

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

Wood Buffalo Environmental Association

# **APRIL 2024**

# MONTHLY CALIBRATION REPORT

CONTINUOUS MONITORING March 31, 2024

> 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 APRIL 2024

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

May 31, 2024



## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:Bertha Ganter-Fort McKayCalibration Date:April 3, 2024Start time (MST):9:57Reason:Routine

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Station number: AMS 01 Last Cal Date: March 5, 2024 End time (MST): 14:14

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#### **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: 4890

#### **Analyzer Information**

Analyzer make:	Thermo 43i	Thermo 43i Serial Number: JC1501301448					
Analyzer Range:	0 - 1000 ppb						
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>		
Calibration slope:	0.997052	1.001305	Backgd or Offset:	19.5	20.8		
Calibration intercept:	-0.112969	-0.794719	Coeff or Slope:	0.885	0.892		

#### SO<sub>2</sub> 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	1.0	
As found High point	4918	81.3	800.3	802.8	0.998
As found Mid point	4959	40.7	400.6	402.7	0.997
As found Low point	4979	20.3	199.8	199.8	1.005
New cylinder response					
Baseline Corr As found:	801.8	Previous response	797.8	*% change	0.5%
Baseline Corr 2nd AF pt:	401.7	AF Slope:	1.002567	AF Intercept:	0.505908
Baseline Corr 3rd AF pt:	198.8	AF Correlation:	0.999995	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.2	
High point	4918	81.3	800.3	801.5	0.998
Mid point	4959	40.7	400.6	398.4	1.006
Low point	4979	20.3	199.8	199.2	1.003
As left zero	5000	0.0	0.0	0.2	
As left span	4918	81.3	800.3	802.3	0.997
			Averag	e Correction Factor:	1.002

Notes:

Changed the inlet filter and pump after multi-point as founds. Adjusted both zero and span.

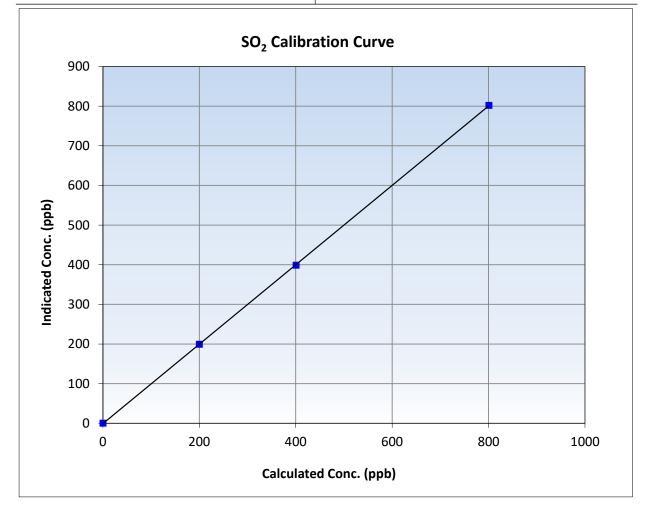


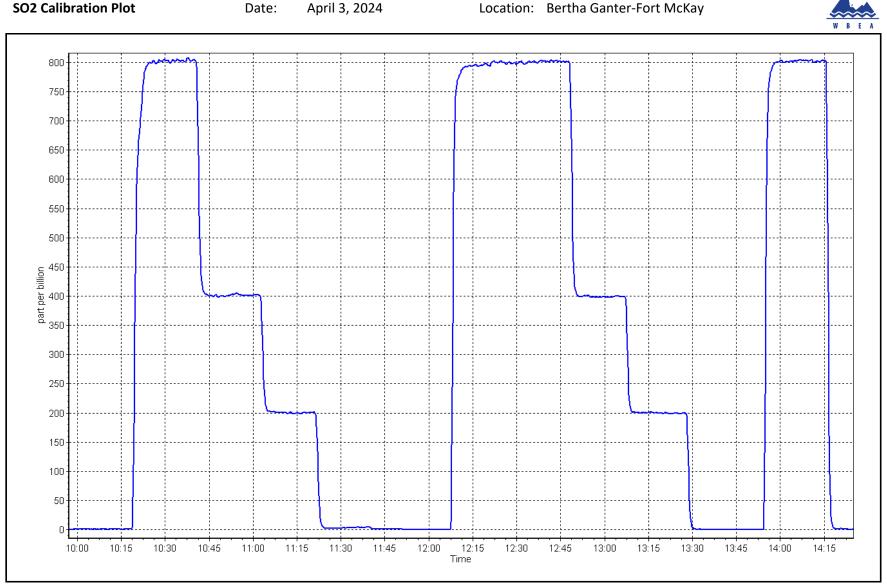
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:57	End Time (MST):	14:14
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301448

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999984	≥0.995
800.3 400.6	801.5 398.4	0.9985 1.0055	Slope	1.001305	0.90 - 1.10
199.8	199.2	1.0031	Intercept	-0.794719	+/-30





April 3, 2024

Location: Bertha Ganter-Fort McKay



### Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Bertha Ganter-Fort McK April 9, 2024 10:43 Routine	ау	Station number: Last Cal Date: End time (MST):	AMS 01 March 18, 2024 14:58	
	Calibration Standards				

Cal Gas Concentration:	5.10	ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511749			
Removed Cal Gas Conc:	5.10	ppm	Rem Gas Exp Date:	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:	4890

#### **Analyzer Information**

Analyzer make: Converter make:	Thermo 43i-TLE CD Nova		Analyzer serial #: Converter serial #:	1218153461 470	
Analyzer Range	0 - 100 ppb		Converter Temp:	<b>6</b> 11	800 degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002936	1.001846	Backgd or Offset:	2.43	2.42
Calibration intercept:	0.199998	0.119998	Coeff or Slope:	0.931	0.918

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4921	78.4	80.0	80.7	0.991
As found Mid point	4960	39.2	40.0	40.5	0.987
As found Low point	4980	19.6	20.0	20.1	0.995
New cylinder response					
Baseline Corr As found:	80.7	Prev response:	80.41	*% change:	0.4%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	1.009563	AF Intercept:	-0.000003
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999993	* = > +/-5% change initiate	es 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	4921	78.4	80.0	80.2	0.997
Mid point	4960	39.2	40.0	40.3	0.992
Low point	4980	19.6	20.0	20.1	0.995
As left zero	5000	5000.0	2550.0	0.3	
As left span	4921	78.4	80.0	80.3	0.996
SO2 Scrubber Check	4919	81.3	813.0	0.0	
Date of last scrubber chan	ge:	December 17, 2021		Ave Corr Factor	0.995

Date of last converter efficiency test:

Notes:

Inlet filter change and scrubber check completed after as founds. Adjusted span only.

Calibration Performed By:



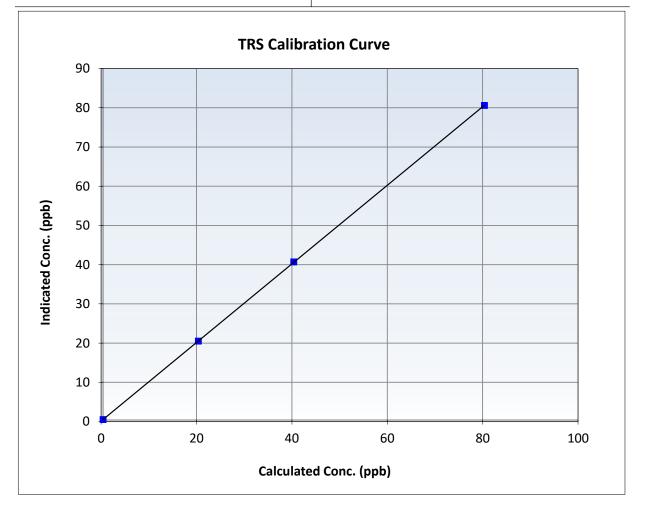
### **Wood Buffalo Environmental Association**

### **TRS Calibration Summary**

#### **Station Information**

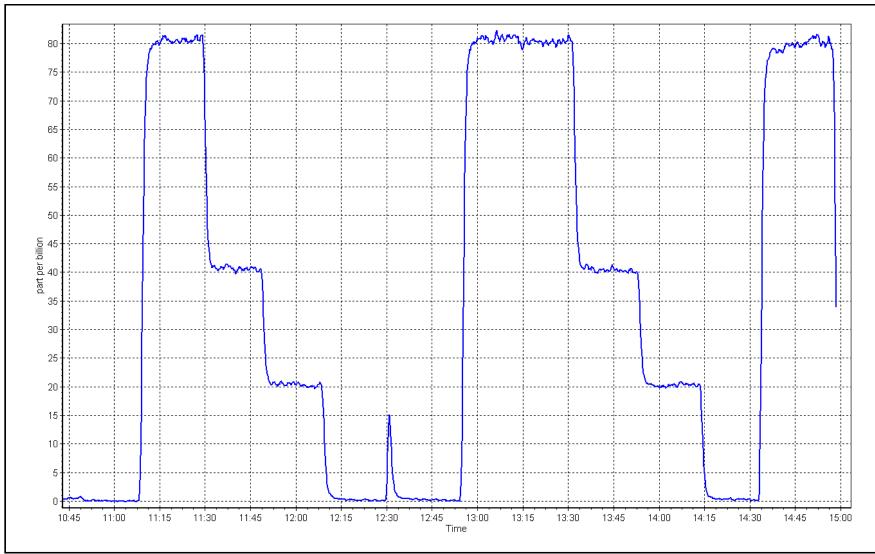
Calibration Date:	April 9, 2024	Previous Calibration:	March 18, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:43	End Time (MST):	14:58
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153461

Calibration Data						
Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>	
0.0	0.1		Correlation Coefficient	0.999995	≥0.995	
80.0 40.0	80.2 40.3	0.9972 0.9923	Slope	1.001846	0.90 - 1.10	
20.0	20.1	0.9947	Intercept	0.119998	+/-3	











### Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST):	Bertha Ganter-Fort McKay April 9, 2024 10:43	Station number: Last Cal Date: End time (MST):	AMS 01 March 18, 2024 14:58
Reason:	Routine		

#### **Calibration Standards**

Cal Gas Concentration:	5.10	ppm	Cal Gas Exp Date:	September 16, 2024
Cal Gas Cylinder #:	CC511749			
Removed Cal Gas Conc:	5.10	ppm	Rem Gas Exp Date:	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:	4890

#### **Analyzer Information**

Analyzer make: Converter make:	Thermo 43iQ-TL CD Nova		Analyzer serial #: Converter serial #:	1200326167 2022-221	
Analyzer Range	0 - 100 ppb		Converter Temp:		350 degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.005285	1.003053	Backgd or Offset:	2.02	2.03
Calibration intercept:	-0.003216	0.056779	Coeff or Slope:	0.985	0.985

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	
As found High point	4922	78.4	80.0	80.3	0.995
As found Mid point	4960	39.2	40.0	40.1	0.995
As found Low point	4980	19.6	20.0	19.9	1.000
New cylinder response					
Baseline Corr As found:	80.4	Prev response:	80.38	*% change:	0.0%
Baseline Corr 2nd AF pt:	40.2	AF Slope:	1.005911	AF Intercept:	-0.143217
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999998	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4922	78.4	80.0	80.2	0.997
Mid point	4960	39.2	40.0	40.3	0.992
Low point	4980	19.6	20.0	20.1	0.995
As left zero	5000	0.0	0.0	0.1	
As left span	4922	78.4	80.0	80.3	0.996
SO2 Scrubber Check	4919	81.3	813.0	0.0	
Date of last scrubber chan	ge:	January 25, 2024		Ave Corr Factor	0.995

Date of last converter efficiency test:

Notes:

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

Calibration Performed By:



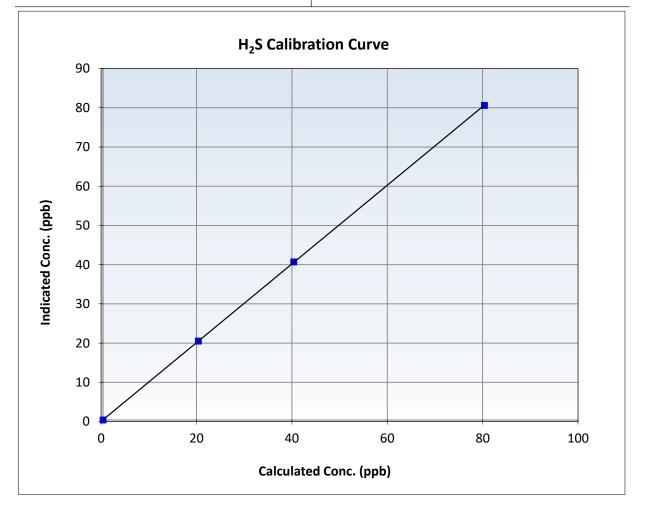
# **Wood Buffalo Environmental Association**

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

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	March 18, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:43	End Time (MST):	14:58
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1200326167

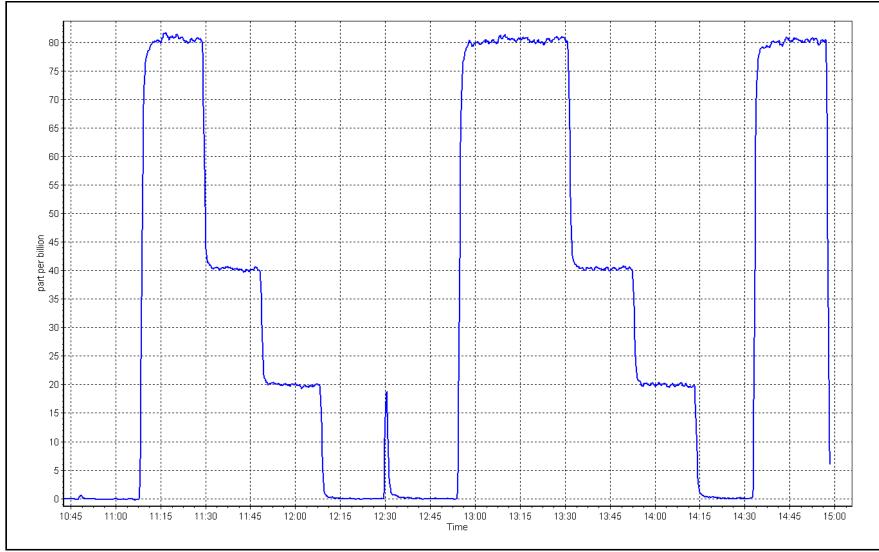
Calibration Data						
Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>	
0.0	0.0		Correlation Coefficient	0.999993	≥0.995	
80.0 40.0	80.2 40.3	0.9970 0.9923	Slope	1.003053	0.90 - 1.10	
20.0	20.1	0.9947	Intercept	0.056779	+/-3	





Location: Bertha Ganter-Fort McKay







### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

Station Name:	Bertha Ganter-Fort McKay	Station number: AMS 01
Calibration Date:	April 3, 2024	Last Cal Date: March 5, 2024
Start time (MST):	9:57	End time (MST): 14:14
Reason:	Routine	

#### **Calibration Standards**

Gas Cert Reference:	C	C418809	C	Cal Gas Expiry Date: N	March 10, 20	031	
CH4 Cal Gas Conc.	497.2	ppm		CH4 Equiv Conc.	:	1061.8 ppm	
C3H8 Cal Gas Conc.	205.3	ppm					
Removed Gas Cert:		NA	Re	emoved Gas Expiry: N	١A		
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 <sub>4</sub> ):			Diff	between cyl (NM):			
Calibrator Model:	Teledyne API T7	'00		Serial Number: 3	3565		
Zero Air Gen model:	Teledyne API T7	'01		Serial Number: 4	1890		
			Analyzer Infor	mation			
Analyzer make:	Thermo 55i			Analyzer serial #: 1	180320040	I Contraction of the second	
THC Range:	0 - 20 ppm			NMHC/CH4 Range: C	) - 10 ppm		
	<u>Start</u>		<u>Finish</u>		<u>Start</u>		Finisł

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.30E-04	4.31E-04	NMHC SP Ratio:	7.20E-05	7.53E-05
CH4 Retention time:	16.7	16.7	NMHC Peak Area:	127593	122095
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	16.90	1.022
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.90	Prev response	17.24	*% change	-2.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4918	81.3	17.27	17.28	0.999
Mid point	4959	40.7	8.64	8.56	1.010
Low point	4979	20.3	4.31	4.28	1.009
As left zero	5000	0.0	0.00	0.00	
As left span	4918	81.3	17.27	17.30	0.998
			Avera	ge Correction Factor	1.006

Notes:

Changed the inlet filter and H2 cylinder after as founds. Adjusted span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4918	81.3	9.18	8.78	1.046
Baseline Corr AF: Baseline Corr 2nd AF:	8.78 NA	Prev response AF Slope:	9.13	*% change AF Intercept:	-4.0%
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiat	es 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	9.21	0.997
Mid point	4959	40.7	4.60	4.60	0.998
Low point	4979	20.3	2.29	2.32	0.988
As left zero	5000	0.0	0.00	0.00	
As left span	4918	81.3	9.18	9.23	0.995
			Avera	ge Correction Factor	0.995

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	AFzero))
	5000		0.00	0.00	Limit = 0.90-1.10
As found zero	5000	0.0	0.00	0.00	
As found High point	4918	81.3	8.09	8.12	0.996
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.12	Prev response	8.11	*% change	0.1%
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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4918	81.3	8.09	8.08	1.001
Mid point	4959	40.7	4.05	3.96	1.022
Low point	4979	20.3	2.02	1.96	1.033
As left zero	5000	0.0	0.00	0.00	
As left span	4918	81.3	8.09	8.07	1.001
			Avera	ge Correction Factor	1.019

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001618	1.001141
THC Cal Offset:	-0.052990	-0.034037
CH4 Cal Slope:	1.008062	1.000742
CH4 Cal Offset:	-0.039196	-0.042118
NMHC Cal Slope:	0.995931	1.001953
NMHC Cal Offset:	-0.013994	0.007481

Calibration Performed By:

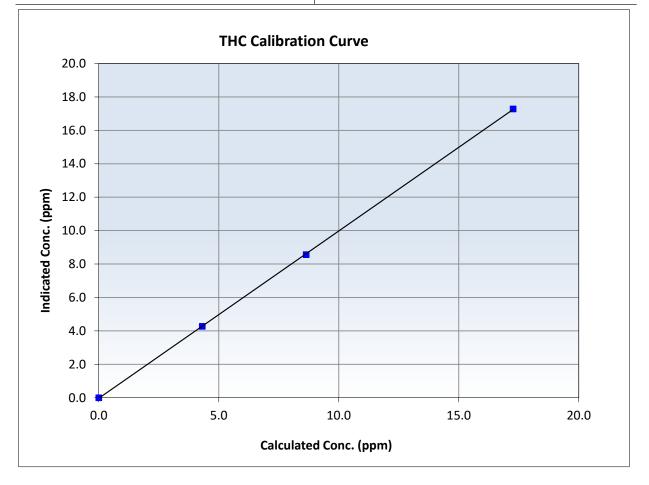


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:57	End Time (MST):	14:14
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999967	≥0.995
17.27 8.64	17.28 8.56	0.9991 1.0095	Slope	1.001141	0.90 - 1.10
4.31	4.28	1.0085	Intercept	-0.034037	+/-0.5



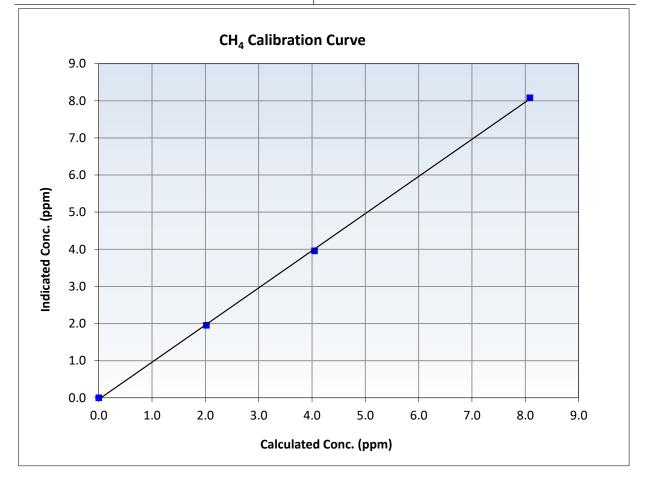


## Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:57	End Time (MST):	14:14
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999841	≥0.995
8.09	8.08	1.0007	Slope	1.000742	0.90 - 1.10
4.05	3.96	1.0223			0.30 - 1.10
2.02	1.96	1.0327	Intercept	-0.042118	+/-0.5



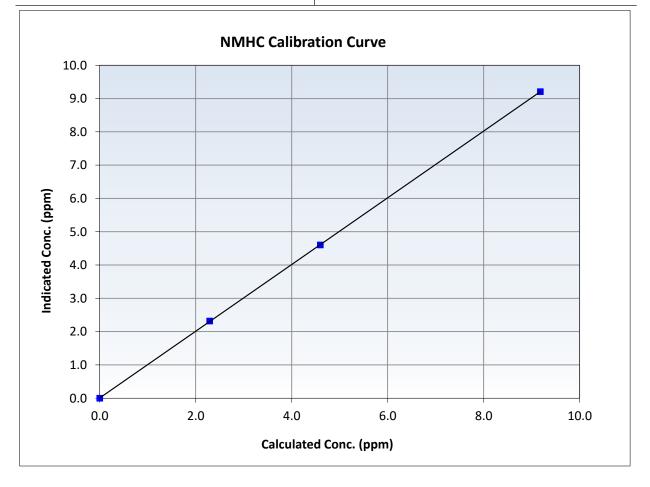


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 5, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:57	End Time (MST):	14:14
Analyzer make:	Thermo 55i	Analyzer serial #:	1180320040

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999992	≥0.995
9.18	9.21	0.9972	Slope	1.001953	0.90 - 1.10
4.60	4.60	0.9982	Slope	1.001355	0.00 1.10
2.29	2.32	0.9881	Intercept	0.007481	+/-0.5



#### **NMHC Calibration Plot**







**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Bertha Ganter-Fort McKay	NO Gas Cylinder #:	CC335700	Cal Gas Expiry Date:	September 1, 2032
Station number:	AMS 01	NOX Cal Gas Conc:	59.40 ppm	NO Cal Gas Conc:	59.20 ppm
Calibration Date:	April 8, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	: NA
Last Cal Date:	March 14, 2024	Removed Gas NOX Conc:	59.40 ppm	Removed Gas NO Conc:	59.20 ppm
Start time (MST):	10:06	NOX gas Diff:		NO gas Diff:	
End time (MST):	14:41	Calibrator Model:	Teledyne API T700	Serial Number:	3565
Reason:	Routine	ZAG make/model:	Teledyne API T701	Serial Number:	4890

#### 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)) <i>Limit = 0.90 - 1.10</i>	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	4932	67.6	803.1	800.4	2.7	791.4	783.5	7.9	1.0152	1.0218
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	802.6 ppb	NO = 799.9	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chang	e NO <sub>x</sub> =	-1.5%
Baseline Corr 1	st pt NO <sub>x</sub> =	791.1 ppb	NO = 783.3	ppb	<u>As Four</u>	d Statistics		*Percent Chang	ge NO =	-2.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
As Found GPT Calibration Data										
								Baseline Adjuste		
O3 Setor	vint (nnh)	Indicated NO Re	ference Indi	cated NO Drop	Calculated N	O2 In	dicated NO2	Correction fa	ictor Conv	erter Efficiency

O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
OS Setbolit (ppb)	concentration (ppb)	concentration (ppb)	oncentration (ppb) concentration (ppb) (Cc)		(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
ound GPT zero						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1218153	3357			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.999371	0.999129
			Instrument Settings			NO <sub>x</sub> Cal Offset:	0.020000	0.380000
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.000862	0.999991
NO coeff or slope:	1.496	1.522	NO bkgnd or offset:	7.4	7.5	NO Cal Offset:	-1.220000	-1.040000
NOX coeff or slope:	0.999	0.997	NOX bkgnd or offset:	7.5	7.6	NO <sub>2</sub> Cal Slope:	0.995953	0.995614
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	201.0	201.0	NO <sub>2</sub> Cal Offset:	0.117298	1.058457

#### **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	0.3	0.2		
High point	4932	67.6	803.1	800.4	2.7	802.6	799.7	2.8	1.0006	1.0009
Mid point	4966	33.8	401.5	400.2	1.4	402.1	399.4	2.7	0.9986	1.0020
Low point	4983	16.9	200.8	200.1	0.7	200.6	197.1	3.5	1.0009	1.0152
As left zero	5000	0.0	0.0	0.0	0.0	0.4	0.1	0.3		
As left span	4932	67.6	803.1	390.6	412.5	802.3	390.6	411.7	1.0010	1.0000
							Average Co	orrection Factor	1.0000	1.0060

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.2		
High GPT point	798.0	389.5	411.2	410.0	1.0029	99.7%
Mid GPT point	798.0	596.6	204.1	204.8	0.9966	100.3%
Low GPT point	798.0	698.7	102.0	103.4	0.9865	101.4%
				Average Correction Factor	0.9953	100.5%

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

Calibration Performed By: Re

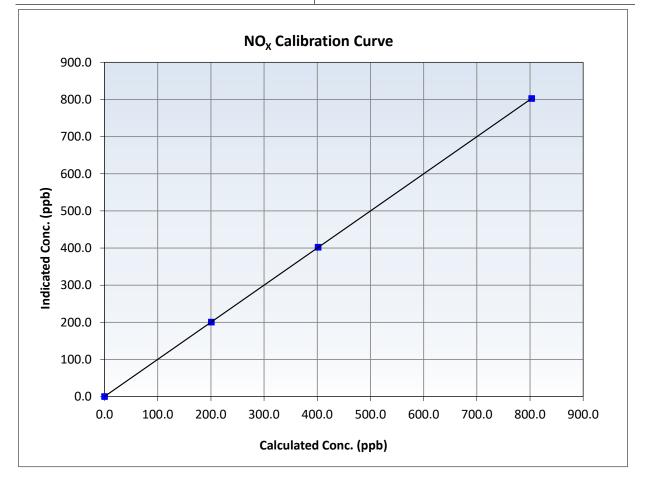


### Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 14, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:06	End Time (MST):	14:41
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.4		Correlation Coefficient	0.999999	≥0.995
803.1 401.5	802.6 402.1	1.0006 0.9986	Slope	0.999129	0.90 - 1.10
200.8	200.6	1.0009	Intercept	0.380000	+/-20



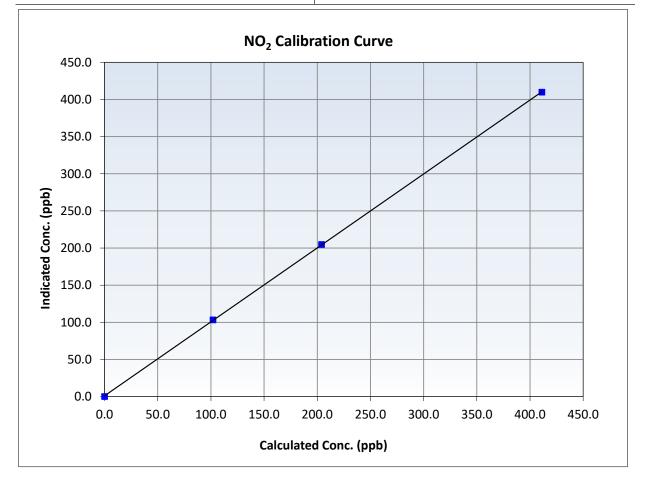


### Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 14, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:06	End Time (MST):	14:41
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999980	≥0.995
411.2 204.1	410.0 204.8	1.0029 0.9966	Slope	0.995614	0.90 - 1.10
102.0	103.4	0.9865	Intercept	1.058457	+/-20



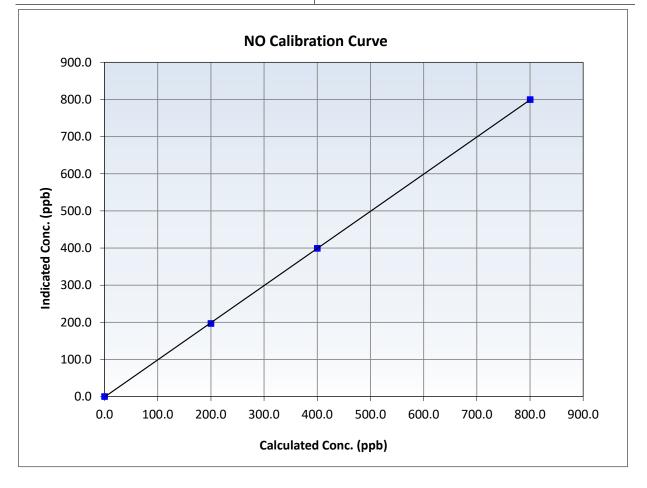


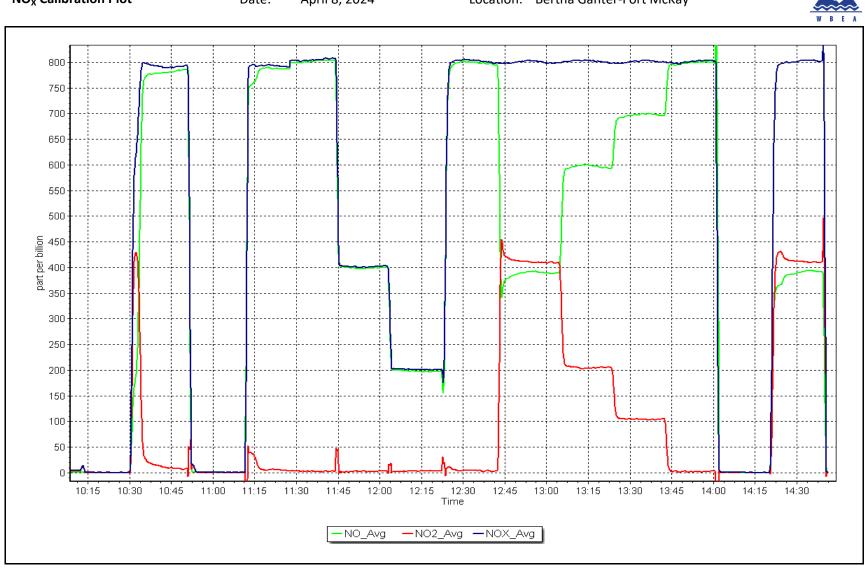
## Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 14, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:06	End Time (MST):	14:41
Analyzer make:	Thermo 42i	Analyzer serial #:	1218153357

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999983	≥0.995
800.4 400.2	799.7 399.4	1.0009 1.0020	Slope	0.999991	0.90 - 1.10
200.1	197.1	1.0152	Intercept	-1.040000	+/-20





NO<sub>x</sub> Calibration Plot

Location: Bertha Ganter-Fort McKay





# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Bertha Ganter-Fort Mcl April 2, 2024 9:21 Routine	Кау	Station number: Last Cal Date: End time (MST):	March 6, 2024	1
		Calibration St	andards_		
O3 generation mode:	Photometer				
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3565	
ZAG Make/Model:	Teledyne API T701		Serial Number:	4890	
		Analyzer Info	rmation		
Analyzer make:	Teledyne API T400		Analyzer serial #:	1107	
Analyzer Range	0 - 500 ppb			-	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	
Calibration slope:	1.001057	0.998829	Backgd or Offset:	5.5	
Calibration intercept:	0.640000	0.180000	Coeff or Slope:	1.044	

#### O<sub>3</sub> As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)		Baseline Adjusted Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero	5000	0.0	0.0	-1.3	
As found High point As found Mid point As found Low point	5000	863.1	400.0	407.4	0.979
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	408.7 NA NA	Previous response AF Slope: AF Correlation:		*% change AF Intercept: * = > +/-5% change initia	

#### **O<sub>3</sub> 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	-0.2	
High point	5000	863.1	400.0	399.4	1.002
Mid point	5000	742.5	200.0	200.5	0.998
Low point	5000	651.7	100.0	100.2	0.998
As left zero	5000	0.0	0.0	-0.2	
As left span	5000	863.1	400.0	400.1	1.000
			Average Correction Factor		0.999

Notes:

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

Calibration Performed By:

**Rene Chamberland** 

Finish 4.6 1.027

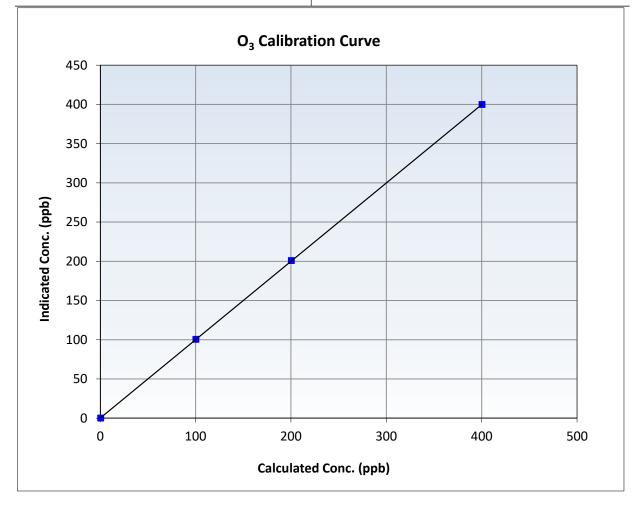


# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

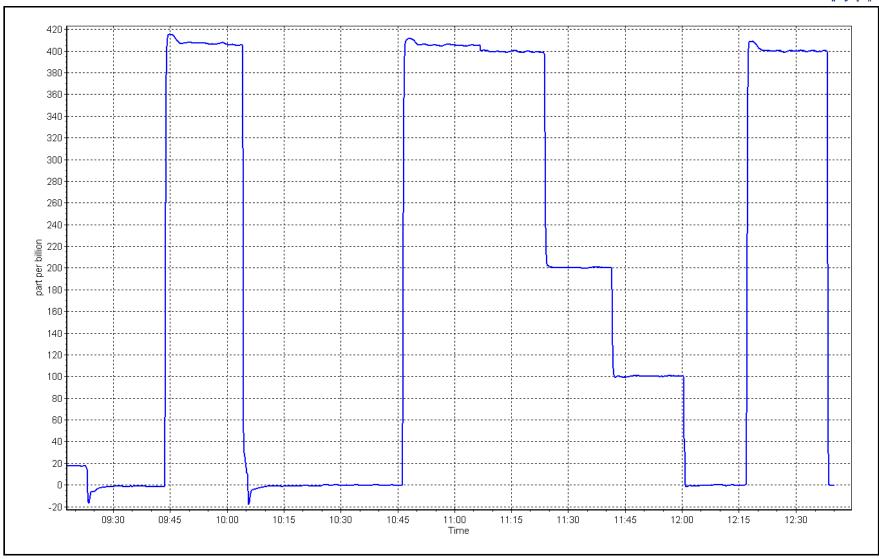
Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	9:21	End Time (MST):	12:38
Analyzer make:	Teledyne API T400	Analyzer serial #:	1107

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999993	≥0.995
400.0 200.0	399.4 200.5	1.0015 0.9975	Slope	0.998829	0.90 - 1.10
100.0	100.2	0.9980	Intercept	0.180000	+/- 5











### Wood Buffalo Environmental Association

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

		Station Informa	tion		Version-01-202
Station Name:	Fort McKay - Bertha Ga	inter	Station number: AMS	01	
Calibration Date:	April 11, 2024		Last Cal Date: Mar	ch 18, 2024	
Start time (MST):	12:29		End time (MST): 13:5	0	
Analyzer Make: Particulate Fraction:	Teledyne API T640 PM2.5		S/N: 324		
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 388	752	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	752	
	I	Monthly Calibratio	n Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	13.9	12.94	13.9		+/- 2 °C
P (mmHg)	736.2	735.46	736.2		+/- 10 mmHg
Flow (LPM)	4.99	5.122	4.99		+/- 0.25 LPM
PW% (pump)	38		38		>80%
Zero Verification	PM w/o HEPA:	7.3	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

 Image: Complete the served of the served

		Quarterly Calibration	Test	
SPAN DUST	Refractive Index:	10.9	Expiry Date:	June 10, 2024
SI AN DOST	Lot No.:	100128-050-042		
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	<u>Adjusted</u> (Limits)
PMT Peak Test	8.8	10.9	10.9	10.9 +/- 0.5
Date Optical Chamber Cleaned:		April 11, 2024		
Date Disposable Filter Changed:		April 11, 2024		
Post- maintenance Zero Ve	rification:	PM w/ HEPA:	0.0	<0.2 ug/m3

Annual	Maintenance
/	manneenanee

Date Sample Tube Cleaned:	September 14, 2023
Date RH/T Sensor Cleaned:	April 11, 2024

Notes:

Verified flow, temperature, and pressure. Leak check passed. PMT peak test completed. Disposable filter changed. Optical chamber and RH/T sensor cleaned.

Calibration by: Rene Chamberland



Analyzer make:

### Wood Buffalo Environmental Association CO Calibration Report

#### Station Information

Station Name:Bertha Ganter-Fort McKayCalibration Date:April 10, 2024Start time (MST):10:25Reason:Routine

Teledyne API T300

Station number: AMS 01 Last Cal Date: March 15, 2024 End time (MST): 13:40

#### **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: 4890
		۸n	alwar Information

#### Analyzer Information Analyzer serial #: 3520

0 - 50 ppm				
<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
1.000382	1.000946	Backgd or Offset:	-0.013	-0.013
0.195846	0.155852	Coeff or Slope:	0.989	0.991
	<u>Start</u> 1.000382	<u>Start</u> <u>Finish</u> 1.000382 1.000946	<u>Start</u> <u>Finish</u> 1.000382 1.000946 Backgd or Offset:	Start         Finish         Start           1.000382         1.000946         Backgd or Offset:         -0.013

#### 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 As found Mid point As found Low point New cylinder response	4933	66.7	40.6	40.8	0.997
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	40.66 NA NA	Prev response: AF Slope: AF Correlation:	40.77	*% change: AF Intercept: * = > +/-5% change initiate	-0.3% es 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	4933	66.7	40.6	40.6	0.999
Mid point	4966	33.3	20.2	20.7	0.977
Low point	4983	16.7	10.2	10.3	0.987
As left zero	5000	0.0	0.0	0.0	
As left span	2960	40.0	40.5	40.1	1.010
			Avera	ge Correction Factor	0.988

Notes:

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

Calibration Performed By:

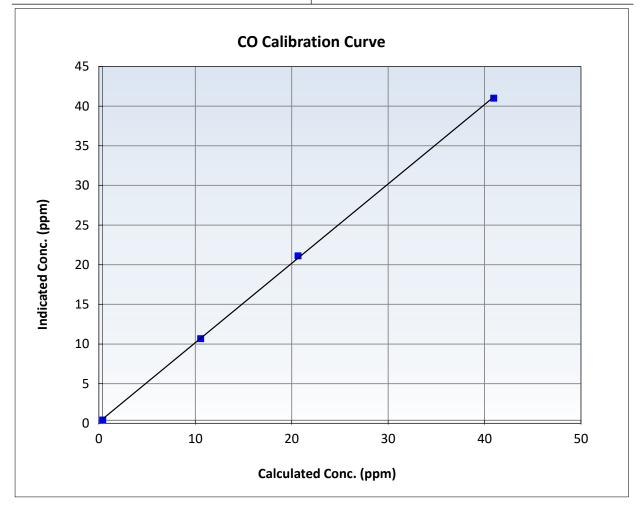


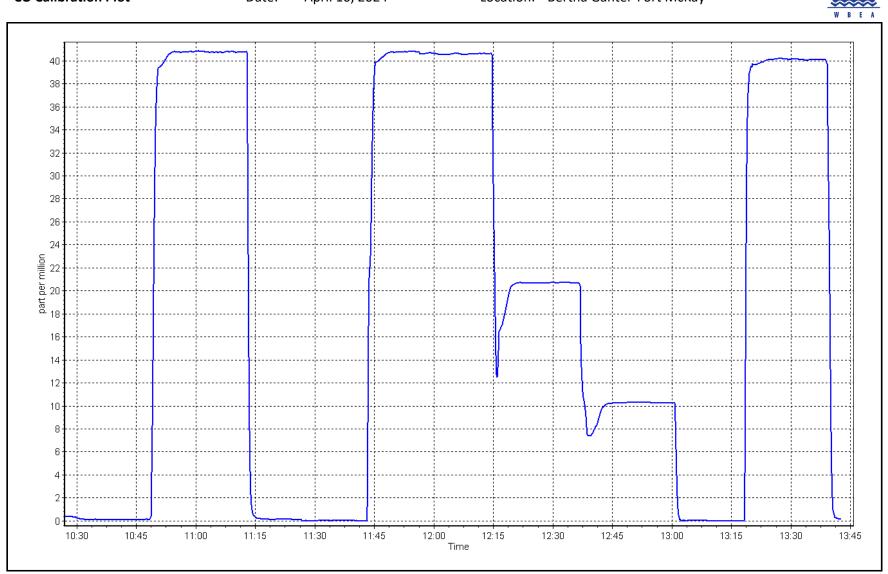
# Wood Buffalo Environmental Association CO Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 15, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:25	End Time (MST):	13:40
Analyzer make:	Teledyne API T300	Analyzer serial #:	3520

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999863	≥0.995
40.6 20.2	40.6 20.7	0.9987 0.9773	Slope	1.000946	0.90 - 1.10
10.2	10.3	0.9868	Intercept	0.155852	+/-1.5





Location: Bertha Ganter-Fort McKay





## Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Report

#### Station Information

Station Name:	Bertha Ganter-Fort McKay
Calibration Date:	April 4, 2024
Start time (MST):	8:44
Reason:	Routine

Station number: AMS 01 Last Cal Date: March 12, 2024 End time (MST): 11:55

#### **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 0 - 2,000 ppm Analyzer Range <u>Start</u> <u>Finish</u> <u>Finish</u> <u>Start</u> Calibration slope: 1.000907 1.001476 Backgd or Offset: 0.045 0.045 Calibration intercept: -6.720000 -5.720000 Coeff or Slope: 0.876 0.876

#### CO<sub>2</sub> 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	-0.1	
As found High Point As found Mid Point As found Low Point New cylinder response	2920	80.0	1605.3	1594.9	1.006
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	1595.0 NA NA	Prev response: AF Slope: AF Correlation:	1600.1	*% change: AF Intercept: * = > +/-5% change initiate	-0.3% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	3000	0.0	0.0	0.2	
High point	2920	80.0	1605.3	1605.1	1.000
Mid point	2960	40.0	802.7	794.7	1.010
Low point	2980	20.0	401.3	390.6	1.027
As left zero	3000	0.0	0.0	0.0	
As left span	2960	40.0	802.7	778.1	1.032
			Avera	ge Correction Factor	1.013

Notes:

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

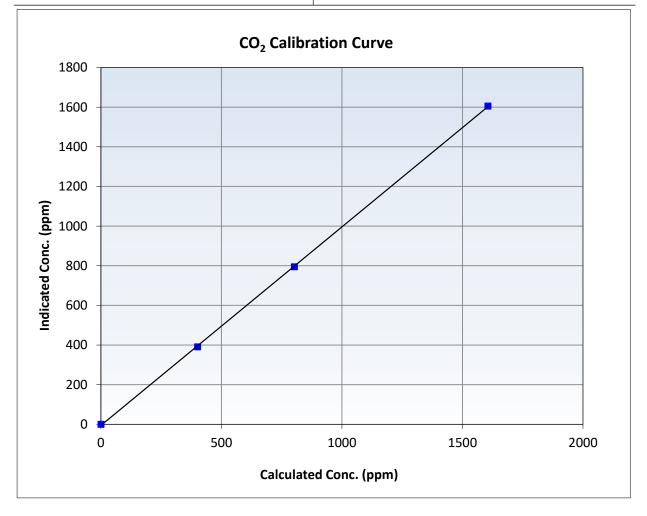


# Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Summary

#### **Station Information**

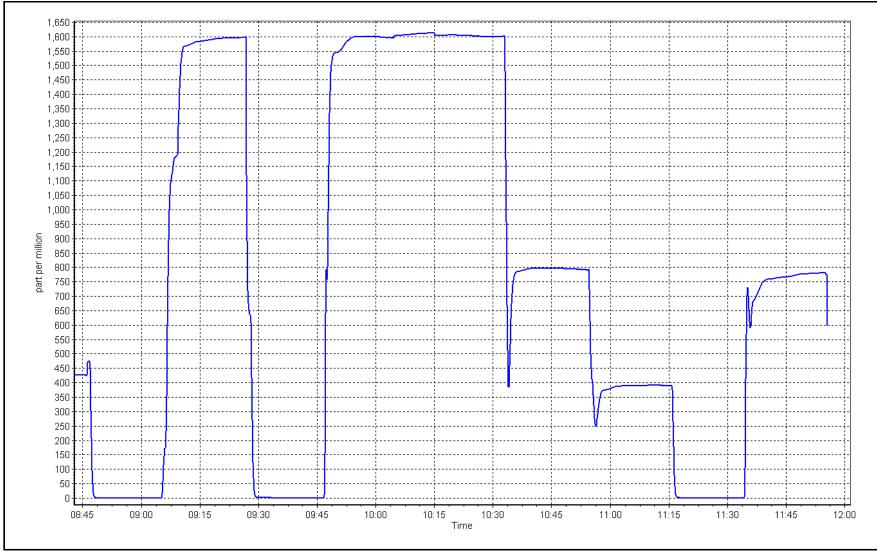
Calibration Date	April 4, 2024	Previous Calibration	March 12, 2024
Station Name	Bertha Ganter-Fort McKay	Station Number	AMS 01
Start Time (MST)	8:44	End Time (MST)	11:55
Analyzer make	Teledyne API 360	Analyzer serial #	442

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999938	≥0.995
1605.3 802.7	1605.1 794.7	1.0001 1.0100	Slope	1.001476	0.90 - 1.10
401.3	390.6	1.0275	Intercept	-5.7	+/-20











### Wood Buffalo Environmental Association Nt - NOX - NH3 Calibration Report

#### **Station Information**

Station Name:	Bertha Ganter-Fort McKay	Station number:	AMS 01
NOX Cal Date:	April 11, 2024	Last Cal Date:	March 19, 2024
Start time (MST):	10:12	End time (MST):	15:15
NH3 Cal Date:	April 11, 2024	Last Cal Date:	March 20, 2024
Start time (MST):	15:35	End time (MST):	18:00
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:	A	VPI T700	Serial Number:	3565
ZAG make/model:	Α	PI T701	Serial Number:	4890

#### **Analyzer Information**

Analyzer model: Converter model: NH3 Range (ppb):	API T201 API T501 0 - 2000 ppb		Analyzer serial #: Converter serial #: Reaction cell Press:	475 824 6.20	
NOX Range (ppb):	0 - 1000 ppb		Sample Flow:	540	
	Start	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient:	0.960	0.952	Nt coefficient:	0.969	0.962
NOX coefficient:	0.966	0.959	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**

	<u>Start</u>	<u>Finish</u>
NO <sub>x</sub> Cal Slope:	1.001292	1.000623
NO <sub>x</sub> Cal Offset:	-2.380000	-2.120000
NO Cal Slope:	0.998821	0.997950
NO Cal Offset:	-2.280000	-2.600000
NO <sub>2</sub> Cal Slope:	0.999426	1.001154
NO <sub>2</sub> Cal Offset:	-0.898937	0.886739
NH3 Cal Slope:	1.002078	0.997027
NH3 Cal Offset:	-0.363408	2.325094
Nt Cal Slope:	1.004775	1.000070
Nt Cal Offset:	-0.436983	2.166761



### Wood Buffalo Environmental Association

### NO<sub>X</sub> - NO - NO<sub>2</sub> 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/lc) Limit = 0.9 - 1.0
As found zero	5000	0.0	0.0	0.0	0.0	-0.4	-0.2	-0.2		
As found span	4932	67.6	803.1	800.4	803.1	813.1	802.3	813.1	0.9877	0.9976
AF GPT span										
new NO cyl rp										
Baseline Corr As	Fd Nt =	813.3 ppb	NO <sub>x</sub> = 813.5	ppb NO =	802.5 ppb			*Percent Chan	ge Nt <sub>(NO)</sub> =	0.8%
Previous Respor	ise Nt =	806.49 ppb	NO <sub>x</sub> = 801.7	ppb NO =	797.2 ppb			*Percent Chan	ge NO <sub>x</sub> =	1.4%
**NO <sub>X</sub> $\Delta$ (NO to G	GPT response) =							*Percent Chan	ge NO =	0.7%
* *= > +/-2% differen	nce initiates investigat	ion						* = > +/-5% change	e initiates investigati	ion
				NOx / NO	/ Nt Calibratio	n 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/lc) Limit = 0.95-1.05
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.5	-0.3	-0.1		
High point	4932	67.6	803.1	800.4	803.1	803.0	798.1	800.3	1.0001	1.0029
Mid point	4966	33.8	401.5	400.2	401.5	396.7	393.2	397.8	1.0122	1.0178
Low point	4983	16.9	200.8	200.1	200.8	198.6	196.4	199.0	1.0109	1.0188
							Average C	orrection Factor	1.0078	1.0132

#### **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) <i>Limit = 0.95-1.05</i>	Converter Efficiency Limit = 96-104%
Calibration zero			0.0	-0.1		
High GPT point (400 ppb O3)	794.8	384.6	412.9	414.0	0.9974	100.3%
Mid GPT point (200 ppb O3)	794.8	588.2	209.3	210.2	0.9957	100.4%
Low GPT point (100 ppb O3)	794.8	690.6	106.9	109.4	0.9772	102.3%
			A	verage Correction Factor	0.9901	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	-0.2	-0.4	0.2		
AF High point	3418	82.2	1798.5		1798.5	1798.2		1793.1	1.000	1.003
AF Mid point										
AF Low point										
new NH3 cyl rp										
Baseline Corr As	Fd Nt =	1798.4 ppb	NH3 = 1792.9	ppb				*Percent Chan	ge Nt <sub>(NH3)</sub> =	-0.5%
Previous Respons	se Nt =	1806.7 ppb	NH3 = 1801.9	ppb	* = > +/-5	i% change initiates	investigation	*Percent Chan	ge NH3 =	-0.5%

#### 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) <i>Limit = 0.95-1.05</i>	NH3 Correction factor (Cc/lc) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.5	0.4		
High point	3418	82.2	1798.5		1798.5	1798.2		1793.1	1.000	1.003
Mid point	3454	45.7	1000.0		1000.0	1006.8		1003.7	0.993	0.996
Low point	3477	22.8	498.9		498.9	501.4		499.7	0.995	0.998
							Average Co	prrection Factor	0.9961	0.9992
NH3 Previous Co	NH3 Previous Converter Efficiency = 90.8 %									

NH3 Current Converter Efficiency = 90.8 %

Notes:

Changed the inlet filter after as founds. Adjusted the NOx/Nt span.

Calibration Performed By:

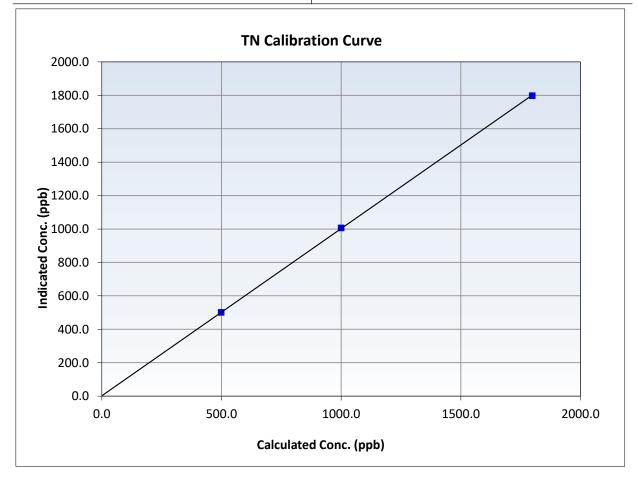


# **Nt Calibration Summary**

# **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:12	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999981	≥0.995
1798.5 1000.0	1798.2 1006.8	1.0002 0.9932	Slope	1.000070	0.90 - 1.10
498.9	501.4	0.9949	Intercept	2.166761	+/-20



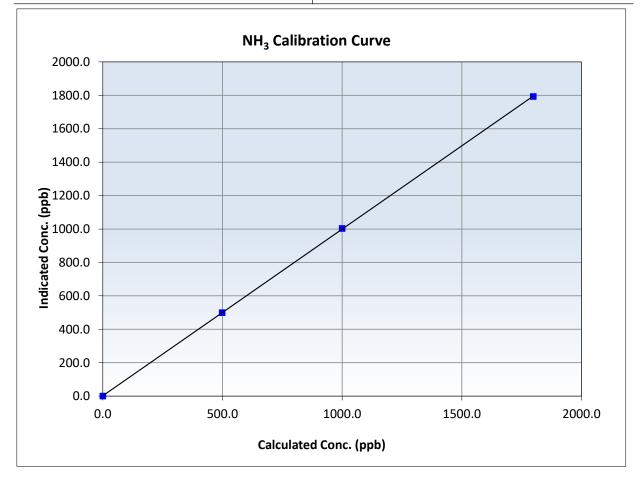


# NH<sub>3</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:12	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.4		Correlation Coefficient	0.999984	≥0.995
1798.5 1000.0	1793.1 1003.7	1.0030 0.9963	Slope	0.997027	0.90 - 1.10
498.9	499.7	0.9983	Intercept	2.325094	+/-20



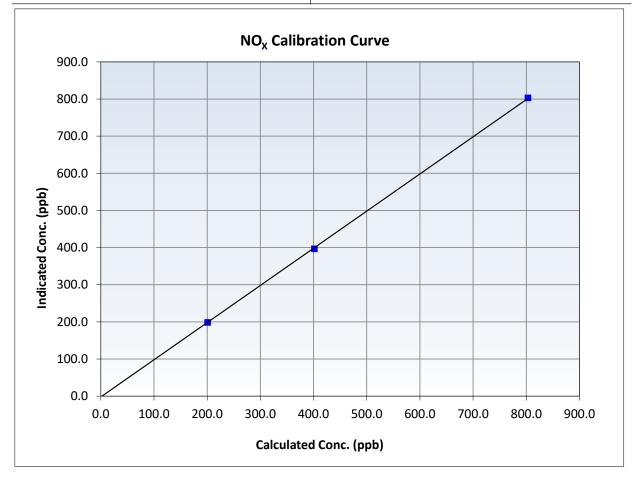


# NO<sub>x</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:12	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.5		Correlation Coefficient	0.999961	≥0.995
803.1 401.5	803.0 396.7	1.0001 1.0122	Slope	1.000623	0.90 - 1.10
200.8	198.6	1.0109	Intercept	-2.120000	+/-20



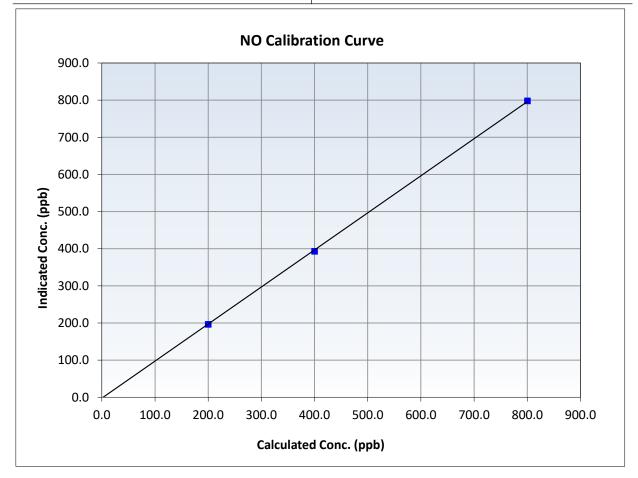


# **NO Calibration Summary**

# **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:12	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.3		Correlation Coefficient	0.999936	≥0.995
800.4 400.2	798.1 393.2	1.0029 1.0178	Slope	0.997950	0.90 - 1.10
200.1	196.4	1.0188	Intercept	-2.600000	+/-20



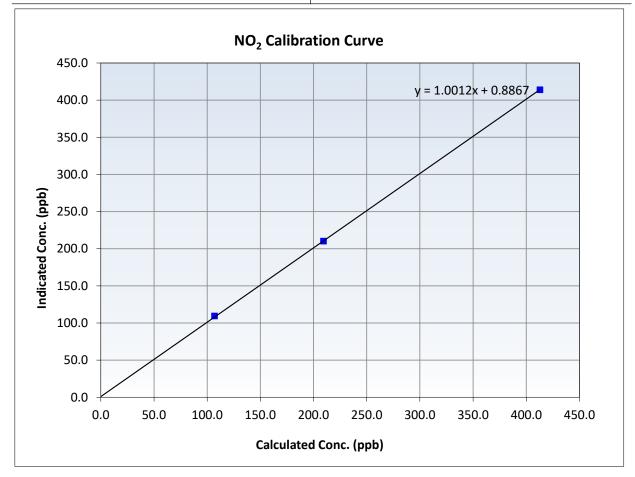


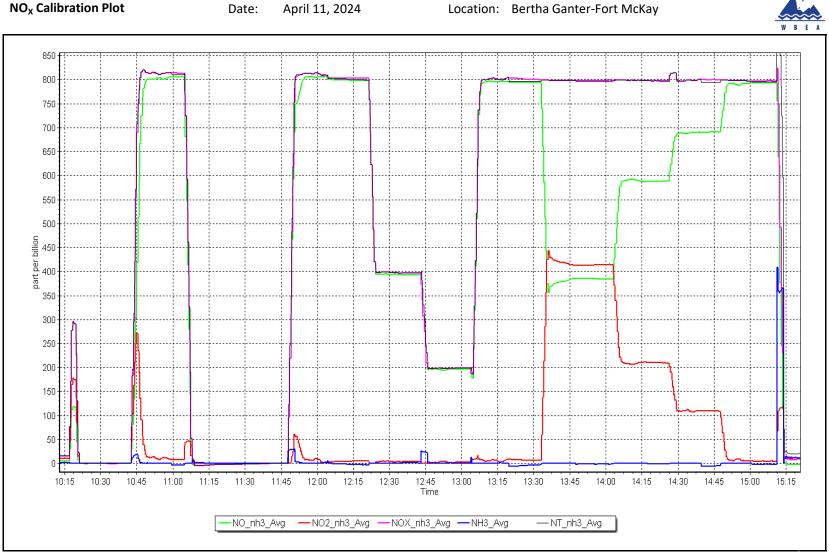
# NO<sub>2</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 19, 2024
Station Name:	Bertha Ganter-Fort McKay	Station Number:	AMS 01
Start Time (MST):	10:12	End Time (MST):	15:15
Analyzer make:	API T201	Analyzer serial #:	475

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999964	≥0.995
412.9 209.3	414.0 210.2	0.9974 0.9957	Slope	1.001154	0.90 - 1.10
106.9	109.4	0.9772	Intercept	0.886739	+/-20













# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

# AMS02 MILDRED LAKE APRIL 2024

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

May 31, 2024



# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

## **Station Information**

Station Name:	Mildred Lake
Calibration Date:	April 5, 2024
Start time (MST):	10:06
Reason:	Routine

Station number: AMS 02 Last Cal Date: March 19, 2024 End time (MST): 15:35

# **Calibration Standards**

Cal Gas Concentration: Cal Gas Cylinder #:	49.98 CC501209	ppm	Cal Gas Exp Date: August 12, 2024
, 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
		Anal	<u>yzer Information</u>
Analyzer make:	Thermo 43i		Serial Number: JC1404901075

#### Analyzer Range: 0-1000 ppb <u>Start</u> **Finish** <u>Start</u> Finish Calibration slope: 1.000614 0.993915 Backgd or Offset: 18.5 18.7 Calibration intercept: -0.364904 -0.766439 Coeff or Slope: 0.787 0.787

### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4920	80.2	801.6	797.6	1.005
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	797.5 NA NA	Previous response AF Slope: AF Correlation:	801.8	*% change AF Intercept: * = > +/-5% change initiate	-0.5% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.2	
High point	4920	80.2	801.6	796.2	1.007
Mid point	4960	40.1	400.8	397.6	1.008
Low point	4980	20.0	199.9	197.2	1.014
As left zero	5000	0.0	0.0	0.0	
As left span	4920	80.2	801.6	794.9	1.008
			Averag	ge Correction Factor:	1.010

Notes:

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

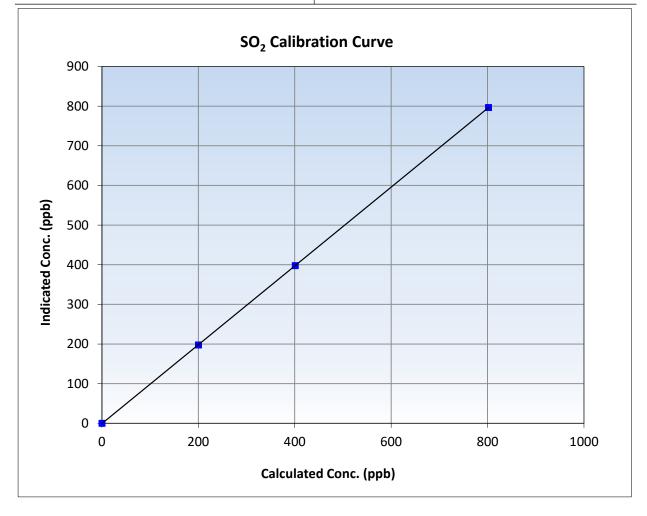


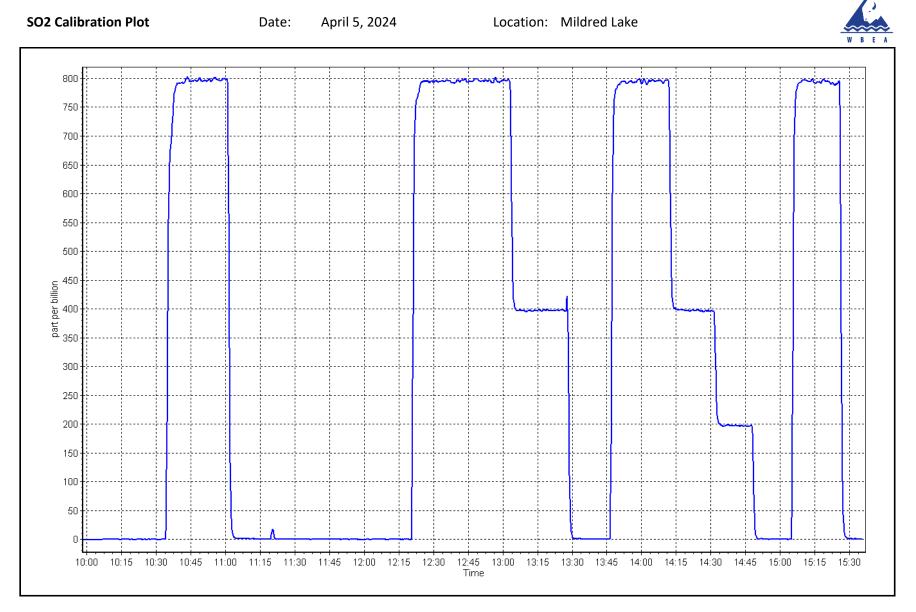
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 19, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:06	End Time (MST):	15:35
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1404901075

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999997	≥0.995
801.6 400.8	796.2 397.6	1.0068 1.0081	Slope	0.993915	0.90 - 1.10
199.9	197.2	1.0138	Intercept	-0.766439	+/-30







# Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Mildred Lake April 23, 2024 10:11 Routine		Station number: Last Cal Date: End time (MST):	AMS 02 March 26, 202 16:00	4	
		Calibration S	standards			
Cal Gas Concentration: Cal Gas Cylinder #:	5.29 CC345191	ppm	Cal Gas Exp Date:	January 4, 202	5	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.29 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA		
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 #:	12113311966		
Converter make:	Global G150		Converter serial #:	2022-198		
Analyzer Range	0 - 100 ppb		Converter Temp:		325	degC

	<u>Start</u>	<u>Finish</u>		<u>Start</u>
Calibration slope:	1.000964	1.008965	Backgd or Offset:	1.67
Calibration intercept:	0.020800	-0.259192	Coeff or Slope:	0.731

# 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	81.4	0.983
As found Mid point	4962	37.8	40.0	40.7	0.983
As found Low point New cylinder response	4981	18.9	20.0	19.9	1.005
Baseline Corr As found:	81.4	Prev response:	80.09	*% change:	1.6%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.019538	AF Intercept:	-0.179186
Baseline Corr 3rd AF pt:	19.9	AF Correlation:	0.999962	* = > +/-5% change initiate	es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.2	
High point	4924	75.6	80.0	80.4	0.995
Mid point	4962	37.8	40.0	40.3	0.992
Low point	4981	18.9	20.0	19.7	1.015
As left zero	5000	0.0	0.0	-0.1	
As left span	4924	75.6	80.0	80.5	0.994
SO2 Scrubber Check	4920	80.2	802.0	0.1	
Date of last scrubber cha	ange:	September 20, 2023	5	Ave Corr Factor	1.001
Date of last converter efficiency test:		April 23, 2024		107.1%	efficiency

Notes:

Changed inlet filter after running the converter efficiency test. Adjusted zero and span.

Calibration Performed By:

Braiden Boutilier

<u>Finish</u>

1.95

0.731

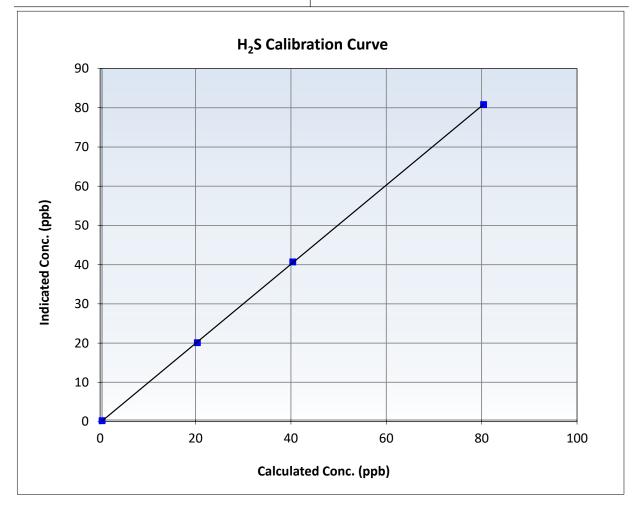


# **H2S Calibration Summary**

# **Station Information**

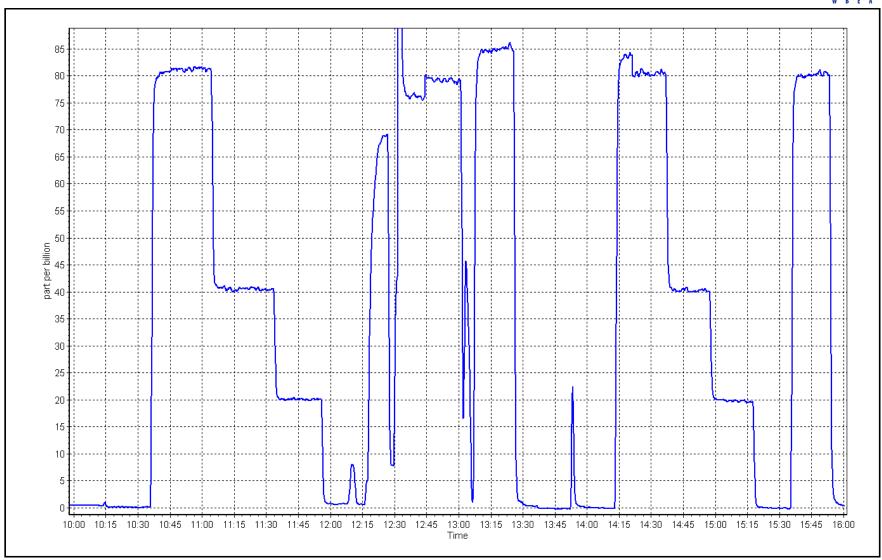
Calibration Date:	April 23, 2024	Previous Calibration:	March 26, 2024
Station Name:	Mildred Lake	Station Number:	AMS 02
Start Time (MST):	10:11	End Time (MST):	16:00
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12113311966

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999973 ≥0.995 0.0 -0.2 ----80.0 80.4 0.9949 Slope 1.008965 0.90 - 1.10 40.0 40.3 0.9924 20.0 19.7 1.0151 Intercept -0.259192 +/-3











# WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

# AMS04 BUFFALO VIEWPOINT APRIL 2024

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

May 31, 2024







# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

## **Station Information**

Station Name:	Buffalo Viewpoint	Station number: AMS 04
Calibration Date:	April 15, 2024	Last Cal Date: March 21, 2024
Start time (MST):	8:48	End time (MST): 11:35
Reason:	Routine	

### **Calibration Standards**

Cal Gas Concentration:	50.87	ppm	Cal Gas Exp Date: March 10, 2031
Cal Gas Cylinder #: Removed Cal Gas Conc:	CC446753 50.87		Pom Cac Evo Data:
Removed Gas Cyl #:	50.87	ppm	Rem Gas Exp Date: Diff between cyl:
Calibrator Model:	API T700		Serial Number: 3808
Zero Air Gen Model:	API T701		Serial Number: 362
Zero Ali Geri Model.	AFTITOL		Senar Number: 502

# Analyzer Information Serial Number: JC1327300932

Analyzer make: Analyzer Range:	Thermo 43i 0-1000ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000873	1.006888	Backgd or Offset:	24.7	25.1
Calibration intercept:	-0.325433	0.395801	Coeff or Slope:	0.867	0.880

### SO<sub>2</sub> 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	
As found High point As found Mid point As found Low point New cylinder response	4921	78.6	799.7	792.6	1.009
Baseline Corr As found: Baseline Corr 2nd AF pt:	792.3 NA	Previous response AF Slope:	800.1	*% change AF Intercept:	-1.0%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.3	
High point	4921	78.6	799.7	805.1	0.993
Mid point	4961	39.3	399.8	404.5	0.988
Low point	4980	19.6	199.4	200.3	0.996
As left zero	5000	0.0	0.0	0.2	
As left span	4921	78.6	799.7	804.7	0.994
	Average Correction Factor:			0.992	

Notes:

No maintenance done. Span adjusted.

Calibration Performed By:

Melissa Lemay

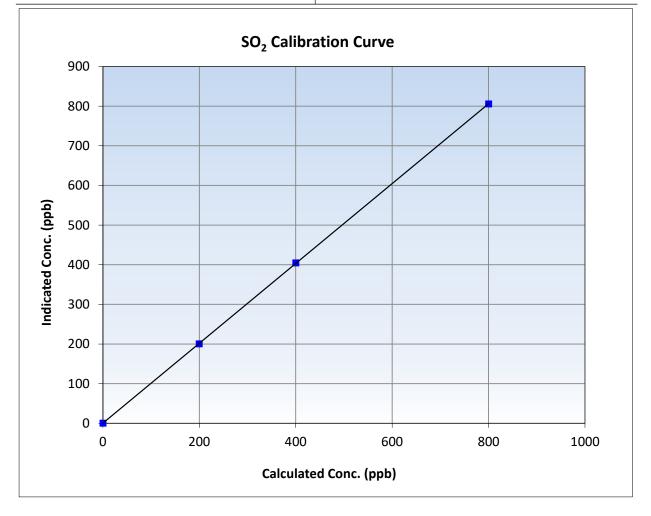


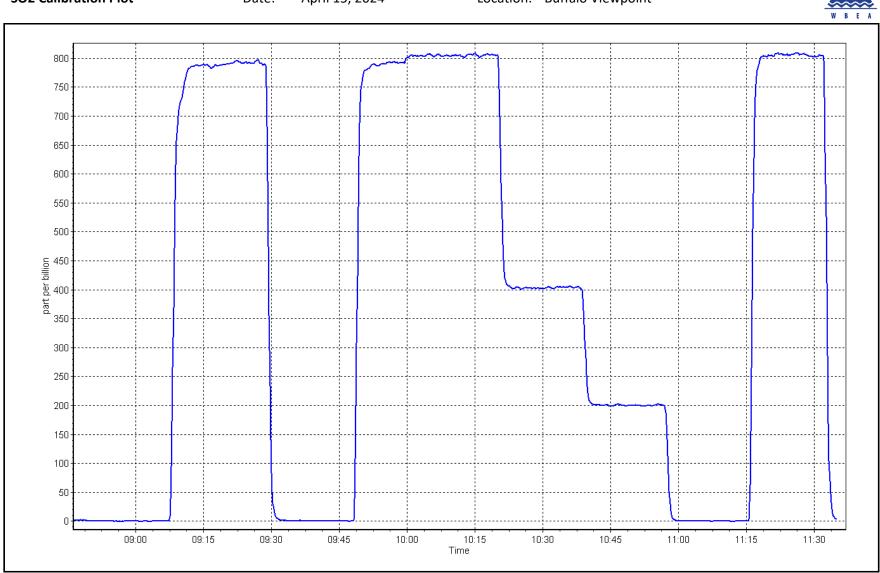
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 21, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:48	End Time (MST):	11:35
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1327300932

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999990	≥0.995
799.7 399.8	805.1 404.5	0.9933 0.9884	Slope	1.006888	0.90 - 1.10
199.4	200.3	0.9956	Intercept	0.395801	+/-30





Location: Buffalo Viewpoint



# Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Buffalo Viewpoint April 5, 2024 6:40 Routine		Station number: Last Cal Date: End time (MST):	AMS 04 March 20, 2024 10:33			
		Calibration S	tandards				
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: Serial Number:	3808			
Calibrator Make/Model:							
ZAG Make/Model:	API T701H		Serial Number:	362			
		Analyzer Info	ormation				
Analyzer make:	Thermo 43i-LTE		Analyzer serial #:	1008841400			
Converter make:	Global		Converter serial #:	2022-200			
Analyzer Range	0 - 100 ppb		Converter Temp:	:	325	degC	2
Calibration slope:	<u>Start</u> 0.995649	<u>Finish</u> 0.997925	Backgd or Offset:	<u>Start</u> 1.09			ŀ
Calibration intercept:	0.182120	0.102175	Coeff or Slope:				
cansi atter intercepti	0.102120	0.1021/0	seen of slope.	1.100			

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	
As found High point	4926	74.1	80.3	81.4	0.988
As found Mid point	4963	37.0	40.1	40.7	0.988
As found Low point	4982	18.5	20.1	20.1	1.003
New cylinder response					
Baseline Corr As found:	81.3	Prev response:	80.16	*% change:	1.4%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.013436	AF Intercept:	-0.017562
Baseline Corr 3rd AF pt:	20.0	AF Correlation:	0.999983	* = > +/-5% change initiates investigation	

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4926	74.1	80.3	80.2	1.002
Mid point	4963	37.0	40.1	40.3	0.995
Low point	4982	18.5	20.1	20.0	1.003
As left zero	5000	0.0	0.0	0.2	
As left span	4926	74.1	80.3	79.9	1.005
SO2 Scrubber Check	4920	80.0	800.0	0.0	
Date of last scrubber chan	ge:	16-May-23		Ave Corr Factor	1.000

Date of last converter efficiency test:

Notes:

Sox scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By:

Melissa Lemay

Finish 1.09 1.130

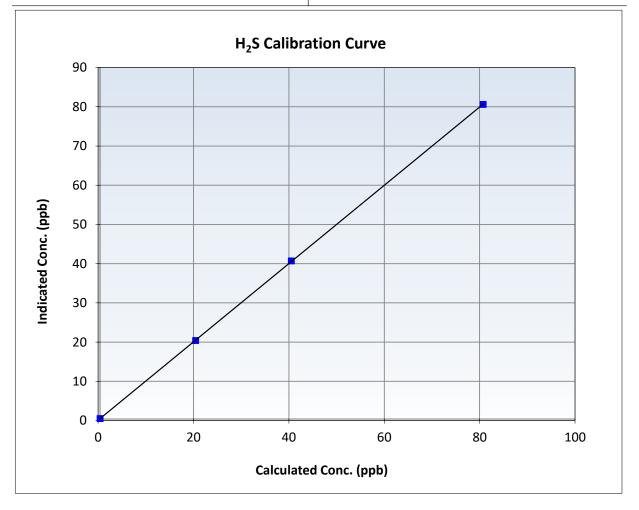


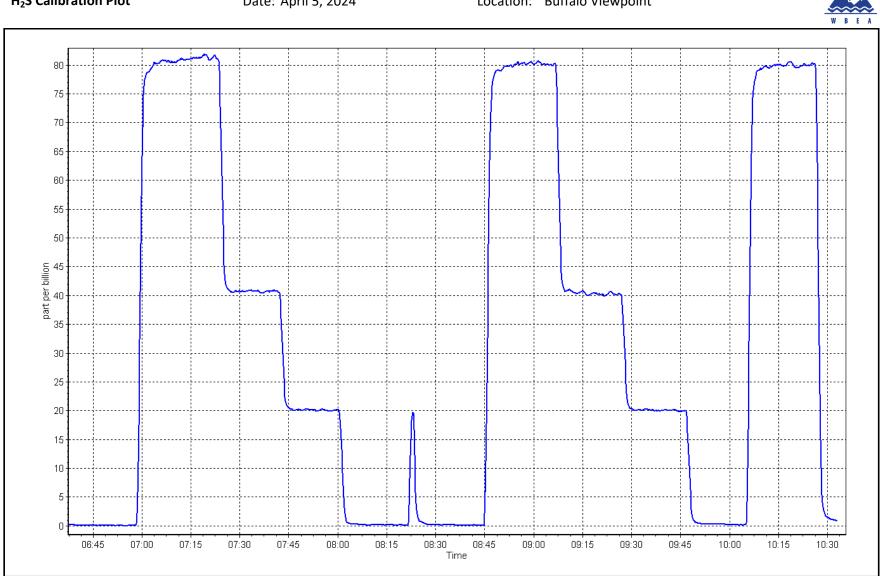
# H<sub>2</sub>S Calibration Summary

# **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 20, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:40	End Time (MST):	10:33
Analyzer make:	Global	Analyzer serial #:	2022-200

	<u>campation bata</u>						
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>		
0.0	0.1		Correlation Coefficient	0.999987	≥0.995		
80.3 40.1	80.2 40.3	1.0015 0.9952	Slope	0.997925	0.90 - 1.10		
20.1	20.0	1.0026	Intercept	0.102175	+/-3		





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

Location: Buffalo Viewpoint





# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

Analyzer serial #: 1426262594

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Buffalo Viewpoint	Station number: AMS 04
Calibration Date:	April 15, 2024	Last Cal Date: March 21, 2024
Start time (MST):	8:47	End time (MST): 11:34
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 <sub>4</sub> ):		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 THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	4.25E-04	4.22E-04	NMHC SP Ratio:	1.10E-04	1.07E-04
CH4 Retention time:	13.7	13.7	NMHC Peak Area:	80500	82687
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	16.95	0.982
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.95	Prev response	16.65	*% change	1.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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	16.60	1.002
Mid point	4961	39.3	8.32	8.30	1.002
Low point	4980	19.6	4.15	4.14	1.001
As left zero	5000	0.0	0.00	0.00	
As left span	4921	78.6	16.64	16.66	0.999
			Avera	ge Correction Factor	1.002

Notes:

No maintenance done. Span adjusted.



# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4921	78.6	8.82	9.06	0.973
Baseline Corr AF:	9.06	Prev response	8.83	*% change	2.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes 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	8.80	1.003
Mid point	4961	39.3	4.41	4.41	1.000
Low point	4980	19.6	2.20	2.20	0.998
As left zero	5000	0.0	0.00	0.00	
As left span	4921	78.6	8.82	8.84	0.998
			Avera	ge Correction Factor	1.000

#### CH4 As Found Data

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
5000	0.0	0.00	0.00	
4921	78.6	7.82	7.89	0.991
7.89 NA	Prev response AF Slope:	7.82	*% change AF Intercept:	
	(sccm) 5000 4921 7.89	(sccm) (sccm) 5000 0.0 4921 78.6 7.89 Prev response NA AF Slope:	(sccm) (sccm) (ppm) (Cc) 5000 0.0 0.00 4921 78.6 7.82 7.89 Prev response 7.82 NA AF Slope:	(sccm)         (sccm)         (ppm) (Cc)         (ppm) (lc)           5000         0.0         0.00         0.00           4921         78.6         7.82         7.89           7.89         Prev response         7.82         *% change           NA         AF Slope:         AF Intercept:

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
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	3.89	1.004
Low point	4980	19.6	1.95	1.94	1.004
As left zero	5000	0.0	0.00	0.00	
As left span	4921	78.6	7.82	7.82	0.999
			Avera	age Correction Factor	1.003

### **Calibration Statistics**

	Start	<u>Finish</u>
THC Cal Slope:	1.000586	0.997908
THC Cal Offset:	0.008071	0.002057
CH4 Cal Slope:	1.001043	0.998894
CH4 Cal Offset:	-0.004702	-0.004105
NMHC Cal Slope:	0.999701	0.997215
NMHC Cal Offset:	0.013373	0.005963

Calibration Performed By:

Melissa Lemay

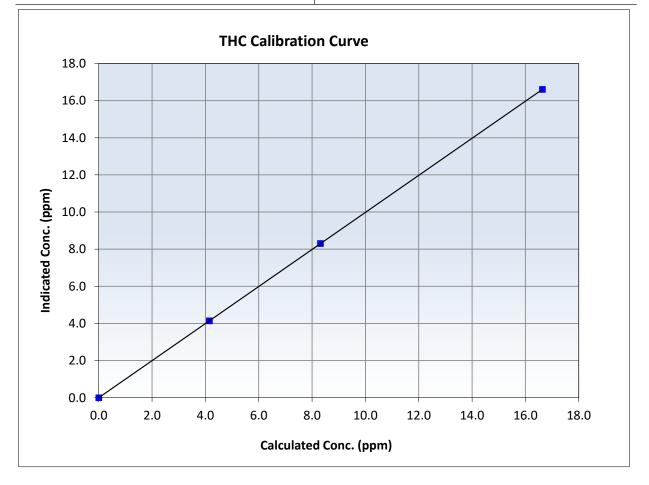


# Wood Buffalo Environmental Association THC Calibration Summary

### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 21, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:47	End Time (MST):	11:34
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	1.000000	≥0.995
16.64 8.32	16.60 8.30	1.0021 1.0016	Slope	0.997908	0.90 - 1.10
4.15	4.14	1.0013	Intercept	0.002057	+/-0.5



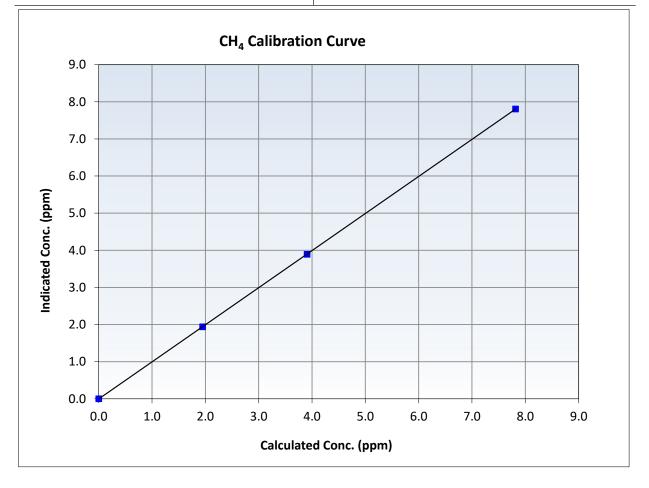


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 21, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:47	End Time (MST):	11:34
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999998	≥0.995
7.82	7.81	1.0012	Slope	0.998894	0.90 - 1.10
3.91	3.89	1.0035	·		
1.95	1.94	1.0042	Intercept	-0.004105	+/-0.5



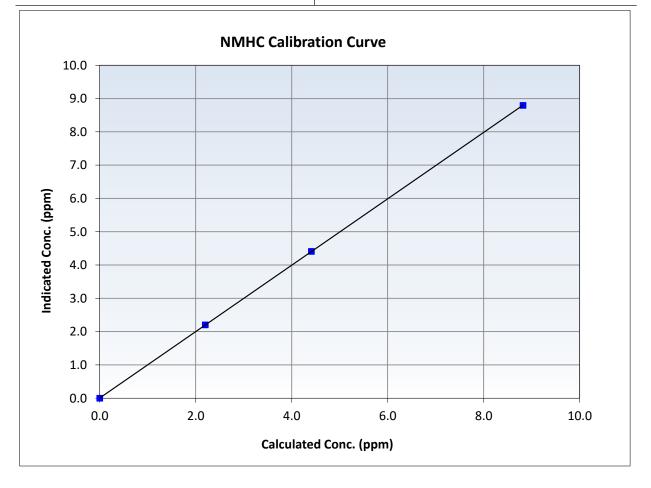


# Wood Buffalo Environmental Association NMHC Calibration Summary

### **Station Information**

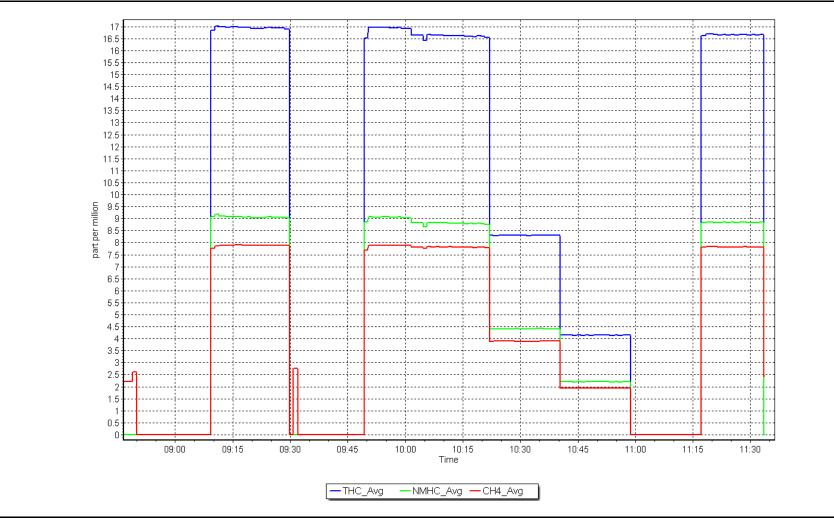
Calibration Date:	April 15, 2024	Previous Calibration:	March 21, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	8:47	End Time (MST):	11:34
Analyzer make:	Thermo 55i	Analyzer serial #:	1426262594

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999998	≥0.995
8.82	8.80	1.0026	Slope	e 0.997215	0.90 - 1.10
4.41	4.41	1.0000	Slope	0.337213	0.50 1.10
2.20	2.20	0.9983	Intercept	0.005963	+/-0.5



### **NMHC Calibration Plot**







# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

### **Station Information**

Station Name:	Buffalo Viewpoint		Station number:	Station number: AMS 04					
Calibration Date:	April 24, 2024		Last Cal Date:	April 15, 2024					
Start time (MST):	7:36		End time (MST):	8:59					
Reason:	Cylinder Change	Nitrogen Cylinder C	Change						
		Calibration	<u>Standards</u>						
Gas Cert Reference:	CC44	46753	Cal Gas Expiry Date:	March 10	0. 2031				
CH4 Cal Gas Conc.	497.2	ppm	CH4 Equiv Conc.	1058.2	•				
C3H8 Cal Gas Conc.		ppm			-				
Removed Gas Cert:			Removed Gas Expiry:						
Removed CH4 Conc.	497.2	ppm	CH4 Equiv Conc.		mac				
Removed C3H8 Conc.		ppm	Diff between cyl (THC):	•	- 1-				
Diff between cyl (CH₄):			Diff between cyl (NM):						
Calibrator Model:	API	Т700	Serial Number:	380	8				
Zero Air Gen model:	API	T701	Serial Number:	36	2				
		Analyzer Ir	nformation						
Analyzer make:	Thermo 55i		Analyzer serial #:	1426262594					
THC Range:	0 - 20 ppm		NMHC/CH4 Range:						
Ũ									
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>				
CH4 SP Ratio:		4.22E-04	NMHC SP Ratio:	1.10E-04	1.07E-04				
CH4 Retention time:	-	13.7	NMHC Peak Area:	80500	82687				
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF				
		THC As Fo	ound Data						
		THC As Fo	ound Data		Baseline Adjusted				
	Dilution air flow rate	THC As Fo	Calculated concentration	Indicated concentration	Baseline Adjusted Correction factor				
Set Point	Dilution air flow rate (sccm)			Indicated concentration (ppm) (Ic)	,				
	(sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor				
As found zero	(sccm) 5000	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.00	Correction factor (Cc/(Ic-AFzero)) Limit = 0.90-1.10				
As found zero As found High point	(sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>				
As found zero As found High point As found Mid point	(sccm) 5000	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.00	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	(sccm) 5000	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.00	Correction factor (Cc/(Ic-AFzero)) Limit = 0.90-1.10				
As found zero As found High point As found Mid point	(sccm) 5000	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.00	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	(sccm) 5000	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.00	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	(sccm) 5000 4921	Source gas flow rate (sccm) 0.0 78.6	Calculated concentration (ppm) (Cc) 0.00 16.64	(ppm) (Ic) 0.00 16.61	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:	(sccm) 5000 4921 16.61	Source gas flow rate (sccm) 0.0 78.6 Prev response	Calculated concentration (ppm) (Cc) 0.00 16.64	(ppm) (Ic) 0.00 16.61 *% change	Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>  1.002 -0.3%				

# **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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4921	78.6	16.64	16.55	1.005
Mid point					
Low point					
As left zero					
As left span					
			Avera	ge Correction Factor	1.005

Notes: Nitr

Nitrogen Cylinder Change.



# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

### NMHC As Found Data

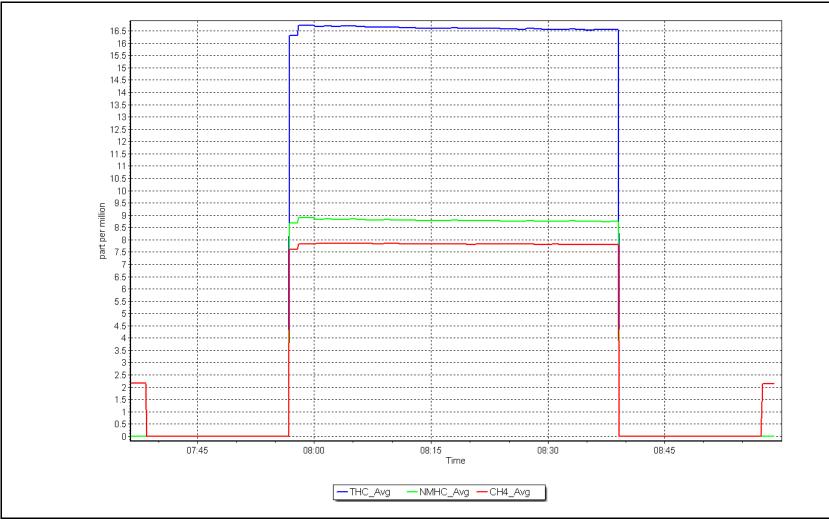
WBEA		NMHC As Fe	ound Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration ( (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic- AFzero)) Limit = 0.90-1.10
As found zero As found High point As found Mid point As found Low point New cylinder response	5000 4921	0.0 78.6	0.00 8.82	0.00 8.78	1.004
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	8.78 NA NA	Prev response AF Slope: AF Correlation:	8.83	*% change AF Intercept: * = > +/-5% change initiate	-0.5% es investigation
		NMHC Calib	ration Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero High point Mid point Low point As left zero As left span	5000 4921	0.0 78.6	0.00 8.82	0.00 8.76	1.007
			Avera	ge Correction Factor	1.007
		CH4 As For	und Data		Paceline Adjusted
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	5000 4921	0.0 78.6	0.00 7.82	0.00 7.82	 0.999
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	7.82 NA NA	Prev response AF Slope: AF Correlation:	7.82	*% change AF Intercept: * = > +/-5% change initiate	0.0%
		CH4 Calibra	ition Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero High point Mid point Low point As left zero	5000 4921	0.0 78.6	0.00 7.82	0.00 7.80	1.002
As left span			Avera	ge Correction Factor	1.002
		Calibration	Statistics	-	
THC Cal Slope: THC Cal Offset: CH4 Cal Slope: CH4 Cal Offset: NMHC Cal Slope:		<u>Start</u> 1.000586 0.008071 1.001043 -0.004702 0.999701		<u>Finish</u> 0.994997 0.000000 0.998003 0.000000 0.992673	
NMHC Cal Slope: NMHC Cal Offset:		0.999701 0.013373		0.992673 0.000000	

Calibration Performed By:

Melissa Lemay

# NMHC Calibration Plot







**Station Information** 

# Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Standards**

Station Name:	Buffalo Viewpoint	NO Gas Cylinder #:	CC324979	Cal Gas Expiry Date:	November 3, 2032
Station number:	AMS 04	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Calibration Date:	April 2, 2024	Removed Cylinder #:		Removed Gas Exp Date	:
Last Cal Date:	March 1, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc	: 48.80 ppm
Start time (MST):	6:08	NOX gas Diff:		NO gas Diff:	
End time (MST):	11:18	Calibrator Model:	API T700	Serial Number:	3808
Reason:	Routine	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	0.4	0.3	0.1		
AF High point	4918	81.8	800.0	798.4	1.6	784.3	777.1	7.2	1.0206	1.0278
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	796.3 ppb	NO = 791.6	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-1.6%
Baseline Corr 1	st pt NO <sub>x</sub> =	783.9 ppb	NO = 776.8	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-1.9%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
								Baseline Adjus	ted NO2	

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero)) Limit = 0.90 - 1.10	Converter Efficiency <i>Limit = 96-104%</i>

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

# Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Statistics**

Analyzer Make:	API T200		Serial Number: 721				<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.995753	1.003822
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-0.374543	-0.272631
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.993186	1.002903
NO coeff or slope:	1.162	1.189	NO bkgnd or offset:	-0.6	-0.6	NO Cal Offset:	-1.315833	-0.733480
NOX coeff or slope:	1.154	1.177	NOX bkgnd or offset:	-0.3	-0.3	NO <sub>2</sub> Cal Slope:	0.998315	0.996313
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	4.3	4.3	NO <sub>2</sub> Cal Offset:	1.614021	-1.280139

### **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	0.7	-0.2		
High point	4918	81.8	800.0	798.4	1.6	803.4	801.0	2.4	0.9958	0.9968
Mid point	4959	40.9	400.0	399.2	0.8	400.3	398.0	2.2	0.9993	1.0030
Low point	4980	20.4	199.5	199.1	0.4	199.6	198.1	1.5	0.9995	1.0050
As left zero	5000	0.0	0.0	0.8	-0.8	0.7	0.8	-0.1		
As left span	4918	81.8	800.0	401.8	800.0	792.6	401.8	390.8	1.0094	1.0000
							Average Co	orrection Factor	0.9982	1.0016

### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	-0.2		
High GPT point	796.0	398.7	398.9	396.7	1.0056	99.4%
Mid GPT point	796.0	598.1	199.5	197.1	1.0124	98.8%
Low GPT point	796.0	694.2	103.4	100.6	1.0282	97.3%
				Average Correction Factor	1.0154	98.5%

Notes: Span adjusted. Due to drifting during the GPT the 2nd NO ref point used.

Calibration Performed By:

Melissa Lemay

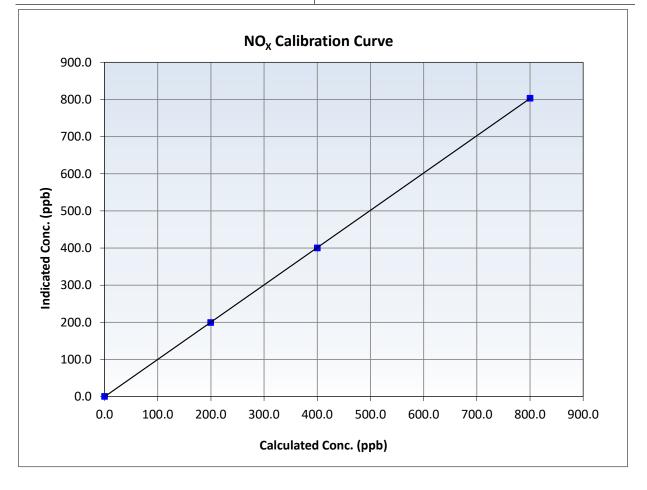


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 1, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:08	End Time (MST):	11:18
Analyzer make:	API T200	Analyzer serial #:	721

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999994	≥0.995
800.0 400.0	803.4 400.3	0.9958 0.9993	Slope	1.003822	0.90 - 1.10
199.5	199.6	0.9995	Intercept	-0.272631	+/-20



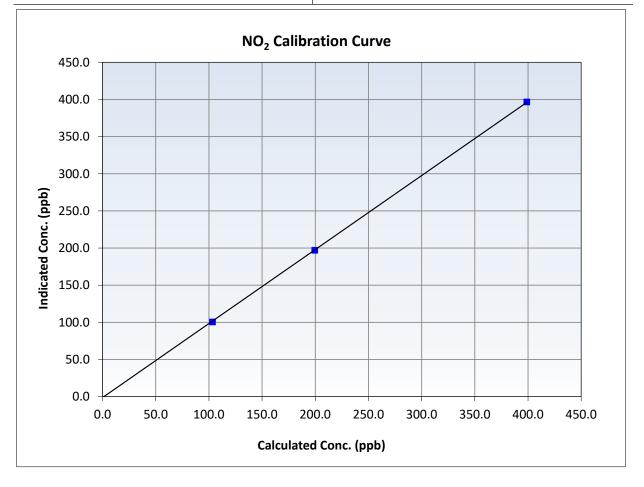


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

# **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 1, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:08	End Time (MST):	11:18
Analyzer make:	API T200	Analyzer serial #:	721

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999965	≥0.995
398.9	396.7	1.0056	Slope	0.996313	0.90 - 1.10
199.5	197.1	1.0124			0.50 1.10
103.4	100.6	1.0282	Intercept	-1.280139	+/-20



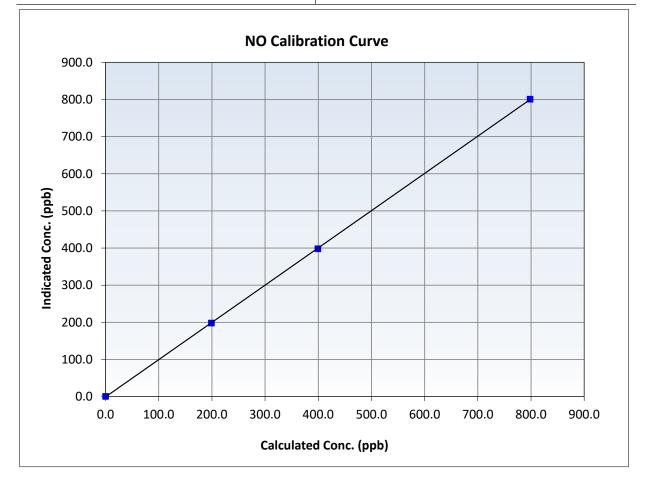


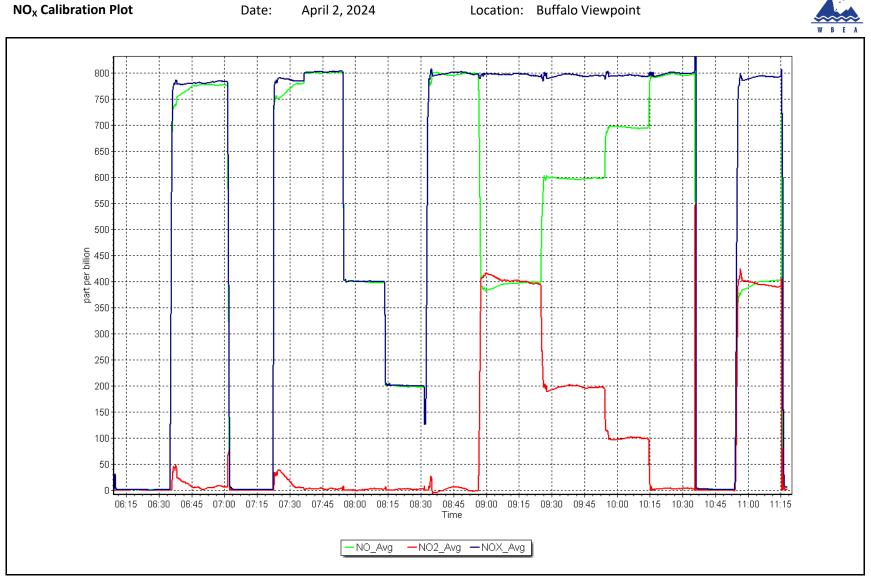
# Wood Buffalo Environmental Association NO Calibration Summary

### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 1, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:08	End Time (MST):	11:18
Analyzer make:	API T200	Analyzer serial #:	721

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.7		Correlation Coefficient	0.999982	≥0.995
798.4 399.2	801.0 398.0	0.9968 1.0030	Slope	1.002903	0.90 - 1.10
199.1	198.1	1.0050	Intercept	-0.733480	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Buffalo Viewpoint April 15, 2024 6:18 Routine	Station number: AMS 04 Last Cal Date: March 15, 2024 End time (MST): 8:48			
		Calibration Sta	andards		
O3 generation mode: Calibrator Make/Model:	Photometer APIP T700		Serial Number: 3808		
ZAG Make/Model:	API T701	Serial Number: 362			
		Analyzer Infor	mation		
Analyzer make:	API T400		Analyzer serial #: 2961		
Analyzer Range	0 - 500 ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	
Calibration slope:	1.004971	1.003629	Backgd or Offset:	-2.2	
Calibration intercept:	-0.120000	0.540000	Coeff or Slope:	1.011	

#### O<sub>3</sub> As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	e Calculated Indicated concentrat concentration (ppb) (Cc) (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 As found Mid point As found Low point	5000	995.7	400.0	401.1	0.996	
Baseline Corr As found:	401.5	Previous response	401.9	*% change	-0.1%	
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:		
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<pre>* = &gt; +/-5% change initiates investigation</pre>		

#### **O<sub>3</sub> 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	0.2	
High point	5000	995.3	400.0	401.8	0.996
Mid point	5000	820.9	200.0	201.5	0.993
Low point	5000	711.9	100.0	101.2	0.988
As left zero	5000	0.0	0.0	0.0	
As left span	5000	995.7	400.0	403.5	0.991
-			Average Correction Factor 0.992		

Notes: No adjustments and maintenance done.

Calibration Performed By: Melissa Lemay

Finish -2.2 1.011

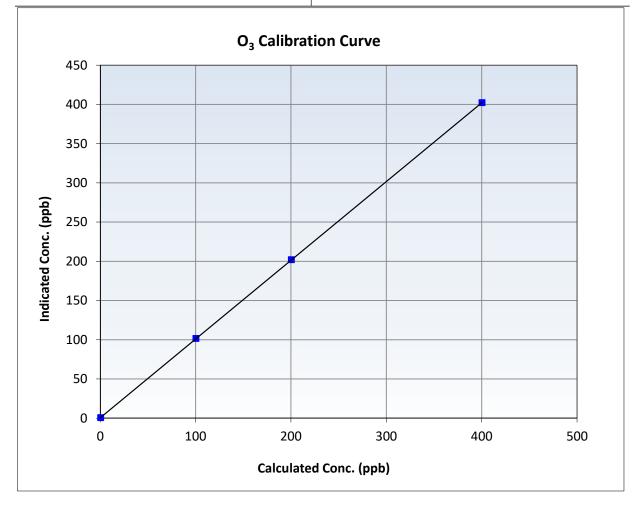


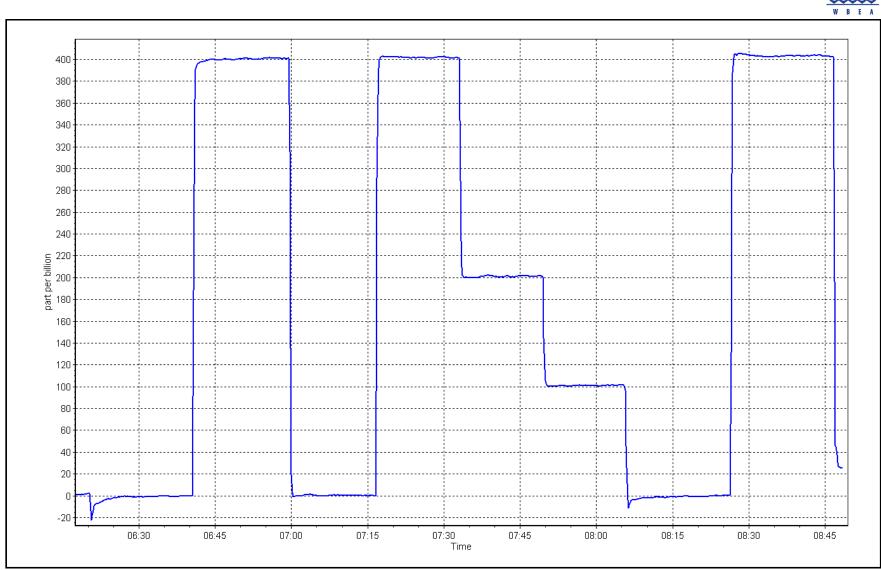
# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 15, 2024
Station Name:	Buffalo Viewpoint	Station Number:	AMS 04
Start Time (MST):	6:18	End Time (MST):	8:48
Analyzer make:	API T400	Analyzer serial #:	2961

Calculated concentratio (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999997	≥0.995
400.0 200.0	401.8 201.5	0.9955 0.9926	Slope	1.003629	0.90 - 1.10
100.0	101.2	0.9881	Intercept	0.540000	+/- 5





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

Location: Buffalo Viewpoint





### Wood Buffalo Environmental Association

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

WBEA					Version-01-2024
		Station Information	on		
Station Name:	Buffalo Viewpoint		Station number: AM	/IS 04	
Calibration Date:	April 24, 2024		Last Cal Date: M		
Start time (MST):	6:57		End time (MST): 7:2	22	
Analyzer Make:	API T640		S/N: 32	1	
Particulate Fraction:	PM2.5				
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 38	8753	
Temp/RH standard:	Alicat FP-25BT		S/N: 38	8753	
		Monthly Calibration	Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	4.6	4.3	4.6		+/- 2 °C
P (mmHg)	727.5	729.4	727.5		+/- 10 mmHg
Flow (LPM)	5.00	5.18	5.00		+/- 0.25 LPM
PW% (pump)	41		41		>80%
Zero Verification	PM w/o HEPA:	15.5	PM w/ HEPA:	0.0	<0.2 ug/m3
Note: this leak check will be PM Inlet observation :	completed before the Inlet Head Clean		serve as the pre mainte ignment Factor On :	enance leak check	
		Quarterly Calibration	Test		
SPAN DUST	Refractive Index:	10.9	Expiry Date:	6-10-2024	1
SPAN DOST	Lot No.:	100128-050-042			
Parameter	As found	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test					+/- 0.5
Date Optical Chan	uber Cleaned:	February 2	27, 2024		
Date Disposable Fi		February 2			
· · · · · · · · · · · · · · · · · · ·					
Post- maintenance Zero Ver	fification:	PM w/ HEPA: _		<0.2 ug/m3	
		Annual Maintenan	ice		
Date Sample Tul	be Cleaned:	February 2	27, 2024		
Date RH/T Sense	or Cleaned:	February 2	27, 2024		
Notes:		No adjustment	ts done. Leak check pas	ssed.	

