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

JOB #: 8449-2017-07-80-C

July 2017

Prepared for:

PEACE RIVER AREA MONITORING PROGRAM COMMITTEE

Attention: LILY LIN

DATE: **August 21, 2017**

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SUMMARY

In July 2017, 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 compliance parameters, as requested by the PRAMP Committee.

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

Non-Conformance: The AMD-required internal zero/span check was not executed on July 1, due to a change in the automated zero/span schedule from a 23-hr to 24-hr interval. The daily zero reponse data of June 30 was applied for baseline correction on data collected from July 1, hour 00:00 to July 2, hour 04:00. As both span responses recorded on June 30 and July 2 met AMD requirements, and the analyzers were operating within optimal specifications, no data was discarded. The non-conformance was reported to AEP. Reference number: 328687

Wind System: There was an electronic failure of the wind system on July 9. The wind system was subsequently replaced on July 10. Thirty hours of downtime were recorded due to this event.

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						MAXIMUM VALUES							OPERATIONAL TIME (%)
Three Creeks 842b Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	3	12	11	5.9	SW	0	1	100.0
TRS (ppb)	-	-	-	-	0.19	1.02	7	4	2.2	ENE	0.26	7	100.0
THC (ppm)	-	-	-	-	1.93	2.19	21	4	0.5	N	1.99	25	99.9
CH ₄ (ppm)	-	-	-	-	1.93	2.19	21	4	0.5	N	1.99	25	99.9
NMHC (ppm)	-	-	-	-	0.00	0.00	1	0	5.5	SE	0.00	1	99.9
RELATIVE HUMIDITY (%)	-	-	-	-	65	96	13	4	4.7	ENE	87	13	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	943	957	31	23	5.0	WNW	953	31	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.7	30.1	7	14	4.3	E	21.0	7	100.0
STATION TEMPERATURE (°C)	-	-	-	-	22.8	38.3	12	17	3.5	ENE	27.8	12	100.0
VECTOR WS (kph)	-	-	-	-	5.3	29.6	3	16	-	WSW	17.3	3	96.0
VECTOR WD (sec)	-	-	-	-	231 (SW)	-	-	-	-	-	-	-	96.0

**SOUR GAS PROCESSING INDUSTRY
MONTHLY REPORT SUMMARY**

Three Creeks 842b Station

Peace River Area Monitoring Program Committee

Plant Name / Location

Company

Licence Number	Report Date	
	YEAR	MONTH
N/A	2017	July

CONTINUOUS AMBIENT MONITORING						
PARAMETER	% TIME OPERATIONAL	ONE - HOUR AVERAGE			24 - HOUR AVERAGE	
		MAXIMUM VALUES	NO. READINGS > REGULATION	MAXIMUM VALUES	NO. READINGS > REGULATION	
SO ₂	100.0	0.003 ppm	0	0.000 ppm	0	
TRS	100.0	0.001 ppm	-	0.000 ppm	-	
THC	99.9	2.19 ppm	-	1.99 ppm	-	
CH ₄	99.9	2.19 ppm	-	1.99 ppm	-	
NMHC	99.9	0.00 ppm	-	0.00 ppm	-	
RH	100.0	96 %	-	87 %	-	
BP	100.0	957 mb	-	953 mb	-	
Ambient TPX	100.0	30.1 °C	-	21.0 °C	-	
Station TPX	100.0	38.3 °C	-	27.8 °C	-	
Wind Speed	96.0	30 kph	-	17 kph	-	
Wind Direction	96.0	-	-	-	-	

SIGNATURE OF COMPANY REPRESENTATIVE

FOR ALBERTA ENVIRONMENT USE ONLY

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 (December, 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. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on July 11.
- Six instances of maximum instantaneous data were discarded this month due to brief power outages.

TOTAL REDUCED SULPHUR (TRS)

- Operational time, for the monitoring period, was 100%.
- The routine monthly calibration was performed on July 11.
- Six instances of maximum instantaneous data were discarded this month due to brief power outages.

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

- Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime.
- The fuel gas cylinder was replaced on July 10.
- The scheduled zero/span check was not executed on July 18. Upon an immediate site visit, the span gas regulator was found shut-off, blocking the release of the span gas. This is likely a result of interference from trailer activities on June 17, while the air conditioning system was being installed. The span gas regulator was reset and the gas pressure was corrected. A successful zero/span check was subsequently completed. As this event was limited to the source of the span gas, and the analyzer or the zero/span system was not impacted, no data was discarded. However, one hour of downtime was recorded due to the unsuccessful zero/span attempt.
- Six instances of maximum instantaneous data were discarded this month due to brief power outages.
- 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)

- Operational time, for the monitoring period was 96.0%, equivalent to thirty hours of downtime.
- There was an electronic failure of the wind system on July 9. On July 10, the resident wind system, RM Young 05305VK (s/n: 110980), was removed for maintenance and a replacement, RM Young 05305VK (s/n: 65521), was installed. The replacement wind system was calibrated on July 11. Thirty hours of downtime were recorded due to this event.
- Six instances of maximum instantaneous data were discarded this month due to brief power outages.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time, for the monitoring period, was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time, for the monitoring period, was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time, for the monitoring period, was 100%.

STATION TEMPERATURE (StnTPX)

- Operational time, for the monitoring period, was 100%. A new air conditioning unit was installed on July 17 to better stabilize station temperature.

2.0 Project Personnel

Karla Reesor was the contact for Peace River Area Monitoring Program Committee and the Maxxam field technician was Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

The AMD-required internal zero/span check was not executed on July 1, due to a change in the automated zero/span schedule from a 23-hr to 24-hr interval. The daily zero reponse data of June 30 was applied for baseline correction on data collected from July 1, hour 00:00 to July 2, hour 04:00. As both span responses recorded on June 30 and July 2 met AMD requirements, and the analyzers were operating within optimal specifications, no data was discarded. The non-conformance was reported to AEP. Reference number: 328687

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 Flourescent Analyzer

Total Reduced Sulphur - Thermo 43i UV Flourescent Analyzer

Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer

Wind System - RM Young Unit

Relative Humidity - RM Young Unit

Barometric Pressure - RM Young 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

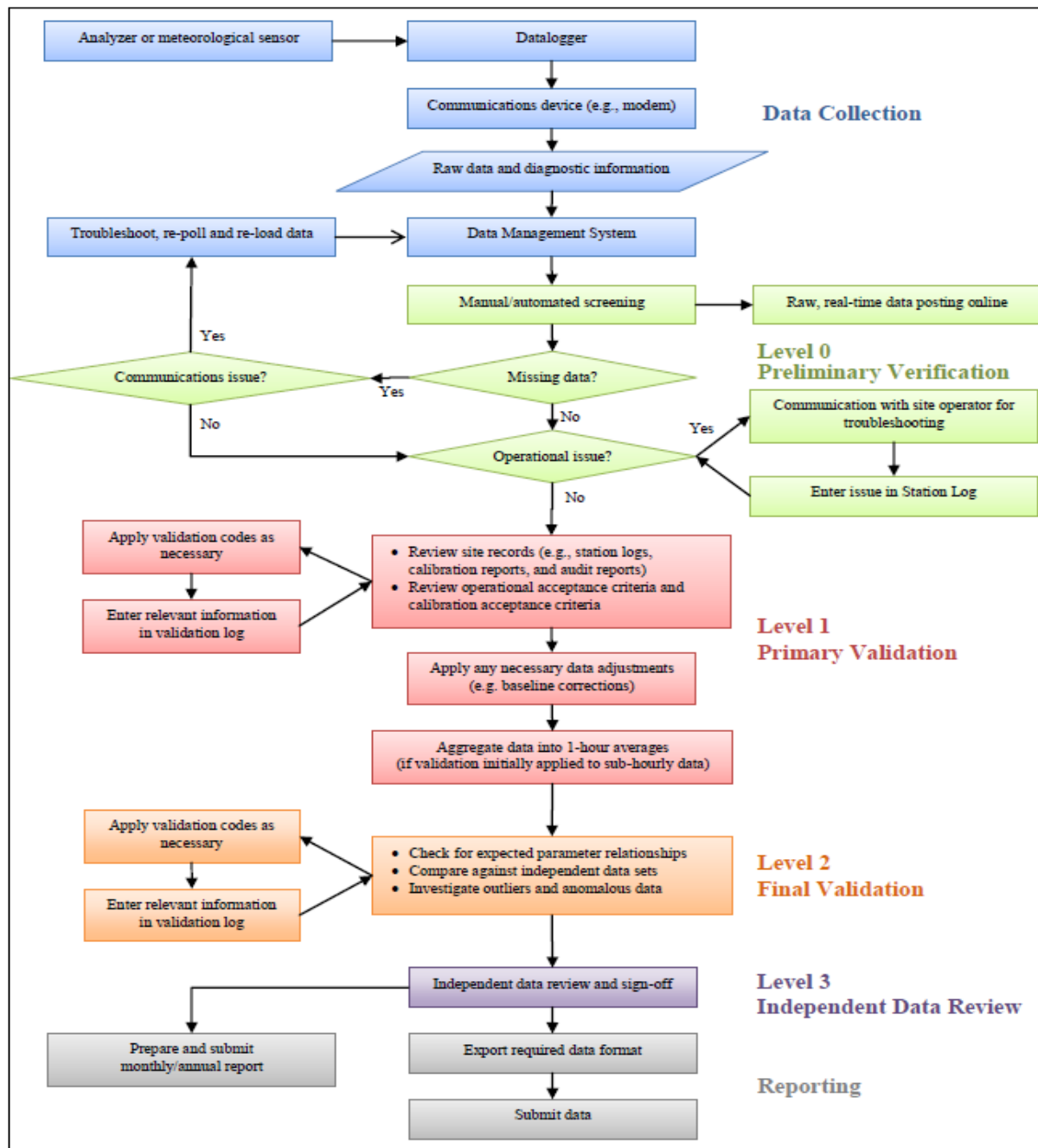
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (December 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)

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
5	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
10	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	S	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	S	0	0	0	0	2	3	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	0	24
13	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
28	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	0	0	0	0	0	0	0	0	0	2	3	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

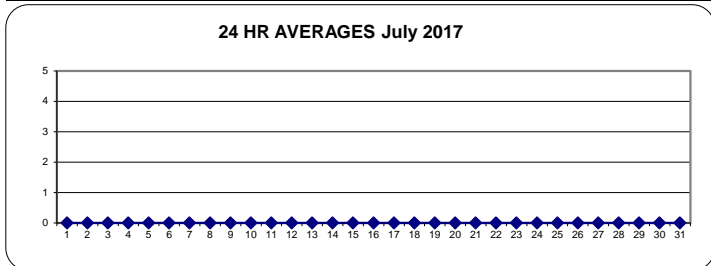
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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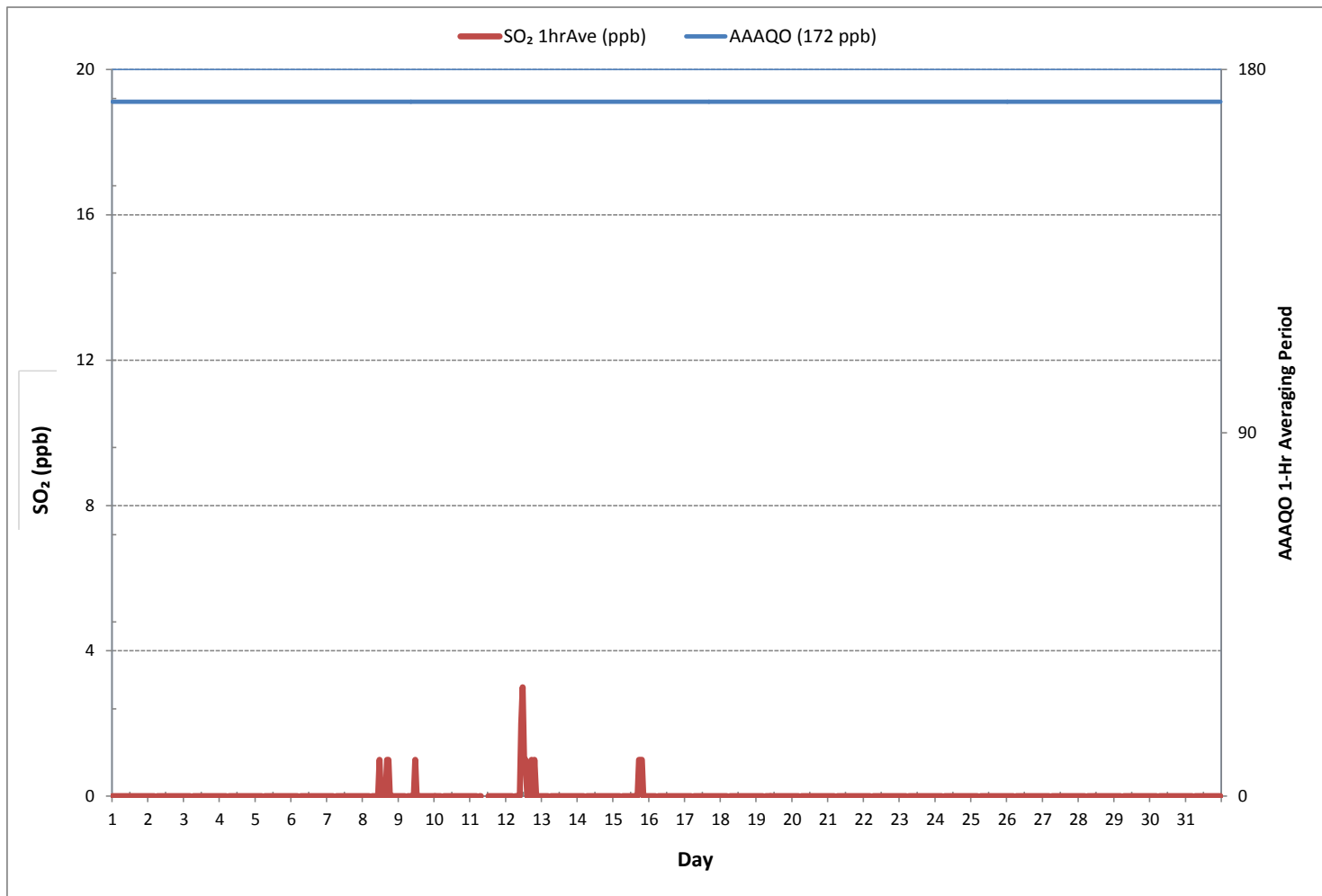
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	13
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR 11 ON DAY 12
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - July 2017

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	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	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
2	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	24	
3	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	1	0	0	1	1	24	
4	1	1	0	0	1	S	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1	24	
5	1	1	0	1	1	S	1	1	1	1	1	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	1	1	24
6	1	0	0	0	0	S	1	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	1	1	0	0	1	0	24
7	1	1	0	0	1	S	1	P	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	23
8	1	0	1	1	1	S	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	24
9	0	1	1	1	1	S	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	24
10	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	P	1	1	1	1	1	1	1	1	1	23
11	1	1	1	1	0	S	1	C	C	C	C	C	1	1	1	0	1	0	1	0	0	0	0	0	0	0	1	1	24
12	0	0	0	1	0	S	1	1	1	1	6	6	3	1	1	1	1	1	1	2	0	0	0	0	0	0	6	1	24
13	0	0	0	0	0	S	1	0	0	0	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	0	24
14	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	P	S	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	23
16	1	1	0	0	0	S	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	S	0	0	P	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	23
18	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	1	0	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0	1	0	1	1	24
20	0	1	1	P	1	S	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	1	0	1	1	1	23
21	0	1	1	1	0	S	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	1	0	0	0	0	1	1	24
22	1	1	1	0	1	S	1	1	1	1	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	1	24
23	1	1	1	0	1	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	24	
24	0	0	0	0	0	S	0	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	0	0	0	1	0	24
25	0	0	0	0	0	S	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	P	1	0	0	1	1	23	
26	1	0	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	24	
27	1	1	1	1	1	S	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1	1	24
28	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	24
29	0	0	1	1	0	S	1	1	1	1	1	1	1	1	1	0	0	1	0	0	1	0	1	1	1	0	1	1	24
30	1	1	1	1	1	S	1	1	1	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	24
31	0	0	0	0	0	S	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	24
HOURLY MAX	1	1	1	1	1	0	1	1	1	1	6	6	3	1	1	1	1	1	1	2	1	1	1	1	1	0	1	1	
HOURLY AVG	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	

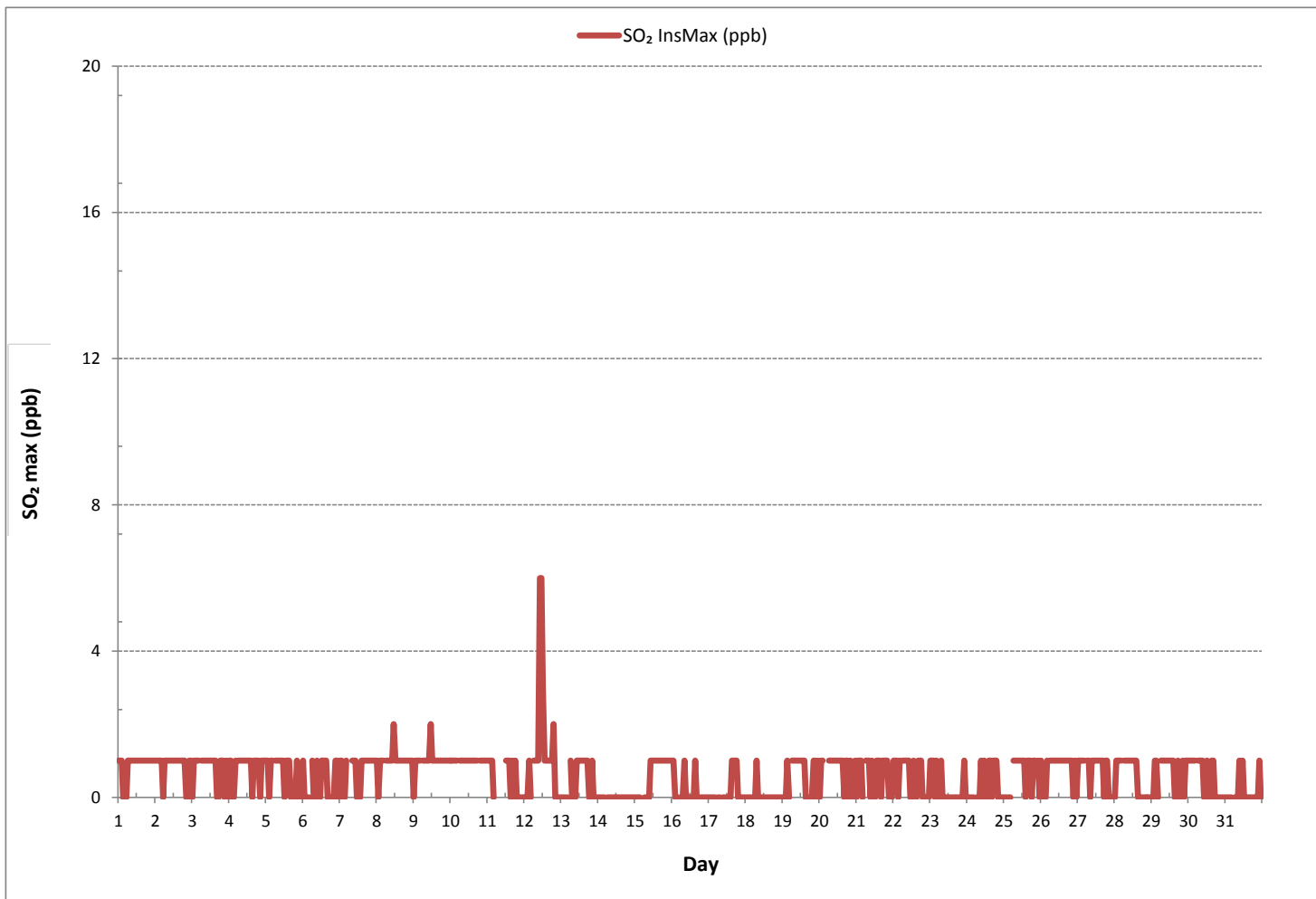
STATUS FLAG CODES

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:	405
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 10 ON DAY 12
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	738 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: PRAMP_842
 Poll.: PRAMP_842-SO2[ppb]
 Monthly: 2017/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

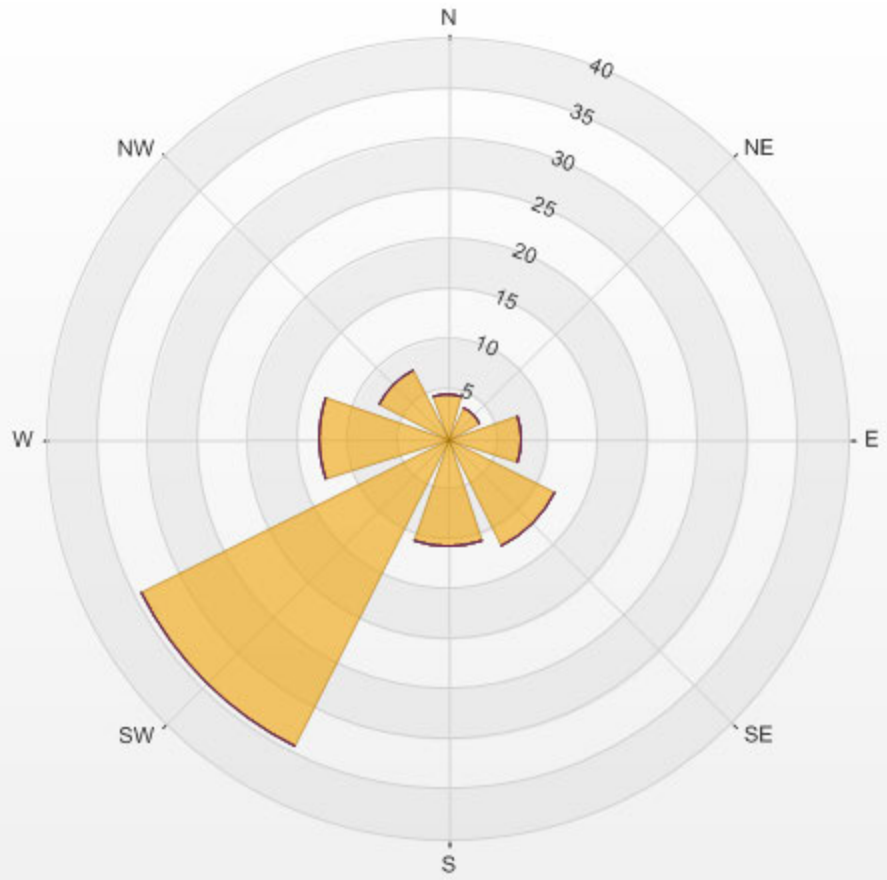
Calm: 7.35%

Calm Avg: 0.03 [ppb]

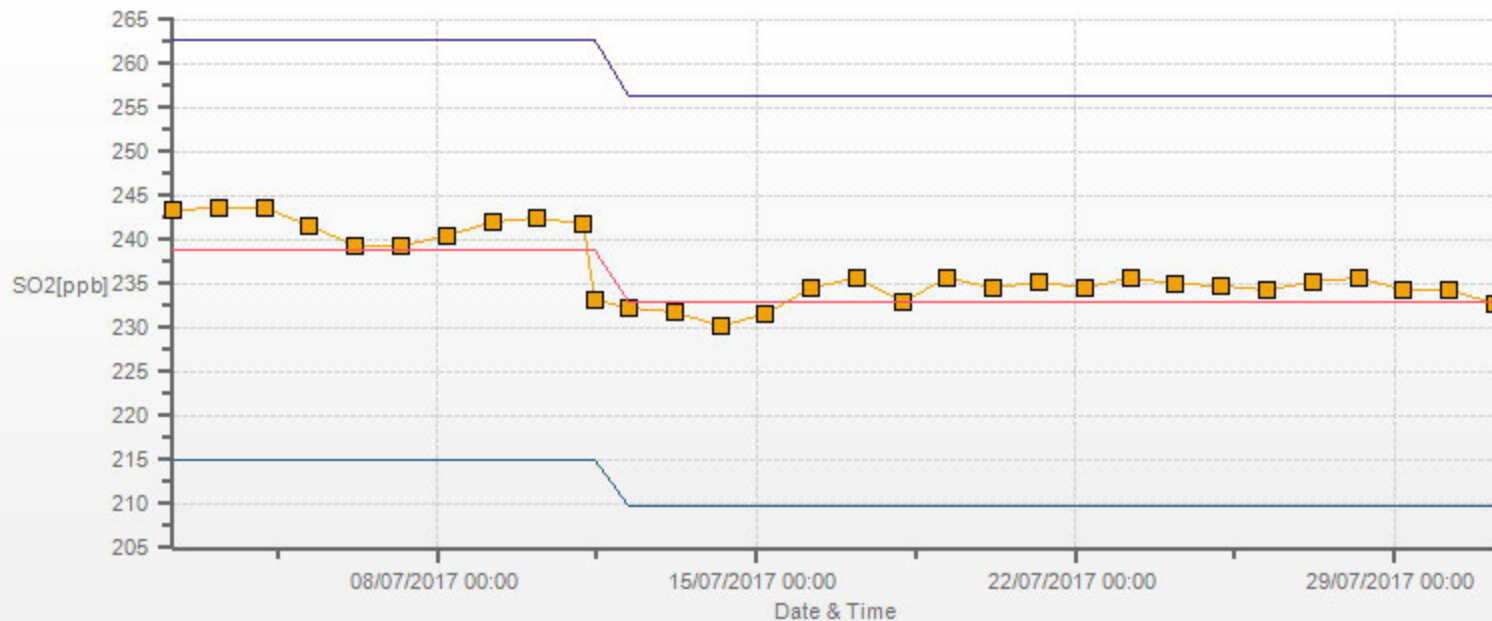
Direction	0-3	3-10	10-85	85-170	>170.0	Total
N	4.4	0.0	0.0	0.0	0.0	4.4
NE	3.5	0.0	0.0	0.0	0.0	3.5
E	7.4	0.0	0.0	0.0	0.0	7.4
SE	11.9	0.0	0.0	0.0	0.0	11.9
S	10.7	0.0	0.0	0.0	0.0	10.7
SW	34.3	0.0	0.0	0.0	0.0	34.3
W	12.8	0.0	0.0	0.0	0.0	12.8
NW	7.7	0.0	0.0	0.0	0.0	7.7
Summary	92.6	0.0	0.0	0.0	0.0	92.6

% Icon	Classes (ppb)	93	0-3	0	3-10	0	10-85	0	85-170	0	>170.0
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PRAMP_842 Poll.: PRAMP_842-SO2[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.35% Calm Poll Avg: 0.03[ppb]



SO2[ppb] Calibration: PRAMP_842 Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR



