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AMBIENT AIR MONITORING MONTHLY DATA REPORT
PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
THREE CREEKS 842B STATION

JOB #: 8449-2016-11-80-C

November 2016

Prepared for:

PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
SUITE #91, 305 - 4625 VARSITY DR. N.W.
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Attention: KARLA REESOR

DATE: **December 23, 2016**

Prepared by: 

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SUMMARY

In November 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Three Creeks 842b Station, near Peace River Oil Sands Area 2, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the PRAMP Committee.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

THC/CH₄/NMHC: Sixty two hours of downtime were recorded, between November 15 and 25, due to necessary analyzer maintenance and additional calibrations, performed to address a zero drift trend.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Peace River Area Monitoring Program Committee, Three Creeks 842b Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Peace River Area Monitoring Program Committee Three Creeks 842b Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.1	1.2	10	18	8.8	SE	0.3	10, 24	100.0
TRS (ppb)	-	-	-	-	0.2	0.5	VAR	VAR	VAR	VAR	0.4	28, 30	100.0
THC (ppm)	-	-	-	-	1.93	2.53	16	2	1.8	ENE	2.13	16	91.5
CH ₄ (ppm)	-	-	-	-	1.93	2.52	16	2	1.8	ENE	2.12	16	91.5
NMHC (ppm)	-	-	-	-	0.00	0.12	8	20	5	ENE	0.03	25	91.5
RELATIVE HUMIDITY (%)	-	-	-	-	79	97	13	VAR	VAR	VAR	93	VAR	100.0
BAROMETRIC PRESSURE (inHg)	-	-	-	-	27.70	28.29	18, 18	3, 4	2.7 3.3	ENE ENE	28.22	18	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-1.6	18.1	8	13	4.8	SW	9.6	8	100.0
STATION TEMPERATURE (°C)	-	-	-	-	21.5	25.5	8	15	2.9	S	23.5	8	100.0
VECTOR WS (kph)	-	-	-	-	3.4	25.3	8	6	-	S	12.0	14	100.0
VECTOR WD (sec)	-	-	-	-	180 (S)	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

**SOUR GAS PROCESSING INDUSTRY
MONTHLY REPORT SUMMARY**

Three Creeks 842b Station
Plant Name / Location

Peace River Area Monitoring Program Committee
Company

Licence Number	Report Date	
	YEAR	MONTH
N/A	2016	November

CONTINUOUS AMBIENT MONITORING								
PARAMETER	STN No.	% TIME OPERATIONAL	ONE - HOUR AVERAGE			24 - HOUR AVERAGE		
			MAXIMUM VALUES		NO. READINGS > REGULATION	MAXIMUM VALUES		NO. READINGS > REGULATION
SO ₂	1	100.0	0.0012	ppm	0	0.0003	ppm	0
TRS	1	100.0	0.0005	ppm	-	0.0004	ppm	-
THC	1	91.5	2.53	ppm	-	2.13	ppm	-
CH ₄	1	91.5	2.52	ppm	-	2.12	ppm	-
NMHC	1	91.5	0.12	ppm	-	0.03	ppm	-
RH	1	100.0	97	%	-	93	%	-
BP	1	100.0	28.29	inHg	-	28.22	inHg	-
Ambient TPX	1	100.0	18.1	°C	-	9.6	°C	-
Station TPX	1	100.0	25.5	°C	-	23.5	°C	-
Wind Speed	1	100.0	25.3	kph	-	12.0	kph	-
Wind Direction	1	100.0	-		-	-		-

SIGNATURE OF COMPANY REPRESENTATIVE

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Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Relative Humidity (RH), Barometric Pressure (BP), Ambient Temperature (AmbTPX), Station Temperature (StnTPX), Wind Speed (WS) and Wind Direction (WD).

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (August 3, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on November 15. There were no operational issues that impacted hourly data this month. Maximum instantaneous data collected on November 18 at 00:00 was invalidated due a brief power outage.

TOTAL REDUCED SULPHUR (TRS)

The routine monthly calibration was performed on November 15. There were no operational issues that impacted hourly data this month. Maximum instantaneous data collected on November 18 at 00:00 was invalidated due a brief power outage.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

The routine monthly calibration was performed on November 15. The analyzer was recording daily zero drifts. The channels were placed in "maintenance" mode for one hour on November 15 and two hours on November 16, while troubleshooting was being performed. The Thermo 55i (S/N: 1501664392) analyzer was replaced with Thermo 55i (S/N: 1433563261) on November 17, and column conditioning was run on November 23, both following successful shut-down calibrations. Sixty-two hours of downtime were recorded due to the troubleshooting and maintenance events performed to address this issue.

Maximum instantaneous data collected on November 18 at 00:00 was invalidated due a brief power outage.

The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered. No canister event was recorded this month.

WIND SPEED (WS) and WIND DIRECTION (WD)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

There were no operational issues that impacted hourly data this month. Maximum instantaneous data collected on November 18 at 00:00 was invalidated due a brief power outage.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

BAROMETRIC PRESSURE (BP)

No operational issues were identified this month.

AMBIENT TEMPERATURE (AmbTPX)

No operational issues were identified this month.

STATION TEMPERATURE (StnTPX)

No operational issues were identified this month.

2.0 Project Personnel

Karla Reesor was the contact for Peace River Area Monitoring Program Committee and the Maxxam field technicians were Raja Ashraf, Christopher Wesson, and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - API 100A UV Fluorescent Analyzer
Total Reduced Sulphur - Thermo 43i UV Fluorescent Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Wind System - RM Young Unit
Relative Humidity - RM Young Unit
Barometric Pressure - Met One Unit
Ambient Temperature - RM Young Unit
Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

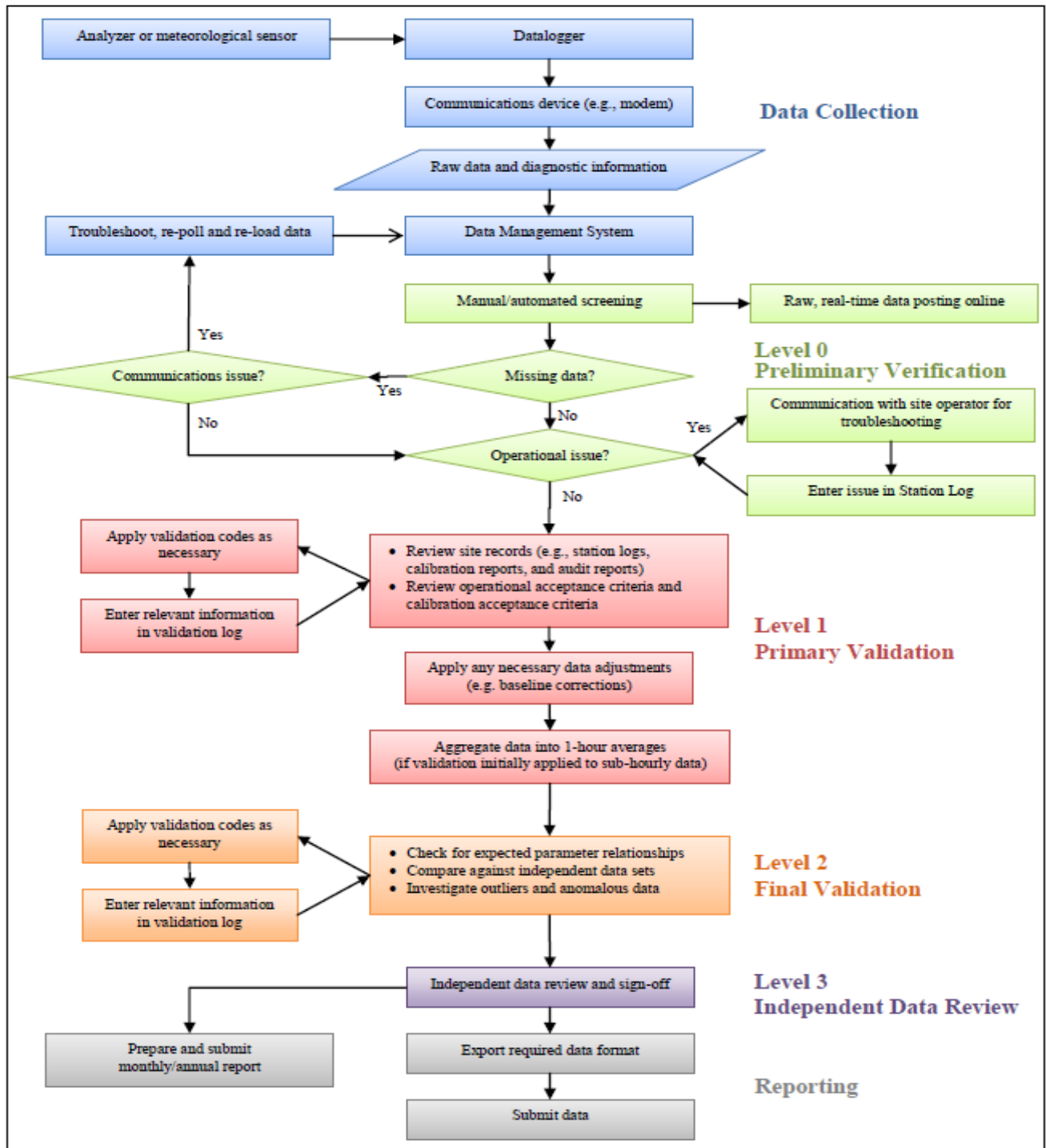
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.

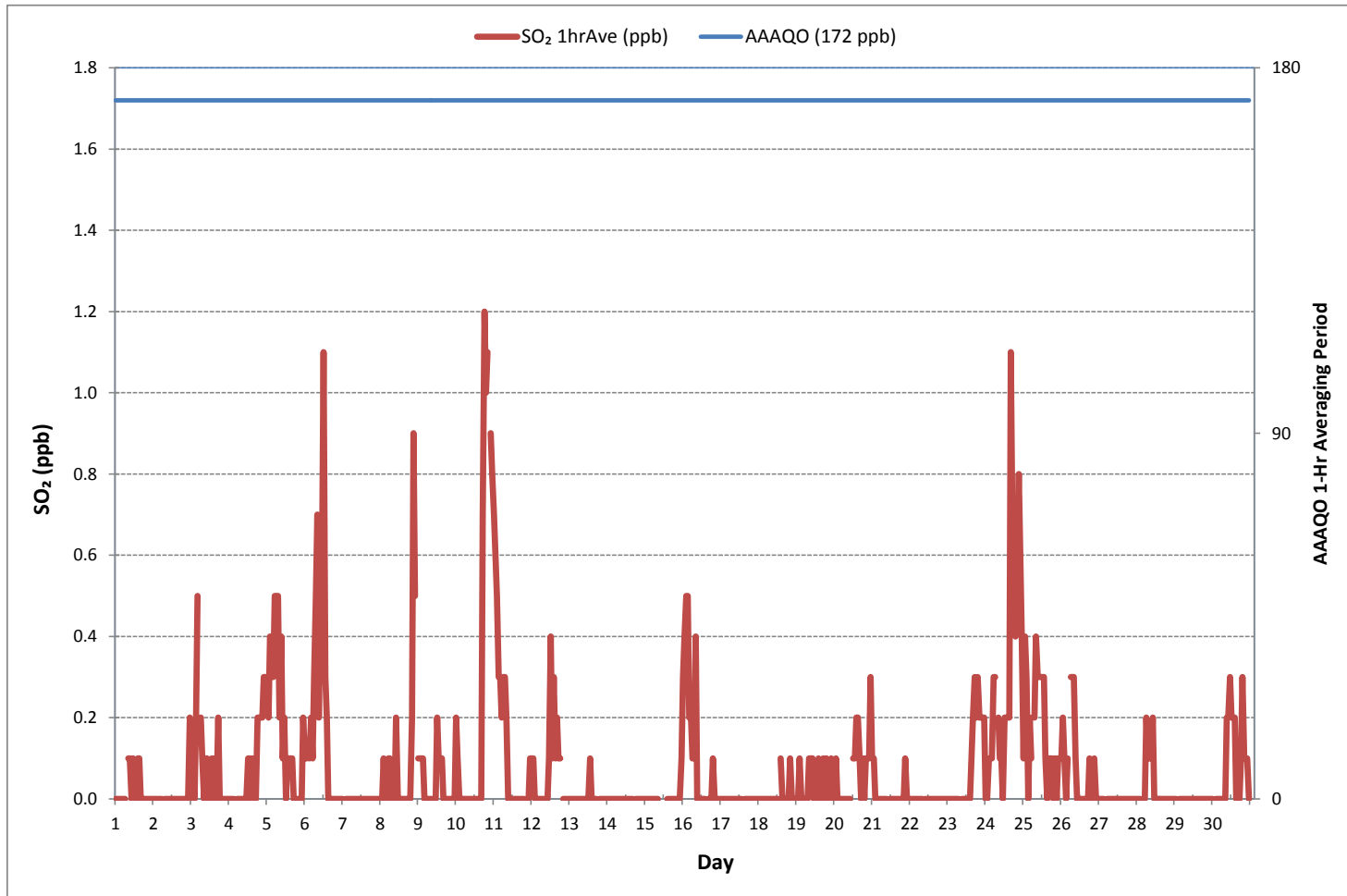


Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.		
DAY																														
1	0.7	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	24	
2	0.5	0.5	0.5	0.8	0.5	0.5	S	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.5	0.8	0.5	24	
3	0.5	0.5	0.5	0.8	1.1	S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.1	0.6	24	
4	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.5	0.8	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.5	0.8	0.6	24
5	0.8	0.5	1.1	S	0.8	0.8	0.8	1.1	0.8	1.1	0.8	0.8	0.5	0.8	0.5	0.8	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.5	0.8	0.5	1.1	0.7	24
6	0.8	0.8	S	0.8	0.8	0.8	1.1	1.1	1.7	0.8	1.4	1.4	2.3	1.1	1.1	0.8	0.8	0.8	0.8	0.5	0.5	0.8	0.8	0.5	0.5	0.5	2.3	1.0	24	
7	0.5	S	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.6	24	
8	S	0.8	0.8	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.5	0.5	0.8	0.5	0.5	0.8	0.5	0.5	0.5	0.5	1.7	1.7	1.1	S	0.5	1.7	0.8	24	
9	0.8	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.8	0.6	24	
10	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.8	0.5	0.8	1.7	1.7	1.7	S	1.7	1.4	0.2	1.7	0.8	24			
11	1.4	1.4	1.1	1.1	1.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.5	0.8	0.8	0.8	0.8	0.5	S	0.5	0.5	0.8	0.5	1.4	0.8	24	
12	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	1.1	1.1	1.1	0.8	1.1	0.8	0.8	S	0.8	0.8	0.8	0.5	0.5	1.1	0.7	24		
13	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.5	S	0.5	0.5	0.8	0.5	0.8	0.5	0.8	0.5	0.8	0.6	24
14	0.8	0.8	0.8	0.5	0.5	0.5	0.5	0.8	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.8	0.8	0.5	0.5	0.8	0.6	24		
15	0.7	0.5	0.7	0.7	0.7	0.8	0.5	0.5	0.5	C	C	C	C	C	0.5	0.8	0.8	0.8	0.5	0.4	0.5	0.8	0.7	0.7	0.4	0.8	0.6	24		
16	0.8	1.1	1.1	1.1	0.8	0.7	0.7	0.5	1.3	1.0	0.4	0.4	0.4	0.4	0.1	S	0.4	0.1	0.4	0.7	0.1	0.1	0.4	0.4	0.4	0.1	1.3	0.6	24	
17	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3	0.0	0.0	0.2	0.2	S	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	1.3	0.2	24	
18	P	0.1	0.1	0.4	0.4	0.4	0.1	0.4	0.4	0.5	0.5	0.2	0.1	S	0.7	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.7	0.3	23	
19	0.4	0.5	0.4	0.1	0.1	0.4	0.4	0.4	0.5	0.4	0.5	0.1	S	0.2	0.5	0.1	0.4	0.5	0.4	0.5	0.1	0.2	0.5	0.1	0.1	0.5	0.3	24		
20	0.5	0.5	0.5	0.1	0.5	0.1	0.4	0.2	0.5	0.5	0.4	S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.1	0.7	0.5	24		
21	0.7	0.5	0.4	0.5	0.5	0.4	0.1	0.1	0.1	0.4	S	0.4	0.1	0.4	0.1	0.4	0.4	0.4	0.4	0.1	0.1	0.4	0.4	0.4	0.1	0.1	0.7	0.3	24	
22	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.4	0.1	S	0.1	0.4	0.4	0.2	0.4	0.4	0.1	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	0.3	24		
23	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.5	0.8	0.6	24	
24	0.5	0.2	0.5	0.5	0.5	0.7	0.7	S	0.7	0.5	1.0	0.5	0.7	0.5	0.7	1.0	1.6	1.3	0.8	0.8	1.1	1.3	1.1	0.8	0.2	1.6	0.8	24		
25	0.7	0.8	0.8	0.5	0.7	0.7	S	0.8	1.0	0.7	0.8	0.7	1.0	0.8	0.5	0.2	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.2	1.0	0.6	24	
26	0.4	0.5	0.7	0.4	0.5	S	0.7	0.7	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.1	0.4	0.4	0.5	0.4	0.4	0.7	0.7	0.1	0.1	0.7	0.5	24		
27	0.4	0.4	0.4	0.4	S	0.4	0.4	0.7	0.7	0.7	0.5	0.7	0.5	0.5	0.4	0.7	0.5	0.7	0.7	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.7	0.5	24	
28	0.5	0.5	0.5	S	0.7	0.7	0.7	0.7	0.7	0.7	1.0	0.4	0.4	0.4	0.4	0.1	0.4	0.1	0.4	0.1	0.4	0.1	0.4	0.1	0.4	0.1	1.0	0.5	24	
29	0.1	0.1	S	0.4	0.1	0.4	0.1	0.4	0.4	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.5	0.1	0.4	0.4	0.1	0.4	0.1	0.5	0.3	24		
30	0.4	S	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.7	0.5	0.5	0.4	0.4	0.4	0.7	0.5	24	
HOURLY MAX	1.4	1.4	1.1	1.1	1.1	0.8	1.1	1.1	1.7	1.3	1.4	1.4	2.3	1.1	1.1	1.0	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.4					
HOURLY AVG	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5					

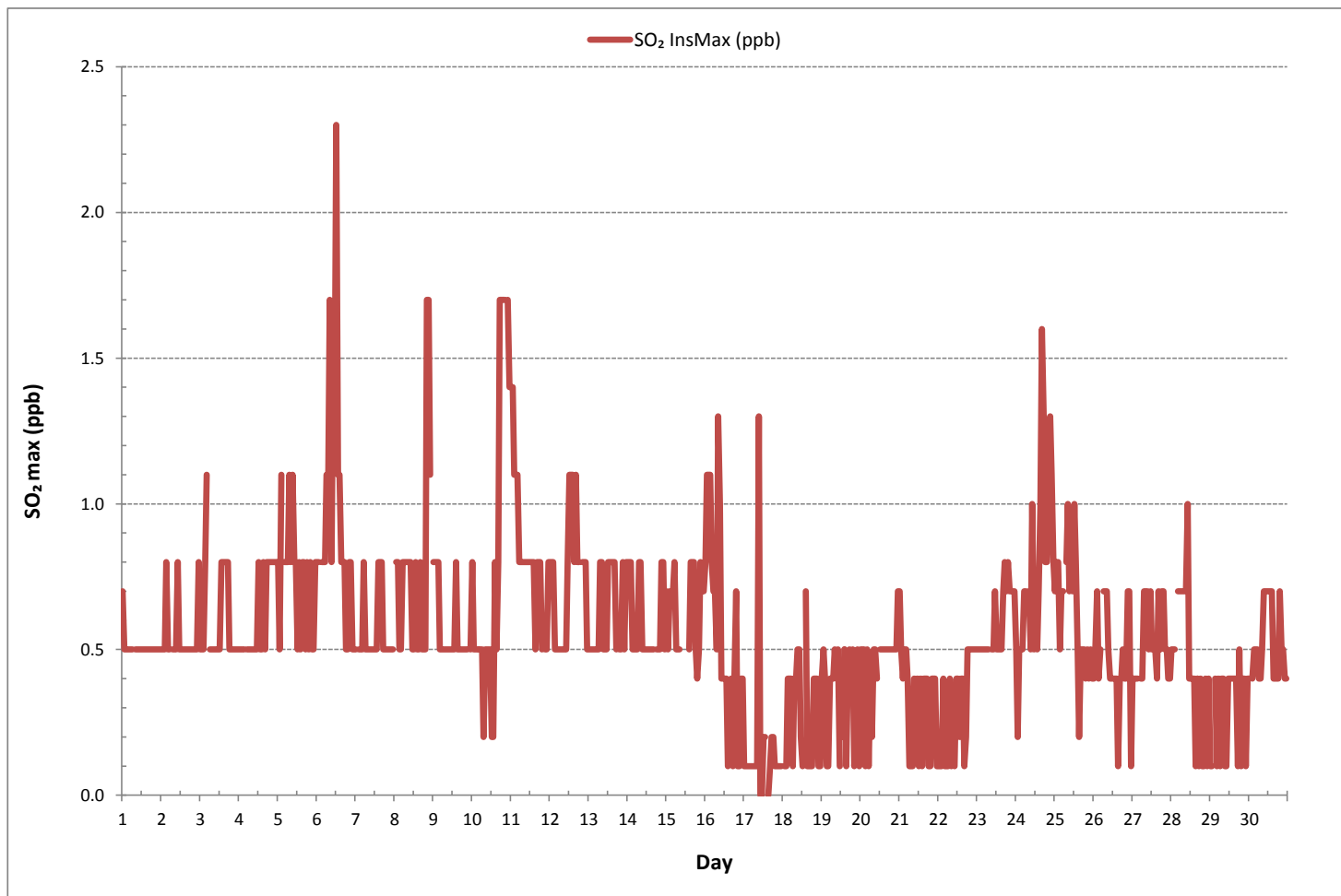
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	2.3 ppb @ HOUR(S) 12 ON DAY(S) 6
VAR-VARIOUS	
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.29
OPERATIONAL TIME:	719 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-SO2[ppb] Monthly: 11/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.86% Calm Avg: 0.00 [ppb]

Direction	0-3	3-10	10-85	85-170	>170.0	Total
N	7.61	0	0	0	0	7.61
NE	10.4	0	0	0	0	10.4
E	13.47	0	0	0	0	13.47
SE	21.52	0	0	0	0	21.52
S	18.89	0	0	0	0	18.89
SW	21.96	0	0	0	0	21.96
W	3.51	0	0	0	0	3.51
NW	2.64	0	0	0	0	2.64
Summary	100	0	0	0	0	100

% Icon Classes (ppb)

100 0-3

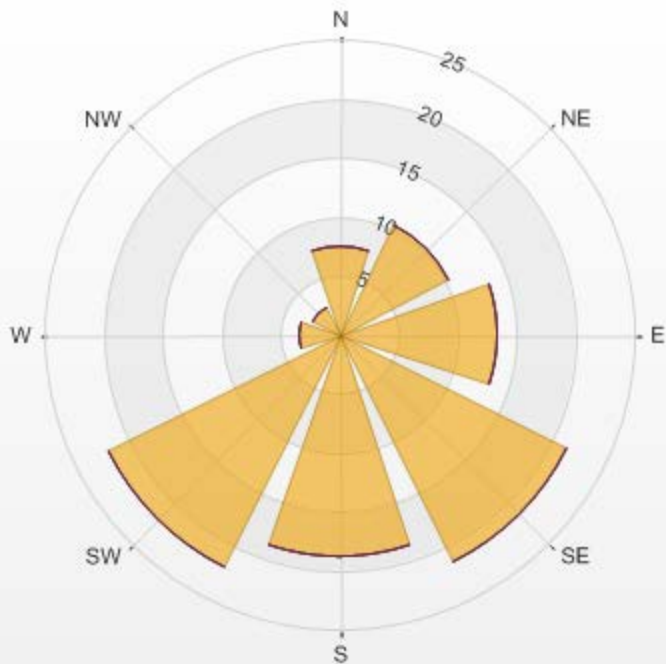
0 3-10

0 10-85

0 85-170

0 >170.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-SO2[ppb] 01/11/2016 00:00 - 30/11/2016 23:00 Calm: 0.00%



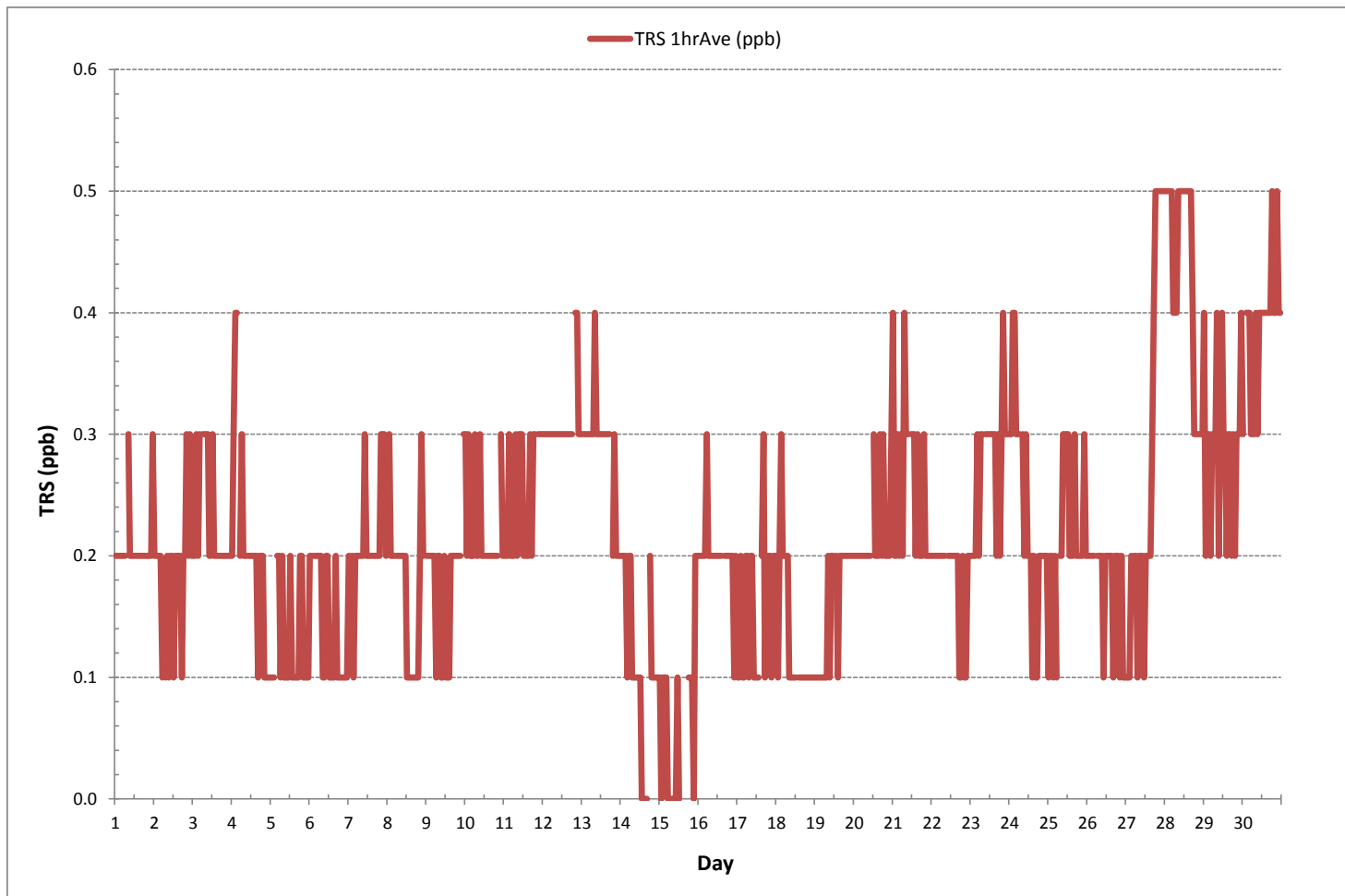
SO2[ppb] Calibration: THREE CREEKS #842 TRAILER Monthly: 2016/11 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	0.6	0.5	0.5	0.4	0.5	0.6	0.6	S	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.4	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.7	0.5	24	
2	0.5	0.6	0.5	0.5	0.7	0.4	S	0.5	0.6	0.4	0.6	0.6	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.4	0.4	0.7	0.5	24	
3	0.6	0.4	0.5	0.5	0.4	S	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.3	0.4	0.4	0.4	0.4	0.6	0.3	0.6	0.5	24	
4	0.4	0.5	0.6	0.6	S	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5	24	
5	0.4	0.5	0.5	S	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.6	0.5	24	
6	0.4	0.4	S	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.6	0.5	24	
7	0.5	S	0.5	0.5	0.5	0.7	0.5	0.6	0.5	0.4	0.5	0.5	0.6	0.4	0.5	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.4	0.3	0.7	0.5	24	
8	S	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.5	0.7	0.5	S	0.3	0.7	0.4	24	
9	0.5	0.5	0.5	0.4	0.6	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.5	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.6	S	0.6	0.3	0.6	0.5	24	
10	0.5	0.4	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.5	S	0.5	0.5	0.4	0.6	0.5	24
11	0.4	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.5	S	0.6	0.4	0.4	0.4	0.7	0.5	24	
12	0.5	0.5	0.5	0.6	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.4	0.5	0.6	0.6	S	0.6	0.5	0.4	0.4	0.4	0.6	0.5	24	
13	0.5	0.5	0.5	0.6	0.5	0.4	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.4	S	0.5	0.5	0.5	0.6	0.5	0.4	0.6	0.5	24	
14	0.5	0.5	0.7	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	S	0.7	0.7	0.6	0.6	0.6	0.5	0.4	0.7	0.5	24	
15	0.7	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	C	C	C	C	C	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.7	0.6	24	
16	0.5	0.8	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	S	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.8	0.6	24	
17	0.5	0.6	0.7	0.5	0.5	0.6	0.6	0.5	0.6	0.7	0.5	0.6	0.4	0.5	S	0.6	0.8	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.4	0.8	0.6	24	
18	S	0.6	0.7	0.8	0.8	0.6	0.7	0.6	0.6	0.7	0.5	0.5	0.5	S	0.6	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.8	0.6	24	
19	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	S	0.5	0.7	0.8	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.8	0.6	24
20	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	24	
21	0.7	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.7	S	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.4	0.7	0.6	24	
22	0.6	0.7	0.5	0.5	0.6	0.7	0.6	0.6	0.7	S	0.6	0.6	0.6	0.6	0.5	0.5	0.7	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.7	0.6	24	
23	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	S	0.6	0.7	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.5	0.7	0.5	24	
24	0.7	0.6	0.6	0.6	0.6	0.6	0.6	S	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.4	0.7	0.6	24	
25	0.5	0.5	0.6	0.5	0.5	0.5	S	0.7	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.8	0.6	24	
26	0.7	0.6	0.6	0.6	0.6	S	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.8	0.6	0.5	0.6	0.7	0.5	0.6	0.7	0.5	0.5	0.5	0.8	0.6	24	
27	0.6	0.5	0.6	0.6	S	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.8	0.7	0.9	0.8	0.8	0.8	0.8	0.8	0.5	0.9	0.7	24	
28	0.7	0.8	0.7	S	0.8	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.6	0.6	0.9	0.8	24
29	0.8	0.7	S	0.8	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.9	0.6	0.8	0.7	0.6	0.8	0.6	0.8	0.8	0.7	0.9	0.6	0.9	0.8	24	
30	0.7	S	0.8	0.8	1.0	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.7	1.0	0.8	24	
HOURLY MAX	0.8	0.8	0.8	0.8	1.0	0.7	0.8	0.7	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.8	24	
HOURLY AVG	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6				

