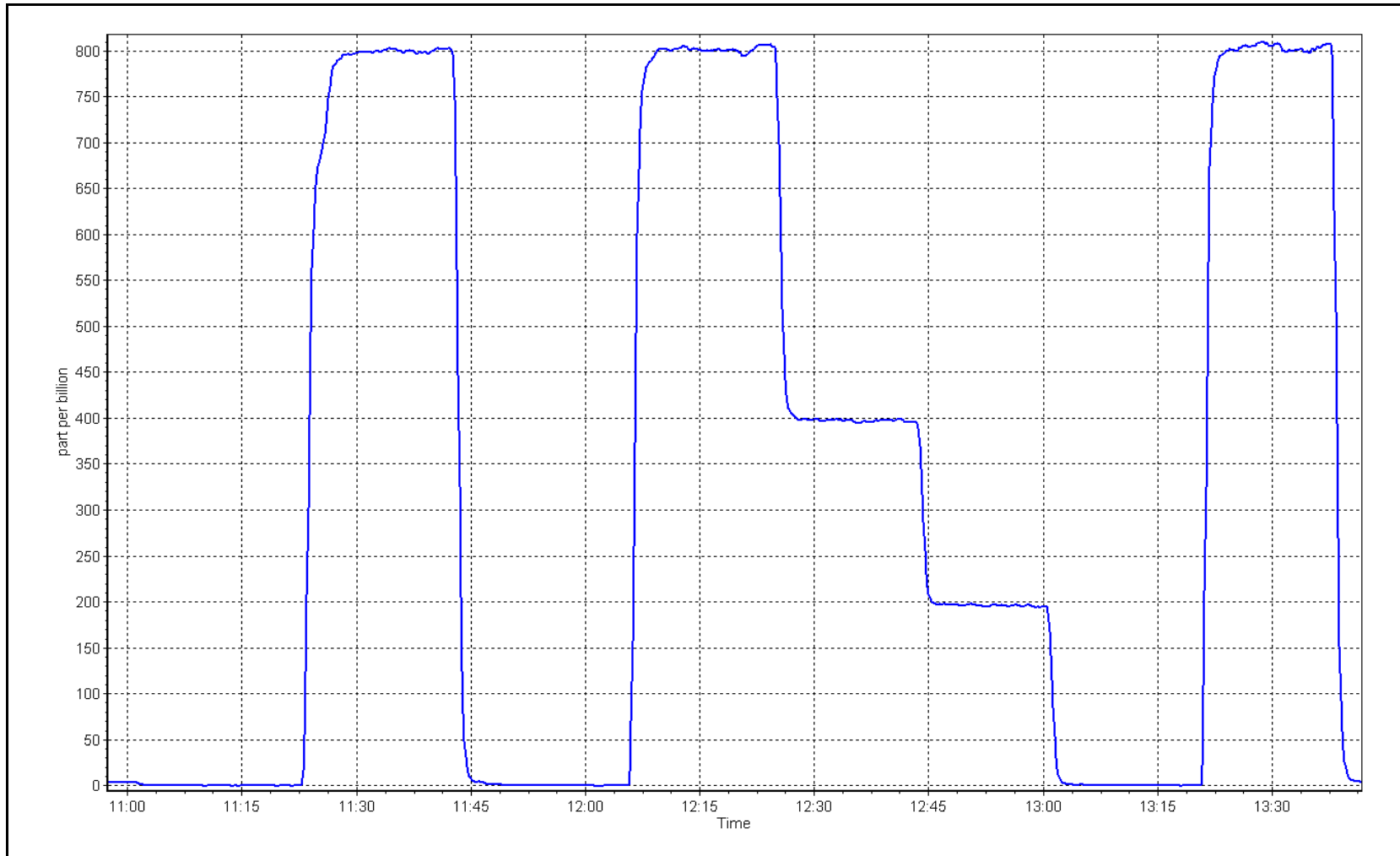
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | 0.1                                   | ----                         | Correlation Coefficient | ≥0.995        |
| 800.2                                  | 800.0                                 | 1.0002                       |                         |               |
| 399.5                                  | 398.1                                 | 1.0036                       | Slope                   | 0.90 - 1.10   |
| 200.3                                  | 196.4                                 | 1.0199                       |                         |               |
|  |                                       |                              | Intercept               | +/-30         |



SO2 Calibration Plot

Date: February 14, 2023

Location: Jackfish 2/3





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Jackfish 2/3      Station number: AMS27  
 Calibration Date: February 7, 2023      Last Cal Date: January 11, 2023  
 Start time (MST): 9:20      End time (MST): 13:50  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.41 ppm      Cal Gas Exp Date: January 4, 2025  
 Cal Gas Cylinder #: CC345023  
 Removed Cal Gas Conc: 5.41 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 3811  
 ZAG Make/Model: API 701      Serial Number: 364

### Analyzer Information

Analyzer make: API T101      Analyzer serial #: 621  
 Converter make:      Converter serial #:  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 0.997920     | 1.000628      | Backgd or Offset: 24.3 | 25.4          |
| Calibration intercept: | 0.042016     | -0.177928     | Coeff or Slope: 0.965  | 0.949         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.5                                | ----   |
| as found span         | 4926                          | 74.1                        | 80.2                                | 82.0                               | 0.984  |
| as found 2nd point    | 4963                          | 37.0                        | 40.0                                | 41.0                               | 0.988  |
| as found 3rd point    | 4982                          | 18.5                        | 20.0                                | 20.2                               | 1.016  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4926                          | 74.1                        | 80.2                                | 80.1                               | 1.001   |
| second point                            | 4963                          | 37.0                        | 40.0                                | 39.9                               | 1.003   |
| third point                             | 4982                          | 18.5                        | 20.0                                | 19.6                               | 1.021   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4926                          | 74.1                        | 80.2                                | 79.8                               | 1.005   |
| SO2 Scrubber Check                      | 4921                          | 79.1                        | 791.0                               | 0.1                                | ----  |
| Date of last scrubber change:           |                               |                             |                                     | Ave Corr Factor                    | 1.008   |
| Date of last converter efficiency test: |                               |                             |                                     | efficiency                         |   |

Baseline Corr As found: 81.5      Prev response: 80.05      \*% change: 1.8%  
 Baseline Corr 2nd AF pt: 40.5      AF Slope: 1.019017      AF Intercept: 0.202428  
 Baseline Corr 3rd AF pt: 19.7      AF Correlation: 0.999930

\* = > +/-5% change initiates investigation

Notes: Adjusted both zero and span.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

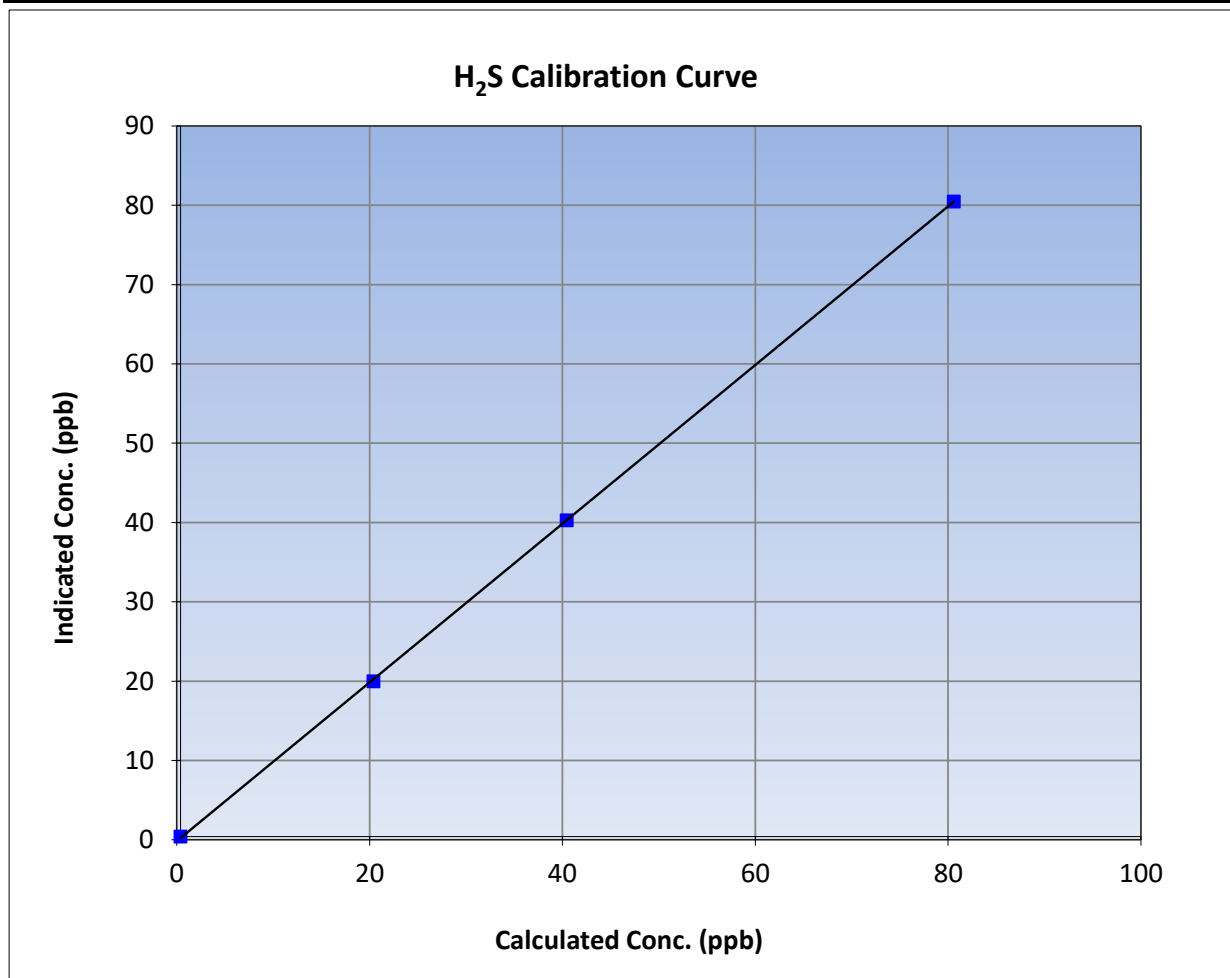
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 7, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Jackfish 2/3     | Station Number:       | AMS27            |
| Start Time (MST): | 9:20             | End Time (MST):       | 13:50            |
| Analyzer make:    | API T101         | Analyzer serial #:    | 621              |

### Calibration Data

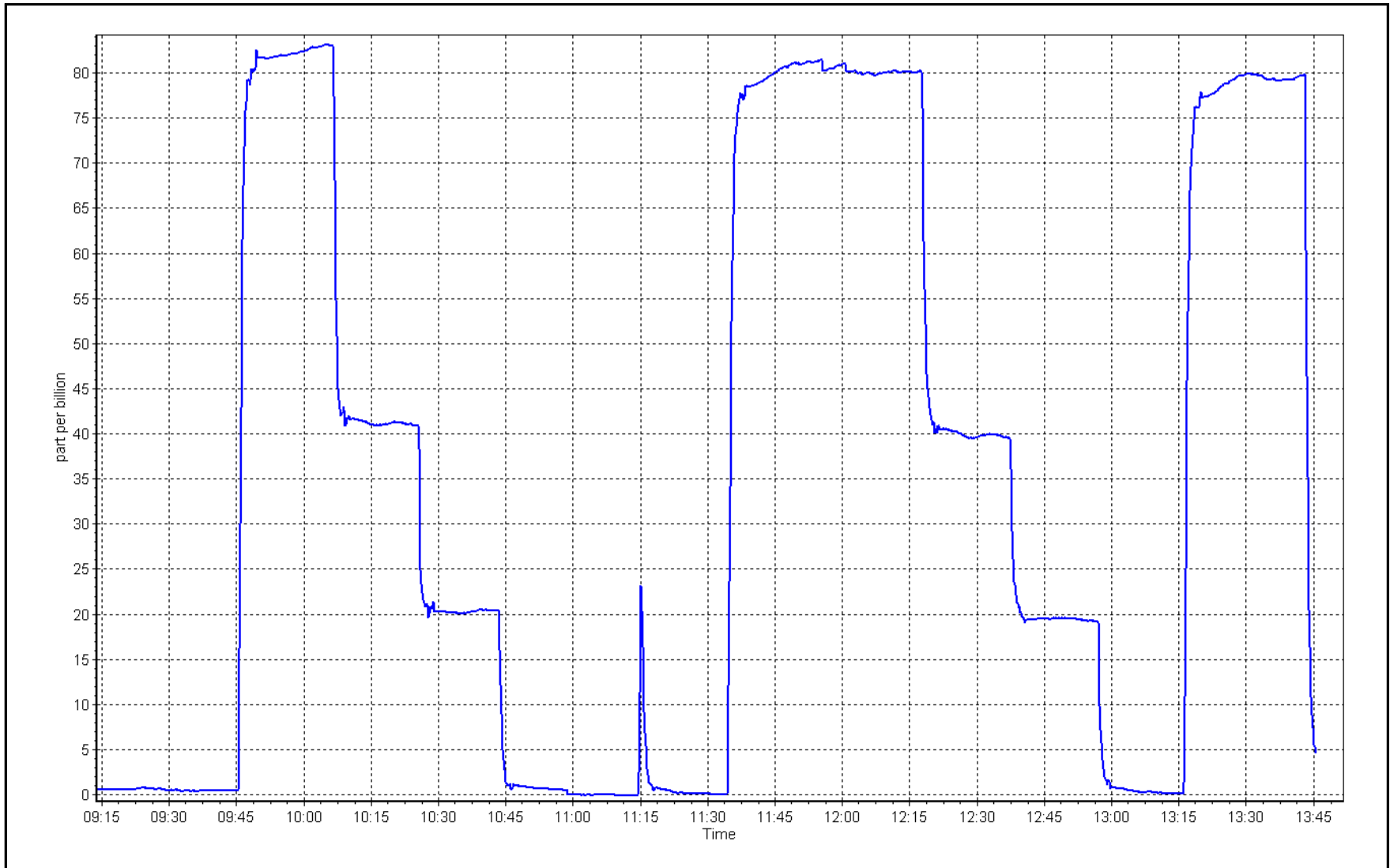
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999972  |             |
| 80.2                                | 80.1                               | 1.0009                    |                         |           | ≥0.995      |
| 40.0                                | 39.9                               | 1.0034                    | Slope                   | 1.000628  |             |
| 20.0                                | 19.6                               | 1.0212                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.177928 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 7, 2023

Location: Jackfish 2/3







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.7   | -0.9                                  | 0.2  | ----  | ----   |
| as found span             | 4921                      | 79.4                        | 816.8   | 800.3                                  | 16.5  | 810.0  | 798.9                                 | 11.5   | 1.0084  | 1.0017   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4921                      | 79.4                        | 816.8   | 800.3                                  | 16.5  | 814.0  | 799.2                                 | 14.7   | 1.0034  | 1.0014   |
| second point              | 4960                      | 39.7                        | 408.5   | 400.2                                  | 8.3   | 404.0  | 398.1                                 | 5.9  | 1.0110  | 1.0053   |
| third point               | 4980                      | 19.8                        | 203.7   | 199.6                                  | 4.1   | 197.0  | 195.2                                 | 1.8  | 1.0341  | 1.0225   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as left span              | 4921                      | 79.4                        | 816.8   | 403.7                                  | 414.2   | 812.1  | 399.0                                 | 413.1  | 1.0058  | 1.0118   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0162  | 1.0097   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 810.7 ppb | NO = 799.8 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -0.5% |                      |
| Previous Response    | NO <sub>x</sub> = 814.7 ppb | NO = 800.3 ppb |  | *Percent Change                  | NO = -0.1%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 801.0                                      | 403.3                                 | 414.2   | 410.0  | 1.0103   | 99.0%  |
| 2nd GPT point (200 ppb O3)       | 801.0                                      | 611.7                                 | 205.8   | 201.6  | 1.0209   | 98.0%  |
| 3rd GPT point (100 ppb O3)       | 801.0                                      | 712.0                                 | 105.5   | 102.6  | 1.0284   | 97.2%  |
| Average Correction Factor        |  |                                       |   |  | 1.0199   | 98.1%  |

Notes:

No adjustments made.

Calibration Performed By:

Denny Ray Estador



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

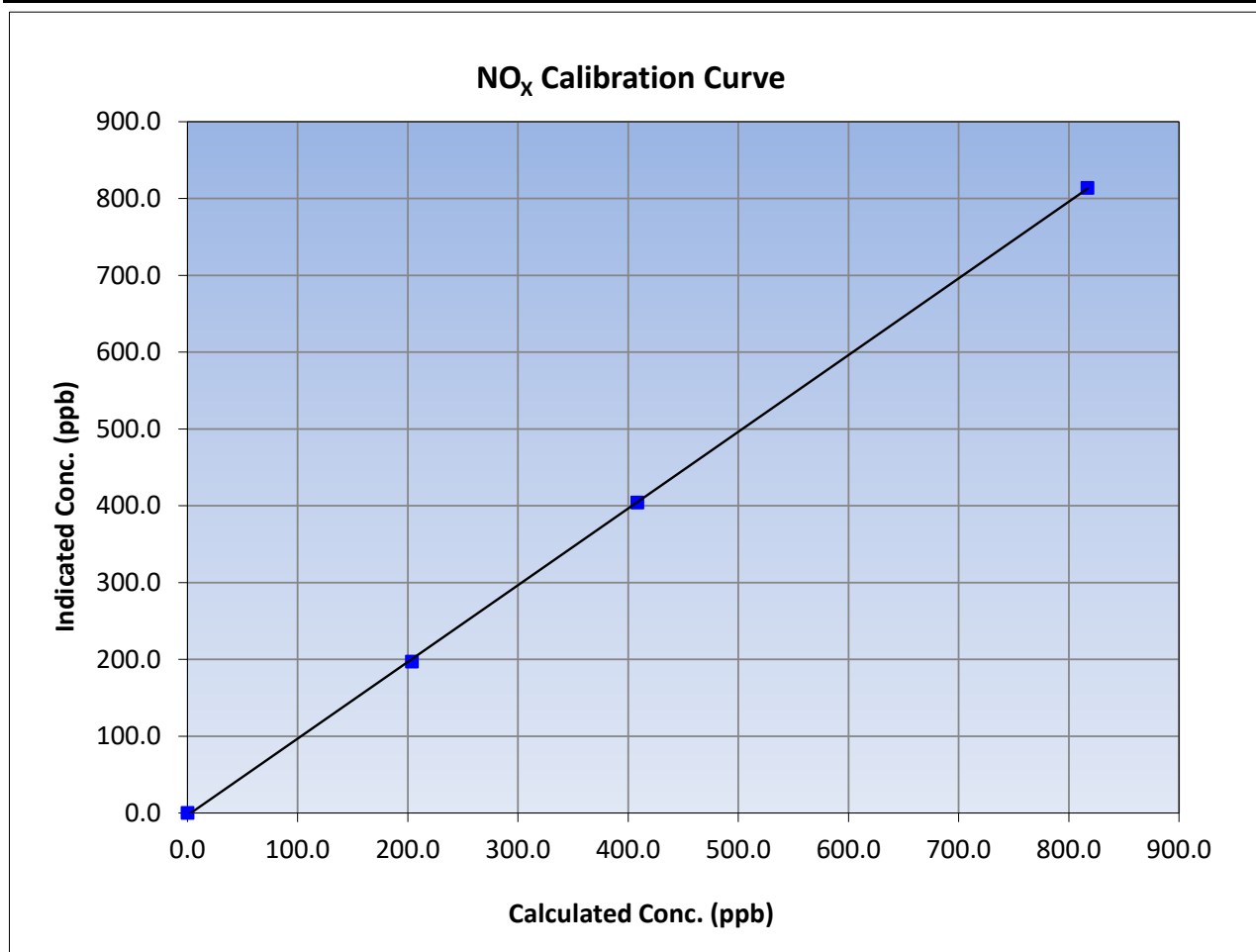
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Jackfish 2/3      | Station Number:       | AMS27            |
| Start Time (MST): | 9:27              | End Time (MST):       | 13:20            |
| Analyzer make:    | API T200          | Analyzer serial #:    | 4460             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 816.8                               | 814.0                              | 1.0034                    |   |                                |
| 408.5                               | 404.0                              | 1.0110                    |   |                                |
| 203.7                               | 197.0                              | 1.0341                    |   |                                |
|                                     |                                    |                           | 0.999936                                      |                                |
|                                     |                                    |                           | 0.998669                                      |                                |
|                                     |                                    |                           | -3.017307                                     |                                |







# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

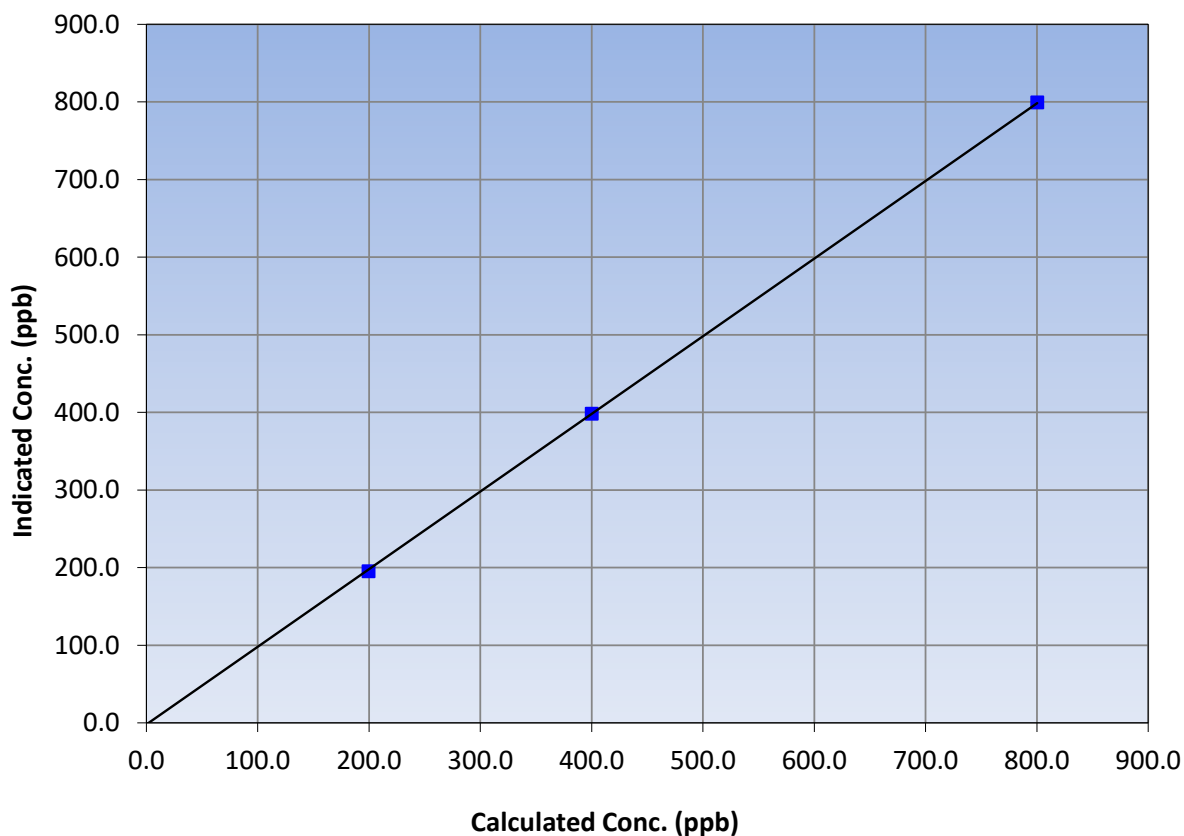
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Jackfish 2/3      | Station Number:       | AMS27            |
| Start Time (MST): | 9:27              | End Time (MST):       | 13:20            |
| Analyzer make:    | API T200          | Analyzer serial #:    | 4460             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995    |             |
| 800.3                               | 799.2                              | 1.0014                    |                         |           |             |
| 400.2                               | 398.1                              | 1.0053                    |                         |           |             |
| 199.6                               | 195.2                              | 1.0225                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 1.000287  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -2.020303 | +/-20       |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

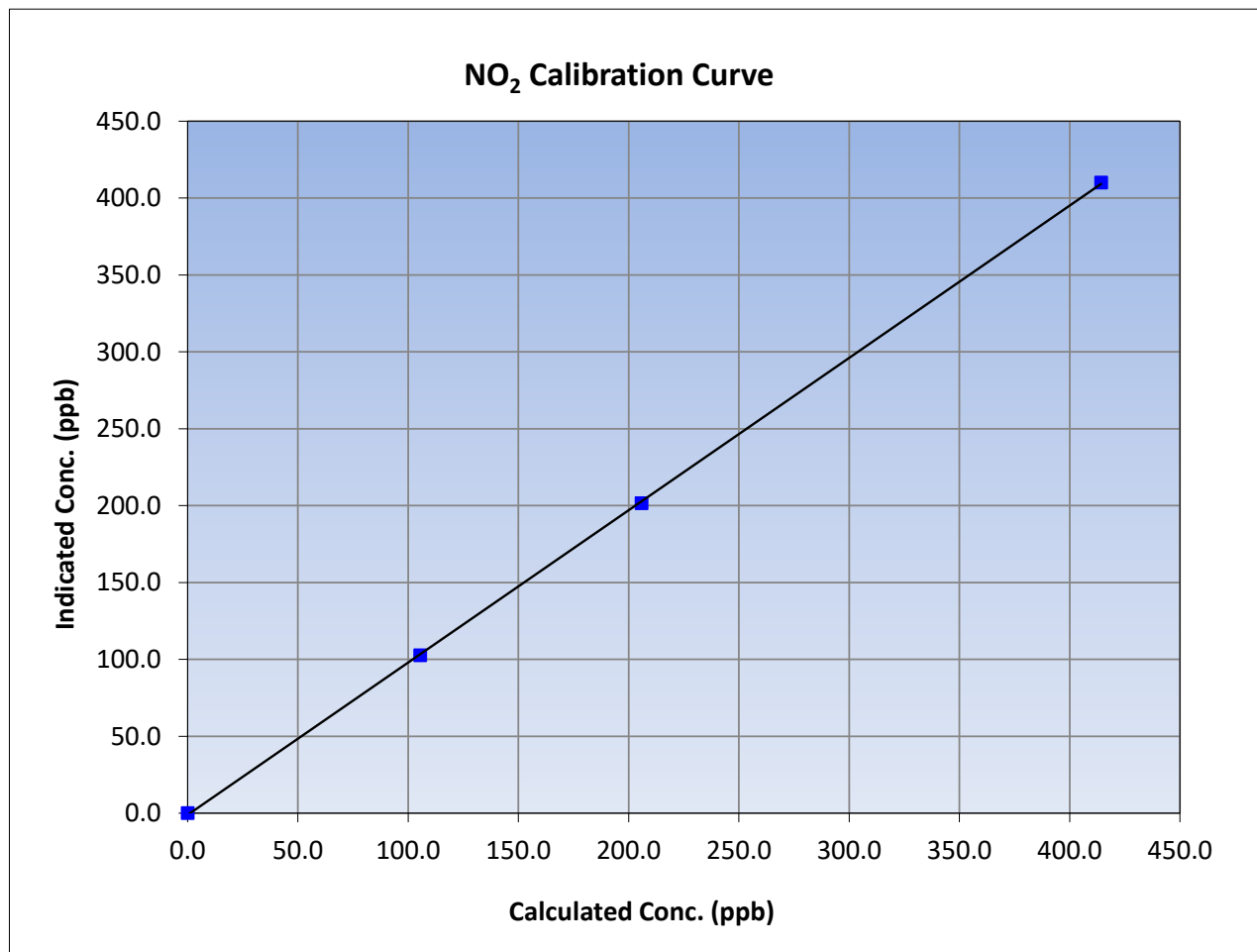
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 18, 2023 |
| Station Name:     | Jackfish 2/3      | Station Number:       | AMS27            |
| Start Time (MST): | 9:27              | End Time (MST):       | 13:20            |
| Analyzer make:    | API T200          | Analyzer serial #:    | 4460             |

### Calibration Data

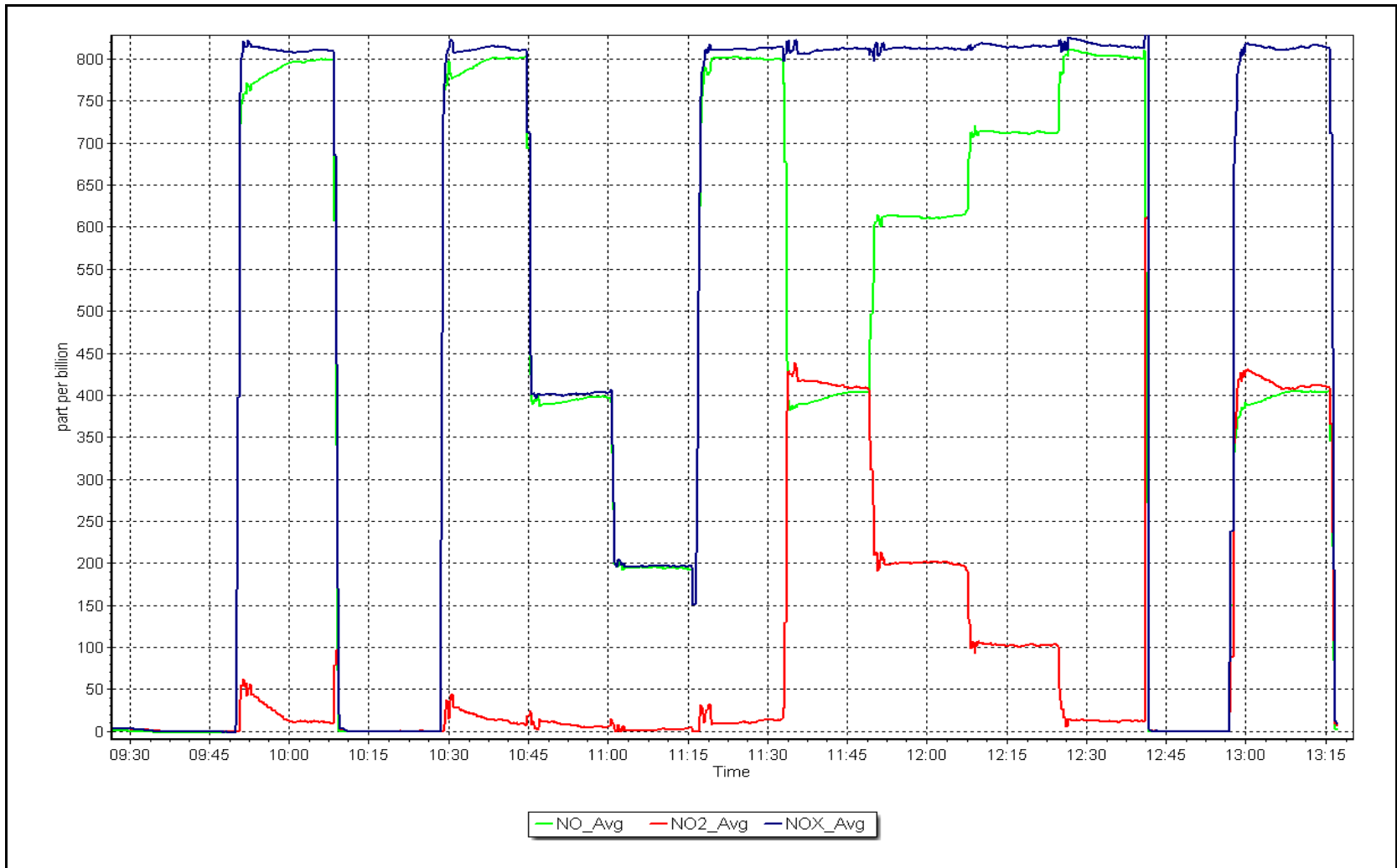
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 414.2                               | 410.0                              | 1.0103                    |                         |           |             |
| 205.8                               | 201.6                              | 1.0209                    |                         |           |             |
| 105.5                               | 102.6                              | 1.0284                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 0.990573  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.100427 | +/-20       |



NO<sub>x</sub> Calibration Plot

Date: February 22, 2023

Location: Jackfish 2/3





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS29 SURMONT 2 FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

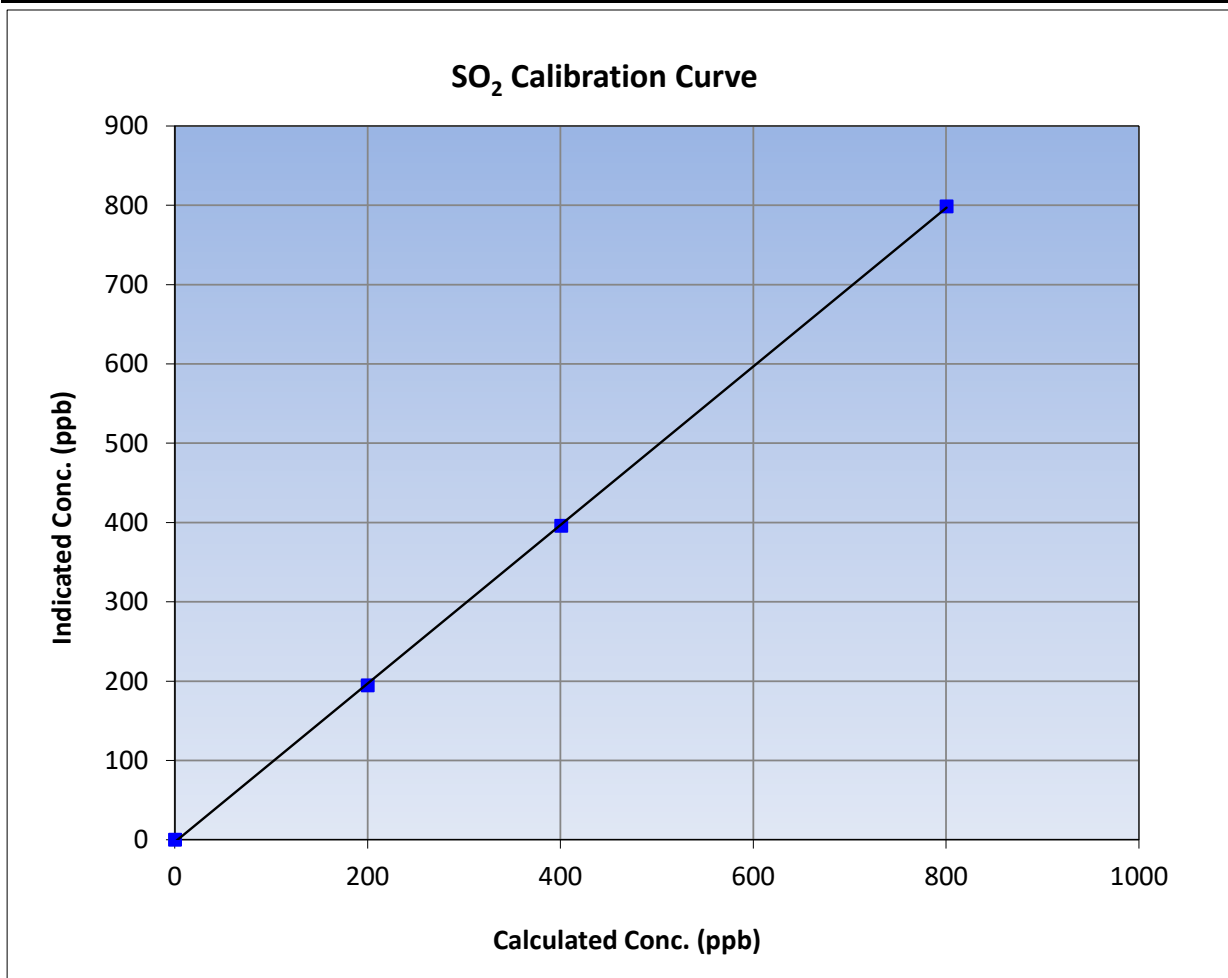
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 13:10             | End Time (MST):       | 17:09           |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1170050150      |

### Calibration Data

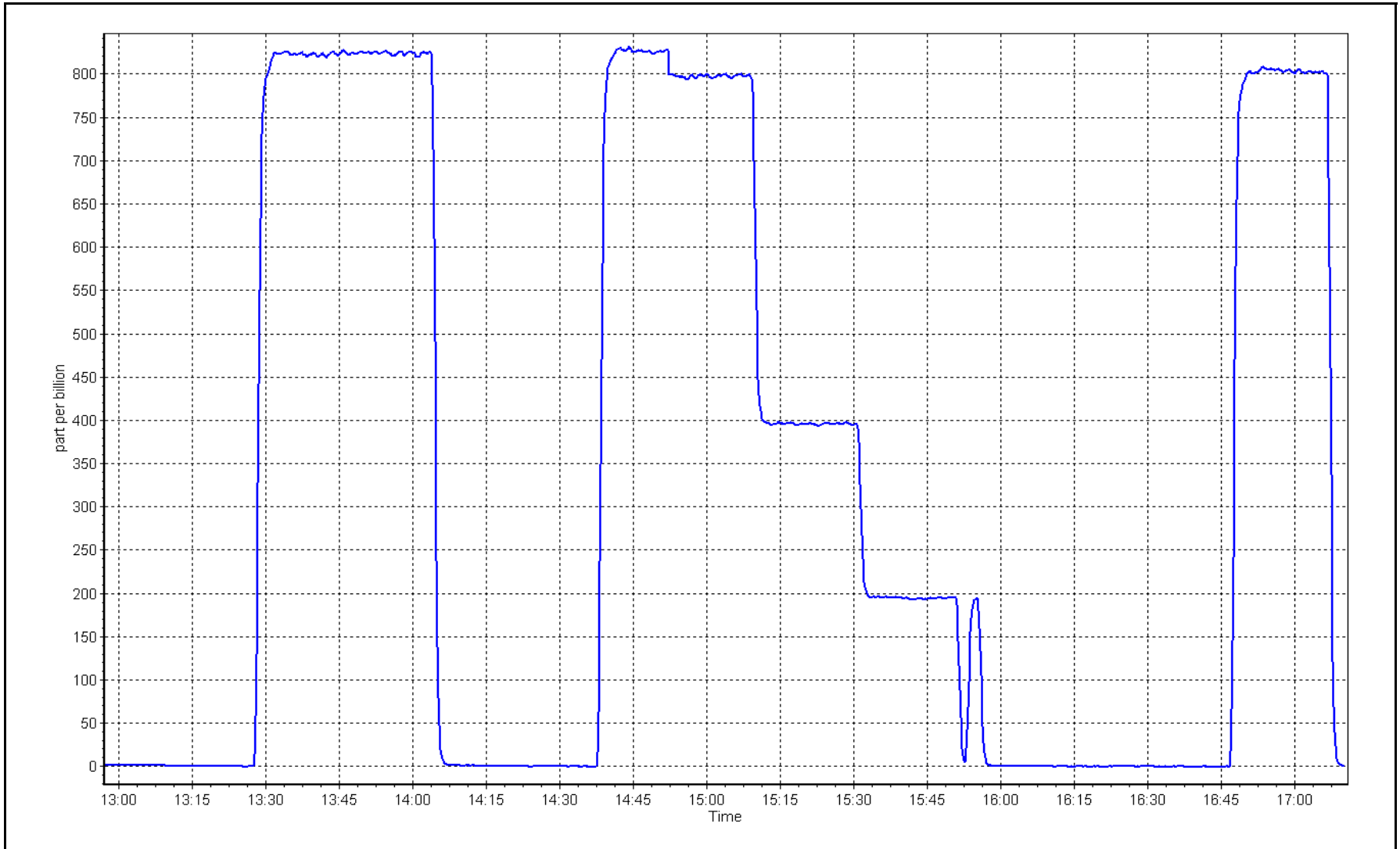
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | -0.2                                  | ----                         | Correlation Coefficient | 0.999944      | ≥0.995      |
| 800.1                                  | 798.2                                 | 1.0024                       |                         |               |             |
| 400.6                                  | 395.6                                 | 1.0126                       | Slope                   | 0.999443      | 0.90 - 1.10 |
| 199.8                                  | 194.2                                 | 1.0289                       |                         |               |             |
|  |                                       |                              | Intercept               | -2.985140     | +/-30       |



SO2 Calibration Plot

Date: February 16, 2023

Location: Surmont 2





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Surmont 2         | Station number: | AMS29           |
| Calibration Date: | February 13, 2023 | Last Cal Date:  | January 9, 2023 |
| Start time (MST): | 11:03             | End time (MST): | 15:54           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|                        |                   |     |                   |                 |
|------------------------|-------------------|-----|-------------------|-----------------|
| Cal Gas Concentration: | <u>5.391</u>      | ppm | Cal Gas Exp Date: | January 4, 2025 |
| Cal Gas Cylinder #:    | <u>CC508338</u>   |     |                   |                 |
| Removed Cal Gas Conc:  | <u>5.391</u>      | ppm | Rem Gas Exp Date: | NA              |
| Removed Gas Cyl #:     | <u>CC508338</u>   |     | Diff between cyl: |                 |
| Calibrator Make/Model: | Teledyne API T700 |     | Serial Number:    | 3808            |
| ZAG Make/Model:        | Teledyne API T701 |     | Serial Number:    | 4297            |

### Analyzer Information

|                 |             |                     |            |
|-----------------|-------------|---------------------|------------|
| Analyzer make:  | Thermo 450i | Analyzer serial #:  | 1170050142 |
| Converter make: | Internal    | Converter serial #: | NA         |
| Analyzer Range  | 0 - 100 ppb |                     |            |

|                        |              |               |                   |                  |
|------------------------|--------------|---------------|-------------------|------------------|
|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u>    |
| Calibration slope:     | 0.996612     | 0.994905      | Backgd or Offset: | 16.0      17.0   |
| Calibration intercept: | 0.177532     | -0.062658     | Coeff or Slope:   | 1.024      1.024 |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----   |
| as found span         | 4926                          | 74.2                        | 80.0                                | 81.7                               | 0.980  |
| as found 2nd point    | 4963                          | 37.2                        | 40.1                                | 41.2                               | 0.976  |
| as found 3rd point    | 4982                          | 18.6                        | 20.1                                | 20.5                               | 0.983  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----  |
| high point                              | 4926                          | 74.2                        | 80.0                                | 79.5                               | 1.006   |
| second point                            | 4963                          | 37.2                        | 40.1                                | 39.9                               | 1.005   |
| third point                             | 4982                          | 18.6                        | 20.1                                | 19.9                               | 1.008   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4926                          | 74.2                        | 80.0                                | 78.7                               | 1.017   |
| SO2 Scrubber Check                      | 4919                          | 81.3                        | 813.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | 15-Apr-21                     |                             |                                     | Ave Corr Factor                    | 1.006   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 81.6 | Prev response:  | 79.91    | *% change:    | 2.1%     |
| Baseline Corr 2nd AF pt: | 41.1 | AF Slope:       | 1.020479 | AF Intercept: | 0.116195 |
| Baseline Corr 3rd AF pt: | 20.4 | AF Correlation: | 0.999991 |               |          |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after MAF's. Conducted SO<sub>x</sub> scrubber check after calibrator zero. Adjusted zero.

