



PAMZ | Parkland Airshed
Management Zone

Parkland Airshed Management Zone

Ambient Air Monitoring Network

February 2015

Continuous Ambient Air Quality Monitoring Program
Monthly Report

Operations and Maintenance:



AIR QUALITY MONITORING

Data Validation and Report:





March 30, 2015

Alberta Environment and Sustainable Resource Development
Enforcement and Monitoring Division
11th Floor, Oxbridge Place
9820-106 Street
Edmonton, Alberta
T6B 2X3

RE: Parkland Airshed Management Zone – February 2015 – Ambient Air Quality Monitoring Report

Enclosed is the Parkland Airshed Management Zone (PAMZ) Ambient Air Monitoring Network Report for the month of **February 2015**. This report is submitted by PAMZ on behalf of the following Member Companies' Facilities, to satisfy the requirement contained in their Operating Approvals:

Company	Facility	Approval No.
BP Canada Energy Company	North Caroline	10158-01-00
BP Canada Energy Company	South Caroline	1071-01-00
Penn West Energy	West Gilby	11437-01-00
Conoco Phillips Canada Limited	Medicine River	381-01-00
Harmattan Gas Processing L.P.	Harmattan	10154-02-01
Husky Oil Operations Limited	Ram River	57-01-00
Imperial Oil Resources Limited	Wilson Creek	10264-01-00
Keyera Energy Limited	Gilby	1333-02-00
Keyera Energy Limited	Homeglen-Rimbey	865-01-00
Keyera Energy Limited	Nevis	261-01-00
Keyera Energy Limited	Strachan	1351-01-00
ExxonMobil Oil Canada Limited	Lone Pine	11341-02-00
NAL Resources	Sylvan Lake	249-01-00
Penn West Petroleum Limited	Wimborne	359-01-00
Shell Canada Limited	Burnt Timber	295-01-00
Shell Canada Limited	Shantz	11379-01-00
Shell Canada Limited	Caroline	11323-01-00
Suncor	East Gilby	1717-02-00

Included in this report is a summary of the monthly continuous monitoring that includes detailed hourly average reports and multipoint calibration reports of all instruments. Operations (which include calibrations and maintenance) of the PAMZ air monitoring network were performed by WSP Canada Inc. Operational summaries can be found on the "Continuous Air Quality Data Summary" and the "Continuous Equipment Summary" pages of the report.



The concentrations of the reported air quality parameters of SO₂, H₂S/TRS, NO₂, CO, and O₃ were within all applicable Provincial and National objectives for the Caroline, Red Deer Riverside, Red Deer Lancaster and Crossfield-Carstairs continuous air monitoring sites.

The concentrations of the reported air quality parameter of PM_{2.5} were within the applicable Provincial and National objectives for the Caroline, Red Deer Riverside, and Crossfield-Carstairs continuous air monitoring sites; however there was one (1) 1-hour exceedence of PM_{2.5} at the Red Deer Lancaster continuous air monitoring site:

February 10: 16:00 149.4 µg/m³ **ASERD Reference # 294776**

Details of the PAMZ Ambient Air Monitoring site locations are as follows:

Caroline Station:

- ◆ Located on the Schmiemann dairy farm at 51° 56' 49" N and 114° 41' 51" W with an elevation of 1135 meters. The Caroline station is a stationary site and operates year round.

Red Deer - Riverside:

- ◆ Located in the city limits of Red Deer on Riverside Drive (52° 17' 56" N and 113° 47' 37" N) and an elevation of 868 meters. The Red Deer Riverside station is a stationary site and operates year round.

Red Deer - Lancaster (Martha Station):

- ◆ Located at 11 Lancaster Drive, in the city of Red Deer; (52° 14' 27.10" N and 113° 45' 55.26" W). The Lancaster site has been designated a stationary site and will operate year round.

Crossfield - Carstairs (McCoy Station):