Calibration by:

Melissa Lemay



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS05 MANNIX APRIL 2024

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

May 31, 2024



# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Mannix April 4, 2024 8:18 Routine		Station number: AM Last Cal Date: Ma End time (MST): 11	arch 20, 2024			
		Calibration S	Standards				
Cal Gas Concentration: Cal Gas Cylinder #:	50.02 XC026809B	ppm	Cal Gas Exp Date: Jar	nuary 12, 2029			
, Removed Cal Gas Conc:	50.02	ppm	Rem Gas Exp Date: N/	A			
Removed Gas Cyl #:	N/A		Diff between cyl:				
Calibrator Model:	API T700		Serial Number: 62	1			
Zero Air Gen Model:	API T701H		Serial Number: 83	2			
		Analyzer Inf	ormation				
Analyzer make:	Thermo 43i		Serial Number: 10	08841399			
Analyzer Range:	0 - 1000 ppb						
	Start	Finish		<u>Start</u>	Finish		
Calibration slope:	1.005098	0.999943	Backgd or Offset:	9.6	9.6		
Calibration intercept:	-0.700000	0.380000	Coeff or Slope:	0.944	0.944		
SO <sub>2</sub> 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	80.0	800.3	800.9	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	800.9	Previous response	803.7	*% change	-0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4920	80.0	800.3	800.4	1.000
Mid point	4960	40.0	400.2	401.0	0.998
Low point	4980	20.0	200.1	200.5	0.998
As left zero	5000	0.0	0.0	0.2	
As left span	4920	80.0	800.3	803.9	0.996
			Averag	0.999	

Notes:

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

Calibration Performed By:

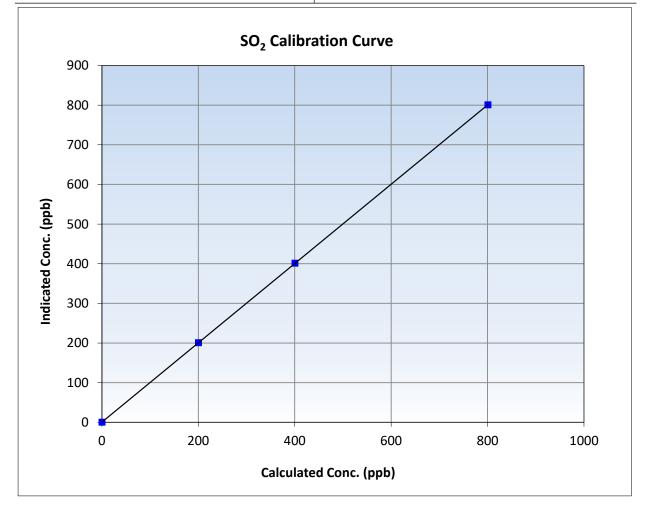


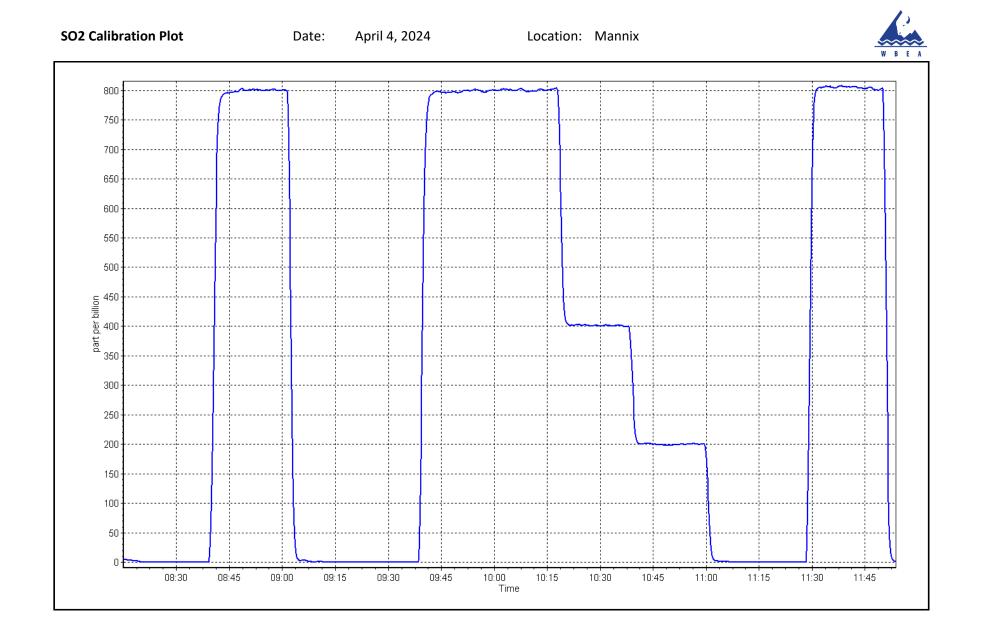
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 20, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	8:18	End Time (MST):	11:55
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841399

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999999	≥0.995
800.3 400.2	800.4 401.0	0.9999 0.9979	Slope	0.999943	0.90 - 1.10
200.1	200.5	0.9979	Intercept	0.380000	+/-30







# Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Mannix April 19, 2024 10:27 Routine		Station number: Last Cal Date: End time (MST):	AMS 05 March 12, 2024 13:45			
		<b>Calibration</b>	<u>Standards</u>				
Cal Gas Concentration: Cal Gas Cylinder #:	4.96 DT0037363	ppm	Cal Gas Exp Date:	November 15, 2	2026		
Removed Cal Gas Conc: Removed Gas Cyl #:	4.96	ppm	Rem Gas Exp Date: Diff between cyl:				
Calibrator Make/Model:	API T700		Serial Number:	1845			
ZAG Make/Model:	API T701H		Serial Number:	832			
		Analyzer Inf	formation				
Analyzer make:	Thermo 43iQTL		Analyzer serial #:	1200326169			
Converter make:	Global		Converter serial #:	2022225			
Analyzer Range	0 - 100 ppb		Converter Temp:		350	degC	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>			<u>Finish</u>
Calibration slope:	0.997116	0.995684	Backgd or Offset:	1.23			1.23
Calibration intercept:	-0.017688	-0.017567	Coeff or Slope:	0.978			0.978

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) Limit = 0.90-1.10
As found zero	5000	0.0	0.0	0.0	
As found High point As found Mid point As found Low point New cylinder response	4919	80.6	80.0	79.5	1.006
Baseline Corr As found:	79.5	Prev response:	79.71	*% change:	-0.3%
Baseline Corr 2nd AF pt:	NA	AF Slope:	NA	AF Intercept:	NA
Baseline Corr 3rd AF pt:	NA	AF Correlation:	NA	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4919	80.6	80.0	79.6	1.005
Mid point	4960	40.3	40.0	39.9	1.002
Low point	4980	20.2	20.0	19.7	1.017
As left zero	5000	0.0	0.0	0.1	
As left span	4919	80.6	80.0	79.6	1.005
SO2 Scrubber Check	4920	80.0	800.0	0.0	
Date of last scrubber chan	ige:			Ave Corr Factor	1.008

Date of last converter efficiency test:

#### Notes:

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

Calibration Performed By: Max F

Max Farrell



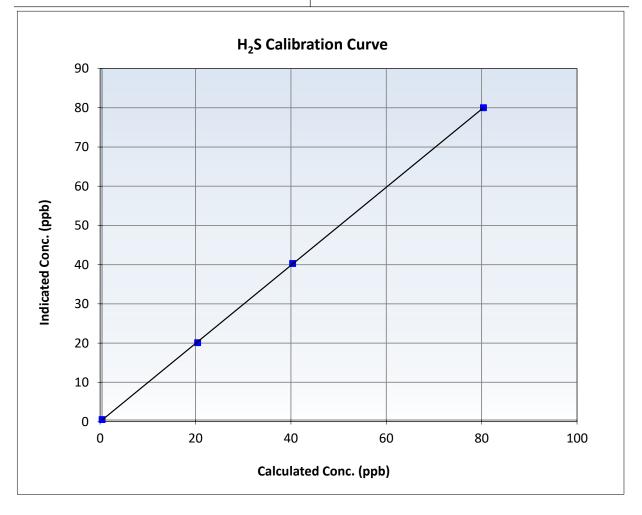
## **Wood Buffalo Environmental Association**

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

#### **Station Information**

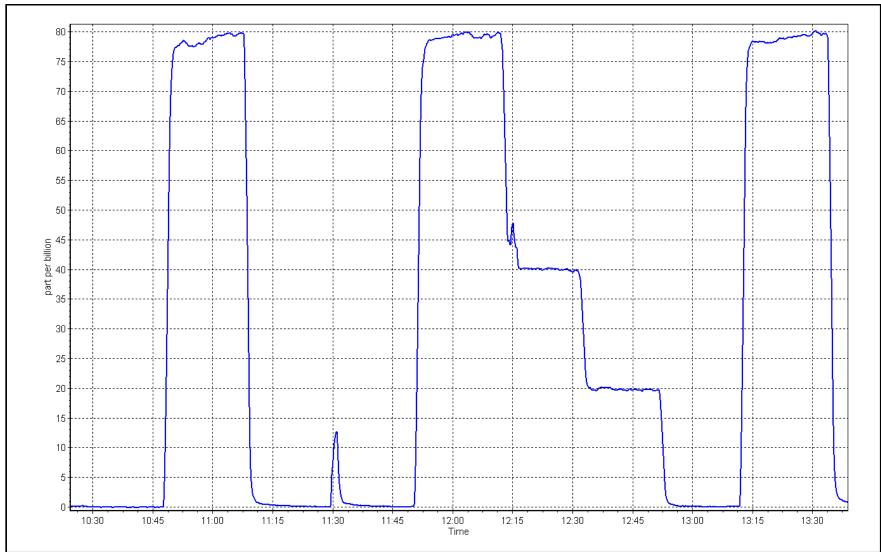
Calibration Date:	April 19, 2024	Previous Calibration:	March 12, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	10:27	End Time (MST):	13:45
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	1200326169

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999976 ≥0.995 0.0 0.1 ----80.0 79.6 1.0045 Slope 0.995684 0.90 - 1.10 40.0 39.9 1.0019 20.0 19.7 1.0171 Intercept -0.017567 +/-3











## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Mannix	Station number: AMS 05
Calibration Date:	April 4, 2024	Last Cal Date: March 13, 2024
Start time (MST):	8:18	End time (MST): 11:55
Reason:	Routine	
		Calibration Standards
Gas Cert Reference:	XCO268098	Cal Gas Expiry Date:

Gas Cert Reference:	XC	.0268098	Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	504.9	ppm	CH4 Equiv Conc.	1076.6 ppm	
C3H8 Cal Gas Conc.	207.9	ppm			
Removed Gas Cert:			Removed Gas Expiry:		
Removed CH4 Conc.	504.9	ppm	CH4 Equiv Conc.	1076.6 ppm	
Removed C3H8 Conc.	207.9	ppm	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number: 621		
Zero Air Gen model:	API T701		Serial Number: 5613		
		An	alyzer Information		
Analyzer make:	Thermo 55i		Analyzer serial #: 1170050	0130	

Analyzer make: Thermo 55i THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.76E-04	2.73E-04	NMHC SP Ratio:	5.97E-05	5.89E-05
CH4 Retention time:	14.4	1.44E+01	NMHC Peak Area:	153276	155276
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 As found Mid point As found Low point New cylinder response	4920	80.0	17.23	17.49	0.985
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	17.49 NA NA	Prev response AF Slope: AF Correlation:	17.22	*% change AF Intercept: * = > +/-5% change initiate	1.5% es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.0	17.23	17.21	1.001
Mid point	4960	40.0	8.61	8.61	1.001
Low point	4980	20.0	4.31	4.29	1.004
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.0	17.23	17.27	0.998
			Avera	ge Correction Factor	1.002

Notes:

Changed the inlet filter and the H2 cylinder after as founds. Adjusted the span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### NMHC As Found Data

		INIVIAC AS F	ound 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 As found Mid point As found Low point New cylinder response	4920	80.0	9.15	9.30	0.984
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	9.30 NA NA	Prev response AF Slope: AF Correlation:	9.16	*% change AF Intercept: * = > +/-5% change initia	

#### **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	9.13	1.002
Mid point	4960	40.0	4.57	4.57	1.000
Low point	4980	20.0	2.29	2.28	1.002
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.0	9.15	9.16	0.998
			Avera	ge Correction Factor	1.001

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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	8.08	8.19	0.987
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	8.19	Prev response	8.06	*% change	1.6%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiat	tes 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	8.08	8.09	0.999
Mid point	4960	40.0	4.04	4.03	1.001
Low point	4980	20.0	2.02	2.01	1.006
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.0	8.08	8.10	0.997
			Avera	ge Correction Factor	1.002

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999917	0.999340
THC Cal Offset:	-0.008000	-0.004400
CH4 Cal Slope:	1.000113	1.001641
CH4 Cal Offset:	-0.024200	-0.007600
NMHC Cal Slope:	0.999769	0.997707
NMHC Cal Offset:	0.016600	0.002600

Calibration Performed By:

Max Farrell

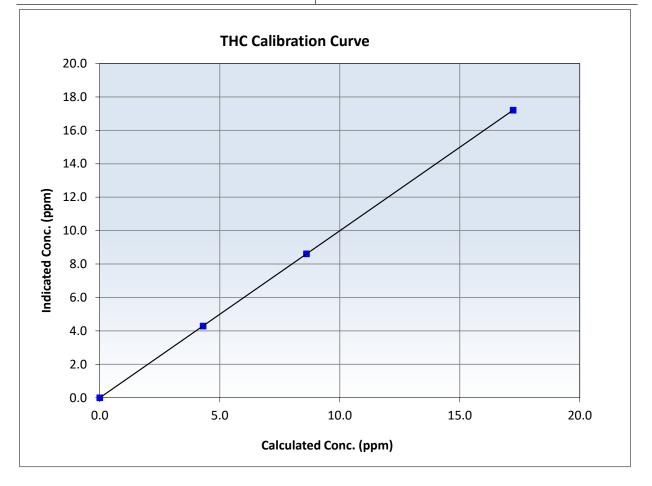


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 13, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	8:18	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050130

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999999	≥0.995
17.23 8.61	17.21 8.61	1.0009 1.0006	Slope	0.999340	0.90 - 1.10
4.31	4.29	1.0038	Intercept	-0.004400	+/-0.5



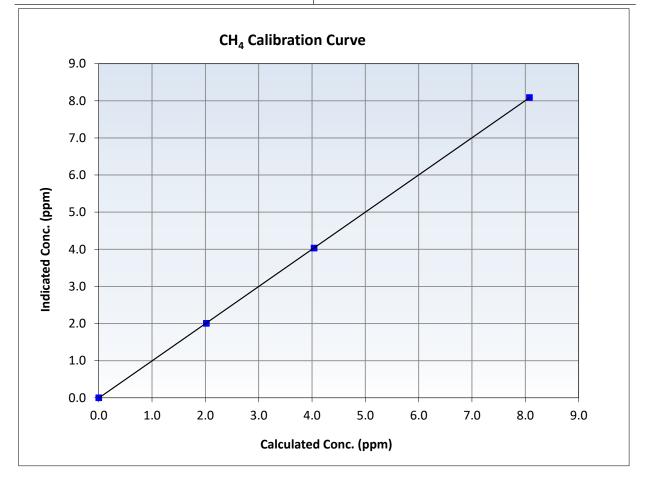


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 13, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	8:18	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050130

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999996	≥0.995
8.08	8.09	0.9988	Slope	1.001641	0.90 - 1.10
4.04	4.03	1.0013	Slope	1.001041	0.00 1.10
2.02	2.01	1.0058	Intercept	-0.007600	+/-0.5



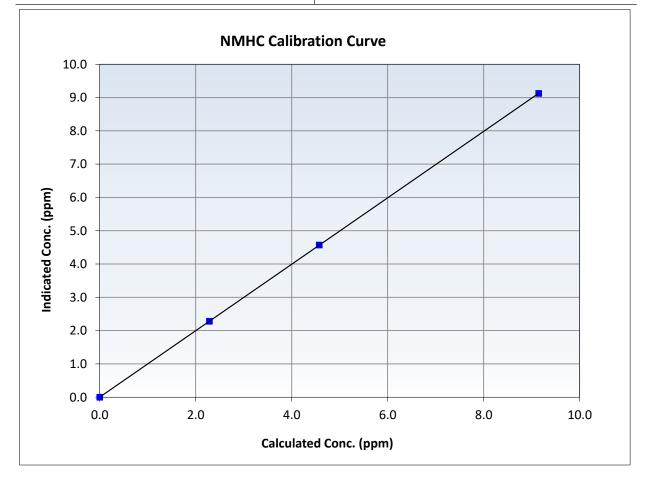


# Wood Buffalo Environmental Association NMHC Calibration Summary

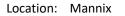
#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 13, 2024
Station Name:	Mannix	Station Number:	AMS 05
Start Time (MST):	8:18	End Time (MST):	11:55
Analyzer make:	Thermo 55i	Analyzer serial #:	1170050130

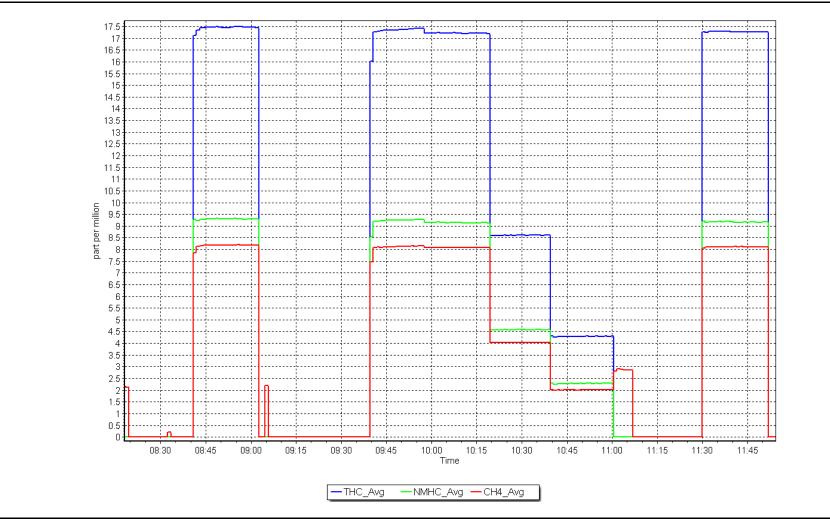
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999998	≥0.995
9.15	9.13	1.0024	Slope	0.997707	0.90 - 1.10
4.57	4.57	1.0002	·		
2.29	2.28	1.0017	Intercept	0.002600	+/-0.5



#### **NMHC Calibration Plot**









### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS06 PATRICIA MCINNES APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Patricia McInnes
Calibration Date:	April 23, 2024
Start time (MST):	8:26
Reason:	Routine

Thermo 43i

0 - 1000 ppb

Station number: AMS 06 Last Cal Date: March 7, 2024 End time (MST): 11:45

#### **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**

Serial Number: 1160290013

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997030	1.004978	Backgd or Offset:	17.7	17.7
Calibration intercept:	1.560821	1.779365	Coeff or Slope:	0.922	0.922

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4919.7	80.3	799.5	800.9	0.998
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	800.9 NA NA	Previous response AF Slope: AF Correlation:	798.7	*% change AF Intercept: * = > +/-5% change initiate	0.3%

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.5	
High point	4919.7	80.3	799.5	804.7	0.993
Mid point	4959.8	40.2	400.2	404.3	0.990
Low point	4979.9	20.1	200.1	204.4	0.979
As left zero	5000	0.0	0.0	0.3	
As left span	4919.7	80.3	799.5	805.0	0.993
			Averag	e Correction Factor:	0.987

Notes:

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

Max Farrell

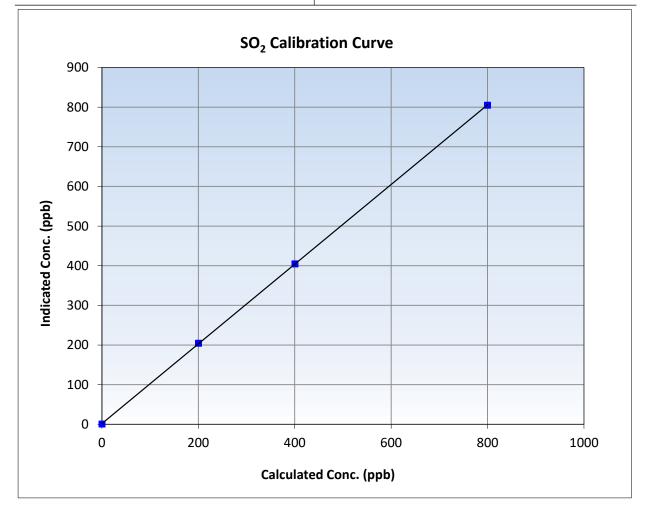


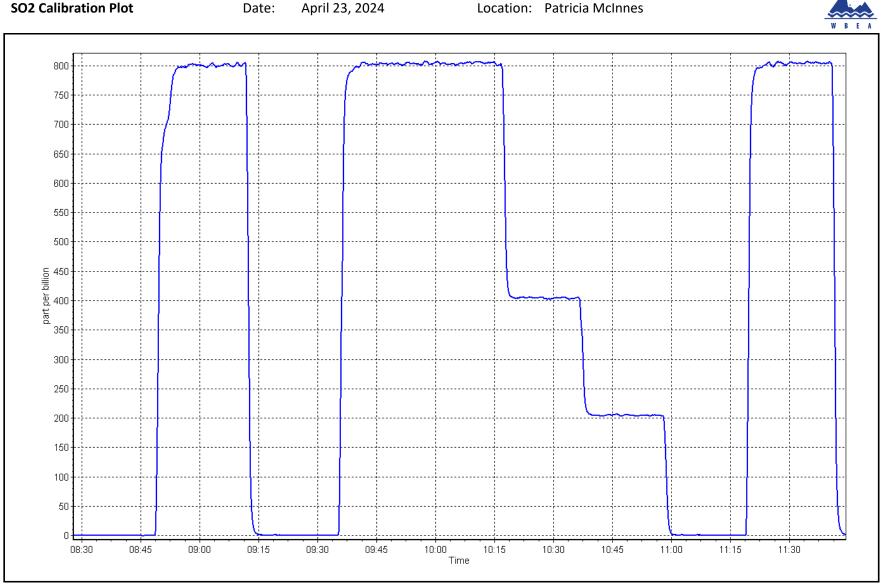
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 7, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	8:26	End Time (MST):	11:45
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290013

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999988	≥0.995
799.5 400.2	804.7 404.3	0.9935 0.9899	Slope	1.004978	0.90 - 1.10
200.1	204.4	0.9790	Intercept	1.779365	+/-30





#### **SO2** Calibration Plot



## Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Patricia McInnes April 18, 2024 9:05 AM Routine		Station number: Last Cal Date: End time (MST):	AMS 06 March 8, 2024 13:30	
		Calibration	<u>Standards</u>		
Cal Gas Concentration: Cal Gas Cylinder #:	5.328 CC506659	ppm	Cal Gas Exp Date:	February 14, 2025	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.328 N/A	ppm	Rem Gas Exp Date: Diff between cyl:	N/A	
Calibrator Make/Model: ZAG Make/Model:	API T700 API T701		Serial Number: Serial Number:	3566 4602	
		Analyzer In	formation		
Analyzer make: Converter make: Analyzer Range	Thermo 43i TLE CDN-101 0 - 100 ppb		Analyzer serial #: Converter serial #: Converter Temp:	1218153358 517 825 de	gC
Calibration slope: Calibration intercept:	<u>Start</u> 0.993746 0.540147	<u>Finish</u> 0.996746 0.460147	Backgd or Offset: Coeff or Slope:		<u>Finish</u> 1.98 1.170
		TRS As Fou	und 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	75.1	80.0	78.2	1.023
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	78.2	Prev response:	80.06	*% change:	-2.4%
Baseline Corr 2nd AF pt:	NA	AF Slope:	NA	AF Intercept:	NA
Baseline Corr 3rd AF pt:	NA	AF Correlation:	NA	* = > +/-5% change initiate	es 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	4925	75.1	80.0	80.1	0.999
Mid point	4963	37.5	40.0	40.4	0.989
Low point	4981	18.8	20.0	20.7	0.968
As left zero	5000	0.0	0.0	0.9	
As left span	4925	75.1	80.0	80.9	0.989
SO2 Scrubber Check	4920	80.3	803.0	0.0	
Date of last scrubber chan	ge:	December 20, 2021		Ave Corr Factor	0.985

Date of last converter efficiency test:

Notes:

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

Calibration Performed By:

Max Farrell



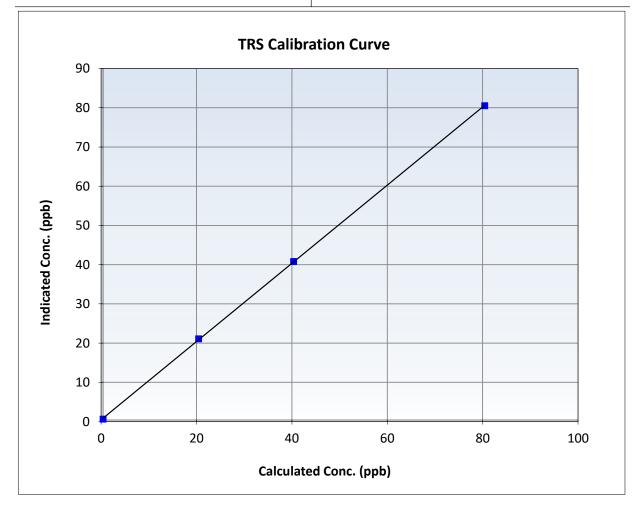
## **Wood Buffalo Environmental Association**

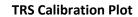
### **TRS Calibration Summary**

#### **Station Information**

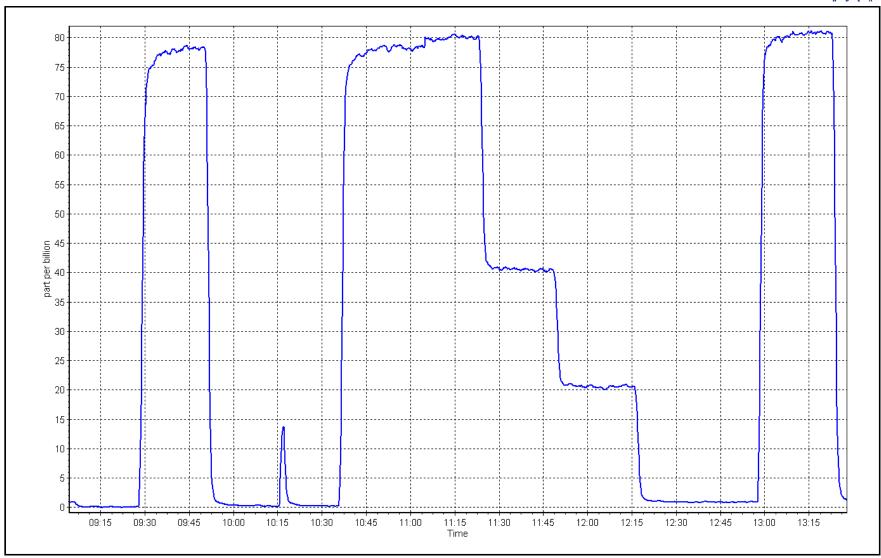
Calibration Date:	April 18, 2024	Previous Calibration:	March 8, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:05	End Time (MST):	13:30
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1218153358

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999951 ≥0.995 0.0 0.2 ----80.0 80.1 0.9991 Slope 0.996746 0.90 - 1.10 40.0 40.4 0.9890 20.7 20.0 0.9678 Intercept 0.460147 +/-3











### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Patricia McInnes	Station number: AMS 06
Calibration Date:	April 22, 2024	Last Cal Date: March 7, 2024
Start time (MST):	9:43 AM	End time (MST): 11:15
Reason:	As Found	
· · · ·		End time (MST): 11:15

### **Calibration Standards**

Gas Cert Reference:	A	AL070632	Cal Gas Expiry Date: Septem	ber 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 <sub>4</sub> )	:		Diff between cyl (NM):	
Calibrator Model:	API T700		Serial Number: 3566	
Zero Air Gen model:	API T701		Serial Number: 4602	
		A	Analyzer Information	
Analyzer make	: Thermo 55i		Analyzer serial #: 111814	8495

Analyzer make: Thermo 55i THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.21E-04	2.21E-04	NMHC SP Ratio:	4.84E-05	4.84E-05
CH4 Retention time:	14.2	14.2	NMHC Peak Area:	187266	187266
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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	
As found High point	4920	80.3	17.12	16.78	1.021
As found Mid point	4960	40.2	8.57	8.41	1.019
As found Low point New cylinder response	4980	20.1	4.29	4.27	1.004
Baseline Corr AF:	16.78	Prev response	17.12	*% change	-2.1%
Baseline Corr 2nd AF:	8.41	AF Slope:	0.978449	AF Intercept:	0.030920
Baseline Corr 3rd AF:	4.27	AF Correlation:	0.999981	* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>	
Calibrator zero High point Mid point Low point As left zero As left span						
			Avera	ge Correction Factor		
Notes:	Multipoint a	Multipoint as founds completed to run a column bakeout. Purpose is to get perfect zero readings during zeros.				



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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	4919.7	80.3	9.07	8.91	1.018
As found Mid point	4960	40.2	4.54	4.49	1.012
As found Low point	4980	20.1	2.27	2.29	0.990
New cylinder response					
Baseline Corr AF:	8.91	Prev response	9.08	*% change	-1.9%
Baseline Corr 2nd AF:	4.49	AF Slope:	0.980742	AF Intercept:	0.031027
Baseline Corr 3rd AF:	2.29	AF Correlation:	0.999944	* = > +/-5% change initia	ites 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	4919.7	80.3	8.06	7.86	1.025
As found Mid point	4960	40.2	4.03	3.92	1.028
As found Low point	4980	20.1	2.02	1.98	1.021
New cylinder response					
Baseline Corr AF:	7.86	Prev response	8.05	*% change	-2.3%
Baseline Corr 2nd AF:	3.92	AF Slope:	0.975585	AF Intercept:	-0.000106
Baseline Corr 3rd AF:	1.98	AF Correlation:	0.999993	* = > +/-5% change initia	tes investigation

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	n Correction factor (Cc/Ic)
	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	<i>Limit = 0.95-1.05</i>

Calibrator zero High point Mid point Low point As left zero

As left span

Average Correction Factor

<u>Finish</u>

#### **Calibration Statistics**

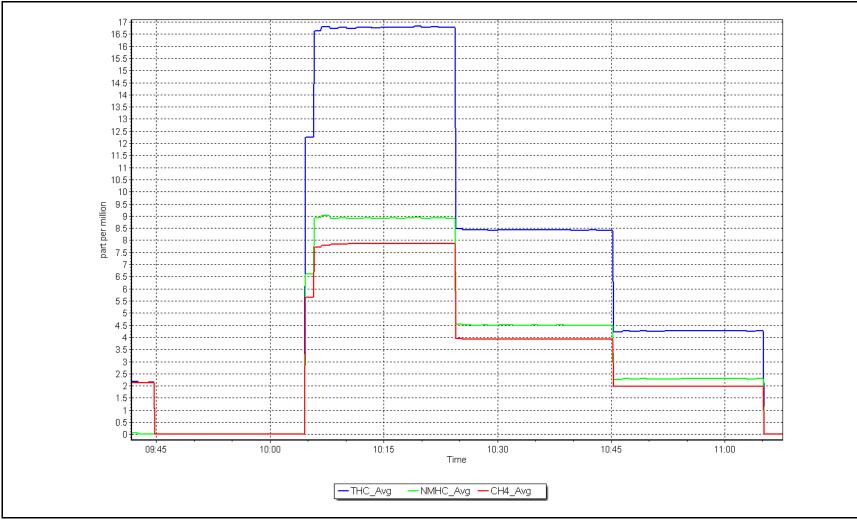
	<u>Start</u>
THC Cal Slope:	0.998467
THC Cal Offset:	0.026638
CH4 Cal Slope:	0.998356
CH4 Cal Offset:	0.002848
NMHC Cal Slope:	0.998464
NMHC Cal Offset:	0.024190

Calibration Performed By:

Max Farrell

#### NMHC Calibration Plot







## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

			Station information		
Station Name:	Patricia McInnes		Station number	r: AMS 06	
Calibration Date:	April 23, 2024		Last Cal Date	e: March 7, 2024	
Start time (MST):	9:15 AM		End time (MST	): 11:45	
Reason:	Maintenance				
		<u>c</u>	Calibration Standards		
Gas Cert Reference:	AAL	070632	Cal Gas Expiry Date	e: September 9, 2024	Ļ
CH4 Cal Gas Conc.	501.6	ppm	CH4 Equiv Cond	. 1066.2	2 ppm
C3H8 Cal Gas Conc.	205.3	ppm			
Removed Gas Cert:			Removed Gas Expiry	/:	
Removed CH4 Conc.	501.6	ppm	CH4 Equiv Cond	. 1066.2	2 ppm
Removed C3H8 Conc.	205.3	ppm	Diff between cyl (THC	):	
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM	):	
Calibrator Model:	API T700		Serial Number	r: 3566	
Zero Air Gen model:	API T701		Serial Number	r: 4602	
			Analyzer Information		
Analyzar maker	Thormo CC:	-		4. 1110140405	
Analyzer make:			Analyzer serial #		
THC Range:	0 - 20 ppm		NMHC/CH4 Range	2: 0 - 10 ppm	
	<u>Start</u>	<u>Fi</u>	nish	<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.21E-04	2.2	6E-04 NMHC SP Ratio	o: 4.84E-05	4.92E-05
CH4 Retention time:	14.2	1	4.4 NMHC Peak Area	a: 187266	184279
Zero Chromatogram:	OFF	(	DFF Flat Baseline	e: 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 initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919.7	80.3	17.12	17.14	0.999
Mid point	4960	40.2	8.57	8.58	0.999
Low point	4980	20.1	4.29	4.35	0.986
As left zero	5000	0.0	0.00	0.01	
As left span	4919.7	80.3	17.12	17.14	0.999
			Avera	ge Correction Factor	0.995

Notes:

Completed multipoint as founds and ran a column bakeout yesterday. Adjusted the span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### NMHC As Found Data

					Baseline Adjusted
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	
As found zero					2
As found High point					
As found Mid point					
As found Low point					
New cylinder response					
		2		*0/	
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 initia	tes investigation
		NMHC Calib	ration Data		
Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Correction factor (Cc/Ic
Set Point	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919.7	80.3	9.07	9.10	0.997
Vid point	4960	40.2	4.54	4.57	0.993
ow point	4980	20.1	2.27	2.33	0.975
As left zero	5000	0.0	0.00	0.01	
As left span	4919.7	80.3	9.07	9.10	0.997
			Avera	ge Correction Factor	0.988
			und Data		
		CH4 As Fo	und Data		
	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Baseline Adjusted
Set Point	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (lc)	AFzero))
	()	()	(FF) ()	(PP····) (···)	<i>Limit = 0.90-1.10</i>
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:	10/1	AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation
				,	
		CH4 Calibra	ation 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	4919.7	80.3	8.06	8.05	1.001
Vid point	4960	40.2	4.03	4.01	1.001
Low point	4980	20.1	2.02	2.02	0.999
As left zero	5000	0.0	0.00	0.00	
As left span	4919.7	80.3	8.06	8.04	1.001
				ge Correction Factor	1.002
				-	
		<b>Calibration</b>	Statistics		
		<u>Start</u>		<u>Finish</u>	
THC Cal Slope:		0.998467		0.999948	
THC Cal Offset:		0.026638		0.023034	
CH4 Cal Slope:		0.998356		0.998696	
CH4 Cal Offset:		0.002848		-0.002350	
NMHC Cal Slope:		0.998464		1.001388	

Calibration Performed By:

NMHC Cal Slope:

NMHC Cal Offset:

Max Farrell

0.998464

0.024190

1.001388

0.024584

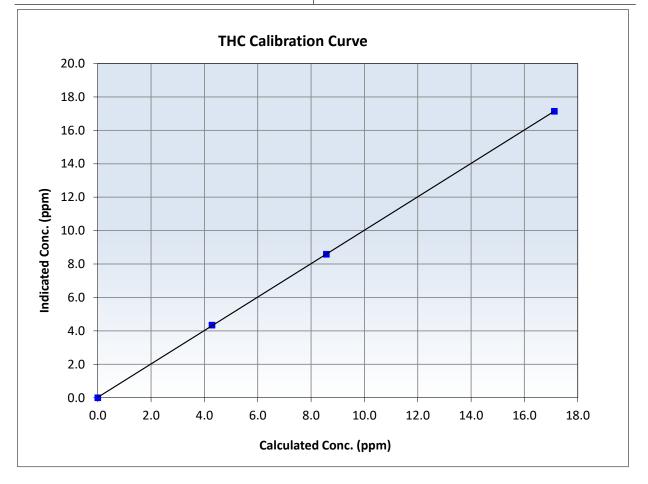


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 7, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:15	End Time (MST):	11:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999987	≥0.995
17.12 8.57	17.14 8.58	0.9989 0.9987	Slope	0.999948	0.90 - 1.10
4.29	4.35	0.9860	Intercept	0.023034	+/-0.5



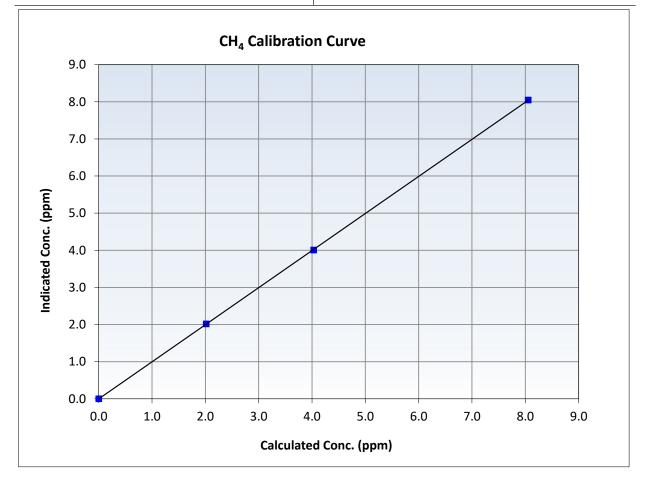


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 7, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:15	End Time (MST):	11:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999990	≥0.995
8.06	8.05	1.0008	Slope	0.998696	0.90 - 1.10
4.03	4.01	1.0059	Slope	0.998090	0.30 - 1.10
2.02	2.02	0.9987	Intercept	-0.002350	+/-0.5



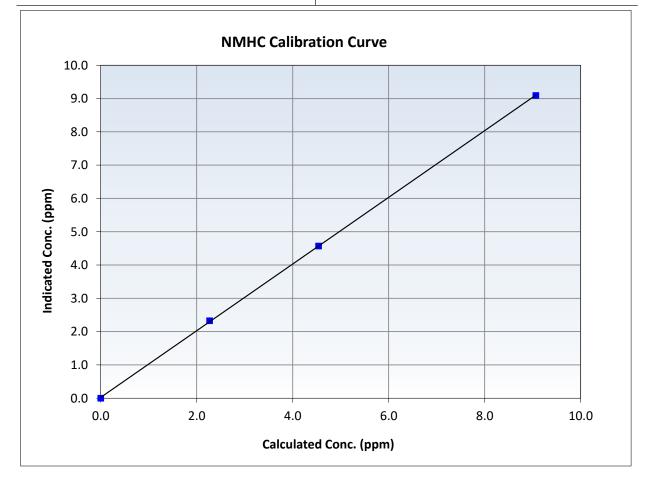


# Wood Buffalo Environmental Association NMHC Calibration Summary

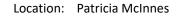
#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 7, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:15	End Time (MST):	11:45
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148495

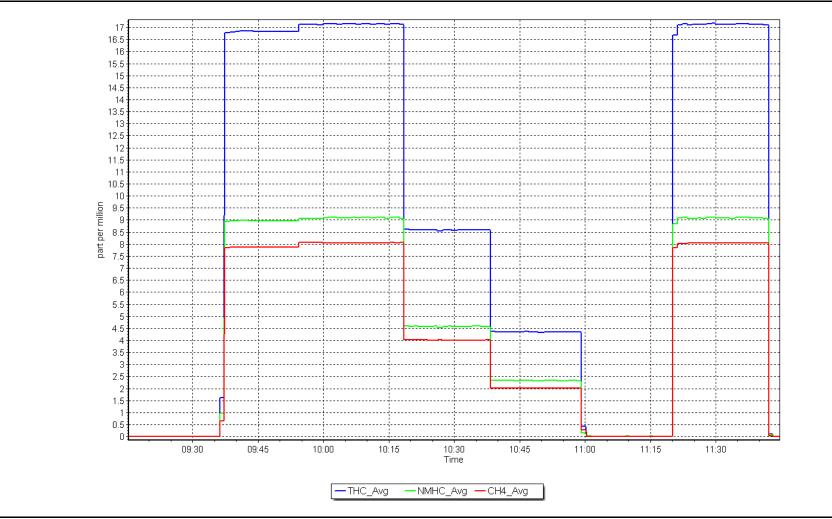
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999964	≥0.995
9.07	9.10	0.9969	Slope	1.001388	0.90 - 1.10
4.54	4.57	0.9926	51046	1.001300	0.50 1.10
2.27	2.33	0.9749	Intercept	0.024584	+/-0.5



#### NMHC Calibration Plot









**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Patricia McInnes	NO Gas Cylinder #:	T30YCWN	Cal Gas Expiry Date:	April 11, 2025
Station number:	AMS 06	NOX Cal Gas Conc:	47.94 ppm	NO Cal Gas Conc:	46.39 ppm
Calibration Date:	April 10, 2024	Removed Cylinder #:	N/A	Removed Gas Exp Date	: N/A
Last Cal Date:	March 5, 2024	Removed Gas NOX Conc:	47.94 ppm	Removed Gas NO Conc	46.39 ppm
Start time (MST):	9:26 AM	NOX gas Diff:		NO gas Diff:	
End time (MST):	14:17	Calibrator Model:	Teledyne API T700	Serial Number:	3566
Reason:	Routine	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	-0.1	0.3	-0.4		
AF High point	4914	86.2	826.5	799.7	26.7	817.6	788.7	28.9	1.0107	1.0144
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	830.4 ppb	NO = 803.5	ppb	* = > +/-59	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-1.6%
Baseline Corr 1	st pt NO <sub>X</sub> =	817.7 ppb	NO = 788.4	ppb	<u>As Foun</u>	d Statistics		*Percent Chan	ge NO =	-1.9%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calibi	ration Data				
								Baseline Adjus		
O3 Setp	pint (ppb)	Indicated NO Rei concentration		cated NO Drop entration (ppb)	Calculated No concentration (pp		dicated NO2 ntration (ppb) (Ic)	Correction f (Cc/(Ic-AFz		verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1172750	022			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.002416	0.997990
			Instrument Settings			NO <sub>x</sub> Cal Offset:	1.975128	2.376066
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.003032	1.000731
NO coeff or slope:	0.825	0.836	NO bkgnd or offset:	3.2	3.3	NO Cal Offset:	1.382192	1.562605
NOX coeff or slope:	0.987	0.987	NOX bkgnd or offset:	3.9	3.9	NO <sub>2</sub> Cal Slope:	0.999602	1.000336
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	157.2	155.4	NO <sub>2</sub> Cal Offset:	-0.538439	-0.255207

#### **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	0.5	-0.2		
High point	4914	86.2	826.5	799.7	26.7	826.1	801.3	25.0	1.0004	0.9980
Mid point	4957	43.1	413.2	399.9	13.4	415.9	402.4	13.5	0.9936	0.9937
Low point	4978	21.6	207.1	200.4	6.7	211.1	203.1	8.0	0.9811	0.9868
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.4	-0.2		
As left span	4914	86.2	826.5	398.9	427.6	826.8	398.9	427.8	0.9996	1.0000
							Average Co	orrection Factor	0.9917	0.9929

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	-0.2		
High GPT point	799.3	399.8	426.2	426.5	0.9993	100.1%
Mid GPT point	799.3	605.7	220.3	219.0	1.0060	99.4%
Low GPT point	799.3	704.3	121.7	122.2	0.9961	100.4%
				Average Correction Factor	1.0005	100.0%

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

Calibration Performed By:

Max Farrell

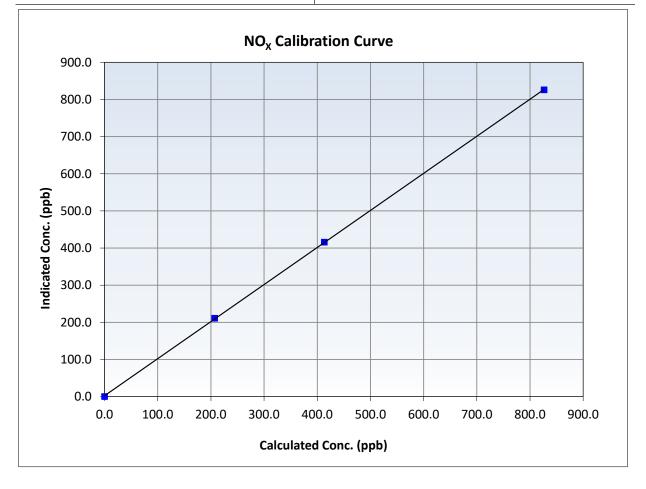


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 5, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:26	End Time (MST):	14:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999971	≥0.995
826.5 413.2	826.1 415.9	1.0004 0.9936	Slope	0.997990	0.90 - 1.10
207.1	211.1	0.9811	Intercept	2.376066	+/-20



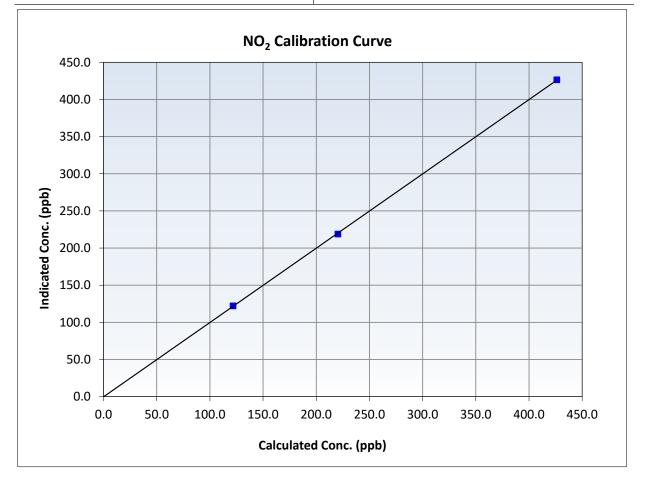


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 5, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:26	End Time (MST):	14:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	lation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999980	≥0.995
426.2 220.3	426.5 219.0	0.9993 1.0060	Slope	1.000336	0.90 - 1.10
121.7	122.2	0.9961	Intercept	-0.255207	+/-20



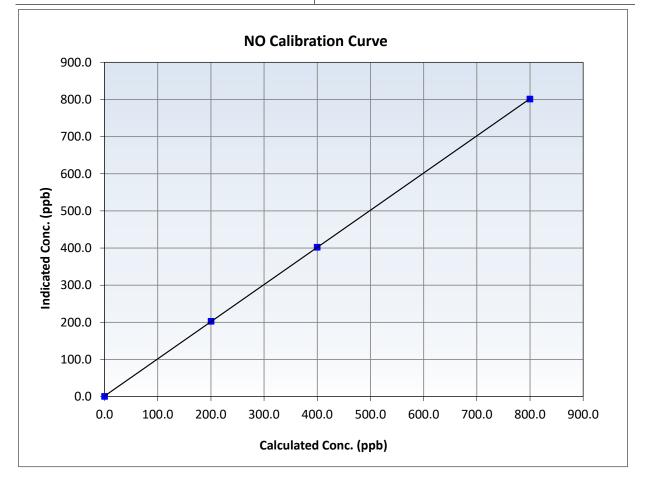


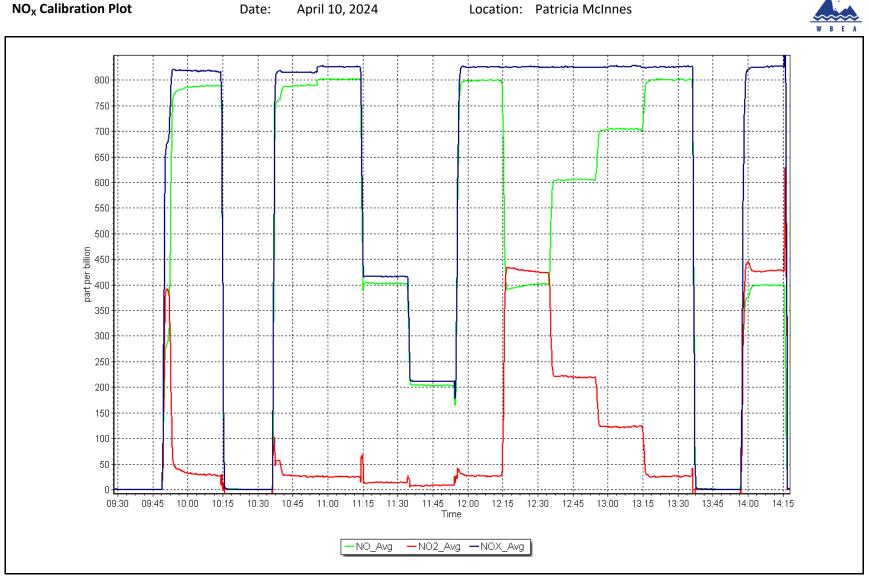
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 5, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	9:26	End Time (MST):	14:17
Analyzer make:	Thermo 42i	Analyzer serial #:	1172750022

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999992	≥0.995
799.7 399.9	801.3 402.4	0.9980 0.9937	Slope	1.000731	0.90 - 1.10
200.4	203.1	0.9868	Intercept	1.562605	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name:	Patricia McInnes		Station number: AMS (	
Calibration Date:	April 12, 2024		Last Cal Date: March	n 22, 2024
Start time (MST):	10:02		End time (MST): 13:00	
Reason:	Routine			
		Calibration Stan	dards	
O3 generation mode:	Photometer			
Calibrator Make/Model:	API T700		Serial Number: 3566	
ZAG Make/Model:	API T701		Serial Number: 4602	
,				
		Analyzer Inform	nation	
Analyzer make:	Thermo 49i		Analyzer serial #: 13001	56234
Analyzer Range	0 - 500 ppb			
				<i>c</i>
	<u>Start</u>	<u>Finish</u>		<u>Start</u>
Calibration slope:	1.004200	1.006514	Backgd or Offset:	-0.2
Calibration intercept:	-0.660000	-0.840000	Coeff or Slope:	1.026

#### O<sub>3</sub> 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 As found Mid point	5000	1303.0	400.0	401.2	0.996
As found Low point					
Baseline Corr As found:	401.5	Previous response	401.0	*% change	0.1%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation

#### **O<sub>3</sub> 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	-0.3	
High point	5000	1303.0	400.0	402.0	0.995
Mid point	5000	966.5	200.0	200.3	0.999
Low point	5000	794.3	100.0	99.2	1.008
As left zero	5000	800.0	0.0	-0.1	
As left span	5000	1303.0	400.0	402.4	0.994
			Averag	e Correction Factor	1.001

#### Notes:

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

Calibration Performed By:

Max Farrell

Finish -0.2 1.026

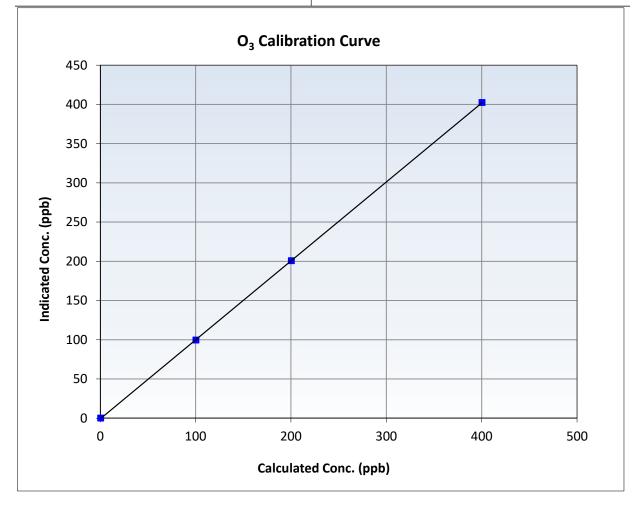


# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 22, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	10:02	End Time (MST):	13:00
Analyzer make:	Thermo 49i	Analyzer serial #:	1300156234

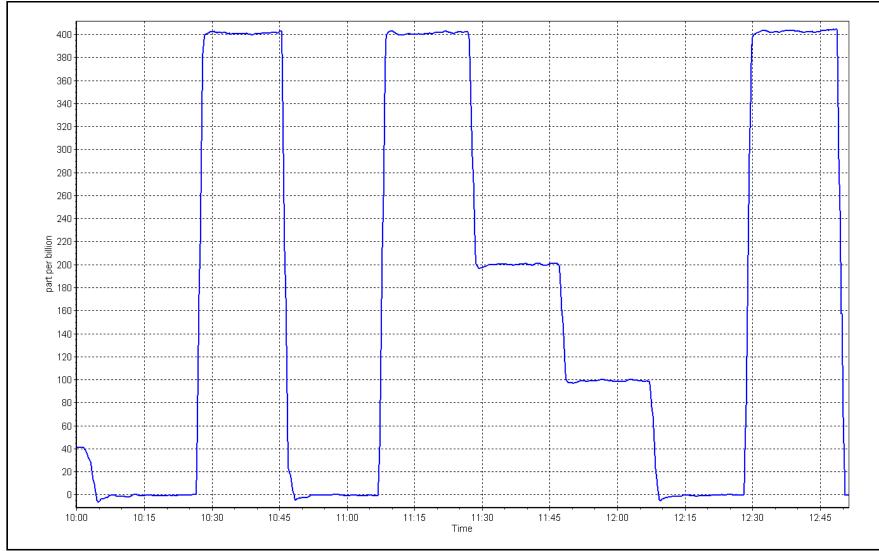
Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.3		Correlation Coefficient	0.999992	≥0.995
400.0 200.0	402.0 200.3	0.9950 0.9985	Slope	1.006514	0.90 - 1.10
100.0	99.2	1.0081	Intercept	-0.840000	+/- 5





Location: Patricia McInnes







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

WBEA					Version-01-202
		Station Informat	tion		
itation Name:	Patricia McInnes		Station number: AMS	5 06	
Calibration Date:	April 22, 2024				
itart time (MST):	12:56		End time (MST): 13:5	7	
Analyzer Make:	API T640		S/N: 766		
Particulate Fraction:	PM2.5				
- low Meter Make/Model:	Alicat FP-25BT		S/N: 388	755	
Temp/RH standard:	Alicat FP-25BT	S/N: 388755			
	I	Monthly Calibratio	n Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	17.8	17.9	17.8		+/- 2 °C
P (mmHg)	720.3	722.7	720.3		+/- 10 mmH
Flow (LPM)	5.01	5.14	5.01		+/- 0.25 LPN
PW% (pump)	42		42		>80%
Zero Verification	PM w/o HEPA:	12.2	PM w/ HEPA:	0.0	<0.2 ug/m3
		,	vill serve as the pre mainte		
PM Inlet observation :	Inlet Head Clean		Alignment Factor On :	1	

Quarterly Calibration Test								
SPAN DUST	Refractive Index:	10.9	Expiry Date:	11-23-2023				
SPAN DOST	Lot No.:	100128-050-035						
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	Adjusted	(Limits)			
PMT Peak Test					+/- 0.5			
Date Optical Chamb	or Cloanod:	March 2	2 2024					
Date Disposable Filte	-	March 2	,					
Post- maintenance Zero Verif	ication:	ation: PM w/ HEPA:						

Annual	Maintenance
Annuar	wantenance

Date Sample Tube Cleaned:April 13, 2023Date RH/T Sensor Cleaned:April 13, 2023

Notes:

Quarterly calibrations completed last month. Leak check passed, no adjustments made.

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:	April 11, 2024	Last Cal Date:	March 6, 2024
Start time (MST):	7:01	End time (MST):	11:11
NH3 Cal Date:	April 11, 2024	Last Cal Date:	March 6, 2024
Start time (MST):	11:20	End time (MST):	13:00
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:	А	PI T700	Serial Number:	3566
ZAG make/model:	А	PI T701	Serial Number:	4602

#### **Analyzer Information**

Analyzer model: Converter model: NH3 Range (ppb):	API T201 API T501 0 - 2000 ppb		Analyzer serial #: Converter serial #: Reaction cell Press:	808 484 4.80	
NOX Range (ppb):	0 - 2000 ppb 0 - 1000 ppb			26.6	
NOV Kalige (hhp).			Sample Flow:		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient:	0.854	0.854	Nt coefficient:	0.849	0.849
NOX coefficient:	0.848	0.848	NO bkgrnd:	-1.0	-1.0
NO2 coefficient:	1.000	1.000	NOX bkgrnd:	-0.6	-0.6
NH3 coefficient:	0.896	0.896	Nt bkgrnd:	5.0	5.0

<b>Calibrati</b>	on Statistics
<u>Start</u>	

	<u>Start</u>	<u>Finish</u>
NO <sub>x</sub> Cal Slope:	0.992580	0.993922
NO <sub>x</sub> Cal Offset:	1.257688	1.997132
NO Cal Slope:	0.996357	0.997329
NO Cal Offset:	-0.056315	0.703361
NO <sub>2</sub> Cal Slope:	1.001744	0.997014
NO <sub>2</sub> Cal Offset:	-0.225723	-0.514270
NH3 Cal Slope:	1.000069	0.990318
NH3 Cal Offset:	3.359353	4.179726
Nt Cal Slope:	1.006770	0.997067
Nt Cal Offset:	4.605099	5.735735



### NO<sub>X</sub> - NO - NO<sub>2</sub> 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/lc) 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	-1.9		
As found span	4914	86.2	826.5	799.7	826.5	818.0	793.2	821.9	1.0103	1.0082
AF GPT span										
new NO cyl rp										
Baseline Corr As	Fd Nt =	823.8 ppb	NO <sub>x</sub> = 817.7	ppb NO =	792.9 ppb			*Percent Chan	ge Nt <sub>(NO)</sub> =	-1.6%
Previous Respor	nse Nt =	836.65 ppb	NO <sub>x</sub> = 821.6	ppb NO =	796.8 ppb			*Percent Chan	ge NO <sub>X</sub> =	-0.5%
**NO <sub>X</sub> $\Delta$ (NO to G	GPT response) =							*Percent Chan	ge NO =	-0.5%
* *= > +/-2% differen	nce initiates investigat	tion						* = > +/-5% change	e initiates investigat	ion
				NOx / NO	/ Nt Calibratio	n 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) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	0.6	0.3	-0.9		
High point	4914	86.2	826.5	799.7	826.5	822.8	798.3	822.4	1.0044	1.0018
Mid point	4957	43.1	413.2	399.9	413.2	413.2	399.1	415.3	1.0001	1.0019
Low point	4978	21.6	207.1	200.4	207.1	209.4	201.4	209.9	0.9891	0.9951

#### **GPT Calibration Data**

Average Correction Factor

0.9979

0.9996

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/lc) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
Calibration zero			0.0	0.2		
High GPT point (400 ppb O3)	795.0	394.7	427.0	425.7	1.0031	99.7%
Mid GPT point (200 ppb O3)	795.0	601.4	220.3	218.6	1.0079	99.2%
Low GPT point (100 ppb O3)	795.0	696.9	124.8	123.3	1.0123	98.8%
			A	verage Correction Factor	1.0078	99.2%



# 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	-1.9	0.3	-2.2		
AF High point	3417	82.6	1800.6		1800.6	1795.1		1782.1	1.002	1.009
AF Mid point										
AF Low point										
new NH3 cyl rp										
Baseline Corr As I	Fd Nt =	1797.0 ppb	NH3 = 1784.3	ppb				*Percent Chan	ge Nt <sub>(NH3)</sub> :	-1.1%
Previous Respons	se Nt =	1817.4 ppb	NH3 = 1804.1	ppb	* = > +/-5	i% change initiates	investigation	*Percent Chan	ge NH3 =	-1.1%

#### 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/lc) <i>Limit = 0.95-1.05</i>
Calibration zero	5000	0.0	0.0	0.0	0.0	-0.9	0.6	-1.4		
High point	3417	82.6	1800.6		1800.6	1795.1		1782.1	1.003	1.010
Mid point	3454	45.9	1000.5		1000.5	1012.3		1003.2	0.988	0.997
Low point	3477	22.9	499.2		499.2	507.1		501.2	0.984	0.996
							Average Co	prrection Factor	0.9919	1.0012
NH3 Previous Co	onverter Efficiency	/ = 90.8	%							

NH3 Current Converter Efficiency = 90.8 %

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

Calibration Performed By: Max Farrell

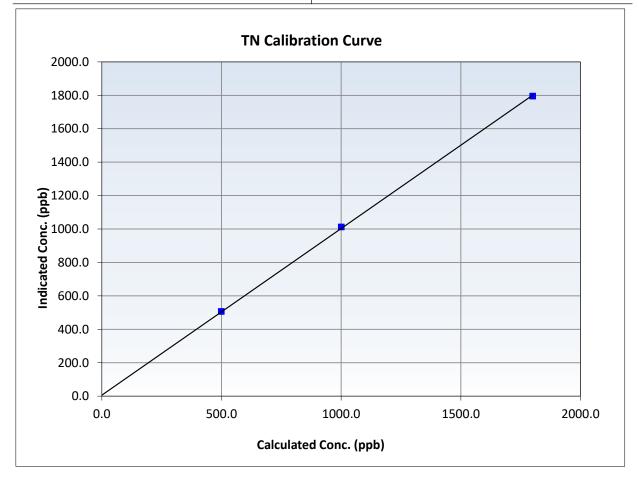


### **Nt Calibration Summary**

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:01	End Time (MST):	11:11
Analyzer make:	API T201	Analyzer serial #:	808

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.9		Correlation Coefficient	0.999901	≥0.995
1800.6 1000.5	1795.1 1012.3	1.0031 0.9884	Slope	0.997067	0.90 - 1.10
499.2	507.1	0.9844	Intercept	5.735735	+/-20



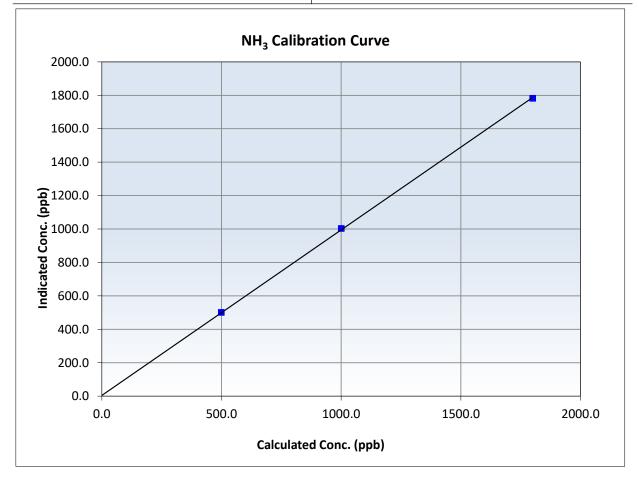


### NH<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:01	End Time (MST):	11:11
Analyzer make:	API T201	Analyzer serial #:	808

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-1.4		Correlation Coefficient	0.999923	≥0.995
1800.6 1000.5	1782.1 1003.2	1.0104 0.9973	Slope	0.990318	0.90 - 1.10
499.2	501.2	0.9959	Intercept	4.179726	+/-20



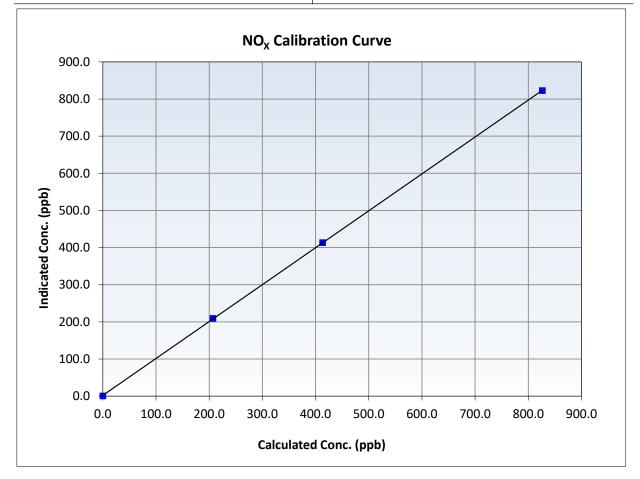


### NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:01	End Time (MST):	11:11
Analyzer make:	API T201	Analyzer serial #:	808

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.6		Correlation Coefficient	0.999987	≥0.995
826.5 413.2	822.8 413.2	1.0044 1.0001	Slope	0.993922	0.90 - 1.10
207.1	209.4	0.9891	Intercept	1.997132	+/-20



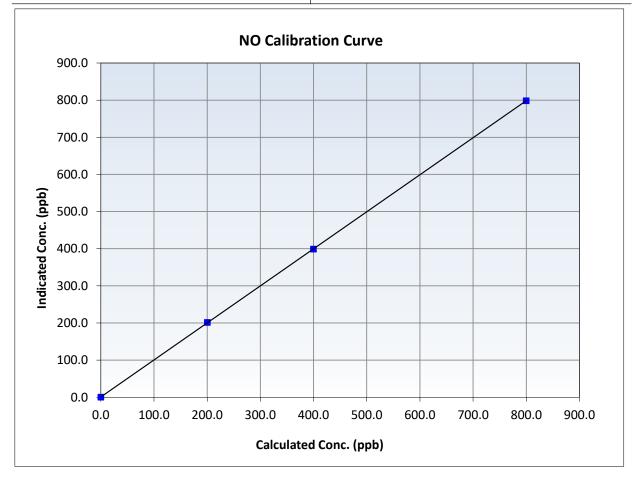


### **NO Calibration Summary**

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:01	End Time (MST):	11:11
Analyzer make:	API T201	Analyzer serial #:	808

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999997	≥0.995
799.7 399.9	798.3 399.1	1.0018 1.0019	Slope	0.997329	0.90 - 1.10
200.4	201.4	0.9951	Intercept	0.703361	+/-20



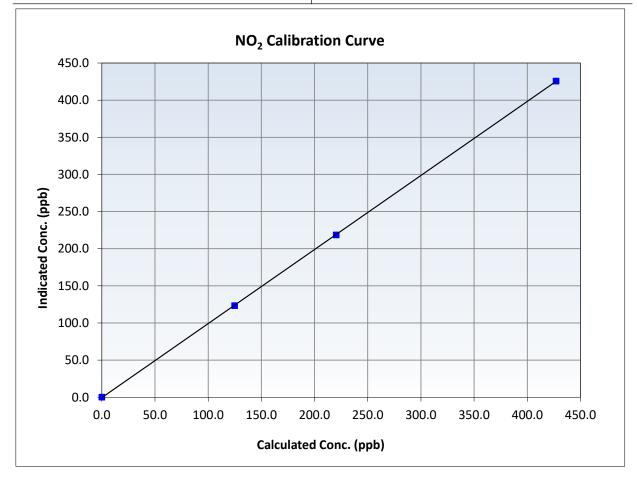


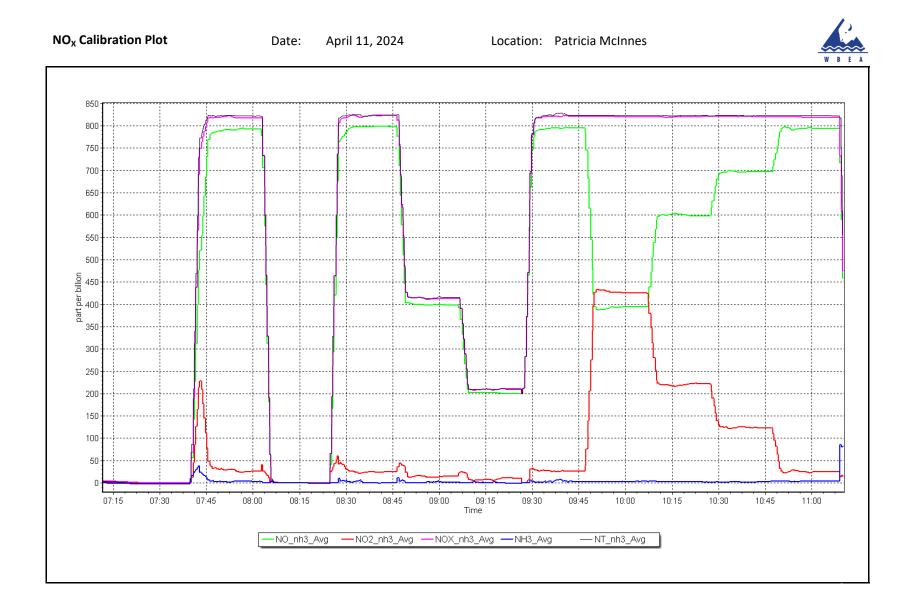
### NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 6, 2024
Station Name:	Patricia McInnes	Station Number:	AMS 06
Start Time (MST):	7:01	End Time (MST):	11:11
Analyzer make:	API T201	Analyzer serial #:	808

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999985	≥0.995
427.0 220.3	425.7 218.6	1.0031 1.0079	Slope	0.997014	0.90 - 1.10
124.8	123.3	1.0123	Intercept	-0.514270	+/-20









### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS07 ATHABASCA VALLEY APRIL 2024

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

May 31, 2024



# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

AMS07 March 22, 2024

14:27

#### **Station Information**

Athabasca Valley	Station number: A
April 10, 2024	Last Cal Date: I
10:45	End time (MST): 1
Routine	
(	Calibration Standards
	April 10, 2024 10:45 Routine

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** Thermo 43i-LTE Analyzer make: Serial Number: 1507864683 Analyzer Range: 0 - 1000 ppb <u>Start</u> **Finish** <u>Start</u> **Finish** 1.000104 Backgd or Offset: Calibration slope: 1.000577 2.6 2.6 Calibration intercept: 1.744314 1.984432 Coeff or Slope: 0.845 0.845

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4920	79.8	799.0	798.8	1.000
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	798.8 NA NA	Previous response AF Slope: AF Correlation:	801.2	*% change AF Intercept: * = > +/-5% change initiat	-0.3%

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.3	
High point	4920	79.8	799.0	799.5	0.999
Mid point	4960	39.9	399.5	404.5	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	799.1	1.000
			Averag	ge Correction Factor:	0.992

Notes:

No adjustments made.

Aswin Sasi Kumar

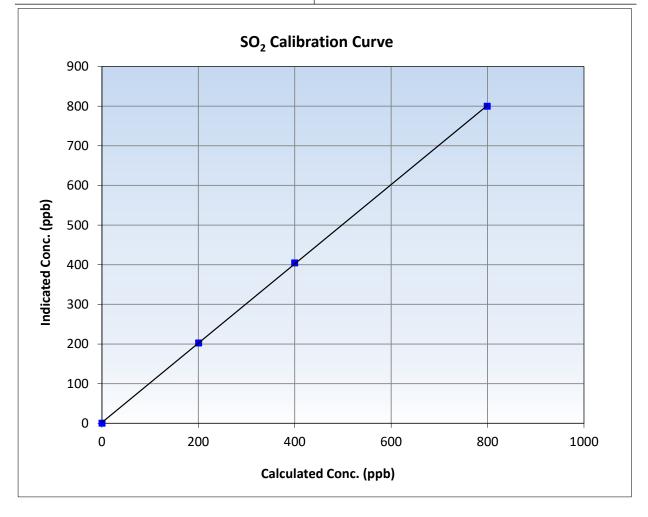


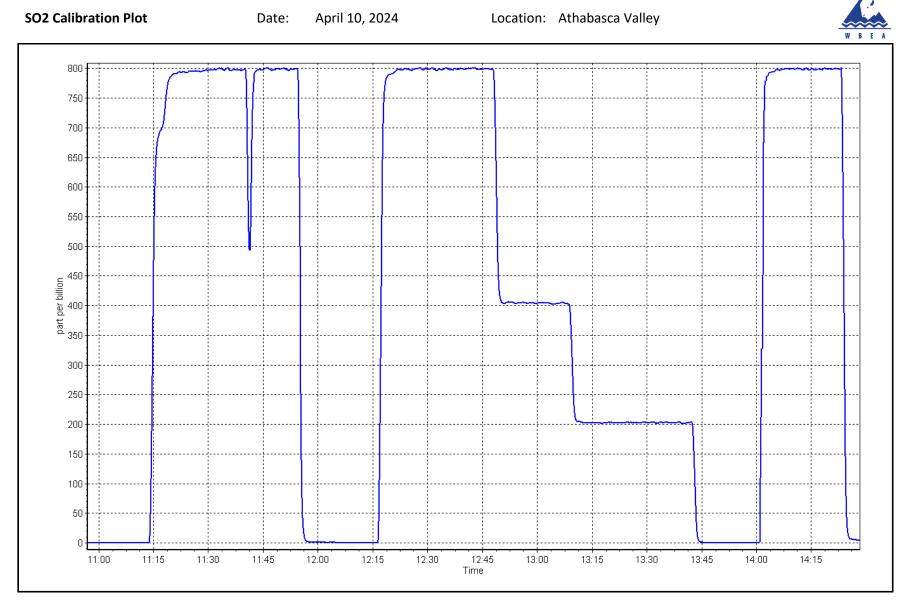
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 22, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	10:45	End Time (MST):	14:27
Analyzer make:	Thermo 43i-LTE	Analyzer serial #:	1507864683

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999959	≥0.995
799.0 399.5	799.5 404.5	0.9994 0.9876	Slope	1.000104	0.90 - 1.10
200.2	202.5	0.9888	Intercept	1.984432	+/-30







### **TRS Calibration Report**

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Athabasca Valley April 15, 2024 9:30 Routine		Station number: Last Cal Date: End time (MST):	AMS07 March 7, 2024 14:27	
		Calibration S	itandards		
Cal Gas Concentration: Cal Gas Cylinder #:	5.25 CC504080	ppm	Cal Gas Exp Date:	January 3, 2026	6
Removed Cal Gas Conc: Removed Gas Cyl #:	5.25 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA	
Calibrator Make/Model:	API T700		Serial Number:	3805	
ZAG Make/Model:	API T701H		Serial Number:	198	
		Analyzer Inf	ormation_		
Analyzer make:	Thermo 43i LTE		Analyzer serial #:	1180540018	
Converter make:	CDN-101		Converter serial #:	551	
Analyzer Range	0 - 100 ppb		Converter Temp:		840 degC
Calibration slope: Calibration intercept:	<u>Start</u> 0.998195 0.217844	<u>Finish</u> 1.013471 0.037852	Backgd or Offset: Coeff or Slope:		<u>Finish</u> 2.4 0.901

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4925	75.5	79.3	81.0	0.979
As found Mid point	4962	37.7	39.6	40.4	0.980
As found Low point New cylinder response	4981	18.9	19.8	20.0	0.992
Baseline Corr As found:	81.0	Prev response	: 79.34	*% change:	2.0%
Baseline Corr 2nd AF pt:	40.4	AF Slope	: 1.022992	AF Intercept:	-0.122207
Baseline Corr 3rd AF pt:	20.0	AF Correlation	: 0.999986	* = > +/-5% change initiat	tes investigation

#### **TRS Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate		Indicated concentration C	,
	(sccm)	(sccm)	concentration (ppb) (Cc)	(ppb) (Ic)	<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.1	
High point	4925	75.5	79.3	80.4	0.986
Mid point	4962	37.7	39.6	40.3	0.983
Low point	4981	18.9	19.9	20.0	0.993
As left zero	5000	0.0	0.0	0.3	
As left span	4925	75.5	79.3	80.6	0.984
SO2 Scrubber Check	4920	79.2	792.1	0.1	
Date of last scrubber ch	nange:	25-Feb-22		Ave Corr Factor	0.987
Date of last converter efficiency test:		April 22, 2022		_	

Notes:

No adjustments needed.

Calibration Performed By:

Aswin Sasi Kumar

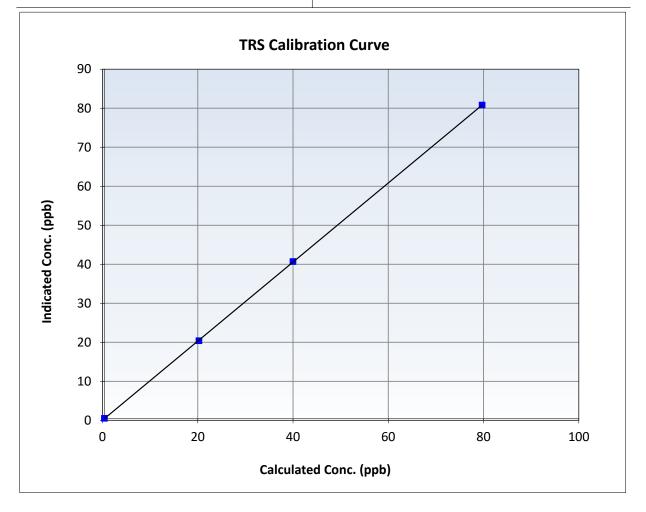


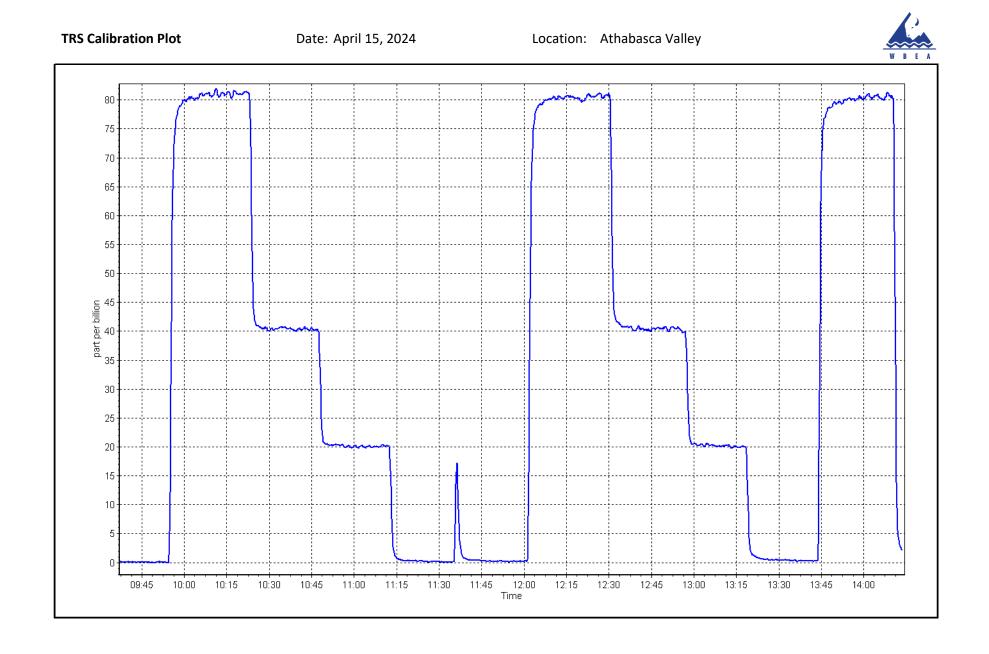
### **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 7, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:30	End Time (MST):	14:27
Analyzer make:	Thermo 43i LTE	Analyzer serial #:	1180540018

Calibration Data						
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalua	ition	<u>Limits</u>	
0.0	0.1		Correlation Coefficient	0.999987	≥0.995	
79.3 39.6	80.4 40.3	0.9865 0.9829	Slope	1.013471	0.90 - 1.10	
19.9	20.0	0.9928	Intercept	0.037852	+/-3	









### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

Analyzer serial #: 12227620777

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Athabasca Valley	a Valley Station number: AMS 07		
Calibration Date:	April 10, 2024	Last Cal Date: March 26, 2024		
Start time (MST):	10:45	End time (MST): 14:27		
Reason:	Routine			
		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	

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 <sub>4</sub> ):		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 THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.55E-04	2.60E-05	NMHC SP Ratio:	5.32E-05	5.34E-05
CH4 Retention time:	13.4	13.4	NMHC Peak Area:	169129	168530
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 As found Mid point As found Low point New cylinder response	4920	79.8	16.91	16.77	1.009
Baseline Corr AF: Baseline Corr 2nd AF:	16.77 NA	Prev response AF Slope:	16.97	*% change	-1.2%
Baseline Corr 3rd AF:	NA	AF Slope. AF Correlation:		AF Intercept: * = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	16.91	16.88	1.002
Mid point	4960	39.9	8.46	8.44	1.003
Low point	4980	20.0	4.24	4.27	0.994
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	16.91	16.98	0.996
			Avera	ge Correction Factor	1.000

Notes:

Hydrogen cylinder swapped out after as founds. Span adjusted.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4920	79.8	9.00	9.02	0.998
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	9.02 NA NA	Prev response AF Slope: AF Correlation:	9.06	*% change AF Intercept: * = > +/-5% change initiat	-0.5% tes 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	8.96	1.004
Mid point	4960	39.9	4.50	4.50	1.000
Low point	4980	20.0	2.26	2.28	0.989
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	9.00	9.04	0.996
			Avera	ge Correction Factor	0.998

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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 As found Mid point As found Low point New cylinder response	4920	79.8	7.92	7.75	1.021
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	7.75 NA NA	Prev response AF Slope: AF Correlation:	7.91	*% change AF Intercept: * = > +/-5% change initia	

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	7.92	7.92	1.000
Mid point	4960	39.9	3.96	3.94	1.005
Low point	4980	20.0	1.98	1.99	0.999
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	7.92	7.94	0.997
			Avera	age Correction Factor	1.001

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.002451	0.997119
THC Cal Offset:	0.015044	0.013262
CH4 Cal Slope:	1.000657	0.999590
CH4 Cal Offset:	-0.011935	-0.002739
NMHC Cal Slope:	1.003673	0.995046
NMHC Cal Offset:	0.027380	0.016600

Calibration Performed By:

Aswin Sasi Kumar

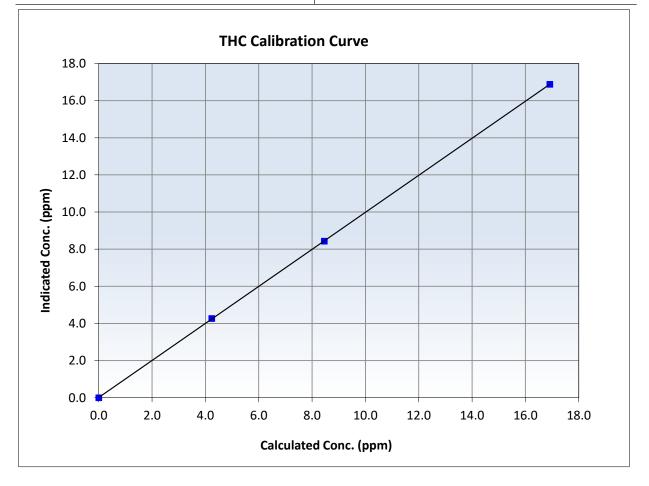


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 26, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:45	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999994	≥0.995
16.91 8.46	16.88 8.44	1.0021 1.0026	Slope	0.997119	0.90 - 1.10
4.24	4.27	0.9939	Intercept	0.013262	+/-0.5



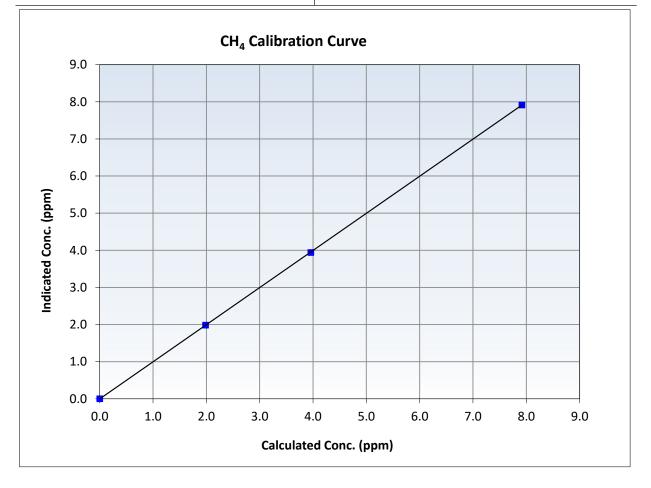


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 26, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:45	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999992	≥0.995
7.92 3.96	7.92 3.94	1.0001 1.0046	Slope	0.999590	0.90 - 1.10
1.98	1.99	0.9990	Intercept	-0.002739	+/-0.5



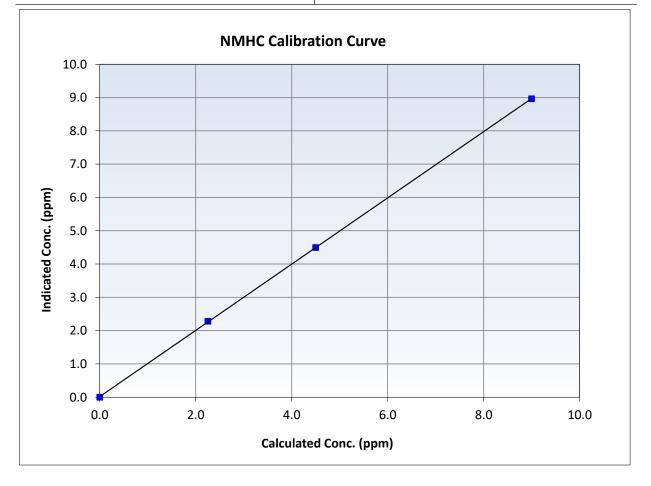


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 26, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	10:45	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	12227620777

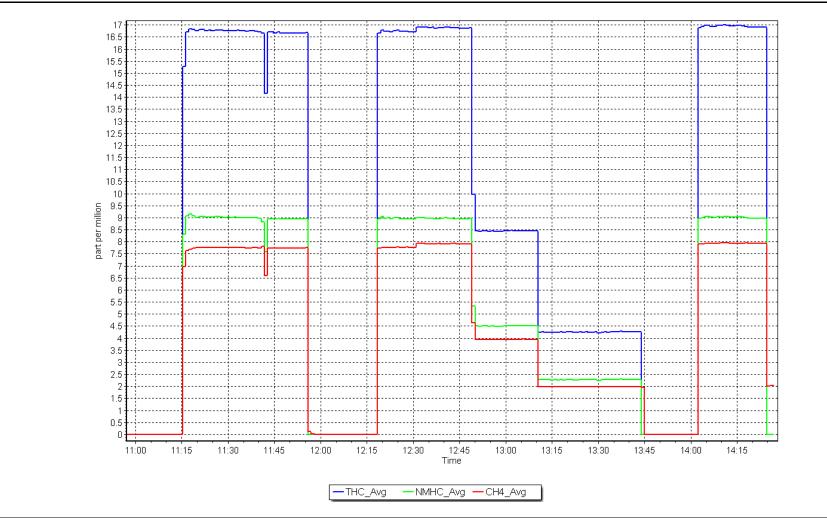
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999984	≥0.995
9.00	8.96	1.0039	Slope	0.995046	0.90 - 1.10
4.50	4.50	1.0004			0.90 - 1.10
2.26	2.28	0.9890	Intercept	0.016600	+/-0.5



#### **NMHC Calibration Plot**









**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Athabasca Valley	NO Gas Cylinder #:	DT0033919	Cal Gas Expiry Date: January 9, 2032
Station number:	AMS 07	NOX Cal Gas Conc:	60.10 ppm	NO Cal Gas Conc: 59.90 ppm
Calibration Date:	April 9, 2024	Removed Cylinder #:	N/A	Removed Gas Exp Date: N/A
Last Cal Date:	February 27, 2024	Removed Gas NOX Conc:	60.10 ppm	Removed Gas NO Conc: 59.90 ppm
Start time (MST):	9:00	NOX gas Diff:		NO gas Diff:
End time (MST):	14:33	Calibrator Model:	API T700	Serial Number: 3805
Reason:	Routine	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)) <i>Limit = 0.90 - 1.10</i>	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	0.1		
AF High point	4933	66.8	803.0	800.3	2.7	803.7	795.6	7.9	0.9991	1.0058
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	804.5 ppb	NO = 800.1	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chang	e NO <sub>x</sub> =	-0.1%
Baseline Corr 1	st pt NO <sub>x</sub> =	803.7 ppb	NO = 795.7	ppb	<u>As Four</u>	nd Statistics		*Percent Chang	e NO =	-0.6%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
								Baseline Adjuste		
O2 Coto	aint (anh)	Indicated NO Re	ference Indie	cated NO Drop	Calculated N	02 In	dicated NO2	Correction fa	ctor Conv	verter Efficiency

 O3 Setpoint (ppb)
 Indicated NO Reference
 Indicated NO Drop
 Calculated NO2
 Indicated NO2
 Correction factor
 Converter Efficience

 concentration (ppb)
 concentration (ppb)
 concentration (ppb)
 concentration (ppb) (Cc)
 concentration (ppb) (Cc)
 concentration (ppb) (Cc)
 Correction factor
 Converter Efficience

 As Found GPT zero
 As Found GPT zero
 Concentration (ppb) (Cc)
 <

As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1160120	<u>Start</u>	<u>Finish</u>			
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.999973	0.997568
			Instrument Settings			NO <sub>x</sub> Cal Offset:	1.541897	1.871922
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.998014	0.997614
NO coeff or slope:	1.075	1.077	NO bkgnd or offset:	7.6	7.6	NO Cal Offset:	1.431946	1.471946
NOX coeff or slope:	1.005	1.003	NOX bkgnd or offset:	7.9	7.8	NO <sub>2</sub> Cal Slope:	1.008548	1.006328
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	214.5	212.0	NO <sub>2</sub> Cal Offset:	1.193739	1.745224

#### **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	4933	66.8	803.0	800.3	2.7	801.7	798.7	3.0	1.0016	1.0020
Mid point	4966	33.4	401.5	400.2	1.3	404.4	402.8	1.6	0.9929	0.9935
Low point	4983	16.7	200.7	200.1	0.7	202.9	201.5	1.4	0.9894	0.9929
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	-0.1		
As left span	4933	66.8	803.0	393.8	409.2	804.0	393.8	410.2	0.9987	1.0000
							Average Co	orrection Factor	0.9946	0.9961

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.2		
High GPT point	794.0	397.2	399.5	402.9	0.9915	100.9%
Mid GPT point	794.0	598.8	197.9	201.9	0.9801	102.0%
Low GPT point	794.0	698.3	98.4	102.1	0.9635	103.8%
				Average Correction Factor	0.9783	102.2%

Notes:

Span adjusted slightly.

Calibration Performed By:

Aswin Sasi Kumar

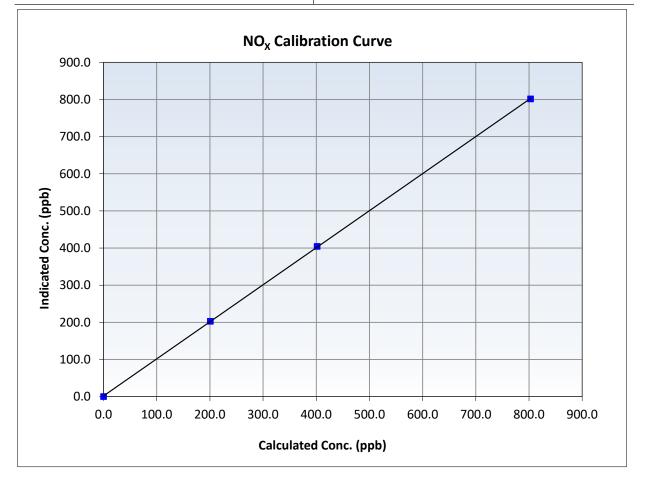


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	February 27, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:00	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999976	≥0.995
803.0 401.5	801.7 404.4	1.0016 0.9929	Slope	0.997568	0.90 - 1.10
200.7	202.9	0.9894	Intercept	1.871922	+/-20



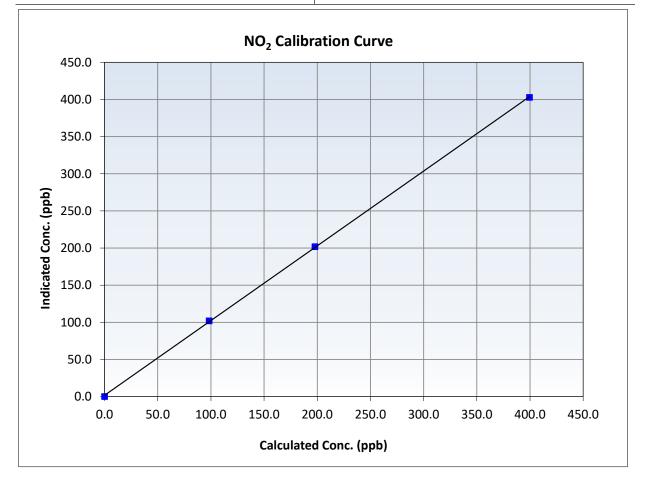


## Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	February 27, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:00	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999932	≥0.995
399.5 197.9	402.9 201.9	0.9915 0.9801	Slope	1.006328	0.90 - 1.10
98.4	102.1	0.9635	Intercept	1.745224	+/-20



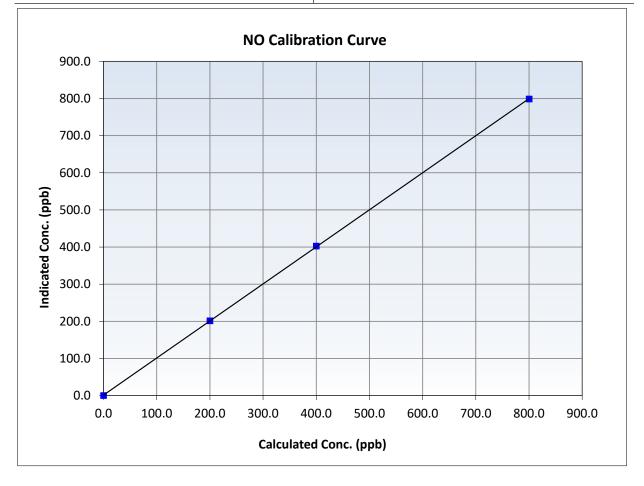


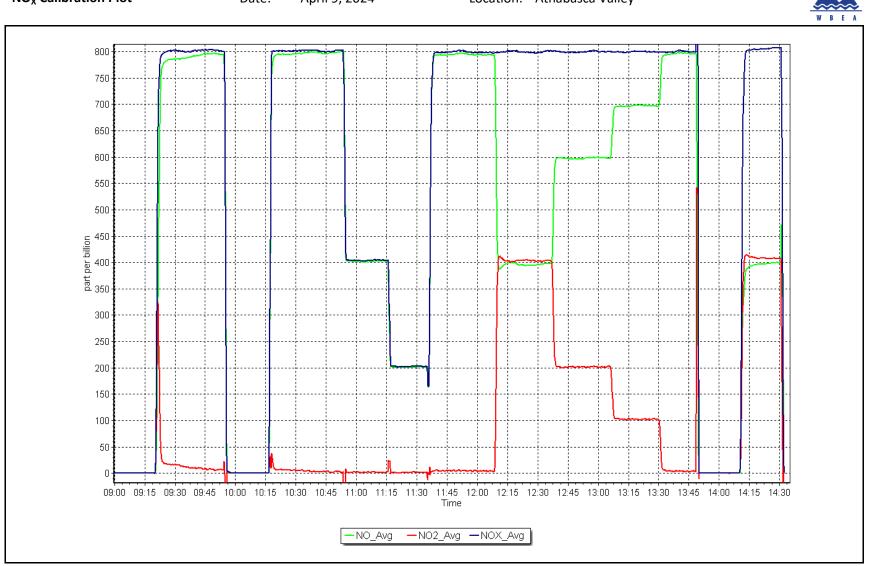
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	February 27, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	9:00	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1160120024

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999978	≥0.995
800.3 400.2	798.7 402.8	1.0020 0.9935	Slope	0.997614	0.90 - 1.10
200.1	201.5	0.9929	Intercept	1.471946	+/-20







# **Wood Buffalo Environmental Association O**<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Athabasca Valley April 12, 2024 9:55 Routine		Station number: AMS Last Cal Date: Mar End time (MST): 14:2	ch 17, 2024
		Calibration Sta	ndards	
O3 generation mode: Calibrator Make/Model: ZAG Make/Model:	Photometer T700 T701H		Serial Number: 380 Serial Number: 198	5
		Analyzer Inform	mation	
Analyzer make:	Thermo 49i		Analyzer serial #: 1152	2220023
Analyzer Range	0 - 500 ppb			
	<u>Start</u>	<u>Finish</u>		<u>Start</u>
Calibration slope:	0.993629	0.999857	Backgd or Offset:	-1.6
Calibration intercept:	1.040000	0.500000	Coeff or Slope:	1.549

#### O<sub>3</sub> 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	-2.0	
As found High point As found Mid point As found Low point	5000	1522.8	400.0	397.8	1.001
Baseline Corr As found: Baseline Corr 2nd AF pt:	399.8 NA	Previous response AF Slope:		*% change AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	ates investigation

#### **O<sub>3</sub> 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	-0.5	
High point	5000	1523.6	400.0	400.0	1.000
Mid point	5000	1088.1	200.0	200.8	0.996
Low point	5000	880.5	100.0	101.6	0.984
As left zero	5000	0.0	0.0	-0.7	
As left span	5000	1522.4	400.0	404.5	0.989
			Averag	e Correction Factor	0.993

#### Notes:

No adjustments needed.

Calibration Performed By:

Aswin Sasi Kumar

<u>Finish</u> -1.6

1.549

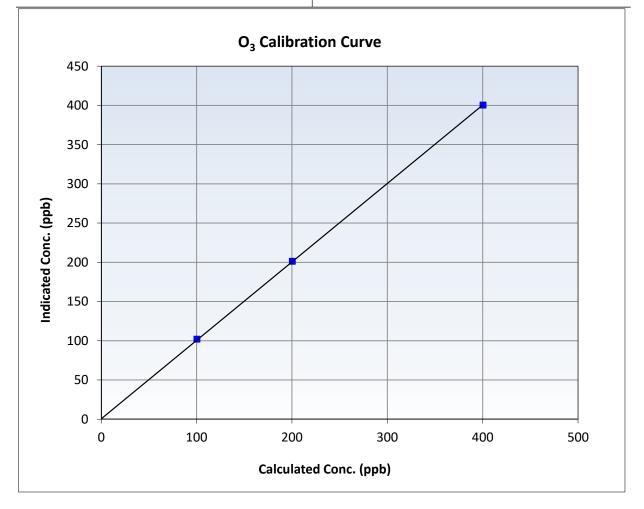


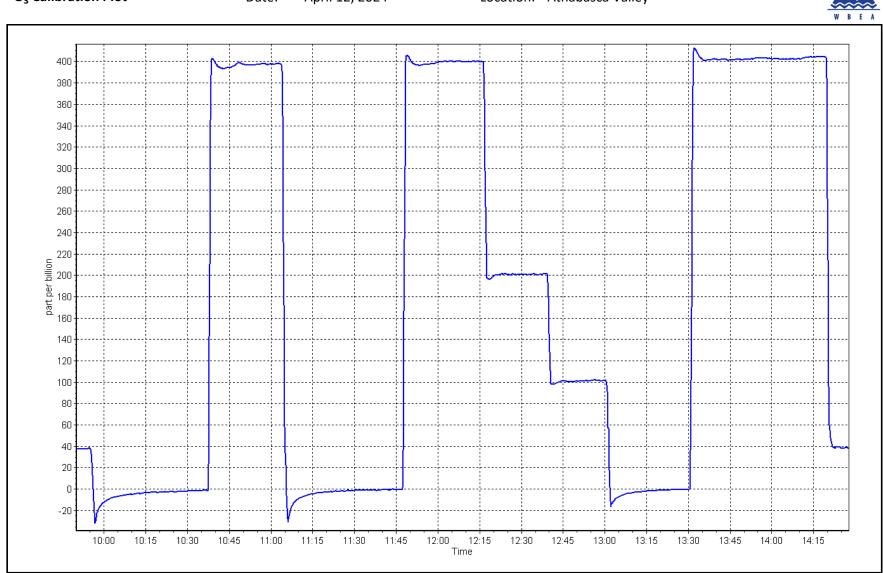
## Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 17, 2024
Station Name:	Athabasca Valley	Station Number:	AMS07
Start Time (MST):	9:55	End Time (MST):	14:29
Analyzer make:	Thermo 49i	Analyzer serial #:	1152220023

Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.5		Correlation Coefficient	0.999971	≥0.995
400.0 200.0	400.0 200.8	1.0000 0.9960	Slope	0.999857	0.90 - 1.10
100.0	101.6	0.9843	Intercept	0.500000	+/- 5





Location: Athabasca Valley



### Wood Buffalo Environmental Association

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

Version-01-2024

				Version-01-202
	Station Information	on		
Athabasca Valley		Station number: AN	1S 07	
April 15, 2024		Last Cal Date: Ma	arch 27, 2024	
13:19		End time (MST): 14:	29	
		S/N: 64	5	
PM2.5				
Alicat FP-25BT		S/N: 38	8754	
Alicat FP-25BT		S/N: 38	8754	
	Monthly Calibration	Test		
<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
5.4	5.8	5.4		+/- 2 °C
736.1	735	736.1		+/- 10 mmH
5.01	5.05	5.01		+/- 0.25 LPN
37		37		>80%
PM w/o HEPA:	3.5	PM w/ HEPA:	0.0	<0.2 ug/m3
	Quarterly Calibration	Test		
Refractive Index:			October 6, 20	024
		Expiry Dute.		
As found	Post maintenance	As left	Adiusted	(Limits)
				+/- 0.5
	February 27, 2024			
Iter Changed:	February 27, 2024			
Post- maintenance Zero Verification:			<0.2 ug/m3	
	Annual Maintenan	се		
a Claanad:	December	5 2022		
pe Cleaned: or Cleaned:	December December			
oe Cleaned: or Cleaned:				
	April 15, 2024 13:19 PM2.5 Alicat FP-25BT Alicat FP-25BT Alicat FP-25BT <u>As found</u> 5.4 736.1 5.01 37 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u>	Athabasca Valley April 15, 2024 13:19       PM2.5         Alicat FP-25BT Alicat FP-25BT       Monthly Calibration         As found       Measured         5.4       5.8         736.1       735         5.01       5.05         37          PM w/o HEPA:       3.5         completed before the quarterly work and will Inlet Head Clean       ✓         Refractive Index:       10.9         Lot No.:       100128-050-042         As found       Post maintenance         Aber Cleaned:       February 2         ification:       PM w/ HEPA:	April 15, 2024 13:19Last Cal Date: Ma End time (MST): 14: S/N: 64: PM2.5Alicat FP-25BTS/N: 38: S/N: 38:Alicat FP-25BTS/N: 38: S/N: 38:Alicat FP-25BTS/N: 38: S/N: 38:Monthly Calibration TestMonthly Calibration TestAs foundMeasuredAs left5.45.85.4736.1735736.15.015.055.013737PM w/o HEPA:3.5PM w/ HEPA:Inlet Head Clean☑Alignment Factor On :Quarterly Calibration TestRefractive Index:10.9Lot No.:100128-050-042As foundPost maintenanceAs leftaber Cleaned:February 27, 2024ther Changed:February 27, 2024	Athabasca Valley April 15, 2024 13:19  Station number: AMS 07 Last Cal Date: March 27, 2024 End time (MST): 14:29  S/N: 645  PM2.5  Alicat FP-25BT S/N: 388754  Alicat FP-25BT S/N: 388754  Monthly Calibration Test  As found Measured As 16ft Adjusted 5.4 5.8 5.4 C C C C C C C C C C C C C C C C C C C

Aswin Sasi Kumar

Calibration by:



Station Name:

### Wood Buffalo Environmental Association CO Calibration Report

Station number: AMS 07

#### **Station Information**

Athabasca Valley

Calibration Date: Start time (MST):	April 22, 2024 12:05		Last Cal Date: N End time (MST): 1		
Reason:	Routine				
		Calibration S	tandards		
		<u>calibration s</u>			
Cal Gas Concentration:	3,000	ppm	Cal Gas Exp Date: D	ecember 12, 2026	
Cal Gas Cylinder #:	LL66942				
Removed Cal Gas Conc:	3,000	ppm	Rem Gas Exp Date: N	A	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Make/Model:	API T700		Serial Number: 38	805	
ZAG Make/Model:	API 700H		Serial Number: 19	98	
		Analyzer Info	ormation		
Analyzer make:	Thermo 48i-TLE		Analyzer serial #: 14	408761381	
•			Analyzei senai #. 1	400701301	
Analyzer Range:	0 - 50 ppm				
	<u>Start</u>	Finish		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.994233	0.990260	Backgd or Offset:	4.642	4.819
Calibration intercept:	0.090507	0.092551	Coeff or Slope:	1.087	1.087

#### 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 As found Mid point As found Low point New cylinder response	4933	66.7	40.0	40.1	1.001
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	39.98 NA NA	Prev response: AF Slope: AF Correlation:	39.88	*% change: AF Intercept: * = > +/-5% change initiat	0.2%

#### **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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4933	66.7	40.0	39.7	1.009
Mid point	4967	33.3	20.0	20.0	0.998
Low point	4983	16.7	10.0	10.1	0.997
As left zero	5000	0.0	0.0	0.0	
As left span	4933	66.7	40.0	39.7	1.009
			Avera	ge Correction Factor	1.002

Zero adjusted.