Calibration Performed By: Braiden Boutilier





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

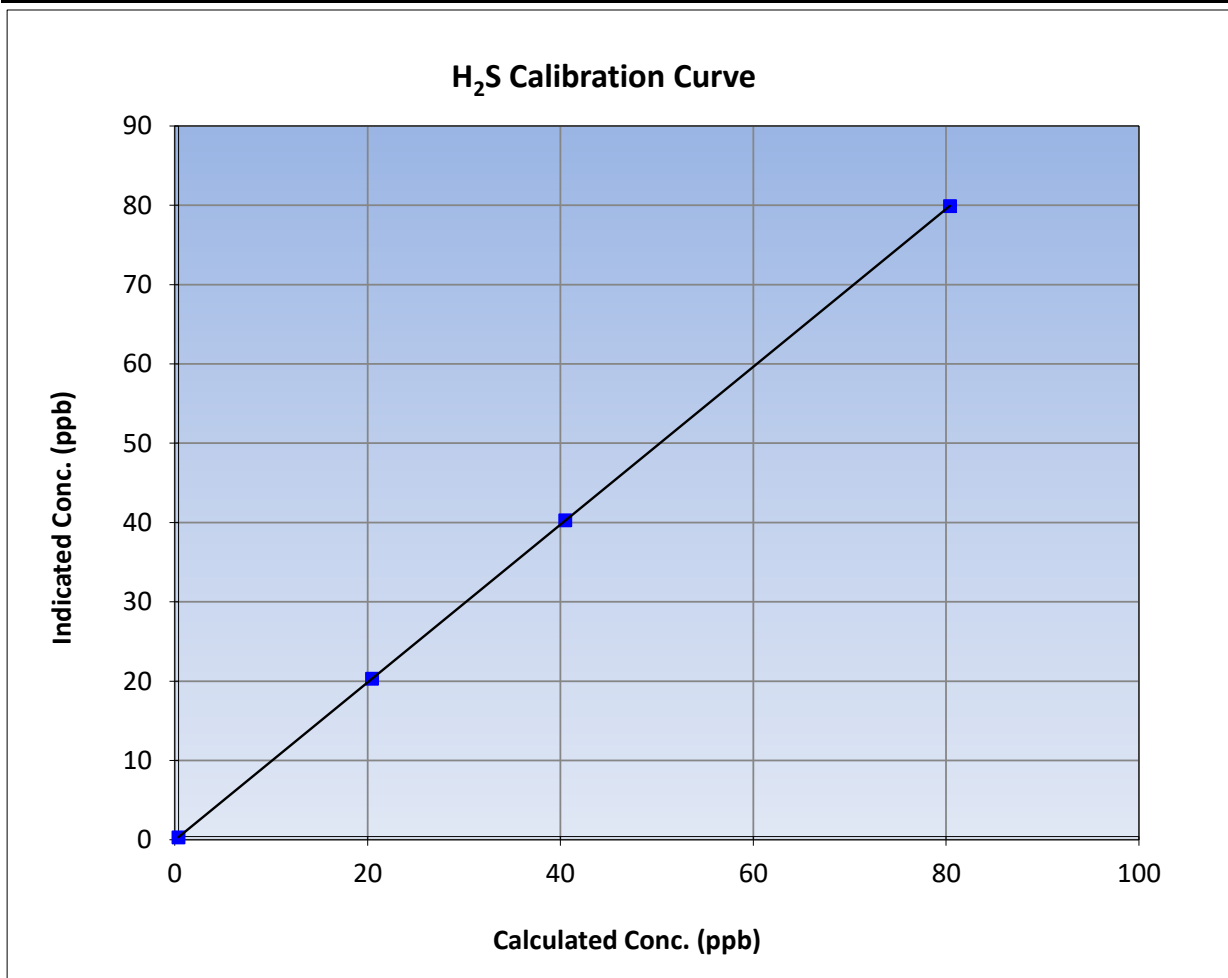
Version-11-2021

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | January 9, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 11:03             | End Time (MST):       | 15:54           |
| Analyzer make:    | Thermo 450i       | Analyzer serial #:    | 1170050142      |

### Calibration Data

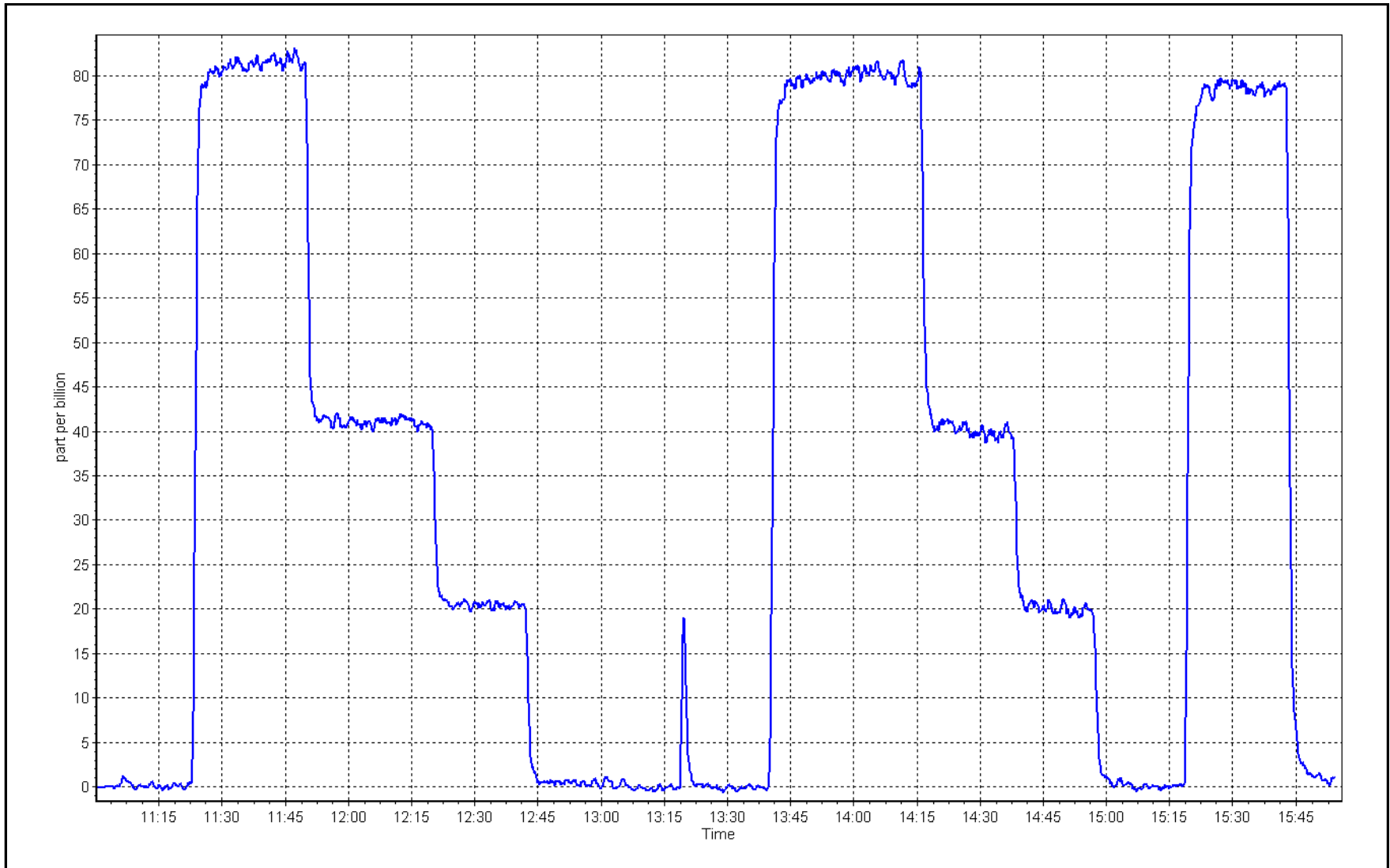
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999998  | ≥0.995      |
| 80.0                                | 79.5                               | 1.0063                    |                         |           |             |
| 40.1                                | 39.9                               | 1.0052                    | Slope                   | 0.994905  | 0.90 - 1.10 |
| 20.1                                | 19.9                               | 1.0077                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.062658 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 13, 2023

Location: Surmont 2





# Wood Buffalo Environmental Association

## THC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Surmont 2         | Station number: | AMS29           |
| Calibration Date: | February 16, 2023 | Last Cal Date:  | January 3, 2023 |
| Start time (MST): | 13:10             | End time (MST): | 17:09           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|                        |                   |                      |                   |
|------------------------|-------------------|----------------------|-------------------|
| Gas Cert Reference:    | CC356008          | Cal Gas Expiry Date: | February 23, 2025 |
| CH4 Cal Gas Conc.      | <u>499.0</u> ppm  | CH4 Equiv Conc.      | 1064.7 ppm        |
| C3H8 Cal Gas Conc.     | <u>205.7</u> ppm  |                      |                   |
| Removed Gas Cert:      | NA                | Removed Gas Expiry:  | NA                |
| Removed CH4 Conc.      | <u>499.0</u> ppm  | CH4 Equiv Conc.      | 1064.7 ppm        |
| Removed C3H8 Conc.     | <u>205.7</u> ppm  | Diff between cyl:    |                   |
| Calibrator Make/Model: | Teledyne API T700 | Serial Number:       | 5258              |
| ZAG Make/Model:        | Teledyne API T701 | Serial Number:       | 4297              |

### Analyzer Information

Analyzer make: Thermo 51i-LT                      Analyzer serial #: 1170050149  
 Analyzer Range: 0 - 20 ppm

|                        |              |               |              |              |               |
|------------------------|--------------|---------------|--------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |              | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 0.999326     | 0.995950      | Background:  | 4.510        | 4.36          |
| Calibration intercept: | -0.002444    | 0.026135      | Coefficient: | 5.288        | 5.223         |

### THC Calibration Data

| Set Point                 | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| as found zero             | 5000                          | 0.0                         | 0.00                                | -0.13                              | ----  |
| as found span             | 4918                          | 81.3                        | 17.31                               | 17.35                              | 0.998   |
| as found 2nd point        |                               |                             |                                     |                                    |   |
| as found 3rd point        |                               |                             |                                     |                                    |   |
| new cylinder response     |                               |                             |                                     |                                    |   |
| calibrator zero           | 5000                          | 0.0                         | 0.00                                | 0.09                               | ----  |
| high point                | 4918                          | 81.3                        | 17.31                               | 17.30                              | 1.001   |
| second point              | 4959                          | 40.7                        | 8.67                                | 8.63                               | 1.004   |
| third point               | 4979                          | 20.3                        | 4.32                                | 4.27                               | 1.013   |
| as left zero              | 5000                          | 0.0                         | 0.00                                | 0.08                               | ----  |
| as left span              | 4918                          | 81.3                        | 17.31                               | 17.44                              | 0.993   |
| Average Correction Factor |                               |                             |                                     |                                    | 1.006   |
| Baseline Corr As found:   | 17.48                         | Previous response           | 17.30                               | *% change                          | 1.0%  |
| Baseline Corr 2nd AF pt:  | NA                            | AF Slope:                   |                                     | AF Intercept:                      |   |
| Baseline Corr 3rd AF pt:  | NA                            | AF Correlation:             |                                     |                                    |   |

\* = > +/-5% change initiates investigation

Notes:                                      Changed sample inlet filter after as founds. Adjusted zero and span.

Calibration Performed By:              Braiden Boutilier



# Wood Buffalo Environmental Association

## THC Calibration Summary

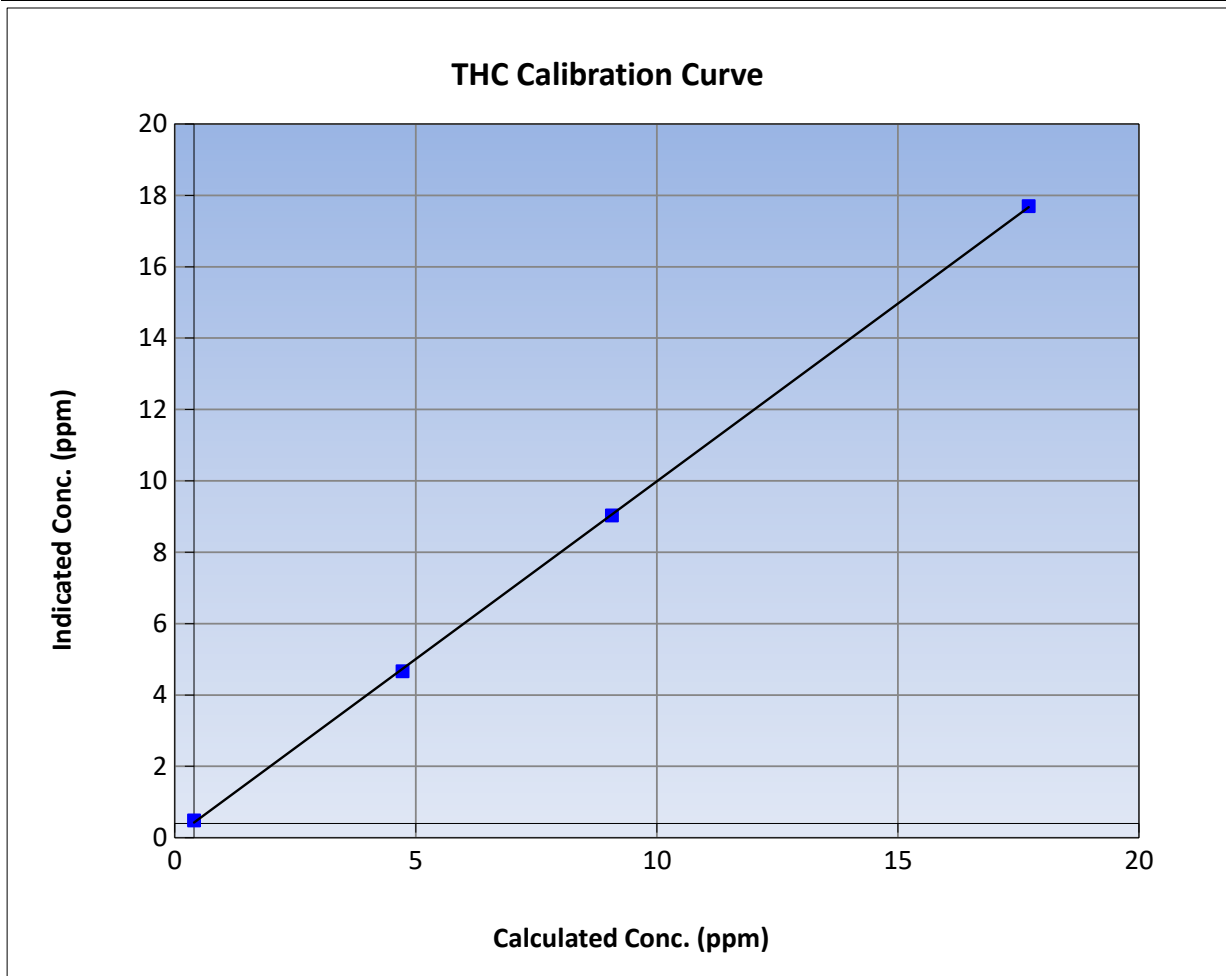
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 16, 2023 | Previous Calibration: | January 3, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 13:10             | End Time (MST):       | 17:09           |
| Analyzer make:    | Thermo 51i-LT     | Analyzer serial #:    | 1170050149      |

### Calibration Data

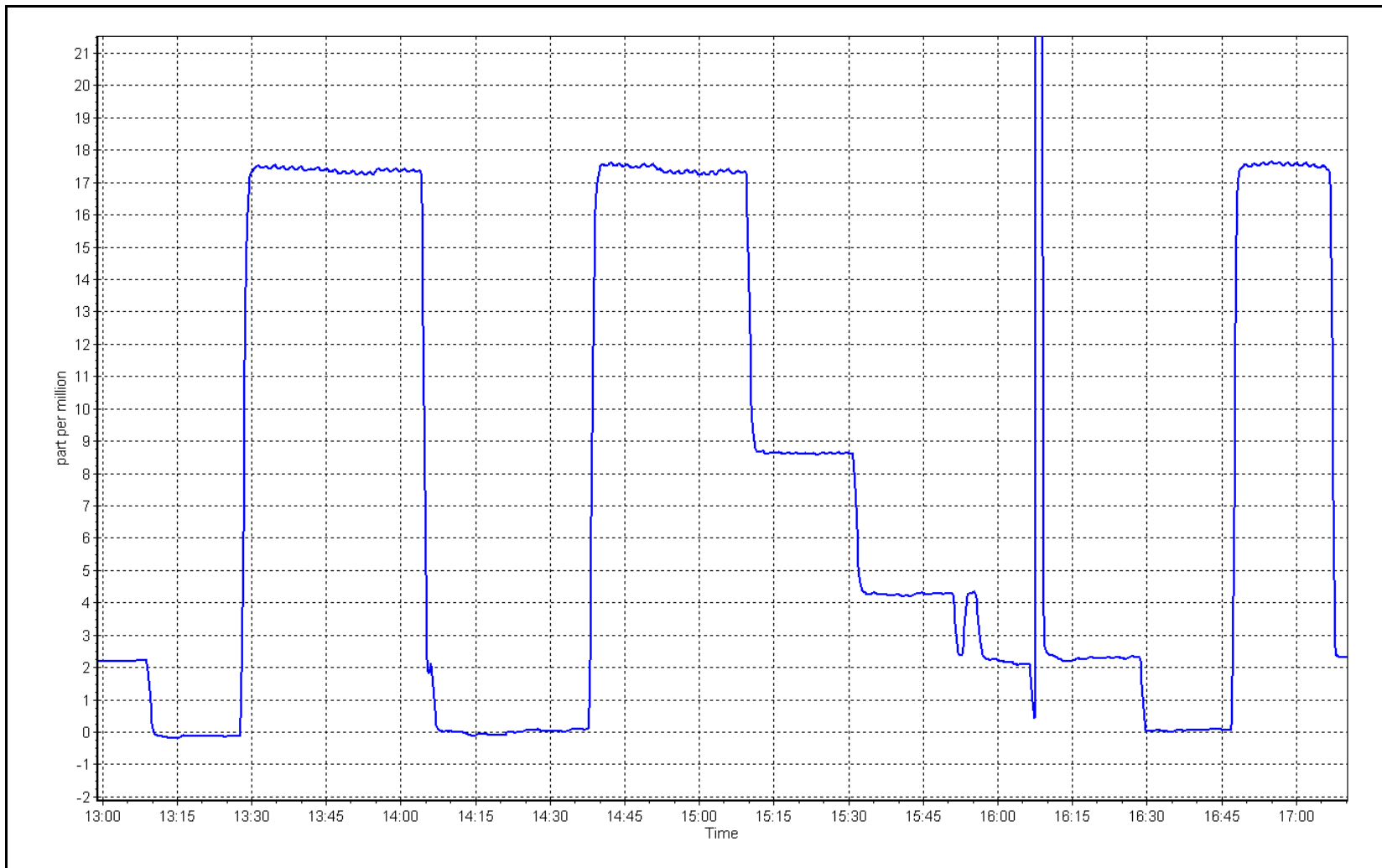
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.00                                | 0.09                               | ----                      | Correlation Coefficient | 0.999941 | ≥0.995      |
| 17.31                               | 17.30                              | 1.0008                    |                         |          |             |
| 8.67                                | 8.63                               | 1.0043                    | Slope                   | 0.995950 | 0.90 - 1.10 |
| 4.32                                | 4.27                               | 1.0129                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.026135 | +/-1.5      |



THC Calibration Plot

Date: February 16, 2023

Location: Surmont 2







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point       | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero   | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span   | 4916                      | 84.2                        | 799.2   | 799.2                                  | 0.0   | 848.0  | 849.0                                 | -0.6   | 0.9424  | 0.9413   |
| as found 2nd    |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd    |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp    |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero |                           |                             |   |  |   |  |                                       |  |   |  |
| high point      |                           |                             |   |  |   |  |                                       |  |   |  |
| second point    |                           |                             |   |  |   |  |                                       |  |   |  |
| third point     |                           |                             |   |  |   |  |                                       |  |   |  |
| as left zero    | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as left span    | 4916                      | 84.2                        | 799.2   |  |   | 842.0  | 429.1                                 | 413.1  | 0.9492  |  |

#### Average Correction Factor

|                      |                             |                |  |                                  |                     |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|---------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 848.2 ppb | NO = 849.2 ppb | <i>* = &gt; +/-5% change initiates investigation</i> |                                  | *Percent Change     | NO <sub>x</sub> = 5.8% |
| Previous Response    | NO <sub>x</sub> = 798.7 ppb | NO = 799.2 ppb |  |                                  | *Percent Change     | NO = 5.9%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:              | Nx Int:                |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found   | NO r <sup>2</sup> :              | NO SI:              | NO Int:                |
|                      |                             |                | As found   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI: | NO <sub>2</sub> Int:   |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |
| 2nd GPT point (200 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |
| 3rd GPT point (100 ppb O <sub>3</sub> )       |  |                                       |   |  |  |  |

#### Average Correction Factor

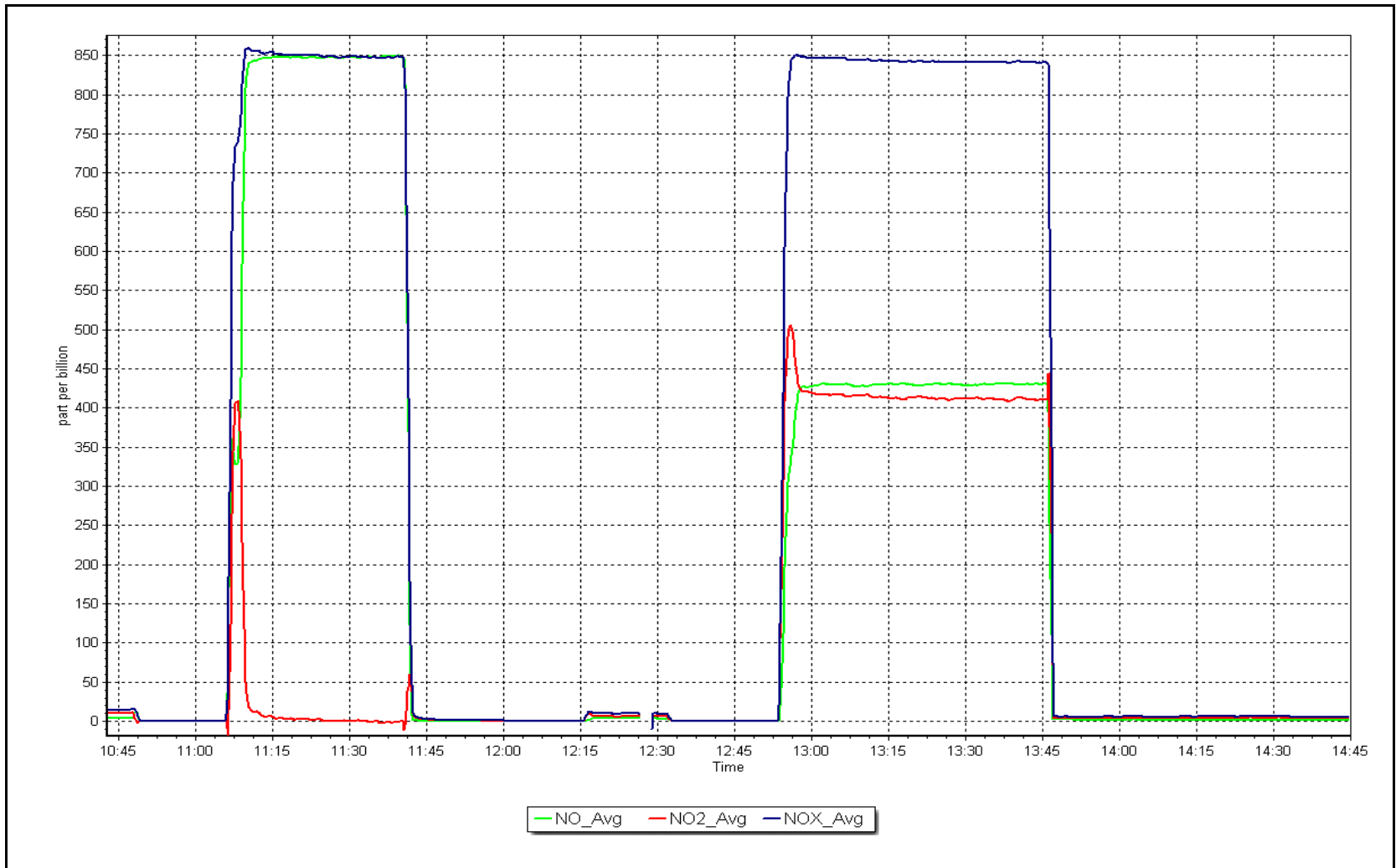
Notes: Attempted calibration after changing the dilution calibrator. A portable calibrator will be brought to verify readings before making any large adjustments. Only as founds, GPTPS points and as lefts done.

Calibration Performed By: Braiden Boutilier

NO<sub>x</sub> Calibration Plot

Date: February 17, 2023

Location: Surmont 2









# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4916                      | 84.2                        | 799.2   | 799.2                                  | 0.0   | 861.0  | 861.0                                 | 0.3  | 0.9282  | 0.9282   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.0  | ----  | ----   |
| high point                | 4916                      | 84.2                        | 799.2   | 799.2                                  | 0.0   | 799.6  | 799.1                                 | 0.5  | 0.9995  | 1.0001   |
| second point              | 4958                      | 42.1                        | 399.6   | 399.6                                  | 0.0   | 400.6  | 399.0                                 | 1.6  | 0.9975  | 1.0015   |
| third point               | 4979                      | 21.1                        | 200.3   | 200.3                                  | 0.0   | 200.8  | 199.2                                 | 1.6  | 0.9974  | 1.0054   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.1   | -0.1                                  | 0.0  | ----  | ----   |
| as left span              | 4916                      | 84.2                        | 799.2   | 414.6                                  | 384.6   | 797.5  | 395.4                                 | 402.1  | 1.0021  | 1.0485   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 0.9981  | 1.0023   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 861.2 ppb | NO = 861.2 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 7.3% |
| Previous Response    | NO <sub>x</sub> = 798.7 ppb | NO = 799.2 ppb |  | *Percent Change                  | NO = 7.2%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 793.3                                      | 408.7                                 | 384.6   | 387.8  | 0.9917   | 100.8%   |
| 2nd GPT point (200 ppb O3)       | 793.3                                      | 606.2                                 | 187.1   | 191.4  | 0.9775   | 102.3%   |
| 3rd GPT point (100 ppb O3)       | 793.3                                      | 697.7                                 | 95.6  | 98.7   | 0.9686   | 103.2%   |
| Average Correction Factor        |  |                                       |   |  | 0.9793   | 102.1%   |

Notes: Calibration done with a portable calibrator and ZAG as the new calibrator installed this month has high readings compared to the old calibrator. Adjusted span.

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

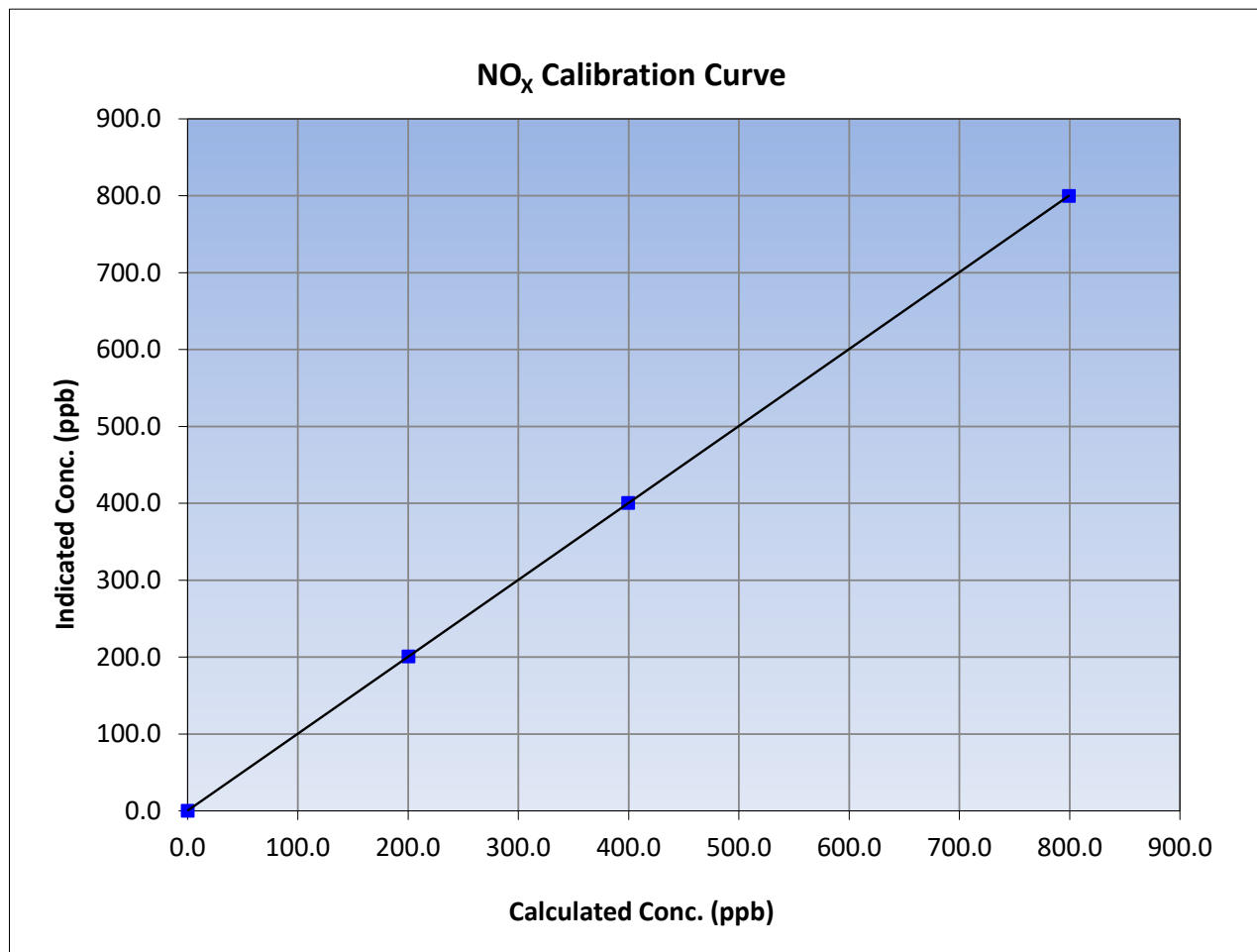
Version-04-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 1, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 11:23             | End Time (MST):       | 16:18           |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1170050148      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.2                               | 799.6                              | 0.9995                    |   |                                |
| 399.6                               | 400.6                              | 0.9975                    |   |                                |
| 200.3                               | 200.8                              | 0.9974                    |   |                                |
|                                     |                                    |                           | 0.999999                                      |                                |
|                                     |                                    |                           | 1.000440                                      |                                |
|                                     |                                    |                           | 0.326827                                      |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

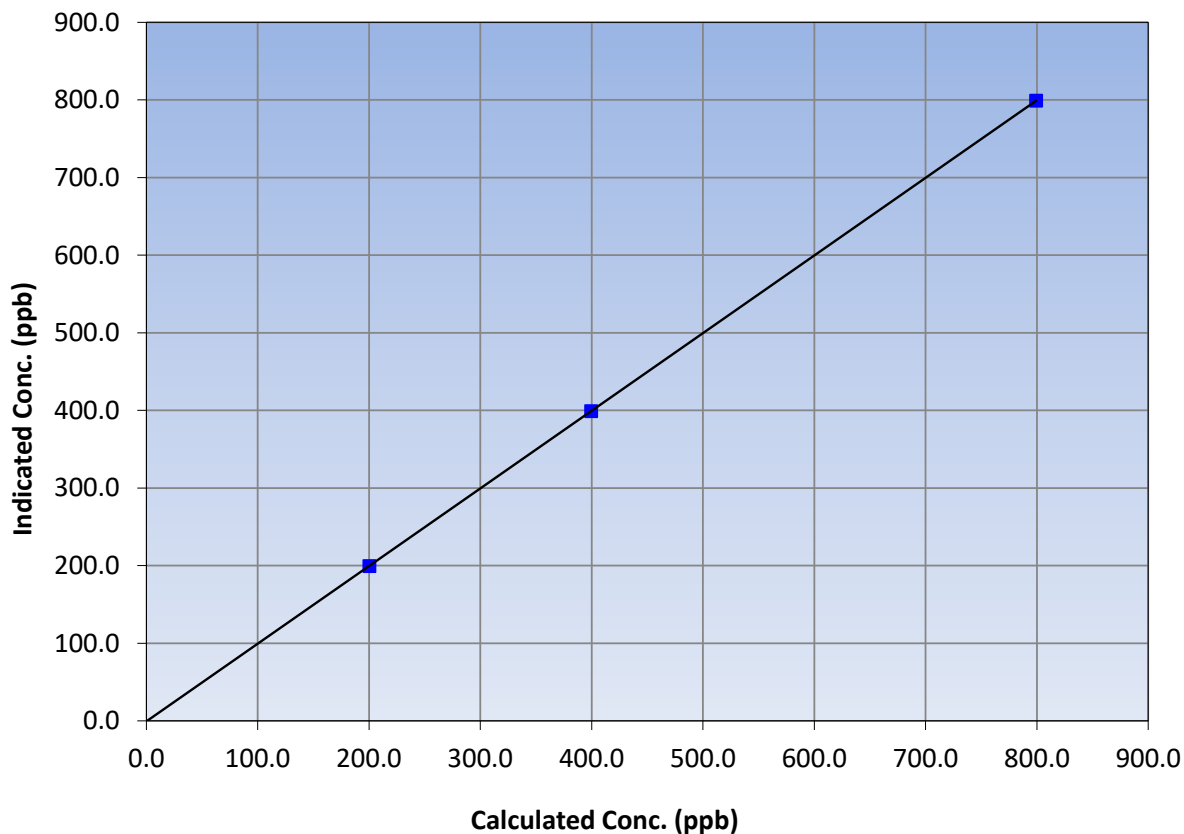
### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 1, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 11:23             | End Time (MST):       | 16:18           |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1170050148      |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | 0.999998  | ≥0.995      |
| 799.2                               | 799.1                              | 1.0001                    |                         |           |             |
| 399.6                               | 399.0                              | 1.0015                    | Slope                   | 1.000353  | 0.90 - 1.10 |
| 200.3                               | 199.2                              | 1.0054                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -0.592834 | +/-20       |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