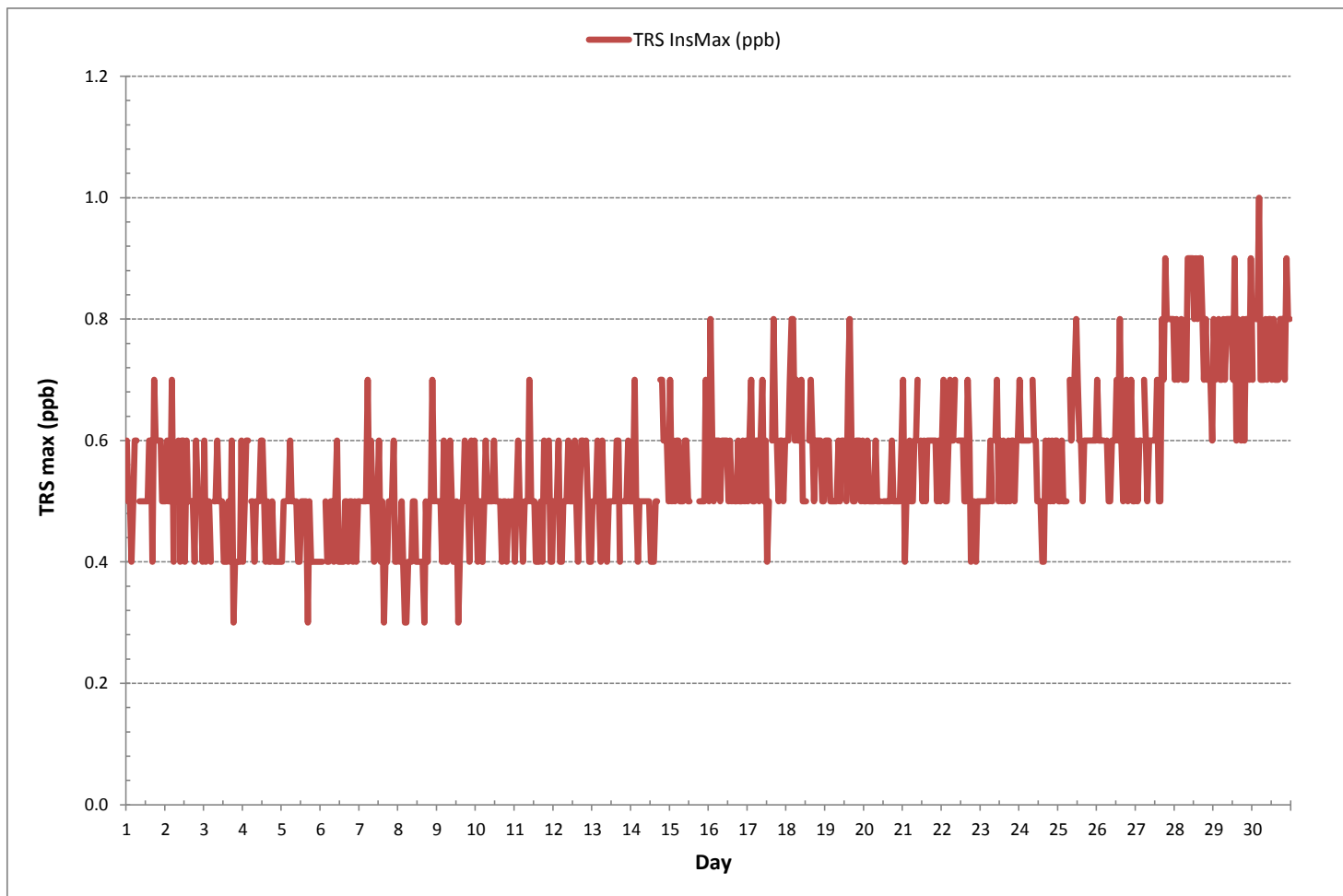
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM INSTANTANEOUS VALUE:	1.0 ppb @ HOUR(S) 4 ON DAY(S) 30
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.12
OPERATIONAL TIME:	720 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-TRS[ppb] Monthly: 11/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.00% Calm Avg: 0.00 [ppb]

Direction	0-1	1-3	3-10	>10.0	Total
N	7.6	0	0	0	7.6
NE	10.38	0	0	0	10.38
E	13.3	0	0	0	13.3
SE	21.49	0	0	0	21.49
S	18.86	0	0	0	18.86
SW	22.22	0	0	0	22.22
W	3.51	0	0	0	3.51
NW	2.63	0	0	0	2.63
Summary	100	0	0	0	100

% Icon Classes (ppb)

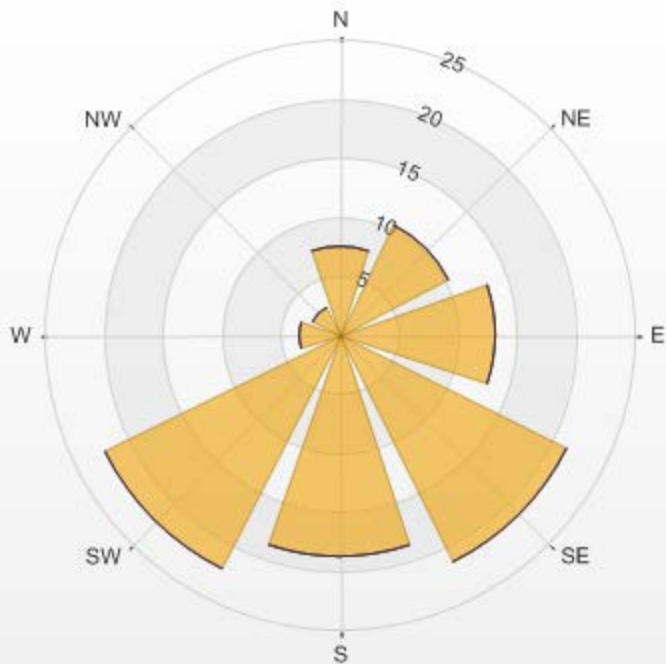
100 0-1

0 1-3

0 3-10

0 >10.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-TRS[ppb] 01/11/2016 00:00 - 30/11/2016
23:00 Calm: 0.00%

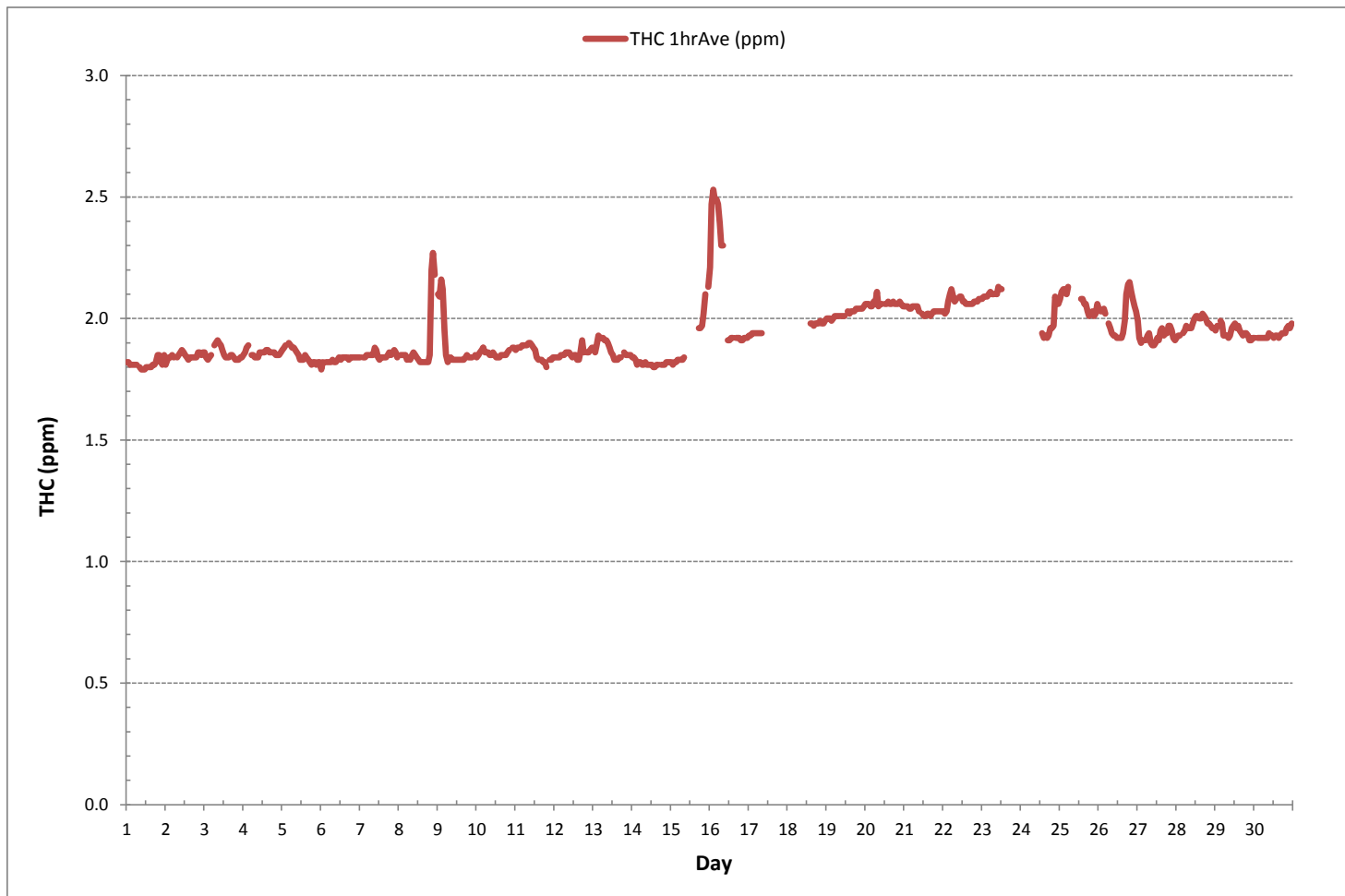




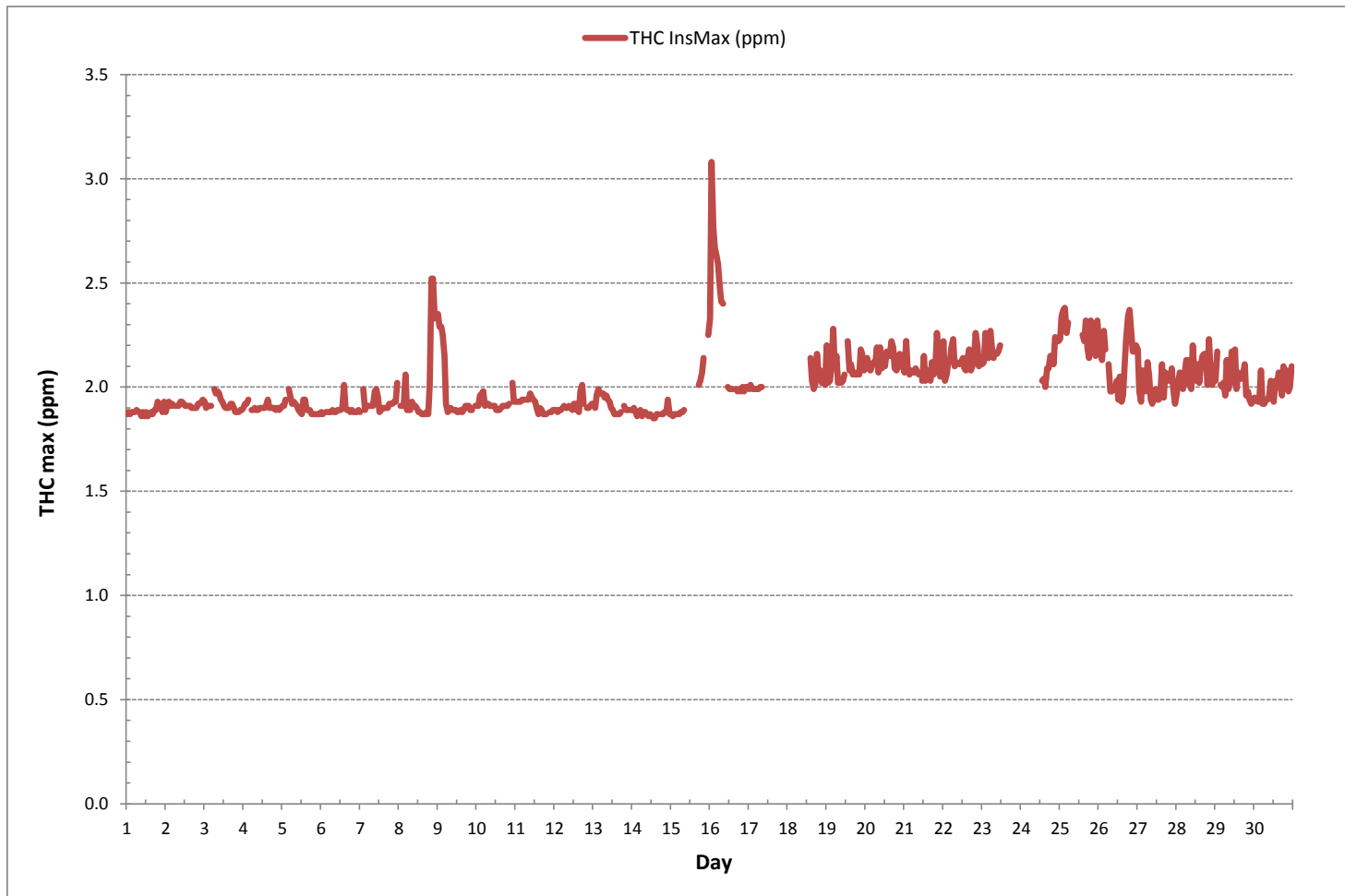
■ Span Meas
 — Span Ref
 — Span Low
 — Span High

TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

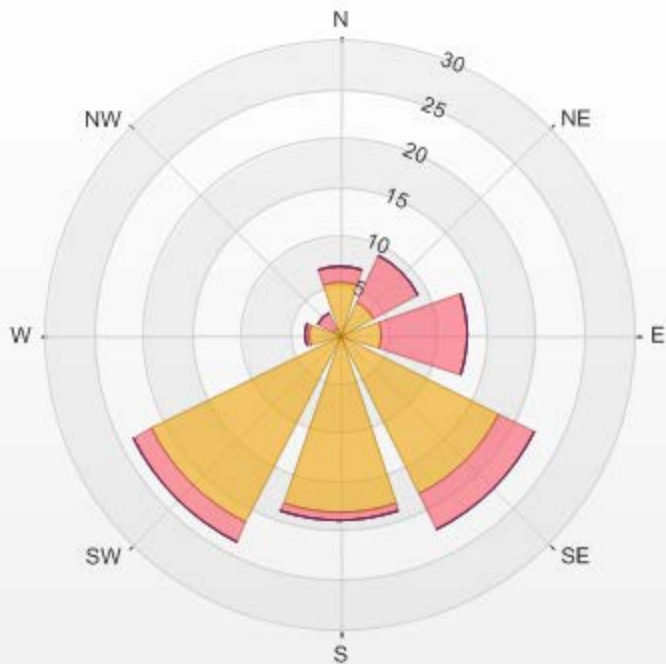


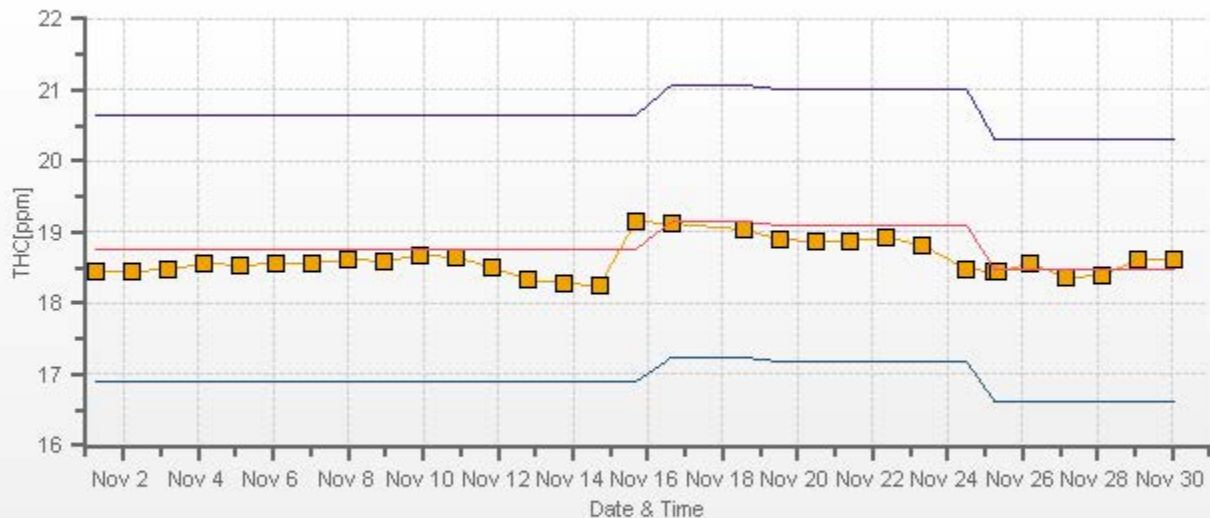
Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-THC[ppm] Monthly: 11/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 0.00% Valid Data: 86.25% Calm Avg: 0.00 [ppm]

Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	5.48	1.61	0	0	0	7.09
NE	3.86	5.15	0	0	0	9.01
E	4.19	8.86	0	0	0	13.05
SE	18.04	4.19	0	0	0	22.23
S	18.04	0.97	0	0	0	19.01
SW	21.42	2.09	0	0	0	23.51
W	3.22	0.32	0	0	0	3.54
NW	0.81	1.77	0	0	0	2.58
Summary	75.06	24.96	0	0	0	100

% Icon	Classes (ppm)	75	0-2	25	2-3	0	3-5	0	5-10	0	>10.0
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THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-THC[ppm] 01/11/2016 00:00 - 30/11/2016 23:00 Calm: 0.00%

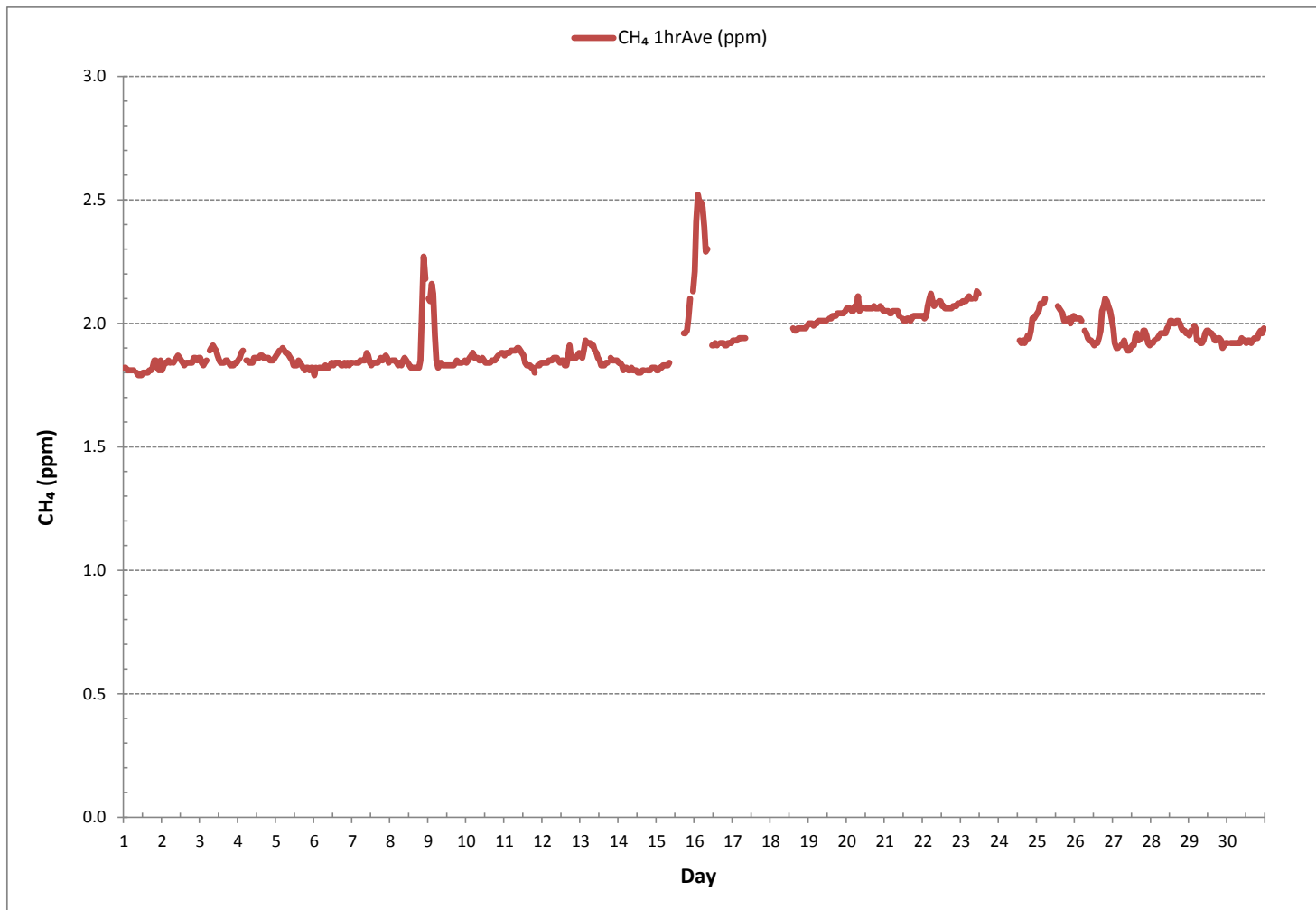




■ Span Meas
 — Span Ref
 — Span Low
 — Span High

METHANE

METHANE Hourly Averages (CH₄ ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	1.86	1.87	1.86	1.87	1.88	1.88	1.88	S	1.87	1.84	1.87	1.85	1.87	1.85	1.86	1.87	1.86	1.88	1.88	1.92	1.90	1.89	1.87	1.89	1.84	1.92	1.87	24	
2	1.87	1.89	1.92	1.89	1.91	1.89	S	1.90	1.90	1.92	1.92	1.91	1.90	1.89	1.90	1.90	1.90	1.89	1.89	1.89	1.91	1.91	1.91	1.92	1.93	1.87	1.93	1.90	24
3	1.92	1.89	1.89	1.90	1.91	S	1.94	1.95	1.96	1.95	1.93	1.92	1.90	1.89	1.89	1.89	1.91	1.91	1.89	1.87	1.87	1.87	1.88	1.88	1.87	1.96	1.90	24	
4	1.89	1.91	1.91	1.93	S	1.88	1.88	1.89	1.88	1.88	1.89	1.89	1.89	1.90	1.90	1.93	1.89	1.89	1.89	1.89	1.88	1.88	1.89	1.88	1.88	1.93	1.89	24	
5	1.90	1.90	1.93	S	1.94	1.94	1.91	1.92	1.92	1.90	1.88	1.88	1.86	1.93	1.93	1.88	1.88	1.89	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.94	1.89	24	
6	1.87	1.87	S	1.87	1.87	1.87	1.87	1.88	1.87	1.87	1.88	1.88	1.88	1.89	1.89	1.89	1.89	1.88	1.88	1.88	1.87	1.87	1.87	1.88	1.87	1.89	1.88	24	
7	1.88	S	1.88	1.89	1.89	1.89	1.90	1.90	1.90	1.96	1.97	1.89	1.87	1.88	1.89	1.89	1.89	1.89	1.89	1.91	1.91	1.92	1.92	1.89	1.87	1.89	1.90	24	
8	S	1.90	1.90	1.90	1.89	1.88	1.88	1.88	1.92	1.90	1.90	1.89	1.87	1.87	1.87	1.86	1.86	1.87	1.86	1.99	2.40	2.38	2.32	S	1.86	2.40	1.95	24	
9	2.33	2.28	2.28	2.24	2.13	1.91	1.87	1.88	1.89	1.88	1.88	1.88	1.88	1.87	1.87	1.88	1.88	1.90	1.90	1.90	1.88	1.88	S	1.89	1.87	2.33	1.96	24	
10	1.90	1.90	1.94	1.95	1.96	1.90	1.91	1.91	1.90	1.90	1.90	1.90	1.89	1.88	1.89	1.89	1.90	1.91	1.90	1.91	1.91	S	1.92	1.92	1.88	1.96	1.91	24	
11	1.92	1.92	1.92	1.92	1.93	1.93	1.93	1.93	1.93	1.95	1.94	1.93	1.92	1.90	1.87	1.89	1.88	1.86	1.86	1.86	S	1.87	1.87	1.88	1.86	1.95	1.90	24	
12	1.88	1.88	1.87	1.88	1.89	1.89	1.89	1.90	1.90	1.90	1.89	1.88	1.91	1.91	1.88	1.91	1.88	1.87	1.96	2.00	1.91	S	1.90	1.90	1.91	1.87	2.00	1.90	24
13	1.91	1.89	1.94	1.98	1.95	1.95	1.95	1.94	1.94	1.93	1.92	1.89	1.88	1.86	1.86	1.87	1.87	S	1.90	1.88	1.88	1.88	1.89	1.86	1.98	1.91	24		
14	1.88	1.89	1.87	1.85	1.87	1.88	1.85	1.87	1.87	1.86	1.86	1.86	1.84	1.84	1.84	1.86	1.86	S	1.86	1.86	1.87	1.87	1.88	1.86	1.84	1.89	1.86	24	
15	1.86	1.85	1.85	1.86	1.86	1.86	1.87	1.87	1.89	C	C	C	C	C	C	C	C	1.99	2.02	2.06	2.12	S	S	2.24	1.85	2.24	1.94	24	
16	2.31	2.79	2.59	2.66	2.62	2.58	2.47	2.40	2.39	S	S	1.99	1.98	1.98	1.97	S	1.98	1.97	1.97	1.97	1.98	1.96	1.98	1.99	1.96	2.79	2.22	24	
17	1.97	2.00	1.98	1.98	1.98	1.98	1.98	1.99	1.98	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.97	2.00	1.98	9	
18	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	2.11	2.02	1.99	2.01	2.16	2.06	2.00	2.02	2.00	2.02	1.99	2.16	2.04	10
19	2.05	2.02	2.03	2.09	2.28	2.02	2.02	2.03	2.04	2.02	2.03	2.04	S	2.04	2.08	2.05	2.05	2.07	2.06	2.06	2.06	2.05	2.16	2.07	2.02	2.28	2.06	24	
20	2.08	2.13	2.08	2.07	2.09	2.11	2.10	2.14	2.07	2.19	2.08	S	2.08	2.08	2.08	2.09	2.08	2.12	2.07	2.07	2.09	2.09	2.09	2.07	2.07	2.19	2.09	24	
21	2.07	2.06	2.08	2.06	2.06	2.07	2.06	2.08	2.06	2.06	S	2.03	2.03	2.03	2.07	2.08	2.03	2.03	2.04	2.06	2.26	2.04	2.04	2.06	2.03	2.26	2.06	24	
22	2.22	2.04	2.05	2.12	2.12	2.19	2.11	2.09	2.09	S	2.10	2.12	2.13	2.08	2.08	2.13	2.08	2.07	2.08	2.11	2.20	2.20	2.09	2.12	2.04	2.22	2.11	24	
23	2.10	2.11	2.10	2.15	2.13	2.27	2.13	2.13	S	2.16	2.17	2.14	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.10	2.27	2.14	12	
24	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	1.95	1.95	2.00	1.94	1.94	1.96	1.96	2.00	2.04	2.04	1.94	2.04	1.98	11
25	2.07	2.08	2.09	2.12	2.10	2.16	S	2.22	C1	C1	C1	C1	C1	C1	2.09	2.06	2.08	2.04	2.02	2.02	2.06	2.02	2.04	2.06	2.02	2.22	2.08	18	
26	2.04	2.04	2.04	2.04	2.03	S	1.99	1.98	1.96	2.00	1.99	1.94	1.93	1.99	1.94	1.96	2.01	2.14	2.12	2.15	2.15	2.11	2.10	2.08	1.93	2.15	2.03	24	
27	2.06	1.96	1.93	1.95	S	1.96	1.96	1.95	1.95	1.91	1.91	1.92	1.93	1.95	1.98	2.01	1.95	1.95	2.01	2.04	2.04	1.96	1.99	1.92	1.91	2.06	1.96	24	
28	1.96	2.00	1.94	S	1.99	1.96	2.06	1.97	2.01	1.99	2.00	2.02	2.03	2.03	2.02	2.07	2.06	2.06	2.03	2.00	2.00	2.01	2.00	1.97	1.94	2.07	2.01	24	
29	1.98	1.99	S	2.01	2.00	1.97	1.94	1.93	1.93	1.95	1.98	2.03	1.99	1.99	2.00	1.97	1.96	1.95	1.96	1.95	1.94	1.93	1.92	1.94	1.92	2.03	1.97	24	
30	1.93	S	1.94	1.94	2.07	1.93	1.93	1.93	1.94	1.95	1.95	1.99	1.94	1.97	2.02	1.95	1.95	1.96	1.95	1.96	1.97	1.98	1.98	2.00	1.93	2.07	1.96	24	
HOURLY MAX	2.33	2.79	2.59	2.66	2.62	2.58	2.47	2.40	2.39	2.19	2.17	2.14	2.13	2.08	2.11	2.13	2.08	2.14	2.16	2.15	2.40	2.38	2.32	2.24					
HOURLY AVG	1.99	2.00	1.99	2.00	2.01	1.99	1.97	1.98	1.96	1.95	1.95	1.94	1.93	1.94	1.95	1.95	1.95	1.96	1.96	1.97	2.00	1.98	1.98	1.97					