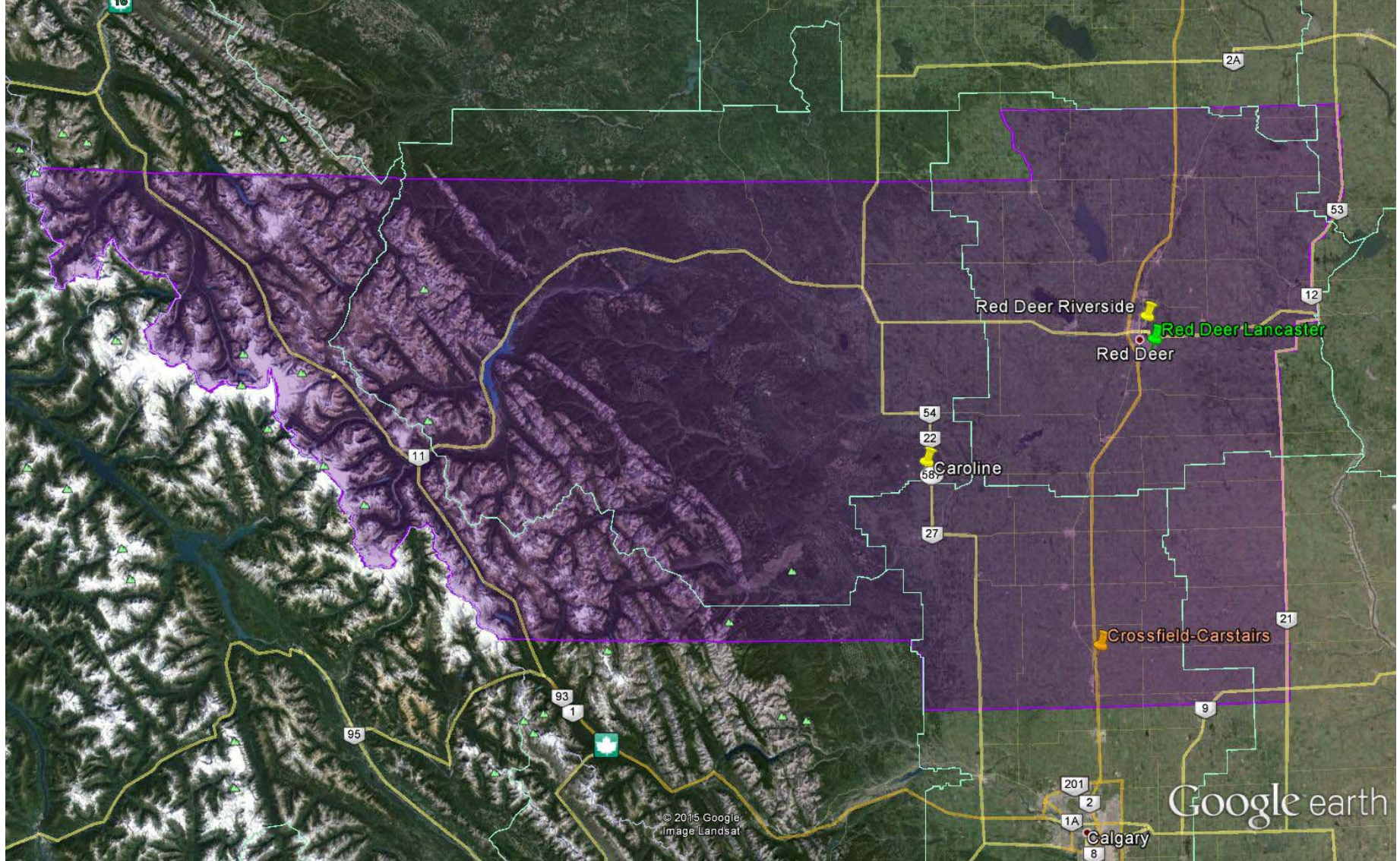
- ◆ Located approximately 1.2 km east of Highway 2 and 1.3 km south of Township Road 294 at 10-13-29-1 W5; (51° 29' 24" N and 114° 00' 28" W), and an elevation of 1046 meters. The site is a mobile site and from September 10th, 2014 to the end of March 2015; the McCoy station will be at the Crossfield–Carstairs site.

Enclosed are the summary results for the PAMZ Passive Monitoring Network. The samples were prepared and analysed by Maxxam Analytics Inc. at their facility in Edmonton, AB. The samples were installed and removed by Gene's Maintenance Services of Leduc, AB. There were no exceedences of the SO₂ 30-day AAAQO objective (11 ppb).

If you have any questions concerning the report please contact the undersigned at 403.862.7046.

