



**PAMZ** | Parkland Airshed  
Management Zone

# **Parkland Airshed Management Zone**

## **Ambient Air Monitoring Network**

### **August 2014**

**Continuous Ambient Air Quality Monitoring Program  
Monthly Report**

**Operations and Maintenance:**



**Data Validation and Report:**





September 30, 2014

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 – August 2014 – Ambient Air Quality  
Monitoring Report**

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Enclosed is the Parkland Airshed Management Zone (PAMZ) Ambient Air Monitoring Network Report for the month of **August 2014**. This report is submitted by PAMZ on behalf of the following Member Companies' Facilities, to satisfy the requirement contained in their Operating Approvals:

<b>Company</b>	<b>Facility</b>	<b>Approval No.</b>
BP Canada Energy Company	North Caroline	10158-01-00
BP Canada Energy Company	South Caroline	1071-01-00
Bonavista Petroleum Limited	Carstairs-Crossfield	351-02-00
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 FOCUS Corporation. 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 SO<sub>2</sub>, H<sub>2</sub>S/TRS, NO<sub>2</sub>, CO, and O<sub>3</sub> were within all applicable Provincial and National objectives for the Caroline, Red Deer Riverside, Ponoka and James River East continuous air monitoring sites.

The concentrations of the reported air quality parameter of PM<sub>2.5</sub> were within the applicable Provincial and National objectives for the Red Deer Riverside, Ponoka and James River East continuous air monitoring sites; however there was one (1) 1-hour exceedence of PM<sub>2.5</sub> at the Caroline continuous air monitoring site:

August 6: 13:00                      100 µg/m<sup>3</sup>                      **ASERD Reference # 287853**

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.

**Ponoka (Martha Station):**

- ◆ Located in the town of Ponoka; (52° 40'48" N and 113° 34' 58" W). The site is a mobile site and from April 3<sup>rd</sup> to the end of September 2014; the Martha station will be at the Ponoka site.

**James River East (McCoy Station):**

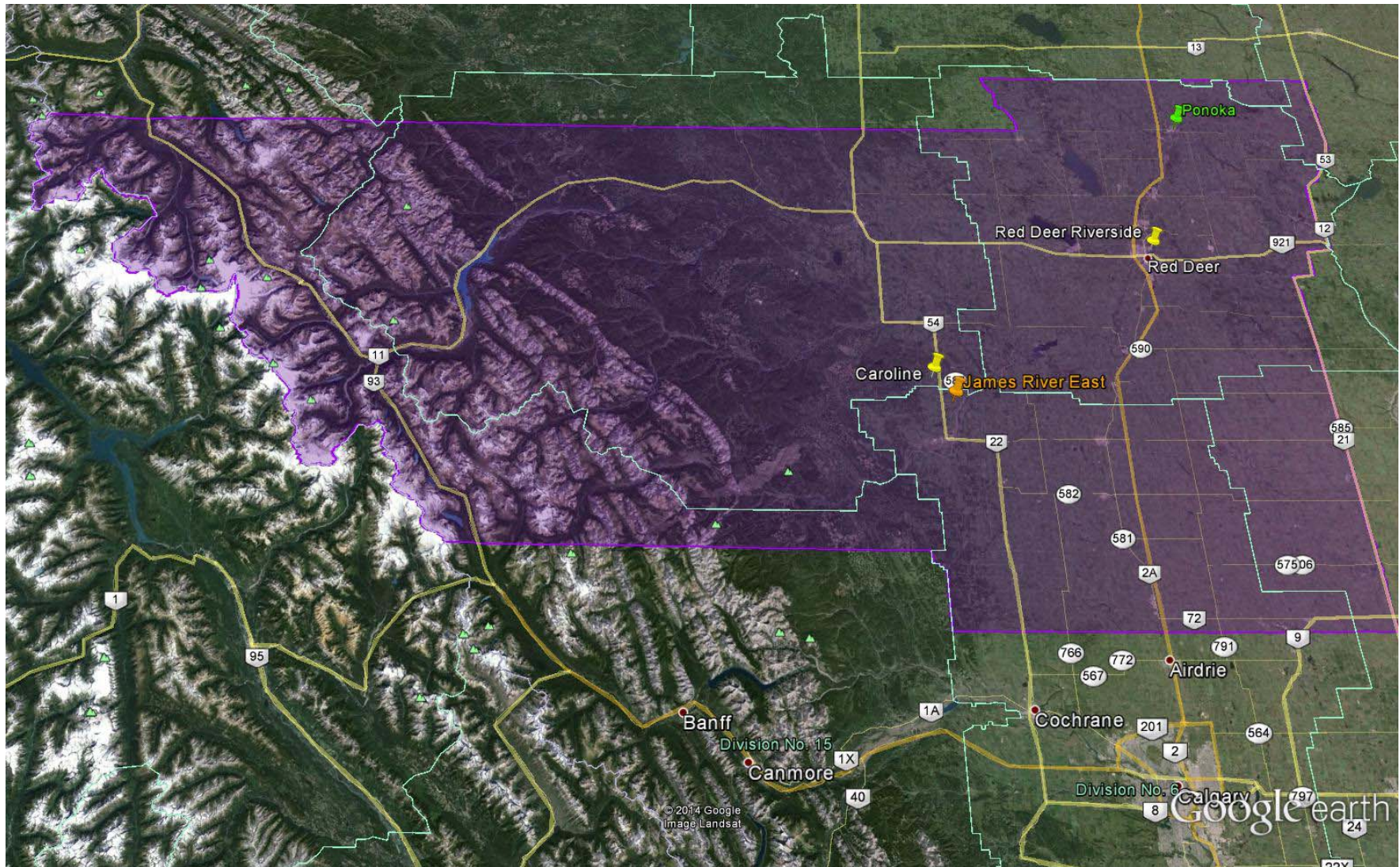
- ◆ Located at the Overgaard residence, approximately 6 km south southeast of the James River Bridge on Highway 587: at SE 3-34-5 W5M (51° 53' 5.09"N and 114° 37'38.57" W). The site is a mobile site and from July 4<sup>th</sup>, 2014 to end of September, 2014 the McCoy station will be at the James River East 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 SO<sub>2</sub> 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 August 2014**