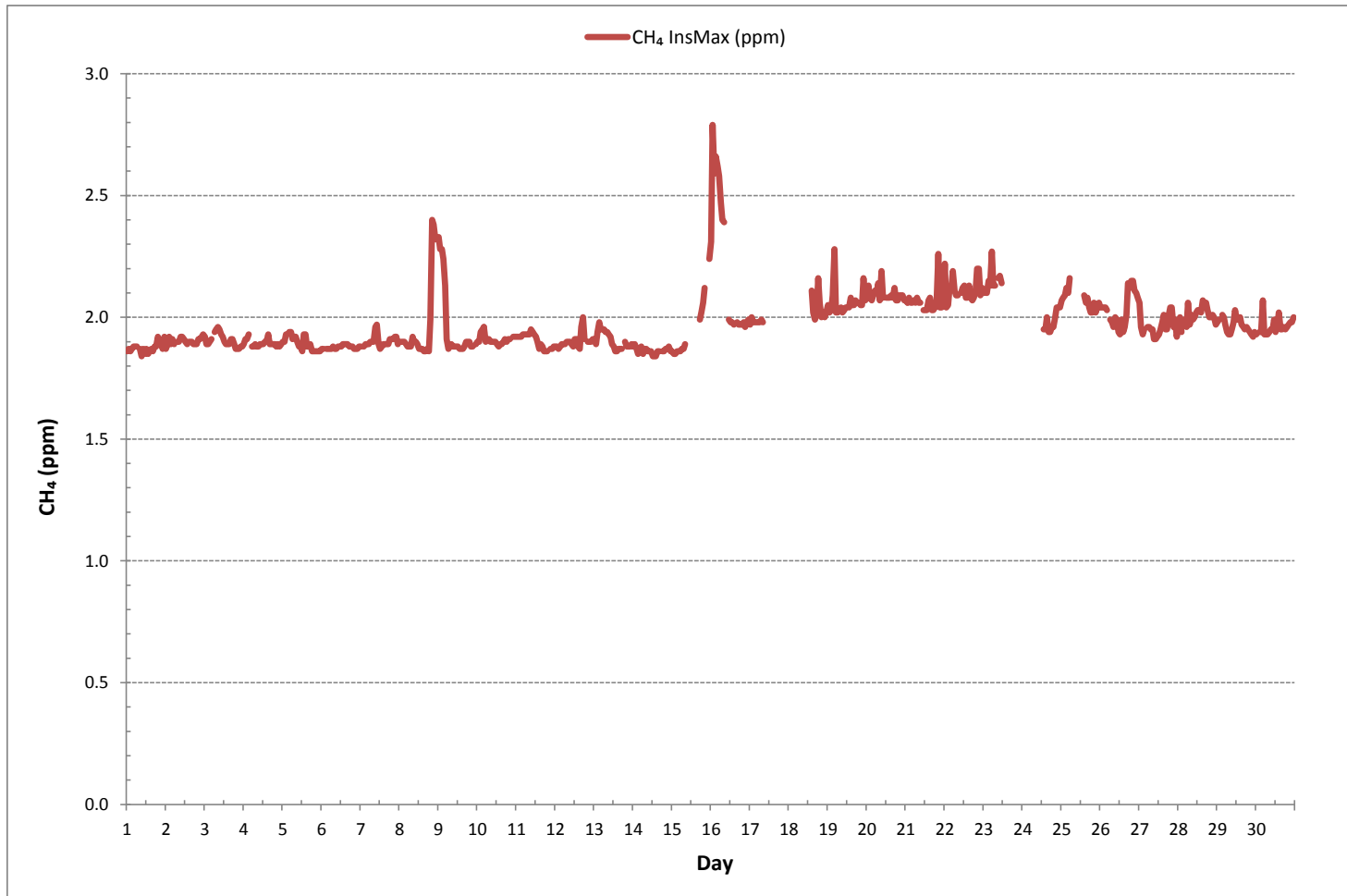
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	621
MAXIMUM INSTANTANEOUS VALUE:	2.79 ppm @ HOUR(S) 1 ON DAY(S) 16
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	0.12
OPERATIONAL TIME:	660 hrs

METHANE MAX Instantaneous Maximum (CH₄ ppm)

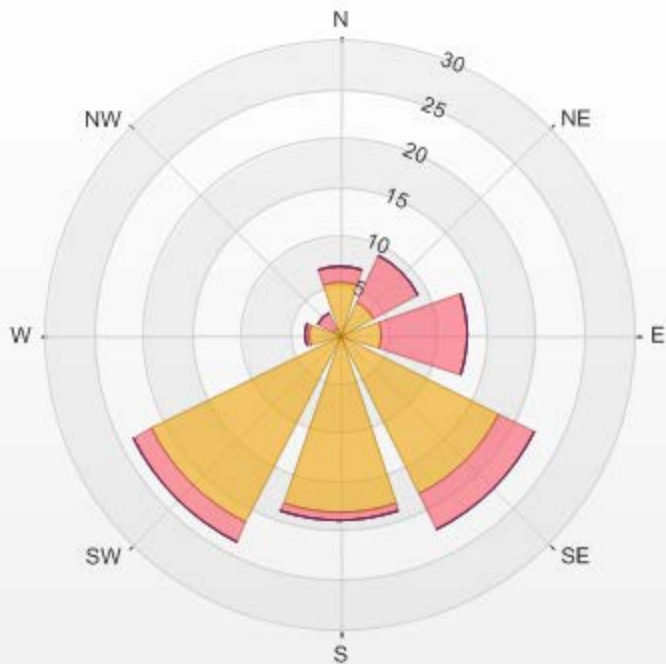


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-CH4[ppm] Monthly: 11/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 86.25% Calm Avg: 0.00 [ppm]

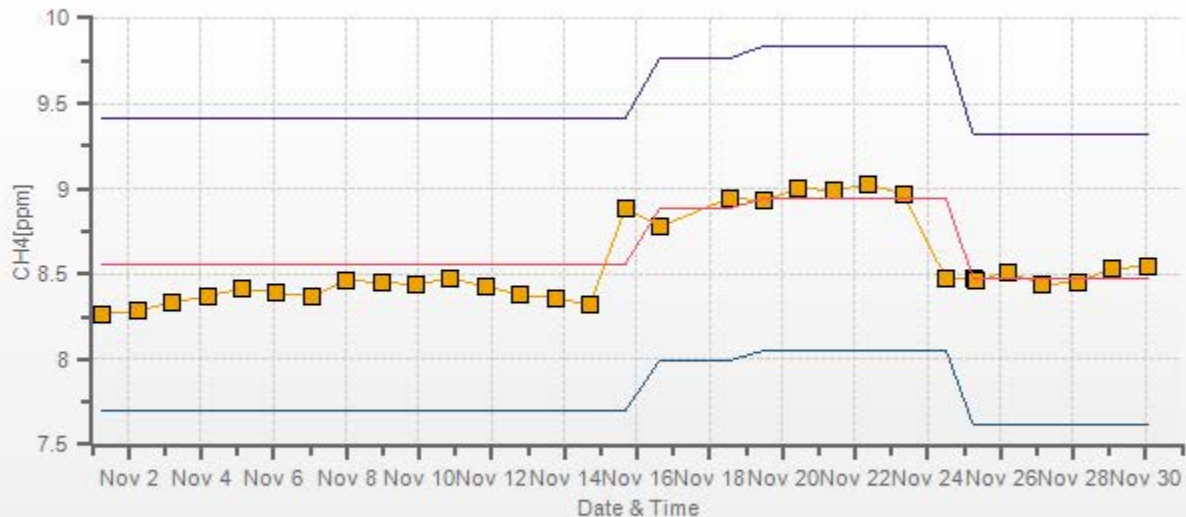
Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	5.48	1.61	0	0	0	7.09
NE	3.86	5.15	0	0	0	9.01
E	4.19	8.86	0	0	0	13.05
SE	18.04	4.19	0	0	0	22.23
S	18.04	0.97	0	0	0	19.01
SW	21.42	2.09	0	0	0	23.51
W	3.22	0.32	0	0	0	3.54
NW	0.81	1.77	0	0	0	2.58
Summary	75.06	24.96	0	0	0	100

% Icon	Classes (ppm)	75	0-2	25	2-3	0	3-5	0	5-10	0	>10.0
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THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-CH4[ppm] 01/11/2016 00:00 - 30/11/2016 23:00 Calm: 0.00%



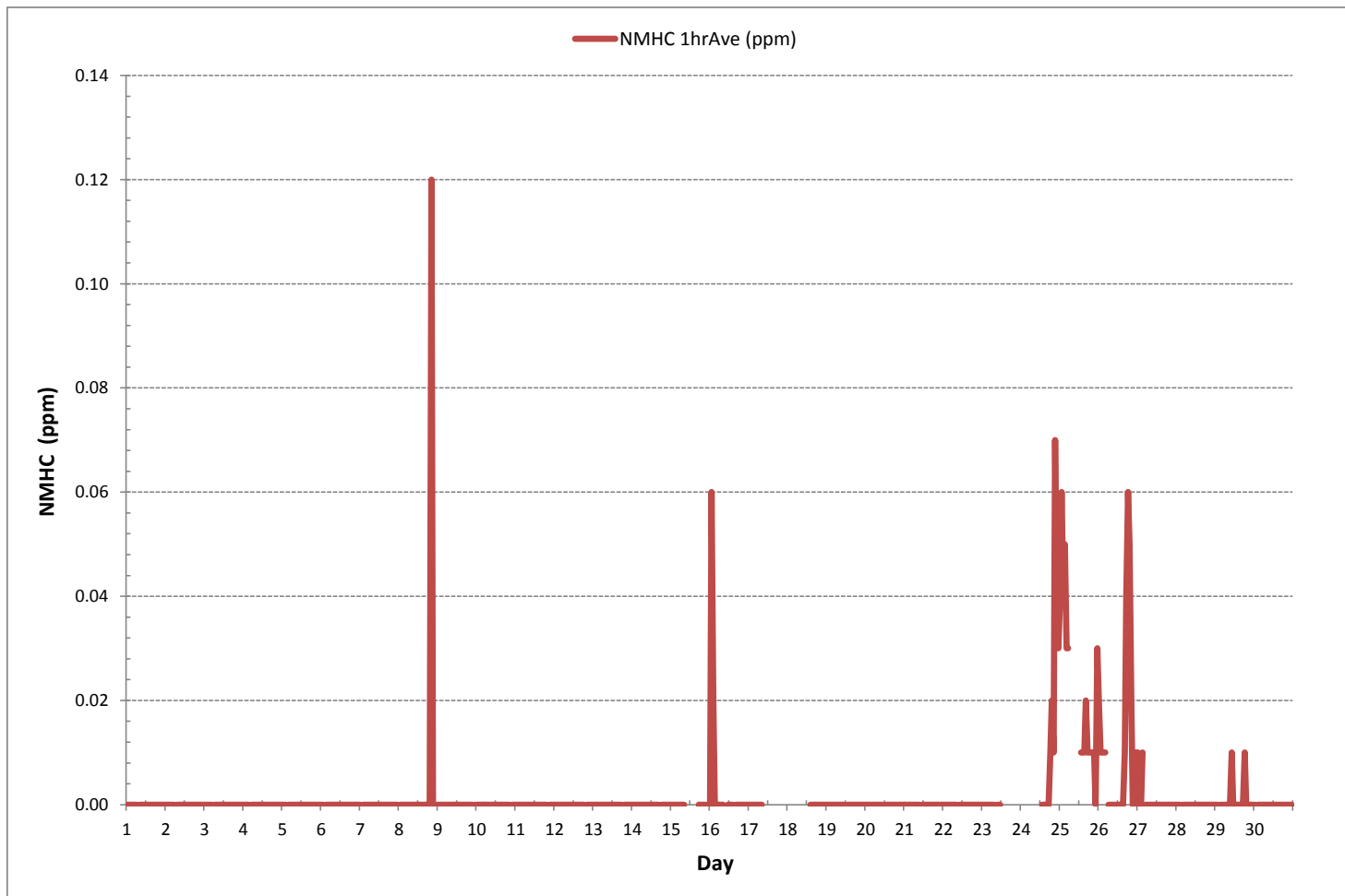
CH4[ppm] Calibration: THREE CREEKS #842 TRAILER Monthly: 2016/11 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

NON-METHANE HYDROCARBON

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	0.00	0.00	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
2	0.02	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24	
3	0.00	0.00	0.00	0.00	0.00	S	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	24	
4	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	24	
5	0.00	0.00	0.00	S	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	24	
6	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.13	0.01	24	
7	0.00	S	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.01	24	
8	S	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.18	0.00	S	0.00	0.35	0.03	24	
9	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.02	0.00	24	
10	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	S	0.11	0.00	0.00	0.11	0.01	24	
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	24	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24	
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09	0.00	0.00	24	
15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	C	C	C	0.00	0.00	0.00	0.00	S	S	0.00	0.00	0.01	0.00	24	
16	0.00	0.32	0.22	0.00	0.00	0.00	0.00	0.00	0.00	Y	Y	0.00	0.00	0.00	0.00	S	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.03	22	
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.00	0.02	0.00	9	
18	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	0.15	0.02	0.00	0.00	0.00	0.00	0.09	0.01	0.07	0.01	0.00	0.15	0.04	10
19	0.20	0.00	0.00	0.00	0.06	0.09	0.14	0.00	0.00	0.01	0.00	0.03	S	0.20	0.02	0.08	0.02	0.00	0.00	0.01	0.01	0.15	0.00	0.00	0.00	0.20	0.04	24	
20	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.08	0.01	0.00	0.01	S	0.05	0.11	0.09	0.07	0.17	0.09	0.03	0.00	0.00	0.09	0.02	0.06	0.00	0.17	0.04	24	
21	0.01	0.18	0.01	0.00	0.03	0.00	0.00	0.00	0.01	0.01	S	0.00	0.14	0.00	0.00	0.00	0.00	0.11	0.04	0.02	0.00	0.13	0.00	0.04	0.00	0.18	0.03	24	
22	0.00	0.00	0.01	0.00	0.00	0.02	0.13	0.03	0.02	S	0.00	0.02	0.00	0.00	0.00	0.00	0.09	0.00	0.02	0.09	0.20	0.01	0.00	0.00	0.00	0.20	0.03	24	
23	0.00	0.00	0.18	0.00	0.00	0.03	0.08	0.00	S	0.00	0.00	0.07	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.00	0.18	0.03	12	
24	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	0.11	0.12	0.07	0.17	0.18	0.19	0.20	0.12	0.24	0.20	0.17	0.07	0.24	0.16	11
25	0.21	0.28	0.29	0.30	0.17	0.20	S	0.28	S1	S1	S1	S1	S1	S1	0.17	0.17	0.27	0.15	0.13	0.30	0.20	0.23	0.13	0.25	0.13	0.30	0.22	18	
26	0.21	0.15	0.11	0.24	0.15	S	0.15	0.01	0.04	0.06	0.01	0.11	0.04	0.07	0.01	0.01	0.15	0.15	0.24	0.25	0.14	0.11	0.09	0.15	0.01	0.25	0.12	24	
27	0.20	0.06	0.02	0.16	S	0.06	0.18	0.11	0.03	0.04	0.07	0.07	0.04	0.01	0.02	0.14	0.02	0.14	0.08	0.00	0.02	0.13	0.01	0.03	0.00	0.20	0.07	24	
28	0.01	0.10	0.14	S	0.04	0.12	0.17	0.17	0.06	0.01	0.23	0.06	0.02	0.09	0.00	0.11	0.16	0.14	0.14	0.03	0.25	0.11	0.03	0.15	0.00	0.25	0.10	24	
29	0.08	0.21	S	0.00	0.00	0.08	0.05	0.19	0.06	0.11	0.24	0.02	0.21	0.00	0.12	0.08	0.11	0.12	0.17	0.03	0.04	0.04	0.01	0.00	0.00	0.24	0.09	24	
30	0.03	S	0.01	0.00	0.00	0.03	0.01	0.03	0.03	0.00	0.10	0.03	0.00	0.13	0.03	0.15	0.08	0.02	0.15	0.11	0.12	0.01	0.03	0.11	0.00	0.15	0.05	24	
HOURLY MAX	0.21	0.32	0.29	0.30	0.17	0.20	0.18	0.28	0.06	0.11	0.24	0.11	0.21	0.20	0.17	0.17	0.27	0.18	0.24	0.30	0.35	0.24	0.20	0.25					
HOURLY AVG	0.04	0.05	0.04	0.03	0.03	0.02	0.04	0.03	0.01	0.01	0.03	0.02	0.02	0.03	0.03	0.03	0.05	0.04	0.04	0.04	0.06	0.06	0.03	0.04					

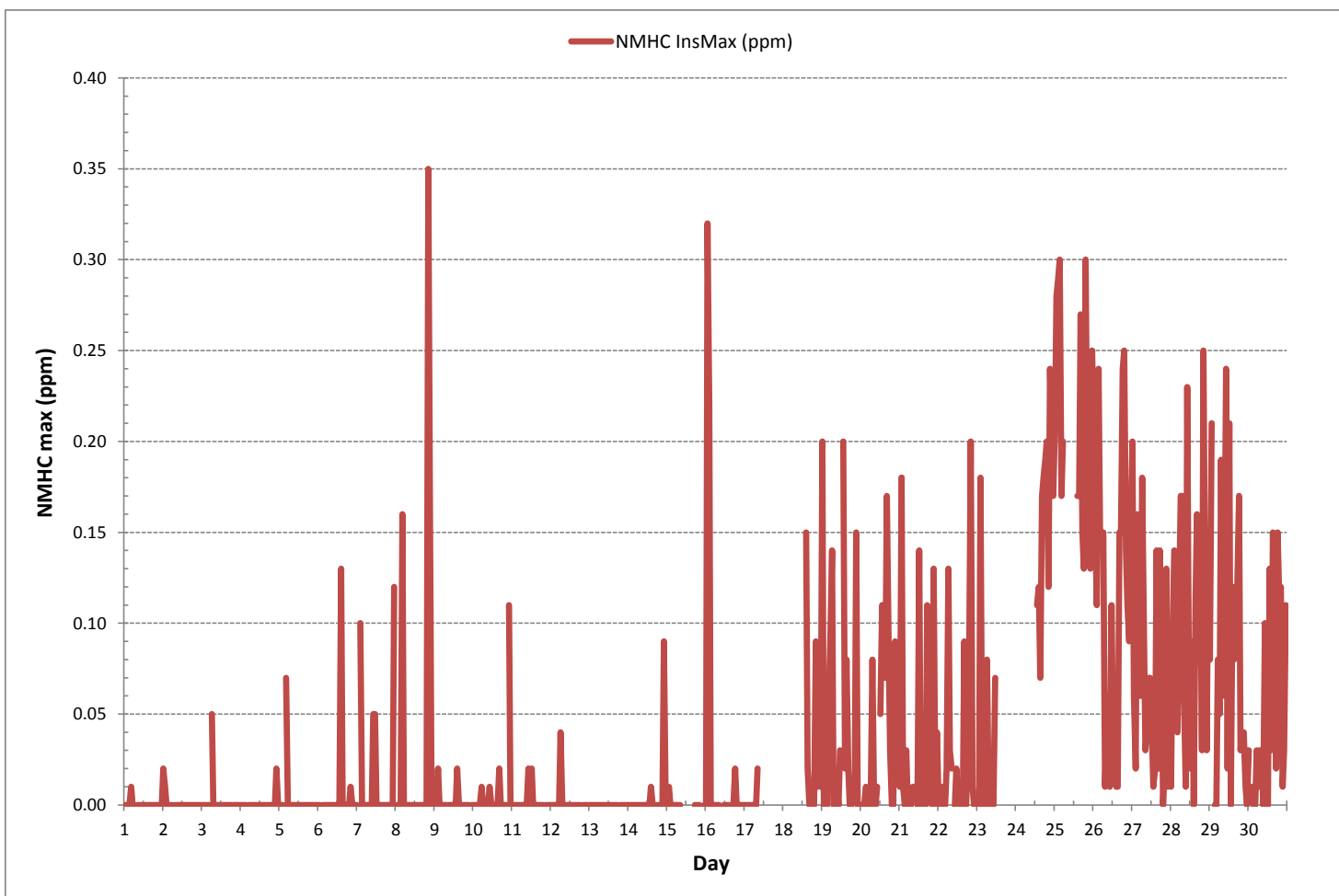
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	224
MAXIMUM INSTANTANEOUS VALUE:	0.35 ppm @ HOUR(S) 20 ON DAY(S) 8
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	0.07
OPERATIONAL TIME:	658 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-NMHC[ppm] Monthly: 11/2016 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 86.25% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	7.09	0	0	0	0	7.09
NE	8.86	0.16	0	0	0	9.02
E	13.04	0	0	0	0	13.04
SE	22.22	0	0	0	0	22.22
S	19	0	0	0	0	19
SW	23.51	0	0	0	0	23.51
W	3.54	0	0	0	0	3.54
NW	2.58	0	0	0	0	2.58
Summary	100	0.16	0	0	0	100

% Icon Classes (ppm)

100

0-0.1

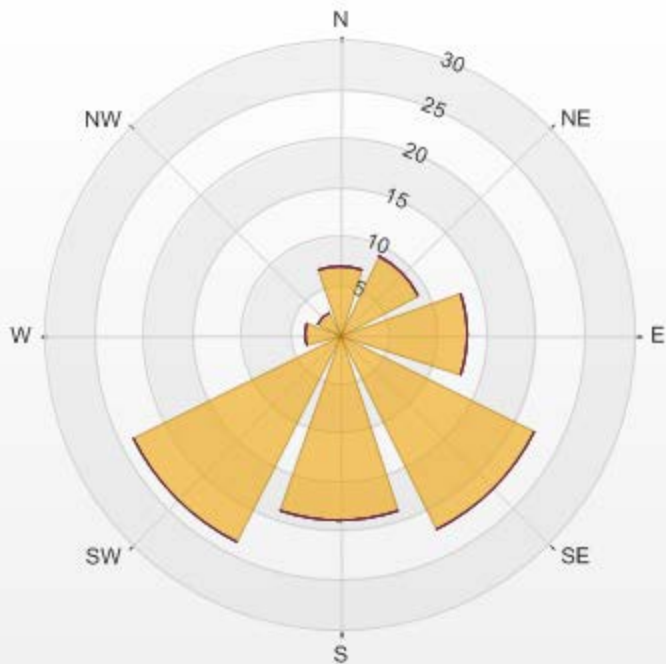
0 0.1-0.3

0 0.3-1

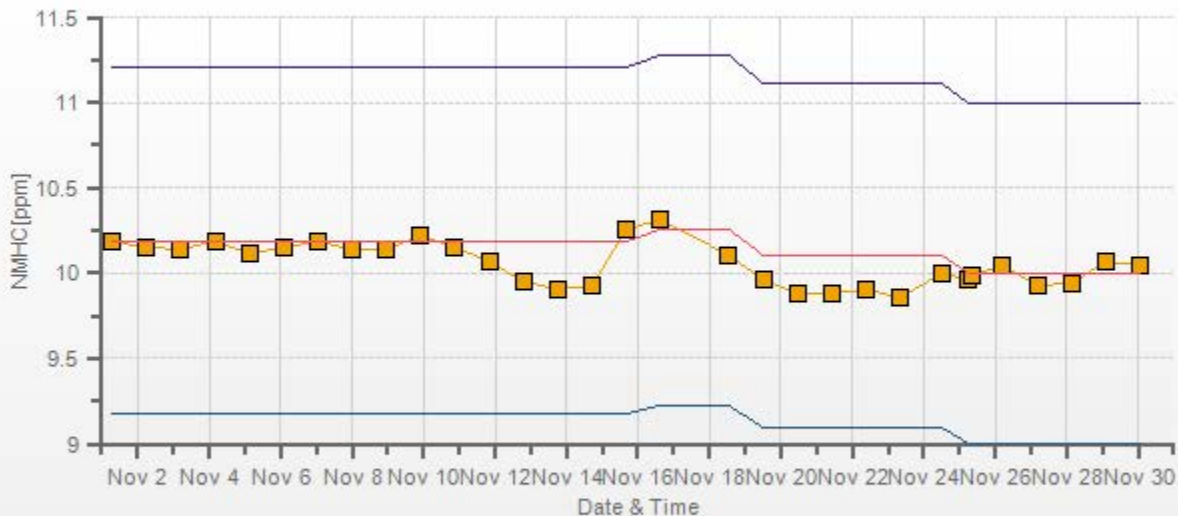
0 1-2

0 >2.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-NMHC[ppm] 01/11/2016 00:00 - 30/11/2016 23:00 Calm: 0.00%



NMHC[ppm] Calibration: THREE CREEKS #842 TRAILER Monthly: 2016/11 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

WIND SPEED



WIND SPEED Hourly Averages (WS kph)

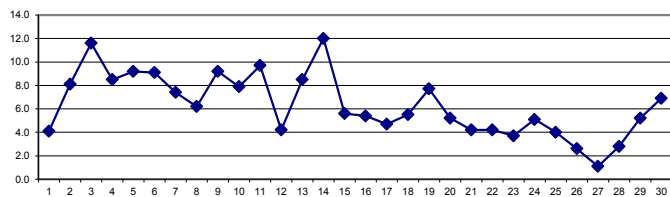
Table with 24 columns (HR START, HR END, DAY 1-24) and 24 rows (DAY 1-24). Includes sub-rows for HOURLY MAX and HOURLY AVG. Values are in kph, with 25.3 highlighted in blue.

STATUS FLAG CODES

Table with 2 columns of status codes and their descriptions: C (MONTHLY CALIBRATION), C1 (REPEAT CALIBRATION), Y (MAINTENANCE), S (DAILY ZERO/SPAN CHECK), S1 (REPEAT ZERO/SPAN CHECK), Q (QUALITY ASSURANCE), R (RECOVERY), X (MACHINE MALFUNCTION), G (OUT FOR REPAIR), P (POWER FAILURE).