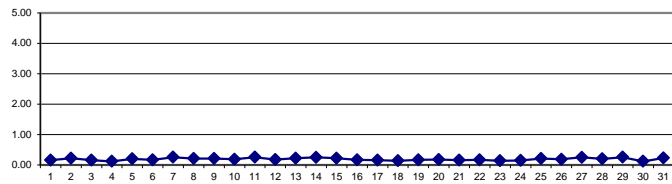
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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	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	0.12	0.15	0.18	0.20	0.16	0.15	0.15	0.14	0.17	0.31	0.16	0.15	0.14	0.12	0.11	0.13	0.12	0.13	0.12	0.17	0.14	0.16	0.17	0.19	0.11	0.31	0.16	24
2	0.25	0.31	0.31	0.50	0.52	S	0.32	0.27	0.25	0.21	0.18	0.17	0.13	0.13	0.11	0.11	0.11	0.12	0.13	0.13	0.16	0.23	0.24	0.22	0.11	0.52	0.22	24
3	0.22	0.21	0.22	0.21	0.26	S	0.29	0.26	0.21	0.14	0.12	0.12	0.13	0.12	0.12	0.11	0.12	0.10	0.08	0.11	0.13	0.17	0.12	0.08	0.29	0.16	24	
4	0.14	0.16	0.16	0.12	0.14	S	0.19	0.15	0.13	0.09	0.09	0.09	0.10	0.09	0.08	0.09	0.10	0.10	0.11	0.09	0.11	0.15	0.16	0.16	0.08	0.19	0.12	24
5	0.20	0.16	0.17	0.18	0.20	S	0.95	0.25	0.21	0.23	0.20	0.16	0.13	0.12	0.11	0.11	0.10	0.09	0.11	0.11	0.18	0.25	0.22	0.22	0.09	0.95	0.20	24
6	0.23	0.20	0.21	0.22	0.15	S	0.19	0.15	0.14	0.14	0.13	0.14	0.13	0.13	0.12	0.14	0.13	0.12	0.12	0.11	0.18	0.24	0.24	0.26	0.11	0.26	0.17	24
7	0.27	0.28	0.34	0.75	1.02	S	0.74	0.30	0.18	0.12	0.11	0.12	0.11	0.12	0.11	0.11	0.11	0.12	0.11	0.12	0.20	0.20	0.14	0.22	0.11	1.02	0.26	24
8	0.33	0.32	0.28	0.22	0.23	S	0.30	0.28	0.28	0.24	0.23	0.18	0.15	0.14	0.12	0.12	0.09	0.10	0.12	0.13	0.17	0.22	0.26	0.22	0.09	0.33	0.21	24
9	0.22	0.23	0.22	0.39	0.30	S	0.23	0.21	0.16	0.14	0.13	0.14	0.14	0.13	0.13	0.20	0.18	0.21	0.26	0.30	0.25	0.15	0.21	0.21	0.13	0.39	0.21	24
10	0.24	0.21	0.20	0.22	0.24	S	0.21	0.20	0.20	0.21	0.18	0.16	0.18	0.16	0.16	0.16	0.16	0.15	0.16	0.17	0.19	0.20	0.23	0.27	0.15	0.27	0.19	24
11	0.27	0.28	0.53	0.86	0.57	S	0.62	0.47	C	C	C	C	C	0.16	0.14	0.16	0.11	0.06	0.05	0.07	0.09	0.11	0.09	0.09	0.05	0.86	0.26	24
12	0.08	0.09	0.07	0.51	0.63	S	0.51	0.16	0.13	0.11	0.11	0.09	0.10	0.11	0.12	0.13	0.13	0.15	0.15	0.10	0.12	0.16	0.13	0.17	0.07	0.63	0.18	24
13	0.18	0.17	0.39	0.27	0.40	S	0.56	0.47	0.21	0.22	0.20	0.17	0.19	0.22	0.17	0.15	0.15	0.13	0.12	0.16	0.15	0.13	0.12	0.12	0.12	0.56	0.22	24
14	0.14	0.15	0.24	0.42	0.54	S	0.48	0.48	0.27	0.27	0.24	0.21	0.19	0.17	0.17	0.13	0.13	0.14	0.16	0.27	0.26	0.25	0.28	0.13	0.13	0.54	0.25	24
15	0.40	0.27	0.18	0.18	0.17	S	0.21	0.22	0.22	0.20	0.19	0.22	0.23	0.23	0.24	0.23	0.21	0.24	0.24	0.24	0.25	0.16	0.17	0.20	0.16	0.40	0.22	24
16	0.24	0.27	0.26	0.17	0.19	S	0.21	0.18	0.18	0.18	0.16	0.15	0.14	0.13	0.13	0.13	0.13	0.14	0.12	0.12	0.12	0.13	0.16	0.20	0.12	0.27	0.17	24
17	0.16	0.17	0.20	0.23	0.23	S	0.20	0.16	0.15	0.16	0.13	0.12	0.12	0.13	0.12	0.13	0.17	0.13	0.14	0.13	0.16	0.14	0.16	0.20	0.12	0.23	0.16	24
18	0.20	0.24	0.20	0.25	0.26	S	0.16	0.15	0.14	0.13	0.13	0.12	0.12	0.11	0.10	0.10	0.09	0.09	0.09	0.08	0.10	0.12	0.12	0.11	0.08	0.26	0.14	24
19	0.18	0.28	0.29	0.27	0.37	S	0.33	0.26	0.21	0.16	0.15	0.12	0.10	0.11	0.11	0.09	0.09	0.07	0.07	0.10	0.15	0.13	0.11	0.14	0.07	0.37	0.17	24
20	0.14	0.17	0.17	0.22	0.23	S	0.24	0.20	0.17	0.16	0.17	0.16	0.18	0.18	0.17	0.15	0.16	0.20	0.15	0.14	0.15	0.21	0.21	0.20	0.14	0.24	0.18	24
21	0.23	0.20	0.18	0.22	0.20	S	0.26	0.20	0.13	0.13	0.14	0.13	0.14	0.11	0.12	0.11	0.10	0.12	0.12	0.16	0.17	0.18	0.18	0.18	0.10	0.26	0.16	24
22	0.15	0.18	0.20	0.31	0.45	S	0.40	0.18	0.18	0.19	0.13	0.11	0.10	0.09	0.11	0.10	0.11	0.11	0.11	0.13	0.13	0.21	0.16	0.13	0.09	0.45	0.17	24
23	0.18	0.20	0.19	0.19	0.17	S	0.22	0.17	0.14	0.11	0.10	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.13	0.13	0.12	0.11	0.20	0.17	0.09	0.22	0.14	24
24	0.13	0.14	0.18	0.25	0.35	S	0.19	0.14	0.14	0.13	0.12	0.12	0.12	0.13	0.14	0.12	0.10	0.09	0.10	0.11	0.15	0.19	0.18	0.22	0.09	0.35	0.15	24
25	0.22	0.21	0.23	0.27	0.47	S	0.73	0.34	0.27	0.26	0.23	0.17	0.15	0.10	0.10	0.08	0.08	0.08	0.09	0.09	0.12	0.15	0.17	0.15	0.08	0.73	0.21	24
26	0.16	0.18	0.27	0.20	0.20	S	0.23	0.23	0.16	0.16	0.30	0.26	0.14	0.11	0.11	0.11	0.12	0.12	0.12	0.17	0.25	0.26	0.27	0.31	0.11	0.31	0.19	24
27	0.30	0.31	0.21	0.21	0.25	S	0.32	0.47	0.30	0.28	0.27	0.25	0.33	0.23	0.21	0.16	0.15	0.16	0.15	0.20	0.24	0.25	0.20	0.23	0.15	0.47	0.25	24
28	0.22	0.18	0.19	0.23	0.23	S	0.26	0.32	0.43	0.34	0.25	0.17	0.15	0.13	0.12	0.13	0.11	0.11	0.11	0.14	0.15	0.19	0.19	0.33	0.11	0.43	0.20	24
29	0.36	0.35	0.43	0.76	1.00	S	0.35	0.29	0.26	0.22	0.21	0.18	0.16	0.13	0.09	0.07	0.09	0.10	0.09	0.14	0.18	0.18	0.19	0.17	0.07	1.00	0.26	24
30	0.17	0.19	0.21	0.24	0.20	S	0.26	0.26	0.18	0.14	0.09	0.07	0.06	0.04	0.03	0.04	0.03	0.04	0.04	0.04	0.06	0.08	0.11	0.12	0.03	0.26	0.12	24
31	0.13	0.18	0.22	0.19	0.53	S	0.68	0.31	0.46	0.31	0.15	0.13	0.16	0.15	0.13	0.13	0.15	0.16	0.13	0.14	0.17	0.16	0.24	0.22	0.13	0.68	0.23	24
HOURLY MAX	0.40	0.35	0.53	0.86	1.02	0.15	0.95	0.48	0.46	0.34	0.30	0.26	0.33	0.23	0.24	0.23	0.21	0.24	0.26	0.30	0.27	0.26	0.27	0.33				
HOURLY AVG	0.21	0.21	0.24	0.31	0.35	0.15	0.35	0.25	0.21	0.19	0.17	0.15	0.14	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.16	0.18	0.18	0.19				

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

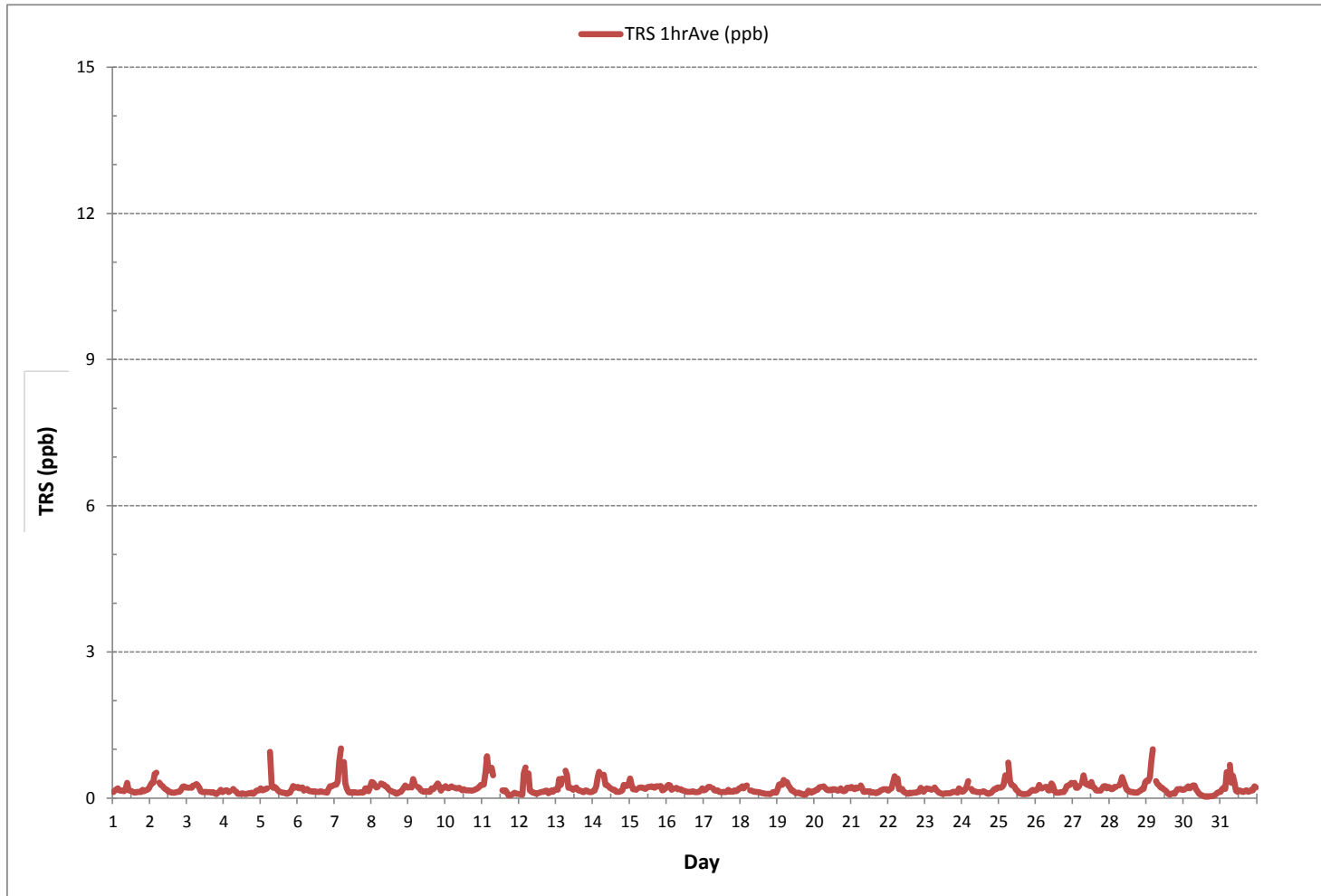
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	709			
MINIMUM 1-HR AVERAGE:	0.03	ppb @ HOUR	14	ON DAY 30
MAXIMUM 1-HR AVERAGE:	1.02	ppb @ HOUR	4	ON DAY 7
MAXIMUM 24-HR AVERAGE:	0.26	ppb		ON DAY 7
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.11		MONTHLY AVERAGE:	0.19 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE

Three Creeks 842b Station - July 2017

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	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	0.15	0.17	0.17	0.20	0.17	0.19	0.15	0.12	0.22	0.44	0.15	0.15	0.15	0.12	0.12	0.12	0.15	0.15	0.15	0.17	0.15	0.17	0.15	0.17	0.12	0.44	0.17	24	
2	0.30	0.28	0.33	0.64	0.67	S	0.33	0.25	0.23	0.22	0.17	0.17	0.09	0.12	0.09	0.07	0.07	0.09	0.12	0.12	0.15	0.22	0.22	0.25	0.07	0.67	0.23	24	
3	0.25	0.20	0.20	0.20	0.25	S	0.25	0.25	0.22	0.15	0.09	0.12	0.22	0.12	0.12	0.15	0.12	0.15	0.12	0.12	0.15	0.20	0.28	0.17	0.09	0.28	0.18	24	
4	0.25	0.23	0.28	0.20	0.22	S	0.28	0.22	0.22	0.18	0.17	0.15	0.18	0.17	0.15	0.15	0.15	0.17	0.20	0.17	0.18	0.28	0.23	0.28	0.15	0.28	0.20	24	
5	0.33	0.30	0.25	0.26	0.33	S	1.44	0.33	0.28	0.33	0.33	0.22	0.22	0.17	0.17	0.22	0.17	0.22	0.17	0.20	0.17	0.28	0.33	0.30	0.30	0.17	1.44	0.31	24
6	0.30	0.28	0.25	0.30	0.23	S	0.25	0.20	0.20	0.18	0.17	0.20	0.20	0.17	0.17	0.17	0.15	0.15	0.17	0.17	0.33	0.28	0.30	0.36	0.15	0.36	0.23	24	
7	0.39	0.41	0.46	0.98	1.69	S	1.11	P	0.28	0.15	0.12	0.17	0.12	0.12	0.15	0.12	0.12	0.15	0.15	0.20	0.33	0.22	0.17	0.57	0.12	1.69	0.37	23	
8	0.46	0.41	0.30	0.28	0.28	S	0.36	0.36	0.36	0.26	0.28	0.22	0.23	0.15	0.15	0.17	0.15	0.12	0.17	0.15	0.23	0.23	0.30	0.25	0.12	0.46	0.26	24	
9	0.28	0.28	0.25	0.49	0.38	S	0.28	0.25	0.17	0.12	0.15	0.12	0.12	0.15	0.15	0.20	0.18	0.22	0.25	0.30	0.30	0.15	0.20	0.26	0.12	0.49	0.23	24	
10	0.30	0.22	0.20	0.20	0.25	S	0.26	0.17	0.20	0.20	0.17	0.15	0.17	0.12	0.12	0.12	0.15	0.15	P	0.12	0.17	0.20	0.25	0.28	0.12	0.30	0.19	23	
11	0.25	0.25	0.75	1.01	0.67	S	0.80	C	C	C	C	C	C	0.36	0.33	0.30	0.30	0.20	0.22	0.20	0.22	0.25	0.22	0.22	0.20	1.01	0.39	24	
12	0.22	0.22	0.22	0.88	0.87	S	1.14	0.36	0.28	0.23	0.23	0.23	0.23	0.23	0.24	0.25	0.25	0.30	0.26	0.23	0.25	0.36	0.30	0.28	0.22	1.14	0.35	24	
13	0.28	0.33	0.75	0.43	0.56	S	0.96	1.01	0.36	0.30	0.30	0.28	0.28	0.36	0.25	0.22	0.25	0.25	0.20	0.25	0.22	0.22	0.22	0.17	0.17	1.01	0.37	24	
14	0.22	0.41	0.33	0.70	0.89	S	0.78	0.64	0.33	0.33	0.30	0.28	0.25	0.22	0.25	0.17	0.17	0.22	0.20	0.20	0.33	0.36	0.28	0.33	0.17	0.89	0.36	24	
15	0.51	0.36	0.20	0.22	P	S	0.25	0.25	0.25	0.23	0.25	0.26	0.25	0.26	0.28	0.23	0.23	0.26	0.27	0.28	0.30	0.20	0.20	0.23	0.20	0.51	0.26	23	
16	0.23	0.33	0.28	0.20	0.22	S	0.23	0.22	0.22	0.20	0.20	0.15	0.15	0.15	0.15	0.15	0.18	0.20	0.12	0.15	0.15	0.17	0.22	0.28	0.12	0.33	0.20	24	
17	0.26	0.20	0.25	0.28	0.30	S	0.36	0.20	P	0.20	0.20	0.17	0.18	0.18	0.15	0.20	0.25	0.17	0.20	0.17	0.22	0.20	0.23	0.26	0.15	0.36	0.22	23	
18	0.26	0.30	0.26	0.31	0.38	S	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.22	0.20	0.17	0.20	0.17	0.20	0.22	0.25	0.25	0.17	0.38	0.23	24	
19	0.33	0.43	0.49	0.41	0.67	S	0.49	0.41	0.33	0.30	0.28	0.22	0.20	0.20	0.20	0.20	0.17	0.15	0.17	0.23	0.23	0.22	0.20	0.22	0.15	0.67	0.29	24	
20	0.22	0.25	0.25	P	0.33	S	0.33	0.33	0.25	0.25	0.25	0.22	0.25	0.26	0.28	0.25	0.25	0.28	0.23	0.25	0.22	0.30	0.30	0.28	0.22	0.33	0.27	23	
21	0.41	0.38	0.28	0.30	0.54	S	0.41	0.43	0.23	0.20	0.23	0.22	0.23	0.25	0.22	0.17	0.17	0.20	0.22	0.25	0.28	0.26	0.25	0.28	0.17	0.54	0.28	24	
22	0.25	0.28	0.30	0.57	0.67	S	0.67	0.28	0.28	0.25	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.22	0.20	0.22	0.22	0.36	0.30	0.22	0.20	0.67	0.29	24	
23	0.28	0.28	0.30	0.33	0.28	S	0.33	0.33	0.28	0.22	0.20	0.17	0.17	0.23	0.20	0.17	0.20	0.25	0.22	0.22	0.20	0.22	0.30	0.28	0.17	0.33	0.25	24	
24	0.25	0.25	0.30	0.41	0.54	S	0.30	0.22	0.22	0.22	0.20	0.25	0.22	0.25	0.30	0.20	0.17	0.17	0.17	0.20	0.25	0.30	0.28	0.33	0.17	0.54	0.26	24	
25	0.33	0.30	0.33	0.38	0.75	S	0.95	0.70	0.38	0.36	0.33	0.28	0.25	0.18	0.18	0.20	0.17	0.17	0.20	0.20	0.22	P	0.28	0.28	0.17	0.95	0.34	23	
26	0.30	0.28	0.41	0.38	0.33	S	0.33	0.36	0.25	0.23	0.44	0.41	0.25	0.17	0.17	0.15	0.20	0.20	0.22	0.28	0.33	0.36	0.33	0.41	0.15	0.44	0.30	24	
27	0.38	0.36	0.23	0.25	0.28	S	0.38	0.57	0.38	0.33	0.33	0.33	0.41	0.38	0.30	0.23	0.20	0.25	0.20	0.28	0.33	0.36	0.28	0.33	0.20	0.57	0.32	24	
28	0.33	0.28	0.30	0.36	0.36	S	0.41	0.51	0.54	0.46	0.39	0.25	0.25	0.22	0.25	0.20	0.22	0.20	0.20	0.22	0.22	0.28	0.25	0.41	0.20	0.54	0.31	24	
29	0.44	0.46	0.73	1.09	1.36	S	0.46	0.38	0.36	0.30	0.28	0.28	0.25	0.22	0.20	0.17	0.20	0.20	0.17	0.28	0.30	0.30	0.33	0.33	0.17	1.36	0.40	24	
30	0.33	0.33	0.33	0.41	0.38	S	0.43	0.41	0.36	0.28	0.23	0.22	0.20	0.17	0.17	0.20	0.17	0.17	0.17	0.17	0.20	0.28	0.28	0.25	0.17	0.43	0.27	24	
31	0.28	0.33	0.38	0.36	1.03	S	1.49	0.51	0.62	0.51	0.28	0.25	0.30	0.28	0.33	0.25	0.28	0.28	0.25	0.25	0.30	0.25	0.38	0.33	0.25	1.49	0.41	24	
HOURLY MAX	0.51	0.46	0.75	1.09	1.69	0.19	1.49	1.01	0.62	0.51	0.44	0.41	0.41	0.38	0.33	0.30	0.30	0.30	0.27	0.30	0.33	0.36	0.38	0.57					
HOURLY AVG	0.30	0.30	0.33	0.43	0.53	0.19	0.53	0.36	0.29	0.26	0.24	0.22	0.21	0.21	0.20	0.19	0.19	0.19	0.19	0.21	0.24	0.26	0.26	0.29					

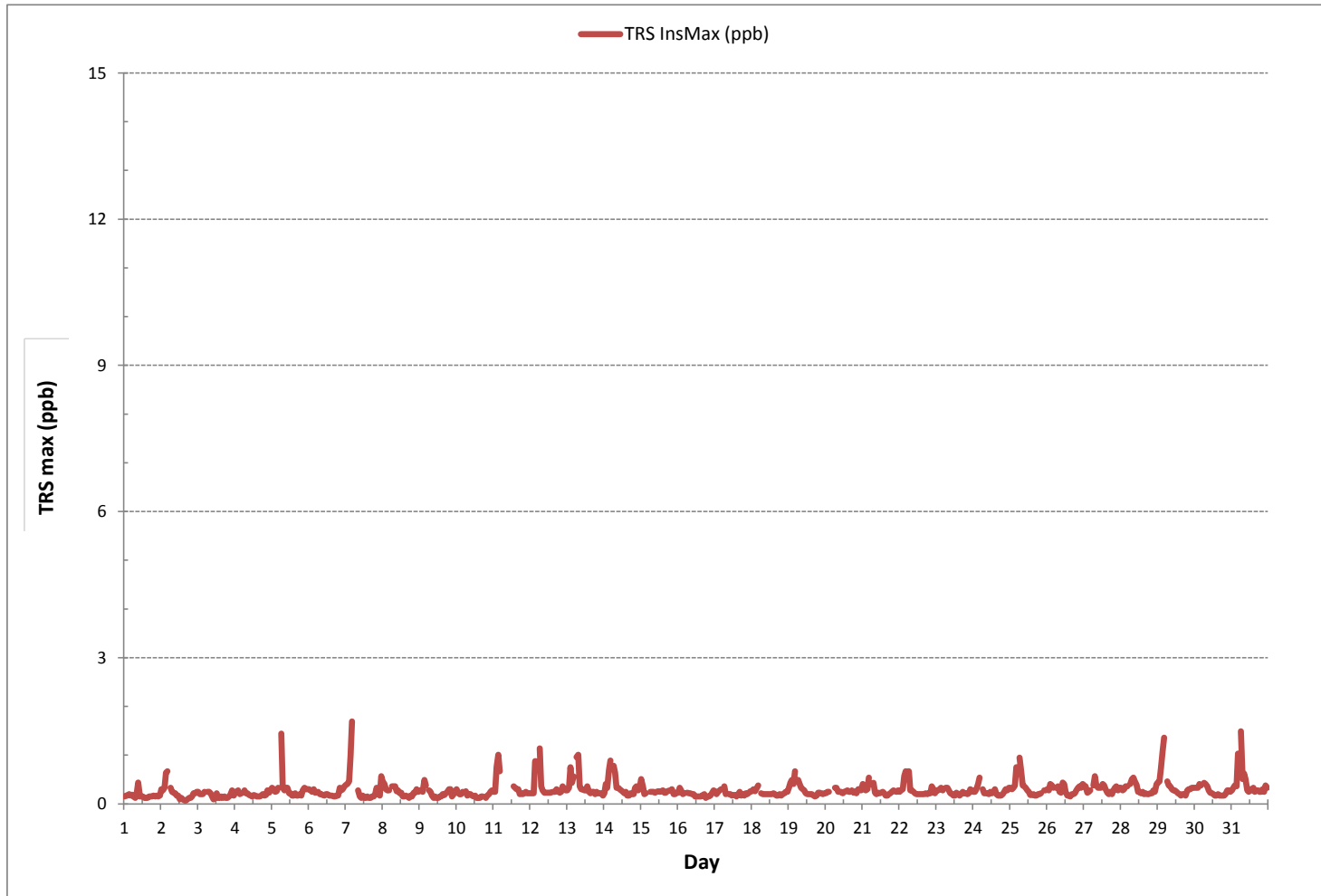
STATUS FLAG CODES

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

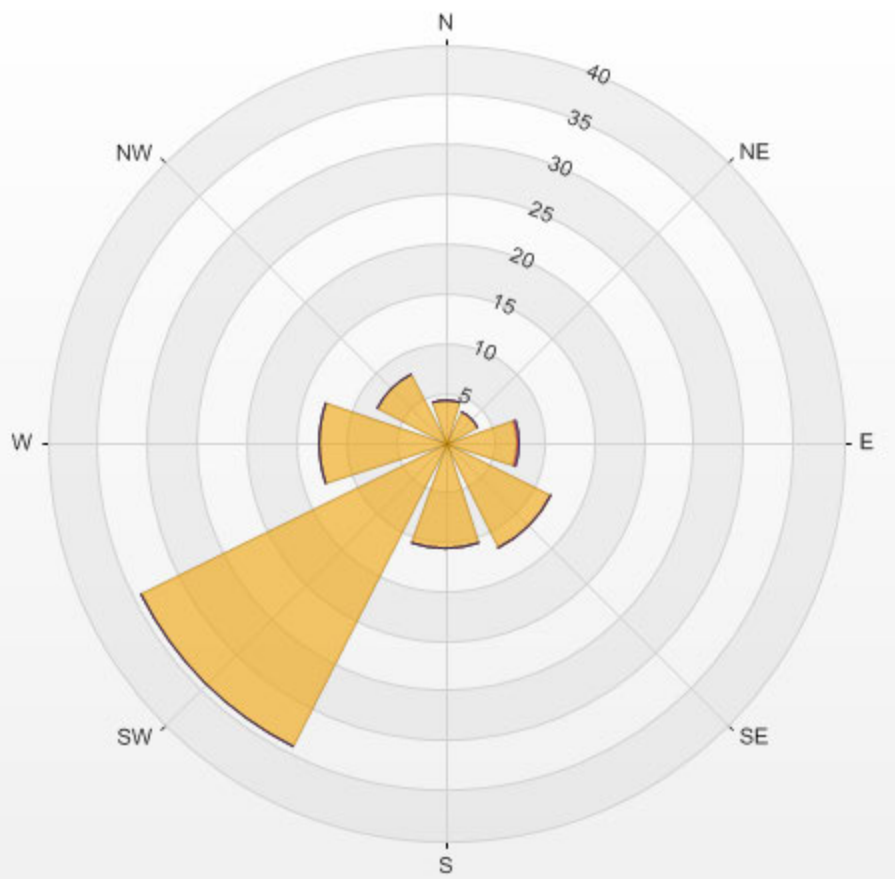
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	1.69 ppb @ HOUR 4 ON DAY 7
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	738 hrs
STANDARD DEVIATION:	0.17

