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AMBIENT AIR MONITORING ANNUAL REPORT

PEACE RIVER AREA MONITORING PROGRAM COMMITTEE

THREE CREEKS 842B STATION

JOB #:8449-2016-80- A

JANUARY - DECEMBER
2016

Prepared for:

PEACE RIVER AREA MONITORING PROGRAM COMMITTEE
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Attention: Karla Reesor

DATE: **February 28, 2017**

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SUMMARY

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

Data presented in this report has undergone the Post-Final Validation Procedures, which include a cursory inspection of annual charts. If errors or omissions in the data are suspected or discovered after the initial submittal of data (monthly report), the post-validation step serves to re-evaluate the affected data. The report certification form is also included in this report to verify that the annual validation review has been completed, as per the Reporting Chapter (Chapter 9) of the Air Monitoring Directive (AMD).

Statistical summaries for monthly mean, maximum, and minimum values as well as comparisons to historical values from 2015 are presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods during the monitoring period are outlined in Section 1.0 Discussion. On this basis, Maxxam 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 403-219-3689 or toll-free at 1-800-386-7247.

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1.0 Discussion

This annual validation report consists of data for parameters Sulphur Dioxide (SO_2), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Methane (CH_4), Non-Methane Hydrocarbon (NMHC), Relative Humidity (RH), Barometric Pressure (BP), Ambient Temperature (AmbTPX), Station Temperature (StnTPX) and Wind Speed (WS).

The air monitoring trailer was located at Latitude of 56°16'26.8"N, Longitude of 116°58'53.1"W for the monitoring period.

The monitoring methods and equipment met all AMD requirements.

All monitoring analyzers and meteorological systems, with the exception of every parameter in July, met the 90% operational uptime requirements during the monitoring period.

All data collected during the monitoring period were within the objectives outlined in the Alberta Ambient Air Quality Objectives and Guidelines Summary (AAAQOs).

An external ambient air monitoring station audit was performed by AEMERA on March 8. Audit report was included in the monthly report for March 2016.

Notification of Changes Made After Monthly Report Issuance

• **Wind Speed Calculated Averages**: In the 2016 monthly reports and 2015 annual report, calculated averages for wind speed and wind direction were presented as arithmetic averages of the individual hourly data. When comparing monthly statistics, the arithmetic averages for wind speed will be higher than vector-averages, calculated from the same hourly data. In this annual report, the 24-Hr and monthly wind speed averages for both 2015 and 2016 were derived using vector averaging.

The summaries of the monthly maintenance reports, for the monitoring period, are presented below:

SULPHUR DIOXIDE (SO2)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18, due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 30 hours of data are missing due to power failures and instrument recovery time this month. A second zero-span test was performed on May 20 at 21:00 and 22:00 hours, to ensure analyzer response was operating within required specifications.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23, due to a lightning strike damage to the AQM equipment.
July	• The analyzer that was damaged during the lightning strike on June 30, API 100A (S/N: 1502), was removed on July 4; and a replacement, API 100A (S/N: 838), was installed on July 7. An analyzer digital/analog output calibration was performed and an installation calibration was completed. The calibration result met AMD's calibration requirements. • One hundred and fifty five hours of data are missing between July 1 and July 7 due to the lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Four hours of data are missing on October 25, from hours 07:00 to 10:00, due to a power failure. Data collected at hour 11:00 was also invalidated as the analyzer was recovering from the power failure.
November	• No issues were identified.
December	• The analyzer spanned towards the upper acceptance limit on December 19. A repeat span check, performed afterwards, confirmed the drift. A successful as-found response check was conducted the same day. A repeat full calibration was completed on December 20 and the expected span value was updated afterwards. Eight hours of downtime were recorded due to this event.

TOTAL REDUCED SULPHUR (TRS)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 30 hours of data are missing due to power failures and instrument recovery time this month. A second zero-span test was performed on May 20 at 21:00 and 22:00 hours, to ensure analyzer response was operating within required specifications.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23, due to a lightning strike damage to the AQM equipment.

July	• The analyzer that was damaged during the lightning strike on June 30, Thermo 43i (S/N: 1314057761), was removed on July 4; and a replacement, Thermo 43i (S/N: 1226154720), was installed on July 7. An installation calibration was completed on July 8 and the calibration result met AMD's requirements. • One hundred and seventy five hours of downtime were recorded between July 1 and July 8 due to lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• A total of fifty-six hours of downtime were recorded this month. • Three hours were attributed to a calibrator cross-check on October 12. • Four hours of data are missing on October 25, from hours 07:00 to 10:00, due to a power failure. • The analyzer malfunctioned after the power outage on October 25. Maintenance was performed on October 26 and a successful zero/span check was completed afterwards, confirming functionality was restored. A repeat span check was initiated on October 27 to assess analyzer performance, following the repairs. Data was invalidated back to the last valid span check, obtained on October 24, before the power failure. Forty-nine hours of downtime were recorded due to this event.
November	• No issues were identified.
December	• The daily span started drifting low on December 5, due to low station temperature. The routine monthly calibration was performed on December 8, during which the station temperature was adjusted. As the calibration met AMD requirements, no data was discarded. Two hours of downtime were, however, recorded due to additional zero/span checks conducted on December 5 and December 7 to assess analyzer performance.

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

No canister event was recorded in 2016.

January	• Operational time was 99.9%, equivalent to 1 hour of downtime. • The analyzer spanned low on January 7 as the span gas was running out. A new span gas cylinder was installed and the expected value was changed following an additional zero/span check on January 8, at hour 09:00. Data at this hour was invalidated due to the additional quality check.
February	• The analyzer flamed out on February 11 as the gas ran out. The gas cylinder was replaced on February 12. A zero/span check was completed after the replacement and the result was good. Twenty-seven hours of data collected from February 11 at hour 5 to February 12 at hour 7 are invalid due to this event.

March	• Operational time was 99.6%, equivalent to 3 hours of downtime. • One hour of data was lost on March 18 due to a malfunction of the polling system software. • Two hours of data were invalidated due to an additional quality check. An additional zero/span check was performed on March 22, between hours 18:00 and 19:00. This was in response to measurements of THC that were below historical levels. The result was within AMD's acceptance criteria and no further action was required.
April	• The analyzer recorded lower than historical values starting on April 12. It was discovered that the sample valve was due for maintenance. The Thermo 55i, S/N: 123665188 was removed following a shut-down calibration on April 13. A Thermo 55i, S/N: 1505664392 was then installed. Column conditioning was run overnight and an installation calibration was completed on April 14. Data was invalidated back to April 12 at hour 13. Forty-one hours of data were invalid due to this event. The channels were put into Maintenance mode for two hours on April 27 while the sample manifold was being cleaned.
May	• A total of forty-nine hours of data are missing this month. Thirty three hours of data are missing due to power failures and instrument recovery time. A second zero-span test was performed on May 20 at 21:00 and 22:00 hours, to ensure analyzer response was operating within required specifications. Sixteen hours of data are missing due to an extinguished analyzer flame.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23, due to a lightning strike damage to the AQM equipment.
July	• On July 7, maintenance was performed on the analyzer that was damaged during the lightening strike on June 30: Thermo 55i (S/N: 1505664392). An analyzer digital/analog output calibration was performed and an installation calibration was completed on July 8 following overnight column conditioning. The calibration result met AMD's requirements. • One hundred and seventy six hours of data are missing between July 1 and July 8 due to this event. • The analyzer became noisy on July 19 possibly due to unstable station temperature. A shut-down calibration was performed prior to troubleshooting. Column conditioning was performed overnight and a post-repair calibration was completed on July 20. The shut-down and post-repair calibration result met AMD's requirements. Fifteen hours of data were invalidated during the column conditioning.
August	• The analyzer started recording lower than historical concentrations on August 26. The channel was placed in "maintenance" mode prior to troubleshooting and it was discovered that the hydrogen gas pressure was low. The gas cylinder was replaced and a repeat span check was performed to assess analyzer performance. The span result was within acceptance limits. Eight hours of hourly data were invalidated due to this event.
September	• It was identified during the monthly calibration that the sample pump was due for maintenance. The sample pump was rebuilt on September 20, following a successful shut-down calibration. A post-repair calibration was completed afterwards. Eight hours of downtime were recorded due to the additional calibrations and maintenance surrounding this event.
October	• Four hours of data are missing on October 25, from hours 07:00 to 10:00, due to a power failure. Data collected at hour 11:00 was also invalidated as the analyzer was recovering from the power failure.

November	• The analyzer was recording daily zero drifts. The channels were placed in "maintenance" mode for one hour on November 15 and two hours on November 16, while troubleshooting was being performed. The Thermo 55i (S/N: 1501664392) analyzer was replaced with Thermo 55i (S/N: 1433563261) on November 17, and column conditioning was run on November 23, both following successful shut-down calibrations. Sixty-two hours of downtime were recorded due to the troubleshooting and maintenance events performed to address this issue.
December	• No issues were identified.

WIND SYSTEM (WS)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 29 hours of data are missing due to power failures this month.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23, due to a lightning strike damage to the AQM equipment.
July	• The wind system damaged by lightning strike on June 30, RM Young (S/N: 41321), was removed on July 4; and a replacement, RM Young (S/N: 129612), was installed and realigned on July 7. • One hundred and sixty one hours of data are missing this month due to the lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Operational time was 99.5%, equivalent to 4 hours of downtime. • Four hours of data are missing on October 18, from hours 07:00 to 10:00, due to a power failure. • The wind system was upgraded from a 5103VK series to a 5305VK series on October 12. Due to an unexpected equipment repair Maxxam's RM Young calibrator (18802, S/N:3309) was at the vendor. A non-Maxxam owned calibrator (18802, S/N:4309) was used for the removal audit (129612) and installation audit (92411). However, this alternate calibrator was not compliant with the manufacturer's recommended calibration interval. A cross check of this calibrator was possible as Campbell Scientific supplied pre and post calibration data for the wind system upgrade. Campbell's acceptance criteria are more stringent than those required by the AMD or Maxxam and any manufacturer grades are assessed accordingly. This calibrator cross check confirms the stability of the calibrator and that the wind system was operating within specifications.
November	• No issues were identified.
December	• No issues were identified.

RELATIVE HUMIDITY (RH)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 29 hours of data are missing due to power failures this month.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23 due to a lightning strike damage to the AQM equipment.
July	• One hundred and fifty four hours of data are missing from July 1 at hour 0:00 to July 7 at hour 9:00, due to lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Four hours of data are missing on October 18, from hours 07:00 to 10:00, due to a power failure.
November	• No issues were identified.
December	• No issues were identified.

BAROMETRIC PRESSURE (BP)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 29 hours of data are missing due to power failures this month.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23, due to a lightning strike damage to the AQM equipment.
July	• One hundred and fifty four hours of data are missing from July 1 at hour 0:00 to July 7 at hour 9:00 due to lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Four hours of data are missing on October 18, from hours 07:00 to 10:00, due to a power failure.
November	• No issues were identified.
December	• No issues were identified.

AMBIENT TEMPERATURE (TPX)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 29 hours of data are missing due to power failures this month.

June	• Twenty one hours of data are missing on June 30 at hours 3 to 23 due to a lightning strike damage to the AQM equipment.
July	• One hundred and fifty four hours of data are missing from July 1 at hour 0:00 to July 7 at hour 9:00, due to lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Four hours of data are missing on October 18, from hours 07:00 to 10:00, due to a power failure.
November	• No issues were identified.
December	• No issues were identified.

STATION TEMPERATURE (STNTPX)

January	• No issues were identified.
February	• No issues were identified.
March	• One hour of data was lost on March 18 due to a malfunction of the polling system software.
April	• No issues were identified.
May	• A total of 29 hours of data are missing due to power failures this month.
June	• Twenty one hours of data are missing on June 30 at hours 3 to 23 due to a lightning strike damage to the AQM equipment.
July	• One hundred and fifty four hours of data are missing from July 1 at hour 0:00 to July 7 at hour 9:00, due to lightning strike damage.
August	• No issues were identified.
September	• No issues were identified.
October	• Four hours of data are missing on October 18, from hours 07:00 to 10:00, due to a power failure.
November	• No issues were identified.
December	• No issues were identified.