Notes:

Calibration Performed By:

Aswin Sasi Kumar

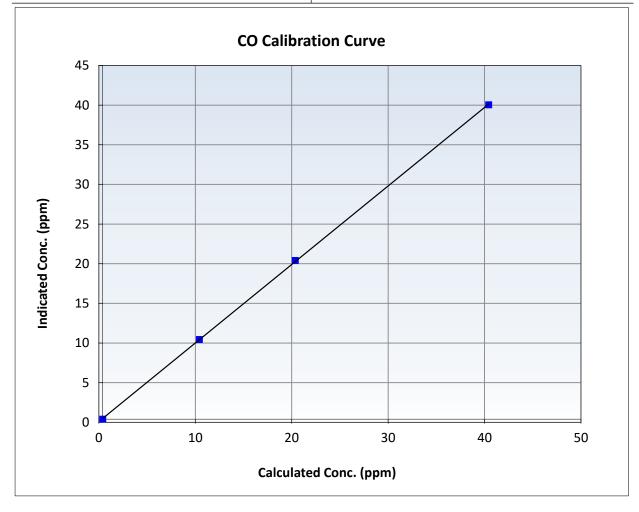


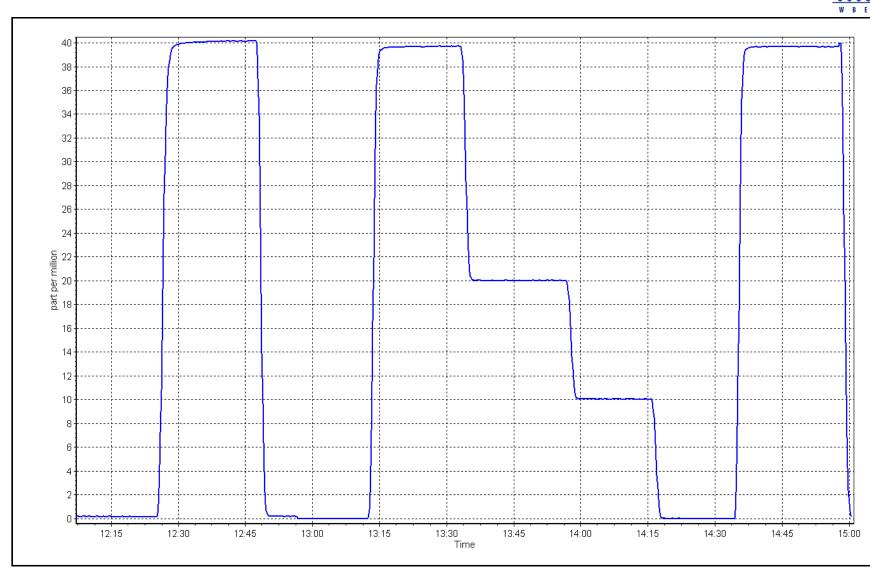
## Wood Buffalo Environmental Association CO Calibration Summary

#### **Station Information**

Calibration Date:	April 22, 2024	Previous Calibration:	March 27, 2024
Station Name:	Athabasca Valley	Station Number:	AMS 07
Start Time (MST):	12:05	End Time (MST):	15:00
Analyzer make:	Thermo 48i-TLE	Analyzer serial #:	1408761381

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999961	≥0.995
40.0 20.0	39.7 20.0	1.0094 0.9984	Slope	0.990260	0.90 - 1.10
10.0	10.1	0.9971	Intercept	0.092551	+/-1.5





**CO Calibration Plot** 

Location: Athabasca Valley



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS08 FORT CHIPEWYAN APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Fort Chipewyan
Calibration Date:	April 17, 2024
Start time (MST):	13:49
Reason:	Routine

Station number: AMS08 Last Cal Date: March 20, 2024 End time (MST): 16:28

#### **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 T70	00	Serial Number: 3252
Zero Air Gen Model:	TELEDYNE API T70	)1	Serial Number: 135

Thermo 43i-TLE

0 - 1000 ppb

#### **Analyzer Information**

Serial Number: 1136451241

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003858	0.999602	Backgd or Offset:	1.8	1.8
Calibration intercept:	0.615265	0.656198	Coeff or Slope:	0.989	0.989

#### SO<sub>2</sub> 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			-0.5	
As found High point	4920			799.1	
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	799.6	Previous response	804.1	*% change	-0.6%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.3	
High point	4920	80.3	800.4	801.0	0.999
Mid point	4960	40.2	400.7	399.4	1.003
Low point	4980	20.1	200.4	203.4	0.985
As left zero	5000	0.0	0.0	-0.2	
As left span	4920	80.3	800.4	799.2	1.001
			Avera	ge Correction Factor:	0.996

Notes:

Changed out inlet filter after as founds. No adjustments made

Calibration Performed By:

Matthew Courtoreille

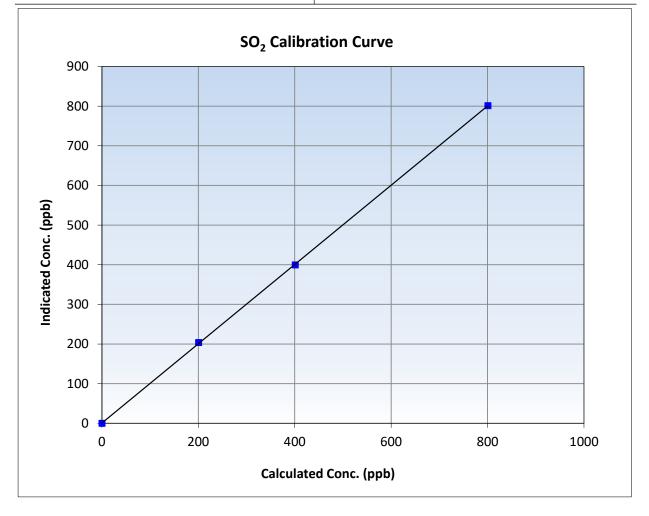


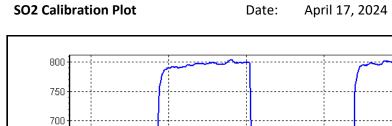
## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 20, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS08
Start Time (MST):	13:49	End Time (MST):	16:28
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1136451241

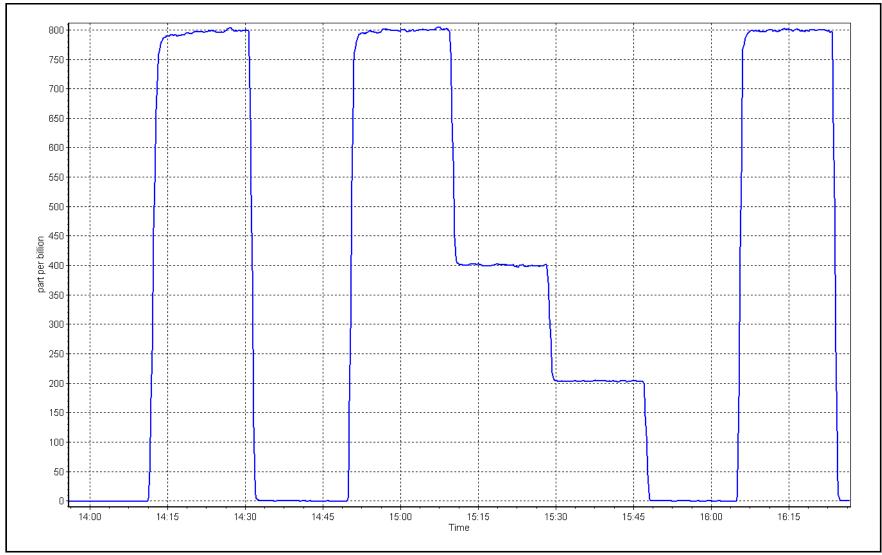
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.3		Correlation Coefficient	0.999971	≥0.995
800.4 400.7	801.0 399.4	0.9992 1.0032	Slope	0.999602	0.90 - 1.10
200.4	203.4	0.9850	Intercept	0.656198	+/-30





Location: Fort Chipewyan







### Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Fort Chipewyan April 18, 2024 14:12 Routine	April 18, 2024 14:12		AMS 08 March 20, 2024 17:57
		Calibration	<u>Standards</u>	
Cal Gas Concentration: Cal Gas Cylinder #:	4.97 EY0002276	ppm	Cal Gas Exp Date:	February 9, 2024

		IF IF		
Cal Gas Cylinder #:	EY0002276			
Removed Cal Gas Conc:	4.97	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3252
ZAG Make/Model:	Teledyne API T701		Serial Number:	135

#### **Analyzer Information**

Analyzer make: Converter make:	Thermo 43iQ-TL CDN-101		Analyzer serial #: Converter serial #:	1203169744 14639	
Analyzer Range	0 - 100 ppb		Converter Temp:		834 degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003284	1.007424	Backgd or Offset:	1.0	1.0
Calibration intercept:	0.498794	0.578976	Coeff or Slope:	0.754	0.754

#### 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	0.6	
As found High point	4920	80.5	80.0	80.5	1.001
As found Mid point	4960	40.2	40.0	40.8	0.994
As found Low point	4980	20.1	20.0	20.8	0.989
New cylinder response					
Baseline Corr As found:	79.9	Prev response:	80.77	*% change:	-1.1%
Baseline Corr 2nd AF pt:	40.2	AF Slope:	0.997996	AF Intercept:	0.758823
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999979	* = > +/-5% change initiate	es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.5	
High point	4920	80.5	80.0	81.1	0.987
Mid point	4960	40.2	40.0	41.0	0.975
Low point	4980	20.1	20.0	20.7	0.965
As left zero	5000	0.0	0.0	0.6	
As left span	4920	80.5	80.0	81.2	0.985
SO2 Scrubber Check	4919.7	80.3	803.0	0.1	
Date of last scrubber cha	ange:	7-Mar-22		Ave Corr Factor	0.975
Date of last converter ef	ficiency test:	March 15, 2022		100.7%	efficiency

Notes:

: Sampled inlet filter after as founds. Scrubber checked passed. No adjustments made.

Calibration Performed By:

Matthew Courtoreille



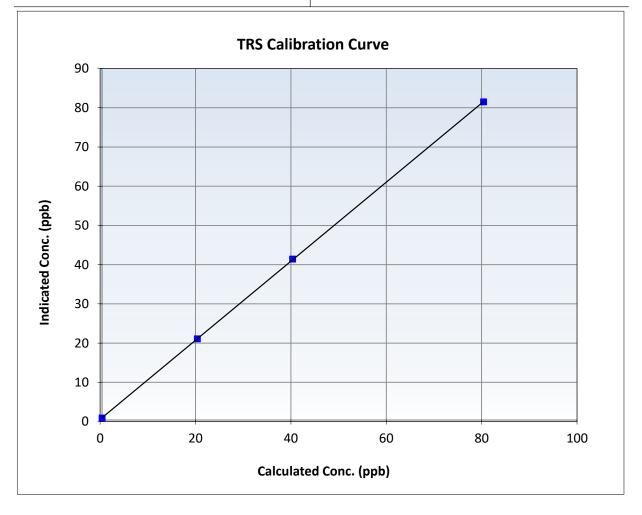
### Wood Buffalo Environmental Association

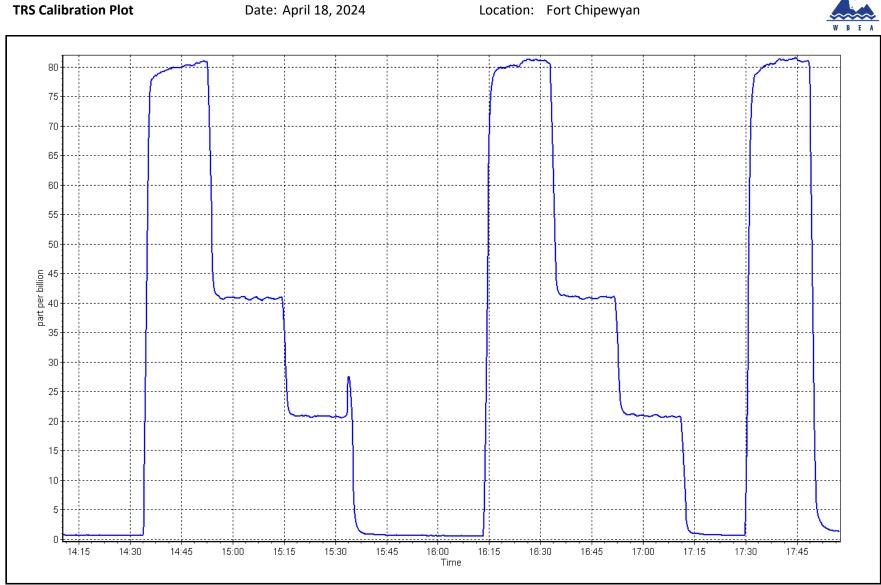
### **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 20, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	14:12	End Time (MST):	17:57
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	1203169744

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999988 ≥0.995 0.0 0.5 ----80.0 81.1 0.9865 Slope 1.007424 0.90 - 1.10 40.0 41.0 0.9746 20.0 20.7 0.9652 Intercept 0.578976 +/-3





#### **TRS Calibration Plot**

Date: April 18, 2024



**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Fort Chipewyan	NO Gas Cylinder #:	DTOO46831	Cal Gas Expiry Date:	January 9,2032
Station number:	AMS 08	NOX Cal Gas Conc:	60.20 ppm	NO Cal Gas Conc:	60.00 ppm
Calibration Date:	April 18, 2024	Removed Cylinder #:	DT0046831	Removed Gas Exp Date	: January 9,2032
Last Cal Date: Start time (MST):	March 20,2024 8:24	Removed Gas NOX Conc: NOX gas Diff:	60.20 ppm	Removed Gas NO Conc NO gas Diff:	
End time (MST):	13:13	Calibrator Model:	Teledyne API T700	Serial Number:	3252
Reason:	Routine	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	1.4	1.4	0.0		
AF High point	4933	66.7	803.1	800.4	2.7	779.6	778.0	1.7	1.0320	1.0307
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	802.5 ppb	NO = 800.4	ppb	* = > +/-59	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-3.1%
Baseline Corr 1	st pt NO <sub>X</sub> =	778.2 ppb	NO = 776.6	ppb	<u>As Foun</u>	d Statistics		*Percent Chan	ge NO =	-3.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
As Found GPT Calibration Data										
								Baseline Adjus		
O3 Setpo	pint (ppb)	Indicated NO Re concentration		cated NO Drop entration (ppb)	Calculated No concentration (pp		dicated NO2 ntration (ppb) (Ic)	Correction f (Cc/(Ic-AFz		verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	API T200		Serial Number: 4460	)			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.995037	1.000160
			Instrument Settings			NO <sub>x</sub> Cal Offset:	3.395408	2.195593
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.998540	0.992944
NO coeff or slope:	1.200	1.231	NO bkgnd or offset:	-2.5	2.5	NO Cal Offset:	1.155021	2.314346
NOX coeff or slope:	1.194	1.229	NOX bkgnd or offset:	-2.2	2.2	NO <sub>2</sub> Cal Slope:	0.993301	0.997333
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	-2.9	-1.8	NO <sub>2</sub> Cal Offset:	0.722793	1.324008

#### **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) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	1.6	1.5	0.1		
High point	4933	66.7	803.1	800.4	2.7	804.7	796.7	8.0	0.9980	1.0047
Mid point	4967	33.3	400.9	399.6	1.3	404.8	399.5	5.4	0.9904	1.0002
Low point	4983	16.7	201.1	200.4	0.7	203.0	202.1	0.9	0.9905	0.9916
As left zero	5000	0.0	0.0	0.0	0.0	1.3	1.3	0.0		
As left span	4933	66.7	803.1	385.4	417.7	795.3	385.4	409.7	1.0098	1.0000
							Average Co	orrection Factor	0.9930	0.9988

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.1		
High GPT point	798.4	389.4	411.7	412.0	0.9992	100.1%
Mid GPT point	798.4	597.9	203.2	202.5	1.0033	99.7%
Low GPT point	798.4	703.3	97.8	101.4	0.9642	103.7%
				Average Correction Factor	0.9889	101.2%

Notes: Changed inlet filter after as founds. Adjusted high point span. Low point needs further investigating from senior technician.

Calibration Performed By: Matthew Courtoreille

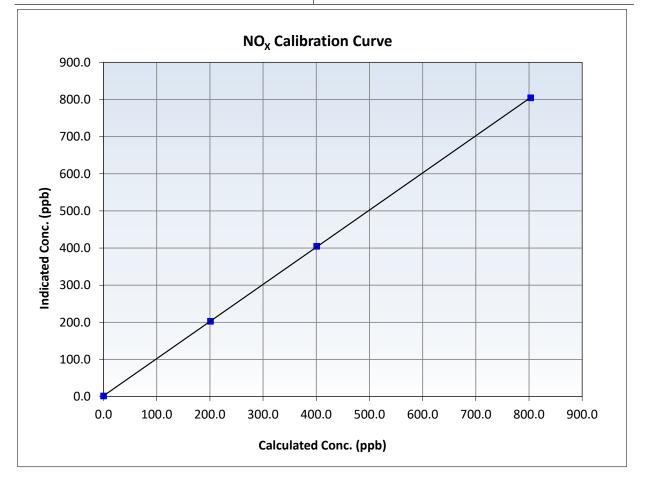


### Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 20,2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:24	End Time (MST):	13:13
Analyzer make:	API T200	Analyzer serial #:	4460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	lation	<u>Limits</u>
0.0	1.6		Correlation Coefficient	0.999990	≥0.995
803.1 400.9	804.7 404.8	0.9980 0.9904	Slope	1.000160	0.90 - 1.10
201.1	203.0	0.9905	Intercept	2.195593	+/-20



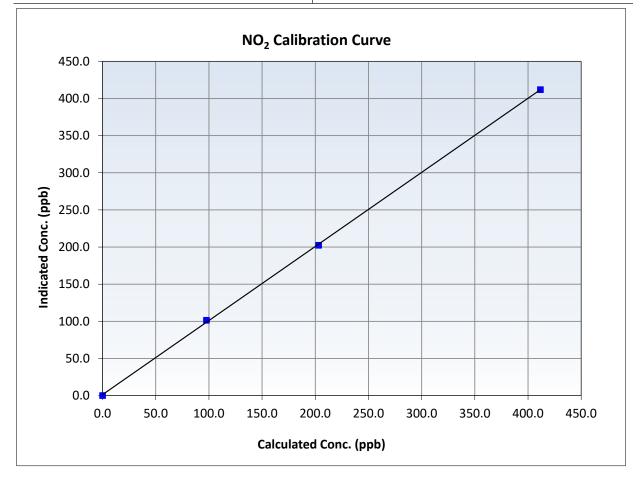


### Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 20,2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:24	End Time (MST):	13:13
Analyzer make:	API T200	Analyzer serial #:	4460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999890	≥0.995
411.7 203.2	412.0 202.5	0.9992 1.0033	Slope	0.997333	0.90 - 1.10
97.8	101.4	0.9642	Intercept	1.324008	+/-20



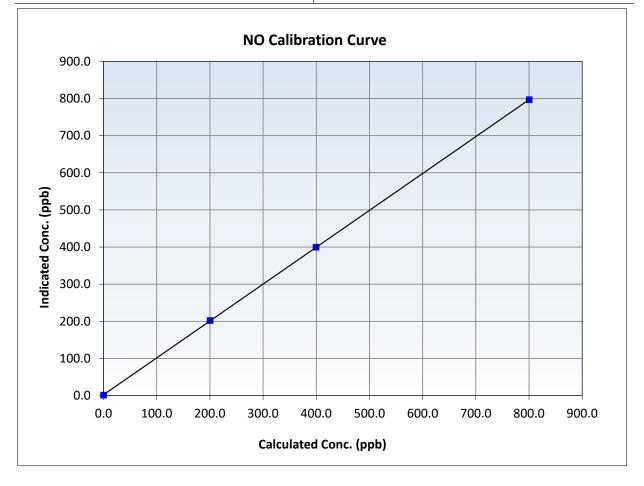


## Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 20,2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	8:24	End Time (MST):	13:13
Analyzer make:	API T200	Analyzer serial #:	4460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	1.5		Correlation Coefficient	0.999995	≥0.995
800.4 399.6	796.7 399.5	1.0047 1.0002	Slope	0.992944	0.90 - 1.10
200.4	202.1	0.9916	Intercept	2.314346	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Fort Chipewyan April 16, 2024 7:02 Routine		Station number: AN Last Cal Date: M End time (MST): 9:4	arch 19, 2024	
		Calibration S	tandards_		
O3 generation mode:	Photometer				
Calibrator Make/Model:	Teledyne API T700		Serial Number: 32	52	
ZAG Make/Model:	Teledyne API T701		Serial Number: 13	5	
		Analyzer Info	ormation		
Analyzer make:	Teledyne API T400		Analyzer serial #: 38	72	
Analyzer Range	0 - 500 ppb		/		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.994571	0.999086	Backgd or Offset:	-2.0	-1.9
Calibration intercept:	0.100000	0.160000	Coeff or Slope:	1.036	1.019

#### O<sub>3</sub> 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 As found Mid point As found Low point	5000	913.0	400.0	409.3	0.978
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	409.1 NA NA	Previous response AF Slope: AF Correlation:		*% change AF Intercept: * = > +/-5% change initia	

#### **O<sub>3</sub> 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.7	
High point	5000	914.7	400.0	400.1	1.000
Mid point	5000	786.4	200.0	199.6	1.002
Low point	5000	701.3	100.0	99.6	1.004
As left zero	5000	0.0	0.0	0.7	
As left span	5000	963.3	400.0	401.2	0.997
			Averag	e Correction Factor	1.002

Notes:

Changed out inlet filter after as found. Adjustments made to span.

Calibration Performed By:

Morgan Voyageur

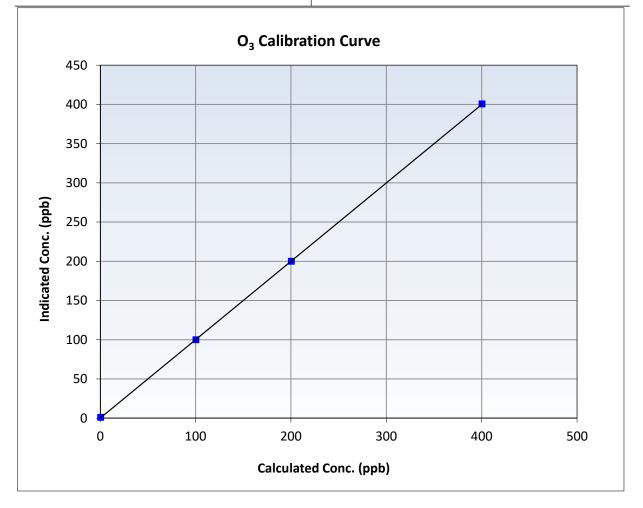


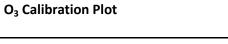
## Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

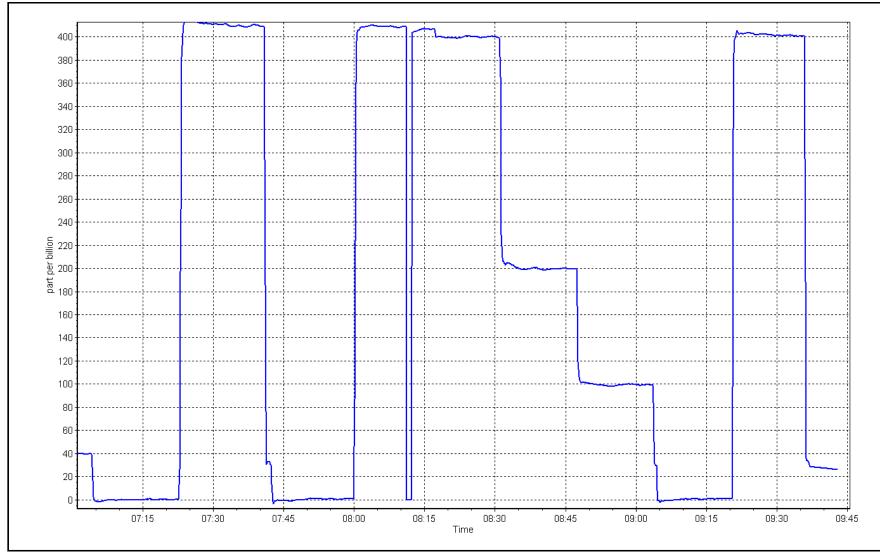
Calibration Date:	April 16, 2024	Previous Calibration:	March 19, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	7:02	End Time (MST):	9:44
Analyzer make:	Teledyne API T400	Analyzer serial #:	3872

Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.7		Correlation Coefficient	0.999991	≥0.995
400.0 200.0	400.1 199.6	0.9998 1.0020	Slope	0.999086	0.90 - 1.10
100.0	99.6	1.0040	Intercept	0.160000	+/- 5











### Wood Buffalo Environmental Association

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

		1040 11	VI2.5 CALIDITATIO			
WBEA					Version-01-202	
		Station Informat	ion			
Station Name:	Fort Chipewyan	Station number: AMS 08				
Calibration Date:	April 29, 2024	Last Cal Date: March 20, 2024				
Start time (MST):	14:28	End time (MST): 15:05				
Analyzer Make: Particulate Fraction:	Teledyne API T640 PM2.5		S/N: 31	9		
Flow Meter Make/Model: Temp/RH standard:	Alicat FP-25BT Alicat FP-25BT		S/N: 38 S/N: 38			
Monthly Calibration Test						
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)	
T (°C)	8.60	7.88	8.60		+/- 2 °C	
P (mmHg)	734.20	734.9	734.20		+/- 10 mmHg	
Flow (LPM)	5.00	5.04	5.00		+/- 0.25 LPM	
PW% (pump)	39%	5.01	3.00		>80%	
Zero Verification	PM w/o HEPA:	4.00	PM w/ HEPA:	0.00	<0.2 ug/m3	
PM Inlet observation :	Inlet Head Clean		lignment Factor On :	✓		
		Quarterly Calibratio	n Test			
SPAN DUST	Refractive Index:	10.90	Expiry Date:	10-Jun-24	ł	
0.7.1.2.001	Lot No.:	100128-050-042				
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	Adjusted	(Limits)	
PMT Peak Test	9.90	0.00	10.80		+/- 0.5	
Date Optical Cham	nber Cleaned:	February	20, 2024			
Date Disposable Fi	Iter Changed:	February 20, 2024				
Post- maintenance Zero Ver	rification:	PM w/ HEPA:	0.00	<0.2 ug/m3		
		Annual Maintena	nce			
Date Sample Tul	be Cleaned:	July 25, 2023				
Date RH/T Sense	-	July 25, 2023				
		••				

Notes:

No adjustments needed.

Calibration by: Morgan Voyageur



### Wood Buffalo Environmental Association **CO** Calibration Report

#### Station Information

Station Name: Calibration Date: 12:20 Start time (MST): Reason: Routine

Fort Chipewyan April 29, 2024

Station number: AMS 08 Last Cal Date: March 19, 2024 End time (MST): 15:09

#### **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: 3252
ZAG Make/Model:	Teledyne API T701	LH	Serial Number: 135

#### **Analyzer Information**

Analyzer make: Analyzer Range:	Teledyne API T300 0 - 50 ppm		Analyzer serial #: 35	05	
Calibration slope:	<u>Start</u> 0.997054	<u>Finish</u> 1.003563	Backgd or Offset:	<u>Start</u> -0.015	<u>Finish</u> -0.015
Calibration intercept:	0.100939	0.210880	Coeff or Slope:	1.007	1.007

#### 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 As found Mid point As found Low point New cylinder response	4934	66.7	40.4	40.7	0.995
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	40.63 NA NA	Prev response: AF Slope: AF Correlation:	40.40	*% change: AF Intercept: * = > +/-5% change initiate	0.6% es 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	4934	66.7	40.4	40.7	0.992
Mid point	4966.7	33.3	20.2	20.5	0.983
Low point	4983.3	16.7	10.1	10.4	0.970
As left zero	5000	0.0	0.0	0.1	
As left span	2960	40.0	40.4	40.5	0.999
			Avera	ge Correction Factor	0.982

Notes:

Changed inlet filter after as found, no adjustments made.

Calibration Performed By:

Morgan Voyageur

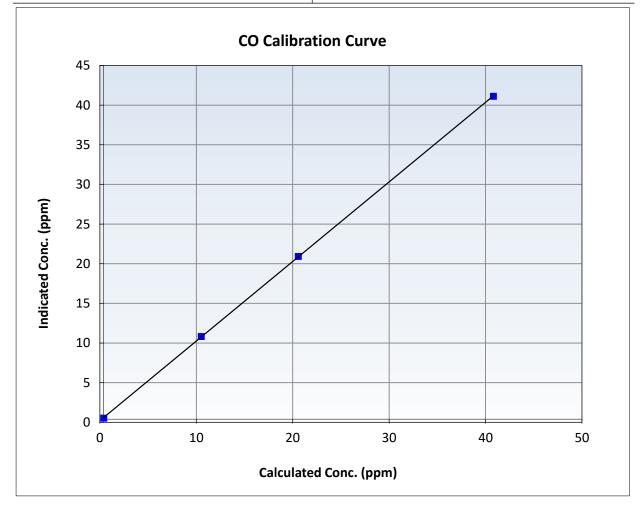


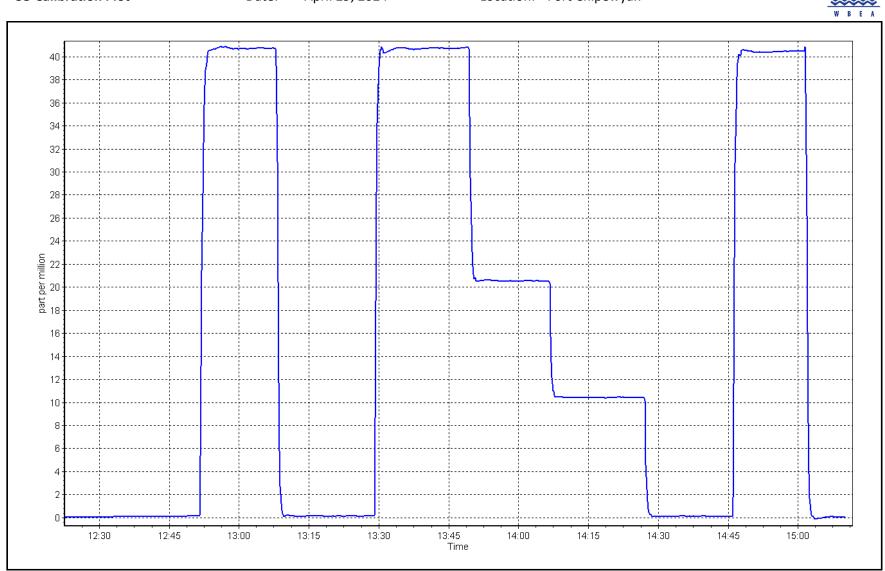
## Wood Buffalo Environmental Association CO Calibration Summary

#### Station Information

Calibration Date:	April 29, 2024	Previous Calibration:	March 19, 2024
Station Name:	Fort Chipewyan	Station Number:	AMS 08
Start Time (MST):	12:20	End Time (MST):	15:09
Analyzer make:	Teledyne API T300	Analyzer serial #:	3505

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>	
0.0	0.1		Correlation Coefficient	0.999981	≥0.995	
40.4 20.2	40.7 20.5	0.9925 0.9829 0.9703		Slope	1.003563	0.90 - 1.10
10.1	10.4		Intercept	0.210880	+/-1.5	





Location: Fort Chipewyan



### Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Fort Chipe
Calibration Date:	April 16, 20
Start time (MST):	9:50
Reason:	Routine

wyan 024

Station number: AMS 08 Last Cal Date: March 19, 2024 End time (MST): 13:43

#### **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: 3252
N2 Gen Make/Model:	Peak Scientific		Serial Number: 135

#### **Analyzer Information**

Analyzer make: Teledyne API T360 Analyzer serial #: 289 0 - 2,000 ppm Analyzer Range <u>Start</u> <u>Finish</u> <u>Finish</u> <u>Start</u> Calibration slope: 1.011498 1.003378 Backgd or Offset: -0.063 -0.063 Calibration intercept: -16.020000 -4.540000 Coeff or Slope: 1.094 1.087

#### CO<sub>2</sub> 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	-4.9	
As found High Point As found Mid Point As found Low Point New cylinder response	2920	80.0	1605.9	1646.4	0.972
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	1651.3 NA NA	Prev response: AF Slope: AF Correlation:	1608.3	*% change: AF Intercept: * = > +/-5% change initiate	2.6% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	3000	0.0	0.0	-4.9	
High point	2920	80.0	1605.9	1606.8	0.999
Mid point	2960	40.0	802.9	800.6	1.003
Low point	2980	20.0	401.5	399.1	1.006
As left zero	3000	0.0	0.0	-4.8	
As left span	2960	40.0	802.9	768.0	1.045
			Avera	ge Correction Factor	1.003

Notes:

Changed inlet filter after as found, Adjustments span, mid point and low point.

Morgan Voyageur

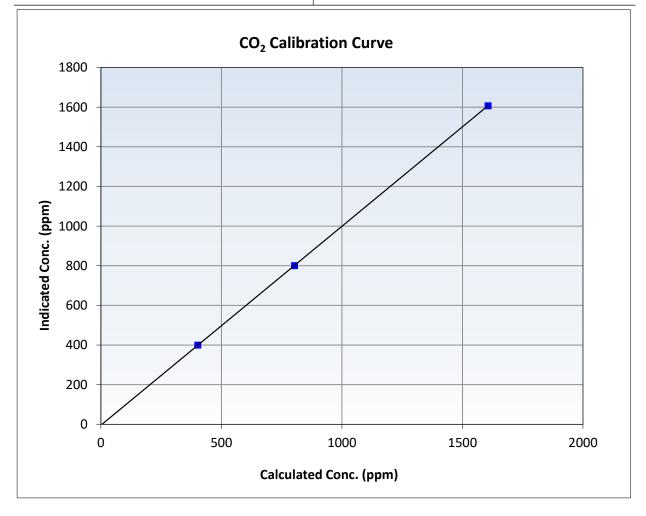


## Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Summary

#### **Station Information**

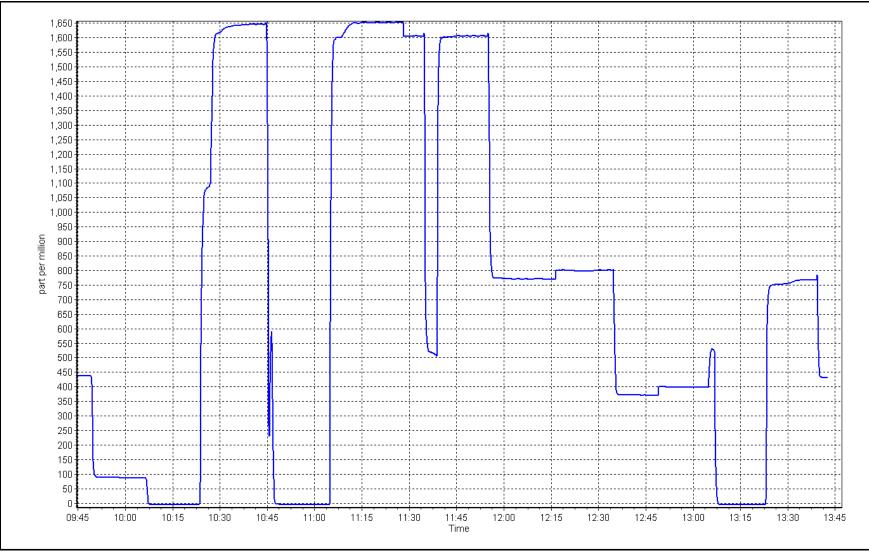
Calibration Date	April 16, 2024	Previous Calibration	March 19, 2024
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	9:50	End Time (MST)	13:43
Analyzer make	Teledyne API T360	Analyzer serial #	289

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-4.9		Correlation Coefficient	0.999999	≥0.995
1605.9 802.9	1606.8 800.6	0.9994 1.0029	Slope	1.003378	0.90 - 1.10
401.5	399.1	1.0059	Intercept	-4.5	+/-20











### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS09 BARGE LANDING APRIL 2024

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

May 31, 2024



Station Name:

Calibration Date:

Barge Landing

April 2, 2024

## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

Station number: AMS 09

Last Cal Date: March 6, 2024

#### **Station Information**

Start time (MST): Reason:	9:18 Routine		End time (MST): 12	:44	
		Calibration S	tandards		
Cal Gas Concentration: Cal Gas Cylinder #:	49.96 CC151285	ppm	Cal Gas Exp Date: Jar	nuary 5, 2025	
Removed Cal Gas Conc:	49.96	ppm	Rem Gas Exp Date: NA	L.	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 38	12	
Zero Air Gen Model:	APIT701		Serial Number: 48	88	
Analyzer make: Analyzer Range:	Thermo 43i 0 - 1000 ppb	<u>Analyzer Inf</u>	ormation Serial Number: 11	18148498	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.001110	0.997204	Backgd or Offset:	10.2	10.1
Calibration intercept:	0.391536	0.710524	Coeff or Slope:	0.963	0.956
SO <sub>2</sub> 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	80.2	801.5	803.1	0.998
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	802.9	Previous response	802.8	*% change	0.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.4	
High point	4919	80.2	801.5	799.7	1.002
Mid point	4959	40.1	400.8	400.8	1.000
Low point	4980	20.0	199.8	200.1	0.999
As left zero	5000	0.0	0.0	0.4	
As left span	4919	80.2	801.5	802.3	0.999
			Averag	ge Correction Factor:	1.000

Notes:

Changed sample inlet filter after as founds. Span adjusted.

Calibration Performed By:

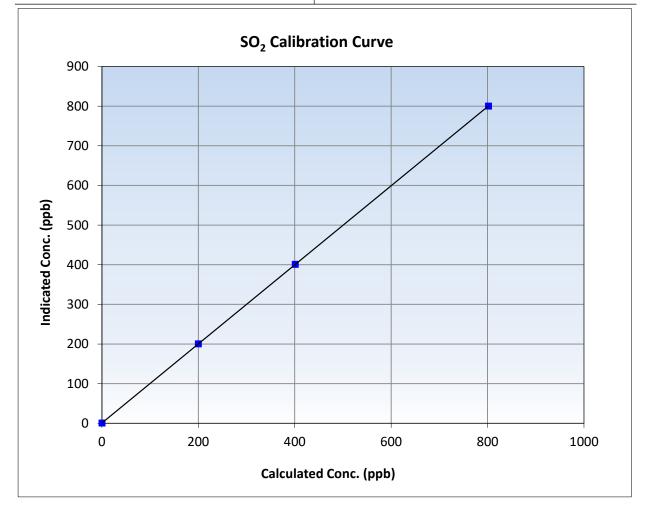


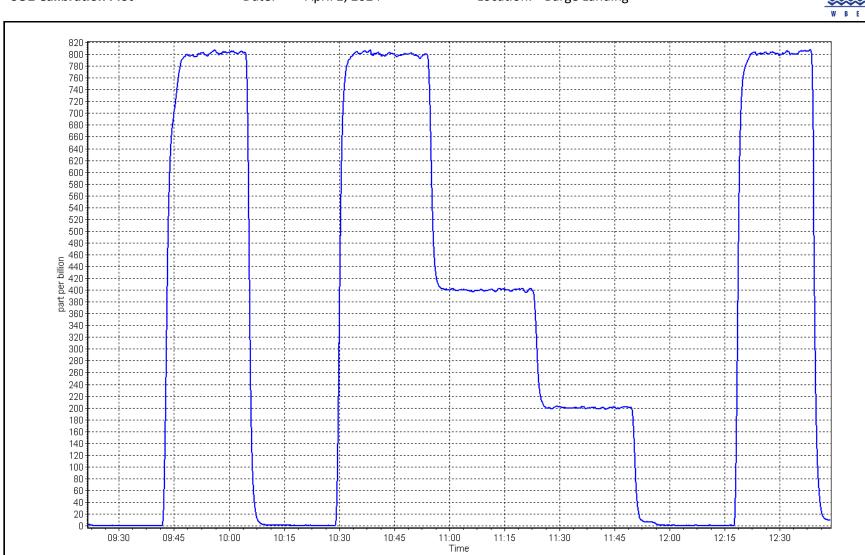
## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	9:18	End Time (MST):	12:44
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148498

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.4		Correlation Coefficient	0.999999	≥0.995
801.5 400.8	799.7 400.8	1.0022 0.9999	Slope	0.997204	0.90 - 1.10
199.8	200.1	0.9987	Intercept	0.710524	+/-30





Location: Barge Landing



## Wood Buffalo Environmental Association

### **TRS Calibration Report**

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Barge Landing April 3, 2024 8:53 Routine		Station number: Last Cal Date: End time (MST):	AMS 09 March 7, 2024 13:05
		<b>Calibration</b>	<u>Standards</u>	
Cal Gas Concentration: Cal Gas Cylinder #:	5.17 CC511415	ppm	Cal Gas Exp Date:	August 22, 2026
Removed Cal Gas Conc: Removed Gas Cyl #:	5.17 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA
Calibrator Make/Model:	API T700		Serial Number:	3812
ZAG Make/Model:	API T701		Serial Number:	4888
		Analyzer In	formation	
Analyzer make: Converter make:	Thermo 43i-TLE CDN-101		Analyzer serial #: Converter serial #:	1331259320 519
Analyzer Range	0 - 100 ppb		Converter Temp:	830 degC
Calibration slope: Calibration intercept:	<u>Start</u> 1.000835 0.139405	<u>Finish</u> 0.990985 0.059198	Backgd or Offset: Coeff or Slope:	

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4923	77.4	80.0	79.1	1.012
As found Mid point	4961	38.7	40.0	39.7	1.008
As found Low point New cylinder response	4981	19.3	20.0	19.7	1.013
Baseline Corr As found:	79.1	Prev response:	80.25	*% change:	-1.4%
Baseline Corr 2nd AF pt:	39.7	AF Slope	0.988559	AF Intercept:	0.019148
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999995	* = > +/-5% change initia	tes investigation

#### **TRS Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate	Calculated	Indicated concentration Correction factor (Cc/Ic)	
	(sccm)	(sccm)	concentration (ppb) (Cc)	(ppb) (Ic)	<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.0	0.0	
High point	4923	77.4	80.0	79.3	1.009
Mid point	4961	38.7	40.0	39.9	1.003
Low point	4981	19.3	20.0	19.8	1.008
As left zero	5000	0.0	0.0	0.2	
As left span	4923	77.4	80.0	79.4	1.008
SO2 Scrubber Check	4920	80.2	802.0	0.0	
Date of last scrubber change:				Ave Corr Factor	1.007
Date of last converter efficiency test:					

Notes:

Changed inlet filter after as founds. Pump was changed due to low flow. No adjustments made.

Sean Bala



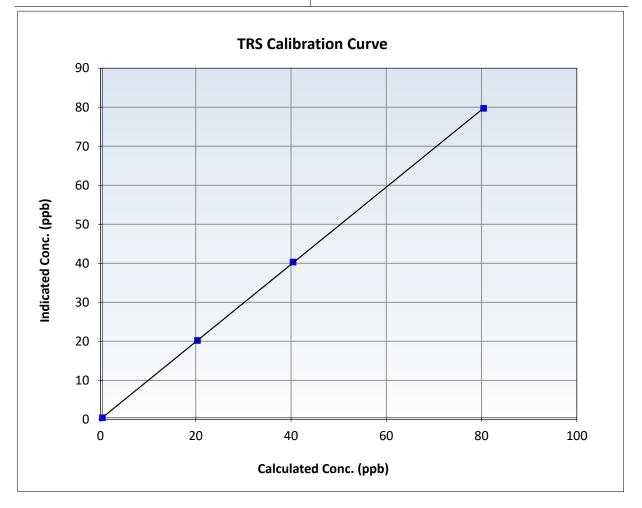
# Wood Buffalo Environmental Association

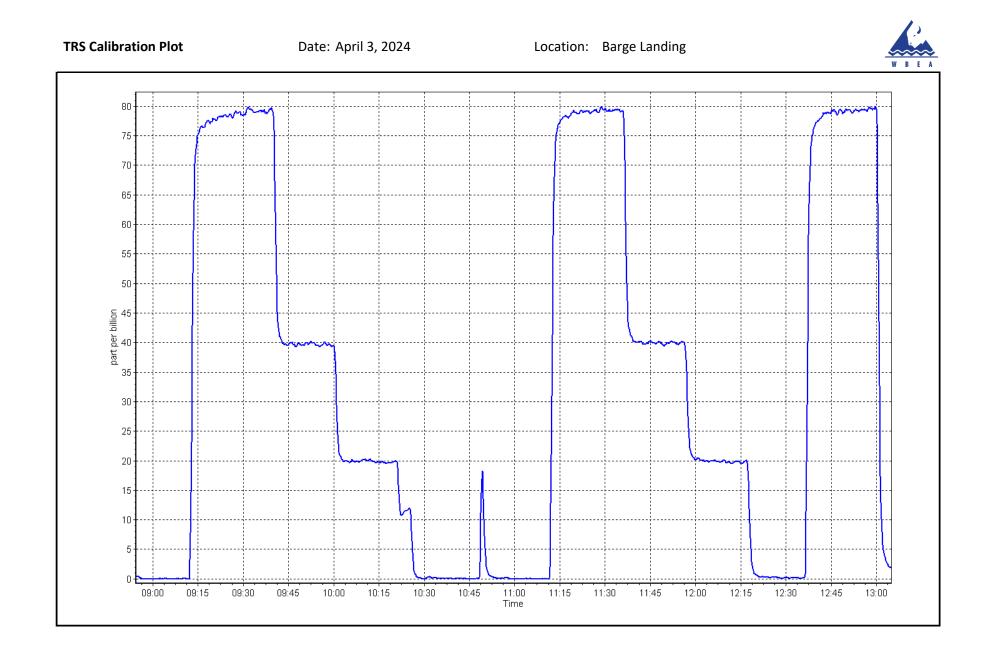
### **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 7, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	8:53	End Time (MST):	13:05
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1331259320

Calibration Data					
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ition	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999988	≥0.995
80.0 40.0	79.3 39.9	1.0093 1.0032	Slope	0.990985	0.90 - 1.10
20.0	19.8	1.0080	Intercept	0.059198	+/-3







### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Barge Landing	Station number: AMS 09
Calibration Date:	April 2, 2024	Last Cal Date: March 6, 2024
Start time (MST):	9:18	End time (MST): 12:44
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 <sub>4</sub> ):		Diff between cyl (NM):		
Calibrator Model:	API T700	Serial Number:	3812	
Zero Air Gen model:	APIT701	Serial Number:	4888	
Analyzer Information				
Analyzer make: Tl	hermo 55i	Analyzer serial #: 13312	259521	

THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.58E-04	2.60E-04	NMHC SP Ratio:	4.37E-05	4.50E-05
CH4 Retention time:	15.00	15.20	NMHC Peak Area:	209298	205331
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	4919	80.2	17.12	16.90	1.013
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.90	Prev response	17.04	*% change	-0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919	80.2	17.12	17.14	0.999
Mid point	4960	40.1	8.56	8.55	1.000
Low point	4980	20.0	4.27	4.28	0.997
As left zero	5000	0.0	0.00	0.00	
As left span	4919	80.2	17.12	17.12	1.000
			Avera	ge Correction Factor	0.999

Notes:

Changed inlet filter after as founds. Span adjusted.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4919	80.2	9.14	9.00	1.015
Baseline Corr AF: Baseline Corr 2nd AF:	9.00 NA	Prev response AF Slope:	9.08	*% change AF Intercept:	-0.8%
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiat	es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919	80.2	9.14	9.16	0.998
Mid point	4960	40.1	4.57	4.57	0.999
Low point	4980	20.0	2.28	2.29	0.996
As left zero	5000	0.0	0.00	0.00	
As left span	4919	80.2	9.14	9.15	0.999
			Avera	ge Correction Factor	0.998

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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 As found Mid point As found Low point New cylinder response	4919	80.2	7.98	7.90	1.010
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	7.90 NA NA	Prev response AF Slope: AF Correlation:	7.96	*% change AF Intercept: * = > +/-5% change initia	

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919	80.2	7.98	7.98	1.000
Mid point	4960	40.1	3.99	3.98	1.002
Low point	4980	20.0	1.99	1.99	0.998
As left zero	5000	0.0	0.00	0.00	
As left span	4919	80.2	7.98	7.98	1.001
			Avera	age Correction Factor	1.000

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.995217	1.000957
THC Cal Offset:	0.001033	0.000059
CH4 Cal Slope:	0.997716	0.999506
CH4 Cal Offset:	-0.000741	0.000263
NMHC Cal Slope:	0.993146	1.001926
NMHC Cal Offset:	0.001575	0.000995

Calibration Performed By:

Sean Bala

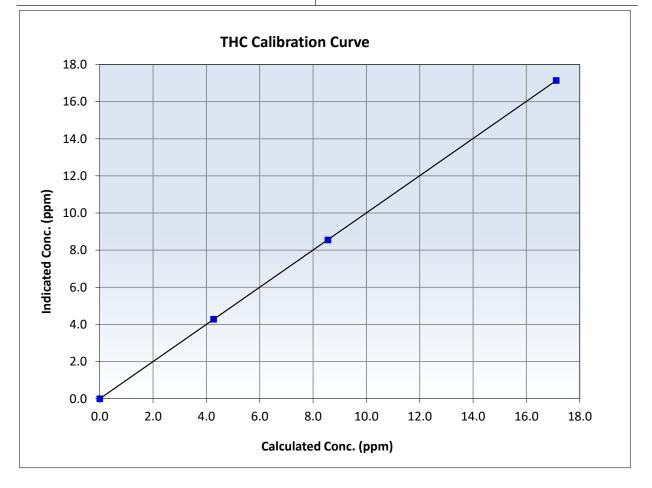


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	9:18	End Time (MST):	12:44
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999998	≥0.995
17.12 8.56	17.14 8.55	0.9988 1.0005	Slope	1.000957	0.90 - 1.10
4.27	4.28	0.9971	Intercept	0.000059	+/-0.5



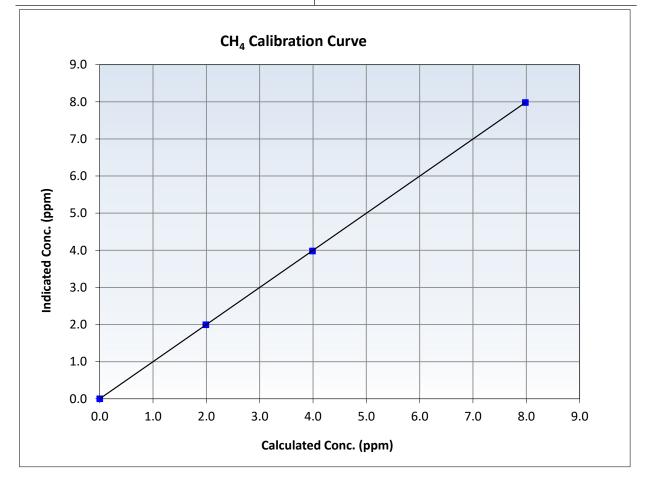


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	9:18	End Time (MST):	12:44
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999998	≥0.995
7.98 3.99	7.98 3.98	1.0002 1.0019	Slope	0.999506	0.90 - 1.10
1.99	1.99	0.9982	Intercept	0.000263	+/-0.5



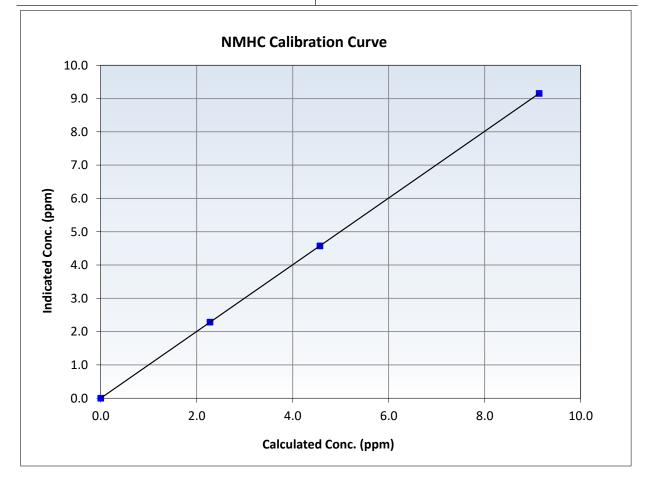


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

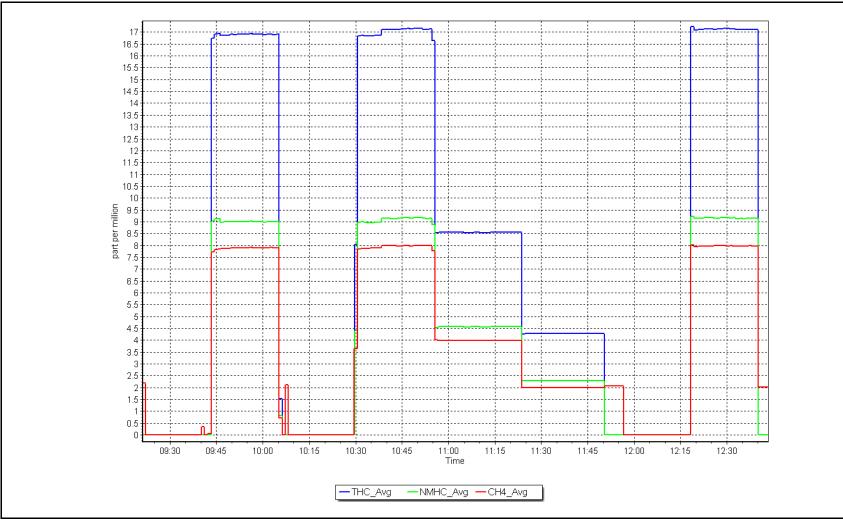
Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	9:18	End Time (MST):	12:44
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259521

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999999	≥0.995
9.14 4.57	9.16 4.57	0.9979 0.9986	Slope	1.001926	0.90 - 1.10
2.28	2.29	0.9961	Intercept	0.000995	+/-0.5



#### **NMHC Calibration Plot**







**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Barge Landing	NO Gas Cylinder #:	T2Y1KDH	Cal Gas Expiry Date: November 17, 2026
Station number:	AMS 09	NOX Cal Gas Conc:	47.38 ppm	NO Cal Gas Conc: 46.94 ppm
Calibration Date:	April 18, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA
Last Cal Date:	March 22, 2024	Removed Gas NOX Conc:	47.38 ppm	Removed Gas NO Conc: 46.94 ppm
Start time (MST):	10:38	NOX gas Diff:		NO gas Diff:
End time (MST):	15:03	Calibrator Model:	API T700	Serial Number: 3812
Reason:	Routine	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	-0.4	-0.1	-0.3		
AF High point	4915	85.3	808.3	800.7	7.5	805.3	793.7	11.6	1.0032	1.0088
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	808.7 ppb	NO = 799.8	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chang	ge NO <sub>x</sub> =	-0.4%
Baseline Corr 1	.st pt NO <sub>x</sub> =	805.7 ppb	NO = 793.8	ppb	<u>As Four</u>	nd Statistics		*Percent Chang	ge NO =	-0.8%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	$NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>X</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	NO <sub>2</sub> $r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data		Baseline Adjust	ed NO2	
		Indicated NO Pa	foronco India	cated NO Drop	Calculated N	00 In	dicated NO2	Correction fo	inter Con	ortor Efficiency

O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
A F LODT						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1426262	593			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.000294	0.999233
			Instrument Settings			NO <sub>x</sub> Cal Offset:	0.198498	0.498364
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.999838	0.998482
NO coeff or slope:	1.094	1.101	NO bkgnd or offset:	10.0	10.1	NO Cal Offset:	-0.783809	-0.583944
NOX coeff or slope:	0.998	0.998	NOX bkgnd or offset:	10.3	10.4	NO <sub>2</sub> Cal Slope:	0.999826	1.006238
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	181.0	182.2	NO <sub>2</sub> Cal Offset:	-1.024158	0.877238

#### **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	807.8	799.2	8.6	1.0006	1.0019
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	198.4	4.4	0.9947	1.0078
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	417.7	390.6	806.6	417.7	388.8	1.0021	1.0000
							Average Co	orrection Factor	0.9980	1.0044

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) 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	795.6	414.7	388.4	391.0	0.9934	100.7%
Mid GPT point	795.6	607.1	196.0	199.1	0.9845	101.6%
Low GPT point	795.6	702.5	100.6	102.9	0.9777	102.3%
				Average Correction Factor	0.9852	101.5%

Notes:

Changed inlet filter after as founds. Adjusted span only.

Calibration Performed By:

Sean Bala

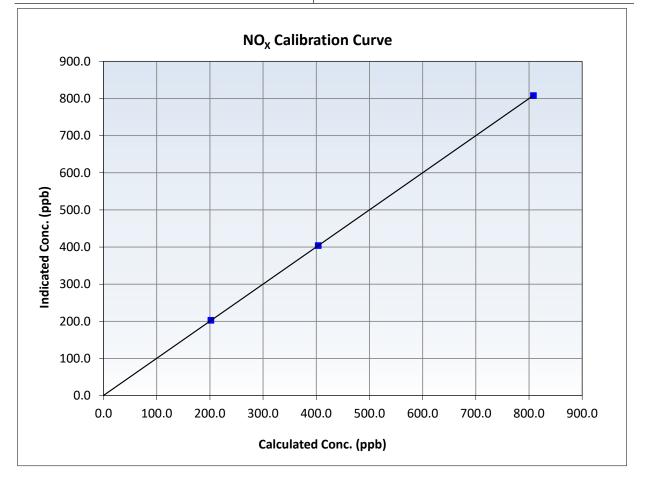


### Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 22, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:38	End Time (MST):	15:03
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999997	≥0.995
808.3 403.7	807.8 404.2	1.0006 0.9988	Slope	0.999233	0.90 - 1.10
201.8	202.9	0.9947	Intercept	0.498364	+/-20



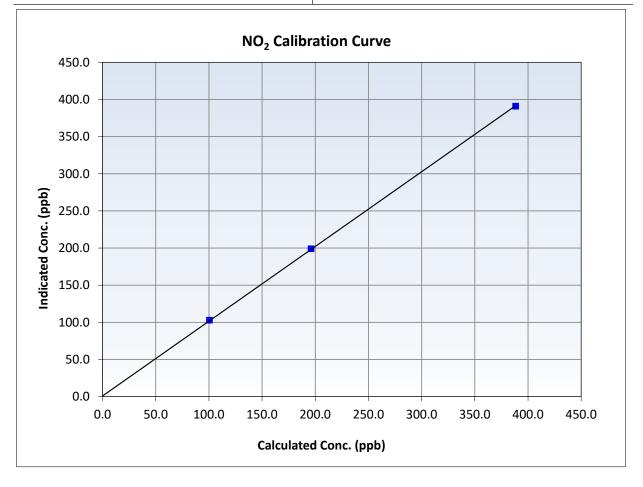


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 22, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:38	End Time (MST):	15:03
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999961	≥0.995
388.4 196.0	391.0 199.1	0.9934 0.9845	Slope	1.006238	0.90 - 1.10
100.6	102.9	0.9777	Intercept	0.877238	+/-20



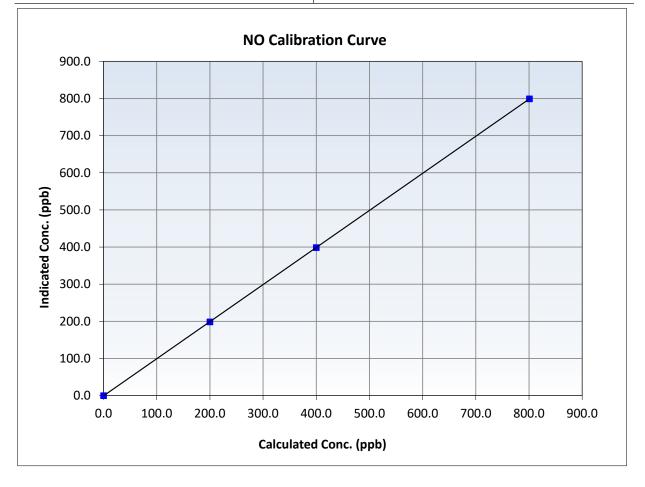


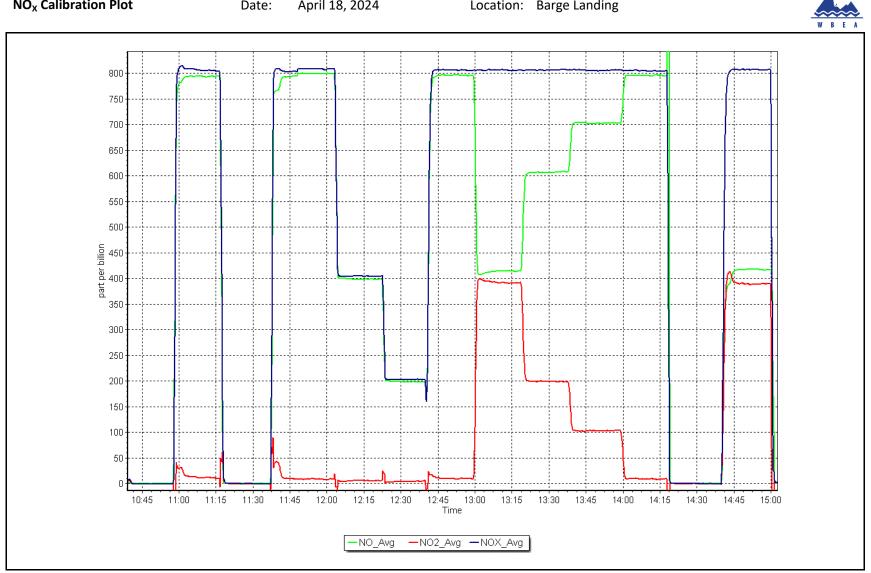
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 22, 2024
Station Name:	Barge Landing	Station Number:	AMS 09
Start Time (MST):	10:38	End Time (MST):	15:03
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262593

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999997	≥0.995
800.7 400.0	799.2 398.6	1.0019 1.0034	Slope	0.998482	0.90 - 1.10
200.0	198.4	1.0078	Intercept	-0.583944	+/-20







### Wood Buffalo Environmental Association

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

WBEA					Version-01-2024
		Station Informa	ation		
Station Name:	Barge Landing		Station number: AMS	09	
Calibration Date:	April 13, 2024		Last Cal Date: Marc	ch 22, 2024	
Start time (MST):	10:20		End time (MST): 11:1	5	
Analyzer Make:	API T640		S/N: 844		
Particulate Fraction:	PM2.5				
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 3887	54	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	54	
	I	Monthly Calibrati	on Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	10.00	9.40	10.00		+/- 2 °C
P (mmHg)	719.40	727.38	719.40		+/- 10 mmHg
Flow (LPM)	4.95	4.96	4.95		+/- 0.25 LPM
PW% (pump)	36.00		36.00		>80%
Zero Verification	PM w/o HEPA:	5.80	PM w/ HEPA:	6.70	<0.2 ug/m3
Note: this leak check will be	completed before the a	uarterly work and	will serve as the pre mainter	nance leak check	
PM Inlet observation :	Inlet Head Clean		· · _		

		<b>Quarterly Calibration</b>	Test		
SPAN DUST	Refractive Index:	10.9	Expiry Date:	June 10, 202	24
SPAN DUST					
Parameter	As found	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test	5.00	11.00	11.00		+/- 0.5
Date Optical Chan	nber Cleaned:	April 13,	2024		
Date Disposable Fi	Iter Changed:	April 13,	2024		
- maintenance Zero Ve	rification:	PM w/ HEPA:	0.00	<0.2 ug/m3	

#### **Annual Maintenance**

Date Sample Tube Cleaned:	August 23, 2023
Date RH/T Sensor Cleaned:	August 23, 2023

Notes:

Inlet head looks good. No adjustments. Leak check passed.

Calibration by:

Jan Castro



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS11 LOWER CAMP APRIL 2024

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

May 31, 2024



Station Name:

Calibration Date:

Lower Camp

April 24, 2024

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

Station number: AMS 11

Last Cal Date: March 26, 2024

#### **Station Information**

Start time (MST): Reason:	10:04 Routine		End time (MST):	14:09	
		Calibration St	andards_		
Cal Gas Concentration: Cal Gas Cylinder #:	49.25 CC2216	ppm	Cal Gas Exp Date:	February 23, 2025	
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 Info	rmation		
Analyzer make:	Thermo 43i		Serial Number:	100841398	
Analyzer Range:	0 - 1000 ppb				
	<u>Start</u>	Finish		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.994478	0.988759	Backgd or Offset:	14.7	14.7
Calibration intercept:	0.097406	-0.098992	Coeff or Slope:	1.034	1.034
		SO <sub>2</sub> As Foun	d 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	1.3	
As found High point	4932	81.4	799.6	788.8	1.015
As found Mid point					
As found Low point					
New cylinder response					

Baseline Corr As found:787.5Previous response795.3\*% change-1.0%Baseline Corr 2nd AF pt:NAAF Slope:AF Intercept:Baseline Corr 3rd AF pt:NAAF Correlation:\*=>+/-5% change initiates investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	1.2	
High point	4932	81.4	799.6	791.3	1.011
Mid point	4959	40.7	400.9	395.4	1.014
Low point	4981	20.4	200.9	197.4	1.018
As left zero	5000	0.0	0.0	1.4	
As left span	4932	81.4	799.6	792.4	1.009
			Averag	ge Correction Factor:	1.014

Notes:

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

Calibration Performed By:

Mohammed Kashif

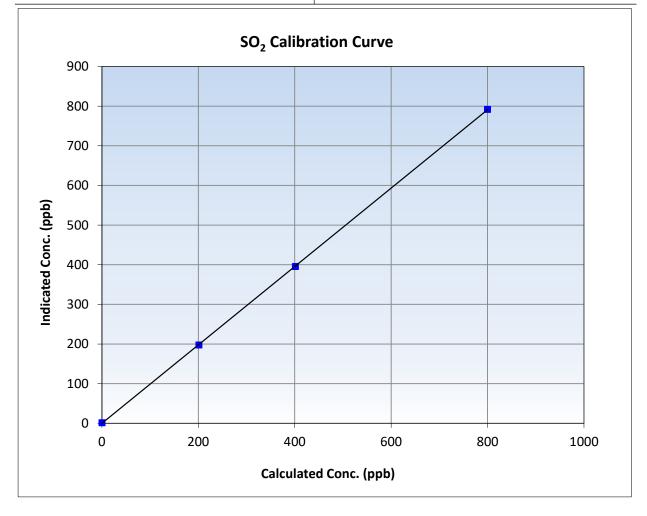


# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

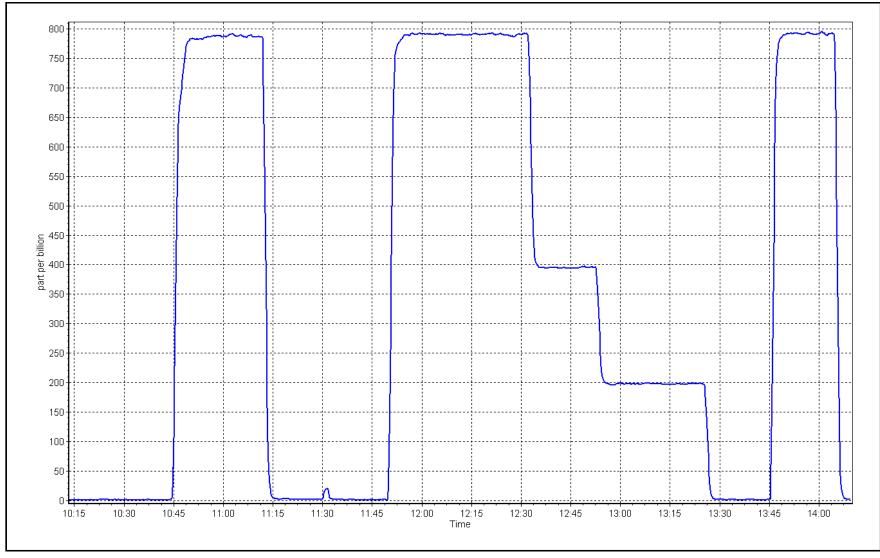
Calibration Date:	April 24, 2024	Previous Calibration:	March 26, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:04	End Time (MST):	14:09
Analyzer make:	Thermo 43i	Analyzer serial #:	100841398

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	1.2		Correlation Coefficient	0.999987	≥0.995
799.6 400.9	791.3 395.4	1.0105 1.0140	Slope	0.988759	0.90 - 1.10
200.9	197.4	1.0140	Intercept	-0.098992	+/-30











# Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Lower Camp April 23, 2024 10:14 Routine		Station number: Last Cal Date: End time (MST):	AMS 11 March 25, 2024 14:37	
		<b>Calibration</b>	Standards		
Cal Gas Concentration: Cal Gas Cylinder #:	5.43 CC501097	ppm	Cal Gas Exp Date:	January 4, 2025	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.43 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA	
Calibrator Make/Model: ZAG Make/Model:	API T700 API T701H		Serial Number: Serial Number:	3807 196	
ZAG Make/Model.	AFTIYOIN		Serial Nulliber.	190	
		Analyzer Inf	ormation		
Analyzer make:	Thermo 43iQ		Analyzer serial #:	1203169745	
Converter make:	Global G150		Converter serial #:	2022-223	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	
Calibration slope:	1.012278	0.990021	Backgd or Offset:	3.0	
Calibration intercept:	-0.364532	0.156017	Coeff or Slope:	0.817	

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.6	
As found High point	4926	73.6	79.9	79.3	1.000
As found Mid point	4963	36.8	40.0	39.5	0.996
As found Low point	4982	18.6	20.2	19.5	1.005
New cylinder response					
Baseline Corr As found:	79.9	Prev response:	80.54	*% change:	-0.8%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	1.000323	AF Intercept:	-0.604758
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999992	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4926	73.6	79.9	79.2	1.009
Mid point	4963	36.8	40.0	39.9	1.001
Low point	4982	18.6	20.2	20.1	1.005
As left zero	5000	0.0	0.0	0.1	
As left span	4926	73.6	79.9	79.9	1.000
SO2 Scrubber Check	4935	81.5	812.3	-0.1	
Date of last scrubber chan	ge:			Ave Corr Factor	1.005

Date of last converter efficiency test:

Notes: Changed sample inlet filter after as founds. Adjusted zero only. Ran scrubber check after calibrator zero and it passed.

Calibration Performed By:

Mohammed Kashif

Einish 2.5 0.817



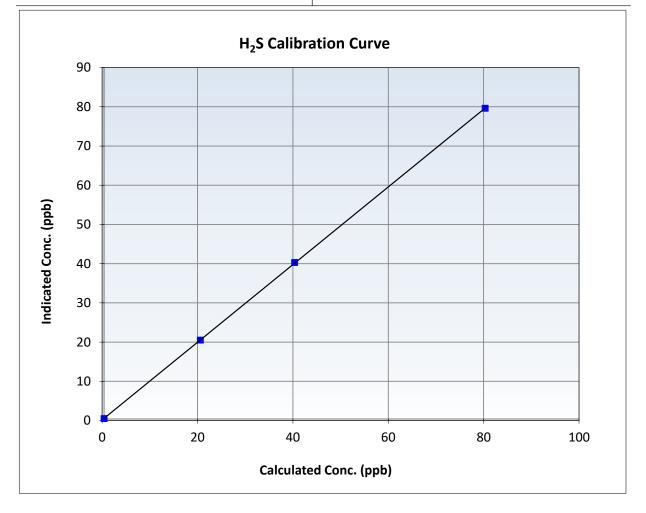
### **Wood Buffalo Environmental Association**

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

#### **Station Information**

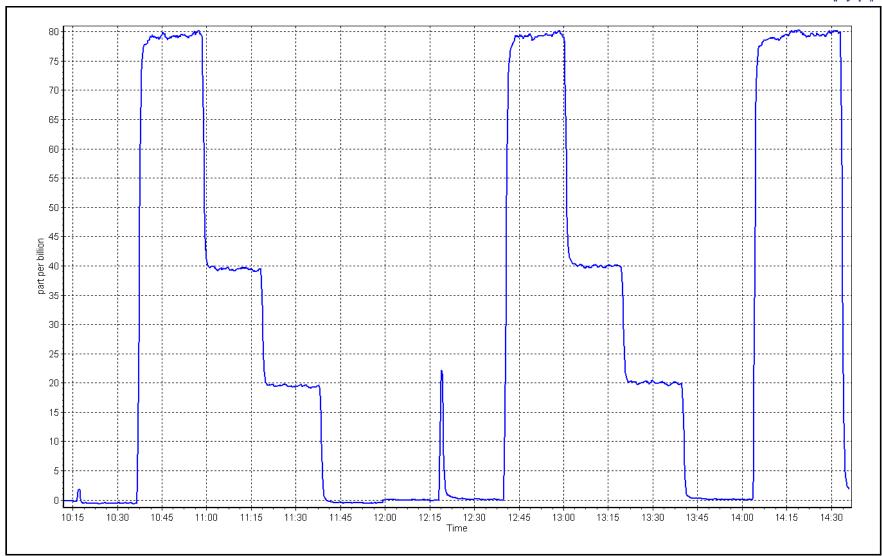
Calibration Date:	April 23, 2024	Previous Calibration:	March 25, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:14	End Time (MST):	14:37
Analyzer make:	Thermo 43iQ	Analyzer serial #:	1203169745

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999987	≥0.995
79.9	79.2	1.0091	Slope	0.990021	0.90 - 1.10
40.0 20.2	39.9 20.1	1.0015 1.0046	·		
20.2	20.1	1.0040	Intercept	0.156017	+/-3











### Wood Buffalo Environmental Association THC / CH4 / NMHC Calibration Report

#### **Station Information**

Station Name:	Lower Camp	Station number: AMS 11
Calibration Date:	April 24, 2024	Last Cal Date: March 26, 2024
Start time (MST):	10:04	End time (MST): 14:09
Reason:	Routine	

#### **Calibration Standards**

Gas Cert Reference:	CC2216	i	Cal Gas Expiry Date:	Febru	uary 23, 2025
CH4 Cal Gas Conc.	502.0 ppi	n	CH4 Equiv Conc.	106	7.1 ppm
C3H8 Cal Gas Conc.	205.5 ppi	n			
Removed Gas Cert:	NA		Removed Gas Expiry:		NA
Removed CH4 Conc.	502.0 ppi	n	CH4 Equiv Conc.	1067.1	ppm
Removed C3H8 Conc.	205.5 ppi	n	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	API T70	0	Serial Number:		3807
Zero Air Gen model:	API T70	1	Serial Number:		196
		Analyze	er Information		
Analyzer make: Th	ermo 55i		Analyzer serial #: 1505164381		
THC Range: 0 -	- 20 ppm		NMHC/CH4 Range: 0	- 10 ppm	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.68E-04	2.75E-04	NMHC SP Ratio:	4.81E-05	4.90E-05

14.8

OFF

#### THC As Found Data

NMHC Peak Area:

Flat Baseline:

190907

OFF

187273

OFF

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	16.82	1.030
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.82	Prev response	17.29	*% change	-2.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4932	81.4	17.33	17.30	1.002
Mid point	4959	40.7	8.69	8.63	1.006
Low point	4981	20.4	4.35	4.31	1.011
As left zero	5000	0.0	0.00	0.00	
As left span	4932	81.4	17.33	17.44	0.993
			Avera	ge Correction Factor	1.006

Notes:

CH4 Retention time:

Zero Chromatogram:

14.6

OFF

Changed sample inlet filter and nitrogen cylinder after as founds. Adjusted span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4932	81.4	9.18	8.96	1.025
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	8.96 NA NA	Prev response AF Slope: AF Correlation:	9.16	*% change AF Intercept: * = > +/-5% change initia	-2.3% tes 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	9.15	1.002
Mid point	4959	40.7	4.60	4.57	1.006
Low point	4981	20.4	2.31	2.28	1.009
As left zero	5000	0.0	0.00	0.00	
As left span	4932	81.4	9.18	9.23	0.994
			Avera	ge 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	4932	81.4	8.15	7.86	1.036
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	7.86	Prev response	8.13	*% change	-3.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	ates 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	8.14	1.001
Mid point	4959	40.7	4.09	4.06	1.007
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	8.22	0.992
			Avera	ge Correction Factor	1.007

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.999083	0.998938
THC Cal Offset:	-0.021522	-0.023918
CH4 Cal Slope:	0.998771	0.999584
CH4 Cal Offset:	-0.011567	-0.013970
NMHC Cal Slope:	0.999149	0.997916
NMHC Cal Offset:	-0.009354	-0.009146

Calibration Performed By:

Mohammed Kashif

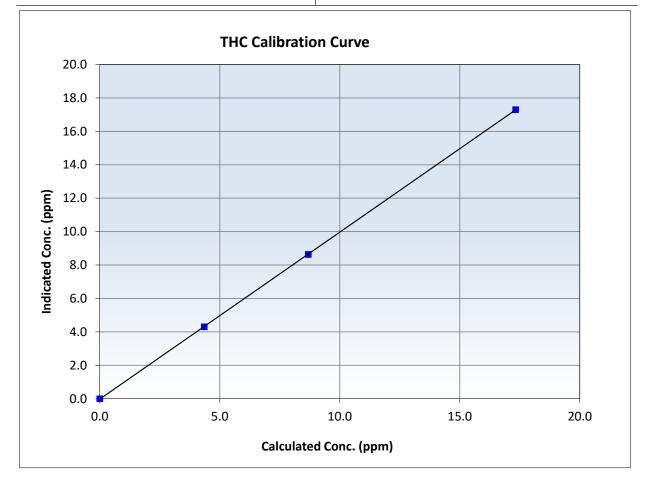


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 24, 2024	Previous Calibration:	March 26, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:04	End Time (MST):	14:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999991	≥0.995
17.33 8.69	17.30 8.63	1.0016 1.0062	Slope	0.998938	0.90 - 1.10
4.35	4.31	1.0108	Intercept	-0.023918	+/-0.5



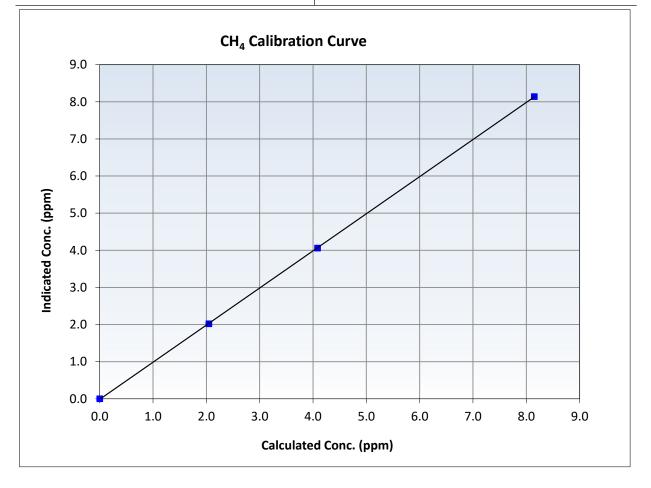


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 24, 2024	Previous Calibration:	March 26, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:04	End Time (MST):	14:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999985	≥0.995
8.15 4.09	8.14 4.06	1.0011 1.0068	Slope	0.999584	0.90 - 1.10
2.05	2.02	1.0127	Intercept	-0.013970	+/-0.5



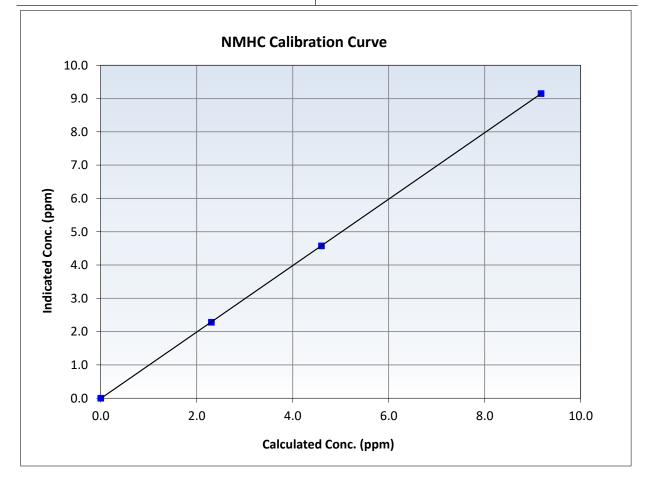


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

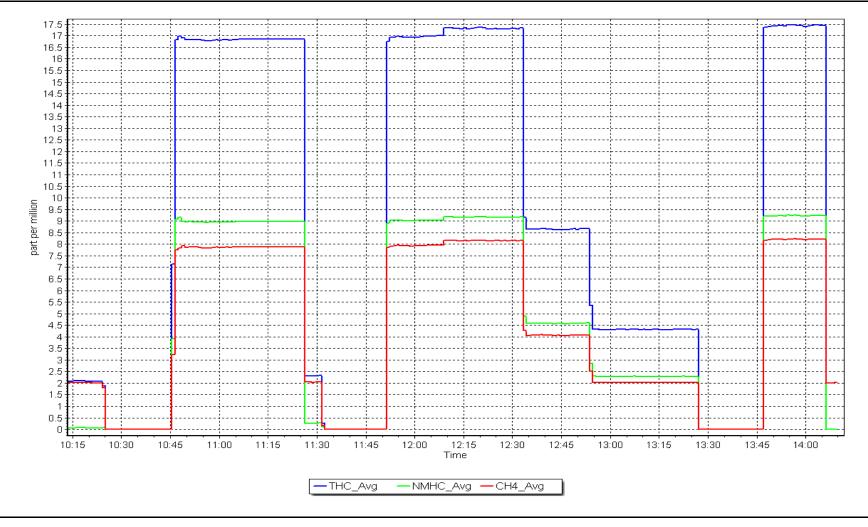
Calibration Date:	April 24, 2024	Previous Calibration:	March 26, 2024
Station Name:	Lower Camp	Station Number:	AMS 11
Start Time (MST):	10:04	End Time (MST):	14:09
Analyzer make:	Thermo 55i	Analyzer serial #:	1505164381

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999995	≥0.995
9.18 4.60	9.15 4.57	1.0025	Slope	0.997916	0.90 - 1.10
2.31	2.28	1.0058 1.0092	Intercept	-0.009146	+/-0.5



#### **NMHC Calibration Plot**







### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS13 FORT MCKAY SOUTH APRIL 2024

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

May 31, 2024



# **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Fort McKay South April 4, 2024 8:47 Routine		Station number: Al Last Cal Date: M End time (MST): 14	arch 12, 2024	
		Calibration St	tandards		
Cal Gas Concentration: Cal Gas Cylinder #:	50.55 CC260812	ppm	Cal Gas Exp Date: De	ecember 29, 2028	
, Removed Cal Gas Conc:	50.55	ppm	Rem Gas Exp Date: N/	4	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 24	48	
Zero Air Gen Model:	API T701		Serial Number: 11	.17	
		Analyzer Info	ormation		
Analyzer make:	API T100		Serial Number: 59	9	
Analyzer Range:	0 - 1000 ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<b>Finish</b>
Calibration slope:	1.002127	1.004442	Backgd or Offset:	90.0	90.0
Calibration intercept:	-2.338170	-2.497906	Coeff or Slope:	0.711	0.711
		SO <sub>2</sub> As Four	nd 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	79.1	799.7	800.9	0.999
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr As found:	800.8	Previous response	799.0	*% change	0.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4921	79.1	799.7	801.8	0.997
Mid point	4961	39.5	399.3	398.0	1.003
Low point	4980	19.8	200.2	195.5	1.024
As left zero	5000	0.0	0.0	0.3	
As left span	4921	79.1	799.7	801.0	0.998
			Averag	e Correction Factor:	1.008

Notes:

Changed inlet filter after as founds. No adjustment made.

Calibration Performed By:

Sean Bala

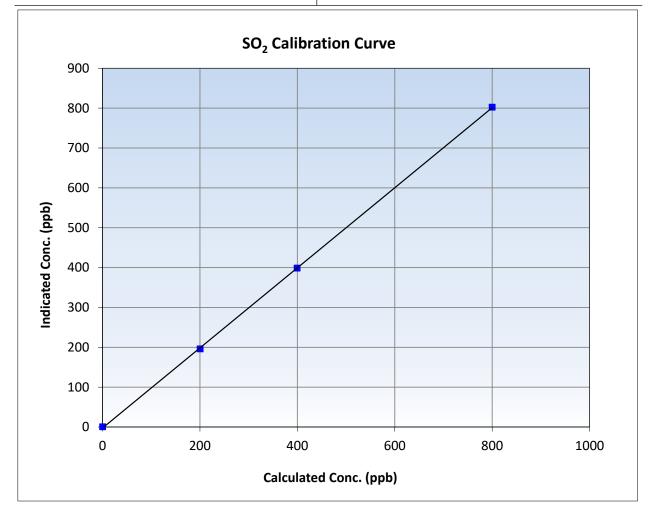


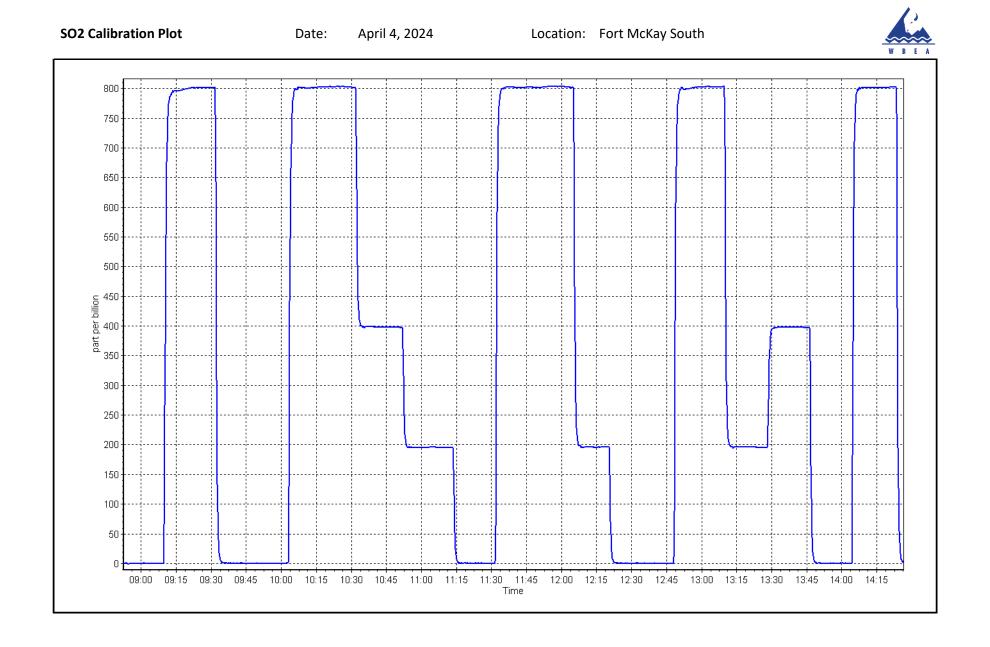
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:47	End Time (MST):	14:27
Analyzer make:	API T100	Analyzer serial #:	599

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999950	≥0.995
799.7 399.3	801.8 398.0	0.9974 1.0033	Slope	1.004442	0.90 - 1.10
200.2	195.5	1.0240	Intercept	-2.497906	+/-30







### Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Fort McKay South April 10, 2024 9:04 Routine		Station number: Last Cal Date: End time (MST):	AMS 13 March 21, 2024 13:13	
		Calibration S	tandards		
Cal Gas Concentration: Cal Gas Cylinder #:	5.34 CC500241	ppm	Cal Gas Exp Date:	January 1, 2025	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.34 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA	
Calibrator Make/Model:	API T700		Serial Number:	2448	
ZAG Make/Model:	API T701		Serial Number:	1117	
		Analyzer Info	ormation		
Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1180540017	
Converter make:	CDN-101		Converter serial #:	521	
Analyzer Range	0 - 100 ppb		Converter Temp:		degC
Calibration slope: Calibration intercept:	<u>Start</u> 1.007879 -0.422268	<u>Finish</u> 1.010145 -0.602184	Backgd or Offset: Coeff or Slope:		<u>Finish</u> 4.1 1.143

#### 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	-0.5	
As found High point	4925	75.5	80.6	82.1	0.976
As found Mid point	4962	37.7	40.3	40.4	0.984
As found Low point	4981	18.9	20.2	19.6	1.004
New cylinder response					
Baseline Corr As found:	82.6	Prev response:	80.84	*% change:	2.1%
Baseline Corr 2nd AF pt:	40.9	AF Slope:	1.026451	AF Intercept:	-0.802285
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999939	* = > +/-5% change initiate	es investigation

#### **TRS Calibration Data**

Dilution air flow rate (sccm)	Source gas flow rate (sccm)	concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
5000	0.0	0.0	-0.4	
4925	75.5	80.6	80.9	0.997
4962	37.7	40.3	40.1	1.004
4981	18.9	20.2	19.5	1.035
5000	0.0	0.0	-0.2	
4925	75.5	80.6	80.5	1.002
4921	79.1	791.0	0.0	
e:	20-Jan-20		Ave Corr Factor	1.012
	5000 4925 4962 4981 5000 4925	(sccm)         (sccm)           5000         0.0           4925         75.5           4962         37.7           4981         18.9           5000         0.0           4925         75.5           4981         18.9           5000         75.5           4925         75.5           4921         79.1	(sccm)         (sccm)         concentration (ppb) (Cc)           5000         0.0         0.0           4925         75.5         80.6           4962         37.7         40.3           4981         18.9         20.2           5000         0.0         0.0           4925         75.5         80.6           4921         79.1         791.0	Dilution air flow rate (sccm)         Source gas flow rate (sccm)         concentration (ppb) (Cc)         Indicated concentration (ppb) (Ic)           5000         0.0         0.0         -0.4           4925         75.5         80.6         80.9           4962         37.7         40.3         40.1           4981         18.9         20.2         19.5           5000         0.0         0.0         -0.2           4925         75.5         80.6         80.5           4925         75.7         91.0         0.0

Date of last converter efficiency test:

Notes:

Changed inlet filter after as founds. Srubber checked after calibrator zero. Span adjusted only.

Calibration Performed By: Sean Bala



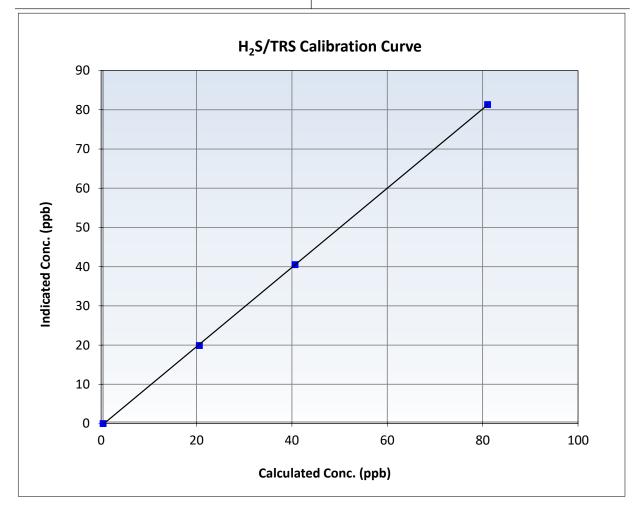
### **Wood Buffalo Environmental Association**

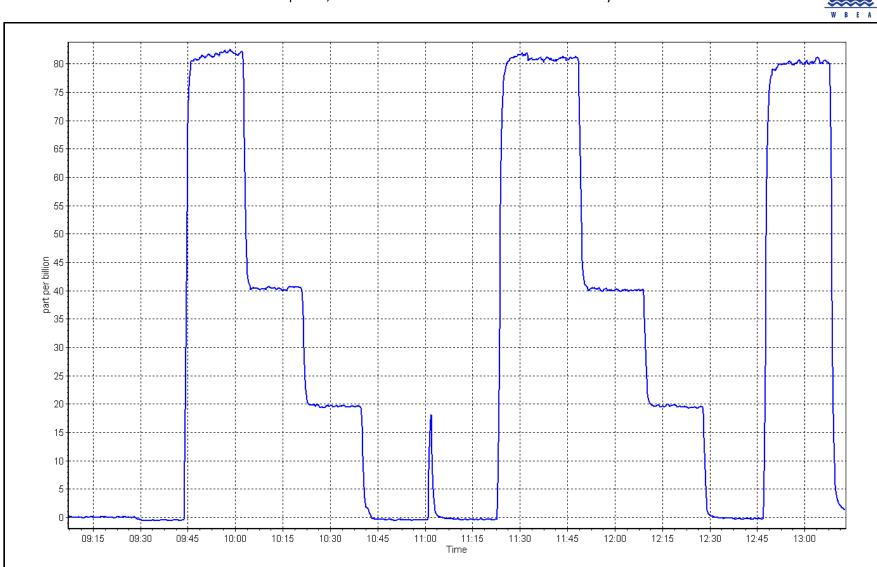
### **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 21, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:04	End Time (MST):	13:13
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1180540017

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999965 ≥0.995 0.0 -0.4 ----80.6 80.9 0.9966 Slope 1.010145 0.90 - 1.10 40.3 40.1 1.0041 20.2 19.5 1.0352 Intercept -0.602184 +/-3





Location: Fort McKay South



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Fort McKay South	Station number: AMS 13
Calibration Date:	April 4, 2024	Last Cal Date: March 12, 2024
Start time (MST):	8:47	End time (MST): 14:27
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 <sub>4</sub> ):		Diff between cyl (NM):	
Calibrator Model:	API T700	Serial Number:	2448
Zero Air Gen model:	API T701	Serial Number:	1117
	Anal	yzer Information	
Analyzer make: Thermo	55i	Analyzer serial #: 11727	50023

THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.95E-04	3.05E-04	NMHC SP Ratio:	5.07E-05	5.21E-05
CH4 Retention time:	15.20	15.40	NMHC Peak Area:	179256	174169
Zero Chromatogram:	OFF	ON	Flat Baseline:	OFF	ON

#### **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	4921	79.1	17.05	16.61	1.028
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.59	Prev response	16.99	*% change	-2.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4921	79.1	17.05	17.07	0.999
Mid point	4961	39.5	8.51	8.52	0.999
Low point	4980	19.8	4.27	4.19	1.019
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.1	17.05	17.14	0.994
			Avera	ge Correction Factor	1.006

Notes:

Changed inlet filter after as founds. Do zero chromatogram and adjsuted span.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4921	79.1	9.08	8.82	1.029
Baseline Corr AF:	8.82	Prev response	9.10	*% change	-3.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes 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	9.11	0.997
Mid point	4961	39.5	4.53	4.54	0.998
Low point	4980	19.8	2.27	2.26	1.005
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.1	9.08	9.19	0.988
			Avera	ge Correction Factor	1.000

#### CH4 As Found Data

	CIT+ ASTO			
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
5000	0.0	0.00	0.02	
4921	79.1	7.97	7.96	1.003
7.95 NA NA	Prev response AF Slope: AF Correlation:	7.89	*% change AF Intercept: * => +/-5% change initia	
	(sccm) 5000 4921 7.95 NA	Dilution air flow rate (sccm)Source gas flow rate (sccm)50000.0492179.17.95Prev response A F Slope:	Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)50000.00.00492179.17.977.95Prev response7.89NAAF Slope:	(sccm)         (ppm) (Cc)         (ppm) (lc)           5000         0.0         0.00         0.02           4921         79.1         7.97         7.96           7.95         Prev response         7.89         *% change           NA         AF Slope:         AF Intercept:

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration C	
Sectionic	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	<i>Limit = 0.95-1.05</i>
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	3.98	1.001
Low point	4980	19.8	1.99	1.93	1.035
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.1	7.97	7.95	1.002
			Avera	ge Correction Factor	1.012

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.001286	1.002927
THC Cal Offset:	-0.078556	-0.034543
CH4 Cal Slope:	0.994805	1.002287
CH4 Cal Offset:	-0.034188	-0.026764
NMHC Cal Slope:	1.007213	1.003450
NMHC Cal Offset:	-0.045569	-0.007378

Calibration Performed By:

Sean Bala

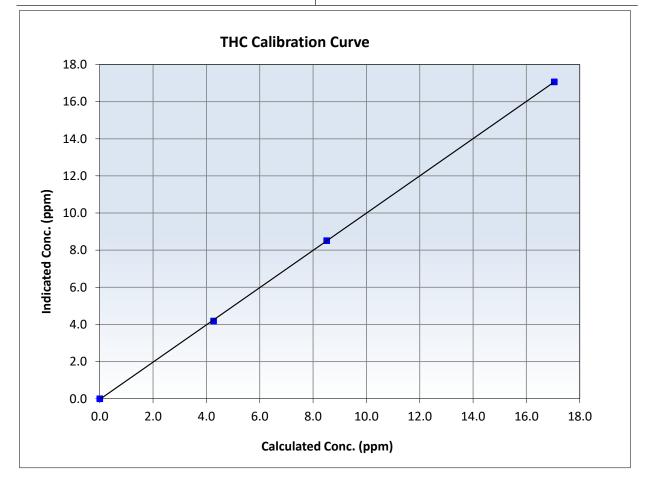


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:47	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1172750023

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999971	≥0.995
17.05 8.51	17.07 8.52	0.9987 0.9994	Slope	1.002927	0.90 - 1.10
4.27	4.19	1.0187	Intercept	-0.034543	+/-0.5



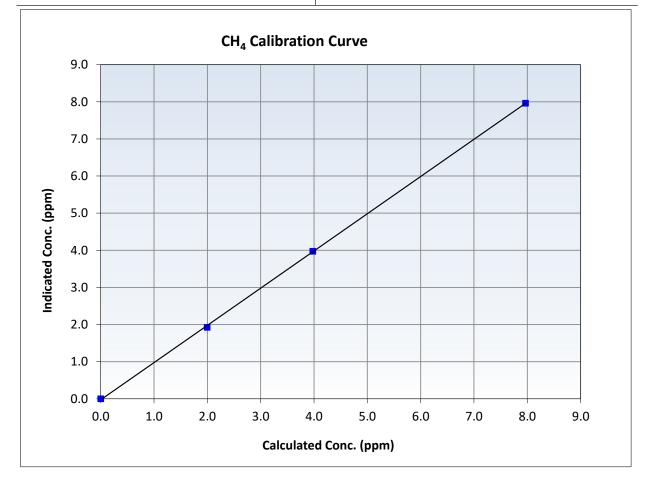


## Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:47	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1172750023

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999911	≥0.995
7.97 3.98	7.96 3.98	1.0006 1.0005	Slope	1.002287	0.90 - 1.10
1.99	1.93	1.0355	Intercept	-0.026764	+/-0.5



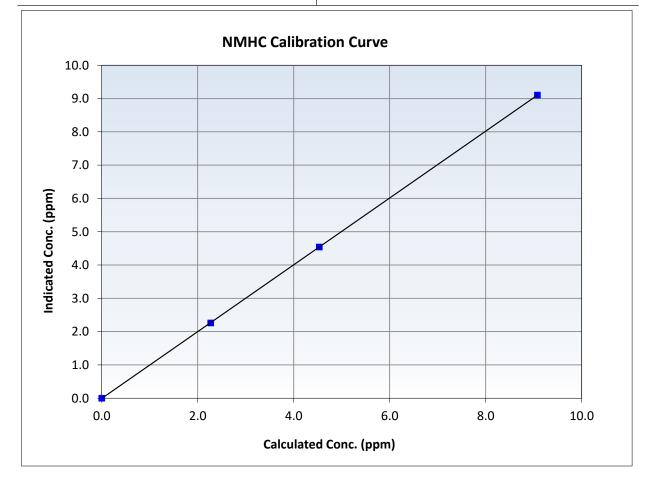


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

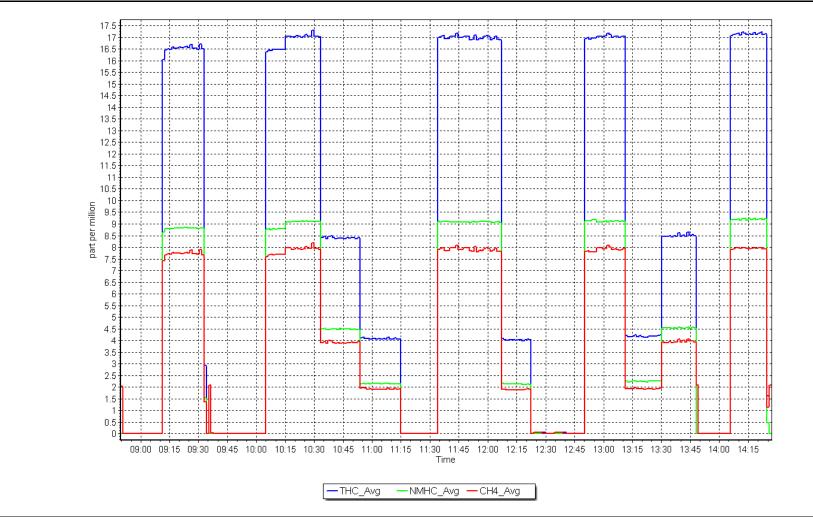
Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:47	End Time (MST):	14:27
Analyzer make:	Thermo 55i	Analyzer serial #:	1172750023

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999996	≥0.995
9.08 4.53	9.11 4.54	0.9972 0.9977	Slope	1.003450	0.90 - 1.10
2.27	2.26	1.0048	Intercept	-0.007378	+/-0.5



#### **NMHC Calibration Plot**







**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Fort McKay South	NO Gas Cylinder #:	T2UP1RP	Cal Gas Expiry Date:	November 17, 2026
Station number:	AMS 13	NOX Cal Gas Conc:	48.25 ppm	NO Cal Gas Conc:	47.88 ppm
Calibration Date:	April 16, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Last Cal Date:	March 27, 2024	Removed Gas NOX Conc:	48.25 ppm	Removed Gas NO Conc:	47.88 ppm
Start time (MST):	8:38	NOX gas Diff:		NO gas Diff:	
End time (MST):	13:10	Calibrator Model:	API T700	Serial Number:	2448
Reason:	Routine	ZAG make/model:	APIT701	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	0.0	0.0	0.0		
AF High point	4917	83.5	805.7	799.5	6.2	797.9	792.3	5.5	1.0098	1.0091
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	799.0 ppb	NO = 794.7	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-0.1%
Baseline Corr 1	lst pt NO <sub>x</sub> =	797.9 ppb	NO = 792.3 ppb		As Found Statistics		*Percent Change NO =		-0.3%	
Baseline Corr 2	2nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
								Baseline Adjus		
		Indicated NO Ret	ference Indio	cated NO Drop	Calculated N	O2 In	dicated NO2	Correction f	actor Conv	erter Efficiency

O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
00 00(point (pp0)	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
As Faund CDT as a						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1410661	<u>Start</u>	<u>Finish</u>			
NOX Range (ppb):	0 - 1000 ppb			NO <sub>x</sub> Cal S				1.000782
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-1.991485	-1.593202
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.997692	1.003482
NO coeff or slope:	1.128	1.140	NO bkgnd or offset:	10.1	10.2	NO Cal Offset:	-2.930061	-2.631535
NOX coeff or slope:	0.999	1.002	NOX bkgnd or offset:	10.2	10.3	NO <sub>2</sub> Cal Slope:	0.999151	1.001146
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	157.3	163.5	NO <sub>2</sub> Cal Offset:	-1.075362	-0.447686

#### **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	0.3	0.0		
High point	4917	83.5	805.7	799.5	6.2	805.6	801.1	4.5	1.0001	0.9980
Mid point	4958	41.8	403.4	400.3	3.1	401.4	397.7	3.7	1.0049	1.0065
Low point	4979	20.9	201.7	200.1	1.5	198.2	195.2	3.0	1.0176	1.0253
As left zero	5000	0.0	0.0	0.0	0.0	0.3	0.2	0.1		
As left span	4917	83.5	805.7	382.8	422.9	809.6	382.8	426.8	0.9952	1.0000
							Average Co	orrection Factor	1.0076	1.0100

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.0		
High GPT point	795.6	381.3	420.5	420.8	0.9992	100.1%
Mid GPT point	795.6	586.7	215.1	214.5	1.0027	99.7%
Low GPT point	795.6	690.8	111.0	110.3	1.0062	99.4%
				Average Correction Factor	1.0027	99.7%

Notes:

Changed inlet filter after as founds. Adjusted span only. Used 2nd NO reference point due to drift.

Calibration Performed By:

Sean Bala

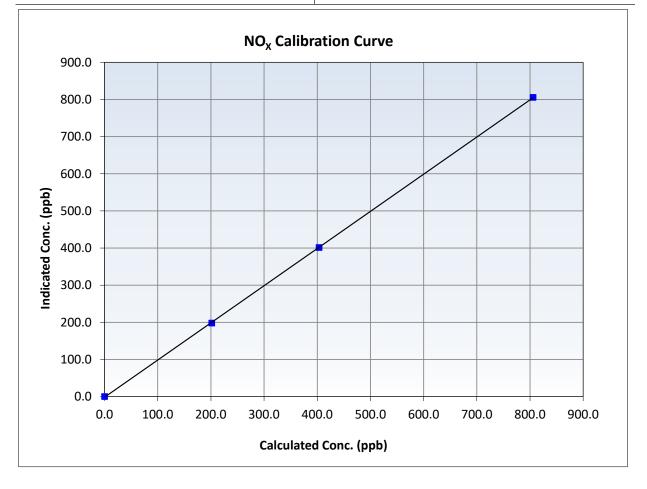


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:38	End Time (MST):	13:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calculated concentration (ppb) (Cc)	culated concentration Indicated concentration (ppb) (Cc) (ppb) (Ic) Correction factor (Cc/Ic)		Statistical Evalu	ation	<u>Limits</u>	
0.0	0.3		Correlation Coefficient	0.999975	≥0.995	
805.7 403.4	805.6 401.4	1.0001 1.0049	Slope	1.000782	0.90 - 1.10	
201.7	198.2	1.0176	Intercept	-1.593202	+/-20	



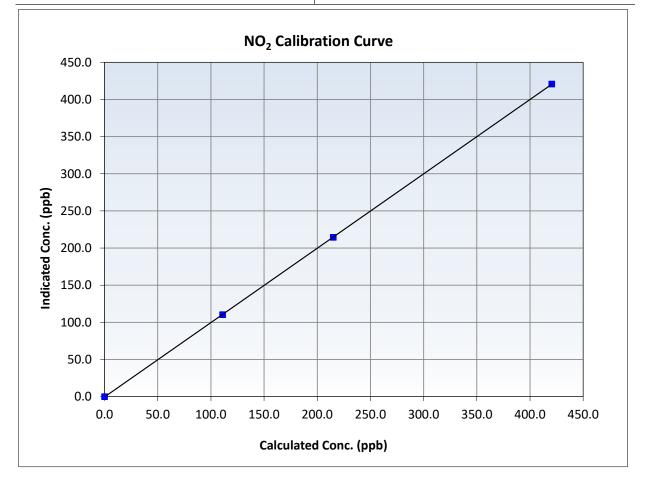


## Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:38	End Time (MST):	13:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>	
0.0	0.0		Correlation Coefficient	0.999994	≥0.995	
420.5	420.8	0.9992	Slope	1.001146	0.90 - 1.10	
215.1	214.5	1.0027				
111.0	111.0 110.3 1.0062	Intercept	-0.447686	+/-20		



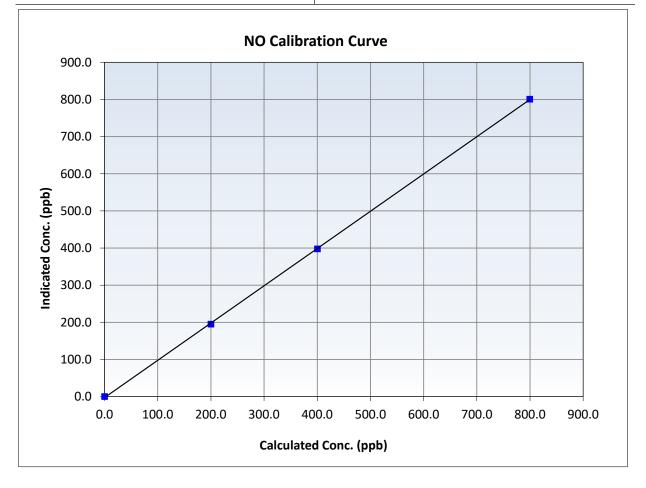


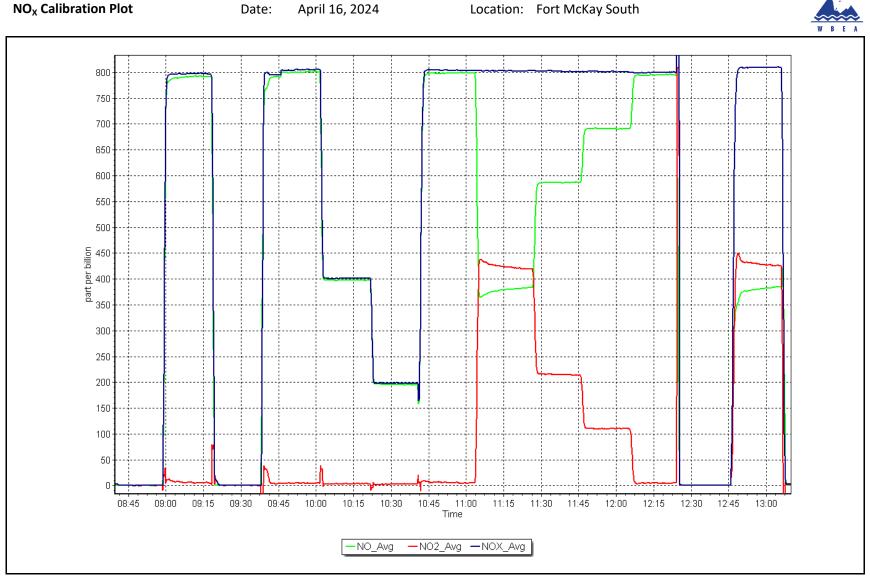
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	8:38	End Time (MST):	13:10
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329

Calculated concentration (ppb) (Cc)	ated concentration Indicated concentration (ppb) (Cc) (ppb) (Ic) Correction factor (Cc/Ic)		Statistical Evalu	<u>Limits</u>	
0.0	0.3		Correlation Coefficient	0.999939	≥0.995
799.5 400.3	801.1 397.7	0.9980 1.0065	Slope	1.003482	0.90 - 1.10
200.1	195.2	1.0253	Intercept	-2.631535	+/-20





Location: Fort McKay South





# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST):	Fort McKay South April 15, 2024 9:37		Station number: AMS Last Cal Date: April End time (MST): 13:08	5, 2024	
Reason:	Routine				
		Calibration Stan	idards		
O3 generation mode:	Photometer				
Calibrator Make/Model:	Teledyne API T700		Serial Number: 2448		
ZAG Make/Model:	Teledyne API T701	Serial Number: 1117			
		Analyzer Inform	nation		
Analyzer make:	Teledyne API T400		Analyzer serial #: 3871		
Analyzer Range	0 - 500 ppb		.,		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	
Calibration slope:	0.999371	1.001029	Backgd or Offset:	4.0	
Calibration intercept:	0.560000	1.320000	Coeff or Slope:	0.984	

#### O<sub>3</sub> 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	-1.2	
As found High point	5000	994.5	400.0	405.2	0.984
As found Mid point					
As found Low point					
Baseline Corr As found:	406.4	Previous response	400.3	*% change	1.5%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	ites investigation

#### **O<sub>3</sub> 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	0.7	
High point	5000	995.4	400.0	401.3	0.997
Mid point	5000	849.9	200.0	202.2	0.989
Low point	5000	745.1	100.0	101.8	0.982
As left zero	5000	0.0	0.0	0.4	
As left span	5000	995.4	400.0	401.7	0.996
			Averag	e Correction Factor	0.989

Sean Bala

Notes:

Changed inlet filter after as founds. Adjusted zero and span.

