WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION

Unit 3 - 805 Memorial Drive
Fort McMurray, AB T9K 0K4
P: 780.799.4420 E: info@wbea.org
wbea.org

Wood Buffalo Environmental Association

JANUARY 2025

MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING

February 28, 2025

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
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 9, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	11:27	End time (MST):	14:24
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.21	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC418809			
Removed Cal Gas Conc:	49.21	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3565
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4766

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1501301448	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000978	1.001634	Backgd or Offset:	20.8	20.5
Calibration intercept:	-0.012554	-1.092350	Coeff or Slope:	0.888	0.888

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4918	81.3	800.3	795.9	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	795.6	Previous response	801.0	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4918	81.3	800.3	801.9	0.998
Mid point	4959	40.7	400.6	397.4	1.008
Low point	4979	20.3	199.8	198.9	1.005
As left zero	5000	0.0	0.0	0.5	----
As left span	4918	81.3	800.3	799.8	1.001
				Average Correction Factor:	1.004

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

SO_2 Calibration Summary

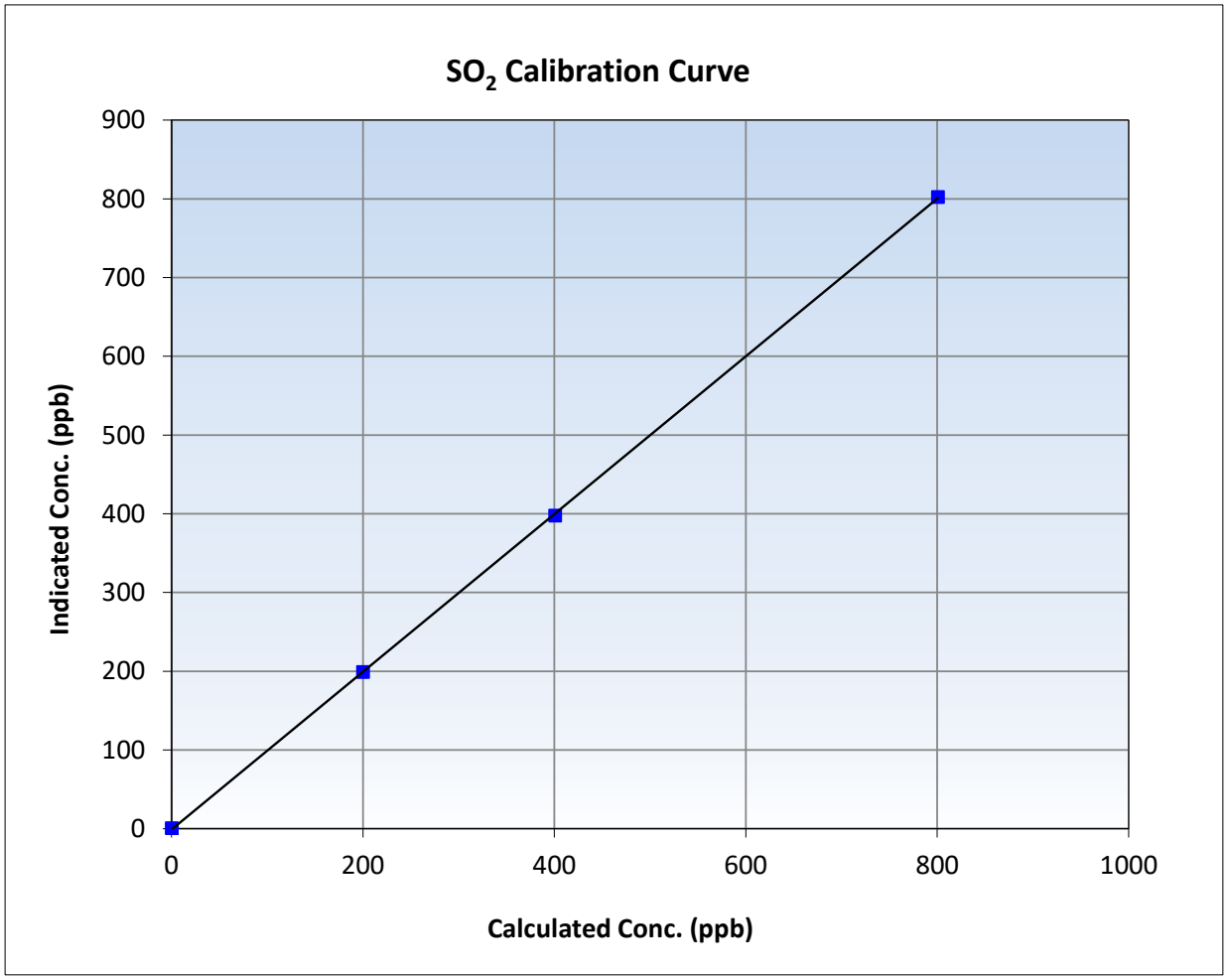
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:27	End Time (MST):	14:24
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301448

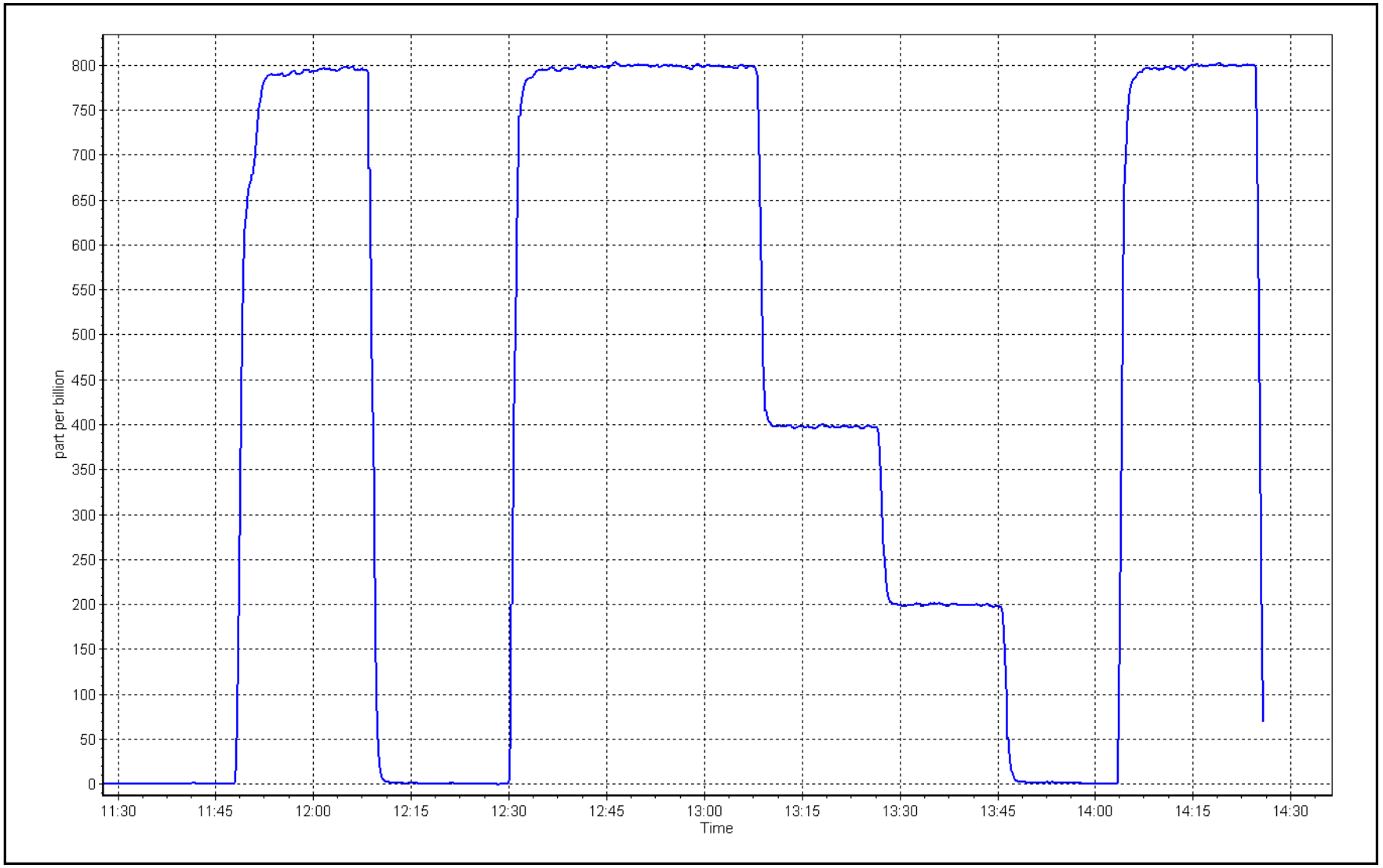
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
800.3	801.9	0.9980
400.6	397.4	1.0080
199.8	198.9	1.0046

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999966	*≥0.995*
Slope	1.001634	*0.90 - 1.10*
Intercept	-1.092350	*+/-30*



SO2 Calibration Plot Date: January 9, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 30, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	12:31	End time (MST):	17:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC738239			
Removed Cal Gas Conc:	4.84	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:	4766

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1218153461
Converter make:	CD Nova		Converter serial #:	470
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.995667	1.001957	Backgd or Offset:	2.50	2.51
Calibration intercept:	0.081535	0.161421	Coeff or Slope:	0.893	0.893

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4917	82.6	80.0	79.4	1.006
As found Mid point	4959	41.3	40.0	39.5	1.009
As found Low point	4979	20.7	20.0	20.1	0.992
New cylinder response					

Baseline Corr As found:	79.5	Prev response:	79.70	*% change:	-0.2%
Baseline Corr 2nd AF pt:	39.6	AF Slope:	0.992815	AF Intercept:	-0.018069
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999975	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4917	82.6	80.0	80.3	0.996
Mid point	4959	41.3	40.0	40.2	0.994
Low point	4979	20.7	20.0	20.2	0.992
As left zero	5000	0.0	0.0	0.2	----
As left span	4921	78.4	75.9	79.4	0.956
SO2 Scrubber Check	4919	81.3	813.0	-0.1	----

Date of last scrubber change:	December 17, 2021	Ave Corr Factor	0.994
Date of last converter efficiency test:			

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

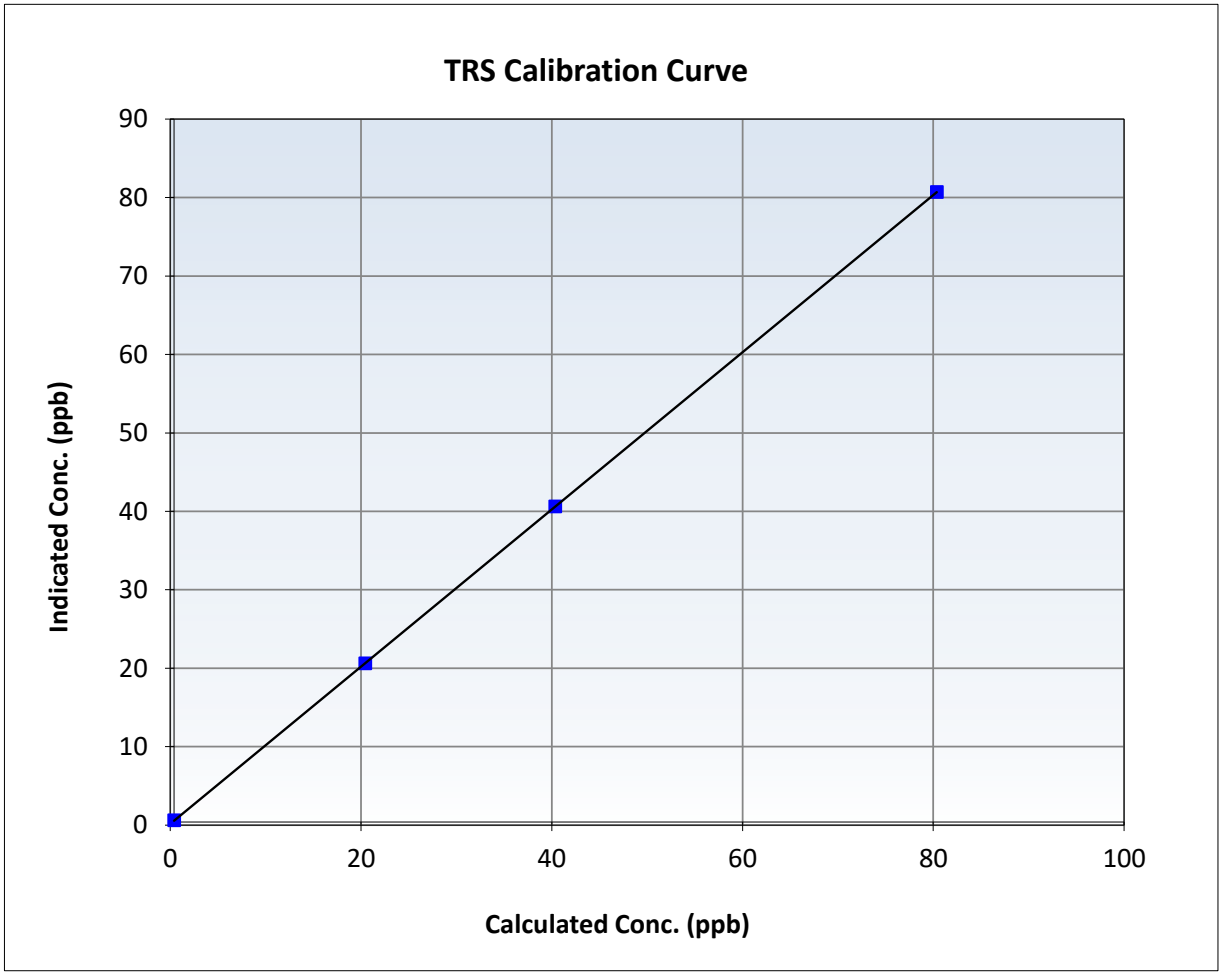
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:31	End Time (MST):	17:05
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153461

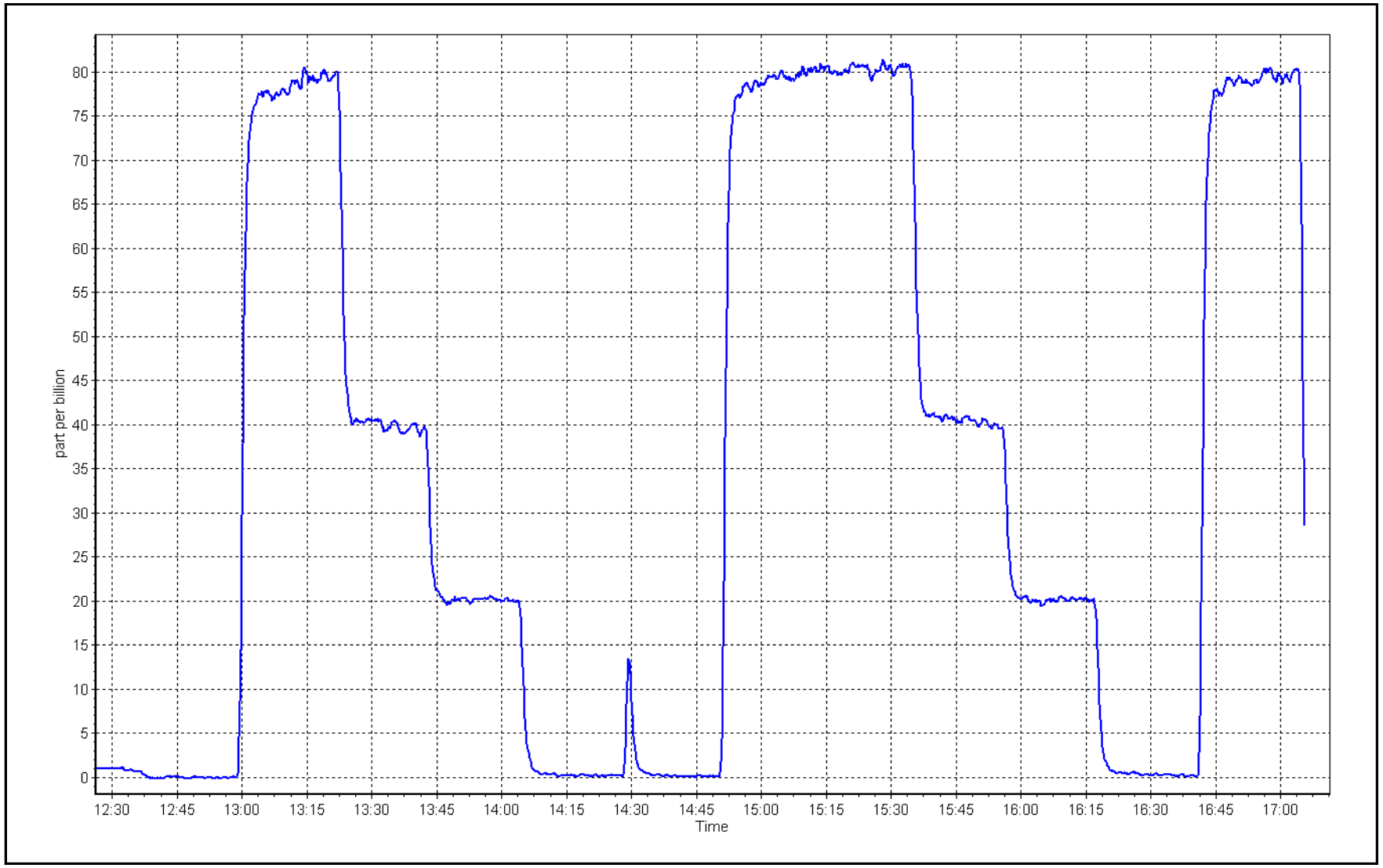
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
80.0	80.3	0.9958
40.0	40.2	0.9945
20.0	20.2	0.9920

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.001957	*0.90 - 1.10*
Intercept	0.161421	*+/-3*



TRS Calibration Plot Date: January 30, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 30, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	12:31	End time (MST):	17:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC738239			
Removed Cal Gas Conc:	4.84	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:	4766

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Analyzer serial #:	1200326167
Converter make:	CD Nova		Converter serial #:	2022-221
Analyzer Range	0 - 100 ppb		Converter Temp:	315 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.992381	0.999099	Backgd or Offset:	1.57	1.59
Calibration intercept:	0.322108	0.362022	Coeff or Slope:	0.969	0.983

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4917	82.6	80.0	78.9	1.017
As found Mid point	4959	41.3	40.0	39.7	1.015
As found Low point	4979	20.7	20.0	20.0	1.017
New cylinder response					

Baseline Corr As found:	78.6	Prev response:	79.68	*% change:	-1.4%
Baseline Corr 2nd AF pt:	39.4	AF Slope:	0.983091	AF Intercept:	0.322239
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999998	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4917	82.6	80.0	80.3	0.996
Mid point	4959	41.3	40.0	40.3	0.992
Low point	4979	20.7	20.0	20.2	0.992
As left zero	5000	0.0	0.0	0.5	----
As left span	4917	82.6	80.0	79.9	1.001
SO2 Scrubber Check	4919	81.3	813.0	0.0	----

Date of last scrubber change:		January 25, 2024		Ave Corr Factor	0.993
Date of last converter efficiency test:		November 7, 2024		107.9%	efficiency

Notes: Inlet filter change and scrubber check completed after as founds. Adjusted the span.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

H_2S Calibration Summary

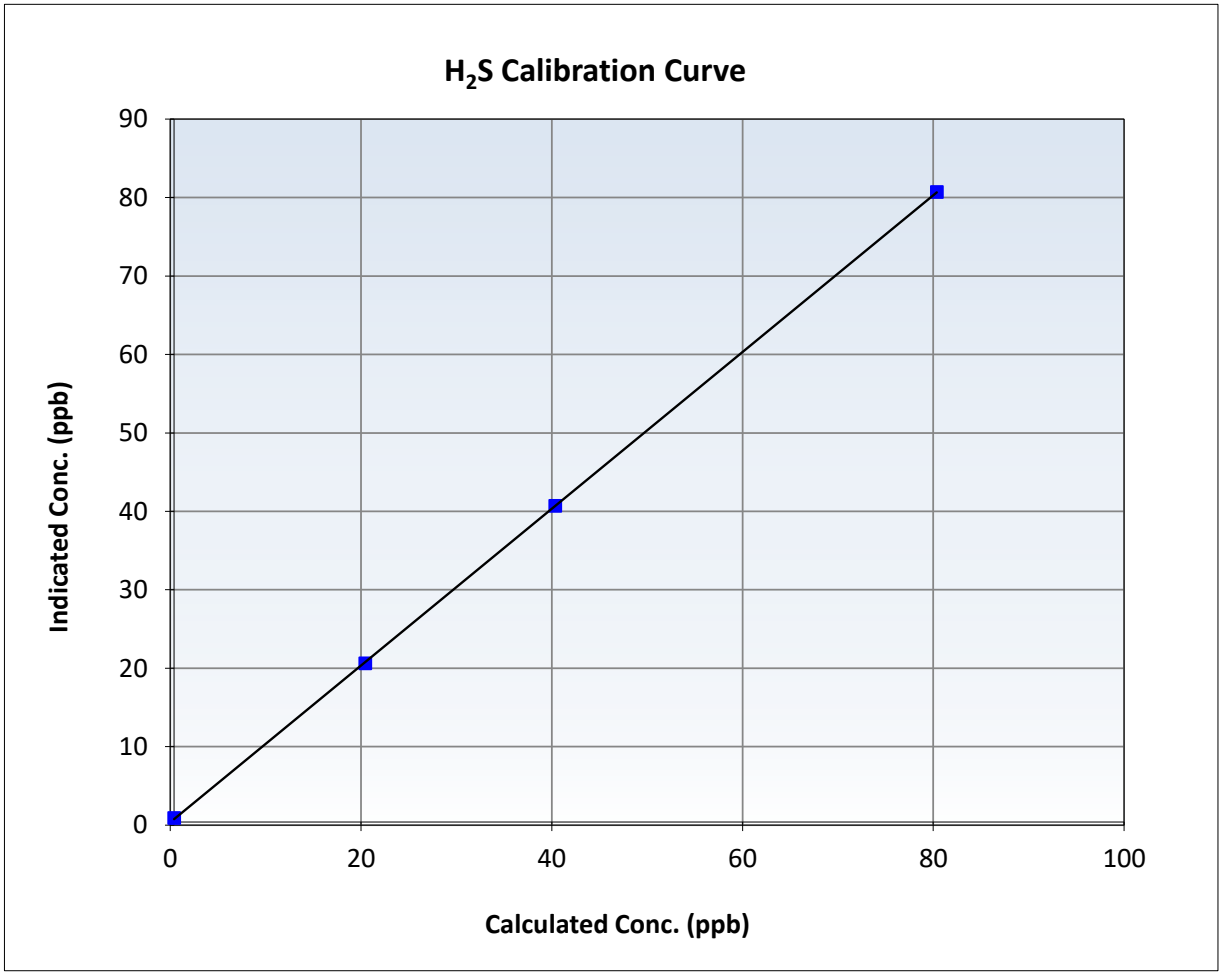
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 9, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:31	End Time (MST):	17:05
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1200326167

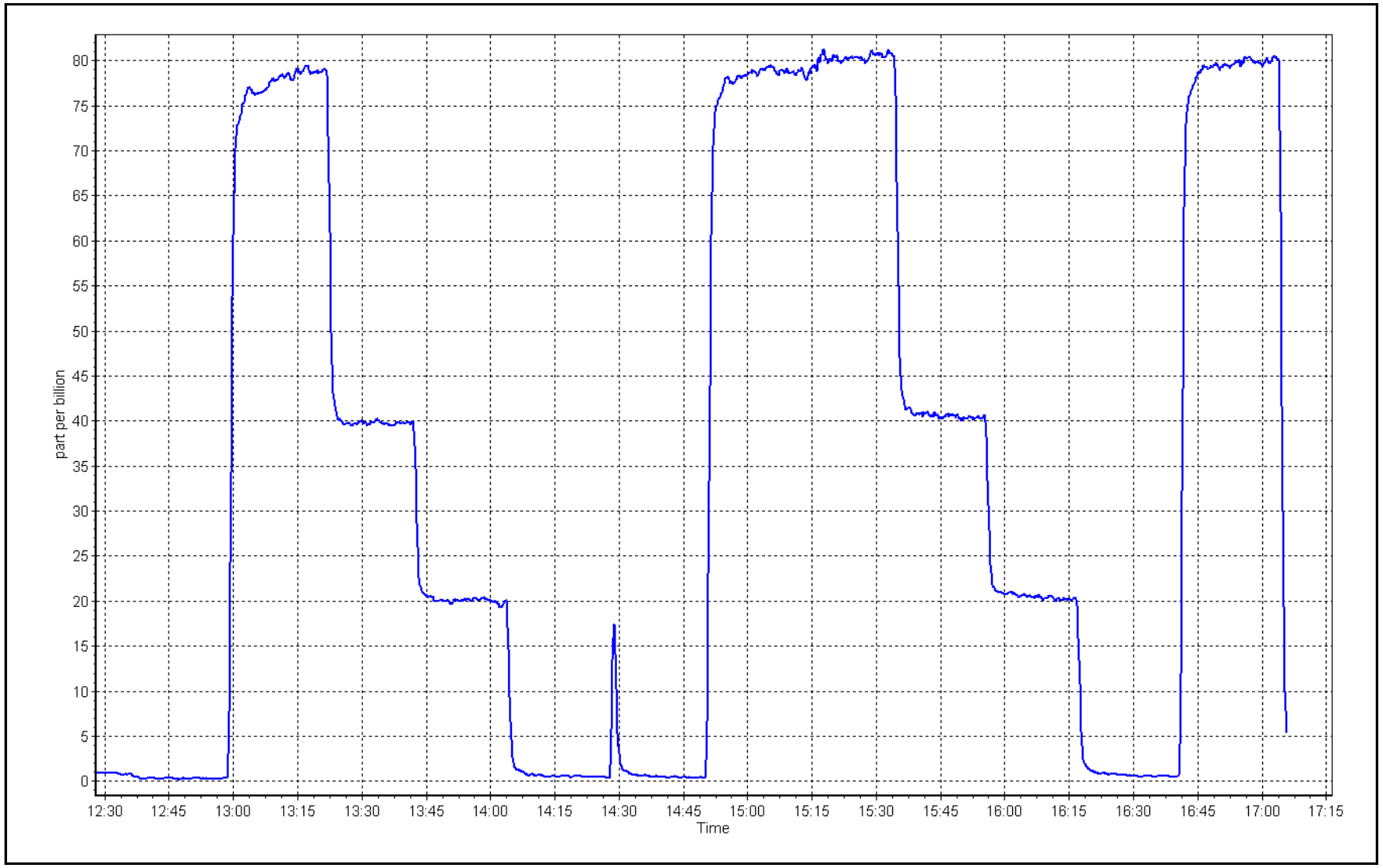
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
80.0	80.3	0.9958
40.0	40.3	0.9920
20.0	20.2	0.9920

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	0.999099	*0.90 - 1.10*
Intercept	0.362022	*+/-3*



H_2S Calibration Plot Date: January 30, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 9, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	11:27	End time (MST):	14:24
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC418809		Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	497.2	ppm	CH4 Equiv Conc.	1061.8	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API T700		Serial Number:	3565	
Zero Air Gen model:	Teledyne API T701		Serial Number:	4766	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320040	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	4.45E-04	4.54E-04	NMHC SP Ratio:	8.40E-05	8.34E-05
CH4 Retention time:	16.7	16.7	NMHC Peak Area:	109431	110147
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	17.27	17.26	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.26	Prev response	17.22	*% change	0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	17.27	17.24	1.002
Mid point	4959	40.7	8.64	8.48	1.020
Low point	4979	20.3	4.31	4.21	1.024
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	17.27	17.20	1.004
				Average Correction Factor	1.015

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

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	9.18	9.28	0.989
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.28	Prev response	9.17	*% change	1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	9.18	9.15	1.004
Mid point	4959	40.7	4.60	4.55	1.011
Low point	4979	20.3	2.29	2.26	1.014
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	9.18	9.11	1.008
				Average Correction Factor	1.010

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	81.3	8.09	7.99	1.012
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.99	Prev response	8.04	*% change	-0.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	81.3	8.09	8.09	0.999
Mid point	4959	40.7	4.05	3.93	1.030
Low point	4979	20.3	2.02	1.95	1.034
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	81.3	8.09	8.10	0.999
				Average Correction Factor	1.021

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	1.000516	0.999194
THC Cal Offset:	-0.055816	-0.067826
CH4 Cal Slope:	1.000794	1.002208
CH4 Cal Offset:	-0.049303	-0.052305
NMHC Cal Slope:	0.999886	0.996552
NMHC Cal Offset:	-0.005712	-0.015321

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

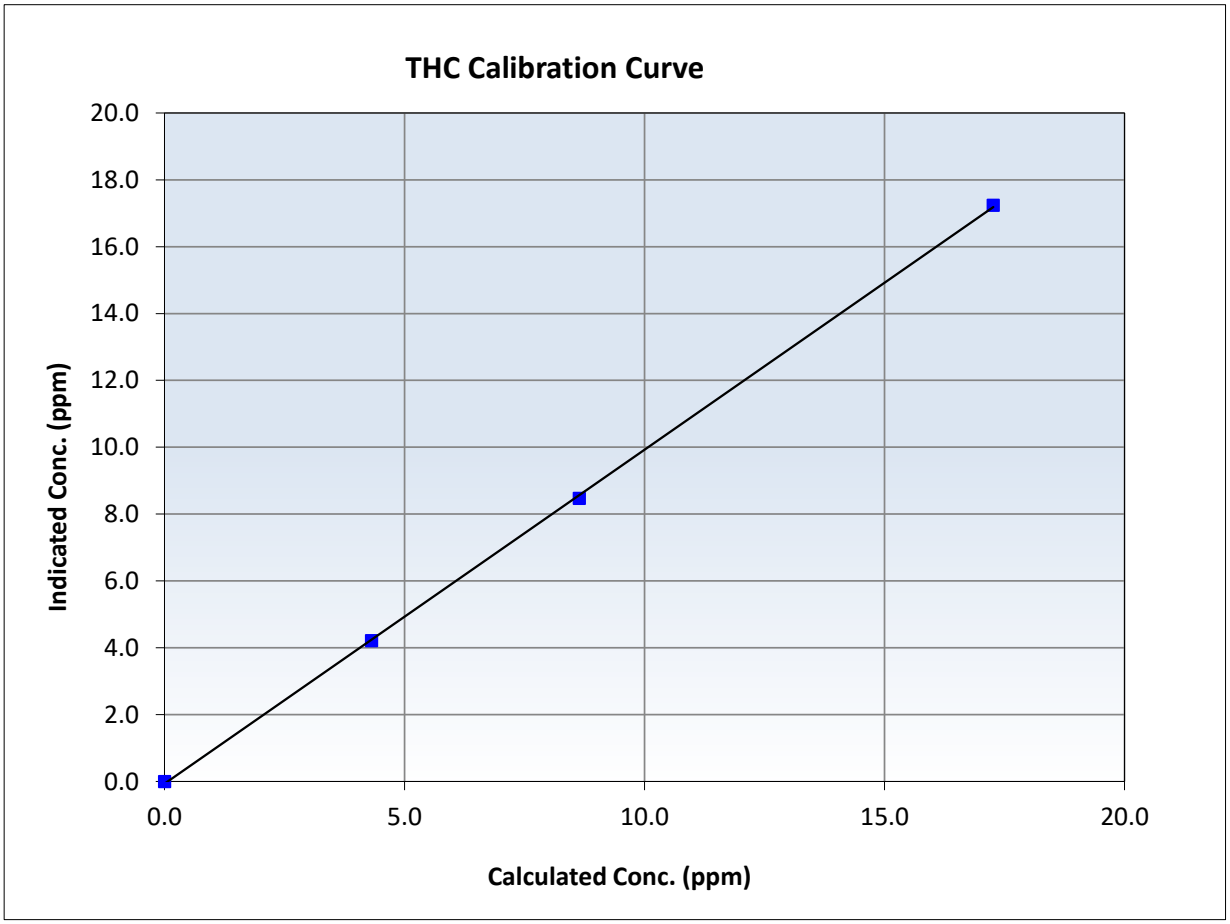
THC Calibration Summary

Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:27	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999895	≥0.995
17.27	17.24	1.0016	Slope	0.999194	0.90 - 1.10
8.64	8.48	1.0199			
4.31	4.21	1.0236	Intercept	-0.067826	+/-0.5



Wood Buffalo Environmental Association

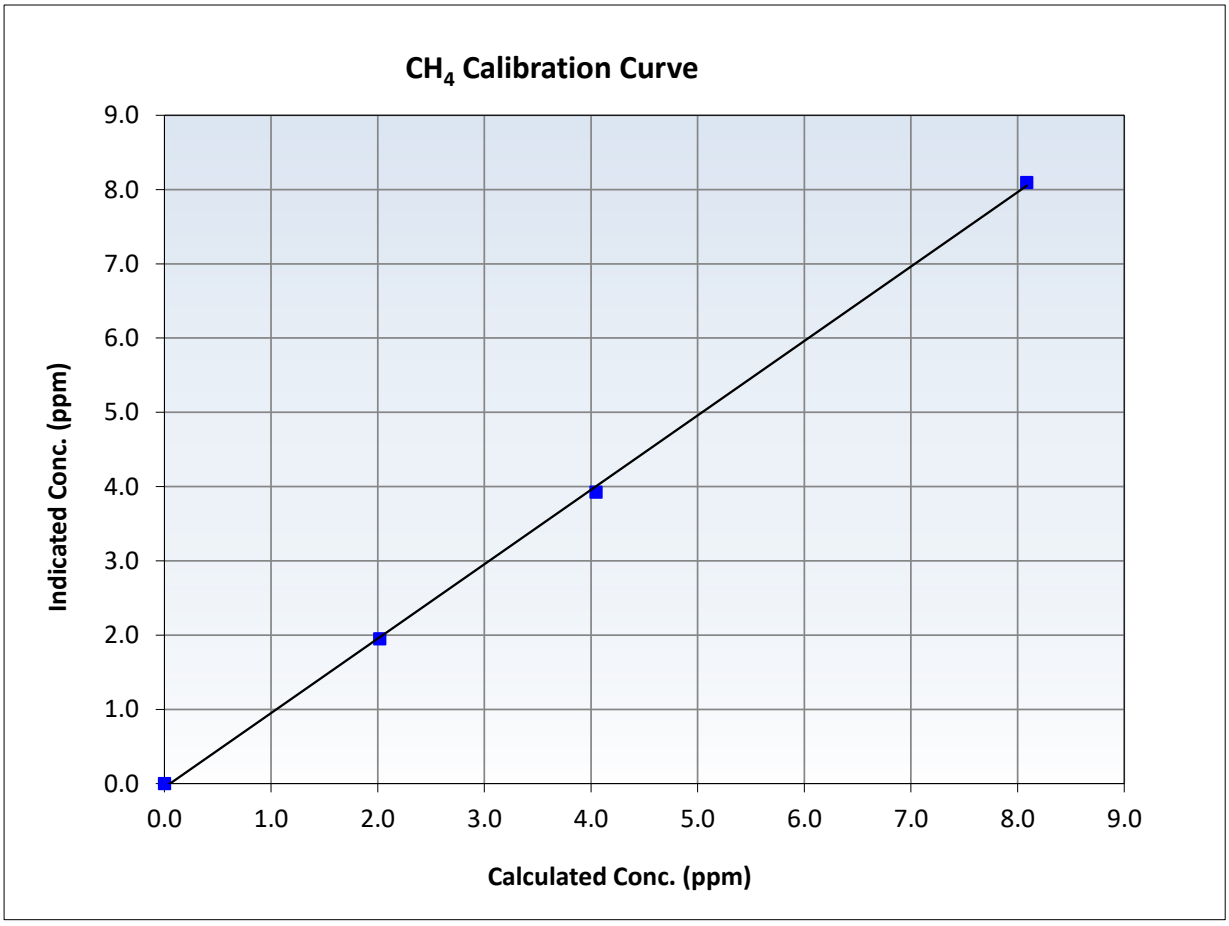
CH_4 Calibration Summary

Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:27	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999702	*≥0.995*
8.09	8.09	0.9990	Slope	1.002208	*0.90 - 1.10*
4.05	3.93	1.0304			
2.02	1.95	1.0343	Intercept	-0.052305	*+/-0.5*



Wood Buffalo Environmental Association

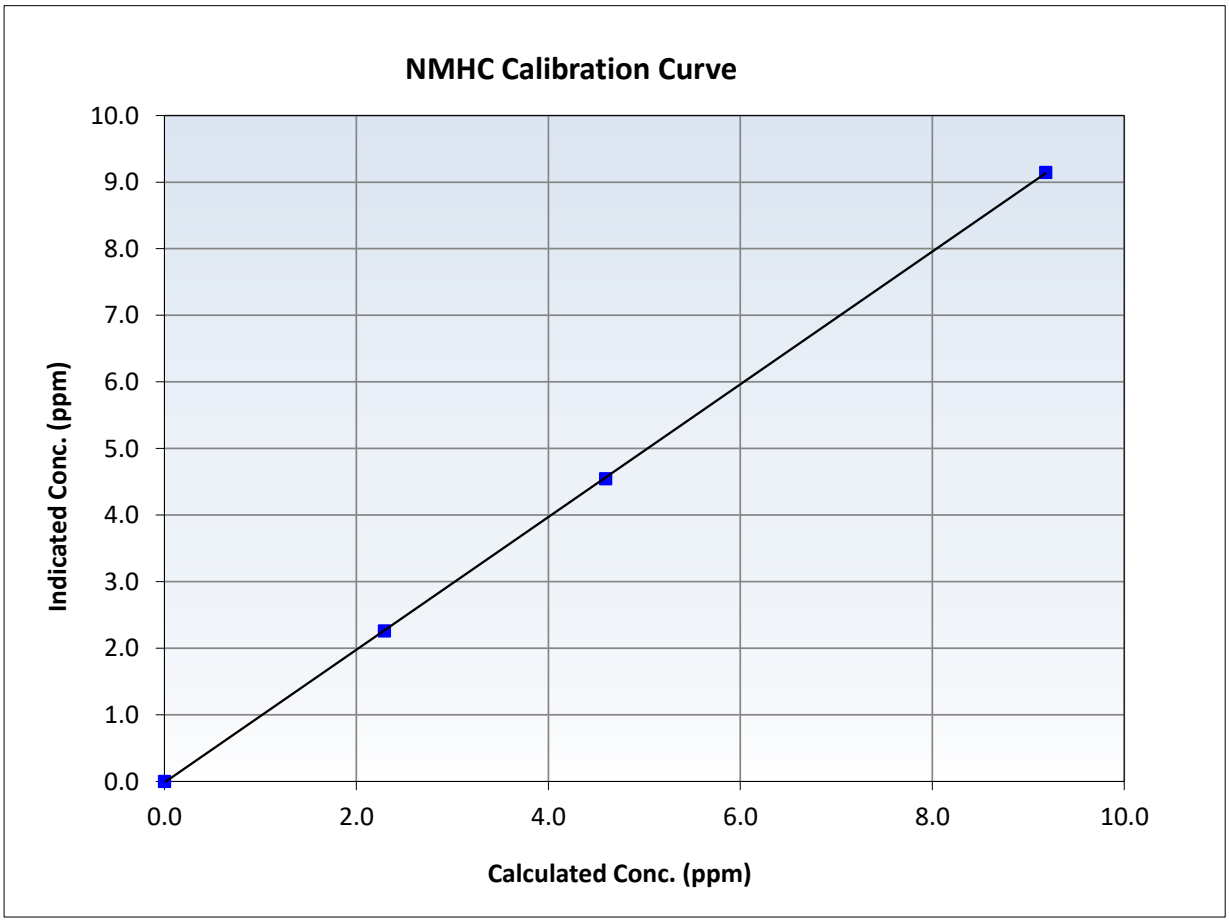
NMHC Calibration Summary

Station Information

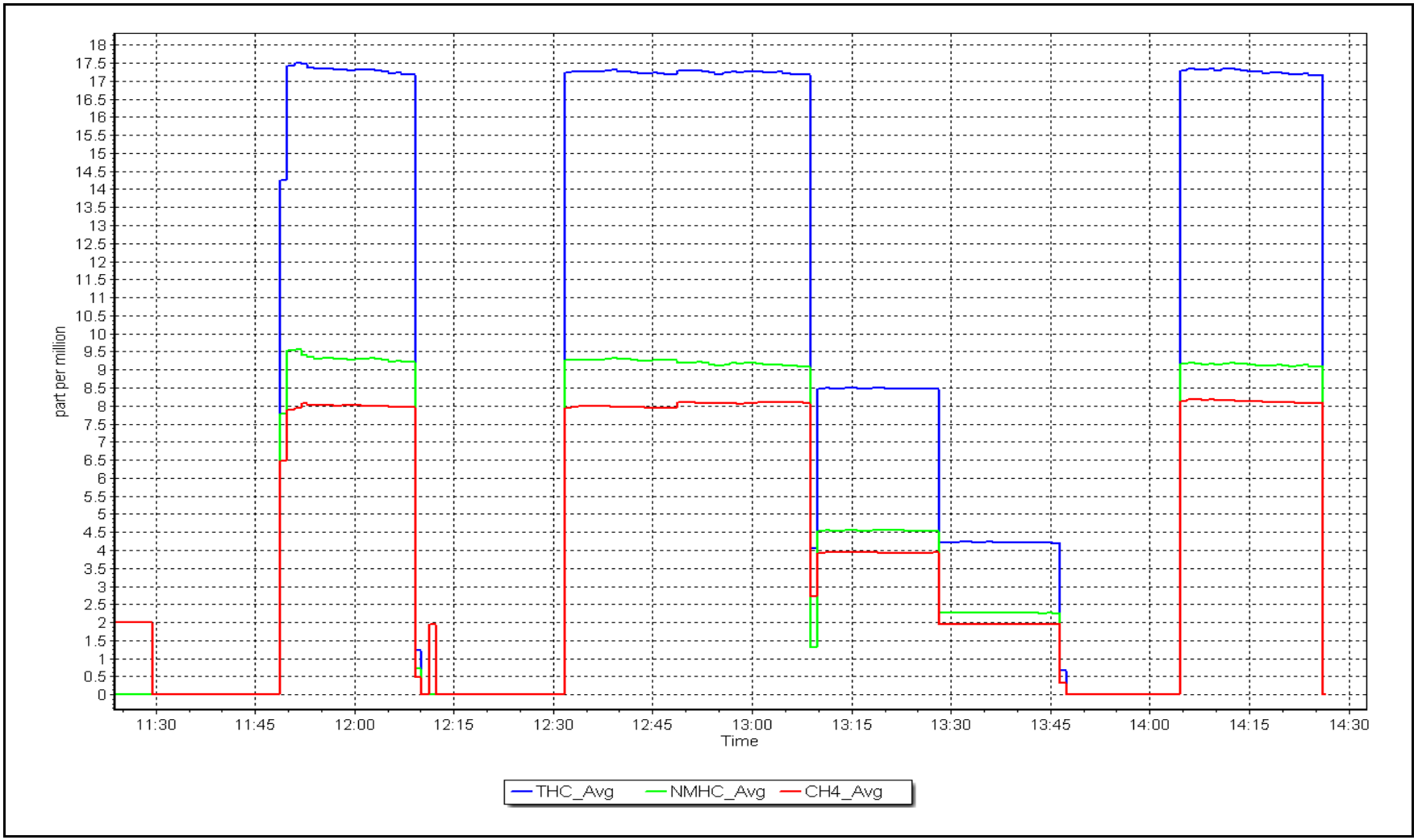
Calibration Date:	January 9, 2025	Previous Calibration:	December 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:27	End Time (MST):	14:24
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999984	≥0.995
9.18	9.15	1.0040	Slope	0.996552	0.90 - 1.10
4.60	4.55	1.0105			
2.29	2.26	1.0144	Intercept	-0.015321	+/-0.5



NMHC Calibration Plot Date: January 9, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay
Station number:	AMS 01
Calibration Date:	January 14, 2025
Last Cal Date:	December 5, 2024
Start time (MST):	12:30
End time (MST):	17:01
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC335700	Cal Gas Expiry Date:	September 1, 2032
NOX Cal Gas Conc:	59.40 ppm	NO Cal Gas Conc:	59.20 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.40 ppm	Removed Gas NO Conc:	59.20 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3565
ZAG make/model:	Teledyne API T701	Serial Number:	4766

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.7	0.3	0.4	----	----
AF High point	4932	67.6	803.1	800.4	2.7	803.0	792.2	10.9	1.0010	1.0107
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 804.4 ppb	NO = 800.0 ppb
Baseline Corr 1st pt	NO_X = 802.3 ppb	NO = 791.9 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -0.3%

*Percent Change NO = -1.0%

As Found Statistics

As found NO_X r^2: Nx Sl: Nx Int:

As found NO r^2: NO Sl: NO Int:

As found NO_2 r^2: NO2 Sl: NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 7117

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.157	1.157	NO bkgnd or offset:	-3.1	-3.1
NOX coeff or slope:	1.161	1.161	NOX bkgnd or offset:	-2.9	-2.9
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	6.9	7.1

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001961	1.001804
NO_X Cal Offset:	-0.240000	0.140000
NO Cal Slope:	1.001534	1.000149
NO Cal Offset:	-1.580000	-1.020000
NO_2 Cal Slope:	1.000167	1.006260
NO_2 Cal Offset:	0.917072	1.284887

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.3	0.1	0.2	----	----
High point	4932	67.6	803.1	800.4	2.7	804.8	800.1	4.7	0.9979	1.0004
Mid point	4966	33.8	401.5	400.2	1.4	402.2	398.5	3.7	0.9984	1.0042
Low point	4983	16.9	200.8	200.1	0.7	201.2	198.1	3.1	0.9979	1.0101
As left zero	5000	0.0	0.0	0.0	0.0	1.3	1.2	0.1	----	----
As left span	4932	67.6	803.1	395.1	408.0	800.0	395.1	404.9	1.0039	1.0000
							Average Correction Factor		0.9980	1.0049

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.2	----	----
High GPT point	797.5	396.9	403.3	406.7	0.9916	100.8%
Mid GPT point	797.5	595.4	204.8	207.5	0.9870	101.3%
Low GPT point	797.5	697.7	102.5	105.8	0.9688	103.2%
				Average Correction Factor	0.9825	101.8%

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

NO_X Calibration Summary

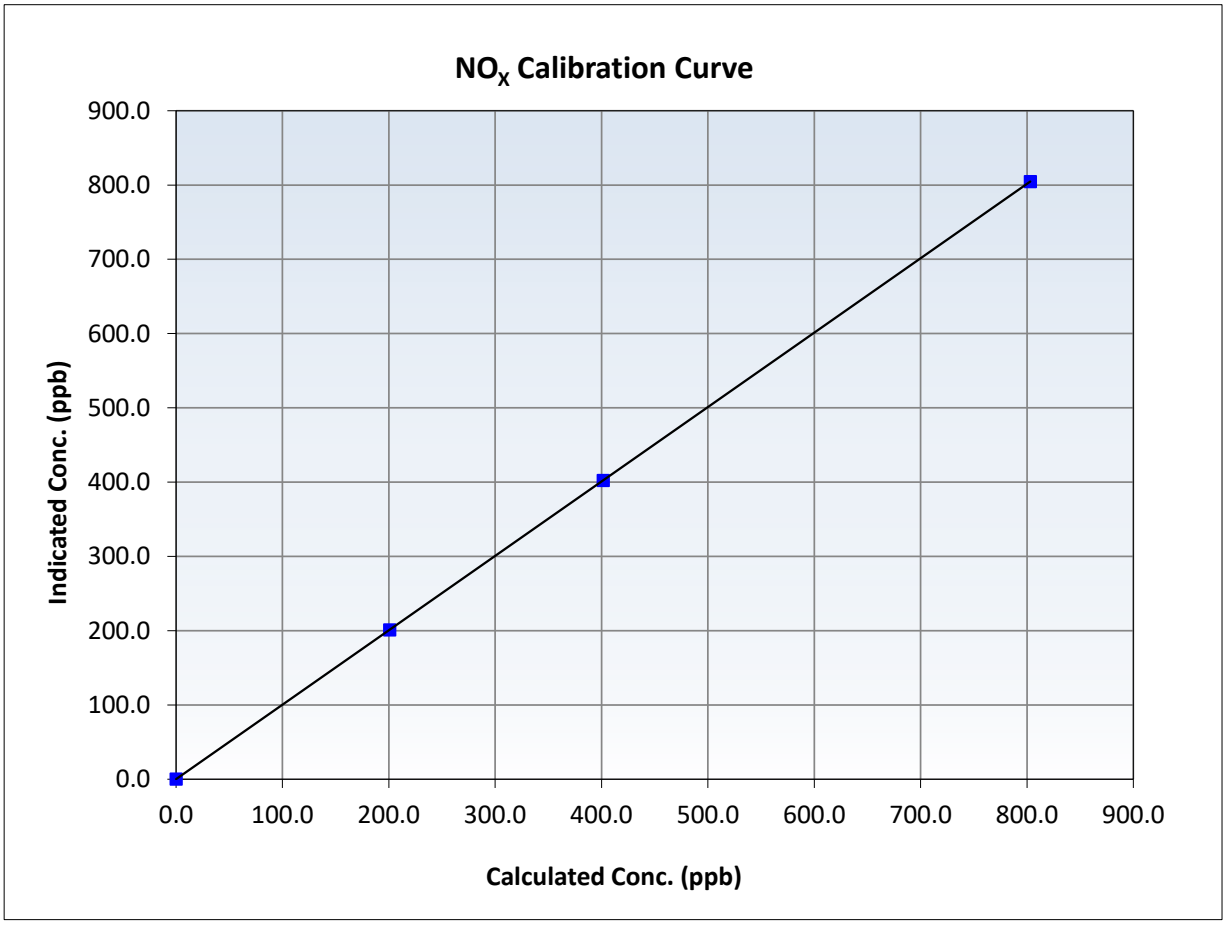
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:30	End Time (MST):	17:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
803.1	804.8	0.9979
401.5	402.2	0.9984
200.8	201.2	0.9979

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	1.001804	*0.90 - 1.10*
Intercept	0.140000	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

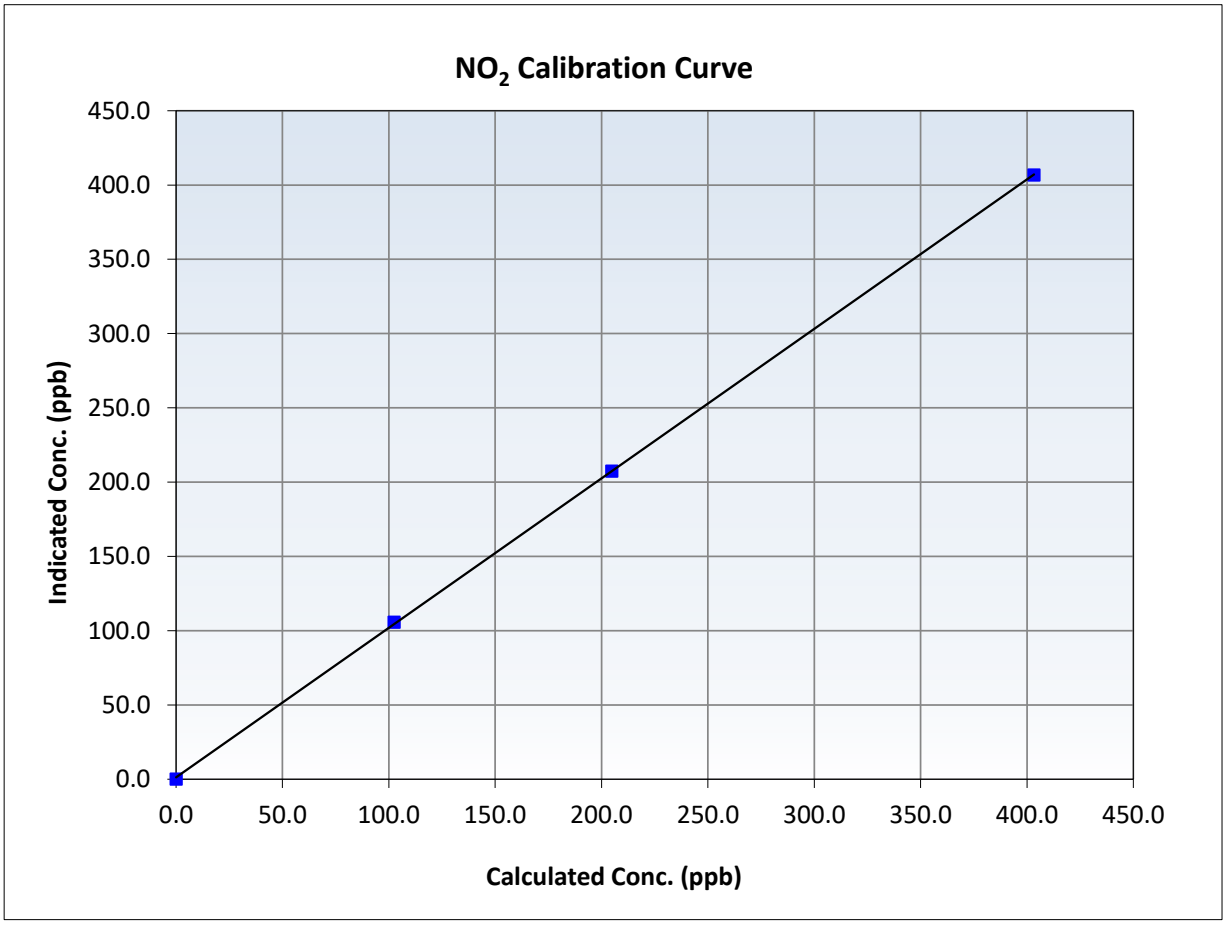
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:30	End Time (MST):	17:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
403.3	406.7	0.9916
204.8	207.5	0.9870
102.5	105.8	0.9688

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999964	*≥0.995*
Slope	1.006260	*0.90 - 1.10*
Intercept	1.284887	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

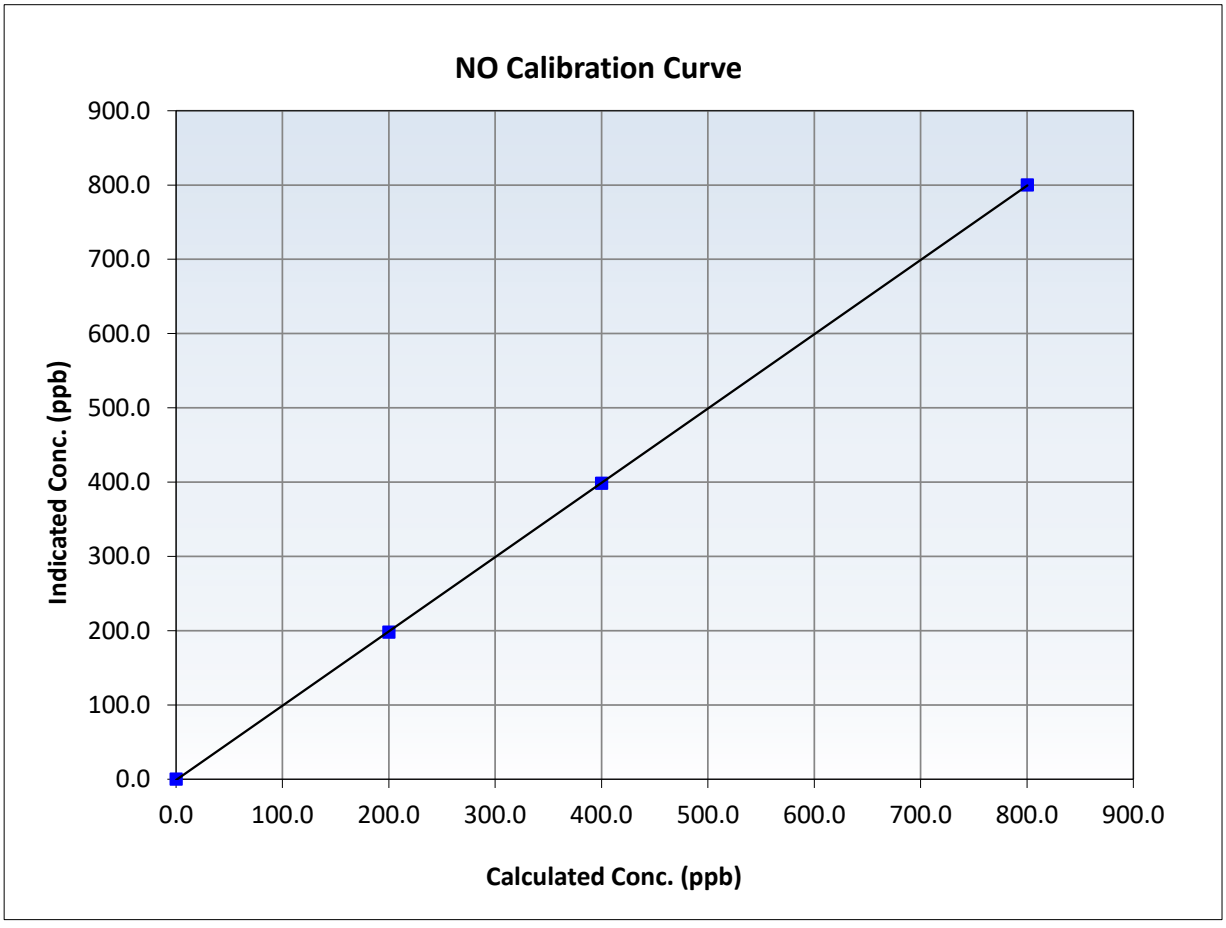
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:30	End Time (MST):	17:01
Analyzer make:	Teledyne API T200	Analyzer serial #:	7117

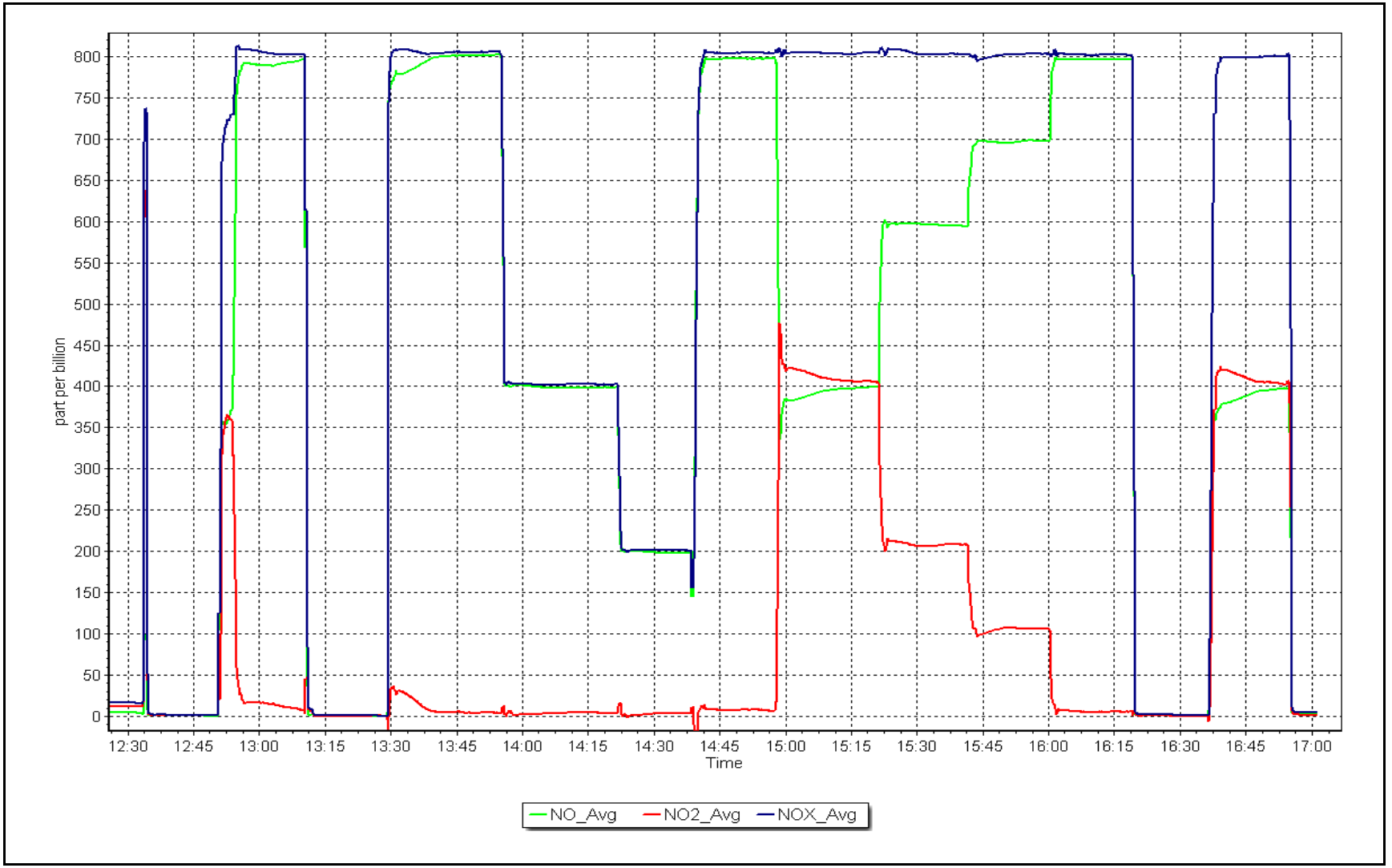
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.4	800.1	1.0004
400.2	398.5	1.0042
200.1	198.1	1.0101

Statistical Evaluation		Limits
Correlation Coefficient	0.999991	≥0.995
Slope	1.000149	0.90 - 1.10
Intercept	-1.020000	+/-20



NO_X Calibration Plot Date: January 14, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 8, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	12:19	End time (MST):	15:10
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:	4766

Analyzer Information

Analyzer make:	Teledyne API T400		Analyzer serial #:	1107	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003514	1.003571	Backgd or Offset:	5.4	5.4
Calibration intercept:	0.160000	-0.100000	Coeff or Slope:	1.010	1.010

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.7	----
As found High point	5000	863.1	400.0	400.6	0.997
As found Mid point					
As found Low point					
Baseline Corr As found:	401.3	Previous response	401.6	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	5000	863.1	400.0	401.3	0.997
Mid point	5000	744.0	200.0	200.7	0.997
Low point	5000	651.7	100.0	100.2	0.998
As left zero	5000	0.0	0.0	-0.3	----
As left span	5000	863.1	400.0	403.2	0.992
				Average Correction Factor	0.997

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

O_3 Calibration Summary

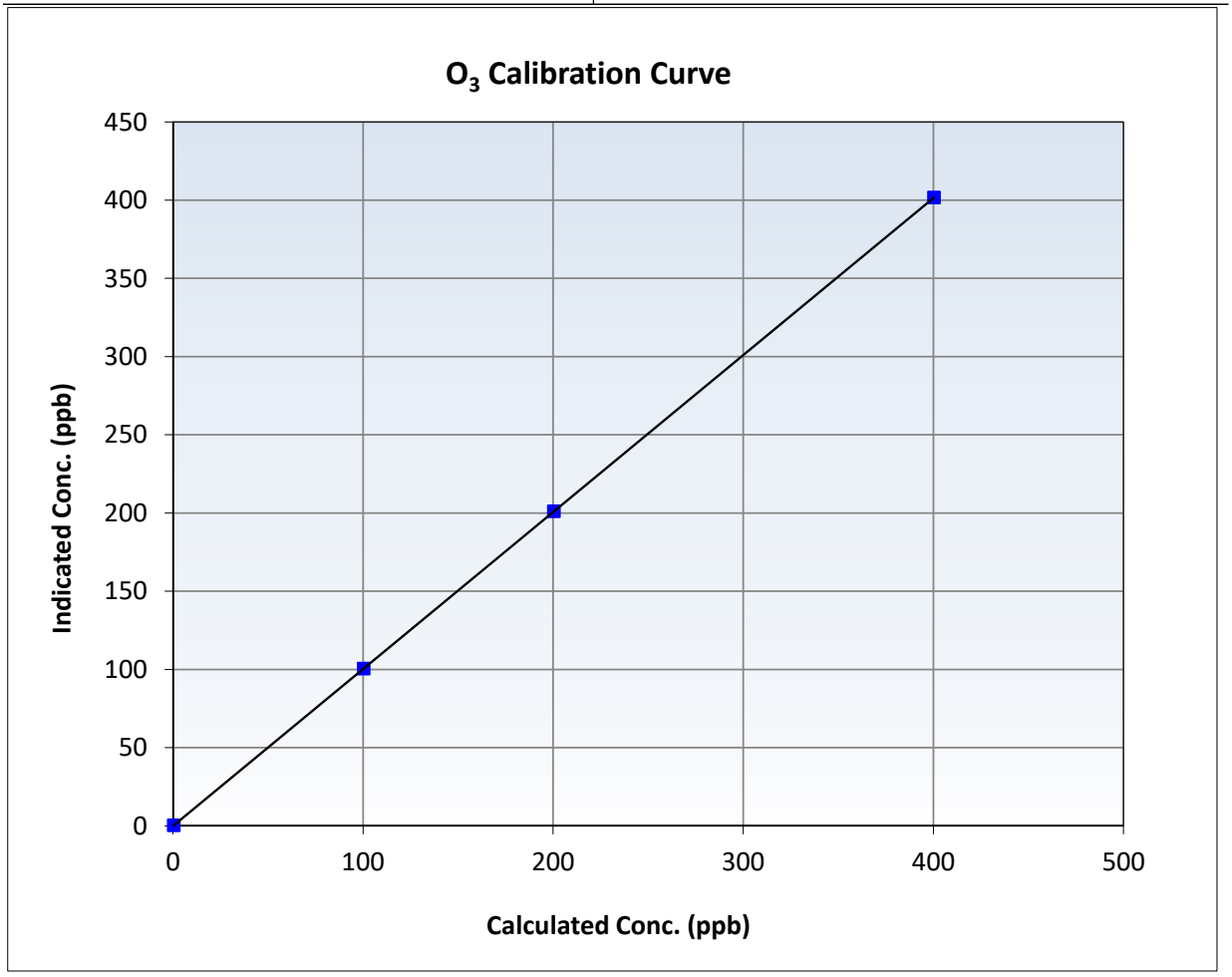
Station Information

Calibration Date:	January 8, 2025	Previous Calibration:	December 2, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:19	End Time (MST):	15:10
Analyzer make:	Teledyne API T400	Analyzer serial #:	1107

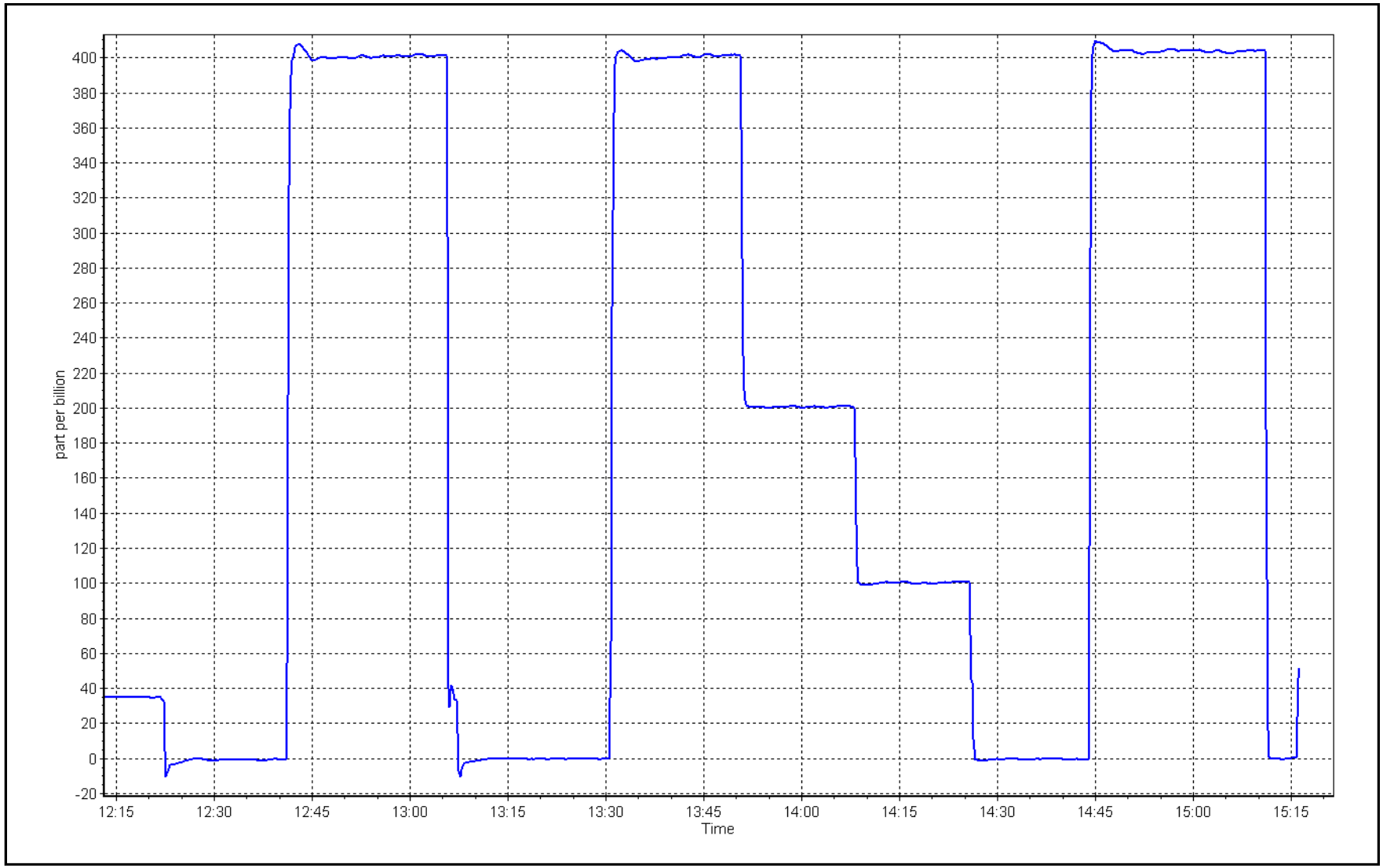
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
400.0	401.3	0.9968
200.0	200.7	0.9965
100.0	100.2	0.9980

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	1.003571	*0.90 - 1.10*
Intercept	-0.100000	*+/- 5*



O_3 Calibration Plot Date: January 8, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	January 30, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	14:52	End time (MST):	16:59
Analyzer Make:	Teledyne API T640	S/N:	322
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388752
Temp/RH standard:	Alicat FP-25BT	S/N:	388752

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	(Limits)
T (°C)	-20.3	-21.9	-20.3	☐	+/- 2 °C
P (mmHg)	741.3	743.62	741.3	☐	+/- 10 mmHg
Flow (LPM)	4.99	4.929	4.99	☐	+/- 0.25 LPM
PW% (pump)	42		42	☐	>80%
Zero Verification	PM w/o HEPA:	6.2	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	11.0	10.7	10.7	☐	10.9 +/- 0.5

Date Optical Chamber Cleaned: January 30, 2025

Date Disposable Filter Changed: January 30, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 24, 2024

Date RH/T Sensor Cleaned: October 24, 2024

Notes: Flow, temperature, and pressure were verified. Leak check passed. Optical chamber cleaned. Disposable filter changed. PMT peak test passed.

Calibration by: Rene Chamberland

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 13, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	11:07	End time (MST):	14:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	3,040	ppm	Cal Gas Exp Date:	December 1, 2028
Cal Gas Cylinder #:	ALM042207			
Removed Cal Gas Conc:	3,040	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:	4766

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3520	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002243	0.998776	Backgd or Offset:	-0.014	-0.014
Calibration intercept:	0.117838	0.271853	Coeff or Slope:	0.996	0.988

CO 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4933	66.7	40.6	41.2	0.987
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	41.08	Prev response:	40.76	*% 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	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4933	66.7	40.6	40.6	0.998
Mid point	4966	33.3	20.2	20.8	0.974
Low point	4983	16.7	10.2	10.4	0.976
As left zero	5000	0.0	0.0	0.1	----
As left span	2960	40.0	40.5	40.2	1.009
				Average Correction Factor	0.983

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

CO Calibration Summary

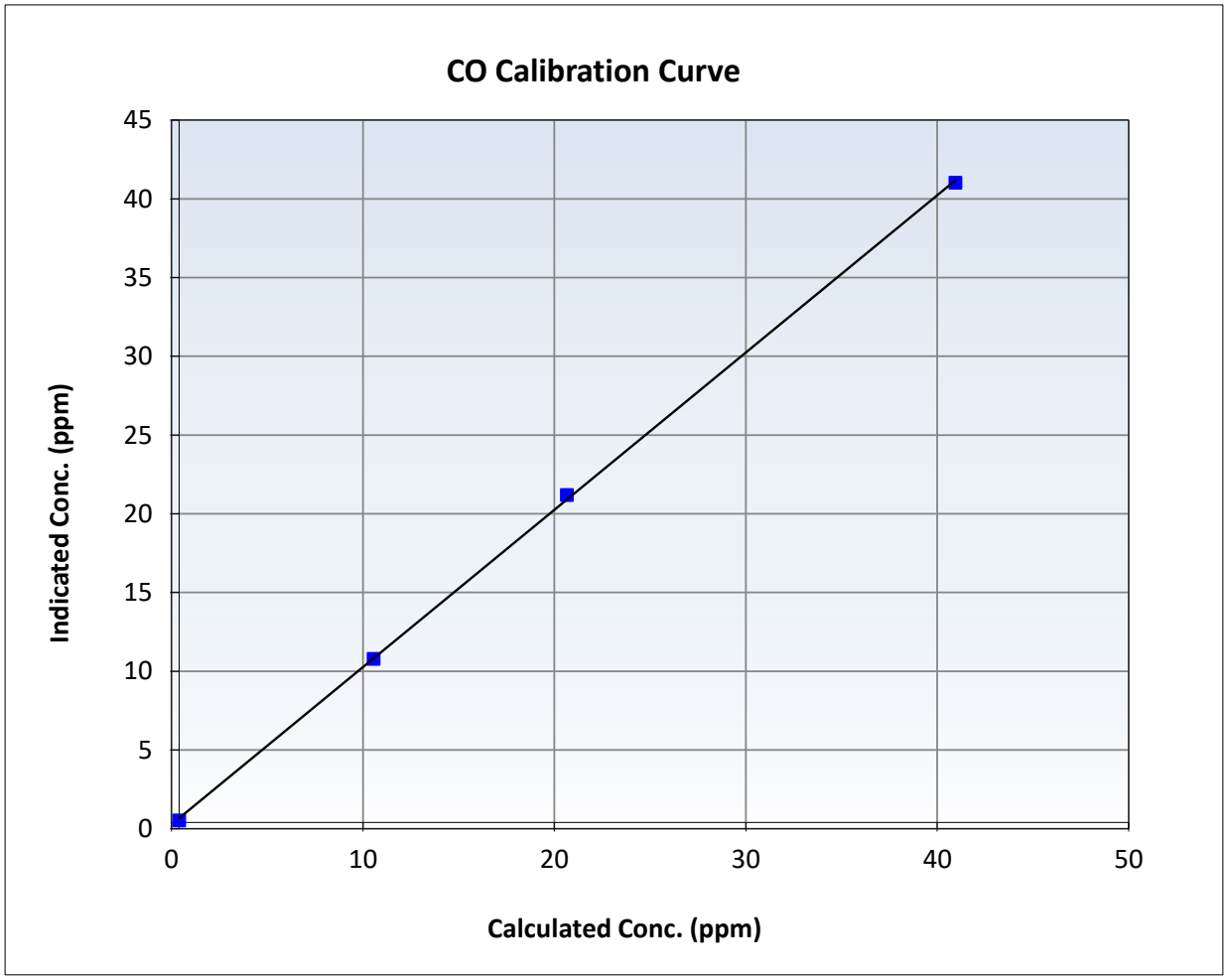
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 3, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:07	End Time (MST):	14:15
Analyzer make:	Teledyne API T300	Analyzer serial #:	3520

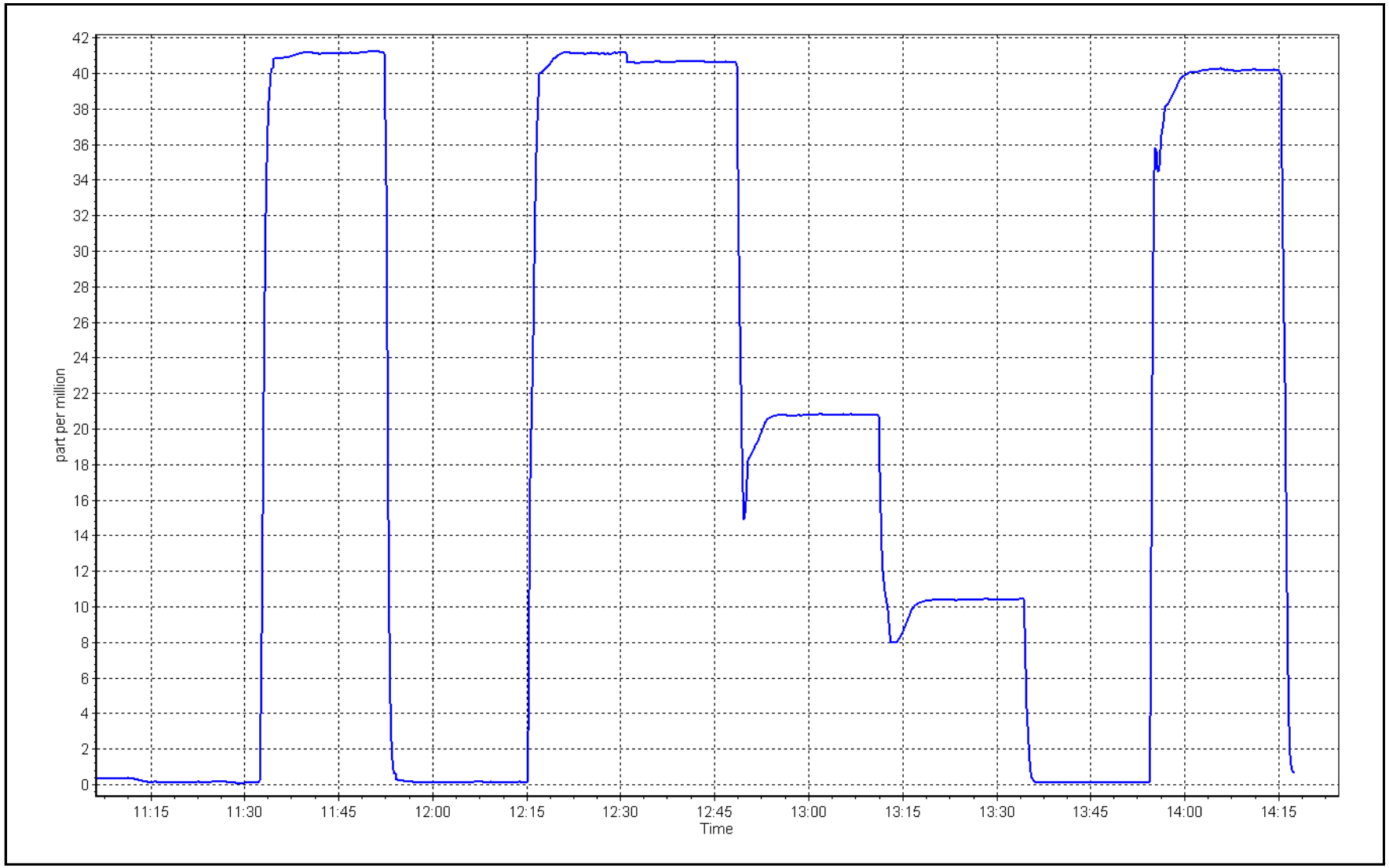
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
40.6	40.6	0.9982
20.2	20.8	0.9735
10.2	10.4	0.9764

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999850	*≥0.995*
Slope	0.998776	*0.90 - 1.10*
Intercept	0.271853	*+/-1.5*



CO Calibration Plot Date: January 13, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
Calibration Date:	January 17, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	11:50	End time (MST):	14:47
Reason:	Routine		

Calibration Standards

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

Analyzer Information

Analyzer make:	Teledyne API 360		Analyzer serial #:	442	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998885	0.995361	Backgd or Offset:	0.002	0.002
Calibration intercept:	-1.400000	-0.800000	Coeff or Slope:	0.913	0.913

CO_2 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) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	0.8	----
As found High Point	2920	80.0	1605.3	1596.5	1.006
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1595.7	Prev response:	1602.1	*% 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	

CO_2 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) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	0.6	----
High point	2920	80.0	1605.3	1599.4	1.004
Mid point	2960	40.0	802.7	792.6	1.013
Low point	2980	20.0	401.3	400.5	1.002
As left zero	3000	0.0	0.0	-2.2	----
As left span	2960	40.0	802.7	784.3	1.023
				Average Correction Factor	1.006

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

CO_2 Calibration Summary

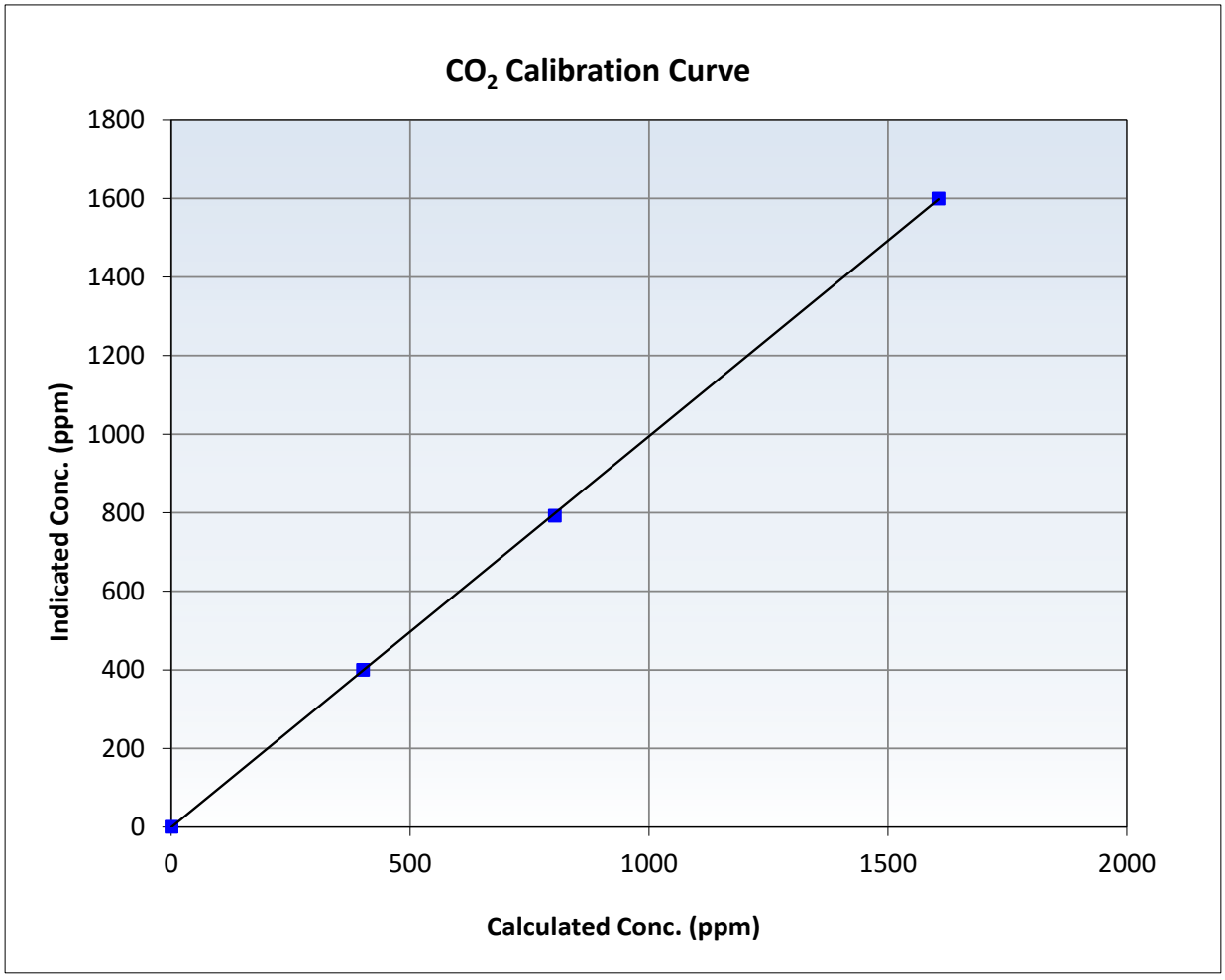
Station Information

Calibration Date	January 17, 2025	Previous Calibration	December 4, 2024
Station Name	Bertha Ganter-Fort McKay	Station Number	AMS 01
Start Time (MST)	11:50	End Time (MST)	14:47
Analyzer make	Teledyne API 360	Analyzer serial #	442

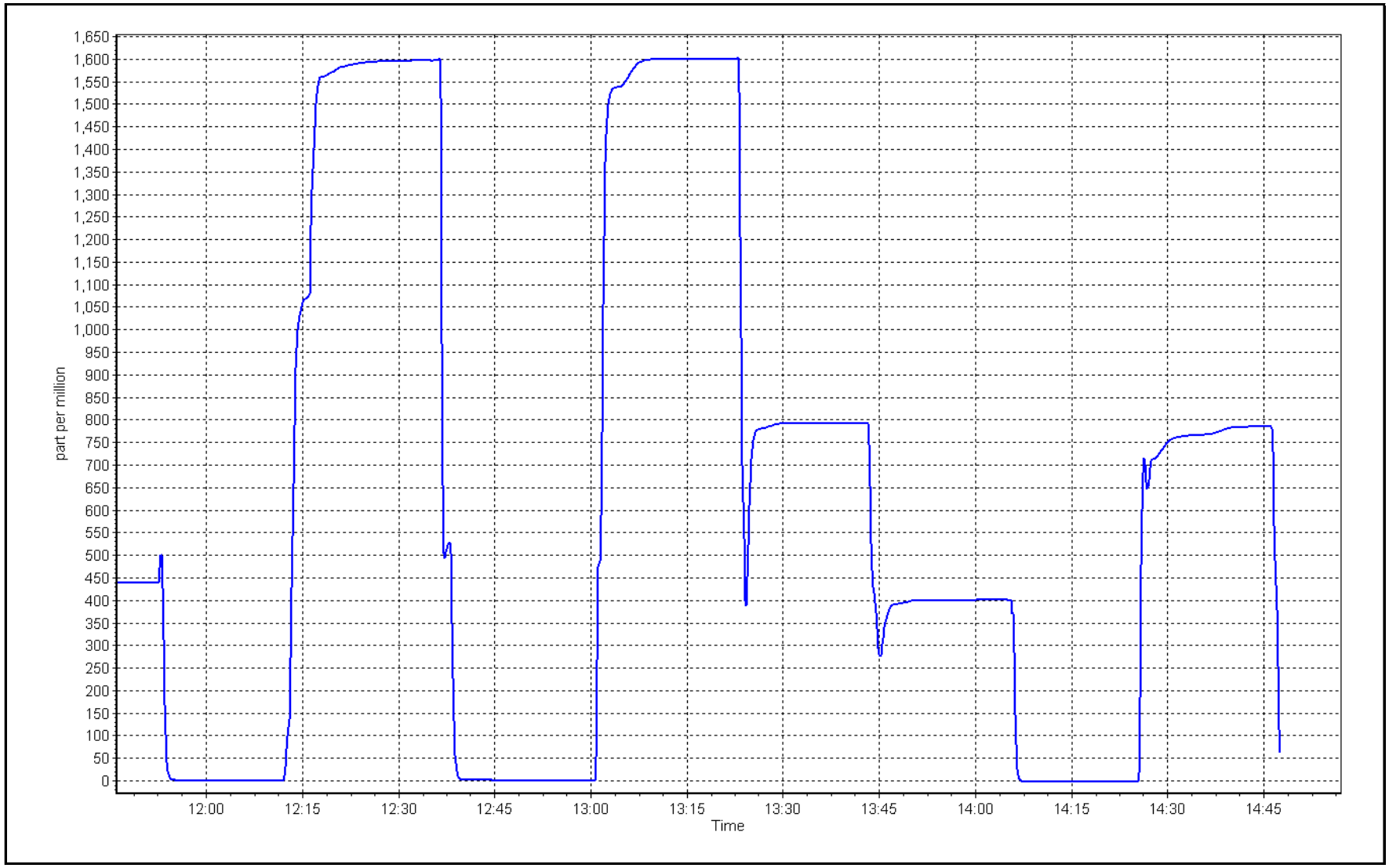
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
1605.3	1599.4	1.0037
802.7	792.6	1.0127
401.3	400.5	1.0021

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999970	*≥0.995*
Slope	0.995361	*0.90 - 1.10*
Intercept	-0.8	*+/-20*



CO_2 Calibration Plot Date: January 17, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
NOX Cal Date:	January 15, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	12:42	End time (MST):	16:54
NH3 Cal Date:	January 16, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	12:15	End time (MST):	15:18
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc:	59.40	ppm	NO Gas Cylinder #:	CC335700
NO Cal Gas Conc:	59.20	ppm	NO Cal Gas Expiry:	September 1, 2032
Removed NOX Conc:	59.40	ppm	Removed Cylinder #:	NA
Removed NO Conc:	59.20	ppm	Removed cyl Expiry:	NA
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.58	ppm	NH3 Gas Cylinder #:	CC743587
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.58	ppm	Removed Cylinder #:	NA
NH3 gas Diff:			Removed cyl Expiry:	NA
Calibrator Model:	API T700		Serial Number:	3565
ZAG make/model:	API T701		Serial Number:	4766

Analyzer Information

Analyzer model:	API T201		Analyzer serial #:	475
Converter model:	API T501		Converter serial #:	824
NH3 Range (ppb):	0 - 2000 ppb		Reaction cell Press:	11.60
NOX Range (ppb):	0 - 1000 ppb		Sample Flow:	510

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	0.838	0.838	Nt coefficient:	0.847	0.847
NOX coefficient:	0.841	0.841	NO bkgrnd:	-0.9	-0.9
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	-0.3	-0.3
NH3 coefficient:	0.946	0.946	Nt bkgrnd:	1.2	1.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.009375	1.006657
NO_X Cal Offset:	-3.420000	-2.040000
NO Cal Slope:	1.003233	1.009044
NO Cal Offset:	-2.800000	-3.160000
NO_2 Cal Slope:	1.000150	0.997626
NO_2 Cal Offset:	0.920283	0.076246
NH3 Cal Slope:	1.002081	0.992426
NH3 Cal Offset:	-2.741292	0.368130
Nt Cal Slope:	1.005363	0.996118
Nt Cal Offset:	-3.121782	-0.300703

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.7	-0.8	----	----
As found span	4932	67.6	803.1	800.4	803.1	807.6	798.6	806.8	0.9944	1.0022
AF GPT span	4932	67.6	803.1	-----	803.1	805.2	-----	805.2	0.9974	-----
new NO cyl rp										

Baseline Corr As Fd	Nt = 807.6 ppb	NO_X = 808.3 ppb	NO = 799.3 ppb	*Percent Change	$Nt_{(NO)}$ =	0.4%
Previous Response	Nt = 804.27 ppb	NO_X = 807.2 ppb	NO = 800.2 ppb	*Percent Change	NO_X =	0.1%
**NO_X Δ (NO to GPT response) =	-0.3%			*Percent Change	NO =	-0.1%

* **= > +/-2% difference initiates investigation

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	-1.1	-0.9	-1.4	----	----
High point	4932	67.6	803.1	800.4	803.1	807.0	806.0	809.4	0.9952	0.9930
Mid point	4966	33.8	401.5	400.2	401.5	401.3	398.3	401.0	1.0006	1.0048
Low point	4983	16.9	200.8	200.1	200.8	199.4	197.3	200.9	1.0069	1.0142
								Average Correction Factor	1.0009	1.0040

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Calibration zero	----	----	0.0	-0.2	----	----
High GPT point (400 ppb O3)	798.0	388.6	412.1	410.8	1.0032	99.7%
Mid GPT point (200 ppb O3)	798.0	592.8	207.9	208.4	0.9976	100.2%
Low GPT point (100 ppb O3)	798.0	697.5	103.2	102.8	1.0039	99.6%
				Average Correction Factor	1.0016	99.8%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero	5000	0.0	0.0	0.0	0.0	-1.2	-1.0	-0.2	----	----
AF High point	3418	82.2	1798.5	----	1798.5	1790.3	----	1784.6	1.004	1.008
AF Mid point							----			
AF Low point							----			
new NH3 cyl rp										

Baseline Corr As Fd Nt = 1791.5 ppb NH3 = 1784.8 ppb *Percent Change $Nt_{(NH3)}$ = -0.8%

Previous Response Nt = 1805.1 ppb NH3 = 1799.5 ppb * = > +/-5% change initiates investigation *Percent Change NH3 = -0.8%

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	-1.4	-1.1	-0.3	----	----
High point	3418	82.2	1798.5	----	1798.5	1790.3	----	1784.6	1.005	1.008
Mid point	3454	45.7	1000.0	----	1000.0	997.2	----	993.9	1.003	1.006
Low point	3477	22.8	498.9	----	498.9	497.3	----	495.7	1.003	1.006
								Average Correction Factor	1.0035	1.0068

NH3 Previous Converter Efficiency = 90.8 %

NH3 Current Converter Efficiency = 90.8 %

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

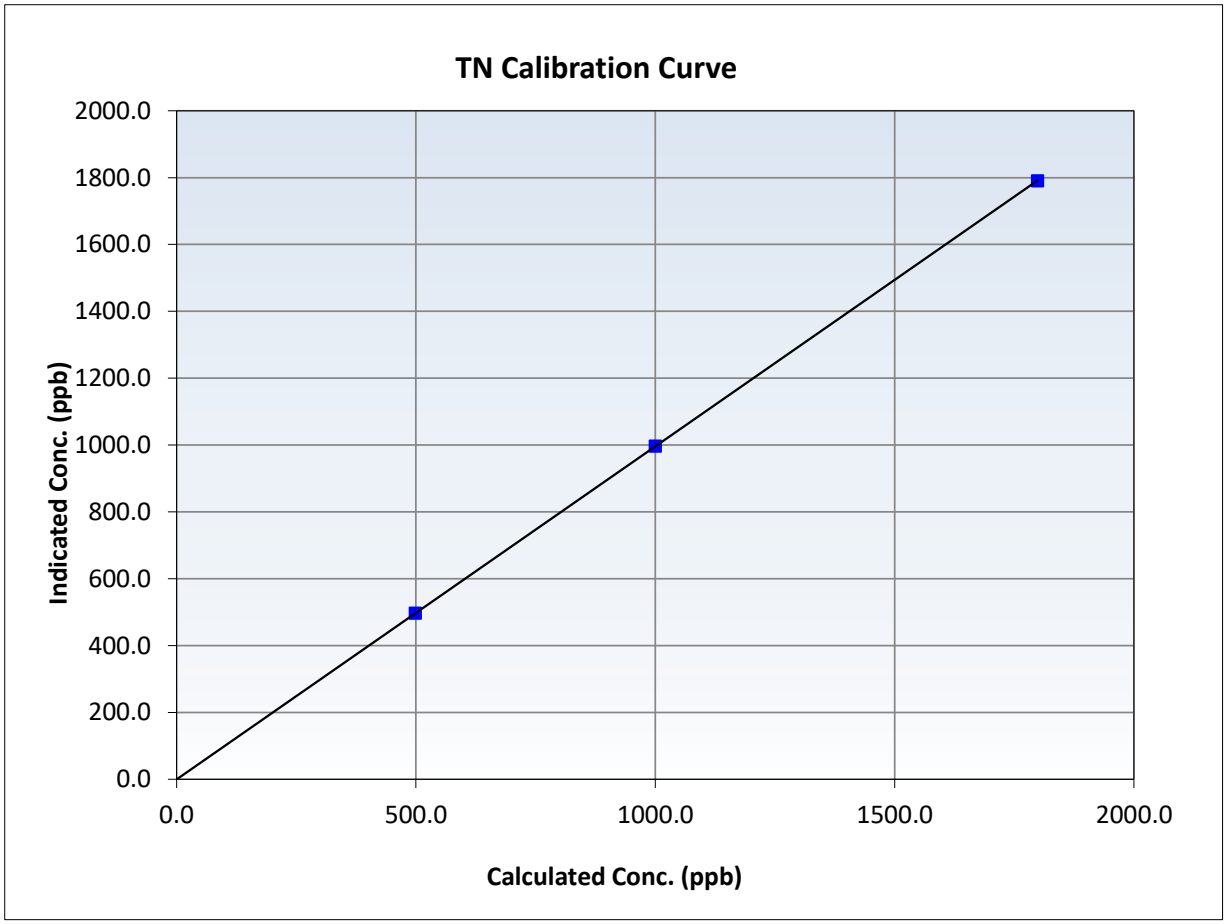
Nt Calibration Summary

Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:42	End Time (MST):	16:54
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	-1.4	----	Correlation Coefficient	0.999997	*≥0.995*
1798.5	1790.3	1.0046	Slope	0.996118	*0.90 - 1.10*
1000.0	997.2	1.0028			
498.9	497.3	1.0031	Intercept	-0.300703	*+/-20*



Wood Buffalo Environmental Association

NH_3 Calibration Summary

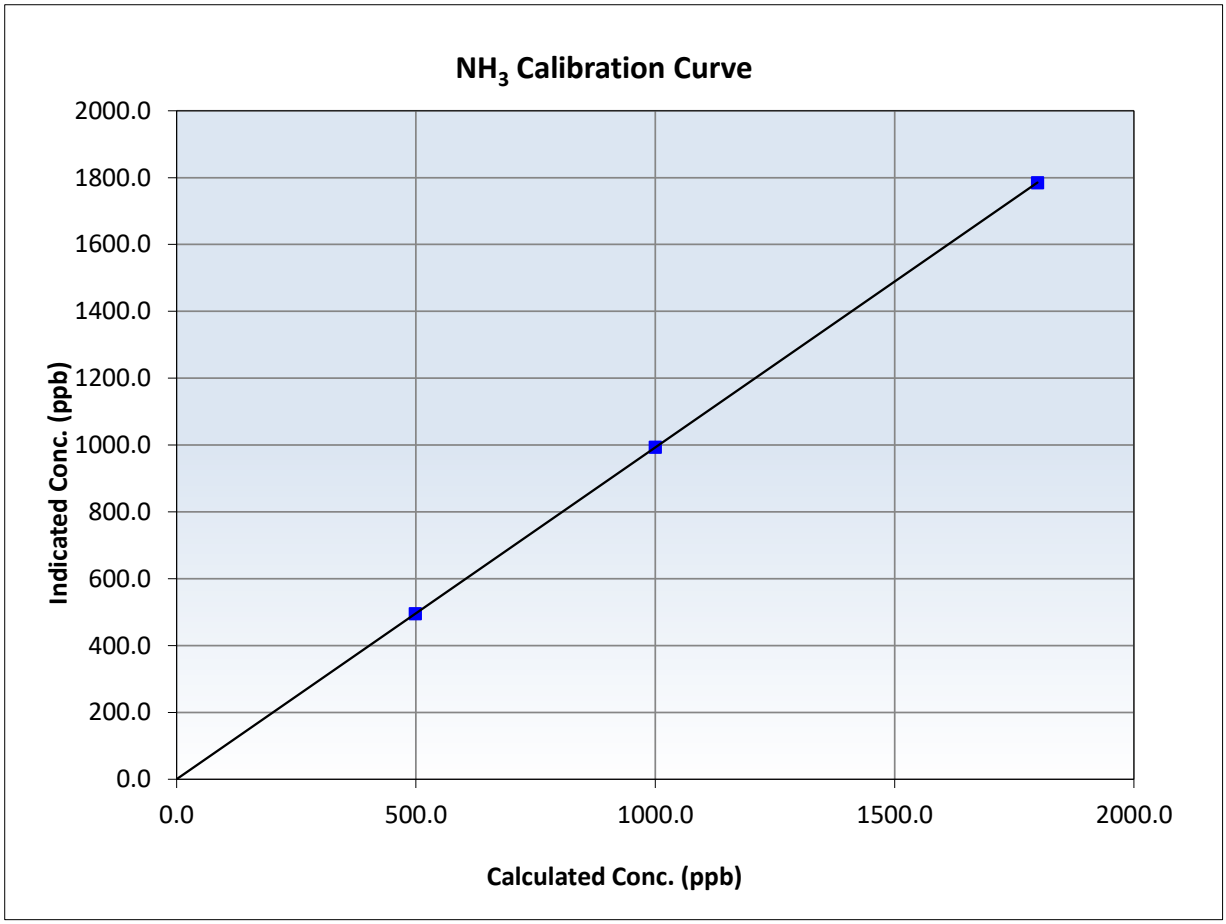
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:42	End Time (MST):	16:54
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
1798.5	1784.6	1.0078
1000.0	993.9	1.0061
498.9	495.7	1.0064

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.992426	*0.90 - 1.10*
Intercept	0.368130	*+/-20*



Wood Buffalo Environmental Association

NO_X Calibration Summary

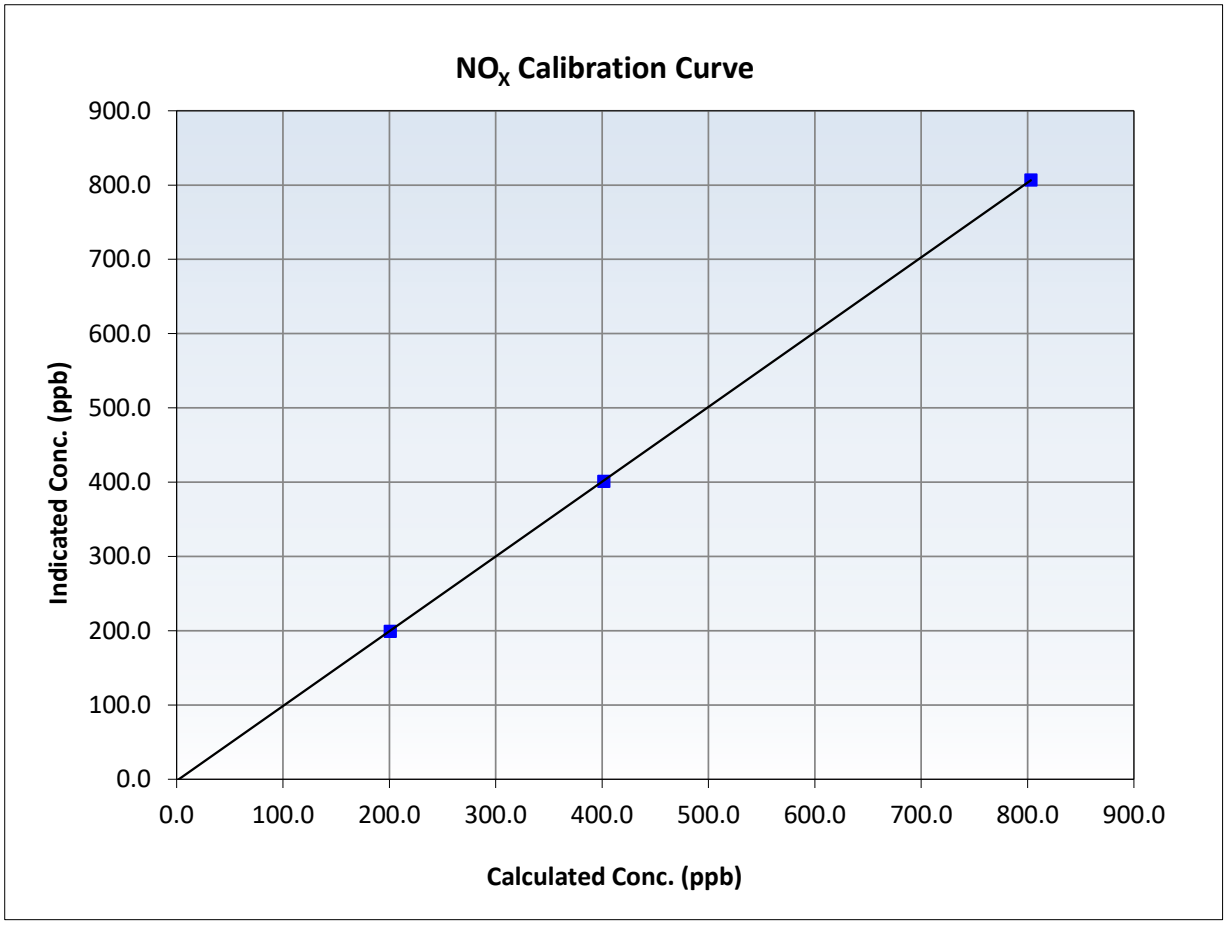
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:42	End Time (MST):	16:54
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-1.1	----
803.1	807.0	0.9952
401.5	401.3	1.0006
200.8	199.4	1.0069

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999993	*≥0.995*
Slope	1.006657	*0.90 - 1.10*
Intercept	-2.040000	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

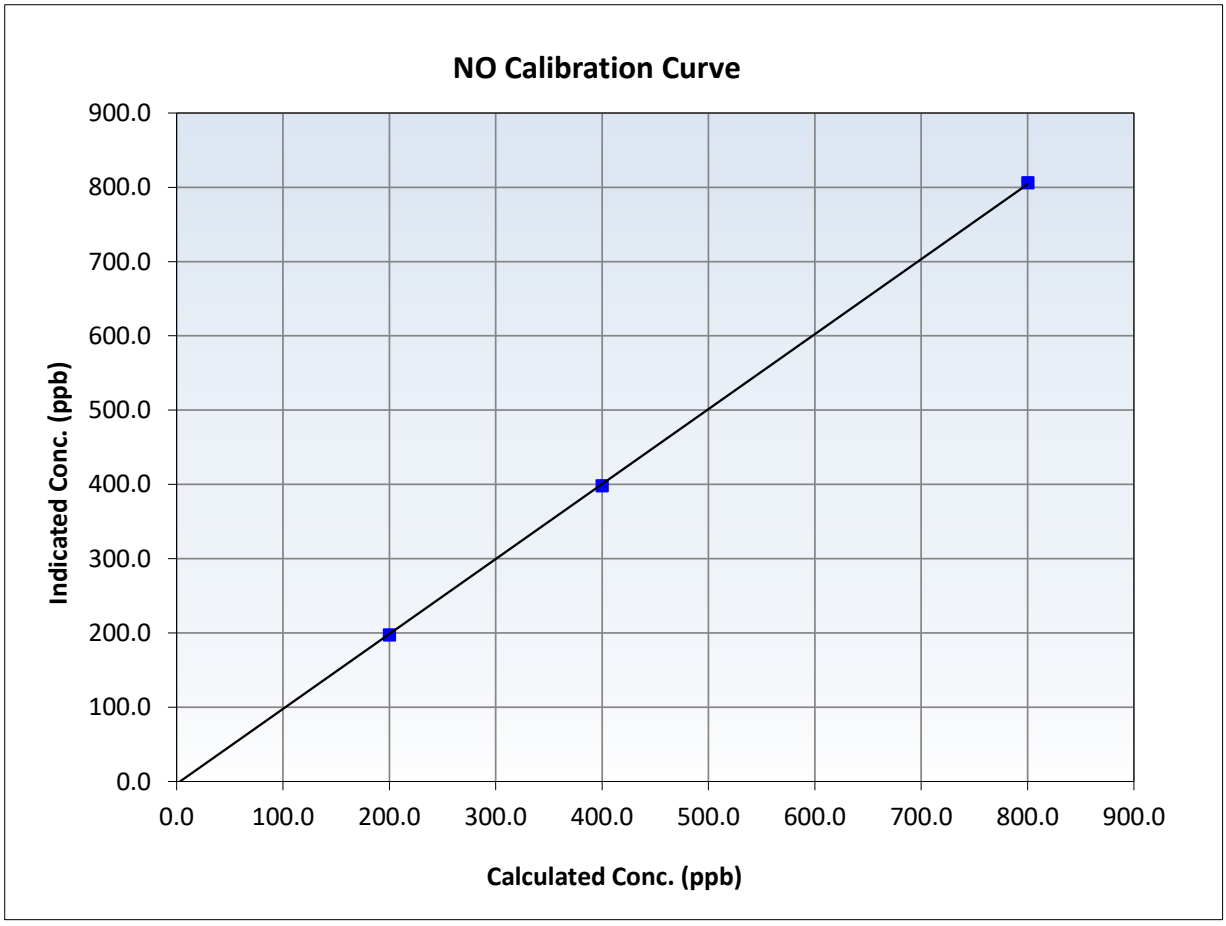
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:42	End Time (MST):	16:54
Analyzer make:	API T201	Analyzer serial #:	475

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.9	----
800.4	806.0	0.9930
400.2	398.3	1.0048
200.1	197.3	1.0142

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999958	*≥0.995*
Slope	1.009044	*0.90 - 1.10*
Intercept	-3.160000	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

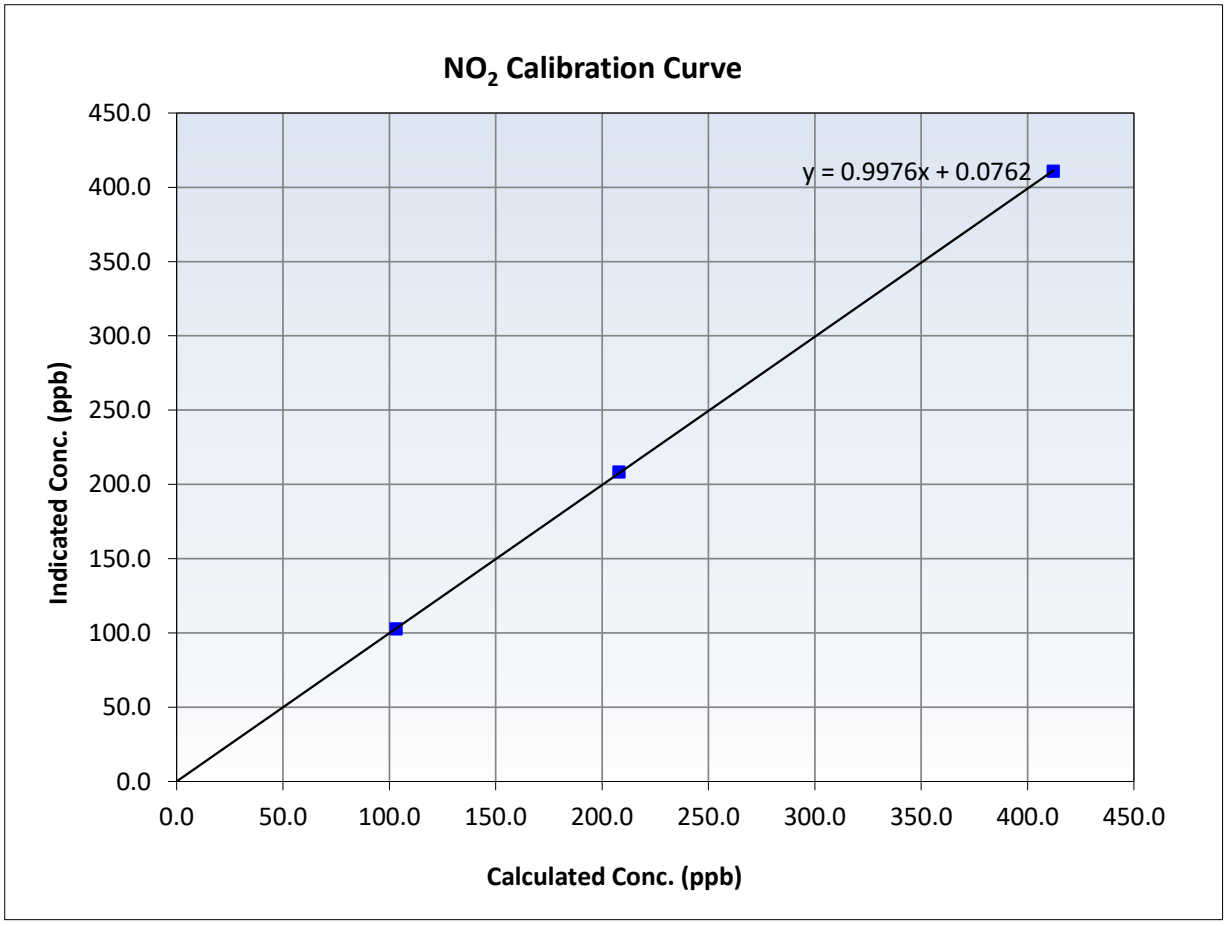
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 11, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:42	End Time (MST):	16:54
Analyzer make:	API T201	Analyzer serial #:	475

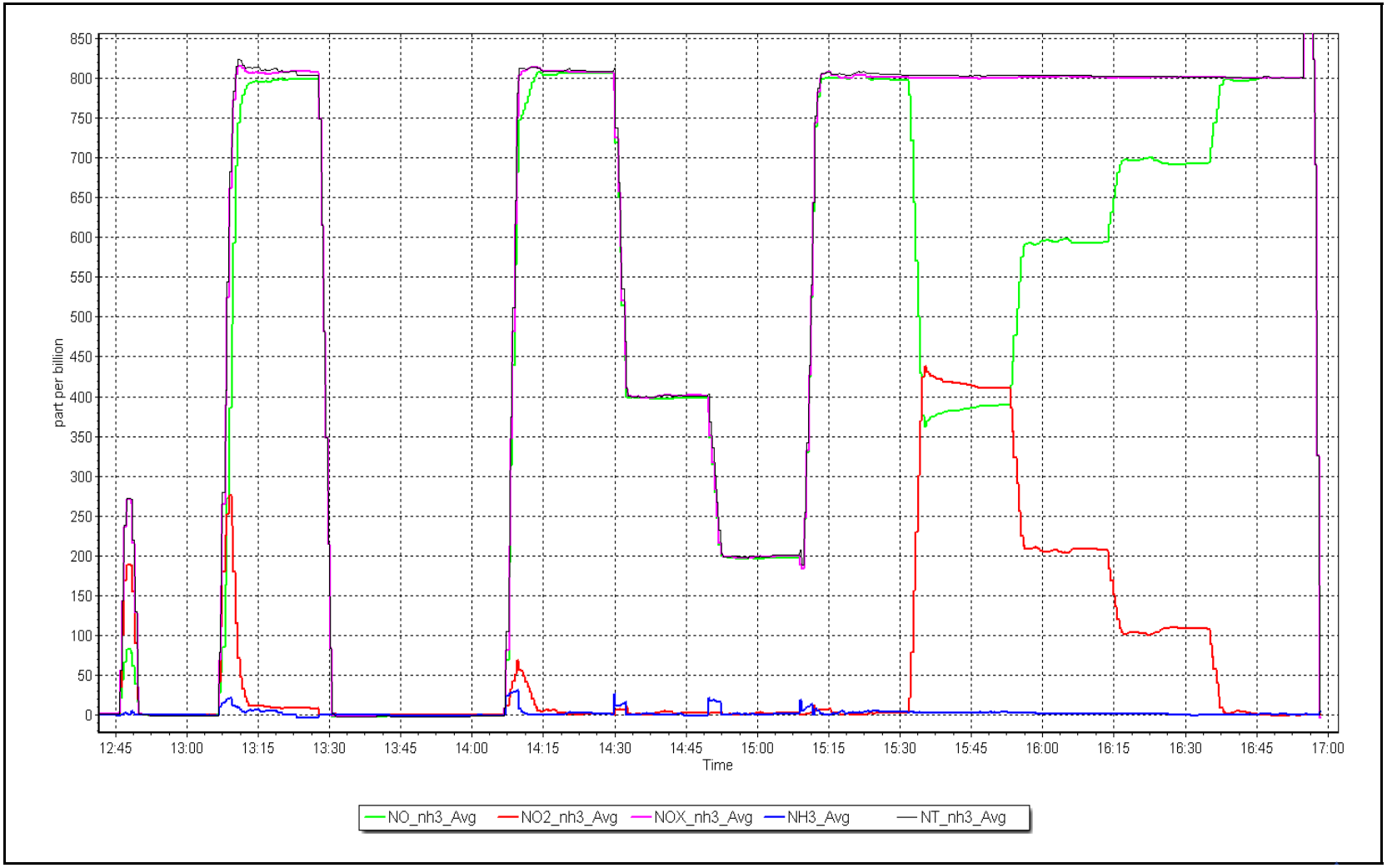
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
412.1	410.8	1.0032
207.9	208.4	0.9976
103.2	102.8	1.0039

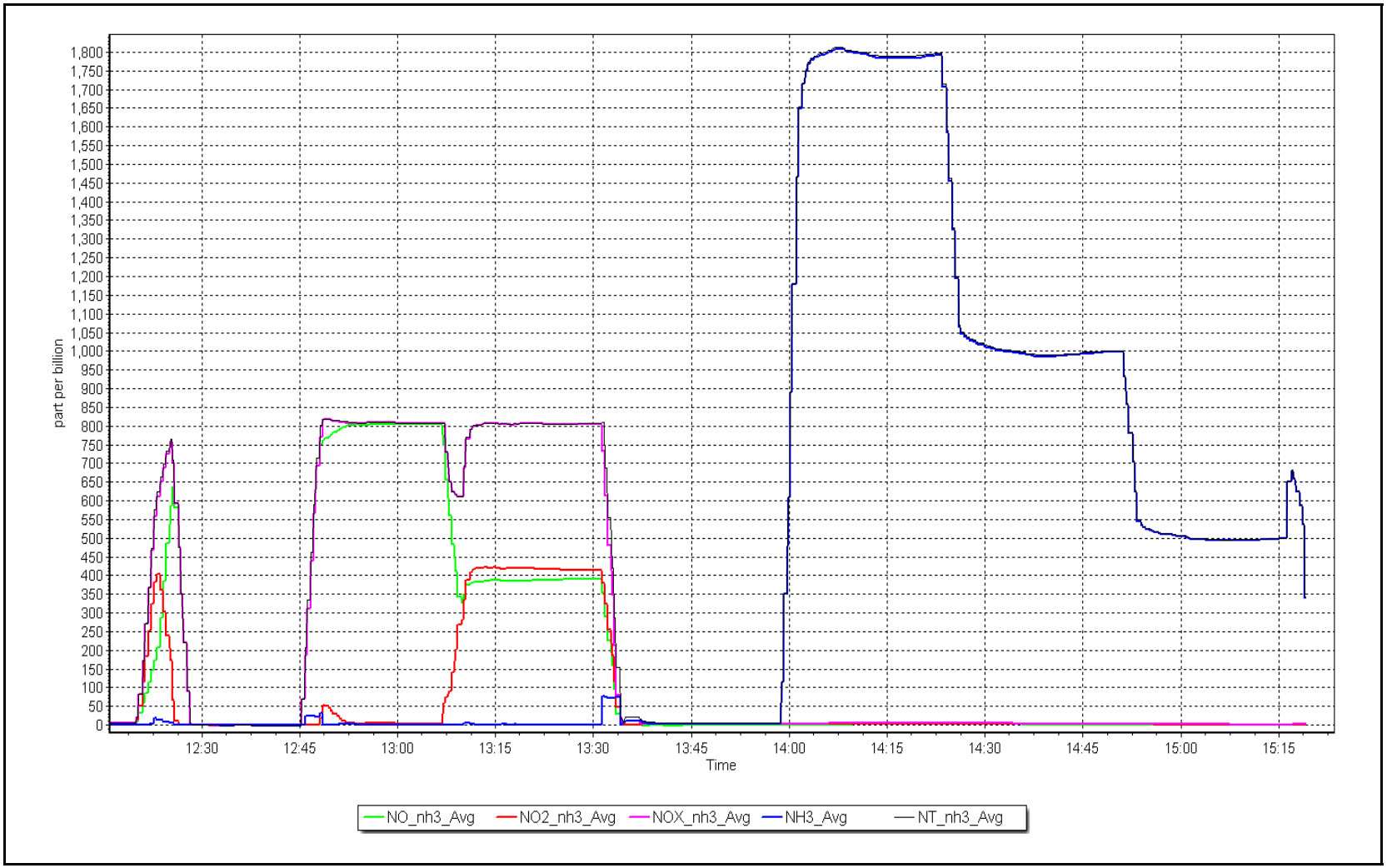
Statistical Evaluation		*Limits*
Correlation Coefficient	0.999988	*≥0.995*
Slope	0.997626	*0.90 - 1.10*
Intercept	0.076246	*+/-20*



NO_X Calibration Plot Date: January 15, 2025 Location: Bertha Ganter-Fort McKay



NH_3 Calibration Plot Date: January 16, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
NOX Cal Date:	January 23, 2025	Last Cal Date:	
Start time (MST):	12:00	End time (MST):	16:15
NH3 Cal Date:	January 23, 2025	Last Cal Date:	
Start time (MST):	16:15	End time (MST):	18:00
Reason:	Install		

Calibration Standards

NOX Cal Gas Conc:	59.40	ppm	NO Gas Cylinder #:	CC335700
NO Cal Gas Conc:	59.20	ppm	NO Cal Gas Expiry:	September 1, 2032
Removed NOX Conc:	59.40	ppm	Removed Cylinder #:	NA
Removed NO Conc:	59.20	ppm	Removed cyl Expiry:	NA
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.58	ppm	NH3 Gas Cylinder #:	CC743587
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.58	ppm	Removed Cylinder #:	NA
NH3 gas Diff:			Removed cyl Expiry:	NA
Calibrator Model:		API T700	Serial Number:	3565
ZAG make/model:		API T701	Serial Number:	4766

Analyzer Information

Analyzer model:	API T201	Analyzer serial #:	808
Converter model:	API T501	Converter serial #:	484
NH3 Range (ppb):	0 - 2000 ppb	Reaction cell Press:	4.40
NOX Range (ppb):	0 - 1000 ppb	Sample Flow:	396

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	N/A	0.982	Nt coefficient:	N/A	0.987
NOX coefficient:	N/A	0.983	NO bkgrnd:	N/A	-1.8
NO2 coefficient:	N/A	1.000	NOX bkgrnd:	N/A	-1.7
NH3 coefficient:	N/A	0.987	Nt bkgrnd:	N/A	-0.6

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	N/A	0.992896
NO_X Cal Offset:	N/A	-4.680000
NO Cal Slope:	N/A	0.996907
NO Cal Offset:	N/A	-5.060000
NO_2 Cal Slope:	N/A	1.002841
NO_2 Cal Offset:	N/A	-0.401758
NH3 Cal Slope:	N/A	0.992427
NH3 Cal Offset:	N/A	11.594347
Nt Cal Slope:	N/A	1.002962
Nt Cal Offset:	N/A	5.454628

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero										
As found span										
AF GPT span										
new NO cyl rp										

Baseline Corr As Fd Nt = NA ppb NO_X = NA ppb NO = NA ppb

Previous Response Nt = NA ppb NO_X = NA ppb NO = NA ppb

**NO_X Δ (NO to GPT response) =

* *= > +/-2% difference initiates investigation

*Percent Change $Nt_{(NO)}$ = NA

*Percent Change NO_X = NA

*Percent Change NO = NA

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.8	0.7	0.5	----	----
High point	4932	67.6	803.1	800.4	803.1	797.0	797.2	799.2	1.0076	1.0040
Mid point	4966	33.8	401.5	400.2	401.5	386.6	386.6	391.1	1.0387	1.0352
Low point	4983	16.9	200.8	200.1	200.8	192.3	191.6	194.7	1.0441	1.0443
								Average Correction Factor	1.0301	1.0278

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Calibration zero	----	----	0.0	0.1	----	----
High GPT point (400 ppb O3)	777.2	379.6	400.3	401.2	0.9978	100.2%
Mid GPT point (200 ppb O3)	777.2	579.1	200.8	201.0	0.9990	100.1%
Low GPT point (100 ppb O3)	777.2	678.8	101.1	100.3	1.0080	99.2%
				Average Correction Factor	1.0016	99.8%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero						0.5	0.8	-0.3		
AF High point										
AF Mid point										
AF Low point										
new NH3 cyl rp										

Baseline Corr As Fd Nt = NA ppb NH3 = NA ppb *Percent Change $Nt_{(NH3)}$ = NA

Previous Response Nt = NA ppb NH3 = NA ppb * = > +/-5% change initiates investigation *Percent Change NH3 = NA

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.5	0.8	-0.3	----	----
High point	2929	70.5	1799.9	----	1799.9	1799.8	----	1789.8	1.000	1.006
Mid point	2960	39.2	1000.9	----	1000.9	1032.7	----	1025.9	0.969	0.976
Low point	3477	22.8	498.9	----	498.9	498.3	----	493.8	1.001	1.010
								Average Correction Factor	0.9901	0.9972

NH3 Previous Converter Efficiency = 90.8 %

NH3 Current Converter Efficiency = 90.8 %

Notes: NOx: Zero and span adjusted. Second GPT ref point used. NH3: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

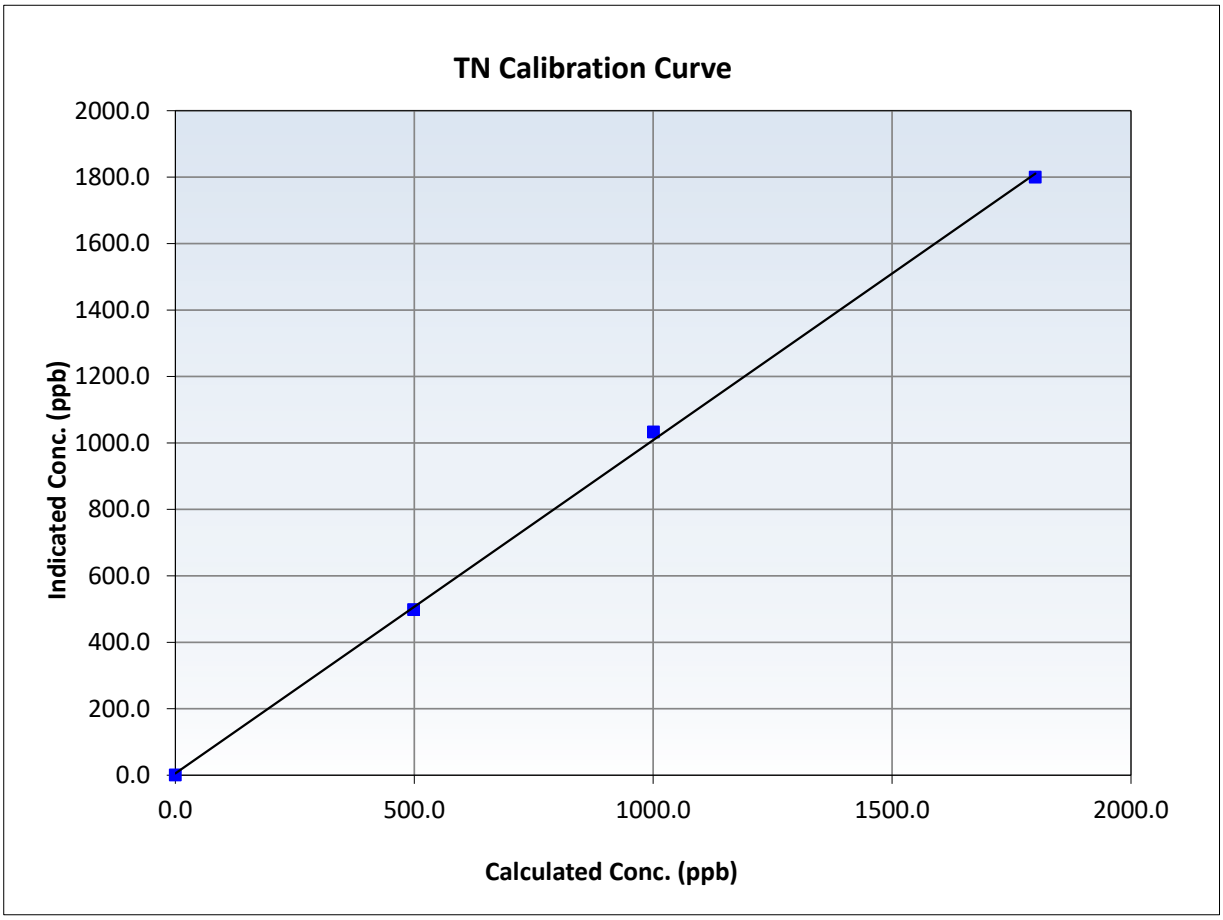
Nt Calibration Summary

Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:00	End Time (MST):	16:15
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.5	----	Correlation Coefficient	0.999581	*≥0.995*
1799.9	1799.8	1.0001	Slope	1.002962	*0.90 - 1.10*
1000.9	1032.7	0.9692	Intercept	5.454628	*+/-20*
498.9	498.3	1.0011			



Wood Buffalo Environmental Association

NO_X Calibration Summary

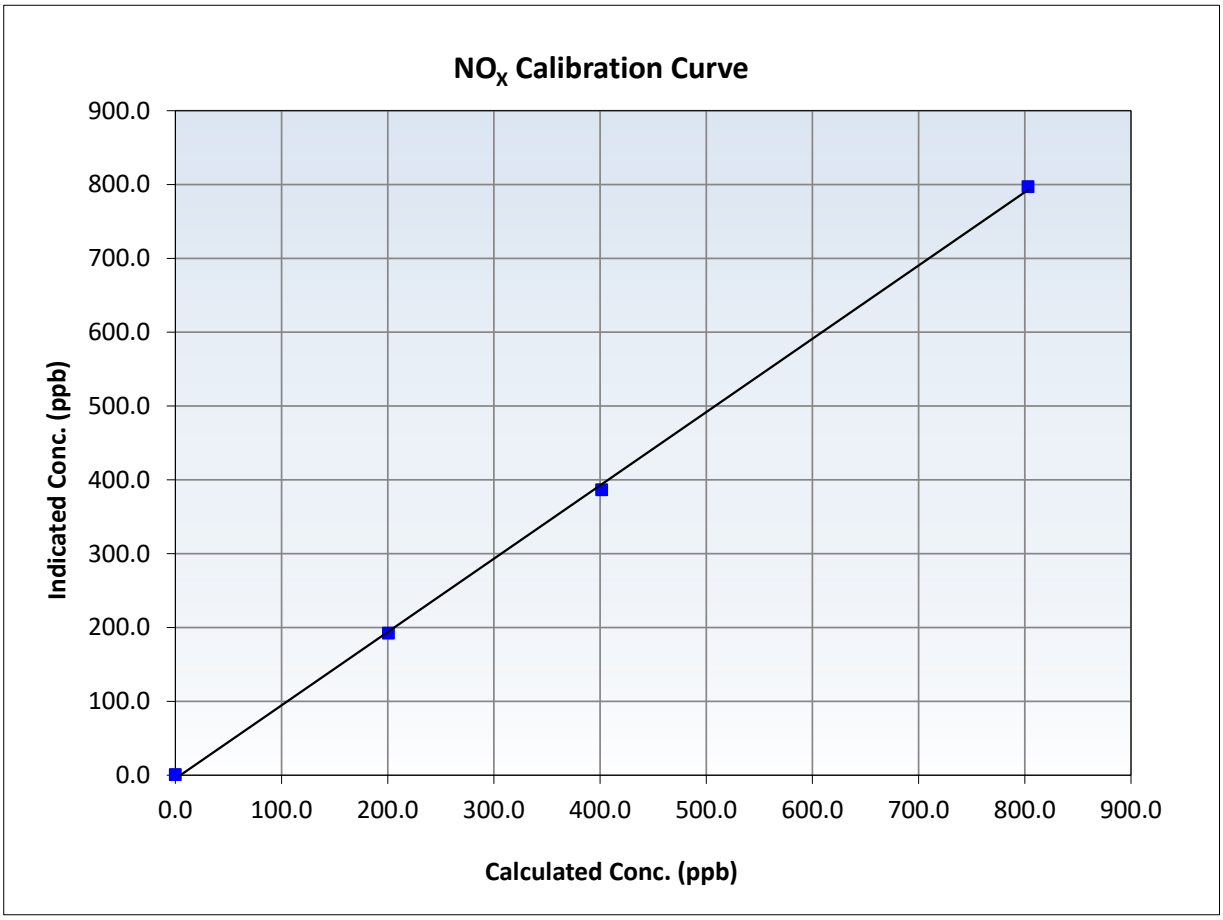
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:00	End Time (MST):	16:15
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.8	----
803.1	797.0	1.0076
401.5	386.6	1.0387
200.8	192.3	1.0441

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999687	*≥0.995*
Slope	0.992896	*0.90 - 1.10*
Intercept	-4.680000	*+/-20*



Wood Buffalo Environmental Association

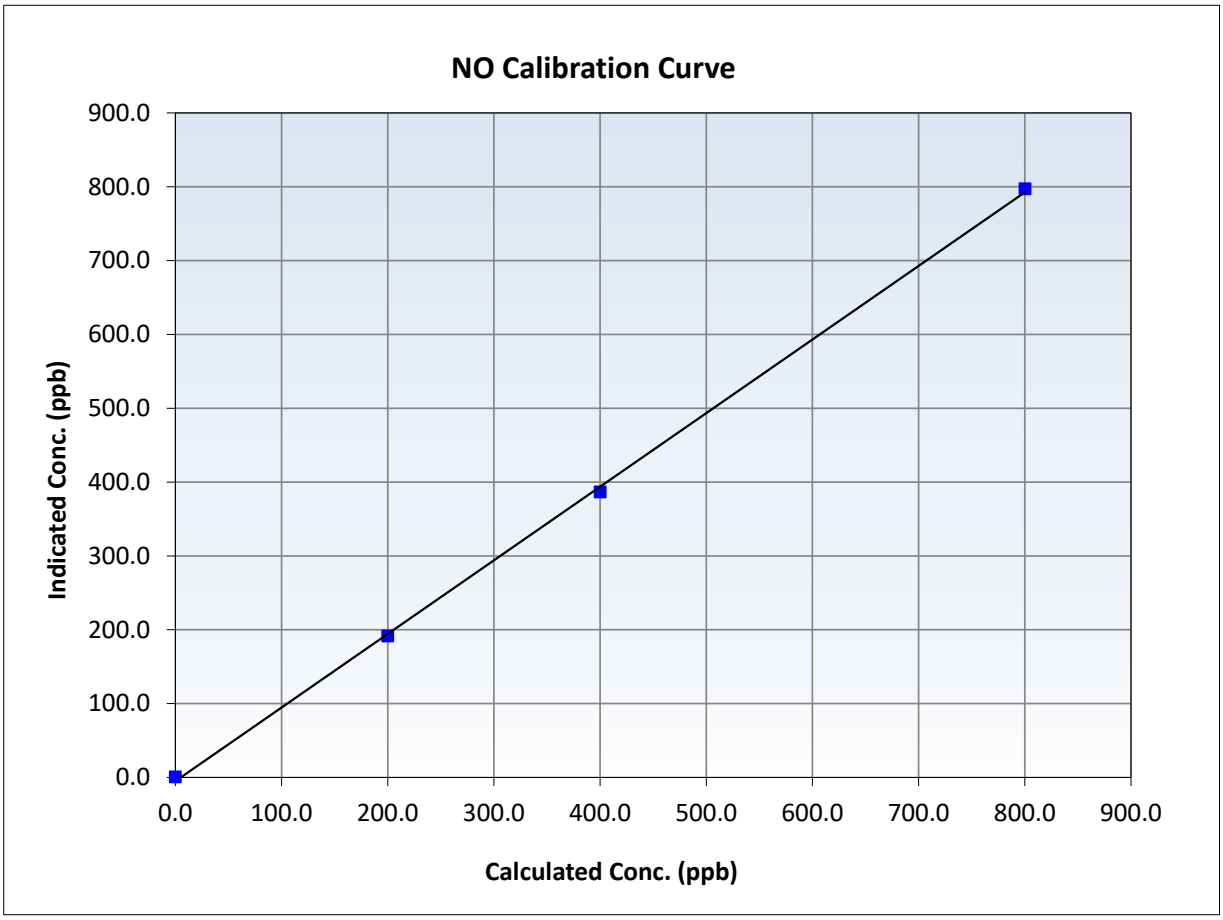
NO Calibration Summary

Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:00	End Time (MST):	16:15
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.7	----	Correlation Coefficient	0.999675	*≥0.995*
800.4	797.2	1.0040	Slope	0.996907	*0.90 - 1.10*
400.2	386.6	1.0352			
200.1	191.6	1.0443	Intercept	-5.060000	*+/-20*



Wood Buffalo Environmental Association

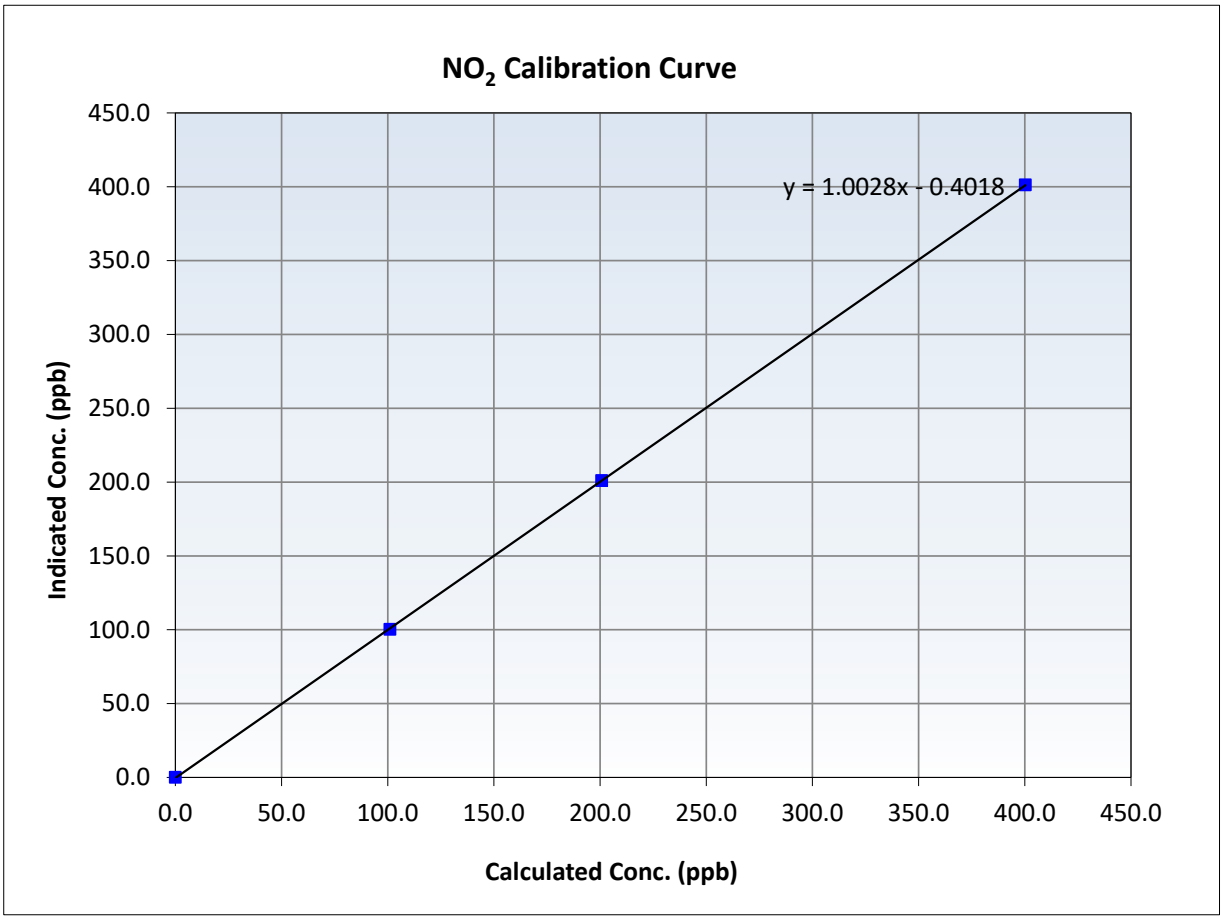
NO_2 Calibration Summary

Station Information

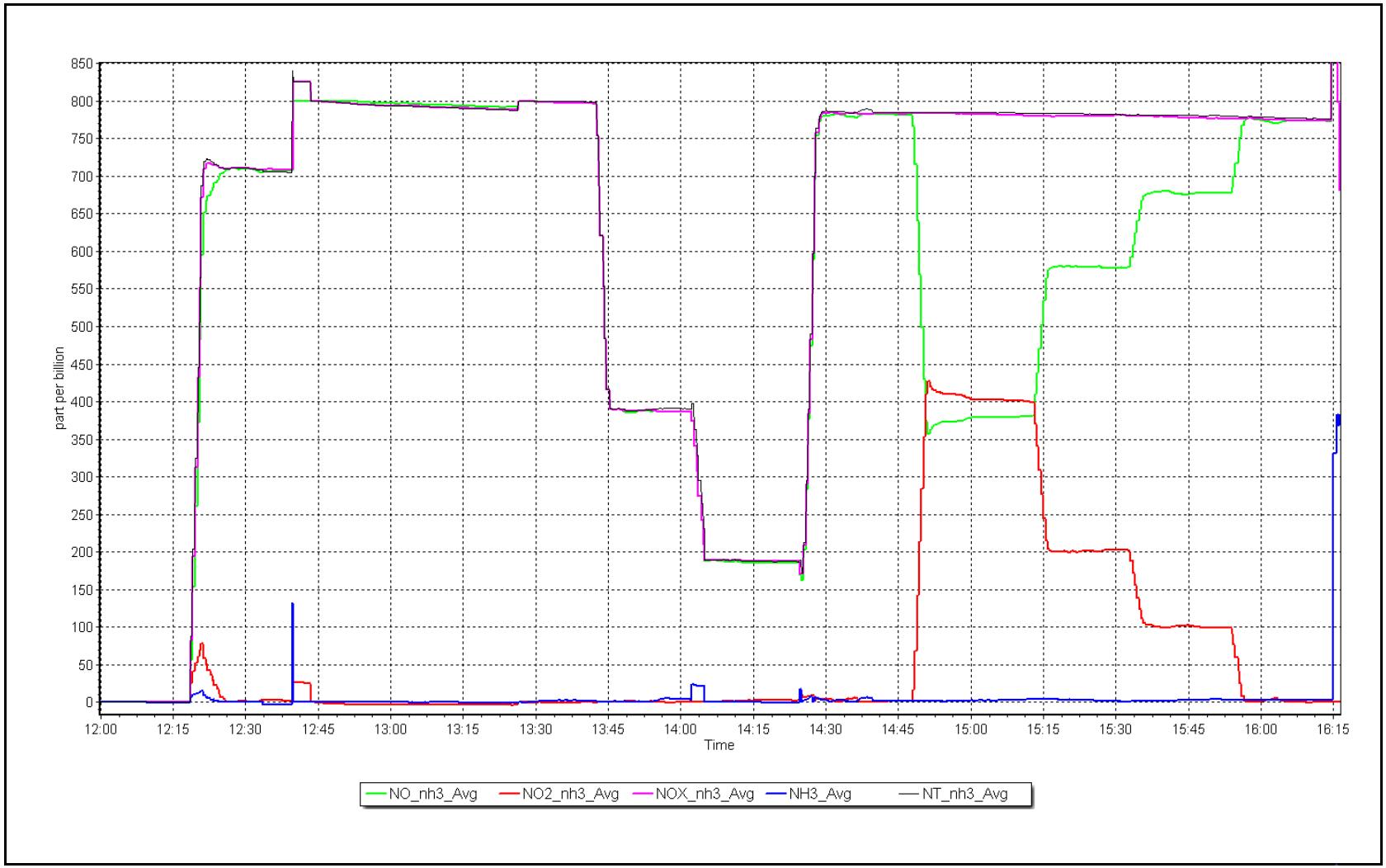
Calibration Date:	January 23, 2025	Previous Calibration:	
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	12:00	End Time (MST):	16:15
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

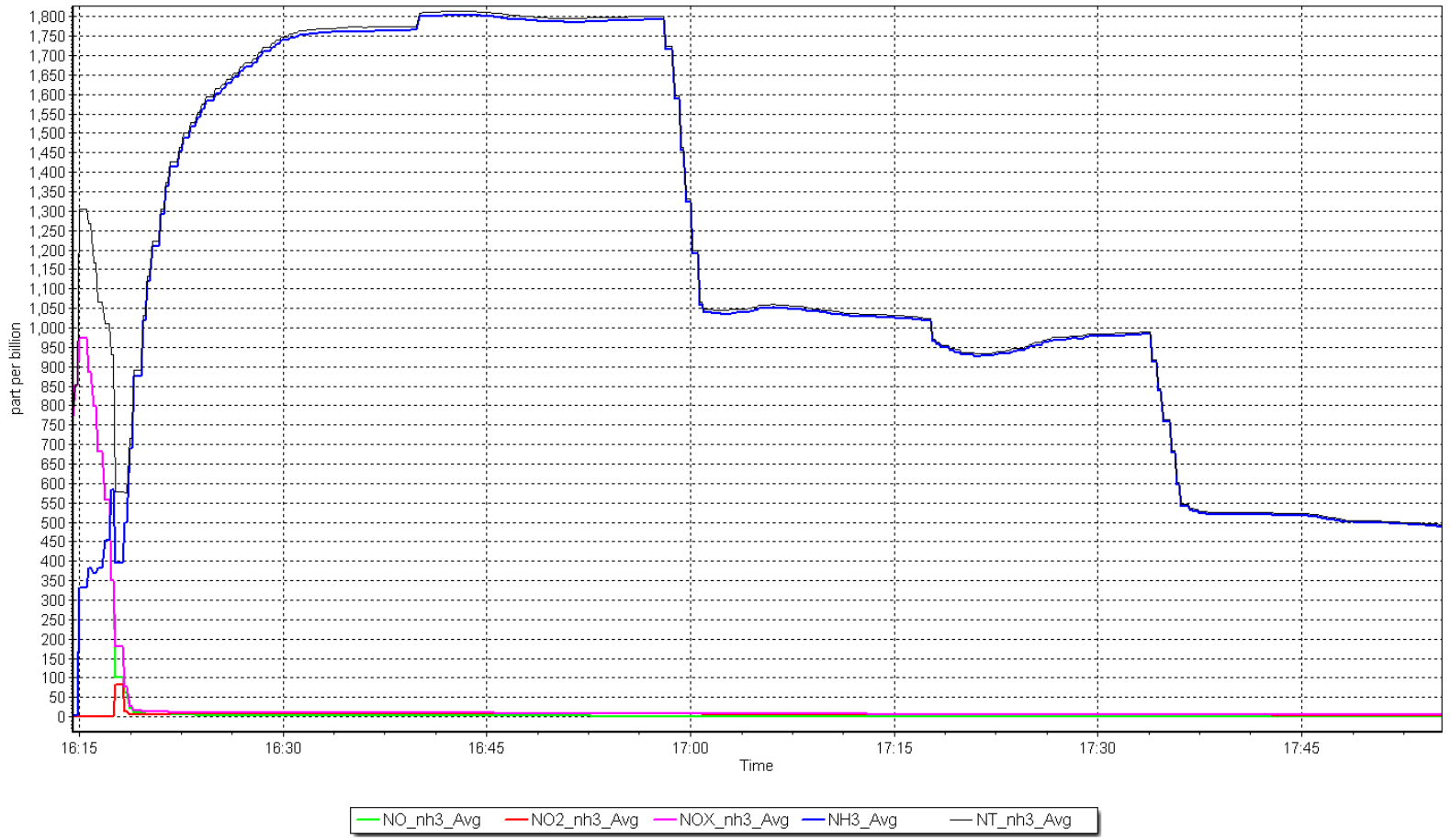
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999991	*≥0.995*
400.3	401.2	0.9978	Slope	1.002841	*0.90 - 1.10*
200.8	201.0	0.9990			
101.1	100.3	1.0080	Intercept	-0.401758	*+/-20*



NO_X Calibration Plot Date: January 23, 2025 Location: Bertha Ganter-Fort McKay



NH_3 Calibration Plot Date: January 23, 2025 Location: Bertha Ganter-Fort McKay



Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
NOX Cal Date:	January 28, 2025	Last Cal Date:	January 23, 2025
Start time (MST):	11:28	End time (MST):	15:40
NH3 Cal Date:	January 29, 2025	Last Cal Date:	January 23, 2025
Start time (MST):	12:10	End time (MST):	16:02
Reason:	Maintenance		

Calibration Standards

NOX Cal Gas Conc:	59.40	ppm	NO Gas Cylinder #:	CC335700
NO Cal Gas Conc:	59.20	ppm	NO Cal Gas Expiry:	September 1, 2032
Removed NOX Conc:	59.40	ppm	Removed Cylinder #:	NA
Removed NO Conc:	59.20	ppm	Removed cyl Expiry:	NA
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.58	ppm	NH3 Gas Cylinder #:	CC743587
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.58	ppm	Removed Cylinder #:	NA
NH3 gas Diff:			Removed cyl Expiry:	NA
Calibrator Model:	API T700		Serial Number:	3565
ZAG make/model:	API T701		Serial Number:	4766

Analyzer Information

Analyzer model:	API T201	Analyzer serial #:	808
Converter model:	API T501	Converter serial #:	484
NH3 Range (ppb):	0 - 2000 ppb	Reaction cell Press:	4.20
NOX Range (ppb):	0 - 1000 ppb	Sample Flow:	394

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	0.982	0.947	Nt coefficient:	0.987	0.956
NOX coefficient:	0.983	0.953	NO bkgrnd:	-1.8	-1.8
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	-1.7	-1.7
NH3 coefficient:	0.987	0.949	Nt bkgrnd:	-0.6	-0.6

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.992896	1.000168
NO_X Cal Offset:	-4.680000	-2.760000
NO Cal Slope:	0.996907	0.998007
NO Cal Offset:	-5.060000	-3.720000
NO_2 Cal Slope:	1.002841	1.006492
NO_2 Cal Offset:	-0.401758	-1.241309
NH3 Cal Slope:	0.992427	1.007076
NH3 Cal Offset:	11.594347	-3.238627
Nt Cal Slope:	1.002962	1.011804
Nt Cal Offset:	5.454628	-1.739162

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero	5000	0.0	0.0	0.0	0.0	0.7	0.6	0.2	----	----
As found span	4932	67.6	803.1	800.4	803.1	836.9	831.0	838.9	0.9596	0.9632
AF GPT span	4932	67.6	803.1	-----	803.1	780.7	-----	784.3	1.0287	-----
new NO cyl rp										

Baseline Corr As Fd Nt = 838.7 ppb NO_X = 836.2 ppb NO = 830.4 ppb

Previous Response Nt = 810.92 ppb NO_X = 792.7 ppb NO = 792.8 ppb

**NO_X Δ (NO to GPT response) = -6.7%

* *= > +/-2% difference initiates investigation

*Percent Change $Nt_{(NO)}$ = 3.3%

*Percent Change NO_X = 5.2%

*Percent Change NO = 4.5%

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.9	0.8	0.8	----	----
High point	4932	67.6	803.1	800.4	803.1	803.0	797.5	802.0	1.0001	1.0036
Mid point	4966	33.8	401.5	400.2	401.5	394.9	392.9	397.7	1.0168	1.0186
Low point	4983	16.9	200.8	200.1	200.8	195.8	191.8	196.1	1.0254	1.0433
								Average Correction Factor	1.0141	1.0218

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Calibration zero	----	----	0.0	0.1	----	----
High GPT point (400 ppb O3)	794.3	385.3	411.7	413.5	0.9957	100.4%
Mid GPT point (200 ppb O3)	794.3	586.4	210.6	211.1	0.9977	100.2%
Low GPT point (100 ppb O3)	794.3	687.2	109.8	107.2	1.0243	97.6%
				Average Correction Factor	1.0059	99.4%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero	5000	0.0	0.0	0.0	0.0	0.7	0.9	-0.1	----	----
AF High point	2929	70.5	1799.9	----	1799.9	1818.4	----	1808.8	0.990	0.995
AF Mid point							----			
AF Low point							----			
new NH3 cyl rp										

Baseline Corr As Fd Nt = 1817.7 ppb NH3 = 1808.9 ppb *Percent Change $Nt_{(NH3)}$ = 0.4%

Previous Response Nt = 1810.7 ppb NH3 = 1797.9 ppb * = > +/-5% change initiates investigation *Percent Change NH3 = 0.6%

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.8	0.9	0.0	----	----
High point	2929	70.5	1799.9	----	1799.9	1818.4	----	1808.8	0.990	0.995
Mid point	2960	39.2	1000.9	----	1000.9	1016.2	----	1009.6	0.985	0.991
Low point	3477	22.8	498.9	----	498.9	496.3	----	491.7	1.005	1.015
								Average Correction Factor	0.9933	1.0004

NH3 Previous Converter Efficiency = 90.8 %

NH3 Current Converter Efficiency = 90.8 %

Notes: Adjusted the NOx/NT/NH3 spans.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

Nt Calibration Summary

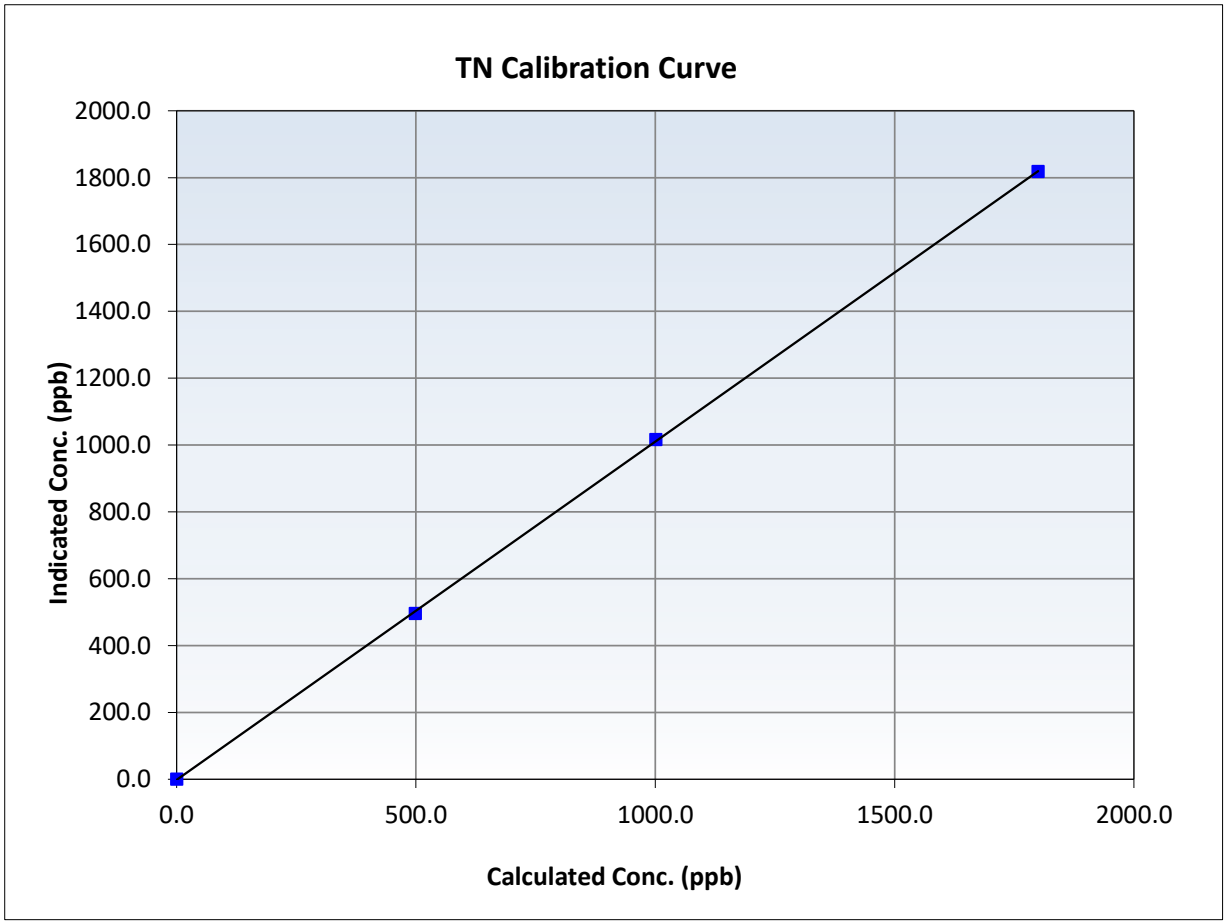
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	January 23, 2025
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:28	End Time (MST):	15:40
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.8	----
1799.9	1818.4	0.9898
1000.9	1016.2	0.9850
498.9	496.3	1.0052

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999956	*≥0.995*
Slope	1.011804	*0.90 - 1.10*
Intercept	-1.739162	*+/-20*



Wood Buffalo Environmental Association

NH_3 Calibration Summary

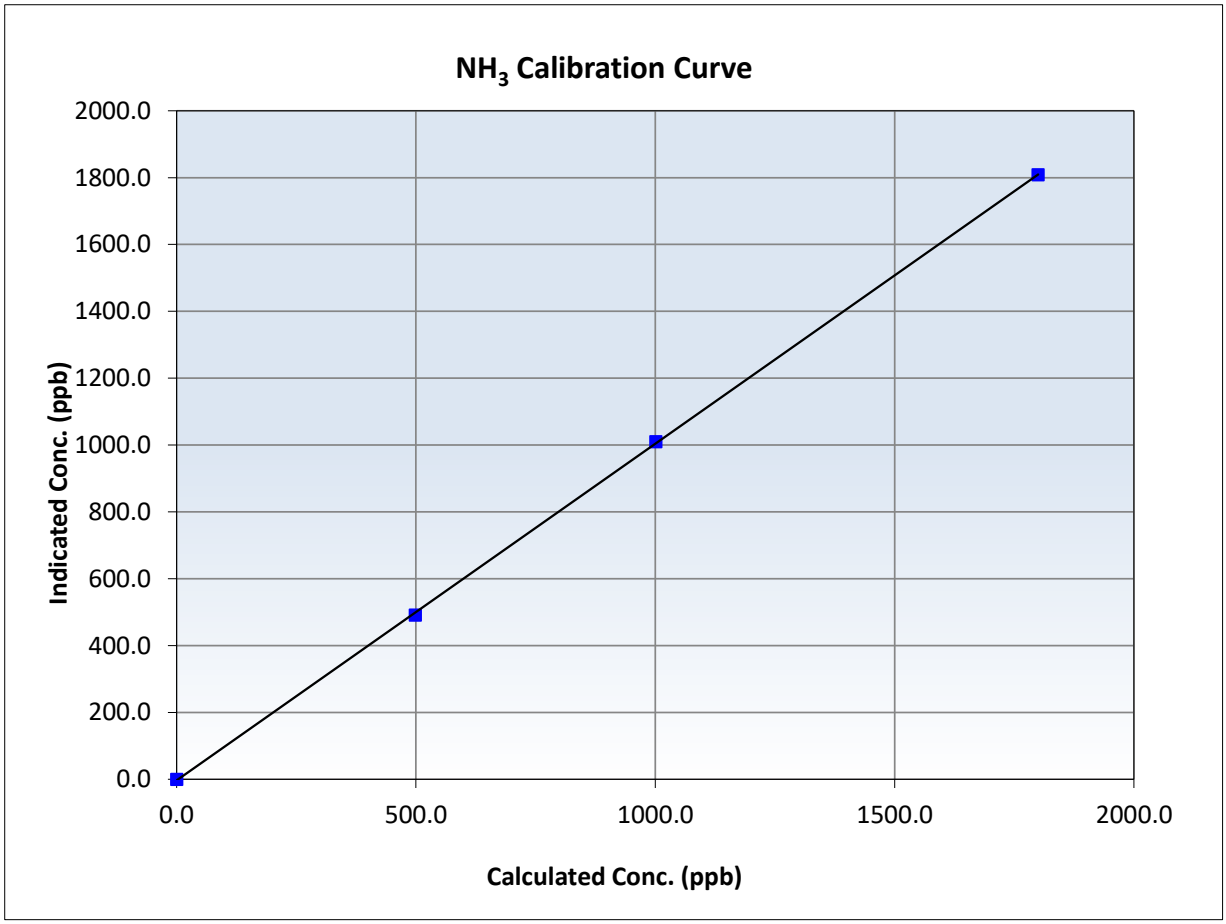
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	January 23, 2025
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:28	End Time (MST):	15:40
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
1799.9	1808.8	0.9951
1000.9	1009.6	0.9914
498.9	491.7	1.0146

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999950	*≥0.995*
Slope	1.007076	*0.90 - 1.10*
Intercept	-3.238627	*+/-20*



Wood Buffalo Environmental Association

NO_X Calibration Summary

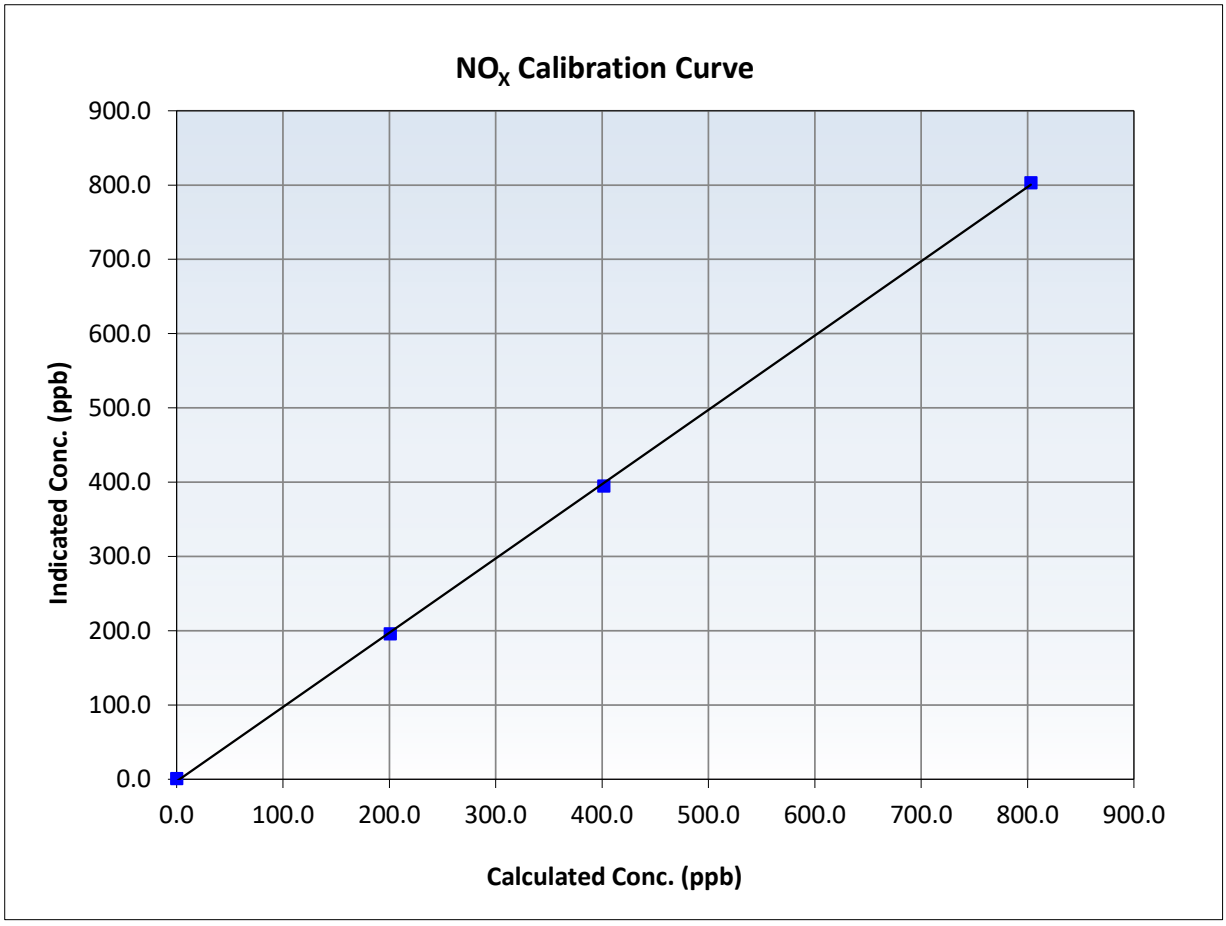
Station Information

Calibration Date:	January 28, 2025	Previous Calibration:	January 23, 2025
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:28	End Time (MST):	15:40
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.9	----
803.1	803.0	1.0001
401.5	394.9	1.0168
200.8	195.8	1.0254

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999885	*≥0.995*
Slope	1.000168	*0.90 - 1.10*
Intercept	-2.760000	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

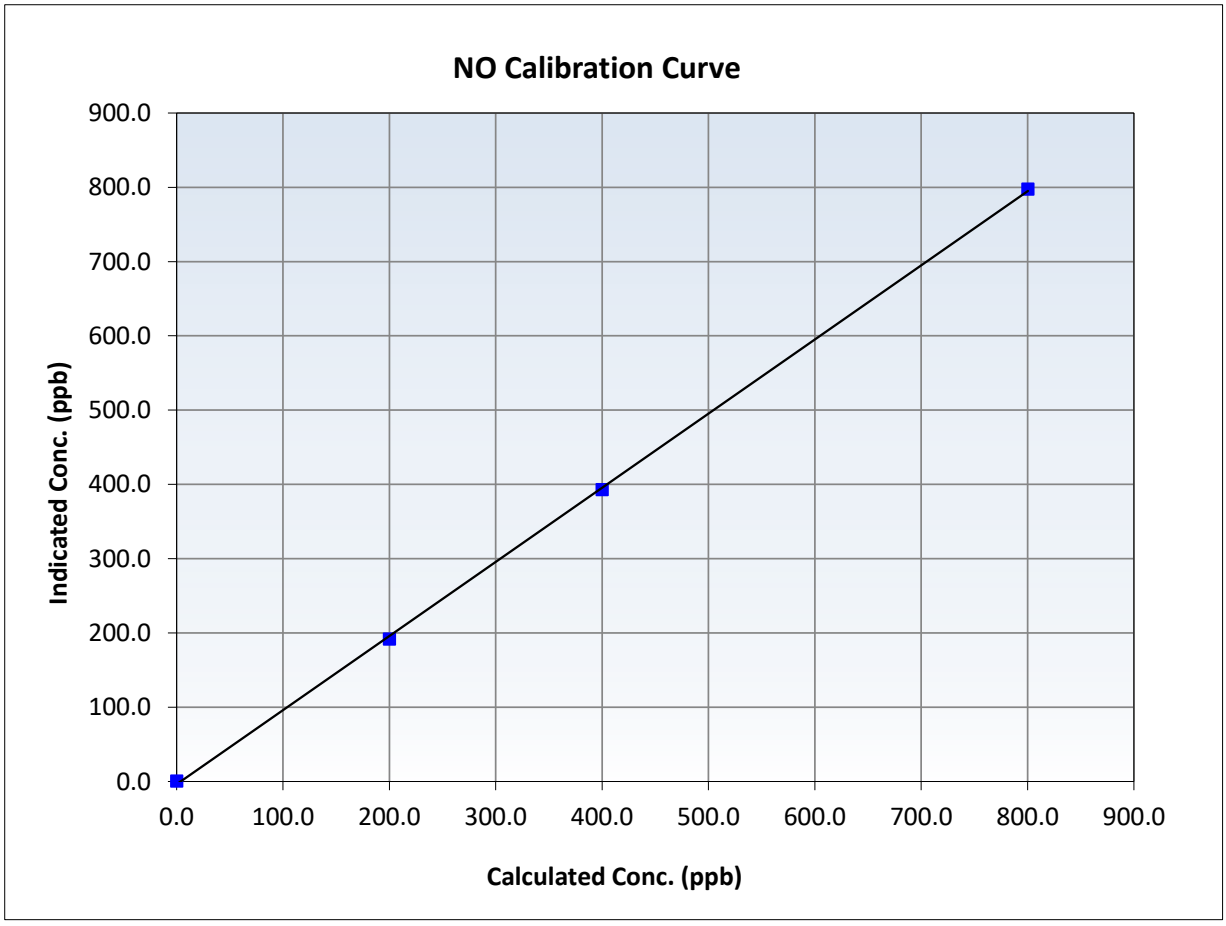
Station Information

Calibration Date:	January 28, 2025	Previous Calibration:	January 23, 2025
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:28	End Time (MST):	15:40
Analyzer make:	API T201	Analyzer serial #:	808

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.8	----
800.4	797.5	1.0036
400.2	392.9	1.0186
200.1	191.8	1.0433

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999852	*≥0.995*
Slope	0.998007	*0.90 - 1.10*
Intercept	-3.720000	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

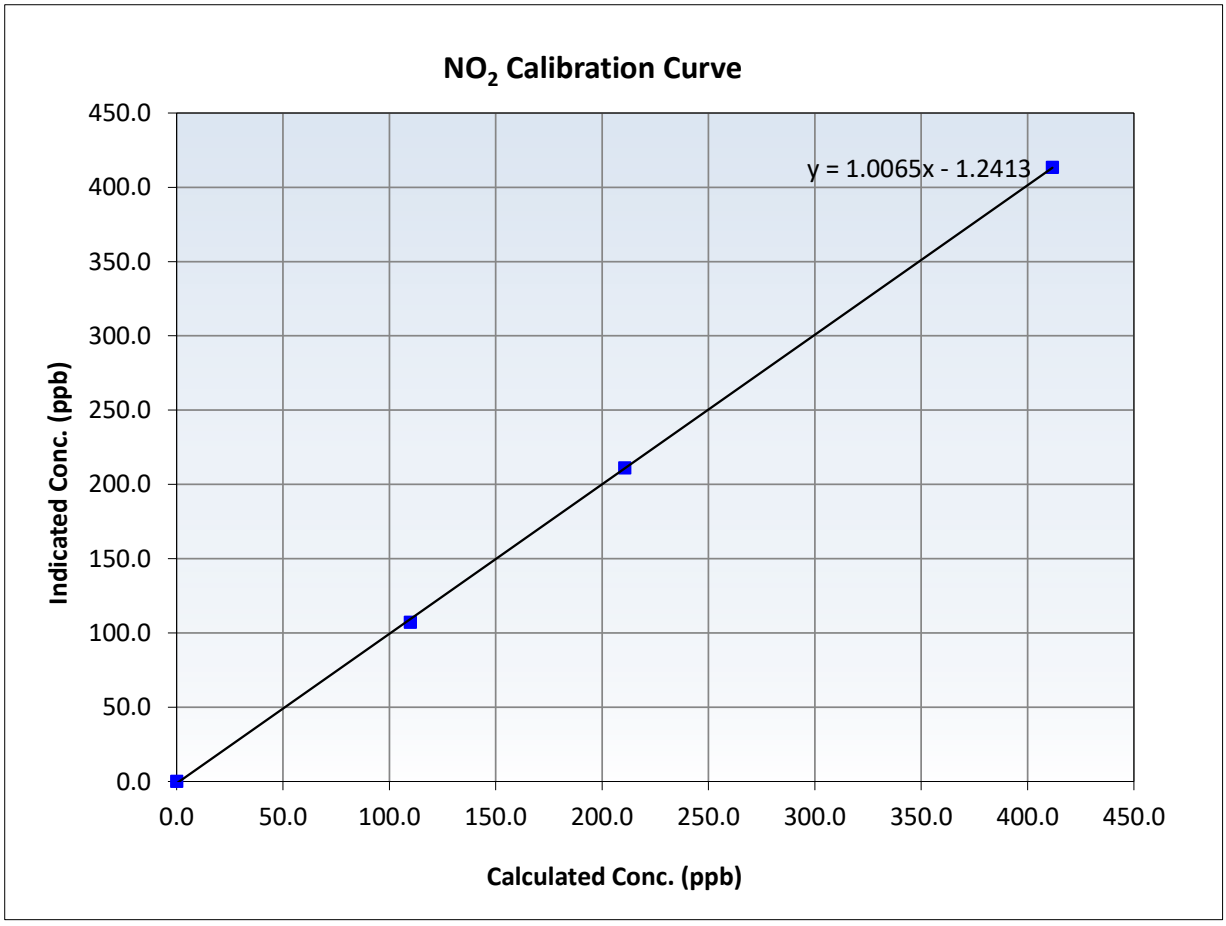
Station Information

Calibration Date:	January 28, 2025	Previous Calibration:	January 23, 2025
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	11:28	End Time (MST):	15:40
Analyzer make:	API T201	Analyzer serial #:	808

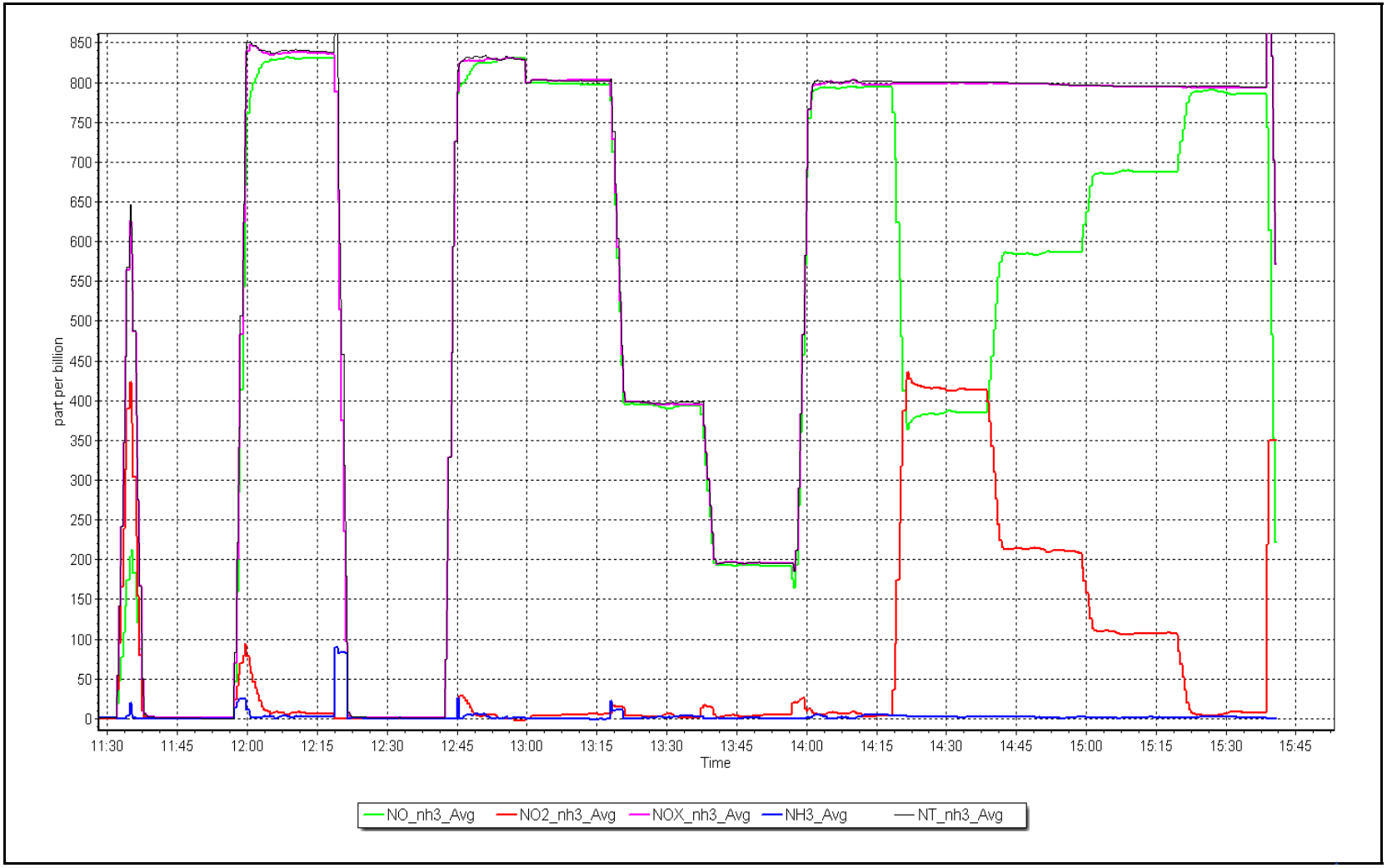
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
411.7	413.5	0.9957
210.6	211.1	0.9977
109.8	107.2	1.0243

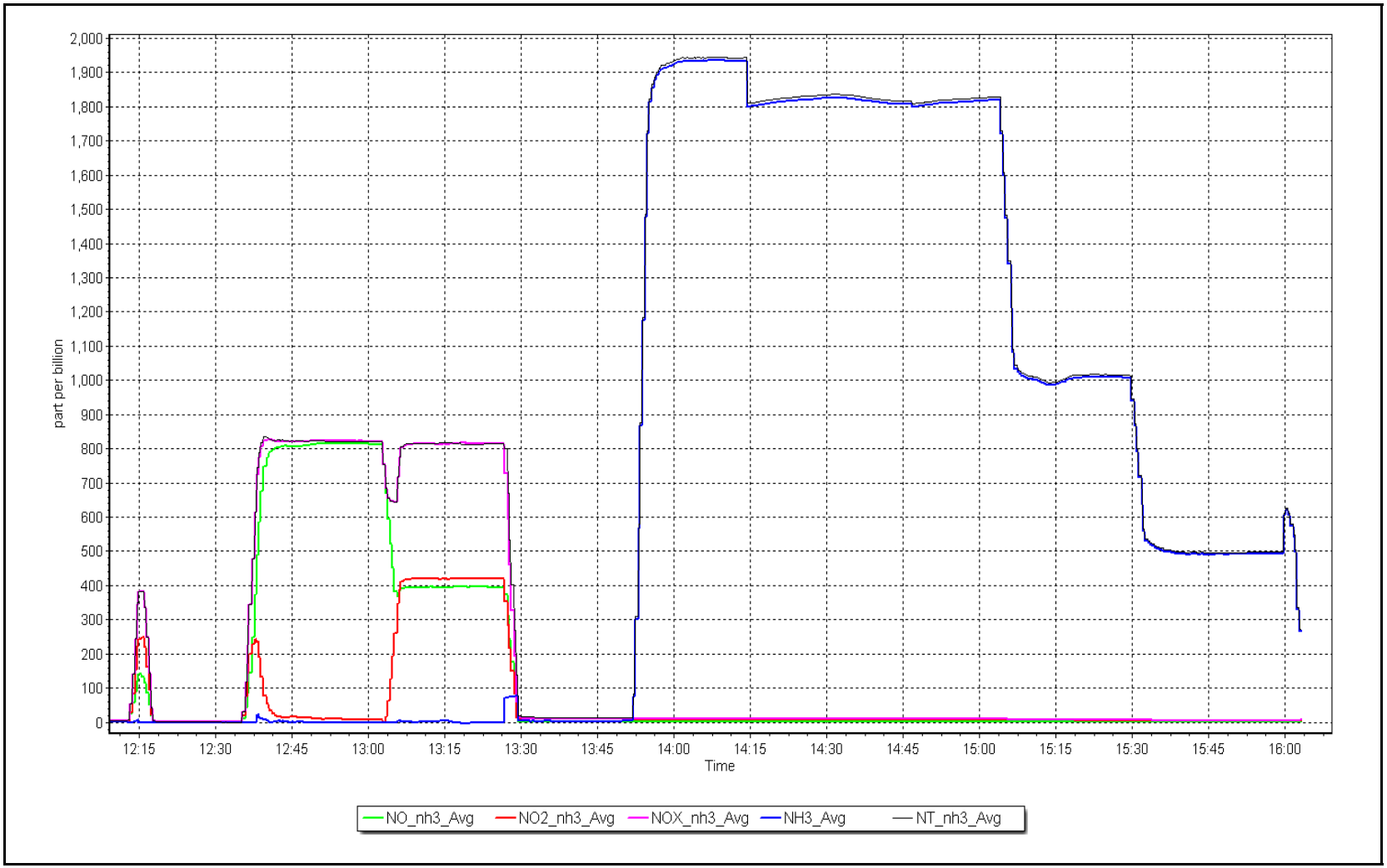
Statistical Evaluation		*Limits*
Correlation Coefficient	0.999932	*≥0.995*
Slope	1.006492	*0.90 - 1.10*
Intercept	-1.241309	*+/-20*



NO_X Calibration Plot Date: January 28, 2025 Location: Bertha Ganter-Fort McKay



NH_3 Calibration Plot Date: January 29, 2025 Location: Bertha Ganter-Fort McKay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS02
MILDRED LAKE
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 3, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	10:35	End time (MST):	14:25
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 Model:	Teledyne API T700		Serial Number:	1185
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1404901075	
Analyzer Range:	0-1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994713	0.994856	Backgd or Offset:	18.9	18.5
Calibration intercept:	-0.546122	-0.846203	Coeff or Slope:	0.781	0.775

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.2	801.6	807.0	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	807.1	Previous response	796.9	*% change	1.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	80.2	801.6	797.3	1.005
Mid point	4960	40.1	400.8	397.0	1.010
Low point	4980	20.0	199.9	197.4	1.013
As left zero	5000	0.0	0.0	-0.2	----
As left span	4920	80.2	801.6	798.6	1.004
				Average Correction Factor:	1.009

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

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

SO_2 Calibration Summary

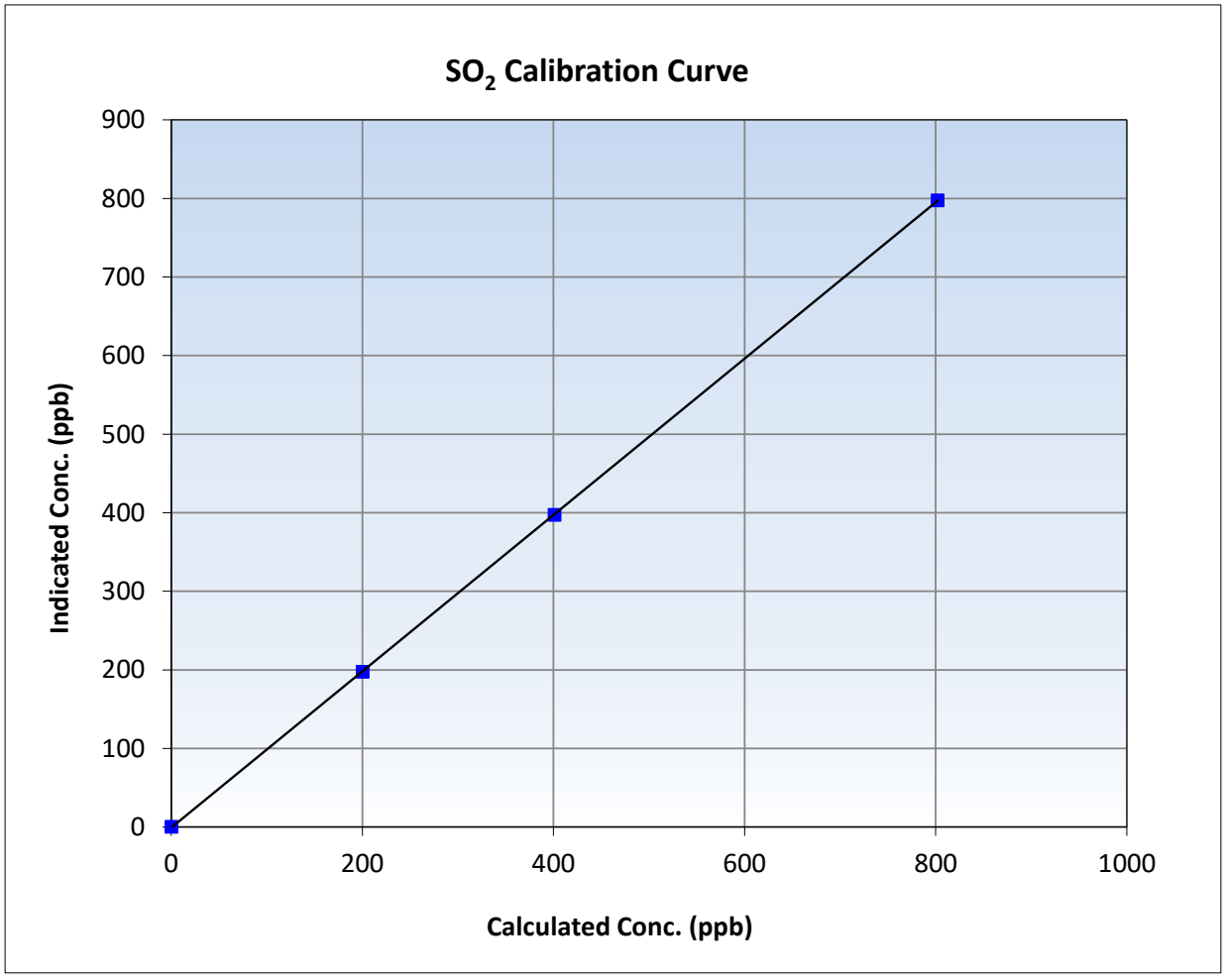
Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 20, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:35	End Time (MST):	14:25
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1404901075

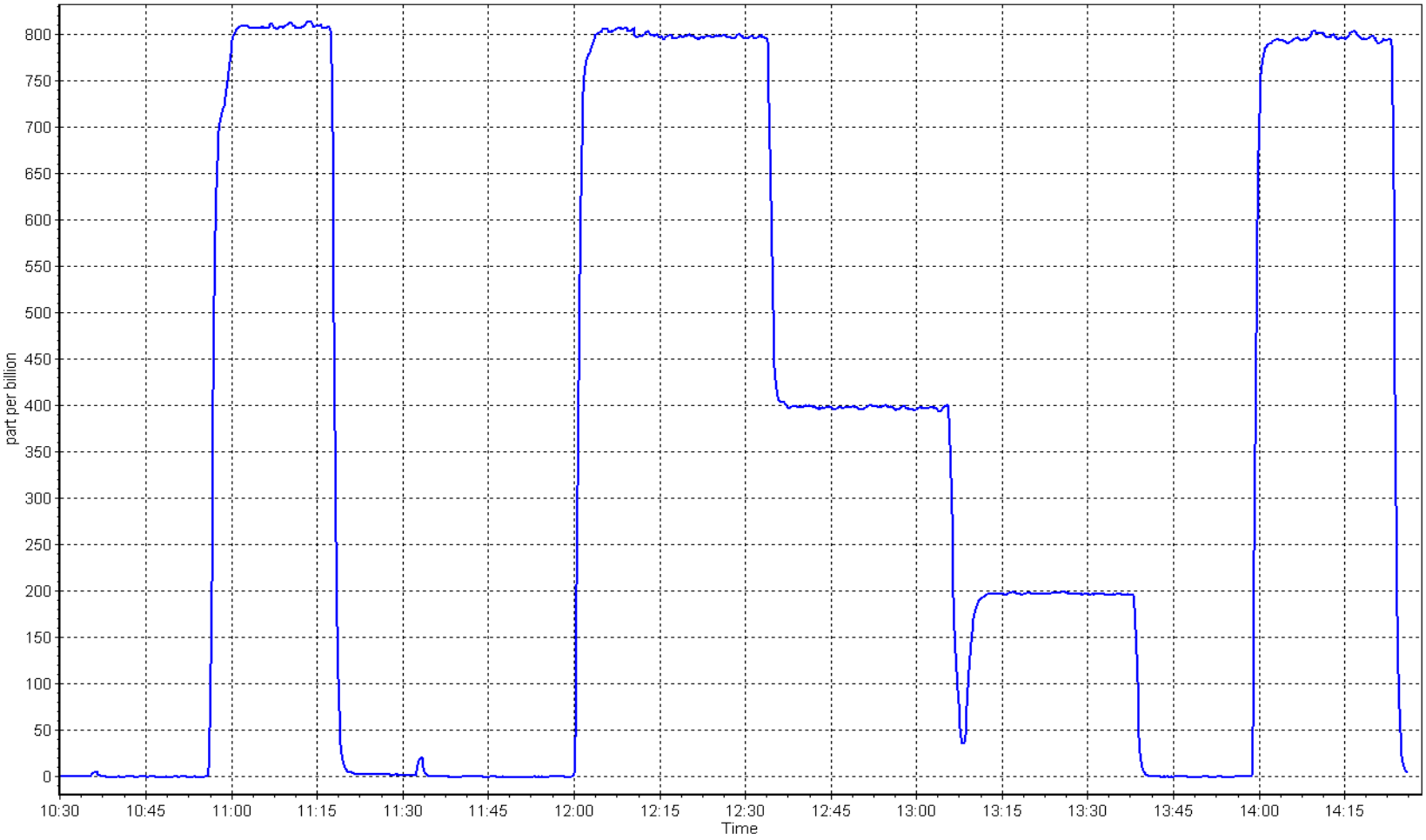
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
801.6	797.3	1.0055
400.8	397.0	1.0097
199.9	197.4	1.0128

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999993	*≥0.995*
Slope	0.994856	*0.90 - 1.10*
Intercept	-0.846203	*+/-30*



SO2 Calibration Plot Date: January 3, 2025 Location: Mildred Lake



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 17, 2025	Last Cal Date:	December 18, 2024
Start time (MST):	11:08	End time (MST):	14:42
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:	Teledyne API T700		Serial Number:	1185
ZAG Make/Model:	Teledyne API T701		Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12333331546	
Converter make:	Global G150		Converter serial #:	2023-267	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.991106	1.016395	Backgd or Offset:	1.46	1.46
Calibration intercept:	-0.059207	-0.019188	Coeff or Slope:	1.007	1.007

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4924	75.6	80.0	81.0	0.988
As found Mid point	4962	37.8	40.0	40.7	0.983
As found Low point	4981	18.9	20.0	20.1	0.995
New cylinder response					

Baseline Corr As found:	81.0	Prev response:	79.22	*% change:	2.2%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.013537	AF Intercept:	-0.019188
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999984	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4924	75.6	80.0	81.3	0.984
Mid point	4962	37.8	40.0	40.7	0.983
Low point	4981	18.9	20.0	20.1	0.995
As left zero	5000	0.0	0.0	0.1	----
As left span	4924	75.6	80.0	81.8	0.978
SO2 Scrubber Check	4920	80.2	802.0	0.0	----

Date of last scrubber change:	July 16, 2024	Ave Corr Factor	0.987
Date of last converter efficiency test:	NA		

Notes: Changed sample inlet filter after as founds. SO2 scrubber test done after calibrator zero. No adjustments made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

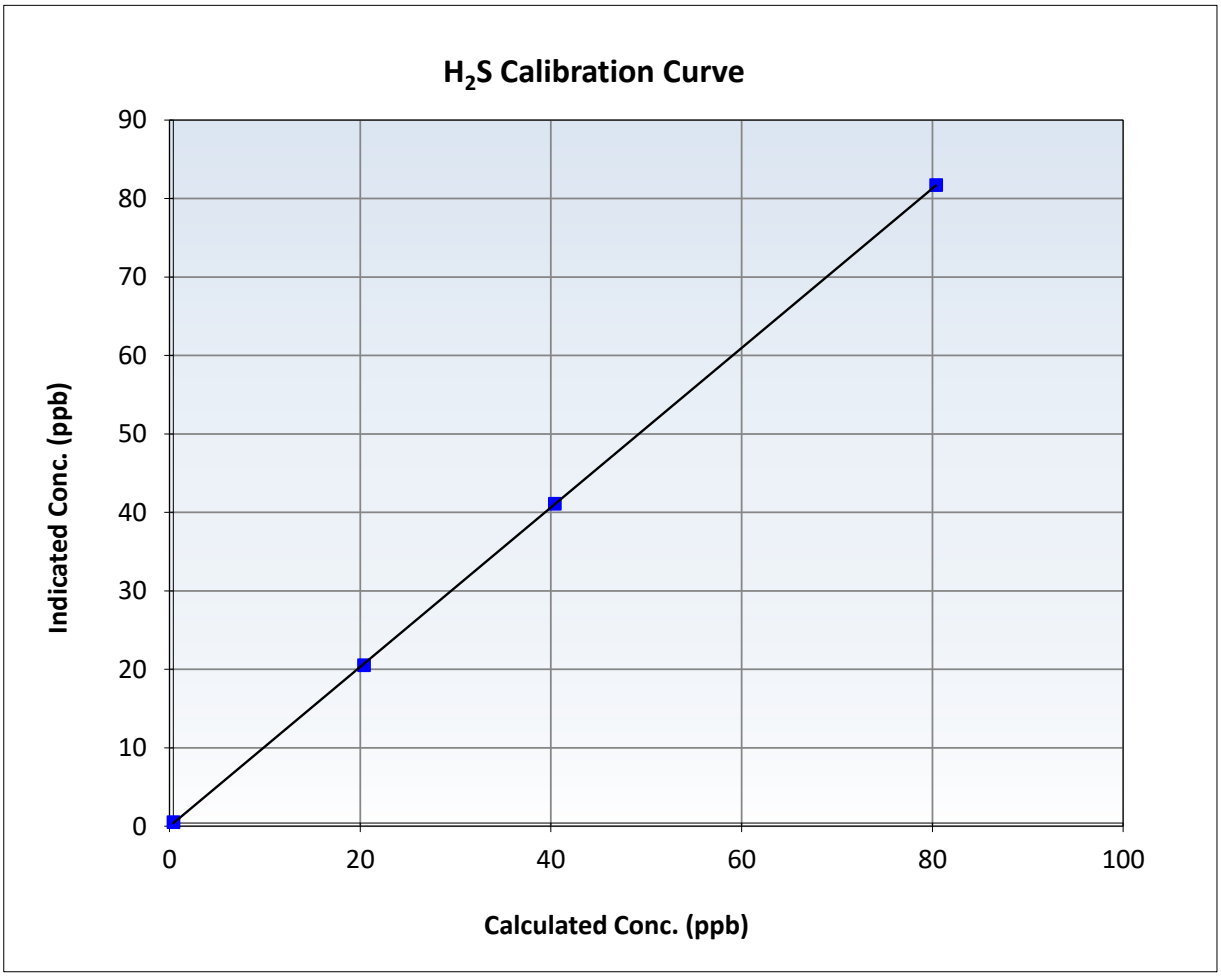
H2S Calibration Summary

Station Information

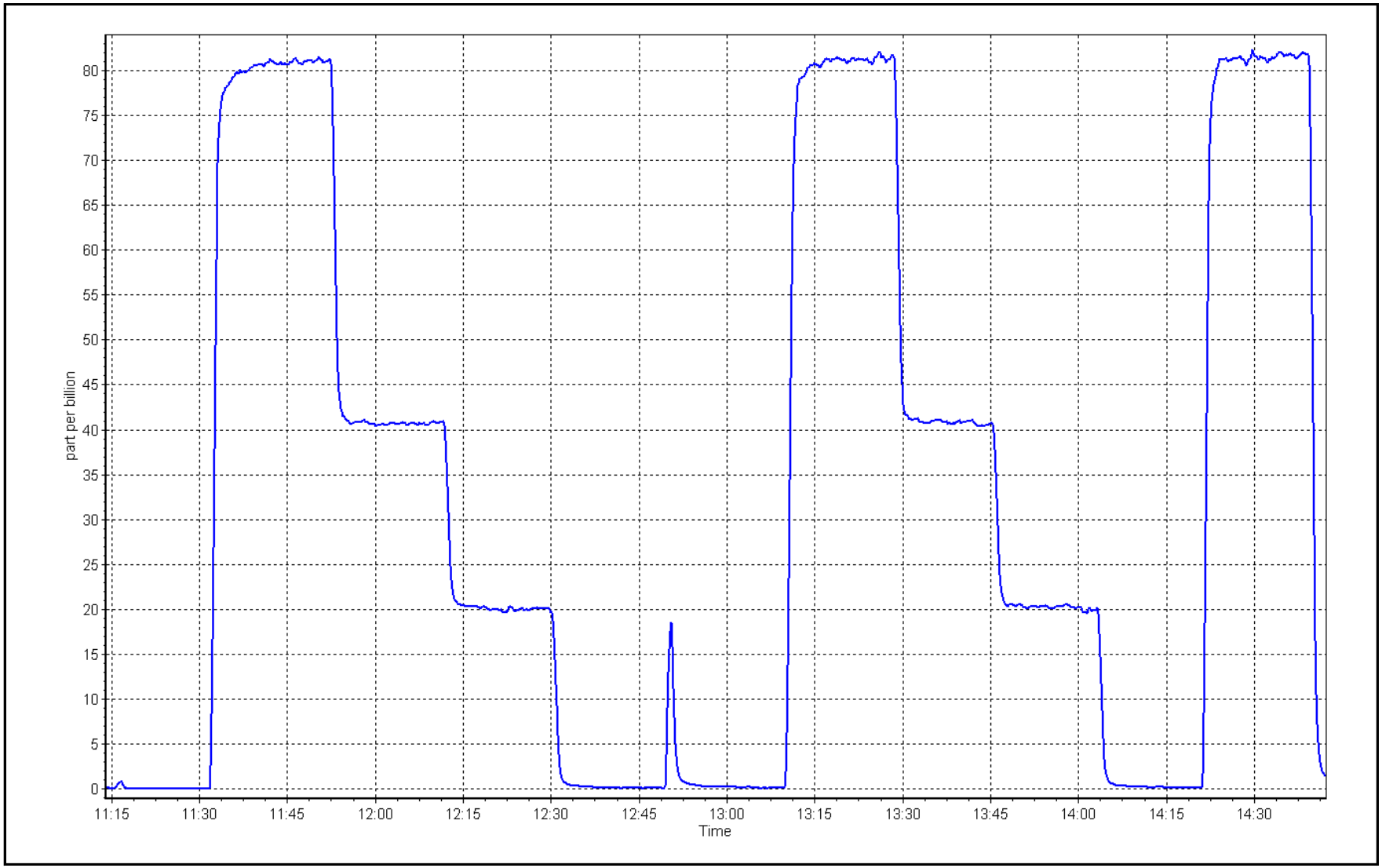
Calibration Date:	July 5, 2024	Previous Calibration:	June 24, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	11:08	End Time (MST):	14:42
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331546

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999983	*≥0.995*
80.0	81.3	0.9839	Slope	1.016395	*0.90 - 1.10*
40.0	40.7	0.9827			
20.0	20.1	0.9949	Intercept	-0.019188	*+/-3*



H2S Calibration Plot Date: January 17, 2025 Location: Mildred Lake



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 3, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	10:35	End time (MST):	14:25
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
C3H8 Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
Removed C3H8 Conc.	199.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	1185
Zero Air Gen model:	Teledyne API T701	Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.60E-04	2.61E-04	NMHC SP Ratio:	6.97E-05	6.97E-05
CH4 Retention time:	14.6	14.6	NMHC Peak Area:	126172	126219
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	16.82	16.78	1.002
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.78	Prev response	16.83	*% change	-0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.78	1.002
Mid point	4960	40.0	8.39	8.42	0.996
Low point	4980	20.0	4.19	4.18	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	16.82	16.76	1.003
				Average Correction Factor	1.001

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

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.80	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.80	Prev response	8.80	*% change	0.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.75	1.005
Mid point	4960	40.0	4.39	4.40	0.997
Low 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	8.66	1.016
				Average Correction Factor	1.001

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.02	7.98	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.98	Prev response	8.03	*% change	-0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	8.03	0.999
Mid point	4960	40.0	4.00	4.02	0.996
Low point	4980	20.0	2.00	1.99	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	8.11	0.989
				Average Correction Factor	1.000

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.000410	0.998192
THC Cal Offset:	0.001069	0.007870
CH4 Cal Slope:	1.000108	1.001705
CH4 Cal Offset:	0.001548	-0.003049
NMHC Cal Slope:	1.000698	0.994976
NMHC Cal Offset:	-0.000278	0.010718

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

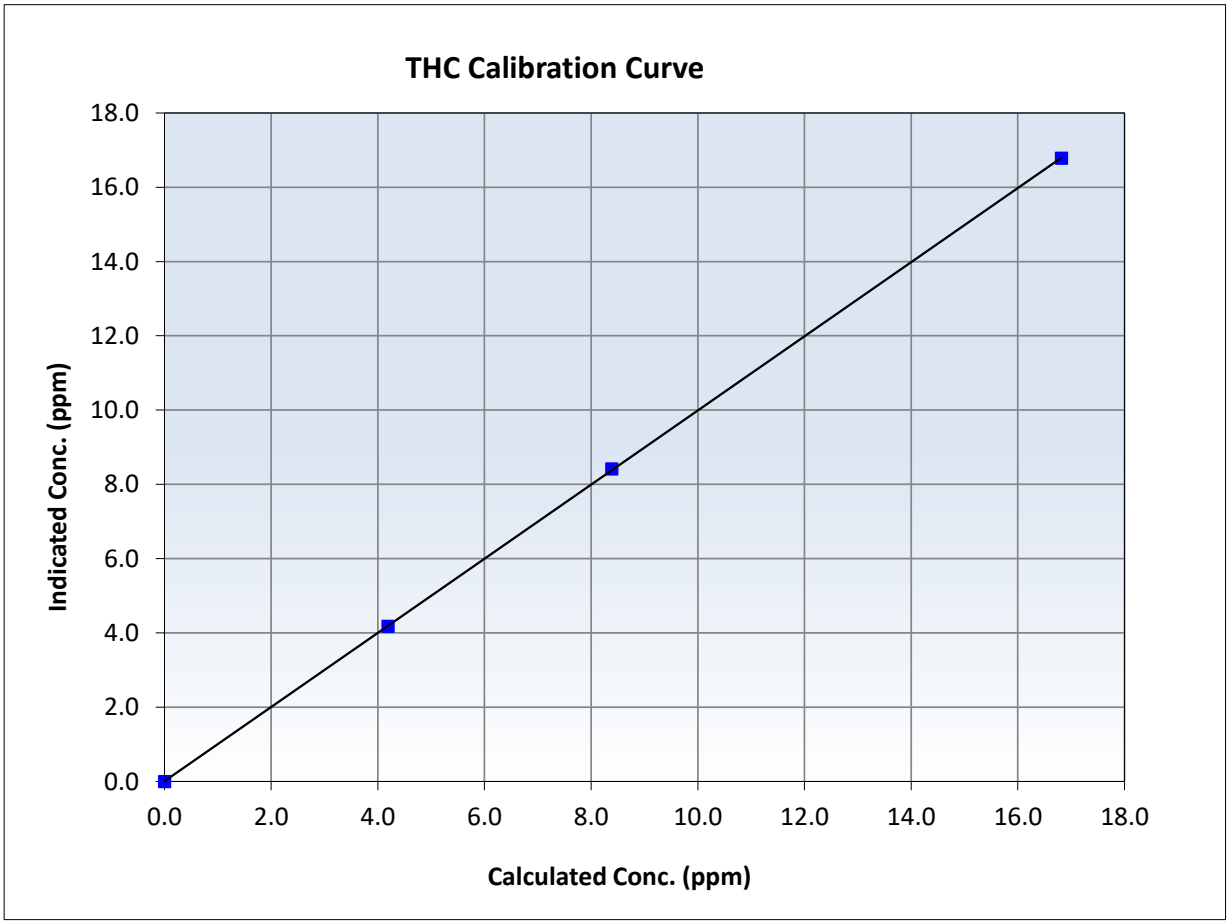
THC Calibration Summary

Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 20, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:35	End Time (MST):	14:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999987	≥0.995
16.82	16.78	1.0023	Slope	0.998192	0.90 - 1.10
8.39	8.42	0.9962	Intercept	0.007870	+/-0.5
4.19	4.18	1.0036			



Wood Buffalo Environmental Association

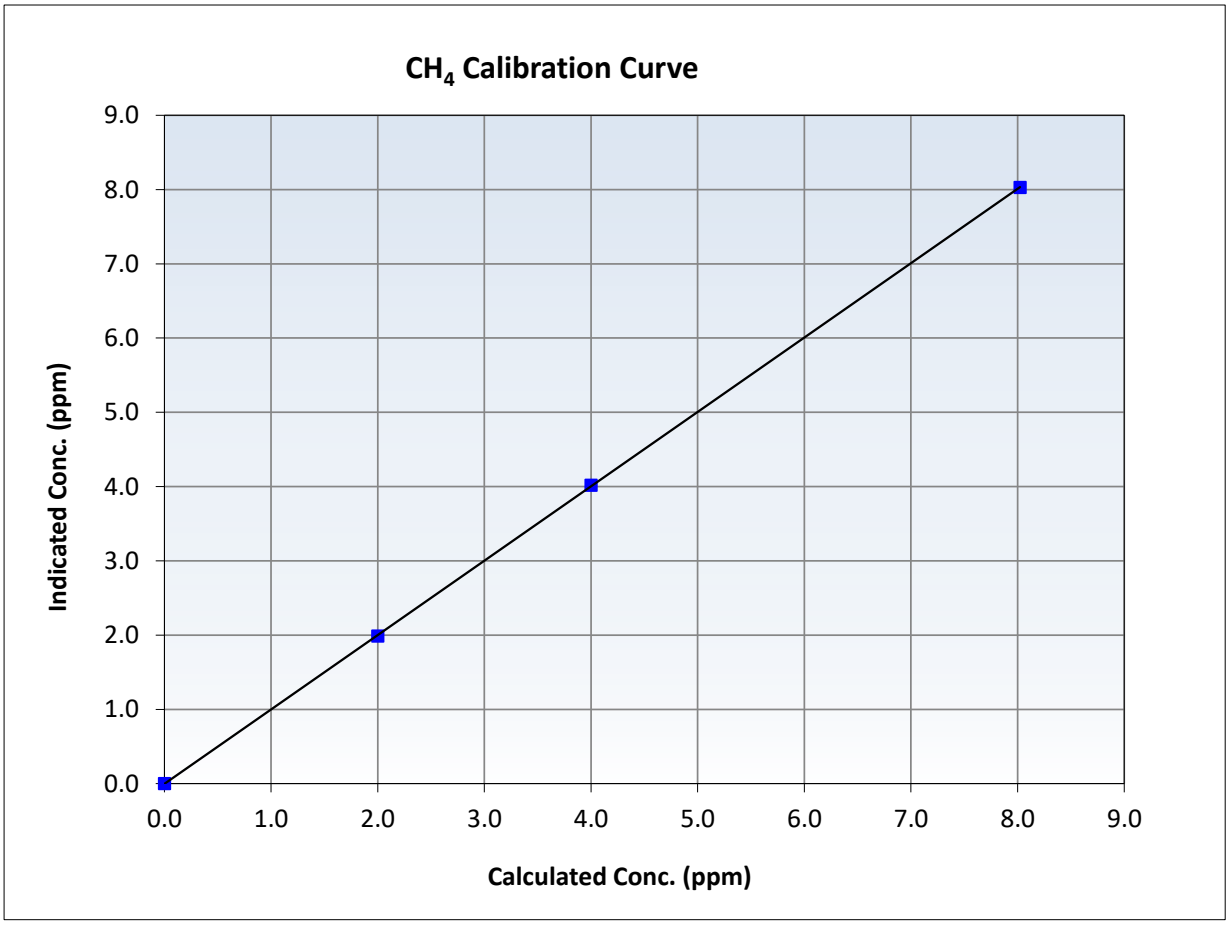
CH_4 Calibration Summary

Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 20, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:35	End Time (MST):	14:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999989	≥0.995
8.02	8.03	0.9991	Slope	1.001705	0.90 - 1.10
4.00	4.02	0.9957	Intercept	-0.003049	+/-0.5
2.00	1.99	1.0064			



Wood Buffalo Environmental Association

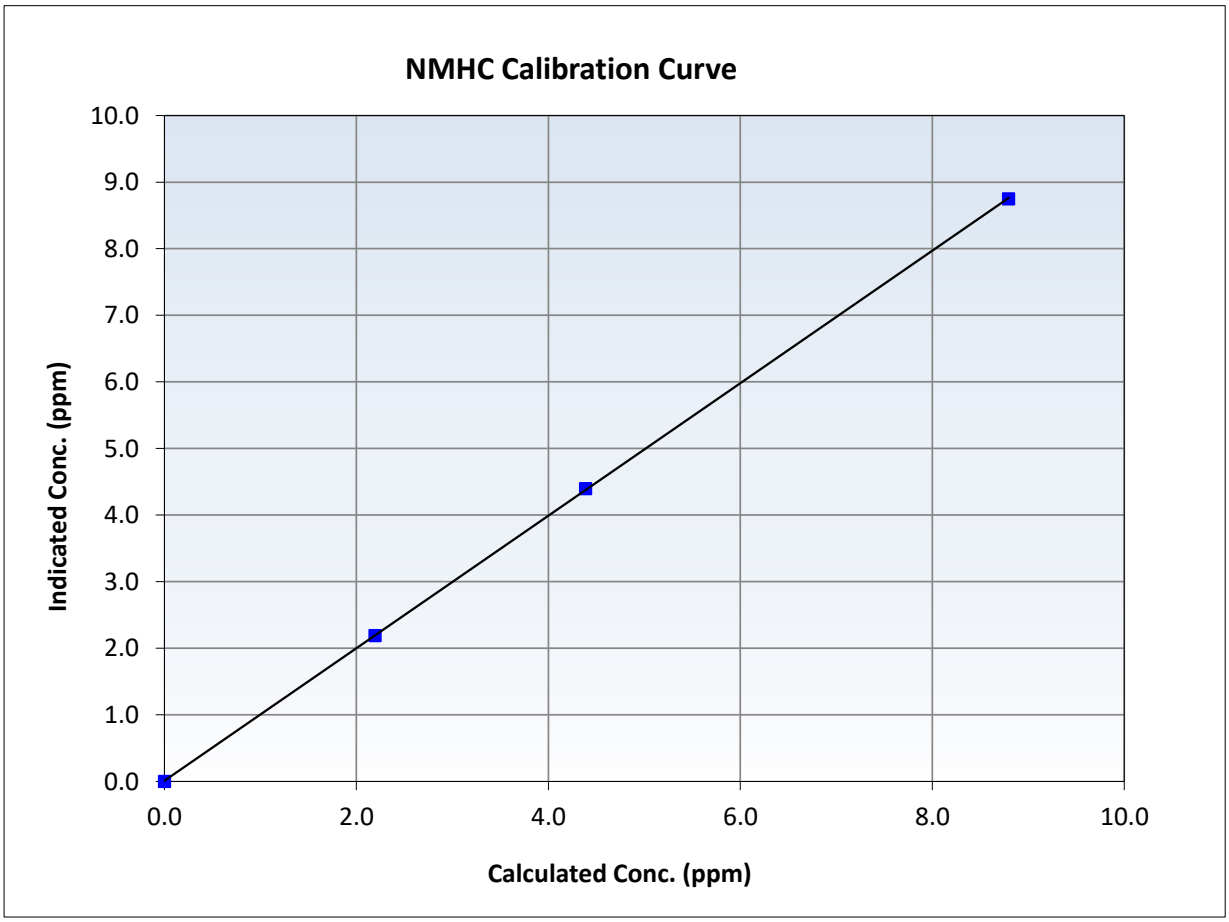
NMHC Calibration Summary

Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 20, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:35	End Time (MST):	14:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999980	≥0.995
8.80	8.75	1.0052	Slope	0.994976	0.90 - 1.10
4.39	4.40	0.9970	Intercept	0.010718	+/-0.5
2.19	2.19	1.0011			