LAST CALIBRATION: October 12, 2016
DECLINATION : MAGNETIC DECLINATION 15 DEGREE EAST

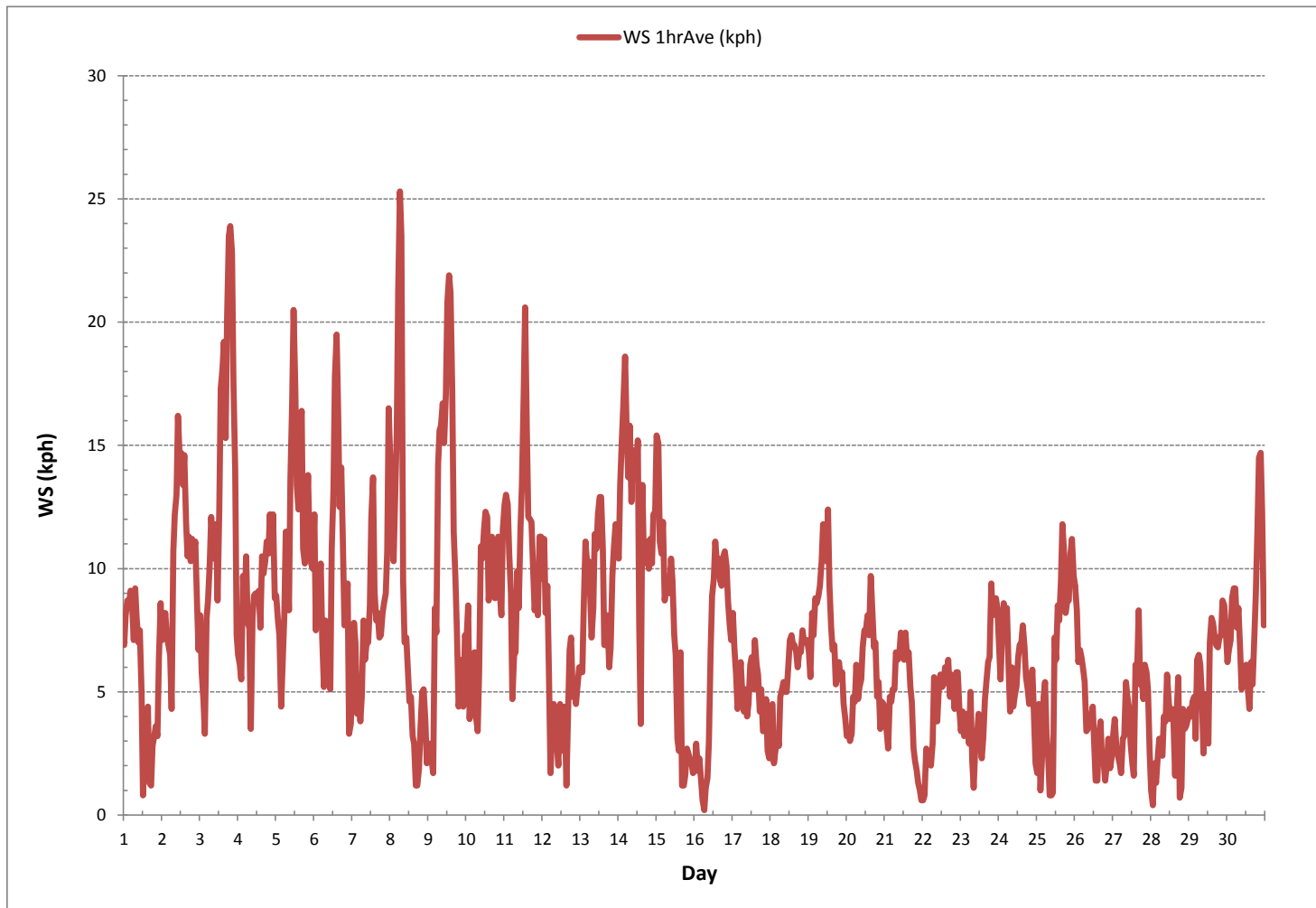
24 HR AVERAGES November 2016



MONTHLY SUMMARY

Summary table with 2 columns: Metric and Value. Includes: NUMBER OF NON-ZERO READINGS: 720; MINIMUM 1-HR AVERAGE: 0.2 kph @ HOUR(S) 6 ON DAY(S) 16; MAXIMUM 1-HR AVERAGE: 25.3 kph @ HOUR(S) 6 ON DAY(S) 8; MAXIMUM 24-HR AVERAGE: 12.0 kph ON DAY(S) 14; MONTHLY CALIBRATION TIME: 0 hrs; MONTHLY AVERAGE: 3.4 kph; OPERATIONAL TIME: 720 hrs; AMD OPERATION UPTIME: 100.0 %.

WIND SPEED Hourly Averages (WS kph)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	17.8	20.3	20.0	20.8	24.3	19.5	17.4	25.6	19.5	16.5	18.4	15.2	12.4	12.6	10.8	11.7	5.1	3.8	6.7	8.1	10.2	10.7	15.3	16.4	3.8	25.6	15.0	24	
2	14.7	16.4	17.3	22.1	16.9	16.7	12.8	22.1	24.3	27.8	30.2	28.2	24.7	27.4	25.4	21.2	18.5	17.7	16.8	19.7	21.1	20.7	16.5	12.3	12.3	30.2	20.5	24	
3	17.7	17.0	10.9	10.1	23.4	15.9	19.6	25.8	20.0	23.9	26.5	19.4	28.1	32.7	32.7	36.9	28.6	36.6	43.4	40.6	40.7	31.1	28.3	17.6	10.1	43.4	26.1	24	
4	13.7	12.9	13.4	16.2	20.8	21.8	18.3	17.0	12.9	16.4	20.4	17.3	14.8	18.0	15.7	17.3	17.6	20.4	21.4	21.3	20.4	23.4	23.7	20.2	12.9	23.7	18.1	24	
5	18.7	14.4	13.9	14.7	16.0	17.1	19.2	19.2	19.1	26.0	35.9	40.6	30.3	31.1	23.2	31.1	39.9	36.8	23.0	25.0	24.2	21.3	18.3	19.2	13.9	40.6	24.1	24	
6	23.6	15.3	16.4	18.7	20.6	16.4	9.7	13.9	12.8	11.3	14.6	19.5	25.6	31.9	37.0	29.5	22.7	25.4	24.6	16.4	19.1	19.4	7.9	12.8	7.9	37.0	19.4	24	
7	14.9	16.7	12.8	7.9	11.9	9.9	13.3	15.2	15.1	13.7	12.8	18.3	23.9	25.6	19.5	17.0	16.4	13.0	16.8	14.9	17.4	16.2	25.6	29.6	7.9	29.6	16.6	24	
8	27.2	25.2	22.7	27.7	34.7	41.6	48.8	42.6	32.6	13.4	17.5	11.1	11.9	12.0	11.8	6.9	3.4	5.6	5.1	7.0	9.1	8.9	7.4	8.3	3.4	48.8	18.4	24	
9	6.5	6.9	6.5	8.0	18.0	20.4	31.0	27.1	26.8	30.8	30.1	29.7	42.4	38.2	41.8	33.2	28.7	18.6	17.1	10.9	12.2	14.6	8.5	14.4	6.5	42.4	21.8	24	
10	16.3	15.2	11.8	12.4	12.7	13.8	10.7	9.1	14.1	19.7	17.4	22.7	26.4	26.5	20.6	22.4	23.6	30.9	22.3	22.9	23.1	18.2	16.3	21.4	9.1	30.9	18.8	24	
11	22.6	23.3	20.1	19.0	15.9	10.7	10.8	13.1	18.2	18.5	24.9	25.5	32.4	38.8	29.9	24.0	21.6	23.4	19.7	16.8	18.1	15.9	19.8	19.2	10.7	38.8	20.9	24	
12	17.4	23.5	15.2	19.5	12.0	6.7	7.4	8.8	6.0	12.2	5.0	8.9	7.7	5.8	13.8	7.7	8.5	12.9	13.8	10.7	10.1	9.6	10.5	10.4	5.0	23.5	11.0	24	
13	10.1	9.9	14.9	22.2	21.1	25.9	20.3	16.6	16.2	20.7	19.8	21.4	25.9	22.7	20.3	16.0	12.1	15.5	12.6	13.3	15.3	20.4	24.2	18.8	9.9	25.9	18.2	24	
14	18.0	26.0	37.1	34.0	35.4	29.1	34.0	33.5	25.0	26.7	25.7	30.7	34.7	17.9	12.6	29.2	17.8	21.0	19.1	16.9	19.6	18.4	22.2	25.9	12.6	37.1	25.4	24	
15	27.8	25.5	20.7	18.5	20.6	19.9	17.0	17.9	20.1	18.1	18.2	14.4	11.1	8.1	8.8	11.3	8.0	5.6	3.3	5.1	3.8	3.9	3.6	3.3	3.3	3.3	27.8	13.1	24
16	2.8	4.1	3.6	3.3	3.1	2.3	3.2	2.5	3.4	8.9	14.7	21.2	22.3	22.2	23.6	22.4	22.9	32.0	24.7	27.1	24.6	23.0	19.7	20.0	2.3	32.0	14.9	24	
17	22.3	17.2	14.1	9.7	15.3	15.2	11.7	10.8	13.3	8.5	15.0	14.1	16.0	16.5	15.7	13.7	11.8	8.3	10.8	9.2	8.7	11.4	7.1	5.5	5.5	22.3	12.6	24	
18	P	11.1	5.6	6.0	7.8	6.5	9.1	11.0	11.6	11.8	11.3	14.6	15.0	17.3	15.0	16.8	15.8	16.0	15.0	15.0	15.9	15.2	15.1	16.1	5.6	17.3	12.8	23	
19	16.2	14.3	18.1	16.5	20.0	19.6	20.9	22.2	24.4	25.3	25.3	23.1	28.1	23.6	18.2	17.7	15.9	12.3	13.9	14.3	13.3	14.2	12.2	8.9	8.9	28.1	18.3	24	
20	9.1	9.4	6.0	13.0	12.5	10.6	12.7	11.9	12.1	13.5	18.1	17.9	17.1	20.5	19.3	22.0	24.1	15.8	17.2	12.6	13.6	9.1	10.3	9.1	6.0	24.1	14.1	24	
21	7.6	8.5	6.5	9.1	10.9	11.6	14.9	15.4	14.1	13.3	17.5	14.3	12.4	14.9	13.1	12.5	11.5	9.9	6.3	8.4	7.7	6.4	5.9	3.3	3.3	17.5	10.7	24	
22	3.0	3.4	4.4	5.2	5.8	5.4	7.9	14.1	12.8	11.3	13.3	14.5	14.7	17.2	16.9	16.3	19.9	16.1	13.2	12.0	12.2	14.8	15.4	10.2	3.0	19.9	11.7	24	
23	9.3	10.1	7.7	8.1	8.2	8.5	11.7	9.6	4.3	5.0	9.5	8.6	7.7	5.9	8.3	9.6	9.7	11.3	11.3	18.9	14.5	16.4	14.1	14.1	4.3	18.9	10.1	24	
24	11.2	10.0	12.6	13.7	14.6	15.6	12.8	9.4	10.5	11.8	12.5	14.5	18.7	16.6	17.7	18.2	17.1	13.6	11.1	11.4	12.2	13.3	10.0	6.3	6.3	18.7	13.1	24	
25	8.5	11.7	10.1	4.8	8.9	9.2	7.8	4.9	6.9	3.1	6.8	15.1	11.6	16.4	16.3	18.5	20.3	19.8	13.8	15.3	15.8	21.2	20.1	17.0	3.1	21.2	12.7	24	
26	19.8	18.7	10.5	10.6	10.2	10.3	10.9	6.7	7.6	8.4	6.8	7.3	7.8	4.1	4.1	5.4	6.4	5.3	3.6	4.3	5.8	5.4	4.6	4.9	3.6	19.8	7.9	24	
27	6.6	7.0	5.3	5.6	5.1	4.3	7.2	6.7	14.1	13.9	10.5	7.9	5.5	8.7	12.7	10.2	13.5	10.3	14.0	11.4	11.1	10.1	12.0	7.4	4.3	14.1	9.2	24	
28	5.0	4.7	7.8	6.2	6.2	6.6	5.7	4.3	7.0	8.3	8.4	7.4	7.0	7.3	7.0	4.6	7.7	9.3	6.0	4.8	8.9	6.7	7.0	6.4	4.3	9.3	6.7	24	
29	9.1	8.5	7.8	8.1	7.3	11.4	10.9	11.0	10.8	7.1	9.6	8.6	11.2	13.2	16.2	14.5	14.6	13.4	12.5	12.7	15.6	16.6	16.7	15.4	7.1	16.7	11.8	24	
30	13.3	13.4	13.6	15.9	18.1	19.9	16.9	19.1	13.7	14.5	14.2	14.8	12.8	13.1	18.1	11.6	10.7	14.5	17.5	18.9	26.7	25.7	22.5	15.6	10.7	26.7	16.5	24	
HOURLY MAX	27.8	26.0	37.1	34.0	35.4	41.6	48.8	42.6	32.6	30.8	35.9	40.6	42.4	38.8	41.8	36.9	39.9	36.8	43.4	40.6	40.7	31.1	28.3	29.6					
HOURLY AVG	14.2	14.0	12.9	13.6	15.3	14.7	15.2	15.6	15.0	15.3	17.0	17.6	18.7	18.9	18.2	17.6	16.5	16.5	15.2	14.9	15.7	15.4	14.7	13.7					

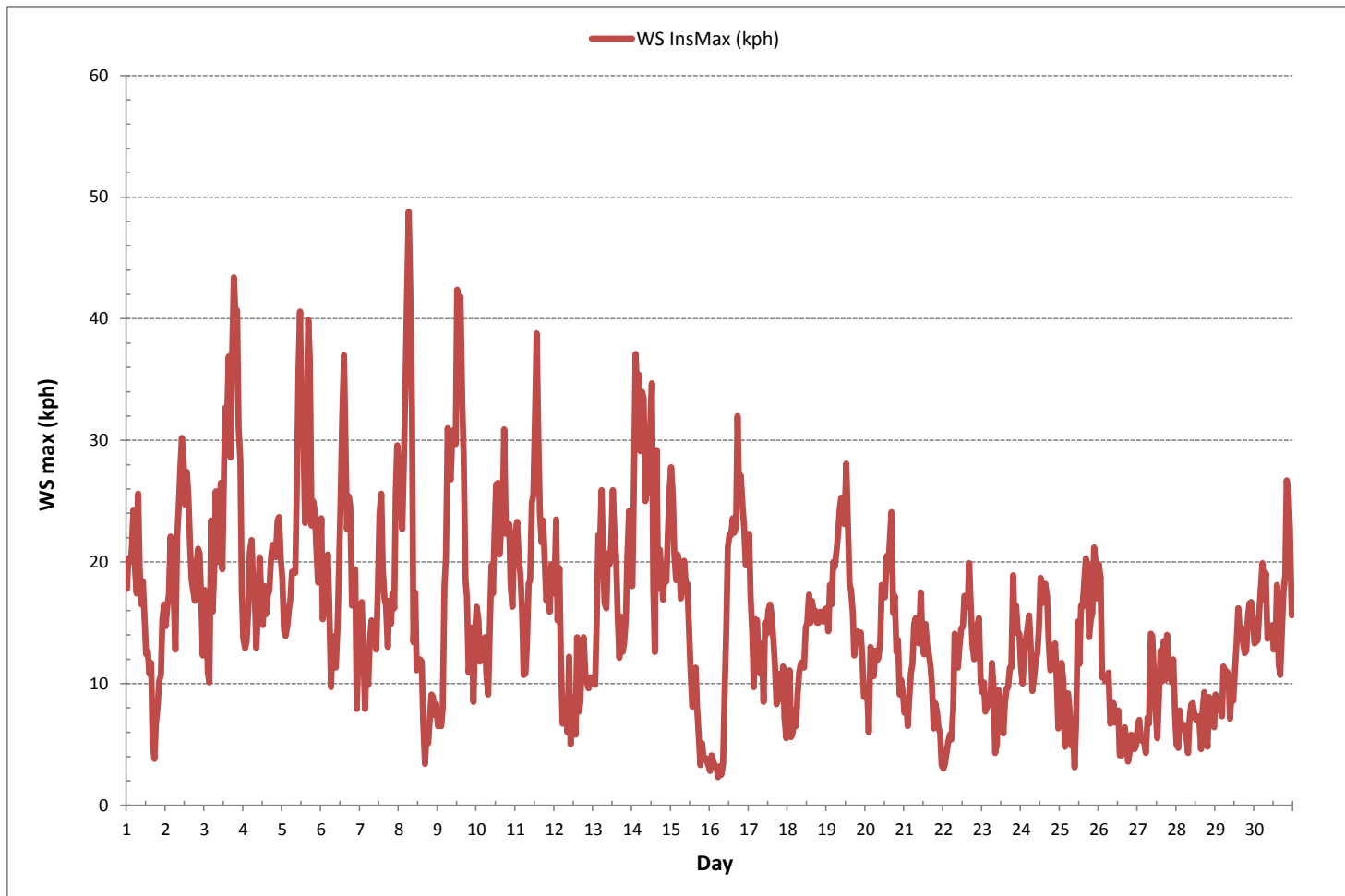
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	48.8	kph	@ HOUR(S)	6	ON DAY(S)	8
					VAR-VARIOUS	
OPERATIONAL TIME:					719	hrs

WIND SPEED Instantaneous Maximum (WS kph)

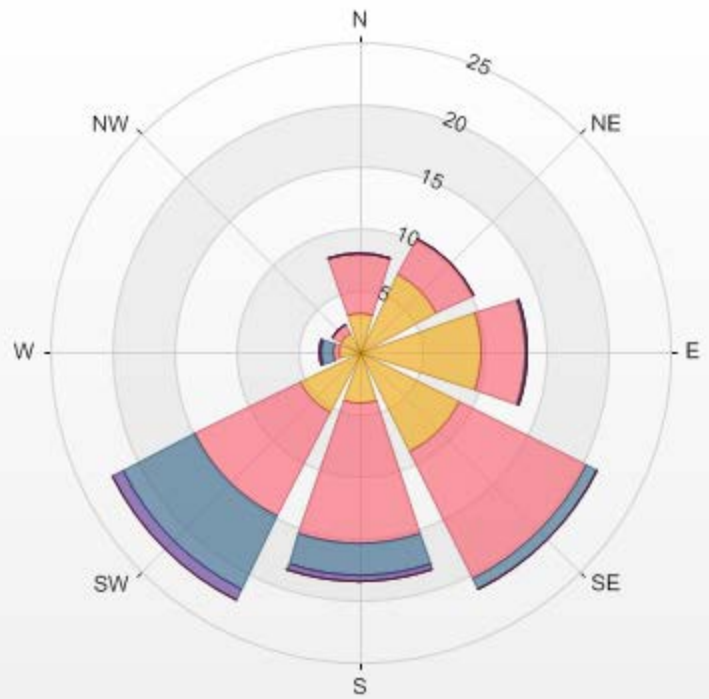


Wind: THREE CREEKS #842 TRAILER Monitor: WSP [kph] Monthly: 11/2016 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00 [kph]

Direction	0.0-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	3.19	4.72	0	0	0	0	7.91
NE	6.94	3.33	0	0	0	0	10.27
E	9.86	3.47	0.14	0	0	0	13.47
SE	9.03	11.53	0.97	0	0	0	21.53
S	4.17	11.39	2.5	0.56	0	0	18.62
SW	5.42	9.44	6.53	0.97	0	0	22.36
W	1.67	0.56	0.97	0.14	0	0	3.34
NW	1.67	0.83	0	0	0	0	2.5
Summary	41.95	45.27	11.11	1.67	0	0	100

% Icon	Classes (kph)	42		0.0-6.0	45		6.0-12.0	11		12.0-20.0	2		20.0-29.0	0		29.0-39.0	0		>39.0
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THREE CREEKS #842 TRAILER 01/11/2016 00:00 - 30/11/2016 23:00 Calm: 0.00%



WIND DIRECTION



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY																											
1	N	NNE	NNE	N	N	NNE	N	N	N	N	NNE	N	N	NNW	NW	ENE	ENE	ENE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	NNE	24
2	ESE	ESE	ESE	ESE	ESE	SE	SE	SSE	S	S	SSW	SW	SW	SW	SW	SSW	SSW	S	SSE	SSE	SSE	SE	ESE	ESE	S	24	
3	ESE	SE	ESE	ESE	SSW	SSW	S	S	S	S	SSE	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SSW	SSW	S	SSW	24	
4	SSE	SSE	SSE	SE	SE	SSE	SE	SSE	S	S	S	S	S	SSE	SSE	SSE	SE	SE	SE	SE	SE	SSE	S	S	SSW	SSE	24
5	S	S	SE	SE	SSE	SSE	SSE	SSE	SSE	S	S	SSW	SSW	SW	WSW	W	W	WSW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	24
6	SSW	SSE	S	S	SSW	SSW	SSE	S	S	S	S	SSW	SW	SW	SW	SW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	24
7	SW	SSW	S	SE	SSE	SE	SE	SE	SE	SE	ESE	SE	SE	SSE	SE	SE	SE	SE	SE	SE	SE	ESE	SE	SE	SSE	SE	24
8	SSE	SSE	SE	SE	SSE	S	S	S	SW	W	S	S	SW	SW	WSW	S	SSE	NNE	ENE	ENE	ENE	ENE	ENE	ENE	NNE	SSE	24
9	ENE	ENE	ESE	SSW	WSW	SSE	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	S	SW	S	SSE	S	SW	24	
10	SSW	SW	SSE	SE	SE	S	SSE	SE	SE	SSE	SSE	SSE	SE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SSE	SSE	SSE	SE	24
11	SSE	S	S	SSE	SSE	SSE	SSE	SSW	S	S	SW	SW	SW	WSW	WSW	WSW	SW	SW	SSW	SW	SW	SW	SSW	S	SSW	24	
12	SSW	SSW	S	SSW	SSE	SW	SSW	SSE	SE	SSE	S	SSW	W	W	NNW	WNW	W	SW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	24
13	SSW	SSW	SSW	SW	SW	SW	SSW	S	S	S	SSW	SW	SW	SSW	SSW	S	SSE	SE	SE	SE	SE	SSW	SSW	SSW	SSW	SSW	24
14	S	SSW	SW	SW	SW	WSW	WSW	WSW	SW	WSW	WSW	W	W	W	SW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	24
15	SW	SW	SW	SSW	SW	SSW	SSW	SSW	S	SSW	SW	SW	SW	SW	SSW	SW	WSW	E	E	ENE	ESE	E	ENE	ENE	SSW	SSW	24
16	E	ENE	ENE	ESE	ESE	E	ENE	ESE	ESE	N	N	NNW	NNW	NNW	NNW	NNW	N	N	NNE	N	NNE	N	NNE	N	N	N	24
17	NNE	NNE	NE	NE	NNE	NNE	NNE	N	NNE	NNE	NNE	NNW	NW	NW	NNW	N	N	N	NNE	NE	NE	NE	NE	NNE	NNE	NNE	24
18	NE	NE	E	ENE	ENE	E	ENE	NE	ENE	ENE	ENE	E	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	24
19	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
20	NE	NE	NNE	E	ESE	E	ESE	ESE	E	E	E	ESE	E	E	E	E	E	ENE	E	E	ENE	NNE	NNE	NNE	E	24	
21	NNE	NNE	N	NW	NW	NNW	N	N	NNW	NNW	NNW	NNW	NNW	NW	NNW	NW	NW	NW	NNW	NNW	NNW	NW	NE	ENE	SE	NNW	24
22	SE	E	ENE	ESE	ESE	SE	ESE	ESE	ESE	SE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24
23	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	E	E	ESE	SE	ESE	ESE	ESE	SSE	S	S	S	SSW	S	S	SSW	S	SSE	24	
24	S	SSE	SSE	SSE	SSE	SSE	SE	E	E	ESE	ESE	ESE	E	E	E	ESE	E	E	ENE	E	E	ESE	E	ESE	E	ESE	24
25	SE	E	ENE	NE	ENE	ENE	ENE	ENE	SE	ENE	W	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	24
26	SSW	SSW	S	S	SSE	SSE	SSE	SE	SE	SE	SSE	SSE	SE	ESE	ENE	ENE	ENE	E	ENE	NNE	ENE	ENE	NE	NNE	SSE	24	
27	N	N	NNE	NE	NE	N	NE	ENE	E	E	E	E	ESE	SSW	WSW	SW	SW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	S	24
28	SE	ENE	WSW	SSW	WSW	WSW	SW	SSW	SSW	WSW	SW	WSW	WSW	WSW	W	W	WSW	SW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
29	SSW	S	S	SSW	S	SSW	S	S	S	SSE	S	SSW	S	S	SSE	SE	SE	SE	SE	SE	ESE	SE	SE	SE	SSE	24	
30	SE	SE	ESE	ESE	SE	SE	ESE	ESE	ESE	ESE	ESE	SE	SE	S	SSW	SSW	S	SSE	SSE	SSE	SSE	SSE	SSE	S	SSW	SSE	24

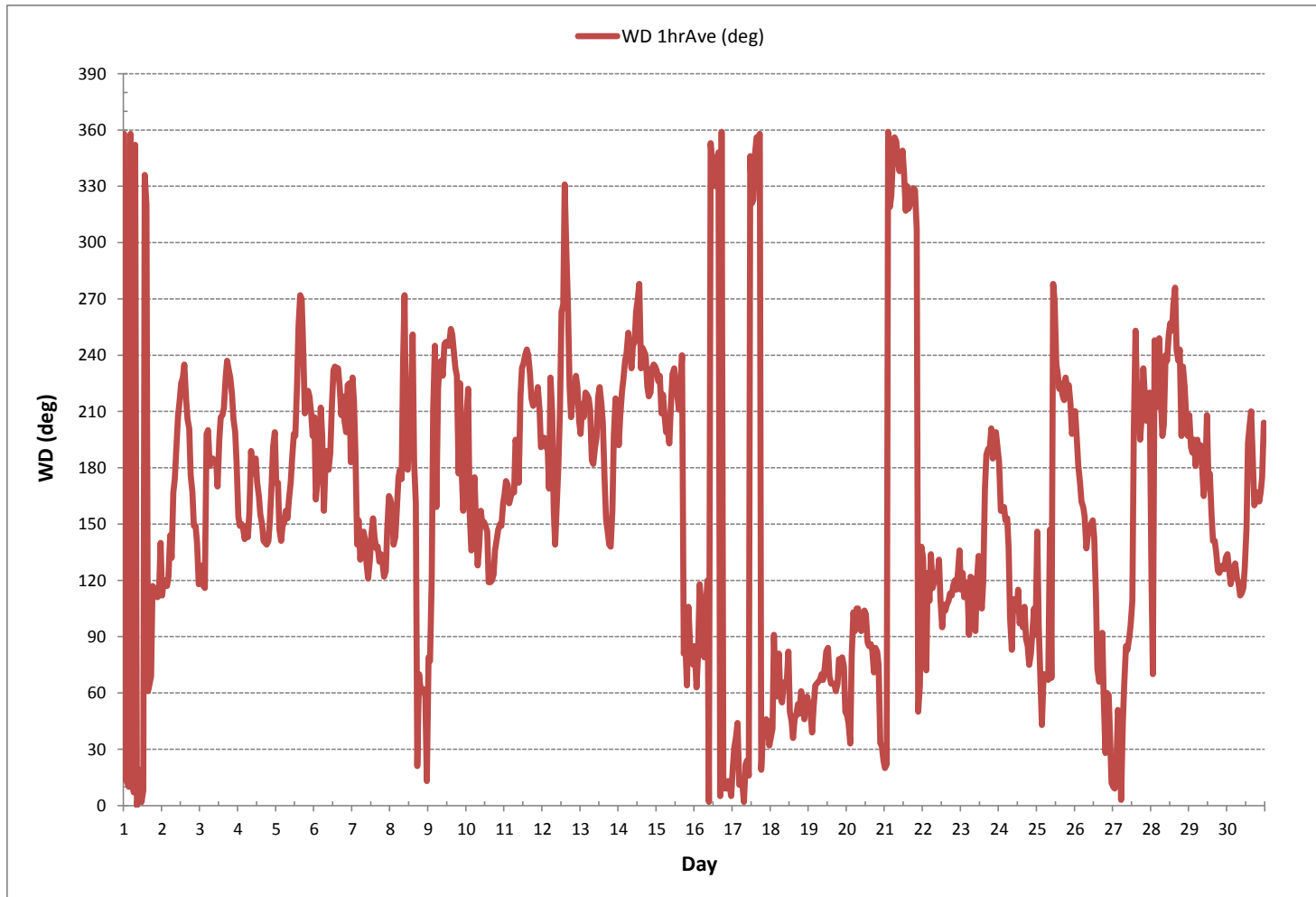
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	October 12, 2016
DECLINATION :	MAGNETIC DECLINATION 15 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	79.32		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	180	(S)

WIND DIRECTION Hourly Averages (WD)



RELATIVE HUMIDITY



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

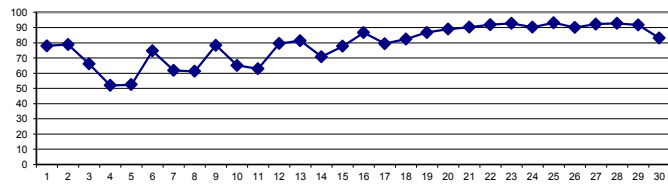
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	91	88	88	85	85	85	86	82	84	82	74	70	67	60	58	53	63	81	86	83	81	80	79	80	53	91	78	24	
2	82	85	86	85	86	86	87	88	87	85	81	75	69	65	61	61	65	73	76	78	83	83	83	81	61	88	79	24	
3	75	70	70	72	73	76	81	81	83	77	69	65	58	52	52	51	55	55	55	57	59	64	64	71	51	83	66	24	
4	77	79	79	80	80	75	71	65	64	56	51	41	36	38	42	40	40	39	36	34	30	30	31	35	30	80	52	24	
5	41	46	50	50	50	47	44	44	43	43	42	40	40	44	49	53	53	59	60	64	70	72	74	81	40	81	52	24	
6	83	89	90	89	85	86	92	92	89	88	82	75	65	56	52	51	56	61	64	65	66	63	70	82	51	92	75	24	
7	73	70	73	82	84	86	85	82	79	78	70	54	39	37	38	41	45	49	51	51	52	55	57	52	37	86	62	24	
8	53	57	59	60	57	50	47	48	59	62	52	44	41	42	41	46	54	72	80	86	89	90	90	91	41	91	61	24	
9	93	94	93	94	94	92	88	87	84	81	78	70	63	58	55	55	59	66	70	76	79	79	86	86	55	94	78	24	
10	80	78	81	86	86	87	88	89	87	82	72	56	45	38	40	43	46	47	48	52	53	56	60	62	38	89	65	24	
11	61	59	62	66	69	69	72	74	75	74	61	61	61	56	56	57	58	60	58	57	58	59	58	58	67	56	75	63	24
12	69	68	70	71	77	79	81	83	83	80	79	74	70	71	69	70	79	87	89	91	92	92	93	93	68	93	80	24	
13	95	94	95	96	97	97	97	97	97	94	86	77	70	62	62	65	70	74	74	73	72	69	70	70	62	97	81	24	
14	69	68	69	72	71	69	68	66	73	69	69	68	66	86	92	81	62	62	61	65	68	69	73	74	76	61	92	71	24
15	74	74	77	77	77	78	81	79	79	75	71	67	64	58	56	64	72	87	91	92	92	93	93	93	56	93	78	24	
16	93	93	93	93	92	92	92	92	92	92	81	75	70	71	69	78	85	87	88	90	91	90	91	90	69	93	87	24	
17	88	88	88	87	88	86	86	84	82	80	77	72	68	65	62	70	75	79	80	78	80	79	80	84	62	88	79	24	
18	86	85	85	87	87	87	87	86	86	85	82	79	77	76	75	76	77	80	82	81	82	83	84	84	75	87	82	24	
19	84	84	85	85	85	86	88	89	89	88	88	88	89	87	84	85	86	87	87	86	87	88	88	89	84	89	87	24	
20	89	91	91	92	90	90	89	89	90	90	89	87	84	84	83	85	88	89	90	91	92	91	91	91	83	92	89	24	
21	92	92	91	93	92	93	92	91	93	92	90	87	87	87	86	88	90	90	90	91	91	91	90	90	86	93	90	24	
22	89	87	88	88	90	91	92	94	94	93	93	92	92	92	93	93	93	94	94	93	93	93	92	92	87	94	92	24	
23	92	94	92	92	93	93	93	92	92	93	92	92	92	91	92	93	94	93	93	94	95	94	93	94	91	95	93	24	
24	94	94	94	93	93	93	94	92	93	93	92	89	87	86	85	86	86	89	89	90	90	88	86	89	85	94	90	24	
25	93	92	90	91	93	93	93	93	93	93	92	92	95	96	96	96	95	93	93	94	93	92	92	92	90	96	93	24	
26	92	91	92	93	93	92	92	91	92	91	89	88	86	82	86	90	91	91	90	90	90	91	89	88	82	93	90	24	
27	88	91	90	91	91	91	92	93	93	93	92	92	92	92	93	94	93	92	92	93	94	94	95	94	88	95	92	24	
28	94	94	94	94	93	93	93	93	93	93	93	93	93	93	92	92	92	92	92	92	92	92	92	92	92	94	93	24	
29	92	92	92	92	92	92	92	91	91	91	92	93	93	93	92	92	92	92	92	92	92	91	89	89	89	93	92	24	
30	89	90	88	86	83	81	82	81	84	82	80	76	73	75	74	79	85	85	85	84	86	87	89	89	73	90	83	24	
HOURLY MAX	95	94	95	96	97	97	97	97	97	94	93	93	95	96	96	96	95	94	94	94	95	94	95	94					
HOURLY AVG	82	83	83	84	84	84	84	84	84	83	79	74	72	70	69	70	73	77	78	79	80	80	81	82					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