## PAMZ Continuous Air Quality Monitoring Data Summary

Ambient Air Quality Data Summary for the Month of August 2014															
Parkland Airshed Management Zone					Maximum Recorded Values										Operational Time (%)
					1-hr				24-hr / 8-hr						
Pollutant (units)	Objectives			Station	Monthly Average	Conc	Day	WSPD (km/hr)	WDIR (Sector)	Conc	Day	Exceedence			
	1-hr	24-hr	30-day									1-hr	24-hr	30-day	
SO <sub>2</sub> (ppb)	172	48	11	Ponoka	0.4	7.5	Aug-19 15:00	12	NNW	1.5	Aug-19	0	0	0	99.7%
SO <sub>2</sub> (ppb)	172	48	11	Caroline	0.4	16.3	Aug-22 09:00	8	ENE	2.4	Aug-22	0	0	0	99.7%
SO <sub>2</sub> (ppb)	172	48	11	Red Deer - Riverside	0.1	3.1	Aug-21 21:00	2	ENE	0.4	Aug-21	0	0	0	100.0%
SO <sub>2</sub> (ppb)	172	48	11	James River East	0.3	3.1	Aug-21 03:00	5	NW	0.7	Aug-21	0	0	0	96.4%
TRS (ppb)	10	3	-	Ponoka	0.4	4.3	Aug-12 07:00	0	E	0.9	Aug-22	0	0	-	99.9%
TRS (ppb)	10	3	-	Caroline	0.3	1.3	Aug-02 08:00	16	SE	0.6	Aug-02	0	0	-	100.0%
TRS (ppb)	10	3	-	James River East	0.1	1.1	Aug-02 07:00	11	SE	0.3	Aug-02	0	0	-	96.4%
H <sub>2</sub> S (ppb)	10	3	-	Red Deer - Riverside	0.3	2.2	Aug-24 07:00	1	NNW	0.5	Aug-24	0	0	-	88.2%
NO <sub>2</sub> (ppb)	159	106	-	Ponoka	4.5	15.5	Aug-26 03:00	2	S	7.5	Aug-14	0	0	-	99.9%
NO (ppb)	-	-	-	Ponoka	1.9	27.5	Aug-12 07:00	0	E	4.0	Aug-08	-	-	-	99.9%
NO <sub>x</sub> (ppb)	-	-	-	Ponoka	6.4	40.9	Aug-12 07:00	0	E	10.4	Aug-19	-	-	-	99.9%
NO <sub>2</sub> (ppb)	159	106	-	Caroline	1.1	5.6	Aug-21 00:00	7	WNW	1.9	Aug-13	0	0	-	99.7%
NO (ppb)	-	-	-	Caroline	0.3	2.8	Aug-23 10:00	12	SE	0.5	Aug-23	-	-	-	99.7%
NO <sub>x</sub> (ppb)	-	-	-	Caroline	1.4	5.9	Aug-28 00:00	6	NW	2.3	Aug-19	-	-	-	99.7%
NO <sub>2</sub> (ppb)	159	106	-	Red Deer - Riverside	5.2	15.2	Aug-01 05:00	5	NNW	9.2	Aug-20	0	0	-	100.0%
NO (ppb)	-	-	-	Red Deer - Riverside	1.3	25.2	Aug-05 08:00	1	SW	3.4	Aug-05	-	-	-	100.0%
NO <sub>x</sub> (ppb)	-	-	-	Red Deer - Riverside	6.4	37.0	Aug-05 08:00	1	SW	11.5	Aug-20	-	-	-	100.0%
NO <sub>2</sub> (ppb)	159	106	-	James River East	1.6	4.9	Aug-23 21:00	3	SE	2.3	Aug-06	0	0	-	96.4%
NO (ppb)	-	-	-	James River East	0.2	3.9	Aug-23 09:00	4	SE	0.5	Aug-23	-	-	-	96.4%
NO <sub>x</sub> (ppb)	-	-	-	James River East	1.9	6.8	Aug-23 09:00	4	SE	2.5	Aug-06	-	-	-	96.4%
O <sub>3</sub> (ppb)	82	-	-	Ponoka	23.1	58.2	Aug-11 16:00	3	SSW	34.2	Aug-06	0	0	-	99.9%
O <sub>3</sub> (ppb) - 8-hr	0			Ponoka						0.0	Aug-22	-			
O <sub>3</sub> (ppb)	82	-	-	Caroline	27.1	59.2	Aug-12 15:00	19	SE	37.6	Aug-06	0	0	-	99.7%
O <sub>3</sub> (ppb) - 8-hr	65			Caroline						48.4	Aug-05	-			
O <sub>3</sub> (ppb)	82	-	-	Red Deer - Riverside	18.0	44.5	Aug-14 12:00	3	NNW	23.9	Aug-02	0	-	-	100.0%
O <sub>3</sub> (ppb) - 8-hr	65			Red Deer - Riverside						36.7	Aug-06	-			
O <sub>3</sub> (ppb)	82	-	-	James River East	24.2	52.8	Aug-03 13:00	5	NNE	32.7	Aug-01	0	0	-	95.3%
O <sub>3</sub> (ppb) - 8-hr	65			James River East						46.0	Aug-03	-			
CO (ppm)	13	-		Red Deer - Riverside	0.1	0.3	Aug-26 23:00	1	S	0.1	Aug-14	0	0	-	100.0%
CO (ppm) - 8-hr	5			Red Deer - Riverside						0.2	Aug-27	-			