2.0 Project Personnel

Karla Reesor was the contact for Three Creeks, and the Maxxam field sampling team consisted of Christopher Wesson, Limin Li, Raja Ashraf, and Russell Kirchner.

3.0 Plant Monthly Required AMD Summary

All data collected during the monitoring period were within the objectives as outlined in the AAAQOs.

The operational uptime for all analyzers and meteorological system, with the exception of every parameter in July, was above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the method described in the Air Monitoring Directive, 1989, 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006) as well as AMD 2015.

5.0 Methods and Procedures

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

Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
Maxxam AIR SOP-00208: RM Young Monitor Calibration
Maxxam AIR SOP-00210: Ambient TRS Monitoring
Maxxam AIR SOP-00211: Ambient SO2 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
Total Hydrocarbons - Thermo 55i FID Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Wind System - RM Young Unit
Relative Humidity - RM Young Unit
Barometric Pressure - Met One Unit
Ambient Temperature - RM Young Unit
StationTemperature - Maxxam Supplied Unit
Datalogger - ESC 8832

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE (SO2) 2016 Monthly Averages and Frequency Distributions of One Hour Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (PPB SO2)						OBJECTIVES**		EXCEEDENCES		MONTHLY AVERAGE (PPB)
			≤ 20 ppb	20 < C ≤ 60 ppb	60 < C ≤ 110 ppb	110 < C ≤ 170 ppb	170 < C ≤ 340 ppb	> 340 ppb	1-HR	24-HR	1-HR	24-HR	
January	708	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
February	662	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
March	705	99.9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
April	686	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
May	675	95.7	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
June	665	97.1	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
July	556	79.3	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
August	707	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.0
September	684	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.0
October	703	99.3	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.0
November	685	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
December	698	98.9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	172	48	0	0	0.1
											ANNUAL AVERAGE		0.1

N/D - Valid Data Not Available
*Number of Readings - included calibration hours
**If Alberta Ambient Air Quality Objectives are not available, N/D is used.

Alberta Ambient Air Quality Objectives Annual Average**	8.0	PPB
Annual Average for 2016	0	PPB

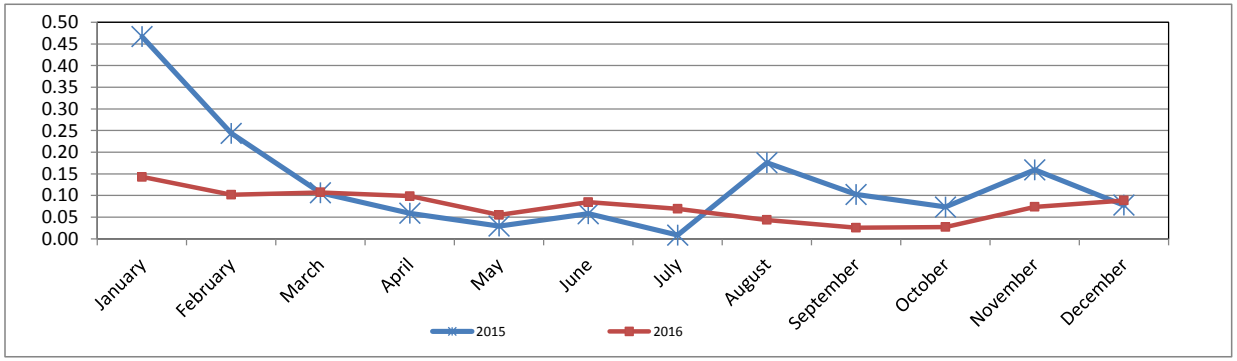
SULPHUR DIOXIDE (SO2) 2015 One-Hour Readings vs. 2016 One-Hour Readings in PPB

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	**0.5**	0.0	1.0	0.1	0.0	1.5	0.3
February	0.2	0.0	2.0	0.1	0.0	1.4	0.1
March	0.1	0.0	2.0	0.1	0.0	1.2	0.0
April	0.1	0.0	1.0	0.1	0.0	1.3	0.0
May	0.0	0.0	1.0	0.1	0.0	1.1	0.0
June	0.1	0.0	1.0	0.1	0.0	**1.8**	0.0
July	0.0	0.0	1.0	0.1	0.0	1.2	-0.1
August	0.2	0.0	1.0	0.0	0.0	1.3	0.1
September	0.1	0.0	1.0	0.0	0.0	1.1	0.1
October	0.1	0.0	**3.0**	0.0	0.0	0.7	0.0
November	0.2	0.0	2.0	0.1	0.0	1.2	0.1
December	0.1	0.0	1.0	0.1	0.0	0.9	0.0

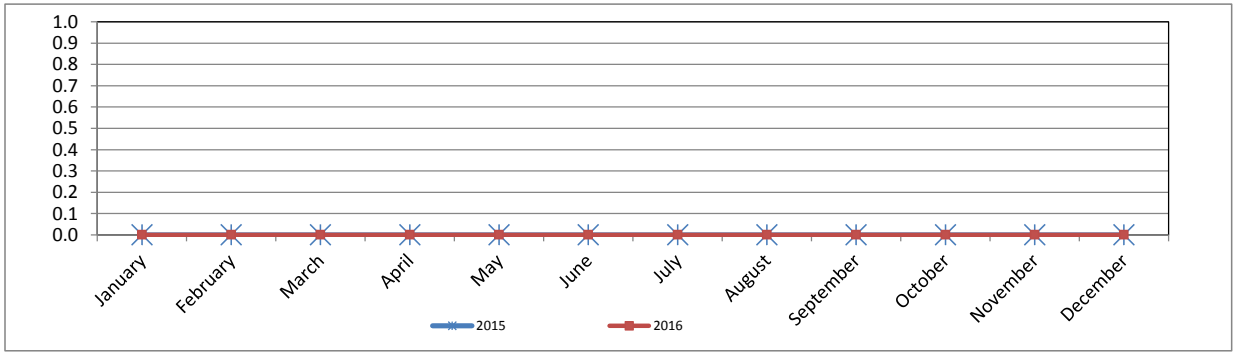
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

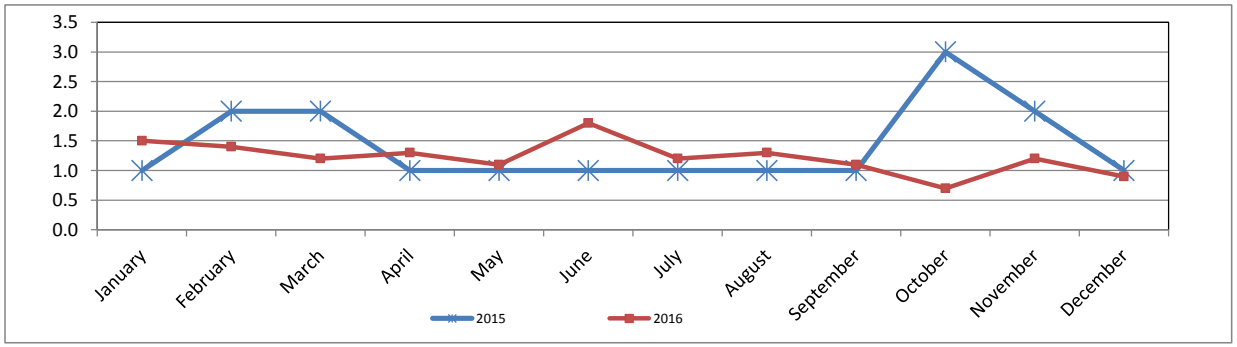
SULPHUR DIOXIDE (SO2) 2015 Monthly Mean vs. 2016 Monthly Mean in PPB



SULPHUR DIOXIDE (SO2) 2015 Monthly Minimum vs. 2016 Monthly Minimum in PPB



SULPHUR DIOXIDE (SO2) 2015 Monthly Maximum vs. 2016 Monthly Maximum in PPB

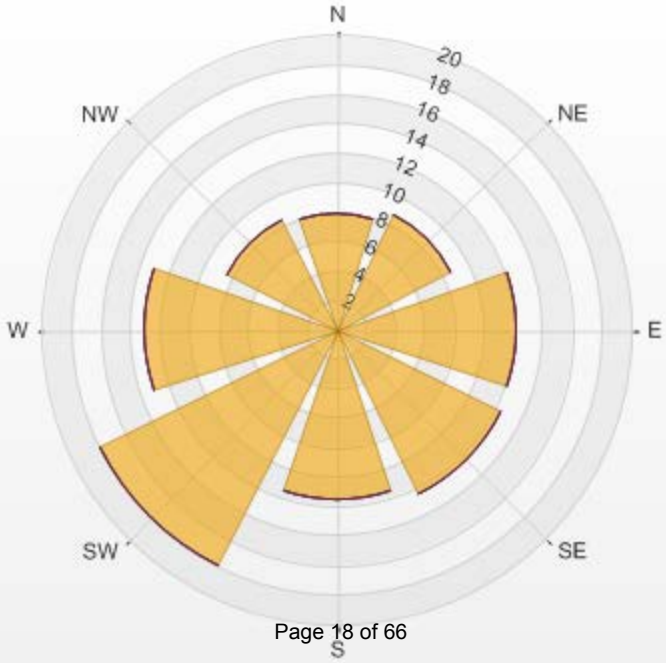


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-SO2[ppb] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 H
Calm: 7.82% Valid Data: 93.39% Calm Avg: 0.00 [ppb]

Direction	0-3	3-10	10-85	85-170	>170.0	Total
N	7.87	0	0	0	0	7.87
NE	8.74	0	0	0	0	8.74
E	12.26	0	0	0	0	12.26
SE	12.51	0	0	0	0	12.51
S	11.49	0	0	0	0	11.49
SW	17.92	0	0	0	0	17.92
W	13.06	0	0	0	0	13.06
NW	8.33	0	0	0	0	8.33
Summary	92.18	0	0	0	0	92.18

% Icon Classes (ppb)	92 0-3	0 3-10	0 10-85	0 85-170	0 >170.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-SO2[ppb] 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.82% Calm Poll Avg: 0.00[ppb]



TOTAL REDUCED SULPHUR

TOTAL REDUCED SULPHUR (TRS) 2016 Monthly Averages and Frequency Distributions of One Hour Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (PPB TRS)				OBJECTIVES**		EXCEEDENCES		MONTHLY AVERAGE
			≤ 3 ppb	4 < C ≤ 10 ppb	11 < C ≤ 50 ppb	> 50 ppb	1-HR	24-HR	1-HR	24-HR	
January	706	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.4
February	662	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.3
March	704	99.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.3
April	686	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.3
May	674	95.7	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.3
June	665	97.1	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.3
July	540	76.5	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.6
August	707	100.0	99.72%	0.28%	0.00%	0.00%	-	-	-	-	0.5
September	684	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.5
October	651	92.5	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.4
November	685	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.2
December	705	99.7	100.00%	0.00%	0.00%	0.00%	-	-	-	-	0.4
									ANNUAL AVERAGE		0.4

N/D - Valid Data Not Available
*Number of Readings - included calibration hours
**If Alberta Ambient Air Quality Objectives are not available, N/D is used.