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

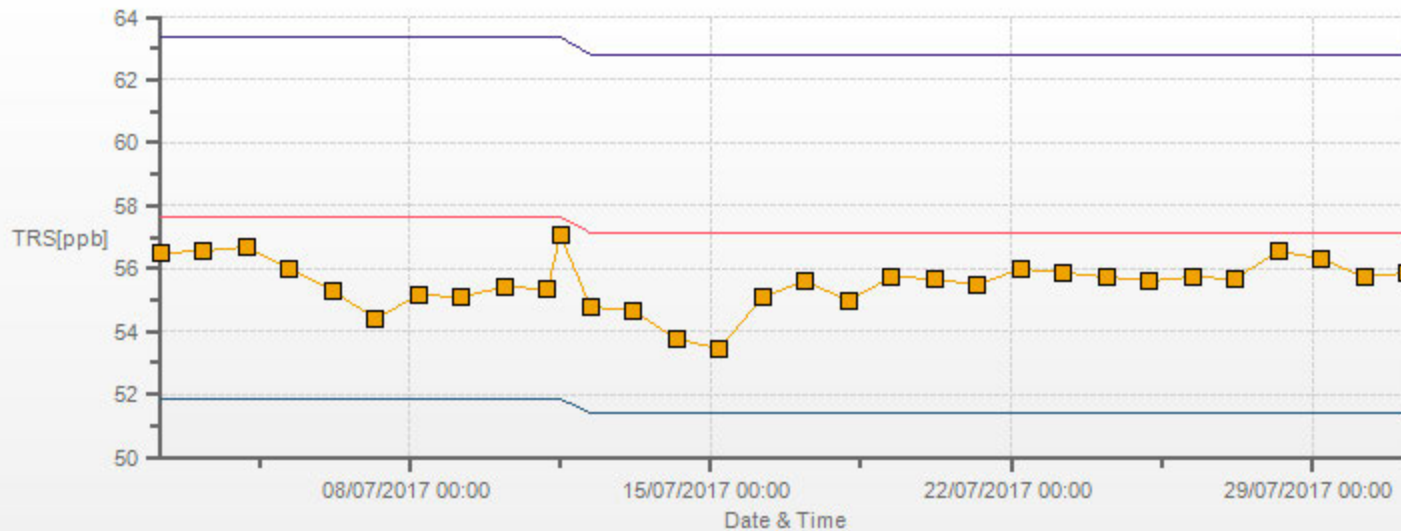


% Icon Classes (ppb) 92 0-1 0 1-3 0 3-10 0 >10.0

PRAMP_842 Poll.: PRAMP_842-TRS[ppb] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.35% Calm Poll Avg: 0.23[ppb]



TRS[ppb] Calibration: PRAMP_842 Monthly: 17/07 Type: Span



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

TOTAL HYDROCARBON

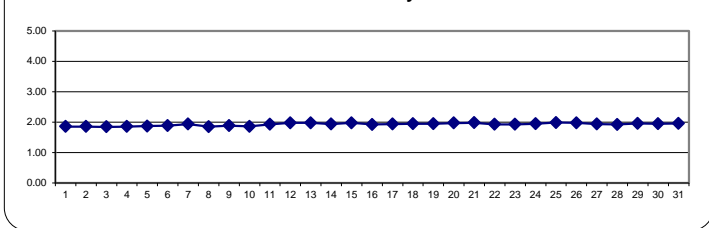
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	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	1.87	1.88	1.87	1.88	1.86	1.86	1.85	1.85	1.87	1.88	1.87	1.86	1.85	1.84	1.84	1.85	1.86	1.85	1.84	1.84	1.84	1.84	1.86	1.87	1.85	1.84	1.88	1.86	24	
2	1.88	1.90	1.88	1.90	1.89	S	1.89	1.87	1.87	1.86	1.85	1.85	1.84	1.84	1.83	1.83	1.83	1.83	1.85	1.85	1.84	1.85	1.85	1.84	1.82	1.90	1.85	24		
3	1.83	1.83	1.84	1.84	1.85	S	1.86	1.85	1.86	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.85	1.84	1.84	1.84	1.86	1.86	1.86	1.83	1.86	1.84	24		
4	1.82	1.87	1.87	1.87	1.87	S	1.86	1.87	1.87	1.86	1.85	1.85	1.85	1.85	1.84	1.85	1.85	1.85	1.85	1.85	1.85	1.87	1.88	1.88	1.82	1.88	1.86	24		
5	1.88	1.86	1.87	1.87	1.88	S	1.93	1.87	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.87	1.87	1.88	1.89	1.90	1.86	1.93	1.87	24		
6	1.90	1.89	1.87	1.89	1.88	S	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.87	1.87	1.88	1.89	1.93	1.97	1.87	1.97	1.89	24	
7	1.97	2.00	2.05	2.10	2.17	S	2.14	1.99	1.93	1.88	1.87	1.87	1.87	1.87	1.87	1.88	1.88	1.88	1.87	1.84	1.88	1.93	1.97	1.91	1.85	1.84	2.17	1.94	24	
8	1.83	1.83	1.86	1.84	1.84	S	1.85	1.83	1.87	1.87	1.87	1.85	1.84	1.84	1.84	1.84	1.84	1.84	1.83	1.84	1.84	1.85	1.89	1.91	1.83	1.91	1.85	24		
9	1.91	1.93	1.93	1.97	1.99	S	1.94	1.92	1.88	1.85	1.86	1.87	1.87	1.86	1.85	1.85	1.86	1.87	1.87	1.88	1.86	1.84	1.85	1.86	1.84	1.99	1.89	24		
10	1.85	1.85	1.85	1.86	1.86	S	1.87	1.87	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.85	1.85	1.85	1.85	1.84	1.84	1.86	1.88	1.92	1.84	1.92	1.86	24	
11	1.89	1.90	1.91	1.93	1.92	S	1.90	1.90	1.90	1.91	C	C	C	C	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.97	1.99	1.89	1.99	1.93	24		
12	2.02	2.03	2.01	2.06	2.09	S	2.06	2.03	1.98	1.95	1.95	1.93	1.95	1.95	1.92	1.94	1.97	1.97	1.97	1.97	1.97	1.96	1.96	1.92	1.91	1.91	2.09	1.98	24	
13	1.92	1.98	2.05	2.03	1.99	S	2.03	2.02	2.00	2.04	2.02	1.99	1.97	1.97	1.96	1.98	2.00	1.96	1.92	1.92	1.92	1.92	1.92	1.93	1.93	1.92	2.05	1.98	24	
14	1.92	1.94	1.96	1.96	1.92	S	1.98	1.97	1.94	1.94	1.94	1.94	1.94	1.93	1.93	1.92	1.92	1.92	1.93	1.92	1.92	1.92	1.95	1.95	1.97	1.92	1.98	1.94	24	
15	2.04	2.07	1.99	1.98	1.99	S	1.98	1.98	1.97	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.99	1.98	1.97	1.97	1.96	1.95	1.95	1.93	1.93	2.07	1.98	24		
16	1.94	1.97	1.93	1.91	1.92	S	1.93	1.93	1.93	1.93	1.93	1.92	1.91	1.90	1.90	1.91	1.92	1.91	1.91	1.91	1.91	1.91	1.92	1.92	1.95	1.90	1.97	1.92	24	
17	1.92	1.92	1.92	1.93	1.93	S	1.93	1.93	1.94	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.93	1.94	1.97	1.92	1.97	1.94	24	
18	1.97	1.97	1.97	1.96	1.94	X	1.94	1.94	1.94	1.94	1.94	S	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.90	1.97	1.94	23	
19	1.96	1.97	1.98	1.97	1.98	S	1.98	1.97	1.97	1.96	1.96	1.95	1.94	1.94	1.94	1.93	1.92	1.92	1.93	1.93	1.94	1.94	1.93	1.94	1.92	1.98	1.95	24		
20	1.93	1.95	1.95	1.95	1.97	S	1.98	1.98	1.98	1.98	1.98	1.97	1.95	1.96	1.95	1.94	1.95	1.99	1.99	1.98	2.01	2.03	2.02	2.02	1.93	2.03	1.97	24		
21	2.06	2.08	2.10	2.17	2.19	S	2.12	2.00	1.94	1.93	1.94	1.94	1.94	1.93	1.93	1.92	1.92	1.91	1.90	1.91	1.91	1.92	1.92	1.93	1.90	2.19	1.98	24		
22	1.92	1.93	1.94	1.95	1.96	S	1.96	1.94	1.94	1.94	1.93	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.92	1.93	1.92	1.92	1.91	1.96	1.93	24	
23	1.93	1.93	1.94	1.94	1.95	S	1.95	1.93	1.93	1.92	1.89	1.92	1.92	1.92	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.89	1.95	1.93	24		
24	1.93	1.94	1.93	1.94	1.95	S	1.96	1.96	1.95	1.95	1.95	1.95	1.95	1.95	1.94	1.95	1.94	1.94	1.94	1.94	1.94	1.95	1.97	1.96	1.99	1.93	1.99	1.95	24	
25	2.02	2.06	2.10	2.10	2.05	S	2.06	2.02	2.00	1.99	1.97	1.96	1.95	1.94	1.94	1.94	1.94	1.94	1.93	1.93	1.95	1.95	1.96	1.95	1.96	1.93	2.10	1.99	24	
26	1.97	1.96	1.98	1.99	2.00	S	2.01	2.00	1.98	1.98	1.98	1.98	1.96	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.99	2.09	1.93	2.09	1.98	24	
27	2.02	1.97	1.92	1.92	1.95	S	2.06	2.01	1.93	1.92	1.89	1.92	1.94	1.93	1.93	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.89	2.06	1.94	24
28	1.93	1.91	1.91	1.93	1.92	S	1.92	1.93	1.94	1.93	1.93	1.93	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.93	1.94	1.94	1.96	1.91	1.96	1.92	24	
29	1.98	1.98	1.98	1.99	1.96	S	1.97	1.96	1.95	1.95	1.95	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.97	1.96	1.98	2.03	1.93	2.03	1.96	24	
30	2.02	1.97	1.95	1.97	1.98	S	1.96	1.96	1.95	1.94	1.93	1.93	1.93	1.93	1.93	1.94	1.93	1.94	1.94	1.94	1.94	1.95	1.94	1.96	1.96	1.93	2.02	1.95	24	
31	1.96	1.97	1.96	1.97	1.99	S	2.00	1.98	1.98	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.96	1.96	1.94	2.00	1.95	24	
HOURLY MAX	2.06	2.08	2.10	2.17	2.19	1.86	2.14	2.03	2.00	2.04	2.02	1.99	1.97	1.97	1.97	1.98	2.00	1.99	1.99	1.98	2.01	2.03	2.09	2.04						
HOURLY AVG	1.94	1.94	1.94	1.95	1.96	1.86	1.96	1.94	1.93	1.92	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.93	1.94					

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

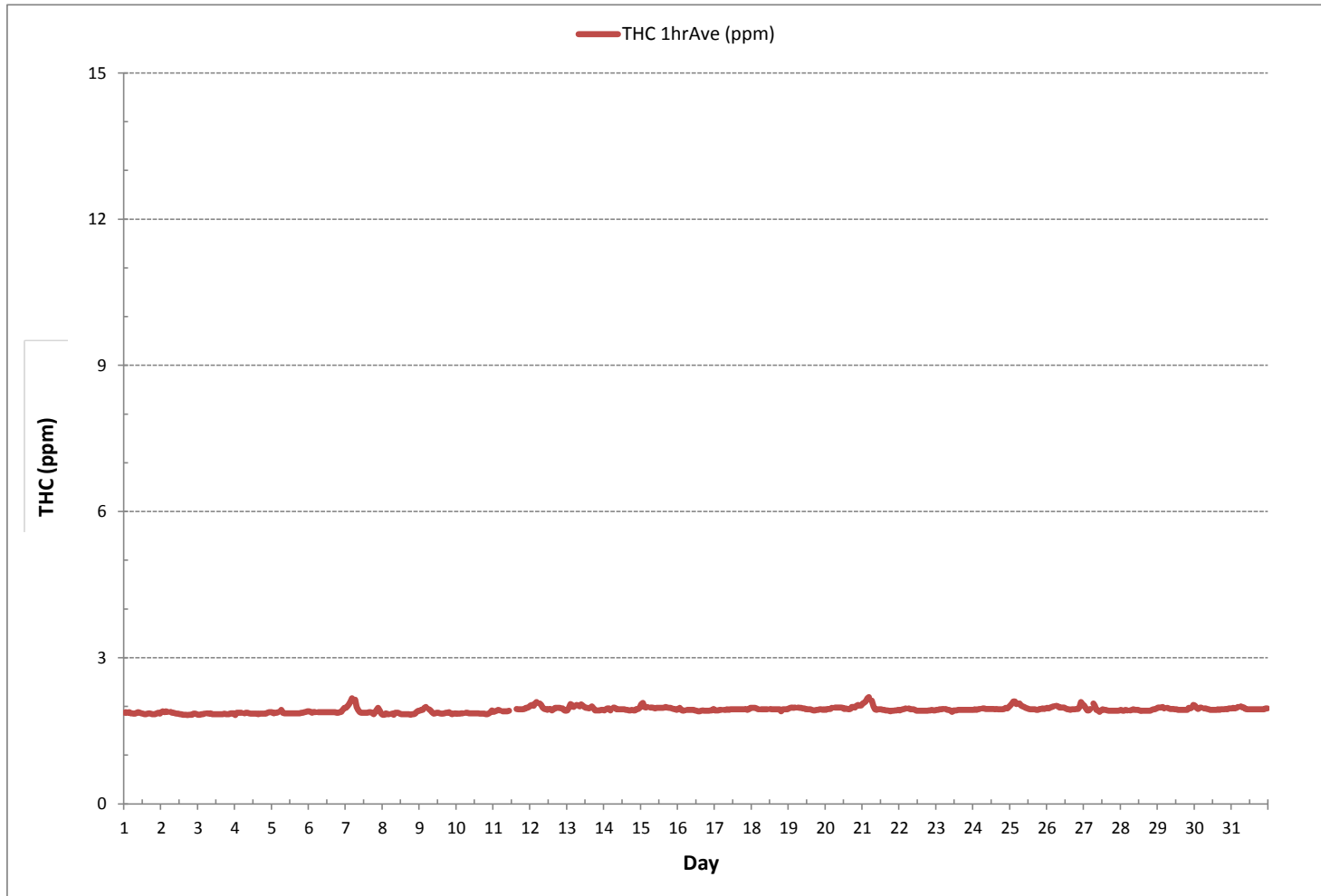
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	709			
MINIMUM 1-HR AVERAGE:	1.82 ppm	@ HOUR	17	ON DAY 2
MAXIMUM 1-HR AVERAGE:	2.19 ppm	@ HOUR	4	ON DAY 21
MAXIMUM 24-HR AVERAGE:	1.99 ppm			ON DAY 25
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	743 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.06	MONTHLY AVERAGE:	1.93 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - July 2017

TOTAL HYDROCARBONS Instantaneous Maximum (THC 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	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	1.90	1.89	1.89	1.89	1.88	1.87	1.87	1.85	1.89	1.89	1.88	1.88	1.85	1.85	1.85	1.86	1.86	1.86	1.84	1.87	1.85	1.88	1.89	1.87	1.84	1.90	1.87	24	
2	1.91	1.92	1.91	1.90	1.90	S	2.39	1.88	1.88	1.87	1.86	1.86	1.85	1.85	1.84	1.84	1.84	1.83	1.84	1.85	1.86	1.86	1.87	1.86	1.83	2.39	1.89	24	
3	1.85	1.85	1.85	1.86	1.87	S	1.87	1.87	1.86	1.86	1.85	1.85	1.85	1.86	1.85	1.85	1.85	1.86	1.85	1.86	1.86	1.88	1.88	1.89	1.85	1.89	1.86	24	
4	1.87	1.88	1.88	1.88	1.87	S	1.87	1.88	1.88	1.86	1.86	1.86	1.86	1.86	2.03	1.86	1.86	1.86	1.86	1.87	1.86	1.86	1.91	1.91	1.90	1.86	2.03	1.88	24
5	1.91	1.87	1.90	1.88	1.90	S	1.94	1.89	1.88	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.89	1.90	1.97	1.94	1.87	1.97	1.89	24	
6	1.93	1.93	1.92	1.92	1.89	S	1.88	1.89	1.89	1.88	1.88	1.88	1.88	1.89	1.89	1.88	1.89	1.88	1.88	1.88	1.88	1.89	1.91	1.98	2.00	1.88	2.00	1.90	24
7	2.03	2.06	2.11	2.14	2.27	S	2.27	P	1.98	1.89	1.88	1.88	1.88	1.88	1.90	1.88	1.88	1.88	1.88	1.88	1.90	2.01	2.03	1.94	1.89	1.88	2.27	1.98	23
8	1.84	1.85	1.91	1.85	1.85	S	1.87	1.87	1.87	1.88	1.87	1.86	1.85	1.85	1.85	1.85	1.85	1.85	1.84	1.84	1.85	1.88	1.92	1.95	1.84	1.95	1.87	24	
9	1.94	1.95	1.94	2.02	2.03	S	1.97	1.94	1.90	1.87	1.87	1.88	1.87	1.89	1.87	1.86	1.86	1.89	1.88	1.88	1.88	1.85	1.89	1.90	1.85	2.03	1.91	24	
10	1.87	1.86	1.86	1.90	1.89	S	1.88	1.90	1.88	1.88	1.87	1.87	1.87	1.87	1.87	1.86	1.87	1.86	P	1.85	1.93	1.87	1.93	1.93	1.85	1.93	1.88	23	
11	1.91	1.91	1.94	1.94	1.93	S	1.91	1.97	1.93	1.94	1.93	C	C	C	C	C	1.97	1.94	1.95	1.96	1.97	2.04	1.99	2.01	1.91	2.04	1.95	24	
12	2.04	2.07	2.09	2.12	2.11	S	2.12	2.06	2.03	1.97	1.97	1.97	1.98	1.96	1.94	1.99	1.99	1.99	1.99	1.99	2.01	1.99	1.97	1.94	1.96	1.94	2.12	2.01	24
13	1.97	2.04	2.17	2.10	2.04	S	2.06	2.06	2.02	2.08	2.06	2.01	1.99	1.99	1.98	2.00	2.04	1.99	1.94	1.93	1.94	1.93	1.95	1.97	1.93	2.17	2.01	24	
14	1.94	2.04	1.98	2.02	2.03	S	2.00	1.99	1.95	1.95	1.96	1.96	1.95	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	2.00	1.99	2.01	1.94	2.04	1.97	24
15	2.08	2.11	2.04	2.00	P	S	2.00	2.02	1.98	1.97	1.98	1.98	1.99	1.99	2.00	2.00	2.00	2.00	2.00	2.00	1.99	1.99	1.96	1.97	1.98	1.96	2.11	2.00	23
16	1.96	2.08	1.98	1.92	1.94	S	1.94	1.95	1.96	1.96	1.95	1.92	1.92	1.90	1.91	1.92	1.93	1.92	1.91	1.92	1.92	1.92	1.92	1.95	1.99	1.90	2.08	1.94	24
17	1.93	1.93	1.92	1.94	1.93	S	1.94	1.94	P	1.94	1.96	1.94	1.96	1.95	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.99	1.96	1.98	2.00	1.92	2.00	1.95	23
18	1.98	2.00	2.01	2.01	1.96	X	1.96	Y	1.95	1.94	S	S	1.95	1.95	1.95	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.98	1.95	1.96	1.94	2.01	1.96	22
19	1.97	2.12	2.02	2.00	2.00	S	2.00	1.98	1.99	1.98	1.97	1.95	1.96	1.95	1.94	1.94	1.92	1.93	1.93	1.94	1.95	1.96	1.94	1.97	1.92	2.12	1.97	24	
20	1.94	1.97	1.99	P	1.99	S	2.00	2.02	2.00	2.01	2.00	2.01	1.97	1.97	1.97	1.96	1.97	2.01	2.01	2.00	2.05	2.11	2.05	2.04	1.94	2.11	2.00	23	
21	2.27	2.13	2.14	2.31	2.34	S	2.18	2.11	1.95	1.94	1.94	1.96	1.95	1.94	1.93	1.93	1.93	1.92	1.93	1.92	1.93	1.92	1.92	1.93	1.95	1.92	2.34	2.02	24
22	1.93	1.95	1.96	1.97	1.97	S	1.99	1.96	1.95	1.94	1.94	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.93	1.93	1.93	1.93	1.92	1.99	1.94	24	
23	1.93	1.97	1.97	1.98	1.98	S	1.97	1.95	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.94	1.94	1.93	1.93	1.93	1.94	1.94	1.93	1.98	1.94	24	
24	1.94	2.00	1.96	1.96	1.97	S	1.97	1.97	1.97	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.98	1.96	1.94	1.94	1.94	1.97	2.03	2.07	2.06	1.94	2.07	1.97	24
25	2.08	2.10	2.18	2.17	2.10	S	2.08	2.06	2.02	2.00	2.00	1.97	1.97	1.95	1.95	1.95	1.94	1.94	1.94	1.94	2.54	1.97	P	1.97	1.97	1.94	2.54	2.04	23
26	1.99	1.97	2.00	2.03	2.03	S	2.03	2.02	2.00	2.00	2.00	2.00	1.97	1.96	1.95	1.94	1.94	1.94	1.94	1.94	1.97	2.01	2.06	2.15	2.24	1.94	2.24	2.01	24
27	2.10	2.01	1.95	1.93	1.97	S	2.14	2.05	1.97	1.93	1.93	1.92	1.95	1.94	1.96	1.93	1.92	1.91	1.92	1.92	1.92	1.92	1.93	1.92	1.93	1.91	2.14	1.96	24
28	1.95	1.92	1.94	1.94	1.94	S	1.94	1.95	1.96	1.94	1.94	1.93	1.92	1.92	1.92	1.91	1.92	1.92	1.92	1.92	1.92	1.95	1.97	1.97	2.02	1.91	2.02	1.94	24
29	2.00	2.00	2.03	2.04	2.02	S	2.00	1.97	1.97	1.96	1.97	1.96	1.94	1.94	1.93	1.93	1.93	1.95	1.93	1.96	2.09	2.00	2.01	2.14	1.93	2.14	1.99	24	
30	2.18	2.00	1.97	2.00	2.01	S	1.97	1.97	1.97	1.95	1.94	1.94	1.94	1.94	1.95	1.96	1.94	1.95	1.96	1.96	1.97	1.96	1.97	1.97	1.94	2.18	1.97	24	
31	2.02	1.99	2.00	1.99	2.05	S	2.03	1.99	2.00	1.97	1.96	1.94	1.96	1.96	1.94	1.95	1.95	1.95	1.97	1.95	1.96	1.97	1.97	1.97	1.94	2.05	1.98	24	
HOURLY MAX	2.27	2.13	2.18	2.31	2.34	1.87	2.39	2.11	2.03	2.08	2.06	2.01	1.99	1.99	2.03	2.00	2.04	2.01	2.01	2.54	2.09	2.11	2.15	2.24					
HOURLY AVG	1.97	1.98	1.98	1.99	1.99	1.87	2.00	1.96	1.95	1.94	1.93	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.94	1.94	1.95	1.96	1.97					

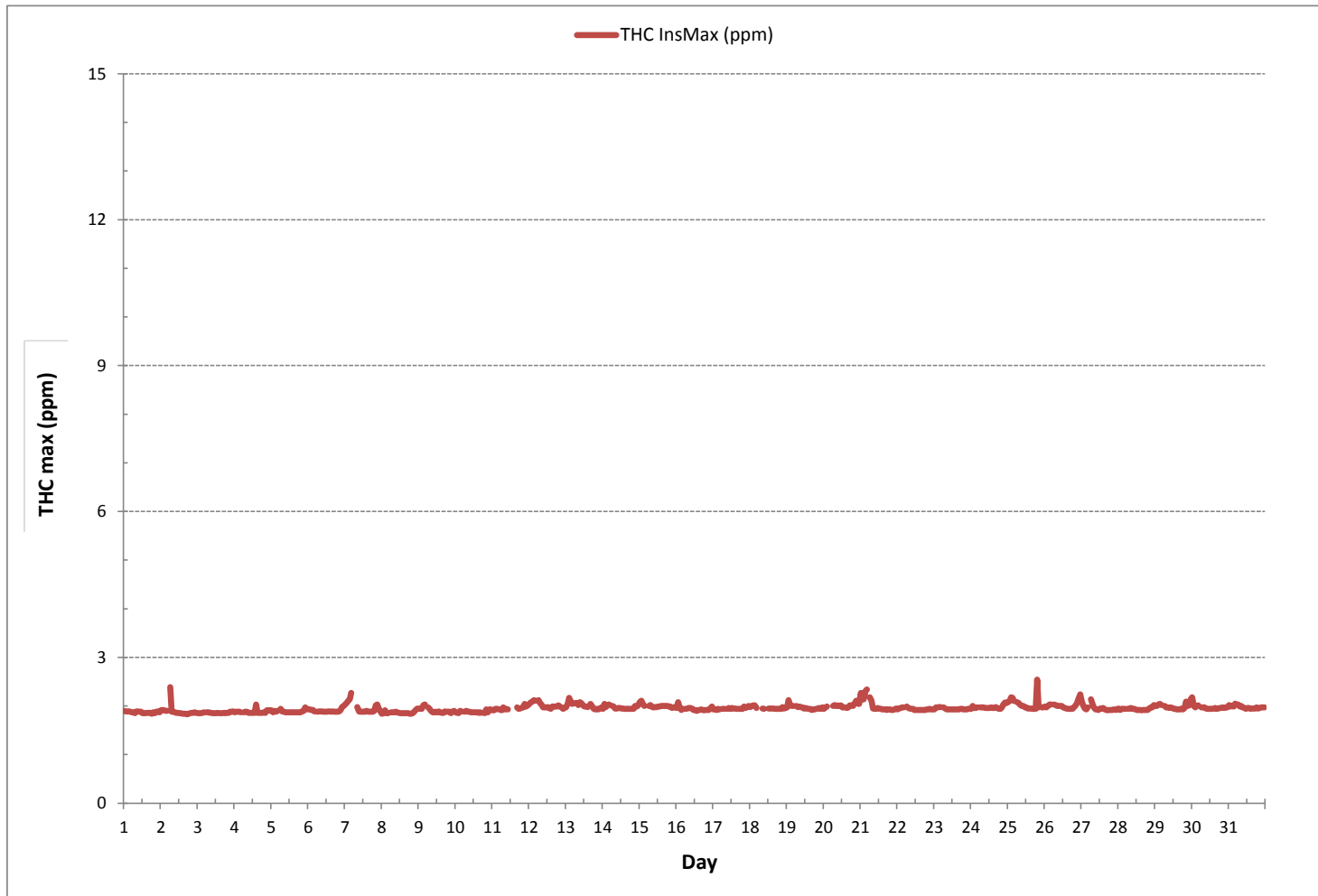
STATUS FLAG CODES

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:	700
MAXIMUM INSTANTANEOUS VALUE:	2.54 ppm @ HOUR 19 ON DAY 25
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	736 hrs
STANDARD DEVIATION:	0.08

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





Wind: PRAMP_842
 Poll.: PRAMP_842-THC55[ppm]
 Monthly: 2017/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