## PAMZ Continuous Air Quality Monitoring Data Summary (continued)

THC (ppm)	-	-	-	Ponoka	2.0	4.0	Aug-27 15:00	6	NE	2.2	Aug-25	-	-	-	100.0%
THC (ppm)	-	-	-	Caroline	2.1	2.5	Aug-19 04:00	6	N	2.3	Aug-13	-	-	-	95.4%
THC (ppm)	-	-	-	Red Deer - Riverside	2.2	6.5	Aug-12 03:00	0	SE	2.6	Aug-24	-	-	-	99.9%
THC (ppm)	-	-	-	James River East	2.1	3.2	Aug-24 06:00	2	WNW	2.4	Aug-24	-	-	-	93.4%
CH <sub>4</sub> (ppm)	-	-	-	Ponoka	2.0	2.9	Aug-18 21:00	n/a	n/a	2.2	Aug-25	-	-	-	100.0%
CH <sub>4</sub> (ppm)	-	-	-	Red Deer - Riverside	2.0	5.0	Aug-12 03:00	0	SE	2.3	Aug-24	-	-	-	99.9%
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	-	Ponoka	14.4	44.1	Aug-17 12:00	13	NW	24.8	Aug-14	0	0	-	99.5%
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	-	Caroline	10.6	99.5	Aug-06 13:00	7	NE	24.0	Aug-14	1	0	-	99.5%
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	-	Red Deer - Riverside	8.9	34.4	Sep-01 00:00	2	S	20.1	Aug-14	0	0	-	100.0%
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	-	James River East	16.4	51.4	Aug-18 21:00	3	NW	28.9	Aug-14	0	0	-	96.4%
Temp (°C)				Ponoka	20.0	31.2	Aug-11 17:00			25.2	Aug-13				100.0%
Temp (°C)				Caroline	15.2	25.9	Aug-11 17:00			21.1	Aug-13				100.0%
Temp (°C)				Red Deer - Riverside	17.2	32.0	Aug-11 18:00			23.1	Aug-13				100.0%
Temp (°C)				James River East	14.8	27.3	Aug-13 16:00			19.9	Aug-14				96.4%
RH (%)				Ponoka	78.2	100.0	Aug-21 07:00			93.9	Aug-08				100.0%
RH (%)				Caroline	75.2	100.0	Aug-05 01:00			89.8	Aug-22				100.0%
RH (%)				Red Deer - Riverside	74.8	100.0	Aug-11 18:00			93.5	Aug-08				100.0%
RH (%)				James River East	81.5	100.0	Aug-05 00:00			93.8	Aug-08				96.4%
SR (W/m <sup>2</sup> )				Ponoka	253.5	1031.0	Aug-01 13:00			365.2	Aug-09				100.0%
SR (W/m <sup>2</sup> )				Caroline	342.0	1473.5	Aug-02 13:00			506.7	Aug-05				100.0%
WSPD v (km/hr)				Ponoka	0.3	17.0	Aug-08 17:00			6.0	Aug-02				96.6%
WSPD v (km/hr)				Caroline	0.9	25.0	Aug-06 22:00			11.0	Aug-07				99.5%
WSPD v (km/hr)				Red Deer - Riverside	0.4	21.0	Aug-08 17:00			7.0	Aug-20				100.0%
WSPD v (km/hr)				James River East	0.9	22.0	Aug-02 17:00			10.0	Aug-17				96.4%
WDIR (sector)*				Ponoka	NNW										96.6%
WDIR (sector)*				Caroline	W										99.5%
WDIR (sector)*				Red Deer - Riverside	ESE										100.0%
WDIR (sector)*				James River East	WSW										96.4%
<b>Note:</b>	* Wind Direction is the predominate direction for the Month														



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Management Zone

# Caroline Station

Ambient Air Quality Monitoring  
Monthly Summary  
Tables, Graphs and Roses





# Caroline - Continuous Air Quality Monitoring Station & Equipment Summary

Caroline			
<b>General Station and Equipment Issues:</b>			
Routine monthly calibrations were performed on August 12 <sup>th</sup> (SO <sub>2</sub> , NO <sub>x</sub> & THC) and August 13 <sup>th</sup> (TRS, O <sub>3</sub> & PM <sub>2.5</sub> ).			
Parameter	Make	Model	Notes
<b>SO<sub>2</sub></b>	API	100A	Two (2) hours were flagged for maintenance on August 13 <sup>th</sup> – manifold cleaned. No span on August 29 <sup>th</sup> – span relay left on.
<b>TRS</b>	API	100E	No span on August 29 <sup>th</sup> – span relay left on.
<b>NO<sub>2</sub>/NO/NO<sub>x</sub></b>	API	200A	Two (2) hours were flagged for maintenance on August 13 <sup>th</sup> – manifold cleaned. No span on August 29 <sup>th</sup> – span relay left on.
<b>O<sub>3</sub></b>	API	400A	Two (2) hours were flagged for maintenance on August 13 <sup>th</sup> – manifold cleaned. No span on August 29 <sup>th</sup> – span relay left on.
<b>PM<sub>2.5</sub></b>	Met One	BAM 1020	Sample head cleaned August 13 <sup>th</sup> . Two (2) hours flagged maintenance on August 13 <sup>th</sup> . There was one (1) 1-hour PM <sub>2.5</sub> exceedence: August 6: 13:00      100 µg/m <sup>3</sup> <b>ASERD Reference # 287853</b>
<b>THC</b>	TEI	51i	Two (2) hours were flagged for maintenance on August 13 <sup>th</sup> – manifold cleaned. Thirty-two (32) hours were flagged invalid on August 17 <sup>th</sup> & 18 <sup>th</sup> due to pump failure (spans below target range) – pump rebuilt August 18 <sup>th</sup> . No span on August 29 <sup>th</sup> – span relay left on.
<b>ET</b>	Met One	083D	No operational issues observed.
<b>RH</b>	Met One	083D	No operational issues observed.
<b>SR</b>	Licor	096-1	No operational issues observed.
<b>WS/WD</b>	Met One	014A/024A	Four (4) hours were flagged invalid due to flatlining – reason unknown (possibly due to moisture).