Regards,

Kevin Warren
PAMZ Executive Director



PAMZ Air Monitoring Stations February 2015

PAMZ Continuous Air Quality Monitoring Data Summary

Ambient Air Quality Data Summary for the Month of February 2015																
Parkland Airshed Management Zone						Maximum Recorded Values										
						1-hr				24-hr / 8-hr						
Pollutant (units)	Objectives			Station	Monthly Average	Conc	Day	WSPD (km/hr)	WDIR (Sector)	Conc	Day	Exceedence			Operational Time (%)	
	1-hr	24-hr	30-day									1-hr	24-hr	30-day		
SO ₂ (ppb)	172	48	11	Caroline	1.3	15.0	Feb-18 11:00	8	WSW	3.4	Feb-08	0	0	0	100.0%	
SO ₂ (ppb)	172	48	11	Red Deer - Riverside	0.2	1.4	Feb-10 14:00	5	NNW	0.8	Feb-10	0	0	0	100.0%	
SO ₂ (ppb)	172	48	11	Red Deer - Lancaster	0.7	5.7	Feb-10 13:00	7	W	2.3	Feb-10	0	0	0	100.0%	
SO ₂ (ppb)	172	48	11	Crossfield-Carstairs	0.7	6.3	Feb-08 08:00	8	NW	3.0	Feb-08	0	0	0	100.0%	
TRS (ppb)	10	3	-	Caroline	0.5	1.4	Feb-10 16:00	8	ESE	0.6	Feb-10	0	0	-	100.0%	
TRS (ppb)	10	3	-	Red Deer - Lancaster	0.2	1.0	Feb-04 21:00	2	SSE	0.5	Feb-01	0	0	-	100.0%	
TRS (ppb)	10	3	-	Crossfield-Carstairs	0.1	0.7	Feb-01 10:00	4	SW	0.3	Feb-01	0	0	-	100.0%	
H ₂ S (ppb)	10	3	-	Red Deer - Riverside	0.3	3.3	Feb-04 23:00	1	NNE	0.7	Feb-04	0	0	-	100.0%	
NO ₂ (ppb)	159	106	-	Caroline	4.4	18.3	Feb-02 09:00	6	ESE	10.6	Feb-09	0	0	-	100.0%	
NO (ppb)	-	-	-	Caroline	0.8	8.3	Feb-10 15:00	7	ESE	2.3	Feb-10	-	-	-	100.0%	
NO _x (ppb)	-	-	-	Caroline	5.2	20.5	Feb-02 09:00	6	ESE	12.5	Feb-09	-	-	-	100.0%	
NO ₂ (ppb)	159	106	-	Red Deer - Riverside	14.5	45.6	Feb-04 23:00	1	NNE	31.6	Feb-04	0	0	-	100.0%	
NO (ppb)	-	-	-	Red Deer - Riverside	6.1	101.3	Feb-04 22:00	1	ESE	31.4	Feb-04	-	-	-	100.0%	
NO _x (ppb)	-	-	-	Red Deer - Riverside	20.6	143.3	Feb-04 22:00	1	ESE	63.0	Feb-04	-	-	-	100.0%	
NO ₂ (ppb)	159	106	-	Red Deer - Lancaster	11.6	42.1	Feb-04 21:00	2	SSE	21.5	Feb-04	0	0	-	100.0%	
NO (ppb)	-	-	-	Red Deer - Lancaster	5.1	69.7	Feb-04 21:00	2	SSE	16.5	Feb-04	-	-	-	100.0%	
NO _x (ppb)	-	-	-	Red Deer - Lancaster	16.7	111.8	Feb-04 21:00	2	SSE	38.0	Feb-04	-	-	-	100.0%	
NO ₂ (ppb)	159	106	-	Crossfield-Carstairs	6.4	35.1	Feb-04 02:00	16	SSE	15.8	Feb-01	0	0	-	100.0%	
NO (ppb)	-	-	-	Crossfield-Carstairs	1.3	45.1	Feb-01 10:00	4	SW	12.1	Feb-01	-	-	-	100.0%	
NO _x (ppb)	-	-	-	Crossfield-Carstairs	7.7	66.5	Feb-01 10:00	4	SW	28.0	Feb-01	-	-	-	100.0%	
O ₃ (ppb)	82	-	-	Caroline	28.7	46.0	Feb-24 16:00	19	N	38.7	Feb-19	0	0	-	100.0%	
O ₃ (ppb) - 8-hr	0			Caroline						44.5	Feb-22	-				
O ₃ (ppb)	82	-	-	Red Deer - Riverside	17.5	38.1	Feb-28 16:00	20	NNW	29.3	Feb-15	0	-	-	100.0%	
O ₃ (ppb) - 8-hr	65			Red Deer - Riverside						36.2	Feb-28	-				
O ₃ (ppb)	82	-	-	Red Deer - Lancaster	18.5	42.5	Feb-28 16:00	19	NW	30.3	Feb-25	0	0	-	100.0%	
O ₃ (ppb) - 8-hr	65			Red Deer - Lancaster						39.5	Feb-24	-				
O ₃ (ppb)	82	-	-	Crossfield-Carstairs	24.7	44.9	Feb-24 15:00	20	NNW	33.1	Feb-28	0	0	-	100.0%	
O ₃ (ppb) - 8-hr	65			Crossfield-Carstairs						41.8	Feb-28	-				
CO (ppm)	13	-		Red Deer - Riverside	0.3	0.9	Feb-12 22:00	4	S	0.5	Feb-12	0	0	-	100.0%	
CO (ppm) - 8-hr	5			Red Deer - Riverside						0.7	Feb-13	-				