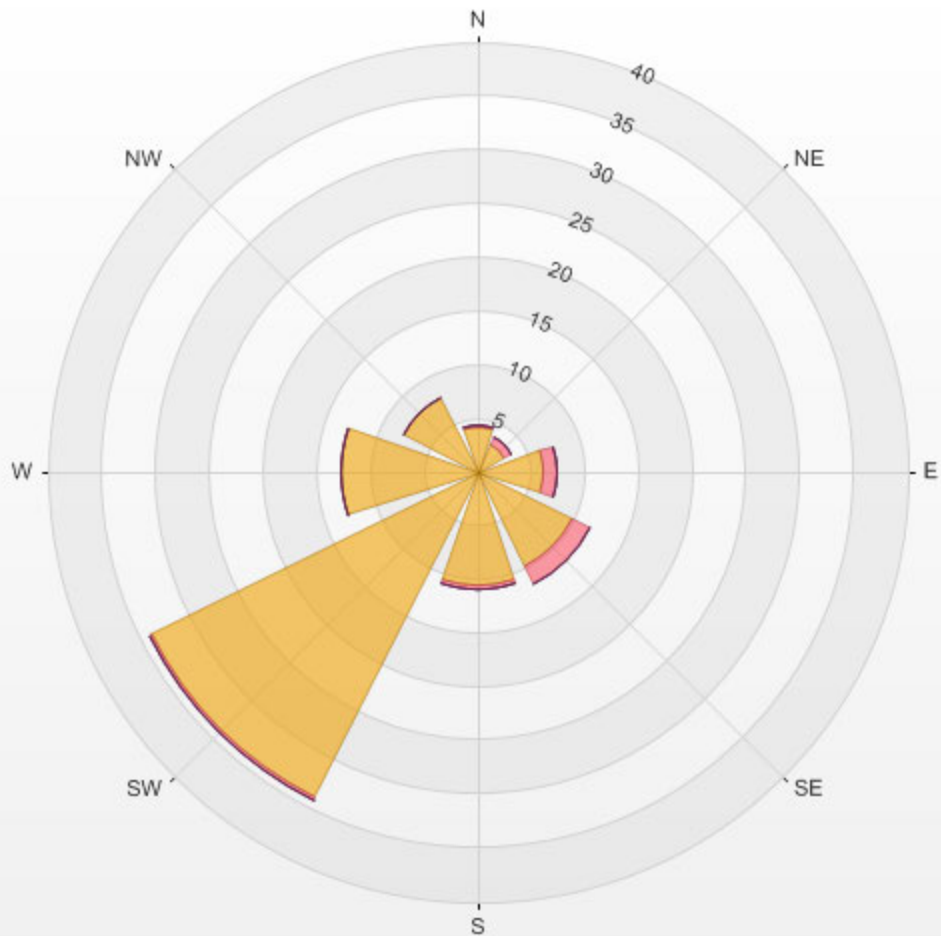
Calm: 7.36%

Calm Avg: 1.98 [ppm]

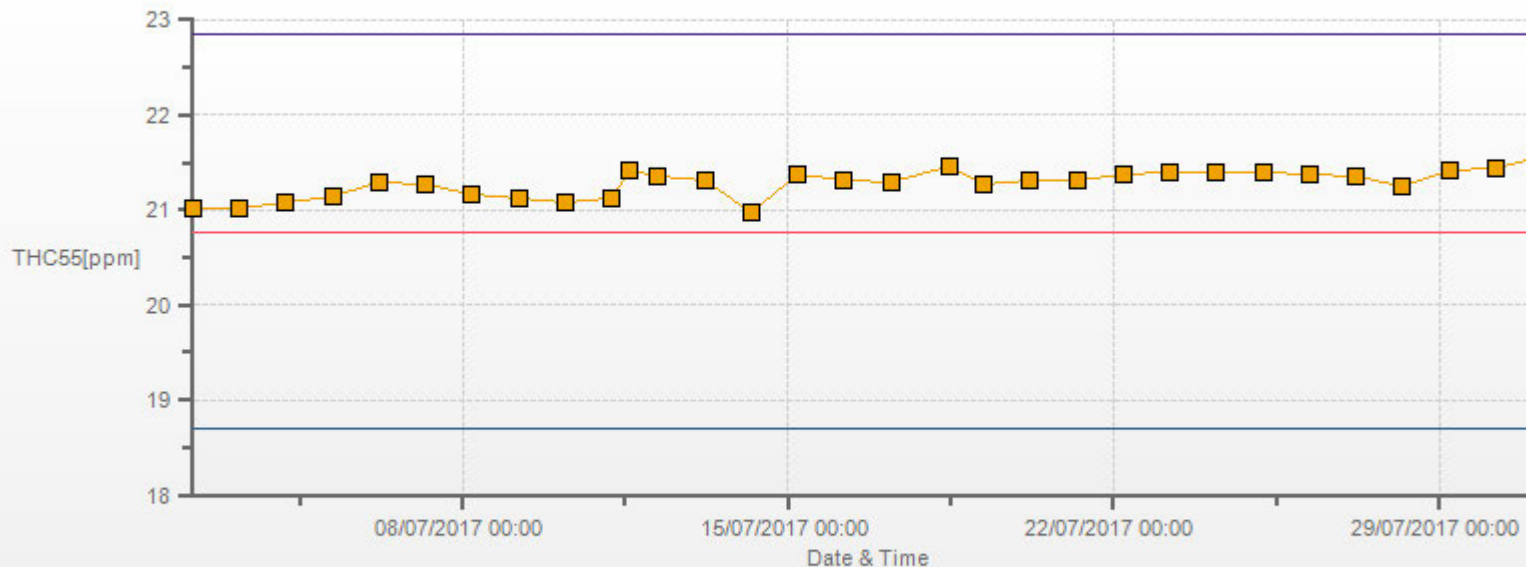
Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	4.3	0.2	0.0	0.0	0.0	4.4
NE	2.8	0.7	0.0	0.0	0.0	3.5
E	6.2	1.2	0.0	0.0	0.0	7.4
SE	9.9	1.9	0.0	0.0	0.0	11.8
S	10.6	0.3	0.0	0.0	0.0	10.9
SW	33.9	0.3	0.0	0.0	0.0	34.2
W	12.7	0.2	0.0	0.0	0.0	12.8
NW	7.7	0.0	0.0	0.0	0.0	7.7
Summary	87.9	4.7	0.0	0.0	0.0	92.6

% Icon	Classes (ppm)	88	5	0	0	0
	0-2					
	2-3					
	3-5					
	5-10					
	>10.0					

PRAMP_842 Poll.: PRAMP_842-THC55[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.36% Calm Poll Avg: 1.98[ppm]



THC55[ppm] Calibration: PRAMP_842 Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

METHANE



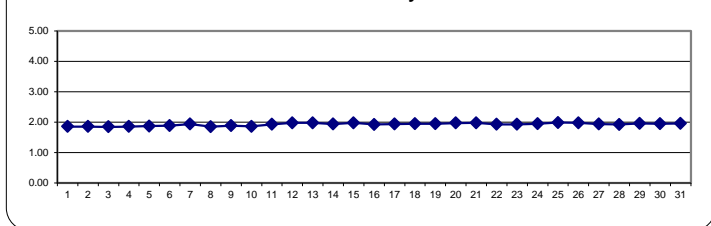
METHANE Hourly Averages (CH₄ ppm)

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	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	1.87	1.88	1.87	1.88	1.86	1.86	1.85	1.85	1.87	1.88	1.87	1.86	1.85	1.84	1.84	1.85	1.86	1.85	1.84	1.84	1.83	1.86	1.87	1.85	1.83	1.88	1.88	1.86	24	
2	1.88	1.90	1.88	1.90	1.89	S	1.89	1.87	1.87	1.86	1.85	1.85	1.84	1.84	1.83	1.83	1.83	1.82	1.83	1.83	1.85	1.85	1.84	1.82	1.90	1.85	24			
3	1.83	1.83	1.84	1.84	1.85	S	1.86	1.85	1.86	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.85	1.84	1.84	1.84	1.86	1.86	1.86	1.83	1.86	1.84	24		
4	1.82	1.87	1.87	1.87	1.87	S	1.86	1.87	1.87	1.86	1.85	1.85	1.85	1.85	1.84	1.85	1.85	1.85	1.85	1.85	1.85	1.87	1.88	1.88	1.82	1.88	1.86	24		
5	1.88	1.86	1.87	1.87	1.88	S	1.93	1.87	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.87	1.87	1.88	1.89	1.90	1.86	1.93	24		
6	1.90	1.89	1.86	1.89	1.88	S	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.87	1.87	1.88	1.89	1.93	1.97	1.86	1.97	1.89	24	
7	1.97	2.00	2.05	2.10	2.17	S	2.14	1.99	1.93	1.88	1.87	1.87	1.87	1.87	1.87	1.88	1.88	1.88	1.87	1.84	1.88	1.93	1.97	1.91	1.85	1.84	2.17	1.94	24	
8	1.83	1.83	1.86	1.84	1.83	S	1.85	1.83	1.87	1.87	1.87	1.85	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.83	1.84	1.84	1.85	1.89	1.90	1.83	1.90	1.85	24	
9	1.91	1.93	1.93	1.97	1.99	S	1.94	1.92	1.88	1.85	1.86	1.87	1.87	1.86	1.85	1.85	1.86	1.87	1.87	1.87	1.86	1.84	1.84	1.86	1.84	1.99	1.88	24		
10	1.85	1.85	1.85	1.86	1.86	S	1.87	1.87	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.85	1.85	1.85	1.85	1.84	1.84	1.86	1.88	1.92	1.84	1.92	1.86	24	
11	1.89	1.90	1.91	1.93	1.92	S	1.90	1.90	1.90	1.90	C	C	C	C	C	1.95	1.94	1.94	1.94	1.94	1.94	1.95	1.97	1.99	1.89	1.99	1.93	24		
12	2.02	2.03	2.01	2.06	2.09	S	2.06	2.03	1.98	1.95	1.95	1.93	1.95	1.95	1.92	1.94	1.97	1.97	1.97	1.97	1.97	1.96	1.96	1.92	1.91	1.91	2.09	1.98	24	
13	1.92	1.98	2.05	2.03	1.99	S	2.03	2.02	2.00	2.04	2.02	1.99	1.97	1.97	1.96	1.98	2.00	1.96	1.92	1.92	1.92	1.92	1.92	1.93	1.93	1.92	2.05	1.98	24	
14	1.92	1.94	1.96	1.96	1.92	S	1.98	1.97	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.95	1.95	1.97	1.92	1.98	1.94	24	
15	2.04	2.07	1.99	1.98	1.99	S	1.98	1.98	1.97	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.99	1.98	1.97	1.97	1.96	1.95	1.95	1.93	1.93	2.07	1.98	24		
16	1.94	1.97	1.93	1.91	1.92	S	1.93	1.93	1.93	1.93	1.93	1.92	1.91	1.90	1.90	1.91	1.92	1.91	1.91	1.91	1.91	1.91	1.92	1.92	1.95	1.90	1.97	1.92	24	
17	1.92	1.92	1.92	1.93	1.93	S	1.93	1.93	1.94	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.93	1.94	1.97	1.92	1.97	1.94	24	
18	1.97	1.97	1.97	1.96	1.94	X	1.94	1.94	1.94	1.94	1.94	S	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.90	1.94	1.94	1.94	1.90	1.97	1.94	23		
19	1.96	1.97	1.97	1.97	1.98	S	1.98	1.97	1.97	1.96	1.96	1.95	1.94	1.94	1.94	1.93	1.92	1.92	1.93	1.93	1.94	1.94	1.92	1.92	1.94	1.92	1.98	1.95	24	
20	1.93	1.95	1.95	1.95	1.97	S	1.98	1.98	1.98	1.98	1.98	1.97	1.95	1.95	1.95	1.94	1.95	1.99	1.99	1.98	2.01	2.03	2.02	2.02	1.93	2.03	1.97	24		
21	2.06	2.08	2.10	2.16	2.19	S	2.11	2.00	1.94	1.93	1.94	1.94	1.94	1.93	1.93	1.92	1.92	1.91	1.90	1.91	1.91	1.92	1.92	1.93	1.90	2.19	1.98	24		
22	1.92	1.93	1.94	1.95	1.96	S	1.96	1.94	1.94	1.94	1.93	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.92	1.93	1.92	1.92	1.91	1.96	1.93	24	
23	1.93	1.93	1.94	1.94	1.95	S	1.95	1.93	1.93	1.92	1.89	1.92	1.92	1.92	1.92	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.89	1.95	1.93	24		
24	1.93	1.94	1.93	1.94	1.95	S	1.96	1.95	1.95	1.95	1.95	1.95	1.95	1.94	1.94	1.95	1.94	1.94	1.94	1.94	1.94	1.95	1.96	1.96	1.99	1.93	1.99	1.95	24	
25	2.02	2.06	2.10	2.10	2.05	S	2.06	2.02	2.00	1.99	1.97	1.96	1.95	1.94	1.94	1.94	1.93	1.93	1.93	1.93	1.95	1.95	1.96	1.95	1.96	1.93	2.10	1.99	24	
26	1.97	1.96	1.98	1.99	2.00	S	2.00	2.00	1.98	1.98	1.98	1.97	1.96	1.94	1.94	1.93	1.94	1.94	1.94	1.94	1.94	1.95	1.95	1.99	2.09	2.04	1.93	2.09	1.97	24
27	2.02	1.97	1.92	1.92	1.94	S	2.06	2.01	1.93	1.92	1.89	1.92	1.94	1.93	1.93	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.89	2.06	1.94	24
28	1.93	1.91	1.91	1.93	1.92	S	1.92	1.93	1.94	1.93	1.93	1.93	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.93	1.94	1.94	1.96	1.91	1.96	1.92	24	
29	1.98	1.98	1.98	1.99	1.96	S	1.97	1.96	1.95	1.95	1.95	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.97	1.96	1.98	2.03	1.93	2.03	1.96	24	
30	2.02	1.97	1.95	1.97	1.98	S	1.96	1.96	1.95	1.94	1.93	1.93	1.93	1.93	1.93	1.94	1.93	1.94	1.94	1.94	1.94	1.95	1.94	1.96	1.96	1.93	2.02	1.95	24	
31	1.96	1.97	1.96	1.97	1.99	S	2.00	1.98	1.98	1.95	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.96	1.96	1.94	2.00	1.95	24	
HOURLY MAX	2.06	2.08	2.10	2.16	2.19	1.86	2.14	2.03	2.00	2.04	2.02	1.99	1.97	1.97	1.97	1.98	2.00	1.99	1.99	1.98	2.01	2.03	2.09	2.04						
HOURLY AVG	1.94	1.94	1.94	1.95	1.96	1.86	1.96	1.94	1.93	1.92	1.92	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.92	1.93	1.93					

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

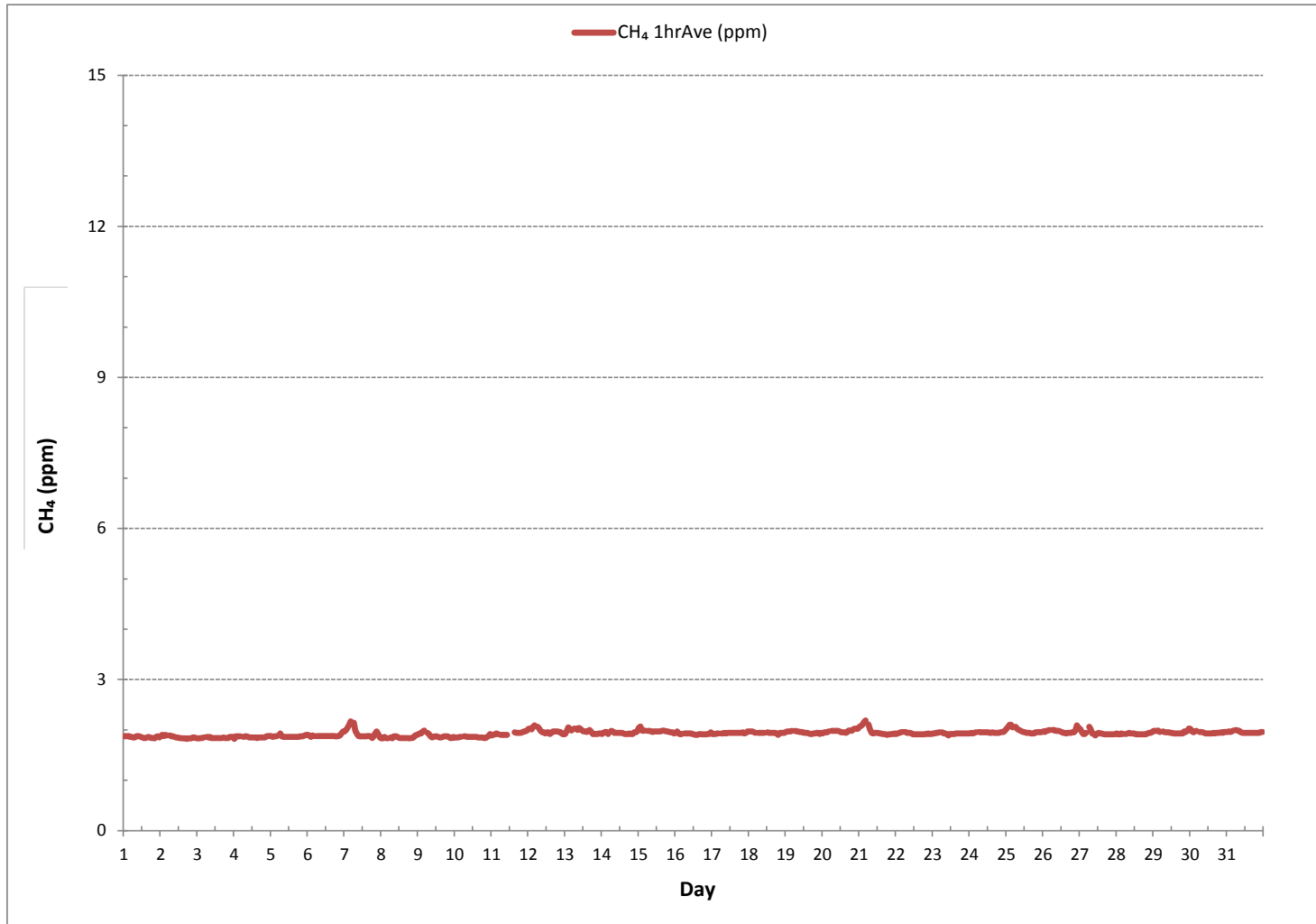
24 HR AVERAGES July 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	709			
MINIMUM 1-HR AVERAGE:	1.82 ppm	@ HOUR	17	ON DAY 2
MAXIMUM 1-HR AVERAGE:	2.19 ppm	@ HOUR	4	ON DAY 21
MAXIMUM 24-HR AVERAGE:	1.99 ppm			ON DAY 25
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	743 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.06	MONTHLY AVERAGE:	1.93 ppm	

METHANE Hourly Averages (CH₄ ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - July 2017

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	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	1.90	1.90	1.89	1.89	1.88	1.87	1.87	1.85	1.88	1.89	1.88	1.88	1.85	1.85	1.85	1.86	1.86	1.86	1.84	1.87	1.85	1.88	1.89	1.87	1.84	1.90	1.87	24	
2	1.91	1.93	1.91	1.90	1.90	S	2.39	1.88	1.88	1.87	1.86	1.86	1.85	1.85	1.84	1.84	1.84	1.83	1.84	1.85	1.85	1.86	1.87	1.86	1.83	2.39	1.89	24	
3	1.85	1.85	1.85	1.86	1.87	S	1.87	1.87	1.86	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.86	1.85	1.86	1.86	1.88	1.88	1.89	1.85	1.89	1.86	24	
4	1.87	1.88	1.88	1.87	1.87	S	1.87	1.88	1.88	1.86	1.86	1.86	1.86	1.86	2.03	1.86	1.86	1.86	1.86	1.87	1.86	1.91	1.91	1.90	1.86	2.03	1.88	24	
5	1.91	1.87	1.90	1.88	1.89	S	1.95	1.89	1.88	1.87	1.87	1.87	1.86	1.87	1.87	1.87	1.87	1.87	1.87	1.88	1.89	1.90	1.97	1.94	1.86	1.97	1.89	24	
6	1.94	1.93	1.92	1.92	1.89	S	1.88	1.88	1.89	1.89	1.88	1.88	1.88	1.89	1.89	1.88	1.88	1.88	1.88	1.88	1.89	1.91	1.98	2.00	1.88	2.00	1.90	24	
7	2.02	2.05	2.11	2.14	2.26	S	2.27	P	1.97	1.89	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.90	2.01	2.03	1.94	1.89	1.88	2.27	1.97	23
8	1.84	1.85	1.91	1.85	1.85	S	1.87	1.87	1.87	1.88	1.87	1.86	1.85	1.85	1.85	1.85	1.85	1.85	1.84	1.84	1.85	1.88	1.93	1.95	1.84	1.95	1.87	24	
9	1.95	1.95	1.94	2.02	2.02	S	1.97	1.94	1.90	1.86	1.87	1.88	1.87	1.87	1.86	1.86	1.86	1.89	1.88	1.88	1.88	1.85	1.89	1.90	1.85	2.02	1.90	24	
10	1.87	1.86	1.86	1.90	1.89	S	1.88	1.90	1.87	1.88	1.87	1.87	1.86	1.87	1.87	1.86	1.86	1.86	P	1.85	1.94	1.87	1.93	1.94	1.85	1.94	1.88	23	
11	1.91	1.91	1.94	1.95	1.94	S	1.91	1.98	1.90	1.91	1.94	C	C	C	C	C	1.96	1.95	1.94	1.96	1.97	2.01	1.99	2.01	1.90	2.01	1.95	24	
12	2.04	2.07	2.09	2.12	2.11	S	2.12	2.05	2.02	1.96	1.97	1.97	1.96	1.94	1.98	1.98	1.98	1.98	1.98	1.98	2.00	1.98	1.97	1.94	1.96	1.94	2.12	2.01	24
13	1.97	2.04	2.16	2.09	2.03	S	2.05	2.05	2.01	2.07	2.05	2.00	1.98	1.98	1.97	2.00	2.03	1.99	1.94	1.94	1.94	1.93	1.95	1.96	1.93	2.16	2.01	24	
14	1.94	2.03	1.98	2.02	2.02	S	1.99	1.98	1.95	1.95	1.95	1.95	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.94	2.00	1.98	2.01	1.93	2.03	1.96	24		
15	2.07	2.11	2.04	2.00	P	S	2.00	2.01	1.98	1.97	1.98	1.98	1.98	1.99	1.99	2.00	1.99	1.99	2.00	1.99	2.00	1.98	1.95	1.96	1.97	1.95	2.11	2.00	23
16	1.95	2.07	1.99	1.93	1.93	S	1.93	1.95	1.95	1.96	1.94	1.93	1.91	1.91	1.91	1.92	1.93	1.93	1.91	1.92	1.92	1.93	1.95	1.98	1.91	2.07	1.94	24	
17	1.93	1.93	1.93	1.94	1.94	S	1.94	1.94	P	1.95	1.95	1.95	1.95	1.95	1.94	1.95	1.95	1.95	1.95	1.95	1.98	1.96	1.97	1.99	1.93	1.99	1.95	23	
18	1.98	1.99	2.01	2.01	1.95	X	1.95	Y	1.95	1.95	S	S	1.96	1.95	1.95	1.95	1.95	1.94	1.94	1.94	1.94	1.97	1.95	1.96	1.94	2.01	1.96	22	
19	1.97	2.12	2.01	1.99	1.99	S	2.00	1.98	1.98	1.98	1.96	1.96	1.97	1.96	1.95	1.95	1.93	1.93	1.94	1.94	1.96	1.96	1.94	1.96	1.93	2.12	1.97	24	
20	1.95	1.98	1.98	P	1.99	S	1.99	2.02	1.99	2.00	1.99	2.00	1.96	1.98	1.97	1.95	1.97	2.00	2.00	1.99	2.04	2.11	2.05	2.04	1.95	2.11	2.00	23	
21	2.27	2.13	2.14	2.31	2.34	S	2.17	2.11	1.95	1.94	1.95	1.96	1.95	1.94	1.94	1.93	1.93	1.93	1.93	1.92	1.93	1.92	1.93	1.95	1.92	2.34	2.02	24	
22	1.93	1.96	1.95	1.97	1.97	S	1.98	1.95	1.95	1.95	1.94	1.92	1.91	1.92	1.92	1.92	1.92	1.93	1.93	1.93	1.93	1.95	1.94	1.93	1.91	1.98	1.94	24	
23	1.94	1.96	1.96	1.97	1.97	S	1.97	1.96	1.93	1.93	1.93	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.93	1.94	1.95	1.93	1.97	1.94	24	
24	1.94	1.99	1.96	1.96	1.96	S	1.96	1.96	1.96	1.96	1.95	1.96	1.95	1.95	1.95	1.95	1.97	1.95	1.95	1.95	1.96	2.02	2.02	2.06	1.94	2.06	1.97	24	
25	2.08	2.10	2.17	2.16	2.09	S	2.07	2.06	2.01	2.00	2.00	1.97	1.97	1.95	1.95	1.95	1.95	1.94	1.95	2.54	1.97	P	1.97	1.98	1.94	2.54	2.04	23	
26	1.98	1.97	2.00	2.03	2.03	S	2.03	2.02	1.99	1.99	1.99	1.99	1.97	1.96	1.95	1.94	1.95	1.95	1.95	1.95	1.97	2.01	2.06	2.14	2.23	1.94	2.23	2.00	24
27	2.09	2.00	1.95	1.94	1.98	S	2.14	2.04	1.97	1.93	1.93	1.93	1.95	1.94	1.95	1.93	1.91	1.91	1.91	1.92	1.92	1.93	1.92	1.94	1.91	2.14	1.96	24	
28	1.95	1.93	1.94	1.95	1.94	S	1.94	1.95	1.96	1.95	1.94	1.93	1.93	1.92	1.92	1.91	1.92	1.92	1.92	1.92	1.96	1.96	1.97	2.01	1.91	2.01	1.94	24	
29	2.00	1.99	2.02	2.03	2.01	S	2.00	1.97	1.96	1.96	1.96	1.95	1.95	1.94	1.94	1.93	1.94	1.96	1.94	1.96	2.08	1.99	2.01	2.14	1.93	2.14	1.98	24	
30	2.17	2.00	1.96	1.99	2.00	S	1.97	1.97	1.97	1.95	1.94	1.94	1.94	1.94	1.95	1.95	1.94	1.95	1.95	1.95	1.96	1.96	1.98	1.98	1.94	2.17	1.97	24	
31	2.01	1.98	1.99	1.99	2.05	S	2.03	1.99	1.99	1.97	1.95	1.95	1.95	1.95	1.95	1.95	1.94	1.94	1.95	1.95	1.95	1.96	1.97	1.97	1.94	2.05	1.97	24	
HOURLY MAX	2.27	2.13	2.17	2.31	2.34	1.87	2.39	2.11	2.02	2.07	2.05	2.00	1.98	1.99	2.03	2.00	2.03	2.00	2.00	2.00	2.54	2.08	2.11	2.14	2.23				
HOURLY AVG	1.97	1.98	1.98	1.99	1.99	1.87	2.00	1.96	1.94	1.93	1.93	1.93	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.94	1.94	1.95	1.96	1.97				