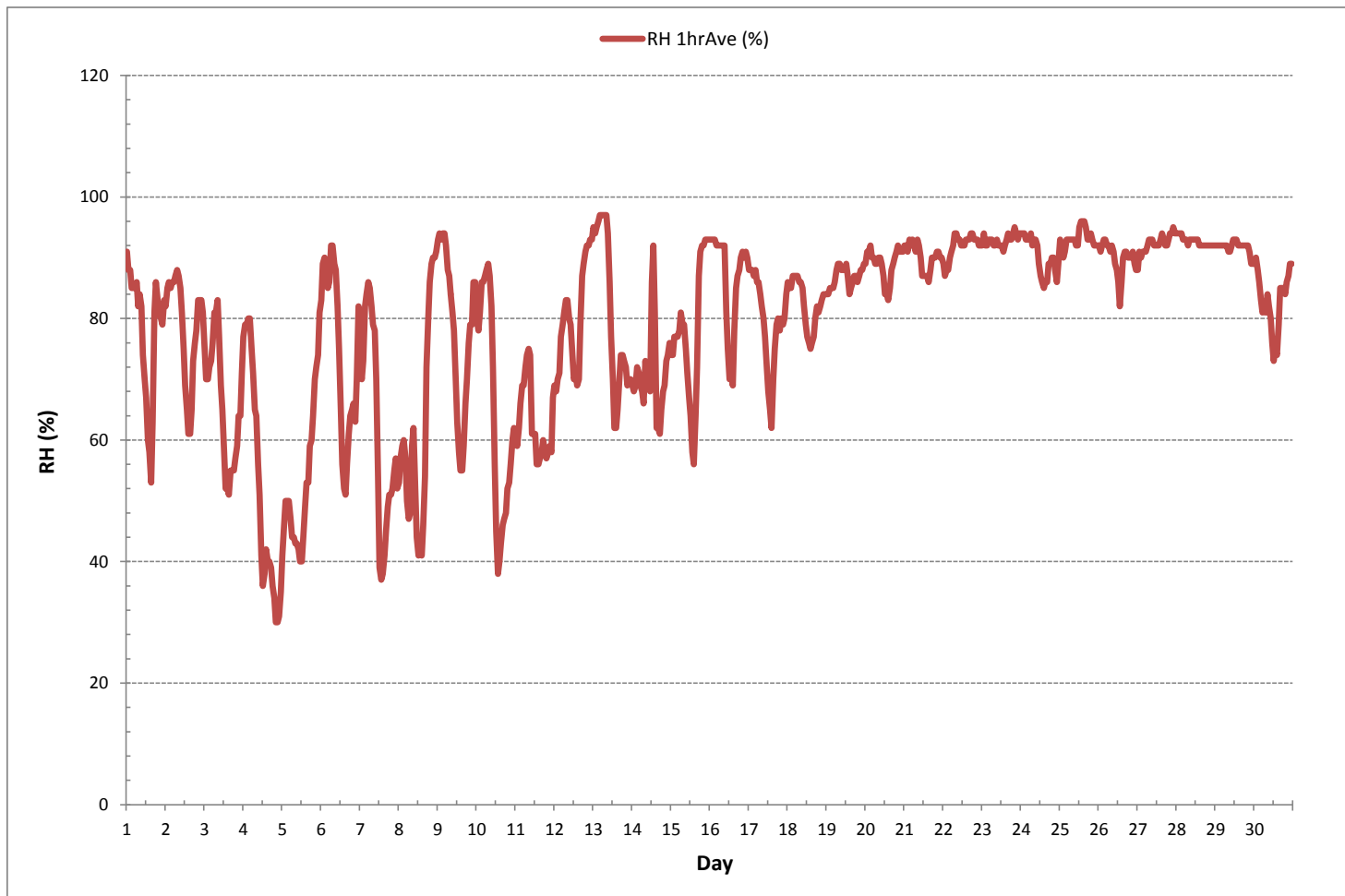
24 HR AVERAGES November 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	30	%	@ HOUR(S)	20, 21	ON DAY(S)	4
MAXIMUM 1-HR AVERAGE:	97	%	@ HOUR(S)	VAR	ON DAY(S)	13
MAXIMUM 24-HR AVERAGE:	93	%			ON DAY(S)	VAR
					VAR-VARIOUS	
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	15.39		MONTHLY AVERAGE:			79 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

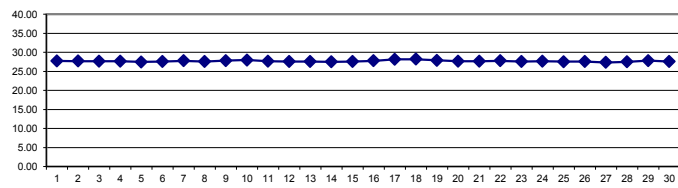
BAROMETRIC PRESSURE Hourly Averages (BP inHg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	27.61	27.62	27.64	27.65	27.66	27.68	27.69	27.71	27.74	27.74	27.75	27.76	27.77	27.76	27.77	27.77	27.77	27.78	27.80	27.79	27.78	27.77	27.75	27.74	27.61	27.80	27.73	24	
2	27.73	27.72	27.70	27.68	27.68	27.67	27.67	27.66	27.66	27.67	27.69	27.70	27.71	27.71	27.72	27.72	27.72	27.73	27.73	27.73	27.72	27.71	27.70	27.67	27.66	27.73	27.70	24	
3	27.65	27.63	27.63	27.62	27.62	27.64	27.66	27.69	27.70	27.70	27.71	27.70	27.69	27.68	27.69	27.69	27.72	27.73	27.74	27.75	27.76	27.77	27.78	27.79	27.62	27.79	27.70	24	
4	27.79	27.79	27.80	27.80	27.78	27.76	27.75	27.74	27.75	27.74	27.74	27.72	27.70	27.69	27.68	27.66	27.64	27.62	27.60	27.57	27.56	27.56	27.55	27.55	27.55	27.80	27.69	24	
5	27.54	27.55	27.54	27.52	27.52	27.51	27.50	27.48	27.47	27.47	27.46	27.45	27.43	27.42	27.42	27.44	27.49	27.49	27.48	27.48	27.48	27.49	27.49	27.50	27.42	27.55	27.48	24	
6	27.50	27.51	27.52	27.51	27.51	27.52	27.53	27.53	27.55	27.57	27.59	27.60	27.60	27.61	27.62	27.64	27.66	27.67	27.69	27.71	27.72	27.74	27.75	27.76	27.76	27.50	27.76	27.61	24
7	27.77	27.80	27.80	27.81	27.82	27.83	27.83	27.85	27.86	27.86	27.84	27.84	27.84	27.82	27.80	27.80	27.79	27.77	27.75	27.74	27.72	27.71	27.70	27.70	27.70	27.86	27.79	24	
8	27.68	27.67	27.65	27.63	27.61	27.60	27.60	27.60	27.61	27.64	27.64	27.64	27.65	27.63	27.62	27.61	27.61	27.61	27.61	27.60	27.60	27.60	27.60	27.59	27.60	27.59	27.68	27.62	24
9	27.59	27.59	27.59	27.61	27.66	27.65	27.66	27.70	27.72	27.76	27.79	27.81	27.84	27.85	27.87	27.90	27.93	27.94	27.97	27.99	28.02	28.04	28.05	28.06	27.59	28.06	27.59	28.02	24
10	28.08	28.10	28.11	28.11	28.10	28.11	28.11	28.10	28.09	28.08	28.06	28.04	28.01	27.96	27.93	27.89	27.86	27.84	27.81	27.78	27.76	27.74	27.72	27.72	27.72	28.11	27.98	24	
11	27.71	27.69	27.67	27.66	27.64	27.63	27.62	27.64	27.66	27.66	27.67	27.67	27.67	27.68	27.68	27.69	27.70	27.70	27.70	27.69	27.69	27.68	27.67	27.66	27.62	27.71	27.67	24	
12	27.64	27.63	27.63	27.61	27.60	27.58	27.56	27.55	27.55	27.55	27.53	27.52	27.52	27.53	27.53	27.54	27.55	27.55	27.56	27.57	27.58	27.59	27.60	27.60	27.52	27.64	27.57	24	
13	27.61	27.62	27.63	27.64	27.64	27.65	27.66	27.65	27.65	27.65	27.65	27.65	27.64	27.62	27.59	27.57	27.55	27.53	27.51	27.48	27.46	27.46	27.46	27.45	27.45	27.66	27.58	24	
14	27.44	27.43	27.43	27.43	27.43	27.43	27.45	27.45	27.46	27.48	27.50	27.52	27.54	27.55	27.56	27.57	27.58	27.59	27.61	27.62	27.62	27.63	27.64	27.64	27.43	27.64	27.52	24	
15	27.65	27.65	27.65	27.65	27.64	27.64	27.63	27.62	27.62	27.62	27.61	27.60	27.59	27.58	27.57	27.56	27.56	27.56	27.57	27.57	27.56	27.57	27.59	27.60	27.61	27.56	27.65	27.60	24
16	27.62	27.63	27.64	27.66	27.67	27.69	27.70	27.71	27.73	27.73	27.75	27.78	27.79	27.81	27.82	27.84	27.85	27.88	27.90	27.92	27.93	27.95	27.97	27.98	27.62	27.98	27.79	24	
17	28.01	28.02	28.04	28.05	28.06	28.07	28.08	28.10	28.11	28.12	28.13	28.14	28.15	28.16	28.17	28.18	28.19	28.20	28.22	28.23	28.24	28.25	28.26	28.27	28.01	28.27	28.14	24	
18	28.28	28.28	28.28	28.29	28.29	28.28	28.27	28.27	28.26	28.25	28.25	28.22	28.19	28.19	28.19	28.17	28.17	28.16	28.15	28.14	28.13	28.12	28.10	28.10	28.10	28.29	28.22	24	
19	28.09	28.08	28.07	28.06	28.03	28.02	28.00	27.99	27.97	27.95	27.93	27.92	27.89	27.86	27.84	27.84	27.83	27.82	27.81	27.80	27.79	27.78	27.77	27.77	27.77	28.09	27.91	24	
20	27.77	27.76	27.75	27.74	27.73	27.71	27.70	27.70	27.69	27.68	27.68	27.66	27.65	27.63	27.62	27.61	27.60	27.59	27.57	27.56	27.55	27.54	27.54	27.55	27.54	27.77	27.65	24	
21	27.55	27.56	27.56	27.57	27.58	27.59	27.60	27.62	27.64	27.65	27.66	27.67	27.68	27.69	27.70	27.73	27.75	27.77	27.78	27.80	27.82	27.83	27.84	27.85	27.55	27.85	27.69	24	
22	27.87	27.88	27.88	27.88	27.88	27.88	27.88	27.87	27.87	27.87	27.86	27.83	27.81	27.80	27.76	27.74	27.73	27.71	27.68	27.67	27.65	27.64	27.63	27.63	27.63	27.88	27.79	24	
23	27.63	27.62	27.62	27.63	27.62	27.61	27.58	27.59	27.60	27.59	27.60	27.60	27.60	27.60	27.61	27.62	27.63	27.64	27.65	27.66	27.67	27.67	27.67	27.68	27.58	27.68	27.62	24	
24	27.69	27.70	27.71	27.72	27.72	27.72	27.73	27.72	27.72	27.70	27.70	27.68	27.67	27.66	27.64	27.62	27.59	27.58	27.56	27.54	27.52	27.52	27.51	27.50	27.50	27.70	27.73	27.64	24
25	27.52	27.49	27.50	27.50	27.51	27.50	27.49	27.49	27.49	27.49	27.49	27.51	27.52	27.55	27.56	27.57	27.58	27.59	27.62	27.63	27.64	27.65	27.66	27.67	27.49	27.67	27.55	24	
26	27.67	27.67	27.69	27.69	27.69	27.70	27.69	27.69	27.68	27.68	27.65	27.64	27.63	27.62	27.60	27.58	27.58	27.59	27.58	27.57	27.56	27.54	27.52	27.52	27.52	27.70	27.63	24	
27	27.51	27.49	27.48	27.46	27.43	27.41	27.40	27.38	27.35	27.33	27.32	27.32	27.30	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.30	27.30	27.30	27.31	27.29	27.51	27.35	24	
28	27.32	27.33	27.35	27.37	27.38	27.40	27.42	27.44	27.46	27.48	27.50	27.52	27.54	27.56	27.58	27.60	27.64	27.66	27.68	27.70	27.73	27.74	27.76	27.78	27.32	27.78	27.54	24	
29	27.79	27.81	27.83	27.84	27.84	27.86	27.86	27.86	27.87	27.87	27.86	27.84	27.84	27.83	27.81	27.79	27.78	27.78	27.76	27.75	27.73	27.72	27.71	27.71	27.71	27.87	27.81	24	
30	27.70	27.69	27.66	27.64	27.63	27.61	27.60	27.59	27.58	27.58	27.59	27.59	27.59	27.59	27.59	27.60	27.60	27.61	27.61	27.61	27.62	27.62	27.63	27.63	27.58	27.70	27.61	24	
HOURLY MAX	28.28	28.28	28.28	28.29	28.29	28.28	28.27	28.27	28.26	28.25	28.25	28.25	28.22	28.19	28.19	28.19	28.19	28.20	28.22	28.23	28.24	28.25	28.26	28.27					
HOURLY AVG	27.70	27.70	27.70	27.70	27.70	27.70	27.70	27.70	27.70	27.71	27.71	27.71	27.70	27.70	27.69	27.69	27.70	27.70	27.70	27.70	27.70	27.70	27.70	27.70					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

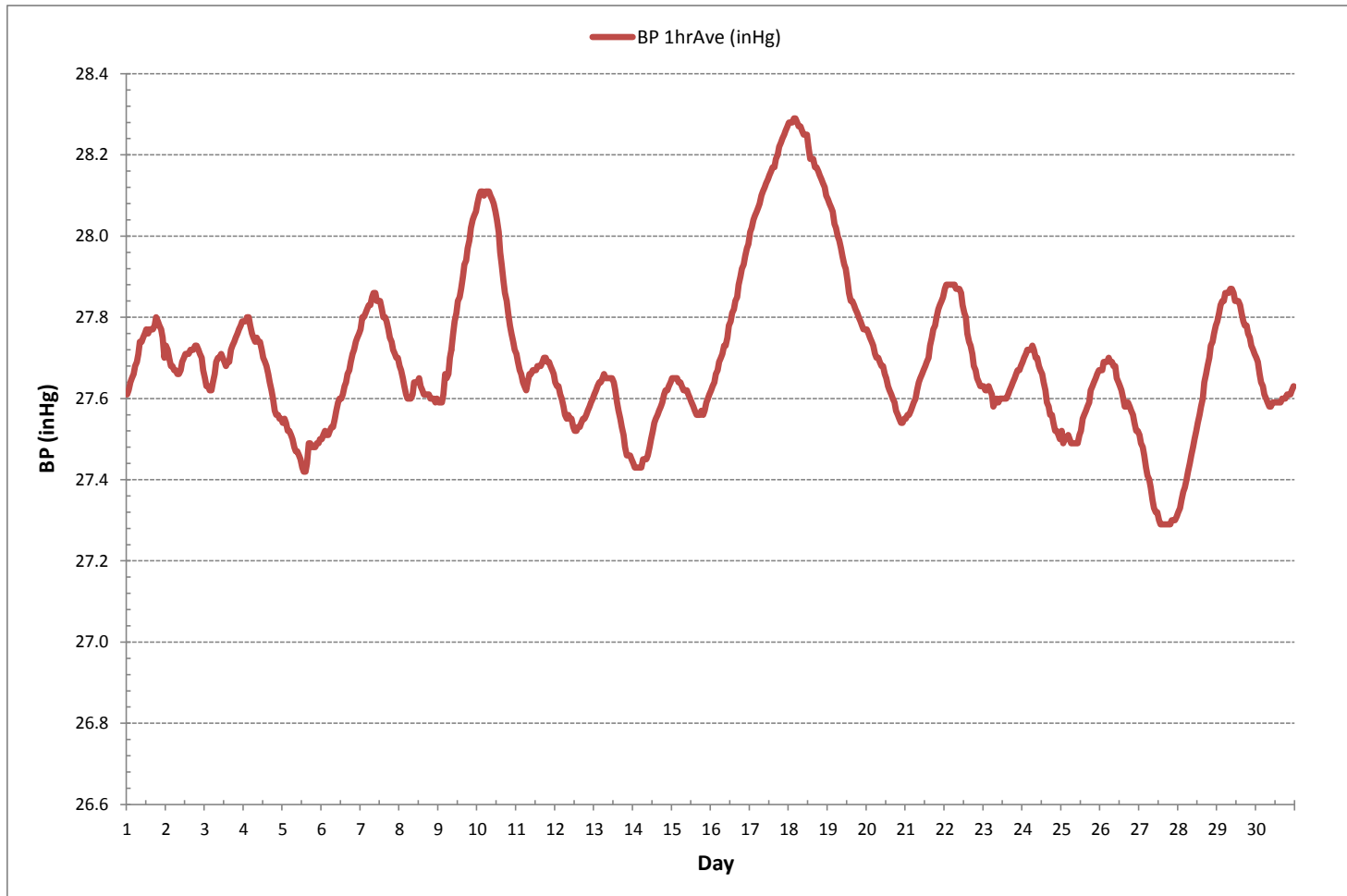
24 HR AVERAGES November 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27.29	inHg	@ HOUR(S)	VAR	ON DAY(S)	27
MAXIMUM 1-HR AVERAGE:	28.29	inHg	@ HOUR(S)	3, 4	ON DAY(S)	18, 18
MAXIMUM 24-HR AVERAGE:	28.22	inHg			ON DAY(S)	18
					VAR-VARIOUS	
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.20				MONTHLY AVERAGE:	27.70 inHg

BAROMETRIC PRESSURE Hourly Averages (BP inHg)



AMBIENT TEMPERATURE



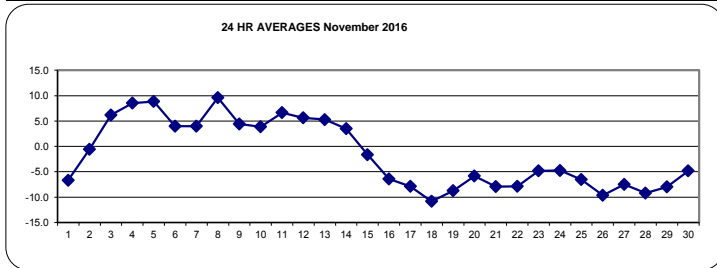
PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - November 2016

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	-5.5	-6.0	-6.3	-6.6	-7.2	-7.3	-7.8	-9.3	-8.3	-6.4	-5.4	-5.3	-3.2	-3.1	-2.2	-4.8	-8.9	-9.5	-8.2	-7.8	-7.4	-7.4	-7.4	-9.5	-9.5	-2.2	-6.7	24
2	-7.4	-6.6	-5.5	-4.7	-3.9	-3.1	-1.9	-1.2	-0.2	1.0	2.2	3.2	4.2	5.0	5.1	4.2	2.3	1.1	0.6	0.1	0.0	-0.1	-0.2	-7.6	-7.6	5.1	-0.6	24
3	2.0	2.4	2.4	3.4	3.5	3.0	3.4	3.0	4.4	6.9	8.5	10.1	11.6	11.8	11.0	9.6	8.6	8.6	8.4	7.9	6.8	6.2	4.5	0.6	0.6	11.8	6.2	24
4	2.8	2.6	2.2	2.3	3.5	4.4	5.1	4.9	7.1	8.8	12.3	13.6	13.1	12.4	12.4	11.4	10.7	11.2	11.7	12.9	13.1	12.7	11.5	2.2	2.2	13.6	8.5	24
5	8.4	7.3	7.2	6.9	7.3	8.1	8.3	8.9	9.9	11.9	13.7	14.0	14.0	12.7	11.3	9.8	8.4	8.2	7.4	6.8	6.5	6.0	4.5	4.5	4.5	14.0	8.8	24
6	2.3	1.9	2.5	3.4	2.6	0.3	0.7	2.2	2.4	4.2	6.2	8.2	9.3	9.7	9.7	8.0	6.9	5.4	4.2	3.4	3.4	1.1	-1.5	-1.5	-1.5	9.7	4.0	24
7	1.7	0.9	-1.5	-2.0	-2.6	-2.0	-0.8	0.0	0.6	2.9	6.8	10.1	10.8	10.2	9.3	8.2	6.9	6.1	6.0	5.7	5.7	6.3	9.1	-2.6	-2.6	10.8	4.0	24
8	8.5	8.0	8.3	9.7	12.3	13.0	12.8	9.9	9.2	12.6	15.3	16.2	17.3	18.1	16.4	14.0	7.9	5.7	3.6	2.6	3.2	2.5	1.5	1.5	1.5	18.1	9.6	24
9	0.4	0.3	0.5	2.4	3.8	6.0	6.2	6.1	6.6	6.7	8.1	8.8	9.4	9.5	9.1	7.7	5.6	4.5	2.5	2.0	1.5	-0.6	-0.6	-0.6	9.5	4.4	24	
10	1.2	0.0	-1.3	-1.5	-1.4	-1.8	-1.8	-1.4	0.0	2.8	6.9	9.4	10.5	9.7	9.1	8.2	7.8	7.2	6.8	7.1	6.5	5.4	5.1	-1.8	-1.8	10.5	3.9	24
11	6.3	5.8	4.8	4.1	4.1	3.6	3.3	3.5	3.4	6.8	8.4	9.4	11.4	11.4	10.4	9.0	8.0	7.7	7.2	6.9	6.7	7.6	6.6	3.3	3.3	11.4	6.7	24
12	6.8	6.3	6.5	5.1	4.3	4.2	3.7	3.6	4.8	5.9	7.0	8.0	8.0	8.6	7.8	6.7	5.3	4.9	4.8	5.0	5.0	5.0	4.6	3.6	3.6	8.6	5.6	24
13	4.8	5.1	4.4	3.3	3.0	3.4	2.8	2.3	3.2	4.7	6.3	7.6	8.9	8.4	7.9	6.2	5.1	5.3	5.8	6.2	7.0	6.6	6.3	2.3	2.3	8.9	5.3	24
14	6.5	6.4	6.6	6.6	6.4	5.3	4.2	2.8	3.5	3.6	4.1	2.5	2.9	4.9	5.0	3.7	3.2	2.0	1.5	1.1	0.5	0.2	0.1	0.1	0.1	6.6	3.5	24
15	0.5	-0.3	-0.7	-1.0	-1.4	-2.3	-2.1	-2.3	-1.4	0.1	1.6	2.8	4.5	4.9	3.1	0.9	-3.2	-4.3	-5.1	-5.7	-6.6	-6.9	-7.2	-7.2	-7.2	4.9	-1.6	24
16	-8.6	-8.7	-9.0	-9.5	-9.7	-10.1	-10.1	-10.0	-6.9	-2.5	-1.5	-0.7	-1.4	-1.1	-3.1	-4.9	-5.5	-6.2	-6.7	-6.9	-6.8	-7.0	-6.9	-10.1	-10.1	-0.7	-6.4	24
17	-7.4	-7.5	-7.5	-7.3	-7.3	-7.3	-7.5	-7.7	-7.1	-6.5	-5.7	-5.1	-4.6	-4.0	-6.3	-7.4	-8.3	-8.9	-9.5	-10.3	-10.3	-10.9	-12.3	-12.3	-12.3	-4.0	-7.9	24
18	-12.9	-13.4	-14.1	-14.0	-13.6	-13.0	-12.7	-12.5	-11.7	-10.4	-9.8	-8.9	-8.2	-8.2	-8.4	-8.6	-9.2	-9.3	-9.4	-9.4	-9.3	-9.4	-9.3	-14.1	-14.1	-8.2	-10.8	24
19	-9.2	-9.3	-9.5	-9.5	-9.3	-9.2	-9.4	-9.4	-9.4	-9.4	-9.3	-9.2	-8.2	-7.4	-7.6	-8.0	-8.1	-8.1	-8.0	-8.1	-8.2	-8.2	-8.2	-9.5	-9.5	-7.4	-8.7	24
20	-8.9	-9.1	-7.4	-6.9	-6.6	-6.3	-6.2	-6.6	-6.4	-5.8	-4.9	-4.1	-3.9	-4.1	-4.6	-4.9	-5.0	-5.1	-5.1	-5.0	-4.7	-4.7	-4.7	-9.1	-9.1	-3.9	-5.8	24
21	-4.7	-5.2	-6.3	-6.4	-6.8	-7.0	-7.5	-7.7	-7.8	-7.6	-7.3	-7.3	-7.5	-7.7	-8.0	-8.5	-8.5	-8.7	-9.7	-10.5	-9.4	-9.2	-10.5	-10.5	-10.5	-4.7	-7.9	24
22	-15.1	-14.3	-14.2	-11.7	-10.5	-9.5	-9.6	-9.8	-9.6	-9.0	-8.7	-7.7	-6.5	-5.6	-4.8	-4.0	-3.2	-2.7	-2.4	-2.9	-3.7	-4.0	-4.3	-15.1	-15.1	-2.4	-7.9	24
23	-5.7	-7.3	-8.7	-7.9	-7.3	-5.9	-5.8	-6.9	-6.1	-4.6	-3.9	-3.3	-2.8	-2.7	-2.6	-2.7	-2.9	-2.9	-3.0	-3.0	-3.0	-3.5	-4.9	-8.7	-8.7	-2.6	-4.8	24
24	-7.2	-7.1	-7.4	-7.6	-7.8	-8.4	-9.6	-9.0	-8.0	-4.0	-2.7	-1.4	-0.8	-0.6	-0.8	-1.1	-2.6	-2.9	-3.1	-3.1	-2.5	-2.4	-4.1	-9.6	-9.6	-0.6	-4.7	24
25	-4.1	-5.8	-9.0	-9.1	-7.4	-7.6	-7.6	-7.2	-6.8	-5.8	-5.7	-5.6	-5.1	-4.5	-3.7	-3.9	-5.3	-6.7	-7.4	-7.3	-7.0	-7.3	-7.4	-9.1	-9.1	-3.7	-6.5	24
26	-7.8	-9.1	-10.4	-10.9	-10.6	-11.0	-11.6	-11.4	-11.3	-8.8	-7.5	-5.6	-4.3	-5.5	-7.2	-9.0	-10.4	-11.0	-11.4	-11.3	-10.4	-10.9	-12.2	-12.2	-12.2	-4.3	-9.7	24
27	-11.8	-10.9	-10.0	-9.3	-9.1	-8.6	-7.2	-6.2	-5.5	-5.2	-4.9	-4.4	-4.2	-6.3	-6.2	-6.9	-7.1	-7.0	-7.1	-7.1	-7.1	-7.4	-13.2	-13.2	-13.2	-4.2	-7.5	24
28	-7.4	-7.9	-8.2	-8.7	-9.1	-9.5	-9.4	-9.2	-9.2	-9.3	-9.3	-9.2	-9.3	-9.4	-9.6	-9.8	-10.0	-9.8	-9.3	-9.2	-9.4	-9.5	-9.4	-10.0	-10.0	-7.4	-9.2	24
29	-9.6	-9.9	-10.0	-9.8	-9.7	-10.1	-10.3	-10.8	-11.1	-10.6	-8.6	-6.7	-5.0	-4.5	-4.4	-5.2	-6.0	-6.6	-6.6	-6.6	-6.2	-5.9	-6.0	-11.1	-11.1	-4.4	-8.0	24
30	-6.5	-5.7	-5.2	-4.7	-4.6	-5.4	-5.4	-5.9	-5.9	-5.5	-4.2	-3.0	-3.2	-3.0	-4.2	-6.0	-5.6	-4.9	-4.3	-4.3	-4.3	-4.1	-3.2	-6.5	-6.5	-3.0	-4.8	24
HOURLY MAX	8.5	8.0	8.3	9.7	12.3	13.0	12.8	9.9	9.9	12.6	15.3	16.2	17.3	18.1	16.4	14.0	10.7	11.2	11.7	12.9	13.1	12.7	11.5	4.5				
HOURLY AVG	-2.9	-3.2	-3.6	-3.4	-3.2	-3.1	-3.1	-3.2	-2.6	-1.1	0.3	1.2	1.9	2.0	1.5	0.4	-0.8	-1.2	-1.5	-1.7	-1.7	-2.0	-2.5	-5.8				