NMHC Calibration Plot Date: January 3, 2025 Location: Mildred Lake

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 20, 2025	Last Cal Date:	January 3, 2025
Start time (MST):	11:30	End time (MST):	14:45
Reason:	Maintenance		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
C3H8 Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
Removed C3H8 Conc.	199.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	1185
Zero Air Gen model:	Teledyne API T701	Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.61E-04	2.64E-04	NMHC SP Ratio:	6.97E-05	7.44E-05
CH4 Retention time:	14.6	14.8	NMHC Peak Area:	126219	118285
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	16.82	16.17	1.040
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.17	Prev response	16.80	*% change	-3.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	16.82	16.73	1.005
Mid point	4960	40.0	8.39	8.43	0.995
Low point	4980	20.0	4.19	4.19	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	16.82	16.53	1.017
				Average Correction Factor	1.001

Notes: Adjusted due to CH4 dips seen during sampling. Adjusted span. Large adjustment made potentially due to extreme cold weather.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.18	1.075
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.18	Prev response	8.76	*% change	-7.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.80	8.73	1.007
Mid point	4960	40.0	4.39	4.39	0.999
Low point	4980	20.0	2.19	2.19	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.38	1.050
				Average Correction Factor	1.003

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.02	7.99	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.99	Prev response	8.03	*% change	-0.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.02	7.99	1.004
Mid point	4960	40.0	4.00	4.04	0.991
Low point	4980	20.0	2.00	2.00	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	8.15	0.984
				Average Correction Factor	0.998

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.998192	0.995077
THC Cal Offset:	0.007870	0.022267
CH4 Cal Slope:	1.001705	0.996840
CH4 Cal Offset:	-0.003049	0.012757
NMHC Cal Slope:	0.994976	0.992754
NMHC Cal Offset:	0.010718	0.010509

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

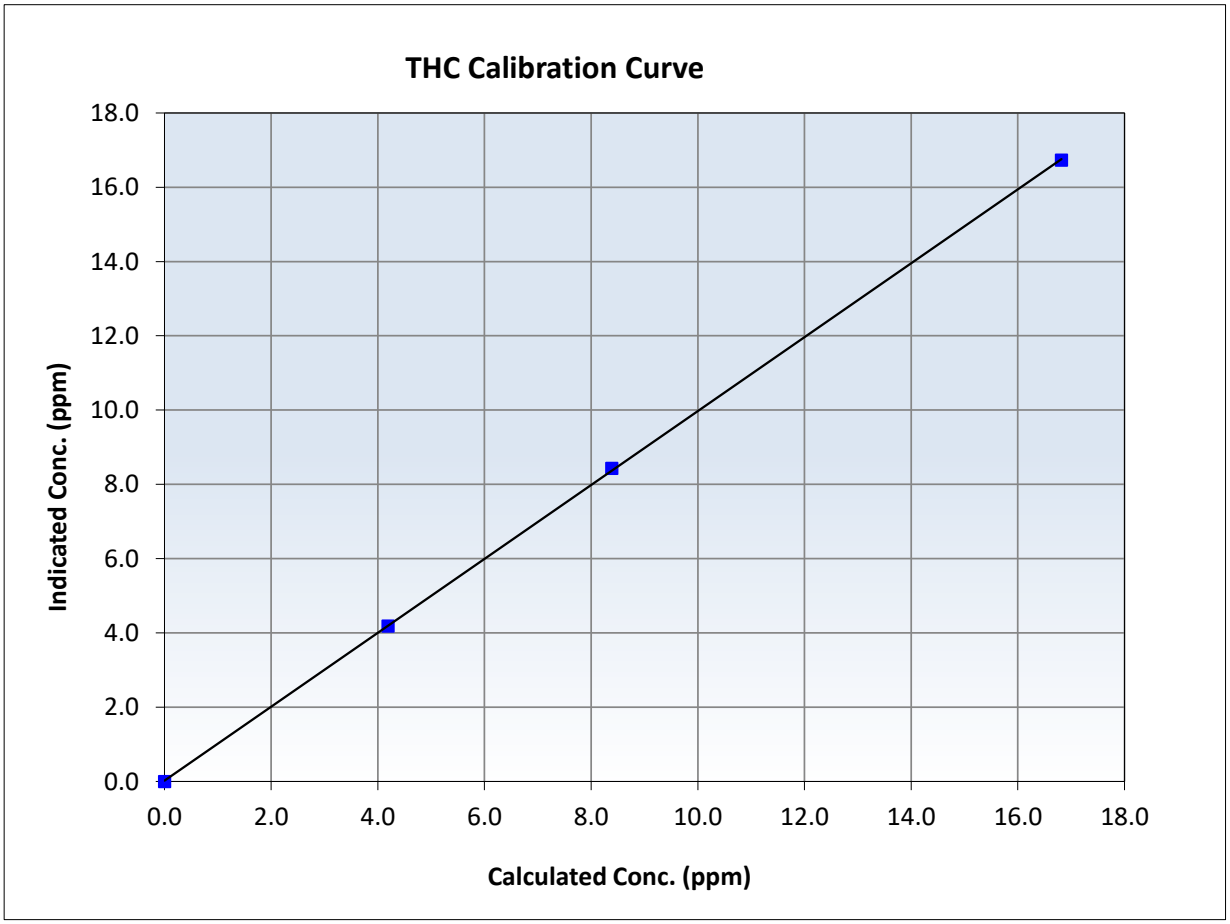
THC Calibration Summary

Station Information

Calibration Date:	January 20, 2025	Previous Calibration:	January 3, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	11:30	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999967	*≥0.995*
16.82	16.73	1.0053	Slope	0.995077	*0.90 - 1.10*
8.39	8.43	0.9951	Intercept	0.022267	*+/-0.5*
4.19	4.19	1.0022			



Wood Buffalo Environmental Association

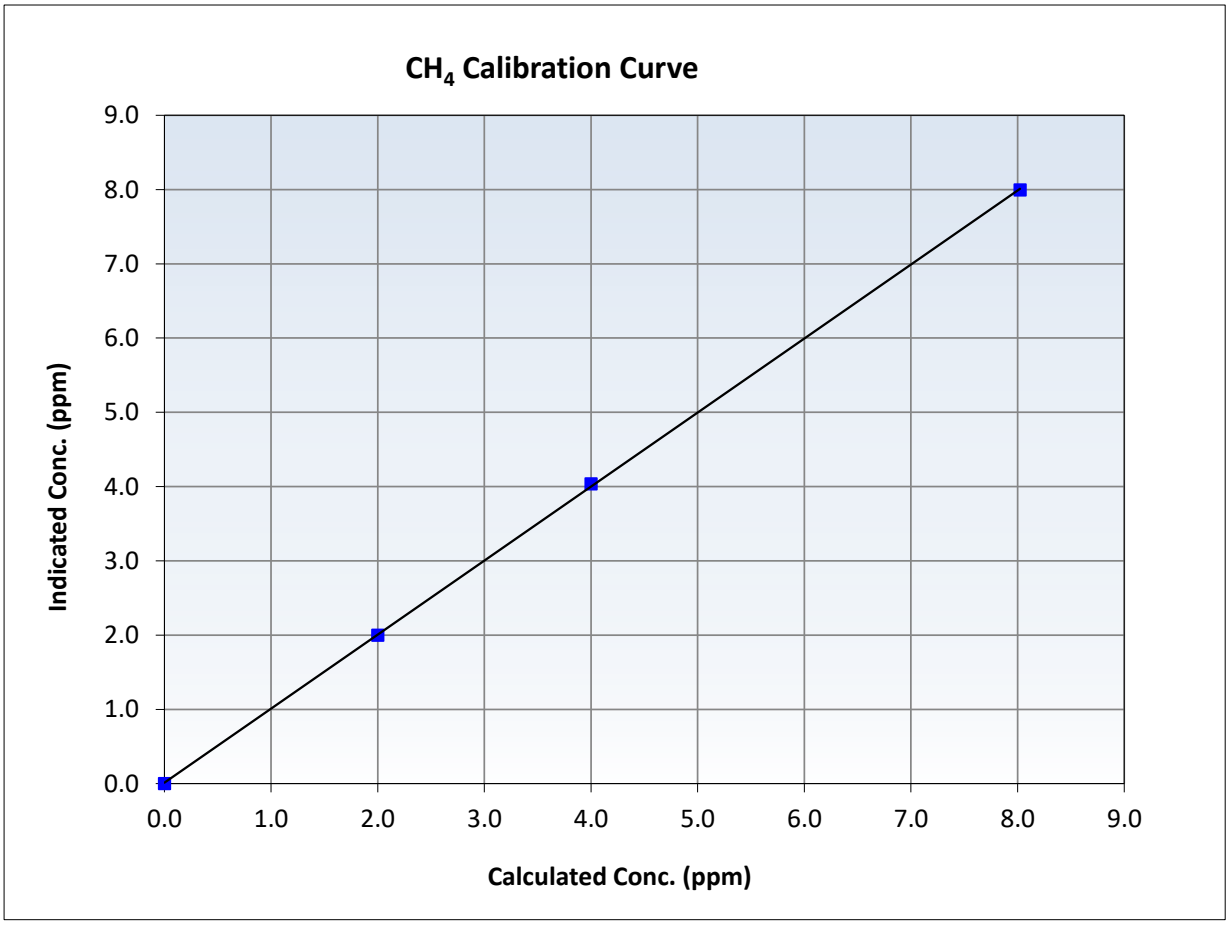
CH_4 Calibration Summary

Station Information

Calibration Date:	January 20, 2025	Previous Calibration:	January 3, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	11:30	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999949	≥0.995
8.02	7.99	1.0036	Slope	0.996840	0.90 - 1.10
4.00	4.04	0.9910	Intercept	0.012757	+/-0.5
2.00	2.00	1.0004			



Wood Buffalo Environmental Association

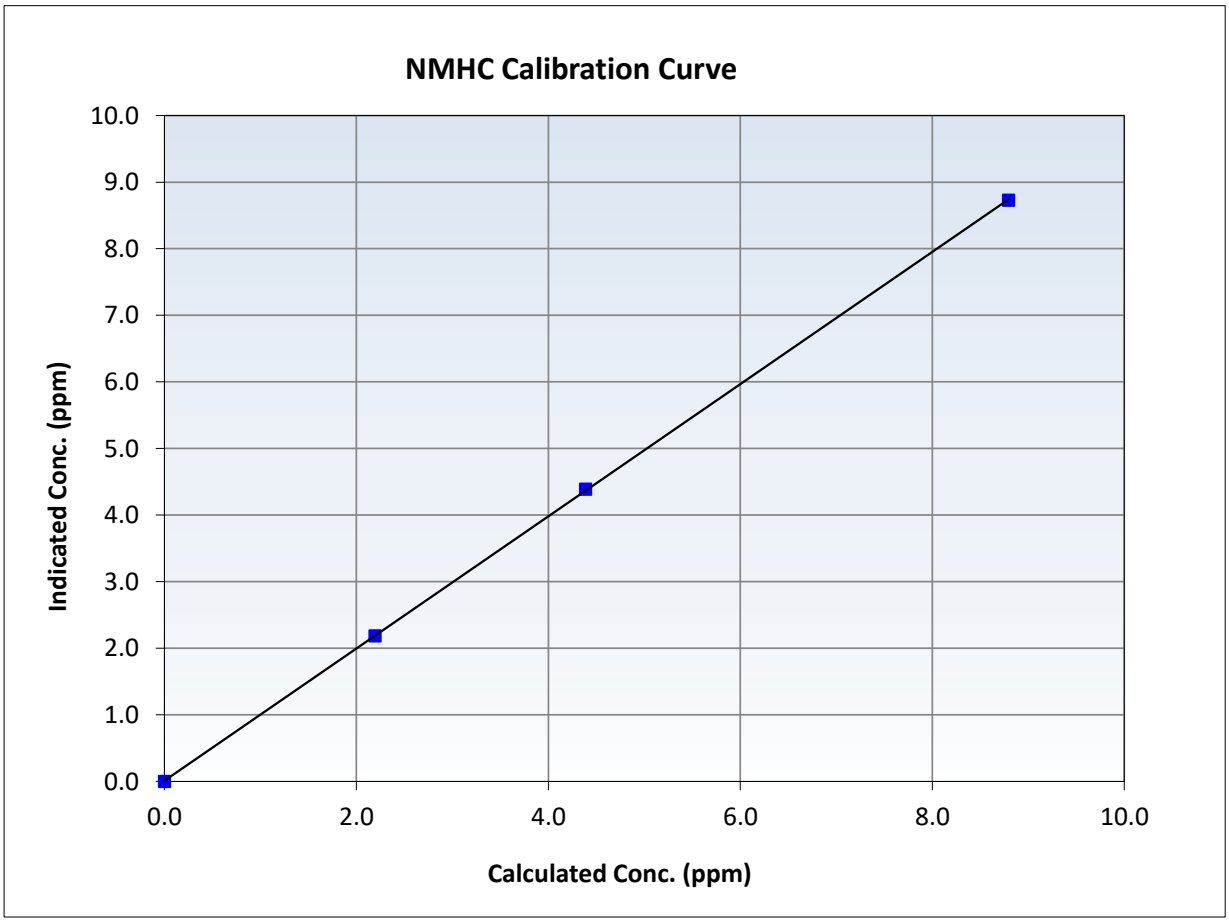
NMHC Calibration Summary

Station Information

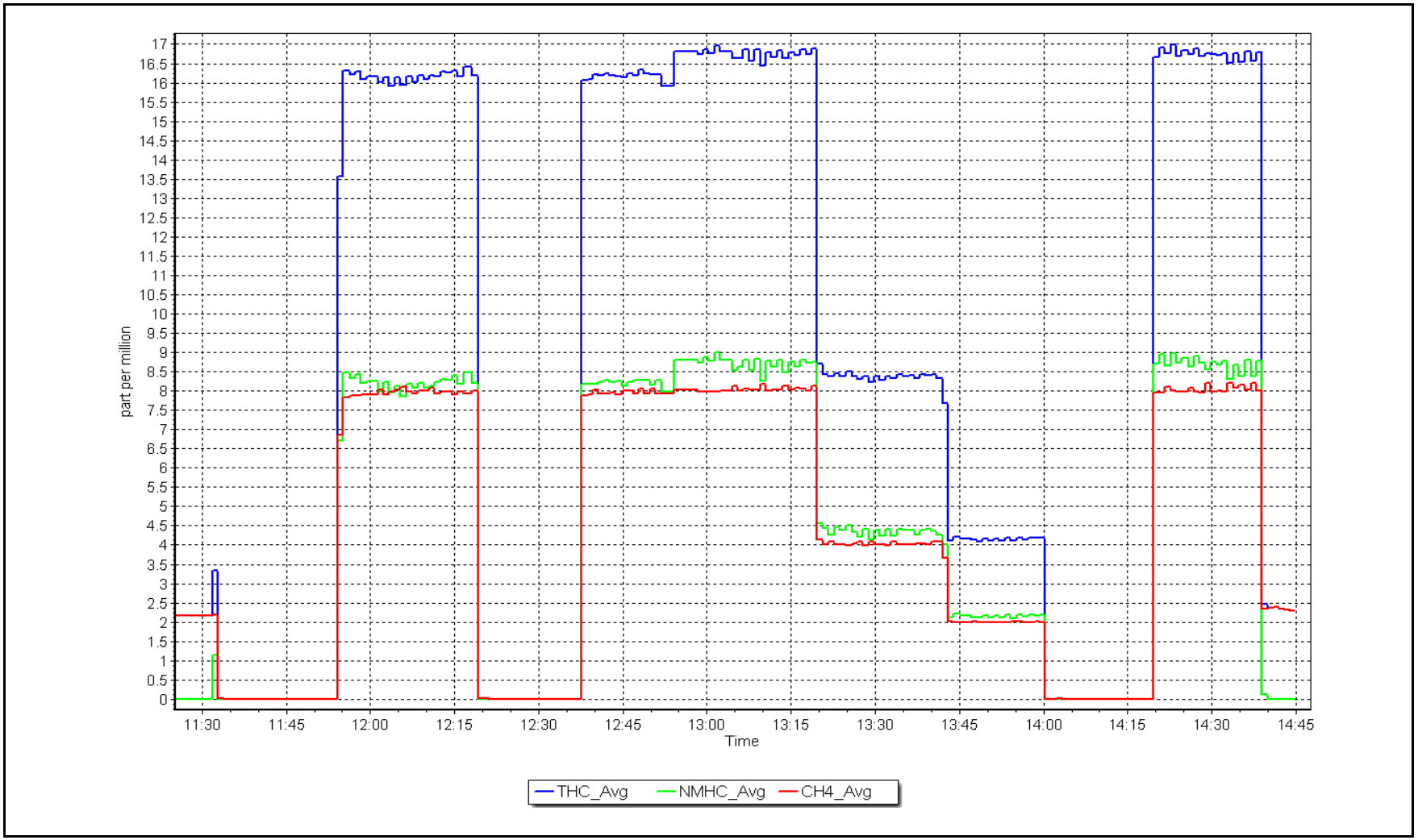
Calibration Date:	January 20, 2025	Previous Calibration:	January 3, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	11:30	End Time (MST):	14:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999978	≥0.995
8.80	8.73	1.0075	Slope	0.992754	0.90 - 1.10
4.39	4.39	0.9990	Intercept	0.010509	+/-0.5
2.19	2.19	1.0038			



NMHC Calibration Plot Date: January 20, 2025 Location: Mildred Lake



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 22, 2025	Last Cal Date:	January 20, 2025
Start time (MST):	11:48	End time (MST):	13:57
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
C3H8 Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
Removed C3H8 Conc.	199.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	1185
Zero Air Gen model:	Teledyne API T701	Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.64E-04	2.64E-04	NMHC SP Ratio:	7.44E-05	7.44E-05
CH4 Retention time:	14.8	14.8	NMHC Peak Area:	118285	118285
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	16.82	16.63	1.011
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.63	Prev response	16.76	*% change	-0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	16.82	16.57	1.015
				Average Correction Factor	

Notes: Swapped nitrogen cylinder.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.80	8.52	1.032
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.52	Prev response	8.74	*% change	-2.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.80	8.56	1.028
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.02	8.10	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.10	Prev response	8.01	*% change	1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

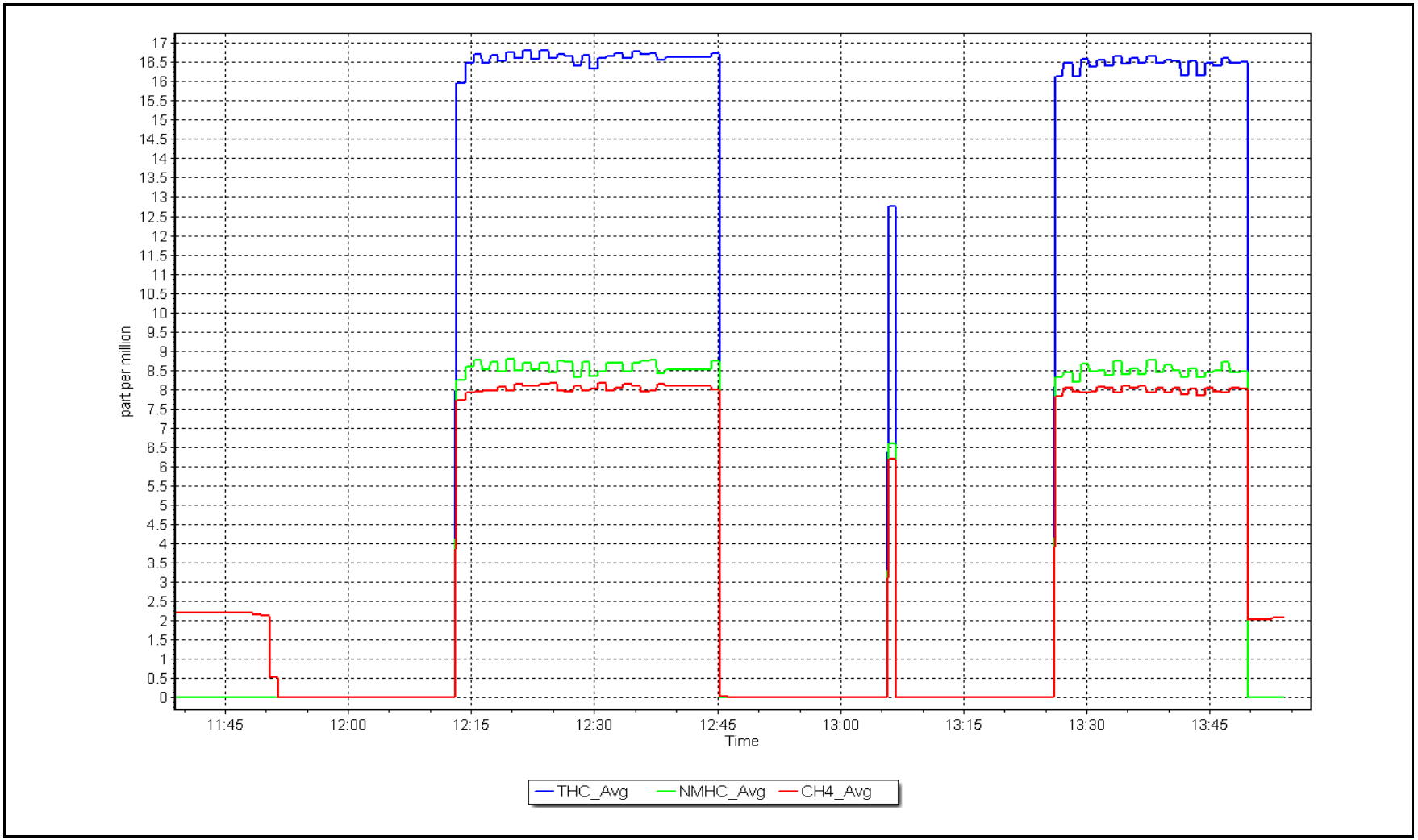
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	8.01	1.001
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.995077	
THC Cal Offset:	0.022267	
CH4 Cal Slope:	0.996840	
CH4 Cal Offset:	0.012757	
NMHC Cal Slope:	0.992754	
NMHC Cal Offset:	0.010509	

Calibration Performed By: Braiden Boutilier

NMHC Calibration Plot Date: January 22, 2025 Location: Mildred Lake



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	January 26, 2025	Last Cal Date:	January 20, 2025
Start time (MST):	12:01	End time (MST):	15:07
Reason:	Maintenance		

Calibration Standards

Gas Cert Reference:	CC501209	Cal Gas Expiry Date:	August 12, 2024
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
C3H8 Cal Gas Conc.	199.4 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1048.6 ppm
Removed C3H8 Conc.	199.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	1185
Zero Air Gen model:	Teledyne API T701	Serial Number:	4891

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.64E-04	2.66E-04	NMHC SP Ratio:	7.44E-05	7.91E-05
CH4 Retention time:	14.8	15.2	NMHC Peak Area:	118285	110917
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	16.78	16.30	1.029
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.30	Prev response	16.72	*% change	-2.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.0	16.78	16.74	1.002
Mid point	4960	40.0	8.39	8.43	0.995
Low point	4980	20.0	4.19	4.19	1.001
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	0.999

Notes: Maintenance calibration done due to baseline dips. Sample inlet filter changed after as founds. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	8.77	8.38	1.047
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.38	Prev response	8.72	*% change	-4.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.0	8.77	8.73	1.006
Mid point	4960	40.0	4.39	4.46	0.983
Low 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	8.87	0.992
				Average Correction Factor	0.997

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	8.00	7.92	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.92	Prev response	7.99	*% change	-0.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.0	8.00	8.01	0.999
Mid point	4960	40.0	4.00	3.97	1.008
Low point	4980	20.0	2.00	2.00	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.02	7.94	1.010
				Average Correction Factor	1.003

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.995077	0.997786
THC Cal Offset:	0.022267	0.015400
CH4 Cal Slope:	0.996840	1.000186
CH4 Cal Offset:	0.012757	-0.007800
NMHC Cal Slope:	0.992754	0.995376
NMHC Cal Offset:	0.010509	0.023800

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

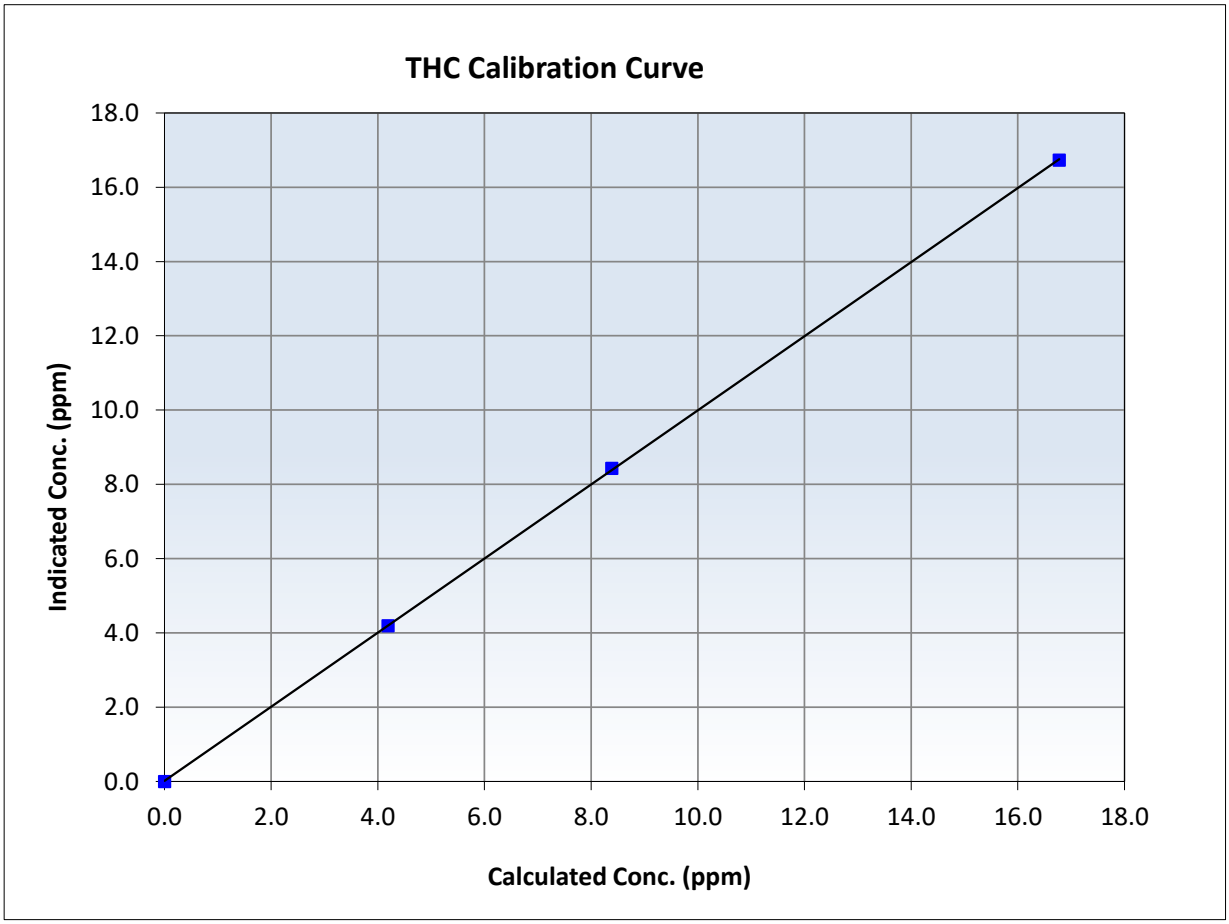
THC Calibration Summary

Station Information

Calibration Date:	January 26, 2025	Previous Calibration:	January 20, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	12:01	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999982	≥0.995
16.78	16.74	1.0025	Slope	0.997786	0.90 - 1.10
8.39	8.43	0.9951	Intercept	0.015400	+/-0.5
4.19	4.19	1.0008			



Wood Buffalo Environmental Association

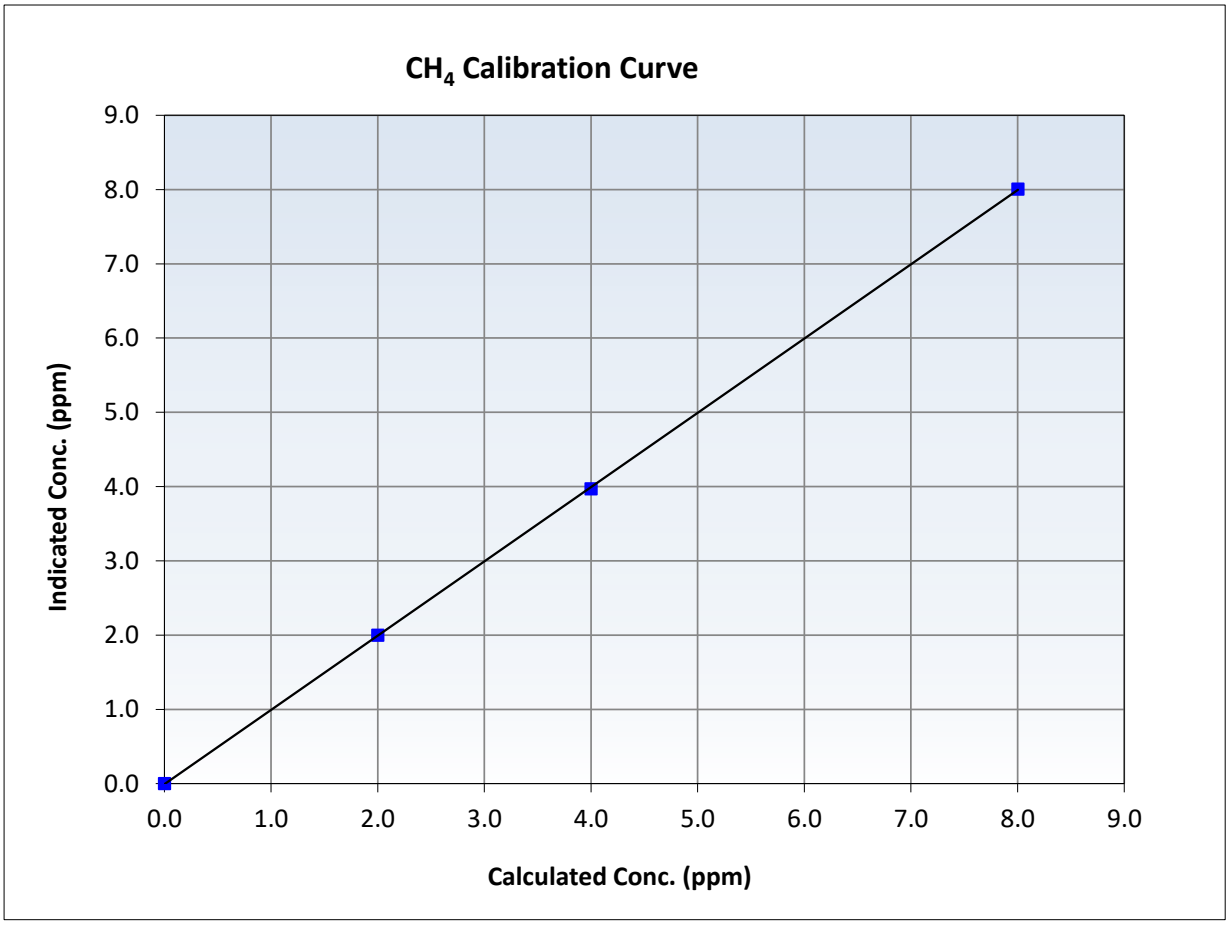
CH_4 Calibration Summary

Station Information

Calibration Date:	January 26, 2025	Previous Calibration:	January 20, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	12:01	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999975	≥0.995
8.00	8.01	0.9994	Slope	1.000186	0.90 - 1.10
4.00	3.97	1.0082			
2.00	2.00	1.0004	Intercept	-0.007800	+/-0.5



Wood Buffalo Environmental Association

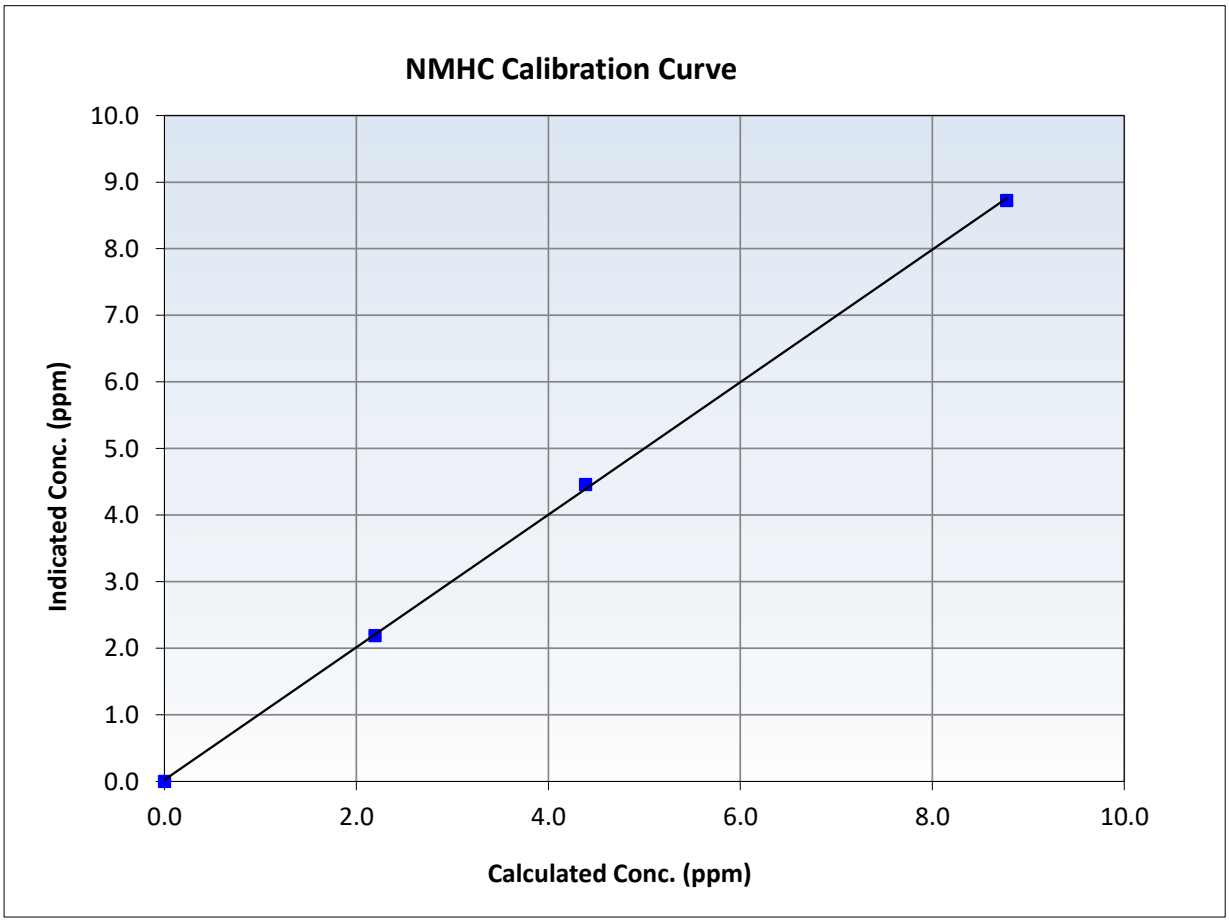
NMHC Calibration Summary

Station Information

Calibration Date:	January 26, 2025	Previous Calibration:	January 20, 2025
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	12:01	End Time (MST):	15:07
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050131

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999833	≥0.995
8.77	8.73	1.0056	Slope	0.995376	0.90 - 1.10
4.39	4.46	0.9831	Intercept	0.023800	+/-0.5
2.19	2.19	1.0011			



NMHC Calibration Plot Date: January 26, 2025 Location: Mildred Lake

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS04
BUFFALO VIEWPOINT
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 21, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	7:20	End time (MST):	10:20
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.87	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC446753			
Removed Cal Gas Conc:	50.87	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3808
Zero Air Gen Model:	API T701		Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1327300932	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996587	0.994771	Backgd or Offset:	26.5	27.0
Calibration intercept:	-0.826674	0.533546	Coeff or Slope:	0.877	0.877

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4921	78.6	799.7	796.8	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.4	Previous response	796.2	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4921	78.6	799.7	795.8	1.005
Mid point	4961	39.3	399.8	398.9	1.002
Low point	4980	19.6	199.4	198.8	1.003
As left zero	5000	0.0	0.0	0.4	----
As left span	4921	78.6	799.7	796.3	1.004
				Average Correction Factor:	1.003

Notes: No maintenance done. Zero adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

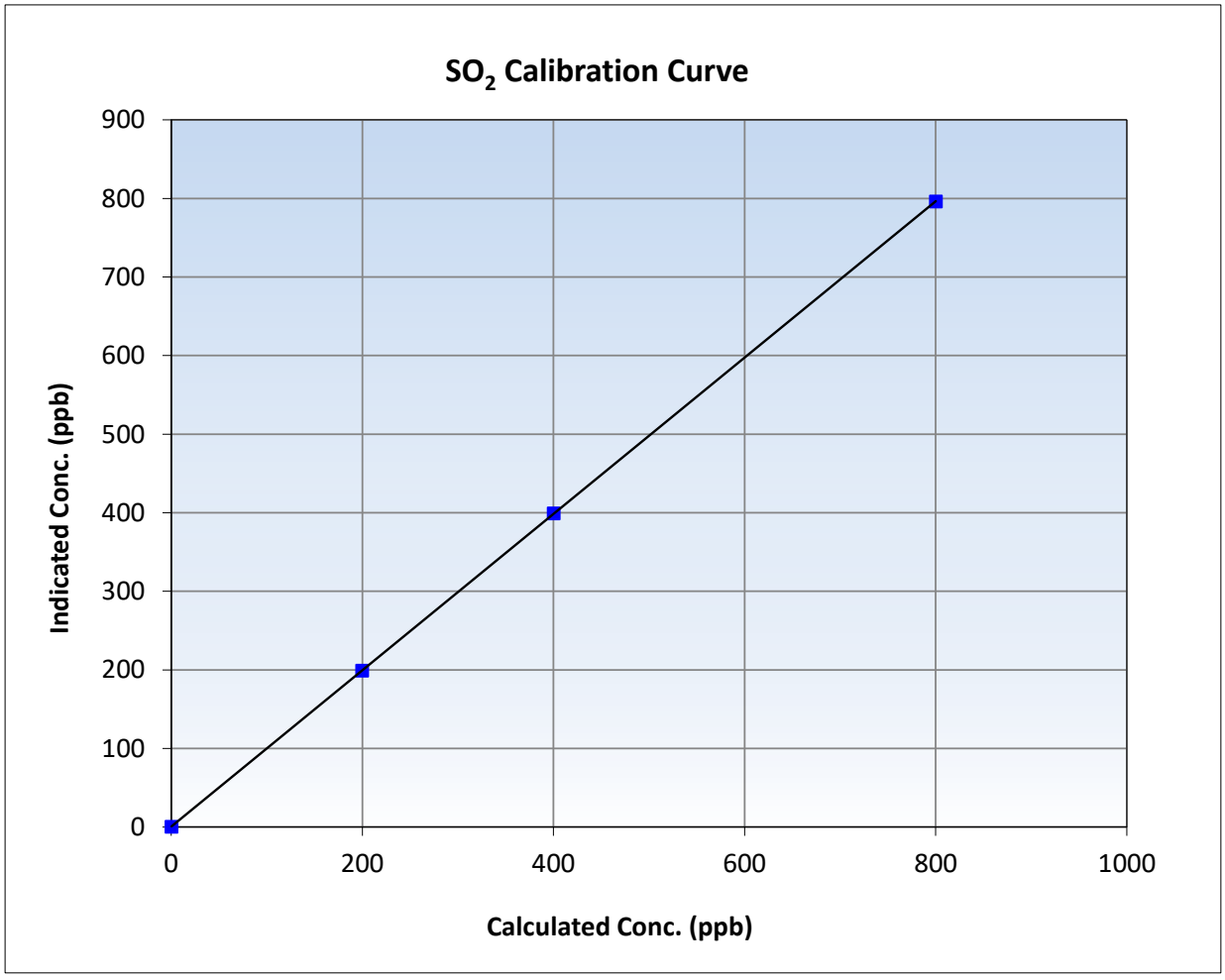
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 11, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	10:20
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1327300932

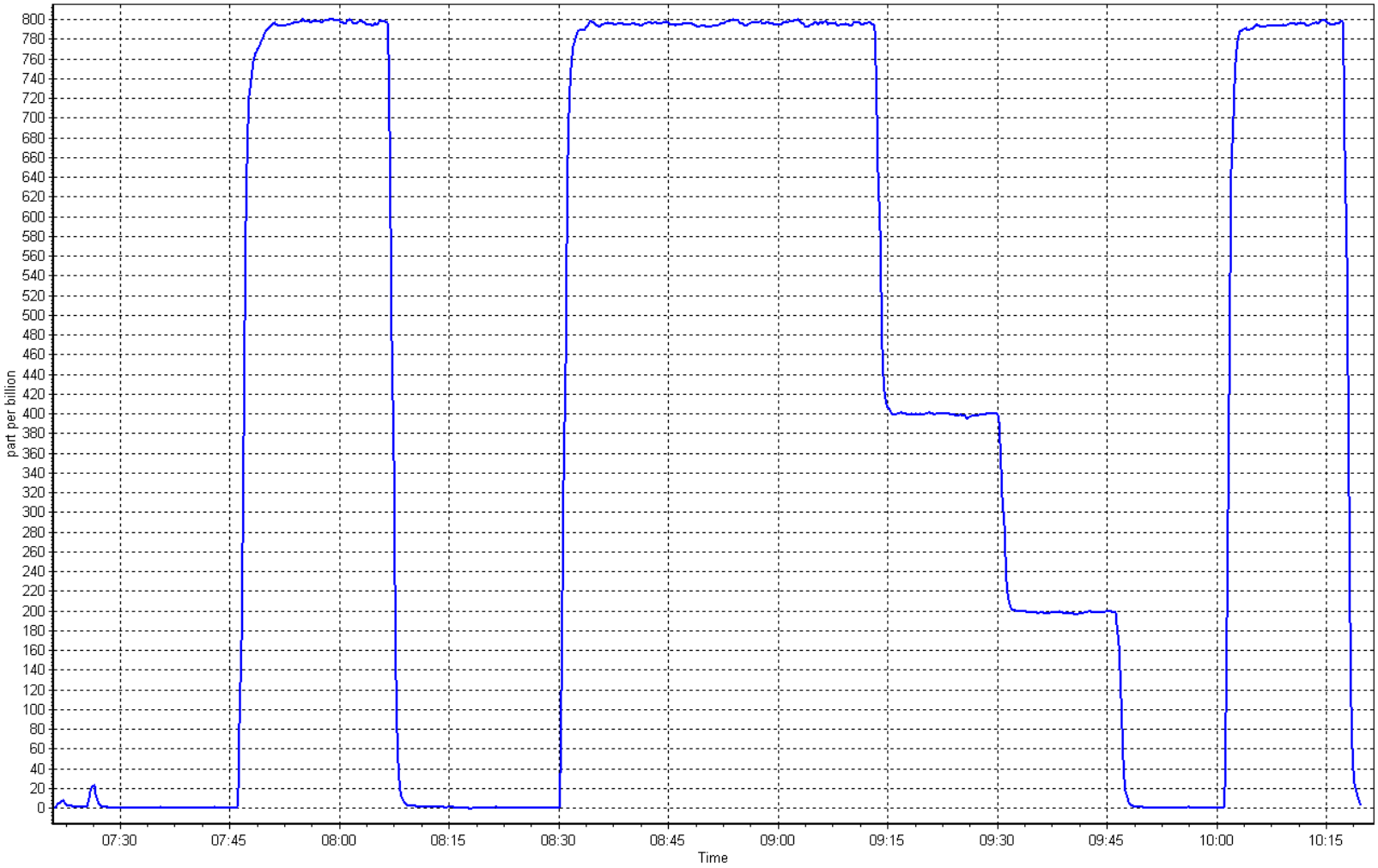
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
799.7	795.8	1.0050
399.8	398.9	1.0023
199.4	198.8	1.0032

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.994771	*0.90 - 1.10*
Intercept	0.533546	*+/-30*



SO2 Calibration Plot Date: January 21, 2025 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 20, 2025	Last Cal Date:	December 19, 2024
Start time (MST):	8:53	End time (MST):	12:42
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:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3808
ZAG Make/Model:	Teledyne API T701H		Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1008841400
Converter make:	Global		Converter serial #:	2022-200
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.990525	0.980142	Backgd or Offset:	1.95	1.95
Calibration intercept:	0.362080	0.301747	Coeff or Slope:	1.140	1.140

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4926	74.1	80.3	79.0	1.018
As found Mid point	4963	37.0	40.1	39.9	1.008
As found Low point	4982	18.5	20.1	19.8	1.018
New cylinder response					

Baseline Corr As found:	78.9	Prev response:	79.92	*% change:	-1.3%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	0.982842	AF Intercept:	0.181913
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999965	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4926	74.1	80.3	79.0	1.017
Mid point	4963	37.0	40.1	39.8	1.008
Low point	4982	18.5	20.1	19.7	1.018
As left zero	5000	0.0	0.0	0.4	----
As left span	4926	74.1	80.3	78.7	1.021
SO2 Scrubber Check	4920	80.0	800.0	-0.2	----
Date of last scrubber change:		16-May-23		Ave Corr Factor	1.014
Date of last converter efficiency test:					

Notes: Sox scrubber checked after calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

H_2S Calibration Summary

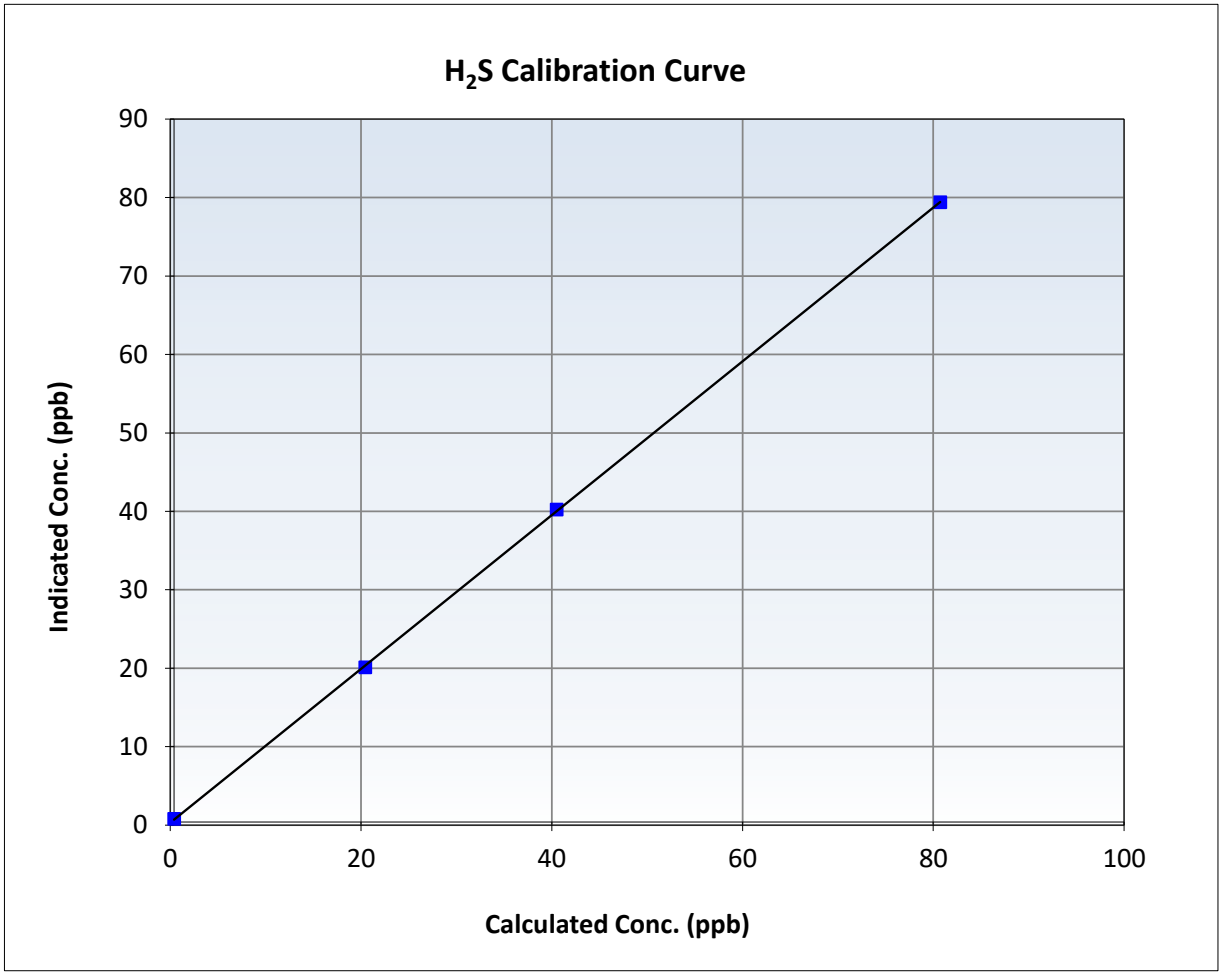
Station Information

Calibration Date:	January 20, 2025	Previous Calibration:	December 19, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:53	End Time (MST):	12:42
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1008841400

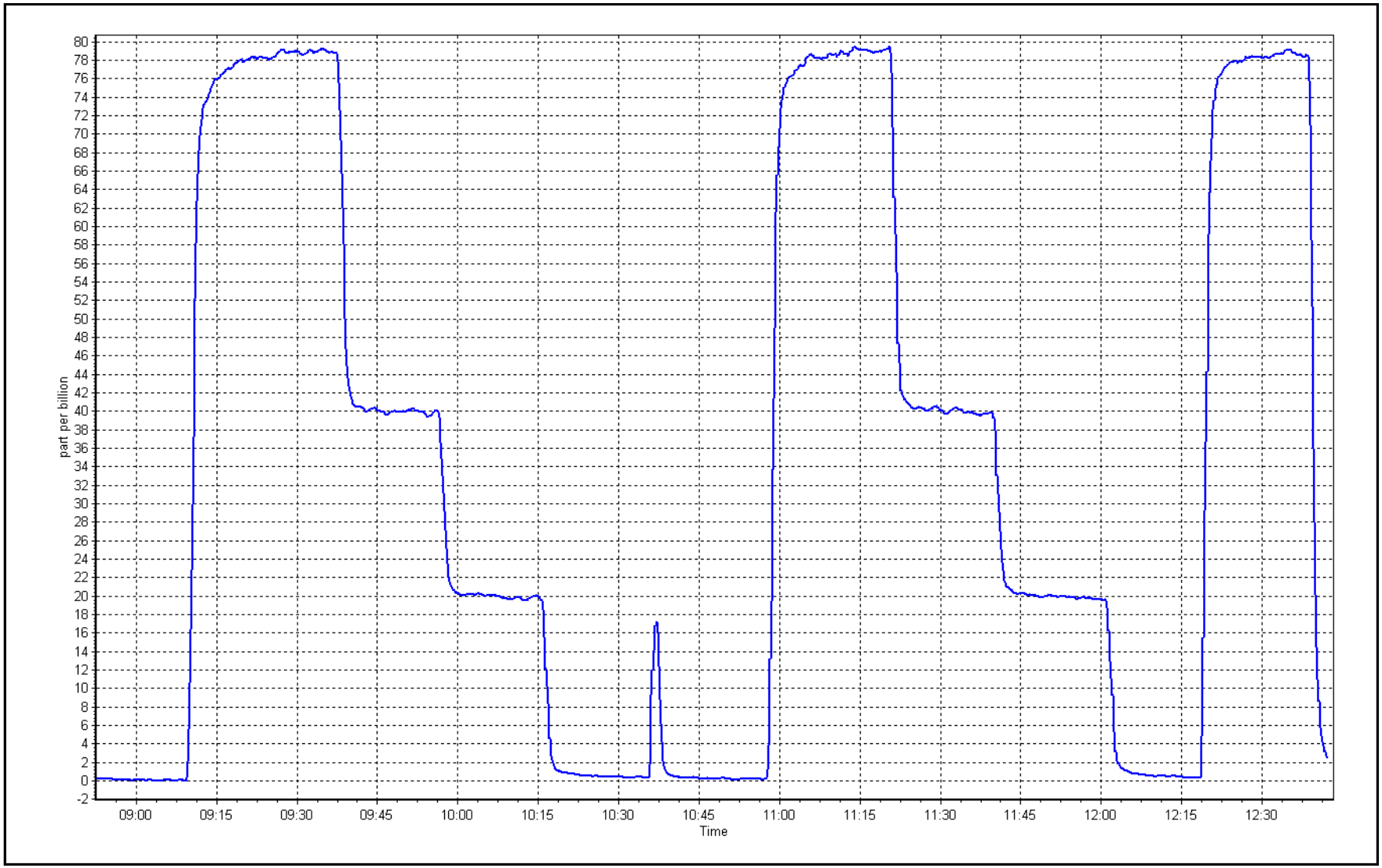
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
80.3	79.0	1.0167
40.1	39.8	1.0077
20.1	19.7	1.0179

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	0.980142	*0.90 - 1.10*
Intercept	0.301747	*+/-3*



H_2S Calibration Plot Date: January 20, 2025 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 21, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	7:20	End time (MST):	10:19
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC446753	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
Removed C3H8 Conc.	204.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3808
Zero Air Gen model:	API T701	Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	4.56E-04	4.49E-04	NMHC SP Ratio:	1.16E-04	1.28E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	75886	68711
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	16.64	16.01	1.039
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.01	Prev response	16.55	*% change	-3.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	16.64	16.63	1.000
Mid point	4961	39.3	8.32	8.29	1.003
Low point	4980	19.6	4.15	4.14	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	16.64	16.64	1.000
				Average Correction Factor	1.002

Notes: Chromatograms similar to last calibration. Diagnostics same as last month. Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	8.82	8.01	1.101
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.01	Prev response	8.76	*% change	-9.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	8.82	8.82	1.000
Mid point	4961	39.3	4.41	4.41	1.000
Low point	4980	19.6	2.20	2.22	0.993
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	8.82	8.82	1.000
				Average Correction Factor	0.997

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	7.82	7.99	0.978
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.99	Prev response	7.78	*% change	2.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	7.82	7.81	1.001
Mid point	4961	39.3	3.91	3.88	1.008
Low point	4980	19.6	1.95	1.93	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	78.6	7.82	7.81	1.001
				Average Correction Factor	1.007

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.996136	0.999817
THC Cal Offset:	-0.022555	-0.008335
CH4 Cal Slope:	0.997784	0.999714
CH4 Cal Offset:	-0.016312	-0.013907
NMHC Cal Slope:	0.994430	0.999676
NMHC Cal Offset:	-0.006044	0.005972

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

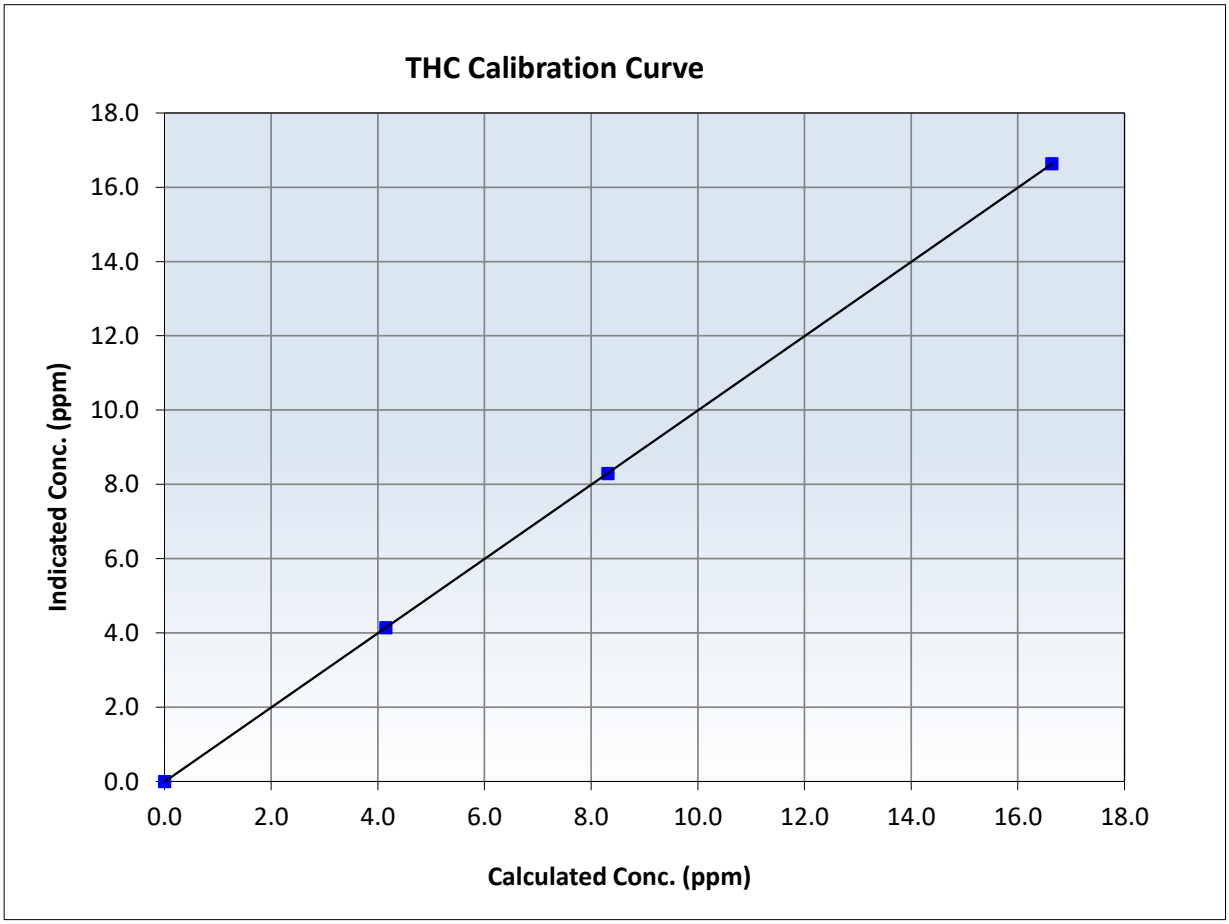
THC Calibration Summary

Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 11, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	10:19
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999997	*≥0.995*
16.64	16.63	1.0001	Slope	0.999817	*0.90 - 1.10*
8.32	8.29	1.0035			
4.15	4.14	1.0018	Intercept	-0.008335	*+/-0.5*



Wood Buffalo Environmental Association

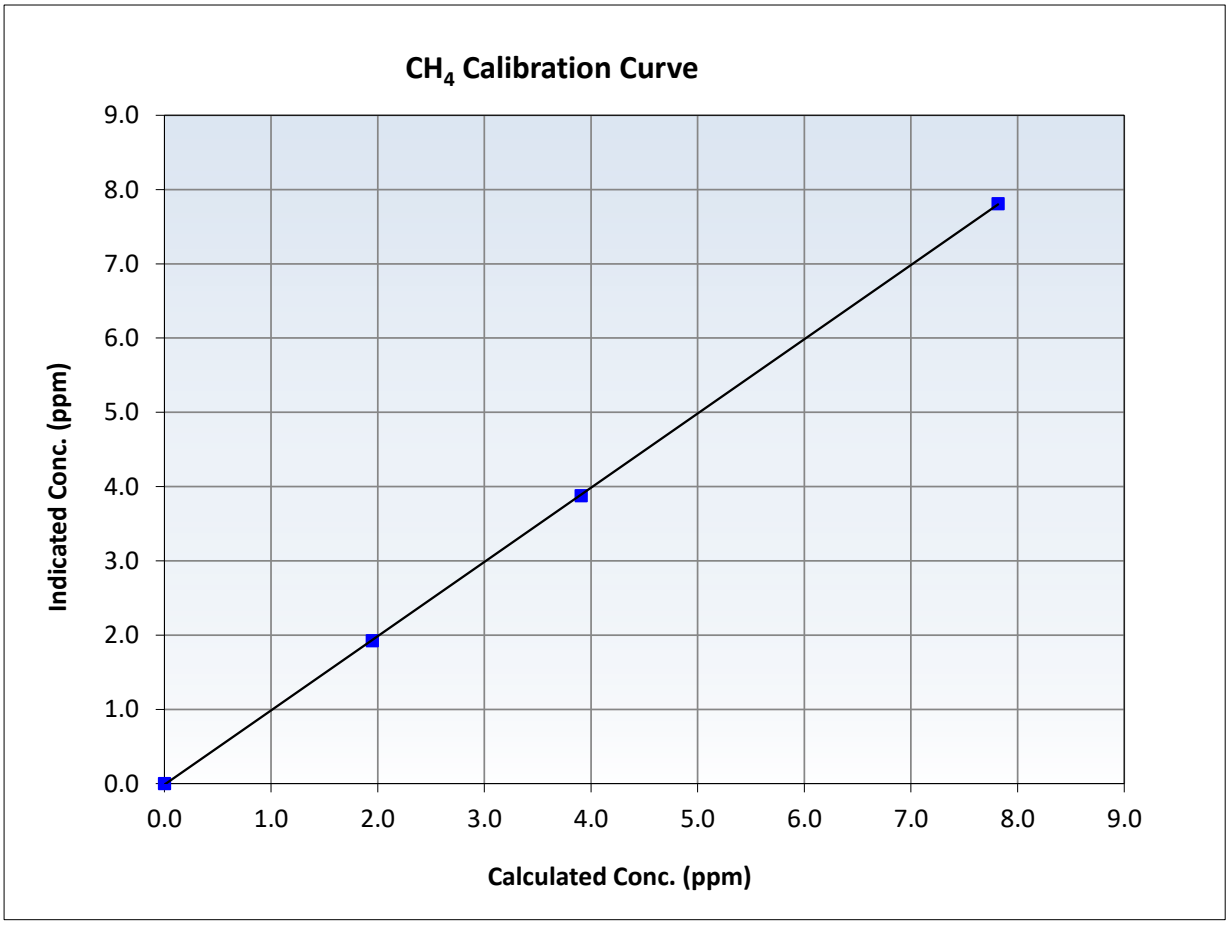
CH_4 Calibration Summary

Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 11, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	10:19
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999983	≥0.995
7.82	7.81	1.0008	Slope	0.999714	0.90 - 1.10
3.91	3.88	1.0077			
1.95	1.93	1.0120	Intercept	-0.013907	+/-0.5



Wood Buffalo Environmental Association

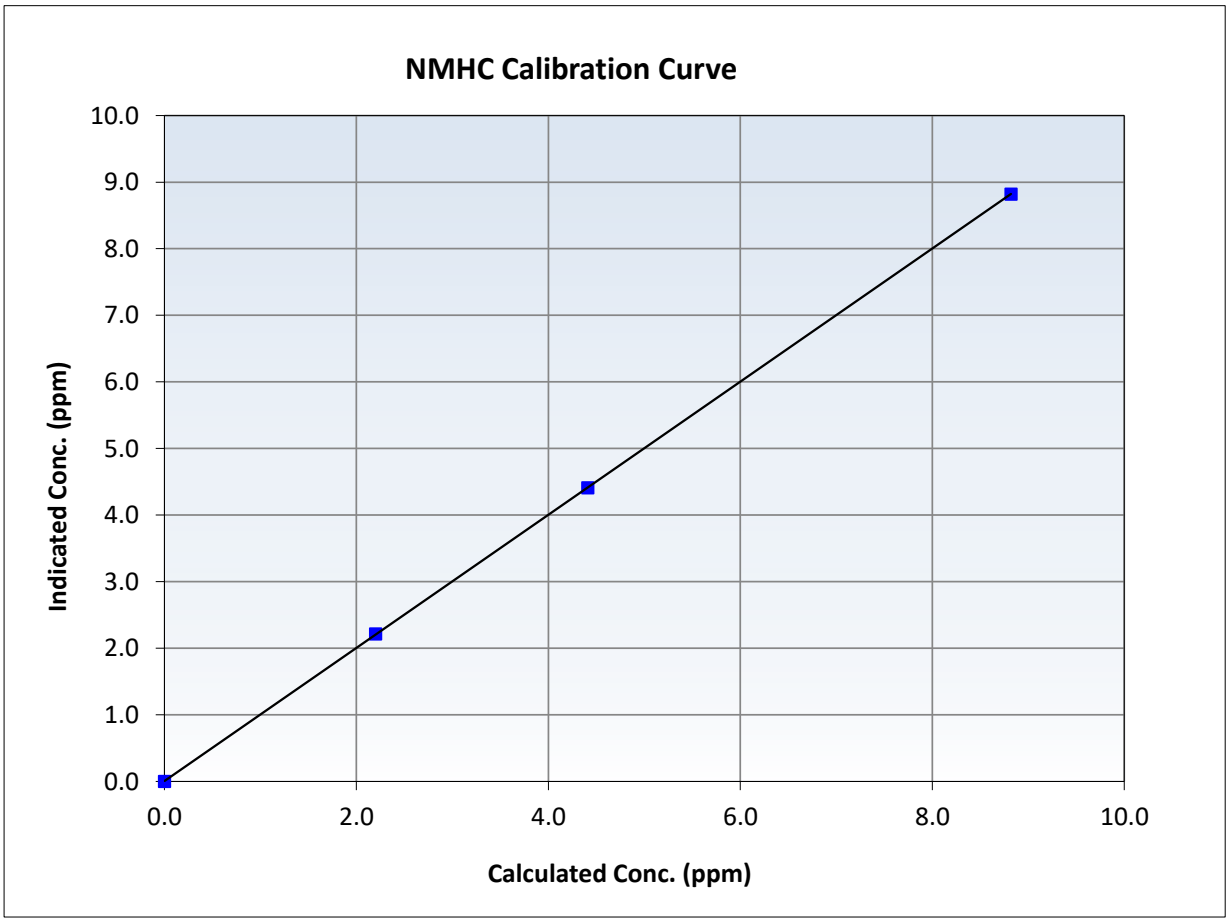
NMHC Calibration Summary

Station Information

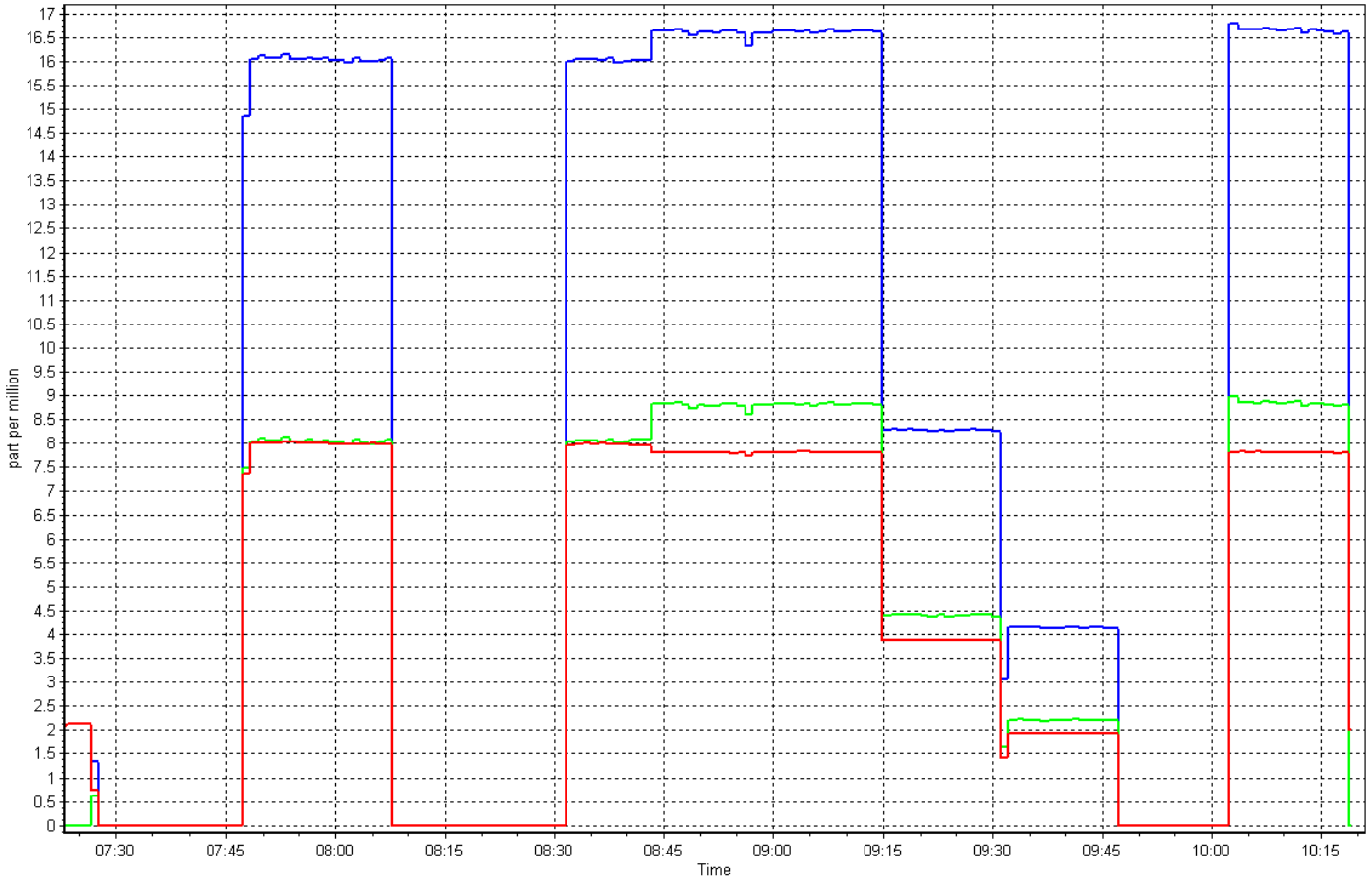
Calibration Date:	January 21, 2025	Previous Calibration:	December 11, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:20	End Time (MST):	10:19
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999996	≥0.995
8.82	8.82	0.9997	Slope	0.999676	0.90 - 1.10
4.41	4.41	0.9998	Intercept	0.005972	+/-0.5
2.20	2.22	0.9929			



NMHC Calibration Plot Date: January 21, 2025 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 28, 2025	Last Cal Date:	January 21, 2025
Start time (MST):	9:20	End time (MST):	10:56
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC446753	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	497.2 ppm	CH4 Equiv Conc.	1058.2 ppm
Removed C3H8 Conc.	204.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3808
Zero Air Gen model:	API T701	Serial Number:	362

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	4.49E-04	4.49E-04	NMHC SP Ratio:	1.28E-04	1.28E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	68711	68711
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	16.64	16.45	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.45	Prev response	16.62	*% change	-1.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	16.64	16.37	1.016
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 1.016

Notes: Hydrogen and nitrogen Cylinder Changed.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	8.82	8.62	1.023
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.62	Prev response	8.82	*% change	-2.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	8.82	8.60	1.026
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.026

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	78.6	7.82	7.83	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.83	Prev response	7.80	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	78.6	7.82	7.77	1.006
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.006

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.999817	0.983937
THC Cal Offset:	-0.008335	0.000000
CH4 Cal Slope:	0.999714	0.994165
CH4 Cal Offset:	-0.013907	0.000000
NMHC Cal Slope:	0.999676	0.974985
NMHC Cal Offset:	0.005972	0.000000

Calibration Performed By: Melissa Lemay

NMHC Calibration Plot Date: January 28, 2025 Location: Buffalo Viewpoint

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint
Station number:	AMS 04
Calibration Date:	January 23, 2025
Last Cal Date:	December 18, 2024
Start time (MST):	7:45
End time (MST):	12:26
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC324979	Cal Gas Expiry Date:	November 3, 2032
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3808
ZAG make/model:	APIT701	Serial Number:	362

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.4	0.4	----	----
AF High point	4918	81.8	800.0	798.4	1.6	793.7	789.7	4.0	1.0080	1.0105
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	803.2 ppb	NO =	794.0 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -1.2%
Baseline Corr 1st pt	NO_X =	793.7 ppb	NO =	790.1 ppb	As Found Statistics	*Percent Change	NO = -0.5%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 721

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.250	1.254	NO bkgnd or offset:	0.2	0.2
NOX coeff or slope:	1.239	1.244	NOX bkgnd or offset:	-0.2	-0.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.7	4.7

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.004479	0.997238
NO_X Cal Offset:	-0.452723	0.105784
NO Cal Slope:	0.996506	0.996249
NO Cal Offset:	-1.575097	-1.335337
NO_2 Cal Slope:	0.989876	0.993635
NO_2 Cal Offset:	0.217112	0.750732

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.3	-0.1	0.3	----	----
High point	4918	81.8	800.0	798.4	1.6	797.7	794.4	3.4	1.0029	1.0050
Mid point	4959	40.9	400.0	399.2	0.8	399.9	396.6	3.4	1.0003	1.0065
Low point	4980	20.4	199.5	199.1	0.4	198.2	195.2	3.0	1.0065	1.0199
As left zero	5000	0.0	0.0	0.6	-0.6	0.6	0.6	0.0	----	----
As left span	4918	81.8	800.0	405.0	800.0	792.2	405.0	387.2	1.0099	1.0000
							Average Correction Factor		1.0032	1.0105

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.3	----	----
High GPT point	792.3	403.7	390.2	387.9	1.0060	99.4%
Mid GPT point	792.3	603.6	190.3	191.3	0.9950	100.5%
Low GPT point	792.3	697.2	96.7	96.5	1.0024	99.8%
				Average Correction Factor	1.0011	99.9%

Notes: No maintenance done. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

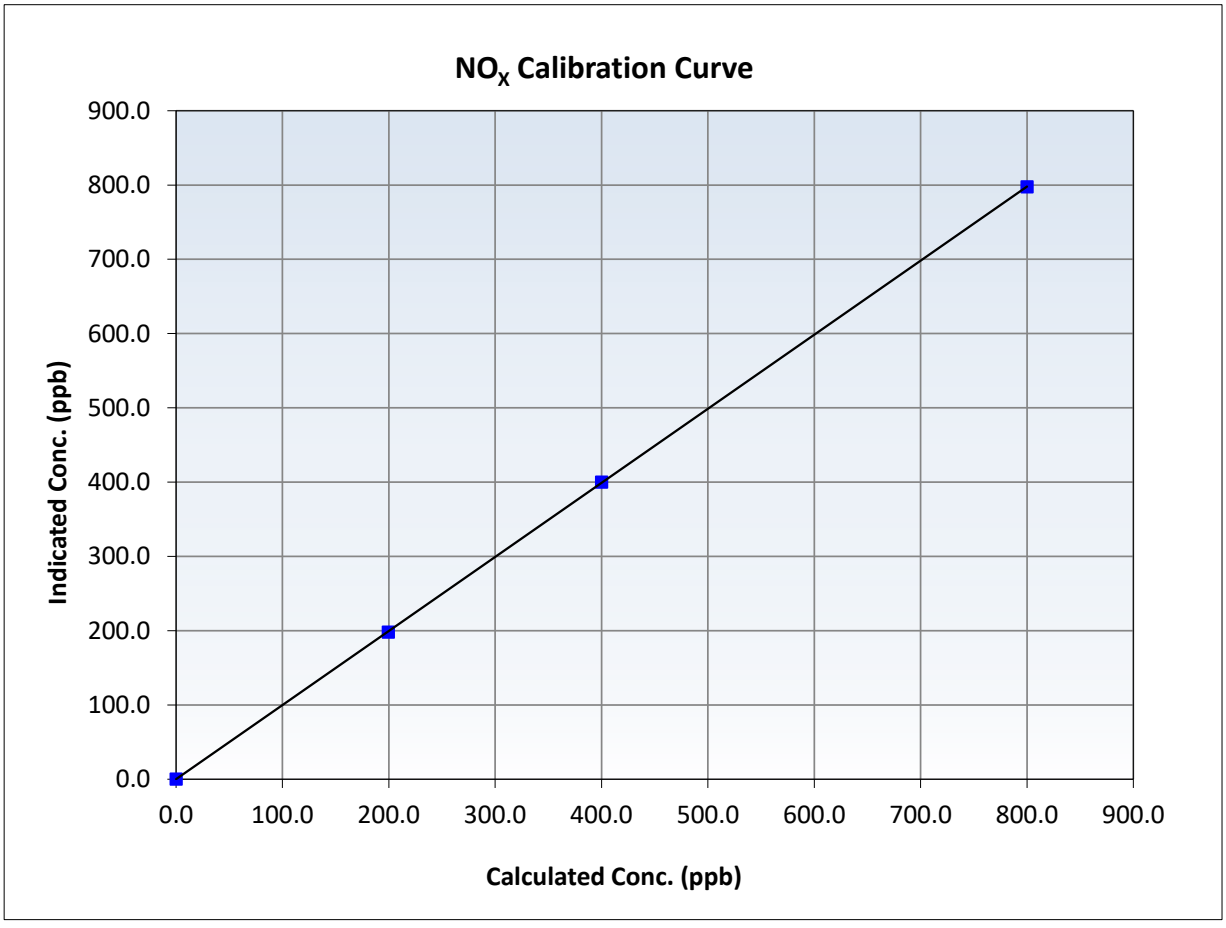
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 18, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:45	End Time (MST):	12:26
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
800.0	797.7	1.0029
400.0	399.9	1.0003
199.5	198.2	1.0065

Statistical Evaluation		Limits
Correlation Coefficient	0.999995	≥0.995
Slope	0.997238	0.90 - 1.10
Intercept	0.105784	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

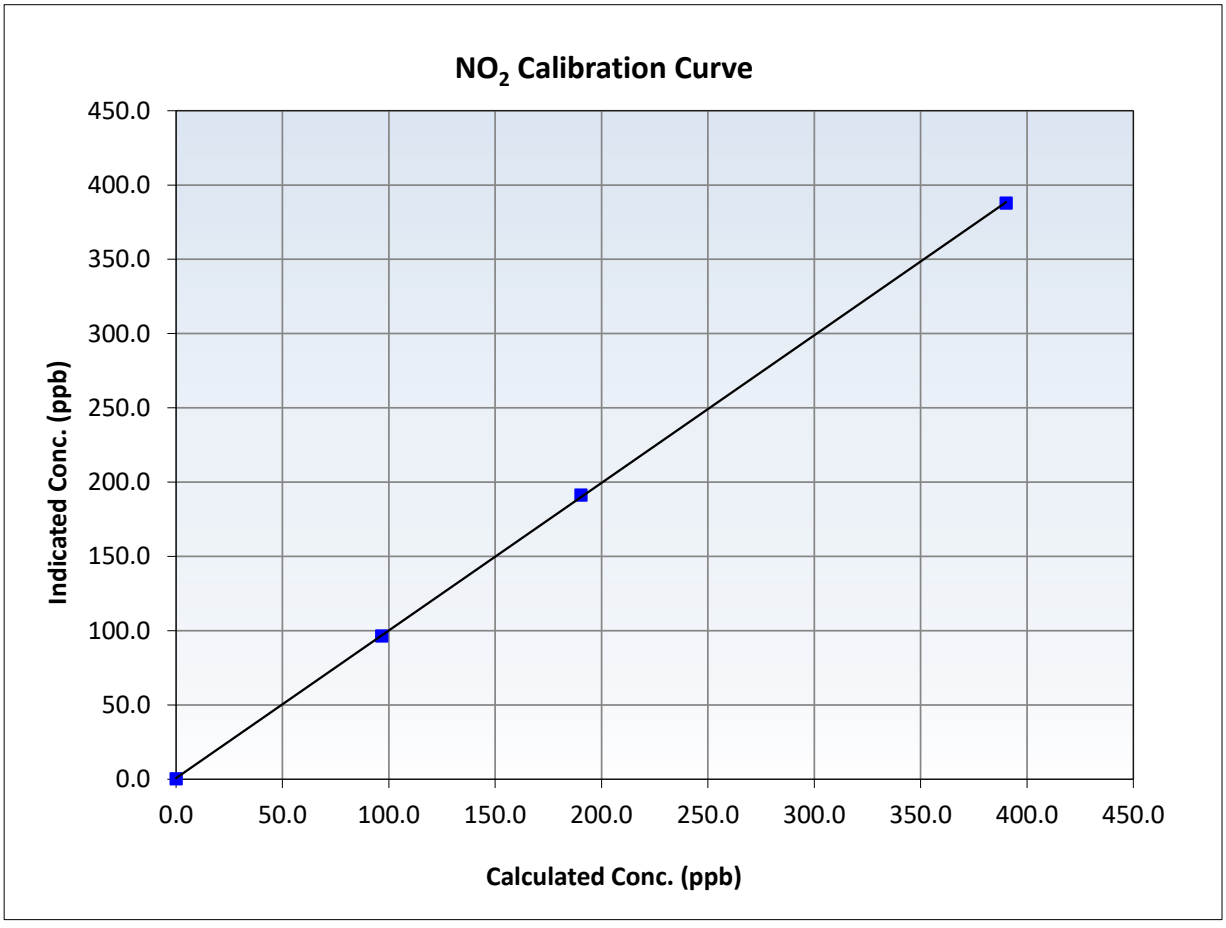
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 18, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:45	End Time (MST):	12:26
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
390.2	387.9	1.0060
190.3	191.3	0.9950
96.7	96.5	1.0024

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	0.993635	*0.90 - 1.10*
Intercept	0.750732	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

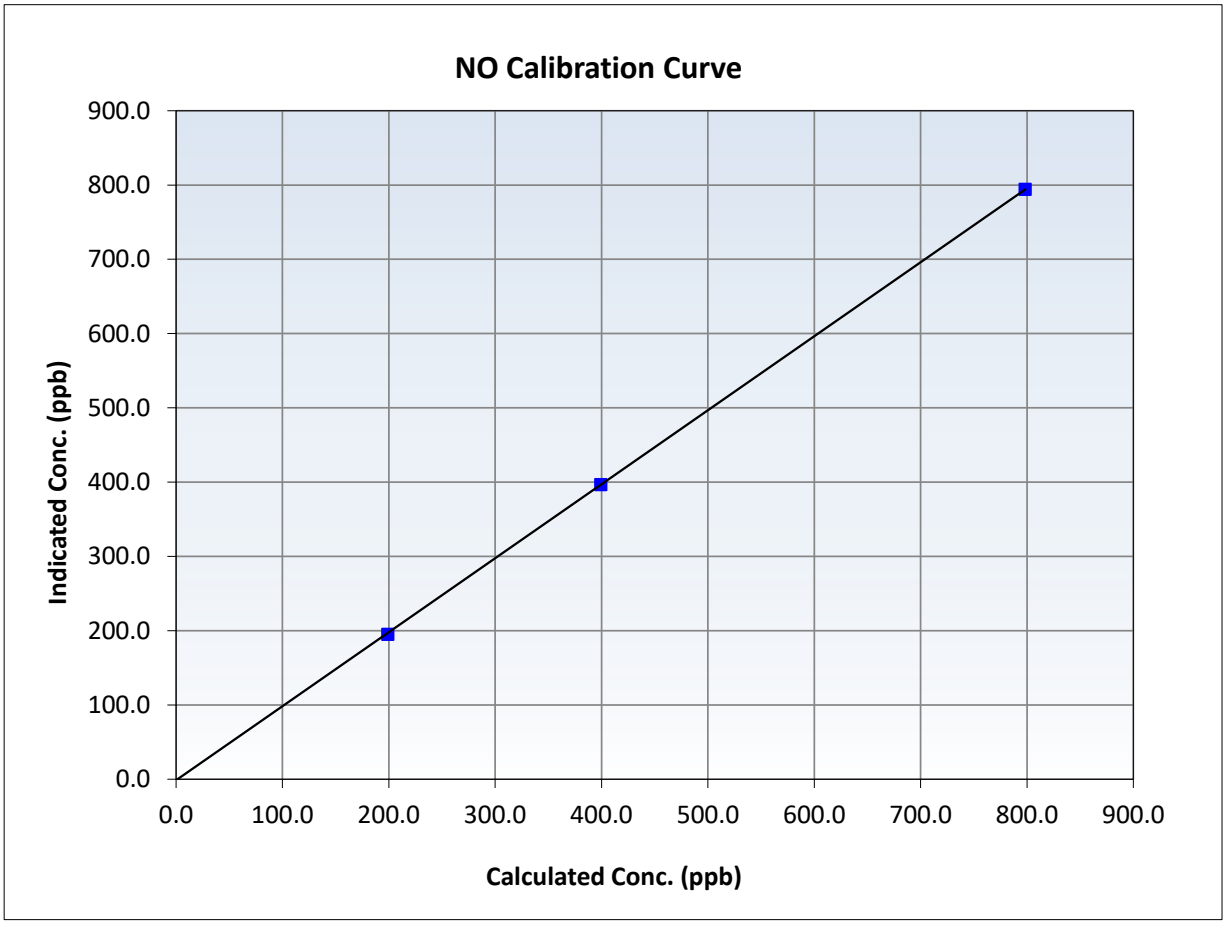
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 18, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	7:45	End Time (MST):	12:26
Analyzer make:	Teledyne API T200	Analyzer serial #:	721

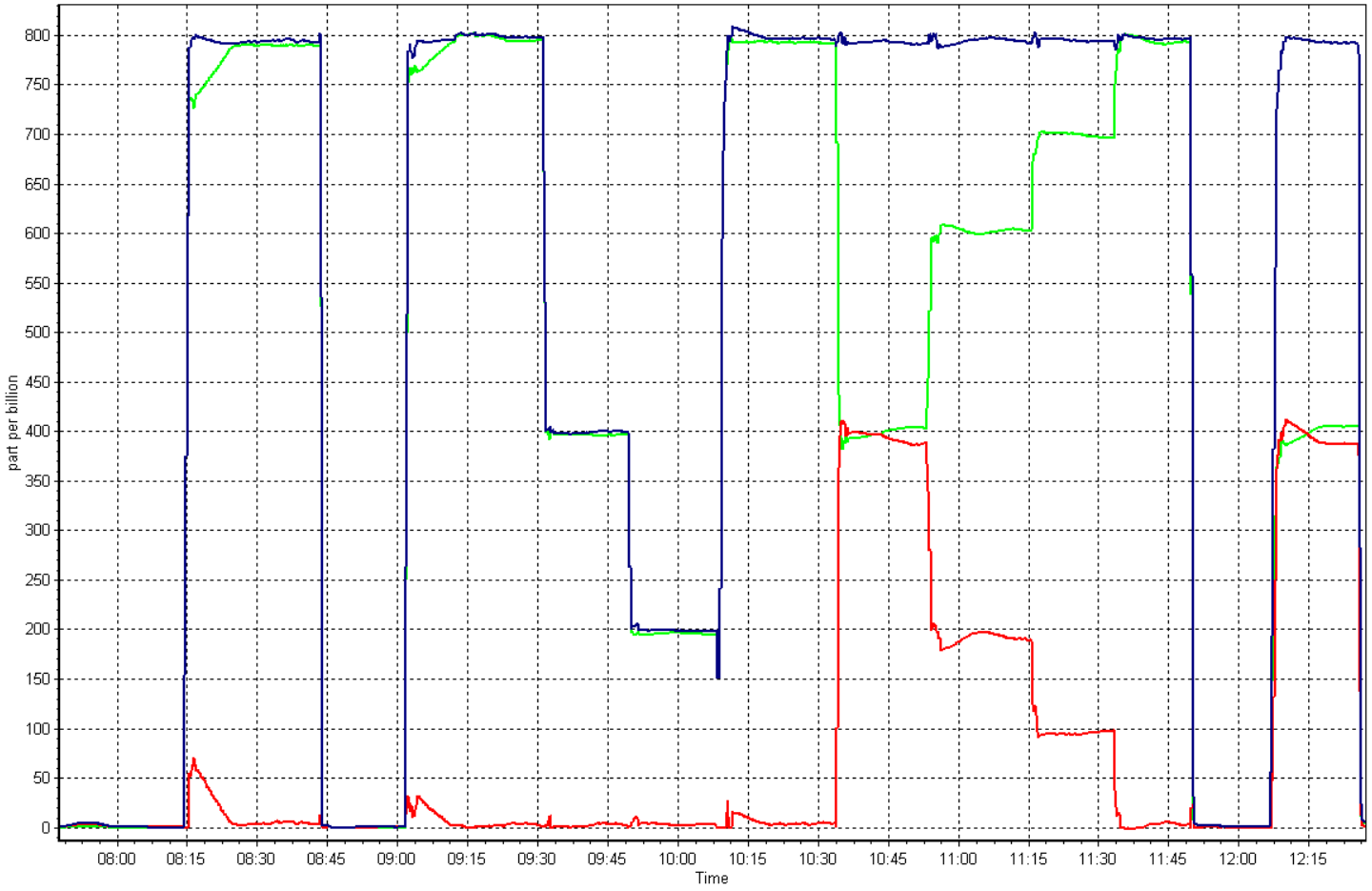
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
798.4	794.4	1.0050
399.2	396.6	1.0065
199.1	195.2	1.0199

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999986	*≥0.995*
Slope	0.996249	*0.90 - 1.10*
Intercept	-1.335337	*+/-20*



NO_X Calibration Plot Date: January 23, 2025 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 21, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	10:18	End time (MST):	12:31
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	APIP T700	Serial Number:	3808
ZAG Make/Model:	API T701	Serial Number:	362

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	2961	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999200	1.009514	Backgd or Offset:	-2.2	-2.2
Calibration intercept:	0.240000	1.760000	Coeff or Slope:	1.020	1.020

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	5000	1007.8	400.0	405.5	0.987
As found Mid point					
As found Low point					
Baseline Corr As found:	405.4	Previous response	399.9	*% change	1.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	1.0	----
High point	5000	1008.0	400.0	405.2	0.987
Mid point	5000	828.7	200.0	204.0	0.980
Low point	5000	715.9	100.0	103.5	0.966
As left zero	5000	0.0	0.0	0.7	----
As left span	5000	1008.2	400.0	404.6	0.989
				Average Correction Factor	0.978

Notes: No adjustments or maintenance done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

O_3 Calibration Summary

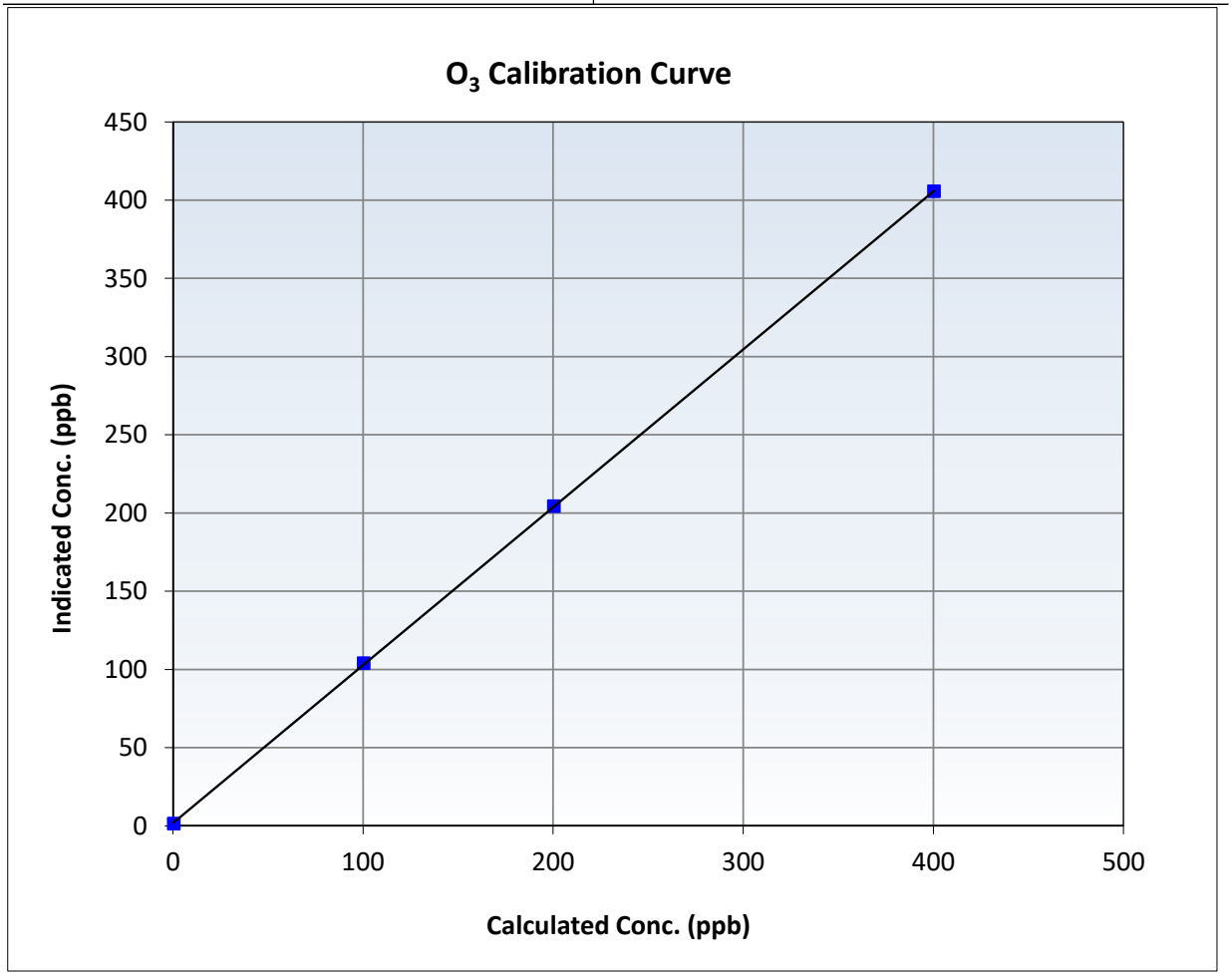
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 11, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	10:18	End Time (MST):	12:31
Analyzer make:	API T400	Analyzer serial #:	2961

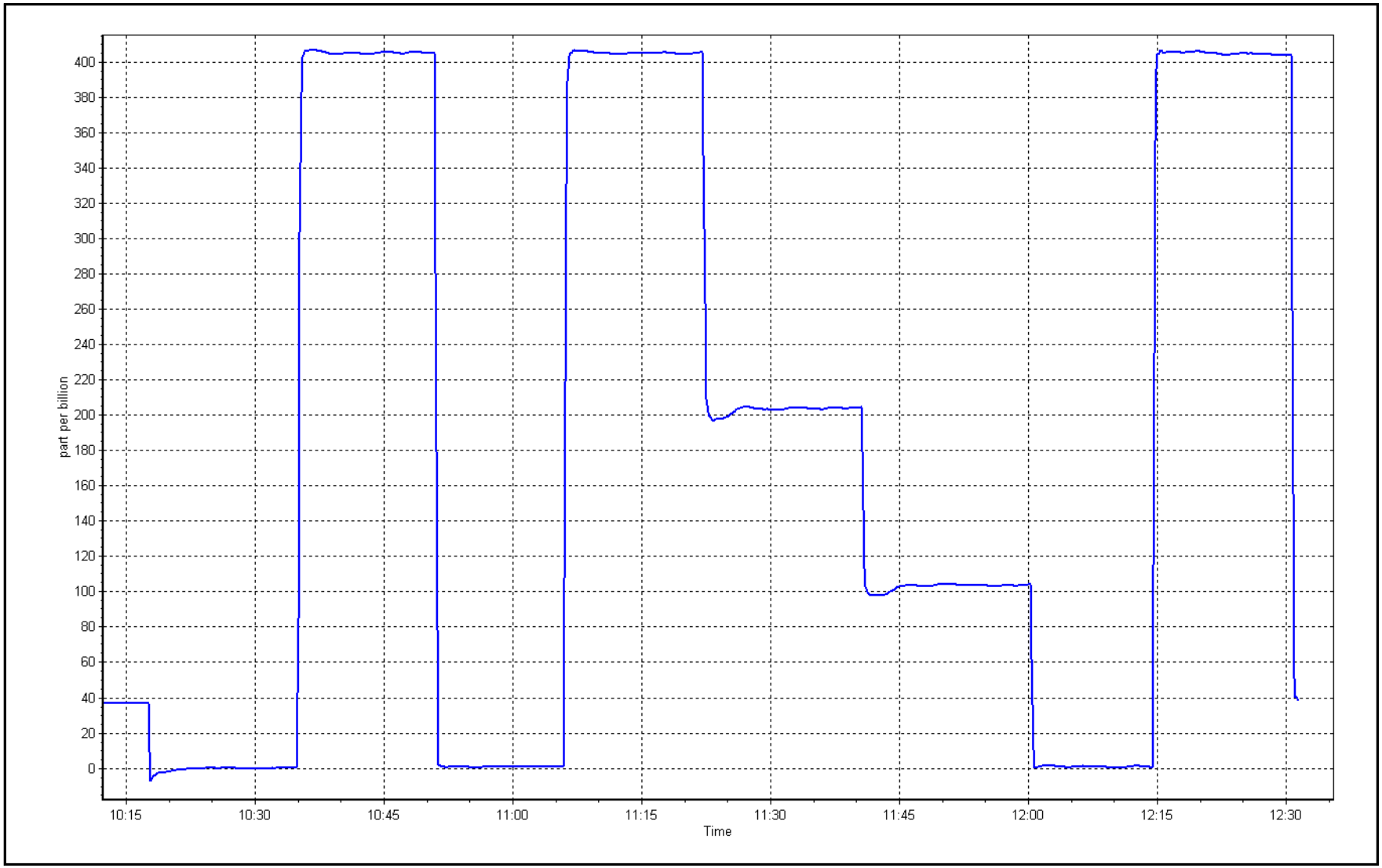
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.0	----
400.0	405.2	0.9872
200.0	204.0	0.9804
100.0	103.5	0.9662

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	1.009514	*0.90 - 1.10*
Intercept	1.760000	*+/- 5*



O_3 Calibration Plot Date: January 21, 2025 Location: Buffalo Viewpoint



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	January 28, 2025	Last Cal Date:	December 19, 2024
Start time (MST):	8:03	End time (MST):	8:41
Analyzer Make:	Teledyne 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)	3.3	2.8	3.3	☐	+/- 2 °C
P (mmHg)	720.4	722.3	720.4	☐	+/- 10 mmHg
Flow (LPM)	5.01	5.09	5.01	☐	+/- 0.25 LPM
PW% (pump)	37	-----	37	☐	>80%
Zero Verification	PM w/o HEPA:	0.7	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 6-10-2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: December 19, 2024

Date Disposable Filter Changed: December 19, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: February 27, 2024

Date RH/T Sensor Cleaned: February 27, 2024

No adjustments done.

Notes:

Calibration by: Melissa Lemay

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS05
MANNIX
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	January 23, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	11:34	End time (MST):	15:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.06	ppm	Cal Gas Exp Date:		October 22, 2032
Cal Gas Cylinder #:		CC308040			
Removed Cal Gas Conc:	49.84	ppm	Rem Gas Exp Date:		January 6, 2030
Removed Gas Cyl #:		CC408659	Diff between cyl:	-0.4%	
Calibrator Model:		API T700	Serial Number:		5470
Zero Air Gen Model:		API T701	Serial Number:		361

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1008841399	
Analyzer Range:	1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.992430	1.002851	Backgd or Offset:	10.0	10.3
Calibration intercept:	-0.685495	-1.097168	Coeff or Slope:	0.935	0.950

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.3	800.4	789.4	1.014
As found Mid point					
As found Low point					
New cylinder response	4920	79.9	800.0	786.0	1.018
Baseline Corr As found:	789.4	Previous response	793.6	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	79.9	800.0	801.6	0.998
Mid point	4960	40.0	400.5	400.5	1.000
Low point	4980	20.0	200.2	198.0	1.011
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	79.9	800.0	801.8	0.998
				Average Correction Factor:	1.003

Notes: Changed the calibration gas cylinder and the inlet filter after as founds. Adjusted the span only.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

SO_2 Calibration Summary

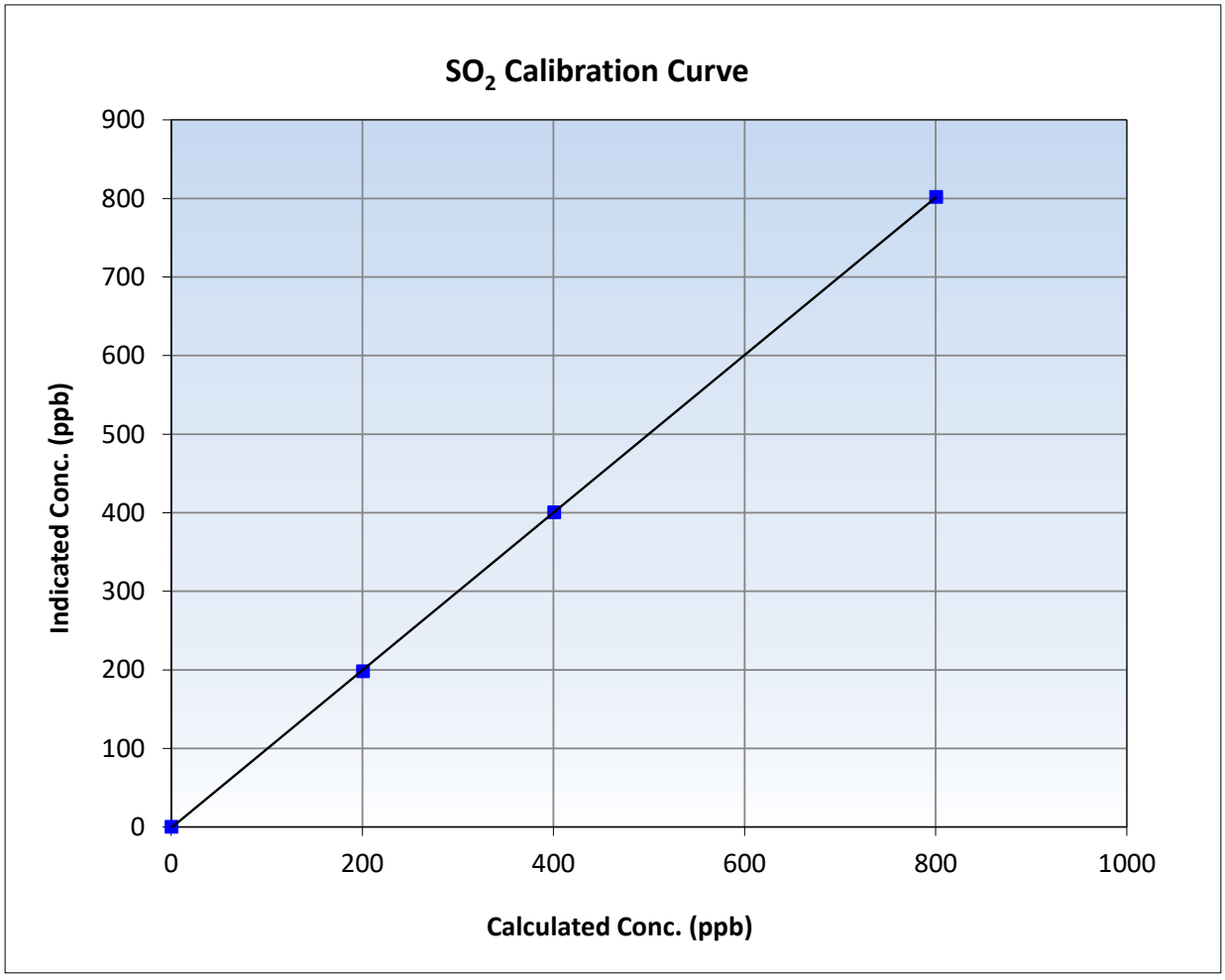
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 12, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	11:34	End Time (MST):	15:30
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841399

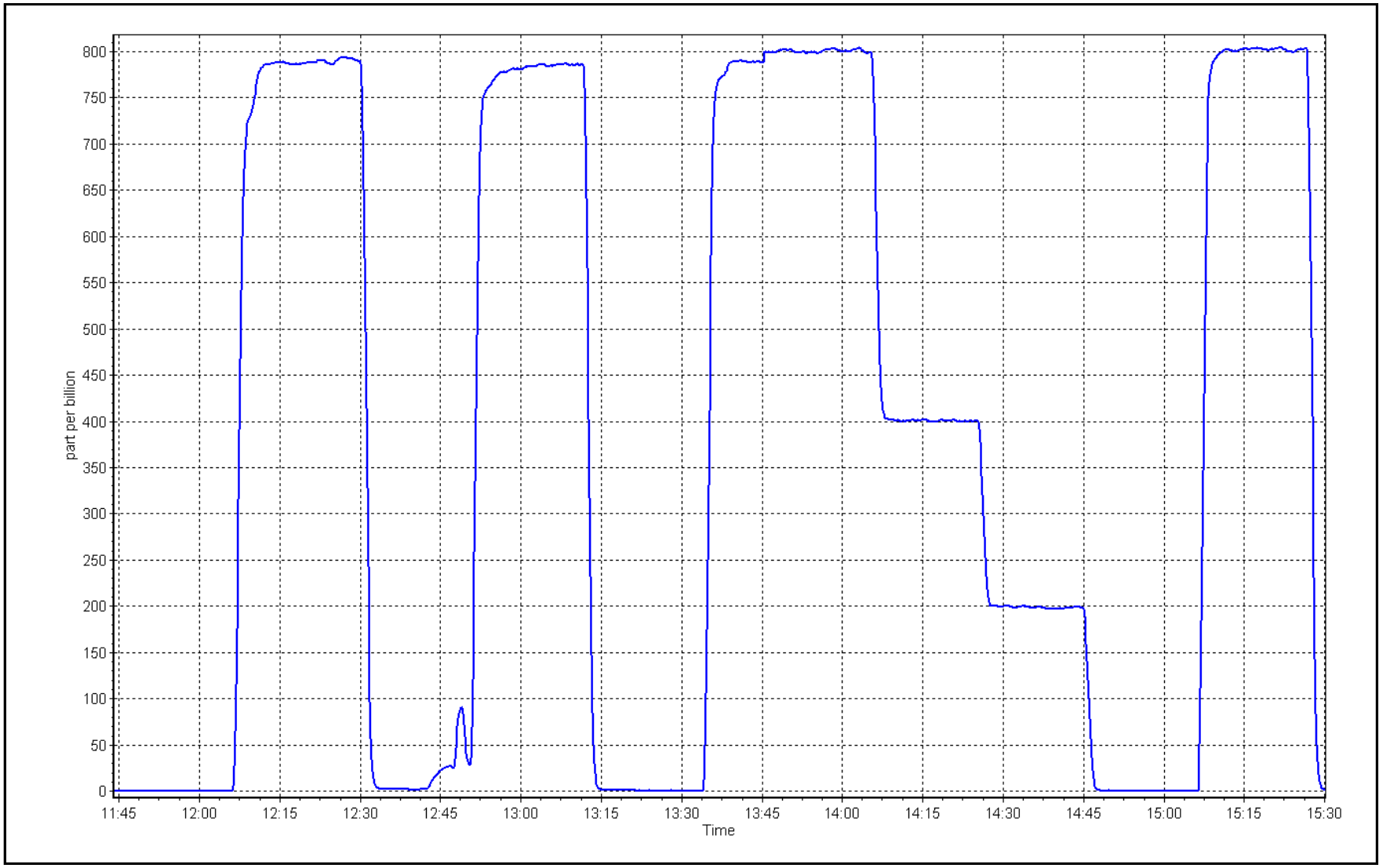
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
800.0	801.6	0.9980
400.5	400.5	1.0000
200.2	198.0	1.0113

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999986	*≥0.995*
Slope	1.002851	*0.90 - 1.10*
Intercept	-1.097168	*+/-30*



SO2 Calibration Plot Date: January 23, 2025 Location: Mannix



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	January 9, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	10:19	End time (MST):	14:13
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.96	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0037363			
Removed Cal Gas Conc:	4.96	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	5470
ZAG Make/Model:	API T701		Serial Number:	361

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	1200326169	
Converter make:	Global		Converter serial #:	2022-225	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996970	1.003834	Backgd or Offset:	1.25	1.25
Calibration intercept:	0.062422	0.122250	Coeff or Slope:	1.029	1.029

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4919	80.6	80.0	81.2	0.986
As found Mid point	4960	40.3	40.0	40.7	0.985
As found Low point	4980	20.2	20.0	20.1	1.002
New cylinder response					
Baseline Corr As found:	81.1	Prev response:	79.78	*% change:	1.6%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.015698	AF Intercept:	-0.017922
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999977	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4919	80.6	80.0	80.3	0.996
Mid point	4960	40.3	40.0	40.5	0.987
Low point	4980	20.2	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.2	----
As left span	4919	80.6	80.0	80.3	0.996
SO2 Scrubber Check	4920	80.3	803.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	0.993
Date of last converter efficiency test:					

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

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

H_2S Calibration Summary

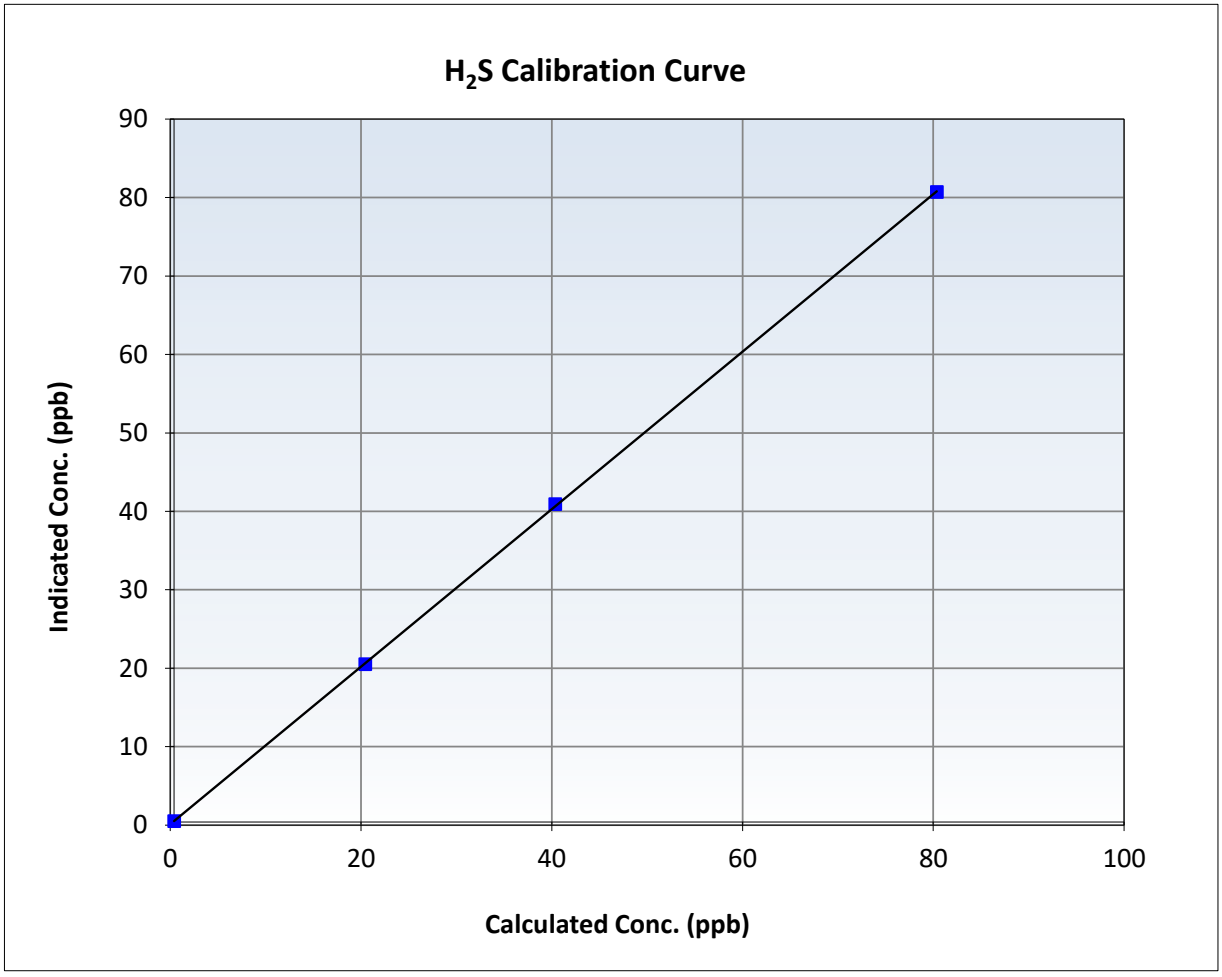
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 3, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:19	End Time (MST):	14:13
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1200326169

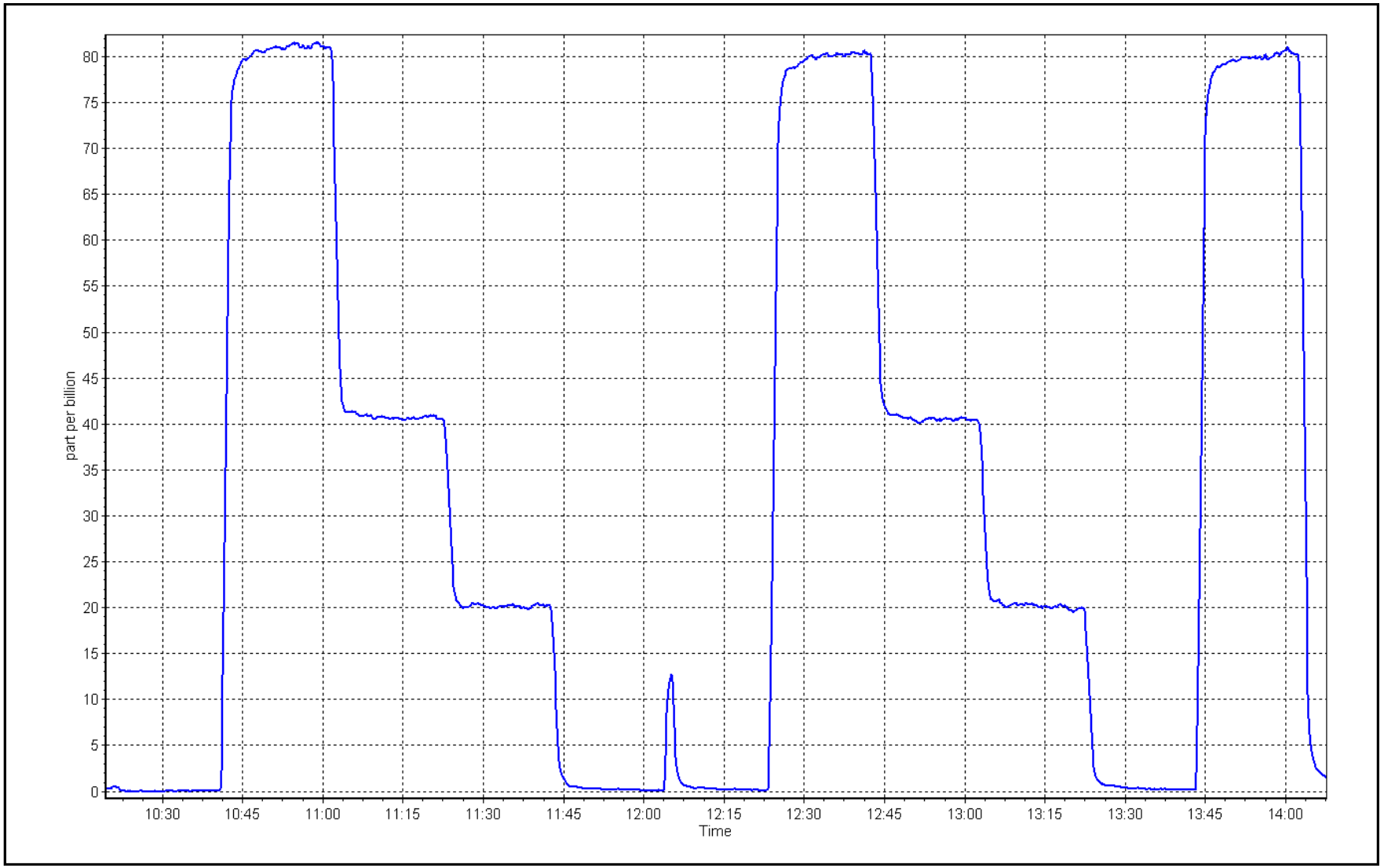
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	80.3	0.9958
40.0	40.5	0.9870
20.0	20.1	0.9969

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	1.003834	*0.90 - 1.10*
Intercept	0.122250	*+/-3*



H_2S Calibration Plot Date: January 9, 2025 Location: Mannix



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	January 23, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	11:34	End time (MST):	15:30
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC308040	Cal Gas Expiry Date:	October 22, 2032
CH4 Cal Gas Conc.	500.3 ppm	CH4 Equiv Conc.	1047.6 ppm
C3H8 Cal Gas Conc.	199.0 ppm		
Removed Gas Cert:	CC408659	Removed Gas Expiry:	January 6, 2030
Removed CH4 Conc.	507.2 ppm	CH4 Equiv Conc.	1057.8 ppm
Removed C3H8 Conc.	200.2 ppm	Diff between cyl (THC):	1.1%
Diff between cyl (CH_4):	2.1%	Diff between cyl (NM):	0.2%
Calibrator Model:	API T700	Serial Number:	5470
Zero Air Gen model:	API T701	Serial Number:	361

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.94E-04	3.26E-04	NMHC SP Ratio:	5.37E-05	6.07E-05
CH4 Retention time:	15.4	15.4	NMHC Peak Area:	164658	145688
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	16.99	15.18	1.119
As found Mid point					
As found Low point					
New cylinder response	4920	79.9	16.74	15.11	1.108
Baseline Corr AF:	15.18	Prev response	17.02	*% change	-12.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	16.74	16.89	0.991
Mid point	4960	40.0	8.38	8.44	0.993
Low point	4980	20.0	4.19	4.20	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.9	16.74	16.88	0.992
				Average Correction Factor	0.994

Notes: As found span is 12% low, instrument diagnostics are normal, will complete maintenance if the span continues to go down. Changed the calibration gas after as founds. Adjusted the span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.84	7.85	1.127
As found Mid point					
As found Low point					
New cylinder response	4920	79.9	8.75	7.77	1.125
Baseline Corr AF:	7.85	Prev response	8.86	*% change	-12.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	8.75	8.78	0.996
Mid point	4960	40.0	4.38	4.39	0.996
Low point	4980	20.0	2.19	2.19	0.998
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.9	8.75	8.78	0.996
				Average Correction Factor	0.997

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.15	7.33	1.111
As found Mid point					
As found Low point					
New cylinder response	4920	79.9	7.99	7.34	1.090
Baseline Corr AF:	7.33	Prev response	8.16	*% change	-11.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	7.99	8.11	0.986
Mid point	4960	40.0	4.00	4.04	0.990
Low point	4980	20.0	2.00	2.00	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.9	7.99	8.10	0.987
				Average Correction Factor	0.992

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.002401	1.009547
THC Cal Offset:	-0.004715	-0.017155
CH4 Cal Slope:	1.002491	1.015445
CH4 Cal Offset:	-0.001054	-0.015192
NMHC Cal Slope:	1.002085	1.004494
NMHC Cal Offset:	-0.003261	-0.002762

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

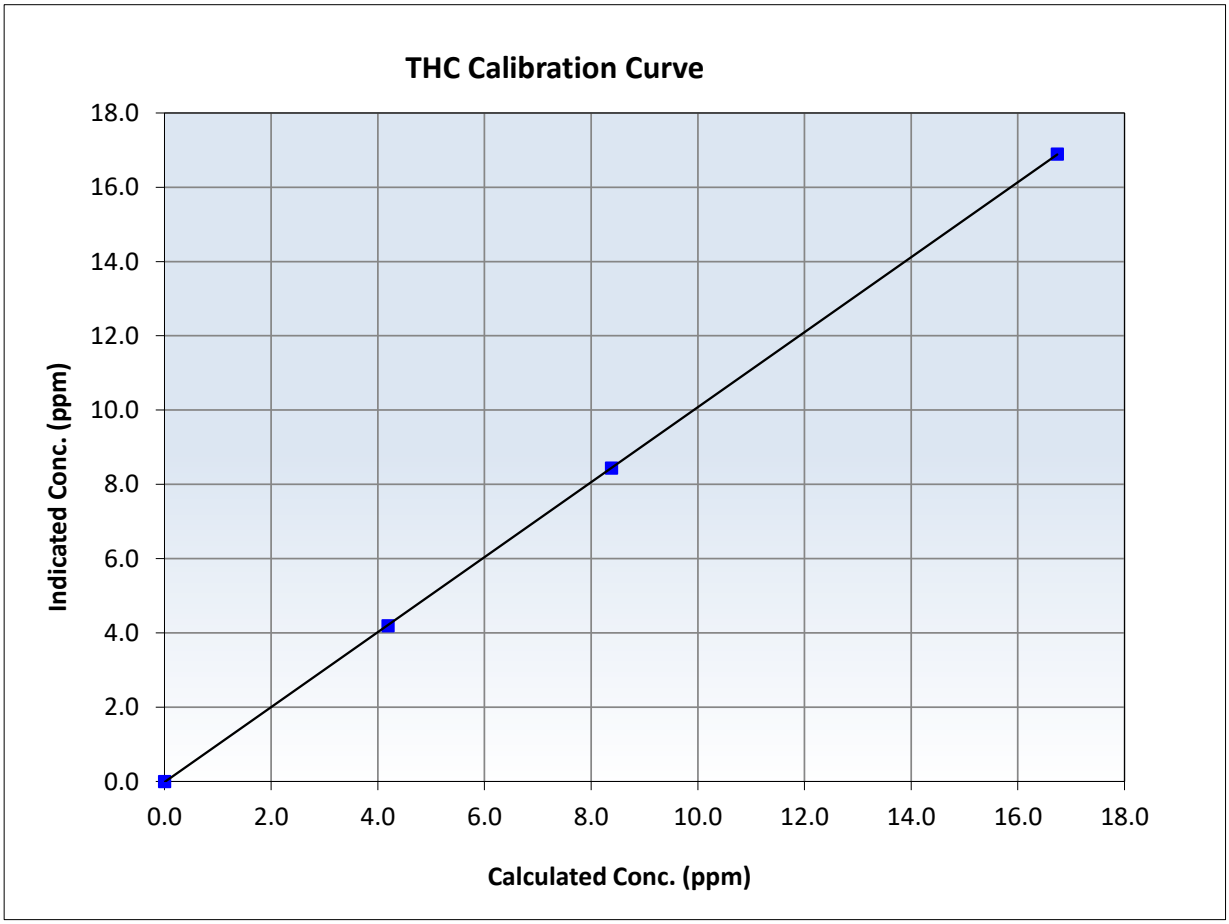
THC Calibration Summary

Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 12, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	11:34	End Time (MST):	15:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999995	≥0.995
16.74	16.89	0.9911	Slope	1.009547	0.90 - 1.10
8.38	8.44	0.9934			
4.19	4.20	0.9989	Intercept	-0.017155	+/-0.5



Wood Buffalo Environmental Association

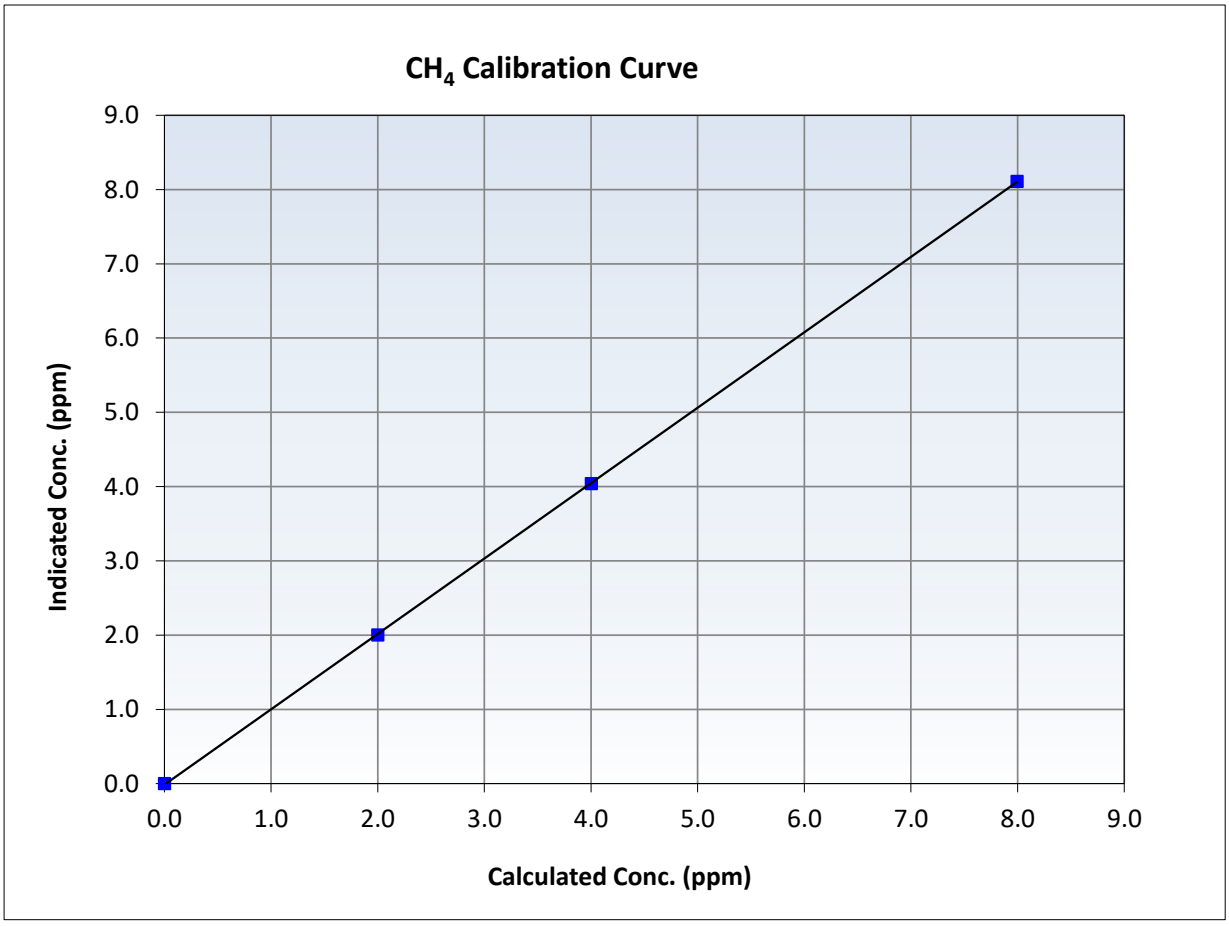
CH_4 Calibration Summary

Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 12, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	11:34	End Time (MST):	15:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999984	≥0.995
7.99	8.11	0.9857	Slope	1.015445	0.90 - 1.10
4.00	4.04	0.9904			
2.00	2.00	0.9996	Intercept	-0.015192	+/-0.5



Wood Buffalo Environmental Association

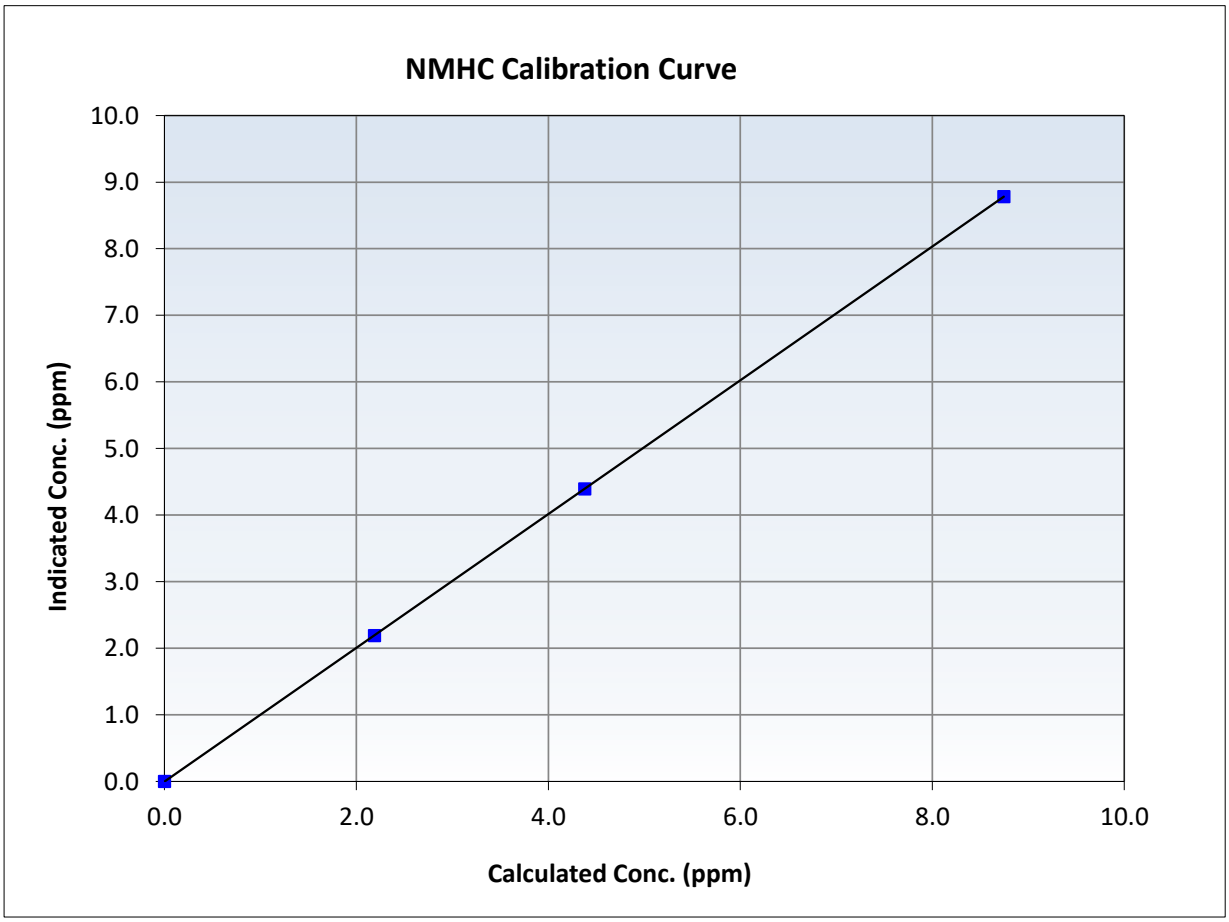
NMHC Calibration Summary

Station Information

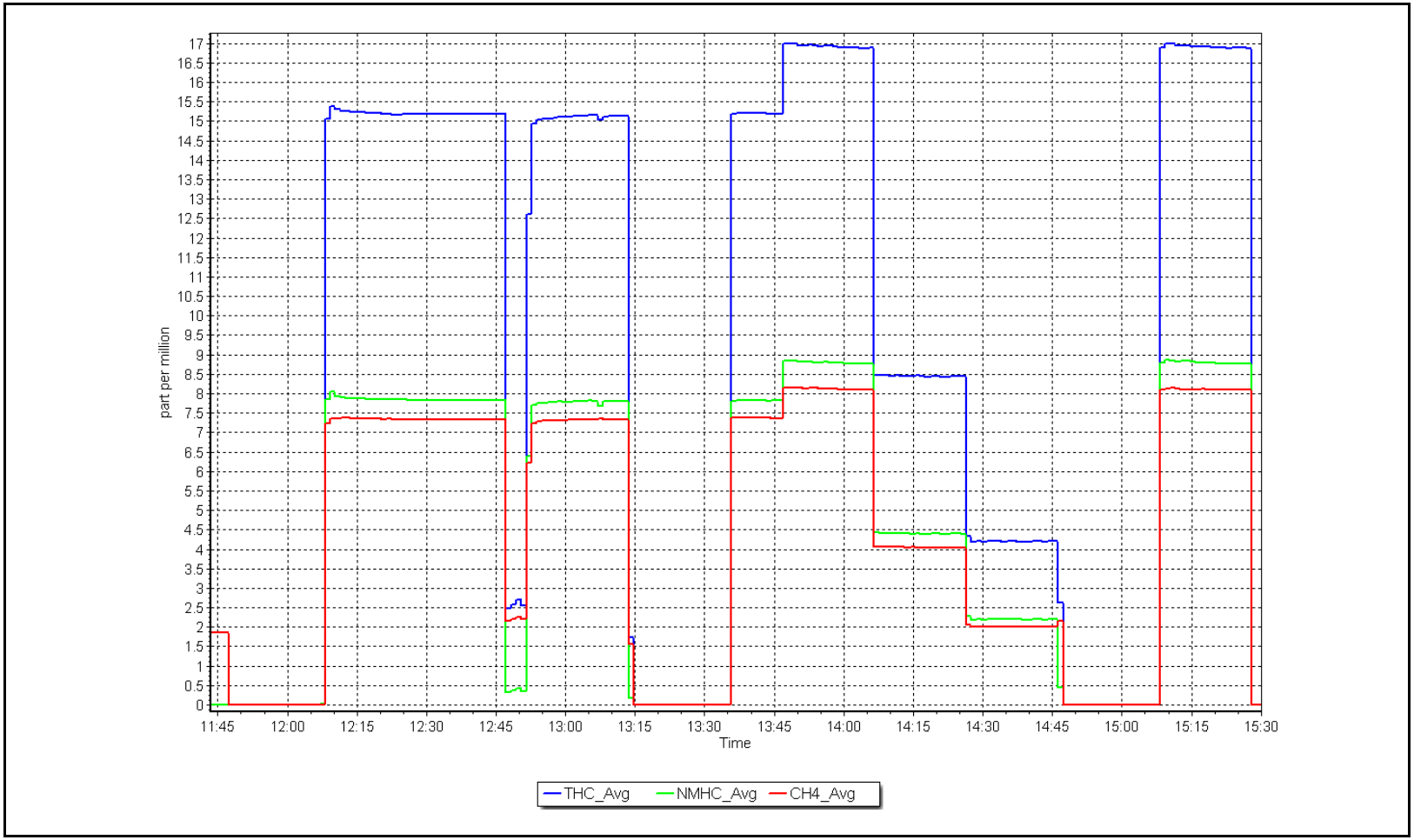
Calibration Date:	January 23, 2025	Previous Calibration:	December 12, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	11:34	End Time (MST):	15:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	1.000000	≥0.995
8.75	8.78	0.9957	Slope	1.004494	0.90 - 1.10
4.38	4.39	0.9964	Intercept	-0.002762	+/-0.5
2.19	2.19	0.9982			



NMHC Calibration Plot Date: January 23, 2025 Location: Mannix



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	January 24, 2025	Last Cal Date:	January 23, 2025
Start time (MST):	10:47	End time (MST):	13:00
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC308040	Cal Gas Expiry Date:	October 22, 2032
CH4 Cal Gas Conc.	500.3 ppm	CH4 Equiv Conc.	1047.6 ppm
C3H8 Cal Gas Conc.	199.0 ppm		
Removed Gas Cert:	N/A	Removed Gas Expiry:	N/A
Removed CH4 Conc.	500.3 ppm	CH4 Equiv Conc.	1047.6 ppm
Removed C3H8 Conc.	199.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	5470
Zero Air Gen model:	API T701	Serial Number:	361

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1193585649
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	3.26E-04	3.26E-04	NMHC SP Ratio:	6.07E-05	6.07E-05
CH4 Retention time:	15.4	15.4	NMHC Peak Area:	145688	145688
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.9	16.74	16.88	0.992
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.88	Prev response	16.88	*% change	0.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	16.74	17.11	0.978
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 0.978

Notes: Changed the N2 cylinder after as founds.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.9	8.75	8.80	0.993
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.80	Prev response	8.78	*% change	0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	8.75	8.99	0.973
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	0.973

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.9	7.99	8.08	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.08	Prev response	8.10	*% change	-0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

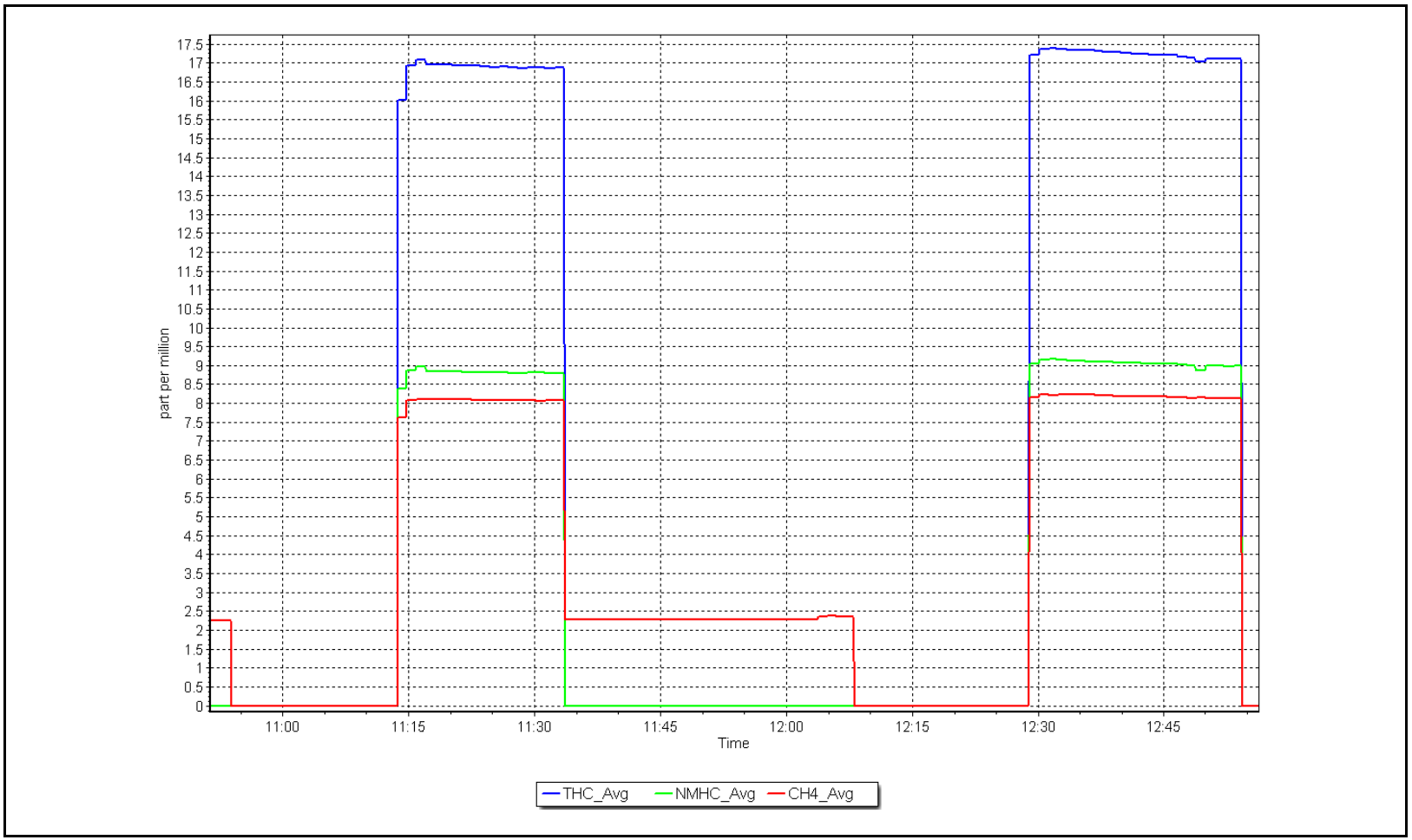
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.9	7.99	8.12	0.985
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	0.985

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.009547	1.022092
THC Cal Offset:	-0.017155	0.000000
CH4 Cal Slope:	1.015445	1.015641
CH4 Cal Offset:	-0.015192	0.000000
NMHC Cal Slope:	1.004494	1.027989
NMHC Cal Offset:	-0.002762	0.000000

Calibration Performed By: Max Farrell

NMHC Calibration Plot Date: January 24, 2025 Location: Mannix



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS06
PATRICIA MCINNES
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 2, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	10:10	End time (MST):	13:30
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:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3566
Zero Air Gen Model:	API T701		Serial Number:	5608

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290013	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996115	0.992043	Backgd or Offset:	18.1	17.7
Calibration intercept:	1.781114	2.281184	Coeff or Slope:	0.910	0.910

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4919.7	80.3	799.5	799.1	1.000
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	799.3	Previous response	798.1	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4919.7	80.3	799.5	794.1	1.007
Mid point	4959.8	40.2	400.2	400.9	0.998
Low point	4979.9	20.1	200.1	202.8	0.987
As left zero	5000	0.0	0.0	0.0	----
As left span	4919.7	80.3	799.5	797.0	1.003
				Average Correction Factor:	0.997

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

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

SO_2 Calibration Summary

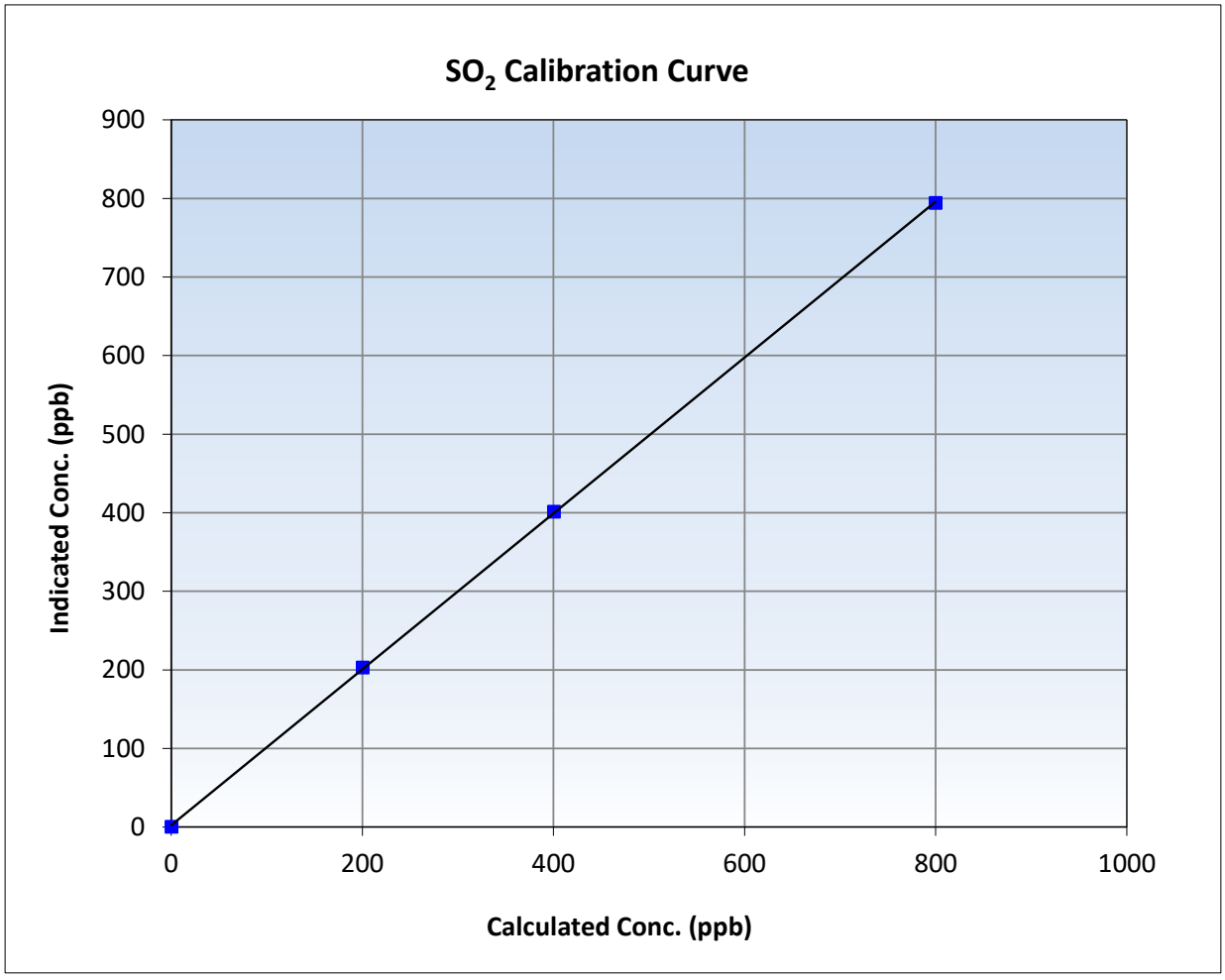
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 2, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:10	End Time (MST):	13:30
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290013

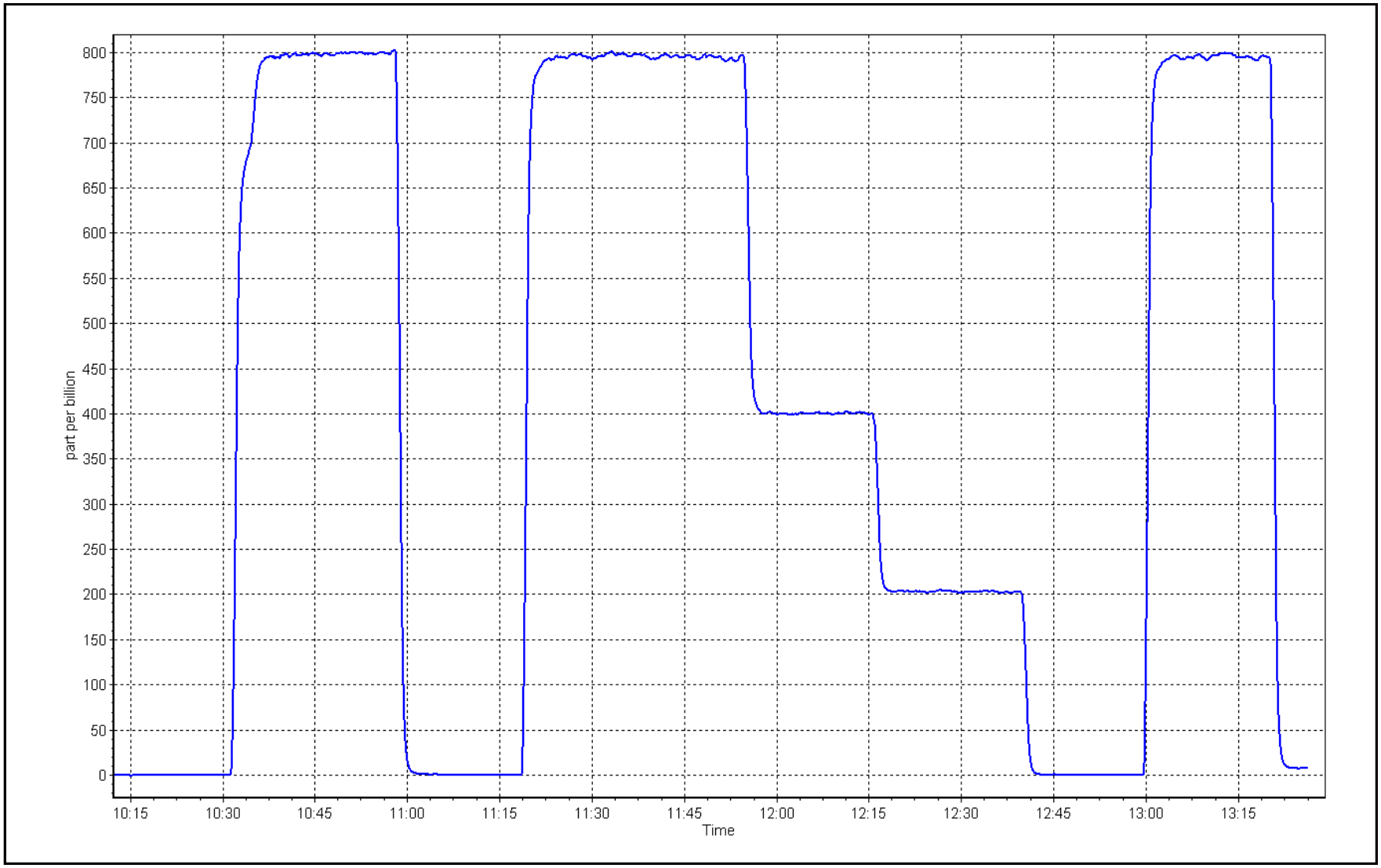
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.5	794.1	1.0068
400.2	400.9	0.9983
200.1	202.8	0.9868

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999961	*≥0.995*
Slope	0.992043	*0.90 - 1.10*
Intercept	2.281184	*+/-30*



SO2 Calibration Plot Date: January 2, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 27, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	10:45	End time (MST):	15:11
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.328	ppm	Cal Gas Exp Date:	February 14, 2025
Cal Gas Cylinder #:	CC506659			
Removed Cal Gas Conc:	5.328	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		Serial Number:	4602

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1218153358
Converter make:	CDN-101		Converter serial #:	517
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001163	0.995884	Backgd or Offset:	1.99	1.98
Calibration intercept:	0.280517	0.440307	Coeff or Slope:	1.153	1.135

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4925	75.1	80.0	82.7	0.970
As found Mid point	4963	37.5	40.0	41.7	0.963
As found Low point	4981	18.8	20.0	21.0	0.963
New cylinder response					

Baseline Corr As found:	82.5	Prev response:	80.40	*% change:	2.5%
Baseline Corr 2nd AF pt:	41.5	AF Slope:	1.030739	AF Intercept:	0.320265
Baseline Corr 3rd AF pt:	20.8	AF Correlation:	0.999983	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4925	75.1	80.0	80.0	1.000
Mid point	4963	37.5	40.0	40.5	0.987
Low point	4981	18.8	20.0	20.4	0.982
As left zero	5000	0.0	0.0	0.4	----
As left span	4925	75.1	80.0	79.4	1.008
SO2 Scrubber Check	4920	80.3	803.0	0.1	----

Date of last scrubber change:	December 20, 2021	Ave Corr Factor	0.990
Date of last converter efficiency test:			

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

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

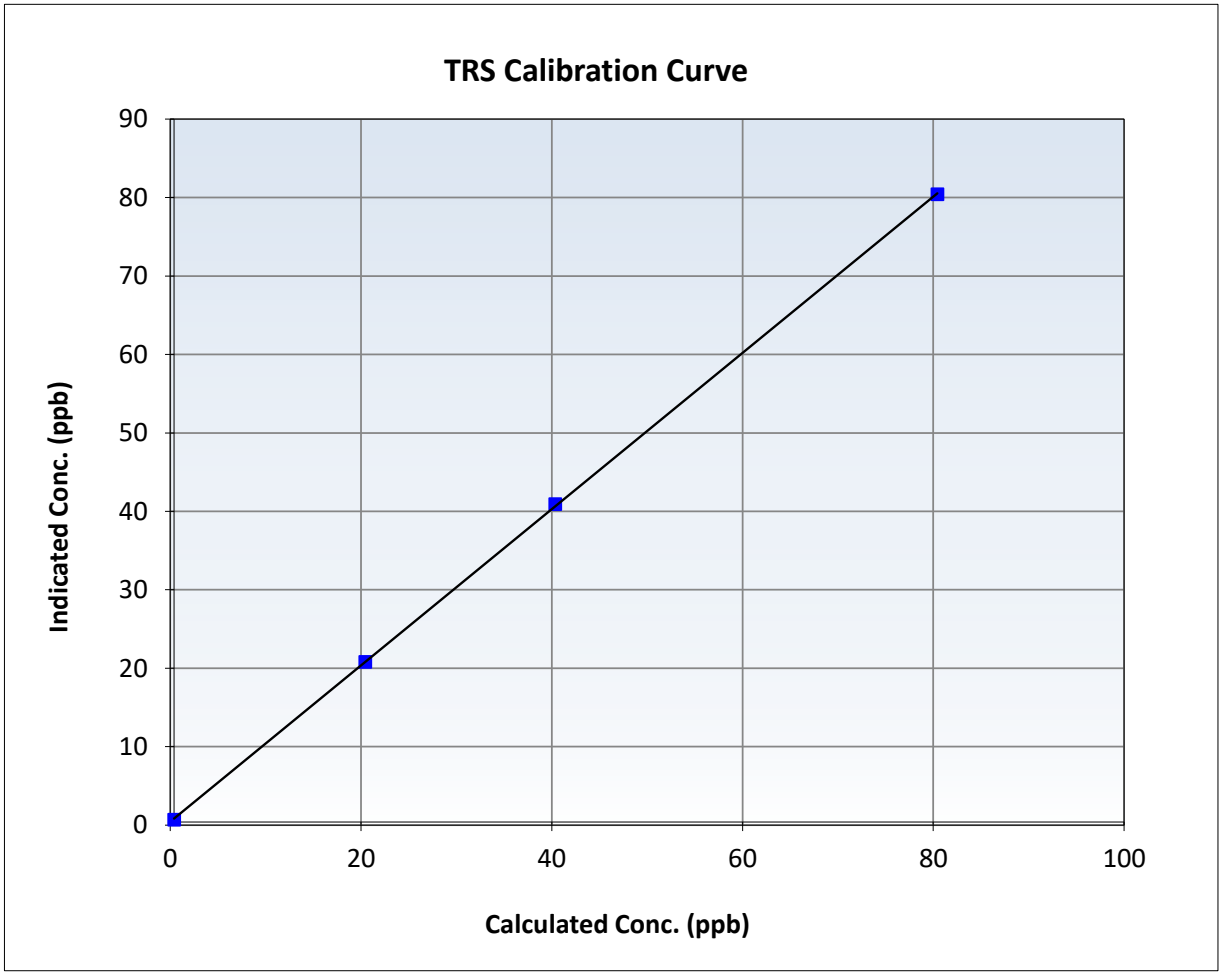
TRS Calibration Summary

Station Information

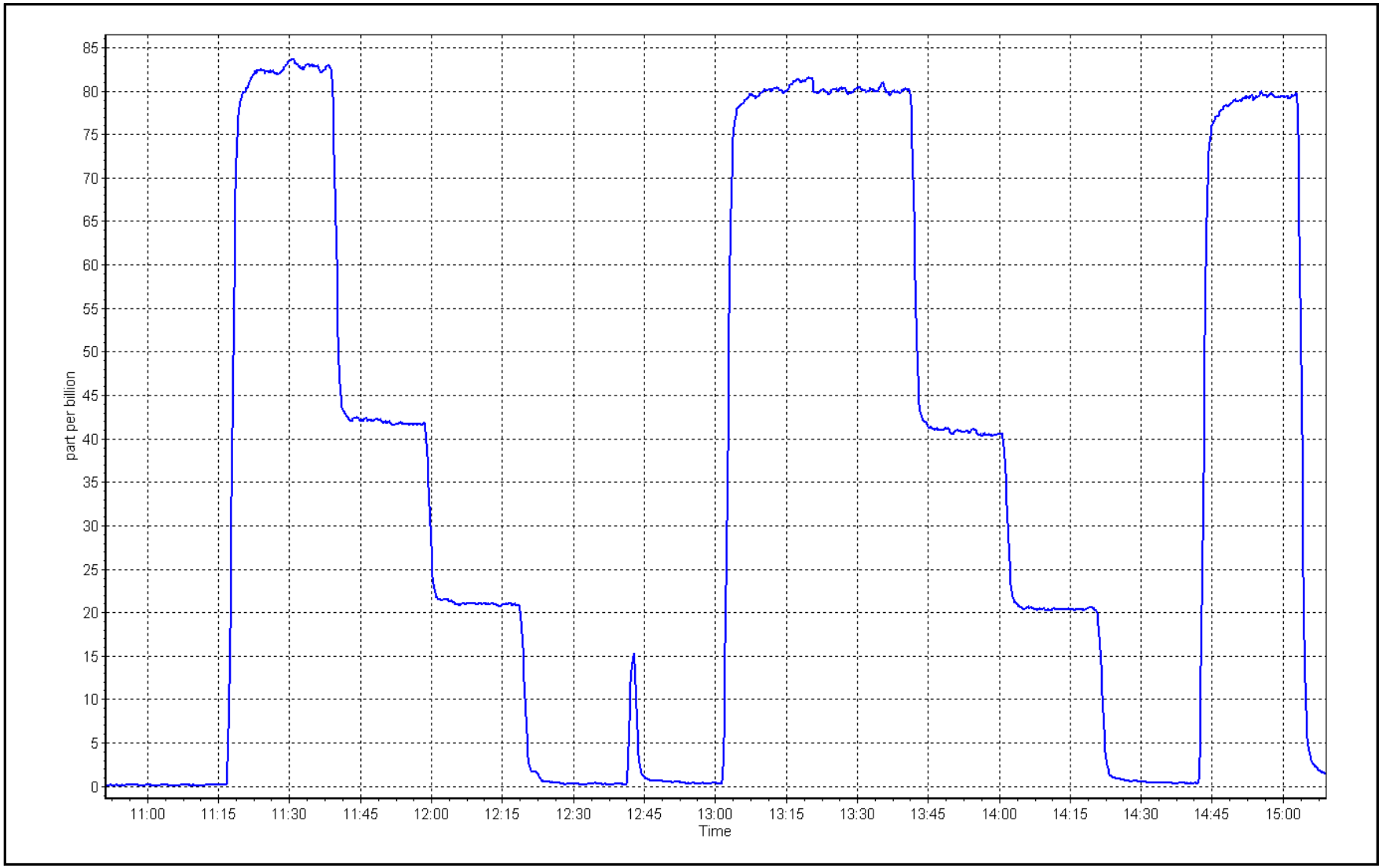
Calibration Date:	January 27, 2025	Previous Calibration:	December 13, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:45	End Time (MST):	15:11
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1218153358

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.3	----	Correlation Coefficient	0.999968	*≥0.995*
80.0	80.0	1.0003	Slope	0.995884	*0.90 - 1.10*
40.0	40.5	0.9866			
20.0	20.4	0.9821	Intercept	0.440307	*+/-3*



TRS Calibration Plot Date: January 27, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 2, 2025	Last Cal Date:	December 1, 2024
Start time (MST):	10:10	End time (MST):	13:30
Reason:	Routine		

Calibration Standards

Gas Cert Reference:		AAL070632	Cal Gas Expiry Date:	September 9, 2024	
CH4 Cal Gas Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3566	
Zero Air Gen model:	API T701		Serial Number:	4602	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320037	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.14E-04	3.48E-04	NMHC SP Ratio:	5.56E-05	5.75E-05
CH4 Retention time:	15.6	16.0	NMHC Peak Area:	163047	157860
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	16.18	1.059
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.17	Prev response	17.12	*% change	-5.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.01	----
High point	4920	80.3	17.12	17.20	0.996
Mid point	4960	40.2	8.57	8.70	0.985
Low point	4980	20.1	4.29	4.39	0.977
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.12	17.04	1.005
				Average Correction Factor	0.986

Notes: CH4 retention time shifted since installation in December. Inlet filter changed after as founds. Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	8.90	1.019
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.90	Prev response	9.08	*% change	-2.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.07	9.13	0.993
Mid point	4960	40.2	4.54	4.62	0.982
Low point	4980	20.1	2.27	2.32	0.977
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.07	8.96	1.012
				Average Correction Factor	0.984

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	7.28	1.107
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.28	Prev response	8.04	*% change	-10.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.06	8.08	0.997
Mid point	4960	40.2	4.03	4.08	0.989
Low point	4980	20.1	2.02	2.07	0.976
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.06	8.07	0.998
				Average Correction Factor	0.987

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997000	1.002675
THC Cal Offset:	0.049629	0.058596
CH4 Cal Slope:	0.996570	1.001993
CH4 Cal Offset:	0.013646	0.024026
NMHC Cal Slope:	0.998050	1.006105
NMHC Cal Offset:	0.035582	0.025365

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

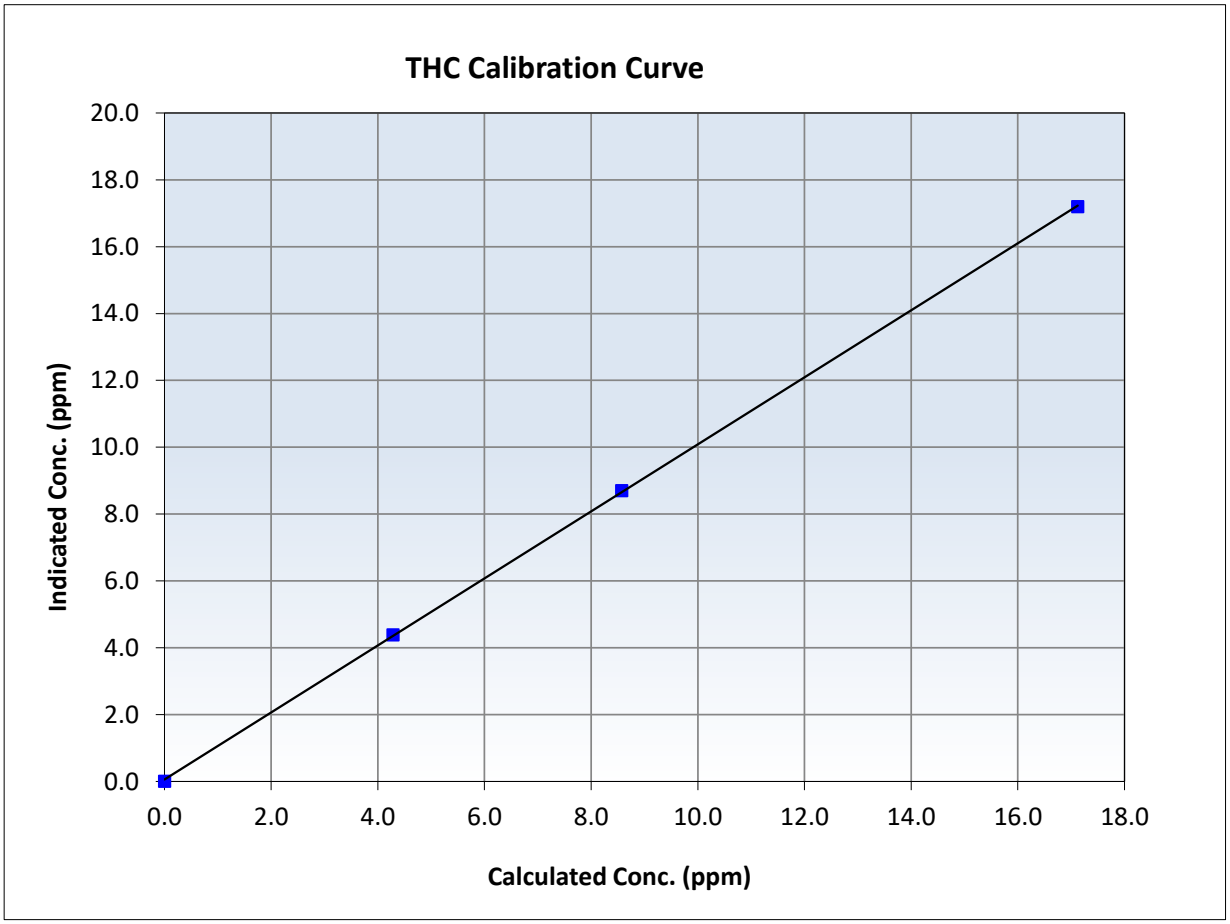
THC Calibration Summary

Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 1, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:10	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.01	----	Correlation Coefficient	0.999958	*≥0.995*
17.12	17.20	0.9958	Slope	1.002675	*0.90 - 1.10*
8.57	8.70	0.9851	Intercept	0.058596	*+/-0.5*
4.29	4.39	0.9765			



Wood Buffalo Environmental Association

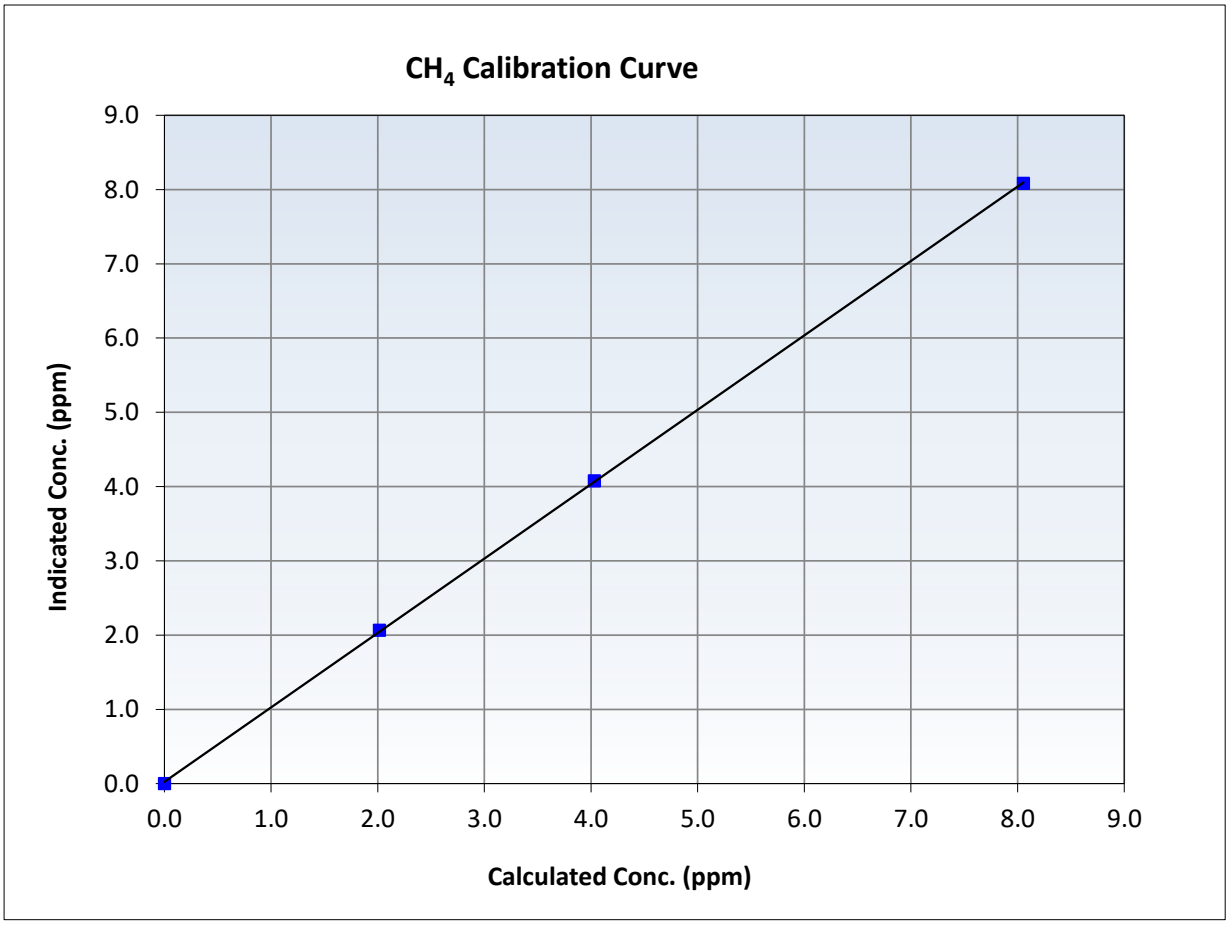
CH_4 Calibration Summary

Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 1, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:10	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999959	≥0.995
8.06	8.08	0.9966	Slope	1.001993	0.90 - 1.10
4.03	4.08	0.9886			
2.02	2.07	0.9755	Intercept	0.024026	+/-0.5



Wood Buffalo Environmental Association

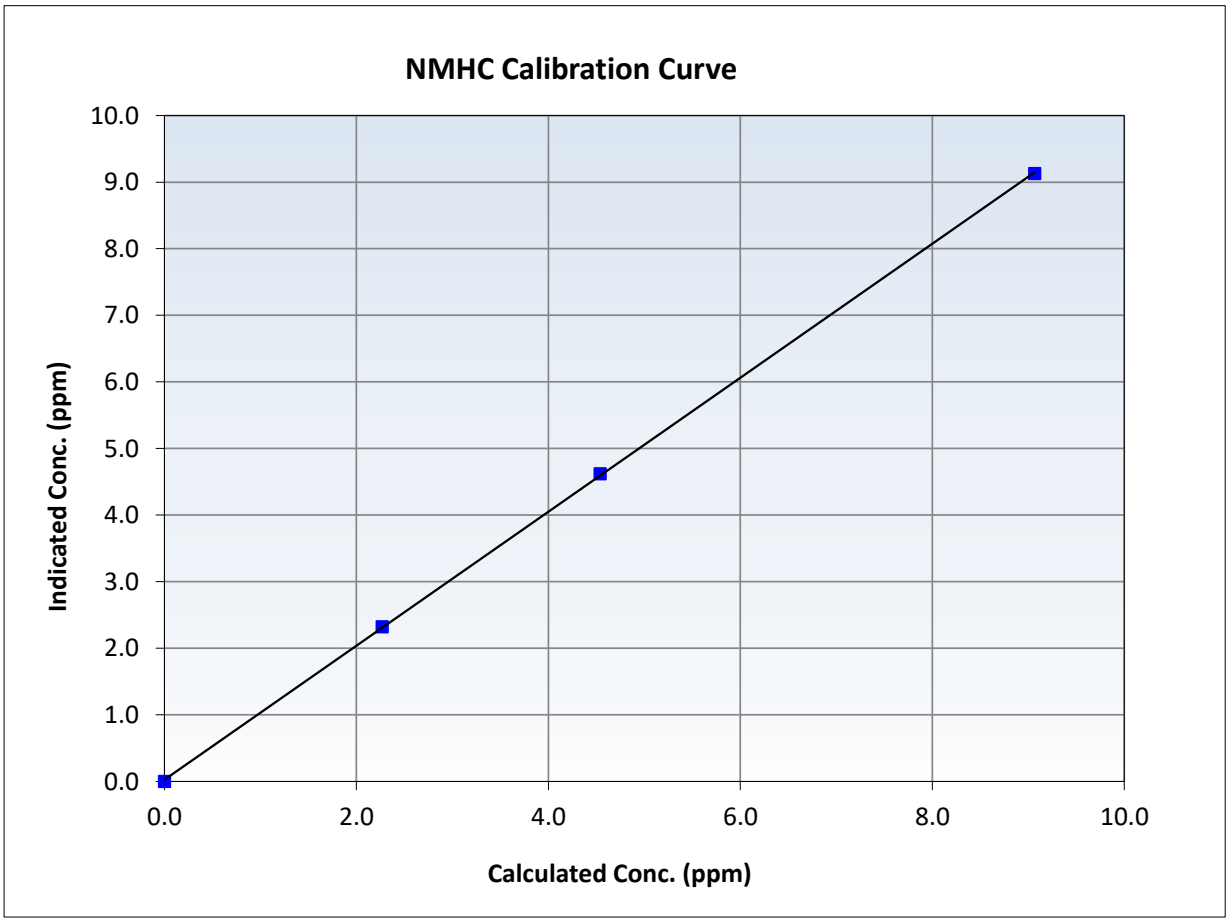
NMHC Calibration Summary

Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 1, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:10	End Time (MST):	13:30
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320037

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999953	≥0.995
9.07	9.13	0.9932	Slope	1.006105	0.90 - 1.10
4.54	4.62	0.9818			
2.27	2.32	0.9774	Intercept	0.025365	+/-0.5



NMHC Calibration Plot Date: January 2, 2025 Location: Patricia McInnes

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 10, 2025	Last Cal Date:	January 2, 2025
Start time (MST):	10:30	End time (MST):	13:59
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:		CC255448	Cal Gas Expiry Date:	October 22, 2032	
CH4 Cal Gas Conc.	501.4	ppm	CH4 Equiv Conc.	1049.5	ppm
C3H8 Cal Gas Conc.	199.3	ppm			
Removed Gas Cert:		AAL070632	Removed Gas Expiry:	September 9, 2024	
Removed CH4 Conc.	501.6	ppm	CH4 Equiv Conc.	1066.2	ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC):	-0.4%	
Diff between cyl (CH_4):	-0.2%		Diff between cyl (NM):	-0.7%	
Calibrator Model:	API T700		Serial Number:	3566	
Zero Air Gen model:	API T701		Serial Number:	4602	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1180320037	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.48E-04	3.48E-04	NMHC SP Ratio:	5.75E-05	5.75E-05
CH4 Retention time:	16.0	16.0	NMHC Peak Area:	157860	157860
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.12	17.31	0.990
As found Mid point					
As found Low point					
New cylinder response	4920	79.8	16.75	16.87	0.993
Baseline Corr AF:	17.30	Prev response	17.23	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.01	----
High point	4920	79.8	16.75	16.87	0.993
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 0.993

Notes: Changed the H2 cylinder and the cal gas cylinder after as founds. Tried using a H2 generator but unable to get a stable response with the generator.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.07	8.91	1.018
As found Mid point					
As found Low point					
New cylinder response	4920	79.8	8.75	8.54	1.025
Baseline Corr AF:	8.91	Prev response	9.15	*% change	-2.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	8.75	8.54	1.025
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.025

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.06	8.40	0.960
As found Mid point					
As found Low point					
New cylinder response	4920	79.8	8.00	8.33	0.961
Baseline Corr AF:	8.40	Prev response	8.10	*% change	3.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

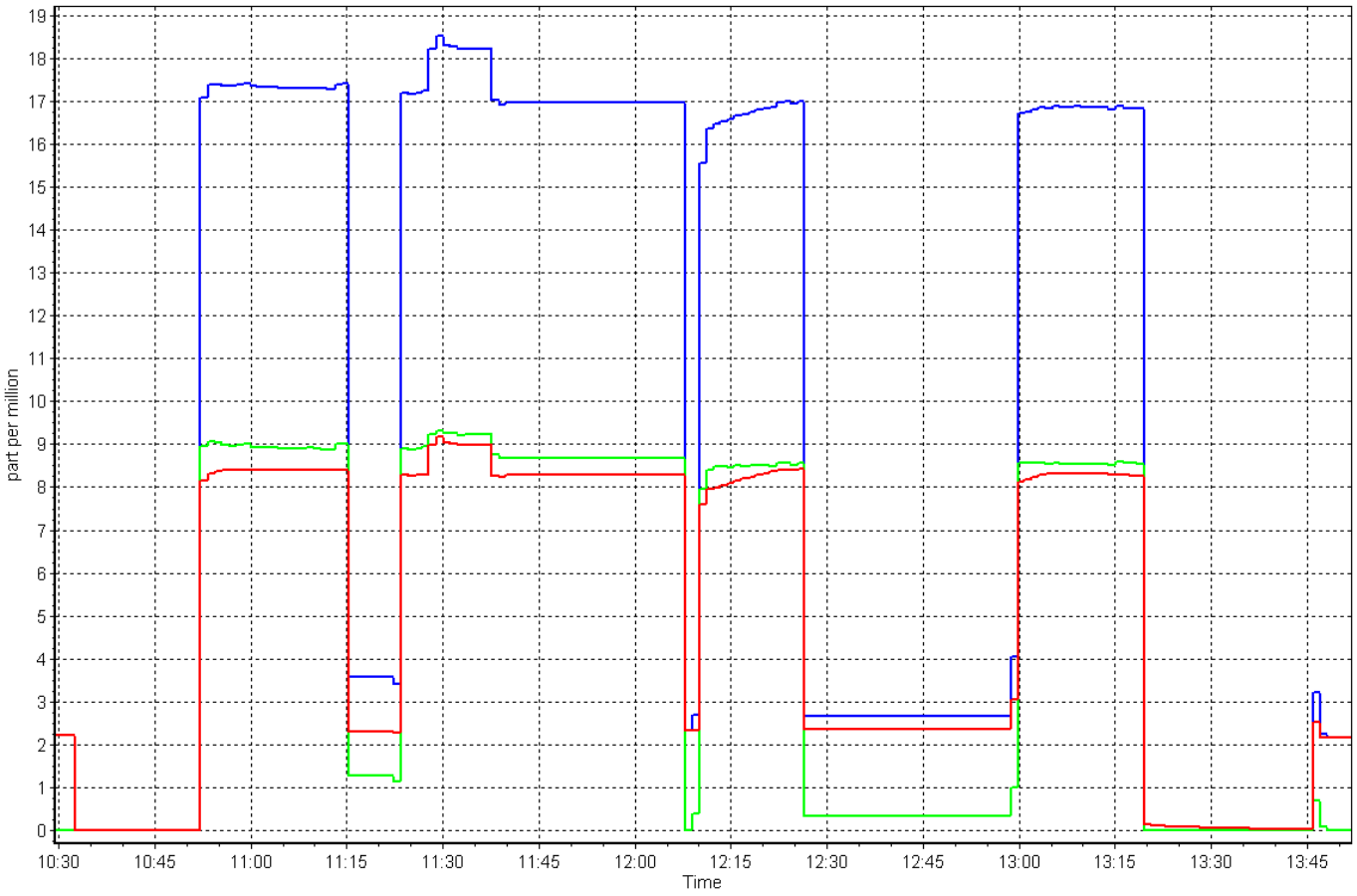
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	8.00	8.33	0.961
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	0.961

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	1.002675	1.006250
THC Cal Offset:	0.058596	0.010000
CH4 Cal Slope:	1.001993	1.040341
CH4 Cal Offset:	0.024026	0.000000
NMHC Cal Slope:	1.006105	0.975978
NMHC Cal Offset:	0.025365	0.000000

Calibration Performed By: Max Farrell

NMHC Calibration Plot Date: January 10, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Patricia McInnes
Station number:	AMS 06
Calibration Date:	January 6, 2025
Last Cal Date:	December 4, 2024
Start time (MST):	10:26
End time (MST):	15:10
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T30YCWN	Cal Gas Expiry Date:	April 11, 2025
NOX Cal Gas Conc:	47.94 ppm	NO Cal Gas Conc:	46.39 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	47.94 ppm	Removed Gas NO Conc:	46.39 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3566
ZAG make/model:	Teledyne API T701	Serial Number:	4602

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.9	-0.3	-0.7	----	----
AF High point	4914	86.2	826.5	799.7	26.7	822.0	792.0	30.0	1.0043	1.0094
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 830.8 ppb	NO = 803.2 ppb
Baseline Corr 1st pt	NO_X = 822.9 ppb	NO = 792.3 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -1.0%

*Percent Change NO = -1.4%

As Found Statistics

As found NO_X r^2: Nx Sl: Nx Int:

As found NO r^2: NO Sl: NO Int:

As found NO_2 r^2: NO2 Sl: NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1172750022

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.832	0.841	NO bkgnd or offset:	3.7	3.8
NOX coeff or slope:	0.989	0.990	NOX bkgnd or offset:	4.7	4.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	155.1	155.1

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.003204	0.998349
NO_X Cal Offset:	1.714916	1.295995
NO Cal Slope:	1.003246	0.997729
NO Cal Offset:	0.882218	0.663296
NO_2 Cal Slope:	1.002822	1.003059
NO_2 Cal Offset:	-0.465504	0.271164

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.1	-0.4	----	----
High point	4914	86.2	826.5	799.7	26.7	825.6	798.2	27.3	1.0010	1.0019
Mid point	4957	43.1	413.2	399.9	13.4	414.4	400.0	14.4	0.9972	0.9997
Low point	4978	21.6	207.1	200.4	6.7	210.1	201.4	8.7	0.9858	0.9951
As left zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.1	-0.6	----	----
As left span	4914	86.2	826.5	402.5	424.0	824.1	402.5	421.6	1.0029	1.0000
							Average Correction Factor		0.9947	0.9989

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.4	----	----
High GPT point	794.9	398.7	422.9	424.2	0.9970	100.3%
Mid GPT point	794.9	599.0	222.6	223.6	0.9956	100.4%
Low GPT point	794.9	698.1	123.5	125.1	0.9874	101.3%
				Average Correction Factor	0.9933	100.7%

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

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

NO_X Calibration Summary

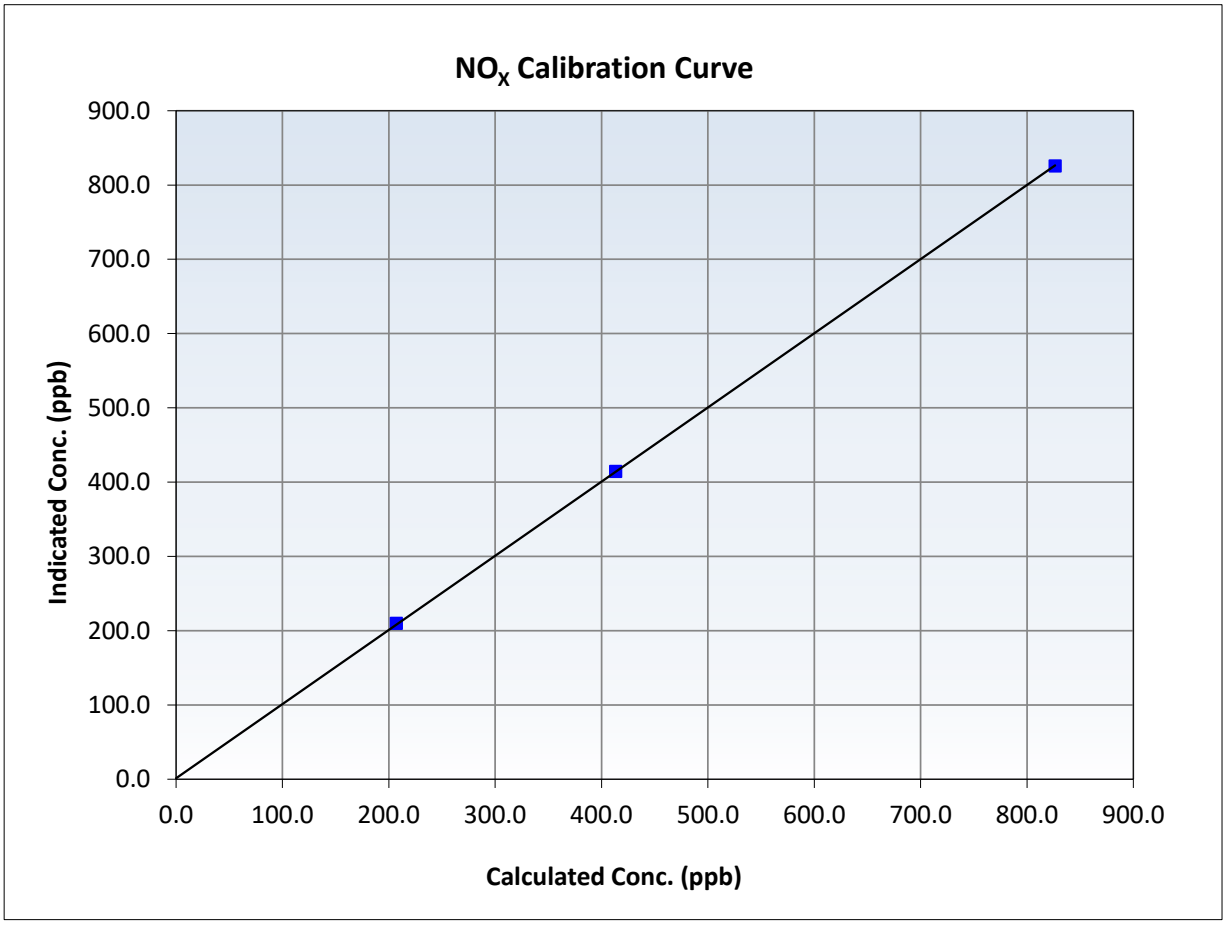
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:26	End Time (MST):	15:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.5	----
826.5	825.6	1.0010
413.2	414.4	0.9972
207.1	210.1	0.9858

Statistical Evaluation		Limits
Correlation Coefficient	0.999978	≥0.995
Slope	0.998349	0.90 - 1.10
Intercept	1.295995	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

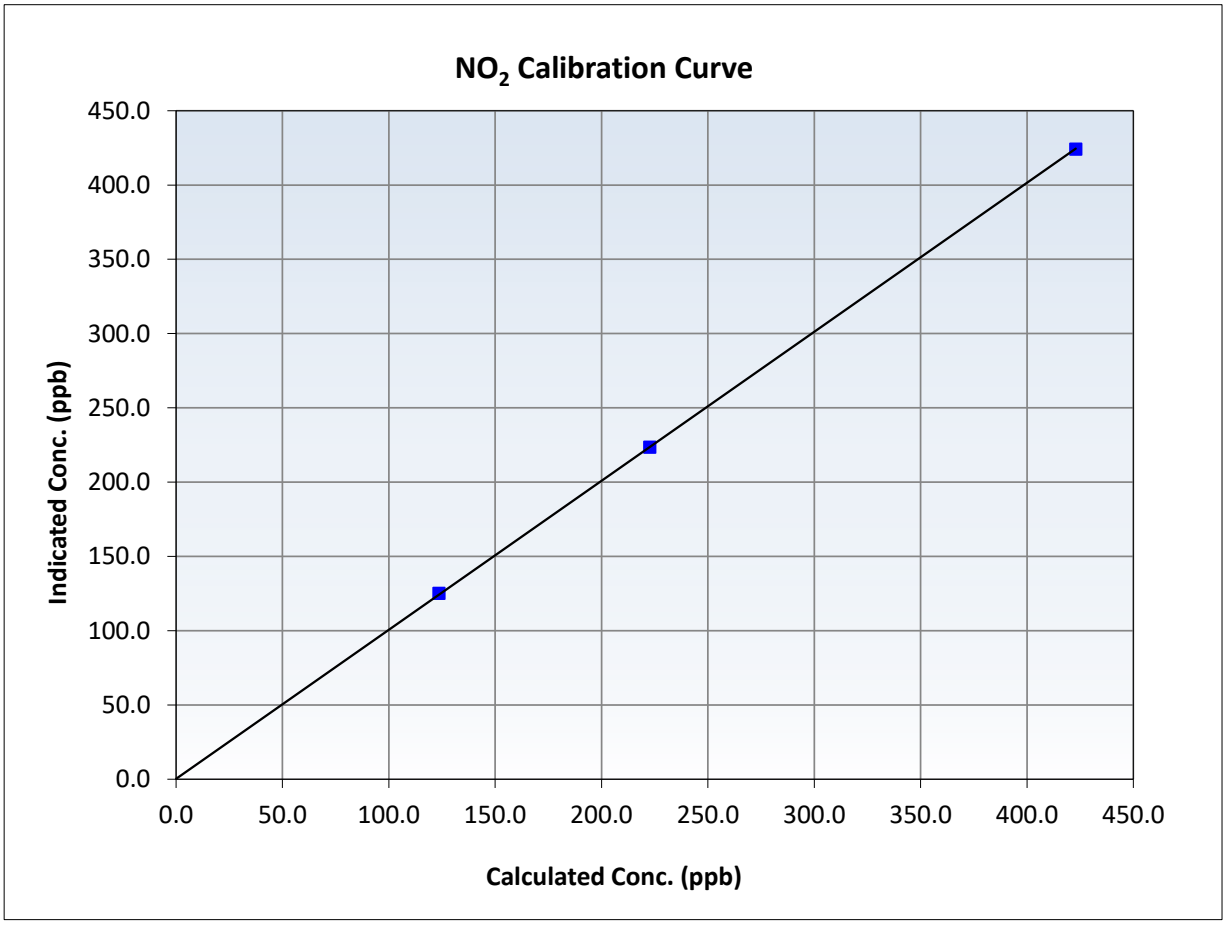
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:26	End Time (MST):	15:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
422.9	424.2	0.9970
222.6	223.6	0.9956
123.5	125.1	0.9874

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999985	*≥0.995*
Slope	1.003059	*0.90 - 1.10*
Intercept	0.271164	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

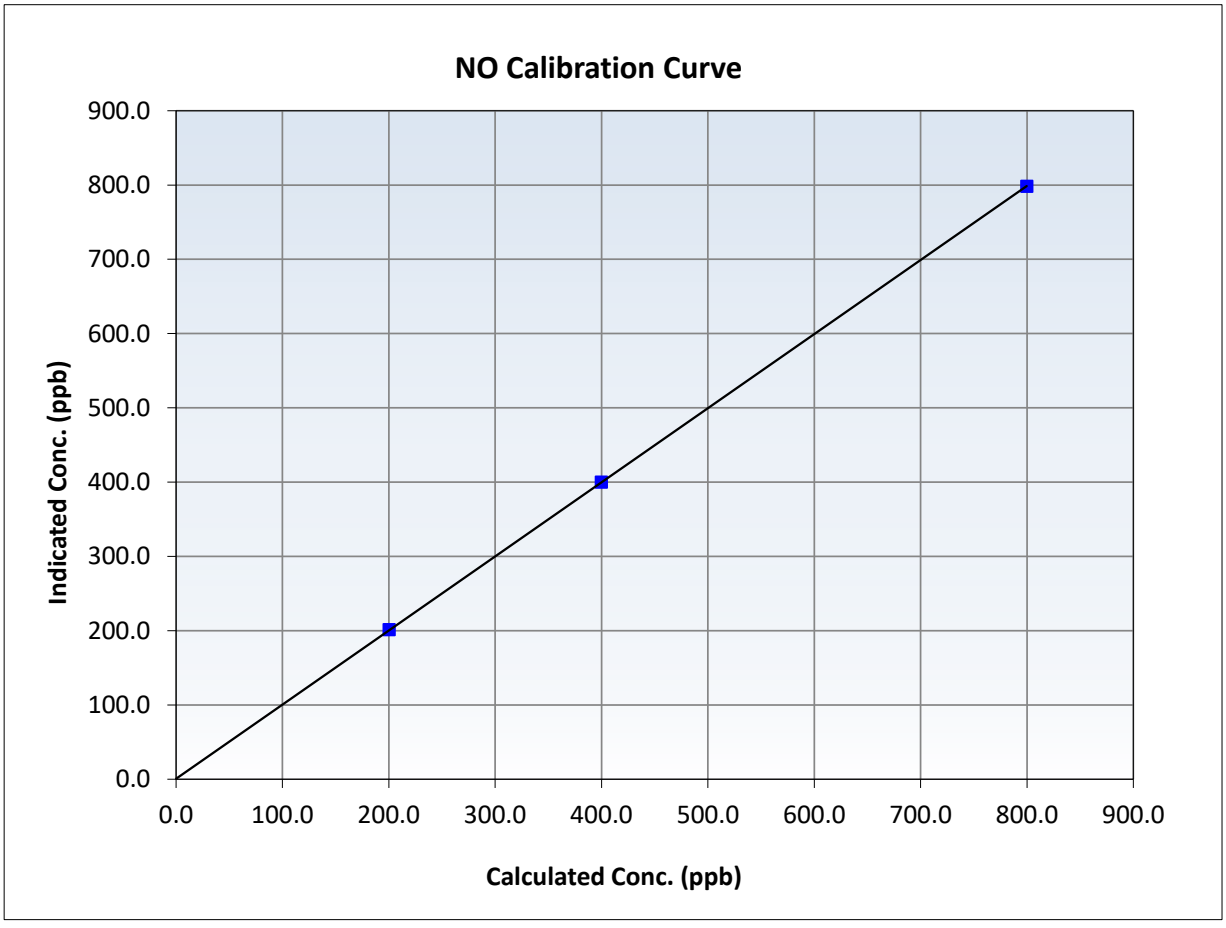
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 4, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:26	End Time (MST):	15:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

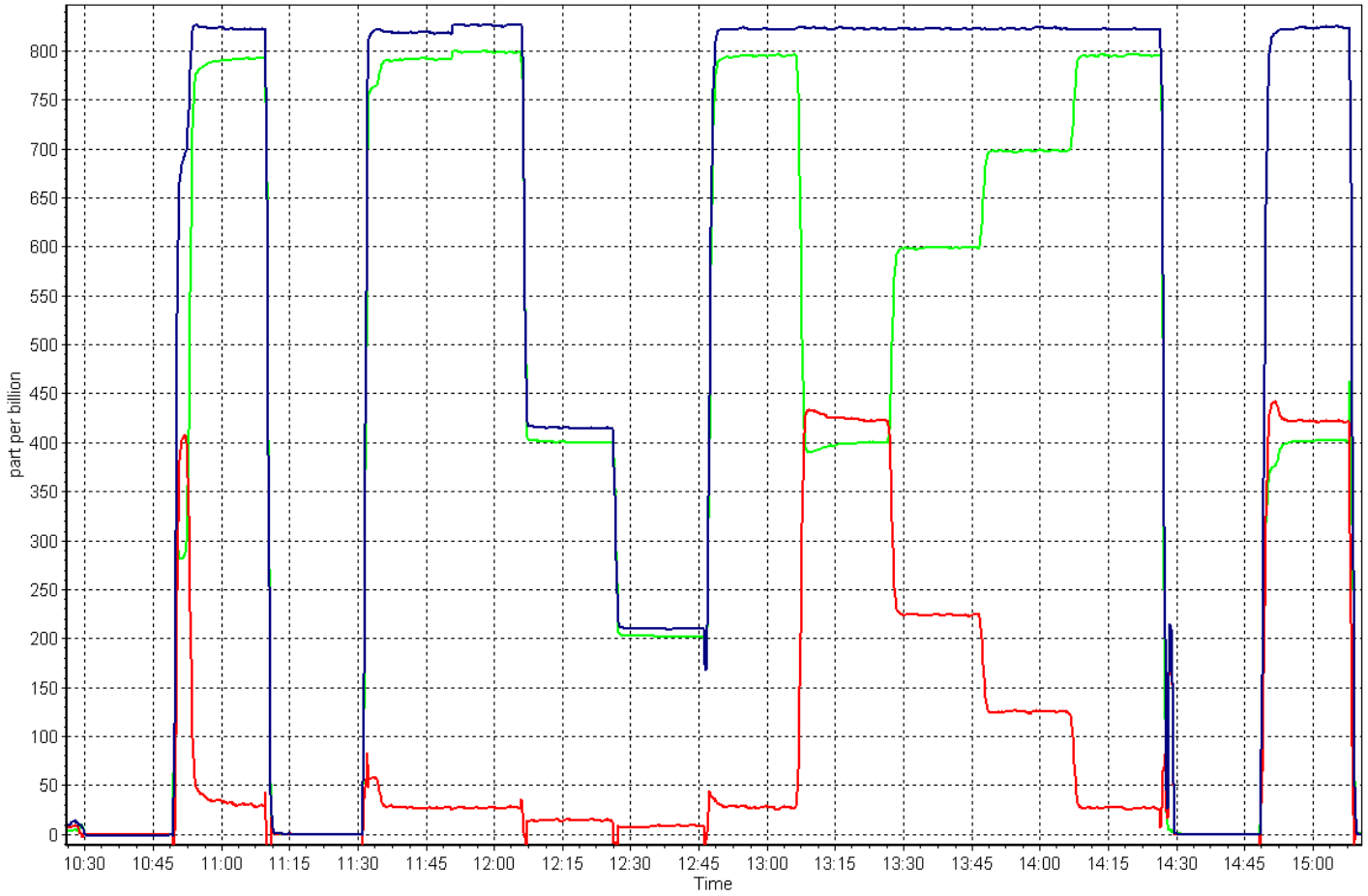
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.7	798.2	1.0019
399.9	400.0	0.9997
200.4	201.4	0.9951

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999996	*≥0.995*
Slope	0.997729	*0.90 - 1.10*
Intercept	0.663296	*+/-20*



NO_X Calibration Plot Date: January 6, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Patricia McInnes
Station number:	AMS 06
Calibration Date:	January 15, 2025
Last Cal Date:	January 6, 2025
Start time (MST):	10:05
End time (MST):	14:58
Reason:	Maintenance

Calibration Standards

NO Gas Cylinder #:	T30YCWN	Cal Gas Expiry Date:	April 11, 2025
NOX Cal Gas Conc:	47.94 ppm	NO Cal Gas Conc:	46.39 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	47.94 ppm	Removed Gas NO Conc:	46.39 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3566
ZAG make/model:	Teledyne API T701	Serial Number:	4602

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.7	0.0	-0.7	----	----
AF High point	4914	86.2	826.5	799.7	26.7	724.2	696.2	28.0	1.1401	1.1487
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	826.4 ppb	NO =	798.6 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -14.0%
Baseline Corr 1st pt	NO_X =	724.9 ppb	NO =	696.2 ppb	As Found Statistics	*Percent Change	NO = -14.7%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1172750022

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	0.841	0.883	NO bkgnd or offset:	3.8	4.0
NOX coeff or slope:	0.990	0.987	NOX bkgnd or offset:	4.7	4.9
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	180.6	163.0

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.998349	0.998225
NO_X Cal Offset:	1.295995	2.016012
NO Cal Slope:	0.997729	0.999688
NO Cal Offset:	0.663296	1.402776
NO_2 Cal Slope:	1.003059	0.999789
NO_2 Cal Offset:	0.271164	-0.750204

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.2	-0.3	----	----
High point	4914	86.2	826.5	799.7	26.7	825.9	800.2	25.6	1.0007	0.9994
Mid point	4957	43.1	413.2	399.9	13.4	415.7	402.0	13.7	0.9941	0.9947
Low point	4978	21.6	207.1	200.4	6.7	210.8	202.8	8.0	0.9825	0.9883
As left zero	5000	0.0	0.0	0.0	0.0	-0.5	0.0	-0.5	----	----
As left span	4914	86.2	826.5	397.2	429.3	824.8	397.2	427.5	1.0020	1.0000
							Average Correction Factor		0.9924	0.9941

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	798.9	399.6	426.0	425.5	1.0012	99.9%
Mid GPT point	798.9	605.1	220.5	219.3	1.0056	99.4%
Low GPT point	798.9	702.9	122.7	121.6	1.0092	99.1%
				Average Correction Factor	1.0053	99.5%

Notes: No multipoint as founds since the spans are 15% low due to low flow. Changed the pump with a new one. Adjusted the span.

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

NO_X Calibration Summary

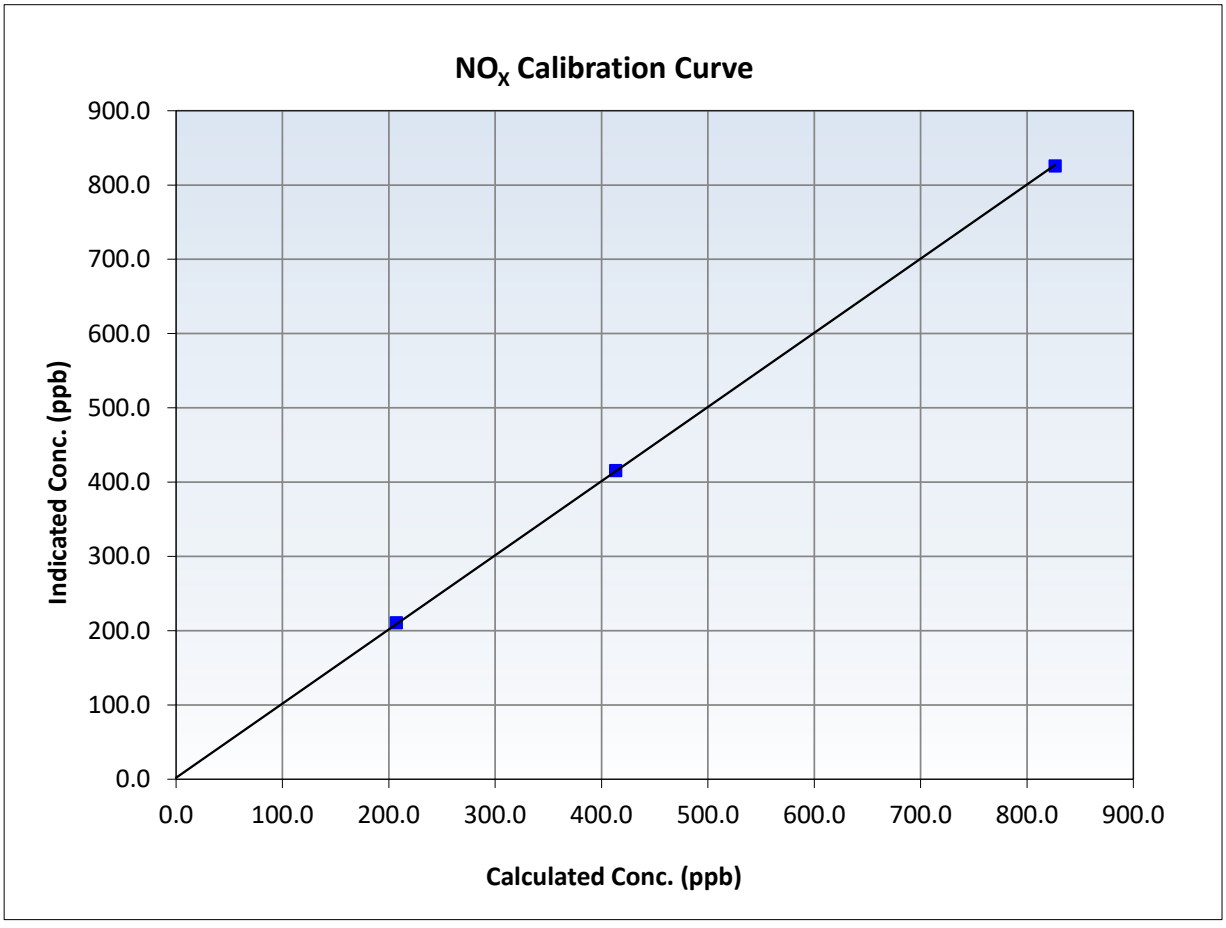
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	January 6, 2025
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:05	End Time (MST):	14:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
826.5	825.9	1.0007
413.2	415.7	0.9941
207.1	210.8	0.9825

Statistical Evaluation		Limits
Correlation Coefficient	0.999970	≥0.995
Slope	0.998225	0.90 - 1.10
Intercept	2.016012	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

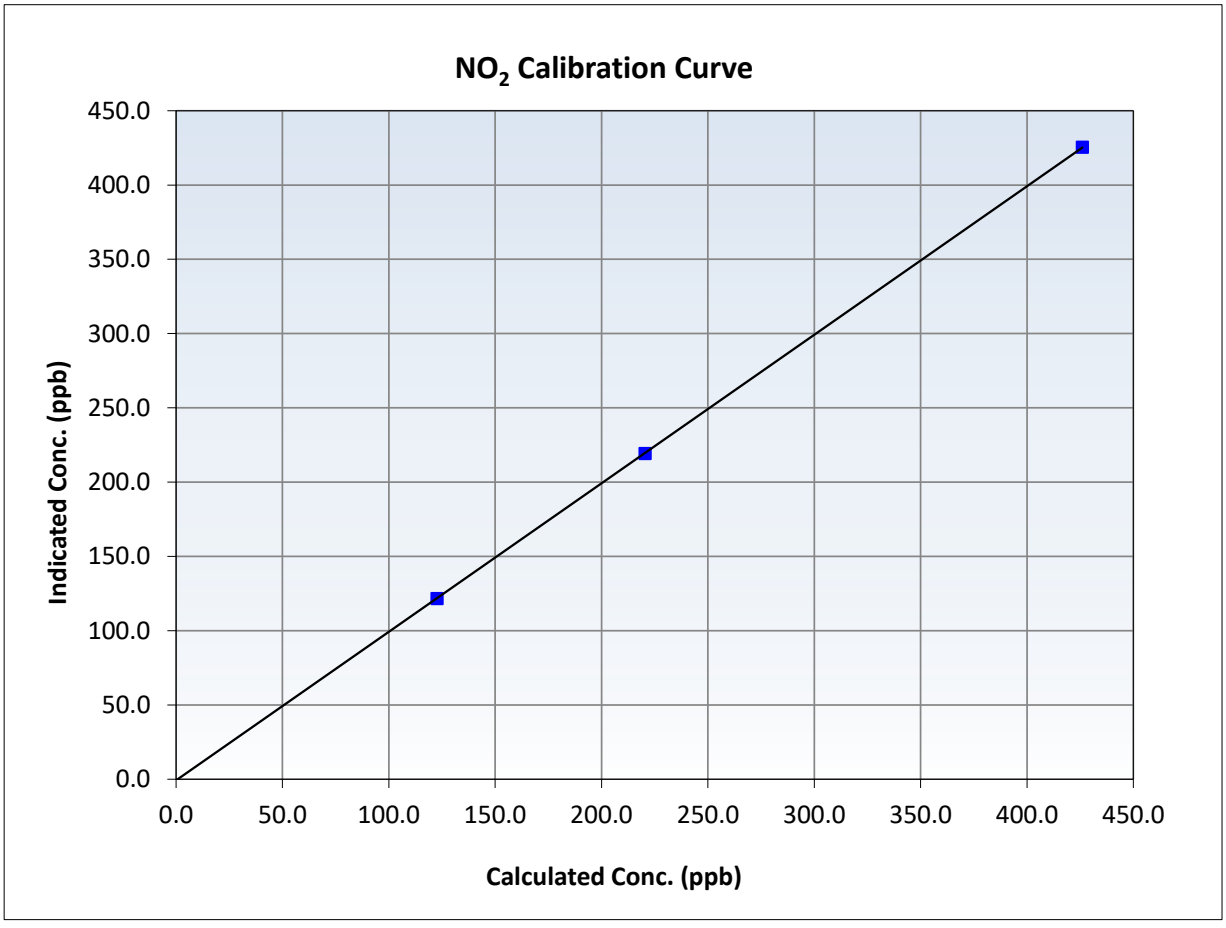
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	January 6, 2025
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:05	End Time (MST):	14:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
426.0	425.5	1.0012
220.5	219.3	1.0056
122.7	121.6	1.0092

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999994	*≥0.995*
Slope	0.999789	*0.90 - 1.10*
Intercept	-0.750204	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

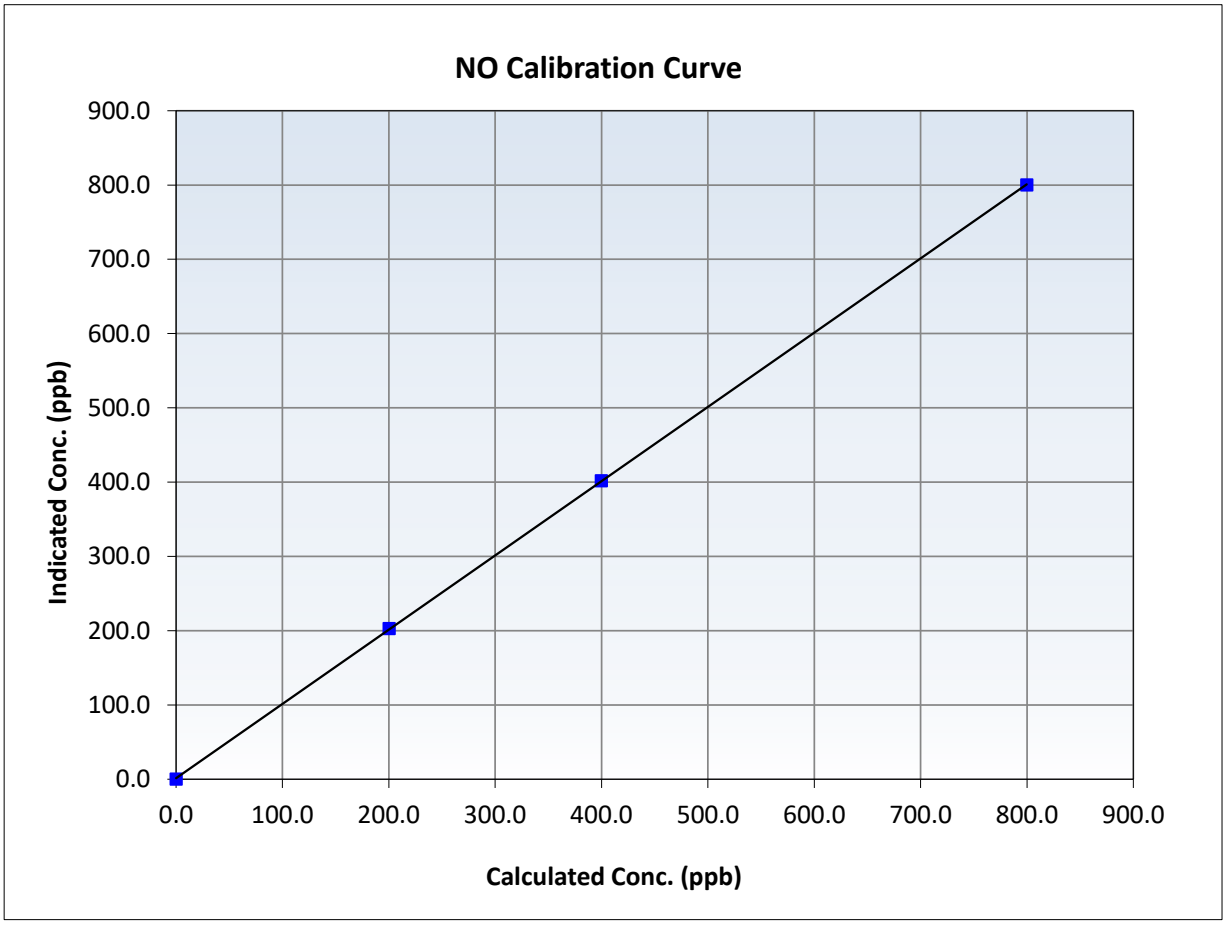
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	January 6, 2025
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:05	End Time (MST):	14:58
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

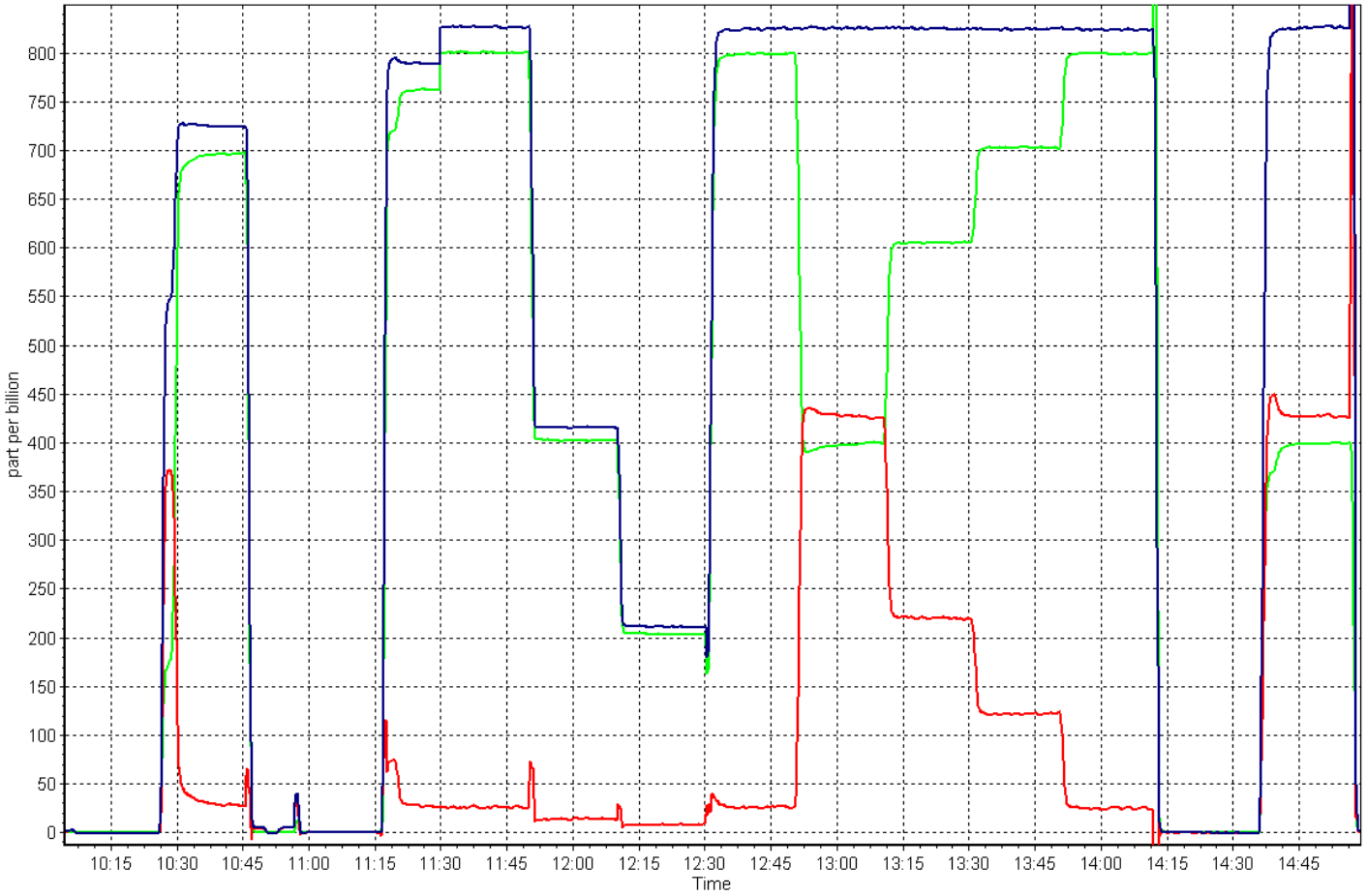
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.7	800.2	0.9994
399.9	402.0	0.9947
200.4	202.8	0.9883

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999989	*≥0.995*
Slope	0.999688	*0.90 - 1.10*
Intercept	1.402776	*+/-20*



NO_X Calibration Plot Date: January 15, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 29, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	10:31	End time (MST):	13:50
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	3566
ZAG Make/Model:	API T701	Serial Number:	4602

Analyzer Information

Analyzer make:	Thermo 49i		Analyzer serial #:	1300156234	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002771	1.002057	Backgd or Offset:	-0.9	-0.9
Calibration intercept:	0.140000	0.340000	Coeff or Slope:	1.020	1.020

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.6	----
As found High point	5000	1031.0	400.0	401.1	0.999
As found Mid point					
As found Low point					
Baseline Corr As found:	400.5	Previous response	401.2	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.4	----
High point	5000	1031.0	400.0	401.0	0.998
Mid point	5000	821.4	200.0	201.3	0.994
Low point	5000	699.5	100.0	100.1	0.999
As left zero	5000	800.0	0.0	0.5	----
As left span	5000	1031.0	400.0	403.2	0.992
				Average Correction Factor	0.997

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

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

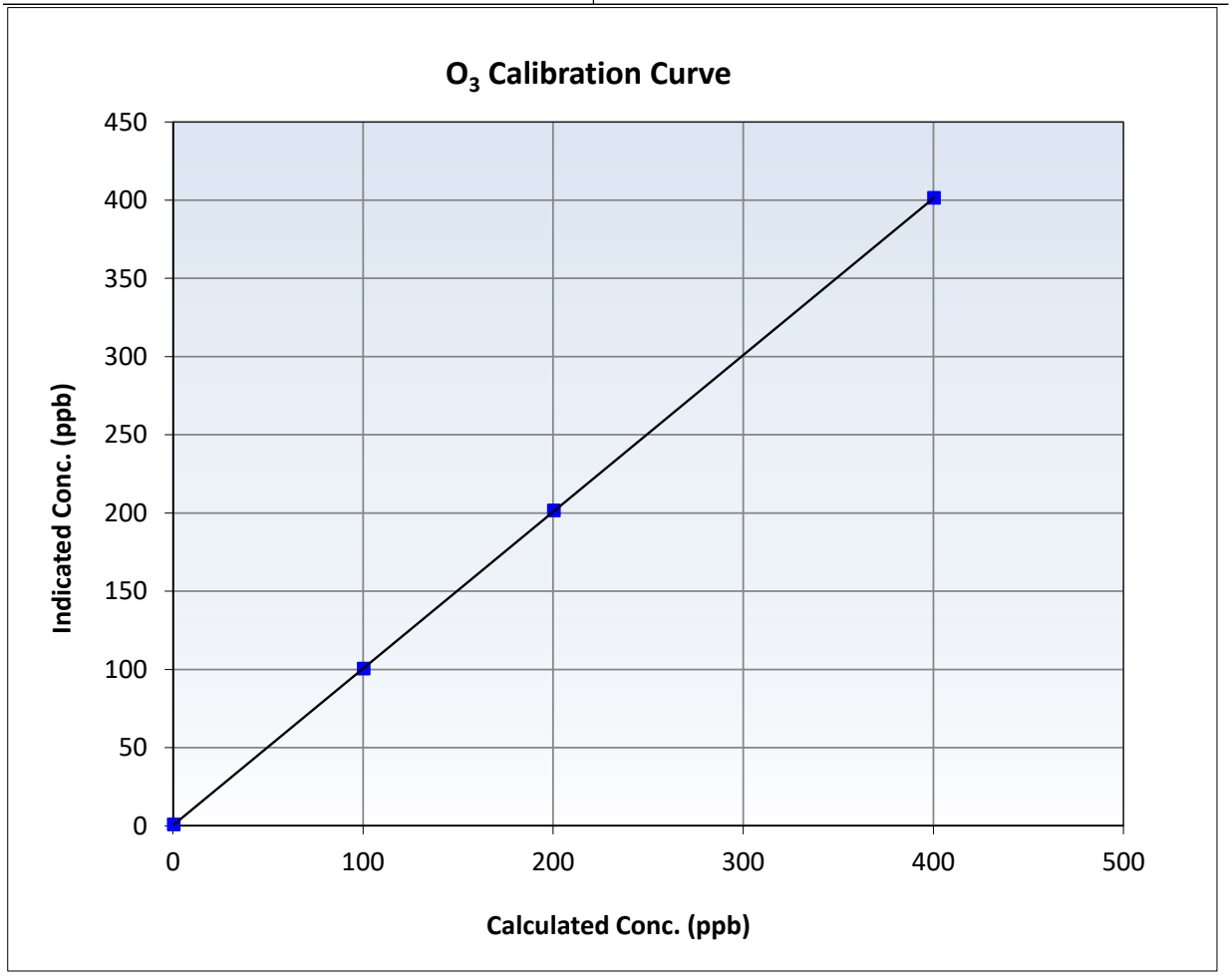
O_3 Calibration Summary

Station Information

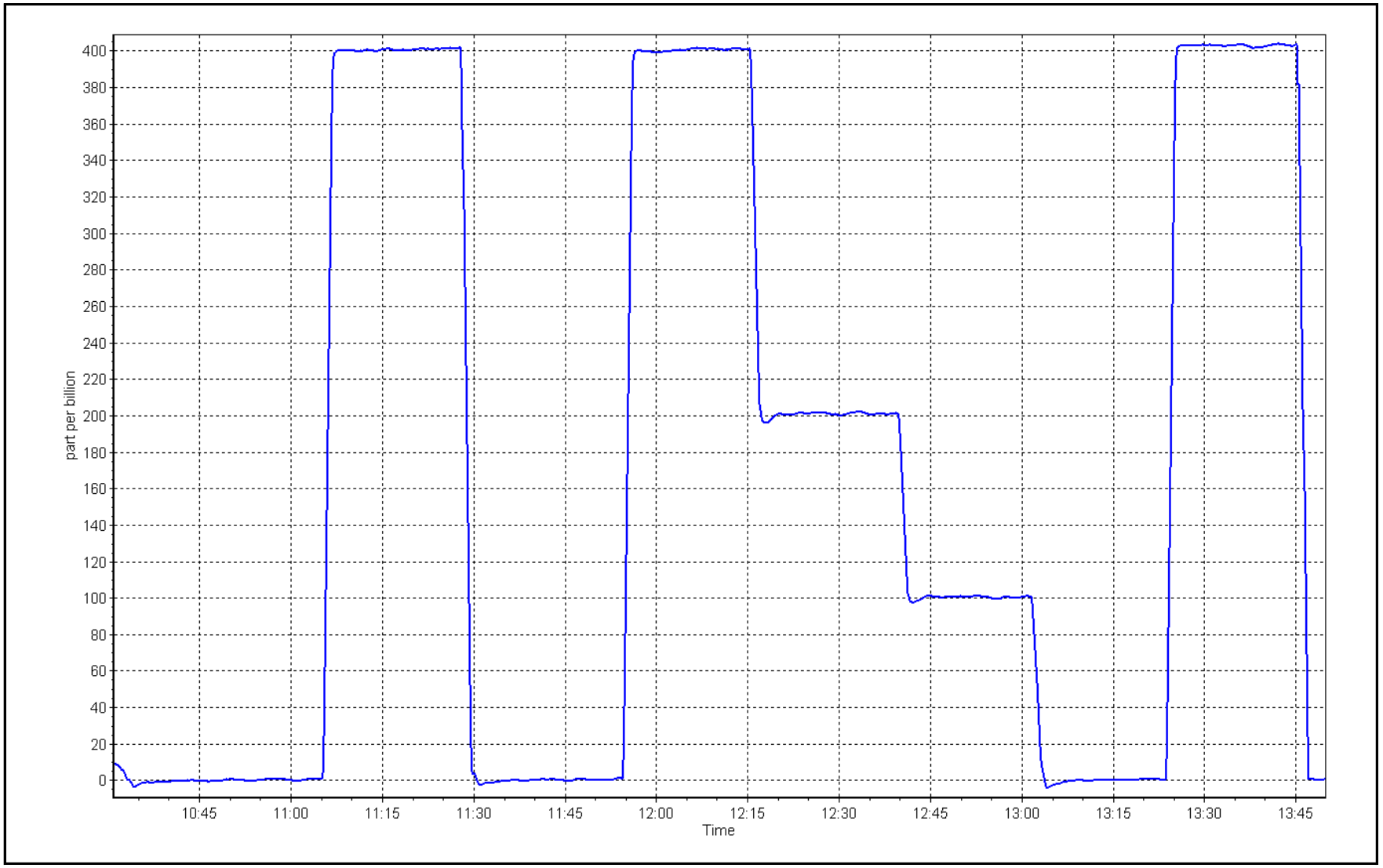
Calibration Date:	January 29, 2025	Previous Calibration:	December 11, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:31	End Time (MST):	13:50
Analyzer make:	Thermo 49i	Analyzer serial #:	1300156234

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	0.4	----	Correlation Coefficient	0.999994	≥0.995
400.0	401.0	0.9975	Slope	1.002057	0.90 - 1.10
200.0	201.3	0.9935			
100.0	100.1	0.9990	Intercept	0.340000	+/- 5



O_3 Calibration Plot Date: January 29, 2025 Location: Patricia McInnes



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	January 15, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	16:04	End time (MST):	16:46
Analyzer Make:	API T640	S/N:	766
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388755
Temp/RH standard:	Alicat FP-25BT	S/N:	388755

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	2.7	1.9	2.7	☐	+/- 2 °C
P (mmHg)	726.60	729.00	726.60	☐	+/- 10 mmHg
Flow (LPM)	4.99	5.09	4.99	☐	+/- 0.25 LPM
PW% (pump)	40	-----	40	☐	>80%
Zero Verification	PM w/o HEPA:	2.1	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 6-10-2024 — Lot No.: 100128-050-035

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: December 13, 2024

Date Disposable Filter Changed: December 13, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: April 13, 2023

Date RH/T Sensor Cleaned: April 13, 2023

Notes: Parameters within limits. Leak check passed.

