Aberta Environment and Parks

Monitoring Branch Environmental Monitoring and Science Division University Research Park 3535 Research Road, NW Calgary, AB, T2L 2K8 http://aep.alberta.ca/

January 25th, 2019

Karla Reesor Executive Director Peace River Air Monitoring Project Suite 91, 305-4625 Varsity Drive NW Calgary, Alberta T3A 0Z9

Ms. Reesor:

File Numbers: 2018-400A/408A

Subject: <u>Ambient Air Monitoring Station Audit Results for the Peace River Air</u> <u>Monitoring Project (PRAMP)</u>

Between the dates of January 15th, and 16th 2019 the Alberta Environment and Parks Ambient Air Monitoring Audit group conducted audits of the PRAMP ambient air monitoring stations. All continuous gas analyzers and meteorological sensors met audit criteria.

The following audit findings require action from PRAMP:

- Based on observations and measurements made at the Reno station it appears that the wind speed and direction sensor siting does not meet AMD criteria found in Chapter 3 SS 2-G and Table 3/Figure 2. The wind sensor siting non-conformance was documented in the updated station site documents provided immediately following the audit. PRAMP is required to either site the wind sensor such that it meets AMD Chapter 3 siting requirements, or obtain written authorization from "The Director" to deviate from AMD siting requirements.
- 2. Based on observations and measurements made at the 986B station it appears that the wind speed and direction sensor siting does not meet AMD criteria found in Chapter 3 SS 2-G and Table 3/Figure 2. The wind sensor siting non-conformance was documented in the updated station site documents provided immediately following the audit. PRAMP is required to either site the wind sensor such that it meets AMD Chapter 3 siting requirements, or obtain written authorization from "The Director" to deviate from AMD siting requirements.

Upon receiving notification of this performance audit PRAMP was asked to provide the date of the most recent quality system audit as required by AMD Chapter 5 QS 4-A and QS 4-B(b). PRAMP indicated that the network QAP is currently in draft form. Additionally, PRAMP relies on Maxxam Analytics QAP which last underwent an internal audit March 30, 2018. The following action is required by PRAMP:

3. PRAMP must provide a timeline to finalize and implement a QAP that meets all requirements found in Chapter 5 of the Alberta AMD.

Please address the issues 1 through 3 noted above in writing as per AMD Chapter 8 AUD 5-C by February 25th, 2019 indicating what corrective actions have been taken and/or a timeline for completion. If you have any questions or comments, please contact the undersigned at 780-554-2238.

Yours truly,

Shea Beaton Monitoring Systems Auditor Phone: 403 351 0579 Cell: 780 554-2238 <u>shea.beaton@gov.ab.ca</u>

Attachments:

- Analyzer Audit Sheets
- PRAMP Audit Summary

CC: AI Clark – AEP/EMSD Ambient Air Monitoring Systems Auditor Marty Collins – AEP/EMSD Air Monitoring Manager Bob Myrick – AEP/EMSD Director of Airshed Sciences Madhan Selvaraj – AEP Air Quality Specialist Wally Qiu – AER Air Quality Specialist Lily Lin – PRAMP Mike Bisaga - PRAMP air.reporting@gov.ab.ca

Audit Summary

			Page
Facility / Zone			PRAMP
Total # of parameters that passed			9
Total # of parameters audited in the network			9
Date(s) of the audit			January 15 & 16, 2019
Issue Date of Audit Summary			25-Jan-19
Station Name	1		Reno
Auditor			Shea Beaton
Audit Date	1		15-Jan-19
Critical	Pass		Fail
SO ₂	Х		
TRS	X		
NMHC	X		
Wind Speed / Wind Direction	X		
Wind head Orientation	X		
Manifold Fan	X		
Zero/Span Systems Operational	X		
Inspection Items	OK		Need for Improvement
Sample pump venting/scrubbing	Х		
Heating / Air Conditioning	Х		
Manifold	Х		
Sample Lines	Х		
Safety	Х		
Site Conditions		Χ	Does not meet AMD criteria
Non-critical	OK		Opportunity for Improvement
RH	Х		
Station Temperature	X		
Ambient Temperature	X		
Barometric Pressure	X		
Station Condition	X		
Station Documentation	X		
Not monitored at this location			



Audit Summary

		Page
Facility / Zone		PRAMP
Total # of parameters that passed	1	9
Total # of parameters audited in the network	1	9
Date(s) of the audit	1	January 15 & 16, 2019
Issue Date of Audit Summary		25-Jan-19
Station Name		842B
Auditor		Shea Beaton
Audit Date	1	16-Jan-19
Critical	Pass	Fail
SO ₂	Х	
TRS	Х	
NMHC	Х	
Wind Speed / Wind Direction	Х	
Wind head Orientation	Х	
Manifold Fan	Х	
Zero/Span Systems Operational	Х	
Inspection Items	OK	Need for Improvement
Sample pump venting/scrubbing	Х	
Heating / Air Conditioning	Х	
Manifold	Х	
Sample Lines	Х	
Safety	Х	
Site Conditions	Х	
Non-critical	OK	Opportunity for Improvement
RH	Х	
Station Temperature	Х	
Ambient Temperature	X	
Barometric Pressure	X	
Station Condition	X	
Station Documentation	X	
Not monitored at this location		



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Audit Summary

			Page			
Facility / Zone			PRAMP			
Total # of parameters that passed			9			
Total # of parameters audited in the network		9				
Date(s) of the audit			January 15 & 16, 2019			
Issue Date of Audit Summary			25-Jan-19			
Station Name			986B			
Auditor			Shea Beaton			
Audit Date			16-Jan-19			
Critical	Pass		Fail			
SO ₂	Х					
TRS	X					
NMHC	X					
Wind Speed / Wind Direction	X					
Wind head Orientation	X					
Manifold Fan	X					
Zero/Span Systems Operational	Х					
Inspection Items	OK		Need for Improvement			
Sample pump venting/scrubbing	Х					
Heating / Air Conditioning	X					
Manifold	X					
Sample Lines	X					
Safety	Х					
Site Conditions		Χ	Does not meet AMD criteria			
Non-critical	OK		Opportunity for Improvement			
RH	Х					
Station Temperature	Х					
Ambient Temperature	X					
Barometric Pressure	Х					
Station Condition	Х					
Station Documentation	Х					
Not monitored at this location						