Calibration Performed By:

<u>Finish</u> 2.7 0.973

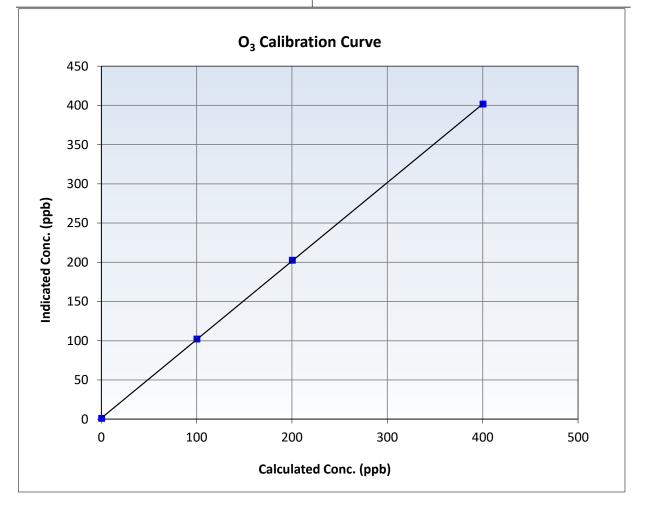


# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	April 5, 2024
Station Name:	Fort McKay South	Station Number:	AMS 13
Start Time (MST):	9:37	End Time (MST):	13:08
Analyzer make:	Teledyne API T400	Analyzer serial #:	3871

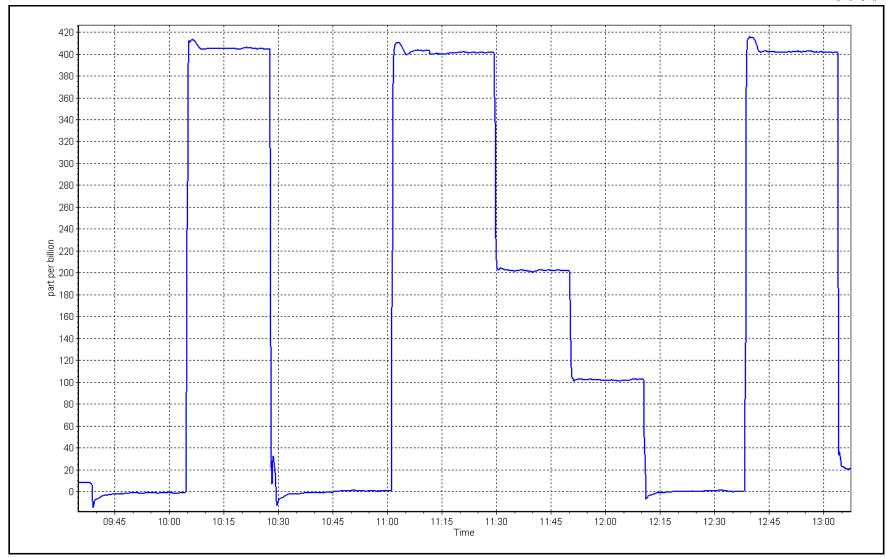
Calculated concentratior (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.7		Correlation Coefficient	0.999987	≥0.995
400.0 200.0	401.3 202.2	0.9968 0.9891	Slope	1.001029	0.90 - 1.10
100.0	101.8	0.9823	Intercept	1.320000	+/- 5





Location: Fort McKay South







### Wood Buffalo Environmental Association

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

WBEA					Version-01-2024
		Station Inform	ation		
Station Name:	Fort McKay South		Station number: AMS	5 13	
Calibration Date:	April 16, 2024		Last Cal Date: Mar	ch 27, 2024	
Start time (MST):	10:04		End time (MST): 11:5	9	
Analyzer Make:	API T640		S/N: 133	5	
Particulate Fraction:	PM2.5				
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 388	746	
Temp/RH standard:	Alicat FP-25BT		S/N: 388	746	
	I	Monthly Calibrati	on Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	-0.80	-0.60	-0.80		+/- 2 °C
P (mmHg)	738.80	740.50	738.80		+/- 10 mmHg
Flow (LPM)	5.02	4.95	5.02		+/- 0.25 LPM
PW% (pump)	46.00		46.00		>80%
Zero Verification	PM w/o HEPA:	1.50	PM w/ HEPA:	0.00	<0.2 ug/m3
Note: this leak check will be	completed before the a	Jarterly work and	will serve as the pre mainte	nance leak check	
PM Inlet observation :	Inlet Head Clean	_			

		Quarterly Calibration	Test		
SPAN DUST	Refractive Index: Lot No.:	10.9 100128-050-042	Expiry Date:	June 10, 202	24
<u>Parameter</u>	<u>As found</u>	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test	7.00	10.00	10.90	V	+/- 0.5
Date Optical Chaml Date Disposable Filt	-	April 16, April 16,			
ost- maintenance Zero Veri	fication:	PM w/ HEPA:	0.00	<0.2 ug/m3	

#### **Annual Maintenance**

Date Sample Tube Cleaned:	June 29, 2023
Date RH/T Sensor Cleaned:	June 29, 2023

Notes:

Inlet head cleaned. PMT peak test adjusted. Leak check passed.

Calibration by:

Sean Bala



### Wood Buffalo Environmental Association

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

WBEA					Version-01-20
		Station Informatio	n		
itation Name:	Fort McKay South		Station number: AM	IS 13	
Calibration Date:	April 19, 2024	Last Cal Date: April 16, 2024			
Start time (MST):	9:02		End time (MST): 9:4	5	
Analyzer Make:	API T640		S/N: 133	35	
Particulate Fraction:	PM2.5				
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 388	3746	
Temp/RH standard:	Alicat FP-25BT		S/N: 388	3746	
		Monthly Calibration 1	est		
<u>Parameter</u>	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	2.50	2.47	2.50		+/- 2 °C
P (mmHg)	749.60	752.03	749.60		+/- 10 mmH
	4.94	4.96	4.94		+/- 0.25 LPN
Flow (LPM)	4.54				
Flow (LPM) PW% (pump)	45.00		45.00		>80%
PW% (pump) Zero Verification	45.00 PM w/o HEPA: _	quarterly work and will	PM w/ HEPA:	0.00	
PW% (pump) Zero Verification Note: this leak check will be	45.00 PM w/o HEPA: completed before the	quarterly work and will	PM w/ HEPA: serve as the pre mainte gnment Factor On :	0.00 enance leak check	
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation :	45.00 PM w/o HEPA: completed before the	quarterly work and will	PM w/ HEPA: serve as the pre mainte gnment Factor On :	0.00 enance leak check	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index:	quarterly work and will Quarterly Calibration	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test	0.00	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation :	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index:	quarterly work and will Quarterly Calibration 10.9	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test	0.00	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.:	quarterly work and will Quarterly Calibration 10.9 100128-050-042	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test Expiry Date:	0.00 enance leak check	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST <u>Parameter</u> PMT Peak Test	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u> 11.00	quarterly work and will Quarterly Calibration 10.9 100128-050-042 <u>Post maintenance</u> 11.00	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test Expiry Date: <u>As left</u> 11.00	0.00 enance leak check	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST <u>Parameter</u>	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u> 11.00	quarterly work and will Alig Quarterly Calibration 10.9 100128-050-042 Post maintenance	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test Expiry Date: <u>As left</u> 11.00 2024	0.00 enance leak check	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST <u>Parameter</u> PMT Peak Test Date Optical Cham Date Disposable Fi	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u> 11.00 aber Cleaned: Iter Changed:	quarterly work and will Quarterly Calibration 10.9 100128-050-042 Post maintenance 11.00 April 19,	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test Expiry Date: <u>As left</u> 11.00 2024 2024	0.00 enance leak check	<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST <u>Parameter</u> PMT Peak Test Date Optical Cham Date Disposable Fi	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u> 11.00 aber Cleaned: Iter Changed:	quarterly work and will Quarterly Calibration 10.9 100128-050-042 Post maintenance 11.00 April 19, April 19,	PM w/ HEPA: serve as the pre mainte gnment Factor On : Test Expiry Date: <u>As left</u> 11.00 2024 2024 0.00		<0.2 ug/m3
PW% (pump) Zero Verification Note: this leak check will be PM Inlet observation : SPAN DUST <u>Parameter</u> PMT Peak Test Date Optical Cham	45.00 PM w/o HEPA: completed before the Inlet Head Clean Refractive Index: Lot No.: <u>As found</u> 11.00 aber Cleaned: Iter Changed: iffication:	quarterly work and will Alig Quarterly Calibration 10.9 100128-050-042 Post maintenance 11.00 April 19, April 19, PM w/ HEPA:	PM w/ HEPA: serve as the pre maintee gnment Factor On : Test Expiry Date: As left 11.00 2024 2024 0.00		<0.2 ug/m3

Elevated readings since yesterday. Diagnostics and rest of the readings are normal. Completed annual maintenance again. Readings were closer to baseline after cycling power to the instrument.

Calibration by: Max Farrell



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS14 ANZAC APRIL 2024

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

May 31, 2024



# **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Anzac April 2, 2024 9:54 Routine		Station number: AN Last Cal Date: Ma End time (MST): 13:	irch 7, 2024		
		Calibration S	<u>Standards</u>			
Cal Gas Concentration: Cal Gas Cylinder #:	49.95 CC279389	ppm	Cal Gas Exp Date: Jan	uary 5, 2025		
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: 306	50		
Zero Air Gen Model:	API T701H		Serial Number: 35	7		
Analyzer Information Analyzer make: Thermo 43i Serial Number: 0710321322						
Analyzer Range:	0 - 1000 ppb					
Calibration slope: Calibration intercept:	<u>Start</u> 1.005467 -1.163959	<u>Finish</u> 0.999403 -1.240981	Backgd or Offset: Coeff or Slope:	<u>Start</u> 26.4 0.836	<u>Finish</u> 26.5 0.836	

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4938	80.3	799.3	802.7	0.996
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	802.2 NA NA	Previous response AF Slope: AF Correlation:	802.5	*% change AF Intercept: * = > +/-5% change initiat	0.0%

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	1.0	
High point	4938	80.3	799.3	798.8	1.001
Mid point	4979	40.2	400.1	397.1	1.007
Low point	4998	20.2	201.1	197.7	1.017
As left zero	5000	0.0	0.0	0.8	
As left span	4938	80.3	799.3	795.4	1.005
			Averag	e Correction Factor:	1.008

Notes:

Sample inlet filter changed after as founds. No adjustments made. High point was noisier than usual; maintenance will be performed during the next visit.

Calibration Performed By:

Mohammed Kashif

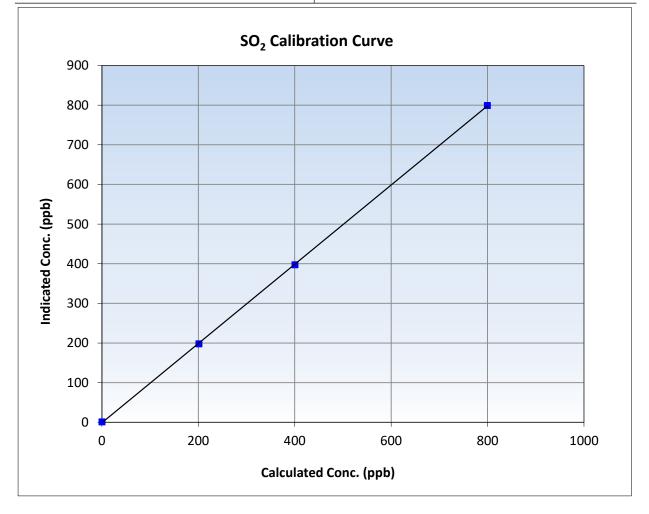


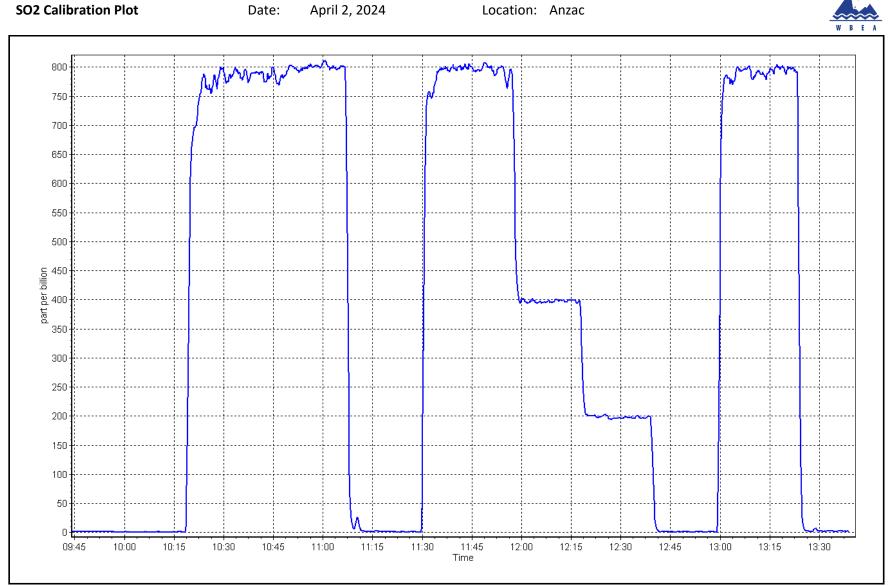
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 7, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:54	End Time (MST):	13:38
Analyzer make:	Thermo 43i	Analyzer serial #:	0710321322

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	1.0		Correlation Coefficient	0.999963	≥0.995
799.3 400.1	798.8 397.1	1.0006 1.0075	Slope	0.999403	0.90 - 1.10
201.1	197.7	1.0170	Intercept	-1.240981	+/-30









# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

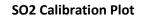
#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Anzac April 16, 2024 9:03 As Found		Station number: Al Last Cal Date: A End time (MST): 10	pril 2, 2024	
		<b>Calibration</b>	<u>Standards</u>		
Cal Gas Concentration: Cal Gas Cylinder #:	49.95 CC279389	ppm	Cal Gas Exp Date: Ja	anuary 5, 2025	
Removed Cal Gas Conc:	49.95	ppm	Rem Gas Exp Date: N	IA	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 30	060	
Zero Air Gen Model:	API T701H		Serial Number: 35	57	
Analyzer make:	Thermo 43i	<u>Analyzer In</u>	formation Serial Number: 07	710321322	
Analyzer Range:	0 - 1000 ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999403	NA	Backgd or Offset:	26.5	NA
Calibration intercept:	-1.240981	NA	Coeff or Slope:	0.836	NA
		SO <sub>2</sub> As For	und 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.5	
As found High point	4938	80.3	799.3	772.1	1.036
As found Mid point	4979	40.2	400.1	385.9	1.038
As found Low point	4998	20.2	201.1	187.8	1.073
New cylinder response					
Baseline Corr As found:	771.6	Previous response	797.6	*% change	-3.4%
Baseline Corr 2nd AF pt:	385.4	AF Slope:	0.968168	AF Intercept:	-2.380666
Baseline Corr 3rd AF pt:	187.3	AF Correlation:	0.999909	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow ra (sccm)	te Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	
Calibrator zero						
High point						
Mid point						
Low point						
As left zero						
As left span				-		
			Avera	ge Correction Factor:		
Notes:	Before performing maintenance on the instrument, as-founds were conducted. Investigation wa Notes: made. No alarms were noticed on the instrument, diagnostics were similar to last calibration, an there were no issues to report with the setup. Suspecting faulty lamp/socket.					
Calibration	Performed By:	Mohammed Kashif				





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### Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Anzac April 16, 2024 14:15 Maintenance		Station number: Last Cal Date: End time (MST):	April 2, 2024	
		Calibration Sta	undards		
Cal Gas Concentration: Cal Gas Cylinder #:	49.95 CC279389	ppm	Cal Gas Exp Date:	January 5, 2025	
, 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 make: Analyzer Range:	Thermo 43i 0 - 1000 ppb	Analyzer Infor	<u>mation</u> Serial Number:	0710321322	
	Start	Finich		Ctart	Finich
Calibration slope:	<u>Start</u> NA	<u>Finish</u> 1.009311	Backgd or Offset:	<u>Start</u> NA	<u>Finish</u> 24.6
Calibration intercept:	NA	-4.184570	Coeff or Slope:		1.043
cambration intercepti		1.101370			1.0 10
		SO <sub>2</sub> As Found	l 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 initiate	es investigation
		SO <sub>2</sub> Calibratio	n 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	4938	80.3	799.3	804.6	0.993
Mid point	4979	40.2	400.1	397.2	1.007
Low point	4998	20.2	201.1	195.3	1.030
As left zero	5000	0.0	0.0	-0.6	
As left span	4938	80.3	799.3	806.5	0.991
			Averag	1.010	

Notes:

In response to the noisy readings during the last calibration, the lamp and socket were replaced. Following this, a PMT and lamp voltages adjustment were carried out, resulting in changes to both flash and PMT voltages values, which are now within limits. A stable and less noisy response was observed post maintenance. Adjusted both zero and span.

Calibration Performed By:

Mohammed Kashif

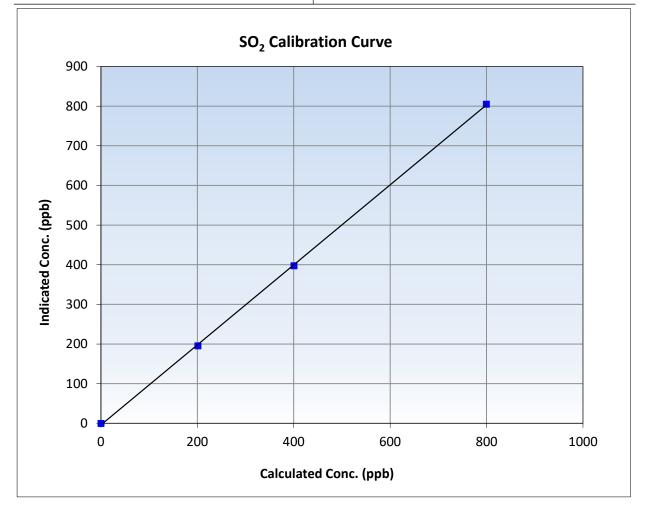


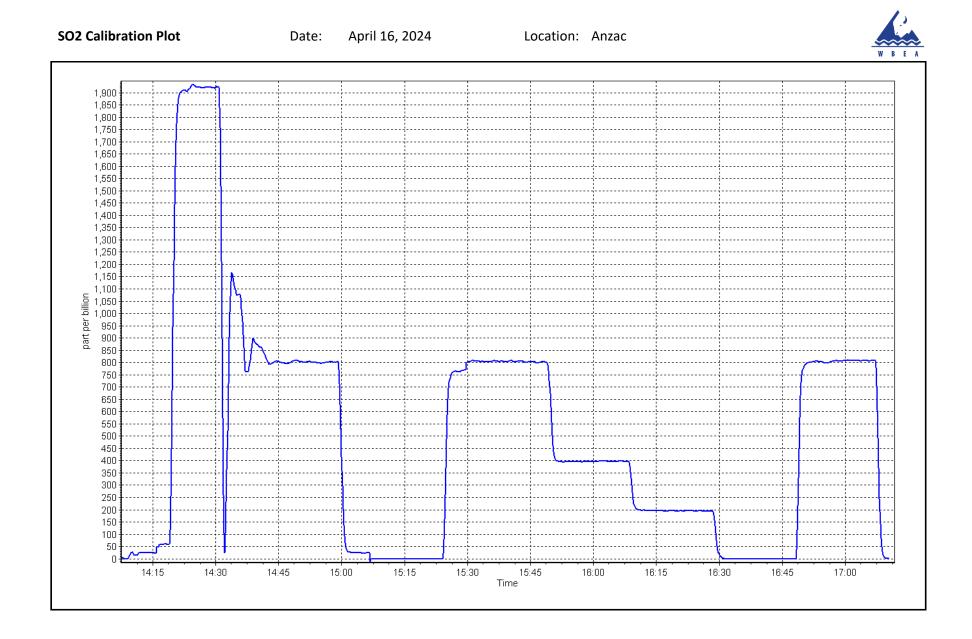
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	April 2, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	14:15	End Time (MST):	17:10
Analyzer make:	Thermo 43i	Analyzer serial #:	0710321322

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.4		Correlation Coefficient	0.999898	≥0.995
799.3 400.1	804.6 397.2	0.9934 1.0072	Slope	1.009311	0.90 - 1.10
201.1	195.3	1.0295	Intercept	-4.184570	+/-30







# Wood Buffalo Environmental Association

### **TRS Calibration Report**

#### **Station Information**

Calibration Standards	
Cal Gas Concentration: 5.15 ppm Cal Gas Exp Date: January 3, 2026 Cal Gas Cylinder #: CC510379	
Removed Cal Gas Conc:5.15ppmRem Gas Exp Date:NARemoved Gas Cyl #:NADiff between cyl:	
Calibrator Make/Model: API T700 Serial Number: 3060	
ZAG Make/Model: API 701H Serial Number: 357	
Analyzer Information	
Analyzer make:Thermo 43i-TLEAnalyzer serial #:1218153582Converter make:CD Nova CDN-101Converter serial #:503	
Analyzer Range0 - 100 ppbConverter Temp:800degC	
StartFinishStartFinishCalibration slope:1.0004451.015603Backgd or Offset:2.32.3Calibration intercept:-0.045344-0.225550Coeff or Slope:0.9840.984	2.3

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	
As found High point	4938	77.9	80.0	81.0	0.986
As found Mid point	4973	38.9	40.0	40.5	0.985
As found Low point	4997	19.5	20.0	20.1	0.991
New cylinder response					
Baseline Corr As found:	81.1	Prev response:	79.97	*% change:	1.4%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.014491	AF Intercept:	-0.125462
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999996	* = > +/-5% change initiate	es 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	81.1	0.986
Mid point	4973	38.9	40.0	40.1	0.996
Low point	4997	19.5	20.0	20.1	0.996
As left zero	5000	0.0	0.0	0.1	
As left span	4938	77.9	80.0	79.3	1.008
SO2 Scrubber Check	4936	80.3	800.4	0.0	
Date of last scrubber chan	ge:			Ave Corr Factor	0.993

Date of last converter efficiency test:

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

Calibration Performed By:

Mohammed Kashif



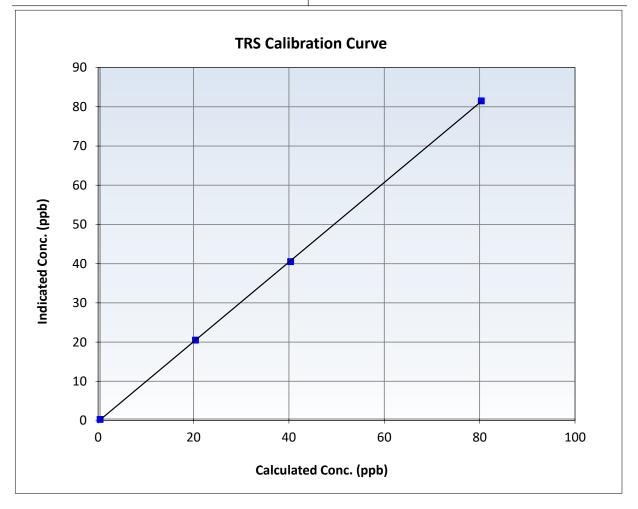
## **Wood Buffalo Environmental Association**

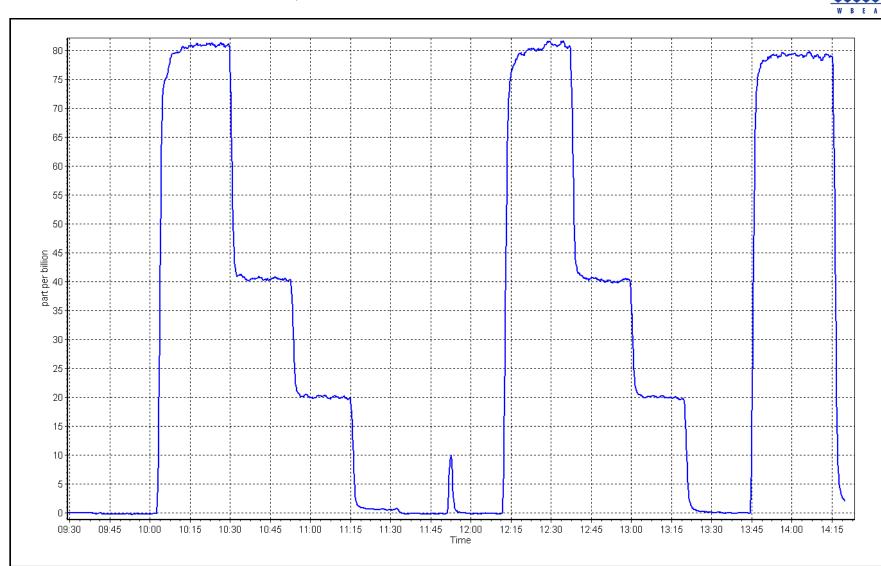
### **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 27, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:47	End Time (MST):	14:19
Analyzer make:	CD Nova CDN-101	Analyzer serial #:	503

Calibration Data					
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999973	≥0.995
80.0 40.0	81.1 40.1	0.9858 0.9964	Slope	1.015603	0.90 - 1.10
20.0	20.1	0.9956	Intercept	-0.225550	+/-3





#### **TRS Calibration Plot**





### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

Station Name:	Anzac	Station number: AMS 14
Calibration Date:	April 2, 2024	Last Cal Date: March 7, 2024
Start time (MST):	9:54	End time (MST): 13:38
Reason:	Routine	

#### **Calibration Standards**

Gas Cert Reference:	CC279389		Cal Gas Expiry Date:	Janu	iary 5, 2025
CH4 Cal Gas Conc.	499.3 ppm		CH4 Equiv Conc.	106	8.8 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.	106	8.8 ppm
Removed C3H8 Conc.	207.1 ppm		Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	API T700		Serial Number:		3060
Zero Air Gen model:	API 701H		Serial Number:		357
		Analyze	r Information		
Analyzer make: T	hermo 55i		Analyzer serial #:	1118148494	
THC Range: 0	- 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.25E-04	2.25E-04	NMHC SP Ratio:	4.11E-05	4.11E-05
CH4 Retention time:	13.30	13.30	NMHC Peak Area:	221451	221451

#### **THC As Found Data**

Flat Baseline:

OFF

OFF

OFF

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	4938	80.3	17.10	16.75	1.021
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.75	Prev response	16.97	*% change	-1.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4938	80.3	17.10	16.74	1.021
Mid point	4979	40.2	8.56	8.29	1.033
Low point	4998	20.2	4.30	4.11	1.047
As left zero	5000	0.0	0.00	0.00	
As left span	4938	80.3	17.10	16.75	1.021
			Avera	ge Correction Factor	1.034

Notes:

Zero Chromatogram:

OFF

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



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4938	80.3	9.11	8.89	1.025
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	8.89 NA NA	Prev response AF Slope: AF Correlation:	9.05	*% change AF Intercept: * = > +/-5% change initia	-1.8% tes 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.00	
High point	4938	80.3	9.11	8.89	1.025
Mid point	4979	40.2	4.56	4.41	1.035
Low point	4998	20.2	2.29	2.19	1.045
As left zero	5000	0.0	0.00	0.00	
As left span	4938	80.3	9.11	8.89	1.025
			Avera	ge Correction Factor	1.035

#### CH4 As Found Data

		CIT <del>T</del> AS TO	una bata		
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 As found Mid point As found Low point New cylinder response	4938	80.3	7.99	7.86	1.017
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	7.86 NA NA	Prev response AF Slope: AF Correlation:	7.91	*% change AF Intercept: * = > +/-5% change initia	

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4938	80.3	7.99	7.86	1.017
Mid point	4979	40.2	4.00	3.88	1.031
Low point	4998	20.2	2.01	1.92	1.050
As left zero	5000	0.0	0.00	0.00	
As left span	4938	80.3	7.99	7.86	1.017
			Avera	ge Correction Factor	1.033

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.995891	0.980408
THC Cal Offset:	-0.064367	-0.060379
CH4 Cal Slope:	0.995346	0.984987
CH4 Cal Offset:	-0.040562	-0.035307
NMHC Cal Slope:	0.995954	0.976268
NMHC Cal Offset:	-0.023403	-0.025072

Calibration Performed By:

Mohammed Kashif

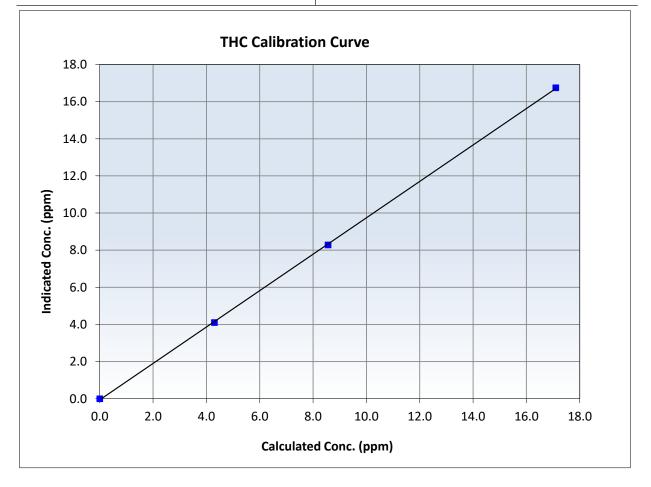


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 7, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:54	End Time (MST):	13:38
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	uation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999938	≥0.995
17.10 8.56	16.74 8.29	1.0215 1.0331	Slope	0.980408	0.90 - 1.10
4.30	4.11	1.0473	Intercept	-0.060379	+/-0.5



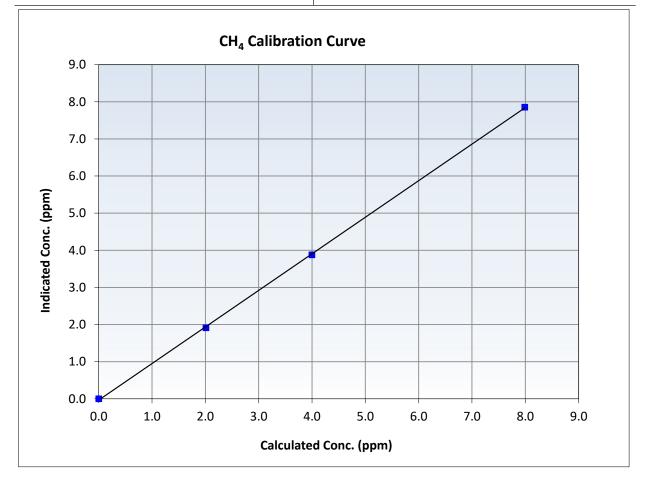


## Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 7, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:54	End Time (MST):	13:38
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999904	≥0.995
7.99 4.00	7.86 3.88	1.0171 1.0315	Slope	0.984987	0.90 - 1.10
2.01	1.92	1.0495	Intercept	-0.035307	+/-0.5



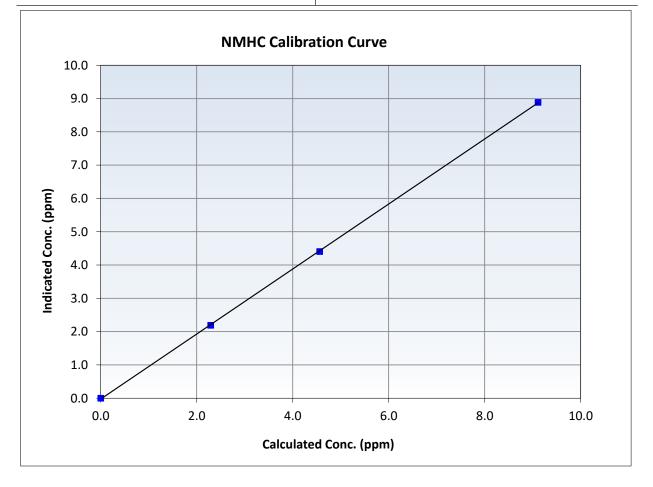


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

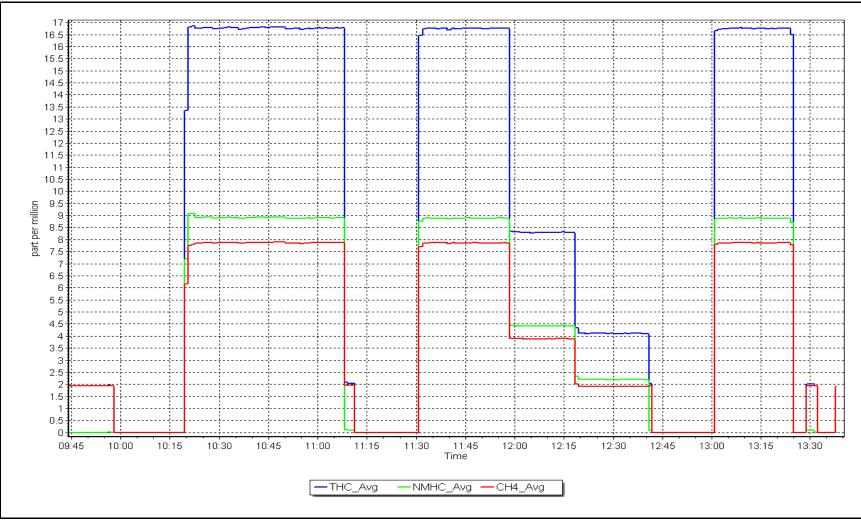
Calibration Date:	April 2, 2024	Previous Calibration:	March 7, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:54	End Time (MST):	13:38
Analyzer make:	Thermo 55i	Analyzer serial #:	1118148494

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999961	≥0.995
9.11	8.89	1.0255	Slope	0.976268	0.90 - 1.10
4.56	4.41	1.0348	·		
2.29	2.19	1.0454	Intercept	-0.025072	+/-0.5



#### **NMHC Calibration Plot**







### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

Station Name:	Anzac	Station number: AMS 14
Calibration Date:	April 30, 2024	Last Cal Date: April 2, 2024
Start time (MST):	11:12	End time (MST): 13:45
Reason:	Cylinder Change	

#### **Calibration Standards**

Gas Cert Reference:	CC27938	9	Cal Gas Expiry Date:	Janua	ary 5, 2025
CH4 Cal Gas Conc.	499.3 ppn	า	CH4 Equiv Conc.	1068	3.8 ppm
C3H8 Cal Gas Conc.	207.1 ppn	า			
Removed Gas Cert:	NA		Removed Gas Expiry: N	1A	
Removed CH4 Conc.	499.3 ppn	า	CH4 Equiv Conc.	1068	3.8 ppm
Removed C3H8 Conc.	207.1 ppn	า	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	API T700	)	Serial Number:		3060
Zero Air Gen model:	API 701F	l	Serial Number:		357
		Analyze	er Information		
Analyzer make: Th	nermo 55i		Analyzer serial #: 1	118148494	
THC Range: 0	- 20 ppm		NMHC/CH4 Range: 0	) - 10 ppm	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.25E-04	2.25E-04	NMHC SP Ratio:	4.11E-05	4.11E-05

13.30

OFF

#### **THC As Found Data**

NMHC Peak Area:

Flat Baseline:

221451

OFF

221451

OFF

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	4938	80.3	17.10	16.31	1.048
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	16.31	Prev response	16.71	*% change	-2.4%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4938	80.3	17.10	16.33	1.047
Mid point					
Low point					
As left zero					
As left span				_	
			Avera	ge Correction Factor	1.047

CH4 Retention time:

Zero Chromatogram:

13.30

OFF

Hydrogen cylinder changed out.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### NMHC As Found Data

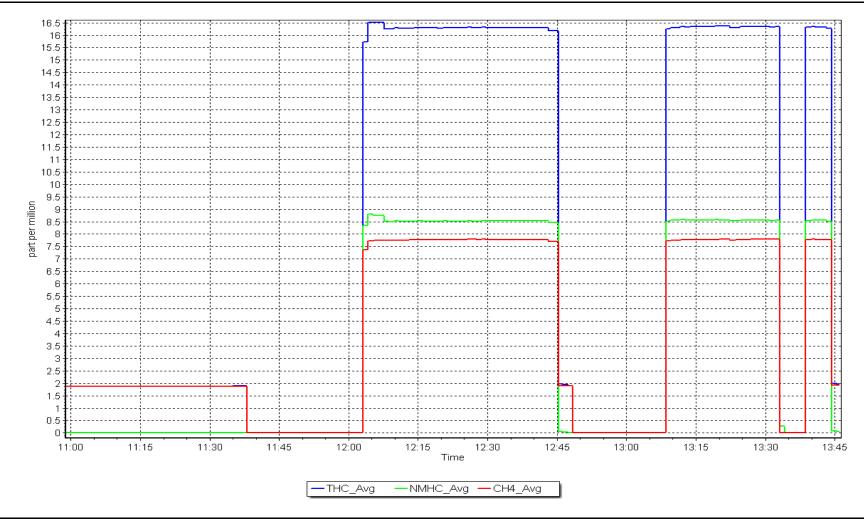
WBEA		NMHC As Fo	ound Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic- AFzero)) Limit = 0.90-1.10
As found zero As found High point As found Mid point As found Low point New cylinder response	5000 4938	0.0 80.3	0.00 9.11	0.00 8.56	 1.065
Baseline Corr AF: Baseline Corr 2nd AF:	8.56 NA	Prev response AF Slope:	8.87	*% change AF Intercept:	-3.7%
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation
		NMHC Calibi	ration Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (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	5000 4938	0.0 80.3	0.00 9.11	0.00 8.55	1.065
As left span			Avera	ge Correction Factor	1.065
		CH4 As For	und 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 As found Mid point As found Low point New cylinder response	4938	80.3	7.99	7.75	1.030
Baseline Corr AF:	7.75	Prev response	7.83	*% change	-1.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation
		CH4 Calibra	ition Data		
Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration (	
	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (lc)	Limit = 0.95-1.05
Calibrator zero High point Mid point Low point As left zero As left span	(sccm) 5000 4938	(sccm) 0.0 80.3	(ppm) (Cc) 0.00 7.99	(ppm) (Ic) 0.00 7.78	 1.027
High point Mid point Low point	5000	0.0	0.00 7.99	0.00	
High point Mid point Low point As left zero	5000	0.0	0.00 7.99 Avera	0.00 7.78	1.027
High point Mid point Low point As left zero	5000	0.0 80.3	0.00 7.99 Avera	0.00 7.78	1.027
High point Mid point Low point As left zero	5000	0.0 80.3 <u>Calibration</u>	0.00 7.99 Avera	0.00 7.78 ge Correction Factor	1.027
High point Mid point Low point As left zero As left span	5000	0.0 80.3 <u>Calibration</u> <u>Start</u> 0.980408 -0.060379	0.00 7.99 Avera	0.00 7.78 ge Correction Factor [ <u>Finish</u>	1.027
High point Mid point Low point As left zero As left span THC Cal Slope:	5000	0.0 80.3 <u>Calibration</u> <u>Start</u> 0.980408	0.00 7.99 Avera	0.00 7.78 ge Correction Factor [ <u>Finish</u> 0.954935	1.027
High point Mid point Low point As left zero As left span THC Cal Slope: THC Cal Slope: CH4 Cal Slope: CH4 Cal Slope:	5000	0.0 80.3 <u>Calibration</u> <u>Start</u> 0.980408 -0.060379 0.984987 -0.035307	0.00 7.99 Avera	0.00 7.78 ge Correction Factor <u>Finish</u> 0.954935 0.000000 0.973275 0.000000	1.027
High point Mid point Low point As left zero As left span THC Cal Slope: THC Cal Slope: CH4 Cal Slope:	5000	0.0 80.3 <u>Calibration</u> <u>Start</u> 0.980408 -0.060379 0.984987	0.00 7.99 Avera	0.00 7.78 ge Correction Factor <u>Finish</u> 0.954935 0.000000 0.973275	1.027

Calibration Performed By:

Mohammed Kashif

#### **NMHC Calibration Plot**







**Station Information** 

### Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Anzac	NO Gas Cylinder #: D1	T0037092	Cal Gas Expiry Date:	May 16, 2031
Station number:	AMS 14	NOX Cal Gas Conc:	60.7 ppm	NO Cal Gas Conc:	60.40 ppm
Calibration Date:	April 3, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date	: NA
Last Cal Date:	March 14, 2024	Removed Gas NOX Conc:	60.70 ppm	Removed Gas NO Conc	: 60.40 ppm
Start time (MST):	10:17	NOX gas Diff:		NO gas Diff:	
End time (MST):	15:07	Calibrator Model:	Teledyne API T700	Serial Number: 3	060
Reason:	Routine	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	0.3	0.0	0.3		
AF High point	4934	66.3	804.8	800.9	4.0	798.1	797.0	1.0	1.0088	1.0048
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	nse NO <sub>x</sub> =	799.1 ppb	NO = 798.7	ppb	* = > +/-5	% change initiates i	investigation	*Percent Chan	ge NO <sub>x</sub> =	-0.2%
Baseline Corr 1	st pt NO <sub>x</sub> =	797.8 ppb	NO = 797.0	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-0.2%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	nd NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	nd NO r <sup>2</sup> :		NO SI:	NO Int:	
					As four	NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
O3 Setpo	int (ppb)	Indicated NO Re		cated NO Drop	Calculated N	02 In	dicated NO2	Baseline Adjust Correction f	actor Con	verter Efficiency

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>
As Found GPT zero						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1426262	<u>Start</u>	<u>Finish</u>			
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.993607	0.992088
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-0.629791	-0.369777
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.999912	0.998384
NO coeff or slope:	1.411	1.411	NO bkgnd or offset:	3.8	3.8	NO Cal Offset:	-2.109531	-1.649243
NOX coeff or slope:	0.996	0.996	NOX bkgnd or offset:	3.8	3.5	NO <sub>2</sub> Cal Slope:	0.994068	0.993217
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	160.0	158.8	NO <sub>2</sub> Cal Offset:	-1.527274	-1.136094

#### **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	0.0	0.3		
High point	4934	66.3	804.8	800.9	4.0	798.3	798.5	-0.2	1.0082	1.0030
Mid point	4985	33.2	401.6	399.6	2.0	398.1	397.2	0.9	1.0088	1.0060
Low point	5004	16.7	201.9	200.9	1.0	199.0	196.8	2.2	1.0146	1.0209
As left zero	5000	0.0	0.0	0.0	0.0	0.3	0.1	0.3		
As left span	4934	66.3	804.8	403.8	401.0	797.8	403.8	394.0	1.0088	1.0000
							Average Co	orrection Factor	1.0105	1.0100

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.3		
High GPT point	795.5	408.1	391.4	388.2	1.0082	99.2%
Mid GPT point	795.5	610.6	188.9	186.0	1.0155	98.5%
Low GPT point	795.5	703.2	96.3	92.9	1.0364	96.5%
				Average Correction Factor	1.0200	98.1%

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

Calibration Performed By:

Mohammed Kashif

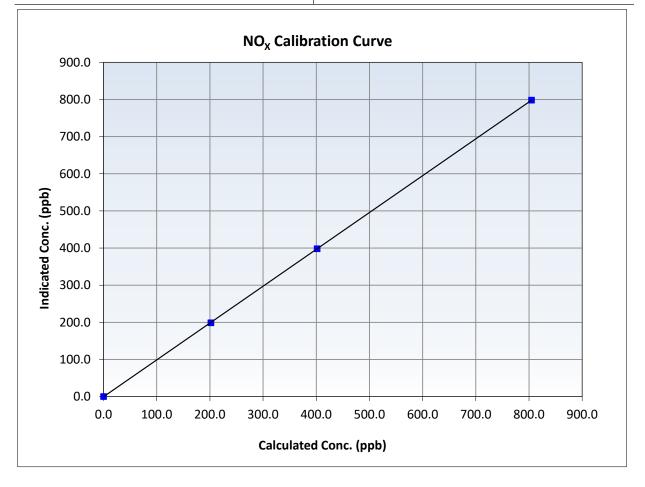


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 14, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:17	End Time (MST):	15:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999996	≥0.995
804.8	798.3	1.0082	Slope	0.992088	0.90 - 1.10
401.6	398.1	1.0088	51000	0.002000	
201.9	199.0	1.0146	Intercept	-0.369777	+/-20



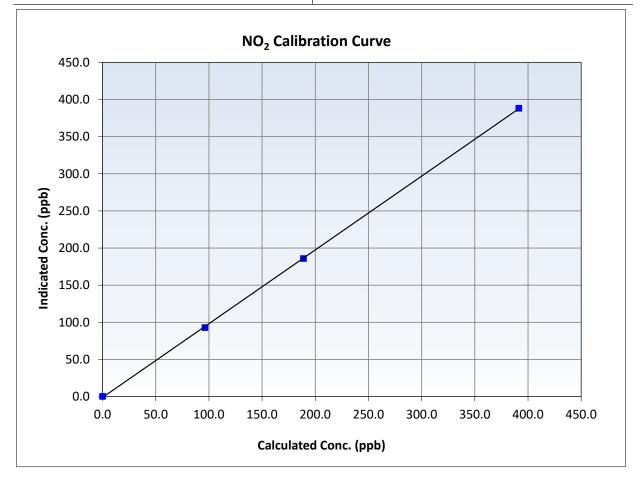


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 14, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:17	End Time (MST):	15:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999937	≥0.995
391.4 188.9	388.2 186.0	1.0082 1.0155	Slope	0.993217	0.90 - 1.10
96.3	92.9	1.0364	Intercept	-1.136094	+/-20



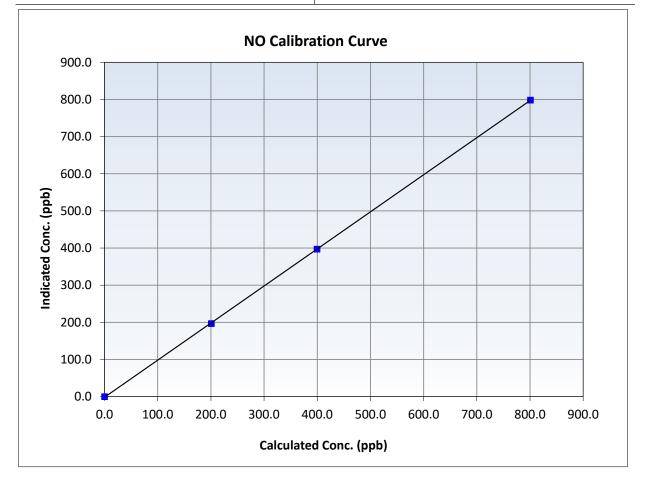


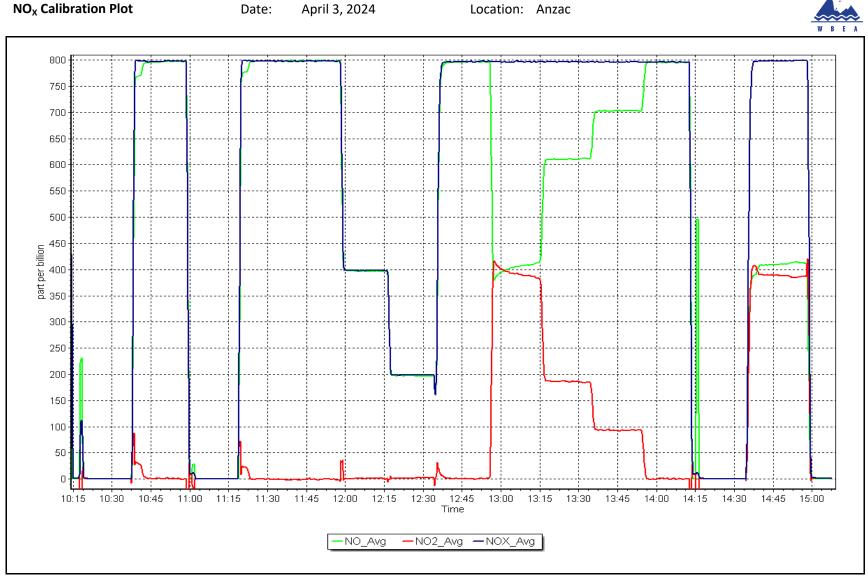
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 14, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	10:17	End Time (MST):	15:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999978	≥0.995
800.9	798.5	1.0030	Slope	0.998384	0.90 - 1.10
399.6	397.2	1.0060	51066	0.550504	0.00 1.10
200.9	196.8	1.0209	Intercept	-1.649243	+/-20





NO<sub>x</sub> Calibration Plot

Location: Anzac



# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name:	Anzac	Station number: AMS 14			
Calibration Date:	April 9, 2024	Last Cal Date: March 6, 2024			
Start time (MST):	9:31		End time (MST): 14:	:19	
Reason:	Routine				
		Calibration Sta	ndards_		
O3 generation mode:	Photometer				
Calibrator Make/Model:	API T700		Serial Number: 30	60	
ZAG Make/Model:	API 701H		Serial Number: 35	7	
		Analyzer Inform	nation		
Analyzer make:	Thermo 49i		Analyzer serial #: 142	26262595	
Analyzer Range	0 - 500 ppb				
	Start	Finish		<u>Start</u>	
Calibration slope:	1.004629	0.997086	Backgd or Offset:	1.4	
Calibration intercept:	0.840000	2.260000	Coeff or Slope:	1.620	
canal attent inter cepti	0.0.0000		eeen er biopei	2.020	

#### O<sub>3</sub> 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	0.9	
As found High point	5000	918.8	400.0	406.2	0.987
As found Mid point	5000	803.8	200.0	206.8	0.971
As found Low point	5000	709.8	100.0	104.6	0.964
Baseline Corr As found:	405.3	Previous response	402.7	*% change	0.6%
Baseline Corr 2nd AF pt:	205.9	AF Slope:	1.012143	AF Intercept:	2.500000
Baseline Corr 3rd AF pt:	103.7	AF Correlation:	0.999909	* = > +/-5% change initia	tes investigation

#### **O<sub>3</sub> 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	0.5	
High point	5000	918.8	400.0	400.1	1.000
Mid point	5000	803.8	200.0	202.9	0.986
Low point	5000	709.8	100.0	103.5	0.966
As left zero	5000	0.0	0.0	1.1	
As left span	5000	918.8	400.0	401.0	0.998
			Averag	e Correction Factor	0.984

#### Notes:

Sample inlet filter changed after as founds. The ozone scrubber was replaced as part of maintenance procedure to address linearity. Adusted span only.

Calibration Performed By:

Mohammed Kashif

<u>Finish</u> 1.4 1.594

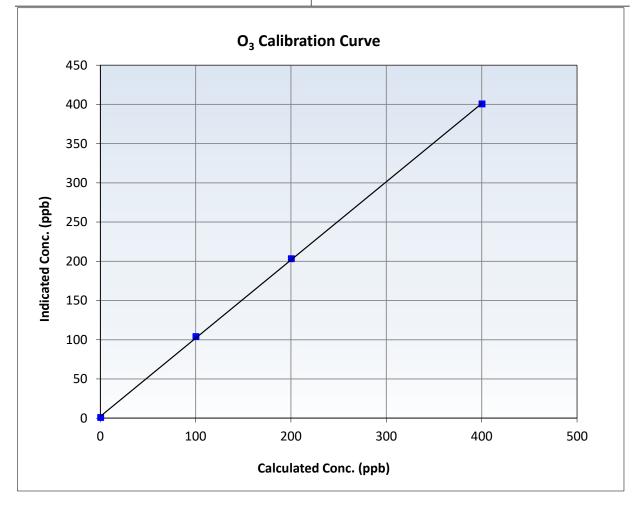


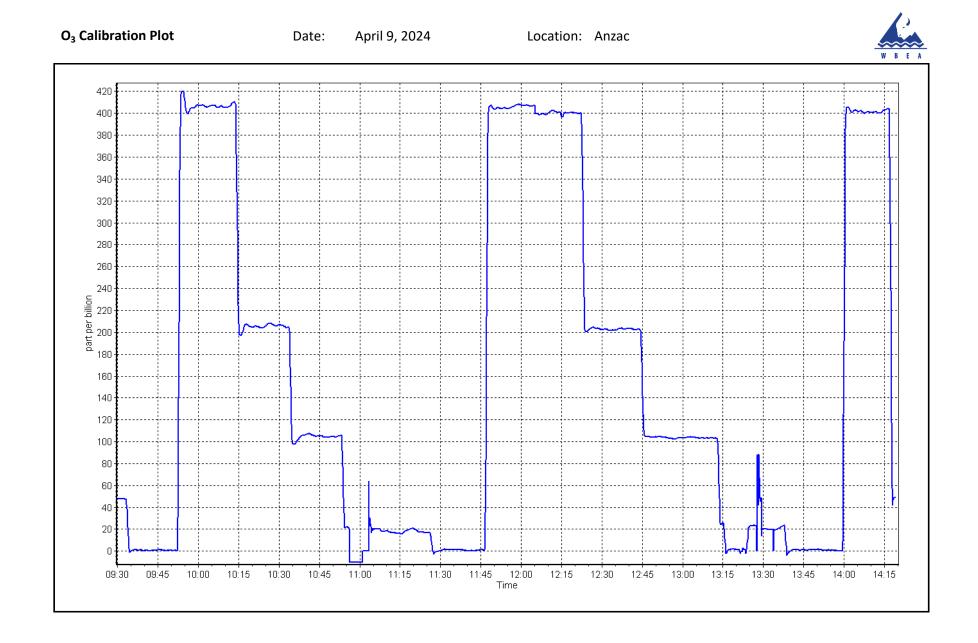
# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	March 6, 2024
Station Name:	Anzac	Station Number:	AMS 14
Start Time (MST):	9:31	End Time (MST):	14:19
Analyzer make:	Thermo 49i	Analyzer serial #:	1426262595

Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999909	≥0.995
400.0 200.0	400.1 202.9	0.9998 0.9857	Slope	0.997086	0.90 - 1.10
100.0	103.5	0.9662	Intercept	2.260000	+/- 5







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

WBEA					Version-01-20
		Station Information	on		
Station Name:	Anzac		Station number: Al		
Calibration Date:	April 30, 2024		Last Cal Date: M		
Start time (MST):	10:26		End time (MST): 12	2:42	
Analyzer Make:	AP T640		S/N: 82	25	
Particulate Fraction:	PM2.5				
low Meter Make/Model:	Alicat FP-25BT		S/N: 38	88749	
Гетр/RH standard:	Alicat FP-25BT		S/N: 38	88749	
		Monthly Calibration	Test		
<u>Parameter</u>	<u>As found</u>	<b>Measured</b>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T ( <sup>o</sup> C)	2.6	2.1	2.6		+/- 2 °C
P (mmHg)	711.9	712.89	711.9		+/- 10 mmH
Flow (LPM)	5.01	5.09	5.01		+/- 0.25 LPM
PW% (pump)	38		38		>80%
Zero Verification	PM w/o HEPA:	4.8	PM w/ HEPA:	0.1	<0.2 ug/m
		Quarterly Calibration	Test		
	Refractive Index:	11.3	Expiry Date:	October 6, 2	024
SPAN DUST	Lot No.:	100128-050-042			
Parameter	As found	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test					+/- 0.5
Date Ontical Chan	ther Cleaned	December	6 2023		
•	nber Cleaned: ilter Changed:	December December			
Date Disposable F	ilter Changed:	December			
Date Disposable F	ilter Changed:			<0.2 ug/m3	
Date Disposable F	ilter Changed:	December	6, 2023	<0.2 ug/m3	
Date Disposable F	ilter Changed:	December PM w/ HEPA: Annual Maintenan	6, 2023	<0.2 ug/m3	
Date Disposable Fi	ilter Changed: rification: be Cleaned:	December PM w/ HEPA: _	6, 2023 ce 2023	<0.2 ug/m3	
Date Disposable Fi Post- maintenance Zero Ve Date Sample Tul	ilter Changed: rification: be Cleaned:	December PM w/ HEPA: Annual Maintenan July 6, 2	6, 2023 ce 2023	<0.2 ug/m3	

Calibration by:

Mohammed Kashif



### Wind Speed/Direction Calibration Report

WBEA					Version-10-20
		Station	Information		
station Name:	Anzac		Station Number:	AMS 14	
alibration Date:	April 8, 2024		Prev Cal Date:	August 23, 2023	
tart Time (MST):	12:15		End Time (MST):	12:30	
ower Height (m):	20.0		Reason:	Removal	
		Wind Spee	ed Information		
ensor make/model:	: Met One 010C-1		Serial Number:	E5132	
VS Calibrator:	MetOne 053		Serial Number:	R10866	
					% Error
Shaft RPM	Calculated Sp	eed (K/hr) (Cv)	Indicated S	Speed (K/hr) (lv)	Limit = +/- 1.5%
0		).0		0.0	
200		0.2		20.2	0.2%
400	3	9.4		39.4	0.1%
600		8.6		58.6	0.1%
800	7	7.8		77.8	0.1%
		<u>Start</u>	Finish	<u>Limits</u>	
	Correl Coeff (r <sup>2</sup> )		1.000000	≥0.9995	
	Calculated slope		0.999465	0.90 - 1.10	_
	Calculated intercept		-0.013446	+/- 2	_
		Wind Direct	ion Information		
ensor make/model:	· Met Or	e 020C-1	Serial Number:	Z1048	
	deg east of True North):	14		eg east of True North):	<u>14</u>
olar noon time (MS		13:34	Calc Declination*:	13.23	Degrees
eadband calc:	#VALUE!	degrees ( <i>Limit 4 deg</i>			nation as per NOAA web
				% Error (bas	ed on 357° FS)
Physical Directi	ion (Degrees) (Cv)	Indicated Dir	ection (Degrees) (Iv)	•	+/- 1.0%
	0		NA		
!	90		NA		
1	180		NA		
	270		NA		
3	356		NA		
		<u>Start</u>	<u>Finish</u>	<u>Limits</u>	
	Correl Coeff (r <sup>2</sup> )			≥0.9995	
	Calculated slope			0.90 - 1.10	_
	Calculated intercept			+/- 4	_
	· · ·			·	-

Notes:

Wind direction sensor was non-functional on arrival due to broken potentiometer connection. Wind speed removal cal only.



### Wind Speed/Direction Calibration Report

WBEA					Version-10-2
		Statio	n Information		
tation Name:	Anzac		Station Number:	AMS 14	
alibration Date:	April 8, 2024		Prev Cal Date:	March 11, 2024	
tart Time (MST):	13:15		End Time (MST):	14:30	
「ower Height (m):	20.0		Reason:	Install	
		Wind Sp	eed Information		
Sensor make/mod	lel: Met One 010C-1		Serial Number:	U11126	
VS Calibrator:	MetOne 053		Serial Number:	R10866	
					or 5
Shaft RPM	Calculated Speed	(K/hr) (Cy)	Indicated	Speed (K/hr) (Iv)	% Error <i>Limit = +/- 1.5%</i>
0	0.0	(	maicateu	0.0	Linint - +/- 1.5%
200	20.2			20.2	0.2%
400	39.4			39.4	0.1%
600	58.6			58.6	0.1%
800	77.8			77.8	0.1%
		Start	<u>Finish</u>	<u>Limits</u>	
	Correl Coeff (r <sup>2</sup> )		1.000000	≥0.9995	
	Correl Coeff (r <sup>2</sup> ) Calculated slope		1.000000 0.999465	≥0.9995 0.90 - 1.10	
Sensor make/mod	Calculated slope Calculated intercept		0.999465	0.90 - 1.10	
Sensor make/mod	Calculated slope Calculated intercept		0.999465 -0.013446 ection Information Serial Number:	0.90 - 1.10 +/- 2 C21020	
As Found Declination	Calculated slope Calculated intercept lel: Met One 02 n (deg east of True North):	20C-1	0.999465 -0.013446 ection Information Serial Number:	0.90 - 1.10 +/- 2	
s Found Declination	Calculated slope Calculated intercept lel: Met One 02 n (deg east of True North): MST):	20C-1 <u>14</u>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*:	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23	
s Found Declination	Calculated slope Calculated intercept lel: Met One 02 n (deg east of True North): MST):	20C-1 <u>14</u> 12:26	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*:	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u>	Degrees
s Found Declination olar noon time (N Deadband calc:	Calculated slope Calculated intercept lel: Met One 02 n (deg east of True North): MST): 1.9 de	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: teg )	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba	Degrees lination as per NOAA web ased on 357° FS)
s Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         lel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: deg )	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba	Degrees
as Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         lel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)         0	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: deg ) Direction (Degrees) (Iv) 0.9	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web ased on 357° FS) = +/- 1.0% 
s Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         lel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)         0         90	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: deg )	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web ased on 357° FS) = +/- 1.0%  -0.1%
as Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         lel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)         0	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: deg ) Direction (Degrees) (Iv) 0.9 89.5 179.9	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web ased on 357° FS) = +/- 1.0%  0.1% 0.0%
s Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         Idel:       Met One 02         n (deg east of True North):         MST):       1.9 degets         ection (Degrees) (Cv)         0         90         180	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: teg ) Direction (Degrees) (Iv) 0.9 89.5	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web ased on 357° FS) = +/- 1.0%  -0.1%
As Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         Idel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)         0         90         180         270	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i> Indicated	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: teg ) Direction (Degrees) (IV) 0.9 89.5 179.9 270.2 356.0	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web assed on 357° FS) = +/- 1.0%  -0.1% 0.0% 0.1%
as Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         Itel:       Met One 02         In (deg east of True North):       MST):         In (deg east of True North):       In (deg east of True North):         MST):       In (deg east of True North):         MST (deg east of True North):       In (deg east of True North):         MST (deg east of True North):       In (deg east of True North):         MST (deg east of True North):       In (deg east of True North):         MST (deg east of True North):       In (deg east of True North):         MST (deg east of True North):       In (deg east of True North):         MST (deg east of True Nor	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i>	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d. Calc Declination*: teg ) Direction (Degrees) (IV) 0.9 89.5 179.9 270.2 356.0 <u>Finish</u>	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web assed on 357° FS) = +/- 1.0%  -0.1% 0.0% 0.1%
As Found Declination Golar noon time (N Deadband calc:	Calculated slope         Calculated intercept         Calculated intercept         Idel:       Met One 02         n (deg east of True North):         MST):       1.9 de         ection (Degrees) (Cv)         0         90         180         270	20C-1 <u>14</u> 12:26 egrees ( <i>Limit 4 a</i> Indicated	0.999465 -0.013446 ection Information Serial Number: As Left Declination (d Calc Declination*: teg ) Direction (Degrees) (IV) 0.9 89.5 179.9 270.2 356.0	0.90 - 1.10 +/- 2 C21020 eg east of True North): 13.23 <u>* - calculated decl</u> % Error (ba <i>Limit</i>	Degrees lination as per NOAA web assed on 357° FS) = +/- 1.0%  -0.1% 0.0% 0.1%

Notes:

Replaced all sensors and cabling.



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS17 WAPASU APRIL 2024

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

May 31, 2024



Station Name:

Calibration Date:

Wapasu

April 2, 2024

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

Station number: AMS17

Last Cal Date: March 6, 2024

#### **Station Information**

Start time (MST): Reason:	10:35 Routine		End time (MST):	13:38	
		Calibration St	andards		
Cal Gas Concentration: Cal Gas Cylinder #:	50.38 ALM066507	ppm	Cal Gas Exp Date:	January 12, 2029	
Removed Cal Gas Conc:	50.38	ppm	Rem Gas Exp Date:	N/A	
Removed Gas Cyl #:	N/A		Diff between cyl:		
Calibrator Model:	API T700		Serial Number:	2449	
Zero Air Gen Model:	API 701H		Serial Number:	359	
		Analyzer Info	<u>rmation</u>		
Analyzer make:	Thermo 43i		Serial Number:	1218153459	
Analyzer Range:	0 - 1000 ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003695	0.998796	Backgd or Offset:	13.2	13.3
Calibration intercept:	-1.998962	-1.859943	Coeff or Slope:	1.098	1.098
		SO <sub>2</sub> As Foun	d 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 As found Mid point	4921	79.4	800.0	790.0	1.012
As found Low point New cylinder response					
Baseline Corr As found: Baseline Corr 2nd AF pt:	790.2 NA	Previous response AF Slope:	800.9	*% change AF Intercept:	-1.4%

AF Correlation:

NA

SO<sub>2</sub> Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.2	
High point	4921	79.4	800.0	798.6	1.002
Mid point	4960	39.7	400.0	395.4	1.012
Low point	4980	19.8	199.5	196.2	1.017
As left zero	5000	0.0	0.0	0.3	
As left span	4920	79.4	800.1	800.0	1.000
			Averag	e Correction Factor:	1.010

Notes:

Baseline Corr 3rd AF pt:

No adjustments needed.

Aswin Sasi Kumar

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

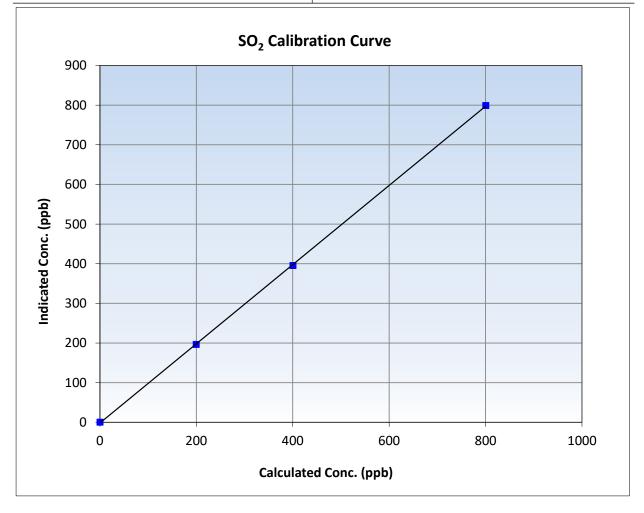


# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

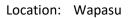
#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:35	End Time (MST):	13:38
Analyzer make:	Thermo 43i	Analyzer serial #:	1218153459

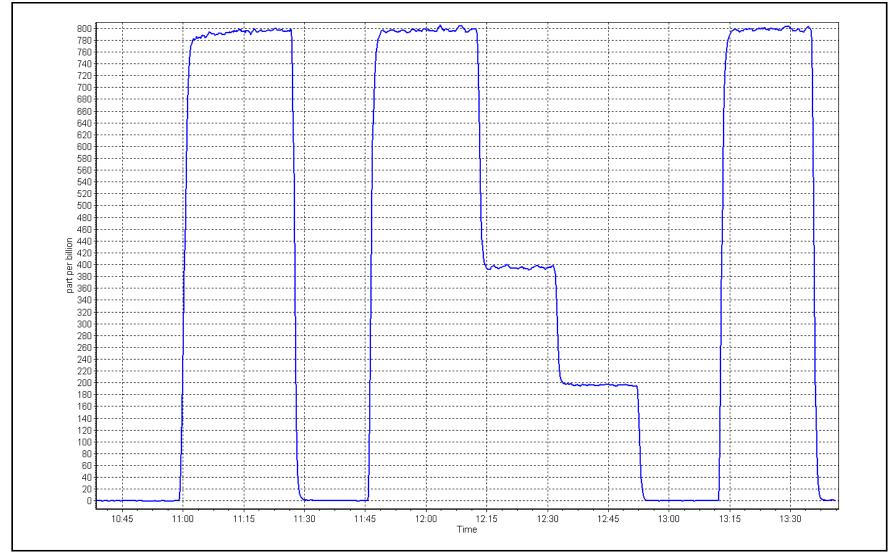
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999962	≥0.995
800.0 400.0	798.6 395.4	1.0017 1.0117	Slope	0.998796	0.90 - 1.10
199.5	196.2	1.0169	Intercept	-1.859943	+/-30













# Wood Buffalo Environmental Association H<sub>2</sub>S/TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Wapasu April 8, 2024 10:28 Routine		Station number: Last Cal Date: End time (MST):	AMS 17 March 12, 2024 16:13	
		<b>Calibration</b>	<u>Standards</u>		
Cal Gas Concentration: Cal Gas Cylinder #:	5.08 CC511852	ppm	Cal Gas Exp Date:	September 16, 2024	4
Removed Cal Gas Conc: Removed Gas Cyl #:	5.08 N/A	ppm	Rem Gas Exp Date: Diff between cyl:	N/A	
, Calibrator Make/Model:	API T700		, Serial Number:	2449	
ZAG Make/Model:	API T701H		Serial Number:	359	
		Analyzer In	formation		
Analyzer make: Converter make: Analyzer Range	Thermo 450i CD Nova 0 - 100 ppb		Analyzer serial #: Converter serial #: Converter Temp:	1218153583 N/A	degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.995282	0.992711	Backgd or Offset:	11.7	11.8
Calibration intercept:	0.340790	-0.119219	Coeff or Slope:	1.096	1.096

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)		Baseline Adjusted Correction factor (Cc/(Ic- AFzero)) Limit = 0.90-1.10
As found zero	5000	0.0	0.0	0.6	
As found High point	4921	78.8	80.0	80.5	1.001
As found Mid point	4961	39.4	40.0	40.4	1.005
As found Low point New cylinder response	4980	19.7	20.0	20.4	1.010
Baseline Corr As found:	79.9	Prev response	: 79.96	*% change:	-0.1%
Baseline Corr 2nd AF pt:	39.8	AF Slope	: 0.999282	AF Intercept:	0.500796
Baseline Corr 3rd AF pt:	19.8	AF Correlation	: 0.999993	* = > +/-5% change initia	tes investigation

#### H<sub>2</sub>S/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	4921	78.8	80.0	79.5	1.006
Mid point	4961	39.4	40.0	39.3	1.018
Low point	4980	19.7	20.0	19.5	1.026
As left zero	5000	0.0	0.0	0.4	
As left span	4921	78.8	80.0	78.9	1.014
SO2 Scrubber Check	4921	79.4	793.9	-0.1	
Date of last scrubber cha	ange:	N/A		Ave Corr Factor	1.017
Date of last converter ef	fficiency test:	N/A		_	

Zero adjusted.

#### Notes:

Calibration Performed By:

Aswin Sasi Kumar



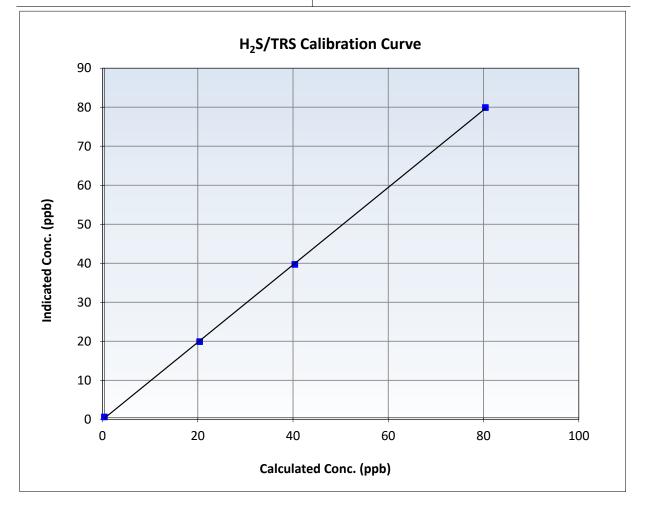
## $H_2S/TRS$ Calibration Summary

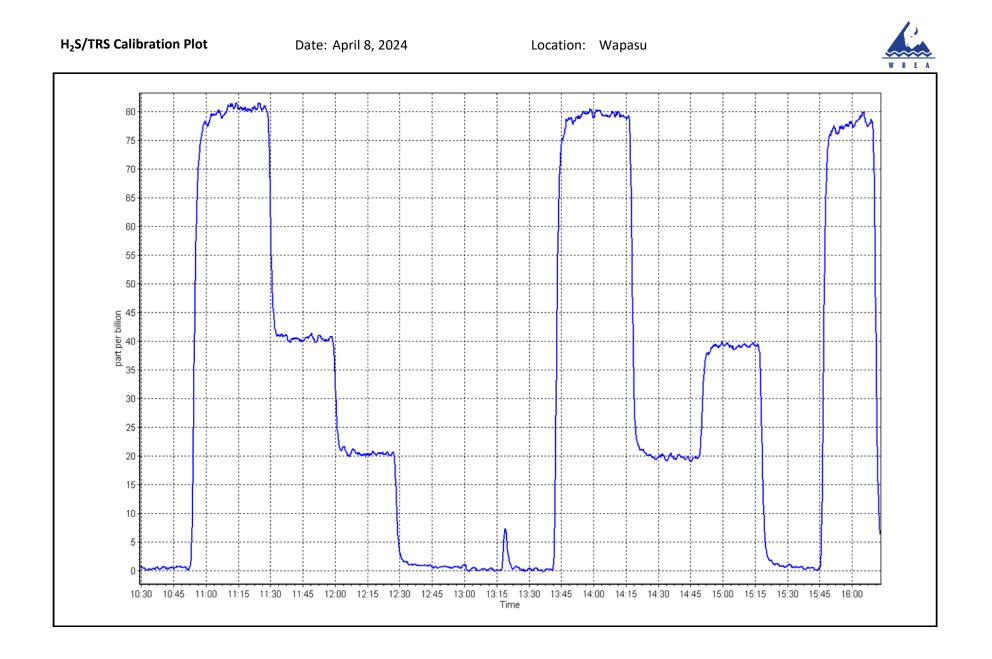
#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 12, 2024
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:28	End Time (MST):	16:13
Analyzer make:	Thermo 450i	Analyzer serial #:	1218153583

...

		Calibra	ation Data		
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999919	≥0.995
80.0 40.0	79.5 39.3	1.0063 1.0177	Slope	0.992711	0.90 - 1.10
20.0	19.5	1.0257	Intercept	-0.119219	+/-3







# Wood Buffalo Environmental Association THC Calibration Report

#### **Station Information**

Station Name:	Wapasu		Station number:	AMS17	
Calibration Date:	April 2, 2024		Last Cal Date:	March 6, 2024	
Start time (MST):	10:35		End time (MST):	13:38	
Reason:	Routine			15.50	
Nedson.	Routine				
		Calibration S	tandards		
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		Ch4 Equiv Conc.	1070.5	ppm
Removed Gas Cert:		ppm n/a	Domoural Cos Funinu		
Removed CH4 Conc.	503.5		Removed Gas Expiry:	1076.2	
		ppm	CH4 Equiv Conc.	1076.3	ppm
Removed C3H8 Conc.	208.3	ppm	Diff between cyl:	2440	
Calibrator Make/Model:	API T700		Serial Number:	2449	
ZAG Make/Model:	API 701H		Serial Number:	359	
		Analyzer Info	ormation		
Analyzer make	: Thermo 51i-LT		Analyzer serial #:	1218153352	
Analyzer Range			Analyzer Schur II.		
	Start	Finish		Start	Finish
Calibration slope:	0.992946	0.990526	Background:		3.020
Calibration intercept:	0.028821	0.030412	Coefficient:		4.390
eanoration intercept.	0.020021	0.000 112	eoemolene.	1.550	1.000
		THC As Fou	nd Data		
					Baseline Adjusted
Set Point	Dilution air flow rate	Source gas flow rate	Calculated Concentration		Correction factor (Cc/(Ic-
Set Point	Dilution air flow rate (sccm)			Indicated Concentration (ppm) (Ic)	Correction factor (Cc/(Ic- AFzero)
	(sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor (Cc/(Ic-
As found zero	(sccm) 5000	Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero As found High point	(sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero As found High point As found Mid point	(sccm) 5000	Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05	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	(sccm) 5000	Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero As found High point As found Mid point	(sccm) 5000	Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05	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	(sccm) 5000	Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05	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	(sccm) 5000 4921	Source gas flow rate (sccm) 0.0 79.4	Calculated Concentration (ppm) (Cc) 0.00 17.09	(ppm) (Ic) 0.05 17.05	Correction factor (Cc/(Ic- AFzero) <i>Limit = 0.90-1.10</i>  1.005
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found:	(sccm) 5000 4921 17.00	Source gas flow rate (sccm) 0.0 79.4 Previous response	Calculated Concentration (ppm) (Cc) 0.00 17.09	(ppm) (Ic) 0.05 17.05 *% change	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0%
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 5000 4921 17.00 NA	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope:	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00	(ppm) (Ic) 0.05 17.05 *% change AF Intercept:	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0%
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	(sccm) 5000 4921 17.00 NA	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u>	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 5000 4921 17.00 NA NA	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation:	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation Correction factor (Cc/Ic)
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000 4921	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 79.4	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.09	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat Indicated Concentration (ppm) (Ic) 0.10 17.01	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  1.005
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat Indicated Concentration (ppm) (Ic) 0.10	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05 
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000 4921	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 79.4	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.09	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat Indicated Concentration (ppm) (Ic) 0.10 17.01	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  1.005
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000 4921 4960	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 79.4 39.7	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.09 8.55	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat Indicated Concentration (ppm) (Ic) 0.10 17.01 8.41	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  1.005 1.016
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point Low point	(sccm) 5000 4921 17.00 NA NA Dilution air flow rate (sccm) 5000 4921 4960 4980	Source gas flow rate (sccm) 0.0 79.4 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 79.4 39.7 19.8	Calculated Concentration (ppm) (Cc) 0.00 17.09 17.00 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.09 8.55 4.26	(ppm) (Ic) 0.05 17.05 *% change AF Intercept: * = > +/-5% change initiat Indicated Concentration (ppm) (Ic) 0.10 17.01 8.41 4.22	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.005 0.0% es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05

Notes:

No adjustments needed.

Calibration Performed By:

Aswin Sasi Kumar

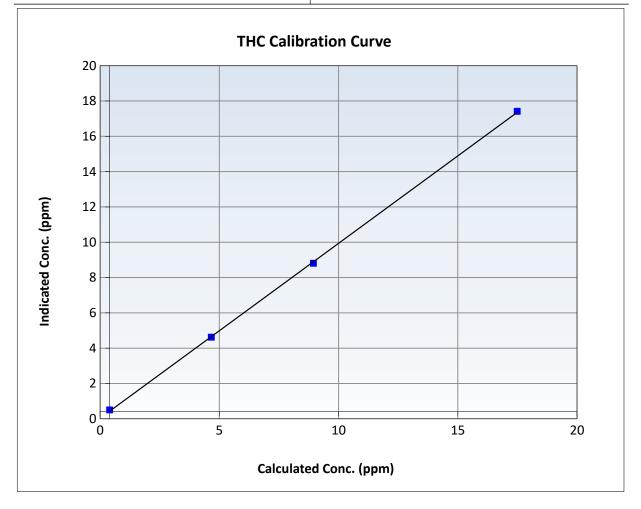


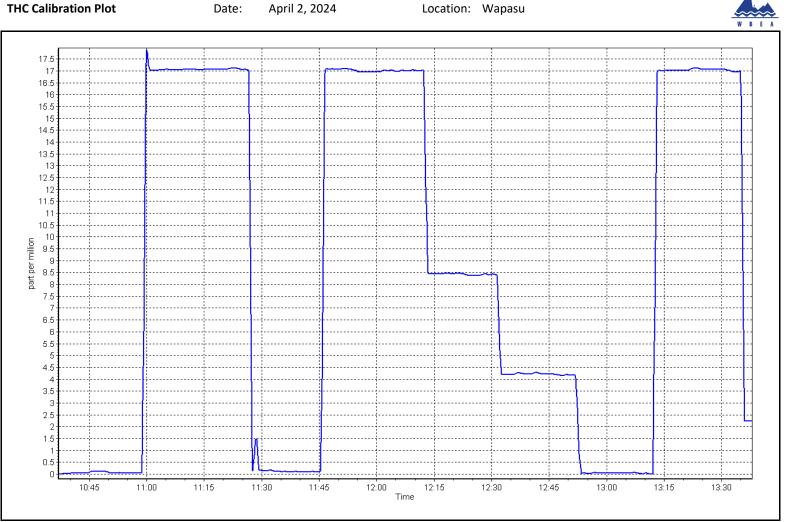
# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:35	End Time (MST):	13:38
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153352

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.10		Correlation Coefficient	0.999897	≥0.995
17.09 8.55	17.01 8.41	1.0047 1.0162	Slope	0.990526	0.90 - 1.10
4.26	4.22	1.0108	Intercept	0.030412	+/-1.5









**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Wapasu	NO Gas Cylinder #:	T375YK8	Cal Gas Expiry Date:	April 13, 2025
Station number:	AMS 17	NOX Cal Gas Conc:	49.11 ppm	NO Cal Gas Conc:	48.07 ppm
Calibration Date:	April 16, 2024	Removed Cylinder #:	T375YK8	Removed Gas Exp Date	: N/A
Last Cal Date:	March 26, 2024	Removed Gas NOX Conc:	49.11 ppm	Removed Gas NO Conc	: 48.07 ppm
Start time (MST):	10:35	NOX gas Diff:		NO gas Diff:	
End time (MST):	N/A	Calibrator Model:	API T700	Serial Number:	2449
Reason:	As Found	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	-0.3	-0.2	-0.1		
AF High point	4917	83.2	817.2	799.9	17.3	809.8	791.0	18.7	1.0088	1.0110
AF Mid point	4958	41.6	408.6	399.9	8.7	395.7	385.3	10.4	1.0318	1.0375
AF Low point	4979	20.8	204.3	200.0	4.3	193.5	187.4	6.2	1.0542	1.0659
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	816.2 ppb	NO = 796.2	ррb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-0.8%
Baseline Corr 1	lst pt NO <sub>x</sub> =	810.1 ppb	NO = 791.2	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-0.6%
Baseline Corr 2	2nd pt NO <sub>x</sub> =	396.0 ppb	NO = 385.5	ppb	As foun	nd NO <sub>x</sub> r <sup>2</sup> :	0.999787	Nx SI: 0.9937	'18 Nx Int:	-5.600
Baseline Corr 3	Brd pt NO <sub>X</sub> =	193.8 ppb	NO = 187.6	ppb	As foun	nd NO r <sup>2</sup> :	0.999710	NO SI: 0.9920	NO Int:	-6.300

#### As Found GPT Calibration Data

As found

NO<sub>2</sub> r<sup>2</sup>: 1.000000

NO2 SI: 0.991618 NO<sub>2</sub> Int: -0.100

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	791.0	390.1	418.2	414.6	1.0087	99.1%
As found mid GPT point	791.0					
As found low GPT point	791.0					



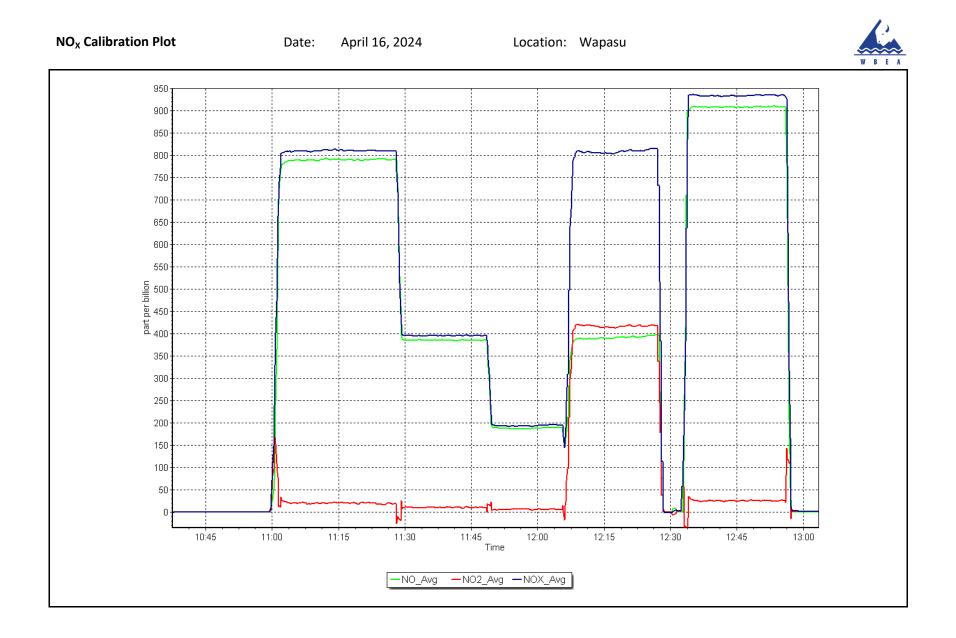
#### Analyzer Information

### Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer mormati						Control		<u>.</u>	
Analyzer Make:	Thermo Scientific 42iQ	Serial	Number: 12300	522720				<u>Start</u>	<u>Finish</u>
IOX Range (ppb):	0 - 1000 ppb						l Slope:	1.004319	
			ment Settings				l Offset:	-4.540000	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal	•	1.001930	
IO coeff or slope:	1.345		bkgnd or offset:		N/A		Offset:	-5.200000	
NOX coeff or slope:	0.994		bkgnd or offset:		N/A		l Slope:	1.007870	
NO2 coeff or slope:	1.000	N/A Read	ction cell Press:	404.0	N/A	NO <sub>2</sub> Ca	l Offset:	1.467173	
			Dil	lution Calibrat	ion Data				
Set Point	on flow rate Source gas sccm) rate (sccr	concentration	Calculated NO concentration	Calculated NO2 concentration	Indicated NOx concentration	Indicated NO concentration	Indicated NO2 concentration	NOx Correction factor (Cc/Ic)	NO Correction facto (Cc/Ic)
(5		(ppb) (Cc)	(ppb) (Cc)	(ppb) (Cc)	(ppb) (Ic)	(ppb) (Ic)	(ppb) (Ic)	<i>Limit = 0.95-1.05</i>	<i>Limit = 0.95-1.05</i>
ligh point Aid point ow point s left zero s left span			,	GPT Calibratio	n Data	Average C	orrection Facto	r	
			_						
O3 Setpoint (ppt	b)		dicated NO Drop acentration (ppb)	Calculated N concentration (p		dicated NO2 ntration (ppb) (Ic)	NO2 Correction fa Limit = 0.95		verter Efficiency nit = 96-104%
Cal zero									
ligh GPT point									
/lid GPT point									
ow GPT point					A				
					Average Co	prrection Factor	L		
Notes:			Pump change	ed out after as fo	ounds. Will calib	orate instrumen	t tomorrow.		
Calibration Per	formed By:	Aswin Sasi	Kumar						





**Station Information** 

### Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name: Station numbe Calibration Da Last Cal Date: Start time (MS End time (MST Reason:	er: AMS te: April N/A ST): 10:37	17 18, 2024		NOX Ca Remov Remov NOX ga Calibra ZAG m	s Cylinder #: al Gas Conc: ed Cylinder #: ed Gas NOX Con as Diff: tor Model: ake/model: ake/model:	49.11 T37 c: 49.11 API API T	5YK8	Cal Gas Expiry NO Cal Gas Cor Removed Gas I Removed Gas I NO gas Diff: Serial Number Serial Number	nc: Exp Date: T NO Conc:	N/A	2025 ppm ppm
Set Point	Dilution flow rat (sccm)	e 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 A NOx Correct (Cc/(Ic-Al <i>Limit = 0.9</i>	ion factor Fzero))	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>

AF High point AF Mid point								
AF Low point								
New cyl resp								
Previous Response	NO <sub>x</sub> = NA	ppb	NO = NA	ppb	* = > +/-5% change initiates investigation	*Percent Change	NO <sub>x</sub> =	NA
Baseline Corr 1st pt	NO <sub>x</sub> = NA	ppb	NO = NA	ppb	As Found Statistics	*Percent Change	NO =	NA
Baseline Corr 2nd pt	NO <sub>X</sub> = NA	ppb	NO = NA	ppb	As found NO <sub>x</sub> r <sup>2</sup> :	Nx SI:	Nx Int:	
Baseline Corr 3rd pt	NO <sub>X</sub> = NA	ppb	NO = NA	ppb	As found NO r <sup>2</sup> :	NO SI:	NO Int:	
					As found $NO_2 r^2$ :	NO2 SI:	NO <sub>2</sub> Int:	

#### As Found GPT Calibration Data

					Baseline Adjusted NO2	
O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero))	Converter Efficiency Limit = 96-104%
					Limit = 0.90 - 1.10	

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo Scientific	: 42i	Serial Number: 1218153	460			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	N/A	0.999550
			Instrument Settings			NO <sub>x</sub> Cal Offset:	N/A	-0.560000
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	N/A	1.000573
NO coeff or slope:	N/A	1.100	NO bkgnd or offset:	N/A	3.8	NO Cal Offset:	N/A	-1.400000
NOX coeff or slope:	N/A	0.992	NOX bkgnd or offset:	N/A	4.2	NO <sub>2</sub> Cal Slope:	N/A	0.995649
NO2 coeff or slope:	N/A	1.000	Reaction cell Press:	N/A	261.0	NO <sub>2</sub> Cal Offset:	N/A	-0.696163

#### **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) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.0		
High point	4917	83.2	817.2	799.9	17.3	816.8	799.8	17.0	1.0005	1.0001
Mid point	4958	41.6	408.6	399.9	8.7	406.9	397.6	9.3	1.0042	1.0059
Low point	4979	20.8	204.3	200.0	4.3	203.4	197.6	5.8	1.0044	1.0120
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1		
As left span	4917	83.2	817.2	401.2	416.0	817.0	401.2	415.8	1.0002	1.0000
							Average Co	orrection Factor	1.0030	1.0060

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	0.0		
High GPT point	797.8	400.1	415.0	413.3	1.0041	99.6%
Mid GPT point	797.8	593.7	221.4	219.0	1.0110	98.9%
Low GPT point	797.8	593.7	221.4	219.0	1.0110	98.9%
				Average Correction Factor	1.0087	99.1%

Notes:

Install calibration. Span adjusted.

Calibration Performed By:

Aswin Sasi Kumar

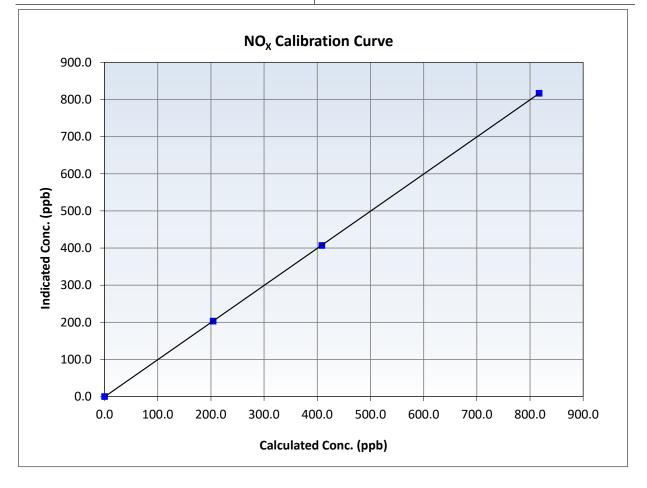


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	N/A
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:37	End Time (MST):	15:02
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999995	≥0.995
817.2 408.6	816.8 406.9	1.0005 1.0042	Slope	0.999550	0.90 - 1.10
204.3	203.4	1.0044	Intercept	-0.560000	+/-20



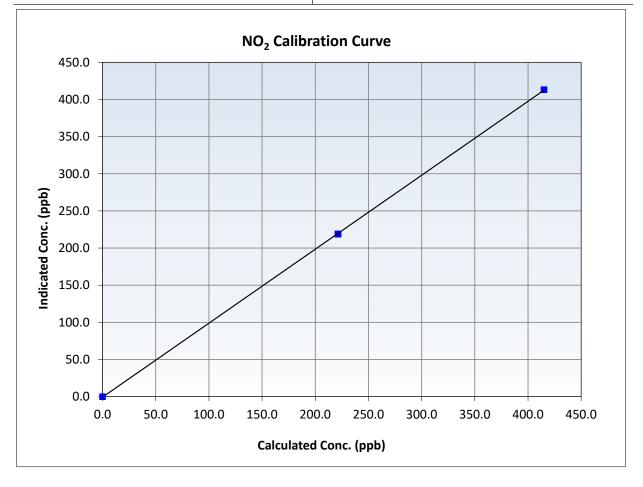


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	N/A
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:37	End Time (MST):	15:02
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999974	≥0.995
415.0	413.3	1.0041	Slope	0.995649	0.90 - 1.10
221.4	219.0	1.0110	Slope	0.555045	0.50 1.10
221.4	219.0	1.0110	Intercept	-0.696163	+/-20



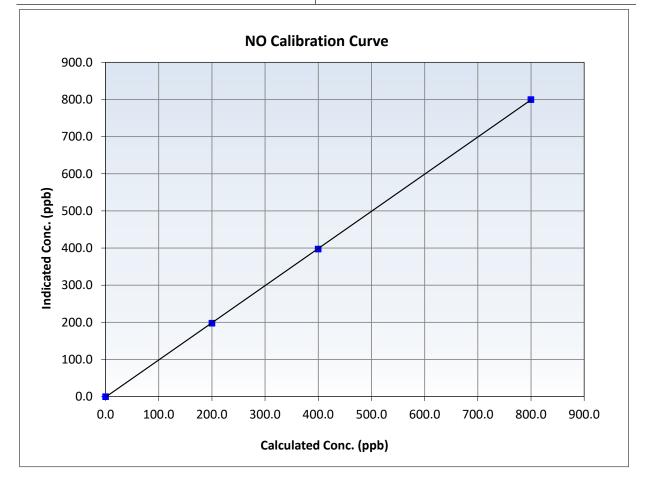


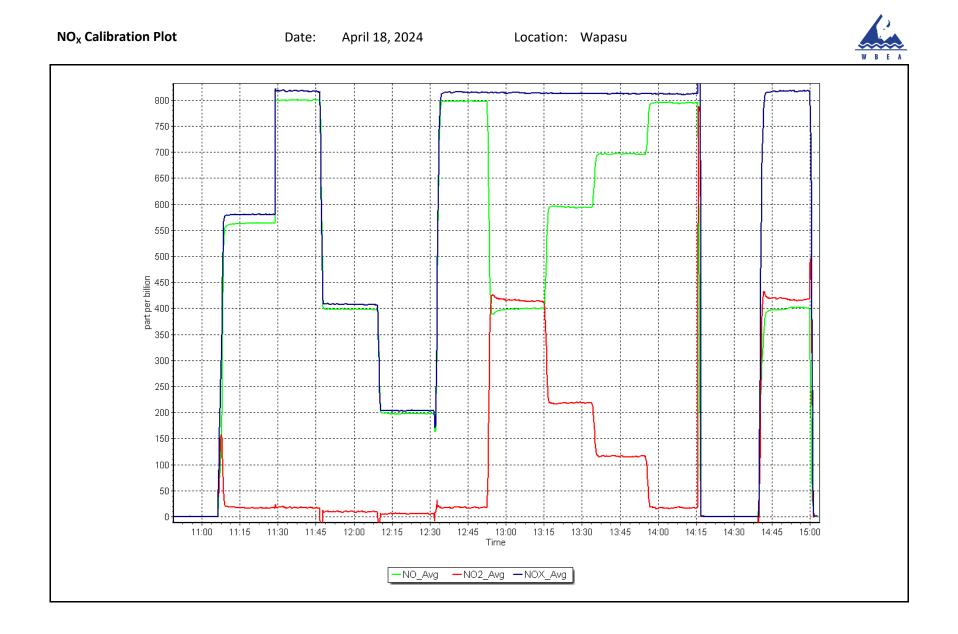
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	N/A
Station Name:	Wapasu	Station Number:	AMS 17
Start Time (MST):	10:37	End Time (MST):	15:02
Analyzer make:	Thermo Scientific 42i	Analyzer serial #:	1218153460

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999985	≥0.995
799.9 399.9	799.8 397.6	1.0001 1.0059	Slope	1.000573	0.90 - 1.10
200.0	197.6	1.0120	Intercept	-1.400000	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Wapasu April 4, 2024 10:03 Routine		Station number: AN Last Cal Date: Ma End time (MST): 13:	rch 11, 2024	
		Calibration S	tandards		
O3 generation mode: Calibrator Make/Model: ZAG Make/Model:	Photometer API T700 API T701H		Serial Number: 244 Serial Number: 359	-	
		Analyzer Info	ormation		
Analyzer make:	API T400		Analyzer serial #: 387	0	
Analyzer Range	0 - 500 ppb				
Calibration slope: Calibration intercept:	<u>Start</u> 1.000657 -0.340000	<u>Finish</u> 1.000714 -0.600000	Backgd or Offset: Coeff or Slope:	<u>Start</u> -1.8 1.013	<u>Finish</u> -1.8 1.013

#### O<sub>3</sub> As Found Data

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)		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	1077.3	400.0	399.4	1.002
As found Mid point					
As found Low point					
Baseline Corr As found:	399.2	Previous response	399.9	*% change	-0.2%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation

#### **O<sub>3</sub> 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.4	
High point	5000	1077.3	400.0	400.1	1.000
Mid point	5000	900.3	200.0	199.3	1.004
Low point	5000	789.5	100.0	98.3	1.017
As left zero	5000	0.0	0.0	0.6	
As left span	5000	1077.3	400.0	404.0	0.990
·			Averag	e Correction Factor	1.007

#### Notes:

No adjustments needed.

Calibration Performed By:

Aswin Sasi Kumar

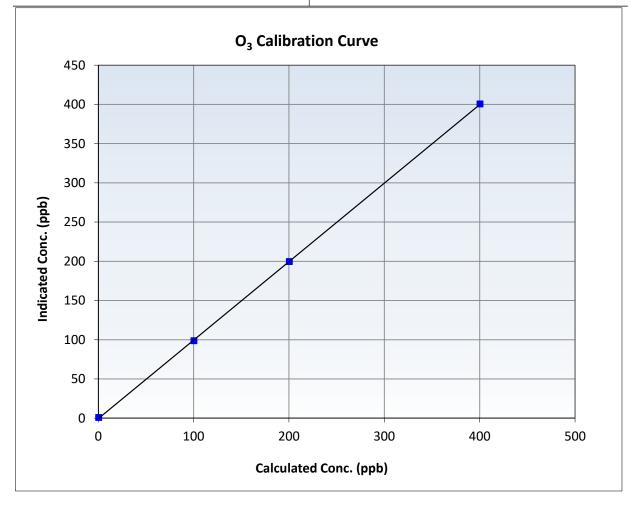


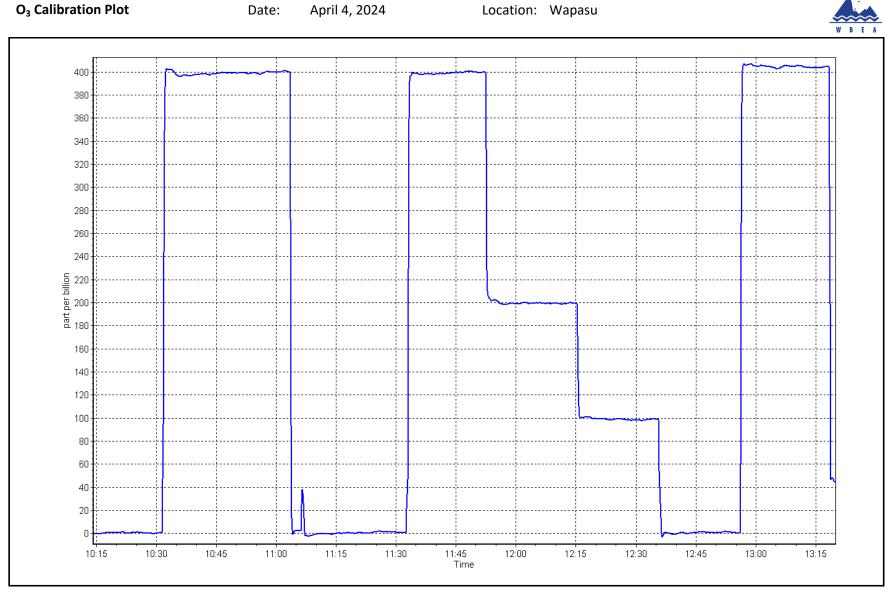
# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 11, 2024
Station Name:	Wapasu	Station Number:	AMS17
Start Time (MST):	10:03	End Time (MST):	13:20
Analyzer make:	API T400	Analyzer serial #:	3870

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.4		Correlation Coefficient	0.999970	≥0.995
400.0	400.1	0.9998	Slope	1.000714	0.90 - 1.10
200.0	199.3	1.0035	Siope	1.000714	0.50 1.10
100.0	98.3	1.0173	Intercept	-0.600000	+/- 5





**O**<sub>3</sub> Calibration Plot

Location: Wapasu



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

WBEA					Version-01-2024
		Station Informat	tion		
Station Name:	Wapasu		Station number: AMS	17	
Calibration Date:	April 17, 2024		Last Cal Date: Marc	h 26, 2024	
Start time (MST):	10:36		End time (MST): 12:28	3	
Analyzer Make: Particulate Fraction:	Teledyne API T640 PM2.5		S/N: 1183		
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 3887	53	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	53	
	I	Monthly Calibratio	n Test		
Parameter_	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	-3.8	-3.68	-3.8		+/- 2 °C
P (mmHg)	726.3	729.6	726.3		+/- 10 mmHg
Flow (LPM)	4.98	5.00	4.98		+/- 0.25 LPM
PW% (pump)	41		41		>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

 Image: Complete the served of the served

		Quarterly Calibration	Test		
SPAN DUST	Refractive Index: Lot No.:	10.9 100128-050-042	Expiry Date:	October 6, 20	24
Parameter	As found	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test	12.7	11.1	11.1	$\checkmark$	+/- 0.5
Date Optical Cham Date Disposable Fi	-	February 1 February 1	,		
Post- maintenance Zero Ver	ification:	PM w/ HEPA:	0.0	<0.2 ug/m3	

#### **Annual Maintenance**

Date Sample Tube Cleaned: Date RH/T Sensor Cleaned:

Notes:

Temp. pressure and flow checked. Leak check passed. Chamber cleaning completed. PMT adjusted.

Calibration by: Aswin Sasi Kumar



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS18 STONY MOUNTAIN APRIL 2024

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

May 31, 2024



## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Stony Moun
Calibration Date:	April 3, 2024
Start time (MST):	10:20
Reason:	Routine

าtain 4

Station number: AMS 18 Last Cal Date: March 1, 2024 End time (MST): 14:11

#### **Calibration Standards**

Cal Gas Concentration: Cal Gas Cylinder #:	49.40 CC463851	ppm	Cal Gas Exp Date: February 23, 2025	
Removed Cal Gas Conc:	49.40	ppm	Rem Gas Exp Date: NA	
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Model:	Teledyne API T700		Serial Number: 2658	
Zero Air Gen Model:	Teledyne API 701H		Serial Number: 360	
		Analyzer Infor	mation	
Analyzer make:	Thermo 43i		Serial Number: JC1501301453	
Analyzer Range:	0 - 1000 ppb			
	Start	Finish	Start	

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000733	1.002389	Backgd or Offset:	22.9	22.9
Calibration intercept:	0.276595	0.496756	Coeff or Slope:	0.800	0.800

#### SO<sub>2</sub> 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	5009	0.0	0.0	0.8	
As found High point As found Mid point As found Low point New cylinder response	4919	81.0	800.3	801.2	1.000
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	800.4 NA NA	Previous response AF Slope: AF Correlation:	801.1	*% change AF Intercept: * = > +/-5% change initiate	-0.1% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.8	
High point	4919	81.0	800.3	802.5	0.997
Mid point	4959	40.5	400.2	402.5	0.994
Low point	4979	20.2	199.6	199.6	1.000
As left zero	5000	0.0	0.0	1.1	
As left span	4919	81.0	800.3	802.6	0.997
			Avera	ge Correction Factor:	0.997

Notes:

No adjustments needed.

Calibration Performed By:

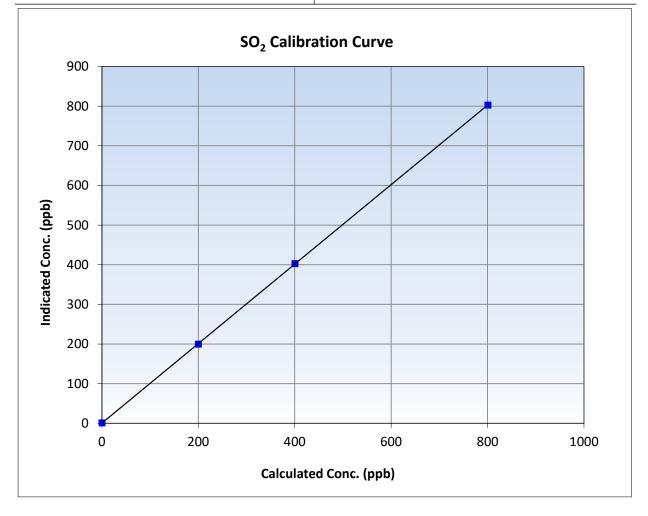


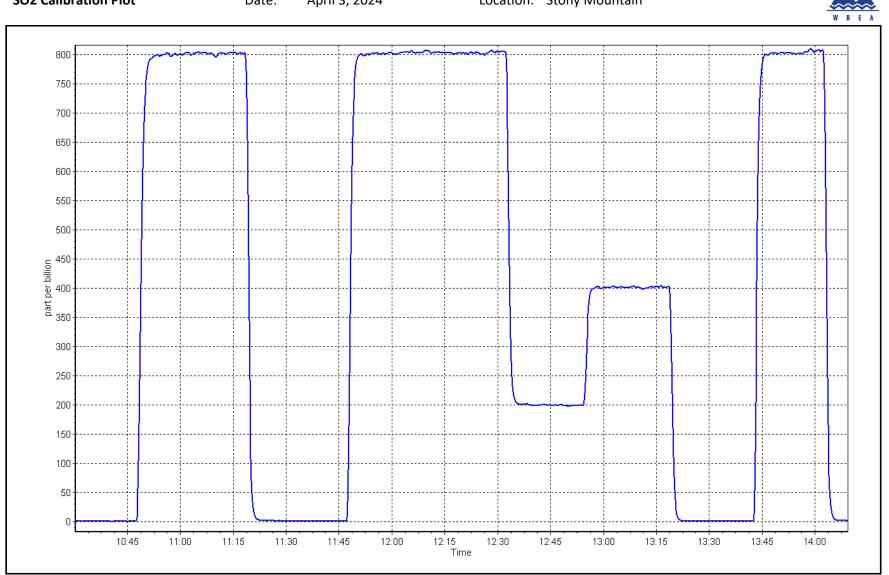
## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 1, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:20	End Time (MST):	14:11
Analyzer make:	Thermo 43i	Analyzer serial #:	JC1501301453

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.8		Correlation Coefficient	0.999995	≥0.995
800.3 400.2	802.5 402.5	0.9972 0.9942	Slope	1.002389	0.90 - 1.10
199.6	199.6	1.0000	Intercept	0.496756	+/-30





#### **SO2** Calibration Plot

Date: April 3, 2024

### Location: Stony Mountain



### Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Stony Mountain April 24, 2024 10:10 Routine		Station number: Last Cal Date: End time (MST):	AMS18 March 27, 2024 15:25
		Calibration S	Standards	
Cal Gas Concentration:	5.48	ppm	Cal Gas Exp Date:	January 4, 2025
Cal Gas Cylinder #:	CC500395			
Removed Cal Gas Conc:	5.48	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	2658
ZAG Make/Model:	Teledyne API T701		Serial Number:	360

#### **Analyzer Information**

Analyzer make: Converter make: Analyzer Range	Thermo 43i-TLE CD Nova CDN-101 0 - 100 ppb		Analyzer serial #: Converter serial #: Converter Temp:	1218153359 555	799 degC
Calibration slope: Calibration intercept:	<u>Start</u> 1.002157 0.240997	<u>Finish</u> 0.993725 0.261187	Backgd or Offset: Coeff or Slope:		<u>Finish</u> 2.6 1.137

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.2	
As found High point	4927	73.0	80.0	82.8	0.968
As found Mid point	4964	36.5	40.0	41.7	0.964
As found Low point	4983	18.3	20.0	20.7	0.978
New cylinder response					
Baseline Corr As found:	82.6	Prev response:	80.41	*% change:	2.7%
Baseline Corr 2nd AF pt:	41.5	AF Slope:	1.033737	AF Intercept:	0.160426
Baseline Corr 3rd AF pt:	20.5	AF Correlation:	0.999979	* = > +/-5% change initiate	es 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	4927	73.0	80.0	79.7	1.004
Mid point	4964	36.5	40.0	40.2	0.995
Low point	4983	18.3	20.0	20.0	1.002
As left zero	5000	0.0	0.0	0.3	
As left span	4927	73.0	80.0	78.6	1.018
SO2 Scrubber Check	4923	77.1	771.0	0.0	
Date of last scrubber chan	ge:	17-Dec-21		Ave Corr Factor	1.000

Span adjusted.