Calibration by: Max Farrell

Wood Buffalo Environmental Association

Nt - NOX - NH3 Calibration Report

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
NOX Cal Date:	January 14, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	7:20	End time (MST):	11:15
NH3 Cal Date:	January 14, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	11:15	End time (MST):	13:30
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc:	47.94	ppm	NO Gas Cylinder #:	T30YCWN
NO Cal Gas Conc:	46.39	ppm	NO Cal Gas Expiry:	April 11, 2025
Removed NOX Conc:	47.94	ppm	Removed Cylinder #:	N/A
Removed NO Conc:	46.39	ppm	Removed cyl Expiry:	N/A
NOX gas Diff:			NO gas Diff:	
NH3 Cal Gas Conc:	76.3	ppm	NH3 Gas Cylinder #:	EB0108520
			NH3 Cal Gas Expiry:	August 22, 2024
Removed NH3 Conc:	76.3	ppm	Removed Cylinder #:	N/A
NH3 gas Diff:			Removed cyl Expiry:	N/A
Calibrator Model:	API T700		Serial Number:	3566
ZAG make/model:	API T701		Serial Number:	4602

Analyzer Information

Analyzer model:	API T201		Analyzer serial #:	215
Converter model:	API T501		Converter serial #:	147
NH3 Range (ppb):	0 - 2000 ppb		Reaction cell Press:	6.20
NOX Range (ppb):	0 - 1000 ppb		Sample Flow:	25.4

	Start	*Finish*		*Start*	*Finish*
NO coefficient:	1.009	1.009	Nt coefficient:	1.700	1.700
NOX coefficient:	1.002	1.002	NO bkgrnd:	0.2	0.2
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	0.1	0.1
NH3 coefficient:	1.200	1.200	Nt bkgrnd:	0.0	0.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.996150	0.997948
NO_X Cal Offset:	3.016603	1.616051
NO Cal Slope:	0.996442	0.994785
NO Cal Offset:	0.463717	0.743822
NO_2 Cal Slope:	0.999502	1.005891
NO_2 Cal Offset:	0.782057	0.570473
NH3 Cal Slope:	0.988331	0.984098
NH3 Cal Offset:	8.443668	8.061529
Nt Cal Slope:	0.991747	0.987406
Nt Cal Offset:	8.825682	8.432296

Wood Buffalo Environmental Association

NO_X - NO - NO_2 Calibration Report

NOx / NO / Nt As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	Baseline corr NOx Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*	Baseline corr NO Correction factor (Cc/Ic) *Limit = 0.9 - 1.0*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.3	-0.4	----	----
As found span	4914	86.2	826.5	799.7	826.5	819.3	793.8	829.5	1.0087	1.0075
AF GPT span										
new NO cyl rp										

Baseline Corr As Fd	Nt =	829.9	ppb	NO_X =	819.6	ppb	NO =	794.1 ppb
Previous Response	Nt =	828.46	ppb	NO_X =	826.3	ppb	NO =	797.3 ppb

**NO_X Δ (NO to GPT response) =

* *= > +/-2% difference initiates investigation

*Percent Change $Nt_{(NO)}$ = 0.2%

*Percent Change NO_X = -0.8%

*Percent Change NO = -0.4%

* = > +/-5% change initiates investigation

NOx / NO / Nt Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated Nt concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated Nt concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	0.1	-0.1	1.8	----	----
High point	4914	86.2	826.5	799.7	826.5	825.9	795.9	832.0	1.0007	1.0048
Mid point	4957	43.1	413.2	399.9	413.2	413.9	398.9	417.4	0.9984	1.0024
Low point	4978	21.6	207.1	200.4	207.1	210.4	201.0	213.0	0.9844	0.9971
								Average Correction Factor	0.9945	1.0015

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
As Found zero	----	----	0.0	0.0	----	----
Calibration zero	----	----	0.0	0.2	----	----
High GPT point (400 ppb O3)	792.6	405.2	414.1	417.0	0.9931	100.7%
Mid GPT point (200 ppb O3)	792.6	600.6	218.7	220.5	0.9919	100.8%
Low GPT point (100 ppb O3)	792.6	695.9	123.4	125.3	0.9850	101.5%
				Average Correction Factor	0.9900	101.0%

Wood Buffalo Environmental Association
NH_3 - N_T Calibration Report

NH3 As Found Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Baseline corr Nt Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*	Baseline corr NH3 Correction factor (Cc/(Ic-zero)) *Limit = 0.9 - 1.1*
As found zero	5000	0.0	0.0	0.0	0.0	-0.8	0.0	-0.8	----	----
AF High point	3417	82.6	1800.6	0.0	1800.6	1782.3	6.3	1776.2	1.010	1.013
AF Mid point										
AF Low point										
new NH3 cyl rp										

Baseline Corr As Fd Nt = 1783.1 ppb NH3 = 1777.0 ppb *Percent Change $Nt_{(NH3)}$ = -0.6%

Previous Response Nt = 1794.6 ppb NH3 = 1788.1 ppb * = > +/-5% change initiates investigation *Percent Change NH3 = -0.6%

NH3 Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated Nt concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated Nt concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	Nt Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NH3 Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibration zero	5000	0.0	0.0	0.0	0.0	1.8	0.1	1.7	----	----
High point	3417	82.6	1800.6	0.0	1800.6	1782.3	6.3	1776.2	1.010	1.014
Mid point	3454	45.9	1000.5	0.0	1000.5	1000.4	4.0	996.4	1.000	1.004
Low point	3477	22.9	499.2	0.0	499.2	508.0	2.3	505.8	0.983	0.987
								Average Correction Factor	0.9977	1.0016

NH3 Previous Converter Efficiency = 90.2 %

NH3 Current Converter Efficiency = 90.2 %

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

Calibration Performed By: Max Farrell

Wood Buffalo Environmental Association

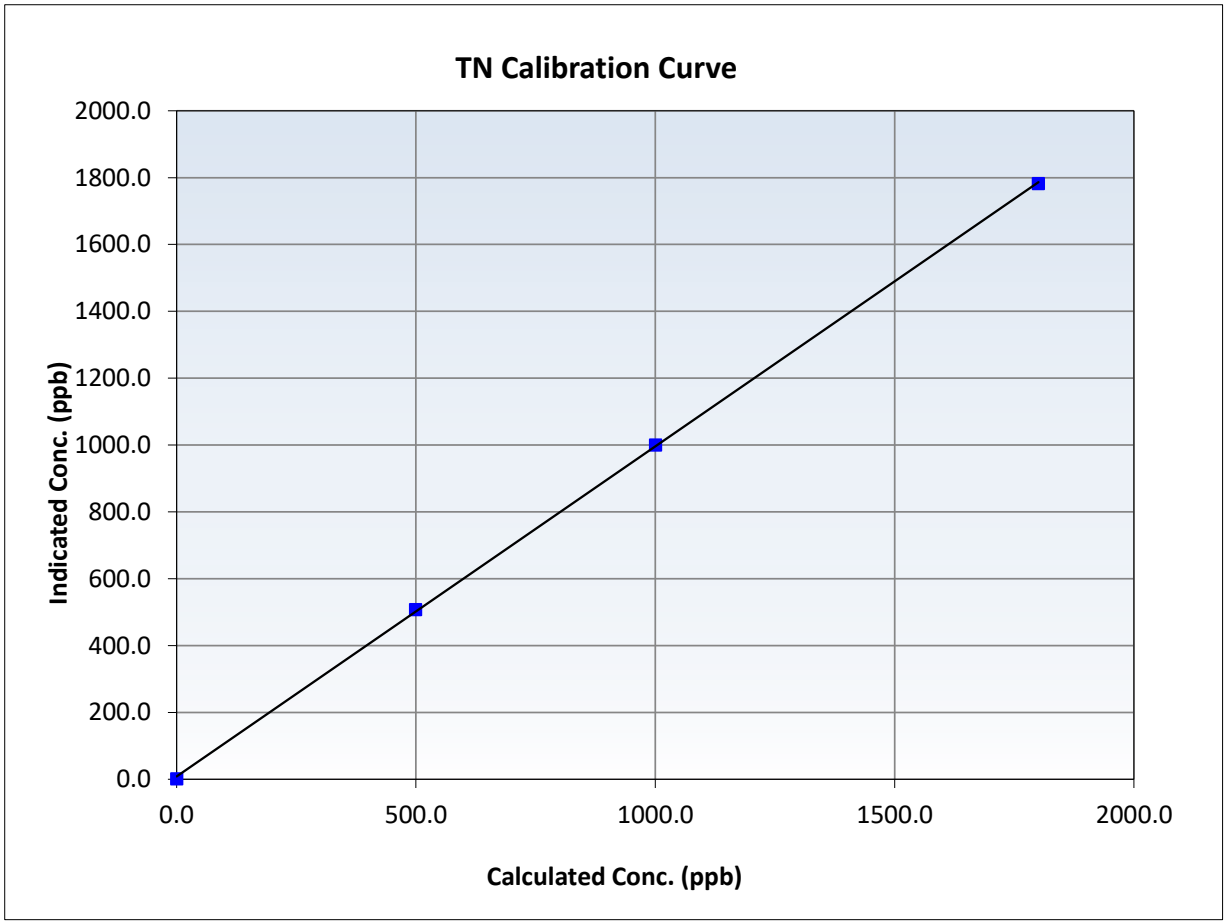
Nt Calibration Summary

Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 9, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:20	End Time (MST):	11:15
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	1.8	----	Correlation Coefficient	0.999929	*≥0.995*
1800.6	1782.3	1.0103	Slope	0.987406	*0.90 - 1.10*
1000.5	1000.4	1.0001	Intercept	8.432296	*+/-20*
499.2	508.0	0.9826			



Wood Buffalo Environmental Association

NH_3 Calibration Summary

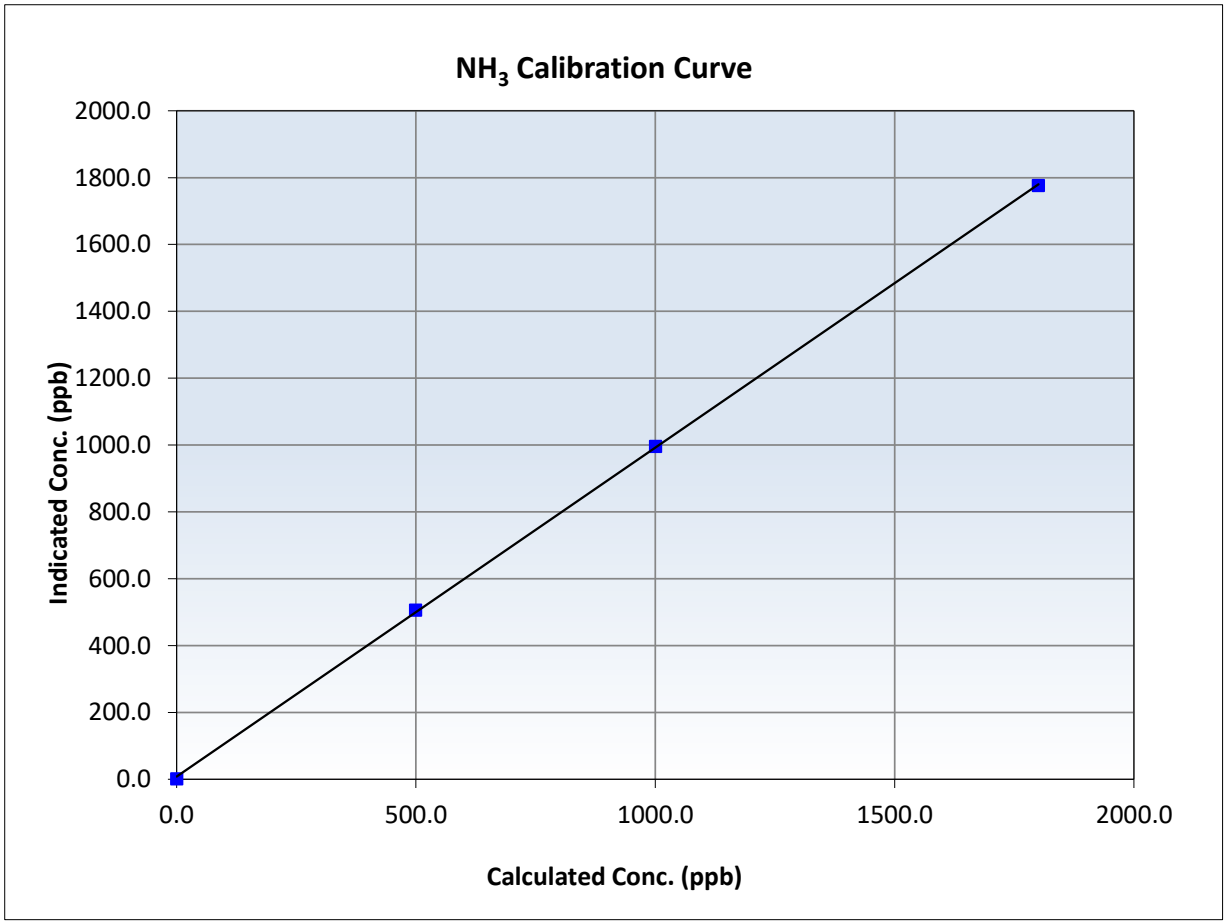
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 9, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:20	End Time (MST):	11:15
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.7	----
1800.6	1776.2	1.0138
1000.5	996.4	1.0041
499.2	505.8	0.9869

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999935	*≥0.995*
Slope	0.984098	*0.90 - 1.10*
Intercept	8.061529	*+/-20*



Wood Buffalo Environmental Association

NO_X Calibration Summary

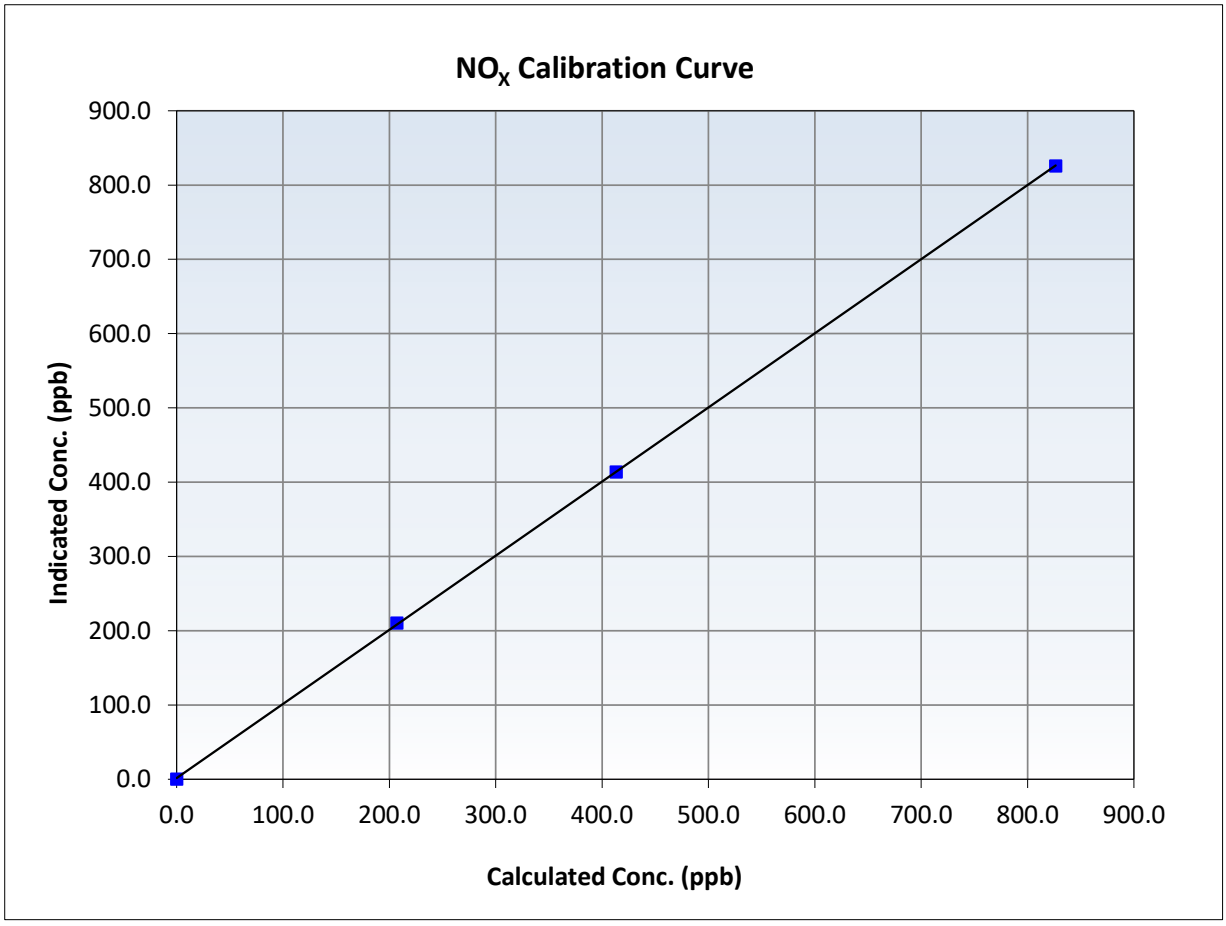
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 9, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:20	End Time (MST):	11:15
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
826.5	825.9	1.0007
413.2	413.9	0.9984
207.1	210.4	0.9844

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999981	*≥0.995*
Slope	0.997948	*0.90 - 1.10*
Intercept	1.616051	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

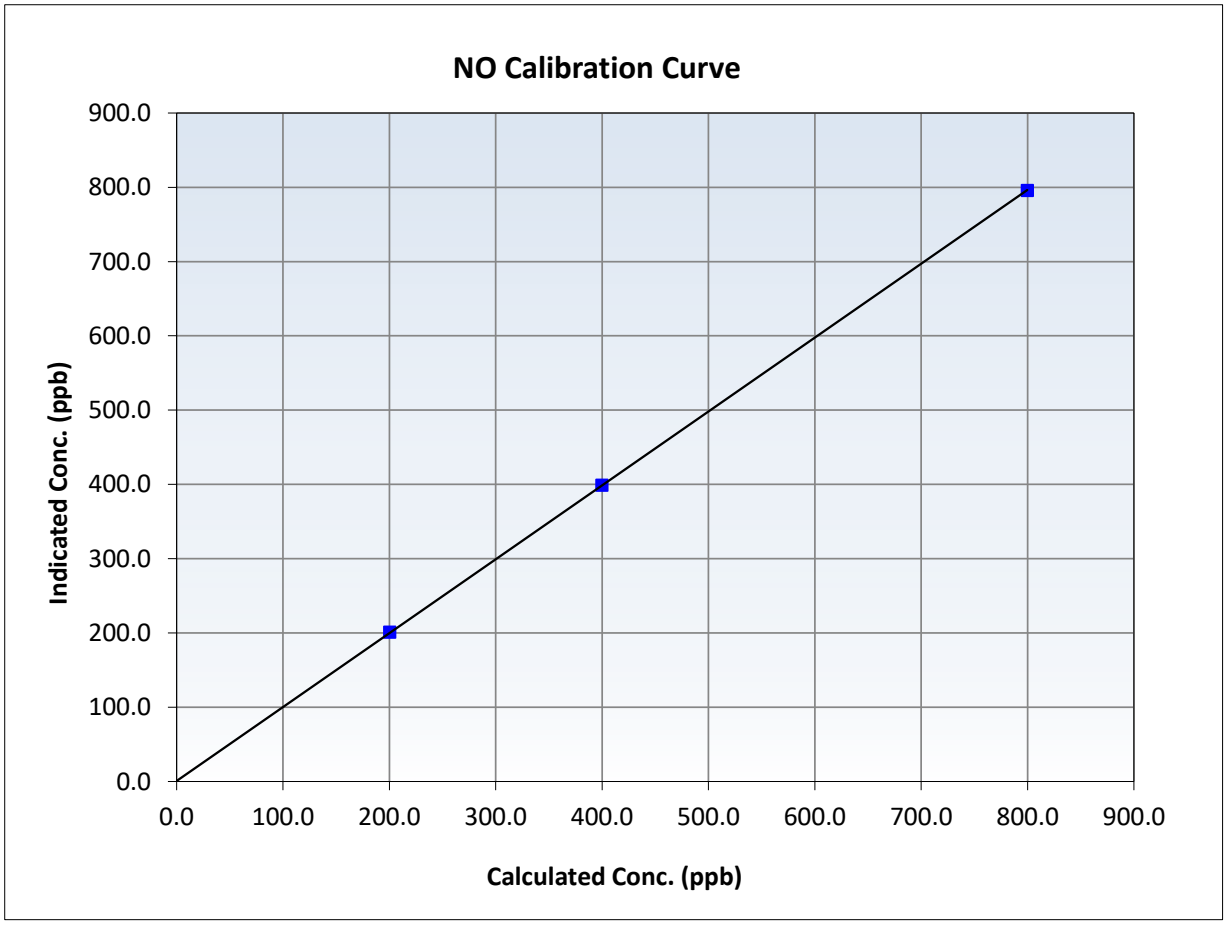
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 9, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:20	End Time (MST):	11:15
Analyzer make:	API T201	Analyzer serial #:	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.7	795.9	1.0048
399.9	398.9	1.0024
200.4	201.0	0.9971

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	0.994785	*0.90 - 1.10*
Intercept	0.743822	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

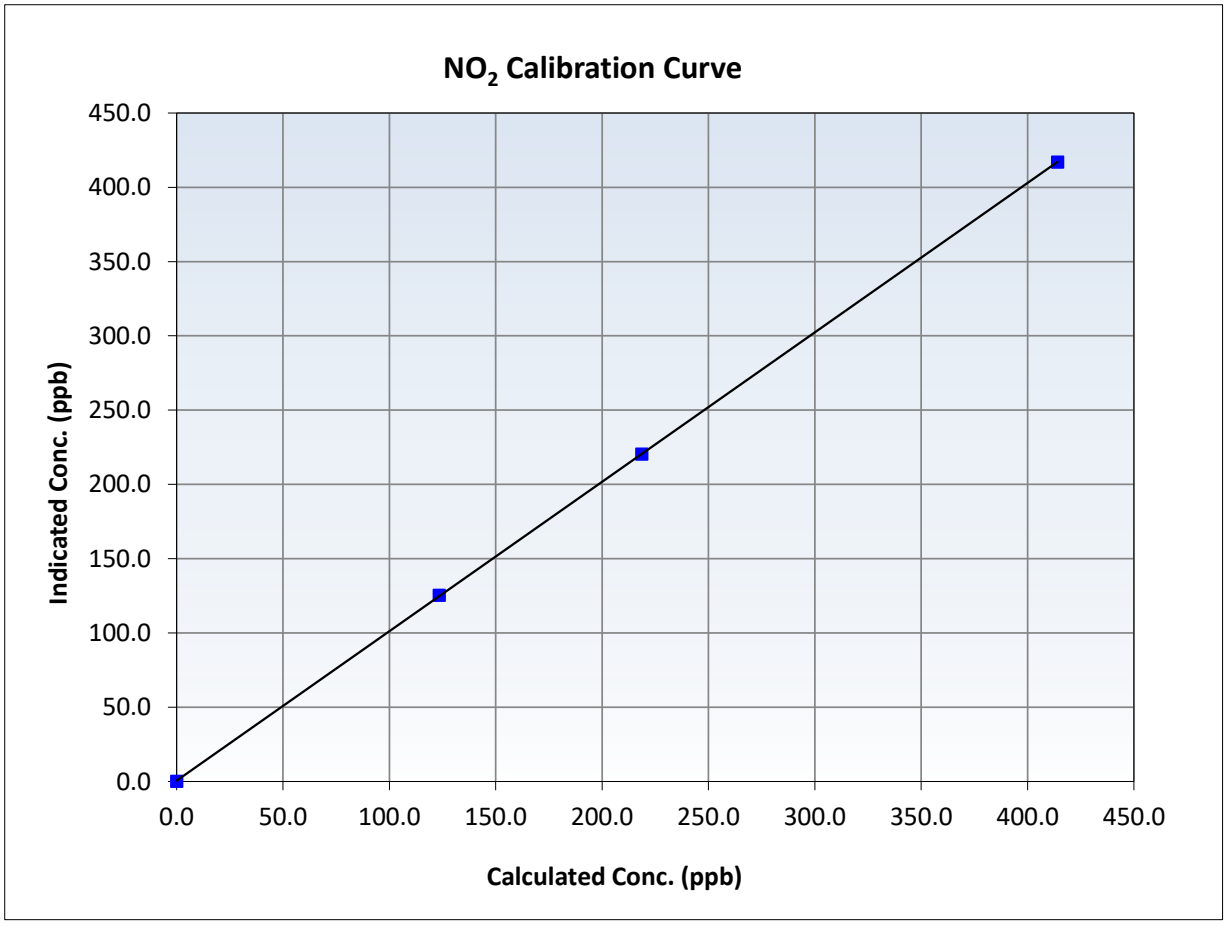
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 9, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:20	End Time (MST):	11:15
Analyzer make:	API T201	Analyzer serial #:	215

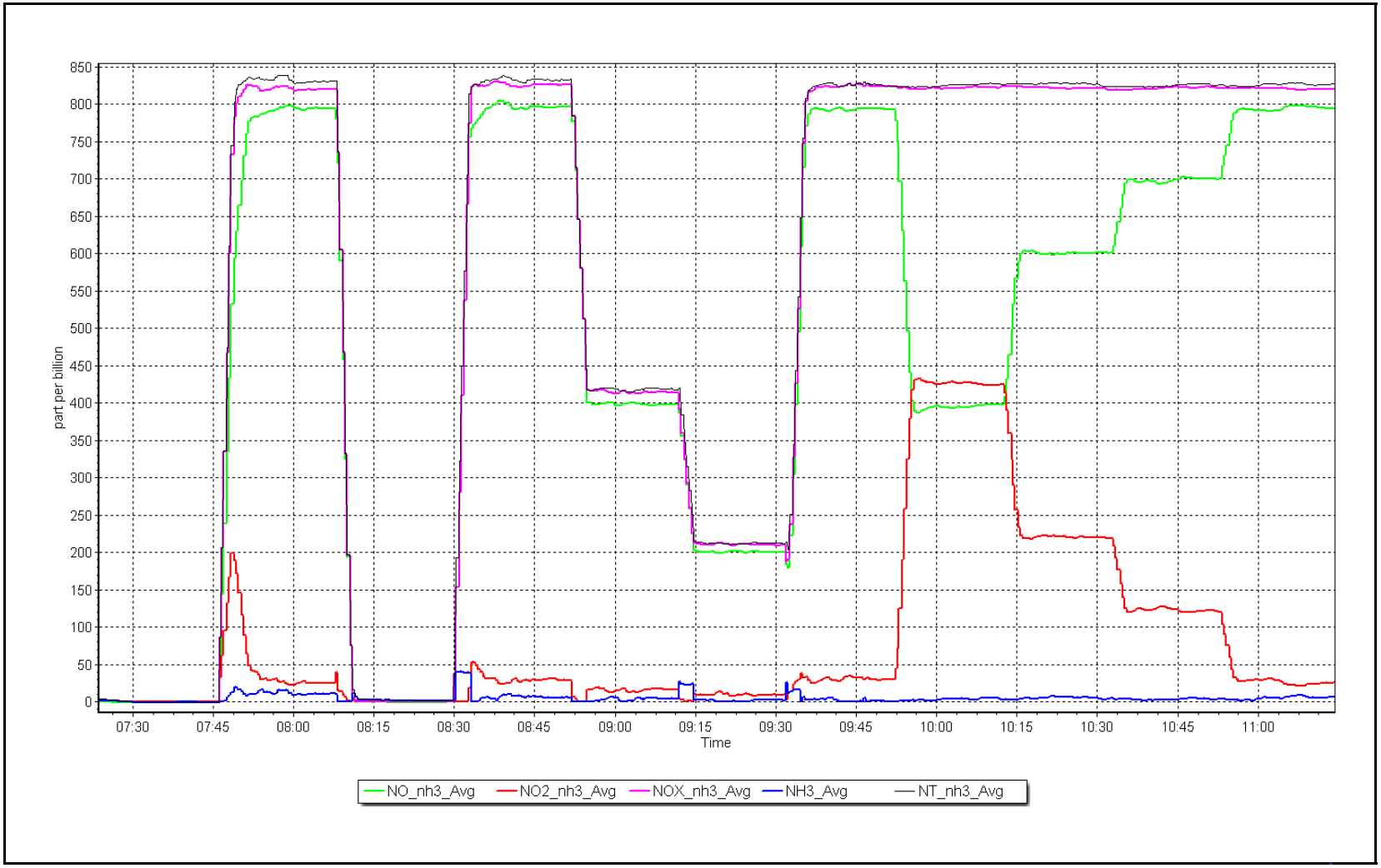
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
414.1	417.0	0.9931
218.7	220.5	0.9919
123.4	125.3	0.9850

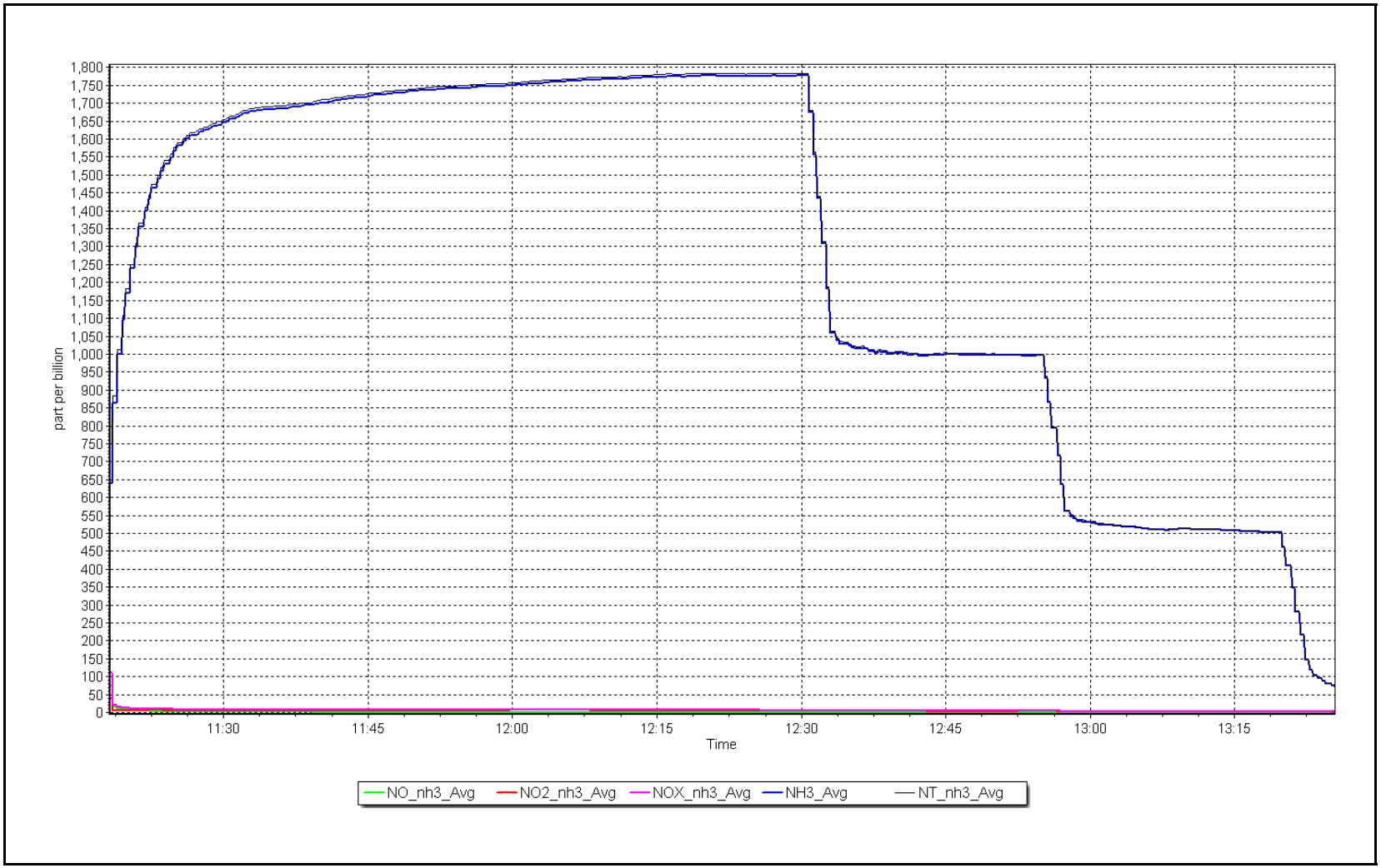
Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.005891	*0.90 - 1.10*
Intercept	0.570473	*+/-20*



NO_X Calibration Plot Date: January 14, 2025 Location: Patricia McInnes



NH_3 Calibration Plot Date: January 14, 2025 Location: Patricia McInnes



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS07
ATHABASCA VALLEY
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	January 13, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	10:15	End time (MST):	14:49
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.06	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC320556			
Removed Cal Gas Conc:	50.06	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3805
Zero Air Gen Model:	API 701H		Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Serial Number:	1507864683	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999948	0.997687	Backgd or Offset:	2.70	2.70
Calibration intercept:	2.064237	2.204778	Coeff or Slope:	0.854	0.854

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	79.8	799.0	795.2	1.005
As found Mid point	4960	39.9	399.5	402.0	0.994
As found Low point	4980	20.0	200.2	202.2	0.990
New cylinder response					
Baseline Corr As found:	795.2	Previous response	801.0	*% change	-0.7%
Baseline Corr 2nd AF pt:	402.0	AF Slope:	0.994640	AF Intercept:	2.045135
Baseline Corr 3rd AF pt:	202.2	AF Correlation:	0.999958	* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	79.8	799.0	797.5	1.002
Mid point	4960	39.9	399.5	404.2	0.988
Low point	4980	20.0	200.2	202.5	0.989
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	79.8	799.0	800.0	0.999
				Average Correction Factor:	0.993

Notes: No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

SO_2 Calibration Summary

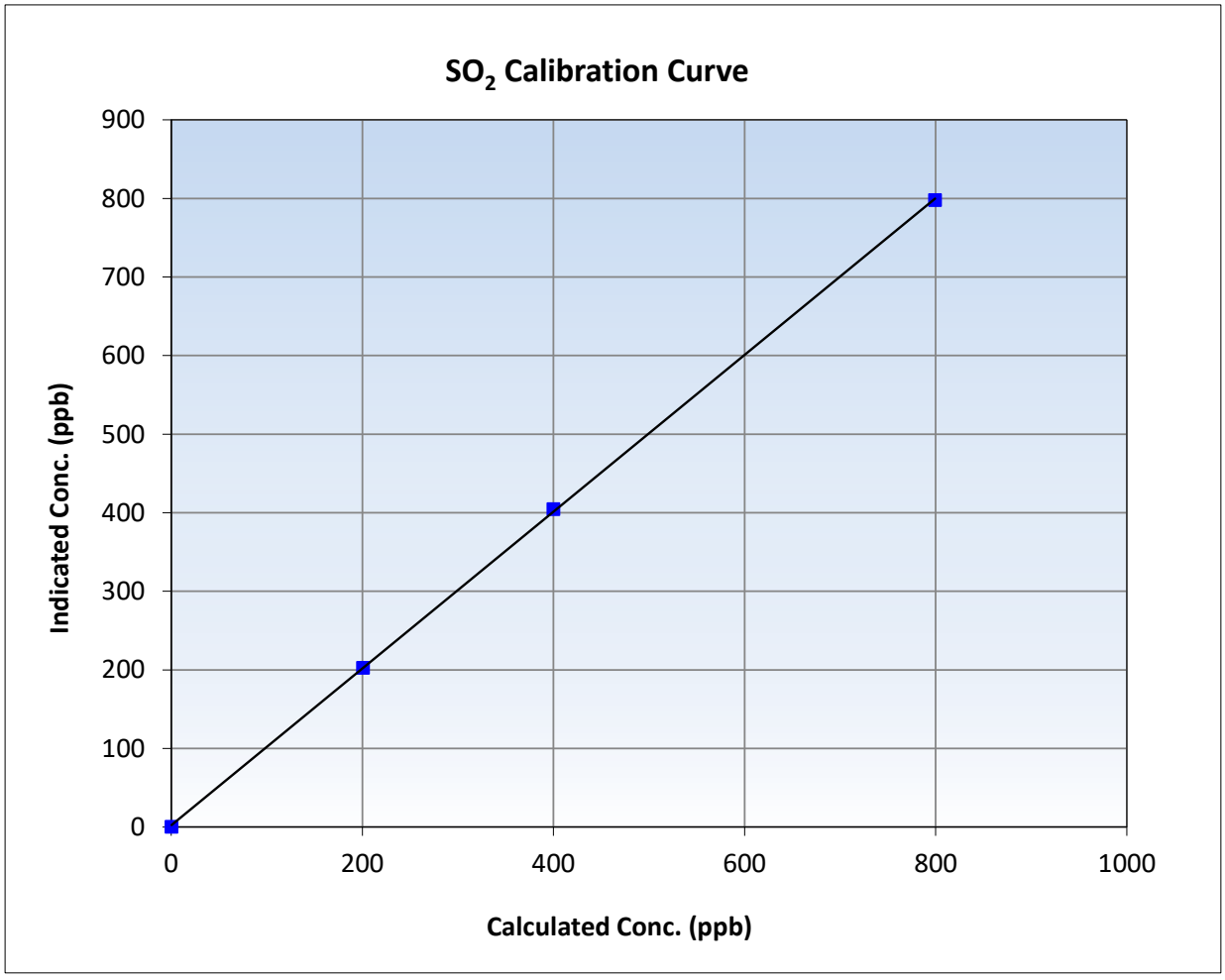
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 13, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	10:15	End Time (MST):	14:49
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1507864683

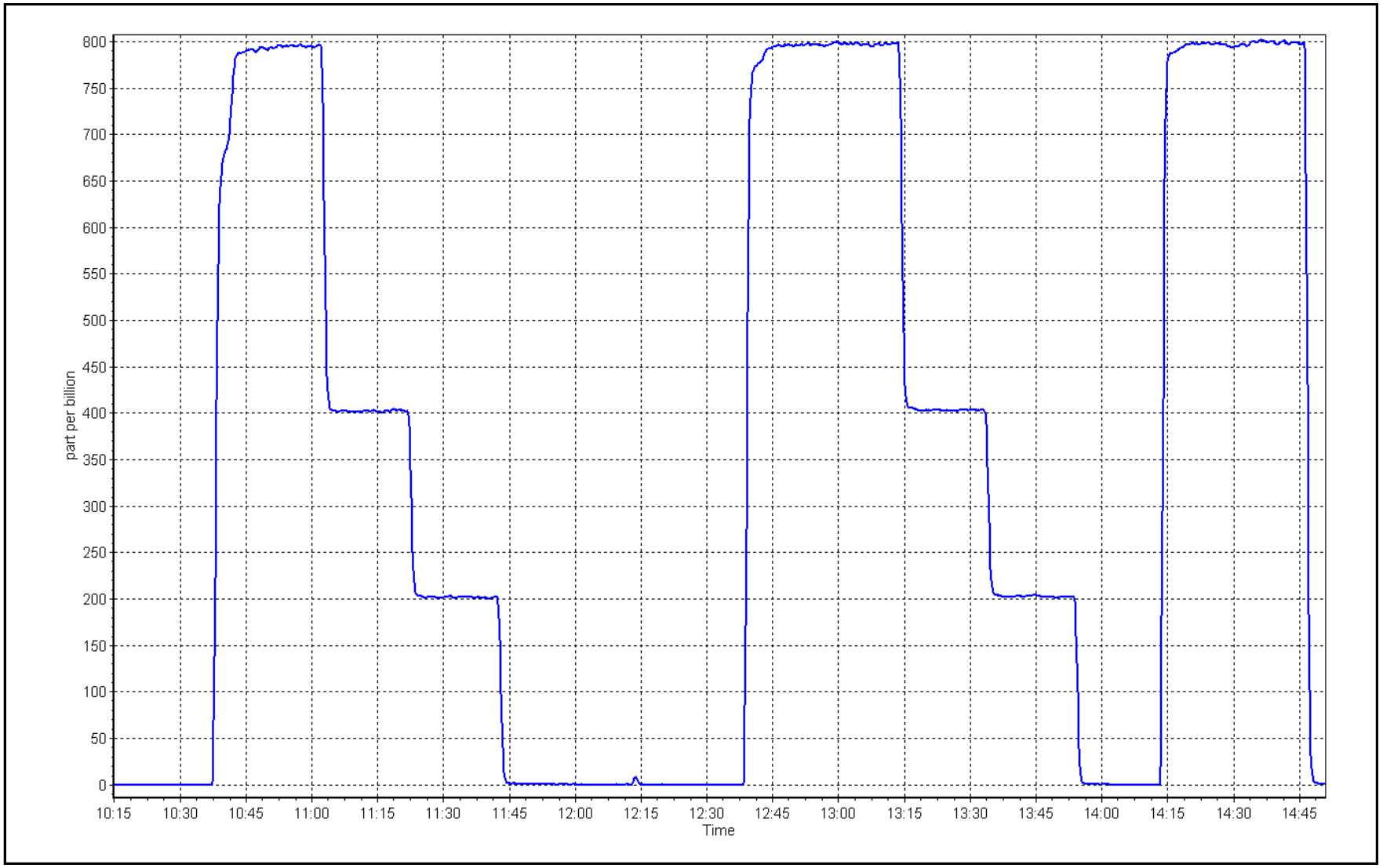
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
799.0	797.5	1.0019
399.5	404.2	0.9883
200.2	202.5	0.9888

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999943	*≥0.995*
Slope	0.997687	*0.90 - 1.10*
Intercept	2.204778	*+/-30*



SO2 Calibration Plot Date: January 13, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	January 24, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	10:20	End time (MST):	15:25
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.25	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC504080			
Removed Cal Gas Conc:	5.25	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		Converter Temp:	840 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.004677	1.013474	Backgd or Offset:	2.7	2.7
Calibration intercept:	-0.182049	0.037747	Coeff or Slope:	0.915	0.900

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4925	75.5	79.3	80.9	0.979
As found Mid point	4962	37.7	39.6	40.5	0.975
As found Low point	4981	18.9	19.8	19.9	0.992
New cylinder response					

Baseline Corr As found:	81.0	Prev response:	79.46	*% change:	1.9%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.023278	AF Intercept:	-0.182125
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999975	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4925	75.5	79.3	80.4	0.986
Mid point	4962	37.7	39.6	40.2	0.985
Low point	4981	18.9	19.9	20.2	0.983
As left zero	5000	0.0	0.0	0.5	----
As left span	4925	75.5	79.3	79.4	0.999
SO2 Scrubber Check	4920	79.2	792.1	0.2	----
Date of last scrubber change:		25-Feb-22		Ave Corr Factor	0.985
Date of last converter efficiency test:		April 22, 2022			

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

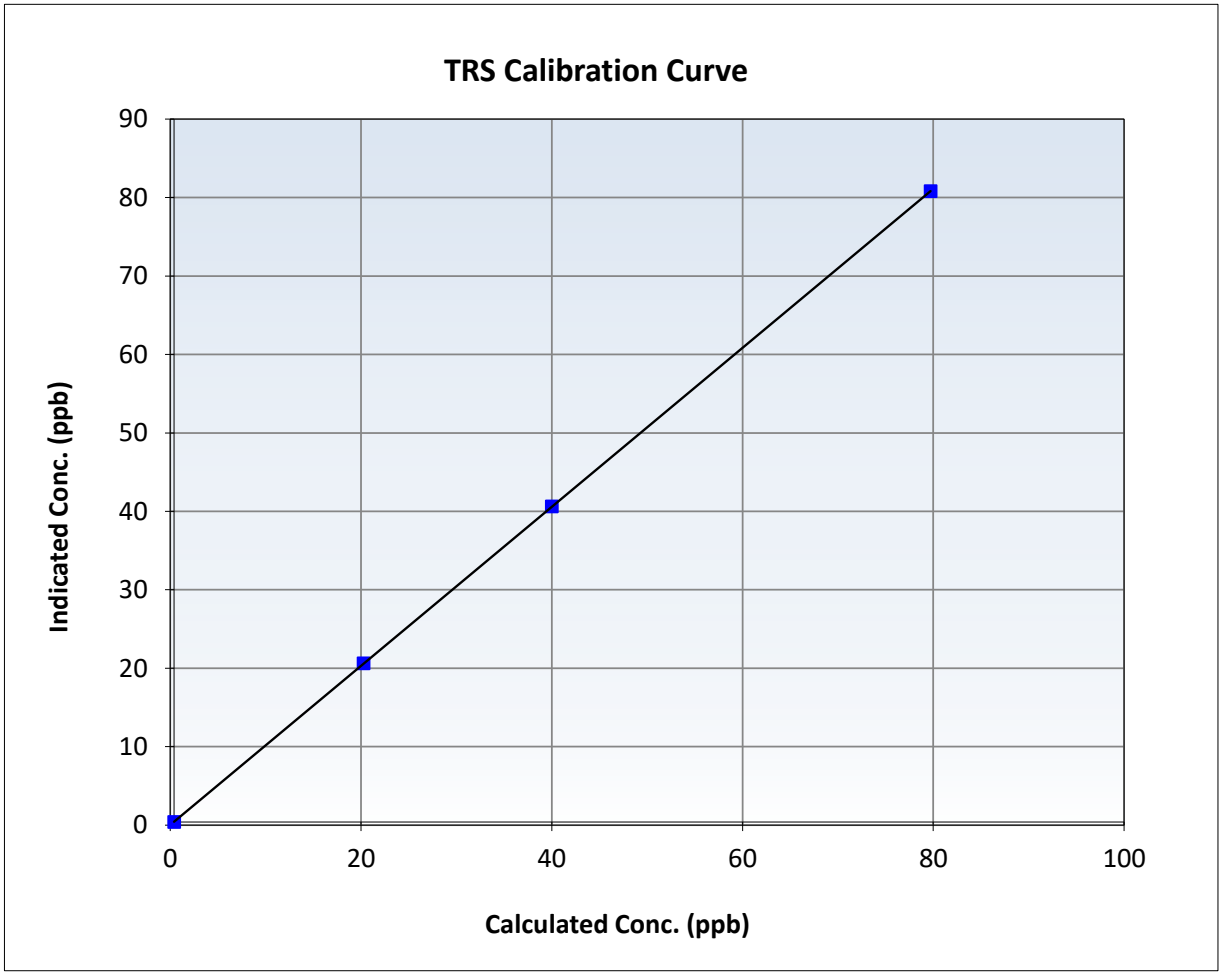
TRS Calibration Summary

Station Information

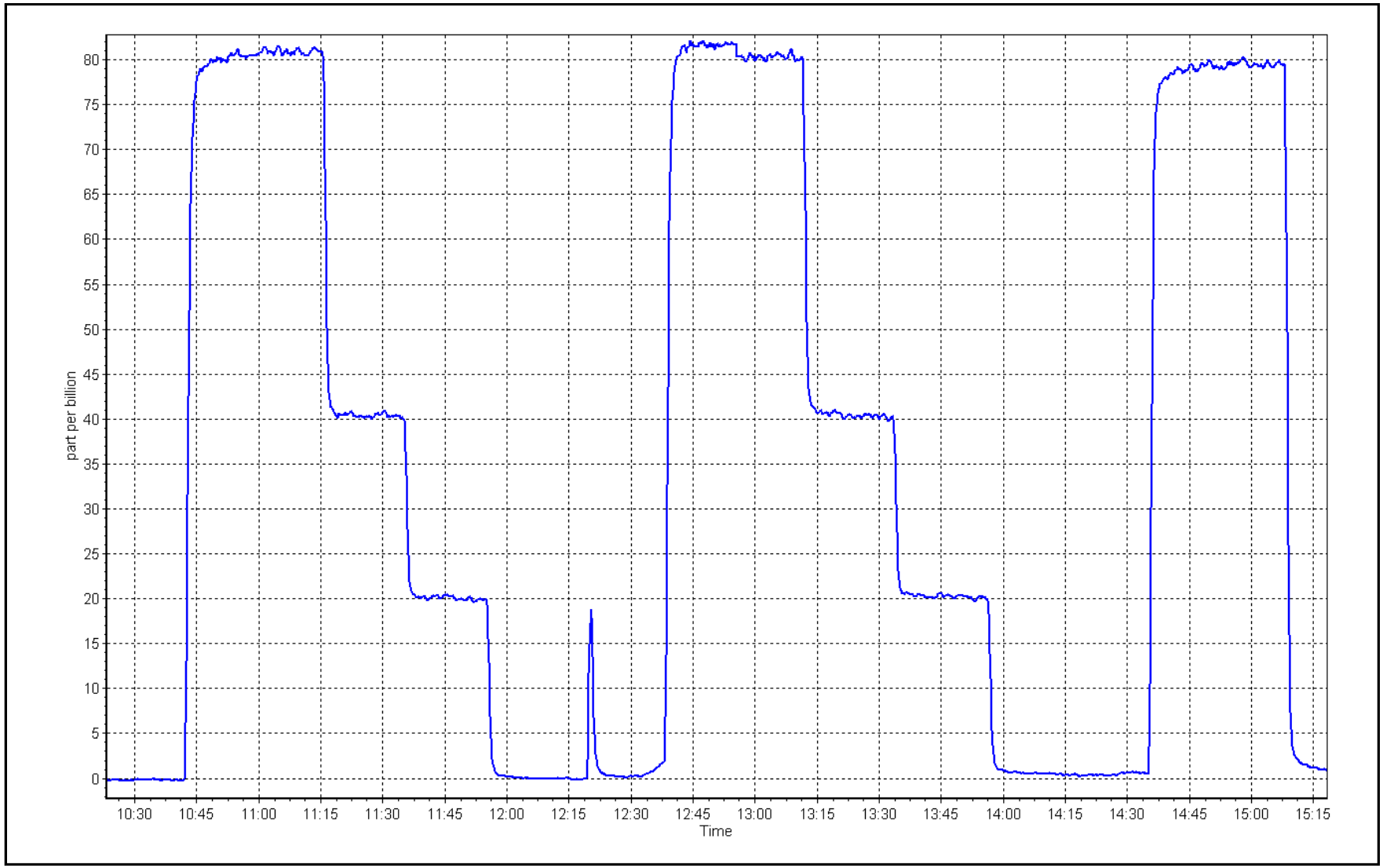
Calibration Date:	January 24, 2025	Previous Calibration:	December 11, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	10:20	End Time (MST):	15:25
Analyzer make:	Thermo 43i LTE	Analyzer serial #:	1180540018

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.0	----	Correlation Coefficient	0.999999	*≥0.995*
79.3	80.4	0.9865	Slope	1.013474	*0.90 - 1.10*
39.6	40.2	0.9853			
19.9	20.2	0.9830	Intercept	0.037747	*+/-3*



TRS Calibration Plot Date: January 24, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	January 5, 2025	Last Cal Date:	December 24, 2024
Start time (MST):	10:11	End time (MST):	12:48
Reason:	Routine	Dipping on CH4 channel	

Calibration Standards

Gas Cert Reference:	CC320556	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	3805
Zero Air Gen model:	Teledyne API T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.99E-04	3.16E-04	NMHC SP Ratio:	5.75E-05	5.85E-05
CH4 Retention time:	14.0	14.4	NMHC Peak Area:	156648	153861
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	16.91	16.29	1.039
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.29	Prev response	16.89	*% change	-3.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	16.91	16.89	1.002
Mid point	4960	39.9	8.46	8.33	1.015
Low point	4980	20.0	4.24	4.21	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	16.91	16.84	1.005
				Average Correction Factor	1.008

Notes: RT increased. Adjusted span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.00	8.90	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.90	Prev response	8.99	*% change	-1.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.00	8.97	1.003
Mid point	4960	39.9	4.50	4.44	1.014
Low point	4980	20.0	2.26	2.26	1.000
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.00	8.96	1.004
				Average Correction Factor	1.005

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	7.92	7.38	1.072
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.38	Prev response	7.90	*% change	-7.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	7.92	7.91	1.000
Mid point	4960	39.9	3.96	3.89	1.017
Low point	4980	20.0	1.98	1.96	1.013
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	7.92	7.88	1.005
				Average Correction Factor	1.010

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.999834	0.997916
THC Cal Offset:	-0.024336	-0.030136
CH4 Cal Slope:	1.001695	0.999849
CH4 Cal Offset:	-0.027533	-0.023135
NMHC Cal Slope:	0.998323	0.996456
NMHC Cal Offset:	0.003197	-0.007202

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

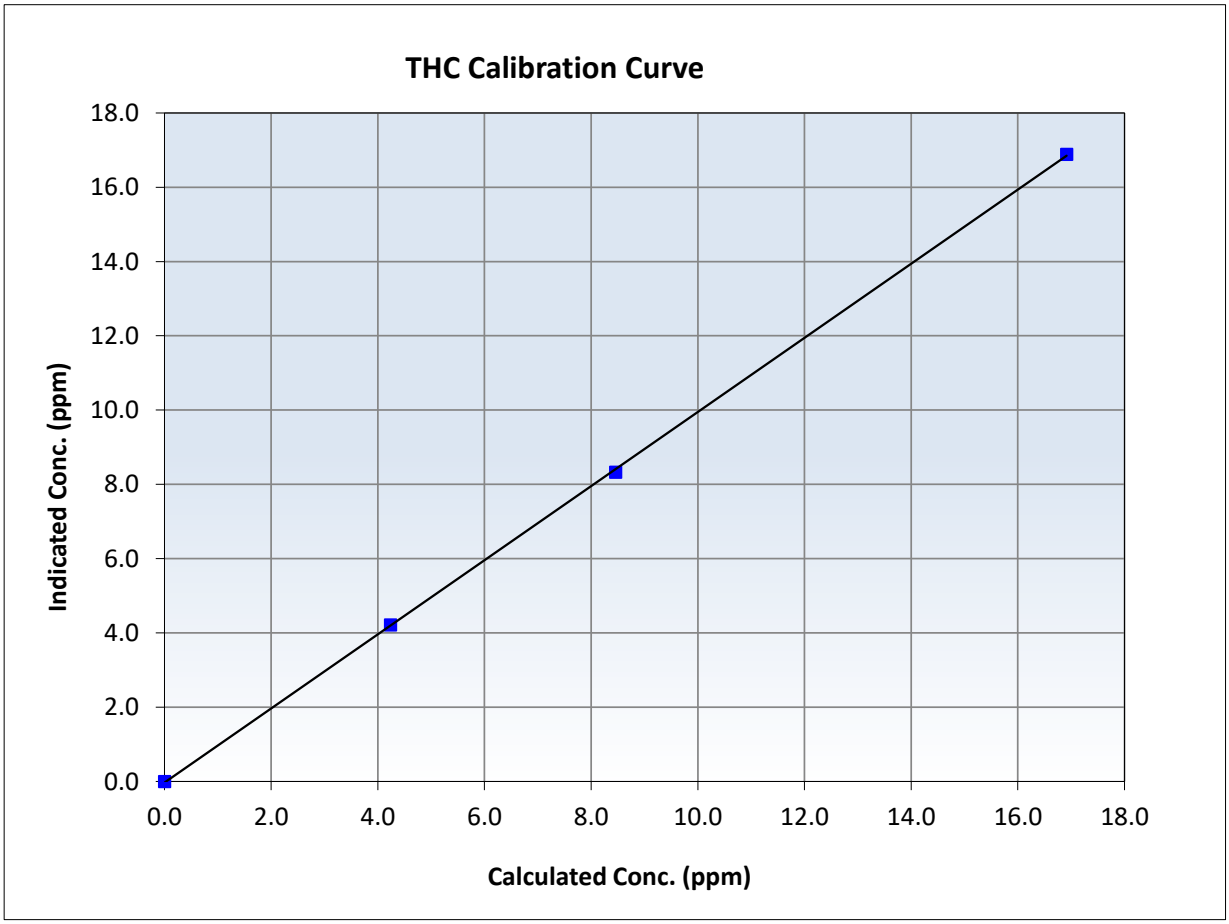
THC Calibration Summary

Station Information

Calibration Date:	January 5, 2025	Previous Calibration:	December 24, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:11	End Time (MST):	12:48
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999942	≥0.995
16.91	16.89	1.0017	Slope	0.997916	0.90 - 1.10
8.46	8.33	1.0155	Intercept	-0.030136	+/-0.5
4.24	4.21	1.0059			



Wood Buffalo Environmental Association

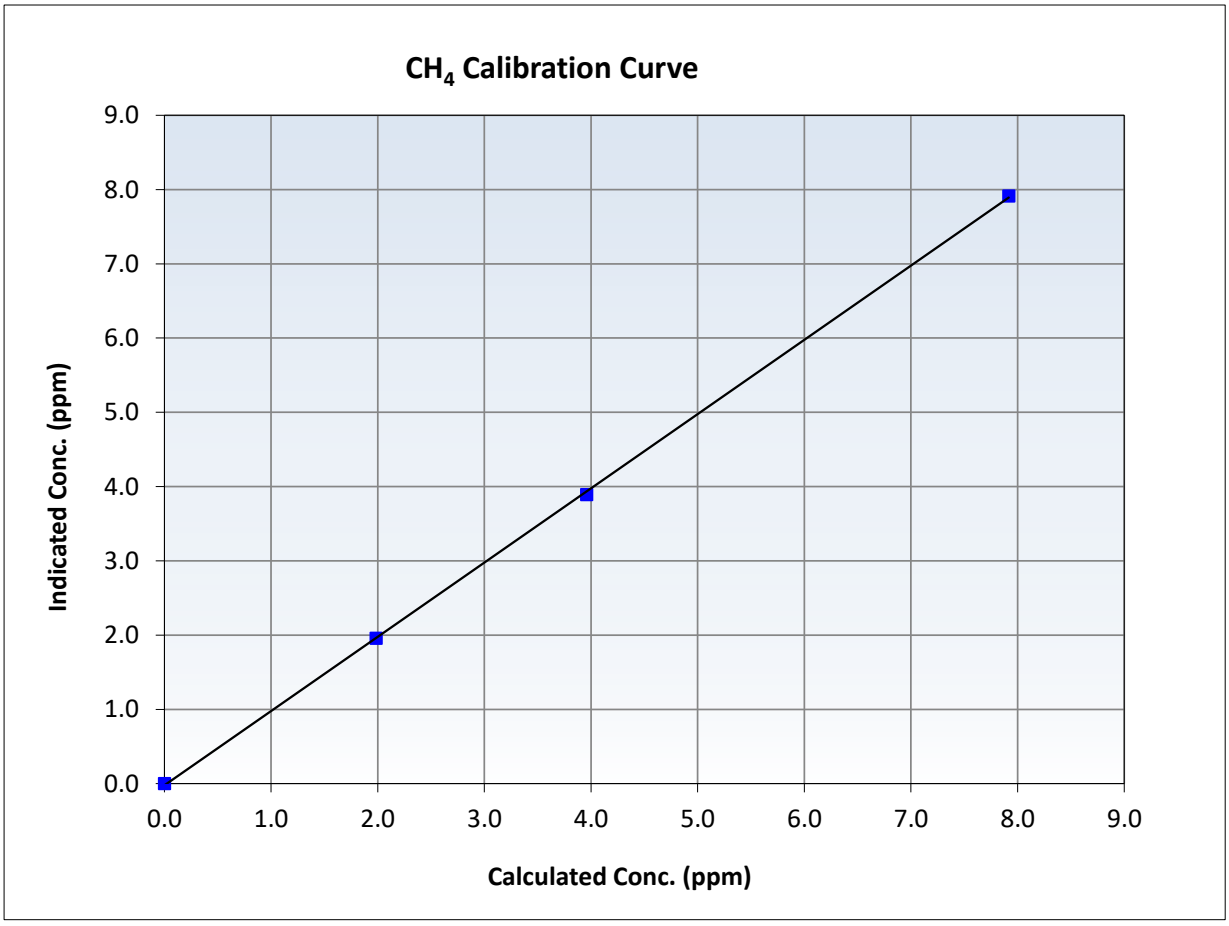
CH_4 Calibration Summary

Station Information

Calibration Date:	January 5, 2025	Previous Calibration:	December 24, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:11	End Time (MST):	12:48
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999918	≥0.995
7.92	7.91	1.0003	Slope	0.999849	0.90 - 1.10
3.96	3.89	1.0170			
1.98	1.96	1.0133	Intercept	-0.023135	+/-0.5



Wood Buffalo Environmental Association

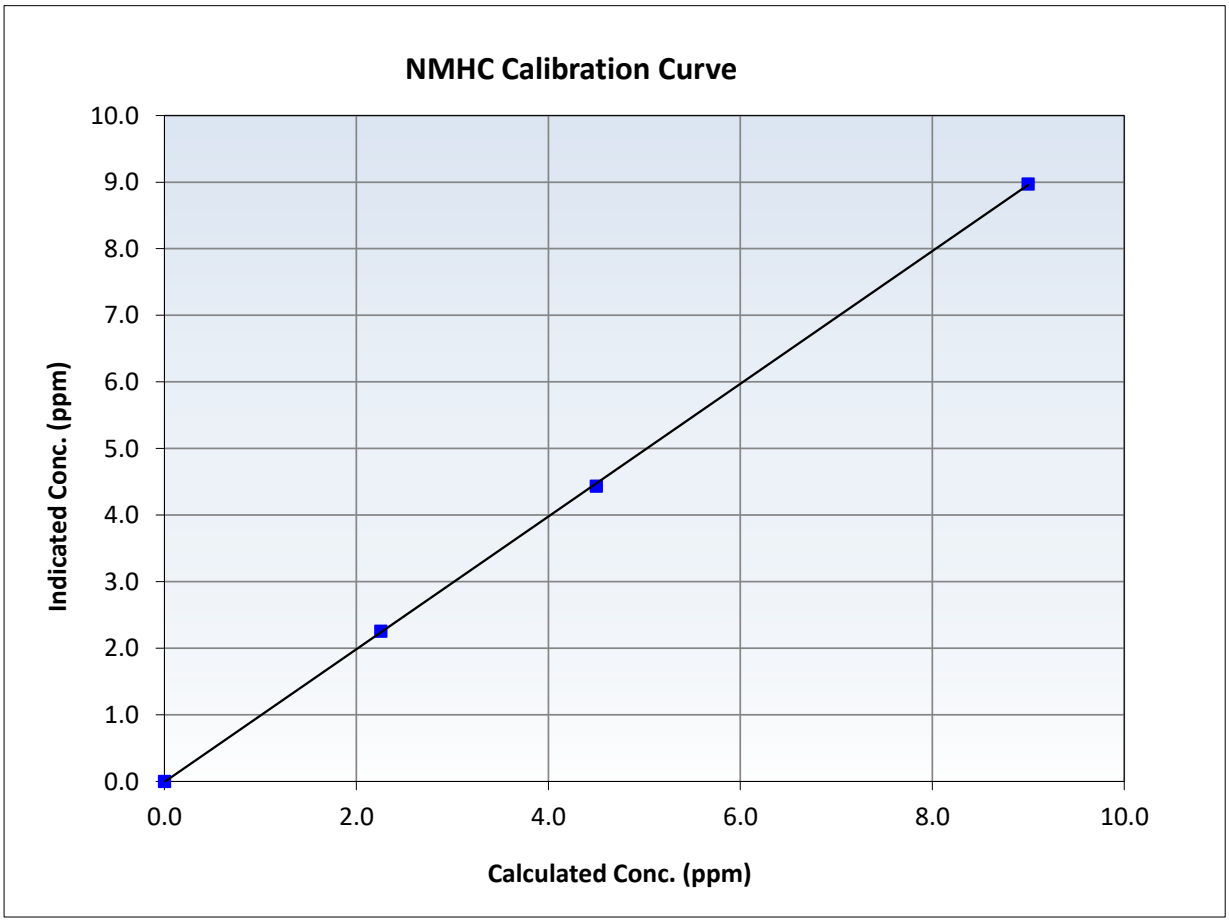
NMHC Calibration Summary

Station Information

Calibration Date:	January 5, 2025	Previous Calibration:	December 24, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:11	End Time (MST):	12:48
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999954	≥0.995
9.00	8.97	1.0027	Slope	0.996456	0.90 - 1.10
4.50	4.44	1.0139			
2.26	2.26	0.9996	Intercept	-0.007202	+/-0.5



NMHC Calibration Plot Date: January 5, 2025 Location: Athabasca Valley

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	January 13, 2025	Last Cal Date:	January 5, 2025
Start time (MST):	10:15	End time (MST):	N/A
Reason:	Removal		

Calibration Standards

Gas Cert Reference:	CC320556	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	3805
Zero Air Gen model:	Teledyne API T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	3.16E-04		NMHC SP Ratio:	5.85E-05	
CH4 Retention time:	14.4		NMHC Peak Area:	153861	
Zero Chromatogram:	OFF		Flat Baseline:	OFF	

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	16.91	15.84	1.068
As found Mid point	4960	39.9	8.46	7.87	1.074
As found Low point	4980	20.0	4.24	3.97	1.069
New cylinder response					
Baseline Corr AF:	15.84	Prev response	16.85	*% change	-6.4%
Baseline Corr 2nd AF:	7.87	AF Slope:	0.936328	AF Intercept:	-0.011478
Baseline Corr 3rd AF:	3.97	AF Correlation:	0.999989	* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

Notes: Removal cal.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.00	8.59	1.048
As found Mid point	4960	39.9	4.50	4.28	1.051
As found Low point	4980	20.0	2.26	2.17	1.042
New cylinder response					
Baseline Corr AF:	8.59	Prev response	8.96	*% change	-4.3%
Baseline Corr 2nd AF:	4.28	AF Slope:	0.953782	AF Intercept:	0.002095
Baseline Corr 3rd AF:	2.17	AF Correlation:	0.999991	* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	7.92	7.25	1.092
As found Mid point	4960	39.9	3.96	3.59	1.101
As found Low point	4980	20.0	1.98	1.80	1.102
New cylinder response					
Baseline Corr AF:	7.25	Prev response	7.89	*% change	-8.8%
Baseline Corr 2nd AF:	3.59	AF Slope:	0.916359	AF Intercept:	-0.013372
Baseline Corr 3rd AF:	1.80	AF Correlation:	0.999975	* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

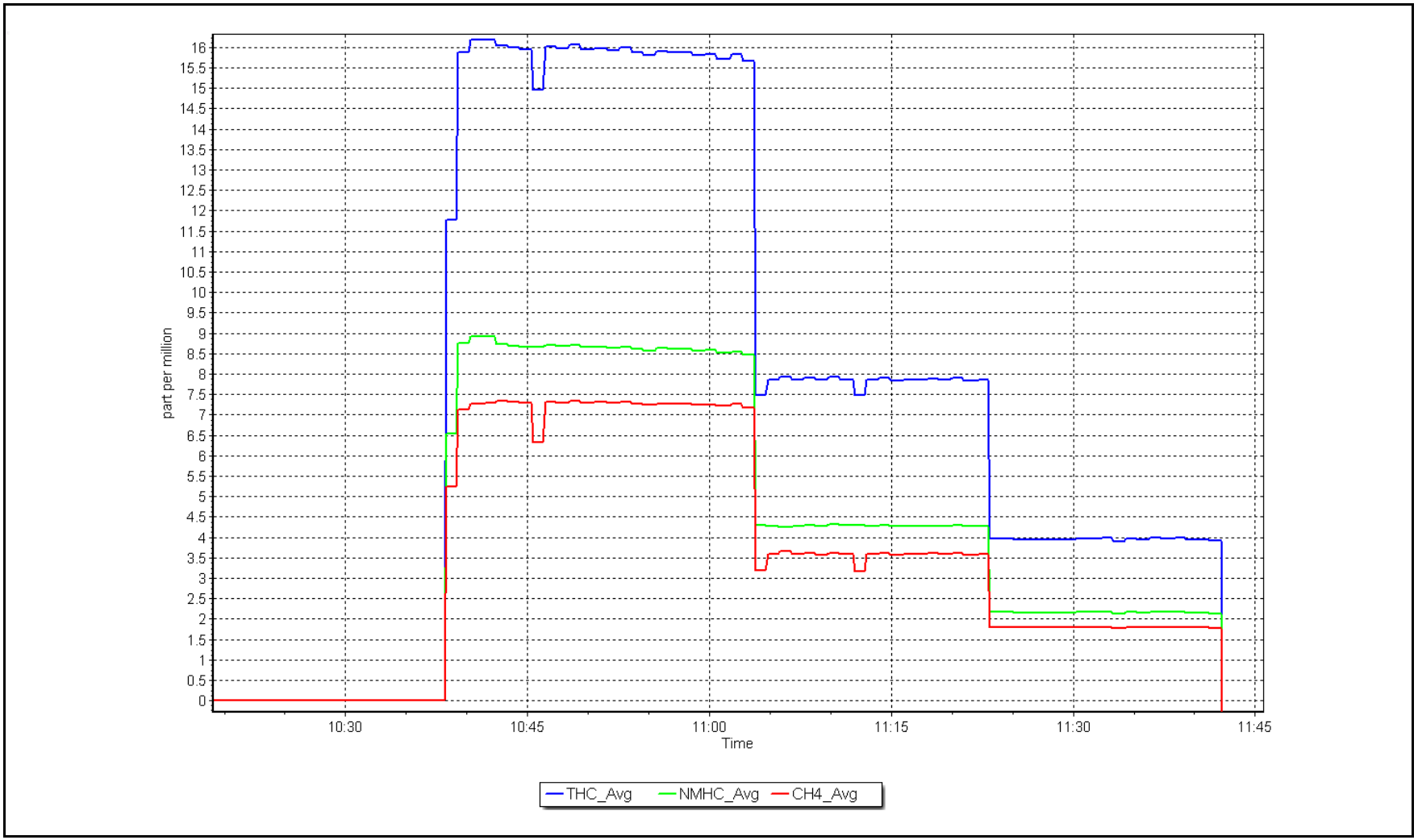
Average Correction Factor

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.997916	
THC Cal Offset:	-0.030136	
CH4 Cal Slope:	0.999849	
CH4 Cal Offset:	-0.023135	
NMHC Cal Slope:	0.996456	
NMHC Cal Offset:	-0.007202	

Calibration Performed By: Aswin Sasi Kumar

NMHC Calibration Plot Date: January 13, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	January 13, 2025	Last Cal Date:	
Start time (MST):	12:20	End time (MST):	14:49
Reason:	Install		

Calibration Standards

Gas Cert Reference:	CC320556	Cal Gas Expiry Date:	March 10, 2031
CH4 Cal Gas Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	496.0 ppm	CH4 Equiv Conc.	1059.8 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	3805
Zero Air Gen model:	Teledyne API T701H	Serial Number:	198

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	N/A	3.08E-04	NMHC SP Ratio:	N/A	5.58E-05
CH4 Retention time:	N/A	14.4	NMHC Peak Area:	N/A	161180
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	16.91	16.86	1.003
Mid point	4960	39.9	8.46	8.48	0.997
Low point	4980	20.0	4.24	4.33	0.979
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	16.91	16.75	1.010
				Average Correction Factor	0.993

Notes: Install calibration. Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.00	8.97	1.003
Mid point	4960	39.9	4.50	4.54	0.992
Low point	4980	20.0	2.26	2.34	0.964
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.00	8.91	1.010
				Average Correction Factor	0.986

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	7.92	7.89	1.003
Mid point	4960	39.9	3.96	3.95	1.003
Low point	4980	20.0	1.98	1.99	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	7.92	7.84	1.010
				Average Correction Factor	1.001

Calibration Statistics

	Start	*Finish*
THC Cal Slope:		0.995067
THC Cal Offset:		0.052453
CH4 Cal Slope:		0.996067
CH4 Cal Offset:		0.006467
NMHC Cal Slope:		0.994098
NMHC Cal Offset:		0.046587

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

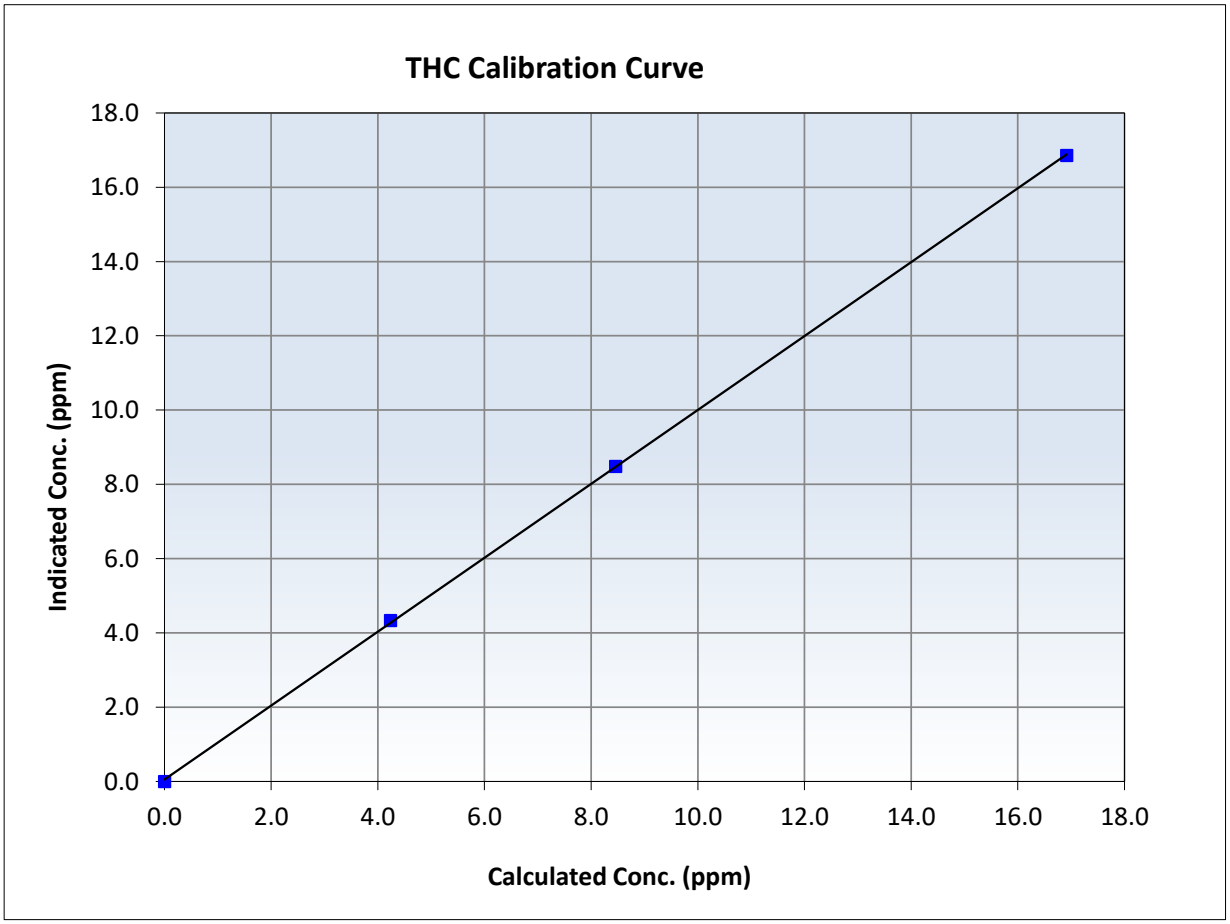
THC Calibration Summary

Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	12:20	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999954	≥0.995
16.91	16.86	1.0032	Slope	0.995067	0.90 - 1.10
8.46	8.48	0.9970	Intercept	0.052453	+/-0.5
4.24	4.33	0.9788			



Wood Buffalo Environmental Association

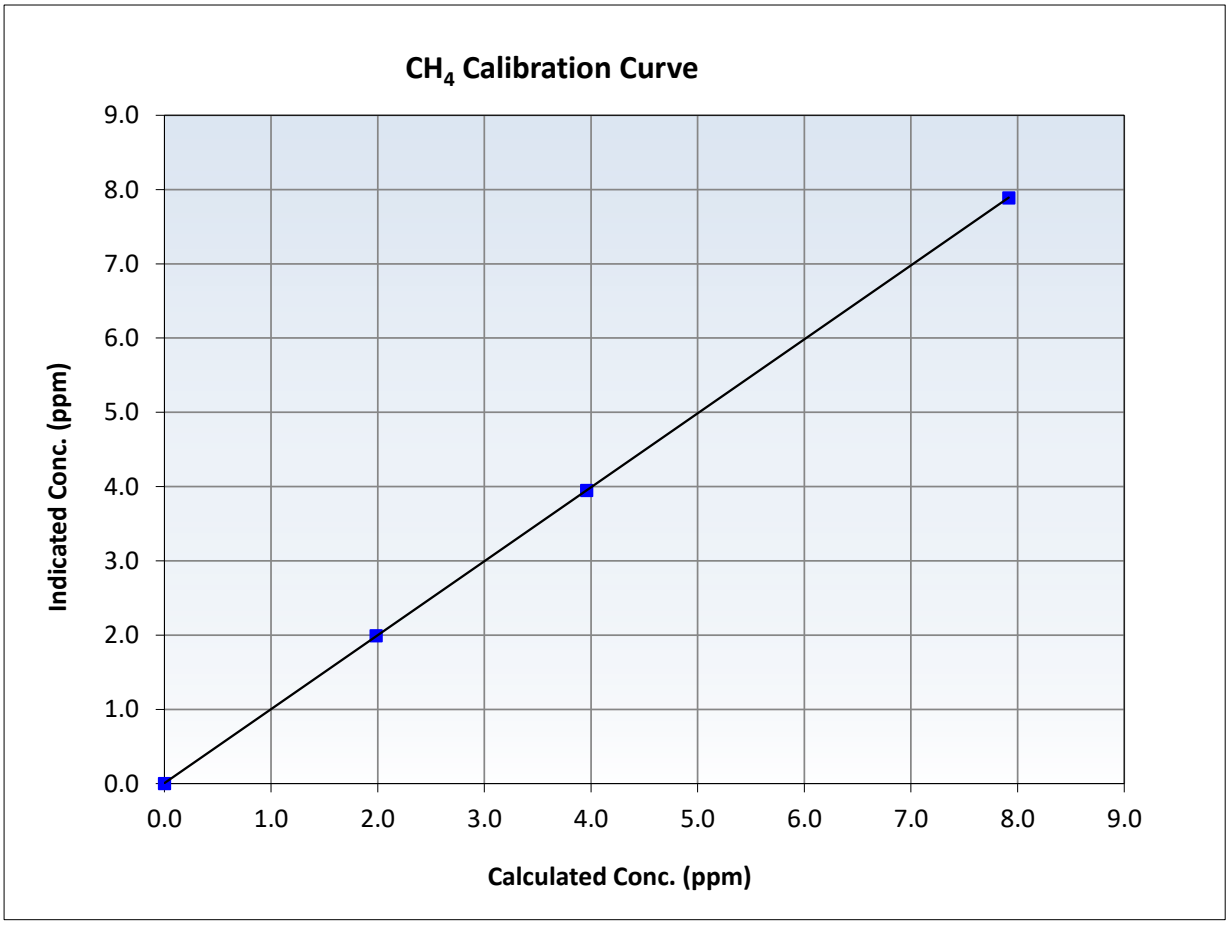
CH_4 Calibration Summary

Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	12:20	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999996	≥0.995
7.92	7.89	1.0034	Slope	0.996067	0.90 - 1.10
3.96	3.95	1.0026			
1.98	1.99	0.9960	Intercept	0.006467	+/-0.5



Wood Buffalo Environmental Association

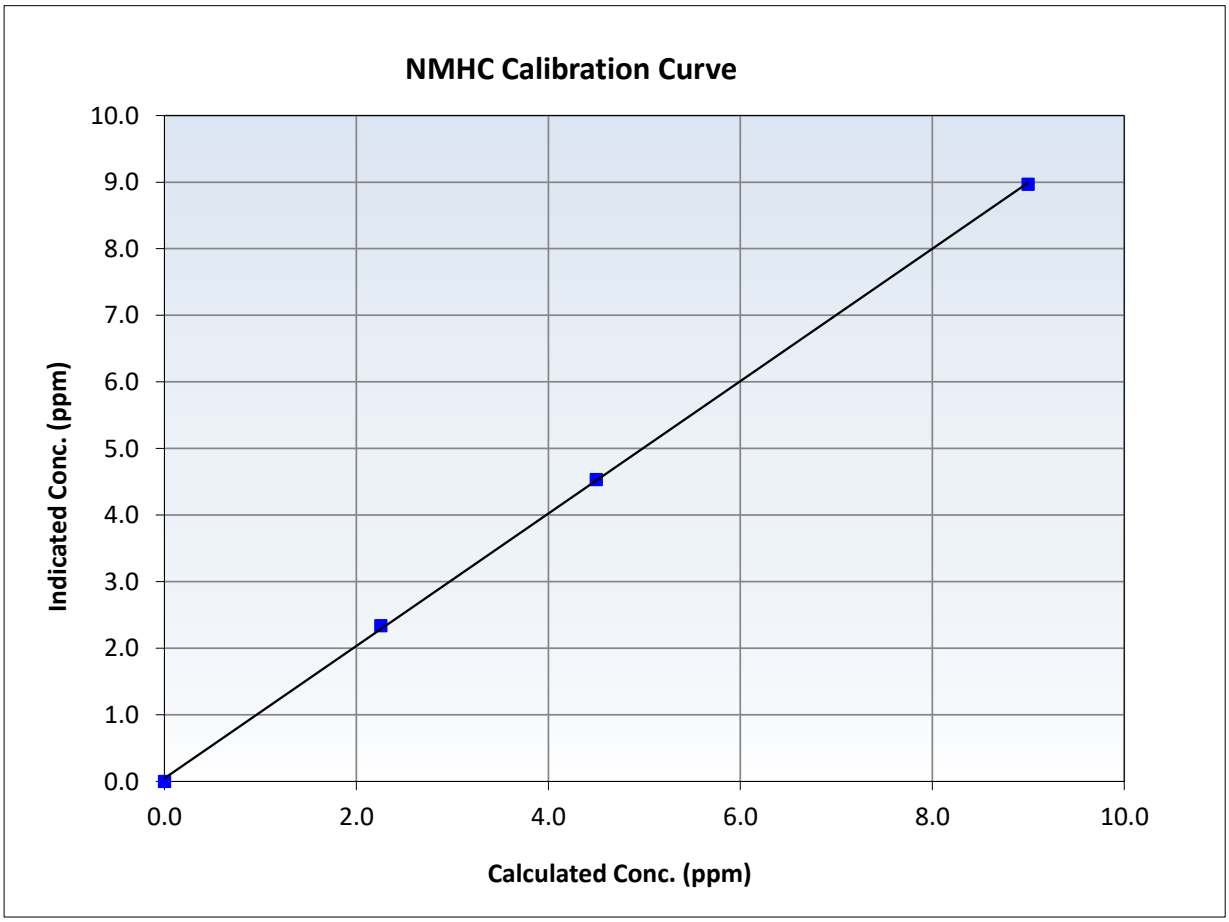
NMHC Calibration Summary

Station Information

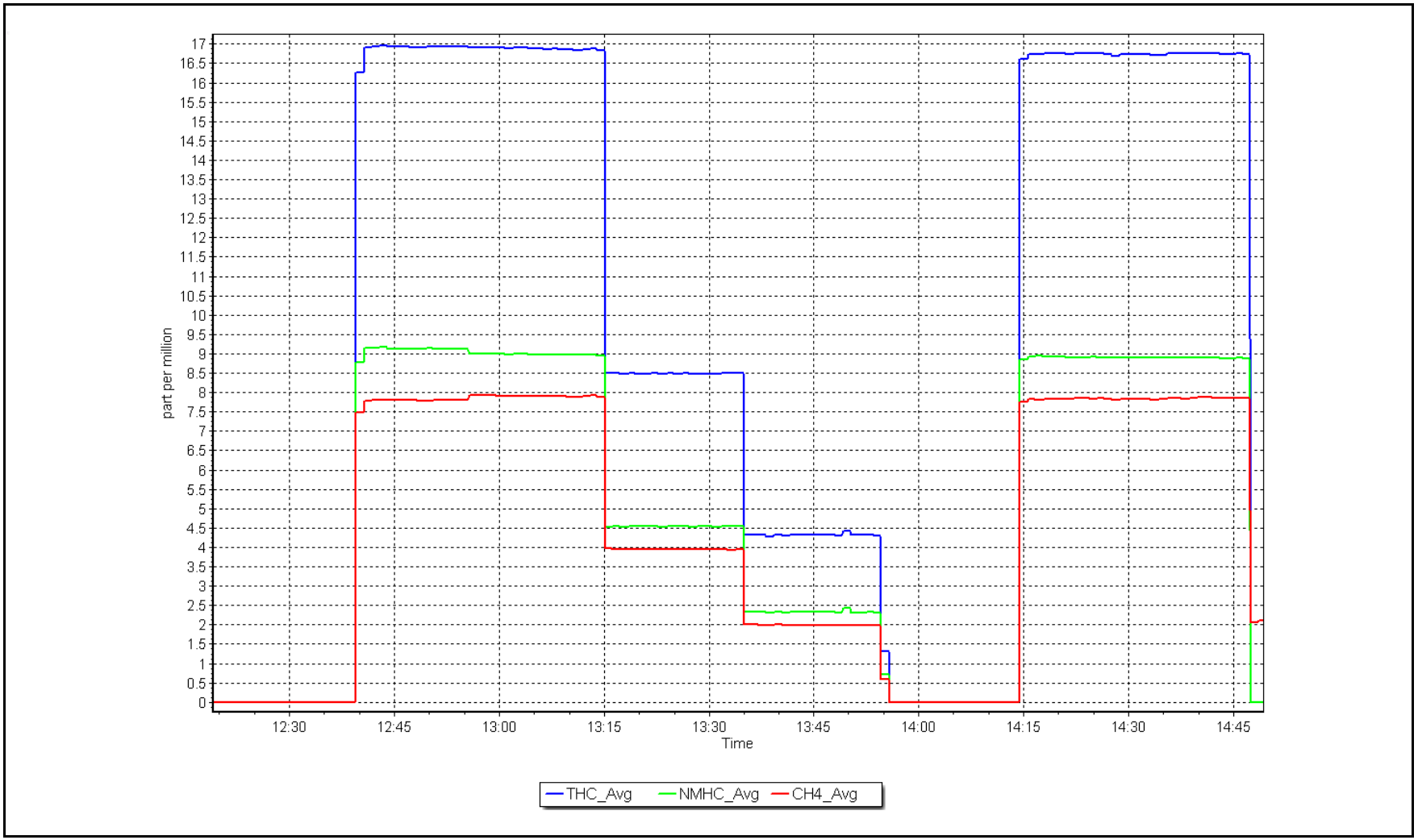
Calibration Date:	January 13, 2025	Previous Calibration:	
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	12:20	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999874	≥0.995
9.00	8.97	1.0031	Slope	0.994098	0.90 - 1.10
4.50	4.54	0.9918	Intercept	0.046587	+/-0.5
2.26	2.34	0.9641			



NMHC Calibration Plot Date: January 13, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Athabasca Valley
Station number:	AMS 07
Calibration Date:	January 10, 2025
Last Cal Date:	December 6, 2024
Start time (MST):	10:26
End time (MST):	15:59
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0033919	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.10 ppm	NO Cal Gas Conc:	59.90 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	60.10 ppm	Removed Gas NO Conc:	59.90 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3805
ZAG make/model:	API T701H	Serial Number:	198

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
AF High point	4933	66.8	803.0	800.3	2.7	803.0	794.1	8.9	0.9998	1.0077
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 805.2 ppb	NO = 801.1 ppb
Baseline Corr 1st pt	NO_X = 803.1 ppb	NO = 794.2 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -0.3%

*Percent Change NO = -0.9%

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1160120024

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.162	1.172	NO bkgnd or offset:	8.3	8.4
NOX coeff or slope:	1.005	1.003	NOX bkgnd or offset:	8.6	8.7
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	227.4	228.6

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.000855	0.999389
NO_X Cal Offset:	1.591906	1.431929
NO Cal Slope:	0.999328	0.991545
NO Cal Offset:	1.371944	2.771937
NO_2 Cal Slope:	1.001200	0.999681
NO_2 Cal Offset:	0.988044	-0.147475

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4933	66.8	803.0	800.3	2.7	803.0	794.1	8.9	1.0000	1.0078
Mid point	4966	33.4	401.5	400.2	1.3	404.0	403.4	0.6	0.9939	0.9920
Low point	4983	16.7	200.7	200.1	0.7	203.1	202.3	0.7	0.9884	0.9890
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4933	66.8	803.0	397.9	405.1	802.2	397.9	404.4	1.0010	1.0000
							Average Correction Factor		0.9941	0.9963

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	798.0	397.9	402.8	402.6	1.0004	100.0%
Mid GPT point	798.0	598.2	202.5	202.1	1.0018	99.8%
Low GPT point	798.0	696.9	103.8	103.5	1.0026	99.7%
				Average Correction Factor	1.0016	99.8%

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

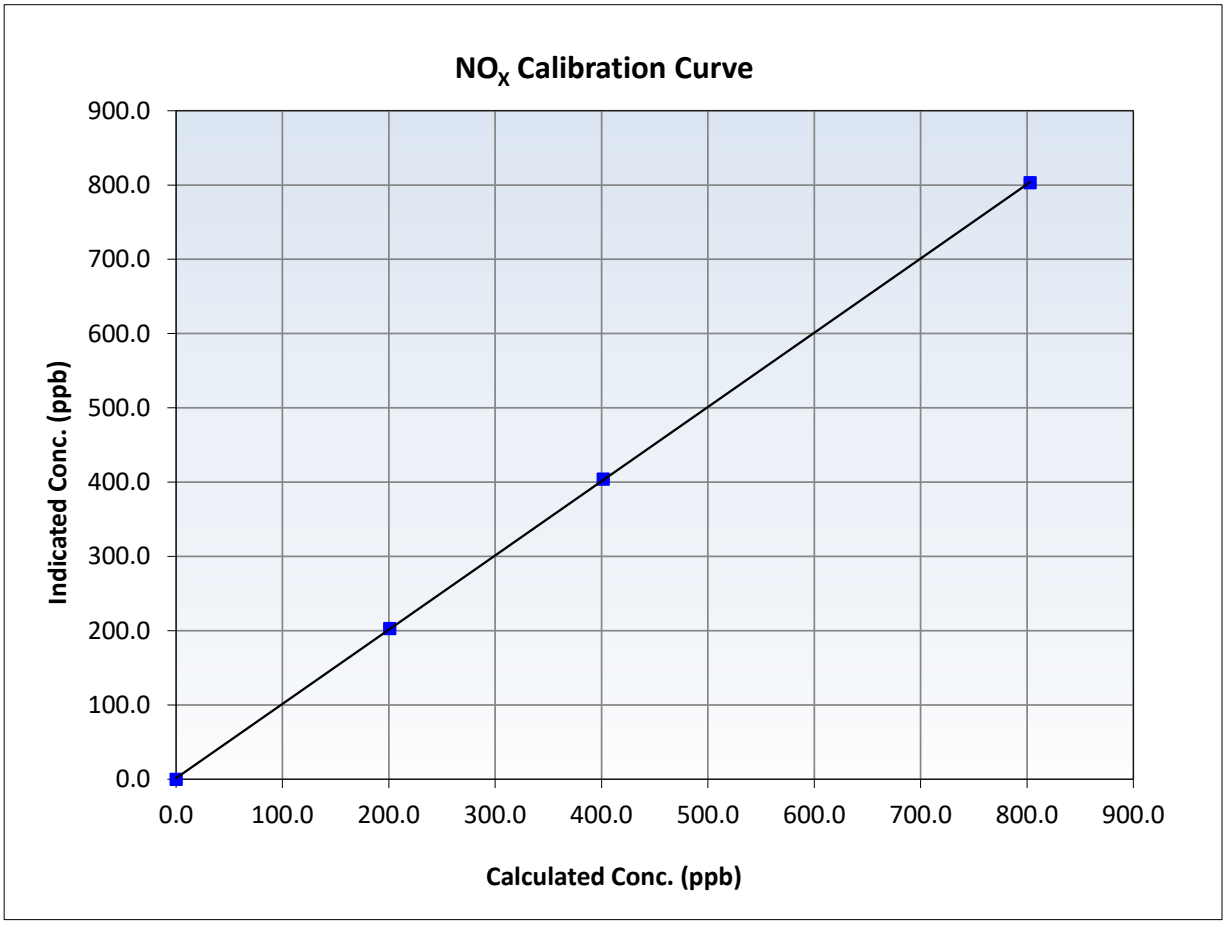
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 6, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
803.0	803.0	1.0000
401.5	404.0	0.9939
200.7	203.1	0.9884

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	0.999389	*0.90 - 1.10*
Intercept	1.431929	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

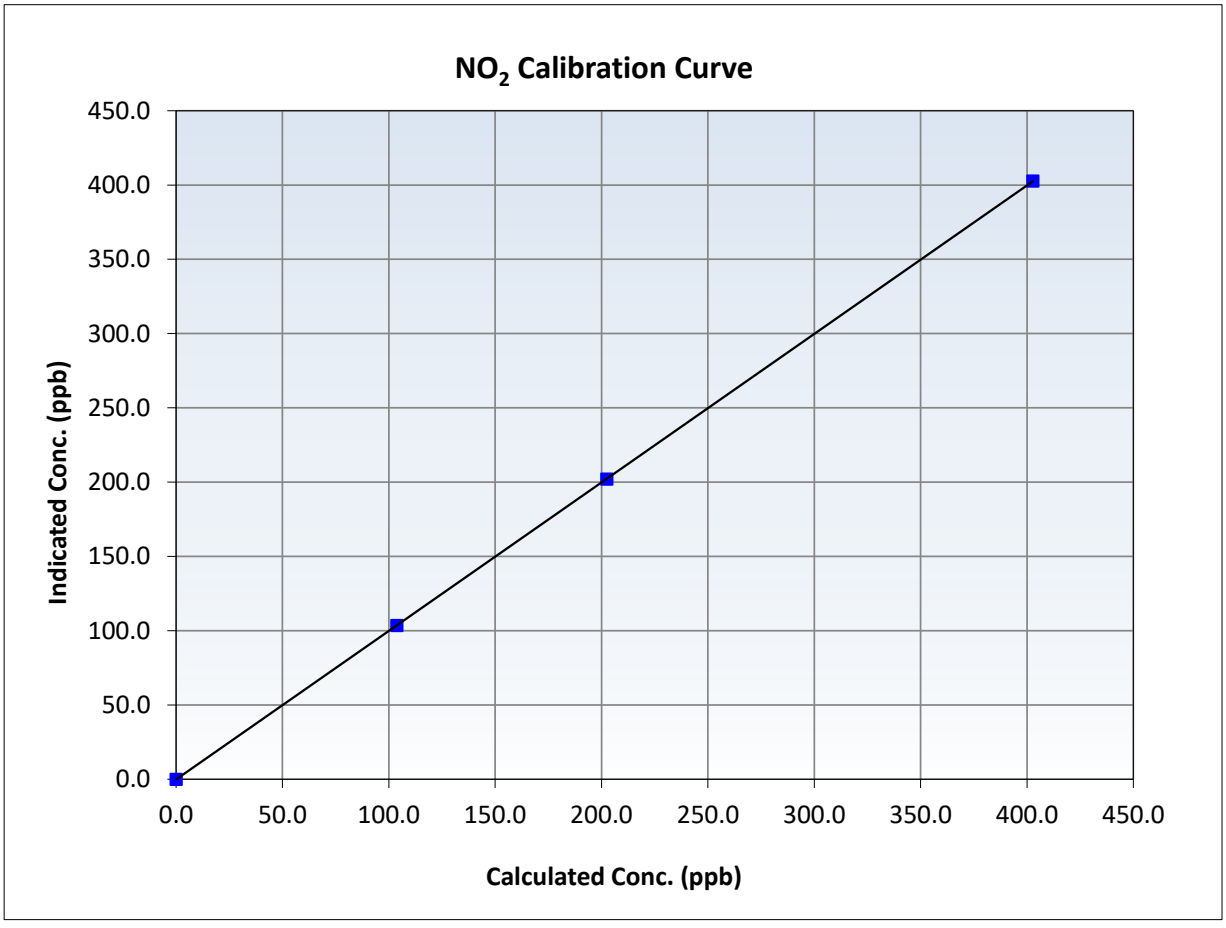
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 6, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
402.8	402.6	1.0004
202.5	202.1	1.0018
103.8	103.5	1.0026

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.999681	*0.90 - 1.10*
Intercept	-0.147475	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

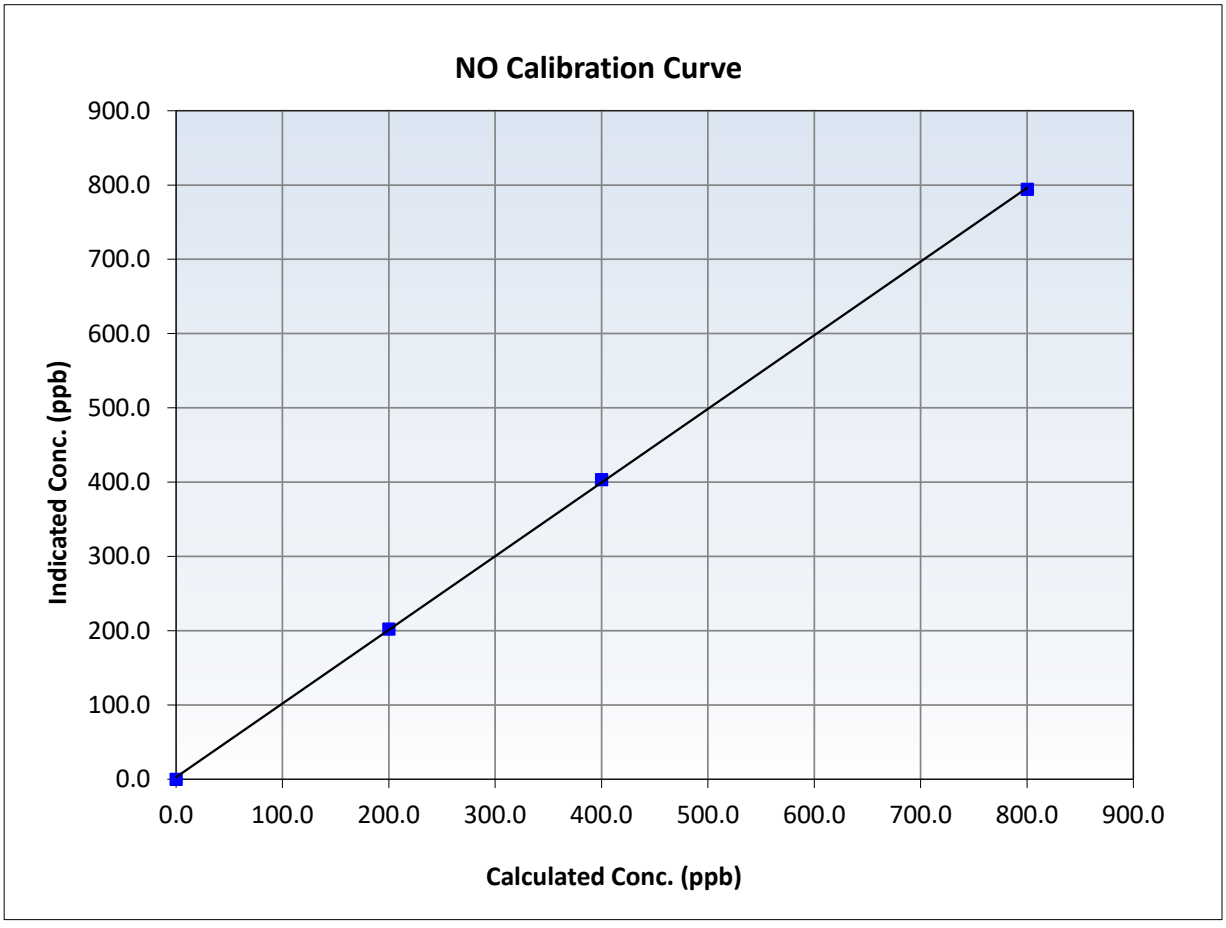
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 6, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:26	End Time (MST):	15:59
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

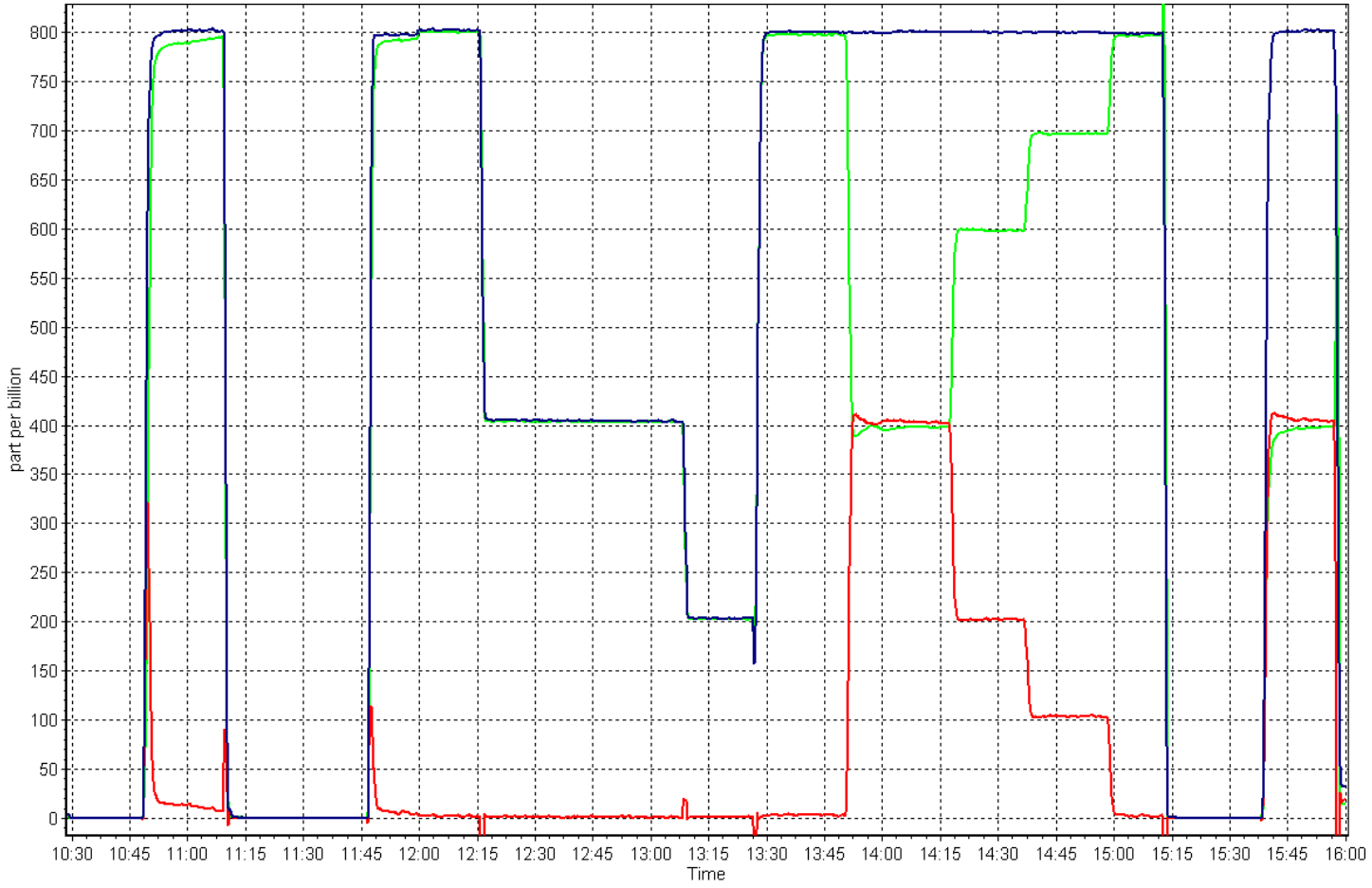
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.3	794.1	1.0078
400.2	403.4	0.9920
200.1	202.3	0.9890

Statistical Evaluation		Limits
Correlation Coefficient	0.999917	≥0.995
Slope	0.991545	0.90 - 1.10
Intercept	2.771937	+/-20



NO_X Calibration Plot Date: January 10, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS07
Calibration Date:	January 17, 2025	Last Cal Date:	December 23, 2024
Start time (MST):	11:04	End time (MST):	15:15
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 #:	1152220023
Analyzer Range	0 - 500 ppb		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001223	0.997086	Backgd or Offset:	-2.0	-1.1
Calibration intercept:	1.996000	0.960000	Coeff or Slope:	1.560	1.560

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.8	----
As found High point	5000	1652.0	400.0	400.7	1.000
As found Mid point					
As found Low point					
Baseline Corr As found:	399.9	Previous response	402.5	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.6	----
High point	5000	1654.3	400.0	399.5	1.001
Mid point	5000	1152.0	200.0	200.9	0.996
Low point	5000	913.0	100.0	100.8	0.992
As left zero	5000	1652.9	0.0	0.4	----
As left span	5000	1582.6	400.0	401.2	0.997
				Average Correction Factor	0.996

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

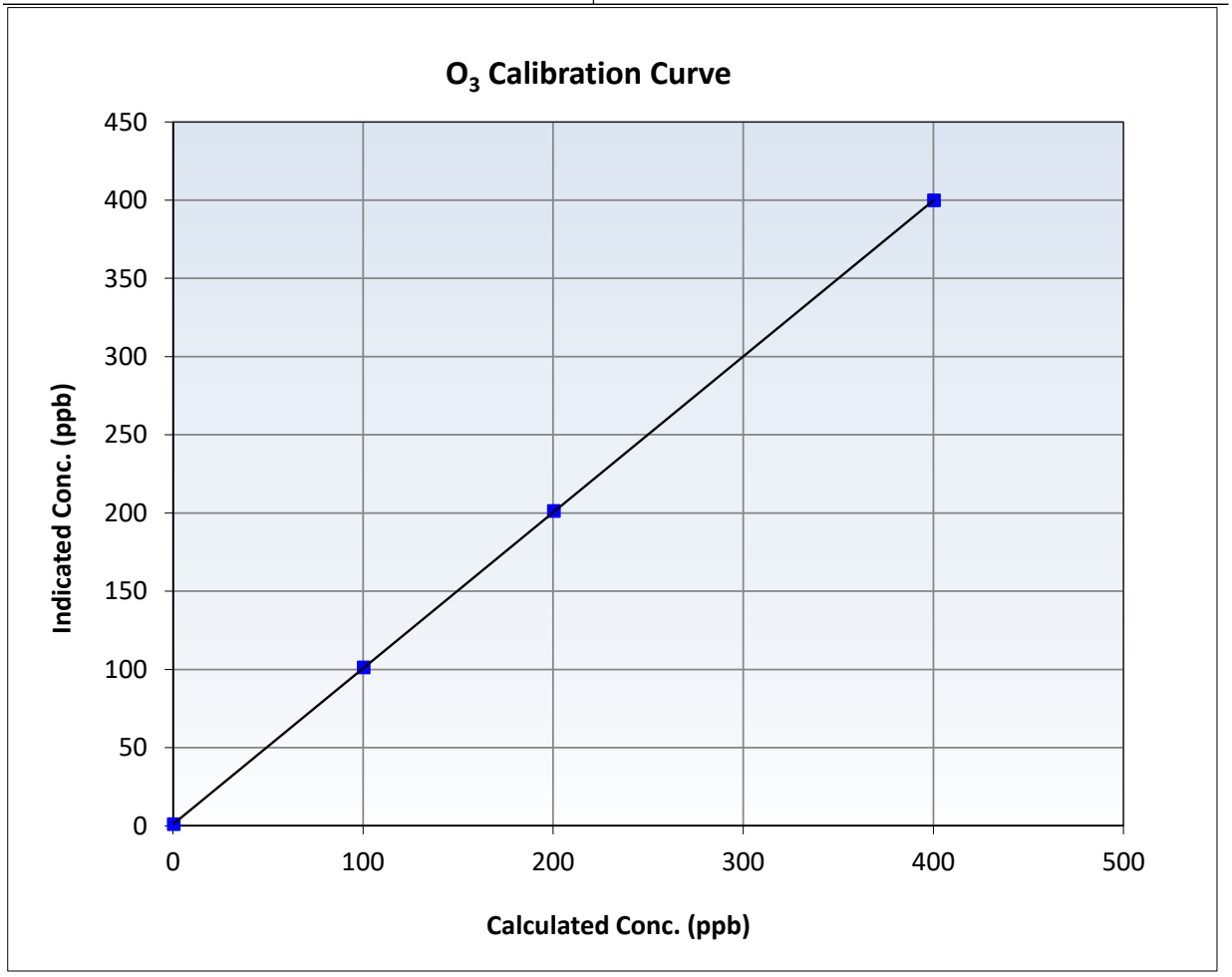
O_3 Calibration Summary

Station Information

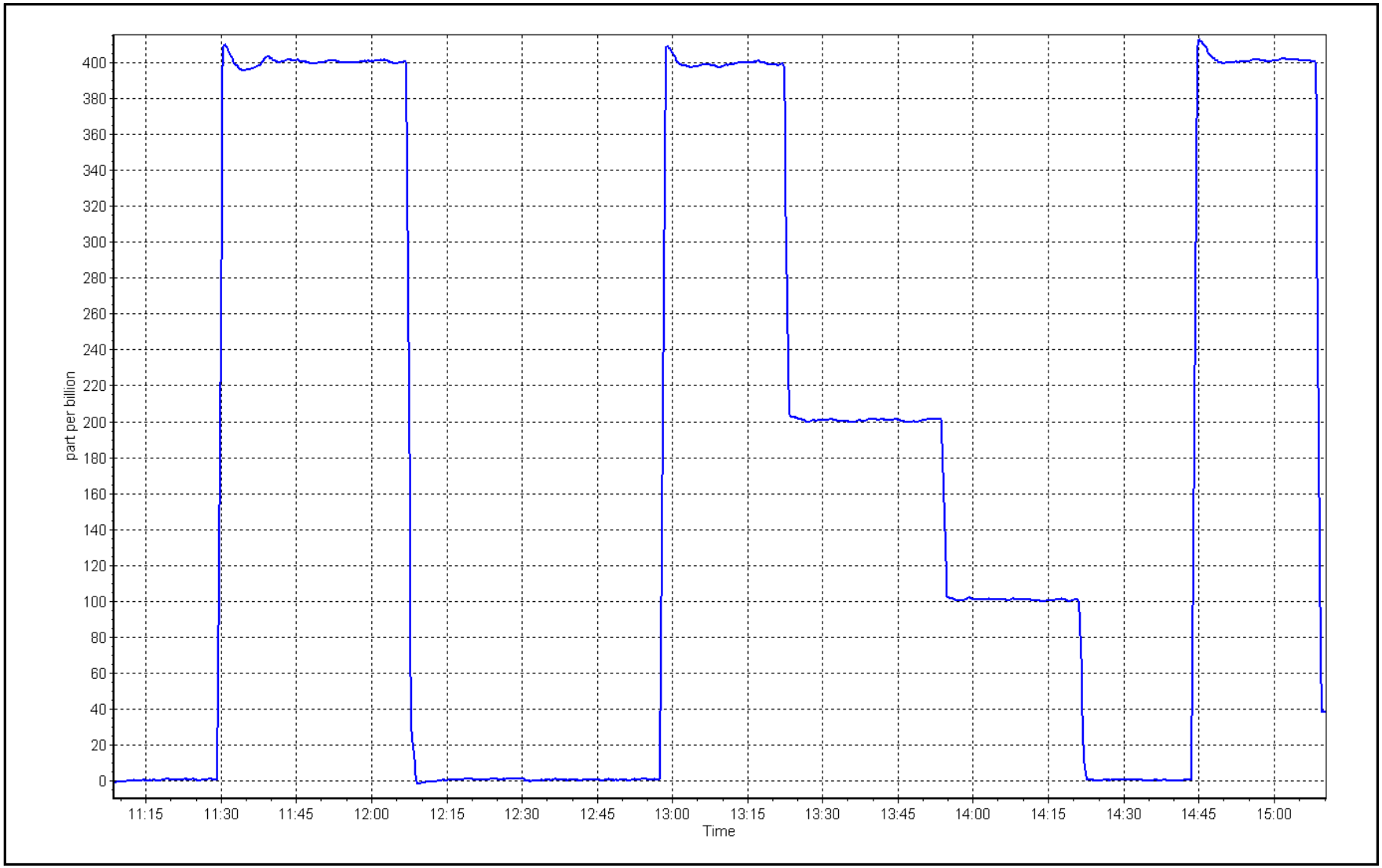
Calibration Date:	January 17, 2025	Previous Calibration:	December 23, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	11:04	End Time (MST):	15:15
Analyzer make:	Thermo 49i	Analyzer serial #:	1152220023

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.6	----	Correlation Coefficient	0.999994	*≥0.995*
400.0	399.5	1.0013	Slope	0.997086	*0.90 - 1.10*
200.0	200.9	0.9955			
100.0	100.8	0.9921	Intercept	0.960000	*+/- 5*



O_3 Calibration Plot Date: January 17, 2025 Location: Athabasca Valley



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	January 24, 2025	Last Cal Date:	December 23, 2024
Start time (MST):	14:35	End time (MST):	15:19
Analyzer Make:	API T640	S/N:	645
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388748
Temp/RH standard:	Alicat FP-25BT	S/N:	388748

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	-3.0	-3.4	-3.0	☐	+/- 2 ^{o}C
P (mmHg)	743.7	740.3	743.7	☐	+/- 10 mmHg
Flow (LPM)	4.98	4.93	4.98	☐	+/- 0.25 LPM
PW% (pump)	38	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	3.8	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 6, 2024

Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: November 22, 2024

Date Disposable Filter Changed: January 24, 2025

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 8, 2024

Date RH/T Sensor Cleaned: July 8, 2024

Notes: DFU filter changed out. No adjustments needed.

Calibration by: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	January 20, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	11:30	End time (MST):	15:36
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	2,953	ppm	Cal Gas Exp Date:	September 30, 2029
Cal Gas Cylinder #:	T1TWKRN			
Removed Cal Gas Conc:	2,953	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T750		Serial Number:	282
ZAG Make/Model:	Teledyne API 751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 48i-TLE		Analyzer serial #:	1408761381	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996926	0.994443	Backgd or Offset:	5.219	5.282
Calibration intercept:	0.191983	0.157964	Coeff or Slope:	1.068	1.068

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4932	67.8	40.0	40.2	0.998
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	40.12	Prev response:	40.11	*% 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	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4932	67.8	40.0	39.9	1.004
Mid point	4966	33.9	20.0	20.2	0.989
Low point	4983	16.9	10.0	10.2	0.980
As left zero	5000	0.0	0.0	0.0	----
As left span	4932	67.8	40.0	40.0	1.002
				Average Correction Factor	0.991

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Summary

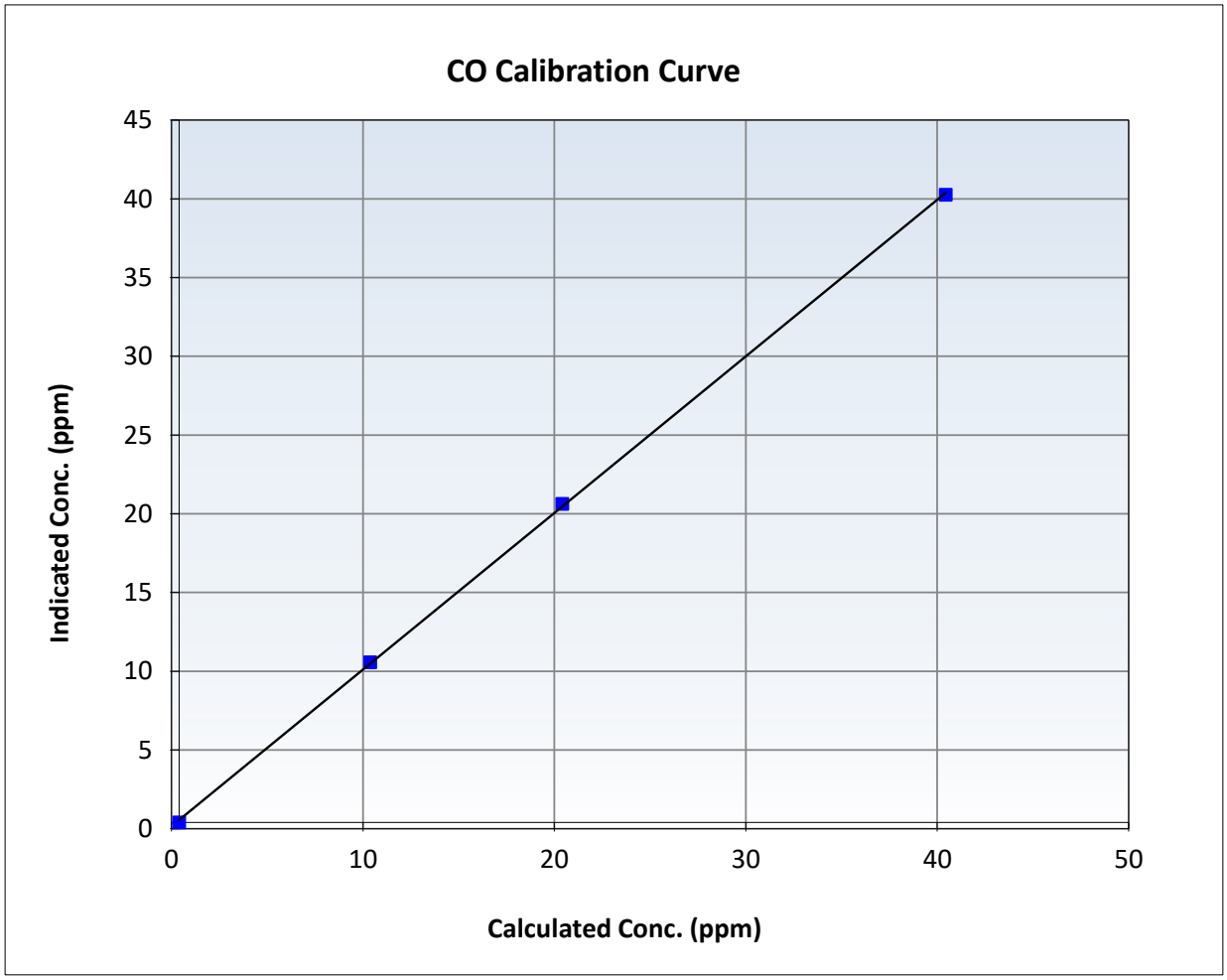
Station Information

Calibration Date:	January 20, 2025	Previous Calibration:	December 11, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	11:30	End Time (MST):	15:36
Analyzer make:	Thermo 48i-TLE	Analyzer serial #:	1408761381

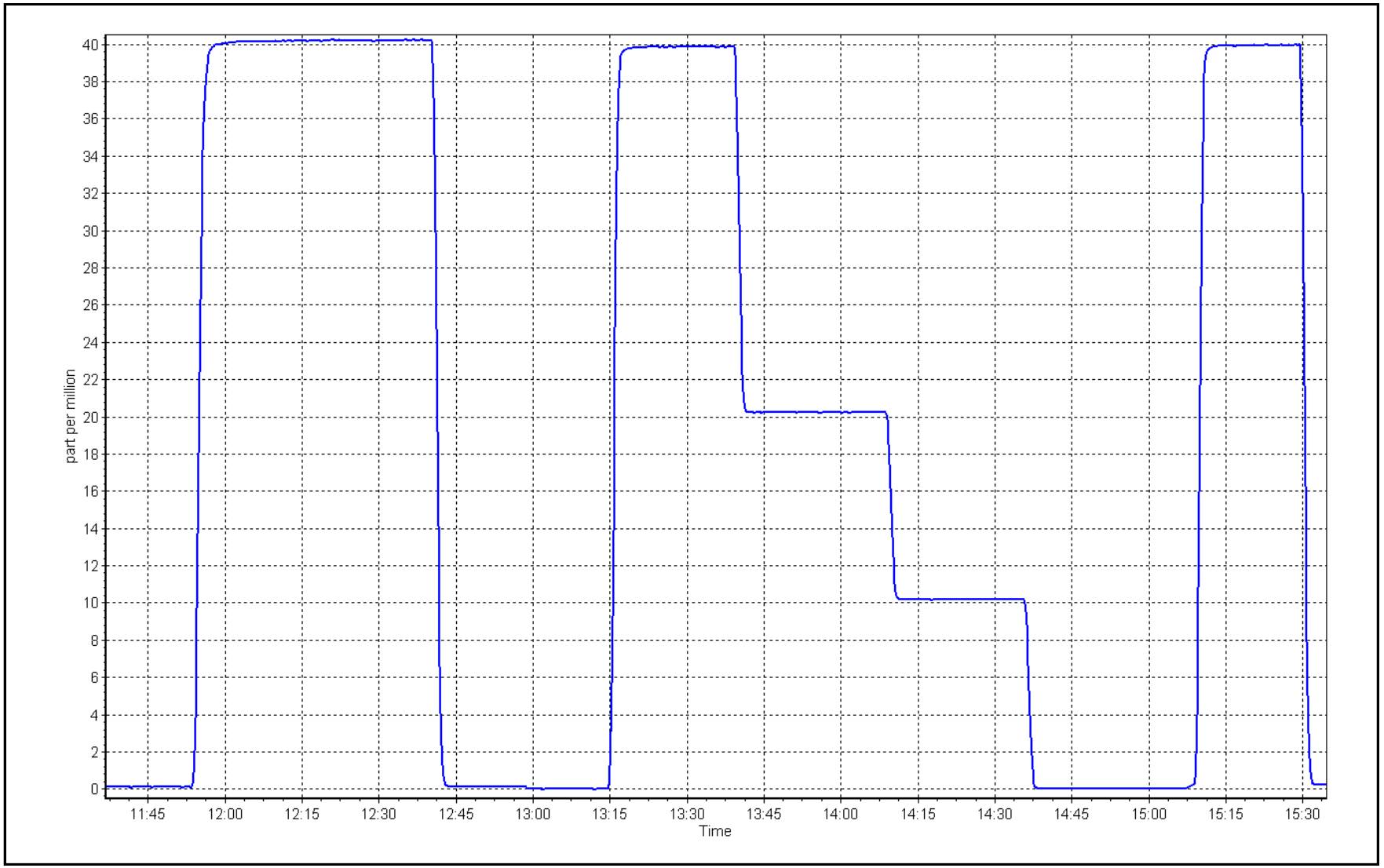
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
40.0	39.9	1.0044
20.0	20.2	0.9892
10.0	10.2	0.9805

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999913	*≥0.995*
Slope	0.994443	*0.90 - 1.10*
Intercept	0.157964	*+/-1.5*



CO Calibration Plot Date: January 20, 2025 Location: Athabasca Valley



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS08
FORT CHIPEWYAN
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS08
Calibration Date:	January 17, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	10:26	End time (MST):	11:36
Reason:	Removal		

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 Model:	Teledyne API T700		Serial Number:	3810
Zero Air Gen Model:	Teledyne API T701		Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Serial Number:	1136451241	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.995662		Backgd or Offset:	1.8	
Calibration intercept:	0.436778		Coeff or Slope:	0.901	

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	4920	80.3	800.4	794.4	1.007
As found Mid point	4960	40.2	400.7	397.1	1.008
As found Low point	4980	20.1	200.4	200.1	0.999
New cylinder response					
Baseline Corr As found:	794.8	Previous response	797.3	*% change	-0.3%
Baseline Corr 2nd AF pt:	397.5	AF Slope:	0.992306	AF Intercept:	0.137449
Baseline Corr 3rd AF pt:	200.5	AF Correlation:	0.999994	* = > +/-5% change initiates investigation	

SO_2 Calibration Data

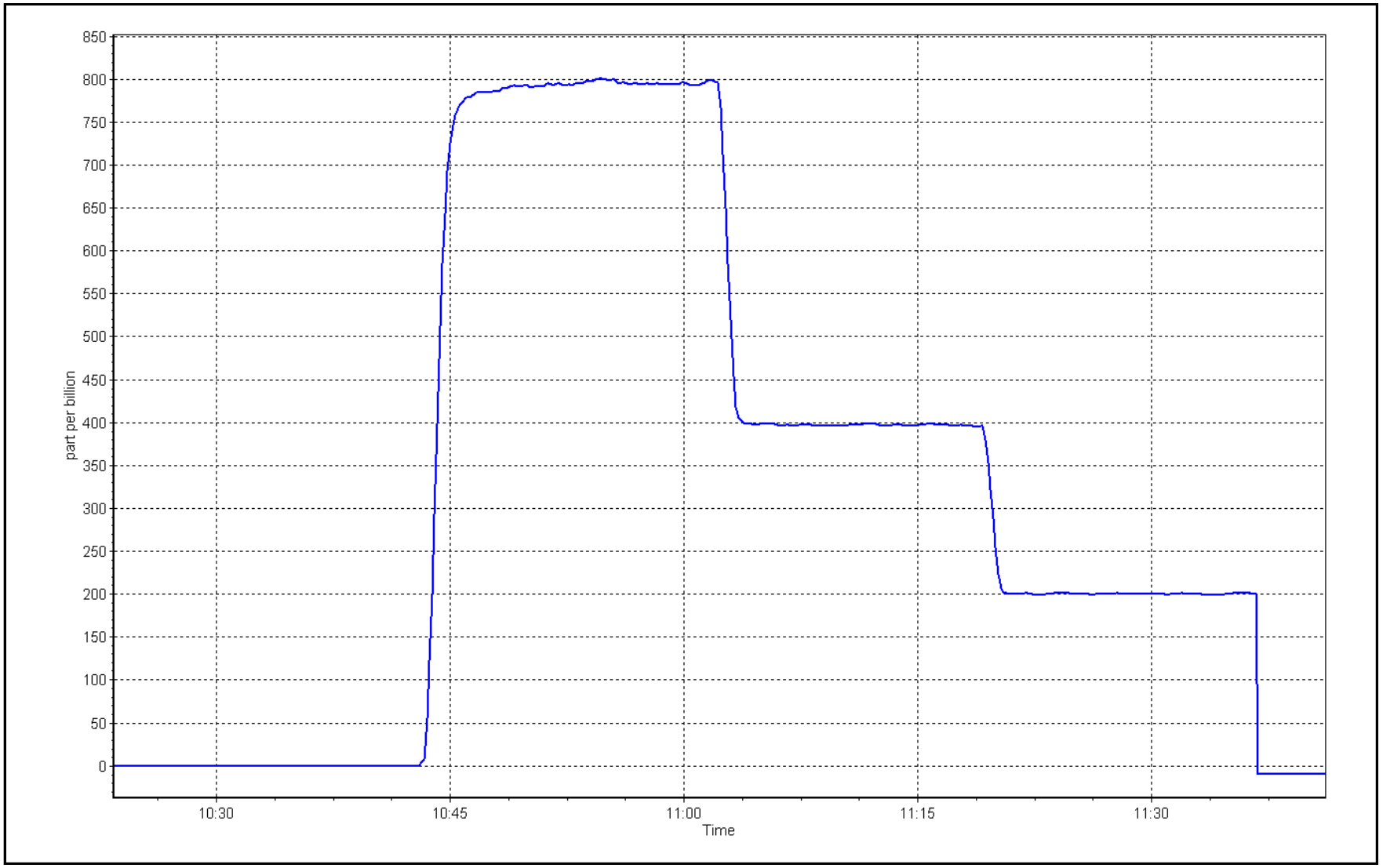
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor:

Notes: 4 point as founds with no filters changes

Calibration Performed By: Matthew Courtoreille

SO2 Calibration Plot Date: January 17, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS08
Calibration Date:	January 17, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	12:50	End time (MST):	14:38
Reason:	Install		

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 Model:	Teledyne API T700		Serial Number:	3810
Zero Air Gen Model:	Teledyne API T701		Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Serial Number:	1236656116
Analyzer Range:	0 - 1000 ppb			

	Start	*Finish*		*Start*	*Finish*
Calibration slope:		1.002213	Backgd or Offset:		1.8
Calibration intercept:		-0.583669	Coeff or Slope:		0.901

SO_2 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) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	NA	Previous 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	80.3	800.4	802.5	0.997
Mid point	4960	40.2	400.7	399.0	1.004
Low point	4980	20.1	200.4	200.5	0.999
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	80.3	800.4	798.3	1.003
				Average Correction Factor:	1.000

Notes: Changed out inlet filter. Adjustments made to span.

Calibration Performed By: Matthew Courtoreille

Wood Buffalo Environmental Association

SO_2 Calibration Summary

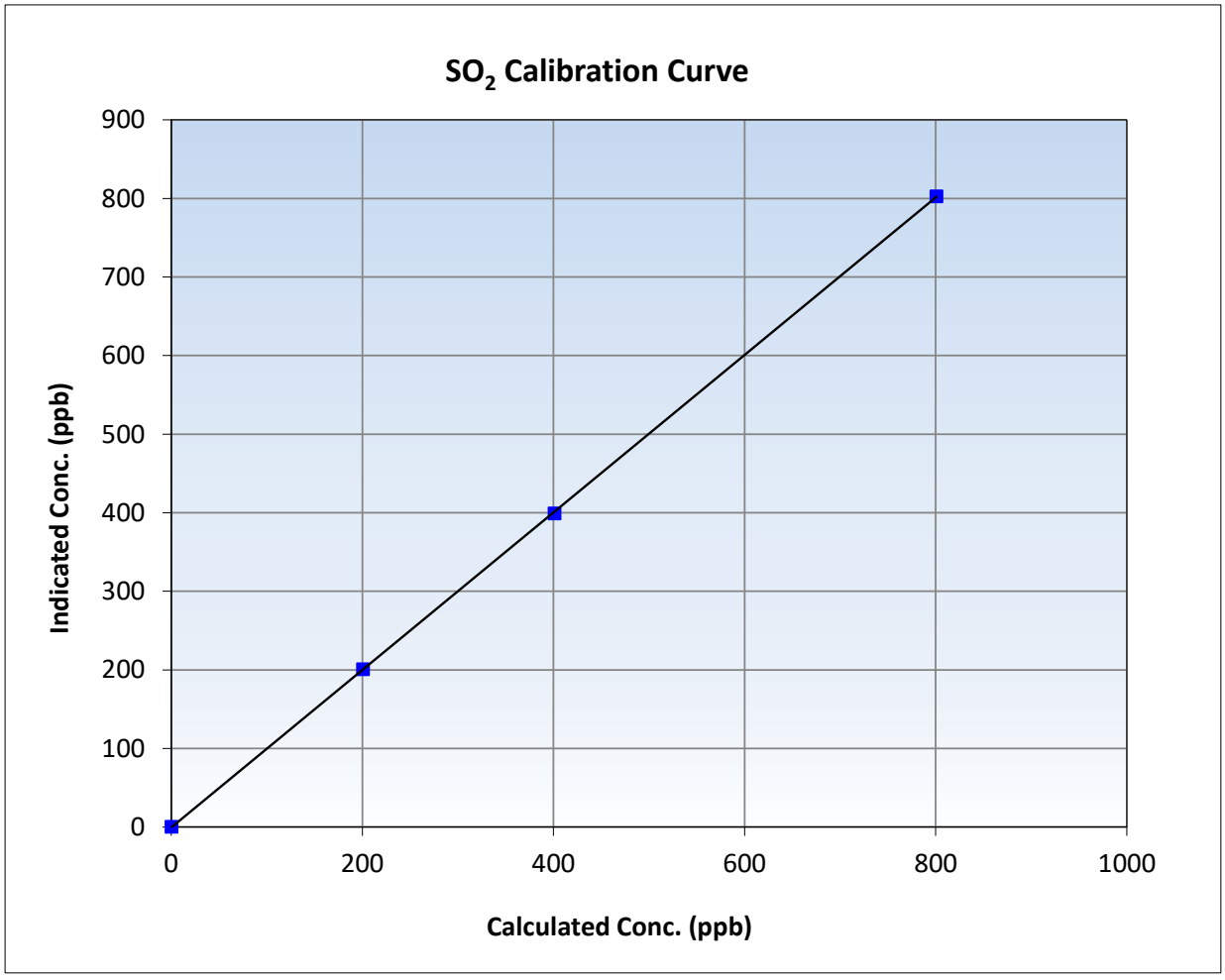
Station Information

Calibration Date:	January 17, 2025	Previous Calibration:	December 12, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS08
Start Time (MST):	12:50	End Time (MST):	14:38
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1236656116

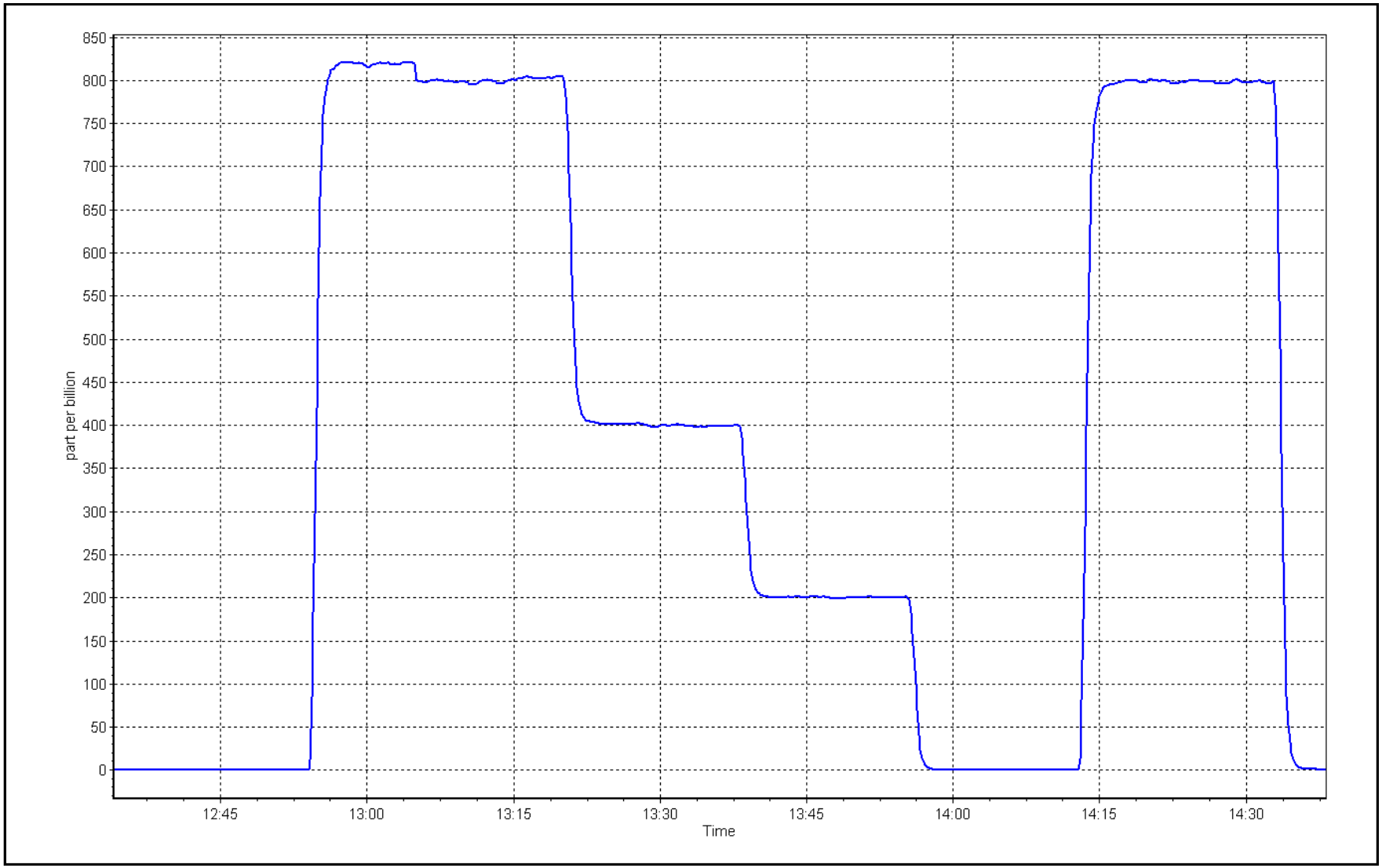
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
800.4	802.5	0.9974
400.7	399.0	1.0043
200.4	200.5	0.9993

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	1.002213	*0.90 - 1.10*
Intercept	-0.583669	*+/-30*



SO2 Calibration Plot Date: January 17, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 9, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	14:07	End time (MST):	18:45
Reason:	Routine Cylinder Change		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	August 28, 2027
Cal Gas Cylinder #:	SA7549			
Removed Cal Gas Conc:	4.97	ppm	Rem Gas Exp Date:	February 9, 2024
Removed Gas Cyl #:	EY0002276		Diff between cyl:	0.1%
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3810
ZAG Make/Model:	Teledyne API T701		Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Analyzer serial #:	1203169744
Converter make:	CDN-101		Converter serial #:	14639
Analyzer Range	0 - 100 ppb		Converter Temp:	833 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.997567	1.001957	Backgd or Offset:	1.4	1.5
Calibration intercept:	0.298821	0.162003	Coeff or Slope:	0.742	0.751

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4920	80.5	80.0	79.6	1.008
As found Mid point	4960	40.2	40.0	40.2	0.999
As found Low point	4980	20.1	20.0	20.0	1.009
New cylinder response	4917	82.6	80.0	79.6	1.005

Baseline Corr As found:	79.4	Prev response:	80.11	*% change:	-0.9%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.992996	AF Intercept:	0.258730
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999973	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4917	82.6	80.0	80.3	0.996
Mid point	4959	41.3	40.0	40.3	0.992
Low point	4979	20.7	20.0	20.0	1.002
As left zero	5000	0.0	0.0	0.3	----
As left span	4917	82.6	80.0	80.1	0.998
SO2 Scrubber Check	4919	80.3	803.1	0.1	----

Date of last scrubber change:	March 7, 2022	Ave Corr Factor	0.997
Date of last converter efficiency test:	March 15, 2022	103.4%	efficiency

Notes: Inlet filter changed after as founds. Calibraiton gas cylinder changed after as founds. Adjused span slightly. Scrubber check completed after third point.

Calibration Performed By: Devin Russell, Mohammed Kashif

Wood Buffalo Environmental Association

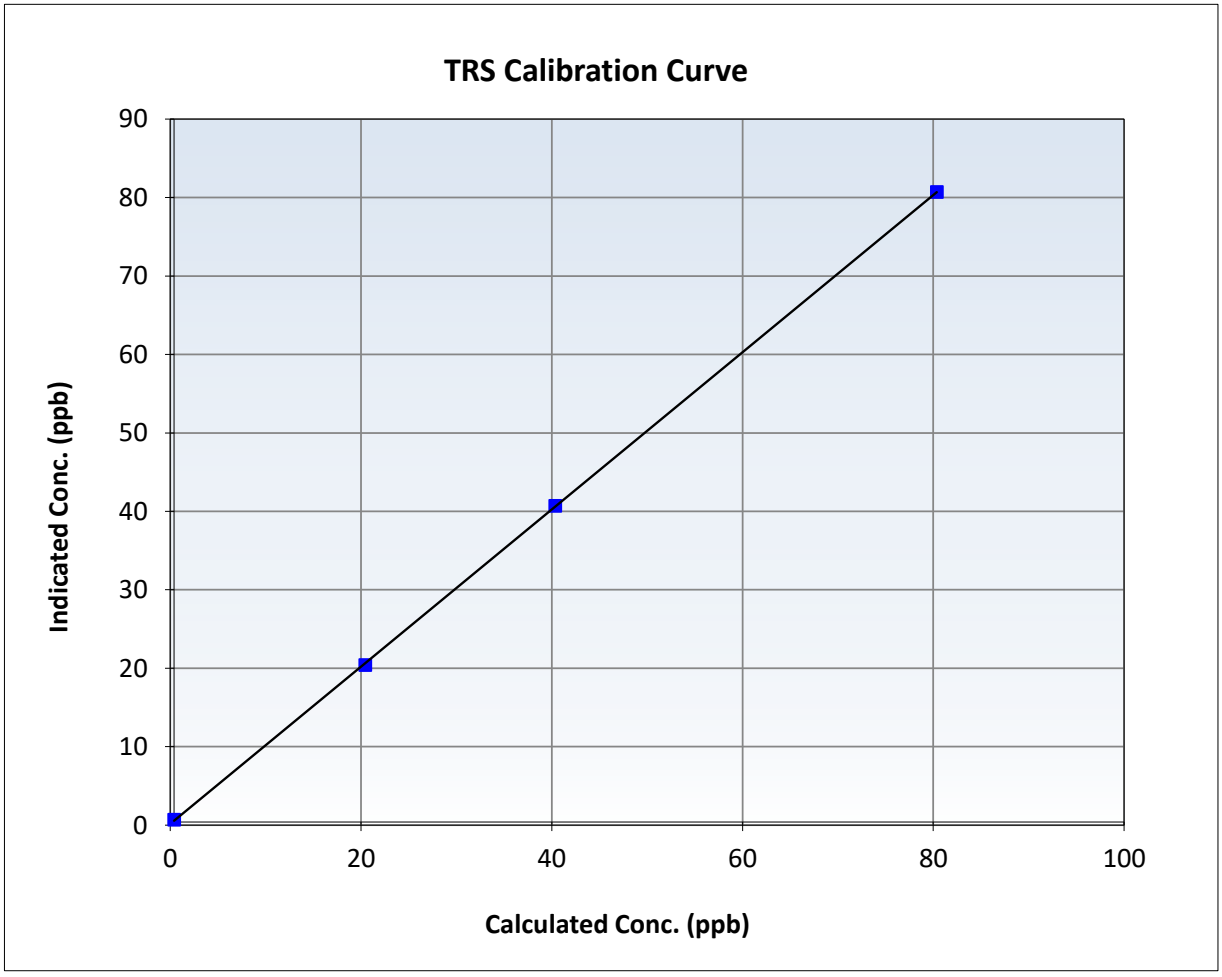
TRS Calibration Summary

Station Information

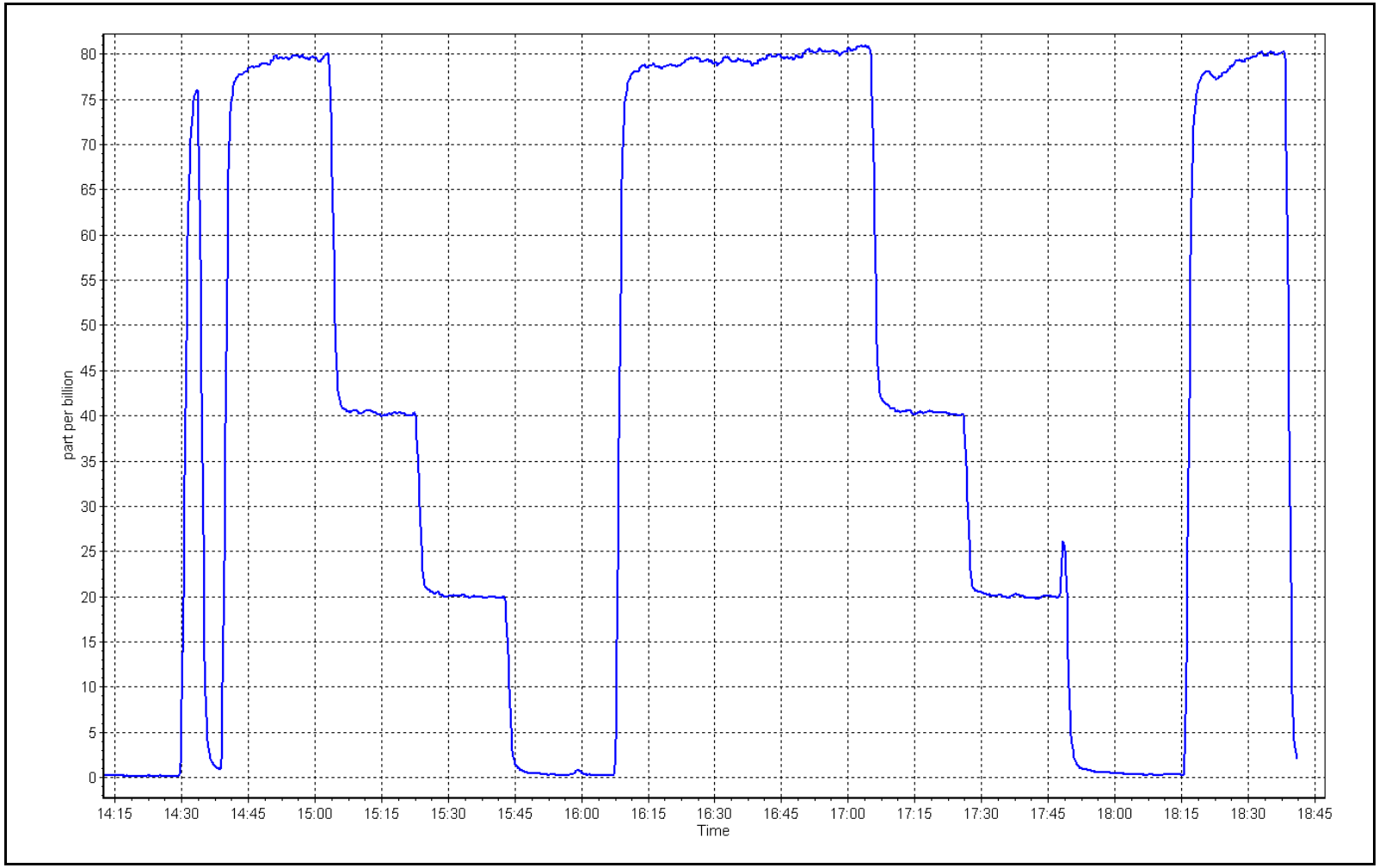
Calibration Date:	January 9, 2025	Previous Calibration:	December 11, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	14:07	End Time (MST):	18:45
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1203169744

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.3	----	Correlation Coefficient	0.999976	*≥0.995*
80.0	80.3	0.9958	Slope	1.001957	*0.90 - 1.10*
40.0	40.3	0.9920			
20.0	20.0	1.0019	Intercept	0.162003	*+/-3*



TRS Calibration Plot Date: January 9, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan
Station number:	AMS 08
Calibration Date:	January 16, 2025
Last Cal Date:	December 12, 2024
Start time (MST):	10:20
End time (MST):	13:01
Reason:	Removal

Calibration Standards

NO Gas Cylinder #:	DT0046831	Cal Gas Expiry Date:	January 9,2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Removed Cylinder #:	DT0046831	Removed Gas Exp Date:	January 9,2032
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.00 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3810
ZAG make/model:	Teledyne API T701H	Serial Number:	135

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.5	0.2	----	----
AF High point	4933	66.7	803.1	800.4	2.7	813.3	808.9	4.5	0.9872	0.9889
AF Mid point	4967	33.3	400.9	399.6	1.3	407.6	403.0	4.7	0.9831	0.9903
AF Low point	4983	16.7	201.1	200.4	0.7	204.1	201.5	2.5	0.9842	0.9921
New cyl resp										

Previous Response	NO_X = 800.4 ppb	NO = 797.2 ppb
Baseline Corr 1st pt	NO_X = 813.5 ppb	NO = 809.4 ppb
Baseline Corr 2nd pt	NO_X = 407.8 ppb	NO = 403.5 ppb
Baseline Corr 3rd pt	NO_X = 204.3 ppb	NO = 202.0 ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = 1.6%

*Percent Change NO = 1.5%

As Found Statistics

As found	NO_X r^2: 0.999995	Nx Sl: 1.012901	Nx Int: 0.395
As found	NO r^2: 0.999999	NO Sl: 1.011381	NO Int: -0.866
As found	NO_2 r^2: 0.999977	NO2 Sl: 1.001543	NO_2 Int: 0.790

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero	----	----	0.0	0.2	----	----
As found high GPT point	808.9	393.1	418.5	419.3	0.9980	100.2%
As found mid GPT point	808.9	602.0	209.6	211.9	0.9890	101.1%
As found low GPT point	808.9	704.2	107.4	108.3	0.9914	100.9%

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 4460

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.168		NO bkgnd or offset:	0.9	
NOX coeff or slope:	1.167		NOX bkgnd or offset:	0.6	
NO2 coeff or slope:	1.300		Reaction cell Press:	1.2	

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.997601	
NO_X Cal Offset:	-0.805395	
NO Cal Slope:	0.997455	
NO Cal Offset:	-1.165086	
NO_2 Cal Slope:	1.007149	
NO_2 Cal Offset:	1.334457	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero										
High point										
Mid point										
Low point										
As left zero										
As left span										
								Average Correction Factor		

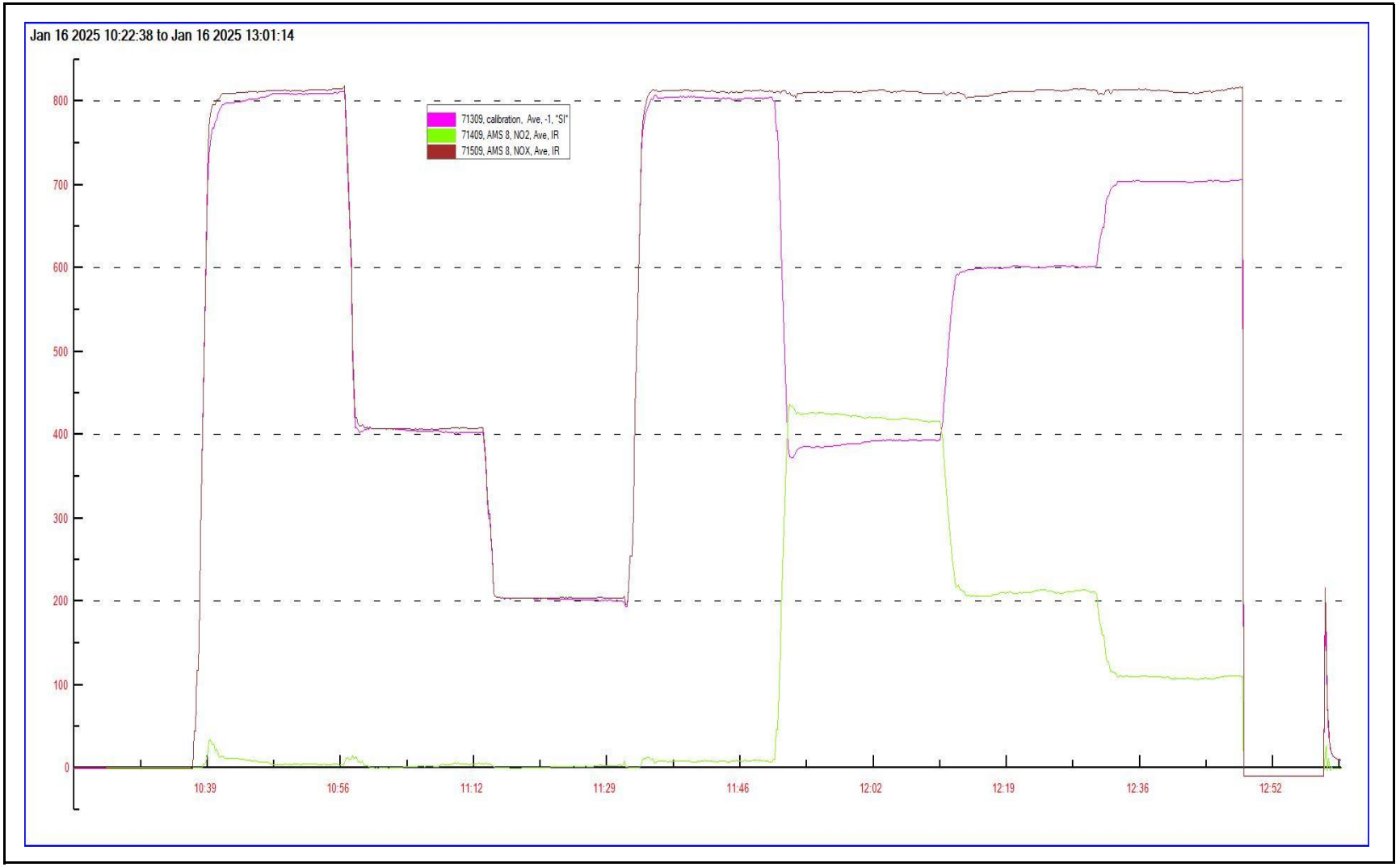
GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero						
High GPT point						
Mid GPT point						
Low GPT point						
				Average Correction Factor		

Notes: Changing out analyzer.

Calibration Performed By: Matthew Courtoreille

NO_X Calibration Plot Date: January 16, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan
Station number:	AMS 08
Calibration Date:	January 16, 2025
Last Cal Date:	December 12, 2024
Start time (MST):	13:01
End time (MST):	16:44
Reason:	Install

Calibration Standards

NO Gas Cylinder #:	DT0046831	Cal Gas Expiry Date:	January 9,2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Removed Cylinder #:	DT0046831	Removed Gas Exp Date:	January 9,2032
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.00 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3810
ZAG make/model:	Teledyne API T701H	Serial Number:	135

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO r^2:	NO Sl:	NO Int:	
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42iQ Serial Number: 2072

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:		-0.200	NO bkgnd or offset:		0.0
NOX coeff or slope:		-0.200	NOX bkgnd or offset:		0.0
NO2 coeff or slope:		-0.400	Reaction cell Press:		1.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:		0.998126
NO_X Cal Offset:		2.235089
NO Cal Slope:		0.998426
NO Cal Offset:		1.695158
NO_2 Cal Slope:		0.993835
NO_2 Cal Offset:		1.070258

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	0.1	-0.3	----	----
High point	4933	66.7	803.1	800.4	2.7	802.4	799.8	2.5	1.0009	1.0008
Mid point	4967	33.3	400.9	399.6	1.3	404.3	402.3	2.0	0.9916	0.9932
Low point	4983	16.7	201.1	200.4	0.7	204.9	202.8	2.1	0.9813	0.9882
As left zero	5000	0.0	0.0	0.0	0.0	-0.3	0.0	-0.3	----	----
As left span	4933	66.7	803.1	407.7	395.4	805.8	407.7	398.0	0.9967	1.0000
								Average Correction Factor	0.9913	0.9941

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	801.1	402.4	401.4	399.4	1.0049	99.5%
Mid GPT point	801.1	609.3	194.5	194.7	0.9988	100.1%
Low GPT point	801.1	704.5	99.3	101.3	0.9799	102.0%
				Average Correction Factor	0.9946	100.6%

Notes: Instrument and inlet filter replaced.

Calibration Performed By: Matthew Courtoreille

Wood Buffalo Environmental Association

NO_X Calibration Summary

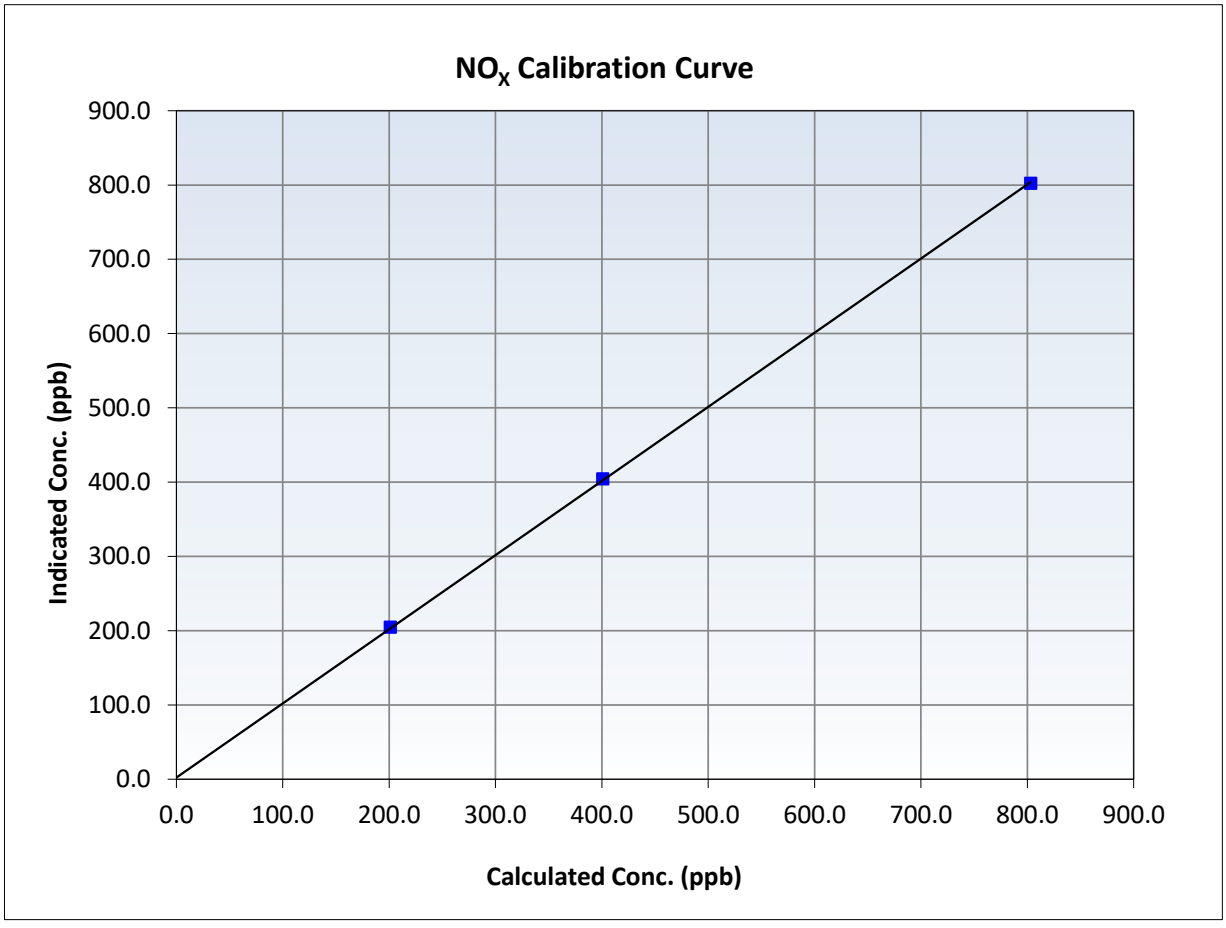
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 12, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	13:01	End Time (MST):	16:44
Analyzer make:	Thermo 42iQ	Analyzer serial #:	2072

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
803.1	802.4	1.0009
400.9	404.3	0.9916
201.1	204.9	0.9813

Statistical Evaluation		Limits
Correlation Coefficient	0.999956	≥0.995
Slope	0.998126	0.90 - 1.10
Intercept	2.235089	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

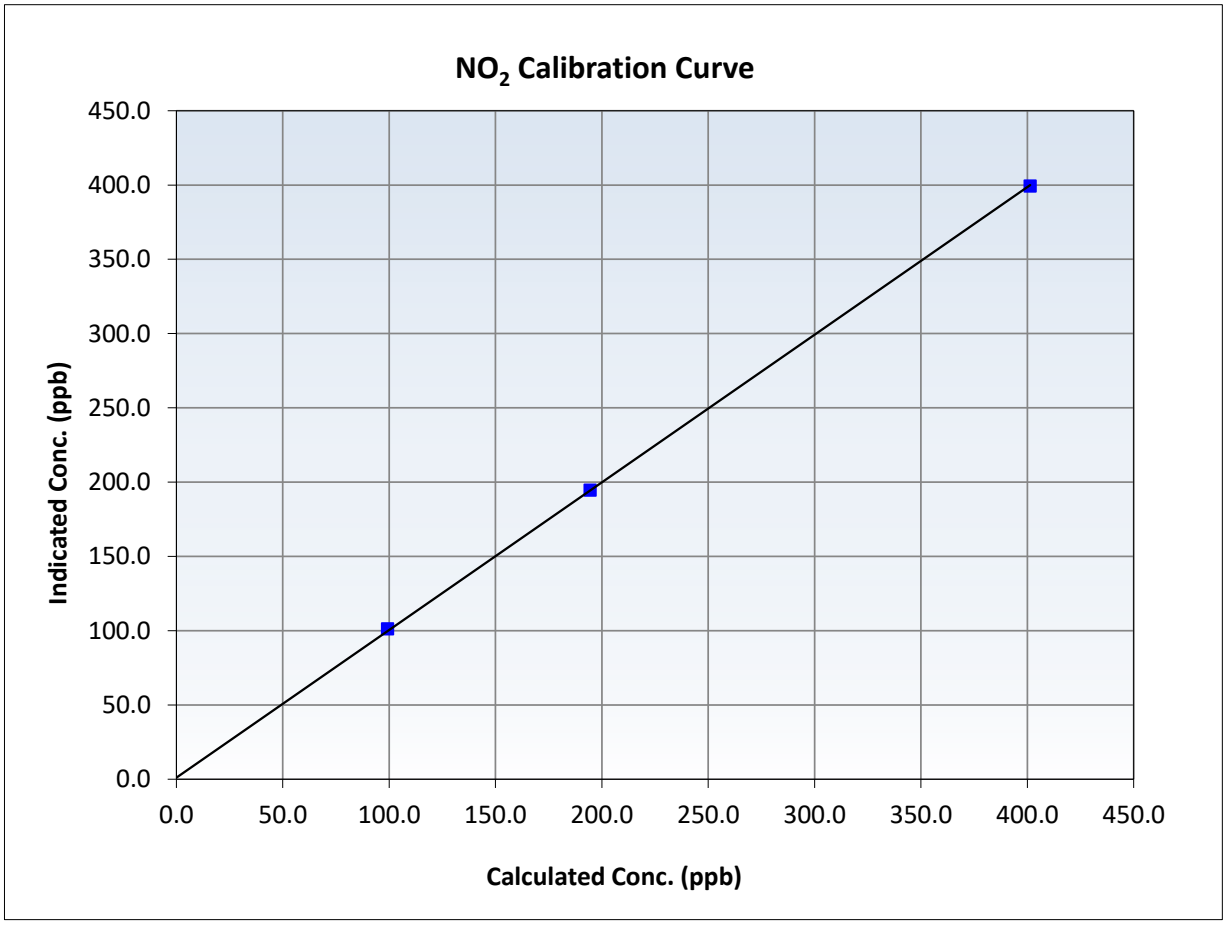
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 12, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	13:01	End Time (MST):	16:44
Analyzer make:	Thermo 42iQ	Analyzer serial #:	2072

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
401.4	399.4	1.0049
194.5	194.7	0.9988
99.3	101.3	0.9799

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999945	*≥0.995*
Slope	0.993835	*0.90 - 1.10*
Intercept	1.070258	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

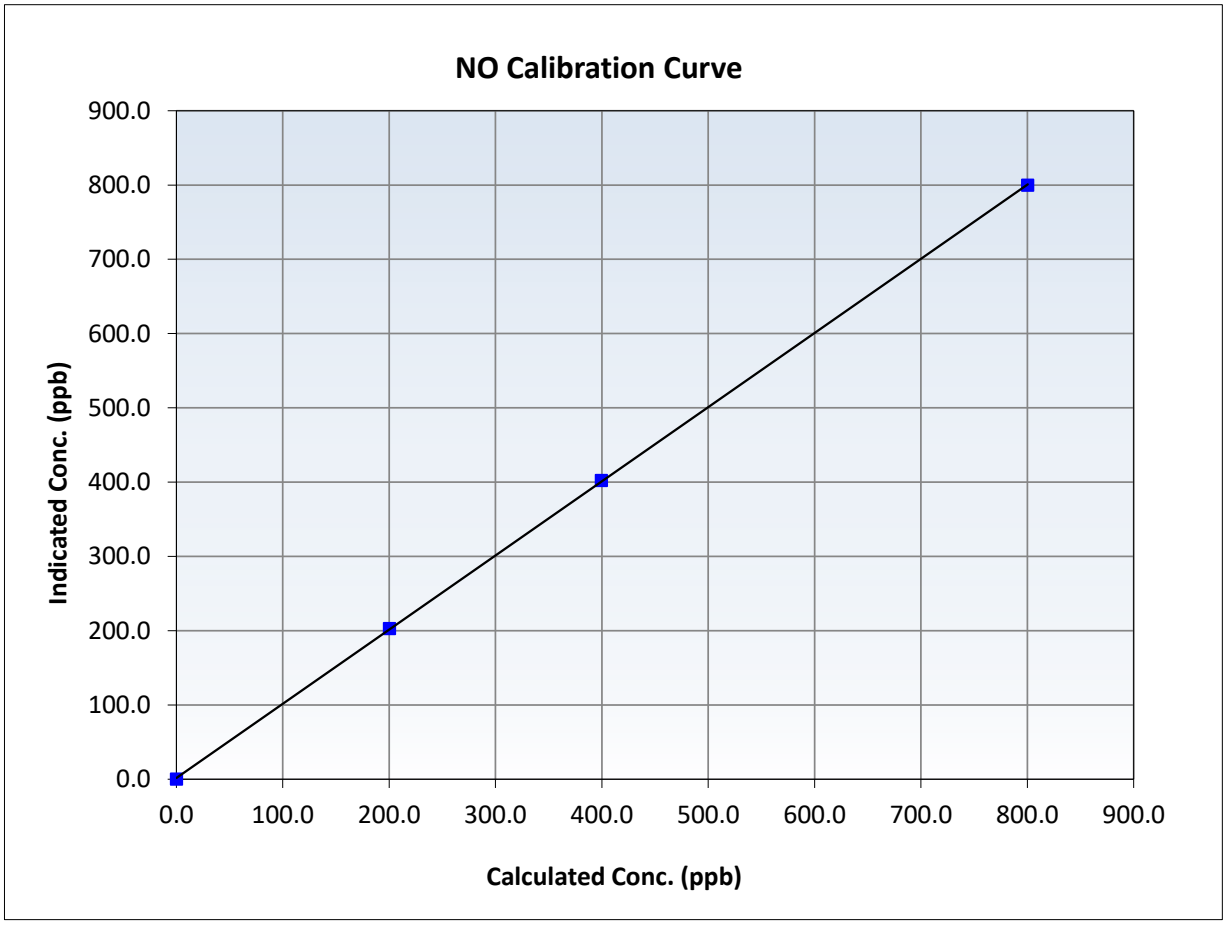
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 12, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	13:01	End Time (MST):	16:44
Analyzer make:	Thermo 42iQ	Analyzer serial #:	2072

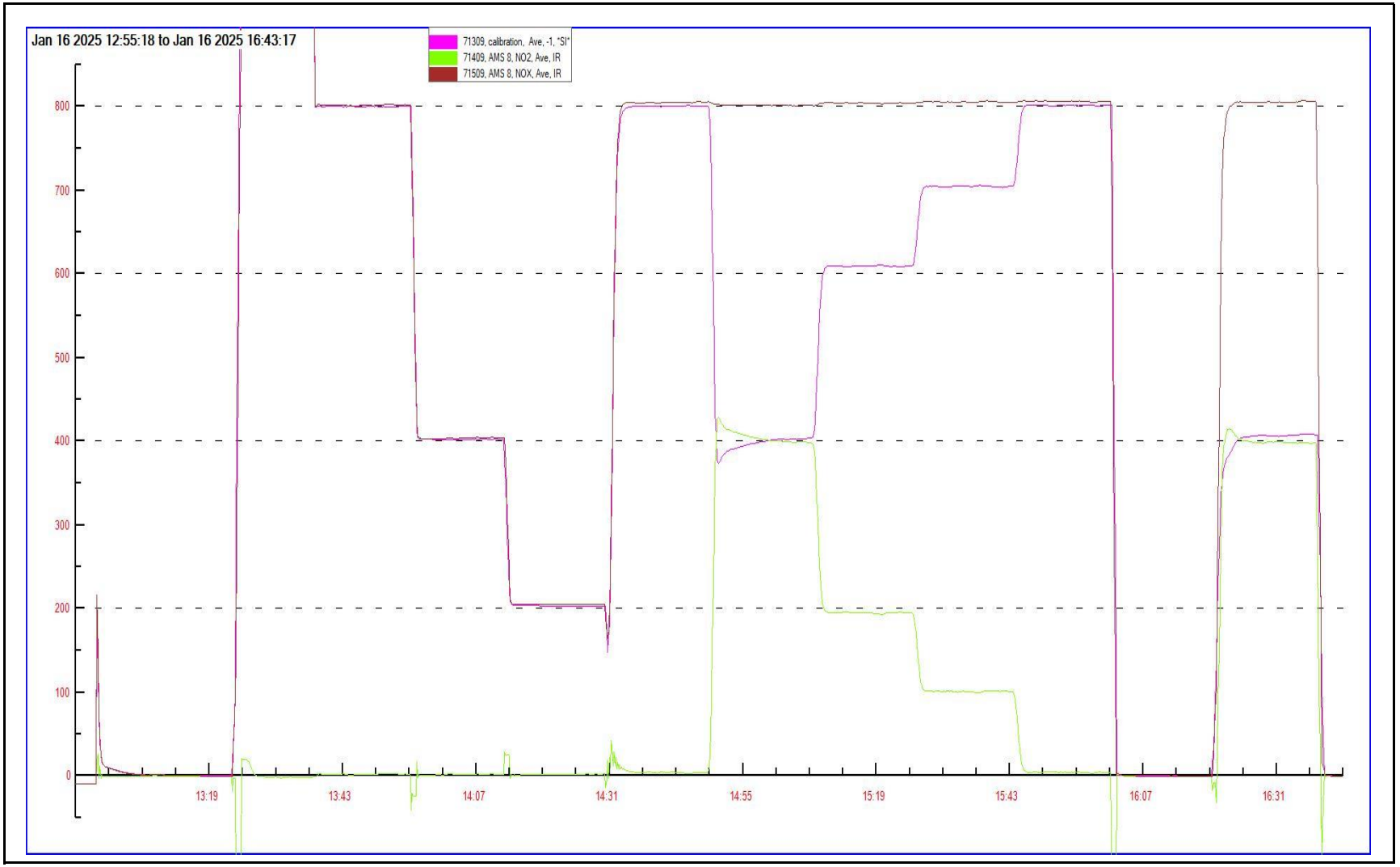
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.4	799.8	1.0008
399.6	402.3	0.9932
200.4	202.8	0.9882

Statistical Evaluation		Limits
Correlation Coefficient	0.999978	≥0.995
Slope	0.998426	0.90 - 1.10
Intercept	1.695158	+/-20



NO_X Calibration Plot Date: January 16, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 9, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	18:40	End time (MST):	19:45
Reason:	Removal		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3810
ZAG Make/Model:	Teledyne API T701	Serial Number:	135

Analyzer Information

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

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.979971		Backgd or Offset:	-2.2	
Calibration intercept:	1.480000		Coeff or Slope:	0.982	

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	1.4	----
As found High point	5000	913.0	400.0	382.2	1.050
As found Mid point	5000	827.7	200.0	194.0	1.038
As found Low point	5000	739.9	100.0	95.8	1.059
Baseline Corr As found:	380.8	Previous response	393.5	*% change	-3.3%
Baseline Corr 2nd AF pt:	192.6	AF Slope:	0.953314	AF Intercept:	1.520000
Baseline Corr 3rd AF pt:	94.4	AF Correlation:	0.999939	* = > +/-5% change initiates investigation	

O_3 Calibration Data

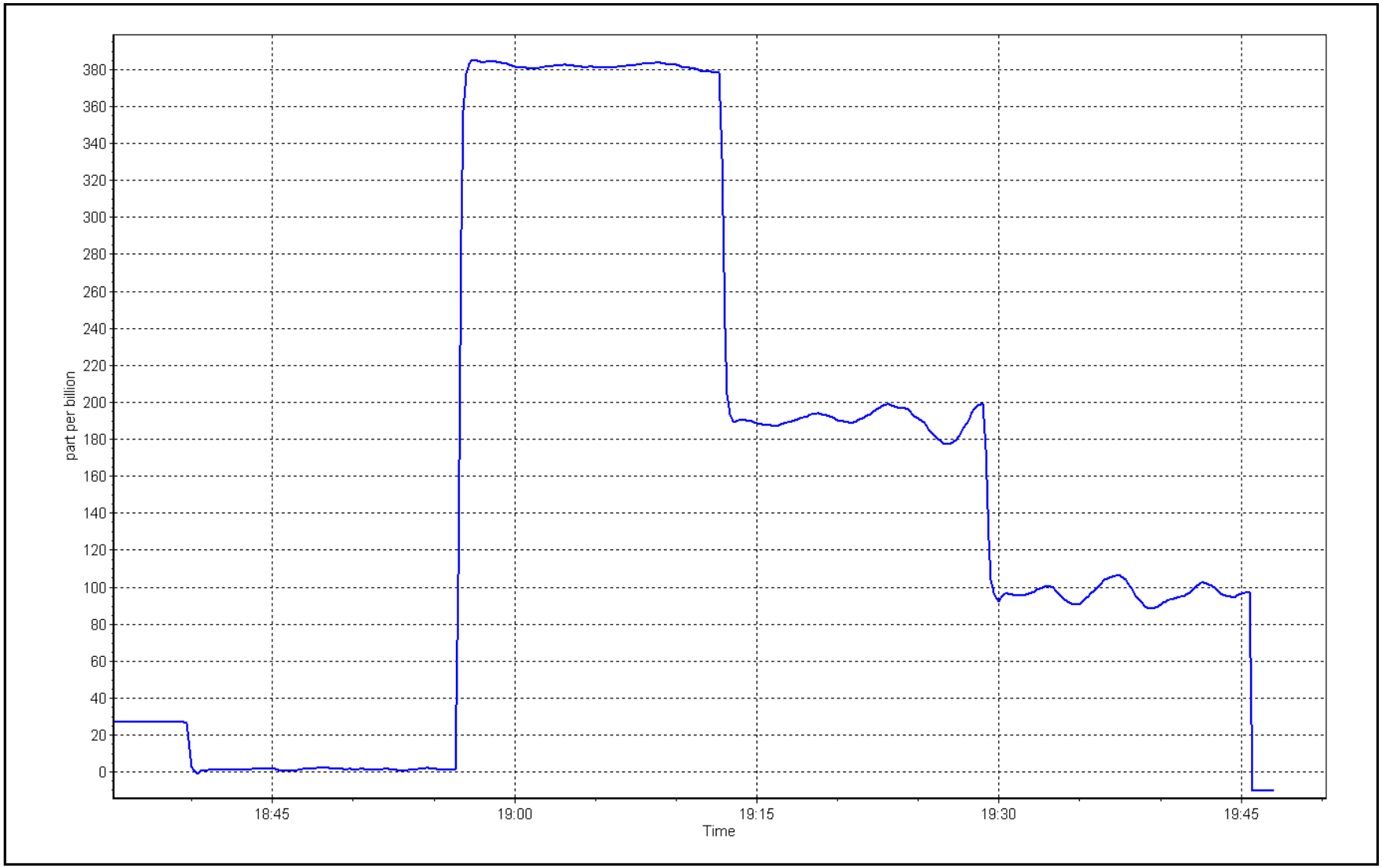
Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor

Notes: Removal Calibration

Calibration Performed By: Devin Russell, Mohammed Kashif

O_3 Calibration Plot Date: January 9, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 9, 2025	Last Cal Date:	NA
Start time (MST):	20:00	End time (MST):	21:30
Reason:	Install		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3810
ZAG Make/Model:	Teledyne API T701	Serial Number:	135

Analyzer Information

Analyzer make:	Thermo 49i		Analyzer serial #:	1152220026	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	NA	1.003714	Backgd or Offset:	NA	-0.3
Calibration intercept:	NA	-0.100000	Coeff or Slope:	NA	0.996

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					

Baseline Corr As found:	NA	Previous 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	5000	968.7	400.0	401.6	0.996
Mid point	5000	820.5	200.0	200.4	0.998
Low point	5000	720.0	100.0	99.9	1.001
As left zero					
As left span					

Average Correction Factor: 0.998

Notes: Installation Calibration

Calibration Performed By: Devin Russell, Mohammed Kashif

Wood Buffalo Environmental Association

O_3 Calibration Summary

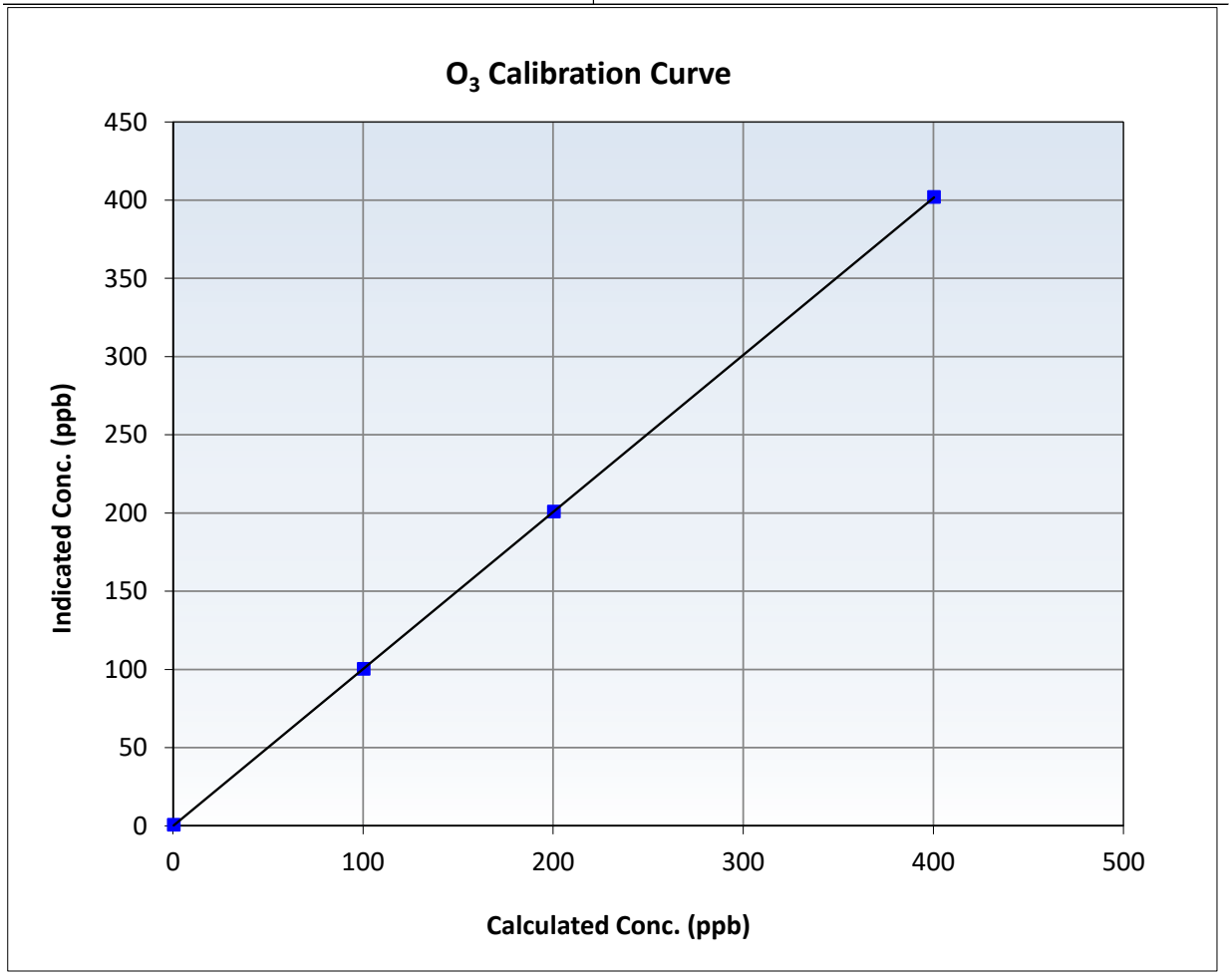
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	NA
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	20:00	End Time (MST):	21:30
Analyzer make:	Thermo 49i	Analyzer serial #:	1152220026

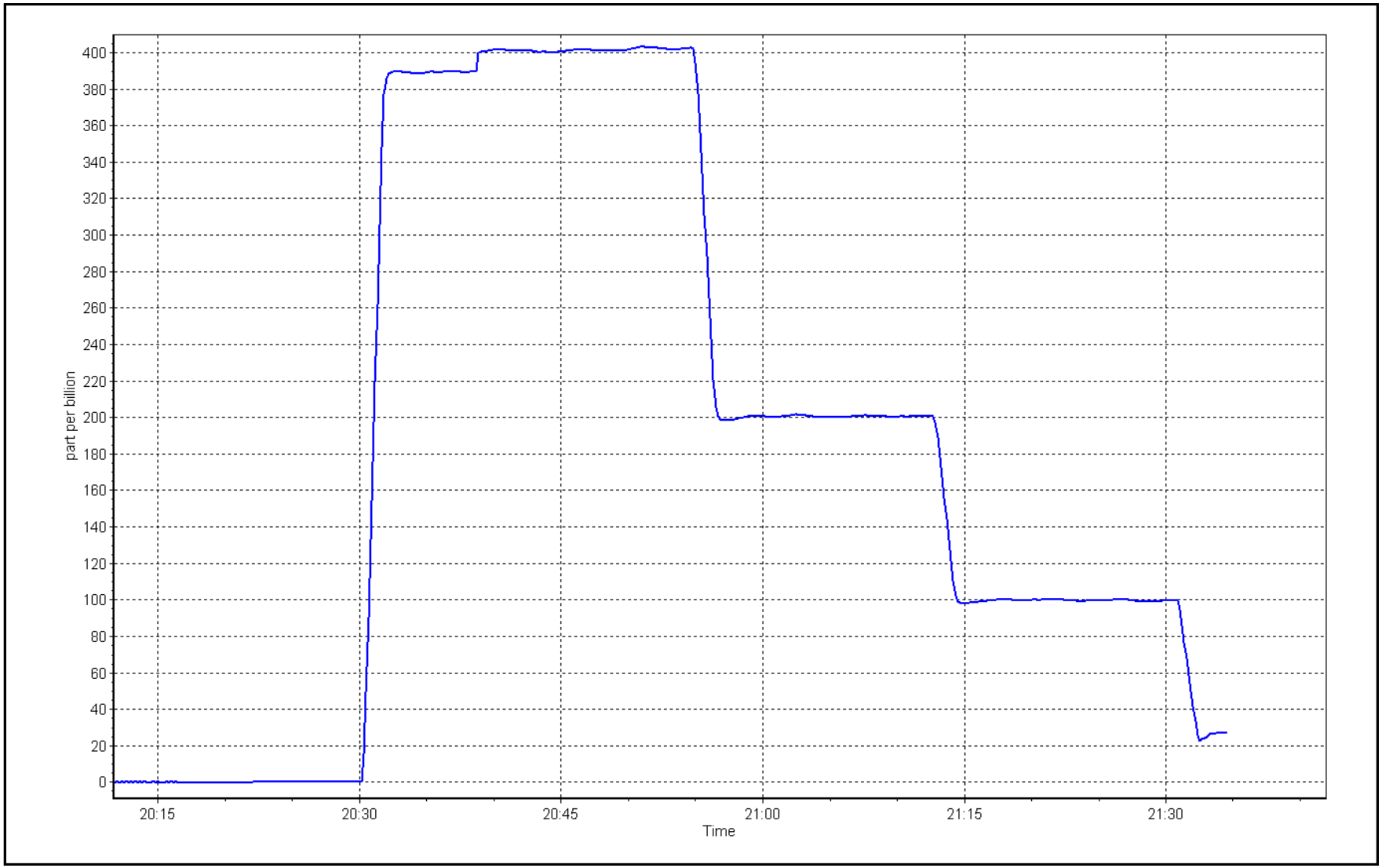
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
400.0	401.6	0.9960
200.0	200.4	0.9980
100.0	99.9	1.0010

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.003714	*0.90 - 1.10*
Intercept	-0.100000	*+/- 5*



O_3 Calibration Plot Date: January 9, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 21, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	10:03	End time (MST):	11:18
Analyzer Make:	Teledyne API T640	S/N:	319
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	14719
Temp/RH standard:	Alicat FP-25BT	S/N:	14719

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-12.10	-12.61	-12.10	☐	+/- 2 °C
P (mmHg)	728.20	731.33	728.20	☐	+/- 10 mmHg
Flow (LPM)	5.01	5.05	5.01	☐	+/- 0.25 LPM
PW% (pump)	40%		40%	☐	>80%
Zero Verification	PM w/o HEPA:	4.40	PM w/ HEPA:	0.00	<0.2 ug/m3

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

PM Inlet observation : Inlet Head Clean ☐ Alignment Factor On : ☐

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: 10-Jun-24 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	11.00	11.00	11.00	☐	+/- 0.5

Date Optical Chamber Cleaned: September 18, 2024

Date Disposable Filter Changed: September 18, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 29, 2024

Date RH/T Sensor Cleaned: August 29, 2024

Notes: No adjustment made

Calibration by: Morgan Voyageur,

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 14, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	9:26	End time (MST):	14:08
Reason:	Routine		

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:	Teledyne API T700		Serial Number:	3810
ZAG Make/Model:	Teledyne API T701H		Serial Number:	135

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3505	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.005457	0.999543	Backgd or Offset:	-0.015	-0.016
Calibration intercept:	0.234888	0.136942	Coeff or Slope:	1.005	1.001

CO As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4934	66.7	40.4	41.4	0.982
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	41.14	Prev response:	40.87	*% change:	0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4934	66.7	40.4	40.4	0.999
Mid point	4966.7	33.3	20.2	20.5	0.986
Low point	4983.3	16.7	10.1	10.3	0.983
As left zero	5000	0.0	0.0	0.0	----
As left span	2960	40.0	40.4	40.3	1.003
				Average Correction Factor	0.989

Notes: Changed inlet filter after as found. Made adjustments to Zero and span high point. As founds left I made an mistake by entering exit, so I'm restarting as founds points.

Calibration Performed By: Matthew Courtoreille

Wood Buffalo Environmental Association

CO Calibration Summary

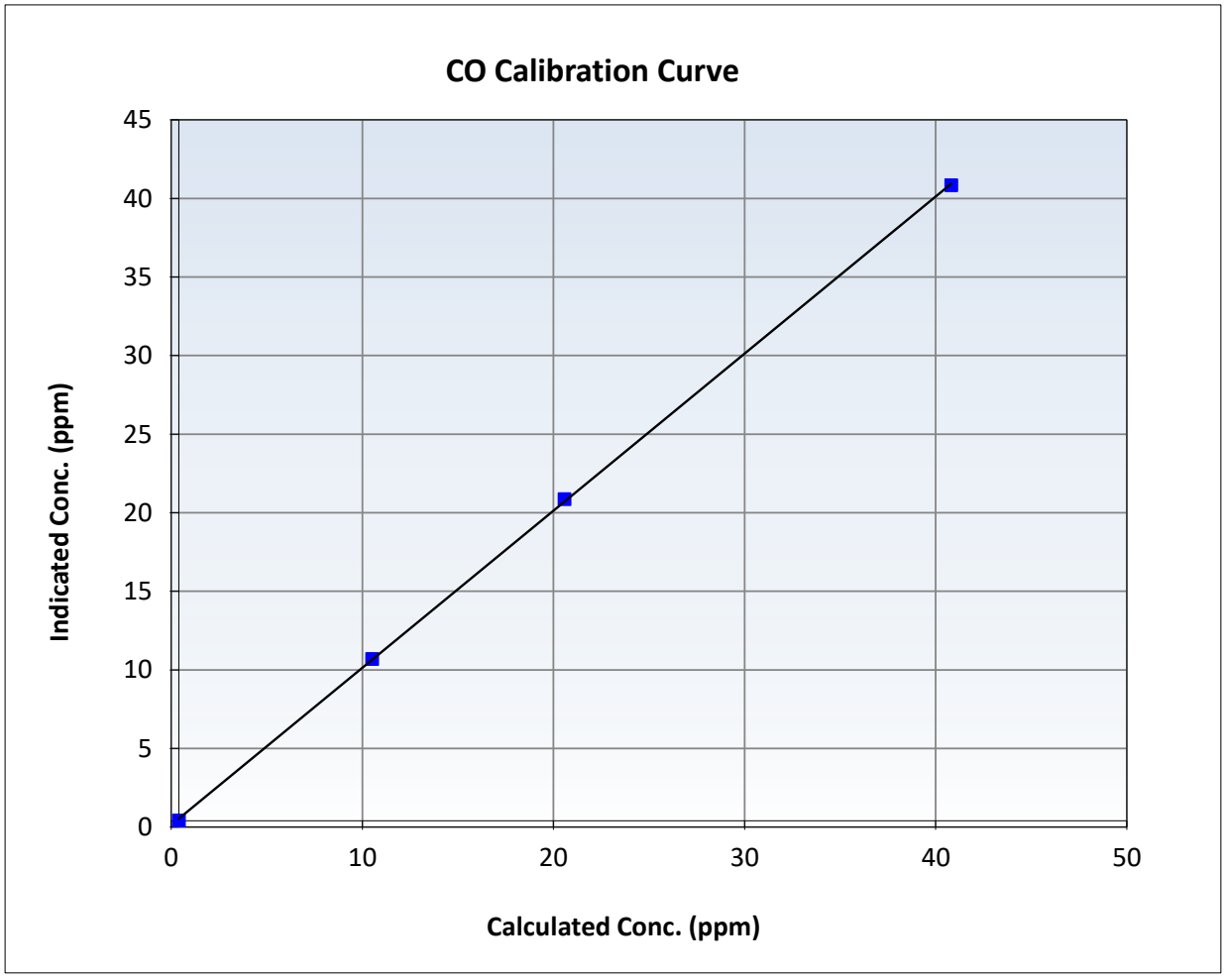
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 10, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	9:26	End Time (MST):	14:08
Analyzer make:	Teledyne API T300	Analyzer serial #:	3505

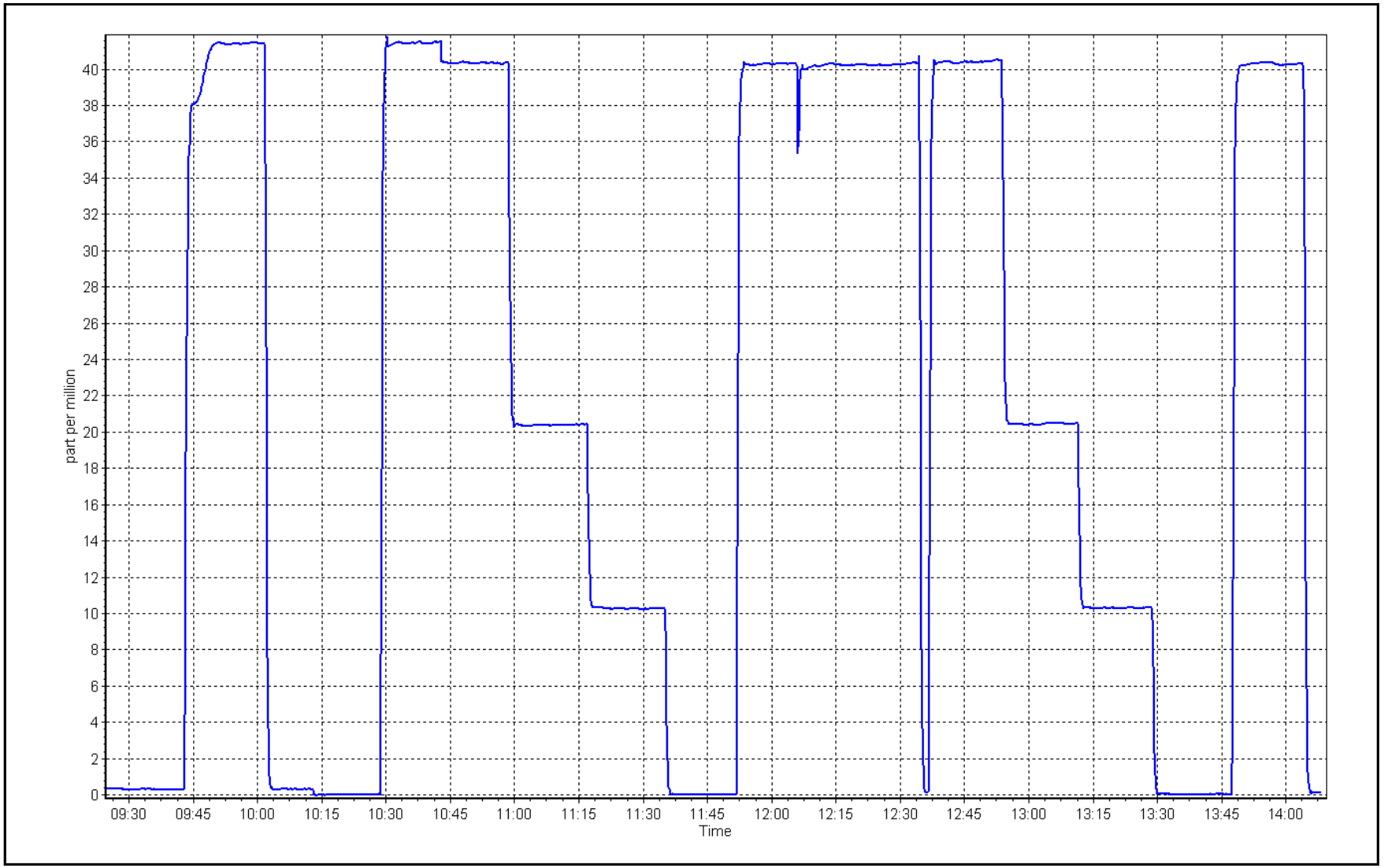
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
40.4	40.4	0.9994
20.2	20.5	0.9858
10.1	10.3	0.9825

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999943	*≥0.995*
Slope	0.999543	*0.90 - 1.10*
Intercept	0.136942	*+/-1.5*



CO Calibration Plot Date: January 14, 2025 Location: Fort Chipewyan



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	January 14, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	14:33	End time (MST):	17:29
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:	3810
N2 Gen Make/Model:	Peak Scientific		Serial Number:	135

Analyzer Information

Analyzer make:	Teledyne API T360		Analyzer serial #:	289	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003841	0.997578	Backgd or Offset:	-0.016	-0.016
Calibration intercept:	-7.440000	-3.240000	Coeff or Slope:	1.034	1.031

CO_2 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) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	0.4	----
As found High Point	2920	80.0	1605.9	1628.3	0.986
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1627.9	Prev response:	1604.6	*% change:	1.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CO_2 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) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	0.3	----
High point	2920	80.0	1605.9	1603.8	1.001
Mid point	2960	40.0	802.9	786.1	1.021
Low point	2980	20.0	401.5	400.3	1.003
As left zero	3000	0.0	0.0	0.0	----
As left span	2960	40.0	802.9	781.6	1.027
				Average Correction Factor	1.009

Notes: Changed inlet filter after as found, adjusted high point span.