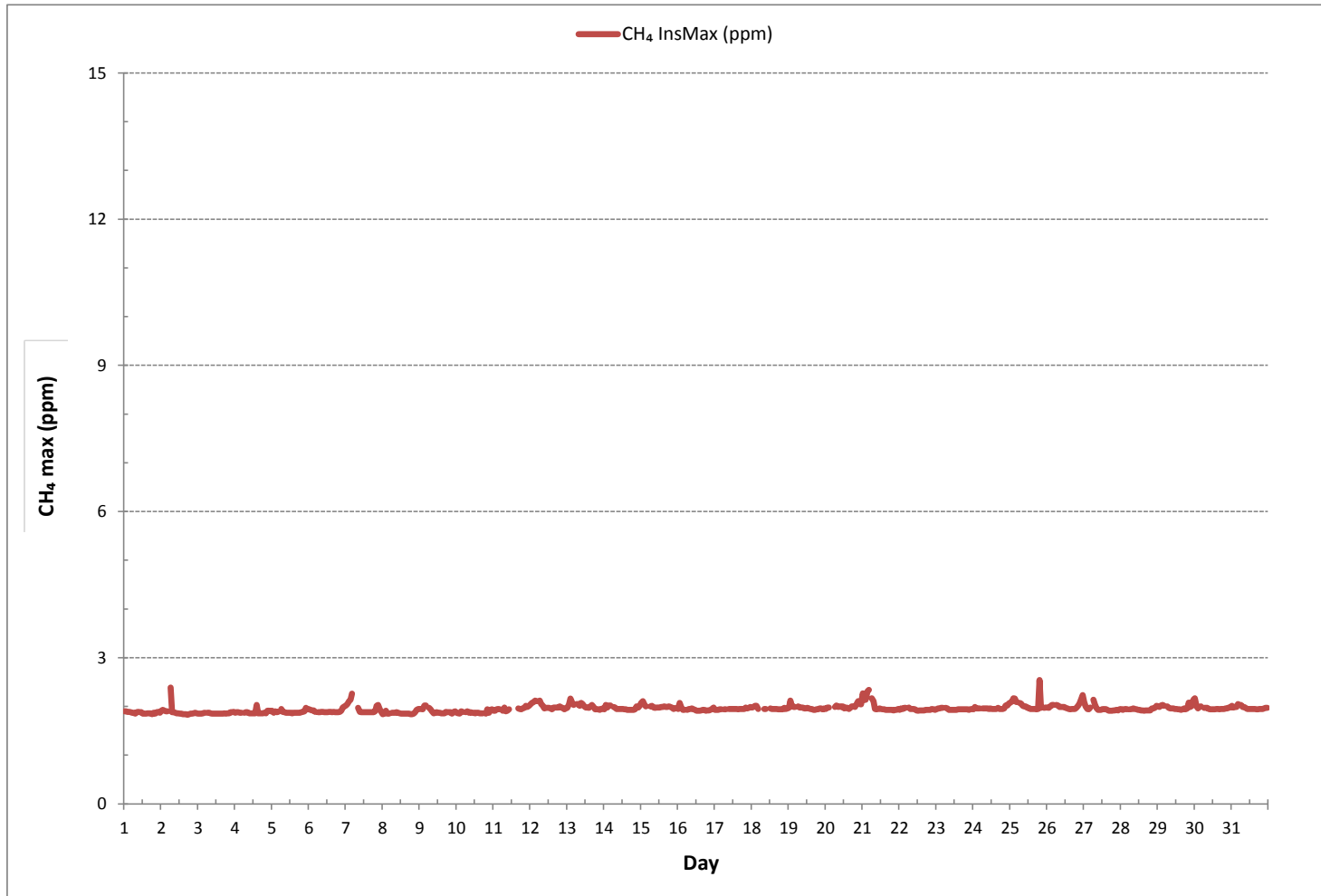
STATUS FLAG CODES

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:	700
MAXIMUM INSTANTANEOUS VALUE:	2.54 ppm @ HOUR 19 ON DAY 25
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	736 hrs
STANDARD DEVIATION:	0.07

METHANE MAX Instantaneous Maximum (CH₄ ppm)



Wind: PRAMP_842
 Poll.: PRAMP_842-CH4[ppm]
 Monthly: 2017/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

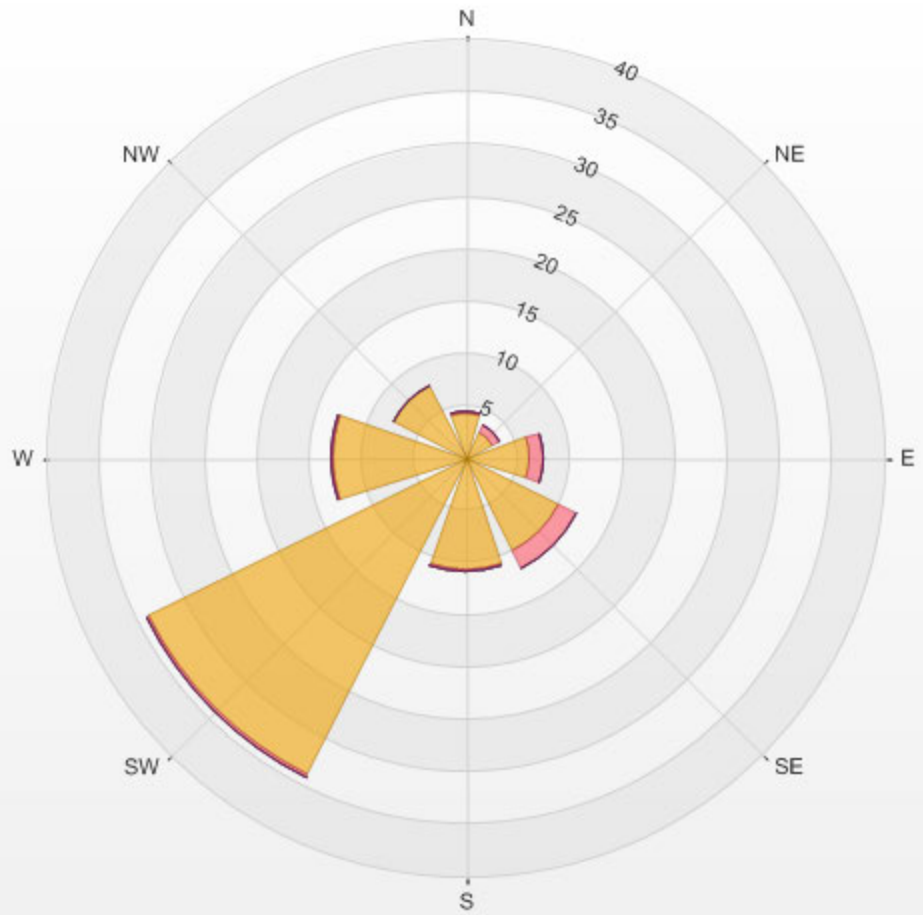
Calm: 7.36%

Calm Avg: 1.98 [ppm]

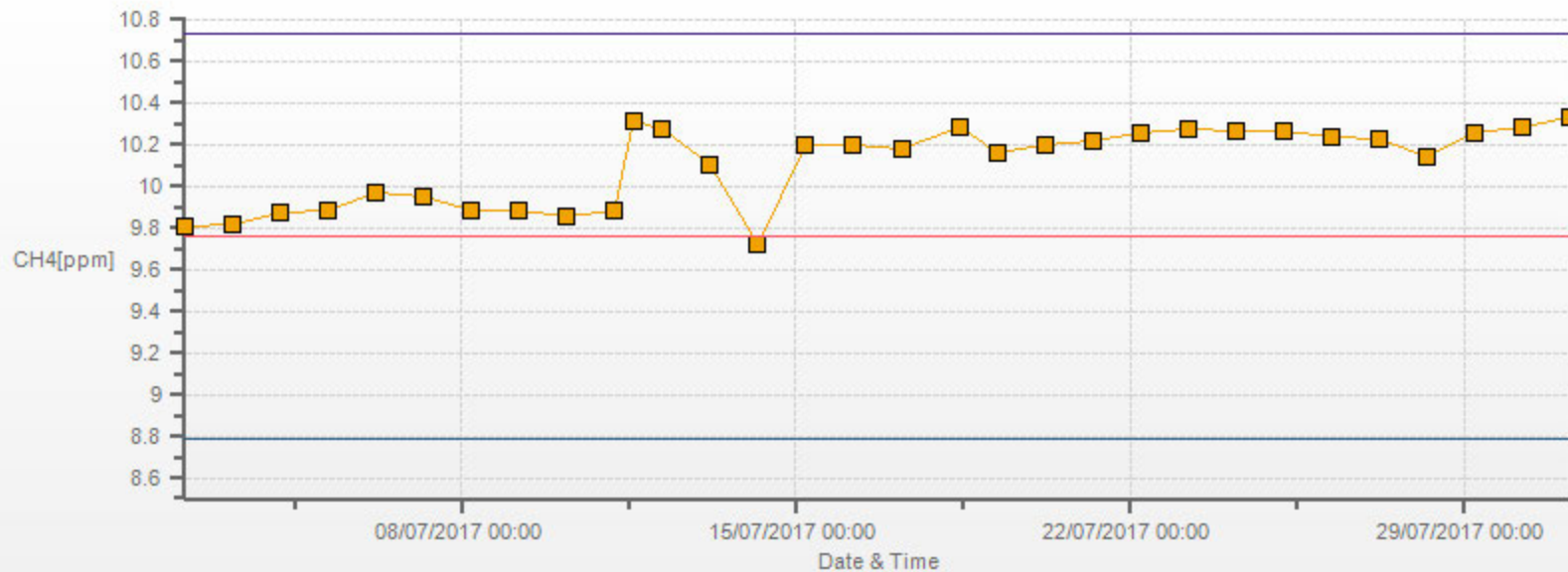
Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	4.3	0.2	0.0	0.0	0.0	4.4
NE	2.8	0.7	0.0	0.0	0.0	3.5
E	6.2	1.2	0.0	0.0	0.0	7.4
SE	9.9	1.9	0.0	0.0	0.0	11.8
S	10.6	0.3	0.0	0.0	0.0	10.9
SW	33.9	0.3	0.0	0.0	0.0	34.2
W	12.7	0.2	0.0	0.0	0.0	12.8
NW	7.7	0.0	0.0	0.0	0.0	7.7
Summary	87.9	4.7	0.0	0.0	0.0	92.6

% Icon Classes (ppm) 88 0-2 5 2-3 0 3-5 0 5-10 0 >10.0

PRAMP_842 Poll.: PRAMP_842-CH4[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.36% Calm Poll Avg: 1.98[ppm]



CH4[ppm] Calibration: PRAMP_842 Monthly: 17/07 Type: Span

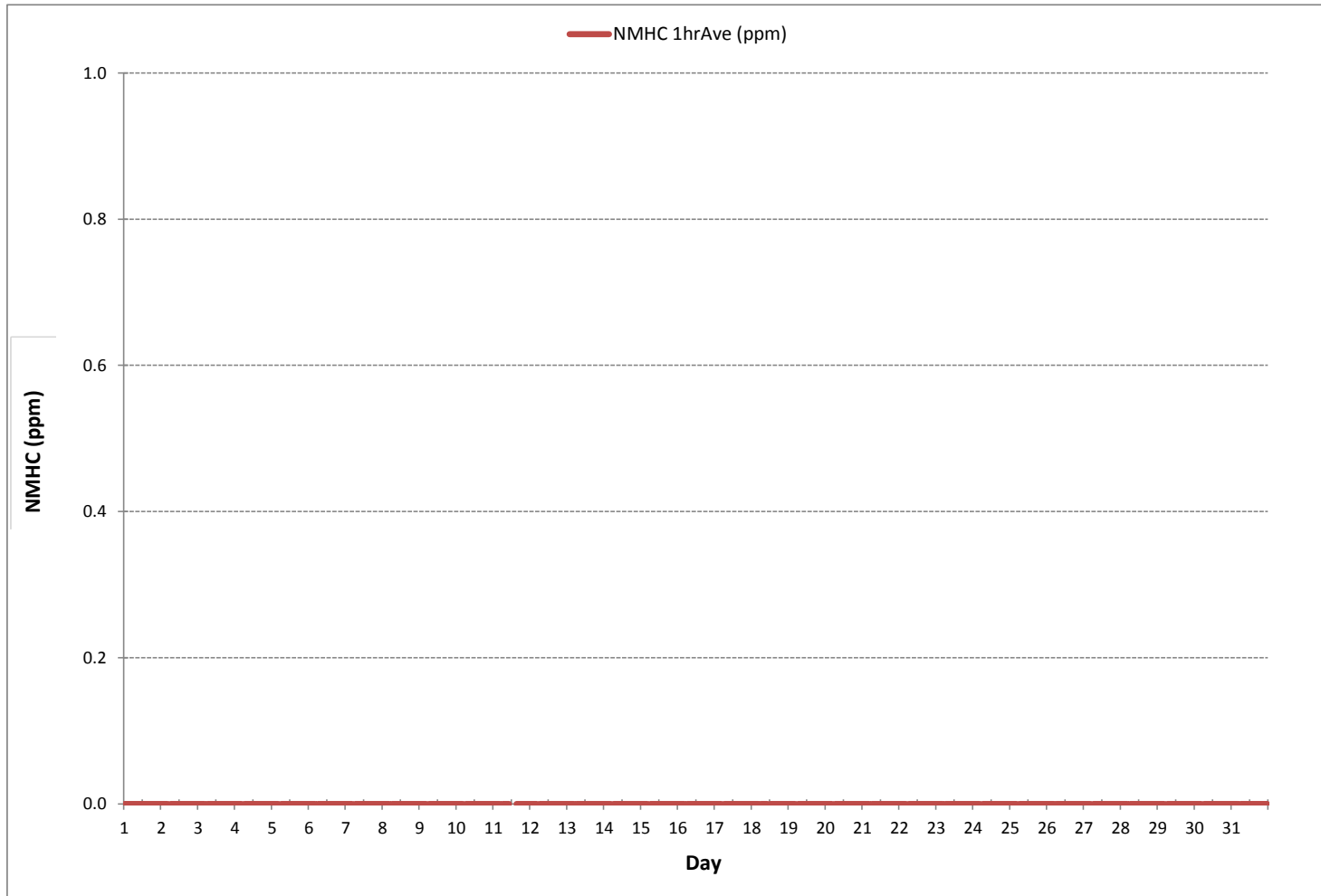


Span Meas Span Ref Span Low Span High

NON-METHANE HYDROCARBON



NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - July 2017

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	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	0.02	0.01	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	0.00	0.00	0.00	0.02	0.00	24	
2	0.00	0.00	0.00	0.00	0.00	S	0.01	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	0.00	0.00	0.00	0.01	0.00	24
3	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	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
4	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.02	0.00	24	
5	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
6	0.01	0.01	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	0.00	0.00	0.01	0.00	24	
7	0.01	0.00	0.00	0.00	0.00	S	0.00	P	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	23	
8	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	0.00	0.00	0.00	0.00	24	
9	0.03	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.03	0.00	24	
10	0.00	0.00	0.01	0.00	0.03	S	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	23	
11	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.05	0.04	0.00	C	C	C	C	C	0.01	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.05	0.01	24	
12	0.00	0.00	0.00	0.00	0.02	S	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24	
13	0.00	0.00	0.00	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.01	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	
14	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
15	0.00	0.00	0.00	0.00	P	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	23	
16	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	0.01	0.00	0.00	0.00	0.01	0.00	24	
17	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	P	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	23	
18	0.00	0.00	0.00	0.01	0.00	X	0.00	Y	0.00	0.00	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	22	
19	0.00	0.00	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
20	0.00	0.00	0.00	P	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	23	
21	0.00	0.00	0.00	0.01	0.00	S	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	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
22	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	0.00	0.00	0.00	0.00	24	
23	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	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	
24	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	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11	0.01	24	
25	0.00	0.02	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	0.01	P	0.00	0.00	0.00	0.02	0.00	23	
26	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	0.02	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	
27	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	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	24	
28	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	
29	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	0.00	0.00	0.00	0.00	24	
30	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	0.00	0.00	0.00	0.00	24	
31	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	24
HOURLY MAX	0.03	0.02	0.01	0.01	0.03	0.00	0.02	0.00	0.05	0.04	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.05	0.01	0.01	0.03	0.11	0.00					
HOURLY AVG	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	0.00	0.00	0.00	0.00					

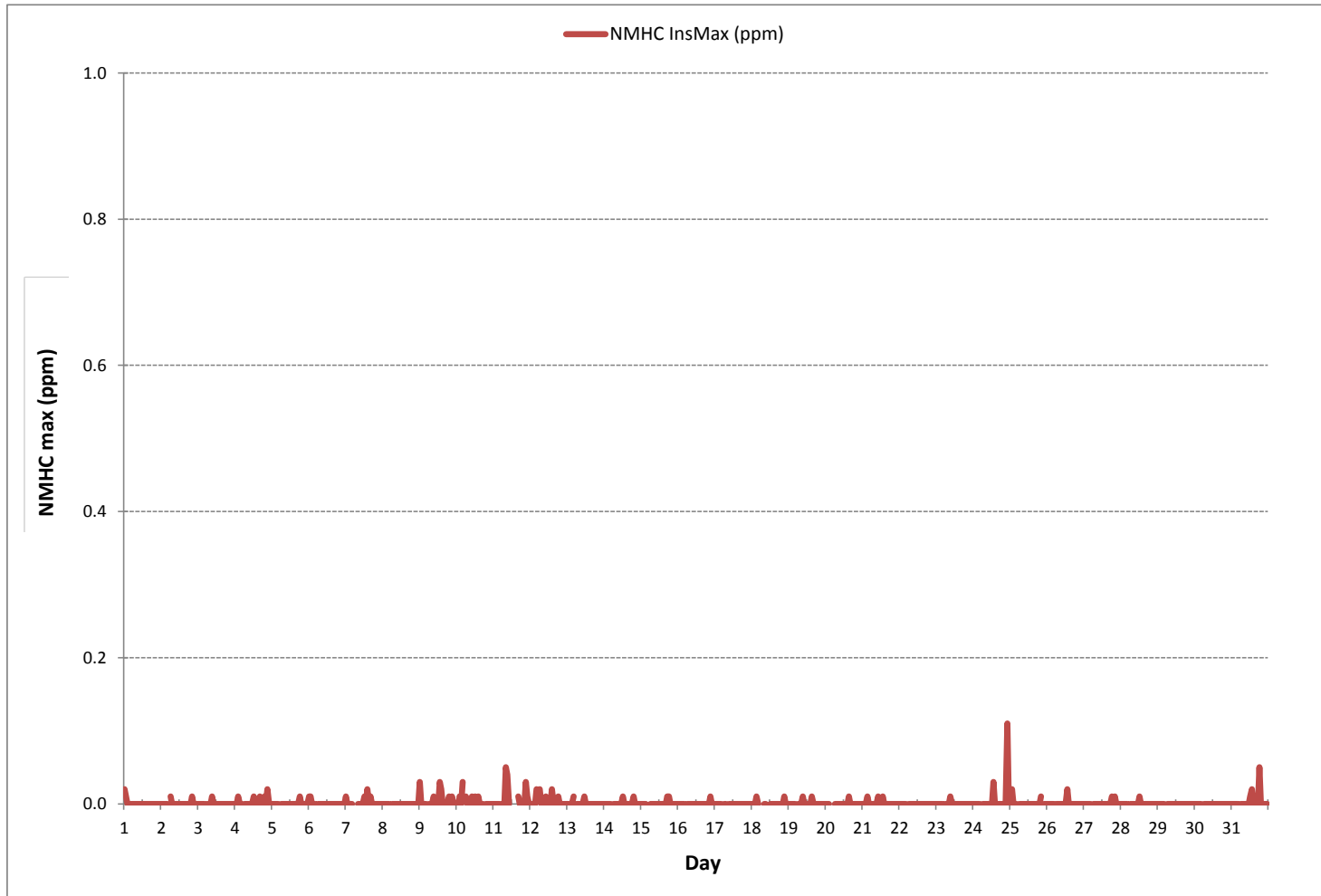
STATUS FLAG CODES

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:	66					
MAXIMUM INSTANTANEOUS VALUE:	0.11	ppm	@ HOUR	22	ON DAY	24
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	736	hrs	
MONTHLY CALIBRATION TIME:	5	hrs				
STANDARD DEVIATION:	0.01					

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: PRAMP_842
 Poll.: PRAMP_842-NMHC[ppm]
 Monthly: 2017/07
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

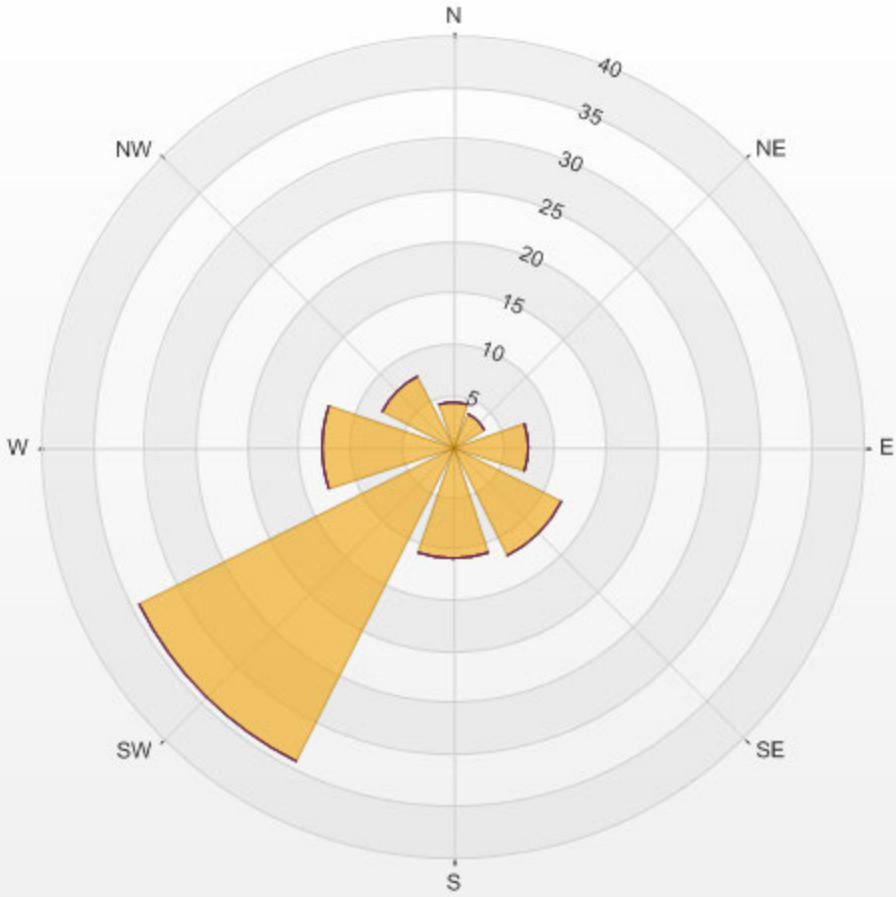
Calm: 7.36%

Calm Avg: 0.00 [ppm]

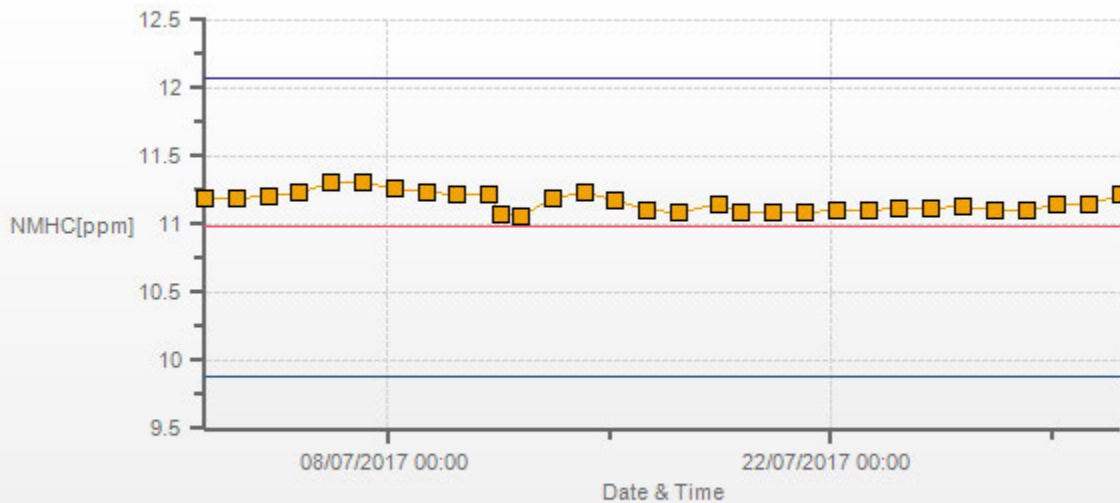
Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	4.4	0.0	0.0	0.0	0.0	4.4
NE	3.5	0.0	0.0	0.0	0.0	3.5
E	7.4	0.0	0.0	0.0	0.0	7.4
SE	11.8	0.0	0.0	0.0	0.0	11.8
S	10.9	0.0	0.0	0.0	0.0	10.9
SW	34.2	0.0	0.0	0.0	0.0	34.2
W	12.8	0.0	0.0	0.0	0.0	12.8
NW	7.7	0.0	0.0	0.0	0.0	7.7
Summary	92.6	0.0	0.0	0.0	0.0	92.6

% Icon Classes (ppm) 93 0-0.1 0 0.1-0.3 0 0.3-1 0 1-2 0 >2.0

PRAMP_842 Poll.: PRAMP_842-NMHC[ppm] 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.36% Calm Poll Avg: 0.00[ppm]



NMHC[ppm] Calibration: PRAMP_842 Monthly: 17/07 Type: Span



Span Meas Span Ref Span Low Span High

WIND SPEED



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
 Three Creeks 842b Station - July 2017

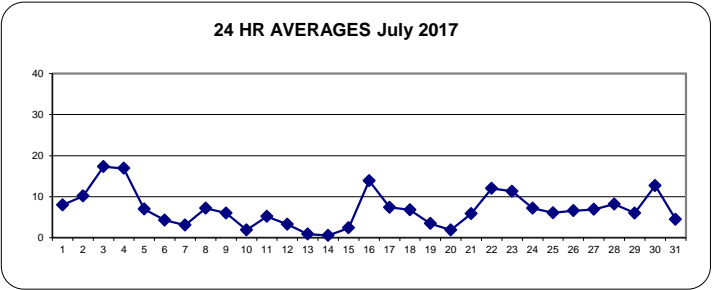
WIND SPEED Hourly Averages (WS kph)