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			STATION AUDIT							
			File No. 2018 - 406/408A	<u>۸</u>						
Date: January 16	, 2019	Performed by:	SB							
Station		T .	1.1							
Facility/Zone: DDAM	D	Location:	Hwy 986							
Temp:	26.6 I	Barometric Press:	713mmHg							
		· · · · · · · · · · · · ·								
Location L	atitude N	56.376								
Lon	Elevation	600m								
Status of Site Docur Status of Network Docur	nentation since the second sec	Supplied electron	fically during audit							
Statu	s of QAP	In Draft								
Manifold Material Manifold Condition	Glass Good									
Meteorological										
Wind Speed Direction	Observed 5.6km/h @ 355		Audit Value NNW 5-10							
Station Temperature	24.3 C		24.1 C							
Relative Humidity	74.1%	<u> </u>	70%							
Ambient Temperature	-18.2 C		-18.3 C							
Solar Radiation	NA		NA							
Pressure 9	52.1mBar (714mm	nHg)	713mmHg							
Remarks: - Trees to the East taller than tower - ~70m away from station and 13 to 16m tall										

Government

	SO ₂ ANALYZER AUDIT						
					File No.	2018 -	407A
			_		-		
Date:	January	16, 2019	- Pe	erformed by:		SB	
Station	00			T a satism.	Lhas	096	
Iname:	90		-	Location:	пwy	900	
Facility/Zone:	PR/	AMP	-	Operator:	Max	xam	
	Temp.	26.6	Baron	metric Press.	713m	ımHg	
Monitor							
Make/Model:		Thern	no 43C	Serial No:	43C-623	339-335	
Inlet flow (scc	m):	7	$\frac{07}{12,2010}$	Full Scale Range	e ppm:	0.5	
Last cal. Date:		Decembe	er 12, 2019	Old Correction I	-actor:	1.000	
Zero/Bkg	85	5.4					
Span Coef	0.9	921	-				
Calibrato	r						
Calibrat	ion Method:	GAS D	ILUTION	Mal	ke/Model:	Sabio 2	2010D
	Cylinder # :	EX00	12544		AMU # :	200)3
	CGA Date:	11-S	ер-18	SO ₂ Concentrat	tion PPM:	51.	.1
C	alibrator Flo	W	Calculated	Indicate	d	% Diffe	erence
	(sccm)	T 1	Conc.	Concentra	tion	VS	.
Air 4095	Gas	Total	(ppm)	(ppm)		Audit Gas	Limits
4905	40.0	4900 4977	0.0000	0.0000	3	-3%	+ 10%
5014	20.0	5034	0.2030	0.199	- 1	-2%	± 10%
5014	10.1	5024	0.1027	0.0984	1	-4%	± 10%
		•	Absolute A	verage Percent I	Difference	3%	
Linear Regre	ession Ana	lysis:			-		
			y=mx+b (wl	here x=calculated o	concentratio MITS	n, y=indicated c	oncentration)
	Correla	tion Coeff.=	1.0000	 ≥ 0).995		
		m (Slope)=	0.9672	0.9	0-1.10		
b (Inte	rcept as % of	f full scale)=	0.0598	± 3	8% F.S.		
Remarks:							

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	TRS ANALYZER AUDIT						
					File No.	2018 -	406A
		10.0010		a 11	-	05	
Date:	January	16, 2019	- Pe	erformed by:		SB	
Station	00	CD		Location		096	
Iname:	90	0D	-	Location:	⊓wy	900	
Facility/Zone:	PR/	AMP	-	Operator:	Maxx	xam	
	Temp.	26.6	Baron	metric Press.	713m	mHg	
Monitor							
Make/Model:		Thermo	43iTLE	Serial No:	115294	40011	
Inlet flow (scci	m):	4	87	Full Scale Range	e ppm:	0.1	
Last cal. Date:		Decembe	r 12, 2018	Old Correction I	Factor:	1.000	
Zero/Bkg	2.1	150					
Span Coef	0.9	989	-				
Calibrato	r		-				
Calibrat	ion Method [.]	GAS D		Mal	ke/Model·	Sabio 2	2010D
Calibrat	Cylinder # :	EX00	09231	With	AMU # :	200)3
	CGA Date:	11-S	ep-18	H ₂ S Concentrat	tion PPM:	9.9	9
					-		
C	alibrator Flo	W	Calculated	Indicate	d	% Diffe	erence
	(sccm)	-	Conc.	Concentra	tion	VS	
Air	Gas	Total	(ppm)	(ppm)		Audit Gas	Limits
4985	0.0	4985	0.0000	0.000)	00/	100(
4938	38.8	4977	0.0779	0.0802	2	3% 5%	± 10%
5015	9.6	5034	0.0303	0.0403	3	5% 1%	± 10% + 10%
	0.0	0024	Absolute A	verage Percent I	Difference	3%	± 1070
Linear Regre	ession Ana	lysis:			L		
_		-	y=mx+b (wh	nere x=calculated o	concentration	n, y=indicated c	oncentration)
	<i>c</i> :		0.0000	LI	MITS		
	Correla	tion Coeff.=	0.9999	≥0).995)0_1 10		
h (Inte	rcent as % of	= (Stope) f full scale)	0.0324	U.S + 3	8% F S		
5 (inte	100pt us 70 0	i iun sculo)–	0.0027	± \			
Remarks:							