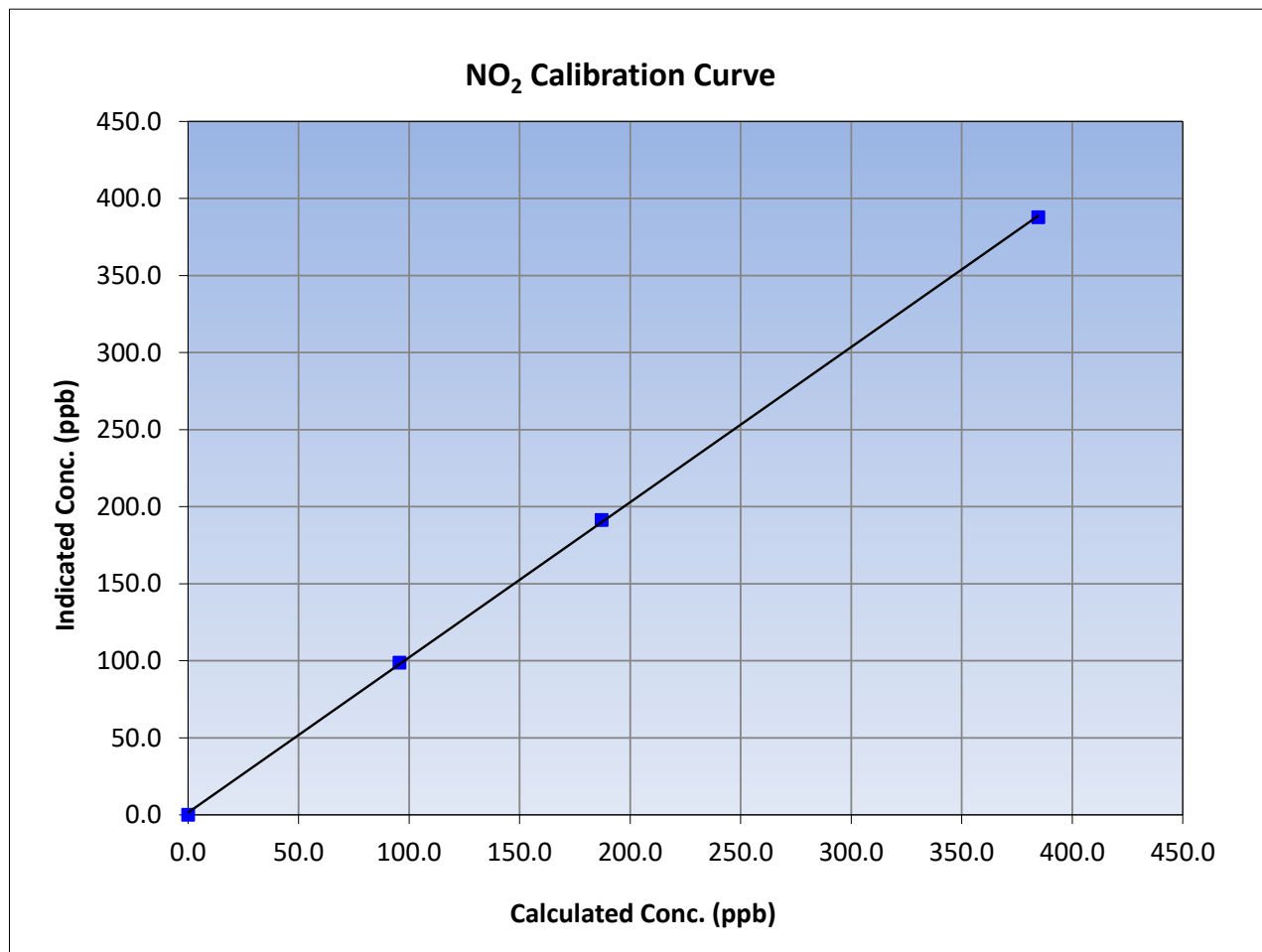
Version-04-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 22, 2023 | Previous Calibration: | January 1, 2023 |
| Station Name:     | Surmont 2         | Station Number:       | AMS29           |
| Start Time (MST): | 11:23             | End Time (MST):       | 16:18           |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1170050148      |

### Calibration Data

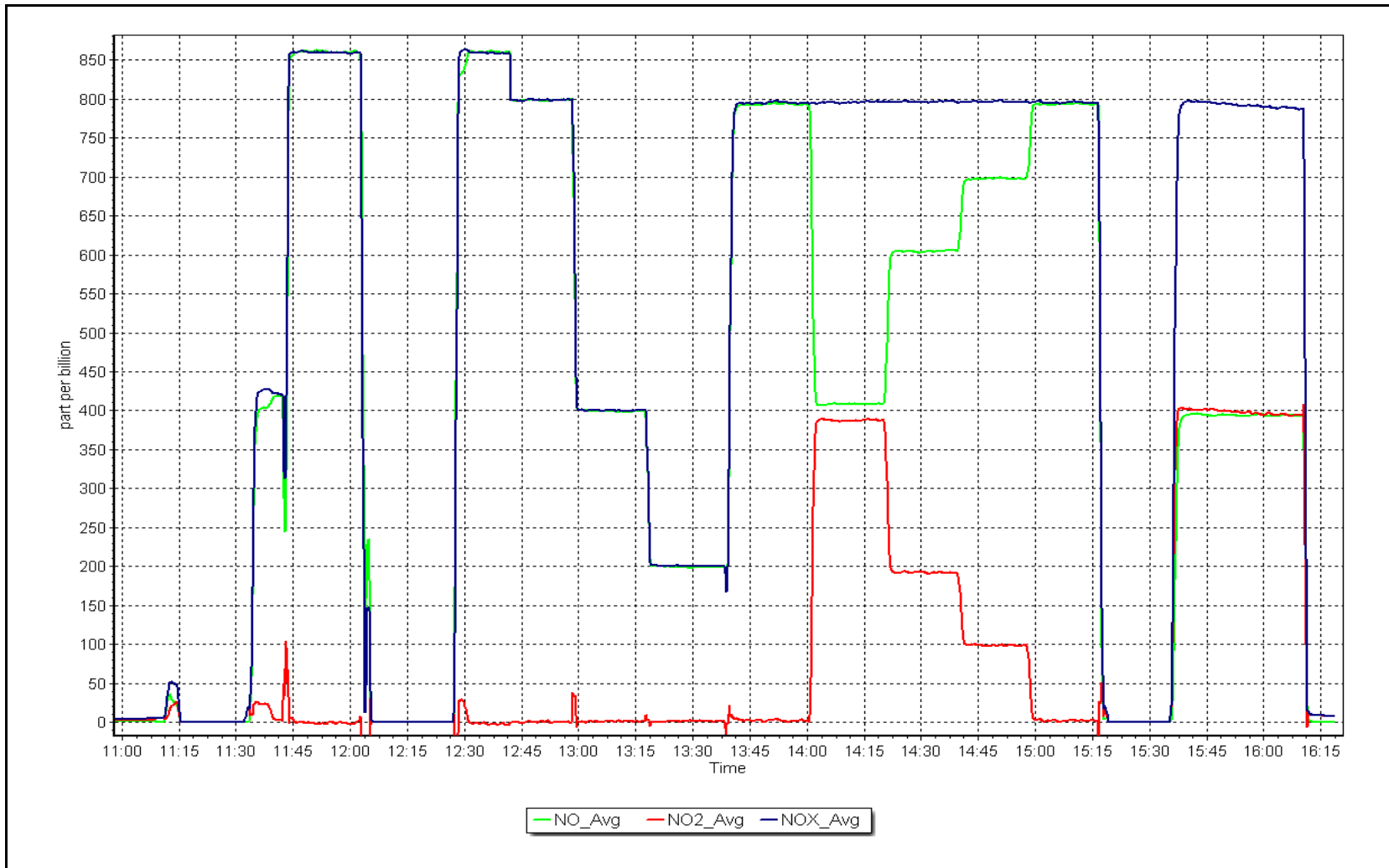
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 384.6                               | 387.8                              | 0.9917                    |   |                                |
| 187.1                               | 191.4                              | 0.9775                    |   |                                |
| 95.6                                | 98.7                               | 0.9686                    |   |                                |



NO<sub>x</sub> Calibration Plot

Date: February 22, 2023

Location: Surmont 2







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

### **AMS30 ELLS RIVER FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023







# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

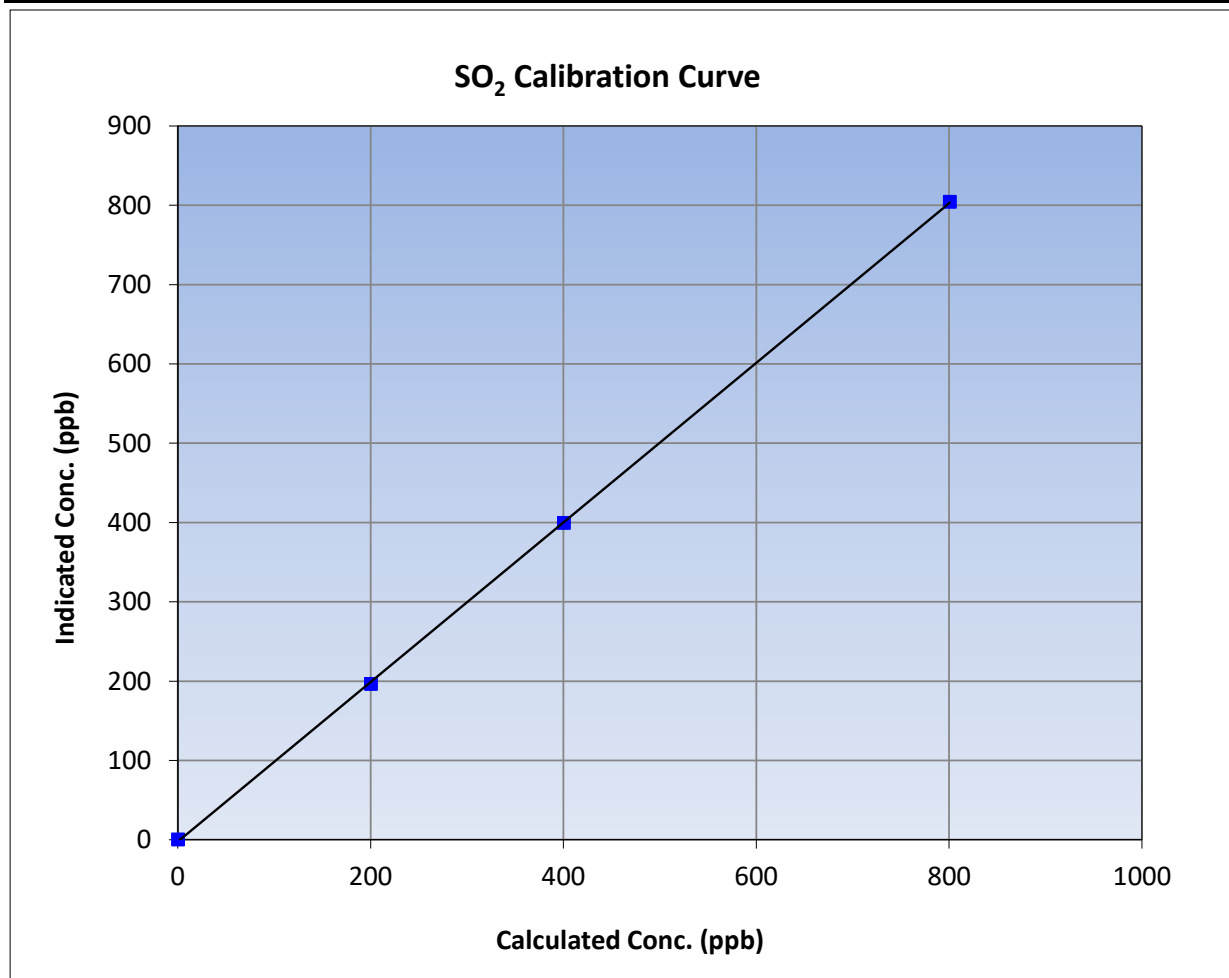
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 10, 2023 |
| Station Name:     | Ells River        | Station Number:       | AMS 30           |
| Start Time (MST): | 9:56              | End Time (MST):       | 12:50            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1008841397       |

### Calibration Data

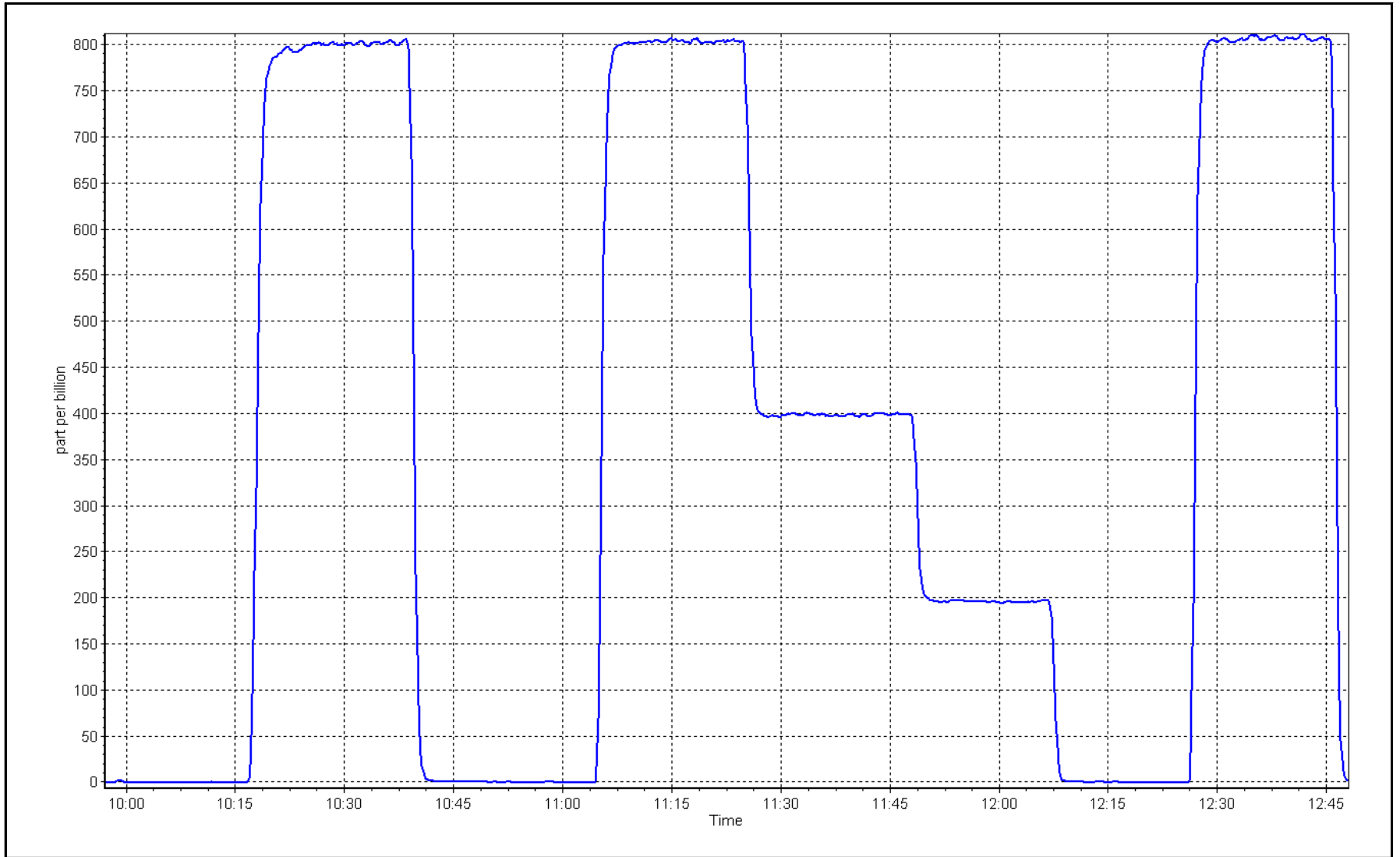
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|--|---------------------------------------|------------------------------|-------------------------|---------------|-------------|
| 0.0                                    | 0.0                                   | ----                         | Correlation Coefficient | 0.999958      |             |
| 800.4                                  | 804.0                                 | 0.9955                       |                         |               | ≥0.995      |
| 400.2                                  | 399.3                                 | 1.0023                       | Slope                   | 1.006172      |             |
| 200.1                                  | 196.3                                 | 1.0194                       |                         |               | 0.90 - 1.10 |
|  |                                       |                              | Intercept               | -2.436019     | +/-30       |



SO2 Calibration Plot

Date: February 15, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## TRS Calibration Report

Version-11-2021

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Ells River        | Station number: | AMS30           |
| Calibration Date: | February 13, 2023 | Last Cal Date:  | January 5, 2023 |
| Start time (MST): | 10:37             | End time (MST): | 14:43           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|                        |           |     |                   |                  |
|------------------------|-----------|-----|-------------------|------------------|
| Cal Gas Concentration: | 5.08      | ppm | Cal Gas Exp Date: | February 9, 2024 |
| Cal Gas Cylinder #:    | EY0002443 |     |                   |                  |
| Removed Cal Gas Conc:  | 5.08      | ppm | Rem Gas Exp Date: |                  |
| Removed Gas Cyl #:     |           |     | Diff between cyl: |                  |
| Calibrator Make/Model: | API T700  |     | Serial Number:    | 3061             |
| ZAG Make/Model:        | API T701H |     | Serial Number:    | 358              |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i TLE | Analyzer serial #:  | 1410661331 |
| Converter make: | CDN - 101      | Converter serial #: | 555        |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
| Calibration slope:     | 1.029508     | 0.999493      | Backgd or Offset: | 1.59         | 1.57          |
| Calibration intercept: | 0.140267     | 0.040843      | Coeff or Slope:   | 1.123        | 1.092         |

### TRS As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----   |
| as found span         | 4921                          | 78.7                        | 80.0                                | 81.5                               | 0.981  |
| as found 2nd point    | 4961                          | 39.4                        | 40.0                                | 40.6                               | 0.986  |
| as found 3rd point    | 4980                          | 19.7                        | 20.0                                | 20.1                               | 0.996  |
| new cylinder response |                               |                             |                                     |                                    |  |

### TRS Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4921                          | 78.7                        | 80.0                                | 80.0                               | 1.000   |
| second point                            | 4961                          | 39.4                        | 40.0                                | 40.0                               | 1.001   |
| third point                             | 4980                          | 19.7                        | 20.0                                | 20.0                               | 1.001   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| as left span                            | 4921                          | 78.7                        | 80.0                                | 80.0                               | 1.000   |
| SO2 Scrubber Check                      | 4921                          | 79.2                        | 800.4                               | -0.1                               | ----  |
| Date of last scrubber change:           | N/A                           |                             | Ave Corr Factor                     |                                    | 1.000   |
| Date of last converter efficiency test: | N/A                           |                             | 95.1% efficiency                    |                                    |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 81.5 | Prev response:  | 82.46    | *% change:    | -1.2%     |
| Baseline Corr 2nd AF pt: | 40.6 | AF Slope:       | 1.020216 | AF Intercept: | -0.159513 |
| Baseline Corr 3rd AF pt: | 20.1 | AF Correlation: | 0.999983 |               |           |

\* = > +/-5% change initiates investigation

Notes: Adjusted the span only.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## TRS Calibration Summary

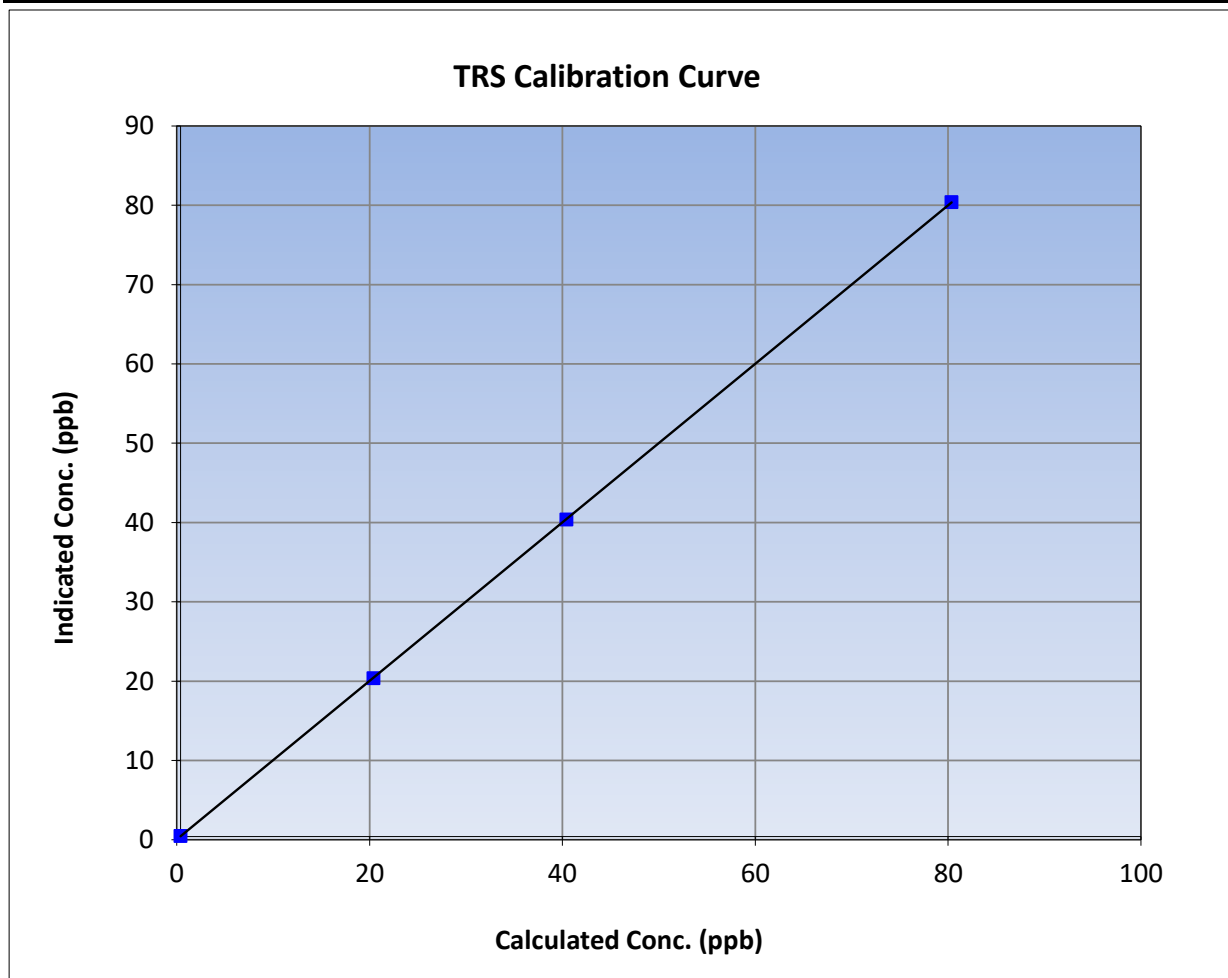
Version-11-2021

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | January 5, 2023 |
| Station Name:     | Ells River        | Station Number:       | AMS30           |
| Start Time (MST): | 10:37             | End Time (MST):       | 14:43           |
| Analyzer make:    | Thermo 43i TLE    | Analyzer serial #:    | 1410661331      |

### Calibration Data

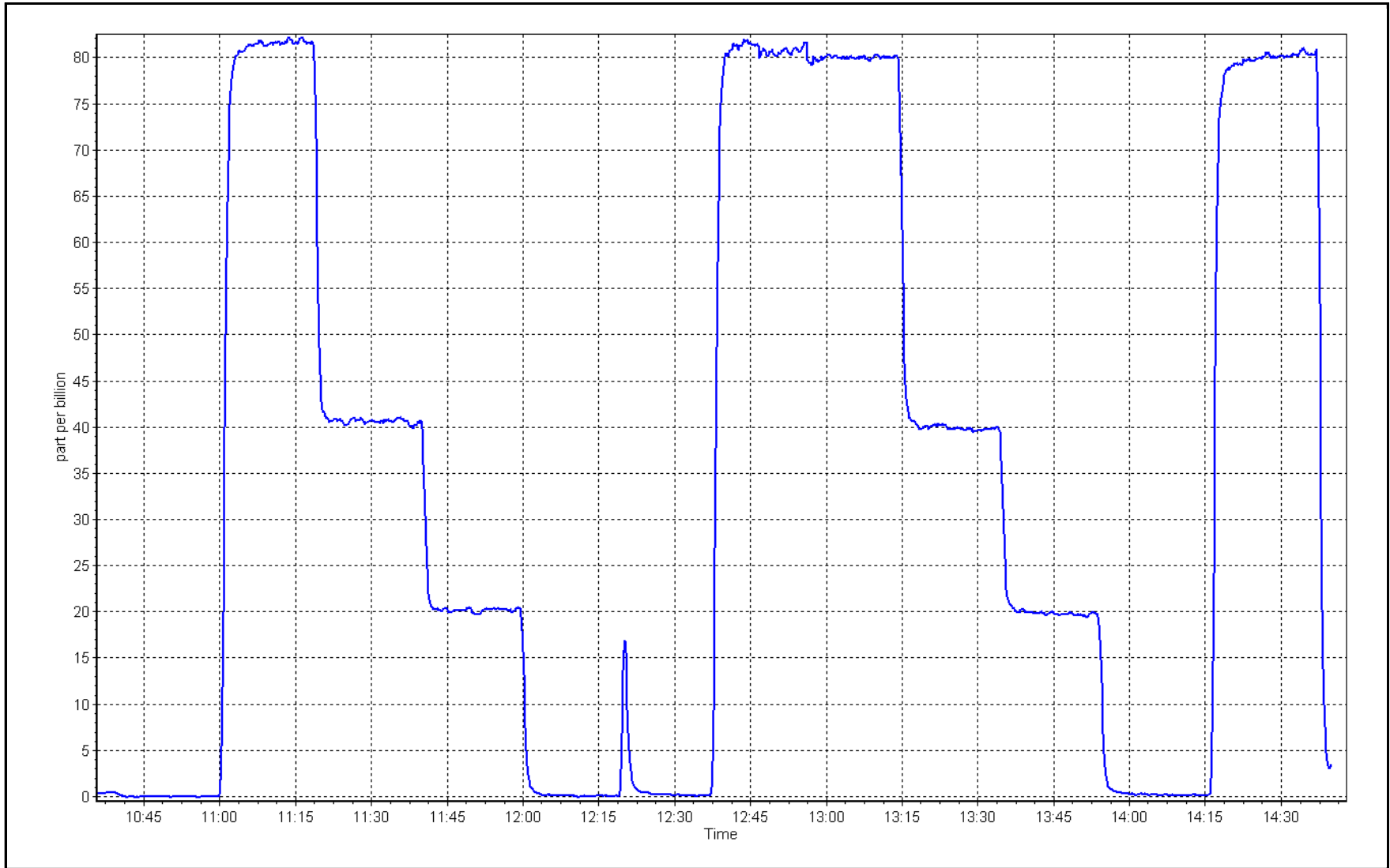
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | 0.999997 | ≥0.995      |
| 80.0                                | 80.0                               | 0.9995                    |                         |          |             |
| 40.0                                | 40.0                               | 1.0007                    | Slope                   | 0.999493 | 0.90 - 1.10 |
| 20.0                                | 20.0                               | 1.0008                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.040843 | +/-3        |



TRS Calibration Plot

Date: February 13, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                 |
|-------------------|-------------------|-----------------|-----------------|
| Station Name:     | Ells River        | Station number: | AMS 30          |
| Calibration Date: | February 10, 2023 | Last Cal Date:  | January 2, 2023 |
| Start time (MST): | 9:56              | End time (MST): | 13:06           |
| Reason:           | Routine           |                 |                 |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC494126  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 209.2 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 209.2 ppm |                             |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (THC):     |                   |
| Calibrator Model:                           | API T700  | Diff between cyl (NM):      |                   |
| ZAG make/model:                             | API T701H | Serial Number:              | 3061              |
|   |           | Serial Number:              | 358               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1193585650 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 0.000234     | 0.000236      | NMHC SP Ratio:  | 5.04E-05      |
| CH <sub>4</sub> Retention time: | 13.2         | 13.6          | NMHC Peak Area: | 180847        |
|                                 |              |               |                 | 183767        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.2                 | 17.03                | 17.06               | 0.998                      |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4921              | 79.2                 | 17.03                | 17.02               | 1.000                      |
| second point          | 4960              | 39.6                 | 8.51                 | 8.35                | 1.020                      |
| third point           | 4980              | 19.8                 | 4.26                 | 4.13                | 1.030                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.2                 | 17.03                | 17.03               | 1.000                      |

| Average Correction Factor |       |                 |       | 1.017                                      |
|---------------------------|-------|-----------------|-------|--|
| Baseline Corr AF:         | 17.06 | Prev response   | 17.05 | *% change 0.1%                             |
| Baseline Corr 2nd AF:     | NA    | AF Slope:       |       | AF Intercept:                              |
| Baseline Corr 3rd AF:     | NA    | AF Correlation: |       | * = > +/-5% change initiates investigation |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.2                 | 9.11                 | 9.25                                       | 0.985                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.2                 | 9.11                 | 9.11                                       | 1.000                      |
| second point              | 4960              | 39.6                 | 4.56                 | 4.51                                       | 1.011                      |
| third point               | 4980              | 19.8                 | 2.28                 | 2.24                                       | 1.018                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 9.11                 | 9.10                                       | 1.002                      |
| Average Correction Factor |                   |                      |                      |  | 1.010                      |
| Baseline Corr AF:         | 9.25              | Prev response        | 9.15                 | *% change                                  | 1.1%                       |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span             | 4921              | 79.2                 | 7.91                 | 7.82                                       | 1.013                      |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.2                 | 7.91                 | 7.91                                       | 1.000                      |
| second point              | 4960              | 39.6                 | 3.96                 | 3.84                                       | 1.031                      |
| third point               | 4980              | 19.8                 | 1.98                 | 1.89                                       | 1.045                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 7.91                 | 7.93                                       | 0.998                      |
| Average Correction Factor |                   |                      |                      |  | 1.025                      |
| Baseline Corr AF:         | 7.82              | Prev response        | 7.90                 | *% change                                  | -1.1%                      |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <i>Start</i> | <i>Finish</i> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.006389     | 1.000952      |
| THC Cal Offset:             | -0.085138    | -0.082136     |
| CH <sub>4</sub> Cal Slope:  | 1.004928     | 1.001462      |
| CH <sub>4</sub> Cal Offset: | -0.050756    | -0.056755     |
| NMHC Cal Slope:             | 1.007959     | 1.000622      |
| NMHC Cal Offset:            | -0.034582    | -0.025581     |

Notes: Adjusted the span.

Calibration Performed By: Denny Ray Estador





# Wood Buffalo Environmental Association

## THC Calibration Summary

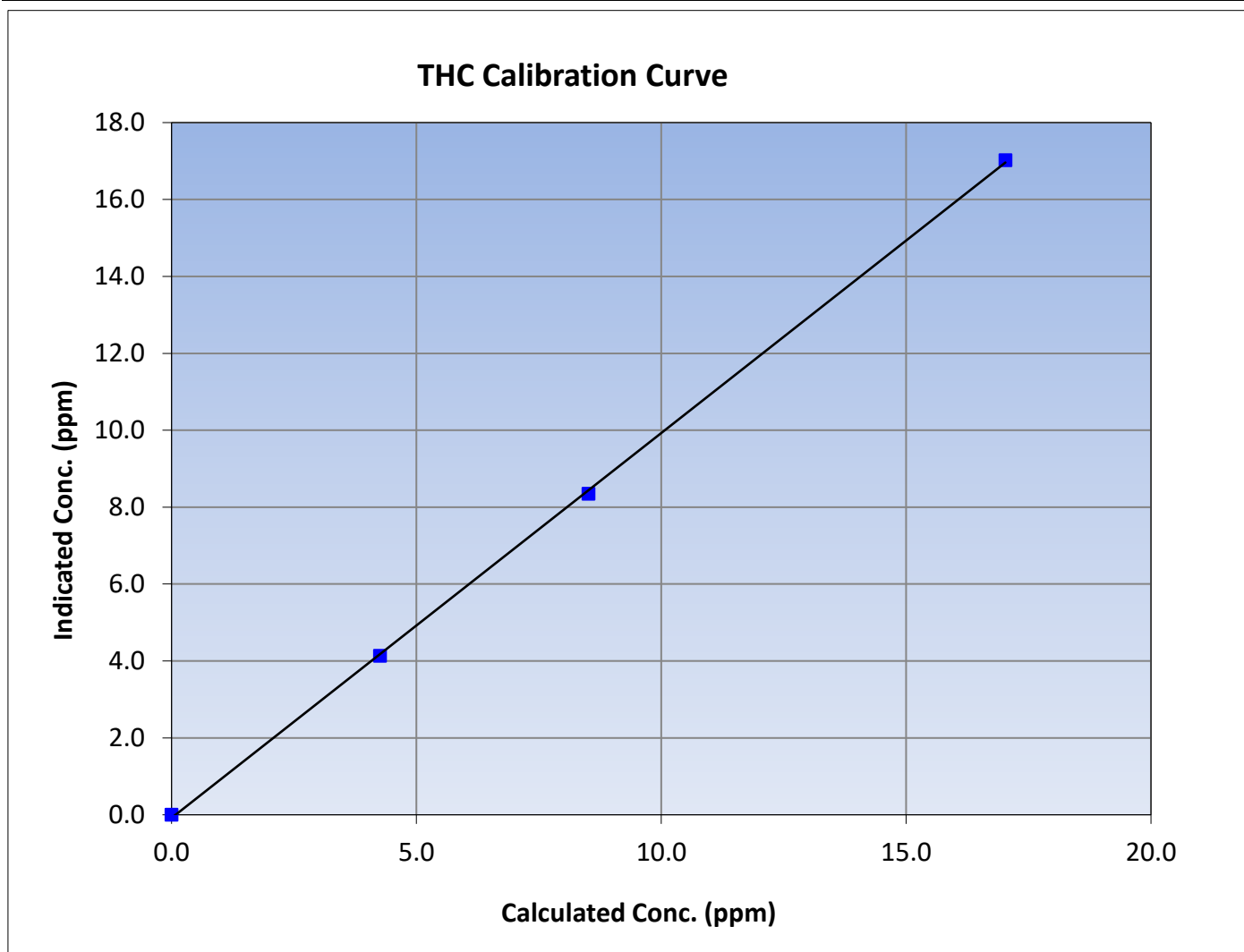
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 2, 2023 |
| Station Name:     | Ells River        | Station Number:       | AMS 30          |
| Start Time (MST): | 9:56              | End Time (MST):       | 13:06           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1193585650      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999867  | $\geq 0.995$  |       |          |             |
| 17.03                               | 17.02                              | 1.0004                    |                         |           |               |       |          |             |
| 8.51                                | 8.35                               | 1.0201                    |                         |           |               | Slope | 1.000952 | 0.90 - 1.10 |
| 4.26                                | 4.13                               | 1.0303                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.082136 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

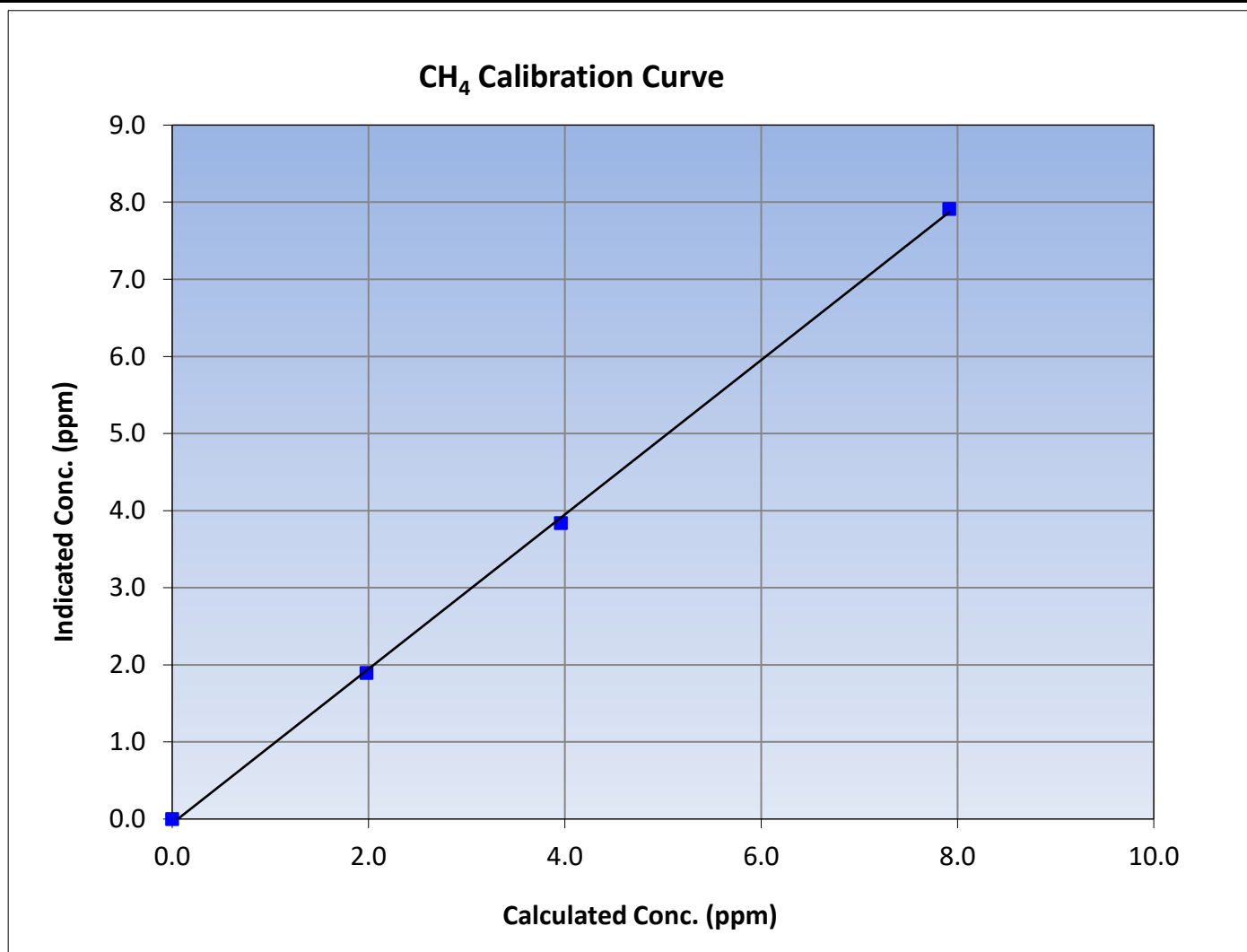
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 2, 2023 |
| Station Name:     | Ells River        | Station Number:       | AMS 30          |
| Start Time (MST): | 9:56              | End Time (MST):       | 13:06           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1193585650      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999698  | ≥0.995        |
| 7.91                                | 7.91                               | 1.0005                    |                         |           |               |
| 3.96                                | 3.84                               | 1.0307                    |                         |           |               |
| 1.98                                | 1.89                               | 1.0448                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.001462  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.056755 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