Calibration Performed By: Matthew Courtoreille

Wood Buffalo Environmental Association

CO_2 Calibration Summary

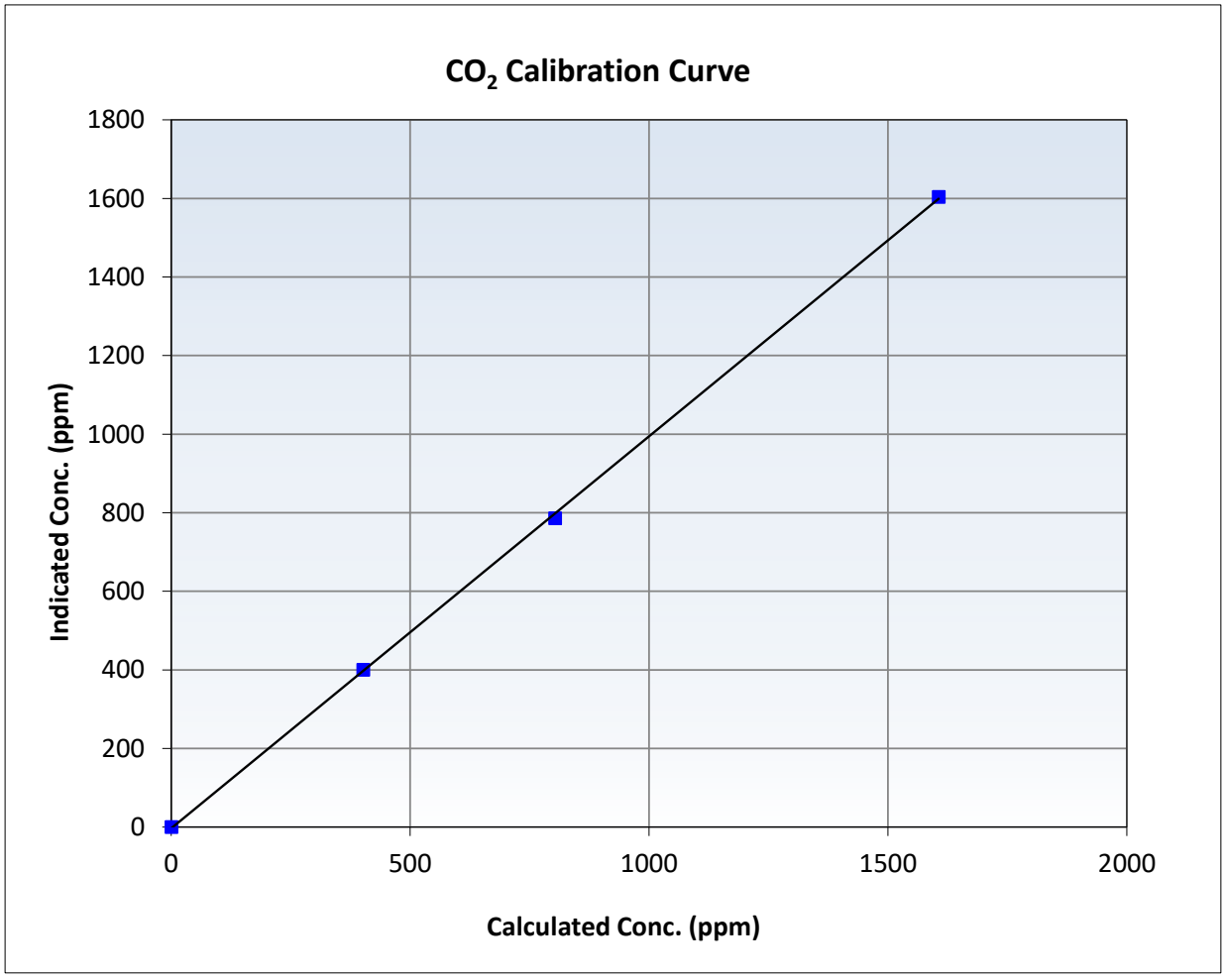
Station Information

Calibration Date	January 14, 2025	Previous Calibration	December 10, 2024
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	14:33	End Time (MST)	17:29
Analyzer make	Teledyne API T360	Analyzer serial #	289

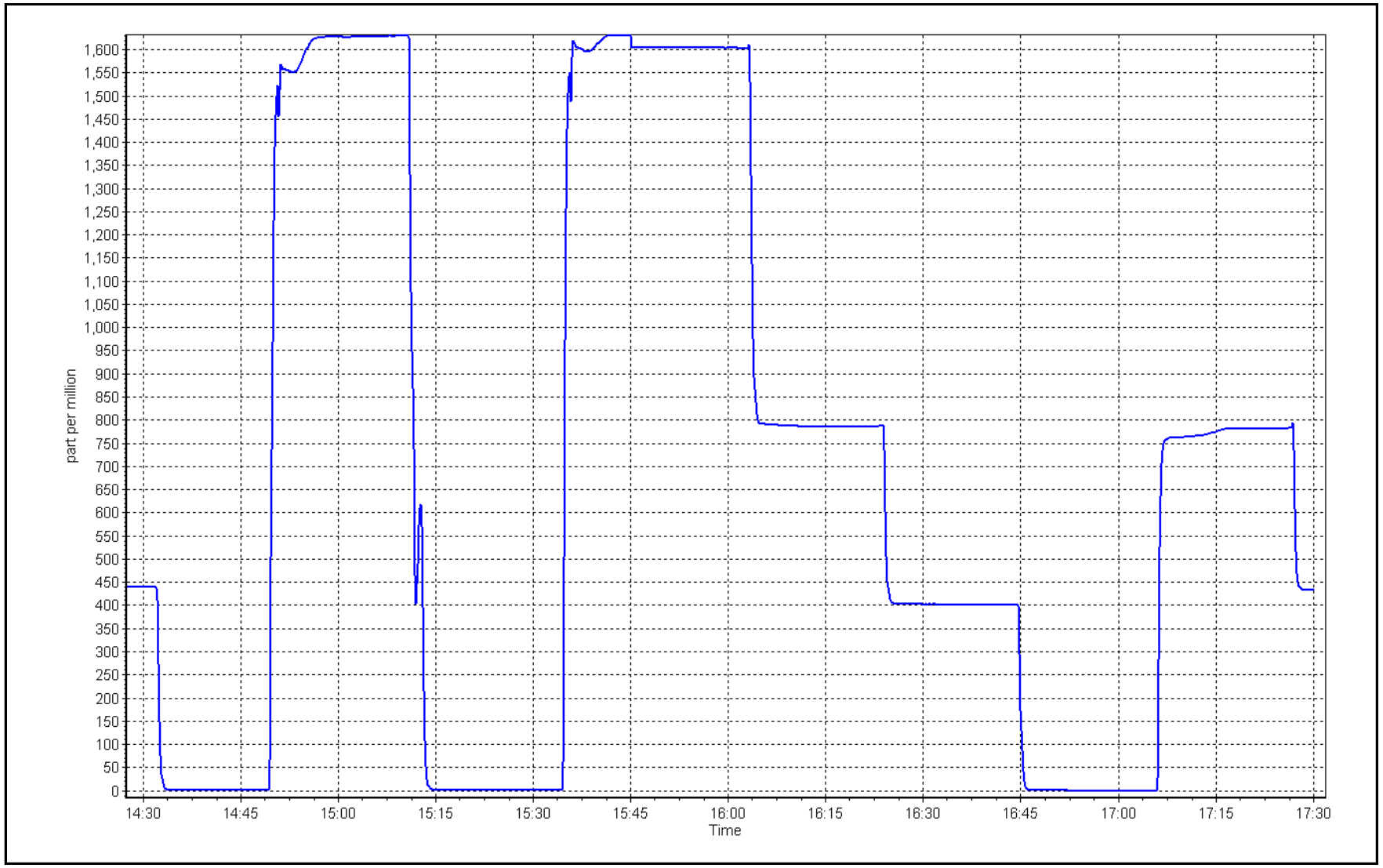
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
1605.9	1603.8	1.0013
802.9	786.1	1.0214
401.5	400.3	1.0029

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999870	*≥0.995*
Slope	0.997578	*0.90 - 1.10*
Intercept	-3.2	*+/-20*



CO_2 Calibration Plot Date: January 14, 2025 Location: Fort Chipewyan



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS09
BARGE LANDING
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	January 7, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	10:04	End time (MST):	13:25
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 Model:	API T700		Serial Number:	3812
Zero Air Gen Model:	APIT701		Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1118148498	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002005	0.996660	Backgd or Offset:	10.9	11.2
Calibration intercept:	0.047698	-0.053641	Coeff or Slope:	0.963	0.987

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.5	----
As found High point	4919	80.2	801.5	779.7	1.027
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	780.2	Previous response	803.1	*% change	-2.9%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4919	80.2	801.5	798.5	1.004
Mid point	4960	40.1	400.7	399.8	1.002
Low point	4980	20.0	199.8	199.1	1.004
As left zero	5000	0.0	0.0	-0.3	----
As left span	4919	80.2	801.5	800.6	1.001
				Average Correction Factor:	1.003

Notes: Inlet filter changed after as founds. Adjusted span only.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

SO_2 Calibration Summary

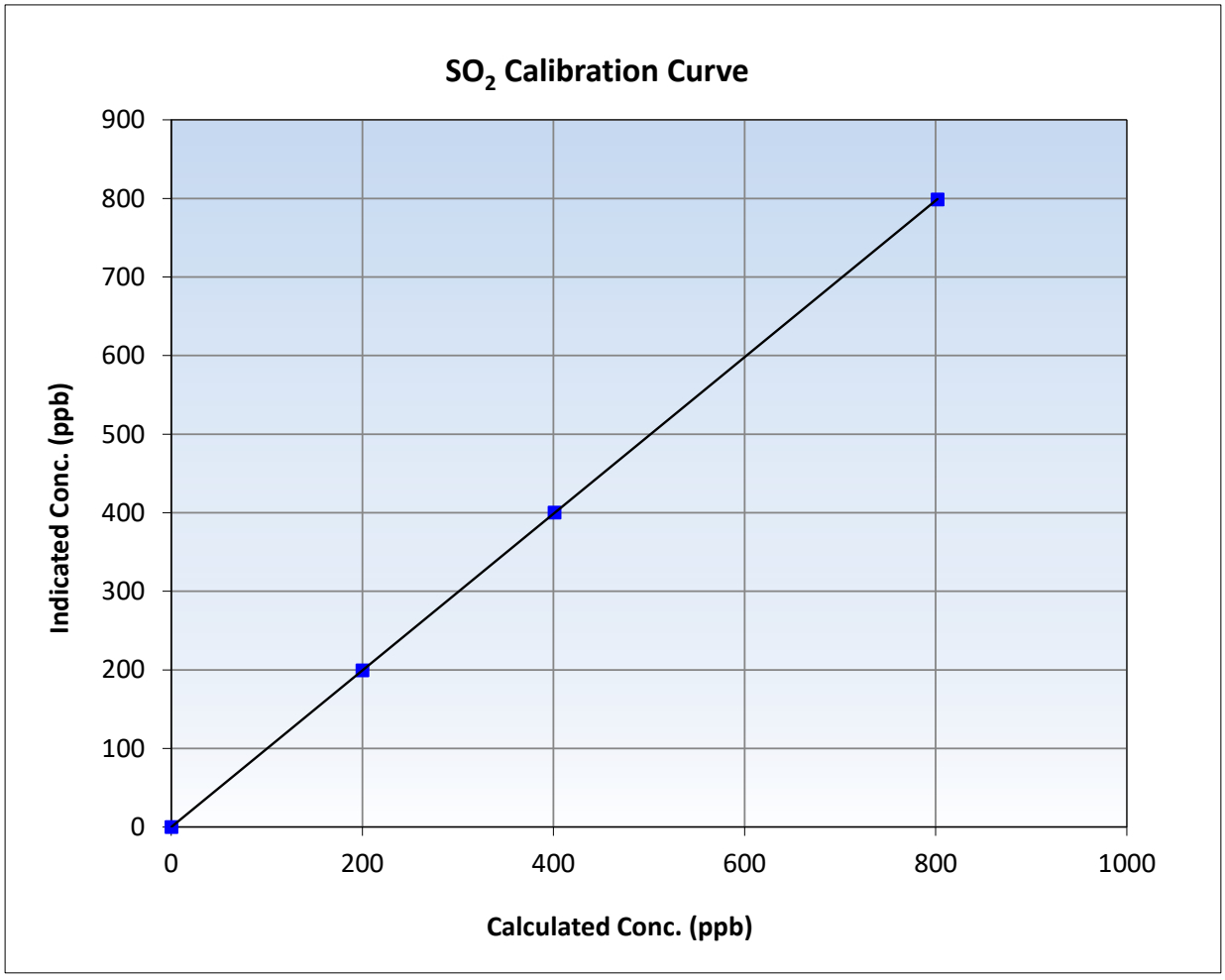
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	13:25
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148498

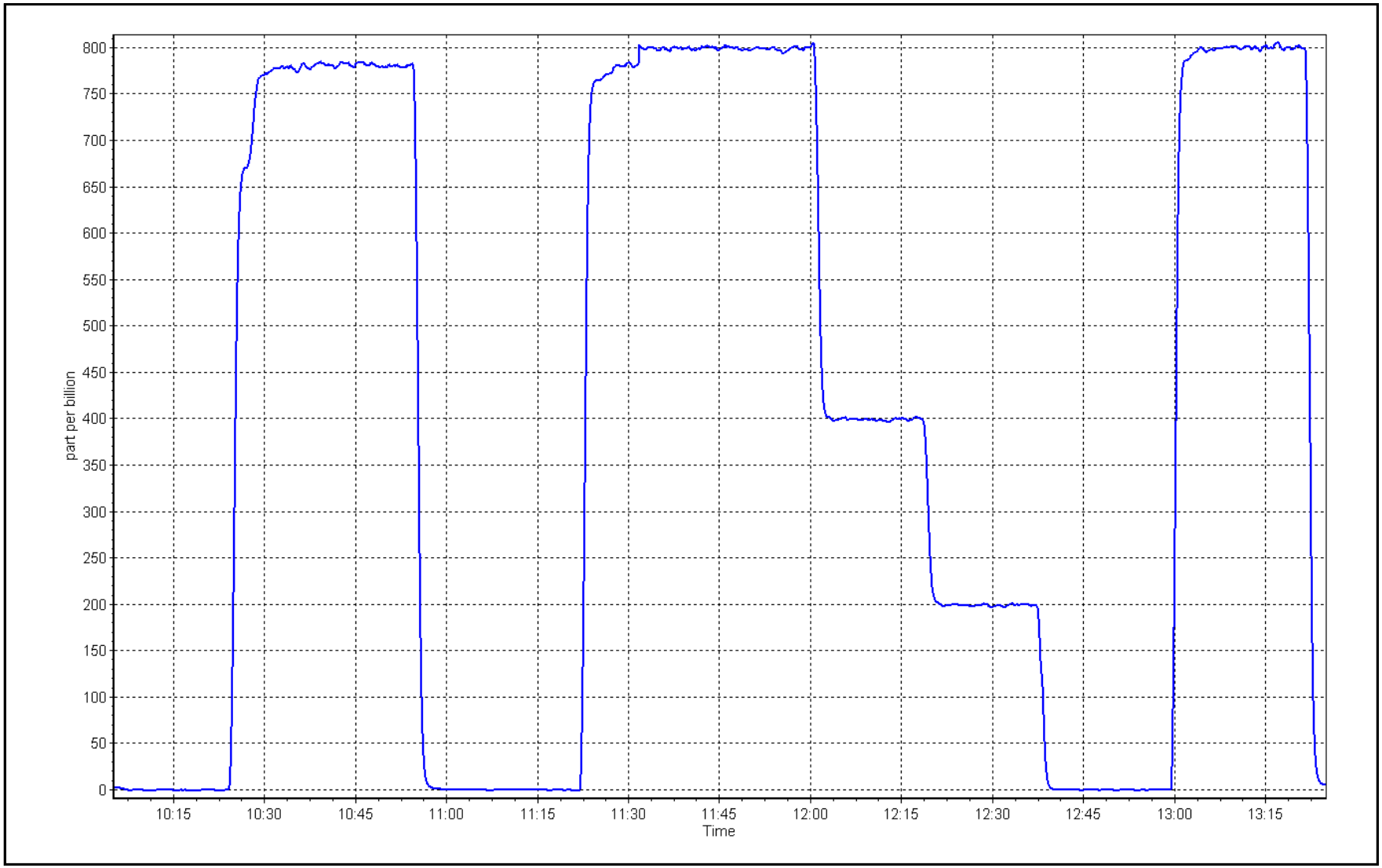
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
801.5	798.5	1.0037
400.7	399.8	1.0022
199.8	199.1	1.0037

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.996660	*0.90 - 1.10*
Intercept	-0.053641	*+/-30*



SO2 Calibration Plot Date: January 7, 2025 Location: Barge Landing



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	January 14, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	10:30	End time (MST):	14:43
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.17	ppm	Cal Gas Exp Date:	August 22, 2026
Cal Gas Cylinder #:	CC511415			
Removed Cal Gas Conc:	5.17	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		Converter Temp:	830 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001834	0.990127	Backgd or Offset:	2.880	2.880
Calibration intercept:	0.179444	0.239254	Coeff or Slope:	1.182	1.182

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4923	77.4	80.0	79.2	1.012
As found Mid point	4961	38.7	40.0	39.9	1.006
As found Low point	4981	19.3	20.0	19.9	1.008
New cylinder response					

Baseline Corr As found:	79.1	Prev response:	80.37	*% change:	-1.6%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	0.988273	AF Intercept:	0.179163
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999988	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4923	77.4	80.0	79.4	1.008
Mid point	4961	38.7	40.0	40.0	1.001
Low point	4981	19.3	20.0	20.1	0.993
As left zero	5000	0.0	0.0	0.2	----
As left span	4923	77.4	80.0	79.9	1.002
SO2 Scrubber Check	4920	80.2	802.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.001
Date of last converter efficiency test:					

Notes: Sample inlet filter changed after multipoint as founds. SO2 scrubber check completed after calibrator zero. No adjustments made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

TRS Calibration Summary

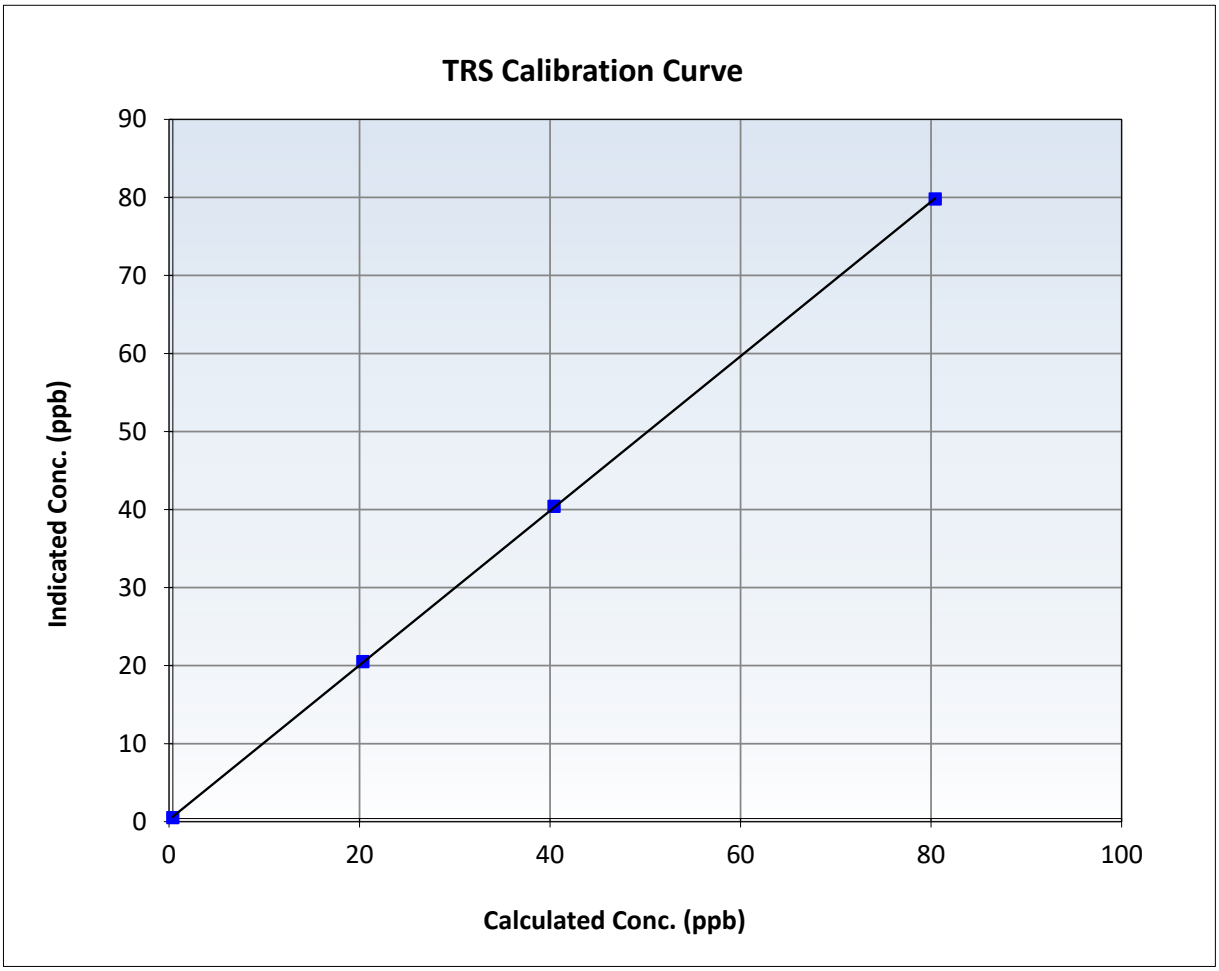
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:30	End Time (MST):	14:43
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1331259320

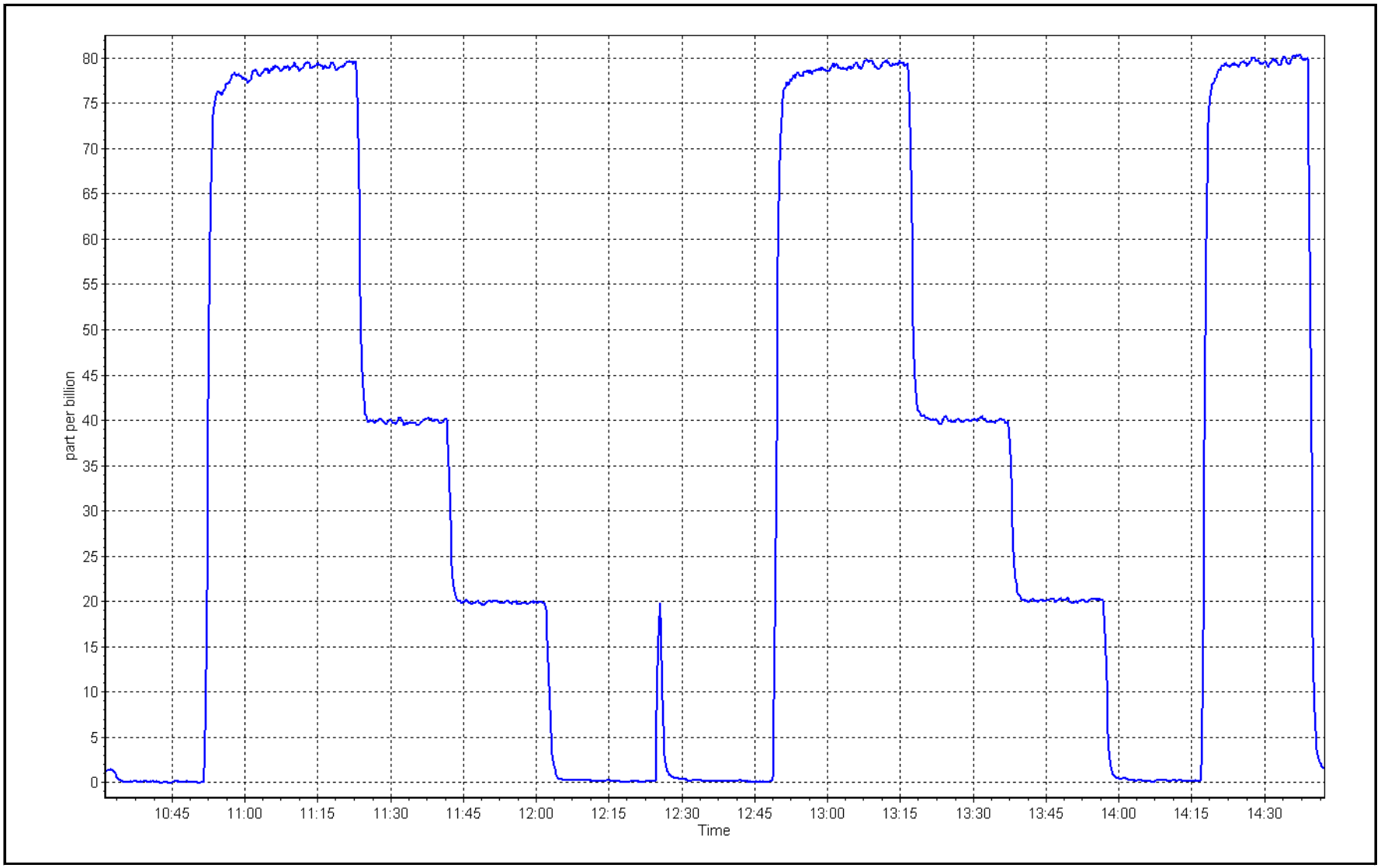
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
80.0	79.4	1.0081
40.0	40.0	1.0006
20.0	20.1	0.9930

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	0.990127	*0.90 - 1.10*
Intercept	0.239254	*+/-3*



TRS Calibration Plot Date: January 14, 2025 Location: Barge Landing



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	January 7, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	10:04	End time (MST):	13:25
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC151285	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
Removed CH4 Conc.	497.6 ppm	CH4 Equiv Conc.	1067.1 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3812
Zero Air Gen model:	APIT701	Serial Number:	4888

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.41E-04	2.71E-04	NMHC SP Ratio:	5.82E-05	6.70E-05
CH4 Retention time:	14.0	14.0	NMHC Peak Area:	157157	136380
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.01	----
As found High point	4919	80.2	17.12	15.29	1.121
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	15.27	Prev response	17.08	*% change	-11.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	17.12	17.07	1.003
Mid point	4960	40.1	8.56	8.45	1.013
Low point	4980	20.0	4.27	4.23	1.008
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	17.12	17.14	0.999
				Average Correction Factor	1.008

Notes: Changed the inlet filter after as founds. As found span response was low, diagnostics seems fine. CH4 peak was low compared last month. Adjusted span.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4919	80.2	9.14	8.11	1.127
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.11	Prev response	9.11	*% change	-12.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	9.14	9.13	1.001
Mid point	4960	40.1	4.57	4.53	1.008
Low point	4980	20.0	2.28	2.28	1.001
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	9.14	9.18	0.995
				Average Correction Factor	1.003

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.01	----
As found High point	4919	80.2	7.98	7.17	1.115
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.16	Prev response	7.96	*% change	-11.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4919	80.2	7.98	7.94	1.005
Mid point	4960	40.1	3.99	3.92	1.019
Low point	4980	20.0	1.99	1.96	1.017
As left zero	5000	0.0	0.00	0.00	----
As left span	4919	80.2	7.98	7.96	1.003
				Average Correction Factor	1.014

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.997813	0.996927
THC Cal Offset:	-0.004153	-0.025766
CH4 Cal Slope:	0.997172	0.994812
CH4 Cal Offset:	0.003659	-0.019354
NMHC Cal Slope:	0.998236	0.998436
NMHC Cal Offset:	-0.007012	-0.005813

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

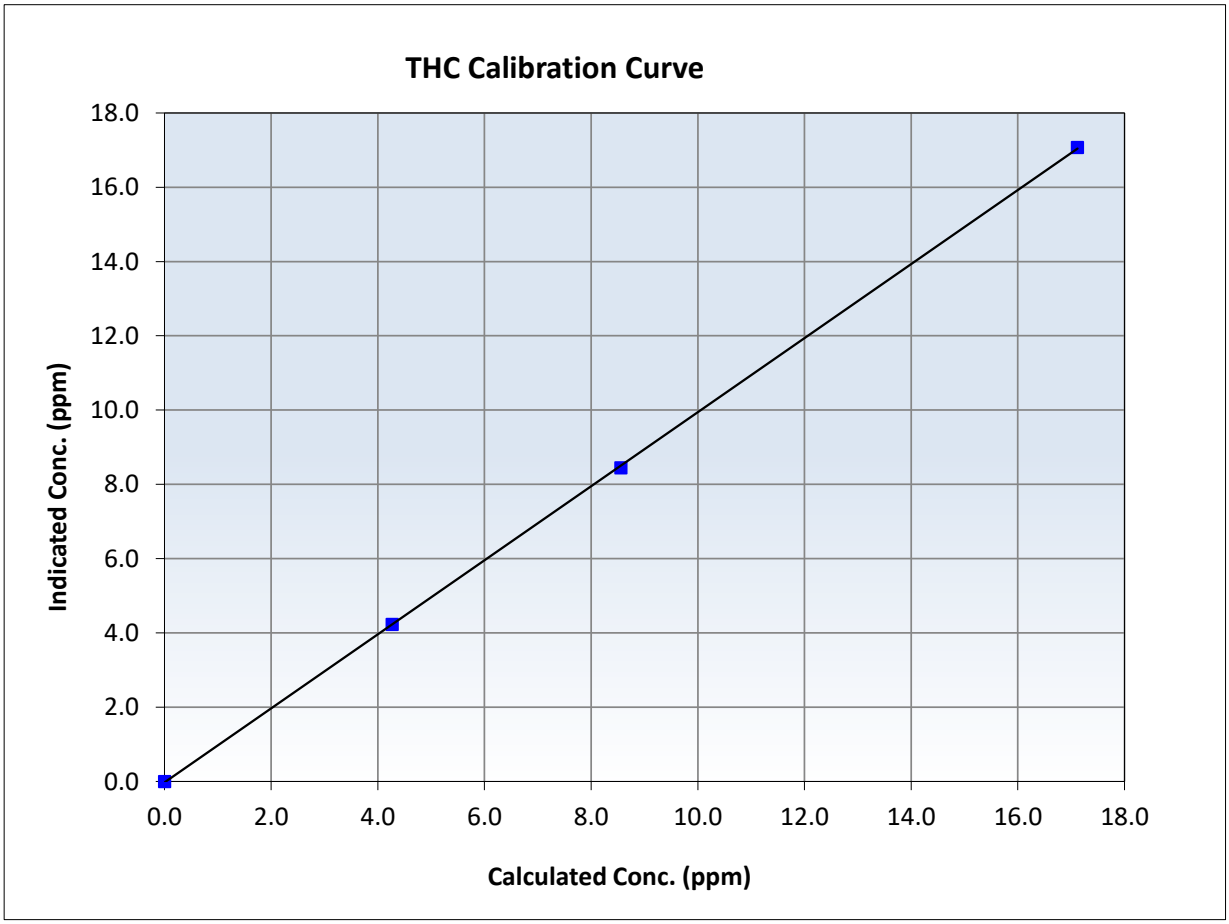
THC Calibration Summary

Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	13:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999970	≥0.995
17.12	17.07	1.0030	Slope	0.996927	0.90 - 1.10
8.56	8.45	1.0130	Intercept	-0.025766	+/-0.5
4.27	4.23	1.0081			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

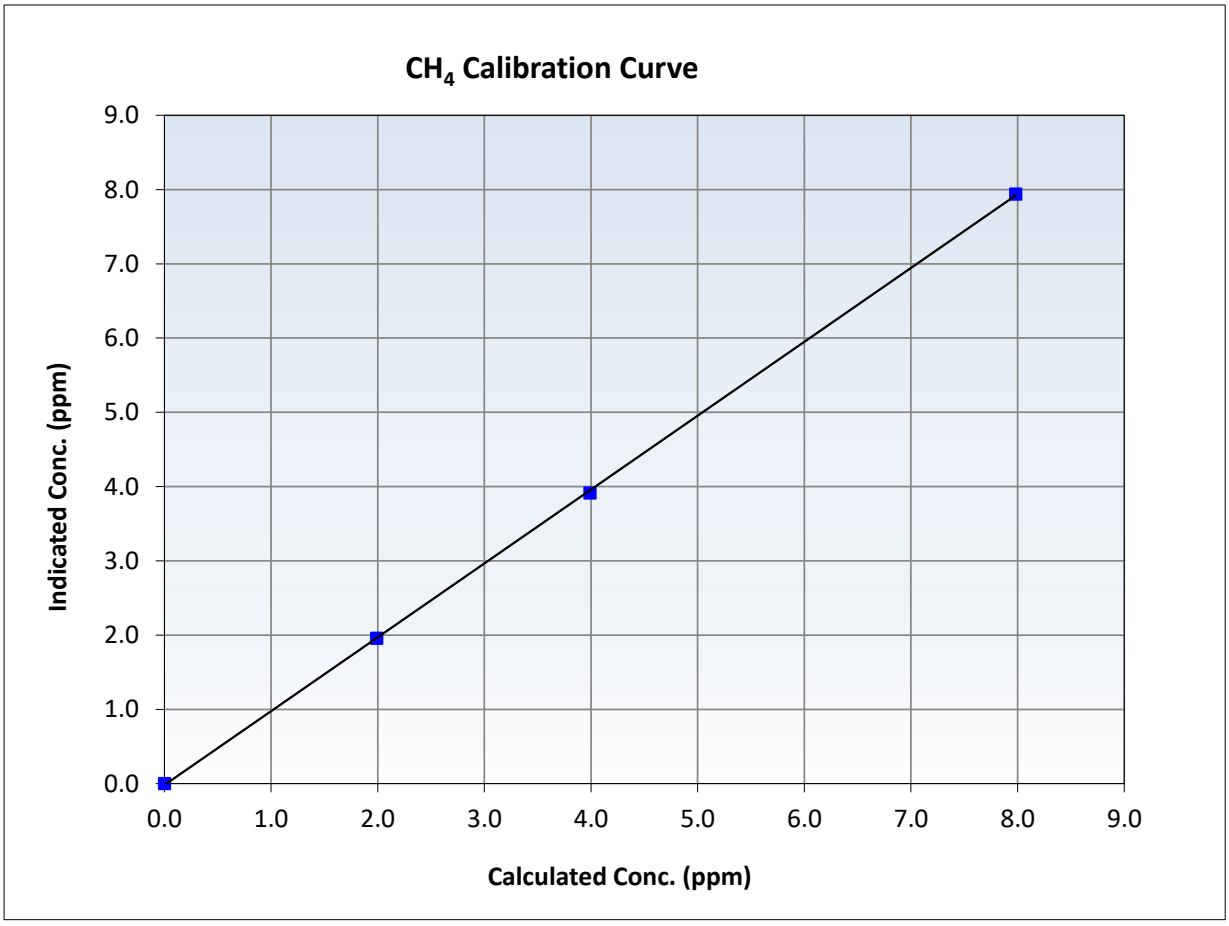
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	13:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
7.98	7.94	1.0054
3.99	3.92	1.0191
1.99	1.96	1.0165

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999945	*≥0.995*
Slope	0.994812	*0.90 - 1.10*
Intercept	-0.019354	*+/-0.5*



Wood Buffalo Environmental Association

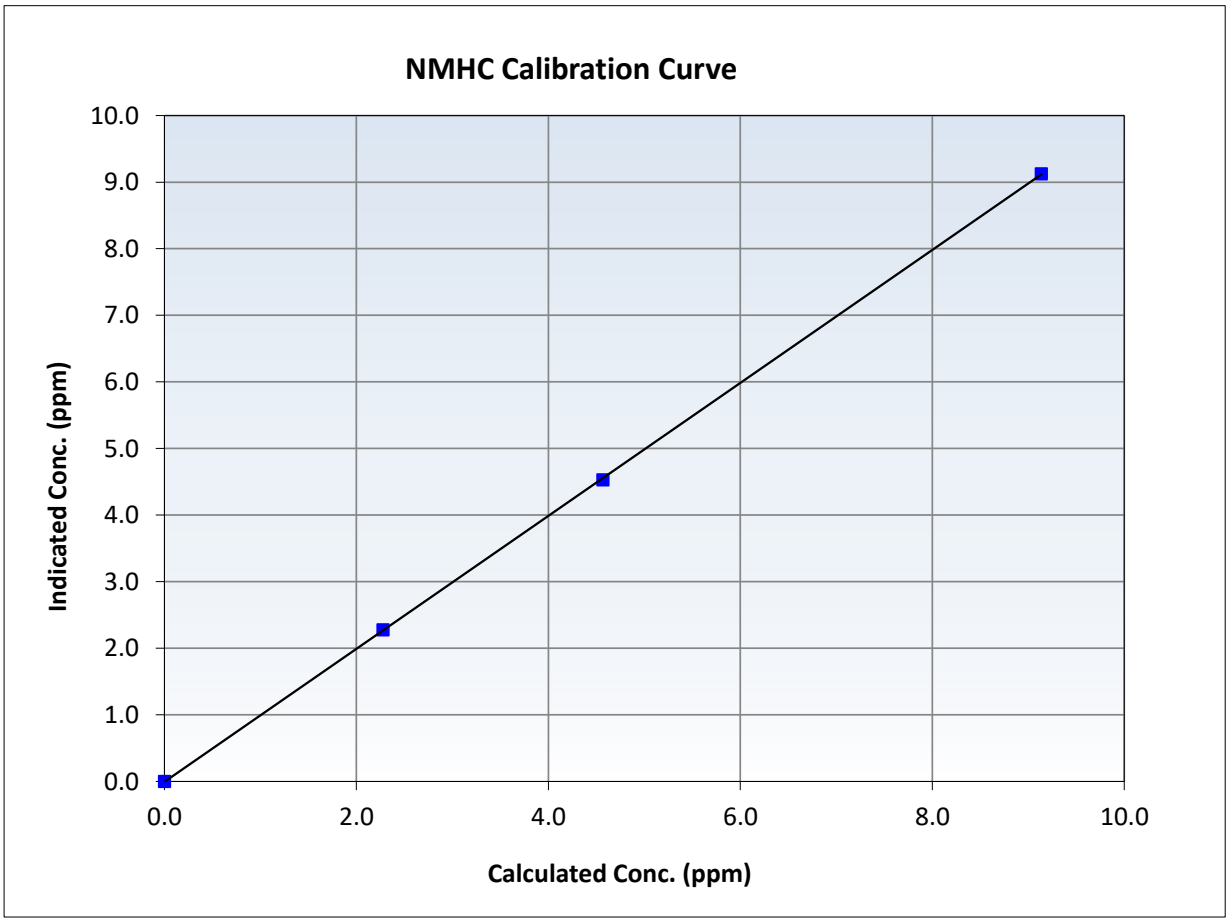
NMHC Calibration Summary

Station Information

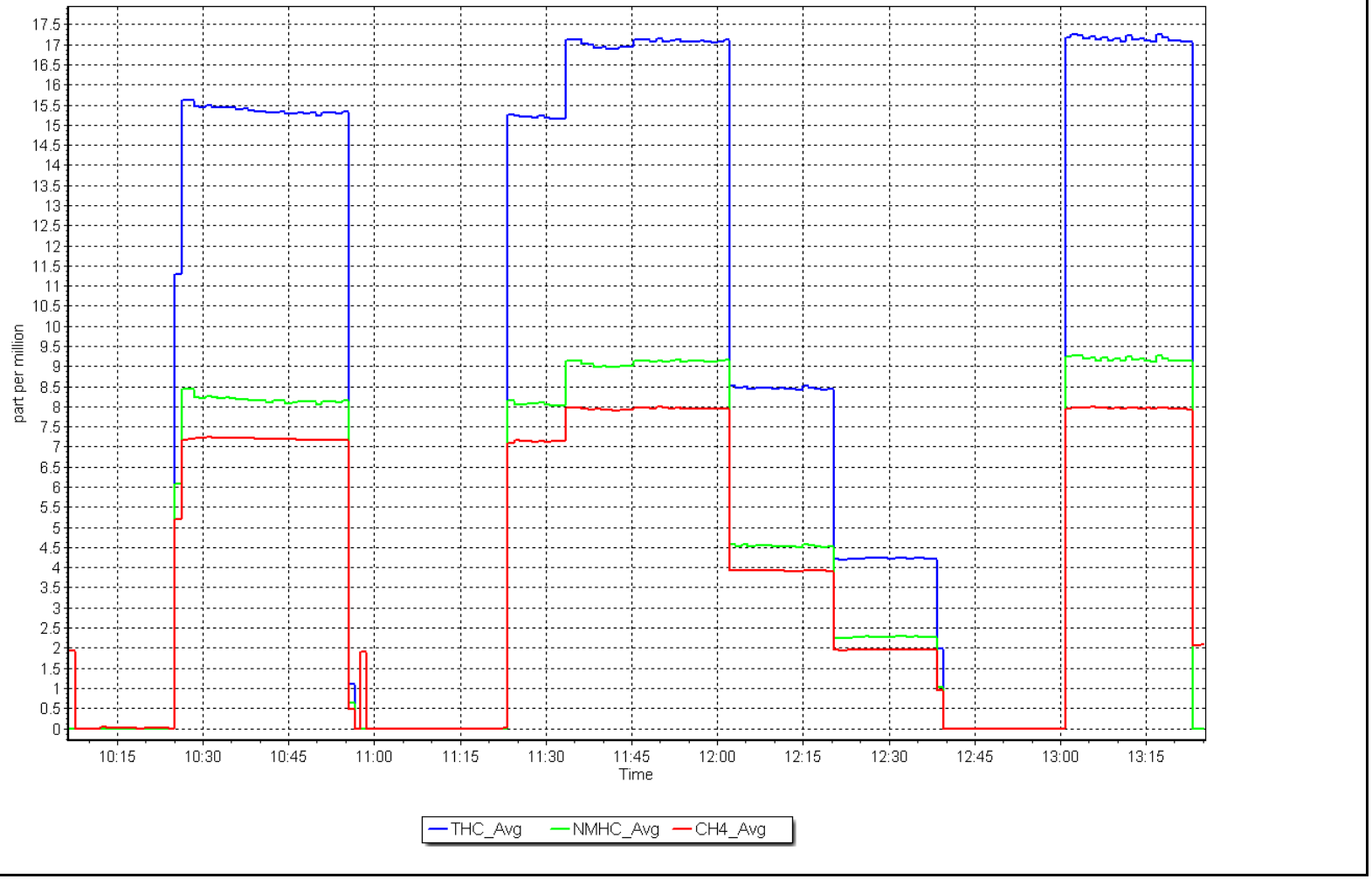
Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	13:25
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320038

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999985	≥0.995
9.14	9.13	1.0012	Slope	0.998436	0.90 - 1.10
4.57	4.53	1.0078			
2.28	2.28	1.0009	Intercept	-0.005813	+/-0.5



NMHC Calibration Plot Date: January 7, 2025 Location: Barge Landing



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Barge Landing
Station number:	AMS 09
Calibration Date:	January 10, 2025
Last Cal Date:	December 9, 2025
Start time (MST):	10:04
End time (MST):	14:22
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T2Y1KDH	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	47.38 ppm	NO Cal Gas Conc:	46.94 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.38 ppm	Removed Gas NO Conc:	46.94 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3812
ZAG make/model:	Api T701	Serial Number:	4888

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.2	----	----
AF High point	4915	85.3	808.3	800.7	7.5	795.4	784.7	10.7	1.0158	1.0202
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 807.2 ppb	NO = 799.1 ppb
Baseline Corr 1st pt	NO_X = 795.7 ppb	NO = 784.9 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X = -1.4%
*Percent Change	NO = -1.8%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
Serial Number: 1426262593
NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.107	1.129	NO bkgnd or offset:	10.1	10.3
NOX coeff or slope:	0.999	0.999	NOX bkgnd or offset:	10.4	10.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	179.5	175.2

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.997861	0.999869
NO_X Cal Offset:	0.658322	0.398406
NO Cal Slope:	0.998554	0.998911
NO Cal Offset:	-0.483887	-0.683917
NO_2 Cal Slope:	1.003546	1.005100
NO_2 Cal Offset:	0.547567	0.561928

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	----	----
High point	4915	85.3	808.3	800.7	7.5	808.3	799.5	8.7	0.9999	1.0016
Mid point	4957	42.6	403.7	400.0	3.7	404.2	398.6	5.6	0.9988	1.0034
Low point	4979	21.3	201.8	200.0	1.9	202.9	198.3	4.6	0.9947	1.0083
As left zero	5000	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	----	----
As left span	4915	85.3	808.3	425.7	382.6	808.1	425.7	382.4	1.0002	1.0000
							Average Correction Factor		0.9978	1.0044

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.2	----	----
High GPT point	796.5	422.2	381.8	383.9	0.9945	100.5%
Mid GPT point	796.5	611.2	192.8	194.8	0.9898	101.0%
Low GPT point	796.5	705.2	98.8	100.6	0.9822	101.8%
				Average Correction Factor	0.9888	101.1%

Notes: Inlet filter changed after as founds. Span adjusted.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

NO_X Calibration Summary

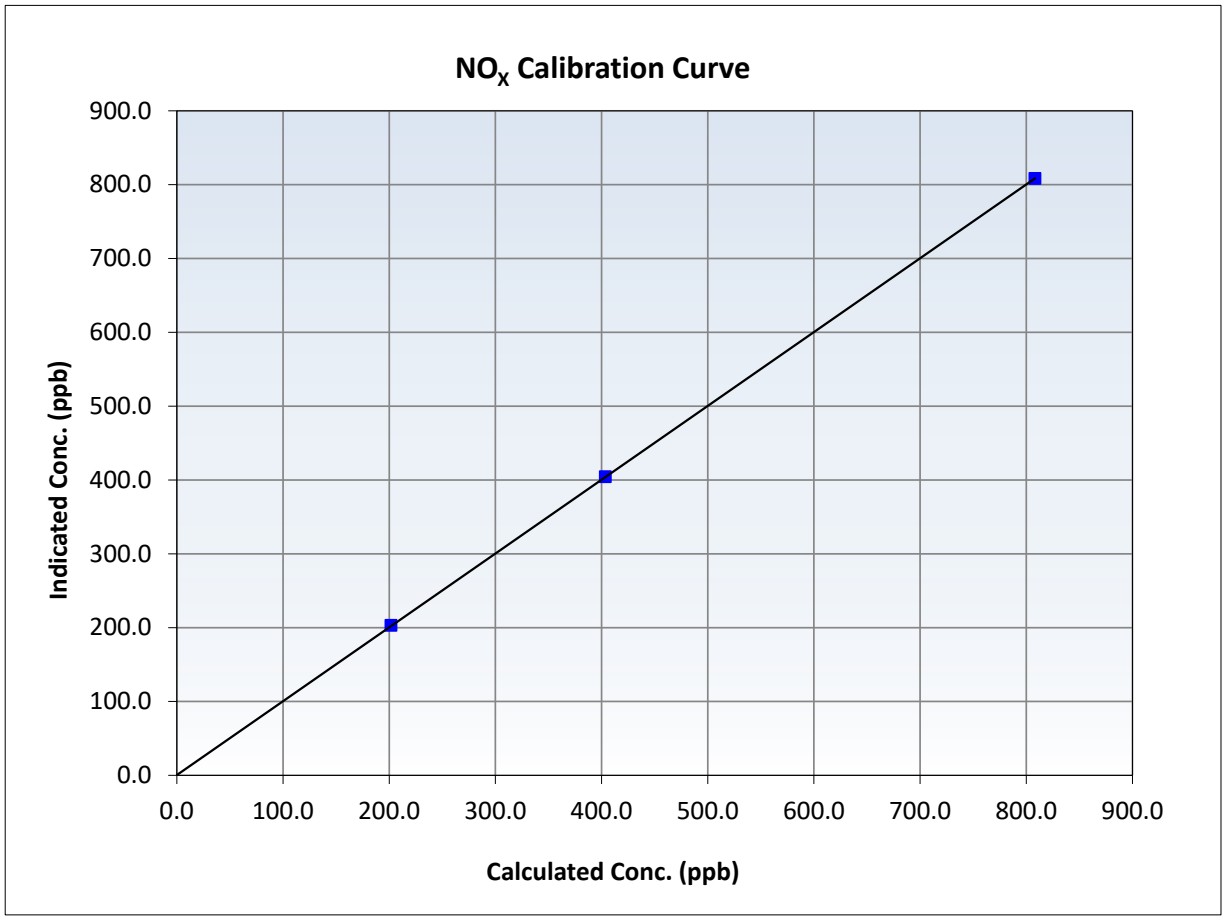
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 9, 2025
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	14:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
808.3	808.3	0.9999
403.7	404.2	0.9988
201.8	202.9	0.9947

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	0.999869	*0.90 - 1.10*
Intercept	0.398406	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

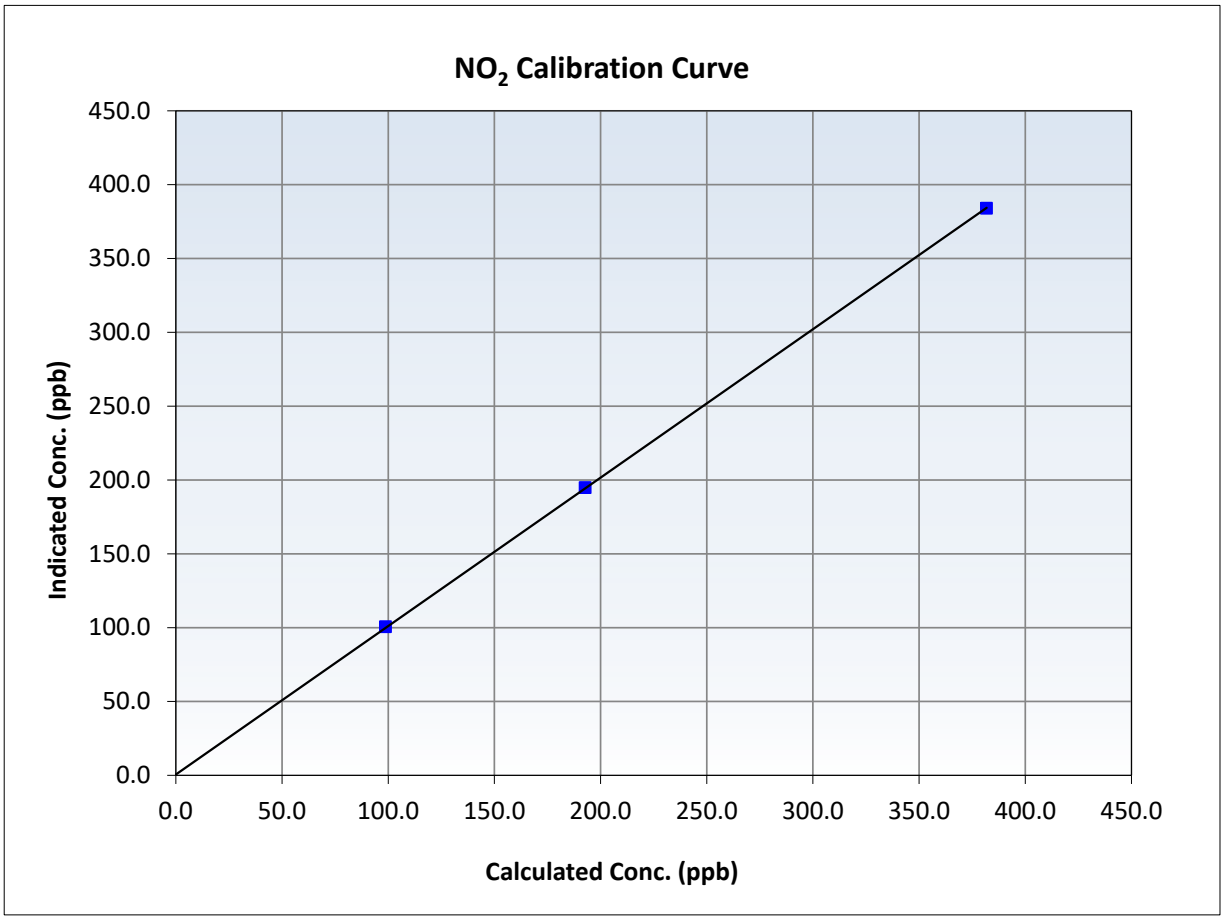
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 9, 2025
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	14:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
381.8	383.9	0.9945
192.8	194.8	0.9898
98.8	100.6	0.9822

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999981	*≥0.995*
Slope	1.005100	*0.90 - 1.10*
Intercept	0.561928	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

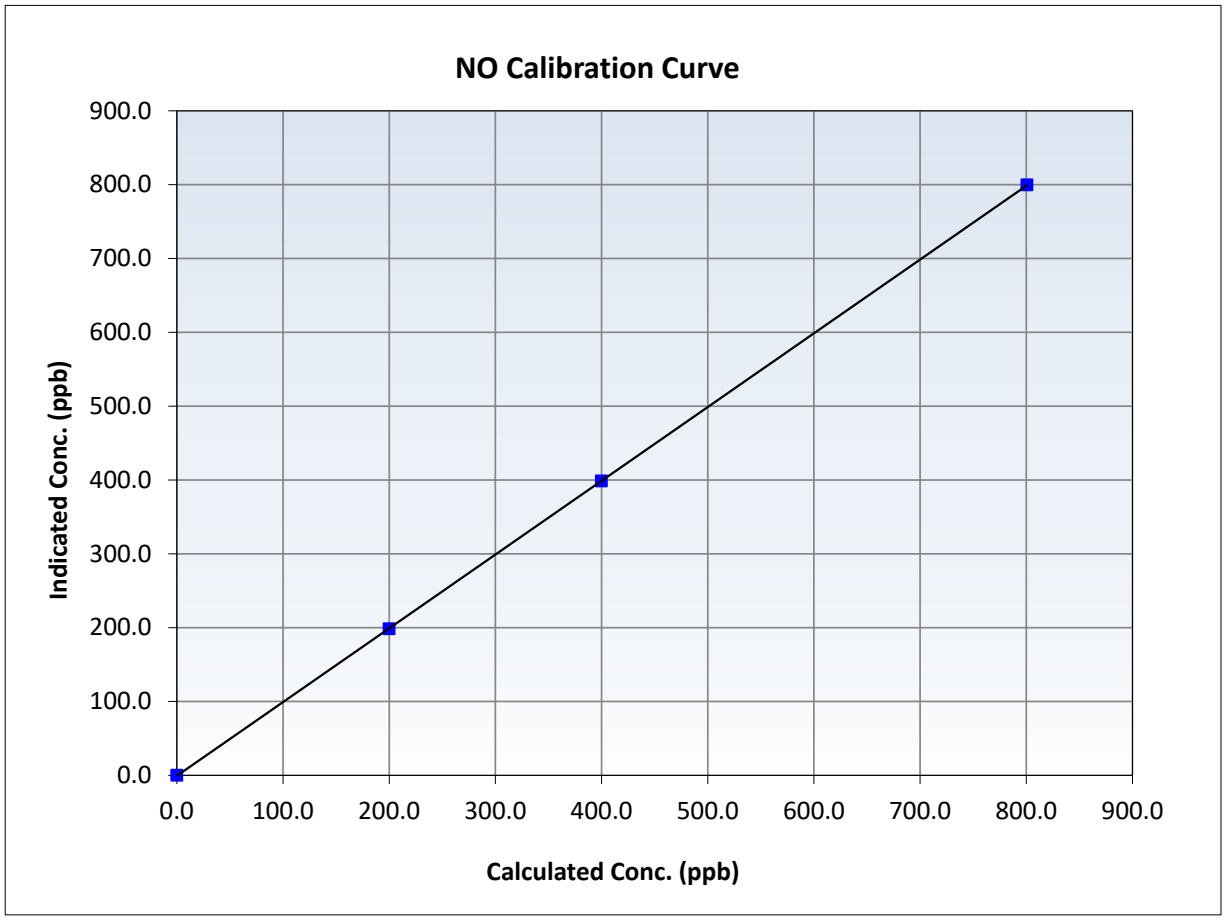
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 9, 2025
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:04	End Time (MST):	14:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

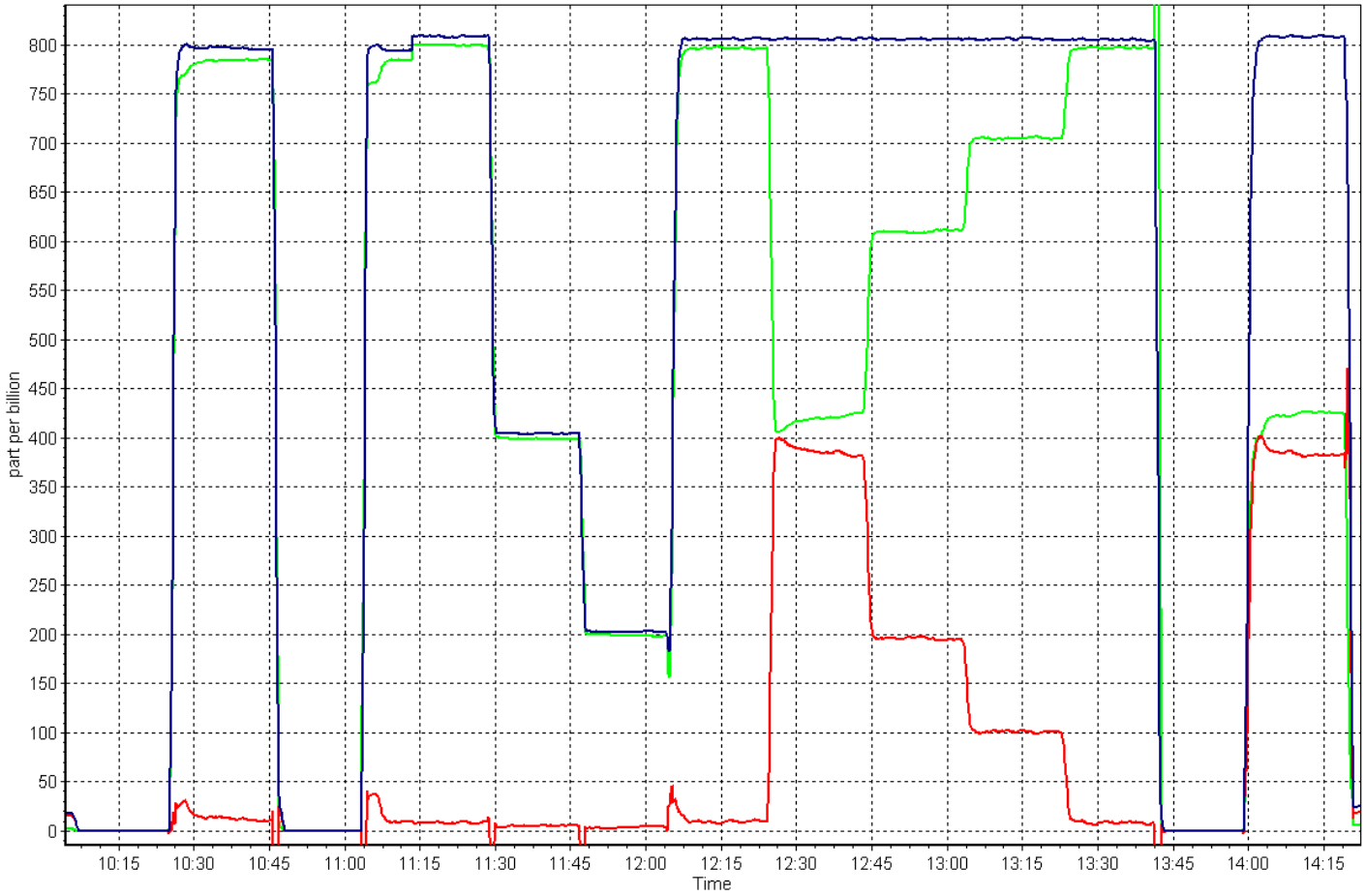
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.7	799.5	1.0016
400.0	398.6	1.0034
200.0	198.3	1.0083

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	0.998911	*0.90 - 1.10*
Intercept	-0.683917	*+/-20*



NO_X Calibration Plot Date: January 10, 2025 Location: Barge Landing



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	January 14, 2025	Last Cal Date:	December 29, 2024
Start time (MST):	13:07	End time (MST):	13:24
Analyzer Make:	API T640	S/N:	844
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388746
Temp/RH standard:	Alicat FP-25BT	S/N:	388746

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	1.00	1.00	1.00	☐	+/- 2 °C
P (mmHg)	717.90	722.50	717.90	☐	+/- 10 mmHg
Flow (LPM)	5.00	4.93	5.00	☐	+/- 0.25 LPM
PW% (pump)	38	-----	38	☐	>80%
Zero Verification	PM w/o HEPA:	6.30	PM w/ HEPA:	0.00	<0.2 ug/m3

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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: December 29, 2024

Date Disposable Filter Changed: December 29, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 18, 2024

Date RH/T Sensor Cleaned: October 18, 2024

Notes: No adjustment made.

Calibration by: Sean Bala

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS11
LOWER CAMP
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	January 23, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	12:50	End time (MST):	16:37
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 Model:	Teledyne API T700		Serial Number:	3807
Zero Air Gen Model:	Teledyne API T701		Serial Number:	196

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	100841398	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994133	0.993167	Backgd or Offset:	15.6	16.2
Calibration intercept:	-1.481721	0.256519	Coeff or Slope:	0.977	0.999

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4932	81.4	799.6	780.2	1.025
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	780.0	Previous response	793.5	*% change	-1.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4932	81.4	799.6	794.5	1.006
Mid point	4959	40.7	400.9	398.5	1.006
Low point	4981	20.4	200.9	199.4	1.007
As left zero	5000	0.0	0.0	0.3	----
As left span	4932	81.4	799.6	799.7	1.000
				Average Correction Factor:	1.007

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

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

SO_2 Calibration Summary

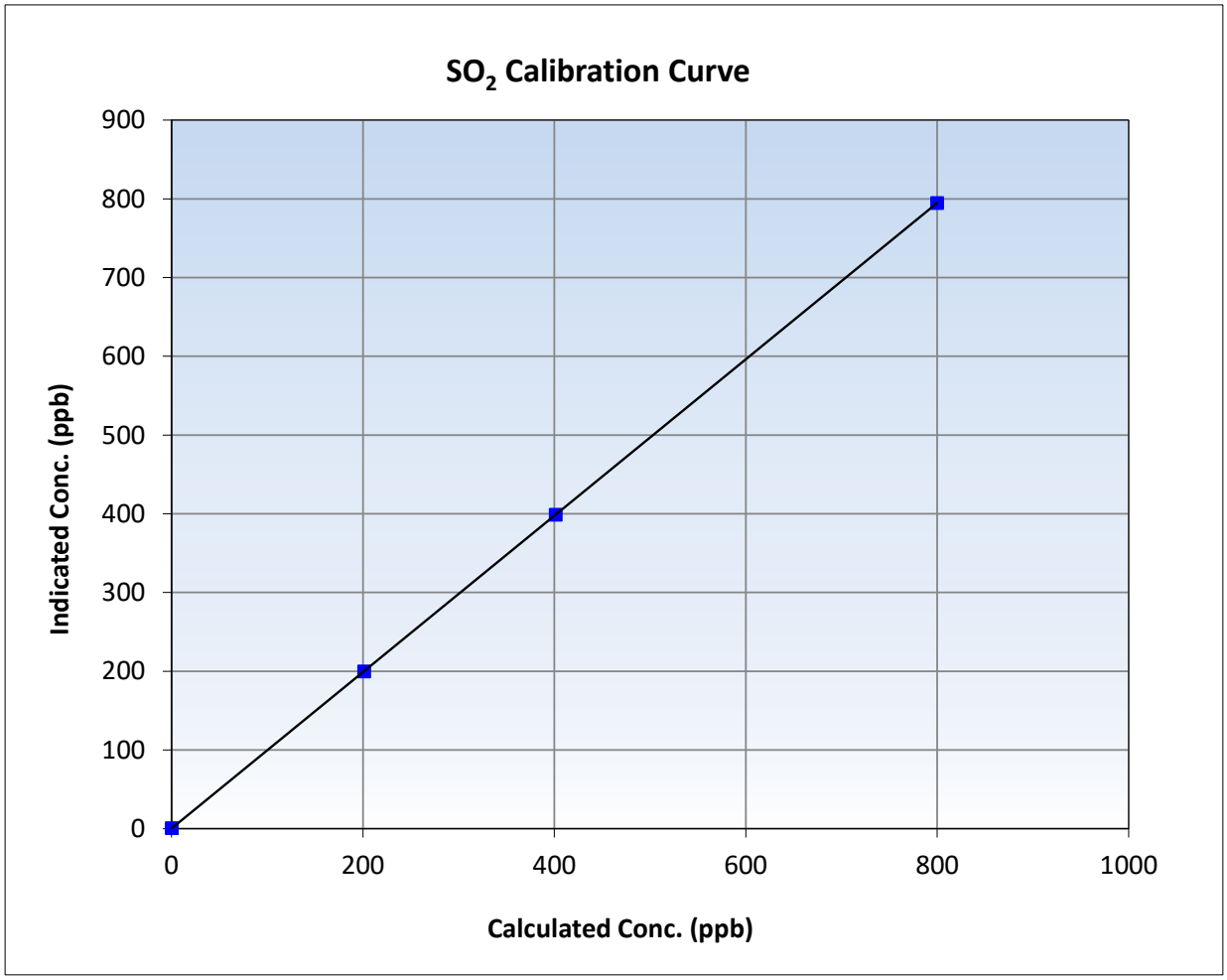
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 11, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	12:50	End Time (MST):	16:37
Analyzer make:	Thermo 43i	Analyzer serial #:	100841398

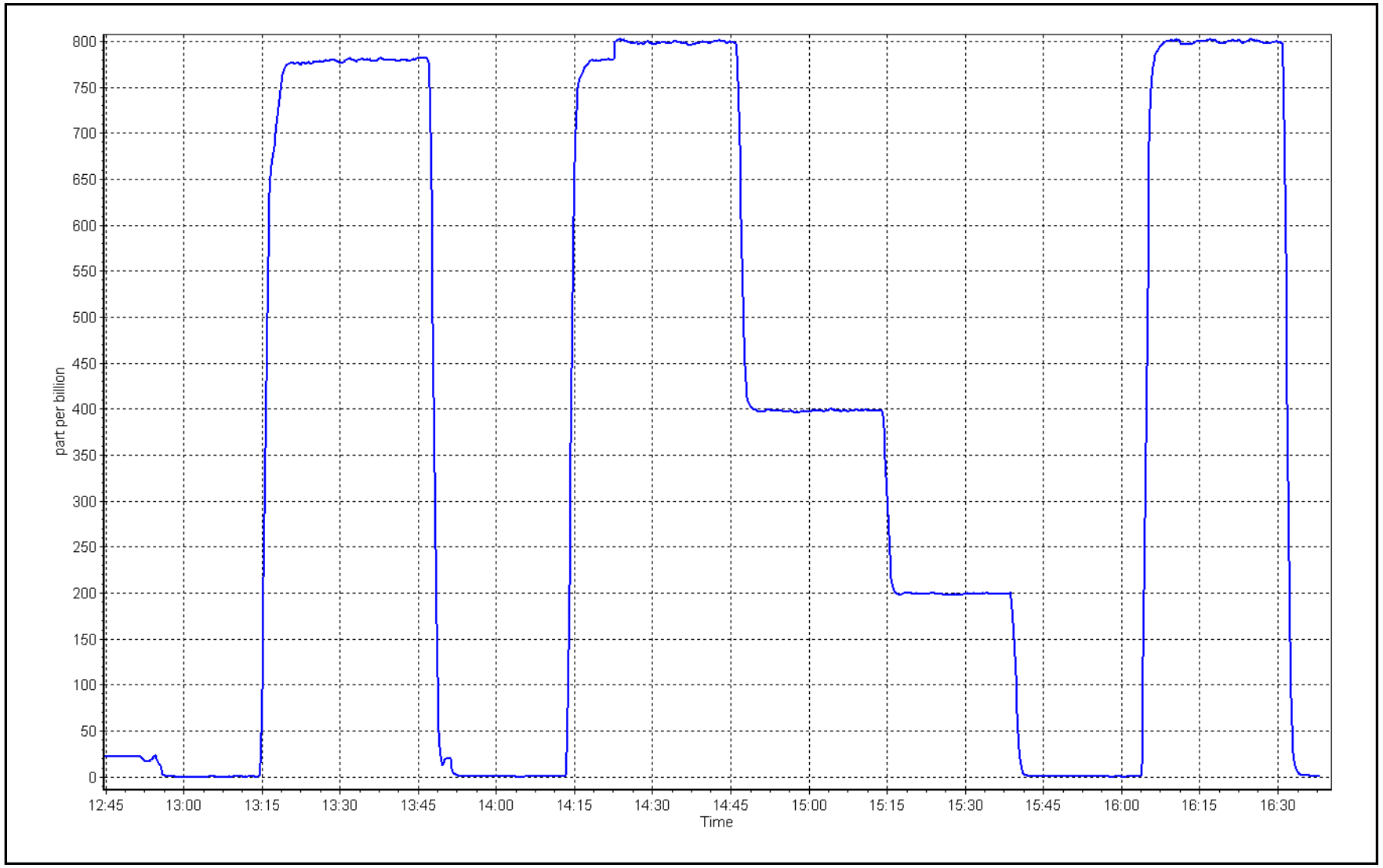
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
799.6	794.5	1.0065
400.9	398.5	1.0061
200.9	199.4	1.0074

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.993167	*0.90 - 1.10*
Intercept	0.256519	*+/-30*



SO2 Calibration Plot Date: January 23, 2025 Location: Lower Camp



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	January 27, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	11:26	End time (MST):	17:11
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.83	ppm	Cal Gas Exp Date:	August 28, 2028
Cal Gas Cylinder #:	CC737863			
Removed Cal Gas Conc:	5.43	ppm	Rem Gas Exp Date:	January 4, 2025
Removed Gas Cyl #:	CC501097		Diff between cyl:	-2.0%
Calibrator Make/Model:	API T700		Serial Number:	3807
ZAG Make/Model:	API T701H		Serial Number:	196

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	1203169745	
Converter make:	Global G150		Converter serial #:	2022-223	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.998327	1.021095	Backgd or Offset:	2.6	2.7
Calibration intercept:	0.015156	-0.503774	Coeff or Slope:	0.769	0.808

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4926	73.6	79.9	79.1	1.008
As found Mid point	4963	36.8	40.0	39.3	1.012
As found Low point	4982	18.6	20.2	19.6	1.020
New cylinder response	4935	83.0	79.9	77.5	1.031

Baseline Corr As found:	79.3	Prev response:	79.82	*% change:	-0.7%
Baseline Corr 2nd AF pt:	39.5	AF Slope:	0.992839	AF Intercept:	-0.324070
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999989	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4935	83.0	79.9	81.3	0.983
Mid point	4977	41.6	40.0	40.0	1.001
Low point	4993	20.9	20.1	19.9	1.012
As left zero	5000	0.0	0.0	-0.1	----
As left span	4935	83.0	79.9	81.2	0.984
SO2 Scrubber Check	4935	81.5	812.3	0.1	----
Date of last scrubber change:				Ave Corr Factor	0.998
Date of last converter efficiency test:					

Notes: Changed sample inlet filter and calibration gas after as founds. Ran scrubber check after calibrator zero and it passed. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

H_2S Calibration Summary

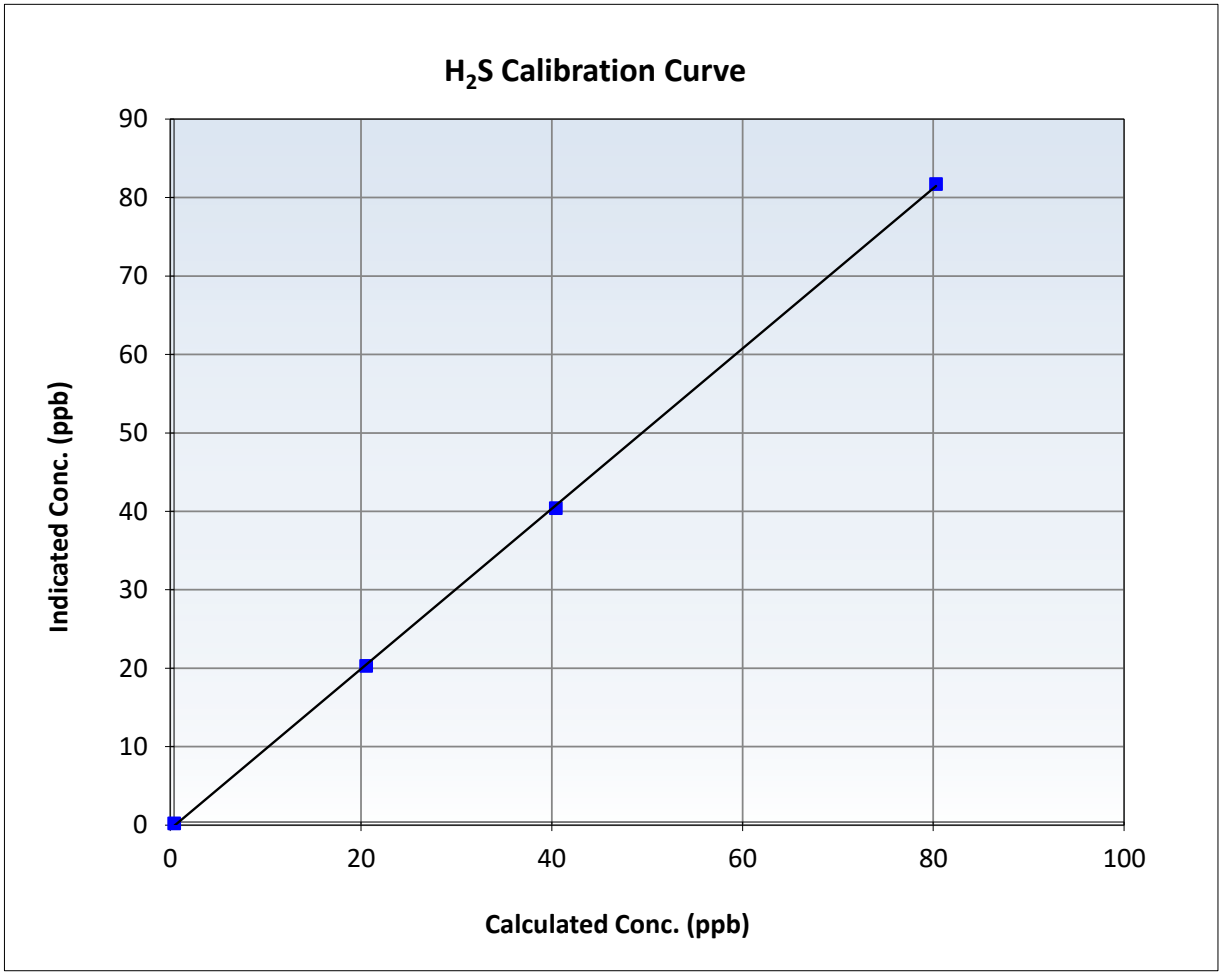
Station Information

Calibration Date:	January 27, 2025	Previous Calibration:	December 10, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	11:26	End Time (MST):	17:11
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1203169745

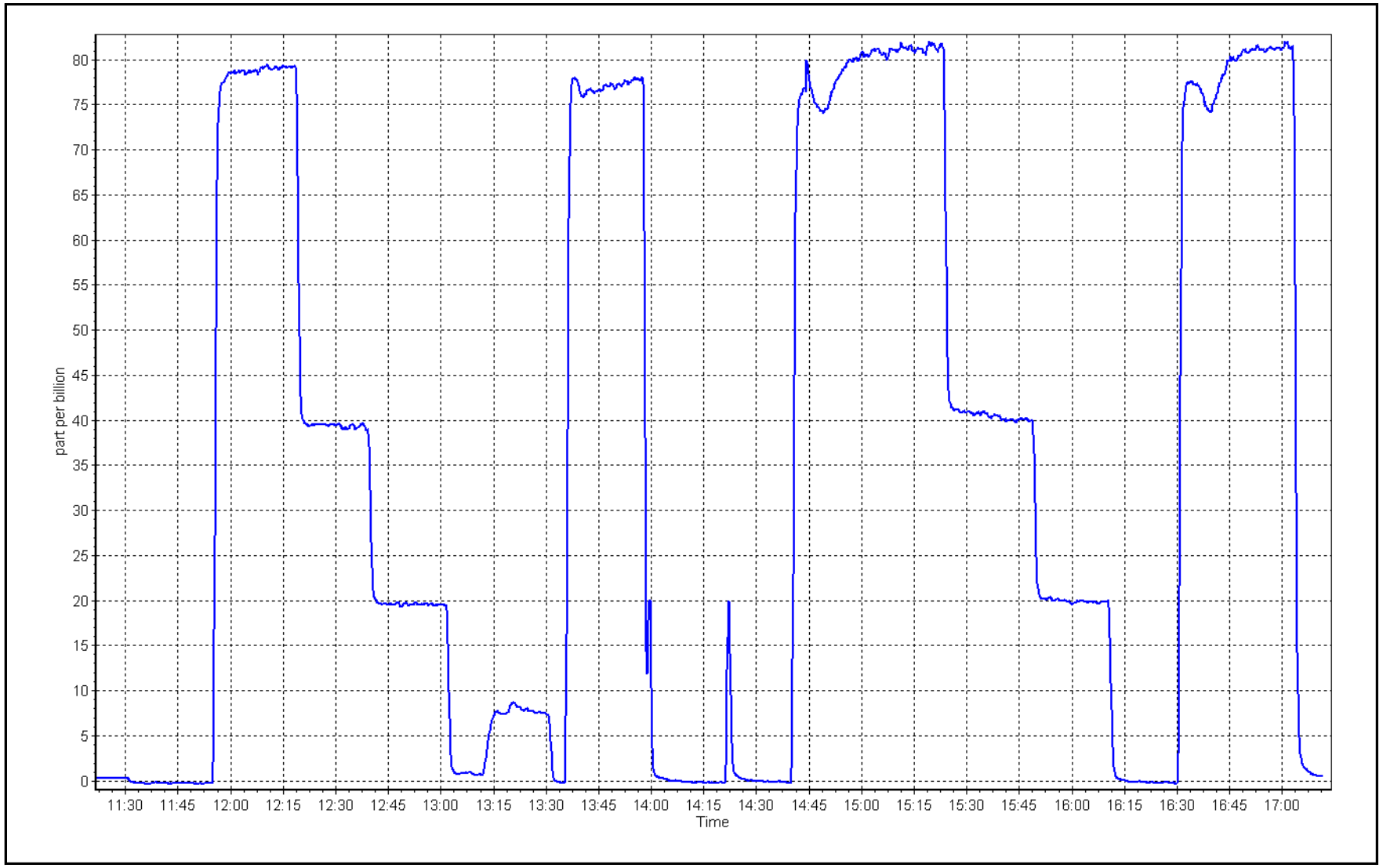
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
79.9	81.3	0.9827
40.0	40.0	1.0009
20.1	19.9	1.0117

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999915	*≥0.995*
Slope	1.021095	*0.90 - 1.10*
Intercept	-0.503774	*+/-3*



H_2S Calibration Plot Date: January 27, 2025 Location: Lower Camp



Wood Buffalo Environmental Association

THC / CH4 / NMHC Calibration Report

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	January 23, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	12:50	End time (MST):	16:37
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC2216	Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	502.0 ppm	CH4 Equiv Conc.	1067.1 ppm	
C3H8 Cal Gas Conc.	205.5 ppm			
Removed Gas Cert:	NA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	502.0 ppm	CH4 Equiv Conc.	1067.1	ppm
Removed C3H8 Conc.	205.5 ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):		Diff between cyl (NM):		
Calibrator Model:	API T700	Serial Number:	3807	
Zero Air Gen model:	API T701	Serial Number:	196	

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.90E-04	3.02E-04	NMHC SP Ratio:	4.65E-05	4.77E-05
CH4 Retention time:	15.8	15.8	NMHC Peak Area:	197066	192145
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	17.33	16.75	1.034
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.75	Prev response	17.25	*% change	-3.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	17.33	17.32	1.000
Mid point	4959	40.7	8.69	8.63	1.006
Low point	4981	20.4	4.35	4.32	1.008
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	17.33	17.31	1.001
				Average Correction Factor	1.005

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

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	9.18	8.94	1.026
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.94	Prev response	9.13	*% change	-2.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	9.18	9.17	1.001
Mid point	4959	40.7	4.60	4.58	1.005
Low point	4981	20.4	2.31	2.30	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	9.18	9.19	0.999
				Average Correction Factor	1.003

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4932	81.4	8.15	7.80	1.045
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.80	Prev response	8.12	*% change	-4.1%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4932	81.4	8.15	8.15	1.000
Mid point	4959	40.7	4.09	4.06	1.008
Low point	4981	20.4	2.05	2.02	1.013
As left zero	5000	0.0	0.00	0.00	----
As left span	4932	81.4	8.15	8.13	1.003
				Average Correction Factor	1.007

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.996781	0.999841
THC Cal Offset:	-0.016298	-0.022527
CH4 Cal Slope:	0.996965	1.000788
CH4 Cal Offset:	-0.004369	-0.016772
NMHC Cal Slope:	0.996730	0.998838
NMHC Cal Offset:	-0.012128	-0.005356

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

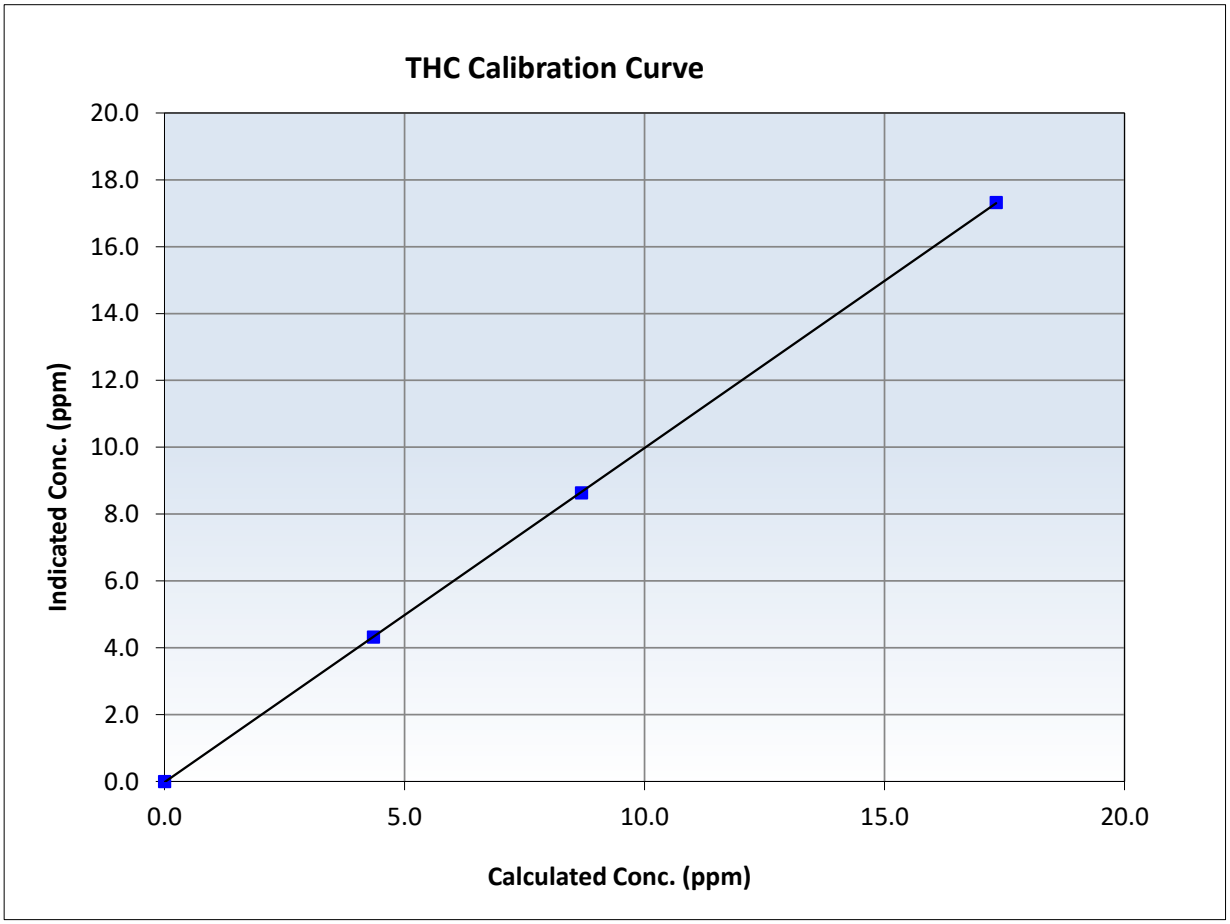
THC Calibration Summary

Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 11, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	12:50	End Time (MST):	16:37
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999989	*≥0.995*
17.33	17.32	1.0004	Slope	0.999841	*0.90 - 1.10*
8.69	8.63	1.0064	Intercept	-0.022527	*+/-0.5*
4.35	4.32	1.0076			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

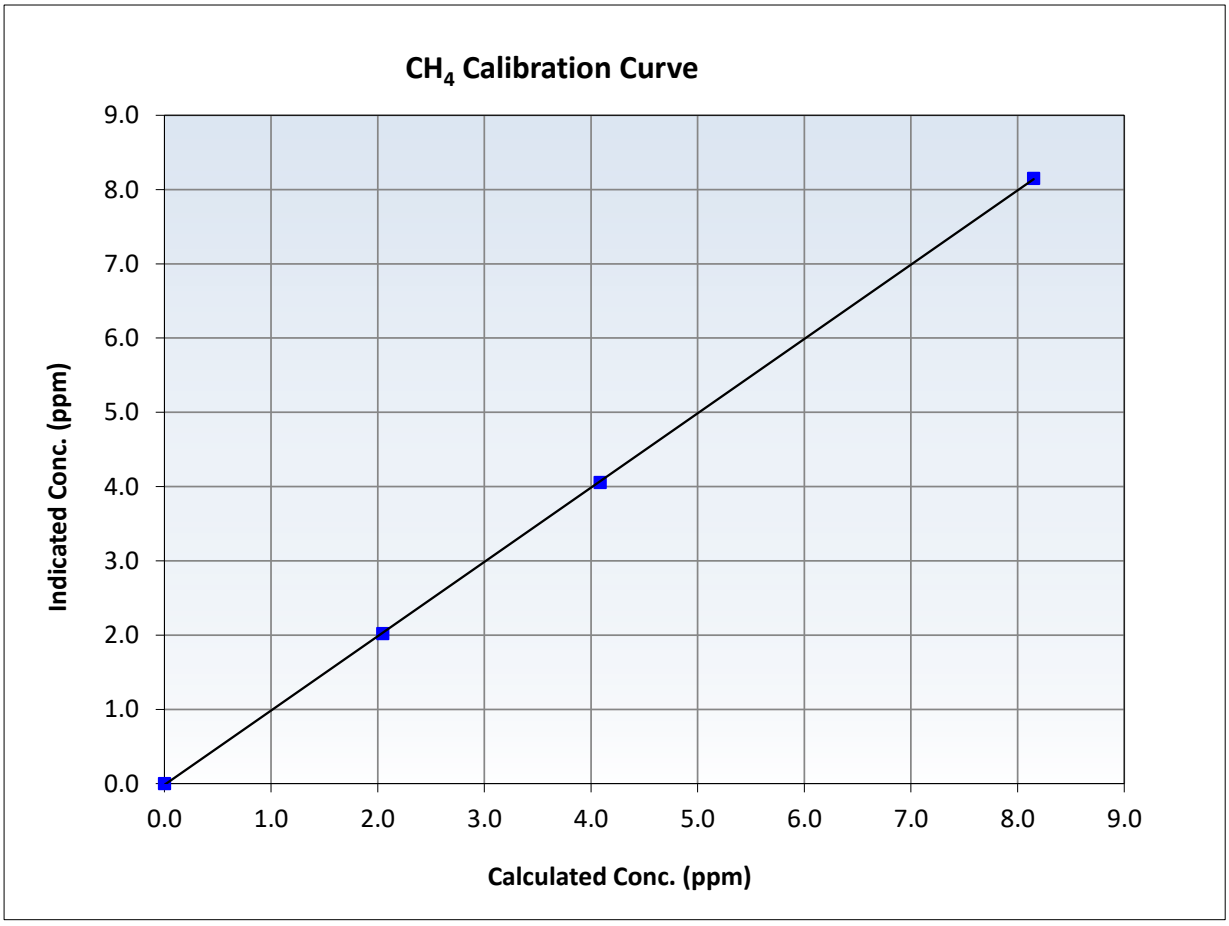
Station Information

Calibration Date:	January 23, 2025	Previous Calibration:	December 11, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	12:50	End Time (MST):	16:37
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.15	8.15	0.9998
4.09	4.06	1.0078
2.05	2.02	1.0127

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999977	*≥0.995*
Slope	1.000788	*0.90 - 1.10*
Intercept	-0.016772	*+/-0.5*



Wood Buffalo Environmental Association

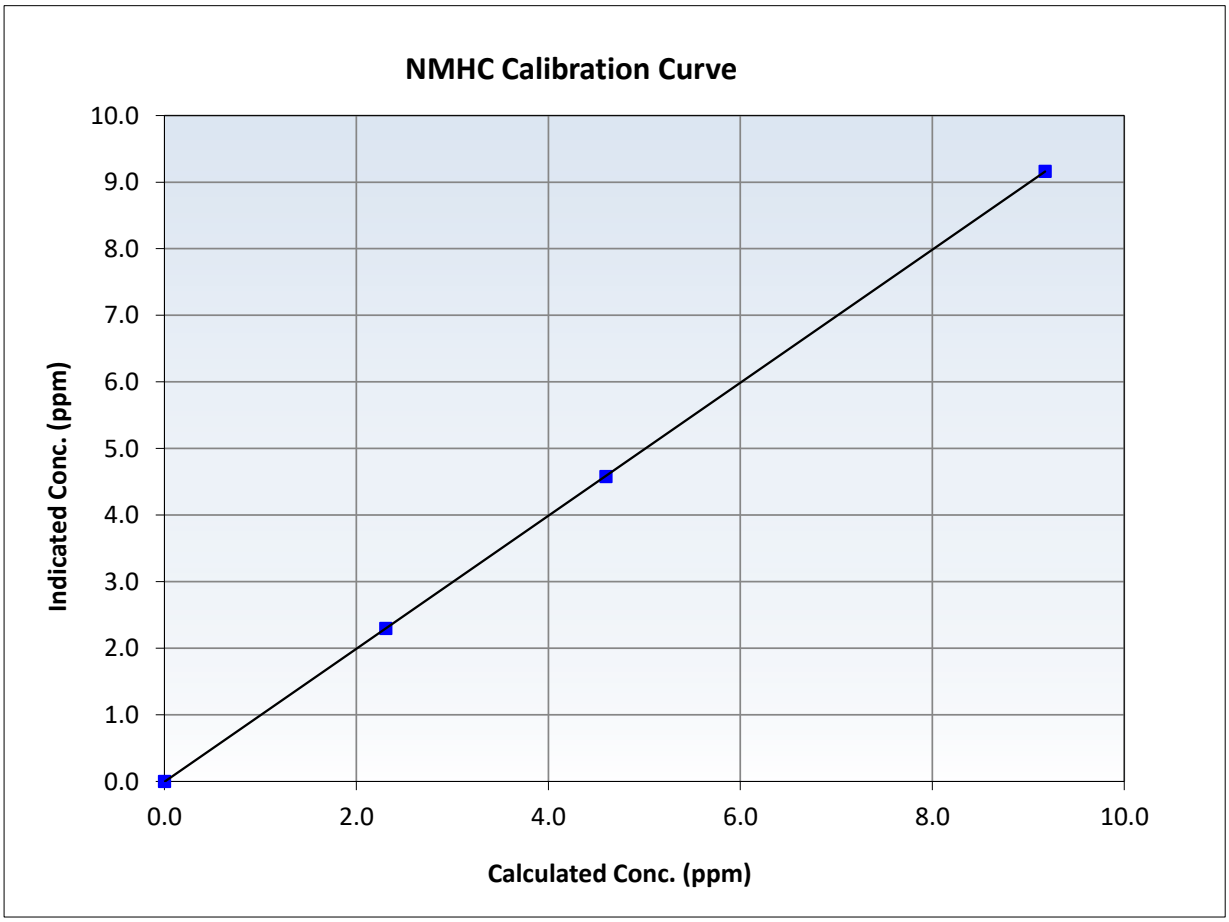
NMHC Calibration Summary

Station Information

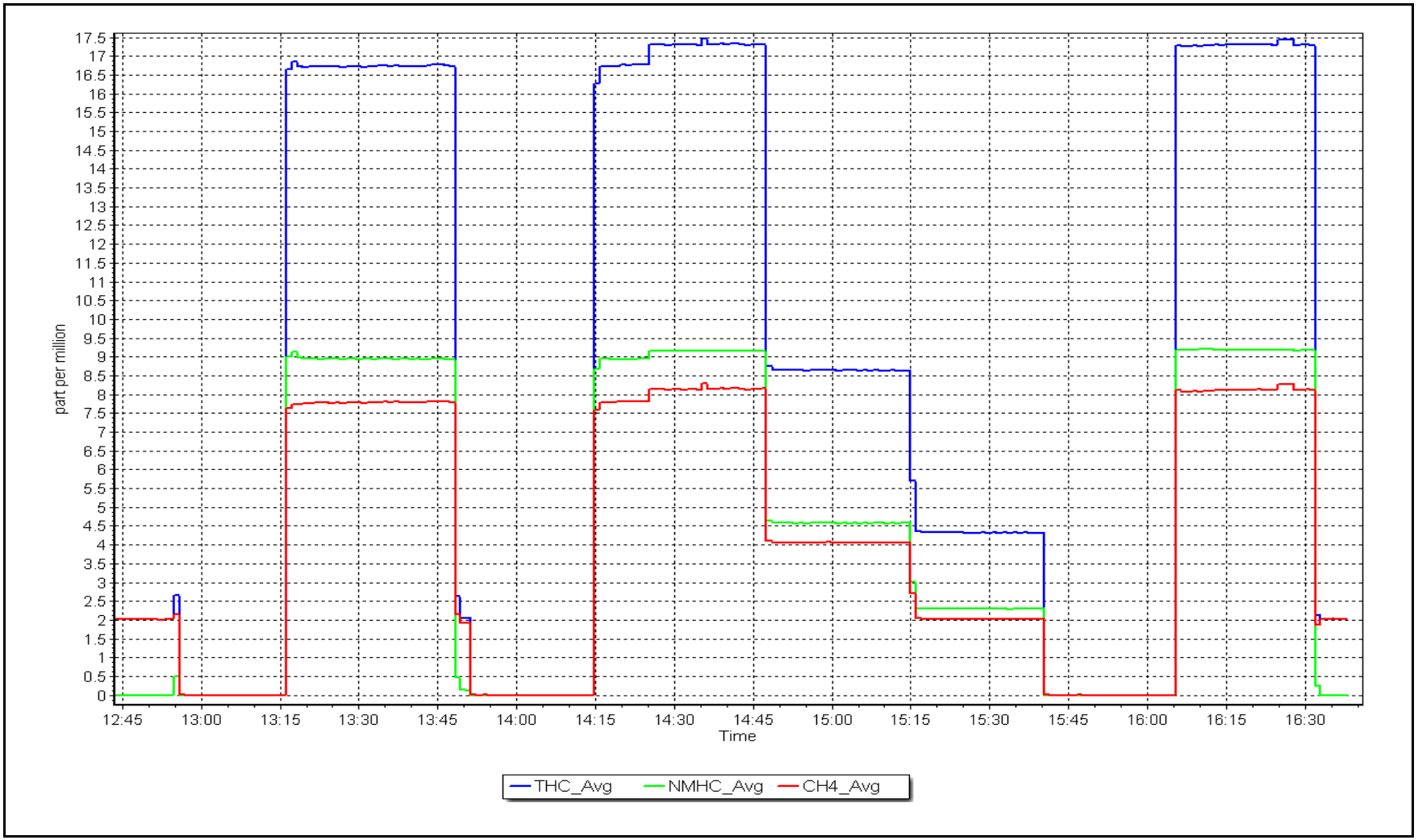
Calibration Date:	January 23, 2025	Previous Calibration:	December 11, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	12:50	End Time (MST):	16:37
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999996	*≥0.995*
9.18	9.17	1.0012	Slope	0.998838	*0.90 - 1.10*
4.60	4.58	1.0047			
2.31	2.30	1.0035	Intercept	-0.005356	*+/-0.5*



NMHC Calibration Plot Date: January 23, 2025 Location: Lower Camp



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS13
FORT MCKAY SOUTH
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	January 6, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:20	End time (MST):	14:10
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:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2448
Zero Air Gen Model:	Teledyne API T701		Serial Number:	1118

Analyzer Information

Analyzer make:	Teledyne API T100		Serial Number:	599	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002885	1.003242	Backgd or Offset:	99.5	99.5
Calibration intercept:	-2.978200	-3.377908	Coeff or Slope:	0.697	0.700

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.9	----
As found High point	4921	79.1	799.7	795.6	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	796.5	Previous response	799.0	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.7	----
High point	4921	79.1	799.7	800.0	1.000
Mid point	4961	39.5	399.3	396.6	1.007
Low point	4980	19.8	200.2	194.3	1.030
As left zero	5000	0.0	0.0	-0.6	----
As left span	4921	79.1	799.7	799.9	1.000
				Average Correction Factor:	1.012

Notes: Sample inlet filters changed after as founds. Adjusted span.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

SO_2 Calibration Summary

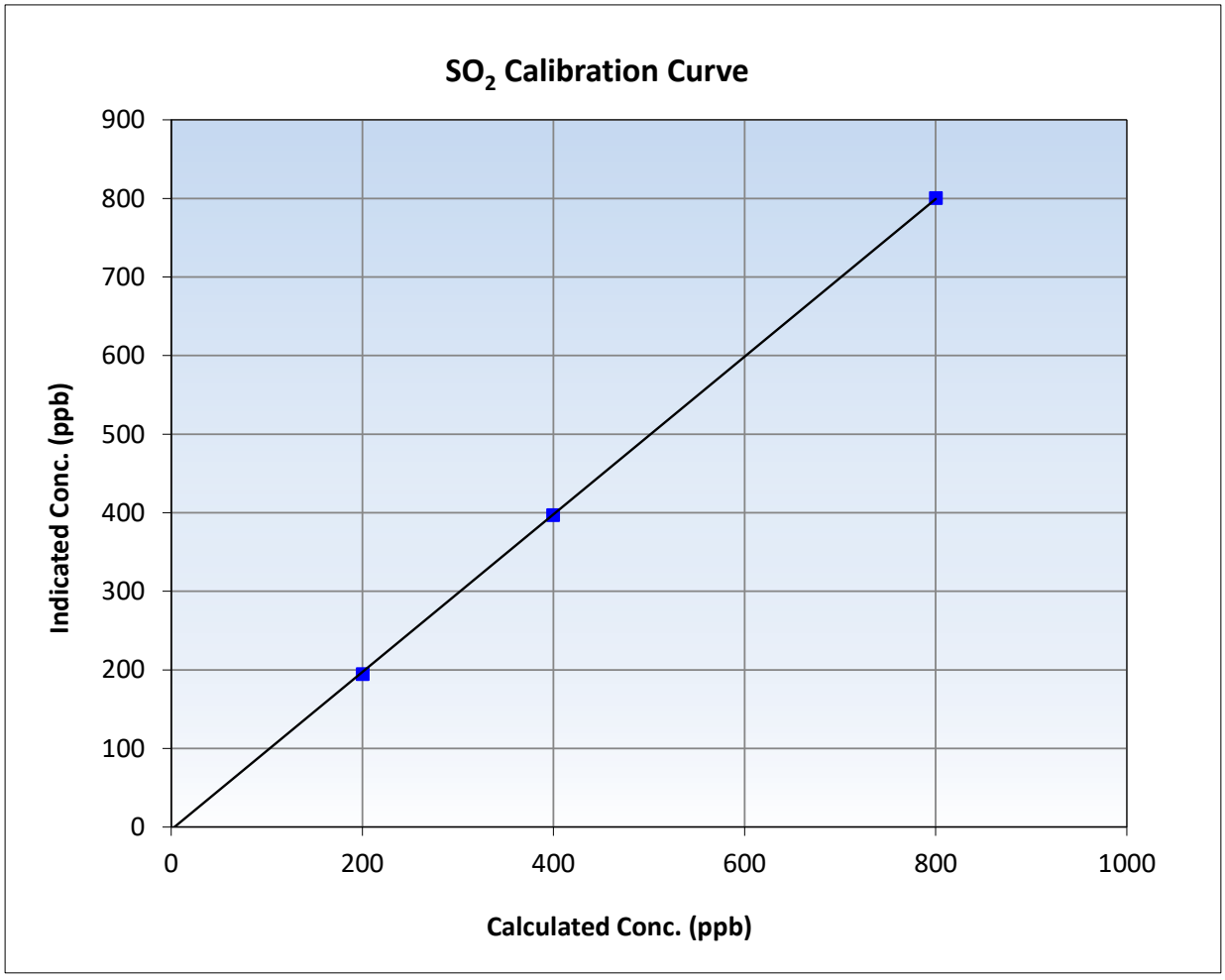
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	11:20	End Time (MST):	14:10
Analyzer make:	Teledyne API T100	Analyzer serial #:	599

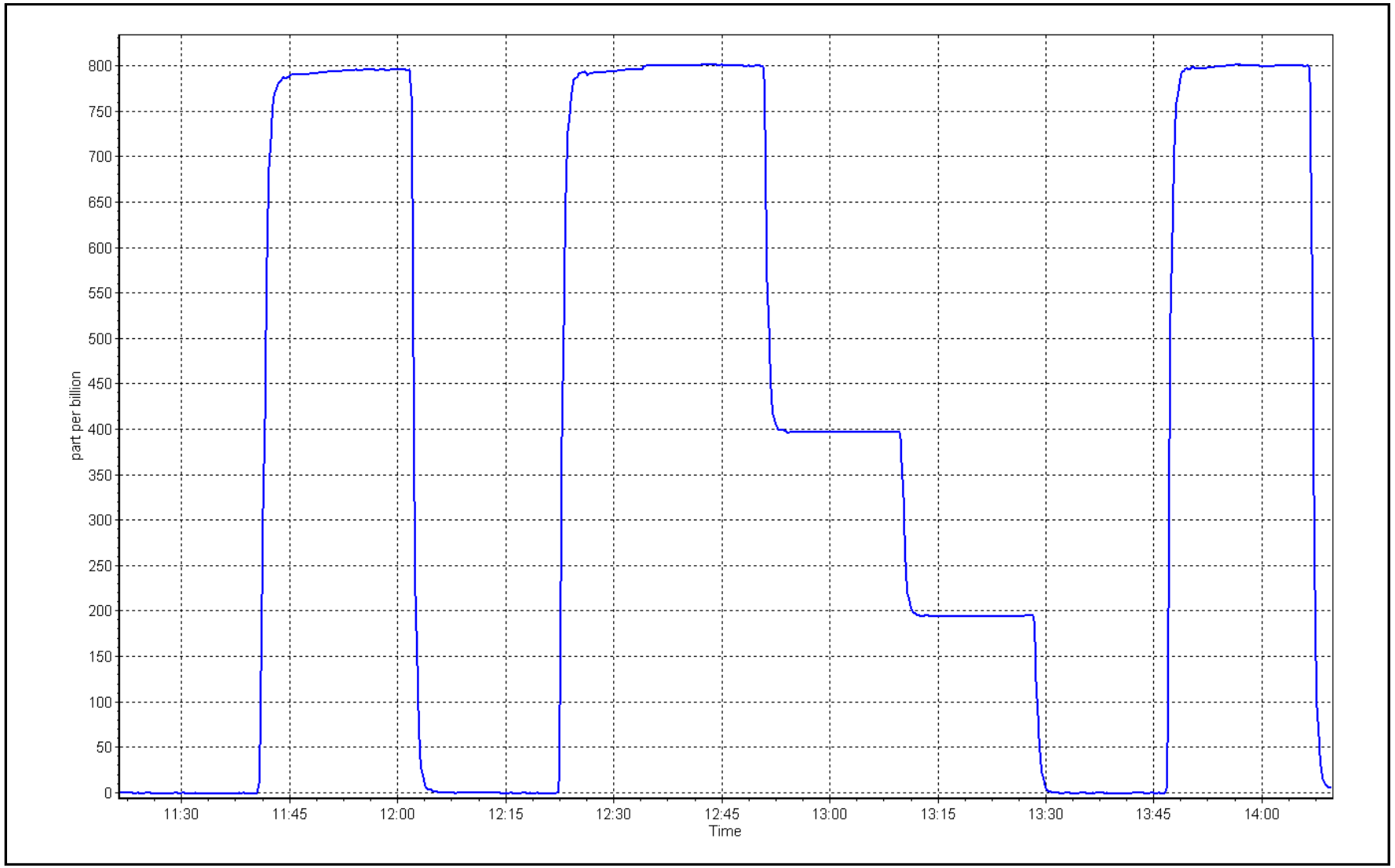
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.7	----
799.7	800.0	0.9996
399.3	396.6	1.0068
200.2	194.3	1.0303

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999947	*≥0.995*
Slope	1.003242	*0.90 - 1.10*
Intercept	-3.377908	*+/-30*



SO2 Calibration Plot Date: January 6, 2025 Location: Fort McKay South



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	January 9, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	10:00	End time (MST):	14:09
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:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2448
ZAG Make/Model:	Teledyne API T701		Serial Number:	5609

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1180540017
Converter make:	CDN-101		Converter serial #:	521
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000080	0.997103	Backgd or Offset:	3.77	3.77
Calibration intercept:	0.077786	-0.042201	Coeff or Slope:	1.14	1.14

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4925	75.5	80.6	80.9	0.997
As found Mid point	4962	37.7	40.3	40.1	1.004
As found Low point	4981	18.9	20.2	19.9	1.014
New cylinder response					

Baseline Corr As found:	80.9	Prev response:	80.71	*% change:	0.2%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	1.004477	AF Intercept:	-0.202284
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999971	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4925	75.5	80.6	80.4	1.003
Mid point	4962	37.7	40.3	40.1	1.004
Low 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	79.0	1.021
SO2 Scrubber Check	4921	79.1	791.0	0.1	----

Date of last scrubber change:	20-Jan-20	Ave Corr Factor	1.007
Date of last converter efficiency test:			

Notes: Changed inlet filter and pump after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

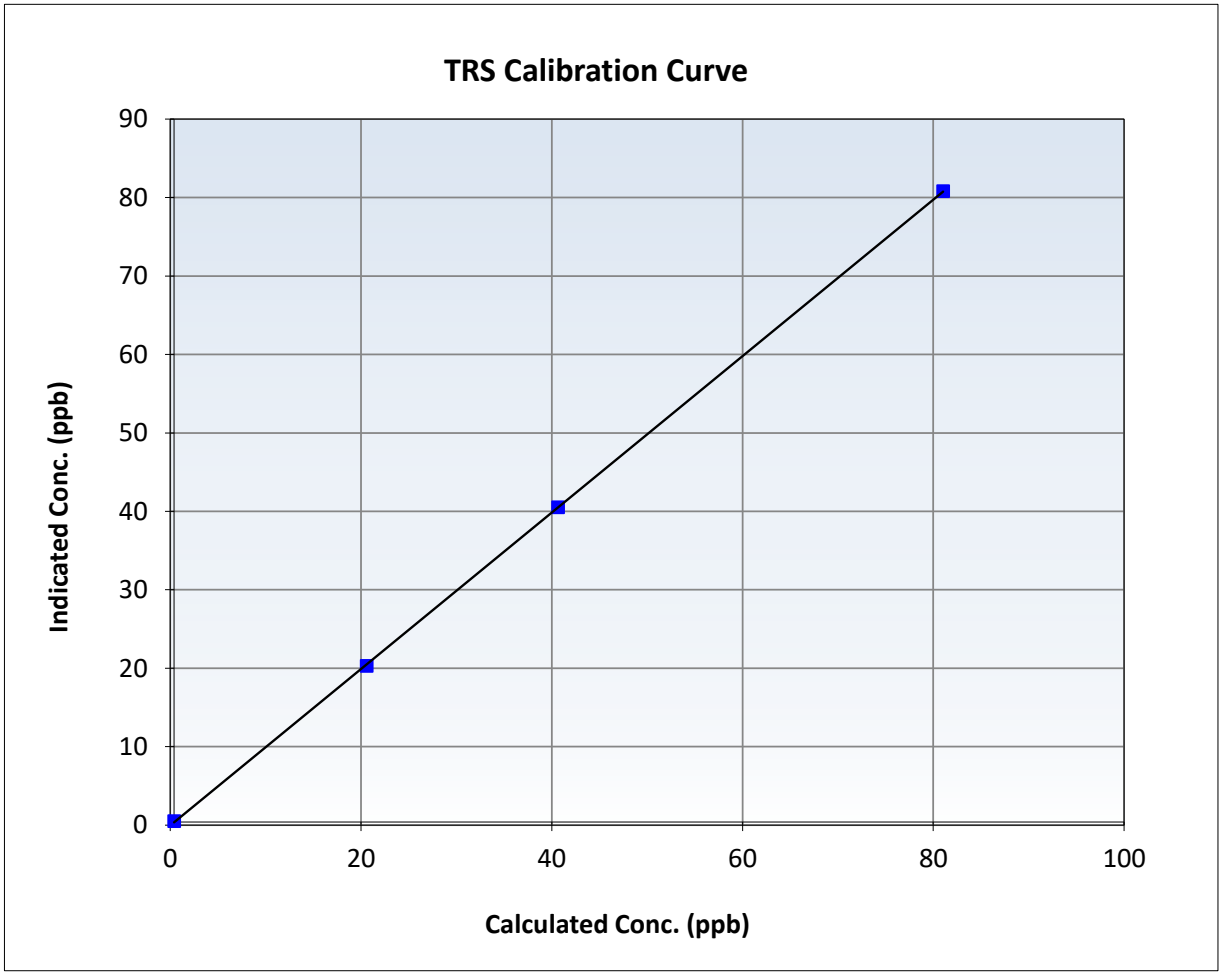
TRS Calibration Summary

Station Information

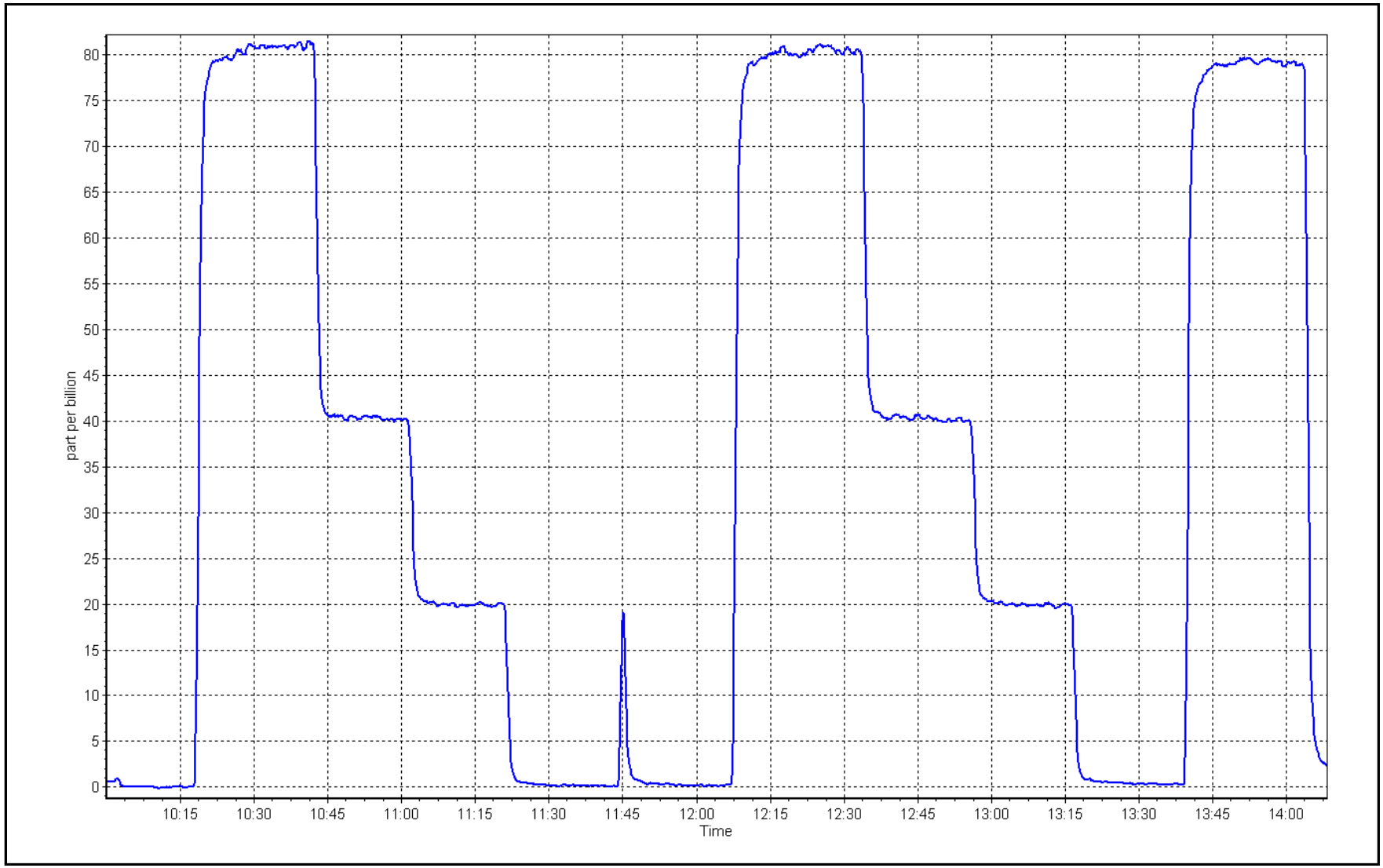
Calibration Date:	January 9, 2025	Previous Calibration:	December 13, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:00	End Time (MST):	14:09
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1180540017

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999984	*≥0.995*
80.6	80.4	1.0028	Slope	0.997103	*0.90 - 1.10*
40.3	40.1	1.0041	Intercept	-0.042201	*+/-3*
20.2	19.9	1.0144			



TRS Calibration Plot Date: January 9, 2025 Location: Fort McKay South



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	January 6, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:20	End time (MST):	14:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC2608112	Cal Gas Expiry Date:	
CH4 Cal Gas Conc.	503.6 ppm	CH4 Equiv Conc.	1077.5 ppm
C3H8 Cal Gas Conc.	208.7 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
Removed CH4 Conc.	503.6 ppm	CH4 Equiv Conc.	1077.5 ppm
Removed C3H8 Conc.	208.7 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	2448
Zero Air Gen model:	Teledyne API T701	Serial Number:	1118

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.58E-04	2.60E-04	NMHC SP Ratio:	5.87E-05	4.50E-05
CH4 Retention time:	14.60	14.80	NMHC Peak Area:	154800	201859
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	17.05	17.51	0.973
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.51	Prev response	17.06	*% change	2.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	17.05	17.04	1.000
Mid point	4961	39.5	8.51	8.46	1.006
Low point	4980	19.8	4.27	4.16	1.025
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	17.05	17.06	0.999
				Average Correction Factor	1.010

Notes: Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	9.08	9.63	0.942
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.63	Prev response	9.11	*% change	5.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	9.08	9.08	1.000
Mid point	4961	39.5	4.53	4.52	1.003
Low point	4980	19.8	2.27	2.23	1.020
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	9.08	9.10	0.998
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4921	79.1	7.97	7.88	1.011
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.88	Prev response	7.96	*% change	-1.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4921	79.1	7.97	7.96	1.001
Mid point	4961	39.5	3.98	3.94	1.009
Low point	4980	19.8	1.99	1.94	1.031
As left zero	5000	0.0	0.00	0.00	----
As left span	4921	79.1	7.97	7.96	1.001
				Average Correction Factor	1.014

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.003815	1.001568
THC Cal Offset:	-0.049161	-0.051157
CH4 Cal Slope:	1.002163	1.001274
CH4 Cal Offset:	-0.025579	-0.029982
NMHC Cal Slope:	1.005604	1.001813
NMHC Cal Offset:	-0.024182	-0.021375

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

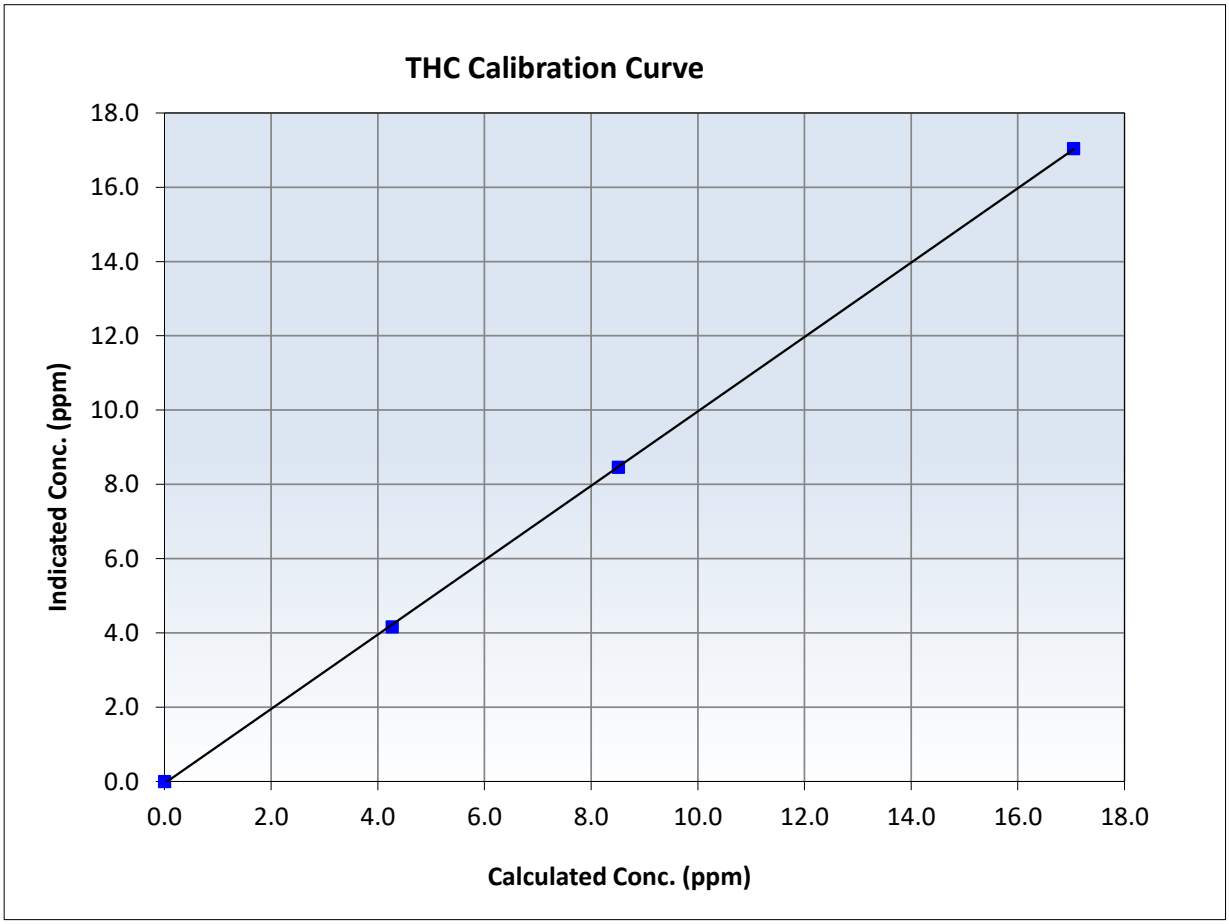
THC Calibration Summary

Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	11:20	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999957	≥0.995
17.05	17.04	1.0002	Slope	1.001568	0.90 - 1.10
8.51	8.46	1.0060	Intercept	-0.051157	+/-0.5
4.27	4.16	1.0250			



Wood Buffalo Environmental Association

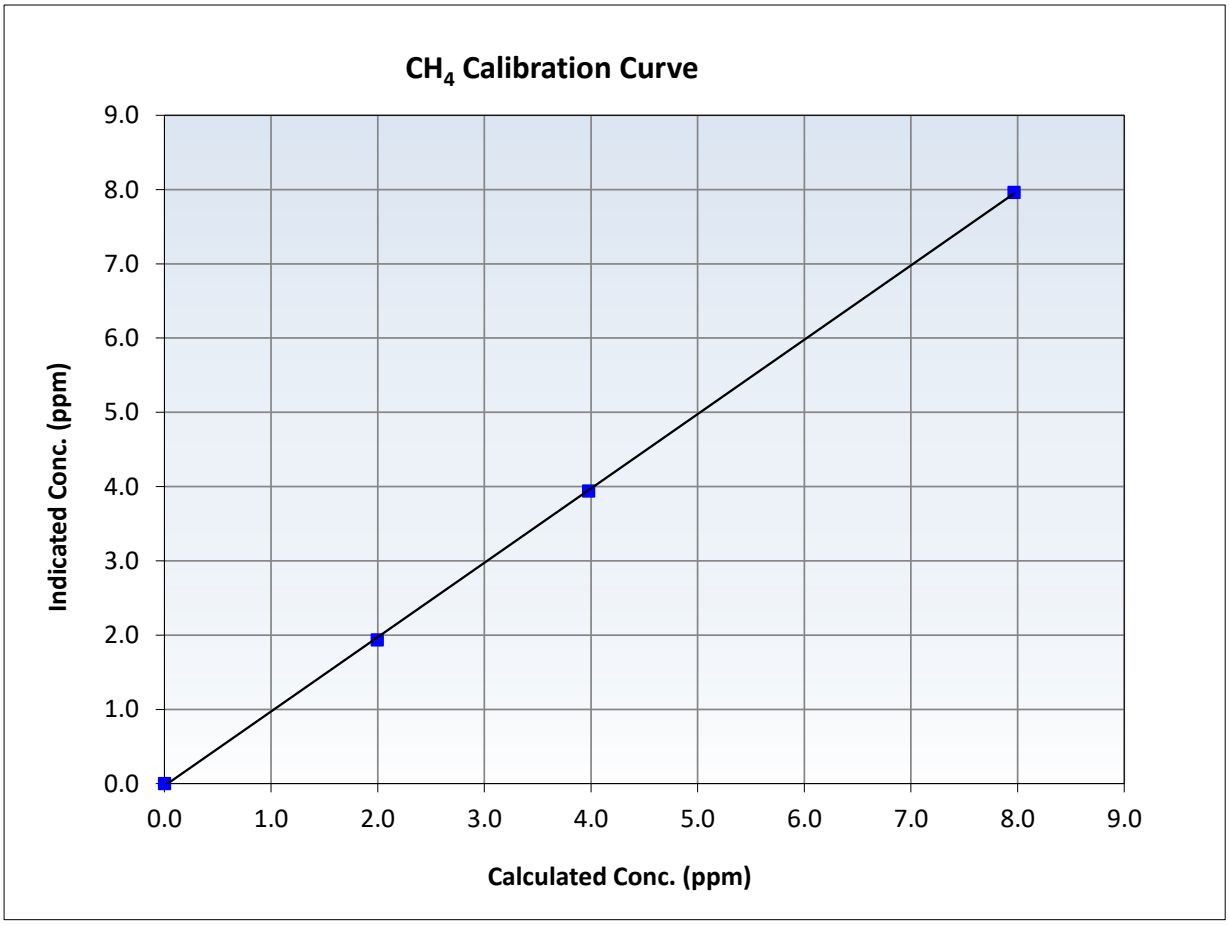
CH_4 Calibration Summary

Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	11:20	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999935	≥0.995
7.97	7.96	1.0007	Slope	1.001274	0.90 - 1.10
3.98	3.94	1.0094			
1.99	1.94	1.0307	Intercept	-0.029982	+/-0.5



Wood Buffalo Environmental Association

NMHC Calibration Summary

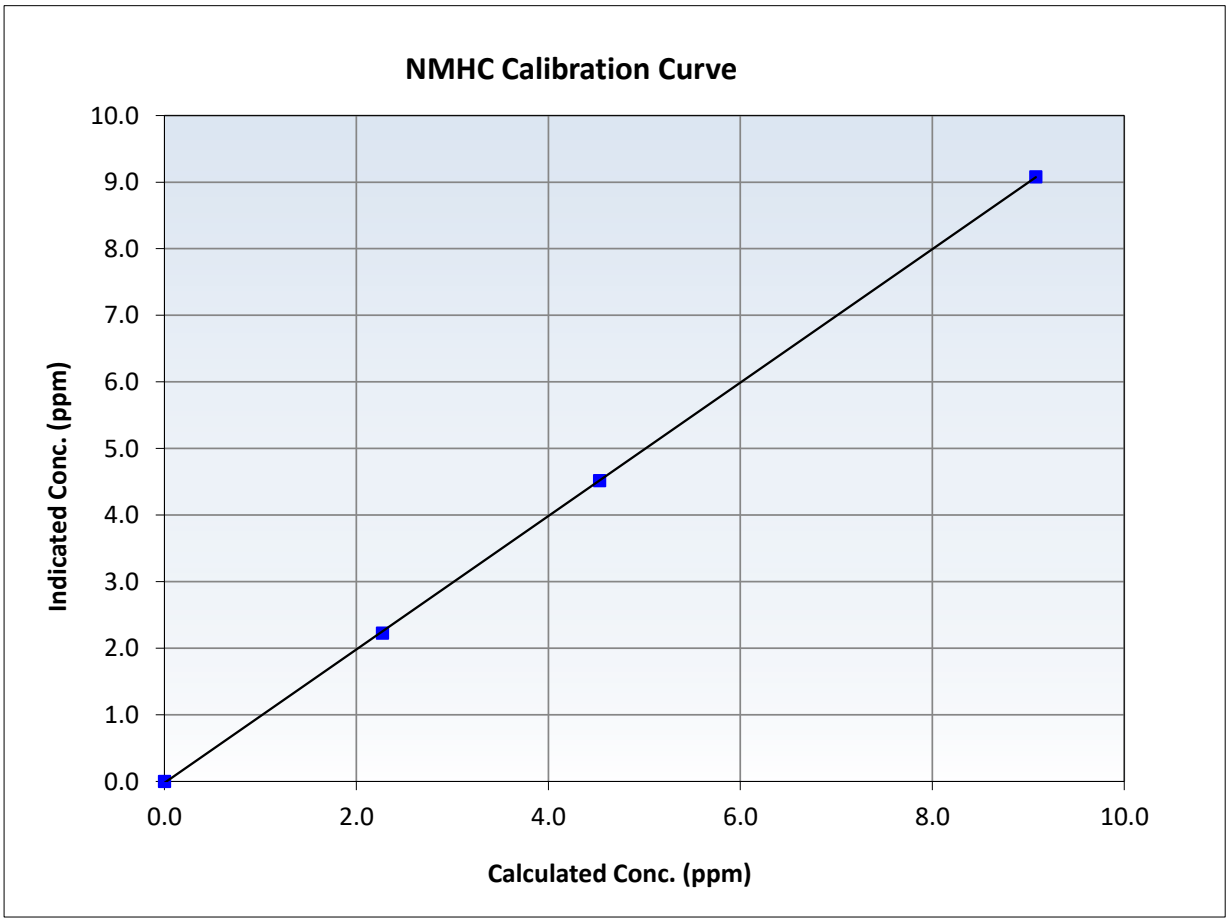
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	11:20	End Time (MST):	14:10
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
9.08	9.08	0.9997
4.53	4.52	1.0032
2.27	2.23	1.0201

Statistical Evaluation		Limits
Correlation Coefficient	0.999972	≥0.995
Slope	1.001813	0.90 - 1.10
Intercept	-0.021375	+/-0.5



NMHC Calibration Plot Date: January 6, 2025 Location: Fort McKay South

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort McKay South
Station number:	AMS 13
Calibration Date:	January 15, 2025
Last Cal Date:	December 10, 2024
Start time (MST):	9:59
End time (MST):	12:44
Reason:	As Found

Calibration Standards

NO Gas Cylinder #:	T2UP1RP	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	48.25 ppm	NO Cal Gas Conc:	47.88 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.25 ppm	Removed Gas NO Conc:	47.88 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2448
ZAG make/model:	Teledyne APIT701	Serial Number:	1118

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.4	0.3	0.1	----	----
AF High point	4917	83.5	805.7	799.5	6.2	796.5	787.5	9.0	1.0121	1.0156
AF Mid point	4958	41.8	403.4	400.3	3.1	396.8	391.5	5.3	1.0176	1.0232
AF Low point	4979	20.9	201.7	200.1	1.5	196.1	191.9	4.1	1.0306	1.0446
New cyl resp										

Previous Response	NO_X = 800.9 ppb	NO = 793.9 ppb
Baseline Corr 1st pt	NO_X = 796.1 ppb	NO = 787.2 ppb
Baseline Corr 2nd pt	NO_X = 396.4 ppb	NO = 391.2 ppb
Baseline Corr 3rd pt	NO_X = 195.7 ppb	NO = 191.6 ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -0.6%

*Percent Change NO = -0.9%

As Found Statistics

As found	NO_X r^2: 0.999975	Nx Sl: 0.989306	Nx Int: -1.471
As found	NO r^2: 0.999943	NO Sl: 0.986515	NO Int: -2.468
As found	NO_2 r^2: 0.999996	NO2 Sl: 1.000845	NO_2 Int: -0.189

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero	----	----	0.0	0.1	----	----
As found high GPT point	784.6	375.6	415.2	415.4	0.9995	100.1%
As found mid GPT point	784.6	580.7	210.1	210.2	0.9994	100.1%
As found low GPT point	784.6	681.3	109.5	108.9	1.0053	99.5%

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i
Serial Number: 1410661329
NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.148	1.148	NO bkgnd or offset:	12.4	12.4
NOX coeff or slope:	1.004	1.004	NOX bkgnd or offset:	12.4	12.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.1	161.1

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.996427	
NO_X Cal Offset:	-1.932112	
NO Cal Slope:	0.996592	
NO Cal Offset:	-2.870130	
NO_2 Cal Slope:	1.011196	
NO_2 Cal Offset:	1.206318	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero										
High point										
Mid point										
Low point										
As left zero										
As left span										
								Average Correction Factor		

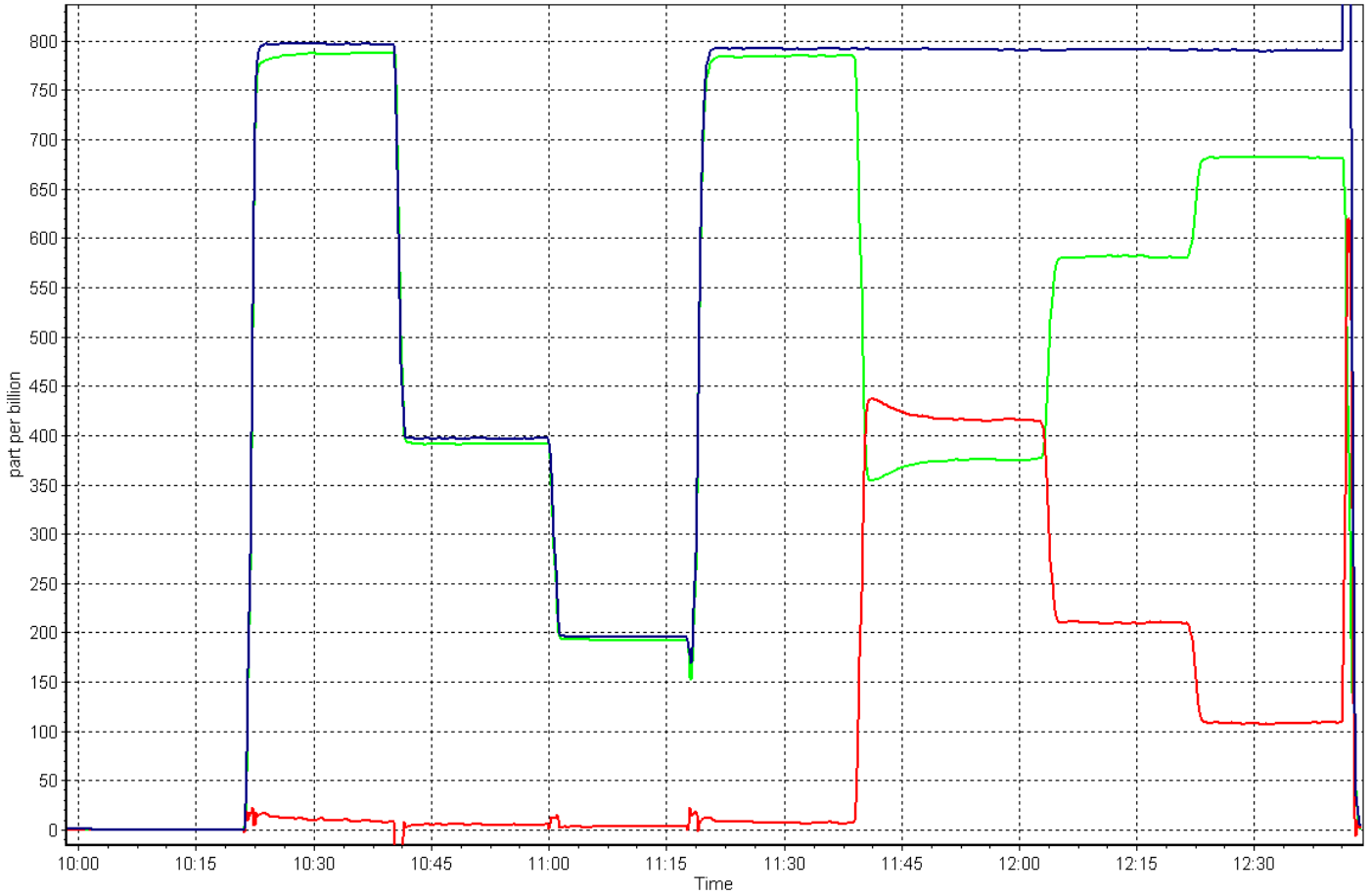
GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero						
High GPT point						
Mid GPT point						
Low GPT point						
				Average Correction Factor		

Notes: As found calibration.

Calibration Performed By: Sean Bala

NO_X Calibration Plot Date: January 15, 2025 Location: Fort McKay South



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort McKay South
Station number:	AMS 13
Calibration Date:	January 16, 2025
Last Cal Date:	NA
Start time (MST):	10:12
End time (MST):	13:57
Reason:	Install

Calibration Standards

NO Gas Cylinder #:	T2UP1RP	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	48.25 ppm	NO Cal Gas Conc:	47.88 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.25 ppm	Removed Gas NO Conc:	47.88 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2448
ZAG make/model:	Teledyne APIT701	Serial Number:	1118

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO r^2:	NO Sl:	NO Int:	
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42iQ

Serial Number: 12300522720

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:		1.623	NO bkgnd or offset:		8.9
NOX coeff or slope:		0.999	NOX bkgnd or offset:		8.7
NO2 coeff or slope:		1.000	Reaction cell Press:		345.9

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:		1.003998
NO_X Cal Offset:		-3.652431
NO Cal Slope:		1.001864
NO Cal Offset:		-4.490071
NO_2 Cal Slope:		0.999833
NO_2 Cal Offset:		-0.877284

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
High point	4917	83.5	805.7	799.5	6.2	807.5	799.0	8.5	0.9978	1.0006
Mid point	4958	41.8	403.4	400.3	3.1	398.4	393.6	4.8	1.0125	1.0170
Low point	4979	20.9	201.7	200.1	1.5	195.8	192.0	3.9	1.0301	1.0424
As left zero	5000	0.0	0.0	0.0	0.0	0.3	0.1	0.2	----	----
As left span	4917	83.5	805.7	374.7	431.0	797.3	374.7	422.6	1.0105	1.0000
							Average Correction Factor		1.0135	1.0200

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	797.9	376.9	427.2	426.8	1.0009	99.9%
Mid GPT point	797.9	587.8	216.3	214.7	1.0074	99.3%
Low GPT point	797.9	691.1	113.0	111.2	1.0160	98.4%
				Average Correction Factor	1.0081	99.2%

Notes: Install calibration. Adjusted zero and span.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

NO_X Calibration Summary

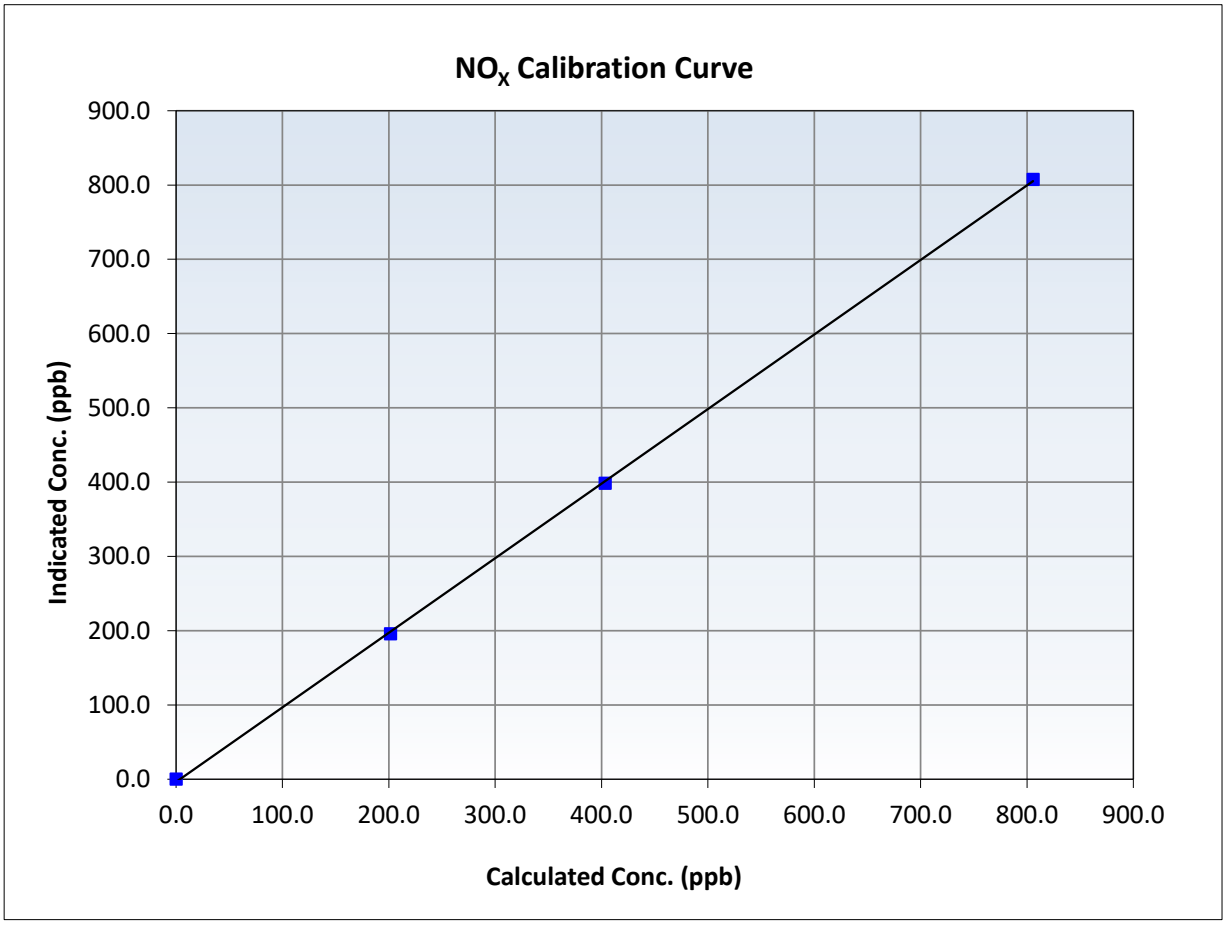
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	NA
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:12	End Time (MST):	13:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12300522720

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
805.7	807.5	0.9978
403.4	398.4	1.0125
201.7	195.8	1.0301

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999897	*≥0.995*
Slope	1.003998	*0.90 - 1.10*
Intercept	-3.652431	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

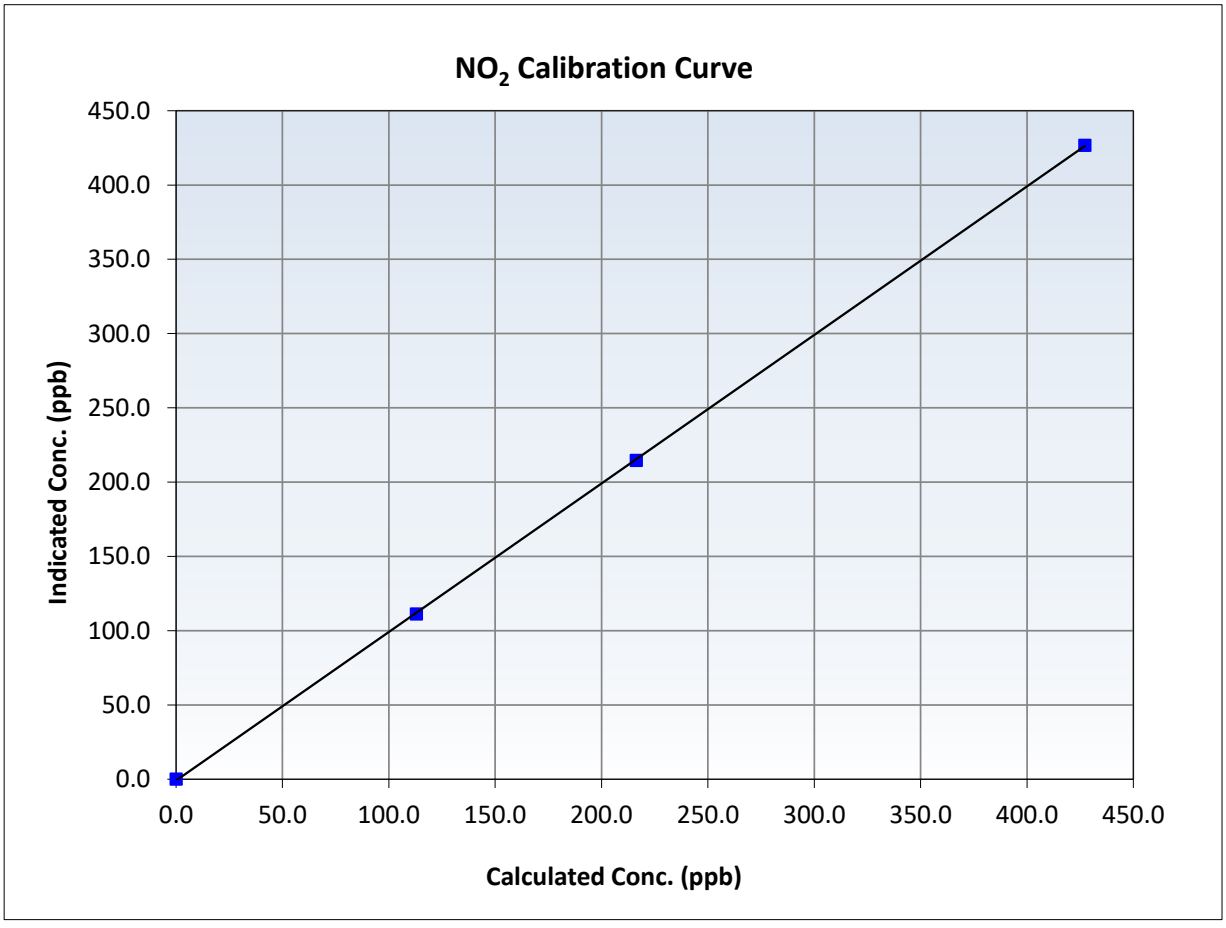
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	NA
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:12	End Time (MST):	13:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12300522720

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
427.2	426.8	1.0009
216.3	214.7	1.0074
113.0	111.2	1.0160

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	0.999833	*0.90 - 1.10*
Intercept	-0.877284	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

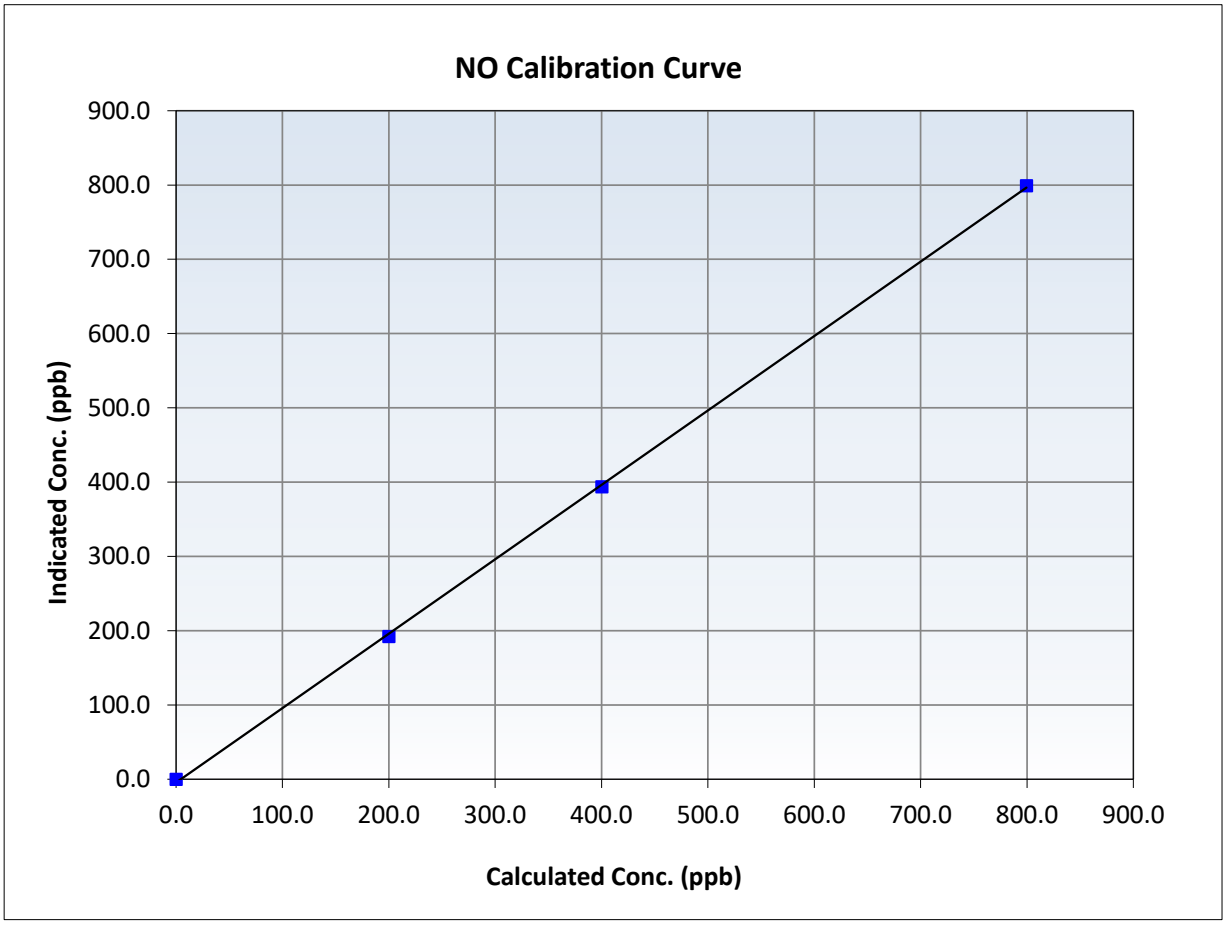
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	NA
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:12	End Time (MST):	13:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12300522720

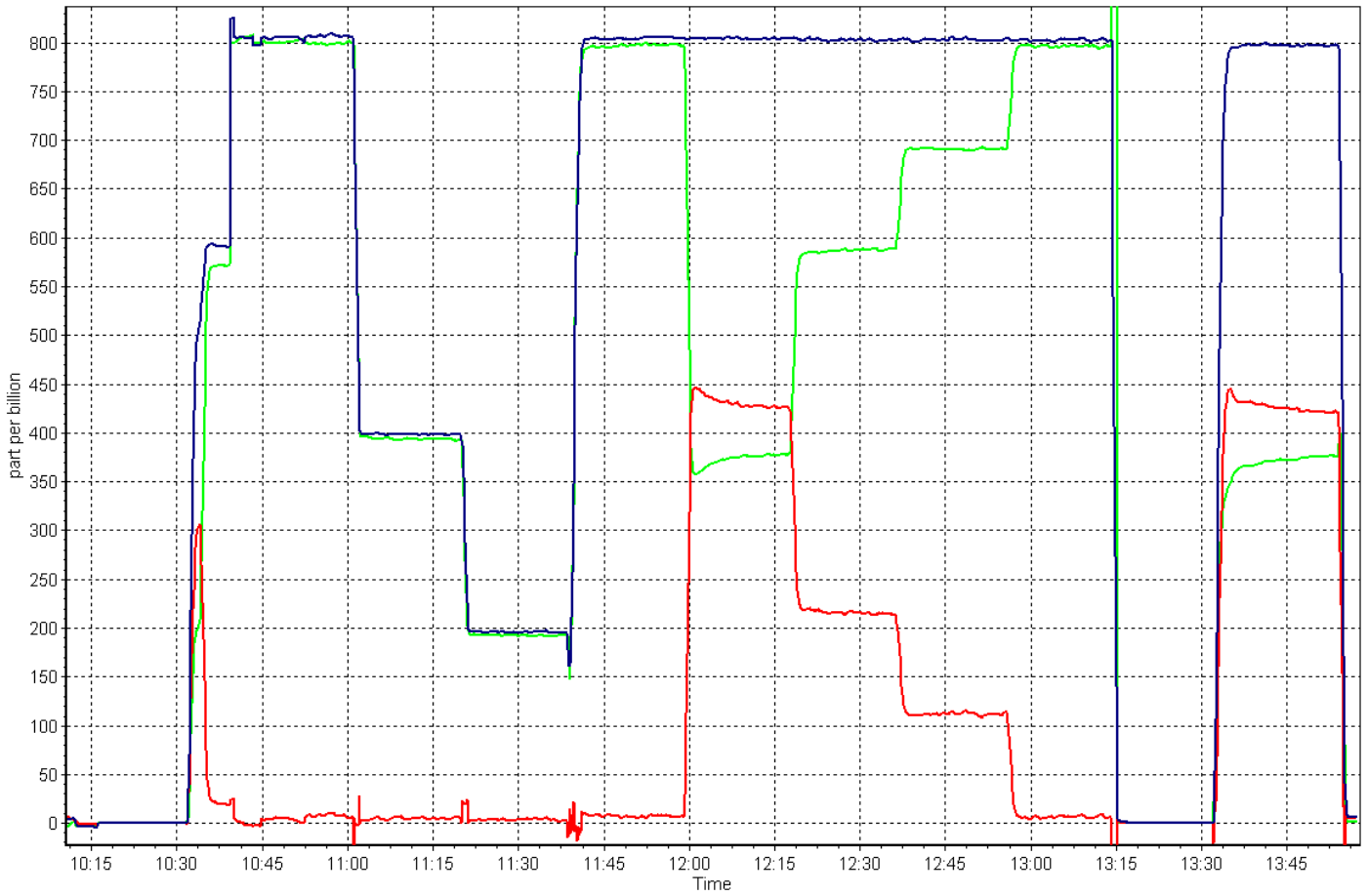
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.5	799.0	1.0006
400.3	393.6	1.0170
200.1	192.0	1.0424

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999854	*≥0.995*
Slope	1.001864	*0.90 - 1.10*
Intercept	-4.490071	*+/-20*



NO_X Calibration Plot Date: January 16, 2025 Location: Fort McKay South



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	January 2, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	10:04	End time (MST):	13:13
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:	1118

Analyzer Information

Analyzer make:	Teledyne API T400		Analyzer serial #:	3871	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002486	1.000371	Backgd or Offset:	2.7	2.7
Calibration intercept:	0.940000	0.560000	Coeff or Slope:	0.973	0.973

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	5000	997.5	400.0	400.8	0.999
As found Mid point					
As found Low point					
Baseline Corr As found:	400.6	Previous response	401.9	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	5000	996.1	400.0	400.2	1.000
Mid point	5000	850.2	200.0	201.5	0.993
Low point	5000	751.7	100.0	100.9	0.991
As left zero	5000	0.0	0.0	0.1	----
As left span	5000	996.1	400.0	400.2	1.000
				Average Correction Factor	0.994

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

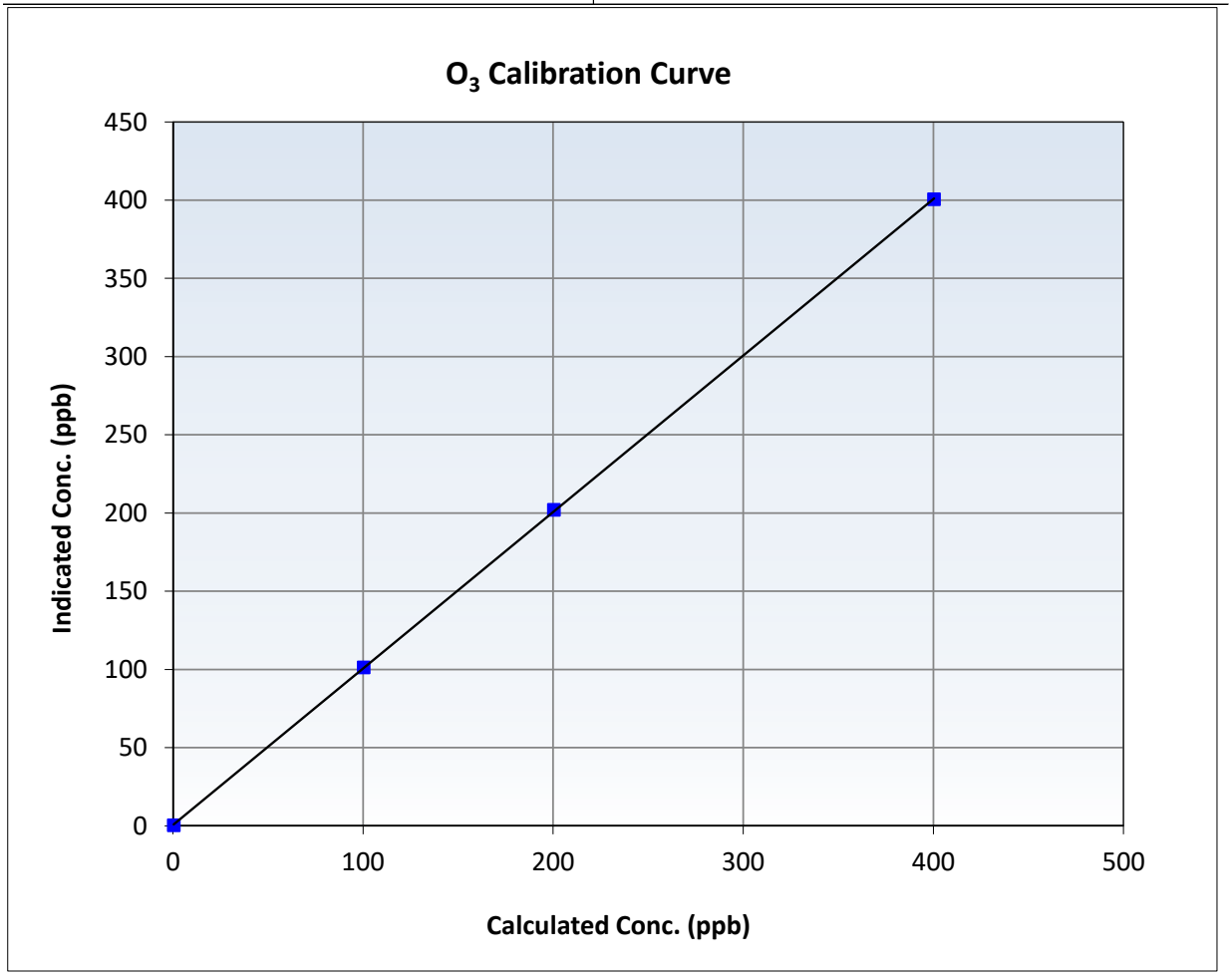
O_3 Calibration Summary

Station Information

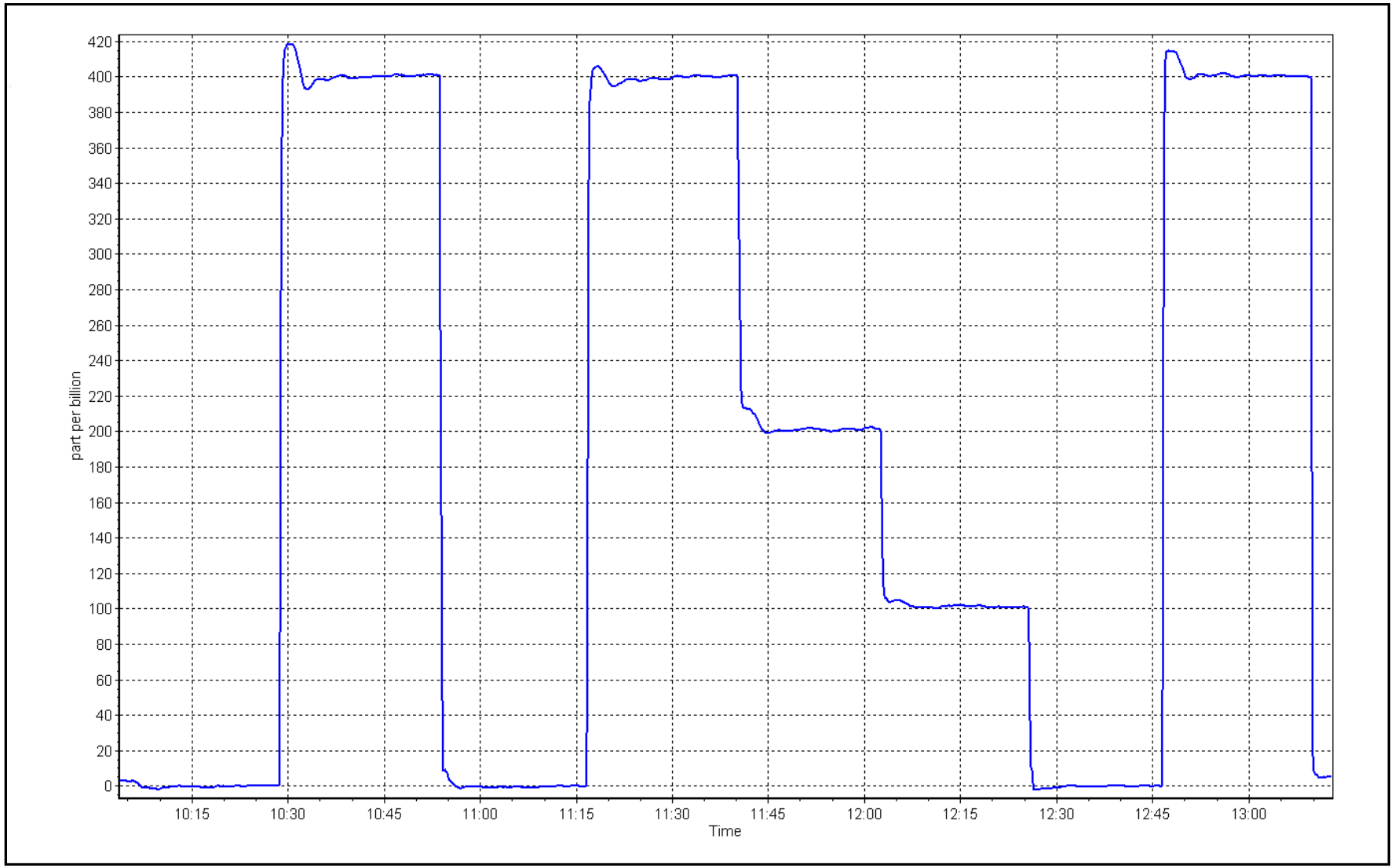
Calibration Date:	January 2, 2025	Previous Calibration:	December 2, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	10:04	End Time (MST):	13:13
Analyzer make:	Teledyne API T400	Analyzer serial #:	3871

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	-0.1	----	Correlation Coefficient	0.999982	≥0.995
400.0	400.2	0.9995	Slope	1.000371	0.90 - 1.10
200.0	201.5	0.9926			
100.0	100.9	0.9911	Intercept	0.560000	+/- 5



O_3 Calibration Plot Date: January 2, 2025 Location: Fort McKay South



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	January 23, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	11:51	End time (MST):	12:56
Analyzer Make:	Teledyne API T640	S/N:	1335
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388746
Temp/RH standard:	Alicat FP-25BT	S/N:	388746

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	1.8	1.42	1.8	☐	+/- 2 °C
P (mmHg)	728.7	727.30	728.7	☐	+/- 10 mmHg
Flow (LPM)	5.03	5.06	5.03	☑	+/- 0.25 LPM
PW% (pump)	44	-----	44	☐	>80%

Zero Verification — PM w/o HEPA: 1.3 — 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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024

Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	10.0	12.9	11.0	☑	+/- 0.5

Date Optical Chamber Cleaned: January 23, 2025

Date Disposable Filter Changed: January 23, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 1, 2024

Date RH/T Sensor Cleaned: October 1, 2024

Notes: Performed peak test and adjusted. Leak check performed before and after PMT adjustment, no issues.

Calibration by: Sean Bala

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS14
ANZAC
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 2, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	11:08	End time (MST):	14:41
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.95	ppm	Cal Gas Exp Date:	January 5, 2025
Cal Gas Cylinder #:	CC279389			
Removed Cal Gas Conc:	49.95	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3060
Zero Air Gen Model:	API T701H		Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	0710321322	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996286	0.988918	Backgd or Offset:	24.1	23.7
Calibration intercept:	-1.499686	-1.595077	Coeff or Slope:	1.043	1.043

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4938	80.3	799.3	789.7	1.013
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	789.3	Previous response	794.8	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4938	80.3	799.3	790.0	1.012
Mid point	4979	40.2	400.1	392.6	1.019
Low point	4998	20.2	201.1	195.4	1.029
As left zero	5000	0.0	0.0	0.6	----
As left span	4938	80.3	799.3	793.4	1.007
				Average Correction Factor:	1.020

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

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

SO_2 Calibration Summary

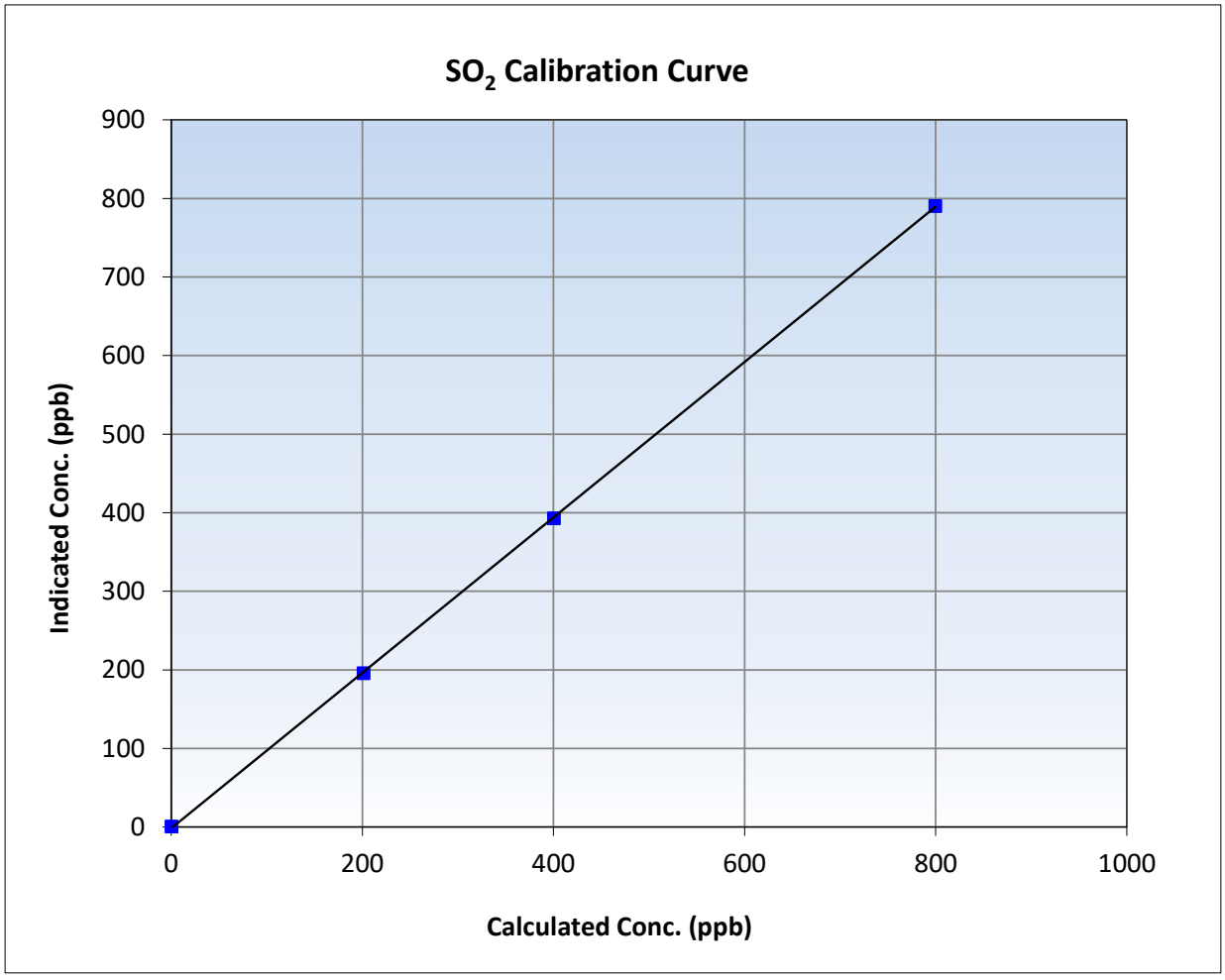
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 3, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:08	End Time (MST):	14:41
Analyzer make:	Thermo 43i	Analyzer serial #:	0710321322

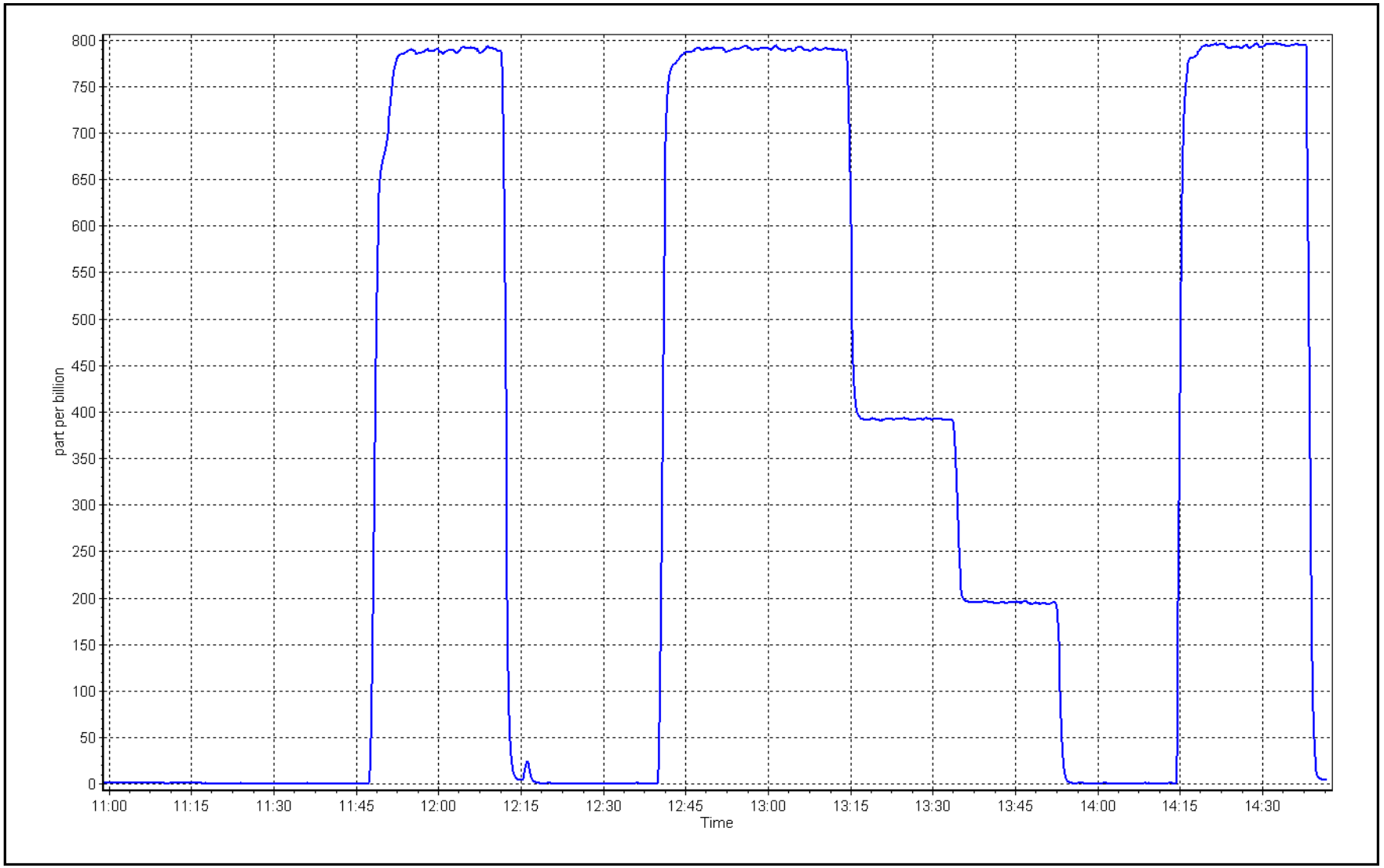
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
799.3	790.0	1.0117
400.1	392.6	1.0190
201.1	195.4	1.0290

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	0.988918	*0.90 - 1.10*
Intercept	-1.595077	*+/-30*



SO2 Calibration Plot Date: January 2, 2025 Location: Anzac



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 13, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	11:30	End time (MST):	16:42
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.15	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC510379			
Removed Cal Gas Conc:	5.15	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	3060
ZAG Make/Model:	API 701H		Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1218153582
Converter make:	CD Nova CDN-101		Converter serial #:	503
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.000876	1.002735	Backgd or Offset:	2.5	2.4
Calibration intercept:	0.014569	-0.125444	Coeff or Slope:	1.065	1.027

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4938	77.9	80.0	84.3	0.948
As found Mid point	4973	38.9	40.0	42.4	0.941
As found Low point	4997	19.5	20.0	20.9	0.953
New cylinder response					
Baseline Corr As found:	84.4	Prev response:	80.07	*% change:	5.1%
Baseline Corr 2nd AF pt:	42.5	AF Slope:	1.056218	AF Intercept:	-0.085633
Baseline Corr 3rd AF pt:	21.0	AF Correlation:	0.999973	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4938	77.9	80.0	80.2	0.997
Mid point	4973	38.9	40.0	39.7	1.006
Low point	4997	19.5	20.0	19.8	1.011
As left zero	5000	0.0	0.0	0.1	----
As left span	4938	77.9	80.0	77.9	1.026
SO2 Scrubber Check	4936	80.3	800.4	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.005
Date of last converter efficiency test:					

Notes: Investigation was made, no alarms were detected, and the diagnostics matched previous calibration results. It is suspected that the issues may have been caused due to last calibration's span adjustment. Sample inlet filter changed after as founds. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

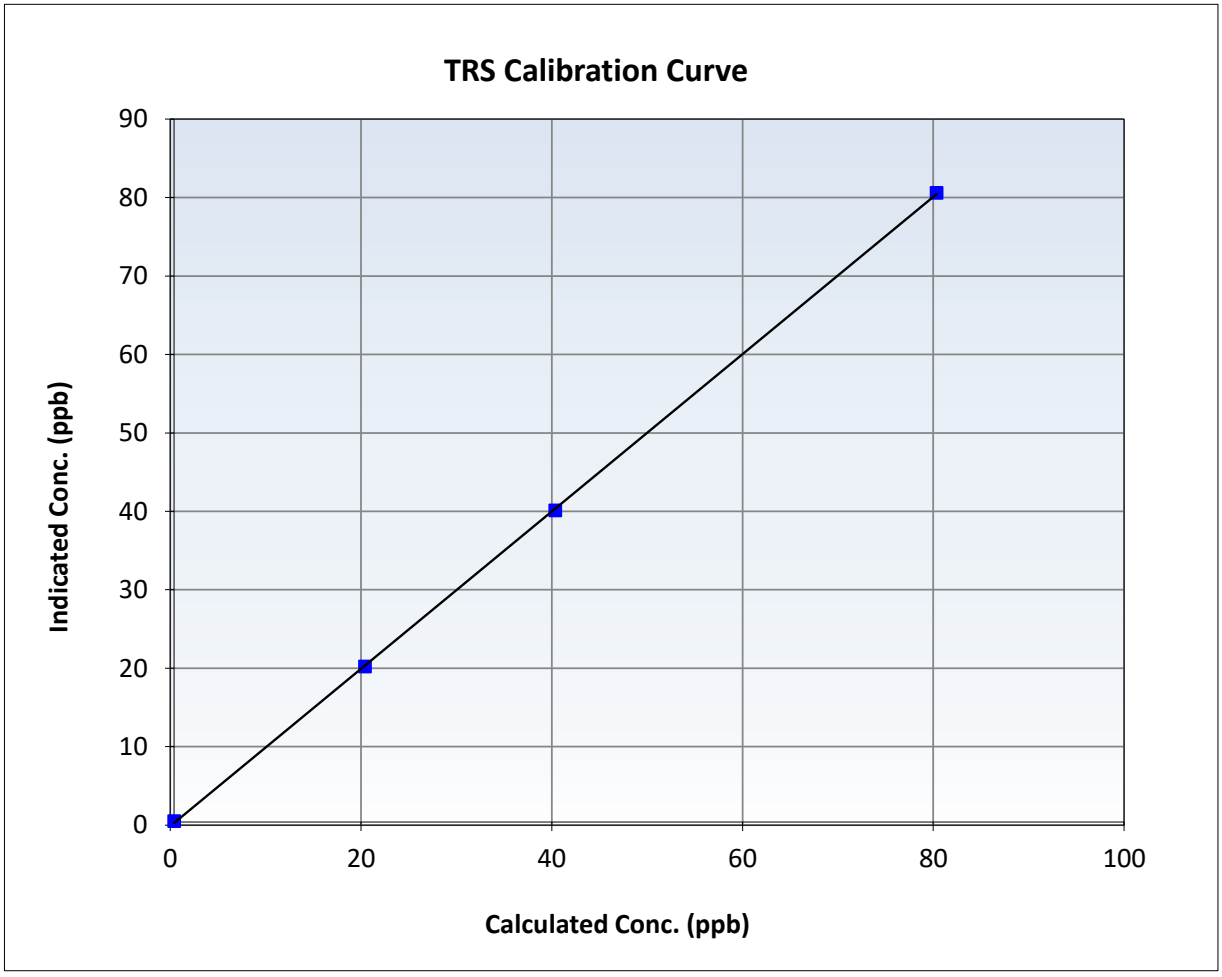
TRS Calibration Summary

Station Information

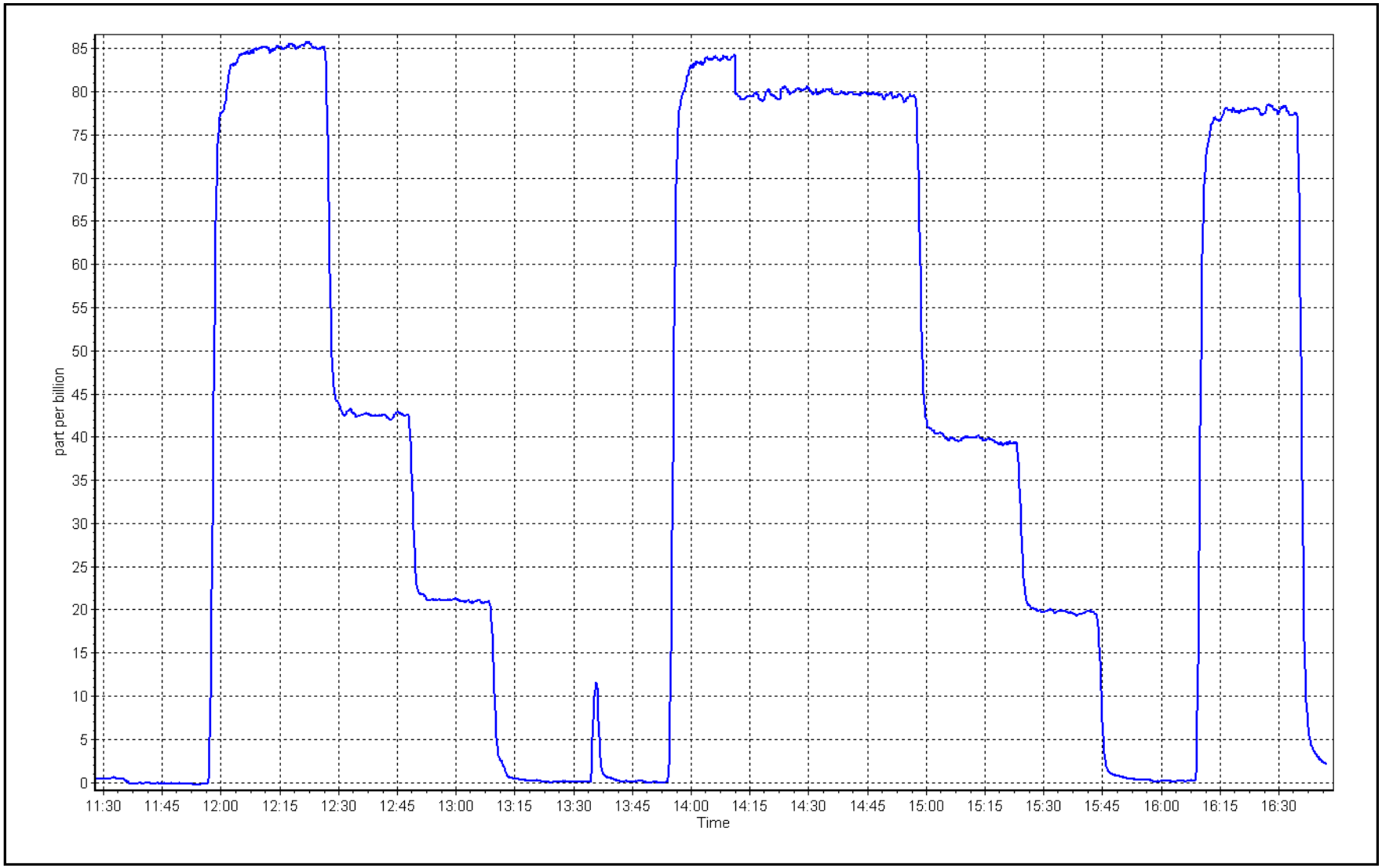
Calibration Date:	January 13, 2025	Previous Calibration:	December 12, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	11:30	End Time (MST):	16:42
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153582

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999957	*≥0.995*
80.0	80.2	0.9969	Slope	1.002735	*0.90 - 1.10*
40.0	39.7	1.0065			
20.0	19.8	1.0107	Intercept	-0.125444	*+/-3*



TRS Calibration Plot Date: January 13, 2025 Location: Anzac



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 2, 2025	Last Cal Date:	December 31, 2024
Start time (MST):	10:08	End time (MST):	14:41
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	5.89E-04	5.91E-04	NMHC SP Ratio:	4.87E-05	4.87E-05
CH4 Retention time:	15.0	15.2	NMHC Peak Area:	187508	187549
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	17.15	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.15	Prev response	17.24	*% change	-0.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.15	0.999
Mid point	4960	40.1	8.57	8.52	1.007
Low point	4980	20.0	4.28	4.26	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.09	1.003
				Average Correction Factor	1.003

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

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	9.15	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.15	Prev response	9.13	*% change	0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.12	1.001
Mid point	4960	40.1	4.57	4.54	1.006
Low point	4980	20.0	2.28	2.27	1.006
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.13	1.000
				Average Correction Factor	1.004

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	8.00	1.001
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.00	Prev response	8.11	*% change	-1.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	8.03	0.997
Mid point	4960	40.1	4.00	3.98	1.007
Low point	4980	20.0	2.00	1.99	1.003
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	7.96	1.006
				Average Correction Factor	1.002

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	1.007143	1.000438
THC Cal Offset:	-0.029399	-0.018626
CH4 Cal Slope:	1.015499	1.002315
CH4 Cal Offset:	-0.021023	-0.009846
NMHC Cal Slope:	0.999793	0.998693
NMHC Cal Offset:	-0.007776	-0.008380

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

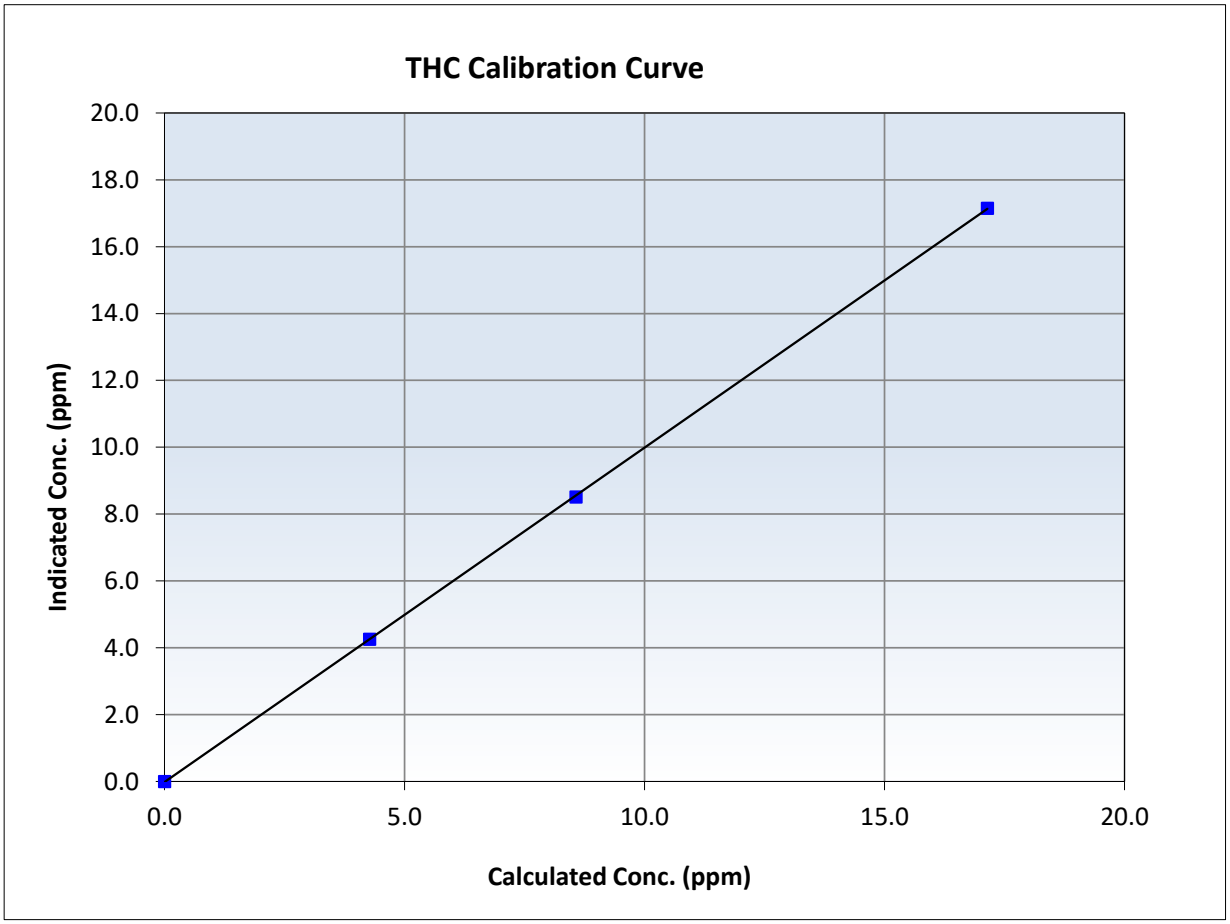
THC Calibration Summary

Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 31, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:08	End Time (MST):	14:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999984	≥0.995
17.14	17.15	0.9994	Slope	1.000438	0.90 - 1.10
8.57	8.52	1.0066	Intercept	-0.018626	+/-0.5
4.28	4.26	1.0043			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

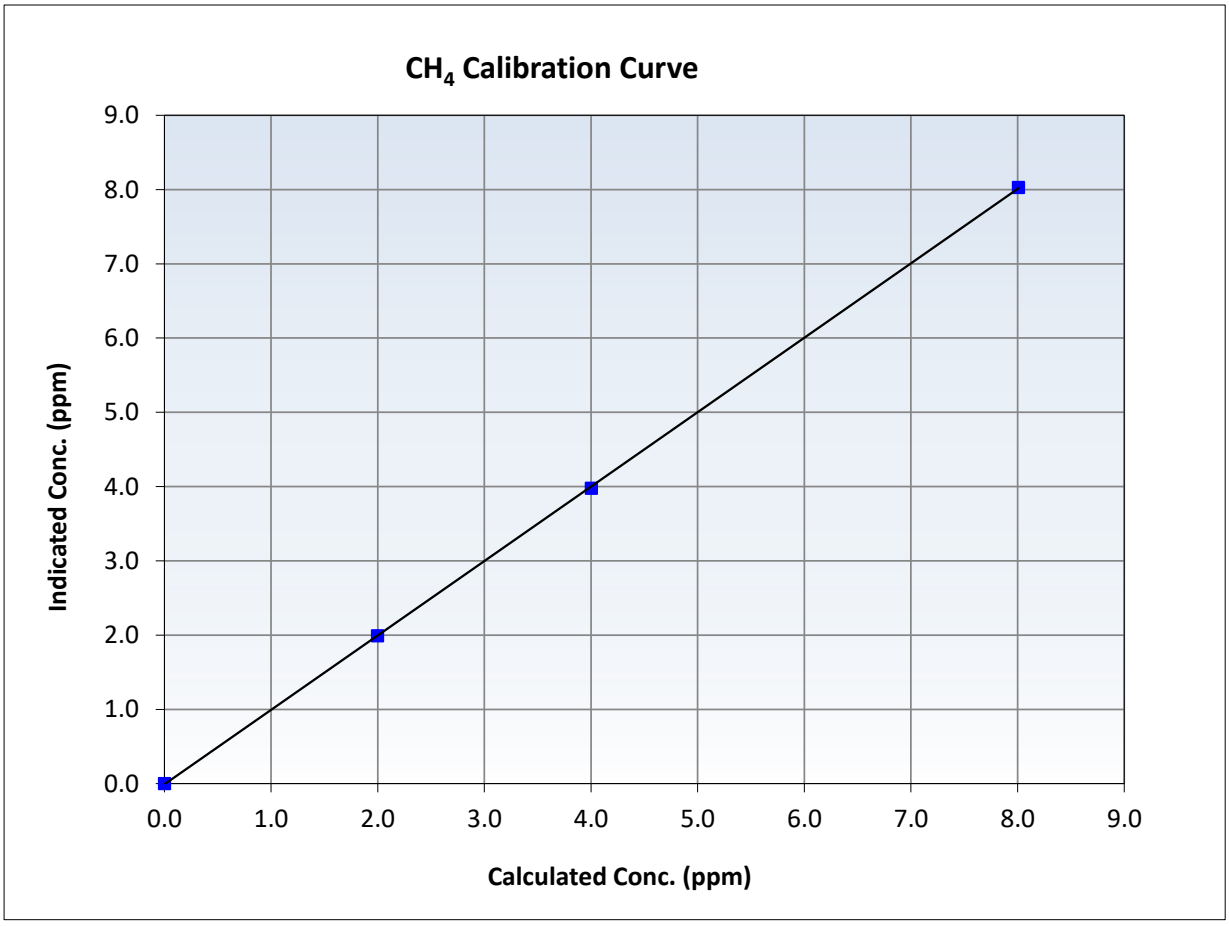
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 31, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:08	End Time (MST):	14:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.01	8.03	0.9973
4.00	3.98	1.0066
2.00	1.99	1.0026

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999972	*≥0.995*
Slope	1.002315	*0.90 - 1.10*
Intercept	-0.009846	*+/-0.5*



Wood Buffalo Environmental Association

NMHC Calibration Summary

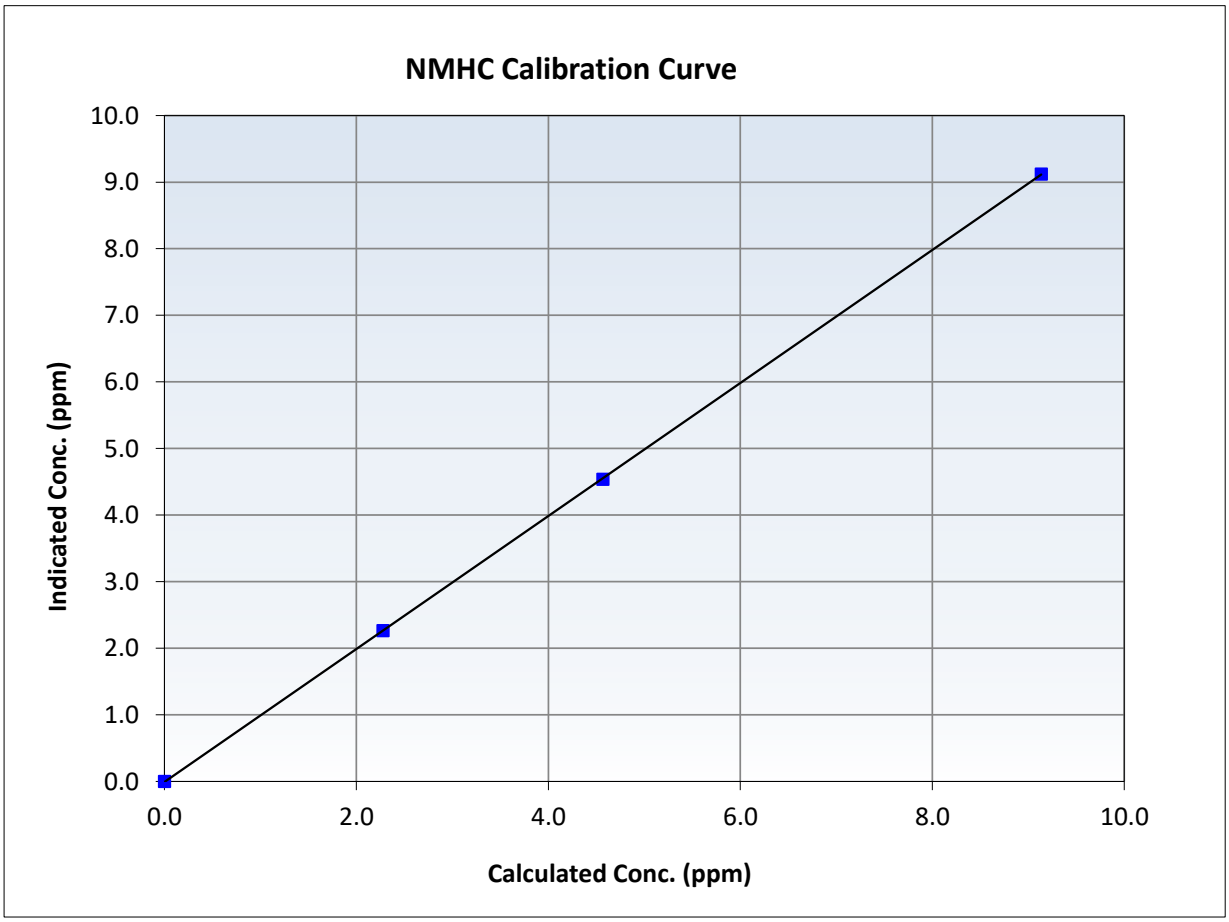
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 31, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:08	End Time (MST):	14:41
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

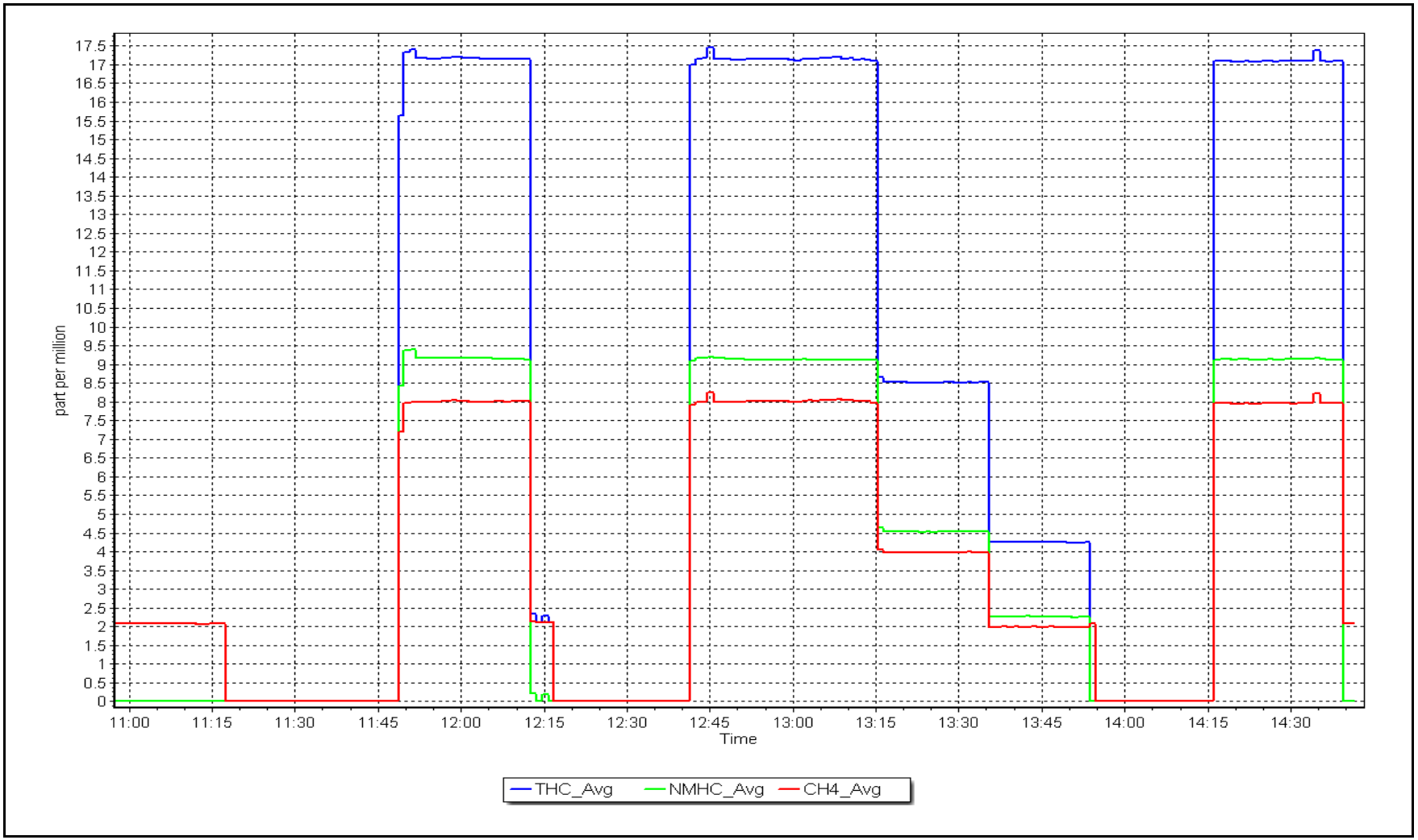
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
9.13	9.12	1.0014
4.57	4.54	1.0063
2.28	2.27	1.0058

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999993	*≥0.995*
Slope	0.998693	*0.90 - 1.10*
Intercept	-0.008380	*+/-0.5*



NMHC Calibration Plot Date: January 2, 2025 Location: Anzac



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 3, 2025	Last Cal Date:	NA
Start time (MST):	18:12	End time (MST):	20:21
Reason:	Install		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	NA	2.94E-04	NMHC SP Ratio:	NA	5.71E-05
CH4 Retention time:	NA	14.9	NMHC Peak Area:	NA	159908
Zero Chromatogram:		OFF	Flat Baseline:		OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	17.25	0.994
Mid point	4960	40.1	8.57	8.50	1.009
Low point	4980	20.0	4.28	4.19	1.020
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.14	17.31	0.990
				Average Correction Factor	1.008

Notes: Install Calibration. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.19	0.994
Mid point	4960	40.1	4.57	4.55	1.004
Low point	4980	20.0	2.28	2.25	1.013
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.13	9.27	0.986
				Average Correction Factor	1.004

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero					
As found High point					
As found Mid point					
As found Low point					
New cylinder response					

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	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	8.05	0.995
Mid point	4960	40.1	4.00	3.95	1.015
Low point	4980	20.0	2.00	1.95	1.026
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.01	8.05	0.995
				Average Correction Factor	1.012

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	NA	1.007246
THC Cal Offset:	NA	-0.068419
CH4 Cal Slope:	NA	1.006941
CH4 Cal Offset:	NA	-0.041049
NMHC Cal Slope:	NA	1.007463
NMHC Cal Offset:	NA	-0.027170

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

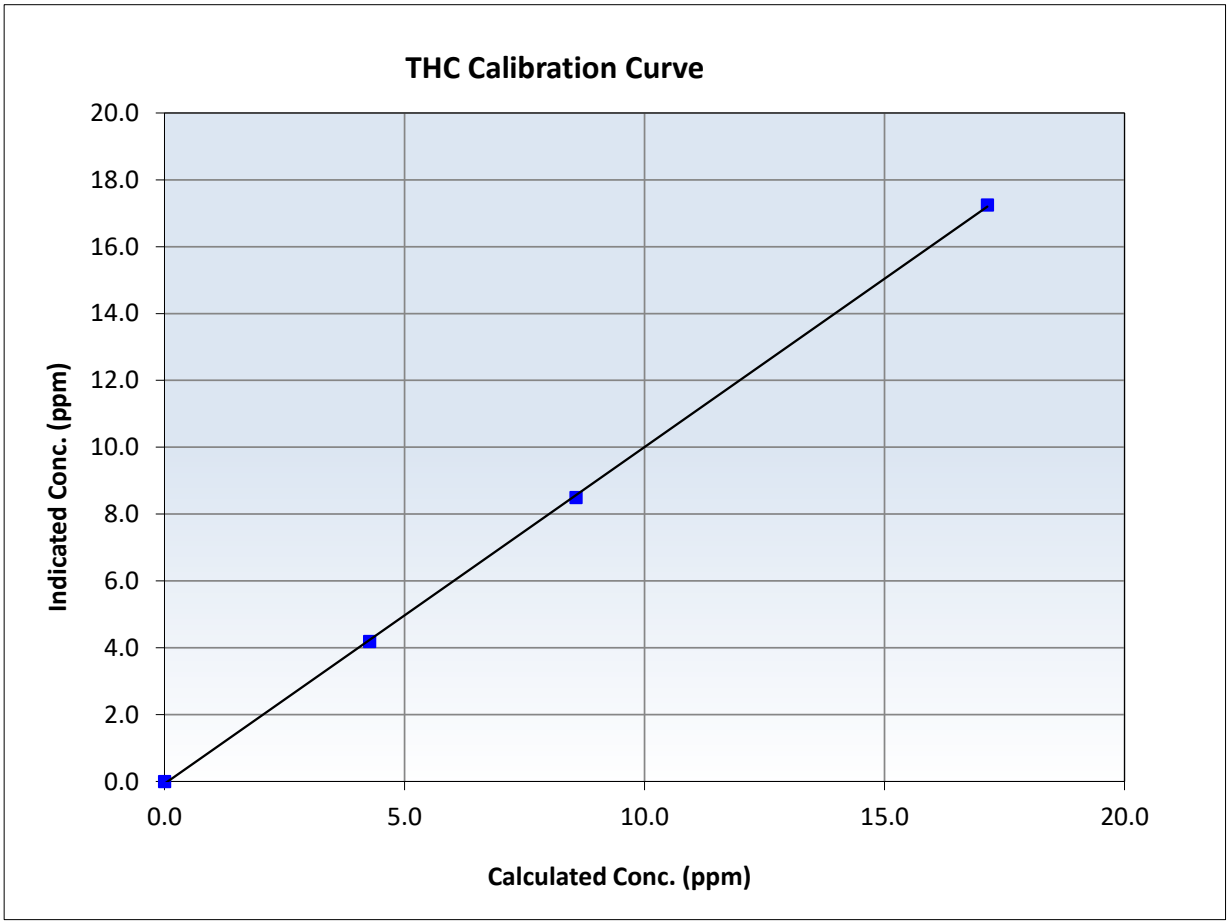
THC Calibration Summary

Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	NA
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	18:12	End Time (MST):	20:21
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999916	≥0.995
17.14	17.25	0.9941	Slope	1.007246	0.90 - 1.10
8.57	8.50	1.0089	Intercept	-0.068419	+/-0.5
4.28	4.19	1.0196			



Wood Buffalo Environmental Association

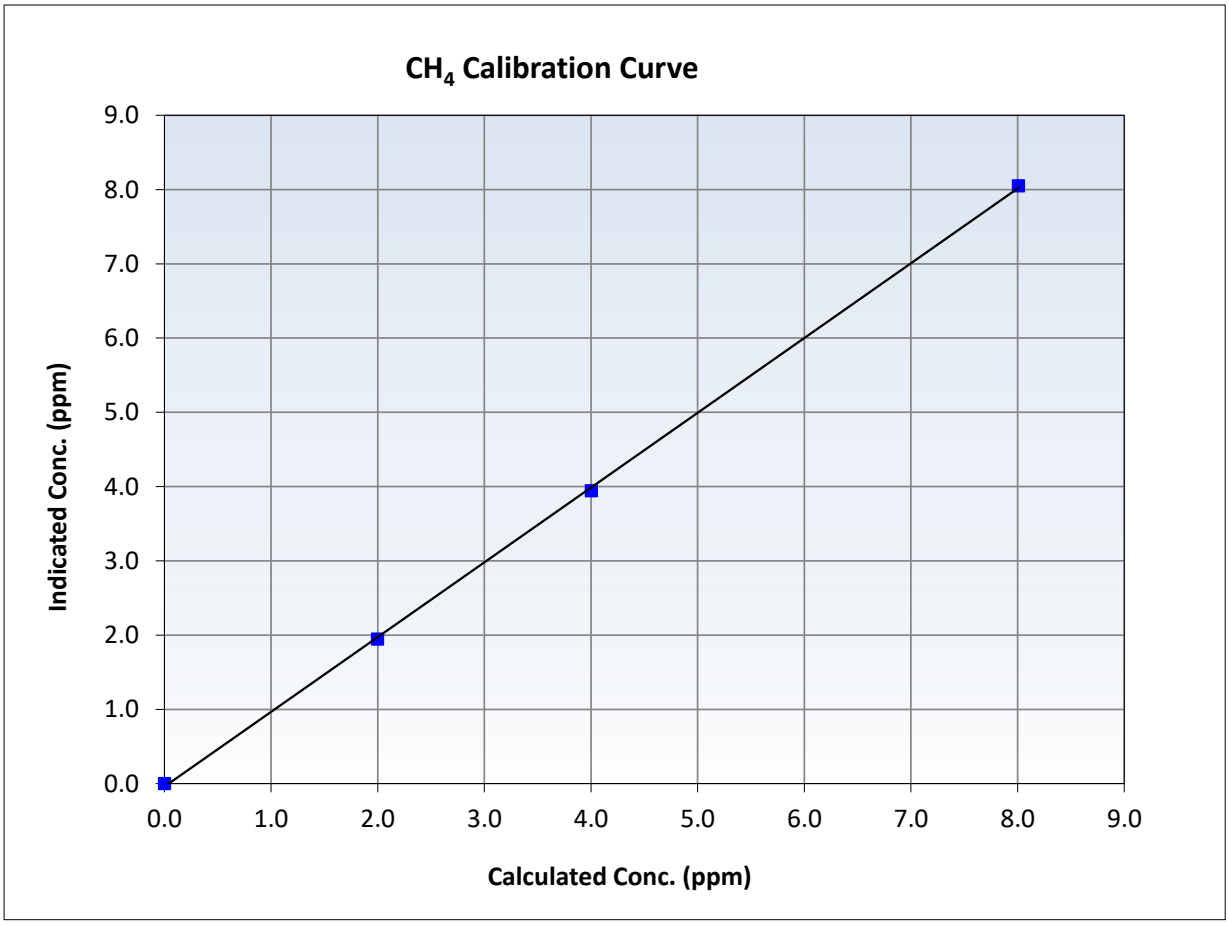
CH_4 Calibration Summary

Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	NA
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	18:12	End Time (MST):	20:21
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999853	*≥0.995*
8.01	8.05	0.9946	Slope	1.006941	*0.90 - 1.10*
4.00	3.95	1.0150			
2.00	1.95	1.0263	Intercept	-0.041049	*+/-0.5*



Wood Buffalo Environmental Association

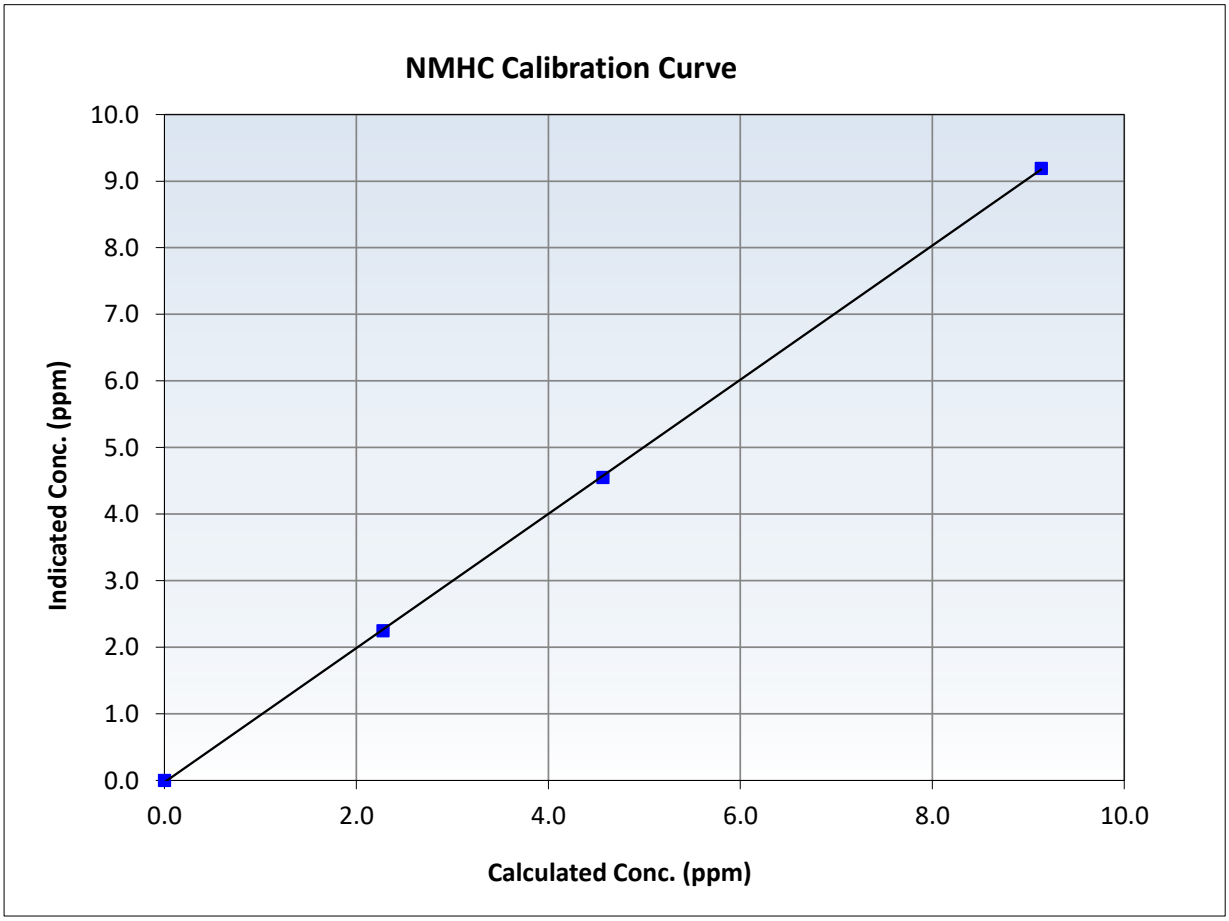
NMHC Calibration Summary

Station Information

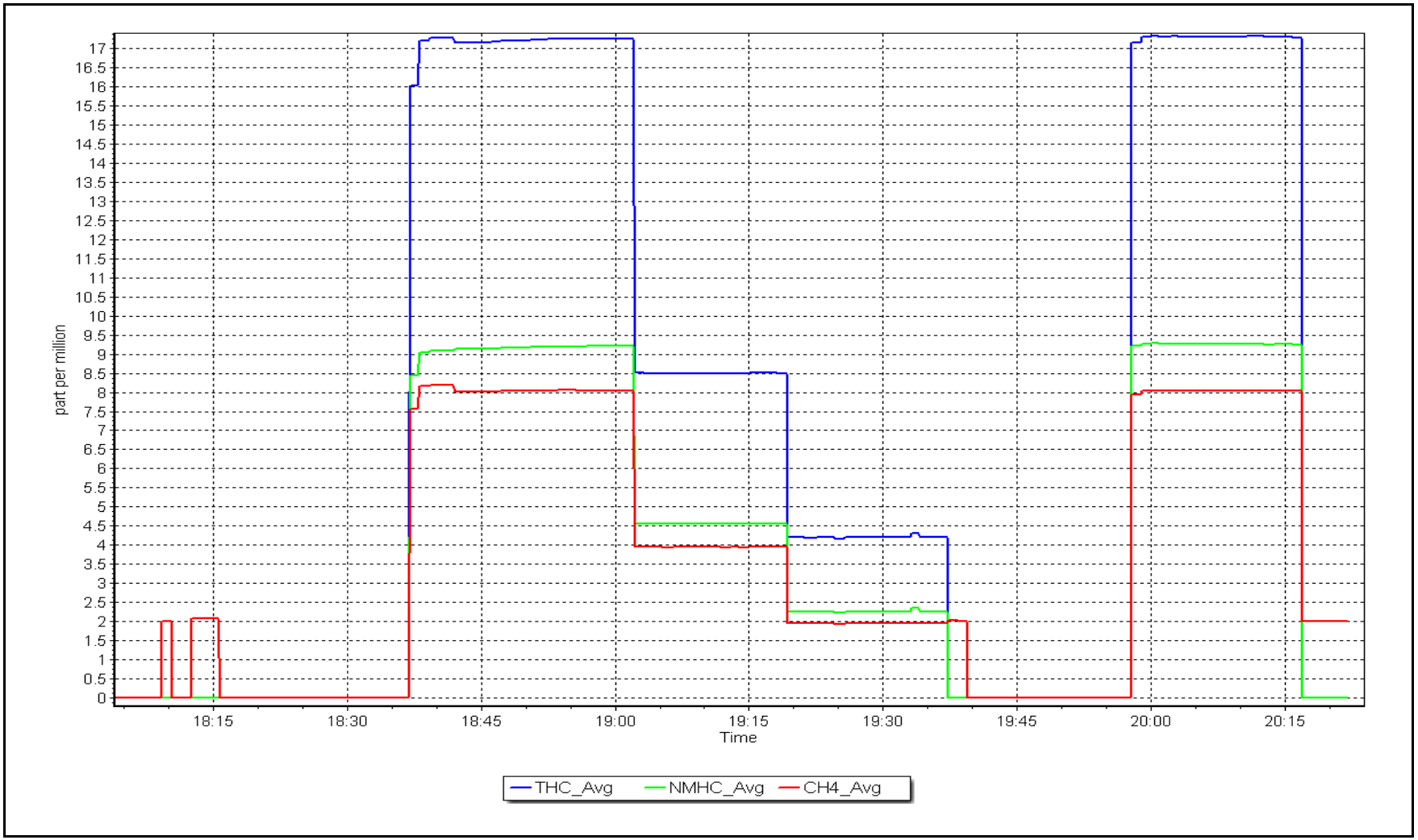
Calibration Date:	January 3, 2025	Previous Calibration:	NA
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	18:12	End Time (MST):	20:21
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999956	≥0.995
9.13	9.19	0.9937	Slope	1.007463	0.90 - 1.10
4.57	4.55	1.0038			
2.28	2.25	1.0134	Intercept	-0.027170	+/-0.5



NMHC Calibration Plot Date: January 3, 2025 Location: Anzac



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 30, 2025	Last Cal Date:	January 3, 2025
Start time (MST):	14:24	End time (MST):	16:06
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC279389	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	207.1 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	499.3 ppm	CH4 Equiv Conc.	1068.8 ppm
Removed C3H8 Conc.	207.1 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	3060
Zero Air Gen model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.94E-04	2.94E-04	NMHC SP Ratio:	5.71E-05	5.71E-05
CH4 Retention time:	14.9	14.9	NMHC Peak Area:	159908	159908
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.14	17.27	0.993
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.27	Prev response	17.20	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.14	16.95	1.012
Mid point					
Low point					
As left zero					
As left span					

Average Correction Factor: 1.012

Notes: Changed Nitrogen cylinder.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.13	9.23	0.990
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.23	Prev response	9.18	*% change	0.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.13	9.07	1.008
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.01	8.05	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.05	Prev response	8.02	*% change	0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

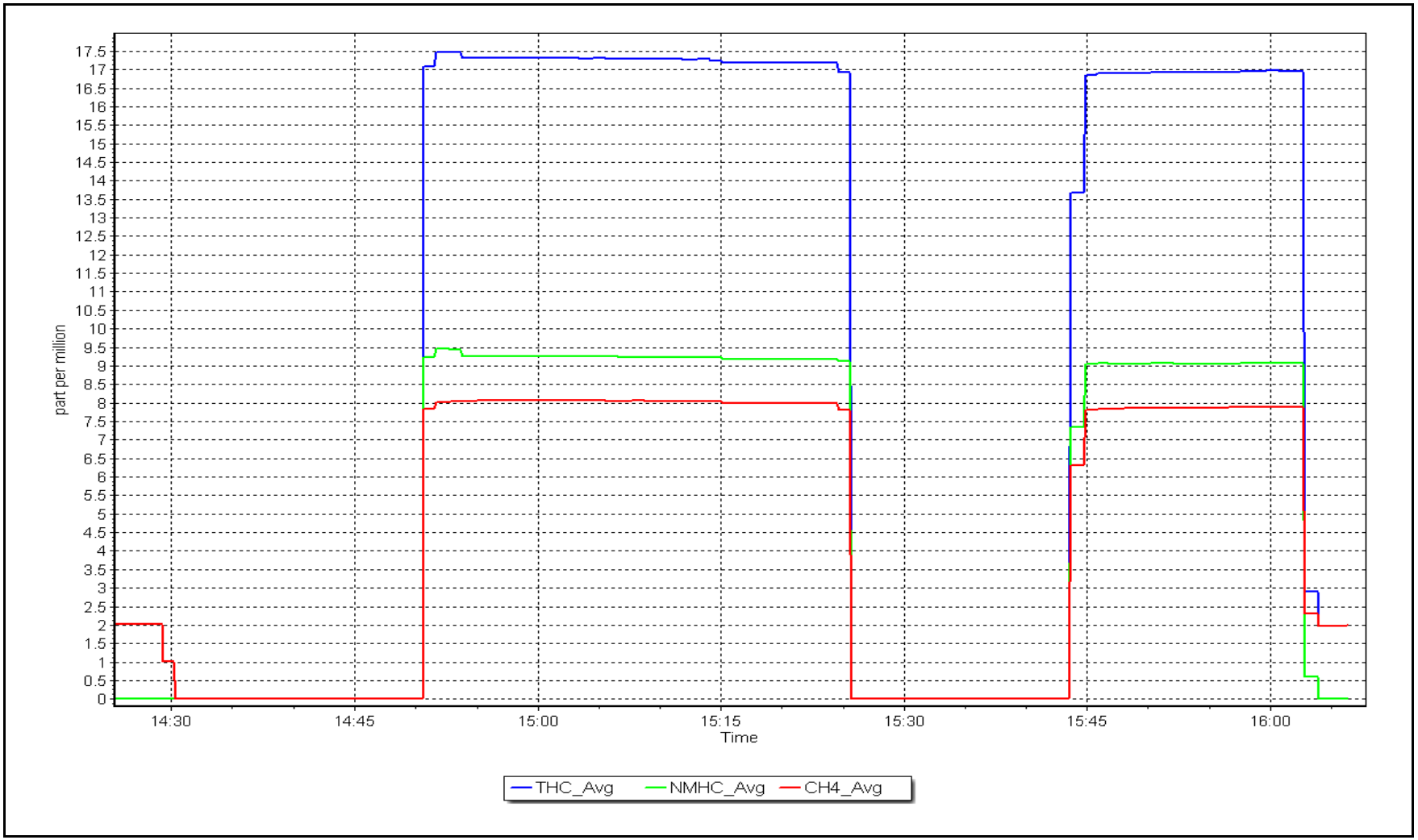
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.01	7.88	1.017
Mid point					
Low point					
As left zero					
As left span					
				Average Correction Factor	1.017

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.007246	NA
THC Cal Offset:	-0.068419	NA
CH4 Cal Slope:	1.006941	NA
CH4 Cal Offset:	-0.041049	NA
NMHC Cal Slope:	1.007463	NA
NMHC Cal Offset:	-0.027170	NA

Calibration Performed By: Mohammed Kashif

NMHC Calibration Plot Date: January 30, 2025 Location: Anzac



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Anzac
Station number:	AMS 14
Calibration Date:	January 7, 2025
Last Cal Date:	December 2, 2024
Start time (MST):	10:11
End time (MST):	14:47
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0037092		Cal Gas Expiry Date:	May 16, 2031	
NOX Cal Gas Conc:	60.7	ppm	NO Cal Gas Conc:	60.40	ppm
Removed Cylinder #:	NA		Removed Gas Exp Date:	NA	
Removed Gas NOX Conc:	60.70	ppm	Removed Gas NO Conc:	60.40	ppm
NOX gas Diff:			NO gas Diff:		
Calibrator Model:	Teledyne API T700		Serial Number:	3060	
ZAG make/model:	Teledyne API T700H		Serial Number:	357	

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.1	-0.2	0.3	----	----
AF High point	4934	66.3	804.8	800.9	4.0	809.4	804.6	4.9	0.9945	0.9951
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	810.3 ppb	NO =	807.9 ppb	
Baseline Corr 1st pt	NO_X =	809.3 ppb	NO =	804.8 ppb	
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	

* = > +/-5% change initiates investigation

*Percent Change	NO_X =	-0.1%	
*Percent Change	NO =	-0.4%	

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1152430008

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.424	1.424	NO bkgnd or offset:	3.9	3.9
NOX coeff or slope:	0.996	0.996	NOX bkgnd or offset:	3.8	3.9
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	157.5	158.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.007671	1.000570
NO_X Cal Offset:	-0.731231	-1.031164
NO Cal Slope:	1.011561	1.004981
NO Cal Offset:	-2.190787	-2.510307
NO_2 Cal Slope:	0.995747	0.999596
NO_2 Cal Offset:	-1.424813	-0.742733

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.2	0.0	0.2	----	----
High point	4934	66.3	804.8	800.9	4.0	804.9	803.5	1.5	0.9999	0.9967
Mid point	4985	33.2	401.6	399.6	2.0	400.1	398.1	1.9	1.0037	1.0038
Low point	5004	16.7	201.9	200.9	1.0	199.8	196.7	3.0	1.0105	1.0214
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
As left span	4934	66.3	804.8	419.7	385.1	799.3	419.7	379.6	1.0069	1.0000
								Average Correction Factor	1.0047	1.0073

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.2	----	----
High GPT point	794.0	421.0	377.0	376.5	1.0013	99.9%
Mid GPT point	794.0	617.9	180.1	178.9	1.0066	99.3%
Low GPT point	794.0	705.7	92.3	90.5	1.0196	98.1%
				Average Correction Factor	1.0092	99.1%

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

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

NO_X Calibration Summary

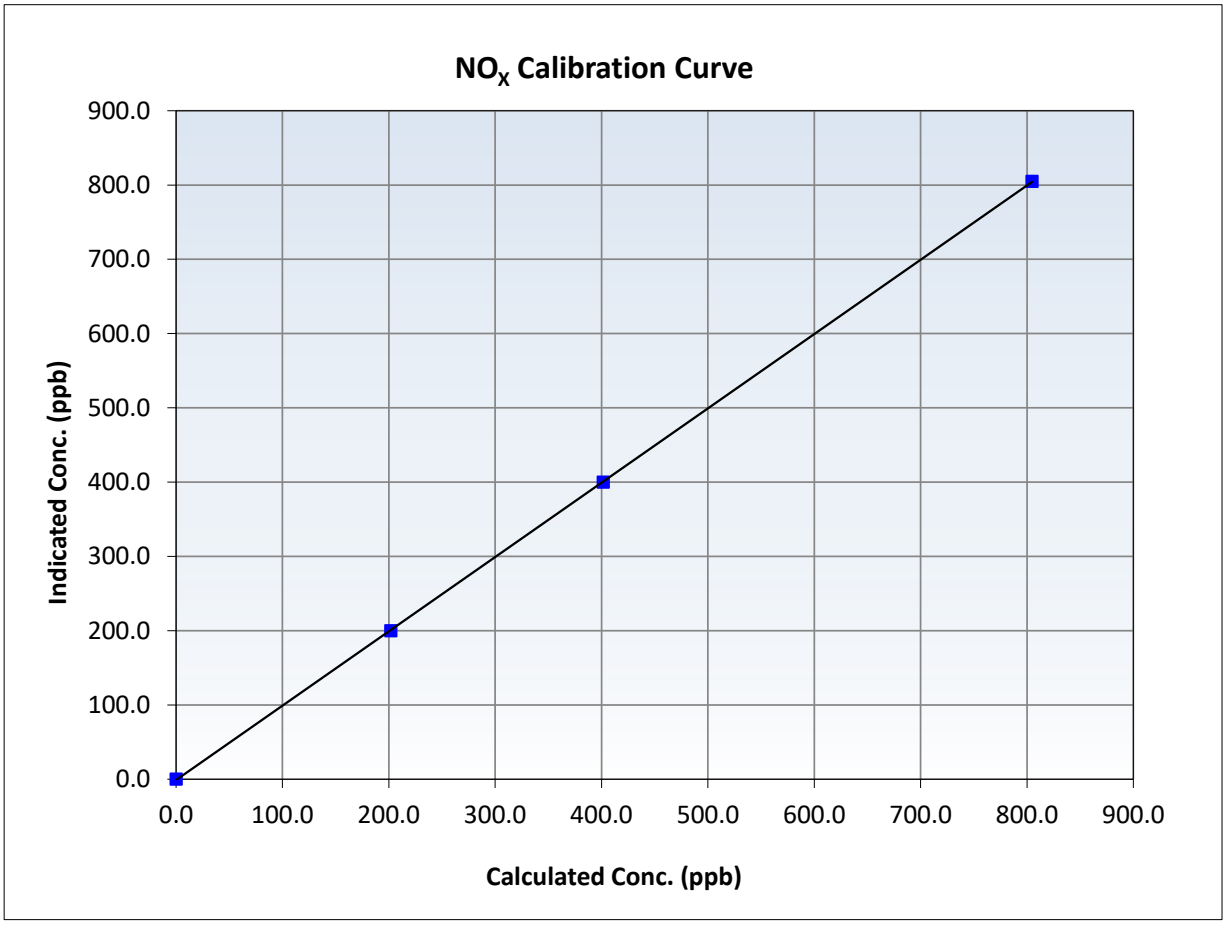
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 2, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:11	End Time (MST):	14:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
804.8	804.9	0.9999
401.6	400.1	1.0037
201.9	199.8	1.0105

Statistical Evaluation		Limits
Correlation Coefficient	0.999989	≥0.995
Slope	1.000570	0.90 - 1.10
Intercept	-1.031164	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

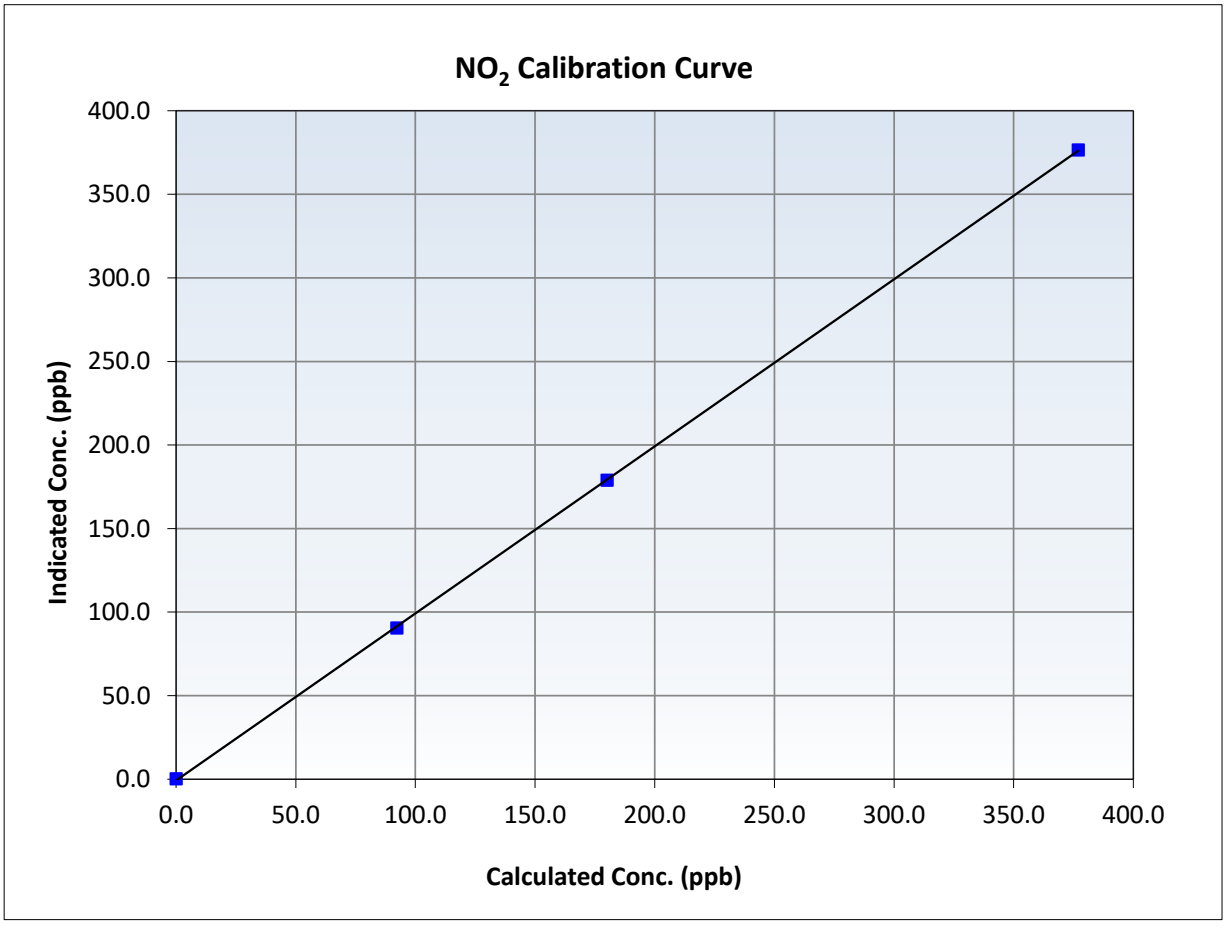
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 2, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:11	End Time (MST):	14:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
377.0	376.5	1.0013
180.1	178.9	1.0066
92.3	90.5	1.0196

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999972	*≥0.995*
Slope	0.999596	*0.90 - 1.10*
Intercept	-0.742733	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

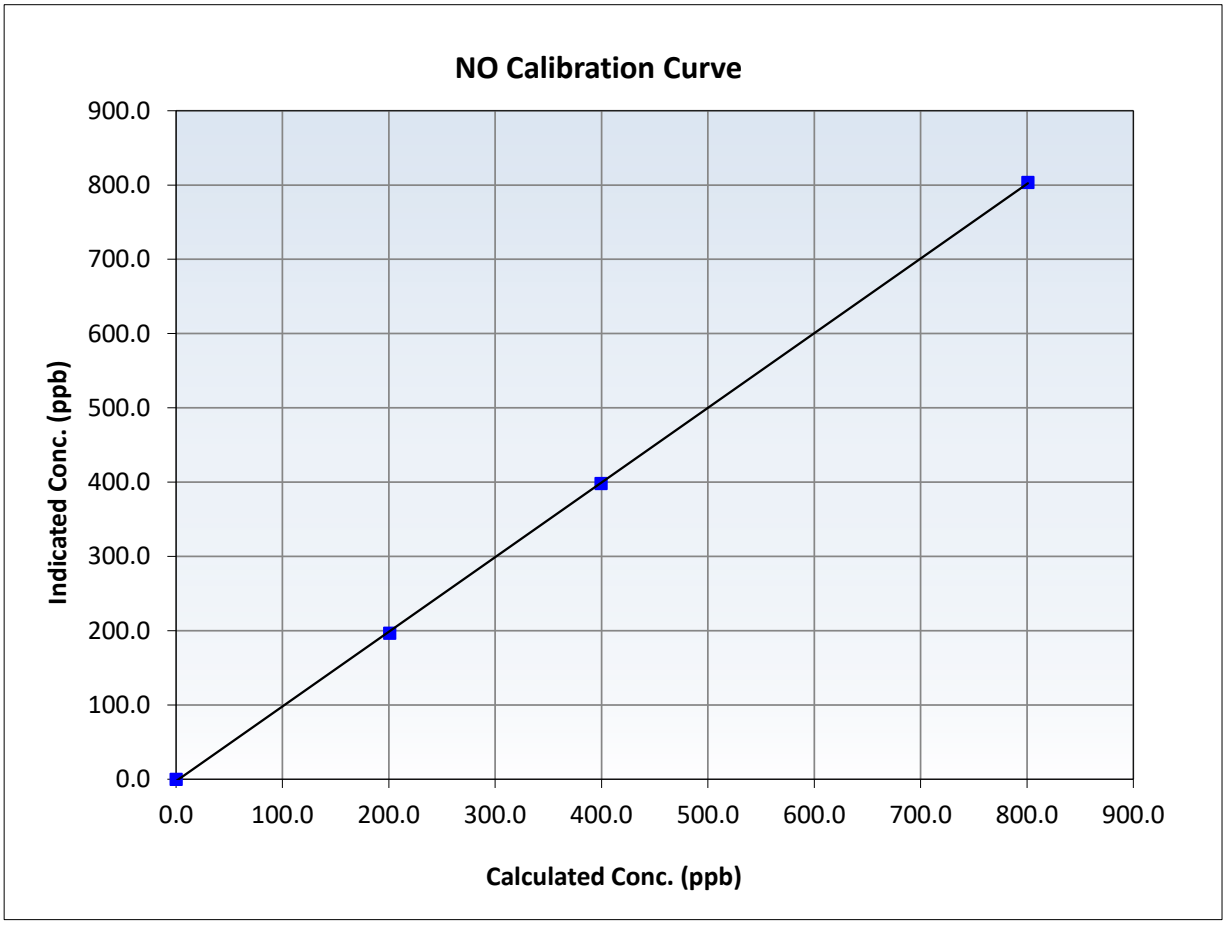
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 2, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:11	End Time (MST):	14:47
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430008

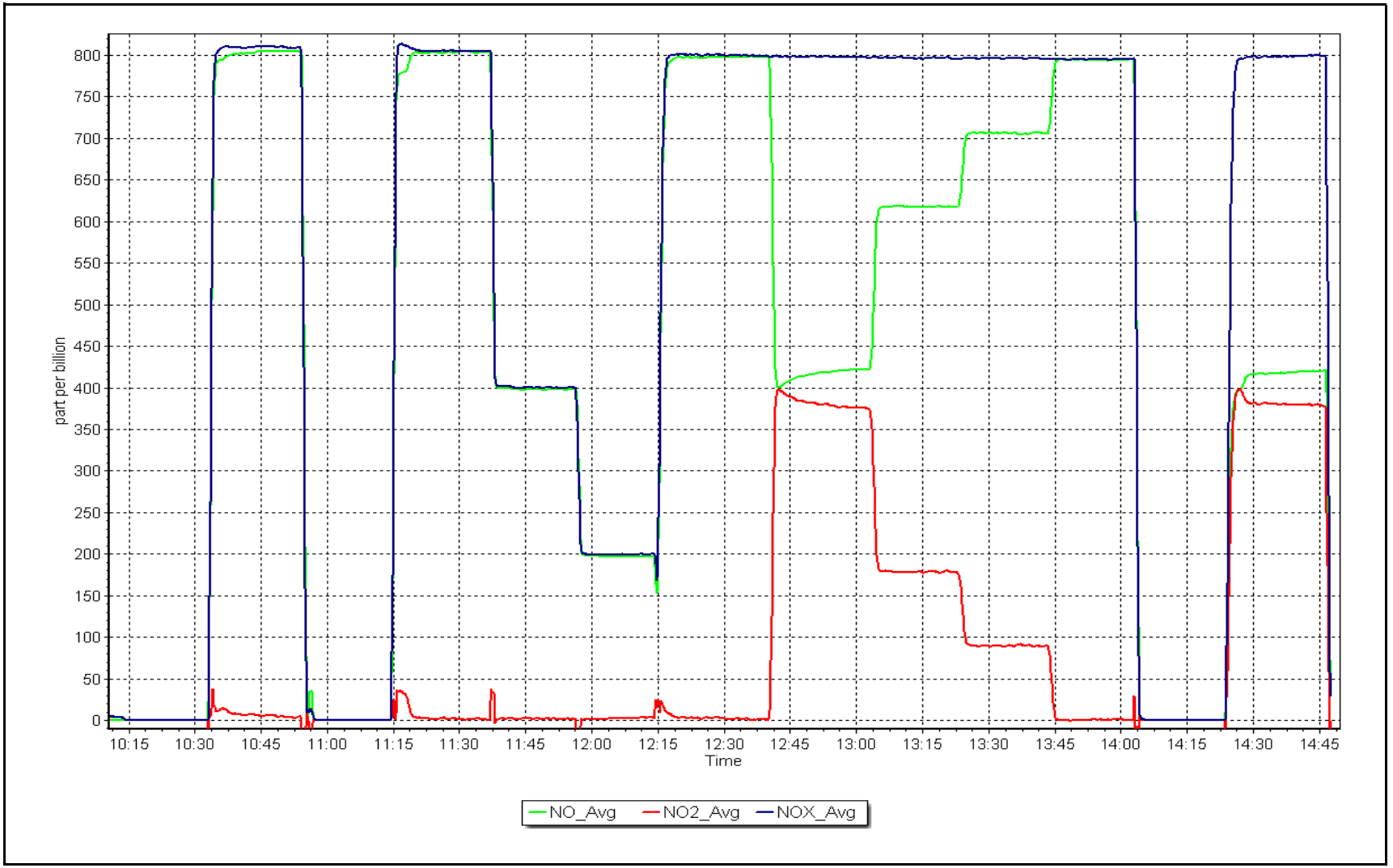
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.9	803.5	0.9967
399.6	398.1	1.0038
200.9	196.7	1.0214

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999955	*≥0.995*
Slope	1.004981	*0.90 - 1.10*
Intercept	-2.510307	*+/-20*



NO_X Calibration Plot Date: January 7, 2025 Location: Anzac



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 8, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	10:56	End time (MST):	18:01
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	3060
ZAG Make/Model:	API 701H	Serial Number:	357

Analyzer Information

Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595
Analyzer Range	0 - 500 ppb		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.004286	1.000886	Backgd or Offset:	2.1	0.9
Calibration intercept:	-1.200000	-0.580000	Coeff or Slope:	1.667	1.668

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	5000	935.9	400.0	398.8	1.003
As found Mid point	5000	817.5	200.0	198.9	1.006
As found Low point	5000	722.8	100.0	97.7	1.025

Baseline Corr As found:	398.7	Previous response	400.5	*% change	-0.5%
Baseline Corr 2nd AF pt:	198.8	AF Slope:	0.998371	AF Intercept:	-0.840000
Baseline Corr 3rd AF pt:	97.6	AF Correlation:	0.999970	* = > +/-5% change initiates investigation	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	5000	935.9	400.0	400.2	1.000
Mid point	5000	817.5	200.0	199.2	1.004
Low point	5000	722.8	100.0	98.6	1.014
As left zero	5000	0.0	0.0	0.5	----
As left span	5000	935.9	400.0	402.9	0.993
				Average Correction Factor	1.006

Notes: As part of the maintenance process, after multi point as founds cleaned the optical bench tubes with zero air, and the sample inlet filter and ozone scrubber were also replaced.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

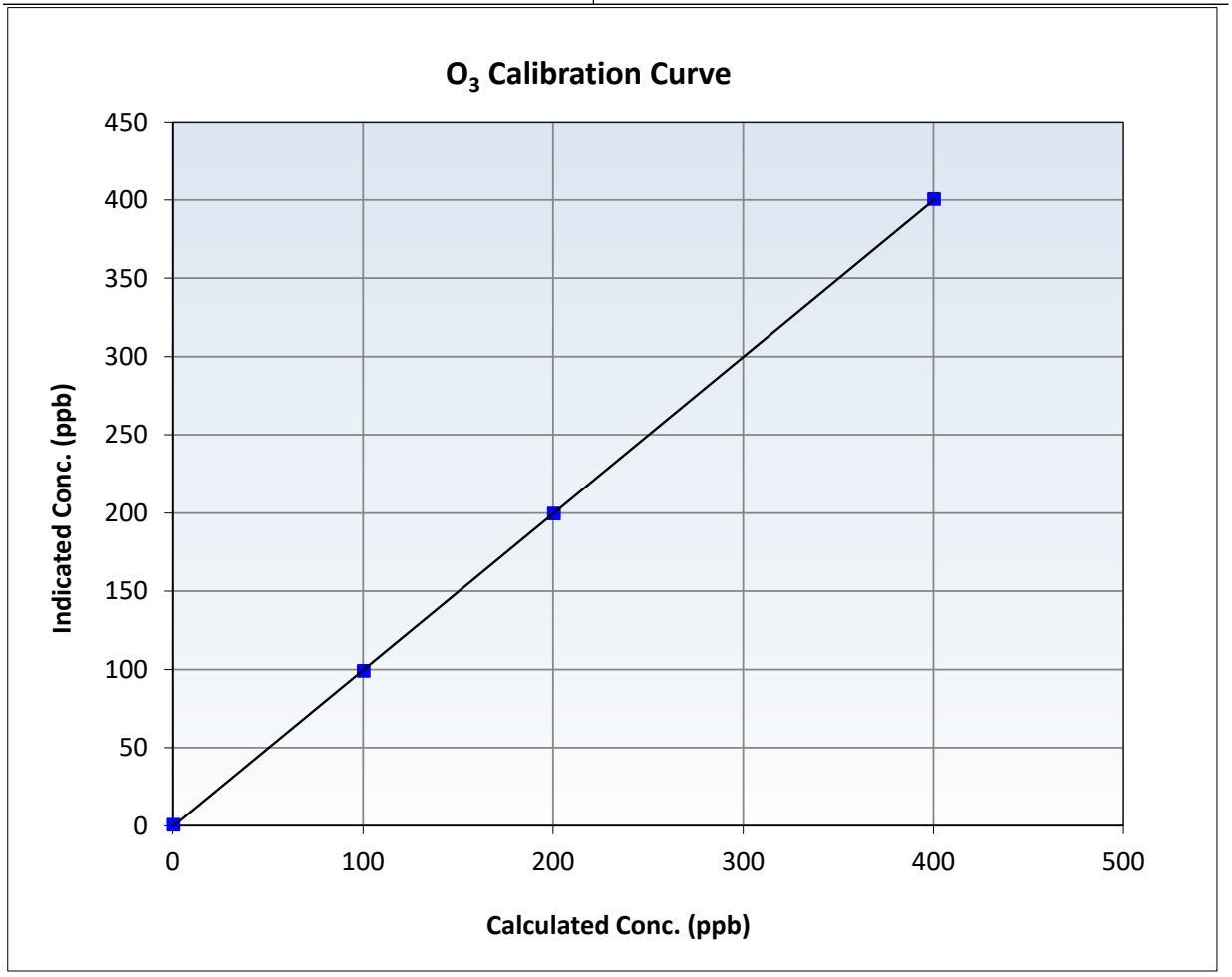
O_3 Calibration Summary

Station Information

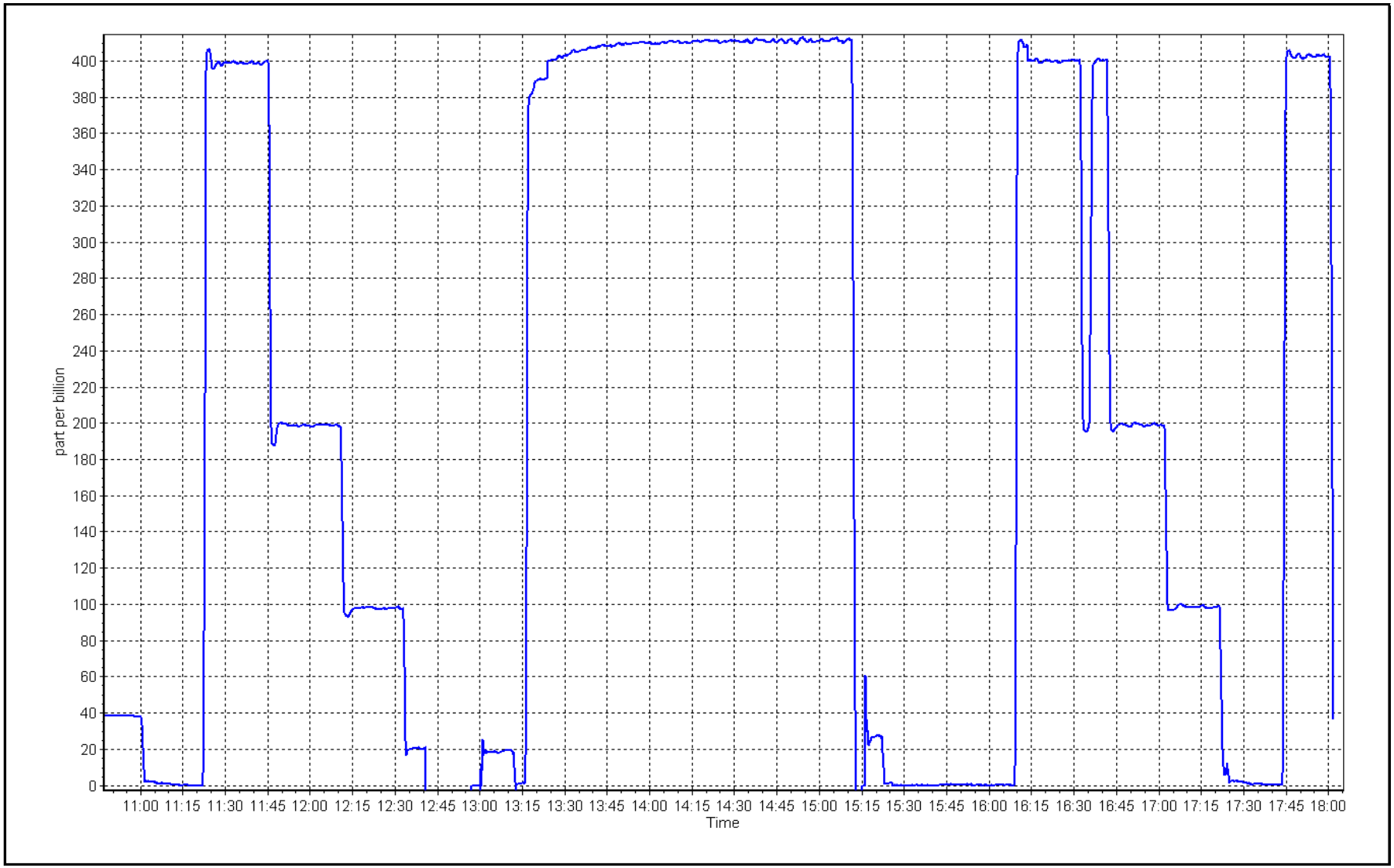
Calibration Date:	January 8, 2025	Previous Calibration:	December 9, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:56	End Time (MST):	18:01
Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	0.3	----	Correlation Coefficient	0.999978	≥0.995
400.0	400.2	0.9995	Slope	1.000886	0.90 - 1.10
200.0	199.2	1.0040			
100.0	98.6	1.0142	Intercept	-0.580000	+/- 5



O_3 Calibration Plot Date: January 8, 2025 Location: Anzac



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	January 30, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	13:13	End time (MST):	14:10
Analyzer Make:	AP T640	S/N:	825
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388749
Temp/RH standard:	Alicat FP-25BT	S/N:	388749

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	(Limits)
T (°C)	-17.5	-19.18	-17.5	☐	+/- 2 °C
P (mmHg)	718.6	719.1	718.6	☐	+/- 10 mmHg
Flow (LPM)	5.000	4.996	5.000	☐	+/- 0.25 LPM
PW% (pump)	42	-----	42	☐	>80%
Zero Verification	PM w/o HEPA:	3.1	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: December 15, 2024 — Lot No.: 100128050040

Parameter	As found	Post maintenance	As left	Adjusted	(Limits)
PMT Peak Test	10.1	11.0	11	☑	+/- 0.5

Date Optical Chamber Cleaned: January 30, 2025

Date Disposable Filter Changed: January 30, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 29, 2024

Date RH/T Sensor Cleaned: August 29, 2024

Notes: Completed quarterly maintenance. Leak check passed. Cleaned the head and chamber. PMT post-maintenance verified at 11.