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		N	on M	etha	ne	Ana	lyzei	r Au	dit	2018 - 4084	Δ
		Date:	Janu	uary 16, 20	019		Perfo	rmed by:		SB	
Station Name: Facilit	98 y/Zone:	6B	Location: PRAMP	ł	Hwy 986 Temp.	2	Operator: 6.6	BP:	Ma	axxam 713mmHg	
Monito	r: Old C	Ma Inlet flo Last	ake/Model: ow (sccm): t cal. Date: Factor:	Th Decen CH4: Non CH4: THC:	nermo 55 NA nber 12, 0.9 1.0 0.9	5i 2019 999 900 999	N	erial No. CH₄ Ra on CH₄ Ra THC Ra	ange ppm ange ppm ange ppm	1022143392 : 20 : 20 : 40	2 .0 .0 .0
Calibra Calibra HC d	tion Meth tor: cylinder #	nod: Make, FF5	/Model 0232	Gas Dil Sa CH₄ cor	ution abio 2010 nc. (ppm)	0 1019.0	-	AMU#_ CH₄ Equi	v (C3H8 o	1778 only) (ppm)	970.8
С	GA Date	12-C)ct-17	C_3H_8 cor	nc. (ppm)	353.0	-	Tot	al CH ₄ E	quiv. (ppm)	1989.8
Air 4980 4994 5036	Calibrato Flows Gas 0.0 68.8 34.2	r Total 4980 5063 5070	CH ₄ (ppm) 0.00 13.85 6.87	Calc. Conc. Non CH ₄ (ppm) 0.00 13.19 6.55	THC (ppm) 0.00 27.04 13.42	Indica CH ₄ (ppm) 0.00 14.45 7.29	ted Concen Non CH ₄ (ppm) 0.00 13.53 6.82	tration THC (ppm) 0.00 27.98 14.11	% Diffe	erence vs Au Limit $\pm 10\%$ Non CH ₄ 3% 4%	dit Gas THC
5033	14.7	5048	2.97	2.83	5.79 Absolut	3.12 e Averag	2.91 e Percent D	6.02 oifference	5% 5%	3% 3%	4% 4%
Linear I	Regressi Correlatio recept as S	on Analy on Coeff.= n (Slope)= % of FS)=	sis:	CH ₄ 1.0000 1.0439 0.1638	y=1 - -	nx+b (wh Non CH 1.0000 1.0263 0.1241	ere x=calcula 4 - -	THC 1.0000 1.0355 0.1336	ntration, y=	indicated cond LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.	centration)
Remark	(S:										

Alberta Government

Station Performance Audit Summary

Company	y:	PRAMP]	Facili	ity Name:		NA	_
Approval No).:	NA			Si	ite Name:		986B	_
Regio	n۰	Lower Peace				District	P	eace River	
Parameters au	udite	d:					1		-
H ₂ S		SO ₂	X	NOx		NH ₃		O ₃	
CO		CH ₄	X	NonCH4	Х	THC	X	TRS	X
PM _{2.5}		PM ₁₀		TSP		BTEX		Wind Speed	Х
Wind Dir	Vind Dir X Amb. Temp X Stn.Temp X RH X Solar Radiation								
Rainfall		Precip		VWS		Other	BP		
All parameters monitored as per approval: Yes No N/A_X									
GENERA	L							YES NO	 N/A
OLIVERU	H	as the location re	main	ed unchanged	1 from	n previous aud	it?		
	Ie	site secure?			,	- p		X	
	15	site secure:	n a a a	nditions adas	motol	•		× –	
	A	le station operati	ng co		luate				
DATA ACQUI	SITIO	ON							
	A	re strip charts in	use?					Х	
	Is	a telemetry syste	em for	data acquisi	tion ii	n use?		Х	
SYSTEM COM	IPON	VENTS							
	Is	a glass sampling	mani	fold installed	1?			X	
	Is	sampling manife	old cle	ean?				X	
	Ic	a manifold tran		2009				X	
	15		11 pia						
	A	re spare manifold	i port	s capped		10		<u> </u>	
	Is	manifold oriente	d so i	t is not exact	ly hoi	rizontal?		X	
	A	re manifold ports	s situa	ted to preven	it wat	er entering mo	onitors	? <u>X</u>	
	Is	manifold pump	prope	rly installed a	and op	perative?		Х	
	De	o sample lines ex	tend	at least 3/4"ii	nto ma	anifold?		Х	
	A	re monitor sampl	ing li	nes connecte	d to n	nanifold?		Х	
	A	re sampling lines	clear	n?				Х	
	A	re monitors prop	erly n	nounted and s	secure	e?		Х	
	Aı	re monitors prop	erlv e	xhausted from	n rooi	m or scrubbed	?	X	
	A	re zero and span	svstei	ms operation	al?		•	X	
			~)~	· F					<u>и и</u>
WIND EQUIP.	MEN	T						r	" "
	Is	wind sensor pro	perly	oriented?				X	
	De	pes wind equipm	ent aj	ppear to be fu	inctio	ning properly	?	Х	
	Da	ate of last calibra	tion.			Date:	A	pril 4, 2018	
COMMENTS:									
AUDITO	R:	Shea Be	eaton			DATE:	L.	lanuary 16, 2019	
				1	,				
				Alber	to				