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 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	5.5	6.1	6.7	6.5	9.1	9.0	9.6	13.1	15.1	13.0	11.3	11.0	10.4	12.2	12.8	13.4	10.7	8.8	9.6	6.3	6.5	9.0	10.0	3.6	3.6	15.1	8.0	24
2	6.8	4.9	7.6	8.3	8.5	7.4	6.8	9.9	9.9	11.4	14.8	15.3	19.2	17.4	17.1	18.8	17.0	13.0	9.2	10.2	19.3	3.9	6.0	8.5	3.9	19.3	10.2	24
3	10.4	12.1	8.3	8.6	9.3	12.0	13.7	16.1	21.7	26.9	28.2	25.8	25.2	27.5	25.5	24.8	29.6	24.3	23.4	14.6	8.0	16.9	11.8	9.1	8.0	29.6	17.3	24
4	11.6	12.6	12.8	13.2	13.4	14.1	15.9	19.7	21.8	20.8	22.7	24.5	24.7	27.3	27.3	23.6	23.0	22.8	20.1	17.2	11.8	7.2	8.0	8.2	7.2	27.3	16.9	24
5	6.4	6.9	4.0	0.9	0.7	1.9	2.4	7.5	7.0	7.7	10.6	13.9	15.6	15.1	16.0	13.9	15.0	12.8	11.3	7.9	3.3	0.3	1.0	1.8	0.3	16.0	7.0	24
6	0.9	3.2	1.5	2.8	5.8	5.7	8.8	10.7	8.4	9.7	8.1	7.7	8.6	7.5	3.6	4.5	3.1	5.4	3.0	3.0	1.8	3.2	2.3	3.2	0.9	10.7	4.3	24
7	3.9	5.2	4.5	2.2	2.7	1.2	1.3	2.4	3.8	4.5	2.8	5.0	4.6	4.3	6.4	7.0	7.5	5.7	4.1	3.2	5.1	7.1	23.5	1.2	23.5	3.1	24	
8	11.3	3.7	7.8	11.9	11.6	8.4	11.1	7.0	8.8	10.1	9.7	10.2	12.2	14.1	14.2	13.4	11.7	8.8	6.1	6.9	4.8	3.2	2.4	1.5	1.5	14.2	7.2	24
9	3.2	3.6	2.3	3.9	5.4	5.9	6.6	4.1	6.4	10.0	7.5	7.2	9.2	10.6	X	X	X	X	X	X	X	X	X	X	2.3	10.6	6.0	14
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.3	10.6	6.0	14
11	2.4	2.3	3.4	4.1	8.7	7.4	2.7	5.0	5.8	6.8	C	C	C	7.9	5.8	9.4	9.0	8.3	6.9	4.9	4.7	6.1	5.0	4.5	2.3	9.4	5.2	24
12	4.1	5.0	5.7	4.8	5.8	3.9	4.1	4.2	4.8	5.8	5.4	5.9	3.4	4.5	5.9	7.3	4.3	3.5	1.6	4.5	8.7	4.4	4.2	2.8	1.6	8.7	3.3	24
13	0.6	2.1	1.6	3.2	4.7	2.0	3.4	5.3	1.8	3.5	2.2	4.6	7.0	5.4	6.2	4.5	1.2	14.0	5.4	4.1	7.6	4.0	0.7	1.1	0.6	14.0	0.9	24
14	0.9	1.8	0.9	1.0	2.1	1.9	2.7	3.7	4.8	4.8	1.5	3.1	3.0	2.1	4.1	4.1	4.2	3.7	4.8	2.6	0.6	1.2	2.0	4.2	0.6	4.8	0.6	24
15	6.4	4.8	4.4	1.1	2.2	1.2	3.2	6.6	8.2	5.8	1.5	4.2	6.7	8.6	5.9	4.8	4.7	7.0	6.7	9.3	11.8	4.4	1.8	7.4	1.1	11.8	2.4	24
16	4.8	4.4	8.6	11.2	10.9	13.1	14.4	13.4	14.5	18.9	19.3	23.5	21.3	22.4	24.0	20.5	18.9	14.6	12.1	16.5	16.8	12.2	8.4	10.2	4.4	24.0	13.9	24
17	10.6	9.5	9.8	9.7	11.5	10.8	15.9	10.3	8.9	11.1	13.1	17.4	12.7	7.9	7.0	8.5	9.3	10.3	6.3	4.8	4.3	2.0	2.3	0.3	0.3	17.4	7.4	24
18	0.3	0.0	0.9	7.1	6.3	3.2	2.8	3.0	3.4	4.8	6.4	6.7	9.9	11.6	10.8	12.3	12.2	10.3	14.0	11.6	8.4	7.5	10.8	8.7	0.0	14.0	6.8	24
19	6.3	3.4	6.0	6.3	8.0	7.7	7.7	9.6	8.8	9.4	8.3	10.8	9.7	10.3	11.2	10.1	6.6	4.8	3.9	3.0	6.8	7.7	5.5	5.4	3.0	11.2	3.5	24
20	3.4	3.2	4.8	6.3	5.9	3.4	2.9	5.3	4.8	2.4	2.2	5.3	6.4	6.7	7.5	7.2	1.3	8.7	4.8	3.5	3.4	1.3	2.6	1.2	1.2	8.7	1.9	24
21	1.0	1.6	0.4	0.8	0.5	1.3	1.2	3.3	5.7	6.4	9.7	11.6	10.8	9.3	12.0	13.2	14.3	14.4	11.3	8.4	7.5	10.3	8.9	4.3	0.4	14.4	5.9	24
22	6.6	6.4	8.2	7.0	7.0	7.2	9.1	13.7	15.7	17.5	19.8	20.5	20.2	17.2	20.5	18.5	17.2	18.9	16.5	13.8	9.7	6.9	6.4	8.6	6.4	20.5	12.0	24
23	8.2	5.2	9.2	9.0	7.5	11.4	10.2	14.4	19.6	19.6	19.7	19.0	19.4	17.1	15.1	15.1	11.9	9.0	8.2	9.9	11.6	6.9	5.7	6.0	5.2	19.7	11.3	24
24	4.4	1.6	0.7	5.5	8.0	10.9	11.5	10.5	12.0	14.0	12.7	15.1	14.0	11.9	10.7	10.8	11.6	8.0	6.5	4.0	4.7	1.1	1.4	3.2	0.7	15.1	7.2	24
25	1.2	2.4	2.9	3.6	3.9	5.1	5.7	5.2	5.6	6.6	10.1	11.8	13.1	11.8	10.2	6.5	9.4	11.4	12.3	9.1	8.1	7.7	8.1	8.7	1.2	13.1	6.1	24
26	8.8	5.9	2.9	5.1	8.0	8.9	10.9	10.3	9.4	8.9	11.9	12.3	11.7	12.4	10.9	9.9	11.8	11.4	7.1	3.7	1.0	3.3	1.9	2.1	1.0	12.4	6.6	24
27	1.8	5.4	11.4	3.0	2.3	1.5	1.3	1.8	7.3	9.4	10.3	11.6	15.2	16.9	8.0	7.2	10.9	12.4	13.8	12.6	7.7	4.5	5.9	6.0	1.3	16.9	6.9	24
28	6.9	8.2	7.1	9.2	5.6	7.3	8.6	8.9	9.7	8.6	10.0	11.9	13.7	18.4	16.9	17.7	15.0	10.7	3.5	5.3	3.4	1.9	2.9	3.5	1.9	18.4	8.2	24
29	4.4	4.1	2.0	3.2	4.1	6.4	7.9	11.3	10.8	10.0	8.9	11.4	11.2	13.1	11.5	10.2	8.3	9.2	7.1	2.0	0.2	2.3	5.4	1.7	0.2	13.1	6.0	24
30	6.5	11.0	4.4	7.3	7.0	7.0	9.9	10.1	14.6	18.6	20.0	22.0	21.4	23.4	26.4	25.3	25.4	22.4	18.5	14.4	10.7	8.7	7.5	3.1	3.1	26.4	12.7	24
31	6.5	6.9	5.7	3.7	2.3	3.9	4.5	6.6	6.3	7.3	9.0	7.5	8.3	7.6	9.5	7.9	10.5	9.4	5.4	4.5	2.6	5.4	7.6	5.0	2.3	10.5	4.5	24
HOURLY MAX	11.6	12.6	12.8	13.2	13.4	14.1	15.9	19.7	21.8	26.9	28.2	25.8	25.2	27.5	27.3	25.3	29.6	24.3	23.4	17.2	19.3	16.9	11.8	23.5				
HOURLY AVG	2.6	2.9	3.0	3.3	3.3	3.6	3.7	4.8	6.1	7.3	8	0.3	9.7	10.3	10.0	9.7	9.4	8.9	7.6	6.4	5.5	4.1	2.0	2.2	2.7			

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

LAST CALIBRATION: July 11, 2017
 DECLINATION : MAGNETIC DECLINATION 15 DEGREE EAST



MONTHLY SUMMARY

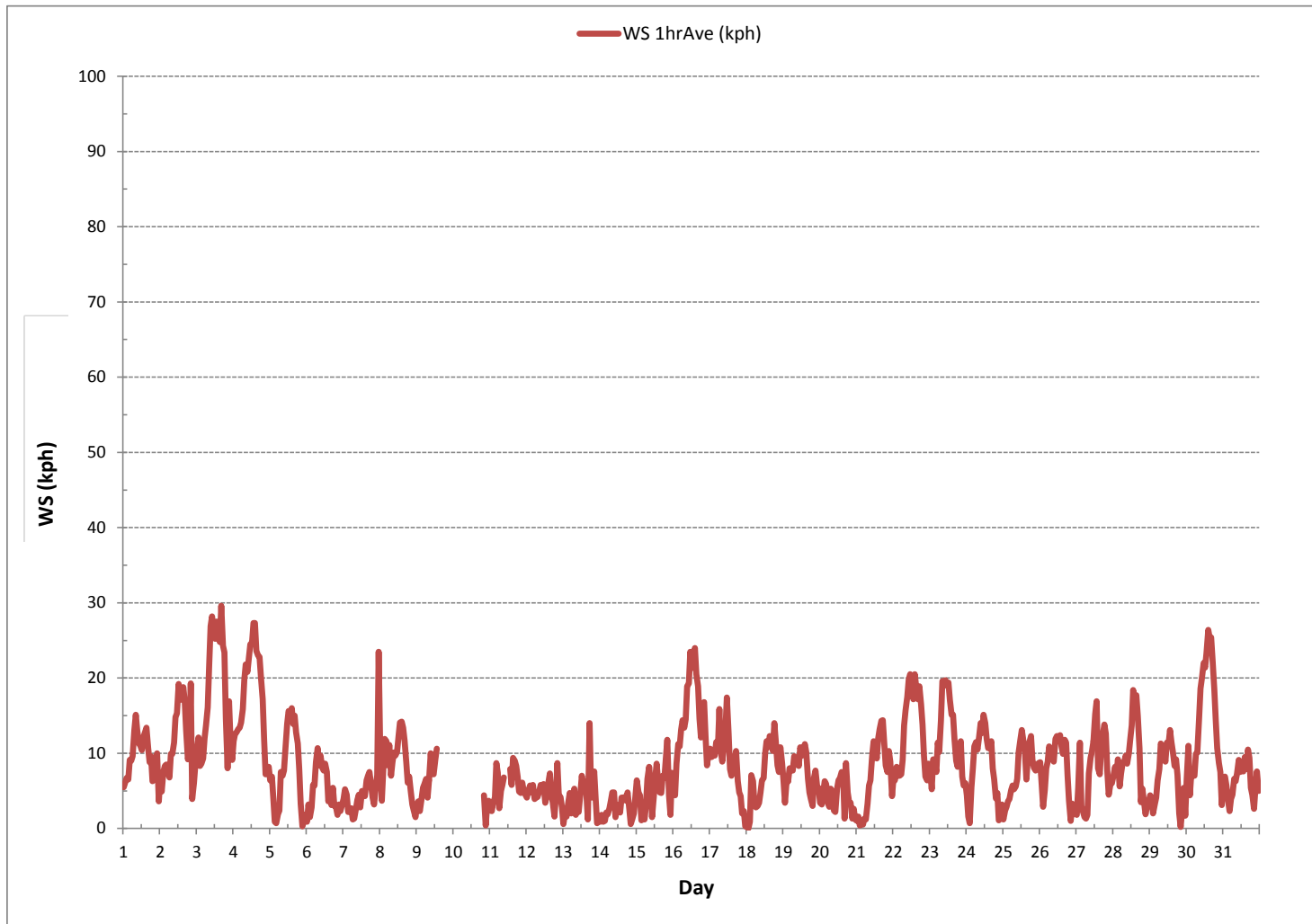
NUMBER OF NON-ZERO READINGS: 710

MINIMUM 1-HR AVERAGE: 0.0 kph @ HOUR 1 ON DAY 18
 MAXIMUM 1-HR AVERAGE: 29.6 kph @ HOUR 16 ON DAY 3
 MAXIMUM 24-HR AVERAGE: 17.3 kph ON DAY 3

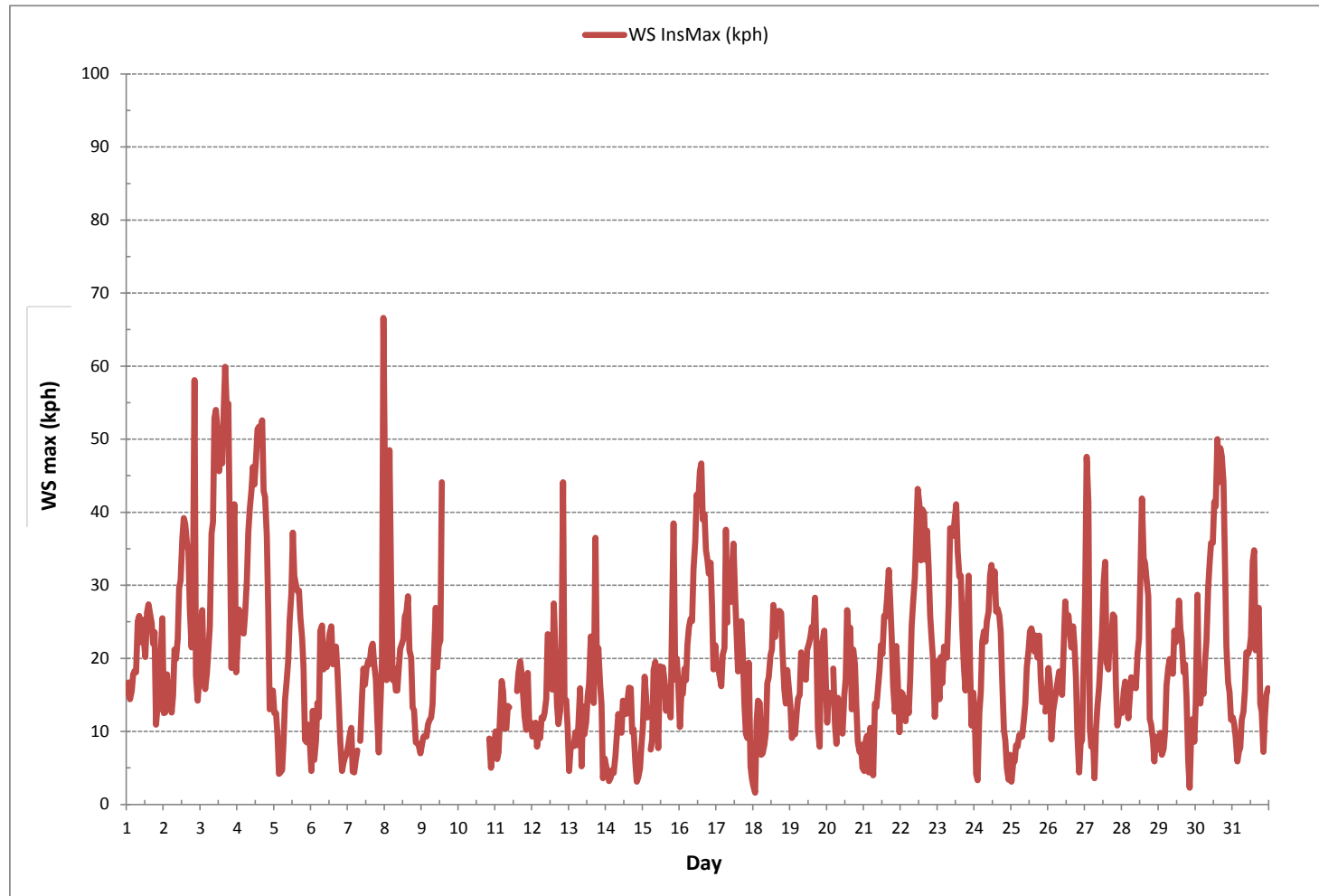
MONTHLY CALIBRATION TIME: 3 hrs OPERATIONAL TIME: 714 hrs
 AMD OPERATION UPTIME: 96.0 %

STANDARD DEVIATION: 5.7 MONTHLY AVERAGE: 5.3 kph

WIND SPEED Hourly Averages (WS kph)



WIND SPEED Instantaneous Maximum (WS kph)



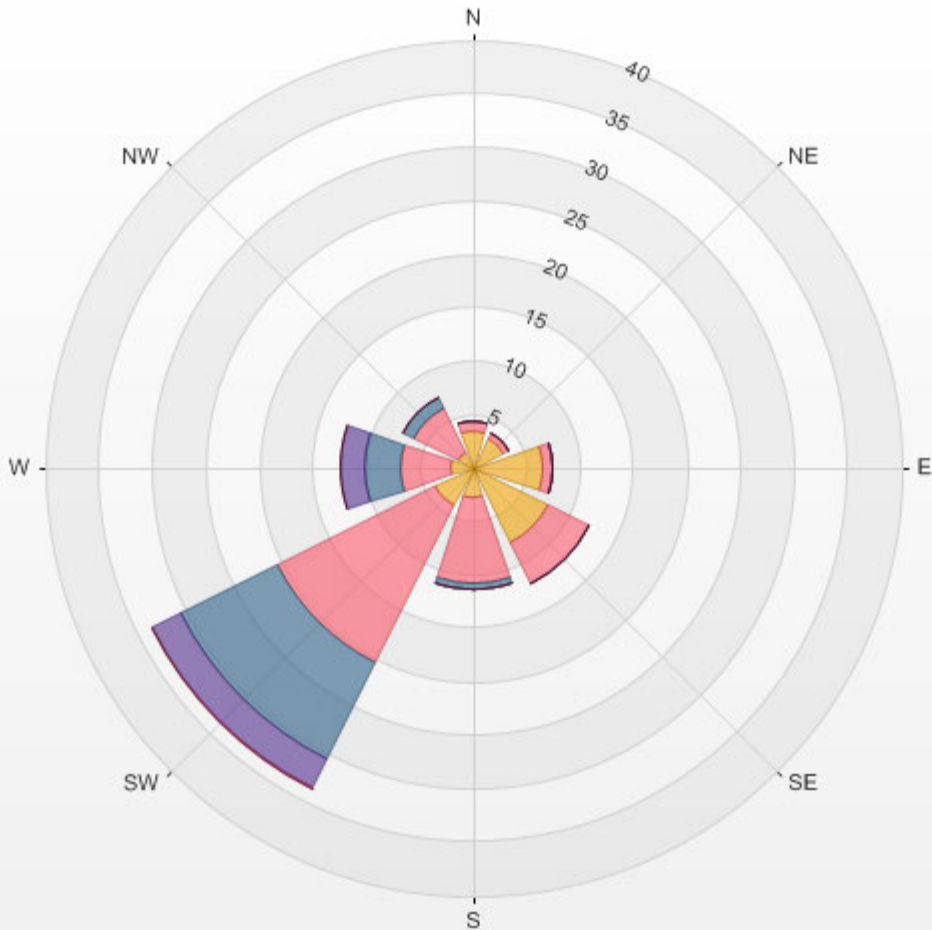
Wind: PRAMP_842
 Monitor: WSP [kph]
 Monthly: 2017/07
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 7.45%

Direction	1.8-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	3.4	1.0	0.0	0.0	0.0	0.0	4.4
NE	3.1	0.6	0.0	0.0	0.0	0.0	3.7
E	6.5	1.0	0.0	0.0	0.0	0.0	7.5
SE	7.9	4.4	0.0	0.0	0.0	0.0	12.2
S	2.8	8.0	0.6	0.0	0.0	0.0	11.4
SW	3.9	16.5	10.1	3.0	0.1	0.0	33.6
W	2.1	4.8	3.2	2.3	0.0	0.0	12.4
NW	1.6	4.8	1.1	0.0	0.0	0.0	7.5
Summary	31.2	40.9	15.1	5.2	0.1	0.0	92.5

%	Icon	Classes (kph)	31	41	15	5	0	0
		1.8-6.0						
		6.0-12.0						
		12.0-20.0						
		20.0-29.0						
		29.0-39.0						
		>39.0						

PRAMP_842 2017/07/01 00:00 - 2017/07/31 23:00 Calm: 7.45% Calm Wind Avg Speed: 1.08(kph)



WIND DIRECTION



PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
Three Creeks 842b Station - July 2017

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	SE	SE	SE	SE	SE	SE	SSE	SSE	S	S	SSW	SW	SW	SW	SW	SSW	S	WSW	SSW	S	S	S	SSW	S	24		
2	SE	SE	S	SSE	S	S	S	SW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	WSW	S	SSE	SSW	SSW	24	
3	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	SW	W	W	SW	WSW	W	WSW	24	
4	SW	SW	SW	SSW	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	WSW	SW	SW	WSW	24	
5	SW	SW	WSW	WSW	S	ESE	S	SW	W	WSW	SW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	SW	E	NNE	NE	WSW	24	
6	NE	N	ENE	N	N	NNW	NNW	NNW	NNW	NW	NW	NW	NW	N	N	N	NNW	N	NNW	N	NNE	ENE	ESE	E	NNW	24	
7	ESE	ESE	E	ENE	ENE	ENE	E	ESE	ENE	ESE	ESE	ESE	E	ESE	E	ESE	ESE	E	E	ENE	ENE	ENE	E	WSW	ESE	24	
8	W	E	ESE	SSW	SSW	S	S	S	SSE	S	S	SSW	SW	SW	SW	SW	WSW	SW	SSW	SSW	S	ESE	SE	ESE	SSW	24	
9	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	SE	SE	E	ESE	E	SE	X	X	X	X	X	X	X	X	X	X	X	ESE	14
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	Y	SW	SE	ESE	SE	SSE	4
11	SE	SE	SE	SE	SSE	SE	SSE	SSW	S	S	C	C	C	SE	SSE	S	S	SSE	SW	SSW	SE	SE	SE	ESE	SSE	24	
12	ESE	ESE	ESE	E	E	E	E	ESE	SE	SSE	SSE	SW	S	ESE	ESE	ESE	ENE	ENE	ENE	NNE	N	SE	NNW	NE	ENE	ESE	24
13	ESE	ENE	NNE	NE	ENE	ENE	ENE	ENE	N	SSW	SW	W	NW	N	ENE	E	NW	W	NNE	SSW	W	WSW	ESE	SW	NNW	24	
14	SSW	SE	SE	SE	ESE	ESE	SSE	S	SW	SW	WNW	NNW	WNW	NE	NW	NNW	NNW	W	WNW	W	ENE	E	ENE	ENE	W	24	
15	ENE	ESE	E	ENE	NNE	NE	NE	NNW	N	NNE	NNW	SW	WSW	WSW	W	NW	NW	NW	NW	NW	NNE	SE	S	SW	NW	24	
16	E	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
17	WSW	WSW	WSW	WSW	WSW	WSW	NW	NNW	NNW	NW	NW	NW	WNW	NNW	NNW	NW	W	WNW	W	W	WSW	NE	SE	SE	WNW	24	
18	E	E	WSW	SW	SW	SW	SW	WSW	W	WSW	W	WSW	SW	WSW	SW	SW	SW	SW	SW	SSW	S	S	S	S	SW	SW	24
19	SSE	SE	SSE	SSE	SSE	SSE	S	SSW	SW	SW	SW	SW	SW	SW	SW	SSW	NW	NE	E	E	NNE	N	ENE	N	SSW	24	
20	ENE	ENE	N	ENE	E	NE	NE	E	E	ENE	NNE	W	W	SSE	SSE	SSW	ESE	NE	E	ESE	SSE	NNW	NE	ENE	E	24	
21	SE	ENE	W	SSE	N	NNW	ENE	NNW	NW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	SSW	SSW	SW	SW	WSW	24	
22	SW	S	S	SSE	SSE	SSE	S	SW	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	SW	WSW	WSW	WSW	SW	SW	SSW	SW	24
23	SSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	SW	WSW	WSW	SW	WSW	WNW	WNW	W	NW	WSW	24	
24	NW	NW	W	W	NW	WNW	NW	NNW	NW	NW	NNW	NW	NW	NW	NW	W	WNW	NW	W	SSW	SE	ESE	ENE	NW	NW	24	
25	ESE	ESE	SE	SE	SE	SE	SSE	SSE	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	S	SSE	SSE	SE	SSW	24
26	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	E	ESE	ESE	WNW	S	SSW	24	
27	ENE	SSW	SW	ESE	ESE	SE	ESE	S	S	S	SSW	SSW	SSW	WSW	SW	S	S	SSW	SSW	SW	SSW	SW	SW	SW	SSW	SW	24
28	SW	SW	SSW	S	S	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	W	WNW	WSW	SSW	SE	SE	SE	SW	24	
29	SE	SSE	SSE	SSE	SE	S	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	S	SE	SE	ESE	ESE	SSW	24	
30	SE	SSW	S	SE	SE	SSW	SSW	SSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
31	SW	WSW	WSW	WSW	SE	SE	SSW	SW	WSW	NW	NW	WNW	WNW	W	WNW	WNW	NNW	NNW	NNW	NNW	N	NNW	W	WNW	WNW	24	

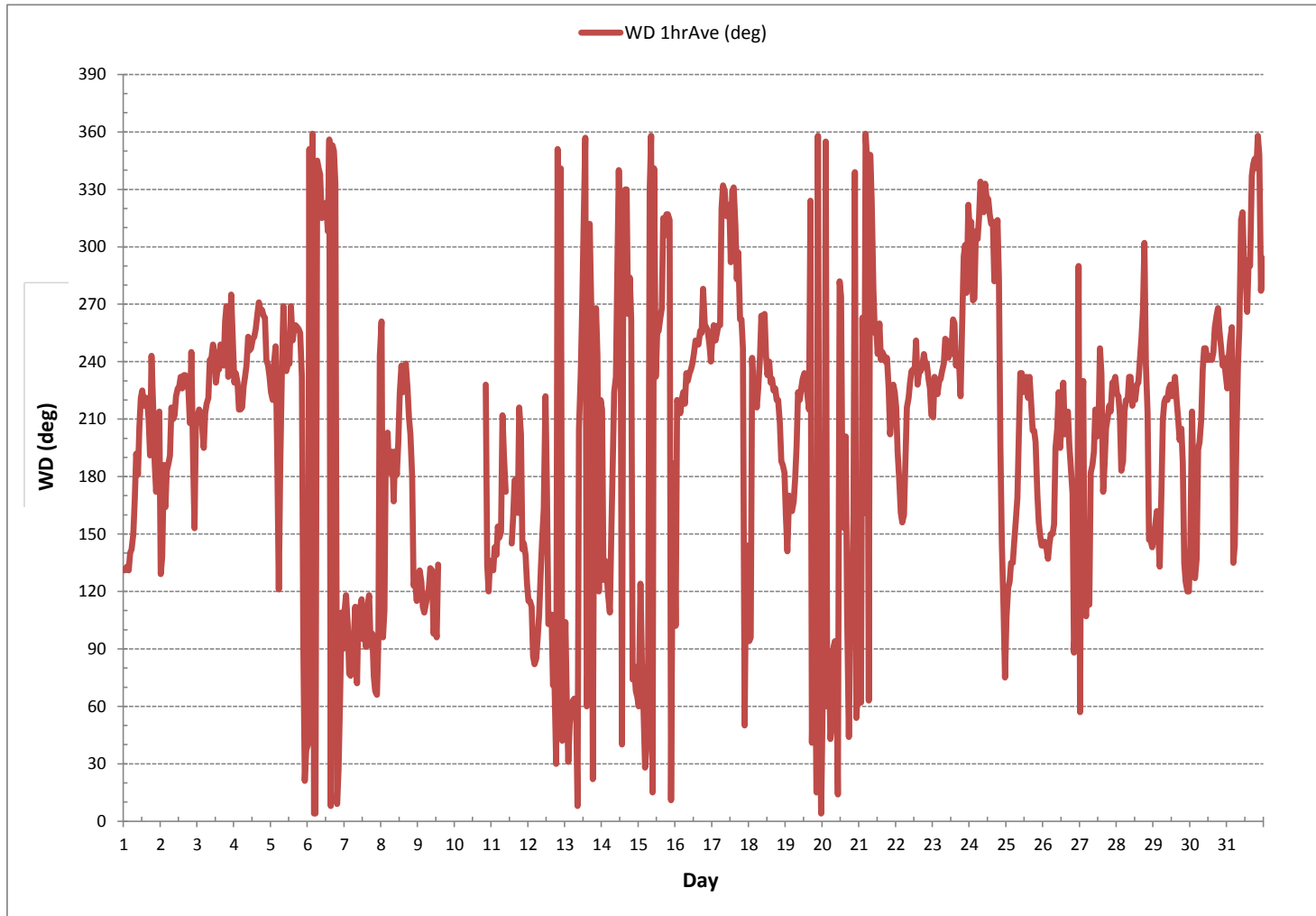
STATUS FLAG CODES

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:	July 11, 2017
DECLINATION :	MAGNETIC DECLINATION 15 DEGREE EAST