STATUS FLAG CODES

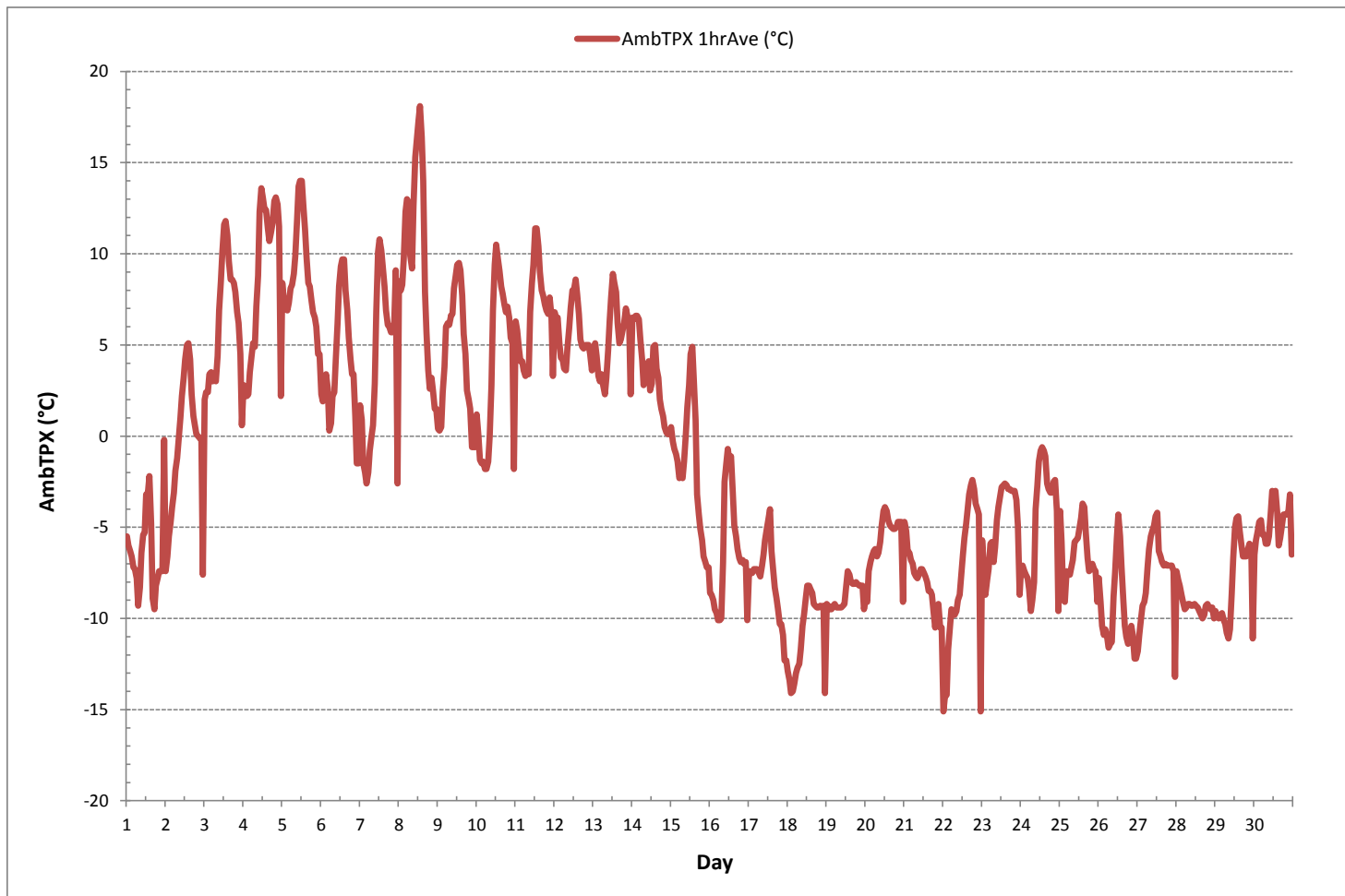
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-15.1 °C	@ HOUR(S)	0 , 23	ON DAY(S)	22 , 22
MAXIMUM 1-HR AVERAGE:	18.1 °C	@ HOUR(S)	13	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	9.6 °C			ON DAY(S)	8
				VAR-VARIOUS	
OPERATIONAL TIME:				720	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	7.17			MONTHLY AVERAGE:	-1.6 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



STATION TEMPERATURE

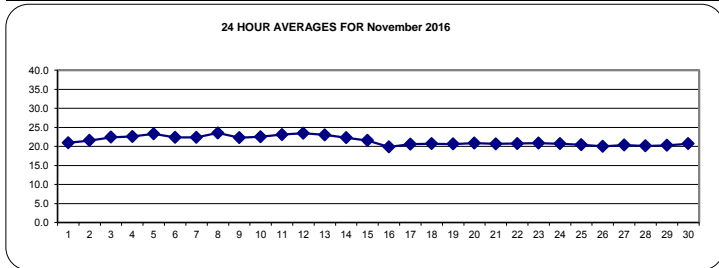


STATION TEMPERATURE Hourly Averages (StnTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	21.1	21.0	20.9	20.9	21.0	20.8	20.6	20.8	20.4	20.6	20.6	20.5	21.0	21.1	21.2	21.2	21.7	21.2	21.2	21.0	20.9	21.3	21.1	20.4	21.7	21.0	24	
2	20.9	21.2	21.1	21.0	21.4	21.4	21.4	21.3	21.4	21.7	21.0	20.9	21.1	21.4	21.8	22.4	22.8	22.7	22.2	21.7	21.6	21.8	21.5	20.9	22.8	21.6	24	
3	21.9	21.3	21.3	22.1	21.6	21.6	21.6	21.4	21.3	21.4	21.9	22.5	23.3	23.1	23.1	22.6	23.5	23.0	23.3	23.3	23.2	23.2	23.1	21.3	23.5	22.4	24	
4	22.8	22.4	22.2	21.9	21.7	21.6	21.5	21.5	21.5	21.7	22.3	23.4	22.9	22.5	23.1	22.8	23.1	23.6	23.4	23.3	23.4	23.5	23.3	23.0	21.5	23.6	22.6	24
5	23.2	23.7	23.2	23.5	23.7	23.8	23.9	23.1	23.7	23.2	23.5	22.7	23.3	23.1	22.7	23.1	22.9	23.6	22.9	23.8	23.2	23.3	23.5	23.3	22.7	23.9	23.3	24
6	23.1	22.8	22.4	22.1	21.8	21.5	21.2	22.0	21.2	21.7	21.9	22.1	22.8	23.6	22.9	23.3	23.5	23.0	23.2	23.0	22.7	22.3	21.9	21.3	21.2	23.6	22.4	24
7	21.9	21.4	21.7	21.6	21.5	21.4	21.3	21.3	21.7	21.7	21.4	21.6	22.5	23.4	23.3	23.5	23.1	23.4	23.6	23.5	23.3	23.2	23.1	23.3	21.3	23.6	22.4	24
8	23.8	23.6	23.3	23.7	24.0	23.1	23.6	23.1	23.0	23.4	22.3	22.7	23.5	24.2	25.0	25.5	25.0	23.3	23.3	23.8	22.8	23.2	22.9	22.7	22.3	25.5	23.5	24
9	22.4	22.0	21.7	21.4	21.2	21.2	21.4	21.7	21.9	22.1	22.3	22.8	23.5	23.4	23.2	23.0	23.3	23.2	23.3	22.9	22.3	21.8	21.3	21.8	21.2	23.5	22.3	24
10	21.4	21.5	21.6	21.4	21.3	21.7	21.5	21.5	21.5	21.2	22.0	21.9	22.6	23.5	23.1	23.7	23.0	23.7	23.8	23.8	23.8	23.9	23.7	23.5	21.2	23.9	22.5	24
11	23.3	23.3	23.3	23.2	23.0	22.9	22.7	22.5	22.3	22.1	22.4	23.2	23.6	22.8	23.0	23.2	23.0	23.4	23.1	23.5	23.7	23.7	23.7	22.1	23.7	23.1	24	
12	23.7	23.7	23.7	23.7	23.7	23.6	23.4	23.3	23.1	23.1	23.2	23.5	23.0	23.5	22.7	23.4	22.9	23.6	23.6	23.7	23.6	23.6	23.6	23.5	22.7	23.7	23.4	24
13	23.3	23.2	23.2	23.3	23.2	22.9	22.7	22.4	22.1	21.8	22.0	22.5	23.1	23.2	23.0	23.1	23.2	23.3	23.4	23.4	23.4	23.5	23.5	23.5	21.8	23.5	23.0	24
14	23.5	23.5	23.6	23.6	23.5	23.5	23.5	23.1	22.7	22.4	22.3	22.3	21.9	21.8	21.9	22.5	22.5	20.6	21.3	20.9	21.5	21.1	20.8	21.2	20.6	23.6	22.3	24
15	21.2	21.0	20.8	20.9	21.1	21.0	20.9	21.0	20.9	21.3	20.9	22.2	22.8	23.2	23.1	23.4	23.2	21.0	21.0	20.6	20.9	20.4	20.6	20.4	20.4	23.4	21.6	24
16	20.5	20.4	20.2	20.6	20.2	20.1	20.6	20.1	19.6	17.7	19.4	19.6	20.1	19.8	20.2	20.1	20.5	20.0	20.1	18.4	19.3	19.8	19.8	20.0	17.7	20.6	19.9	24
17	19.8	20.1	20.2	19.9	20.2	20.1	19.8	20.0	19.9	17.6	19.7	21.4	22.1	21.7	21.1	22.1	21.2	22.2	21.0	21.0	20.8	21.0	20.9	17.6	22.2	20.6	24	
18	20.5	20.7	20.3	20.7	20.3	20.7	20.3	20.6	20.5	21.5	21.8	22.0	21.7	19.8	20.6	20.7	20.7	20.3	20.5	20.7	20.7	20.5	20.3	19.8	22.0	20.7	24	
19	20.6	20.8	20.6	20.5	20.5	20.4	20.5	20.6	20.6	20.4	20.6	20.7	20.6	20.8	20.9	20.5	21.0	20.5	20.8	20.9	20.4	20.9	20.9	20.4	20.4	21.0	20.6	24
20	20.8	20.8	20.6	20.6	21.1	20.7	20.8	20.9	20.7	21.1	20.7	20.9	20.9	21.0	20.9	20.9	21.2	21.0	20.9	20.8	20.8	21.2	20.8	20.8	20.6	21.2	20.9	24
21	20.8	20.8	21.2	20.8	20.6	20.9	20.4	20.9	20.5	20.7	20.7	20.4	20.7	20.7	20.4	20.6	20.7	20.7	20.3	20.7	20.7	20.7	20.7	20.3	21.2	20.7	24	
22	20.5	20.4	20.3	20.8	20.5	20.5	20.6	20.7	20.7	20.5	20.6	20.9	20.7	20.8	20.7	21.2	21.1	20.9	21.0	21.0	21.0	21.0	20.9	20.8	20.3	21.2	20.8	24
23	20.8	21.2	20.6	20.9	20.5	20.9	20.5	21.1	20.6	21.1	20.8	20.7	20.8	21.2	21.3	21.4	20.4	21.2	20.9	20.8	20.8	20.6	20.8	20.9	20.4	21.4	20.9	24
24	21.0	20.7	20.7	21.0	20.6	20.9	20.8	20.6	20.8	20.3	19.8	20.6	20.6	20.7	20.6	21.1	21.1	20.9	20.8	20.8	20.8	20.8	20.7	20.8	19.8	21.1	20.7	24
25	20.7	20.8	20.7	20.3	20.4	20.3	20.4	20.5	20.3	20.6	20.4	20.4	20.8	20.8	20.7	20.6	20.6	20.3	20.4	20.1	20.2	20.0	20.2	20.0	20.0	20.8	20.4	24
26	19.9	20.2	20.0	19.9	19.8	20.0	19.8	19.7	19.7	19.6	19.8	20.1	20.2	20.2	20.6	20.3	20.2	20.1	20.1	19.8	19.9	20.1	20.0	19.8	19.6	20.6	20.0	24
27	19.7	19.9	20.0	20.0	19.9	20.4	20.0	20.4	20.2	20.7	20.6	20.7	20.7	20.8	20.6	20.4	20.6	20.4	20.4	20.3	20.5	20.2	20.3	20.5	19.7	20.8	20.3	24
28	20.4	20.2	20.5	20.3	20.3	20.2	20.1	20.3	20.1	20.2	20.1	20.0	20.1	20.0	20.1	19.9	20.2	19.8	20.1	20.0	20.2	20.1	19.9	20.2	19.8	20.5	20.1	24
29	19.9	20.1	20.2	19.8	20.2	20.1	19.8	20.1	20.0	19.8	19.9	20.3	20.2	20.5	20.8	21.1	20.9	20.6	20.8	20.5	20.3	20.7	20.5	20.4	19.8	21.1	20.3	24
30	20.7	20.5	20.5	20.8	20.7	20.6	20.5	20.9	20.6	20.5	20.5	20.7	21.0	20.8	20.7	21.0	20.7	20.7	20.7	20.7	20.7	20.8	20.7	20.7	20.5	21.0	20.7	24
HOURLY MAX	23.8	23.7	23.7	23.7	24.0	23.8	23.9	23.3	23.7	23.4	23.5	23.5	23.6	24.2	25.0	25.5	25.0	23.7	23.8	23.8	23.8	23.9	23.7	23.7				
HOURLY AVG	21.5	21.4	21.4	21.4	21.3	21.3	21.2	21.2	21.1	21.1	21.3	21.5	21.7	21.8	21.8	22.0	21.9	21.7	21.7	21.6	21.6	21.6	21.5	21.5				

STATUS FLAG CODES

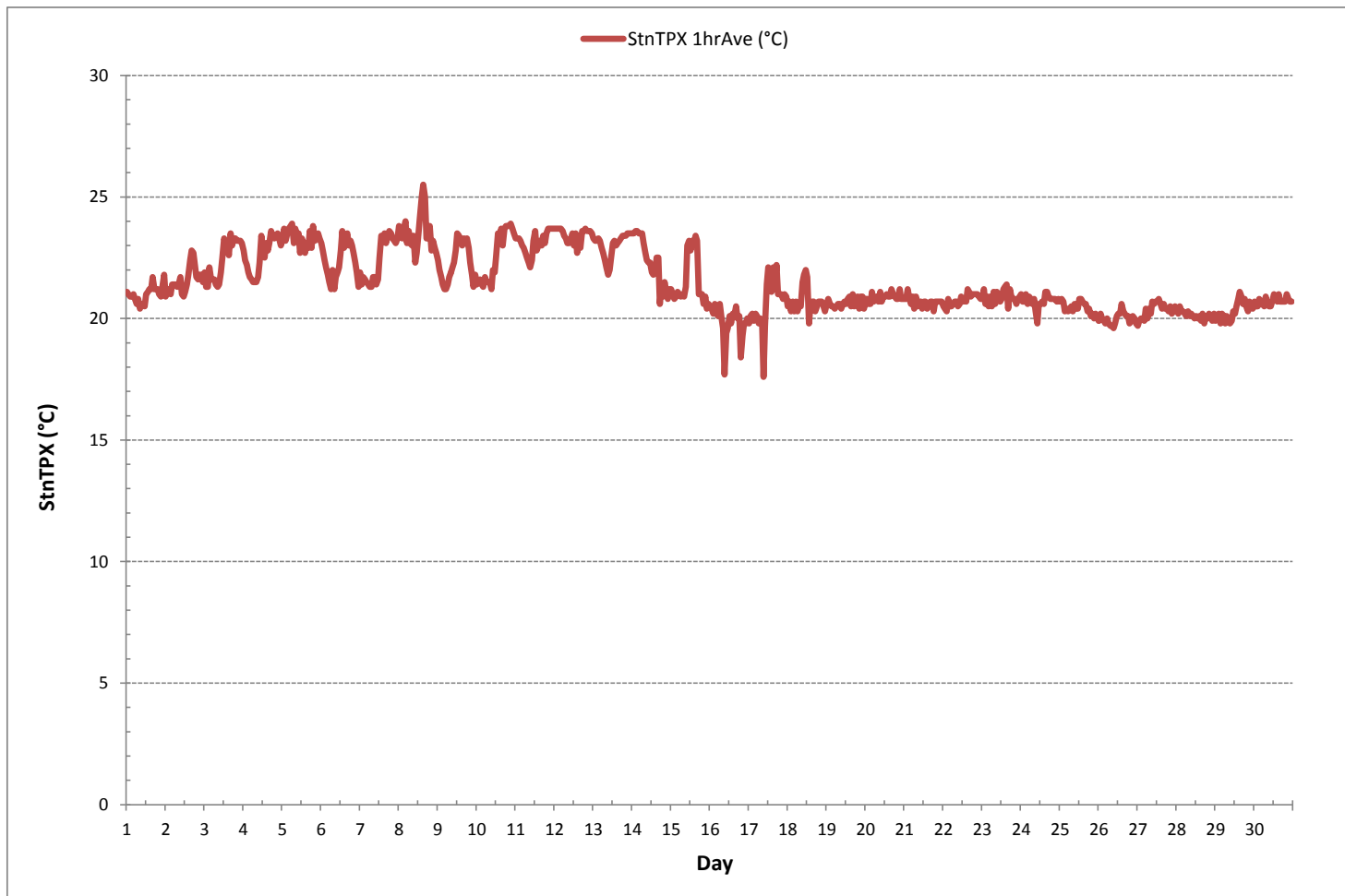
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	17.6 °C	@ HOUR(S)	9	ON DAY(S)	17
MAXIMUM 1-HR AVERAGE:	25.5 °C	@ HOUR(S)	15	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	23.5 °C			ON DAY(S)	8
				VAR-VARIOUS	
OPERATIONAL TIME:				720	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	1.27	MONTHLY AVERAGE:		21.5	°C

STATION TEMPERATURE Hourly Averages (StnTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100A Sulphur Dioxide Analyzer Calibration

Date: November 15, 2016	Barometric Pressure: 27.53 inHg
Company/Airshed: PRAMP	Station Temperature °C: 21
Location/Station Name: 842b	Weather Conditions: Sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:45	Performed By/Reviewer: Raja Abid / Trina Whitsitt
End Time 24 hr. (mst): 13:40	Cal Gas Expiry Date: May 23, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 838	Range ppb: 500
Last Calibration Date: October 12, 2016	As Found C.F.: 1.023
Previous C.F.: 0.999	New C.F.: 1.000

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								
Make & Model: API 700									
Serial #: 830									
Cal Gas Cylinder I.D. #: LL 119513									
Cal Gas Conc. (ppm): 50.6									

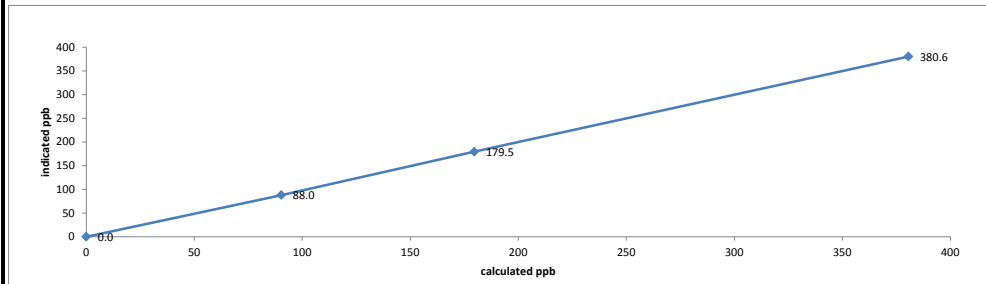
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5996	0.00	5996	0.0	-0.1	n/a
as found high	5951	45.10	5996	380.6	372.0	1.023
adjusted zero	5996	0.00	5996	0.0	0.0	n/a
adjusted high	5951	45.10	5996	380.6	380.6	1.000
mid	5977	21.30	5998	179.7	179.5	1.001
low	5987	10.70	5998	90.3	88.0	1.026
calibrator zero	5996	0.00	5996	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.998	> or = 0.995
b (Intercept as % of full scale) = 0.19%	.95-1.05
% change in C.F. from last cal = -2.38%	± 3% F.S.
	± 10%

API 100A Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: 1.027	SLOPE: 1.048
OFFSET: 19.9	OFFSET: 20.0
HVPS: 686	HVPS: 686
DCPS: 2545	DCPS: 2545
RCELL TEMP: 51.2	RCELL TEMP: 51.2
BOX TEMP: 31.1	BOX TEMP: 31.2
PMT TEMP: 7.2	PMT TEMP: 7.2
IZS TEMP: 60.0	IZS TEMP: 60.1
Converter Temp: n/a	Converter Temp: n/a
PRES: 26.4	PRES: 26.3
SAMP FL: 641	SAMP FL: 640
PMT: 57.9	PMT: 58.6
UV LAMP: 2506	UV LAMP: 2535
LAMP RATIO: 100.3	LAMP RATIO: 101.5
STR. LGT: 10.2	STR. LGT: 10.5
DRK PMT: 32.7	DRK PMT: 32.6
DRK LMP: -6.8	DRK LMP: -6.7
Expected Value: 235.9	Expected Value: 243.0

Comments:

The analyzer sample inlet filter was changed.



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 43i Total Reduced Sulphur Analyzer Calibration

Date:	November 15, 2016	Barometric Pressure:	27.53 inHg
Company/Airshed:	PRAMP	Station Temperature °C:	21
Location/Station Name:	842b	Weather Conditions:	Sunny
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	13:02	Performed By/Reviewer:	Raja Abid / Trina Whitsitt
End Time 24 hr. (mst):	17:40	Cal Gas Expiry Date:	December 1, 2018
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	WATLOW 05572

Analyzer:	ID# or Serial Number: 1226154720	Range ppb: 100	Station SO2 Analyzer Range? _____
	Last Calibration Date: October 12, 2016	As Found C.F.: 0.942	500 ppb
	Previous C.F.: 1.000	New C.F.: 1.000	

Calibrator:	Flow Meter ID's: n/a	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)
	Make & Model: API 700	Point	Start/End Time 24 hr.: 13:59-14:09
	Serial #: 830	High	Target Concentration (ppb): 380
	Cal Gas Cylinder I.D. #: BLM 002197	Mid	Result (ppb): 0.7
	Cal Gas Conc. (ppm): 10.3	Low	Zero Corrected Result (ppb): 1

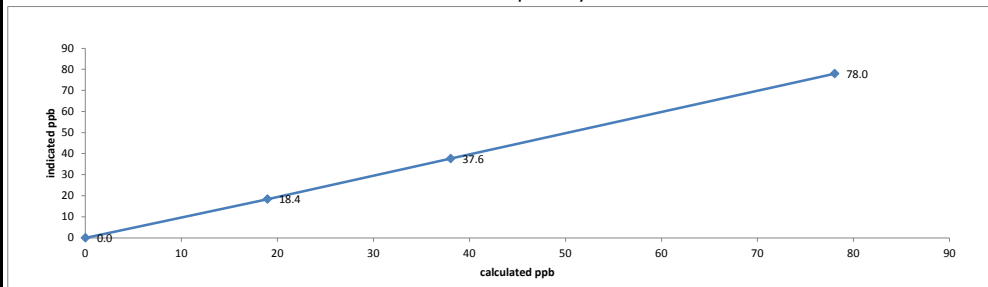
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7496	0.00	7496	0.0	-0.2	n/a
as found high	7440	56.80	7497	78.0	82.6	0.942
adjusted zero	7496	0.00	7496	0.0	0.0	n/a
adjusted high	7440	56.80	7497	78.0	78.0	1.000
mid	7470	27.70	7498	38.1	37.6	1.012
low	7482	13.80	7496	19.0	18.4	1.031
calibrator zero	7496	0.00	7496	0.0	0.0	n/a
Average C.F. =						1.014

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.31%		± 3% F.S.
% change in C.F. from last cal =	5.75%		± 10%

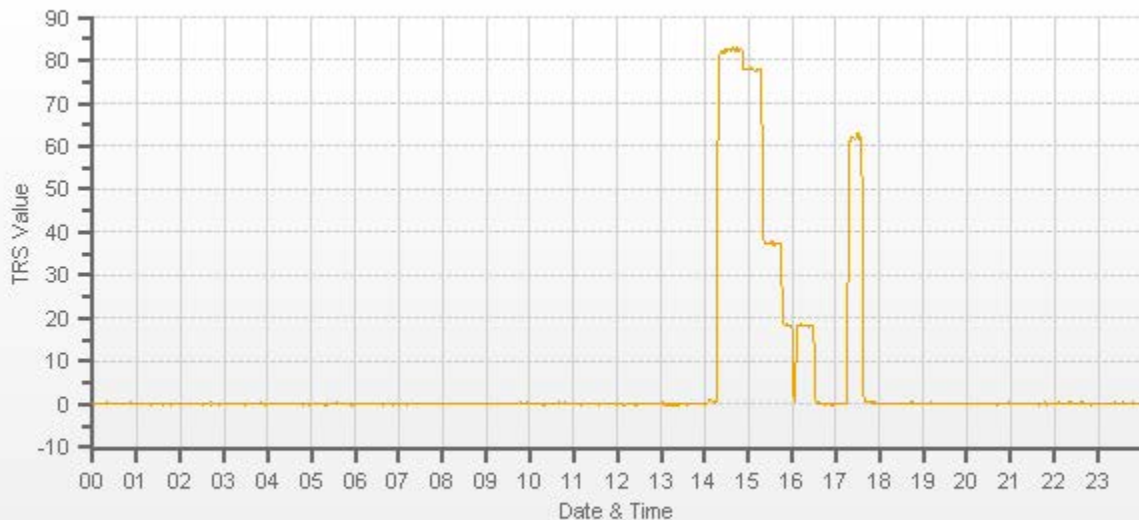
Thermo 43i Total Reduced Sulphur Analyzer Calibration



As found:	As left:
BKG: 12.4	BKG: 11.7
COEF: 1.015	COEF: 0.958
PMT: -649.7	PMT: -649.7
FLASH: 909	FLASH: 909
INTERNAL: 31.9	INTERNAL: 32.5
CHAMBER: 44.9	CHAMBER: 45.0
PERM OVEN GAS: 45.00	PERM OVEN GAS: 45.00
PERM OVEN HEATER: 44.33	PERM OVEN HEATER: 44.34
PRESSURE: 624.8	PRESSURE: 624.8
SAMPLE FLOW: 0.376	SAMPLE FLOW: 0.376
LAMP INTENSITY: 91	LAMP INTENSITY: 91
CONVERTER: 850	CONVERTER: 850
CONVERTER SET: 850	CONVERTER SET: 850
Expected Value: 62.0	Expected Value: 62.2


Comments:

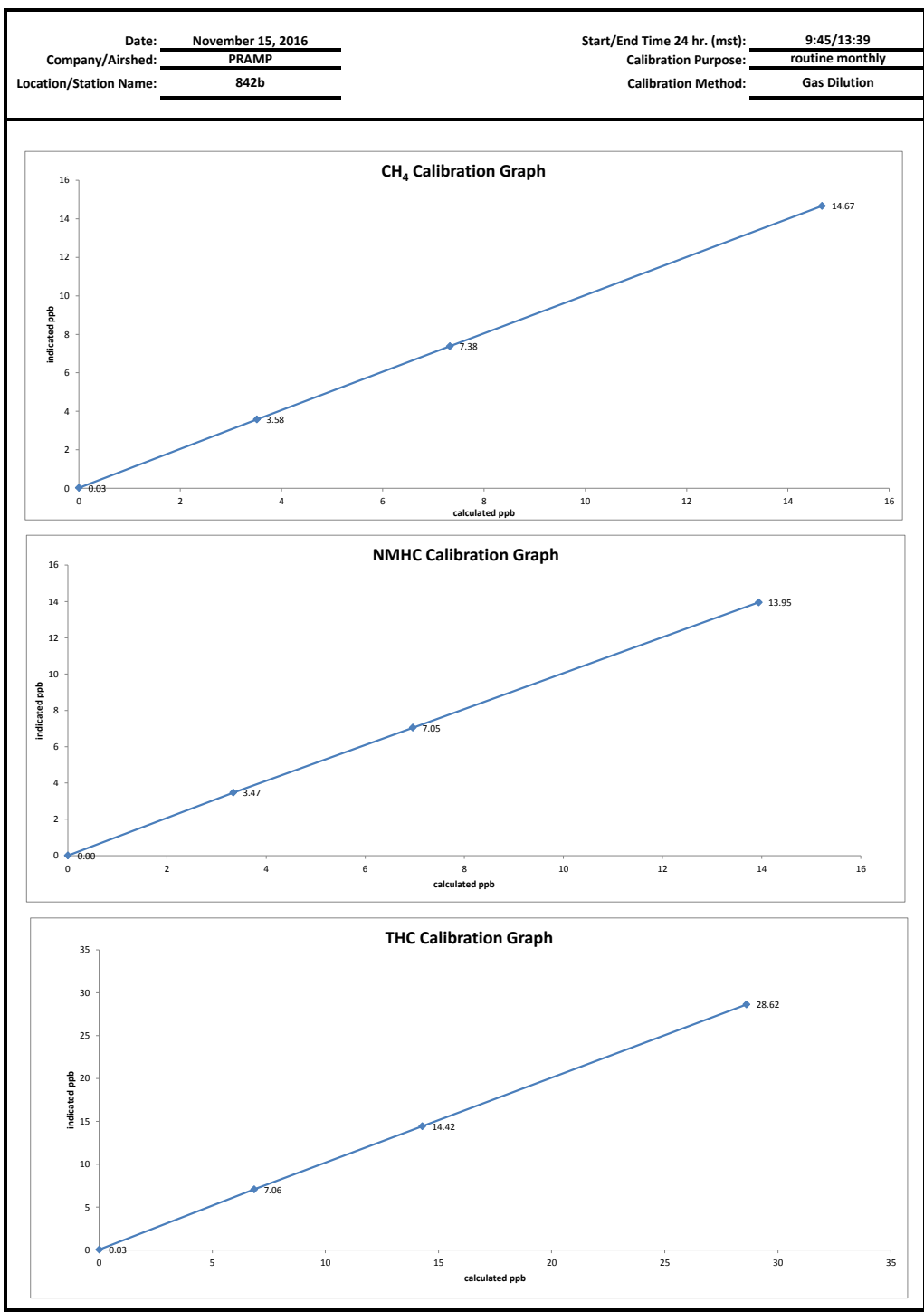
The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.