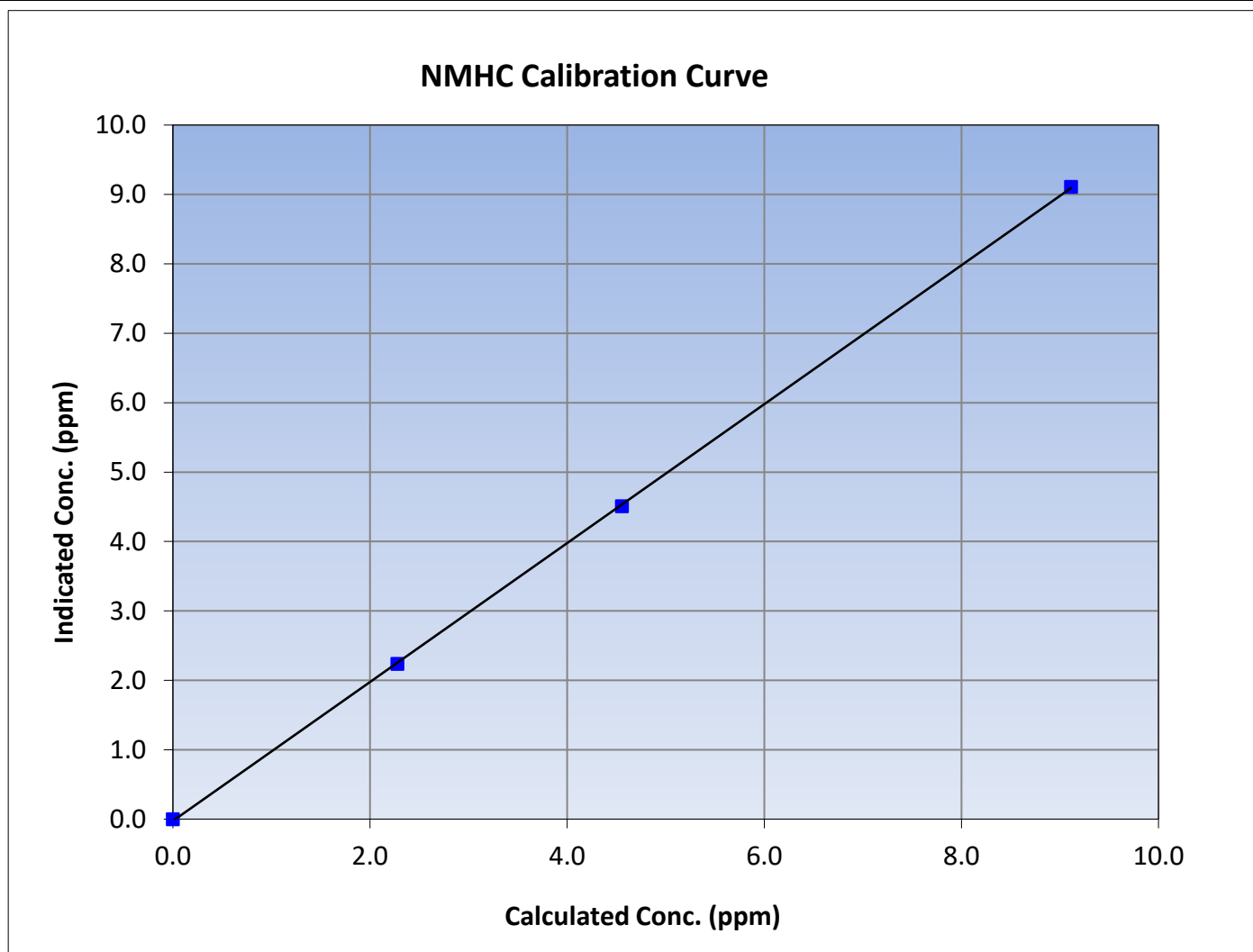
Version-01-2020

### Station Information

|                   |                   |                       |                 |
|-------------------|-------------------|-----------------------|-----------------|
| Calibration Date: | February 10, 2023 | Previous Calibration: | January 2, 2023 |
| Station Name:     | Ells River        | Station Number:       | AMS 30          |
| Start Time (MST): | 9:56              | End Time (MST):       | 13:06           |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1193585650      |

### Calibration Data

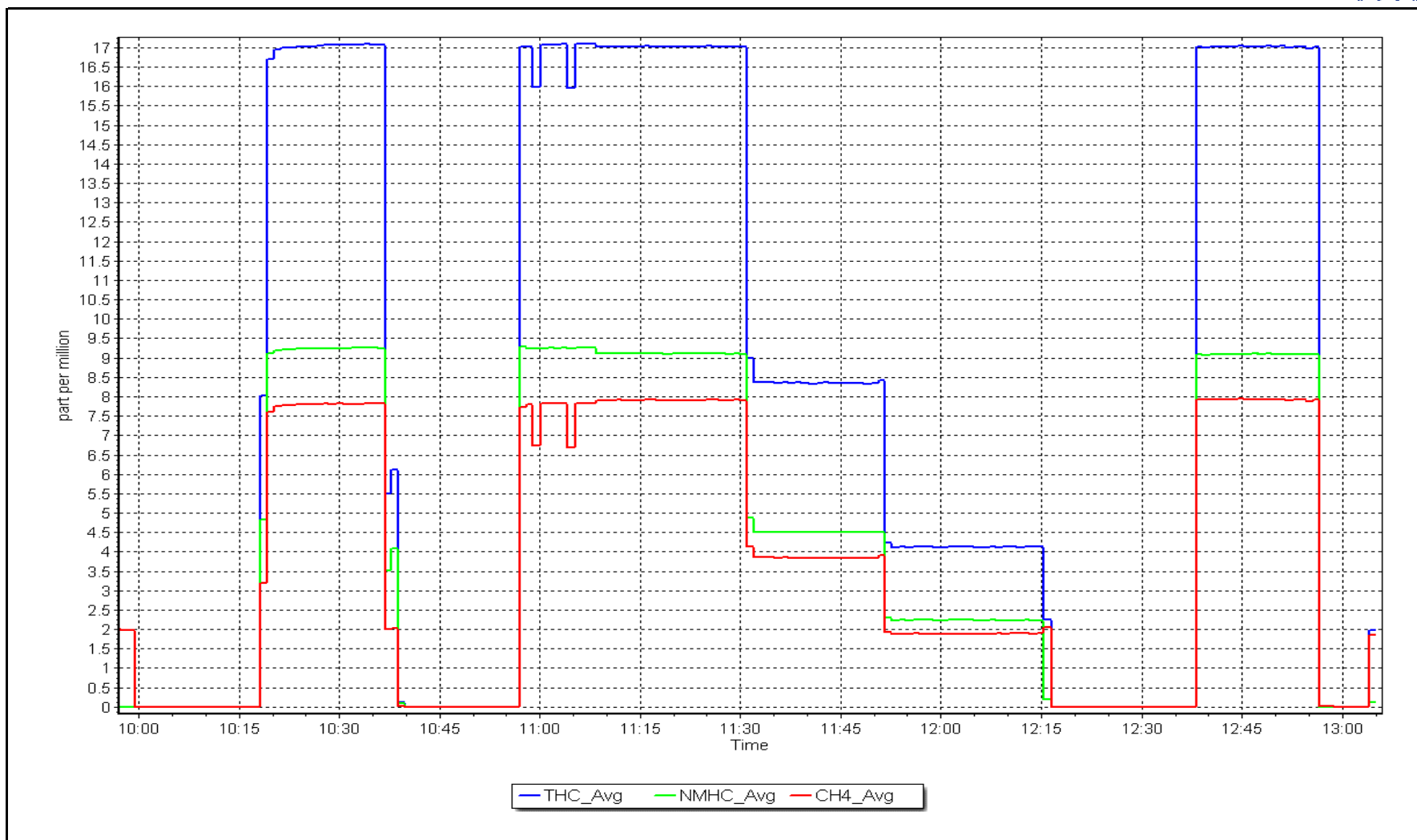
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999957  | $\geq 0.995$  |       |          |             |
| 9.11                                | 9.11                               | 1.0003                    |                         |           |               |       |          |             |
| 4.56                                | 4.51                               | 1.0110                    |                         |           |               | Slope | 1.000622 | 0.90 - 1.10 |
| 2.28                                | 2.24                               | 1.0180                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.025581 | $\pm 0.5$     |       |          |             |



NMHC Calibration Plot

Date: February 10, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Ells River        | Station number: | AMS 30            |
| Calibration Date: | February 12, 2023 | Last Cal Date:  | February 10, 2023 |
| Start time (MST): | 10:00             | End time (MST): | 11:23             |
| Reason:           | Removal           |                 |                   |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC494126  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 209.2 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 209.2 ppm | Diff between cyl (THC):     |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3061              |
| ZAG make/model:                             | API T701H | Serial Number:              | 358               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1193585650 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | 0.000236     | NA            | NMHC SP Ratio:  | 4.96E-05      |
| CH <sub>4</sub> Retention time: | 13.6         | NA            | NMHC Peak Area: | 183767        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as found span         | 4921              | 79.2                 | 17.03                | 16.90               | 1.007                      |
| as found 2nd point    | 4960              | 39.6                 | 8.51                 | 8.29                | 1.027                      |
| as found 3rd point    | 4980              | 19.8                 | 4.26                 | 4.15                | 1.027                      |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       |                   |                      |                      |                     |                            |
| high point            |                   |                      |                      |                     |                            |
| second point          |                   |                      |                      |                     |                            |
| third point           |                   |                      |                      |                     |                            |
| as left zero          |                   |                      |                      |                     |                            |
| as left span          |                   |                      |                      |                     |                            |

| Average Correction Factor |       |                 |          |   |           |
|---------------------------|-------|-----------------|----------|---|-----------|
| Baseline Corr AF:         | 16.90 | Prev response   | 16.96    | *% change                                 | -0.4%     |
| Baseline Corr 2nd AF:     | 8.3   | AF Slope:       | 0.993223 | AF Intercept:                             | -0.064347 |
| Baseline Corr 3rd AF:     | 4.1   | AF Correlation: | 0.999889 | * => +/-5% change initiates investigation |           |



# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4921              | 79.2                 | 9.11                 | 9.11                                       | 1.000                      |
| as found 2nd point    | 4960              | 39.6                 | 4.56                 | 4.51                                       | 1.011                      |
| as found 3rd point    | 4980              | 19.8                 | 2.28                 | 2.24                                       | 1.020                      |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       |                   |                      |                      |  |                            |
| high point            |                   |                      |                      |  |                            |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  |                            |
| Baseline Corr AF:     | 9.11              | Prev response        | 9.09                 | *% change                                  | 0.2%                       |
| Baseline Corr 2nd AF: | 4.5               | AF Slope:            | 1.000681             | AF Intercept:                              | -0.027312                  |
| Baseline Corr 3rd AF: | 2.2               | AF Correlation:      | 0.999954             | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero         | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as found span         | 4921              | 79.2                 | 7.91                 | 7.79                                       | 1.016                      |
| as found 2nd point    | 4960              | 39.6                 | 3.96                 | 3.78                                       | 1.048                      |
| as found 3rd point    | 4980              | 19.8                 | 1.98                 | 1.91                                       | 1.035                      |
| new cylinder response |                   |                      |                      |  |                            |
| calibrator zero       |                   |                      |                      |  |                            |
| high point            |                   |                      |                      |  |                            |
| second point          |                   |                      |                      |  |                            |
| third point           |                   |                      |                      |  |                            |
| as left zero          |                   |                      |                      |  |                            |
| as left span          |                   |                      |                      |  |                            |
|                       |                   |                      |                      | Average Correction Factor                  |                            |
| Baseline Corr AF:     | 7.79              | Prev response        | 7.87                 | *% change                                  | -1.0%                      |
| Baseline Corr 2nd AF: | 3.78              | AF Slope:            | 0.984307             | AF Intercept:                              | -0.038378                  |
| Baseline Corr 3rd AF: | 1.91              | AF Correlation:      | 0.999713             | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | 1.000952     |               |
| THC Cal Offset:             | -0.082136    |               |
| CH <sub>4</sub> Cal Slope:  | 1.001462     |               |
| CH <sub>4</sub> Cal Offset: | -0.056755    |               |
| NMHC Cal Slope:             | 1.000622     |               |
| NMHC Cal Offset:            | -0.025581    |               |

Notes: Removal calibration for instrument change out.

Calibration Performed By: Karan Pandit

NMHC Calibration Plot

Date: February 12, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### Station Information

|                   |                   |                 |        |
|-------------------|-------------------|-----------------|--------|
| Station Name:     | Ells River        | Station number: | AMS 30 |
| Calibration Date: | February 12, 2023 | Last Cal Date:  | NA     |
| Start time (MST): | 12:30             | End time (MST): | 14:50  |
| Reason:           | Install           |                 |        |

### Calibration Standards

|   |           |                             |                   |
|---|-----------|-----------------------------|-------------------|
| Gas Cert Reference:                         | CC494126  | Cal Gas Expiry Date:        | December 29, 2028 |
| CH <sub>4</sub> Cal Gas Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| C <sub>3</sub> H <sub>8</sub> Cal Gas Conc. | 209.2 ppm |                             |                   |
| Removed Gas Cert:                           |           | Removed Gas Expiry:         |                   |
| Removed CH <sub>4</sub> Conc.               | 499.7 ppm | CH <sub>4</sub> Equiv Conc. | 1075.0 ppm        |
| Removed C <sub>3</sub> H <sub>8</sub> Conc. | 209.2 ppm |                             |                   |
| Diff between cyl (CH <sub>4</sub> ):        |           | Diff between cyl (THC):     |                   |
| Diff between cyl (NMHC):                    |           | Diff between cyl (NM):      |                   |
| Calibrator Model:                           | API T700  | Serial Number:              | 3061              |
| ZAG make/model:                             | API T701H | Serial Number:              | 358               |

### Analyzer Information

|                   |            |                              |            |
|-------------------|------------|------------------------------|------------|
| Analyzer make:    | Thermo 55i | Analyzer serial #:           | 1181490018 |
| THC Range (ppm):  | 0 - 20 ppm |                              |            |
| NMHC Range (ppm): | 0 - 10 ppm | CH <sub>4</sub> Range (ppm): | 0 - 10 ppm |

|                                 | <u>Start</u> | <u>Finish</u> | <u>Start</u>    | <u>Finish</u> |
|---------------------------------|--------------|---------------|-----------------|---------------|
| CH <sub>4</sub> SP Ratio:       | NA           | 0.000230      | NMHC SP Ratio:  | NA            |
| CH <sub>4</sub> Retention time: | NA           | 14.0          | NMHC Peak Area: | NA            |
|                                 |              |               |                 | 4.00E-05      |
|                                 |              |               |                 | 227486        |

### THC Calibration Data

| Set Point             | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic) | CF <i>Limit= 0.95-1.05</i> |
|-----------------------|-------------------|----------------------|----------------------|---------------------|----------------------------|
| as found zero         |                   |                      |                      |                     |                            |
| as found span         |                   |                      |                      |                     |                            |
| as found 2nd point    |                   |                      |                      |                     |                            |
| as found 3rd point    |                   |                      |                      |                     |                            |
| new cylinder response |                   |                      |                      |                     |                            |
| calibrator zero       | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| high point            | 4921              | 79.2                 | 17.03                | 16.92               | 1.006                      |
| second point          | 4960              | 39.6                 | 8.51                 | 8.36                | 1.018                      |
| third point           | 4980              | 19.8                 | 4.26                 | 4.14                | 1.028                      |
| as left zero          | 5000              | 0.0                  | 0.00                 | 0.00                | ----                       |
| as left span          | 4921              | 79.2                 | 17.03                | 16.73               | 1.018                      |

|                       |    |                 |    | Average Correction Factor                  | 1.017 |
|-----------------------|----|-----------------|----|--|-------|
| Baseline Corr AF:     | NA | Prev response   | NA | *% change                                  | NA    |
| Baseline Corr 2nd AF: | NA | AF Slope:       |    | AF Intercept:                              |       |
| Baseline Corr 3rd AF: | NA | AF Correlation: |    | * = > +/-5% change initiates investigation |       |





# Wood Buffalo Environmental Association

## THC / CH<sub>4</sub> / NMHC Calibration Report

Version-01-2020

### NMHC Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             |                   |                      |                      |  |                            |
| as found span             |                   |                      |                      |  |                            |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.2                 | 9.11                 | 9.01                                       | 1.011                      |
| second point              | 4960              | 39.6                 | 4.56                 | 4.47                                       | 1.020                      |
| third point               | 4980              | 19.8                 | 2.28                 | 2.21                                       | 1.029                      |
| as left zero              | 5000              | 0                    | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 9.11                 | 8.91                                       | 1.023                      |
| Average Correction Factor |                   |                      |                      |  | 1.020                      |
| Baseline Corr AF:         | NA                | Prev response        | NA                   | *% change                                  | NA                         |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### CH<sub>4</sub> Calibration Data

| Set Point                 | Dil air flow rate | Source gas flow rate | Calc conc (ppm) (Cc) | Ind conc (ppm) (Ic)                        | CF <i>Limit= 0.95-1.05</i> |
|---------------------------|-------------------|----------------------|----------------------|--|----------------------------|
| as found zero             |                   |                      |                      |  |                            |
| as found span             |                   |                      |                      |  |                            |
| as found 2nd point        |                   |                      |                      |  |                            |
| as found 3rd point        |                   |                      |                      |  |                            |
| new cylinder response     |                   |                      |                      |  |                            |
| calibrator zero           | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| high point                | 4921              | 79.2                 | 7.91                 | 7.91                                       | 1.001                      |
| second point              | 4960              | 39.6                 | 3.96                 | 3.90                                       | 1.016                      |
| third point               | 4980              | 19.8                 | 1.98                 | 1.93                                       | 1.026                      |
| as left zero              | 5000              | 0.0                  | 0.00                 | 0.00                                       | ----                       |
| as left span              | 4921              | 79.2                 | 7.91                 | 7.82                                       | 1.012                      |
| Average Correction Factor |                   |                      |                      |  | 1.014                      |
| Baseline Corr AF:         | NA                | Prev response        | NA                   | *% change                                  | NA                         |
| Baseline Corr 2nd AF:     | NA                | AF Slope:            |                      | AF Intercept:                              |                            |
| Baseline Corr 3rd AF:     | NA                | AF Correlation:      |                      | * = > +/-5% change initiates investigation |                            |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| THC Cal Slope:              | NA           | 0.994670      |
| THC Cal Offset:             | NA           | -0.054336     |
| CH <sub>4</sub> Cal Slope:  | NA           | 1.000380      |
| CH <sub>4</sub> Cal Offset: | NA           | -0.030757     |
| NMHC Cal Slope:             | NA           | 0.989848      |
| NMHC Cal Offset:            | NA           | -0.023379     |

Notes: Install calibration for instrument change out. Adjusted the span only.

Calibration Performed By: Karan Pandit



# Wood Buffalo Environmental Association

## THC Calibration Summary

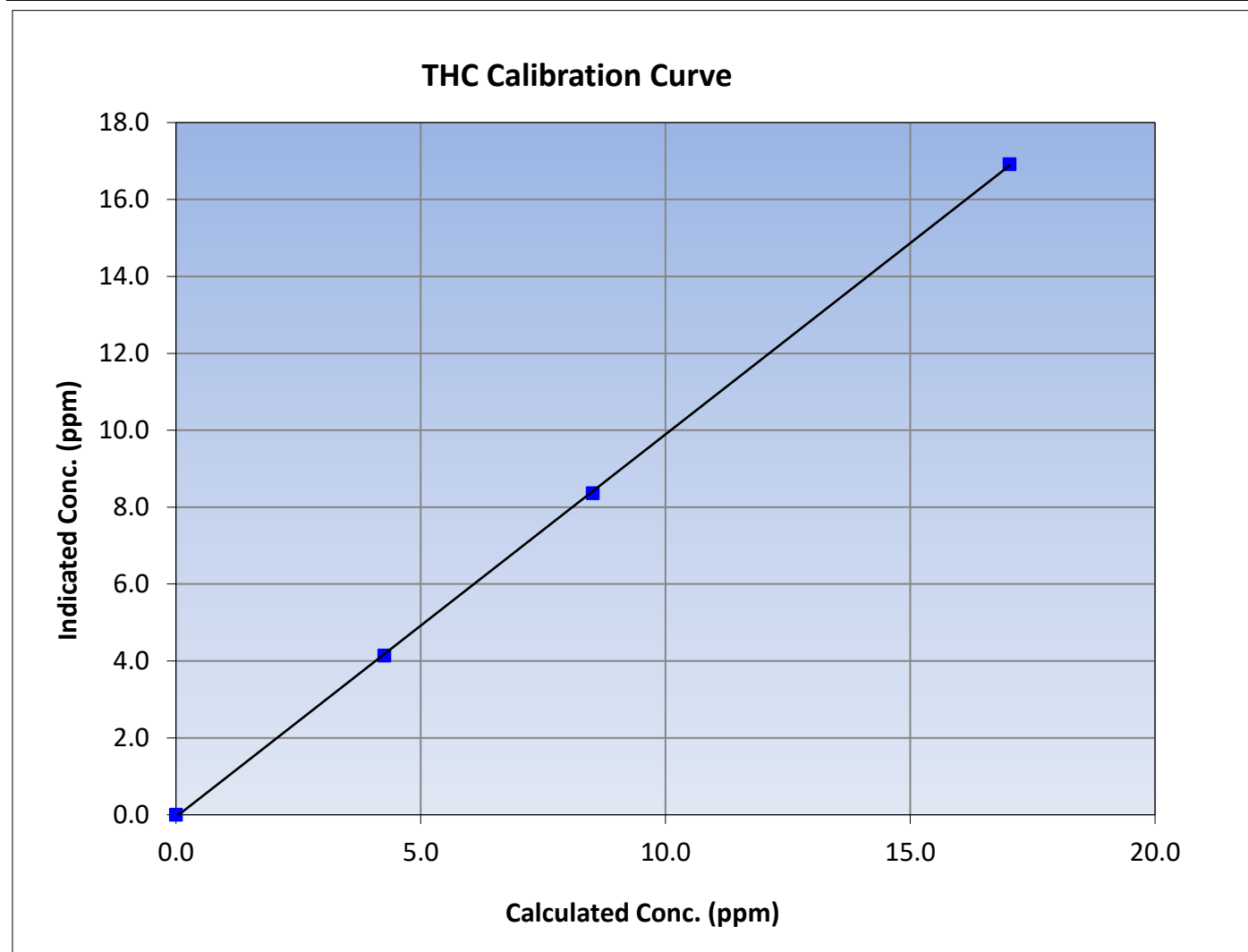
Version-01-2020

### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | February 12, 2023 | Previous Calibration: | NA         |
| Station Name:     | Ells River        | Station Number:       | AMS 30     |
| Start Time (MST): | 12:30             | End Time (MST):       | 14:50      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |       |          |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|-------|----------|-------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999946  | $\geq 0.995$  |       |          |             |
| 17.03                               | 16.92                              | 1.0065                    |                         |           |               |       |          |             |
| 8.51                                | 8.36                               | 1.0183                    |                         |           |               | Slope | 0.994670 | 0.90 - 1.10 |
| 4.26                                | 4.14                               | 1.0276                    |                         |           |               |       |          |             |
|                                     |                                    |                           | Intercept               | -0.054336 | $\pm 0.5$     |       |          |             |





# Wood Buffalo Environmental Association

## CH<sub>4</sub> Calibration Summary

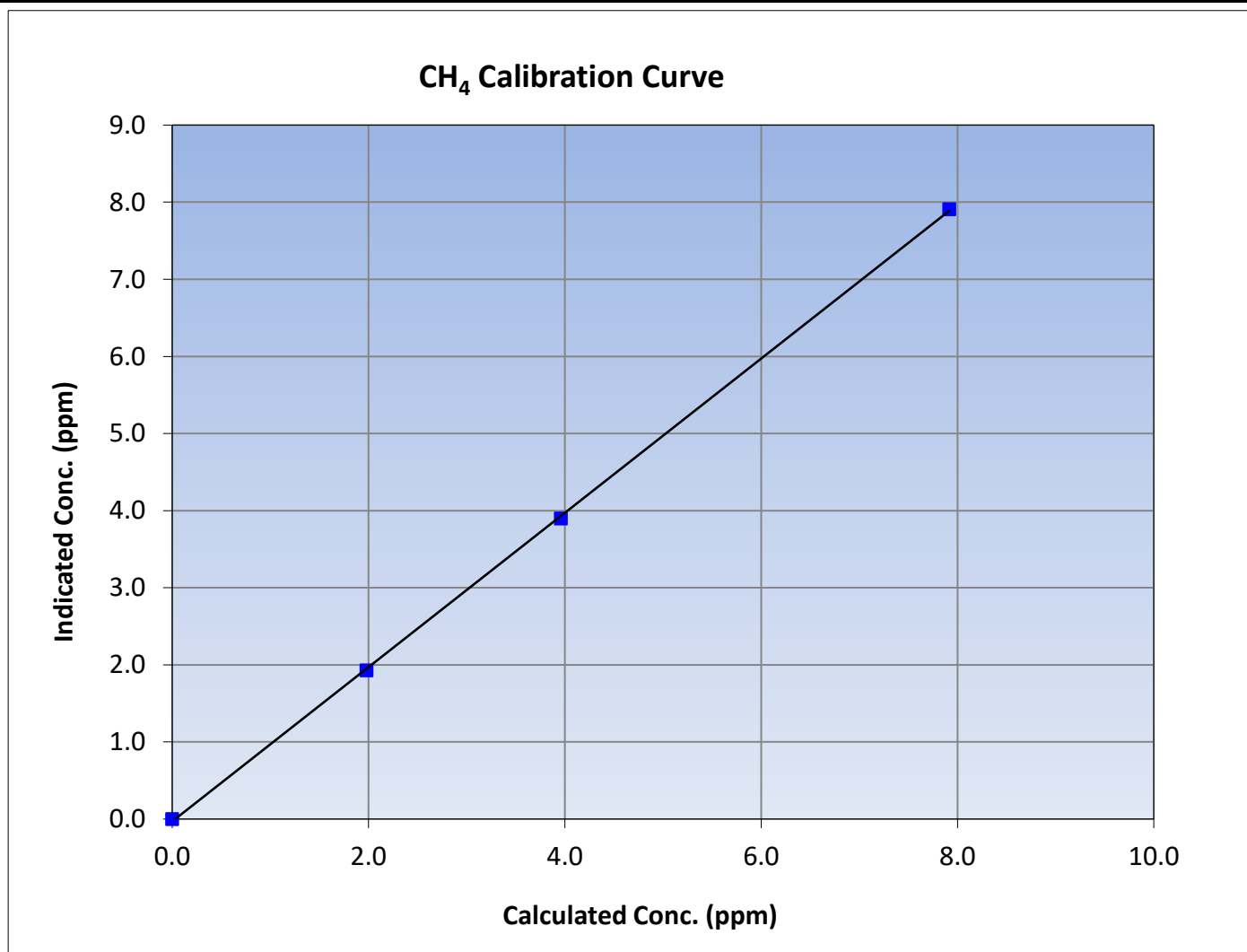
Version-01-2020

### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | February 12, 2023 | Previous Calibration: | NA         |
| Station Name:     | Ells River        | Station Number:       | AMS 30     |
| Start Time (MST): | 12:30             | End Time (MST):       | 14:50      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999919  | $\geq 0.995$  |
| 7.91                                | 7.91                               | 1.0009                    |                         |           |               |
| 3.96                                | 3.90                               | 1.0156                    |                         |           |               |
| 1.98                                | 1.93                               | 1.0259                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 1.000380  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.030757 | +/-0.5        |





# Wood Buffalo Environmental Association

## NMHC Calibration Summary

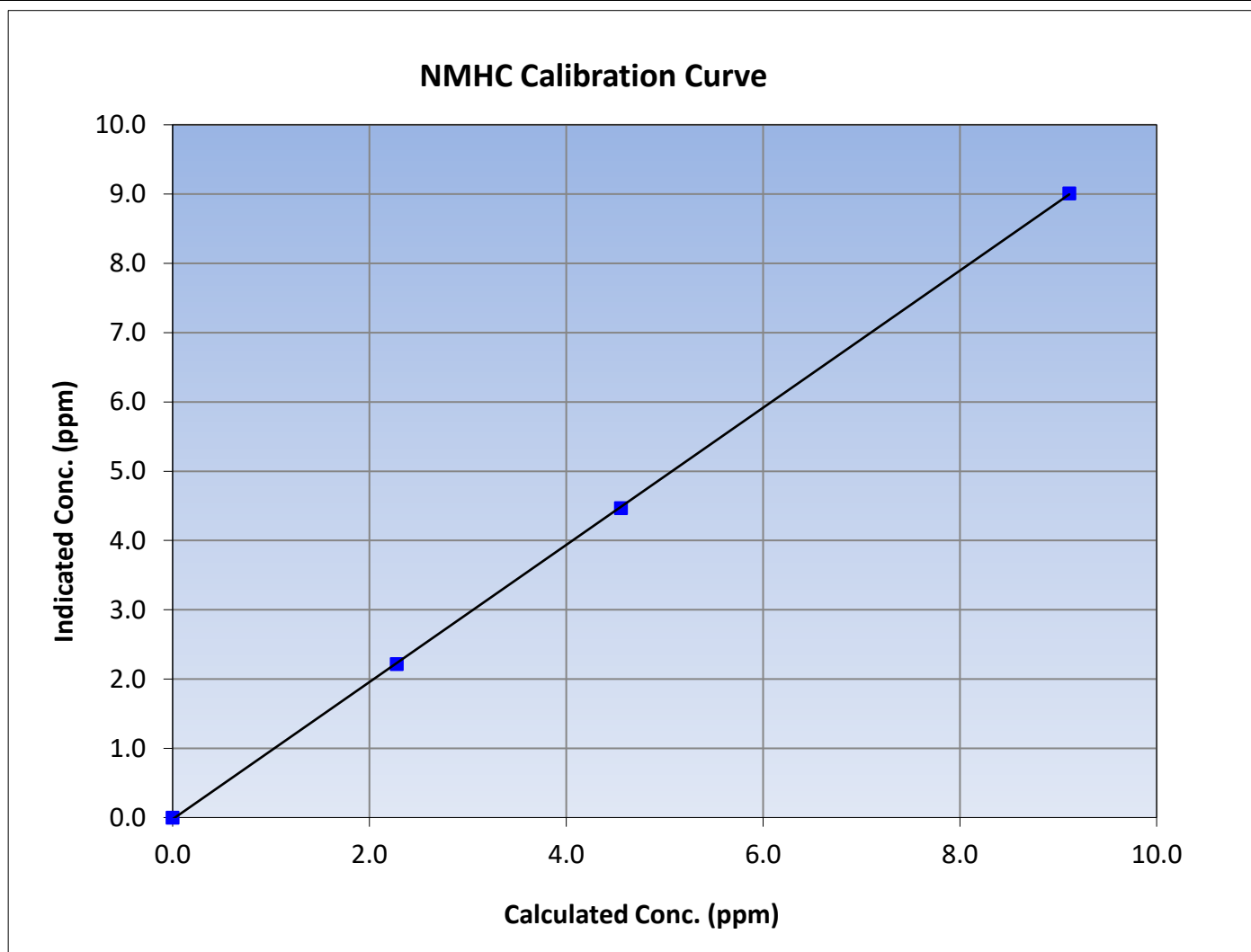
Version-01-2020

### Station Information

|                   |                   |                       |            |
|-------------------|-------------------|-----------------------|------------|
| Calibration Date: | February 12, 2023 | Previous Calibration: | NA         |
| Station Name:     | Ells River        | Station Number:       | AMS 30     |
| Start Time (MST): | 12:30             | End Time (MST):       | 14:50      |
| Analyzer make:    | Thermo 55i        | Analyzer serial #:    | 1181490018 |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           | <u>Limits</u> |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|---------------|
| 0.00                                | 0.00                               | ----                      | Correlation Coefficient | 0.999967  | $\geq 0.995$  |
| 9.11                                | 9.01                               | 1.0113                    |                         |           |               |
| 4.56                                | 4.47                               | 1.0201                    |                         |           |               |
| 2.28                                | 2.21                               | 1.0290                    |                         |           |               |
|                                     |                                    |                           | Slope                   | 0.989848  | 0.90 - 1.10   |
|                                     |                                    |                           | Intercept               | -0.023379 | +/-0.5        |



NMHC Calibration Plot

Date: February 12, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Station Information

Station Name: Ells River Station number: AMS 30  
Calibration Date: February 1, 2023 Last Cal Date: January 13, 2023  
Start time (MST): 8:55 End time (MST): 13:15  
Reason: Routine

### Calibration Standards

NO Gas Cylinder #: T2Y1P2R Cal Gas Expiry Date: December 11, 2023  
NOX Cal Gas Conc: 50.83 ppm NO Cal Gas Conc: 49.97 ppm  
Removed Cylinder #: Removed Gas Exp Date:  
Removed Gas NOX Conc: 50.83 ppm Removed Gas NO Conc: 49.97 ppm  
NOX gas Diff: NO gas Diff:  
Calibrator Model: API T700 Serial Number: 3061  
ZAG make/model: API T701H Serial Number: 358

### Analyzer Information

Analyzer make: Thermo 42i Analyzer serial #: 710321429  
NOX Range (ppb): 0 - 1000 ppb

|                     | <u>Start</u> | <u>Finish</u> |                      | <u>Start</u> | <u>Finish</u> |
|---------------------|--------------|---------------|----------------------|--------------|---------------|
| NO coeff or slope:  | 1.029        | 1.029         | NO bkgnd or offset:  | 12.6         | 12.5          |
| NOX coeff or slope: | 0.992        | 0.992         | NOX bkgnd or offset: | 12.5         | 12.4          |
| NO2 coeff or slope: | 1.000        | 1.000         | Reaction cell Press: | 181.5        | 185.1         |

### Calibration Statistics

|                             | <u>Start</u> | <u>Finish</u> |
|-----------------------------|--------------|---------------|
| NO <sub>x</sub> Cal Slope:  | 0.998693     | 1.001096      |
| NO <sub>x</sub> Cal Offset: | -0.720000    | -0.800000     |
| NO Cal Slope:               | 0.997541     | 1.001429      |
| NO Cal Offset:              | -1.280000    | -1.540000     |
| NO <sub>2</sub> Cal Slope:  | 1.000846     | 1.001609      |
| NO <sub>2</sub> Cal Offset: | 0.511635     | 0.350570      |



# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.2   | -0.2                                  | 0.0  | ----  | ----   |
| as found span             | 4920                      | 80.0                        | 813.3   | 799.5                                  | 13.8  | 817.9  | 802.1                                 | 15.8   | 0.9944  | 0.9968   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| high point                | 4920                      | 80.0                        | 813.3   | 799.5                                  | 13.8  | 813.8  | 799.9                                 | 14.0   | 0.9994  | 0.9995   |
| second point              | 4960                      | 40.0                        | 406.6   | 399.8                                  | 6.9   | 405.8  | 397.9                                 | 7.9  | 1.0021  | 1.0047   |
| third point               | 4980                      | 20.0                        | 203.3   | 199.9                                  | 3.4   | 202.0  | 197.3                                 | 4.7  | 1.0065  | 1.0131   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | -0.1                                  | 0.1  | ----  | ----   |
| as left span              | 4920                      | 80.0                        | 813.3   | 422.6                                  | 390.7   | 813.6  | 429.2                                 | 384.3  | 0.9996  | 0.9847   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0027  | 1.0058   |

|                      |                             |                |  |                                  |                        |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|
| Corrected As found   | NO <sub>x</sub> = 818.1 ppb | NO = 802.3 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.8% |
| Previous Response    | NO <sub>x</sub> = 811.5 ppb | NO = 796.3 ppb |  | *Percent Change                  | NO = 0.8%              |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 797.4                                      | 420.5                                 | 390.7   | 391.2  | 0.9986   | 100.1%   |
| 2nd GPT point (200 ppb O3)       | 797.4                                      | 613.2                                 | 198.0   | 199.7  | 0.9913   | 100.9%   |
| 3rd GPT point (100 ppb O3)       | 797.4                                      | 704.9                                 | 106.3   | 106.4  | 0.9987   | 100.1%   |
| Average Correction Factor        |  |                                       |   |  | 0.9962   | 100.4%   |

Notes:

No adjustments have been made.