Alberta Ambient Air Quality Objectives Annual Average**	N/D	PPB
Annual Average for 2016	0	PPB

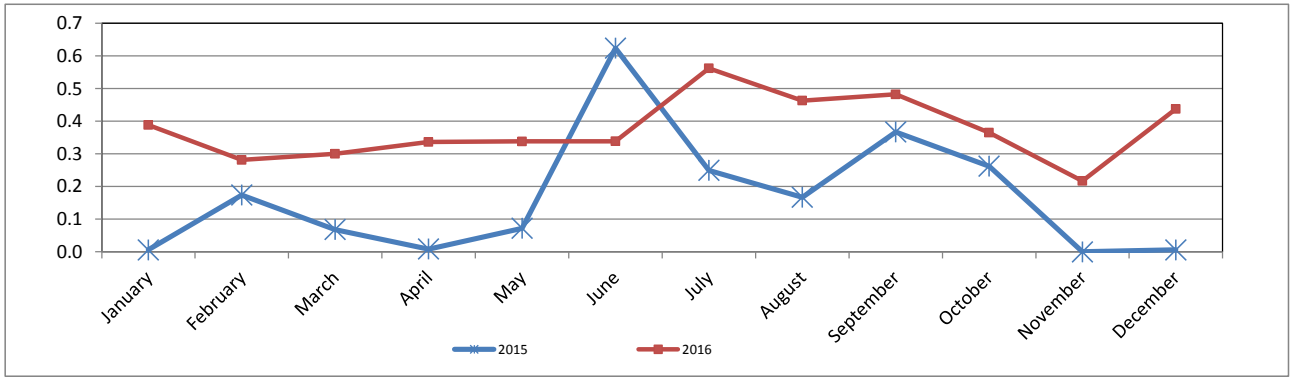
TOTAL REDUCED SULPHUR (TRS) 2015 One-Hour Readings vs. 2016 One-Hour Readings in PPB

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	0.0	0.0	1.0	0.4	0.2	0.6	-0.4
February	0.2	0.0	1.0	0.3	0.0	0.6	-0.1
March	0.1	0.0	1.0	0.3	0.1	0.8	-0.2
April	0.0	0.0	1.0	0.3	0.2	1.9	-0.3
May	0.1	0.0	1.0	0.3	0.0	1.4	-0.3
June	**0.6**	0.0	**2.0**	0.3	0.1	0.9	0.3
July	0.2	0.0	**2.0**	**0.6**	0.1	2.5	-0.3
August	0.2	0.0	1.0	0.5	0.1	**3.6**	-0.3
September	0.4	0.0	1.0	0.5	0.2	1.5	-0.1
October	0.3	0.0	1.0	0.4	0.0	0.7	-0.1
November	0.0	0.0	0.0	0.2	0.0	0.5	-0.2
December	0.0	0.0	1.0	0.4	0.0	0.8	-0.4

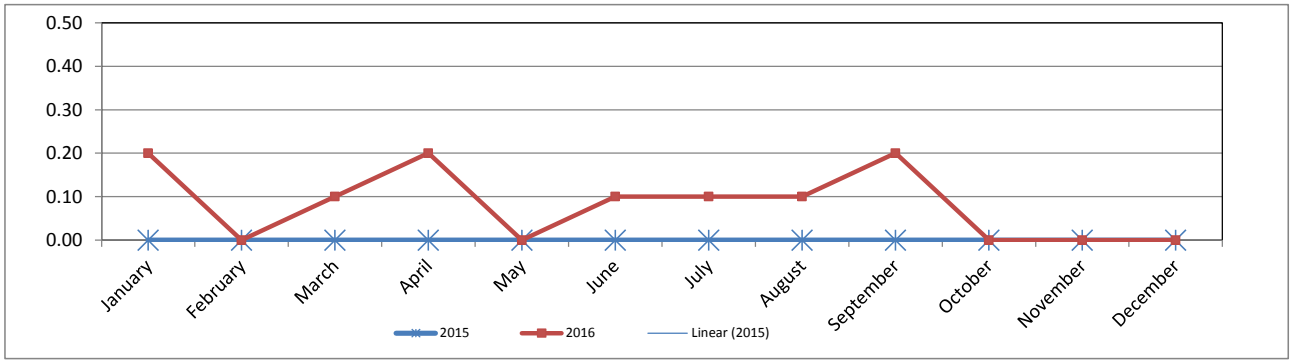
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

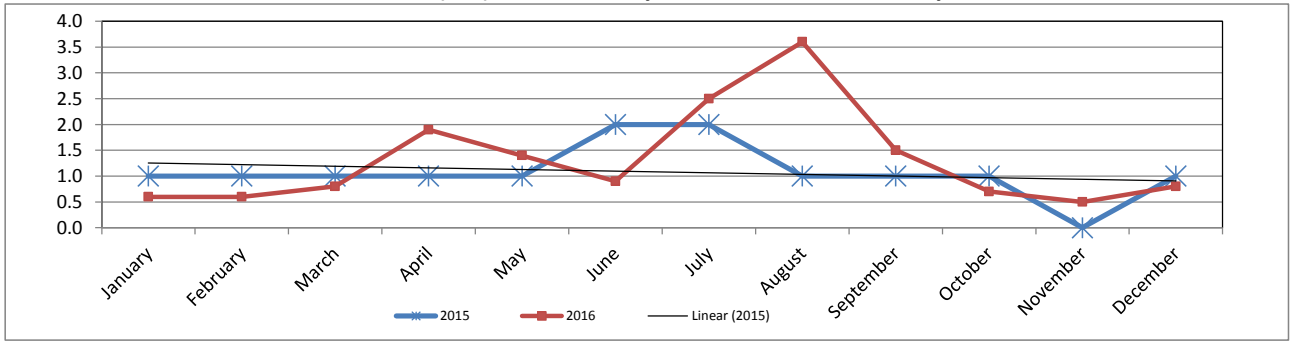
TOTAL REDUCED SULPHUR (TRS) 2015 Monthly Mean vs. 2016 Monthly Mean in PPB



TOTAL REDUCED SULPHUR (TRS) 2015 Monthly Minimum vs. 2016 Monthly Minimum in PPB



TOTAL REDUCED SULPHUR (TRS) 2015 Monthly Maximum vs. 2016 Monthly Maximum in PPB

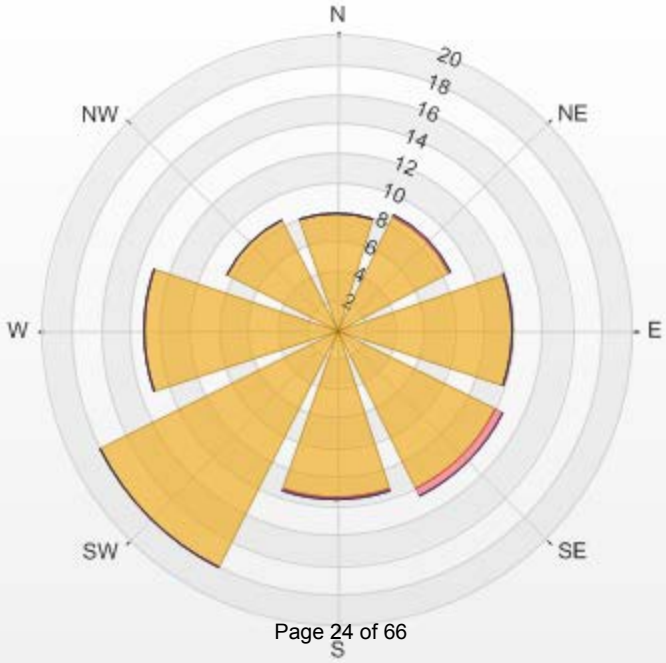


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-TRS[ppb] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
Calm: 7.86% Valid Data: 92.63% Calm Avg: 0.45 [ppb]

Direction	0-1	1-3	3-10	>10.0	Total
N	7.9	0.01	0	0	7.91
NE	8.58	0.1	0	0	8.68
E	11.88	0.1	0.02	0	12
SE	12.09	0.48	0	0	12.57
S	11.45	0.14	0	0	11.59
SW	17.99	0.01	0	0	18
W	13.09	0	0	0	13.09
NW	8.28	0	0	0	8.28
Summary	91.26	0.84	0.02	0	92.12

%	Icon	Classes (ppb)							
91		0-1	1		1-3	0		3-10	0		>10.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-TRS[ppb] 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.86% Calm Poll Avg: 0.45[ppb]



TOTAL HYDROCARBON

TOTAL HYDROCARBONS (THC) 2016 Monthly Averages and Frequency Distributions of One Hour Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (PPM THC)				OBJECTIVES**		EXCEEDENCES		MONTHLY AVERAGE
			≤ 3.0 ppm	3.1 < C ≤ 10.0 ppm	10.1 < C ≤ 50.0 ppm	> 50.0 ppm	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	2.03
February	634	95.8	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
March	703	99.6	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
April	642	93.8	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
May	659	93.3	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.90
June	665	97.1	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.92
July	518	73.4	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
August	699	98.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
September	676	98.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.94
October	700	99.3	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.93
November	624	91.5	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.93
December	706	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
									ANNUAL AVERAGE		1.95

N/D - Valid Data Not Available
*Number of Readings - included calibration hours
**If Alberta Ambient Air Quality Objectives are not available, N/D is used.

Alberta Ambient Air Quality Objectives Annual Average**	N/D	PPM
Annual Average for 2016	2	PPM

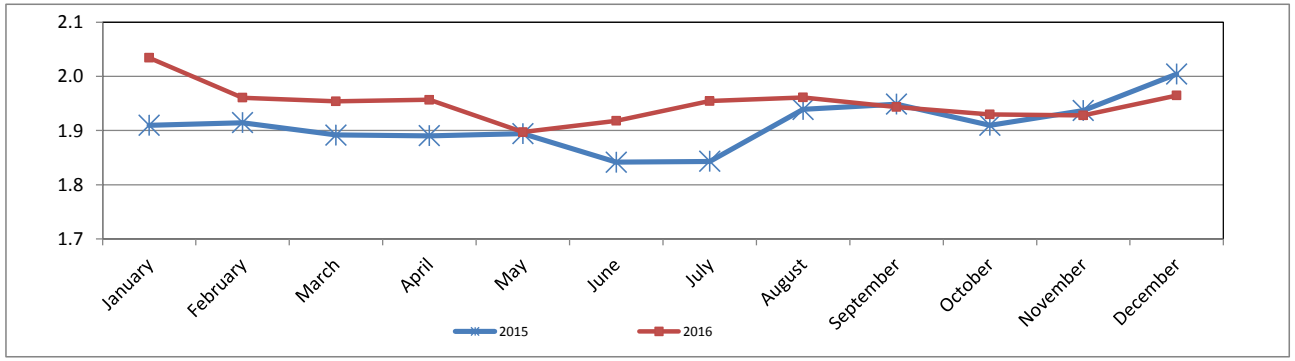
TOTAL HYDROCARBONS (THC) 2015 One-Hour Readings vs. 2016 One-Hour Readings in PPM

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	1.91	1.80	2.50	**2.03**	1.89	**2.75**	-0.12
February	1.91	1.80	2.10	1.96	1.87	2.12	-0.05
March	1.89	1.82	2.34	1.95	1.55	2.55	-0.06
April	1.89	1.81	2.15	1.96	1.85	2.41	-0.07
May	1.89	1.81	2.18	1.90	1.68	2.40	0.00
June	1.84	1.54	2.32	1.92	1.80	2.16	-0.08
July	1.84	1.50	2.41	1.95	1.85	2.55	-0.11
August	1.94	1.83	2.36	1.96	1.55	2.67	-0.02
September	1.95	1.86	2.18	1.94	1.82	2.58	0.01
October	1.91	1.82	2.31	1.93	1.79	2.20	-0.02
November	1.94	1.86	2.31	1.93	1.79	2.53	0.01
December	**2.00**	1.89	**3.17**	1.96	1.85	2.23	0.04

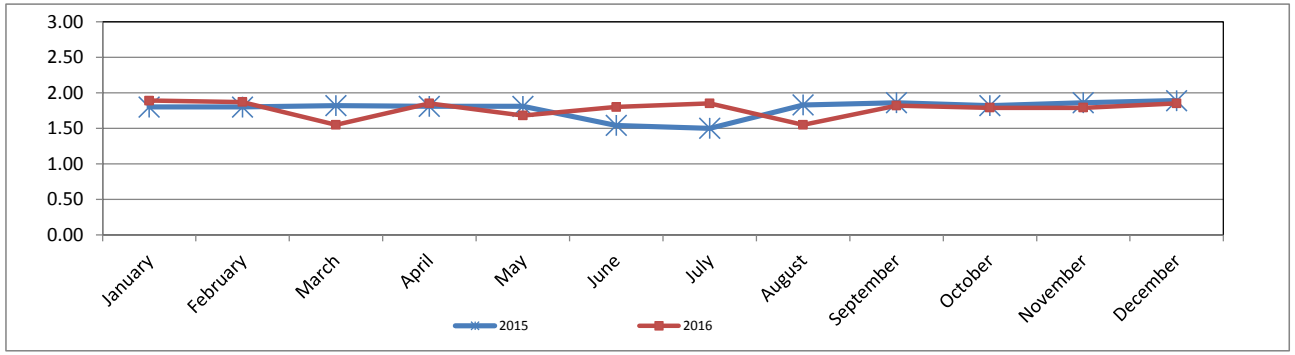
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

