



Peace Airshed Zone Association

Ambient Air Monitoring Network Summary

**Continuous Ambient Air Quality Monitoring Program
Annual Report
2011**

Operations and Reporting

FOCUS
AIR QUALITY MONITORING

Peace Airshed Zone Association 2011 Annual Ambient Air Monitoring Report

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February 3rd, 2012

Alberta Environment
 11th Floor, Oxbridge Place
 9820-106 Street
 Edmonton Alberta T5K 2J6

RE: Peace Airshed Zone Association (PAZA) – 2011 Annual Ambient Air Monitoring Report

Please find enclosed for your review the Peace Airshed Zone Association (PAZA) 2011 Ambient Air Monitoring Network Annual Report.

This report is submitted by PAZA on behalf of the industrial member companies to satisfy the requirements of the following facility Operating Approvals:

Company	Facility	LSD	AENV Approval Number
Advantage Oil & Gas Ltd.	Glacier	05-02-076-13-W6	262479-00-00
AltaGas Ltd.	Pouce Coupe	03-03-081-13-W6	247673-00-00
	Ante Creek	02-26-068-25-W5	266694-00-00
	Gordondale	16-31-78-11-W6M	287474-00-00
Barrick Energy Inc.	Sturgeon/Valleyview	02-02-069-22-W5	1633-02-00
Birchcliff Energy Ltd.	Pouce Coupe	03-22-078-12-W6	252529-00-00
Bonavista Energy Corporation	Rycroft	08-25-077-06-W6	11351-02-00
	Spirit River	08-34-077-06-W6	11096-02-00
Canadian Natural Resources Limited	Bonanza	11-25-081-11-W6	29-01-01
	Progress/Gordondale	01-01-077-10-W6	10036-02-00
	Gold Creek	13-26-067-05-W6	10446-02-00
	Teepee Creek	SE-2-074-04-W6	1635-02-02

Conocophillips Canada Energy Partnership	Wembley	06-19-073-08-W6	212-01-00
Devon Canada	Tangent	16-20-080-24-W5	11346-02-00
	NW Belloy (Dunvegan)	16-36-079-03-W6	9810-02-00
	Eaglesham (South)	02-14-077-25-W5	47669-01-00
	Puskwaskau	03-26-074-01-W6	17524-01-00
	North Normanville	03-36-079-23-W5	47455-01-00
	West Culp	05-34-078-25-W6	136284-00-00
	Cecil	08-15-084-08-W6	10032-02-00
EnCana Corporation	Hythe Brainard	11-18-074-12-W6	10910-02-02
	Sexsmith	04-08-075-07-W6	10002-01-00
Galleon Energy Inc.	Eaglesham	01-25-076-01-W6	241532-00-00
	Kakut	14-12-075-03-W6	248469-00-01
	Donnelly	06-01-077-21-W5	87-02-00
Grande Prairie Generation Inc.	Northern Prairie Power Project	04-19-073-08-W6	238762-00-02
Longview Oil Corp.	Sunset House	06-22-70-20-W5	138884-01-00
Penn West Petroleum Ltd.	Tangent	13-29-080-23-W5	1746-02-01
	Pouce Coupe	16-07-078-11-W6	614-01-00
Spectra Energy Midstream Corporation	Fourth Creek	16-11-082-09-W6	263-01-00
Suncor Energy Inc.	Progress	07-22-078-09-W6	11428-02-00
Taq North Ltd.	Valhalla	13-21-076-09-W6	17620-01-01
Weyerhaeuser Canada	Grande Prairie Pulp and Wood Plant	01-14-070-05-W6	113-02-00

The PAZA network consists of six continuous air monitoring stations including Henry Pirker (Grande Prairie), Evergreen Park, Smoky Heights, Beaverlodge, Valleyview and a portable station. In 2011, the portable station was located in Bonanza and will be referred to as the Bonanza-Portable in this report. This station was decommissioned on June 30th, 2011. The portable station was relocated to Sunset House in December 2011. Reporting will commence for this station in January 2012.

There were no 1-hour, 24-hour or annual averages of sulphur dioxide, nitrogen dioxide, ozone, carbon monoxide, or hydrogen sulfide above the Alberta Ambient Air Quality Objectives (AAAQO).

There were fifty-seven (57) 1-hr averages of PM_{2.5} above the Alberta Ambient Air Quality Guideline (AAAQG) of 80 µg/m³ and eight (8) 24-hr average above the AAAQO of 30 µg/m³:

	Date	Time	Location	Recorded Concentration (µg/m ³)
One (1) 1-hr average PM _{2.5}	28-Mar	20:00	Smoky Heights	183
One (1) 1-hr average PM _{2.5}	8-Apr	14:00	Evergreen Park	81
One (1) 1-hr average PM _{2.5}	11-Apr	14:00	Evergreen Park	92
One (1) 1-hr average PM _{2.5}	11-Apr	15:00	Evergreen Park	151
One (1) 1-hr average PM _{2.5}	11-Apr	16:00	Evergreen Park	185
One (1) 1-hr average PM _{2.5}	3-May	9:00	Evergreen Park	141
One (1) 1-hr average PM _{2.5}	3-May	10:00	Evergreen Park	296
One (1) 1-hr average PM _{2.5}	3-May	11:00	Evergreen Park	337
One (1) 1-hr average PM _{2.5}	3-May	12:00	Evergreen Park	130
One (1) 1-hr average PM _{2.5}	3-May	14:00	Evergreen Park	89
One (1) 1-hr average PM _{2.5}	23-May	4:00	Smoky Heights	124
One (1) 1-hr average PM _{2.5}	23-May	5:00	Beaverlodge	119
One (1) 1-hr average PM _{2.5}	23-May	5:00	Evergreen Park	84
One (1) 1-hr average PM _{2.5}	23-May	5:00	Henry Pirker	89
One (1) 1-hr average PM _{2.5}	23-May	5:00	Smoky Heights	96
One (1) 1-hr average PM _{2.5}	23-May	6:00	Beaverlodge	149
One (1) 1-hr average PM _{2.5}	23-May	6:00	Evergreen Park	111
One (1) 1-hr average PM _{2.5}	23-May	6:00	Henry Pirker	132
One (1) 1-hr average PM _{2.5}	23-May	7:00	Beaverlodge	134
One (1) 1-hr average PM _{2.5}	23-May	7:00	Evergreen Park	88
One (1) 1-hr average PM _{2.5}	23-May	7:00	Henry Pirker	108
One (1) 1-hr average PM _{2.5}	23-May	8:00	Beaverlodge	114
One (1) 1-hr average PM _{2.5}	23-May	8:00	Henry Pirker	84
One (1) 1-hr average PM _{2.5}	23-May	9:00	Beaverlodge	92