Date of last converter efficiency test:

#### Notes:

Calibration Performed By:



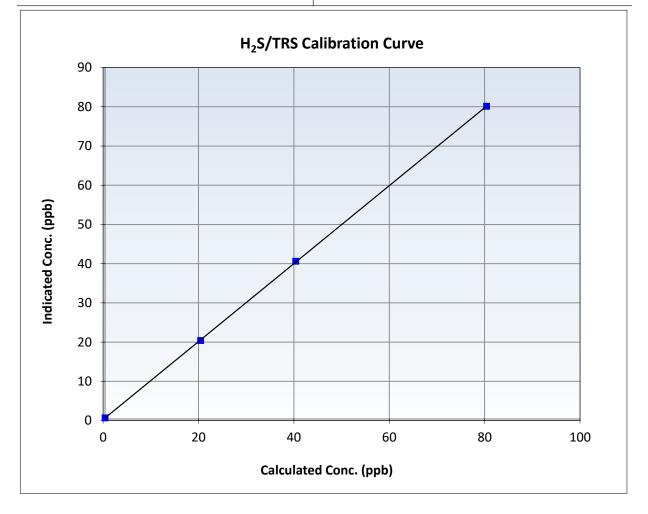
### **Wood Buffalo Environmental Association**

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

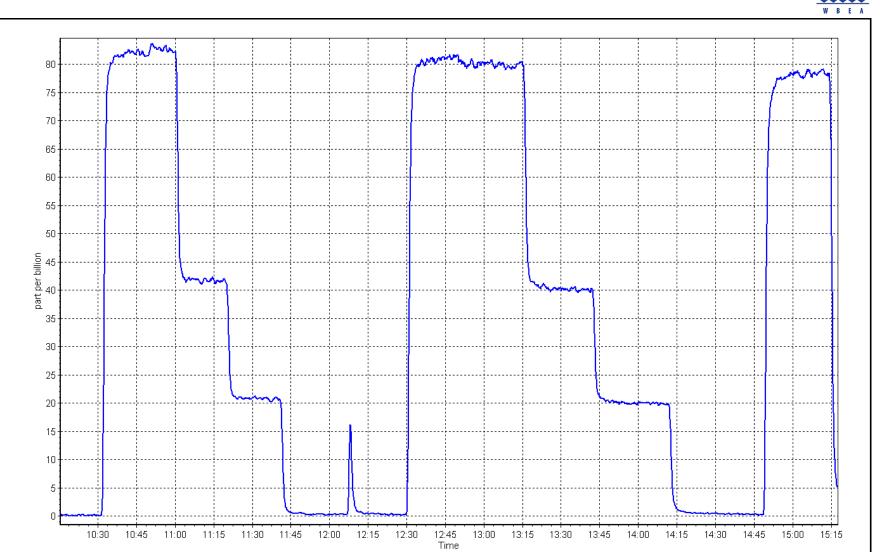
#### **Station Information**

Calibration Date:	April 24, 2024	Previous Calibration:	March 27, 2024
Station Name:	Stony Mountain	Station Number:	AMS18
Start Time (MST):	10:10	End Time (MST):	15:25
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153359

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ition	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999978	≥0.995
80.0	79.7	1.0037	Slope	0.993725	0.90 - 1.10
40.0	40.2	0.9948	Slope	0.993725	0.90 - 1.10
20.0	20.0	1.0024	Intercept	0.261187	+/-3



### H<sub>2</sub>S/TRS Calibration Plot Date: April 24, 2024







### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

Analyzer serial #: 1193585647

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Stony Mountain	Station number: AMS 18		
Calibration Date:	April 3, 2024	Last Cal Date: March 1, 2024		
Start time (MST):	10:20	End time (MST): 14:11		
Reason:	Routine			
		Calibration Standards		
Gas Cert Reference:	CC463851	Cal Gas Expiry Date:	February 23, 2025	
CH4 Cal Gas Conc.	500.8 ppm	CH4 Equiv Conc.	1066.8 ppm	
COLUR Cal Cas Cana	205.0			

	200.8 hhu	Chi4 Equiv Conc.	1000.8 ppm
C3H8 Cal Gas Conc.	205.8 ppm		
Removed Gas Cert:	NA	Removed Gas Expiry:	
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 <sub>4</sub> ):		Diff between cyl (NM):	
Calibrator Model:	Teledyne API T700	Serial Number:	2658
Zero Air Gen model:	Teledyne API T701H	Serial Number:	360

#### **Analyzer Information**

Analyzer make: Thermo 55i THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	3.10E-04	3.23E-04	NMHC SP Ratio:	5.89E-05	5.94E-05
CH4 Retention time:	16.2	16.4	NMHC Peak Area:	156523	154457
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	0.08	
As found High point	4919	81.0	17.28	16.83	1.032
As found Mid point As found Low point					
New cylinder response					
Baseline Corr AF:	16.75	Prev response	17.37	*% change	-3.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.07	
High point	4919	81.0	17.28	17.34	0.997
Mid point	4959	40.5	8.64	8.69	0.994
Low point	4979	20.2	4.31	4.38	0.984
As left zero	5000	0.0	0.00	0.03	
As left span	4919	81.0	17.28	17.68	0.977
			Avera	ge Correction Factor	0.992

Notes:

As found CH4 5.4% out. Diagnostics all normal, possible shift after zero chromatogram procedure last month. Span adjusted.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4919	81.0	9.17	9.06	1.012
Baseline Corr AF:	9.06	Prev response	9.23	*% change	-1.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	ates 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.00	
High point	4919	81.0	9.17	9.19	0.997
Mid point	4959	40.5	4.58	4.62	0.993
Low point	4979	20.2	2.29	2.30	0.995
As left zero	5000	0.0	0.00	0.00	
As left span	4919	81.0	9.17	9.41	0.974
			Avera	ge Correction Factor	0.995

#### 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	0.08	
As found High point As found Mid point As found Low point New cylinder response	4919	81.0	8.11	7.77	1.054
Baseline Corr AF: Baseline Corr 2nd AF:	7.70 NA	Prev response AF Slope:	8.15	*% change AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	ates 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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.07	
High point	4919	81.0	8.11	8.15	0.996
Mid point	4959	40.5	4.06	4.07	0.996
Low point	4979	20.2	2.02	2.08	0.971
As left zero	5000	0.0	0.00	0.03	
As left span	4919	81.0	8.11	8.27	0.981
			Avera	ge Correction Factor	0.988

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.003678	0.999037
THC Cal Offset:	0.027639	0.068218
CH4 Cal Slope:	1.002169	0.994973
CH4 Cal Offset:	0.018204	0.061988
NMHC Cal Slope:	1.005151	1.002583
NMHC Cal Offset:	0.009635	0.006430

Calibration Performed By:

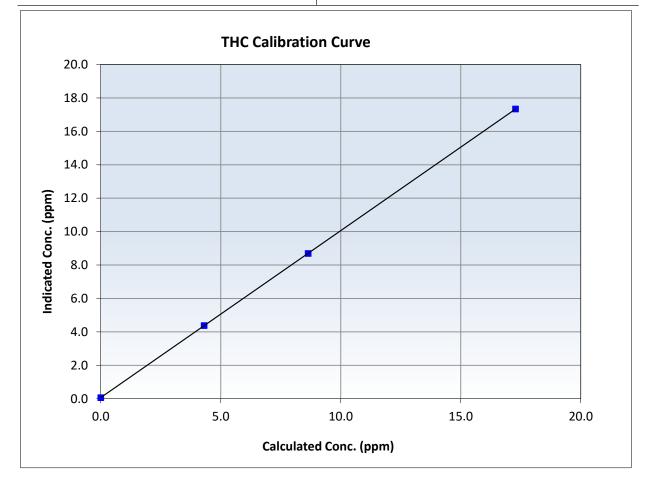


## Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 1, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:20	End Time (MST):	14:11
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	<u>Limits</u>	
0.00	0.07		Correlation Coefficient	0.999999	≥0.995
17.28 8.64	17.34 8.69	0.9968 0.9944	Slope	0.999037	0.90 - 1.10
4.31	4.38	0.9839	Intercept	0.068218	+/-0.5



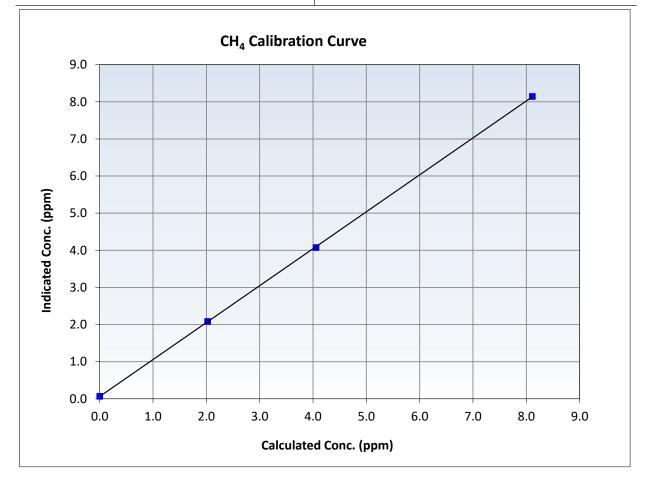


## Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 1, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:20	End Time (MST):	14:11
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.07		Correlation Coefficient	0.999975	≥0.995
8.11 4.06	8.15 4.07	0.9961 0.9960	Slope	0.994973	0.90 - 1.10
2.02	2.08	0.9715	Intercept	0.061988	+/-0.5



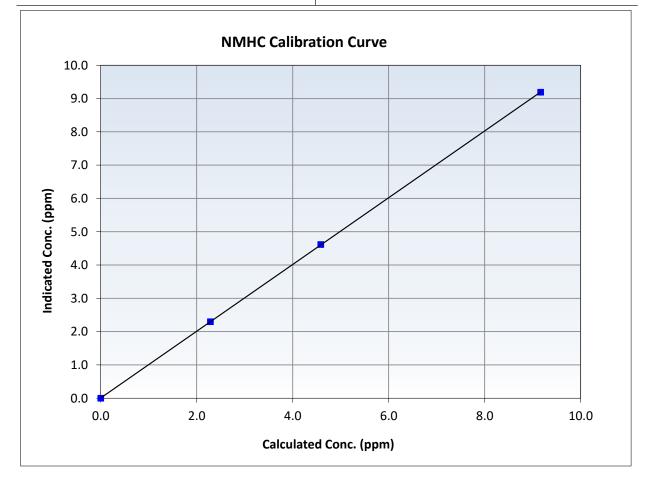


## Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

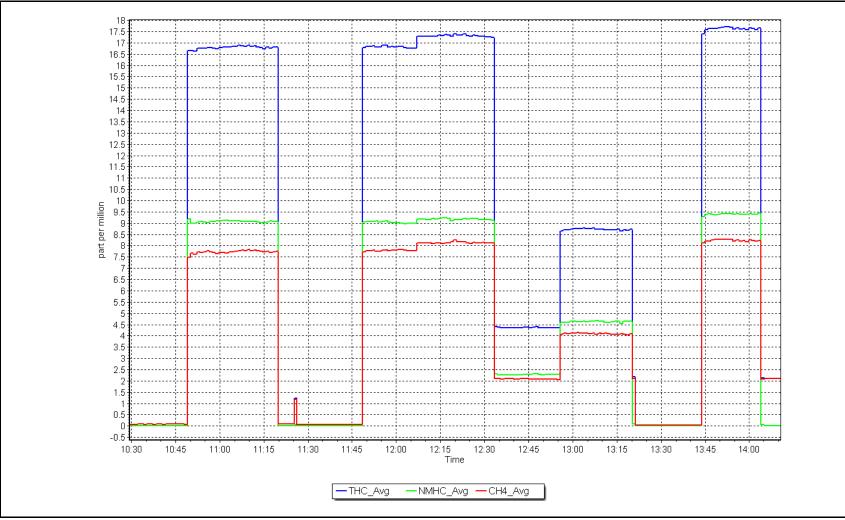
Calibration Date:	April 3, 2024	Previous Calibration:	March 1, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:20	End Time (MST):	14:11
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585647

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	<u>Limits</u>	
0.00	0.00		Correlation Coefficient	0.999994	≥0.995
9.17	9.19	0.9974	Slope	1.002583	0.90 - 1.10
4.58	4.62	0.9932	Siope	1.002385	0.50 1.10
2.29	2.30	0.9947	Intercept	0.006430	+/-0.5



#### **NMHC Calibration Plot**







### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

		Station in	ormation				
Station Name:	Stony Mountain		Station number:	Station number: AMS 18			
Calibration Date:	April 26, 2024		Last Cal Date: April 3, 2024				
Start time (MST):	13:45		End time (MST):	15:18			
Reason:	Cylinder Change	N2					
		<b>Calibration</b>	<u>Standards</u>				
Gas Cert Reference:	CC46	53851	Cal Gas Expiry Date:	February 2	23, 2025		
CH4 Cal Gas Conc.	500.8	ppm	CH4 Equiv Conc.		opm		
C3H8 Cal Gas Conc.	205.8	••		·			
Removed Gas Cert:		IA.	Removed Gas Expiry:				
Removed CH4 Conc.	500.8	ppm	CH4 Equiv Conc.	1066.8 p	opm		
Removed C3H8 Conc.	205.8		Diff between cyl (THC):				
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):				
Calibrator Model:	Teledyne	e API T700	Serial Number:	265	8		
Zero Air Gen model:			Serial Number:	360	0		
		Analyzer In	formation				
Analyzer make:	Thermo 55i		Analyzer serial #:	1193585647			
THC Range:			NMHC/CH4 Range:				
-	61 J	<b>F</b> 1. 1. 1.		61 J	<b>F</b> <sup>1</sup> · 1 · 1		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>		
CH4 SP Ratio:		3.23E-04	NMHC SP Ratio:		5.94E-05		
CH4 Retention time:		16.4	NMHC Peak Area:		154457		
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF		
		THC As Fo	und Data				
					Baseline Adjusted		
Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Correction factor		
Sectionic	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	(Cc/(Ic-AFzero))		
As found zero	5000	0.0	0.00	0.03	Limit = 0.90-1.10		
As found High point	4919	81.0	17.28	17.38	0.996		
As found Mid point	4919	81.0	17.20	17.50	0.990		
As found Low point							
New cylinder response							
	17.25	D	17.22	*0/	0.1%		
Baseline Corr AF: Baseline Corr 2nd AF:	17.35 NA	Prev response AF Slope:	17.33	*% change AF Intercept:	0.1%		
Baseline Corr 3rd AF:	NA	AF Sibpe.		* = > +/-5% change initiate	as investigation		
baseline con siu Ar.	NA	AF Correlation.					
		THC Calibra	ation Data				
	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Correction factor		
Set Point	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	(Cc/(Ic-AFzero)) <i>Limit = 0.95-1.05</i>		
Calibrator zero	5000	0.0	0.00	0.03			
High point	4919	81.0	17.28	17.44	0.991		
Mid point							
Low point							

Low point As left zero

As left span

Average Correction Factor

0.991

Notes:

N2 cylinder change



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### NMHC As Found Data

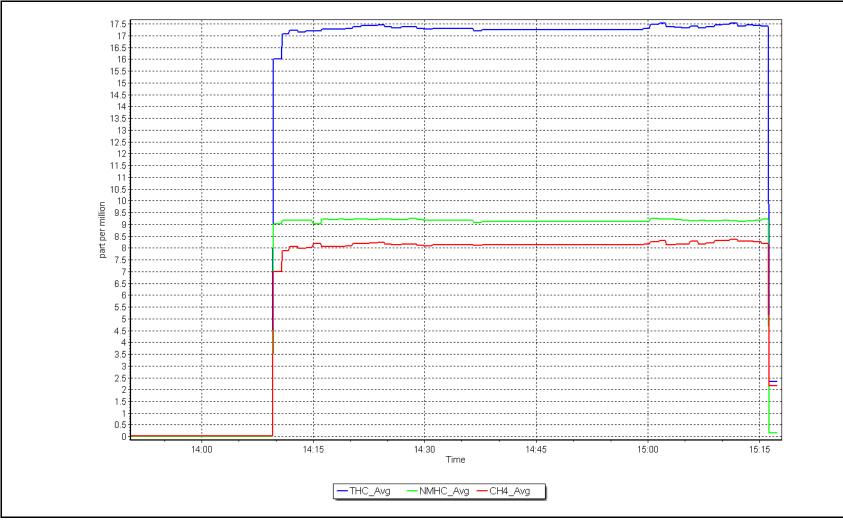
	NMHC As Fo	Dund Data		
Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration ( (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic- AFzero)) Limit = 0.90-1.10
5000 4919	0.0 81.0	0.00 9.17	0.00 9.24	0.992
9.24 NA NA	Prev response AF Slope: AF Correlation:	9.20	*% change AF Intercept:	0.4%
N/A		ation Data		
Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	(ppm) (Ic)	Limit = 0.95-1.05
5000 4919	0.0 81.0	0.00 9.17	0.00 9.17	1.000
		Avera	ge Correction Factor	1.000
	CH4 As Fou	und Data		
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
5000	0.0	0.00	0.03	
4919	81.0	8.11	8.15	1.000
8.12	Prev response	8.13	*% change	-0.2%
8.12 NA	Prev response AF Slope:	8.13	*% change AF Intercept:	-0.2%
		8.13	•	
NA	AF Slope:		AF Intercept:	
NA	AF Slope: AF Correlation:		AF Intercept:	es investigation
NA NA Dilution air flow rate	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate	tion Data Calculated concentration	AF Intercept: * => +/-5% change initiat Indicated concentration of	es investigation Correction factor (Cc/lc)
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11	AF Intercept: * => +/-5% change initiat Indicated concentration ( (ppm) (Ic) 0.03	es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration ( (ppm) (Ic) 0.03 8.27	es investigation Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>  0.981
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0 81.0 <u>Calibration</u> <u>Start</u>	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration ( (ppm) (Ic) 0.03 8.27	es investigation Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>  0.981
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0 81.0 <u>Calibration</u> <u>Start</u> 0.999037	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration ( (ppm) (Ic) 0.03 8.27 ge Correction Factor [ <u>Finish</u> 1.007271	es investigation Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>  0.981
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0 81.0 <u>Calibration</u> <u>Start</u> 0.999037 0.068218	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration of (ppm) (Ic) 0.03 8.27 ge Correction Factor <u>Finish</u> 1.007271 0.033000	es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  0.981
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: CH4 Calibra Source gas flow rate (sccm) 0.0 81.0 Calibration Start 0.999037 0.068218 0.994973	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration of (ppm) (Ic) 0.03 8.27 ge Correction Factor <u>Finish</u> 1.007271 0.033000 1.015289	es investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  0.981
NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>CH4 Calibra</u> Source gas flow rate (sccm) 0.0 81.0 <u>Calibration</u> <u>Start</u> 0.999037 0.068218	tion Data Calculated concentration (ppm) (Cc) 0.00 8.11 Avera	AF Intercept: * => +/-5% change initiat Indicated concentration of (ppm) (Ic) 0.03 8.27 ge Correction Factor <u>Finish</u> 1.007271 0.033000	es investigation Correction factor (Cc/lc) Limit = 0.95-1.05  0.981
	(sccm) 5000 4919 9.24 NA NA Dilution air flow rate (sccm) Dilution air flow rate (sccm)	Dilution air flow rate (sccm)Source gas flow rate (sccm)50000.0491981.09.24Prev response AF Slope: AF Correlation:NAAF Correlation:Dilution air flow rate (sccm)Source gas flow rate (sccm)50000.0491981.0	Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)50000.00.00491981.09.179.24 NA AFPrev response AF Slope: AF Correlation:9.20NA NAAF Correlation:Calculated concentration (ppm) (Cc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)50000.00.00491981.09.17Dilution air flow rate (sccm)CH4 As Four DataDilution air flow rate (sccm)Source gas flow rate (sccm)CH4 As Four DataDilution air flow rate (sccm)Source gas flow rate (ppm) (Cc)Avera50000.00.000.0050000.00.000.0050000.00.000.0050000.00.000.00	Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)Indicated concentration ( (ppm) (lc)50000.00.000.00491981.09.179.249.24Prev response AF Slope: AF Correlation:9.20*% change AF Intercept: * => +/-5% change initiatDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (lc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (lc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (lc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (lc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (lc)Indicated concentration ( (ppm) (lc)Dilution air flow rate (sccm)Source gas flow rate (sccm)Calculated concentration (ppm) (Cc)Indicated concentration ( (ppm) (lc)

Calibration Performed By:

#### NMHC Calibration Plot









**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Stony Mountain	NO Gas Cylinder #:	T26DHGA	Cal Gas Expiry Date:	November 17, 2026
Station number:	AMS 18	NOX Cal Gas Conc:	48.28 ppm	NO Cal Gas Conc:	47.58 ppm
Calibration Date:	April 23, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	: NA
Last Cal Date:	March 26, 2024	Removed Gas NOX Conc:	48.28 ppm	Removed Gas NO Conc:	47.58 ppm
Start time (MST):	9:52	NOX gas Diff:		NO gas Diff:	
End time (MST):	14:53	Calibrator Model:	Teledyne API T700	Serial Number:	2658
Reason:	Routine	ZAG make/model:	Teledyne API T701	Serial Number:	13779

#### 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	0.1		
AF High point	4916	84.0	811.1	799.3	11.8	811.7	800.3	11.3	0.9991	0.9986
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	809.1 ppb	NO = 797.8	ppb	* = > +/-59	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	0.3%
Baseline Corr 1	st pt NO <sub>x</sub> =	811.8 ppb	NO = 800.5	ppb	<u>As Foun</u>	d Statistics		*Percent Chan	ge NO =	0.3%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>X</sub> $r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calibr	ration Data				
								Baseline Adjus		
O3 Setpo	pint (ppb)	Indicated NO Re concentration		cated NO Drop entration (ppb)	Calculated No concentration (pp		dicated NO2 ntration (ppb) (Ic)	Correction f (Cc/(Ic-AFz		verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1336160	0088			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.998146	1.003895
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-0.500000	-0.640000
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.998819	1.005239
NO coeff or slope:	1.119	1.119	NO bkgnd or offset:	3.1	3.1	NO Cal Offset:	-0.600000	-1.220000
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	3.2	3.1	NO <sub>2</sub> Cal Slope:	0.999802	1.001293
NO2 coeff or slope:	0.999	0.999	Reaction cell Press:	253.2	256.4	NO <sub>2</sub> Cal Offset:	0.793514	-0.223061

#### **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	4916	84.0	811.1	799.3	11.8	813.7	802.7	11.1	0.9968	0.9958
Mid point	4958	42.0	405.6	399.7	5.9	407.0	400.5	6.6	0.9964	0.9979
Low point	4979	21.0	202.8	199.8	2.9	201.6	198.2	3.4	1.0058	1.0083
As left zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.1		
As left span	4916	84.0	811.1	371.4	439.7	816.5	371.4	445.1	0.9934	1.0000
							Average Co	orrection Factor	0.9997	1.0007

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	0.1		
High GPT point	801.4	372.2	441.0	441.6	0.9986	100.1%
Mid GPT point	801.4	588.1	225.1	224.6	1.0020	99.8%
Low GPT point	801.4	696.6	116.6	116.4	1.0014	99.9%
				Average Correction Factor	1.0007	99.9%

Notes:

No adjustments needed.

Calibration Performed By:

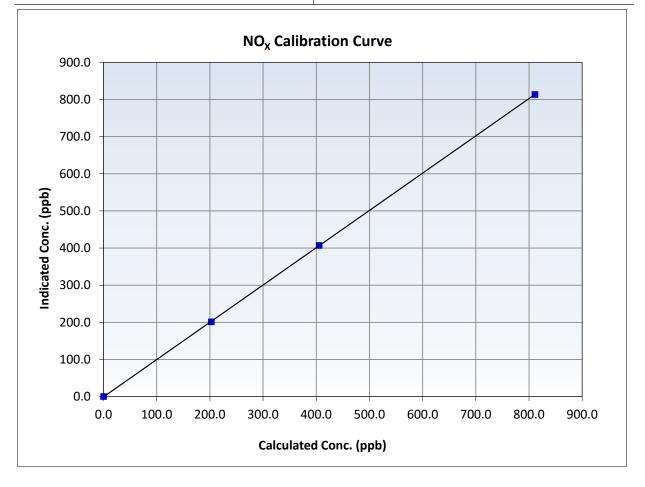


### Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 26, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:52	End Time (MST):	14:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1336160088

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999993	≥0.995
811.1 405.6	813.7 407.0	0.9968 0.9964	Slope	1.003895	0.90 - 1.10
202.8	201.6	1.0058	Intercept	-0.640000	+/-20



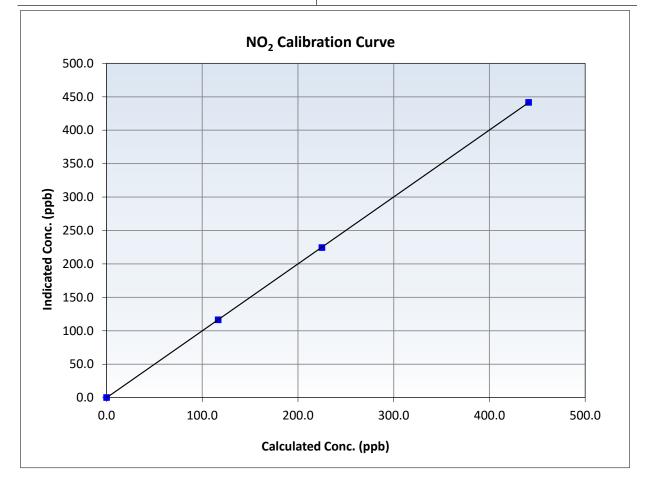


## Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 26, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:52	End Time (MST):	14:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1336160088

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	lation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999995	≥0.995
441.0 225.1	441.6 224.6	0.9986 1.0020	Slope	1.001293	0.90 - 1.10
116.6	116.4	1.0014	Intercept	-0.223061	+/-20



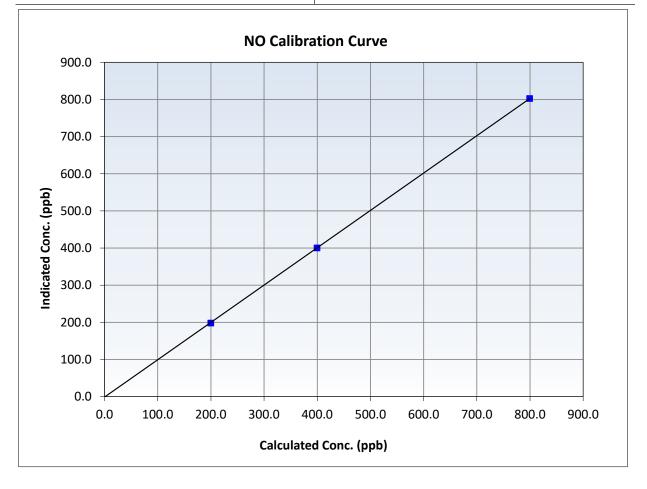


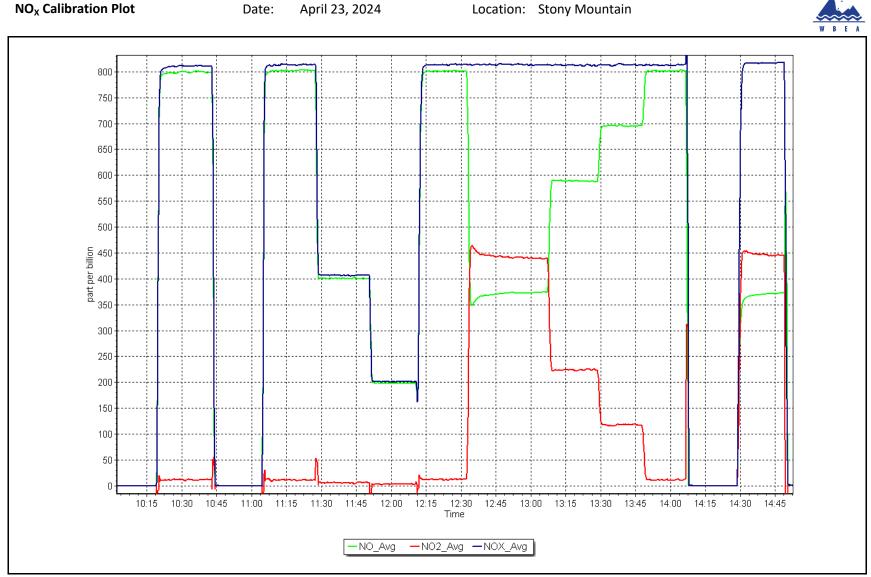
## Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 26, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	9:52	End Time (MST):	14:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1336160088

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999990	≥0.995
799.3 399.7	802.7 400.5	0.9958 0.9979	Slope	1.005239	0.90 - 1.10
199.8	198.2	1.0083	Intercept	-1.220000	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST):	Stony Mountain April 11, 2024 10:35		Station number: AMS Last Cal Date: Mar End time (MST): 14:0	ch 20, 2024
Reason:	Routine			2
		Calibration St	andards	
O3 generation mode:	Photometer			
Calibrator Make/Model:	Teledyne API T700		Serial Number: 2658	3
ZAG Make/Model:	Teledyne API 701H		Serial Number: 360	
		Analyzer Info	rmation	
Analyzer make:	API T400		Analyzer serial #: 825	
Analyzer Range	0 - 500 ppb		.,	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>
Calibration slope:	0.995743	1.000029	Backgd or Offset:	0.3
Calibration intercept:	0.220000	-0.180000	Coeff or Slope:	0.982

#### O<sub>3</sub> 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	4804	1141.9	400.0	402.0	0.994
As found Mid point					
As found Low point					
Baseline Corr As found:	402.4	Previous response	398.5	*% change	1.0%
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation

#### **O<sub>3</sub> 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	NA	0.0	-0.2	
High point	4888	1138.1	400.0	399.7	1.001
Mid point	4888	884.5	200.0	200.2	0.999
Low point	4888	741.4	100.0	99.6	1.004
As left zero	5000	NA	0.0	-0.1	
As left span	4812	1097.9	400.0	403.0	0.993
			Averag	e Correction Factor	1.001

#### Notes:

No adjustments needed.

Calibration Performed By:

Aswin Sasi Kumar

<u>Finish</u> 0.3 0.982

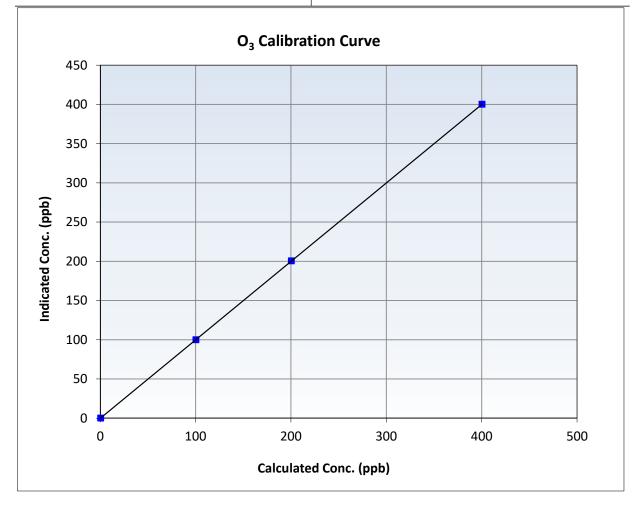


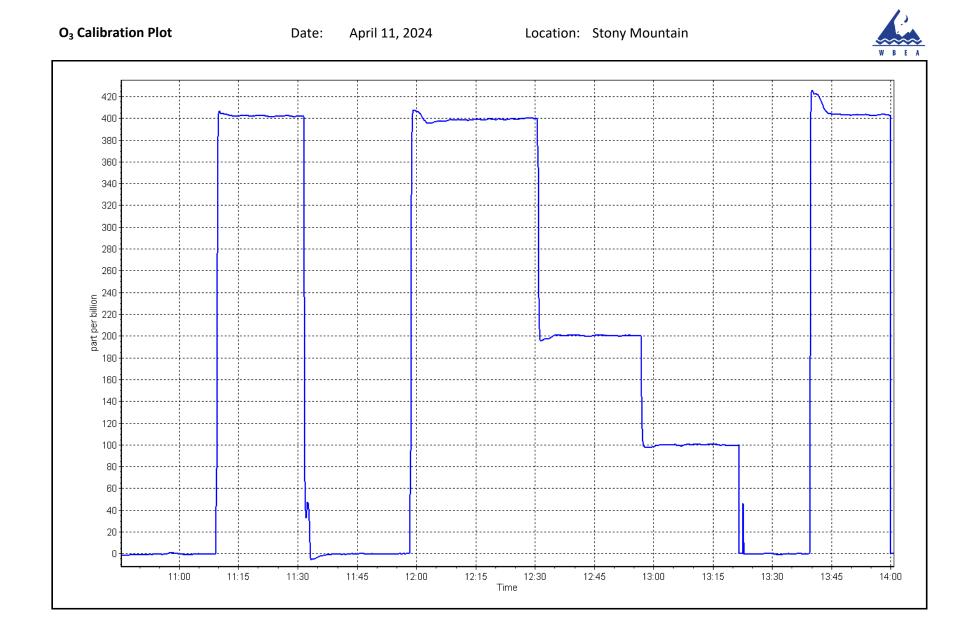
## Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 20, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	10:35	End Time (MST):	14:02
Analyzer make:	API T400	Analyzer serial #:	825

Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999998	≥0.995
400.0 200.0	399.7 200.2	1.0008 0.9990	Slope	1.000029	0.90 - 1.10
100.0	99.6	1.0040	Intercept	-0.180000	+/- 5







### Wood Buffalo Environmental Association

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

W B E A					Version-01-202
		Station Informatio	on		
Station Name: Calibration Date: Start time (MST):	Stony Mountain April 26, 2024 13:07		Station number: AN Last Cal Date: Ma End time (MST): 13	arch 27, 2024	
Analyzer Make: Particulate Fraction:	API T640 PM2.5		S/N: 11	62	
Flow Meter Make/Model: Femp/RH standard:	Alicat FP-25BT Alicat FP-25BT		S/N: 38 S/N: 38		
		Monthly Calibration	Test		
<u>Parameter</u>	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	7.4	7.6	7.4		+/- 2 °C
P (mmHg)	701.2	702.4	701.2		+/- 10 mmHg
Flow (LPM)	5.02	5.03	5.02		+/- 0.25 LPM
PW% (pump)	37		37		>80%
Zero Verification	PM w/o HEPA:	2.4	PM w/ HEPA:	0.0	<0.2 ug/m3
SPAN DUST	Refractive Index:	Quarterly Calibration	Test Expiry Date:	October 10, 2	2024
	Lot No.: 1	100128-050-042			
<u>Parameter</u>	<u>As found</u>	Dect maintenance	A - 1 - Ft	ام مانی ما	<i></i>
DNAT Deals Test		Post maintenance	<u>As left</u>	<u>Adjusted</u>	(Limits)
PMT Peak Test	N/A	Post maintenance	<u>As left</u> N/A		( <i>Limits)</i> +/- 0.5
Date Optical Chan Date Disposable F	nber Cleaned:	February 2 February 2	N/A 1, 2024		
Date Optical Chan Date Disposable F	nber Cleaned: ilter Changed:	February 2	N/A 1, 2024	<0.2 ug/m3	
Date Optical Chan Date Disposable F	nber Cleaned: ilter Changed:	February 2 February 2	N/A 1, 2024 1, 2024		
Date Optical Chan Date Disposable F Post- maintenance Zero Ve	nber Cleaned: ilter Changed: rification:	February 2 February 2 PM w/ HEPA: Annual Maintenan	N/A 1, 2024 1, 2024 ce		
Date Optical Chan Date Disposable F	nber Cleaned: ilter Changed: rification: be Cleaned:	February 2 February 2 PM w/ HEPA:	N/A 1, 2024 1, 2024 ce 0, 2022		
Date Optical Chan Date Disposable F Post- maintenance Zero Ve Date Sample Tu	nber Cleaned: ilter Changed: rification: be Cleaned:	February 2 February 2 PM w/ HEPA: Annual Maintenan August 30 August 30	N/A 1, 2024 1, 2024 ce 0, 2022	<0.2 ug/m3	

Calibration by:



### Wood Buffalo Environmental Association **CO** Calibration Report

#### Station Information

Station Name:	Stony Mou
Calibration Date:	April 5, 202
Start time (MST):	11:20
Reason:	Routine

untain 24

Station number: AMS 18 Last Cal Date: March 14, 2024 End time (MST): 14:03

#### **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 T701	Н	Serial Number: 355
		Ana	lyzer Information

#### Analyzer make: API T300 Analyzer serial #: 3504 Analyzer Range: 0 - 50 ppm <u>Start</u> Finish <u>Start</u> **Finish** Calibration slope: 0.996462 1.006642 Backgd or Offset: -0.010 -0.010 Calibration intercept: 0.037795 0.249837 Coeff or Slope: 0.905 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 As found Mid point As found Low point New cylinder response	4933	66.7	41.1	41.5	0.996
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	41.27 NA NA	Prev response: AF Slope: AF Correlation:	40.98	*% change: AF Intercept: * = > +/-5% change initiate	0.7% es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.2	
High point	4933	66.7	41.1	41.5	0.990
Mid point	4966	33.3	20.5	21.1	0.970
Low point	4983	16.7	10.3	10.5	0.980
As left zero	5000	0.0	0.0	0.2	
As left span	4933	66.7	41.1	41.4	0.992
			Avera	ge Correction Factor	0.980

Notes:

No adjustments needed.

Calibration Performed By:

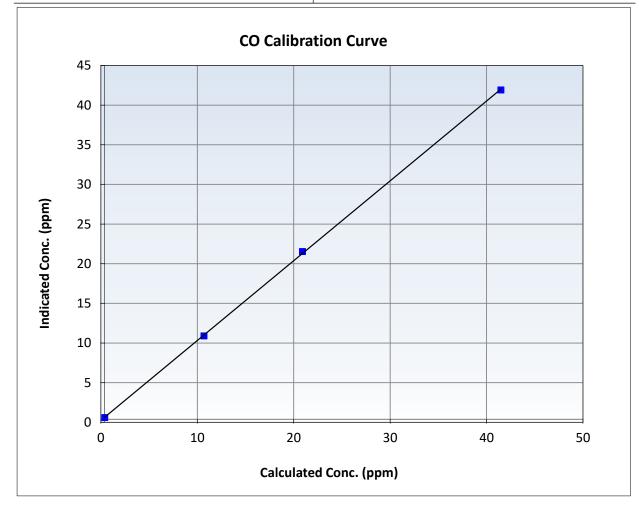


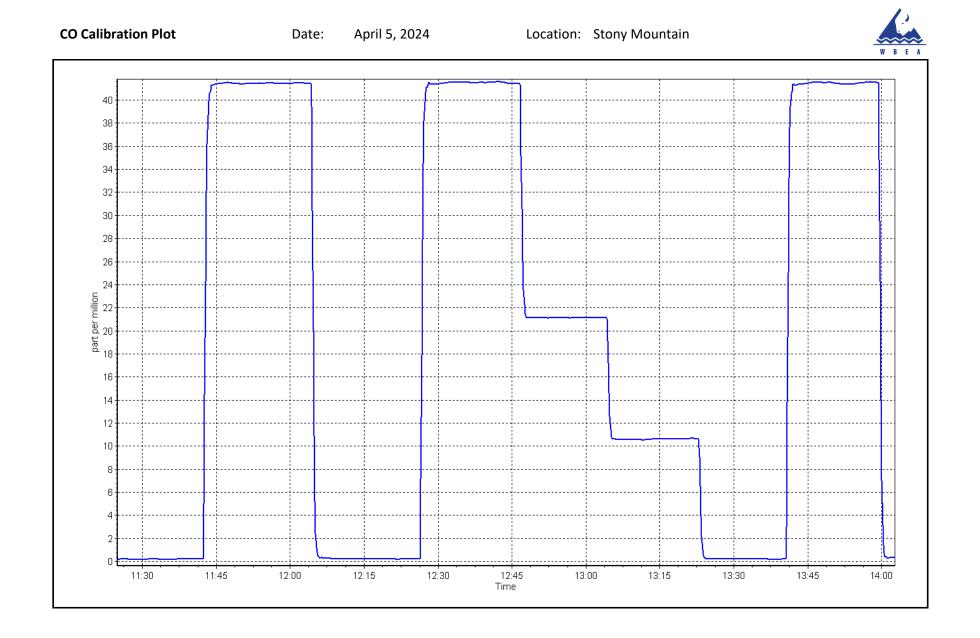
## Wood Buffalo Environmental Association CO Calibration Summary

#### **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 14, 2024
Station Name:	Stony Mountain	Station Number:	AMS 18
Start Time (MST):	11:20	End Time (MST):	14:03
Analyzer make:	API T300	Analyzer serial #:	3504

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999916	≥0.995
41.1 20.5	41.5 21.1	0.9896 0.9705	Slope	1.006642	0.90 - 1.10
10.3	10.5	0.9798	Intercept	0.249837	+/-1.5







Analyzer make:

Analyzer Range

## Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Stony Mountain
Calibration Date:	April 26, 2024
Start time (MST):	10:05
Reason:	Routine

API T360

0 - 2,000 ppm

Station number: AMS 18 Last Cal Date: March 21, 2024 End time (MST): 13:47

#### **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:	Peak Scientific		Serial Number: 771048317

#### **Analyzer Information**

Analyzer serial #: 489

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.000660	1.006157	Backgd or Offset:	-0.037	-0.037
Calibration intercept:	-4.780000	-3.120000	Coeff or Slope:	0.939	0.939

#### CO<sub>2</sub> 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	0.1	
As found High Point As found Mid Point As found Low Point New cylinder response	2920	80.0	1576.0	1581.2	0.997
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	1581.1 NA NA	Prev response: AF Slope: AF Correlation:	1572.3	*% change: AF Intercept: * = > +/-5% change initiat	0.6% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	3000	0.0	0.0	0.5	
High point	2920	80.0	1576.0	1586.2	0.994
Mid point	2960	40.0	788.0	782.5	1.007
Low point	2980	20.0	394.0	393.3	1.002
As left zero	3000	0.0	0.0	0.0	
As left span	2930	80.0	1570.8	1584.0	0.992
			Avera	ge Correction Factor	1.001

Notes:

No adjustments needed.

Calibration Performed By:

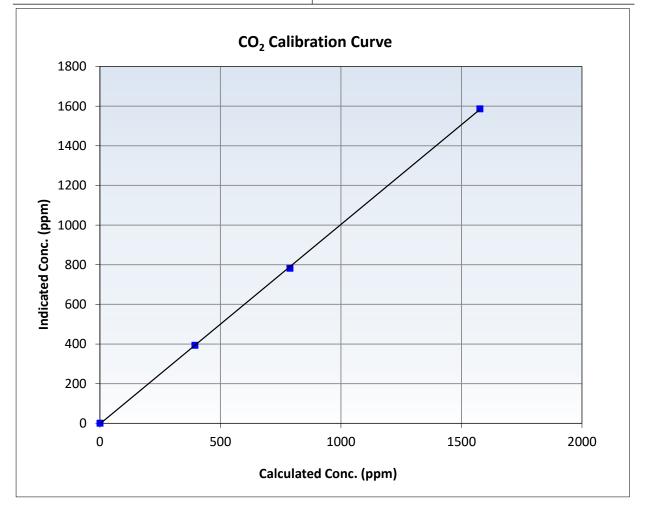


## Wood Buffalo Environmental Association CO<sub>2</sub> Calibration Summary

#### **Station Information**

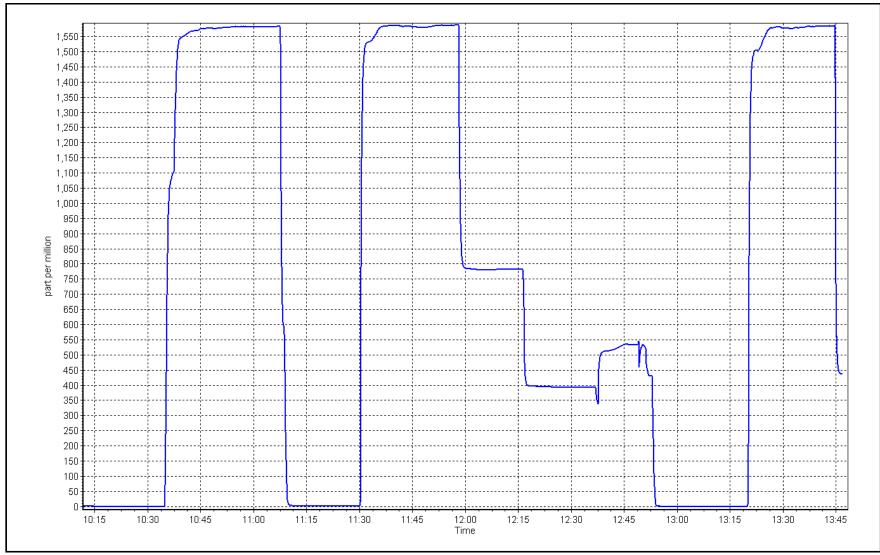
Calibration Date	April 26, 2024	Previous Calibration	March 21, 2024
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	10:05	End Time (MST)	13:47
Analyzer make	API T360	Analyzer serial #	489

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/lc)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999943	≥0.995
1576.0 788.0	1586.2 782.5	0.9936 1.0070	Slope	1.006157	0.90 - 1.10
394.0	393.3	1.0018	Intercept	-3.1	+/-20











### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS19 FIREBAG APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

## **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Firebag
Calibration Date:	April 22,
Start time (MST):	10:11
Reason:	Routine

2024

Thermo 43i

0 - 1000 ppb

Station number: AMS 19 Last Cal Date: March 12, 2024 End time (MST): 13:21

#### **Calibration Standards**

49.29 CC716618	ppm	Cal Gas Exp Date: February 23, 2025
49.29	ppm	Rem Gas Exp Date: NA
		Diff between cyl:
Teledyne API T700	C	Serial Number: 1607
Teledyne API T702	1H	Serial Number: 201
	CC716618 49.29 Teledyne API T700	CC716618

#### **Analyzer Information**

Serial Number: 1410661308

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997705	0.996719	Backgd or Offset:	10.5	10.6
Calibration intercept:	0.418240	0.438192	Coeff or Slope:	0.991	0.991

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4919	81.1	799.5	797.0	1.003
Baseline Corr As found: Baseline Corr 2nd AF pt:	797.1 NA	Previous response AF Slope:	798.1	*% change AF Intercept:	-0.1%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	4999	0.0	0.0	-0.1	
High point	4919	81.1	799.5	796.8	1.003
Mid point	4959	40.6	400.3	400.3	1.000
Low point	4980	20.3	200.1	200.0	1.001
As left zero	4999	0.0	0.0	0.2	
As left span	4919	81.1	799.5	799.2	1.000
			Averag	ge Correction Factor:	1.001

Notes:

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

Calibration Performed By:

Braiden Boutilier

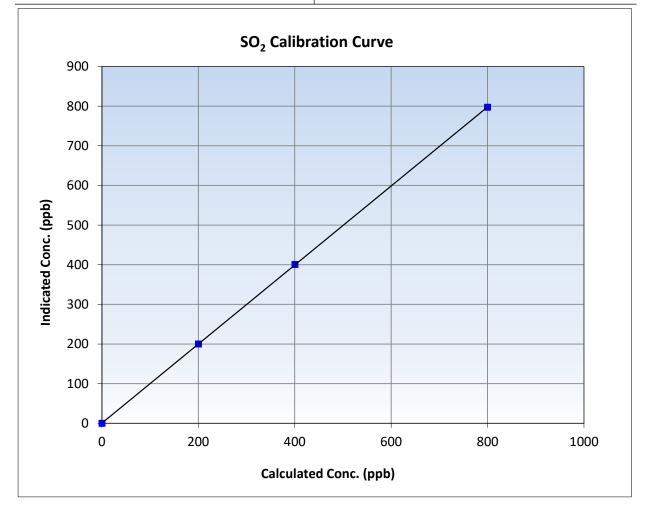


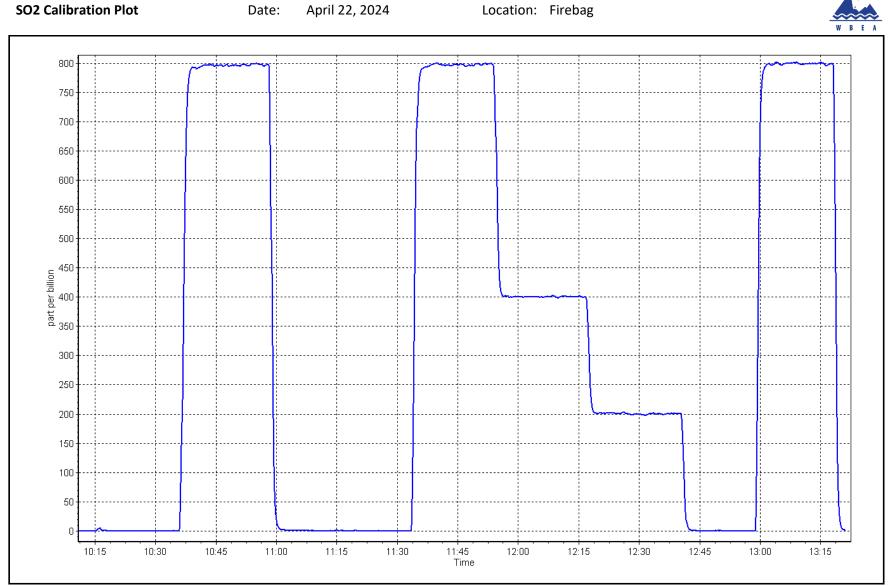
## Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 22, 2024	Previous Calibration:	March 12, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:11	End Time (MST):	13:21
Analyzer make:	Thermo 43i	Analyzer serial #:	1410661308

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999996	≥0.995
799.5 400.3	796.8 400.3	1.0033 0.9999	Slope	0.996719	0.90 - 1.10
200.1	200.0	1.0005	Intercept	0.438192	+/-30







## Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

		-					
Station Name: Calibration Date:	Firebag April 16, 2024		Station number: Last Cal Date:	AMS 19 March 5, 2024			
Start time (MST):	10:19		End time (MST):	14:48			
Reason:	Routine						
		Calibration S	tandards				
Cal Gas Concentration:	5.114	ppm	Cal Gas Exp Date:	February 5, 202	24		
Cal Gas Cylinder #:	CC517427						
Removed Cal Gas Conc:	5.114	ppm	Rem Gas Exp Date:	n/a			
Removed Gas Cyl #:	n/a		Diff between cyl:				
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607			
ZAG Make/Model:	Teledyne API T701		Serial Number:	201			
		Analyzer Info	ormation				
Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680032			
Converter make:	Global		Converter serial #:	2022-222			
Analyzer Range	0 - 100 ppb		Converter Temp:		350	degC	2
	Start	Finish		<u>Start</u>			ŀ
Calibration slope:	0.999337	1.001197	Backgd or Offset:				
Calibration intercept:	-0.081535	0.078370	Coeff or Slope:				
•			•				

#### 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)) <i>Limit = 0.90-1.10</i>	
As found zero	5000	0.0	0.0	-0.5		
As found High point	4922	78.2	80.0	83.0	0.958	
As found Mid point	4961	39.1	40.0	41.2	0.959	
As found Low point	4980	19.6	20.0	20.4	0.959	
New cylinder response						
Baseline Corr As found:	83.5	Prev response:	79.85	*% change:	4.4%	
Baseline Corr 2nd AF pt:	41.7	AF Slope:	1.044074	AF Intercept:	-0.522523	
Baseline Corr 3rd AF pt:	20.9	AF Correlation:	1.000000	* = > +/-5% change initiate	es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4922	78.2	80.0	80.1	0.998
Mid point	4961	39.1	40.0	40.2	0.995
Low point	4980	19.6	20.0	20.2	0.992
As left zero	5000	0.0	0.0	0.1	
As left span	4922	78.2	80.0	79.3	1.009
SO2 Scrubber Check	4922	78.3	783.0	0.0	
Date of last scrubber chan	ge:	18-Jan-23		Ave Corr Factor	0.995
Date of last converter efficiency test:		n/a			

Changed sample inlet filter after as founds. Adjusted zero and span.

Notes:

Calibration Performed By:

Braiden Boutilier

Version 02-2024 CALS\_325

Finish 2.72 1.163



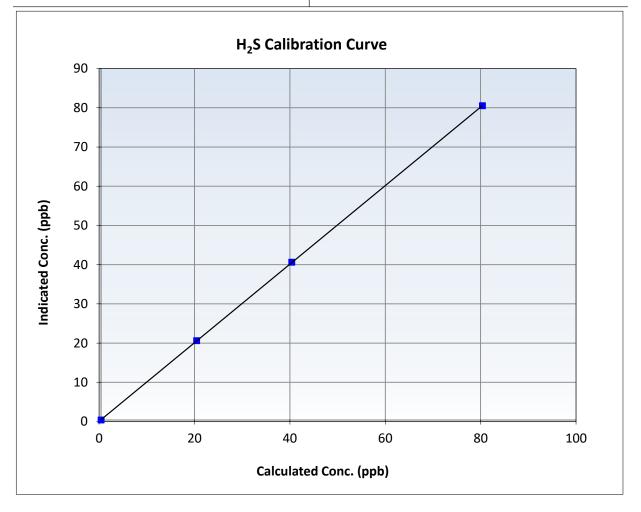
# **Wood Buffalo Environmental Association**

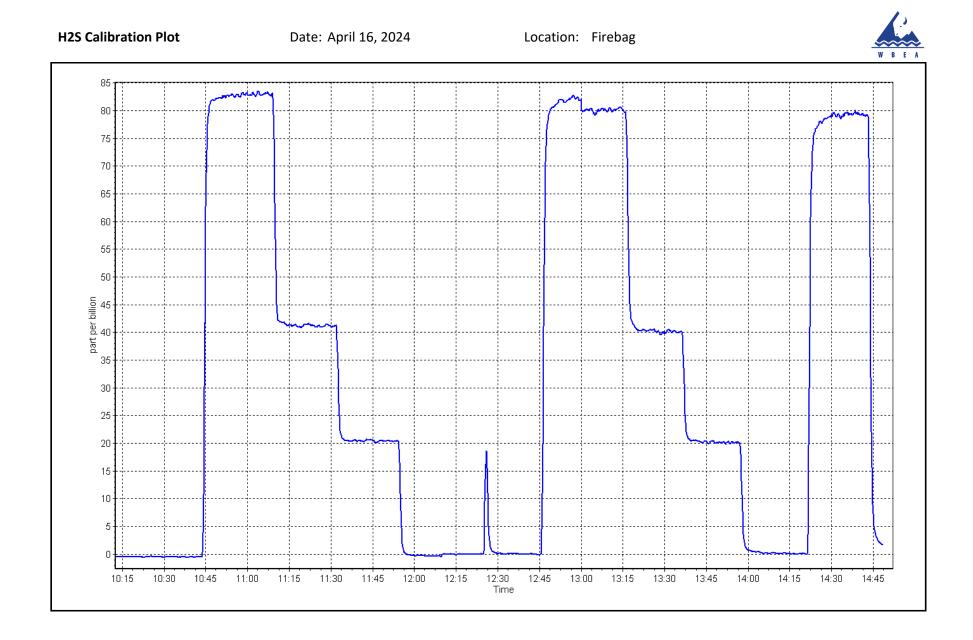
## **H2S Calibration Summary**

#### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 5, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:19	End Time (MST):	14:48
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680032

	Calibration Data								
Calculated concentration Indicated concentration (ppb) (Cc) (ppb) (Ic)		Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>				
0.0	0.0		Correlation Coefficient	0.999995	≥0.995				
80.0	80.1	0.9985	Slope	1.001197	0.90 - 1.10				
40.0	40.2	0.9948	Slope	1.001197	0.90 - 1.10				
20.0	20.2	0.9925	Intercept	0.078370	+/-3				







# **Wood Buffalo Environmental Association THC Calibration Report**

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Firebag April 22, 2024 10:11 Routine		Station number: Last Cal Date: End time (MST):	AMS 19 March 12, 2024 13:21		
		Calibration S	tandards			
Gas Cert Reference:	CC71	6618	Cal Gas Expiry Date:	February 23, 2025		
CH4 Cal Gas Conc.	500.7	ppm	CH4 Equiv Conc.	1066.9	ppm	
C3H8 Cal Gas Conc.	205.9	ppm				
Removed Gas Cert:			Removed Gas Expiry:			
Removed CH4 Conc.	500.7	ppm	CH4 Equiv Conc.	1066.9	ppm	
Removed C3H8 Conc.	205.9	ppm	Diff between cyl:			
Calibrator Make/Model:	Teledyne API T700		Serial Number:	1607		
ZAG Make/Model:	Teledyne API T701	4	Serial Number:	201		
		Analyzer Info	ormation			
Analyzer make	: Thermo 51i-LT		Analyzer serial #:	1336160089		
Analyzer Range						
	<u>Start</u>	<b>Finish</b>		<u>Start</u>	<u>Finish</u>	
Calibration slope:	1.003849	0.996237	Background:	2.15	1.99	
Calibration intercept:	-0.040348	0.011064	Coefficient:	3.788	3.757	
THC As Found Data         Baseline Adjusted           Set Point         Dilution air flow rate         Source gas flow rate         Calculated Concentration         Indicated Concentration Correction factor (Cc/(Ic))						
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)		Indicated Concentration (ppm) (Ic)	•	
	(sccm)	(sccm)	Calculated Concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10	
As found zero	(sccm) 4999	(sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10	
As found zero As found High point	(sccm)	(sccm)	Calculated Concentration (ppm) (Cc)	(ppm) (Ic)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10	
As found zero As found High point As found Mid point	(sccm) 4999	(sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06	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	(sccm) 4999	(sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10	
As found zero As found High point As found Mid point	(sccm) 4999	(sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06	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:	(sccm) 4999	(sccm) 0.0 81.1 Previous response	Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 4999 4919	(sccm) 0.0 81.1 Previous response AF Slope:	Calculated Concentration (ppm) (Cc) 0.00 17.31	(ppm) (Ic) -0.06 17.32 *% change AF Intercept:	Correction factor (Cc/(Ic- AFzero) <i>Limit = 0.90-1.10</i>  0.996	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found:	(sccm) 4999 4919 17.38	(sccm) 0.0 81.1 Previous response	Calculated Concentration (ppm) (Cc) 0.00 17.31	(ppm) (Ic) -0.06 17.32 *% change	Correction factor (Cc/(Ic- AFzero) <i>Limit = 0.90-1.10</i>  0.996	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 4999 4919 17.38 NA	(sccm) 0.0 81.1 Previous response AF Slope:	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33	(ppm) (Ic) -0.06 17.32 *% change AF Intercept:	Correction factor (Cc/(Ic- AFzero) <i>Limit = 0.90-1.10</i>  0.996	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 4999 4919 17.38 NA	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation:	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * = > +/-5% change initia	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3%	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	(sccm) 4999 4919 17.38 NA NA NA	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ion Data Calculated Concentration	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * =>+/-5% change initia	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% attes investigation	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point	(sccm) 4999 4919 17.38 NA NA NA Dilution air flow rate (sccm)	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ition Data Calculated Concentration (ppm) (Cc)	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (Ic)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero	(sccm) 4999 4919 17.38 NA NA NA Dilution air flow rate (sccm) 4999	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ion Data Calculated Concentration (ppm) (Cc) 0.00	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * =>+/-5% change initia Indicated Concentration (ppm) (Ic) 0.05	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point	(sccm) 4999 4919 17.38 NA NA Dilution air flow rate (sccm) 4999 4919	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.1	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.31	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * =>+/-5% change initia Indicated Concentration (ppm) (Ic) 0.05 17.27	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Baseline Corr 3rd AF pt: Calibrator zero High point Mid point	(sccm) 4999 4919 17.38 NA NA Dilution air flow rate (sccm) 4999 4919 4959	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.1 40.6	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.31 8.66	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * =>+/-5% change initia Indicated Concentration (ppm) (Ic) 0.05 17.27 8.62	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05	
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Baseline Corr 3rd AF pt: Calibrator zero High point Mid point Low point	(sccm) 4999 4919 17.38 NA NA Dilution air flow rate (sccm) 4999 4919 4959 4959 4980	(sccm) 0.0 81.1 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.1 40.6 20.3	Calculated Concentration (ppm) (Cc) 0.00 17.31 17.33 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.31 8.66 4.33 0.00 17.31	(ppm) (Ic) -0.06 17.32 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (Ic) 0.05 17.27 8.62 4.30	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  0.996 0.3% 0.3% tes investigation Correction factor (Cc/Ic) Limit = 0.95-1.05  1.002 1.005 1.008  0.995	

Notes:

Changed sample inlet filter after as founds. Adjusted zero.

Calibration Performed By:

Braiden Boutilier

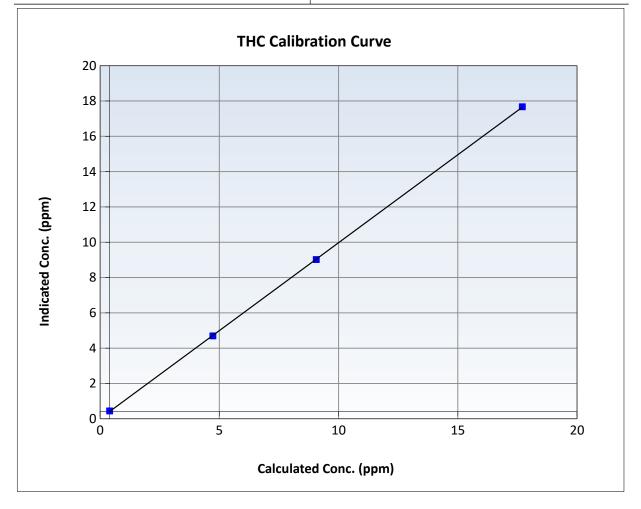


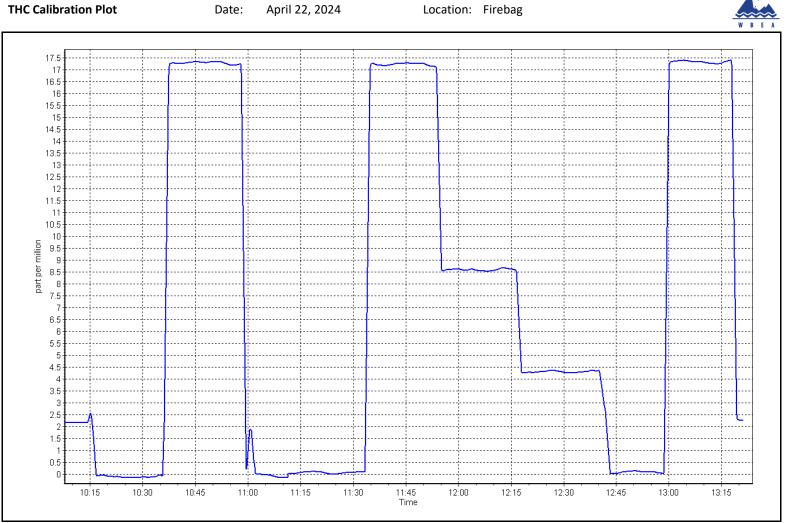
# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 22, 2024	Previous Calibration:	March 12, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:11	End Time (MST):	13:21
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1336160089

Calculated Concentration (ppm) (Cc)	Calculated Concentration Indicated Concentration (ppm) (Cc) (ppm) (Ic)		Correction factor (Cc/Ic) Statistical Evaluation			
0.00	0.05		Correlation Coefficient	0.999982	≥0.995	
17.31 8.66	17.27 8.62	1.0020 1.0051	Slope	0.996237	0.90 - 1.10	
4.33	4.30	1.0083	Intercept	0.011064		









**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name: Firebag		NO Gas Cylinder #:	DT0044018	Cal Gas Expiry Date:	November 3, 2031
Station number:	AMS 19	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.70 ppm
Calibration Date:	April 3, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Last Cal Date:	March 21, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.70 ppm
Start time (MST):	10:40	NOX gas Diff:		NO gas Diff:	
End time (MST):	13:45	Calibrator Model:	Teledyne API T700	Serial Number: 1607	,
Reason:	Maintenance	ZAG make/model:	Teledyne API T701	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)) <i>Limit = 0.90 - 1.10</i>	Baseline Adjusted NO Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>
As found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1		
AF High point	4918	82.1	802.9	799.7	3.3	772.9	767.5	5.4	1.0386	1.0418
AF Mid point	4959	41.1	402.0	400.3	1.6	387.6	383.8	3.7	1.0365	1.0428
AF Low point New cyl resp	4980	20.5	200.5	199.7	0.8	194.0	191.6	2.4	1.0324	1.0416
Previous Respo	A		NO = 805.5			% change initiates	nvestigation	*Percent Chan		-4.6%
Baseline Corr 1	Lst pt NO <sub>X</sub> =	773.1 ppb	NO = 767.6	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-4.9%
Baseline Corr 2	2nd pt NO <sub>x</sub> =	387.8 ppb	NO = 383.9	ppb	As four	nd NO <sub>x</sub> r <sup>2</sup> :	0.999997	Nx SI: 0.9624	154 Nx Int:	0.420
Baseline Corr 3	Brd pt NO <sub>x</sub> =	194.2 ppb	NO = 191.7	ppb	As four	nd NO r <sup>2</sup> :	1.000000	NO SI: 0.9598	348 NO Int:	-0.160
					As four	nd $NO_2 r^2$ :	0.999965	NO2 SI: 0.9992	NO <sub>2</sub> Int:	-0.649

#### As Found GPT Calibration Data

					Baseline Adjusted NO2	
O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero))	Converter Efficiency
	concentration (ppb)	concentration (ppb)	concentration (ppb) (cc)	concentration (ppb) (ic)	Limit = 0.90 - 1.10	Limit = 96-104%
As Found GPT zero			0.0	-0.1		
As found high GPT point	765.1	371.3	397.1	396.8	1.0007	99.9%
As found mid GPT point	765.1	568.4	200.0	197.7	1.0116	98.9%
As found low GPT point	765.1	668.2	100.2	99.7	1.0049	99.5%



#### **Analyzer Information**

### Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i	Seria	l Number: 14106	61309				<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Ca	l Slope:	1.006289	NA
		Inst	rument Settings			NO <sub>x</sub> Ca	l Offset:	0.400360	NA
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal	Slope:	1.006923	NA
NO coeff or slope:	1.040	1.040 N	O bkgnd or offset:	7.3	7.3	NO Cal	Offset:	0.340247	NA
NOX coeff or slope:	0.995	0.995 NC	X bkgnd or offset:	7.4	7.4	NO <sub>2</sub> Ca	l Slope:	0.998051	NA
NO2 coeff or slope:	1.000	1.000 Re	action cell Press:	216.5	210.3	NO <sub>2</sub> Ca	l Offset:	-0.640112	NA
			Dil	ution Calibrat	ion Data				
Set Point	on flow rate Source g (sccm) rate (s	gas flow sccm) Calculated No concentratic (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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
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/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero High GPT point Mid GPT point Low GPT point						
			Ανε	rage Correction Factor		

Notes: As founds done for maintenance. Changing reaction cell O-rings, pump and charcoal filter.

Calibration Performed By:

Braiden Boutilier



NO<sub>x</sub> Calibration Plot

Location: Firebag



**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

	-					_				
Station Name:	Firebag			NO Gas	s Cylinder #:	DT004	44018	Cal Gas Expiry E	Date: Novemb	er 3, 2031
Station number:	AMS 19			NOX Ca	al Gas Conc:	48.90	ppm	NO Cal Gas Con	48.70 dt	ppm
Calibration Date:	April 4, 2024			Remov	ed Cylinder #:	N	A	Removed Gas E	xp Date: NA	
Last Cal Date:	April 3, 2024			Remov	ed Gas NOX Con	c: 48.90	ppm	Removed Gas N	IO Conc: 48.70	ppm
Start time (MST):	10:15			NOX ga	is Diff:			NO gas Diff:		
End time (MST):	15:04			Calibra	tor Model:	Teledyne	API T700	Serial Number:	1607	
Reason:	Routine			ZAG m	ake/model:	Teledyne	API T701	Serial Number:	201	
				As Four	d Dilution Cali	bration Data				
									Baseline Adjusted	Baseline Adjusted NO
Dilution	flow rate Source	gas flow Calc	ulated NOx	Calculated NO	Calculated NO2	Indicated NOx	Indicated NO	Indicated NO2	NOx Correction factor	Correction factor
Set Point		cor	centration	concentration	concentration	concentration	concentration	concentration	(Cc/(Ic-AFzero))	(Cc/(Ic-AFzero))
		. (	ppb) (Cc)	(ppb) (Cc)	(ppb) (Cc)	(ppb) (Ic)	(ppb) (Ic)	(ppb) (Ic)	<i>Limit = 0.90 - 1.10</i>	<i>Limit = 0.90 - 1.10</i>
As found zero										
AF High point										
AF Mid point										
AF Low point										
New cyl resp										
Previous Response	NO <sub>x</sub> = NA	ppb NC	) = NA	ppb	* = > +/-5%	% change initiates i	nvestigation	*Percent Chang	ge NO <sub>x</sub> =	NA
Baseline Corr 1st pt	~		) = NA	ppb	As Foun	d Statistics		*Percent Chang		NA
Baseline Corr 2nd pt		••	D = NA	ppb	As found	2		Nx SI:	Nx Int:	
Baseline Corr 3rd pt	~		) = NA	ppb	As found			NO SI:	NO Int:	
busenne con siù pr	$NO_{\chi} - NA$	PP0 100		660	As found	2		NO2 SI:	NO INC. NO <sub>2</sub> Int:	
					AS IOUII	$100_21$ .		1102 31.	$NO_2$ IIIt.	
				Δ. Γ.		ation Data				

#### As Found GPT Calibration Data

					Baseline Adjusted NO2	
O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90 - 1.10</i>	Converter Efficiency <i>Limit = 96-104%</i>

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1410661	<u>Start</u>	<u>Finish</u>			
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.006289	0.998971
			Instrument Settings			NO <sub>x</sub> Cal Offset:	0.400360	1.739938
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.006923	1.001345
NO coeff or slope:	1.040	0.990	NO bkgnd or offset:	7.3	5.0	NO Cal Offset:	0.340247	0.620021
NOX coeff or slope:	0.995	0.995	NOX bkgnd or offset:	7.4	5.0	NO <sub>2</sub> Cal Slope:	0.998051	1.000081
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	216.5	177.5	NO <sub>2</sub> Cal Offset:	-0.640112	0.547188

#### **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	0.2		
High point	4918	82.1	802.9	799.7	3.3	803.0	801.0	1.8	0.9999	0.9983
Mid point	4959	41.1	402.0	400.3	1.6	404.2	401.8	2.4	0.9945	0.9963
Low point	4980	20.5	200.5	199.7	0.8	203.6	201.3	2.3	0.9847	0.9919
As left zero	5000	0	0.0	0.0	0.0	0.1	-0.1	0.2		
As left span	4918	82.1	802.9	384.9	418.0	804.0	384.9	419.3	0.9987	1.0000
							Average Co	orrection Factor	0.9930	0.9955

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	0.2		
High GPT point	798.0	383.8	417.5	417.7	0.9995	100.1%
Mid GPT point	798.0	593.1	208.2	209.5	0.9937	100.6%
Low GPT point	798.0	697.5	103.8	104.3	0.9951	100.5%
				Average Correction Factor	0.9961	100.4%

Notes: Calibration after maintenance done on April 3. Changed sample inlet filter. Reset calibration factors. Adjusted PMT voltage, zero and span.

Calibration Performed By:

**Braiden Boutilier** 

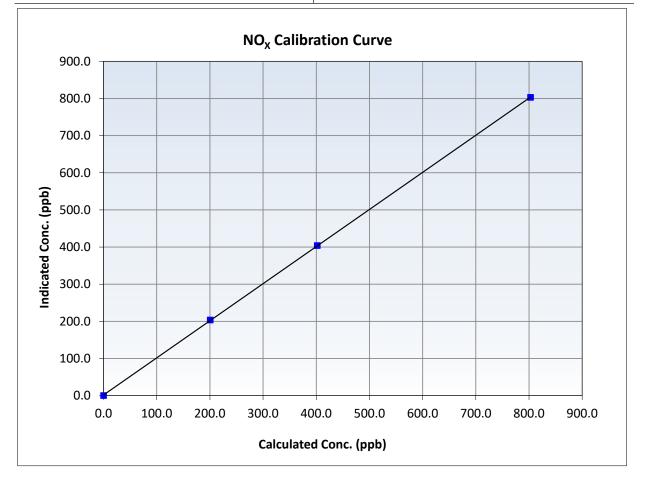


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	April 3, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:15	End Time (MST):	15:04
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999981	≥0.995
802.9 402.0	803.0 404.2	0.9999 0.9945	Slope	0.998971	0.90 - 1.10
200.5	203.6	0.9847	Intercept	1.739938	+/-20



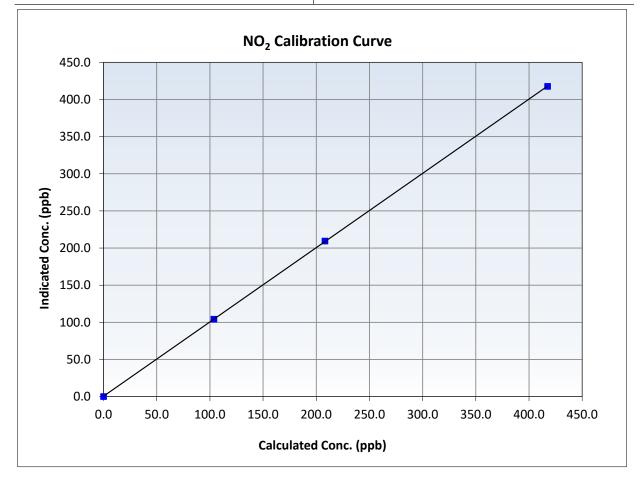


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	April 3, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:15	End Time (MST):	15:04
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.2		Correlation Coefficient	0.999991	≥0.995
417.5 208.2	417.7 209.5	0.9995 0.9937	Slope	1.000081	0.90 - 1.10
103.8	104.3	0.9951	Intercept	0.547188	+/-20



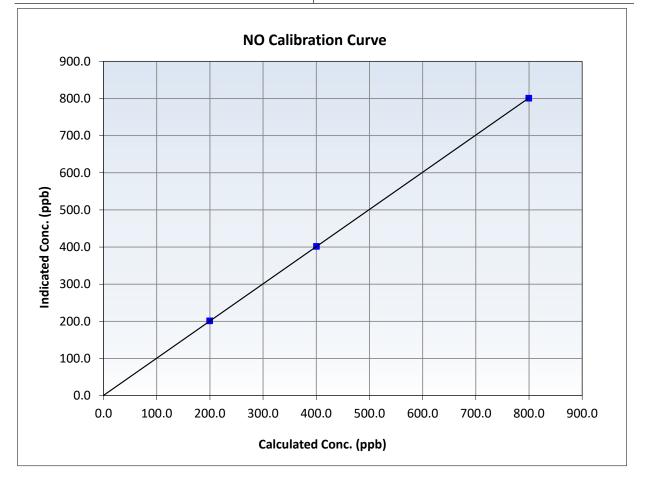


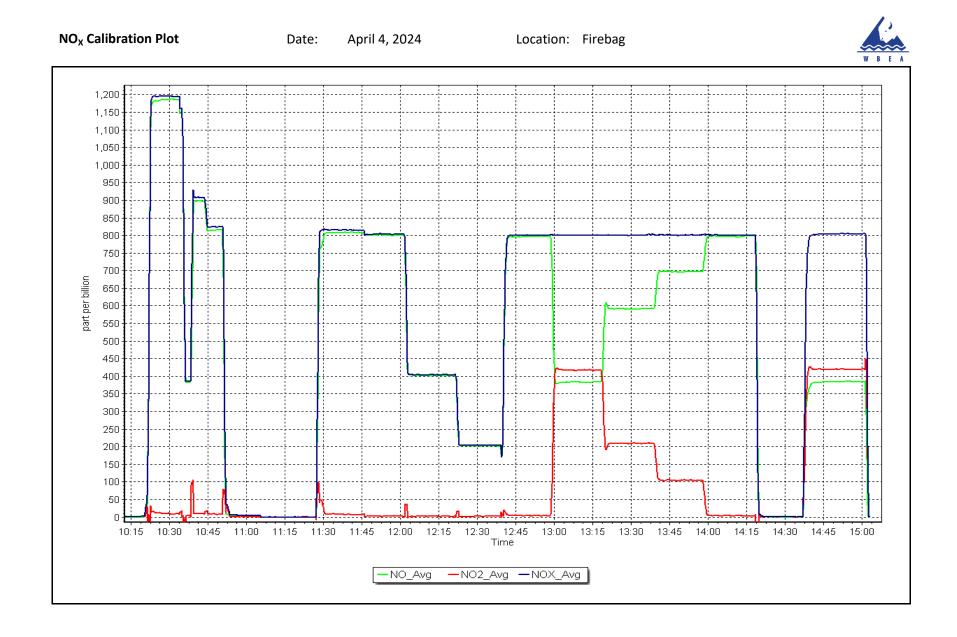
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	April 3, 2024
Station Name:	Firebag	Station Number:	AMS 19
Start Time (MST):	10:15	End Time (MST):	15:04
Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999996	≥0.995
799.7 400.3	801.0 401.8	0.9983 0.9963	Slope	1.001345	0.90 - 1.10
199.7	201.3	0.9919	Intercept	0.620021	+/-20







### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS20 MACKAY RIVER APRIL 2024

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

May 31, 2024



# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name: Calibration Date:	MacKay River April 10, 2024	Station number: AMS 20 Last Cal Date: March 7, 2024
Start time (MST):	7:46	End time (MST): 10:29
Reason:	Routine	

#### **Calibration Standards**

Cal Gas Concentration: Cal Gas Cylinder #:	49.22 CC30686	ppm	Cal Gas Exp Date: February 23, 2025
Removed Cal Gas Conc:	49.22	ppm	Rem Gas Exp Date:
Removed Gas Cyl #:			Diff between cyl:
Calibrator Model:	API T700		Serial Number: 1220
Zero Air Gen Model:	API 701		Serial Number: 4522

		Analyzer Info	ormation		
Analyzer make:	Thermo 43i		Serial Number: 15	01301450	
Analyzer Range:	0-1000ppb				
	<u>Start</u>	<b>Finish</b>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.004703	0.994567	Backgd or Offset:	19.7	19.3
Calibration intercept:	2.311780	3.111267	Coeff or Slope:	0.965	0.950

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4919	81.3	800.3	814.1	0.983
Baseline Corr As found: Baseline Corr 2nd AF pt:	814.0 NA	Previous response AF Slope:	806.3	*% change AF Intercept:	0.9%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.6	
High point	4919	81.3	800.3	798.2	1.003
Mid point	4959	40.7	400.7	401.6	0.998
Low point	4980	20.3	199.8	205.2	0.974
As left zero	5000	0.0	0.0	0.6	
As left span	4919	81.3	800.3	801.7	0.998
			Averag	e Correction Factor:	0.991

Notes:

No maintenance done. Span adjusted.

Calibration Performed By:

Melissa Lemay

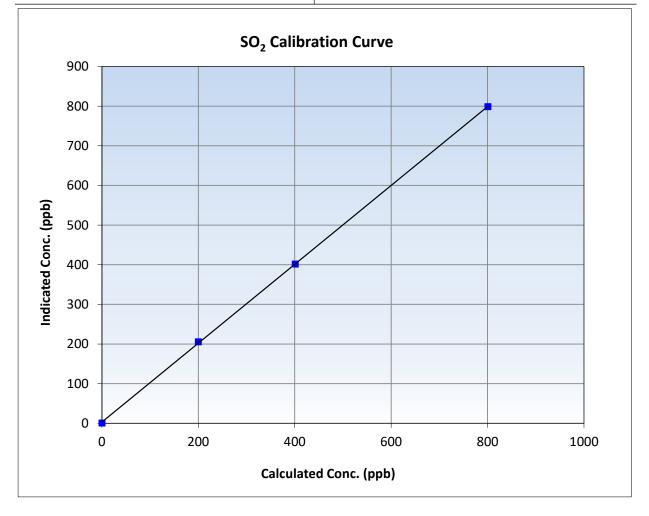


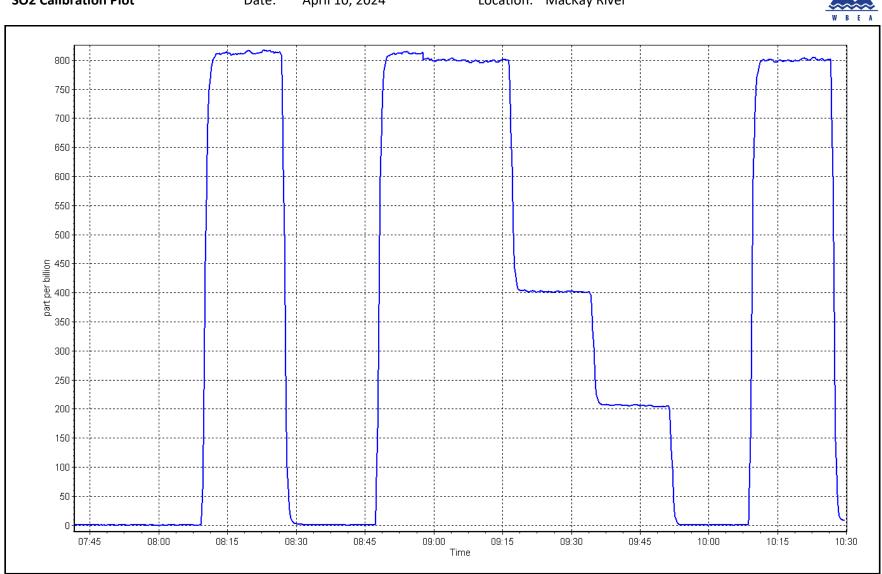
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 7, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	7:46	End Time (MST):	10:29
Analyzer make:	Thermo 43i	Analyzer serial #:	1501301450

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.6		Correlation Coefficient	0.999947	≥0.995
800.3 400.7	798.2 401.6	1.0026 0.9977	Slope	0.994567	0.90 - 1.10
199.8	205.2	0.9738	Intercept	3.111267	+/-30





Location: MacKay River



# Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date:	MacKay River April 9, 2024		Station number: Last Cal Date:	AMS 20 March 5, 2024			
Start time (MST):	6:43		End time (MST):	11:00			
Reason:	Routine						
		Calibration S	tandards				
Cal Gas Concentration: Cal Gas Cylinder #:	5.12 CC515997	ppm	Cal Gas Exp Date:	January 3, 2020	5		
Removed Cal Gas Conc: Removed Gas Cyl #:	5.12	ppm	Rem Gas Exp Date: Diff between cyl:				
Calibrator Make/Model:	API T700		Serial Number:	1220			
ZAG Make/Model:	API 701		Serial Number:	4522			
		Analyzer Info	ormation				
Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1236656117			
Converter make:	Global		Converter serial #:	2022-226			
Analyzer Range	0 - 100 ppb		Converter Temp:		325	degC	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>			ŀ
Calibration slope:	0.975111	0.984302	Backgd or Offset:	3.2			
Calibration intercept:	0.699032	0.679249	Coeff or Slope:	1.113			

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.1	
As found High point	4922	78.1	80.0	80.2	0.998
As found Mid point	4961	39.0	39.9	40.6	0.986
As found Low point	4980	19.5	20.0	20.7	0.969
New cylinder response					
Baseline Corr As found:	80.1	Prev response:	78.68	*% change:	1.8%
Baseline Corr 2nd AF pt:	40.5	AF Slope:	0.999736	AF Intercept:	0.439543
Baseline Corr 3rd AF pt:	20.6	AF Correlation:	0.999916	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.3	
High point	4922	78.1	80.0	79.2	1.010
Mid point	4961	39.0	39.9	40.2	0.993
Low point	4980	19.5	20.0	20.7	0.965
As left zero	5000	0.0	0.0	0.3	
As left span	4922	78.1	80.0	78.6	1.017
SO2 Scrubber Check	4982	81.3	802.8	0.0	
Date of last scrubber chan	ge:	25-May-23		Ave Corr Factor	0.989

Date of last converter efficiency test:

Notes: Flow sensor replaced and calibrated. Sox scrubber checked after the calibrator zero. No adjustments done.

Calibration Performed By: Melissa Lemay

Finish 3.2 1.113



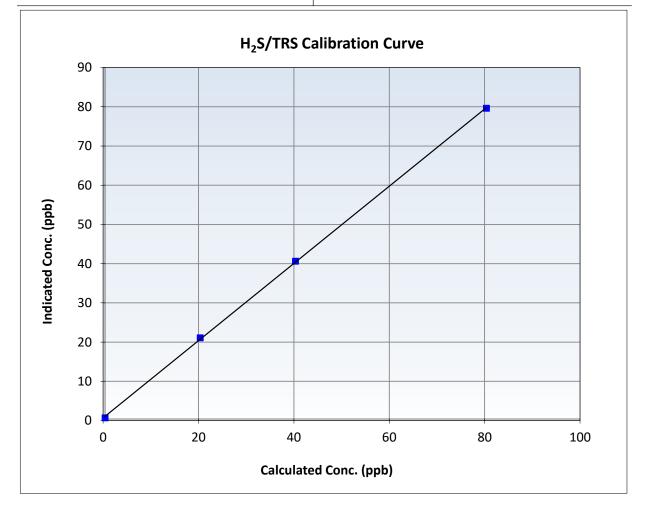
# Wood Buffalo Environmental Association

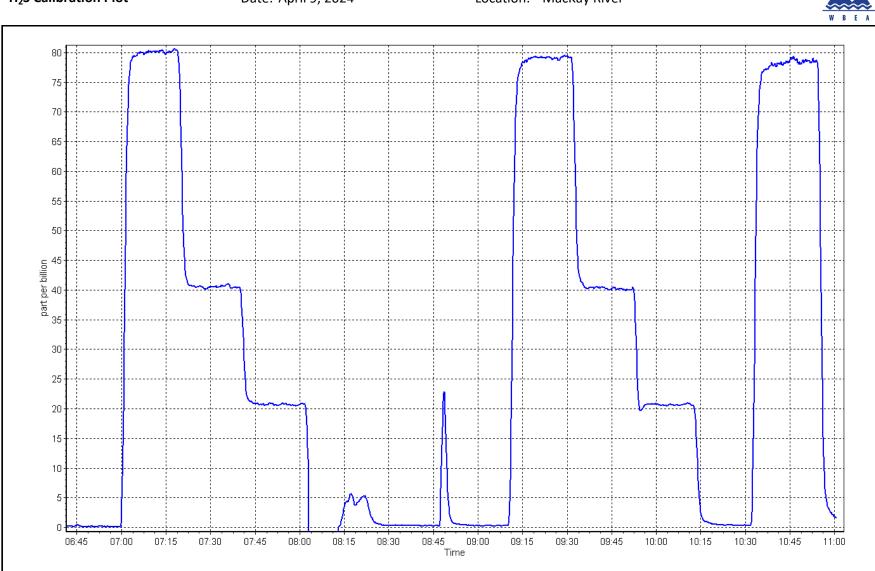
## H<sub>2</sub>S Calibration Summary

#### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	March 5, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	6:43	End Time (MST):	11:00
Analyzer make:	Global	Analyzer serial #:	2022-226

Calculated concentratior (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999894	≥0.995
80.0	79.2	1.0098	Slope	0.984302	0.90 - 1.10
39.9	40.2	0.9934	Siope	0.964302	0.90 - 1.10
20.0	20.7	0.9647	Intercept	0.679249	+/-3





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

Location: MacKay River



# Wood Buffalo Environmental Association THC Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	MacKay River April 10, 2024 8:45 Routine		Station number: Last Cal Date: End time (MST):	AMS 20 March 7, 2024 10:28	
		Calibration S	tandards		
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:	1220	
ZAG Make/Model:	API 701		Serial Number:	4522	
		Analyzer Info	ormation		
Analyzer make	: Thermo 51i-LT		Analyzer serial #:	1501663727	
Analyzer Range			, and yeer bernar at		
	Start	Finish		Start	Finish
Calibration slope:	0.997159	0.995490	Background:		3.680
Calibration intercept:	0.028212	-0.003380	Coefficient:		6.124
		THC As Fou	nd Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentratior (ppm) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic· AFzero)
	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (lc)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero	(sccm) 5000	(sccm) 0.0	(ppm) (Cc) 0.00	(ppm) (Ic) -0.03	Correction factor (Cc/(Ic AFzero) Limit = 0.90-1.10
As found zero As found High point	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (lc)	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero As found High point As found Mid point	(sccm) 5000	(sccm) 0.0	(ppm) (Cc) 0.00	(ppm) (Ic) -0.03	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	(sccm) 5000	(sccm) 0.0	(ppm) (Cc) 0.00	(ppm) (Ic) -0.03	Correction factor (Cc/(Ic AFzero) Limit = 0.90-1.10
As found zero As found High point As found Mid point	(sccm) 5000	(sccm) 0.0	(ppm) (Cc) 0.00	(ppm) (Ic) -0.03	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:	(sccm) 5000 4919 17.13	(sccm) 0.0 81.3 Previous response	(ppm) (Cc) 0.00	(ppm) (lc) -0.03 17.09 *% change	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 5000 4919 17.13 NA	(sccm) 0.0 81.3 Previous response AF Slope:	(ppm) (Cc) 0.00 17.34	(ppm) (lc) -0.03 17.09 *% change AF Intercept:	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found:	(sccm) 5000 4919 17.13	(sccm) 0.0 81.3 Previous response	(ppm) (Cc) 0.00 17.34	(ppm) (lc) -0.03 17.09 *% change	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 5000 4919 17.13 NA	(sccm) 0.0 81.3 Previous response AF Slope:	(ppm) (Cc) 0.00 17.34 17.32	(ppm) (lc) -0.03 17.09 *% change AF Intercept:	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt:	(sccm) 5000 4919 17.13 NA	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation:	(ppm) (Cc) 0.00 17.34 17.32	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.1% ates investigation
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.1% ates investigation
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate (sccm)	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm)	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration (ppm) (Cc)	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (lc)	<pre>Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.013   1.013      </pre>
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate (sccm) 5000 4919 4959	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.3 40.7	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration (ppm) (Cc) 0.00	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (lc) -0.01 17.27 8.60	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.013   correction factor (Cc/Ic) Limit = 0.95-1.05 
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Baseline Corr 3rd AF pt: Calibrator zero High point Mid point Low point	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.3 40.7 20.3	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.34 8.68 4.33	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (lc) -0.01 17.27 8.60 4.33	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.013  t.1%  Correction factor (Cc/Ic) Limit = 0.95-1.05
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Baseline Corr 3rd AF pt: Calibrator zero High point Mid point Low point As left zero	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980 5000	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.3 40.7 20.3 0.0	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.34 8.68 4.33 0.00	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (lc) -0.01 17.27 8.60 4.33 -0.10	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.013  1.013  t.019  t.019  t.019  t.004  t.009 
As found zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Baseline Corr 3rd AF pt: Calibrator zero High point Mid point Low point	(sccm) 5000 4919 17.13 NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980	(sccm) 0.0 81.3 Previous response AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0 81.3 40.7 20.3	(ppm) (Cc) 0.00 17.34 17.32 ion Data Calculated Concentration (ppm) (Cc) 0.00 17.34 8.68 4.33 0.00 17.34	(ppm) (lc) -0.03 17.09 *% change AF Intercept: * = > +/-5% change initia Indicated Concentration (ppm) (lc) -0.01 17.27 8.60 4.33	Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10  1.013  1.013  1.013  1.013  Correction factor (Cc/Ic) Limit = 0.95-1.05  1.004 1.009 0.999  1.002

Notes:

No Maintenance done. Span adjusted.

Calibration Performed By:

Melissa Lemay

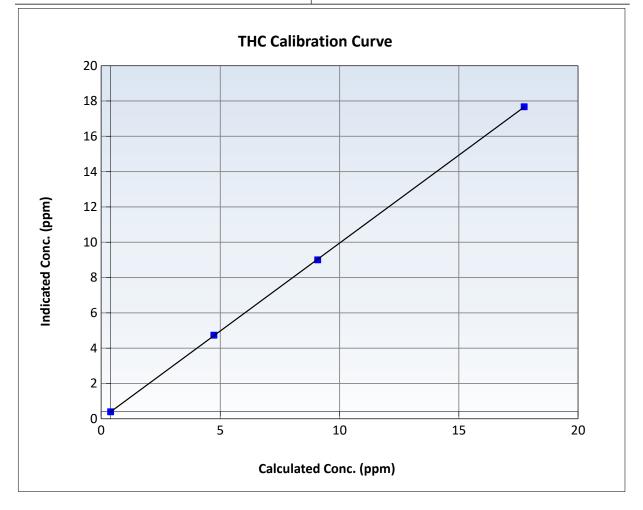


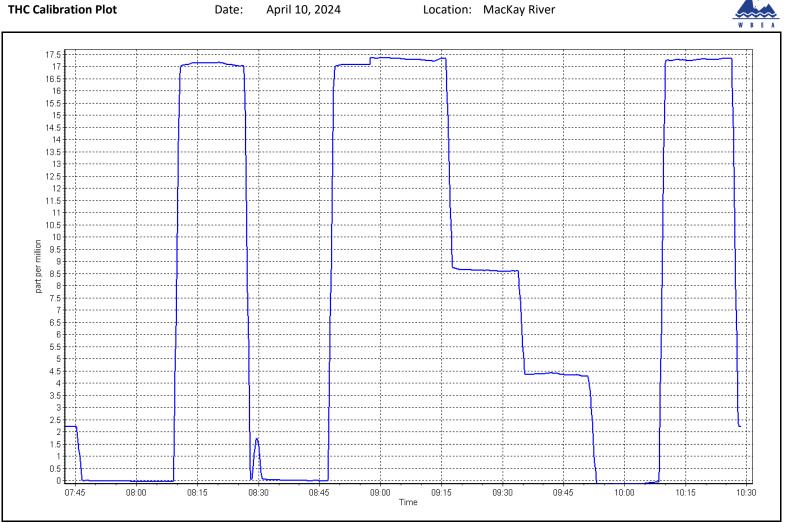
# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 10, 2024	Previous Calibration:	March 7, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	8:45	End Time (MST):	10:28
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	-0.01		Correlation Coefficient	0.999986	≥0.995
17.34 8.68	17.27 8.60	1.0040 1.0094	Slope	0.995490	0.90 - 1.10
4.33	4.33	0.9990	Intercept	-0.003380	+/-1.5









**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	MacKay River	NO Gas Cylinder #:	T376265	Cal Gas Expiry Date:	April 13, 2025
Station number:	AMS 20	NOX Cal Gas Conc:	49.19 ppm	NO Cal Gas Conc:	48.04 ppm
Calibration Date:	April 8, 2024	Removed Cylinder #:		Removed Gas Exp Date:	
Last Cal Date:	March 6, 2024	Removed Gas NOX Conc:	49.19 ppm	Removed Gas NO Conc:	48.04 ppm
Start time (MST):	6:45	NOX gas Diff:		NO gas Diff:	
End time (MST):	11:07	Calibrator Model:	API T700	Serial Number: 1220	)
Reason:	Routine	ZAG make/model:	API T701	Serial Number: 4522	2

#### 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	0.0	-0.2		
AF High point	4917	83.3	819.5	800.3	19.2	817.8	797.4	20.4	1.0019	1.0036
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	824.0 ppb	NO = 804.2	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-0.7%
Baseline Corr 1	.st pt NO <sub>x</sub> =	817.9 ppb	NO = 797.4	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-0.8%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
								Baseline Adjus		
		Indicated NO Re	ference Indie	cated NO Drop	Calculated N	O2 In	dicated NO2	Correction	factor Conv	erter Efficiency

 O3 Setpoint (ppb)
 Indicated NO Reference
 Indicated NO Drop
 Calculated NO2
 Indicated NO2
 Correction factor
 Converter Efficiency

 Limit = 96-104%
 Limit = 0.90 - 1.10
 Limit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1505164	1379			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.001037	0.994162
			Instrument Settings			NO <sub>x</sub> Cal Offset:	3.662215	3.902461
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.001142	0.993845
NO coeff or slope:	0.990	0.990	NO bkgnd or offset:	2.8	2.8	NO Cal Offset:	2.942582	2.922811
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	3.0	3.0	NO <sub>2</sub> Cal Slope:	0.998215	1.003001
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	164.2	164.2	NO <sub>2</sub> Cal Offset:	-0.831656	-0.362701

#### **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	0.1	-0.1		
High point	4917	83.3	819.5	800.3	19.2	816.9	797.1	19.6	1.0031	1.0040
Mid point	4958	41.7	410.3	400.7	9.6	412.9	401.9	11.0	0.9936	0.9970
Low point	4979	20.8	204.6	199.9	4.8	211.8	204.8	7.1	0.9662	0.9759
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1		
As left span	4917	83.3	819.5	438.5	381.0	814.7	438.5	376.1	1.0058	1.0000
							Average Co	orrection Factor	0.9876	0.9923

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	-0.1		
High GPT point	793.3	438.0	374.5	375.2	0.9980	100.2%
Mid GPT point	793.3	609.3	203.2	203.8	0.9968	100.3%
Low GPT point	793.3	697.9	114.6	113.9	1.0058	99.4%
				Average Correction Factor	1.0002	100.0%

Notes: No adjustments and maintenance done.

Calibration Performed By: Melissa Lemay

CALS 351 Version 03-2024

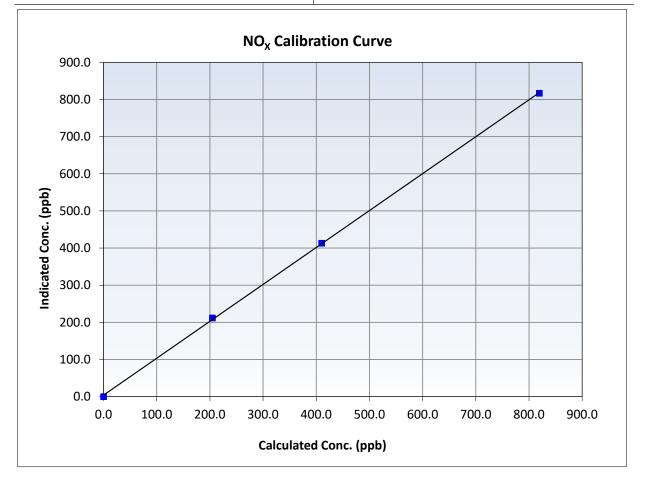


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 6, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	6:45	End Time (MST):	11:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999892	≥0.995
819.5 410.3	816.9 412.9	1.0031 0.9936	Slope	0.994162	0.90 - 1.10
204.6	211.8	0.9662	Intercept	3.902461	+/-20



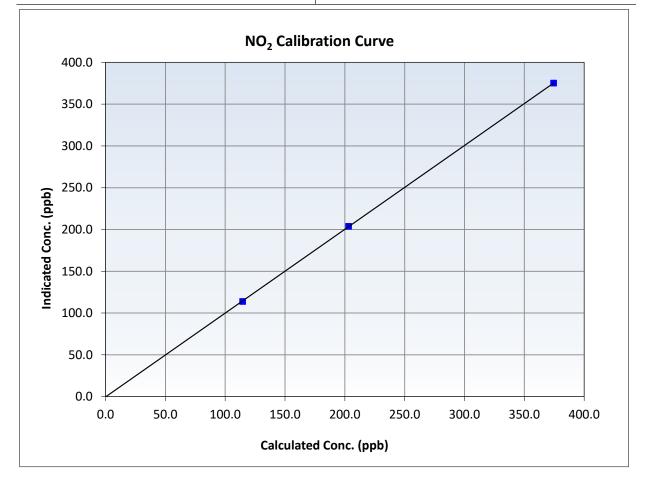


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 6, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	6:45	End Time (MST):	11:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999992	≥0.995
374.5 203.2	375.2 203.8	0.9980 0.9968	Slope	1.003001	0.90 - 1.10
114.6	113.9	1.0058	Intercept	-0.362701	+/-20



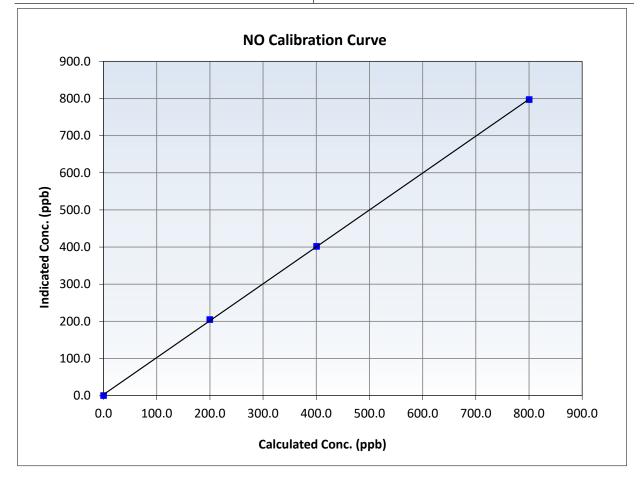


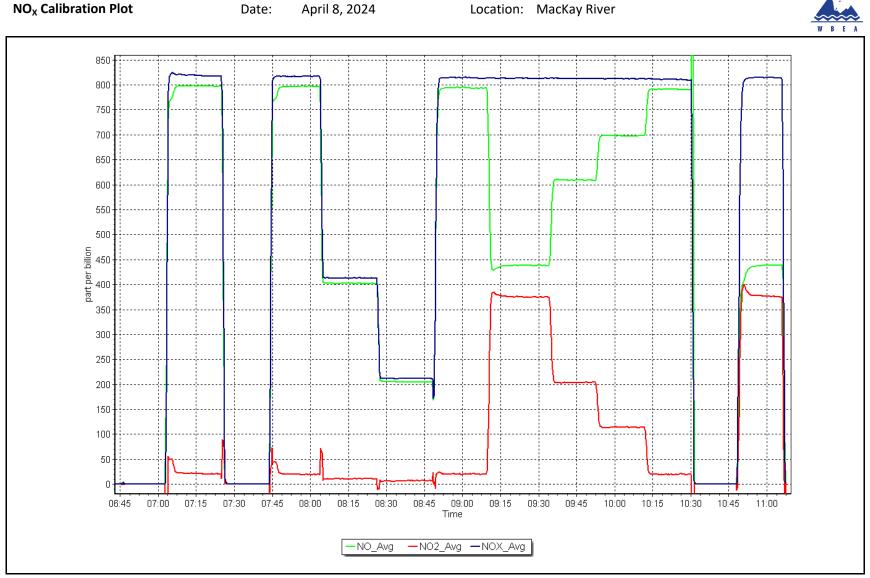
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 6, 2024
Station Name:	MacKay River	Station Number:	AMS 20
Start Time (MST):	6:45	End Time (MST):	11:07
Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999941	≥0.995
800.3 400.7	797.1 401.9	1.0040 0.9970	Slope	0.993845	0.90 - 1.10
199.9	204.8	0.9759	Intercept	2.922811	+/-20







### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS21 CONKLIN APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Conklin
Calibration Date:	April 3, 2
Start time (MST):	9:14
Reason:	Routine

2024

Thermo 43i

0 - 1000 ppb

Station number: AMS 21 Last Cal Date: March 18, 2024 End time (MST): 12:13

#### **Calibration Standards**

Cal Gas Concentration: Cal Gas Cylinder #:	49.93 <u>CC259455</u>	ppm	Cal Gas Exp Date: January 5, 2025
Removed Cal Gas Conc:	49.93	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 701		Serial Number: 953

#### **Analyzer Information**

Serial Number: 1428701363

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997419	0.992525	Backgd or Offset:	28.3	28.3
Calibration intercept:	1.855817	1.395547	Coeff or Slope:	0.901	0.901

#### SO<sub>2</sub> As Found Data

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) <i>Limit = 0.90-1.10</i>
5000	0.0	0.0	0.0	
4920	80.2	800.8	794.0	1.009
794.0 NA	Previous response AF Slope:	800.6	*% change AF Intercept:	-0.8%
	(sccm) 5000 4920 794.0	(sccm) (sccm) 5000 0.0 4920 80.2 794.0 Previous response NA AF Slope:	Dilution air flow rate (sccm)Source gas flow rate (sccm)concentration (ppb) (Cc)50000.00.0492080.2800.8794.0Previous response AF Slope:800.6	Dilution air flow rate (sccm)Source gas flow rate (sccm)concentration (ppb) (Cc)Indicated concentration (ppb) (lc)50000.00.00.0492080.2800.8794.0794.0Previous response AF Slope:800.6*% change AF Intercept:

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.4	
High point	4920	80.2	800.8	795.5	1.007
Mid point	4960	40.1	400.4	400.1	1.001
Low point	4980	20.0	200.1	200.5	0.998
As left zero	5005	0.0	0.0	0.5	
As left span	4920	80.2	800.8	798.2	1.003
			Averag	1.002	

Notes:

Sample inlet filter changed after as founds. No adjustment made.