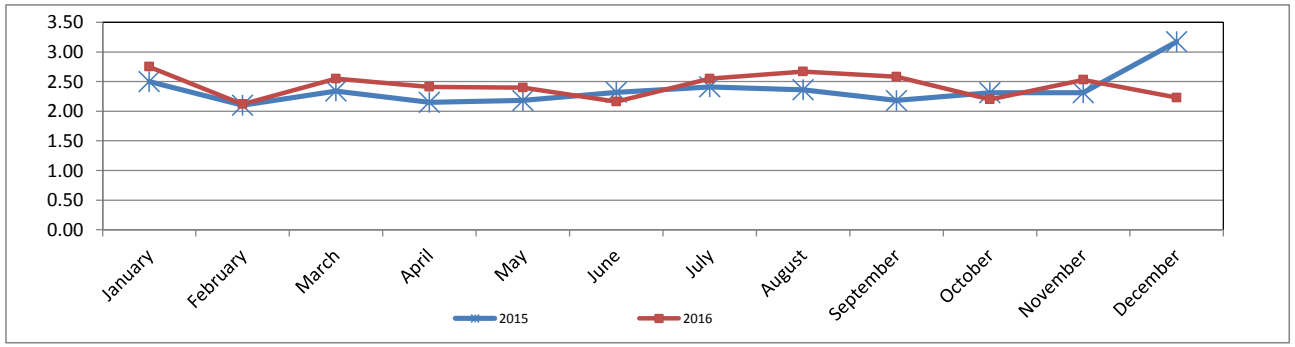
TOTAL HYDROCARBONS (THC) 2015 Monthly Mean vs. 2016 Monthly Mean in PPM



TOTAL HYDROCARBONS (THC) 2015 Monthly Minimum vs. 2016 Monthly Minimum in PPM



TOTAL HYDROCARBONS (THC) 2015 Monthly Maximum vs. 2016 Monthly Maximum in PPM

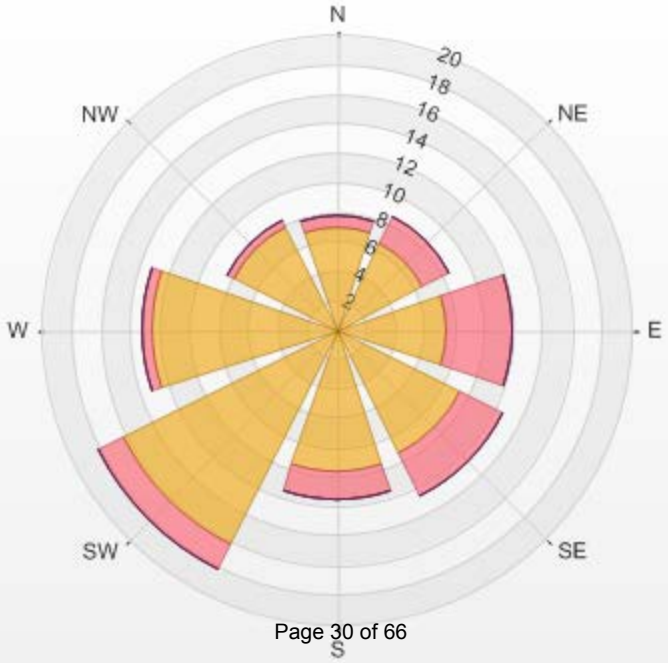


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-THC[ppm] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
Calm: 7.88% Valid Data: 91.09% Calm Avg: 1.99 [ppm]

Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	7.03	0.8	0	0	0	7.83
NE	6.55	2.03	0	0	0	8.58
E	7.4	4.52	0	0	0	11.92
SE	9.33	3.28	0	0	0	12.61
S	9.65	1.87	0	0	0	11.52
SW	16.25	1.86	0	0	0	18.11
W	12.51	0.68	0	0	0	13.19
NW	7.73	0.62	0	0	0	8.35
Summary	76.45	15.66	0	0	0	92.11

%	Icon	Classes (ppm)	76	0-2	16	2-3	0	3-5	0	5-10	0	>10.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-THC[ppm] 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.88% Calm Poll Avg: 1.99[ppm]



METHANE

METHANE (CH4) 2016 Monthly Averages and Frequency Distributions of One Hour Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (PPM CH4)				OBJECTIVES**		EXCEEDENCES		MONTHLY AVERAGE
			≤ 3.0 ppm	3.1 < C ≤ 10.0 ppm	10.1 < C ≤ 50.0 ppm	> 50.0 ppm	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	2.02
February	634	95.8	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
March	703	99.6	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
April	642	93.8	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
May	659	93.3	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.90
June	665	97.1	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.92
July	518	73.4	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.95
August	699	98.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
September	676	98.9	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.94
October	700	99.3	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.93
November	624	91.5	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.93
December	706	100.0	100.00%	0.00%	0.00%	0.00%	-	-	-	-	1.96
									ANNUAL AVERAGE		1.95

N/D - Valid Data Not Available
*Number of Readings - included calibration hours
**If Alberta Ambient Air Quality Objectives are not available, N/D is used.

Alberta Ambient Air Quality Objectives Annual Average**	N/D	PPM
Annual Average for 2016	2	PPM

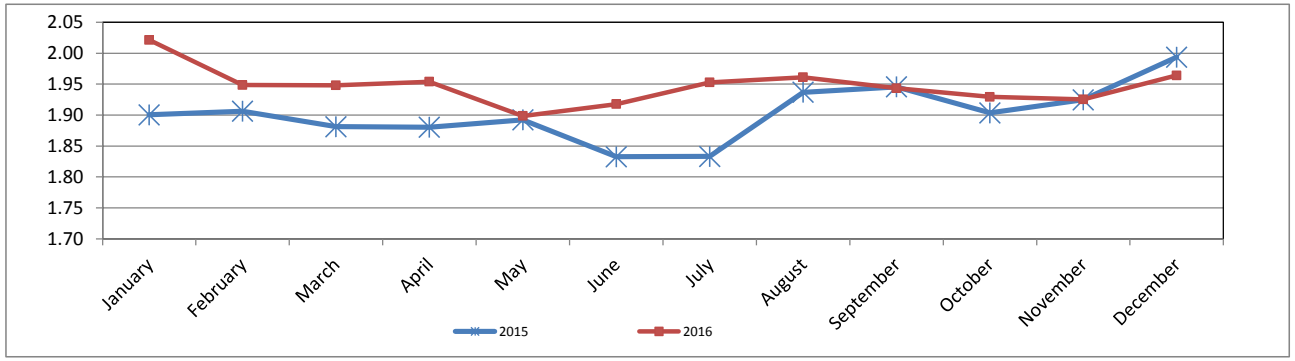
METHANE (CH4) 2015 One-Hour Readings vs. 2016 One-Hour Readings in PPM

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	1.90	1.80	2.50	**2.02**	1.88	**2.74**	-0.12
February	1.91	1.80	2.10	1.95	1.87	2.10	-0.04
March	1.88	1.81	2.33	1.95	1.55	2.54	-0.07
April	1.88	1.80	2.14	1.95	1.84	2.40	-0.07
May	1.89	1.81	2.17	1.90	1.68	2.40	-0.01
June	1.83	1.54	2.31	1.92	1.80	2.16	-0.09
July	1.83	1.50	2.40	1.95	1.85	2.48	-0.12
August	1.94	1.83	2.36	1.96	1.55	2.67	-0.02
September	1.95	1.86	2.18	1.94	1.82	2.58	0.00
October	1.90	1.82	2.30	1.93	1.79	2.20	-0.03
November	1.92	1.85	2.30	1.93	1.79	2.52	0.00
December	**1.99**	1.88	**3.16**	1.96	1.85	2.23	0.03

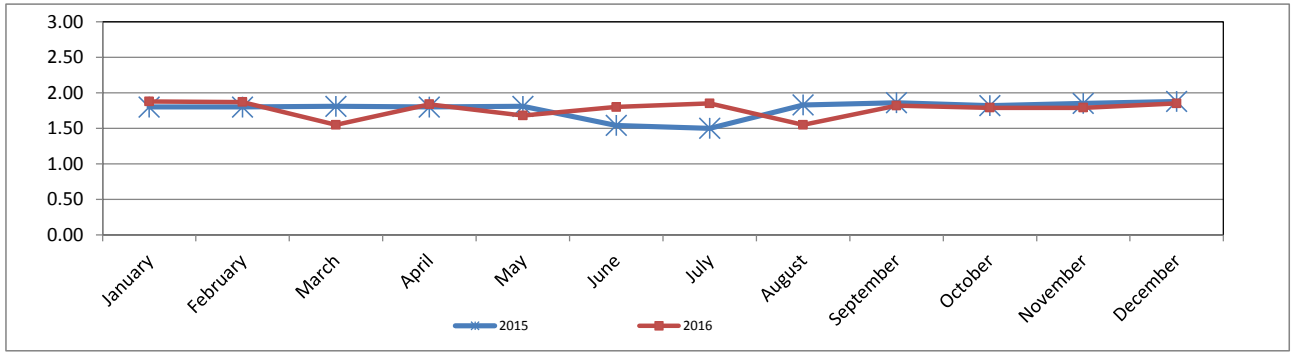
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

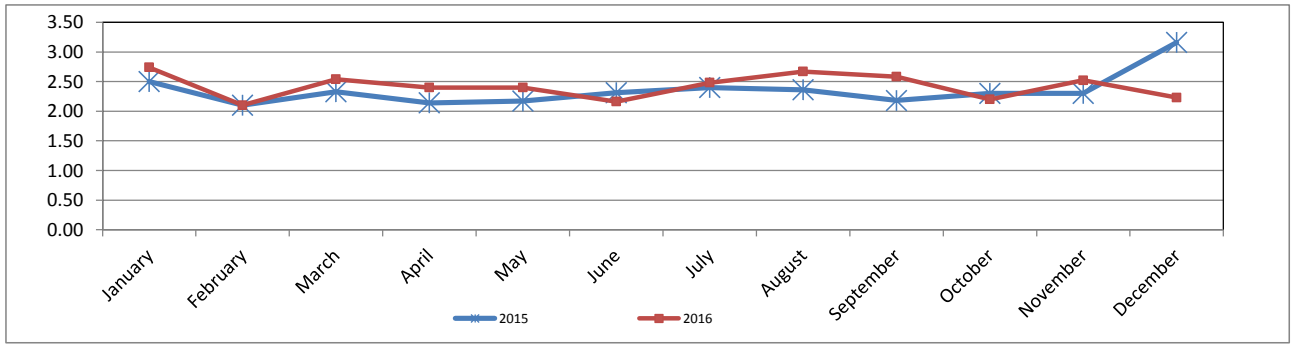
METHANE (CH4) 2015 Monthly Mean vs. 2016 Monthly Mean in PPM



METHANE (CH4) 2015 Monthly Minimum vs. 2016 Monthly Minimum in PPM



METHANE (CH4) 2015 Monthly Maximum vs. 2016 Monthly Maximum in PPM

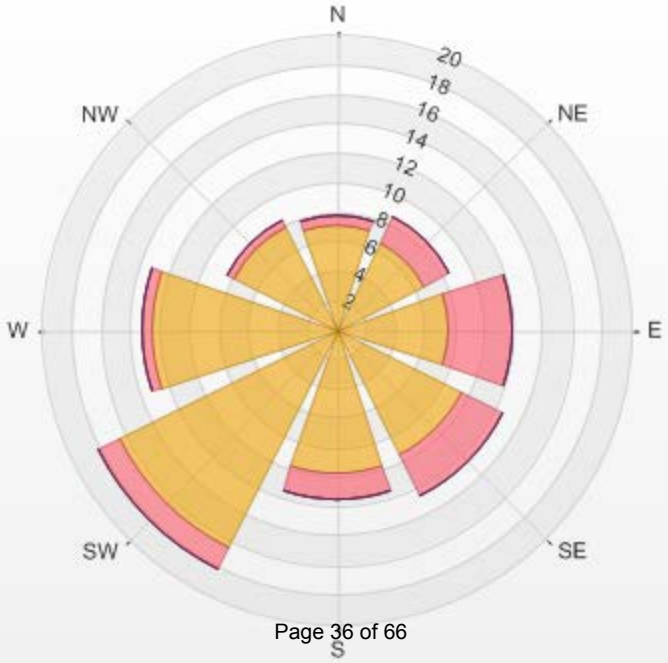


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-CH4[ppm] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 H
Calm: 7.88% Valid Data: 91.09% Calm Avg: 1.99 [ppm]