PAMZ Continuous Air Quality Monitoring Data Summary (continued)

THC (ppm)	-	-	-	Caroline	2.0	2.9	Feb-01 10:00	8	W	2.4	Feb-10	-	-	-	100.0%
THC (ppm)	-	-	-	Red Deer - Riverside	2.3	4.0	Feb-04 23:00	1	NNE	2.9	Feb-13	-	-	-	99.1%
THC (ppm)	-	-	-	Red Deer - Lancaster	2.2	3.6	Feb-01 07:00	2	SSE	2.7	Feb-01	-	-	-	99.7%
THC (ppm)	-	-	-	Crossfield-Carstairs	2.2	3.2	Feb-02 06:00	3	SE	2.5	Feb-01	-	-	-	100.0%
CH ₄ (ppm)	-	-	-	Red Deer - Riverside	2.2	3.7	Feb-04 23:00	1	NNE	2.5	Feb-13	-	-	-	99.1%
CH ₄ (ppm)	-	-	-	Red Deer - Lancaster	2.2	3.5	Feb-01 07:00	2	SSE	2.6	Feb-01	-	-	-	99.7%
NMHC (ppm)	-	-	-	Red Deer - Riverside	0.1	0.6	Feb-13 06:00	2	S	0.4	Feb-13	-	-	-	99.1%
NMHC (ppm)	-	-	-	Red Deer - Lancaster	0.0	0.3	Feb-13 04:00	2	SSE	0.1	Feb-13	-	-	-	99.7%
PM _{2.5} (µg/m ³)	80	30	-	Caroline	5.6	41.3	Feb-24 11:00	17	N	21.1	Feb-11	0	0	-	99.9%
PM _{2.5} (µg/m ³)	80	30	-	Red Deer - Riverside	8.2	49.9	Feb-01 23:00	9	NNE	23.1	Feb-12	0	0	-	100.0%
PM _{2.5} (µg/m ³)	80	30	-	Red Deer - Lancaster	12.7	149.4	Feb-10 16:00	4	E	28.1	Feb-12	1	0	-	100.0%
PM _{2.5} (µg/m ³)	80	30	-	Crossfield-Carstairs	13.1	42.7	Feb-11 22:00	23	SSE	28.0	Feb-11	0	0	-	100.0%
Temp (°C)				Caroline	5.6	41.3	Feb-24 11:00			21.1	Feb-11				99.9%
Temp (°C)				Red Deer - Riverside	-7.9	12.8	Feb-23 17:00			5.0	Feb-19				100.0%
Temp (°C)				Red Deer - Lancaster	-2.1	15.2	Feb-23 16:00			9.0	Feb-19				100.0%
Temp (°C)				Crossfield-Carstairs	-6.2	13.1	Feb-13 15:00			4.9	Feb-23				100.0%
RH (%)				Caroline	70.3	98.2	Feb-14 03:00			88.6	Feb-11				100.0%
RH (%)				Red Deer - Riverside	76.8	97.9	Feb-13 07:00			86.6	Feb-05				100.0%
RH (%)				Red Deer - Lancaster	78.8	95.7	Feb-20 09:00			87.9	Feb-17				100.0%
RH (%)				Crossfield-Carstairs	76.7	98.0	Feb-14 08:00			85.9	Feb-11				100.0%
SR (W/m ²)				Caroline	136.4	894.0	Feb-26 14:00			235.4	Feb-26				100.0%
SR (W/m ²)				Red Deer - Lancaster	99.3	639.5	Feb-26 13:00			168.0	Feb-26				100.0%
WSPD v (km/hr)				Caroline	4.0	38.0	Feb-25 01:00			14.0	Feb-28				98.8%
WSPD v (km/hr)				Red Deer - Riverside	1.0	27.0	Feb-25 01:00			9.0	Feb-20				100.0%
WSPD v (km/hr)				Red Deer - Lancaster	1.3	24.0	Feb-24 13:00			13.0	Feb-11				100.0%
WSPD v (km/hr)				Crossfield-Carstairs	2.6	35.0	Feb-26 16:00			21.0	Feb-26				100.0%
WDIR (sector)*				Caroline	NW										98.8%
WDIR (sector)*				Red Deer - Riverside	N										100.0%
WDIR (sector)*				Red Deer - Lancaster	NE										100.0%
WDIR (sector)*				Crossfield-Carstairs	W										100.0%
Note:	* Wind Direction is the predominate direction for the Month														