	Date	Time	Location	Recorded Concentration ($\mu\text{g}/\text{m}^3$)
One (1) 1-hr average PM _{2.5}	23-May	10:00	Beaverlodge	83
One (1) 1-hr average PM _{2.5}	28-May	5:00	Smoky Heights	140
One (1) 1-hr average PM _{2.5}	28-May	6:00	Evergreen Park	86
One (1) 1-hr average PM _{2.5}	28-May	6:00	Henry Pirker	127
One (1) 1-hr average PM _{2.5}	28-May	6:00	Smoky Heights	117
One (1) 1-hr average PM _{2.5}	28-May	7:00	Beaverlodge	119
One (1) 1-hr average PM _{2.5}	28-May	7:00	Evergreen Park	141
One (1) 1-hr average PM _{2.5}	28-May	7:00	Henry Pirker	185
One (1) 1-hr average PM _{2.5}	28-May	7:00	Smoky Heights	116
One (1) 1-hr average PM _{2.5}	28-May	8:00	Beaverlodge	162
One (1) 1-hr average PM _{2.5}	28-May	8:00	Evergreen Park	166
One (1) 1-hr average PM _{2.5}	28-May	8:00	Henry Pirker	231
One (1) 1-hr average PM _{2.5}	28-May	8:00	Smoky Heights	114
One (1) 1-hr average PM _{2.5}	28-May	9:00	Beaverlodge	179
One (1) 1-hr average PM _{2.5}	28-May	9:00	Evergreen Park	146
One (1) 1-hr average PM _{2.5}	28-May	9:00	Henry Pirker	247
One (1) 1-hr average PM _{2.5}	28-May	9:00	Smoky Heights	138
One (1) 1-hr average PM _{2.5}	28-May	10:00	Beaverlodge	181
One (1) 1-hr average PM _{2.5}	28-May	10:00	Evergreen Park	159
One (1) 1-hr average PM _{2.5}	28-May	10:00	Henry Pirker	235
One (1) 1-hr average PM _{2.5}	28-May	10:00	Smoky Heights	153
One (1) 1-hr average PM _{2.5}	28-May	11:00	Beaverlodge	163
One (1) 1-hr average PM _{2.5}	28-May	11:00	Evergreen Park	116
One (1) 1-hr average PM _{2.5}	28-May	11:00	Henry Pirker	197
One (1) 1-hr average PM _{2.5}	28-May	11:00	Smoky Heights	115
One (1) 1-hr average PM _{2.5}	28-May	12:00	Beaverlodge	132
One (1) 1-hr average PM _{2.5}	28-May	12:00	Smoky Heights	84
One (1) 1-hr average PM _{2.5}	28-May	13:00	Evergreen Park	83
One (1) 1-hr average PM _{2.5}	28-May	13:00	Henry Pirker	110
One (1) 1-hr average PM _{2.5}	28-May	14:00	Beaverlodge	87
One (1) 1-hr average PM _{2.5}	28-May	14:00	Henry Pirker	82
One (1) 1-hr average PM _{2.5}	28-May	0:00	Evergreen Park	113
One (1) 1-hr average PM _{2.5}	26-Oct	17:00	Evergreen Park	93

	Date	Location	Recorded Concentration (µg/m ³)
One (1) 24-hr average PM _{2.5}	11-Apr	Evergreen Park	33.7
One (1) 24-hr average PM _{2.5}	23-May	Beaverlodge	50.7
One (1) 24-hr average PM _{2.5}	28-May	Beaverlodge	84.8
One (1) 24-hr average PM _{2.5}	3-May	Evergreen Park	61.1
One (1) 24-hr average PM _{2.5}	23-May	Henry Pirker	37.3
One (1) 24-hr average PM _{2.5}	28-May	Evergreen Park	67.6
One (1) 24-hr average PM _{2.5}	28-May	Henry Pirker	90.6
One (1) 24-hr average PM _{2.5}	28-May	Smoky Heights	58.3

The passive monitoring network consists of forty-four (44) samplers. The parameters measured at each site are sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and ozone (O₃). There were no annual averages of the sulphur dioxide, nitrogen dioxide, or ozone above the AAAQO.

Figure 1 shows the location of the continuous monitoring sites, and Figure 2 shows the location of the passive monitoring sites.

Additional information about PAZA, including its membership, objectives and details on the monitoring network are included on the web at <http://www.PAZA.ca/>.

We trust that the report satisfies your requirements and if you have any questions or concerns please contact Shelly Pruden, PAZA Program Manager at 780.833.4343 or 780.882.4071