Direction	0-2	2-3	3-5	5-10	>10.0	Total
N	7.07	0.76	0	0	0	7.83
NE	6.62	1.97	0	0	0	8.59
E	7.6	4.32	0	0	0	11.92
SE	9.47	3.14	0	0	0	12.61
S	9.79	1.73	0	0	0	11.52
SW	16.53	1.58	0	0	0	18.11
W	12.58	0.62	0	0	0	13.2
NW	7.84	0.51	0	0	0	8.35
Summary	77.5	14.63	0	0	0	92.13

% Icon Classes (ppm)	78 0-2	15 2-3	0 3-5	0 5-10	0 >10.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-CH4[ppm] 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.88% Calm Poll Avg: 1.99[ppm]



NON-METHANE HYDROCARBON

NON-METHANE HYDROCARBONS (NMHC) 2016 Monthly Averages and Frequency Distributions of One Hour Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (PPM NMHC)						OBJECTIVES**		EXCEEDENCES		MONTHLY AVERAGE
			≤ 0.20 ppm	0.21 < C ≤ 0.50 ppm	0.51 < C ≤ 1.00 ppm	1.01 < C ≤ 2.00 ppm	2.01 < C ≤ 4.00 ppm	> 4.00 ppm	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
February	634	95.8	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
March	703	99.6	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
April	642	93.8	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
May	659	93.3	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
June	665	97.1	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
July	518	73.4	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
August	699	98.9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
September	676	98.9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
October	700	99.3	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
November	624	91.5	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
December	706	100.0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00
											ANNUAL AVERAGE		0.00

N/D - Valid Data Not Available
*Number of Readings - included calibration hours
**If Alberta Ambient Air Quality Objectives are not available, N/D is used.

Alberta Ambient Air Quality Objectives Annual Average**	N/D	PPM
Annual Average for 2016	0.00	PPM

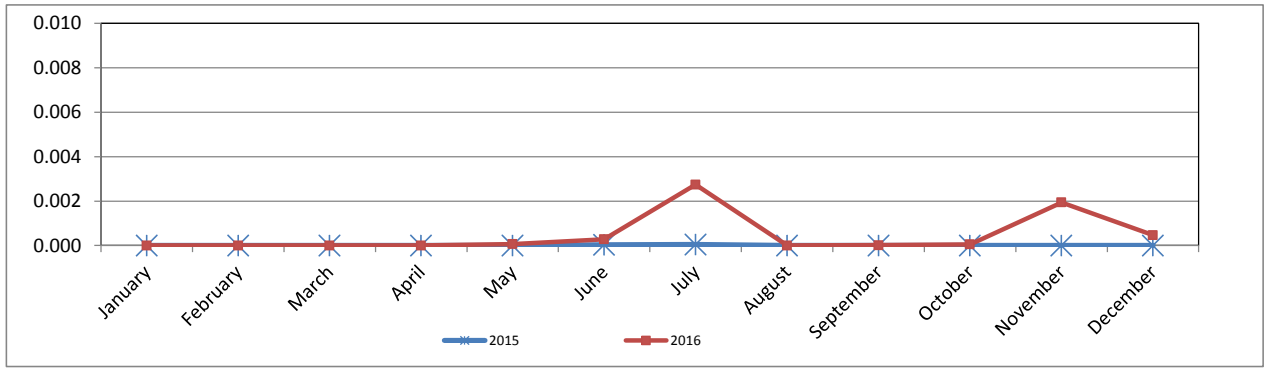
NON-METHANE HYDROCARBONS (NMHC) 2015 One-Hour Readings vs. 2016 One-Hour Readings in PPM

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	0.00	0.00	0.00	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	0.00	0.03	0.00
June	0.00	0.00	0.01	0.00	0.00	0.08	0.00
July	0.00	0.00	0.01	0.00	0.00	0.10	0.00
August	0.00	0.00	0.00	0.00	0.00	0.00	0.00
September	0.00	0.00	0.00	0.00	0.00	0.01	0.00
October	0.00	0.00	0.00	0.00	0.00	0.04	0.00
November	0.00	0.00	0.00	0.00	0.00	0.12	0.00
December	0.00	0.00	0.00	0.00	0.00	0.11	0.00

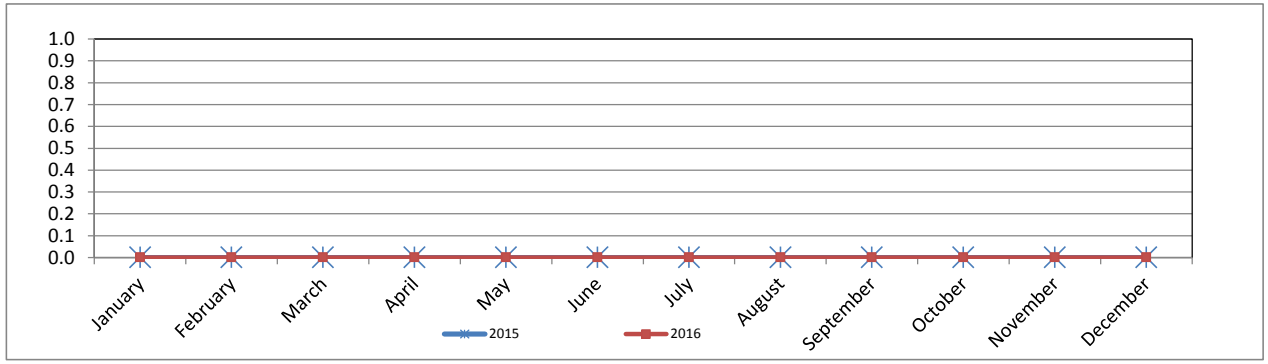
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

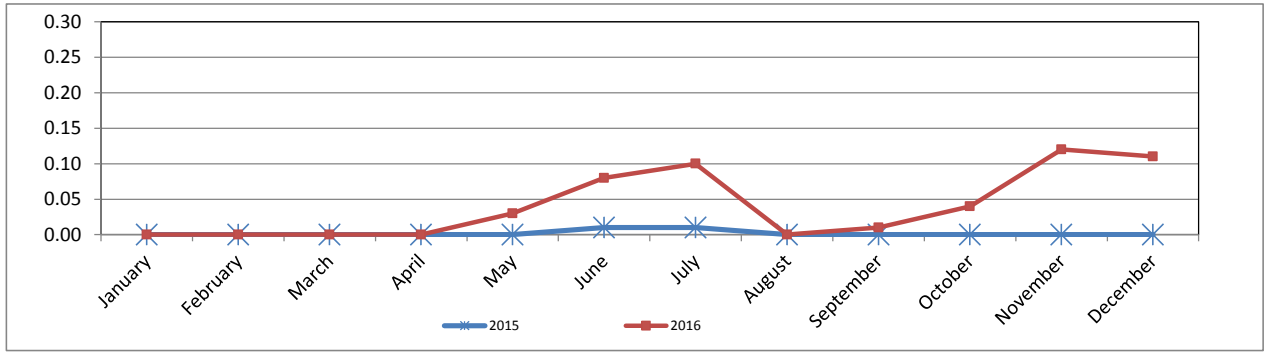
NON-METHANE HYDROCARBONS (NMHC) 2015 Monthly Mean vs. 2016 Monthly Mean in PPM



NON-METHANE HYDROCARBONS (NMHC) 2015 Monthly Minimum vs. 2016 Monthly Minimum in PPM



NON-METHANE HYDROCARBONS (NMHC) 2015 Monthly Maximum vs. 2016 Monthly Maximum in PPM

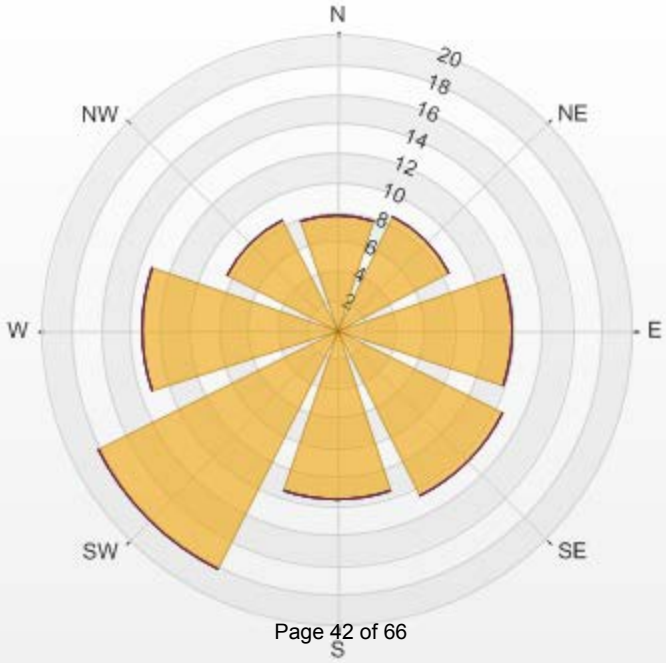


Wind: THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-NMHC[ppm] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
Calm: 7.88% Valid Data: 91.09% Calm Avg: 0.00 [ppm]

Direction	0-0.1	0.1-0.3	0.3-1	1-2	>2.0	Total
N	7.83	0	0	0	0	7.83
NE	8.57	0.01	0	0	0	8.58
E	11.91	0.01	0	0	0	11.92
SE	12.6	0.01	0	0	0	12.61
S	11.52	0	0	0	0	11.52
SW	18.11	0	0	0	0	18.11
W	13.2	0	0	0	0	13.2
NW	8.35	0	0	0	0	8.35
Summary	92.09	0.03	0	0	0	92.12

%	Icon	Classes (ppm)									
92		0-0.1	0		0.1-0.3	0		0.3-1	0		1-2	0		>2.0

THREE CREEKS #842 TRAILER Poll.: THREE CREEKS #842 TRAILER-NMHC[ppm] 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.88% Calm Poll Avg: 0.00[ppm]



WIND SPEED

WIND SPEED (WS) 2016 Monthly Data Summary of One Hour Readings

Month	Number of Readings*	Operational Time (%)	Monthly Average (KPH)	Minimum Hourly Average (KPH)	Maximum Hourly Average (KPH)	Maximum Daily Average (KPH)
January	744	100.0	2.3	0.0	**33.8**	16.4
February	696	100.0	2.7	0.0	29.9	14.6
March	743	99.9	0.4	0.0	17.2	9.4
April	720	100.0	2.9	0.5	30.6	15.9
May	715	96.1	3.6	0.0	27.5	15.4
June	699	97.1	4.1	0.1	33.7	**19.0**
July	582	78.2	3.3	0.1	27.8	14.0
August	744	100.0	0.5	0.1	19.7	9.9
September	720	100.0	**5.3**	0.1	24.6	14.5
October	740	99.5	1.6	0.6	16.3	10.1
November	720	100.0	3.4	0.2	25.3	12.0
December	744	100.0	4.9	0.1	27.7	18.7

N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

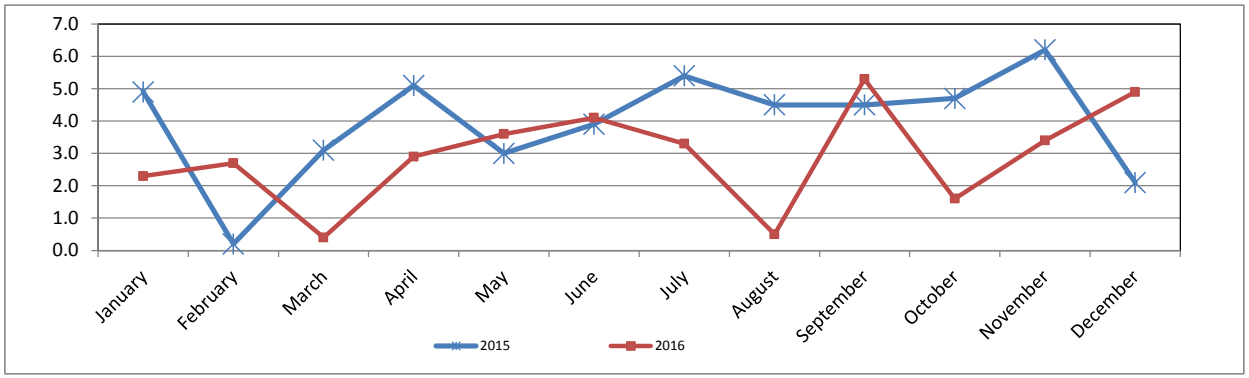
WIND SPEED (WS) 2015 One-Hour Readings vs. 2016 One-Hour Readings in km/hr