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Caroline Station

Ambient Air Quality Monitoring
Monthly Summary
Tables, Graphs and Roses

Caroline - Continuous Air Quality Monitoring Station & Equipment Summary

Caroline			
General Station and Equipment Issues:			
Routine monthly calibrations were performed on February 24 th (SO ₂ , NO _x & THC) and February 25 th (TRS, O ₃ , THC & PM _{2.5}).			
Parameter	Make	Model	Notes
SO₂	API	100A	No operational issues observed. Note: large maximum spike on February 18 th reason indeterminate.
TRS	API	100E	No operational issues observed.
NO₂/NO/NO_x	API	200E	No operational issues observed.
O₃	API	400A	No operational issues observed.
PM_{2.5}	Met One	BAM 1020	Sample head cleaned February 25 th . One hour flagged invalid on February 3 rd due to a system error.
THC	TEI	51i	No operational issues observed.
ET	Met One	083D	No operational issues observed.
RH	Met One	083D	No operational issues observed.
SR	Licor	096-1	No operational issues observed.
WSWD	Met One	014A/024A	Eight (8) hours were flagged invalid due to freezing conditions.



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Red Deer Riverside Station

Ambient Air Quality Monitoring

Monthly Summary

Tables, Graphs and Roses

Red Deer Riverside - Continuous Air Quality Monitoring Station & Equipment Summary

Red Deer Riverside			
General Station and Equipment Issues:			
Routine monthly calibrations were performed on February 3 rd (SO ₂ , NO ₂ /NO/NO _x , THC/CH ₄ /NMHC & PM _{2.5}), February 5 th (NO ₂ /NO/NO _x , O ₃ & CO) and February 6 th (H ₂ S).			
<i>Parameter</i>	<i>Make</i>	<i>Model</i>	<i>Notes</i>
SO₂	TEI	43C	No operational issues observed.
H₂S	TEI	45C	No operational issues observed. A second calibration was performed on February 20 th to check on spans as they were starting to drop.
NO₂/NO/NO_x	TEI	42i	Pump was rebuilt on February 3 rd and a second calibration was performed on February 5 th to ensure integrity.
O₃	TEI	49i	Span level setting set high with calibration on February 5 th – setting changed to correct level and span check was performed on February 12 th .
PM_{2.5}	Sharpe 5030	E-905	Sample head cleaned February 3 rd . No operational issues observed.
CO	TEI	48C TL/48i	New analyzer installed on February 6 th . Note: zeros rise throughout month, manufacturer communication states this is normal.
THC/CH₄/NMHC	TEI	55C	No zero/spans February 4 th & 5 th - six (6) hours were flagged for maintenance on February 5 th to check and modify span system.
ET	Met One	064	No operational issues observed.
RH	Met One	064	No operational issues observed.
WS/WD	Ultrasonic Met One	50.5	No operational issues observed.



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Management Zone

Red Deer Lancaster Martha Station

Ambient Air Quality Monitoring
Monthly Summary
Tables, Graphs and Roses

Red Deer Lancaster (Martha) - Continuous Air Quality Monitoring Station & Equipment Summary

Red Deer Lancaster (Martha)			
General Station and Equipment Issues:			
Routine monthly calibrations were performed on February 17 th (THC/CH ₄ /NMHC), February 18 th (SO ₂ , TRS, NO _x , O ₃ & PM _{2.5}) and February 19 th (TRS).			
Parameter	Make	Model	Notes
SO₂	API	100A	No operational issues observed.
TRS	API	100A	Calibration on February 18 th was aborted to allow replaced scrubber beads to condition overnight, full calibration completed on February 19 th .
NO₂/NO/NO_x	API	200A	No operational issues observed.
O₃	API	400A	No operational issues observed.
PM_{2.5}	Met One	BAM 1020	Sample head cleaned February 18 th . There was one (1) 1-hour exceedences of PM _{2.5} : February 10: 16:00 149.4 µg/m ³ ASERD Reference # 294776
THC/CH₄/NMHC	TEI	55C	Spans outside target February 17 (calibration performed), and 21 st , 22 nd & no span on February 24 th – due to line breaking. Span system replaced with calibrator on February 24 th .
ET	Met One	083D-1	No operational issues observed.
RH	Met One	083D-1	No operational issues observed.
SR	LICOR	096-1	No operational issues observed.
WS/WD	Met One	014 / 024	No operational issues observed.