Government

Station	Site D	ocuments	Audit	Checklist
		ocumento	I I G GIU	

Name:	986B	Location:	Hwv 98	6				
Facility/Zono:		Operator:	Maxvar	<u> </u>				
Facinty/Zone:	F KAIVIF	Operator:	IVIAXXAI	11				
Required Flow	ants of AMD Chanter 3	SS 1_R		Moote	AMD		Cur	ront
Do the Site Docu	ments Contain the Followin	g:		YES	NO	NA	YES	NO
(a) Name of Owr	ner/ Approval Holder	6		Х			Х	
(b) Name of Ope	rating Agency			Х			Х	
(c) Contact Inform	mation			Х			Х	
(d) Date the Site	or Station was Established			Х			Х	
(e) Date the infor	mation was last updated			Х			Х	
(f) Location inclu	iding Latitude and Longitud	e		Х			Х	
(g) Four Colour I	Photos Looking N, E, S, W	From Manifold Inlet		Х			Х	
(h) Additional Ph	notos/Sketches of AMD Star	dard Site Non-Conformar	ce	Х			Х	
(i) List of Instrun	nents Located at the Site			Х			Х	
(j) Site Description	on Including the following:							
(i) Land Use	e By Sector			Х			Х	
(ii) Site Elev	vation			Х			Х	
(iii) Greates	t Angle of Elevation & Dire	ction to Nearby Buildings		Х			Х	
(iv) Average	e Building height in the area			Х			Х	
(v) Distance	e to Nearest Trees			Х			Х	
Required Elem	ents of AMD Chapter 3	SS 4-D		Meets	AMD		Cur	rent
1	te Documents Contain the F	ollowing:		YES	NO	NA	YES	NO
Do the Station Si		0						
Do the Station Si (a) Recent Area M	Map Covering Approximate	ly 1Km ²		Х			Х	
Do the Station Si (a) Recent Area M (b) Plan View Sk	Map Covering Approximate	ly 1Km ²		X X			X X	
Do the Station Si (a) Recent Area M (b) Plan View Sk (c) Cross-Section	Map Covering Approximate tetch aal Sketch of Area Within 50	ly 1Km ² 00 m Radius		X X		X	X X	
Do the Station Si (a) Recent Area M (b) Plan View Sk (c) Cross-Section (d) Colour Photo	Map Covering Approximate tetch hal Sketch of Area Within 50 s Showing Sample Manifold	ly 1Km ² 00 m Radius I/Inlet		X X X		X	X X X	
Do the Station Si (a) Recent Area M (b) Plan View Sk (c) Cross-Section (d) Colour Photo (e) Colour Photo	Map Covering Approximate aetch aal Sketch of Area Within 50 s Showing Sample Manifold of the Station	ly 1Km ² 00 m Radius I/Inlet		X X X X		X	X X X X	

COMMENTS: Site does not appear to meet AMD criteria - trees to East taller than 10m towe					
	umented				
AUDITOR:	Shea Beaton	DATE:	January 16, 2019		

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STATION AUDIT							
			File No. 2018 - 4	03/405A			
Date: January	16, 2019	Performed by:	SB				
Station	2B	Location:	TW/P 842				
Facility/Zone: PR/	AMP	Operator:	Maxxam				
Temp:	23.4	Barometric Press:	713mmHg				
Location I Status of Site Do Status of Network Do St	Latitude N Longitude W Elevation cumentation cumentation atus of QAP	56°, 16', 26.9 116°, 58', 52.8" 615m Update supplied fo Complete In Draft	llowing station audit				
Manifold Material Manifold Condition	Manifold Material Glass Manifold Condition Good						
Meteorological Wind Speed Direction	Observe 7.8km/h @	d 356°	Audit Value 5 - 10km/h North				
Station Temperature	21.0		21.5				
Relative Humidity	80.6		72.0				
Ambient Temperature	-18.9 C	<u> </u>	-18.3 C				
Solar Radiation	NA		NA				
Pressure	951.8mBar(713	3.9mmHg)	713mmHg				
Remarks:							

Government

SO ₂ ANALYZER AUDIT								
					File No.	2018 -	404A	
-			_		-	05		
Date:	January	16, 2019	- P	erformed by:		SB		
Station	0.4			Lessien		0.40		
Iname:		-20	-	Location:		042		
Facility/Zone:	PR	AMP	-	Operator:	Max	xam		
	Temp.	23.4	Baro	metric Press.	713m	nmHg		
Monitor								
Make/Model:		Thern	mo 43i	Serial No:	8350	3373		
Inlet flow (scci	m):	4	09	Full Scale Rang	e ppm:	0.5		
Last cal. Date:		January	0,2019	Old Correction	ractor:	1.000		
Zero/Bkg	14	4.6						
Span Coef	1.	02	-					
Calibrato	r							
Calibrat	ion Method:	GAS D	ILUTION	Ma	ke/Model:	Sabio 2	2010D	
	Cylinder # :	EX00	12544		AMU # :	200)3	
	CGA Date:	11-S	ep-18	SO ₂ Concentra	tion PPM:	51.	.1	
C	alibrator Flo	W	Calculated	Indicate	d	% Diffe	erence	
	(sccm)	T 1	Conc.	Concentra	tion	VS	.	
Air E017	Gas	Total	(ppm)	(ppm)	1	Audit Gas	Limits	
4972	0.0 39.8	5017	0.0000	0.000	1	-1%	+ 10%	
5008	19.8	5028	0.2012	0.201	+ 7	0%	+ 10%	
5014	10.0	5024	0.1017	0.1014	4	0%	± 10%	
		•	Absolute A	verage Percent l	Difference	0%		
Linear Regre	ession Ana	lysis:						
			y=mx+b (w	here x=calculated	concentratio MITS	n, y=indicated c	oncentration)	
	Correla	tion Coeff.=	1.0000	 ≥ ().995			
		m (Slope)=	0.9941	0.9	90-1.10			
b (Inter	rcept as % of	f full scale)=	0.1017	± 3	3% F.S.			
Remarks:								