Calibration Performed By: Denny Ray Estador



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

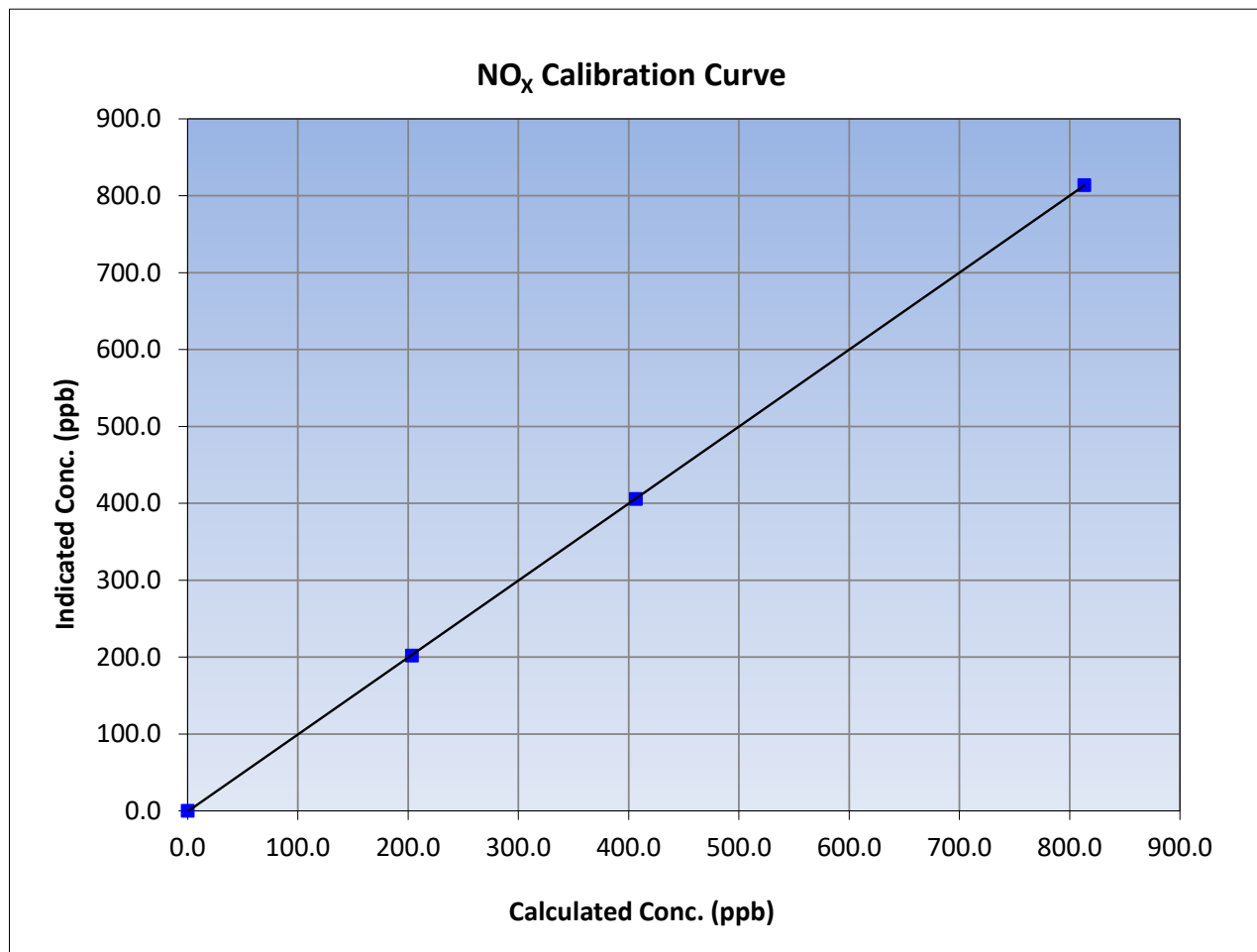
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Ells River       | Station Number:       | AMS 30           |
| Start Time (MST): | 8:55             | End Time (MST):       | 13:15            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 710321429        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 813.3                               | 813.8                              | 0.9994                    |   |                                |
| 406.6                               | 405.8                              | 1.0021                    |   |                                |
| 203.3                               | 202.0                              | 1.0065                    |   |                                |
|                                     |                                    |                           | 0.999996                                      |                                |
|                                     |                                    |                           | 1.001096                                      |                                |
|                                     |                                    |                           | -0.800000                                     |                                |







# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

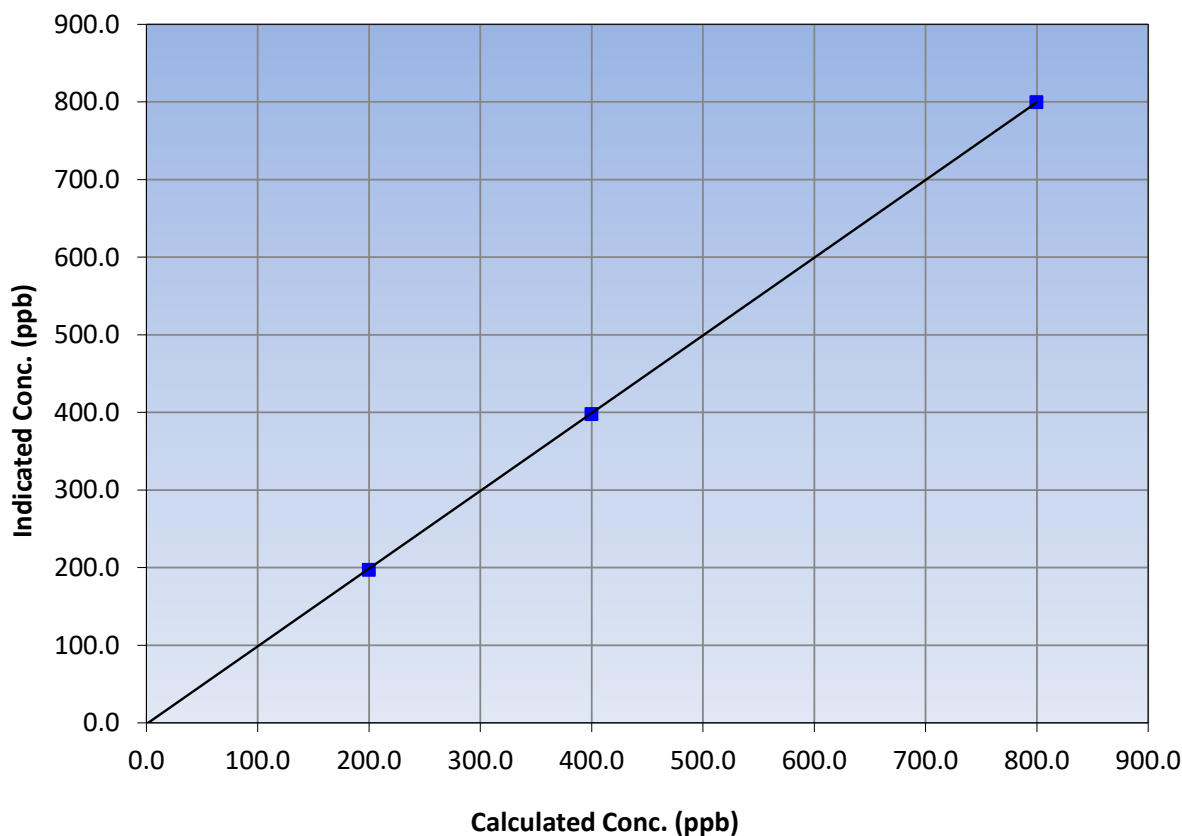
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Ells River       | Station Number:       | AMS 30           |
| Start Time (MST): | 8:55             | End Time (MST):       | 13:15            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 710321429        |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | -0.1                               | ----                      | Correlation Coefficient | ≥0.995    |             |
| 799.5                               | 799.9                              | 0.9995                    |                         |           |             |
| 399.8                               | 397.9                              | 1.0047                    |                         |           |             |
| 199.9                               | 197.3                              | 1.0131                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 1.001429  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.540000 | +/-20       |

NO Calibration Curve





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

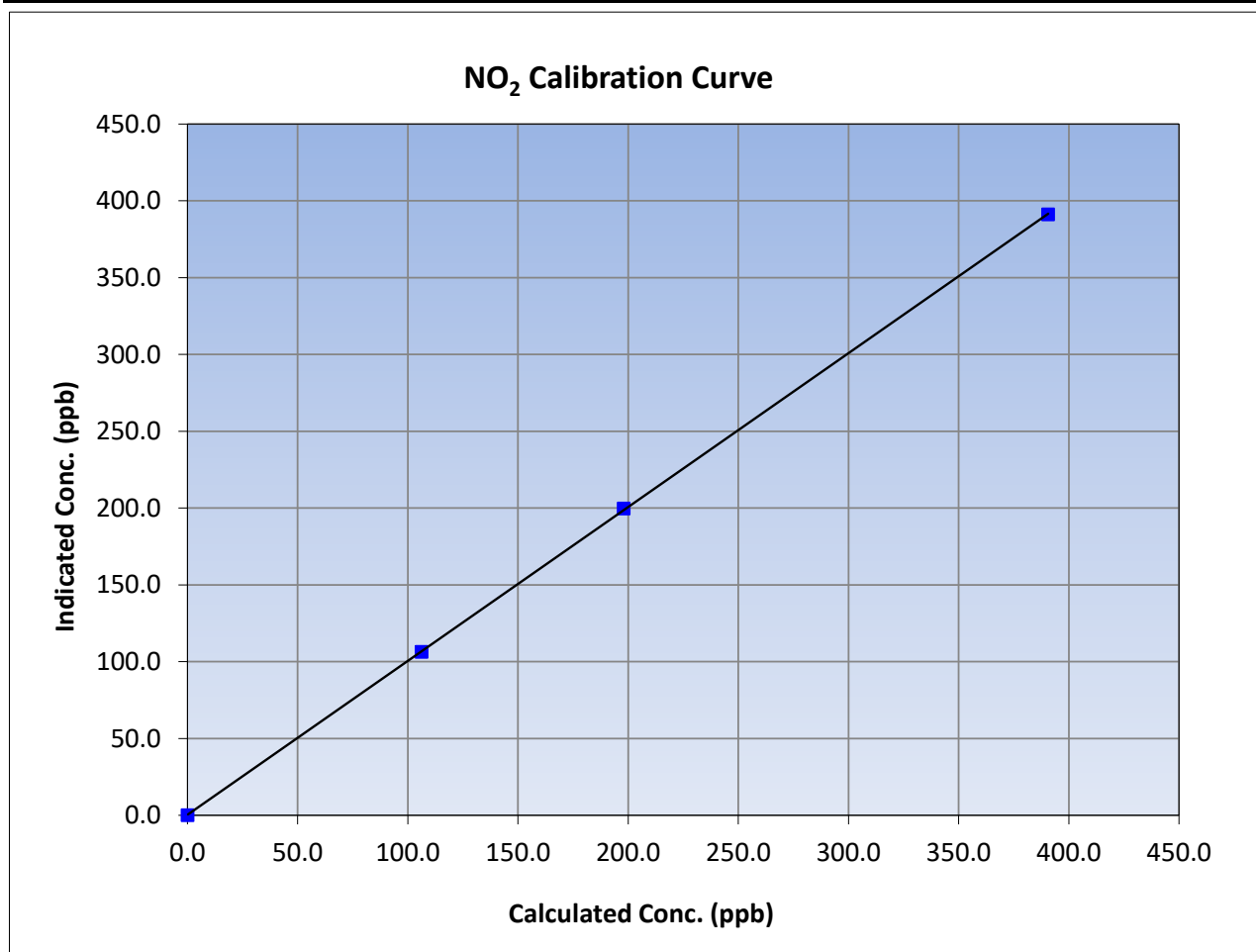
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 13, 2023 |
| Station Name:     | Ells River       | Station Number:       | AMS 30           |
| Start Time (MST): | 8:55             | End Time (MST):       | 13:15            |
| Analyzer make:    | Thermo 42i       | Analyzer serial #:    | 710321429        |

### Calibration Data

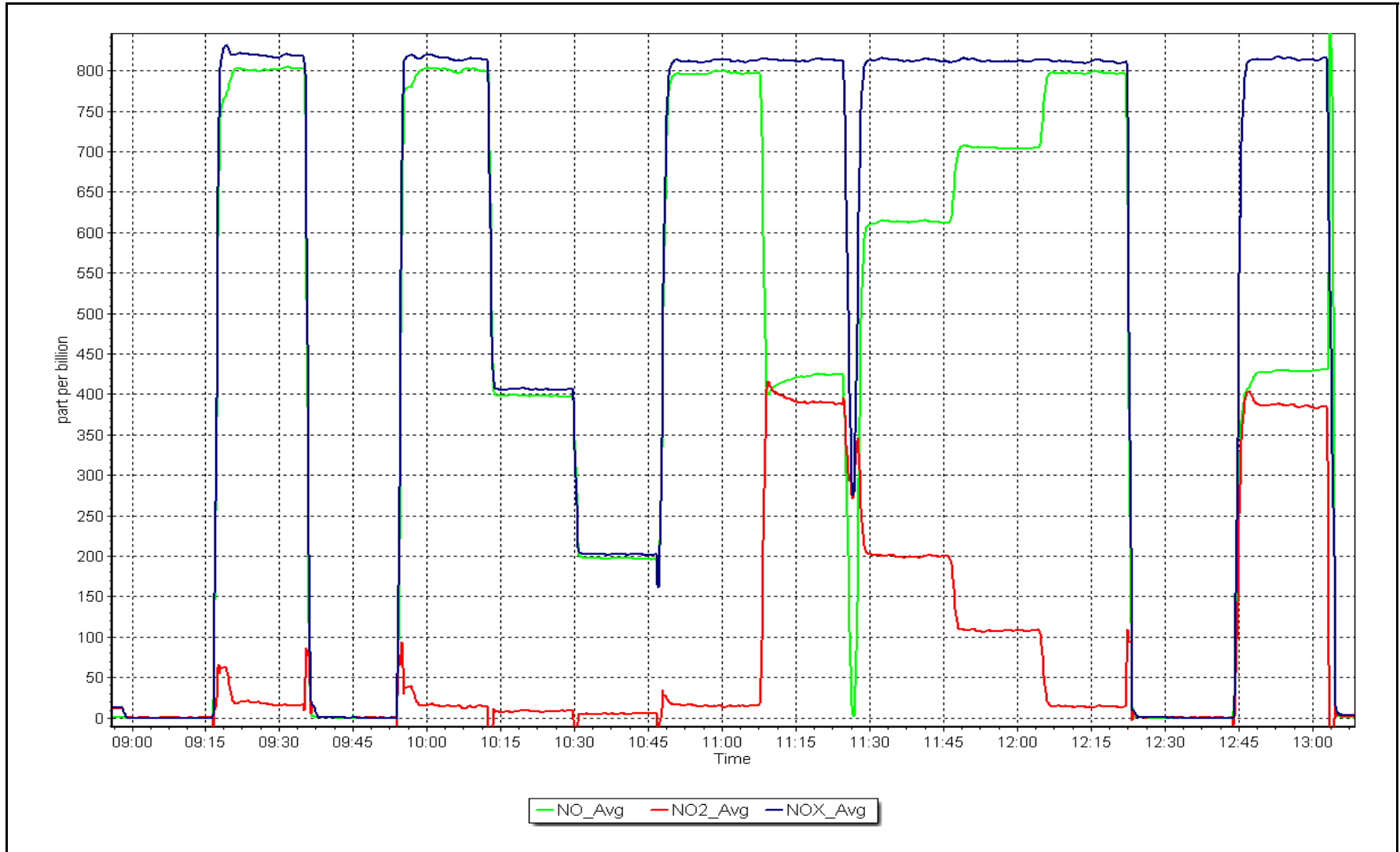
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <i>Limits</i>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 390.7                               | 391.2                              | 0.9986                    |   |                                |
| 198.0                               | 199.7                              | 0.9913                    |   |                                |
| 106.3                               | 106.4                              | 0.9987                    |   |                                |
|                                     |                                    |                           |   |                                |



NO<sub>x</sub> Calibration Plot

Date: February 1, 2023

Location: Ells River





# Wood Buffalo Environmental Association

## T640 PM<sub>2.5</sub> CALIBRATION

Version-01-2023

### Station Information

Station Name: Ells River Station number: AMS 30  
 Calibration Date: February 17, 2023 Last Cal Date: January 5, 2023  
 Start time (MST): 12:55 End time (MST): 13:08

Analyzer Make: API T640 S/N: 875  
 Particulate Fraction: PM2.5

Flow Meter Make/Model: Delta Cal S/N: 954  
 Temp/RH standard: Delta Cal S/N: 954

### Monthly Calibration Test

| Parameter  | As found | Measured | As left | Adjusted                 | (Limits)     |
|------------|----------|----------|---------|--------------------------|--------------|
| T (°C)     | -16.8    | -17.1    | -16.8   | <input type="checkbox"/> | +/- 2 °C     |
| P (mmHg)   | 730.4    | 726.5    | 730.4   | <input type="checkbox"/> | +/- 10 mmHg  |
| flow (LPM) | 5.01     | 5.07     | 5.01    | <input type="checkbox"/> | +/- 0.25 LPM |

Leak Test: Date of check: February 17, 2023 Last Cal Date: January 5, 2023  
 PM w/o HEPA: 3.1 PM w/ HEPA: 0 <0.2 ug/m3

Note: this leak check will be completed before the quarterly work and will serve as the pre maintenance leak check

Inlet cleaning : Inlet Head

### Quarterly Calibration Test

| Parameter     | As found | Post maintenance | As left | Adjusted                 | (Limits)     |
|---------------|----------|------------------|---------|--------------------------|--------------|
| PMT Peak Test |          |                  |         | <input type="checkbox"/> | 11.3 +/- 0.5 |

Post-maintenance leak check: PM w/o HEPA: \_\_\_\_\_ w/ HEPA: \_\_\_\_\_  
 Date Optical Chamber Cleaned: December 19, 2022 <0.2 ug/m3  
 Disposable Filter Changed: December 19, 2022

### Annual Maintenance

Date Sample Tube Cleaned: October 17, 2022  
 Date RH/T Sensor Cleaned: October 17, 2022

Notes: No adjustments required.

Calibration by: Denny Ray Estador



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS506**  
**JACKFISH 1**  
**FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

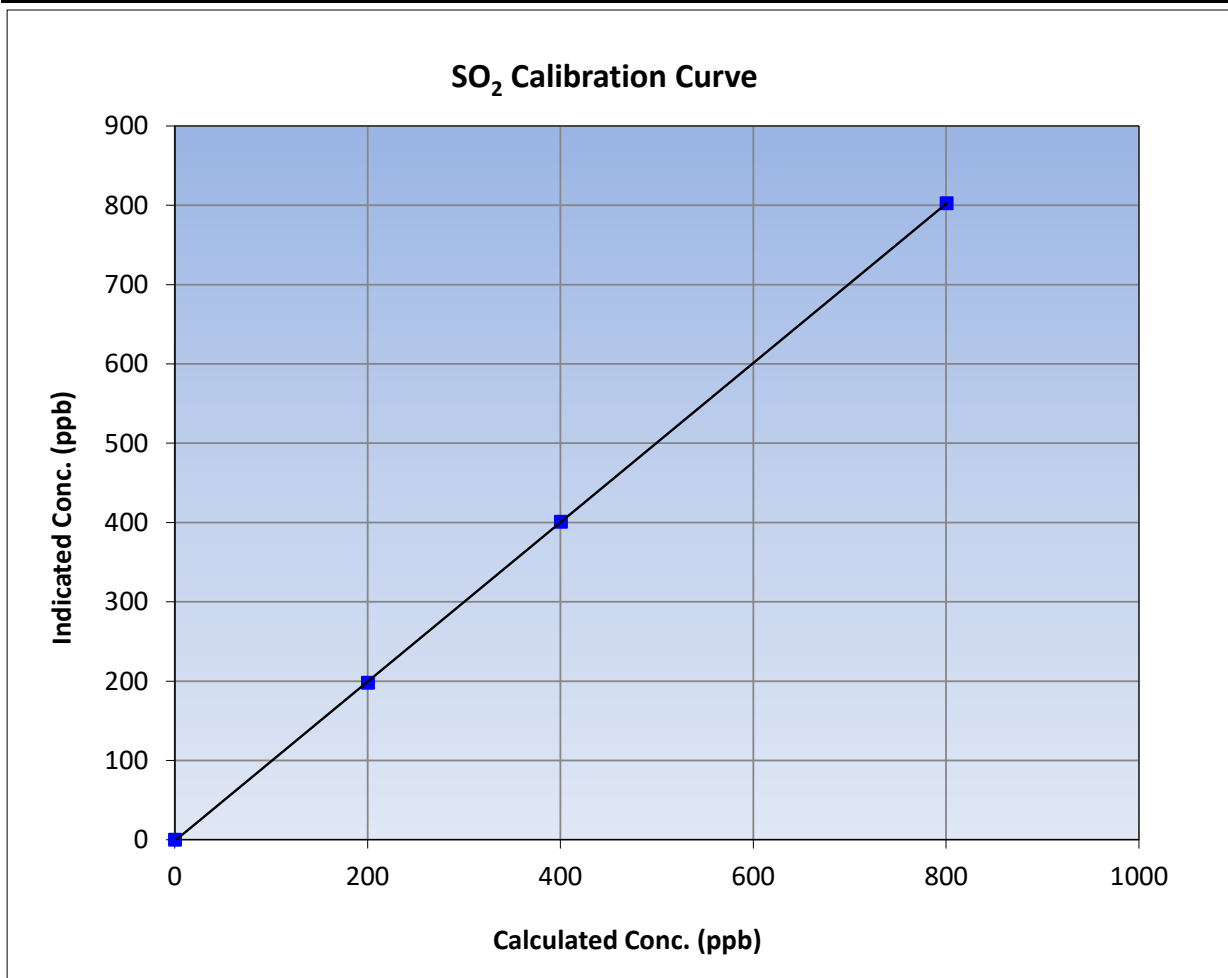
Version-01-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 14, 2023 | Previous Calibration: | January 24, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS 506          |
| Start Time (MST): | 11:36             | End Time (MST):       | 14:16            |
| Analyzer make:    | Thermo 43i        | Analyzer serial #:    | 1160290011       |

### Calibration Data

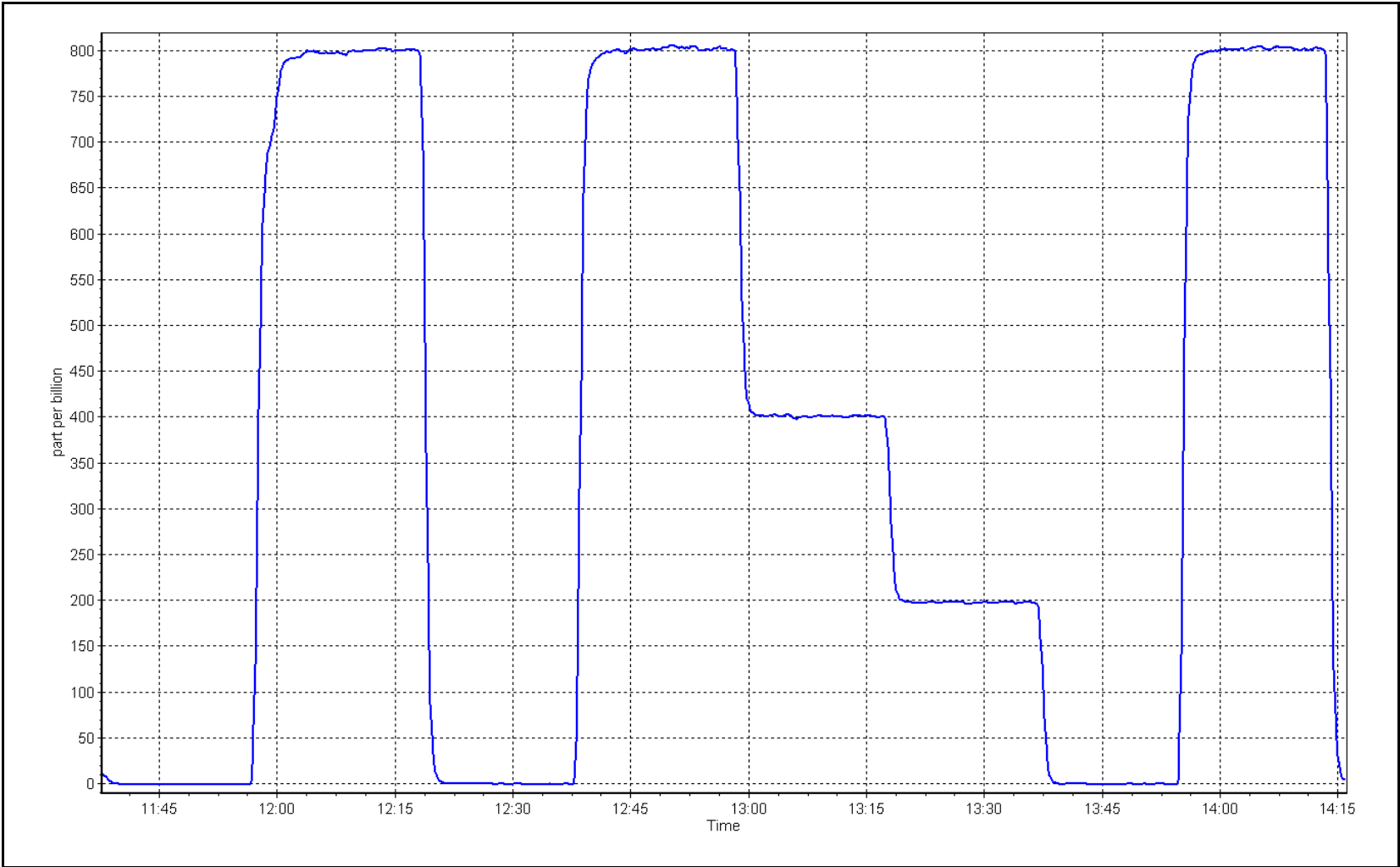
| Calculated concentration<br>(ppb) (Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor<br>(Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |
|--|---------------------------------------|------------------------------|-------------------------|---------------|
| 0.0                                    | -0.4                                  | ----                         | Correlation Coefficient | ≥0.995        |
| 800.2                                  | 802.4                                 | 0.9973                       |                         |               |
| 400.2                                  | 400.6                                 | 0.9989                       | Slope                   | 0.90 - 1.10   |
| 200.1                                  | 197.7                                 | 1.0120                       |                         |               |
|  |                                       |                              | Intercept               | +/-30         |



SO2 Calibration Plot

Date: February 14, 2023

Location: Jackfish 1







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Jackfish 1      Station number: AMS506  
 Calibration Date: February 1, 2023      Last Cal Date: January 20, 2023  
 Start time (MST): 10:12      End time (MST): 14:10  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.14 ppm      Cal Gas Exp Date: September 16, 2024  
 Cal Gas Cylinder #: CC511843  
 Removed Cal Gas Conc: 5.14 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 2659  
 ZAG Make/Model: API 701      Serial Number: 4427

### Analyzer Information

Analyzer make: Thermo 43iQTL      Analyzer serial #: 12124313139  
 Converter make: Global G150      Converter serial #: 2022-200  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.008437     | 1.003151      | Backgd or Offset: 1.04 | 1.04          |
| Calibration intercept: | -0.098415    | -0.038506     | Coeff or Slope: 0.736  | 0.736         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4922                          | 77.8                        | 80.0                                | 74.6                               | 1.075  |
| as found 2nd point    | 4961                          | 38.9                        | 40.0                                | 37.0                               | 1.087  |
| as found 3rd point    | 4981                          | 19.4                        | 19.9                                | 17.8                               | <b>1.133</b>   |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point          | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|--------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero    | 5000                          | 0.0                         | 0.0                                 | 0.4                                | ----  |
| high point         | 4922                          | 77.8                        | 80.0                                | 80.4                               | 0.995   |
| second point       | 4961                          | 38.9                        | 40.0                                | 39.9                               | 1.002   |
| third point        | 4981                          | 19.4                        | 19.9                                | 19.5                               | 1.023   |
| as left zero       | 5000                          | 0.0                         | 0.0                                 | 0.6                                | ----  |
| as left span       | 4922                          | 77.8                        | 80.0                                | 80.9                               | 0.989   |
| SO2 Scrubber Check | 4921                          | 79.2                        | 792.0                               | 0.1                                | ----  |

|   |                  |                 |       |
|---|------------------|-----------------|-------|
| Date of last scrubber change:           |                  | Ave Corr Factor | 1.007 |
| Date of last converter efficiency test: | December 1, 2022 | efficiency      |       |

Baseline Corr As found: 74.4      Prev response: 80.56      \*% change: **-8.3%**  
 Baseline Corr 2nd AF pt: 36.8      AF Slope: 0.933723      AF Intercept: -0.260061  
 Baseline Corr 3rd AF pt: 17.6      AF Correlation: 0.999815

*\* = > +/-5% change initiates investigation*

Notes: Noticed as found 3rd point is off the correction factor. Hydration might be required, inlet filter changed and hydrator filled after third As Found, scrubber check after calibrator zero. No adjustment made.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

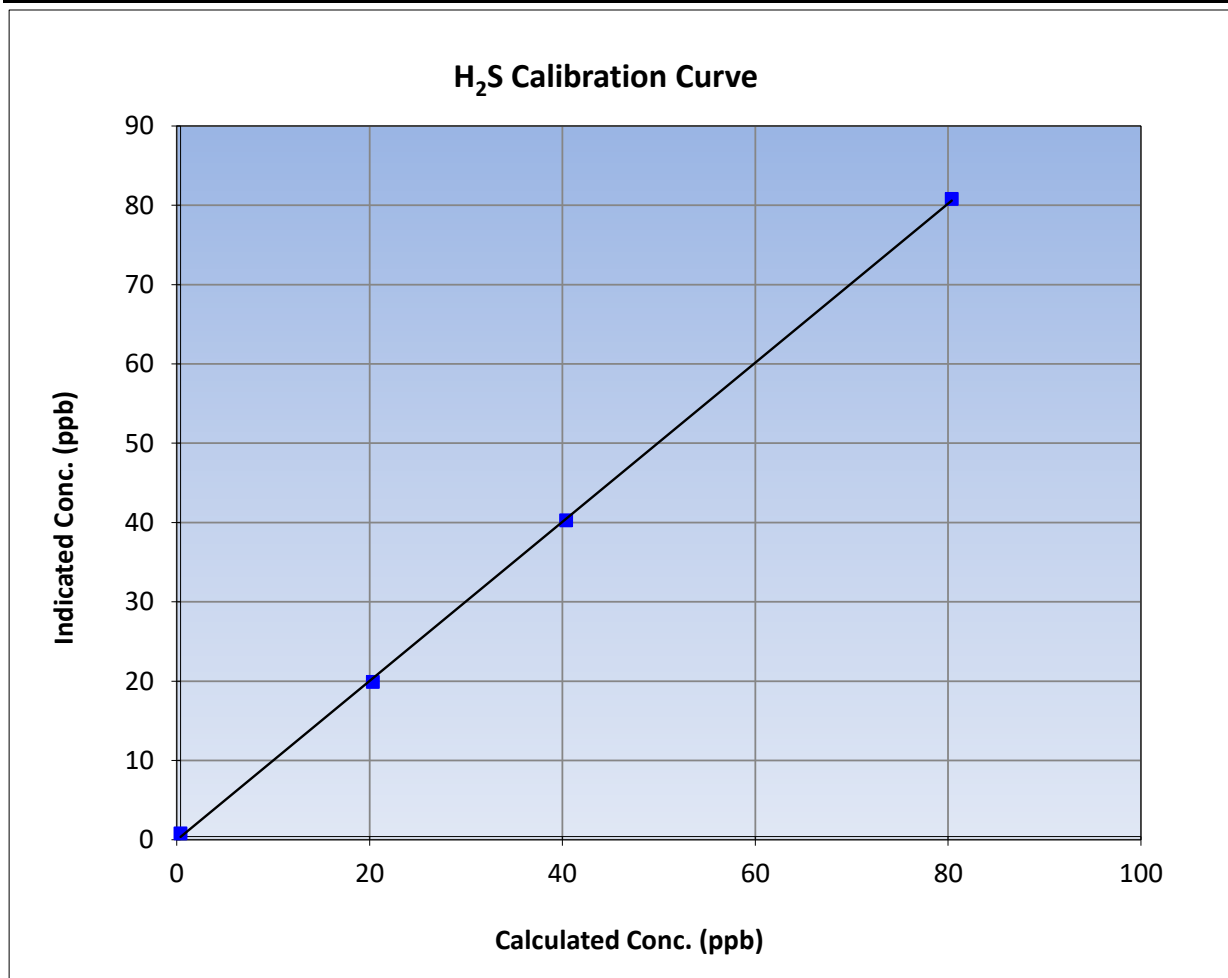
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 20, 2023 |
| Station Name:     | Jackfish 1       | Station Number:       | AMS506           |
| Start Time (MST): | 10:12            | End Time (MST):       | 14:10            |
| Analyzer make:    | Thermo 43iQTL    | Analyzer serial #:    | 12124313139      |

### Calibration Data

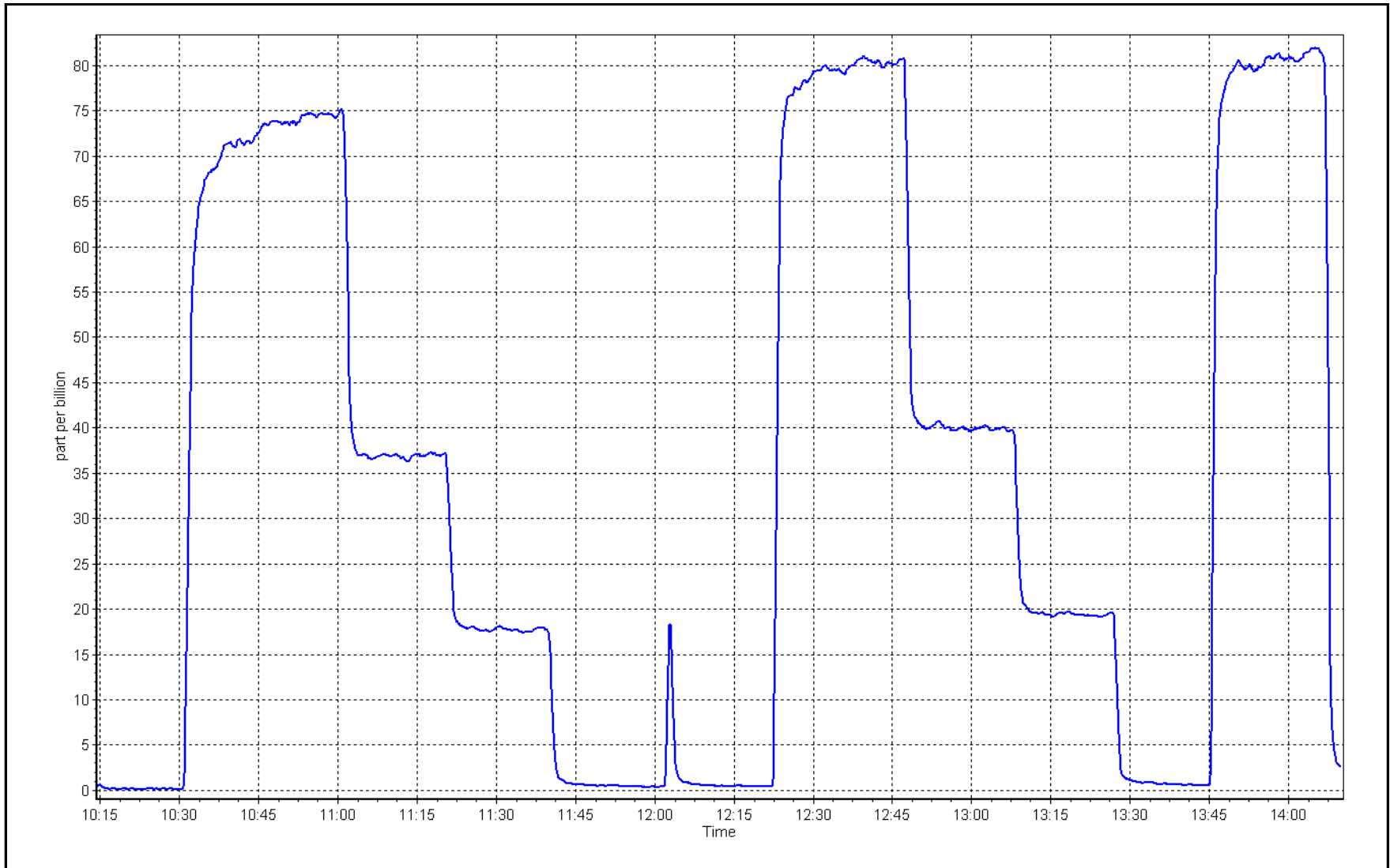
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999863  |             |
| 80.0                                | 80.4                               | 0.9948                    |                         |           | ≥0.995      |
| 40.0                                | 39.9                               | 1.0023                    | Slope                   | 1.003151  |             |
| 19.9                                | 19.5                               | 1.0226                    |                         |           | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.038506 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 1, 2023

Location: Jackfish 1







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

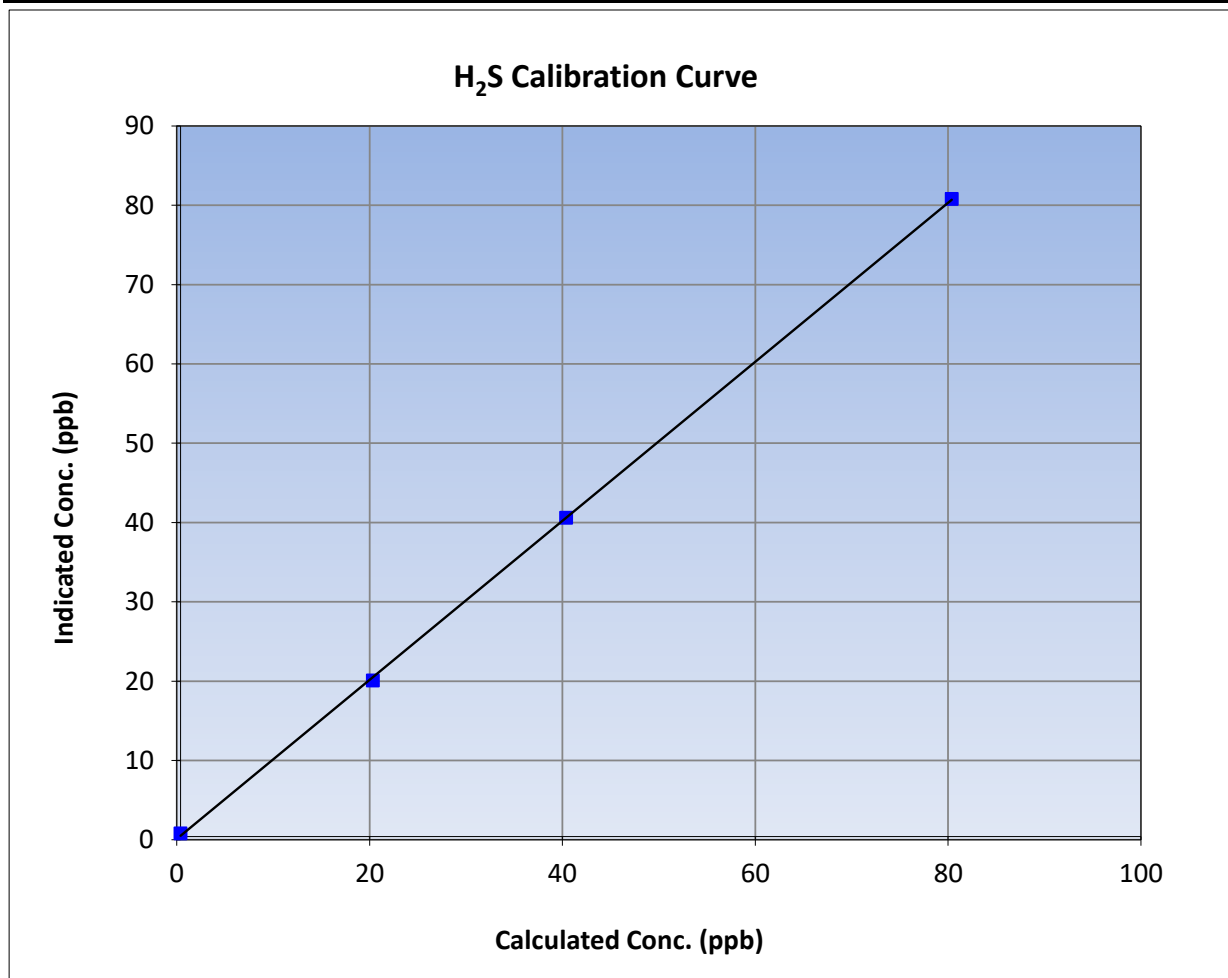
Version-11-2021

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 13, 2023 | Previous Calibration: | February 1, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS506           |
| Start Time (MST): | 10:00             | End Time (MST):       | 14:06            |
| Analyzer make:    | Thermo 43iQTL     | Analyzer serial #:    | 12124313139      |