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	4.9	0.2	34.9	2.3	0.0	**33.8**	2.6
February	0.2	0.1	19.8	2.7	0.0	29.9	-2.5
March	3.1	0.0	31.3	0.4	0.0	17.2	2.7
April	5.1	0.4	36.1	2.9	0.5	30.6	2.2
May	3.0	0.3	25.5	3.6	0.0	27.5	-0.6
June	3.9	0.0	27.0	4.1	0.1	33.7	-0.2
July	5.4	0.2	25.3	3.3	0.1	27.8	2.1
August	4.5	0.0	30.7	0.5	0.1	19.7	4.0
September	4.5	0.6	29.8	**5.3**	0.1	24.6	-0.8
October	4.7	0.1	**38.5**	1.6	0.6	16.3	3.1
November	**6.2**	0.0	32.0	3.4	0.2	25.3	2.8
December	2.1	0.1	23.4	4.9	0.1	27.7	-2.8

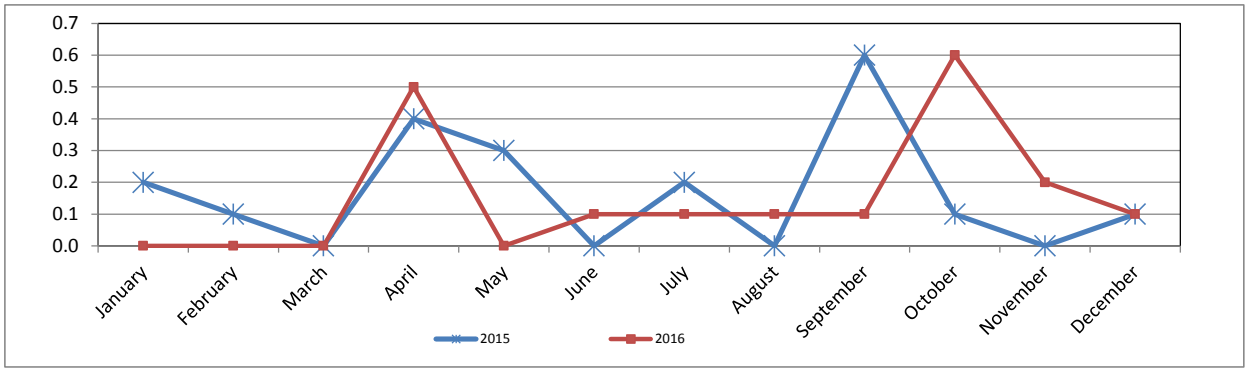
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

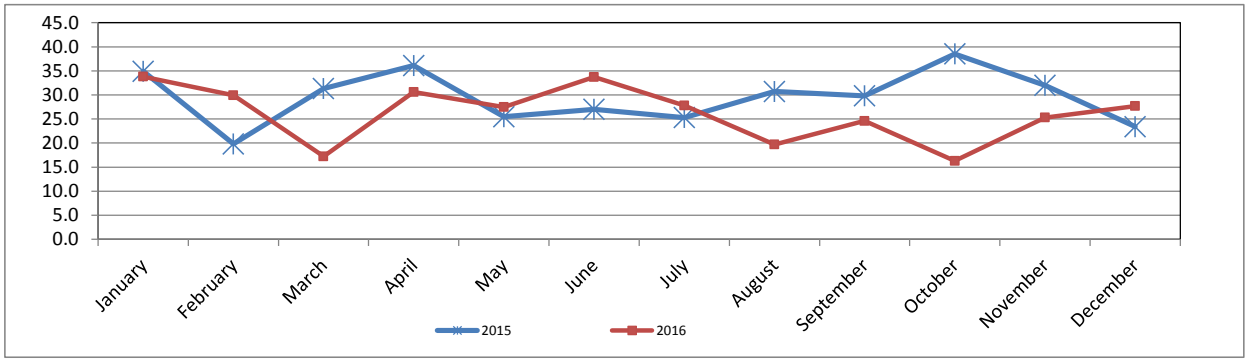
WIND SPEED (WS) 2015 Monthly Mean vs. 2016 Monthly Mean in km/hr



WIND SPEED (WS) 2015 Monthly Minimum vs. 2016 Monthly Minimum in km/hr



WIND SPEED (WS) 2015 Monthly Maximum vs. 2016 Monthly Maximum in km/hr

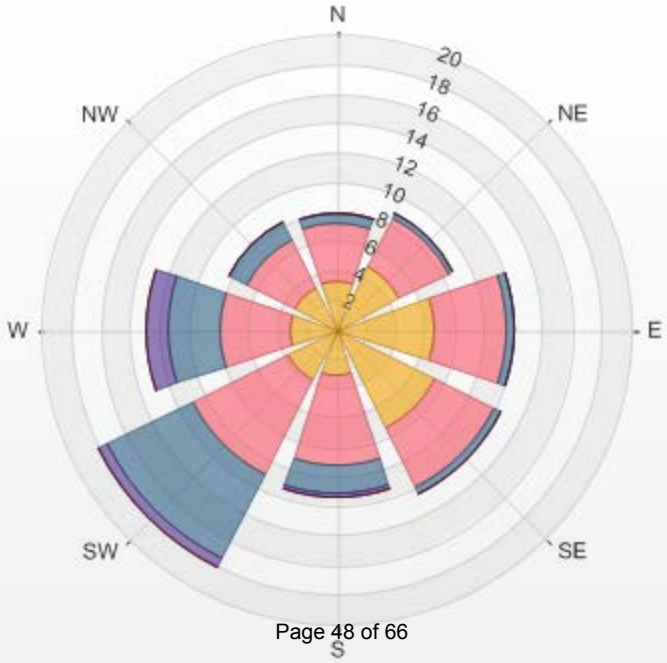


Wind: THREE CREEKS #842 TRAILER Monitor: WSP [kph] Periodically: 01/01/2016 00:00-31/12/2016 23:59 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
Calm: 7.84% Valid Data: 98.46%

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	3.38	3.84	0.69	0.04	0	0	7.95
NE	4.75	3.75	0.36	0	0	0	8.86
E	6.66	4.91	0.56	0	0	0	12.13
SE	7.39	4.51	0.64	0	0	0	12.54
S	3.14	6.02	1.97	0.25	0.01	0	11.39
SW	3.73	7.22	6.41	0.7	0	0	18.06
W	3.22	4.78	3.43	1.53	0.04	0	13
NW	3.15	3.71	1.29	0.07	0	0	8.22
Summary	35.42	38.74	15.35	2.59	0.05	0	92.15

% Icon Classes (kph)	35	1.8-6.0	39	6.0-12.0	15	12.0-20.0	3	20.0-29.0	0	29.0-39.0	0	>39.0

THREE CREEKS #842 TRAILER 01/01/2016 00:00 - 31/12/2016 23:59 Calm: 7.84% Calm Wind Avg Speed: 1.08 (kph)



RELATIVE HUMIDITY

RELATIVE HUMIDITY (RH) 2016 Monthly Data Summary of One Hour Readings

Month	Number of Readings*	Operational Time (%)	Monthly Average (%)	Minimum Hourly Average (%)	Maximum Daily Average (%)	Maximum Daily Average (%)
January	744	100.0	79.8	42.0	94.0	89.5
February	696	100.0	76.7	37.0	96.0	91.1
March	743	99.9	74.9	30.0	97.0	89.6
April	720	100.0	54.1	12.0	97.0	92.8
May	715	96.1	55.4	13.0	98.0	96.4
June	699	97.1	67.2	22.0	96.0	94.0
July	590	79.3	70.6	33.0	96.0	90.5
August	744	100.0	78.3	37.0	96.0	94.7
September	720	100.0	73.5	28.0	98.0	93.8
October	740	99.5	87.7	40.0	98.0	97.0
November	720	100.0	79.1	30.0	97.0	93.1
December	744	100.0	76.5	52.0	95.0	86.7

N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

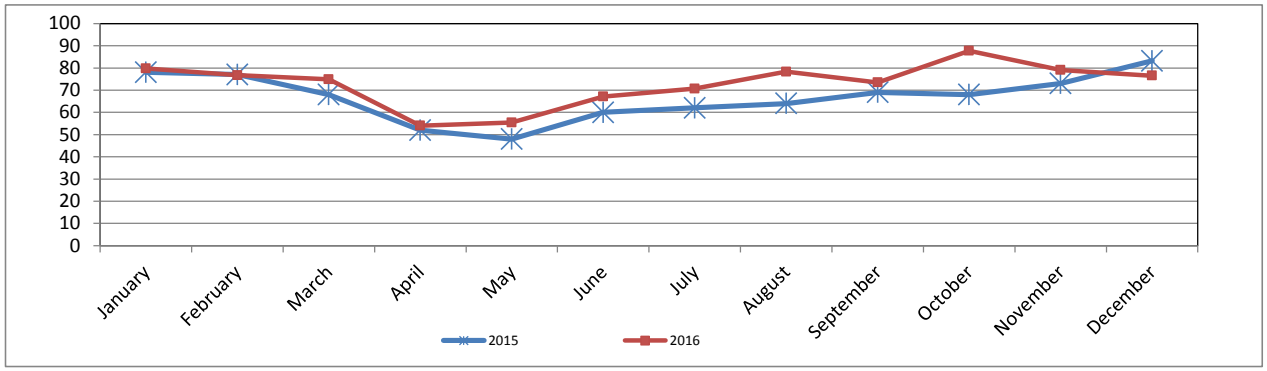
RELATIVE HUMIDITY (RH) 2015 One-Hour Readings vs. 2016 One-Hour Readings in %

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	78.0	55	97	79.8	42	94	-2
February	77.0	45	96	76.7	37	96	0
March	68.0	16	97	74.9	30	97	-7
April	52.0	11	97	54.1	12	97	-2
May	48.0	12	97	55.4	13	98	-7
June	60.0	21	97	67.2	22	96	-7
July	62.0	22	96	70.6	33	96	-9
August	64.0	16	97	78.3	37	96	-14
September	69.0	23	97	73.5	28	98	-5
October	68.0	25	96	**87.7**	40	98	-20
November	73.0	27	97	79.1	30	97	-6
December	**83.2**	43	97	76.5	52	95	7

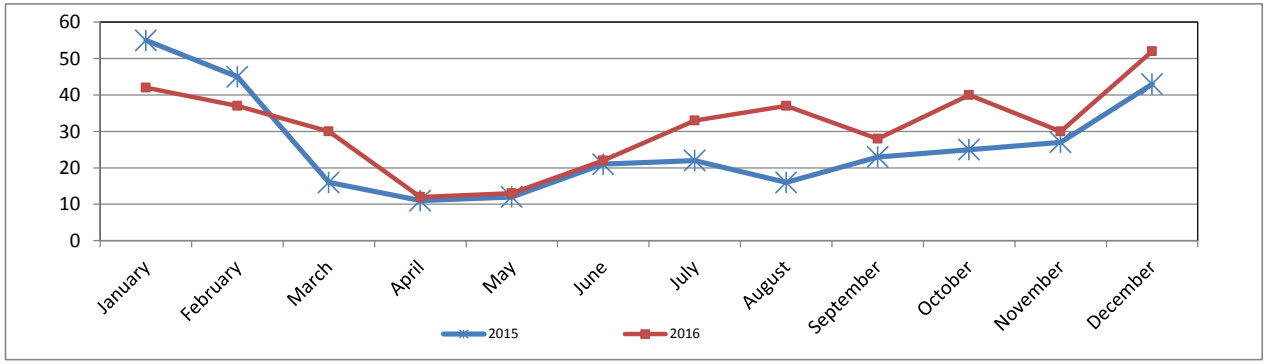
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