Calibration by: Mohammed Kashif

Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Anzac	Station Number:	AMS 14
Calibration Date:	January 27, 2025	Prev Cal Date:	April 8, 2024
Start Time (MST):	11:30	End Time (MST):	12:38
Tower Height (m):	20.0	Reason:	Routine

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	U11126
WS Calibrator:	MetOne 053	Serial Number:	R10866

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error *Limit = +/- 1.5%*
0	0.0	0.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.6	0.1%
800	77.8	77.8	0.1%

	Start	***Finish***	*Limits*
Correl Coeff (r^2)	1.000000	0.999999	*≥0.9995*
Calculated slope	0.999465	0.998960	*0.90 - 1.10*
Calculated intercept	-0.013446	0.026359	*+/- 2*

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	C21020	
As Found Declination (deg east of True North):	14	As Left Declination (deg east of True North):	14	
Solar noon time (MST):	12:36	Calc Declination*:	13.23	Degrees

* - calculated declination as per NOAA website

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) *Limit = +/- 1.0%*
10	9.5	-0.1%
90	90.0	0.0%
180	182.1	0.6%
270	271.6	0.4%
350	352.2	0.6%

	Start	***Finish***	*Limits*
Correl Coeff (r^2)	0.999994	0.999991	*≥0.9995*
Calculated slope	1.001229	0.991924	*0.90 - 1.10*
Calculated intercept	-0.320328	0.378436	*+/- 4*

Notes: WD vane was replaced due to vane's tail missing.

Calibration Performed By: Kelly Baragar and Melissa Lemay

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS17
WAPASU
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	January 8, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	11:14	End time (MST):	14:37
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.38	ppm	Cal Gas Exp Date:	January 12, 2029
Cal Gas Cylinder #:	ALM066507			
Removed Cal Gas Conc:	50.38	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2449
Zero Air Gen Model:	Teledyne API 701H		Serial Number:	359

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1218153459	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000869	0.997254	Backgd or Offset:	15.0	14.0
Calibration intercept:	-2.760072	-1.820289	Coeff or Slope:	1.109	1.109

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-1.0	----
As found High point	4921	79.4	800.0	792.5	1.008
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	793.5	Previous response	797.9	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4921	79.4	800.0	797.4	1.003
Mid point	4960	39.7	400.0	394.9	1.013
Low point	4980	19.8	199.5	195.8	1.019
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	79.4	800.1	799.5	1.001
				Average Correction Factor:	1.012

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

SO_2 Calibration Summary

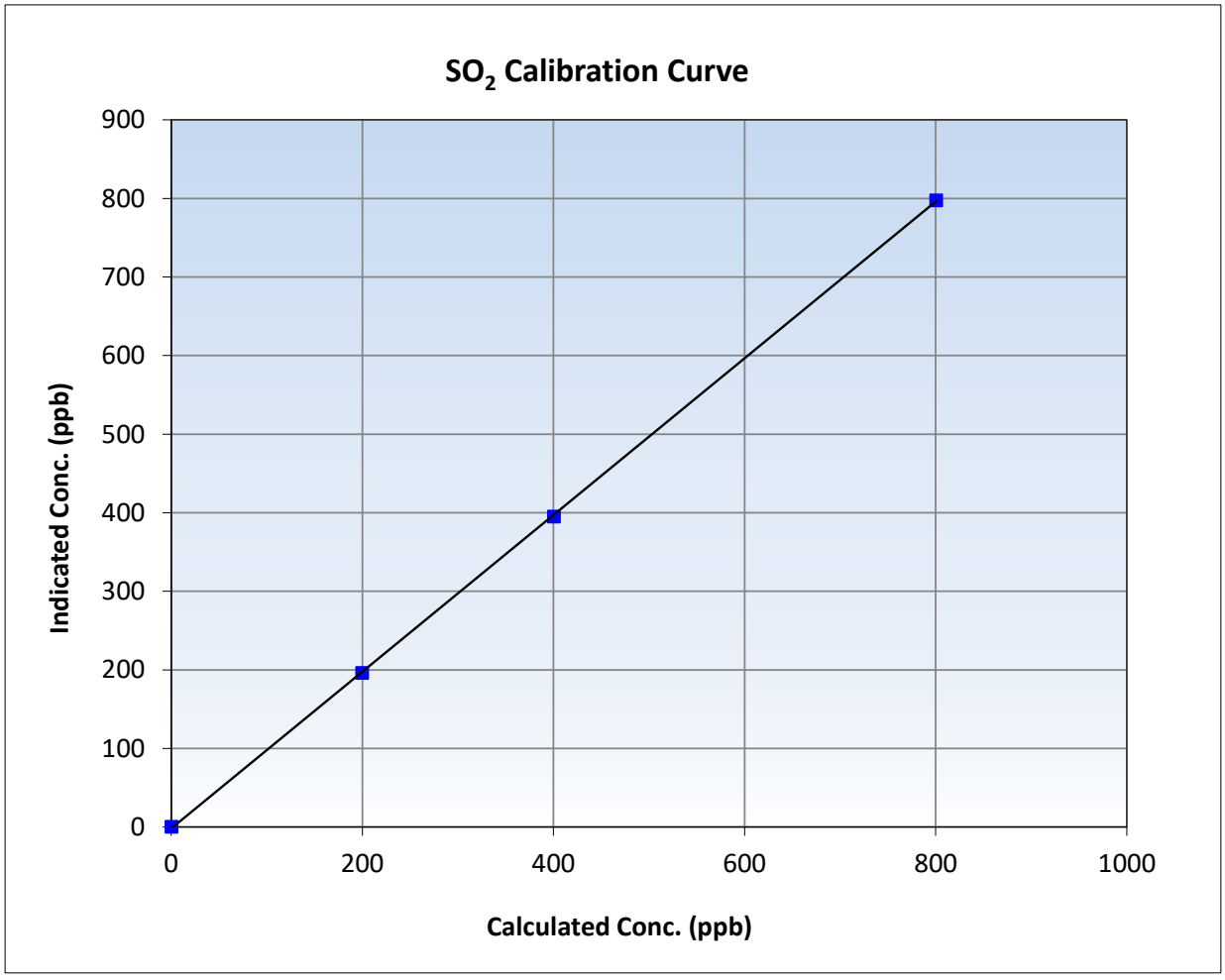
Station Information

Calibration Date:	January 8, 2025	Previous Calibration:	December 2, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:14	End Time (MST):	14:37
Analyzer make:	Thermo 43i	Analyzer serial #:	1218153459

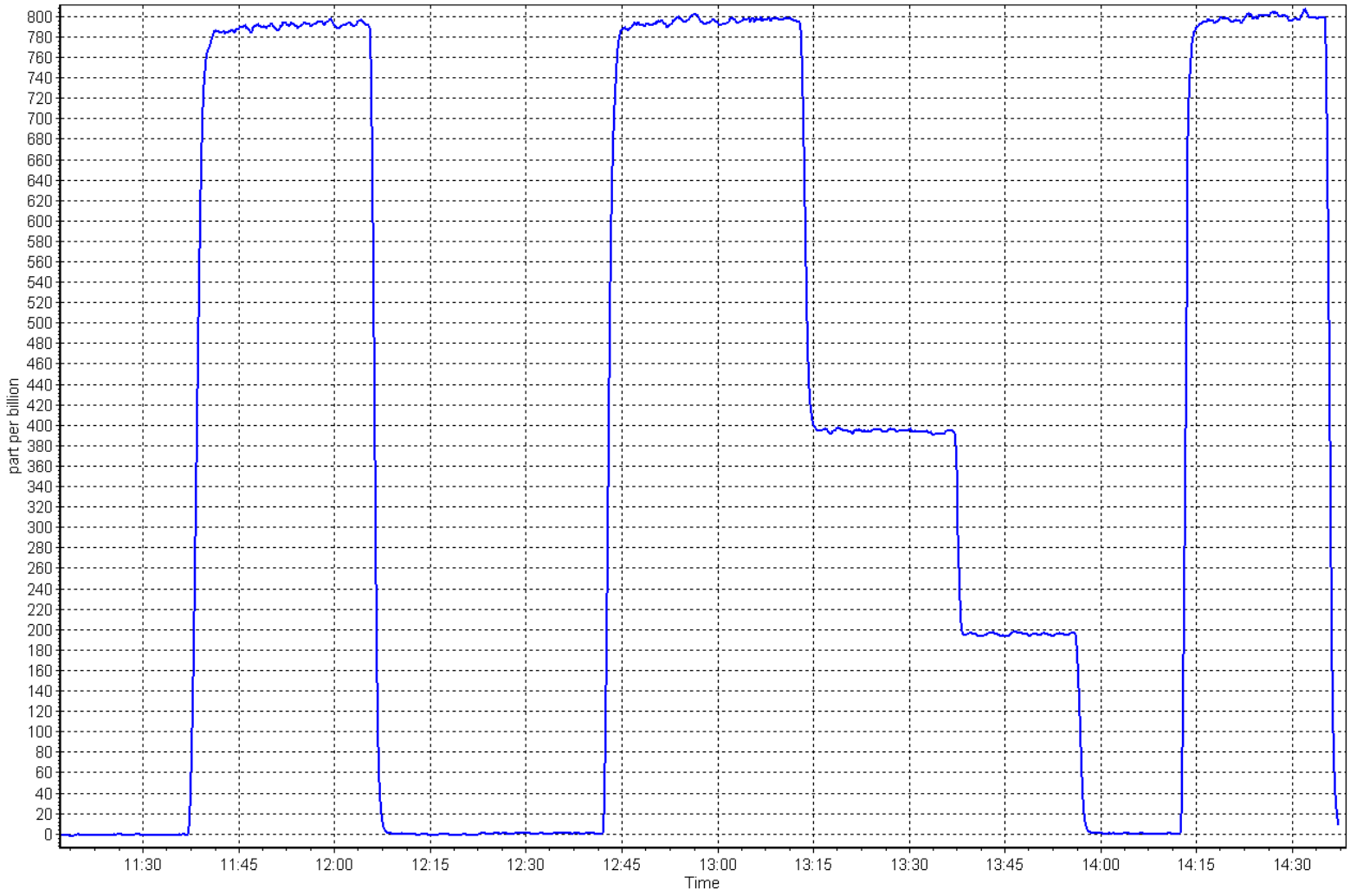
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
800.0	797.4	1.0032
400.0	394.9	1.0130
199.5	195.8	1.0190

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999962	*≥0.995*
Slope	0.997254	*0.90 - 1.10*
Intercept	-1.820289	*+/-30*



SO2 Calibration Plot Date: January 8, 2025 Location: Wapasu



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	January 27, 2025	Last Cal Date:	December 16, 2024
Start time (MST):	11:45	End time (MST):	16:38
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.77	ppm	Cal Gas Exp Date:	August 28, 2027
Cal Gas Cylinder #:	DT20029267			
Removed Cal Gas Conc:	5.08	ppm	Rem Gas Exp Date:	September 16, 2024
Removed Gas Cyl #:	CC511852		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:	CD Nova		Converter serial #:	N/A	
Analyzer Range	0 - 100 ppb		Converter Temp:	340	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.011211	1.008496	Backgd or Offset:	13.5	13.1
Calibration intercept:	-0.079935	-0.259854	Coeff or Slope:	1.141	1.099

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4921	78.8	80.0	84.3	0.950
As found Mid point	4961	39.4	40.0	41.9	0.957
As found Low point	4980	19.7	20.0	21.1	0.952
New cylinder response					

Baseline Corr As found:	84.2	Prev response:	80.82	*% change:	4.0%
Baseline Corr 2nd AF pt:	41.8	AF Slope:	1.052282	AF Intercept:	0.020832
Baseline Corr 3rd AF pt:	21.0	AF Correlation:	0.999985	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4916	83.9	80.0	80.6	0.993
Mid point	4958	41.9	40.0	39.9	1.002
Low point	4979	21.0	20.0	19.7	1.017
As left zero	5000	0.0	0.0	0.5	----
As left span	4916	83.9	80.0	78.6	1.018
SO2 Scrubber Check	4921	79.4	793.9	0.2	----

Date of last scrubber change:	N/A	Ave Corr Factor	1.004
Date of last converter efficiency test:	N/A		

Notes: Changed the sample inlet filter after as founds. Completed a SO2 scrubber check after calibrator zero. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

H_2S Calibration Summary

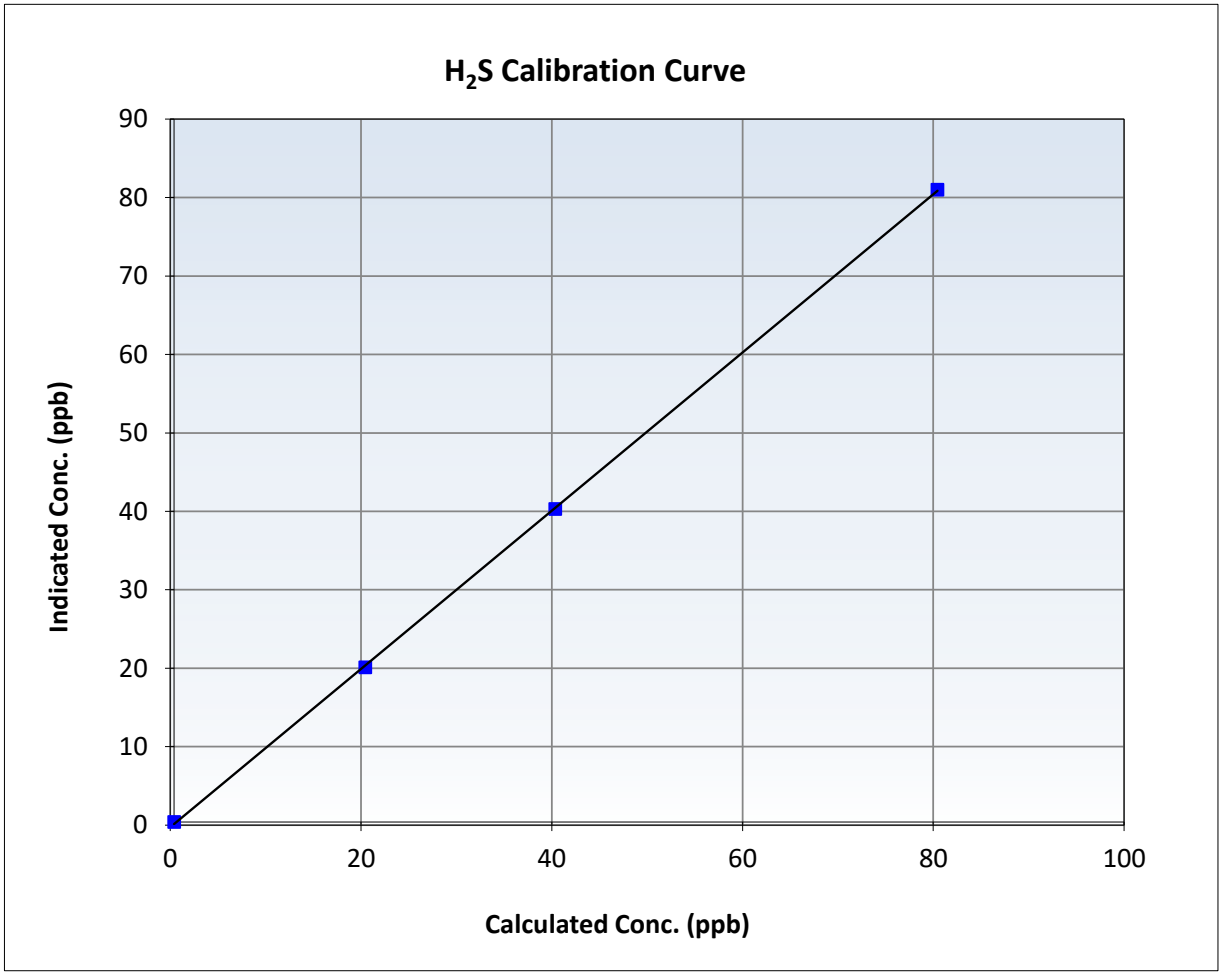
Station Information

Calibration Date:	January 27, 2025	Previous Calibration:	December 16, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	11:45	End Time (MST):	16:38
Analyzer make:	Thermo 450i	Analyzer serial #:	1218153583

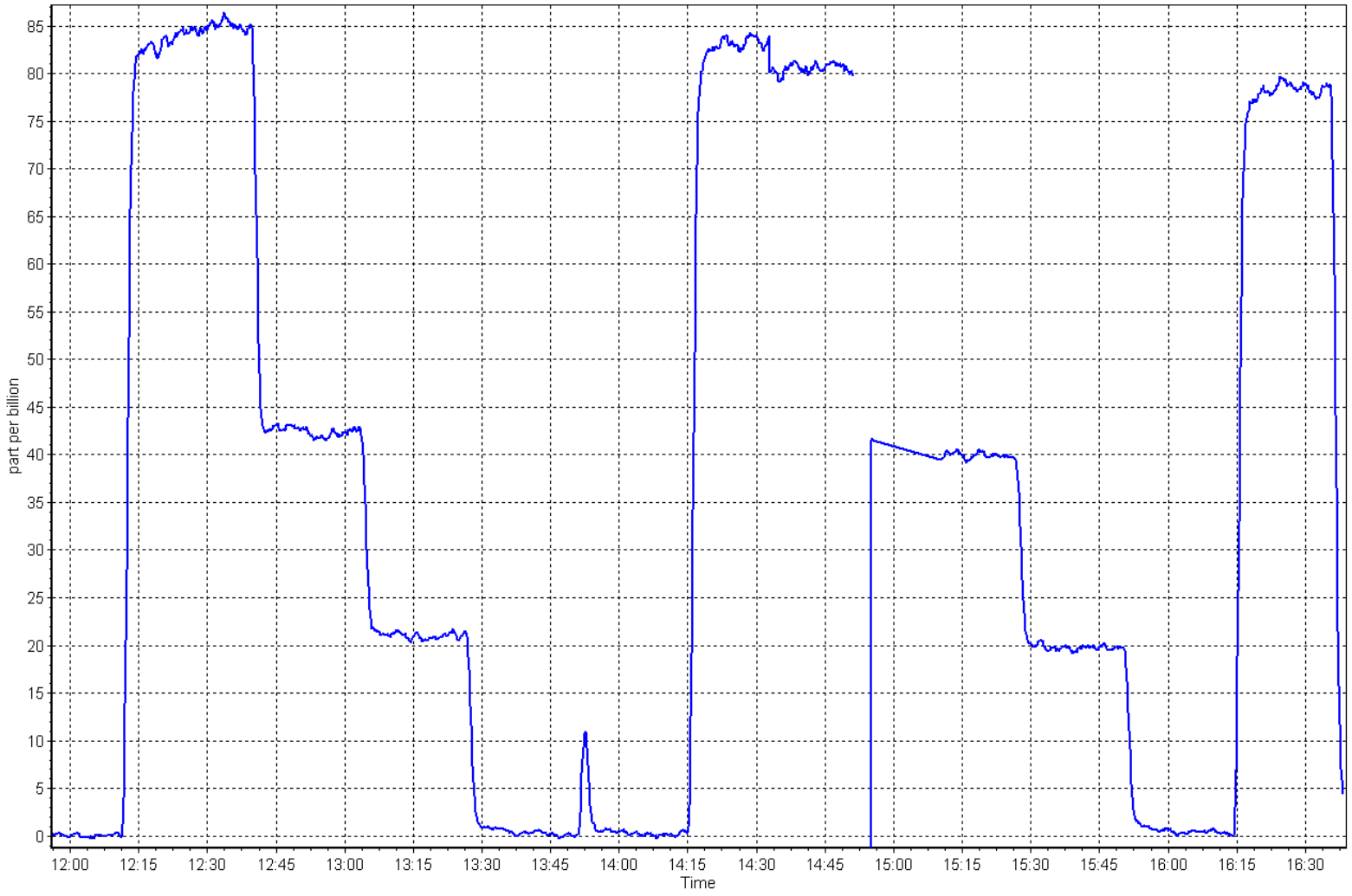
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	80.6	0.9931
40.0	39.9	1.0018
20.0	19.7	1.0170

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999952	*≥0.995*
Slope	1.008496	*0.90 - 1.10*
Intercept	-0.259854	*+/-3*



H_2S Calibration Plot Date: January 27, 2025 Location: Wapasu



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	January 8, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	11:14	End time (MST):	14:37
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	ALM066507		Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	503.5	ppm	CH4 Equiv Conc.	1076.3	ppm
C3H8 Cal Gas Conc.	208.3	ppm			
Removed Gas Cert:		n/a	Removed Gas Expiry:		
Removed CH4 Conc.	503.5	ppm	CH4 Equiv Conc.	1076.3	ppm
Removed C3H8 Conc.	208.3	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2449	
ZAG Make/Model:	Teledyne API 701H		Serial Number:	359	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1218153352

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.002146	0.996055	Background:	3.020	3.130
Calibration intercept:	0.019052	-0.061168	Coefficient:	4.475	4.441

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.11	----
As found High point	4921	79.4	17.09	17.23	0.998
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	17.12	Previous response	17.15	*% 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	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.01	----
High point	4921	79.4	17.09	17.01	1.005
Mid point	4960	39.7	8.55	8.38	1.020
Low point	4980	19.8	4.26	4.15	1.028
As left zero	5000	0.0	0.00	-0.03	----
As left span	4921	79.4	17.09	16.97	1.007
				Average Correction Factor	1.018

Notes: Zero and span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

THC Calibration Summary

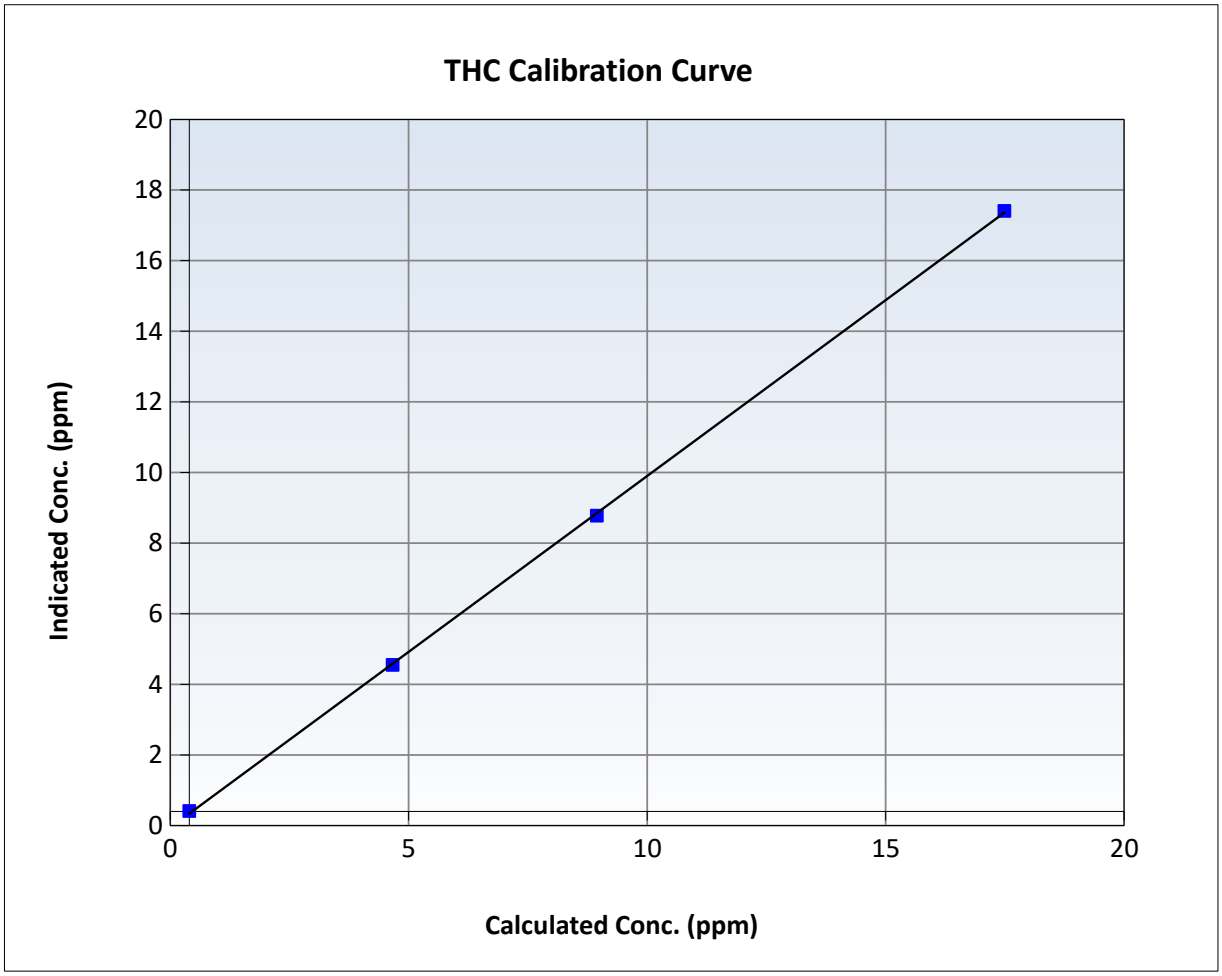
Station Information

Calibration Date:	January 8, 2025	Previous Calibration:	December 2, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:14	End Time (MST):	14:37
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153352

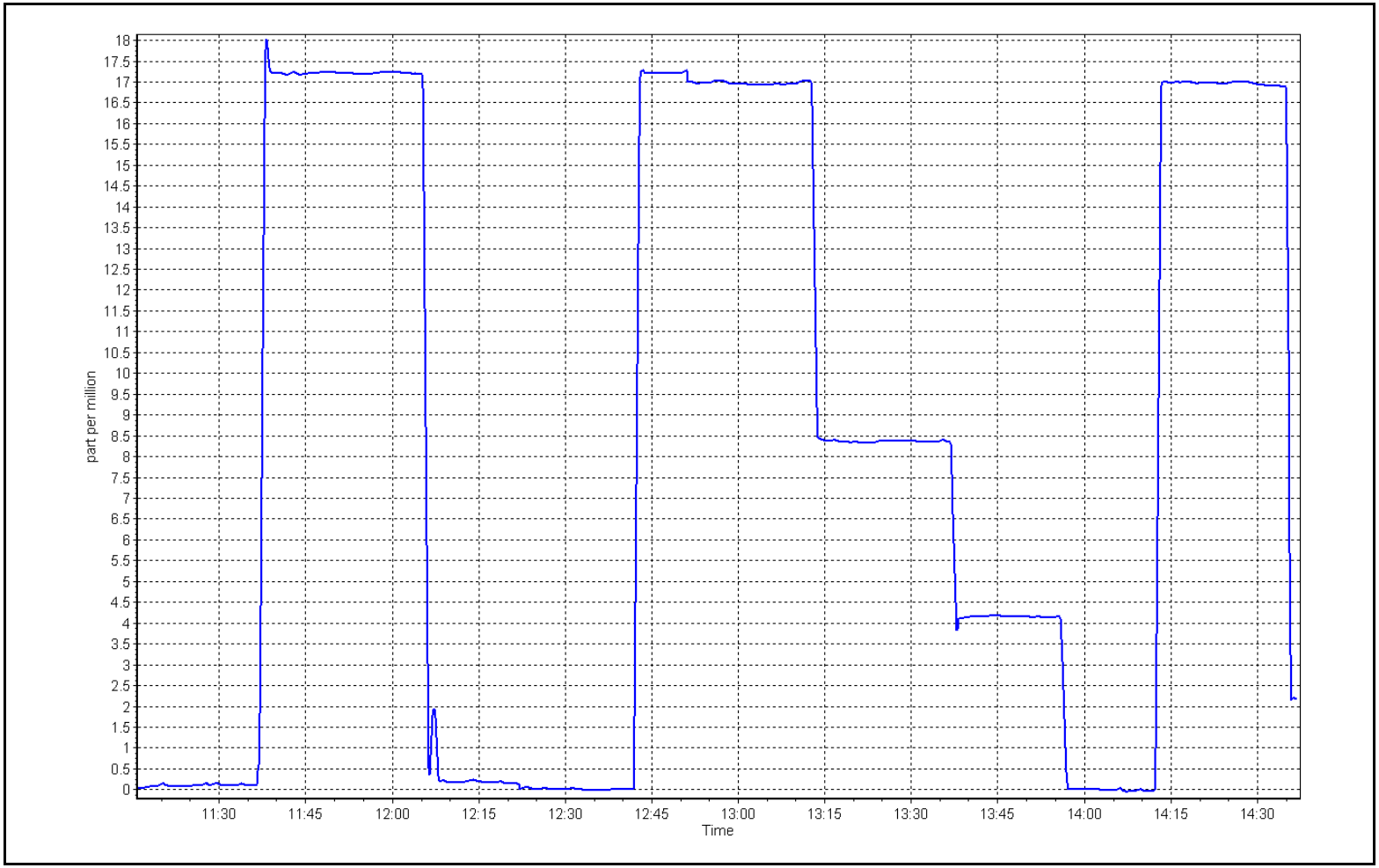
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.01	----
17.09	17.01	1.0047
8.55	8.38	1.0205
4.26	4.15	1.0281

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999911	*≥0.995*
Slope	0.996055	*0.90 - 1.10*
Intercept	-0.061168	*+/-1.5*



THC Calibration Plot Date: January 8, 2025 Location: Wapasu



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Wapasu
Station number:	AMS 17
Calibration Date:	January 21, 2025
Last Cal Date:	December 12, 2024
Start time (MST):	11:23
End time (MST):	15:36
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T375YK8	Cal Gas Expiry Date:	April 13, 2025
NOX Cal Gas Conc:	49.11 ppm	NO Cal Gas Conc:	48.07 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	49.11 ppm	Removed Gas NO Conc:	48.07 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	2449
ZAG make/model:	API T701H	Serial Number:	359

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.4	----	----
AF High point	4917	83.2	817.2	799.9	17.3	817.1	798.3	18.9	0.9994	1.0017
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 816.7 ppb	NO = 798.9 ppb
Baseline Corr 1st pt	NO_X = 817.7 ppb	NO = 798.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	*Percent Change	NO_X = 0.1%
As found	NO r^2:	*Percent Change	NO = -0.1%
As found	NO_2 r^2:	Nx Sl:	Nx Int:
		NO Sl:	NO Int:
		NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo Scientific 42i Serial Number: 1218153460

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.091	1.091	NO bkgnd or offset:	3.8	3.8
NOX coeff or slope:	0.994	0.993	NOX bkgnd or offset:	4.2	4.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	239.7	240.3

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001214	1.002459
NO_X Cal Offset:	-1.480000	-1.500000
NO Cal Slope:	1.001016	1.002730
NO Cal Offset:	-1.780000	-1.880000
NO_2 Cal Slope:	1.001334	1.000117
NO_2 Cal Offset:	-0.701642	-0.576184

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.4	0.0	-0.3	----	----
High point	4917	83.2	817.2	799.9	17.3	818.3	801.2	17.1	0.9986	0.9984
Mid point	4958	41.6	408.6	399.9	8.7	407.4	398.0	9.4	1.0029	1.0049
Low point	4979	20.8	204.3	200.0	4.3	202.3	196.9	5.4	1.0099	1.0156
As left zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.1	-0.3	----	----
As left span	4917	83.2	817.2	400.0	417.2	818.6	400.0	418.5	0.9983	1.0000
							Average Correction Factor		1.0038	1.0063

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.3	----	----
High GPT point	800.2	397.8	419.7	419.4	1.0007	99.9%
Mid GPT point	800.2	602.1	215.4	214.5	1.0042	99.6%
Low GPT point	800.2	701.8	115.7	115.0	1.0061	99.4%
				Average Correction Factor	1.0037	99.6%

Notes: Sample inlet filter changed after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

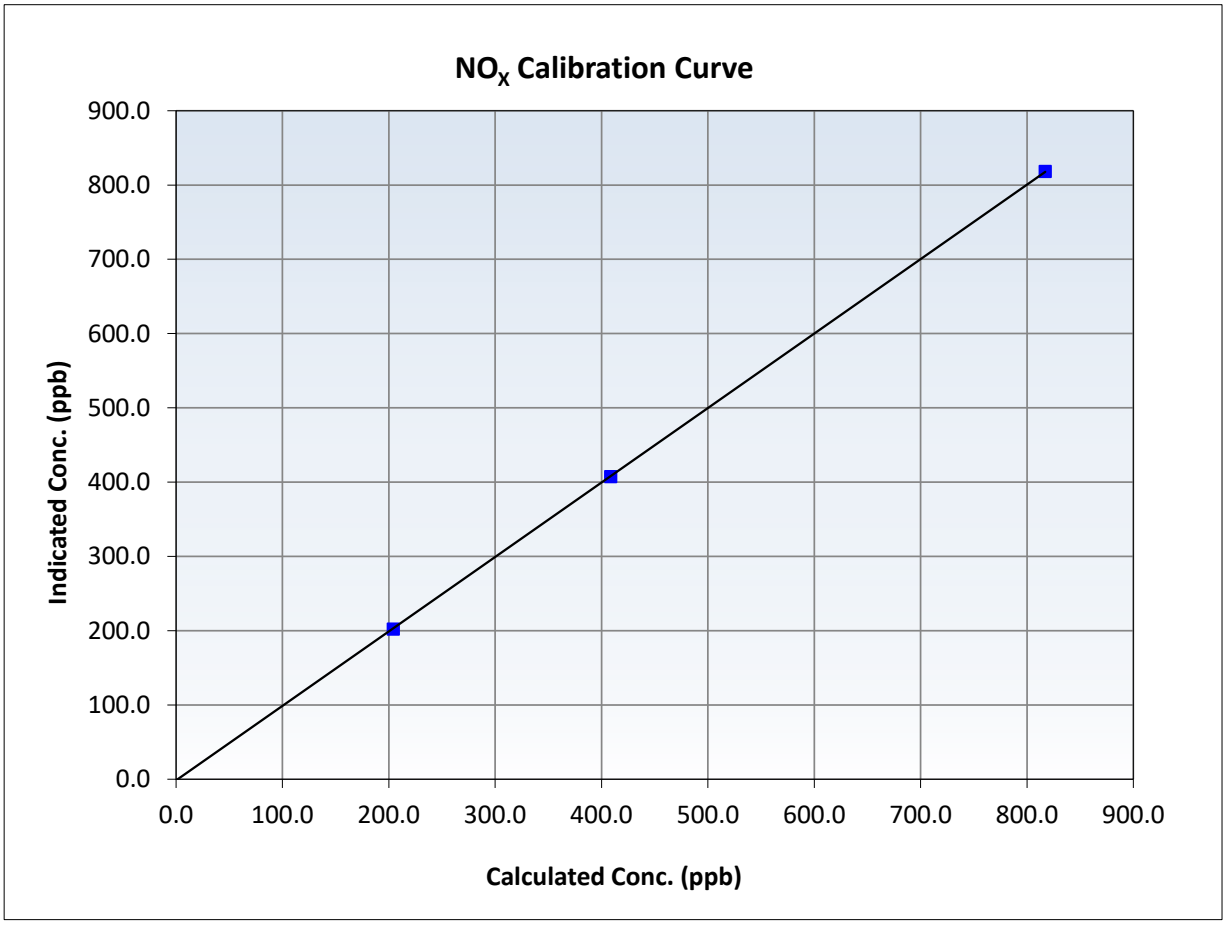
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	11:23	End Time (MST):	15:36
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.4	----
817.2	818.3	0.9986
408.6	407.4	1.0029
204.3	202.3	1.0099

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	1.002459	*0.90 - 1.10*
Intercept	-1.500000	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

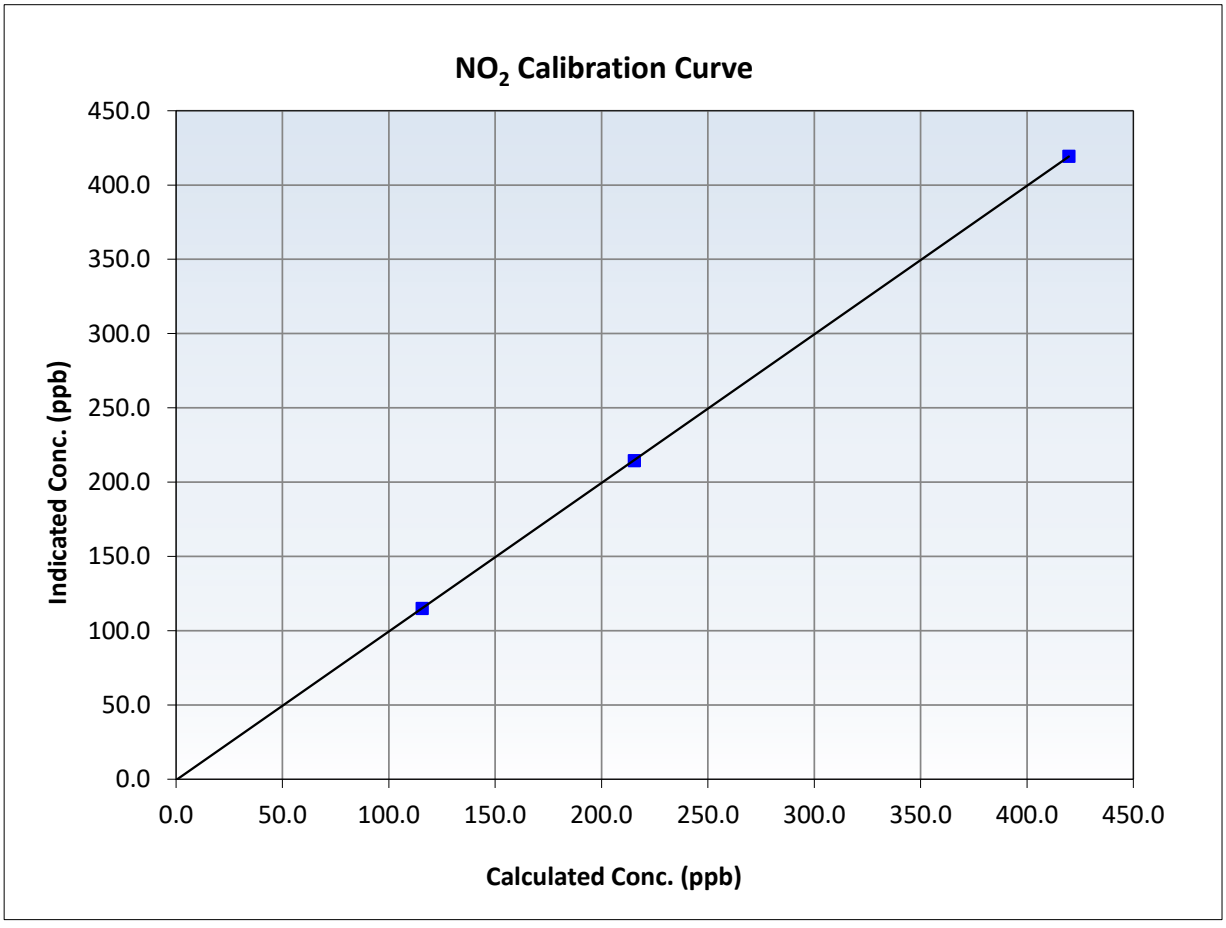
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	11:23	End Time (MST):	15:36
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
419.7	419.4	1.0007
215.4	214.5	1.0042
115.7	115.0	1.0061

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	1.000117	*0.90 - 1.10*
Intercept	-0.576184	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

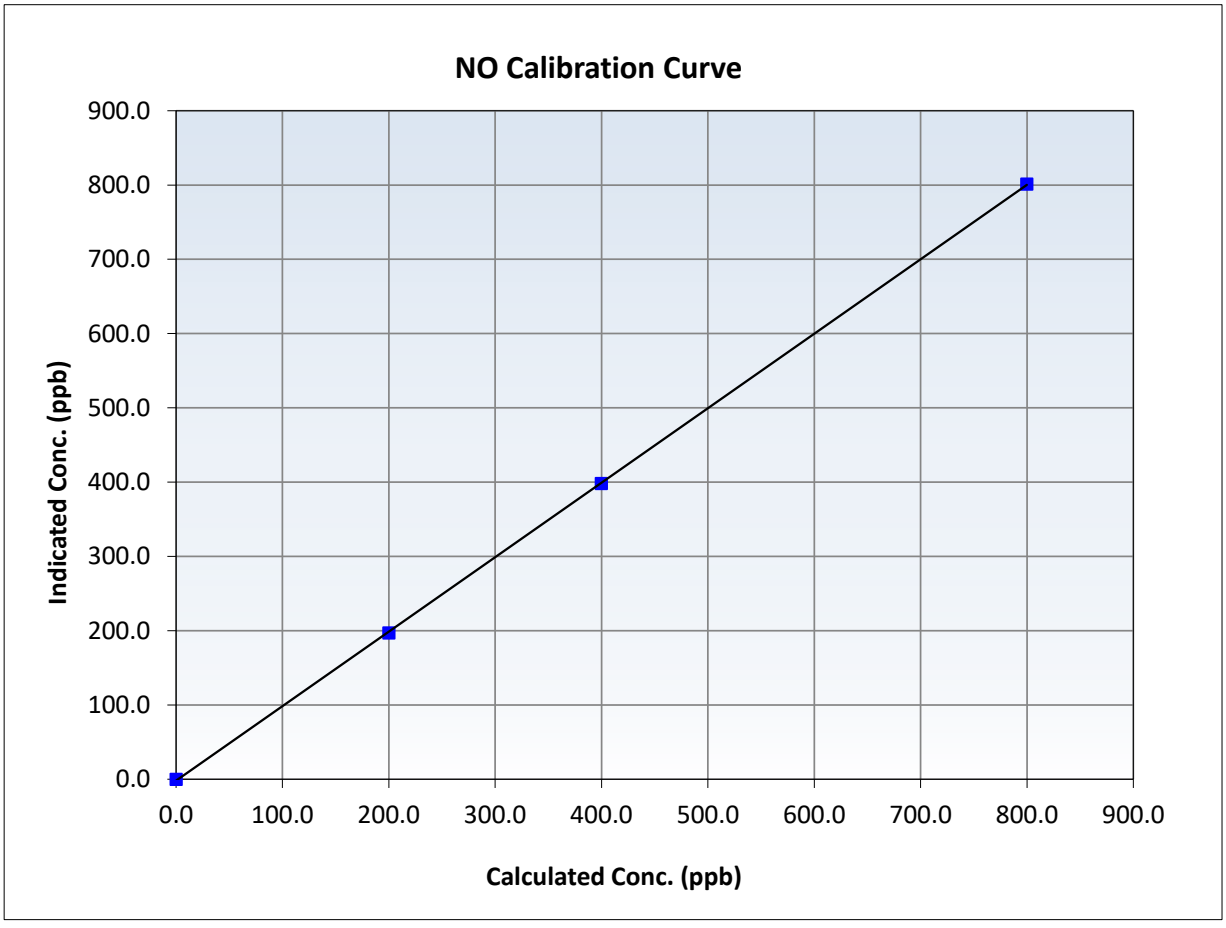
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	11:23	End Time (MST):	15:36
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

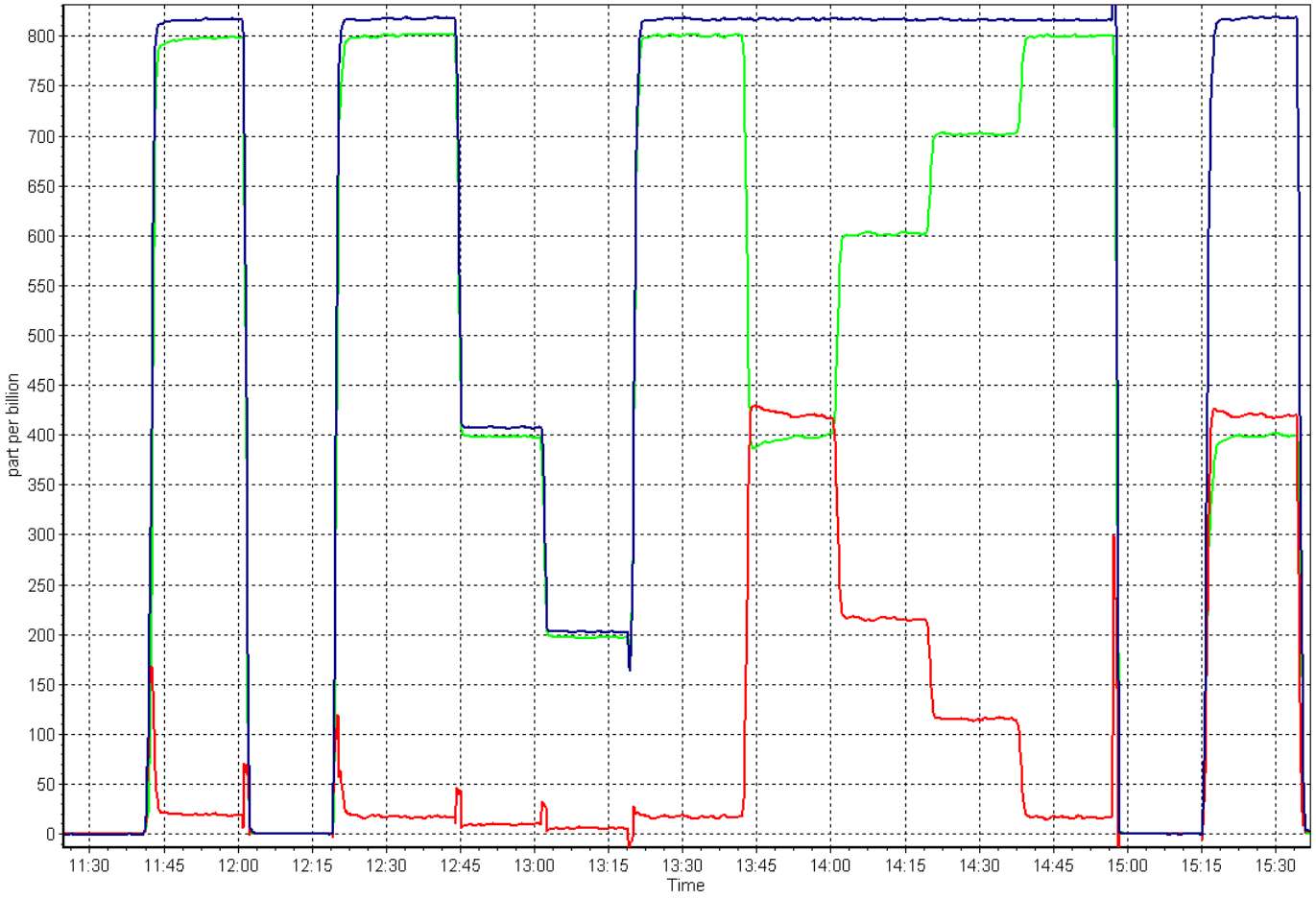
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.9	801.2	0.9984
399.9	398.0	1.0049
200.0	196.9	1.0156

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	1.002730	*0.90 - 1.10*
Intercept	-1.880000	*+/-20*



NO_X Calibration Plot Date: January 21, 2025 Location: Wapasu



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Wapasu	Station number:	AMS17
Calibration Date:	January 2, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	11:15	End time (MST):	14:13
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	API T700	Serial Number:	2449
ZAG Make/Model:	API T701H	Serial Number:	359

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	7045	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002114	1.000457	Backgd or Offset:	0.6	0.6
Calibration intercept:	-0.420000	-0.180000	Coeff or Slope:	1.028	1.028

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	5000	1104.7	400.0	399.5	1.000
As found Mid point					
As found Low point					
Baseline Corr As found:	399.9	Previous response	400.4	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	5000	1104.7	400.0	400.3	0.999
Mid point	5000	917.3	200.0	199.6	1.002
Low point	5000	797.9	100.0	99.3	1.007
As left zero	5000	0.0	0.0	0.6	----
As left span	5000	1104.0	400.0	405.4	0.987
				Average Correction Factor	1.003

Notes: Inlet filter changed after as founds. No adjustments needed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

O_3 Calibration Summary

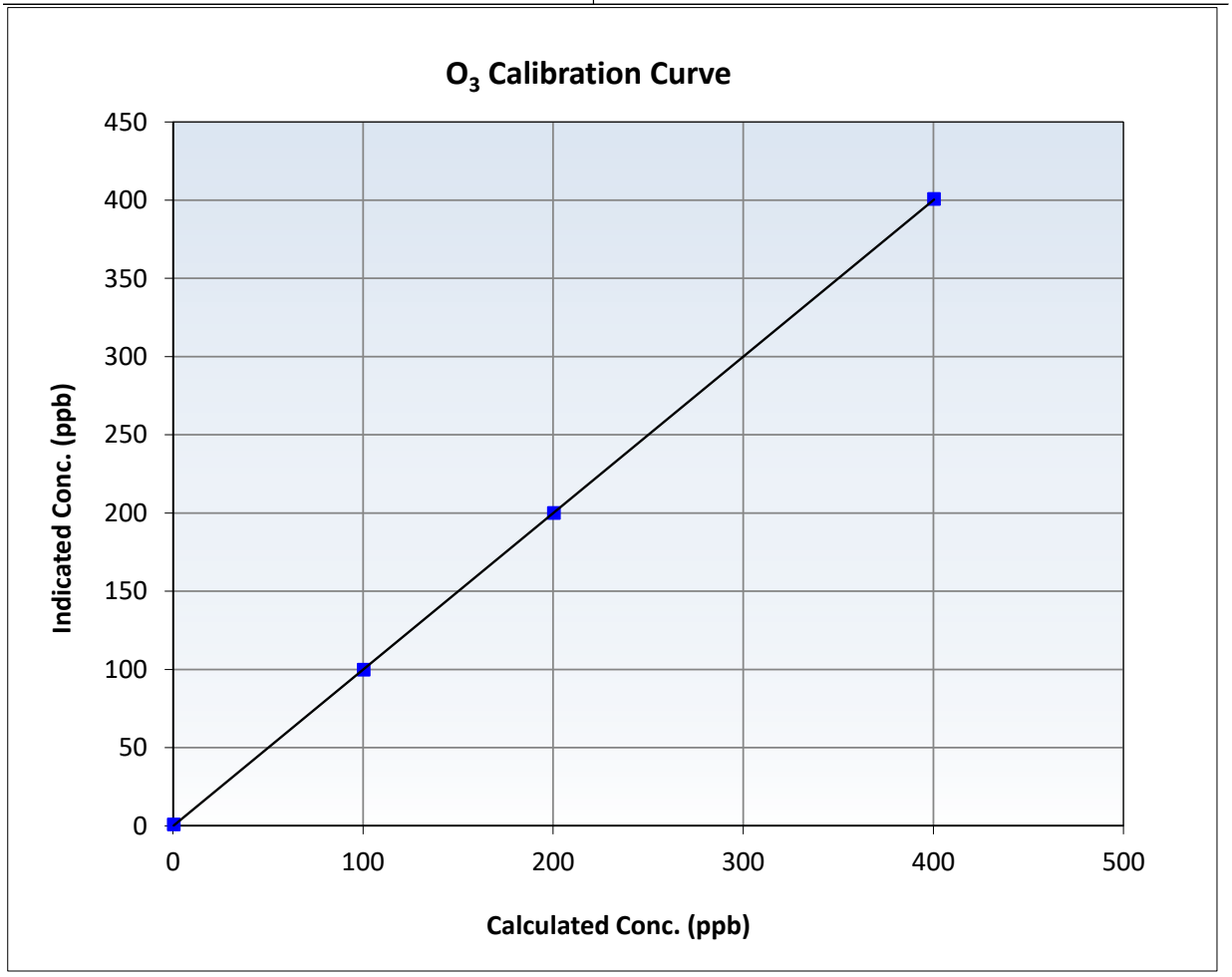
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 9, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	11:15	End Time (MST):	14:13
Analyzer make:	API T400	Analyzer serial #:	7045

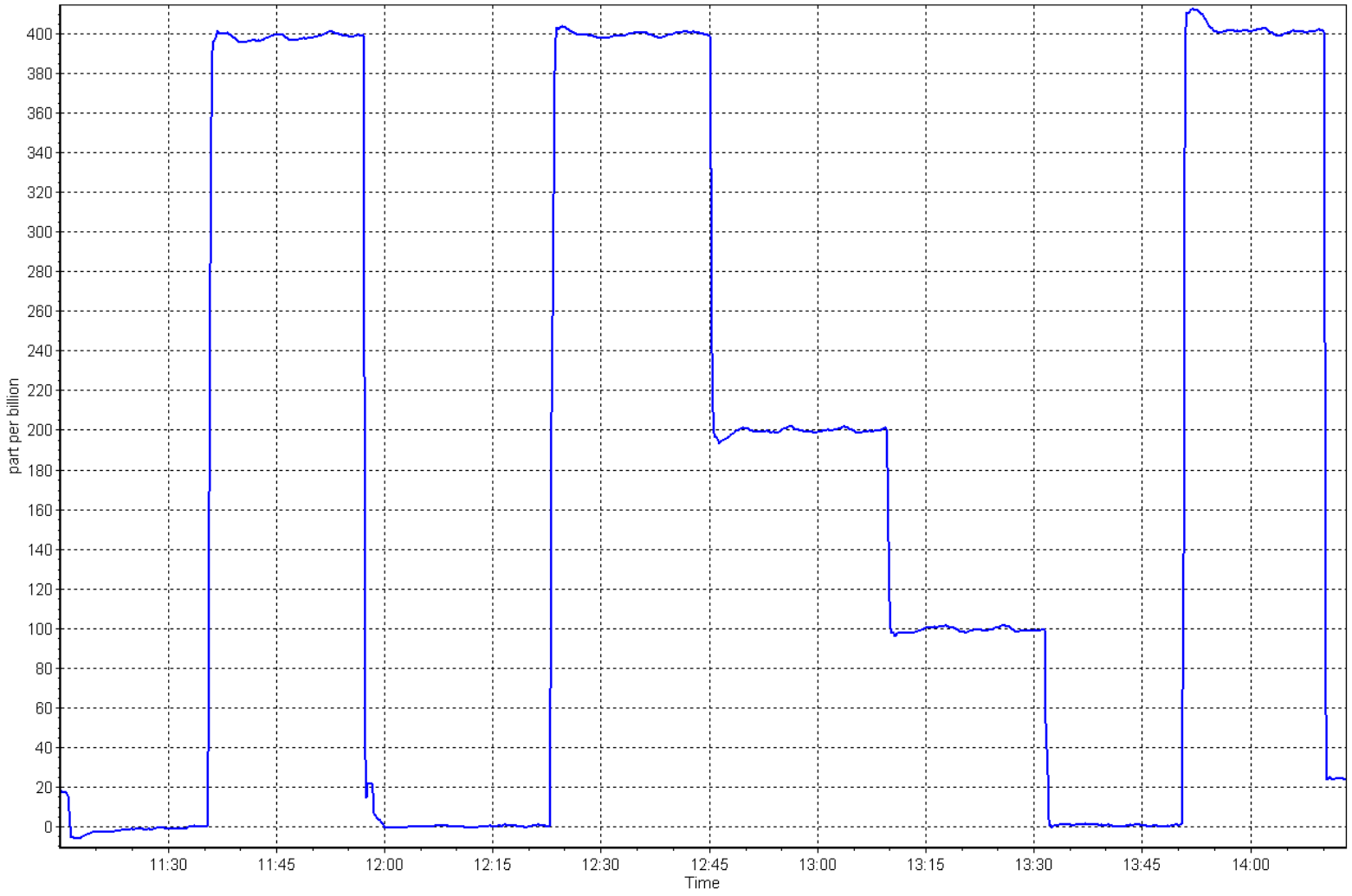
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
400.0	400.3	0.9993
200.0	199.6	1.0020
100.0	99.3	1.0070

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999990	*≥0.995*
Slope	1.000457	*0.90 - 1.10*
Intercept	-0.180000	*+/- 5*



O_3 Calibration Plot Date: January 2, 2025 Location: Wapasu



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	January 27, 2025	Last Cal Date:	December 19, 2024
Start time (MST):	15:52	End time (MST):	16:31
Analyzer Make:	Teledyne API T640	S/N:	1183
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388749
Temp/RH standard:	Alicat FP-25BT	S/N:	388749

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	3.40	2.90	3.40	☐	+/- 2 °C
P (mmHg)	701.50	698.50	701.50	☐	+/- 10 mmHg
Flow (LPM)	5.04	4.98	5.04	☐	+/- 0.25 LPM
PW% (pump)	34	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	4.3	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 6, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: October 18, 2024

Date Disposable Filter Changed: December 19, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 23, 2024

Date RH/T Sensor Cleaned: July 23, 2024

Notes:

No adjustments needed.

Calibration by: Aswin Sasi Kumar

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS18
STONY MOUNTAIN
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 14, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:28	End time (MST):	15:03
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.02	ppm	Cal Gas Exp Date:	January 12, 2029
Cal Gas Cylinder #:	XC026809B			
Removed Cal Gas Conc:	50.02	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	XC026809B		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2658
Zero Air Gen Model:	Teledyne API 701H		Serial Number:	360

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	JC1501301453	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996102	0.996087	Backgd or Offset:	23.6	24.7
Calibration intercept:	-0.800000	-0.620000	Coeff or Slope:	0.797	0.797

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.8	----
As found High point	4920	80.0	800.3	797.8	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	797.0	Previous response	796.4	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.0	800.3	796.5	1.005
Mid point	4960	40.0	400.2	398.8	1.003
Low point	4980	20.0	200.1	197.3	1.014
As left zero	5000	0.0	0.0	-0.4	----
As left span	4920	80.0	800.3	799.5	1.001
				Average Correction Factor:	1.007

Notes: Zero adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

SO_2 Calibration Summary

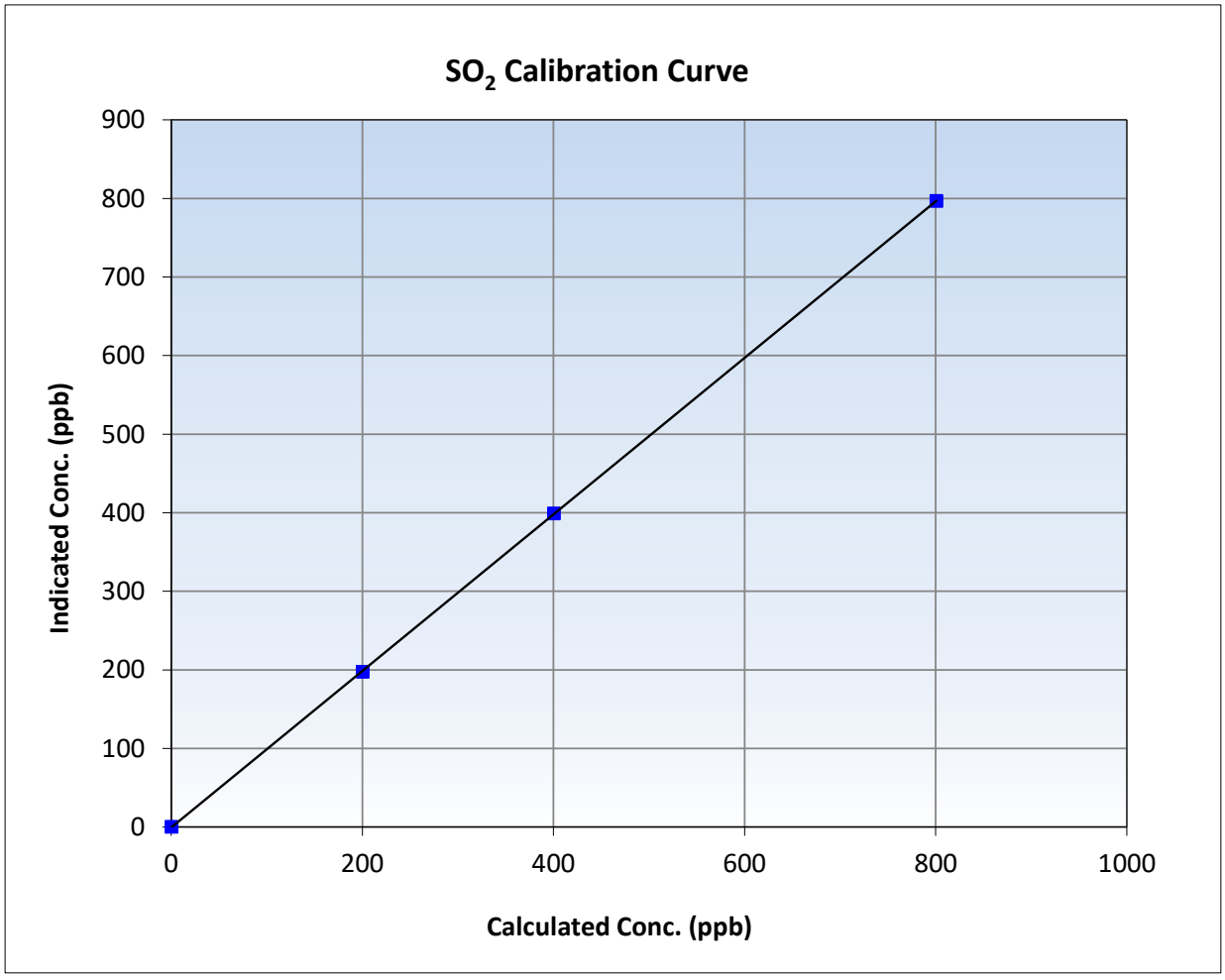
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:28	End Time (MST):	15:03
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301453

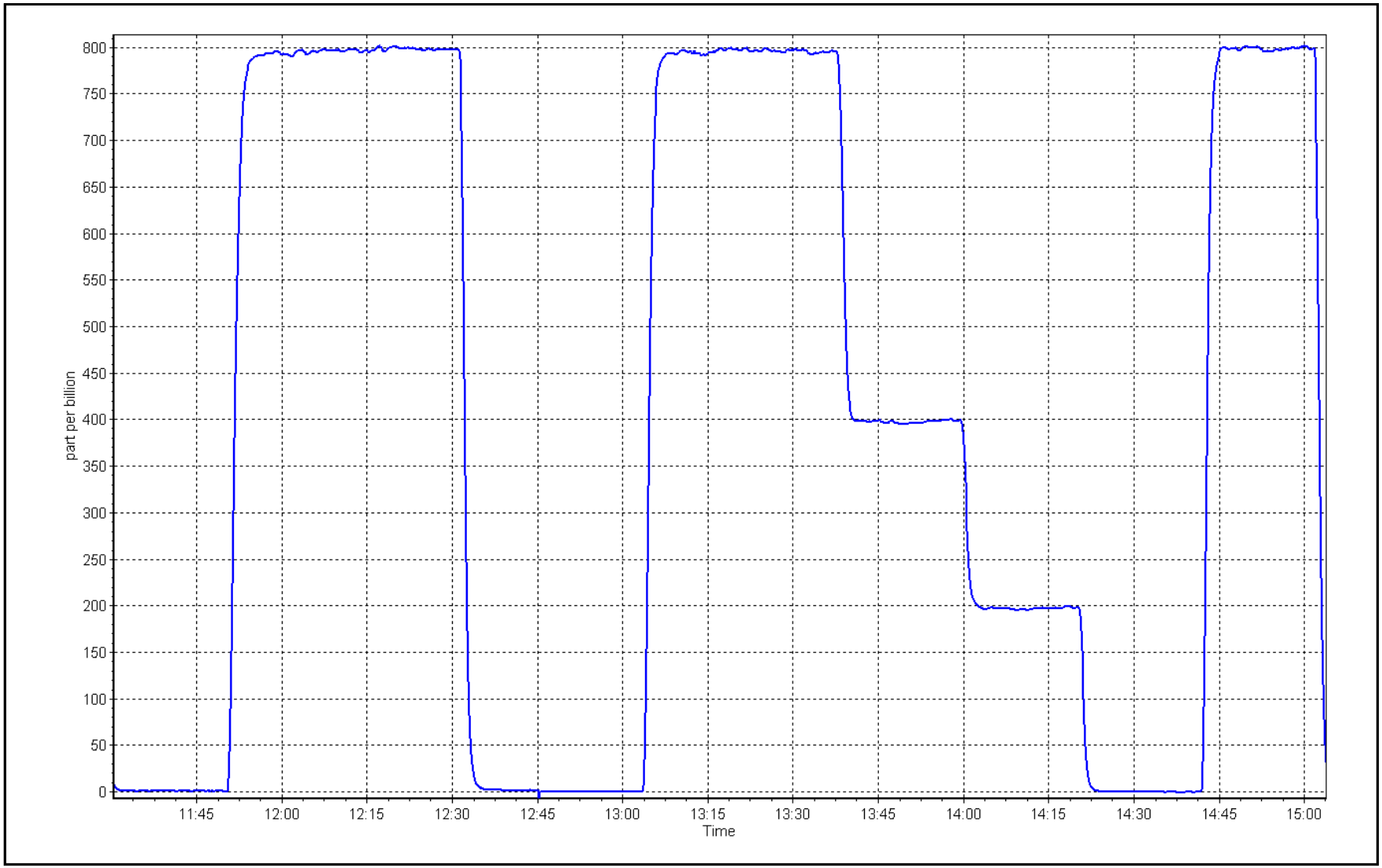
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.3	796.5	1.0048
400.2	398.8	1.0034
200.1	197.3	1.0141

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999991	*≥0.995*
Slope	0.996087	*0.90 - 1.10*
Intercept	-0.620000	*+/-30*



SO2 Calibration Plot Date: January 14, 2025 Location: Stony Mountain



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS18
Calibration Date:	January 29, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	11:45	End time (MST):	17:24
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.86	ppm	Cal Gas Exp Date:	May 9, 2027
Cal Gas Cylinder #:	CC523103			
Removed Cal Gas Conc:	5.48	ppm	Rem Gas Exp Date:	January 4, 2025
Removed Gas Cyl #:	CC500395		Diff between cyl:	2.4%
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		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996582	0.995231	Backgd or Offset:	3.1	2.90
Calibration intercept:	0.161164	0.220919	Coeff or Slope:	1.248	1.172

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4927	73.0	80.0	83.9	0.953
As found Mid point	4964	36.5	40.0	42.0	0.952
As found Low point	4983	18.3	20.0	20.8	0.964
New cylinder response	4917	82.3	80.0	86.1	0.929

Baseline Corr As found:	83.9	Prev response:	79.88	*% change:	4.8%
Baseline Corr 2nd AF pt:	42.0	AF Slope:	1.049885	AF Intercept:	-0.079893
Baseline Corr 3rd AF pt:	20.8	AF Correlation:	0.999989	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4917	82.3	80.0	79.8	1.003
Mid point	4958	41.2	40.1	40.3	0.994
Low point	4979	20.6	20.0	19.9	1.006
As left zero	5000	0.0	0.0	0.3	----
As left span	4917	82.3	80.0	80.2	0.998
SO2 Scrubber Check	4923	77.1	771.0	0.0	----
Date of last scrubber change:		17-Dec-21		Ave Corr Factor	1.001
Date of last converter efficiency test:					

Notes: Calibration gas changed out after as founds. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

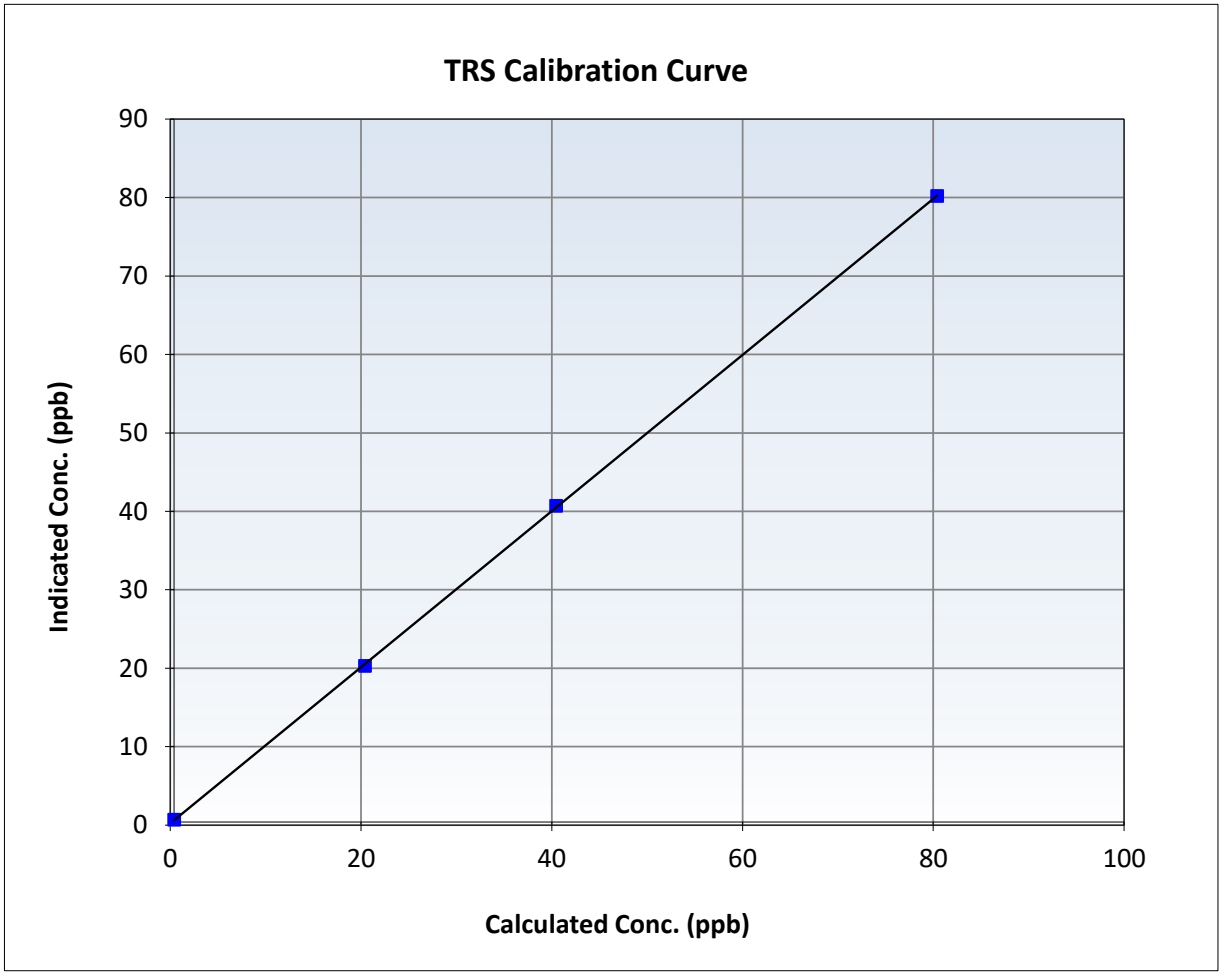
TRS Calibration Summary

Station Information

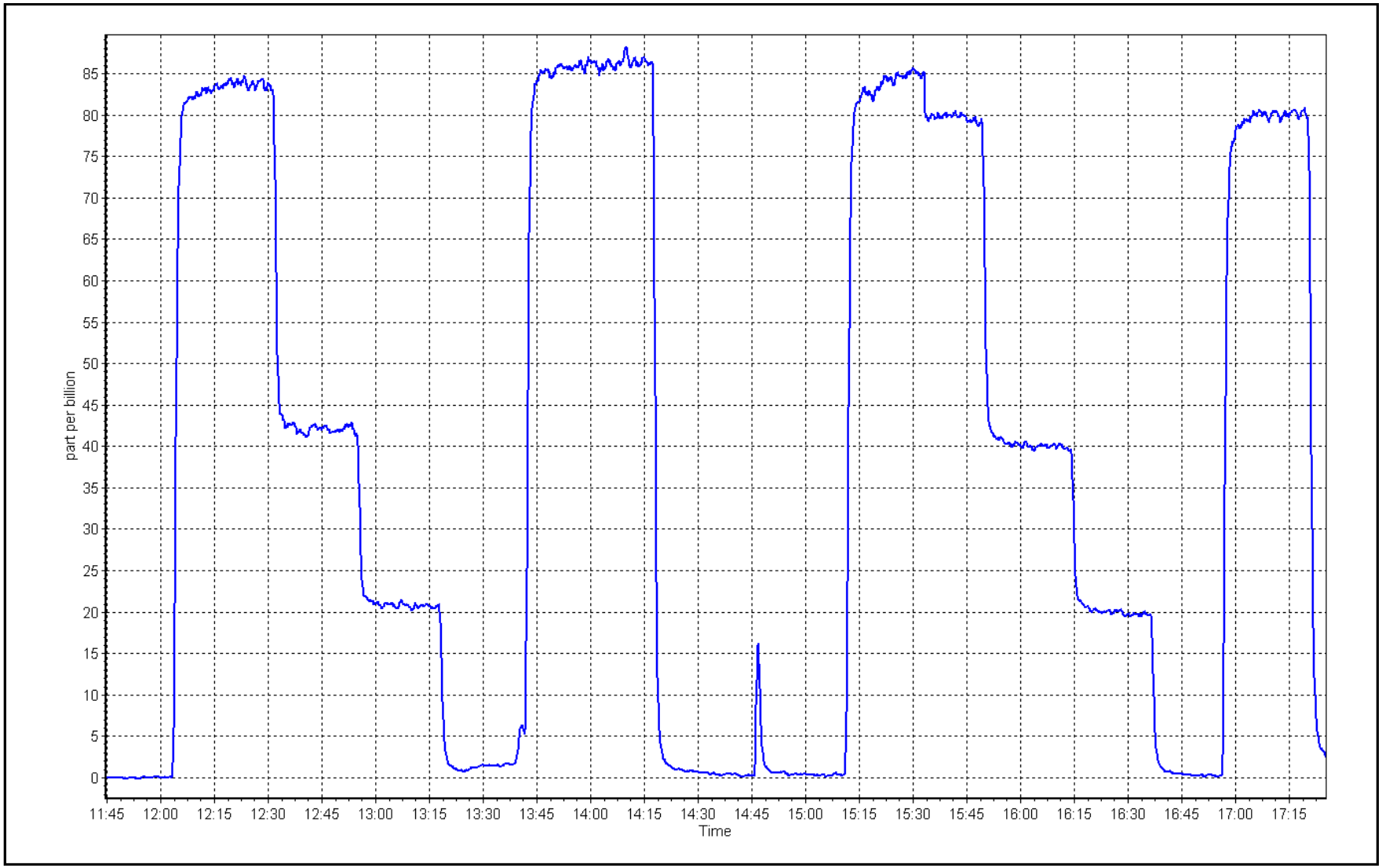
Calibration Date:	January 29, 2025	Previous Calibration:	December 3, 2024
Station Name:	Stony Mountain	Station Number:	AMS18
Start Time (MST):	11:45	End Time (MST):	17:24
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153359

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.3	----	Correlation Coefficient	0.999966	*≥0.995*
80.0	79.8	1.0026	Slope	0.995231	*0.90 - 1.10*
40.1	40.3	0.9939			
20.0	19.9	1.0063	Intercept	0.220919	*+/-3*



TRS Calibration Plot Date: January 29, 2025 Location: Stony Mountain



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 14, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:28	End time (MST):	15:03
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	XC026809B	Cal Gas Expiry Date:	January 12, 2029
CH4 Cal Gas Conc.	504.9 ppm	CH4 Equiv Conc.	1076.6 ppm
C3H8 Cal Gas Conc.	207.9 ppm		
Removed Gas Cert:	CC463851	Removed Gas Expiry:	February 23, 2025
Removed CH4 Conc.	500.8 ppm	CH4 Equiv Conc.	1066.8 ppm
Removed C3H8 Conc.	205.8 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T750	Serial Number:	282
Zero Air Gen model:	Teledyne API T751H	Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.71E-04	2.86E-04	NMHC SP Ratio:	4.16E-05	4.17E-05
CH4 Retention time:	16.4	16.4	NMHC Peak Area:	223110	219476
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4920	80.0	17.07	16.75	1.020
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.73	Prev response	16.83	*% change	-0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.02	----
High point	4920	80.0	17.23	17.26	0.998
Mid point	4960	40.0	8.61	8.65	0.995
Low point	4980	20.0	4.31	4.32	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	17.23	17.38	0.991
				Average Correction Factor	0.996

Notes: Span adjusted.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.0	9.06	9.00	1.006
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.00	Prev response	8.95	*% change	0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.0	9.15	9.15	1.000
Mid point	4960	40.0	4.57	4.59	0.996
Low point	4980	20.0	2.29	2.30	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	9.15	9.23	0.991
				Average Correction Factor	0.998

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.02	----
As found High point	4920	80.0	8.01	7.75	1.037
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.73	Prev response	7.88	*% change	-1.9%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.02	----
High point	4920	80.0	8.08	8.12	0.995
Mid point	4960	40.0	4.04	4.06	0.995
Low point	4980	20.0	2.02	2.03	0.996
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.0	8.08	8.15	0.991
				Average Correction Factor	0.995

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.984207	1.001271
THC Cal Offset:	0.027400	0.018800
CH4 Cal Slope:	0.980986	1.003112
CH4 Cal Offset:	0.017400	0.011200
NMHC Cal Slope:	0.987150	0.999644
NMHC Cal Offset:	0.009600	0.007600

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

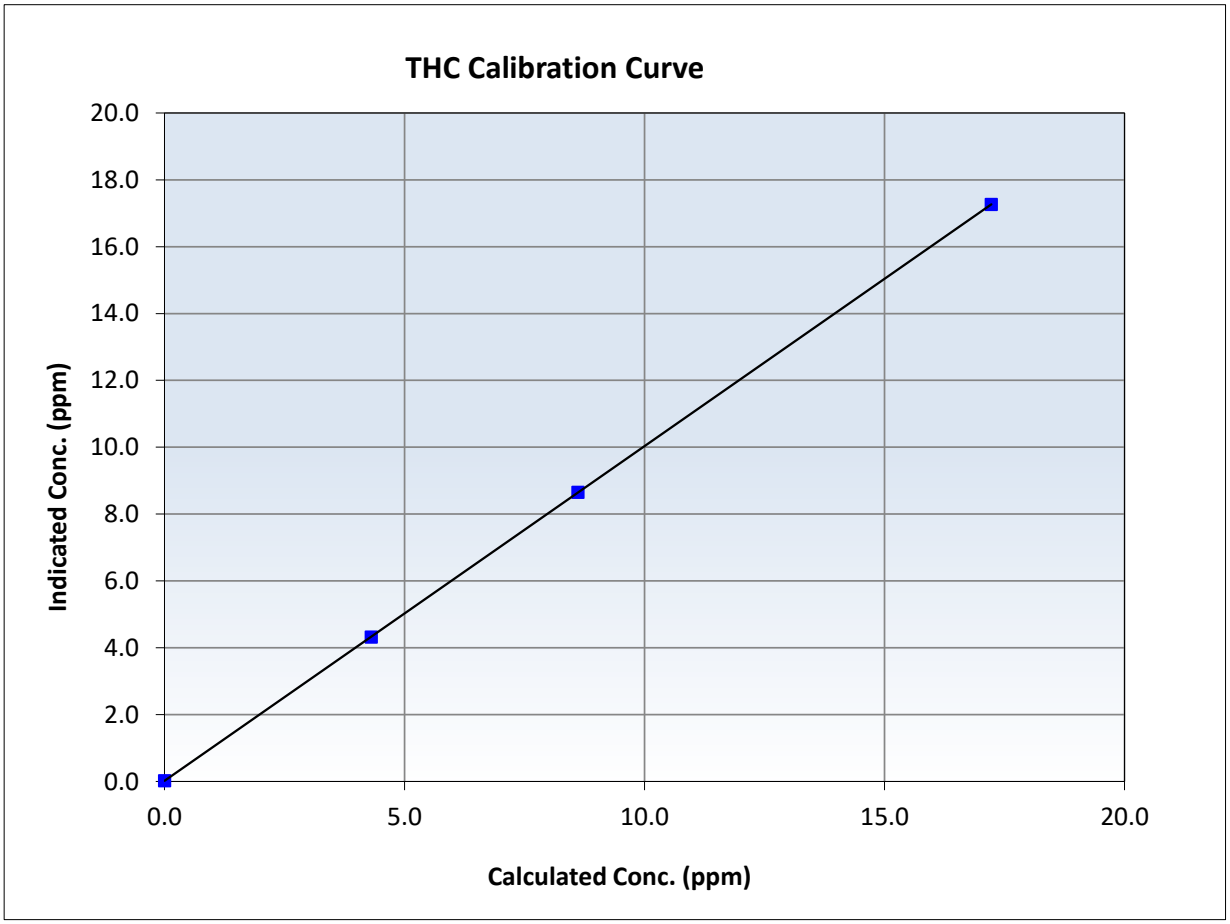
THC Calibration Summary

Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:28	End Time (MST):	15:03
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.02	----	Correlation Coefficient	0.999999	≥0.995
17.23	17.26	0.9978	Slope	1.001271	0.90 - 1.10
8.61	8.65	0.9955			
4.31	4.32	0.9962	Intercept	0.018800	+/-0.5



Wood Buffalo Environmental Association

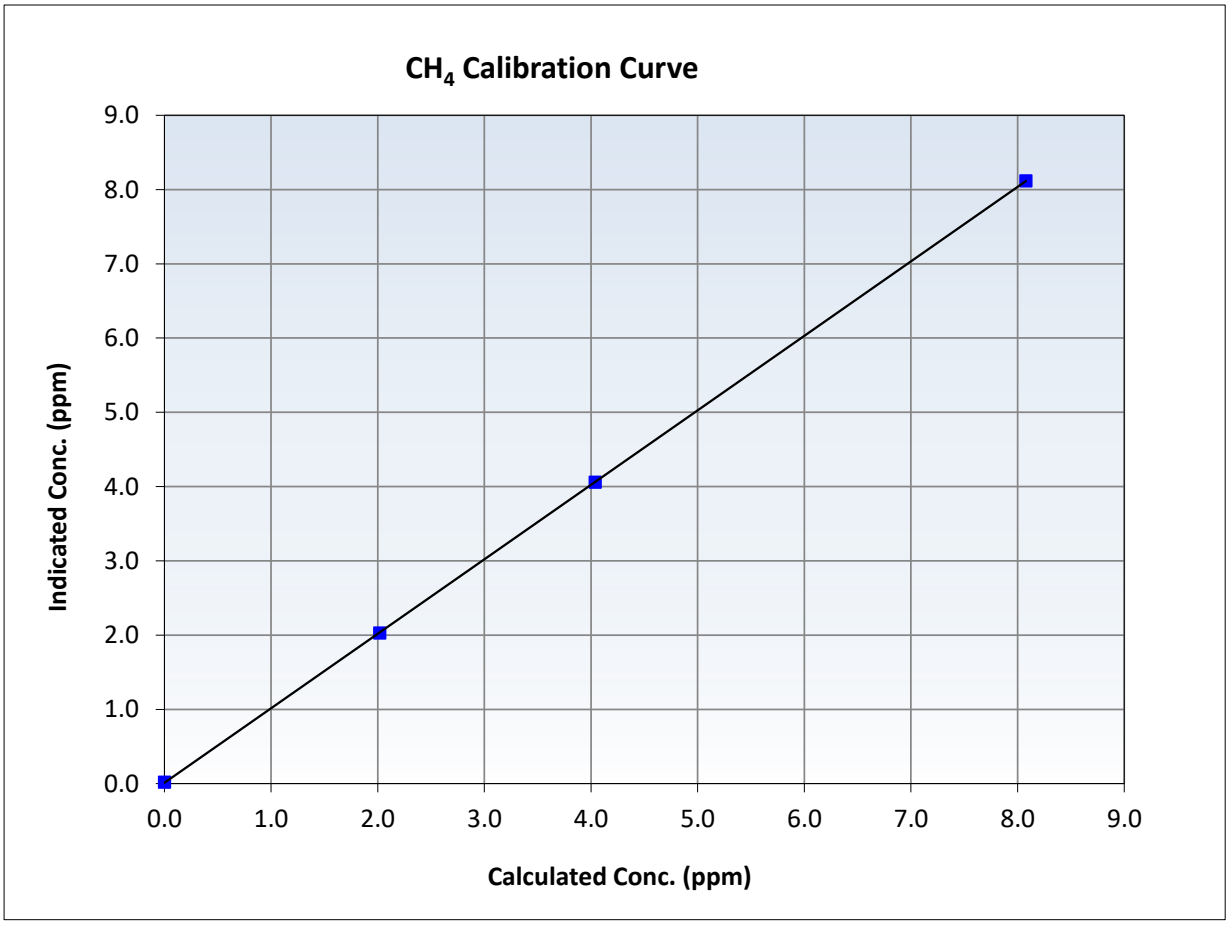
CH_4 Calibration Summary

Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:28	End Time (MST):	15:03
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.02	----	Correlation Coefficient	0.999995	*≥0.995*
8.08	8.12	0.9950	Slope	1.003112	*0.90 - 1.10*
4.04	4.06	0.9951	Intercept	0.011200	*+/-0.5*
2.02	2.03	0.9959			



Wood Buffalo Environmental Association

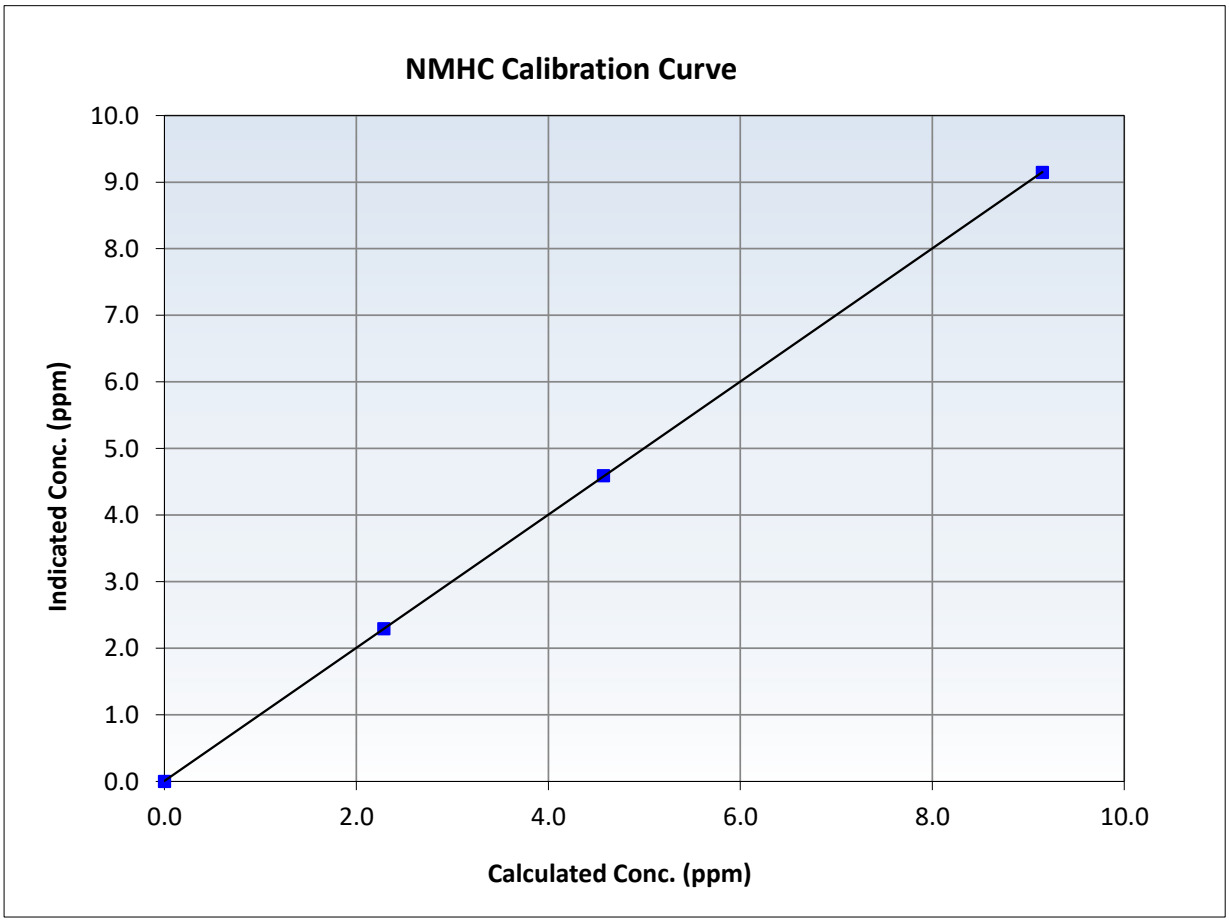
NMHC Calibration Summary

Station Information

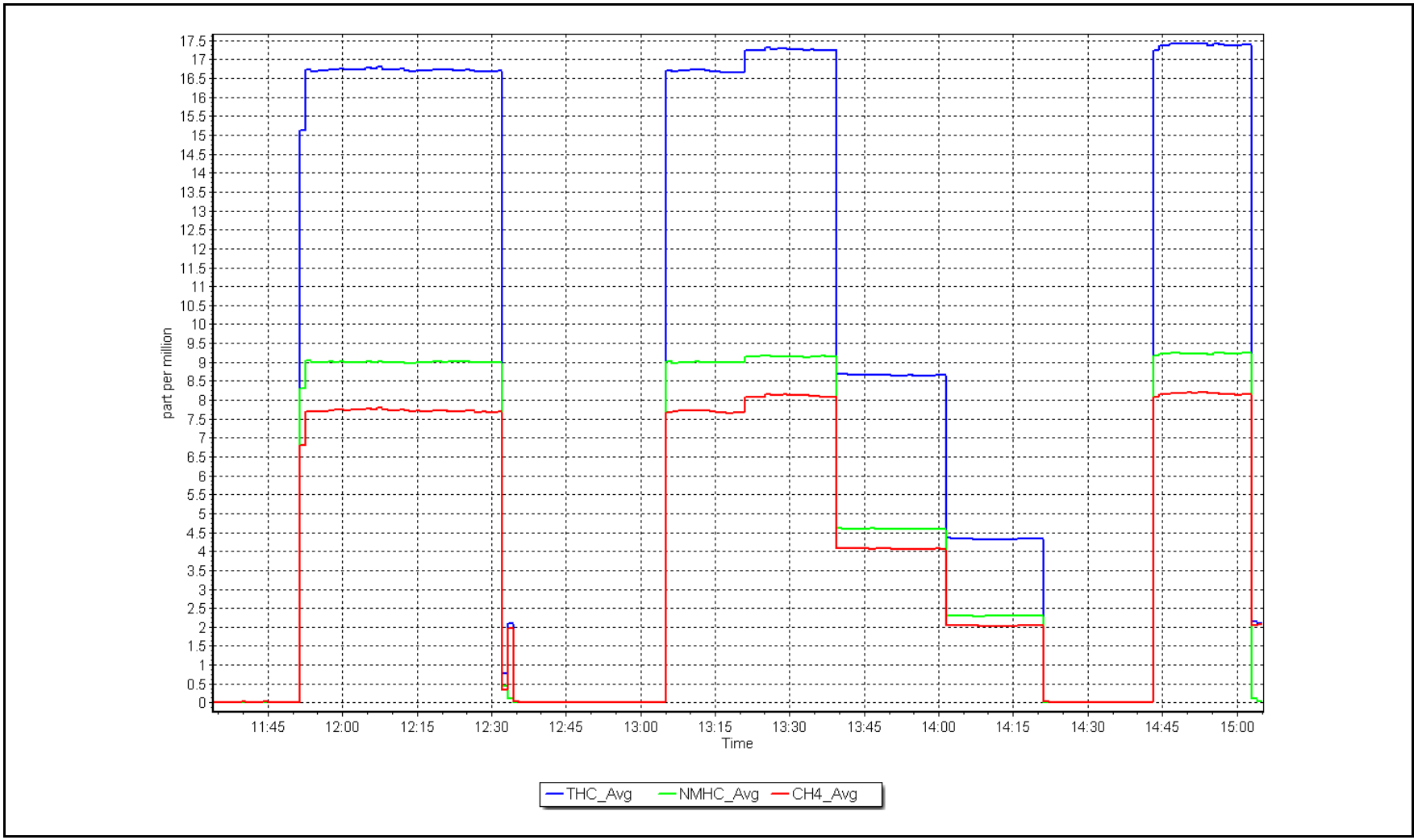
Calibration Date:	January 14, 2025	Previous Calibration:	December 5, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:28	End Time (MST):	15:03
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999994	≥0.995
9.15	9.15	1.0003	Slope	0.999644	0.90 - 1.10
4.57	4.59	0.9958			
2.29	2.30	0.9965	Intercept	0.007600	+/-0.5



NMHC Calibration Plot Date: January 14, 2025 Location: Stony Mountain



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Stony Mountain
Station number:	AMS 18
Calibration Date:	January 29, 2025
Last Cal Date:	December 20, 2024
Start time (MST):	11:55
End time (MST):	17:23
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0045516	Cal Gas Expiry Date:	November 17, 2026
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:	N/A	Removed Gas Exp Date:	N/A
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T750	Serial Number:	282
ZAG make/model:	Teledyne API 751H	Serial Number:	321

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-2.3	-1.9	-0.4	----	----
AF High point	4933	66.6	803.3	800.6	2.7	809.4	809.8	-0.4	0.9896	0.9863
AF Mid point										
AF Low point										
New cyl resp										

Previous Respo	4933	NO_X = 803.0 ppb	NO = 800.9 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	1.1%
Baseline Corr 1st pt		NO_X = 811.7 ppb	NO = 811.7 ppb	As Found Statistics	*Percent Change	NO =	1.3%
Baseline Corr 2nd pt		NO_X = NA ppb	NO = NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt		NO_X = NA ppb	NO = NA ppb	As found NO r^2:	NO Sl:	NO Int:	
				As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 1035

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.932	0.921	NO bkgnd or offset:	-38.0	-35.3
NOX coeff or slope:	0.929	0.915	NOX bkgnd or offset:	-37.1	-35.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	7.2	6.9

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999821	0.998552
NO_X Cal Offset:	-0.148573	0.772118
NO Cal Slope:	1.001637	1.002474
NO Cal Offset:	-0.969502	0.112537
NO_2 Cal Slope:	1.001892	0.996438
NO_2 Cal Offset:	1.135453	-0.482407

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.4	0.1	----	----
High point	4933	66.6	803.3	800.6	2.7	801.7	802.4	-0.6	1.0019	0.9978
Mid point	4967	33.3	401.6	400.2	1.3	404.2	401.7	2.4	0.9935	0.9964
Low point	4983	16.6	200.2	199.5	0.7	200.5	200.6	-0.2	0.9986	0.9948
As left zero										
As left span										
								Average Correction Factor	0.9980	0.9963

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	800.4	421.2	381.9	380.8	1.0028	99.7%
Mid GPT point	800.4	615.7	187.4	184.4	1.0161	98.4%
Low GPT point	800.4	708.9	94.2	93.8	1.0039	99.6%
				Average Correction Factor	1.0076	99.3%

Notes: Portable calibration system used. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

NO_X Calibration Summary

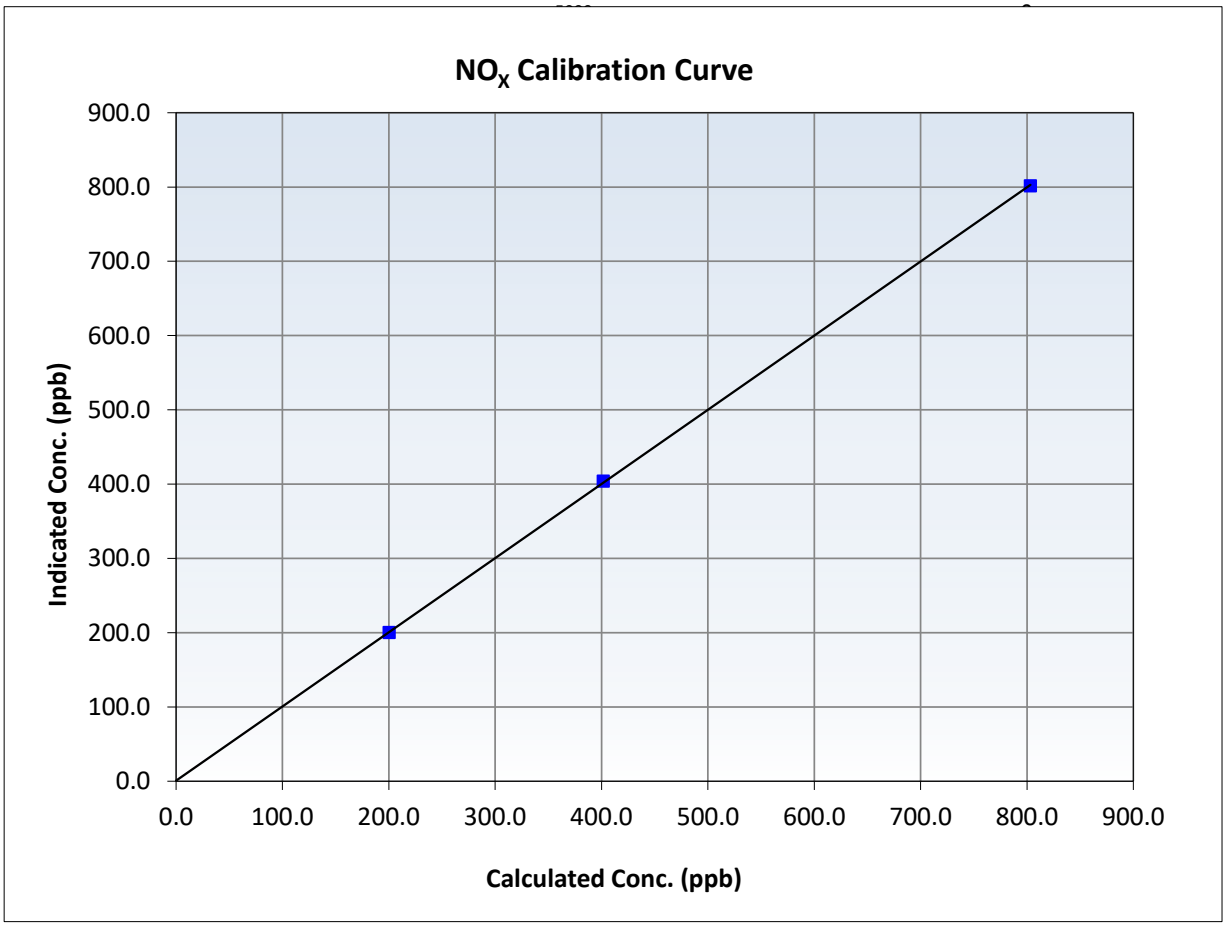
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	December 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	17:23
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
803.3	801.7	1.0019
401.6	404.2	0.9935
200.2	200.5	0.9986

Statistical Evaluation		Limits
Correlation Coefficient	0.999976	≥0.995
Slope	0.998552	0.90 - 1.10
Intercept	0.772118	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

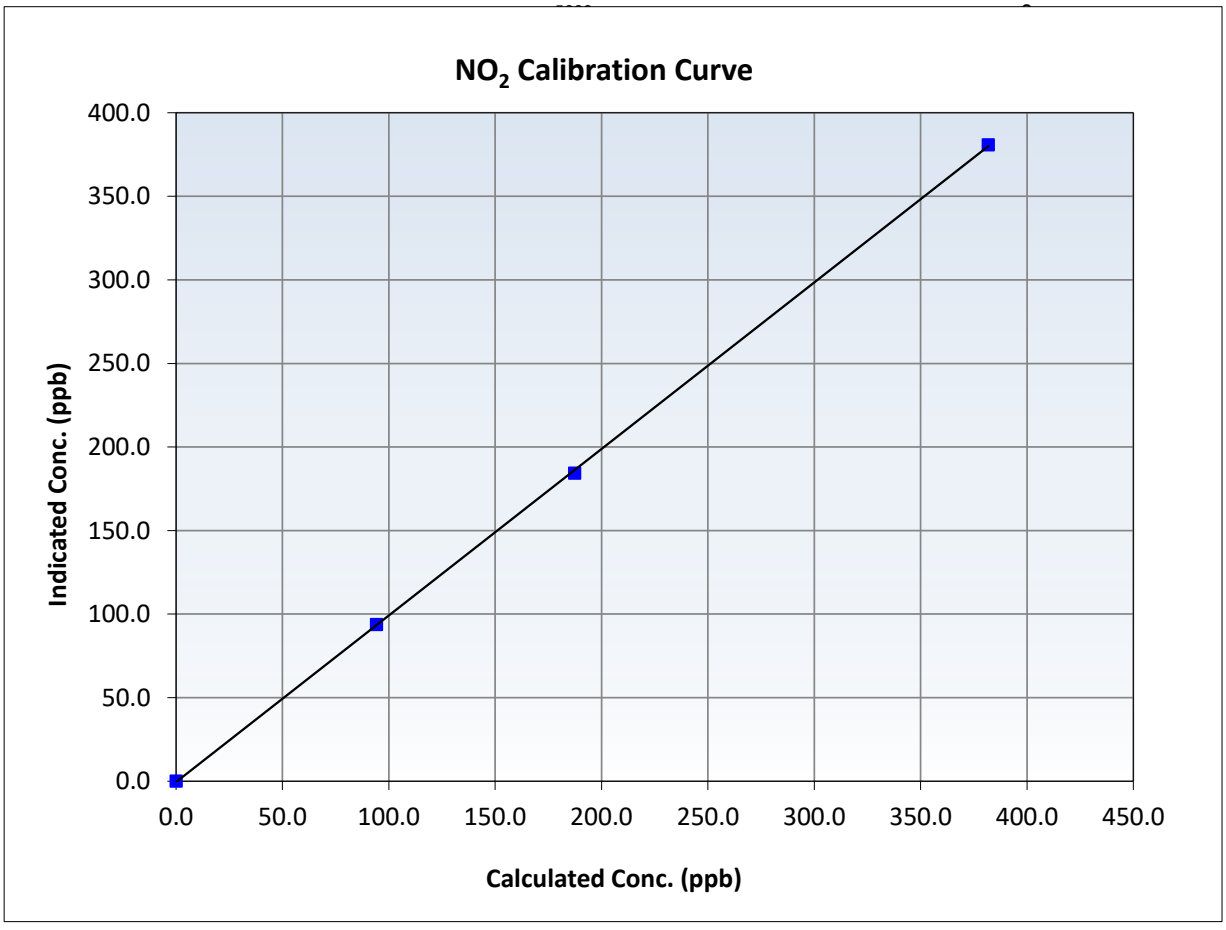
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	December 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	17:23
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
381.9	380.8	1.0028
187.4	184.4	1.0161
94.2	93.8	1.0039

Statistical Evaluation		Limits
Correlation Coefficient	0.999944	≥0.995
Slope	0.996438	0.90 - 1.10
Intercept	-0.482407	+/-20



Wood Buffalo Environmental Association

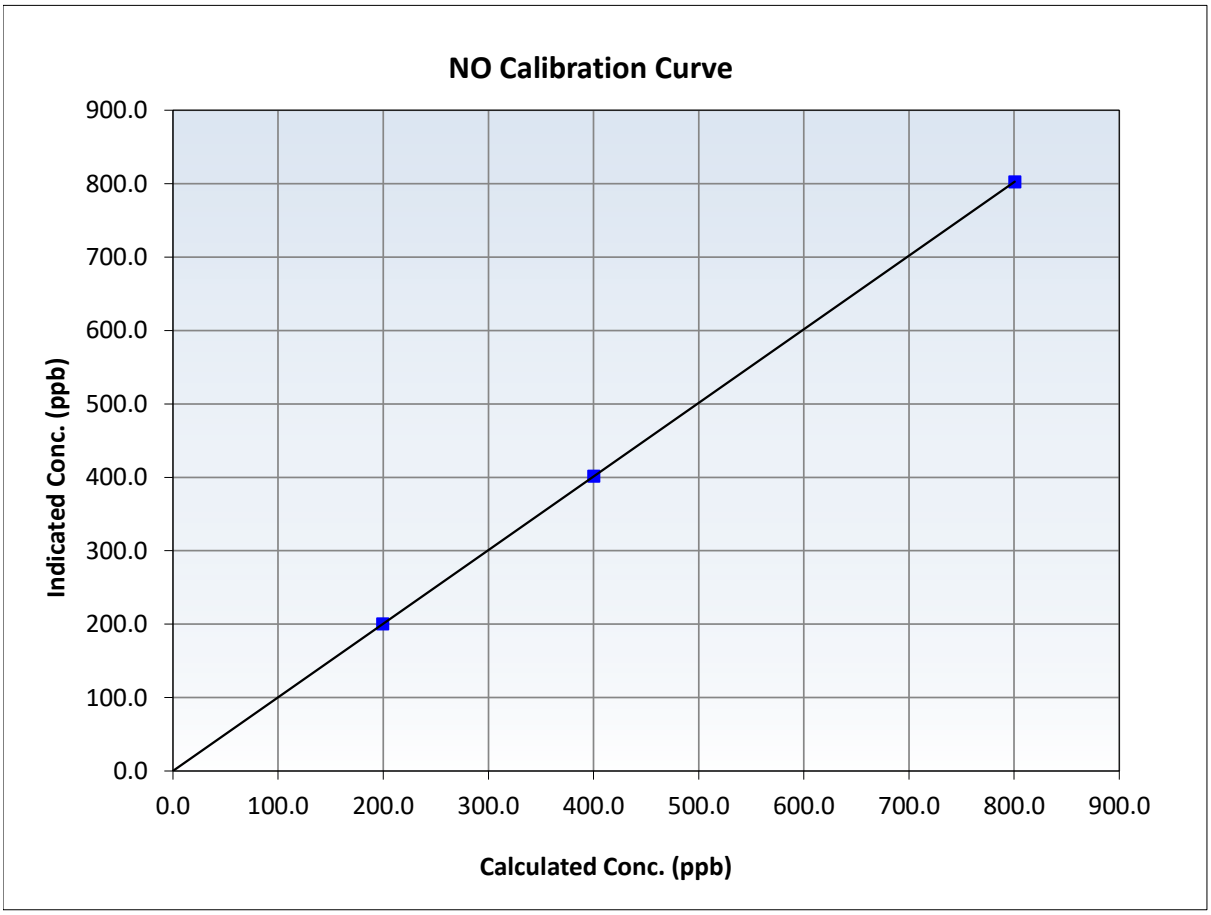
NO Calibration Summary

Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	December 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:55	End Time (MST):	17:23
Analyzer make:	Teledyne API T200	Analyzer serial #:	1035

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	-0.4	----	Correlation Coefficient	0.999998	*≥0.995*
800.6	802.4	0.9978	Slope	1.002474	*0.90 - 1.10*
400.2	401.7	0.9964			
199.5	200.6	0.9948	Intercept	0.112537	*+/-20*
		5000		0	
		4933		66.6	



NO_X Calibration Plot Date: January 29, 2025 Location: Stony Mountain

Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 6, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	10:50	End time (MST):	13:57
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	2658
ZAG Make/Model:	Teledyne API 701H	Serial Number:	355

Analyzer Information

Analyzer make:	API T400		Analyzer serial #:	825	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003457	0.990286	Backgd or Offset:	2.0	2.0
Calibration intercept:	0.220000	1.000000	Coeff or Slope:	1.009	1.009

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	NA	0.0	0.4	----
As found High point	4888	1138.1	400.0	398.3	1.005
As found Mid point					
As found Low point					
Baseline Corr As found:	397.9	Previous response	401.6	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	NA	0.0	0.6	----
High point	4888	1138.1	400.0	396.7	1.008
Mid point	4888	884.5	200.0	199.9	1.001
Low point	4888	741.4	100.0	100.0	1.000
As left zero	5000	NA	0.0	1.3	----
As left span	4812	1097.9	400.0	398.8	1.003
				Average Correction Factor	1.003

Notes: No adjustment needed.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

O_3 Calibration Summary

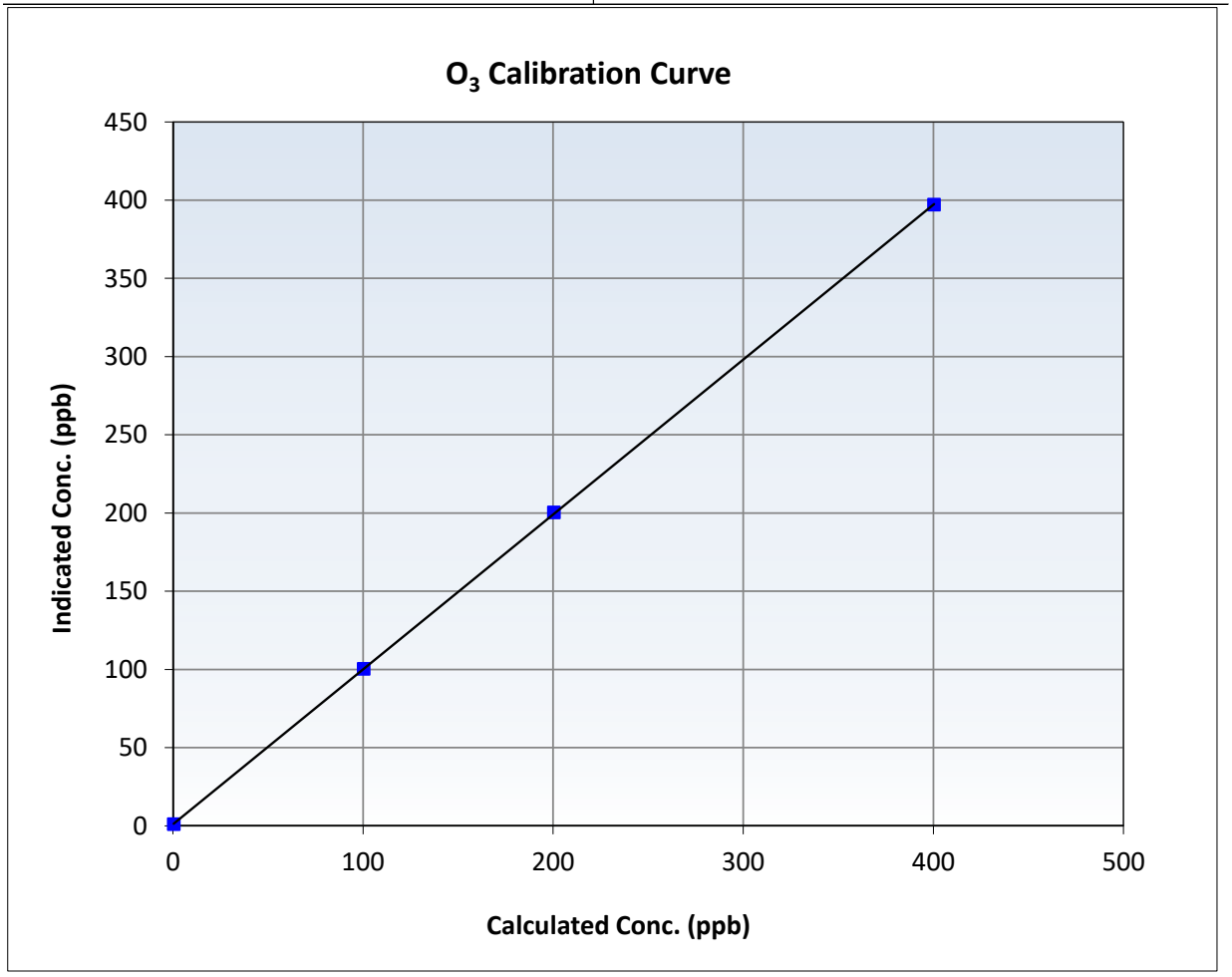
Station Information

Calibration Date:	January 6, 2025	Previous Calibration:	December 4, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:50	End Time (MST):	13:57
Analyzer make:	API T400	Analyzer serial #:	825

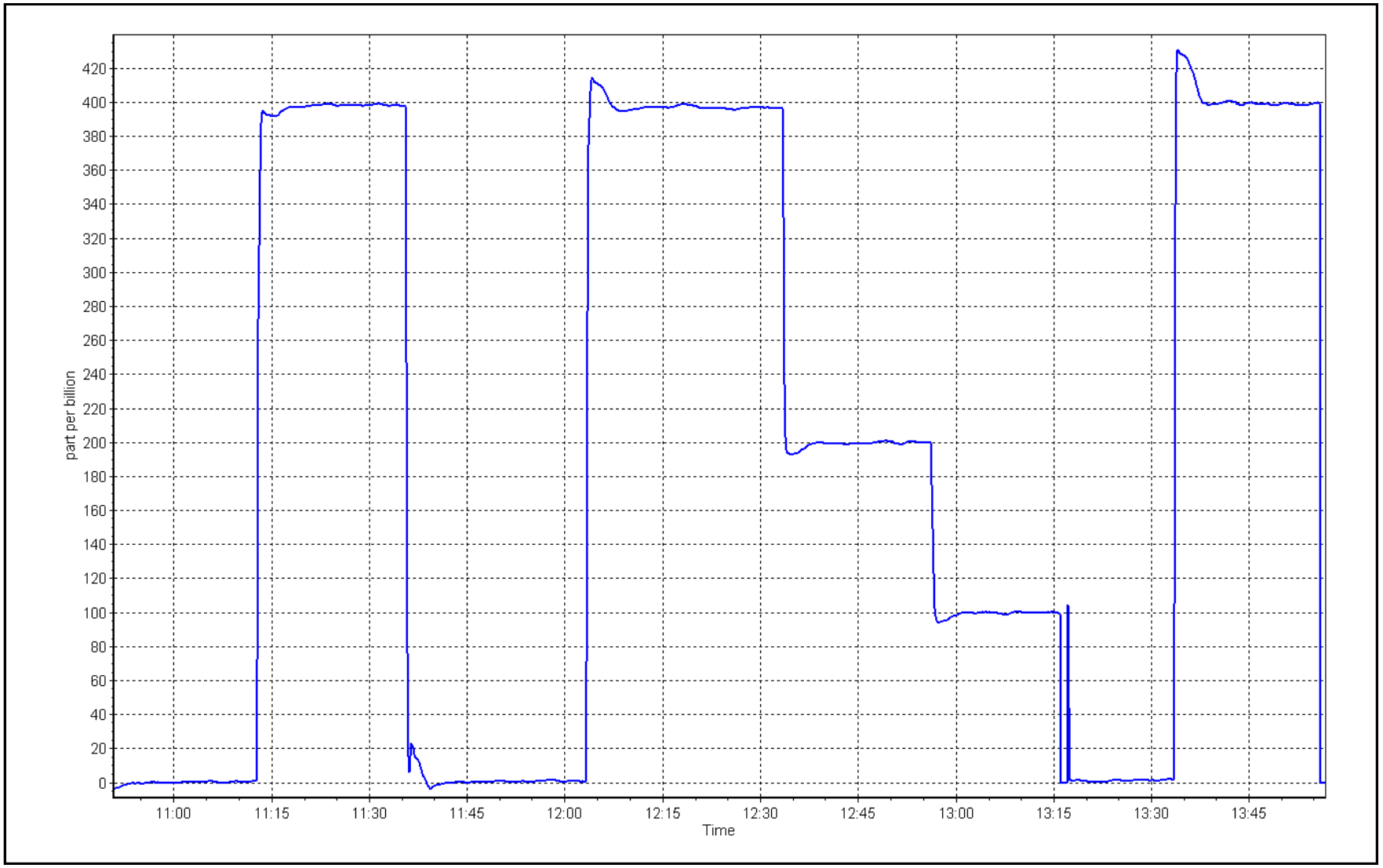
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
400.0	396.7	1.0083
200.0	199.9	1.0005
100.0	100.0	1.0000

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999988	*≥0.995*
Slope	0.990286	*0.90 - 1.10*
Intercept	1.000000	*+/- 5*



O_3 Calibration Plot Date: January 6, 2025 Location: Stony Mountain



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 31, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	14:34	End time (MST):	15:11
Analyzer Make:	API T640	S/N:	324
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388750
Temp/RH standard:	Alicat FP-25BT	S/N:	388750

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (^{o}C)	-14.3	-15.2	-14.3	☐	+/- 2 ^{o}C
P (mmHg)	699.2	697.50	699.2	☐	+/- 10 mmHg
Flow (LPM)	5.00	5.05	5.00	☐	+/- 0.25 LPM
PW% (pump)	57	-----	57	☐	>80%
Zero Verification	PM w/o HEPA:	1.9	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: October 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	N/A	N/A	N/A	☐	+/- 0.5

Date Optical Chamber Cleaned: September 24, 2024

Date Disposable Filter Changed: December 20, 2024

Post- maintenance Zero Verification: PM w/ HEPA: N/A <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: July 4, 2024

Date RH/T Sensor Cleaned: July 4, 2024

Notes: Flow, temp and pressure checked. Leak check passed.

Calibration by: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 7, 2025	Last Cal Date:	December 17, 2024
Start time (MST):	11:30	End time (MST):	14:31
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	3,080	ppm	Cal Gas Exp Date:	November 4, 2028
Cal Gas Cylinder #:	EB0065608			
Removed Cal Gas Conc:	3,080	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 T701H		Serial Number:	355

Analyzer Information

Analyzer make:	Teledyne API T300		Analyzer serial #:	3504	
Analyzer Range:	0 - 50 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.010873	0.998188	Backgd or Offset:	-0.012	-0.012
Calibration intercept:	0.123780	0.161778	Coeff or Slope:	0.909	0.905

CO 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4933	66.7	41.1	42.0	0.982
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	41.83	Prev response:	41.66	*% 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	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4933	66.7	41.1	41.1	1.000
Mid point	4966	33.3	20.5	20.8	0.986
Low point	4983	16.7	10.3	10.4	0.989
As left zero	5000	0.0	0.0	0.1	----
As left span	4933	66.7	41.1	41.3	0.996
				Average Correction Factor	0.992

Notes: Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO Calibration Summary

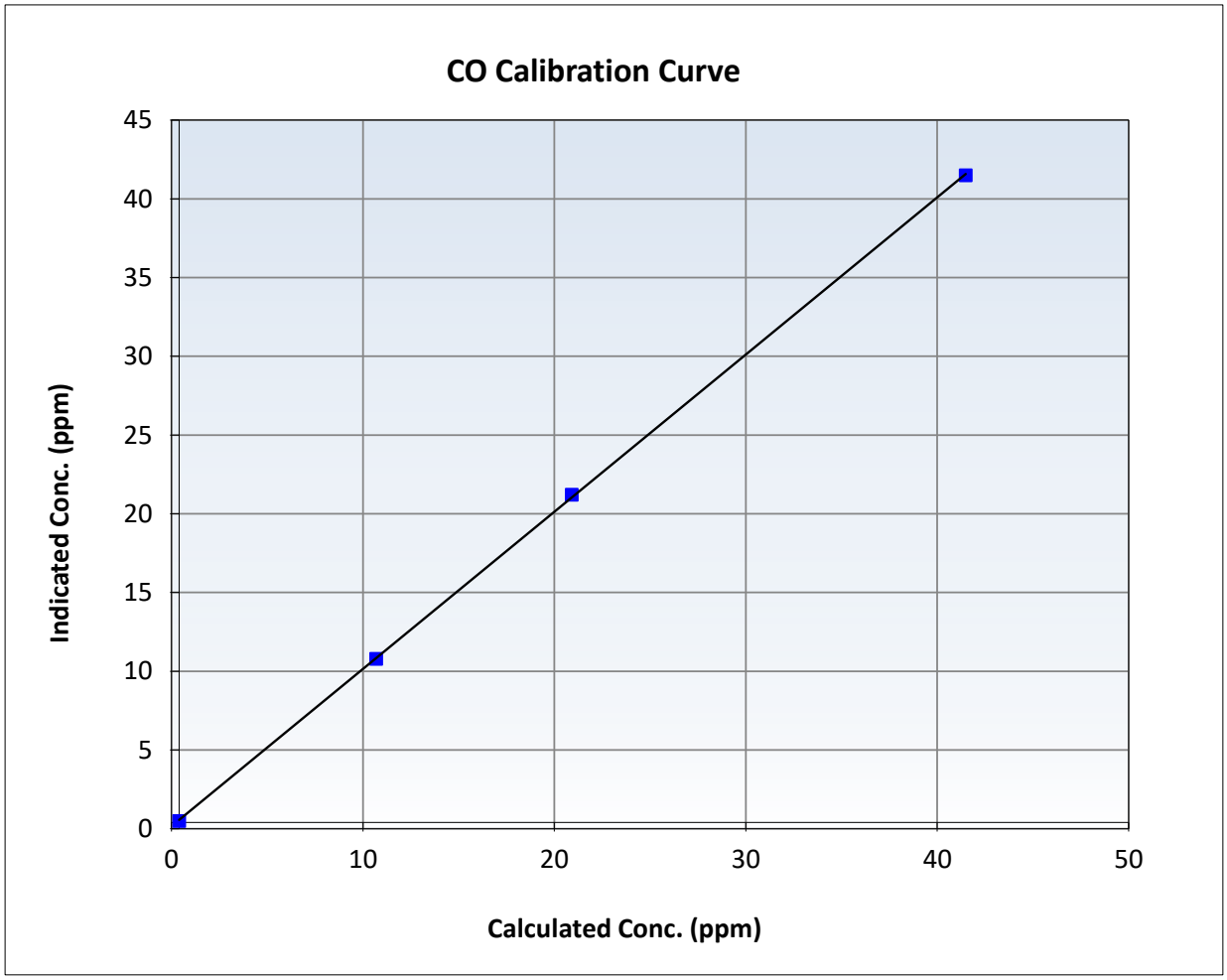
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 17, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:30	End Time (MST):	14:31
Analyzer make:	Teledyne API T300	Analyzer serial #:	3504

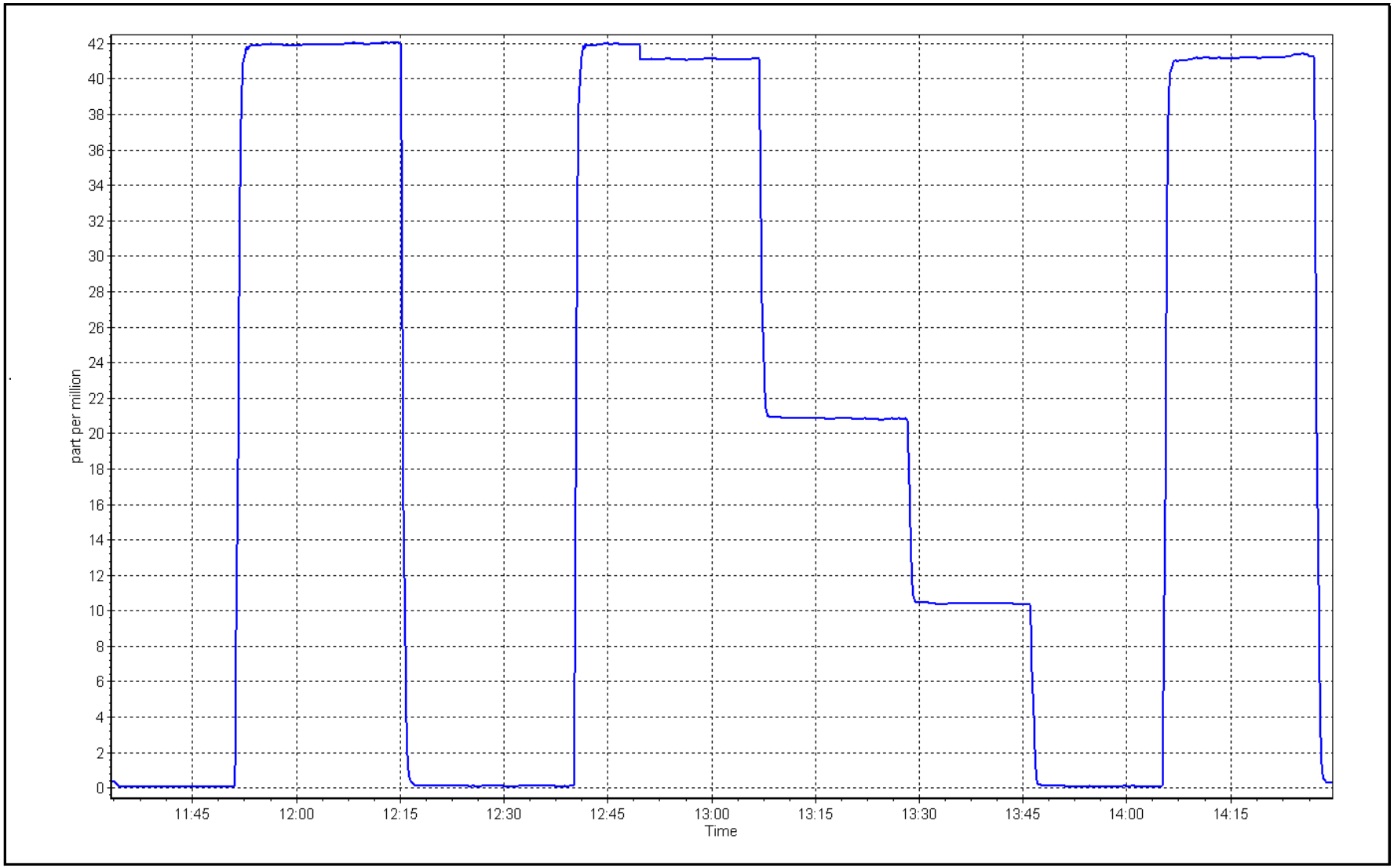
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
41.1	41.1	0.9997
20.5	20.8	0.9859
10.3	10.4	0.9892

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999957	*≥0.995*
Slope	0.998188	*0.90 - 1.10*
Intercept	0.161778	*+/-1.5*



CO Calibration Plot Date: January 7, 2025 Location: Stony Mountain



Wood Buffalo Environmental Association

CO_2 Calibration Report

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	January 31, 2025	Last Cal Date:	December 18, 2024
Start time (MST):	12:00	End time (MST):	15:18
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	59,100	ppm	Cal Gas Exp Date:	November 4, 2028
Cal Gas Cylinder #:	EB0065608			
Removed Cal Gas Conc:	59,100	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:	Zero Air Cylinder		Serial Number:	N/A

Analyzer Information

Analyzer make:	API T360		Analyzer serial #:	489	
Analyzer Range	0 - 2,000 ppm				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000819	1.000065	Backgd or Offset:	-0.068	-0.068
Calibration intercept:	-4.740000	-3.020000	Coeff or Slope:	0.961	0.964

CO_2 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) *Limit = 0.90-1.10*
As found zero	3000	0.0	0.0	0.0	----
As found High Point	2920	80.0	1576.0	1554.0	1.014
As found Mid Point					
As found Low Point					
New cylinder response					

Baseline Corr As found:	1554.0	Prev response:	1572.6	*% 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	

CO_2 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) *Limit = 0.95-1.05*
Calibrator zero	3000	0.0	0.0	0.3	----
High point	2920	80.0	1576.0	1577.0	0.999
Mid point	2960	40.0	788.0	776.6	1.015
Low point	2980	20.0	394.0	392.2	1.005
As left zero	3000	0.0	0.0	0.0	----
As left span	2930	80.0	1570.8	1573.0	0.999
				Average Correction Factor	1.006

Notes: Zero air cylinder used for calibration. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar

Wood Buffalo Environmental Association

CO_2 Calibration Summary

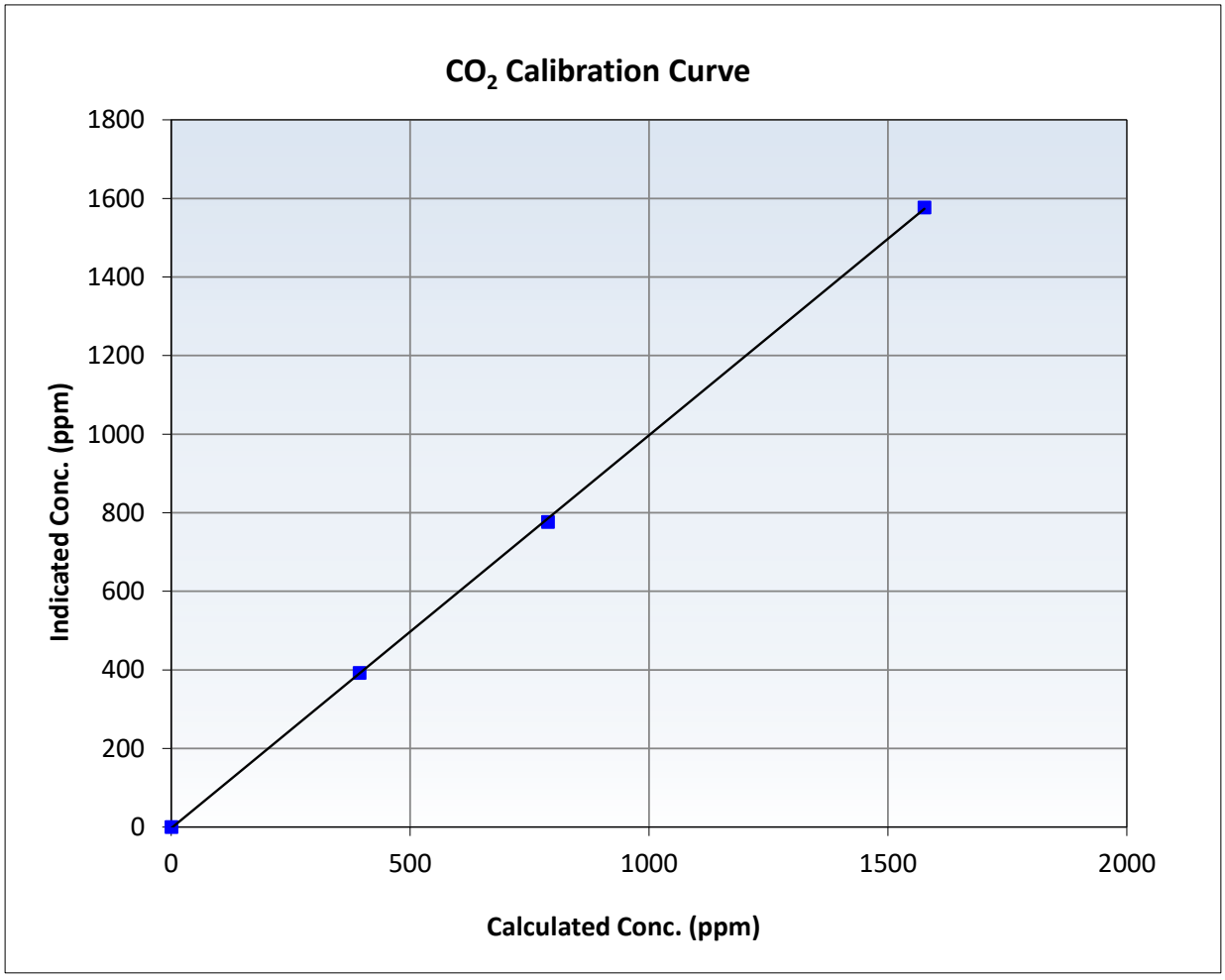
Station Information

Calibration Date	January 31, 2025	Previous Calibration	December 18, 2024
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	12:00	End Time (MST)	15:18
Analyzer make	API T360	Analyzer serial #	489

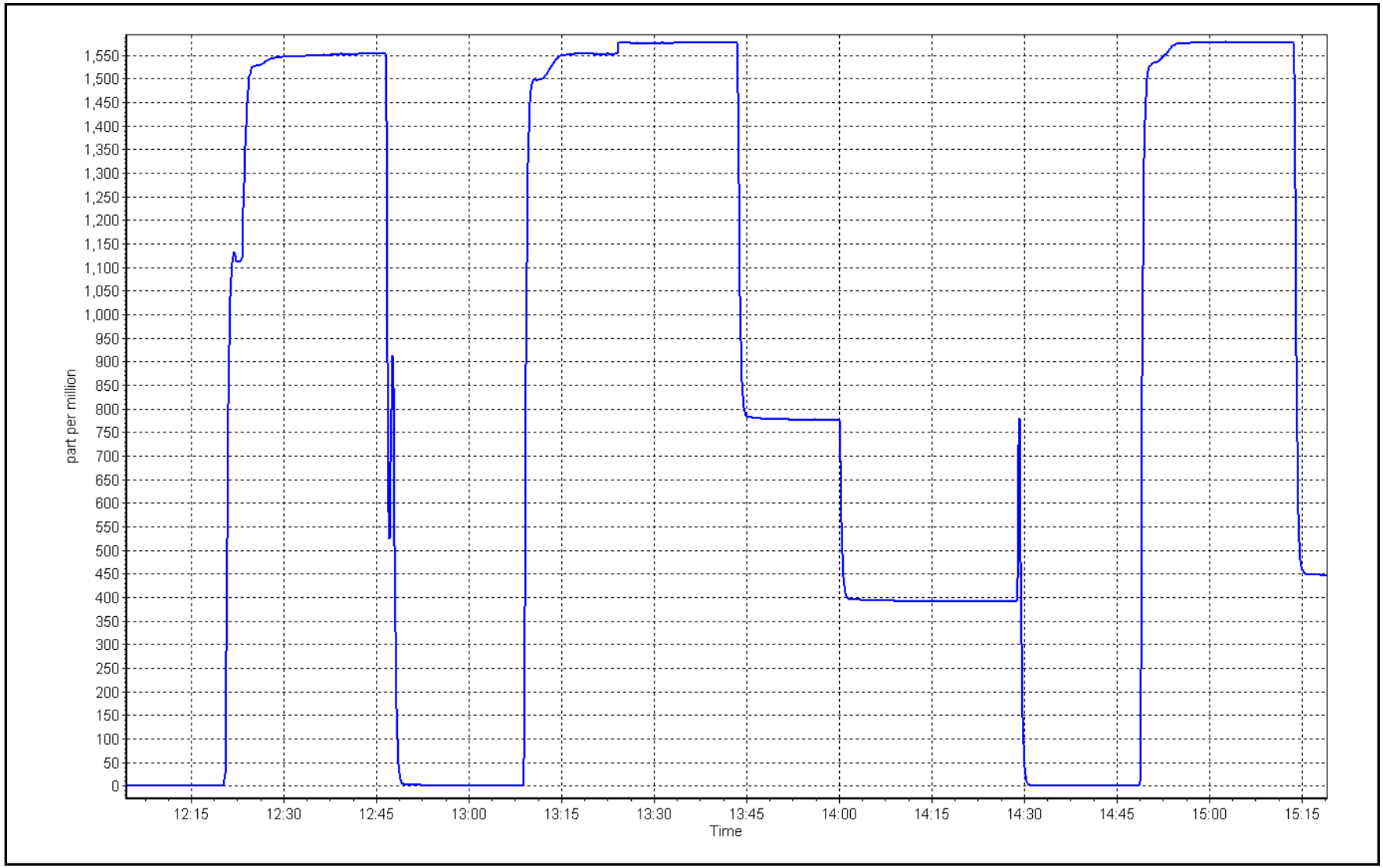
Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
1576.0	1577.0	0.9994
788.0	776.6	1.0147
394.0	392.2	1.0046

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999927	*≥0.995*
Slope	1.000065	*0.90 - 1.10*
Intercept	-3.0	*+/-20*



CO_2 Calibration Plot Date: January 31, 2025 Location: Stony Mountain



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS19
FIREBAG
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	January 30, 2025	Last Cal Date:	December 16, 2024
Start time (MST):	12:48	End time (MST):	17:35
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.97	ppm	Cal Gas Exp Date:	October 9, 2032
Cal Gas Cylinder #:	CC705799			
Removed Cal Gas Conc:	49.29	ppm	Rem Gas Exp Date:	February 23, 2025
Removed Gas Cyl #:	CC716618		Diff between cyl:	-2.3%
Calibrator Model:	Teledyne API T700		Serial Number:	1607
Zero Air Gen Model:	Teledyne API T701H		Serial Number:	201

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1410661308	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003024	1.007152	Backgd or Offset:	10.5	11.6
Calibration intercept:	0.856640	-0.380000	Coeff or Slope:	0.981	1.016

SO_2 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) *Limit = 0.90-1.10*
As found zero	4999	0.0	0.0	-0.1	----
As found High point	4919	81.1	799.5	798.1	1.002
As found Mid point	4959	40.6	400.3	401.0	0.998
As found Low point	4980	20.3	200.1	200.5	0.998
New cylinder response	4922	78.4	799.2	779.6	1.025
Baseline Corr As found:	798.2	Previous response	802.7	*% change	-0.6%
Baseline Corr 2nd AF pt:	401.1	AF Slope:	0.998277	AF Intercept:	0.517853
Baseline Corr 3rd AF pt:	200.6	AF Correlation:	0.999996	* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	4999	0.0	0.0	-0.2	----
High point	4922	78.4	799.2	805.0	0.993
Mid point	4961	39.2	399.6	400.9	0.997
Low point	4980	19.6	199.8	201.4	0.992
As left zero	4999	0.0	0.0	0.0	----
As left span	4922	78.4	799.2	812.0	0.984
				Average Correction Factor:	0.994

Notes: Swapped inlet filter and calibration gas after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

SO_2 Calibration Summary

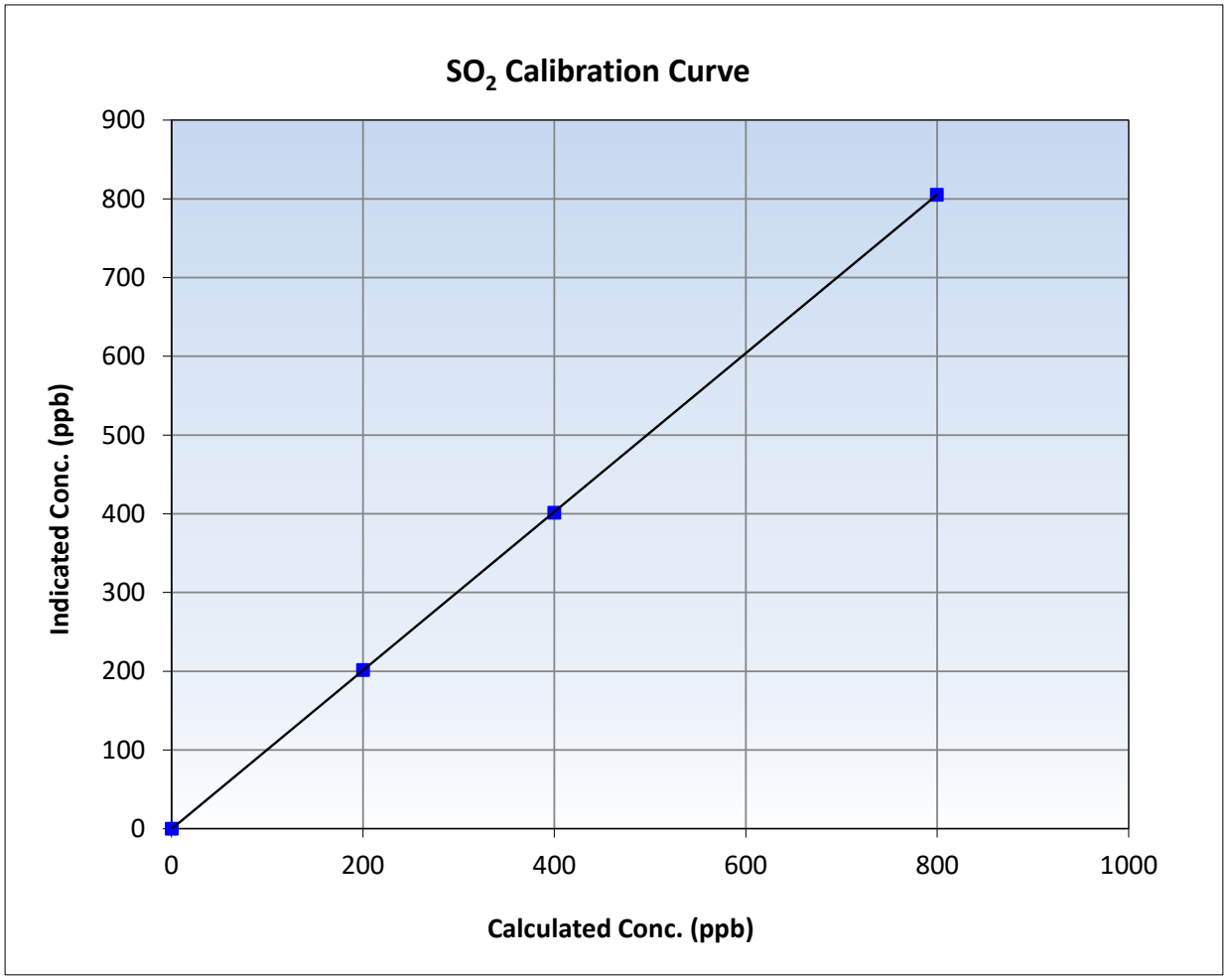
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 16, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	12:48	End Time (MST):	17:35
Analyzer make:	Thermo 43i	Analyzer serial #:	1410661308

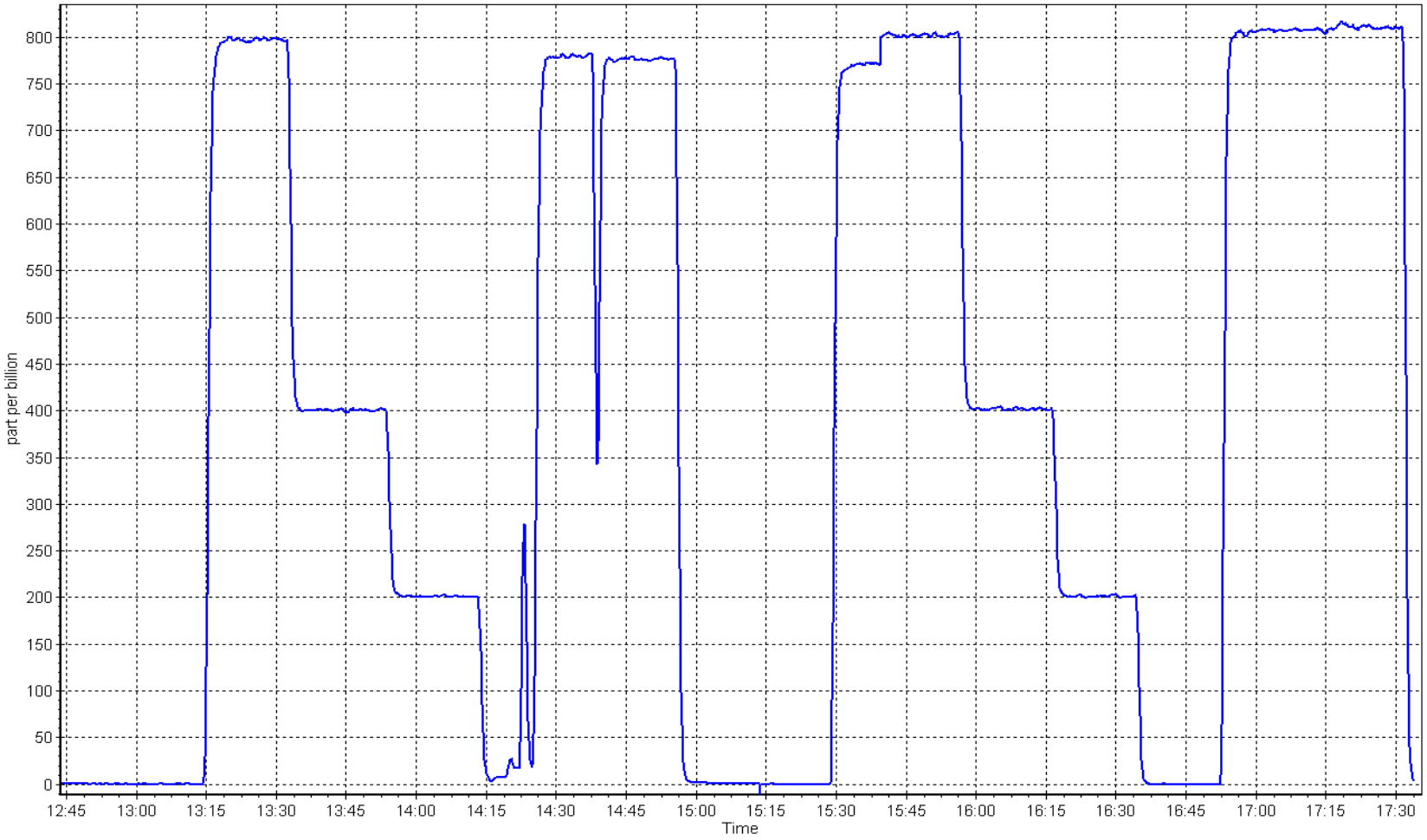
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
799.2	805.0	0.9928
399.6	400.9	0.9968
199.8	201.4	0.9921

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.007152	*0.90 - 1.10*
Intercept	-0.380000	*+/-30*



SO2 Calibration Plot Date: January 30, 2025 Location: Firebag



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	January 21, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	11:20	End time (MST):	16:23
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.29	ppm	Cal Gas Exp Date:	March 19, 2027
Cal Gas Cylinder #:	DT0010492			
Removed Cal Gas Conc:	5.29	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607
ZAG Make/Model:	Teledyne API T701		Serial Number:	201

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680032
Converter make:	Global		Converter serial #:	2022-222
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.989902	0.991760	Backgd or Offset:	2.98	2.95
Calibration intercept:	0.360000	0.120000	Coeff or Slope:	1.215	1.215

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4924	75.6	80.0	80.0	1.001
As found Mid point	4962	37.8	40.0	40.1	1.000
As found Low point	4981	18.9	20.0	20.2	0.995
New cylinder response					

Baseline Corr As found:	79.9	Prev response:	79.54	*% change:	0.5%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.998475	AF Intercept:	0.160000
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999997	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4924	75.6	80.0	79.4	1.007
Mid point	4962	37.8	40.0	39.9	1.002
Low point	4981	18.9	20.0	19.9	1.005
As left zero	5000	0.0	0.0	0.2	----
As left span	4924	75.6	80.0	78.8	1.015
SO2 Scrubber Check	4922	78.3	783.0	0.0	----
Date of last scrubber change:		18-Jan-23		Ave Corr Factor	1.005
Date of last converter efficiency test:		November 26, 2024		106.2%	efficiency

Notes: Changed sample inlet filter after as founds. Completed scrubber test after calibrator zero. No adjustments made.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

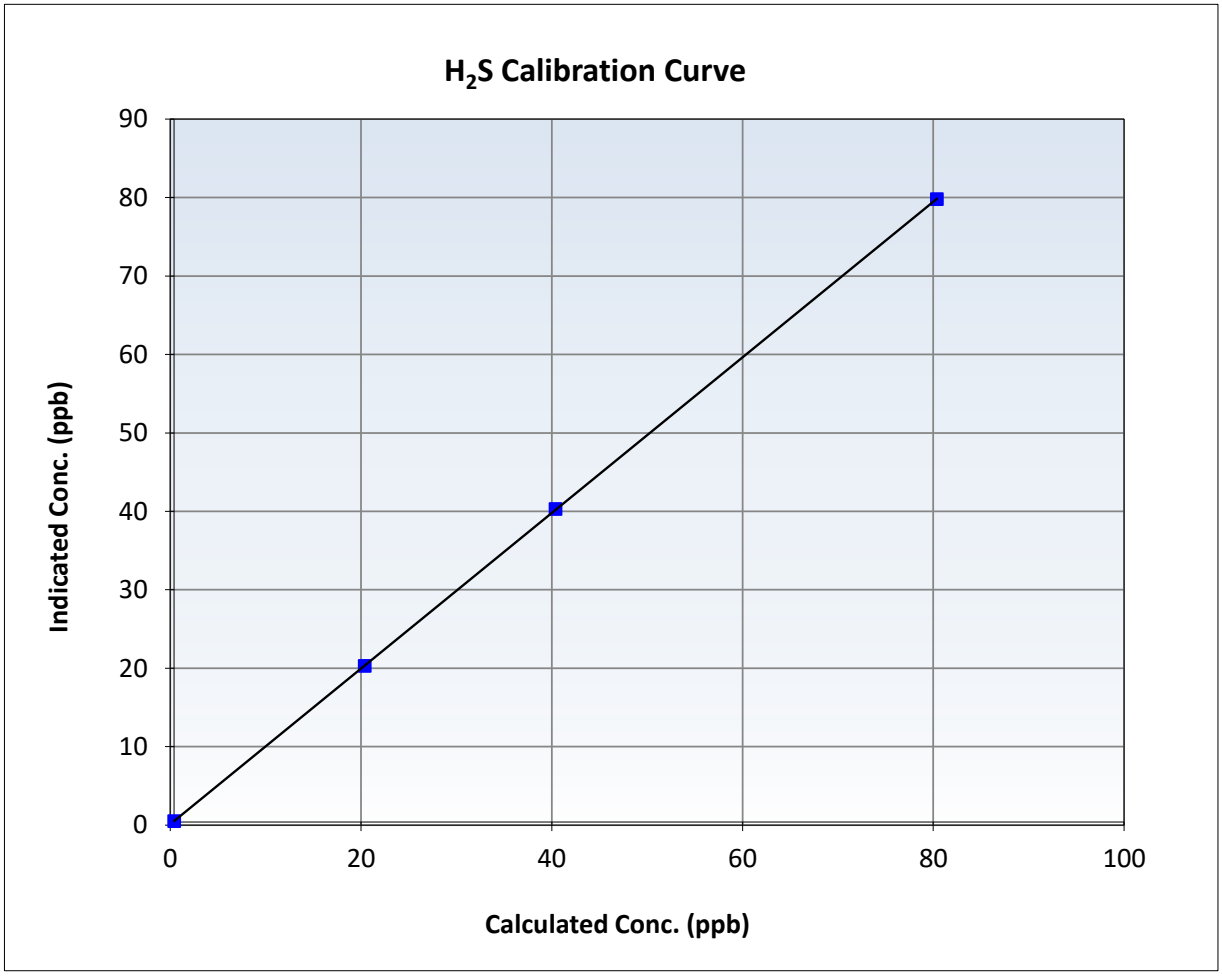
H2S Calibration Summary

Station Information

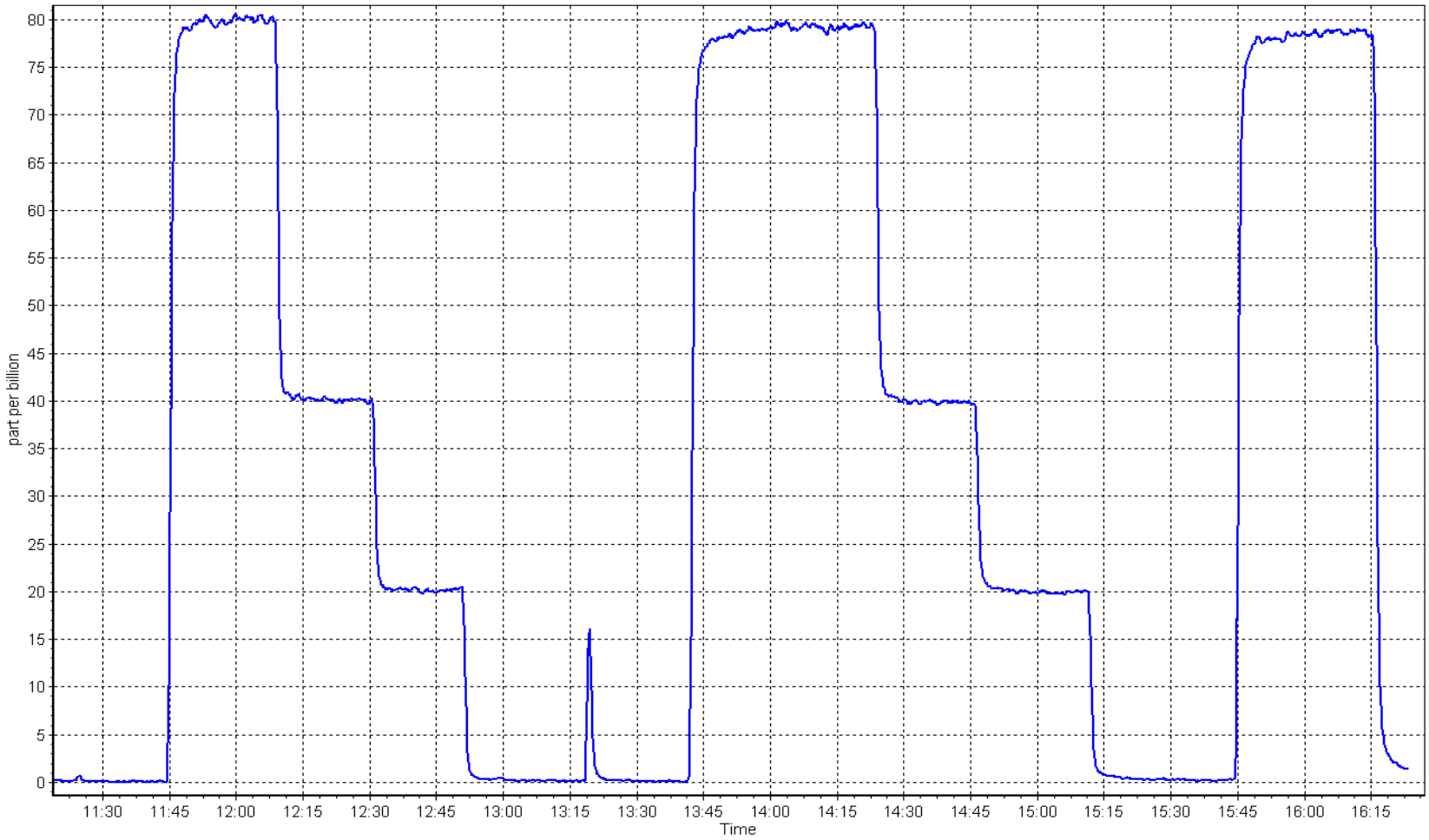
Calibration Date:	January 21, 2025	Previous Calibration:	December 6, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:20	End Time (MST):	16:23
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680032

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.1	----	Correlation Coefficient	0.999995	*≥0.995*
80.0	79.4	1.0074	Slope	0.991760	*0.90 - 1.10*
40.0	39.9	1.0023			
20.0	19.9	1.0048	Intercept	0.120000	*+/-3*



H2S Calibration Plot Date: January 21, 2025 Location: Firebag



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	January 30, 2025	Last Cal Date:	December 16, 2024
Start time (MST):	12:48	End time (MST):	17:35
Reason:	Routine		

Calibration Standards

Gas Cert Reference:		CC705799	Cal Gas Expiry Date:	October 9, 2032	
CH4 Cal Gas Conc.	505.1	ppm	CH4 Equiv Conc.	1066.9	ppm
C3H8 Cal Gas Conc.	204.3	ppm			
Removed Gas Cert:		CC716618	Removed Gas Expiry:	February 23, 2025	
Removed CH4 Conc.	500.7	ppm	CH4 Equiv Conc.	1066.9	ppm
Removed C3H8 Conc.	205.9	ppm	Diff between cyl:	0.5%	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607	
ZAG Make/Model:	Teledyne API T701H		Serial Number:	201	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1336160089

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.993942	0.999029	Background:	1.91	2.07
Calibration intercept:	0.054452	-0.029334	Coefficient:	3.851	3.876

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	4999	0.0	0.00	0.13	----
As found High point	4919	81.1	17.31	17.31	1.007
As found Mid point	4959	40.6	8.66	8.64	1.018
As found Low point	4980	20.3	4.33	4.31	1.036
New cylinder response	4922	78.4	16.73	16.82	0.995

Baseline Corr As found:	17.19	Previous response	17.25	*% change	-0.4%
Baseline Corr 2nd AF pt:	8.52	AF Slope:	0.994828	AF Intercept:	0.059486
Baseline Corr 3rd AF pt:	4.18	AF Correlation:	0.999933	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	4999	0.0	0.00	-0.03	----
High point	4922	78.4	16.73	16.68	1.003
Mid point	4961	39.2	8.36	8.34	1.003
Low point	4980	19.6	4.18	4.14	1.011
As left zero	5000	0.0	0.00	-0.04	----
As left span	4922	78.4	16.73	16.75	0.999
				Average Correction Factor	1.005

Notes: Swapped inlet filter and calibration gas after as founds. Adjusted zero and span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

THC Calibration Summary

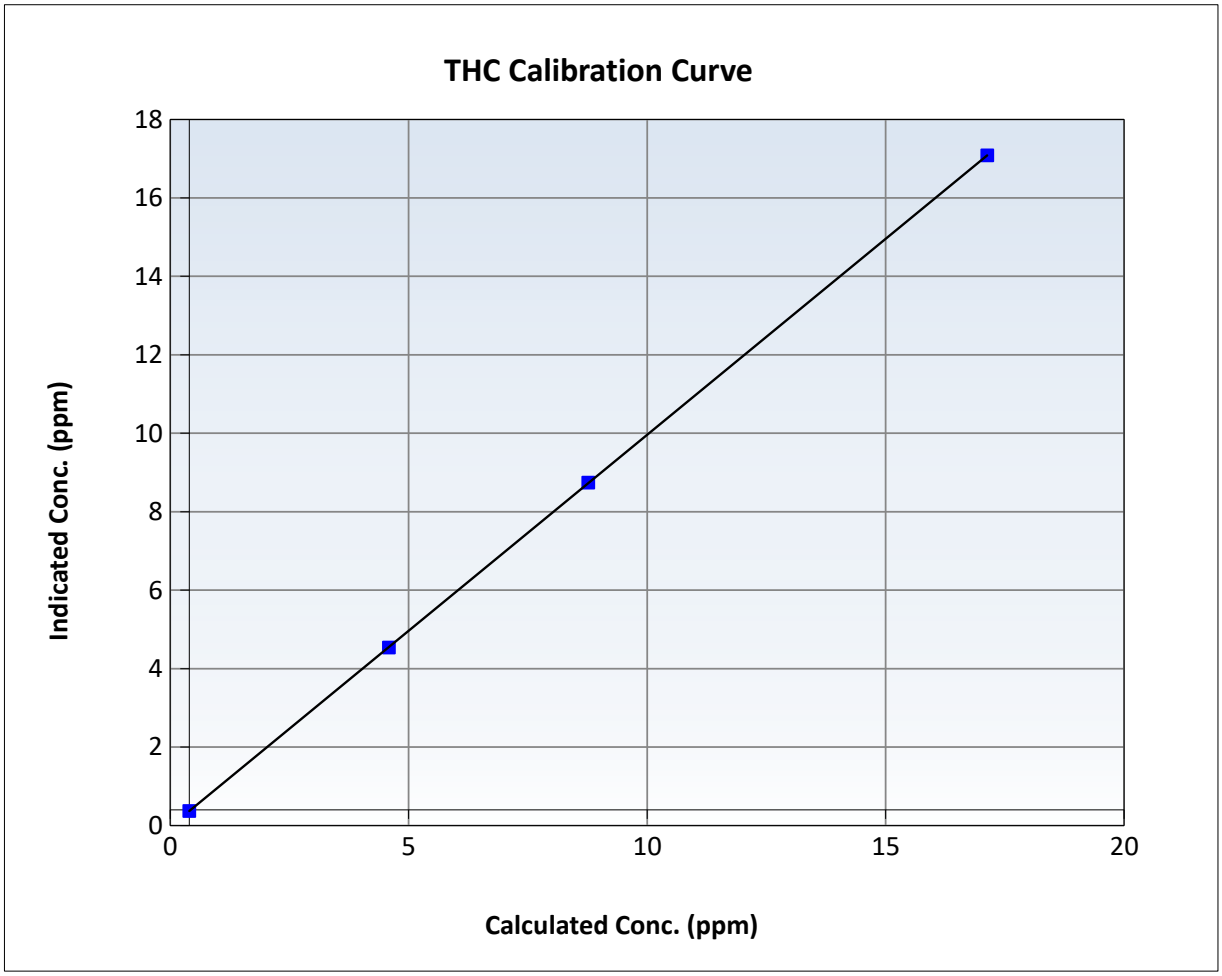
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 16, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	12:48	End Time (MST):	17:35
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1336160089

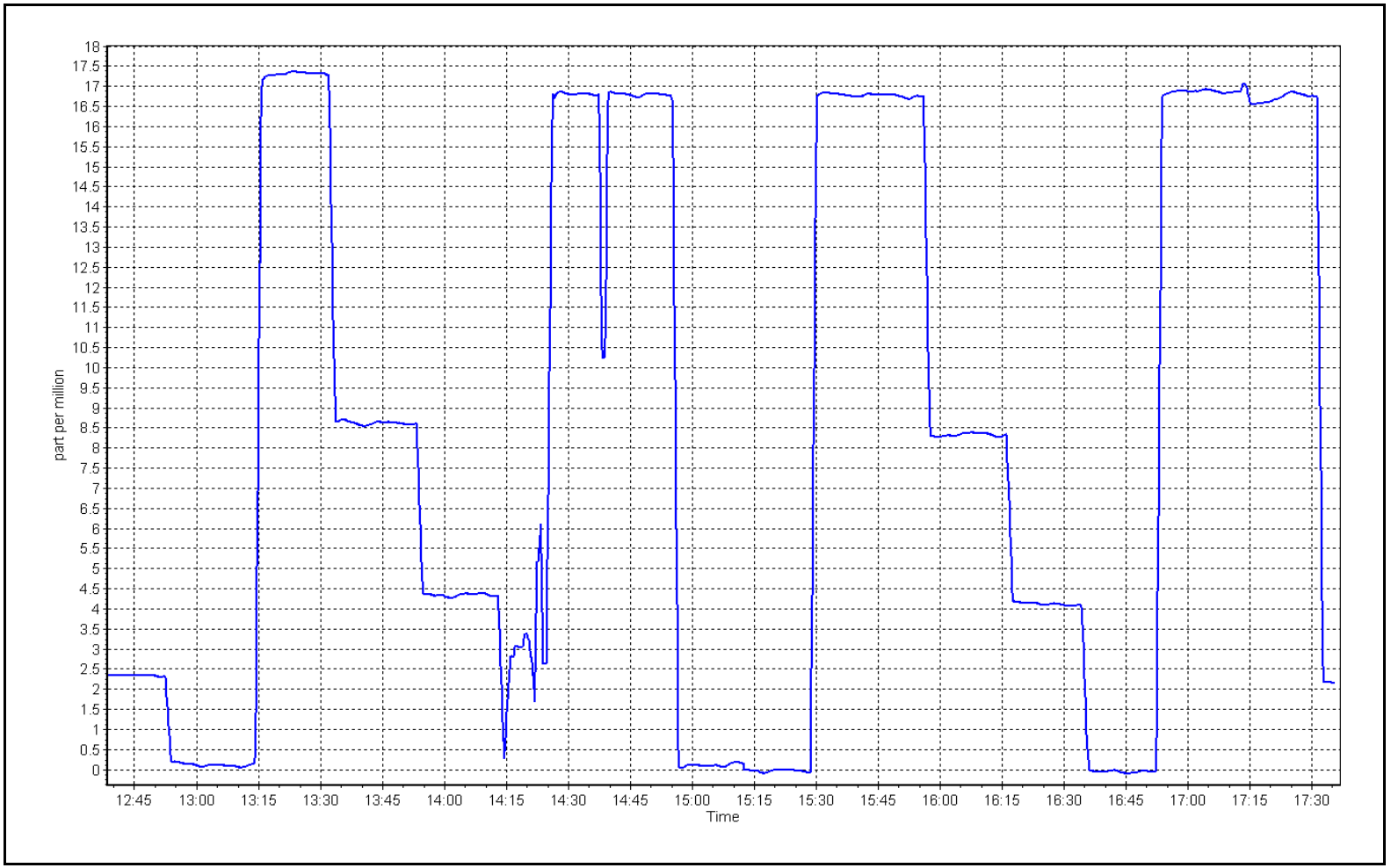
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	-0.03	----
16.73	16.68	1.0030
8.36	8.34	1.0030
4.18	4.14	1.0106

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.999029	*0.90 - 1.10*
Intercept	-0.029334	*+/-1.5*



THC Calibration Plot Date: January 30, 2025 Location: Firebag



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Firebag
Station number:	AMS 19
Calibration Date:	January 14, 2025
Last Cal Date:	December 17, 2024
Start time (MST):	11:48
End time (MST):	16:34
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0044018	Cal Gas Expiry Date:	November 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	1607
ZAG make/model:	Teledyne API T701H	Serial Number:	201

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
AF High point	4918	82.1	802.9	799.7	3.3	797.4	792.2	5.2	1.0068	1.0093
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 803.4 ppb	NO = 801.1 ppb
Baseline Corr 1st pt	NO_X = 797.5 ppb	NO = 792.3 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = -0.7%

*Percent Change NO = -1.1%

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1410661309

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.903	0.911	NO bkgnd or offset:	4.5	4.5
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	4.5	4.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	164.2	160.8

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.999383	0.991757
NO_X Cal Offset:	0.920189	2.099672
NO Cal Slope:	1.001559	0.991001
NO Cal Offset:	0.219979	1.739169
NO_2 Cal Slope:	1.007368	0.999850
NO_2 Cal Offset:	-0.236154	-0.987634

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4918	82.1	802.9	799.7	3.3	797.2	792.9	4.3	1.0072	1.0085
Mid point	4959	41.1	402.0	400.3	1.6	402.3	400.6	1.7	0.9991	0.9993
Low point	4980	20.5	200.5	199.7	0.8	202.7	200.5	2.3	0.9891	0.9959
As left zero	5000	0	0.0	0.0	0.0	0.0	-0.1	0.1	----	----
As left span	4918	82.1	802.9	475.8	327.1	802.0	475.8	326.6	1.0012	1.0000
								Average Correction Factor	0.9985	1.0012

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	797.8	416.4	384.7	384.1	1.0015	99.8%
Mid GPT point	797.8	606.5	194.6	193.2	1.0072	99.3%
Low GPT point	797.8	703.1	98.0	95.9	1.0217	97.9%
				Average Correction Factor	1.0101	99.0%

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

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

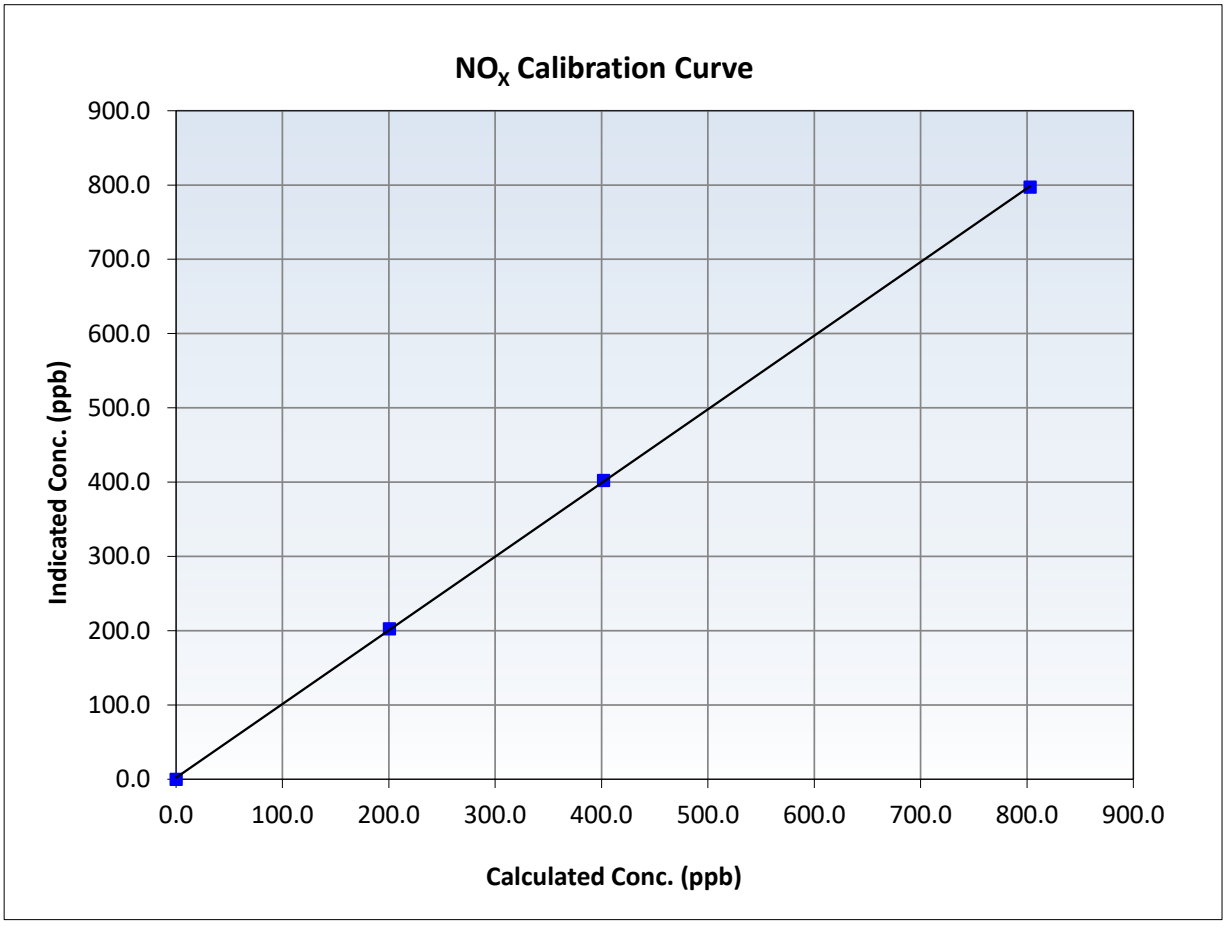
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 17, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:48	End Time (MST):	16:34
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
802.9	797.2	1.0072
402.0	402.3	0.9991
200.5	202.7	0.9891

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999967	*≥0.995*
Slope	0.991757	*0.90 - 1.10*
Intercept	2.099672	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

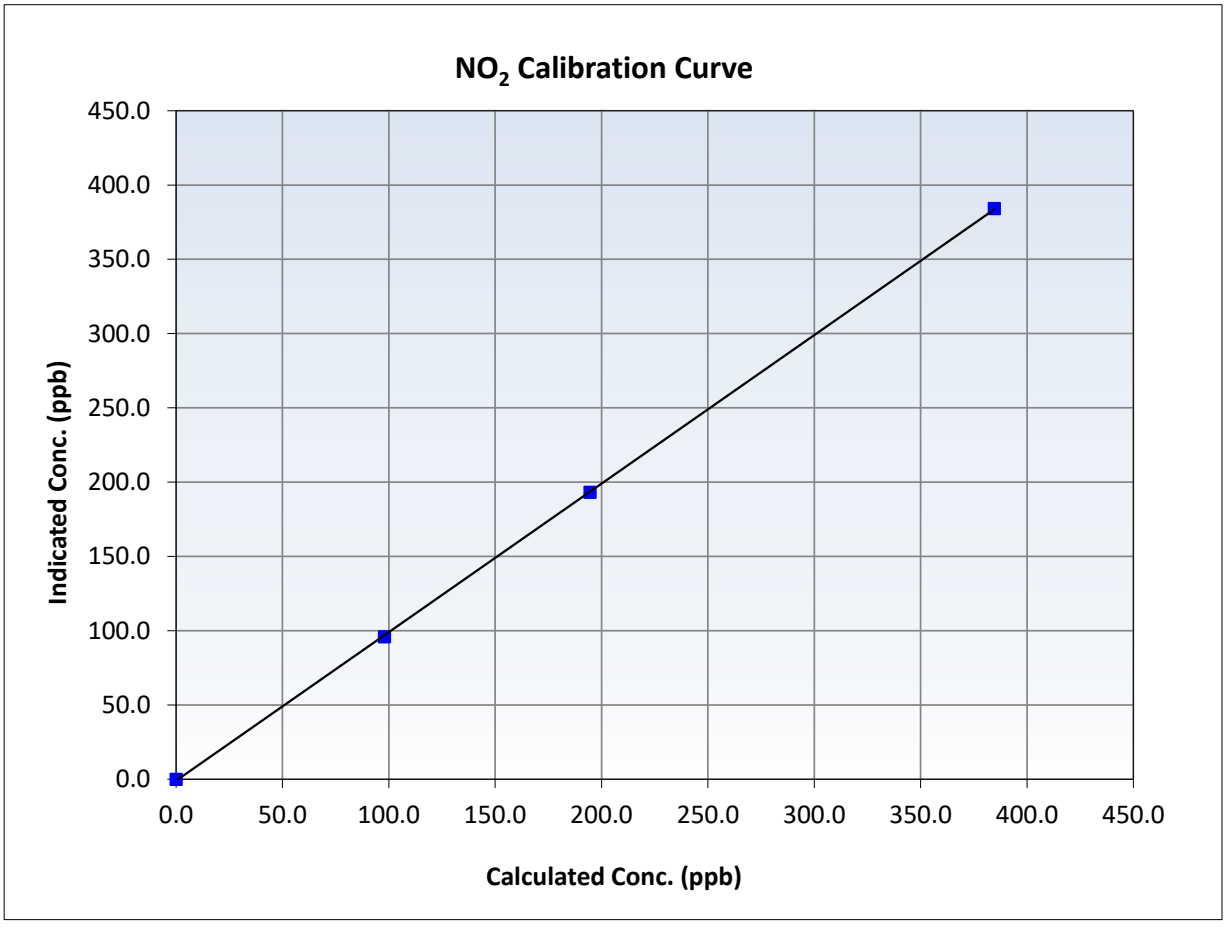
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 17, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:48	End Time (MST):	16:34
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
384.7	384.1	1.0015
194.6	193.2	1.0072
98.0	95.9	1.0217

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999969	*≥0.995*
Slope	0.999850	*0.90 - 1.10*
Intercept	-0.987634	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

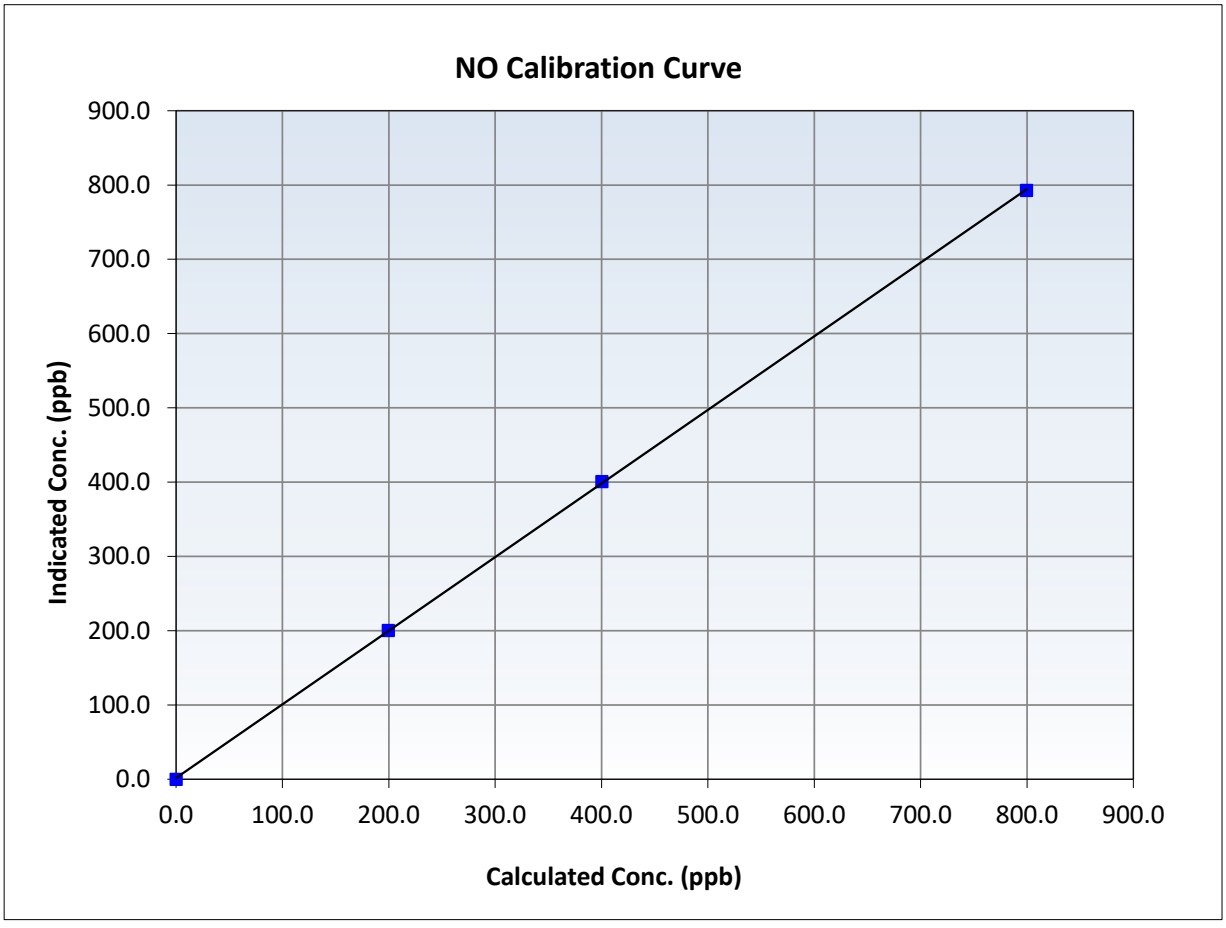
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 17, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	11:48	End Time (MST):	16:34
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

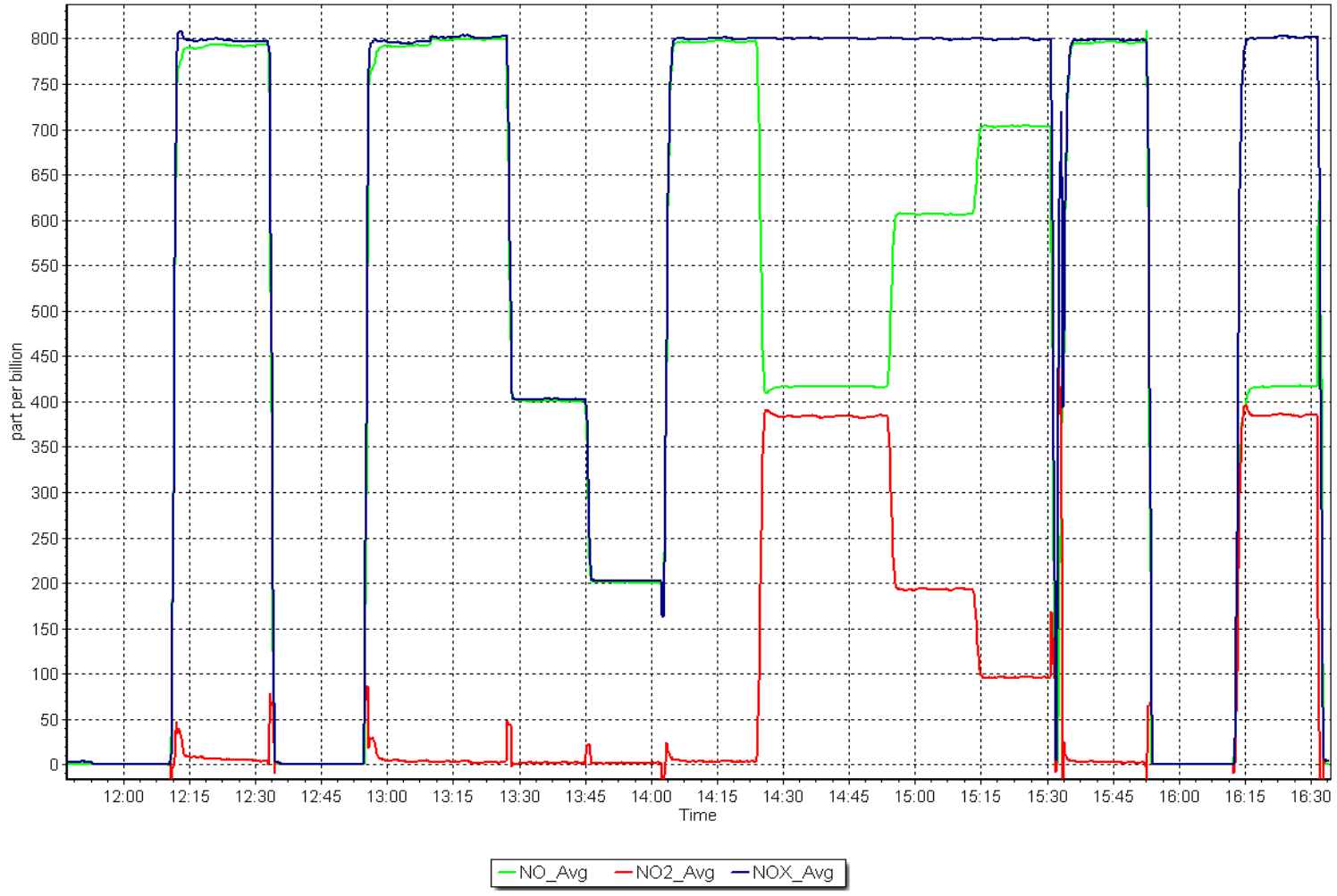
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.7	792.9	1.0085
400.3	400.6	0.9993
199.7	200.5	0.9959

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999971	*≥0.995*
Slope	0.991001	*0.90 - 1.10*
Intercept	1.739169	*+/-20*



NO_X Calibration Plot Date: January 14, 2025 Location: Firebag



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS20
MACKAY RIVER
DECEMBER 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	January 10, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	8:00	End time (MST):	11:17
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.22	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC30686			
Removed Cal Gas Conc:	49.22	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	5706
Zero Air Gen Model:	API 701		Serial Number:	4522

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1501301450	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996980	1.001949	Backgd or Offset:	19.3	20.2
Calibration intercept:	3.691185	-0.649003	Coeff or Slope:	0.939	0.939

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4919	81.3	800.3	804.7	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	804.3	Previous response	801.5	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4919	81.3	800.3	801.7	0.998
Mid point	4959	40.7	400.7	399.7	1.002
Low point	4980	20.3	199.8	199.7	1.001
As left zero	5000	0.0	0.0	-0.3	----
As left span	4919	81.3	800.3	804.0	0.995
				Average Correction Factor:	1.000

Notes: No Maintenance done. Zero adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