Jan Castro

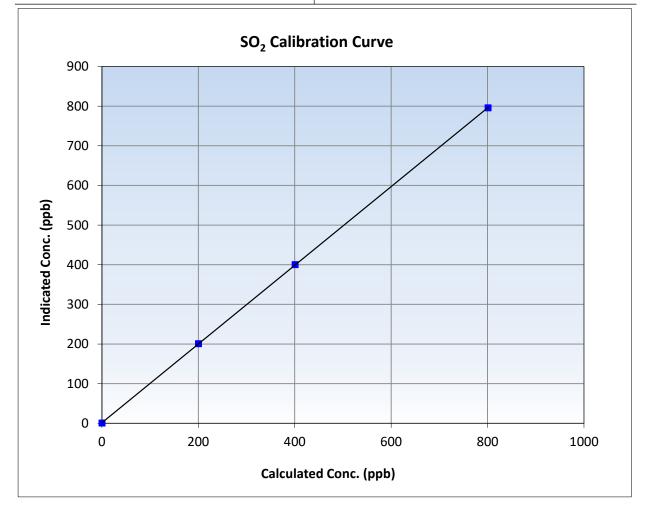


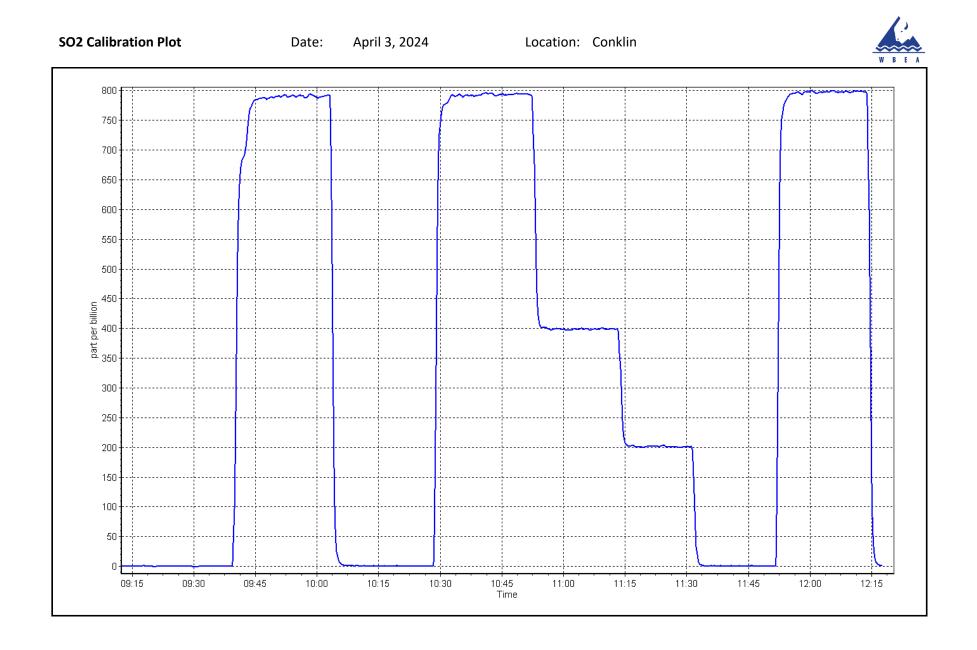
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 18, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:14	End Time (MST):	12:13
Analyzer make:	Thermo 43i	Analyzer serial #:	1428701363

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.4		Correlation Coefficient	0.999990	≥0.995
800.8 400.4	795.5 400.1	1.0067 1.0008	Slope	0.992525	0.90 - 1.10
200.1	200.5	0.9981	Intercept	1.395547	+/-30







## Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date:	Conklin April 18, 2024		Station number: Last Cal Date:	AMS 21 March 21, 2024	ļ		
Start time (MST):	10:03		End time (MST):	14:41			
Reason:	Routine						
		Calibration S	tandards				
Cal Gas Concentration:	5.00	ppm	Cal Gas Exp Date:	January 3, 2026	5		
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 API T700		Serial Number:	3810			
ZAG Make/Model:	Teledyne API 701H		Serial Number:	691			
		Applyzor Inf	rmation				
		Analyzer Info	Dimation				
Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1236656116			
Converter make:	CD-Nova 101		Converter serial #:	NA			
Analyzer Range	0 - 100 ppb		Converter Temp:		800	degC	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>			ŀ
Calibration slope:	1.000286	0.999714	Backgd or Offset:	2.8			
Calibration intercept:	0.140000	0.060000	Coeff or Slope:	0.998			(

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.2	
As found High point	4920	80.0	80.0	80.0	0.998
As found Mid point	4960	40.0	40.0	40.0	0.995
As found Low point	4980	20.0	20.0	20.0	0.990
New cylinder response					
Baseline Corr As found:	80.2	Prev response:	80.16	*% change:	0.0%
Baseline Corr 2nd AF pt:	40.2	AF Slope:	1.002000	AF Intercept:	-0.120000
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999995	* = > +/-5% change initiate	es 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	80.0	1.000
Mid point	4960	40.0	40.0	40.1	0.998
Low point	4980	20.0	20.0	20.1	0.995
As left zero	5000	0.0	0.0	0.0	
As left span	4920	80.0	80.0	79.9	1.001
SO2 Scrubber Check	4920	80.2	802.0	-0.1	
Date of last scrubber chan	ge:			Ave Corr Factor	0.998

Date of last converter efficiency test:

Notes: Sample inlet filters was changed after multipoint as founds. SO2 scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Jan Castro

Einish 2.8 0.998



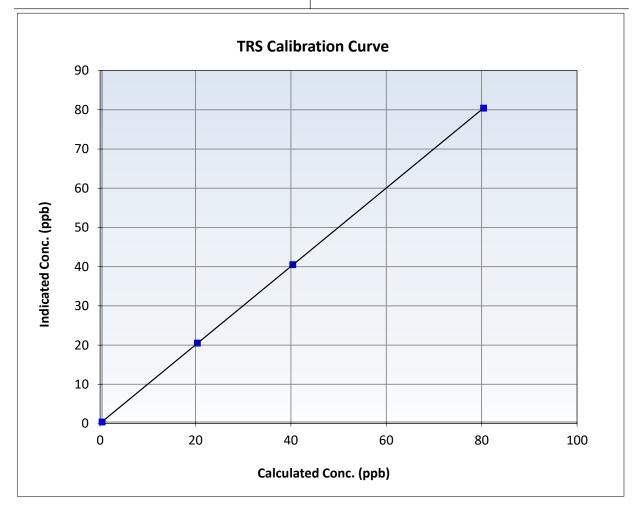
## Wood Buffalo Environmental Association

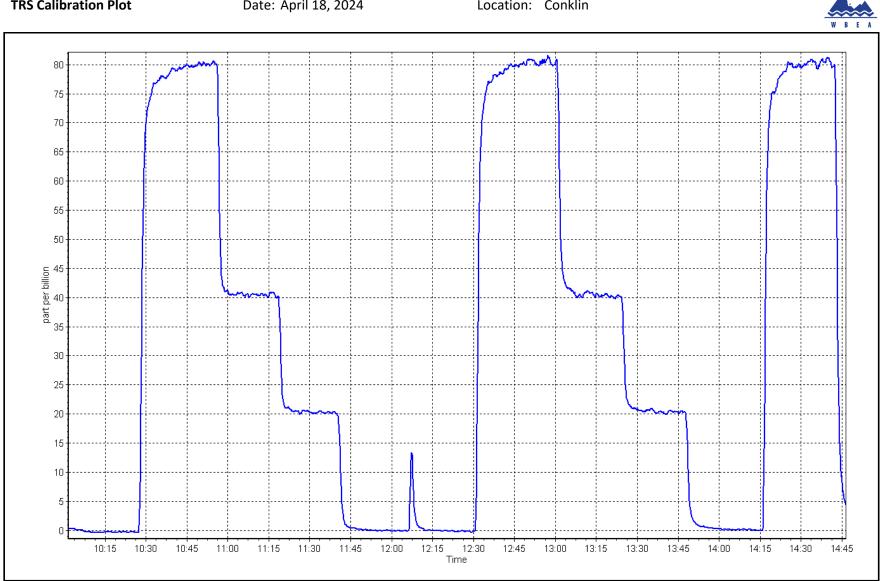
## **TRS Calibration Summary**

## **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 21, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:03	End Time (MST):	14:41
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1236656116

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999997 ≥0.995 0.0 0.0 ----80.0 80.0 1.0000 Slope 0.999714 0.90 - 1.10 40.0 40.1 0.9975 20.0 20.1 0.9950 Intercept 0.060000 +/-3





## Date: April 18, 2024

Location: Conklin



# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

### **Station Information**

Station Name: Calibration Date: Start time (MST):	Conklin April 3, 2024 9:14	<u>Station in</u>	Station number: Last Cal Date: End time (MST):	March 20, 2024	
Reason:	Routine				
		<b>Calibration</b>	<u>Standards</u>		
Gas Cert Reference:	CC25	59455	Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	497.9	ppm	CH4 Equiv Conc.	1067.7 p	opm
C3H8 Cal Gas Conc.	207.2	••			
Removed Gas Cert:	-	IA	Removed Gas Expiry:		
Removed CH4 Conc.	497.9		CH4 Equiv Conc.	1067.7 p	opm
Removed C3H8 Conc.	207.2	ppm	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:		API T700	Serial Number:	381	
Zero Air Gen model:	Teledyne	API 701H	Serial Number:	95	3
		Analyzer Ir	nformation		
Analyzer make:	Thermo 55i		Analyzer serial #:	1331259520	
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	Finish
CH4 SP Ratio:	2.55E-04	2.26E-04	NMHC SP Ratio:	5.96E-05	5.81E-05
CH4 Retention time:	15.0	14.2	NMHC Peak Area:	153262	157380
Zero Chromatogram:	ON	ON	Flat Baseline:	OFF	OFF
		THC As Fo	ound Data		
					Baseline Adjusted
Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated	Correction factor
Set Point	(sccm)	(sccm)	(ppm) (Cc)	concentration (ppm) (Ic)	(Cc/(Ic-AFzero))
A. C	5000		0.00		<i>Limit = 0.90-1.10</i>
As found zero	5000	0.0 80.2	0.00 17.13	0.00	
As found High point As found Mid point	4920	80.2	17.13	17.39	0.985
As found Low point					
New cylinder response					
Baseline Corr AF:	17.39	Prev response	17.07	*% change	1.9%
Baseline Corr 2nd AF:	NA	AF Slope:	17.07	AF Intercept:	1.370
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	17.13	17.11	1.001
Mid point	4960	40.1	8.56	8.58	0.998
Low point	4980	20.0	4.28	4.33	0.988
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	17.13	17.15	0.999
			Avera	ge Correction Factor	0.995

Notes:

Sample inlet filter changed after as founds. Adjusted span only.



## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4920	80.2	9.14	9.22	0.991
Baseline Corr AF:	9.22	Prev response	9.13	*% change	1.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes 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	9.14	9.13	1.001
Mid point	4960	40.1	4.57	4.60	0.994
Low point	4980	20.0	2.28	2.34	0.978
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	9.14	9.15	0.999
			Avera	ge Correction Factor	0.991

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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 As found Mid point As found Low point New cylinder response	4920	80.2	7.99	8.17	0.977
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	8.17 NA NA	Prev response AF Slope: AF Correlation:	7.94	*% change AF Intercept: * = > +/-5% change initia	

#### **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	7.99	7.99	1.000
Mid point	4960	40.1	3.99	3.99	1.001
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	7.99	8.00	0.998
			Avera	ge Correction Factor	1.000

### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	0.993227	0.998192
THC Cal Offset:	0.057164	0.027967
CH4 Cal Slope:	0.991351	0.999780
CH4 Cal Offset:	0.026556	-0.000643
NMHC Cal Slope:	0.995229	0.997354
NMHC Cal Offset:	0.029409	0.027410

Calibration Performed By:

Jan Castro

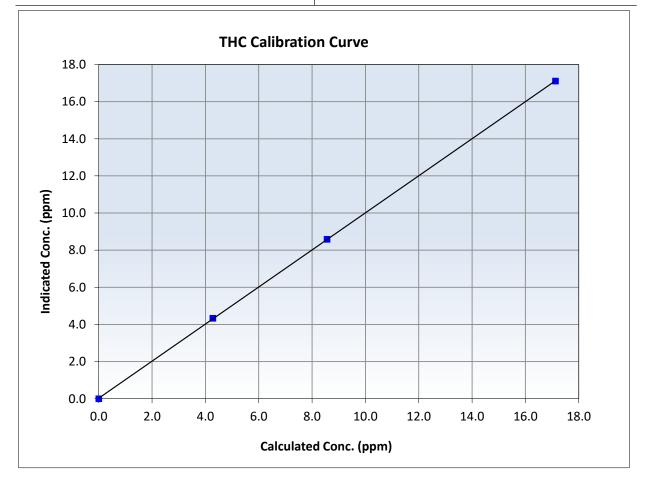


# Wood Buffalo Environmental Association THC Calibration Summary

## **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 20, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:14	End Time (MST):	12:13
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999987	≥0.995
17.13 8.56	17.11 8.58	1.0009 0.9975	Slope	0.998192	0.90 - 1.10
4.28	4.33	0.9881	Intercept	0.027967	+/-0.5



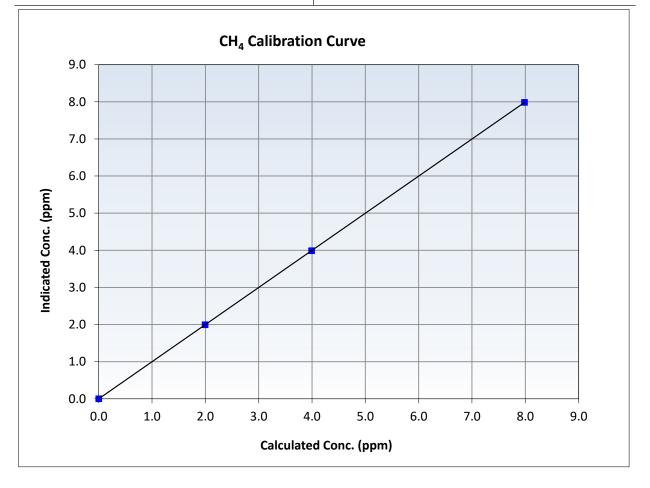


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 20, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:14	End Time (MST):	12:13
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	1.000000	≥0.995
7.99	7.99	1.0001	Slope	0.999780	0.90 - 1.10
3.99	3.99	1.0013	Slope	0.555700	0.00 1.10
2.00	2.00	0.9998	Intercept	-0.000643	+/-0.5



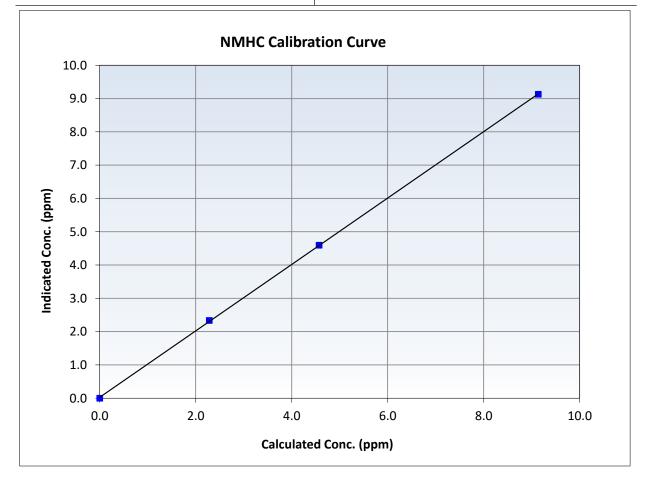


# Wood Buffalo Environmental Association NMHC Calibration Summary

## **Station Information**

Calibration Date:	April 3, 2024	Previous Calibration:	March 20, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:14	End Time (MST):	12:13
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

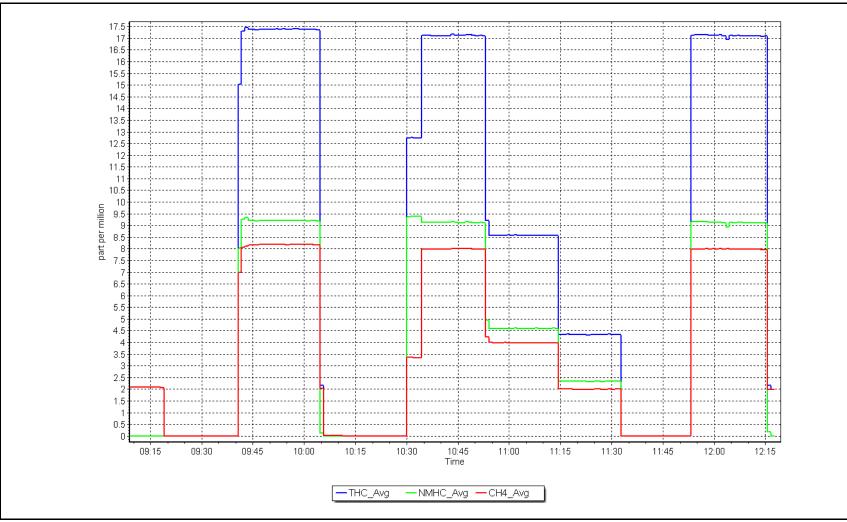
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999958	≥0.995
9.14 4.57	9.13 4.60	1.0010 0.9945	Slope	0.997354	0.90 - 1.10
2.28	2.34	0.9780	Intercept	0.027410	+/-0.5



### **NMHC Calibration Plot**









# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

## Station Information

		Station In	formation		
Station Name:	Conklin		Station number:	AMS 21	
Calibration Date:	April 19, 2024		Last Cal Date:	April 3, 2024	
Start time (MST):	10:12		End time (MST):	12:26	
Reason:	Maintenance				
		Calibration	Standards		
Gas Cert Reference:	CC25	59455	Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	497.9		CH4 Equiv Conc.	1067.7	nm
C3H8 Cal Gas Conc.	207.2	••	citi Equiv conc.	1007.77	o pin
Removed Gas Cert:		IA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	497.9		CH4 Equiv Conc.		oom
Removed C3H8 Conc.	207.2		Diff between cyl (THC):		- p
Diff between cyl (CH <sub>4</sub> ):		PP	Diff between cyl (NM):		
Calibrator Model:		API T700	Serial Number:		0
Zero Air Gen model:	•	API 701H	Serial Number:		
	,	Analyzer Ir			
Analyzer make:	Thormo 55i	Analyzer II		1221250520	
			Analyzer serial #: 1331259520 NMHC/CH4 Range: 0 - 10 ppm		
THC Range:	0 - 20 ppm		NIVIHC/CH4 Range:	0 - 10 ppm	
	Start	<u>Finish</u>		<u>Start</u>	Finish
CH4 SP Ratio:	NA	2.48E-04	NMHC SP Ratio:	NA	4.50E-05
CH4 Retention time:	NA	15.4	NMHC Peak Area:	NA	202994
Zero Chromatogram:	OFF	ON	Flat Baseline:	OFF	ON
		THC As Fo	ound 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					2
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 initiat	es investigation
		THC Calibr	ation Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm)	Correction factor (Cc/(Ic-AFzero))

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	concentration (ppm) (Ic)	(Cc/(Ic-AFzero)) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.03	
High point	4920	80.2	17.13	17.15	0.999
Mid point	4960	40.1	8.56	8.62	0.993
Low point	4980	20.0	4.28	4.35	0.983
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	17.13	17.18	0.997
			Avera	ge Correction Factor	0.992

Notes:

Actuator was change and inlet filters before calibrator zero. Use flat baseline. Adjusted span.



## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

## NMHC As Found Data

					Baseline Adjusted
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	
As found zero As found High point As found Mid point As found Low point New cylinder response					
Baseline Corr AF: Baseline Corr 2nd AF:	NA NA	Prev response AF Slope:	NA	*% change AF Intercept:	NA
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation
		NMHC Calib	ration 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	9.14	9.12	1.002
Mid point	4960	40.1	4.57	4.59	0.997
Low point	4980	20.0	2.28	2.32	0.986
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	9.14	9.13	1.001
			Avera	ge Correction Factor	0.995
As found zero As found High point As found Mid point As found Low point					Limit = 0.90-1.10
New cylinder response Baseline Corr AF:	NA	Prev response	NA	*% change	NA
Baseline Corr 2nd AF: Baseline Corr 3rd AF:	NA NA	AF Slope: AF Correlation:		AF Intercept: * = > +/-5% change initia	tos invostigation
	NA .				tes investigation
		CH4 Calibra			
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	0.03	
High point	4920	80.2	7.99	8.02	0.996
Mid point	4960	40.1	3.99	4.03	0.990
Low point	4980	20.0	2.00	2.04	0.980
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	7.99 Avera	8.05 ge Correction Factor	0.992
			Avera		0.585
		<b>Calibration</b>	Statistics		
		<u>Start</u>		<u>Finish</u>	
THC Cal Slope:		NA		0.999013	
THC Cal Offset:		NA		0.053566	
CH4 Cal Slope:		NA		1.000152	
CH4 Cal Officate		NIA		0.025557	

Calibration Performed By:

CH4 Cal Offset:

NMHC Cal Slope:

NMHC Cal Offset:

Jan Castro

NA

NA

NA

0.035557

0.996817

0.019809

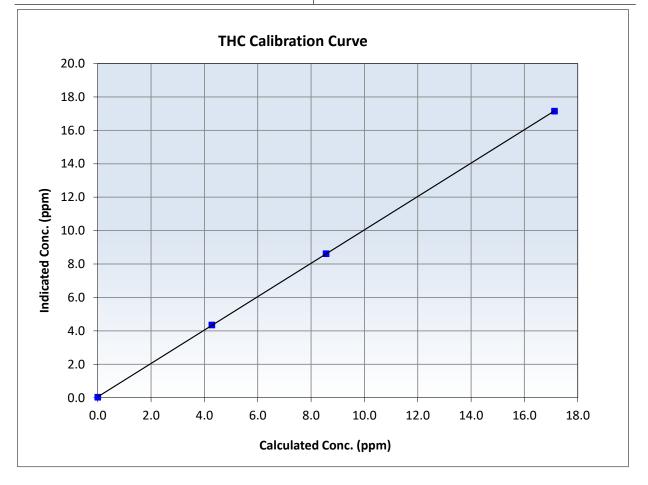


# Wood Buffalo Environmental Association THC Calibration Summary

## **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 3, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:12	End Time (MST):	12:26
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.03		Correlation Coefficient	0.999991	≥0.995
17.13	17.15	0.9986	Slope	0.999013	0.90 - 1.10
8.56	8.62	0.9934	Slope	0.555015	0.50 1.10
4.28	4.35	0.9833	Intercept	0.053566	+/-0.5



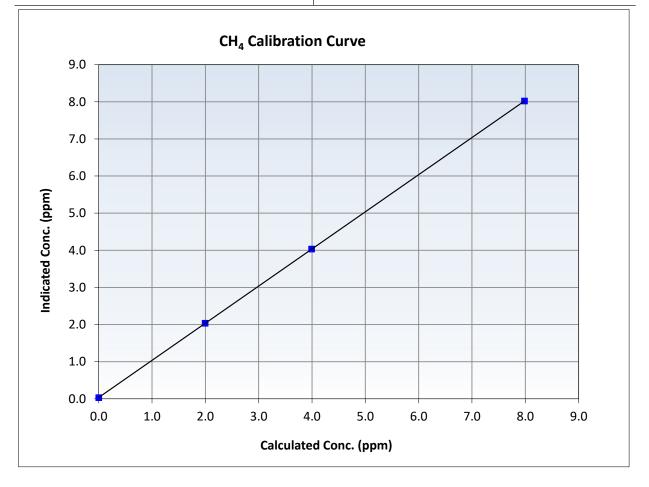


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 3, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:12	End Time (MST):	12:26
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.03		Correlation Coefficient	0.999998	≥0.995
7.99	8.02	0.9958	Slope	1.000152	0.90 - 1.10
3.99	4.03	0.9903	51066	1.000152	0.00 1.10
2.00	2.04	0.9797	Intercept	0.035557	+/-0.5



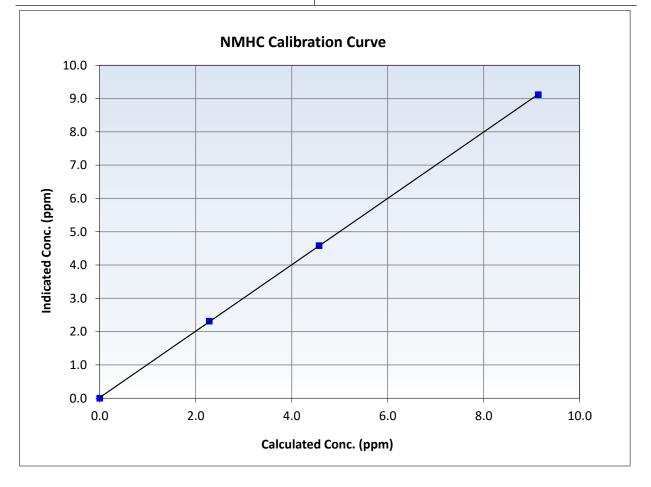


# Wood Buffalo Environmental Association NMHC Calibration Summary

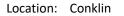
## **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 3, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:12	End Time (MST):	12:26
Analyzer make:	Thermo 55i	Analyzer serial #:	1331259520

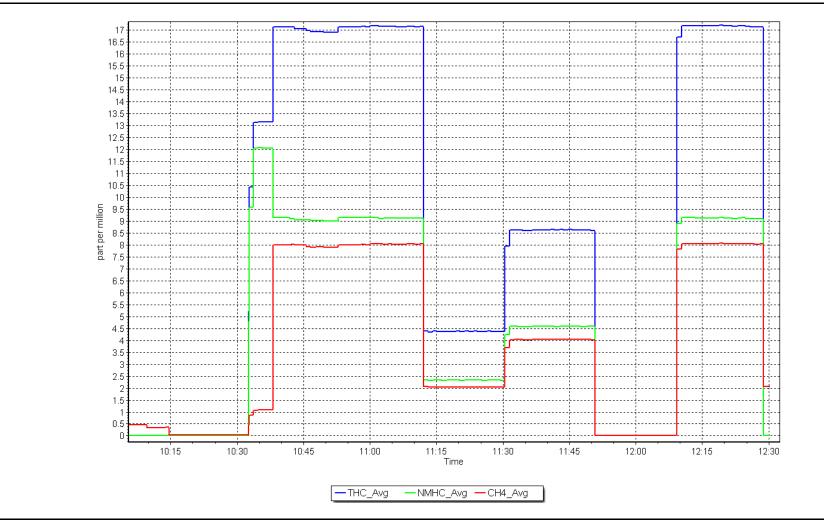
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999978	≥0.995
9.14 4.57	9.12 4.59	1.0021 0.9967	Slope	0.996817	0.90 - 1.10
2.28	2.32	0.9861	Intercept	0.019809	+/-0.5



### NMHC Calibration Plot









## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

#### **Station Information**

		Station	normation		
Station Name:	Conklin		Station number:	AMS 21	
Calibration Date:	April 22, 2024		Last Cal Date:	NA	
Start time (MST):	11:59		End time (MST):	14:12	
Reason:	Install				
		Calibratia	n Standarda		
		Calibratio	n Standards		
Gas Cert Reference:	CC25	9455	Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	497.9	ppm	CH4 Equiv Conc.	1067.7	ppm
C3H8 Cal Gas Conc.	207.2	ppm			
Removed Gas Cert:	N	A	Removed Gas Expiry:	NA	
Removed CH4 Conc.	497.9	ppm	CH4 Equiv Conc.	1067.7	ppm
Removed C3H8 Conc.	207.2	ppm	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	Teledyne	API T700	Serial Number:	383	10
Zero Air Gen model:	Teledyne	API 701H	Serial Number:	95	3
		Analyzer I	nformation		
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:	NA	2.64E-04	NMHC SP Ratio:	NA	6.99E-05
CH4 SP Ratio.	NA	2.042-04	NMHC Peak Area:	NA	130849
Zero Chromatogram:	OFF	OFF	Flat Baseline:	OFF	OFF
	OFF	UFF	Flat Dasellile.	OFF	OFF
		THC As F	ound 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 zero As found High point As found Mid point As found Low point New cylinder response Baseline Corr AF: Prev response NA NA \*% change NA Baseline Corr 2nd AF: NA AF Slope: AF Intercept: \* = > +/-5% change initiates investigation Baseline Corr 3rd AF: NA AF Correlation:

#### **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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.2	17.13	17.18	0.997
Mid point	4960	40.1	8.56	8.62	0.993
Low point	4980	20.0	4.28	4.38	0.977
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	17.13	17.20	0.995
			Avera	ge Correction Factor	0.989

Notes:

Install Calibrations. Adjusted span only.



## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 initia	tes investigation
		NMHC Calib	ration 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	9.14	9.19	0.994
Mid point	4960	40.1	4.57	4.64	0.986
Low point	4980	20.0	2.28	2.36	0.969
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	9.14	9.22	0.992
			Avera	ge Correction Factor	0.983
Set Point As found zero As found High point As found Mid point As found Low point New cylinder response	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	AFzero)) <i>Limit = 0.90-1.10</i>
Baseline Corr AF: Baseline Corr 2nd AF:	NA NA	Prev response AF Slope:	NA	*% change AF Intercept:	NA
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes investigation
		CH4 Calibra	ation 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	7.99	7.99	1.000
Mid point	4960	40.1	3.99	3.99	1.002
Low point	4980	20.0	2.00	2.02	0.988
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.2	7.99	7.99	1.000 0.996
			Avera	ge Correction Factor	0.996
		Calibration	Statistics		
		Start		<u>Finish</u>	
THC Cal Slope:		NA		1.001709	
THC Cal Offset:		NA		0.040371	
CH4 Cal Slope:		NA		0.998993	

Calibration Performed By:

Jan Castro and Sean Bala

0.008358

1.004194 0.031813

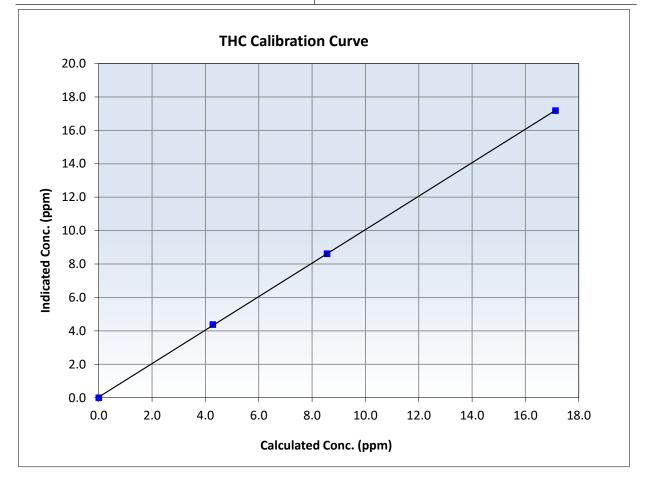


# Wood Buffalo Environmental Association THC Calibration Summary

## **Station Information**

Calibration Date:	April 22, 2024	Previous Calibration:	NA
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:59	End Time (MST):	14:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999972	≥0.995
17.13 8.56	17.18 8.62	0.9968 0.9931	Slope	1.001709	0.90 - 1.10
4.28	4.38	0.9775	Intercept	0.040371	+/-0.5



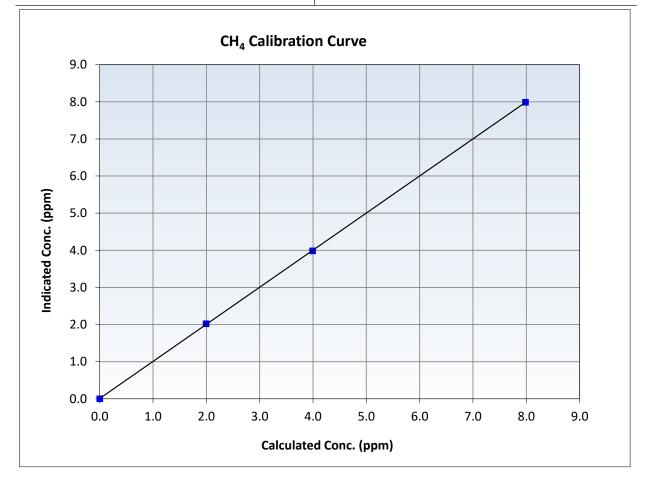


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 22, 2024	Previous Calibration:	NA
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:59	End Time (MST):	14:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999985	≥0.995
7.99	7.99	0.9999	Slope	0.998993	0.90 - 1.10
3.99	3.99	1.0015	51000	0.550555	0.00 1.10
2.00	2.02	0.9879	Intercept	0.008358	+/-0.5



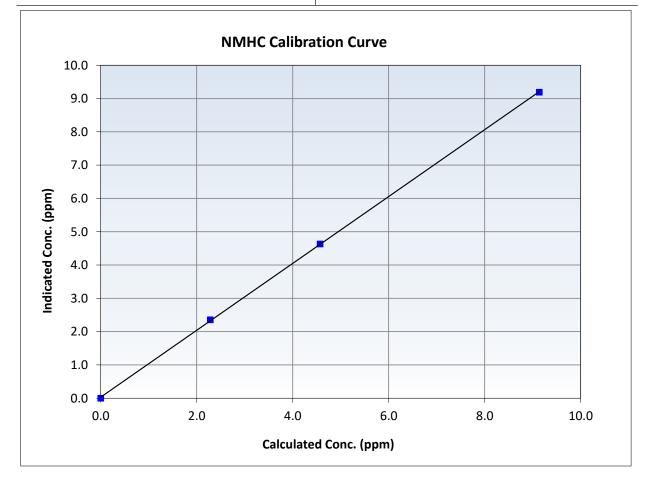


# Wood Buffalo Environmental Association NMHC Calibration Summary

## **Station Information**

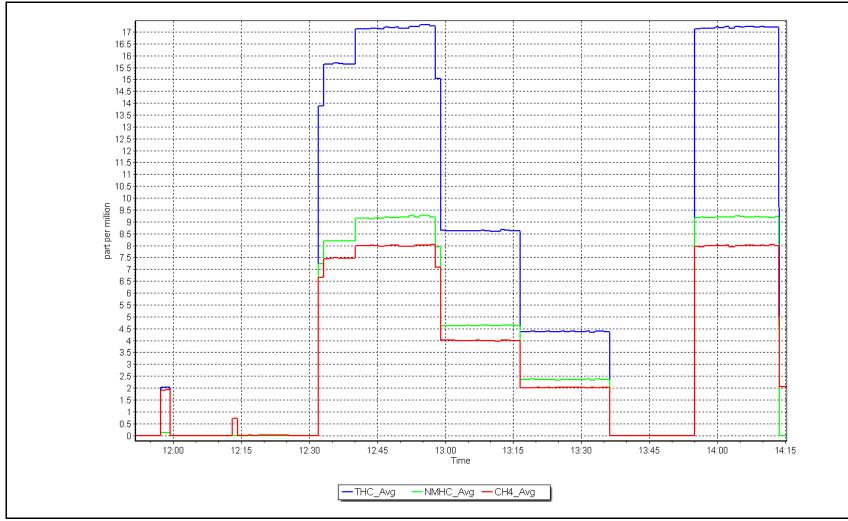
Calibration Date:	April 22, 2024	Previous Calibration:	NA
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	11:59	End Time (MST):	14:12
Analyzer make:	Thermo 55i	Analyzer serial #:	1181490018

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999945	≥0.995
9.14	9.19	0.9940	Slope	1.004194	0.90 - 1.10
4.57 2.28	4.64 2.36	0.9859 0.9685	Intercept	0.031813	+/-0.5
			intercept	0.031813	+/-0.5



### **NMHC Calibration Plot**







**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

## **Calibration Standards**

Station Name:	Conklin	NO Gas Cylinder #:	SA18828	Cal Gas Expiry Date:	November 3, 2031
Station number:	AMS 21	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Calibration Date:	April 12, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Last Cal Date:	March 26, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
Start time (MST):	10:29	NOX gas Diff:		NO gas Diff:	
End time (MST):	14:43	Calibrator Model:	Teledyne API T700	Serial Number: 3810	
Reason:	Routine	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	-0.4	-0.4	0.0		
AF High point	4918	82.0	802.0	800.3	1.6	865.0	864.0	1.5	0.9267	0.9259
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	800.1 ppb	NO = 801.3	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chang	ge NO <sub>x</sub> =	7.6%
Baseline Corr 1	st pt NO <sub>x</sub> =	865.4 ppb	NO = 864.4	ppb	<u>As Four</u>	d Statistics		*Percent Chang	ge NO =	7.3%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calibi	ration Data				
O3 Setpo	pint (ppb)	Indicated NO Ref		ated NO Drop entration (ppb)	Calculated No concentration (pp		dicated NO2 ntration (ppb) (Ic)	Baseline Adjust Correction fa (Cc/(Ic-AFze	actor Conv	verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1501663	3731			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.994854	0.996407
			Instrument Settings			NO <sub>x</sub> Cal Offset:	2.228020	1.908027
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.000020	0.998578
NO coeff or slope:	1.004	0.929	NO bkgnd or offset:	10.1	9.3	NO Cal Offset:	1.008029	1.088012
NOX coeff or slope:	0.993	0.993	NOX bkgnd or offset:	10.2	9.4	NO <sub>2</sub> Cal Slope:	0.996734	0.999882
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	147.3	146.2	NO <sub>2</sub> Cal Offset:	-0.362609	0.066334

### **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	-0.1		
High point	4918	82.0	802.0	800.3	1.6	799.8	799.6	0.2	1.0027	1.0009
Mid point	4959	41.0	401.0	400.2	0.8	402.9	401.5	1.4	0.9952	0.9967
Low point	4980	20.5	200.5	200.1	0.4	203.5	201.9	1.6	0.9851	0.9909
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	387.9	414.1	797.1	387.9	409.3	1.0061	1.0000
							Average Co	orrection Factor	0.9943	0.9961

## **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	-0.1		
High GPT point	798.2	384.4	415.4	415.3	1.0003	100.0%
Mid GPT point	798.2	596.2	203.6	204.0	0.9982	100.2%
Low GPT point	798.2	697.8	102.0	102.1	0.9994	100.1%
				Average Correction Factor	0.9993	100.1%

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

Calibration Performed By:

Jan Castro

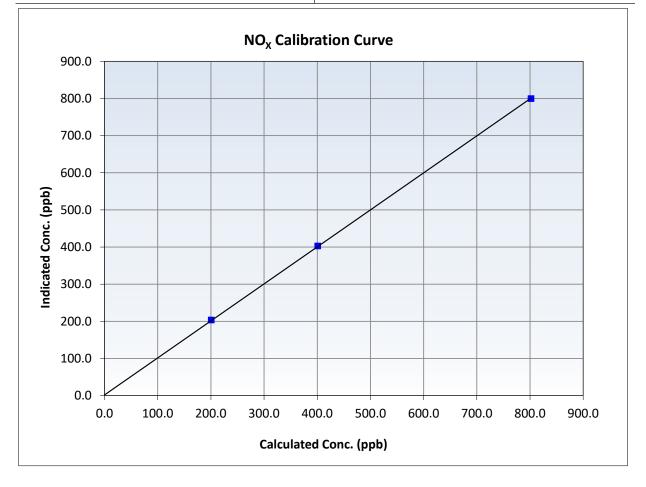


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 26, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:29	End Time (MST):	14:43
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999967	≥0.995
802.0 401.0	799.8 402.9	1.0027 0.9952	Slope	0.996407	0.90 - 1.10
200.5	203.5	0.9851	Intercept	1.908027	+/-20



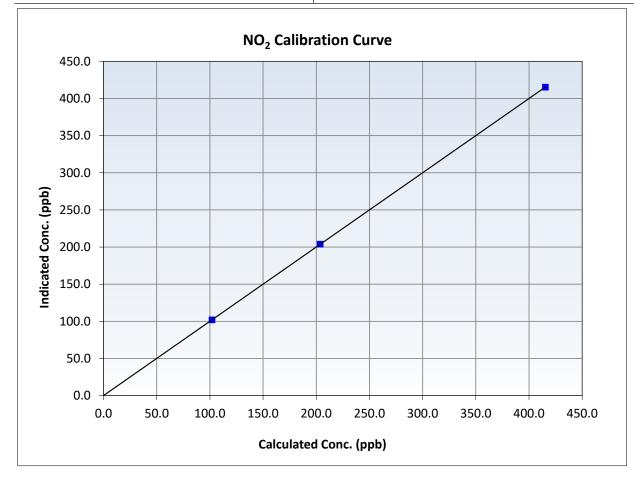


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 26, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:29	End Time (MST):	14:43
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999998	≥0.995
415.4 203.6	415.3 204.0	1.0003 0.9982	Slope	0.999882	0.90 - 1.10
102.0	102.1	0.9994	Intercept	0.066334	+/-20



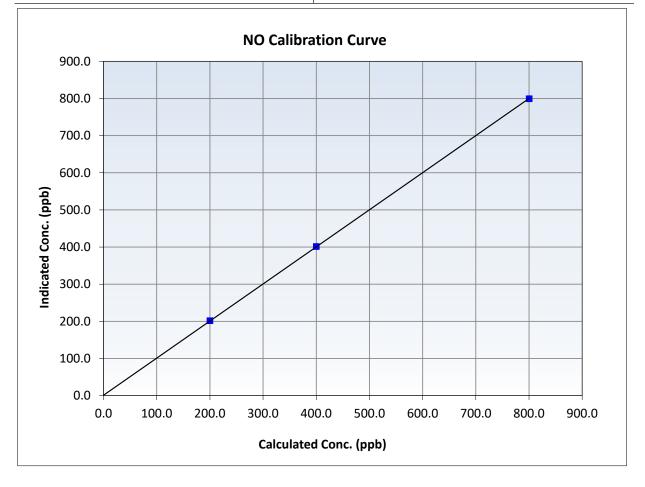


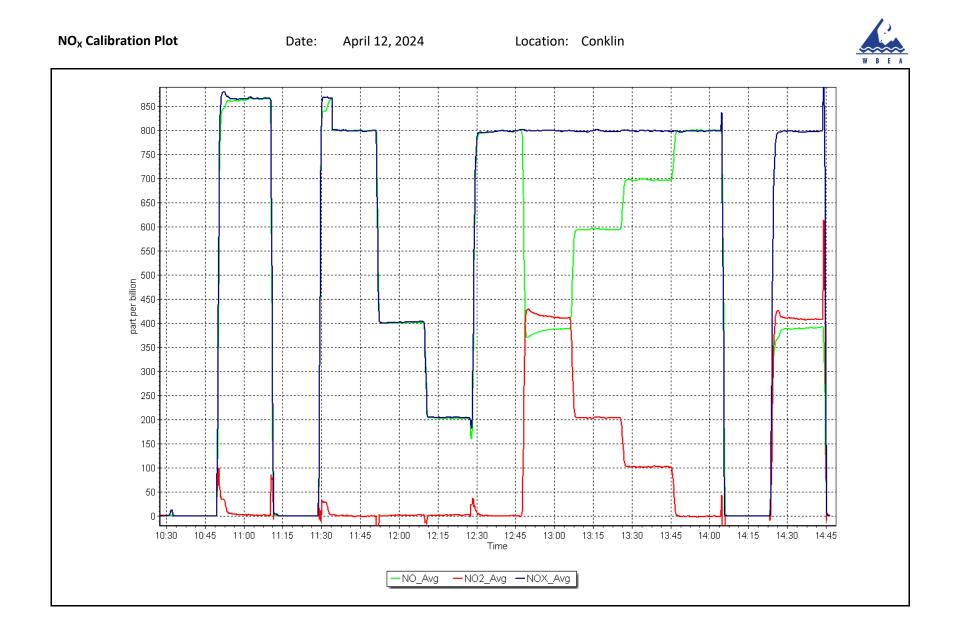
# Wood Buffalo Environmental Association NO Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 26, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:29	End Time (MST):	14:43
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999990	≥0.995
800.3 400.2	799.6 401.5	1.0009 0.9967	Slope	0.998578	0.90 - 1.10
200.1	201.9 0.9909		Intercept	1.088012	+/-20







**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

## **Calibration Standards**

Station Name:	Conklin	NO Gas Cylinder #:	SA18828	Cal Gas Expiry Date: November 3, 2031		
Station number:	AMS 21	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc: 48.80 ppm		
Calibration Date:	April 16, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA		
Last Cal Date:	April 12, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc: 48.80 ppm		
Start time (MST):	8:55	NOX gas Diff:		NO gas Diff:		
End time (MST):	11:00	Calibrator Model:	Teledyne API T700	Serial Number: 3810		
Reason:	As Found	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	-0.5	-0.5	0.0		
AF High point	4918	82.0	802.0	800.3	1.6	712.5	709.0	3.4	1.1248	1.1280
AF Mid point	4959	41.0	401.0	400.2	0.8	354.5	352.1	2.5	1.1295	1.1349
AF Low point New cyl resp	4980	20.5	200.5	200.1	0.4	181.3	179.1	2.2	1.1027	1.1139
Previous Respo	onse NO <sub>x</sub> =	801.0 ppb	NO = 800.3	ppb	* = > +/-5	i% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-12.3%
Baseline Corr 1	lst pt NO <sub>x</sub> =	713.0 ppb	NO = 709.5	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-12.8%
Baseline Corr 2	2nd pt NO <sub>x</sub> =	355.0 ppb	NO = 352.6	ppb	As foun	nd NO <sub>x</sub> r <sup>2</sup> :	0.999954	Nx SI: 0.8873	33 Nx Int:	0.627
Baseline Corr 3	Brd pt NO <sub>X</sub> =	181.8 ppb	NO = 179.6	ppb	As foun	nd NO r <sup>2</sup> :	0.999967	NO SI: 0.8852	NO Int:	-0.033

### As Found GPT Calibration Data

As found

NO<sub>2</sub> r<sup>2</sup>: 1.000000

NO2 SI: 1.002046 NO<sub>2</sub> Int: 0.000

					Baseline Adjusted NO2	
O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
os serpoint (pps)	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
As Found GPT zero			0.0	0.0		
As found high GPT point	704.4	334.5	371.5	372.3	0.9980	100.2%
As found mid GPT point	704.4					
As found low GPT point	704.4					



#### **Analyzer Information**

## Wood Buffalo Environmental Association

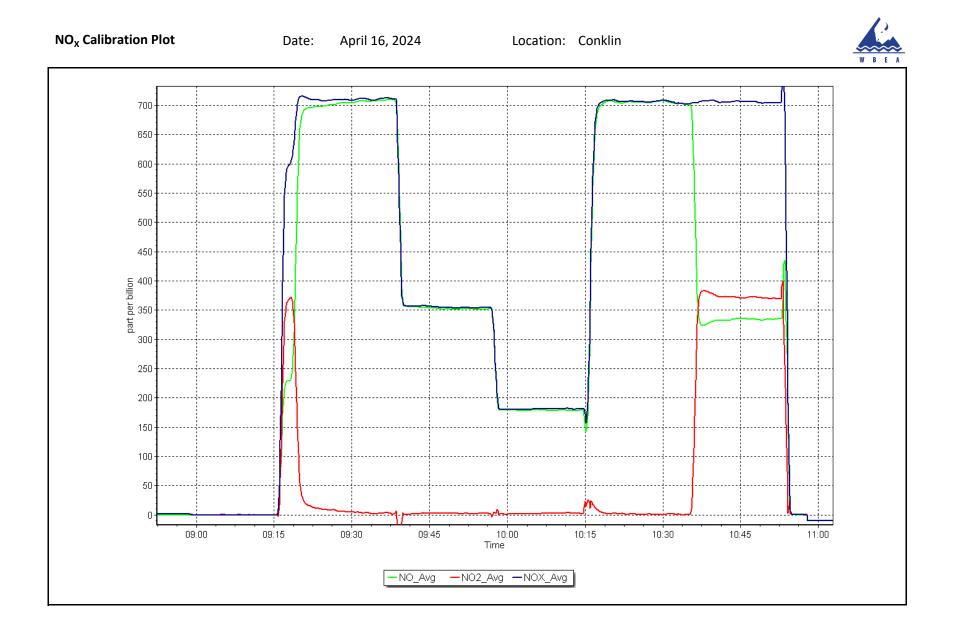
## $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Statistics**

Analyzer Informati	on					Calibra	ation Statistic	S	
Analyzer Make: NOX Range (ppb):	Thermo 42i 0 - 1000 ppb	:	Serial Number: 15016	63731		NO <sub>2</sub> Ca	l Slope:	<u>Start</u> 0.996407	<u>Finish</u> NA
			Instrument Settings				l Offset:	1.908027	NA
	<u>Start</u>	Finish	<u></u>	<u>Start</u>	Finish	NO Cal		0.998578	NA
NO coeff or slope:	0.929	NA	NO bkgnd or offset:	9.3	NA		Offset:	1.088012	NA
NOX coeff or slope:	0.993	NA	NOX bkgnd or offset:	9.4	NA	NO <sub>2</sub> Ca	l Slope:	0.999882	NA
NO2 coeff or slope:	1.000	NA	Reaction cell Press:	146.2	NA	NO <sub>2</sub> Ca	l Offset:	0.066334	NA
			Dil	ution Calibrat	ion Data				
Set Point	on flow rate Source ga sccm) rate (so	concent	tration concentration	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) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/lc) <i>Limit = 0.95-1.05</i>
Cal zero High point Mid point Low point As left zero As left span						Average C	orrection Facto	r	
			G	<b>GPT Calibratio</b>	n Data				
O3 Setpoint (ppl	n)	d NO Reference htration (ppb)	Indicated NO Drop concentration (ppb)	Calculated N concentration (p		dicated NO2 ntration (ppb) (Ic)	NO2 Correction fa Limit = 0.95		verter Efficiency nit = 96-104%
Cal zero High GPT point Mid GPT point Low GPT point									
					Average Co	orrection Factor			
Notes:	Maintenance is o orings replaced.	done due to +/·	- 10% high reading. Afte	er multipoint as	founds pump a	and charcoal wa	s replaced. Rea	ction chamber was	cleaned and

Calibration Performed By:

Jan Castro





**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

## **Calibration Standards**

Station Name: Station number Calibration Dat	e: April 17, 2024		NO Gas Cylinder #: NOX Cal Gas Conc: Removed Cylinder #: Removed Gas NOX Conc:		48.90 N	SA18828 48.90 ppm NA 48.90 ppm		Cal Gas Expiry Date: NO Cal Gas Conc: Removed Gas Exp Date: Removed Gas NO Conc:		er 3, 2031 ppm
Last Cal Date: Start time (MS <sup>-</sup> End time (MST)	: 13:09		NOX ga Calibrat	s Diff: tor Model:	Teledyne	API T700	NO gas Diff: Serial Number:	3810		ppm
Reason:	Maintenance			ake/model: I <mark>d Dilution Calik</mark>	Teledyne / pration Data	API 1701H	Serial Number:	953		
	Dilution flow rate Source gas flow	Calculated NOx	Calculated NO	Calculated NO2	Indicated NOx	Indicated NO	Indicated NO2		Adjusted ction factor	Baseline Adjusted NO Correction factor

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	concentration (ppb) (Cc)	concentration (ppb) (Cc)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	concentration (ppb) (Ic)	concentration (ppb) (Ic)	NOx Correction factor (Cc/(Ic-AFzero)) Limit = 0.90 - 1.10	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 Respor	nse NO <sub>x</sub> =	NA ppb	NO = NA	ppb	* = > +/-5	5% change initiates	investigation	*Percent Chan	ge NO <sub>x</sub> =	NA
Baseline Corr 1s	stpt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As Fou	nd Statistics		*Percent Chan	ge NO =	NA
Baseline Corr 2r	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As four	nd NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3r	d pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As four	nd NO r <sup>2</sup> :		NO SI:	NO Int:	
					As four	nd $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	

## As Found GPT Calibration Data

					Baseline Adjusted NO2	
O3 Setpoint (nph)	cated NO Reference oncentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NO2 concentration (ppb) (Ic)	Correction factor (Cc/(Ic-AFzero)) Limit = 0.90 - 1.10	Converter Efficiency <i>Limit = 96-104%</i>

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1501663	<u>Start</u>	<u>Finish</u>			
NOX Range (ppb):	0 - 1000 ppb				NO <sub>x</sub> Cal Slope:	NA	0.999799	
			Instrument Settings			NO <sub>x</sub> Cal Offset:	NA	2.168069
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	NA	0.998620
NO coeff or slope:	NA	1.098	NO bkgnd or offset:	NA	12.0	NO Cal Offset:	NA	0.948023
NOX coeff or slope:	NA	0.999	NOX bkgnd or offset:	NA	12.2	NO <sub>2</sub> Cal Slope:	NA	1.011507
NO2 coeff or slope:	NA	1.000	Reaction cell Press:	NA	157.8	NO <sub>2</sub> Cal Offset:	NA	-1.127282

## **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	4918	82.0	802.0	800.3	1.6	803.0	800.0	2.9	0.9987	1.0004
Mid point	4959	41.0	401.0	400.2	0.8	403.7	400.1	3.6	0.9933	1.0001
Low point	4980	20.5	200.5	200.1	0.4	205.2	202.3	2.9	0.9769	0.9889
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
As left span	4918	82.0	802.0	385.7	416.3	804.0	385.7	418.6	0.9975	1.0000
							Average Co	orrection Factor	0.9896	0.9965

### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	-0.1		
High GPT point	792.8	380.9	413.5	417.6	0.9903	101.0%
Mid GPT point	792.8	586.4	208.0	209.1	0.9949	100.5%
Low GPT point	792.8	687.0	107.4	106.3	1.0107	98.9%
				Average Correction Factor	0.9986	100.1%

Notes: Maintenance calibration. Sample inlet filters changed before calibrator zero. Adjusted zero and span. Used 2nd NO reference point because of drift.

Calibration Performed By:

Jan Castro

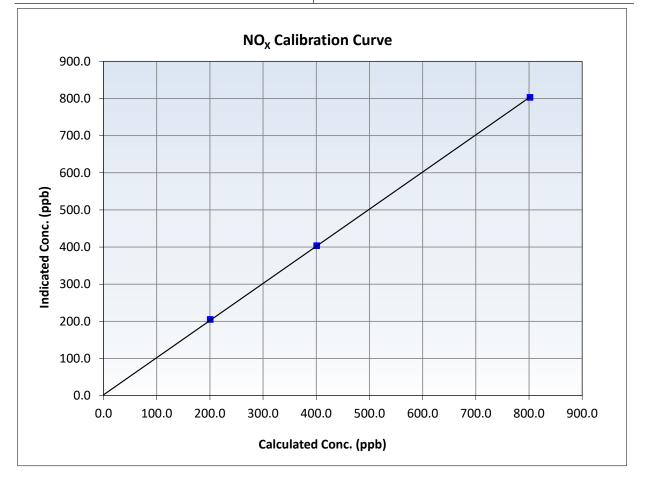


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	April 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:03	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999962	≥0.995
802.0 401.0	803.0 403.7	0.9987 0.9933	Slope	0.999799	0.90 - 1.10
200.5	205.2	0.9769	Intercept	2.168069	+/-20



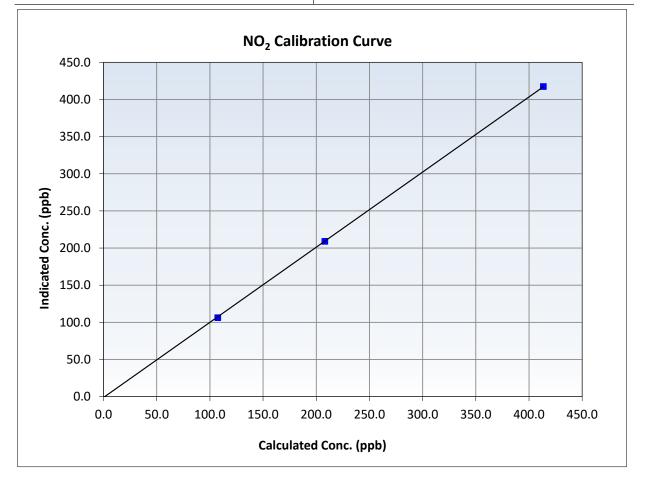


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

## **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	April 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:03	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999970	≥0.995
413.5 208.0	417.6 209.1	0.9903 0.9949	Slope	1.011507	0.90 - 1.10
107.4	106.3	1.0107	Intercept	-1.127282	+/-20



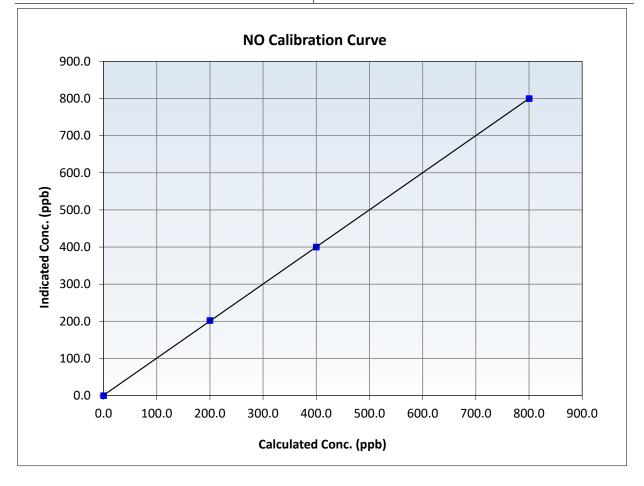


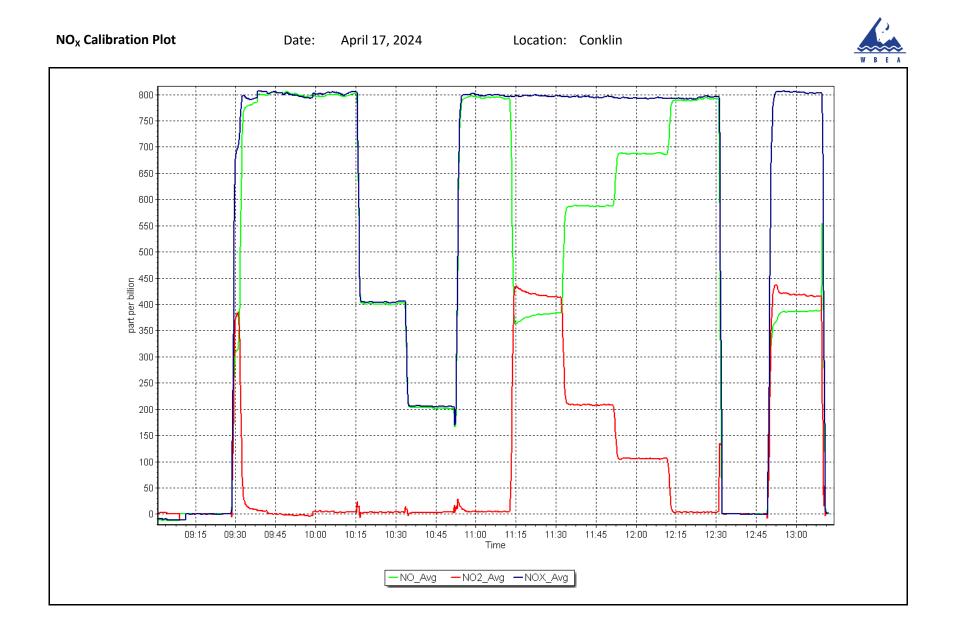
# Wood Buffalo Environmental Association NO Calibration Summary

### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	April 12, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	9:03	End Time (MST):	13:09
Analyzer make:	Thermo 42i	Analyzer serial #:	1501663731

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999990	≥0.995
800.3 400.2	800.0 400.1	1.0004 1.0001	Slope	0.998620	0.90 - 1.10
200.1	202.3	0.9889	Intercept	0.948023	+/-20







# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Report

## **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Conklin April 8, 2024 10:23 Routine		Station number: Last Cal Date: End time (MST):	March 15, 2024
		Calibration Sta	andards	
O3 generation mode:	Photometer			
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3810
ZAG Make/Model:	Teledyne API 701H		Serial Number:	691
		Analyzer Infor	mation	
Analyzer make:	Thermo 49i		Analyzer serial #:	1501663734
Analyzer Range	0 - 500 ppb			
	<u>Start</u>	<u>Finish</u>		<u>Start</u>
Calibration slope:	0.999171	0.999943	Backgd or Offset:	-1.1
Calibration intercept:	0.320000	0.060000	Coeff or Slope:	0.998

## O<sub>3</sub> 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	0.0		
As found High point	5000	952.3	400.0	399.9	1.000	
As found Mid point						
As found Low point						
Baseline Corr As found:	399.9	Previous response	400.0	*% change	0.0%	
Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:		
Baseline Corr 3rd AF pt:	NA	AF Correlation:		<pre>* = &gt; +/-5% change initiates investigation</pre>		

## **O<sub>3</sub> 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	0.0	
High point	5000	950.7	400.0	400.0	1.000
Mid point	5000	806.9	200.0	200.1	1.000
Low point	5000	704.5	100.0	100.1	0.999
As left zero	5000	800.0	0.0	0.0	
As left span	5000	951.8	400.0	401.1	0.997
			Averag	1.000	

Notes:

Changed sample inlet filters after as founds. No adjustment made.

Calibration Performed By: Jan Castro

Finish -1.1 0.998

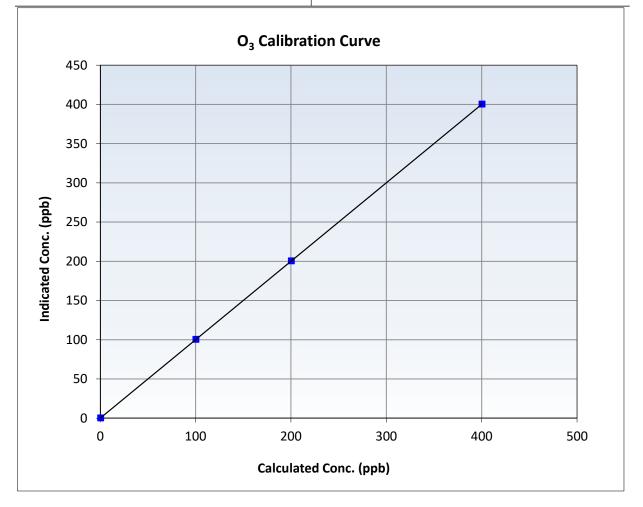


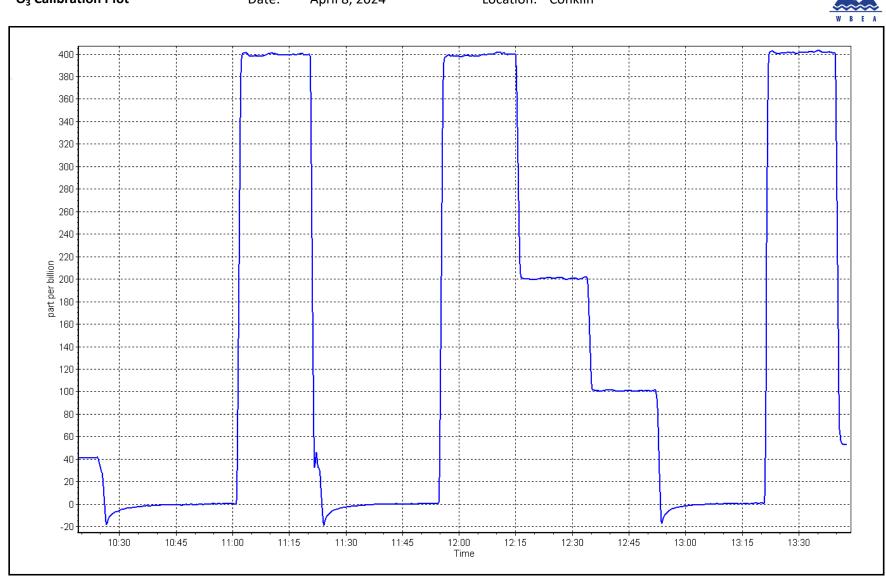
# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 8, 2024	Previous Calibration:	March 15, 2024
Station Name:	Conklin	Station Number:	AMS 21
Start Time (MST):	10:23	End Time (MST):	13:39
Analyzer make:	Thermo 49i	Analyzer serial #:	1501663734

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		Correction factor (Cc/Ic) Statistical Evaluatio		<u>Limits</u>
0.0	0.0		Correlation Coefficient	1.000000	≥0.995		
400.0 200.0	400.0 200.1	1.0000 0.9995	Slope	0.999943	0.90 - 1.10		
100.0	100.1	0.9990	Intercept	0.060000	+/- 5		





Date: April 8, 2024

Location: Conklin



### Wood Buffalo Environmental Association

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

WBEA					Version-01-202
		Station Information	on		
Station Name:	Conklin		Station number:	AMS 21	
Calibration Date:	April 18, 2024			March 18, 2024	
Start time (MST):	11:47		End time (MST):	12:24	
Analyzer Make:	API T640		S/N:	326	
Particulate Fraction:	PM2.5				
-low Meter Make/Model:	Alicat FP-25BT		S/N:	388754	
Temp/RH standard:	Alicat FP-25BT		S/N:	388754	
		Monthly Calibration	Test		
<u>Parameter</u>	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	-1.00	-1.36	-1.00		+/- 2 °C
P (mmHg)	721.90	723.58	721.90		+/- 10 mmHg
Flow (LPM)	5.00	5.05	5.00		+/- 0.25 LPM
PW% (pump)	40.00		40.00		>80%
Zero Verification	PM w/o HEPA:	2.80	PM w/ HEPA:	0.00	<0.2 ug/m3
Note: this leak check will be	completed before the	guarterly work and wi	Il serve as the pre m	aintenance leak check	
PM Inlet observation :	Inlet Head Clean		ignment Factor On :		
			-		
		Quarterly Calibration	Test		
SPAN DUST	Refractive Index:	10.90	Expiry Date:	September 29, 2024	
51 AN 2051	Lot No.:	100128-050-040			
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test	9.10	11.00	11.00		+/- 0.5
Date Optical Chan	nber Cleaned:	April 18,	2024	_	
Date Disposable Fi	ilter Changed:	April 18,	2024		

Post- maintenance Zero Verification:

#### **Annual Maintenance**

Date Sample Tube Cleaned:December 7, 2023Date RH/T Sensor Cleaned:December 7, 2023

Notes:

Verified flow, pressure, temperature and pump power.Leak check passed. No adjustment made.

PM w/ HEPA: 0.00

<0.2 ug/m3

Calibration by: Ja

Jan Castro



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS22 JANVIER APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

### **Station Information**

Station Name:	Janvier
Calibration Date:	April 12, 2024
Start time (MST):	11:19
Reason:	Routine

Station number: AMS 22 Last Cal Date: March 11, 2024 End time (MST): 14:40

### **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: 4890

Thermo 43i

0 - 1000 ppb

### **Analyzer Information**

Serial Number: 1152430006

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999806	1.002236	Backgd or Offset:	23.6	24.1
Calibration intercept:	0.664437	-0.036002	Coeff or Slope:	1.022	1.013

### SO<sub>2</sub> 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) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.3	
As found High point As found Mid point As found Low point New cylinder response	4920	79.8	799.8	805.6	0.993
Baseline Corr As found: Baseline Corr 2nd AF pt:	805.3 NA	Previous response AF Slope:	800.3	*% change AF Intercept:	0.6%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4920	79.8	799.8	801.5	0.998
Mid point	4960	39.9	399.9	400.9	0.997
Low point	4980	20.0	200.4	200.7	0.999
As left zero	5000	0.0	0.0	0.2	
As left span	4920	79.8	799.8	799.7	1.000
			Averag	0.998	

Notes:

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

Calibration Performed By:

**Rene Chamberland** 

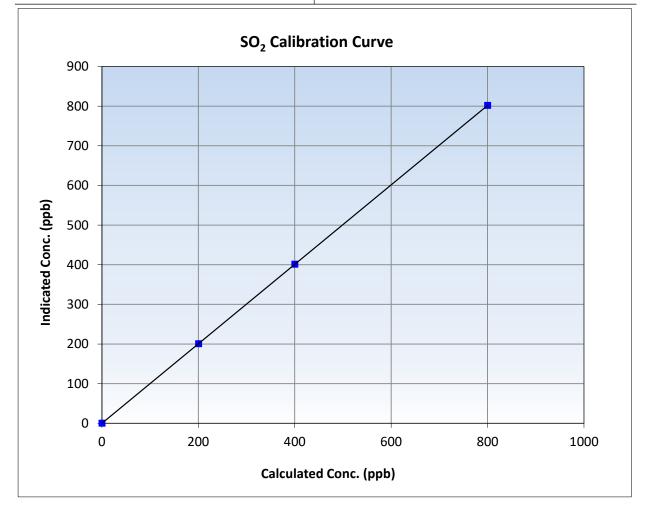


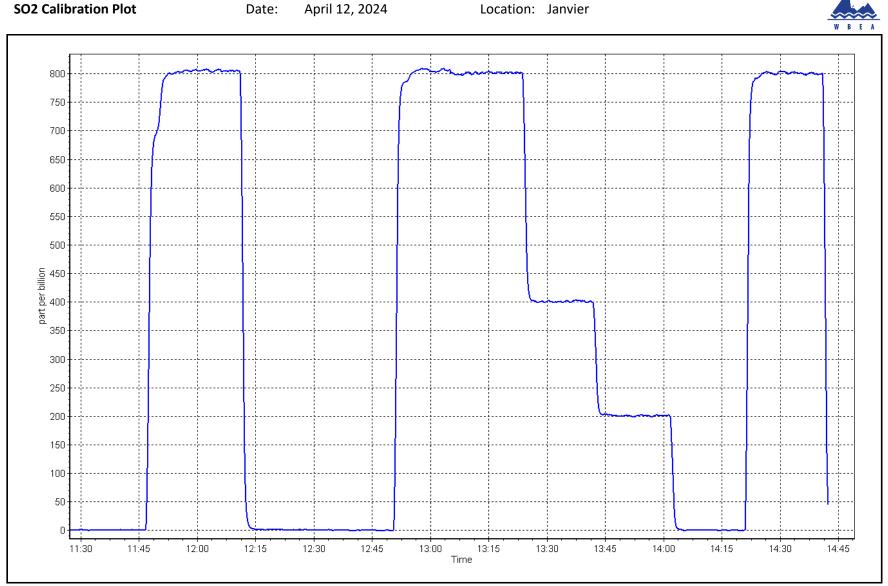
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 11, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:19	End Time (MST):	14:40
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430006

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	1.000000	≥0.995
799.8 399.9	801.5 400.9	0.9979 0.9975	Slope	1.002236	0.90 - 1.10
200.4	200.7	0.9987	Intercept	-0.036002	+/-30







### Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date:	Janvier April 18, 2024		Station number: Last Cal Date:	AMS 22 March 26, 2024	4		
Start time (MST): Reason:	11:09 Routine		End time (MST):	15:32			
		<b>Calibration S</b>	tandards				
Cal Gas Concentration: Cal Gas Cylinder #:	5.02 CC424047	ppm	Cal Gas Exp Date:	November 15,	2026		
Removed Cal Gas Conc: Removed Gas Cyl #:	5.02 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA			
Calibrator Make/Model:	Teledyne API T700		Serial Number:	3806			
ZAG Make/Model:	Teledyne API T701		Serial Number:	4890			
		Analyzer Info	ormation				
Analyzer make:	Thermo 43i-TLE		Analyzer serial #:	1151680031			
Converter make:	CDN-101		Converter serial #:	620			
Analyzer Range	0 - 100 ppb		Converter Temp:		850	degC	2
	<u>Start</u>	<u>Finish</u>		<u>Start</u>			F
Calibration slope:	0.989096	0.995809	Backgd or Offset:	3.65			
Calibration intercept:	0.440430	0.280545	Coeff or Slope:	1.188			

### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4920	79.7	80.0	79.7	1.004
As found Mid point	4960	39.8	40.0	40.4	0.989
As found Low point	4980	19.9	20.0	20.2	0.989
New cylinder response					
Baseline Corr As found:	79.7	Prev response:	79.59	*% change:	0.1%
Baseline Corr 2nd AF pt:	40.4	AF Slope:	0.995519	AF Intercept:	0.240679
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999929	* = > +/-5% change initiate	es 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	79.9	1.002
Mid point	4960	39.8	40.0	40.2	0.994
Low point	4980	19.9	20.0	20.2	0.989
As left zero	5000	0.0	0.0	0.3	
As left span	4920	79.7	80.0	79.5	1.007
SO2 Scrubber Check	4920	79.8	798.0	0.0	
Date of last scrubber chan	ge:			Ave Corr Factor	0.995

Changed the inlet filter after as founds. Scrubber test passed. No adjustments made.

Date of last converter efficiency test:

Notes:

Rene Chamberland

Finish 3.57 1.188



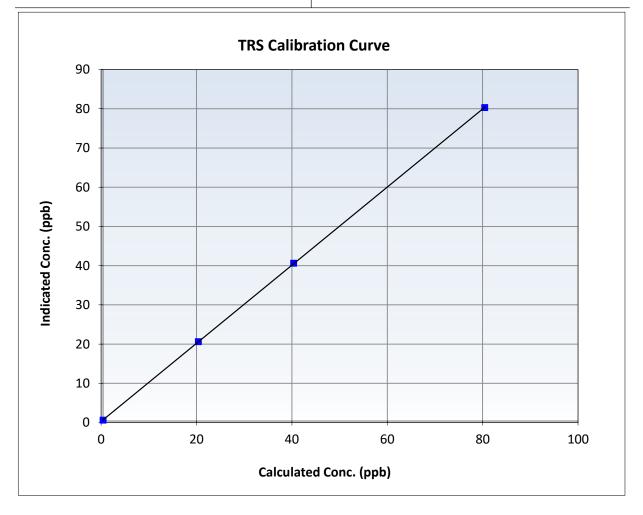
### Wood Buffalo Environmental Association

### **TRS Calibration Summary**

### **Station Information**

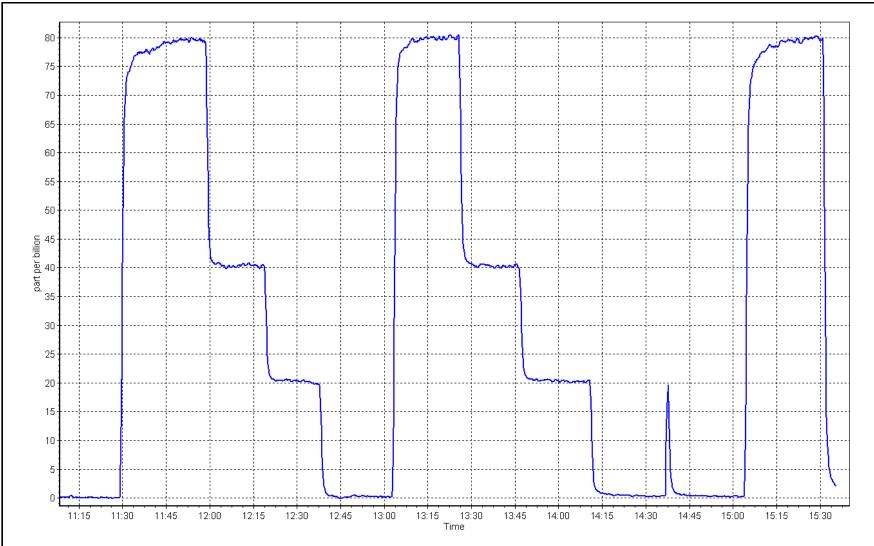
Calibration Date:	April 18, 2024	Previous Calibration:	March 26, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:09	End Time (MST):	15:32
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1151680031

#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999992 ≥0.995 0.0 0.2 ----80.0 79.9 1.0015 Slope 0.995809 0.90 - 1.10 40.0 40.2 0.9940 20.0 20.2 0.9891 Intercept 0.280545 +/-3











### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

### **Station Information**

Station Name:	Janvier	Station number: AMS 22
Calibration Date:	April 12, 2024	Last Cal Date: March 25, 2024
Start time (MST):	11:19	End time (MST): 14:40
Reason:	Routine	

### **Calibration Standards**

Gas Cert Reference:	CC281519 Cal Gas Expiry Date: Jan			January 18, 2029	9
CH4 Cal Gas Conc.	502.8	ppm	CH4 Equiv Conc.	107	5.9 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.	107	5.9 ppm
Removed C3H8 Conc.	208.4	ppm	Diff between cyl (THC):		
Diff between cyl (CH <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 700		Serial Number:	3806	
Zero Air Gen model:	Teledyne API 701		Serial Number:	4890	
		Analy	zer Information		
Analyzer make:	Thermo 55i		Analyzer serial #: 1317958219		
THC Range:	0 - 20 ppm		NMHC/CH4 Range:	0 - 10 ppm	
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.360E-04	2.49E-04	NMHC SP Ratio:	5.52E-05	5.65E-05
CH4 Retention time:	11.6	11.8	NMHC Peak Area:	165650	162086

#### **THC As Found Data**

OFF

Flat Baseline:

OFF

OFF

OFF

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	17.10	1.004
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.10	Prev response	17.15	*% change	-0.3%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	17.17	17.17	1.000
Mid point	4960	39.9	8.59	8.56	1.003
Low point	4980	20.0	4.30	4.29	1.002
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	17.17	17.14	1.002
			Avera	ge Correction Factor	1.002

Notes:

Zero Chromatogram:

Changed the inlet filter and H2 cylinder after as founds. Adjusted span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4920	79.8	9.15	9.25	0.989
Baseline Corr AF:	9.25	Prev response	9.14	*% change	1.2%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes 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	9.16	0.999
Mid point	4960	39.9	4.57	4.58	0.999
Low point	4980	20.0	2.29	2.30	0.998
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	9.15	9.11	1.004
			Avera	ge Correction Factor	0.998

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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 As found Mid point As found Low point New cylinder response	4920	79.8	8.03	7.84	1.023
Baseline Corr AF: Baseline Corr 2nd AF: Baseline Corr 3rd AF:	7.84 NA NA	Prev response AF Slope: AF Correlation:	8.01	*% change AF Intercept: * = > +/-5% change initia	

#### **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) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	8.03	8.01	1.002
Mid point	4960	39.9	4.01	3.98	1.008
Low point	4980	20.0	2.01	2.00	1.007
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	8.03	8.03	0.999
			Avera	ge Correction Factor	1.006

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.000249	0.999704
THC Cal Offset:	-0.023996	-0.008399
CH4 Cal Slope:	1.001651	0.998349
CH4 Cal Offset:	-0.024958	-0.009359
NMHC Cal Slope:	0.999256	1.001105
NMHC Cal Offset:	0.000762	0.001359

Calibration Performed By:

Rene Chamberland

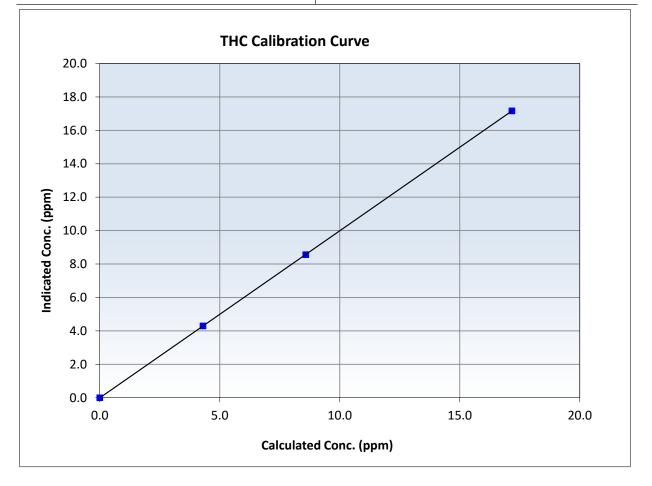


# Wood Buffalo Environmental Association THC Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:19	End Time (MST):	14:40
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999997	≥0.995
17.17	17.17	1.0003	Slope	0.999704	0.90 - 1.10
8.59	8.56	1.0033	Slope	01000701	
4.30	4.29	1.0022	Intercept	-0.008399	+/-0.5



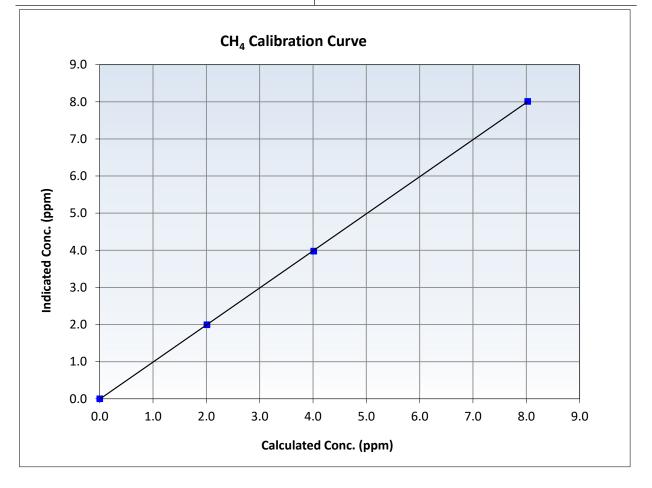


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:19	End Time (MST):	14:40
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999988	≥0.995
8.03 4.01	8.01 3.98	1.0017 1.0081	Slope	0.998349	0.90 - 1.10
2.01	2.00	1.0071	Intercept	-0.009359	+/-0.5



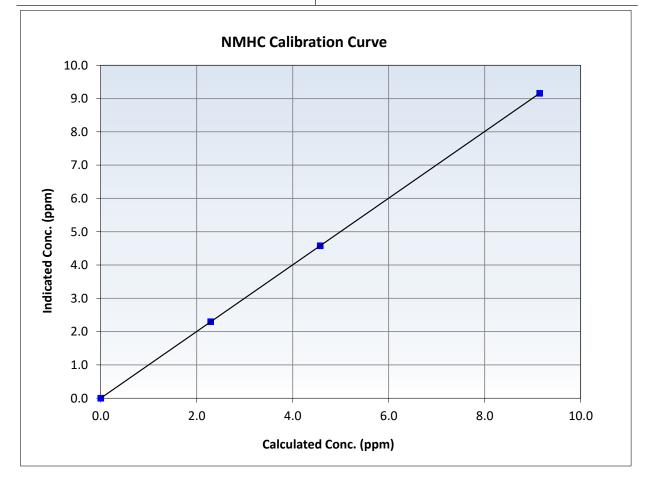


# Wood Buffalo Environmental Association NMHC Calibration Summary

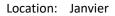
### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 25, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:19	End Time (MST):	14:40
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

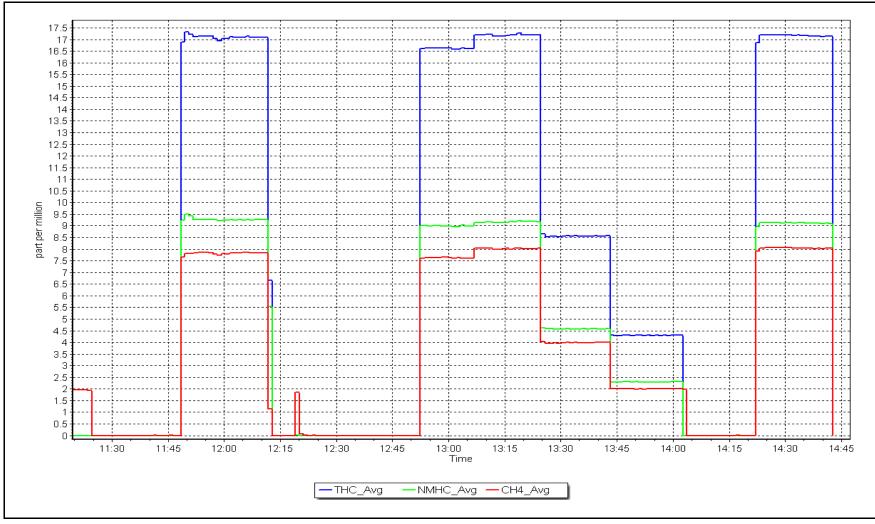
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	1.000000	≥0.995
9.15 4.57	9.16 4.58	0.9988 0.9986	Slope	1.001105	0.90 - 1.10
2.29	2.30	0.9976	Intercept	0.001359	+/-0.5



#### **NMHC Calibration Plot**









### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

### **Station Information**

Station Name:	Janvier
Calibration Date:	April 19, 2024
Start time (MST):	11:03
Reason:	Maintenance

Station number: AMS 22 Last Cal Date: April 12, 2024 End time (MST): 14:47

### **Calibration Standards**

Gas Cert Reference:	CC	281519	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 <sub>4</sub> ):			Diff between cyl (NM):		
Calibrator Model:	Teledyne API 70	C	Serial Number: 3806		
Zero Air Gen model:	Teledyne API 70	1	Serial Number: 4890		
			Analyzer Information		
Analyzer make:	Thermo 55i		Analyzer serial #: 131795	8219	
THC Range:	0 - 20 ppm		NMHC/CH4 Range: 0 - 10 p	pm	
	<i>.</i> .				

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.49E-04	2.41E-04	NMHC SP Ratio:	5.65E-05	5.65E-05
CH4 Retention time:	11.8	11.6	NMHC Peak Area:	162086	161932
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	17.42	0.986
As found Mid point	4960	39.9	8.59	8.72	0.985
As found Low point	4980	20.0	4.30	4.37	0.985
New cylinder response					
Baseline Corr AF:	17.42	Prev response	17.16	*% change	1.5%
Baseline Corr 2nd AF:	8.72	AF Slope:	1.014275	AF Intercept:	0.002340
Baseline Corr 3rd AF:	4.37	AF Correlation:	1.000000	* = > +/-5% change initiate	es 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	17.19	0.999
Mid point	4960	39.9	8.59	8.52	1.007
Low point	4980	20.0	4.30	4.24	1.015
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	17.17	17.03	1.008
			Avera	ge Correction Factor	1.007

Notes:

Changed the actuator after as founds. Adjusted span only.



### Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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	9.15	1.000
As found Mid point	4960	39.9	4.57	4.60	0.994
As found Low point New cylinder response	4980	20.0	2.29	2.31	0.992
Baseline Corr AF:	9.15	Prev response	9.16	*% change	-0.1%
Baseline Corr 2nd AF:	4.60	AF Slope:	0.999618	AF Intercept:	0.012560
Baseline Corr 3rd AF:	2.31	AF Correlation:	0.999989	* = > +/-5% change initia	ites investigation

#### **NMHC Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Correction factor (Cc/Ic)
	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	9.15	9.16	0.999
Mid point	4960	39.9	4.57	4.56	1.003
Low point	4980	20.0	2.29	2.27	1.010
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	9.15	9.08	1.007
			Avera	age Correction Factor	1.004

#### CH4 As Found Data

	CIT <del>T</del> AS TO			
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))
F000	0.0	0.00	0.00	Limit = 0.90-1.10
5000	0.0	0.00	0.00	
4920	79.8	8.03	8.27	0.970
4960	39.9	4.01	4.12	0.975
4980	20.0	2.01	2.06	0.979
8.27	Prev response	8.00	*% change	3.2%
4.12	AF Slope:	1.030868	AF Intercept:	-0.010820
2.06	AF Correlation:	0.999991	* = > +/-5% change initia	ates investigation
	(sccm) 5000 4920 4960 4980 8.27 4.12	Dilution air flow rate (sccm)Source gas flow rate (sccm)50000.0492079.8496039.9498020.08.27Prev response 4.124.12AF Slope:	(sccm)         (sccm)         (ppm) (Cc)           5000         0.0         0.00           4920         79.8         8.03           4960         39.9         4.01           4980         20.0         2.01           8.27         Prev response         8.00           4.12         AF Slope:         1.030868	Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calculated concentration (ppm) (Cc)         Indicated concentration (ppm) (lc)           5000         0.0         0.00         0.00           4920         79.8         8.03         8.27           4960         39.9         4.01         4.12           4980         20.0         2.01         2.06           8.27         Prev response         8.00         *% change           4.12         AF Slope:         1.030868         AF Intercept:

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate	Source gas flow rate	Calculated concentration	Indicated concentration	Correction factor (Cc/Ic)
SetFont	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	<i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	79.8	8.03	8.04	0.999
Mid point	4960	39.9	4.01	3.97	1.012
Low point	4980	20.0	2.01	1.97	1.021
As left zero	5000	0.0	0.00	0.00	
As left span	4920	79.8	8.03	7.95	1.010
			Avera	ge Correction Factor	1.010

#### **Calibration Statistics**

<u>Start</u>	<u>Finish</u>
0.999704	1.002111
-0.008399	-0.041995
0.998349	1.002620
-0.009359	-0.028359
1.001105	1.001665
0.001359	-0.013635
	0.999704 -0.008399 0.998349 -0.009359 1.001105

Calibration Performed By:

Rene Chamberland

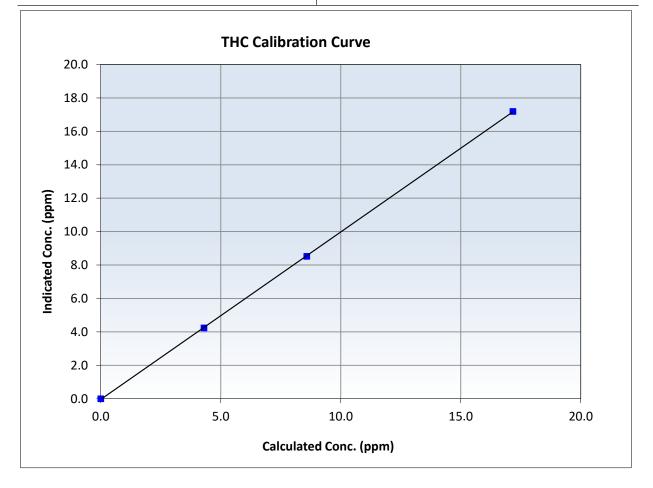


# Wood Buffalo Environmental Association THC Calibration Summary

### **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 12, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:03	End Time (MST):	14:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	<u>Limits</u>	
0.00	0.00		Correlation Coefficient	0.999970	≥0.995
17.17 8.59	17.19 8.52	0.9988 1.0073	Slope	1.002111	0.90 - 1.10
4.30	4.24	1.0150	Intercept	-0.041995	+/-0.5



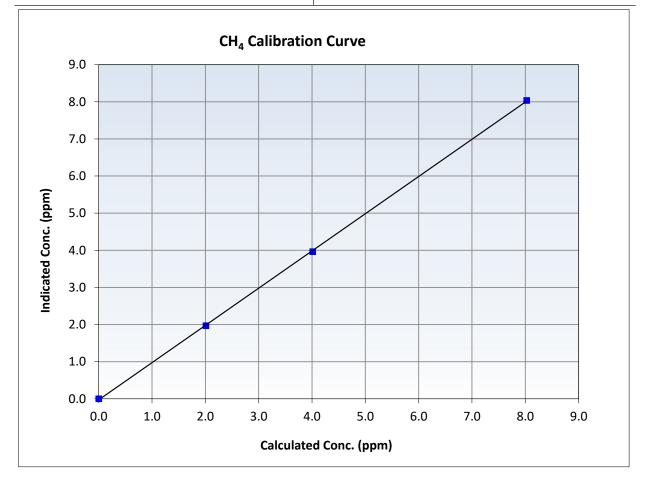


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 12, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:03	End Time (MST):	14:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999933	≥0.995
8.03 4.01	8.04 3.97	0.9985 1.0120	Slope	1.002620	0.90 - 1.10
2.01	1.97	1.0209	Intercept	-0.028359	+/-0.5



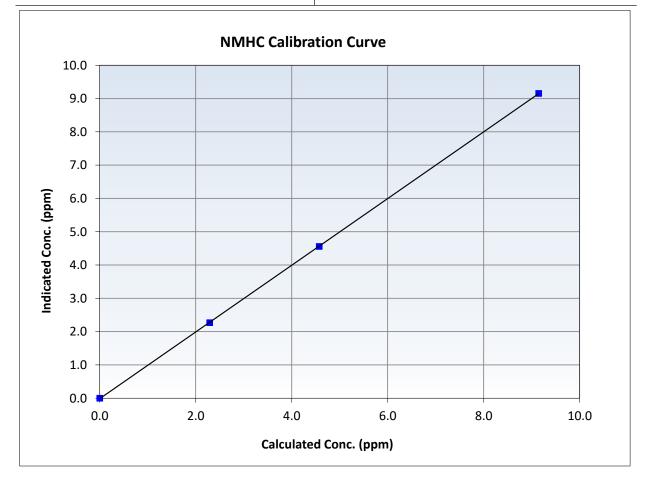


# Wood Buffalo Environmental Association NMHC Calibration Summary

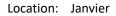
### **Station Information**

Calibration Date:	April 19, 2024	Previous Calibration:	April 12, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	11:03	End Time (MST):	14:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1317958219

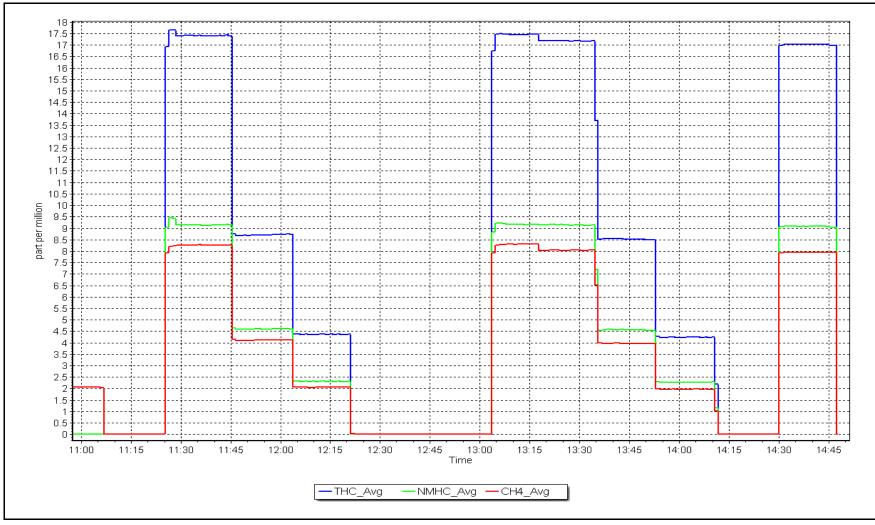
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999990	≥0.995
9.15 4.57	9.16 4.56	0.9990 1.0032	Slope	1.001665	0.90 - 1.10
2.29	2.27	1.0099	Intercept	-0.013635	+/-0.5



#### **NMHC Calibration Plot**









**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Standards**

Station Name:	Janvier	NO Gas Cylinder #:	DT0047765	Cal Gas Expiry Date:	March 11, 2031
Station number:	AMS 22	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc:	48.80 ppm
Calibration Date:	April 16, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Last Cal Date:	March 27, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc:	48.80 ppm
Start time (MST):	10:54	NOX gas Diff:		NO gas Diff:	
End time (MST):	15:52	Calibrator Model:	Teledyne API T700	Serial Number:	3806
Reason:	Routine	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	1.0	-0.1	1.0		
AF High point	4918	82.0	802.0	800.3	1.6	807.8	802.6	5.2	0.9940	0.9970
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	805.1 ppb	NO = 804.1	ppb	* = > +/-59	% change initiates	investigation	*Percent Chan	ge NO <sub>X</sub> =	0.2%
Baseline Corr 1	.st pt NO <sub>X</sub> =	806.8 ppb	NO = 802.7	ppb	<u>As Foun</u>	d Statistics		*Percent Chan	ge NO =	-0.2%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>X</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
As Found GPT Calibration Data										
								Baseline Adjus	ted NO2	
O3 Setpo	pint (ppb)	Indicated NO Re concentration		cated NO Drop entration (ppb)	Calculated No concentration (pp		dicated NO2 ntration (ppb) (Ic)	Correction f (Cc/(Ic-AFz		verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Statistics**

Analyzer Make:	Teledyne API T20	0	Serial Number: 833				<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.003829	0.997901
			Instrument Settings			NO <sub>x</sub> Cal Offset:	0.024109	0.704052
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.005929	0.999703
NO coeff or slope:	0.853	0.846	NO bkgnd or offset:	0.0	-0.7	NO Cal Offset:	-0.915862	0.464053
NOX coeff or slope:	0.845	0.840	NOX bkgnd or offset:	-0.2	0.5	NO <sub>2</sub> Cal Slope:	0.998553	0.997737
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	6.4	6.7	NO <sub>2</sub> Cal Offset:	-0.654801	-0.534162

### **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	0.1	-0.1		
High point	4918	82.0	802.0	800.3	1.6	800.6	800.2	0.2	1.0017	1.0001
Mid point	4960	41.0	400.9	400.1	0.8	401.2	401.1	0.1	0.9993	0.9975
Low point	4980	20.5	200.5	200.1	0.4	201.4	200.5	0.9	0.9954	0.9978
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	400.1	401.9	795.7	400.1	395.6	1.0079	1.0000
							Average Co	orrection Factor	0.9988	0.9985

### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	-0.1		
High GPT point	798.1	400.4	399.3	398.1	1.0031	99.7%
Mid GPT point	798.1	600.6	199.1	198.0	1.0058	99.4%
Low GPT point	798.1	698.7	101.0	99.8	1.0124	98.8%
				Average Correction Factor	1.0071	99.3%

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

Calibration Performed By:

Rene Chamberland

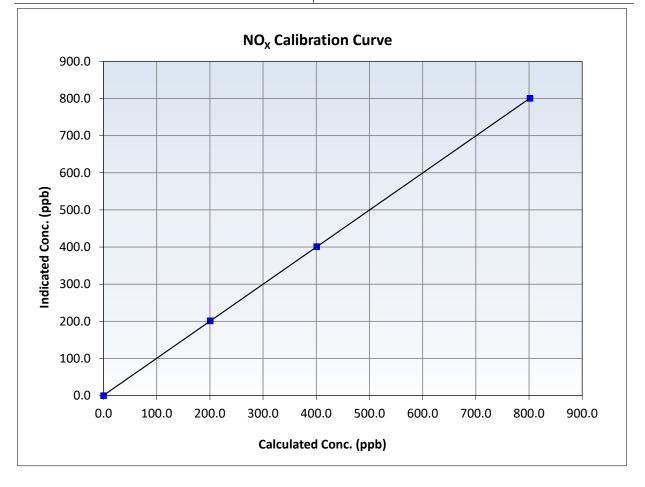


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:54	End Time (MST):	15:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999996	≥0.995
802.0 400.9	800.6 401.2	1.0017 0.9993	Slope	0.997901	0.90 - 1.10
200.5	201.4	0.9954	Intercept	0.704052	+/-20



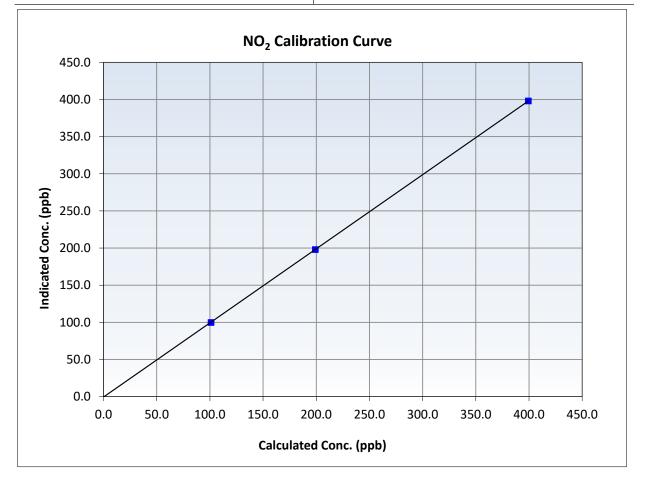


## Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:54	End Time (MST):	15:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999994	≥0.995
399.3 199.1	398.1 198.0	1.0031 1.0058	Slope	0.997737	0.90 - 1.10
101.0	99.8	1.0124	Intercept	-0.534162	+/-20



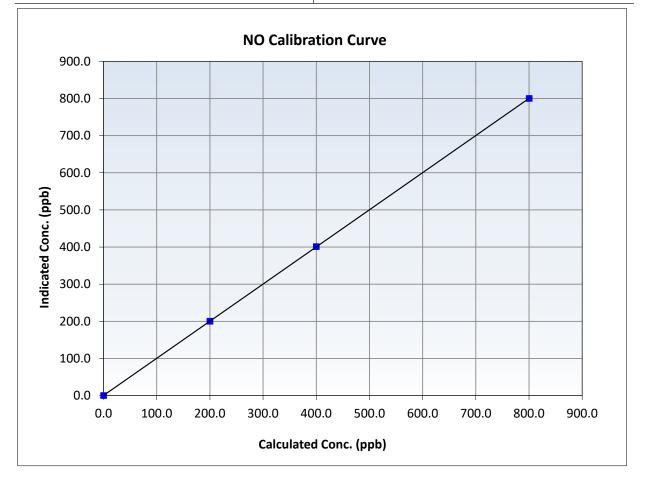


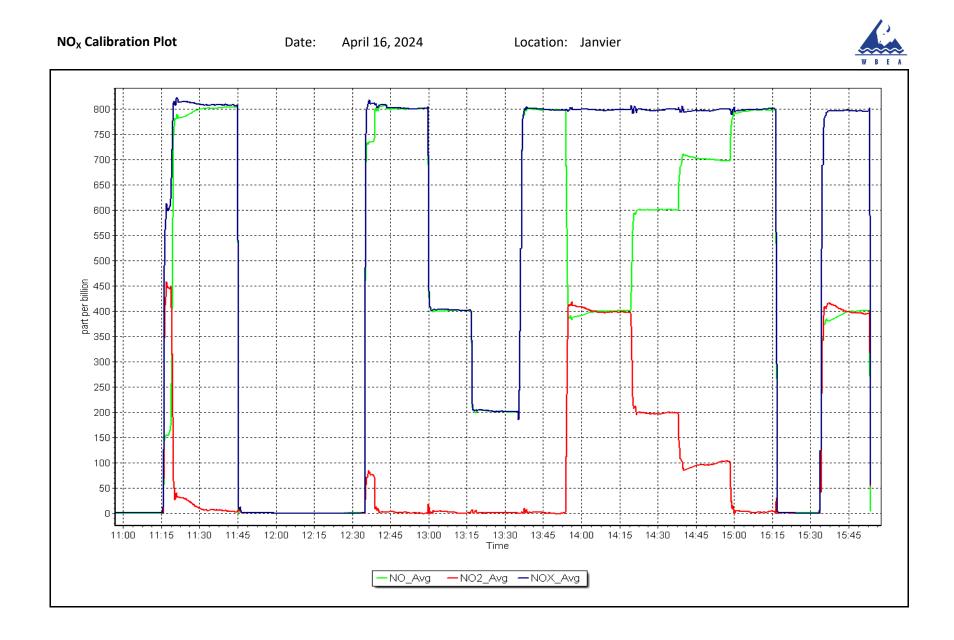
# Wood Buffalo Environmental Association NO Calibration Summary

### **Station Information**

Calibration Date:	April 16, 2024	Previous Calibration:	March 27, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:54	End Time (MST):	15:52
Analyzer make:	Teledyne API T200	Analyzer serial #:	833

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999998	≥0.995
800.3 400.1	800.2 401.1	1.0001 0.9975	Slope	0.999703	0.90 - 1.10
200.1	200.5	0.9978	Intercept	0.464053	+/-20







# **Wood Buffalo Environmental Association O**<sub>3</sub> Calibration Report

### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Janvier April 15, 2024 10:46 Routine		Station number: AW Last Cal Date: Ma End time (MST): 13:	rch 22, 2024	
		Calibration	Standards		
O3 generation mode:	Photometer				
Calibrator Make/Model:			Serial Number: 380	16	
ZAG Make/Model:	Teledyne API T700		Serial Number: 69:	-	
ZAG WIAKE/ WIOUEI.	Teledyne AFT 170111		Senai Number. 05.	L	
		Analyzer Inf	ormation		
		Analyzer ini	ormation		
Analyzer make:	Teledyne API T400		Analyzer serial #: 704	16	
Analyzer Range	0 - 500 ppb				
	Start	Finish		Start	Finish
Calibration slope:	1.003829	1.003571	Backgd or Offset:	2.2	2.2
Calibration intercept:	0.480000	0.300000	Coeff or Slope:	1.027	1.027
Campiation Intercept.	0.460000	0.300000	coen or slope.	1.027	1.027

### **O<sub>3</sub> As Found Data**

Set Point	Dilution air flow rate (sccm)	Calibrator Lamp Voltage Drive (mV)	Calculated concentration (ppb) (Cc)		Baseline Adjusted Correction factor (Cc/(Ic- AFzero) Limit = 0.90-1.10
As found zero	5000	800.0	0.0	-1.3	
As found High point As found Mid point As found Low point	5000	916.2	400.0	401.0	0.994
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	402.3 NA NA	Previous response AF Slope: AF Correlation:		*% change AF Intercept: * = > +/-5% change initia	

#### **O<sub>3</sub> 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	-0.1	
High point	5000	916.2	400.0	401.4	0.997
Mid point	5000	763.7	200.0	201.6	0.992
Low point	5000	656.1	100.0	100.8	0.992
As left zero	5000	800.0	0.0	0.2	
As left span	5000	916.2	400.0	403.7	0.991
			Averag	e Correction Factor	0.994

Notes:

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

Calibration Performed By:

Rene Chamberland

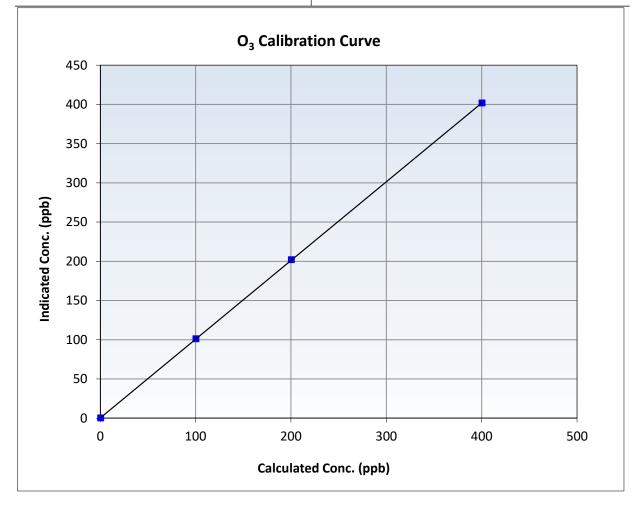


# Wood Buffalo Environmental Association O<sub>3</sub> Calibration Summary

### **Station Information**

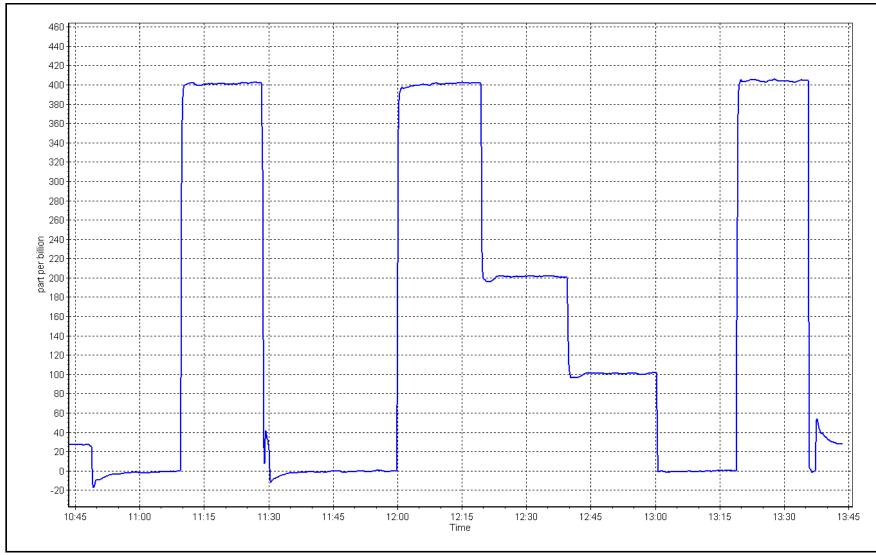
Calibration Date:	April 15, 2024	Previous Calibration:	March 22, 2024
Station Name:	Janvier	Station Number:	AMS 22
Start Time (MST):	10:46	End Time (MST):	13:40
Analyzer make:	Teledyne API T400	Analyzer serial #:	7046

Calculated concentration (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999993	≥0.995
400.0 200.0	401.4 201.6	0.9965 0.9921	Slope	1.003571	0.90 - 1.10
100.0	100.8	0.9921	Intercept	0.300000	+/- 5











### Wood Buffalo Environmental Association

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

WBEA					Version-01-2024
		Station Informat	tion		
Station Name:	Janvier		Station number: AMS	22	
Calibration Date:	April 18, 2024		Last Cal Date: Marc	ch 26, 2024	
Start time (MST):	13:33		End time (MST): 15:22	2	
Analyzer Make: Particulate Fraction:	Teledyne API T640 PM2.5		S/N: 325		
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 3887	52	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	52	
	I	Monthly Calibratio	n Test		
<u>Parameter</u>	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	0.6	0.16	0.6		+/- 2 °C
P (mmHg)	731.2	731.78	731.2		+/- 10 mmHg
Flow (LPM)	5.01	5.074	5.01		+/- 0.25 LPM
PW% (pump)	38		38		>80%
Zero Verification	PM w/o HEPA:	1.7	PM w/ HEPA:	0.0	<0.2 ug/m3
Note: this leak check will be PM Inlet observation :	e completed before the qu Inlet Head Clean		vill serve as the pre mainter Alignment Factor On :		

**Quarterly Calibration Test Refractive Index:** 10.9 Expiry Date: June 10, 2024 SPAN DUST Lot No.: 100128-050-042 <u>Adjusted</u> (Limits) <u>Parameter</u> As found Post maintenance <u>As left</u> **PMT Peak Test** 10.2 11.9 10.9  $\checkmark$ 10.9 +/- 0.5 Date Optical Chamber Cleaned: April 18, 2024 Date Disposable Filter Changed: April 18, 2024 PM w/ HEPA: 0 Post- maintenance Zero Verification: <0.2 ug/m3

	Annual Maintenance
Date Sample Tube Cleaned:	July 26, 2023
Date RH/T Sensor Cleaned:	April 18, 2024

Notes:

Verified flow, temperature, and pressure. Leak check passed. PMT peak voltage adjusted. Optical chamber and RH/T sensor cleaned. Disposable filter changed.