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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

<b>Red Deer Riverside</b>			
<b>General Station and Equipment Issues:</b>			
Routine monthly calibrations were performed on August 18 <sup>th</sup> (H <sub>2</sub> S), August 19 <sup>th</sup> (SO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> & CO), August 20 <sup>th</sup> (THC/CH <sub>4</sub> ) and August 21 <sup>st</sup> (PM <sub>2.5</sub> ).			
<i>Parameter</i>	<i>Make</i>	<i>Model</i>	<i>Notes</i>
<b>SO<sub>2</sub></b>	TEI	43C	No operational issues noted.
<b>H<sub>2</sub>S</b>	TEI	45C	Total of eighty-eight (88) hours were flagged for maintenance in August due to span issues. The analyzer was replaced on August 18 <sup>th</sup> . Less than 90% operational. <b>ASERD Reference # 289529</b>
<b>NO<sub>2</sub>/NO/NO<sub>x</sub></b>	TEI	42i	No operational issues noted.
<b>O<sub>3</sub></b>	TEI	49c TEI/49i	No operational issues noted.
<b>PM<sub>2.5</sub></b>	Sharpe 5030	E-905	Sample head cleaned August 21 <sup>st</sup> . No operational issues noted.
<b>CO</b>	TEI	48C TL	No operational issues noted.
<b>THC / CH<sub>4</sub></b>	TEI	55C	One (1) hour was flagged invalid on August 16 <sup>th</sup> due to tech activity. No other operational issues noted.
<b>ET</b>	Met One	064	No operational issues noted.
<b>RH</b>	Met One	064	No operational issues noted.
<b>WS/WD</b>	Ultrasonic Met One	50.5	No operational issues noted.



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Management Zone

# Ponoka

## Martha Portable Station

Ambient Air Quality Monitoring  
Monthly Summary  
Tables, Graphs and Roses



## Ponoka (Martha) - Continuous Air Quality Monitoring Station & Equipment Summary

<b>Ponoka (Martha)</b>			
<b>General Station and Equipment Issues:</b>			
Routine monthly calibrations were performed on August 20 <sup>th</sup> (SO <sub>2</sub> & NO <sub>x</sub> ) and August 21 <sup>st</sup> (TRS, O <sub>3</sub> , PM <sub>2.5</sub> & THC/CH <sub>4</sub> ).			
Parameter	Make	Model	Notes
<b>SO<sub>2</sub></b>	API	100A	Two (2) hours were flagged invalid due to power bumps.
<b>TRS</b>	API	100A	One (1) hour was flagged invalid due to a power bump.
<b>NO<sub>2</sub>/NO/NO<sub>x</sub></b>	API	200A	One (1) hour was flagged invalid due to a power bump.
<b>O<sub>3</sub></b>	API	400A	One (1) hour was flagged invalid due to a power bump.
<b>PM<sub>2.5</sub></b>	Met One	BAM 1020	Four (4) hours were flagged invalid due to a power bump.
<b>THC/CH<sub>4</sub></b>	TEI	55C	One (1) hour was flagged invalid due to power bump. A large maximum spike occurred on August 27 <sup>th</sup> – probable vehicle idling close by.
<b>ET</b>	Met One	083D-1	No operational issues observed.
<b>RH</b>	Met One	083D-1	No operational issues observed.
<b>SR</b>	LICOR	096-1	No operational issues observed.
<b>WS/WD</b>	Met One	014 / 024	Twenty-five (25) hours were flagged invalid due to sensor flatlining, possibly due to moisture, bearings changed out in September.