MONTHLY CALIBRATION TIME:	3 hrs	OPERATIONAL TIME:	714 hrs
STANDARD DEVIATION:	78	AMD OPERATION UPTIME:	96.0 %
		MONTHLY AVERAGE:	231 (SW)

WIND DIRECTION Hourly Averages (WD)



RELATIVE HUMIDITY



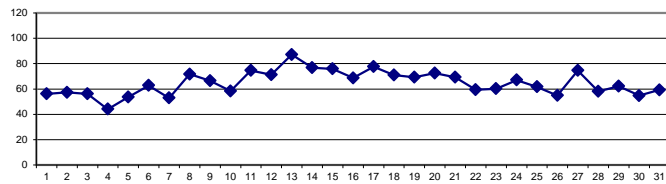
RELATIVE HUMIDITY Hourly Averages (RH %)

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	76	79	80	79	75	72	69	60	58	61	52	48	43	36	37	43	38	41	34	42	45	55	57	67	34	80	56	24	
2	68	68	74	80	83	80	73	61	61	56	48	45	40	35	36	34	32	33	37	43	55	74	76	82	32	83	57	24	
3	81	82	80	81	85	84	81	66	56	49	45	44	45	42	42	39	35	41	39	39	47	41	47	57	35	85	56	24	
4	55	52	55	59	61	60	58	53	49	43	40	37	34	32	31	30	31	30	29	30	34	47	53	55	29	61	44	24	
5	58	60	69	80	90	87	72	61	55	52	48	44	40	32	29	28	26	25	27	31	42	67	80	84	25	90	54	24	
6	88	91	91	93	94	89	76	66	60	59	54	49	45	42	39	36	36	35	37	35	44	74	84	89	35	94	63	24	
7	91	89	88	91	93	93	77	56	42	36	33	32	29	27	25	24	26	28	32	39	51	54	44	70	24	93	53	24	
8	89	93	92	87	84	87	90	91	91	86	82	68	56	50	47	44	42	43	49	49	62	77	79	82	42	93	72	24	
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10	79	78	79	79	74	71	65	67	63	56	52	48	44	39	38	39	36	39	43	44	55	68	74	69	36	79	58	24	
11	75	78	78	79	83	84	81	79	80	82	86	84	83	80	68	62	55	52	51	56	65	77	84	88	51	88	75	24	
12	90	90	90	92	94	95	91	84	76	63	52	47	46	43	42	41	44	48	53	67	84	91	93	94	41	95	71	24	
13	94	95	95	95	96	95	96	94	89	81	72	72	86	88	85	83	76	78	85	78	82	89	92	94	72	96	87	24	
14	95	95	95	95	96	96	96	96	96	94	81	65	60	56	50	45	45	46	48	54	72	86	91	91	45	96	77	24	
15	88	85	87	89	94	94	94	87	79	70	67	67	66	65	62	57	55	54	63	71	78	75	84	89	54	94	76	24	
16	90	93	92	84	83	79	78	73	69	66	64	60	55	48	48	51	55	60	58	54	59	69	76	83	48	93	69	24	
17	84	84	85	86	89	93	92	88	85	73	63	56	65	82	81	69	63	58	60	64	75	84	91	92	56	93	78	24	
18	94	94	94	93	94	89	80	71	66	64	64	58	55	49	46	50	52	55	58	63	70	80	82	85	46	94	71	24	
19	89	92	93	93	92	92	87	79	74	70	64	59	55	51	49	46	48	39	42	50	67	76	76	81	39	93	69	24	
20	85	80	87	91	86	85	81	75	70	62	55	54	58	61	62	52	59	65	60	65	73	86	92	93	52	93	72	24	
21	94	95	95	95	95	96	96	92	73	69	66	60	53	50	47	43	43	44	45	51	59	63	67	71	43	96	69	24	
22	67	72	76	76	80	79	74	64	59	54	49	44	41	44	43	45	47	47	48	51	58	65	70	70	41	80	59	24	
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29	81	81	90	87	88	85	75	66	62	56	54	47	41	37	34	34	37	38	41	56	72	81	71	76	34	90	62	24	
30	72	75	87	90	91	91	87	82	74	62	49	42	38	33	26	21	20	23	27	32	39	46	50	57	20	91	55	24	
31	64	64	69	78	80	83	76	68	59	47	43	40	40	43	47	45	45	37	38	44	68	75	78	91	37	91	59	24	
HOURLY MAX	95	95	95	95	96	96	96	96	96	96	94	86	84	86	88	85	83	76	78	85	78	84	91	93	94				
HOURLY AVG	81	81	84	85	86	85	81	74	68	62	57	52	50	48	46	45	43	44	46	50	61	71	75	79					

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

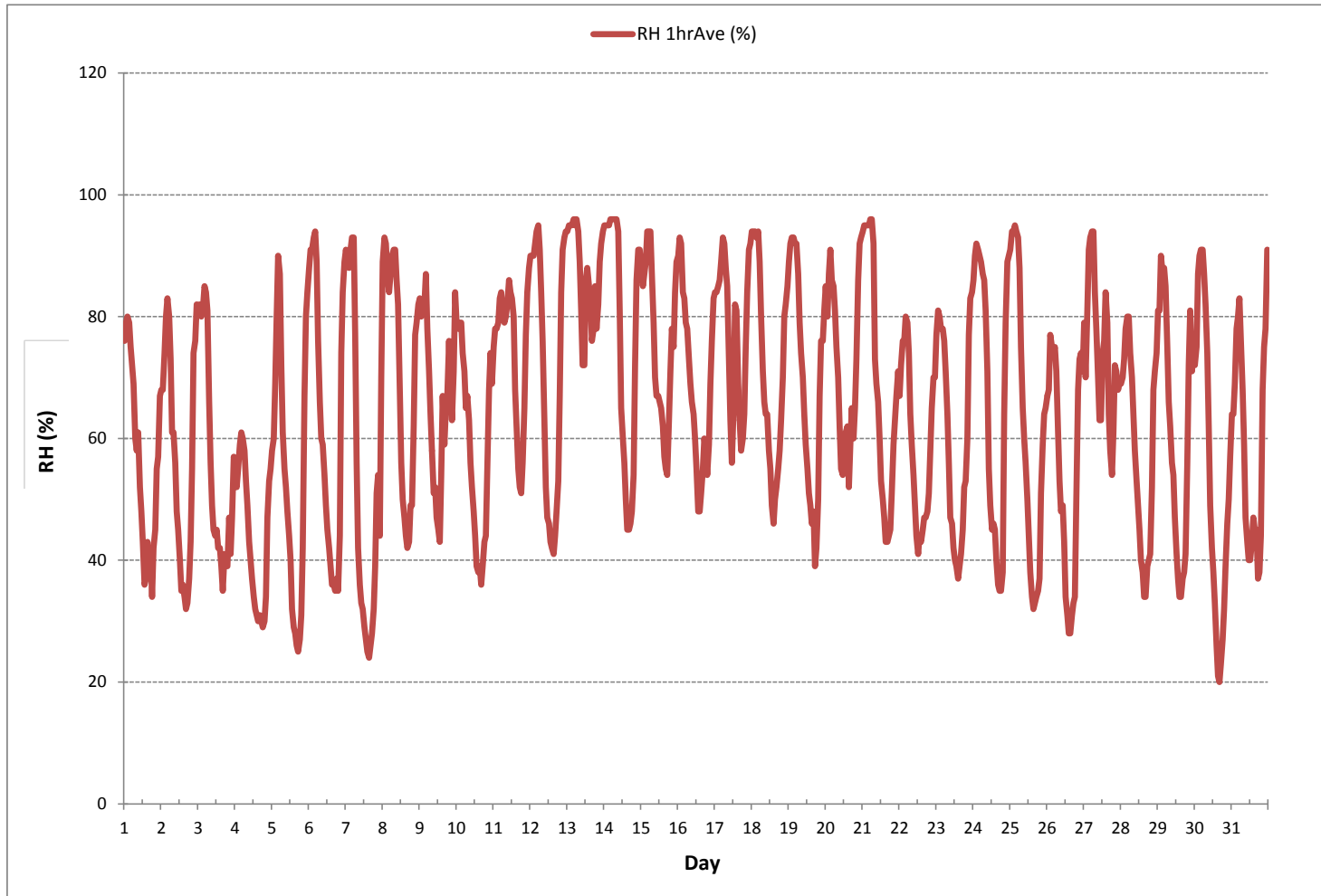
24 HR AVERAGES July 2017



MONTHLY SUMMARY

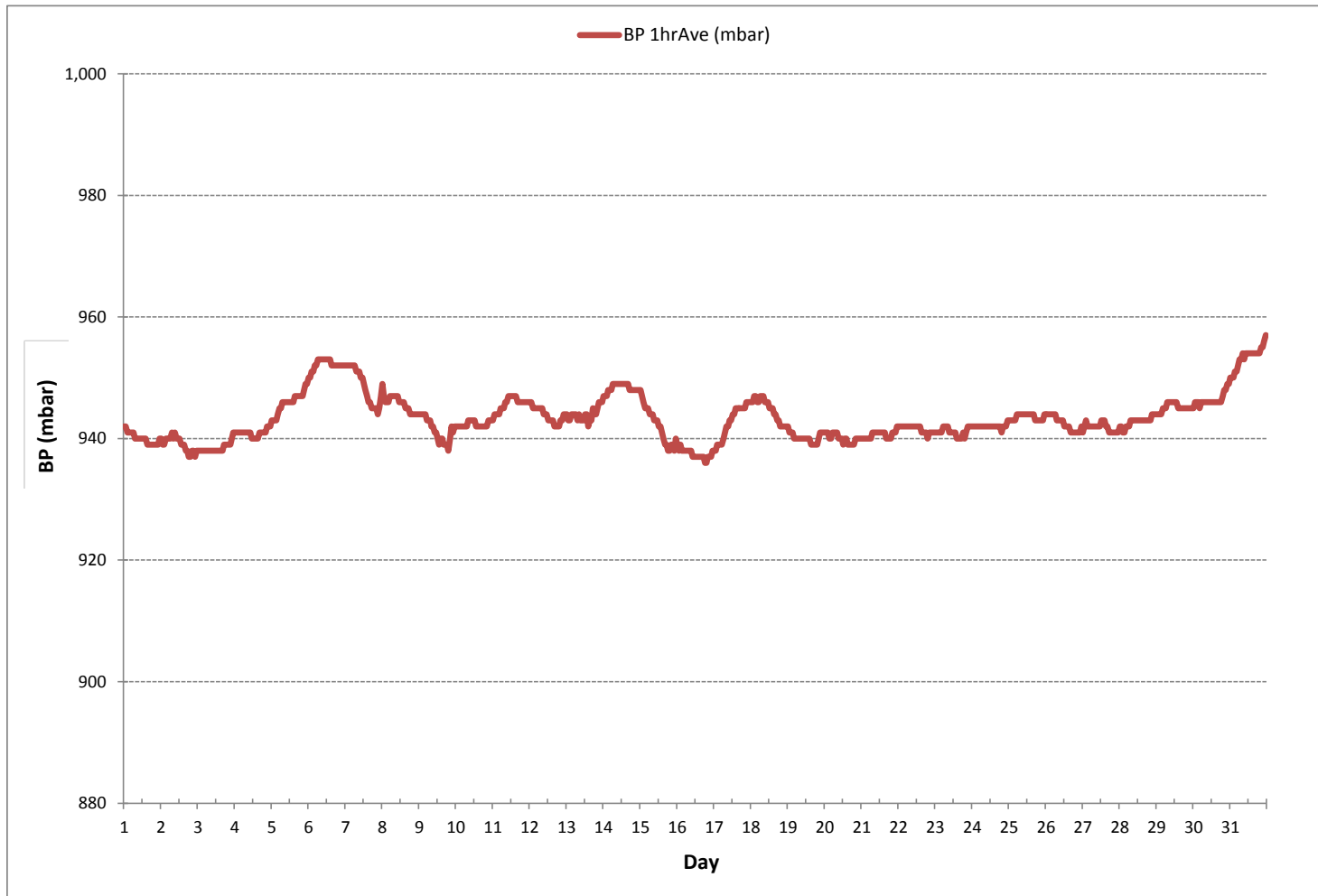
MINIMUM 1-HR AVERAGE:	20	%	@ HOUR	16	ON DAY	30
MAXIMUM 1-HR AVERAGE:	96	%	@ HOUR	4	ON DAY	13
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	13
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	20					MONTHLY AVERAGE: 65 %

RELATIVE HUMIDITY Hourly Averages (RH %)



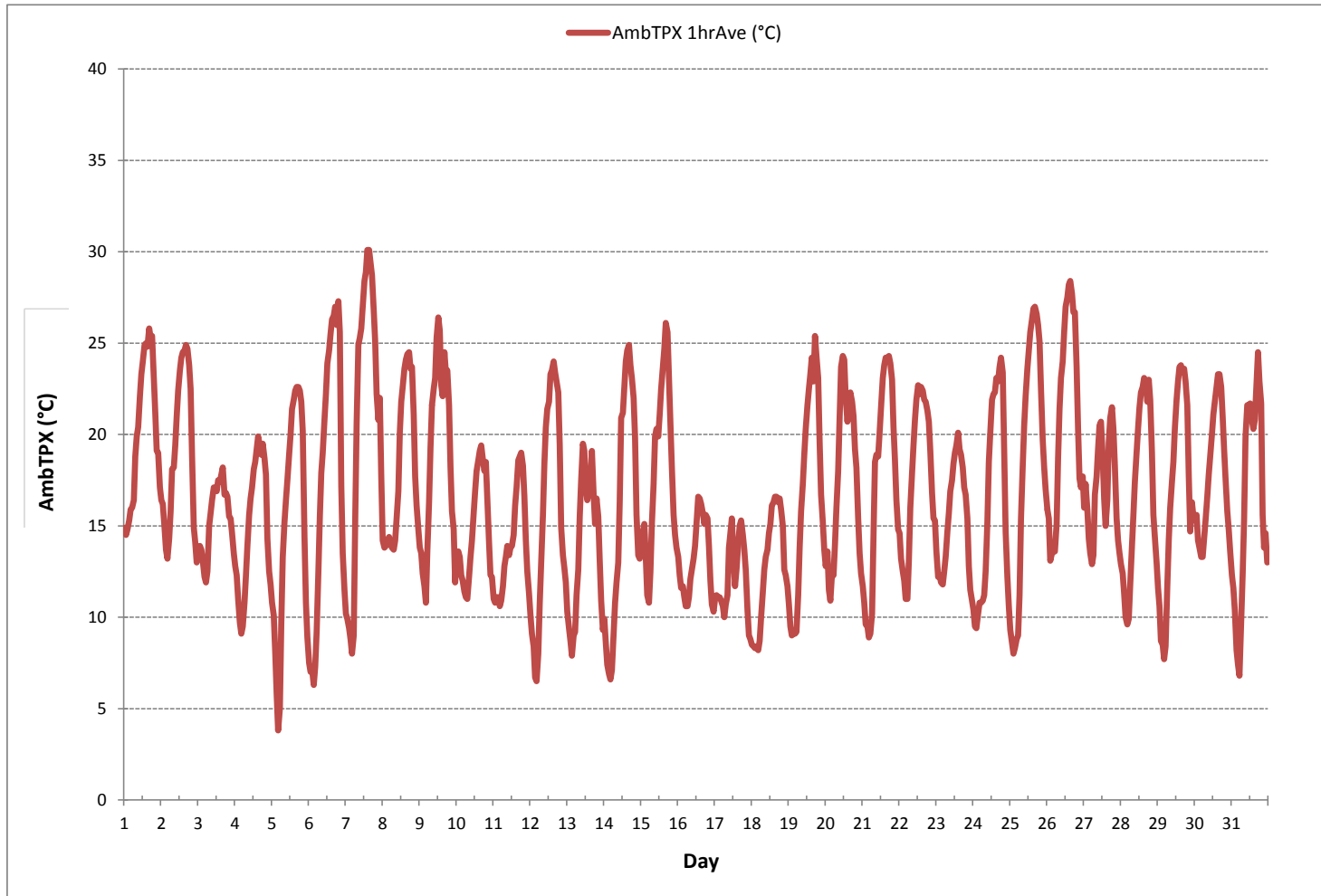
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



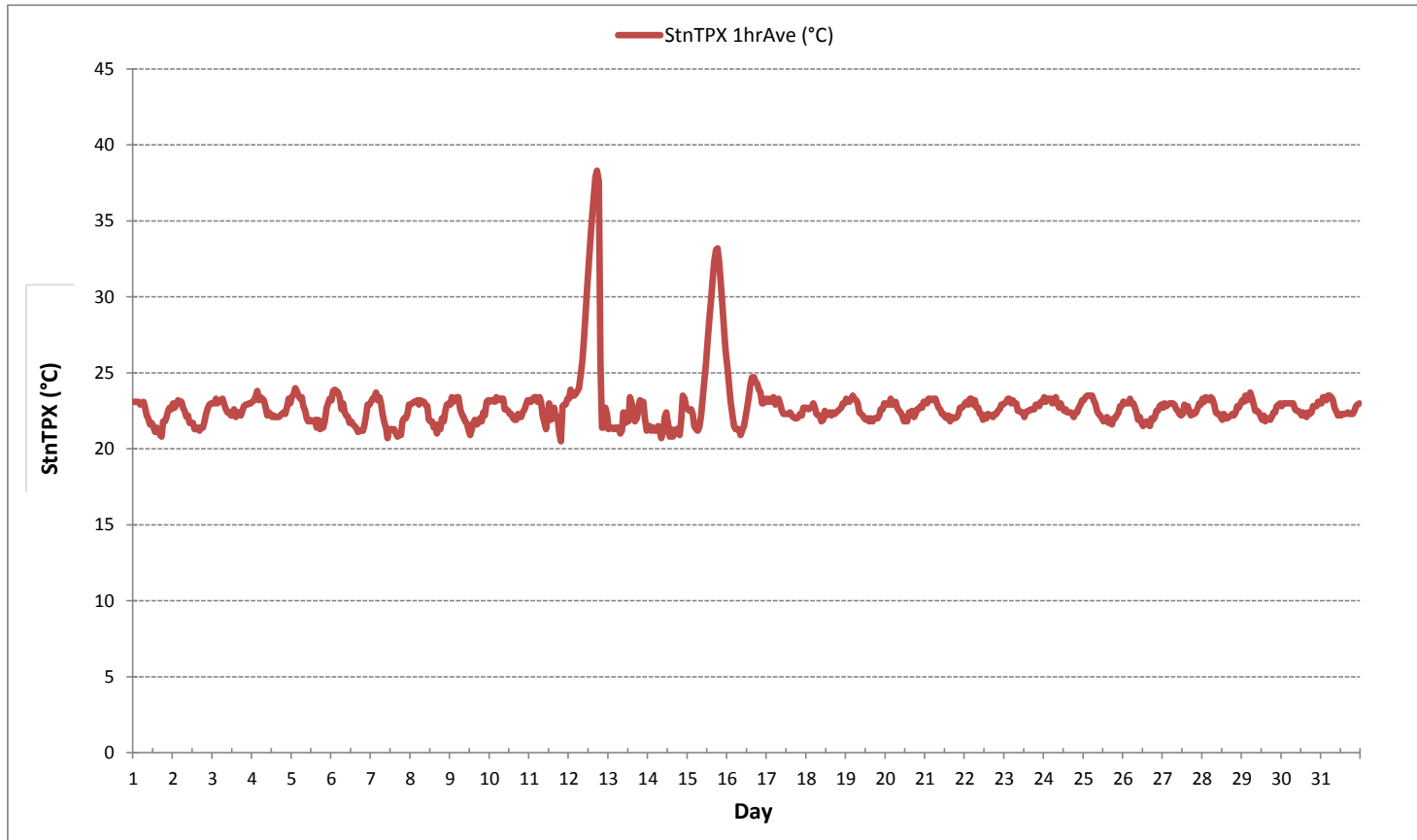
AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



STATION TEMPERATURE

STATION TEMPERATURE Hourly Averages (StnTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100ASulphur Dioxide Analyzer Calibration

Date:	July 11, 2017	Barometer Data/B.P.:	Brunton 05535, December 5, 2016	947 hPa
Company/Airshed:	PRAMP	Thermometer Data/Station Temp °C:	Fisher Scientific 160459244, May 19, 2016	22 °C
Location/Station Name:	842b	Weather Conditions:	Cloudy/Overcast	
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly	
Start Time 24 hr. (mst):	8:13	Performed By/Reviewer:	Chris Wesson	Trina Whitsitt
End Time 24 hr. (mst):	11:45	Cal Gas Expiry Date:	December 8, 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:	June 6, 2017	As Found C.F.:	0.974
Previous C.F.:	0.999	New C.F.:	0.999

Calibration Standards:		Standard Calibration Points for Ranges	
Low Flow Meter ID/Cert. Date:	Definer Low ID# 129069 February 5, 2017	Point	ppb
High Flow Meter ID/Cert. Date:	Definer High ID# 128686 February 5, 2017	High	380
Calibrator ID/Cert. Date:	API 700 829, January 27, 2017	Mid	180
Cal Gas Cylinder I.D. #:	EY0000597	Low	90
Cal Gas Conc. (ppm):	50.4		

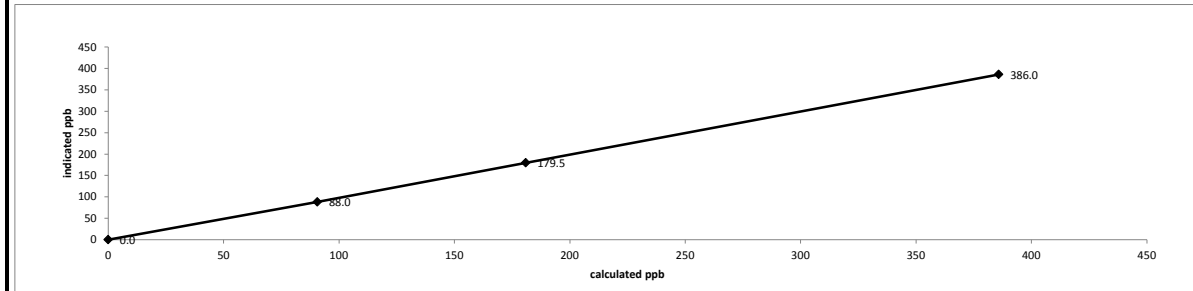
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5983	0.00	5983	0.0	-0.1	n/a
as found high	5936	45.79	5982	385.8	396.0	0.974
adjusted zero	5983	0.00	5983	0.0	0.0	n/a
adjusted high	5936	45.79	5982	385.8	386.0	0.999
mid	5953	21.44	5974	180.9	179.5	1.008
low	5962	10.74	5973	90.6	88.0	1.030
calibrator zero	5983	0.00	5983	0.0	0.5	n/a
Average C.F.=						1.012

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.997	> or = 0.995
b (Intercept as % of full scale) =	0.28%	.95-1.05
% change in C.F. from last cal =	2.50%	± 3% F.S.
		± 10%

API 100ASulphur Dioxide Analyzer Calibration

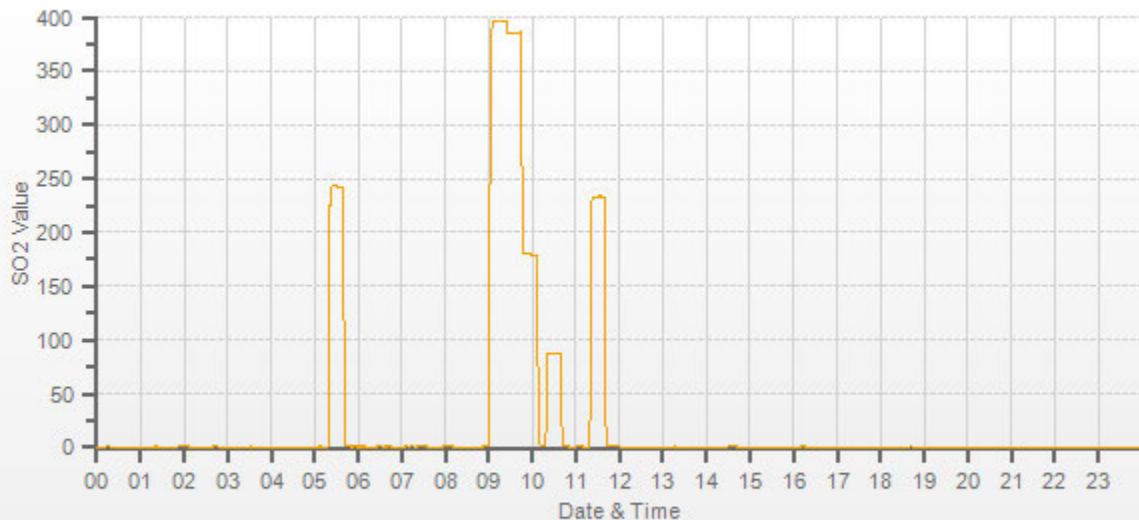


<p style="text-align: center;">As found:</p> Slope: 1.049 Offset: 19.3 Hvps: 685 Dcps: 2544 Rcell Temp: 49.8 Box Temp: 31.5 Pmt Temp: 7.2 Izs Temp: 60.0 Pres: 26.7 Samp Fl: 647 Pmt: 55 Uv Lamp: 2158.5 Lamp Ratio: 86.8 Str Lgt: 10.1 Drk Pmt: 31.9 Drk Lmp: 7.1 Expected Value: 239.0	<p style="text-align: center;">As left:</p> Slope: 1.022 Offset: 19.6 Hvps: 685 Dcps: 2545 Rcell Temp: 49.6 Box Temp: 29.9 Pmt Temp: 7.3 Izs Temp: 60.1 Pres: 26.7 Samp Fl: 649 Pmt: 55.0 Uv Lamp: 2100.6 Lamp Ratio: 84.7 Str Lgt: 10.0 Drk Pmt: 31.5 Drk Lmp: -7.1 Expected Value: 233.0
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Comments:
The analyzer sample inlet filter was changed.

Flow measurements completed after mid-point.