Sincerely,

On Behalf of the Peace Airshed Zone Association,



Shelly Pruden
Program Manager



Patrick Andersen, B.Sc.
FOCUS AQM Data Specialist



Jeff Cooper, C.Tech.
AQM Operations Manager

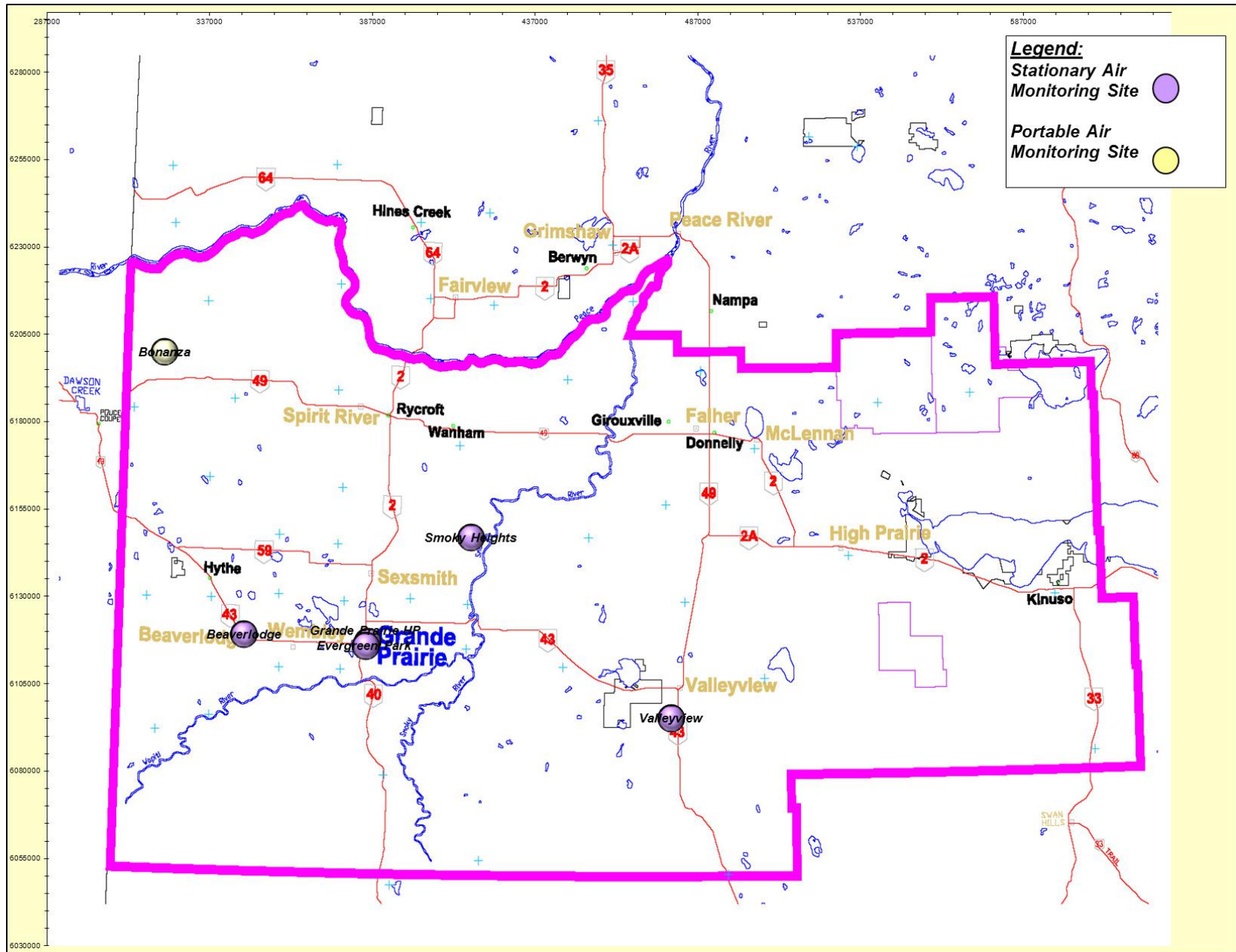


Figure 1. Peace Airshed Zone Association – Continuous Air Monitoring Network

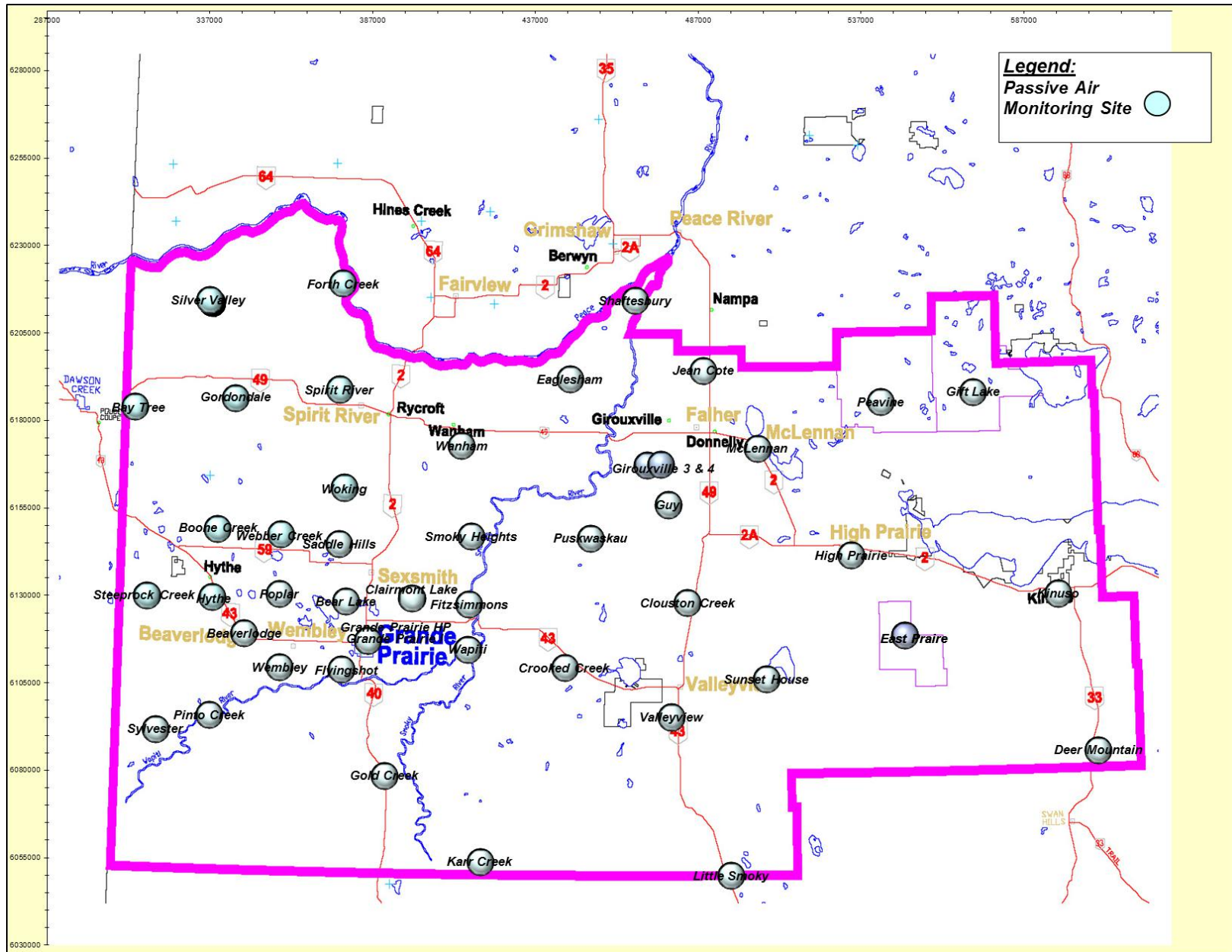


Figure 2. Peace Airshed Zone Association – Passive Air Monitoring Network

PAZA

HENRY PIRKER

CONTINUOUS AMBIENT AIR MONITORING STATION

2011

ANNUAL SUMMARY TABLES

Table 1. Henry Pirker - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Henry Pirker	0.27	2.07	Nov 21	9.44	Nov 21 23:00	99.9	0	0
Nitrogen Dioxide NO₂ measured in ppb	Henry Pirker	8.95	32.48	Jan 03	53.56	Mar 17 09:00	99.8	0	0
Ozone O₃ measured in ppb	Henry Pirker	24.5	47.70	May 15	64.33	Jun 01 18:00	99.7	0	0
Carbon Monoxide CO measured in ppm	Henry Pirker	0.20	0.45	May 28	1.56	Feb 14 09:00	99.9	-	0
Total Hydrocarbons THC measured in ppm	Henry Pirker	2.13	2.89	Feb 20	4.83	Aug 08 05:00	99.6	-	-
Total Reduced Sulphur TRS measured in ppb	Henry Pirker	0.33	0.80	Dec 15	4.72	Nov 04 11:00	99.9	-	-
Particulate Matter PM_{2.5} measured in µg/m³	Henry Pirker	8.45	90.61	May 28	247.11	May 28 09:00	89.2	2	12