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## James River East

# McCoy Portable Station

Ambient Air Quality Monitoring  
Monthly Summary  
Tables, Graphs and Roses



# James River East (McCoy) – Continuous Air Quality Monitoring Data Summary

<b>Ambient Air Quality Data Summary for the Month of August 2014</b>																	
<b>Parkland Airshed Management Zone</b>					<b>Maximum Recorded Values</b>											<b>Operational Time (%)</b>	
					1-hr						24-hr / 8-hr						<b>Exceedence</b>
<b>Pollutant (units)</b>	<b>Objectives</b>			<b>Station</b>	<b>Monthly Average</b>	Conc	Day	WSPD (km/hr)	WDIR (Sector)	Conc	Day	1-hr	24-hr	30-day			
	1-hr	24-hr	30-day														
<b>SO<sub>2</sub> (ppb)</b>	172	48	11	James River East	0.3	3.1	Aug-21 03:00	5	NW	0.7	Aug-21	0	0	0			96.4%
<b>TRS (ppb)</b>	10	3	-	James River East	0.1	1.1	Aug-02 07:00	11	SE	0.3	Aug-02	0	0	-			96.4%
<b>NO<sub>2</sub> (ppb)</b>	159	106	-	James River East	1.6	4.9	Aug-23 21:00	3	SE	2.3	Aug-06	0	0	-			96.4%
<b>NO (ppb)</b>	-	-	-	James River East	0.2	3.9	Aug-23 09:00	4	SE	0.5	Aug-23	-	-	-			96.4%
<b>NO<sub>x</sub> (ppb)</b>	-	-	-	James River East	1.9	6.8	Aug-23 09:00	4	SE	2.5	Aug-06	-	-	-			96.4%
<b>O<sub>3</sub> (ppb)</b>	82	-	-	James River East	24.2	52.8	Aug-03 13:00	5	NNE	32.7	Aug-01	0	0	-			95.3%
<b>O<sub>3</sub> (ppb) - 8-hr</b>				James River East						46.0	Aug-03	-					
<b>THC (ppm)</b>	-	-	-	James River East	2.12	3.2	Aug-24 06:00	2	WNW	2.4	Aug-24	-	-	-			93.4%
<b>PM<sub>2.5</sub> (ug/m<sup>3</sup>)</b>	80	30	-	James River East	16.4	51.4	Aug-18 21:00	3	NW	28.9	Aug-14	0	0	-			96.4%
<b>Temp (°C)</b>	-	-	-	James River East	14.8	27.3	Aug-13 16:00			19.9	Aug-14						96.4%
<b>RH (%)</b>	-	-	-	James River East	81.5	100.0	Aug-05 00:00			93.8	Aug-08						96.4%
<b>WSPD v (km/hr)</b>	-	-	-	James River East	0.9	22.0	Aug-02 17:00			10.0	Aug-17						96.4%
<b>WDIR (sector)</b>	-	-	-	James River East	WSW												96.4%

# James River East (McCoy) - Continuous Air Quality Monitoring Station & Equipment Summary

James River East (McCoy)			
<b>General Station and Equipment Issues:</b>			
Routine monthly calibrations were performed on August 15 <sup>th</sup> (TRS, THC & PM <sub>2.5</sub> ) and August 19 <sup>th</sup> (SO <sub>2</sub> , NO <sub>x</sub> & O <sub>3</sub> ). A power failure on August 12 <sup>th</sup> resulted in twenty-seven (27) hours of invalid data for all parameters except THC which had forty-nine (49) hours of invalid data.			
Parameter	Make	Model	Notes
<b>SO<sub>2</sub></b>	API	100A	No operational issues observed, except above noted power failure.
<b>TRS</b>	API	T100	No operational issues observed, except above noted power failure.
<b>NO<sub>2</sub>/NO/NO<sub>x</sub></b>	API	T200	No operational issues observed, except above noted power failure.
<b>O<sub>3</sub></b>	API	T400	Twenty-seven (27) hours were flagged due to above noted power failure. Eight (8) hours were flagged invalid due to some intermittent spiking – reason under investigation but suspect a valve issue.
<b>PM<sub>2.5</sub></b>	Met One	BAM 1020	Sample head cleaned August 15 <sup>th</sup> . Twenty-seven (27) hours were flagged due to above noted power failure.
<b>THC</b>	TEI	51C-LT	No operational issues observed, except above noted power failure.
<b>ET</b>	Met One	093	No operational issues observed, except above noted power failure.
<b>RH</b>	Met One	093	No operational issues observed, except above noted power failure.
<b>WS/WD</b>	Met One	010 / 020	No operational issues observed, except above noted power failure.



# PAMZ Passive Network

Monthly Summary  
Tables and Bubble Charts