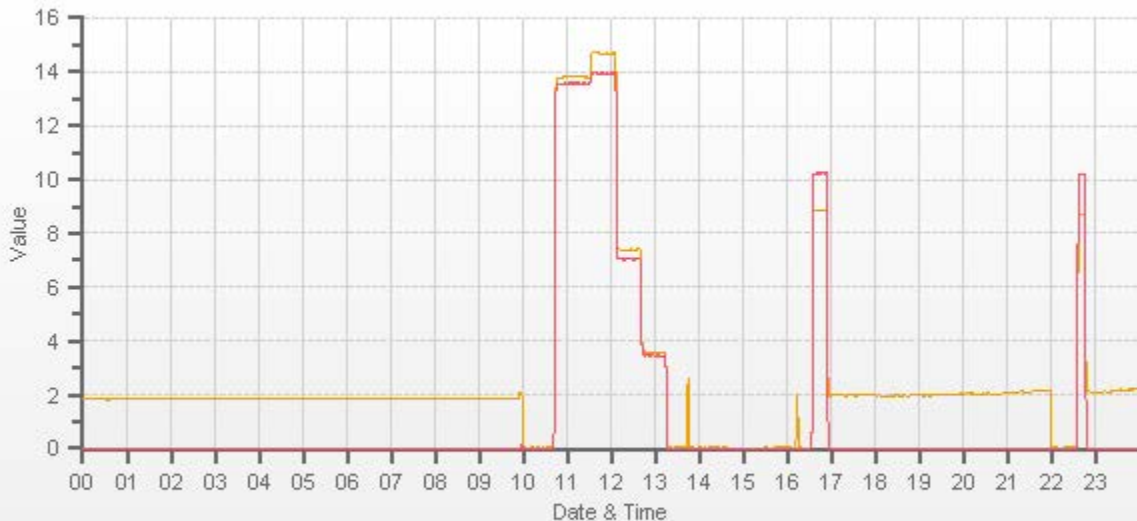


— TRS[ppb]

TOTAL HYDROCARBON

 Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																																																												
Date: November 15, 2016 Company/Airshed: PRAMP Location/Station Name: 842b Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 9:45/13:39 Calibration Method: Gas Dilution	Barometric Pressure: 27.53 inHg Station Temperature °C: 21 Weather Conditions: Sunny Calibration Purpose: routine monthly Performed By/Reviewer: Raja Abid Trina Whitsitt Cal Gas Expiry Date: January 9, 2021																																																																																																																											
Analyzer: ID# or Serial Number: 1505664392 Measured Flow: 1398 Last Calibration Date: October 12, 2016 Range ppm: 20 CH ₄ /20 NMHC/40 THC																																																																																																																												
Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.000</td> <td>1.063</td> <td>1.002</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>1.026</td> <td>0.999</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>1.043</td> <td>1.001</td> </tr> </tbody> </table>			Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.000	1.063	1.002	NMHC =	1.000	1.026	0.999	THC =	1.000	1.043	1.001																																																																																																											
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Calibrator: Flow Meter ID's: n/a Make & Model: Envirotronics 6100 Serial #: 5212 Cal Gas Cylinder I.D. #: LL 19638 CH₄ Cylinder Conc. = 880.0 304.0 =C ₂ H ₆ Cylinder Conc. CH₄ as C₂H₆ = 836.0 1716.0 =total CH ₄ equivalent																																																																																																																												
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<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: Interface Board Voltages: Bias Supply: -294.2 Temperatures: Detector Oven: 175.1 Filter: 175.0 Column Oven: 75.1 Internal: 34.7 Cylinder Pressures/reg.: Carrier: 1300 50 Fuel: 600 50 Span Gas: 1200 14 Zero Air Generator: 45 Internal Pressures: Carrier: 35.0 Fuel: 45.3 Air: 23.7 FID Status: Status: LIT Counts: 30935 Flame: 346 Det Base: 175.0 Flame and Power Stats: Last Power On: 25Oct2016@10:33 Flameouts: 1 Det Oven at Start: 36.4 Col Oven at Start: 31.6 Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH₄ Span Conc: n/a CH₄ SP Ratio: n/a CH₄ RT: n/a CH₄ PK IDX: n/a CH₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a </td> <td style="width:50%; vertical-align: top;"> As left: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: 15Nov16 Time: 9:51 CH₄ PK HT: 0 CH₄ RT: 11.6 CH₄ Baseline: 2728 CH₄ LOD: 42 CH₄ SD: 14 CH₄ CONC: 0.05 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2690 NM Base End: 2710 NM LOD: 10 NM Start IDX: 34 NM End IDX: 64 NM Max Slope: 1.1e+00 NM Min Slope: -8.6e-01 NM PT Count: 0 Expected Values: Previous CH₄: 8.56 Previous NMHC: 10.19 Previous THC: 18.77 New CH₄: 8.88 New NMHC: 10.25 New THC: 19.16 </td> </tr> </table>		As found: Interface Board Voltages: Bias Supply: -294.2 Temperatures: Detector Oven: 175.1 Filter: 175.0 Column Oven: 75.1 Internal: 34.7 Cylinder Pressures/reg.: Carrier: 1300 50 Fuel: 600 50 Span Gas: 1200 14 Zero Air Generator: 45 Internal Pressures: Carrier: 35.0 Fuel: 45.3 Air: 23.7 FID Status: Status: LIT Counts: 30935 Flame: 346 Det Base: 175.0 Flame and Power Stats: Last Power On: 25Oct2016@10:33 Flameouts: 1 Det Oven at Start: 36.4 Col Oven at Start: 31.6 Calibration History: Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH ₄ Span Conc: n/a CH ₄ SP Ratio: n/a CH ₄ RT: n/a CH ₄ PK IDX: n/a CH ₄ PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a	As left: Calibration History cnt'd: NM Peak Area: n/a Crucial Settings: Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Run History>1: Date: 15Nov16 Time: 9:51 CH ₄ PK HT: 0 CH ₄ RT: 11.6 CH ₄ Baseline: 2728 CH ₄ LOD: 42 CH ₄ SD: 14 CH ₄ CONC: 0.05 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 2690 NM Base End: 2710 NM LOD: 10 NM Start IDX: 34 NM End IDX: 64 NM Max Slope: 1.1e+00 NM Min Slope: -8.6e-01 NM PT Count: 0 Expected Values: Previous CH ₄ : 8.56 Previous NMHC: 10.19 Previous THC: 18.77 New CH ₄ : 8.88 New NMHC: 10.25 New THC: 19.16																																																																																																																									
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Comments: The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes. The analyzer cooling fan filter(s) were cleaned. Flow check was done from 9:55-9:56. NMHC: 9:45-13:39 Calibration. During As found zero the CH ₄ readings were 0.03. As a part of regular maintenance a possible analyzer replacement or new H2 or N2 purifiers is recommended.																																																																																																																												

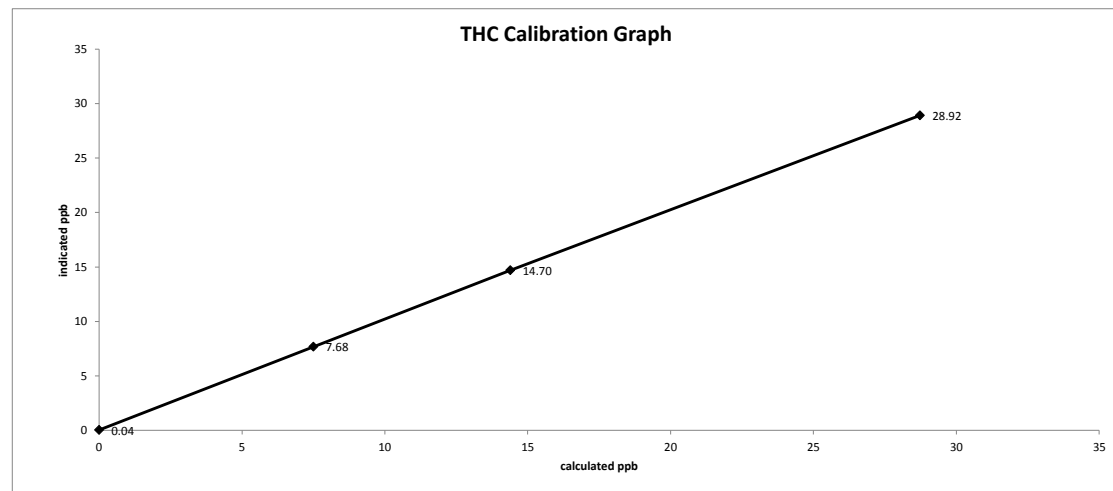
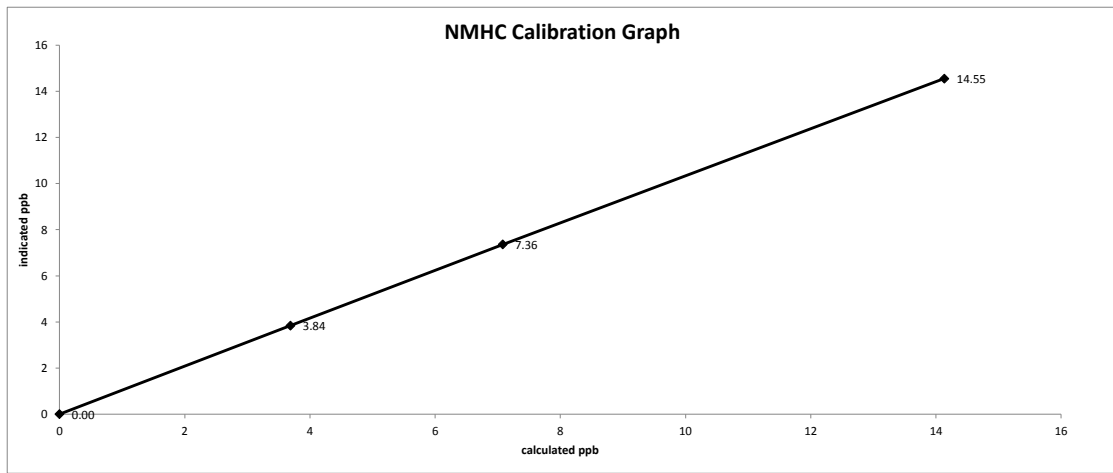
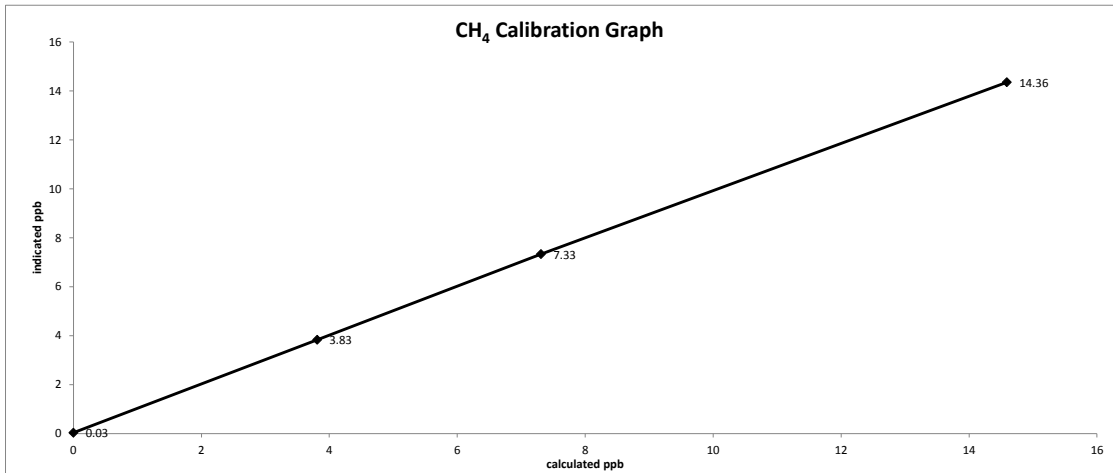


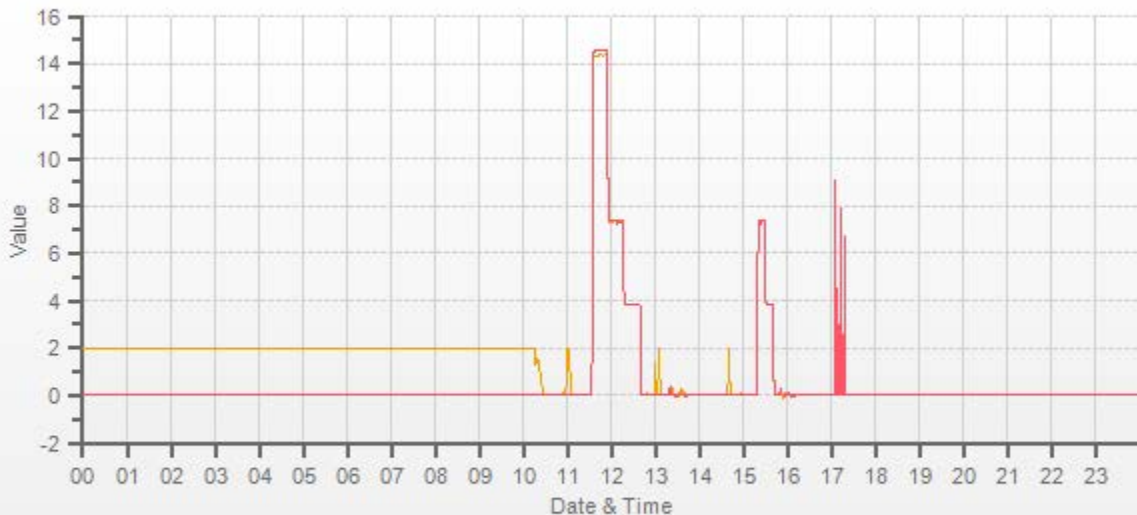


CH4[ppm] NMHC[ppm]

Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																						
Date: November 17, 2016 Company/Airshed: PRAMP Location/Station Name: 842b Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 11:17 / 13:40 Calibration Method: Gas Dilution	Barometric Pressure: 27.62 inHg Station Temperature °C: 21 Weather Conditions: Light snow Calibration Purpose: shut down Performed By/Reviewer: Chris Wesson / Trina Whitsitt Cal Gas Expiry Date: November 25, 2023																																																																																					
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Serial Number: 1505664392 Last Calibration Date: November 15, 2016 Range ppm: 20 CH ₄ /20 NMHC/40 THC	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.002</td> <td>1.018</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>0.999</td> <td>0.972</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.001</td> <td>0.995</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.002	1.018	n/a	NMHC =	0.999	0.972	n/a	THC =	1.001	0.995	n/a																																																																					
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Shut-down due to unstable zero																																																																																						

Date:	November 17, 2016	Start/End Time 24 hr. (mst):	11:17 / 13:40
Company/Airshed:	PRAMP	Calibration Purpose:	shut down
Location/Station Name:	842b	Calibration Method:	Gas Dilution

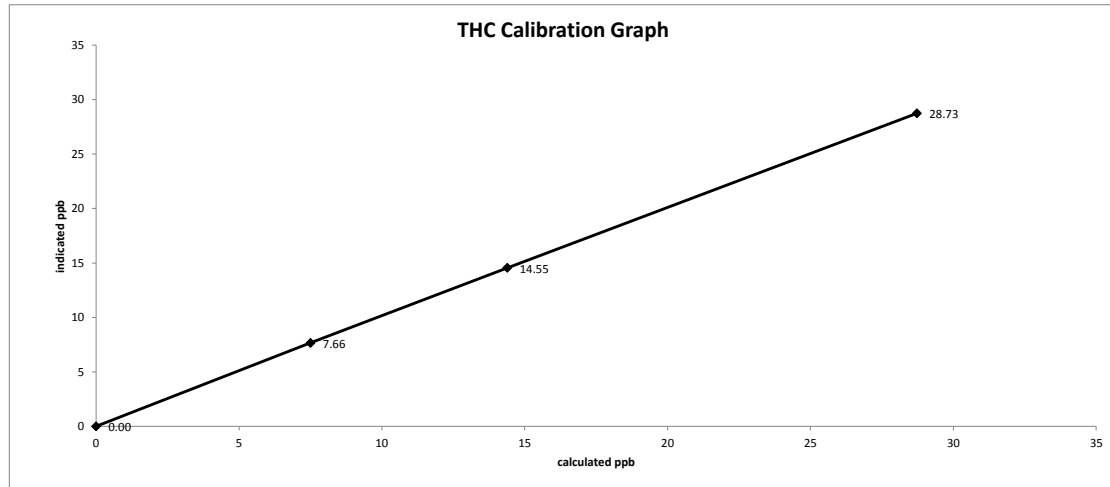
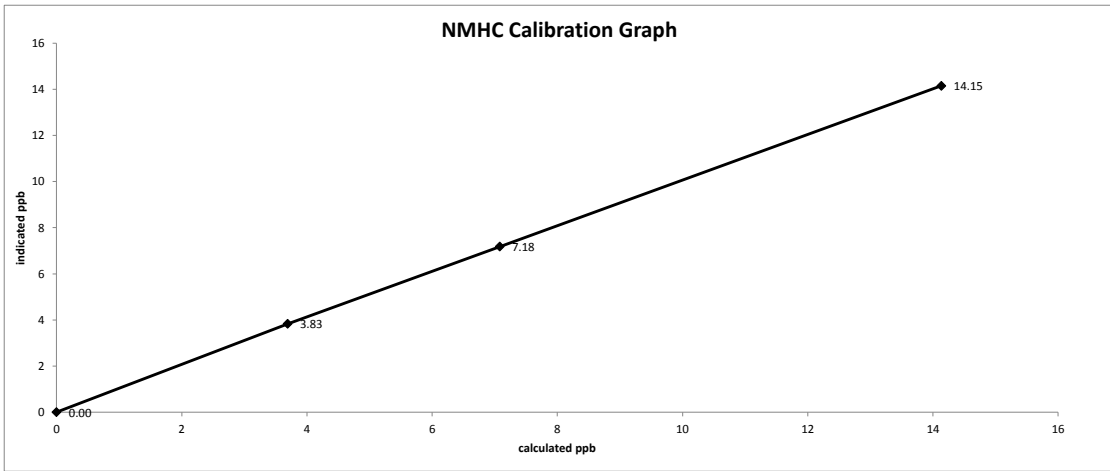
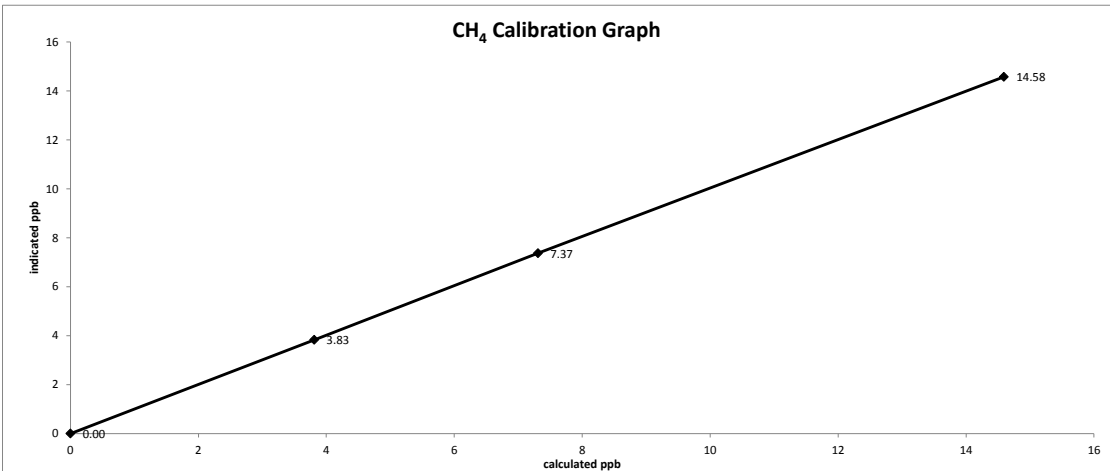


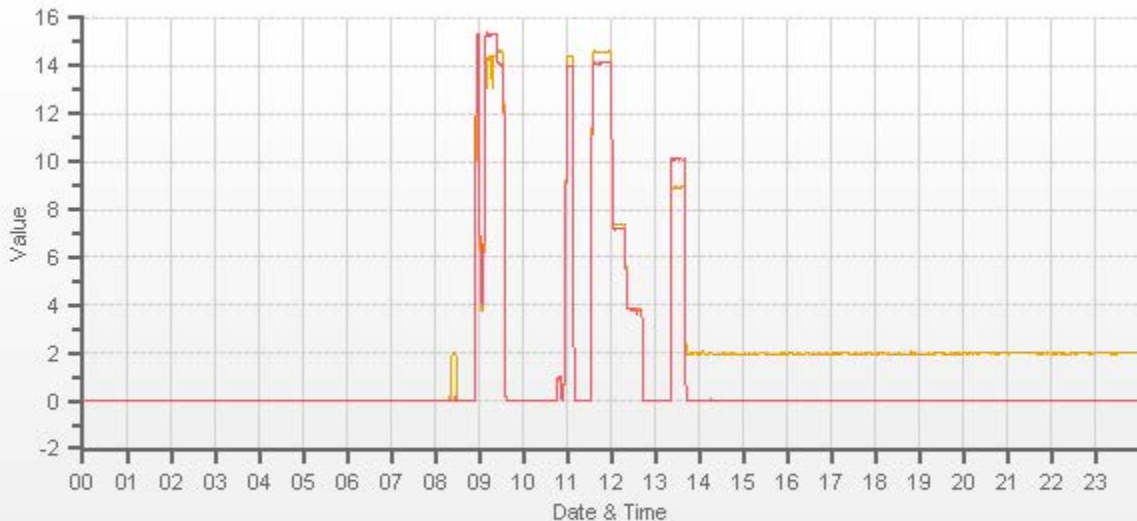


CH4[ppm] NMHC[ppm]

Thermo 55i Methane/Non-Methane Analyzer Calibration																	
Date: <u>November 18, 2016</u> Company/Airshed: <u>PRAMP</u> Location/Station Name: <u>842b</u> Parameter: <u>CH₄ / NMHC / THC</u> Start/End Time 24 hr. (mst): <u>11:11 / 13:45</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>28.25 inHg</u> Station Temperature °C: <u>21</u> Weather Conditions: <u>Ice Crystals</u> Calibration Purpose: <u>Installation</u> Performed By/Reviewer: <u>Chris Wesson</u> / <u>Trina Whitsitt</u> Cal Gas Expiry Date: <u>November 25, 2023</u>																
Analyzer: Serial Number: <u>1433563261</u> Last Calibration Date: <u>n/a</u> Range ppm: <u>20 CH₄/20 NMHC/40 THC</u>	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>n/a</td> <td>n/a</td> <td>1.001</td> </tr> <tr> <td>NMHC =</td> <td>n/a</td> <td>n/a</td> <td>0.999</td> </tr> <tr> <td>THC =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	n/a	n/a	1.001	NMHC =	n/a	n/a	0.999	THC =	n/a	n/a	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	n/a	n/a	1.001														
NMHC =	n/a	n/a	0.999														
THC =	n/a	n/a	1.000														
Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>Sabio 2010</u> Serial #: <u>17100415</u> Cal Gas Cylinder I.D. #: <u>LL86139</u> CH ₄ Cylinder Conc.: <u>599.0</u> <u>211.0</u> = C ₃ H ₈ Cylinder Conc. CH ₄ as C ₃ H ₈ : <u>580.3</u> <u>1179.3</u> = total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH ₄	NMHC	THC														
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Low	3.00	3.00	6.00														
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																	
Calibrator Flow Rates (cc/min)										Correction Factors:							
Point	Diluent	Cal Gas	Total Flow	Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC					
adjusted zero	2499	0.00	2499	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
adjusted high	2439	60.90	2500	14.59	14.14	28.73	14.58	14.15	28.73	1.001	0.999	1.000					
mid	2469	30.50	2500	7.31	7.08	14.39	7.37	7.18	14.55	0.992	0.986	0.989					
low	2483	15.90	2499	3.81	3.69	7.50	3.83	3.83	7.66	0.995	0.964	0.980					
calibrator zero	2498	0.00	2498	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
Average C.F.=										0.996	0.983	0.989					
Linear Regression/Calibration Results:																	
				CH ₄	NMHC	THC	LIMITS										
Correlation Coefficient =				1.000	1.000	1.000	> or = 0.995										
Slope =				0.999	0.999	0.999	.95-1.05										
b (Intercept as % of full scale)=				0.11%	0.36%	0.23%	± 3% F.S.										
% change in C.F. from last cal=				n/a	n/a	n/a	± 10%										
As found:						As left:											
Interface Board Voltages:	Bias Supply:	<u>-300.8</u>					Calibration History cnt'd:	NM Peak Area:	<u>96758</u>								
Temperatures:	Detector Oven:	<u>175.1</u>					Crucial Settings:	Methane Start:	<u>8.0</u>								
	Filter:	<u>175.0</u>						Methane End:	<u>16.0</u>								
	Column Oven:	<u>75.1</u>						Backflush:	<u>18.0</u>								
Cylinder Pressures/reg.:	Internal:	<u>29.6</u>					Run History>1:	NMHV Start:	<u>26.0</u>								
	Carrier:	<u>2400</u>	<u>50</u>					NMHC End:	<u>56.0</u>								
	Fuel:	<u>500</u>	<u>50</u>					Date:	<u>18Nov2016</u>								
Internal Pressures:	Span Gas:	<u>1200</u>	<u>15</u>				Time:	<u>11:10</u>									
	Zero Air Generator:	<u>45</u>					CH ₄ PK HT:	<u>0</u>									
	Carrier:	<u>28.7</u>					CH ₄ RT:	<u>8.0</u>									
FID Status:	Fuel:	<u>37.6</u>					CH ₄ Baseline:	<u>1920</u>									
	Air:	<u>34.3</u>					CH ₄ LOD:	<u>45</u>									
	Status:	<u>LIT</u>					CH ₄ SD:	<u>15</u>									
Flame and Power Stats:	Counts:	<u>~25000</u>					CH ₄ CONC:	<u>0.00</u>									
	Flame:	<u>349.2</u>					NM PK HT:	<u>0</u>									
	Det Base:	<u>175.0</u>					NM Peak Area:	<u>0</u>									
Calibration History:	Last Power On:	<u>17Nov2016@16:02</u>					NM CONC:	<u>0.00</u>									
	Flameouts:	<u>1</u>					NM Base Start:	<u>1927</u>									
	Det Oven at Start:	<u>20.5</u>					NM Base End:	<u>1992</u>									
Comments:	Col Oven at Start:	<u>22.7</u>					NM LOD:	<u>18</u>									
	Time:	<u>18Nov2016@09:18</u>					NM Start IDX:	<u>35</u>									
	Type:	<u>Span</u>					NM End IDX:	<u>54</u>									
	Status:	<u>Good</u>					NM Max Slope:	<u>2.1E+00</u>									
	Check/Adjust:	<u>Adjust</u>					NM Min Slope:	<u>-4.5E-01</u>									
	CH ₄ Span Conc:	<u>14.59</u>					NM PT Count:	<u>0</u>									
	CH ₄ SP Ratio:	<u>0.000704</u>					Daily Zero/Span Values:	Previous CH ₄ :	<u>8.88</u>								
	CH ₄ RT:	<u>12.2</u>					Previous NMHC:	<u>10.25</u>									
	CH ₄ PK IDX:	<u>21</u>					Previous THC:	<u>19.16</u>									
	CH ₄ PK HT:	<u>20737</u>					New CH ₄ :	<u>8.94</u>									
NM Span Conc:	<u>14.14</u>					New NMHC:	<u>10.1</u>										
NM SP Ratio:	<u>0.000146</u>					New THC:	<u>19.1</u>										