Table 2. Sulphur Dioxide (SO₂) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker		SO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	703	0.43	1.04	Jan 24	4.47	Jan 24 23:00	99.2	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	641	0.38	0.94	Feb 01	5.55	Feb 11 19:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	703	0.73	1.22	Mar 27	3.17	Mar 23 21:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	686	0.19	0.60	Apr 13	2.22	Apr 24 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	708	0.16	0.63	May 27	4.05	May 27 07:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	686	0.20	0.44	Jun 02	5.78	Jun 01 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	704	0.31	0.58	Jul 30	3.26	Jul 02 12:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	707	0.05	0.33	Aug 16	3.41	Aug 11 11:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	681	0.05	0.21	Sep 21	1.47	Sep 29 11:00	99.4	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	702	0.09	0.47	Oct 18	6.74	Oct 18 12:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	686	0.37	2.07	Nov 21	9.44	Nov 21 23:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	707	0.26	0.73	Dec 31	2.53	Dec 31 12:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8314	0.27	2.07	Nov 21	9.44	Nov 21 23:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00

Table 3. Nitrogen Dioxide (NO₂) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker		NO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 25	25 - 50	50 - 110	110 - 210	>210	
January	701	14.80	32.48	Jan 03	51.41	Jan 23 23:00	99.1	0	0	78.74	21.11	0.14	0.00	0.00	
February	640	12.45	28.64	Feb 08	51.89	Feb 14 09:00	100.0	0	0	82.81	16.88	0.31	0.00	0.00	
March	702	13.83	25.33	Mar 01	53.56	Mar 17 09:00	100.0	0	0	84.90	14.81	0.28	0.00	0.00	
April	685	7.18	14.35	Apr 03	40.14	Apr 01 23:00	100.0	0	0	97.52	2.48	0.00	0.00	0.00	
May	707	5.27	9.70	May 20	21.65	May 31 07:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	
June	685	4.25	7.91	Jun 01	21.01	Jun 01 01:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	
July	705	3.00	4.83	Jul 05	14.59	Jul 18 00:00	99.7	0	0	100.00	0.00	0.00	0.00	0.00	
August	705	4.35	7.63	Aug 26	20.98	Aug 07 23:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	
September	679	6.37	10.87	Sep 22	25.00	Sep 10 21:00	99.4	0	0	100.00	0.00	0.00	0.00	0.00	
October	700	8.59	15.42	Oct 18	31.98	Oct 28 19:00	100.0	0	0	96.29	3.71	0.00	0.00	0.00	
November	685	13.82	26.70	Nov 23	45.58	Nov 23 02:00	100.0	0	0	87.59	12.41	0.00	0.00	0.00	
December	705	13.76	26.90	Dec 14	45.98	Dec 14 10:00	100.0	0	0	83.40	16.60	0.00	0.00	0.00	
Annual	8299	8.95	32.48	Jan 03	53.56	Mar 17 09:00	99.8	0	0	92.59	7.35	0.06	0.00	0.00	

Table 4. Ozone (O₃) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker O ₃ (ppb) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 10	10 - 20	20 - 40	40 - 82	>82
January	704	20.27	37.56	Jan 22	44.55	Jan 22 23:00	99.2	0	0	10.80	14.77	15.06	56.53	2.84	0.00
February	643	27.31	39.61	Feb 21	46.46	Feb 21 04:00	100.0	0	0	3.89	10.42	9.80	66.87	9.02	0.00
March	703	28.08	43.34	Mar 31	51.40	Mar 28 17:00	100.0	0	0	1.56	8.39	12.80	66.43	10.81	0.00
April	685	36.56	46.11	Apr 10	63.99	Apr 25 16:00	100.0	0	0	0.15	1.61	7.15	49.20	41.90	0.00
May	709	37.14	47.70	May 15	61.97	May 29 14:00	100.0	0	0	0.00	2.26	8.32	44.57	44.85	0.00
June	687	28.57	39.68	Jun 01	64.33	Jun 01 18:00	100.0	0	0	0.29	3.06	19.07	60.12	17.47	0.00
July	710	20.26	27.95	Jul 03	43.83	Jul 17 13:00	100.0	0	0	0.28	8.59	37.89	52.11	1.13	0.00
August	707	19.26	24.35	Aug 25	39.69	Aug 26 15:00	99.9	0	0	1.84	16.55	34.23	47.38	0.00	0.00
September	682	19.00	27.47	Sep 24	45.76	Sep 23 17:00	99.4	0	0	6.01	16.28	28.74	48.39	0.59	0.00
October	703	20.34	30.66	Oct 31	38.36	Oct 16 16:00	100.0	0	0	4.84	16.64	21.34	57.18	0.00	0.00
November	688	17.30	32.57	Nov 13	38.18	Nov 27 11:00	100.0	0	0	9.01	19.91	25.44	45.64	0.00	0.00
December	696	19.65	33.62	Dec 01	40.94	Dec 06 01:00	98.4	0	0	14.22	16.38	14.94	54.02	0.43	0.00
Annual	8317	24.46	47.70	May 15	64.33	Jun 01 18:00	99.7	0	0	4.43	11.24	19.60	53.97	10.75	0.00

Table 5. Carbon Monoxide (CO) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker CO (ppm) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 0.1	0.1 - 1.0	1.0 - 2.5	2.5 - 5.0	5.0 - 13.0	> 13.0
January	704	0.23	0.45	Jan 03	1.30	Jan 23 23:00	99.5	0	0	0.00	99.72	0.28	0.00	0.00	0.00
February	641	0.23	0.40	Feb 14	1.56	Feb 14 09:00	100.0	0	0	0.00	99.69	0.31	0.00	0.00	0.00
March	704	0.25	0.38	Mar 17	1.43	Mar 17 08:00	100.0	0	0	0.00	99.72	0.28	0.00	0.00	0.00
April	686	0.21	0.27	Apr 03	0.51	Apr 12 07:00	100.0	0	0	0.00	100.00	0.00	0.00	0.00	0.00
May	707	0.21	0.45	May 28	0.95	May 28 08:00	100.0	0	0	0.00	100.00	0.00	0.00	0.00	0.00
June	685	0.17	0.27	Jun 16	0.35	Jun 16 05:00	99.9	0	0	3.80	96.20	0.00	0.00	0.00	0.00
July	709	0.13	0.21	Jul 13	0.48	Jul 18 12:00	100.0	0	0	26.52	73.48	0.00	0.00	0.00	0.00
August	707	0.13	0.21	Aug 08	0.43	Aug 20 22:00	99.9	0	0	22.91	77.09	0.00	0.00	0.00	0.00
September	683	0.14	0.25	Sep 07	0.73	Sep 07 22:00	99.4	0	0	32.36	67.64	0.00	0.00	0.00	0.00
October	701	0.16	0.24	Oct 18	0.90	Oct 21 08:00	100.0	0	0	7.70	92.30	0.00	0.00	0.00	0.00
November	685	0.23	0.44	Nov 23	1.08	Nov 29 10:00	99.9	0	0	3.07	96.64	0.29	0.00	0.00	0.00
December	708	0.24	0.43	Dec 15	1.23	Dec 15 18:00	100.0	0	0	0.28	98.73	0.99	0.00	0.00	0.00
Annual	8320	0.20	0.45	May 28	1.56	Feb 14 09:00	99.9	0	0	8.16	91.66	0.18	0.00	0.00	0.00