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TRS ANALYZER AUDIT								
					File No.	2018 -	403A	
Data	lonuon	16 2010	П	auformad by	-	SD		
Date:	January	16, 2019	- P	erformed by:		28		
Station Name:	84	2B		Location.	TWP	842		
Facility/Zono:			-	Organistani	Mov	<u> </u>		
Facility/Zone:	FK/		-	Operator:	IVIAX.			
	Temp.	23.4	- Baro	metric Press.	713m	mHg		
Monitor		T I		G : 1 M	4400.4			
Make/Model:	m).	I nermo	0 4311LE	Serial No:	116240	0.1		
Last cal. Date:		January	/ 8, 2019	Old Correction	Factor:	1.000		
				-	-			
Zero/Bkg	3.0)90	-					
Span Coef	0.8	398	-					
Calibrato	r							
Calibrat	ion Method:	GAS D		<u>.</u> Ma	ke/Model:	Sabio 2	2010D	
	Cylinder # :	EX00	09231 ep-18	H S Concentra	AMU # :	200	03	
	COA Daie.	11-0	ep-10			9.0		
C	alibrator Flo	w	Calculated	Indicate	ed	% Diff	erence	
	(sccm)		Conc.	Concentra	ation	VS		
Air	Gas	Total	(ppm)	(ppm))	Audit Gas	Limits	
5017	0.0	5017	0.0000	-0.000)1			
4973	38.7	5012	0.0771	0.078	2	2%	± 10%	
5009	19.2	5028	0.0381	0.039	1	3%	± 10%	
5015	9.5	5024	0.0189	0.019	2	2%	± 10%	
Linear Regre	ssion Ana	lveie	Absolute A	Average Percent	Difference	2%		
Ellical Regie		19515.	y=mx+b (w	here x=calculated	concentratior	n, y=indicated o	concentration)	
			-	LI	MITS	-	,	
	Correla	tion Coeff.=	1.0000	<u>_</u>	0.995			
		m (Slope)=	1.0152	0.	90-1.10			
b (Inte	rcept as % of	f full scale)=	0.0468	- ±	3% F.S.			
Domorko								
Remarks.								
-								

Alberta Government

		N	on M	etha	ne	Ana	lyzei	r Au	dit	2018 - 4054	A
		Date:	Janu	uary 16, 20	019		Perfo	rmed by:		SB	
Station:Name:842Facility/Zone:PRAMP				TWP 842 C			Operator: Maxxam 23.4 BP: 713mmHg				
Monitor: Make/Model: Inlet flow (sccm): Last cal. Date: Old Correction Factor:				Th Janu CH4: Non CH4: THC:	Thermo 55i Serial No. 14335632 NA CH4 Range ppm: 2 January 9, 2018 Non CH4 Range ppm: 2 CH4: 0.999 7 Non CH4: 0.999 7 THC: 0.999 7					143356326 ⁻ : 20 : 20 : 40	1 .0 .0 .0
Calibra Calibra HC d	tion Meth tor: cylinder #	nod: Make/ FF5	/Model 0232	Gas Dil Sa CH ₄ cor	ution abio 2010 nc. (ppm)	0 1019.0	-	AMU#_ CH4 Equiv	v (C3H8 o	1778 only) (ppm)	970.8
С	GA Date	12-C	Oct-17	C_3H_8 cor	nc. (ppm)	353.0	-	Tot	al CH ₄ E	quiv. (ppm)	1989.8
Air	Calibrato Flows Gas	r Total	CH ₄ (ppm)	Calc. Conc. Non CH ₄ (ppm)	THC (ppm)	Indica CH ₄ (ppm)	ted Concen Non CH ₄ (ppm)	tration THC (ppm)	% Diffe	erence vs Au Limit $\pm 10\%$ Non CH ₄	dit Gas THC
5015 5015 5034 5030	0.0 68.7 34.4 14.6	5015 5084 5068 5045	0.00 13.77 6.92 2.95	0.00 13.12 6.59 2.81	26.89 13.51 5.76 Absolut	0.00 13.78 6.92 2.99 e Average	0.00 13.04 6.61 2.91 e Percent D	26.82 13.53 5.90 ifference	0% 0% 1% 1%	-1% 0% 4% 1%	0% 0% 2% 1%
Linear b (Int	Regressi Correlatio m tercept as 9	on Analy on Coeff.= n (Slope)= % of FS)=	rsis:	CH ₄ 1.0000 0.9996 0.0787	y=r	nx+b (wh Non CH 1.0000 0.9912 0.3012	ere x=calcula 4	THC 1.0000 0.9955 0.1899	ntration, y=	indicated cond LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.	centration)
Remark	(S:										

Alberta Government

Station Performance Audit Summary

Compar	ny:	PRAMP		I	Facili	ty Name:		NA	
Approval N	o.:	NA			Si	te Name:		842B	
Docio		Lower Peace				District	De		
Parameters a	n: ndit	ed.				District:	Pe	ace River	
	uun		17	NO		N YT T	-		
H_2S		SO_2	X	NO _X	v	NH ₃	V	O_3	V
DM		CH ₄	Χ	NonCH4	Χ	IHC	X	IKS Wind Speed	
PIM _{2.5} Wind Dir	v	PM ₁₀	v	15P Str. Tomp	v	BIEA	v	Solar Padiation	
Wind Dir Doinfall	Λ	Progin	Λ	Sur remp	Λ	КП Othor		Solar Kadiation	
All parame	tore	monitored as 1	or at	v ws proval: Ve	с С	No			
An parame		monitored as j			<u> </u>	NO	1	N/AA	
GENER/	A.L.							YES NO	N/A
OLIVER	IL F	las the location re	main	ed unchanged	l from	previous audi	t?	X	
	L	s site secure?	Jinain	ea anonangee		previous addi		X	
	1	s site secure:						X	
	F	Are station operation	ing co	nations adeq	[uate?			~	
DATA ACQU	ISIT	ION							
	A	Are strip charts in	use?					Х	
	I	s a telemetry system	em foi	data acquisit	tion in	use?		Х	
		5 5		1					<u> </u>
SYSTEM CON	MPO	NENTS						·	
	I	s a glass sampling	g man	ifold installed	1?			Х	
	I	s sampling manif	old cle	ean?				Х	
	I	s a manifold trap	in pla	ce?				Х	
	A	Are spare manifol	d port	s capped				Х	
	I	s manifold orient	ed so i	it is not exact	lv hor	izontal?		X	
	Δ	re manifold port	e citus	ited to preven	t wate	er entering mo	nitors?	X	
	I I	a manifold pump	nrono	rly installed a	and on	orotivo?	111015:	X	
	I: E		prope		ina op			<u>^</u>	
	L	Jo sample lines ez	ktena	at least 3/4 'ir	ito ma	inifold ?		X	
	P	Are monitor samp	ling li	nes connected	d to m	anifold?		X	
	Α	Are sampling lines	s clear	1?				Х	
	A	Are monitors prop	erly n	nounted and s	secure	?		Х	
	A	Are monitors prop	erly e	xhausted fror	n roor	n or scrubbed	?	Х	
	A	Are zero and span	syste	ms operationa	al?			Х	
			•	•				<u> </u>	
WIND EQUIF	PME	NT							
	l	s wind sensor pro	perly	oriented?				X	
	Γ	Does wind equipn	nent aj	ppear to be fu	inction	ning properly?		Х	
	Γ	Date of last calibrate	ation.			Date:	Augu	ist 22, 2018	
COMMENTS.	:								
	_								
· 		-					-		
AUDITO	R:	Shea B	eaton			DATE:	Ja	anuary 16, 2019	
				/Mhas	tr				