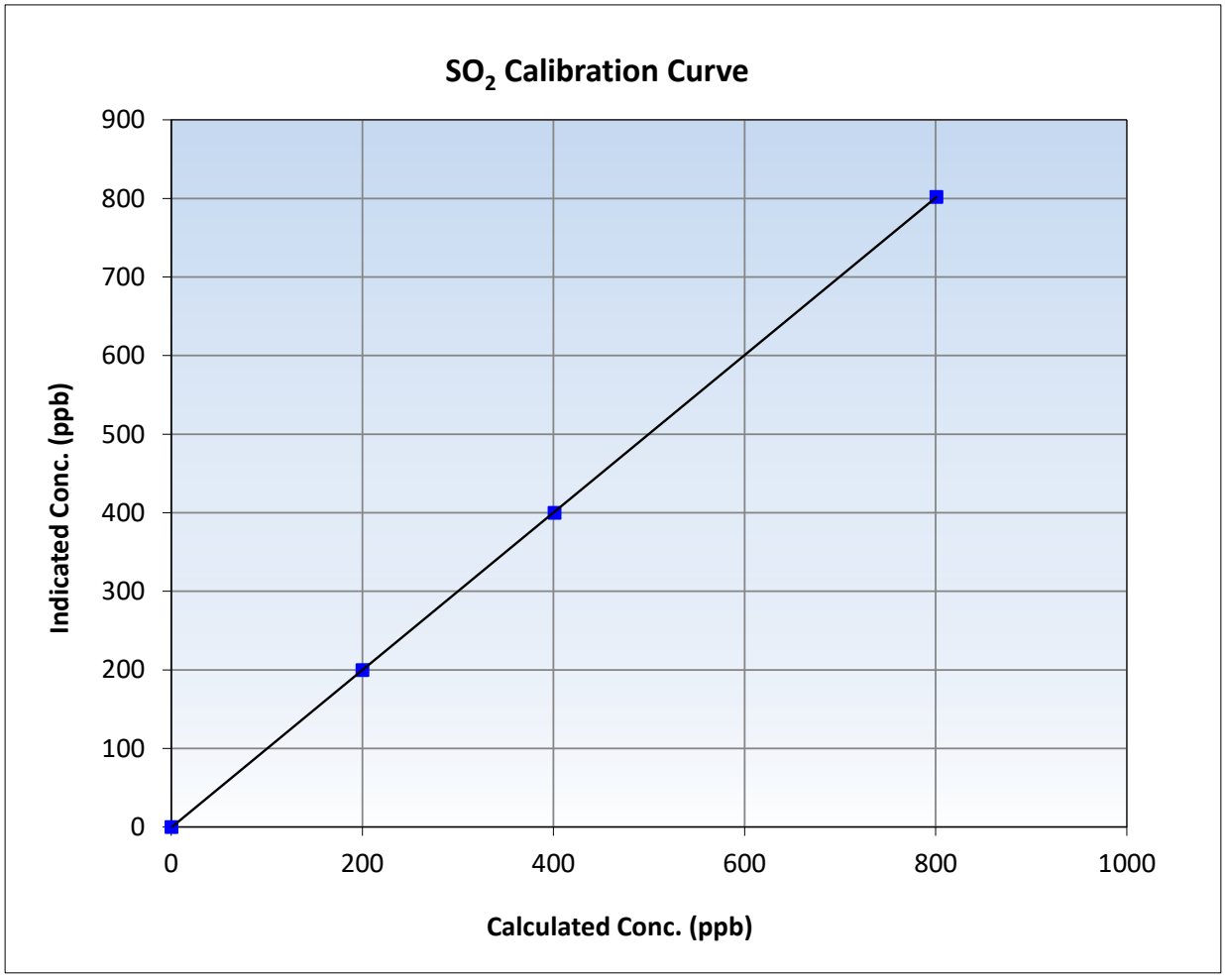
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 5, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:00	End Time (MST):	11:17
Analyzer make:	Thermo 43i	Analyzer serial #:	1501301450

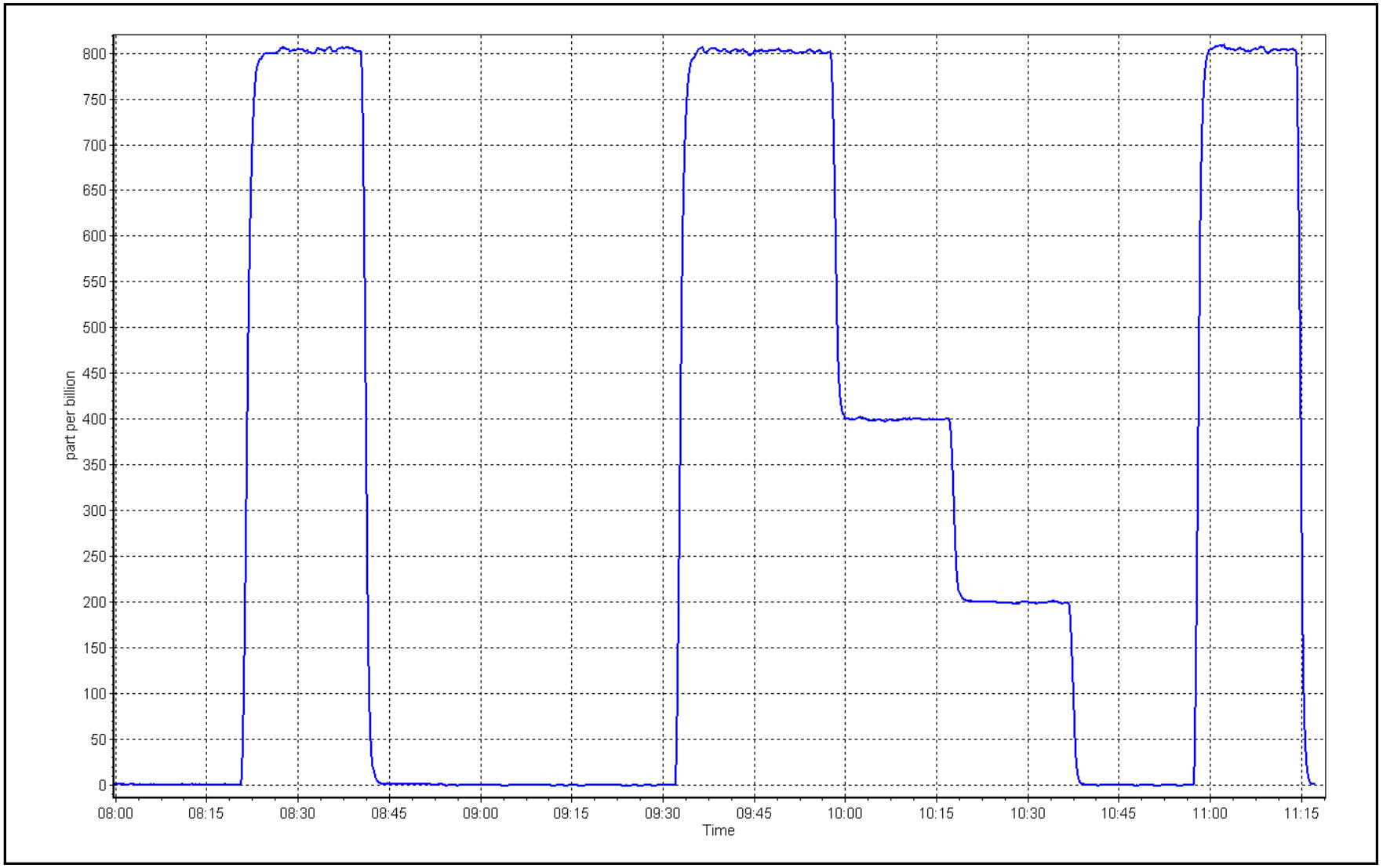
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
800.3	801.7	0.9982
400.7	399.7	1.0024
199.8	199.7	1.0006

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.001949	*0.90 - 1.10*
Intercept	-0.649003	*+/-30*



SO2 Calibration Plot Date: January 10, 2025 Location: MacKay River



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	January 9, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	8:10	End time (MST):	11:59
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.12	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC515997			
Removed Cal Gas Conc:	5.12	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	5706
ZAG Make/Model:	API 701		Serial Number:	4522

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1236656117
Converter make:	Global		Converter serial #:	2022-226
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.968153	0.980880	Backgd or Offset:	3.43	3.43
Calibration intercept:	0.718985	0.198935	Coeff or Slope:	1.051	1.051

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4922	78.1	80.0	79.7	1.005
As found Mid point	4961	39.0	39.9	39.8	1.006
As found Low point	4980	19.5	20.0	19.8	1.014
New cylinder response					

Baseline Corr As found:	79.6	Prev response:	78.14	*% change:	1.8%
Baseline Corr 2nd AF pt:	39.7	AF Slope:	0.996026	AF Intercept:	0.019261
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999994	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4922	78.1	80.0	78.7	1.016
Mid point	4961	39.0	39.9	39.3	1.016
Low point	4980	19.5	20.0	19.7	1.014
As left zero	5000	0.0	0.0	0.4	----
As left span	4922	78.1	80.0	78.0	1.025
SO2 Scrubber Check	4982	81.3	802.8	-0.1	----
Date of last scrubber change:		25-May-23		Ave Corr Factor	1.015
Date of last converter efficiency test:					

Notes: Sox scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

H_2S Calibration Summary

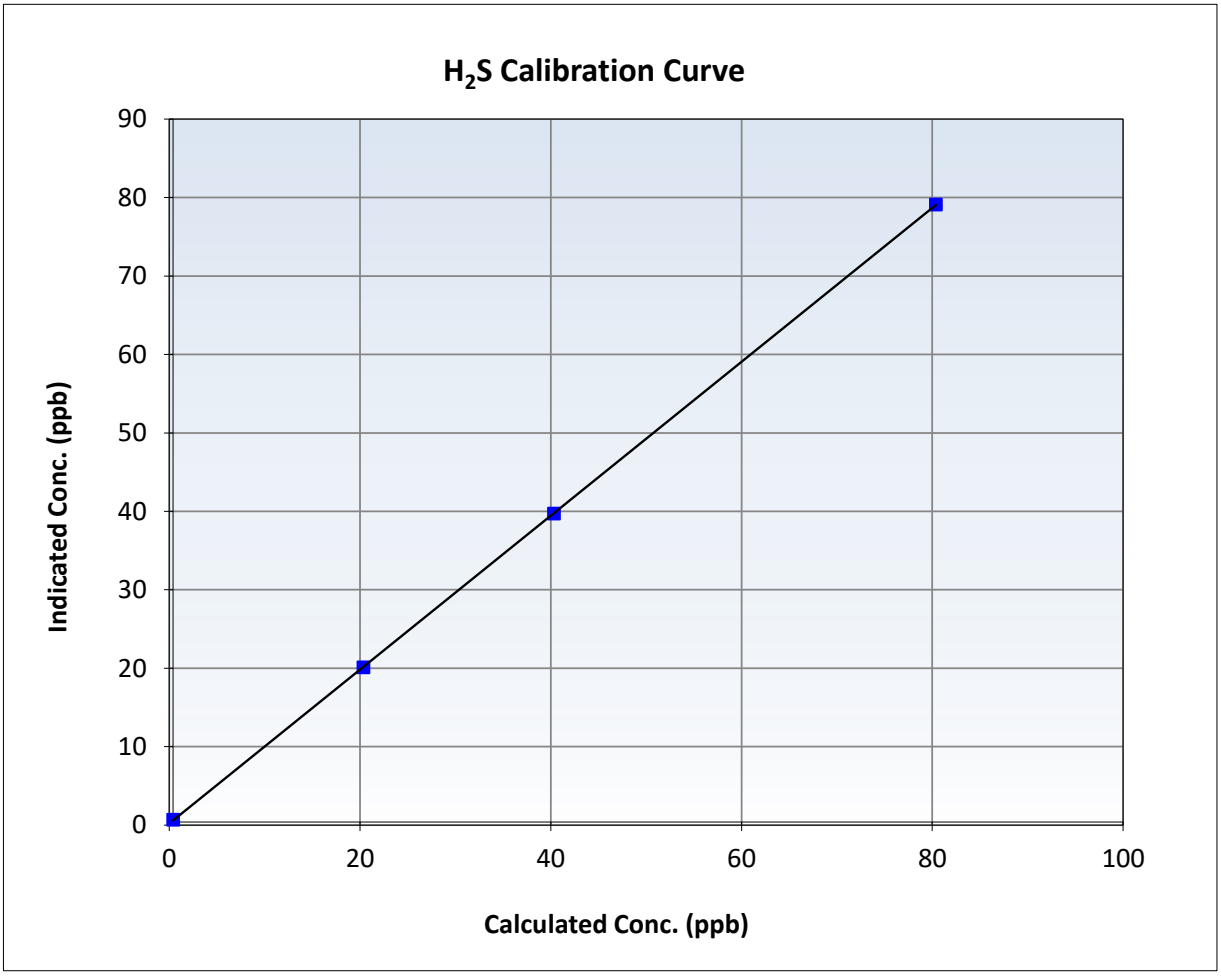
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 4, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:10	End Time (MST):	11:59
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1236656117

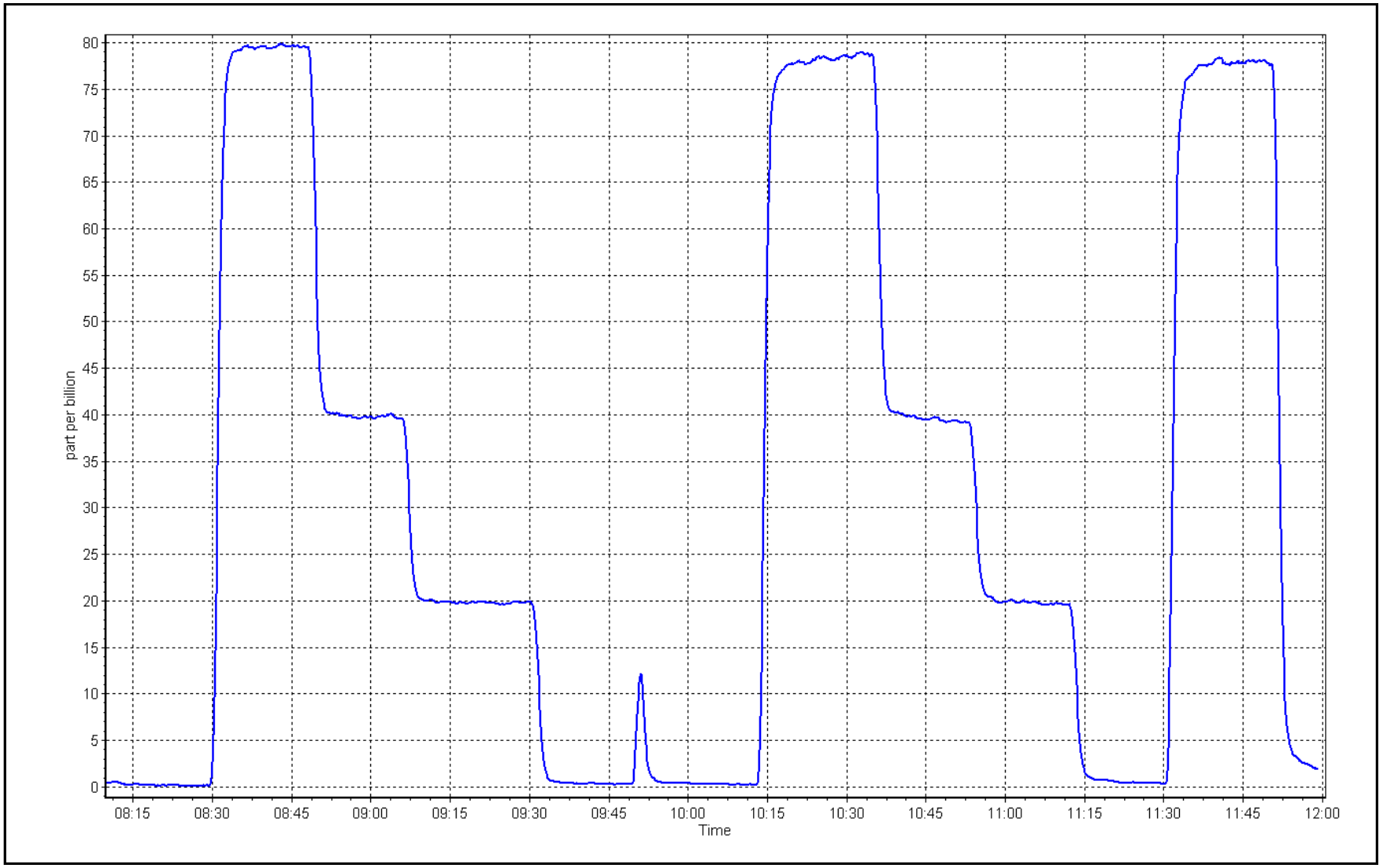
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
80.0	78.7	1.0162
39.9	39.3	1.0162
20.0	19.7	1.0137

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999992	*≥0.995*
Slope	0.980880	*0.90 - 1.10*
Intercept	0.198935	*+/-3*



H_2S Calibration Plot Date: January 9, 2025 Location: MacKay River



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	January 10, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	8:00	End time (MST):	11:16
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC306868		Cal Gas Expiry Date:	February 23, 2024	
CH4 Cal Gas Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
C3H8 Cal Gas Conc.	206.2	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	499.4	ppm	CH4 Equiv Conc.	1066.5	ppm
Removed C3H8 Conc.	206.2	ppm	Diff between cyl:		
Calibrator Make/Model:	API T700		Serial Number:	5706	
ZAG Make/Model:	API 701		Serial Number:	4522	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1501663727

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.992322	0.993719	Background:	4.140	4.640
Calibration intercept:	0.086409	0.046058	Coefficient:	5.026	4.902

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.30	----
As found High point	4919	81.3	17.34	18.27	0.965
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.97	Previous response	17.29	*% change	3.8%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.04	----
High point	4919	81.3	17.34	17.30	1.002
Mid point	4959	40.7	8.68	8.58	1.011
Low point	4980	20.3	4.33	4.42	0.980
As left zero	5000	0.0	0.00	-0.09	----
As left span	4919	81.3	17.34	17.34	1.000
				Average Correction Factor	0.998

Notes: Zero Air generator Hydrocarbon scrubber working good. Pump changed out last month. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC Calibration Summary

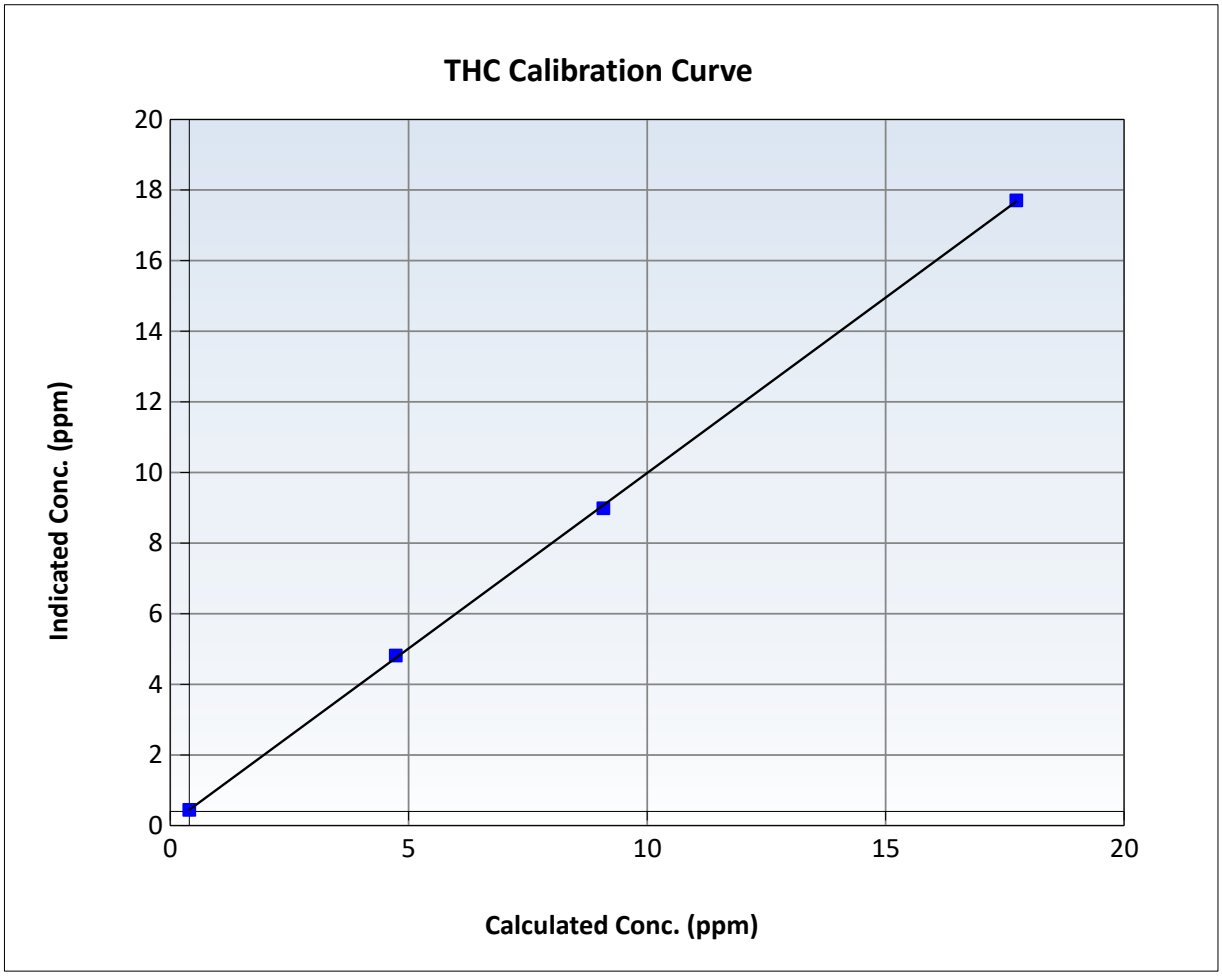
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 12, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:00	End Time (MST):	11:16
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727

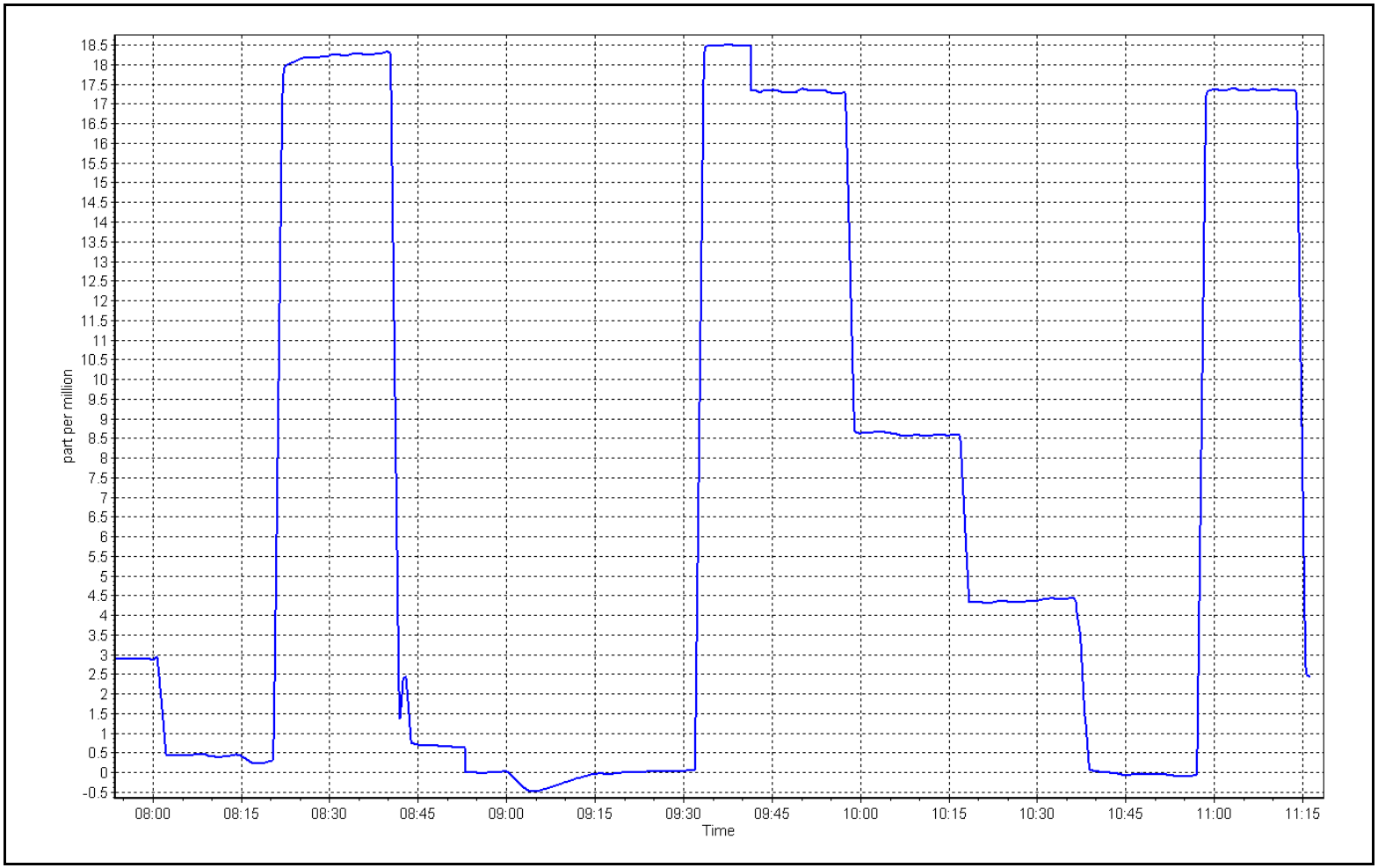
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.04	----
17.34	17.30	1.0020
8.68	8.58	1.0113
4.33	4.42	0.9802

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999917	*≥0.995*
Slope	0.993719	*0.90 - 1.10*
Intercept	0.046058	*+/-1.5*



THC Calibration Plot Date: January 10, 2025 Location: MacKay River



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	MacKay River
Station number:	AMS 20
Calibration Date:	January 7, 2025
Last Cal Date:	December 3, 2024
Start time (MST):	8:06
End time (MST):	12:13
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 #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	49.19 ppm	Removed Gas NO Conc:	48.04 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	5706
ZAG make/model:	API T701	Serial Number:	4522

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
AF High point	4917	83.3	819.5	800.3	19.2	827.2	805.5	21.7	0.9906	0.9935
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 821.5 ppb	NO = 800.2 ppb
Baseline Corr 1st pt	NO_X = 827.2 ppb	NO = 805.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change	NO_X = 0.7%		
*Percent Change	NO = 0.7%		

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1505164379

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.001	1.001	NO bkgnd or offset:	2.8	2.8
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	3.0	3.0
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	161.2	161.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.997202	1.004509
NO_X Cal Offset:	4.362344	0.442029
NO Cal Slope:	0.995687	1.003826
NO Cal Offset:	3.402729	-0.297582
NO_2 Cal Slope:	1.002574	1.000884
NO_2 Cal Offset:	-0.544534	-0.607993

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	----	----
High point	4917	83.3	819.5	800.3	19.2	823.5	803.3	20.0	0.9951	0.9963
Mid point	4958	41.7	410.3	400.7	9.6	412.5	401.6	10.9	0.9946	0.9977
Low point	4979	20.8	204.6	199.9	4.8	206.5	200.0	6.5	0.9910	0.9993
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	----	----
As left span	4917	83.3	819.5	413.0	406.5	818.4	413.0	405.4	1.0013	1.0000
								Average Correction Factor	0.9936	0.9977

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	800.0	407.9	411.3	411.2	1.0001	100.0%
Mid GPT point	800.0	604.2	215.0	214.6	1.0017	99.8%
Low GPT point	800.0	700.3	118.9	117.6	1.0107	98.9%
				Average Correction Factor	1.0042	99.6%

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

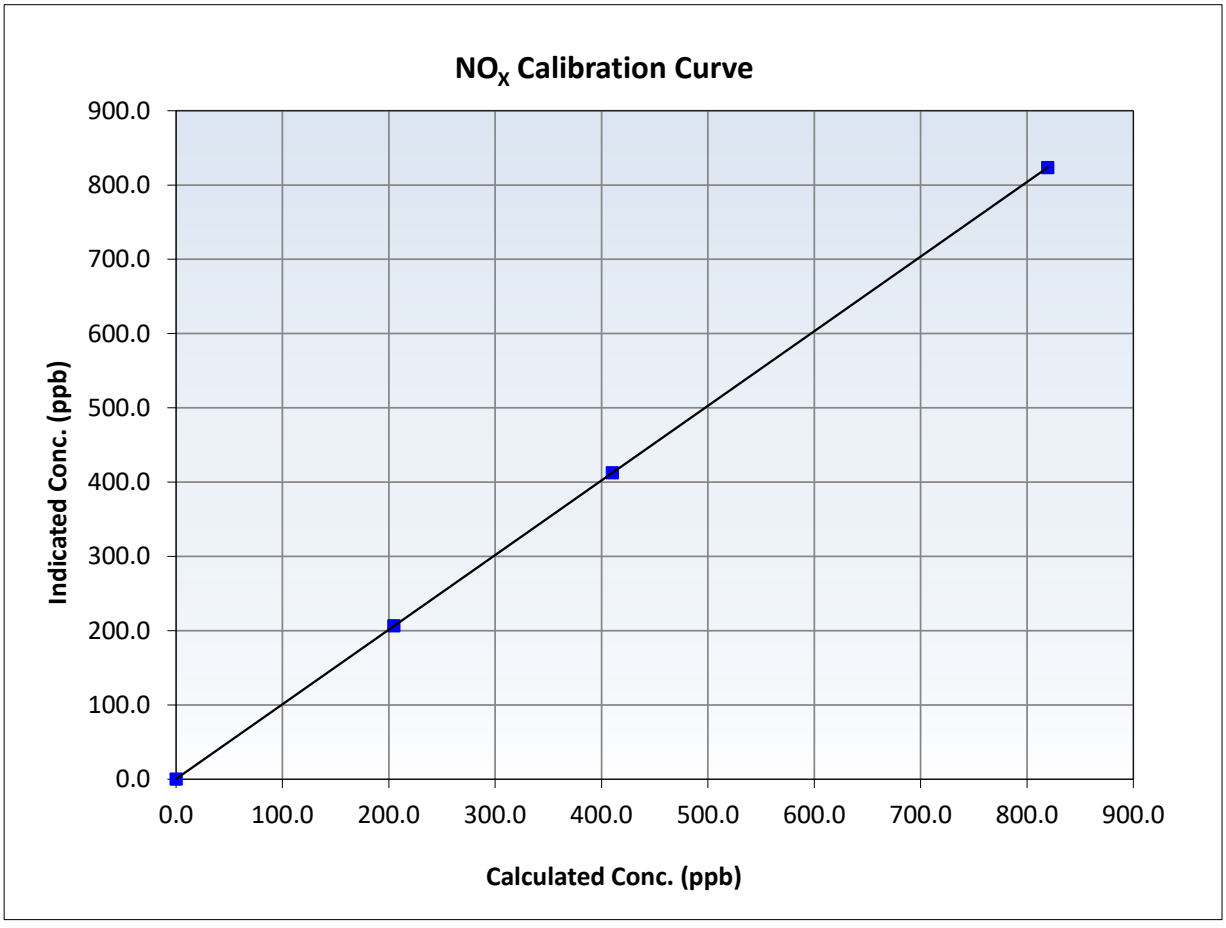
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:06	End Time (MST):	12:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
819.5	823.5	0.9951
410.3	412.5	0.9946
204.6	206.5	0.9910

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.004509	*0.90 - 1.10*
Intercept	0.442029	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

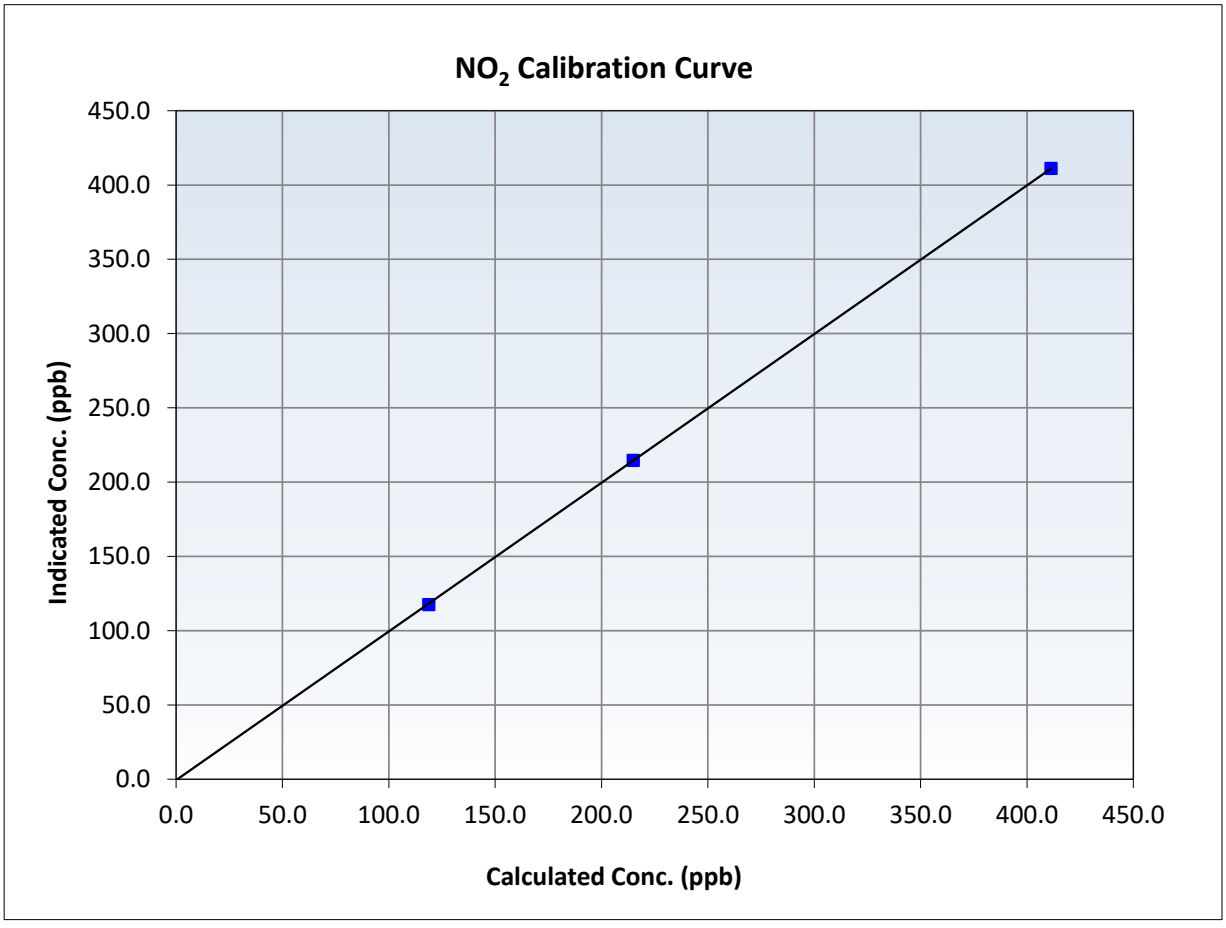
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:06	End Time (MST):	12:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
411.3	411.2	1.0001
215.0	214.6	1.0017
118.9	117.6	1.0107

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999990	*≥0.995*
Slope	1.000884	*0.90 - 1.10*
Intercept	-0.607993	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

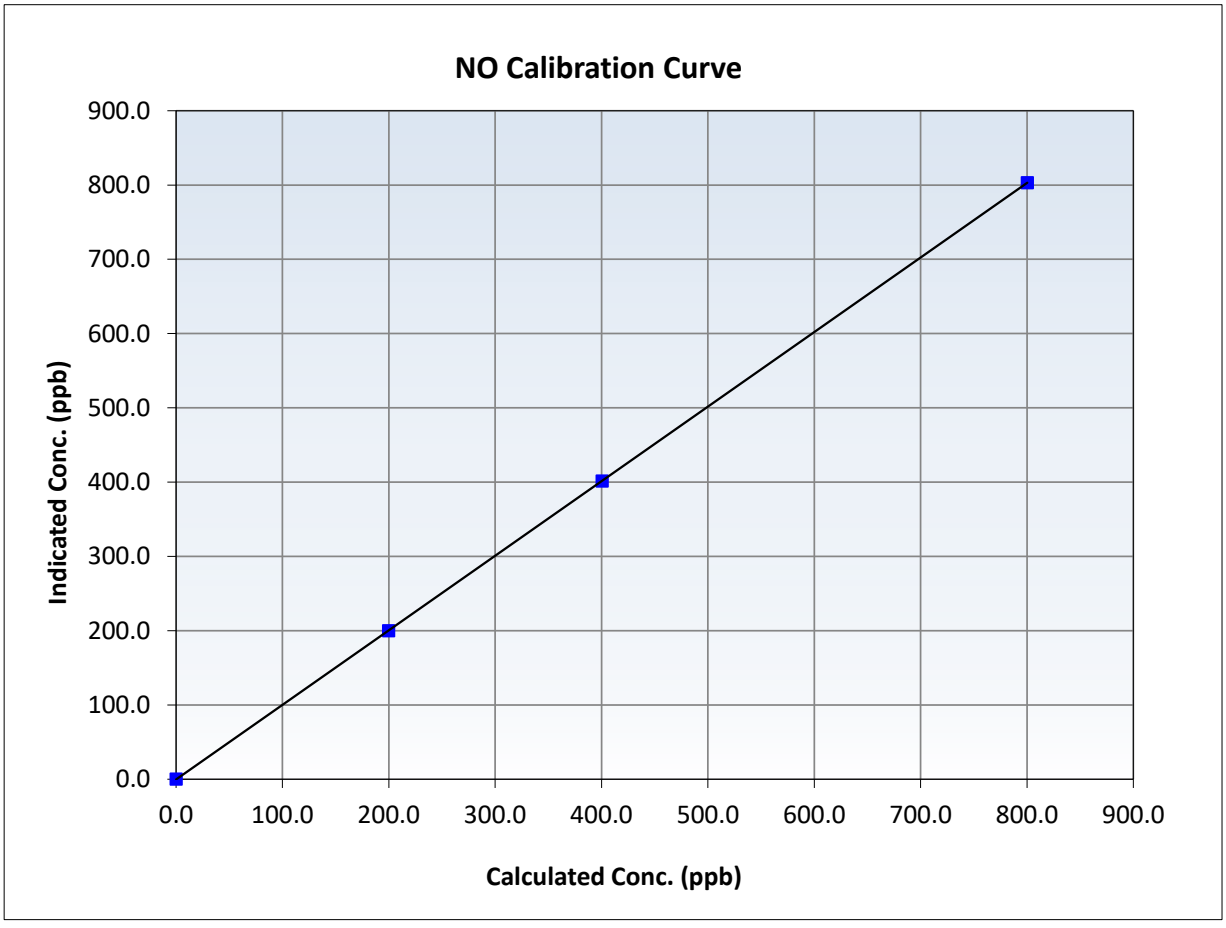
Station Information

Calibration Date:	January 7, 2025	Previous Calibration:	December 3, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:06	End Time (MST):	12:13
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

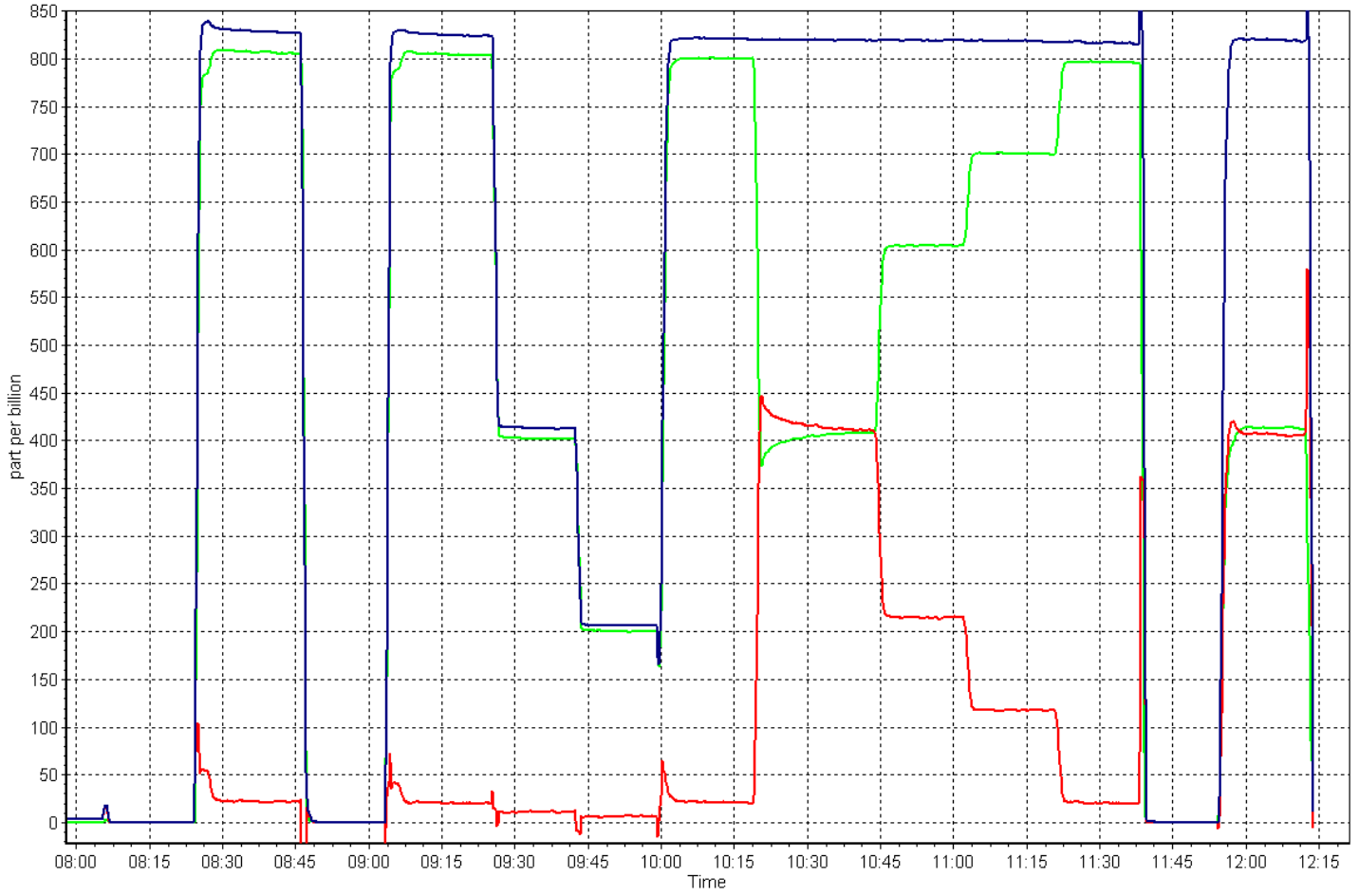
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.3	803.3	0.9963
400.7	401.6	0.9977
199.9	200.0	0.9993

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.003826	*0.90 - 1.10*
Intercept	-0.297582	*+/-20*



NO_X Calibration Plot Date: January 7, 2025 Location: MacKay River



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS21
CONKLIN
DECEMBER 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	January 21, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	11:21	End time (MST):	14:29
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.34	ppm	Cal Gas Exp Date:	October 9, 2032
Cal Gas Cylinder #:	CC340840			
Removed Cal Gas Conc:	50.34	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	5252
Zero Air Gen Model:	Teledyne API T701		Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1428701363	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998751	0.995056	Backgd or Offset:	29.3	29.3
Calibration intercept:	-0.083970	-0.204107	Coeff or Slope:	0.899	0.899

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	80.2	807.4	799.5	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.5	Previous response	806.3	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4920	80.2	807.4	803.5	1.005
Mid point	4960	40.1	403.7	401.0	1.007
Low point	4980	20.0	201.8	200.5	1.006
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	80.2	807.4	804.7	1.003
				Average Correction Factor:	1.006

Notes: Sample inlet filter and H2/ N2 cylinder was changed after as founds. No adjustment made.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

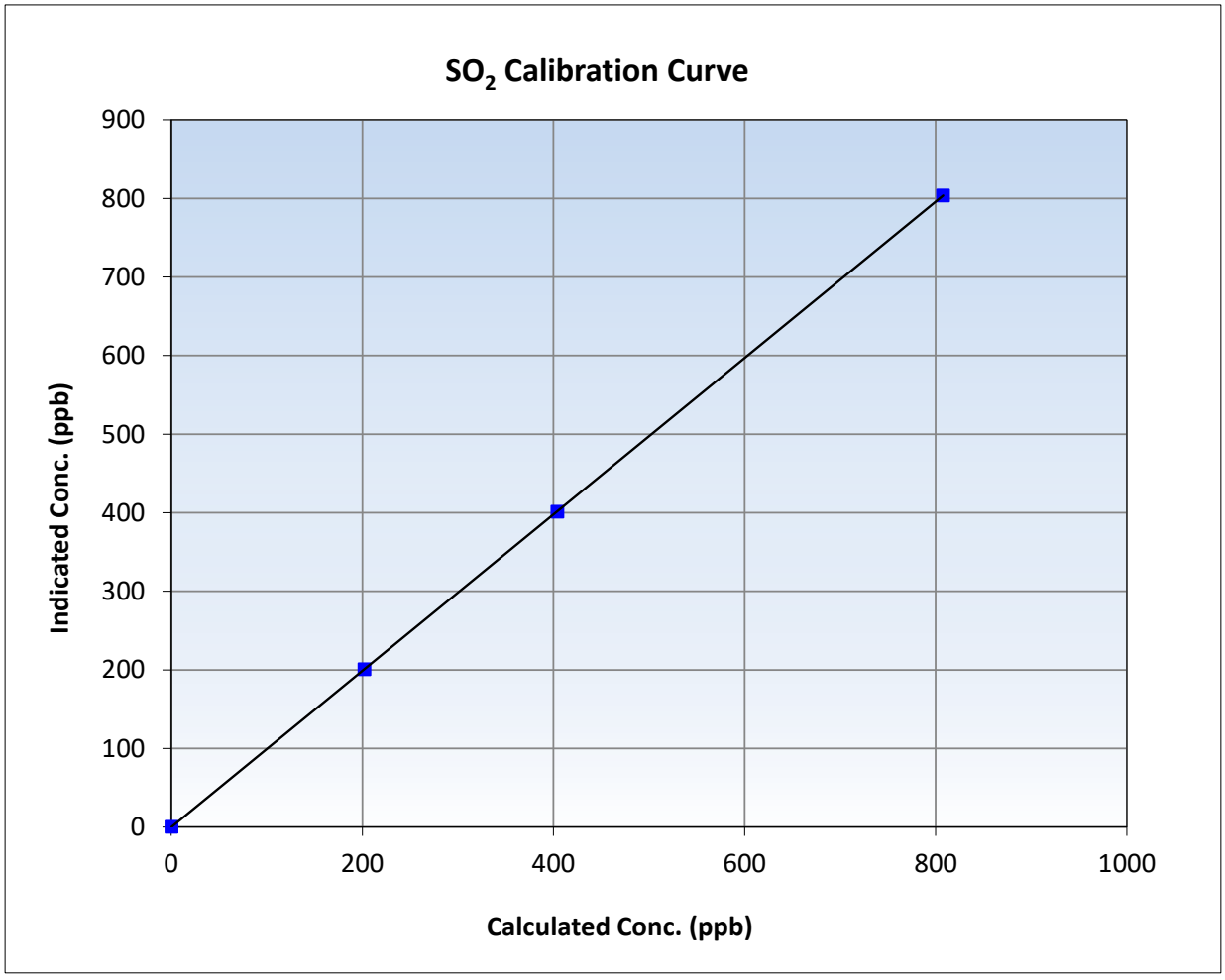
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:21	End Time (MST):	14:29
Analyzer make:	Thermo 43i	Analyzer serial #:	1428701363

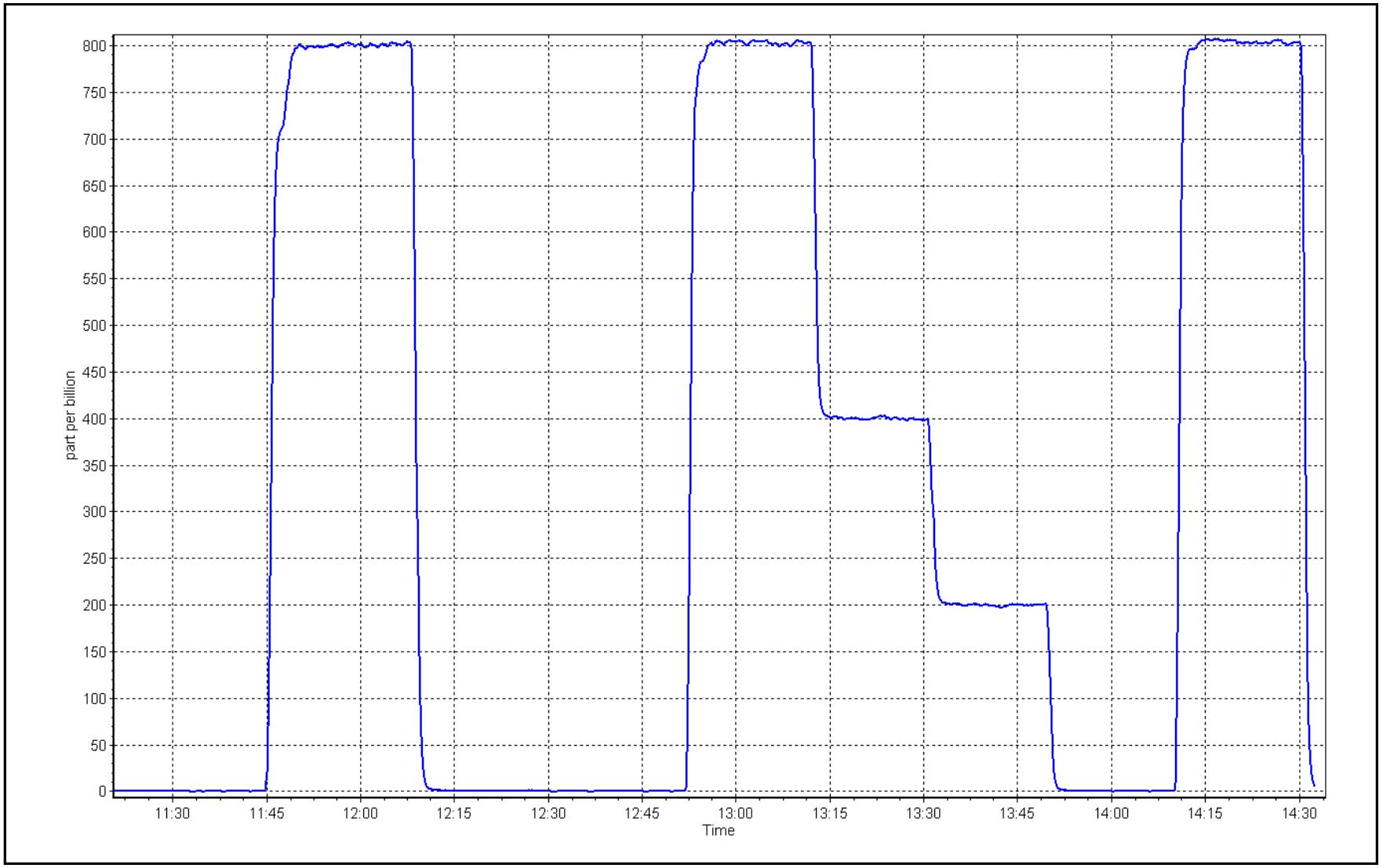
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
807.4	803.5	1.0049
403.7	401.0	1.0068
201.8	200.5	1.0063

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.995056	*0.90 - 1.10*
Intercept	-0.204107	*+/-30*



SO2 Calibration Plot Date: January 21, 2025 Location: Conklin



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	January 28, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	10:26	End time (MST):	14:11
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.00	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC501204			
Removed Cal Gas Conc:	5.00	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne T700		Serial Number:	5252
ZAG Make/Model:	Teledyne T701		Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 43i-QTL		Analyzer serial #:	12228021058
Converter make:	CD-Nova 101		Converter serial #:	565
Analyzer Range	0 - 100 ppb		Converter Temp:	850 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.011143	1.005286	Backgd or Offset:	3.1	3.1
Calibration intercept:	-0.040000	0.040000	Coeff or Slope:	1.556	1.556

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.0	80.0	80.4	0.994
As found Mid point	4960	40.0	40.0	40.3	0.990
As found Low point	4980	20.0	20.0	20.0	0.995
New cylinder response					

Baseline Corr As found:	80.5	Prev response:	80.85	*% change:	-0.4%
Baseline Corr 2nd AF pt:	40.4	AF Slope:	1.006571	AF Intercept:	-0.080000
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999995	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.0	80.0	80.4	0.995
Mid point	4960	40.0	40.0	40.4	0.990
Low point	4980	20.0	20.0	20.1	0.995
As left zero	5000	0.0	0.0	0.1	----
As left span	4920	80.0	80.0	81.0	0.988
SO2 Scrubber Check	4920	80.2	802.0	0.0	----

Date of last scrubber change:	November 13, 2024	Ave Corr Factor	0.993
Date of last converter efficiency test:			

Notes: Sample inlet filter was changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

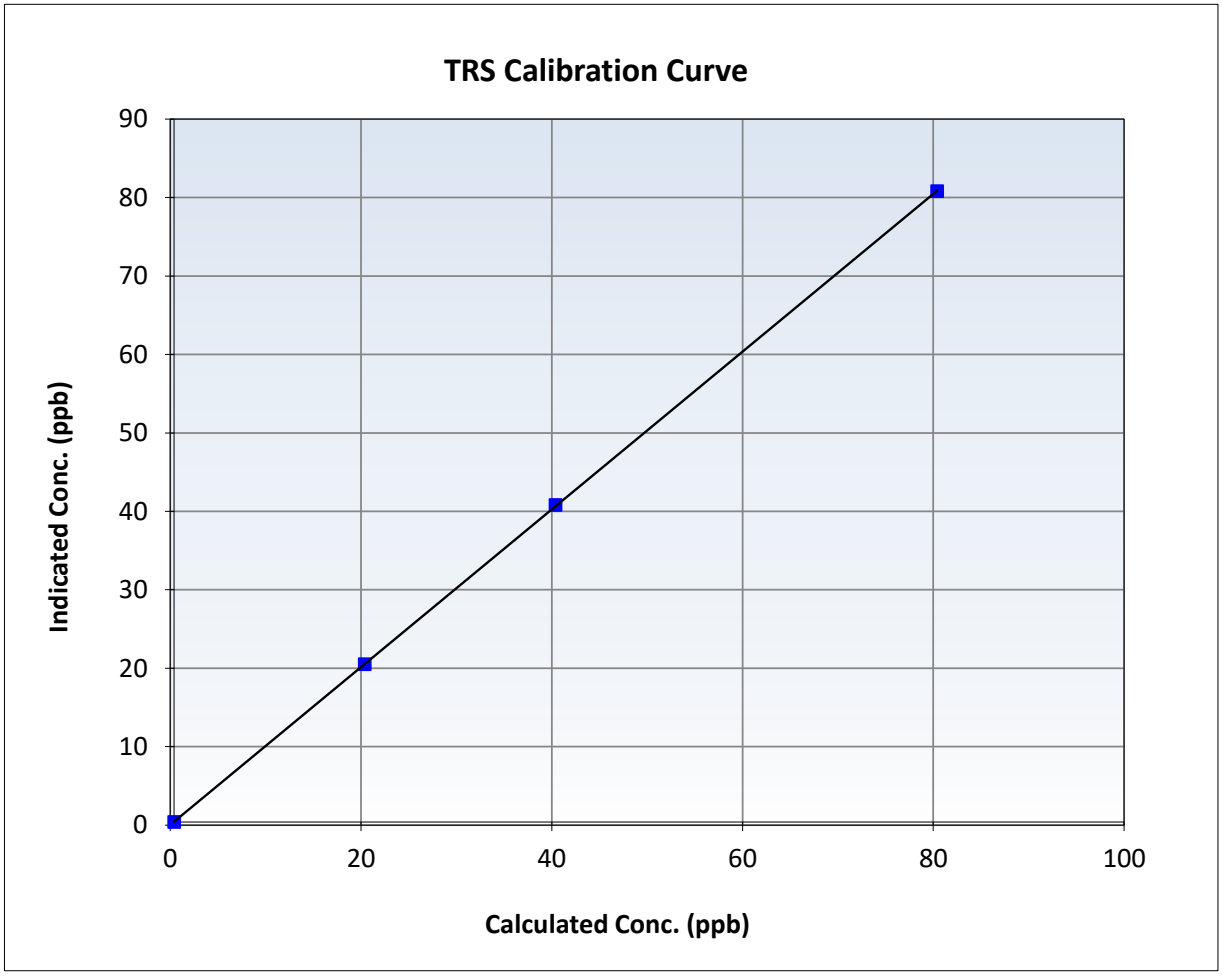
TRS Calibration Summary

Station Information

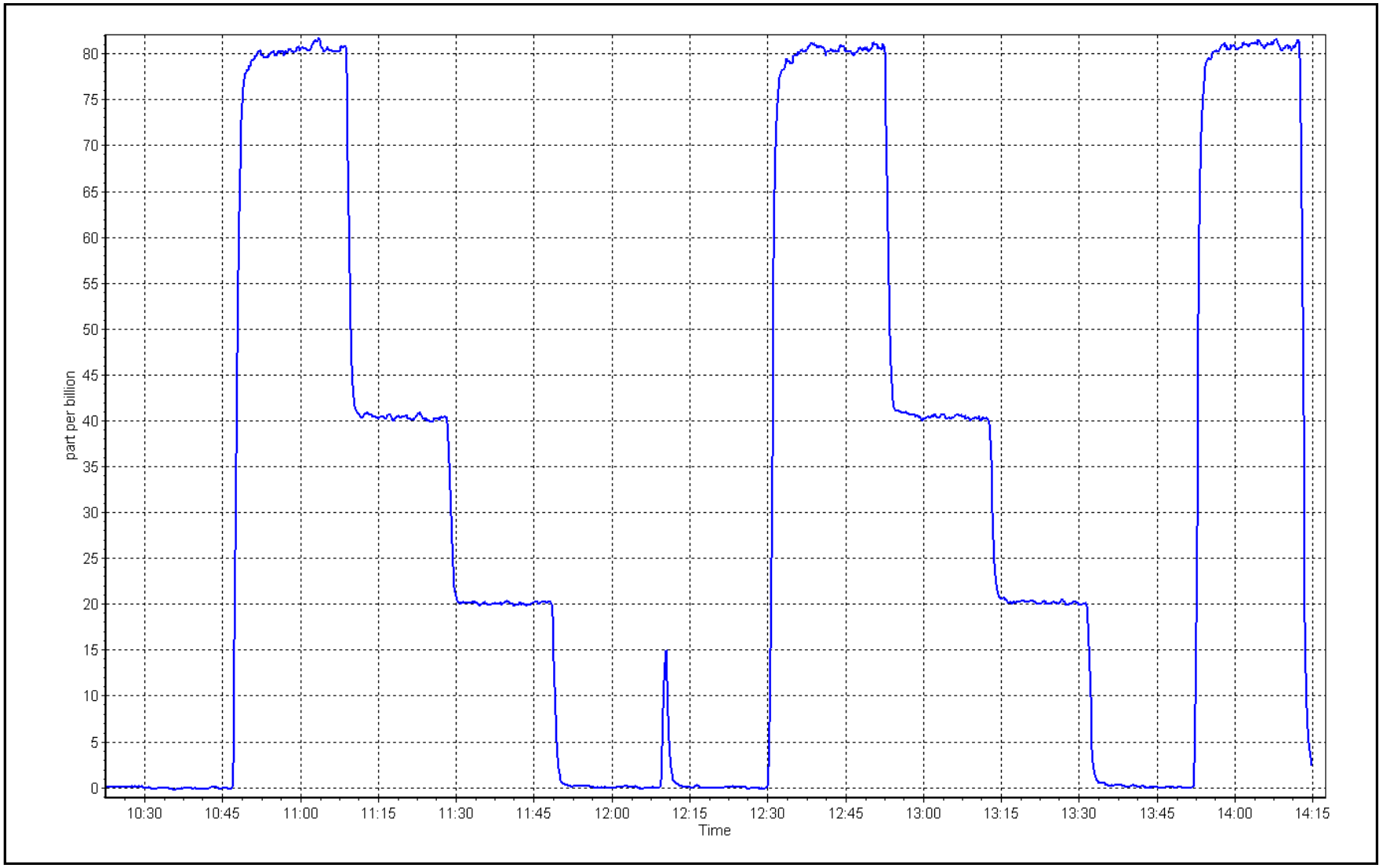
Calibration Date:	January 28, 2025	Previous Calibration:	December 2, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:26	End Time (MST):	14:11
Analyzer make:	Thermo 43i-QTL	Analyzer serial #:	12228021058

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.0	----	Correlation Coefficient	0.999992	*≥0.995*
80.0	80.4	0.9950	Slope	1.005286	*0.90 - 1.10*
40.0	40.4	0.9901			
20.0	20.1	0.9950	Intercept	0.040000	*+/-3*



TRS Calibration Plot Date: January 28, 2025 Location: Conklin



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	January 21, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	11:21	End time (MST):	14:29
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC340840	Cal Gas Expiry Date:	October 9, 2032
CH4 Cal Gas Conc.	503.8 ppm	CH4 Equiv Conc.	1067.6 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	NA
Removed CH4 Conc.	503.8 ppm	CH4 Equiv Conc.	1067.6 ppm
Removed C3H8 Conc.	205.0 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	5252
Zero Air Gen model:	Teledyne API T701	Serial Number:	953

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.30E-04	2.30E-04	NMHC SP Ratio:	4.73E-05	4.73E-05
CH4 Retention time:	15.2	15.2	NMHC Peak Area:	190954	190954
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	17.12	14.47	1.183
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	14.47	Prev response	17.10	*% change	-18.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	17.12	17.07	1.003
Mid point	4960	40.1	8.56	8.51	1.006
Low point	4980	20.0	4.28	4.27	1.002
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	17.12	17.09	1.002
				Average Correction Factor	1.004

Notes: Sample inlet filter and H2/ N2 cylinder was changed after as founds. No adjustment made.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	9.04	7.36	1.229
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.36	Prev response	9.04	*% change	-22.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	9.04	8.97	1.008
Mid point	4960	40.1	4.52	4.49	1.007
Low point	4980	20.0	2.26	2.26	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	9.04	8.99	1.006
				Average Correction Factor	1.005

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.2	8.08	7.11	1.137
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.11	Prev response	8.07	*% change	-13.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.2	8.08	8.11	0.997
Mid point	4960	40.1	4.04	4.02	1.005
Low point	4980	20.0	2.02	2.01	1.004
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.2	8.08	8.10	0.997
				Average Correction Factor	1.002

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.998793	0.996858
THC Cal Offset:	0.000765	-0.004236
CH4 Cal Slope:	0.999952	1.003431
CH4 Cal Offset:	-0.012639	-0.012438
NMHC Cal Slope:	0.997884	0.990971
NMHC Cal Offset:	0.013405	0.009002

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

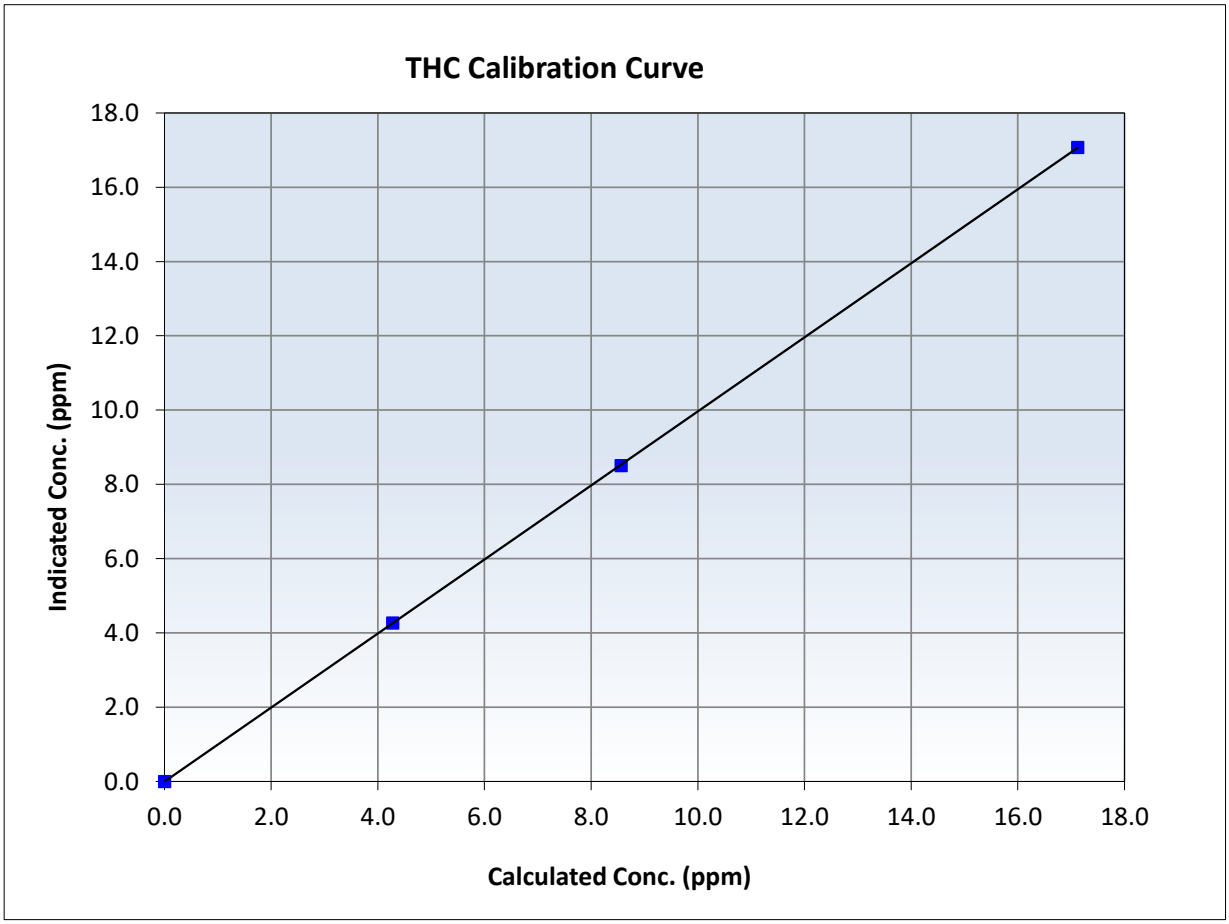
THC Calibration Summary

Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:21	End Time (MST):	14:29
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999995	*≥0.995*
17.12	17.07	1.0029	Slope	0.996858	*0.90 - 1.10*
8.56	8.51	1.0064	Intercept	-0.004236	*+/-0.5*
4.28	4.27	1.0018			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

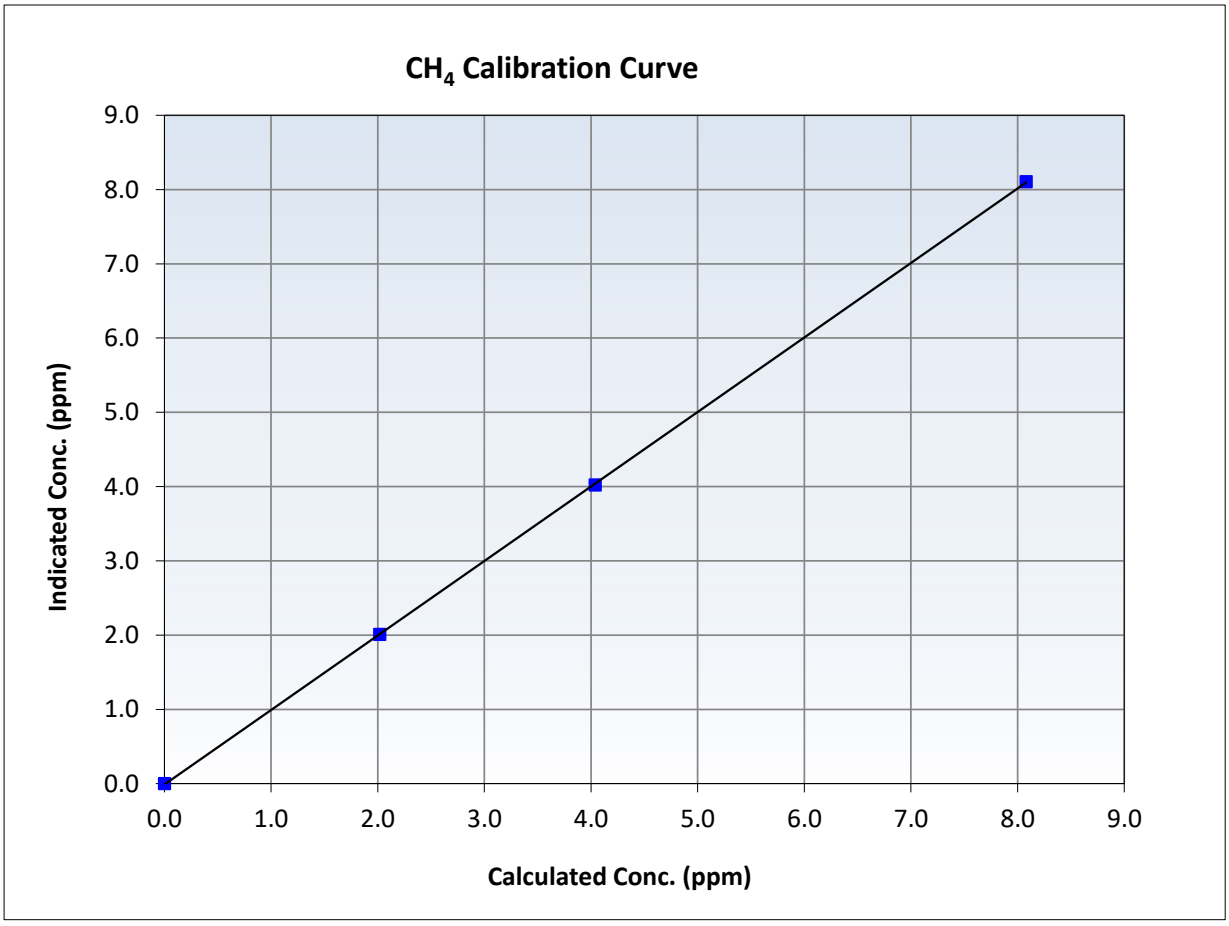
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:21	End Time (MST):	14:29
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.08	8.11	0.9967
4.04	4.02	1.0048
2.02	2.01	1.0041

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999980	*≥0.995*
Slope	1.003431	*0.90 - 1.10*
Intercept	-0.012438	*+/-0.5*



Wood Buffalo Environmental Association

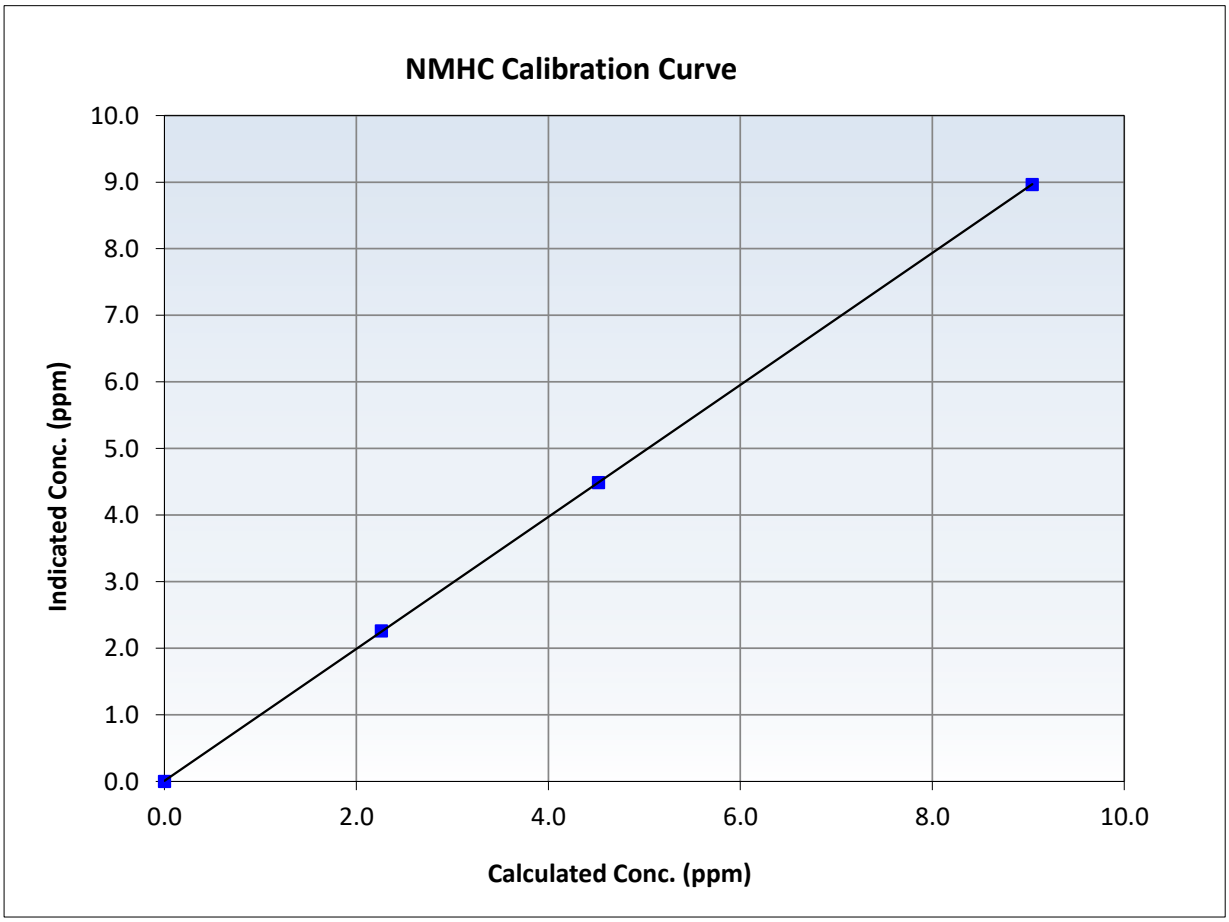
NMHC Calibration Summary

Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:21	End Time (MST):	14:29
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320039

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999994	*≥0.995*
9.04	8.97	1.0084	Slope	0.990971	*0.90 - 1.10*
4.52	4.49	1.0074	Intercept	0.009002	*+/-0.5*
2.26	2.26	0.9993			



NMHC Calibration Plot Date: January 21, 2025 Location: Conklin

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Conklin
Station number:	AMS 21
Calibration Date:	January 27, 2025
Last Cal Date:	December 11, 2024
Start time (MST):	10:18
End time (MST):	14:50
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	SA18828	Cal Gas Expiry Date:	November 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5252
ZAG make/model:	Teledyne API T701H	Serial Number:	953

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	----	----
AF High point	4918	82.0	802.0	800.3	1.6	801.8	798.3	3.5	1.0002	1.0024
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 797.6 ppb	NO = 796.1 ppb	
Baseline Corr 1st pt	NO_X = 801.8 ppb	NO = 798.4 ppb	
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb	
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb	

* = > +/-5% change initiates investigation

*Percent Change	NO_X = 0.5%		
*Percent Change	NO = 0.3%		

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1501663731

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.034	1.034	NO bkgnd or offset:	10.1	10.1
NOX coeff or slope:	0.996	0.996	NOX bkgnd or offset:	10.0	10.0
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	148.8	147.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.993172	0.993087
NO_X Cal Offset:	1.067977	0.947975
NO Cal Slope:	0.994694	0.995708
NO Cal Offset:	0.047961	-0.232047
NO_2 Cal Slope:	0.999973	0.997640
NO_2 Cal Offset:	0.024329	0.343500

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	----	----
High point	4918	82.0	802.0	800.3	1.6	796.8	796.6	0.2	1.0065	1.0047
Mid point	4959	41.0	401.0	400.2	0.8	400.0	398.7	1.3	1.0025	1.0037
Low point	4980	20.5	200.5	200.1	0.4	200.6	198.2	2.4	0.9994	1.0094
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	----	----
As left span	4918	82.0	802.0	414.6	387.4	797.4	414.6	382.8	1.0057	1.0000
							Average Correction Factor		1.0028	1.0059

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	794.1	400.6	395.1	394.2	1.0024	99.8%
Mid GPT point	794.1	606.7	189.0	189.8	0.9960	100.4%
Low GPT point	794.1	704.6	91.1	91.0	1.0015	99.8%
				Average Correction Factor	1.0000	100.0%

Notes: Sample inlet filter was changed after as founds. No adjustment made. Used 2nd NO reference point because of drift.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

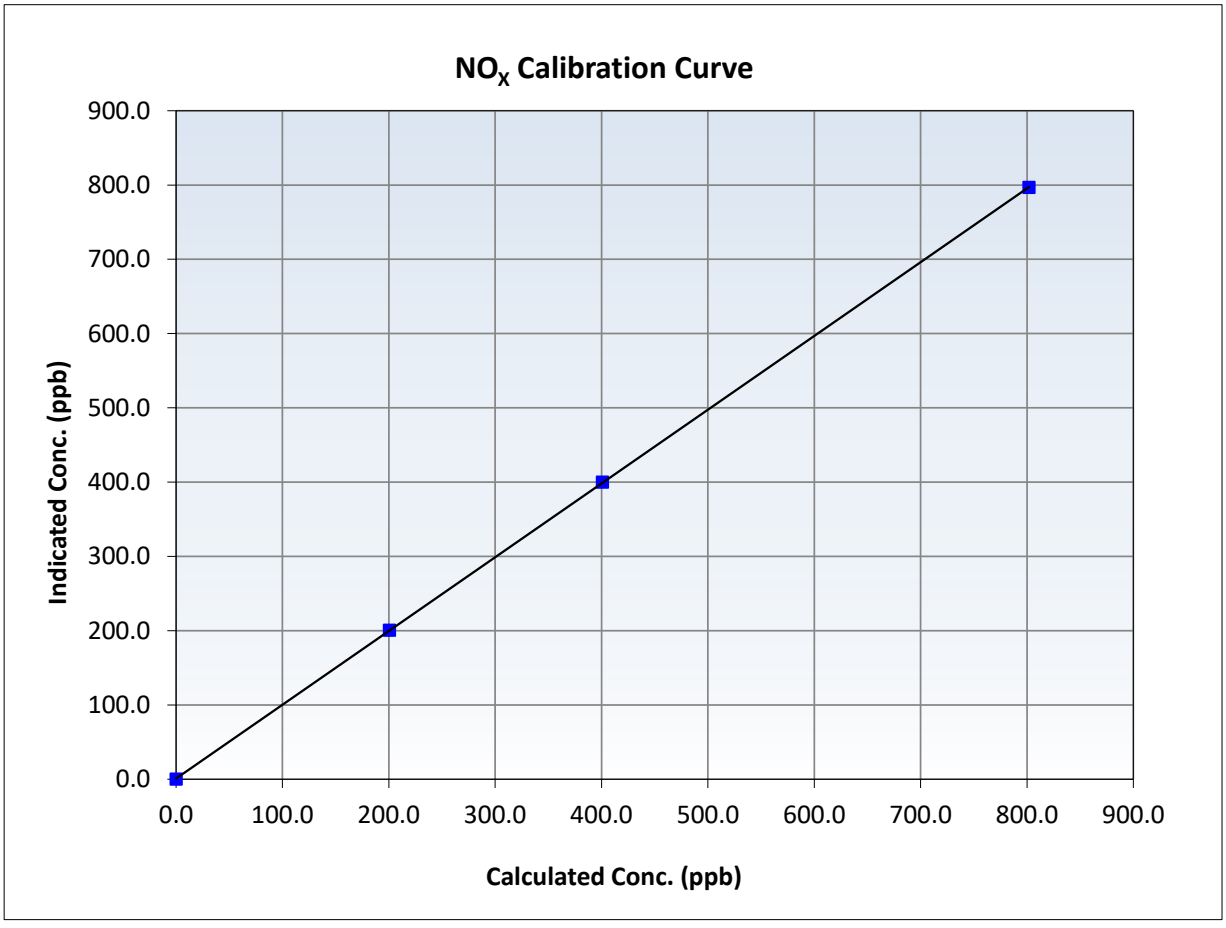
Station Information

Calibration Date:	January 27, 2025	Previous Calibration:	December 11, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:18	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
802.0	796.8	1.0065
401.0	400.0	1.0025
200.5	200.6	0.9994

Statistical Evaluation		Limits
Correlation Coefficient	0.999994	≥0.995
Slope	0.993087	0.90 - 1.10
Intercept	0.947975	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

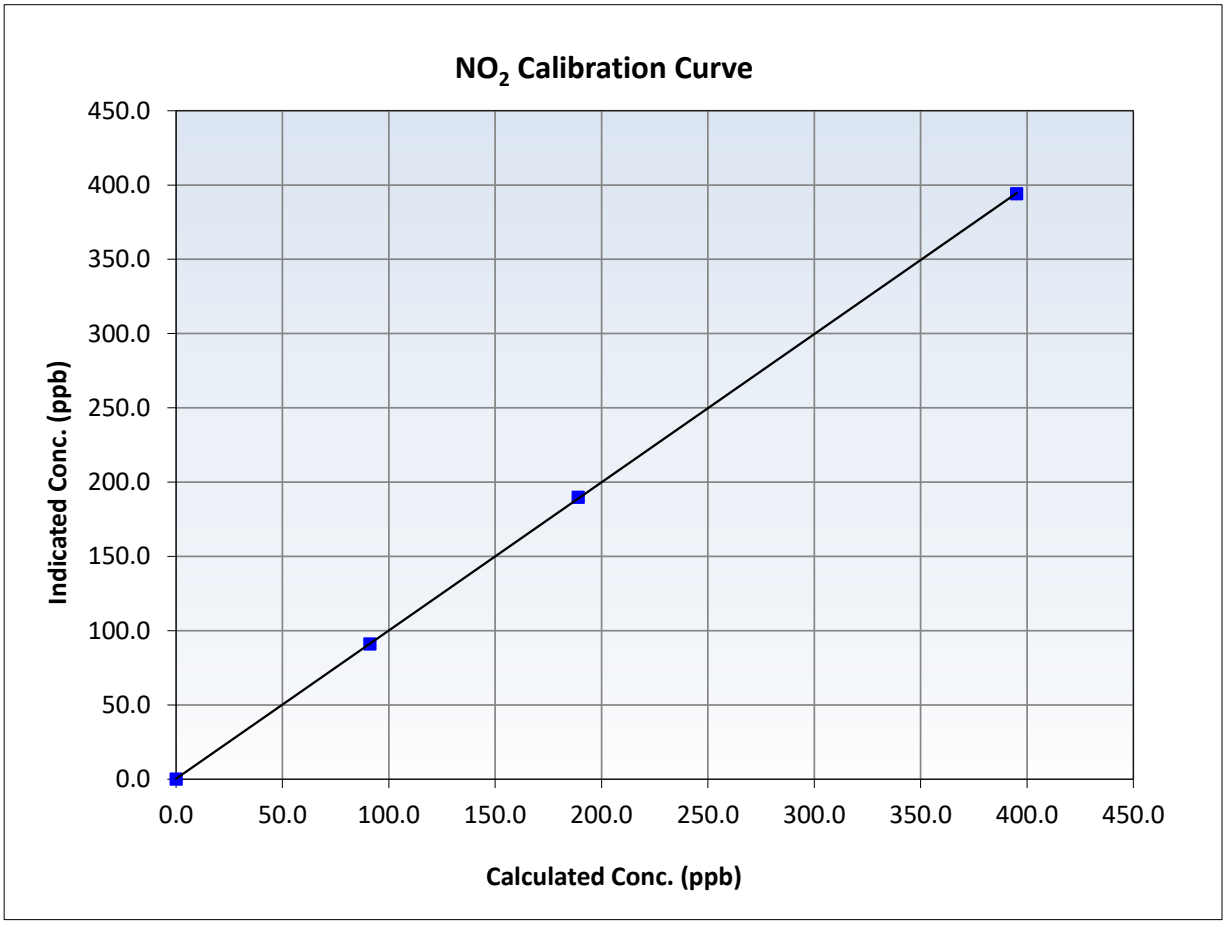
Station Information

Calibration Date:	January 27, 2025	Previous Calibration:	December 11, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:18	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
395.1	394.2	1.0024
189.0	189.8	0.9960
91.1	91.0	1.0015

Statistical Evaluation		Limits
Correlation Coefficient	0.999988	≥0.995
Slope	0.997640	0.90 - 1.10
Intercept	0.343500	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

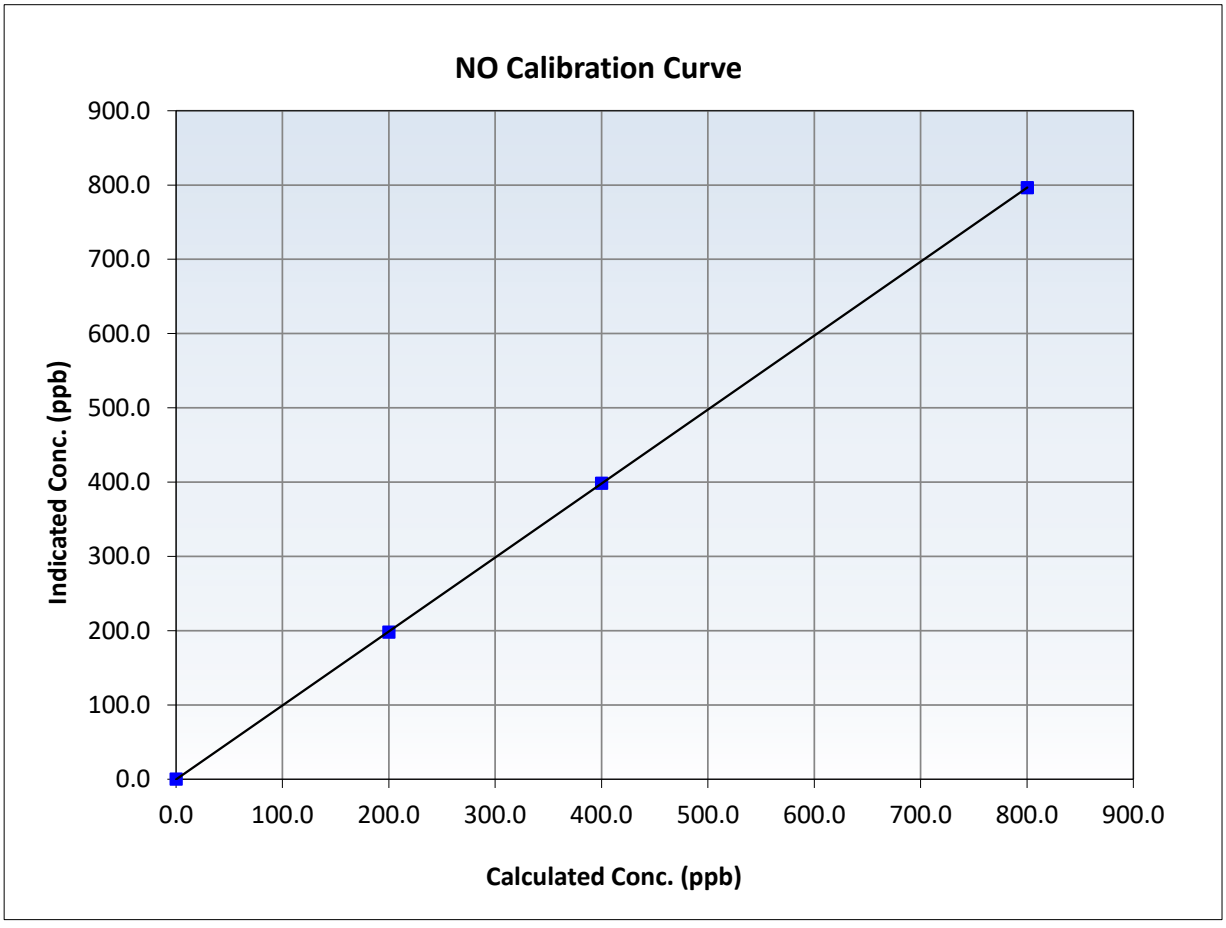
Station Information

Calibration Date:	January 27, 2025	Previous Calibration:	December 11, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:18	End Time (MST):	14:50
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

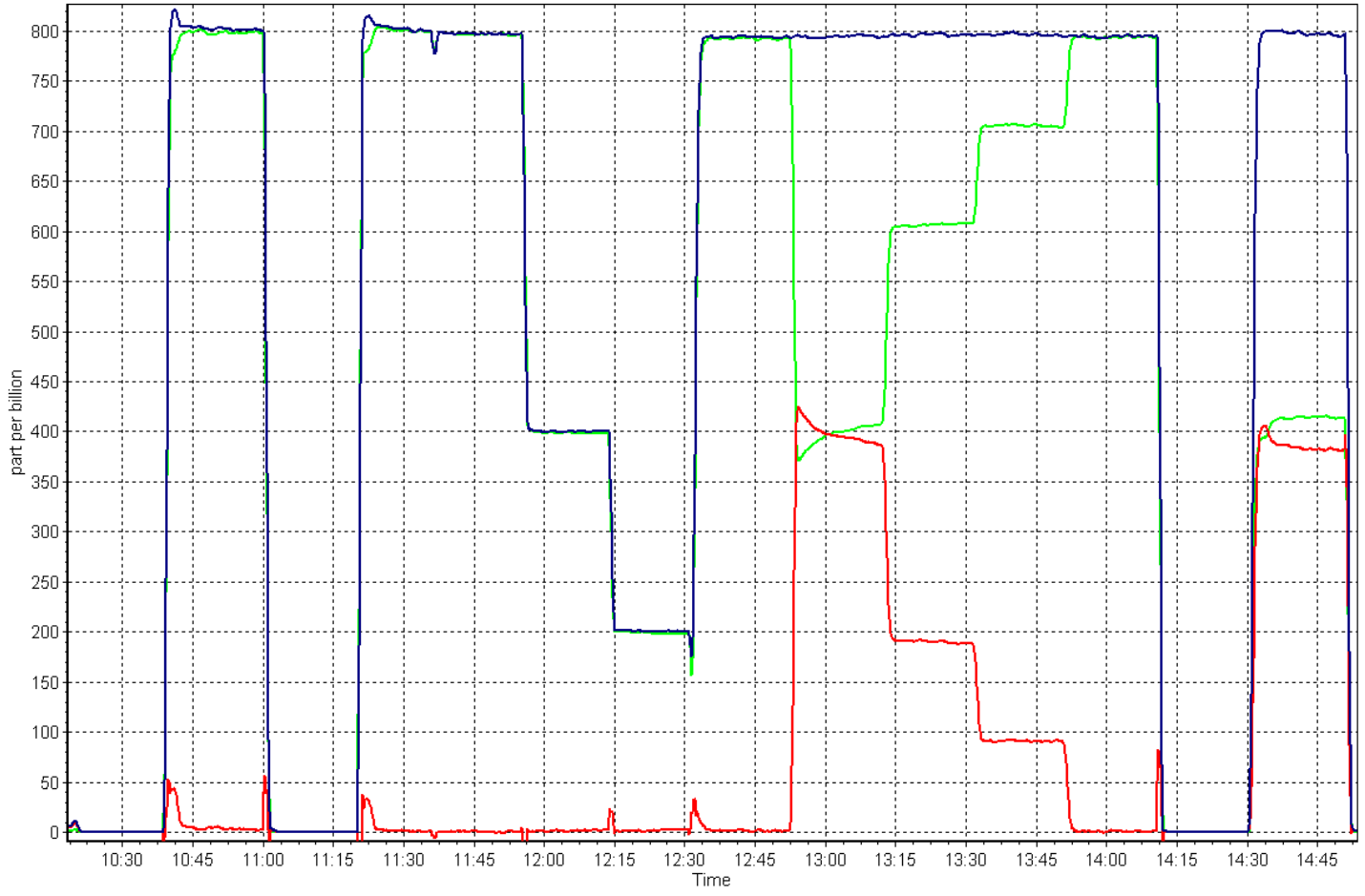
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
800.3	796.6	1.0047
400.2	398.7	1.0037
200.1	198.2	1.0094

Statistical Evaluation		Limits
Correlation Coefficient	0.999997	≥0.995
Slope	0.995708	0.90 - 1.10
Intercept	-0.232047	+/-20



NO_X Calibration Plot Date: January 27, 2025 Location: Conklin



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	January 7, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	11:50	End time (MST):	14:45
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T750	Serial Number:	281
ZAG Make/Model:	Teledyne API 751H	Serial Number:	77

Analyzer Information

Analyzer make:	Thermo 49i		Analyzer serial #:	1501663734	
Analyzer Range	0 - 500 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000571	1.006429	Backgd or Offset:	1.3	1.3
Calibration intercept:	-0.500000	-2.300000	Coeff or Slope:	1.097	1.097

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.1	----
As found High point	5000	925.0	400.0	400.2	1.000
As found Mid point					
As found Low point					
Baseline Corr As found:	400.1	Previous response	399.7	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.2	----
High point	5000	925.0	400.0	401.4	0.997
Mid point	5000	813.9	200.0	198.1	1.010
Low point	5000	722.0	100.0	95.6	1.046
As left zero	5000	800.0	0.0	-0.5	----
As left span	5000	925.0	400.0	412.8	0.969
				Average Correction Factor	1.017

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

Calibration Performed By: Devin Russell

Wood Buffalo Environmental Association

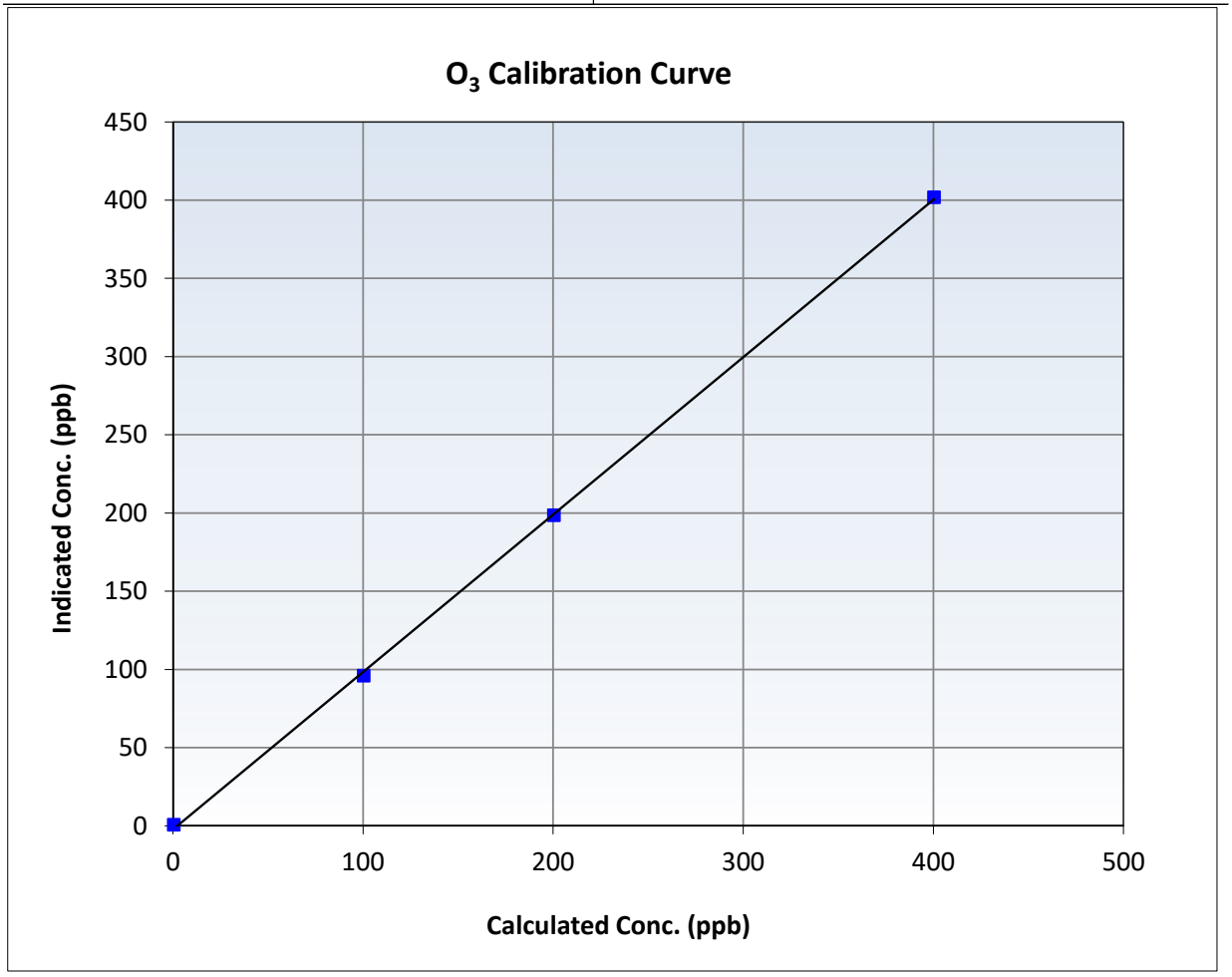
O_3 Calibration Summary

Station Information

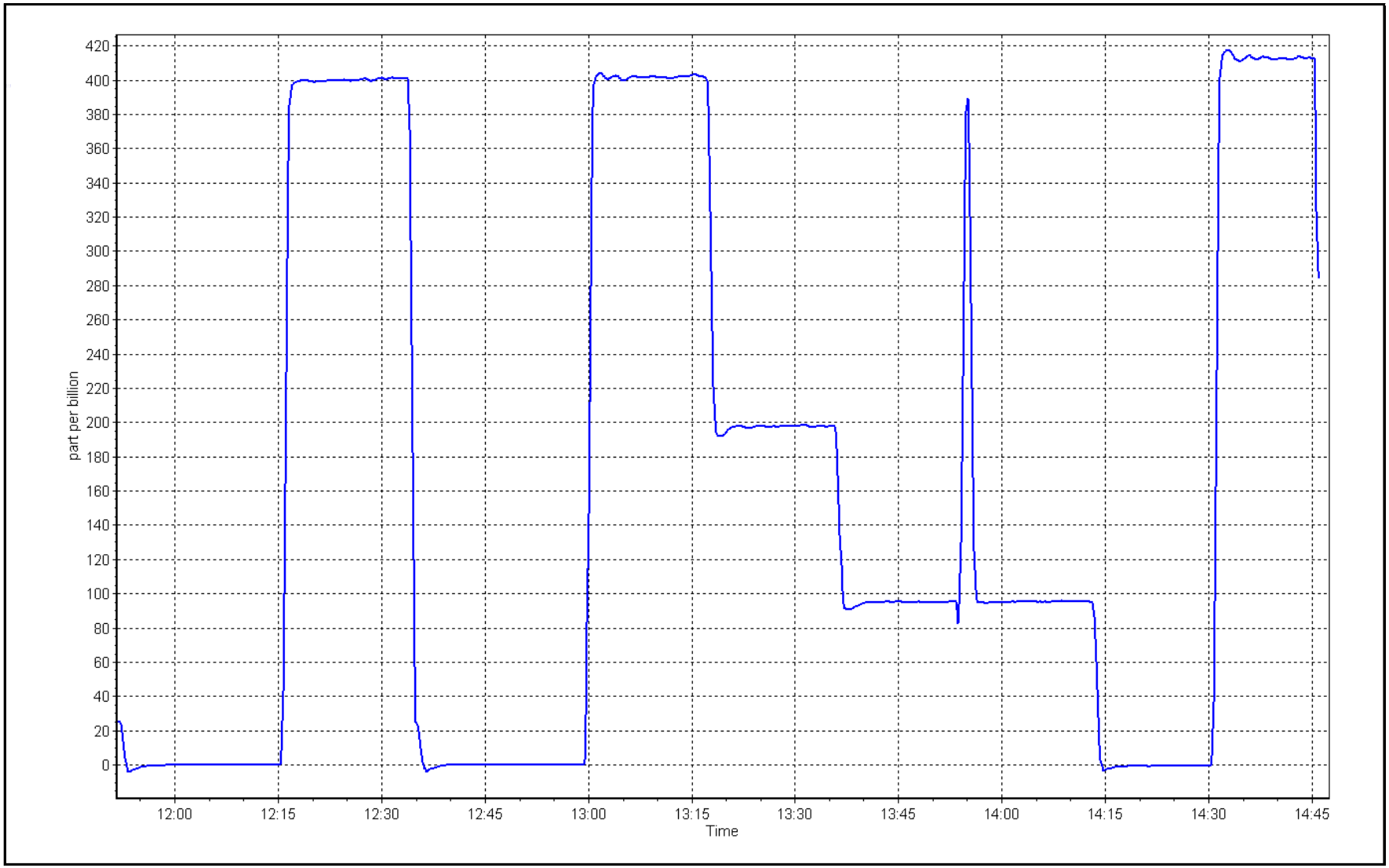
Calibration Date:	January 7, 2025	Previous Calibration:	December 2, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:50	End Time (MST):	14:45
Analyzer make:	Thermo 49i	Analyzer serial #:	1501663734

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999821	*≥0.995*
400.0	401.4	0.9965	Slope	1.006429	*0.90 - 1.10*
200.0	198.1	1.0096			
100.0	95.6	1.0460	Intercept	-2.300000	*+/- 5*



O_3 Calibration Plot Date: January 7, 2025 Location: Conklin



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	January 27, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	13:16	End time (MST):	13:39
Analyzer Make:	API T640	S/N:	326
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	4.00	3.28	4.00	☐	+/- 2 °C
P (mmHg)	702.00	704.26	702.00	☐	+/- 10 mmHg
Flow (LPM)	5.00	5.22	5.00	☐	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%
Zero Verification	PM w/o HEPA:	2.10	PM w/ HEPA:	0.00	<0.2 ug/m3

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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test				☐	+/- 0.5

Date Optical Chamber Cleaned: November 27, 2024

Date Disposable Filter Changed: November 27, 2024

Post- maintenance Zero Verification: PM w/ HEPA: _____ <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: August 9, 2024

Date RH/T Sensor Cleaned: August 9, 2024

Notes: Verified flow, pressure, temperature and pump power. No adjustment needed. Leak check passed.

Calibration by: Jan Castro

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS22
JANVIER
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 2, 2025	Last Cal Date:	December 19, 2024
Start time (MST):	11:46	End time (MST):	14:49
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.11	ppm	Cal Gas Exp Date:	January 18, 2029
Cal Gas Cylinder #:	CC281519			
Removed Cal Gas Conc:	50.11	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	3806
Zero Air Gen Model:	Teledyne API T701		Serial Number:	691

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1152430006	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.000706	0.996320	Backgd or Offset:	25.2	25.1
Calibration intercept:	-0.075626	0.184921	Coeff or Slope:	1.046	1.028

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4920	79.8	799.8	811.5	0.985
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	811.8	Previous response	800.3	*% change	1.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	79.8	799.8	797.2	1.003
Mid point	4960	39.9	399.9	398.1	1.004
Low point	4980	20.0	200.4	200.2	1.001
As left zero	5000	0.0	0.0	0.0	----
As left span	4920	79.8	799.8	798.8	1.001
				Average Correction Factor:	1.003

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

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

SO_2 Calibration Summary

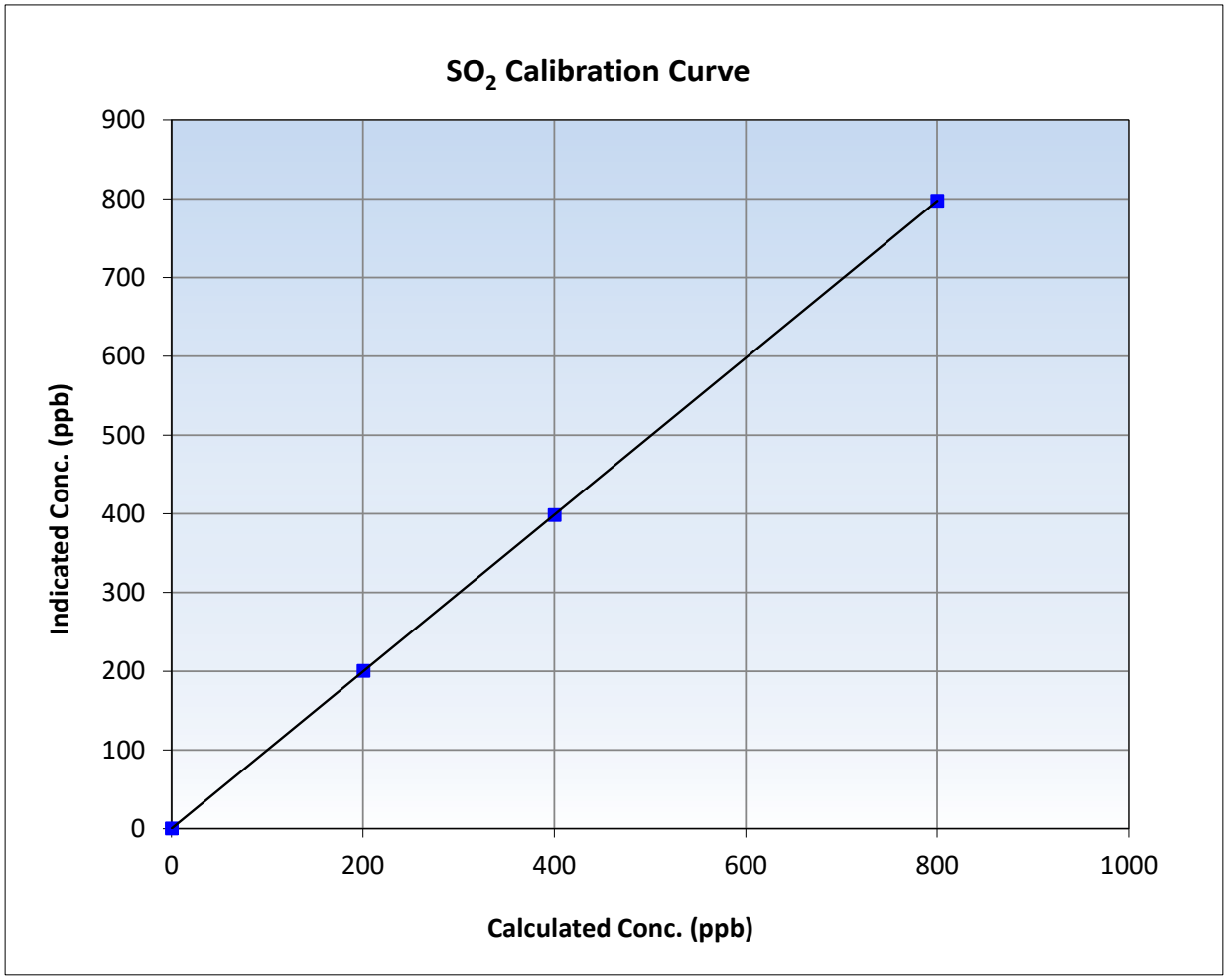
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 19, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:46	End Time (MST):	14:49
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430006

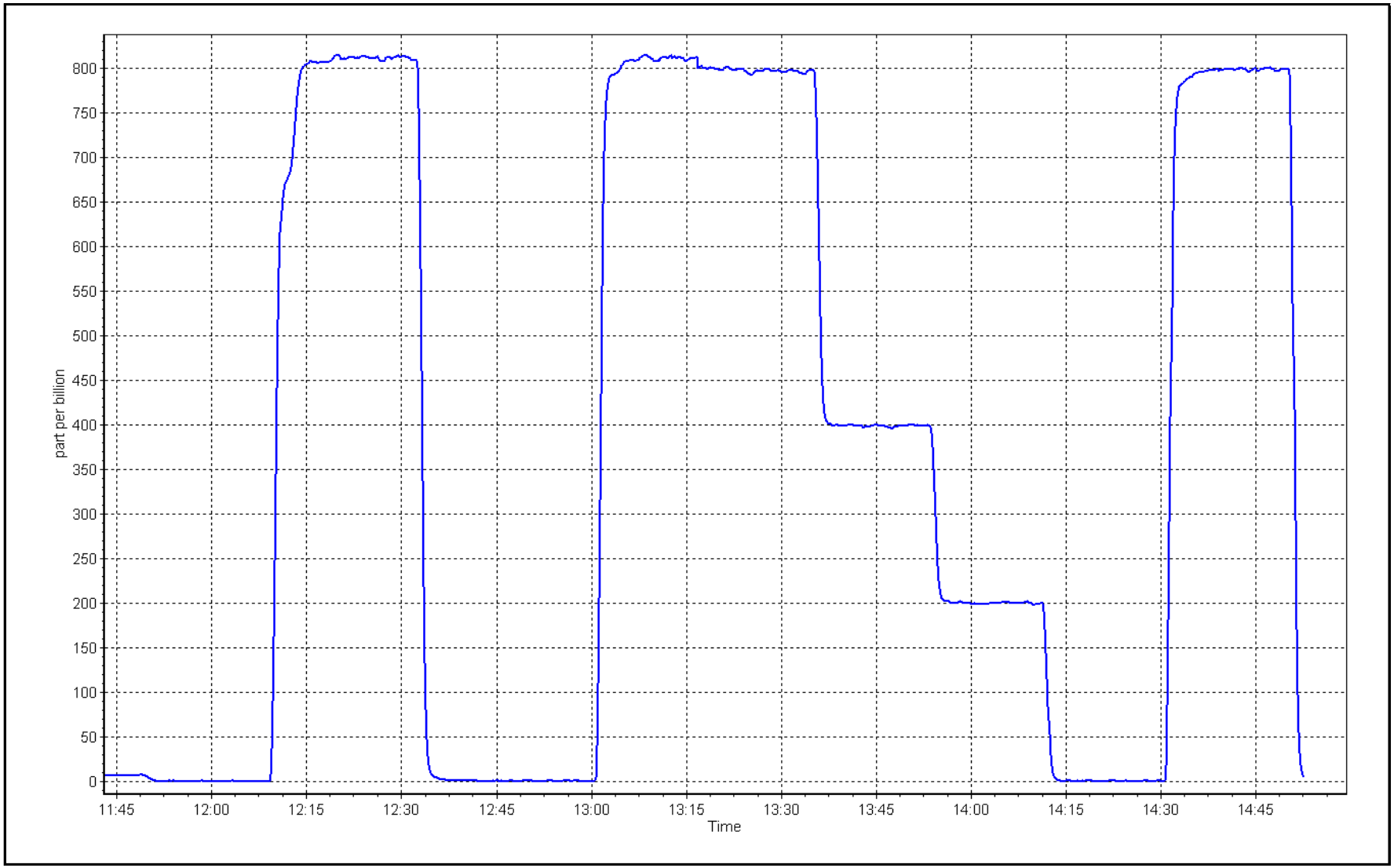
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
799.8	797.2	1.0032
399.9	398.1	1.0045
200.4	200.2	1.0012

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	0.996320	*0.90 - 1.10*
Intercept	0.184921	*+/-30*



SO2 Calibration Plot Date: January 2, 2025 Location: Janvier



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 27, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	11:17	End time (MST):	15:29
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.02	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	CC424047			
Removed Cal Gas Conc:	5.02	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:	691

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680031
Converter make:	CDN-101		Converter serial #:	620
Analyzer Range	0 - 100 ppb		Converter Temp:	850 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.979100	0.984669	Backgd or Offset:	3.77	3.77
Calibration intercept:	0.440224	0.320365	Coeff or Slope:	1.197	1.197

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4920	79.7	80.0	80.9	0.989
As found Mid point	4960	39.8	40.0	40.7	0.982
As found Low point	4980	19.9	20.0	20.3	0.984
New cylinder response					

Baseline Corr As found:	80.9	Prev response:	78.79	*% change:	2.6%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.010946	AF Intercept:	0.100888
Baseline Corr 3rd AF pt:	20.3	AF Correlation:	0.999983	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	79.7	80.0	79.0	1.013
Mid point	4960	39.8	40.0	39.9	1.002
Low point	4980	19.9	20.0	20.0	0.999
As left zero	5000	0.0	0.0	0.4	----
As left span	4920	79.7	80.0	78.9	1.014
SO2 Scrubber Check	4920	79.8	798.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.004
Date of last converter efficiency test:					

Notes: Changed the inlet filter after as founds. Scrubber test performed after zero point, no issues. No adjustments were made.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

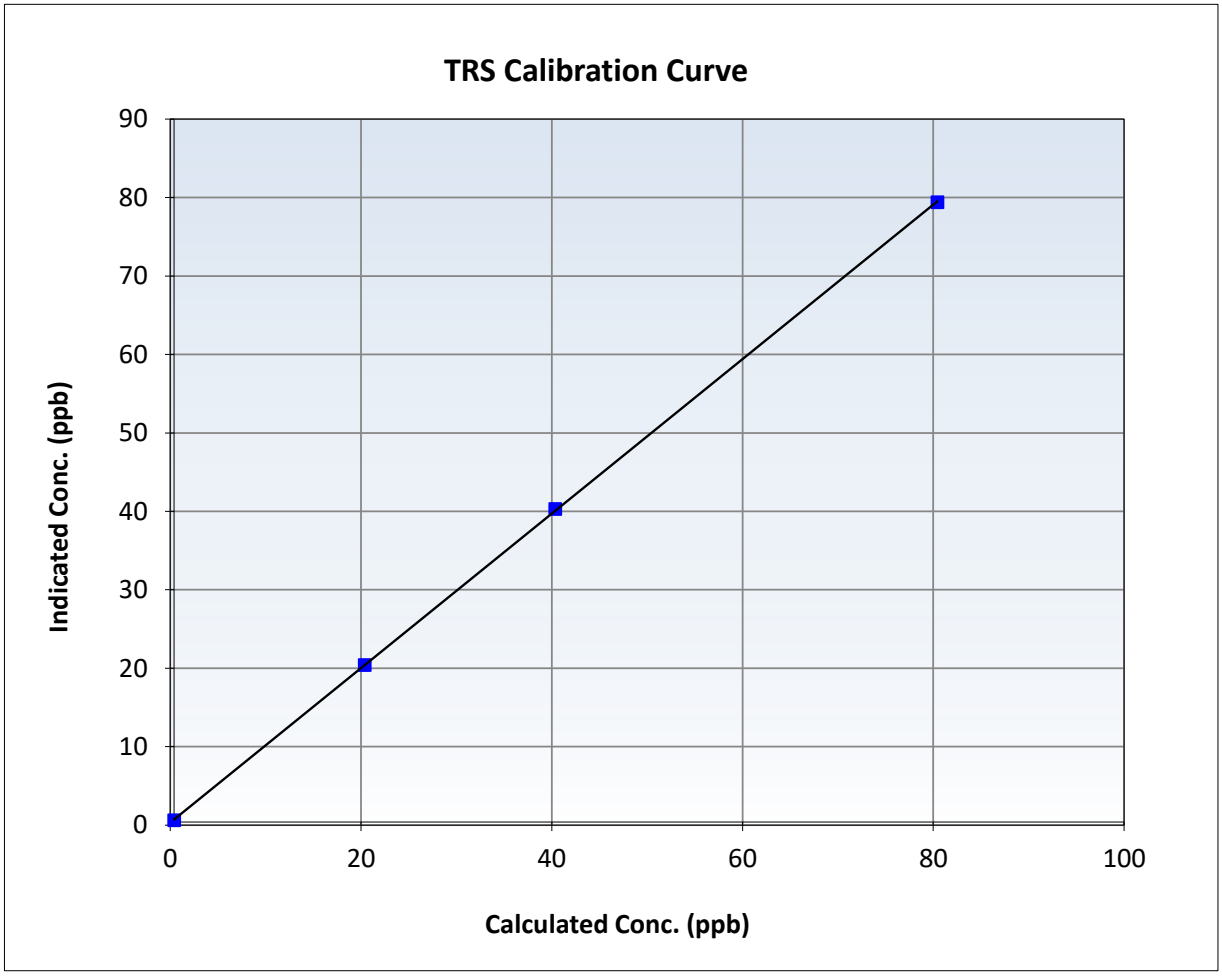
TRS Calibration Summary

Station Information

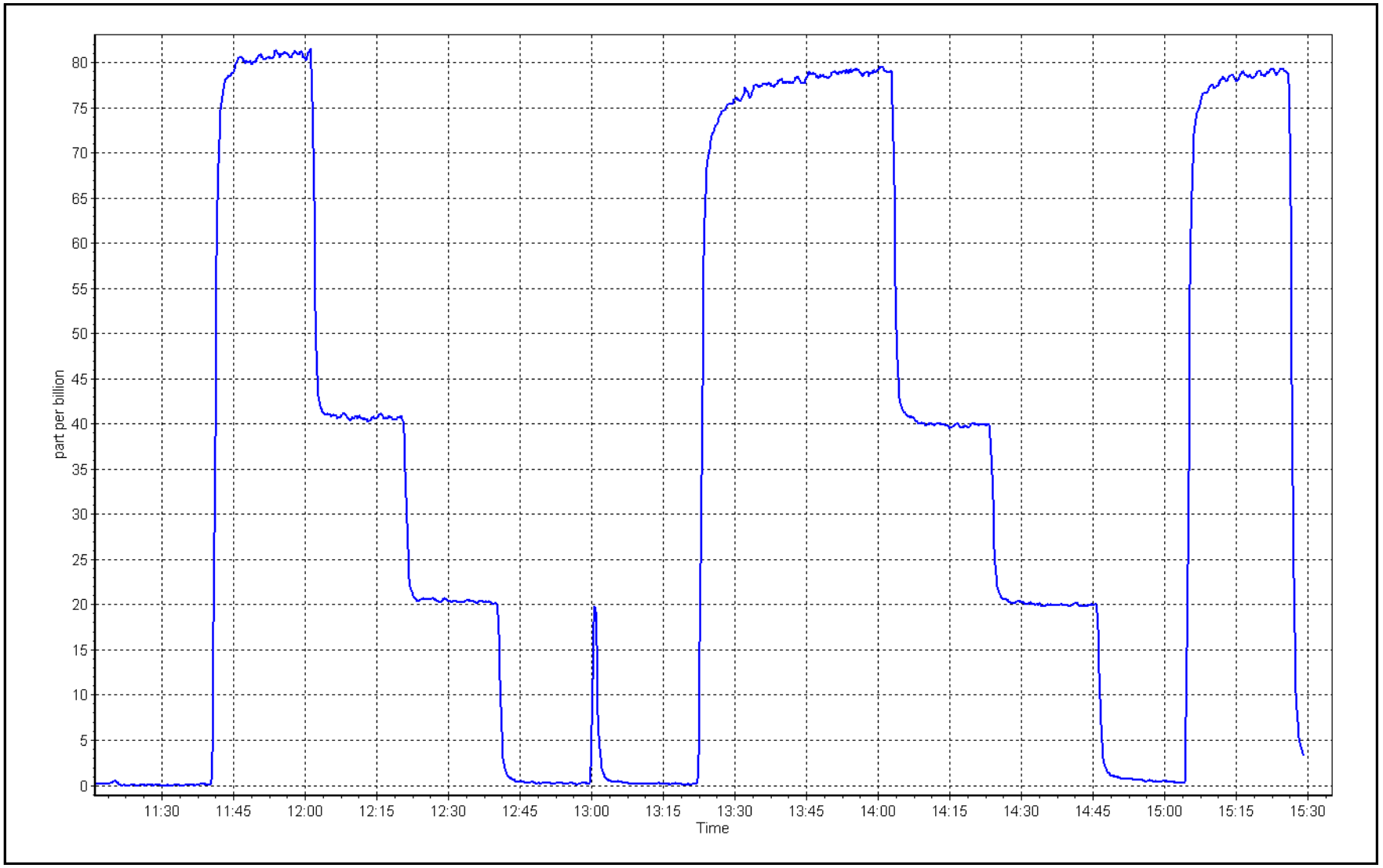
Calibration Date:	January 27, 2025	Previous Calibration:	December 20, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:17	End Time (MST):	15:29
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680031

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999976	*≥0.995*
80.0	79.0	1.0130	Slope	0.984669	*0.90 - 1.10*
40.0	39.9	1.0015			
20.0	20.0	0.9990	Intercept	0.320365	*+/-3*



TRS Calibration Plot Date: January 27, 2025 Location: Janvier



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 2, 2025	Last Cal Date:	December 19, 2024
Start time (MST):	11:46	End time (MST):	14:49
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC281519		Cal Gas Expiry Date:	January 18, 2029	
CH4 Cal Gas Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
C3H8 Cal Gas Conc.	208.4	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
Removed C3H8 Conc.	208.4	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 700		Serial Number:	3806	
Zero Air Gen model:	Teledyne API 701		Serial Number:	691	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1317958219	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	2.44E-04	2.47E-04	NMHC SP Ratio:	5.75E-05	5.88E-05
CH4 Retention time:	11.6	11.6	NMHC Peak Area:	159068	155659
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	17.17	17.00	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.00	Prev response	17.10	*% change	-0.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	17.17	17.18	0.999
Mid point	4960	39.9	8.59	8.54	1.006
Low 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	17.15	1.001
				Average Correction Factor	1.005

Notes: Changed the inlet filter and H2 cylinder after as founds. Adjusted span only.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.15	9.03	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.03	Prev response	9.10	*% change	-0.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	9.15	9.15	1.000
Mid point	4960	39.9	4.57	4.57	1.000
Low point	4980	20.0	2.29	2.29	0.999
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.15	9.14	1.000
				Average Correction Factor	1.000

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	8.03	7.97	1.007
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.97	Prev response	8.00	*% change	-0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	79.8	8.03	8.03	0.999
Mid point	4960	39.9	4.01	3.96	1.012
Low point	4980	20.0	2.01	1.97	1.019
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	8.03	8.01	1.001
				Average Correction Factor	1.010

Calibration Statistics

	Start	*Finish*
THC Cal Slope:	0.997965	1.000914
THC Cal Offset:	-0.037583	-0.025998
CH4 Cal Slope:	0.999957	1.001538
CH4 Cal Offset:	-0.027756	-0.025559
NMHC Cal Slope:	0.995631	1.000367
NMHC Cal Offset:	-0.008227	-0.000439

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

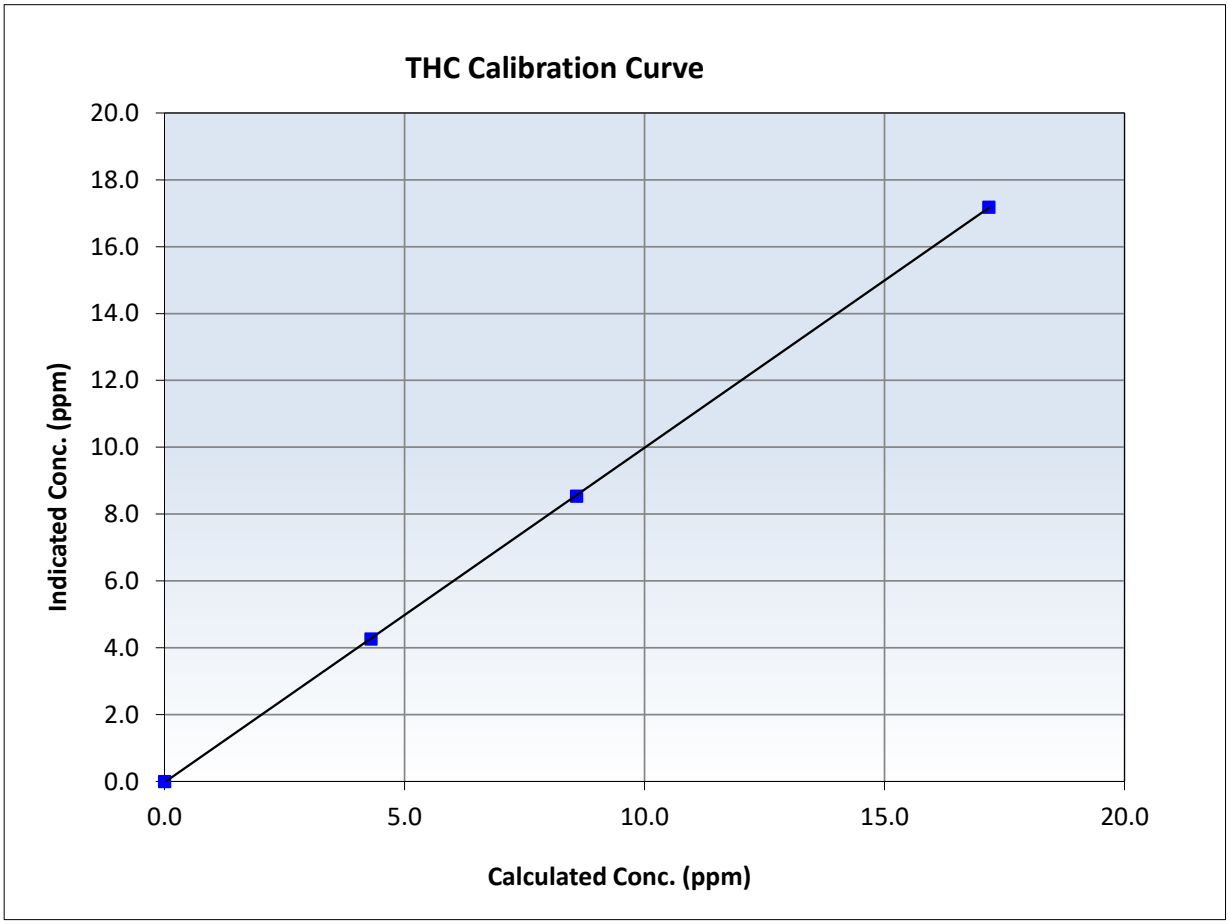
THC Calibration Summary

Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 19, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:46	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999986	≥0.995
17.17	17.18	0.9995	Slope	1.000914	0.90 - 1.10
8.59	8.54	1.0058	Intercept	-0.025998	+/-0.5
4.30	4.27	1.0083			



Wood Buffalo Environmental Association

CH_4 Calibration Summary

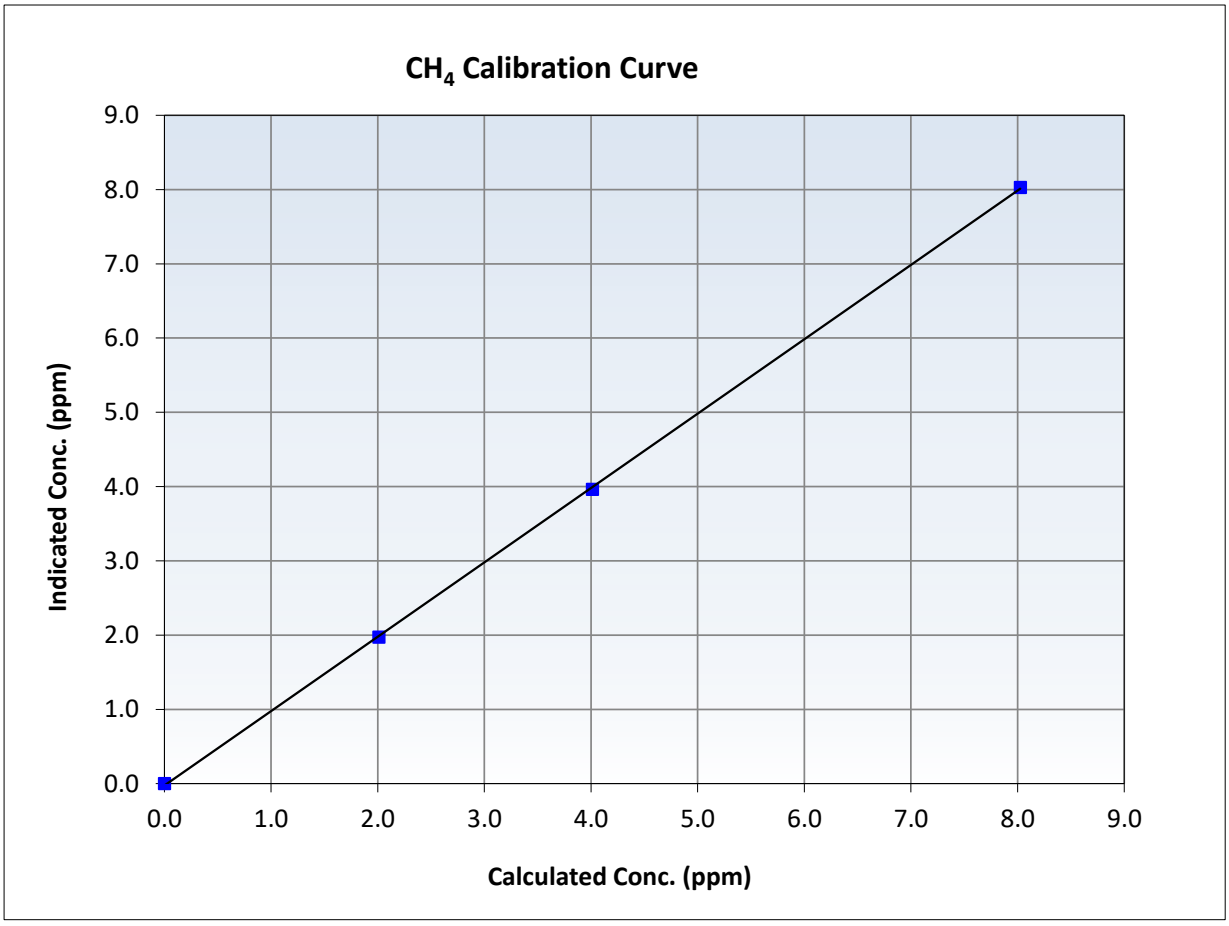
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 19, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:46	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.03	8.03	0.9994
4.01	3.96	1.0122
2.01	1.97	1.0188

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999942	*≥0.995*
Slope	1.001538	*0.90 - 1.10*
Intercept	-0.025559	*+/-0.5*



Wood Buffalo Environmental Association

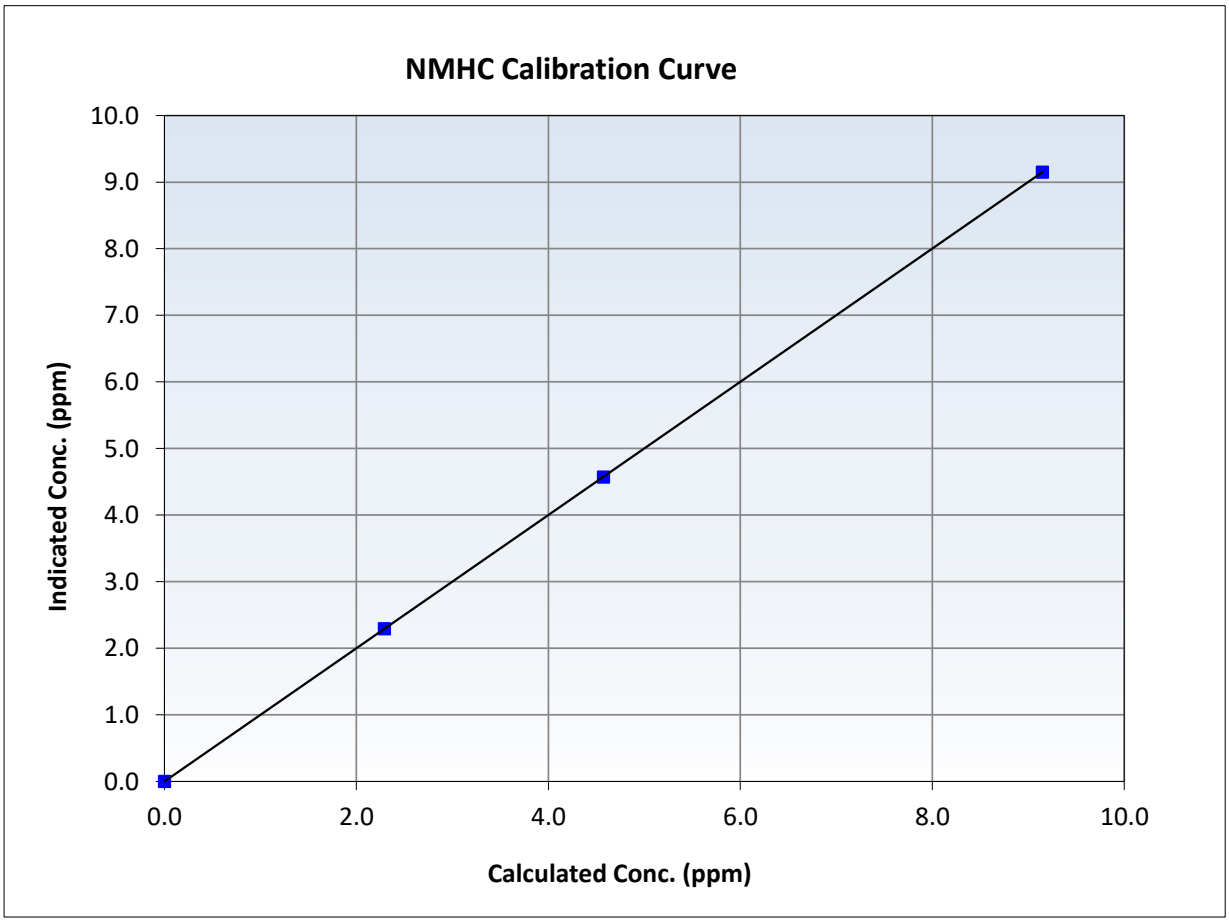
NMHC Calibration Summary

Station Information

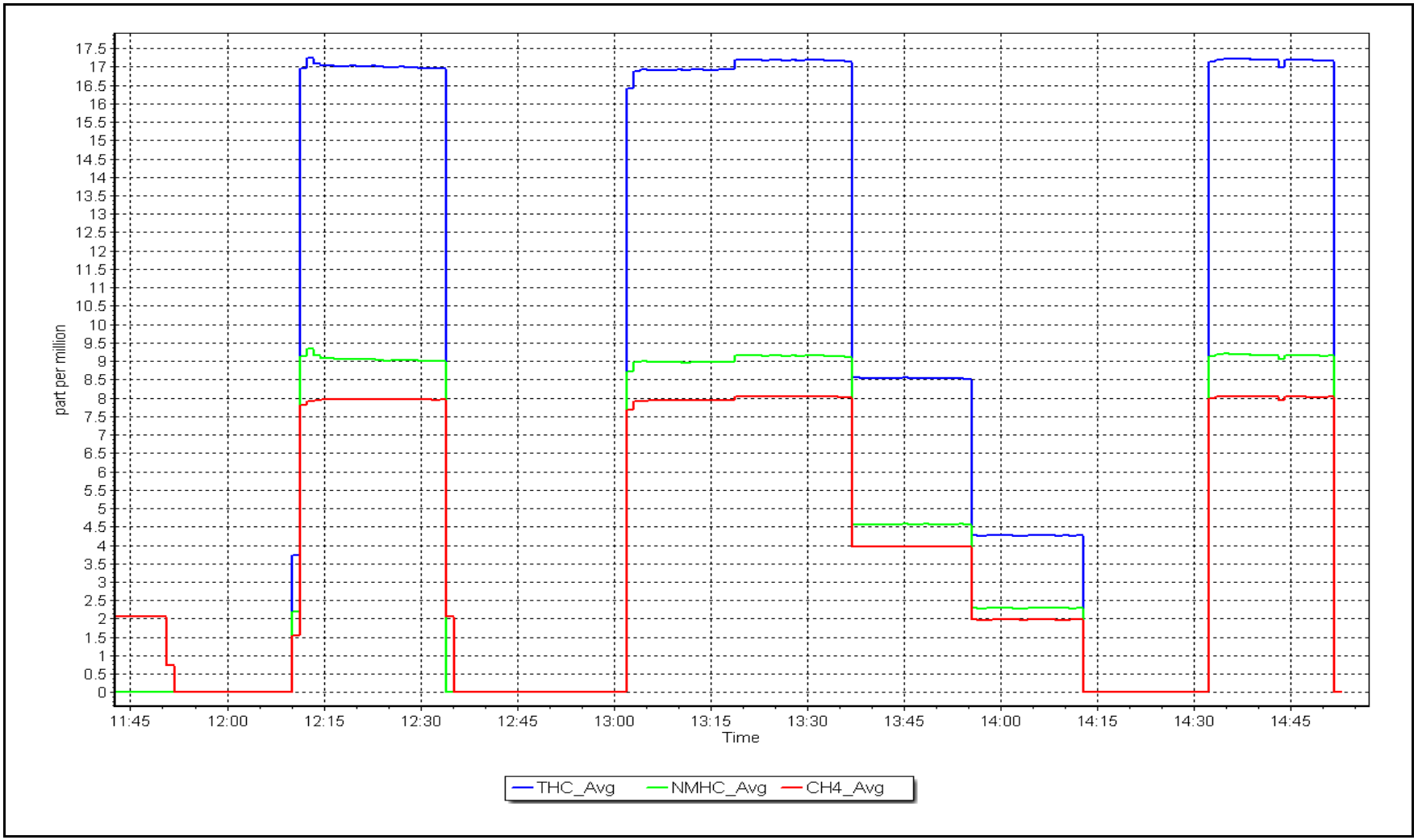
Calibration Date:	January 2, 2025	Previous Calibration:	December 19, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:46	End Time (MST):	14:49
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	1.000000	≥0.995
9.15	9.15	0.9996	Slope	1.000367	0.90 - 1.10
4.57	4.57	1.0003	Intercept	-0.000439	+/-0.5
2.29	2.29	0.9993			



NMHC Calibration Plot Date: January 2, 2025 Location: Janvier



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 6, 2025	Last Cal Date:	January 2, 2025
Start time (MST):	12:45	End time (MST):	14:25
Reason:	Cylinder Change		

Calibration Standards

Gas Cert Reference:	CC281519		Cal Gas Expiry Date:	January 18, 2029	
CH4 Cal Gas Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
C3H8 Cal Gas Conc.	208.4	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	502.8	ppm	CH4 Equiv Conc.	1075.9	ppm
Removed C3H8 Conc.	208.4	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 700		Serial Number:	3806	
Zero Air Gen model:	Teledyne API 701		Serial Number:	691	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1317958219	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	2.47E-04	2.47E-04	NMHC SP Ratio:	5.88E-05	5.88E-05
CH4 Retention time:	11.6	11.6	NMHC Peak Area:	155659	155659
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	17.17	17.24	0.996
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.24	Prev response	17.16	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	17.17	17.15	1.001
				Average Correction Factor	

Notes: Changed the H2 cylinder after as founds.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	9.15	9.19	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.19	Prev response	9.15	*% change	0.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	9.15	9.13	1.002
				Average Correction Factor	

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	79.8	8.03	8.05	0.997
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.05	Prev response	8.01	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 Calibration Data

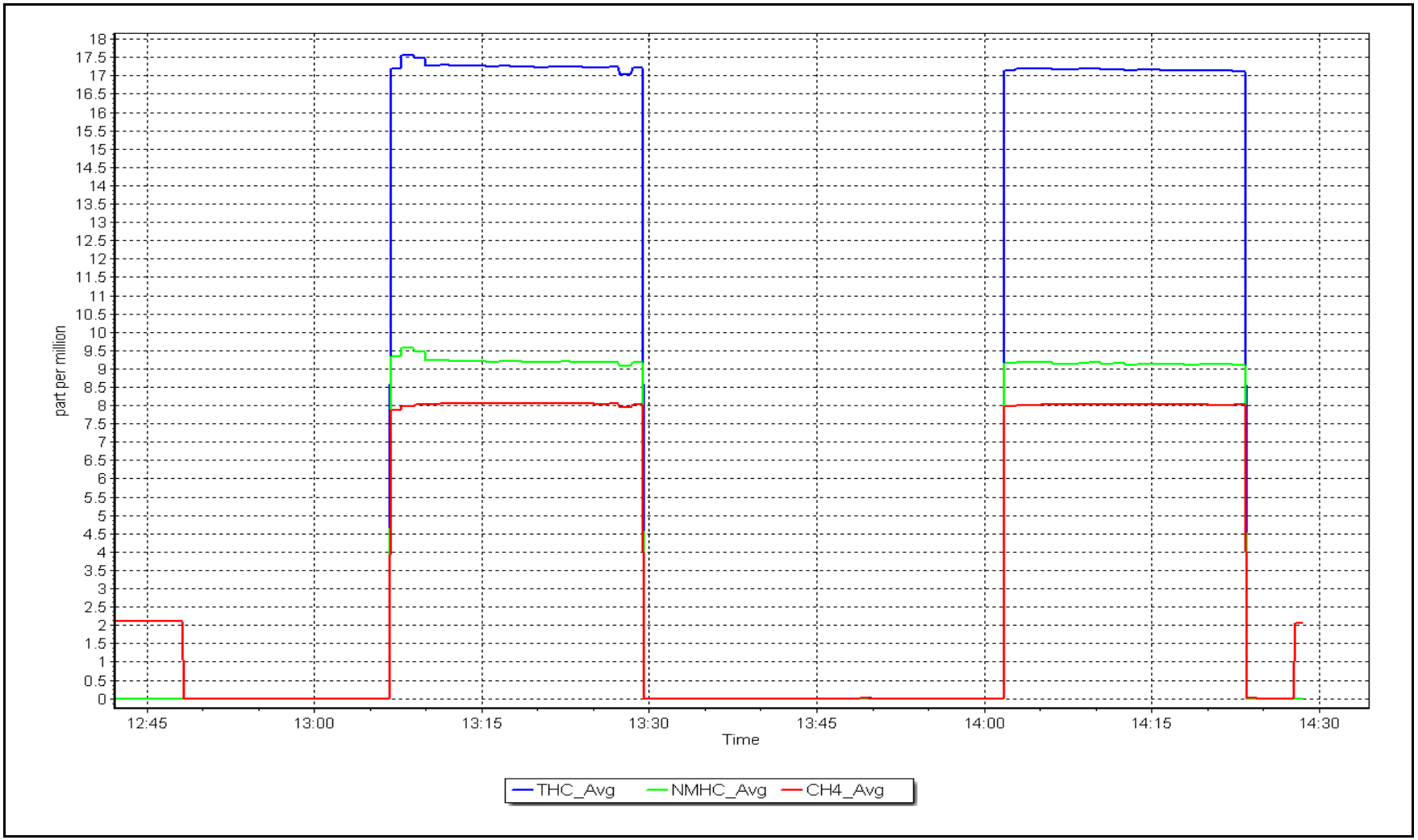
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero					
High point					
Mid point					
Low point					
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	79.8	8.03	8.03	1.000
				Average Correction Factor	

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	1.000914	
THC Cal Offset:	-0.025998	
CH4 Cal Slope:	1.001538	
CH4 Cal Offset:	-0.025559	
NMHC Cal Slope:	1.000367	
NMHC Cal Offset:	-0.000439	

Calibration Performed By: Rene Chamberland

NMHC Calibration Plot Date: January 6, 2025 Location: Janvier



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Janvier
Station number:	AMS 22
Calibration Date:	January 31, 2025
Last Cal Date:	December 16, 2024
Start time (MST):	12:40
End time (MST):	17:13
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0047765	Cal Gas Expiry Date:	March 11, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3806
ZAG make/model:	Teledyne API T701	Serial Number:	691

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	0.1	-0.4	----	----
AF High point	4918	82.0	802.0	800.3	1.6	798.5	787.4	11.1	1.0040	1.0165
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	805.1 ppb	NO =	800.7 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.8%
Baseline Corr 1st pt	NO_X =	798.8 ppb	NO =	787.3 ppb	As Found Statistics	*Percent Change	NO = -1.7%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 833

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	0.880	0.880	NO bkgnd or offset:	-0.7	-0.7
NOX coeff or slope:	0.879	0.879	NOX bkgnd or offset:	0.5	0.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	8.7	8.7

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.002119	0.998670
NO_X Cal Offset:	1.424245	0.584055
NO Cal Slope:	0.999960	0.994805
NO Cal Offset:	0.424054	-0.796198
NO_2 Cal Slope:	0.997993	1.004121
NO_2 Cal Offset:	1.353493	1.604021

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.5	0.4	0.1	----	----
High point	4918	82.0	802.0	800.3	1.6	801.3	796.0	5.3	1.0008	1.0054
Mid point	4960	41.0	400.9	400.1	0.8	401.4	396.5	4.9	0.9988	1.0090
Low point	4980	20.5	200.5	200.1	0.4	200.6	197.1	3.5	0.9994	1.0150
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.4	-0.5	----	----
As left span	4918	82.0	802.0	403.0	399.0	797.6	403.0	394.6	1.0055	1.0000
								Average Correction Factor	0.9996	1.0098

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.1	----	----
High GPT point	792.3	400.0	393.9	396.3	0.9940	100.6%
Mid GPT point	792.3	593.8	200.1	203.6	0.9830	101.7%
Low GPT point	792.3	693.0	100.9	104.3	0.9678	103.3%
				Average Correction Factor	0.9816	101.9%

Notes: Changed the inlet filter after as founds. No adjustments made. Used the 2nd GPT reference point.

Calibration Performed By: Rene Chamberland

Wood Buffalo Environmental Association

NO_X Calibration Summary

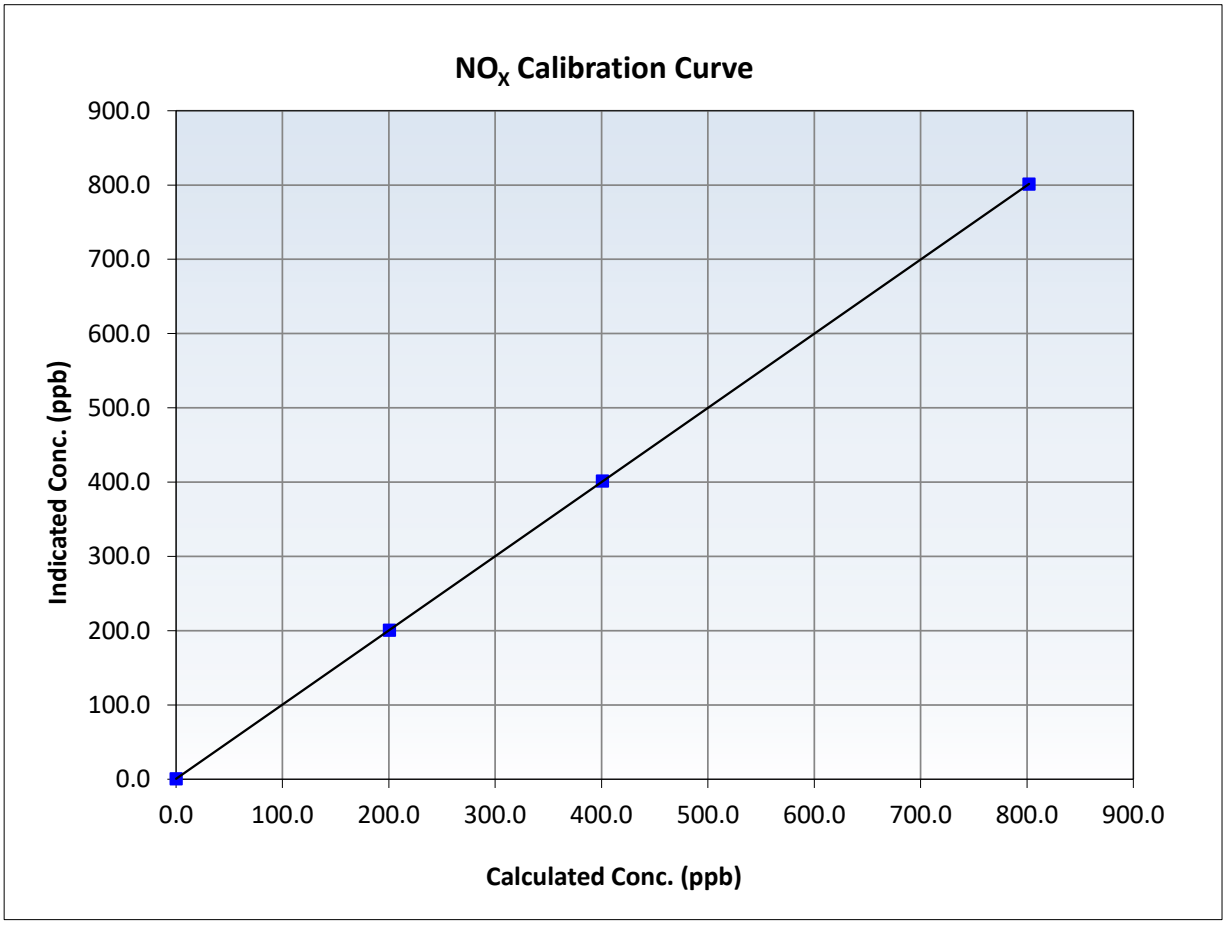
Station Information

Calibration Date:	January 31, 2025	Previous Calibration:	December 16, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:40	End Time (MST):	17:13
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
802.0	801.3	1.0008
400.9	401.4	0.9988
200.5	200.6	0.9994

Statistical Evaluation		Limits
Correlation Coefficient	0.999999	≥0.995
Slope	0.998670	0.90 - 1.10
Intercept	0.584055	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

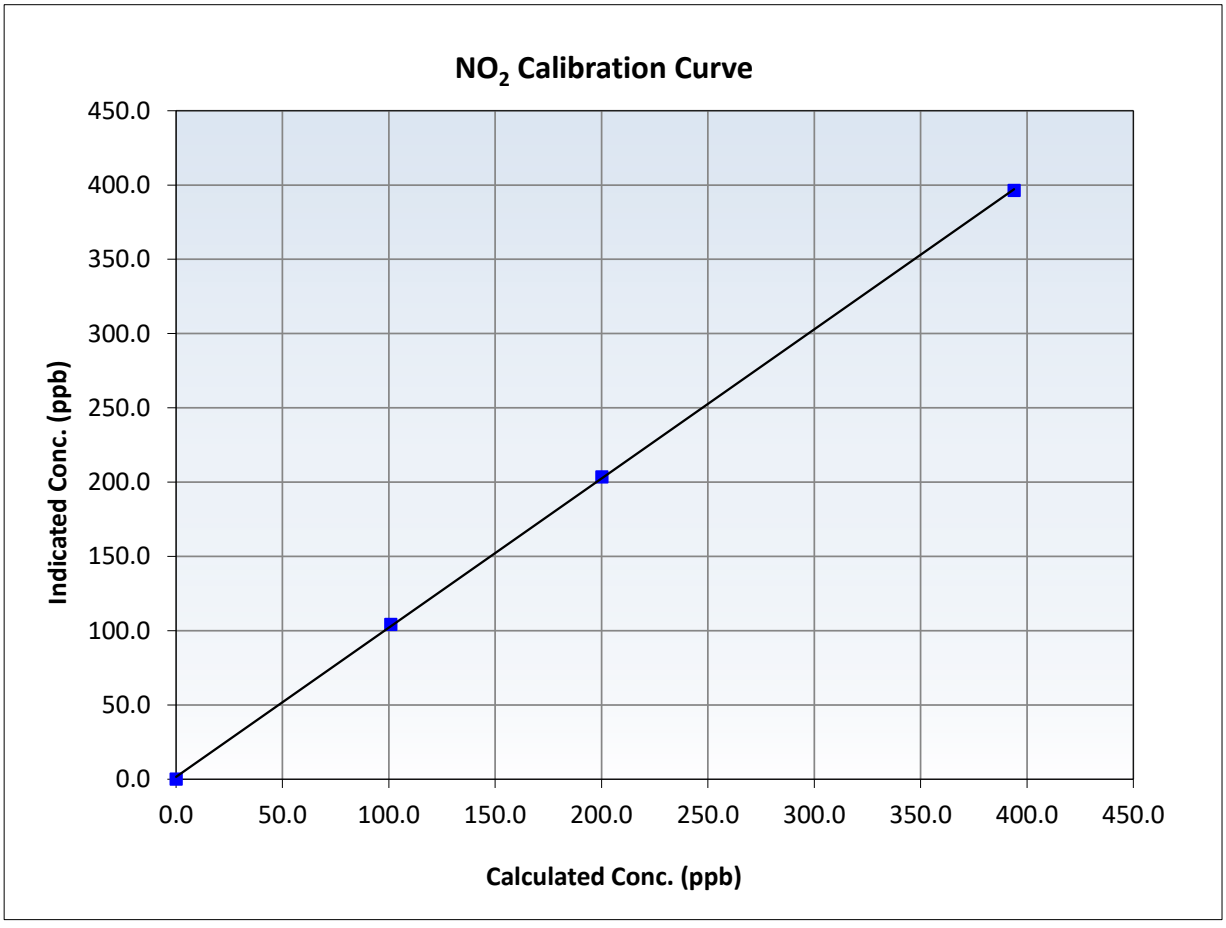
Station Information

Calibration Date:	January 31, 2025	Previous Calibration:	December 16, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:40	End Time (MST):	17:13
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
393.9	396.3	0.9940
200.1	203.6	0.9830
100.9	104.3	0.9678

Statistical Evaluation		Limits
Correlation Coefficient	0.999931	≥0.995
Slope	1.004121	0.90 - 1.10
Intercept	1.604021	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

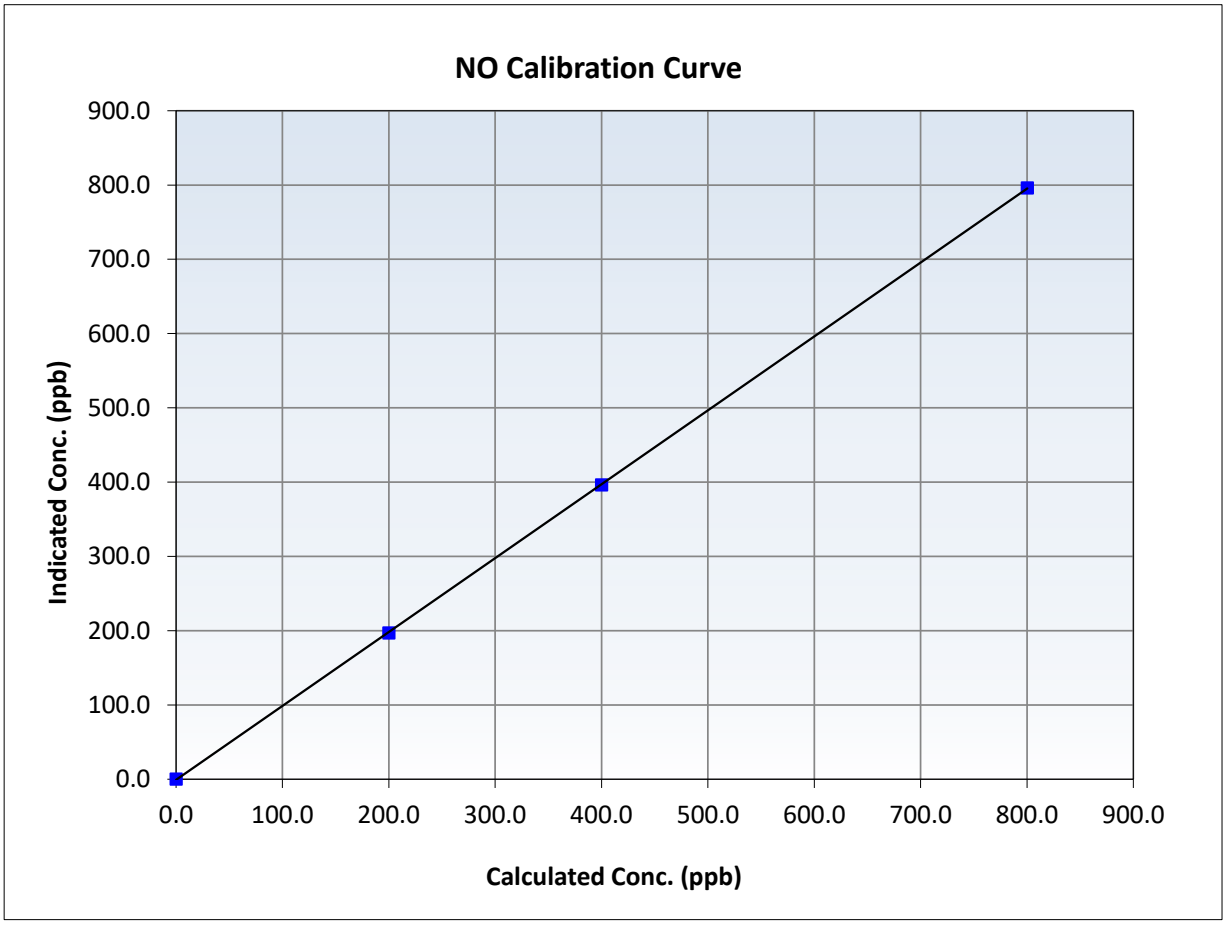
Station Information

Calibration Date:	January 31, 2025	Previous Calibration:	December 16, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:40	End Time (MST):	17:13
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

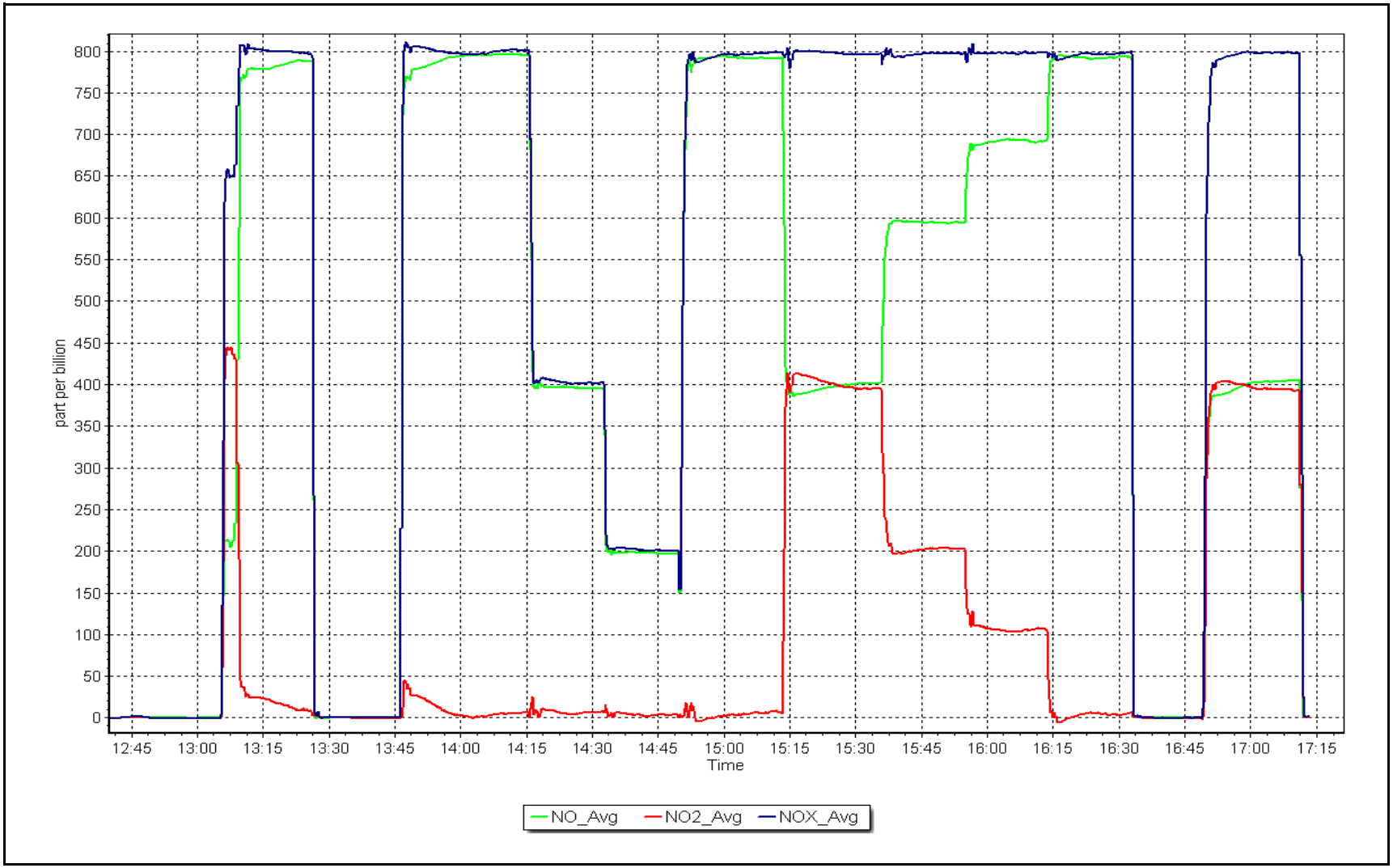
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
800.3	796.0	1.0054
400.1	396.5	1.0090
200.1	197.1	1.0150

Statistical Evaluation		Limits
Correlation Coefficient	0.999990	≥0.995
Slope	0.994805	0.90 - 1.10
Intercept	-0.796198	+/-20



NO_X Calibration Plot Date: January 31, 2025 Location: Janvier



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 30, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	12:09	End time (MST):	15:01
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer		
Calibrator Make/Model:	Teledyne API T700	Serial Number:	3806
ZAG Make/Model:	Teledyne API T701H	Serial Number:	691

Analyzer Information

Analyzer make:	Teledyne API T400	Analyzer serial #:	7046
Analyzer Range	0 - 500 ppb		

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996314	0.997057	Backgd or Offset:	1.5	1.6
Calibration intercept:	1.220000	1.340000	Coeff or Slope:	1.011	1.017

O_3 As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero) *Limit = 0.90-1.10*
As found zero	5000	800.0	0.0	0.3	----
As found High point	5000	922.9	400.0	398.7	1.004
As found Mid point					
As found Low point					
Baseline Corr As found:	398.4	Previous response	399.7	*% 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	

O_3 Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Calibrator zero	5000	800.0	0.0	0.6	----
High point	5000	922.9	400.0	399.8	1.001
Mid point	5000	768.8	200.0	201.1	0.995
Low point	5000	656.1	100.0	101.8	0.982
As left zero	5000	800.0	0.0	0.8	----
As left span	5000	916.2	400.0	402.6	0.994
				Average Correction Factor	0.992

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

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

O_3 Calibration Summary

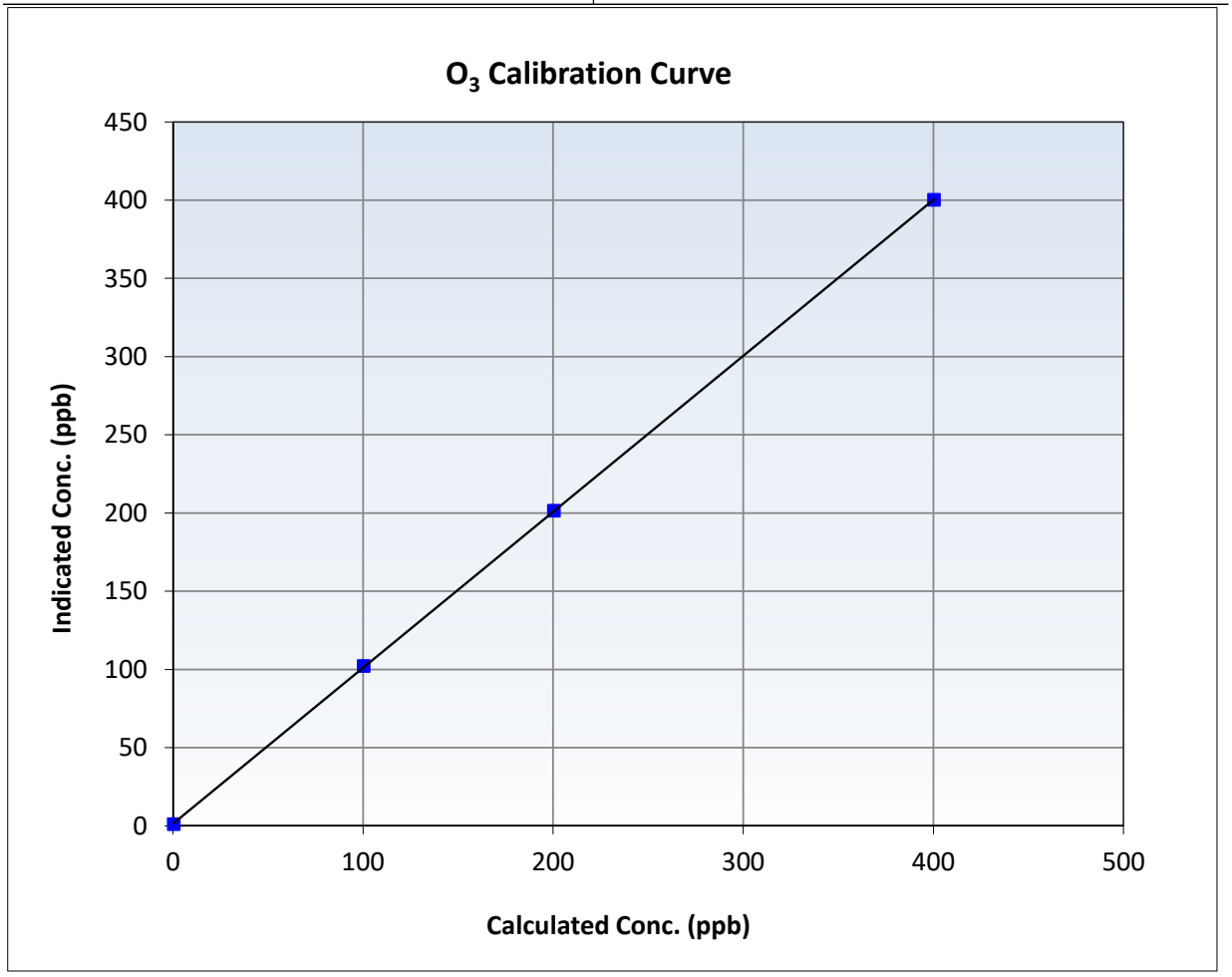
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 13, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	12:09	End Time (MST):	15:01
Analyzer make:	Teledyne API T400	Analyzer serial #:	7046

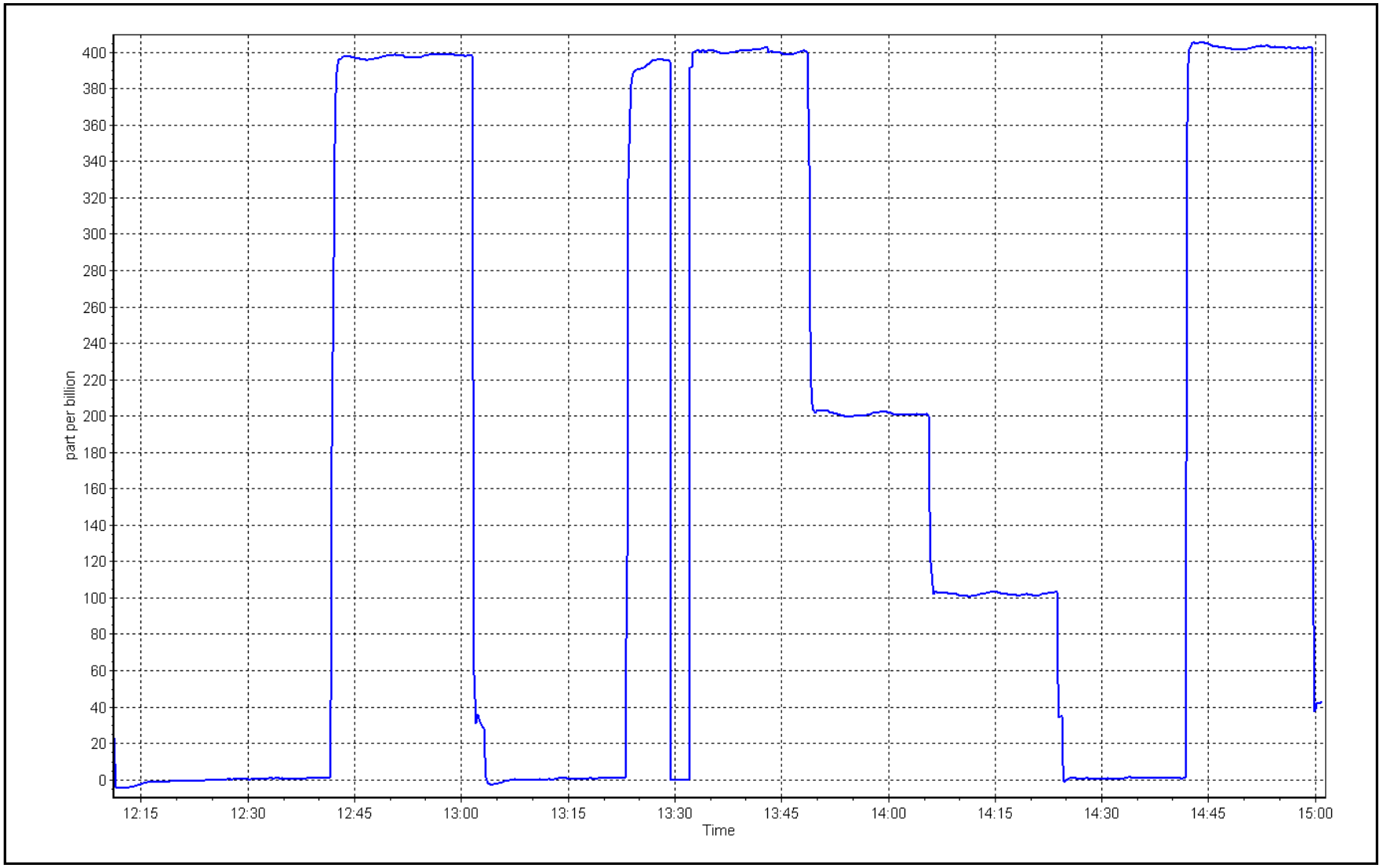
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
400.0	399.8	1.0005
200.0	201.1	0.9945
100.0	101.8	0.9823

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	0.997057	*0.90 - 1.10*
Intercept	1.340000	*+/- 5*



O_3 Calibration Plot Date: January 30, 2025 Location: Janvier



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	January 31, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	14:35	End time (MST):	16:29
Analyzer Make:	Teledyne API T640	S/N:	325
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388752
Temp/RH standard:	Alicat FP-25BT	S/N:	388752

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-15.5	-16.6	-15.5	☐	+/- 2 °C
P (mmHg)	717.8	718.98	717.8	☐	+/- 10 mmHg
Flow (LPM)	5.01	4.967	5.01	☐	+/- 0.25 LPM
PW% (pump)	42	-----	42	☐	>80%
Zero Verification	PM w/o HEPA:	1.4	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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	11.1	11	11	☐	10.9 +/- 0.5

Date Optical Chamber Cleaned: January 31, 2025

Date Disposable Filter Changed: January 31, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 29, 2024

Date RH/T Sensor Cleaned: October 29, 2024

Notes: Verified flow, temperature, and pressure. Leak checks passed. Cleaned the optical chamber and changed the disposable filter. PMT peak test passed.

Calibration by: Rene Chamberland

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS23
FORT HILLS
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	January 16, 2025	Last Cal Date:	December 17, 2024
Start time (MST):	9:28	End time (MST):	12:01
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:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	451
Zero Air Gen Model:	API T701		Serial Number:	1117

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290012	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.992885	1.005743	Backgd or Offset:	18.3	18.9
Calibration intercept:	-0.282101	-0.904569	Coeff or Slope:	1.056	1.071

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	80.3	799.1	791.5	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	791.4	Previous response	793.1	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4920	80.3	799.1	803.2	0.995
Mid point	4960	40.2	400.1	401.5	0.996
Low point	4980	20.1	200.0	198.5	1.008
As left zero	5000	0.0	0.0	0.3	----
As left span	4920	80.3	799.1	806.6	0.991
				Average Correction Factor:	1.000

Notes: No maintenance or adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

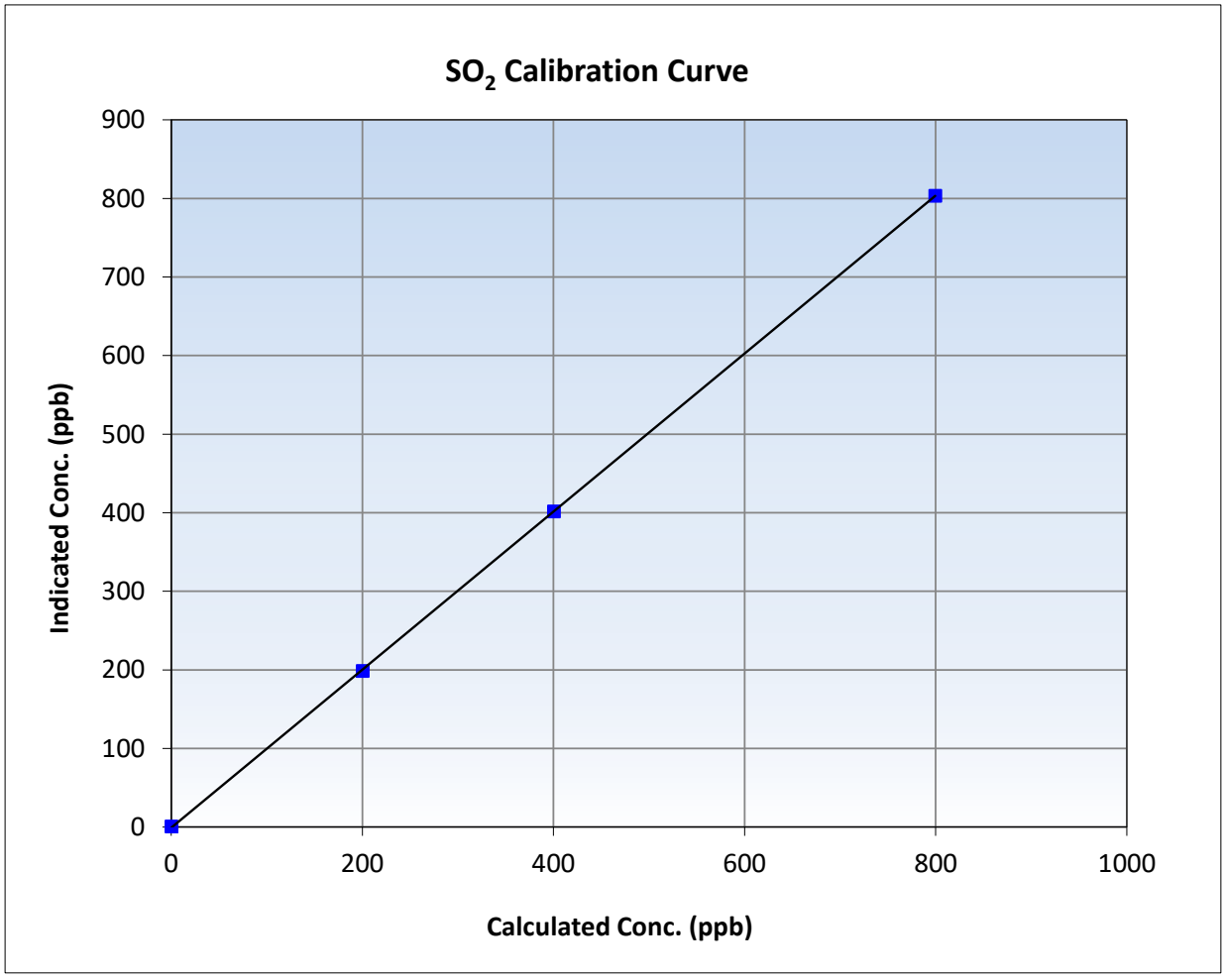
Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 17, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	9:28	End Time (MST):	12:01
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290012

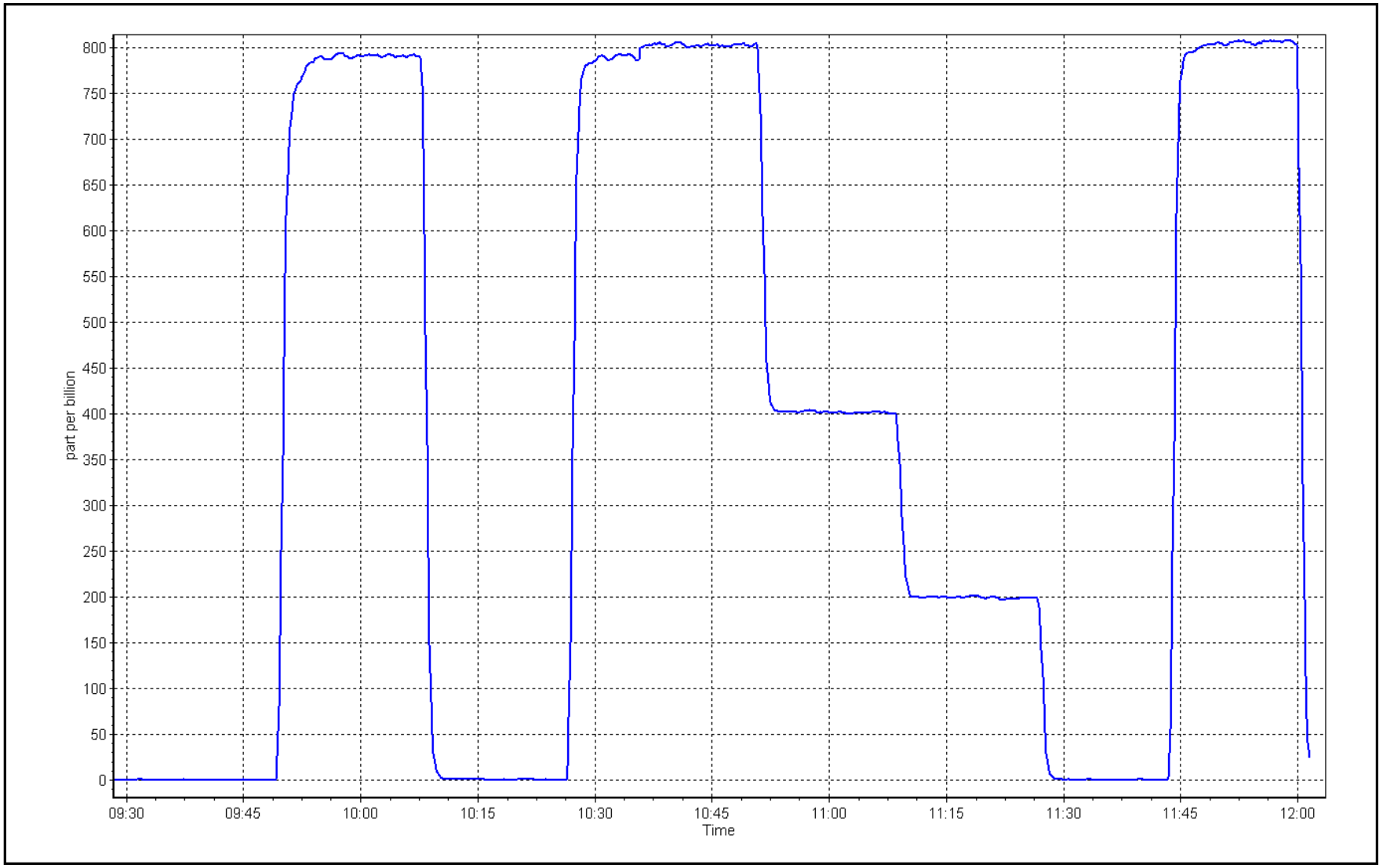
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
799.1	803.2	0.9949
400.1	401.5	0.9964
200.0	198.5	1.0077

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999986	*≥0.995*
Slope	1.005743	*0.90 - 1.10*
Intercept	-0.904569	*+/-30*



SO2 Calibration Plot Date: January 16, 2025 Location: Fort Hills



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	January 14, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	8:22	End time (MST):	11:57
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.84	ppm	Cal Gas Exp Date:	August 28, 2027
Cal Gas Cylinder #:	DT0021910			
Removed Cal Gas Conc:	4.84	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Make/Model:	API T700		Serial Number:	451
ZAG Make/Model:	API T701		Serial Number:	1117

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1300156232
Converter make:	CDN-101		Converter serial #:	594
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.017684	0.996383	Backgd or Offset:	2.00	2.00
Calibration intercept:	-0.138341	-0.017935	Coeff or Slope:	1.172	1.172

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4917	82.6	80.0	81.2	0.985
As found Mid point	4959	41.3	40.0	40.5	0.987
As found Low point	4979	20.7	20.0	20.0	1.002
New cylinder response					

Baseline Corr As found:	81.2	Prev response:	81.24	*% change:	0.0%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	1.016825	AF Intercept:	-0.158281
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999979	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4917	82.6	80.0	79.6	1.005
Mid point	4959	41.3	40.0	40.0	0.999
Low point	4979	20.7	20.0	19.8	1.012
As left zero	5000	0.0	0.0	0.1	----
As left span	4917	82.6	80.0	82.8	0.966
SO2 Scrubber Check	4920	80.3	803.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	1.005
Date of last converter efficiency test:		March 13, 2024		110.3%	efficiency

Notes: SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

TRS Calibration Summary

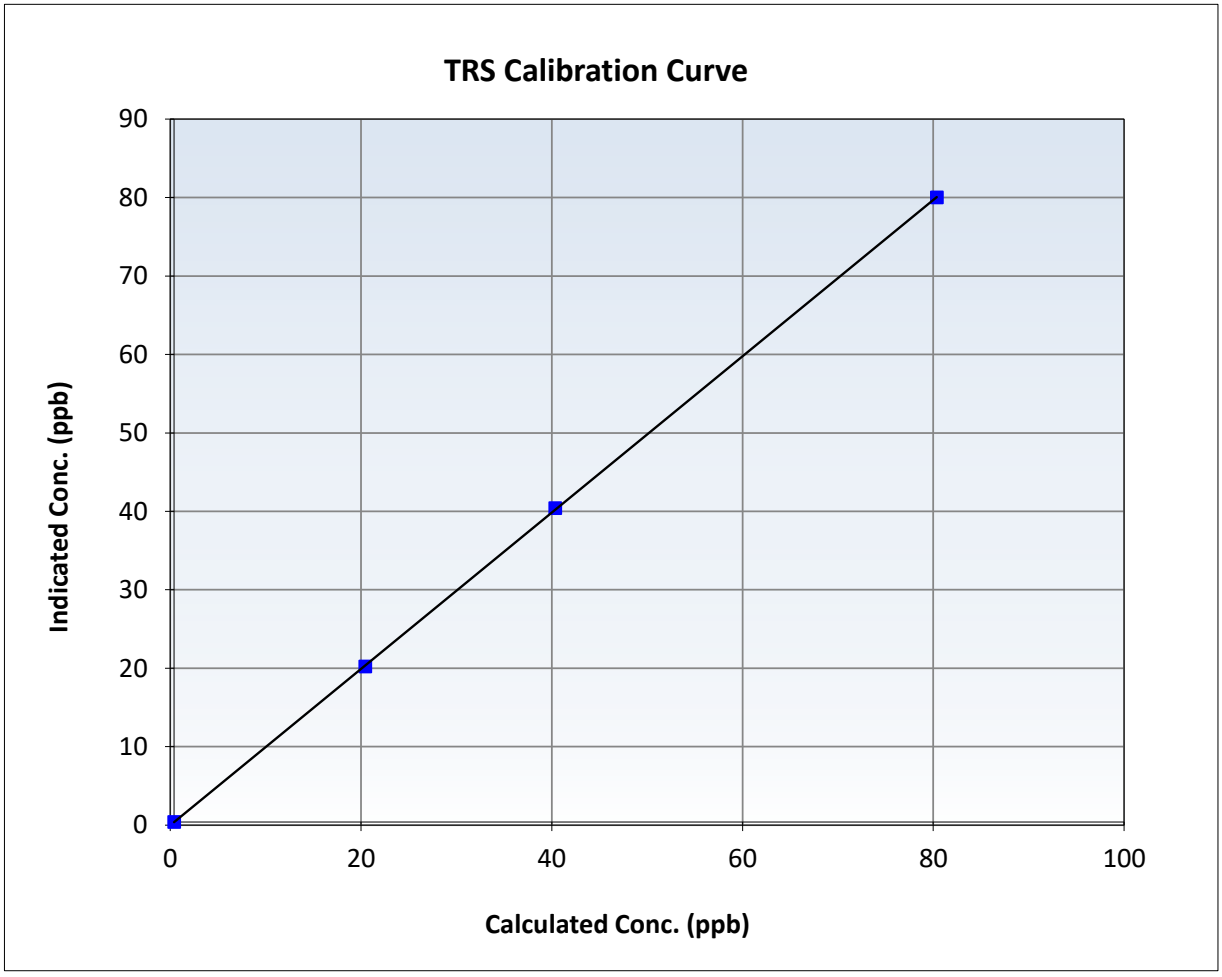
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	December 10, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	8:22	End Time (MST):	11:57
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1300156232

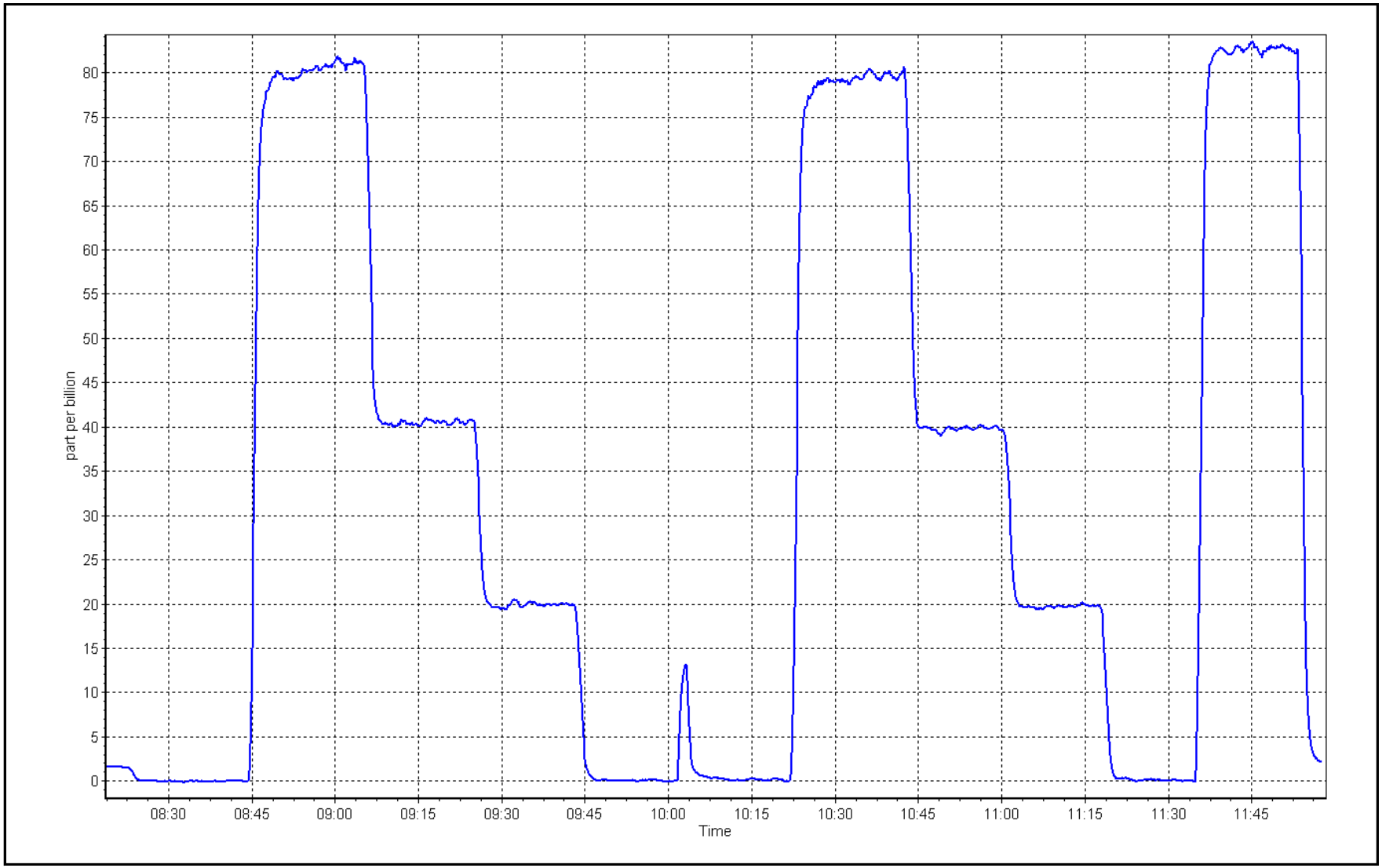
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	79.6	1.0046
40.0	40.0	0.9994
20.0	19.8	1.0121

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999983	*≥0.995*
Slope	0.996383	*0.90 - 1.10*
Intercept	-0.017935	*+/-3*



TRS Calibration Plot Date: January 14, 2025 Location: Fort Hills



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	January 16, 2025	Last Cal Date:	December 17, 2024
Start time (MST):	9:28	End time (MST):	12:00
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC281425	Cal Gas Expiry Date:	January 5, 2025
CH4 Cal Gas Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
C3H8 Cal Gas Conc.	207.4 ppm		
Removed Gas Cert:		Removed Gas Expiry:	
Removed CH4 Conc.	500.2 ppm	CH4 Equiv Conc.	1070.6 ppm
Removed C3H8 Conc.	207.4 ppm	Diff between cyl (THC):	
Diff between cyl (CH_4):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	451
Zero Air Gen model:	API T701	Serial Number:	1117

Analyzer Information

Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012
THC Range:	0 - 20 ppm	NMHC/CH4 Range:	0 - 10 ppm

	Start	*Finish*		*Start*	*Finish*
CH4 SP Ratio:	2.02E-05	2.02E-05	NMHC SP Ratio:	7.43E-05	7.72E-05
CH4 Retention time:	12.0	12.2	NMHC Peak Area:	122718	118211
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	17.19	16.85	1.020
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	16.85	Prev response	17.13	*% change	-1.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	17.19	17.14	1.003
Mid point	4960	40.2	8.61	8.50	1.012
Low point	4980	20.1	4.30	4.25	1.014
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	17.19	17.09	1.006
				Average Correction Factor	1.010

Notes: Span adjusted. No maintenance done.

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	9.16	8.78	1.043
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.78	Prev response	9.09	*% change	-3.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	9.16	9.15	1.002
Mid point	4960	40.2	4.59	4.51	1.017
Low point	4980	20.1	2.29	2.28	1.005
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	9.16	9.06	1.011
				Average Correction Factor	1.008

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4920	80.3	8.03	8.07	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.07	Prev response	8.04	*% change	0.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4920	80.3	8.03	8.00	1.004
Mid point	4960	40.2	4.02	3.99	1.008
Low point	4980	20.1	2.01	1.96	1.024
As left zero	5000	0.0	0.00	0.00	----
As left span	4920	80.3	8.03	8.03	1.000
				Average Correction Factor	1.012

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997331	0.997588
THC Cal Offset:	-0.015765	-0.034946
CH4 Cal Slope:	1.004381	0.997540
CH4 Cal Offset:	-0.026641	-0.018837
NMHC Cal Slope:	0.991173	0.997853
NMHC Cal Offset:	0.010277	-0.016509

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

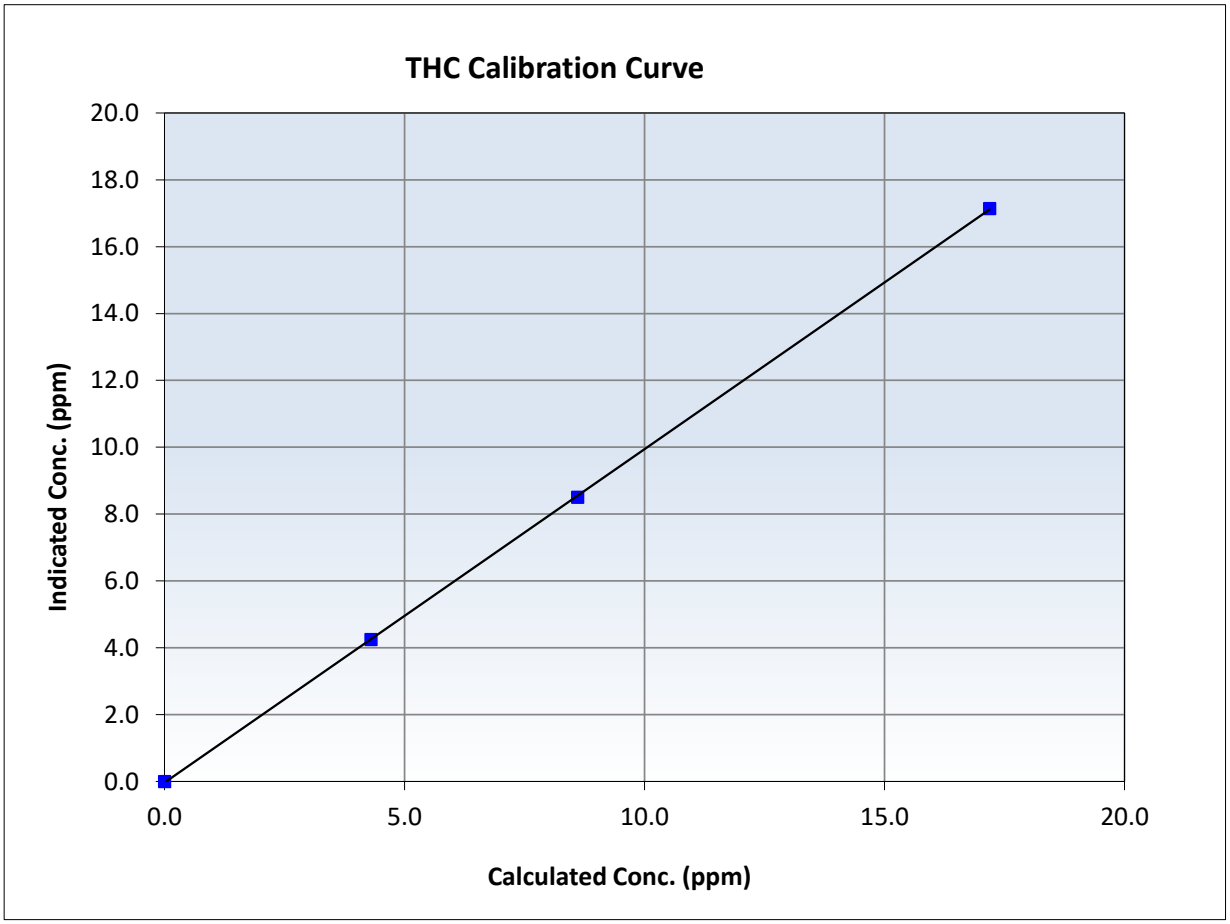
THC Calibration Summary

Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 17, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	9:28	End Time (MST):	12:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999971	≥0.995
17.19	17.14	1.0028	Slope	0.997588	0.90 - 1.10
8.61	8.50	1.0125			
4.30	4.25	1.0138	Intercept	-0.034946	+/-0.5



Wood Buffalo Environmental Association

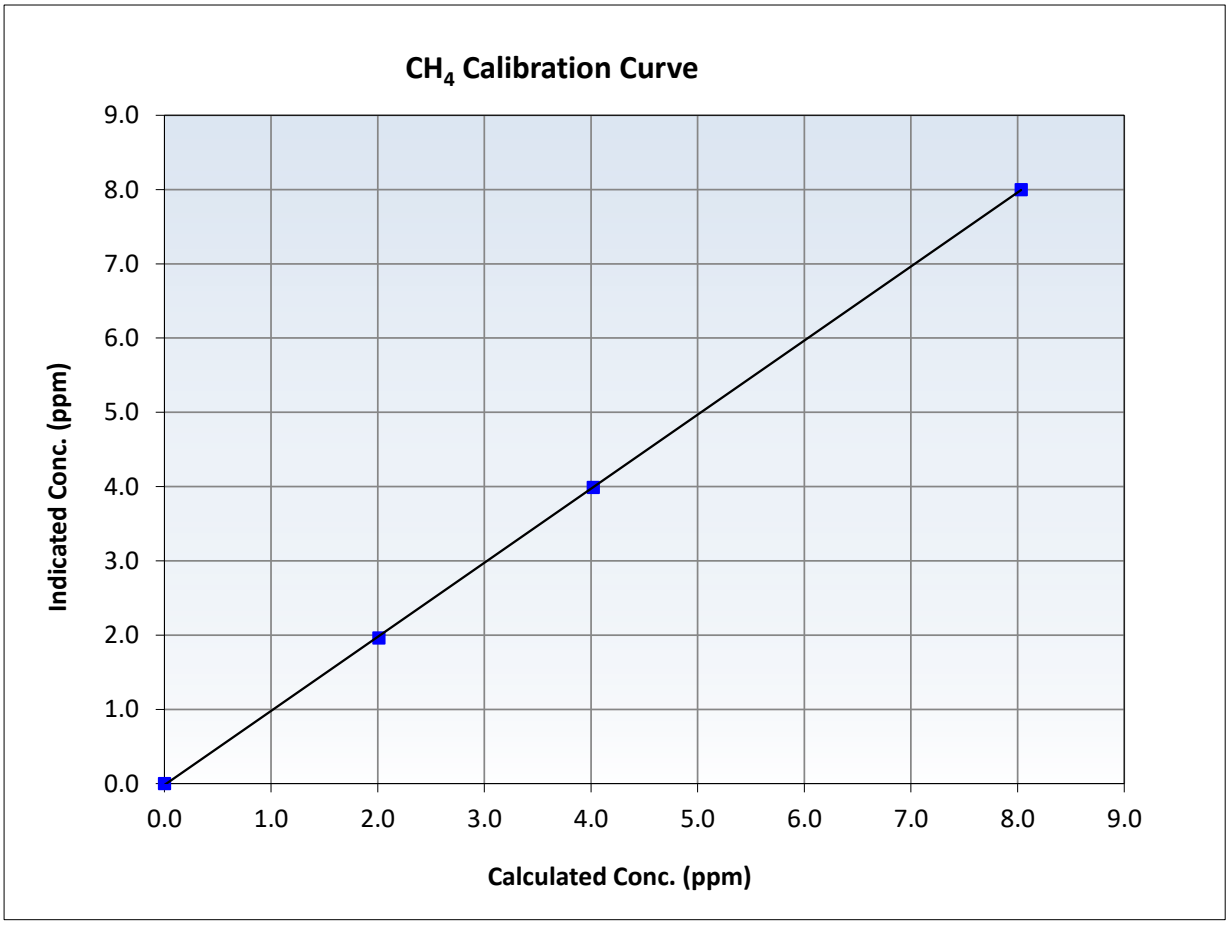
CH_4 Calibration Summary

Station Information

Calibration Date:	January 16, 2025	Previous Calibration:	December 17, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	9:28	End Time (MST):	12:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999972	≥0.995
8.03	8.00	1.0040	Slope	0.997540	0.90 - 1.10
4.02	3.99	1.0076			
2.01	1.96	1.0243	Intercept	-0.018837	+/-0.5



Wood Buffalo Environmental Association

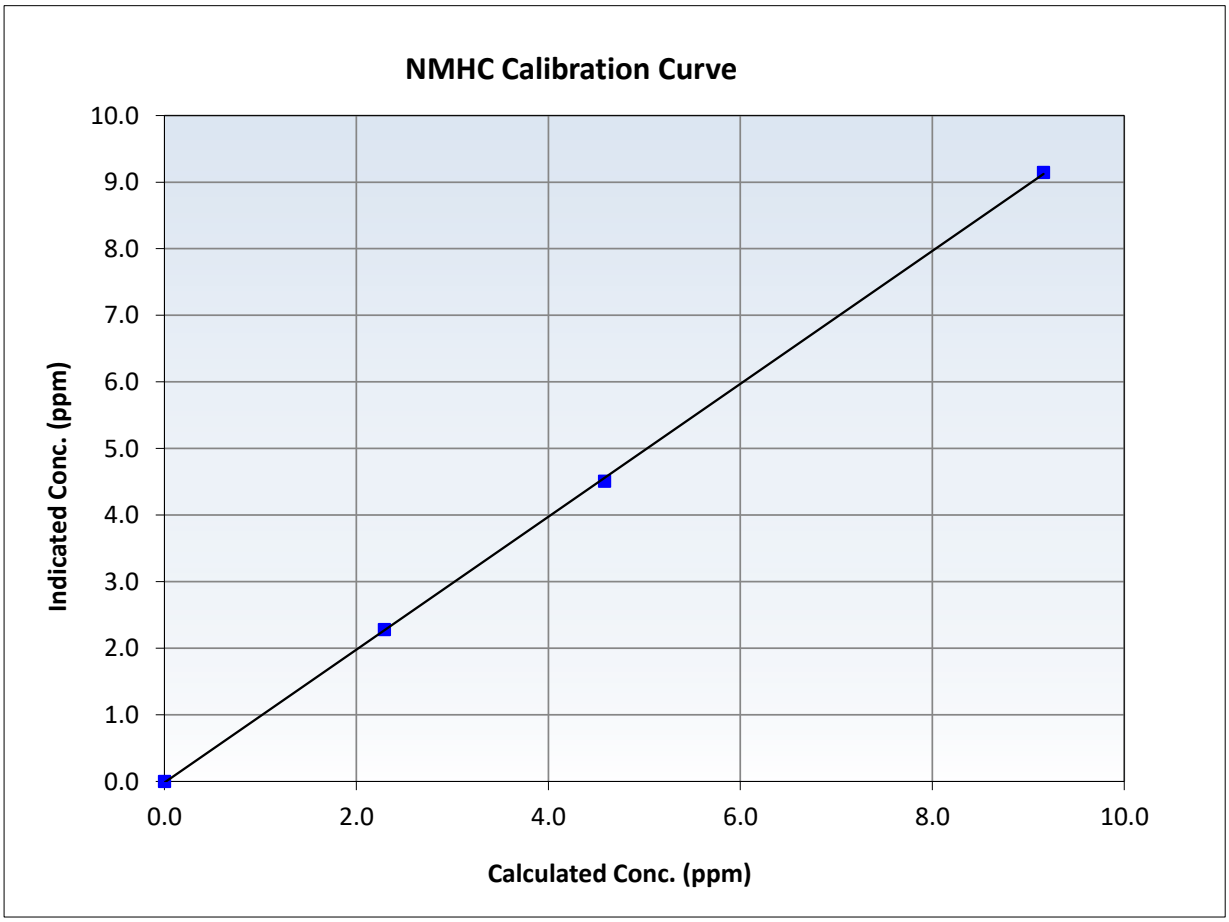
NMHC Calibration Summary

Station Information

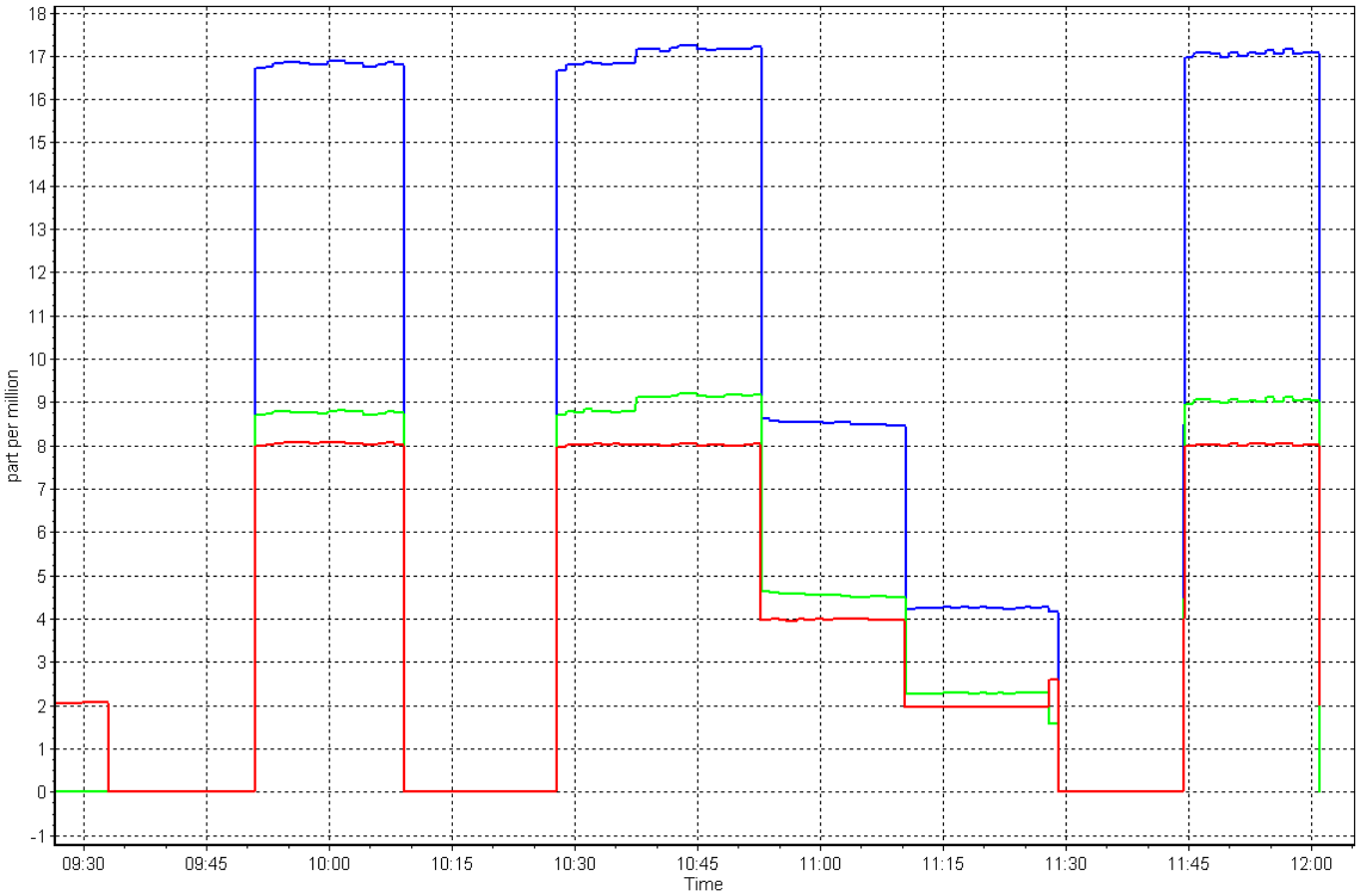
Calibration Date:	January 16, 2025	Previous Calibration:	December 17, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	9:28	End Time (MST):	12:00
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.00	0.00	----	Correlation Coefficient	0.999928	≥0.995
9.16	9.15	1.0016	Slope	0.997853	0.90 - 1.10
4.59	4.51	1.0167	Intercept	-0.016509	+/-0.5
2.29	2.28	1.0047			



NMHC Calibration Plot Date: January 16, 2025 Location: Fort Hills



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Fort Hills
Station number:	AMS 23
Calibration Date:	January 15, 2025
Last Cal Date:	December 13, 2024
Start time (MST):	7:25
End time (MST):	12:22
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC358149	Cal Gas Expiry Date:	January 5, 1932
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:		Removed Gas Exp Date:	
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	451
ZAG make/model:	API T701	Serial Number:	1117

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
AF High point	4934	66.3	799.5	796.9	2.7	791.1	788.1	3.0	1.0103	1.0109
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	797.9 ppb	NO =	796.9 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.8%
Baseline Corr 1st pt	NO_X =	791.4 ppb	NO =	788.3 ppb	As Found Statistics	*Percent Change	NO = -1.1%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1152430007

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	0.955	0.955	NO bkgnd or offset:	2.9	2.9
NOX coeff or slope:	0.999	0.999	NOX bkgnd or offset:	3.1	3.1
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	147.2	147.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.998240	0.999602
NO_X Cal Offset:	-0.213435	0.984647
NO Cal Slope:	1.002376	1.004518
NO Cal Offset:	-1.872616	-0.394853
NO_2 Cal Slope:	1.000947	1.000990
NO_2 Cal Offset:	-1.074996	-1.809488

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	----	----
High point	4934	66.3	799.5	796.9	2.7	799.0	799.6	-0.6	1.0007	0.9966
Mid point	4967	33.2	400.4	399.0	1.3	403.7	402.2	1.5	0.9918	0.9922
Low point	4983	16.6	200.2	199.5	0.7	200.9	198.5	2.4	0.9966	1.0053
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
As left span	4934	66.3	799.5	409.7	389.8	802.0	409.7	392.3	0.9969	1.0000
								Average Correction Factor	0.9963	0.9980

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	799.6	411.0	391.3	390.8	1.0012	99.9%
Mid GPT point	799.6	604.5	197.8	195.0	1.0141	98.6%
Low GPT point	799.6	702.0	100.3	97.0	1.0335	96.8%
				Average Correction Factor	1.0163	98.4%

Notes: Span adjusted. Dipping started during 2nd Point, tried through external valve, dipping stopped around 9:30MST when switching back and forth through the external valve. Due to drifting during the GPT the 2nd NO ref point used.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

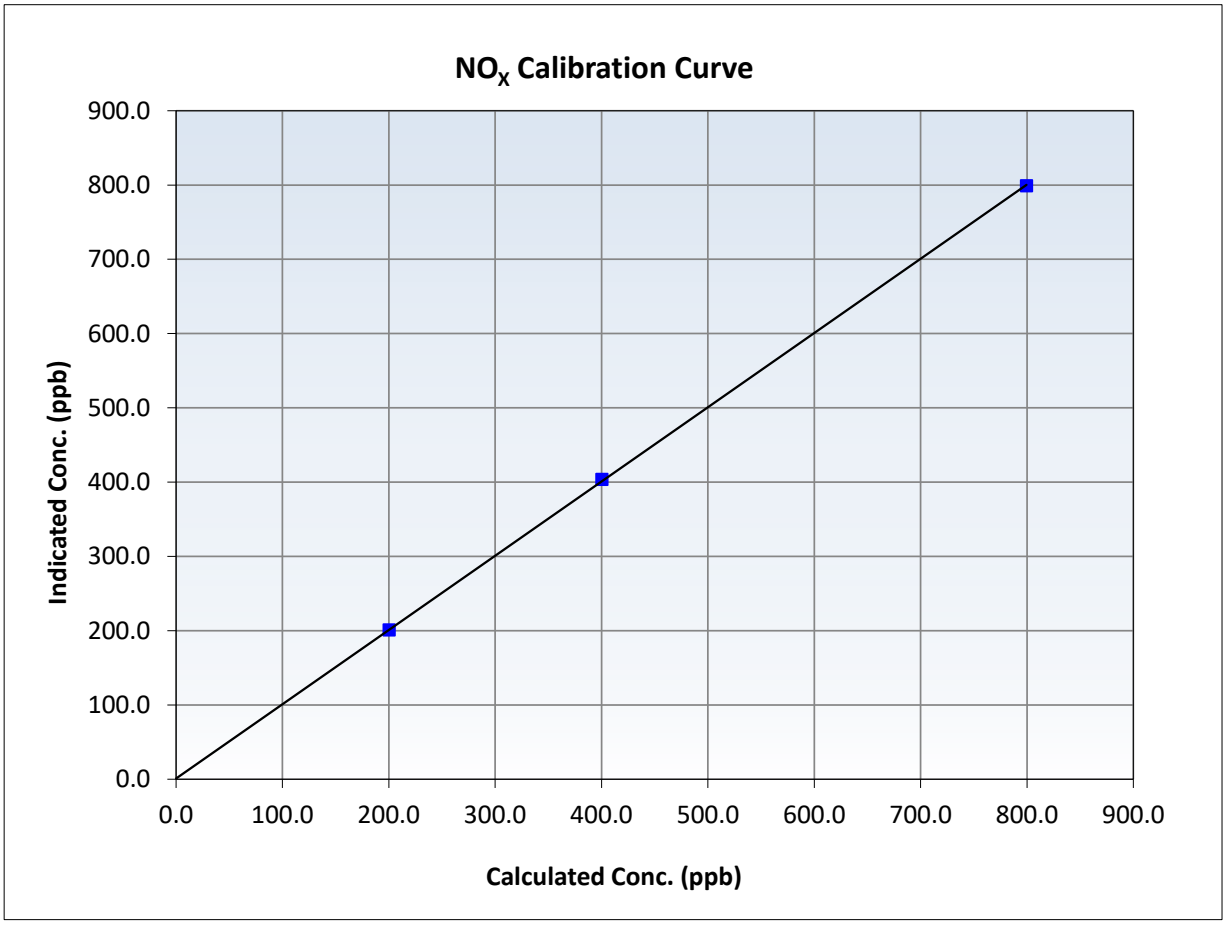
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 13, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:25	End Time (MST):	12:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
799.5	799.0	1.0007
400.4	403.7	0.9918
200.2	200.9	0.9966

Statistical Evaluation		Limits
Correlation Coefficient	0.999975	≥0.995
Slope	0.999602	0.90 - 1.10
Intercept	0.984647	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

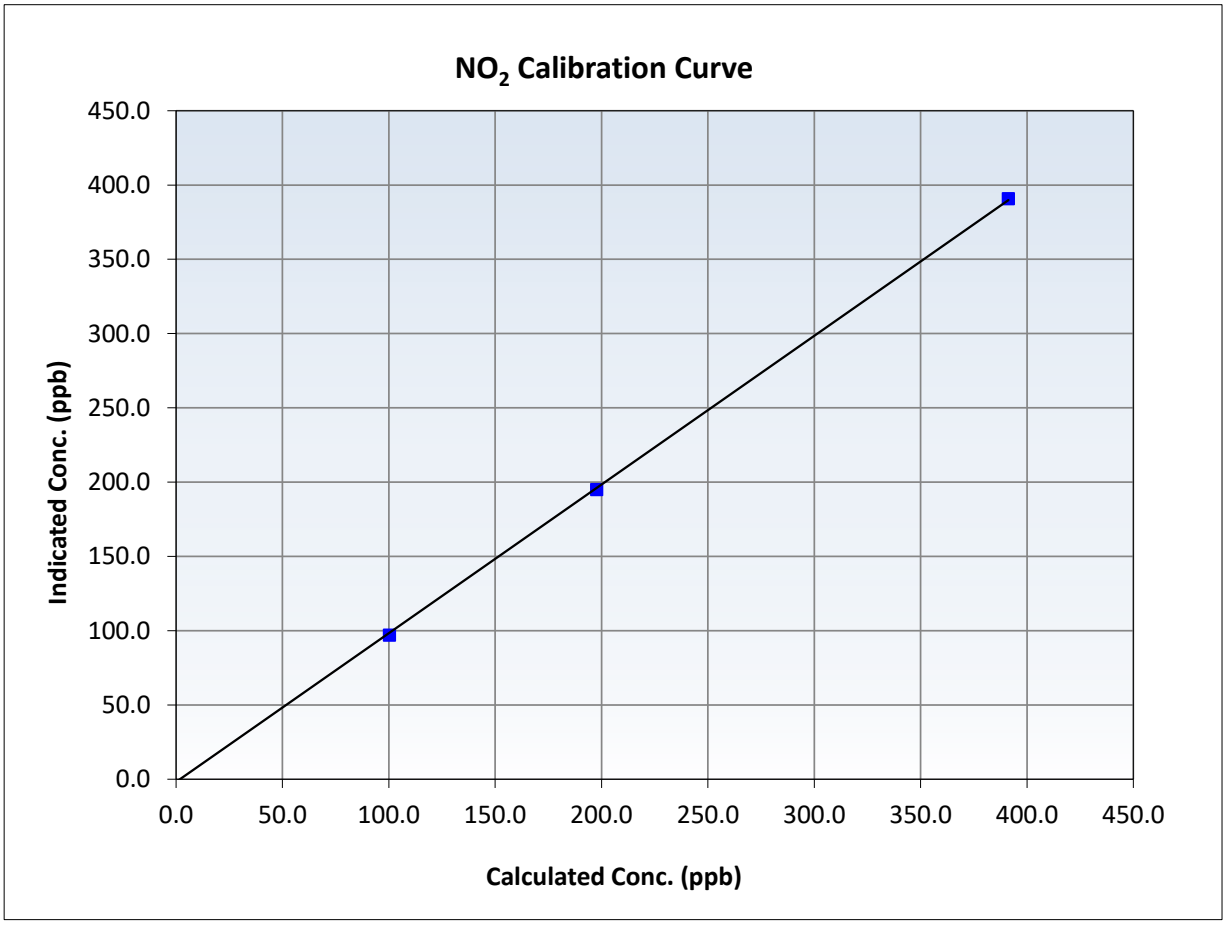
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 13, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:25	End Time (MST):	12:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
391.3	390.8	1.0012
197.8	195.0	1.0141
100.3	97.0	1.0335

Statistical Evaluation		Limits
Correlation Coefficient	0.999910	≥0.995
Slope	1.000990	0.90 - 1.10
Intercept	-1.809488	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

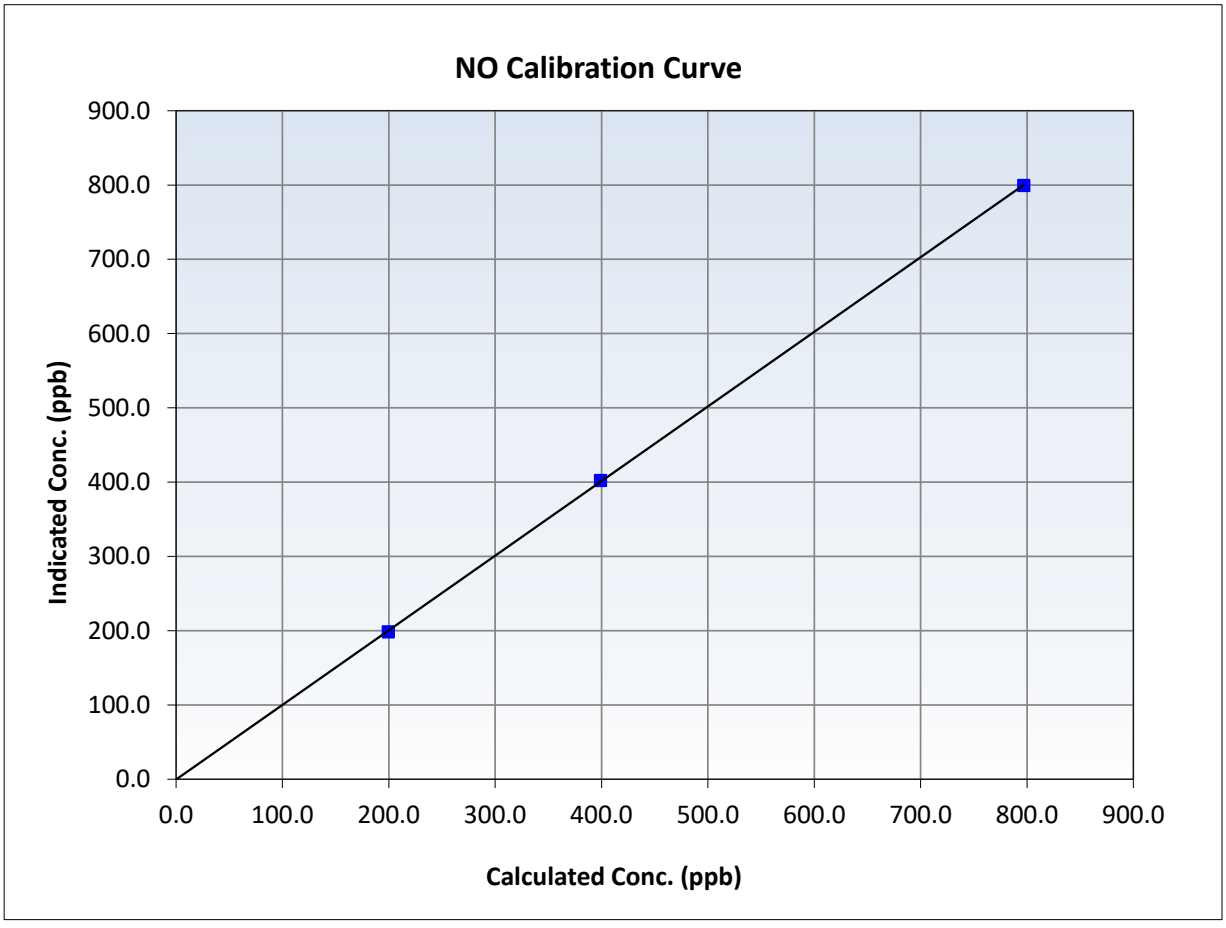
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 13, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:25	End Time (MST):	12:22
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
796.9	799.6	0.9966
399.0	402.2	0.9922
199.5	198.5	1.0053

Statistical Evaluation		Limits
Correlation Coefficient	0.999984	≥0.995
Slope	1.004518	0.90 - 1.10
Intercept	-0.394853	+/-20



NO_X Calibration Plot Date: January 15, 2025 Location: Fort Hills

Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Fort Hills	Station number:	AMS 23
Calibration Date:	January 16, 2025	Last Cal Date:	December 17, 2024
Start time (MST):	8:29	End time (MST):	9:20
Analyzer Make:	API T640	S/N:	320
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388744
Temp/RH standard:	Alicat FP-25BT	S/N:	388744

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	-7.5	-7	-7.5	☐	+/- 2 °C
P (mmHg)	726.5	724	726.5	☐	+/- 10 mmHg
Flow (LPM)	5.00	4.64	5.00	☑	+/- 0.25 LPM
PW% (pump)	39	-----	39	☐	>80%

Zero Verification — 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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: 10-Jun-24 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	8.8	11	11	☐	+/- 0.5

Date Optical Chamber Cleaned: January 16, 2025

Date Disposable Filter Changed: January 16, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: January 16, 2025

Date RH/T Sensor Cleaned: January 16, 2025

Notes: Flow Adjusted. No other adjustments done. Leak check passed before and after cleaning.