Table 6. Total Hydrocarbons (THC) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker															THC (ppm)		2011	
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	*AAQO		Number of Readings in Concentration Range								
								24-Hr	1-Hr	0 - 1.5	1.5 - 2.0	2.0 - 2.5	2.5 - 5.0	5.0 - 10.0	>10.0			
January	704	2.21	2.86	Jan 03	3.55	Jan 11 21:00	99.5	0	0	0.00	22.02	62.07	15.91	0.00	0.00			
February	641	2.14	2.89	Feb 20	3.39	Feb 01 16:00	100.0	0	0	0.00	35.57	51.79	12.64	0.00	0.00			
March	703	2.26	2.70	Mar 07	3.26	Mar 18 10:00	100.0	0	0	0.00	3.56	81.93	14.51	0.00	0.00			
April	686	2.07	2.32	Apr 18	3.22	Apr 07 23:00	100.0	0	0	0.00	34.69	62.83	2.48	0.00	0.00			
May	707	1.99	2.07	May 20	2.54	May 09 08:00	100.0	0	0	0.00	67.33	32.53	0.14	0.00	0.00			
June	684	1.99	2.13	Jun 06	2.83	Jun 22 04:00	99.7	0	0	0.00	73.25	25.58	1.17	0.00	0.00			
July	708	2.02	2.15	Jul 18	3.22	Jul 18 00:00	100.0	0	0	0.00	65.25	32.34	2.40	0.00	0.00			
August	689	2.16	2.57	Aug 08	4.83	Aug 08 05:00	97.3	0	0	0.00	37.16	50.65	12.19	0.00	0.00			
September	675	2.22	2.59	Sep 08	4.44	Sep 01 04:00	98.3	0	0	0.00	28.89	55.26	15.85	0.00	0.00			
October	703	2.12	2.40	Oct 16	3.64	Oct 19 03:00	100.0	0	0	0.00	25.75	69.84	4.41	0.00	0.00			
November	686	2.22	2.57	Nov 09	4.40	Nov 09 04:00	100.0	0	0	0.00	11.52	76.24	12.24	0.00	0.00			
December	708	2.17	2.87	Dec 15	3.42	Dec 12 12:00	100.0	0	0	0.00	33.33	54.10	12.57	0.00	0.00			
Annual	8294	2.13	2.89	Feb 20	4.83	Aug 08 05:00	99.6	0	0	0.00	36.63	54.49	8.88	0.00	0.00			

*No Alberta Environment Objectives or Guidelines for THC

Table 7. Total Reduced Sulphur (TRS) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker															TRS (ppb)		2011	
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	*AAQO		Number of Readings in Concentration Range								
								24-Hr	1-Hr	0 - 1	1 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	>10			
January	704	0.31	0.62	Jan 24	3.81	Jan 24 18:00	99.2	0	0	99.57	0.28	0.14	0.00	0.00	0.00			
February	642	0.32	0.57	Feb 01	1.34	Feb 14 10:00	100.0	0	0	99.53	0.47	0.00	0.00	0.00	0.00			
March	701	0.36	0.52	Mar 17	1.83	Mar 30 11:00	100.0	0	0	99.57	0.43	0.00	0.00	0.00	0.00			
April	686	0.28	0.41	Apr 15	1.14	Apr 28 10:00	100.0	0	0	99.85	0.15	0.00	0.00	0.00	0.00			
May	708	0.31	0.44	May 22	1.22	May 19 11:00	100.0	0	0	99.44	0.56	0.00	0.00	0.00	0.00			
June	687	0.27	0.37	Jun 13	1.45	Jul 01 00:00	100.0	0	0	99.85	0.15	0.00	0.00	0.00	0.00			
July	709	0.40	0.67	Jul 05	4.67	Jul 02 05:00	100.0	0	0	97.18	2.12	0.71	0.00	0.00	0.00			
August	708	0.41	0.78	Aug 08	4.11	Aug 08 03:00	100.0	0	0	95.48	4.10	0.42	0.00	0.00	0.00			
September	682	0.30	0.78	Sep 08	3.24	Sep 10 07:00	99.4	0	0	96.48	3.37	0.15	0.00	0.00	0.00			
October	702	0.27	0.52	Oct 26	1.23	Oct 14 05:00	100.0	0	0	98.86	1.14	0.00	0.00	0.00	0.00			
November	685	0.37	0.77	Nov 04	4.72	Nov 04 11:00	100.0	0	0	98.69	0.73	0.58	0.00	0.00	0.00			
December	708	0.35	0.80	Dec 15	1.86	Dec 13 13:00	100.0	0	0	98.31	1.69	0.00	0.00	0.00	0.00			
Annual	8322	0.33	0.80	Dec 15	4.72	Nov 04 11:00	99.9	0	0	98.63	1.21	0.16	0.00	0.00	0.00			

*No Alberta Environment Objectives or Guidelines for TRS

Table 8. Particulate Matter (PM_{2.5}) – Henry Pirker 2011 Summary and Frequency Distribution

Henry Pirker		PM _{2.5} (µg/m ³)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 6	6 - 11	11 - 17	17 - 30	> 30
January	624	9.86	21.64	Jan 08	40.80	Jan 11 19:00	84.0	0	0	16.03	21.96	25.48	19.39	14.58	2.56
February	602	8.55	17.23	Feb 01	45.57	Feb 25 00:00	89.6	0	0	16.61	27.24	26.91	18.44	8.47	2.33
March	607	13.61	23.75	Mar 28	55.44	Mar 04 04:00	81.6	0	0	15.82	14.00	15.65	21.25	24.05	9.23
April	692	7.51	12.75	Apr 03	26.56	Apr 03 08:00	96.4	0	0	8.96	29.77	44.65	11.99	4.62	0.00
May	725	12.83	90.61	May 28	247.11	May 28 09:00	97.5	2	12	11.86	29.93	22.48	14.76	15.17	5.79
June	663	6.80	19.32	Jun 16	75.03	Jul 01 00:00	92.2	0	0	23.98	31.07	25.79	12.52	5.88	0.75
July	574	4.65	9.42	Jul 13	68.25	Jul 18 13:00	77.2	0	0	36.93	28.40	27.70	6.10	0.35	0.52
August	740	5.20	11.24	Aug 09	27.80	Aug 11 12:00	99.7	0	0	38.51	24.59	21.76	11.89	3.24	0.00
September	644	5.55	13.53	Sep 14	41.27	Sep 14 16:00	89.4	0	0	30.75	31.68	22.20	11.18	3.88	0.31
October	716	5.40	9.17	Oct 11	39.54	Oct 11 23:00	97.0	0	0	29.47	31.01	27.65	10.34	1.26	0.28
November	645	10.90	28.14	Nov 23	73.63	Nov 23 22:00	89.6	0	0	21.86	19.53	25.74	11.16	13.18	8.53
December	573	11.14	20.04	Dec 04	61.81	Dec 02 05:00	77.0	0	0	22.16	15.71	20.07	18.50	17.10	6.46
Annual	7805	8.45	90.61	May 28	247.11	May 28 09:00	89.2	2	12	22.89	25.81	25.63	13.73	8.95	2.97