Government

Station She Documents Auun Checkins	Station	Site	Documents	Audit	Checklist
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Station								
Name:	842B	Location:	TWP 84	2				
		—						
Facility/Zone:	PRAMP	Operator:	Maxxar	n				
				-				
Required Elen	nents of AMD Chapter 3	3 SS 4-B		Meets	AMD	NA	Cur	rent
Do the Site Docu	iments Contain the Followi	ng:		YES	NO	1 11 1	YES	NO
(a) Name of Own	ner/ Approval Holder			Х			Х	
(b) Name of Ope	erating Agency			Х			Х	
(c) Contact Infor	mation			Х			Х	
(d) Date the Site	or Station was Established			Х			Х	
(e) Date the infor	rmation was last updated			Х			Х	
(f) Location inclu	uding Latitude and Longitue	de		Х			Х	
(g) Four Colour	Photos Looking N, E, S, W	From Manifold Inlet		Х			Х	
(h) Additional Ph	hotos/Sketches of AMD Sta	ndard Site Non-Conformand	ce			Х		
(i) List of Instrum	nents Located at the Site			Х			Х	
(j) Site Descripti	on Including the following:							
(i) Land Use	e By Sector			Х			Х	
(ii) Site Ele	vation			Х			Х	
(iii) Greates	st Angle of Elevation & Dir	ection to Nearby Buildings		Х			Х	
(iv) Average	e Building height in the are	a		Х			Х	
(v) Distance	e to Nearest Trees			Х			Х	
				<u>.</u>				
Required Elem	nents of AMD Chapter 3	3 SS 4-D		Meets	AMD	NΛ	Cur	rent
Do the Station Si	ite Documents Contain the	Following:		YES	NO	INA	YES	NO
(a) Recent Area	Map Covering Approximate	ely 1Km ²		Х			Х	
(b) Plan View Sk	ketch			Х			Х	
(c) Cross-Section	nal Sketch of Area Within 5	00 m Radius				Х		
(d) Colour Photo	os Showing Sample Manifol	d/Inlet		Х			Х	
(e) Colour Photo	of the Station			Х			Х	
(f) Additional Ph	notos/Sketches of AMD Stat	ndard Station Non-Conform	ance	Х			Х	
				_				
COMMENTS:	-	Electronic copy of Site Docs	provided du	iring au	dit.			

AUDITOR: Shea Beaton DATE: January 18, 2019

Alberta Government

STATION AUDIT									
			File No. <u>2018 - 4</u>	00A/402A					
Date: January	15, 2019	Performed by:	SB						
Station Name: Re Facility/Zone: PRA	no MP	Location: Operator:	Reno Maxxam	-					
Temp:	24.5	Barometric Press:	707mmHg	-					
Location L Status of Site Do Status of Network Do St	Latitude N ongitude W Elevation cumentation cumentation atus of QAP	55°, 52', 10.7" 117°, 03', 27.1" 641 Supplied electro Complete In Draft	nically during audit	_					
Manifold Material Manifold Condition	Glass Good	s d							
Meteorological Wind Speed Direction	Observ 7.7km/h @	ved ⊉ 345°	Audit Value NNW 5-10km/h	_					
Station Temperature	20.3	с	20.5 C	_					
Relative Humidity	77.2%	%	72.3%	_					
Ambient Temperature	-12.2	C	-11.8 C	_					
Solar Radiation	NA		NA	_					
Pressure	942.9mBar(7	707mmHg)	707 mmHg	_					
Remarks:									