Calibration by: Rene Chamberland



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS23 FORT HILLS APRIL 2024

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

May 31, 2024



Station Name:

Fort Hills

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

Station number: AMS 23

### **Station Information**

Calibration Date: Start time (MST): Reason:	April 11, 2024 7:55 Routine		Last Cal Date: Ma End time (MST): 10:	arch 8, 2024	
		Calibration S	tandards		
Cal Gas Concentration: Cal Gas Cylinder #:	49.76 CC281425	ppm	Cal Gas Exp Date: Jan	nuary 5, 2025	
Removed Cal Gas Conc: Removed Gas Cyl #:	49.76	ppm	Rem Gas Exp Date: Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 45:	1	
Zero Air Gen Model:	API T701		Serial Number: 56	11	
		Analyzer Info	ormation		
Analyzer make:	Thermo 43i		Serial Number: 11	60290012	
Analyzer Range:	0-1000ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003512	1.009318	Backgd or Offset:	18.5	18.6
Calibration intercept:	-0.524217	-1.305054	Coeff or Slope:	1.063	1.063

### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4920	80.3	799.1	802.6	0.995
Baseline Corr As found: Baseline Corr 2nd AF pt:	803.0 NA	Previous response AF Slope:	801.4	*% change AF Intercept:	0.2%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.1	
High point	4920	80.3	799.1	805.9	0.992
Mid point	4960	40.2	400.1	401.7	0.996
Low point	4980	20.1	200.0	199.5	1.003
As left zero	5000	0.0	0.0	0.0	
As left span	4920	80.3	799.1	804.8	0.993
			Averag	ge Correction Factor:	0.997

Notes:

Zero adjusted. No maintenance done.

Calibration Performed By:

Melissa Lemay

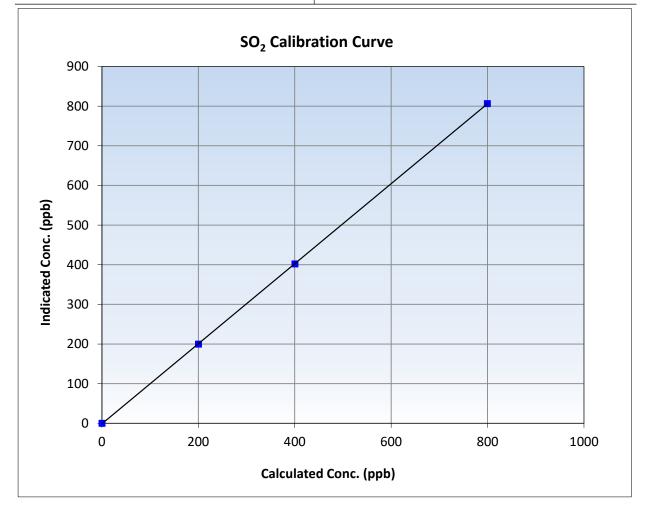


# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

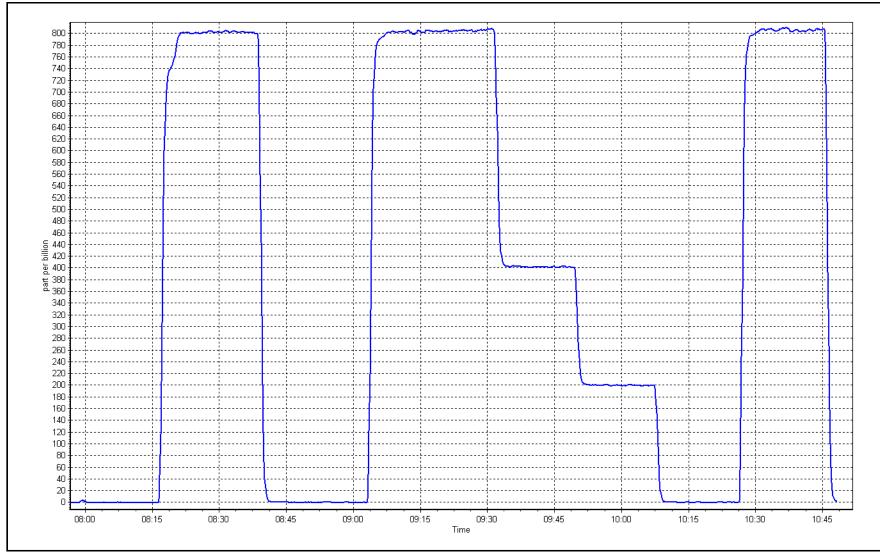
Calibration Date:	April 11, 2024	Previous Calibration:	March 8, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:55	End Time (MST):	10:48
Analyzer make:	Thermo 43i	Analyzer serial #:	1160290012

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999990	≥0.995
799.1 400.1	805.9 401.7	0.9916 0.9959	Slope	1.009318	0.90 - 1.10
200.0	199.5	1.0027	Intercept	-1.305054	+/-30











# Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Station Name: Calibration Date:	Fort Hills April 12, 2024		Station number: Last Cal Date:	AMS 23 March 13, 2024	
Start time (MST):	6:50		End time (MST):	10:53	
Reason:	Routine			10.55	
RedSUII.	Routine				
		Calibration S	<u>tandards</u>		
Cal Gas Concentration:	5.20	ppm	Cal Gas Exp Date:	February 5, 2024	
Cal Gas Cylinder #:	CC517372		•		
, Removed Cal Gas Conc:	5.20	ppm	Rem Gas Exp Date:		
Removed Gas Cyl #:			Diff between cyl:		
, Calibrator Make/Model:	API T700		, Serial Number:	451	
ZAG Make/Model:	API T701		Serial Number:	5611	
,					
		Analyzer Info	ormation		
Analyzer make:	Thermo 43i TLE		Analyzer serial #:	1300156232	
Converter make:	CDN-101		Converter serial #:		
Analyzer Range	0 - 100 ppb		Converter Temp:	750 deg	r.
Analyzer Kallge	0 - 100 hhn		converter remp.	750 ueg	,C
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	1
Calibration slope:	0.991459	1.008213	Backgd or Offset:	2.0	
Calibration intercept:	-0.038309	0.074071	Coeff or Slope:	1.160	

### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4923	77.0	80.1	77.4	1.035
As found Mid point	4962	38.5	40.0	38.5	1.040
As found Low point	4981	19.2	20.0	19.2	1.040
New cylinder response					
Baseline Corr As found:	77.4	Prev response:	79.36	*% change:	-2.5%
Baseline Corr 2nd AF pt:	38.5	AF Slope:	0.966678	AF Intercept:	-0.078827
Baseline Corr 3rd AF pt:	19.2	AF Correlation:	0.999992	* = > +/-5% change initiate	es 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	4923	77.0	80.1	80.7	0.992
Mid point	4962	38.5	40.0	40.7	0.984
Low point	4981	19.2	20.0	20.1	0.992
As left zero	5000	0.0	0.0	0.0	
As left span	4923	77.0	80.1	83.1	0.964
SO2 Scrubber Check	4920	80.3	803.0	0.0	
Date of last scrubber c	hange:			Ave Corr Factor	0.989
Date of last converter	efficiency test:	March 13, 2024		102.7%	efficiency

Notes:

SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By:

Melissa Lemay

Einish 2.1 1.190



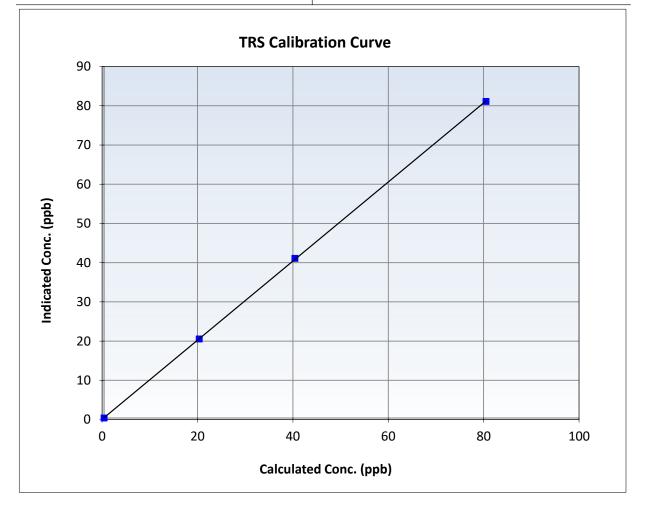
# Wood Buffalo Environmental Association

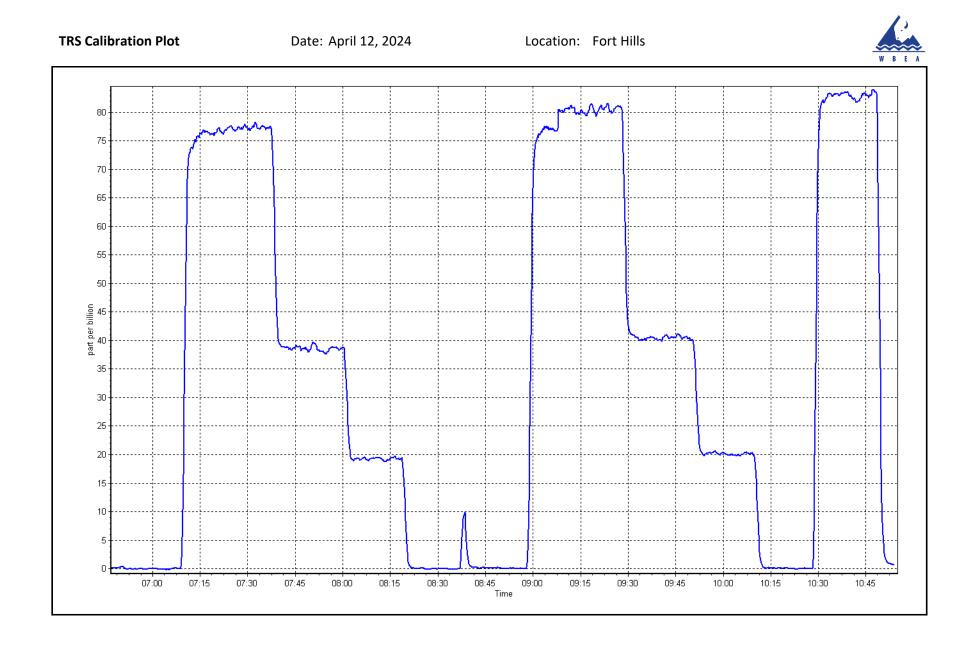
## **TRS Calibration Summary**

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 13, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:50	End Time (MST):	10:53
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1300156232

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999974	≥0.995
80.1 40.0	80.7 40.7	0.9923 0.9837	Slope	1.008213	0.90 - 1.10
20.0	20.1	0.9919	Intercept	0.074071	+/-3







# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

Analyzer serial #: 1193585648

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Fort Hills	Station number: AMS 23
Calibration Date:	April 11, 2024	Last Cal Date: March 8, 2024
Start time (MST):	7:55	End time (MST): 10:47
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 <sub>4</sub> ):		Diff between cyl (NM):		
Calibrator Model:	API T700	Serial Number:	451	
Zero Air Gen model:	API T701	Serial Number:	5611	
Analyzer Information				

Analyzer make: Thermo 55i THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	2.35E-04	2.33E-04	NMHC SP Ratio:	4.93E-05	5.01E-05
CH4 Retention time:	13.2	13.2	NMHC Peak Area:	183614	182937
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	17.28	0.995
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.28	Prev response	17.27	*% change	0.0%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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	17.20	0.999
Mid point	4960	40.2	8.61	8.64	0.996
Low point	4980	20.1	4.30	4.32	0.996
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.3	17.19	17.18	1.001
			Avera	ge Correction Factor	0.997

Notes:

Nitrogen Cylinder changed. Span adjusted.



# Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4920	80.3	9.16	9.11	1.006
Baseline Corr AF:	9.11	Prev response	9.17	*% change	-0.8%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	tes 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	1.001
Mid point	4960	40.2	4.59	4.66	0.985
Low point	4980	20.1	2.29	2.36	0.972
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.3	9.16	9.13	1.003
			Avera	ge Correction Factor	0.986

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	AFzero))
					<i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.00	0.00	
As found High point	4920	80.3	8.03	8.17	0.983
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 initial	tes investigation

#### **CH4 Calibration Data**

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration C (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4920	80.3	8.03	8.06	0.997
Mid point	4960	40.2	4.02	3.98	1.010
Low point	4980	20.1	2.01	1.96	1.025
As left zero	5000	0.0	0.00	0.00	
As left span	4920	80.3	8.03	8.04	0.999
			Avera	ge Correction Factor	1.010

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.004093	1.000451
THC Cal Offset:	0.011596	0.012003
CH4 Cal Slope:	1.012136	1.004637
CH4 Cal Offset:	-0.025657	-0.032039
NMHC Cal Slope:	0.997614	0.997117
NMHC Cal Offset:	0.036452	0.043442

Calibration Performed By:

Melissa Lemay

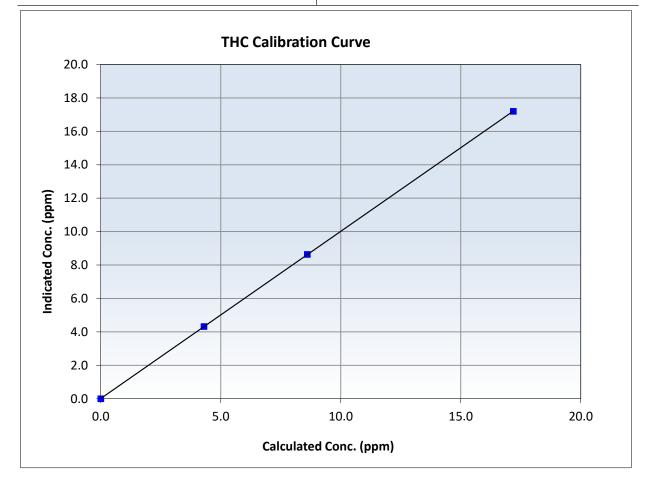


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 8, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:55	End Time (MST):	10:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585648

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>	
0.00	0.00		Correlation Coefficient	0.999997	≥0.995	
17.19 8.61	17.20 8.64	0.9994 0.9962 0.9957		Slope	1.000451	0.90 - 1.10
4.30	4.32		Intercept	0.012003	+/-0.5	



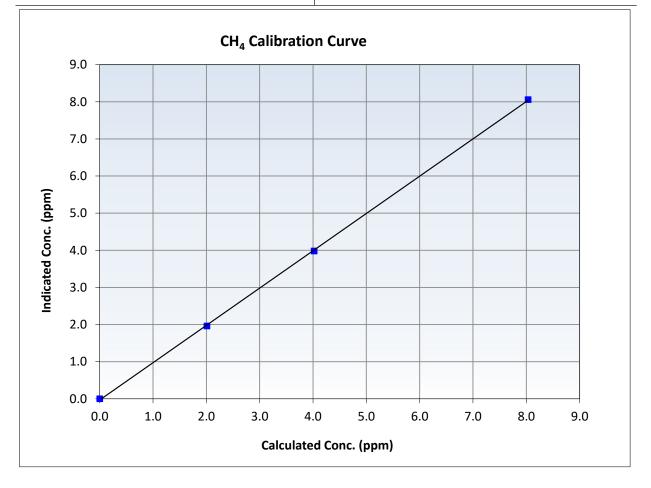


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 8, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:55	End Time (MST):	10:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585648

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999924	≥0.995
8.03 4.02	8.06 3.98	0.9970 1.0097	Slope	1.004637	0.90 - 1.10
2.01	1.96	1.0249	Intercept	-0.032039	+/-0.5



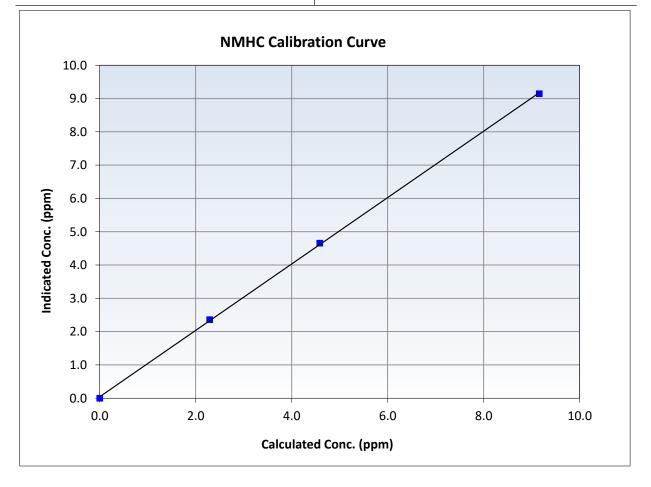


# Wood Buffalo Environmental Association NMHC Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 8, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	7:55	End Time (MST):	10:47
Analyzer make:	Thermo 55i	Analyzer serial #:	1193585648

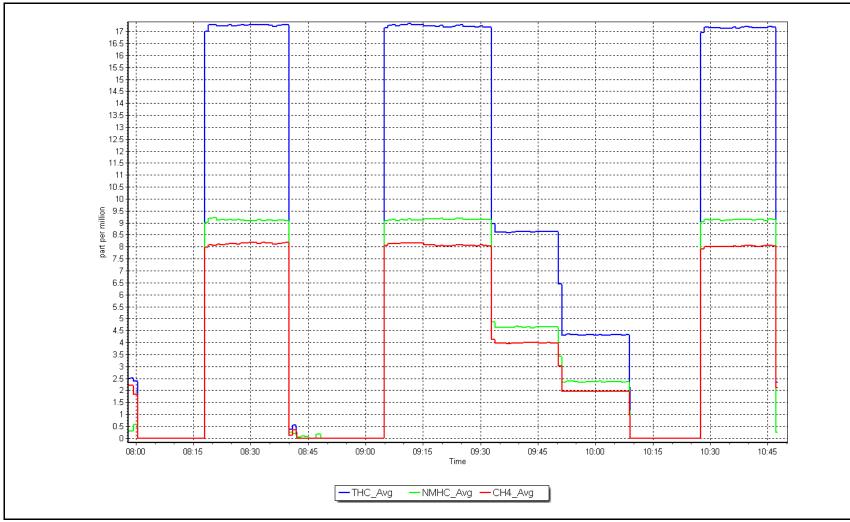
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999883	≥0.995
9.16 4.59	9.15 4.66	1.0012 0.9846	Slope	0.997117	0.90 - 1.10
2.29	2.36	0.9715	Intercept	0.043442	+/-0.5



#### NMHC Calibration Plot









**Station Information** 

# Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Fort Hills	NO Gas Cylinder #:	CC358149	Cal Gas Expiry Date:	January 5, 2032
Station number:	AMS 23	NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc:	60.10 ppm
Calibration Date:	April 4, 2024	Removed Cylinder #:		Removed Gas Exp Date	:
Last Cal Date:	March 12, 2024	Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc	: 60.10 ppm
Start time (MST):	6:32	NOX gas Diff:		NO gas Diff:	
End time (MST):	10:53	Calibrator Model:	API T700	Serial Number:	451
Reason:	Routine	ZAG make/model:	API T701	Serial Number:	5611

### 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	-0.1	-0.1		
AF High point	4934	66.3	799.5	796.9	2.7	777.6	770.3	7.3	1.0279	1.0344
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	798.3 ppb	NO = 794.1	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>X</sub> =	-2.6%
Baseline Corr 1	st pt NO <sub>x</sub> =	777.8 ppb	NO = 770.4	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-3.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
			c				1	Baseline Adjus		

O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
· · ·						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1152430007					<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.998626	1.000499
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-0.173464	0.045790
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.998303	1.001459
NO coeff or slope:	1.132	1.169	NO bkgnd or offset:	3.1	3.2	NO Cal Offset:	-1.451679	-1.552494
NOX coeff or slope:	0.996	0.995	NOX bkgnd or offset:	3.3	3.4	NO <sub>2</sub> Cal Slope:	1.002264	1.003459
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	177.0	177.0	NO <sub>2</sub> Cal Offset:	0.618019	-1.071483

#### **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	4934	66.3	799.5	796.9	2.7	799.9	797.3	2.7	0.9995	0.9995
Mid point	4967	33.2	400.4	399.0	1.3	400.9	397.3	3.6	0.9987	1.0044
Low point	4983	16.6	200.2	199.5	0.7	200.1	196.6	3.5	1.0006	1.0150
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.1	-0.1		
As left span	4934	66.3	799.5	388.0	411.5	804.5	388.0	416.4	0.9938	1.0000
							Average Co	orrection Factor	0.9996	1.0063

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.0		
High GPT point	796.2	386.2	412.7	414.1	0.9965	100.4%
Mid GPT point	796.2	588.0	210.9	208.4	1.0118	98.8%
Low GPT point	796.2	690.9	108.0	107.2	1.0070	99.3%
				Average Correction Factor	1.0051	99.5%

Notes:

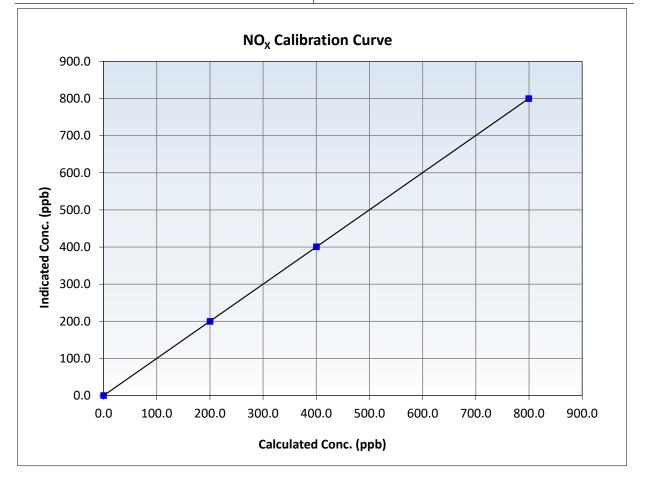


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:32	End Time (MST):	10:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	1.000000	≥0.995
799.5 400.4	799.9 400.9	0.9995 0.9987	Slope	1.000499	0.90 - 1.10
200.2	200.1	1.0006	Intercept	0.045790	+/-20



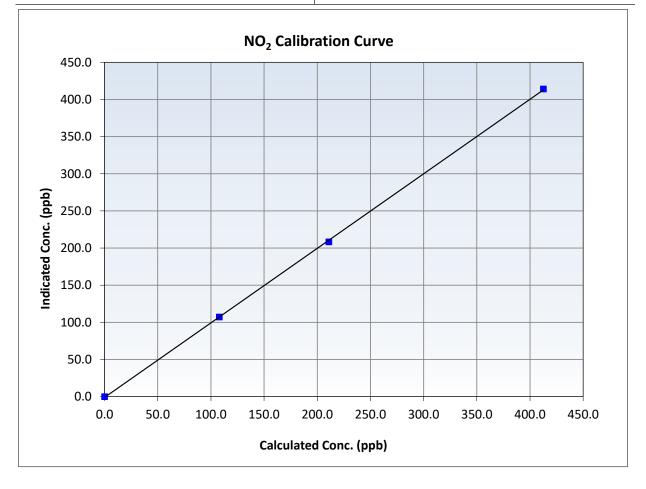


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:32	End Time (MST):	10:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999927	≥0.995
412.7 210.9	414.1 208.4	0.9965 1.0118	Slope	1.003459	0.90 - 1.10
108.0	107.2	1.0070	Intercept	-1.071483	+/-20



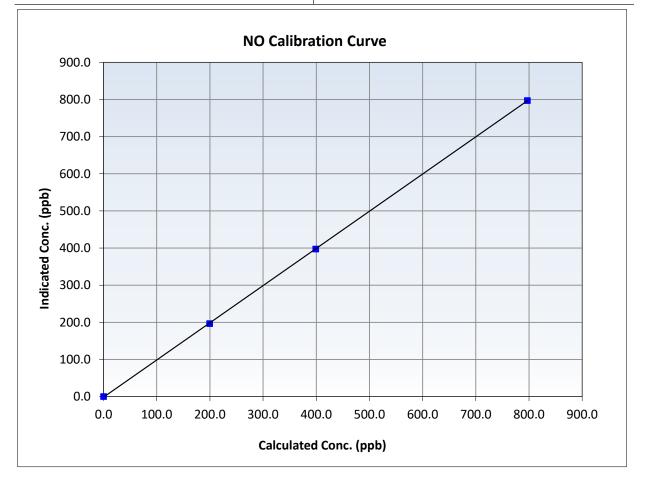


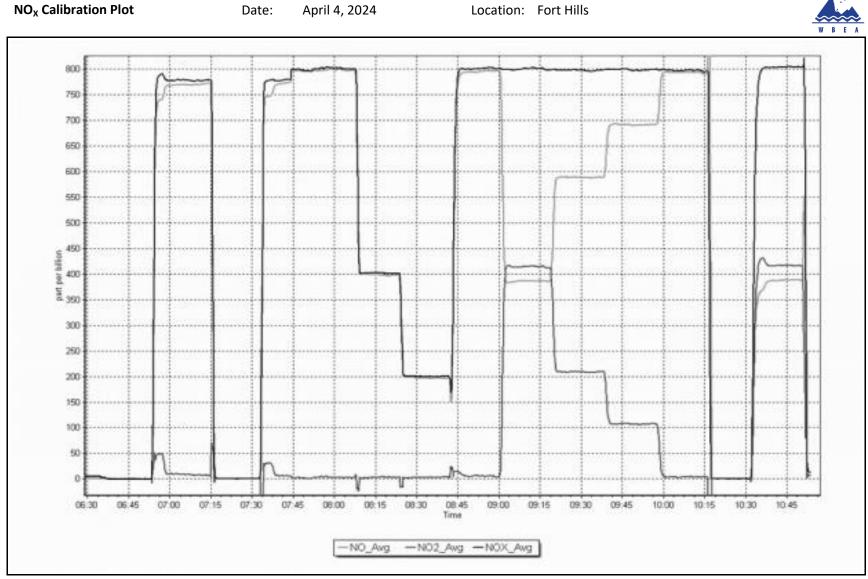
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 12, 2024
Station Name:	Fort Hills	Station Number:	AMS 23
Start Time (MST):	6:32	End Time (MST):	10:53
Analyzer make:	Thermo 42i	Analyzer serial #:	1152430007

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	lation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999980	≥0.995
796.9	797.3	0.9995	Slope	1.001459	0.90 - 1.10
399.0	397.3	1.0044	Slope	1.001439	0.30 - 1.10
199.5	196.6	1.0150	Intercept	-1.552494	+/-20





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# Wood Buffalo Environmental Association

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

WBEA					Version-01-2024
		Station Informat	tion		
Station Name:	Fort Hills		Station number: AMS	23	
Calibration Date:	April 11, 2024		Last Cal Date: Marc	h 8, 2024	
Start time (MST):	6:56		End time (MST): 7:56		
Analyzer Make: Particulate Fraction:	API T640 PM2.5		S/N: 1546		
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 3887	53	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	53	
	I	Monthly Calibration	n Test		
Parameter	<u>As found</u>	Measured	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	0.4	-0.6	0.4		+/- 2 °C
P (mmHg)	737.6	737.5	737.6		+/- 10 mmHg
Flow (LPM)	5.00	4.97	5.00		+/- 0.25 LPM
PW% (pump)	42		42		>80%
Zero Verification	PM w/o HEPA:	5.3	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:	10-Jun-24			
SPAN DOST	Lot No.:	100128-050-042					
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	<u>Adjusted</u>	(Limits)		
PMT Peak Test	9.1	11	11		+/- 0.5		
Date Optical Chamber Cleaned:		April 11,	2024				
Date Disposable Filter Changed:		April 11,	2024				
Post- maintenance Zero Verification:		PM w/ HEPA:0		<0.2 ug/m3			

#### **Annual Maintenance**

Date Sample Tube Cleaned:October 17, 2023Date RH/T Sensor Cleaned:October 17, 2023

Notes:

No 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 APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:Waskow ohci PimatisiwinStation number: AMS 25Calibration Date:April 22, 2024Last Cal Date: March 11, 2024Start time (MST):7:54End time (MST): 10:53Reason:RoutineFour time (MST): 10:53

Thermo 43i

0-1000ppb

### **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

Serial Number: 1118148497

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.002469	0.998541	Backgd or Offset:	11.2	10.8
Calibration intercept:	0.048260	-0.052708	Coeff or Slope:	1.056	1.048

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4920	80.5	800.1	803.0	0.996
Baseline Corr As found: Baseline Corr 2nd AF pt:	803.4 NA	Previous response AF Slope:	802.1	*% change AF Intercept:	0.2%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4920	80.5	800.1	798.9	1.001
Mid point	4960	40.2	399.6	399.0	1.001
Low point	4980	20.1	199.8	199.2	1.003
As left zero	5000	0.0	0.0	0.2	
As left span	4920	80.5	800.1	800.2	1.000
			Average Correction Factor:		1.002

Notes:

No maintenance done. Zero and span adjusted.

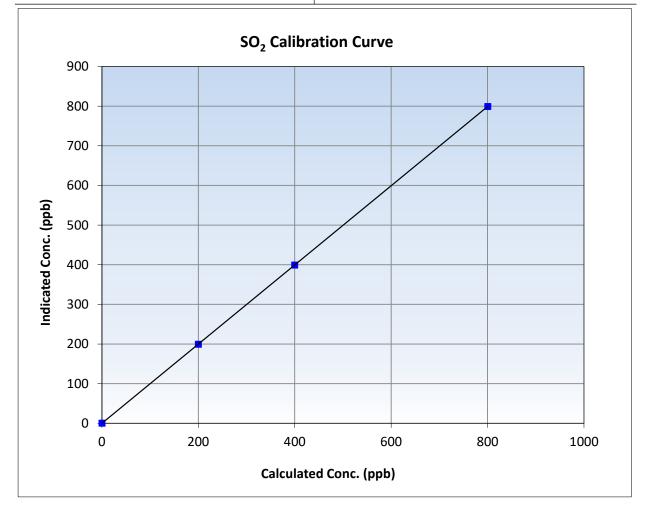


# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

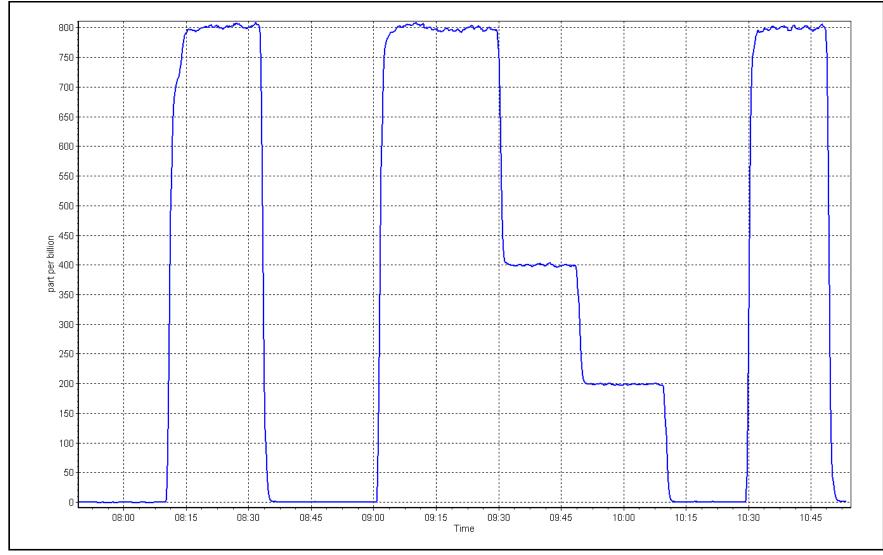
Calibration Date:	April 22, 2024	Previous Calibration:	March 11, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	7:54	End Time (MST):	10:53
Analyzer make:	Thermo 43i	Analyzer serial #:	1118148497

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	1.000000	≥0.995
800.1	798.9	1.0015	Slope	0.998541	0.90 - 1.10
399.6	399.0	1.0014	51000	0.550541	0.50 1.10
199.8	199.2	1.0030	Intercept	-0.052708	+/-30











# Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Waskow ohci Pimat April 17, 2024 6:15 Routine	isiwin	Station number: Last Cal Date: End time (MST):	AMS 25 March 18, 202 10:58	4	
		<b>Calibration S</b>	tandards			
Cal Gas Concentration: Cal Gas Cylinder #:	4.97 CC517099	ppm	Cal Gas Exp Date:	January 3, 202	6	
Removed Cal Gas Conc: Removed Gas Cyl #:	4.97	ppm	Rem Gas Exp Date: Diff between cyl:			
Calibrator Make/Model: ZAG Make/Model:	API T700 API T701		Serial Number: Serial Number:	747 261		
		Analyzer Info	ormation			
Analyzer make: Converter make:	Thermo 43i-LTE Global G-150		Analyzer serial #: Converter serial #:	1170050146 2022-219		
Analyzer Range	0 - 100 ppb		Converter Temp:		350	degC
Calibration slope: Calibration intercept:	<u>Start</u> 1.008429 0.120000	<u>Finish</u> 1.001868 0.120000	Backgd or Offset: Coeff or Slope:			

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4920	80.0	79.5	81.3	0.978
As found Mid point	4960	40.0	39.8	40.6	0.979
As found Low point	4980	20.0	19.9	20.4	0.975
New cylinder response					
Baseline Corr As found:	81.3	Prev response:	80.31	*% change:	1.2%
Baseline Corr 2nd AF pt:	40.6	AF Slope:	1.021989	AF Intercept:	0.020000
Baseline Corr 3rd AF pt:	20.4	AF Correlation:	0.999998	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4920	80.0	79.5	79.7	0.998
Mid point	4960	40.0	39.8	40.2	0.989
Low point	4980	20.0	19.9	19.9	0.999
As left zero	5000	0.0	0.0	0.2	
As left span	4912	88.3	800.0	819.8	0.976
SO2 Scrubber Check	4921	79.2	800.0	0.0	
Date of last scrubber chan	ige:			Ave Corr Factor	0.995

Date of last converter efficiency test:

Notes:

SOx scrubber checked after the calibrator zero. Span adjusted.

Calibration Performed By: Melissa Lemay

Finish 3.2 1.095



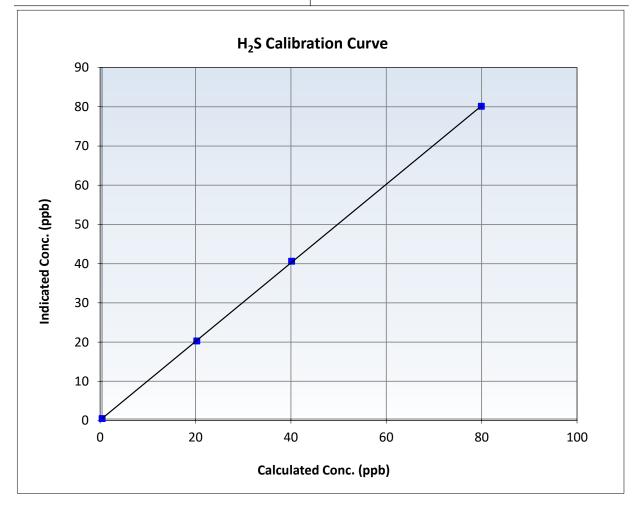
# Wood Buffalo Environmental Association

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

### **Station Information**

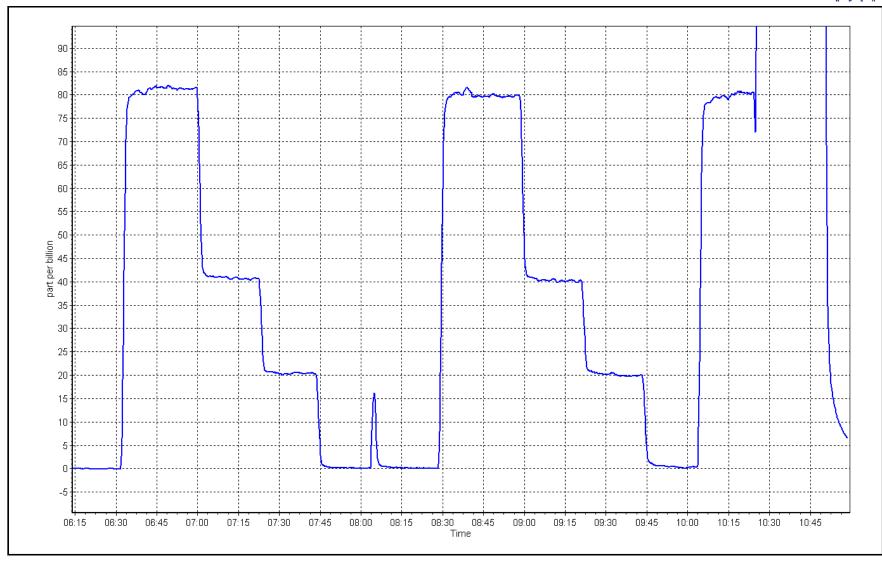
Calibration Date:	April 17, 2024	Previous Calibration:	March 18, 2024
Station Name:	Waskow ohci Pimatisiwin	Station Number:	AMS 25
Start Time (MST):	6:15	End Time (MST):	10:58
Analyzer make:	Global G-150	Analyzer serial #:	2022-219

		<u>compression</u>			
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999975	≥0.995
79.5 39.8	79.7 40.2	0.9977 0.9891	Slope	1.001868	0.90 - 1.10
19.9	19.9	0.9990	Intercept	0.120000	+/-3











## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

## AMS26 CHRISTINA LAKE APRIL 2024

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

May 31, 2024



# **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Christina Lake April 9, 2024 9:46 Routine		Station number: Al Last Cal Date: M End time (MST): 12	arch 22, 2024	
		<b>Calibration</b>	Standards		
Cal Gas Concentration: Cal Gas Cylinder #:	49.56 CC362134	ppm	Cal Gas Exp Date: Fe	bruary 23, 2025	
Removed Cal Gas Conc:	49.56	ppm	Rem Gas Exp Date: NA	4	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 28	31	
Zero Air Gen Model:	API T701H		Serial Number: 83	32	
		Analyzer Inf	ormation		
Analyzer make:	Thermo 43i		Serial Number: 11	152430005	
Analyzer Range:	0- 1000 ppb				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.997322	0.999449	Backgd or Offset:	25.8	26.5
Calibration intercept:	0.975976	0.556005	Coeff or Slope:	0.956	0.944

# SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4919	80.8	800.9	805.6	0.995
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	805.3 NA NA	Previous response AF Slope: AF Correlation:	799.8	*% change AF Intercept: * = > +/-5% change initiate	0.7% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.1	
High point	4919	80.8	800.9	801.0	1.000
Mid point	4960	40.4	400.4	400.4	1.000
Low point	4980	20.2	200.2	201.5	0.994
As left zero	5000	0.0	0.0	0.1	
As left span	4919	80.8	800.9	800.0	1.001
			Averag	ge Correction Factor:	0.998

Notes:

Changed sample inlet filters after as founds. Adjusted zero and span.

Version 03-2024 CALS 457

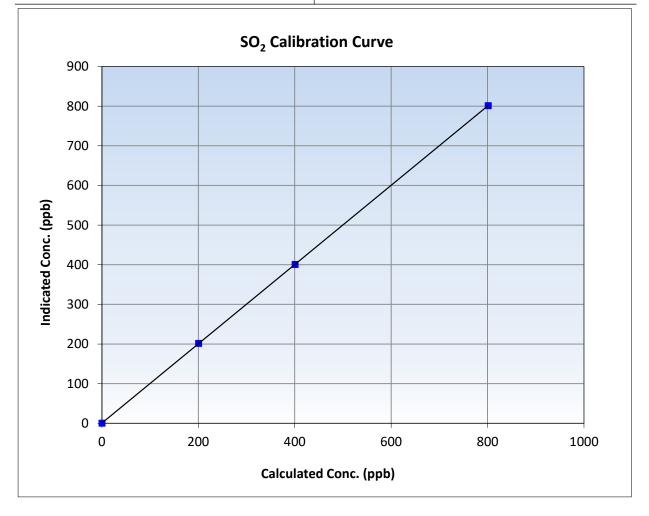


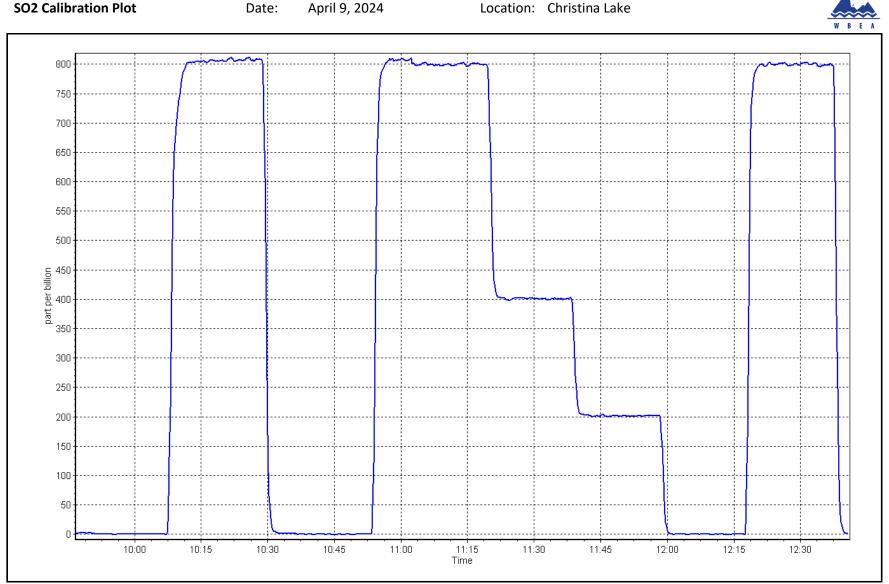
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 9, 2024	Previous Calibration:	March 22, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	9:46	End Time (MST):	12:36
Analyzer make:	Thermo 43i	Analyzer serial #:	1152430005

Calculated concentration Indicated concentration Co (ppb) (Cc) (ppb) (Ic)		Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>	
0.0	0.1		Correlation Coefficient	0.999997	≥0.995	
800.9 400.4	801.0 400.4	0.9999 1.0000	Slope	0.999449	0.90 - 1.10	
200.2	201.5	0.9936	Intercept	0.556005	+/-30	







Calibration intercept:

# Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

			Station mile	iniation				
Station Name: Calibration Date: Start time (MST): Reason:		Christina Lake April 10, 2024 9:43 Removal		Station number: Last Cal Date: End time (MST):	AMS 26 March 12, 2024 11:42	1		
			Calibration S	itandards				
	Cal Gas Concentration: Cal Gas Cylinder #:	5.05 DT0014831	ppm	Cal Gas Exp Date:	November 15, 2	2026		
	Removed Cal Gas Conc: Removed Gas Cyl #:	5.05 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA			
	Calibrator Make/Model:	API T700		Serial Number:	5258			
	ZAG Make/Model:	API T701H		Serial Number:	832			
			Analyzer Info	ormation				
	Analyzer make:	Thermo 450i		Analyzer serial #:	1180030032			
	, Converter make:	NA		, Converter serial #:	NA			
	Analyzer Range	0 - 100 ppb		Converter Temp:		322	degC	2
		<u>Start</u>	<u>Finish</u>		<u>Start</u>			F
	Calibration slope:	0.996996	NA	Backgd or Offset:	34.5			

NA

#### H2S As Found Data

Coeff or Slope:

1.064

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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.5	
As found High point	4921	79.2	80.0	80.2	1.004
As found Mid point	4960	39.6	40.0	40.2	1.008
As found Low point	4980	19.8	20.0	20.0	1.026
New cylinder response					
Baseline Corr As found:	79.7	Prev response:	80.11	*% change:	-0.5%
Baseline Corr 2nd AF pt:	39.7	AF Slope:	0.997997	AF Intercept:	0.298408
Baseline Corr 3rd AF pt:	19.5	AF Correlation:	0.999968	* = > +/-5% change initiate	es 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					
High point					
Mid point					
Low point					
As left zero					
As left span					
SO2 Scrubber Check					
Date of last scrubber chang	e:			Ave Corr Factor	
Date of last converter effici	ency test:				

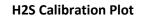
Notes: Removing instrument for upgrade. Will install new analyzer with external converter.

Calibration Performed By: Jan Castro

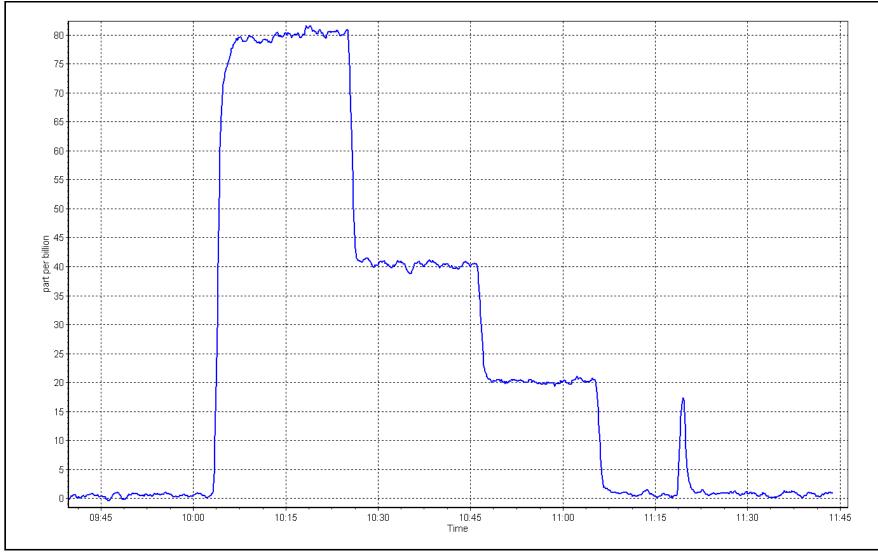
0.358415

<u>Finish</u> NA

NA









# Wood Buffalo Environmental Association H2S Calibration Report

## Station Information

Station Name: Calibration Date: Start time (MST):	Christina Lake April 11, 2024 10:57		Station number: Last Cal Date: End time (MST):	AMS 26 NA 13:53	
Reason:	Install			13.33	
		Calibration S	itandards		
Cal Gas Concentration: Cal Gas Cylinder #:	5.05 DT0014831	ppm	Cal Gas Exp Date:	November 15, 2026	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.05 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA	
Calibrator Make/Model:			Serial Number:	5258	
ZAG Make/Model:	API T701H		Serial Number:	832	
		Analyzer Info	ormation		
Analyzer make:	Thermo 43iQTL		Analyzer serial #:	12333331547	
Converter make:	Global 150		Converter serial #:	2022-196	
Analyzer Range	0 - 100 ppb		Converter Temp:	325	degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	NA	1.004141	Backgd or Offset:	NA	1.5
Calibration intercept:	NA	-0.141605	Coeff or Slope:	NA	1.030
		H2S As Fou	nd Data		
Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero))

(Cc/(Ic-AFzero)) (sccm) (sccm) (ppb) (Ic) (Cc) 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 Prev response: NA \*% change: NA Baseline Corr 2nd AF pt: NA AF Slope: NA AF Intercept: NA Baseline Corr 3rd AF pt: NA AF Correlation: NA \* = > +/-5% change initiates investigation

#### **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	80.2	0.997
Mid point	4960	39.6	40.0	40.0	1.000
Low point	4980	19.8	20.0	19.9	1.005
As left zero	5000	0.0	0.0	-0.1	
As left span	4921	79.2	80.0	80.0	1.000
SO2 Scrubber Check	4919	80.8	808.0	0.0	
Date of last scrubber chan	ge:	11-Apr-24		Ave Corr Factor	1.001

Date of last converter efficiency test:

Notes: Install calibrations. Changed sample inlet filters before calibrator zero. Scrubber check done after calibrator zero and passed. Adjusted zero and span.

Calibration Performed By: Jan Castro



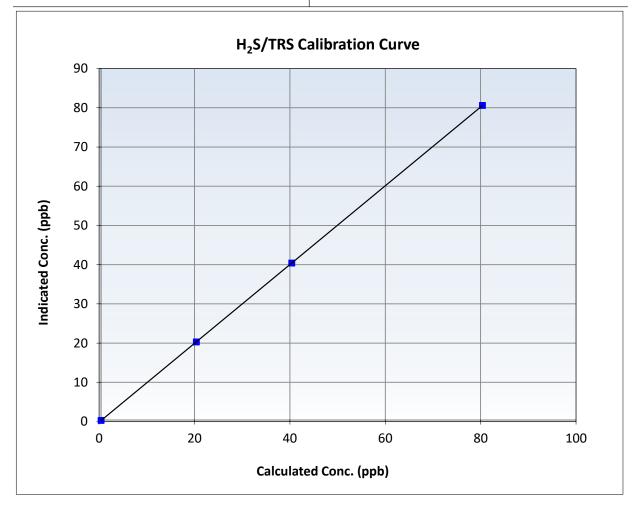
# **Wood Buffalo Environmental Association**

## **H2S Calibration Summary**

### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	NA
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	10:57	End Time (MST):	13:53
Analyzer make:	Thermo 43iQTL	Analyzer serial #:	12333331547

	Calibration Data									
Calculated concentratior (ppb) (Cc)	n Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>					
0.0	-0.1		Correlation Coefficient	0.999999	≥0.995					
80.0 40.0	80.2 40.0	0.9974 1.0000	Slope	1.004141	0.90 - 1.10					
20.0	19.9	1.0050	Intercept	-0.141605	+/-3					



### H2S Calibration Plot









**Station Information** 

## Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Christina Lake	NO Gas Cylinder #:	CC755290	Cal Gas Expiry Date: January 3, 2031
Station number:	AMS 26	NOX Cal Gas Conc:	48.90 ppm	NO Cal Gas Conc: 48.70 ppm
Calibration Date:	April 23, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA
Last Cal Date:	March 13, 2024	Removed Gas NOX Conc:	48.90 ppm	Removed Gas NO Conc: 48.70 ppm
Start time (MST):	9:37	NOX gas Diff:		NO gas Diff:
End time (MST):	14:24	Calibrator Model:	API T700	Serial Number: 3253
Reason:	Routine	ZAG make/model:	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)) <i>Limit = 0.90 - 1.10</i>	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	-0.8	-0.2	-0.7		
AF High point	4918	82.1	802.9	799.6	3.3	808.9	803.3	5.5	0.9916	0.9952
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	803.7 ppb	NO = 799.5	ppb	* = > +/-5	% change initiates i	investigation	*Percent Chang	e NO <sub>x</sub> =	0.7%
Baseline Corr 1	lst pt NO <sub>x</sub> =	809.7 ppb	NO = 803.5	ppb	<u>As Four</u>	nd Statistics		*Percent Chang	je NO =	0.5%
Baseline Corr 2	2nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
		Indicated NO Do	foronco Indi	asted NO Dran	Coloulated N	0.2	diasted NO2	Baseline Adjuste		vortor Efficiency

 O3 Setpoint (ppb)
 Indicated NO Reference
 Indicated NO Drop
 Calculated NO2
 Indicated NO2
 Correction factor
 Converter Efficiency

 Concentration (ppb)
 concentration (ppb)
 concentration (ppb)
 concentration (ppb) (Cc)
 concentration (ppb) (Ic)
 (Cc/(Ic-AFzero))
 Limit = 96-104%

 Limit = 0.90 - 1.10
 Limit = 0.90 - 1.10
 Limit = 0.90 - 1.10
 Limit = 0.90 - 1.10

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

# $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1173480	0006			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.000066	1.000009
			Instrument Settings			NO <sub>x</sub> Cal Offset:	0.766423	-1.813460
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	0.999129	0.998685
NO coeff or slope:	1.318	1.329	NO bkgnd or offset:	2.5	2.6	NO Cal Offset:	0.606305	-2.513223
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	3.3	2.7	NO <sub>2</sub> Cal Slope:	1.004655	1.022718
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	162.8	162.5	NO <sub>2</sub> Cal Offset:	0.153346	0.962157

#### **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) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	-0.1	0.0		
High point	4918	82.1	802.9	799.6	3.3	802.1	797.5	4.6	1.0010	1.0027
Mid point	4959	41.1	401.9	400.3	1.6	399.0	395.4	3.6	1.0074	1.0124
Low point	4980	20.5	200.5	199.7	0.8	197.0	194.9	2.1	1.0176	1.0244
As left zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
As left span	4918	82.1	802.9	406.0	396.9	802.7	406.0	396.7	1.0003	1.0000
							Average Co	orrection Factor	1.0087	1.0132

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.0		
High GPT point	775.7	403.3	375.7	384.1	0.9781	102.2%
Mid GPT point	775.7	582.2	196.8	204.3	0.9632	103.8%
Low GPT point	775.7	682.4	96.6	99.7	0.9687	103.2%
				Average Correction Factor	0.9700	103.1%

Notes: Sample inlet filters changed after as founds. Adjusted zero and span. Used 2nd NO reference point because of drift.

Calibration Performed By:

Jan Castro

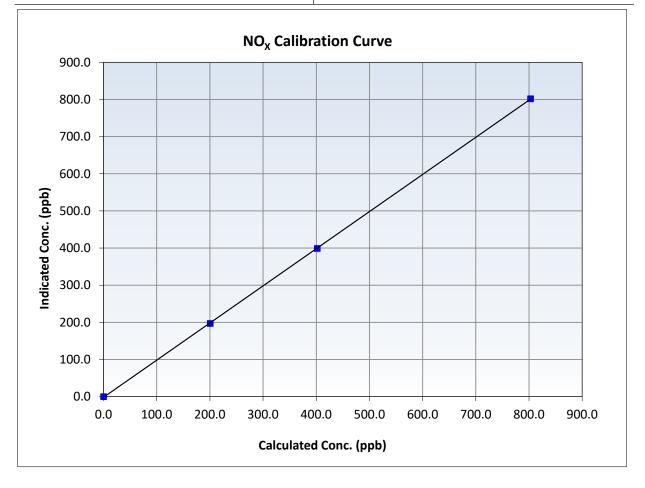


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 13, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	9:37	End Time (MST):	14:24
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	factor (Cc/Ic) Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999976	≥0.995
802.9	802.1	1.0010	Slope	1.000009	0.90 - 1.10
401.9	399.0	1.0074			0.50 1.10
200.5	197.0	1.0176	Intercept	-1.813460	+/-20



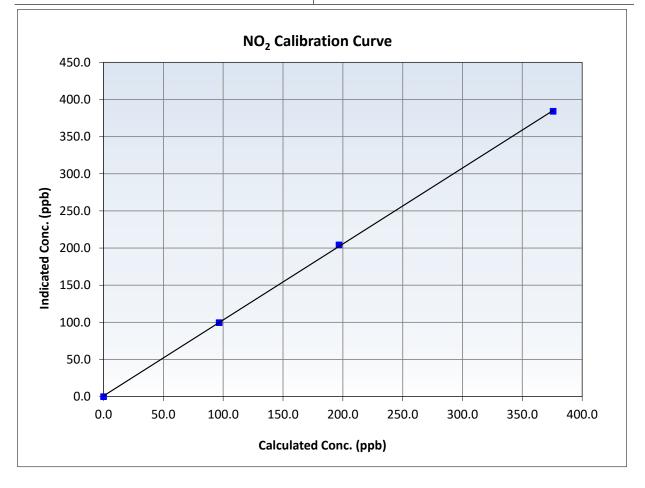


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 13, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	9:37	End Time (MST):	14:24
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999920	≥0.995
375.7 196.8	384.1 204.3	0.9781 0.9632	Slope	1.022718	0.90 - 1.10
96.6	99.7	0.9687	Intercept	0.962157	+/-20



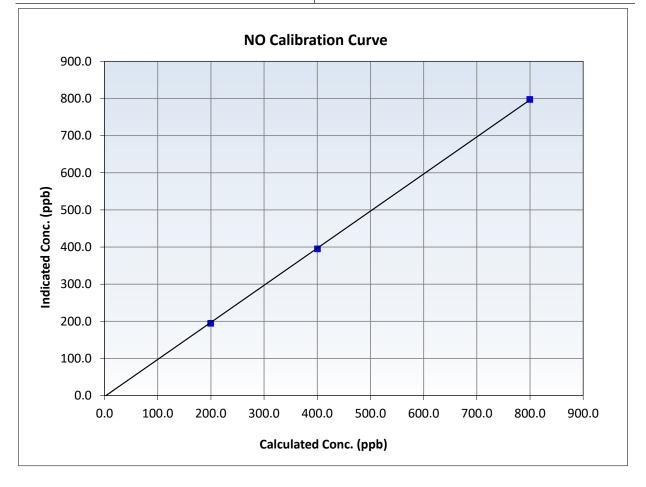


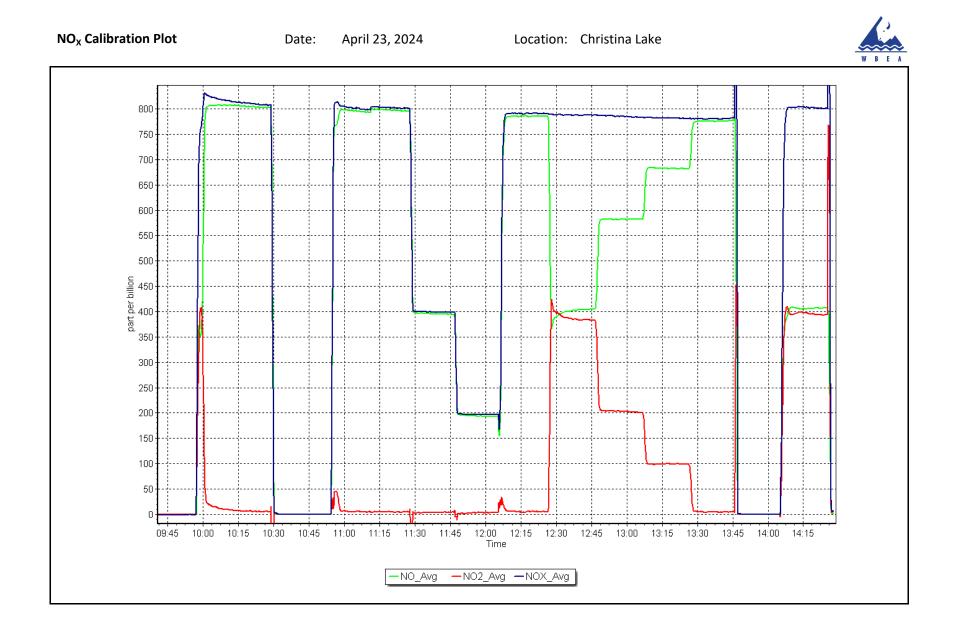
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 23, 2024	Previous Calibration:	March 13, 2024
Station Name:	Christina Lake	Station Number:	AMS 26
Start Time (MST):	9:37	End Time (MST):	14:24
Analyzer make:	Thermo 42i	Analyzer serial #:	1173480006

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999956	≥0.995
799.6 400.3	797.5 395.4	1.0027 1.0124	Slope	0.998685	0.90 - 1.10
199.7	194.9	1.0244	Intercept	-2.513223	+/-20







### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS27 JACKFISH 2/3 APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

### **Station Information**

Station Name:	Jackfish 2/3
Calibration Date:	April 15, 2024
Start time (MST):	11:03
Reason:	Routine

Station number: AMS 27 Last Cal Date: March 8, 2024 End time (MST): 14:10

### **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

Thermo 43iQ-TL

0 - 1000 ppb

### **Analyzer Information**

Serial Number: 12124313138

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.003248	0.999989	Backgd or Offset:	8.7	8.4
Calibration intercept:	-1.638441	-1.697880	Coeff or Slope:	0.983	0.955

### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4921	79.1	800.2	821.4	0.974
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	821.6 NA NA	Previous response AF Slope: AF Correlation:	801.1	*% change AF Intercept: * = > +/-5% change initiate	2.5% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.3	
High point	4921	79.1	800.2	799.2	1.001
Mid point	4961	39.5	399.5	397.6	1.005
Low point	4980	19.8	200.3	196.1	1.021
As left zero	5000	0.0	0.0	0.1	
As left span	4921	79.1	800.2	803.7	0.996
			Averag	ge Correction Factor:	1.009

Notes:

Changed the sample inlet filter after as founds. Adjusted span only.

Calibration Performed By:

Mohammed Kashif

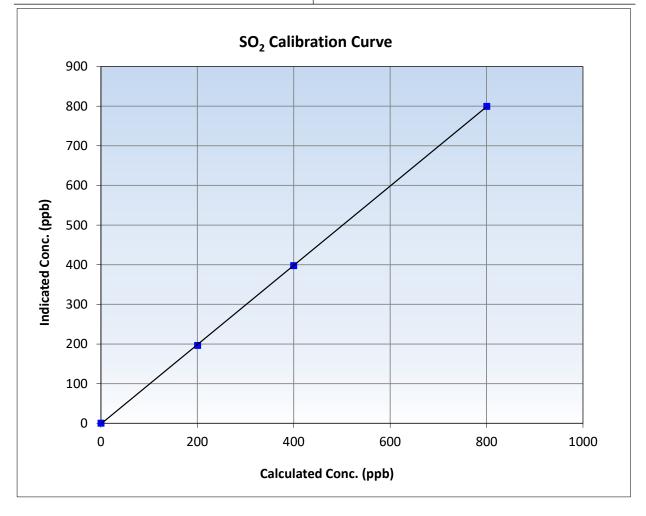


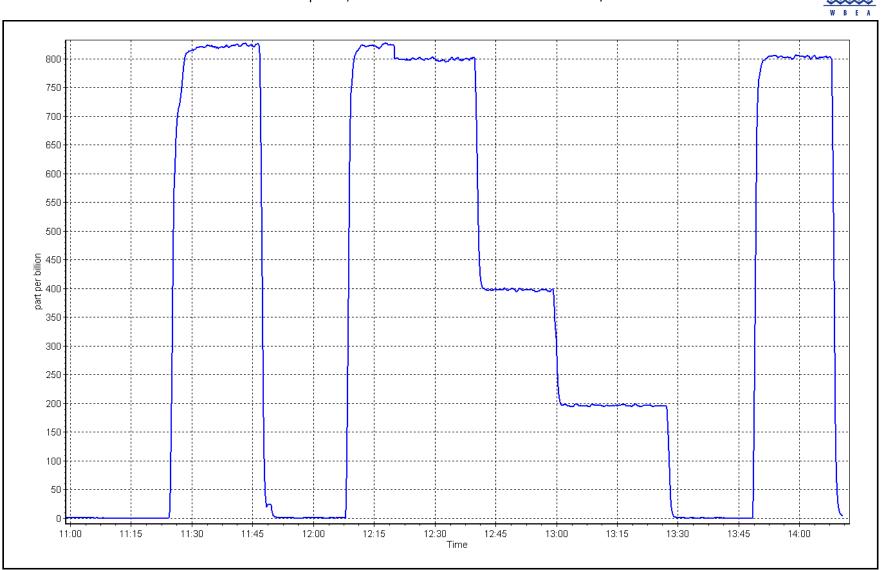
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 8, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:03	End Time (MST):	14:10
Analyzer make:	Thermo 43iQ-TL	Analyzer serial #:	12124313138

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999969	≥0.995
800.2 399.5	799.2 397.6	1.0012 1.0049	Slope	0.999989	0.90 - 1.10
200.3	196.1	1.0214	Intercept	-1.697880	+/-30





**SO2** Calibration Plot

Location: Jackfish 2/3



## Wood Buffalo Environmental Association H<sub>2</sub>S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Jackfish 2/3 April 17, 2024 10:34 Routine		Station number: Last Cal Date: End time (MST):	AMS 27 March 12, 2024 15:17	
		Calibration S	tandards		
Cal Gas Concentration: Cal Gas Cylinder #:	5.41 CC345023	ppm	Cal Gas Exp Date:	January 4, 2025	
Removed Cal Gas Conc: Removed Gas Cyl #:	5.41 NA	ppm	Rem Gas Exp Date: Diff between cyl:	NA	
Calibrator Make/Model:	API T700		Serial Number:	3811	
ZAG Make/Model:	API 701		Serial Number:	268	
		Analyzer Info	ormation		
Analyzer make:	API T101		Analyzer serial #:	621	
Converter make:	NA		Converter serial #:	NA	
Analyzer Range	0 - 100 ppb		Converter Temp:	316	degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	I
Calibration slope:	1.014173	0.990223	Backgd or Offset:	29.9	
Calibration intercept:	-0.277753	-0.338155	Coeff or Slope:	0.965	

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Baseline Adjusted Correction factor (Cc/(Ic-AFzero)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.3	
As found High point	4926	74.1	80.2	81.0	0.986
As found Mid point	4963	37.0	40.0	40.4	0.984
As found Low point	4982	18.5	20.0	19.4	1.016
New cylinder response					
Baseline Corr As found:	81.3	Prev response:	81.03	*% change:	0.3%
Baseline Corr 2nd AF pt:	40.7	AF Slope:	1.016734	AF Intercept:	-0.517520
Baseline Corr 3rd AF pt:	19.7	AF Correlation:	0.999923	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.1	
High point	4926	74.1	80.2	79.1	1.014
Mid point	4963	37.0	40.0	39.4	1.016
Low point	4982	18.5	20.0	19.1	1.048
As left zero	5000	0.0	0.0	0.0	
As left span	4926	74.1	80.2	79.5	1.008
SO2 Scrubber Check	4921	79.1	791.0	0.0	
Date of last scrubber chan	ge:			Ave Corr Factor	1.026

Date of last converter efficiency test:

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

Calibration Performed By:

Mohammed Kashif

*Finish* 29.9 0.965



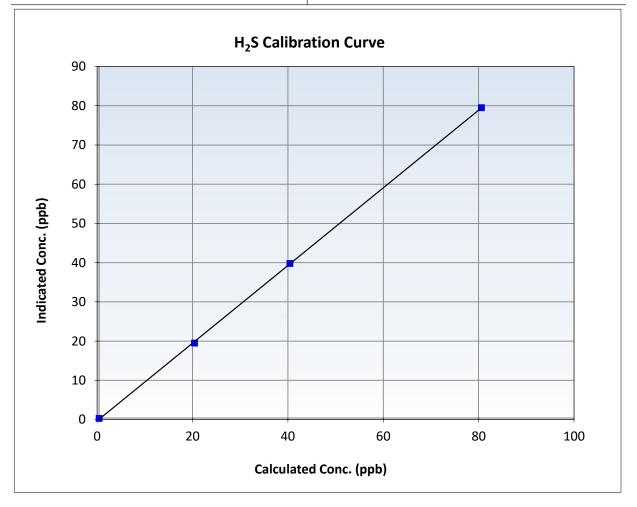
# Wood Buffalo Environmental Association

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

### **Station Information**

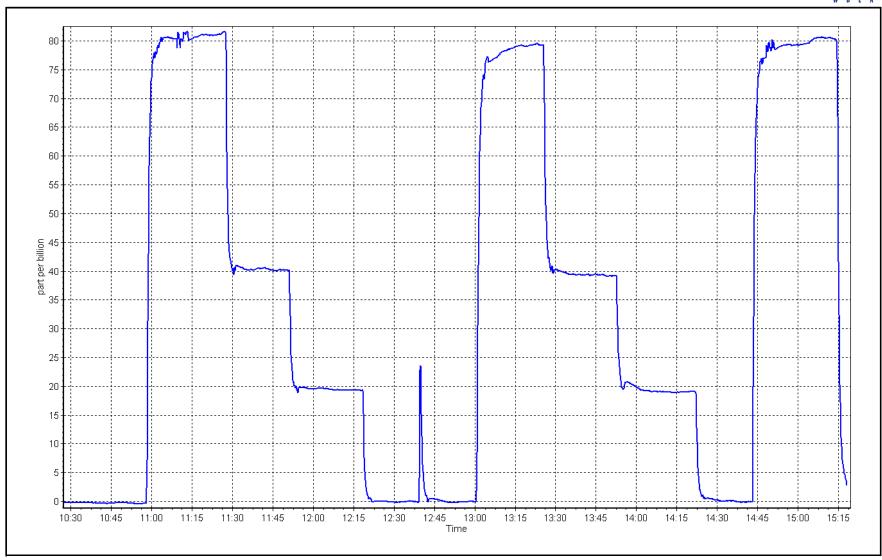
Calibration Date:	April 17, 2024	Previous Calibration:	March 12, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	10:34	End Time (MST):	15:17
Analyzer make:	API T101	Analyzer serial #:	621

Calculated co (ppb)		Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalu	ation	<u>Limits</u>			
0.	0	-0.1		Correlation Coefficient	0.999938	≥0.995			
80 40		79.1 39.4	1.0136 1.0161	Slope	0.990223	0.90 - 1.10			
20	.0	19.1	1.0479	Intercept	-0.338155	+/-3			











**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

### **Calibration Standards**

Station Name:	Jackfish 2/3	NO Gas Cylinder #:	CC757838	Cal Gas Expiry Date: January 9, 2023
Station number:	AMS 27	NOX Cal Gas Conc:	60.30 ppm	NO Cal Gas Conc: 60.20 ppm
Calibration Date:	April 18, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA
Last Cal Date:	March 19, 2024	Removed Gas NOX Conc:	60.30 ppm	Removed Gas NO Conc: 60.20 ppm
Start time (MST):	11:47	NOX gas Diff:		NO gas Diff:
End time (MST):	17:26	Calibrator Model:	API T700	Serial Number: 3811
Reason:	Routine	ZAG make/model:	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	-0.3	-0.3	0.0		
AF High point	4942	66.5	800.6	799.3	1.3	771.6	764.6	7.0	1.0372	1.0450
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	795.9 ppb	NO = 796.6	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-3.1%
Baseline Corr 1	st pt NO <sub>x</sub> =	771.9 ppb	NO = 764.9	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-4.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_{\chi} r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data		Baseline Adius	ted NO2	

					Baseline Aujusteu NOZ	
02 Satasiat (anh)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
O3 Setpoint (ppb)	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

### Wood Buffalo Environmental Association

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

#### **Calibration Statistics**

Analyzer Make:	API T200		Serial Number: 722				<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	0.998635	1.004943
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-3.655643	-4.114844
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.002024	0.996905
NO coeff or slope:	1.236	1.271	NO bkgnd or offset:	0.3	0.3	NO Cal Offset:	-4.335475	-3.695611
NOX coeff or slope:	1.217	1.260	NOX bkgnd or offset:	1.2	1.2	NO <sub>2</sub> Cal Slope:	0.991424	0.980873
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	3.2	3.2	NO <sub>2</sub> Cal Offset:	-0.986298	1.007817

### **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	0.5	-0.7		
High point	4942	66.5	800.6	799.3	1.3	802.2	795.3	6.9	0.9980	1.0050
Mid point	4979	33.3	400.6	399.9	0.7	397.2	392.7	4.5	1.0086	1.0185
Low point	4996	16.6	199.7	199.4	0.3	192.2	191.0	1.2	1.0390	1.0438
As left zero	5000	0.0	0.0	0.0	0.0	1.1	2.2	-1.1		
As left span	4942	66.5	800.6	415.6	385.0	799.6	415.6	384.0	1.0013	1.0000
							Average Co	orrection Factor	1.0152	1.0224

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	-0.7		
High GPT point	801.8	413.5	389.6	382.7	1.0181	98.2%
Mid GPT point	801.8	627.2	175.9	173.5	1.0140	98.6%
Low GPT point	801.8	714.4	88.7	90.3	0.9826	101.8%
				Average Correction Factor	1.0049	99.5%

Notes:

Changed the inlet filter after as founds. Adjusted span only

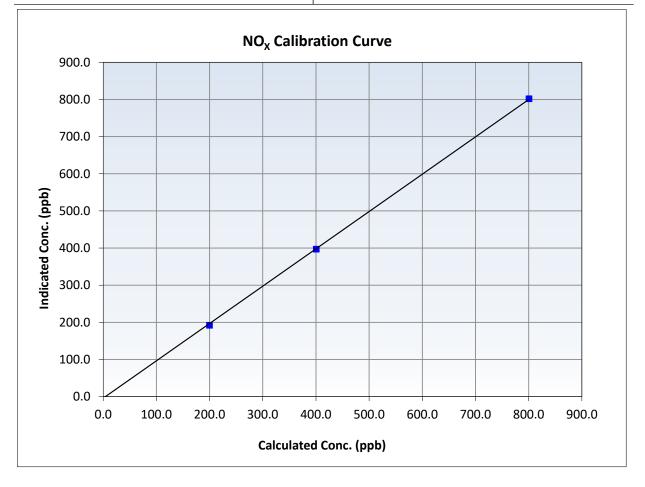


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

### Station Information

Calibration Date:	April 18, 2024	Previous Calibration:	March 19, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:47	End Time (MST):	17:26
Analyzer make:	API T200	Analyzer serial #:	722

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999890	≥0.995
800.6	802.2	0.9980	Slope	1.004943	0.90 - 1.10
400.6	397.2	1.0086	Slope	1.004945	0.50 1.10
199.7	192.2	1.0390	Intercept	-4.114844	+/-20



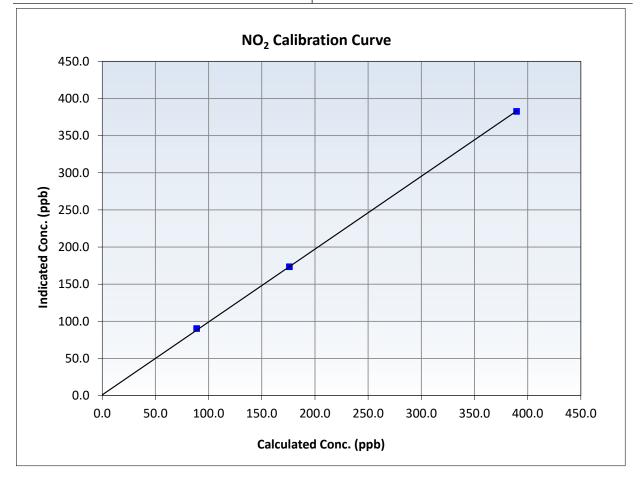


## Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

### Station Information

Calibration Date:	April 18, 2024	Previous Calibration:	March 19, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:47	End Time (MST):	17:26
Analyzer make:	API T200	Analyzer serial #:	722

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	-0.7		Correlation Coefficient	0.999897	≥0.995
389.6 175.9	382.7 173.5	1.0181 1.0140	Slope	0.980873	0.90 - 1.10
88.7	90.3	0.9826	Intercept	1.007817	+/-20



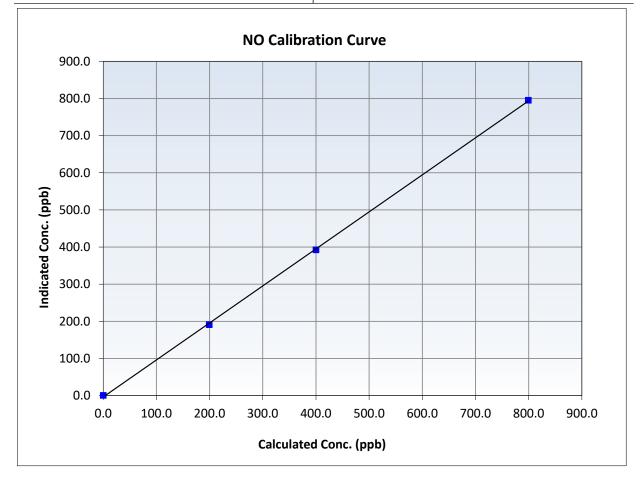


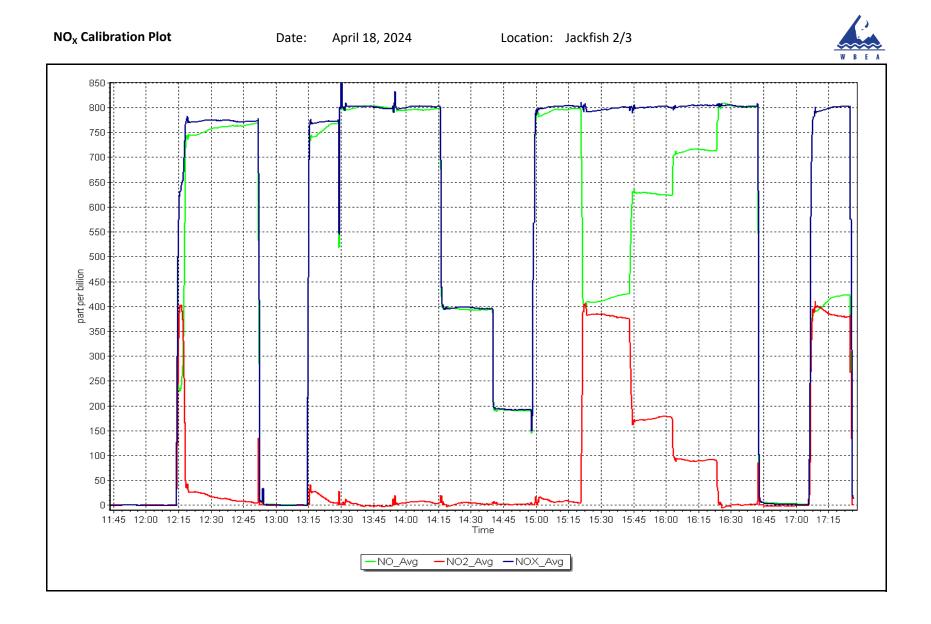
# Wood Buffalo Environmental Association NO Calibration Summary

### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 19, 2024
Station Name:	Jackfish 2/3	Station Number:	AMS 27
Start Time (MST):	11:47	End Time (MST):	17:26
Analyzer make:	API T200	Analyzer serial #:	722

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.5		Correlation Coefficient	0.999873	≥0.995
799.3 399.9	795.3 392.7	1.0050 1.0185	Slope	0.996905	0.90 - 1.10
199.4	191.0	1.0438	Intercept	-3.695611	+/-20







### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS29 SURMONT 2 APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

### **Station Information**

Station Name:	Surmont 2
Calibration Date:	April 12, 2024
Start time (MST):	9:45
Reason:	Routine

Station number: AMS 29 Last Cal Date: March 8, 2024 End time (MST): 14:18

### **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

Thermo 43i

0 - 1000 ppb

### **Analyzer Information**

Serial Number: 1170050150

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.007141	1.006014	Backgd or Offset:	12.9	13.0
Calibration intercept:	-1.805499	-1.785690	Coeff or Slope:	0.939	0.939

### SO<sub>2</sub> 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	81.3	800.1	803.0	0.996
As found Mid point	4959	40.7	400.6	400.1	1.001
As found Low point	4979	20.3	199.8	197.6	1.011
New cylinder response					
Baseline Corr As found:	803.1	Previous response	804.0	*% change	-0.1%
Baseline Corr 2nd AF pt:	400.2	AF Slope:	1.004700	AF Intercept:	-1.625629
Baseline Corr 3rd AF pt:	197.7	AF Correlation:	0.999984	* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4919	81.3	800.1	804.0	0.995
Mid point	4959	40.7	400.6	400.4	1.000
Low point	4979	20.3	199.8	197.4	1.012
As left zero	5000	0.0	0.0	0.1	
As left span	4919	81.3	800.1	803.0	0.996
			Averag	1.003	

Notes:

No maintenance done. No adjustments made.

Calibration Performed By:

Braiden Boutilier

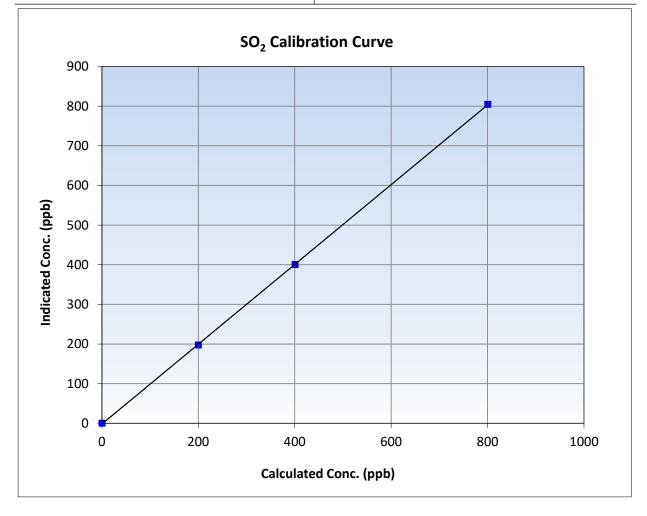


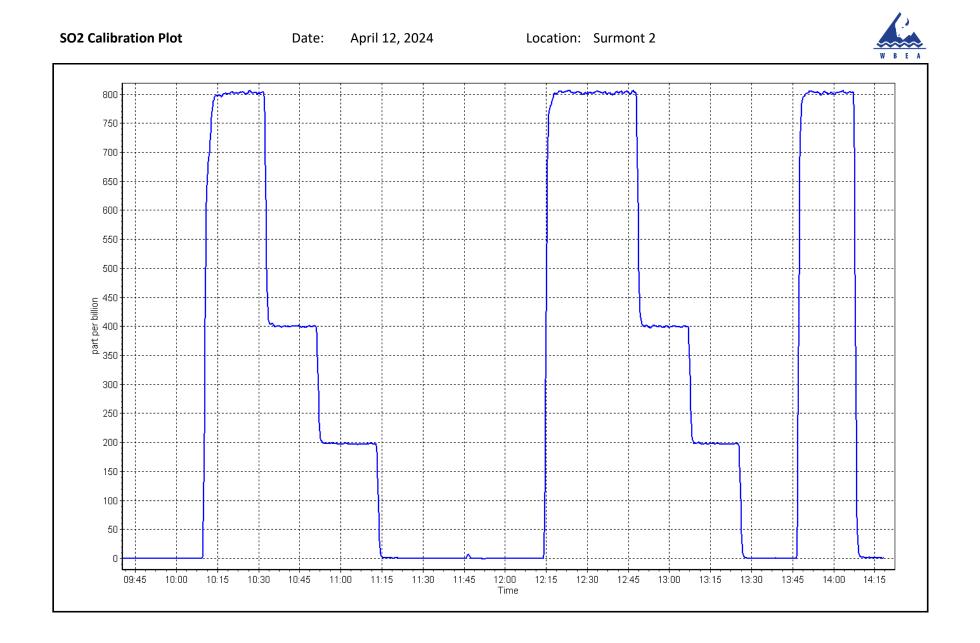
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 8, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:45	End Time (MST):	14:18
Analyzer make:	Thermo 43i	Analyzer serial #:	1170050150

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999977	≥0.995
800.1 400.6	804.0 400.4	0.9952 1.0005	Slope	1.006014	0.90 - 1.10
199.8	197.4	1.0123	Intercept	-1.785690	+/-30







### Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

		Station mil	mation				
Station Name: Calibration Date: Start time (MST): Reason:	Surmont 2 April 15, 2024 10:24 Routine		Station number: Last Cal Date: End time (MST):	AMS 29 March 7, 202 15:06	4		
		<b>Calibration S</b>	tandards				
Cal Gas Concentration: Cal Gas Cylinder #:	<u>5.391</u> <u>CC508338</u>	ppm	Cal Gas Exp Date:	January 4, 20	25		
Removed Cal Gas Conc: Removed Gas Cyl #:	<u>5.391</u> <u>CC508338</u>	ppm	Rem Gas Exp Date: Diff between cyl:	NA			
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472			
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698			
		Analyzer Info	ormation				
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	2
	<u>Start</u>	<u>Finish</u>		<u>Start</u>			F
Calibration slope:	0.997613	0.998614	Backgd or Offset:	0.92			
Calibration intercept:	0.017447	-0.142639	Coeff or Slope:	1.074			

### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	
As found High point	4925.8	74.2	80.0	82.0	0.974
As found Mid point	4962.9	37.2	40.1	41.0	0.976
As found Low point	4981.5	18.6	20.1	20.3	0.983
New cylinder response					
Baseline Corr As found:	82.1	Prev response:	79.83	*% change:	2.8%
Baseline Corr 2nd AF pt:	41.1	AF Slope:	1.026903	AF Intercept:	-0.183896
Baseline Corr 3rd AF pt:	20.4	AF Correlation: 0.999995 * = > +/-5% change initiates inves		es 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	4925.8	74.2	80.0	79.8	1.003
Mid point	4962.9	37.2	40.1	39.8	1.008
Low point	4981.5	18.6	20.1	19.9	1.008
As left zero	5000	0.0	0.0	0.0	
As left span	4925.8	74.2	80.0	79.3	1.009
SO2 Scrubber Check	4919	81.3	813.0	0.0	
Date of last scrubber change: Ave Corr Factor				1.006	

Date of last converter efficiency test:

Notes:

Adjusted span. Changed sample inlet filter after as founds.

Calibration Performed By: Brain

Braiden Boutilier

Finish 0.90 1.050



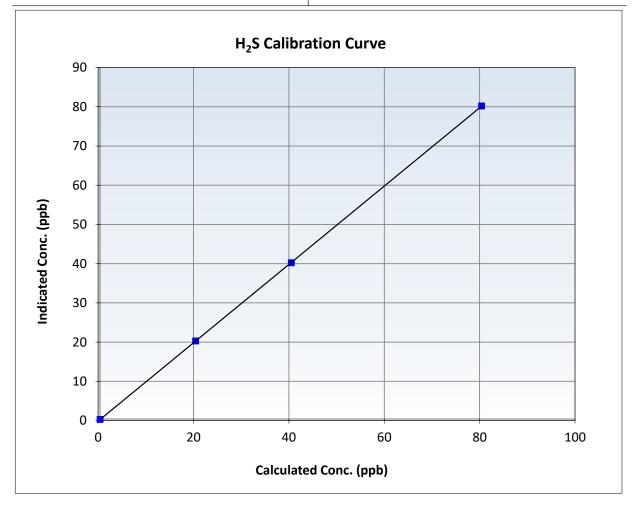
## **Wood Buffalo Environmental Association**

### **H2S Calibration Summary**

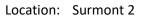
### **Station Information**

Calibration Date:	April 15, 2024	Previous Calibration:	March 7, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	10:24	End Time (MST):	15:06
Analyzer make:	Thermo 43iQ-TLE	Analyzer serial #:	1200326170

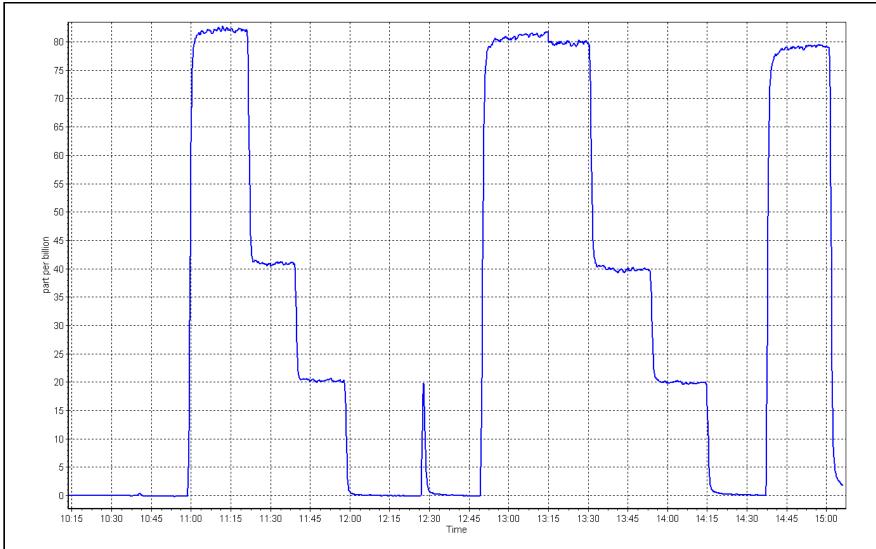
Calibration Data							
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>		
0.0	-0.1		Correlation Coefficient	0.999995	≥0.995		
80.0 40.1	79.8 39.8	1.0025 1.0077	Slope	0.998614	0.90 - 1.10		
20.1	19.9	1.0077	Intercept	-0.142639	+/-3		













# Wood Buffalo Environmental Association THC Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Surmont 2 April 12, 2024 9:45 Routine		Station number: Last Cal Date: End time (MST):	AMS 29 March 8, 2024 14:18	
		<b>Calibration</b>	Standards		
Gas Cert Reference:	CC356008		Cal Gas Expiry Date:		
CH4 Cal Gas Conc.	<u>499.0</u>	ppm	CH4 Equiv Conc.	1064.7	ppm
C3H8 Cal Gas Conc.	205.7	ppm			
Removed Gas Cert:	N	IA	Removed Gas Expiry:	NA	
Removed CH4 Conc.	<u>499.0</u>	ppm	CH4 Equiv Conc.	1064.7	ppm
Removed C3H8 Conc.	<u>205.7</u>	ppm	Diff between cyl:		
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5472	
ZAG Make/Model:	Teledyne API T701		Serial Number:	4698	
		Analyzer Inf	ormation		
Analyzor mako	: Thermo 51i-LT	<u>randiji zer m</u>	Analyzer serial #:	1170050149	
Analyzer Make			Allalyzer Serial #.	1170050149	
Allalyzer Kallge	. 0 - 20 ppm				
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	Finish
Calibration slope:	1.004976	0.997593	Background:		3.50
Calibration intercept:	-0.063439	-0.041046	Coefficient:	4.046	3.886
		THC As Fou	Ind Data		
					Baseline Adjusted
Set Point	Dilution air flow rate	Source gas flow rate	Calculated Concentration		Correction factor (Cc/(Ic-
Sectionic	(sccm)	(sccm)	(ppm) (Cc)	(ppm) (Ic)	AFzero)
As found zero	5000	0.0	0.00	-0.12	Limit = 0.90-1.10
As found High point	4918	81.3	17.31	-0.12 16.52	1.040
As found Mid point	4918	40.6	8.65	8.23	1.040
As found Low point	4979	20.3	4.32	4.08	1.035
New cylinder response	4979	20.5	4.52	4.06	1.029
New cylinder response					
Baseline Corr As found:	16.64	Previous response	17.34	*% change	-4.2%
Baseline Corr 2nd AF pt:	8.35	AF Slope:	0.960509	AF Intercept:	-0.094793
Baseline Corr 3rd AF pt:	4.20	AF Correlation	0.999988	* = > +/-5% change initia	tes 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	-0.02	
High point	4918	81.3	17.31	17.23	1.005
Mid point	4959	40.6	8.65	8.61	1.004
Low point	4979	20.3	4.32	4.23	1.023
As left zero	5000	0.0	0.00	-0.04	
As left span	4918	81.3	17.31	17.43	0.993
			Avera	ge Correction Factor	1.011

Notes:

Swapped 51i internal pump, nightly Z/S solenoid valve. Adjusted span.

Calibration Performed By:

Braiden Boutilier

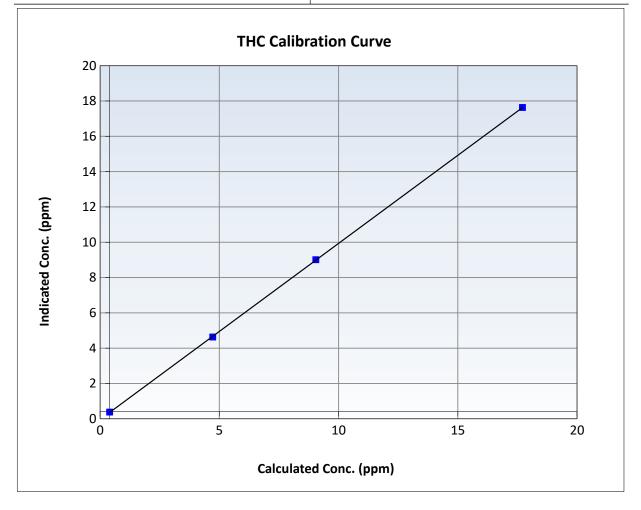


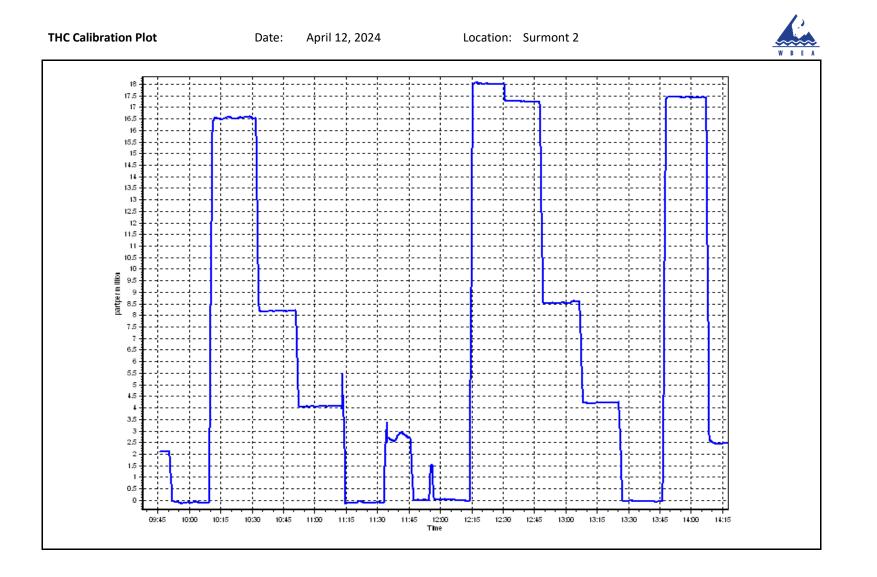
# Wood Buffalo Environmental Association THC Calibration Summary

### **Station Information**

Calibration Date:	April 12, 2024	Previous Calibration:	March 8, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:45	End Time (MST):	14:18
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1170050149

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.00	-0.02		Correlation Coefficient	0.999979	≥0.995
17.31 8.65	17.23 8.61	1.0049 1.0042	Slope	0.997593	0.90 - 1.10
4.32	4.23	1.0232	Intercept	-0.041046	+/-1.5







**Station Information** 

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Surmont 2	NO Gas Cylinder #:	T12YYFE	Cal Gas Expiry Date:	October 30, 2024
Station number:	AMS 29	NOX Cal Gas Conc:	47.46 ppm	NO Cal Gas Conc:	47.46 ppm
Calibration Date:	April 2, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date:	NA
Last Cal Date:	March 6, 2024	Removed Gas NOX Conc:	47.46 ppm	Removed Gas NO Conc:	47.46 ppm
Start time (MST):	9:50	NOX gas Diff:		NO gas Diff:	
End time (MST):	14:33	Calibrator Model:	Teledyne API T700	Serial Number:	5472
Reason:	Routine	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	-0.2	-0.2	0.0		
AF High point	4916	84.3	800.1	800.1	0.0	790.4	789.8	0.6	1.0121	1.0128
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	799.7 ppb	NO = 799.0	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chan	ge NO <sub>x</sub> =	-1.2%
Baseline Corr 1	st pt NO <sub>X</sub> =	790.6 ppb	NO = 790.0	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	-1.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
As Found GPT Calibration Data										
O3 Setpo	pint (ppb)	Indicated NO Rei concentration		cated NO Drop entration (ppb)	Calculated Ne concentration (pp		dicated NO2 ntration (ppb) (Ic)	Baseline Adjust Correction f (Cc/(Ic-AFze	actor Conv	verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

### Wood Buffalo Environmental Association

### $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i		Serial Number: 1170050	)148			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.000767	1.001053
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-1.012410	-0.812441
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.000380	1.000036
NO coeff or slope:	1.414	1.429	NO bkgnd or offset:	1.4	1.4	NO Cal Offset:	-1.452150	-1.731680
NOX coeff or slope:	0.996	0.996	NOX bkgnd or offset:	1.4	1.4	NO <sub>2</sub> Cal Slope:	0.998848	1.002282
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	174.7	173.8	NO <sub>2</sub> Cal Offset:	0.144949	0.146547

#### **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	84.2	799.2	799.2	0.0	799.2	797.8	1.3	1.0000	1.0017
Mid point	4958	42.1	399.6	399.6	0.0	400.1	398.7	1.4	0.9988	1.0023
Low point	4979	21.1	200.3	200.3	0.0	198.0	195.7	2.3	1.0115	1.0234
As left zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1		
As left span	4916	84.2	799.2	408.8	390.4	795.1	408.8	386.3	1.0051	1.0000
							Average Co	orrection Factor	1.0034	1.0091

### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (C	Indicated NO2 c) concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	0.0		
High GPT point	793.2	406.1	387.1	388.2	0.9972	100.3%
Mid GPT point	793.2	608.7	184.5	184.7	0.9989	100.1%
Low GPT point	793.2	701.5	91.7	92.5	0.9914	100.9%
				Average Correction Factor	0.9958	100.4%

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

Calibration Performed By:

**Braiden Boutilier** 

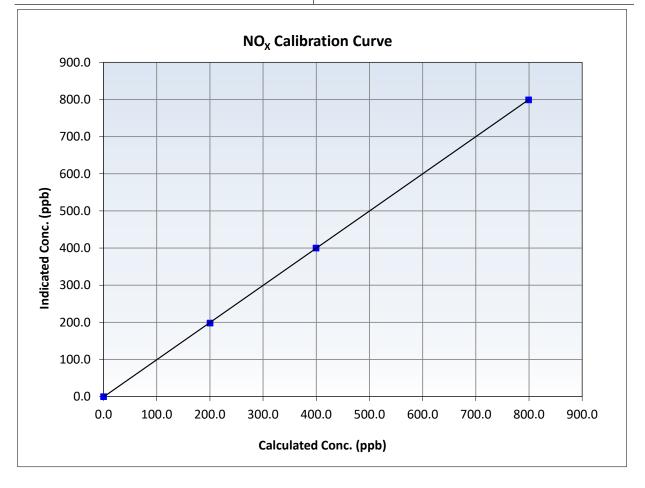


## Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:50	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999988	≥0.995
799.2 399.6	799.2 400.1	1.0000 0.9988	Slope	1.001053	0.90 - 1.10
200.3	198.0	1.0115	Intercept	-0.812441	+/-20



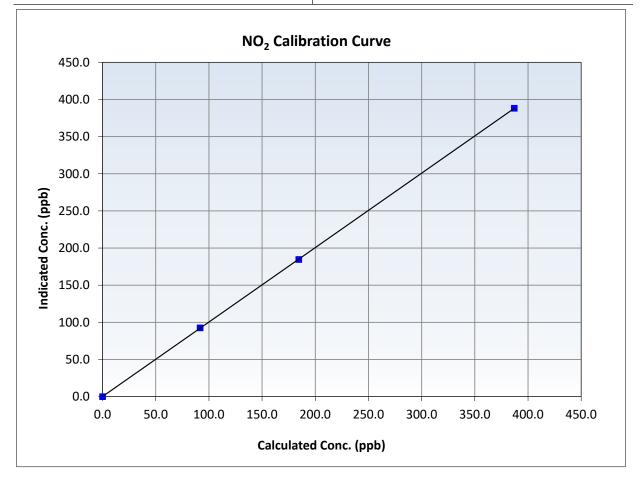


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:50	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999996	≥0.995
387.1 184.5	388.2 184.7	0.9972 0.9989	Slope	1.002282	0.90 - 1.10
91.7	92.5	0.9914	Intercept	0.146547	+/-20



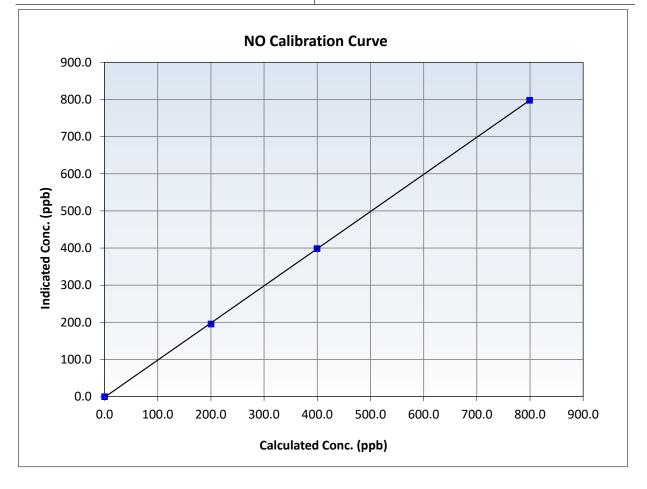


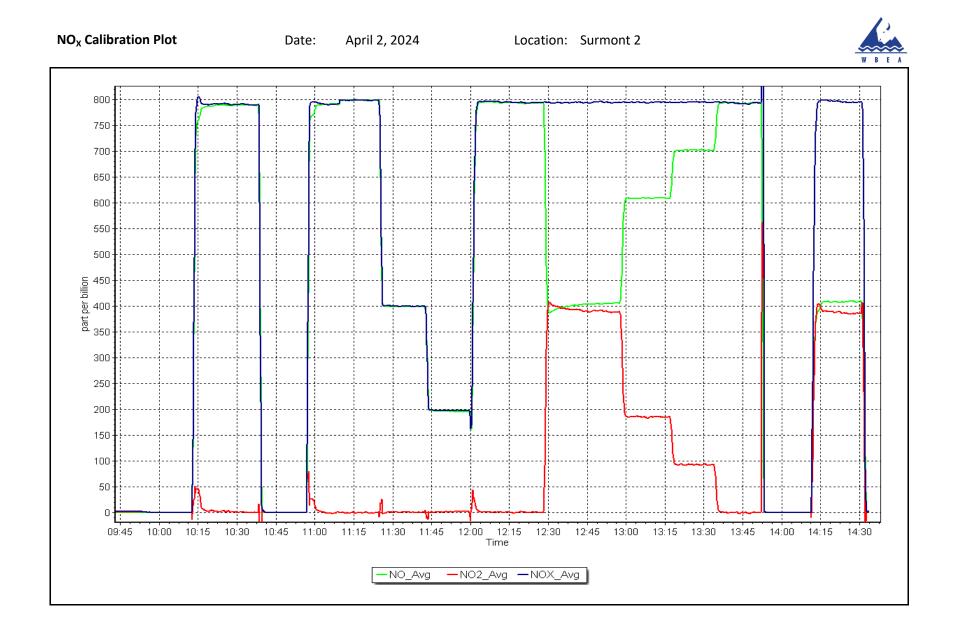
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 6, 2024
Station Name:	Surmont 2	Station Number:	AMS 29
Start Time (MST):	9:50	End Time (MST):	14:33
Analyzer make:	Thermo 42i	Analyzer serial #:	1170050148

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999966	≥0.995
799.2	797.8	1.0017	Slope	1.000036	0.90 - 1.10
399.6	398.7	1.0023	Slope	1.000030	0.50 1.10
200.3	195.7	1.0234	Intercept	-1.731680	+/-20







### Wood Buffalo Environmental Association

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

WBEA					Version-01-202
		Station Informat	ion		
Station Name:	Surmont 2		Station number: AMS	29	
Calibration Date:	April 15, 2024		Last Cal Date: Mar	ch 8, 2024	
Start time (MST):	12:56		End time (MST): 14:1	3	
Analyzer Make:	API T640		S/N: 253		
Particulate Fraction:	PM2.5				
Flow Meter Make/Model:	Alicat FP-25BT		S/N: 3887	'54	
Temp/RH standard:	Alicat FP-25BT		S/N: 3887	54	
	I	Monthly Calibration	n Test		
<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T (°C)	2.5	2.07	2.5		+/- 2 °C
P (mmHg)	707.3	708.45	707.3		+/- 10 mmHg
Flow (LPM)	5.01	5.088	5.01		+/- 0.25 LPM
PW% (pump)	36		36		>80%
Zero Verification	PM w/o HEPA:	2.7	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:	x: 10.9 Expiry Date:		June 10, 2024	
SPAN DOST					
Parameter	As found	Post maintenance	<u>As left</u>	Adjusted	(Limits)
PMT Peak Test	10.9	10.8	10.8		+/- 0.5
Date Optical Cham	ber Cleaned:	April 15,	2024		
Date Disposable Filter Changed:		April 15, 2024			
Post- maintenance Zero Ve	rification:	PM w/ HEPA:	0.0	<0.2 ug/m3	

#### **Annual Maintenance**

Date Sample Tube Cleaned:Otober 25, 2023Date RH/T Sensor Cleaned:October 25, 2023

Notes:

No adjustments made.

Calibration by: Braiden Boutilier



### WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

### AMS30 ELLS RIVER APRIL 2024

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

May 31, 2024



# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Ells River April 4, 2024 8:45 Routine		Station number: AM Last Cal Date: Ma End time (MST): 11:	arch 6, 2024	
		Calibration S	Standards		
Cal Gas Concentration: Cal Gas Cylinder #:	50.53 CC494126	ppm	Cal Gas Exp Date: De	cember 29 <i>,</i> 2028	
Removed Cal Gas Conc:	50.53	ppm	Rem Gas Exp Date: NA	L Contraction of the second seco	
Removed Gas Cyl #:	NA		Diff between cyl:		
Calibrator Model:	API T700		Serial Number: 30	61	
Zero Air Gen Model:	API T701H		Serial Number: 358	8	
		Analyzer Inf	ormation		
Analyzer make:	Thermo 43i		Serial Number: 100	08841397	
Analyzer Range:	0 - 1000 ppb				
	<u>Start</u>	Finish		<u>Start</u>	Finish
Calibration slope:	1.000331	0.997233	Backgd or Offset:	9.5	9.5
Calibration intercept:	-2.815894	-2.355844	Coeff or Slope:	0.982	0.982

### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4921	79.2	800.4	796.5	1.005
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	796.6 NA NA	Previous response AF Slope: AF Correlation:	797.8	*% change AF Intercept: * = > +/-5% change initiate	-0.2% es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4921	79.2	800.4	797.2	1.004
Mid point	4960	39.6	400.2	394.9	1.013
Low point	4980	19.8	200.1	195.3	1.025
As left zero	5000	0.0	0.0	0.0	
As left span	4921	79.2	800.4	797.9	1.003
			Averag	1.014	

Notes:

Sample inlet filter changed after as founds. No adjustment made.