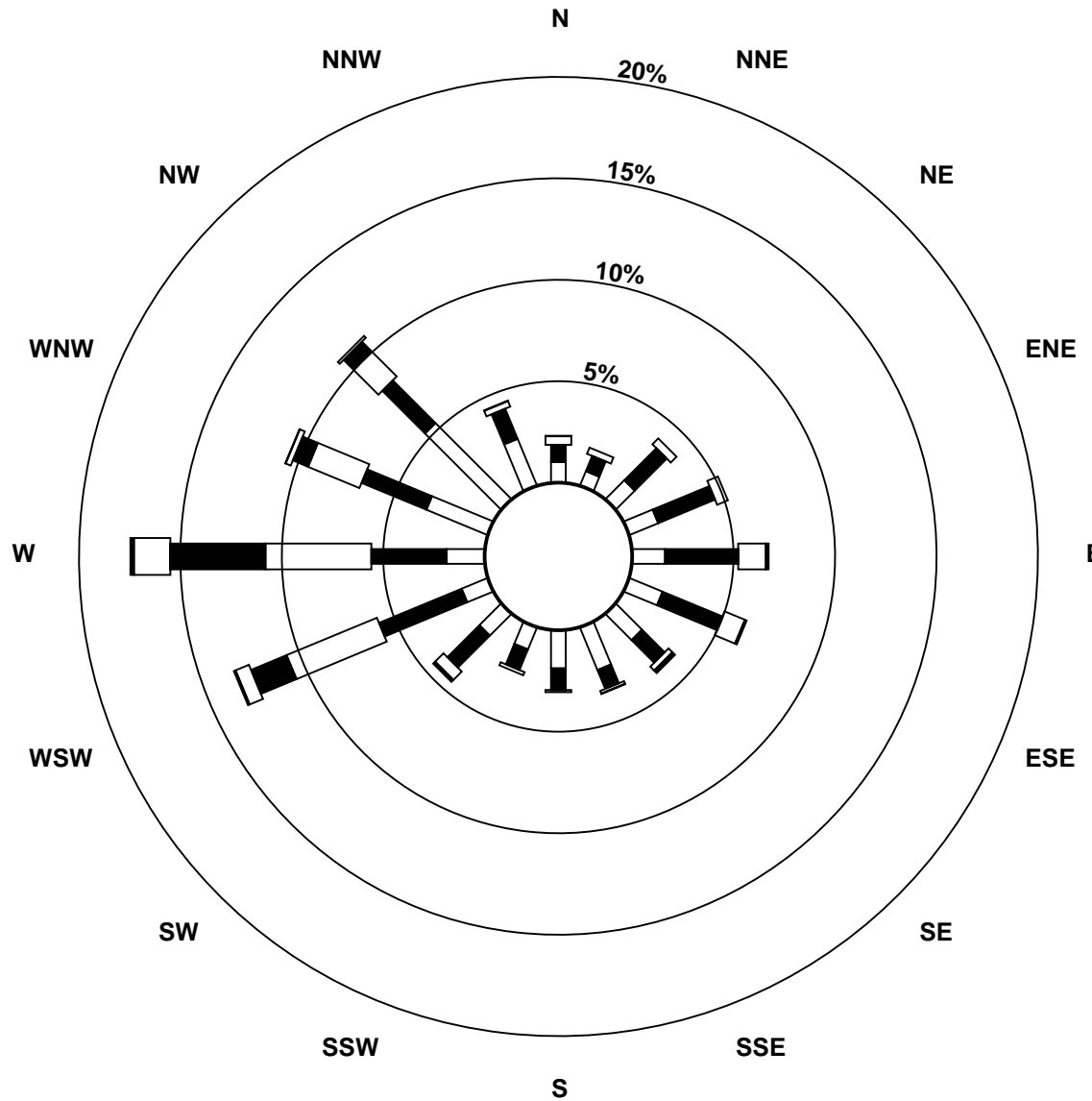
Table 9. Wind Speed and Wind Direction Frequency Distribution – Henry Pirker 2011 Summary

Henry Pirker								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	196	1.02	0.85	0.43	0.02	0.00	0.00	2.31
NNE	162	0.77	0.81	0.33	0.00	0.00	0.00	1.91
NE	335	1.32	2.23	0.40	0.00	0.00	0.00	3.96
ENE	435	1.54	3.04	0.57	0.00	0.00	0.00	5.14
E	569	1.62	3.60	1.37	0.13	0.00	0.00	6.72
ESE	520	1.77	3.19	1.09	0.09	0.00	0.00	6.14
SE	326	1.82	1.58	0.27	0.18	0.00	0.00	3.85
SSE	291	2.27	1.00	0.14	0.02	0.00	0.00	3.44
S	258	1.88	1.06	0.11	0.00	0.00	0.00	3.05
SSW	206	1.17	1.10	0.17	0.00	0.00	0.00	2.43
SW	378	1.51	2.23	0.58	0.14	0.00	0.00	4.46
WSW	1127	1.38	4.41	4.82	1.90	0.71	0.09	13.31
WSW	1479	1.88	3.71	5.22	4.69	1.80	0.18	17.47
WNW	894	3.26	3.46	2.74	0.81	0.27	0.01	10.56
NW	917	5.30	2.98	1.75	0.67	0.13	0.00	10.83
NNW	374	2.49	1.61	0.30	0.02	0.00	0.00	4.42
Totals	8467	30.99	36.86	20.27	8.69	2.91	0.28	100

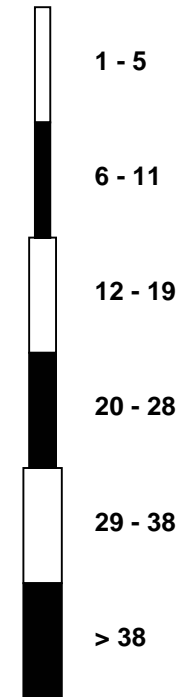
Wind Rose

Wind Speed (WS) (km/h)