Calibration by: Melissa Lemay

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS25
WASKŌW OHCI PIMÂTISIWIN
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number:	AMS 25
Calibration Date:	January 24, 2025	Last Cal Date:	December 20, 2024
Start time (MST):	8:00	End time (MST):	10:52
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.70	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC342445			
Removed Cal Gas Conc:	49.70	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	747
Zero Air Gen Model:	API T701		Serial Number:	4765

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1118148497	
Analyzer Range:	0-1000ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.998456	0.998541	Backgd or Offset:	11.8	11.2
Calibration intercept:	-0.372807	0.447577	Coeff or Slope:	1.071	1.059

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.4	----
As found High point	4920	80.5	800.1	806.9	0.991
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	807.3	Previous response	798.5	*% change	1.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4920	80.5	800.1	799.1	1.001
Mid point	4960	40.2	399.6	400.2	0.998
Low point	4980	20.1	199.8	199.5	1.001
As left zero	5000	0.0	0.0	0.4	----
As left span	4920	80.5	800.1	798.1	1.002
				Average Correction Factor:	1.000

Notes: No Maintenance done. Zero and Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

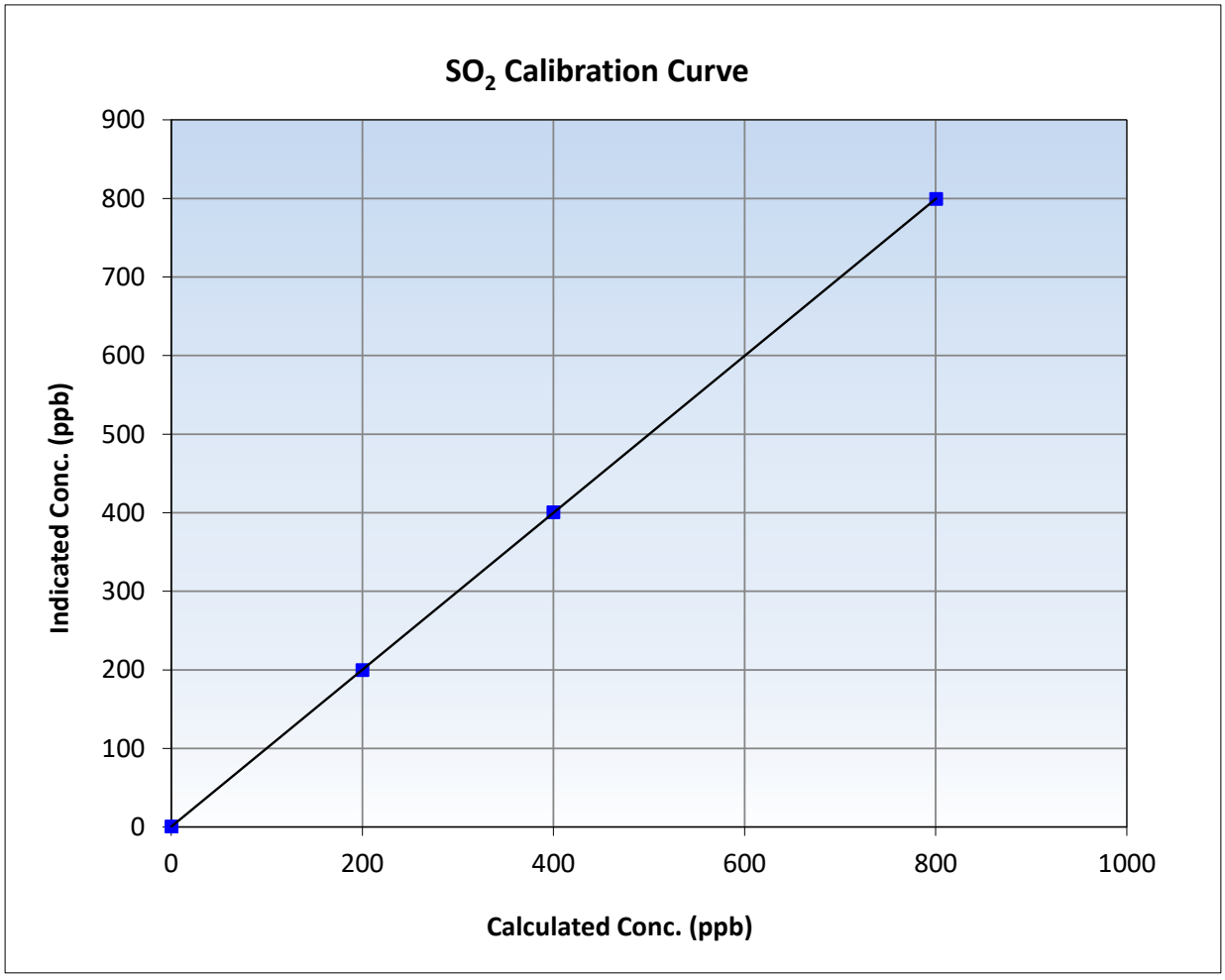
Station Information

Calibration Date:	January 24, 2025	Previous Calibration:	December 20, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	8:00	End Time (MST):	10:52
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148497

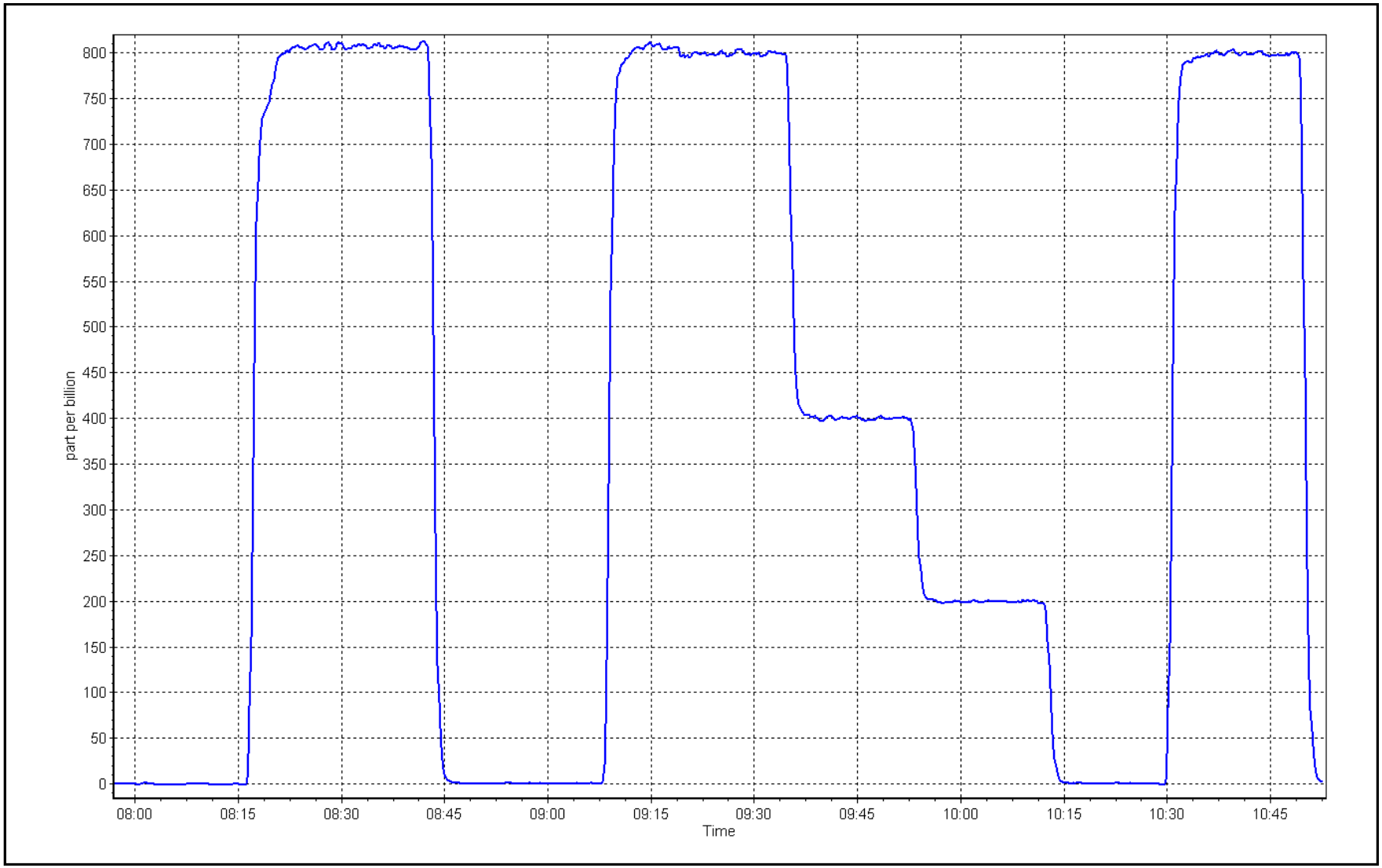
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
800.1	799.1	1.0012
399.6	400.2	0.9984
199.8	199.5	1.0015

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.998541	*0.90 - 1.10*
Intercept	0.447577	*+/-30*



SO2 Calibration Plot Date: January 24, 2025 Location: Waskow ohci Pimatisiwin



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Waskow ohci Pimatisiwin	Station number:	AMS 25
Calibration Date:	January 2, 2025	Last Cal Date:	December 16, 2024
Start time (MST):	7:41	End time (MST):	11:50
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.97	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC517099			
Removed Cal Gas Conc:	4.97	ppm	Rem Gas Exp Date:	
Removed Gas Cyl #:			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:	Global G-150		Converter serial #:	2022-219
Analyzer Range	0 - 100 ppb		Converter Temp:	350 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.003306	0.991377	Backgd or Offset:	3.50	3.50
Calibration intercept:	0.320000	0.560000	Coeff or Slope:	1.096	1.096

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	80.0	79.5	79.4	1.003
As found Mid point	4960	40.0	39.8	40.0	0.996
As found Low point	4980	20.0	19.9	20.2	0.989
New cylinder response					

Baseline Corr As found:	79.3	Prev response:	80.10	*% change:	-1.0%
Baseline Corr 2nd AF pt:	39.9	AF Slope:	0.996407	AF Intercept:	0.260000
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999981	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4920	80.0	79.5	79.3	1.003
Mid point	4960	40.0	39.8	40.1	0.992
Low point	4980	20.0	19.9	20.4	0.975
As left zero	5000	0.0	0.0	0.9	----
As left span	4912	88.3	800.0	801.0	0.999
SO2 Scrubber Check	4921	79.2	800.0	-0.1	----
Date of last scrubber change:				Ave Corr Factor	0.990
Date of last converter efficiency test:					

Notes: SOx scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

H_2S Calibration Summary

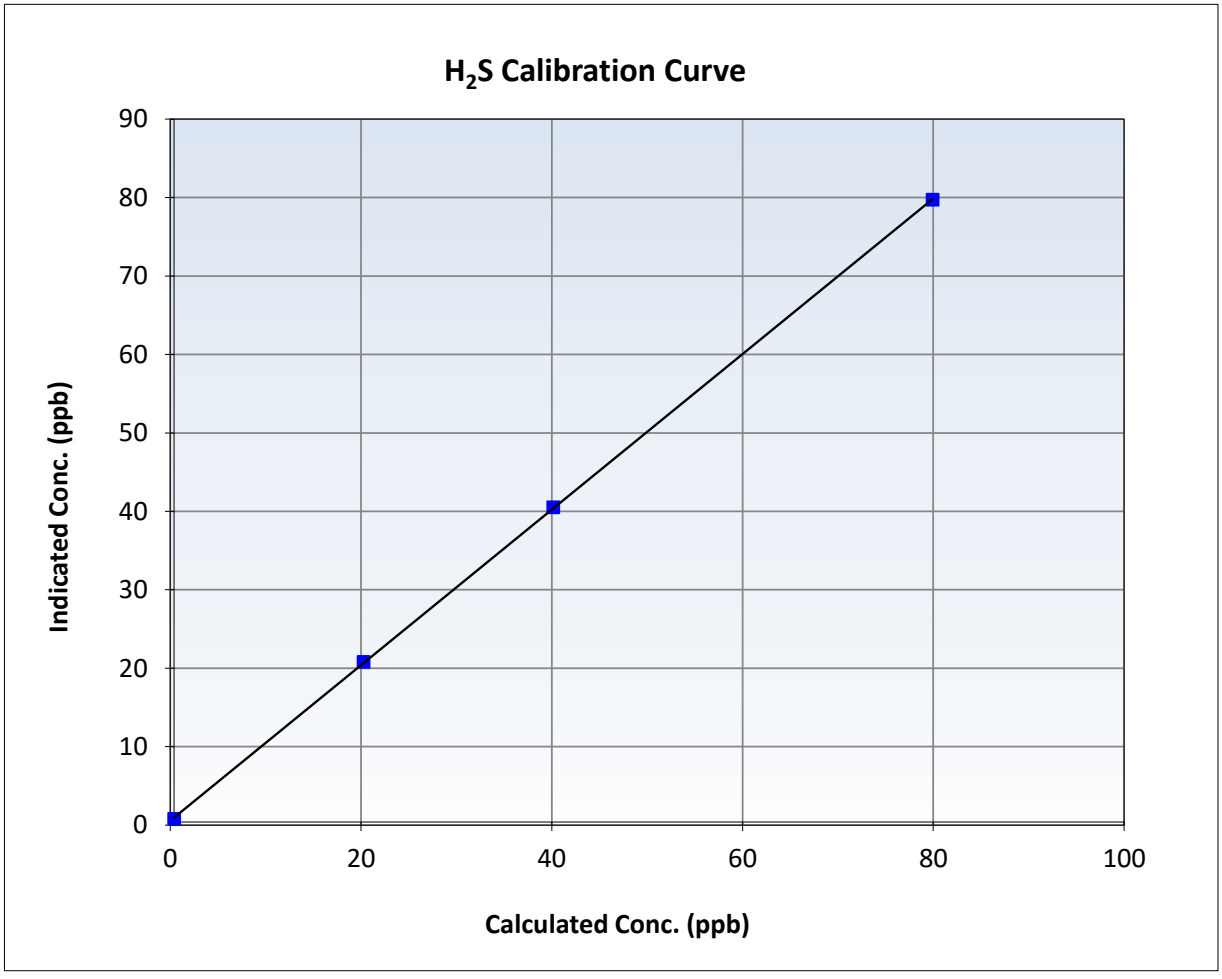
Station Information

Calibration Date:	January 2, 2025	Previous Calibration:	December 16, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	7:41	End Time (MST):	11:50
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1170050146

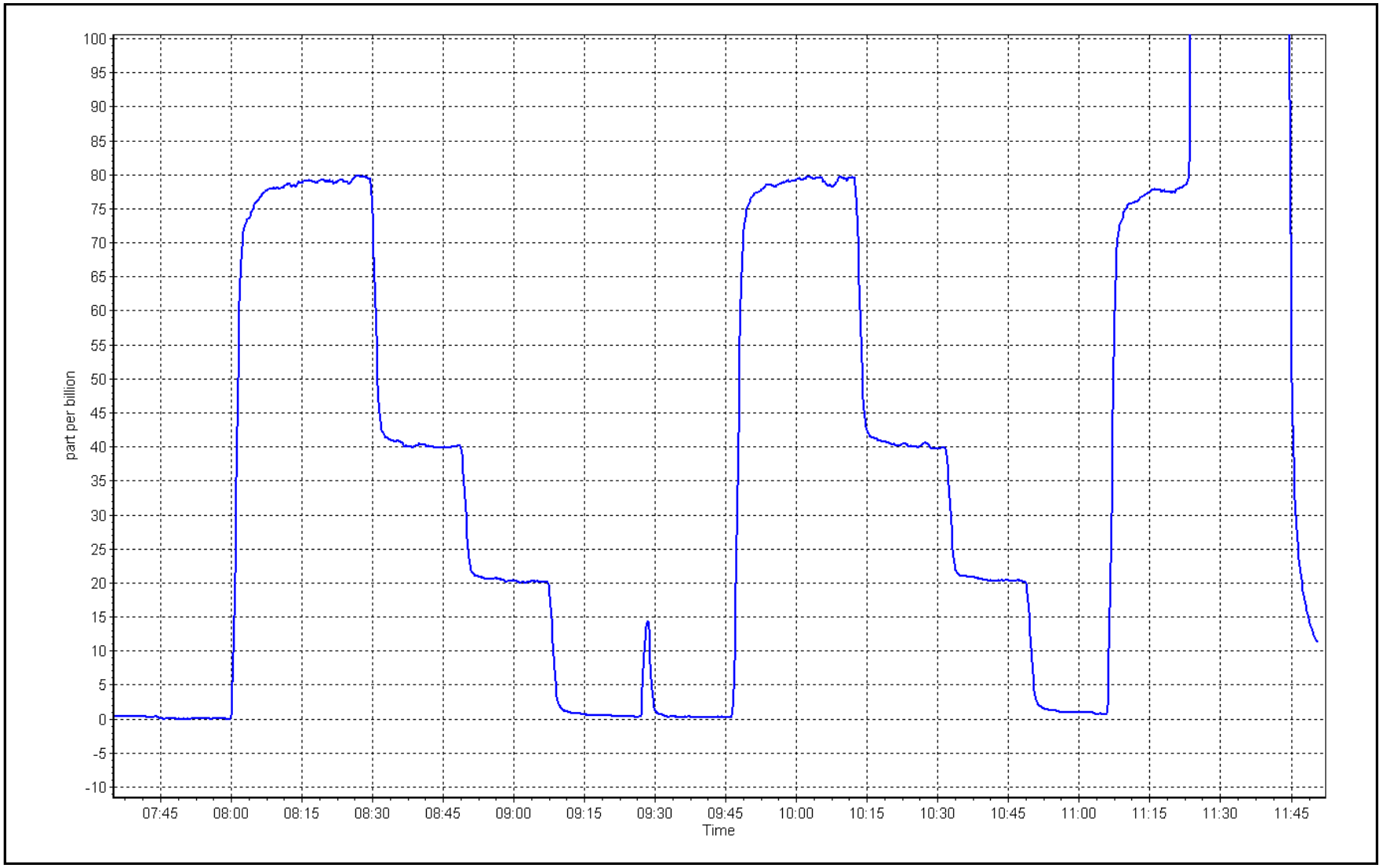
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
79.5	79.3	1.0028
39.8	40.1	0.9915
19.9	20.4	0.9745

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999980	*≥0.995*
Slope	0.991377	*0.90 - 1.10*
Intercept	0.560000	*+/-3*



H_2S Calibration Plot Date: January 2, 2025 Location: Waskow ohci Pimatisiwin



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS27
JACKFISH 2/3
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	January 20, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	10:46	End time (MST):	14:22
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.58	ppm	Cal Gas Exp Date:	December 29, 2028
Cal Gas Cylinder #:	SG9133974BAL			
Removed Cal Gas Conc:	50.58	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3811
Zero Air Gen Model:	API 701		Serial Number:	268

Analyzer Information

Analyzer make:	Thermo 43iQ-TL		Serial Number:	12124313138	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001040	0.995957	Backgd or Offset:	8.3	8.4
Calibration intercept:	-1.325883	-0.446048	Coeff or Slope:	0.947	0.947

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	1.0	----
As found High point	4919	79.1	800.5	798.7	1.003
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	797.7	Previous response	800.0	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	1.3	----
High point	4919	79.1	800.5	797.4	1.004
Mid point	4960	39.5	399.6	397.5	1.005
Low point	4979	19.8	200.3	196.8	1.018
As left zero	5000	0.0	0.0	1.2	----
As left span	4921	79.1	800.2	805.2	0.994
				Average Correction Factor:	1.009

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

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

SO_2 Calibration Summary

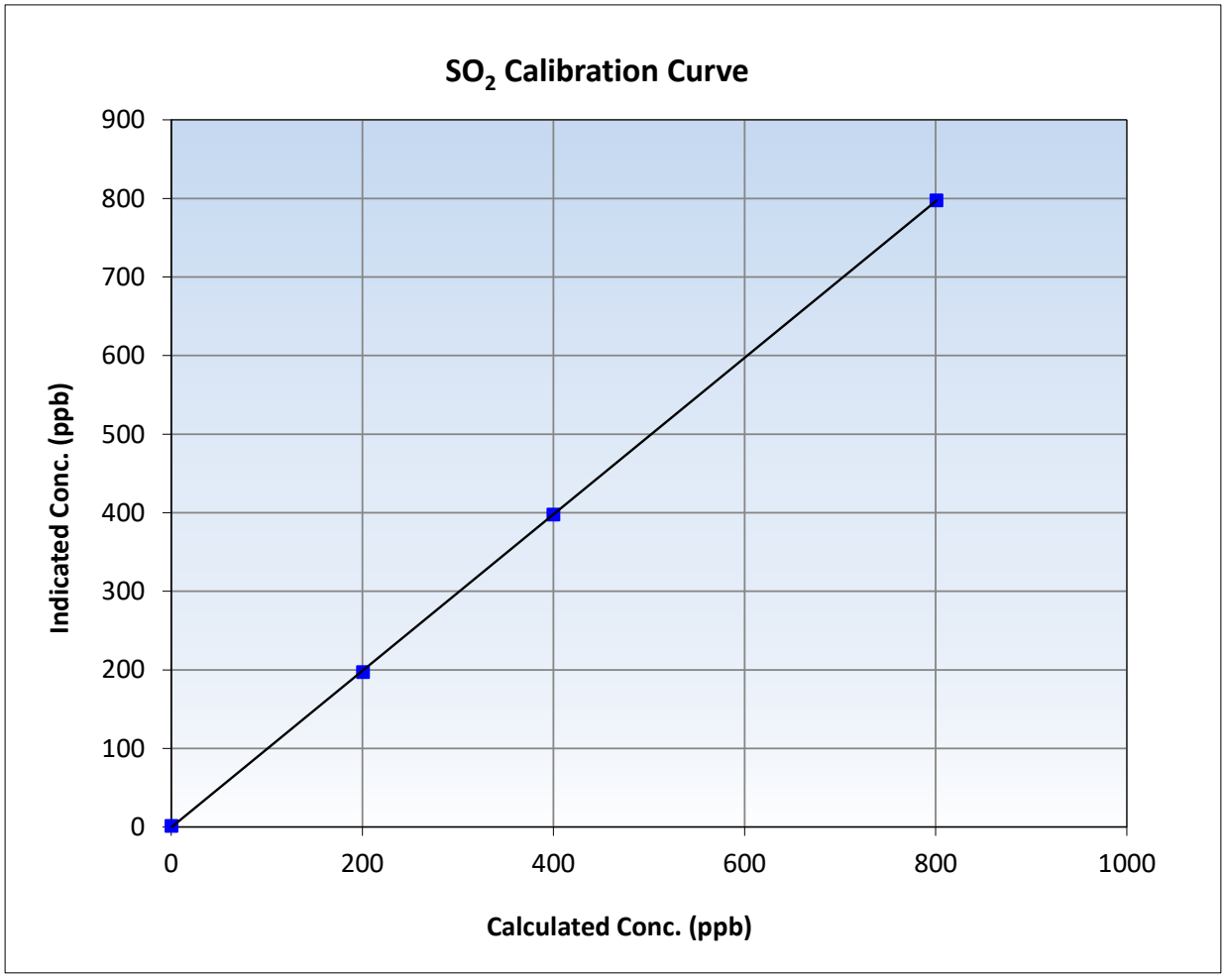
Station Information

Calibration Date:	January 20, 2025	Previous Calibration:	December 4, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:46	End Time (MST):	14:22
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	12124313138

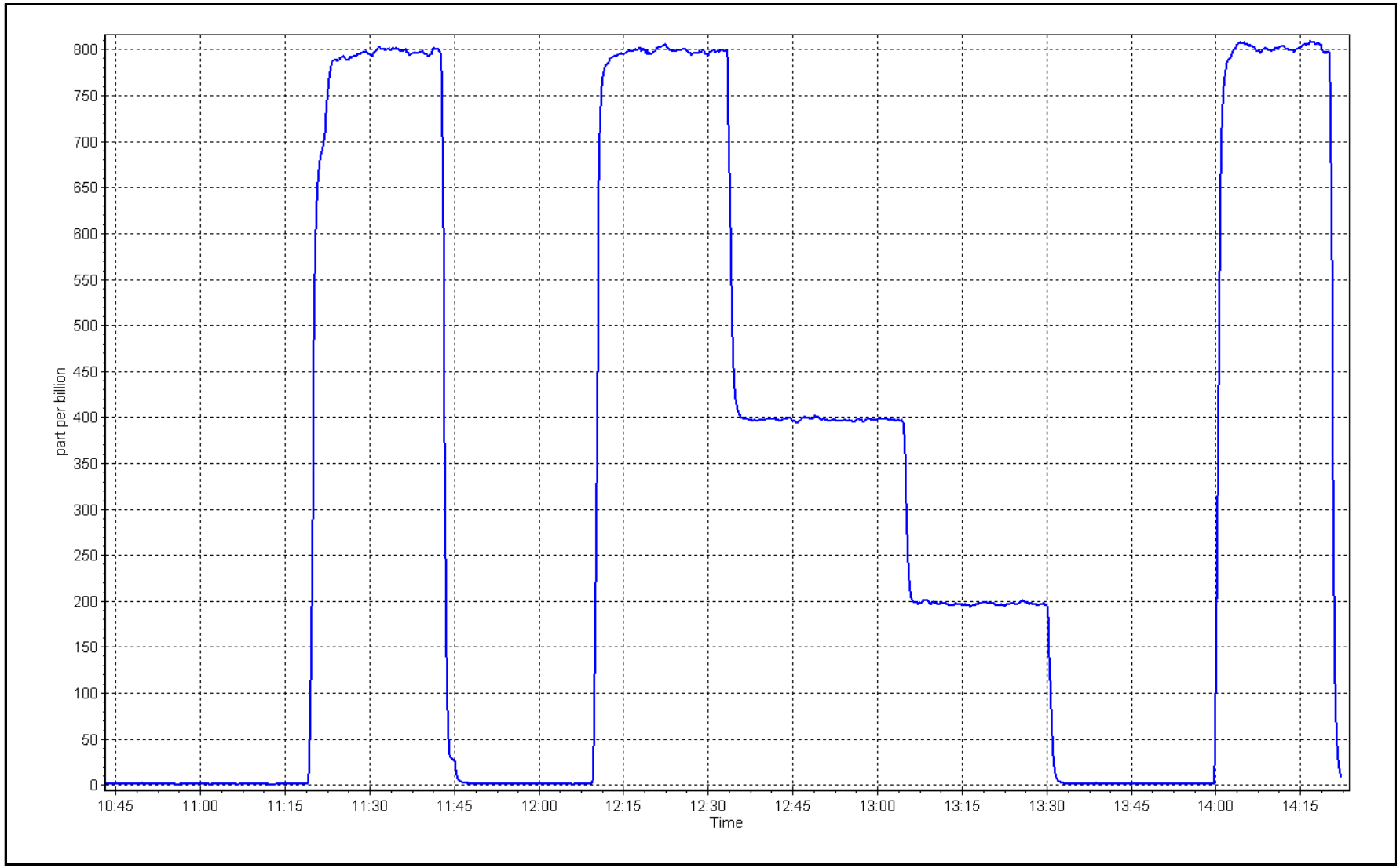
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.3	----
800.5	797.4	1.0039
399.6	397.5	1.0053
200.3	196.8	1.0180

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	0.995957	*0.90 - 1.10*
Intercept	-0.446048	*+/-30*



SO2 Calibration Plot Date: January 20, 2025 Location: Jackfish 2/3



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Jackfish 2/3	Station number:	AMS 27
Calibration Date:	January 24, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:01	End time (MST):	16:59
Reason:	Cylinder Change		

Calibration Standards

Cal Gas Concentration:	4.87	ppm	Cal Gas Exp Date:	September 5, 2027	
Cal Gas Cylinder #:	CC523090				
Removed Cal Gas Conc:	5.41	ppm	Rem Gas Exp Date:	January 4, 2025	
Removed Gas Cyl #:	CC345023		Diff between cyl:	1.5%	
Calibrator Make/Model:	API T700		Serial Number:	3811	
ZAG Make/Model:	API T701H		Serial Number:	268	

Analyzer Information

Analyzer make:	Thermo 43iQ		Analyzer serial #:	12228021055	
Converter make:	Global G150		Converter serial #:	2022-195	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.014598	1.017825	Backgd or Offset:	3.2	3.0
Calibration intercept:	-0.317640	-0.167830	Coeff or Slope:	1.162	1.109

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4926	74.1	80.2	83.9	0.957
As found Mid point	4963	37.0	40.0	42.0	0.955
As found Low point	4982	18.5	20.0	20.7	0.972
New cylinder response	4923	82.2	80.0	85.0	0.941

Baseline Corr As found:	83.8	Prev response:	81.03	*% change:	3.3%
Baseline Corr 2nd AF pt:	41.9	AF Slope:	1.046667	AF Intercept:	-0.016853
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999979	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4923	82.2	80.0	81.4	0.983
Mid point	4966	41.1	40.0	40.4	0.989
Low point	4990	20.6	20.0	19.8	1.011
As left zero	5000	0.0	0.0	0.3	----
As left span	4923	82.2	80.0	80.0	1.000
SO2 Scrubber Check	4921	79.1	791.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.994
Date of last converter efficiency test:					

Notes: Changed sample inlet filter and calibration gas after as founds. Ran scrubber check after calibrator zero and it passed. Adjusted span only.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

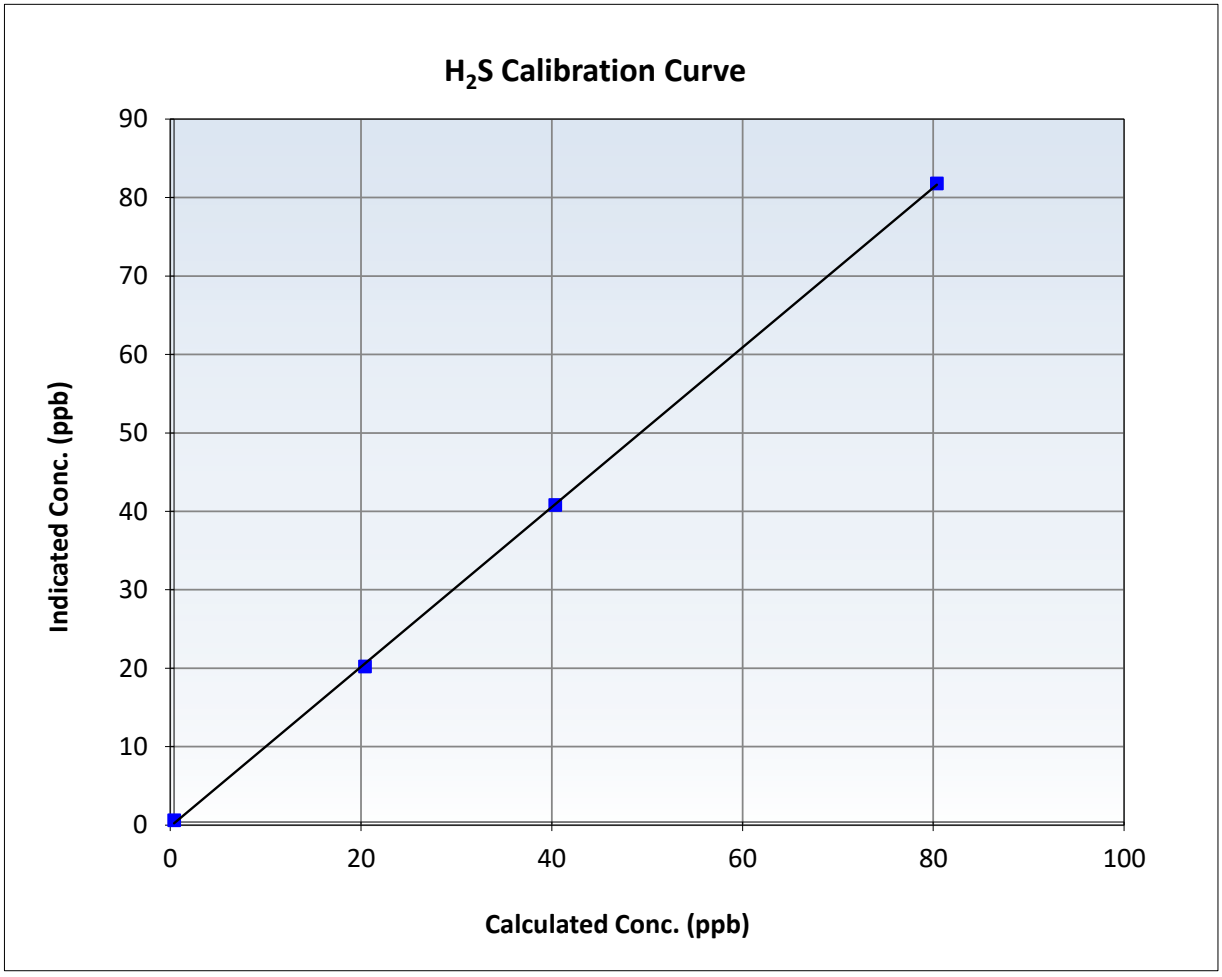
H_2S Calibration Summary

Station Information

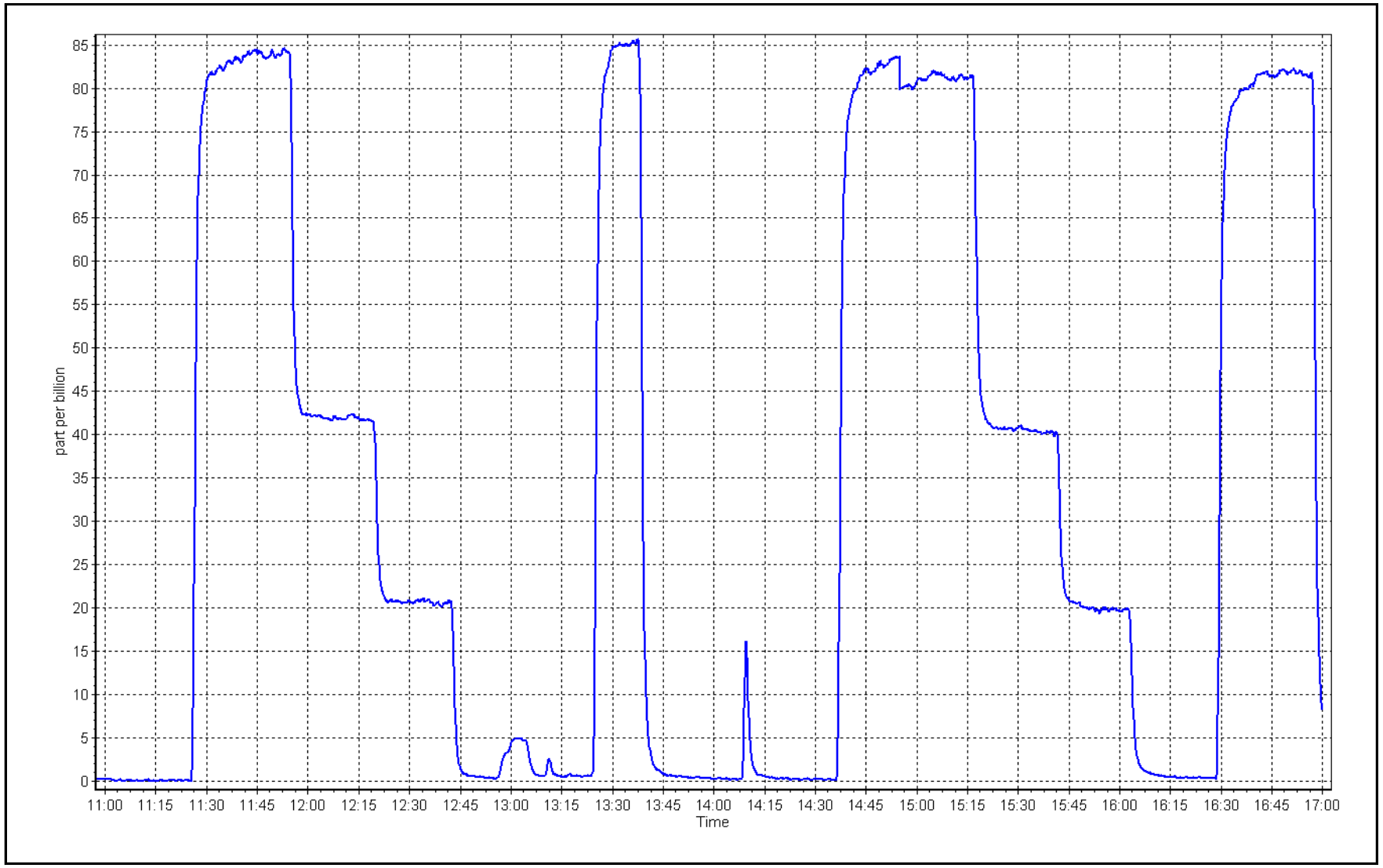
Calibration Date:	January 24, 2025	Previous Calibration:	December 5, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:01	End Time (MST):	16:59
Analyzer make:	Thermo 43iQ	Analyzer serial #:	12228021055

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.2	----	Correlation Coefficient	0.999905	*≥0.995*
80.0	81.4	0.9826	Slope	1.017825	*0.90 - 1.10*
40.0	40.4	0.9895			
20.0	19.8	1.0112	Intercept	-0.167830	*+/-3*



H_2S Calibration Plot Date: January 24, 2025 Location: Jackfish 2/3



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Jackfish 2/3
Station number:	AMS 27
Calibration Date:	January 15, 2025
Last Cal Date:	December 6, 2024
Start time (MST):	8:55
End time (MST):	14:20
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC757838	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.20 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc:	60.20 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3811
ZAG make/model:	Teledyne API T701	Serial Number:	268

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	0.0	----	----
AF High point	4942	66.5	800.6	799.3	1.3	815.5	814.1	1.4	0.9819	0.9821
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 795.0 ppb	NO = 796.6 ppb
Baseline Corr 1st pt	NO_X = 815.4 ppb	NO = 813.9 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = 2.5%

*Percent Change NO = 2.1%

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1218153357

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.332	1.308	NO bkgnd or offset:	4.6	4.4
NOX coeff or slope:	0.992	0.992	NOX bkgnd or offset:	4.7	4.5
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	156.3	159.3

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	0.995064	1.007166
NO_X Cal Offset:	-1.654761	-2.693388
NO Cal Slope:	1.001235	1.012457
NO Cal Offset:	-3.734605	-4.733515
NO_2 Cal Slope:	0.996639	0.995995
NO_2 Cal Offset:	-0.410548	-0.699355

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	1.0	0.4	0.6	----	----
High point	4942	66.5	800.6	799.3	1.3	805.9	807.4	-1.5	0.9935	0.9900
Mid point	4979	33.3	400.6	399.9	0.7	397.8	396.7	1.1	1.0071	1.0082
Low point	4996	16.6	199.7	199.4	0.3	195.5	192.6	2.8	1.0214	1.0351
As left zero	5000	0.0	0.0	0.0	0.0	2.5	0.3	2.2	----	----
As left span	4942	66.5	800.6	402.5	398.1	800.9	402.5	398.4	0.9997	1.0000
								Average Correction Factor	1.0073	1.0111

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.6	----	----
High GPT point	801.6	401.4	401.5	399.4	1.0053	99.5%
Mid GPT point	801.6	624.0	178.9	178.2	1.0041	99.6%
Low GPT point	801.6	712.8	90.1	86.9	1.0371	96.4%
				Average Correction Factor	1.0155	98.5%

Notes: Changed sample inlet filter after as founds. Span adjustments made.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

NO_X Calibration Summary

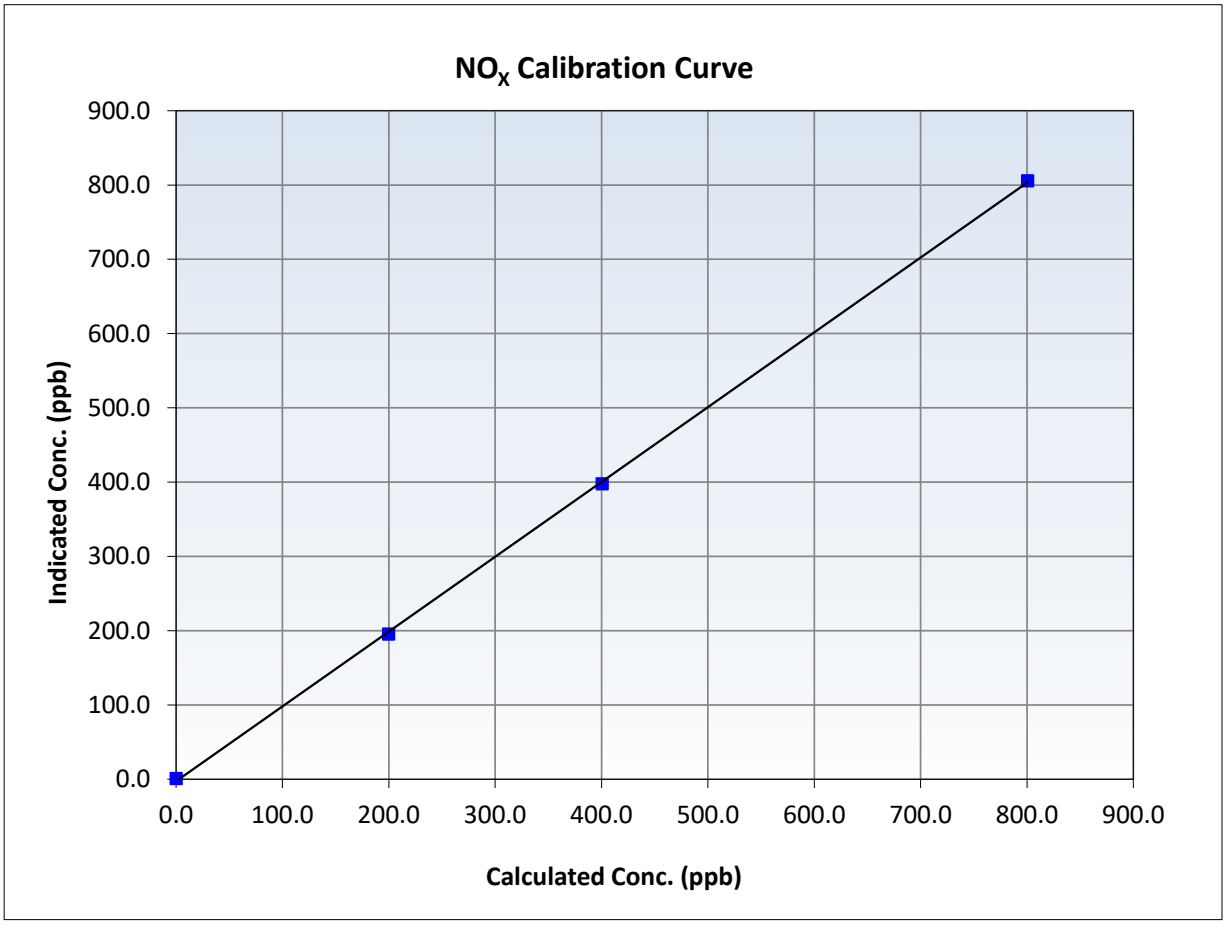
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 6, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:55	End Time (MST):	14:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	1.0	----
800.6	805.9	0.9935
400.6	397.8	1.0071
199.7	195.5	1.0214

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999898	*≥0.995*
Slope	1.007166	*0.90 - 1.10*
Intercept	-2.693388	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

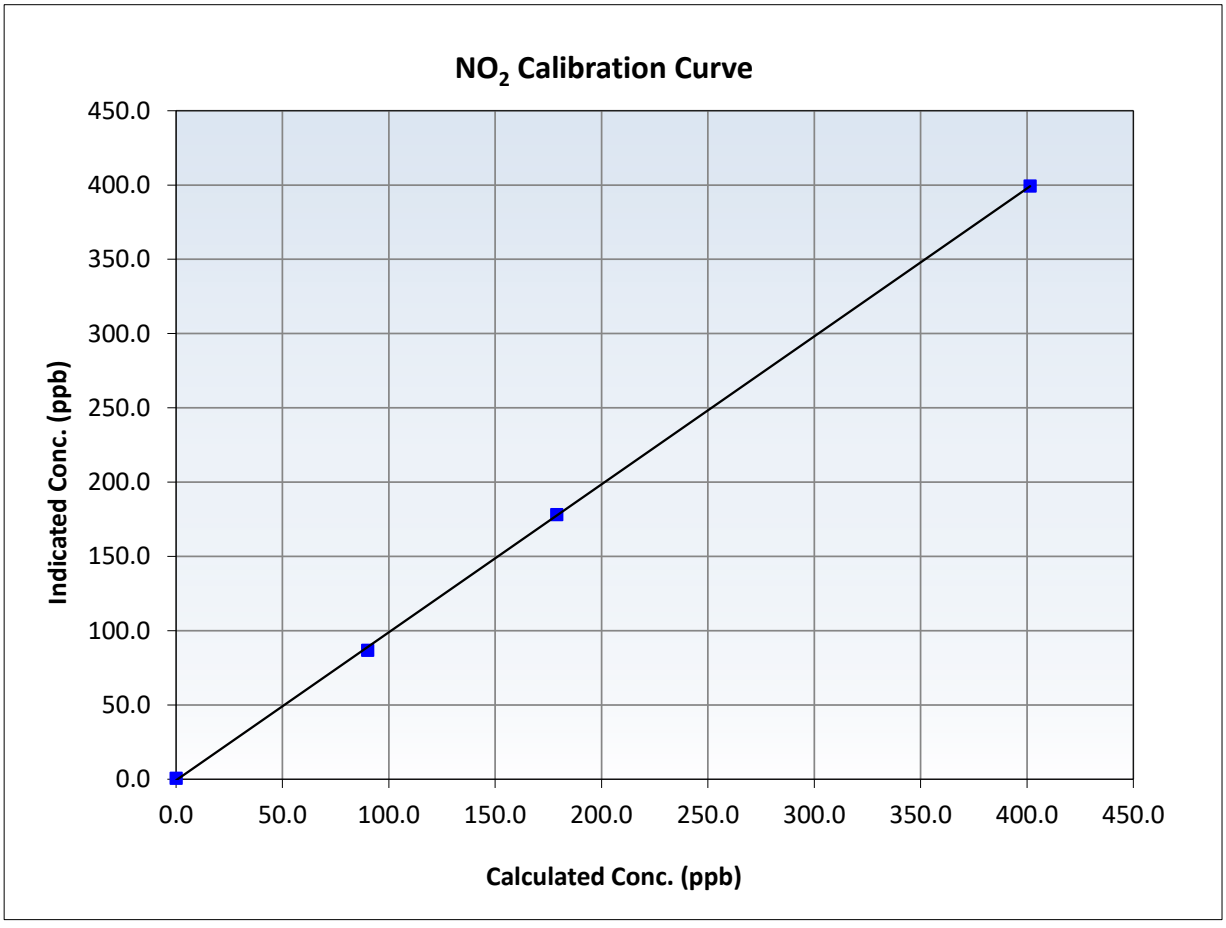
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 6, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:55	End Time (MST):	14:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.6	----
401.5	399.4	1.0053
178.9	178.2	1.0041
90.1	86.9	1.0371

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999922	*≥0.995*
Slope	0.995995	*0.90 - 1.10*
Intercept	-0.699355	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

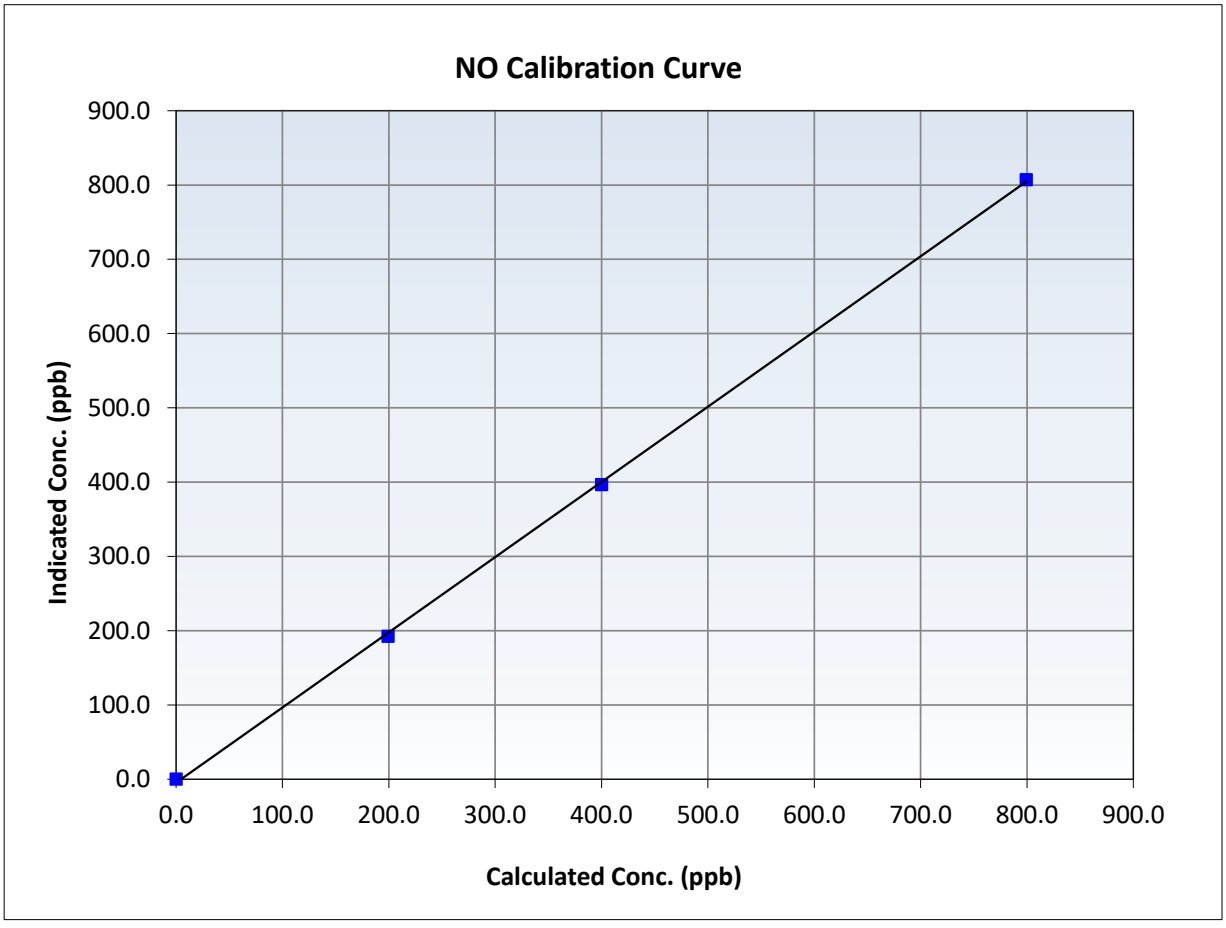
Station Information

Calibration Date:	January 15, 2025	Previous Calibration:	December 6, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	8:55	End Time (MST):	14:20
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

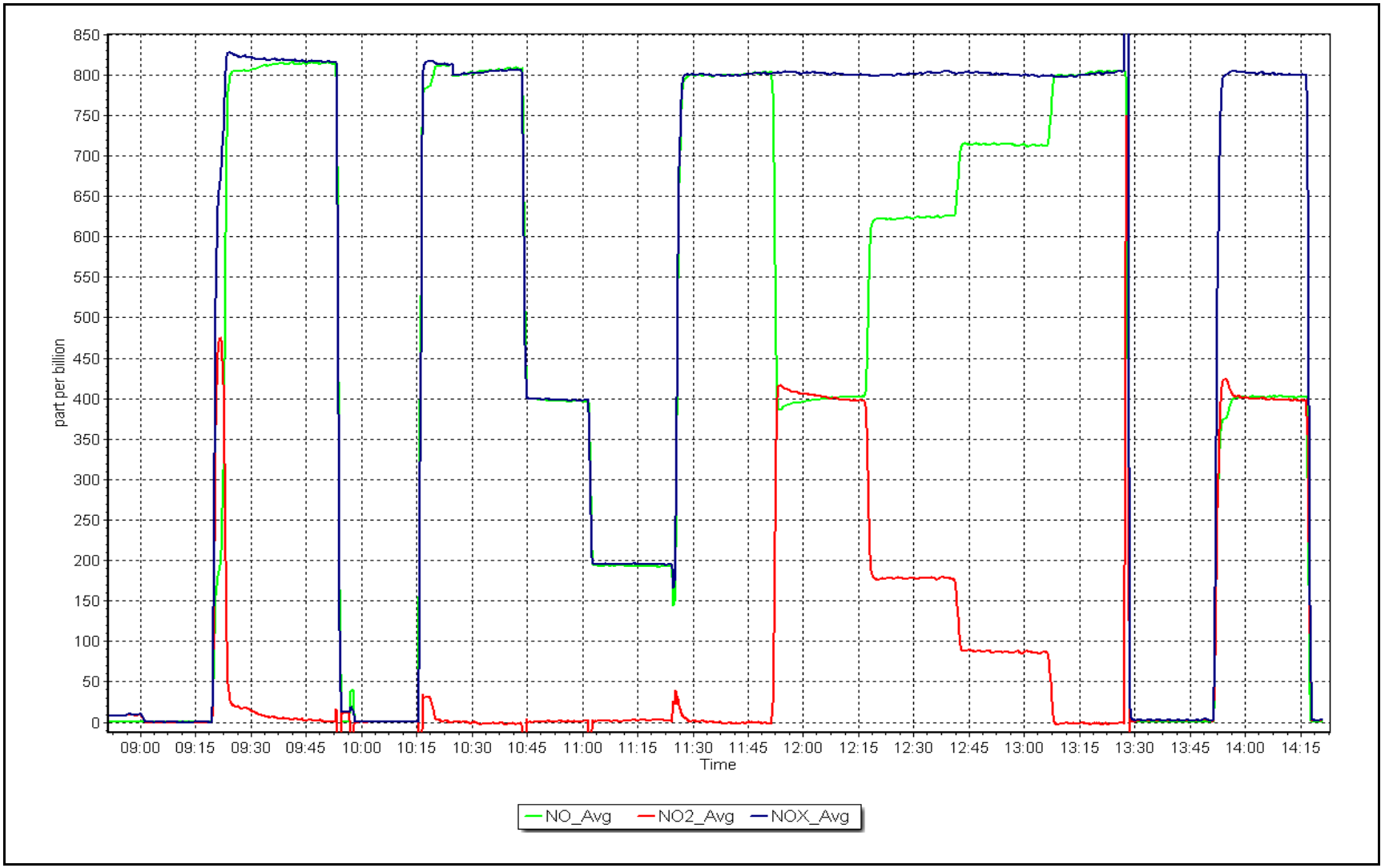
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
799.3	807.4	0.9900
399.9	396.7	1.0082
199.4	192.6	1.0351

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999812	*≥0.995*
Slope	1.012457	*0.90 - 1.10*
Intercept	-4.733515	*+/-20*



NO_X Calibration Plot Date: January 15, 2025 Location: Jackfish 2/3



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS29
SURMONT 2
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	January 10, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	11:35	End time (MST):	14:51
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.21	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC356008			
Removed Cal Gas Conc:	49.21	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	5472
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4698

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1170050150	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.006441	1.005683	Backgd or Offset:	14.1	14.0
Calibration intercept:	-2.285476	-2.344879	Coeff or Slope:	0.970	0.938

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.2	----
As found High point	4919	81.3	800.1	825.0	0.970
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	825.2	Previous response	803.0	*% change	2.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.5	----
High point	4919	81.3	800.1	803.6	0.996
Mid point	4959	40.7	400.6	398.5	1.005
Low point	4979	20.3	199.8	197.5	1.012
As left zero	5000	0.0	0.0	-0.1	----
As left span	4919	81.3	800.1	802.0	0.998
				Average Correction Factor:	1.004

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

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

SO_2 Calibration Summary

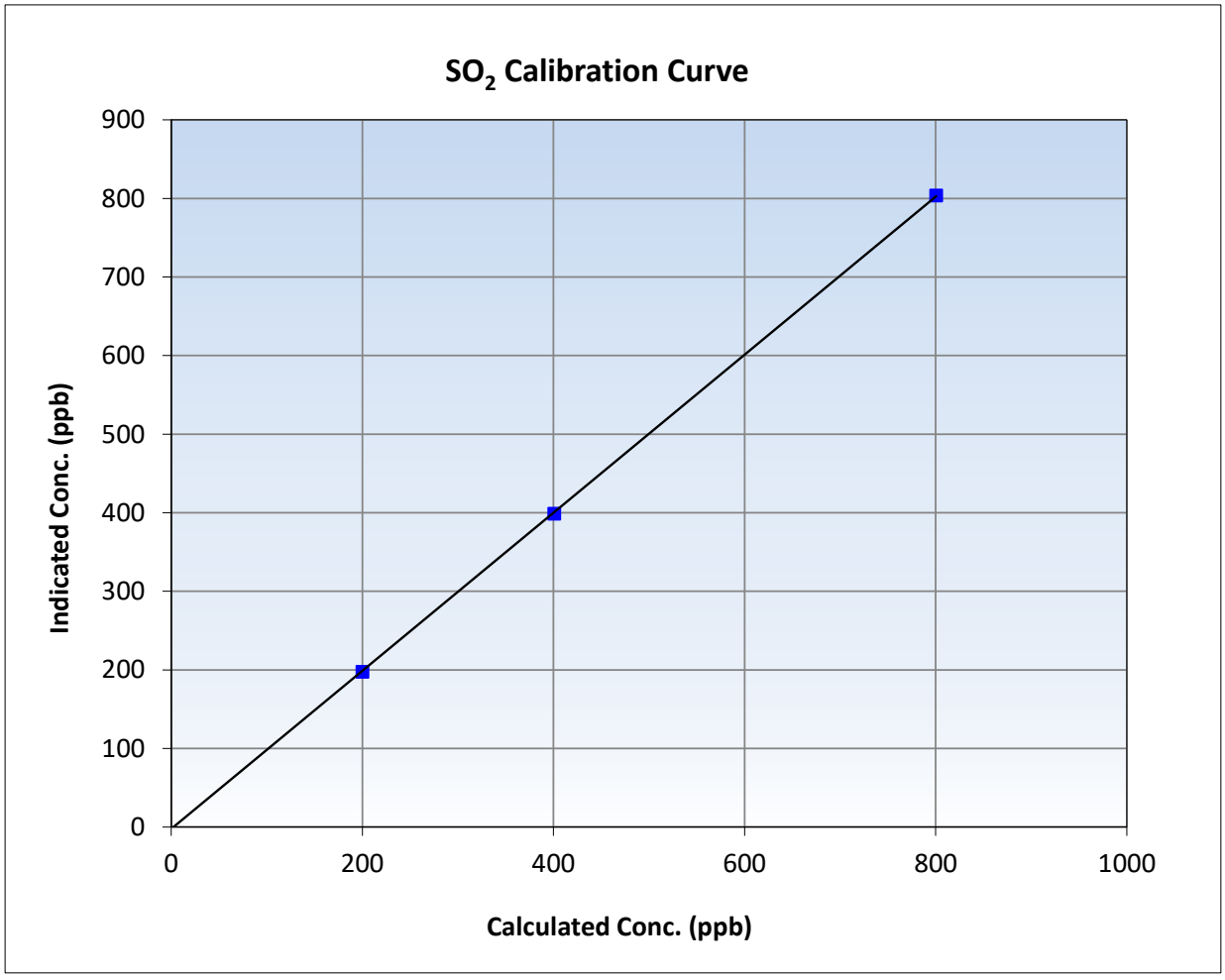
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 2, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:35	End Time (MST):	14:51
Analyzer make:	Thermo 43i	Analyzer serial #:	1170050150

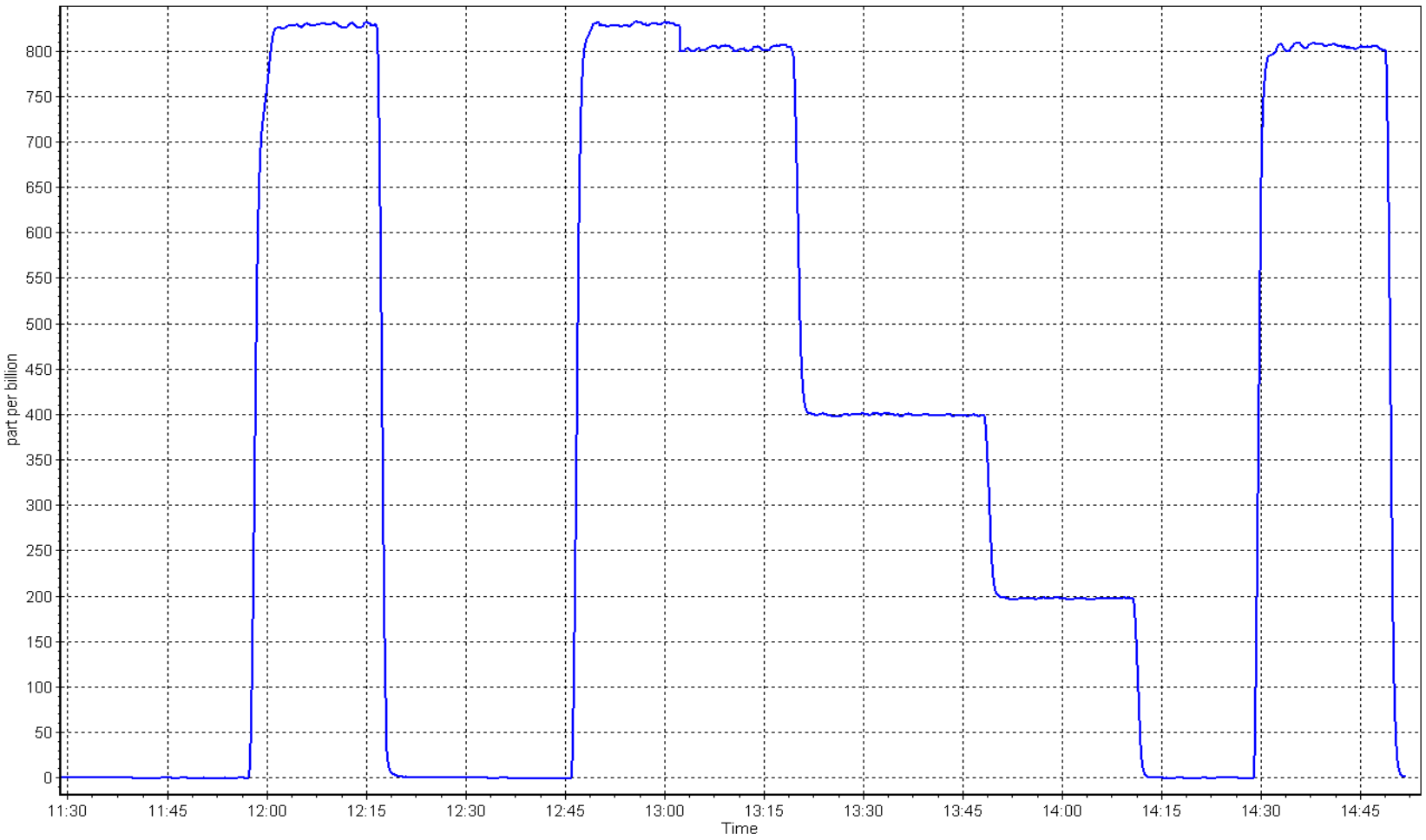
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.5	----
800.1	803.6	0.9957
400.6	398.5	1.0053
199.8	197.5	1.0117

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999971	*≥0.995*
Slope	1.005683	*0.90 - 1.10*
Intercept	-2.344879	*+/-30*



SO2 Calibration Plot Date: January 10, 2025 Location: Surmont 2



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	January 6, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	11:37	End time (MST):	17:10
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.391	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC508338			
Removed Cal Gas Conc:	5.391	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	CC508338		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698

Analyzer Information

Analyzer make:	Thermo 43iQ-TLE		Analyzer serial #:	1200326170	
Converter make:	Global		Converter serial #:	2022-220	
Analyzer Range	0 - 100 ppb		Converter Temp:	325.0	degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.001184	1.002758	Backgd or Offset:	0.88	0.89
Calibration intercept:	-0.082675	0.037160	Coeff or Slope:	1.030	1.045

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4926	74.2	80.0	79.6	1.005
As found Mid point	4963	37.2	40.1	39.8	1.008
As found Low point	4982	18.6	20.1	19.9	1.008
New cylinder response					

Baseline Corr As found:	79.6	Prev response:	80.01	*% change:	-0.5%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	0.995043	AF Intercept:	-0.042517
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999998	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.1	----
High point	4926	74.2	80.0	80.3	0.996
Mid point	4963	37.2	40.1	40.2	0.998
Low point	4982	18.6	20.1	20.1	0.998
As left zero	5000	0.0	0.0	0.2	----
As left span	4926	74.2	80.0	79.7	1.004
SO2 Scrubber Check	4919	81.3	813.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.997
Date of last converter efficiency test:		December 5, 2024		108.1%	efficiency

Notes: Changed sample inlet filter after as founds. Ran SOx scrubber check after cal zero. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

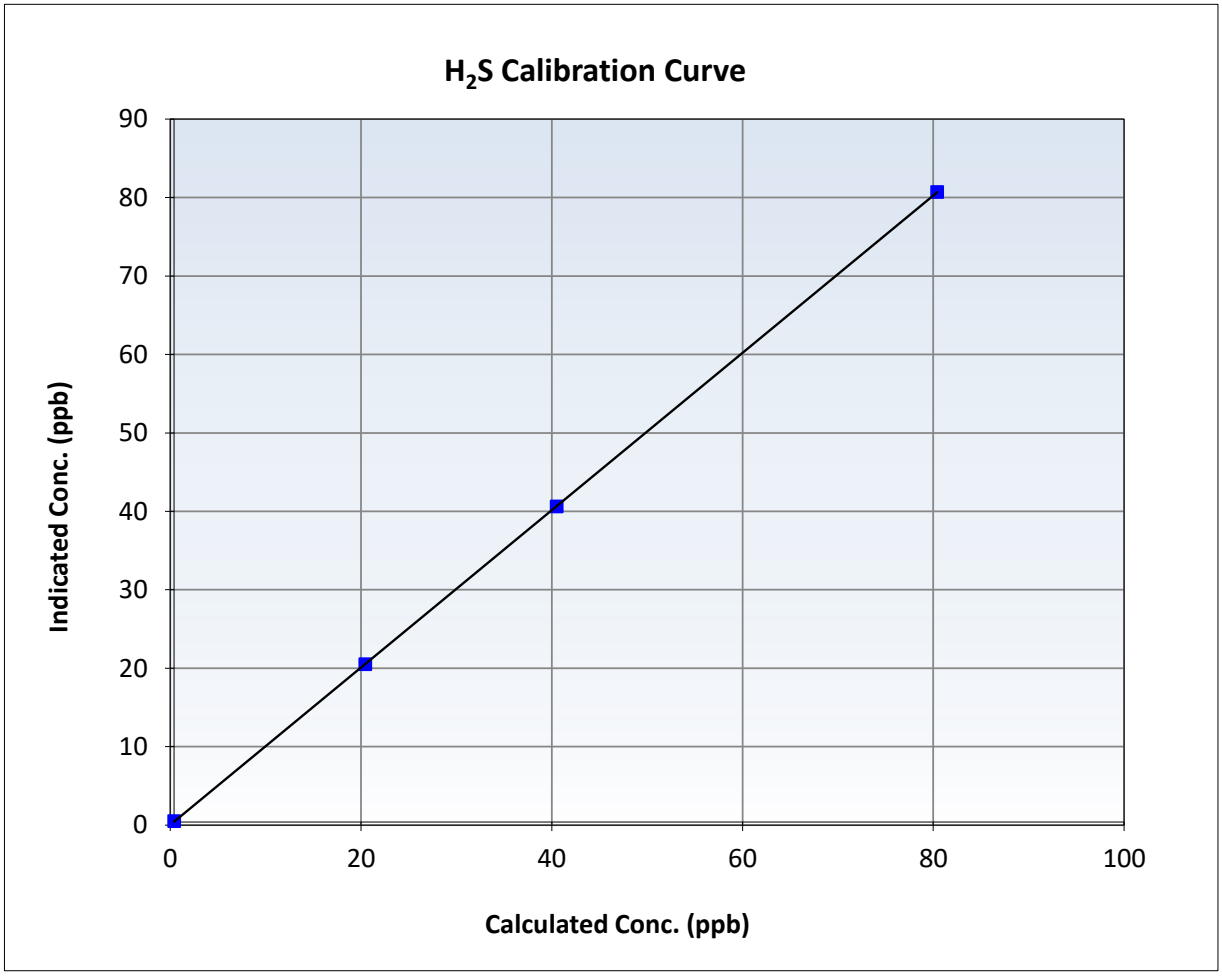
H2S Calibration Summary

Station Information

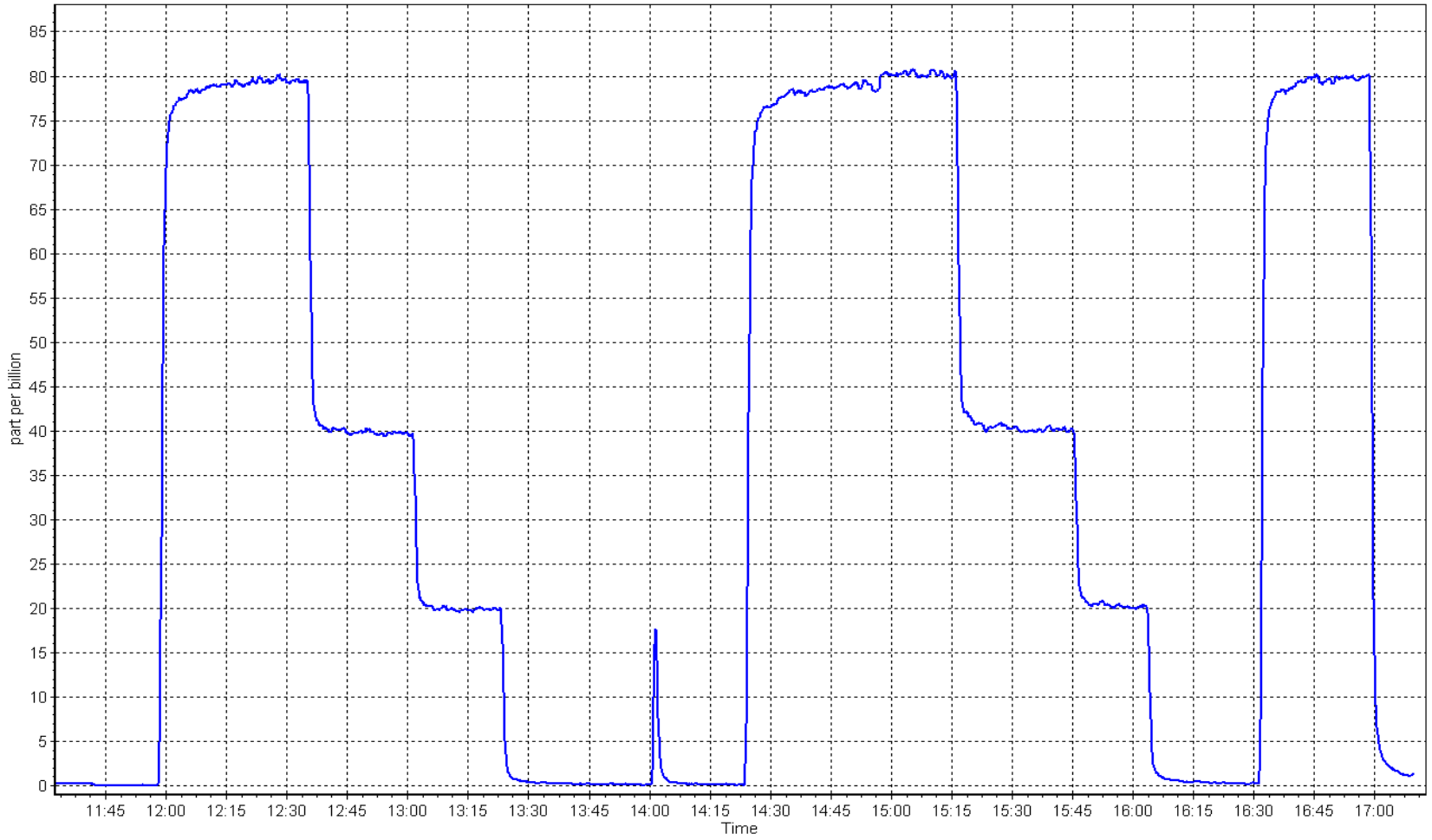
Calibration Date:	January 6, 2025	Previous Calibration:	December 5, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:37	End Time (MST):	17:10
Analyzer make:	Thermo 43iQ-TLE	Analyzer serial #:	1200326170

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	80.3	0.9963	Slope	1.002758	*0.90 - 1.10*
40.1	40.2	0.9977	Intercept	0.037160	*+/-3*
20.1	20.1	0.9977			



H2S Calibration Plot Date: January 6, 2025 Location: Surmont 2



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	January 10, 2025	Last Cal Date:	December 2, 2024
Start time (MST):	11:35	End time (MST):	14:51
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC356008		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
C3H8 Cal Gas Conc.	205.7	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	499.0	ppm	CH4 Equiv Conc.	1064.7	ppm
Removed C3H8 Conc.	205.7	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472	
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1170050149

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	1.007016	0.997616	Background:	3.37	3.40
Calibration intercept:	-0.076638	-0.003468	Coefficient:	3.876	3.919

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.05	----
As found High point	4918	81.3	17.31	17.06	1.018
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.01	Previous response	17.36	*% change	-2.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.04	----
High point	4918	81.3	17.31	17.29	1.001
Mid point	4959	40.6	8.65	8.60	1.005
Low point	4979	20.3	4.32	4.27	1.012
As left zero	5000	0.0	0.00	0.03	----
As left span	4918	81.3	17.31	17.37	0.997
				Average Correction Factor	1.006

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

Calibration Performed By: Braiden Boutilier

Version 03-2024

CALS_512

Wood Buffalo Environmental Association

THC Calibration Summary

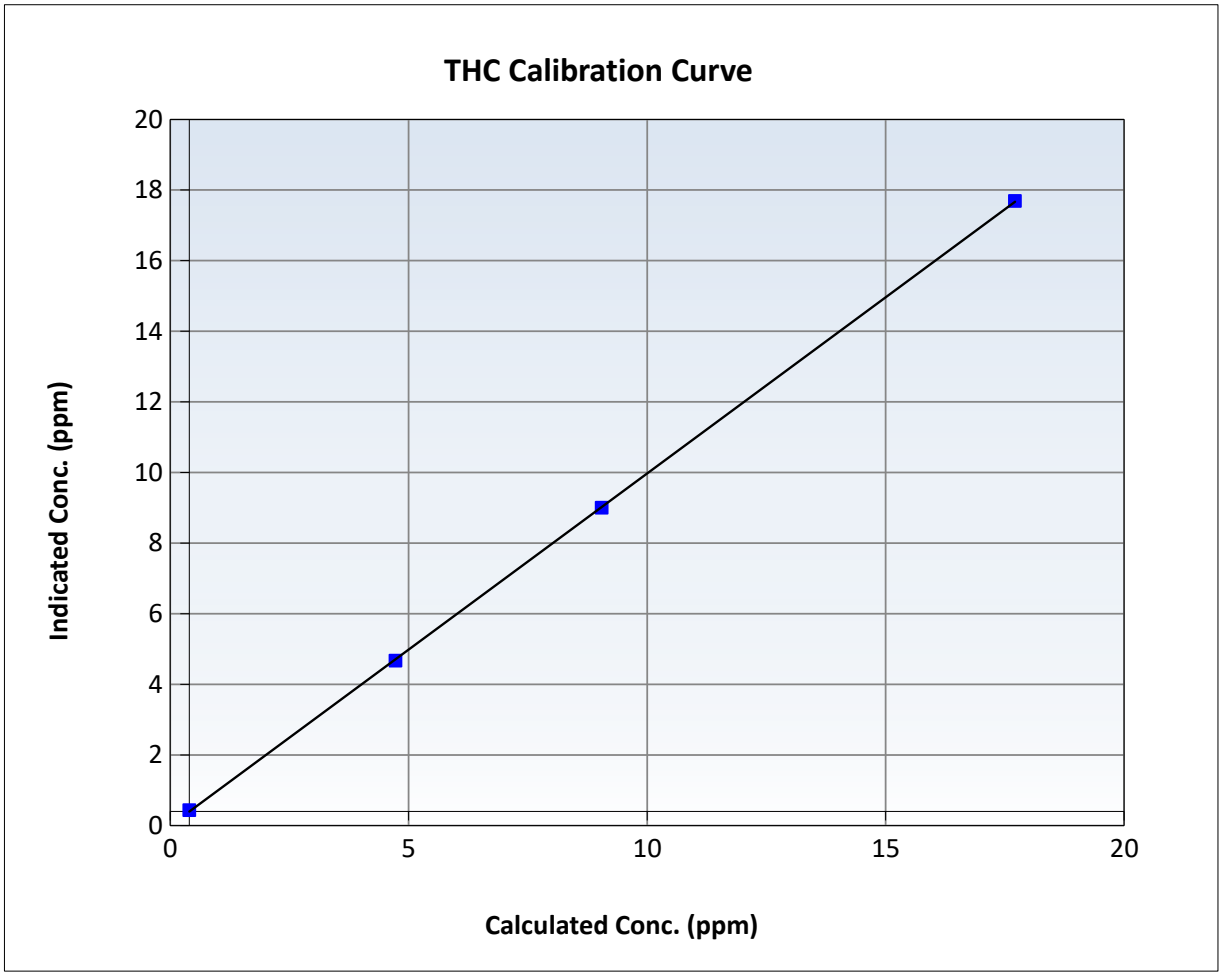
Station Information

Calibration Date:	January 10, 2025	Previous Calibration:	December 2, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:35	End Time (MST):	14:51
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1170050149

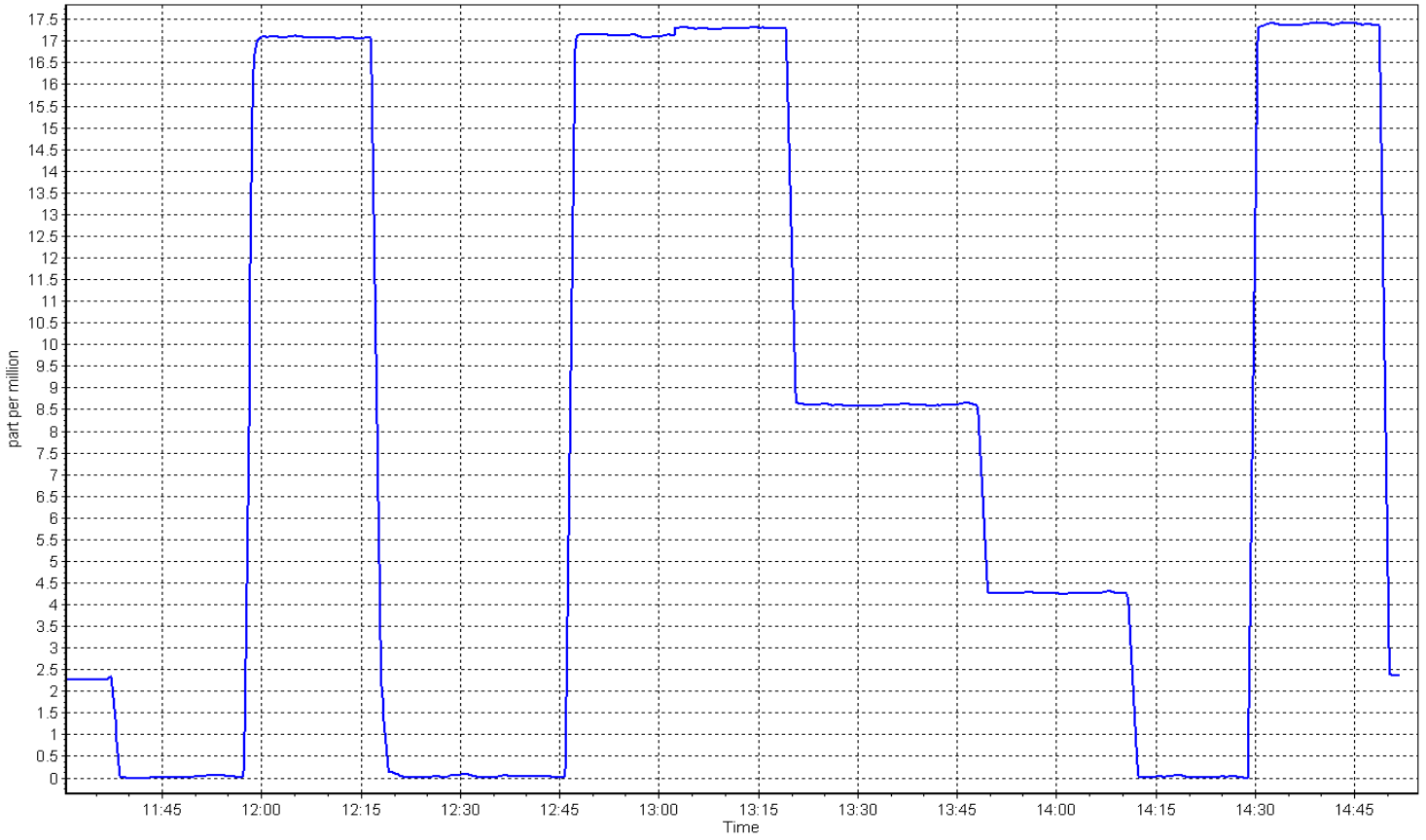
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.04	----
17.31	17.29	1.0014
8.65	8.60	1.0053
4.32	4.27	1.0125

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999975	*≥0.995*
Slope	0.997616	*0.90 - 1.10*
Intercept	-0.003468	*+/-1.5*



THC Calibration Plot Date: January 10, 2025 Location: Surmont 2



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Surmont 2
Station number:	AMS 29
Calibration Date:	January 13, 2025
Last Cal Date:	December 18, 2024
Start time (MST):	11:09
End time (MST):	16:17
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	CC218007	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.00 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5472
ZAG make/model:	Teledyne API T701	Serial Number:	4698

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
AF High point	4933	66.7	803.1	800.4	2.7	782.1	774.5	7.6	1.0267	1.0335
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	803.3	ppb	NO =	799.3	ppb	
Baseline Corr 1st pt	NO_X =	782.2	ppb	NO =	774.5	ppb	
Baseline Corr 2nd pt	NO_X =	NA	ppb	NO =	NA	ppb	
Baseline Corr 3rd pt	NO_X =	NA	ppb	NO =	NA	ppb	

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	-2.7%	
*Percent Change	NO =	-3.2%	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1170050148

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	1.652	1.711	NO bkgnd or offset:	1.4	1.5
NOX coeff or slope:	0.998	0.988	NOX bkgnd or offset:	1.5	1.6
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	198.0	194.7

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.001023	1.000735
NO_X Cal Offset:	-0.652175	-0.609358
NO Cal Slope:	1.000922	1.005185
NO Cal Offset:	-1.891558	-2.349334
NO_2 Cal Slope:	1.006053	0.993889
NO_2 Cal Offset:	1.038885	-1.329805

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4933	66.7	803.1	800.4	2.7	803.0	803.0	-0.5	1.0001	0.9968
Mid point	4967	33.3	400.9	399.6	1.3	401.5	399.4	2.1	0.9985	1.0004
Low point	4983	16.7	201.1	200.4	0.7	199.2	195.9	3.4	1.0094	1.0230
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
As left span	4933	84.2	1010.3	405.8	397.3	795.1	405.8	389.3	1.2706	1.0000
								Average Correction Factor	1.0027	1.0068

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	795.1	399.9	397.9	394.9	1.0075	99.3%
Mid GPT point	795.1	607.9	189.9	186.2	1.0197	98.1%
Low GPT point	795.1	700.6	97.2	94.3	1.0304	97.0%
				Average Correction Factor	1.0192	98.1%

Notes: Changed sample inlet filter after as founds. Adjusted span. Second high NO ref point used in GPT Calibration Data formulas.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

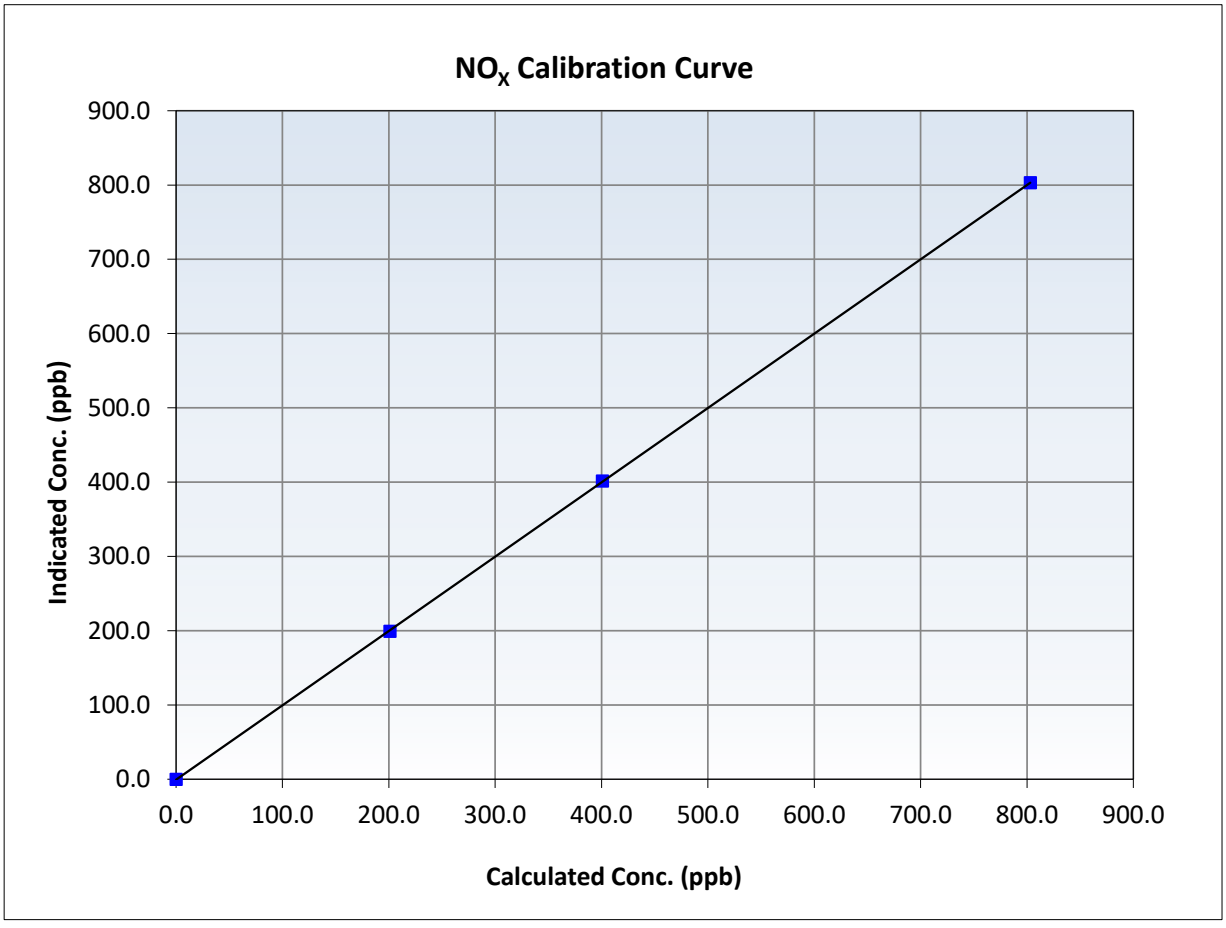
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 18, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:09	End Time (MST):	16:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
803.1	803.0	1.0001
400.9	401.5	0.9985
201.1	199.2	1.0094

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999991	*≥0.995*
Slope	1.000735	*0.90 - 1.10*
Intercept	-0.609358	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

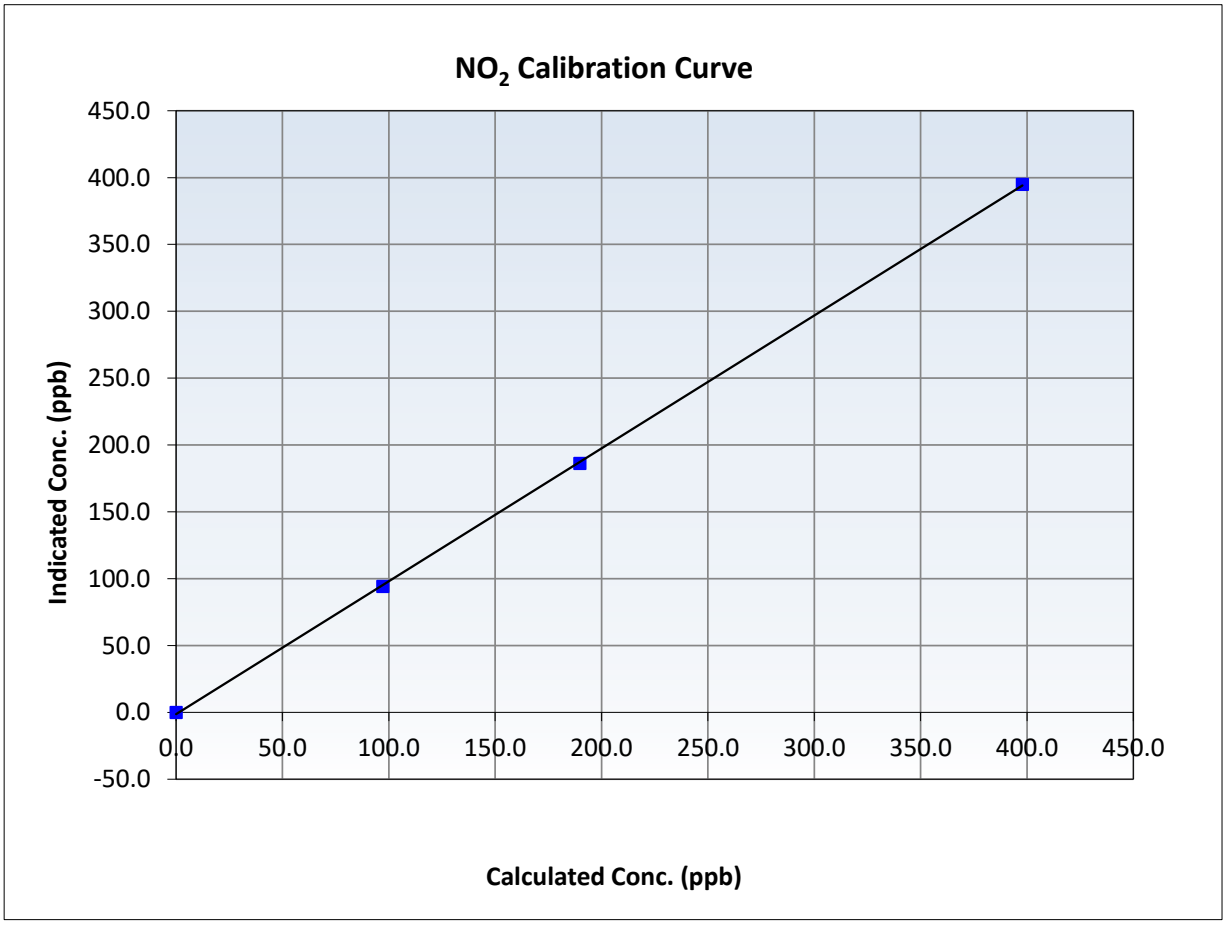
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 18, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:09	End Time (MST):	16:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
397.9	394.9	1.0075
189.9	186.2	1.0197
97.2	94.3	1.0304

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999945	*≥0.995*
Slope	0.993889	*0.90 - 1.10*
Intercept	-1.329805	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

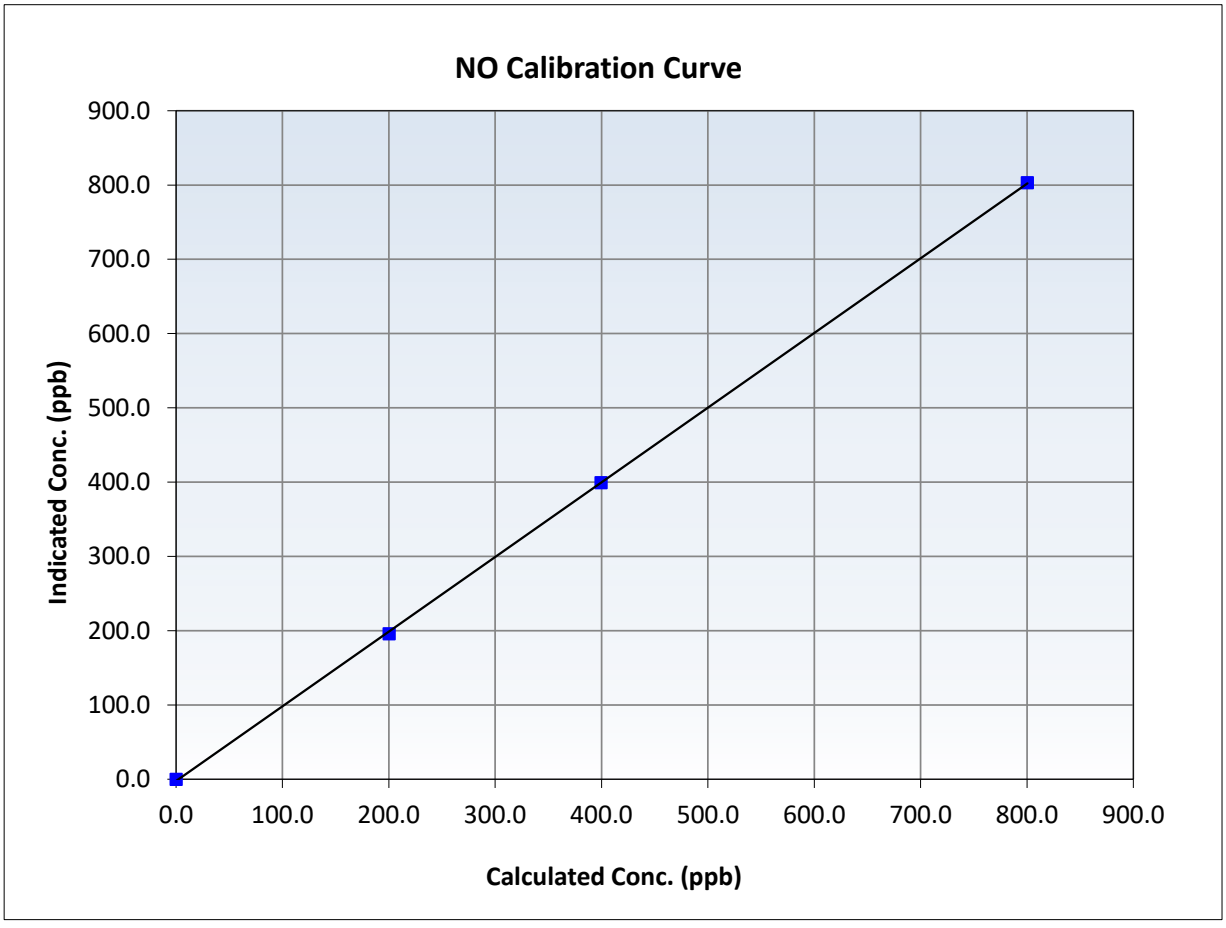
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 18, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	11:09	End Time (MST):	16:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

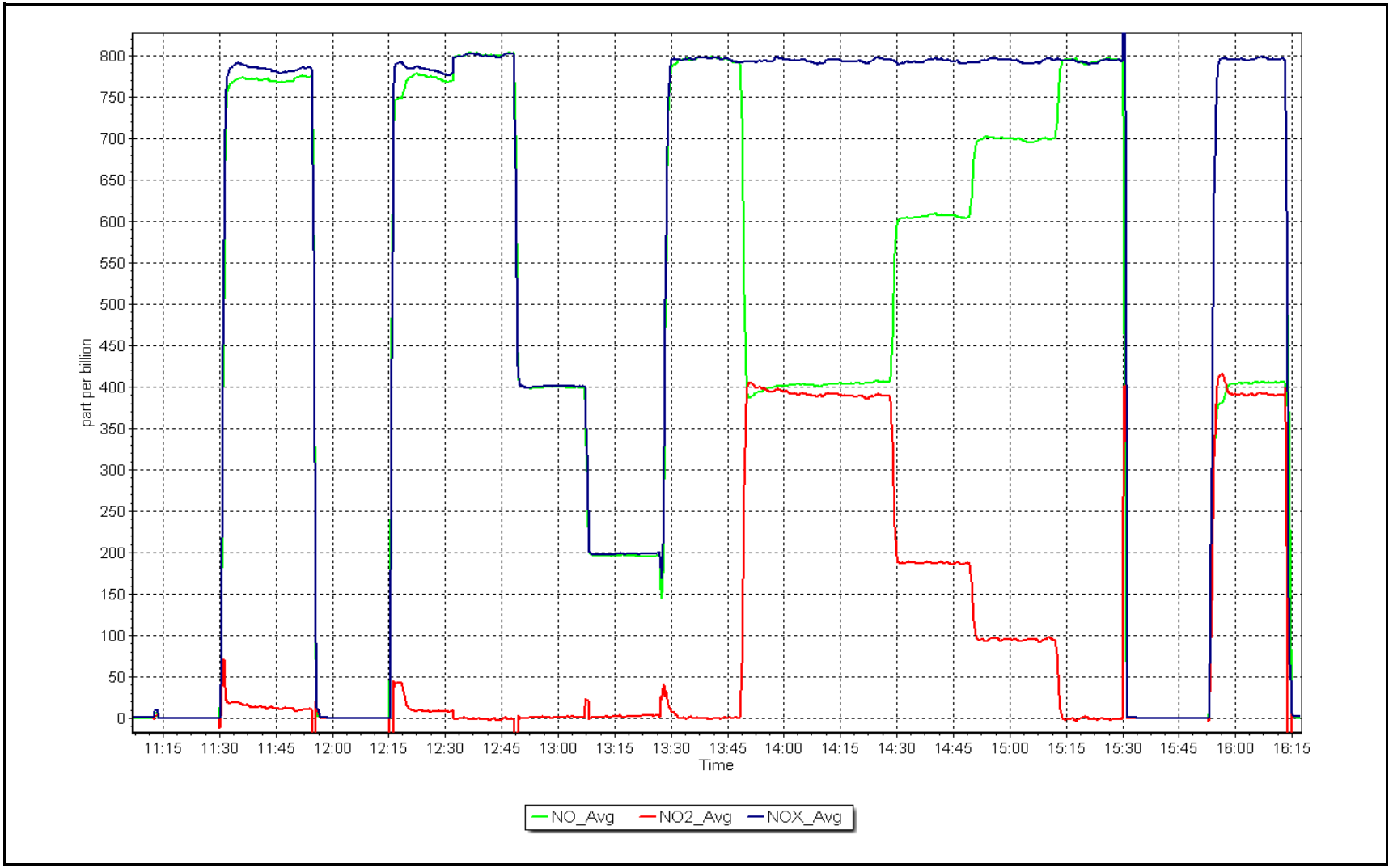
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.4	803.0	0.9968
399.6	399.4	1.0004
200.4	195.9	1.0230

Statistical Evaluation		Limits
Correlation Coefficient	0.999954	≥0.995
Slope	1.005185	0.90 - 1.10
Intercept	-2.349334	+/-20



NO_X Calibration Plot Date: January 13, 2025 Location: Surmont 2



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Surmont 2	Station number:	AMS 29
Calibration Date:	January 10, 2025	Last Cal Date:	December 13, 2024
Start time (MST):	13:13	End time (MST):	14:03
Analyzer Make:	API T640	S/N:	323
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	1.9	1.64	1.9	☐	+/- 2 °C
P (mmHg)	699.1	698.00	699.1	☐	+/- 10 mmHg
Flow (LPM)	5.03	4.982	5.03	☐	+/- 0.25 LPM
PW% (pump)	37	-----	37	☐	>80%

Zero Verification — PM w/o HEPA: 4.5 — 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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.9 — Expiry Date: June 10, 2024 — Lot No.: 100128-050-042

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	11.2	11.2	11.2	☐	+/- 0.5

Date Optical Chamber Cleaned: January 10, 2025

Date Disposable Filter Changed: October 31, 2024

Post- maintenance Zero Verification: PM w/ HEPA: 0.0 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: October 30, 2024

Date RH/T Sensor Cleaned: October 30, 2024

Notes: Verified temperature, pressure and flow. Quarterly maintenance completed. Filter to be changed next month.

Calibration by: Braiden Boutilier

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS30
ELLS RIVER
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	January 13, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	10:20	End time (MST):	13:16
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	48.75	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC350110			
Removed Cal Gas Conc:	48.75	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	API T700		Serial Number:	3061
Zero Air Gen Model:	API T701H		Serial Number:	358

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1008841397	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001932	1.000903	Backgd or Offset:	10.1	10.1
Calibration intercept:	-3.552064	-3.092063	Coeff or Slope:	0.992	0.988

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.3	----
As found High point	4918	82.0	799.5	799.9	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	800.2	Previous response	797.5	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4918	82.0	799.5	798.6	1.001
Mid point	4959	41.0	399.8	395.7	1.010
Low point	4980	20.5	199.9	193.7	1.032
As left zero	5000	0.0	0.0	-0.1	----
As left span	4918	82.0	799.5	800.6	0.999
				Average Correction Factor:	1.014

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

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

SO_2 Calibration Summary

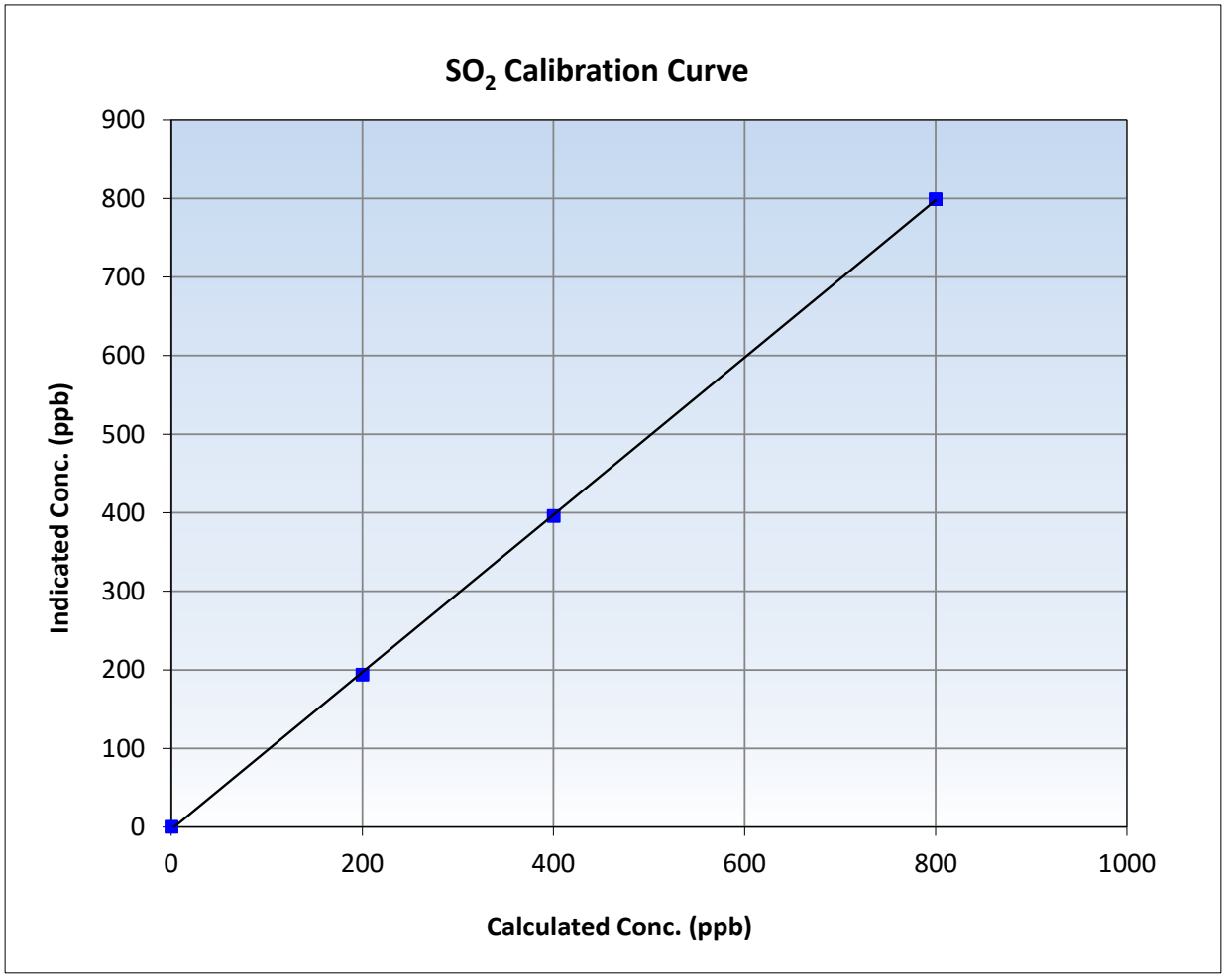
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 6, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:20	End Time (MST):	13:16
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841397

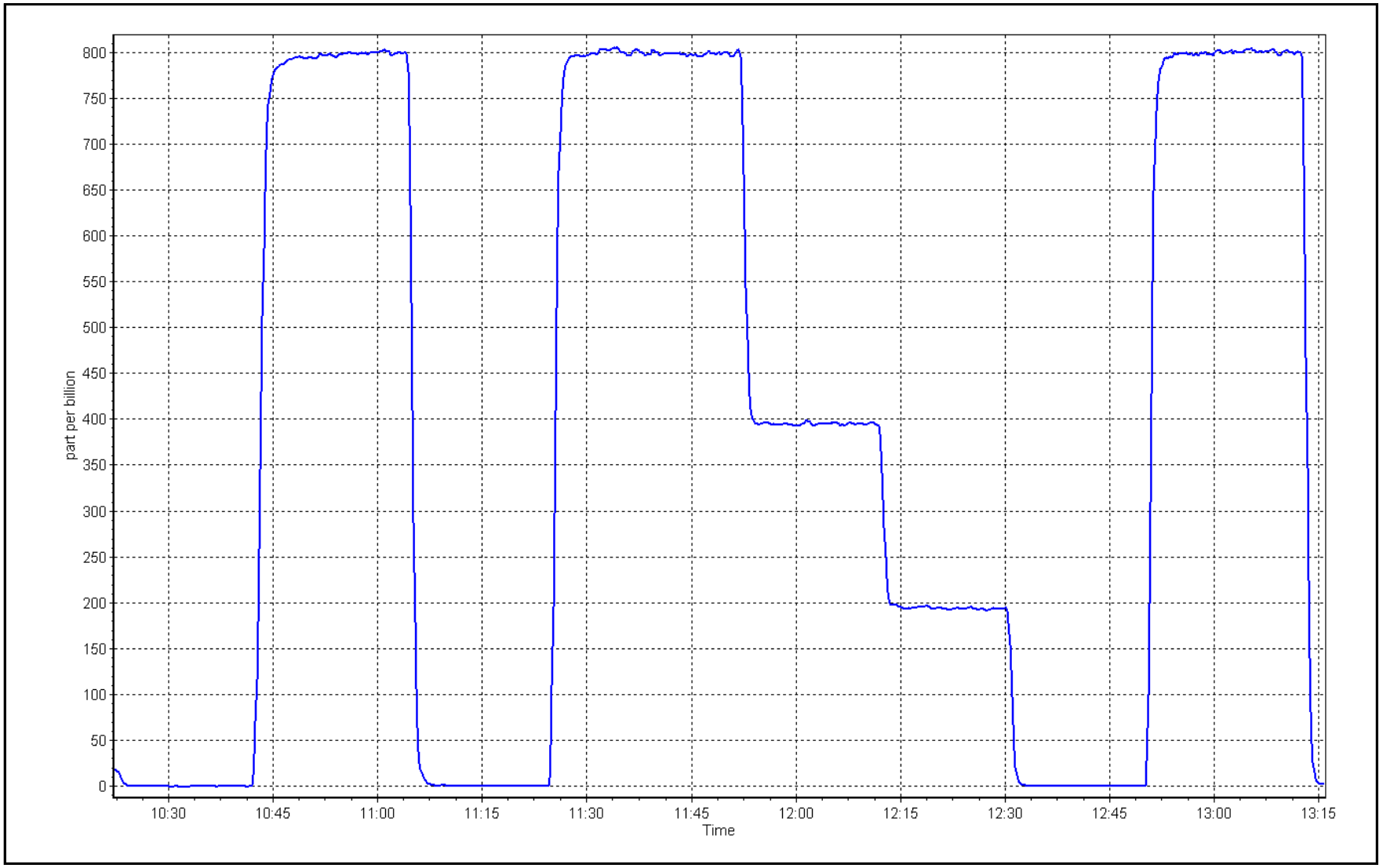
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.5	798.6	1.0011
399.8	395.7	1.0102
199.9	193.7	1.0318

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999932	*≥0.995*
Slope	1.000903	*0.90 - 1.10*
Intercept	-3.092063	*+/-30*



SO2 Calibration Plot Date: January 13, 2025 Location: Ells River



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	January 8, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	10:11	End time (MST):	14:12
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.99	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	CC505806			
Removed Cal Gas Conc:	4.99	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	API T750		Serial Number:	281
ZAG Make/Model:	API 751H		Serial Number:	77

Analyzer Information

Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1410661331
Converter make:	CDN- 101		Converter serial #:	562
Analyzer Range	0 - 100 ppb		Converter Temp:	800 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.991618	1.005332	Backgd or Offset:	1.6	1.7
Calibration intercept:	0.439545	-0.040479	Coeff or Slope:	1.042	1.080

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4920	80.2	80.0	77.0	1.038
As found Mid point	4960	40.1	40.0	38.2	1.045
As found Low point	4980	20.0	20.0	18.8	1.056
New cylinder response					

Baseline Corr As found:	77.1	Prev response:	79.81	*% change:	-3.5%
Baseline Corr 2nd AF pt:	38.3	AF Slope:	0.964360	AF Intercept:	-0.281296
Baseline Corr 3rd AF pt:	18.9	AF Correlation:	0.999975	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	80.2	80.0	80.4	0.995
Mid point	4960	40.1	40.0	40.3	0.993
Low point	4980	20.0	20.0	19.9	1.003
As left zero	5000	0.0	0.0	0.4	----
As left span	4920	80.2	80.0	80.5	0.994
SO2 Scrubber Check	4918	82.0	820.0	0.1	----
Date of last scrubber change:				Ave Corr Factor	0.997
Date of last converter efficiency test:					

Notes: Changed sample inlet filter after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted span only.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

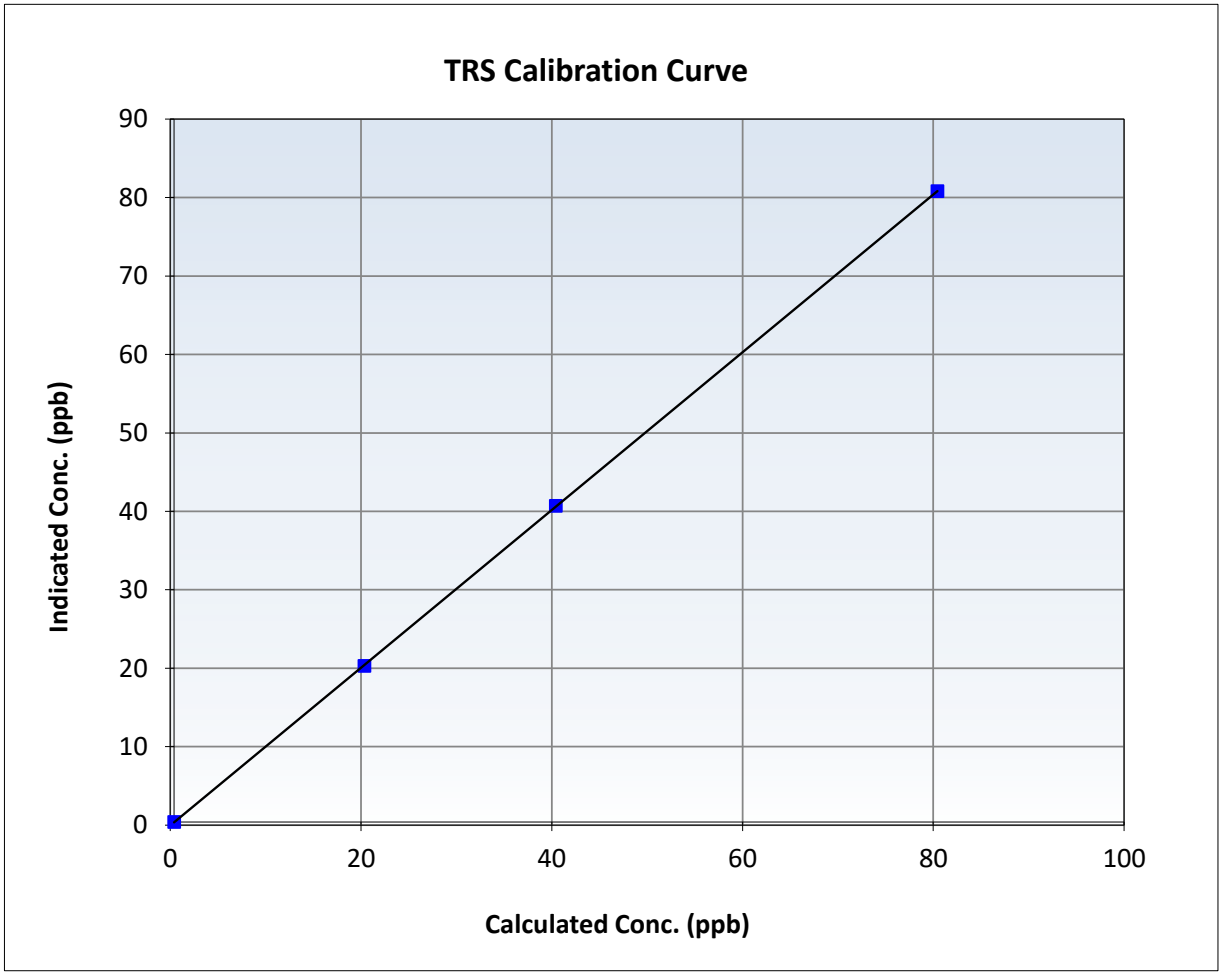
TRS Calibration Summary

Station Information

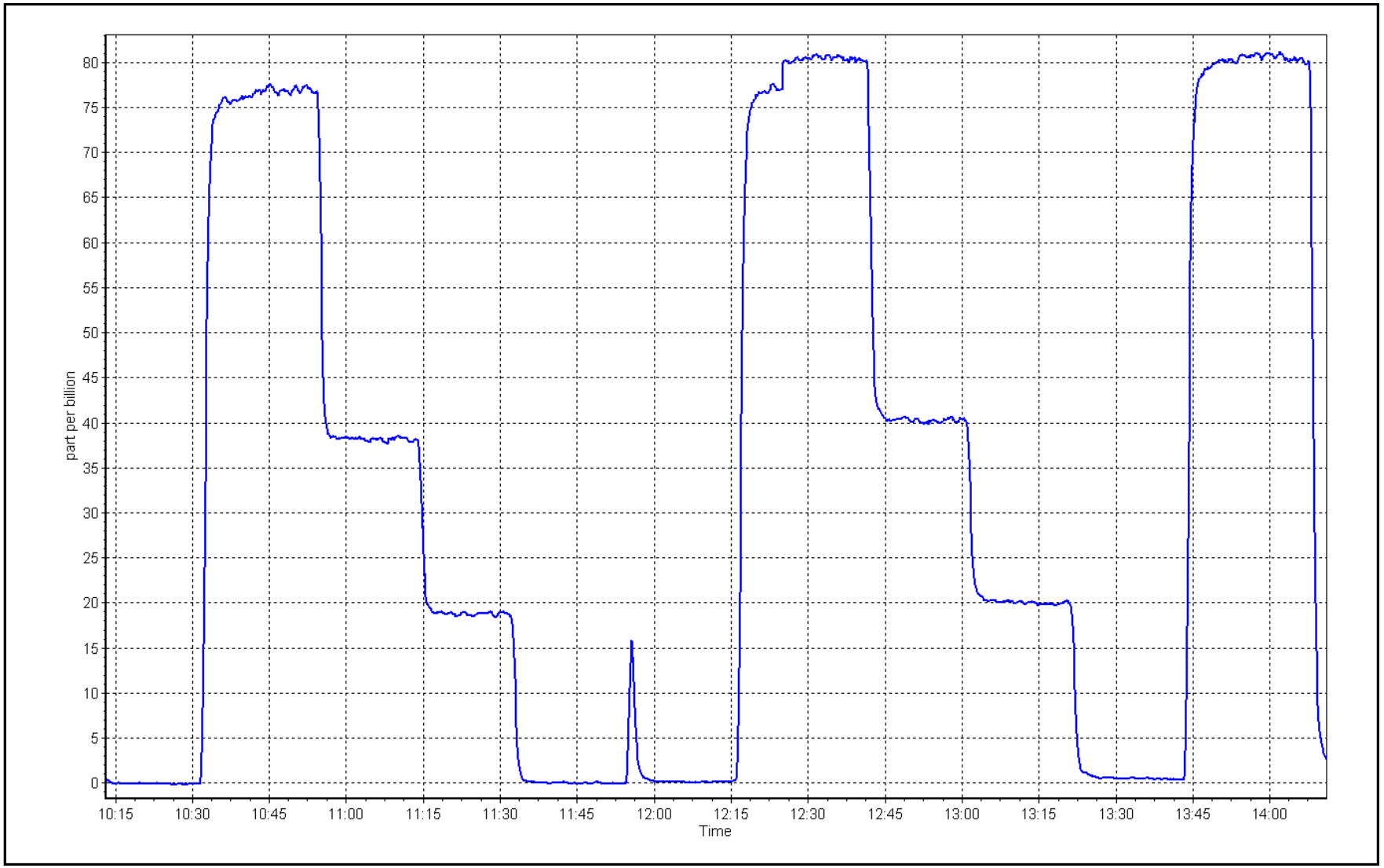
Calibration Date:	January 8, 2025	Previous Calibration:	December 3, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:11	End Time (MST):	14:12
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1410661331

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.0	----	Correlation Coefficient	0.999992	*≥0.995*
80.0	80.4	0.9955	Slope	1.005332	*0.90 - 1.10*
40.0	40.3	0.9930			
20.0	19.9	1.0030	Intercept	-0.040479	*+/-3*



TRS Calibration Plot Date: January 8, 2025 Location: Ells River



Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	January 13, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	10:20	End time (MST):	13:16
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC350110		Cal Gas Expiry Date:	March 10, 2031	
CH4 Cal Gas Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
C3H8 Cal Gas Conc.	207.2	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1066.4	ppm
Removed C3H8 Conc.	207.2	ppm	Diff between cyl (THC):		
Diff between cyl (CH_4):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:	3061	
Zero Air Gen model:	API T701H		Serial Number:	358	

Analyzer Information

Analyzer make:	Thermo 55i		Analyzer serial #:	1152430011	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	Start	***Finish***		***Start***	***Finish***
CH4 SP Ratio:	3.12E-04	3.11E-04	NMHC SP Ratio:	5.94E-05	6.00E-05
CH4 Retention time:	17.6	17.4	NMHC Peak Area:	157107	155673
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	17.49	17.43	1.004
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr AF:	17.43	Prev response	17.40	*% change	0.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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-AFzero)) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	17.49	17.49	1.000
Mid point	4959	41.0	8.74	8.66	1.010
Low point	4980	20.5	4.37	4.28	1.022
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	17.49	17.46	1.002
				Average Correction Factor	1.011

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

Wood Buffalo Environmental Association

THC / CH_4 / NMHC Calibration Report

NMHC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	9.34	9.26	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	9.26	Prev response	9.30	*% change	-0.5%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

NMHC 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	9.34	9.35	0.999
Mid point	4959	41.0	4.67	4.64	1.008
Low point	4980	20.5	2.34	2.31	1.012
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	9.34	9.32	1.003
				Average Correction Factor	1.006

CH4 As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	0.00	----
As found High point	4918	82.0	8.14	8.17	0.997
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.17	Prev response	8.10	*% change	0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

CH4 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	0.00	----
High point	4918	82.0	8.14	8.14	1.001
Mid point	4959	41.0	4.07	4.02	1.013
Low point	4980	20.5	2.04	1.97	1.034
As left zero	5000	0.0	0.00	0.00	----
As left span	4918	82.0	8.14	8.14	1.001
				Average Correction Factor	1.016

Calibration Statistics

	Start	***Finish***
THC Cal Slope:	0.997832	1.001152
THC Cal Offset:	-0.052226	-0.054626
CH4 Cal Slope:	0.998966	1.001548
CH4 Cal Offset:	-0.036119	-0.036319
NMHC Cal Slope:	0.997065	1.001125
NMHC Cal Offset:	-0.017507	-0.019107

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

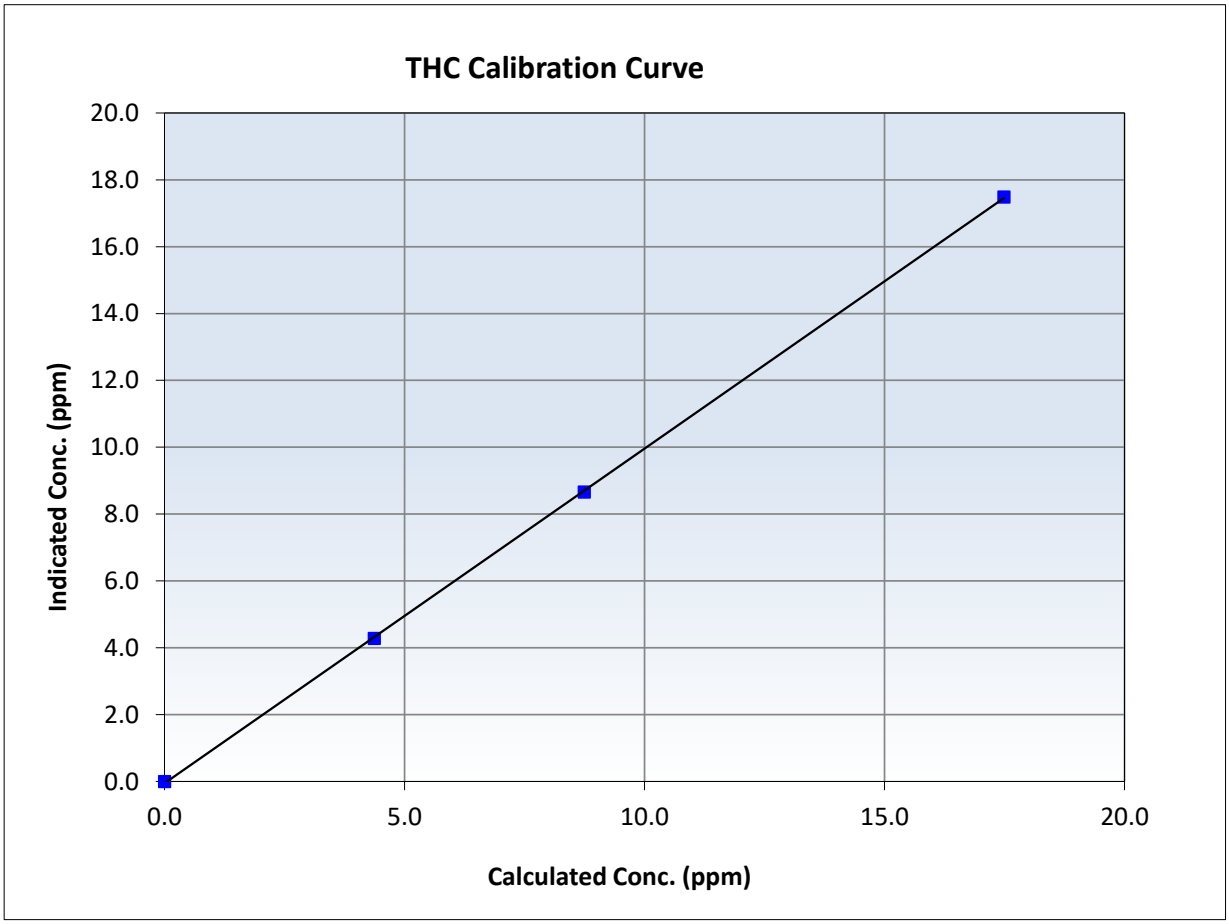
THC Calibration Summary

Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 6, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:20	End Time (MST):	13:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999953	*≥0.995*
17.49	17.49	1.0001	Slope	1.001152	*0.90 - 1.10*
8.74	8.66	1.0101			
4.37	4.28	1.0219	Intercept	-0.054626	*+/-0.5*



Wood Buffalo Environmental Association

CH_4 Calibration Summary

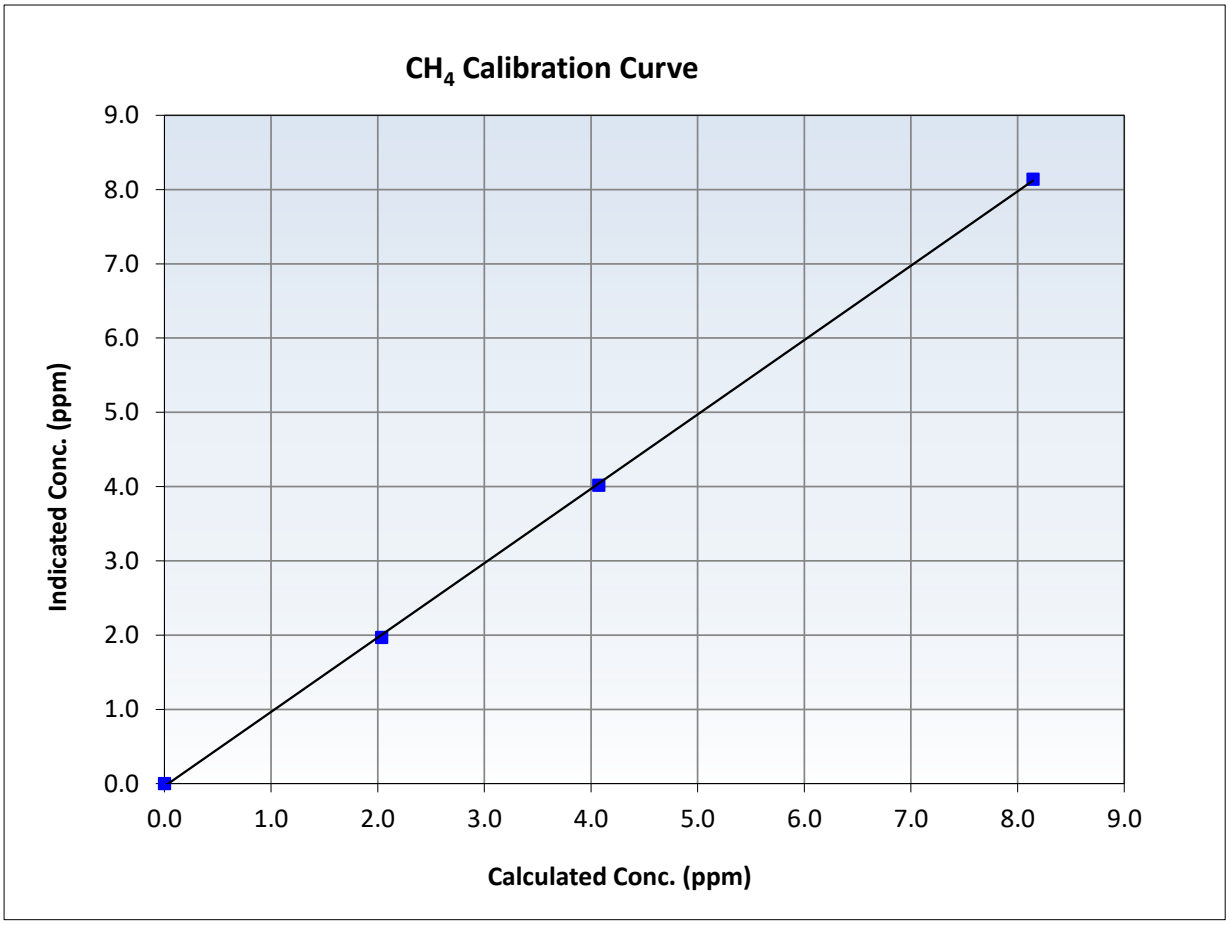
Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 6, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:20	End Time (MST):	13:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	0.00	----
8.14	8.14	1.0005
4.07	4.02	1.0130
2.04	1.97	1.0340

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999909	*≥0.995*
Slope	1.001548	*0.90 - 1.10*
Intercept	-0.036319	*+/-0.5*



Wood Buffalo Environmental Association

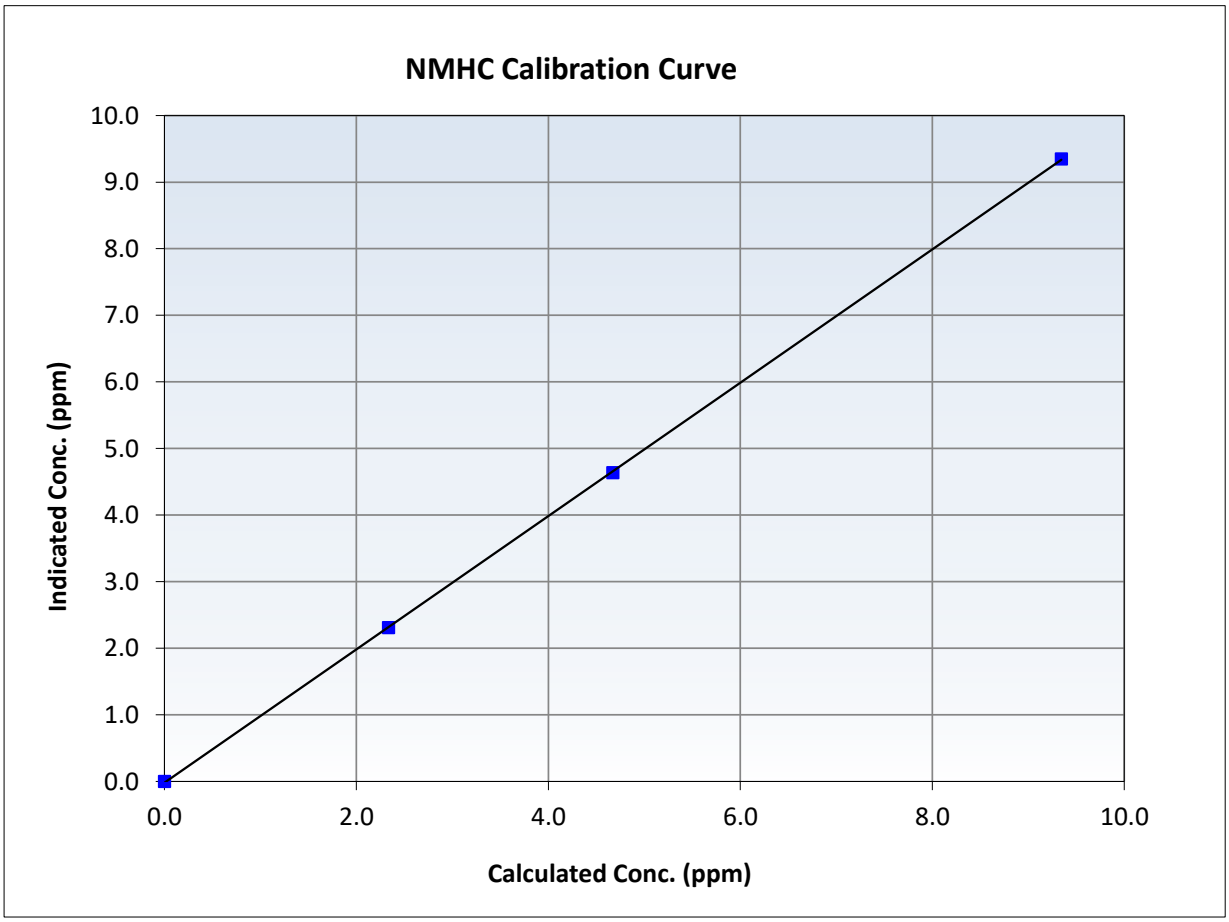
NMHC Calibration Summary

Station Information

Calibration Date:	January 13, 2025	Previous Calibration:	December 6, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:20	End Time (MST):	13:16
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.00	0.00	----	Correlation Coefficient	0.999975	*≥0.995*
9.34	9.35	0.9994	Slope	1.001125	*0.90 - 1.10*
4.67	4.64	1.0078	Intercept	-0.019107	*+/-0.5*
2.34	2.31	1.0117			



NMHC Calibration Plot Date: January 13, 2025 Location: Ells River

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Ells River
Station number:	AMS 30
Calibration Date:	January 23, 2025
Last Cal Date:	December 3, 2024
Start time (MST):	11:33
End time (MST):	14:53
Reason:	As Found

Calibration Standards

NO Gas Cylinder #:	DT0027487	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc:	59.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc:	59.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3061
ZAG make/model:	API T701H	Serial Number:	358

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.4	-0.3	----	----
AF High point	4932	67.7	803.0	800.3	2.7	808.0	798.2	9.8	0.9929	1.0021
AF Mid point	4966	33.8	400.9	399.5	1.4	400.2	393.3	6.9	1.0000	1.0148
AF Low point	4983	16.9	200.4	199.8	0.7	197.8	193.6	4.2	1.0098	1.0297
New cyl resp										

Previous Response	NO_X = 803.1 ppb	NO = 796.7 ppb
Baseline Corr 1st pt	NO_X = 808.7 ppb	NO = 798.6 ppb
Baseline Corr 2nd pt	NO_X = 400.9 ppb	NO = 393.7 ppb
Baseline Corr 3rd pt	NO_X = 198.5 ppb	NO = 194.0 ppb

* = > +/-5% change initiates investigation

*Percent Change NO_X = 0.7%

*Percent Change NO = 0.2%

As Found Statistics

As found	NO_X r^2: 0.999974	Nx Sl: 1.008173	Nx Int: -2.617
As found	NO r^2: 0.999926	NO Sl: 0.999506	NO Int: -3.541
As found	NO_2 r^2: 0.999906	NO2 Sl: 1.008561	NO_2 Int: 1.323

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero	----	----	0.0	-0.3	----	----
As found high GPT point	795.0	435.1	362.6	366.1	0.9905	101.0%
As found mid GPT point	795.0	613.9	183.8	187.8	0.9787	102.2%
As found low GPT point	795.0	703.5	94.2	97.8	0.9633	103.8%

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 710321429

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.143	NA	NO bkgnd or offset:	13.4	NA
NOX coeff or slope:	0.999	NA	NOX bkgnd or offset:	13.8	NA
NO2 coeff or slope:	1.000	NA	Reaction cell Press:	198.1	NA

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001750	
NO_X Cal Offset:	-1.237513	
NO Cal Slope:	0.998473	
NO Cal Offset:	-2.379819	
NO_2 Cal Slope:	0.999496	
NO_2 Cal Offset:	0.002264	

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero										
High point										
Mid point										
Low point										
As left zero										
As left span										
								Average Correction Factor		

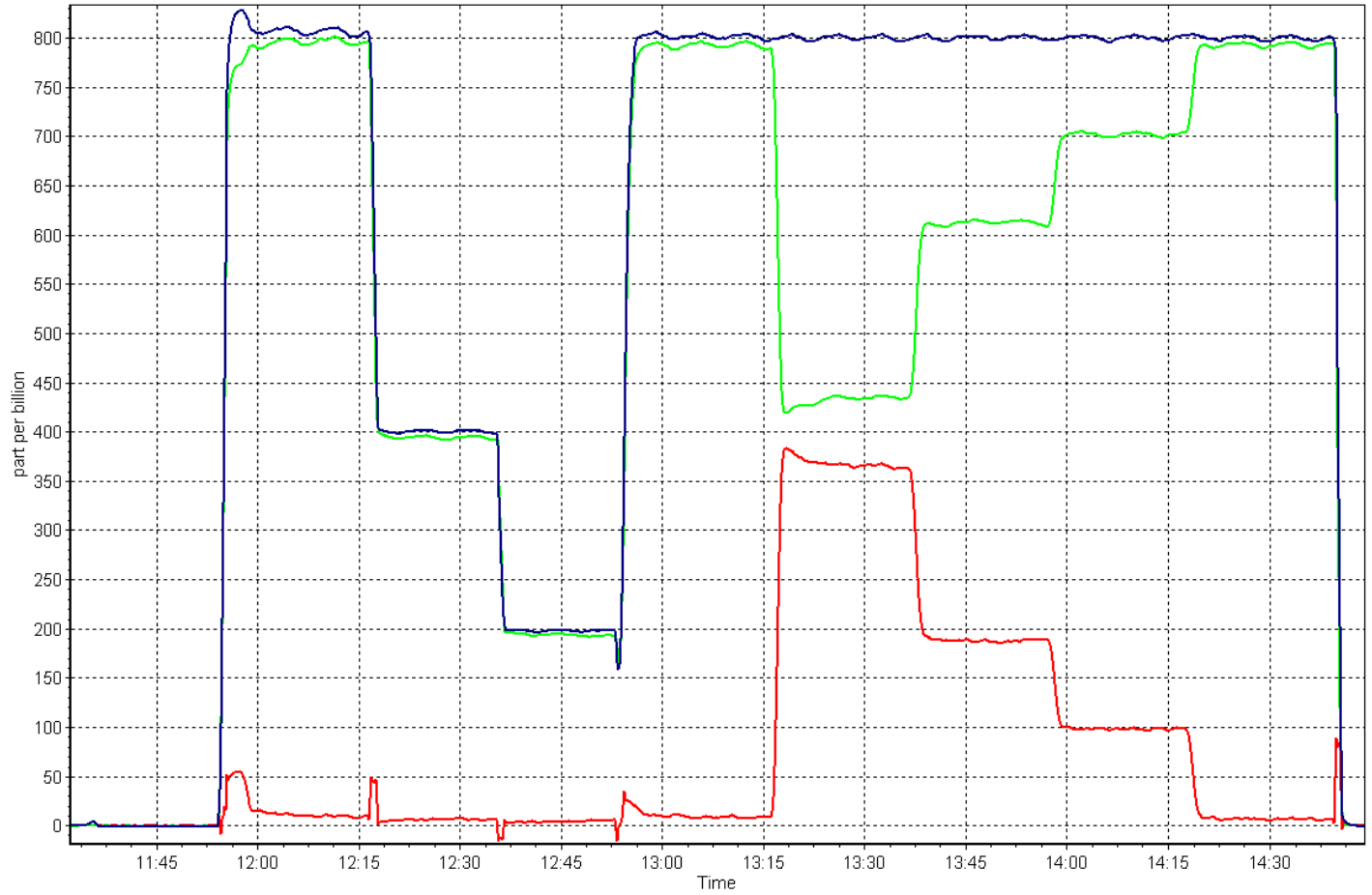
GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero						
High GPT point						
Mid GPT point						
Low GPT point						
				Average Correction Factor		

Notes: Multipoint as founds was done to replace pump and charcoal.

Calibration Performed By: Jan Castro

NO_X Calibration Plot Date: January 23, 2025 Location: Ells River



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Ells River
Station number:	AMS 30
Calibration Date:	January 24, 2025
Last Cal Date:	NA
Start time (MST):	10:01
End time (MST):	13:58
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0027487	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc:	59.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc:	59.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	API T700	Serial Number:	3061
ZAG make/model:	API T701H	Serial Number:	358

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO r^2:	NO Sl:	NO Int:	
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 710321429

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:		0.996	NO bkgnd or offset:		11.6
NOX coeff or slope:		0.994	NOX bkgnd or offset:		11.7
NO2 coeff or slope:		1.000	Reaction cell Press:		183.0

Calibration Statistics

	Start	Finish
NO_X Cal Slope:		0.999203
NO_X Cal Offset:		-0.818278
NO Cal Slope:		1.001133
NO Cal Offset:		-2.860318
NO_2 Cal Slope:		1.000511
NO_2 Cal Offset:		-0.151727

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
High point	4932	67.7	803.0	800.3	2.7	801.6	799.8	1.9	1.0017	1.0006
Mid point	4966	33.8	400.9	399.5	1.4	400.2	395.5	4.7	1.0017	1.0102
Low point	4983	16.9	200.4	199.8	0.7	198.2	194.4	3.8	1.0113	1.0276
As left zero	5000	0.0	0.0	0.0	0.0	0.2	0.3	-0.1	----	----
As left span	4932	67.7	803.0	439.4	363.6	797.6	439.4	358.1	1.0067	1.0000
							Average Correction Factor		1.0049	1.0128

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	797.7	434.2	366.2	366.3	0.9997	100.0%
Mid GPT point	797.7	609.4	191.0	190.9	1.0006	99.9%
Low GPT point	797.7	609.4	191.0	190.9	1.0006	99.9%
				Average Correction Factor	1.0003	100.0%

Notes: As founds was done yesterday. Adjusted zero and span.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

NO_X Calibration Summary

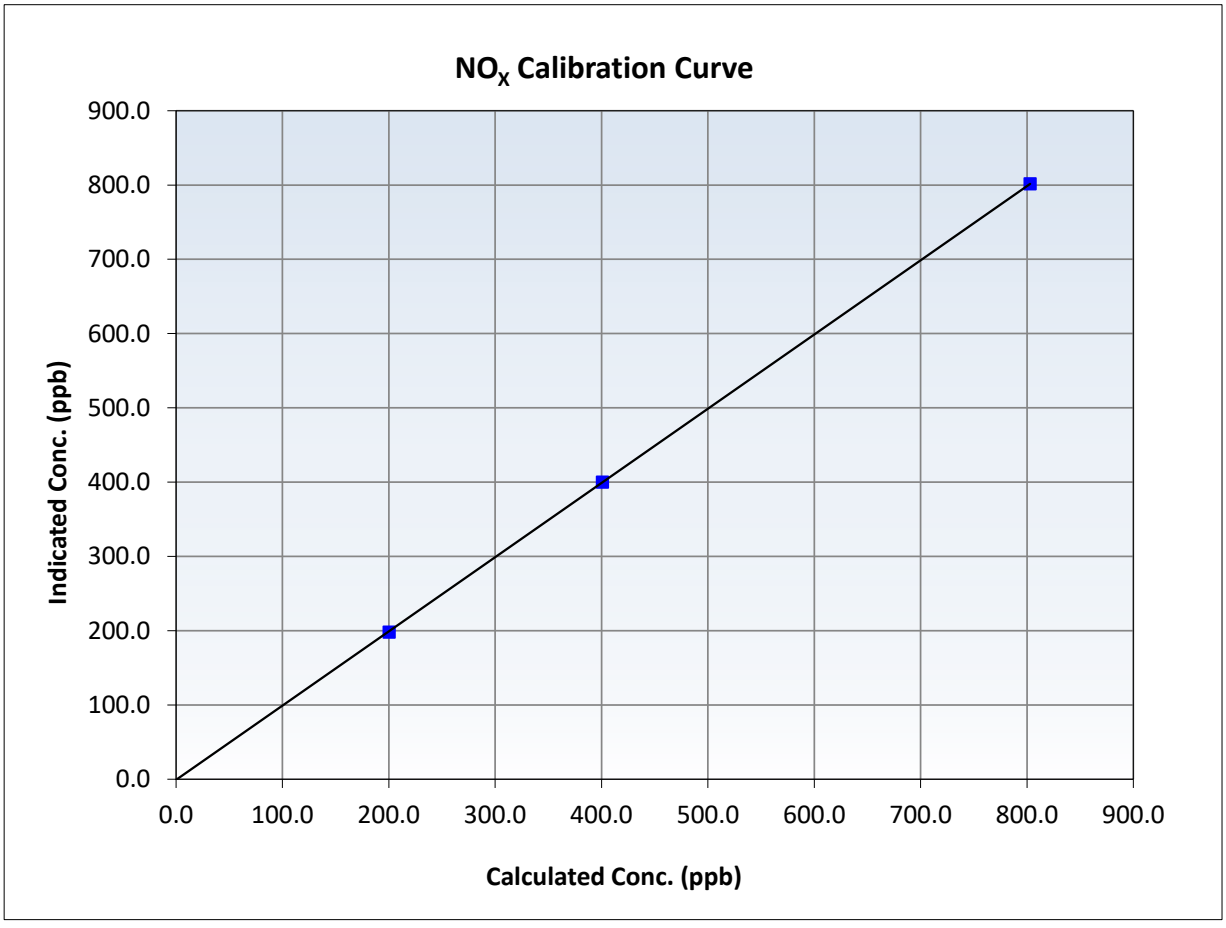
Station Information

Calibration Date:	January 24, 2025	Previous Calibration:	NA
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:01	End Time (MST):	13:58
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
803.0	801.6	1.0017
400.9	400.2	1.0017
200.4	198.2	1.0113

Statistical Evaluation		Limits
Correlation Coefficient	0.999993	≥0.995
Slope	0.999203	0.90 - 1.10
Intercept	-0.818278	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

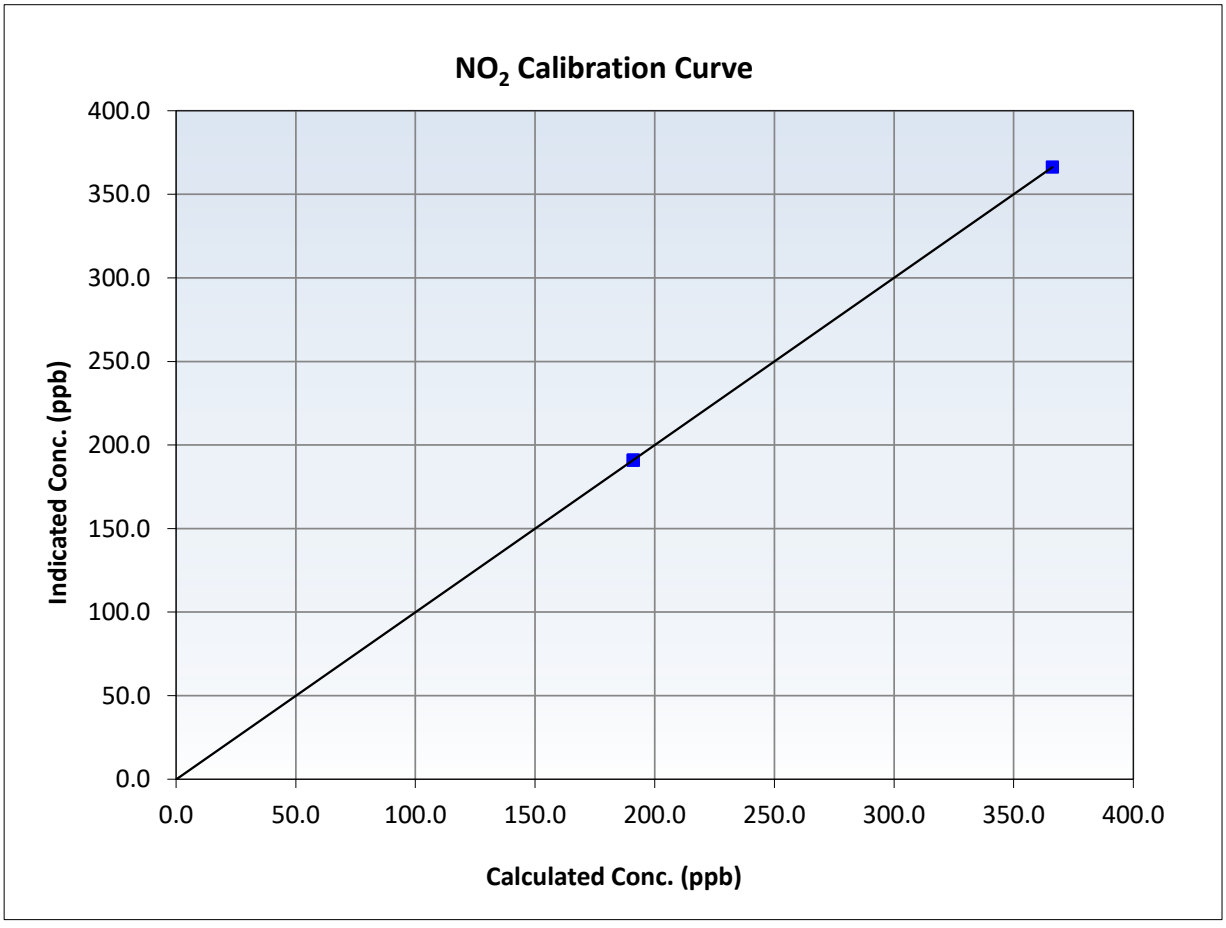
Station Information

Calibration Date:	January 24, 2025	Previous Calibration:	NA
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:01	End Time (MST):	13:58
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
366.2	366.3	0.9997
191.0	190.9	1.0006
191.0	190.9	1.0006

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	1.000511	*0.90 - 1.10*
Intercept	-0.151727	*+/-20*



Wood Buffalo Environmental Association

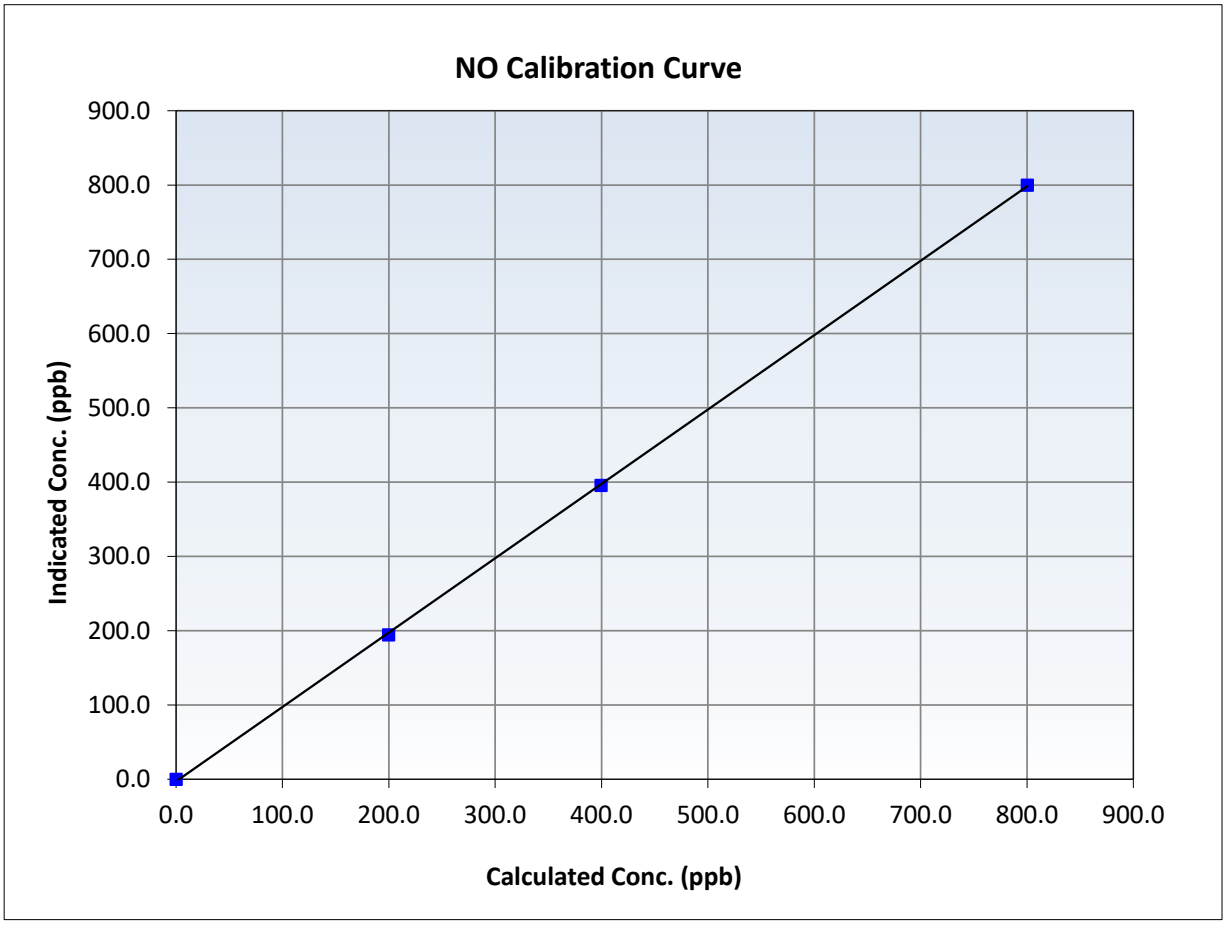
NO Calibration Summary

Station Information

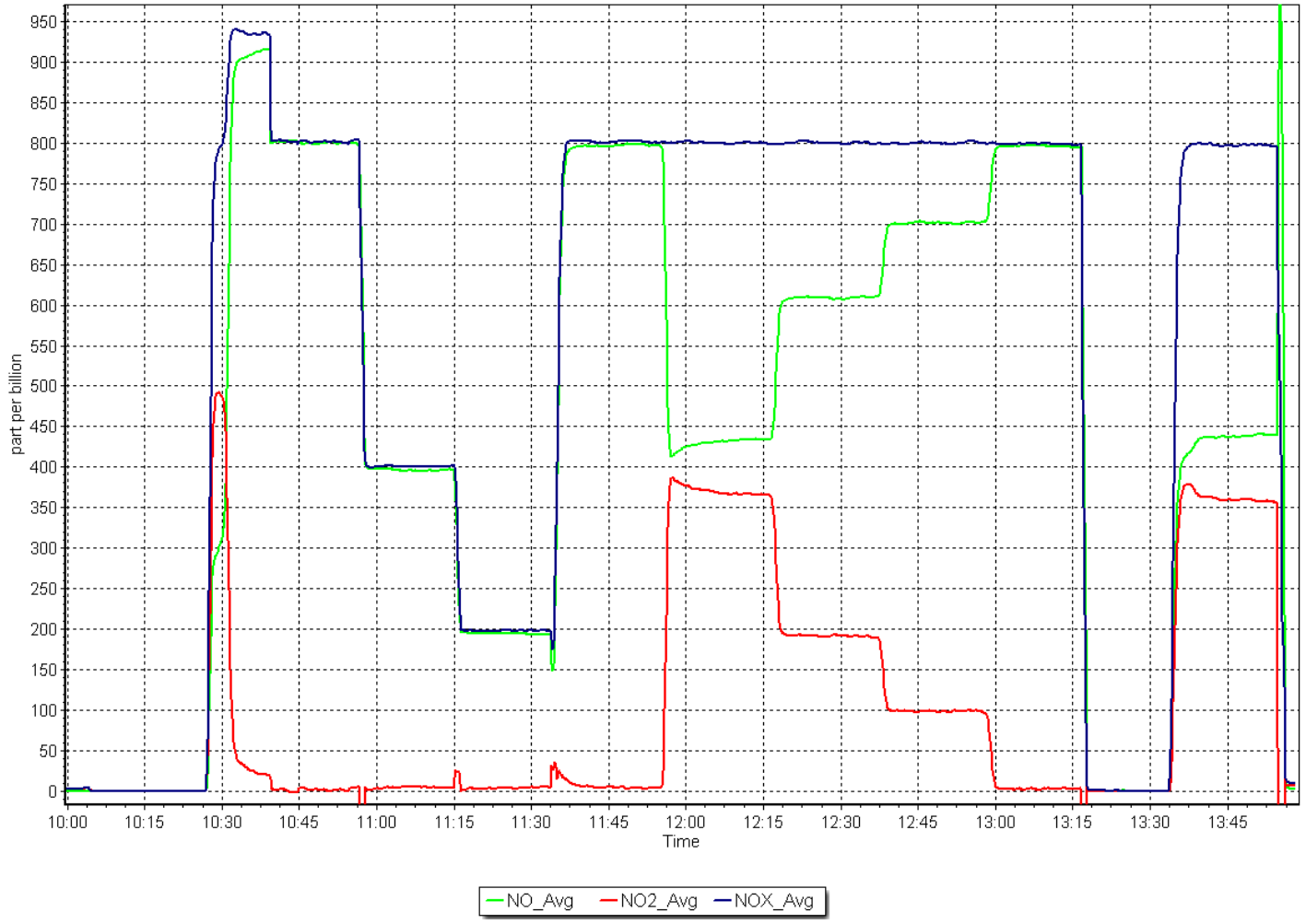
Calibration Date:	January 24, 2025	Previous Calibration:	NA
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	10:01	End Time (MST):	13:58
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Limits
0.0	0.0	----	Correlation Coefficient	0.999942	≥0.995
800.3	799.8	1.0006	Slope	1.001133	0.90 - 1.10
399.5	395.5	1.0102	Intercept	-2.860318	+/-20
199.8	194.4	1.0276			



NO_X Calibration Plot Date: January 24, 2025 Location: Ells River



Wood Buffalo Environmental Association

T640 $PM_{2.5}$ CALIBRATION

Version-01-2024

Station Information

Station Name:	Ells River	Station number:	AMS 30
Calibration Date:	January 23, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	13:11	End time (MST):	14:12
Analyzer Make:	API T640	S/N:	875
Particulate Fraction:	PM2.5		
Flow Meter Make/Model:	Alicat FP-25BT	S/N:	388754
Temp/RH standard:	Alicat FP-25BT	S/N:	388754

Monthly Calibration Test

Parameter	As found	Measured	As left	Adjusted	*(Limits)*
T (°C)	3.90	3.10	3.90	☐	+/- 2 °C
P (mmHg)	725.10	727.53	725.10	☐	+/- 10 mmHg
Flow (LPM)	5.00	5.08	5.00	☐	+/- 0.25 LPM
PW% (pump)	34	-----	34	☐	>80%
Zero Verification	PM w/o HEPA:	0.50	PM w/ HEPA:	0.00	<0.2 ug/m3

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

PM Inlet observation : Inlet Head Clean ☑ Alignment Factor On : ☑

Quarterly Calibration Test

SPAN DUST — Refractive Index: 10.90 — Expiry Date: September 29, 2024 — Lot No.: 100128-050-040

Parameter	As found	Post maintenance	As left	Adjusted	*(Limits)*
PMT Peak Test	10.20	10.90	10.90	☐	+/- 0.5

Date Optical Chamber Cleaned: January 23, 2025

Date Disposable Filter Changed: January 23, 2025

Post- maintenance Zero Verification: PM w/ HEPA: 0.00 <0.2 ug/m3

Annual Maintenance

Date Sample Tube Cleaned: December 6, 2024

Date RH/T Sensor Cleaned: February 23, 2024

Notes: Verified flow, temperature, pump power and pressure No adjustment made. Leak check passed.

Calibration by: Jan Castro

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS31
BLACKROD
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Blackrod	Station number:	AMS 31
Calibration Date:	January 30, 2025	Last Cal Date:	December 10, 2024
Start time (MST):	15:16	End time (MST):	18:02
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.25	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC327023			
Removed Cal Gas Conc:	50.25	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Model:	Teledyne T700		Serial Number:	5762
Zero Air Gen Model:	Teledyne N701H		Serial Number:	72

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290014	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.008313	1.001285	Backgd or Offset:	38.9	39.2
Calibration intercept:	-0.871944	-0.211996	Coeff or Slope:	1.025	1.025

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	79.6	800.0	800.0	1.000
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.9	Previous response	805.8	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.2	----
High point	4920	79.6	800.0	801.0	0.999
Mid point	4960	39.8	400.0	400.3	0.999
Low point	4980	19.9	200.0	199.5	1.003
As left zero	5000	0.0	0.0	0.2	----
As left span	4920	79.6	800.0	801.2	0.999
				Average Correction Factor:	1.000

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

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

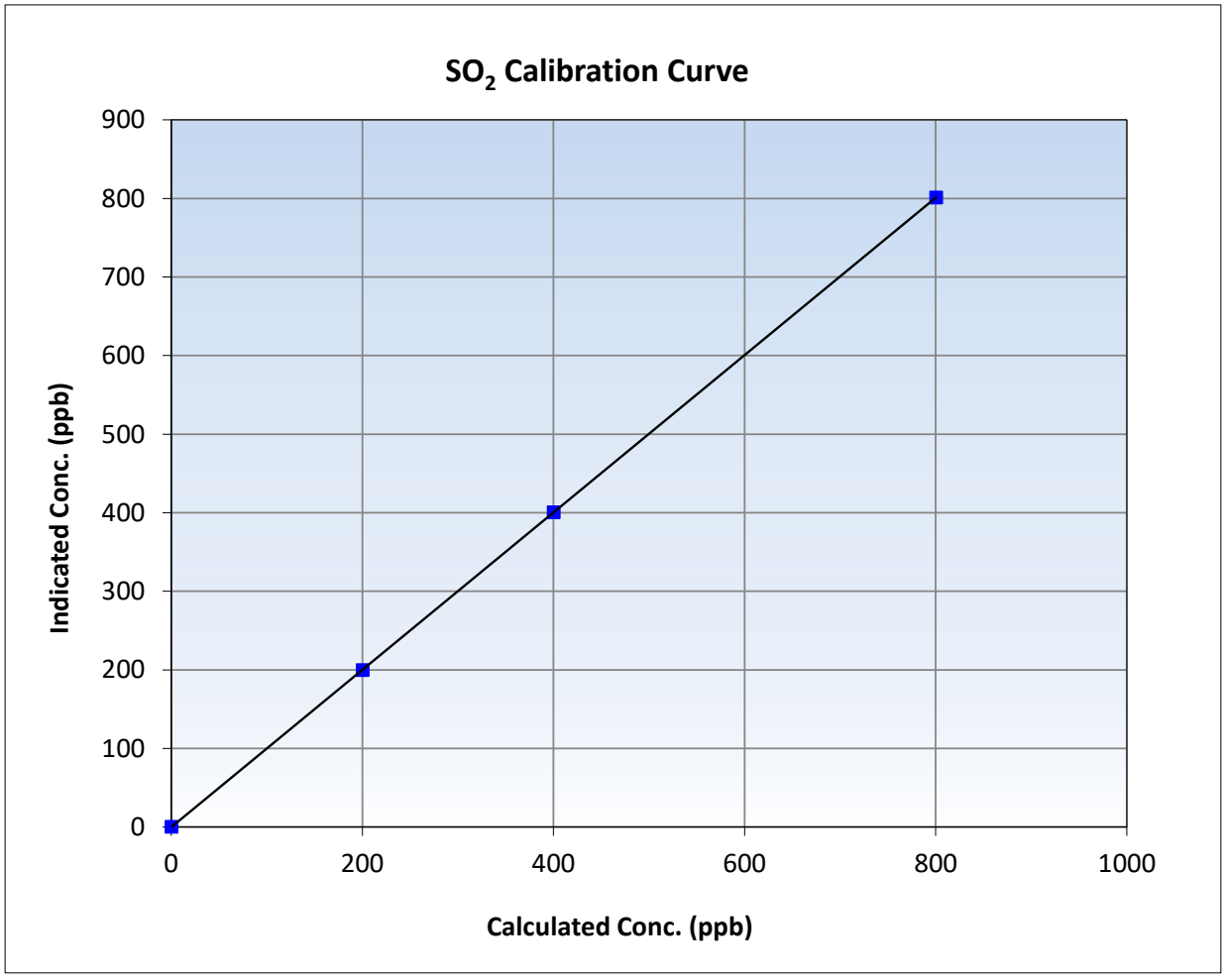
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 10, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	15:16	End Time (MST):	18:02
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290014

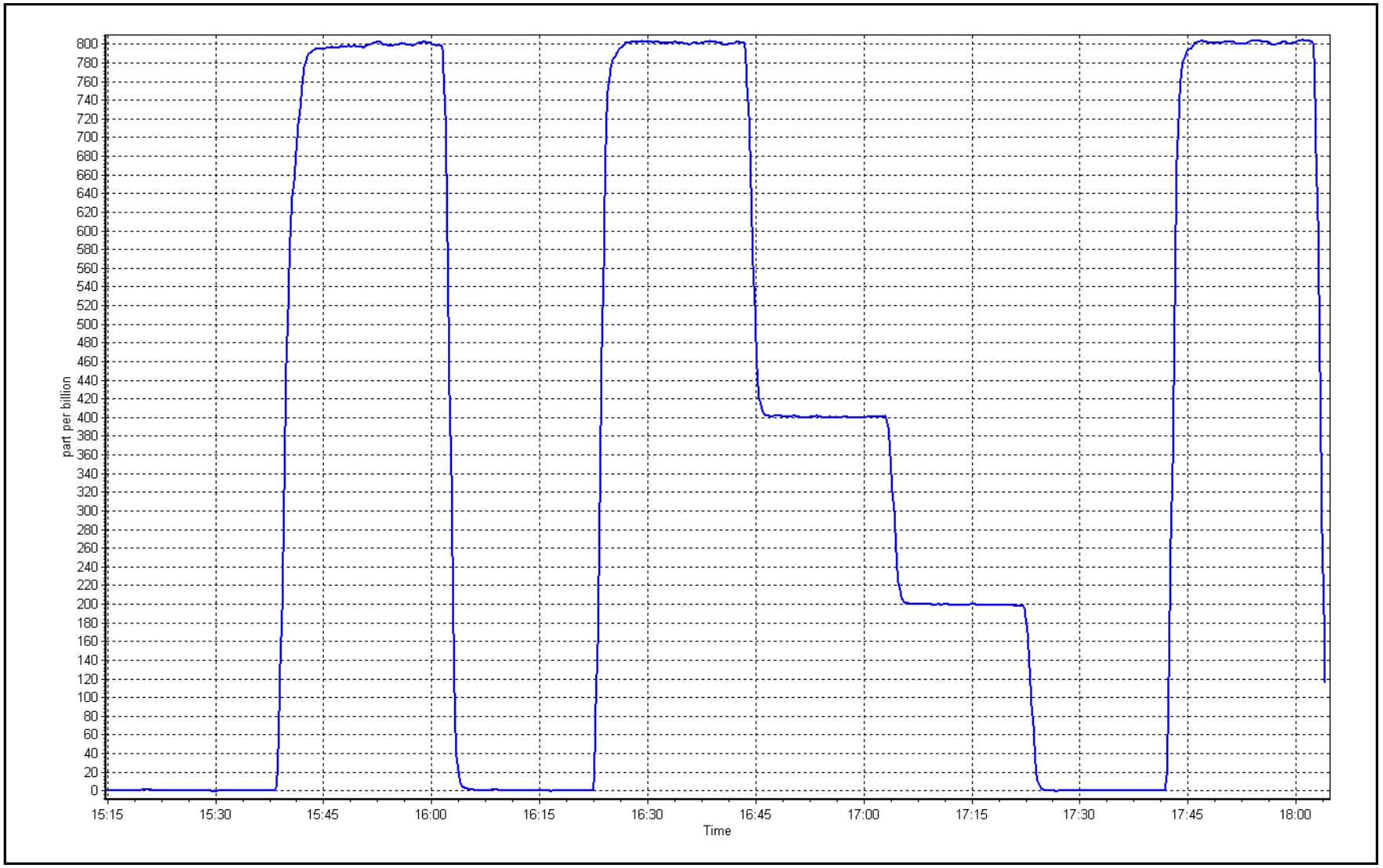
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.2	----
800.0	801.0	0.9988
400.0	400.3	0.9993
200.0	199.5	1.0025

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.001285	*0.90 - 1.10*
Intercept	-0.211996	*+/-30*



SO2 Calibration Plot Date: January 30, 2025 Location: Blackrod



Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Blackrod	Station number:	AMS 31
Calibration Date:	December 10, 2024	Last Cal Date:	November 20, 2024
Start time (MST):	9:37	End time (MST):	12:31
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.25	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	CC327023			
Removed Cal Gas Conc:	50.25	ppm	Rem Gas Exp Date:	N/A
Removed Gas Cyl #:	N/A		Diff between cyl:	
Calibrator Model:	Teledyne T700		Serial Number:	5762
Zero Air Gen Model:	Teledyne N701H		Serial Number:	72

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290014	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.999842	1.008313	Backgd or Offset:	38.1	38.9
Calibration intercept:	1.268021	-0.871944	Coeff or Slope:	1.025	1.025

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.3	----
As found High point	4920	79.6	800.0	808.0	0.991
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	807.7	Previous response	801.2	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.3	----
High point	4920	79.6	800.0	806.1	0.992
Mid point	4960	39.8	400.0	402.2	0.995
Low point	4980	19.9	200.0	200.2	0.999
As left zero	5000	0.0	0.0	-0.3	----
As left span	4920	79.6	800.0	805.3	0.993
				Average Correction Factor:	0.995

Notes: Sample inlet filter was changed after as founds. Adjusted zero only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

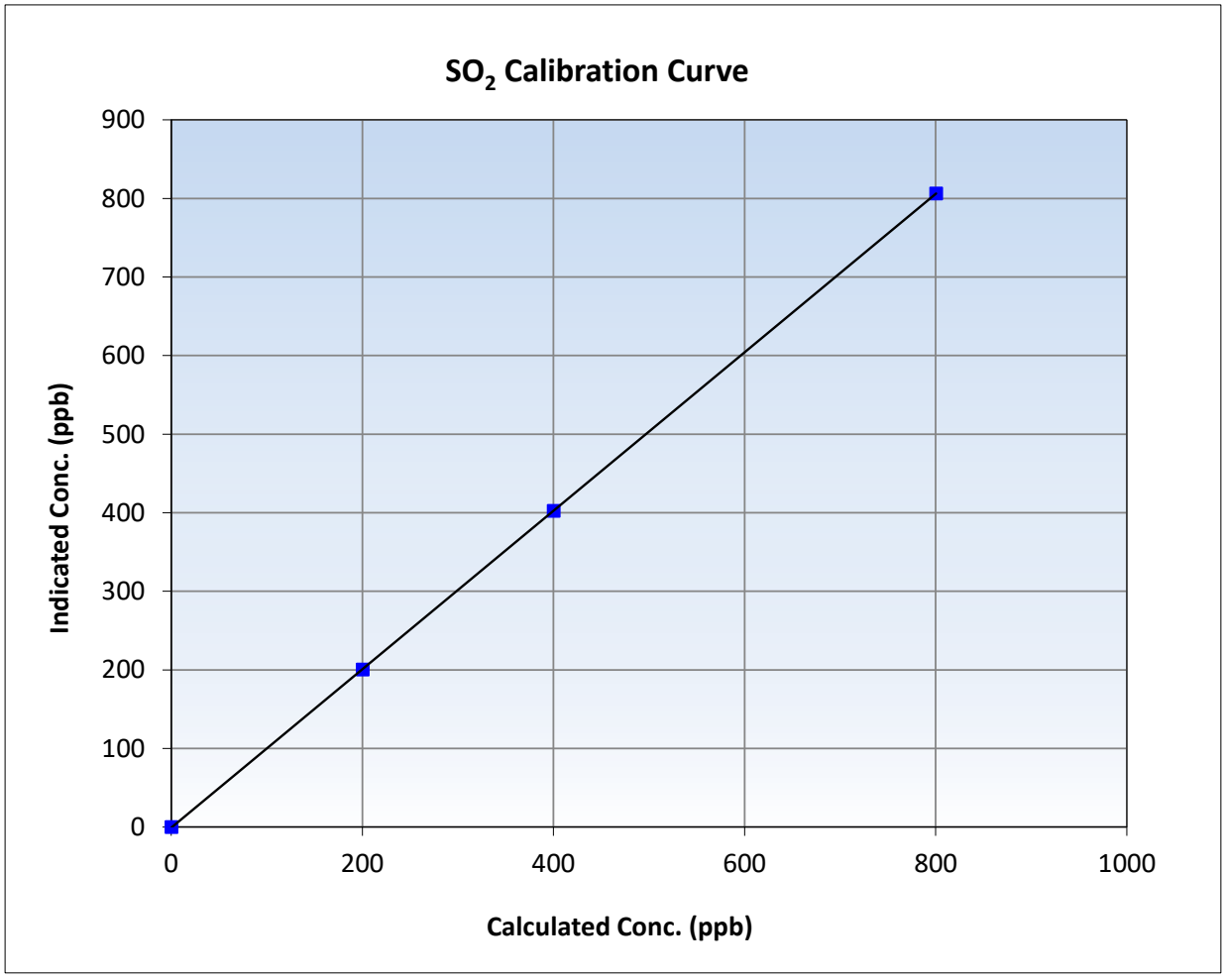
Station Information

Calibration Date:	December 10, 2024	Previous Calibration:	November 20, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	9:37	End Time (MST):	12:31
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290014

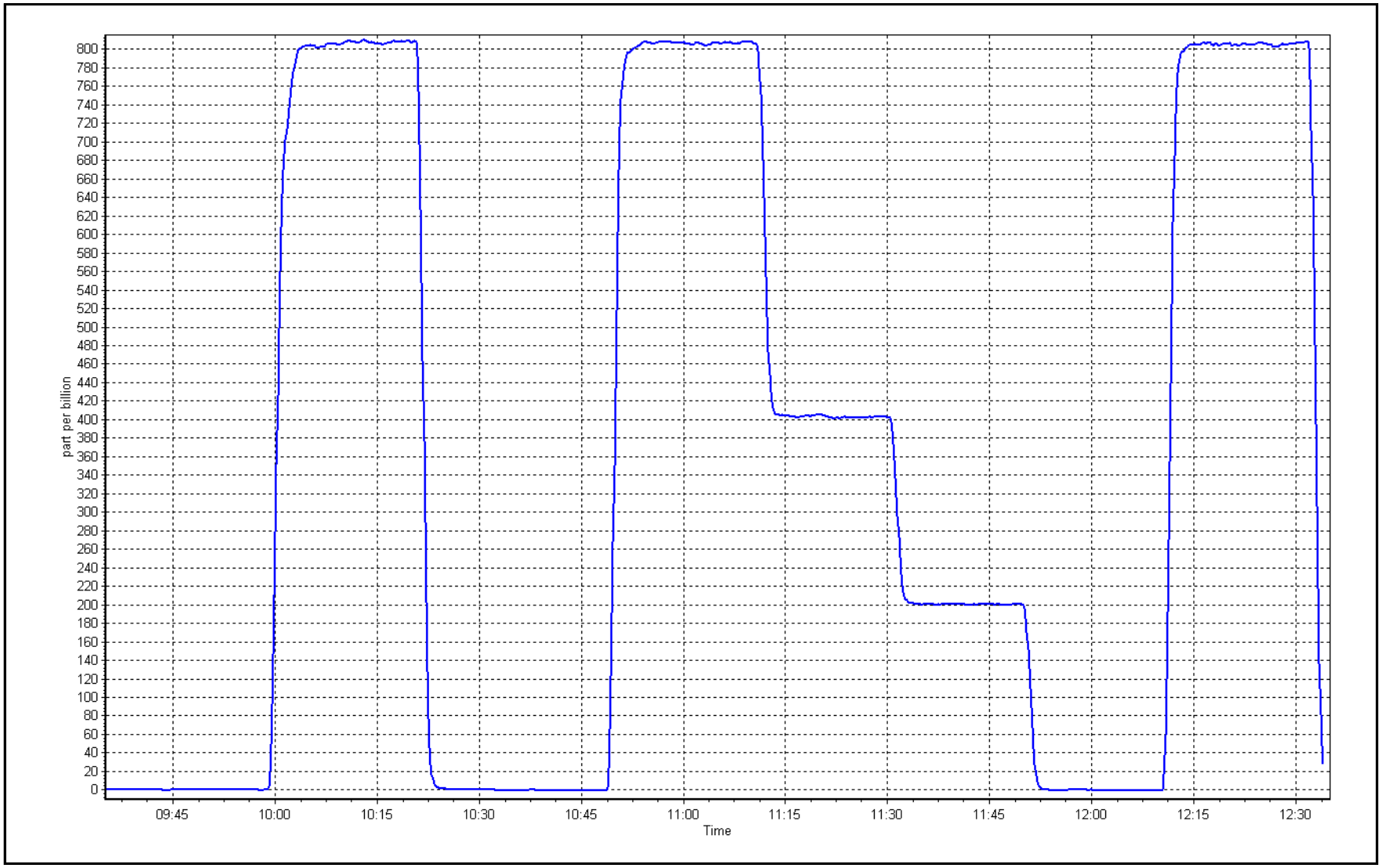
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.3	----
800.0	806.1	0.9925
400.0	402.2	0.9945
200.0	200.2	0.9990

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	1.008313	*0.90 - 1.10*
Intercept	-0.871944	*+/-30*



SO2 Calibration Plot Date: December 10, 2024 Location: Blackrod



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Blackrod	Station number:	AMS 31
Calibration Date:	January 31, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	8:29	End time (MST):	13:15
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.42	ppm	Cal Gas Exp Date:	March 19, 2027
Cal Gas Cylinder #:	DT0016926			
Removed Cal Gas Conc:	5.42	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5762
ZAG Make/Model:	Teledyne API N701H		Serial Number:	72

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12228021056	
Converter make:	Global		Converter serial #:	2023-266	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.998908	0.998047	Backgd or Offset:	2.50	2.96
Calibration intercept:	0.199538	-0.220310	Coeff or Slope:	1.035	1.021

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.0	----
As found High point	4926	73.8	80.0	81.2	0.985
As found Mid point	4963	36.9	40.0	40.5	0.988
As found Low point	4982	18.5	20.1	20.2	0.993
New cylinder response					

Baseline Corr As found:	81.2	Prev response:	80.11	*% change:	1.3%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	1.015479	AF Intercept:	-0.080672
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999995	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.2	----
High point	4926	73.8	80.0	79.6	1.005
Mid point	4963	36.9	40.0	39.8	1.005
Low point	4982	18.5	20.1	19.7	1.018
As left zero	5000	0.0	0.0	-0.1	----
As left span	4926	73.8	80.0	78.7	1.017
SO2 Scrubber Check	4920	79.6	796.1	-0.1	----
Date of last scrubber change:				Ave Corr Factor	1.009
Date of last converter efficiency test:					

Notes: Sample inlet filter was changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted zero and span.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

H_2S Calibration Summary

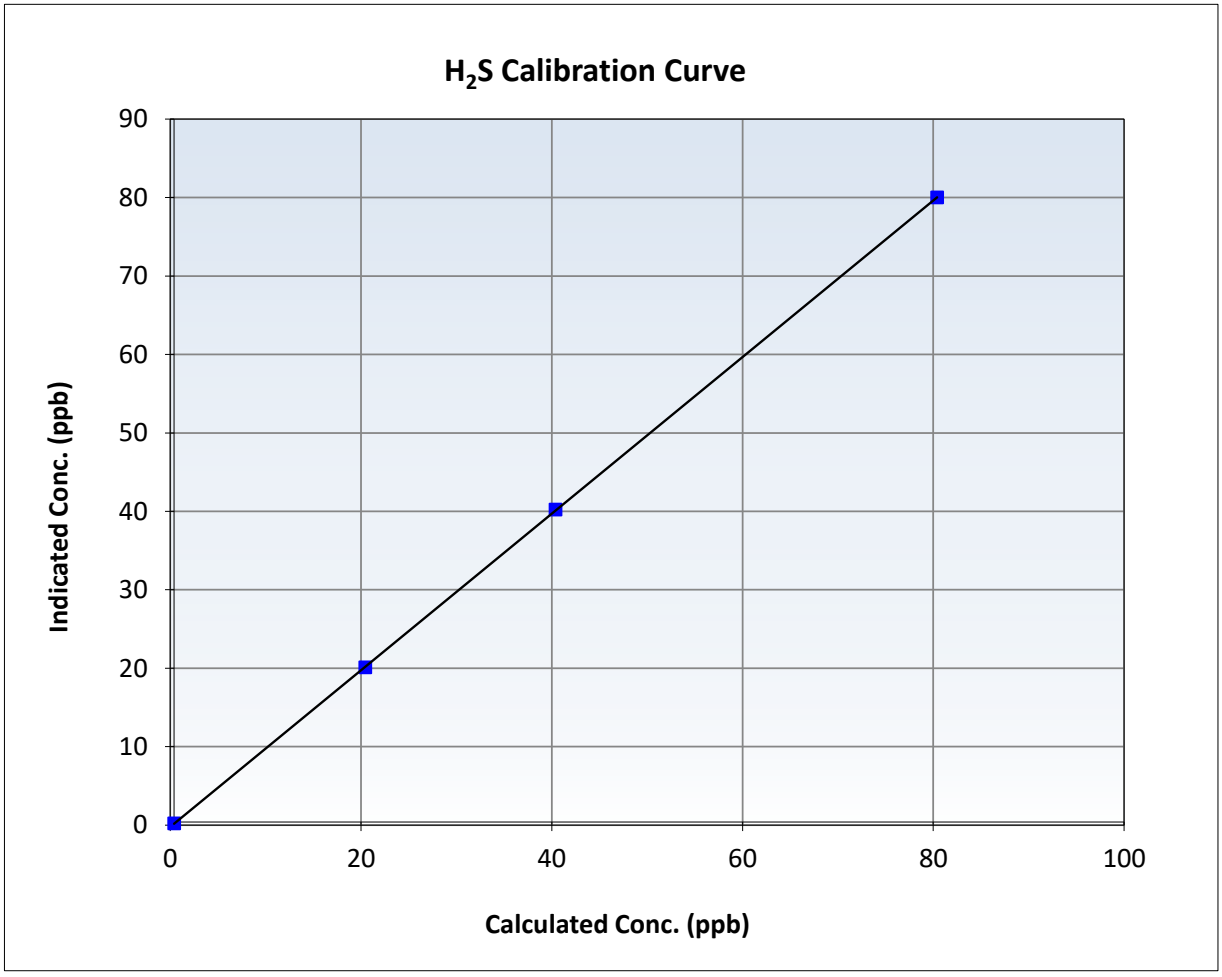
Station Information

Calibration Date:	January 31, 2025	Previous Calibration:	December 9, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	8:29	End Time (MST):	13:15
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12228021056

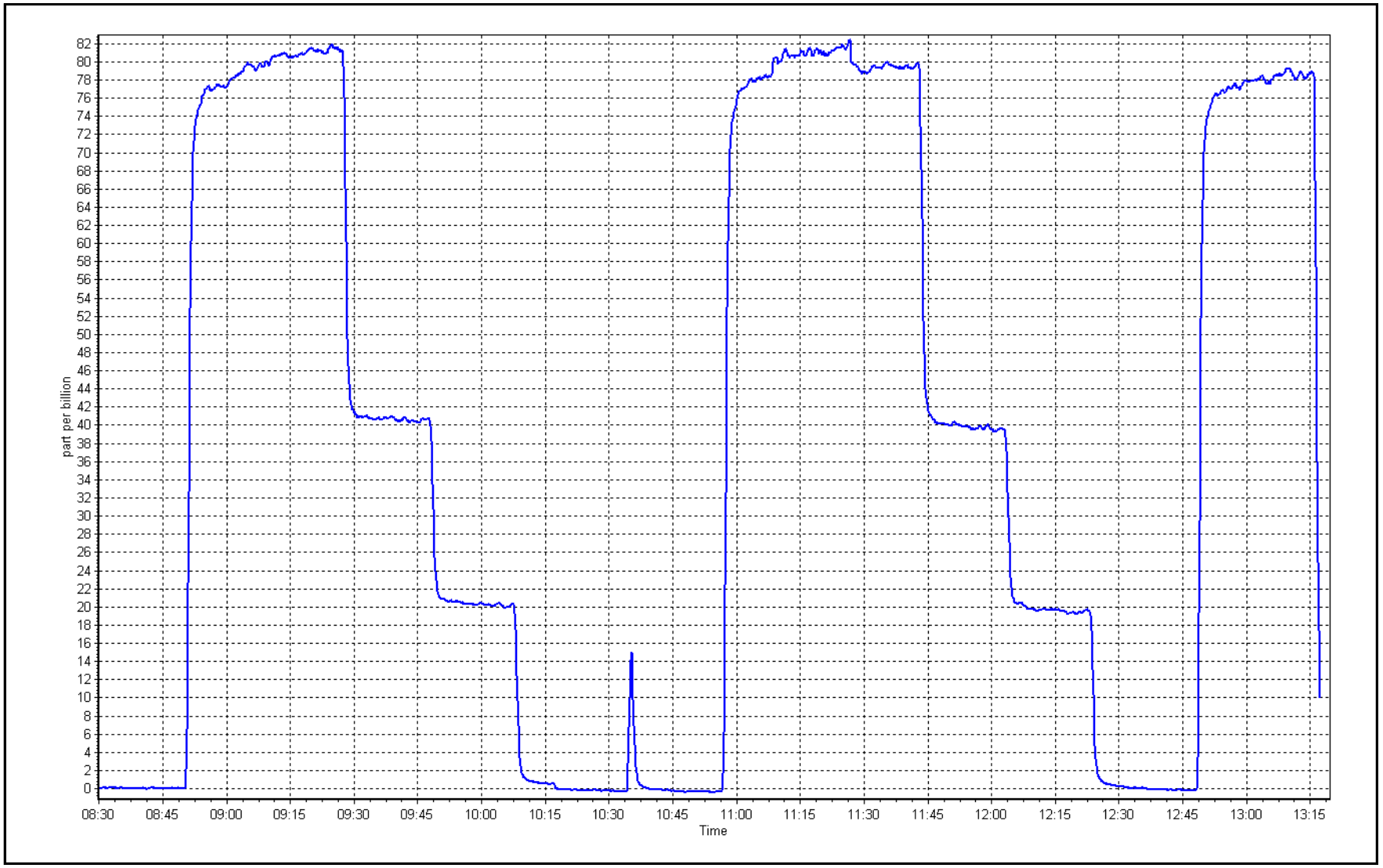
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
80.0	79.6	1.0051
40.0	39.8	1.0050
20.1	19.7	1.0179

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999994	*≥0.995*
Slope	0.998047	*0.90 - 1.10*
Intercept	-0.220310	*+/-3*



H_2S Calibration Plot Date: January 31, 2025 Location: Blackrod



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Blackrod	Station number:	AMS 31
Calibration Date:	December 9, 2024	Last Cal Date:	November 21, 2024
Start time (MST):	9:56	End time (MST):	15:27
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.42	ppm	Cal Gas Exp Date:	March 19, 2027
Cal Gas Cylinder #:	DT0016926			
Removed Cal Gas Conc:	5.42	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T750		Serial Number:	281
ZAG Make/Model:	API N701H		Serial Number:	72

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12228021056	
Converter make:	Global		Converter serial #:	2023-266	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.002047	0.998908	Backgd or Offset:	2.50	2.50
Calibration intercept:	-0.160371	0.199538	Coeff or Slope:	1.035	1.035

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4926	73.8	80.0	80.5	0.993
As found Mid point	4963	36.9	40.0	40.6	0.983
As found Low point	4982	18.5	20.1	20.4	0.978
New cylinder response					
Baseline Corr As found:	80.6	Prev response:	80.01	*% change:	0.7%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.006766	AF Intercept:	0.099408
Baseline Corr 3rd AF pt:	20.5	AF Correlation:	0.999965	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4926	73.8	80.0	80.0	1.000
Mid point	4963	36.9	40.0	40.3	0.993
Low point	4982	18.5	20.1	20.4	0.983
As left zero	5000	0.0	0.0	0.0	----
As left span	4926	73.8	80.0	80.2	0.998
SO2 Scrubber Check	4920	79.6	796.1	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.992
Date of last converter efficiency test:					

Notes: Sample inlet filter was changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

H_2S Calibration Summary

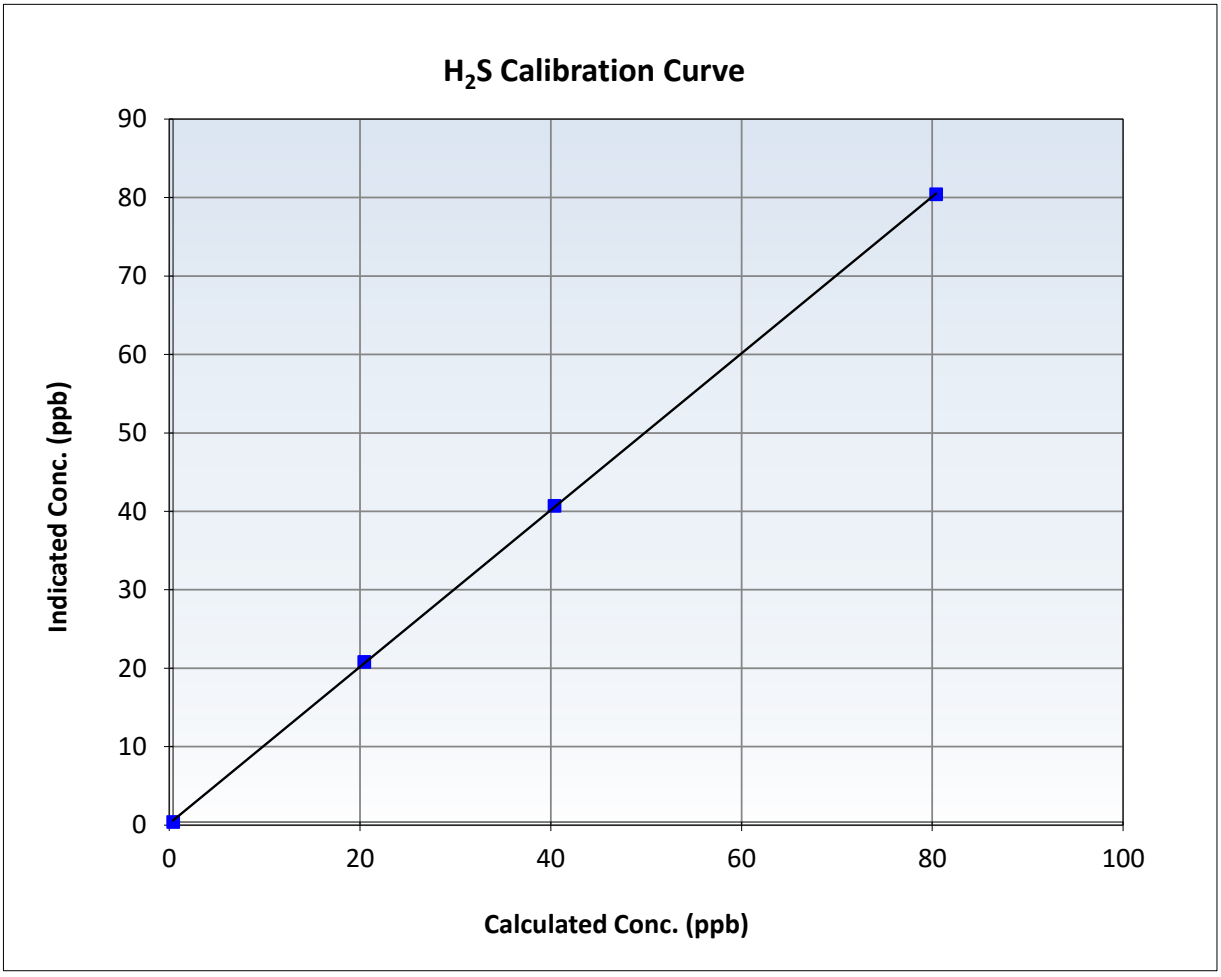
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 21, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	9:56	End Time (MST):	15:27
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12228021056

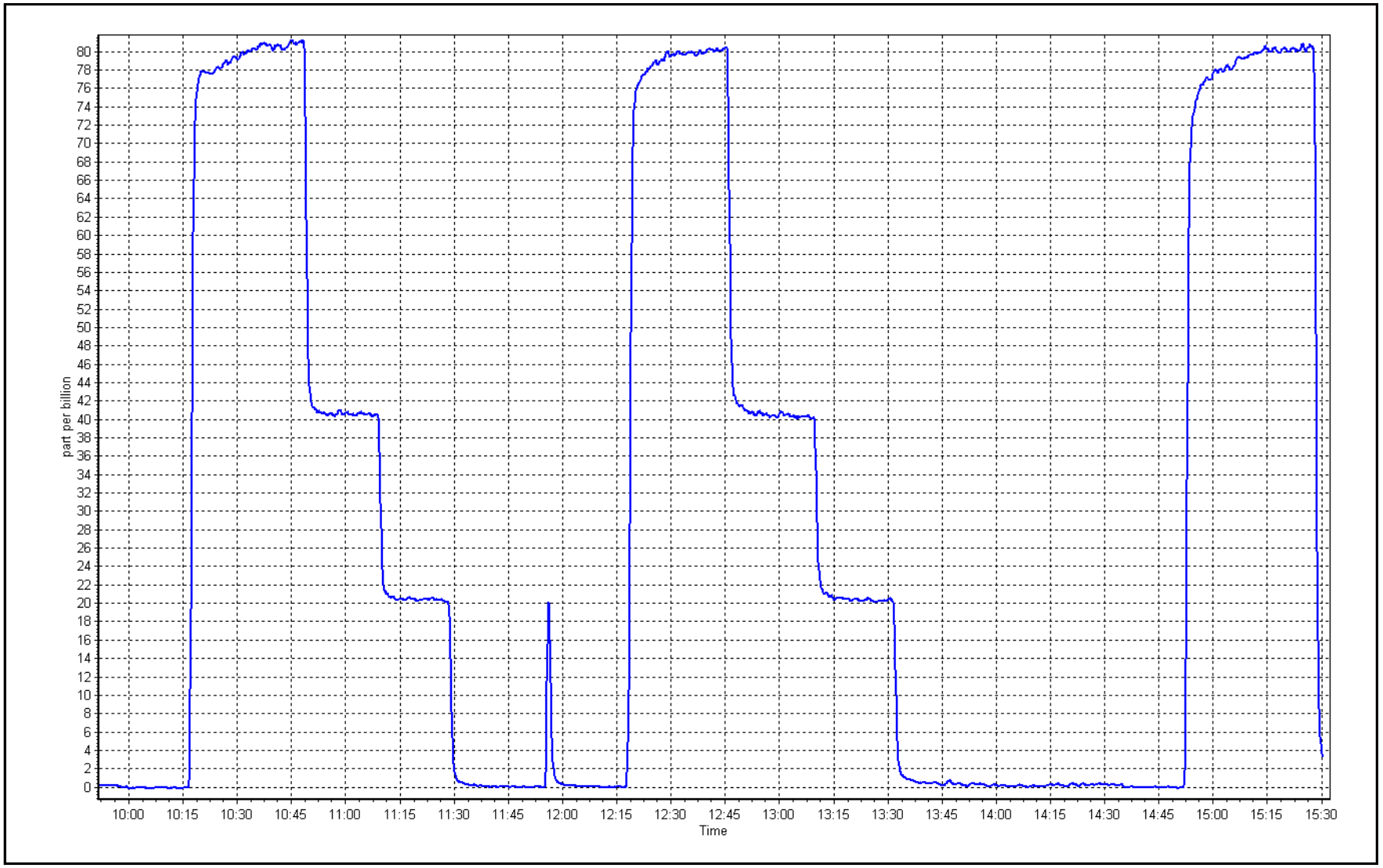
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	80.0	1.0000
40.0	40.3	0.9926
20.1	20.4	0.9829

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999971	*≥0.995*
Slope	0.998908	*0.90 - 1.10*
Intercept	0.199538	*+/-3*



H_2S Calibration Plot Date: December 9, 2024 Location: Blackrod



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Blackrod
Station number:	AMS 31
Calibration Date:	January 30, 2025
Last Cal Date:	December 9, 2024
Start time (MST):	10:15
End time (MST):	15:16
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0035071	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc:	59.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc:	59.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5762
ZAG make/model:	Teledyne API N701H	Serial Number:	72

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.5	0.6	-0.1	----	----
AF High point	4932	67.7	803.0	800.3	2.7	790.1	788.1	2.0	1.0169	1.0162
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 807.6 ppb	NO = 806.8 ppb
Baseline Corr 1st pt	NO_X = 789.6 ppb	NO = 787.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X =	-2.3%
*Percent Change	NO =	-2.5%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1426262592

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:	0.922	0.938	NO bkgnd or offset:	10.7	11.7
NOX coeff or slope:	0.994	0.998	NOX bkgnd or offset:	10.8	11.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	211.0	221.3

Calibration Statistics

	Start	Finish
NO_X Cal Slope:	1.005891	0.998587
NO_X Cal Offset:	-0.116211	0.622950
NO Cal Slope:	1.009997	0.998611
NO Cal Offset:	-1.436837	0.122153
NO_2 Cal Slope:	0.994695	0.996484
NO_2 Cal Offset:	-0.888037	0.999752

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4932	67.7	803.0	800.3	2.7	801.4	798.2	3.2	1.0020	1.0026
Mid point	4966	33.8	400.9	399.5	1.4	403.4	402.1	1.3	0.9938	0.9936
Low point	4983	16.9	200.4	199.8	0.7	200.1	197.9	2.2	1.0017	1.0094
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	----	----
As left span	4932	67.7	803.0	393.7	409.3	797.9	393.7	404.3	1.0064	1.0000
							Average Correction Factor		0.9991	1.0019

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	795.0	384.4	413.3	412.3	1.0024	99.8%
Mid GPT point	795.0	595.0	202.7	203.7	0.9951	100.5%
Low GPT point	795.0	696.1	101.6	103.1	0.9855	101.5%
				Average Correction Factor	0.9944	100.6%

Notes: Sample inlet filter was changed after as founds. Adjusted zero and span.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

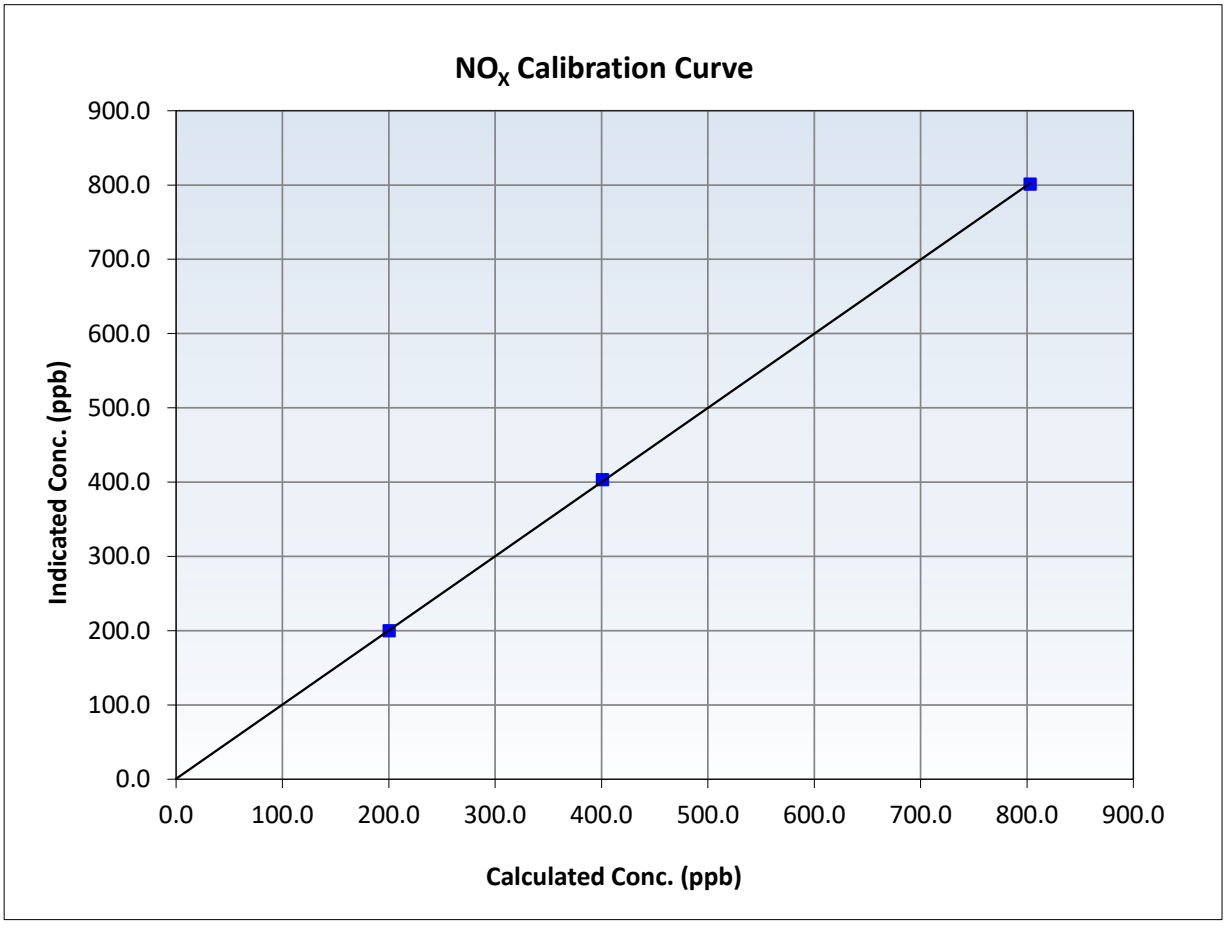
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 9, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	10:15	End Time (MST):	15:16
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
803.0	801.4	1.0020
400.9	403.4	0.9938
200.4	200.1	1.0017

Statistical Evaluation		Limits
Correlation Coefficient	0.999977	≥0.995
Slope	0.998587	0.90 - 1.10
Intercept	0.622950	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

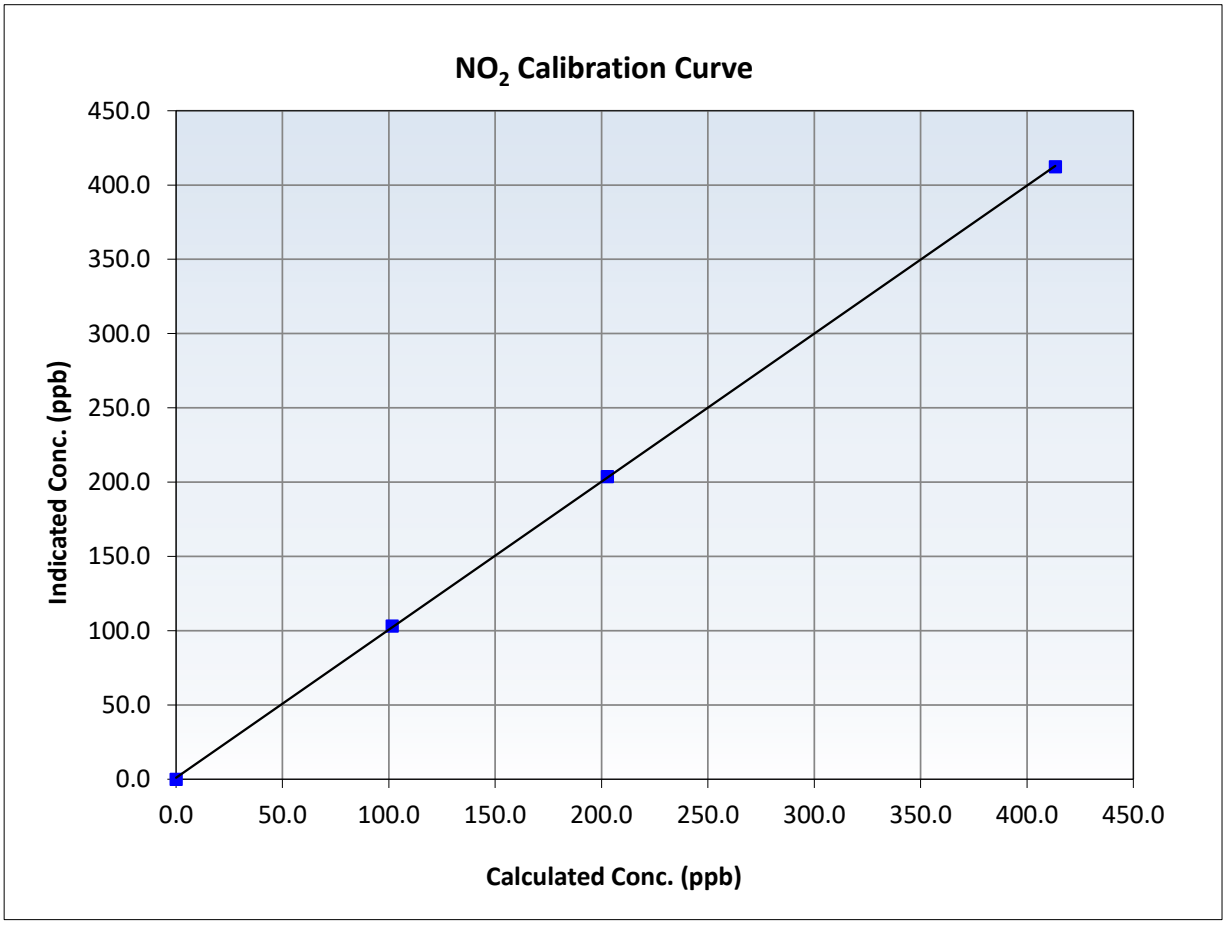
Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 9, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	10:15	End Time (MST):	15:16
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
413.3	412.3	1.0024
202.7	203.7	0.9951
101.6	103.1	0.9855

Statistical Evaluation		Limits
Correlation Coefficient	0.999973	≥0.995
Slope	0.996484	0.90 - 1.10
Intercept	0.999752	+/-20



Wood Buffalo Environmental Association

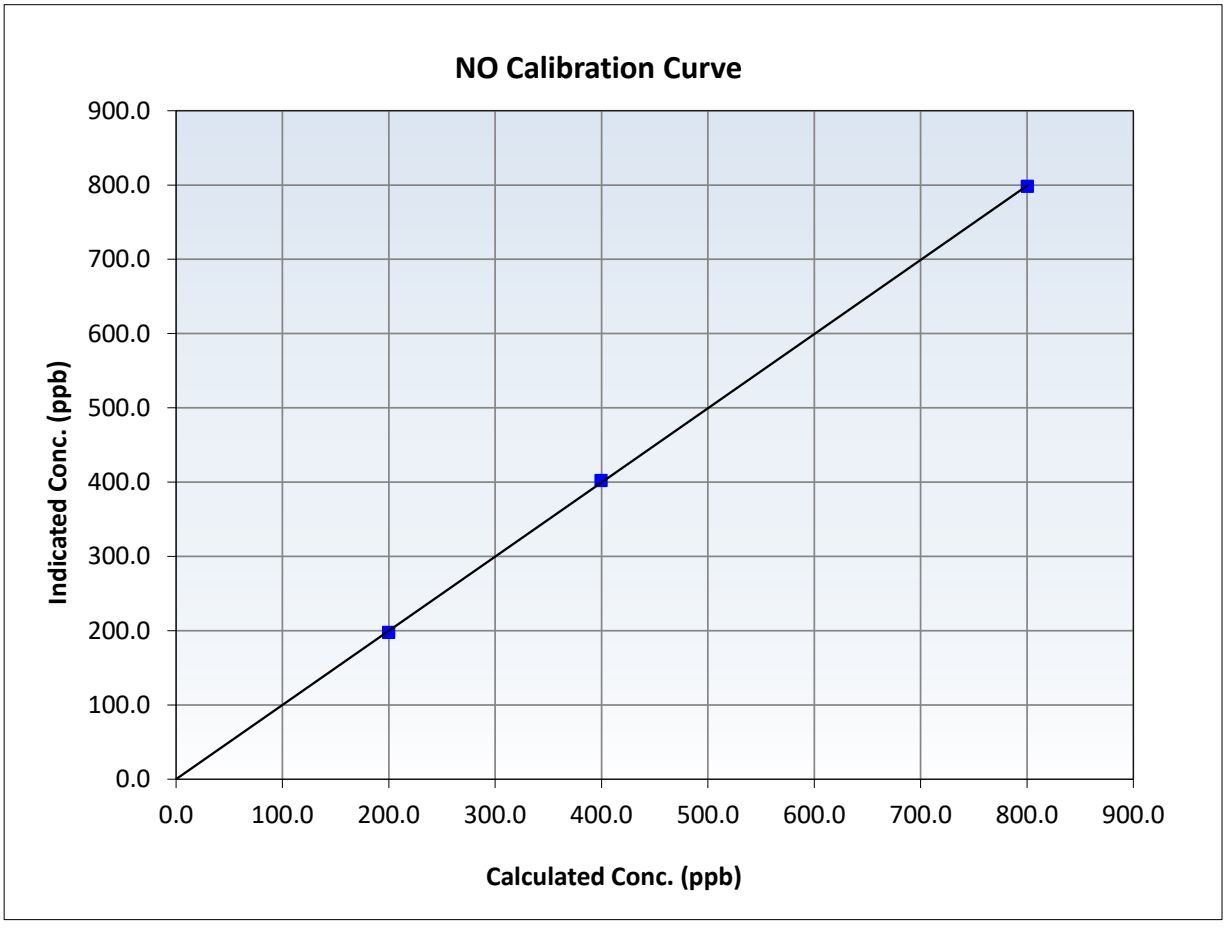
NO Calibration Summary

Station Information

Calibration Date:	January 30, 2025	Previous Calibration:	December 9, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	10:15	End Time (MST):	15:16
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	0.999962	≥0.995
800.3	798.2	1.0026	Slope	0.998611	0.90 - 1.10
399.5	402.1	0.9936	Intercept	0.122153	+/-20
199.8	197.9	1.0094			



NO_X Calibration Plot Date: January 30, 2025 Location: Blackrod

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Blackrod
Station number:	AMS 31
Calibration Date:	December 9, 2024
Last Cal Date:	November 20, 2024
Start time (MST):	9:56
End time (MST):	14:33
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	DT0035071	Cal Gas Expiry Date:	January 9, 2032
NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc:	59.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc:	59.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5762
ZAG make/model:	Teledyne API N701H	Serial Number:	72

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.5	0.8	-0.3	----	----
AF High point	4932	67.7	803.0	800.3	2.7	846.7	841.3	5.6	0.9489	0.9521
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 803.7 ppb	NO = 803.0 ppb
Baseline Corr 1st pt	NO_X = 846.2 ppb	NO = 840.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	*Percent Change	NO_X = 5.0%
As found	NO r^2:	*Percent Change	NO = 4.5%
As found	NO_2 r^2:	Nx Sl:	Nx Int:
		NO Sl:	NO Int:
		NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 1426262592

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.973	0.922	NO bkgnd or offset:	10.5	10.7
NOX coeff or slope:	0.995	0.994	NOX bkgnd or offset:	10.8	10.8
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	252.3	211.0

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	0.998956	1.005891
NO_X Cal Offset:	1.543301	-0.116211
NO Cal Slope:	1.003282	1.009997
NO Cal Offset:	0.062774	-1.436837
NO_2 Cal Slope:	1.002267	0.994695
NO_2 Cal Offset:	-1.279695	-0.888037

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4932	67.7	803.0	800.3	2.7	807.3	807.2	0.1	0.9946	0.9914
Mid point	4966	33.8	400.9	399.5	1.4	404.0	402.3	1.8	0.9923	0.9931
Low point	4983	16.9	200.4	199.8	0.7	200.9	198.4	2.5	0.9977	1.0069
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.1	----	----
As left span	4932	67.7	803.0	415.9	387.1	808.8	415.9	392.9	0.9928	1.0000
							Average Correction Factor		0.9949	0.9971

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	799.6	416.2	386.1	383.6	1.0065	99.4%
Mid GPT point	799.6	611.3	191.0	188.7	1.0122	98.8%
Low GPT point	799.6	706.0	96.3	94.0	1.0246	97.6%
				Average Correction Factor	1.0144	98.6%

Notes: Sample inlet filter was changed after as founds. Adjusted zero and span. Used 2nd NO reference point because of drift.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

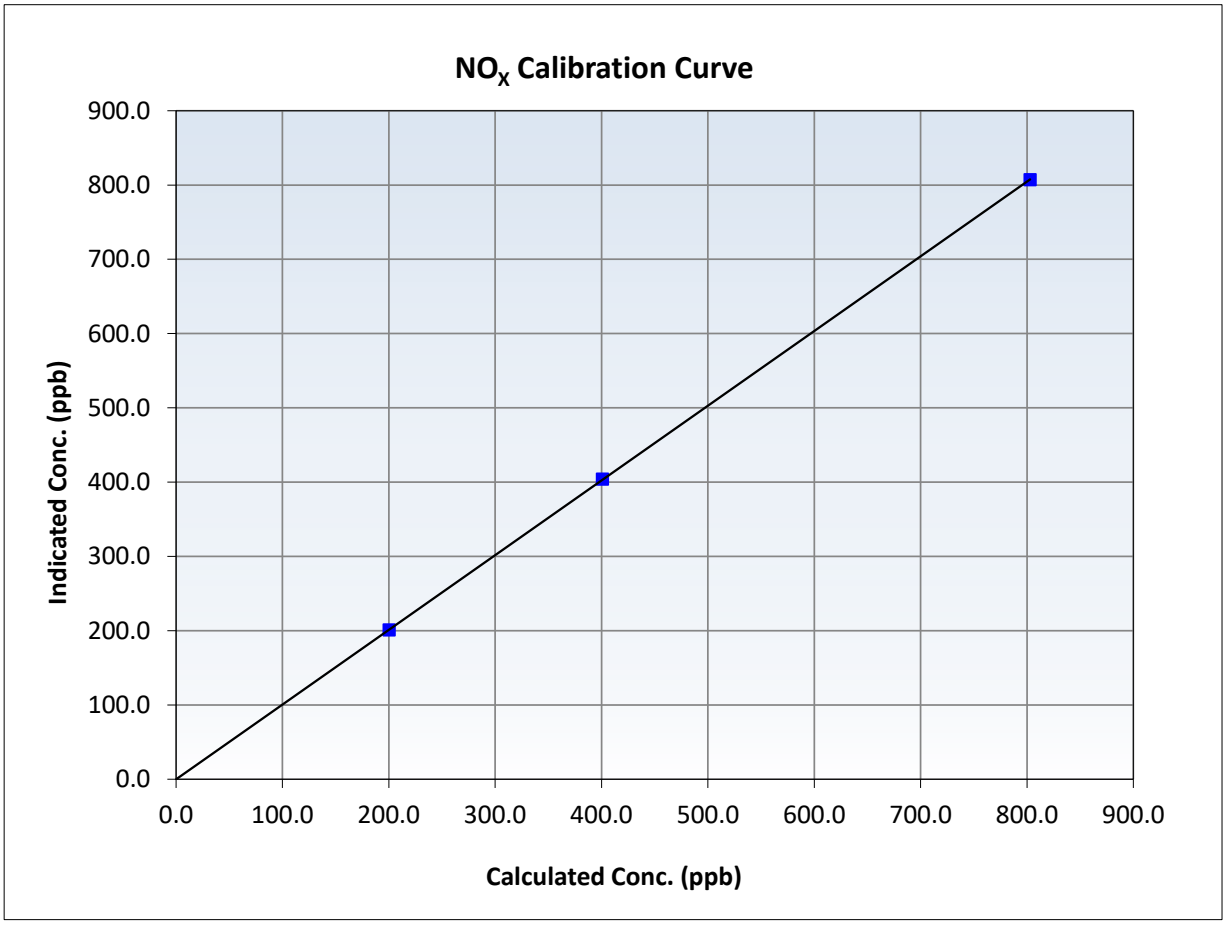
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 20, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	9:56	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
803.0	807.3	0.9946
400.9	404.0	0.9923
200.4	200.9	0.9977

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	1.005891	*0.90 - 1.10*
Intercept	-0.116211	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

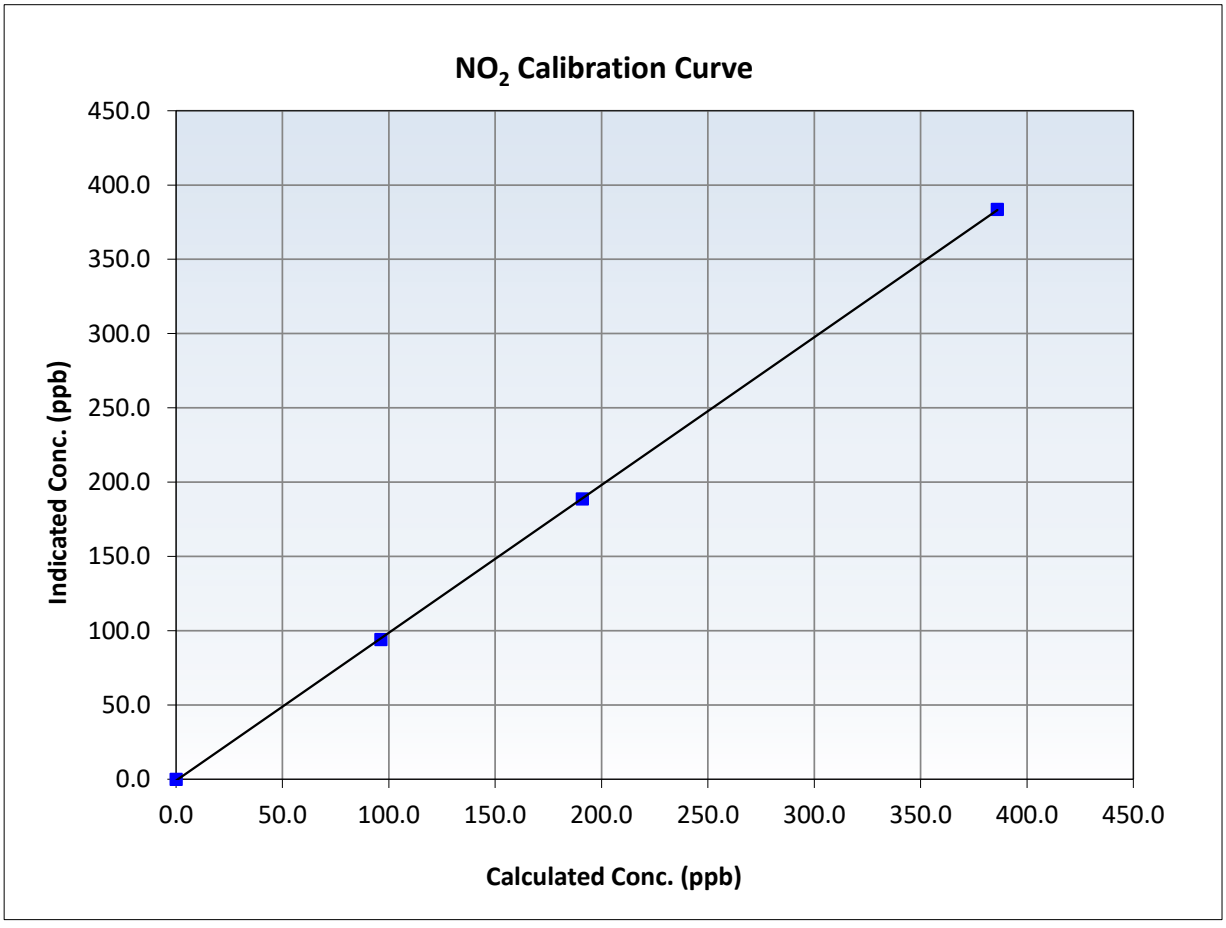
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 20, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	9:56	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
386.1	383.6	1.0065
191.0	188.7	1.0122
96.3	94.0	1.0246

Statistical Evaluation		Limits
Correlation Coefficient	0.999976	≥0.995
Slope	0.994695	0.90 - 1.10
Intercept	-0.888037	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

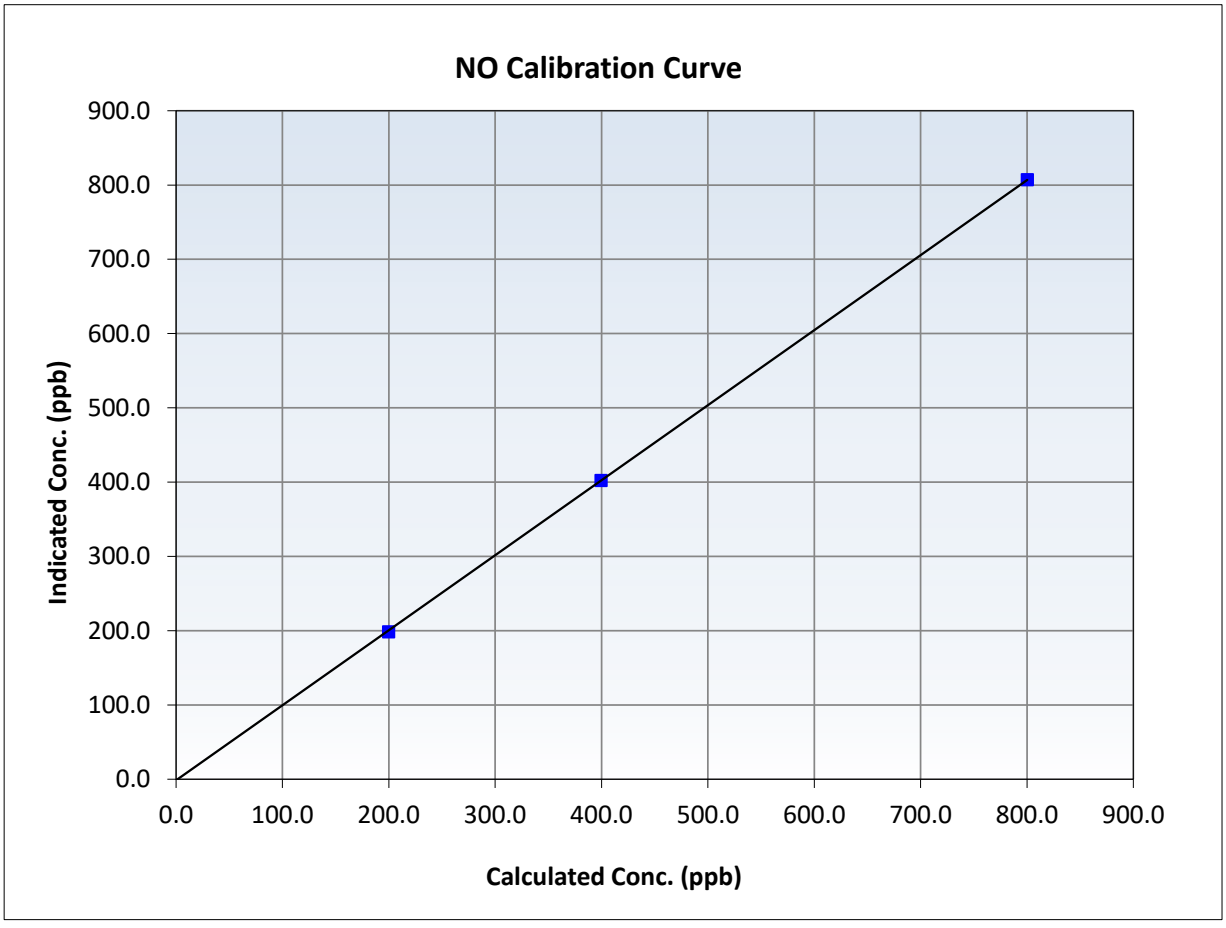
Station Information

Calibration Date:	December 9, 2024	Previous Calibration:	November 20, 2024
Station Name:	Blackrod	Station Number:	AMS 31
Start Time (MST):	9:56	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

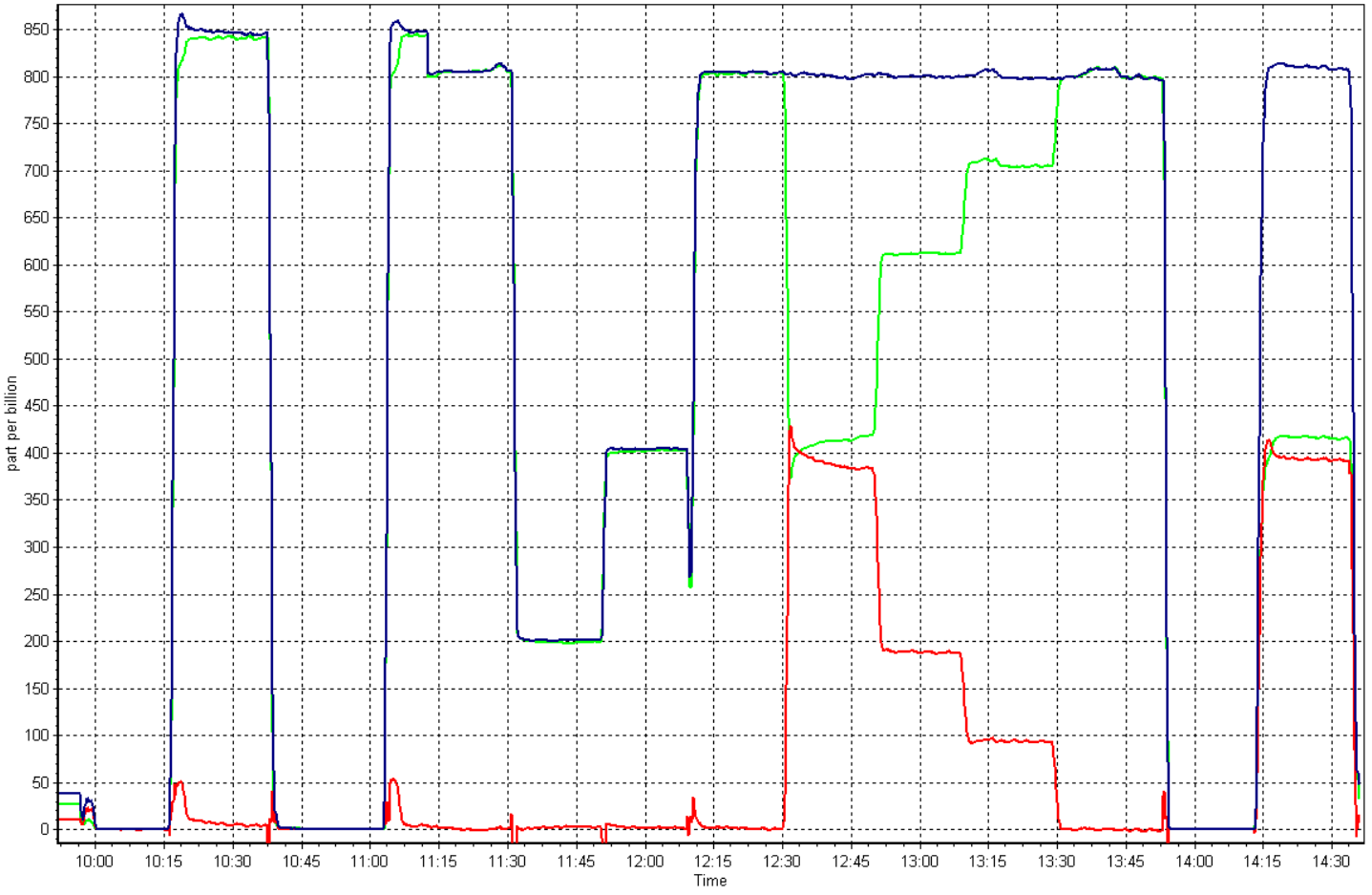
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
800.3	807.2	0.9914
399.5	402.3	0.9931
199.8	198.4	1.0069

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999984	*≥0.995*
Slope	1.009997	*0.90 - 1.10*
Intercept	-1.436837	*+/-20*



NO_X Calibration Plot Date: December 9, 2024 Location: Blackrod



Wood Buffalo Environmental Association

Wind Speed/Direction Calibration Report

Version-10-2022

Station Information

Station Name:	Blackrod	Station Number:	AMS 31
Calibration Date:	November 21, 2024	Prev Cal Date:	NA
Start Time (MST):	10:12	End Time (MST):	13:25
Tower Height (m):	10.0	Reason:	Install

Wind Speed Information

Sensor make/model:	Met One 010C-1	Serial Number:	E15359
WS Calibrator:	MetOne 053	Serial Number:	CA05230

Shaft RPM	Calculated Speed (K/hr) (Cv)	Indicated Speed (K/hr) (Iv)	% Error *Limit = +/- 1.5%*
0	0.0	1.0	---
200	20.2	20.1	-0.3%
400	39.4	39.4	0.1%
600	58.6	58.5	-0.1%
800	77.8	77.8	0.1%

	Start	***Finish***	*Limits*
Correl Coeff (r^2)		0.999943	*≥0.9995*
Calculated slope	NA	1.009451	*0.90 - 1.10*
Calculated intercept	NA	-0.558306	*+/- 2*

Wind Direction Information

Sensor make/model:	Met One 020C-1	Serial Number:	E13779
As Found Declination (deg east of True North):	NA	As Left Declination (deg east of True North):	14
Solar noon time (MST):	12:16	Calc Declination*:	13.86 Degrees
Deadband calc:	1.1 degrees (*Limit 4 deg*)		* - calculated declination as per NOAA website

Physical Direction (Degrees) (Cv)	Indicated Direction (Degrees) (Iv)	% Error (based on 357° FS) *Limit = +/- 1.0%*
0	-0.1	---
90	88.8	-0.3%
180	179.8	-0.1%
270	270.4	0.1%
357	355.8	-0.3%

	Start	***Finish***	*Limits*
Correl Coeff (r^2)		0.999987	*≥0.9995*
Calculated slope	NA	1.000623	*0.90 - 1.10*
Calculated intercept	NA	0.348483	*+/- 4*

Notes: New WS/ WD sensor installed. No issues. True north confirmed using a compass.