### Calibration Data

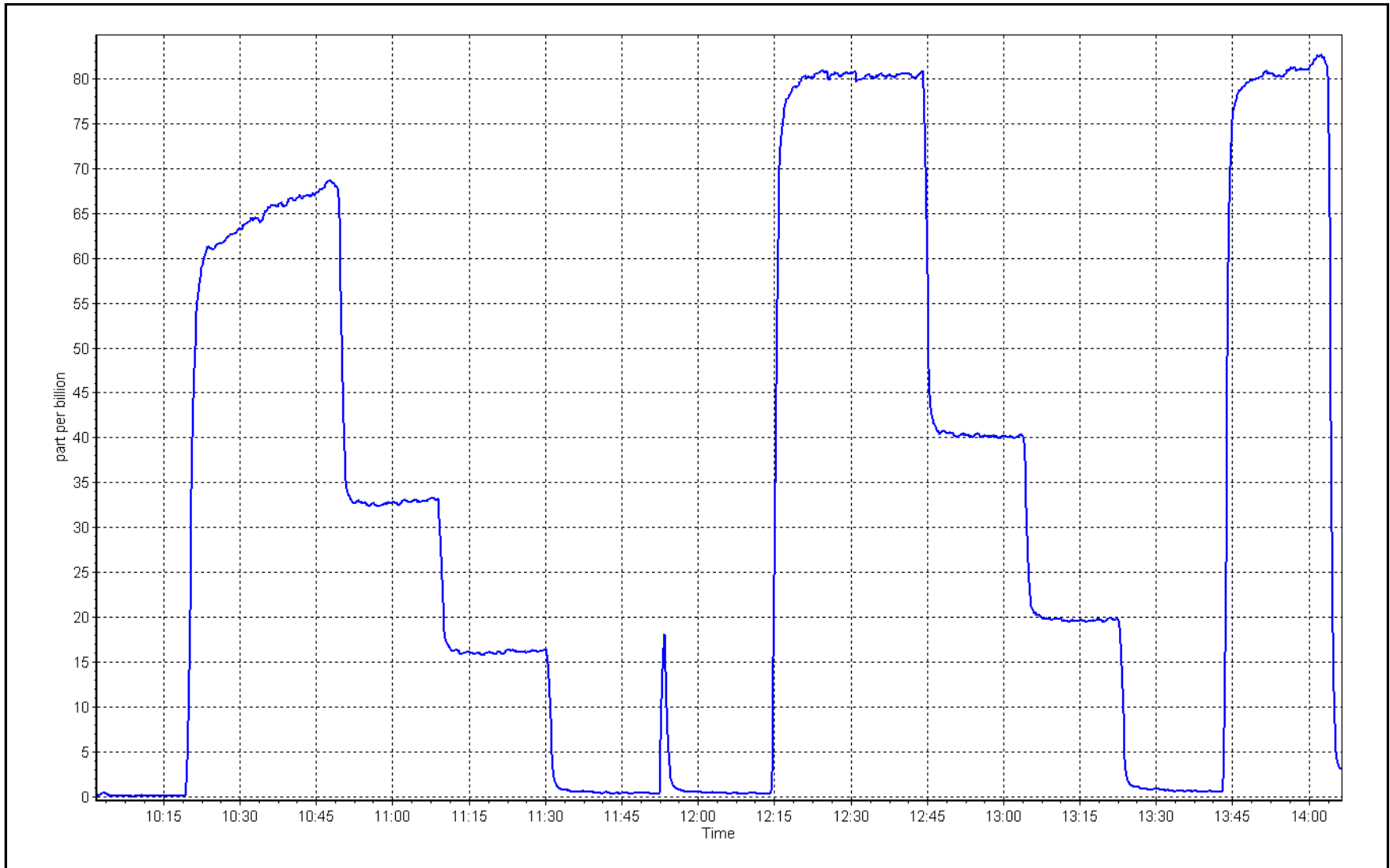
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.0                                 | 0.4                                | ----                      | Correlation Coefficient | 0.999927 | ≥0.995      |
| 80.0                                | 80.4                               | 0.9948                    |                         |          |             |
| 40.0                                | 40.2                               | 0.9948                    | Slope                   | 1.002721 | 0.90 - 1.10 |
| 19.9                                | 19.7                               | 1.0123                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.101523 | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 13, 2023

Location: Jackfish 1





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Jackfish 1        | Station number: | AMS506            |
| Calibration Date: | February 22, 2023 | Last Cal Date:  | February 13, 2023 |
| Start time (MST): | 9:57              | End time (MST): | 14:49             |
| Reason:           | Maintenance       |                 |                   |

### Calibration Standards

|                        |          |     |                   |                    |
|------------------------|----------|-----|-------------------|--------------------|
| Cal Gas Concentration: | 5.14     | ppm | Cal Gas Exp Date: | September 16, 2024 |
| Cal Gas Cylinder #:    | CC511843 |     |                   |                    |
| Removed Cal Gas Conc:  | 5.14     | ppm | Rem Gas Exp Date: | NA                 |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                    |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 2659               |
| ZAG Make/Model:        | API 701  |     | Serial Number:    | 4427               |

### Analyzer Information

|                 |             |                     |             |
|-----------------|-------------|---------------------|-------------|
| Analyzer make:  | Thermo 43iQ | Analyzer serial #:  | 12124313139 |
| Converter make: | Global G150 | Converter serial #: | 2022-200    |
| Analyzer Range  | 0 - 100 ppb |                     |             |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.002721     |               | Backgd or Offset: | 1.04         | 1.04          |
| Calibration intercept: | 0.101523     |               | Coeff or Slope:   | 0.720        | 0.720         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | 0.2                                | ----   |
| as found span         | 4922                          | 77.8                        | 80.0                                | 75.1                               | 1.068  |
| as found 2nd point    | 4961                          | 38.9                        | 40.0                                | 37.9                               | 1.061  |
| as found 3rd point    | 4981                          | 19.4                        | 19.9                                | 18.4                               | 1.096  |
| new cylinder response |                               |                             |                                     |                                    |  |

*Limit = 0.90-1.10*

### H<sub>2</sub>S Calibration Data

| Set Point       | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|-----------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---------------------------|
| calibrator zero |                               |                             |                                     |                                    |                           |
| high point      |                               |                             |                                     |                                    |                           |
| second point    |                               |                             |                                     |                                    |                           |
| third point     |                               |                             |                                     |                                    |                           |
| as left zero    |                               |                             |                                     |                                    |                           |
| as left span    |                               |                             |                                     |                                    |                           |

*Limit = 0.95-1.05*

### SO<sub>2</sub> Scrubber Check

|   |                  |                 |  |
|---|------------------|-----------------|--|
| Date of last scrubber change:           | 22-Feb-23        | Ave Corr Factor |  |
| Date of last converter efficiency test: | December 1, 2022 | efficiency      |  |

|                          |      |                 |          |               |          |
|--------------------------|------|-----------------|----------|---------------|----------|
| Baseline Corr As found:  | 74.9 | Prev response:  | 80.30    | *% change:    | -7.2%    |
| Baseline Corr 2nd AF pt: | 37.7 | AF Slope:       | 0.938864 | AF Intercept: | 0.060149 |
| Baseline Corr 3rd AF pt: | 18.2 | AF Correlation: | 0.999917 |               |          |

\* = > +/-5% change initiates investigation

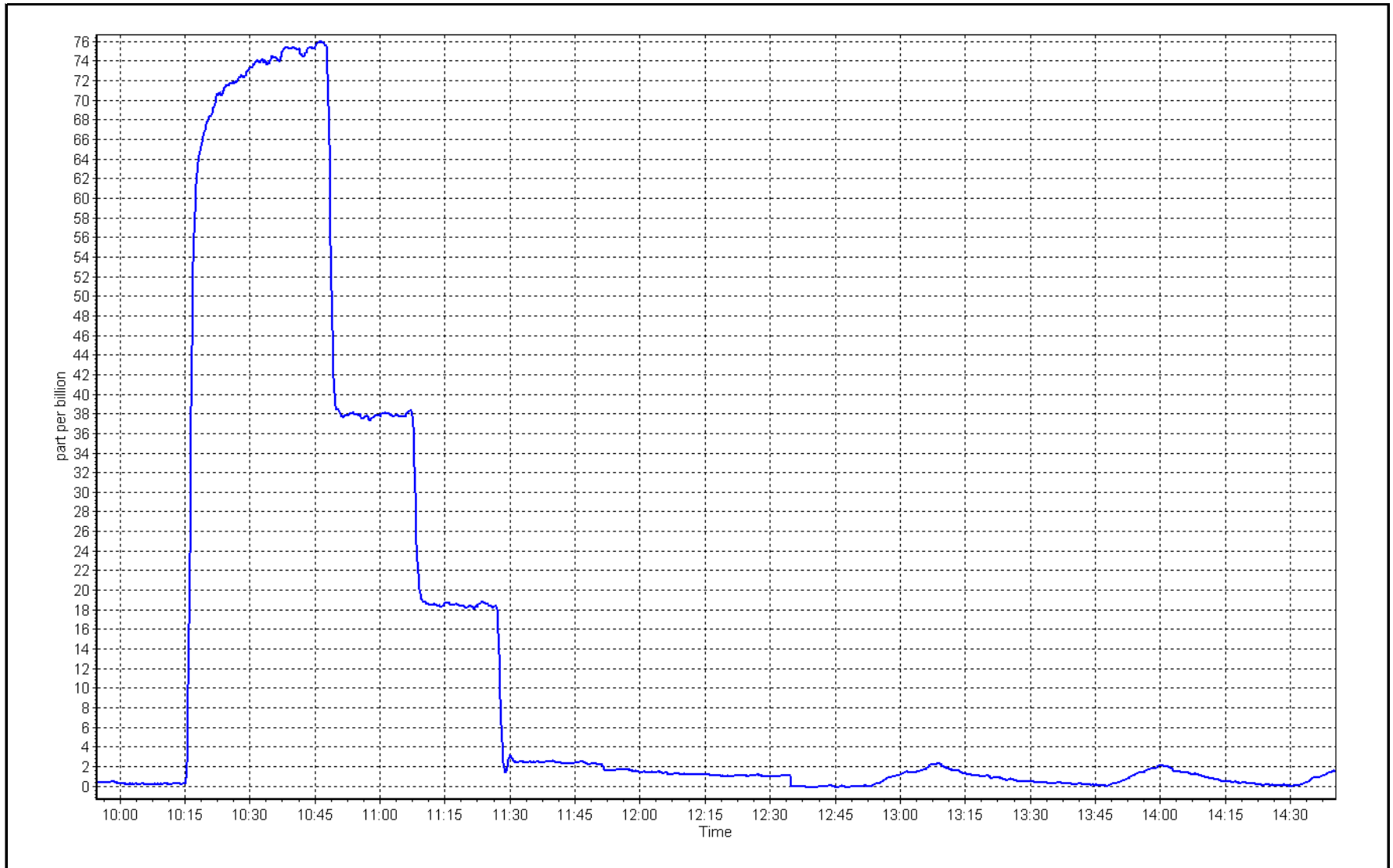
Notes: Changed inlet filter and SO<sub>2</sub> scrubber beads after multi-point as founds. Multiple attempts to remedy SO<sub>2</sub> scrubber failure. Discussed with the lead and decided to leave it hydrated overnight.

Calibration Performed By: Sean Bala

H<sub>2</sub>S Calibration Plot

Date: February 22, 2023

Location: Jackfish 1







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                   |                            |                   |
|-------------------|-------------------|----------------------------|-------------------|
| Station Name:     | Jackfish 1        | Station number:            | AMS506            |
| Calibration Date: | February 24, 2023 | Last Cal Date:             | February 22, 2023 |
| Start time (MST): | 9:32              | End time (MST):            | 13:05             |
| Reason:           | Maintenance       | Installing a new H2S setup |                   |

### Calibration Standards

|                        |          |     |                   |                    |
|------------------------|----------|-----|-------------------|--------------------|
| Cal Gas Concentration: | 5.14     | ppm | Cal Gas Exp Date: | September 16, 2024 |
| Cal Gas Cylinder #:    | CC511843 |     |                   |                    |
| Removed Cal Gas Conc:  | 5.14     | ppm | Rem Gas Exp Date: | NA                 |
| Removed Gas Cyl #:     | NA       |     | Diff between cyl: |                    |
| Calibrator Make/Model: | API T700 |     | Serial Number:    | 2659               |
| ZAG Make/Model:        | API 701  |     | Serial Number:    | 4427               |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i-TLE | Analyzer serial #:  | 1180540020 |
| Converter make: | Global G150    | Converter serial #: | 2022-218   |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>      | <u>Finish</u> |
|------------------------|--------------|---------------|-------------------|---------------|
| Calibration slope:     | NA           | 0.995862      | Backgd or Offset: | NA            |
| Calibration intercept: | NA           | 0.041428      | Coeff or Slope:   | NA            |
|                        |              |               |                   | 1.04          |
|                        |              |               |                   | 0.720         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (scm) | Source gas flow rate (scm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) |
|-----------------------|------------------------------|----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         |                              |                            |                                     |                                    | <i>Limit = 0.90-1.10</i>                             |
| as found span         |                              |                            |                                     |                                    |  |
| as found 2nd point    |                              |                            |                                     |                                    |  |
| as found 3rd point    |                              |                            |                                     |                                    |  |
| new cylinder response |                              |                            |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (scm) | Source gas flow rate (scm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---|------------------------------|----------------------------|-------------------------------------|------------------------------------|---------------------------|
| calibrator zero                         | 5000                         | 0.0                        | 0.0                                 | 0.2                                | ----                      |
| high point                              | 4922                         | 77.8                       | 80.0                                | 79.7                               | 1.004                     |
| second point                            | 4961                         | 38.9                       | 40.0                                | 40.0                               | 1.000                     |
| third point                             | 4981                         | 19.4                       | 19.9                                | 19.6                               | 1.017                     |
| as left zero                            | 5000                         | 0.0                        | 0.0                                 | 0.1                                | ----                      |
| as left span                            | 4922                         | 77.8                       | 80.0                                | 80.0                               | 1.000                     |
| SO2 Scrubber Check                      | 4921                         | 79.2                       | 792.0                               | -0.1                               | ----                      |
| Date of last scrubber change:           | 24-Feb-23                    |                            |                                     | Ave Corr Factor                    | 1.007                     |
| Date of last converter efficiency test: | December 1, 2022             |                            |                                     | efficiency                         |                           |

|                          |    |                 |    |               |    |
|--------------------------|----|-----------------|----|---------------|----|
| Baseline Corr As found:  | NA | Prev response:  | NA | *% change:    | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope:       | NA | AF Intercept: | NA |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | NA |               |    |

\* = > +/-5% change initiates investigation

Notes: Started maintenance on 2023-02-22. Inlet filter changed and multi-point as found was already done. H2S setup need to be change because it was not responding. Adjusted span.

Calibration Performed By: Sean Bala



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

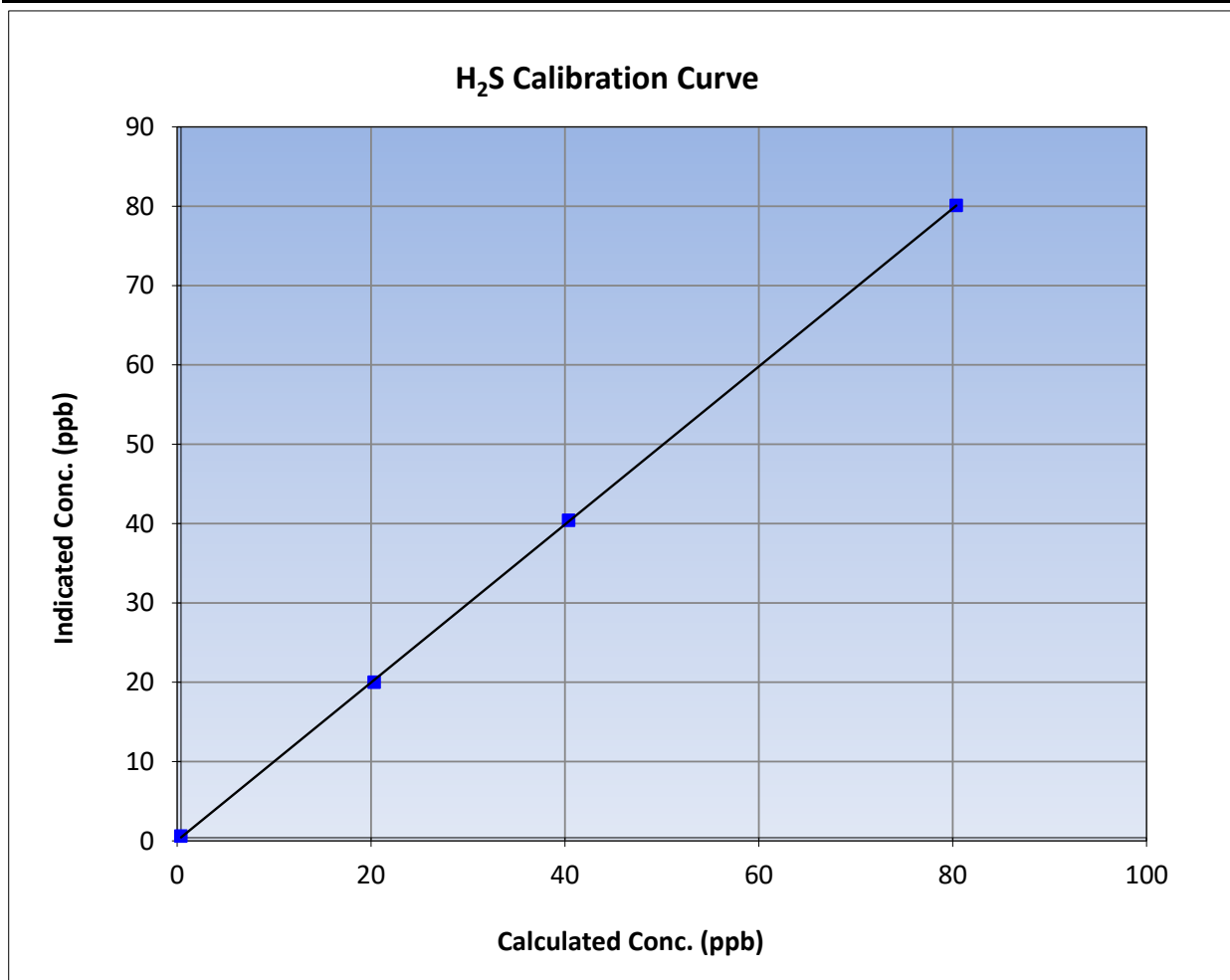
Version-11-2021

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 24, 2023 | Previous Calibration: | February 22, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS506            |
| Start Time (MST): | 9:32              | End Time (MST):       | 13:05             |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1180540020        |

### Calibration Data

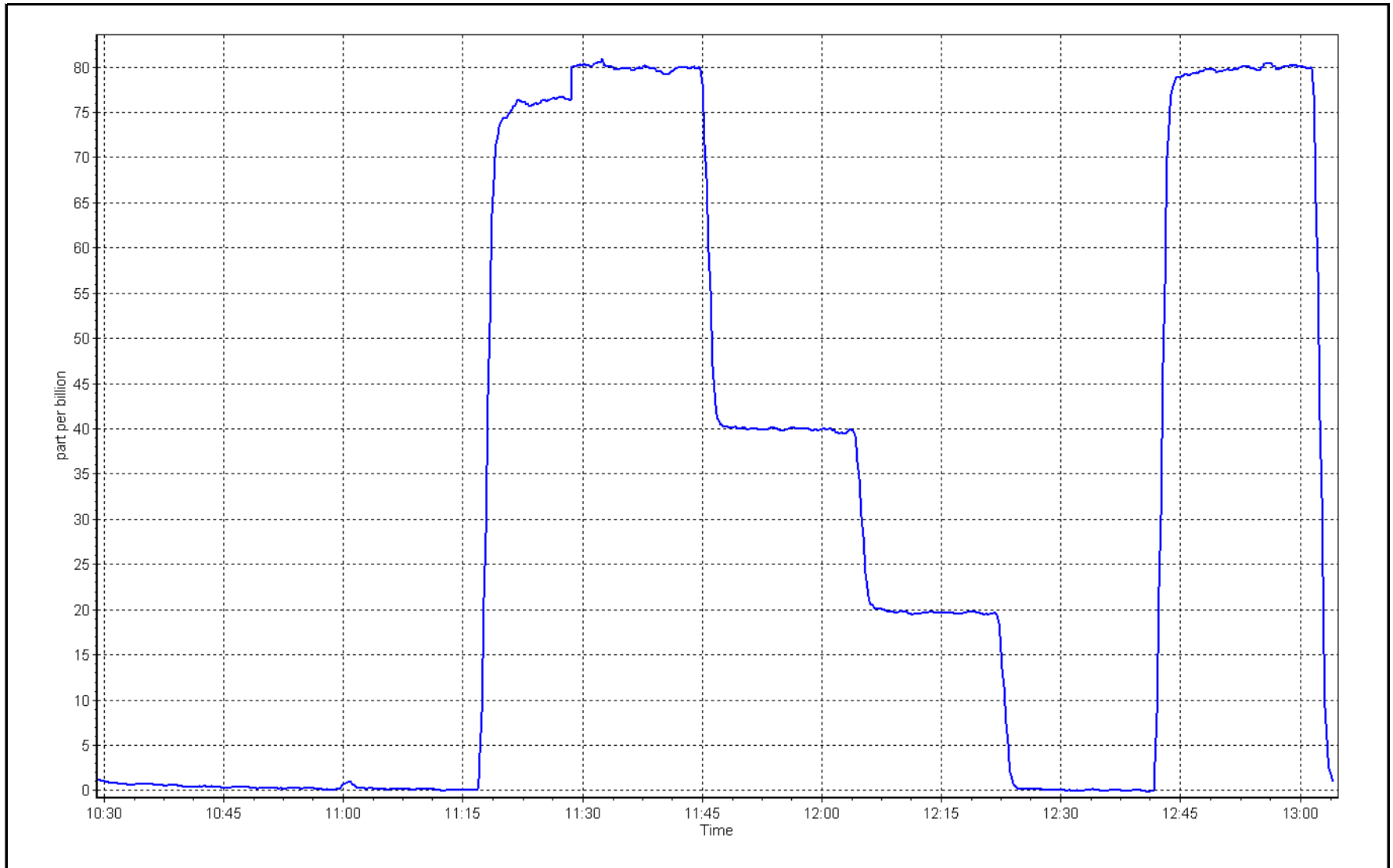
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          | <u>Limits</u> |       |          |                    |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|---------------|-------|----------|--------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient | 0.999962 | <b>≥0.995</b> |       |          |                    |
| 80.0                                | 79.7                               | 1.0035                    |                         |          |               |       |          |                    |
| 40.0                                | 40.0                               | 0.9997                    |                         |          |               | Slope | 0.995862 | <b>0.90 - 1.10</b> |
| 19.9                                | 19.6                               | 1.0174                    |                         |          |               |       |          |                    |
|                                     |                                    |                           | Intercept               | 0.041428 | <b>+/-3</b>   |       |          |                    |



# H<sub>2</sub>S Calibration Plot

Date: February 24, 2023

Location: Jackfish 1







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.1  | 0.1                                   | 0.0  | ----  | ----   |
| as found span             | 4916                      | 84.4                        | 801.1   | 799.9                                  | 1.2   | 806.9  | 804.8                                 | 2.1  | 0.9928  | 0.9939   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.2                                   | 0.1  | ----  | ----   |
| high point                | 4916                      | 84.4                        | 801.1   | 799.9                                  | 1.2   | 800.1  | 799.5                                 | 0.6  | 1.0012  | 1.0005   |
| second point              | 4958                      | 42.2                        | 400.5   | 400.0                                  | 0.6   | 400.0  | 398.5                                 | 1.5  | 1.0014  | 1.0037   |
| third point               | 4979                      | 21.1                        | 200.3   | 200.0                                  | 0.3   | 197.0  | 195.0                                 | 2.0  | 1.0166  | 1.0255   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.3  | 0.2                                   | 0.1  | ----  | ----   |
| as left span              | 4916                      | 84.4                        | 801.1   | 415.9                                  | 385.2   | 793.9  | 411.3                                 | 382.6  | 1.0090  | 1.0111   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0064  | 1.0099   |

|                      |                             |                |  |                                  |                        |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 806.8 ppb | NO = 804.7 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = 0.9% |                      |
| Previous Response    | NO <sub>x</sub> = 799.9 ppb | NO = 798.8 ppb |  | *Percent Change                  | NO = 0.7%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                 | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                 | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:    | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|----------------------------------|--|---------------------------------------|---|--|--|--|
| as found GPT zero                |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO2) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO2) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O3)       | 792.8                                      | 408.8                                 | 385.2   | 385.0  | 1.0005   | 100.0%   |
| 2nd GPT point (200 ppb O3)       | 792.8                                      | 591.0                                 | 203.0   | 201.6  | 1.0069   | 99.3%  |
| 3rd GPT point (100 ppb O3)       | 792.8                                      | 687.5                                 | 106.5   | 106.0  | 1.0045   | 99.5%  |
| Average Correction Factor        |  |                                       |   |  | 1.0040   | 99.6%  |

Notes:

Adjusted the span only.

Calibration Performed By:

Sean Bala



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

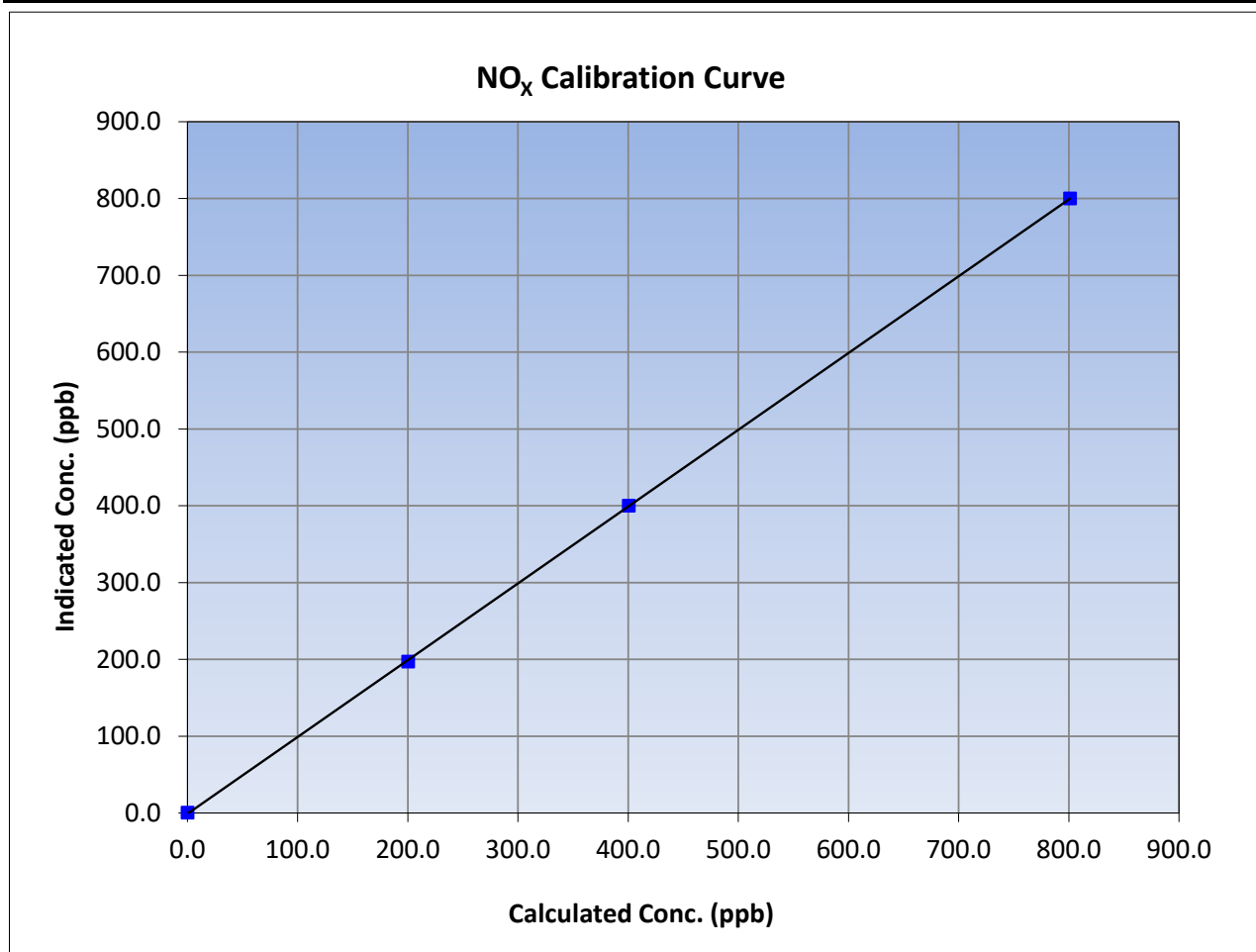
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS506           |
| Start Time (MST): | 10:21             | End Time (MST):       | 14:36            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1218153356       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 801.1                               | 800.1                              | 1.0012                    |   |                                |
| 400.5                               | 400.0                              | 1.0014                    |   |                                |
| 200.3                               | 197.0                              | 1.0166                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO Calibration Summary

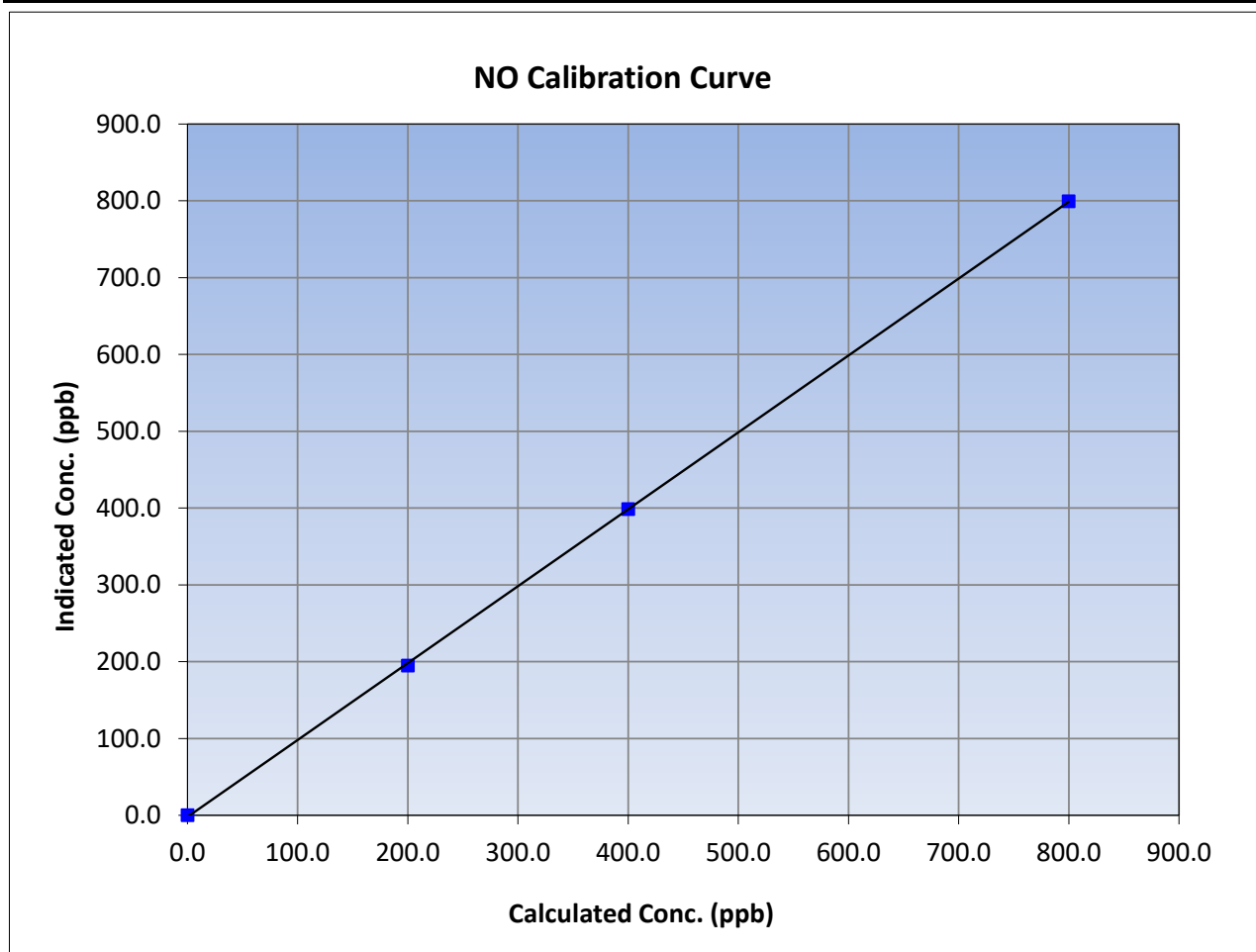
Version-04-2020

### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS506           |
| Start Time (MST): | 10:21             | End Time (MST):       | 14:36            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1218153356       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | Limits                         |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.2                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 799.9                               | 799.5                              | 1.0005                    |   |                                |
| 400.0                               | 398.5                              | 1.0037                    |   |                                |
| 200.0                               | 195.0                              | 1.0255                    |   |                                |
|                                     |                                    |                           |   |                                |





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

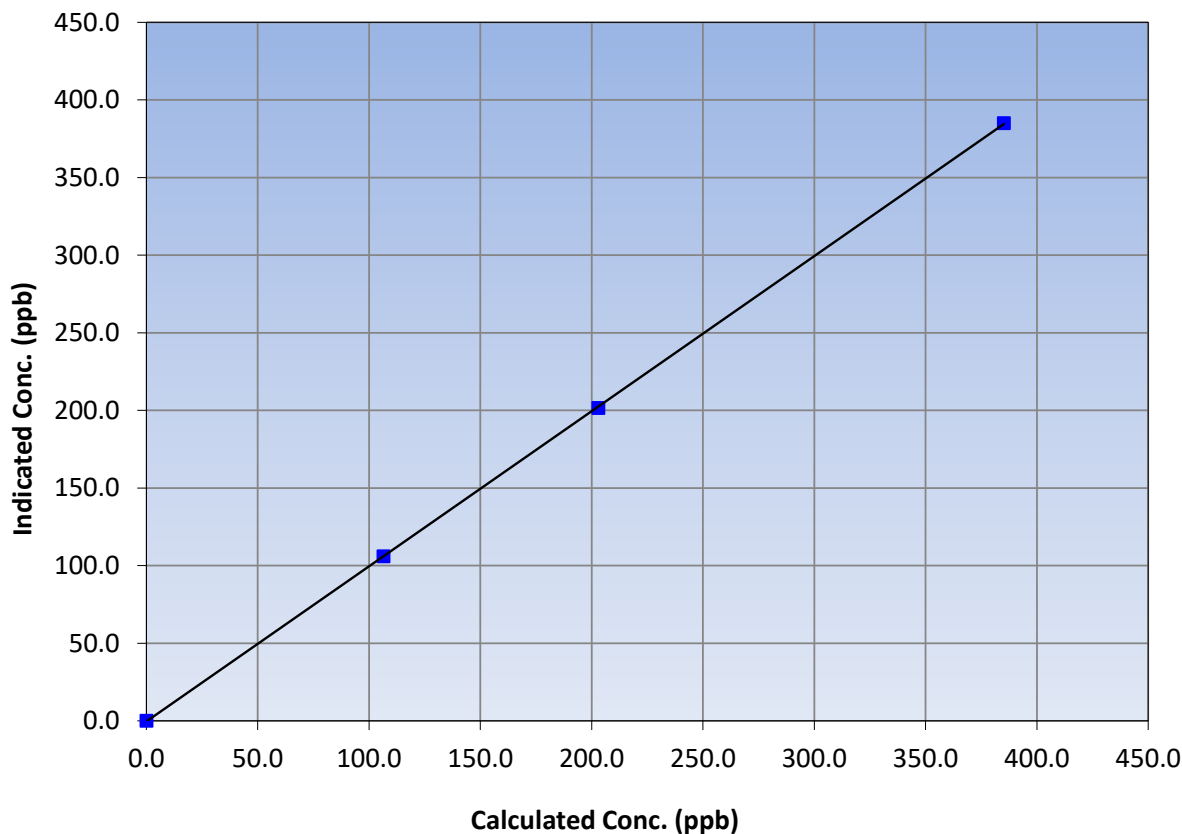
### Station Information

|                   |                   |                       |                  |
|-------------------|-------------------|-----------------------|------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | January 25, 2023 |
| Station Name:     | Jackfish 1        | Station Number:       | AMS506           |
| Start Time (MST): | 10:21             | End Time (MST):       | 14:36            |
| Analyzer make:    | Thermo 42i        | Analyzer serial #:    | 1218153356       |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995        |             |
| 385.2                               | 385.0                              | 1.0005                    |                         |               |             |
| 203.0                               | 201.6                              | 1.0069                    |                         |               |             |
| 106.5                               | 106.0                              | 1.0045                    |                         |               |             |
|                                     |                                    |                           | Slope                   | 0.999204      | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.347850     | +/-20       |