Jan Castro

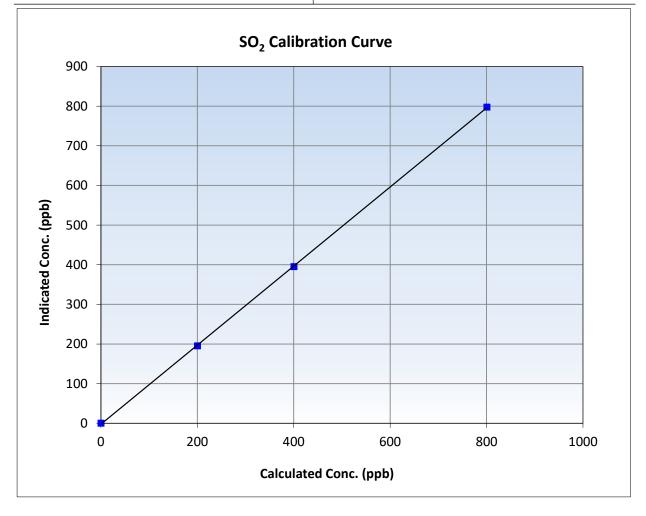


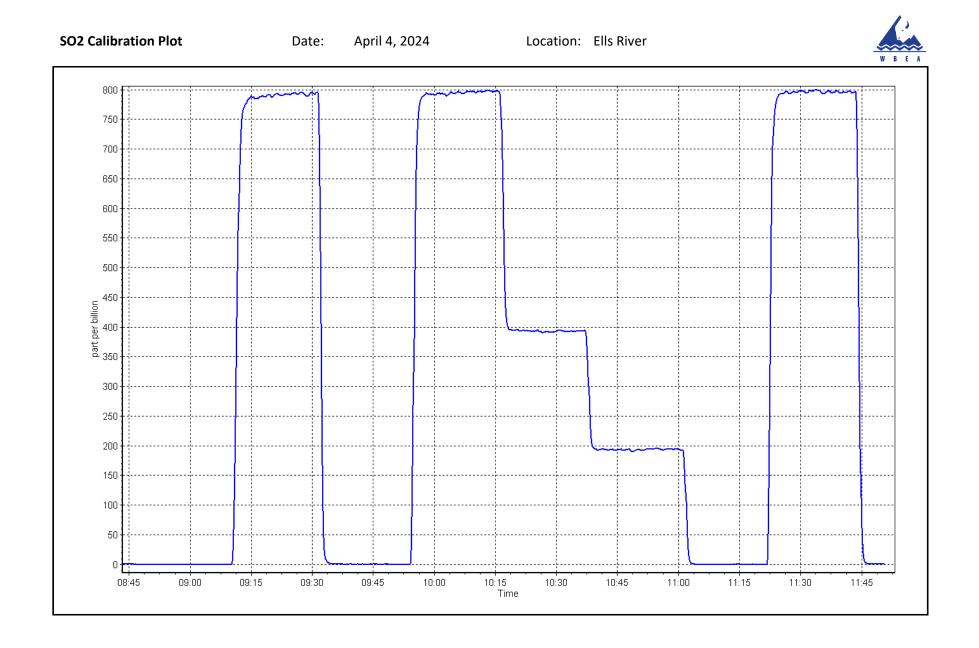
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 6, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	8:45	End Time (MST):	11:43
Analyzer make:	Thermo 43i	Analyzer serial #:	1008841397

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999958	≥0.995
800.4 400.2	797.2 394.9	1.0040 1.0135	Slope	0.997233	0.90 - 1.10
200.1	195.3	1.0246	Intercept	-2.355844	+/-30







## Wood Buffalo Environmental Association TRS Calibration Report

#### **Station Information**

Calibration Standards Cal Gas Concentration: 4.99 ppm Cal Gas Exp Date: November 15, 2026
Cal Gas Concentration: 4.99 ppm Cal Gas Exp Date: November 15, 2026
Cal Gas Cylinder #: CC505806
Removed Cal Gas Conc:4.99ppmRem Gas Exp Date:NARemoved Gas Cyl #:NADiff between cyl:
Calibrator Make/Model: API T700 Serial Number: 3061
ZAG Make/Model: API T701H Serial Number: 358
Analyzer Information
Analyzer make: Thermo 43i TLE Analyzer serial #: 1410661331
Converter make: CDN- 101 Converter serial #: 562
Analyzer Range0 - 100 ppbConverter Temp:800 degC
StartFinishStartFinishCalibration slope:1.0029021.005758Backgd or Offset:1.61.6
Calibration slope:         1.002302         1.003738         Datkgd of Offset.         1.0         1.0           Calibration intercept:         -0.080433         -0.080404         Coeff or Slope:         1.060         1.060

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	0.0	
As found High point	4920	80.2	80.0	80.0	1.000
As found Mid point	4960	40.1	40.0	39.7	1.008
As found Low point	4980	20.0	20.0	19.8	1.008
New cylinder response					
Baseline Corr As found:	80.0	Prev response:	80.19	*% change:	-0.2%
Baseline Corr 2nd AF pt:	39.7	AF Slope:	0.999763	AF Intercept:	-0.120540
Baseline Corr 3rd AF pt:	19.8	AF Correlation:	0.999982	* = > +/-5% change initiate	es 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.0	
High point	4920	80.2	80.0	80.5	0.994
Mid point	4960	40.1	40.0	40.0	1.000
Low point	4980	20.0	20.0	20.0	0.998
As left zero	5000	0.0	0.0	0.1	
As left span	4920	80.2	80.0	80.2	0.998
SO2 Scrubber Check	4921	79.2	792.0	0.0	
Date of last scrubber chan	ge:			Ave Corr Factor	0.998

Date of last converter efficiency test:

Notes: Change sample inlet filters after multipoint as founds. Sox scrubber check done after calibrator zero and passed. No adjustment made.

Calibration Performed By: Jan Castro



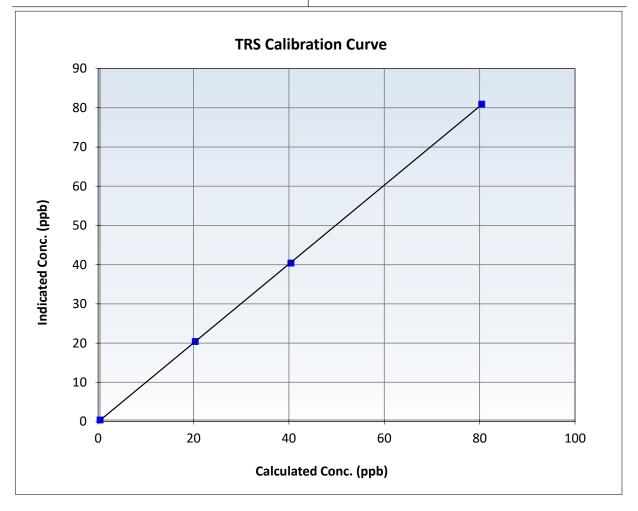
# Wood Buffalo Environmental Association

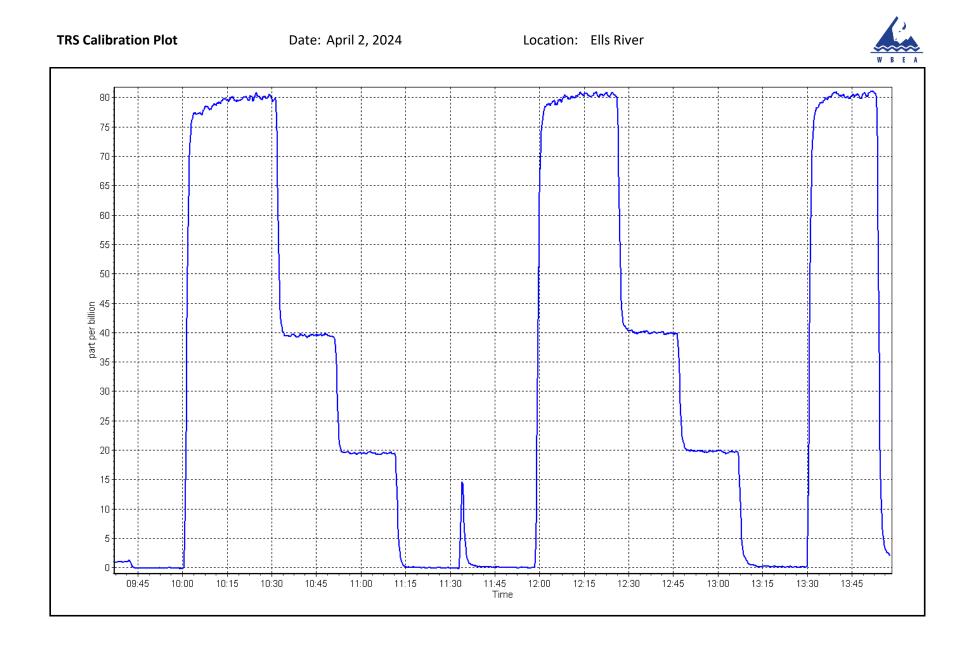
## **TRS Calibration Summary**

#### **Station Information**

Calibration Date:	April 2, 2024	Previous Calibration:	March 11, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:37	End Time (MST):	13:52
Analyzer make:	Thermo 43i TLE	Analyzer serial #:	1410661331

Calibration Data						
Calculated concentration Indicated concentration (ppb) (Cc) (ppb) (Ic)		Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>	
0.0	0.0		Correlation Coefficient	0.999988	≥0.995	
80.0 40.0	80.5 40.0	0.9942 1.0005	Slope	1.005758	0.90 - 1.10	
20.0	20.0	0.9980	Intercept	-0.080404	+/-3	







## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / NMHC Calibration Report

NMHC/CH4 Range: 0 - 10 ppm

#### **Station Information**

Station Name:	Ells River		Station number: AMS 30
Calibration Date:	April 4, 2024		Last Cal Date: March 28, 2024
Start time (MST):	8:45		End time (MST): 11:43
Reason:	Routine		
			Calibration Standards
Gas Cert Reference:		CC494126	Cal Gas Expiry Date: December 29, 2028

Uas cert hererence.		CC+J+120	Cal Gas Expiry Date. Dec	25, 20	520	
CH4 Cal Gas Conc.	499.7	ppm	CH4 Equiv Conc.	1075.0	ppm	
C3H8 Cal Gas Conc.	209.2	ppm				
Removed Gas Cert:			Removed Gas Expiry:			
Removed CH4 Conc.	499.7	ppm	CH4 Equiv Conc.	1075.0	ppm	
Removed C3H8 Conc.	209.2	ppm	Diff between cyl (THC):			
Diff between cyl (CH <sub>4</sub> )	:		Diff between cyl (NM):			
Calibrator Model:	API T700		Serial Number: 306	1		
Zero Air Gen model:	API T701H		Serial Number: 358			
	Analyzer Information					
Analyzer make	: Thermo 55i		Analyzer serial #: 115	2430011		

THC Range: 0 - 20 ppm

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
CH4 SP Ratio:	3.07E-04	3.07E-04	NMHC SP Ratio:	6.43E-05	6.43E-05
CH4 Retention time:	17.4	17.4	NMHC Peak Area:	141658	141658
Zero Chromatogram:	OFF	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	4921	79.2	17.03	17.16	0.992
As found Mid point					
As found Low point					
New cylinder response					
Baseline Corr AF:	17.16	Prev response	17.04	*% change	0.7%
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initiate	es 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)) <i>Limit = 0.95-1.05</i>
Calibrator zero	5000	0.0	0.00	0.00	
High point	4921	79.2	17.03	17.15	0.993
Mid point	4960	39.6	8.51	8.51	1.001
Low point	4980	19.8	4.26	4.20	1.013
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.2	17.03	17.18	0.991
			Avera	ge Correction Factor	1.002

Notes:

Sample inlet filters changed after as founds. No adjustment made.



## Wood Buffalo Environmental Association THC / CH<sub>4</sub> / 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 As found Mid point As found Low point New cylinder response	4921	79.2	9.11	9.30	0.980
Baseline Corr AF:	9.30	Prev response	9.15	47116	
Baseline Corr 2nd AF:	NA	AF Slope:		AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	ates 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/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.00	
High point	4921	79.2	9.11	9.29	0.981
Mid point	4960	39.6	4.56	4.62	0.987
Low point	4980	19.8	2.28	2.28	0.998
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.2	9.11	9.30	0.980
			Avera	ge Correction Factor	0.989

#### CH4 As Found Data

		CIT <del>T</del> AS TO			
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 As found Mid point As found Low point New cylinder response	4921	79.2	7.91	7.86	1.007
Baseline Corr AF: Baseline Corr 2nd AF:	7.86 NA	Prev response AF Slope:	7.89	*% change AF Intercept:	
Baseline Corr 3rd AF:	NA	AF Correlation:		* = > +/-5% change initia	ates 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) <i>Limit</i> = 0.95-1.05
Calibrator zero	5000	0.0	0.00	0.00	
High point	4921	79.2	7.91	7.86	1.007
Mid point	4960	39.6	3.96	3.89	1.017
Low point	4980	19.8	1.98	1.92	1.030
As left zero	5000	0.0	0.00	0.00	
As left span	4921	79.2	7.91	7.88	1.005
			Avera	ge Correction Factor	1.018

#### **Calibration Statistics**

	<u>Start</u>	<u>Finish</u>
THC Cal Slope:	1.002121	1.008470
THC Cal Offset:	-0.024340	-0.047141
CH4 Cal Slope:	1.000048	0.994402
CH4 Cal Offset:	-0.029357	-0.025556
NMHC Cal Slope:	1.003946	1.020664
NMHC Cal Offset:	0.005416	-0.021985

Calibration Performed By:

Jan Castro

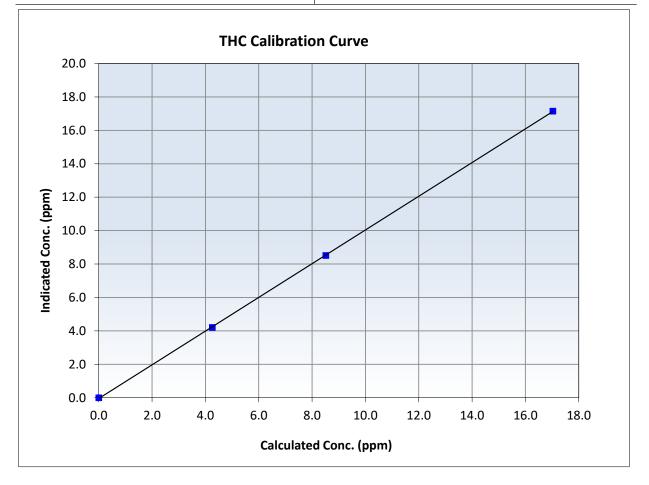


# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 28, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	8:45	End Time (MST):	11:43
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999965	≥0.995
17.03 8.51	17.15 8.51	0.9928 1.0006 1.0129	Slope	1.008470	0.90 - 1.10
4.26	4.20		Intercept	-0.047141	+/-0.5



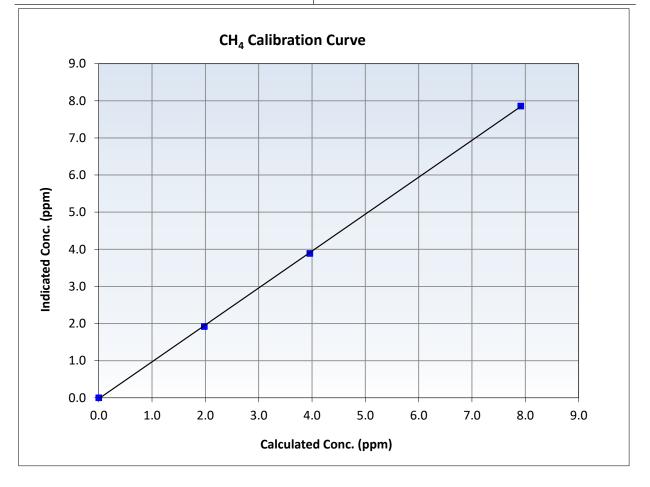


# Wood Buffalo Environmental Association CH<sub>4</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 28, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	8:45	End Time (MST):	11:43
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999950	≥0.995
7.91	7.86	1.0070	1.0070 Slana		0.90 - 1.10
3.96	3.89	1.0172	Slope	0.994402	0.30 - 1.10
1.98	1.92	1.0301	Intercept	-0.025556	+/-0.5



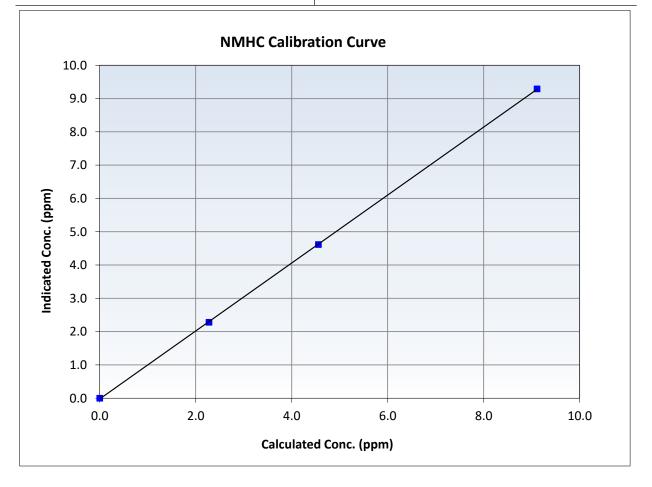


# Wood Buffalo Environmental Association NMHC Calibration Summary

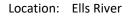
#### **Station Information**

Calibration Date:	April 4, 2024	Previous Calibration:	March 28, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	8:45	End Time (MST):	11:43
Analyzer make:	Thermo 55i	Analyzer serial #:	1152430011

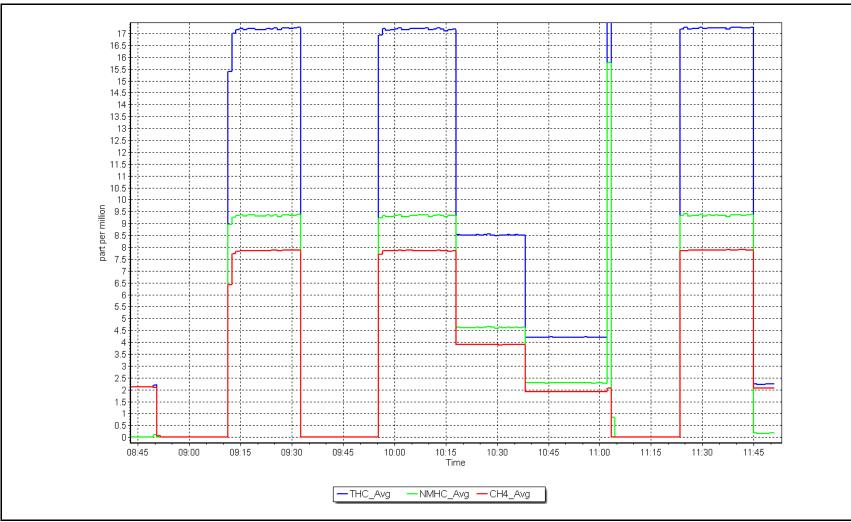
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00		Correlation Coefficient	0.999974	≥0.995
9.11 4.56	9.29 4.62	0.9809 0.9869	Slope	1.020664	0.90 - 1.10
2.28	2.28	0.9984	Intercept	-0.021985	+/-0.5



#### **NMHC Calibration Plot**









**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Ells River	NO Gas Cylinder #:	DT0027487	Cal Gas Expiry Date: January 9, 2032
Station number:	AMS 30	NOX Cal Gas Conc:	59.30 ppm	NO Cal Gas Conc: 59.10 ppm
Calibration Date:	April 5, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA
Last Cal Date:	March 8, 2024	Removed Gas NOX Conc:	59.30 ppm	Removed Gas NO Conc: 59.10 ppm
Start time (MST):	9:44	NOX gas Diff:		NO gas Diff:
End time (MST):	14:16	Calibrator Model:	API T700	Serial Number: 3061
Reason:	Routine	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	-0.1	-0.2	0.1		
AF High point	4932	67.7	803.0	800.3	2.7	794.6	792.1	2.5	1.0104	1.0100
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	802.0 ppb	NO = 800.8	ppb	* = > +/-5	% change initiates i	nvestigation	*Percent Chang	ge NO <sub>x</sub> =	-0.9%
Baseline Corr 1	st pt NO <sub>x</sub> =	794.7 ppb	NO = 792.3	ppb	<u>As Four</u>	nd Statistics		*Percent Chang	ge NO =	-1.1%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_X r^2$ :		Nx SI:	Nx Int:	
Baseline Corr 3	rd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
	As Found GPT Calibration Data									
								Baseline Adjust	ed NO2	
O3 Setor	aint (nah)	Indicated NO Re	ference Indi	cated NO Drop	Calculated N	O2 In	dicated NO2	Correction f	actor Conv	erter Efficiency

O3 Setpoint (ppb)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	
Found GPT zero						

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42i	Serial Number: 710321429				<u>Start</u>	<u>Finish</u>	
NOX Range (ppb):	0 - 1000 ppb		N				0.999616	0.996856
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-0.638284	-0.719188
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.002443	0.999360
NO coeff or slope:	1.182	1.195	NO bkgnd or offset:	13.9	14.0	NO Cal Offset:	-1.418930	-1.439899
NOX coeff or slope:	0.994	0.994	NOX bkgnd or offset:	13.8	13.9	NO <sub>2</sub> Cal Slope:	0.996723	0.994435
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	192.4	193.6	NO <sub>2</sub> Cal Offset:	-0.460536	0.194273

#### **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) <i>Limit = 0.95-1.05</i>
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	800.1	799.1	1.0	1.0036	1.0015
Mid point	4966	33.8	400.9	399.5	1.4	398.6	396.9	1.7	1.0057	1.0066
Low point	4983	16.9	200.4	199.8	0.7	198.2	196.9	1.3	1.0113	1.0145
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	419.1	383.9	801.0	419.1	382.1	1.0025	1.0000
							Average Co	orrection Factor	1.0069	1.0075

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	0.1		
High GPT point	797.0	417.3	382.4	380.4	1.0053	99.5%
Mid GPT point	797.0	613.3	186.4	185.7	1.0038	99.6%
Low GPT point	797.0	703.4	96.3	96.0	1.0032	99.7%
				Average Correction Factor	1.0041	99.6%

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

Calibration Performed By:

Jan Castro

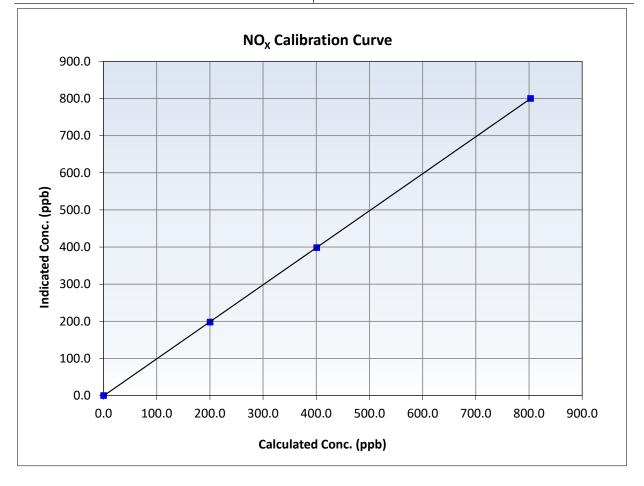


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 8, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:44	End Time (MST):	14:16
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	lation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999995	≥0.995
803.0 400.9	800.1 398.6	1.0036 1.0057	Slope	0.996856	0.90 - 1.10
200.4	198.2	1.0113	Intercept	-0.719188	+/-20



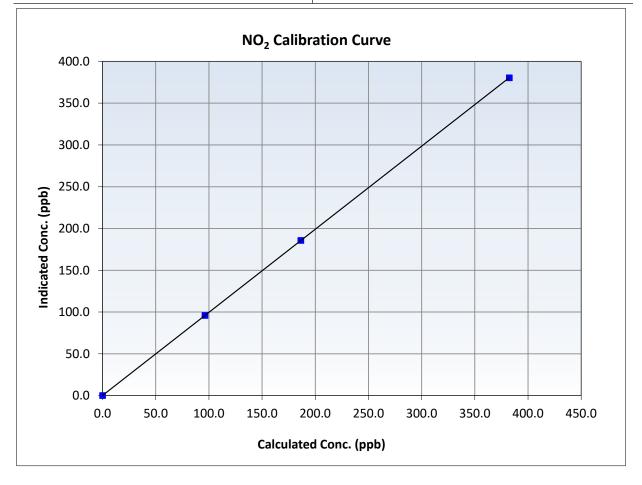


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 8, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:44	End Time (MST):	14:16
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.1		Correlation Coefficient	1.000000	≥0.995
382.4 186.4	380.4 185.7	1.0053 1.0038	Slope	0.994435	0.90 - 1.10
96.3	96.0	1.0032	Intercept	0.194273	+/-20



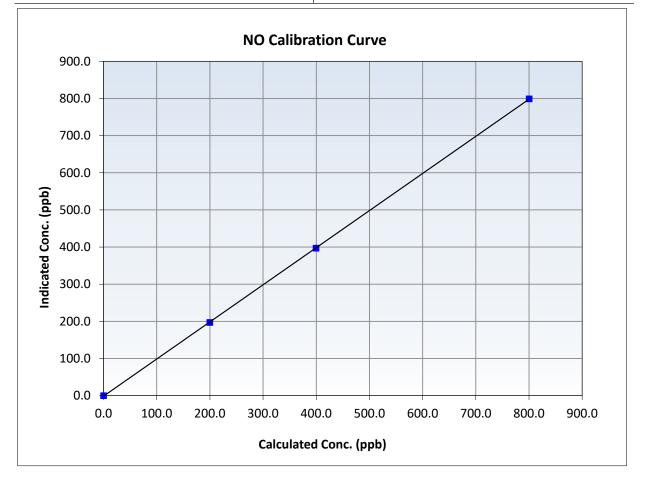


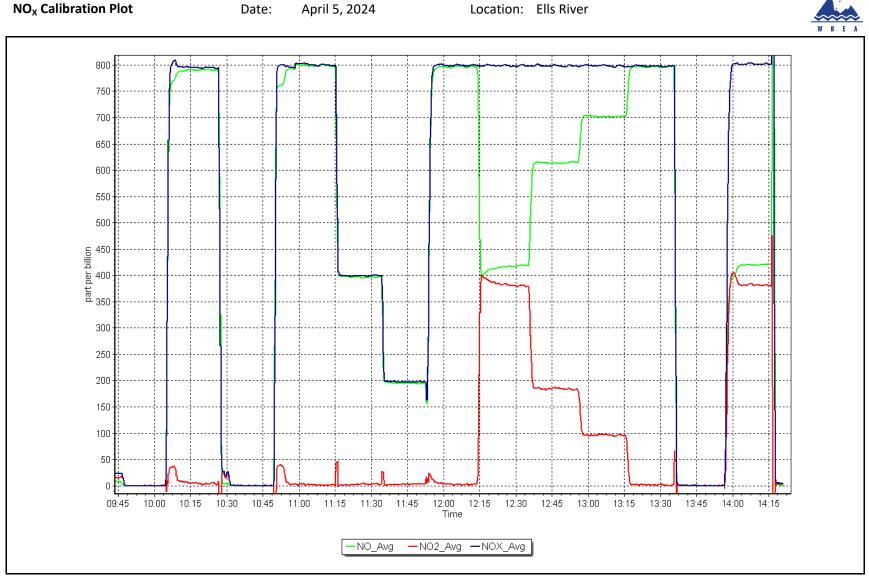
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 5, 2024	Previous Calibration:	March 8, 2024
Station Name:	Ells River	Station Number:	AMS 30
Start Time (MST):	9:44	End Time (MST):	14:16
Analyzer make:	Thermo 42i	Analyzer serial #:	710321429

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evalu	ation	<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999985	≥0.995
800.3 399.5	799.1 396.9	1.0015 1.0066	Slope	0.999360	0.90 - 1.10
199.8	196.9	1.0145	Intercept	-1.439899	+/-20







## Wood Buffalo Environmental Association

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

WBEA					Version-01-20	
		Station Information	n			
itation Name:	Ells River		Station number: AN			
Calibration Date:	April 2, 2024	Last Cal Date: March 8, 2024				
Start time (MST):	10:11		End time (MST): 12	:02		
Analyzer Make:	API T640		S/N: 87	5		
Particulate Fraction:	PM2.5					
low Meter Make/Model:	Alicat FP-25BT		S/N: 38	8754		
Гетр/RH standard:	Alicat FP-25BT		S/N: 38	8754		
		Monthly Calibration	Test			
Parameter	As found	Measured	<u>As left</u>	Adjusted	(Limits)	
T (°C)	6.50	6.33	6.50		+/- 2 °C	
P (mmHg)	726.80	728.54	726.80		+/- 10 mmH	
Flow (LPM)	4.43	4.50	5.01		+/- 0.25 LPN	
PW% (pump)	100.00		39.00	$\checkmark$	>80%	
Zero Verification	PM w/o HEPA:	5.70	PM w/ HEPA:	1.60	<0.2 ug/m3	
lote: this leak check will b	e completed before the	quarterly work and will	serve as the pre maint	enance leak check		
PM Inlet observation :	Inlet Head Clean	Ali	gnment Factor On :	<b>v</b>		
		Quarterly Calibration	Test			
	Refractive Index:	10.90	Expiry Date:	September 29,	2024	
SPAN DUST	Lot No.:	100128-050-040				
Parameter	<u>As found</u>	Post maintenance	<u>As left</u>	Adjusted	(Limits)	
PMT Peak Test	6.00	10.60	10.60		+/- 0.5	
Date Optical Cha	mber Cleaned	April 2, 1	2024			
Date Disposable F	-	January 22				
Post- maintenance Zero Ve	rification	PM w/ HEPA:	0.00	<0.2 ug/m3		
			0.00	NO.2 06/113		
		Annual Maintenan	се			
Date Sample Tu	ibe Cleaned:	October 2	7, 2023			
Date RH/T Sensor Cleaned:		February 2				
	Verified flow temps	rature and pressure. Pu	imp changed Leak che	ock passed. No adjus	tment made	
Notes:	. ennea now, tempe		and analysed. Leak che			

Calibration by: Jan Castro



## Wood Buffalo Environmental Association

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

					Version-01-202
		Station Informatio			
itation Name: Calibration Date:	Ells River		Station number: AN		
Start time (MST):	April 4, 2024 11:57		Last Cal Date: Ap End time (MST): 12:		
	11.07				
Analyzer Make:	API T640		S/N: 87	5	
Particulate Fraction:	PM2.5				
-low Meter Make/Model:	Alicat FP-25BT		S/N: 38	8754	
Temp/RH standard:	Alicat FP-25BT		S/N: 388		
		Monthly Calibration	Test		
Parameter	As found	Measured	As left	Adjusted	(Limits)
т (°С)	2.60	1.89	2.60		+/- 2 °C
P (mmHg)	737.40	739.59	737.40		+/- 10 mmH
Flow (LPM)	5.03	5.02	5.03		+/- 0.25 LPN
PW% (pump)	39.00		39.00		>80%
Zero Verification	PM w/o HEPA:	4.80	PM w/ HEPA:	0.00	<0.2 ug/m3
		<b>Quarterly Calibration</b>	Test		
	Refractive Index:	10.90	Expiry Date:	September 29,	2024
SPAN DUST	Refractive Index: Lot No.:	<mark>10.90</mark> 100128-050-040	Expiry Date:	September 29,	2024
SPAN DUST <u>Parameter</u>			Expiry Date: <u>As left</u>	September 29, <u>Adjusted</u>	2024 (Limits)
	Lot No.:	100128-050-040			
<u>Parameter</u>	Lot No.: : <u>As found</u>	100128-050-040	<u>As left</u>		(Limits)
Parameter PMT Peak Test	Lot No.: : <u>As found</u> nber Cleaned:	100128-050-040 Post maintenance	<u>As left</u> 2024		(Limits)
<u>Parameter</u> PMT Peak Test Date Optical Cham Date Disposable Fi	Lot No.: <u>As found</u> nber Cleaned: Iter Changed:	100128-050-040 <u>Post maintenance</u> April 2, 2	<u>As left</u> 2024 2024		(Limits)
<u>Parameter</u> PMT Peak Test Date Optical Cham	Lot No.: <u>As found</u> nber Cleaned: Iter Changed:	100128-050-040 Post maintenance April 2, 2 April 4, 2	<u>As left</u> 2024 2024	Adjusted	(Limits)
<u>Parameter</u> PMT Peak Test Date Optical Cham Date Disposable Fi	Lot No.: <u>As found</u> bber Cleaned: Iter Changed:	100128-050-040 Post maintenance April 2, 2 April 4, 2 PM w/ HEPA: Annual Maintenan	<u>As left</u> 2024 2024 ce	Adjusted	(Limits)
Parameter PMT Peak Test Date Optical Cham Date Disposable Fi Post- maintenance Zero Ver	Lot No.: <u>As found</u> ber Cleaned: Iter Changed: - ification: be Cleaned:	100128-050-040 Post maintenance April 2, 2 April 4, 2 PM w/ HEPA:	<u>As left</u> 2024 2024 ce 7, 2023	Adjusted	(Limits)
Parameter PMT Peak Test Date Optical Cham Date Disposable Fi Post- maintenance Zero Ver Date Sample Tub	Lot No.: : <u>As found</u> ber Cleaned: ification: be Cleaned: or Cleaned:	100128-050-040 Post maintenance April 2, 2 April 4, 2 PM w/ HEPA: Annual Maintenan October 22 February 2	<u>As left</u> 2024 2024 2024 ce 7, 2023 3, 2024	Adjusted	(Limits) +/- 0.5
Parameter PMT Peak Test Date Optical Cham Date Disposable Fi Post- maintenance Zero Ver Date Sample Tub	Lot No.: : <u>As found</u> ber Cleaned: ification: be Cleaned: or Cleaned:	100128-050-040 Post maintenance April 2, 2 April 4, 2 PM w/ HEPA: Annual Maintenan October 22 February 2	<u>As left</u> 2024 2024 ce 7, 2023	Adjusted	(Limits) +/- 0.5



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

## AMS505 SAWBONES BAY APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# **Wood Buffalo Environmental Association** SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Sawbones Bay
Calibration Date:	April 17, 2024
Start time (MST):	9:48
Reason:	Routine

Station number: AMS 505 Last Cal Date: March 18, 2024 End time (MST): 12:35

#### **Calibration Standards**

Cal Gas Concentration: Cal Gas Cylinder #:	51.40 EY0000672	ppm	Cal Gas Exp Date: February 15, 2029
, Removed Cal Gas Conc:	51.40	ppm	Rem Gas Exp Date: February 15, 2029
Removed Gas Cyl #:	EY0000672		Diff between cyl:
Calibrator Model:	Teledyne API T700	)	Serial Number: 5112
Zero Air Gen Model:	Teledyne API T701	LH	Serial Number: 690

Bay

Thermo 43i

0 - 1000 ppb

## **Analyzer Information**

Serial Number: 710321323

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.999393	1.008070	Backgd or Offset:	20.5	20.3
Calibration intercept:	-1.051659	-1.013890	Coeff or Slope:	1.008	1.001

#### SO<sub>2</sub> 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 As found Mid point As found Low point New cylinder response	4922	77.8	799.8	811.7	0.985
Baseline Corr As found: Baseline Corr 2nd AF pt:	812.0 NA	Previous response AF Slope:	798.3	*% change AF Intercept:	1.7%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	0.3	
High point	4922	77.8	799.8	806.1	0.992
Mid point	4961	38.9	399.9	400.9	0.998
Low point	4981	19.5	200.4	200.1	1.002
As left zero	5000	0.0	0.0	0.1	
As left span	4922	77.8	799.8	805.3	0.993
			Averag	ge Correction Factor:	0.997

Notes:

Changed inlet filter after as founds. Adjusted span only.

Calibration Performed By:

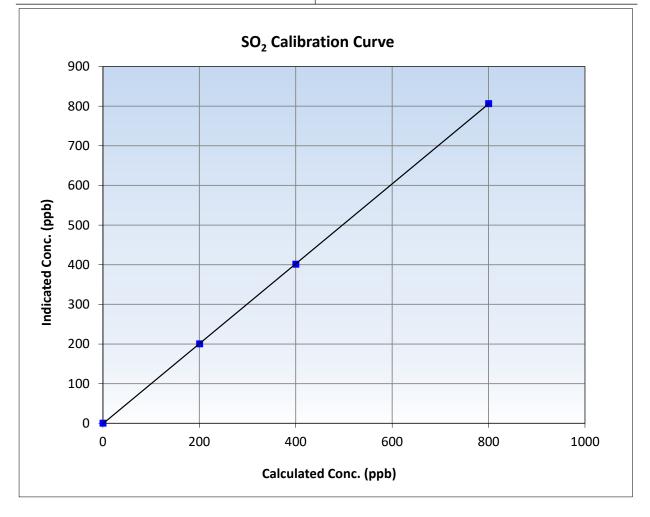


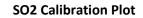
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 18, 2024
Station Name:	Sawbones Bay	Station Number:	AMS 505
Start Time (MST):	9:48	End Time (MST):	12:35
Analyzer make:	Thermo 43i	Analyzer serial #:	710321323

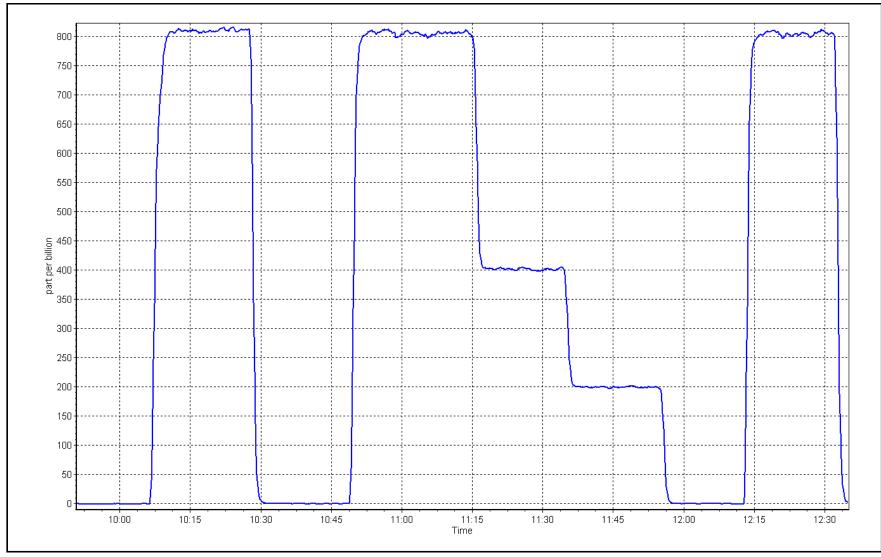
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	0.3		Correlation Coefficient	0.999986	≥0.995
799.8 399.9	806.1 400.9	0.9922 0.9975	Slope	1.008070	0.90 - 1.10
200.4	200.1	1.0017	Intercept	-1.013890	+/-30













## Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

Station Name: Calibration Date: Start time (MST): Reason:	Sawbones Bay April 24, 2024 8:45 Routine		Station number: Last Cal Date: End time (MST):	AMS 505 March 19, 2024 12:22
		Calibra	ation Standards	
Cal Gas Concentration: Cal Gas Cylinder #:	5.15 CC517397	ppm	Cal Gas Exp Date:	February 5, 2024

	0.110	PP	ear eas Emp Bater	
Cal Gas Cylinder #:	CC517397			
Removed Cal Gas Conc:	5.15	ppm	Rem Gas Exp Date:	NA
Removed Gas Cyl #:	NA		Diff between cyl:	
Calibrator Make/Model:	Teledyne API T700		Serial Number:	5112
ZAG Make/Model:	Teledyne API T701		Serial Number:	690

#### **Analyzer Information**

Analyzer make: Converter make:	Thermo 43iQ Global 150		Analyzer serial #: Converter serial #:	12113311965 2022-224	
Analyzer Range	0 - 100 ppb		Converter Temp:		degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	1.015068	0.998937	Backgd or Offset:	1.010	0.990
Calibration intercept:	0.002254	-0.158258	Coeff or Slope:	1.119	1.092

#### 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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	
As found High point	4922	77.7	80.0	82.6	0.968
As found Mid point	4961	38.8	40.0	40.8	0.977
As found Low point	4981	19.4	20.0	20.1	0.989
New cylinder response					
Baseline Corr As found:	82.7	Prev response:	81.24	*% change:	1.8%
Baseline Corr 2nd AF pt:	40.9	AF Slope:	1.034635	AF Intercept:	-0.357524
Baseline Corr 3rd AF pt:	20.2	AF Correlation:	0.999954	* = > +/-5% change initiate	es 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	4922	77.7	80.0	79.9	1.002
Mid point	4961	38.8	40.0	39.6	1.009
Low point	4981	19.4	20.0	19.7	1.014
As left zero	5000	0.0	0.0	0.0	
As left span	4922	77.7	80.0	79.7	1.004
SO2 Scrubber Check	4922	77.8	778.0	0.0	
Date of last scrubber char	nge:			Ave Corr Factor	1.008

Date of last converter efficiency test:

Changed inlet filter after as founds. Adjusted span only.

Calibration Performed By:

Sean Bala

Notes:



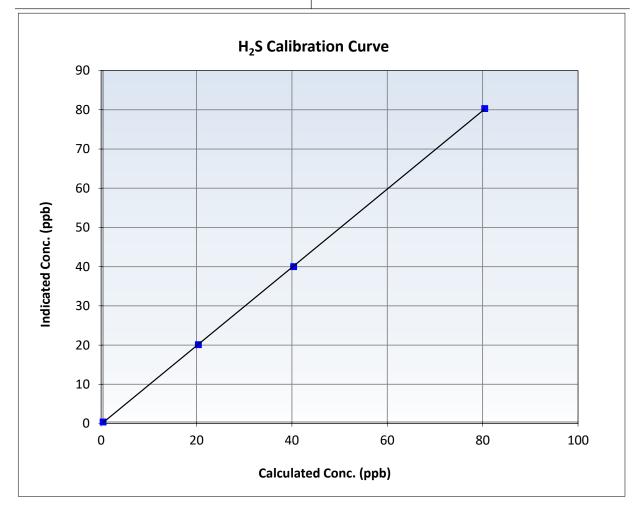
# Wood Buffalo Environmental Association

## **H2S Calibration Summary**

#### **Station Information**

Calibration Date:	April 24, 2024	Previous Calibration:	March 19, 2024
Station Name:	Sawbones Bay	Station Number:	AMS 505
Start Time (MST):	8:45	End Time (MST):	12:22
Analyzer make:	Thermo 43iQ	Analyzer serial #:	12113311965

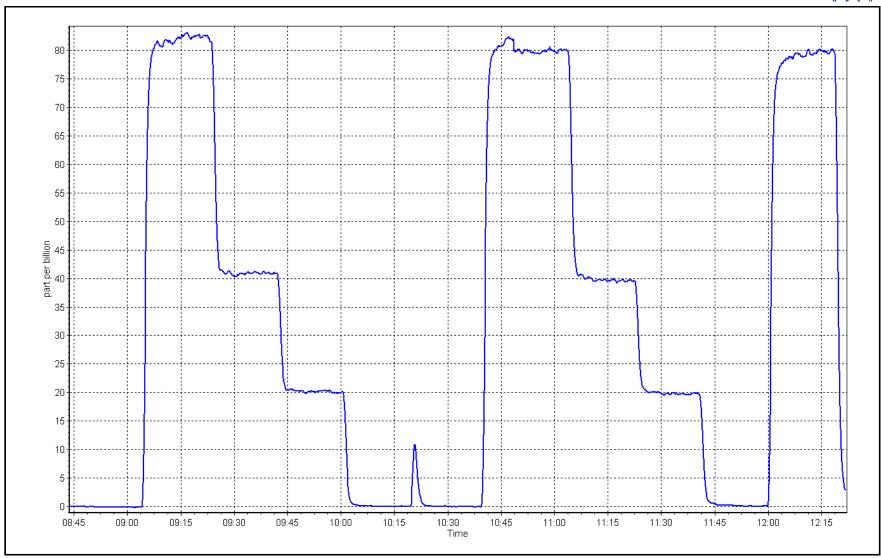
#### **Calibration Data** Calculated concentration Indicated concentration Correction factor (Cc/lc) Statistical Evaluation <u>Limits</u> (ppb) (Cc) (ppb) (Ic) **Correlation Coefficient** 0.999979 ≥0.995 0.0 0.0 ----80.0 79.9 1.0017 Slope 0.998937 0.90 - 1.10 40.0 39.6 1.0092 20.0 1.0142 19.7 Intercept -0.158258 +/-3













**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Sawbones Bay	NO Gas Cylinder #:	T1FY3PK	Cal Gas Expiry Date:	March 14, 2025
Station number:	AMS 505	NOX Cal Gas Conc:	47.94 ppm	NO Cal Gas Conc:	47.94 ppm
Calibration Date:	April 11, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date	: NA
Last Cal Date:	March 20, 2024	Removed Gas NOX Conc:	47.94 ppm	Removed Gas NO Conc	: 47.94 ppm
Start time (MST):	8:44	NOX gas Diff:		NO gas Diff:	
End time (MST):	13:23	Calibrator Model:	API T700	Serial Number:	5112
Reason:	Routine	ZAG make/model:	API T701H	Serial Number:	690

#### 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	0.5	0.6		
AF High point	4917	83.4	799.6	799.6	0.0	805.0	801.2	3.9	0.9945	0.9986
AF Mid point										
AF Low point										
New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	799.3 ppb	NO = 798.5	ppb	* = > +/-5	% change initiates i	investigation	*Percent Chan	ge NO <sub>X</sub> =	0.6%
Baseline Corr 1	.st pt NO <sub>x</sub> =	804.0 ppb	NO = 800.7	ppb	<u>As Four</u>	nd Statistics		*Percent Chan	ge NO =	0.3%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d $NO_{X} r^{2}$ :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>X</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d $NO_2 r^2$ :		NO2 SI:	NO <sub>2</sub> Int:	
				<u>As Fo</u>	und GPT Calib	ration Data				
								Baseline Adjus	ted NO2	

O2 Cota sint (auch)	Indicated NO Reference	Indicated NO Drop	Calculated NO2	Indicated NO2	Correction factor	Converter Efficiency
O3 Setpoint (ppb)	concentration (ppb)	concentration (ppb)	concentration (ppb) (Cc)	concentration (ppb) (Ic)	(Cc/(Ic-AFzero))	<i>Limit = 96-104%</i>
					<i>Limit = 0.90 - 1.10</i>	

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	API T200		Serial Number: 4260	D			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.001550	1.001007
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-1.470566	-0.830518
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.000349	1.002164
NO coeff or slope:	1.045	1.044	NO bkgnd or offset:	-1.1	-0.2	NO Cal Offset:	-1.350176	-1.110354
NOX coeff or slope:	1.044	1.039	NOX bkgnd or offset:	-0.1	0.7	NO <sub>2</sub> Cal Slope:	1.002397	0.998476
NO2 coeff or slope:	NA	NA	Reaction cell Press:	8.0	8.1	NO <sub>2</sub> Cal Offset:	0.386621	0.748401

#### **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) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	-0.1	0.1	-0.2		
High point	4917	83.4	799.6	799.6	0.0	799.6	800.3	-0.6	1.0000	0.9991
Mid point	4958	41.7	399.8	399.8	0.0	400.0	400.5	-0.5	0.9996	0.9984
Low point	4979	20.9	200.4	200.4	0.0	198.4	197.5	0.9	1.0100	1.0146
As left zero	5000	0.0	0.0	0.0	0.0	-0.1	0.2	-0.3		
As left span	4916	83.4	799.7	341.6	458.0	796.6	341.6	455.0	1.0039	1.0000
							Average Co	orrection Factor	1.0032	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/lc) Limit = 0.95-1.05	Converter Efficiency Limit = 96-104%
Cal zero			0.0	-0.2		
High GPT point	796.8	340.4	456.4	456.0	1.0009	99.9%
Mid GPT point	796.8	549.6	247.2	247.6	0.9984	100.2%
Low GPT point	796.8	651.3	145.5	147.4	0.9871	101.3%
			A	verage Correction Factor	0.9955	100.5%

Notes:

Changed inlet filter after as founds. Adjusted zero and span.

Calibration Performed By:

Sean Bala

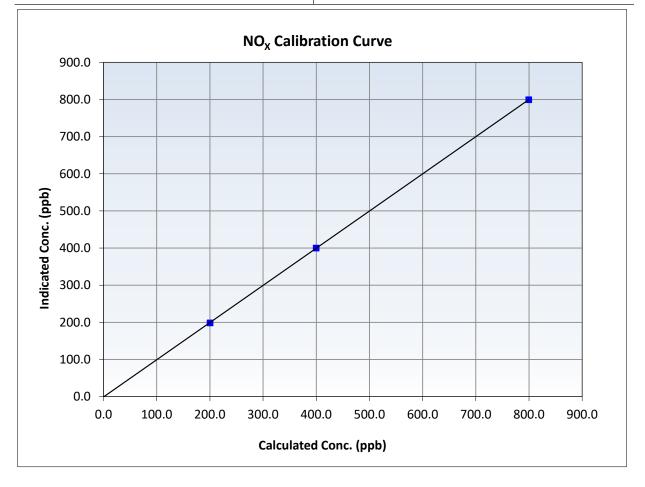


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 20, 2024
Station Name:	Sawbones Bay	Station Number:	AMS 505
Start Time (MST):	8:44	End Time (MST):	13:23
Analyzer make:	API T200	Analyzer serial #:	4260

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	-0.1		Correlation Coefficient	0.999992	≥0.995
799.6 399.8	799.6 400.0	1.0000 0.9996	Slope	1.001007	0.90 - 1.10
200.4	198.4	1.0100	Intercept	-0.830518	+/-20



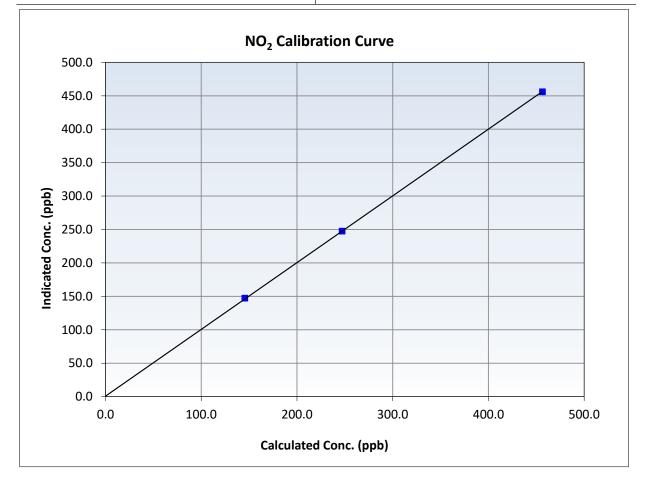


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 20, 2024
Station Name:	Sawbones Bay	Station Number:	AMS 505
Start Time (MST):	8:44	End Time (MST):	13:23
Analyzer make:	API T200	Analyzer serial #:	4260

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	-0.2		Correlation Coefficient	0.999973	≥0.995
456.4 247.2	456.0 247.6	1.0009 0.9984	Slope	0.998476	0.90 - 1.10
145.5	147.4	0.9871	Intercept	0.748401	+/-20



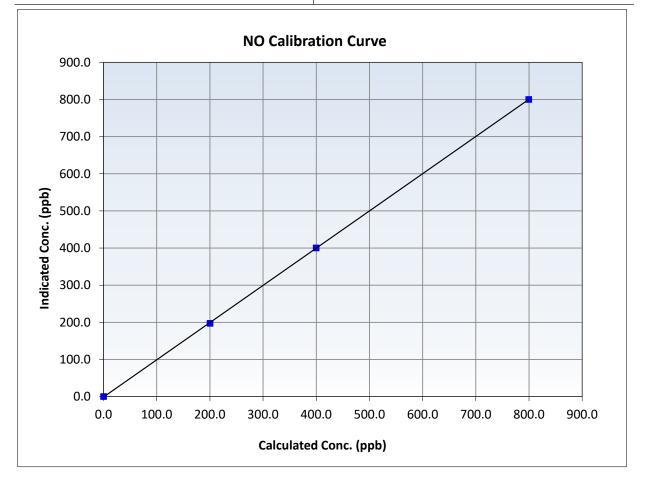


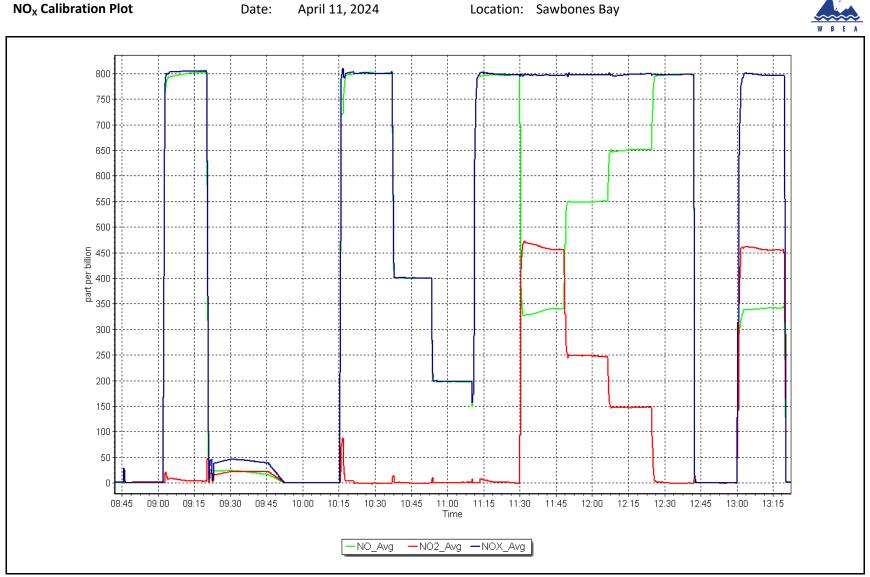
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 11, 2024	Previous Calibration:	March 20, 2024
Station Name:	Sawbones Bay	Station Number:	AMS 505
Start Time (MST):	8:44	End Time (MST):	13:23
Analyzer make:	API T200	Analyzer serial #:	4260

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.1		Correlation Coefficient	0.999979	≥0.995
799.6	800.3	0.9991	Slope	1.002164	0.90 - 1.10
399.8	400.5	0.9984	Slope	1.002104	0.30 - 1.10
200.4	197.5	1.0146	Intercept	-1.110354	+/-20







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM CALIBRATION REPORT

## AMS507 KIRBY SOUTH APRIL 2024

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

May 31, 2024



Analyzer make: Analyzer Range:

# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Report

#### **Station Information**

Station Name:	Kirby South
Calibration Date:	April 18, 2024
Start time (MST):	7:45
Reason:	Routine

Station number: AMS 507 Last Cal Date: March 14, 2024 End time (MST): 11:13

#### **Calibration Standards**

Cal Gas Concentration:	49.18	ppm	Cal Gas Exp Date: February 23, 2025
Cal Gas Cylinder #:	<u>CC303554</u>		
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: 3804
Zero Air Gen Model:	Teledyne API T701	H	Serial Number: 880

Thermo 43i

0 - 1000 ppb

#### **Analyzer Information**

Serial Number: 1173410001

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.995804	1.000467	Backgd or Offset:	21.7	25.5
Calibration intercept:	0.311657	-1.470231	Coeff or Slope:	0.906	0.906

#### SO<sub>2</sub> 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	3.4	
As found High point As found Mid point As found Low point New cylinder response	4919	81.3	799.6	801.6	1.002
Baseline Corr As found: Baseline Corr 2nd AF pt:	798.2 NA	Previous response AF Slope:	796.6	*% change AF Intercept:	0.2%
Baseline Corr 3rd AF pt:	NA	AF Correlation:		* = > +/-5% change initiate	es investigation

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

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc) Limit = 0.95-1.05
Calibrator zero	5000	0.0	0.0	-0.3	
High point	4919	81.3	799.6	798.8	1.001
Mid point	4959	40.7	400.3	399.4	1.002
Low point	4980	20.3	199.7	196.5	1.016
As left zero	5000	0.0	0.0	-0.2	
As left span	4919	81.3	799.6	801.0	0.998
			Averag	ge Correction Factor:	1.006

Notes:

Changed sample inlet filter after as founds. Adjusted zero.

Calibration Performed By:

Braiden Boutilier

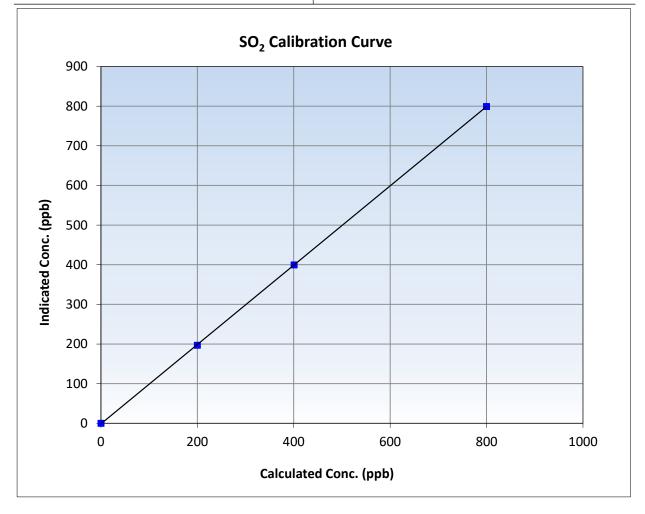


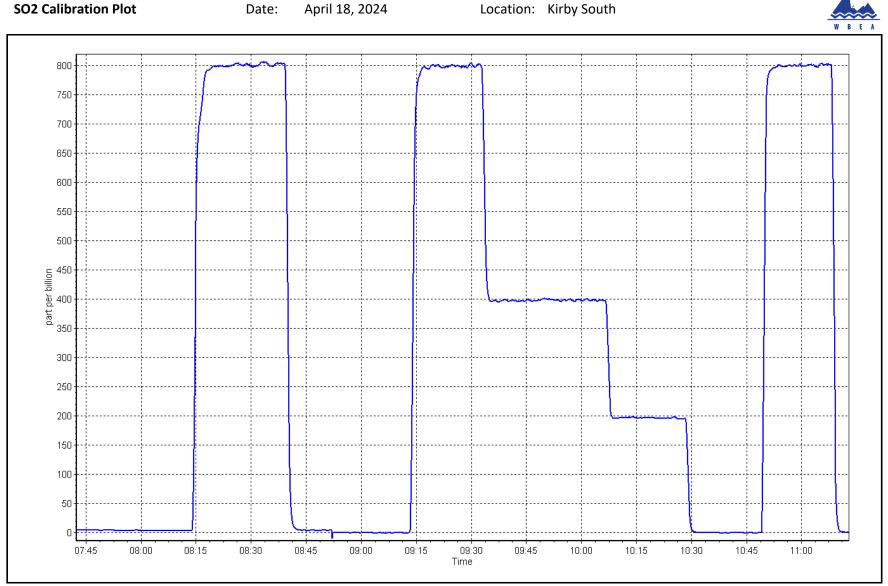
# Wood Buffalo Environmental Association SO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 14, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	7:45	End Time (MST):	11:13
Analyzer make:	Thermo 43i	Analyzer serial #:	1173410001

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evalua	ation	<u>Limits</u>
0.0	-0.3		Correlation Coefficient	0.999986	≥0.995
799.6	798.8	1.0010	Slope	1.000467	0.90 - 1.10
400.3	399.4	1.0024	Siope	1.000407	0.90 - 1.10
199.7	196.5	1.0161	Intercept	-1.470231	+/-30







## Wood Buffalo Environmental Association H2S Calibration Report

#### **Station Information**

Station Name:	Kirby South	Station number:	AMS 507
Calibration Date:	April 17, 2024	Last Cal Date:	March 13, 2024
Start time (MST):	11:15	End time (MST):	16:07
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:	281
ZAG Make/Model:	Teledyne API T751		Serial Number:	321

#### **Analyzer Information**

Analyzer make: Converter make:	Thermo 43i-TLE Global		Analyzer serial #: Converter serial #:	1150840012 2022-197	
Analyzer Range	0 - 100 ppb		Converter Temp:		350 degC
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Calibration slope:	0.996813	0.999242	Backgd or Offset:	1.73	1.72
Calibration intercept:	0.139039	-0.020960	Coeff or Slope:	1.041	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)) <i>Limit = 0.90-1.10</i>
As found zero	5000	0.0	0.0	-0.1	
As found High point	4921	79.2	80.0	81.1	0.985
As found Mid point	4960	39.6	40.0	40.0	0.997
As found Low point	4980	19.8	20.0	20.0	0.995
New cylinder response	5000	0.0	0.0		
Baseline Corr As found:	81.2	Prev response:	79.88	*% change:	1.6%
Baseline Corr 2nd AF pt:	40.1	AF Slope:	1.015243	AF Intercept:	-0.280964
Baseline Corr 3rd AF pt:	20.1	AF Correlation:	0.999953	* = > +/-5% change initiate	es 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	4921	79.2	80.0	79.9	1.001
Mid point	4960	39.6	40.0	40.0	1.000
Low point	4980	19.8	20.0	19.9	1.005
As left zero	5000	0.0	0.0	0.1	
As left span	4921	79.2	80.0	78.2	1.023
SO2 Scrubber Check	4919	80.0	800.2	0.0	
Date of last scrubber char	nge:	July 25, 2023		Ave Corr Factor	1.002
Date of last converter effi	iciency test:	NA			

Notes:

Calibration Performed By: Braiden Boutilier

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

Version 02-2024 CALS\_539



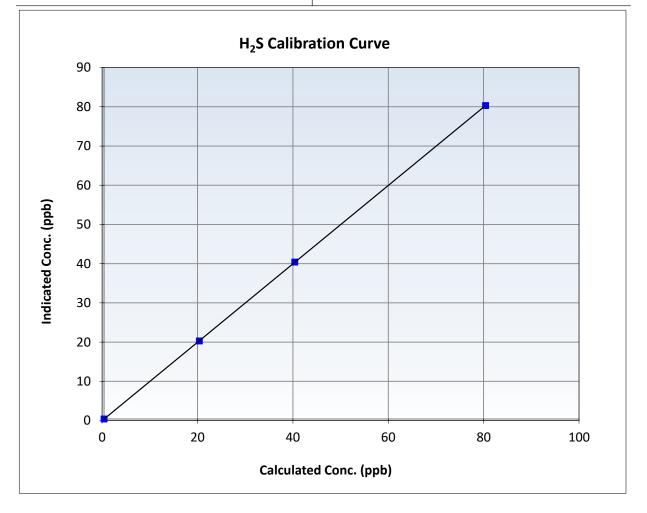
# **Wood Buffalo Environmental Association**

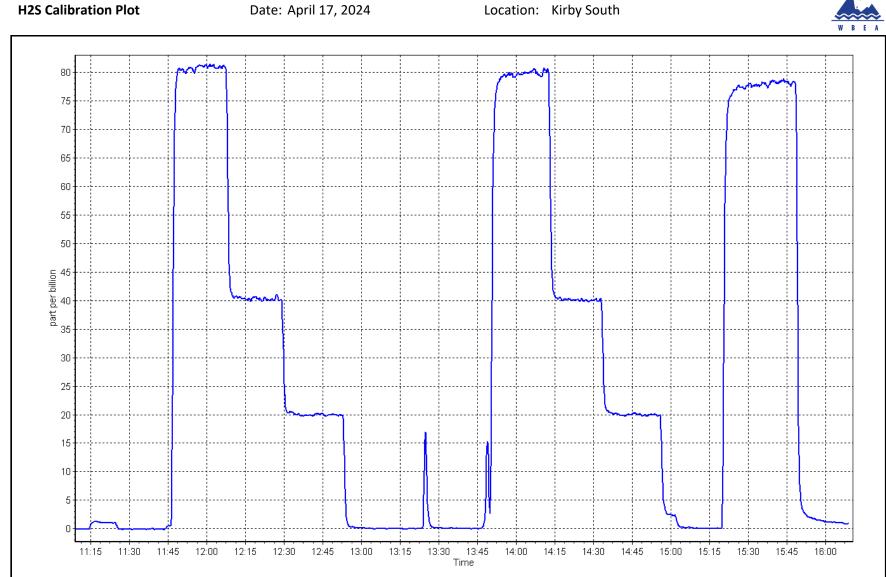
## **H2S Calibration Summary**

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 13, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	11:15	End Time (MST):	16:07
Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1150840012

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999998	≥0.995
80.0	79.9	1.0012	Slope	0.999242	0.90 - 1.10
40.0	40.0	1.0000			
20.0	19.9	1.0050	Intercept	-0.020960	+/-3







# Wood Buffalo Environmental Association THC Calibration Report

#### **Station Information**

Station Name:         Kirby South         Station number:         AMS 507           Calibration DATE:         APAIS         End time (MST):         1.1.13           Reason:         Routine         End time (MST):         1.1.13           Calibration Standards         End time (MST):         1.1.13           Gas Cert Reference:         CC203554         Cal Gas Expiry Date:         March 23, 2025           CH4 Cal Gas Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           CH8 Conc.         205.5         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibrator Make/Model:         Teledyne API T700         Serial Number:         3804           ZAG Make/Model:         Teledyne API T701         Serial Number:         3804           Calibration slope:         0.397260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           Calibration slope:         0.397260         0.0         0.00         0.00         4.64         2.07         3.685						
Calibration Date:         April 18, 2024         Last Cal Date:         March 14, 2024           Start time (MST):         7:45         End time (MST):         11:13           Reason:         Boutine         Calibration Standards         March 23, 2025           Gas Cert Reference:         CC303554         Cal Gas Expiry Date:         March 23, 2025           CH4 Cal Gas Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed Gas Cert:         NA         Removed Gas Expiry:         NA         Removed Gas Expiry:         NA           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibration Make/Model:         Teledyne API 1700         Serial Number:         3804         Serial Number:         3804           ZAG Make/Model:         Teledyne API 1701         Serial Number:         880         Serial Number:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           Calibration intercept:         Dilution air flow rate         Source gas flow rate         Calculated Concentration         Correction factor (CG) (cm)           As found Mitig point         4919         81.3	Station Name:	Kirby South		Station number:	AMS 507	
Start time (MST):       7.45       End time (MST):       11:13         Reason:       Routine       Calibration Standards         Gas Cert Reference:       CC303554       Cal Gas Conc.       1061.7       ppm         CH4 Cal Gas Conc.       496.6       ppm       CH4 Equiv Conc.       1061.7       ppm         Removed Gas Conc.       496.6       ppm       CH4 Equiv Conc.       1061.7       ppm         Removed Gas Conc.       496.6       ppm       CH4 Equiv Conc.       1061.7       ppm         Removed Gas BConc.       496.6       ppm       CH4 Equiv Conc.       1061.7       ppm         Removed Gas BConc.       205.5       ppm       Diff between cyl:       1061.7       ppm         Zallorator Make/Modet:       Teledyne API T700       Serial Number:       3804       3804         Zad Make/Modet:       Teledyne API T701       Serial Number:       3804       2.15       2.07         Calibration slope:       0.997260       1.001763       Background:       2.15       2.07       3.685         Calibration intercept:       0.000217       -0.076111       Coefficient:       3.701       3.685         As found liph point       4919       81.3       17.26       17.25       0.		•				
Reason: Reutine Routine Reason: Reason						
Calibration StandardsGas Cert Reference:CC303554CAI G Gas Expiry Date:March 23, 2025.CH4 CaI Gas Conc.205.5ppmCH4 Equiv Conc.1061.7pmRemoved Gas Expiry Date:NARemoved Gas Expiry.NARemoved CH4 Conc.496.6ppmCH4 Equiv Conc.1061.7ppmRemoved CH8 Conc.205.5ppmDiff between cyl:304Calibrator MAR/Model:Teledyne API T701Serial Number:380ZAG Make/Model:Teledyne API T701Serial Number:880Analyzer make:Thermo 51i-LTAnalyzer serial #:11823400005Analyzer make:0.9972601.001763Background:2.152.07Calibration slope:0.9972601.001763Background:2.152.07Calibration intercept:0.004217-0.076111Coefficient:3.7013.685THC As Found DataSet PointDilution air flow rateSource gas flow rateCalculated ConcentrationIndicated Concentration Correction factor (C/L/LAs found High pointA91981.317.2617.250.998As found High pointA919AF Slope:*****/% change indicate InvestigationAs found High point17.29Previous response17.22*% change indicate InvestigationSet PointDilution air flow rateSource gas flow rate(form (fcc) (form (fcc)	Start time (MST):	7:45		End time (MST):	11:13	
Gas Cert Reference:         CC303554         Cal Gas Expiry Date:         March 23, 2025           CH4 Equiv Conc.         1061.7         ppm           Removed Gas Conc.         205.5         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed Gas Conc.         205.5         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibrator Make/Model:         Teledyne API T700         Serial Number:         3804         3804           ZAG Make/Model:         Teledyne API T701         Serial Number:         880         3804           Calibration slope:         0.20 ppm         Analyzer Information         1182340005         Analyzer Analyzer Name:         Finish           Calibration slope:         0.397260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.075111         Coefficient:         3.701         3.685           Set Point         Dilution air flow rate (scm)         Calculated Concentration         Indicated Concentration Correction factor (Cc/le/le/gpm) (c)         fmi = 0.00.10         fmi = 0.00.10           As found toro         5000         0.0 <td>Reason:</td> <td>Routine</td> <td></td> <td></td> <td></td> <td></td>	Reason:	Routine				
Gas Cert Reference:         CC303554         Cal Gas Expiry Date:         March 23, 2025           CH4 Equiv Conc.         1061.7         ppm           Removed Gas Conc.         205.5         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed Gas Conc.         205.5         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibrator Make/Model:         Teledyne API T700         Serial Number:         3804         3804           ZAG Make/Model:         Teledyne API T701         Serial Number:         880         3804           Calibration slope:         0.20 ppm         Analyzer Information         1182340005         Analyzer Analyzer Name:         Finish           Calibration slope:         0.397260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.075111         Coefficient:         3.701         3.685           Set Point         Dilution air flow rate (scm)         Calculated Concentration         Indicated Concentration Correction factor (Cc/le/le/gpm) (c)         fmi = 0.00.10         fmi = 0.00.10           As found toro         5000         0.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
CH4 & G as Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           CH4 & G as Gonc.         205.5         ppm         Removed Gas Expiry:         NA           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibrator Make/Model:         Teledyne API T700         Serial Number:         3804         3804           ZAG Make/Model:         Teledyne API T701H         Serial Number:         880         3804           ZAG Make/Model:         Teledyne API T701H         Serial Number:         3804           Calibration slope:         0.20 ppm         Analyzer Information         Start         Finish           Calibration slope:         0.997260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           Set Point         Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calulated Concentration         <			<b>Calibration S</b>	tandards		
CH4 & G as Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           CH4 & G as Gonc.         205.5         ppm         Removed Gas Expiry:         NA           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Calibrator Make/Model:         Teledyne API T700         Serial Number:         3804         3804           ZAG Make/Model:         Teledyne API T701H         Serial Number:         880         3804           ZAG Make/Model:         Teledyne API T701H         Serial Number:         3804           Calibration slope:         0.20 ppm         Analyzer Information         Start         Finish           Calibration slope:         0.997260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           Set Point         Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calulated Concentration         <	Cas Cart Pafaranca	CC202554		Cal Gas Expiry Data:	March 23, 2025	
C3H8 Cal Gas Conc.205.5ppmNANARemoved Gas Cert:NARemoved Gas Cert:NARemoved CH4 Conc.205.5ppmCalibrator Make/Model:Teledyne API T700Serial Number:3804ZAG Make/Model:Teledyne API T701HSerial Number:3804Calibrator Make/Model:Teledyne API T701HSerial Number:3804Calibration Make/Model:Teledyne API T701HAnalyzer InformationAnalyzer InformationAnalyzer InformationAnalyzer Name:Tereidyne API T701Serial Number:3804Calibration Make/Model:Teledyne API T701HCalibration StartFinishCalibration slope:StortFinishCalibration infercept:0.004217-0.076111Coefficient:3.7013.685Set PointDilution air flow rate (scorn)Calibration flow rate (scorn)Calibration flow rate (scorn)Calibration flow rate (scorn)Calibration flow rate (scorn)StortFinish Baseline Corr 2nd AF pt: <th< td=""><td></td><td></td><td></td><td></td><td>,</td><td></td></th<>					,	
Removed Gas Cert:NARemoved Gas Expiry:NARemoved CH4 Conc.496.6ppmCH4 Equiv Conc.1061.7ppmCalibrator Make/Model:Teledyne API T700Serial Number:3804ZAG Make/Model:Teledyne API T701HSerial Number:880ZAG Make/Model:Teledyne API T701HSerial Number:880Analyzer make:Thermo 51i-LTAnalyzer InformationAnalyzer Range:0 - 20 ppm70.076111Coefficient:Calibration intercept:0.004217-0.076111Coefficient:3.701Calibration intercept:0.004217-0.076111Coefficient:3.7013.685StartFinish (scm)Source gas flow rate (scm)Calculated Concentration (ppm) (c)Indicated Concentration Correction factor (CC/Ic (ppm) (c)As found High point491981.317.2617.250.998As found High point491981.317.2617.250.998As found High pointNAAF Correlation:*=>+/5% change Initiates investigationTHC Calibration DataSateline Corr 2nd AF pt:NAAF Correlation:*=>+/5% change Initiates investigationSet PointDilution air flow rate (scm)Source gas flow rate (scm)Calculated Concentration (ppm) (c)Initiate 3.95.100As found Mig point491981.317.2617.250.998As found Mig point4919AF Correlation:*=>+/5% change Initiates investigationTHC Calibration zero5000 <td< td=""><td></td><td></td><td></td><td>CH4 Equiv Conc.</td><td>1061.7</td><td>ppm</td></td<>				CH4 Equiv Conc.	1061.7	ppm
Removed CH4 Conc.         496.6         ppm         CH4 Equiv Conc.         1061.7         ppm           Removed C3H8 Conc.         Teledyne API T700         Serial Number:         3804           ZAG Make/Model:         Teledyne API T701         Serial Number:         3804           ZAG Make/Model:         Teledyne API T701         Serial Number:         880           Analyzer make:         Thermo 51i-LT Analyzer Range:         Analyzer Serial #:         1182340005           Calibration slope:         0.997260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           Set Point         Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calculated Concentration         Indicated Concentration Correction factor (Cc//LC (ppm) (LC)         Marent and	C3H8 Cal Gas Conc.	205.5	ppm			
Removed C3H8 Conc. 205.5 ppm Diff between cyl: Calibrator Make/Model: Teledyne API T700 Serial Number: 3804 Serial Number: 880 CAnalyzer Mange: 0 - 20 ppm Analyzer Range: 0 - 20 ppm Calibration slope: 0.997260 Calibration intercept: 0.004217 -0.076111 Calibration intercept: 0.004217 -0.076111 Coefficient: 3.701 3.685 Calibration intercept: 0.004217 -0.076111 Coefficient: 3.701 3.685 Calibration intercept: 0.004217 -0.076111 Coefficient: 3.701 3.685 Calibration intercept: 0.004217 -0.076111 Set Point Dilution air flow rate (sccm) Coefficient: 0.000 -0.04 As found zero 5000 0.0 0.0 0.00 -0.04 As found Yero Source gas flow rate (sccm) Coefficient: 0.004 As found Mid point A919 81.3 17.26 17.25 0.998 As found Mid point As found: 17.29 Baseline Corr 2nd AF pt: NA AF Slope: 17.22 *% change 0.4% AF Intercept: Baseline Corr 2nd AF pt: NA AF Slope: 4F Correlation: *==>+/5% change 0.4% AF Intercept: Baseline Corr 2nd AF pt: NA AF Slope: 4F Correlation: *==>+/5% change 0.4% Calibration inflow rate (sccm) Correlation factor (Cc/(c) (ppm) (c)	Removed Gas Cert:	N	A	Removed Gas Expiry:	NA	
Removed C3H8 Conc. Calibrator Make/Model:         205.5 Teledyne API T700 Teledyne API T701H         Diff between cyl: Serial Number:         3804           ZAG Make/Model:         Teledyne API T700 Teledyne API T701H         Serial Number:         880           Analyzer make:         Thermo 51i-LT Analyzer make:         Analyzer reirial #:         1182340005           Analyzer make:         0 - 20 ppm         Analyzer serial #:         1182340005           Calibration slope:         0.997260         1.001763         Background:         2.15         2.07           Calibration intercept:         0.004217         -0.076111         Coefficient:         3.701         3.685           THC As Found Data           Baseline Adjusted           Surve gas flow rate (sccm)         Calculated Concentration         Indicated Correction factor (ICC/(Ic (ppm) (Ic)         Arero)           A found zero         5000         0.0         0.00         -0.04            As found lip point         4919         81.3         17.26         17.25         0.998           As found Mid point           As found Low point         AF Slope:         *=+/5% change initiates investigation           THC Calibration Data           Set Point	Removed CH4 Conc.	496.6	ppm	CH4 Equiv Conc.	1061.7	ppm
Calibrator Make/Model:Teledyne API T700 Teledyne API T701HSerial Number:3804 Serial Number:Serial Number:3804 Serial Number:Serial Number:Serial Number:3804 Serial Number:Serial Number:	Removed C3H8 Conc			•		r r
ZAG Make/Model:Teledyne API T701HSerial Number:880Analyzer make:Thermo 51i-LT Analyzer Range: $0.20 \text{ pm}$ Analyzer serial #: $1182340005$ Calibration slope: $0.997260$ $1.001763$ Background: $2.15$ $2.07$ Calibration intercept: $0.004217$ $-0.076111$ Coefficient: $3.701$ $3.685$ THC As Found DataSet PointDilution air flow rate (sccm)Calibration (cccentration) calibration intercept: $0.000$ $-0.04$ $$ As found zero $5000$ $0.0$ $0.00$ $-0.04$ $$ As found High point As found High point Resolut As found High point Resolut Baseline Corr As found: $17.29$ Previous response A F Slope: $17.22$ $*\%$ change $+>/5%$ change initiates investigationBaseline Corr A found: $17.29$ NAPrevious response A F Slope: $17.22$ $*\%$ change initiates investigationHC Calibration:THC Calibration:****/5% change initiates investigationTHC Calibration:***********************************			ppin		2004	
Analyzer InformationAnalyzer make: Thermo 51i-LT Analyzer Range: 0 - 20 ppmAnalyzer Range: 0 - 20 ppmCalibration slope: 0.997260StartFinish 1.001763Background: 2.152.152.07Calibration slope: 0.004217O.076111Coefficient: 3.7013.685THC As Found DataSet PointDilution air flow rate (sccm)Calculated Concentration (ppm) (fc)Indicated Concentration Correction factor (C/(Ic/ (AF ero))A found High point A found Figure esponseITEC Calibration DataEaseline Corr 3rd AF pt: NANA A F Slope: AF Correlation: *=> +/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Calculated Concentration (ppm) (fc)Imter colspan="4">Calculated Concentration (ppm) (fc)Colspan= Set PointDilu	•	•				
Analyzer make:       Thermo 51i-LT Analyzer Range:       Analyzer Serial #:       182340005         Calibration slope: $0.097260$ $1.001763$ Background: $2.15$ $2.07$ Calibration intercept: $0.004217$ $-0.076111$ Coefficient: $3.701$ $3.685$ THC As Found Data         Baseline Adjusted         Set Point       Dilution air flow rate (sccm)       Source gas flow rate (sccm)       Caliculated Concentration (sccm)       Indicated Concentration (sccm)       Baseline Adjusted (sccm)         As found zero $5000$ $0.0$ $0.00$ $-0.04$ $$ As found Low point       A919 $81.3$ $17.26$ $17.25$ $0.998$ AF Correlation:         THC Calibration Data         Baseline Corr 3 found: $17.29$ Previous response $17.22$ $*\%$ change $0.4\%$ Baseline Corr 3 af AF pt:       NA       AF Slope: $* = * +/5\%$ change initiates investigation         Stet Point       Dilution air flow rate (sccm)       Source gas flow rate (sccm)       Calculated Concentration       Indicated Concentration Correction factor (Cc//(c)/(pm))(c)       Limit = 0.95-1.05 <the< td=""><td>ZAG Make/Model:</td><td>Teledyne API 1701F</td><td>1</td><td>Serial Number:</td><td>880</td><td></td></the<>	ZAG Make/Model:	Teledyne API 1701F	1	Serial Number:	880	
Analyzer make:       Thermo 51i-LT Analyzer Range:       Analyzer Serial #:       182340005         Calibration slope: $0.097260$ $1.001763$ Background: $2.15$ $2.07$ Calibration intercept: $0.004217$ $-0.076111$ Coefficient: $3.701$ $3.685$ THC As Found Data         Baseline Adjusted         Set Point       Dilution air flow rate (sccm)       Source gas flow rate (sccm)       Caliculated Concentration (sccm)       Indicated Concentration (sccm)       Baseline Adjusted (sccm)         As found zero $5000$ $0.0$ $0.00$ $-0.04$ $$ As found Low point       A919 $81.3$ $17.26$ $17.25$ $0.998$ AF Correlation:         THC Calibration Data         Baseline Corr 3 found: $17.29$ Previous response $17.22$ $*\%$ change $0.4\%$ Baseline Corr 3 af AF pt:       NA       AF Slope: $* = * +/5\%$ change initiates investigation         Stet Point       Dilution air flow rate (sccm)       Source gas flow rate (sccm)       Calculated Concentration       Indicated Concentration Correction factor (Cc//(c)/(pm))(c)       Limit = 0.95-1.05 <the< td=""><td></td><td></td><td>Analyzar lafe</td><td>ormation</td><td></td><td></td></the<>			Analyzar lafe	ormation		
Analyzer Range: 0 - 20 ppmCalibration slope:StartFinish 0.997260StartFinish 2.05Calibration intercept:0.004217-0.076111Coefficient:3.7013.685THC As Found DataBaseline AdjustedSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/(Ic AFzero) Limit = 0.99.10As found zero50000.00.00-0.04As found High point As found Ling point As found Ling point As found Ling point As found Ling point As found AF pt:17.29Previous response AF Slope:17.22*% change $AF$ Correlation:0.4% $F \Rightarrow +/5%$ change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration factor (Cc/(c) (ppm) (Cc)Baseline Corr 3rd AF pt:NAAF Slope: AF Correlation:*=> +/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration factor (Cc/(c) (ppm) (c)Calibrator zero50000.00.00Mid point491981.317.2617.231.002Mid point495940.78.648.571.009Ling point495940.78.648.571.009<			Analyzer Into	ormation		
Start Calibration slope: Calibration intercept:         Start 0.997260 0.004217         Finish 1.001763 -0.076111         Background: Coefficient:         Start 2.15         Finish 2.07           Set Point         Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calculated Concentration (uppm) (Cc)         Indicated Concentration Indicated Concentration Correction factor (Cc/(Ic AFzero)           As found zero         5000         0.0         0.00         -0.04	Analyzer make	: Thermo 51i-LT		Analyzer serial #:	1182340005	
Calibration slope: $0.997260$ $1.001763$ Background: $2.15$ $2.07$ Calibration intercept: $0.004217$ $-0.076111$ Coefficient: $3.701$ $3.685$ THC As Found Data         Set Point       Dilution air flow rate (sccm)       Calculated Concentration (ppm) (c)       Baseline Adjusted Concentration Correction factor (C/((cpm) (c))         As found zero $5000$ $0.0$ $0.00$ $-0.04$ $$ As found High point       4919 $81.3$ $17.26$ $17.25$ $0.998$ As found Low point       New cylinder response       NA       AF Slope: $AF$ Intercept:       Baseline Corr As found: $17.29$ Previous response $17.22$ $*\%$ change initiates investigation         THC Calibration Data         Set Point       Dilution air flow rate (sccm)       Cource gas flow rate (sccm)       Calculated Concentration (correction factor (Cc/tc) (ppm) (c)         Set Point       Dilution air flow rate (sccm)       Calculated Concentration (correction factor (Cc/tc) (ppm) (c)         Calibration Data         Set Point       Dilution air flow rate (sccm)       Calculated Concentration (ppm) (c)       Limit =	Analyzer Range	e: 0 - 20 ppm				
Calibration intercept:0.004217-0.076111Coefficient: $3.701$ $3.685$ THC As Found DataBaseline Adjusted ConcentrationSet PointBaseline Adjusted Source gas flow rate (scem)Calculated Concentration (ppm) (lc)Baseline Adjusted Baseline Correction factor (Cc/(lc- AFzero)As found zero50000.00.00 $-0.04$ $$ As found High point491981.3 $17.26$ $17.25$ $0.998$ As found Low pointNAAF Slope: AF Slope:AF Intercept: *=>+/5% change $0.4\%$ Baseline Corr 3rd AF pt:NAAF Correlation: (scem)*=>+/5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (scem)Source gas flow rate (scem)Calculated Concentration (ppm) (lc)Indicated Concentration Correction factor (Cc/(c) (ppm) (lc)Calibrator zero50000.00.00 $-0.05$ $$ High point491981.3 $17.26$ $17.23$ $1.002$ Mid point495940.7 $8.64$ $8.57$ $1.009$ Low point498020.3 $4.31$ $4.21$ $1.023$ As left zero50000.00.00 $-0.04$ $$ As left zero50000.00.00 $-0.04$ $$ As left zero50000.00.00 $-0.04$ $$		<u>Start</u>	<u>Finish</u>		<u>Start</u>	Finish
Calibration intercept:0.004217-0.076111Coefficient: $3.701$ $3.685$ THC As Found DataBaseline Adjusted ConcentrationSet PointBaseline Adjusted Source gas flow rate (scem)Calculated Concentration 	Calibration slope:	0.997260	1.001763	Background:	2.15	2.07
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 A P2ero)           As found zero         5000         0.0         0.00         -0.04            As found High point         4919         81.3         17.26         17.25         0.998           As found Low point         As found Low point         As found Correction factor (Cc/(tc) (ppm) (Cc)             Baseline Corr As found:         17.29         Previous response         17.22         *% change         0.4%           Baseline Corr 3rd 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) (Ic)         Imit = 0.95-1.05           Calibrator zero         5000         0.0         0.00         -0.05            High point         4919         81.3         17.26         17.23         1.002           Mido		0.004217	-0.076111	_	3.701	3.685
Set PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (IC)Baseline Adjusted (ppm) (IC)As found zero50000.00.00-0.04As found High point491981.317.2617.250.998As found Mid point As found Low point17.29Previous response17.22*% change AF Slope:0.4%Baseline Corr As found:17.29Previous response17.22*% change AF Slope:0.4%Baseline Corr 3rd AF pt:NAAF Slope:* = > +/-5% change0.4%Baseline Corr 3rd AF pt:NAAF Correlation:* = > +/-5% change0.4%Set PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (IC)Correction factor (Cc/Ic) (ppm) (IC)Calibrator zero50000.00.00-0.05High point491981.317.2617.231.002Mid point495940.78.648.571.002Mid point495940.78.648.571.002As left zero50000.00.00-0.04As left span491981.317.2617.251.001						
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Set Point         (sccm)         (sccm)         (ppm) (Cc)         (ppm) (lc)         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         17.25         0.998           As found Low point           New cylinder response         Baseline Corr As found:         17.29         Previous response         17.22         *% change         0.4%           Baseline Corr As found:         17.29         Previous response         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)         Calculated Concentration (cppm) (lc)         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         8.57         1.009<		Dilution air flow rate	Source gas flow rate	Calculated Concentration	Indicated Concentration	•
As found zero       5000       0.0       0.00       -0.04          As found High point       4919       81.3       17.26       17.25       0.998         As found Mid point       As found Low point       17.29       Previous response       17.22       *% change       0.4%         Baseline Corr As found:       17.29       Previous response       17.22       *% 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         THC Calibration Data         Set Point       Dilution air flow rate (sccm)       Calculated Concentration (ppm) (lc)       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       8.57       1.009         Low point       4980       20.3       4.31       4.21       1.023         As left zero       5000       0.0       0.00        As left zero       5000       0.00      <	Set Point		-			
As found zero       5000       0.0       0.00       -0.04          As found High point       4919       81.3       17.26       17.25       0.998         As found Mid point       As found Low point       Nas found Low point       17.29       Previous response       17.22       *% change       0.4%         Baseline Corr As found:       17.29       Previous response       17.22       AF Intercept:       AF Intercept:         Baseline Corr 3rd AF pt:       NA       AF Correlation:       * => +/-5% change initiates investigation         THC Calibration Data         Set Point       Dilution air flow rate (sccm)       Calculated Concentration (ppm) (lc)       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       8.57       1.009         Low point       4980       20.3       4.31       4.21       1.023         As left zero       5000       0.0       0.00       -0.04          As left span       4919       81.3       17.26       17.25       1.		(50011)	(30011)	(pp) (00)	(pp) (.c)	
As found High point As found Mid point As found Low point New cylinder response491981.317.2617.250.998Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:17.29Previous response17.22*% change AF Intercept: * =>+/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/lc) (ppm) (lc)Limit = 0.95-1.05Calibrator zero50000.00.001.002High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	As found zero	5000	0.0	0.00	-0.04	
As found Mid point As found Low point New cylinder response Baseline Corr As found: 17.29 Previous response 17.22 *% change 0.4% Baseline Corr 2nd AF pt: NA AF Slope: *=>+/-5% change initiates investigation THC Calibration Data Set Point Dilution air flow rate (sccm) Dilution air flow rate (sccm) (ppm) (Cc) (ppm) (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 8.57 1.009 Low point 4980 20.3 4.31 4.21 1.023 As left zero 5000 0.0 0.00 -0.04 As left span 4919 81.3 17.26 17.25 1.001						0.008
As found Low point New cylinder response17.29Previous response17.22*% change0.4% AF AF AF Baseline Corr 2nd AF pt: NA17.29Previous response AF Slope: AF Slope: AF Intercept: *=>+/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (c)Indicated Concentration factor (Cc/lc) Limit = 0.95-1.05Calibrator zero50000.00.00High point491981.317.2617.231.002Mid point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001		4919	01.5	17.20	17.25	0.998
New cylinder responseBaseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:17.29 NAPrevious response AF Slope: AF Slope: AF Correlation:17.22*% change AF Intercept: $*=>+/-5%$ change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/Ic) Limit = 0.95-1.05Calibrator zero50000.00.00-0.05High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001						
Baseline Corr As found: Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:17.29 NAPrevious response AF Slope: AF Slope: AF Correlation:17.22*% change AF Intercept: * => +/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/lc) (ppm) (lc)Calibrator zero50000.00.00 8.6417.231.002High point491981.317.2617.231.009Low point498020.34.314.211.023As left zero50000.00.001.001	As found Low point					
Baseline Corr 2nd AF pt:NA NAAF Slope: AF Correlation:AF Intercept: *=>+/-5% change initiates investigationBaseline Corr 3rd AF pt:NAAF Correlation:*=>+/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/lc) (ppm) (lc)Calibrator zero50000.00.00 (ppm) (Cc)1.002High point491981.317.2617.231.002Mid point498020.34.314.211.023As left zero50000.00.001.001	New cylinder response					
Baseline Corr 2nd AF pt:NA NAAF Slope: AF Correlation:AF Intercept: *=>+/-5% change initiates investigationBaseline Corr 3rd AF pt:NAAF Correlation:*=>+/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration Correction factor (Cc/lc) (ppm) (lc)Calibrator zero50000.00.00 (ppm) (Cc)1.002High point491981.317.2617.231.002Mid point498020.34.314.211.023As left zero50000.00.001.001						
Baseline Corr 3rd AF pt:NAAF Correlation:* => +/-5% change initiates investigationTHC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration (ppm) (lc)Correction factor (Cc/lc) Limit = 0.95-1.05Calibrator zero50000.00.00-0.05High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr As found	17 29	Previous response	17 22	*% change	0.4%
THC Calibration DataSet PointDilution air flow rate (sccm)Source gas flow rate (sccm)Calculated Concentration (ppm) (Cc)Indicated Concentration (ppm) (lc)Correction factor (Cc/lc) Limit = 0.95-1.05Calibrator zero50000.00.00-0.05High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001		-			-	0.4%
Set Point         Dilution air flow rate (sccm)         Source gas flow rate (sccm)         Calculated Concentration (ppm) (Cc)         Indicated Concentration (ppm) (lc)         Correction factor (Cc/lc) 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         8.57         1.009           Low point         4980         20.3         4.31         4.21         1.023           As left zero         5000         0.0         0.00         -0.04            As left span         4919         81.3         17.26         17.25         1.001	Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Set Point         (sccm)         (sccm)         (ppm) (Cc)         (ppm) (lc)         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         8.57         1.009           Low point         4980         20.3         4.31         4.21         1.023           As left zero         5000         0.0         0.00         -0.04            As left span         4919         81.3         17.26         17.25         1.001	Baseline Corr 2nd AF pt:	NA	AF Slope:		AF Intercept:	
Set Point         (sccm)         (sccm)         (ppm) (Cc)         (ppm) (lc)         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         8.57         1.009           Low point         4980         20.3         4.31         4.21         1.023           As left zero         5000         0.0         0.00         -0.04            As left span         4919         81.3         17.26         17.25         1.001	Baseline Corr 2nd AF pt:	NA	AF Slope: AF Correlation:		AF Intercept:	
Calibrator zero50000.00.00-0.05High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr 2nd AF pt:	NA NA	AF Slope: AF Correlation: <u>THC Calibrat</u>	ion Data	AF Intercept: * = > +/-5% change initiat	es investigation
High point491981.317.2617.231.002Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	NA NA Dilution air flow rate	AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate	tion Data Calculated Concentration	AF Intercept: * => +/-5% change initiat Indicated Concentration	es investigation Correction factor (Cc/Ic)
Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt:	NA NA Dilution air flow rate	AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate	tion Data Calculated Concentration	AF Intercept: * => +/-5% change initiat Indicated Concentration	es investigation Correction factor (Cc/Ic)
Mid point495940.78.648.571.009Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point	NA NA Dilution air flow rate (sccm)	AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm)	con Data Calculated Concentration (ppm) (Cc)	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic)	correction factor (Cc/Ic) Limit = 0.95-1.05
Low point498020.34.314.211.023As left zero50000.00.00-0.04As left span491981.317.2617.251.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero	NA NA Dilution air flow rate (sccm) 5000	AF Slope: AF Correlation: <u>THC Calibrat</u> Source gas flow rate (sccm) 0.0	calculated Concentration (ppm) (Cc)	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05	Correction factor (Cc/Ic) Limit = 0.95-1.05
As left zero         5000         0.0         0.00         -0.04            As left span         4919         81.3         17.26         17.25         1.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point	NA NA Dilution air flow rate (sccm) 5000 4919	AF Slope: AF Correlation: THC Calibrat Source gas flow rate (sccm) 0.0 81.3	calculated Concentration (ppm) (Cc) 0.00 17.26	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05 17.23	Correction factor (Cc/Ic) Limit = 0.95-1.05
As left span 4919 81.3 17.26 17.25 1.001	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point	NA NA Dilution air flow rate (sccm) 5000 4919 4959	AF Slope: AF Correlation: THC Calibrat Source gas flow rate (sccm) 0.0 81.3 40.7	Calculated Concentration (ppm) (Cc) 0.00 17.26 8.64	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05 17.23 8.57	Correction factor (Cc/lc) <i>Limit = 0.95-1.05</i>  1.002 1.009
	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point Low point	NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980	AF Slope: AF Correlation: THC Calibrat Source gas flow rate (sccm) 0.0 81.3 40.7 20.3	Calculated Concentration (ppm) (Cc) 0.00 17.26 8.64 4.31	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05 17.23 8.57 4.21	Correction factor (Cc/Ic) Limit = 0.95-1.05
Average correction Factor 1.011	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point Low point As left zero	NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980 5000	AF Slope: AF Correlation: THC Calibrat Source gas flow rate (sccm) 0.0 81.3 40.7 20.3 0.0	Calculated Concentration (ppm) (Cc) 0.00 17.26 8.64 4.31 0.00	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05 17.23 8.57 4.21 -0.04	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>  1.002 1.009 1.023 
	Baseline Corr 2nd AF pt: Baseline Corr 3rd AF pt: Set Point Calibrator zero High point Mid point Low point As left zero	NA NA Dilution air flow rate (sccm) 5000 4919 4959 4980 5000	AF Slope: AF Correlation: THC Calibrat Source gas flow rate (sccm) 0.0 81.3 40.7 20.3 0.0	Calculated Concentration (ppm) (Cc) 0.00 17.26 8.64 4.31 0.00 17.26	AF Intercept: * => +/-5% change initiat Indicated Concentration (ppm) (Ic) -0.05 17.23 8.57 4.21 -0.04 17.25	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>  1.002 1.009 1.023  1.001

Notes:

Changed sample inlet filter after as founds. Adjusted zero.

Calibration Performed By:

Braiden Boutilier

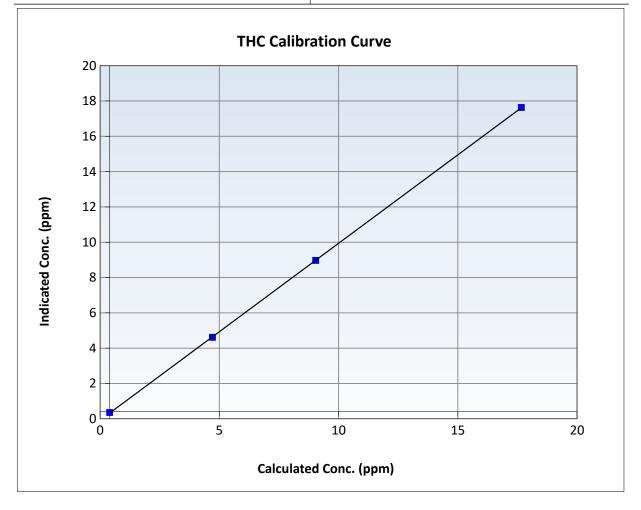


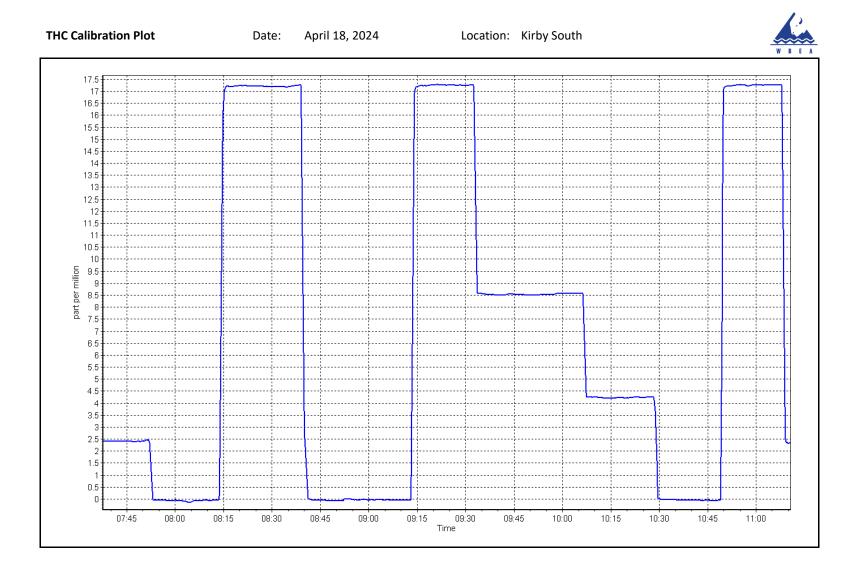
# Wood Buffalo Environmental Association THC Calibration Summary

#### **Station Information**

Calibration Date:	April 18, 2024	Previous Calibration:	March 14, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	7:45	End Time (MST):	11:13
Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1182340005

Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	-0.05		Correlation Coefficient	0.999989	≥0.995
17.26 8.64	17.23 8.57	1.0019 1.0085	Slope	1.001763	0.90 - 1.10
4.31	4.21	1.0229	Intercept	-0.076111	+/-1.5







**Station Information** 

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Standards**

Station Name:	Kirby South	NO Gas Cylinder #:	T34ULGL	Cal Gas Expiry Date: March 8, 2025
Station number:	AMS 507	NOX Cal Gas Conc:	49.39 ppm	NO Cal Gas Conc: 49.02 ppm
Calibration Date:	April 17, 2024	Removed Cylinder #:	NA	Removed Gas Exp Date: NA
Last Cal Date:	March 15, 2024	Removed Gas NOX Conc:	49.39 ppm	Removed Gas NO Conc: 49.02 ppm
Start time (MST):	11:05	NOX gas Diff:		NO gas Diff:
End time (MST):	16:11	Calibrator Model:	Teledyne API T700	Serial Number: 3804
Reason:	Routine	ZAG make/model:	Teledyne API T701	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	-1.3	-0.7	-0.6		
AF High point	4919	81.0	800.1	794.1	6.0	832.0	826.0	6.2	0.9602	0.9606
AF Mid point AF Low point New cyl resp										
Previous Respo	onse NO <sub>x</sub> =	796.1 ppb	NO = 790.9	ppb	* = > +/-59	% change initiates i	investigation	*Percent Chan	ge NO <sub>x</sub> =	4.5%
Baseline Corr 1	.st pt NO <sub>x</sub> =	833.3 ppb	NO = 826.7	ppb	<u>As Foun</u>	d Statistics		*Percent Chan	ge NO =	4.3%
Baseline Corr 2	nd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO <sub>x</sub> r <sup>2</sup> :		Nx SI:	Nx Int:	
Baseline Corr 3	Brd pt NO <sub>x</sub> =	NA ppb	NO = NA	ppb	As foun	d NO r <sup>2</sup> :		NO SI:	NO Int:	
					As foun	d NO <sub>2</sub> r <sup>2</sup> :		NO2 SI:	NO <sub>2</sub> Int:	
	As Found GPT Calibration Data									
								Baseline Adjus		
O3 Setpo	oint (ppb)	Indicated NO Re concentration		cated NO Drop entration (ppb)	Calculated No concentration (pp		idicated NO2 ntration (ppb) (Ic)	Correction f (Cc/(Ic-AFz		verter Efficiency nit = 96-104%

As Found GPT zero As found high GPT point As found mid GPT point As found low GPT point *Limit = 0.90 - 1.10* 



#### **Analyzer Information**

## Wood Buffalo Environmental Association

## $NO_X \setminus NO \setminus NO_2$ Calibration Report

#### **Calibration Statistics**

Analyzer Make:	Thermo 42iQ		Serial Number: 1240023	2071			<u>Start</u>	<u>Finish</u>
NOX Range (ppb):	0 - 1000 ppb					NO <sub>x</sub> Cal Slope:	1.000646	1.000289
			Instrument Settings			NO <sub>x</sub> Cal Offset:	-4.504120	-4.604106
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>	NO Cal Slope:	1.002372	1.001623
NO coeff or slope:	1.097	1.057	NO bkgnd or offset:	1.8	1.1	NO Cal Offset:	-5.105630	-5.445289
NOX coeff or slope:	0.996	0.998	NOX bkgnd or offset:	2.5	1.2	NO <sub>2</sub> Cal Slope:	0.996340	0.999497
NO2 coeff or slope:	1.000	1.000	Reaction cell Press:	196.86	197.21	NO <sub>2</sub> Cal Offset:	0.258912	1.161308

#### **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) <i>Limit = 0.95-1.05</i>
Cal zero	5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
High point	4919	81.0	800.1	794.1	6.0	798.6	793.7	4.9	1.0019	1.0005
Mid point	4960	40.5	400.1	397.1	3.0	391.6	386.5	5.1	1.0216	1.0273
Low point	4980	20.2	199.5	198.0	1.5	191.5	189.5	2.1	1.0420	1.0451
As left zero	5000	0.0	0.0	0.0	0.0	0.2	0.3	-0.1		
As left span	4919	81.0	800.1	408.3	391.8	802.0	408.3	393.8	0.9977	1.0000
							Average Co	orrection Factor	1.0218	1.0243

#### **GPT Calibration Data**

O3 Setpoint (ppb)	Indicated NO Reference concentration (ppb)	Indicated NO Drop concentration (ppb)	Calculated NO2 concentration (ppb) (Co	Indicated NO2 concentration (ppb) (Ic)	NO2 Correction factor (Cc/lc) Limit = 0.95-1.05	Converter Efficiency <i>Limit = 96-104%</i>
Cal zero			0.0	0.0		
High GPT point	787.3	403.7	389.6	389.9	0.9992	100.1%
Mid GPT point	787.3	619.2	174.1	176.3	0.9875	101.3%
Low GPT point	787.3	706.5	86.8	88.6	0.9796	102.1%
				Average Correction Factor	0.9888	101.1%

Notes: Changed sample inlet filters after as founds. Adjusted zero and span.

Calibration Performed By:

**Braiden Boutilier** 

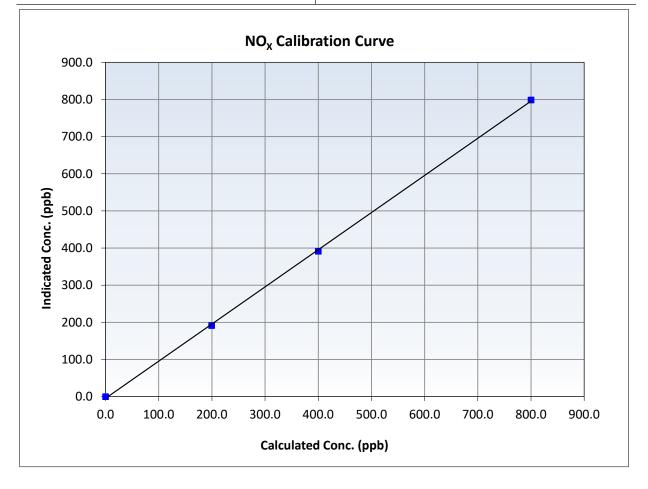


# Wood Buffalo Environmental Association NO<sub>x</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 15, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	11:05	End Time (MST):	16:11
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12400232071

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999837	≥0.995
800.1 400.1	798.6 391.6	1.0019 1.0216	Slope	1.000289	0.90 - 1.10
199.5	191.5	1.0420	Intercept	-4.604106	+/-20



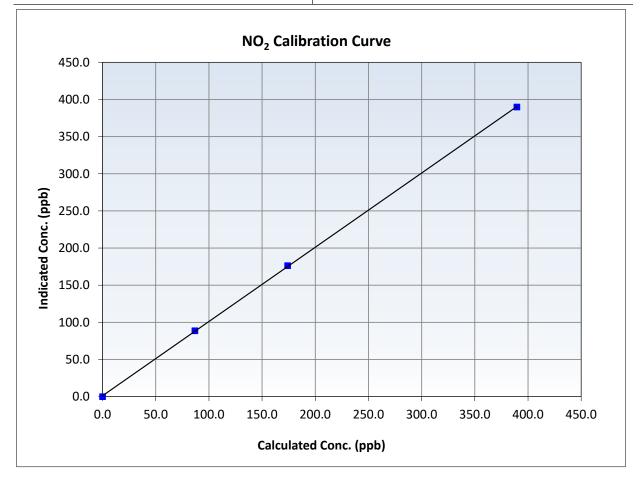


# Wood Buffalo Environmental Association NO<sub>2</sub> Calibration Summary

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 15, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	11:05	End Time (MST):	16:11
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12400232071

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999958	≥0.995
389.6 174.1	389.9 176.3	0.9992 0.9875	Slope	0.999497	0.90 - 1.10
86.8	88.6	0.9796	Intercept	1.161308	+/-20



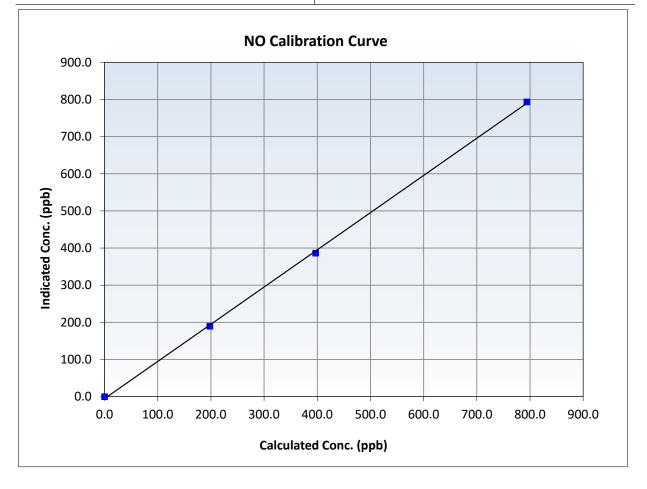


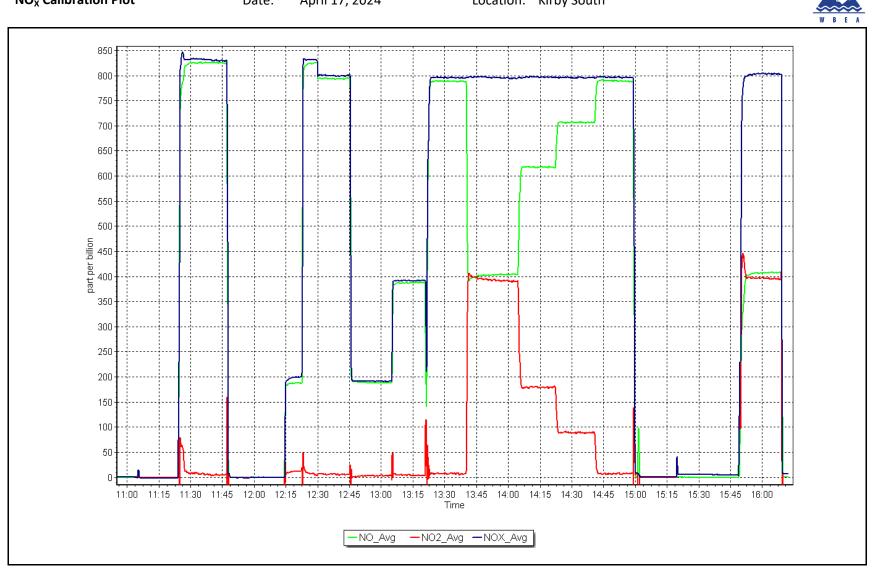
# Wood Buffalo Environmental Association NO Calibration Summary

#### **Station Information**

Calibration Date:	April 17, 2024	Previous Calibration:	March 15, 2024
Station Name:	Kirby South	Station Number:	AMS 507
Start Time (MST):	11:05	End Time (MST):	16:11
Analyzer make:	Thermo 42iQ	Analyzer serial #:	12400232071

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/lc)	Statistical Evaluation		<u>Limits</u>
0.0	0.0		Correlation Coefficient	0.999745	≥0.995
794.1 397.1	793.7 386.5	1.0005 1.0273	Slope	1.001623	0.90 - 1.10
198.0	189.5	1.0451	Intercept	-5.445289	+/-20





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



# End of Report