Calibration Performed By: Jan Castro

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS33
MONDAY CREEK
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Monday Creek	Station number:	AMS 33
Calibration Date:	January 24, 2025	Last Cal Date:	December 5, 2024
Start time (MST):	10:31	End time (MST):	14:13
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.62	ppm	Cal Gas Exp Date:	March 10, 2031
Cal Gas Cylinder #:	EB0008522			
Removed Cal Gas Conc:	50.62	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne T700		Serial Number:	3253
Zero Air Gen Model:	Teledyne T701H		Serial Number:	832

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1152430005	
Analyzer Range:	0- 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.004012	0.999795	Backgd or Offset:	28.8	29.2
Calibration intercept:	-1.253595	0.242482	Coeff or Slope:	0.960	0.985

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4921	79.0	799.8	781.0	1.025
As found Mid point	4961	39.5	399.9	391.5	1.022
As found Low point	4980	19.8	200.5	196.7	1.021
New cylinder response					
Baseline Corr As found:	780.6	Previous response	801.8	*% change	-2.7%
Baseline Corr 2nd AF pt:	391.1	AF Slope:	0.975841	AF Intercept:	0.826975
Baseline Corr 3rd AF pt:	196.3	AF Correlation:	0.999998	* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.5	----
High point	4921	79.0	799.8	800.0	1.000
Mid point	4961	39.5	399.9	399.9	1.000
Low point	4980	19.8	200.5	200.4	1.000
As left zero	5000	0.0	0.0	0.5	----
As left span	4921	79.0	799.8	799.7	1.000
				Average Correction Factor:	1.000

Notes: Sample inlet filter and pump was changed after multipoint as founds. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

SO_2 Calibration Summary

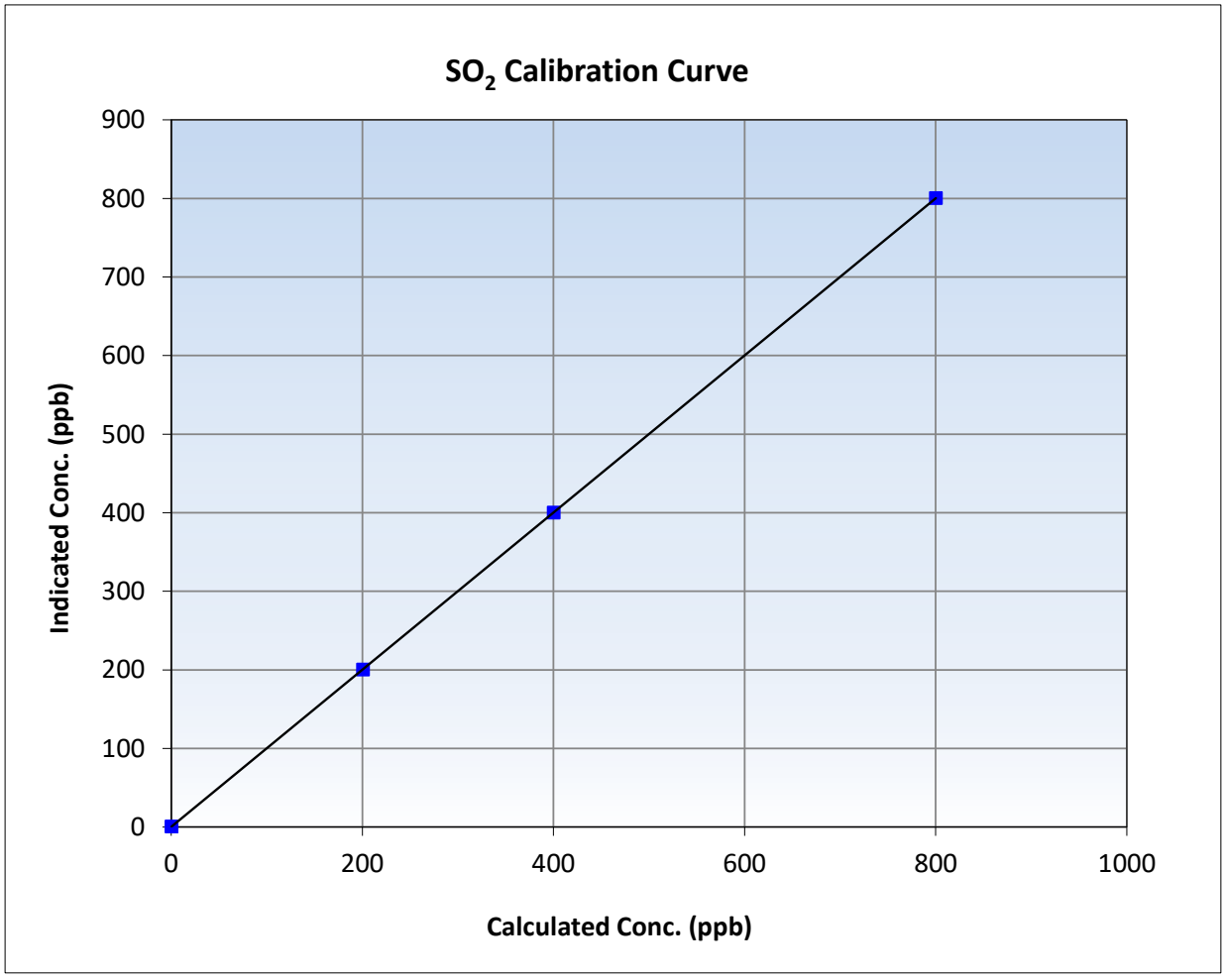
Station Information

Calibration Date:	January 24, 2025	Previous Calibration:	December 5, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	10:31	End Time (MST):	14:13
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430005

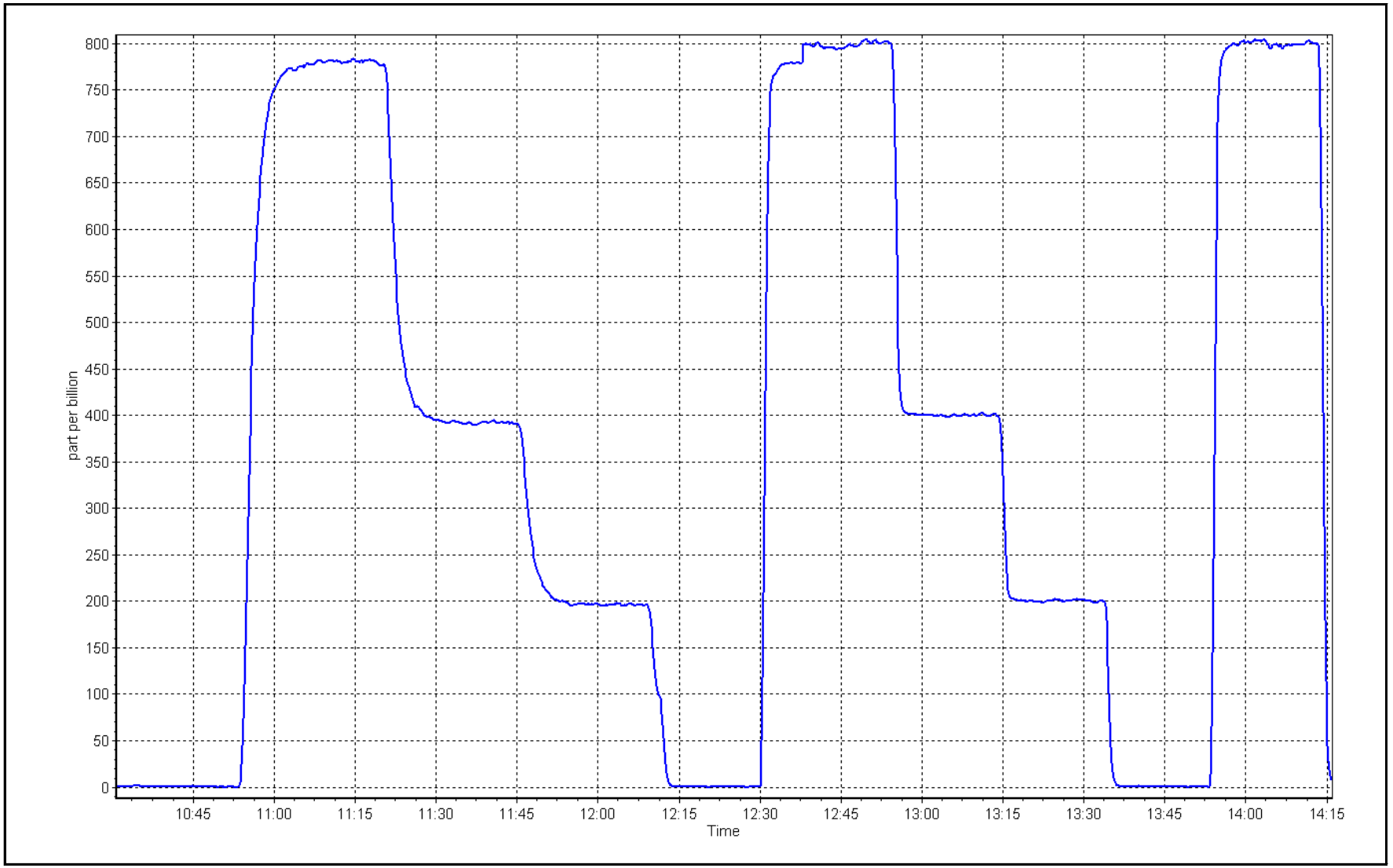
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.5	----
799.8	800.0	0.9997
399.9	399.9	0.9999
200.5	200.4	1.0003

Statistical Evaluation		*Limits*
Correlation Coefficient	1.000000	*≥0.995*
Slope	0.999795	*0.90 - 1.10*
Intercept	0.242482	*+/-30*



SO2 Calibration Plot Date: January 24, 2025 Location: Monday Creek



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Monday Creek	Station number:	AMS 33
Calibration Date:	January 22, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	10:49	End time (MST):	14:39
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.05	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0014831			
Removed Cal Gas Conc:	5.05	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3253
ZAG Make/Model:	Teledyne T701H		Serial Number:	832

Analyzer Information

Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12333331547
Converter make:	Global 150		Converter serial #:	2022-196
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996854	1.006141	Backgd or Offset:	1.5	1.6
Calibration intercept:	0.038399	-0.061611	Coeff or Slope:	1.063	1.076

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	79.2	80.0	79.7	1.002
As found Mid point	4960	39.6	40.0	39.9	1.000
As found Low point	4980	19.8	20.0	20.0	0.995
New cylinder response					

Baseline Corr As found:	79.8	Prev response:	79.78	*% change:	0.0%
Baseline Corr 2nd AF pt:	40.0	AF Slope:	0.997140	AF Intercept:	-0.021598
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999996	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4921	79.2	80.0	80.4	0.995
Mid point	4960	39.6	40.0	40.2	0.995
Low point	4980	19.8	20.0	20.1	0.995
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	79.2	80.0	80.3	0.996
SO2 Scrubber Check	4921	79.1	791.0	0.1	----

Date of last scrubber change:	11-Apr-24	Ave Corr Factor	0.995
Date of last converter efficiency test:			

Notes: Sample inlet filter changed after multipoint as founds. Sox scrubber check done after calibrator zero and passed. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

H2S Calibration Summary

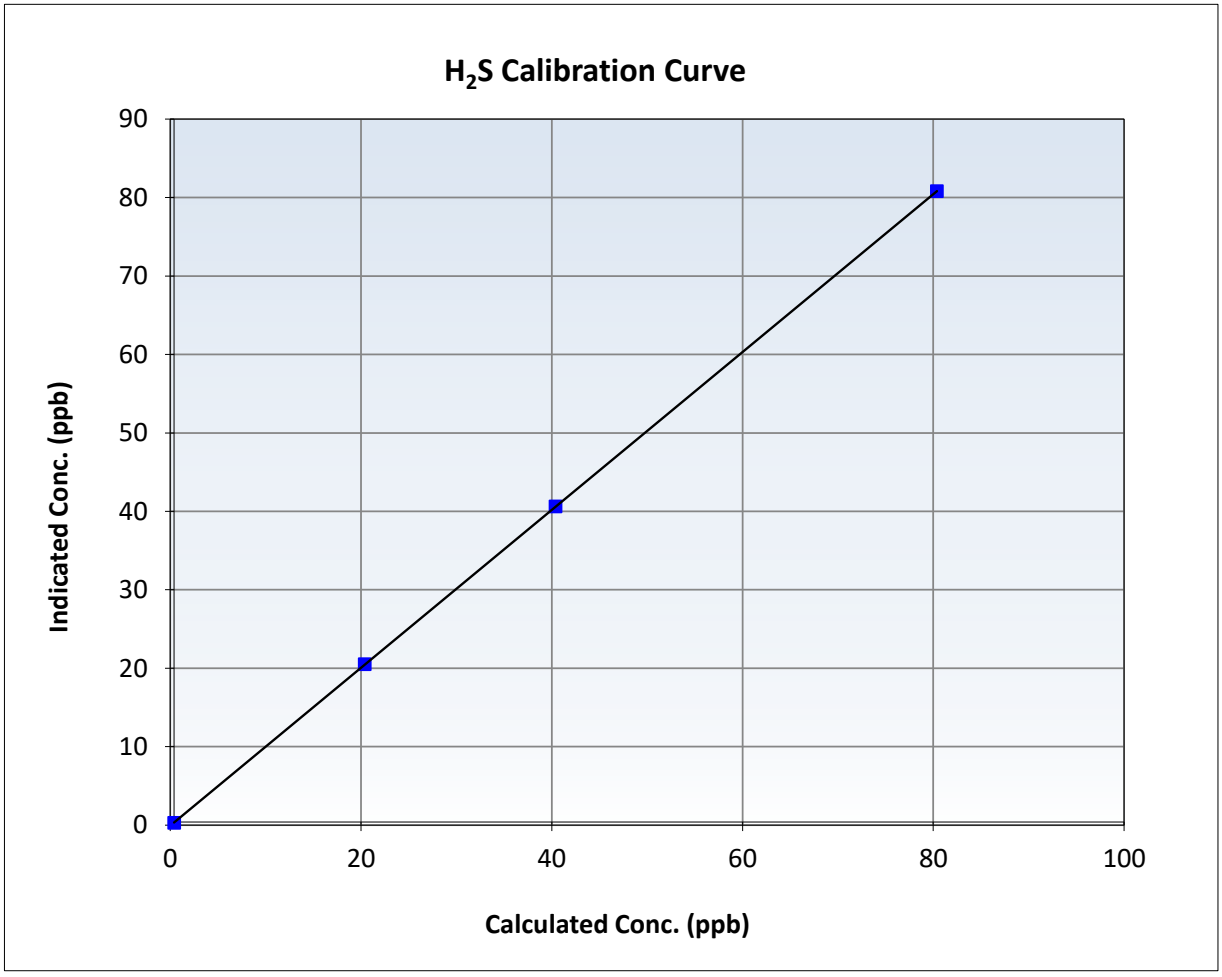
Station Information

Calibration Date:	January 22, 2025	Previous Calibration:	December 4, 2024
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	10:49	End Time (MST):	14:39
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331547

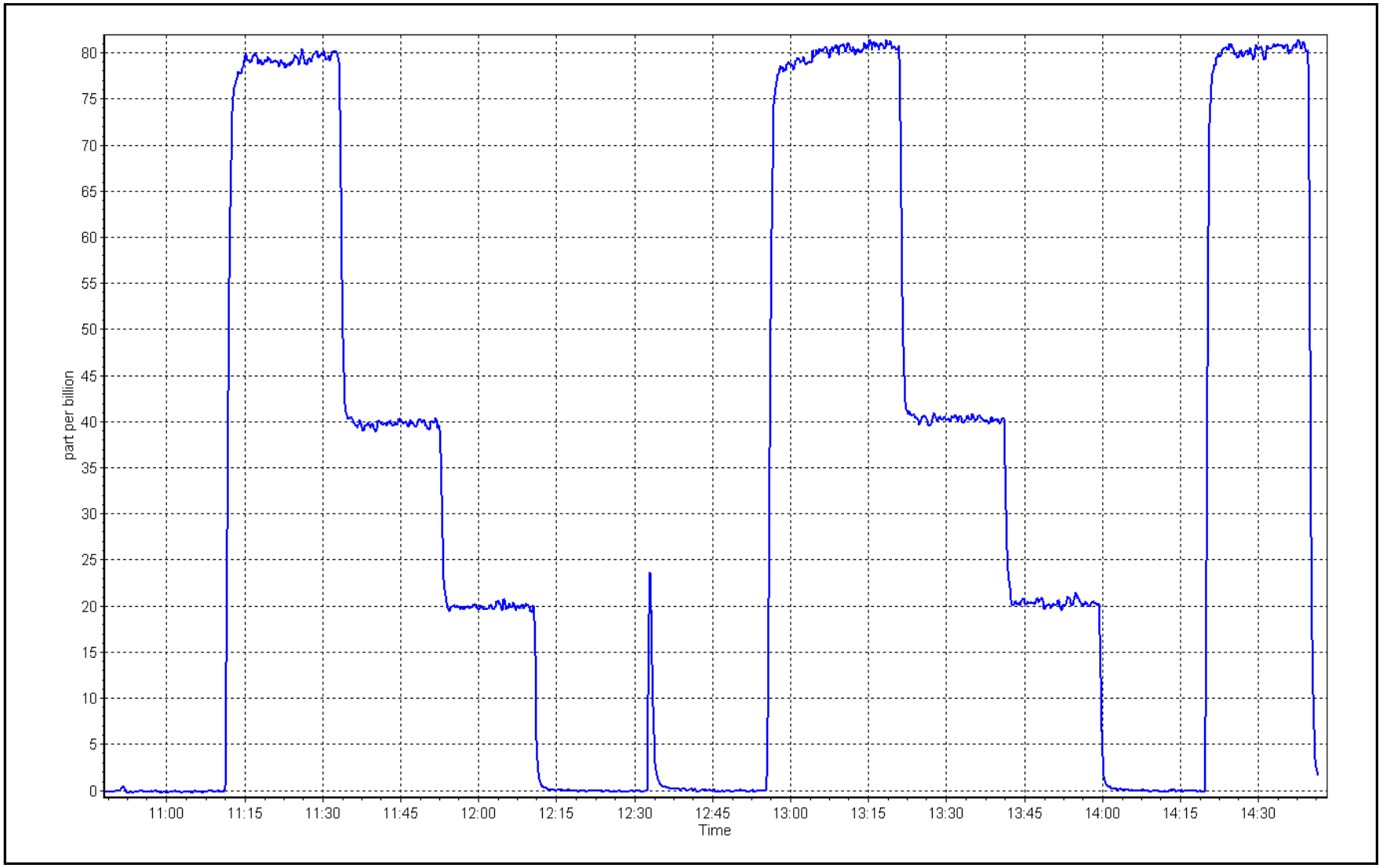
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
80.0	80.4	0.9949
40.0	40.2	0.9950
20.0	20.1	0.9950

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.006141	*0.90 - 1.10*
Intercept	-0.061611	*+/-3*



H2S Calibration Plot Date: January 22, 2025 Location: Monday Creek



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Monday Creek
Station number:	AMS 33
Calibration Date:	January 14, 2025
Last Cal Date:	NA
Start time (MST):	14:35
End time (MST):	19:01
Reason:	Install

Calibration Standards

NO Gas Cylinder #:	CC755290	Cal Gas Expiry Date:	January 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3253
ZAG make/model:	Teledyne API T701H	Serial Number:	832

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found NO r^2:	NO Sl:	NO Int:	
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42iQ

Serial Number: 1182340006

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	NA	1.331	NO bkgnd or offset:	NA	1.1
NOX coeff or slope:	NA	0.998	NOX bkgnd or offset:	NA	1.3
NO2 coeff or slope:	NA	1.000	Reaction cell Press:	NA	104.9

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	NA	1.007682
NO_X Cal Offset:	NA	-0.469417
NO Cal Slope:	NA	1.001388
NO Cal Offset:	NA	-1.269219
NO_2 Cal Slope:	NA	1.006705
NO_2 Cal Offset:	NA	1.467871

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
High point	4918	82.1	802.9	799.6	3.3	808.9	800.2	8.6	0.9926	0.9993
Mid point	4959	41.1	401.9	400.3	1.6	404.0	398.5	5.5	0.9949	1.0045
Low point	4979	20.5	200.5	199.7	0.8	201.6	198.0	3.5	0.9946	1.0085
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
As left span	4918	82.1	802.9	409.0	393.9	805.6	409.0	396.6	0.9967	1.0000
							Average Correction Factor		0.9940	1.0041

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	800.2	404.3	399.2	402.6	0.9915	100.9%
Mid GPT point	800.2	605.6	197.9	201.4	0.9825	101.8%
Low GPT point	800.2	703.1	100.4	104.0	0.9652	103.6%
				Average Correction Factor	0.9798	102.1%

Notes: Install calibration. Sample inlet filter changed after as founds. Adjusted zero and span.

Calibration Performed By: Mohammed Kashif

Wood Buffalo Environmental Association

NO_X Calibration Summary

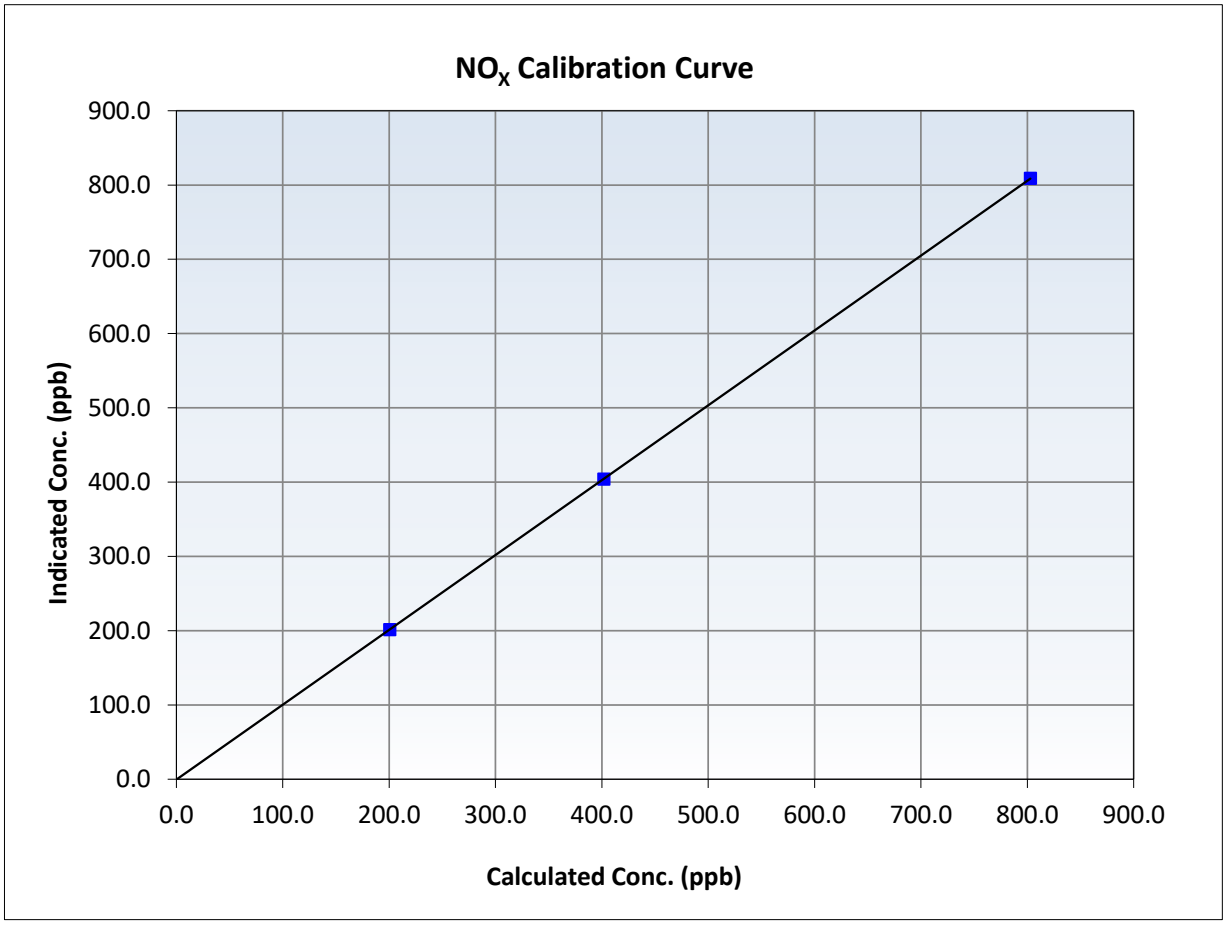
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	NA
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	14:35	End Time (MST):	19:01
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
802.9	808.9	0.9926
401.9	404.0	0.9949
200.5	201.6	0.9946

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999999	*≥0.995*
Slope	1.007682	*0.90 - 1.10*
Intercept	-0.469417	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

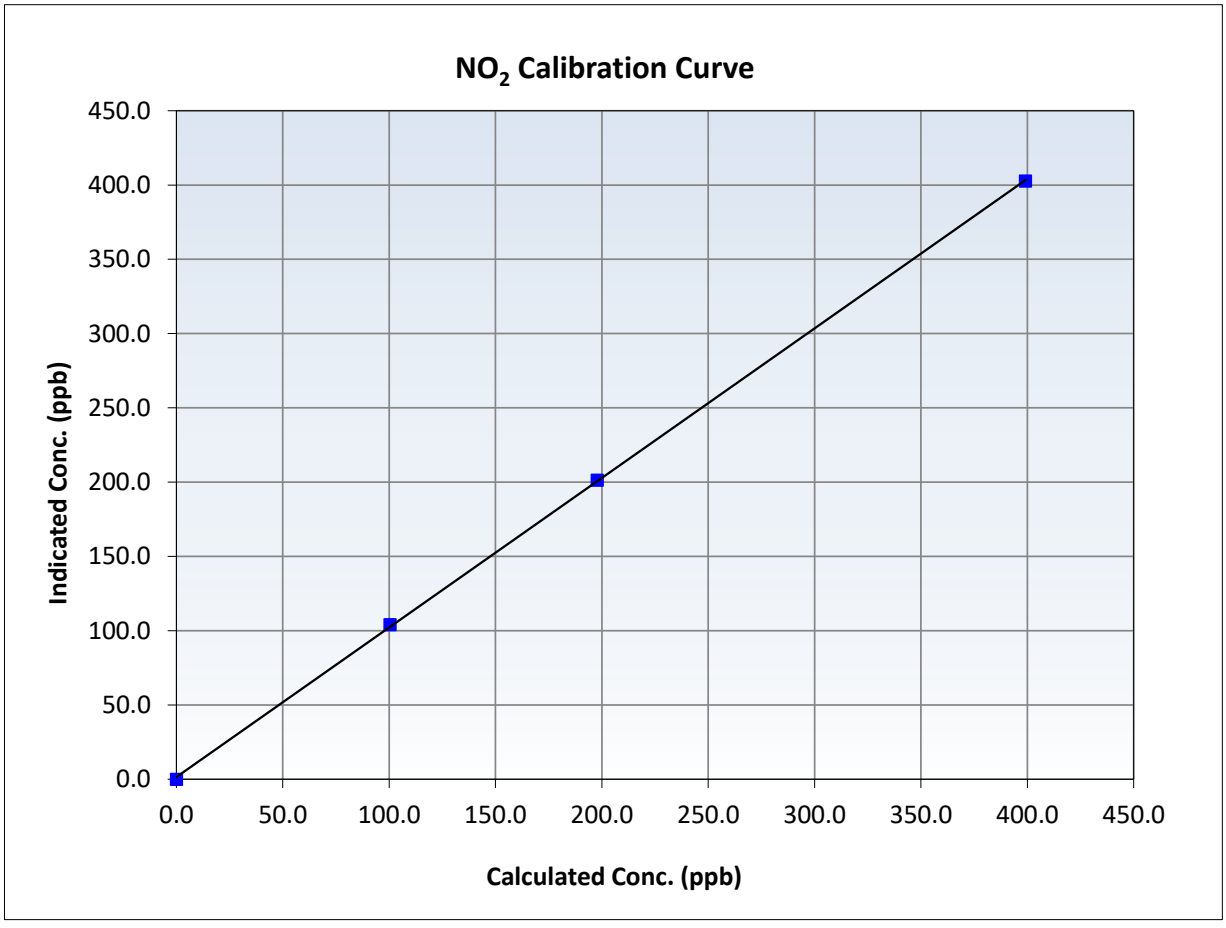
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	NA
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	14:35	End Time (MST):	19:01
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
399.2	402.6	0.9915
197.9	201.4	0.9825
100.4	104.0	0.9652

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999939	*≥0.995*
Slope	1.006705	*0.90 - 1.10*
Intercept	1.467871	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

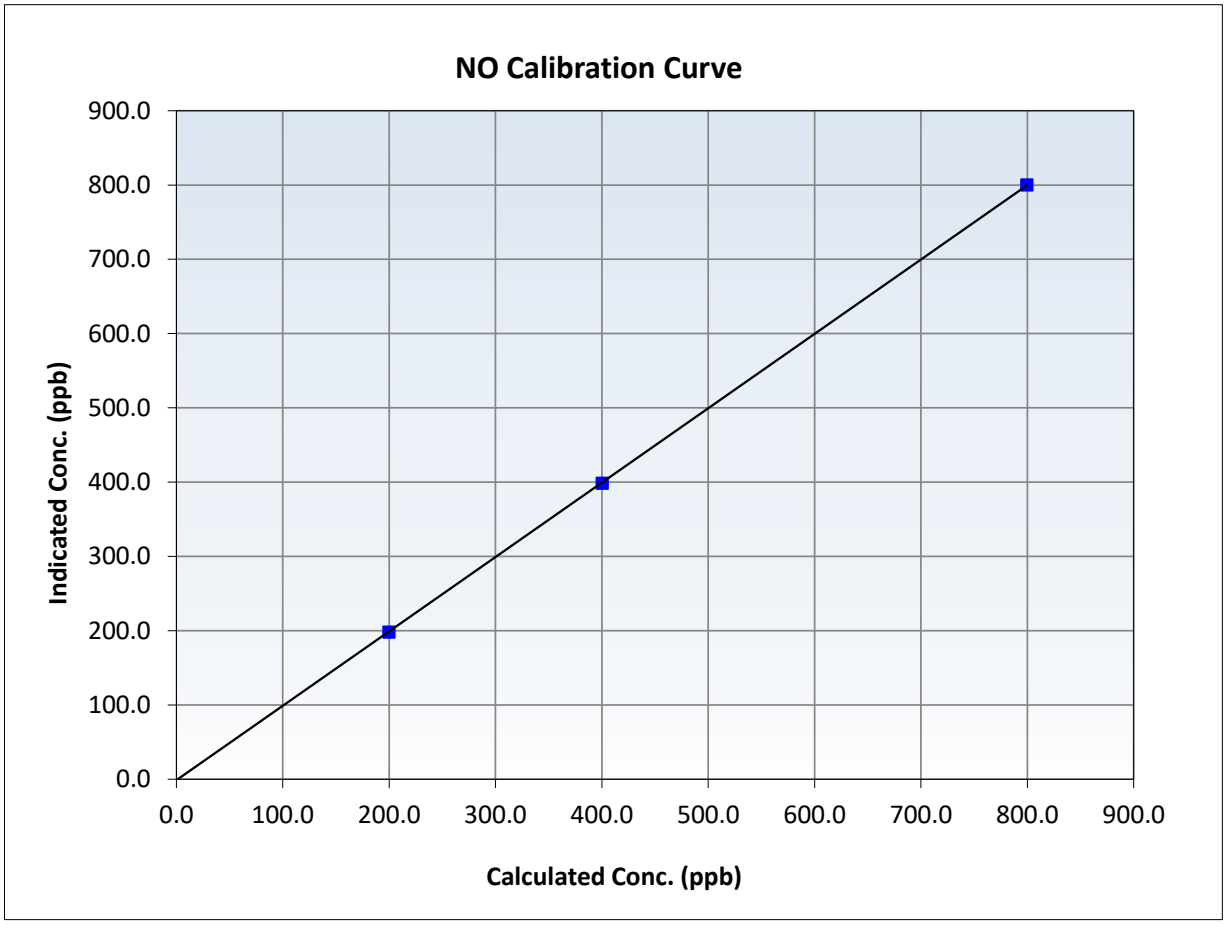
Station Information

Calibration Date:	January 14, 2025	Previous Calibration:	NA
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	14:35	End Time (MST):	19:01
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

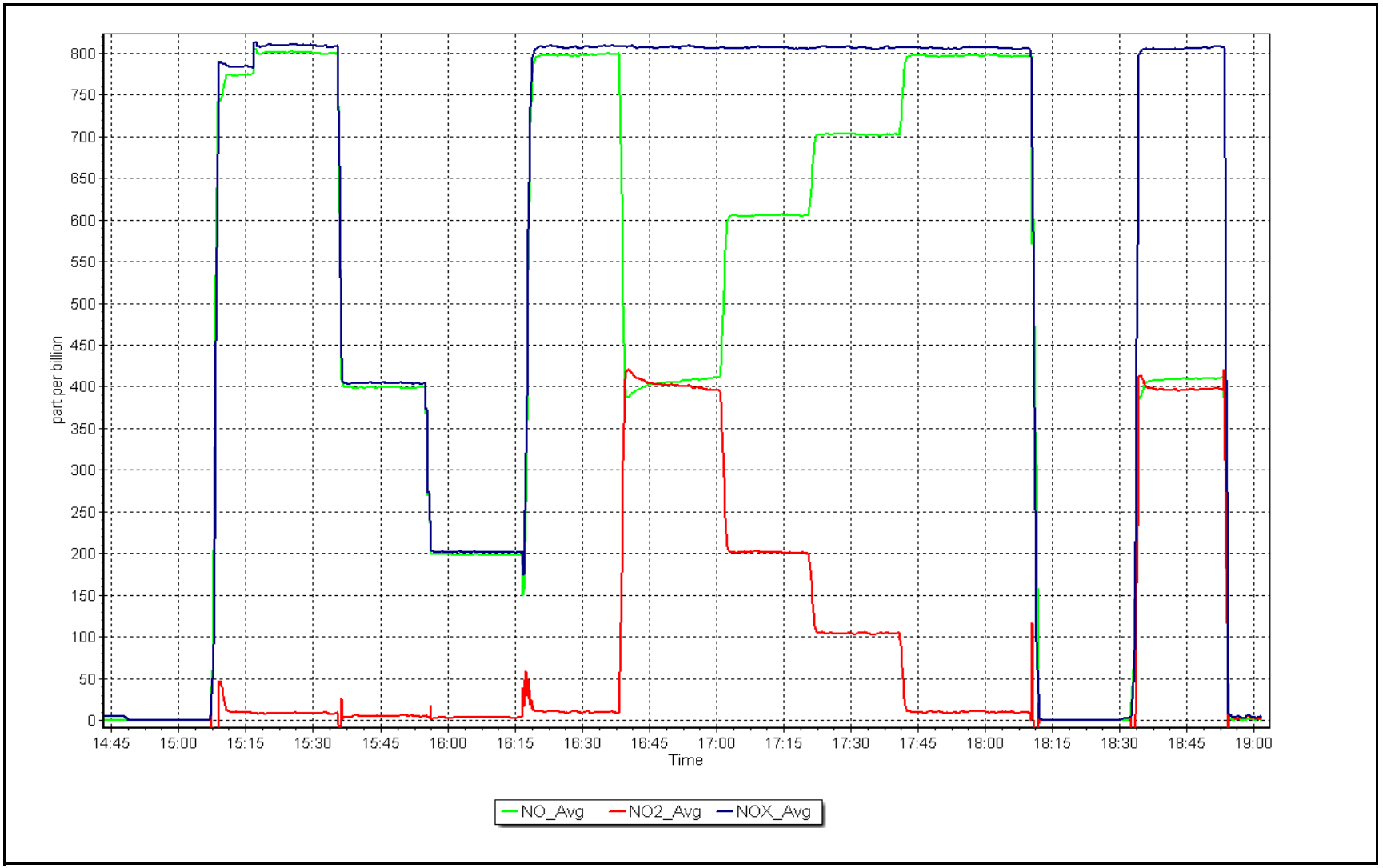
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
799.6	800.2	0.9993
400.3	398.5	1.0045
199.7	198.0	1.0085

Statistical Evaluation		Limits
Correlation Coefficient	0.999990	≥0.995
Slope	1.001388	0.90 - 1.10
Intercept	-1.269219	+/-20



NO_X Calibration Plot Date: January 14, 2025 Location: Monday Creek



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Monday Creek
Station number:	AMS 33
Calibration Date:	January 29, 2025
Last Cal Date:	January 14, 2025
Start time (MST):	10:36
End time (MST):	14:57
Reason:	Maintenance

Calibration Standards

NO Gas Cylinder #:	CC755290	Cal Gas Expiry Date:	January 3, 2031
NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3253
ZAG make/model:	Teledyne API T701H	Serial Number:	832

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.6	-0.2	----	----
AF High point	4918	82.1	802.9	799.6	3.3	883.6	870.6	13.0	0.9080	0.9179
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 808.6 ppb	NO = 799.5 ppb
Baseline Corr 1st pt	NO_X = 884.3 ppb	NO = 871.2 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X = 8.6%
*Percent Change	NO = 8.2%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42iQ Serial Number: 1182340006

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.331	1.214	NO bkgnd or offset:	1.1	1.0
NOX coeff or slope:	0.998	0.989	NOX bkgnd or offset:	1.3	1.2
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	104.9	104.7

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.007682	1.007108
NO_X Cal Offset:	-0.469417	-1.832707
NO Cal Slope:	1.001388	1.009701
NO Cal Offset:	-1.269219	-2.492802
NO_2 Cal Slope:	1.006705	0.998522
NO_2 Cal Offset:	1.467871	-0.497751

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.3	-0.2	----	----
High point	4918	82.1	802.9	799.6	3.3	808.2	806.7	1.4	0.9935	0.9912
Mid point	4959	41.1	401.9	400.3	1.6	400.7	399.1	1.6	1.0031	1.0030
Low point	4980	20.5	200.5	199.7	0.8	199.0	197.1	1.9	1.0074	1.0129
As left zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.1	----	----
As left span	4918	82.1	802.9	393.6	409.3	800.3	393.6	406.7	1.0033	1.0000
								Average Correction Factor	1.0013	1.0024

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.2	----	----
High GPT point	802.9	391.9	414.3	413.3	1.0024	99.8%
Mid GPT point	802.9	605.1	201.1	200.2	1.0044	99.6%
Low GPT point	802.9	703.7	102.5	101.5	1.0097	99.0%
				Average Correction Factor	1.0055	99.5%

Notes: Maintenance calibration due to high span during systems check. Sample inlet filter changed after as founds. Adjusted span only.

Calibration Performed By: Jan Castro

Wood Buffalo Environmental Association

NO_X Calibration Summary

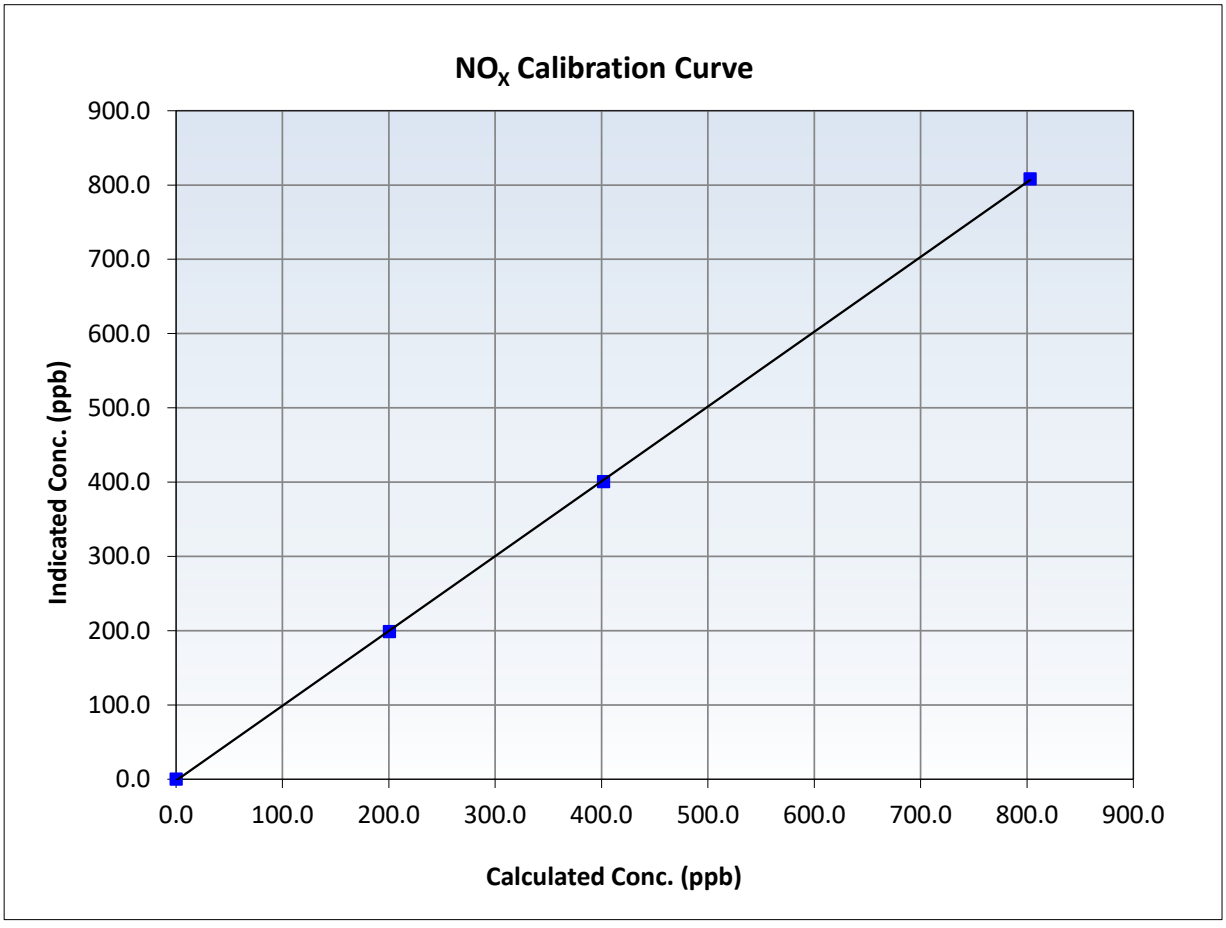
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	January 14, 2025
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	10:36	End Time (MST):	14:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.1	----
802.9	808.2	0.9935
401.9	400.7	1.0031
200.5	199.0	1.0074

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999966	*≥0.995*
Slope	1.007108	*0.90 - 1.10*
Intercept	-1.832707	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

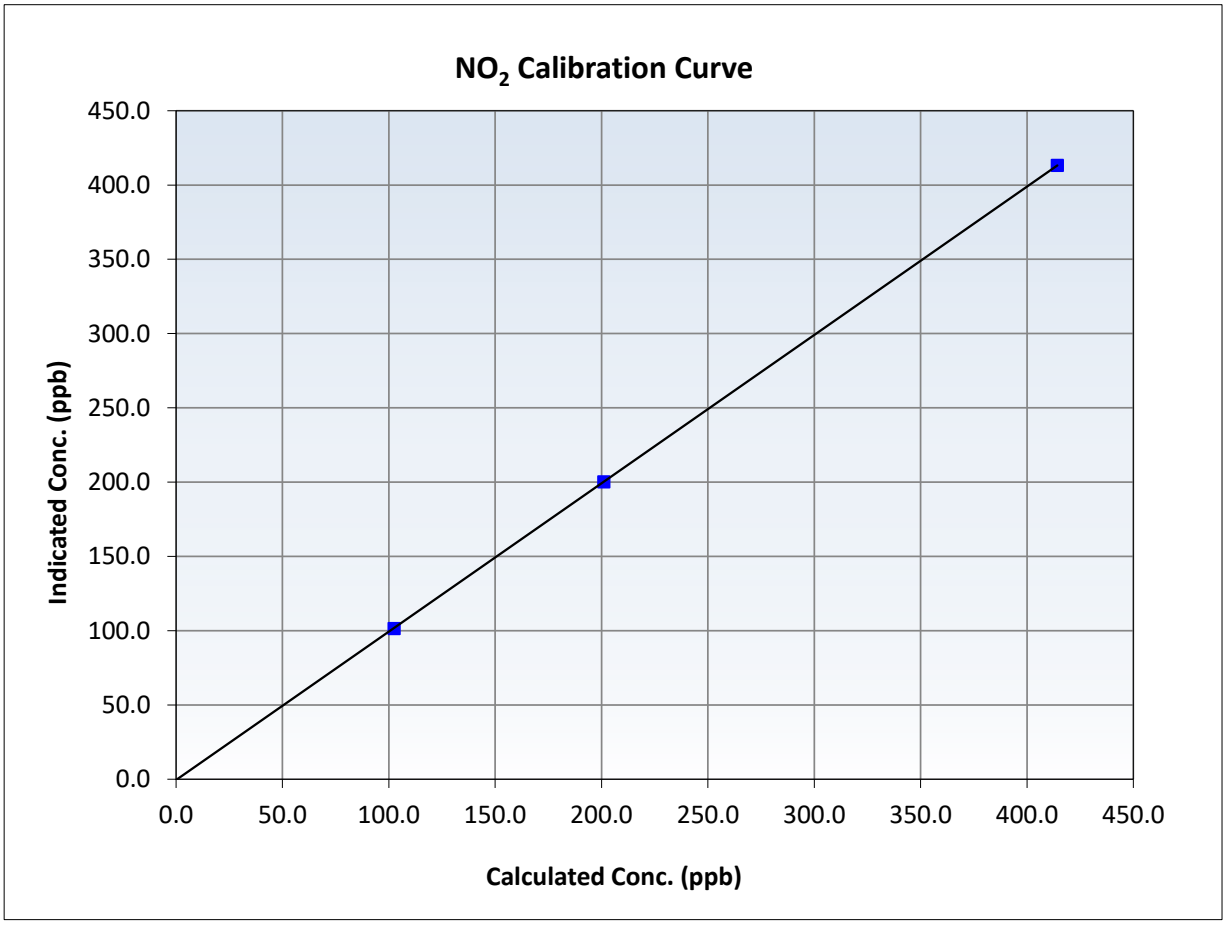
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	January 14, 2025
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	10:36	End Time (MST):	14:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.2	----
414.3	413.3	1.0024
201.1	200.2	1.0044
102.5	101.5	1.0097

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	0.998522	*0.90 - 1.10*
Intercept	-0.497751	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

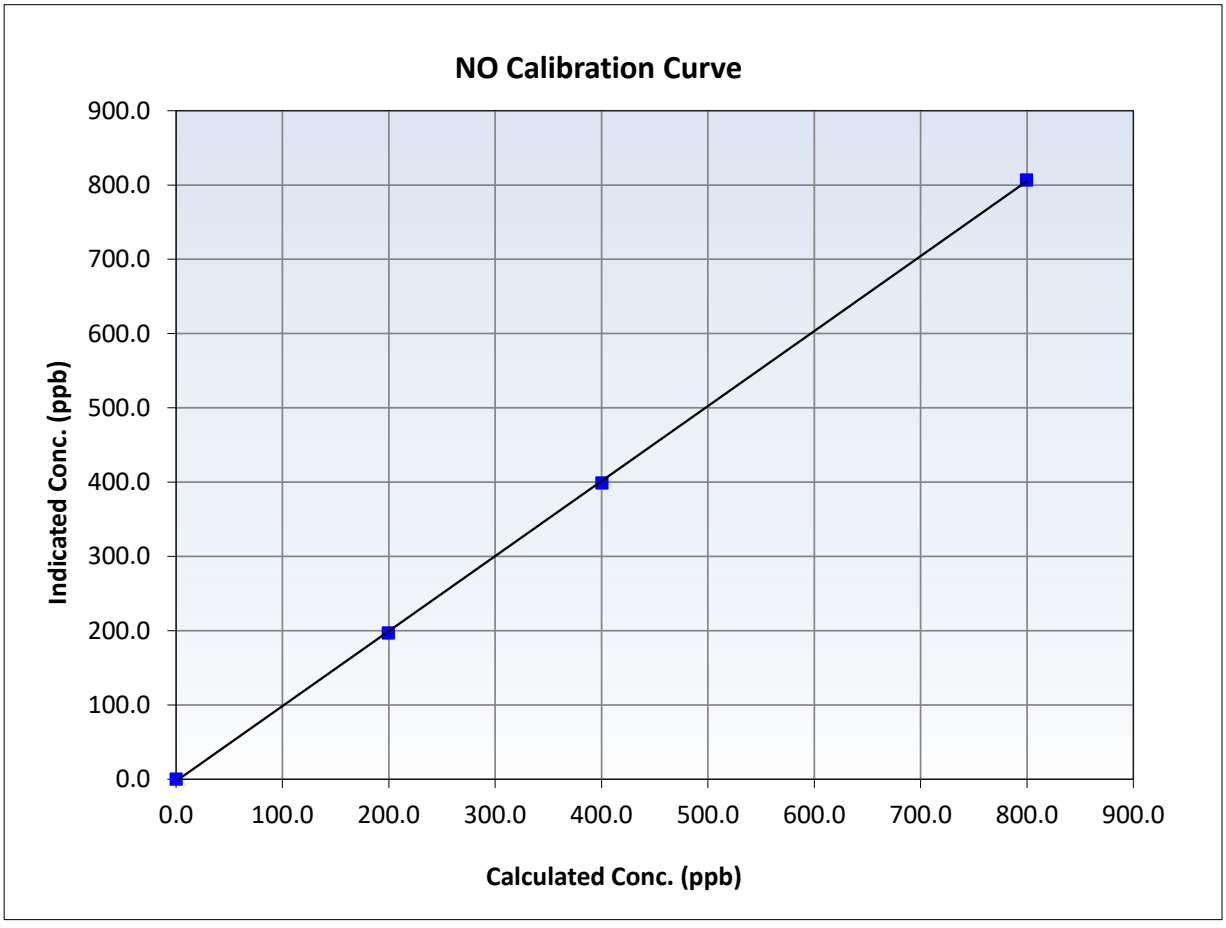
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	January 14, 2025
Station Name:	Monday Creek	Station Number:	AMS 33
Start Time (MST):	10:36	End Time (MST):	14:57
Analyzer make:	Thermo 42iQ	Analyzer serial #:	1182340006

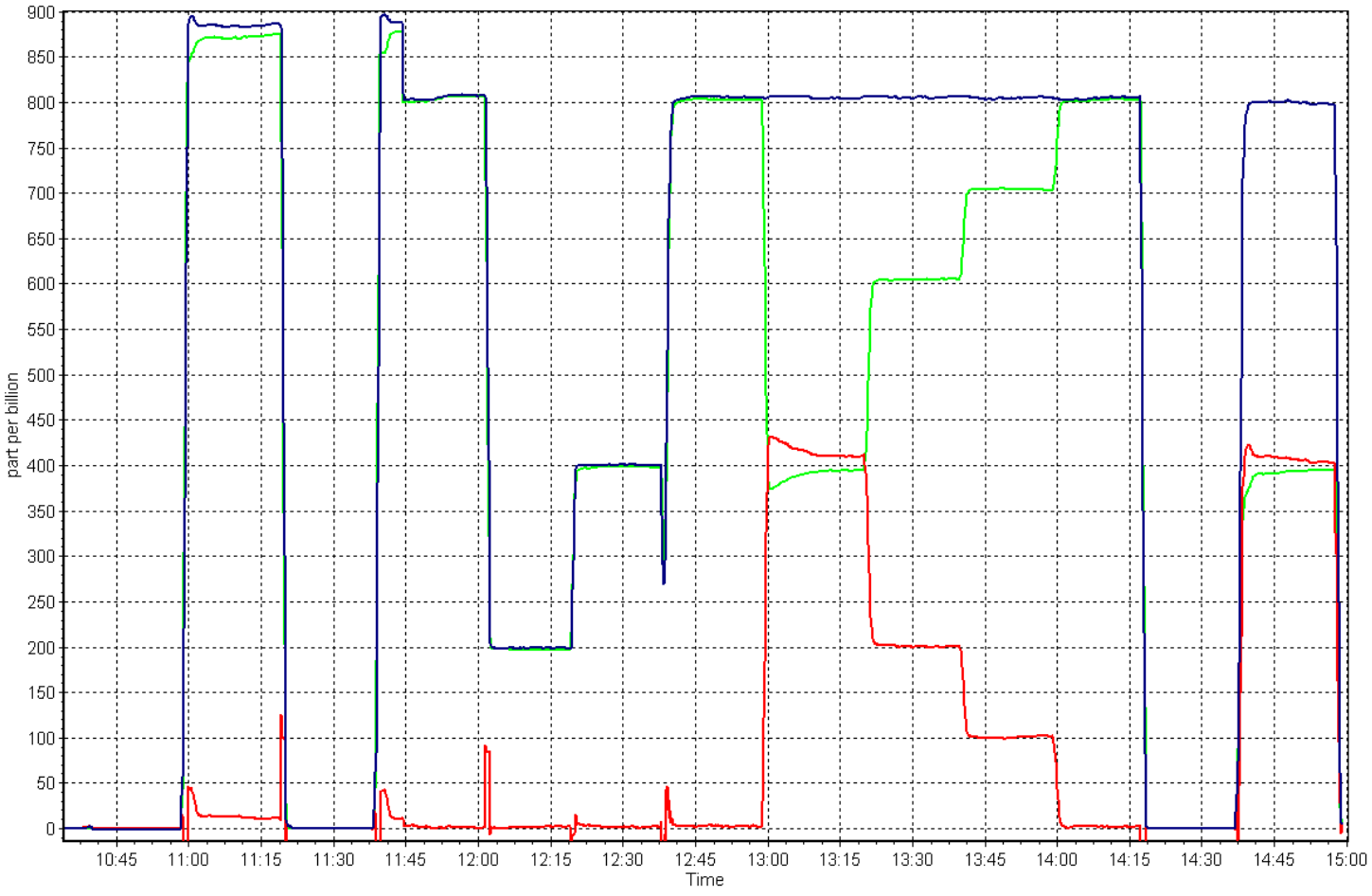
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.3	----
799.6	806.7	0.9912
400.3	399.1	1.0030
199.7	197.1	1.0129

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999939	*≥0.995*
Slope	1.009701	*0.90 - 1.10*
Intercept	-2.492802	*+/-20*



NO_X Calibration Plot Date: January 29, 2025 Location: Monday Creek



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS506
JACKFISH 1
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	January 21, 2025	Last Cal Date:	December 3, 2024
Start time (MST):	10:03	End time (MST):	12:39
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.52	ppm	Cal Gas Exp Date:	December 29, 2028
Cal Gas Cylinder #:	CC274266			
Removed Cal Gas Conc:	50.52	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2659
Zero Air Gen Model:	Teledyne API T701		Serial Number:	4427

Analyzer Information

Analyzer make:	Thermo 43i		Serial Number:	1160290011	
Analyzer Range:	0-1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.996659	0.997031	Backgd or Offset:	20.1	20.4
Calibration intercept:	0.464029	-0.215980	Coeff or Slope:	0.979	0.989

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4921	79.2	800.2	795.5	1.006
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:	795.3	Previous response	798.0	*% 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	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4921	79.2	800.2	797.5	1.003
Mid point	4960	39.6	400.2	399.7	1.001
Low point	4980	19.8	200.1	197.8	1.011
As left zero	5000	0.0	0.0	0.3	----
As left span	4921	79.2	800.2	797.8	1.003
				Average Correction Factor:	1.005

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

SO_2 Calibration Summary

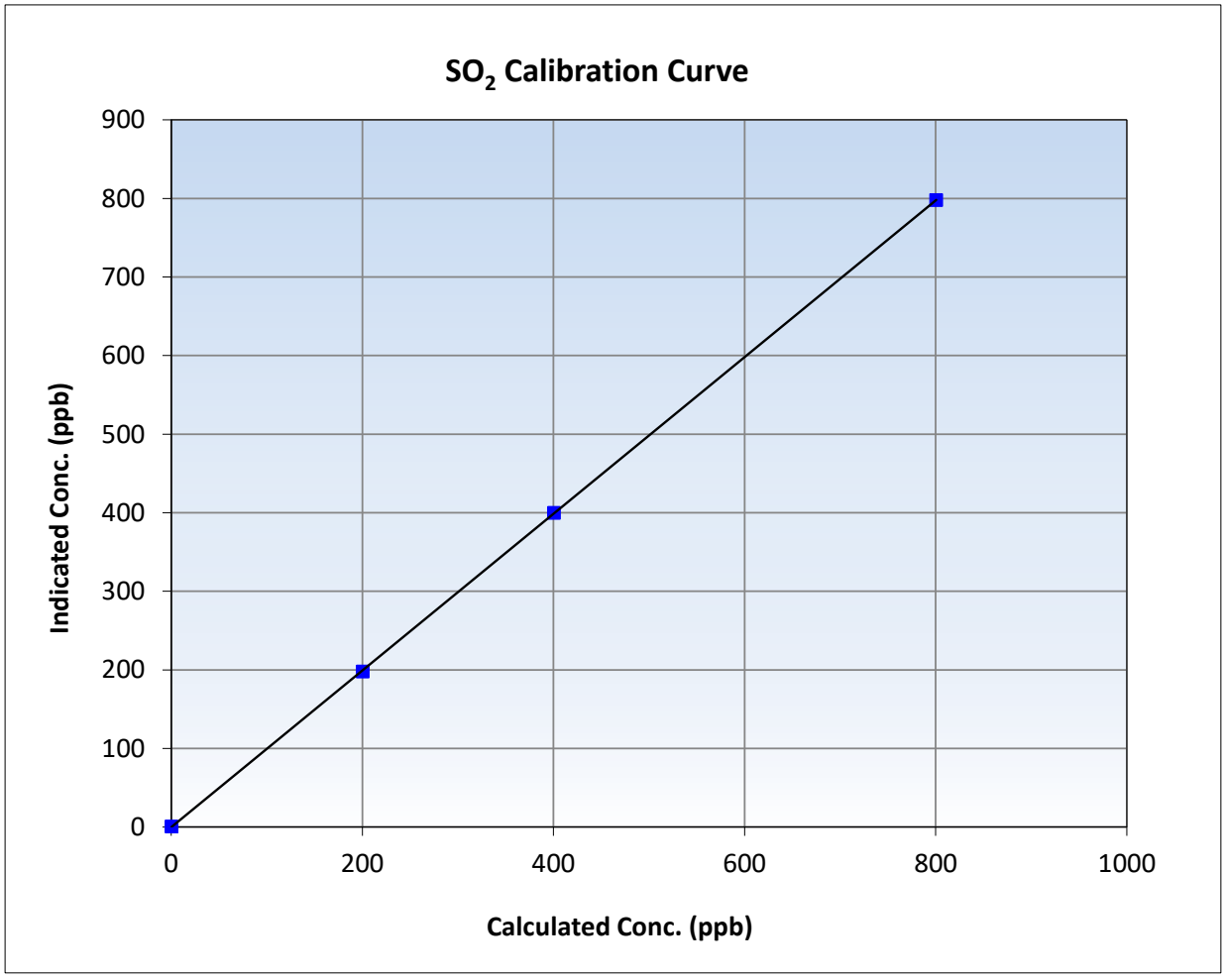
Station Information

Calibration Date:	January 21, 2025	Previous Calibration:	December 3, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	10:03	End Time (MST):	12:39
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290011

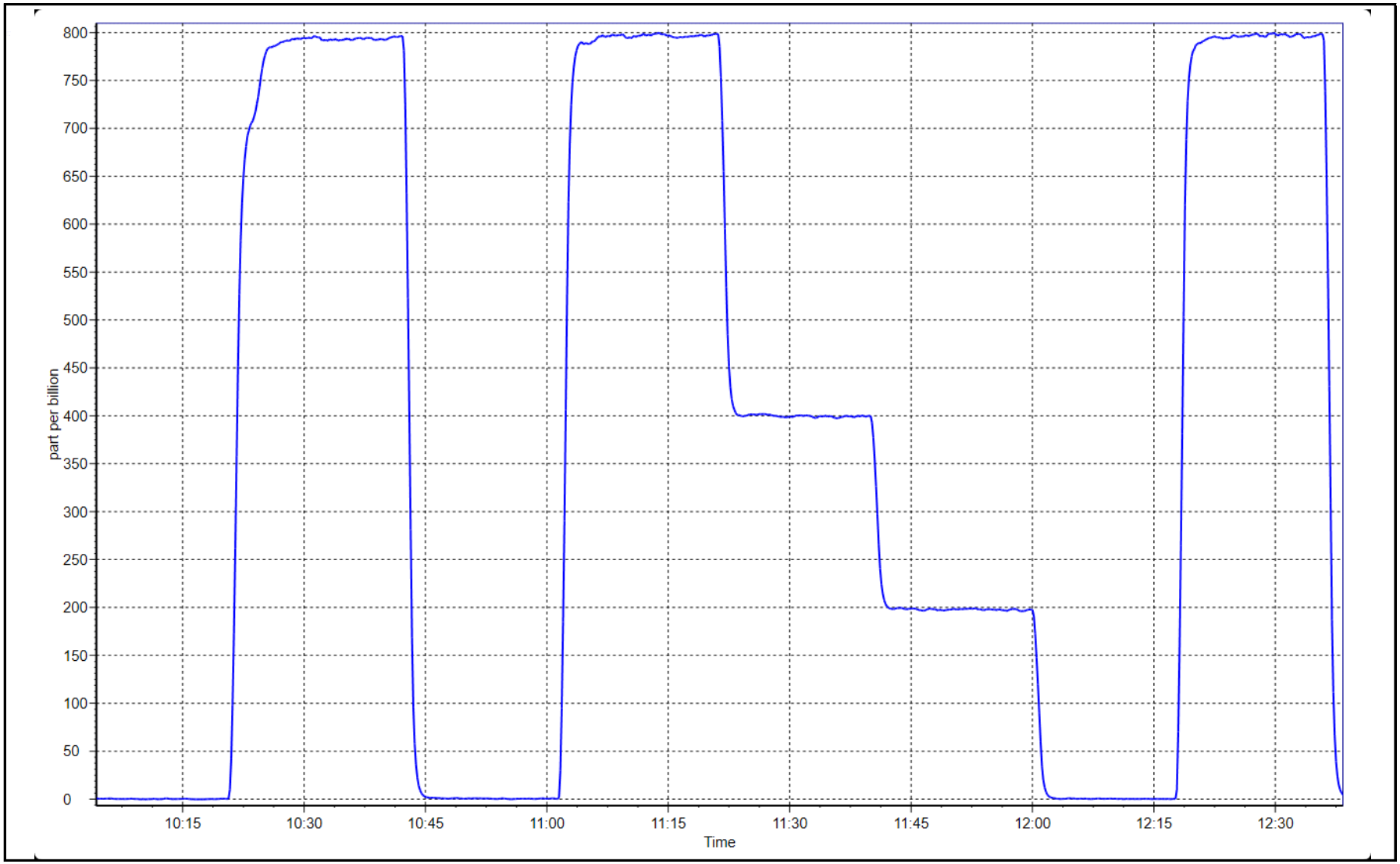
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
800.2	797.5	1.0034
400.2	399.7	1.0011
200.1	197.8	1.0115

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999990	*≥0.995*
Slope	0.997031	*0.90 - 1.10*
Intercept	-0.215980	*+/-30*



SO2 Calibration Plot Date: January 21, 2025 Location: Jackfish 1



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Jackfish 1	Station number:	AMS 506
Calibration Date:	January 22, 2025	Last Cal Date:	December 4, 2024
Start time (MST):	9:31	End time (MST):	13:35
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	4.89	ppm	Cal Gas Exp Date:	September 5, 2027
Cal Gas Cylinder #:	CC737971			
Removed Cal Gas Conc:	4.89	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne 750		Serial Number:	282
ZAG Make/Model:	Teledyne 751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1180540020
Converter make:	Global G150		Converter serial #:	2022-218
Analyzer Range	0 - 100 ppb		Converter Temp:	325.0 degC

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.989169	0.982029	Backgd or Offset:	3.56	3.56
Calibration intercept:	0.040416	0.040242	Coeff or Slope:	1.154	1.154

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4918	81.8	80.0	78.6	1.017
As found Mid point	4959	40.9	40.0	39.8	1.003
As found Low point	4980	20.4	19.9	19.7	1.008
New cylinder response					

Baseline Corr As found:	78.7	Prev response:	79.18	*% change:	-0.6%
Baseline Corr 2nd AF pt:	39.9	AF Slope:	0.983741	AF Intercept:	0.080342
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999940	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4918	81.8	80.0	78.5	1.019
Mid point	4959	40.9	40.0	39.6	1.010
Low point	4980	20.4	19.9	19.5	1.023
As left zero	5000	0.0	0.0	0.1	----
As left span	4918	81.8	80.0	78.6	1.018
SO2 Scrubber Check	4921	79.2	800.2	0.0	----
Date of last scrubber change:				Ave Corr Factor	1.017
Date of last converter efficiency test:					

Notes: Changed inlet filter after as founds. No adjustment made.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

H2S Calibration Summary

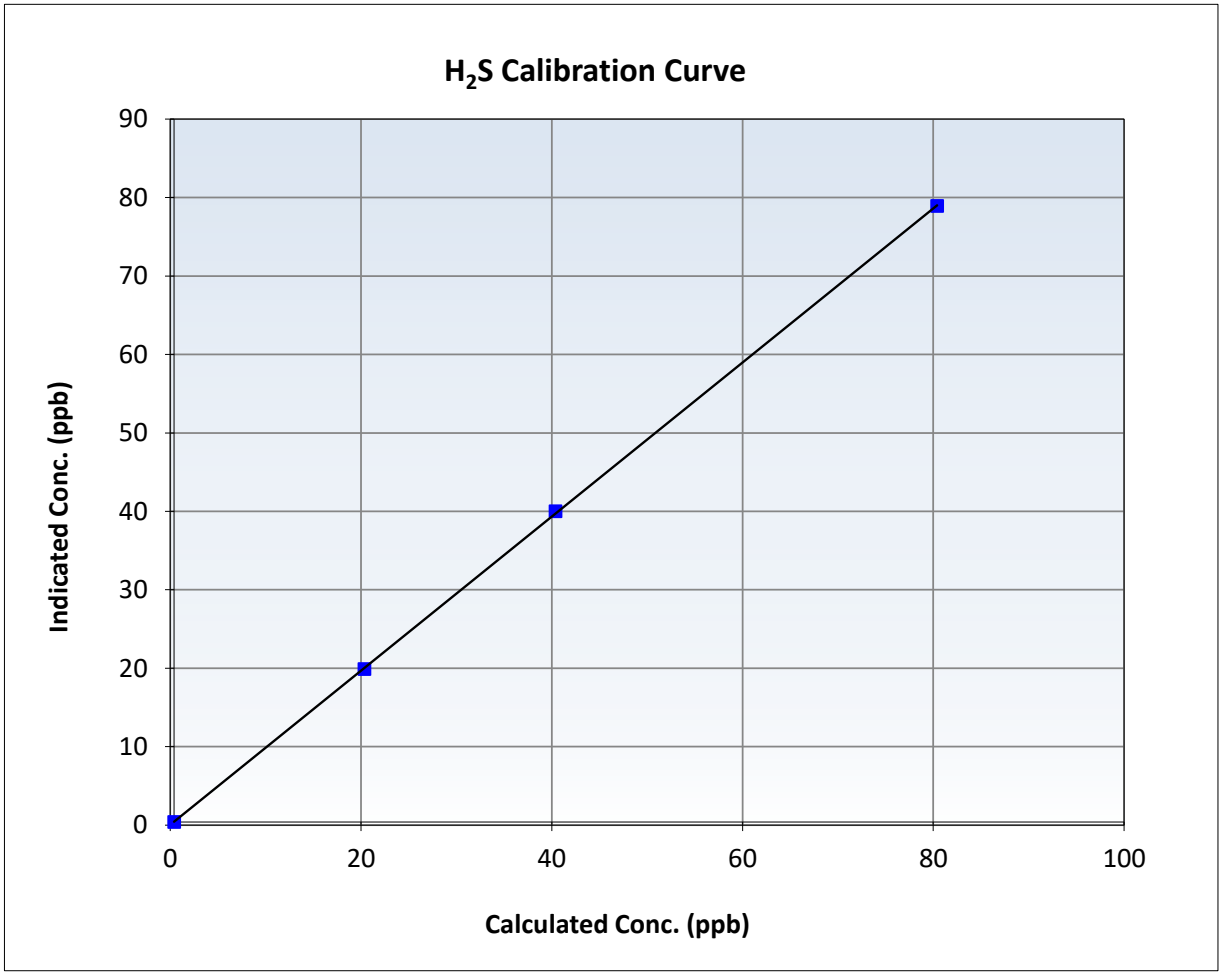
Station Information

Calibration Date:	January 22, 2025	Previous Calibration:	December 4, 2024
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	9:31	End Time (MST):	13:35
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1180540020

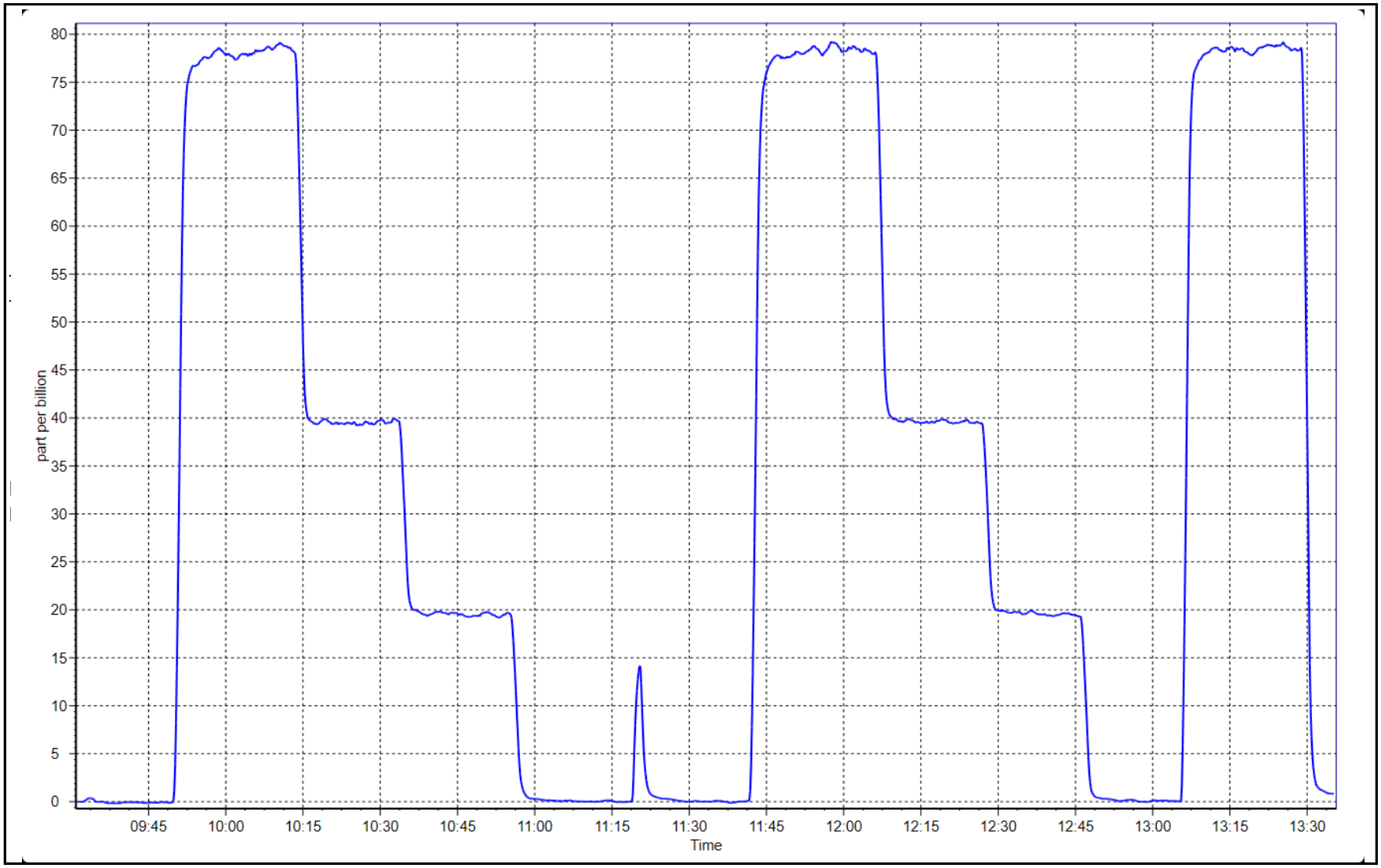
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
80.0	78.5	1.0192
40.0	39.6	1.0101
19.9	19.5	1.0231

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999968	*≥0.995*
Slope	0.982029	*0.90 - 1.10*
Intercept	0.040242	*+/-3*



H2S Calibration Plot Date: January 22, 2025 Location: Jackfish 1



0

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Jackfish 1
Station number:	AMS 506
Calibration Date:	January 28, 2025
Last Cal Date:	December 3, 2024
Start time (MST):	9:19
End time (MST):	12:06
Reason:	Removal

Calibration Standards

NO Gas Cylinder #:	DT0022706	Cal Gas Expiry Date:	January 5, 2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T750	Serial Number:	282
ZAG make/model:	Teledyne API T751H	Serial Number:	321

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-1.0	-0.4	-0.6	----	----
AF High point	4933	66.6	801.9	800.6	1.3	813.0	809.0	4.0	0.9852	0.9891
AF Mid point	4967	33.3	400.9	400.2	0.7	404.3	401.5	2.7	0.9892	0.9959
AF Low point	4983	16.6	199.9	199.5	0.3	198.7	195.4	3.4	1.0009	1.0191
New cyl resp										

Previous Response	NO_X = 802.2 ppb	NO = 801.3 ppb
Baseline Corr 1st pt	NO_X = 814.0 ppb	NO = 809.4 ppb
Baseline Corr 2nd pt	NO_X = 405.3 ppb	NO = 401.9 ppb
Baseline Corr 3rd pt	NO_X = 199.7 ppb	NO = 195.8 ppb

* = > +/-5% change initiates investigation

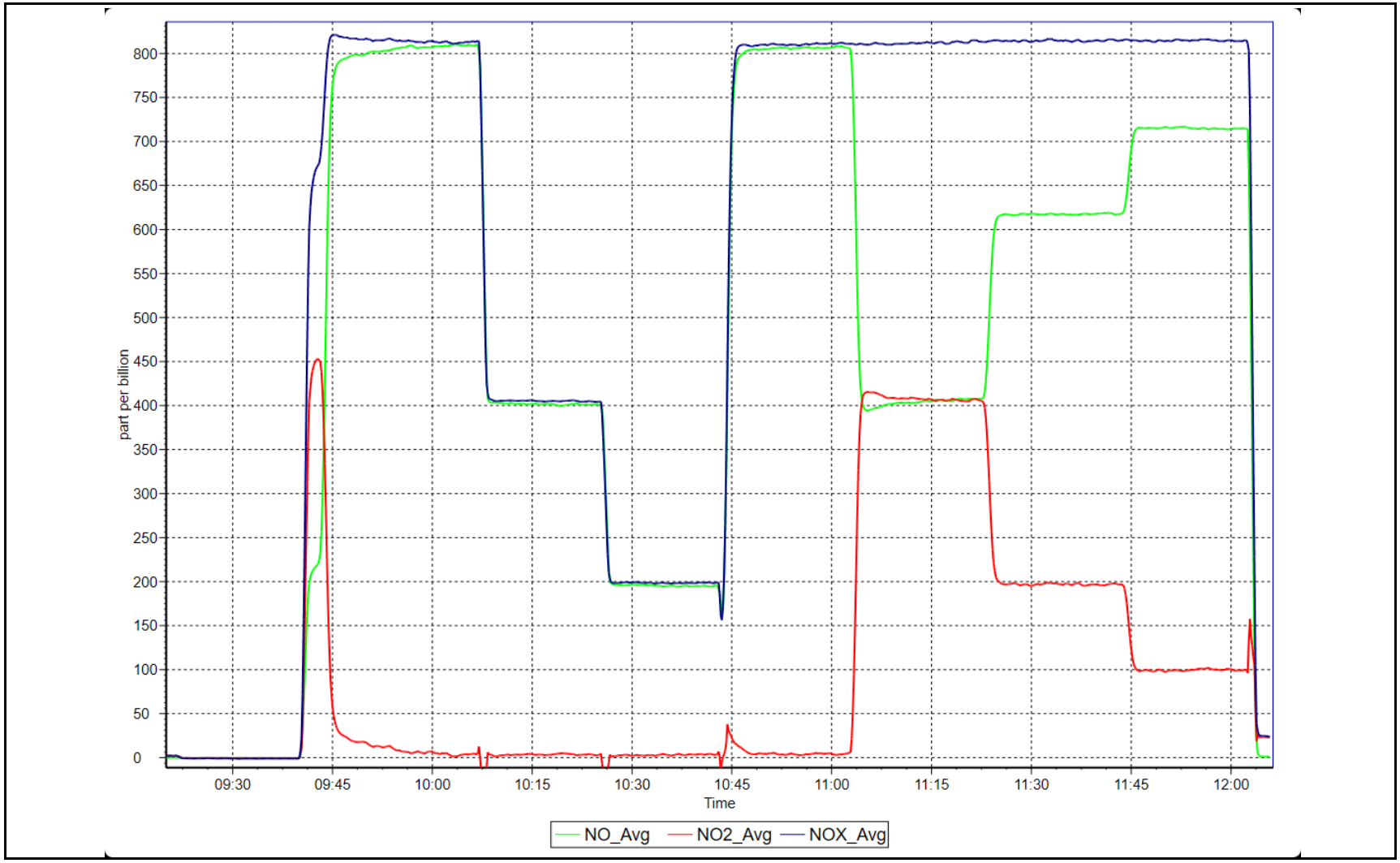
As Found Statistics

As found	NO_X r^2: 0.999982	*Percent Change	NO_X = 1.4%
As found	NO r^2: 0.999938	*Percent Change	NO = 1.0%
As found	NO_2 r^2: 0.999899	Nx Sl: 1.016186	Nx Int: -2.605
		NO Sl: 1.013155	NO Int: -3.327
		NO2 Sl: 1.013416	NO_2 Int: 1.062

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero	----	----	0.0	-0.6	----	----
As found high GPT point	808.0	407.2	402.1	407.4	0.9871	101.3%
As found mid GPT point	808.0	617.1	192.2	198.0	0.9709	103.0%
As found low GPT point	808.0	713.7	95.6	98.7	0.9689	103.2%

NO_X Calibration Plot Date: January 28, 2025 Location: Jackfish 1



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Jackfish 1
Station number:	AMS 506
Calibration Date:	January 29, 2025
Last Cal Date:	NA
Start time (MST):	10:51
End time (MST):	14:27
Reason:	Install

Calibration Standards

NO Gas Cylinder #:	DT0022706	Cal Gas Expiry Date:	January 5, 2032
NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.10 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	60.20 ppm	Removed Gas NO Conc:	60.10 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	3252
ZAG make/model:	Teledyne API 701	Serial Number:	4427

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation		*Percent Change	NO_X =	NA
Baseline Corr 1st pt	NO_X = NA	ppb	NO = NA	ppb	As Found Statistics		*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO_X = NA	ppb	NO = NA	ppb	As found	NO_X r^2:	Nx Sl:	Nx Int:	
Baseline Corr 3rd pt	NO_X = NA	ppb	NO = NA	ppb	As found	NO r^2:	NO Sl:	NO Int:	
					As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:	

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i Serial Number: 12400232071

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	Finish		Start	Finish
NO coeff or slope:		0.939	NO bkgnd or offset:		0.8
NOX coeff or slope:		0.993	NOX bkgnd or offset:		0.9
NO2 coeff or slope:		1.000	Reaction cell Press:		192.2

Calibration Statistics

	Start	Finish
NO_X Cal Slope:		1.001518
NO_X Cal Offset:		1.313569
NO Cal Slope:		1.000376
NO Cal Offset:		-0.128187
NO_2 Cal Slope:		0.993390
NO_2 Cal Offset:		0.722478

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
High point	4933	66.6	801.9	800.6	1.3	804.0	801.0	2.7	0.9974	0.9995
Mid point	4967	33.3	400.9	400.2	0.7	402.8	399.7	3.1	0.9953	1.0014
Low point	4983	16.6	199.9	199.5	0.3	203.4	199.7	3.7	0.9827	0.9992
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.2	0.0	----	----
As left span	4933	66.6	801.9	390.3	411.6	797.2	390.3	406.9	1.0059	1.0000
								Average Correction Factor	0.9918	1.0000

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	-0.1	----	----
High GPT point	799.9	390.2	411.0	408.8	1.0055	99.5%
Mid GPT point	799.9	587.9	213.3	212.4	1.0044	99.6%
Low GPT point	799.9	686.4	114.8	116.1	0.9891	101.1%
				Average Correction Factor	0.9996	100.0%

Notes: Changed inlet filter. Adjusted zero and span.

Calibration Performed By: Sean Bala

Wood Buffalo Environmental Association

NO_X Calibration Summary

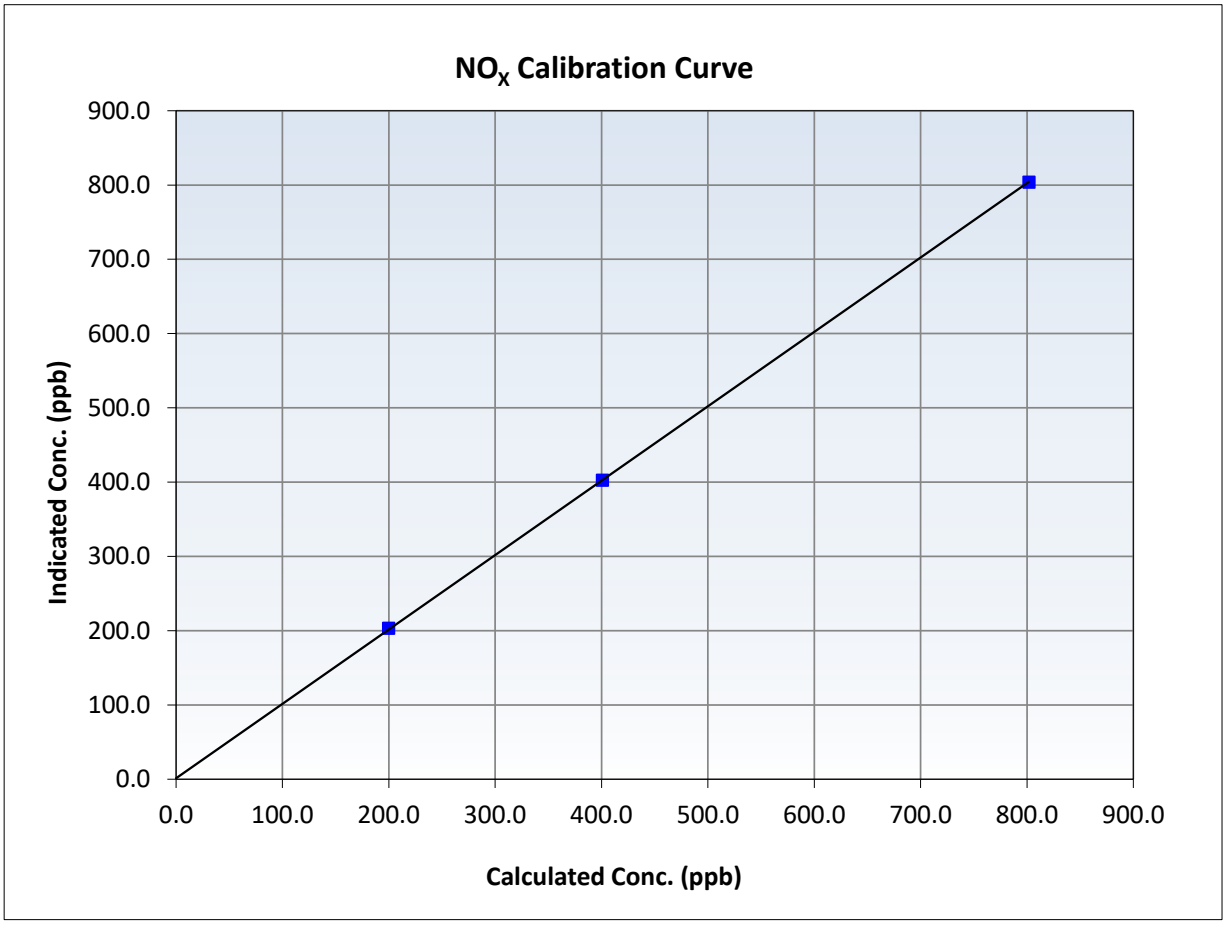
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	NA
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	10:51	End Time (MST):	14:27
Analyzer make:	Thermo 42i	Analyzer serial #:	12400232071

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
801.9	804.0	0.9974
400.9	402.8	0.9953
199.9	203.4	0.9827

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999983	*≥0.995*
Slope	1.001518	*0.90 - 1.10*
Intercept	1.313569	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

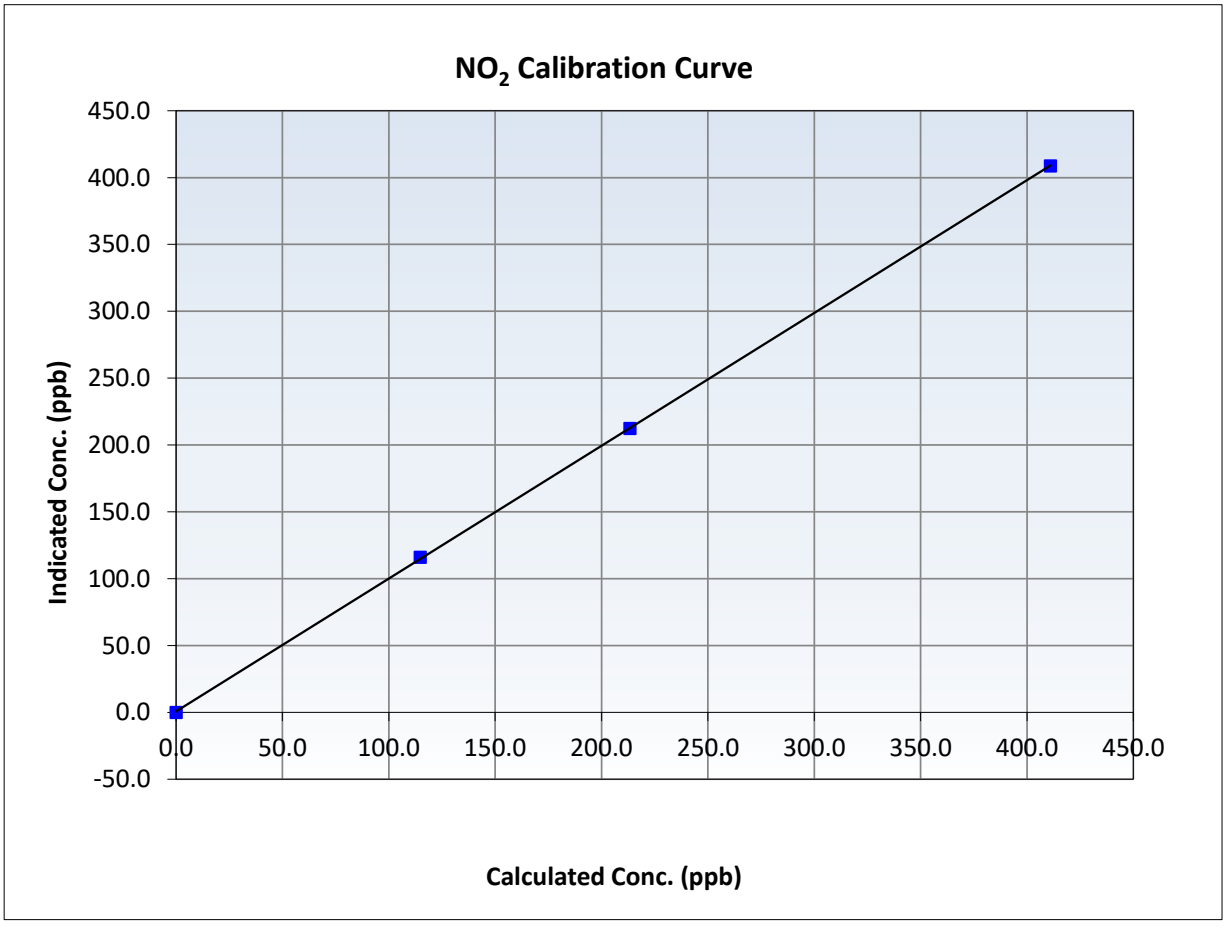
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	NA
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	10:51	End Time (MST):	14:27
Analyzer make:	Thermo 42i	Analyzer serial #:	12400232071

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
411.0	408.8	1.0055
213.3	212.4	1.0044
114.8	116.1	0.9891

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999972	*≥0.995*
Slope	0.993390	*0.90 - 1.10*
Intercept	0.722478	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

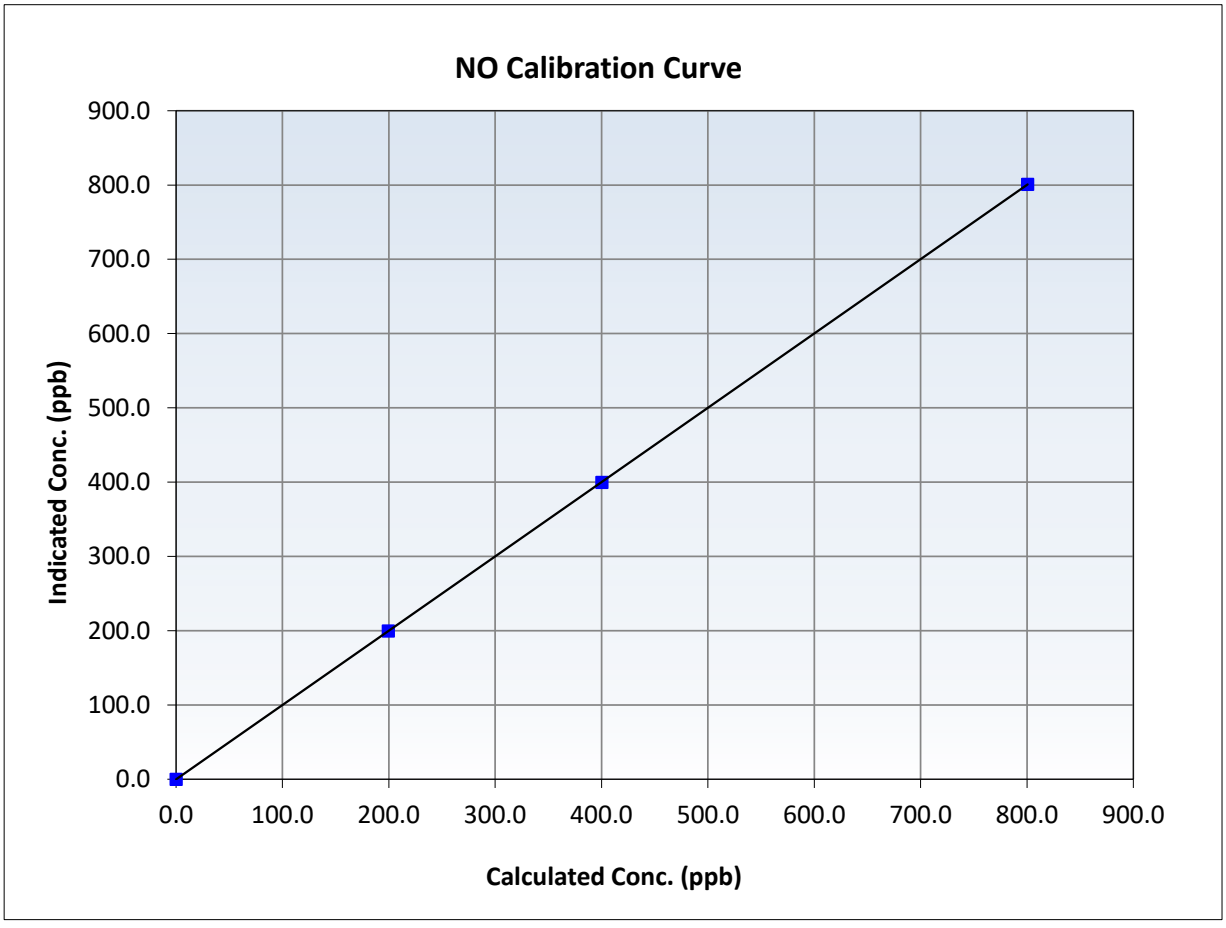
Station Information

Calibration Date:	January 29, 2025	Previous Calibration:	NA
Station Name:	Jackfish 1	Station Number:	AMS 506
Start Time (MST):	10:51	End Time (MST):	14:27
Analyzer make:	Thermo 42i	Analyzer serial #:	12400232071

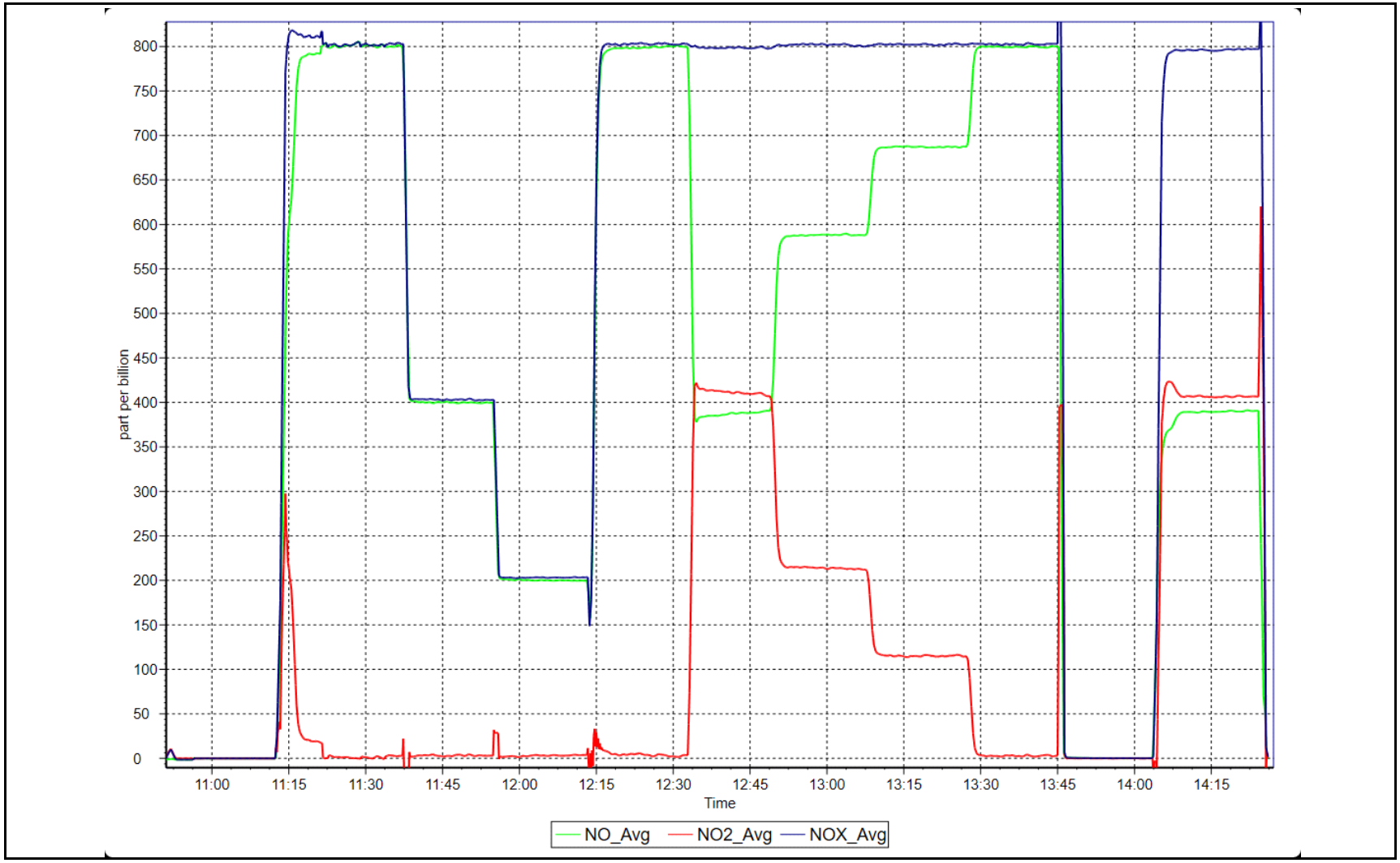
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	801.0	0.9995
400.2	399.7	1.0014
199.5	199.7	0.9992

Statistical Evaluation		Limits
Correlation Coefficient	0.999999	≥0.995
Slope	1.000376	0.90 - 1.10
Intercept	-0.128187	+/-20



NO_X Calibration Plot Date: January 29, 2025 Location: Jackfish 1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS508
KIRBY NORTH
JANUARY 2025

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

February 28, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	January 8, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	12:58	End time (MST):	16:21
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	49.18	ppm	Cal Gas Exp Date:	February 23, 2025
Cal Gas Cylinder #:	CC303554			
Removed Cal Gas Conc:	49.18	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	5240
Zero Air Gen Model:	Teledyne API T701H		Serial Number:	880

Analyzer Information

Analyzer make:	Thermo 43iQ		Serial Number:	1182340007	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.994819	1.000821	Backgd or Offset:	27.3	27.9
Calibration intercept:	0.431080	0.530926	Coeff or Slope:	1.072	1.072

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.4	----
As found High point	4919	81.3	799.6	802.0	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	801.6	Previous response	795.9	*% change	0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.4	----
High point	4919	81.3	799.6	801.0	0.998
Mid point	4959	40.7	400.3	400.5	1.000
Low point	4980	20.3	199.7	201.0	0.993
As left zero	5000	0.0	0.0	0.0	----
As left span	4919	81.3	799.6	804.0	0.995
				Average Correction Factor:	0.997

Notes: Changed sample inlet filter after as founds. Adjusted zero.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

SO_2 Calibration Summary

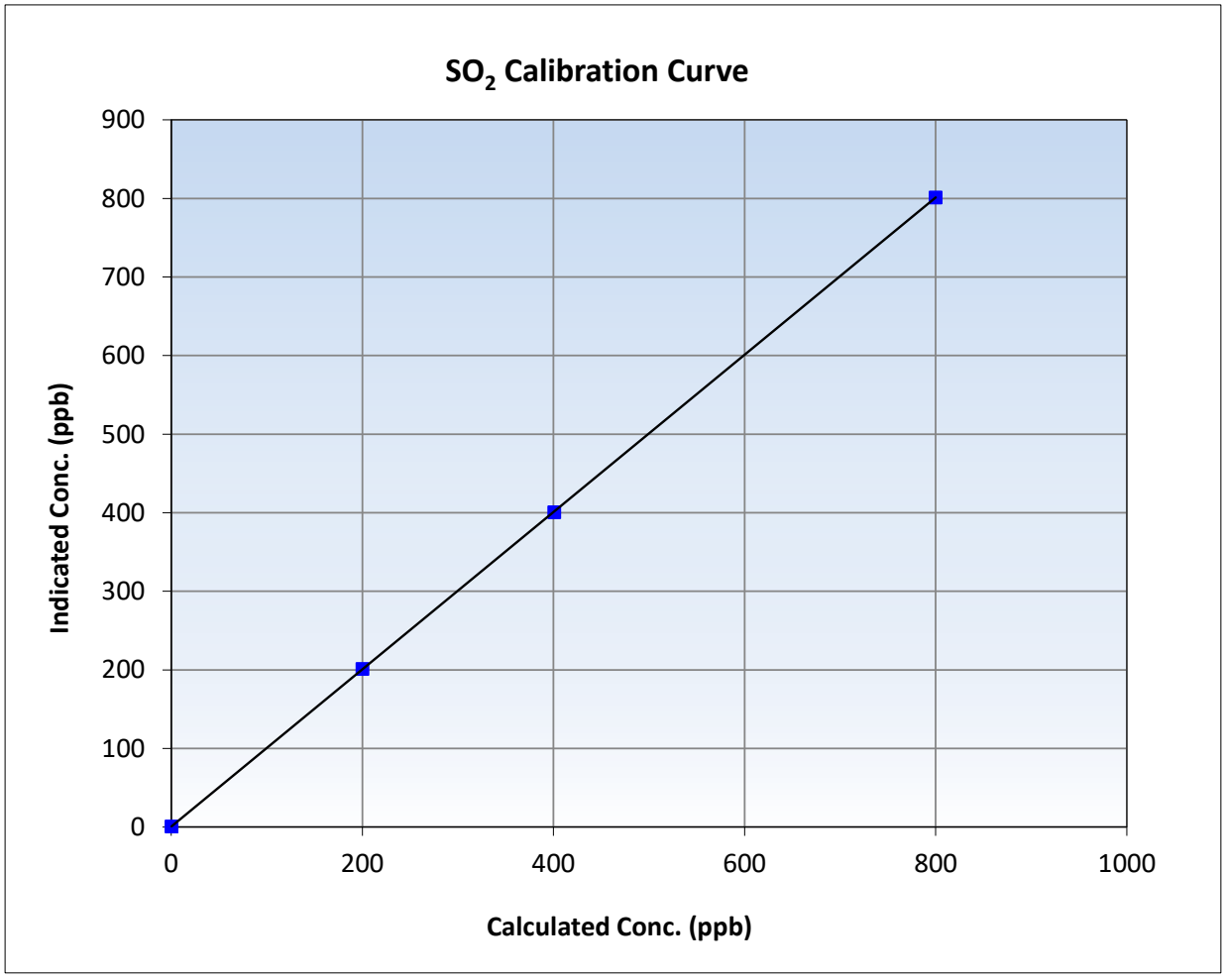
Station Information

Calibration Date:	January 8, 2025	Previous Calibration:	December 12, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	12:58	End Time (MST):	16:21
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1182340007

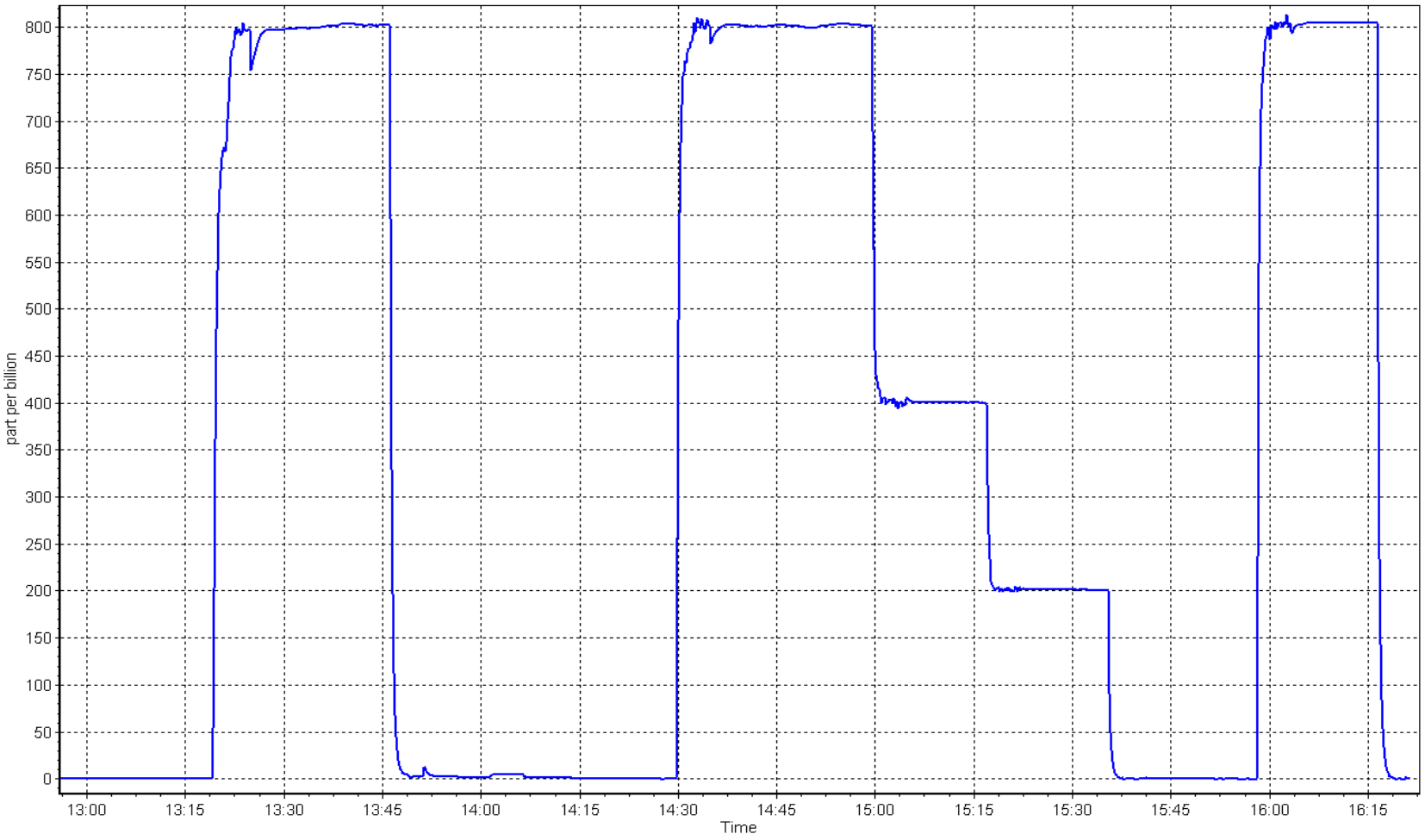
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.4	----
799.6	801.0	0.9983
400.3	400.5	0.9996
199.7	201.0	0.9933

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999997	*≥0.995*
Slope	1.000821	*0.90 - 1.10*
Intercept	0.530926	*+/-30*



SO2 Calibration Plot Date: January 8, 2025 Location: Kirby North



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	January 9, 2025	Last Cal Date:	December 11, 2024
Start time (MST):	8:26	End time (MST):	14:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.05	ppm	Cal Gas Exp Date:	November 15, 2026
Cal Gas Cylinder #:	DT0019762			
Removed Cal Gas Conc:	5.05	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	n/a		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T750		Serial Number:	282
ZAG Make/Model:	Teledyne API T751H		Serial Number:	321

Analyzer Information

Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1150840012	
Converter make:	Global		Converter serial #:	2022-197	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.001242	1.009685	Backgd or Offset:	1.74	1.72
Calibration intercept:	-0.240953	-0.218967	Coeff or Slope:	1.030	1.041

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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	-0.1	----
As found High point	4921	79.2	80.0	80.2	0.996
As found Mid point	4960	39.6	40.0	39.7	1.005
As found Low point	4980	19.8	20.0	19.7	1.010
New cylinder response					

Baseline Corr As found:	80.3	Prev response:	79.85	*% change:	0.6%
Baseline Corr 2nd AF pt:	39.8	AF Slope:	1.004528	AF Intercept:	-0.280957
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999972	* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	-0.1	----
High point	4921	79.2	80.0	80.6	0.992
Mid point	4960	39.6	40.0	40.1	0.997
Low point	4980	19.8	20.0	19.9	1.005
As left zero	5000	0.0	0.0	0.0	----
As left span	4921	79.2	80.0	79.9	1.001
SO2 Scrubber Check	4919	80.0	800.2	0.1	----
Date of last scrubber change:		July 25, 2023		Ave Corr Factor	0.998
Date of last converter efficiency test:		n/a			

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

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

H2S Calibration Summary

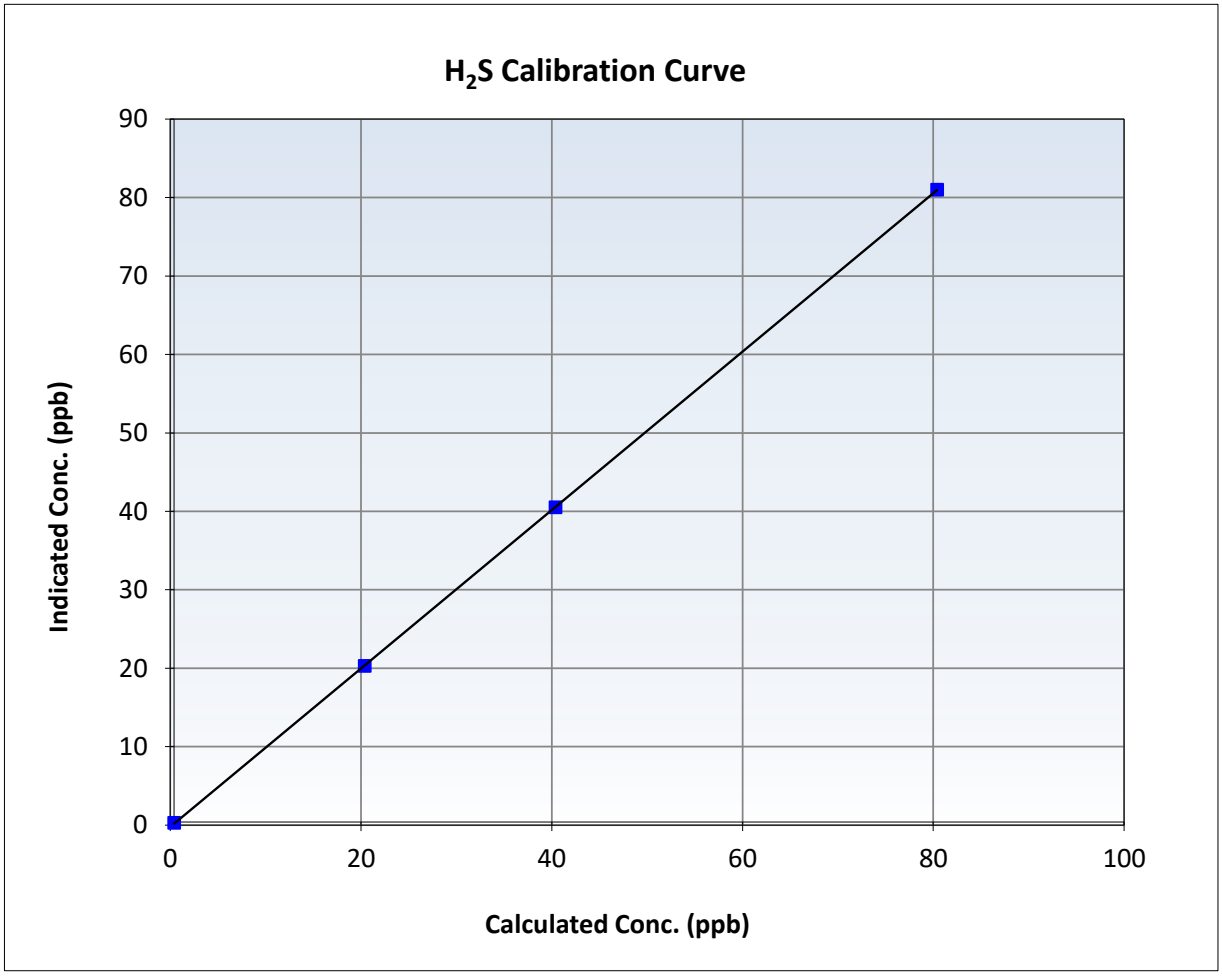
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 11, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	8:26	End Time (MST):	14:07
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1150840012

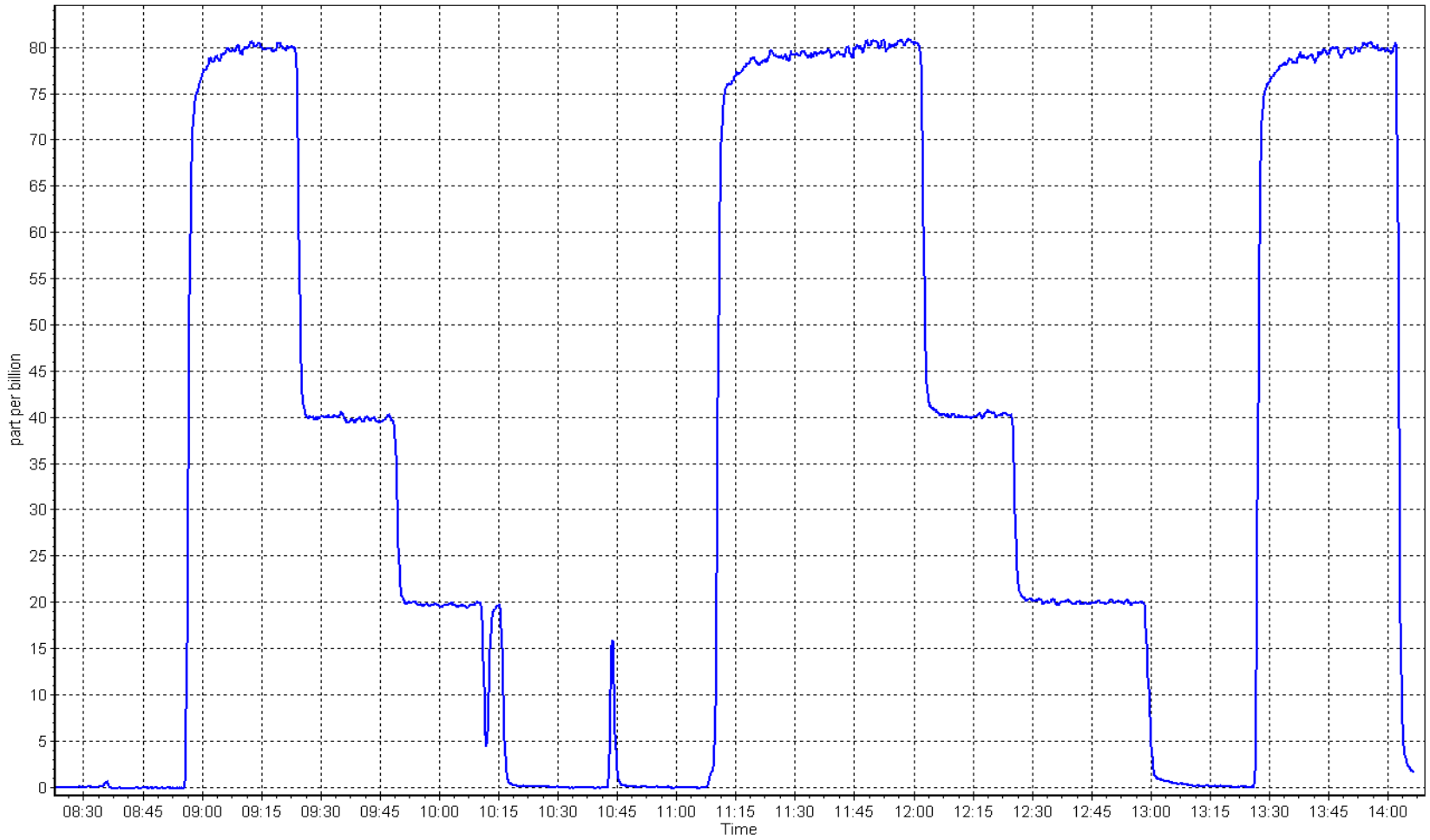
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
80.0	80.6	0.9925
40.0	40.1	0.9975
20.0	19.9	1.0050

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999994	*≥0.995*
Slope	1.009685	*0.90 - 1.10*
Intercept	-0.218967	*+/-3*



H2S Calibration Plot Date: January 9, 2025 Location: Kirby North



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Station Name:	Kirby North	Station number:	AMS 508
Calibration Date:	January 8, 2025	Last Cal Date:	December 12, 2024
Start time (MST):	12:58	End time (MST):	16:21
Reason:	Routine		

Calibration Standards

Gas Cert Reference:	CC303554		Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	496.6	ppm	CH4 Equiv Conc.	1061.7	ppm
C3H8 Cal Gas Conc.	205.5	ppm			
Removed Gas Cert:	NA		Removed Gas Expiry:	NA	
Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1061.7	ppm
Removed C3H8 Conc.	205.5	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5240	
ZAG Make/Model:	Teledyne API T701H		Serial Number:	880	

Analyzer Information

Analyzer make: Thermo 51i-LT Analyzer serial #: 1182340005

Analyzer Range: 0 - 20 ppm

	Start	*Finish*		*Start*	*Finish*
Calibration slope:	0.996210	1.001060	Background:	2.13	2.16
Calibration intercept:	0.030089	-0.057302	Coefficient:	3.659	3.703

THC As Found Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.00	-0.04	----
As found High point	4919	81.3	17.26	17.08	1.009
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	17.12	Previous response	17.23	*% change	-0.7%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.00	-0.05	
High point	4919	81.3	17.26	17.23	1.002
Mid point	4959	40.7	8.64	8.58	1.007
Low point	4980	20.3	4.31	4.26	1.011
As left zero	5000	0.0	0.00	-0.04	----
As left span	4919	81.3	17.26	17.34	0.996
				Average Correction Factor	1.007

Notes: Changed sample inlet filter and Hydrogen cylinder after as founds. Adjusted span.

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

THC Calibration Summary

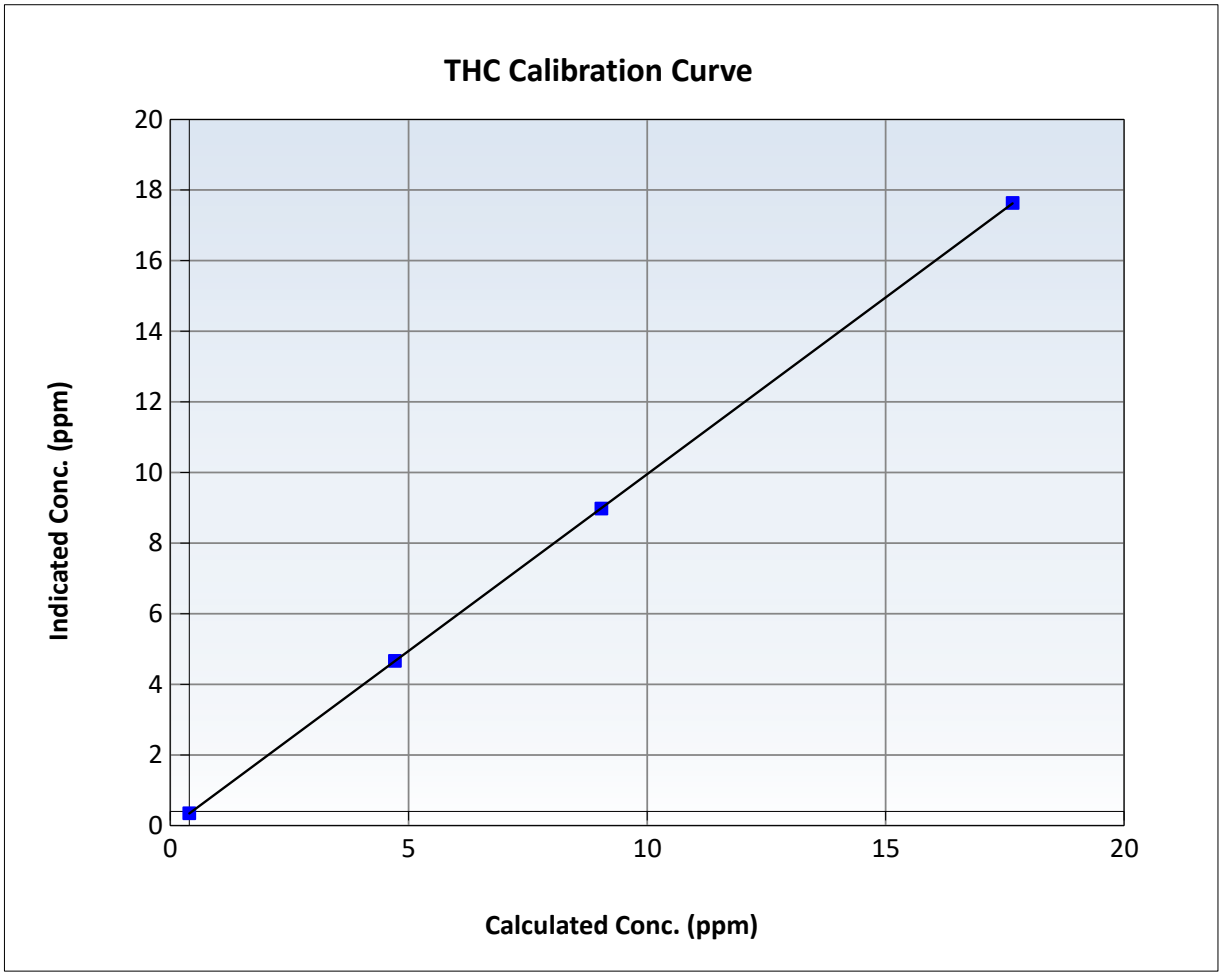
Station Information

Calibration Date:	January 8, 2025	Previous Calibration:	December 12, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	12:58	End Time (MST):	16:21
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1182340005

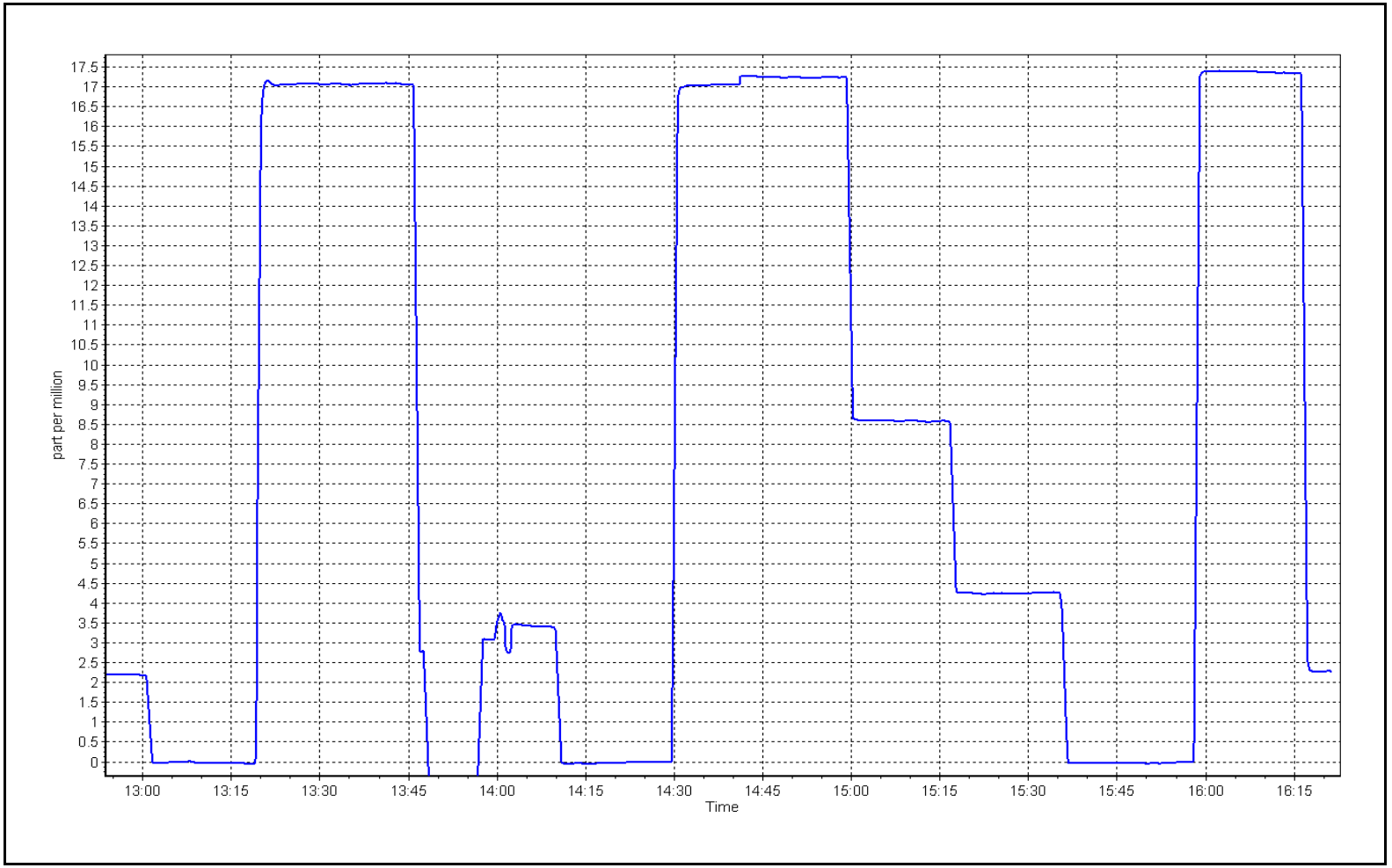
Calibration Data

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)
0.00	-0.05	----
17.26	17.23	1.0019
8.64	8.58	1.0073
4.31	4.26	1.0114

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999998	*≥0.995*
Slope	1.001060	*0.90 - 1.10*
Intercept	-0.057302	*+/-1.5*



THC Calibration Plot Date: January 8, 2025 Location: Kirby North



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Kirby North
Station number:	AMS 508
Calibration Date:	January 9, 2025
Last Cal Date:	December 10, 2024
Start time (MST):	8:26
End time (MST):	13:14
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T34ULGL	Cal Gas Expiry Date:	March 8, 2025
NOX Cal Gas Conc:	49.39 ppm	NO Cal Gas Conc:	49.02 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	49.39 ppm	Removed Gas NO Conc:	49.02 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	5240
ZAG make/model:	Teledyne API T701H	Serial Number:	880

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	0.2	0.2	0.0	----	----
AF High point	4918	81.6	806.1	800.1	6.0	800.0	794.7	5.7	1.0079	1.0070
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X = 806.2 ppb	NO = 800.6 ppb
Baseline Corr 1st pt	NO_X = 799.8 ppb	NO = 794.5 ppb
Baseline Corr 2nd pt	NO_X = NA ppb	NO = NA ppb
Baseline Corr 3rd pt	NO_X = NA ppb	NO = NA ppb

* = > +/-5% change initiates investigation

As Found Statistics

As found	NO_X r^2:	Nx Sl:	Nx Int:
As found	NO r^2:	NO Sl:	NO Int:
As found	NO_2 r^2:	NO2 Sl:	NO_2 Int:

*Percent Change	NO_X = -0.8%
*Percent Change	NO = -0.8%

As Found GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero						
As found high GPT point						
As found mid GPT point						
As found low GPT point						

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Thermo 42i

Serial Number: 1118148496

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	0.698	0.701	NO bkgnd or offset:	7.6	8.0
NOX coeff or slope:	0.993	0.996	NOX bkgnd or offset:	7.6	8.1
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	146.8	146.8

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001923	1.000406
NO_X Cal Offset:	-1.463910	-0.603894
NO Cal Slope:	1.003129	1.000686
NO Cal Offset:	-1.964029	-1.284038
NO_2 Cal Slope:	0.978262	0.992657
NO_2 Cal Offset:	2.102038	1.202338

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
High point	4918	81.6	806.1	800.1	6.0	806.0	799.8	6.1	1.0001	1.0003
Mid point	4959	40.8	403.0	400.0	3.0	402.6	398.8	3.8	1.0011	1.0031
Low point	4980	20.4	201.5	200.0	1.5	200.3	197.4	2.9	1.0060	1.0131
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
As left span	4918	81.6	806.1	401.5	404.6	800.0	401.5	398.9	1.0076	1.0000
							Average Correction Factor		1.0024	1.0055

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	796.7	399.7	403.0	400.7	1.0058	99.4%
Mid GPT point	796.7	609.2	193.5	193.9	0.9981	100.2%
Low GPT point	796.7	701.2	101.5	103.2	0.9839	101.6%
				Average Correction Factor	0.9960	100.4%

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

Calibration Performed By: Braiden Boutilier

Wood Buffalo Environmental Association

NO_X Calibration Summary

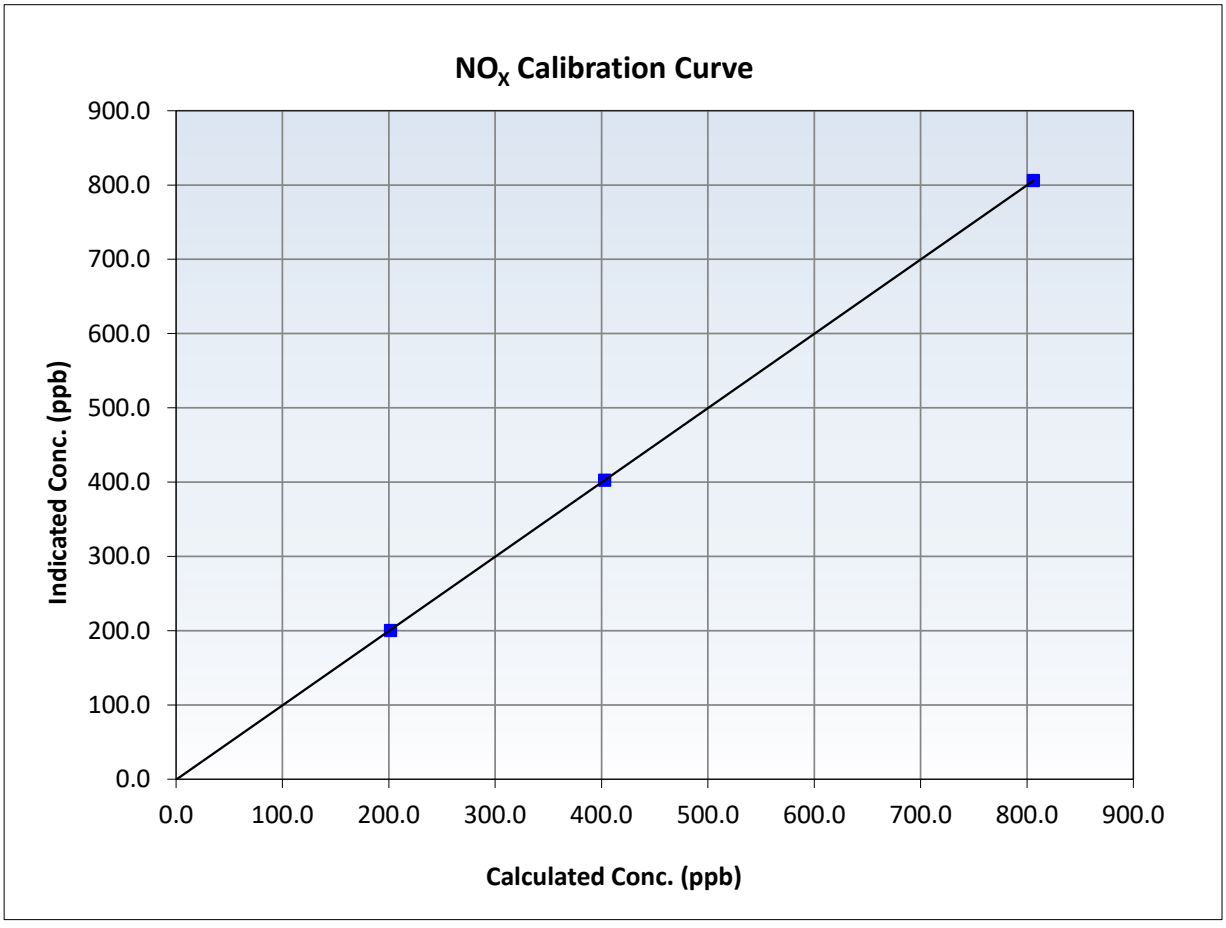
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 10, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	8:26	End Time (MST):	13:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
806.1	806.0	1.0001
403.0	402.6	1.0011
201.5	200.3	1.0060

Statistical Evaluation		Limits
Correlation Coefficient	0.999998	≥0.995
Slope	1.000406	0.90 - 1.10
Intercept	-0.603894	+/-20



Wood Buffalo Environmental Association

NO_2 Calibration Summary

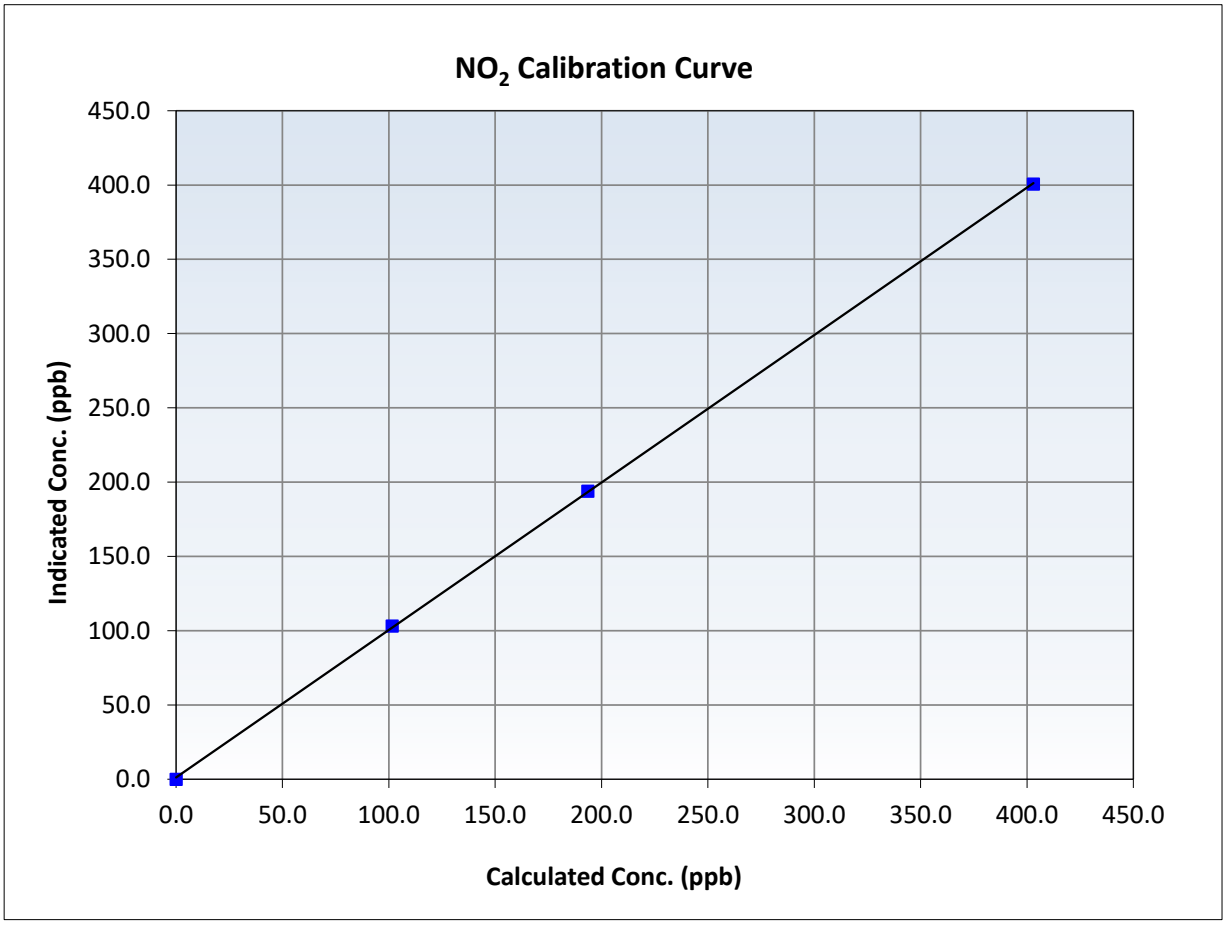
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 10, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	8:26	End Time (MST):	13:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
403.0	400.7	1.0058
193.5	193.9	0.9981
101.5	103.2	0.9839

Statistical Evaluation		Limits
Correlation Coefficient	0.999959	≥0.995
Slope	0.992657	0.90 - 1.10
Intercept	1.202338	+/-20



Wood Buffalo Environmental Association

NO Calibration Summary

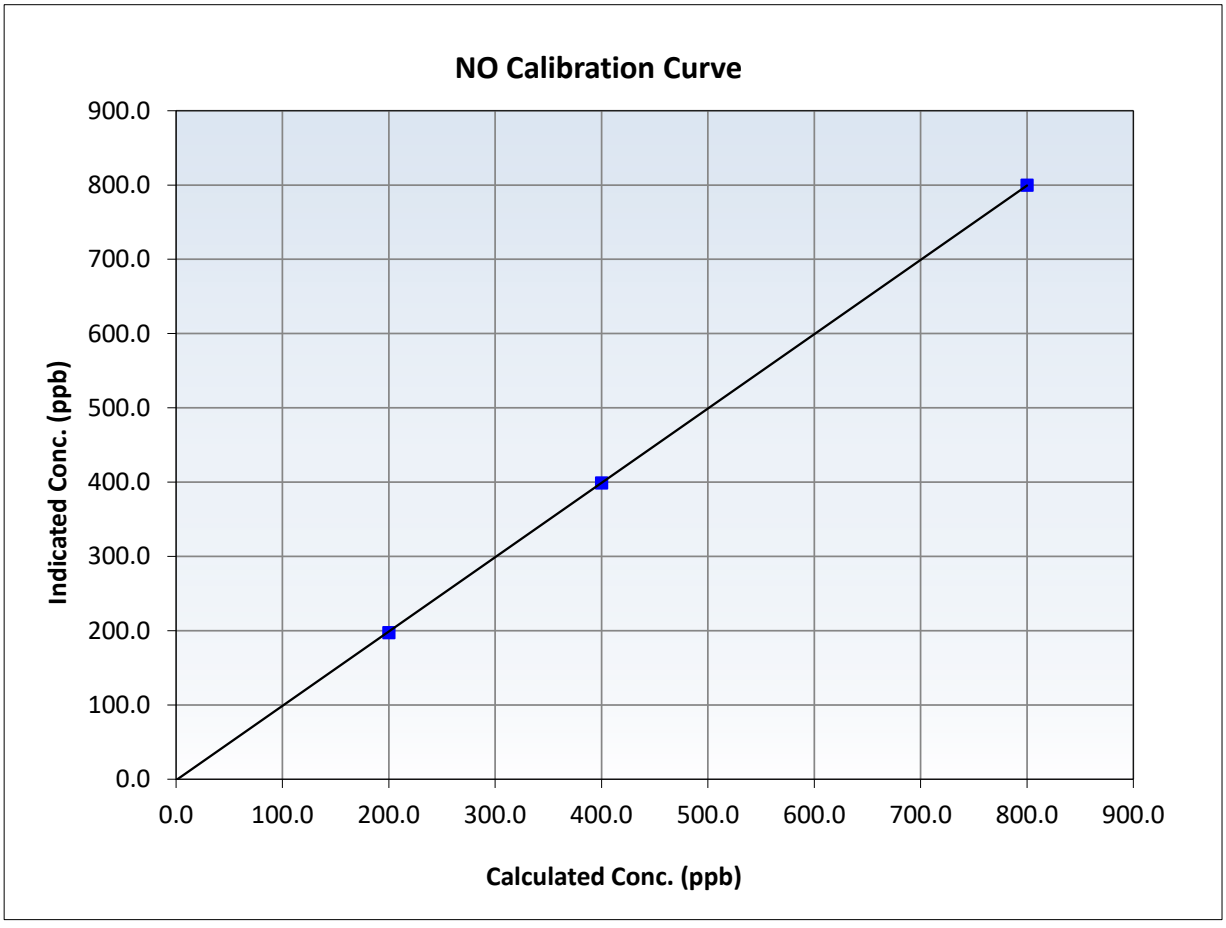
Station Information

Calibration Date:	January 9, 2025	Previous Calibration:	December 10, 2024
Station Name:	Kirby North	Station Number:	AMS 508
Start Time (MST):	8:26	End Time (MST):	13:14
Analyzer make:	Thermo 42i	Analyzer serial #:	1118148496

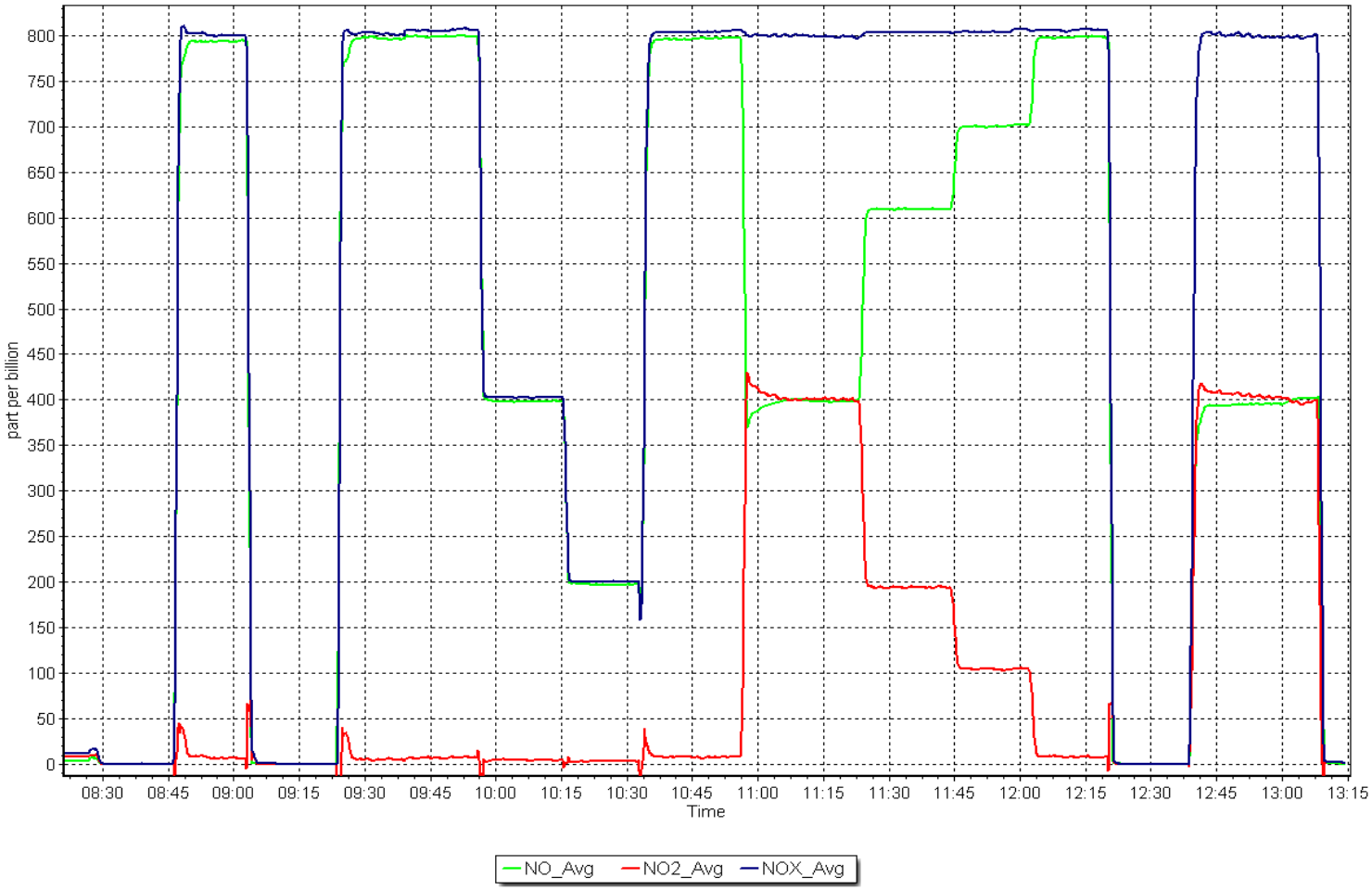
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	-0.1	----
800.1	799.8	1.0003
400.0	398.8	1.0031
200.0	197.4	1.0131

Statistical Evaluation		Limits
Correlation Coefficient	0.999989	≥0.995
Slope	1.000686	0.90 - 1.10
Intercept	-1.284038	+/-20



NO_X Calibration Plot Date: January 9, 2025 Location: Kirby North



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
CALIBRATION REPORT

AMS512
HANGINGSTONE EXPANSION
DECEMBER 2025

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

January 31, 2025

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Station Name:	Hangingstone Expansion	Station number:	AMS 512
Calibration Date:	January 22, 2025	Last Cal Date:	December 9, 2024
Start time (MST):	7:18	End time (MST):	10:00
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	50.06	ppm	Cal Gas Exp Date:	January 5, 2029
Cal Gas Cylinder #:	CC147416			
Removed Cal Gas Conc:	50.06	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number:	2445
Zero Air Gen Model:	Teledyne API 701		Serial Number:	138

Analyzer Information

Analyzer make:	Thermo scientific		Serial Number:	1173410001	
Analyzer Range:	0 - 1000 ppb				
	Start	***Finish***		***Start***	***Finish***
Calibration slope:	1.003116	1.002315	Backgd or Offset:	14.1	14.2
Calibration intercept:	-1.623537	-2.043317	Coeff or Slope:	1.157	1.175

SO_2 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) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.1	----
As found High point	4920	79.8	799.0	790.9	1.010
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	790.8	Previous response	799.9	*% change	-1.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiates investigation	

SO_2 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.0	----
High point	4920	79.8	799.0	800.0	0.999
Mid point	4960	39.9	399.5	396.8	1.007
Low point	4987	20.0	200.0	196.7	1.017
As left zero	5000	0.0	0.0	0.1	----
As left span	4920	79.8	799.0	799.6	0.999
				Average Correction Factor:	1.007

Notes: No maintanence done. Span adjusted

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Summary

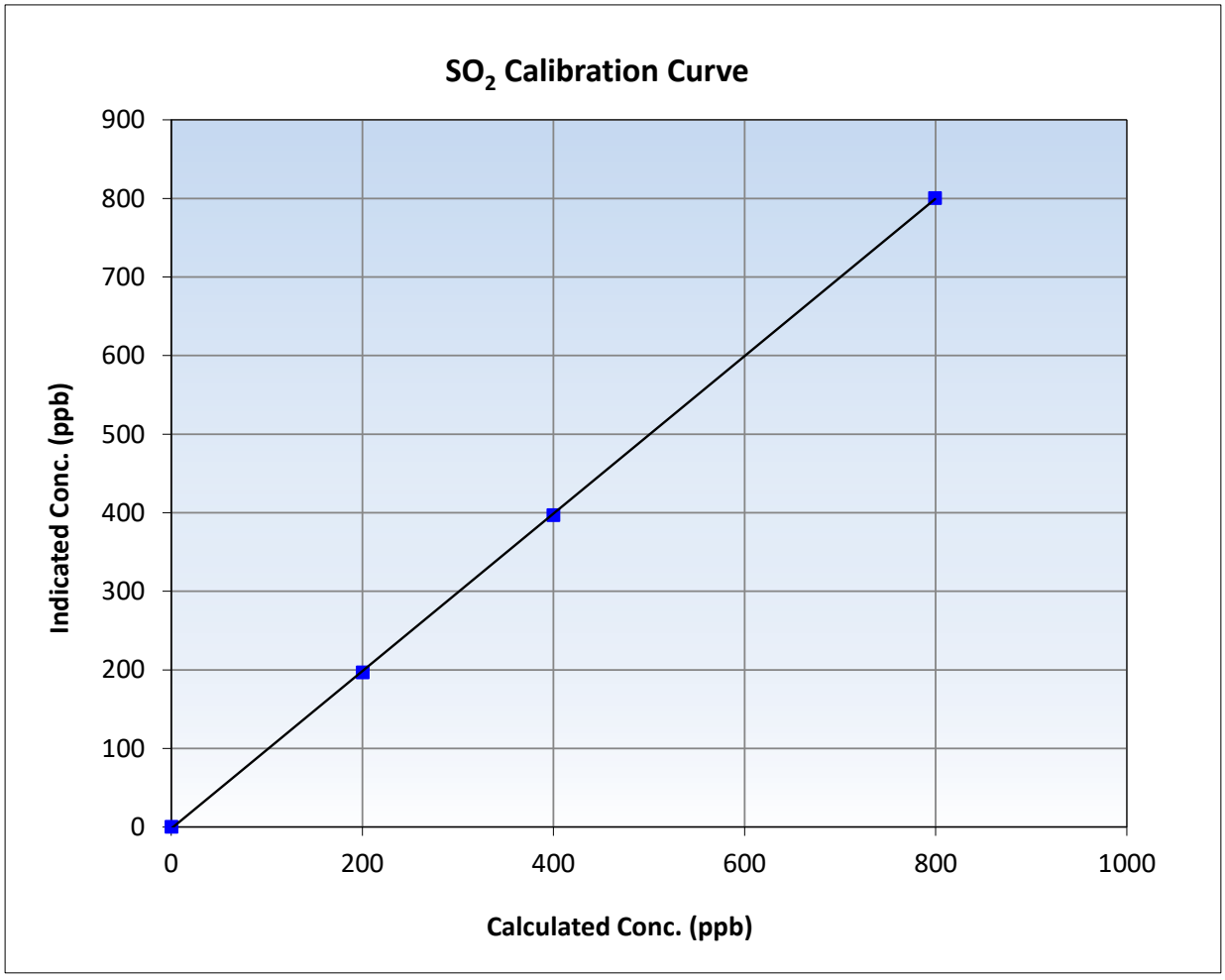
Station Information

Calibration Date:	January 22, 2025	Previous Calibration:	December 9, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:18	End Time (MST):	10:00
Analyzer make:	Thermo scientific	Analyzer serial #:	1173410001

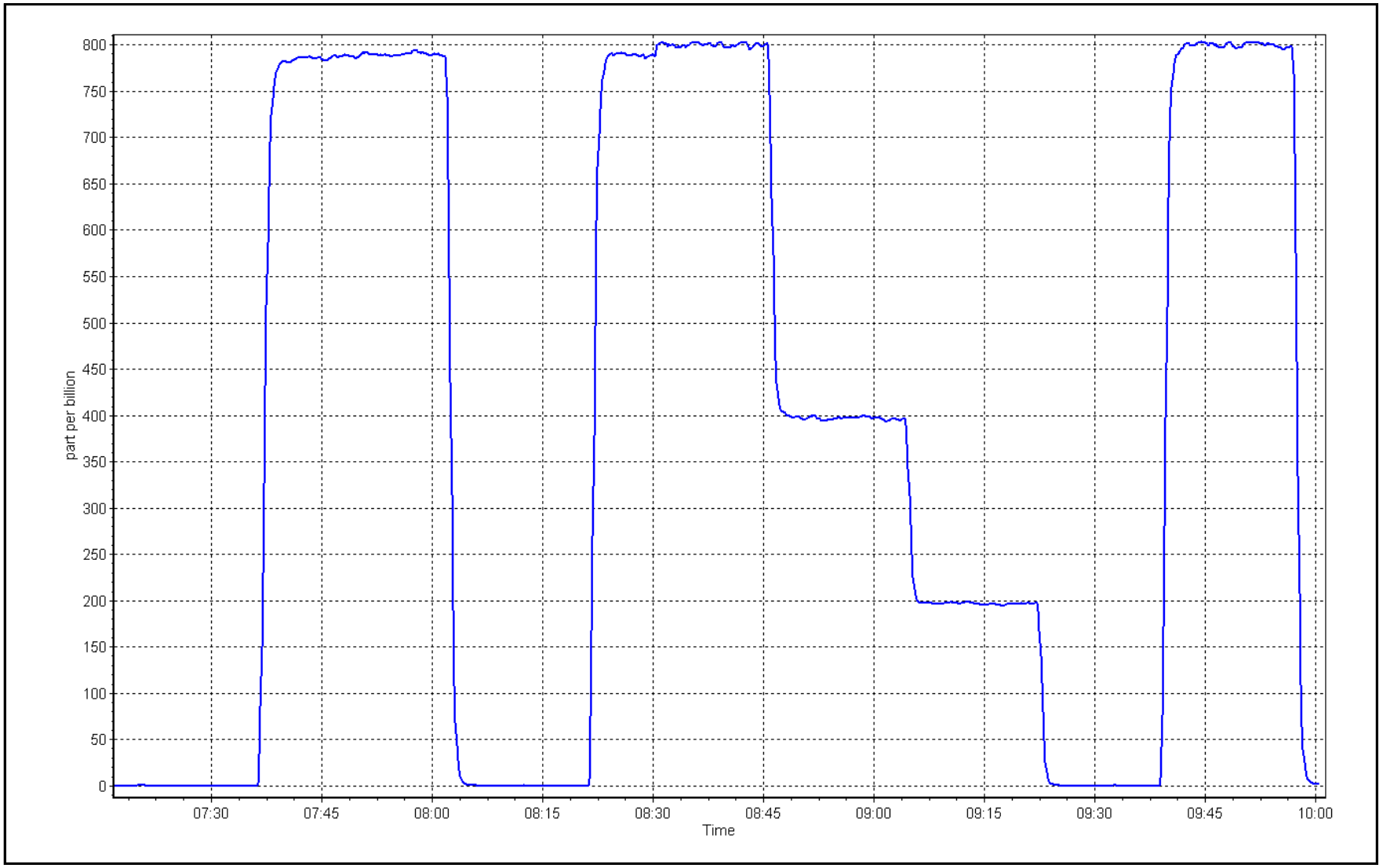
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
799.0	800.0	0.9987
399.5	396.8	1.0068
200.0	196.7	1.0166

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999969	*≥0.995*
Slope	1.002315	*0.90 - 1.10*
Intercept	-2.043317	*+/-30*



SO2 Calibration Plot Date: January 22, 2025 Location: Hangingstone Expansion



Wood Buffalo Environmental Association

H_2S Calibration Report

Station Information

Station Name:	Hangingstone Expansion	Station number:	AMS 512
Calibration Date:	January 17, 2025	Last Cal Date:	December 6, 2024
Start time (MST):	8:07	End time (MST):	12:06
Reason:	Routine		

Calibration Standards

Cal Gas Concentration:	5.139	ppm	Cal Gas Exp Date:	January 3, 2026
Cal Gas Cylinder #:	CC511397			
Removed Cal Gas Conc:	5.139	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:	138

Analyzer Information

Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1336160090
Converter make:	Global G150		Converter serial #:	2022-227
Analyzer Range	0 - 100 ppb		Converter Temp:	325 degC

	Start	***Finish***		***Start***	***Finish***
Calibration slope:	0.997057	0.997488	Backgd or Offset:	3.49	3.56
Calibration intercept:	-0.019091	0.240838	Coeff or Slope:	1.210	1.235

H_2S 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)) *Limit = 0.90-1.10*
As found zero	5000	0.0	0.0	0.2	----
As found High point	4922	77.8	80.0	79.3	1.011
As found Mid point	4961	38.9	40.0	39.7	1.012
As found Low point	4981	19.5	20.0	19.7	1.028
New cylinder response					

Baseline Corr As found:	79.1	Prev response:	79.71	*% change:	-0.8%
Baseline Corr 2nd AF pt:	39.5	AF Slope:	0.990482	AF Intercept:	0.061011
Baseline Corr 3rd AF pt:	19.5	AF Correlation:	0.999981	* = > +/-5% change initiates investigation	

H_2S 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) *Limit = 0.95-1.05*
Calibrator zero	5000	0.0	0.0	0.3	----
High point	4922	77.8	80.0	80.0	1.000
Mid point	4961	38.9	40.0	40.2	0.995
Low point	4981	19.5	20.0	20.1	0.997
As left zero	5000	0.0	0.0	0.3	----
As left span	4922	77.8	80.0	79.9	1.001
SO2 Scrubber Check	4920	80.0	800.0	0.0	----
Date of last scrubber change:				Ave Corr Factor	0.997
Date of last converter efficiency test:					

Notes: Sox scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

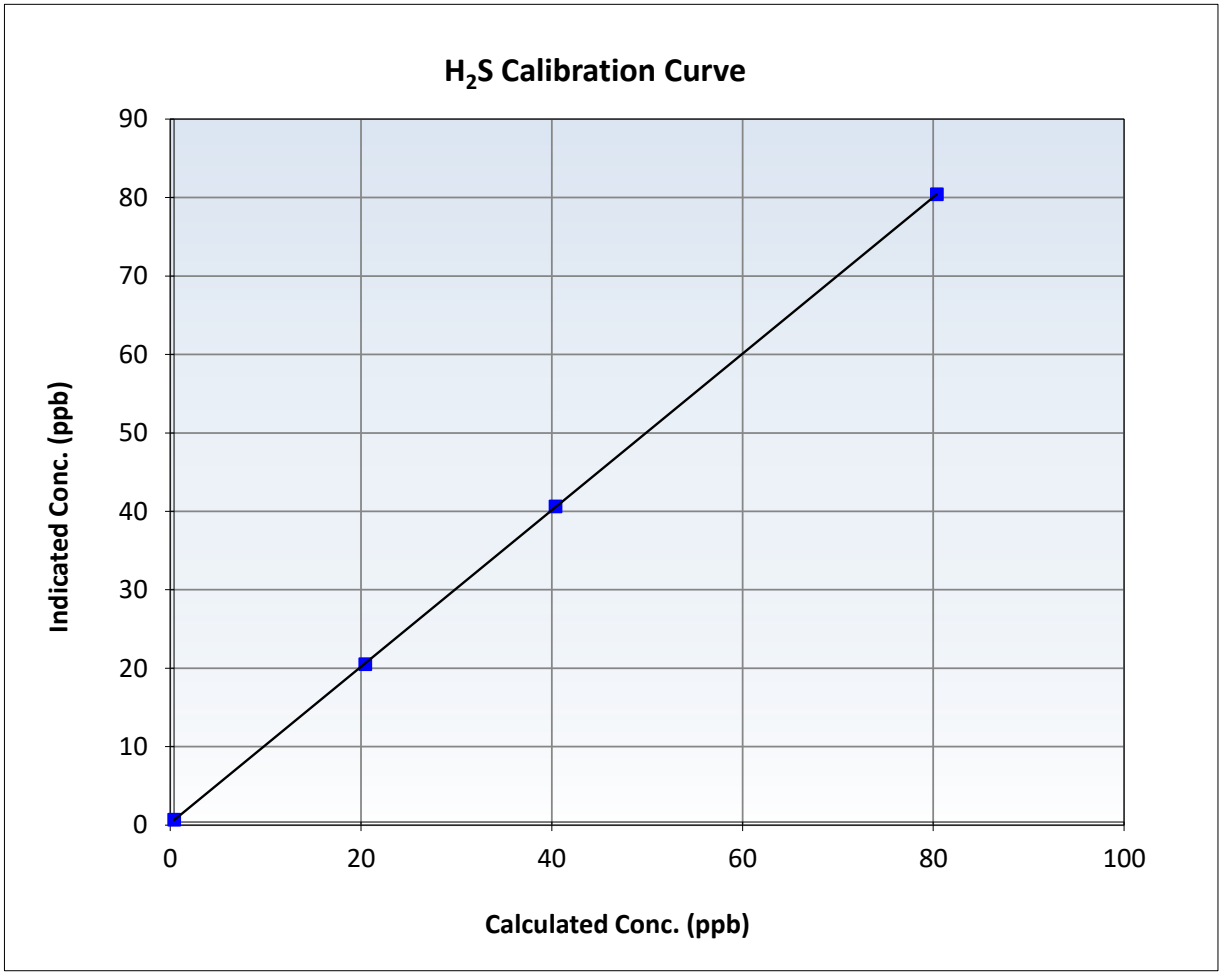
H_2S Calibration Summary

Station Information

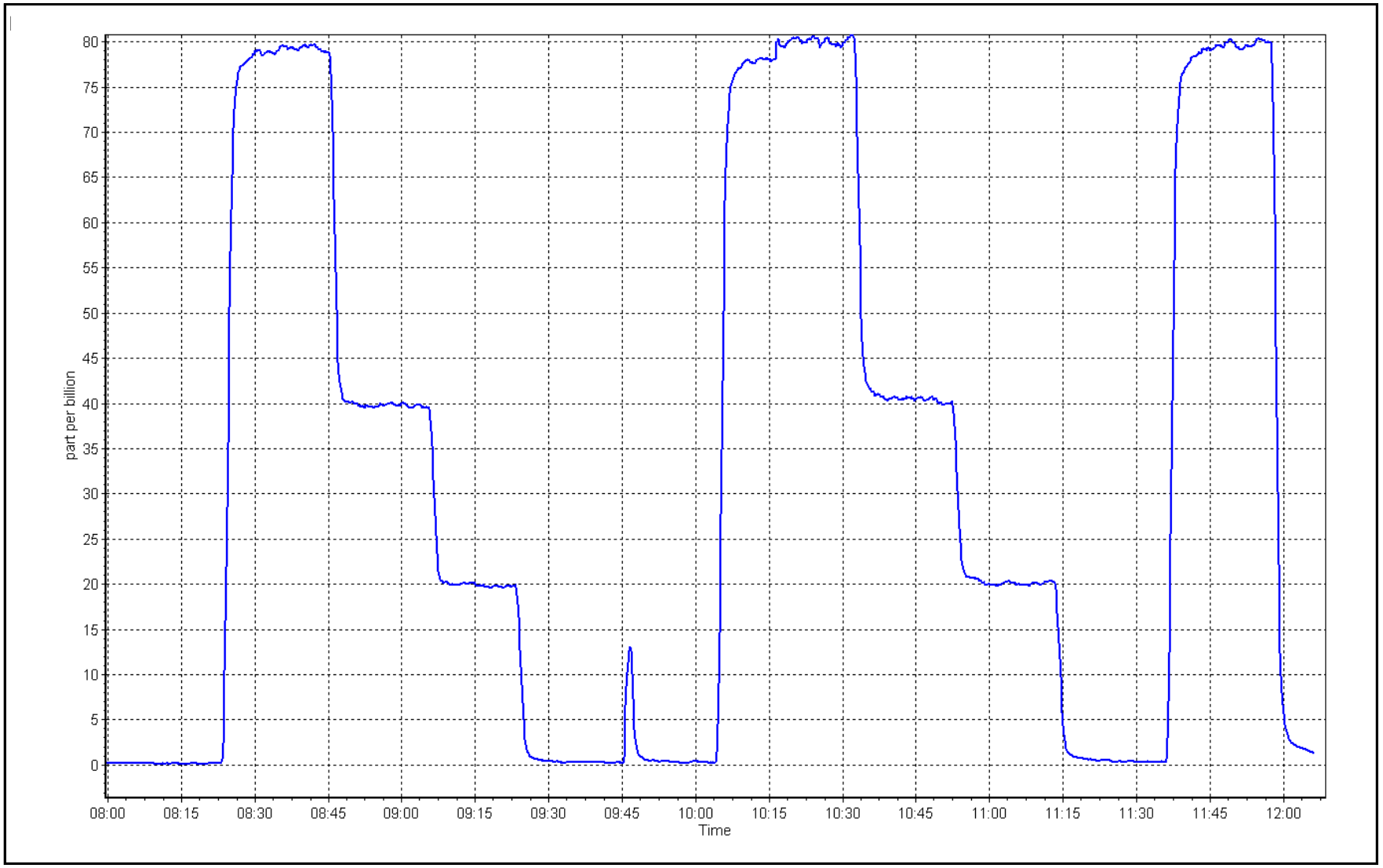
Calibration Date:	January 17, 2025	Previous Calibration:	December 6, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	8:07	End Time (MST):	12:06
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1336160090

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		*Limits*
0.0	0.3	----	Correlation Coefficient	0.999992	*≥0.995*
80.0	80.0	0.9996	Slope	0.997488	*0.90 - 1.10*
40.0	40.2	0.9946			
20.0	20.1	0.9970	Intercept	0.240838	*+/-3*



H_2S Calibration Plot Date: January 17, 2025 Location: Hangingstone Expansion



Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Station Information

Station Name:	Hangingstone Expansion
Station number:	AMS 512
Calibration Date:	January 3, 2025
Last Cal Date:	December 2, 2024
Start time (MST):	7:10
End time (MST):	11:14
Reason:	Routine

Calibration Standards

NO Gas Cylinder #:	T0F8P52	Cal Gas Expiry Date:	August 16, 2026
NOX Cal Gas Conc:	47.43 ppm	NO Cal Gas Conc:	47.43 ppm
Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Removed Gas NOX Conc:	47.43 ppm	Removed Gas NO Conc:	47.43 ppm
NOX gas Diff:		NO gas Diff:	
Calibrator Model:	Teledyne API T700	Serial Number:	2445
ZAG make/model:	Teledyne API T701	Serial Number:	138

As Found Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NOx Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
AF High point	4916	84.4	800.6	800.6	0.0	799.7	799.9	-0.1	1.0008	1.0006
AF Mid point										
AF Low point										
New cyl resp										

Previous Response	NO_X =	800.9 ppb	NO =	800.2 ppb	* = > +/-5% change initiates investigation	*Percent Change	NO_X = -0.1%
Baseline Corr 1st pt	NO_X =	799.9 ppb	NO =	800.1 ppb	As Found Statistics	*Percent Change	NO = 0.0%
Baseline Corr 2nd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO_X r^2:	Nx Sl:	Nx Int:
Baseline Corr 3rd pt	NO_X =	NA ppb	NO =	NA ppb	As found NO r^2:	NO Sl:	NO Int:
					As found NO_2 r^2:	NO2 Sl:	NO_2 Int:

As Found GPT Calibration Data

	O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Baseline Adjusted NO2 Correction factor (Cc/(Ic-AFzero)) *Limit = 0.90 - 1.10*	Converter Efficiency *Limit = 96-104%*
As Found GPT zero							
As found high GPT point							
As found mid GPT point							
As found low GPT point							

Wood Buffalo Environmental Association

NO_X \ NO \ NO_2 Calibration Report

Analyzer Information

Analyzer Make: Teledyne API T200 Serial Number: 7029

NOX Range (ppb): 0 - 1000 ppb

Instrument Settings

	Start	*Finish*		*Start*	*Finish*
NO coeff or slope:	1.056	1.056	NO bkgnd or offset:	0.2	0.2
NOX coeff or slope:	1.052	1.052	NOX bkgnd or offset:	0.4	0.4
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.7	4.7

Calibration Statistics

	Start	*Finish*
NO_X Cal Slope:	1.001494	1.003650
NO_X Cal Offset:	-0.852815	-0.832826
NO Cal Slope:	1.001080	1.004749
NO Cal Offset:	-1.232796	-1.692823
NO_2 Cal Slope:	0.996045	0.996411
NO_2 Cal Offset:	0.110093	0.085743

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) *Limit = 0.95-1.05*	NO Correction factor (Cc/Ic) *Limit = 0.95-1.05*
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
High point	4916	84.4	800.6	800.6	0.0	803.1	803.4	-0.4	0.9968	0.9965
Mid point	4958	42.2	400.3	400.3	0.0	400.4	400.0	0.5	0.9998	1.0008
Low point	4979	21.1	200.2	200.2	0.0	199.3	197.5	1.8	1.0043	1.0134
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.1	0.0	----	----
As left span	4916	84.4	800.6	408.0	392.6	796.6	408.0	388.6	1.0050	1.0000
							Average Correction Factor		1.0003	1.0036

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/Ic) *Limit = 0.95-1.05*	Converter Efficiency *Limit = 96-104%*
Cal zero	----	----	0.0	0.0	----	----
High GPT point	801.2	410.6	390.6	389.1	1.0039	99.6%
Mid GPT point	801.2	625.6	175.6	175.6	1.0000	100.0%
Low GPT point	801.2	714.6	86.6	86.1	1.0058	99.4%
				Average Correction Factor	1.0032	99.7%

Notes: No adjustments and maintenance done.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X Calibration Summary

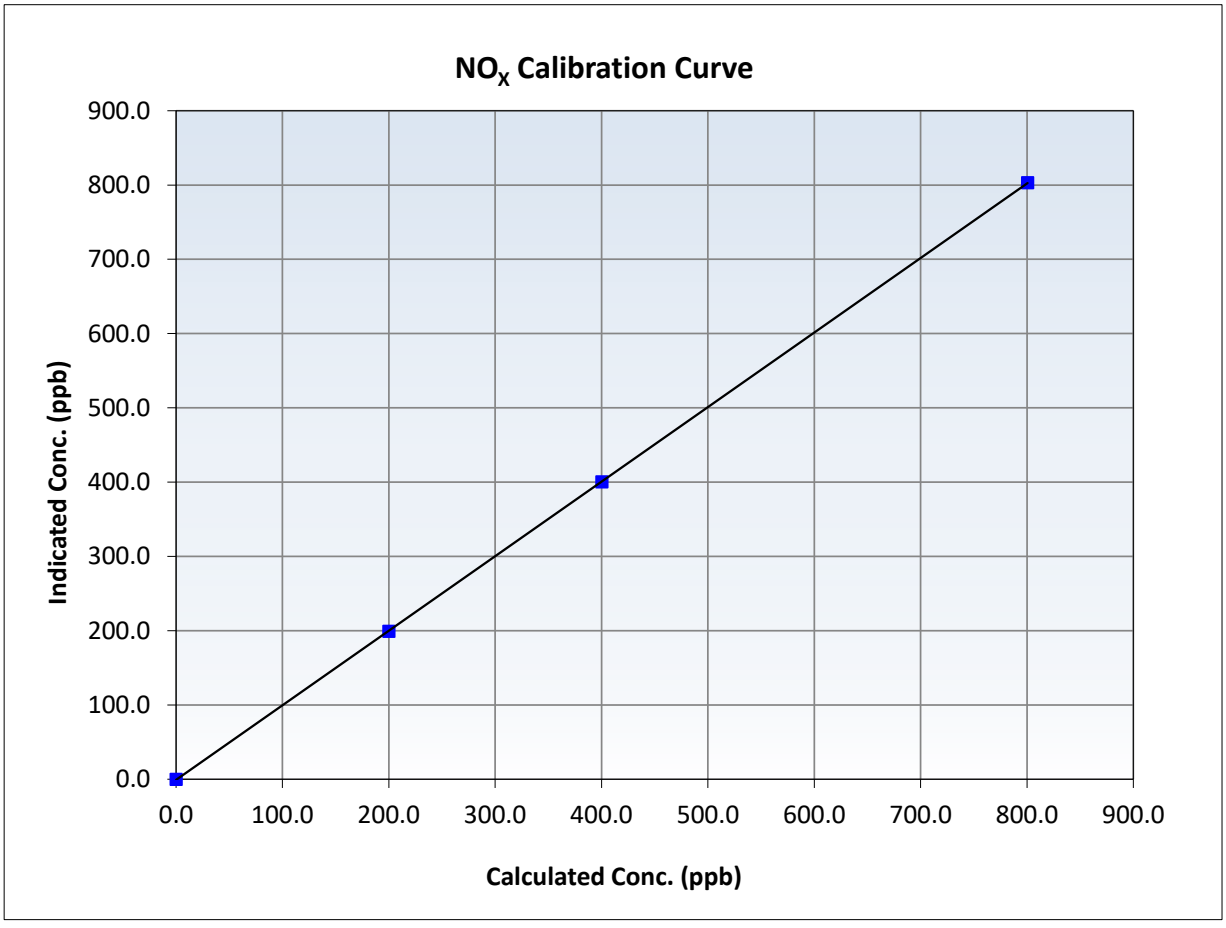
Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 2, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:14
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	803.1	0.9968
400.3	400.4	0.9998
200.2	199.3	1.0043

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	1.003650	*0.90 - 1.10*
Intercept	-0.832826	*+/-20*



Wood Buffalo Environmental Association

NO_2 Calibration Summary

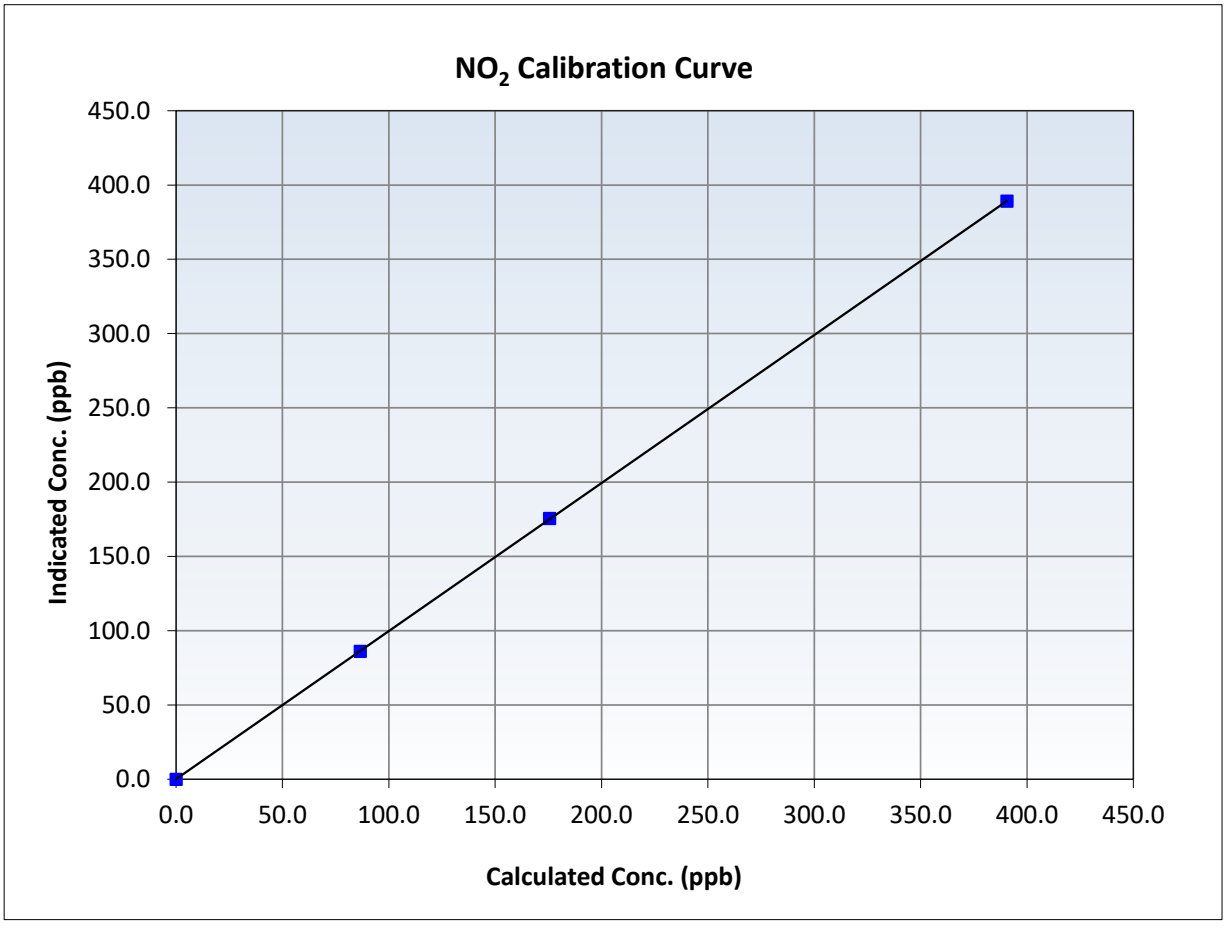
Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 2, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:14
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
390.6	389.1	1.0039
175.6	175.6	1.0000
86.6	86.1	1.0058

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999995	*≥0.995*
Slope	0.996411	*0.90 - 1.10*
Intercept	0.085743	*+/-20*



Wood Buffalo Environmental Association

NO Calibration Summary

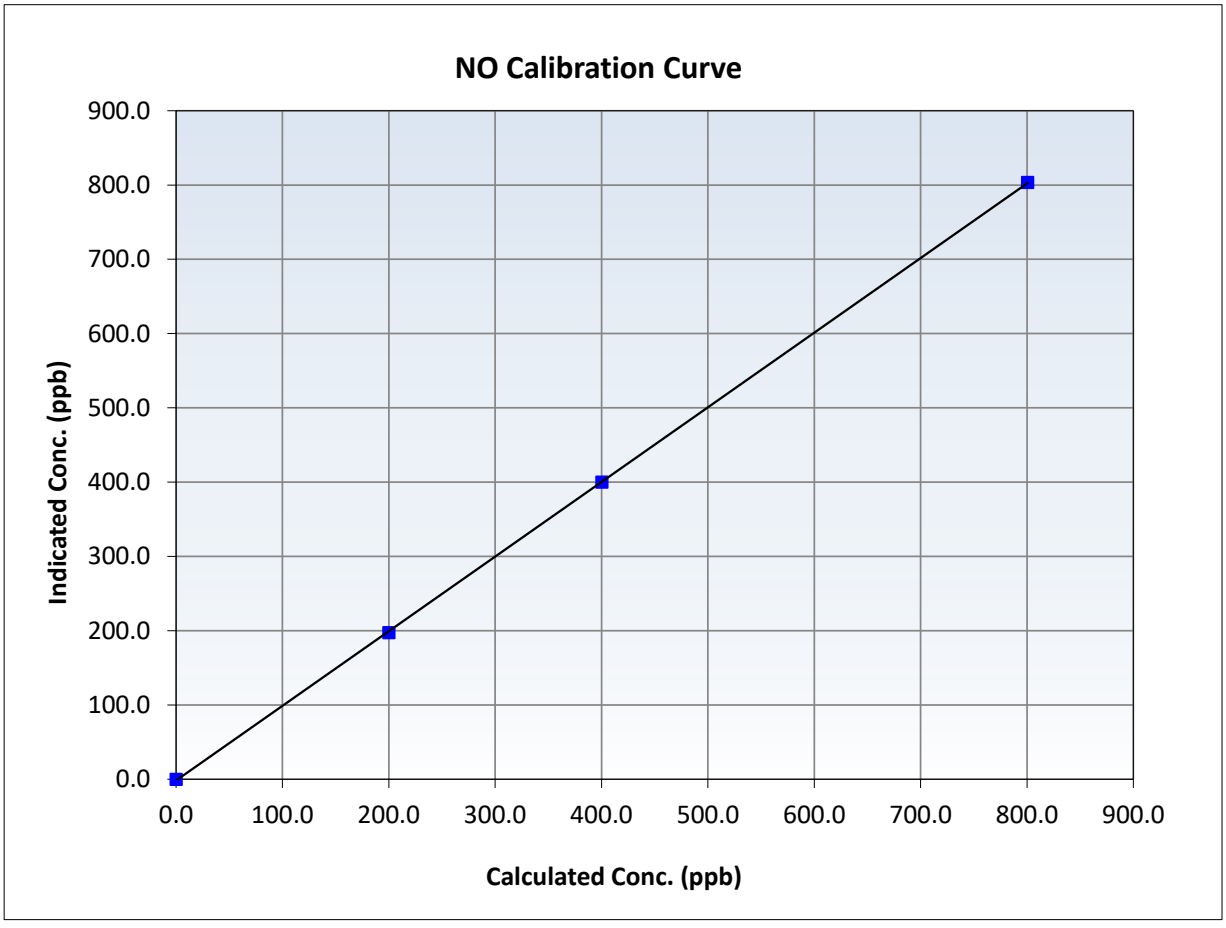
Station Information

Calibration Date:	January 3, 2025	Previous Calibration:	December 2, 2024
Station Name:	Hangingstone Expansion	Station Number:	AMS 512
Start Time (MST):	7:10	End Time (MST):	11:14
Analyzer make:	Teledyne API T200	Analyzer serial #:	7029

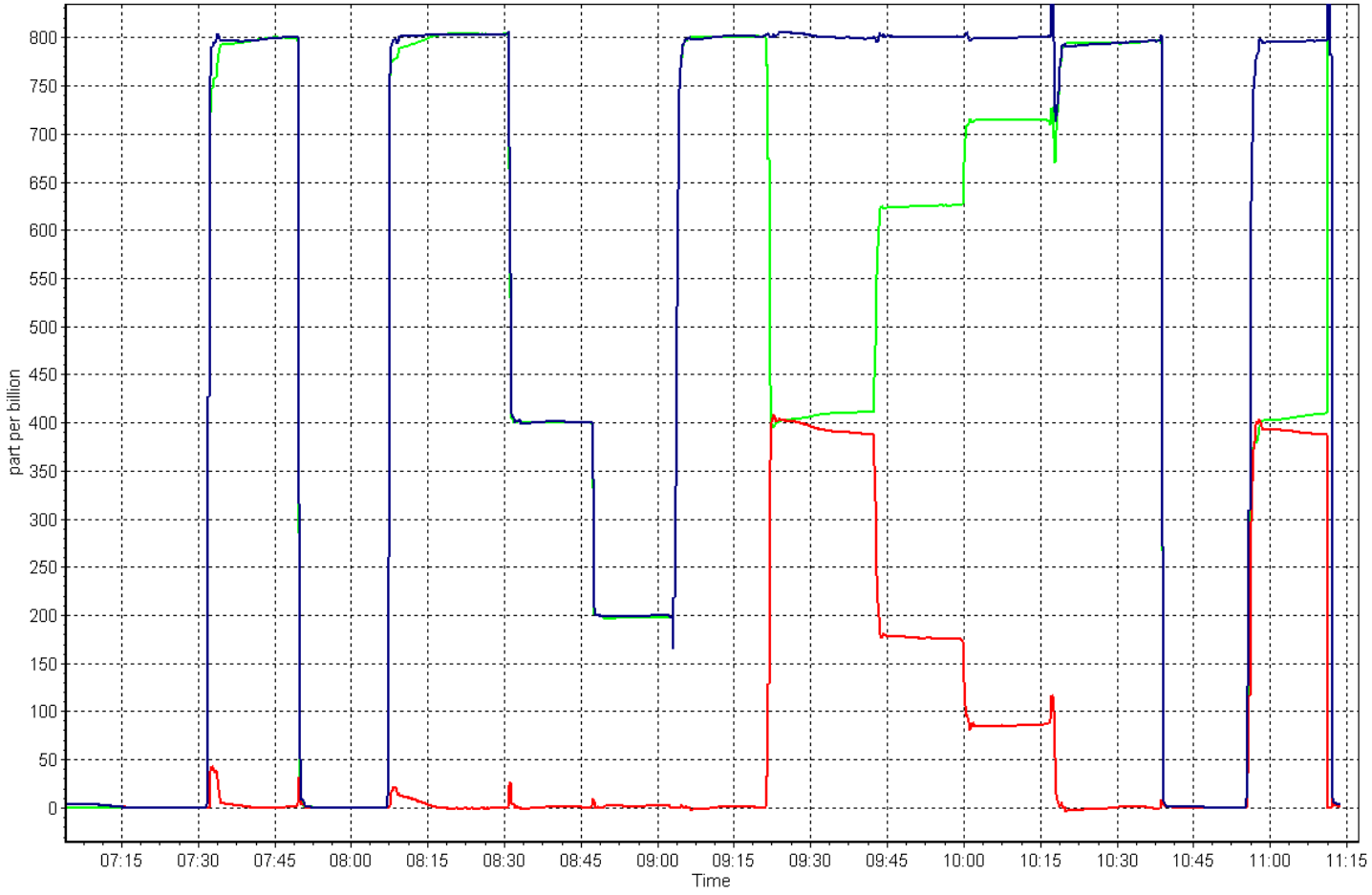
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
0.0	0.0	----
800.6	803.4	0.9965
400.3	400.0	1.0008
200.2	197.5	1.0134

Statistical Evaluation		*Limits*
Correlation Coefficient	0.999979	*≥0.995*
Slope	1.004749	*0.90 - 1.10*
Intercept	-1.692823	*+/-20*



NO_X Calibration Plot Date: January 3, 2025 Location: Hangingstone Expansion



End of Report