**NO<sub>2</sub> Calibration Curve**

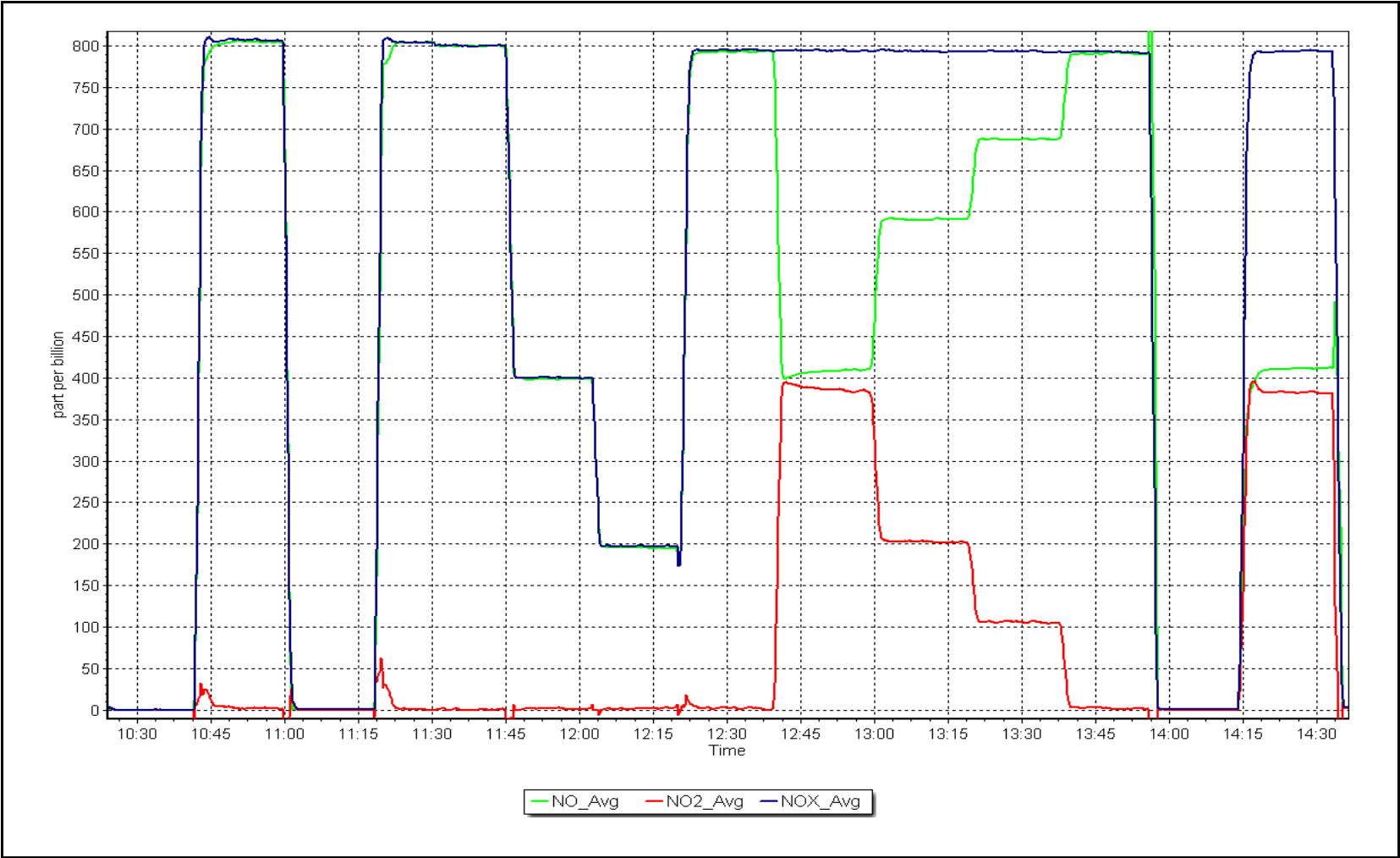




NO<sub>x</sub> Calibration Plot

Date: February 15, 2023

Location: Jackfish 1





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
CALIBRATION REPORT

**AMS508**  
**KIRBY NORTH**  
**FEBRUARY 2023**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

March 31, 2023





# Wood Buffalo Environmental Association

## SO<sub>2</sub> Calibration Summary

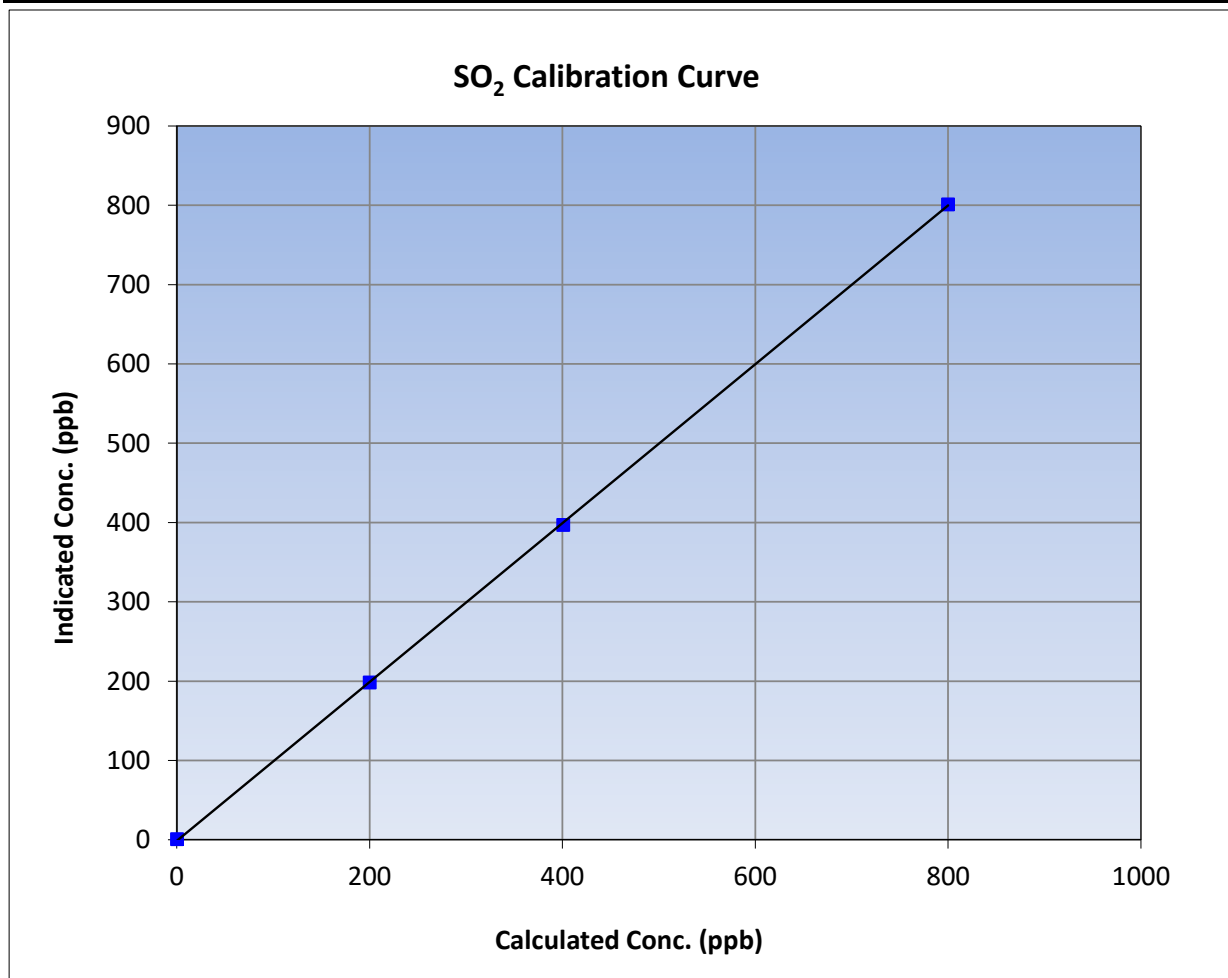
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 8:41             | End Time (MST):       | 14:52            |
| Analyzer make:    | Thermo 43iQ      | Analyzer serial #:    | 1182340007       |

### Calibration Data

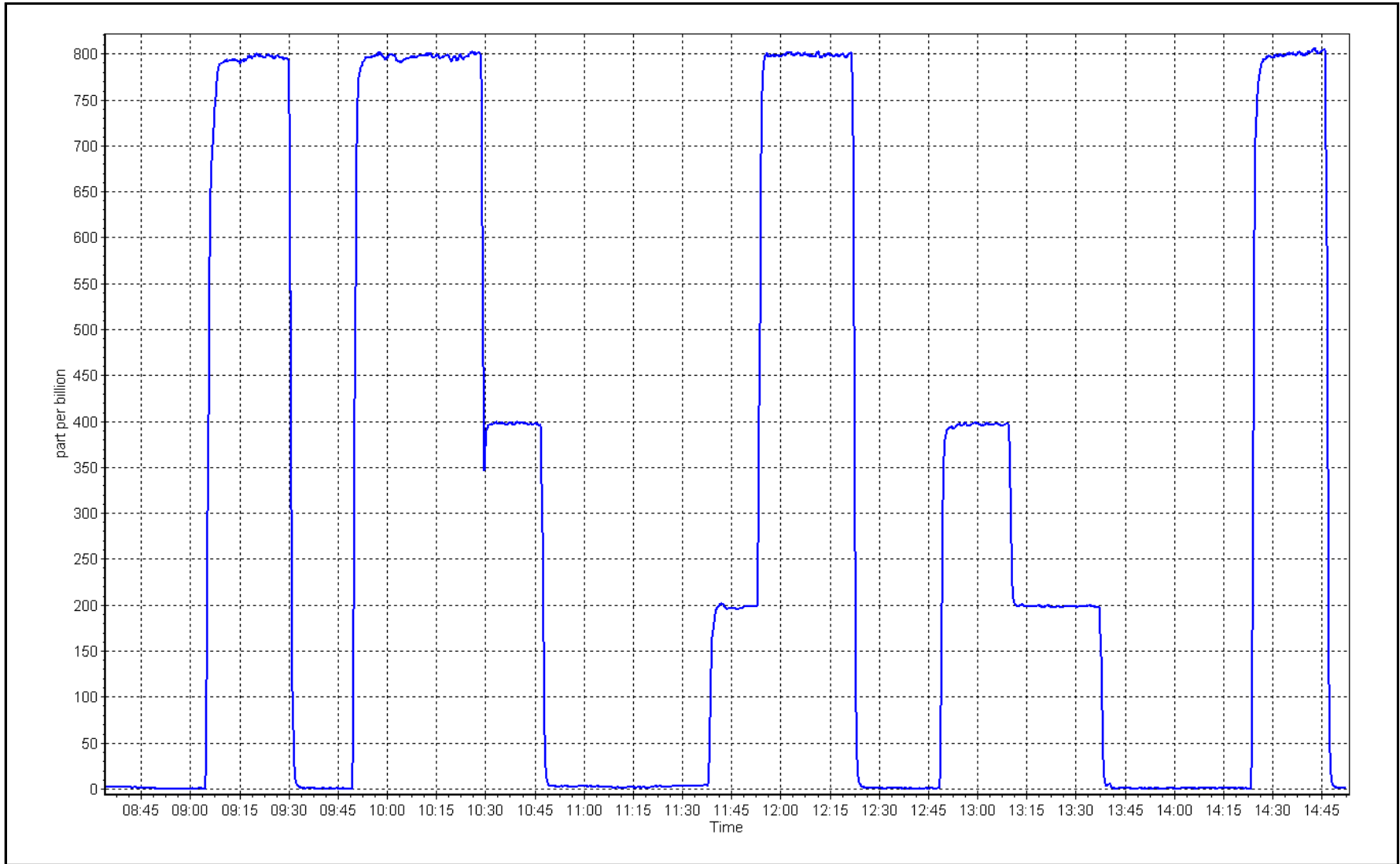
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.3                                | ----                      | Correlation Coefficient | 0.999962  | ≥0.995      |
| 799.6                               | 801.0                              | 0.9983                    |                         |           |             |
| 400.3                               | 396.8                              | 1.0089                    | Slope                   | 1.001676  | 0.90 - 1.10 |
| 199.7                               | 198.0                              | 1.0084                    |                         |           |             |
|                                     |                                    |                           | Intercept               | -1.468267 | +/-30       |



SO2 Calibration Plot

Date: February 2, 2023

Location: Kirby North





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Kirby North      Station number: AMS508  
 Calibration Date: February 2, 2023      Last Cal Date: January 12, 2023  
 Start time (MST): 8:41      End time (MST): 14:34  
 Reason: Routine

### Calibration Standards

Cal Gas Concentration: 5.167 ppm      Cal Gas Exp Date: February 5, 2024  
 Cal Gas Cylinder #: CC517378  
 Removed Cal Gas Conc: 5.167 ppm      Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA      Diff between cyl:  
 Calibrator Make/Model: API T700      Serial Number: 3804  
 ZAG Make/Model: API 701H      Serial Number: 880

### Analyzer Information

Analyzer make: Thermo 43i TLE      Analyzer serial #: 1150840012  
 Converter make: Global      Converter serial #: 2022-197  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.007171     | 1.005874      | Backgd or Offset: 1.76 | 1.77          |
| Calibration intercept: | -0.280963    | -0.260560     | Coeff or Slope: 1.058  | 1.069         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.2                               | ----   |
| as found span         | 4923                          | 77.4                        | 80.0                                | 81.8                               | 0.975  |
| as found 2nd point    | 4961                          | 38.8                        | 40.1                                | 41.0                               | 0.973  |
| as found 3rd point    | 4981                          | 19.3                        | 19.9                                | 20.4                               | 0.968  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.1                                | ----  |
| high point                              | 4923                          | 77.4                        | 80.0                                | 80.5                               | 0.994   |
| second point                            | 4961                          | 38.8                        | 40.1                                | 39.5                               | 1.015   |
| third point                             | 4981                          | 19.3                        | 19.9                                | 19.7                               | 1.012   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4923                          | 77.4                        | 80.0                                | 78.3                               | 1.021   |
| SO2 Scrubber Check                      | 4920                          | 79.8                        | 798.0                               | 0.1                                | ----  |
| Date of last scrubber change:           | 27-Nov-19                     |                             |                                     | Ave Corr Factor                    | 1.007   |
| Date of last converter efficiency test: | efficiency                    |                             |                                     |                                    |   |

|                          |      |                 |          |               |           |
|--------------------------|------|-----------------|----------|---------------|-----------|
| Baseline Corr As found:  | 82.0 | Prev response:  | 80.27    | *% change:    | 2.1%      |
| Baseline Corr 2nd AF pt: | 41.2 | AF Slope:       | 1.024745 | AF Intercept: | -0.121140 |
| Baseline Corr 3rd AF pt: | 20.6 | AF Correlation: | 0.999996 |               |           |

\* = > +/-5% change initiates investigation

Notes: Changed sample inlet filter after as founds. First scrubber check failed. Used DI water in a hydrator to hydrate the scrubber beads. Second test passed. Adjusted span.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

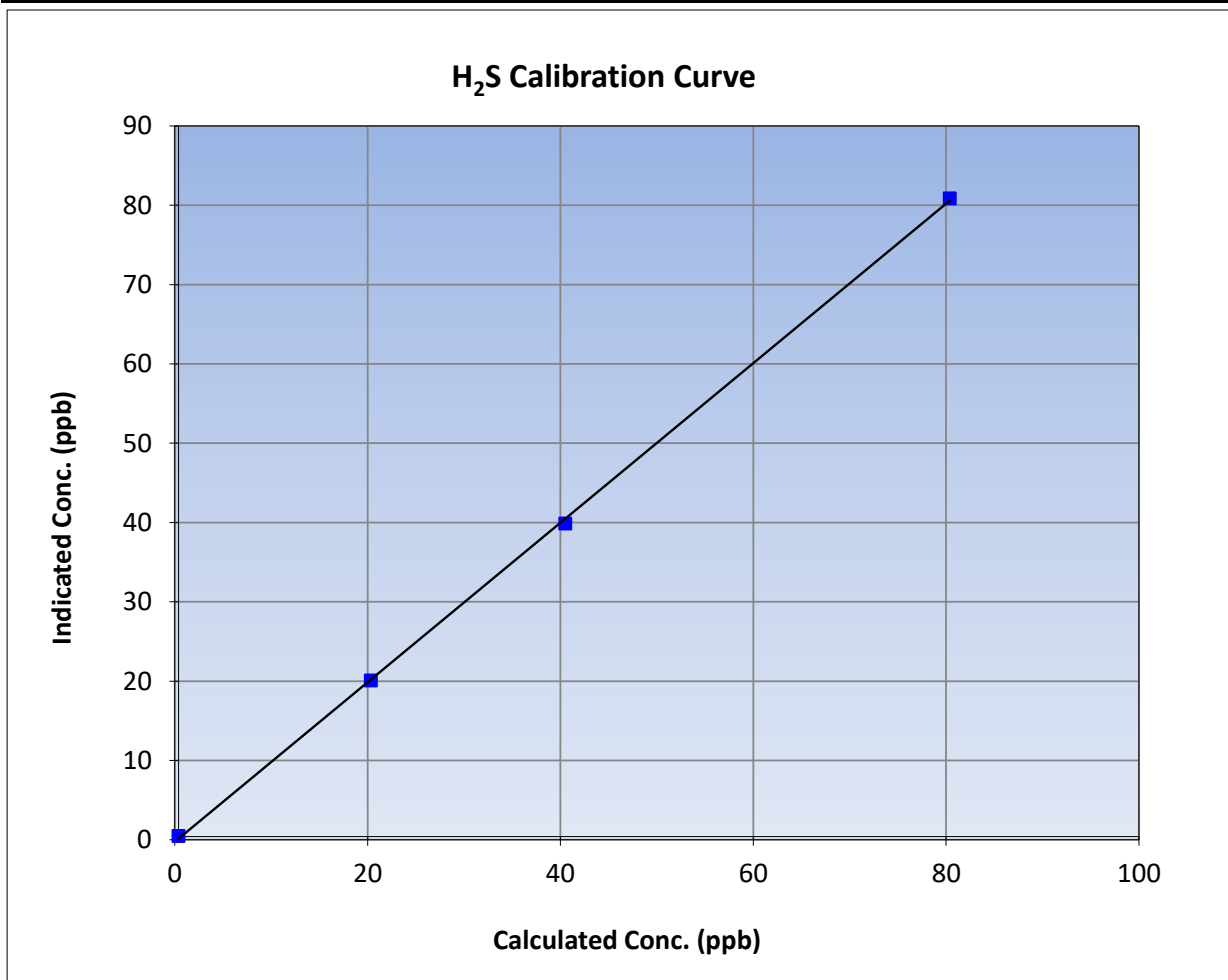
Version-11-2021

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 12, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 8:41             | End Time (MST):       | 14:34            |
| Analyzer make:    | Thermo 43i-TLE   | Analyzer serial #:    | 1150840012       |

### Calibration Data

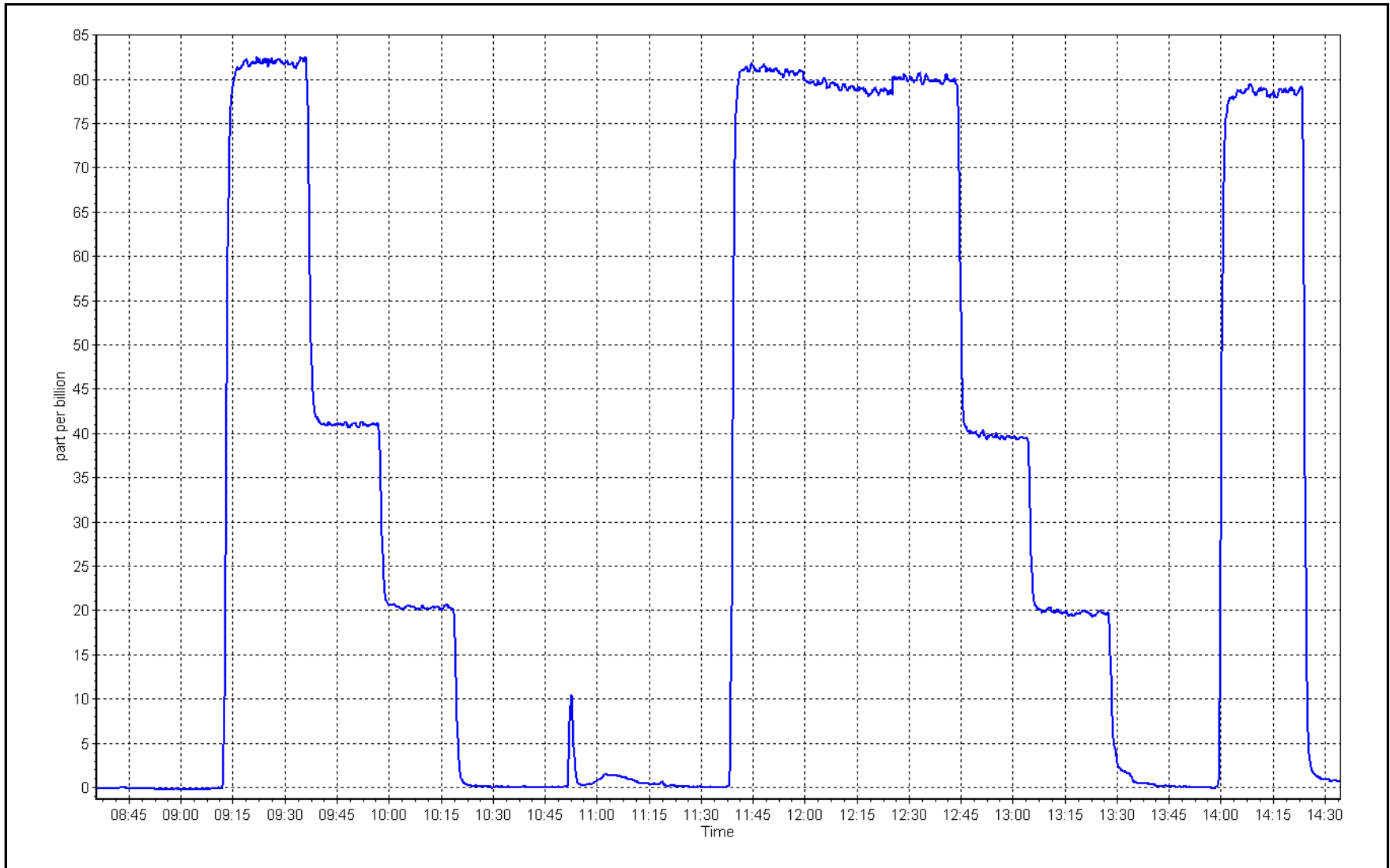
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits      |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-------------|
| 0.0                                 | 0.1                                | ----                      | Correlation Coefficient | ≥0.995      |
| 80.0                                | 80.5                               | 0.9935                    |                         |             |
| 40.1                                | 39.5                               | 1.0151                    | Slope                   | 0.90 - 1.10 |
| 19.9                                | 19.7                               | 1.0124                    |                         |             |
|                                     |                                    |                           | Intercept               | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 2, 2023

Location: Kirby North







# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

Station Name: Kirby North Station number: AMS508  
 Calibration Date: February 14, 2023 Last Cal Date: February 2, 2023  
 Start time (MST): 12:51 End time (MST): 16:45  
 Reason: As Found

### Calibration Standards

Cal Gas Concentration: 5.167 ppm Cal Gas Exp Date: February 5, 2024  
 Cal Gas Cylinder #: CC517378  
 Removed Cal Gas Conc: 5.167 ppm Rem Gas Exp Date: NA  
 Removed Gas Cyl #: NA Diff between cyl:  
 Calibrator Make/Model: API T700 Serial Number: 3804  
 ZAG Make/Model: API 701H Serial Number: 880

### Analyzer Information

Analyzer make: Thermo 43i TLE Analyzer serial #: 1150840012  
 Converter make: Global Converter serial #: 2022-197  
 Analyzer Range: 0 - 100 ppb

|                        | <u>Start</u> | <u>Finish</u> | <u>Start</u>           | <u>Finish</u> |
|------------------------|--------------|---------------|------------------------|---------------|
| Calibration slope:     | 1.007171     |               | Backgd or Offset: 1.77 | 1.77          |
| Calibration intercept: | -0.280963    |               | Coeff or Slope: 1.069  | 1.069         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         | 5000                          | 0.0                         | 0.0                                 | -0.1                               | ----   |
| as found span         | 4923                          | 77.4                        | 80.0                                | 78.2                               | 1.021  |
| as found 2nd point    | 4961                          | 38.8                        | 40.1                                | 38.5                               | 1.039  |
| as found 3rd point    | 4981                          | 19.3                        | 19.9                                | 19.1                               | 1.039  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point       | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|-----------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero |                               |                             |                                     |                                    |   |
| high point      |                               |                             |                                     |                                    |   |
| second point    |                               |                             |                                     |                                    |   |
| third point     |                               |                             |                                     |                                    |   |
| as left zero    |                               |                             |                                     |                                    |   |
| as left span    |                               |                             |                                     |                                    |   |

### SO<sub>2</sub> Scrubber Check

|   |           |                 |  |
|---|-----------|-----------------|--|
| Date of last scrubber change:           | 27-Nov-19 | Ave Corr Factor |  |
| Date of last converter efficiency test: |           | efficiency      |  |

Baseline Corr As found: 78.3 Prev response: 80.27 \*% change: -2.5%  
 Baseline Corr 2nd AF pt: 38.6 AF Slope: 0.979453 AF Intercept: -0.360689  
 Baseline Corr 3rd AF pt: 19.2 AF Correlation: 0.999912

\* = > +/-5% change initiates investigation

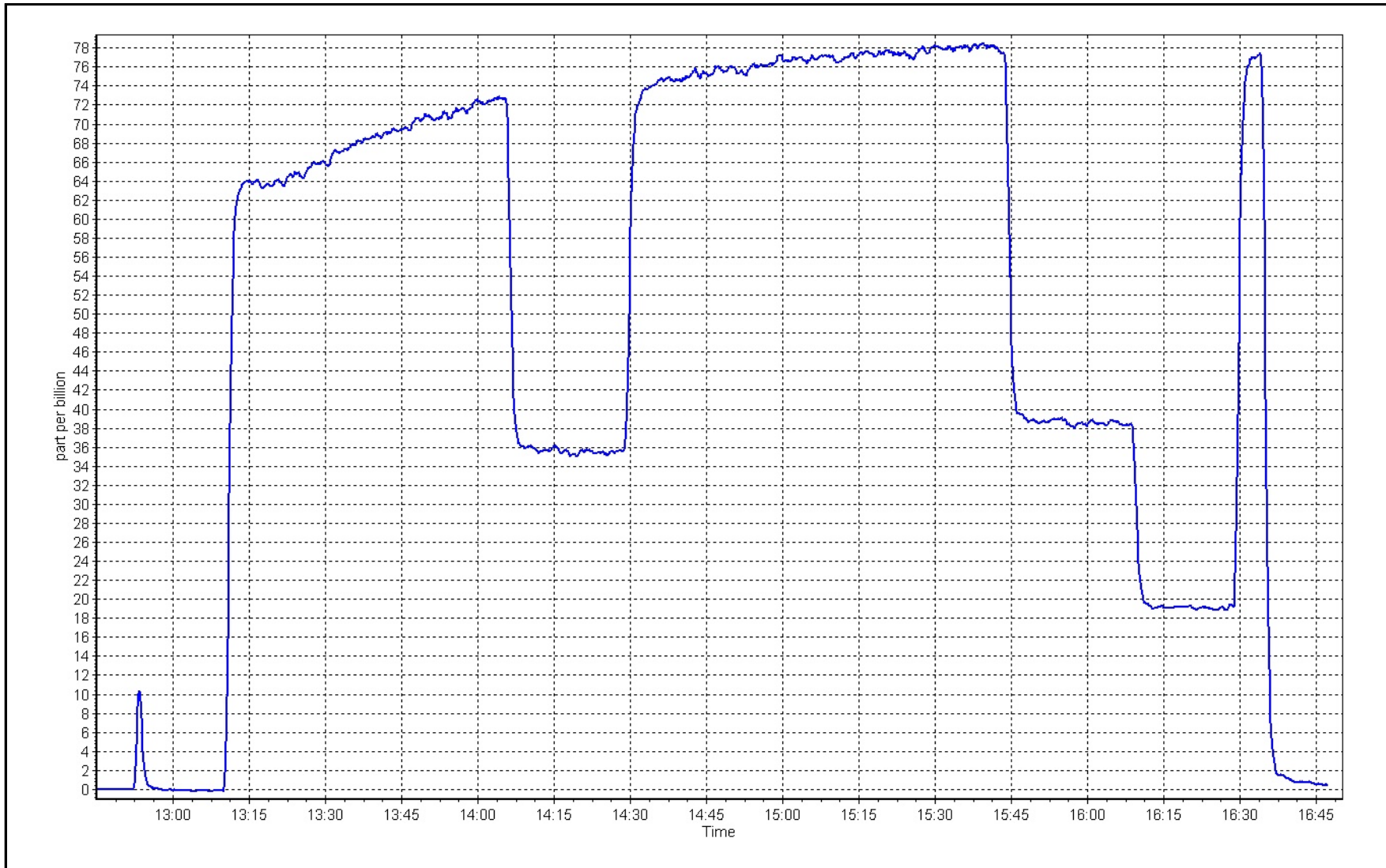
Notes: As finds done after a low nightly span. Hydrator ran dry and likely changed the conditions of the scrubber.

Calibration Performed By: Braiden Boutillier

# H<sub>2</sub>S Calibration Plot

Date: February 14, 2023

Location: Kirby North





# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Report

Version-11-2021

### Station Information

|                   |                   |                 |                   |
|-------------------|-------------------|-----------------|-------------------|
| Station Name:     | Kirby North       | Station number: | AMS508            |
| Calibration Date: | February 15, 2023 | Last Cal Date:  | February 14, 2023 |
| Start time (MST): | 11:48             | End time (MST): | 17:04             |
| Reason:           | Maintenance       |                 |                   |

### Calibration Standards

|                        |                 |     |                   |                  |
|------------------------|-----------------|-----|-------------------|------------------|
| Cal Gas Concentration: | 5.167           | ppm | Cal Gas Exp Date: | February 5, 2024 |
| Cal Gas Cylinder #:    | <u>CC517378</u> |     |                   |                  |
| Removed Cal Gas Conc:  | 5.167           | ppm | Rem Gas Exp Date: | NA               |
| Removed Gas Cyl #:     | <u>NA</u>       |     | Diff between cyl: |                  |
| Calibrator Make/Model: | API T700        |     | Serial Number:    | 3804             |
| ZAG Make/Model:        | API 701H        |     | Serial Number:    | 880              |

### Analyzer Information

|                 |                |                     |            |
|-----------------|----------------|---------------------|------------|
| Analyzer make:  | Thermo 43i TLE | Analyzer serial #:  | 1150840012 |
| Converter make: | Global         | Converter serial #: | 2022-197   |
| Analyzer Range  | 0 - 100 ppb    |                     |            |

|                        |              |               |                   |              |               |
|------------------------|--------------|---------------|-------------------|--------------|---------------|
|                        | <u>Start</u> | <u>Finish</u> |                   | <u>Start</u> | <u>Finish</u> |
| Calibration slope:     | 1.005874     | 0.995603      | Backgd or Offset: | 1.77         | 1.70          |
| Calibration intercept: | -0.260560    | -0.101015     | Coeff or Slope:   | 1.069        | 1.022         |

### H<sub>2</sub>S As Found Data

| Set Point             | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Baseline Adjusted Correction factor (Cc/(Ic-AFzero))<br><i>Limit = 0.90-1.10</i> |
|-----------------------|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|--|
| as found zero         |                               |                             |                                     |                                    |  |
| as found span         |                               |                             |                                     |                                    |  |
| as found 2nd point    |                               |                             |                                     |                                    |  |
| as found 3rd point    |                               |                             |                                     |                                    |  |
| new cylinder response |                               |                             |                                     |                                    |  |

### H<sub>2</sub>S Calibration Data

| Set Point                               | Dilution air flow rate (sccm) | Source gas flow rate (sccm) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---|-------------------------------|-----------------------------|-------------------------------------|------------------------------------|---|
| calibrator zero                         | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| high point                              | 4923                          | 77.4                        | 80.0                                | 79.6                               | 1.005   |
| second point                            | 4961                          | 38.8                        | 40.1                                | 39.7                               | 1.010   |
| third point                             | 4981                          | 19.3                        | 19.9                                | 19.7                               | 1.012   |
| as left zero                            | 5000                          | 0.0                         | 0.0                                 | 0.0                                | ----  |
| as left span                            | 4923                          | 77.4                        | 80.0                                | 79.4                               | 1.007   |
| SO2 Scrubber Check                      | 4920                          | 79.8                        | 798.0                               | 0.0                                | ----  |
| Date of last scrubber change:           | 21-Sep-22                     |                             |                                     | Ave Corr Factor                    | 1.009   |
| Date of last converter efficiency test: |                               |                             |                                     |                                    | efficiency  |

|                          |    |                 |    |               |    |
|--------------------------|----|-----------------|----|---------------|----|
| Baseline Corr As found:  | NA | Prev response:  | NA | *% change:    | NA |
| Baseline Corr 2nd AF pt: | NA | AF Slope:       | NA | AF Intercept: | NA |
| Baseline Corr 3rd AF pt: | NA | AF Correlation: | NA |               |    |

\* = > +/-5% change initiates investigation

Notes: Followup calibration after as founds from February 14. Adjusted zero and span. Second SO<sub>2</sub> scrubber check passed.

Calibration Performed By: Braiden Boutillier



# Wood Buffalo Environmental Association

## H<sub>2</sub>S Calibration Summary

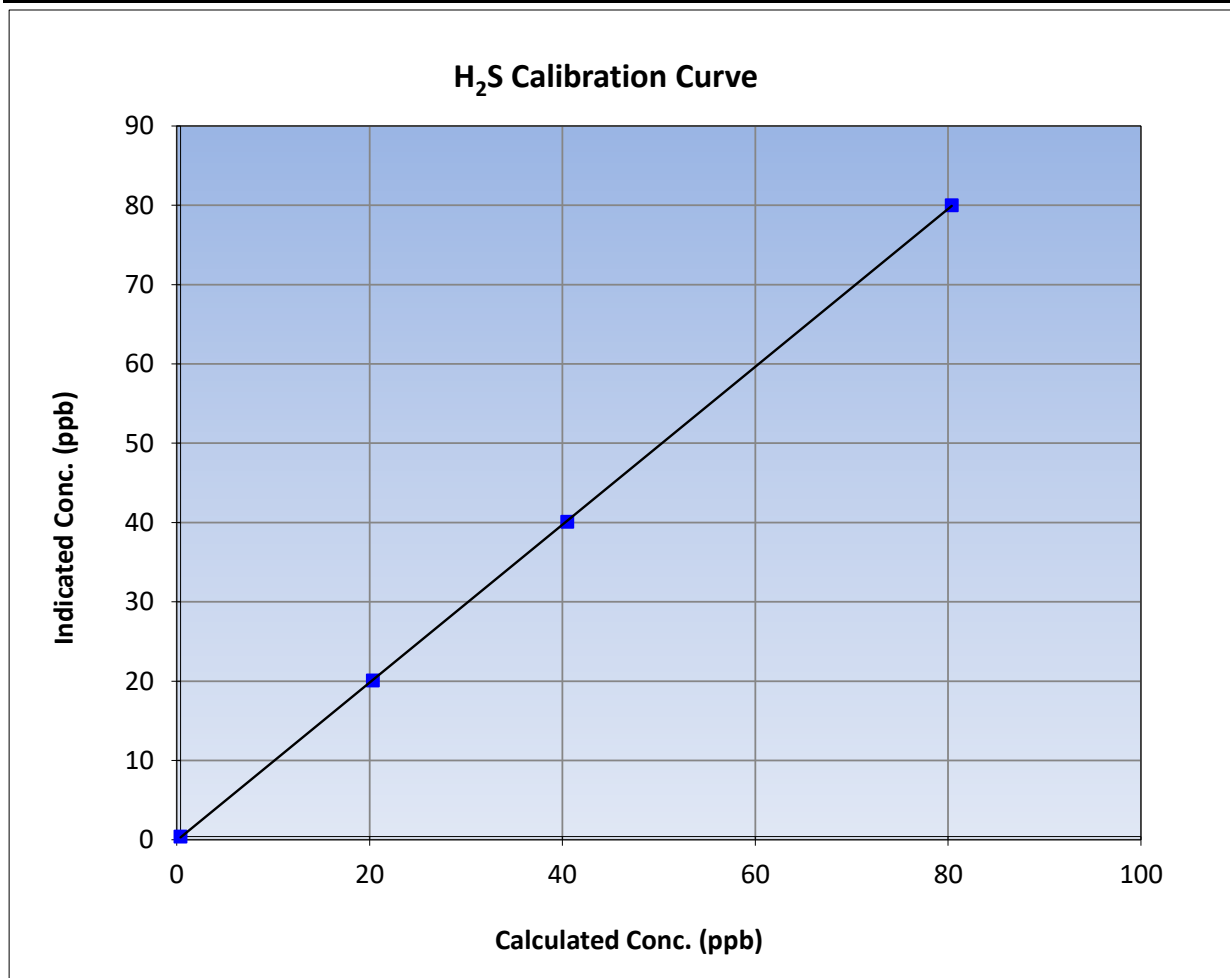
Version-11-2021

### Station Information

|                   |                   |                       |                   |
|-------------------|-------------------|-----------------------|-------------------|
| Calibration Date: | February 15, 2023 | Previous Calibration: | February 14, 2023 |
| Station Name:     | Kirby North       | Station Number:       | AMS508            |
| Start Time (MST): | 11:48             | End Time (MST):       | 17:04             |
| Analyzer make:    | Thermo 43i-TLE    | Analyzer serial #:    | 1150840012        |

### Calibration Data

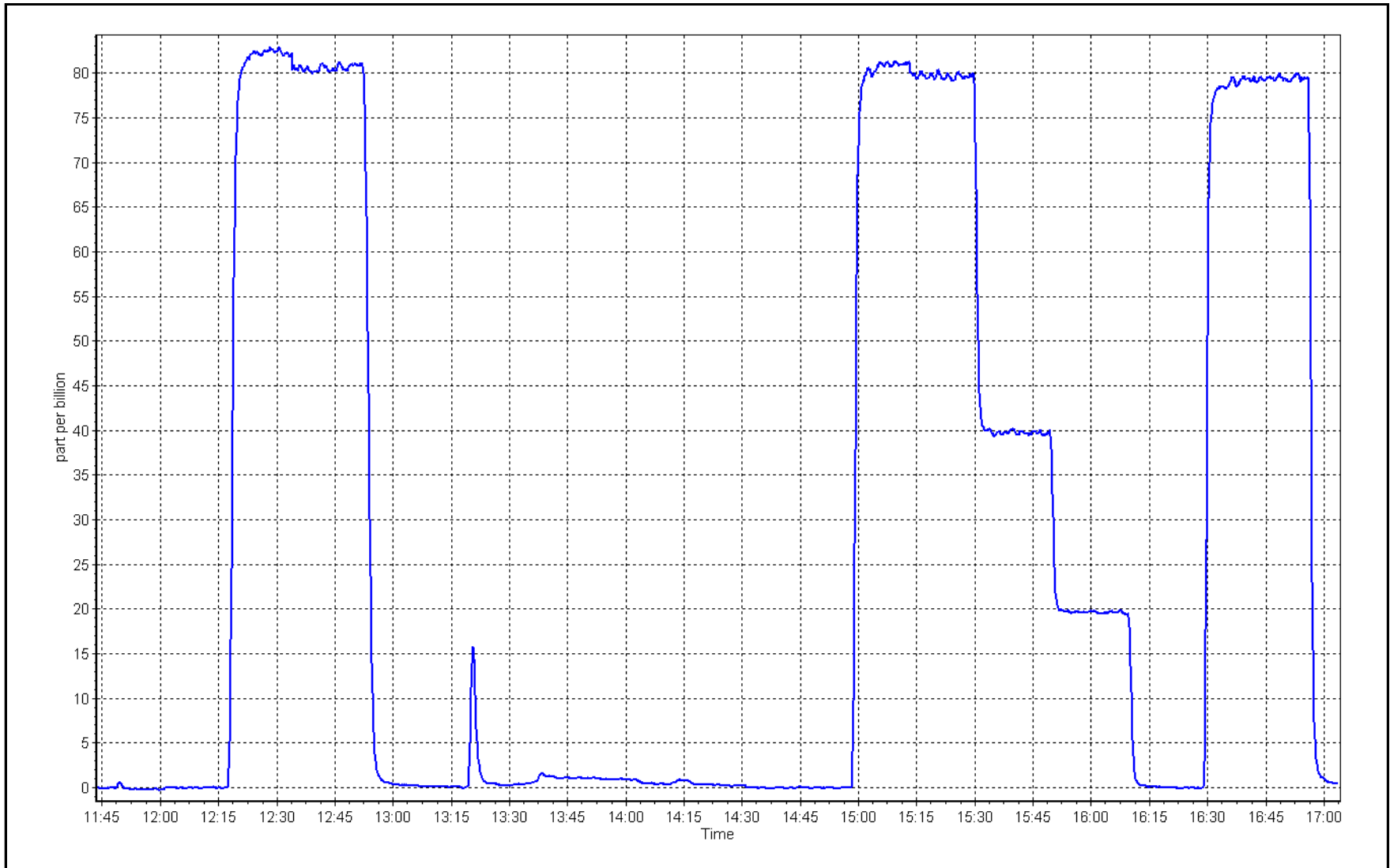
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | 0.999990      |             |
| 80.0                                | 79.6                               | 1.0048                    |                         |               | ≥0.995      |
| 40.1                                | 39.7                               | 1.0100                    | Slope                   | 0.995603      |             |
| 19.9                                | 19.7                               | 1.0124                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.101015     | +/-3        |