Henry Pirker - 2011



Wind Speed Classes (km/h)



PAZA
EVERGREEN PARK
CONTINUOUS AMBIENT AIR MONITORING STATION

2011
ANNUAL SUMMARY TABLES

Table 13. Evergreen Park - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Evergreen Park	0.33	2.67	Sep 09	12.54	Sep 30 18:00	99.6	0	0
Total Reduced Sulphur TRS measured in ppb	Evergreen Park	0.60	1.52	Jul 15	7.84	Jul 15 15:00	99.6	-	-
Particulate Matter PM_{2.5} measured in µg/m³	Evergreen Park	5.15	67.63	May 28	336.67	May 03 11:00	96.0	3	21

Table 14. Sulphur Dioxide (SO₂) – Evergreen Park 2011 Summary and Frequency Distribution

Evergreen Park		SO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	707	0.33	1.20	Jan 18	6.67	Jan 18 09:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	641	0.38	1.15	Feb 02	4.63	Feb 17 04:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	680	0.57	1.15	Mar 03	3.14	Mar 05 16:00	95.8	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	683	0.17	0.40	Apr 24	2.70	Apr 12 10:00	99.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	708	0.16	0.47	May 28	2.39	May 10 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	685	0.27	0.91	Jun 21	7.24	Jun 10 11:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	708	0.48	2.24	Jul 27	11.89	Jul 26 19:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	707	0.33	1.13	Aug 17	9.41	Aug 17 17:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	686	0.47	2.67	Sep 09	12.54	Sep 30 18:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	706	0.45	2.14	Oct 27	9.61	Oct 23 22:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	683	0.20	0.64	Nov 27	7.12	Nov 27 16:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	708	0.11	0.33	Dec 15	0.76	Dec 07 16:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8302	0.33	2.67	Sep 09	12.54	Sep 30 18:00	99.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00

Table 15. Total Reduced Sulphur (TRS) – Evergreen Park 2011 Summary and Frequency Distribution

Evergreen Park		TRS (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	*AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 1	1 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	>10
January	707	0.64	1.08	Jan 10	2.58	Jan 05 16:00	99.9	0	0	91.94	7.92	0.14	0.00	0.00	0.00
February	641	0.65	1.10	Feb 01	1.51	Feb 01 16:00	100.0	0	0	92.98	7.02	0.00	0.00	0.00	0.00
March	680	0.66	0.88	Mar 08	3.43	Mar 18 09:00	95.8	0	0	94.41	5.44	0.15	0.00	0.00	0.00
April	682	0.55	0.66	Apr 28	1.26	Apr 25 07:00	99.6	0	0	99.56	0.44	0.00	0.00	0.00	0.00
May	707	0.55	0.70	May 11	1.72	May 22 04:00	100.0	0	0	98.87	1.13	0.00	0.00	0.00	0.00
June	685	0.51	0.61	Jun 15	0.93	Jun 02 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	708	0.78	1.52	Jul 15	7.84	Jul 15 15:00	100.0	0	0	85.73	10.03	3.53	0.56	0.14	0.00
August	708	0.51	0.64	Aug 24	1.82	Aug 24 05:00	100.0	0	0	97.74	2.26	0.00	0.00	0.00	0.00
September	685	0.52	0.78	Sep 09	1.89	Sep 09 19:00	100.0	0	0	96.35	3.65	0.00	0.00	0.00	0.00
October	704	0.52	0.79	Oct 28	2.11	Oct 28 14:00	100.0	0	0	97.44	2.56	0.00	0.00	0.00	0.00
November	684	0.60	0.99	Nov 24	3.19	Nov 22 11:00	100.0	0	0	95.76	3.95	0.29	0.00	0.00	0.00
December	708	0.66	0.96	Dec 17	2.60	Dec 17 02:00	100.0	0	0	93.93	5.93	0.14	0.00	0.00	0.00
Annual	8299	0.60	1.52	Jul 15	7.84	Jul 15 15:00	99.6	0	0	95.37	4.20	0.36	0.05	0.01	0.00

*No Alberta Environment Objectives or Guidelines for TRS

Table 16. Particulate Matter (PM_{2.5}) – Evergreen Park 2011 Summary and Frequency Distribution