Government

SO ₂ ANALYZER AUDIT								
			File No.	2018-4	401A			
Date: Ja	anuary 15, 2019	Pe	erformed by:	SB				
Station								
Name:	Reno	_	Location: Re	eno				
Facility/Zone:	PRAMP	_	Operator: Max	xam				
	Temp. 24.5	Baror	netric Press. 707m	nmHg				
Monitor								
Make/Model:	API	100A	Serial No: 84	41				
Inlet flow (sccm):	6	61	Full Scale Range ppm:	0.5				
Last cal. Date:	January	10, 2019	Old Correction Factor:	1.000				
Zero/Bkg	50 5							
Span Coef	1.084	-						
	11001							
Calibrator								
Calibration M	Iethod: GAS D	ILUTION	Make/Model:	Sabio 2	2010D			
Cylin	nder # : EX00	012544	AMU # :	200	03			
CGA Date:11-Sep-18SO2 Concentration PPM:51.1								
Calibra	ator Flow	Calculated	Indicated	% Diffe	erence			
(s	ccm)	Conc.	Concentration	vs				
Air (Gas Total	(ppm)	(ppm)	Audit Gas	Limits			
5041	0.0 5041	0.0000	0.0003					
5006 4	0.3 5046	0.4081	0.4006	-2%	± 10%			
5027 1	9.9 5047	0.2015	0.2000	-1%	± 10%			
0030 1	0.1 5046	Absolute A	U.UYY/ Verage Percent Difference	-3% 2%	± 10%			
l inear Regressio	n Analysis:	Absolute A	verage reicent Difference	2 /0				
Ellical Regressio	Analysis.		are y colorilated concentratio	n. v=indicated c	oncentration)			
		y=mx+b (wh	iere x=calculateu concentralio					
		y=mx+b (wh		,)				
	Correlation Coeff.=	y=mx+b (wf	LIMITS ≥ 0.995	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
	Correlation Coeff.= m (Slope)=	y=mx+b (wh = 1.0000 = 0.9822	LIMITS ≥ 0.995 0.90-1.10	,,, , , ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
b (Intercept	Correlation Coeff.= m (Slope)= as % of full scale)=	y=mx+b (wf = 1.0000 = 0.9822 = 0.0710	LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.	.,,,				
b (Intercept Remarks:	Correlation Coeff.= m (Slope)= as % of full scale)=	y=mx+b (wf = 1.0000 = 0.9822 = 0.0710	LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.					
b (Intercept Remarks:	Correlation Coeff.= m (Slope)= as % of full scale)=	y=mx+b (wf = 1.0000 = 0.9822 = 0.0710	LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.					
b (Intercept Remarks:	Correlation Coeff.= m (Slope)= as % of full scale)=	y=mx+b (wf = 1.0000 = 0.9822 = 0.0710	LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.					

Alberta Government

TRS ANALYZER AUDIT								
				F	File No. 2018-	400A		
Date:	January	15, 2019	Pe	erformed by:	SB			
Station								
Name:	Re	eno		Location:	Reno			
Facility/Zone:	PR		-	Operator:	Maxyam	•		
Tacinty/Zone.			-			-		
	Temp.	24.5	Baror	netric Press.	707mmHg	-		
Monitor								
Make/Model:		Thermo	43iTLE	Serial No:	1162460022	-		
Inlet flow (scc	m):	4	11	Full Scale Range p	pm: 0.1	-		
Last cal. Date:		Jan 10	0, 2-19	Old Correction Fac	etor: <u>1.000</u>	-		
Zero/Bkg	2	380						
Span Coef	0.9	949	-					
Calibrato	r		•					
	• • • • • • •					00400		
Calibrat	Culinder #	GAS D		Make/	Model: Sabio	2010D		
	CGA Date:	 11-S	09231 en-18	H ₂ S Concentration	$\frac{100 \# 1}{20}$	<u>99</u>		
	CON Date.							
	liberton Ele		Calmilated	Ter d'anter d	0/ D:f0			
	(scem))W	Conc	Concentratio	n Vs	erence		
Air	Gas	Total	(ppm)	(ppm)	Audit Gas	Limits		
5041	0.0	5041	0.0000	-0.0001		2000		
5007	39.2	5046	0.0776	0.0791	2%	± 10%		
5028	19.3	5047	0.0382	0.0394	3%	± 10%		
5036	9.6	5046	0.0190	0.0195	3%	± 10%		
			Absolute A	verage Percent Diff	ference 3%			
Linear Regre	ession Ana	lysis:				· · · · · · · · · · · · · · · · · · ·		
			y=rrix+D (Wh	iere x=caiculated coni LIMI	centration, y=indicated (FS	concentration)		
	Correla	tion Coeff.=	1.0000	≥ 0.9	95			
		m (Slope)=	1.0203	0.90-	1.10			
b (Inte	rcept as % o	f full scale)=	0.0865	± 3%	F.S.			
Remarks:								

Government

		N	on M	etha	ne	Ana	lyzei	r Au	dit	2018-4024	
		Date:	Janu	uary 15, 20	019	_	Perfo	rmed by:		SB	
Station Name: Facilit	Station: Name: <u>Reno</u> Location Facility/Zone: PRAMP				: <u>Reno</u> Temp. 24			Operator: Maxxam 4.5 BP: 707mmHg			
Monitor: Make/Model: Inlet flow (sccm): Last cal. Date: Old Correction Factor:				Th Janua CH4: Non CH4: THC:	Thermo 55i Serial No. 131405775 NA CH4 Range ppm: 20 January 10, 2019 Non CH4 Range ppm: 20 CH4: 0.998 740 Non CH4: 1.001 740 THC: 0.999 40					1314057759 n: 20. n: 20. n: 40.	9 0 0 0
Calibra Calibra HC o	tion Meth tor: cylinder #	nod: Make FF5	/Model 0232	Gas Dil Sa CH ₄ cor	ution abio 2010 nc. (ppm)	0 1019.0	-	AMU#_ CH₄ Equi	v (C3H8	1778 only) (ppm)	970.8
С	GA Date	12-C)ct-17	C_3H_8 cor	nc. (ppm)	353.0	-	Tot	al CH ₄ E	quiv. (ppm)	1989.8
Air 5041 5047 5060 5060	Calibrato Flows Gas 0.0 69.0 34.9 14.9	r Total 5041 5116 5095 5075	CH ₄ (ppm) 0.00 13.74 6.98 2.99	Calc. Conc. Non CH ₄ (ppm) 0.00 13.09 6.65 2.85	THC (ppm) 0.00 26.84 13.63 5.84 Absolut	Indica CH ₄ (ppm) 0.00 13.67 6.92 2.95 e Averag	tted Concent Non CH ₄ (ppm) 0.00 12.98 6.53 2.84 e Percent D	tration THC (ppm) 0.00 26.66 13.45 5.78 ifference	% Diff CH ₄ -1% -1% -1% 1%	erence vs Au Limit ± 10% Non CH ₄ -1% -2% 0% 1%	dit Gas THC -1% -1% -1% 1%
Linear b	Regressi Correlatio rr tercept as S	on Analy on Coeff.= a (Slope)= % of FS)=	sis:	CH ₄ 1.0000 0.9952 -0.0751	y=r	mx+b (wh Non CH 1.0000 0.9903 -0.0297	ere x=calcula 4 - -	THC 1.0000 0.9933 -0.0674	ntration, y=	indicated cond LIMITS ≥ 0.995 0.90-1.10 ± 3% F.S.	centration)
Remark	(S:										