H<sub>2</sub>S Calibration Plot

Date: February 15, 2023

Location: Kirby North







# Wood Buffalo Environmental Association

## THC Calibration Summary

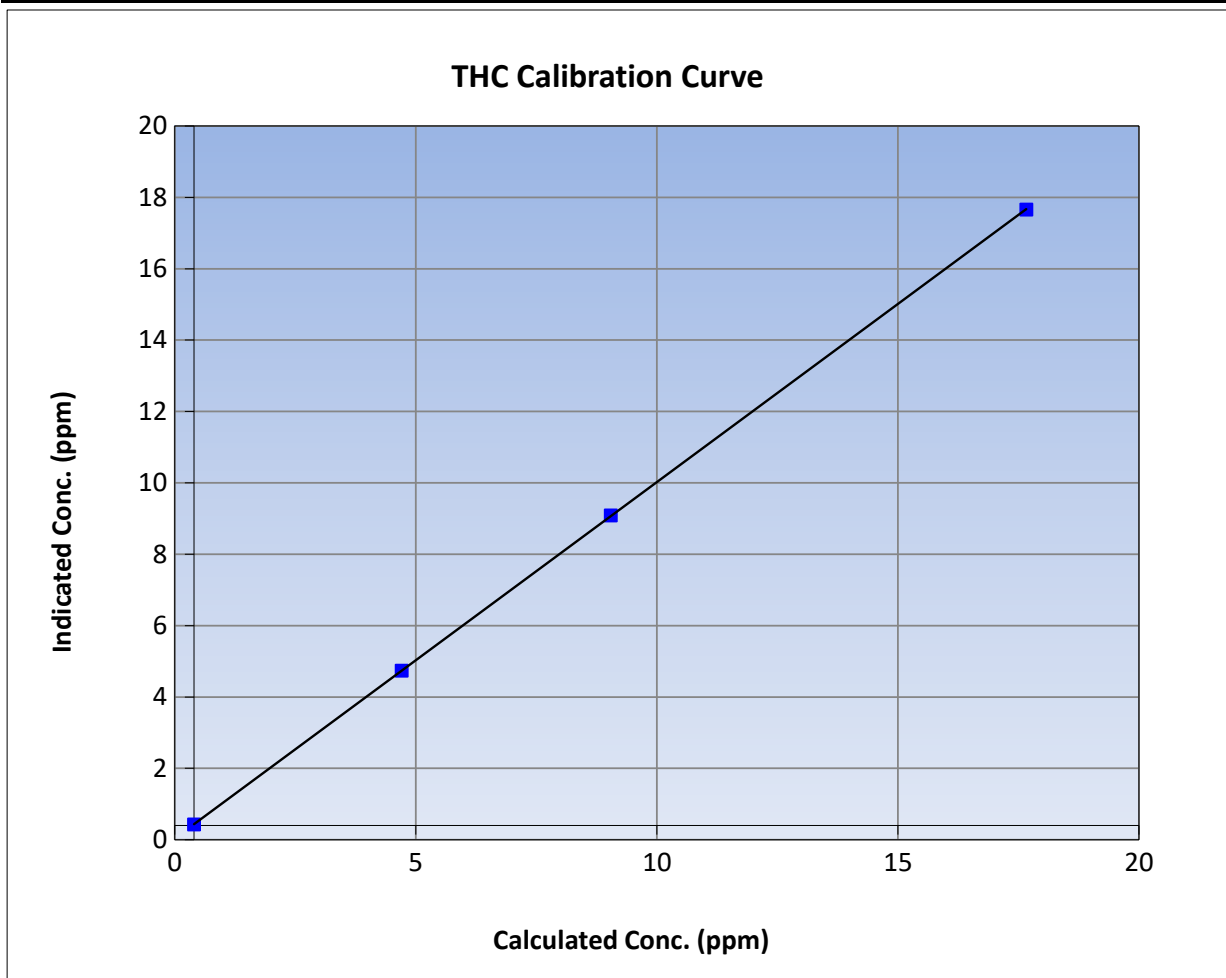
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 2, 2023 | Previous Calibration: | January 11, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 8:41             | End Time (MST):       | 14:52            |
| Analyzer make:    | Thermo 51i       | Analyzer serial #:    | 1182340005       |

### Calibration Data

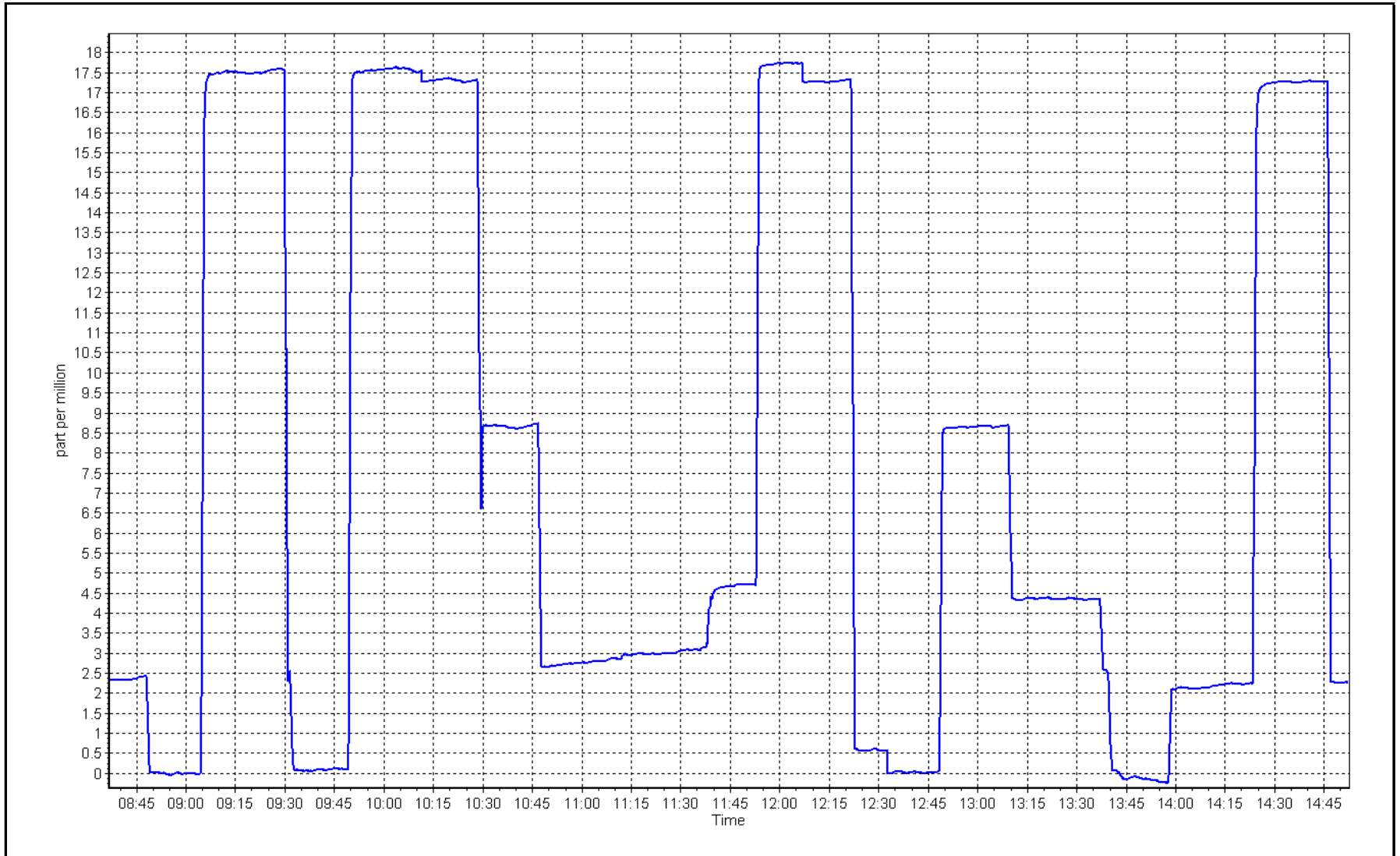
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | Limits   |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|-------------|
| 0.00                                | 0.03                               | ----                      | Correlation Coefficient | 0.999995 | ≥0.995      |
| 17.26                               | 17.26                              | 1.0002                    |                         |          |             |
| 8.64                                | 8.69                               | 0.9946                    | Slope                   | 0.998377 | 0.90 - 1.10 |
| 4.31                                | 4.34                               | 0.9939                    |                         |          |             |
|                                     |                                    |                           | Intercept               | 0.036779 | +/-1.5      |



THC Calibration Plot

Date: February 2, 2023

Location: Kirby North









# Wood Buffalo Environmental Association

## THC Calibration Summary

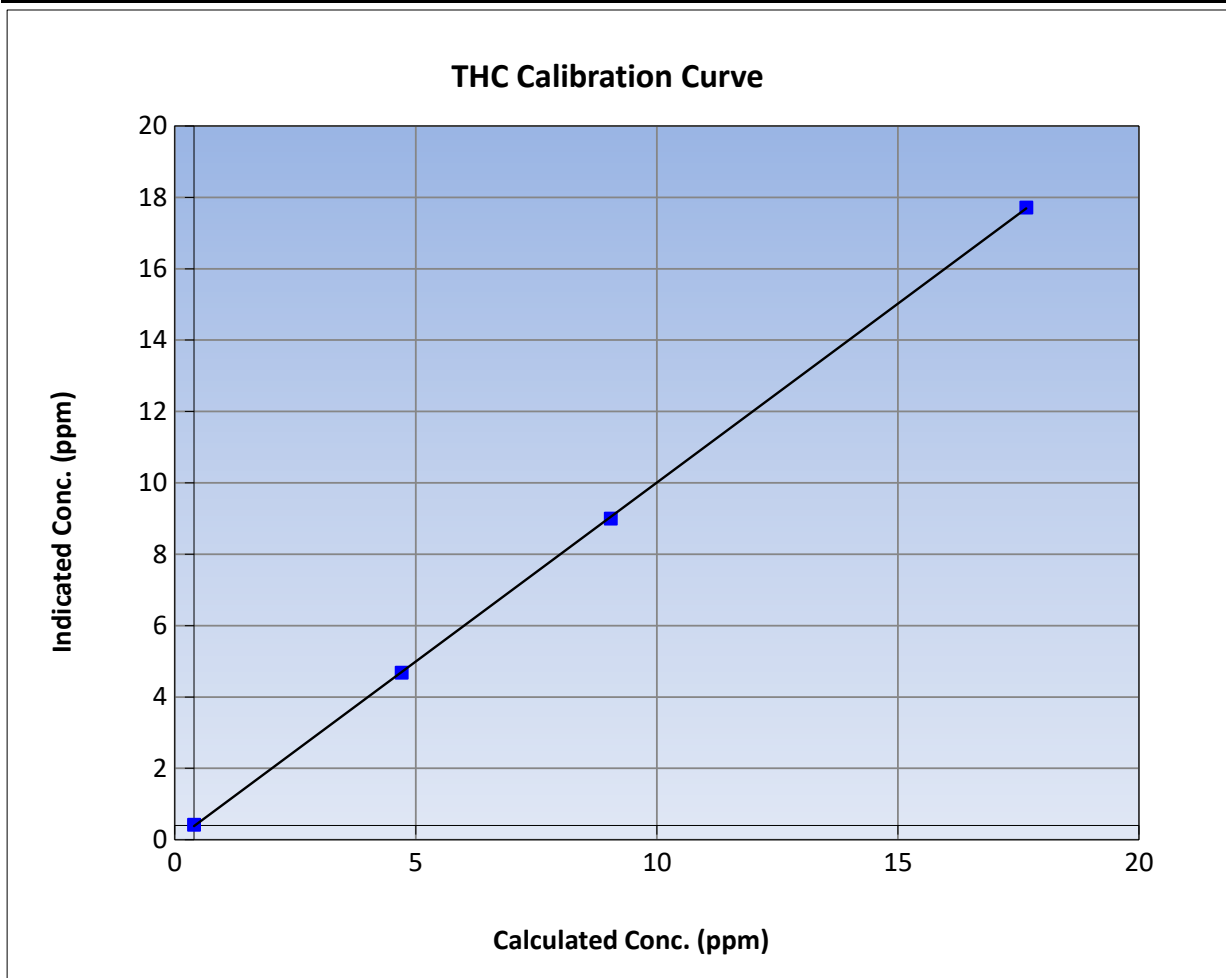
Version-01-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 4, 2023 | Previous Calibration: | February 2, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 10:50            | End Time (MST):       | 14:29            |
| Analyzer make:    | Thermo 51i       | Analyzer serial #:    | 1182340005       |

### Calibration Data

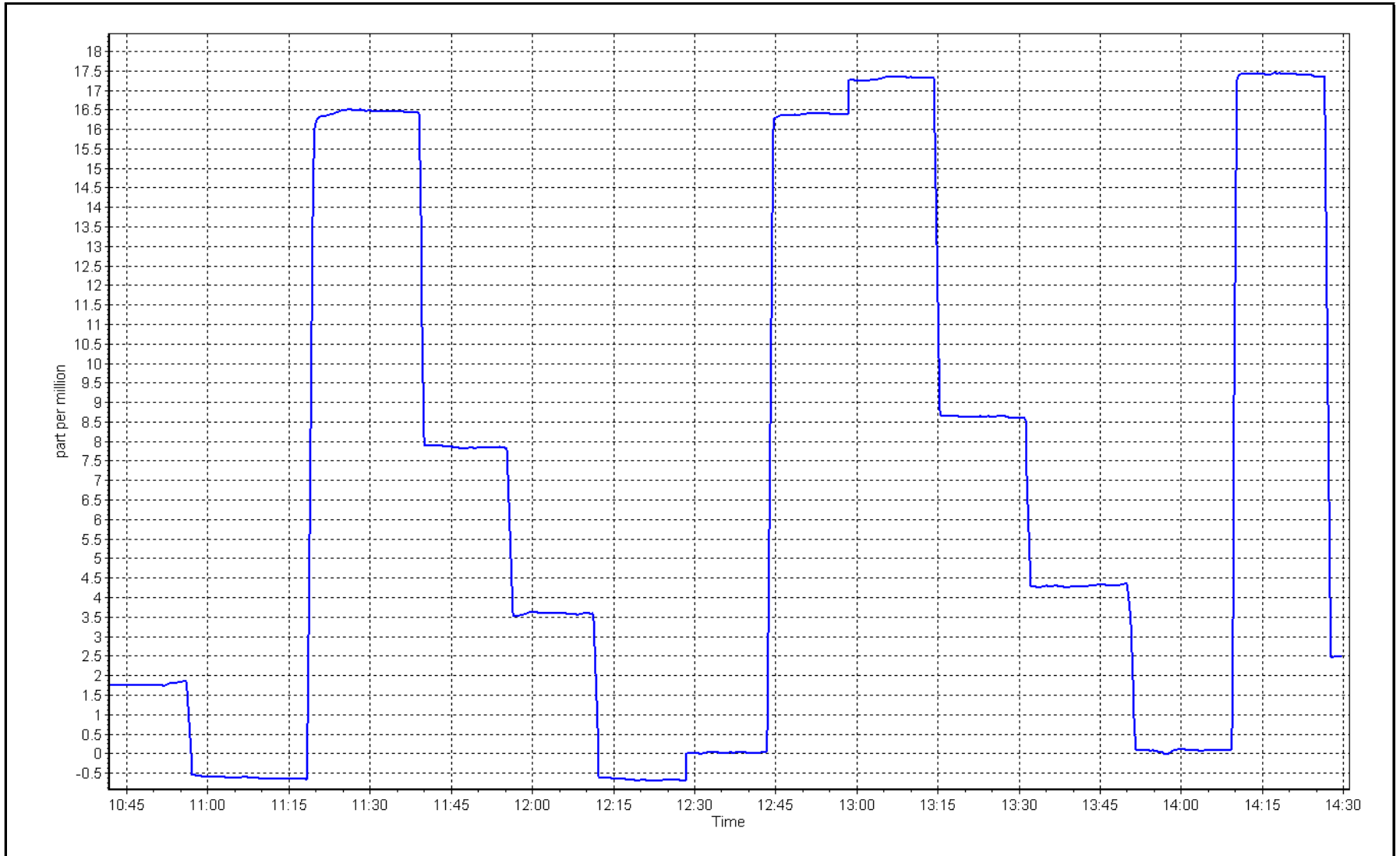
| Calculated Concentration (ppm) (Cc) | Indicated Concentration (ppm) (lc) | Correction factor (Cc/lc) | Statistical Evaluation  | <u>Limits</u> |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|---------------|-------------|
| 0.00                                | 0.02                               | ----                      | Correlation Coefficient | 0.999968      |             |
| 17.26                               | 17.32                              | 0.9967                    |                         |               | ≥0.995      |
| 8.64                                | 8.60                               | 1.0050                    | Slope                   | 1.002675      |             |
| 4.31                                | 4.28                               | 1.0066                    |                         |               | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -0.018187     | +/-1.5      |



THC Calibration Plot

Date: February 4, 2023

Location: Kirby North







# Wood Buffalo Environmental Association

## NO<sub>x</sub> \ NO \ NO<sub>2</sub> Calibration Report

Version-04-2020

### Dilution Calibration Data

| Set Point                 | Dilution flow rate (sccm) | Source gas flow rate (sccm) | Calculated NO <sub>x</sub> concentration (ppb) (Cc) | Calculated NO concentration (ppb) (Cc) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>x</sub> concentration (ppb) (Ic) | Indicated NO concentration (ppb) (Ic) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>x</sub> Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> | NO Correction factor (Cc/Ic)<br><i>Limit = 0.95-1.05</i> |
|---------------------------|---------------------------|-----------------------------|---|--|---|--|---------------------------------------|--|---|--|
| as found zero             | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | -0.3   | -0.2                                  | -0.1   | ----  | ----   |
| as found span             | 4919                      | 81.0                        | 800.1   | 794.1                                  | 6.0   | 791.3  | 784.3                                 | 7.0  | 1.0111  | 1.0125   |
| as found 2nd              |                           |                             |   |  |   |  |                                       |  |   |  |
| as found 3rd              |                           |                             |   |  |   |  |                                       |  |   |  |
| new cyl resp              |                           |                             |   |  |   |  |                                       |  |   |  |
| calibrator zero           | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| high point                | 4919                      | 81.0                        | 800.1   | 794.1                                  | 6.0   | 801.0  | 793.7                                 | 7.1  | 0.9989  | 1.0005   |
| second point              | 4960                      | 40.5                        | 400.0   | 397.0                                  | 3.0   | 399.0  | 395.0                                 | 4.0  | 1.0026  | 1.0051   |
| third point               | 4980                      | 20.2                        | 199.5   | 198.0                                  | 1.5   | 197.0  | 193.6                                 | 3.4  | 1.0128  | 1.0229   |
| as left zero              | 5000                      | 0.0                         | 0.0   | 0.0                                    | 0.0   | 0.0  | 0.0                                   | 0.0  | ----  | ----   |
| as left span              | 4919                      | 81.0                        | 800.1   | 413.2                                  | 386.9   | 799.5  | 420.8                                 | 378.7  | 1.0008  | 0.9820   |
| Average Correction Factor |                           |                             |   |  |   |  |                                       |  | 1.0048  | 1.0095   |

|                      |                             |                |  |                                  |                         |                      |
|----------------------|-----------------------------|----------------|--|----------------------------------|-------------------------|----------------------|
| Corrected As found   | NO <sub>x</sub> = 791.6 ppb | NO = 784.5 ppb | * = > +/-5% change initiates investigation | *Percent Change                  | NO <sub>x</sub> = -1.0% |                      |
| Previous Response    | NO <sub>x</sub> = 799.2 ppb | NO = 793.2 ppb |  | *Percent Change                  | NO = -1.1%              |                      |
| Baseline Corr 2nd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO <sub>x</sub> r <sup>2</sup> : | Nx SI:                  | Nx Int:              |
| Baseline Corr 3rd pt | NO <sub>x</sub> = NA ppb    | NO = NA ppb    | As found                                   | NO r <sup>2</sup> :              | NO SI:                  | NO Int:              |
|                      |                             |                | As found                                   | NO <sub>2</sub> r <sup>2</sup> : | NO <sub>2</sub> SI:     | NO <sub>2</sub> Int: |

### GPT Calibration Data

| O3 Setpoint (ppb)                             | Indicated NO Reference concentration (ppb) | Indicated NO Drop concentration (ppb) | Calculated NO <sub>2</sub> concentration (ppb) (Cc) | Indicated NO <sub>2</sub> concentration (ppb) (Ic) | NO <sub>2</sub> Correction factor (Cc/Ic)<br><i>Calibration Limit = 0.95-1.05</i><br><i>As Found Limit = 0.90-1.10</i> | Converter Efficiency<br><i>Calibration Limit = 96-104%</i> |
|---|--|---------------------------------------|---|--|--|--|
| as found GPT zero                             |  |                                       |   |  |  |  |
| as found GPT point (400 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (200 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| as found GPT point (100 ppb NO <sub>2</sub> ) |  |                                       |   |  |  |  |
| 1st GPT point (400 ppb O <sub>3</sub> )       | 793.5                                      | 412.6                                 | 386.9   | 385.4  | 1.0039   | 99.6%  |
| 2nd GPT point (200 ppb O <sub>3</sub> )       | 793.5                                      | 599.0                                 | 200.5   | 201.2  | 0.9965   | 100.4%   |
| 3rd GPT point (100 ppb O <sub>3</sub> )       | 793.5                                      | 696.1                                 | 103.4   | 100.3  | 1.0308   | 97.0%  |
| Average Correction Factor                     |  |                                       |   |  | 1.0104   | 99.0%  |

Notes: Changed sample inlet filter after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier



# Wood Buffalo Environmental Association

## NO<sub>x</sub> Calibration Summary

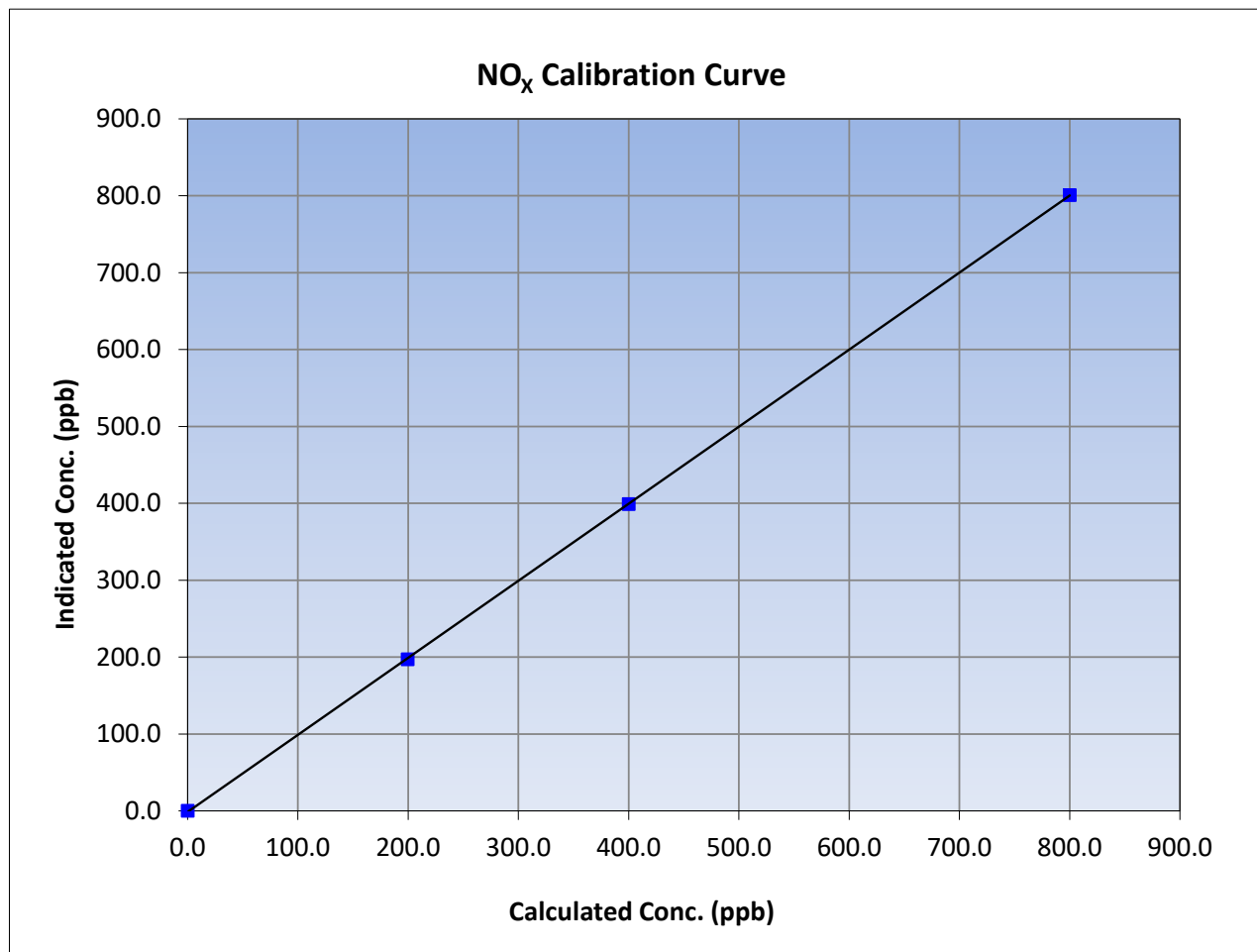
Version-04-2020

### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 22, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 11:39            | End Time (MST):       | 17:28            |
| Analyzer make:    | API T200         | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  | Limits    |             |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient | ≥0.995    |             |
| 800.1                               | 801.0                              | 0.9989                    |                         |           |             |
| 400.0                               | 399.0                              | 1.0026                    |                         |           |             |
| 199.5                               | 197.0                              | 1.0128                    |                         |           |             |
|                                     |                                    |                           | Slope                   | 1.002073  | 0.90 - 1.10 |
|                                     |                                    |                           | Intercept               | -1.391610 | +/-20       |





# Wood Buffalo Environmental Association

## NO Calibration Summary

Version-04-2020

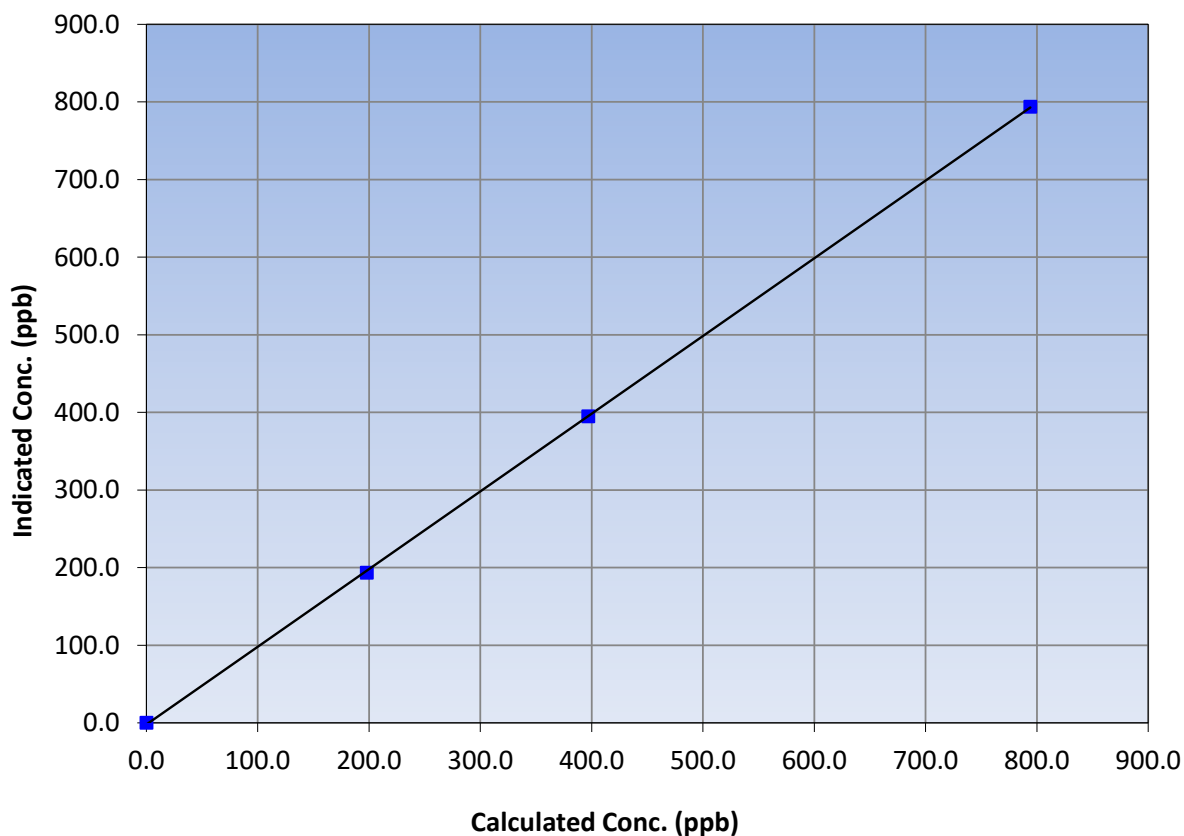
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 22, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 11:39            | End Time (MST):       | 17:28            |
| Analyzer make:    | API T200         | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <u>Limits</u>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 794.1                               | 793.7                              | 1.0005                    |   |                                |
| 397.0                               | 395.0                              | 1.0051                    |   |                                |
| 198.0                               | 193.6                              | 1.0229                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO Calibration Curve**





# Wood Buffalo Environmental Association

## NO<sub>2</sub> Calibration Summary

Version-04-2020

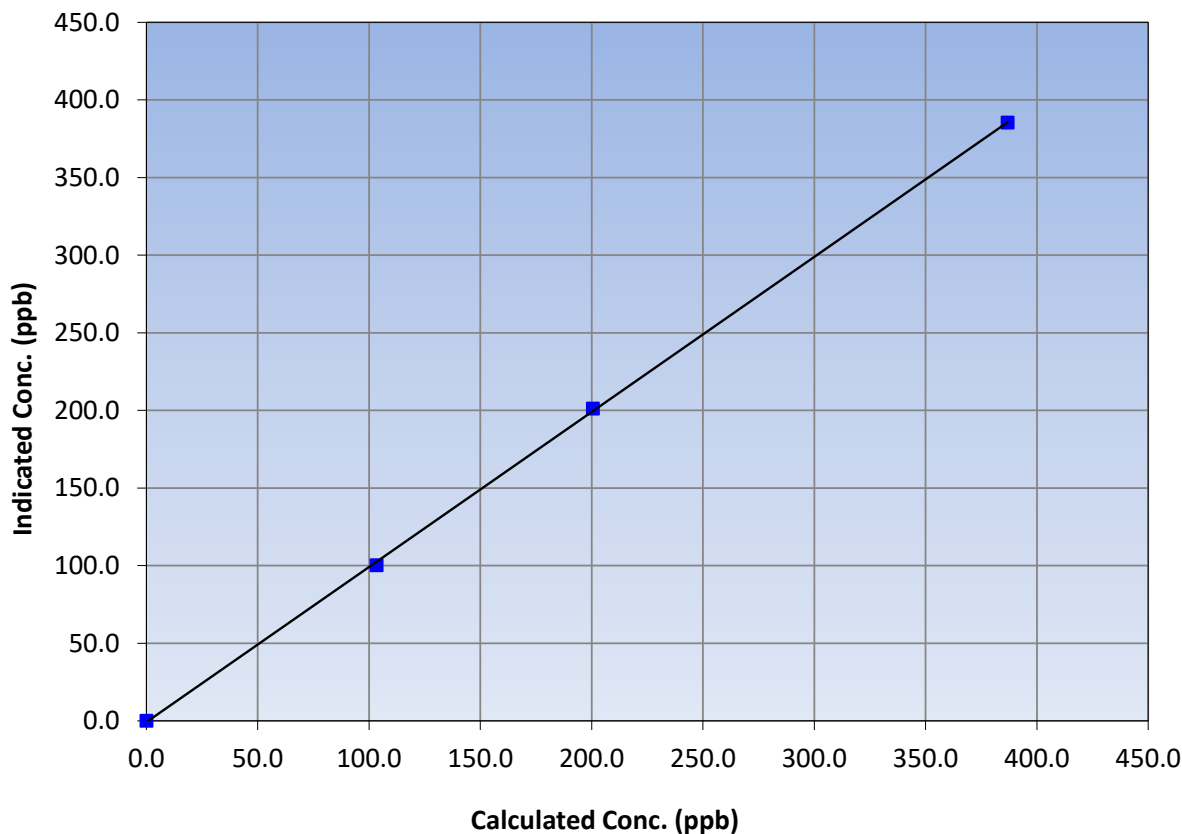
### Station Information

|                   |                  |                       |                  |
|-------------------|------------------|-----------------------|------------------|
| Calibration Date: | February 1, 2023 | Previous Calibration: | January 22, 2023 |
| Station Name:     | Kirby North      | Station Number:       | AMS508           |
| Start Time (MST): | 11:39            | End Time (MST):       | 17:28            |
| Analyzer make:    | API T200         | Analyzer serial #:    | 7029             |

### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation                        | <u>Limits</u>                  |
|-------------------------------------|------------------------------------|---------------------------|---|--------------------------------|
| 0.0                                 | 0.0                                | ----                      | Correlation Coefficient<br>Slope<br>Intercept | ≥0.995<br>0.90 - 1.10<br>+/-20 |
| 386.9                               | 385.4                              | 1.0039                    |   |                                |
| 200.5                               | 201.2                              | 0.9965                    |   |                                |
| 103.4                               | 100.3                              | 1.0308                    |   |                                |
|                                     |                                    |                           |   |                                |

**NO<sub>2</sub> Calibration Curve**

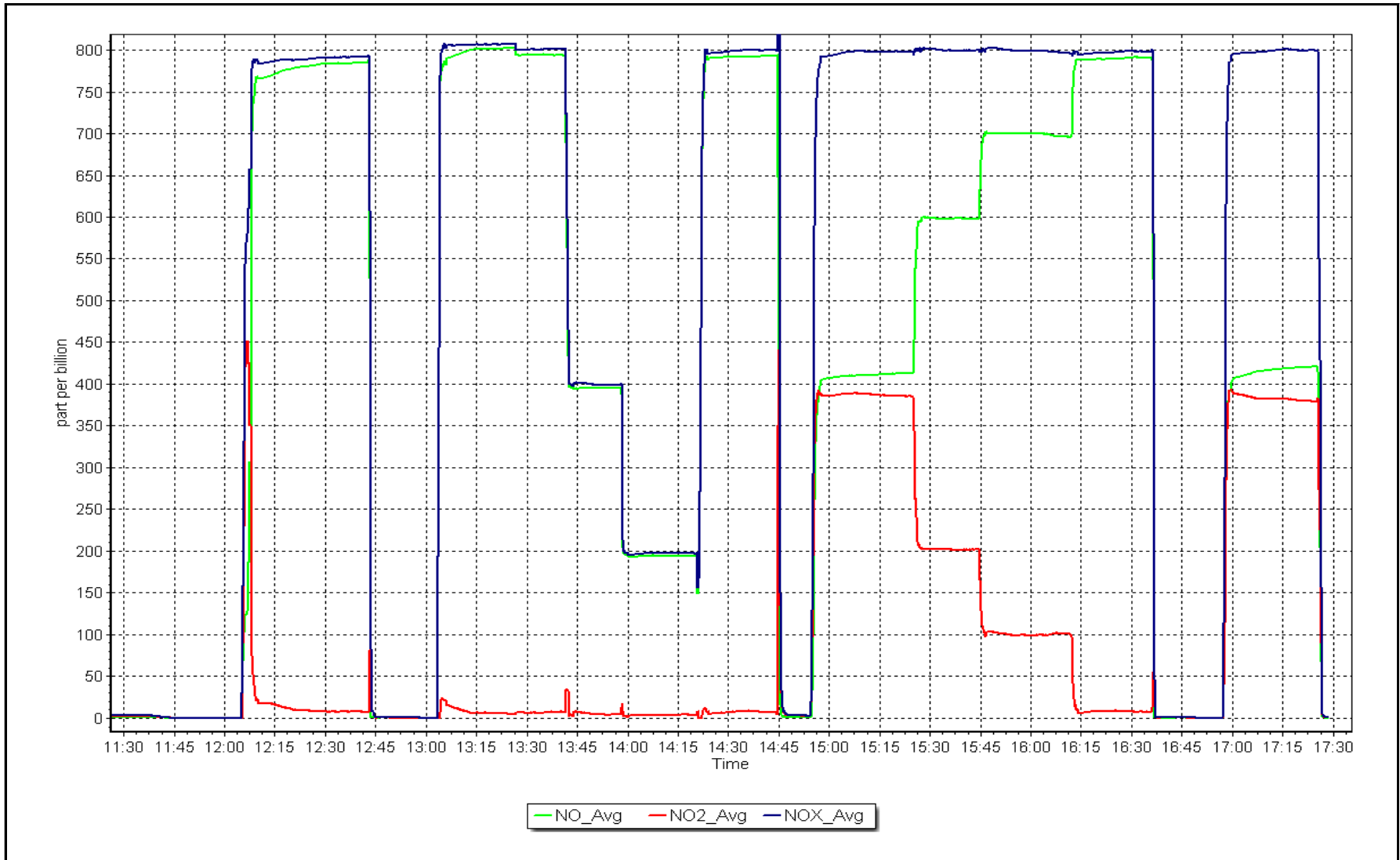




NO<sub>x</sub> Calibration Plot

Date: February 1, 2023

Location: Kirby North





End of Report