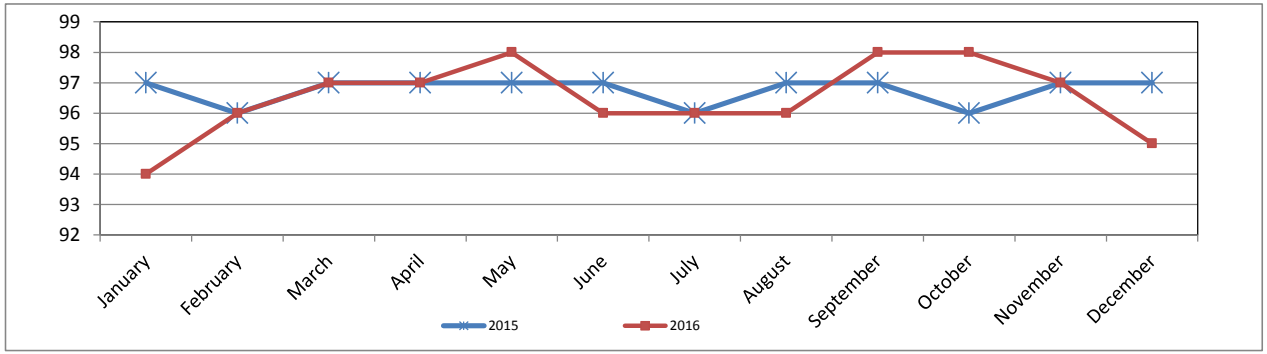
RELATIVE HUMIDITY (RH) 2015 Monthly Mean vs. 2016 Monthly Mean in %



RELATIVE HUMIDITY (RH) 2015 Monthly Minimum vs. 2016 Monthly Minimum in %



RELATIVE HUMIDITY (RH) 2015 Monthly Maximum vs. 2016 Monthly Maximum in %



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE (BP) 2016 Monthly Data Summary of One Hour Readings

Month	Number of Readings*	Operational Time (%)	Monthly Average (inHg)	Minimum Hourly Average (inHg)	Maximum Hourly Average (inHg)	Maximum Daily Average (inHg)
January	744	100.0	27.8	27.1	28.1	28.1
February	696	100.0	27.8	27.1	28.2	28.1
March	743	99.9	27.7	27.2	28.3	28.2
April	720	100.0	27.8	27.3	28.2	28.1
May	715	96.1	27.9	27.4	28.3	28.3
June	699	97.1	27.8	27.2	28.1	28.1
July	590	79.3	27.8	27.7	28.1	28.1
August	744	100.0	27.9	27.5	28.2	28.2
September	720	100.0	27.8	27.4	28.2	28.1
October	740	99.5	27.8	27.2	28.2	28.1
November	720	100.0	27.7	27.3	28.3	28.2
December	744	100.0	27.8	27.1	28.7	28.6

N/D - Valid Data Not Available

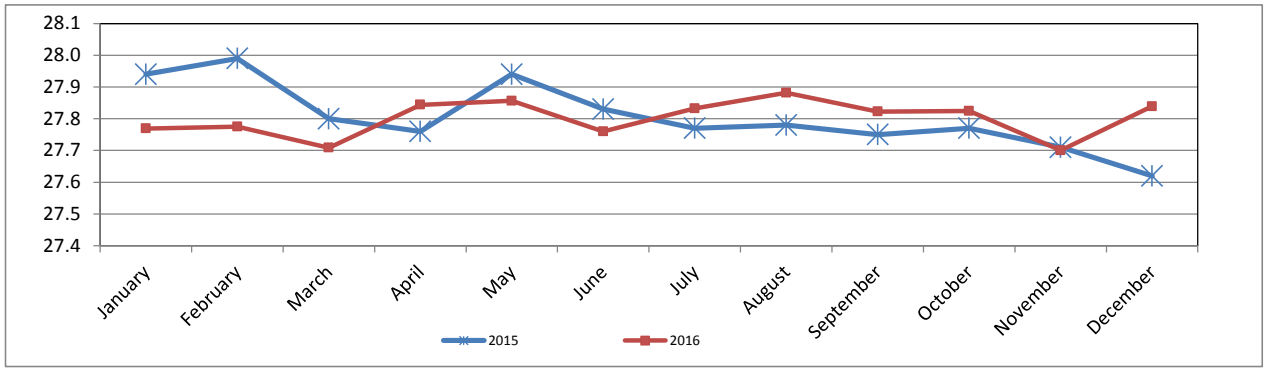
BAROMETRIC PRESSURE (BP) 2015 One-Hour Readings vs. 2016 One-Hour Readings in inHg

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	27.94	27.2	**28.7**	27.77	27.1	28.1	0.2
February	**27.99**	27.3	28.5	27.77	27.1	28.2	0.2
March	27.80	27.0	28.3	27.71	27.2	28.3	0.1
April	27.76	27.2	28.2	27.84	27.3	28.2	-0.1
May	27.94	27.6	28.3	27.86	27.4	28.3	0.1
June	27.83	27.6	28.2	27.76	27.2	28.1	0.1
July	27.77	27.5	28.1	27.83	27.7	28.1	-0.1
August	27.78	27.3	28.1	**27.88**	27.5	28.2	-0.1
September	27.75	27.4	28.1	27.82	27.4	28.2	-0.1
October	27.77	27.1	28.4	27.82	27.2	28.2	-0.1
November	27.71	27.1	28.2	27.70	27.3	28.3	0.0
December	27.62	27.1	28.2	27.84	27.1	**28.7**	-0.2

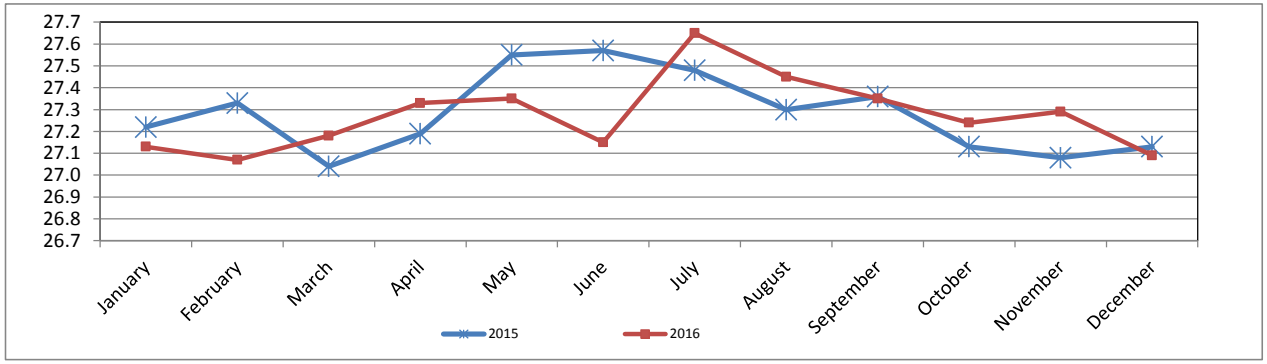
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

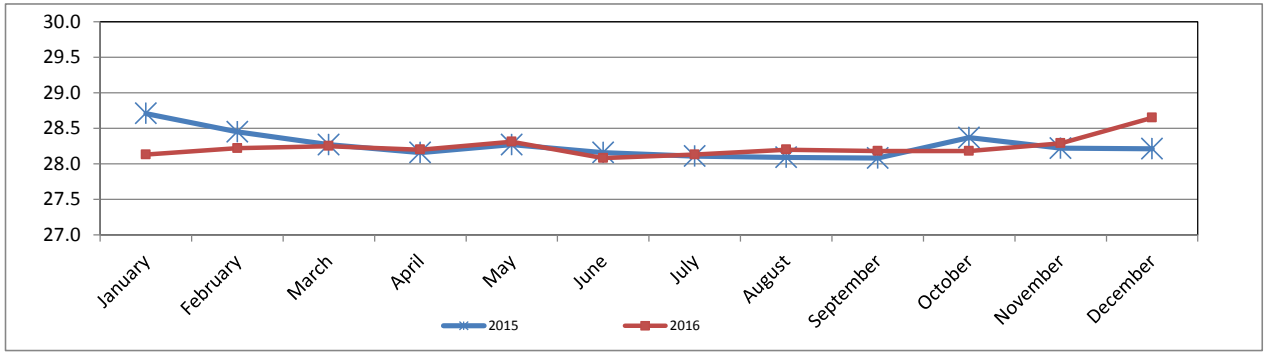
BAROMETRIC PRESSURE (BP) 2015 Monthly Mean vs. 2016 Monthly Mean in inHg



BAROMETRIC PRESSURE (BP) 2015 Monthly Minimum vs. 2016 Monthly Minimum in inHg



BAROMETRIC PRESSURE (BP) 2015 Monthly Maximum vs. 2016 Monthly Maximum in inHg



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE (TPX) 2016 Monthly Data Summary of One Hour Readings

Month	Number of Readings*	Operational Time (%)	Monthly Average (Deg C)	Minimum Hourly Average (Deg C)	Maximum Hourly Average (Deg C)	Maximum Daily Average (Deg C)
January	744	100.0	-11.2	-28.9	5.4	3.2
February	696	100.0	-4.9	-17.3	7.7	3.9
March	743	99.9	-1.6	-17.3	13.7	6.0
April	720	100.0	7.1	-5.8	27.8	18.3
May	715	96.1	11.1	-2.5	29.1	18.3
June	699	97.1	15.3	2.8	28.5	20.8
July	590	79.3	17.1	6.5	27.9	19.3
August	744	100.0	15.2	1.7	26.1	18.2
September	720	100.0	9.4	-4.1	22.0	15.0
October	740	99.5	-0.5	-8.1	7.8	2.9
November	720	100.0	-1.6	-15.1	18.1	9.6
December	744	100.0	-13.8	-33.6	2.3	-0.1

N/D - Valid Data Not Available

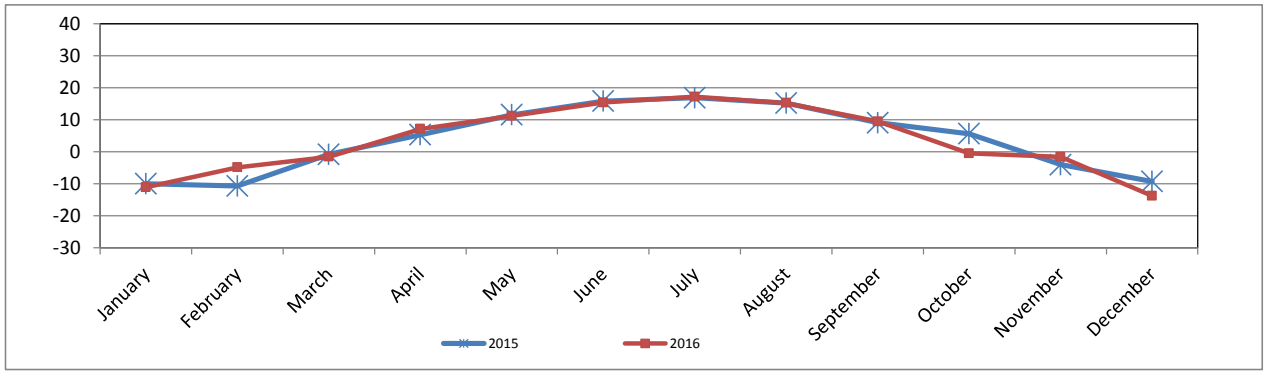
AMBIENT TEMPERATURE (TPX) 2015 One-Hour Readings vs. 2016 One-Hour Readings in Degrees Celsius