Alberta Government

Station Performance Audit Summary

Company	y:	PRAMP]	Facili	ty Name:		N	A		
Approval No	o.:	NA			Si	ite Name:		Re	no		
Region Parameters au	n: 1dite	Upper Peace d:				District:	Р	eace	River		
LL-S		SO	v	NOv		NH		Ω_{2}			
Γ_{23}			$\frac{\Lambda}{X}$	NonCH4	x	THC	x		S		x
PM2 5		PM10	21	TSP	11	BTEX		Wi	nd Spee	ed	X
Wind Dir	X	Amb. Temp	X	Stn.Temp	X	RH	X	Sola	ar Radiat	ion	
Rainfall		Precip		VWS		Other	BP				
All parame	eters	monitored as	ber ap	oproval: Ye	s	No	l	$N/A_$	X	_	
GENERA	L								YES	NO	N/A
	Ha	as the location re	maine	ed unchanged	l fron	n previous aud	lit?		Х		
	Is	site secure?							Х		
	A	re station operati	ng co	nditions adec	uate?	,			Х		
					1			L			1
DATA ACQUI	SITI	ON									
	A	re strip charts in	use?							Х	
	Is	a telemetry syste	em for	data acquisi	tion in	n use?			Х		
SYSTEM COM	PON	VENTS						r			
	Is	a glass sampling	; mani	fold installed	1?				Х		
	Is	sampling manifo	old cle	ean?					Х		
	Is	a manifold trap	in pla	ce?					Х		
	A	re spare manifold	l port	s capped					Х		
	Is	manifold oriente	ed so i	t is not exact	lv hoi	rizontal?			Х		
	A	re manifold ports	situa	ited to pr ever	t wat	er entering mo	nitors	,	X		
	Ie	manifold nump	nrone	rly installed :	and or	perative?	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		X		
	15 D		prope	11y instance a	and Oj	point of the second sec			~		
		o sample lines ex		at least 5/4 II					<u>^</u>		
	A	re monitor sampl	ing li	nes connecte	d to n	nanifold?			X		
	A	re sampling lines	clear	1?					Х		
	A	re monitors prop	erly n	nounted and a	secure	??			Х		
	A	re monitors prop	erly e	xhausted from	n roo	m or scrubbed	1?		Х		
	A	re zero and span	system	ms operation	al?				Х		
WIND EQUIP	MEN	^T						r	n		
	Is	wind sensor pro	perly	oriented?					X		
	Do	pes wind equipm	ent aj	ppear to be fu	inctio	ning properly	?		Х		
	Da	ate of last calibra	tion.			Date:	A	pril 5,	2018		
COMMENTS:											
	.	Shaa D	aaton			ΓΑΤΕ ·		ميرموا	ary 15 0	010	
AUDITOR	·. <u> </u>	Silea Di	saiUII			DATE.		anua	ary 10, Z	013	
				1 m	,						
				K ber	×1						

Government

Station	Site Documents	Audit	Checklist

Ctotion								
Name:	Mame: Reno Location: Rer							
					i i			
Facility/Zone:	PRAMP	Operator:	Maxxan	Maxxam				
Dequired Floments of AMD Chapter 2 SS 4 P							G	
Required Elements OF AIVED Unapter 3 SS 4-B			Meets	Meets AMD VFS NO N		VFS NO		
(a) Name of Owner/ Approval Holder				X	no		TE5	
(b) Name of Operating Agency				X			X	
(c) Contact Information				X			X	
(d) Date the Site or Station was Established				X			X	
(e) Date the information was last updated				X			X	
(f) Location including Latitude and Longitude				X			X	
(g) Four Colour Photos Looking N. E. S. W From Manifold Inlet				X			X	
(h) Additional Photos/Sketches of AMD Standard Site Non-Conformance				X			X	
(i) List of Instruments Located at the Site				X			X	
(i) Site Description Including the following:							<u>. </u>	
(i) Land Use By Sector				Х			Х	
(ii) Site Elevation			Х			Х		
(iii) Greatest Angle of Elevation & Direction to Nearby Buildings				Х			Х	
(iv) Average Building height in the area				Х			Х	
(v) Distance to Nearest Trees				Х			Х	
Required Elements of AMD Chapter 3 SS 4-D			Meets AMD			Current		
Do the Station Site Documents Contain the Following:			YES	NO	NA	YES	NO	
(a) Recent Area Map Covering Approximately 1Km ²			Х			Х		
(b) Plan View Sketch				Х			Х	
(c) Cross-Sectional Sketch of Area Within 500 m Radius						Х		
(d) Colour Photos Showing Sample Manifold/Inlet				Х			Х	
(e) Colour Photo of the Station				Х				Х
(f) Additional Photos/Sketches of AMD Standard Station Non-Conformance				Х			Х	

COMMENTS: _____ Site does not appear to meet AMD criteria - trees to South and West taller than 10m tower - Siting non-conformace documented in newly updated site docs.

AUDITOR: Shea Beaton

DATE: January 15, 2019

Alberta Government