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Parkland Airshed
Management Zone

Crossfield-Carstairs McCoy Portable Station

Ambient Air Quality Monitoring
Monthly Summary
Tables, Graphs and Roses

Crossfield-Carstairs (McCoy) – Continuous Air Quality Monitoring Data Summary

Ambient Air Quality Data Summary for the Month of February 2015																
Parkland Airshed Management Zone						Maximum Recorded Values										
Pollutant (units)	Objectives			Station	Monthly Average	1-hr		24-hr / 8-hr		Exceedence			Operational Time (%)			
	1-hr	24-hr	30-day			Conc	Day	WSPD (km/hr)	WDIR (Sector)	Conc	Day	1-hr		24-hr	30-day	
SO₂ (ppb)	172	48	11	Crossfield-Carstairs	0.7	6.3	Feb-08 08:00	8	NW	3.0	Feb-08	0	0	0	100.0%	
TRS (ppb)	10	3	-	Crossfield-Carstairs	0.1	0.7	Feb-01 10:00	4	SW	0.3	Feb-01	0	0	-	100.0%	
NO₂ (ppb)	159	106	-	Crossfield-Carstairs	6.4	35.1	Feb-04 02:00	16	SSE	15.8	Feb-01	0	0	-	100.0%	
NO (ppb)	-	-	-	Crossfield-Carstairs	1.3	45.1	Feb-01 10:00	4	SW	12.1	Feb-01	-	-	-	100.0%	
NO_x (ppb)	-	-	-	Crossfield-Carstairs	7.7	66.5	Feb-01 10:00	4	SW	28.0	Feb-01	-	-	-	100.0%	
O₃ (ppb)	82	-	-	Crossfield-Carstairs	24.7	44.9	Feb-24 15:00	20	NNW	33.1	Feb-28	0	0	-	100.0%	
O₃ (ppb) - 8-hr				Crossfield-Carstairs						41.8	Feb-28	-	-	-		
THC (ppm)	-	-	-	Crossfield-Carstairs	2.17	3.2	Feb-02 06:00	3	SE	2.5	Feb-01	-	-	-	100.0%	
PM_{2.5} (ug/m³)	80	30	-	Crossfield-Carstairs	13.1	42.7	Feb-11 22:00	23	SSE	28.0	Feb-11	0	0	-	100.0%	
Temp (°C)	-	-	-	Crossfield-Carstairs	-6.2	13.1	Feb-13 15:00			4.9	Feb-23				100.0%	
RH (%)	-	-	-	Crossfield-Carstairs	76.7	98.0	Feb-14 08:00			85.9	Feb-11				100.0%	
WSPD v (km/hr)	-	-	-	Crossfield-Carstairs	2.6	35.0	Feb-26 16:00			21.0	Feb-26				100.0%	
WDIR (sector)	-	-	-	Crossfield-Carstairs	W										100.0%	

Crossfield-Carstairs (McCoy) - Continuous Air Quality Monitoring Station & Equipment Summary

Crossfield-Carstairs (McCoy)			
General Station and Equipment Issues:			
Routine monthly calibrations were performed on February 18 th (SO ₂ , TRS & NO _x) and February 19 th (O ₃ , THC & PM _{2.5}).			
Parameter	Make	Model	Notes
SO₂	API	100A	No operational issues observed.
TRS	API	T100	No operational issues observed.
NO₂/NO/NO_x	API	T200	No operational issues observed.
O₃	API	T400	No operational issues observed.
PM_{2.5}	Met One	BAM 1020	Sample head cleaned February 19 th . No operational issues observed.
THC	TEI	51C-LT	Pressure switch replaced on zero air generator on February 10 th , followed by a zero/span check. No other operational issues observed.
ET	Met One	093	No operational issues observed.
RH	Met One	093	No operational issues observed.
WS/WD	Met One	010 / 020	No operational issues observed.



PAMZ Passive Network

Monthly Summary
Tables and Bubble Charts