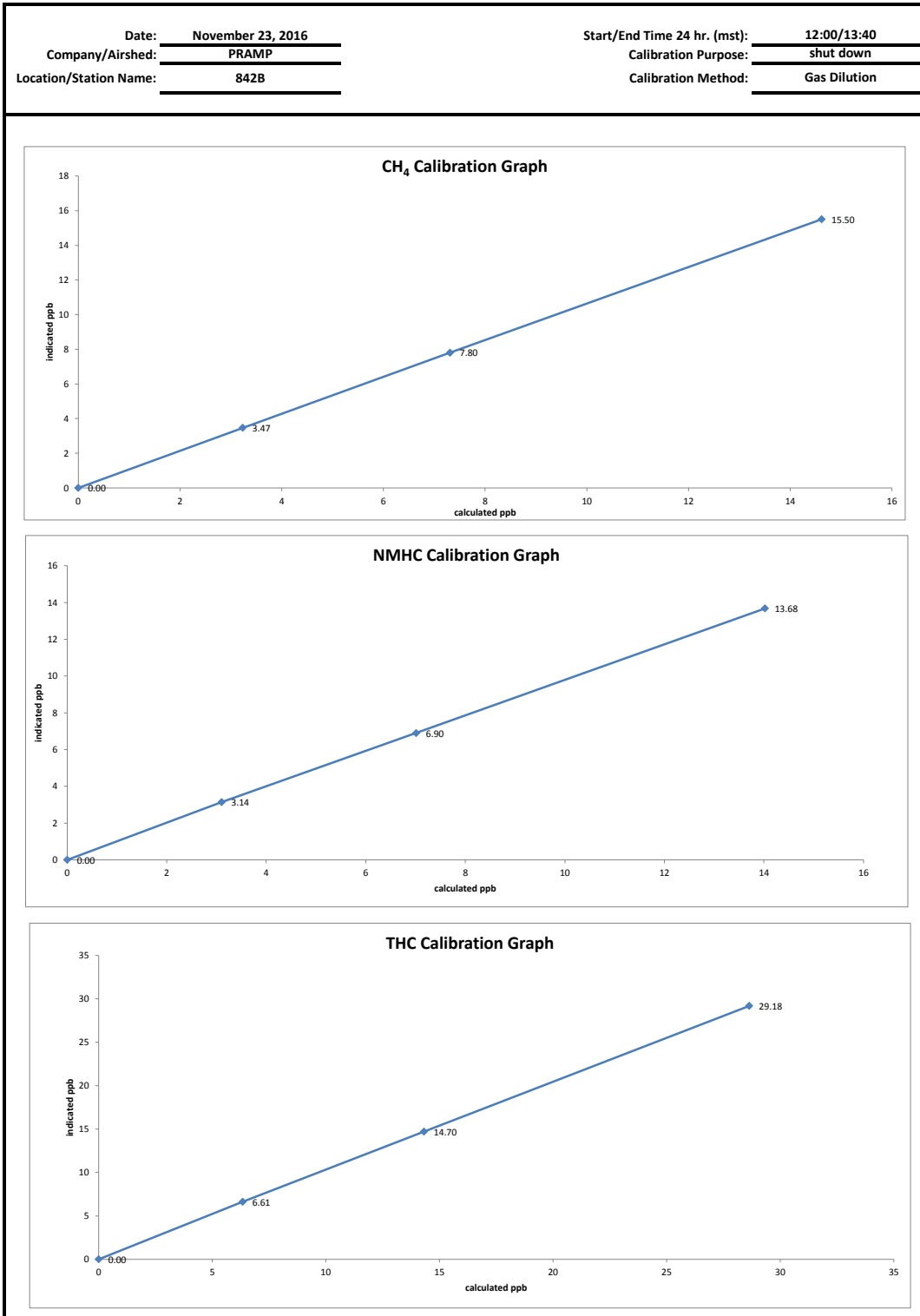
Date:	November 18, 2016	Start/End Time 24 hr. (mst):	11:11 / 13:45
Company/Airshed:	PRAMP	Calibration Purpose:	installation
Location/Station Name:	842b	Calibration Method:	Gas Dilution

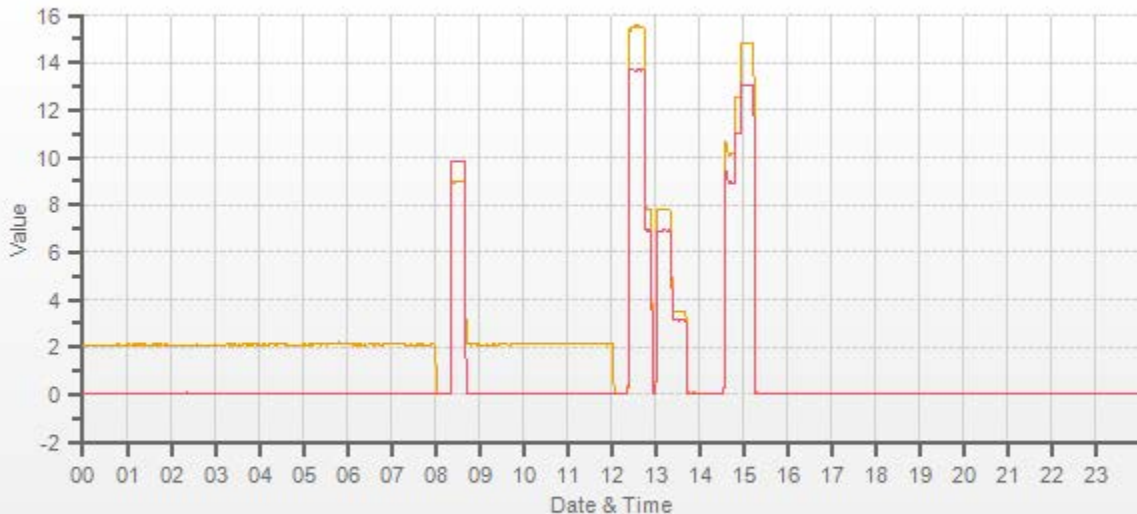




CH4[ppm] NMHC[ppm]

Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																					
Date: November 23, 2016 Company/Airshed: PRAMP Location/Station Name: 842B Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 12:00/13:40 Calibration Method: Gas Dilution	Barometric Pressure: 27.57 inHg Station Temperature °C: 20.6 Weather Conditions: Mainly cloudy with clear breaks Calibration Purpose: shut down Performed By/Reviewer: Limin Li Trina Whitsitt Cal Gas Expiry Date: July 7, 2022																																																																																				
Analyzer: ID# or Serial Number: 1433563261 Measured Flow: 1.3 LPM Last Calibration Date: November 18, 2016 Range ppm: 20 CH ₄ /20 NMHC/40 THC	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.001</td> <td>0.943</td> <td>n/a</td> </tr> <tr> <td>NMHC =</td> <td>0.999</td> <td>1.025</td> <td>n/a</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>0.981</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.001	0.943	n/a	NMHC =	0.999	1.025	n/a	THC =	1.000	0.981	n/a																																																																				
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Calibrator: Flow Meter ID's: n/a Make & Model: Sabio 2010 Serial #: 17200415 Cal Gas Cylinder I.D. # : LL83638 CH₄ Cylinder Conc. = 582.0 203.0 =C ₃ H ₈ Cylinder Conc. CH₄ as C₃H₈ = 558.3 1140.3 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00																																																																				
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Comments: <p style="text-align: center;">After shut-down calibration, the column was conditioned overnight.</p>																																																																																					



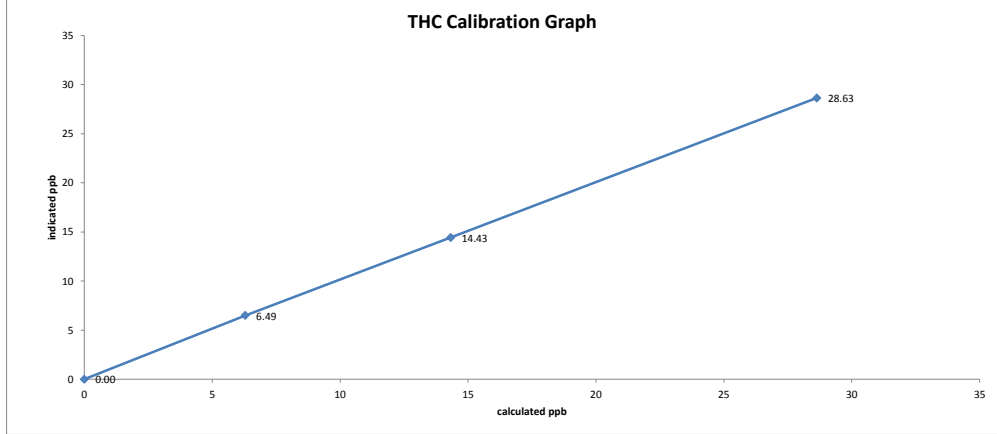
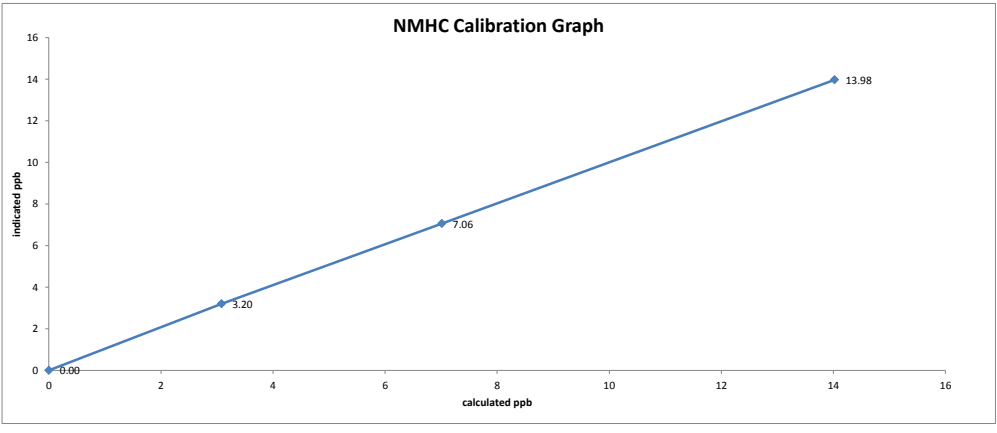
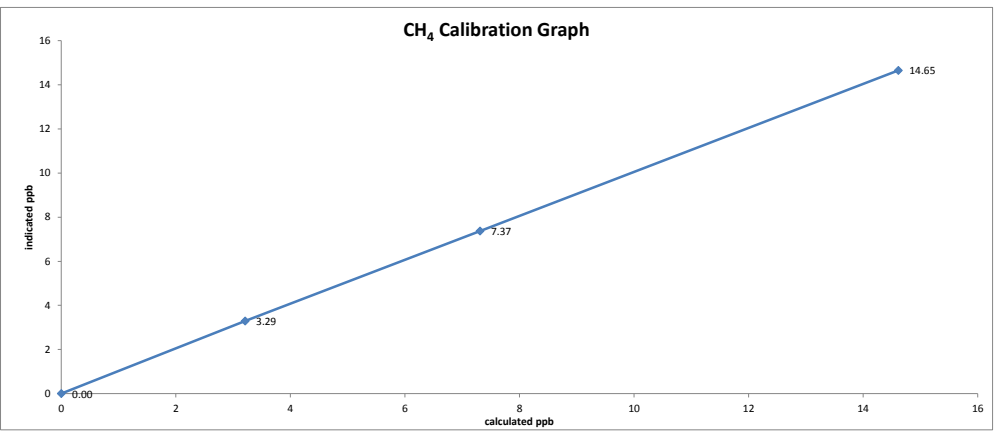


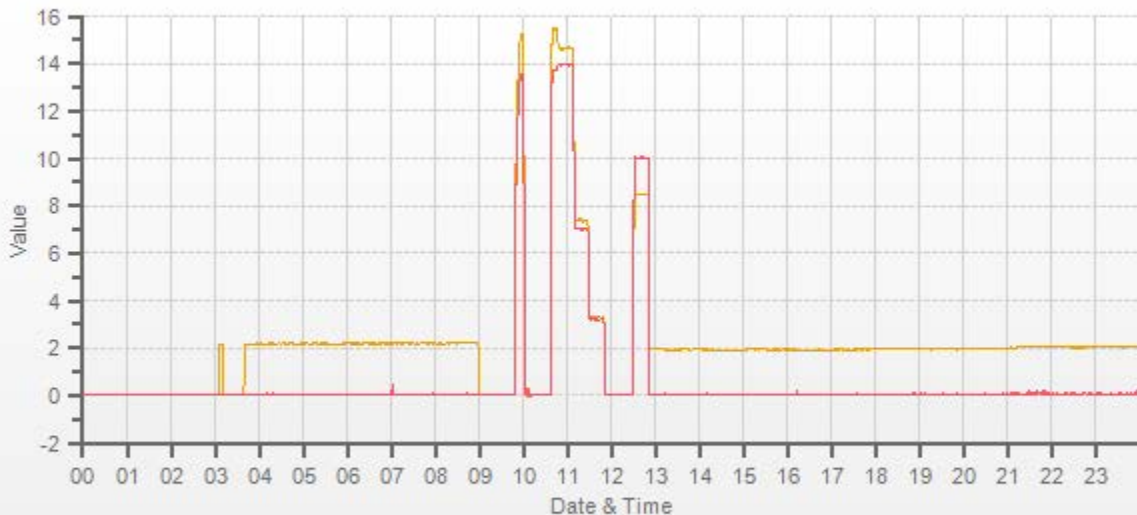
CH4[ppm] NMHC[ppm]

Thermo 55i Methane/Non-Methane Analyzer Calibration																	
Date: November 24, 2016 Company/Airshed: PRAMP Location/Station Name: 842B Parameter: CH ₄ / NMHC / THC Start/End Time 24 hr. (mst): 10:20/13:00 Calibration Method: Gas Dilution	Barometric Pressure: 27.65 inHg Station Temperature °C: 20.6 Weather Conditions: Mainly cloudy with clear breaks Calibration Purpose: post repair Performed By/Reviewer: Limin Li Trina Whitsitt Cal Gas Expiry Date: July 7, 2022																
Analyzer: ID# or Serial Number: 1433563261 Measured Flow: 1.3 LPM Last Calibration Date: n/a Range ppm: 20 CH ₄ /20 NMHC/40 THC	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>n/a</td> <td>n/a</td> <td>0.998</td> </tr> <tr> <td>NMHC =</td> <td>n/a</td> <td>n/a</td> <td>1.003</td> </tr> <tr> <td>THC =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	n/a	n/a	0.998	NMHC =	n/a	n/a	1.003	THC =	n/a	n/a	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	n/a	n/a	0.998														
NMHC =	n/a	n/a	1.003														
THC =	n/a	n/a	1.000														
Calibrator: Flow Meter ID's: n/a Make & Model: Sabio 2010 Serial #: 17200415 Cal Gas Cylinder I.D. #: LU83638 CH ₄ Cylinder Conc.: 582.0 203.0 =C ₃ H ₈ Cylinder Conc. CH ₄ as C ₃ H ₈ : 558.3 1140.3 =total CH ₄ equivalent	Standard Calibration Points for Analyzer Range of 20/20/40 ppm <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point	CH ₄	NMHC	THC														
High	13.00	13.00	26.00														
Mid	7.00	7.00	14.00														
Low	3.00	3.00	6.00														
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																	
Calibrator Flow Rates (cc/min)										Correction Factors:							
Point	Diluent	Cal Gas	Total Flow	Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH ₄	NMHC	THC					
adjusted zero	2523	0.00	2523	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
adjusted high	2523	65.00	2588	14.62	14.02	28.64	14.65	13.98	28.63	0.998	1.003	1.000					
mid	2523	32.10	2555	7.31	7.01	14.33	7.37	7.06	14.43	0.992	0.993	0.993					
low	2523	14.00	2537	3.21	3.08	6.29	3.29	3.20	6.49	0.976	0.963	0.970					
calibrator zero	2523	0.00	2523	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a					
										Average C.F. =							
										0.989 0.986 0.988							
Linear Regression/Calibration Results:																	
				CH ₄	NMHC	THC											
Correlation Coefficient =				1.000	1.000	1.000	LIMITS > or = 0.995										
Slope =				1.001	0.994	0.998	.95-1.05										
b (Intercept as % of full scale)=				0.19%	0.33%	0.26%	± 3% F.S.										
% change in C.F. from last cal=				n/a	n/a	n/a	± 10%										
As found:						As left:											
Interface Board Voltages:	Bias Supply: -300.3					Calibration History cnt'd:	NM Peak Area: 93791										
Temperatures:	Detector Oven: 175					Crucial Settings:	Methane Start: 8										
	Filter: 175						Methane End: 16										
	Column Oven: 75						Backflush: 18										
Cylinder Pressures/reg.:	Internal: 27.8						NMHV Start: 26										
	Carrier: 2300		50				NMHC End: 56										
	Fuel: 2000		50			Run History>1:	Date: 24NOV16										
Internal Pressures:	Span Gas: 1050 18						Time: 11:06										
	Zero Air Generator: 45						CH ₄ PK HT: 11189										
	Carrier: 28.6						CH ₄ RT: 12.2										
FID Status:	Fuel: 37.6						CH ₄ Baseline: 1774										
	Air: 34.3						CH ₄ LOD: 11										
	Status: LIT						CH ₄ SD: 3										
Flame and Power Stats:	Counts: 21635						CH ₄ CONC: 7.46										
	Flame: 348.6						NM PK HT: 1413										
	Det Base: 175						NM Peak Area: 47442										
Calibration History:	Last Power On: 24NOV2016 10:01:29						NM CONC: 7.09										
	Flameouts: 1						NM Base Start: 1768										
	Det Oven at Start: 162.6						NM Base End: 1837										
Comments:	Col Oven at Start: 73						NM LOD: 13										
	Time: 24NOV2016 10:41						NM Start IDX: 2										
	Type: SPAN						NM End IDX: 19										
	Status: GOOD						NM Max Slope: 7.1e+01										
	Check/Adjust: ADJUST						NM Min Slope: -5.1e+01										
	CH ₄ Span Conc: 14.62					Expected Values:	NM PT Count: 87										
	CH ₄ SP Ratio: 0.000666						Previous CH ₄ : 8.94										
	CH ₄ RT: 12.2						Previous NMHC: 10.1										
	CH ₄ PK IDX: 21						Previous THC: 19.1										
	CH ₄ PK HT: 21942						New CH ₄ : 8.47										
NM Span Conc: 14.02					New NMHC: 10.00												
NM SP Ratio: 0.000149					New THC: 18.47												

Before post repair calibration, the H2 gas and NMHC threshold were changed.

Date:	November 24, 2016	Start/End Time 24 hr. (mst):	10:20/13:00
Company/Airshed:	PRAMP	Calibration Purpose:	post repair
Location/Station Name:	842B	Calibration Method:	Gas Dilution





CH4[ppm] NMHC[ppm]

WIND SYSTEM



Meteorological Sensor Audit

Location Information

Company:	PRAMP	Performed By:	Limin Li
Audit Location:	842b	Reviewed By:	Trina Whitsitt
Audit Date:	October 12, 2016	Start Time (mst):	16:30
Previous Audit Date:	n/a	End Time (mst):	17:30

Wind Speed Sensor Information

Sensor make:	RM Young
Sensor model:	5305VK
Serial#:	92411
Voltage range:	0-1V/output single range: 0-200kph

Calibrator Information

Make:	RM Young
Model:	18802
I.D.#/Serial#:	4309
Ceritification Date:	October 6, 2016

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.1	0.1	-
1000	17.6	17.6	17.5	1.003
2000	35.3	35.1	35.1	1.005
3000	52.9	52.6	52.6	1.007
4000	70.6	70.1	70.1	1.007
5000	88.2	87.6	87.6	1.007
6000	105.8	105.1	105.1	1.007
7000	123.5	122.6	122.6	1.007
8000	141.1	140.1	140.1	1.007
9000	158.8	157.6	157.6	1.007
10000	176.4	175.0	175.0	1.008
		The audit meets AMD requirements.	Average Correction Factor=	1.006

Wind Direction Audit Data ****+/- 3° of the average degrees difference is the limit****

Generated Wind Direction	Indicated Wind Direction	Degrees Difference
0	0.4	-0.4
45	46.5	-1.5
90	91.0	-1.0
135	135.5	-0.5
180	180.2	-0.2
225	224.2	0.8
270	268.3	1.7
315	313.0	2.0
355	351.4	3.6
The audit meets AMD requirements.		Average Degrees Difference= 1.3

Recommendations: The wind calibrator is SIA property.

CALIBRATORS

Company: Maxxam

Operator: Christopher Wesson

Calibrator:
 Make/Model API 700
 Serial Number 830
 Last Verification Date December 2014
 SO₂ Cylinder Conc. 50.3
 SO₂ Cylinder S/N LL42475

Flow Measurement Device:
 Make/Model N/A
 Serial Number N/A
 Temperature (°C) N/A
 Barometric Pressure N/A

Flow Measurements

Pt. No. 1 77.5 **Pt. No. 2** 37.8 **Pt. No. 3** 18.9

Calibrator Flow (scm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4998	0.780	0.746	-4%	± 10%
5002	0.380	0.365	-4%	± 10%
4997	0.190	0.182	-4%	± 10%
Absolute Average Percent Difference			4%	± 10%

LINEAR REGRESSION ANALYSIS

y=mx+b (where x=calculated concentration, y=indicated concentration)

<u>SO₂</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9565	0.90-1.10
b (Intercept % of FS)=	0.0436	± 3% F.S.

AENV Standards

Audit Calibrator
 Make/Model R&R MFC 201
 Serial/AMU Number AMU 1690

SO₂ Analyzer

Make/Model Teco 43C
 Serial/AMU Number AMU 1623
 Last Calibration Date January 19, 2016
 Full Scale (ppm) 1.0

COMMENTS:

Gas was check for accuracy - 1% low from stated cylinder gas concentration.
Flows are not measured at each pt - AMD not being followed as per section 5.0.
Checked SO₂ high pt using a Sabio 2010 - found a significantly higher response.
Both MFC's need to be re-calibrated.

Auditor: Al Clark

Date: January 19, 2016

Operator Signature: 

Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>EnviroNics 6100</u>	Make/Model	<u>Bios Definer 220</u>
Serial Number	<u>5212</u>	Serial Number	<u>High - 128686, Low 129069</u>
Last Verification Date	<u>December 18, 2014</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>77.4</u>	Pt. #2	<u>37.7</u>
		Pt. #3	<u>18.9</u>
Gas Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4995	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5000	77.4	0.780	0.780	0.785	0.001	0.786	1%	1%
4996	37.7	0.379	0.379	0.380	0.000	0.380	0%	0%
4991	18.9	0.190	0.190	0.190	0.000	0.190	0%	0%
Absolute Average Percent Difference							0%	0%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0068	0.90-1.10		m (Slope)=	1.0081		
b (Intercept % of FS)=	-0.0783	± 3% F.S.		b (Intercept % of FS)=	-0.0981		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5000	0	0.000	0.785	-0.001	0.784	NO ₂	% Diff. Limit
5000	0.5	0.500	0.285	0.499	0.784	0%	± 10%
5000	0.25	0.257	0.528	0.258	0.786	1%	± 10%
5000	0.1	0.101	0.684	0.104	0.788	4%	± 10%
Absolute Average Percent Difference						2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9974	0.90-1.10					
b (Intercept % of FS)=	0.1057	± 3% F.S.					

<p style="text-align: center;">AENV Standards</p> <p style="text-align: center;">Audit Calibrator</p> <p>Make/Model <u>Thermo 146i</u></p> <p>Serial/AMU Number <u>1809</u></p>	<p style="text-align: center;">NO_x Analyzer</p> <p>Make/Model <u>Thermo 42i</u></p> <p>Serial/AMU Number <u>1868</u></p> <p>Last Calibration Date <u>February 1, 2016</u></p> <p>Full Scale (ppm) <u>1</u></p>
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COMMENTS: Flow values above were the calibrator displayed values; flows were also measured using certified flow meters (Maxxam-owned); the target concentrations were as follows: High 0.771ppm, Mid 0.377ppm, Low 0.189ppm; % Diff High 2%, Mid 1%, low 1%

Auditor: Shea Beaton

Operator Signature: [Signature]

Date: February 3, 2016

Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Christopher Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17100415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>May 2015</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)					
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>	Pt. #3	<u>5000</u>
Gas Flow (sccm)					
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>	Pt. #3	<u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	80.7	0.783	0.783	0.810	-0.004	0.806	3%	3%
5001	39.4	0.382	0.382	0.395	-0.001	0.393	3%	3%
5000	19.8	0.192	0.192	0.198	0.000	0.198	3%	3%
Absolute Average Percent Difference							3%	3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0347	0.90-1.10	m (Slope)= 1.0292
b (Intercept % of FS)= -0.0283	± 3% F.S.	b (Intercept % of FS)= 0.0098

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5001	Lamp C.	0.000	0.808	-0.004	0.804	NO ₂	% Diff. Limit
5001	1.316	0.476	0.332	0.472	0.804	0%	± 10%
5001	0.696	0.234	0.574	0.231	0.805	0%	± 10%
5001	0.392	0.089	0.719	0.086	0.805	1%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9994	0.90-1.10
b (Intercept % of FS)= -0.3382	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
	Last Calibration Date <u>May 18, 2016</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: Contains 50.3 ppm SO₂. Flows not measured as per Chapter 7, Section 5 of AMD.

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: May 18, 2016
 Location: McIntyre Center Edmonton

Company Maxxam Operator: Christopher Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>May 2015</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5029	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5030	80.6	0.777	0.777	0.805	-0.005	0.800	4%	3%
5025	39.4	0.380	0.380	0.394	-0.002	0.392	4%	3%
5028	19.8	0.191	0.191	0.198	-0.001	0.197	4%	3%
Absolute Average Percent Difference							3.65%	3.09%

LINEAR REGRESSION ANALYSIS				$y=mx+b$ (where x=calculated concentration, y=indicated concentration)			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0360	0.90-1.10		m (Slope)=	1.0295		
b (Intercept % of FS)=	0.0110	± 3% F.S.		b (Intercept % of FS)=	0.0293		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas		
5030	Lamp C.	0.000	0.804	-0.004	0.800	NO ₂	% Diff. Limit	
5030	1.388	0.495	0.309	0.491	0.800	0%	± 10%	
5030	0.745	0.241	0.563	0.239	0.802	1%	± 10%	
5030	0.367	0.091	0.713	0.089	0.801	2%	± 10%	
Absolute Average Percent Difference							1%	± 10%

LINEAR REGRESSION ANALYSIS				$y=mx+b$ (where x=calculated concentration, y=indicated concentration)			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9988	0.90-1.10					
b (Intercept % of FS)=	-0.2760	± 3% F.S.					

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>May 18, 2016</u>
		Full Scale (ppm)	<u>1.0</u>

 COMMENTS: Contains 50.3 ppm SO₂. Flows not measured as per Chapter 7, Section 5 of AMD.

 Auditor: AI Clark
 Operator Signature: *Christopher Wesson*

 Date: May 18, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-086CGA

Company: Maxxam Operator's Name: Chris Wesson
Cylinder #: LL119513 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model: Teco 146i
Serial Number: AMU 1809
Last Verification Date: June 17, 2016
Gas Type: SO2 Conc. 98.07
Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 23.0 C
B.P. 700 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
Last Calibration: Date: June 17/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01654	60.462	50.1
4976	82.3	0.828	0.01654	60.462	50.1
4985	40.8	0.411	0.00818	122.181	50.2
4965	20.2	0.203	0.00407	245.792	49.9
Average Cylinder Concentration:					50.1

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: June 17, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-112CGA

Company: Maxxam Operator's Name: Chris Wesson
Cylinder #: BLM002197 Concentration PPM: 10.3 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: February 2, 2016
Gas Type: H2S Conc. 20.43
Cylinder Number: CAL015584

Flow Measurement Device:

Make/Model: Bios DC-2
Serial Number: Bios D
Temp. °C: 24.5
B.P. 702mmHg

Reference Analyzer:

Make/Model: Thermo 450i Serial/AMU Number: 1980
Instrument Settings: Zero: 15.3 Span: 1.126 Range: 0.1
Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5017	0.0	0.000	0.00000	0.00000	0.000
5054	37.96	0.078	0.00751	133.140	10.4
5055	17.78	0.037	0.00352	284.308	10.4
5029	9.07	0.019	0.00180	554.465	10.3
Average Cylinder Concentration:					10.3

Previous Stated Concentration PPM: 10.3

Percent variance from Stated: 0.5

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 2, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2013-298CGA

Company: Maxxam Operators name: Theo
 Cylinder #: LL19638 Conc CH4 (PPM) 880/304 Tolerance (%) 2 Certified By: Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1690</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 17, 2013</u>			Temp. °C	<u>21.0 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>999.2</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:
 Make/Model Teco 55C Serial/AMU Number: 1625
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: Oct 17/13 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.04	0.00	0.001481	67.534	889	309
3505	51.9	13.16	12.58	0.01481	67.534	889	309
3487	22.2	5.64	5.43	0.00637	157.072	886	310
3458	10.8	2.80	2.73	0.00312	320.185	897	318
Average Cylinder Concentration:						890	312

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>880</u>	<u>304</u>
Percent variance from Stated: <u>1.2</u>	<u>2.7</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance, Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: October 17, 2013
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-091CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL86139 Conc CH4 (PPM) 599/211 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Bios D
Temp. °C 23
B.P. 599mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1,000 Done By: SB

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2583	0.00	0.00	0.00	0.02145	46.621	597	213
2635	56.52	12.80	12.59	0.02145	46.621	597	213
2592	19.72	4.54	4.49	0.00761	131.440	597	215
2584	9.69	2.25	2.24	0.00375	266.667	600	217
Average Cylinder Concentration:						598	215

	<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM:	<u>599</u>	<u>211</u>
Percent variance from Stated:	<u>0.2</u>	<u>1.9</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
Operator Signature: _____ Location: McIntyre Center Edmonton



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay:	581.93 ppm	

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:	0 ppm	

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay:	202.53 ppm	

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:	0 ppm	

Analyzed by:

Jack Fu

Certified by:

Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
NO	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Peace River Area Monitoring Program Committee	Three Creeks 842b Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

23-12-2016




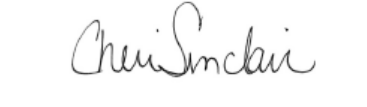
Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Peace River Area Monitoring Program Committee</u>	Project #: <u>8449-2016-11-80-C</u>
Site: <u>Three Creeks 842b Station</u>	Contact: <u>Karla Reesor</u>

Level 0 Preliminary Verification	<u></u>	Date <u>12-Dec-2016</u>
Level 1 Primary Validation	<u></u>	Date <u>12-Dec-2016</u>
Level 2 Final Validation	<u></u>	Date <u>15-Dec-2016</u>
Level 3 Independent Data Review	<u></u>	Date <u>15-Dec-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.