SO2[ppb] Station: PRAMP_842 Daily: 2017/07/11 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 43i Total Reduced Sulphur Analyzer Calibration

Date: July 11, 2017	Barometer Data/B.P.: Brunton 05535, December 5, 2016	947 hPa
Company/Airshed: PRAMP	Thermometer Data/Station Temp °C: Fisher Scientific 160459244, May 19, 2016	22 °C
Location/Station Name: 842b	Weather Conditions: Cloudy/Overcast	
Parameter: Total Reduced Sulphur	Calibration Purpose: routine monthly	
Start Time 24 hr. (mst): 8:13	Performed By/Reviewer: Chris Wesson	Trina Whitsitt
End Time 24 hr. (mst): 12:42	Cal Gas Expiry Date: December 1, 2018	
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable):	CD Nova CDN-101 #553

Analyzer:	ID# or Serial Number: 1162460023	Range ppb: 100
	Last Calibration Date: June 6, 2017	As Found C.F.: 0.987
	Previous C.F.: 1.000	New C.F.: 1.000

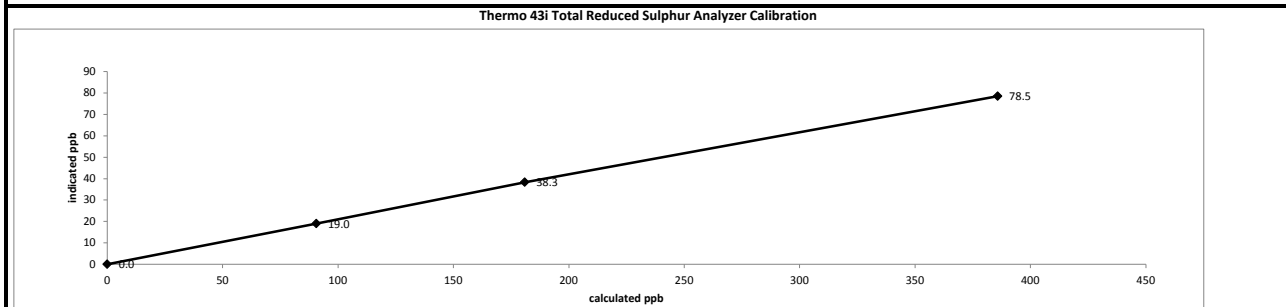
Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 829, January 27, 2017 Cal Gas Cylinder I.D. #: BLM002197 Cal Gas Conc. (ppm): 10.3	Standard Calibration Points for Ranges <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 8:47/8:57 SO2 Analyzer Range: 500 Target Concentration (ppb): 380 As Found Zero: 0.0 Analyzer Response (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

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	7473	0.00	7473	0.0	0.0	n/a
as found high	7437	57.10	7494	78.5	79.5	0.987
adjusted zero	7473	0.00	7473	0.0	0.0	n/a
adjusted high	7437	57.10	7494	78.5	78.5	1.000
mid	7471	28.01	7499	38.5	38.3	1.005
low	7477	14.05	7491	19.3	19.0	1.017
calibrator zero	7473	0.00	7473	0.0	0.1	n/a
Average C.F.=						1.007

Linear Regression/Calibration Results:

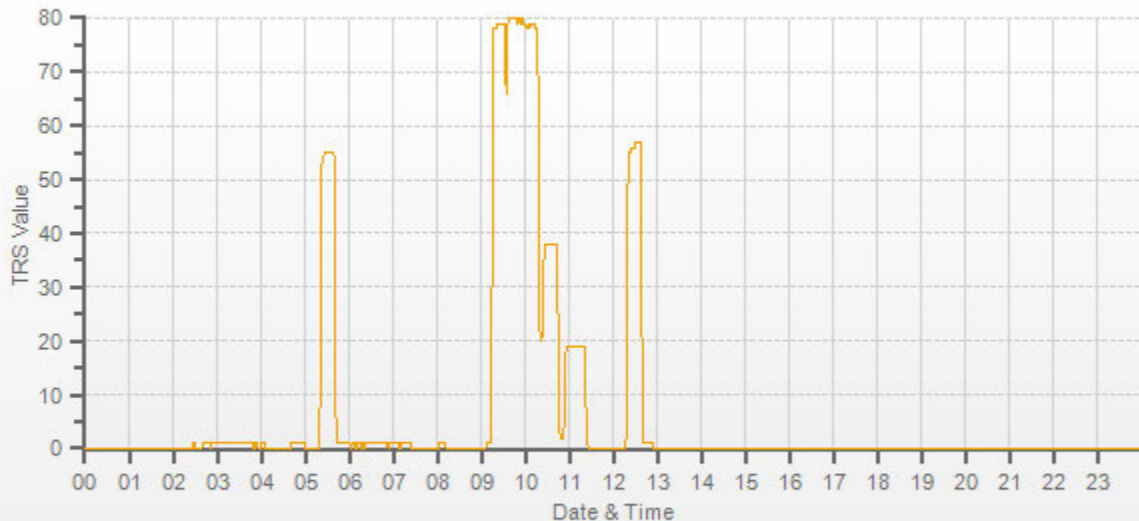
Correlation Coefficient =	1.000	> or = 0.995
Slope =	0.999	.95-1.05
b (Intercept as % of full scale) =	0.17%	± 3% F.S.
% change in C.F. from last cal =	1.32%	± 10%



As found: Bkg: 2.51 Coef: 0.850 Pmt: -725.6 Flash: 975 Internal: 30.8 Chamber: 45.0 Perm Oven Gas: 44.99 Perm Oven Heater: 44.10 Pressure: 666.9 Sample Flow: 0.410 Lamp Intensity: 88 Converter: 850 Converter Set: 850 Averaging Time: 120 Expected Value: 57.6	As left: Bkg: 2.42 Coef: 0.841 Pmt: -725.6 Flash: 973 Internal: 31.4 Chamber: 44.9 Perm Oven Gas: 45.00 Perm Oven Heater: 44.12 Pressure: 667.2 Sample Flow: 0.410 Lamp Intensity: 89 Converter: 850 Converter Set: 850 Averaging Time: 120 Expected Value: 57.1
---	--

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

Thermo 43i-TLE
 Slow to stabilize for as-found high. Regulator flushed at 09:33. Point restarts at 9:37
 Incorrect calibrator setting at start of mid-point. No effect on calibration validity.
 Flow measurements completed after mid-point.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	July 11, 2017	Barometer Data/B.P.:	Brunton 05535, December 5, 2016	947 hPa
Company/Airshed:	PRAMP	Thermometer Data/Station Temp °C:	Fisher Scientific 160459244, May 19, 2016	22 °C
Location/Station Name:	842b	Weather Conditions:	Moderate rain	
Parameter:	CH ₄ / NMHC / THC	Calibration Purpose:	routine monthly	
Start/End Time 24 hr. (mst):	11:20 / 15:01	Performed By/Reviewer:	Chris Wesson	Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023	

Analyzer: ID# or Serial Number: 1236656188 Measured Flow: 1.12 L/min Last Calibration Date: June 14, 2017 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>1.042</td> <td>1.001</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.986</td> <td>1.000</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>1.014</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.000	1.042	1.001	NMHC =	1.000	0.986	1.000	THC =	1.000	1.014	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
CH ₄ =	1.000	1.042	1.001														
NMHC =	1.000	0.986	1.000														
THC =	1.000	1.014	1.000														

Calibration Standards: Low Flow Meter ID/Cert. Date: Definer Low ID# 129069 February 5, 2017 High Flow Meter ID/Cert. Date: Definer High ID# 128686 February 5, 2017 Calibrator ID/Cert. Date: API 700 829, January 27, 2017 Cal Gas Cylinder I.D. #: LL86139 CH ₄ Cylinder Conc.= 599.0 211.0 =C ₃ H ₈ Cylinder Conc. CH ₄ as C ₃ H ₈ = 580.3 1179.3 =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)				Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
Point	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	2489	0.00	2489	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2478	60.80	2539	14.34	13.89	28.24	13.76	14.09	27.85	1.042	0.986	1.014
adjusted zero	2489	0.00	2489	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2478	60.80	2539	14.34	13.89	28.24	14.33	13.89	28.24	1.001	1.000	1.000
mid	2477	30.40	2507	7.26	7.04	14.30	7.24	7.03	14.27	1.003	1.001	1.002
low	2478	15.06	2494	3.62	3.50	7.12	3.59	3.48	7.08	1.007	1.007	1.006
calibrator zero	2489	0.00	2489	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F.=										1.004	1.003	1.003

Linear Regression/Calibration Results:

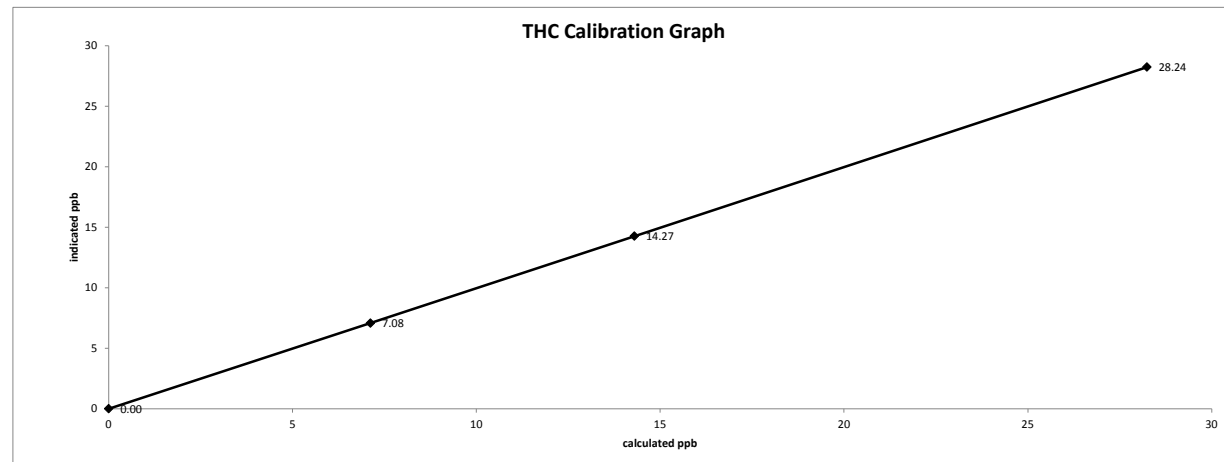
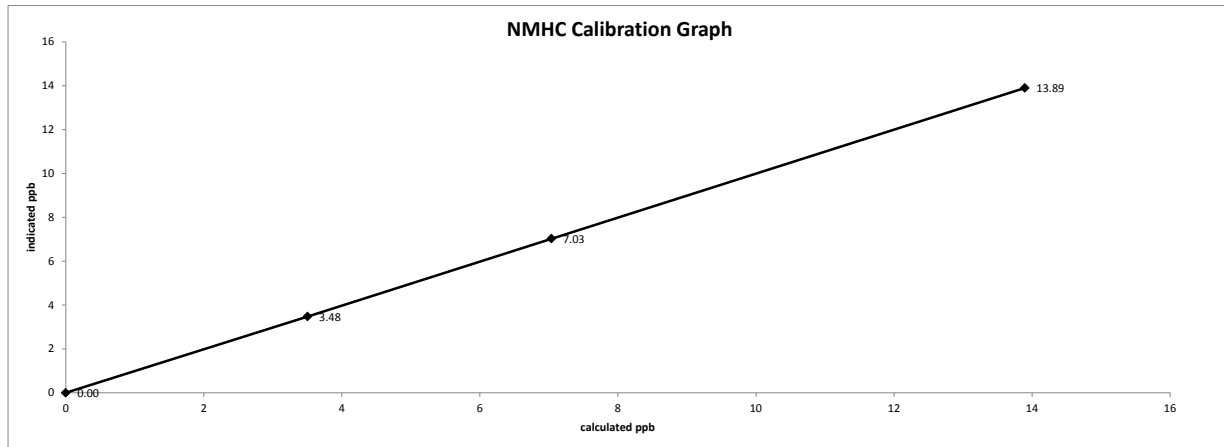
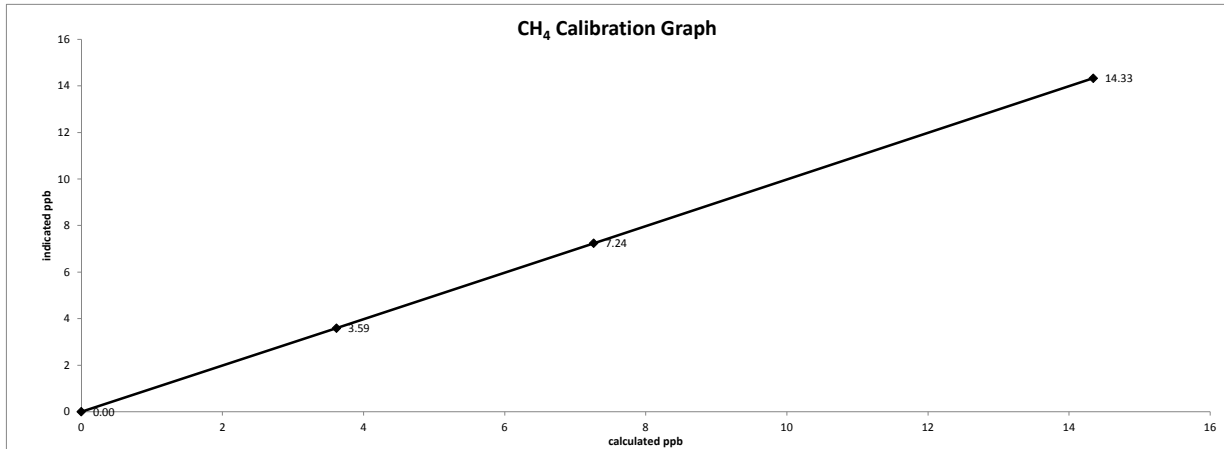
	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.000	1.000	.95-1.05
b (Intercept as % of full scale)=	-0.06%	-0.05%	-0.05%	± 3% F.S.
% change in C.F. from last cal=	-4.24%	1.39%	-1.39%	± 10%

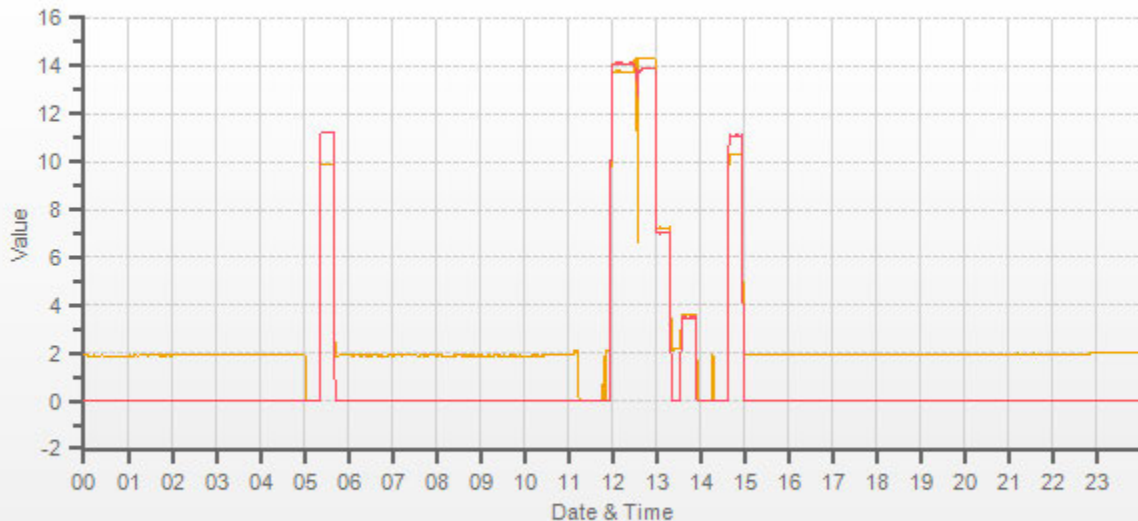
Interface Board Voltages: Bias Supply: -288.2 Detector Oven: 175.0 Filter: 175.1 Column Oven: 75.0 Internal: 33.3 Cylinder Pressures/reg.: Carrier: 2400 50 Fuel: 950 50 Span Gas: 1100 18 Zero Air Generator: 48 Internal Pressures: Carrier: 30.5 Fuel: 40.0 Air: 24.8 FID Status: Status: LIT Counts: 17000 Flame: 348.0 Det Base: 175.1 Flame and Power Stats: Last Power On: 26June17@14:56 Flameouts: 1 Det Oven at Start: 170.5 Col Oven at Start: 74.5 Calibration History: Time: 01Jan70@00:00 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	Calibration History cnt'd: Crucial Settings: Run History>1: Expected Values:	As left: NM Peak Area: n/a Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a Date: 11July17 Time: 11:08 CH ₄ PK HT: 0 CH ₄ RT: 8.0 CH ₄ Baseline: 1318 CH ₄ LOD: 26 CH ₄ SD: 8 CH ₄ CONC: 0.00 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 1289 NM Base End: 1305 NM LOD: 6 NM Start IDX: 23 NM End IDX: 83 NM Max Slope: 5.1E-01 NM Min Slope: -4.5E-01 NM PT Count: 0 Previous CH ₄ : 9.76 Previous NMHC: 10.98 Previous THC: 20.77 New CH ₄ : 9.76 New NMHC: 10.98 New THC: 20.77
---	--	--

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.
 Operator error between as-found and adjusted high points. No effect on validity of calibration. Flow measurements completed after mid-point.
 The analyzer cooling fan filter(s) were cleaned.

Date: July 11, 2017
Company/Airshed: PRAMP
Location/Station Name: 842b

Start/End Time 24 hr. (mst): 11:20 / 15:01
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution





CH4[ppm] NMHC[ppm]

WIND SYSTEM

Certificate of Calibration

Equipment:

Model:	05103VK → 05305VK Conversion
Model Description:	RMY Wind Monitor
Serial No:	65521
RMA No:	26634

	Before Service		After Service	
Vane Condition	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Propeller Condition	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Propeller Shaft Alignment	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Vane Balance	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Flange Bearing Check	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Vertical Bearing Check	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Potentiometer Resistance	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Coil Resistance	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Wind Speed Signal Check	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

WIND SPEED SIGNAL CHECK (0 – 1000mV)				
RPM	05103 Voltage(mV)	Before Service (mV) (±5.4mV)	05305 Voltage (mV)	After Service (mV) (±3.6mV)
1000	88.0	88.6	92.0	92.4
2000	176.5	176.5	184.5	184.2
3000	264.5	264.6	276.5	276.1
4000	353.0	352.7	368.5	368.0
5000	441.0	440.8	461.0	460.0
6000	529.0	528.9	553.0	552.1
7000	617.5	616.8	645.0	643.8
8000	705.5	705.1	737.0	735.9
9000	794.0	792.9	829.5	827.6
10000	882.0	880.9	921.5	919.6
		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Based on Report option requested by the client, some fields are intentionally left blank.
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WIND DIRECTION SIGNAL CHECK (0-1000mV)			
COMPASS DIRECTION (Degree / Voltage (mV))		SENSOR READINGS	
		Before Service 05103VK (±8.3mV)	After Service 05305VK (±8.3mV)
0°	0	985.0	1.6
30°	83.3	80.0	83.7
60°	166.7	164.6	169.0
90°	250.0	248.1	252.9
120°	333.3	331.6	335.9
150°	416.7	415.3	420.2
180°	500.0	496.9	501.3
210°	583.3	580.6	582.8
240°	666.7	663.6	665.4
270°	750.0	745.7	748.1
300°	833.3	828.9	831.9
330°	916.7	911.2	915.2
355°	986.1	978.8	983.0
		<input type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

MECHANICAL DEADBAND		
COMPASS DIRECTION		
	Before Service	After Service
MAX ^{o1} (Start)	359°	357°
MIN ^{o2} (End)	1°	359°
Deadband Width ³ (5°MAX)	2°	2°
	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

1. **Max** is the result just before the deadband resistance measures an open circuit or 1MΩ.
2. **Min** is the result of when the sensor first reads 0Ω.
3. **Deadband Width** is difference between **MAX** & **MIN**.

General Comments: _____

Calibration Date: June 27, 2017

It is recommended that the sensor be recalibrated every year.

Calibration by: 
Emir Muratovic

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Meteorological Sensor Audit/Calibration

Location Information

Company: PRAMP	Performed By: Chris Wesson
Audit Location: 842b	Reviewed By: Trina Whitsitt
Audit Date: June 29, 2017	Start /EndTime (mst): 8:20 / 08:34
Calibration Purpose: installation	Weather Conditions: A few clouds

Wind Sensor Information

Sensor ID Data:	Sensor Outputs:
Sensor Make: RM Young	Velocity Voltage Output Range: 0-1V
Sensor Model: 05305VK	Velocity Unit Output Range: 0-200 km/h
Serial #: 110980	Direction Voltage Output Range: 0-1V
Previous Cal/Audit Date: n/a or unknown	Direction Unit Output Range: 0-360°

Wind Calibrator Information

Calibrator Make/ Model: RM Young	Serial #: CA 4039
Maxxam Unit ID #: n/a	Certification Date: February 24, 2017

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	0.0	0.1	-
1000	18.4	18.4	18.5	1.000
2000	36.9	36.8	36.8	1.002
3000	55.3	55.2	55.2	1.001
4000	73.7	73.6	73.6	1.002
5000	92.2	92.0	92.0	1.002
6000	110.6	110.4	110.4	1.002
7000	129.0	128.7	128.7	1.002
8000	147.4	147.2	147.2	1.002
9000	165.9	165.5	165.5	1.002
10000	184.3	184.3	183.9	1.001
The audit meets AMD requirements.			Average Correction Factor=	1.002

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	1	355	0.8	-0.1	0.5
30	330	30	330	0.3	0.1	0.2
60	300	60	300	-0.1	-0.2	0.1
90	270	90	270	0.1	-0.2	0.1
120	240	121	240	-0.7	-0.3	0.5
150	210	150	210	0.5	0.0	0.3
180	180	180	180	0.4	-0.3	0.4
210	150	210	150	-0.4	0.1	0.3
240	120	240	120	-0.1	0.4	0.3
270	90	270	91	-0.2	-0.9	0.5
300	60	300	60	-0.3	-0.1	0.2
330	30	331	30	-0.5	-0.2	0.4
355	0	354	0	0.6	0.2	0.4
The audit meets AMD requirements.				Average Absolute Degrees Difference=		0.3

Comments:

Meteorological Sensor Audit/Calibration

Location Information

Company: PRAMP	Performed By: Chris Wesson
Audit Location: 842b	Reviewed By: Trina Whitsitt
Audit Date: July 11, 2017	Start /EndTime (mst): 11:10 / 12:01
Calibration Purpose: installation	Weather Conditions: Light rain/scattered showers

Wind Sensor Information

Sensor ID Data:	Sensor Outputs:
Sensor Make: RM Young	Velocity Voltage Output Range: 0-1V
Sensor Model: 05305VK	Velocity Unit Output Range: 0-200kmh
Serial #: 65521	Direction Voltage Output Range: 0-1V
Previous Cal/Audit Date: June 27, 2017	Direction Unit Output Range: 0-360°

Wind Calibrator Information

Calibrator Make/ Model: RM Young	Serial #: CA 4039
Maxxam Unit ID #: n/a	Certification Date: February 24, 2017

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	18.4	18.4	18.4	1.003
2000	36.9	36.8	36.8	1.002
3000	55.3	55.2	55.2	1.002
4000	73.7	73.6	73.6	1.002
5000	92.2	92.0	92.0	1.002
6000	110.6	110.4	110.4	1.002
7000	129.0	128.3	128.7	1.004
8000	147.4	147.1	147.1	1.002
9000	165.9	165.5	165.5	1.002
10000	184.3	183.9	183.9	1.002
The audit meets AMD requirements.			Average Correction Factor=	1.002

Wind Direction Audit Data ****+/- 5° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.3	0.0	0.2
30	330	31	330	-0.5	0.0	0.3
60	300	60	300	0.2	-0.1	0.2
90	270	89	270	0.6	0.2	0.4
120	240	120	240	0.5	0.0	0.3
150	210	151	210	-0.7	0.5	0.6
180	180	180	179	-0.4	0.7	0.5
210	150	210	150	0.1	0.0	0.0
240	120	241	120	-0.5	0.4	0.5
270	90	270	90	-0.3	0.2	0.2
300	60	300	60	0.2	-0.1	0.1
330	30	330	30	-0.2	-0.1	0.2
355	0	354	0	1.0	0.3	0.7
The audit meets AMD requirements.				Average Absolute Degrees Difference=		0.3

Comments:

CALIBRATORS

Company Maxxam Operator: Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>829</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)			
Pt. #1	<u>4846</u>	Pt. #2	<u>4888</u>
Pt. #3	<u>4908</u>		
Gas Flow (sccm)			
Pt. #1	<u>80.6</u>	Pt. #2	<u>38.9</u>
Pt. #3	<u>18.4</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	0.0001	0.0001	Limit ± 10%	
4927	80.6	0.8016	0.8016	0.8021	0.0015	0.8036	0.1%	0.2%
4927	38.9	0.3867	0.3867	0.3862	0.0001	0.3863	-0.1%	-0.1%
4927	18.4	0.1830	0.1830	0.1820	0.0004	0.1824	-0.5%	-0.4%
Absolute Average Percent Difference							0.2%	0.1%

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)=	1.0010	0.90-1.10		m (Slope)=	1.0027
b (Intercept % of FS)=	-0.0604	± 3% F.S.		b (Intercept % of FS)=	-0.0652

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4927	0	0.0000	0.8016	0.0010	0.8020	NO ₂	% Diff. Limit
4927	500	0.5450	0.2566	0.5421	0.7987	-0.7%	± 10%
4927	250	0.2797	0.5219	0.2797	0.8016	-0.4%	± 10%
4927	80	0.0954	0.7062	0.0958	0.8026	-0.6%	± 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)=	0.9931	0.90-1.10	
b (Intercept % of FS)=	0.1220	± 3% F.S.	

AENV Standards		NO _x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017

Operator Signature: [Signature] Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-438CGA

Company: Maxxam **Operator's Name:** Chris

Cylinder #: EY0000597 **Concentration PPM:** 50.4 **Tolerance(%)** 1.0 **Certified By:** Praxair

Expiry Date: December 8, 2019

Reference Calibrator and Gas:

Make/Model: Thermo 146i

Serial Number: AMU 1809

Last Verification Date: January 26, 2017

Gas Type: SO2 **Conc.** 98.07

Cylinder Number: CAL016625

Expiry Date: January 5, 2019

Flow Measurement Device:

Make/Model: Bios Befiner 220

Serial Number: AMU1941

Temp. °C: 24.4

B.P. 704.7

Reference Analyzer:

Make/Model: Themro 43C **Serial/AMU Number:** AMU 1623

Instrument Settings: **Zero:** 9.5 **Span:** 1.023 **Range:** 1.0

Last Calibration: **Date:** 25-Jan-17 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4923	0.0	0.000	0.01642	60.917	50.8
4916	80.7	0.834	0.01642	60.917	50.8
4902	40.3	0.416	0.00822	121.638	50.6
4916	19.9	0.206	0.00405	247.035	50.9
Average Cylinder Concentration:					50.7

Previous Stated Concentration PPM: 50.4

Percent variance from Stated: 0.7

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: _____

Date: January 26, 2017

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	0.00751	133.140	10.4
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. 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 (sccm)		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

***APPENDIX IV
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	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
Maram Ghaleb	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.

Maram Ghaleb

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

August 21, 2017

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Peace River Area Monitoring Program Committee</u>	Project #: <u>8449-2017-07-80-C</u>
Site: <u>Three Creeks 842b Station</u>	Contact: <u>Karla Reesor</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>August 10, 2017</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>August 10, 2017</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>August 18, 2017</u>
Level 3 Independent Data Review	<u>Carla Reesor</u>	Date <u>August 18, 2017</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.