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	-10.06	-31.9	6.7	-11.16	-28.9	5.4	1.1
February	-10.76	-28.0	7.0	-4.90	-17.3	7.7	-5.9
March	-0.83	-26.7	12.7	-1.60	-17.3	13.7	0.8
April	5.30	-7.9	23.0	7.08	-5.8	27.8	-1.8
May	11.51	-4.0	30.0	11.14	-2.5	**29.1**	0.4
June	15.78	-0.1	**32.3**	15.34	2.8	28.5	0.4
July	**16.84**	1.0	30.1	**17.14**	6.5	27.9	-0.3
August	15.13	-1.0	27.9	15.21	1.7	26.1	-0.1
September	9.03	-4.4	25.4	9.44	-4.1	22.0	-0.4
October	5.62	-7.2	23.6	-0.52	-8.1	7.8	6.1
November	-4.07	-22.7	6.2	-1.64	-15.1	18.1	-2.4
December	-9.34	-24.1	5.2	-13.78	-33.6	2.3	4.4

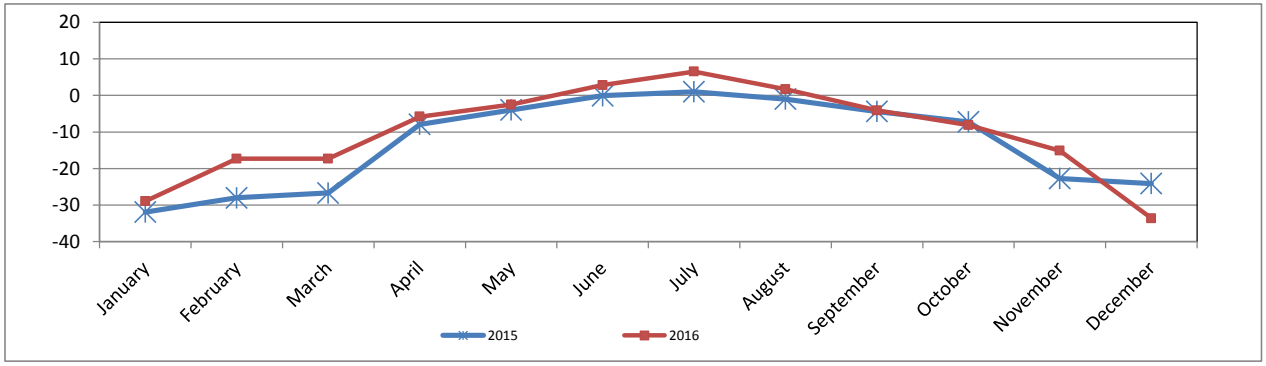
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

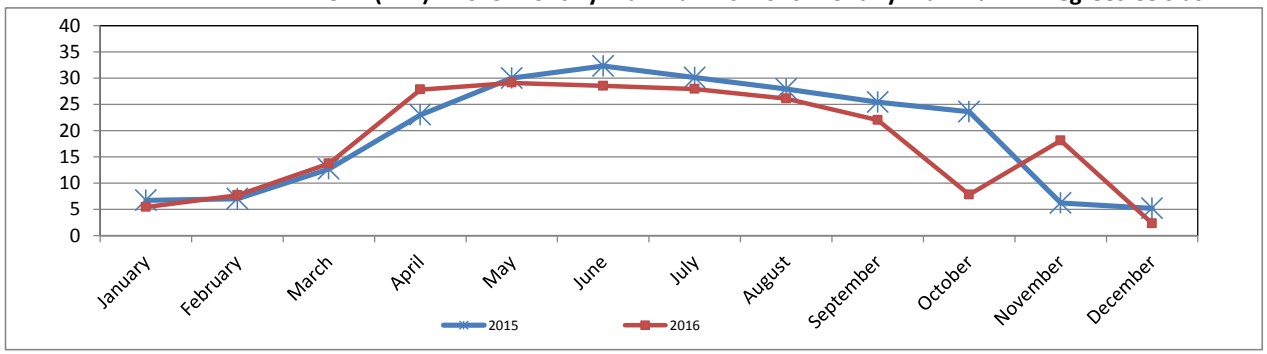
AMBIENT TEMPERATURE (TPX) 2015 Monthly Mean vs. 2016 Monthly Mean in Degrees Celsius



AMBIENT TEMPERATURE (TPX) 2015 Monthly Minimum vs. 2016 Monthly Minimum in Degrees Celsius



AMBIENT TEMPERATURE (TPX) 2015 Monthly Maximum vs. 2016 Monthly Maximum in Degrees Celsius



STATION TEMPERATURE

STATION TEMPERATURE (STNTPX) 2016 Monthly Data Summary of One Hour Readings

Month	Number of Readings*	Operational Time (%)	Monthly Average (Deg C)	Minimum Hourly Average (Deg C)	Maximum Hourly Average (Deg C)	Maximum Daily Average (Deg C)
January	744	100.0	21.8	20.0	23.0	22.6
February	696	100.0	22.3	20.1	23.7	22.8
March	743	99.9	22.7	20.2	24.6	23.2
April	720	100.0	22.8	20.4	24.8	23.3
May	715	96.1	22.9	20.2	25.0	24.0
June	699	97.1	22.6	19.6	25.4	24.2
July	590	79.3	23.6	18.7	26.3	24.3
August	744	100.0	23.5	19.5	25.3	24.5
September	720	100.0	23.4	20.0	25.7	24.7
October	740	99.5	21.5	18.7	25.2	22.3
November	720	100.0	21.5	17.6	25.5	23.5
December	744	100.0	21.4	13.5	24.0	23.0

N/D - Valid Data Not Available

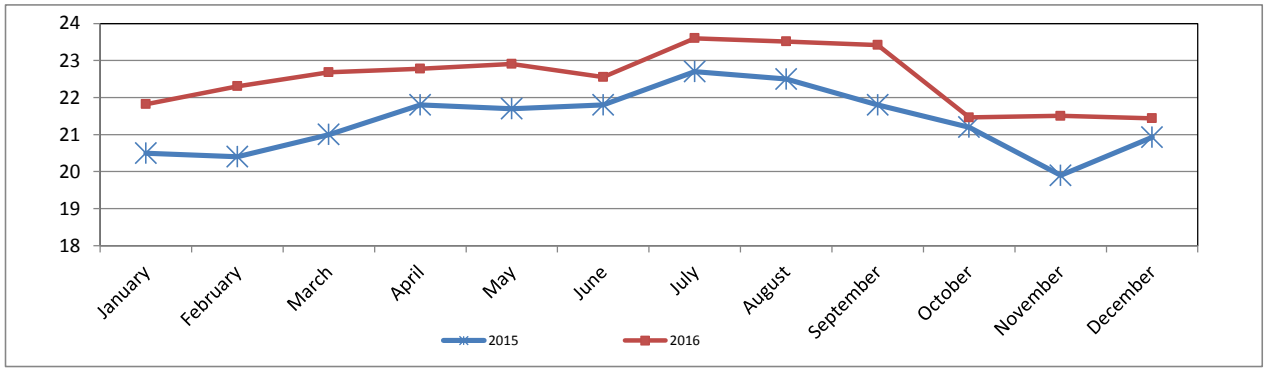
STATION TEMPERATURE (STNTPX) 2015 One-Hour Readings vs. 2016 One-Hour Readings in Degrees Celsius

	2015			2016			
Month	**MEAN**	**MINIMUM**	**MAXIMUM**	**MEAN**	**MINIMUM**	**MAXIMUM**	**Difference**
January	20.50	16.8	22.3	21.82	20.0	23.0	-1.3
February	20.40	15.0	22.1	22.31	20.1	23.7	-1.9
March	21.00	18.1	23.2	22.68	20.2	24.6	-1.7
April	21.80	19.1	24.1	22.78	20.4	24.8	-1.0
May	21.70	18.6	24.0	22.91	20.2	25.0	-1.2
June	21.80	18.4	**25.8**	22.56	19.6	25.4	-0.8
July	**22.70**	19.2	24.2	**23.60**	18.7	**26.3**	-0.9
August	22.50	19.5	24.3	23.52	19.5	25.3	-1.0
September	21.80	19.3	24.1	23.42	20.0	25.7	-1.6
October	21.20	18.7	23.5	21.46	18.7	25.2	-0.3
November	19.90	17.6	22.4	21.50	17.6	25.5	-1.6
December	20.93	19.8	22.1	21.44	13.5	24.0	-0.5

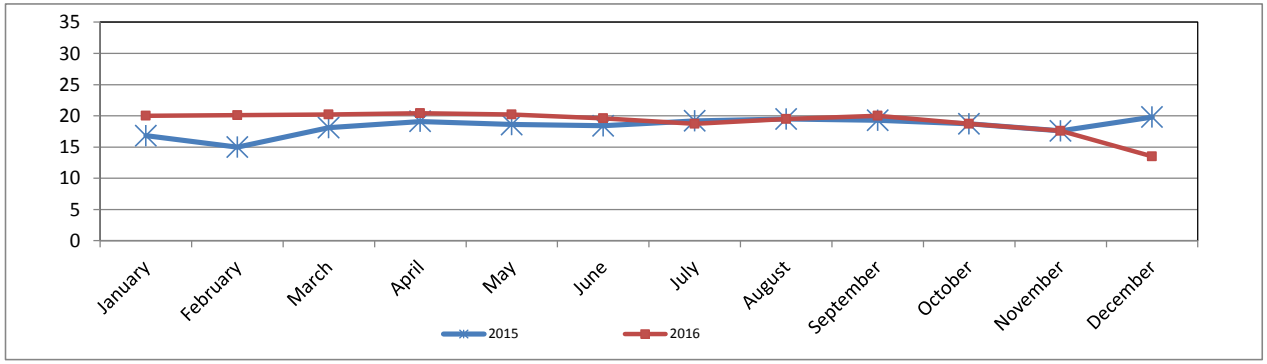
N/D - Valid Data Not Available

*Annual peak is bolded and highlighted.

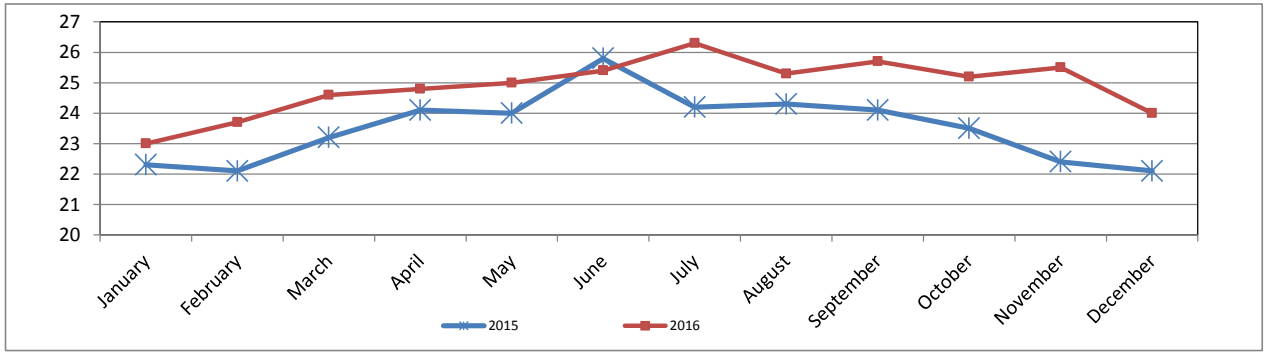
STATION TEMPERATURE (STNTPX) 2015 Monthly Mean vs. 2016 Monthly Mean in Degrees Celsius



STATION TEMPERATURE (STNTPX) 2015 Monthly Minimum vs. 2016 Monthly Minimum in Degrees Celsius



STATION TEMPERATURE (STNTPX) 2015 Monthly Maximum vs. 2016 Monthly Maximum in Degrees Celsius



APPENDIX II
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	**EPA Approval or Code of Practice Registration #** (if applicable)
NO	**NA**
Company Name (if applicable)	**Industrial Operation Name** (if applicable)
THREE CREEKS	**842b Station**
Name of the Representative of the Person Responsible (Last, First, Middle)	**Position / Title of the Representative of the Person Responsible**
Wilson, Kim	**Project Manager, Customer Service - Air Services**
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.	
☐ **Yes** ■ **No**	
Name of External Person Certifying the Report (Last, First, Middle)	**Position / Title of External Person Certifying the Report**
NA	**NA**
Company Name for the External Person Certifying the Report	**Identification of Qualifications / Professional Designations of the External Person Certifying the Report**
NA	**NA**

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

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

28-02-2017

Report Issued Date (dd-mm-yyyy)