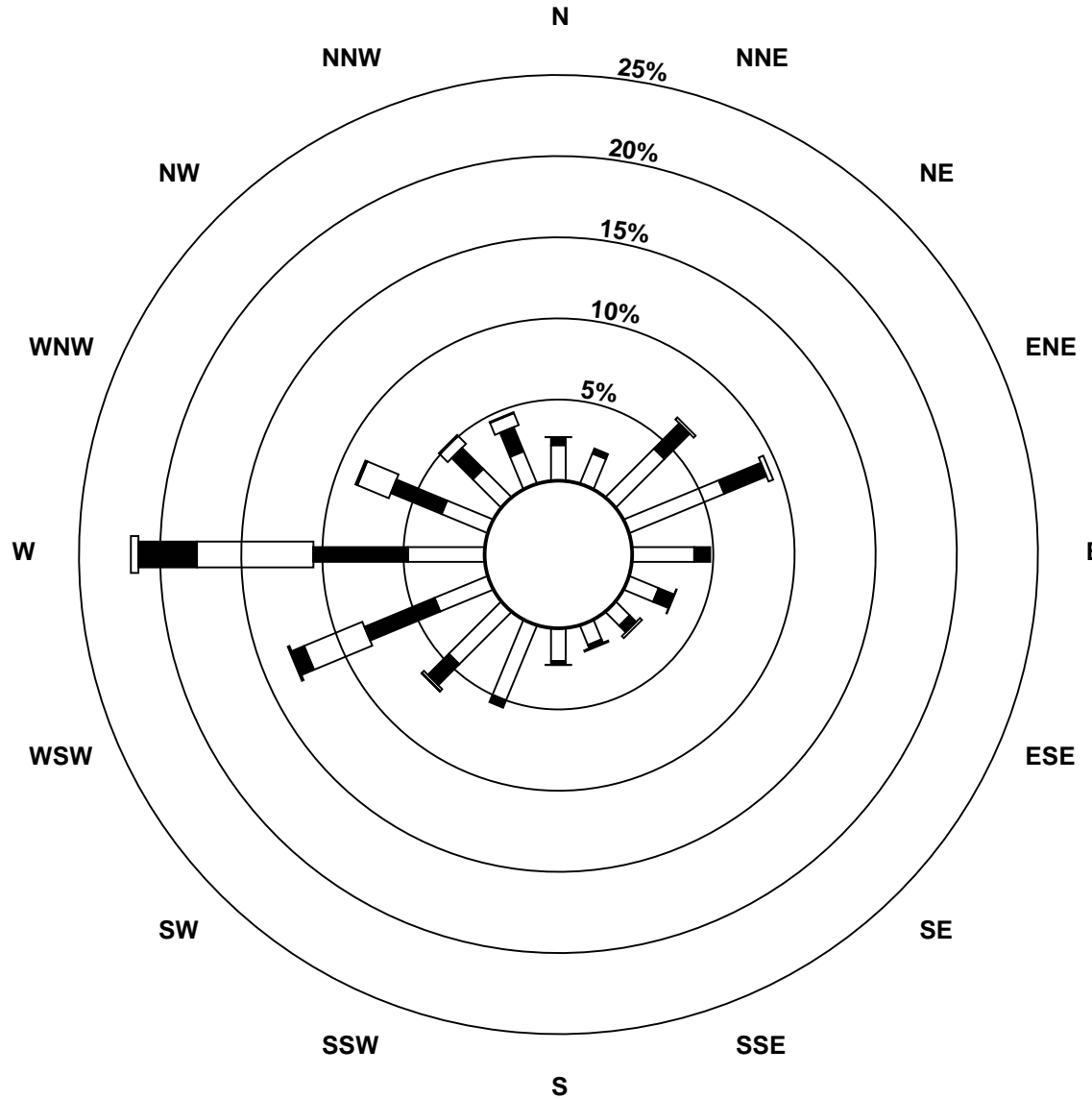
Evergreen Park														PM _{2.5} (µg/m ³)		2011	
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range							
								24-Hr	1-Hr	0 - 2	2 - 6	6 - 11	11 - 17	17 - 30	> 30		
January	726	2.68	9.69	Jan 31	57.39	Jan 27 05:00	97.6	0	0	57.44	30.58	9.23	1.79	0.83	0.14		
February	554	5.93	13.75	Feb 20	75.93	Feb 15 05:00	82.7	0	0	38.09	30.87	14.44	7.94	5.60	3.07		
March	658	7.72	13.33	Mar 07	27.11	Mar 21 20:00	88.7	0	0	8.36	36.17	33.43	16.11	5.93	0.00		
April	660	8.30	33.71	Apr 11	184.63	Apr 11 16:00	91.7	1	4	21.52	33.94	23.48	10.76	6.67	3.64		
May	732	10.37	67.63	May 28	336.67	May 03 11:00	98.7	2	16	32.24	33.61	14.21	8.47	4.10	7.38		
June	688	6.14	13.48	Jun 14	69.82	Jun 23 15:00	95.7	0	0	35.61	26.74	17.88	12.50	6.25	1.02		
July	736	2.80	7.77	Jul 29	32.56	Jul 29 12:00	99.2	0	0	63.18	23.23	7.88	3.40	2.17	0.14		
August	740	3.51	6.71	Aug 27	30.93	Aug 03 08:00	99.7	0	0	45.54	36.08	12.97	4.05	1.22	0.14		
September	718	3.43	11.10	Sep 09	39.30	Sep 28 09:00	99.7	0	0	55.99	27.30	9.05	3.90	3.34	0.42		
October	727	3.97	13.93	Oct 27	92.64	Oct 26 17:00	98.1	0	1	51.86	29.16	9.63	3.99	4.26	1.10		
November	714	4.94	15.59	Nov 22	37.95	Nov 22 01:00	99.2	0	0	42.30	30.39	13.03	7.28	6.58	0.42		
December	742	2.80	10.10	Dec 15	30.24	Dec 14 16:00	99.7	0	0	56.33	30.32	9.57	2.56	1.08	0.13		
Annual	8395	5.15	67.63	May 28	336.67	May 03 11:00	96.0	3	21	42.92	30.53	14.38	6.78	3.94	1.44		

Table 17. Wind Speed and Wind Direction Frequency Distribution – Evergreen Park 2011 Summary

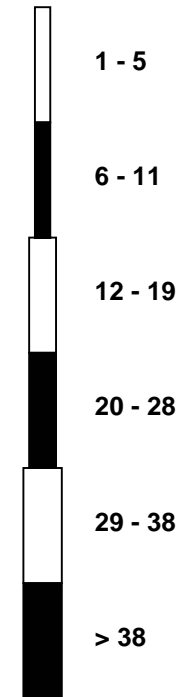
Evergreen Park								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	204	2.19	0.49	0.01	0.00	0.00	0.00	2.70
NNE	177	2.01	0.33	0.00	0.00	0.00	0.00	2.34
NE	500	4.23	2.21	0.17	0.00	0.00	0.00	6.61
ENE	715	6.33	2.81	0.30	0.00	0.00	0.00	9.45
E	364	3.82	0.99	0.00	0.00	0.00	0.00	4.81
ESE	228	1.96	1.03	0.03	0.00	0.00	0.00	3.01
SE	147	1.20	0.57	0.17	0.00	0.00	0.00	1.94
SSE	121	1.29	0.22	0.08	0.00	0.00	0.00	1.60
S	171	2.01	0.24	0.01	0.00	0.00	0.00	2.26
SSW	415	4.99	0.49	0.00	0.00	0.00	0.00	5.48
SW	499	4.56	1.82	0.17	0.04	0.00	0.00	6.59
WSW	987	3.53	4.68	3.88	0.83	0.12	0.00	13.04
WSW	1650	4.73	5.83	7.17	3.61	0.46	0.00	21.80
WNW	656	3.07	3.38	2.09	0.13	0.00	0.00	8.67
NW	385	2.47	1.84	0.71	0.07	0.00	0.00	5.09
NNW	350	2.15	1.61	0.79	0.07	0.00	0.00	4.62
Totals	7569	50.54	28.54	15.60	4.74	0.58	0.00	100

Wind Rose

Wind Speed (WS) (km/h)
Evergreen Park - 2011



Wind Speed Classes (km/h)



PAZA

SMOKY HEIGHTS

CONTINUOUS AMBIENT AIR MONITORING STATION

2011

ANNUAL SUMMARY TABLES

Table 19. Smoky Heights - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Smoky Heights	0.46	3.30	Jan 30	14.27	Jan 30 02:00	98.7	0	0
Total Reduced Sulphur TRS measured in ppb	Smoky Heights	0.28	0.93	Apr 20	2.25	Aug 13 05:00	98.2	-	-
Particulate Matter PM_{2.5} measured in µg/m³	Smoky Heights	3.99	58.31	May 28	183.26	Mar 28 20:00	98.5	1	11

Table 20. Sulphur Dioxide (SO₂) – Smoky Heights 2011 Summary and Frequency Distribution

Smoky Heights		SO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	707	0.81	3.30	Jan 30	14.27	Jan 30 02:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	634	0.86	2.60	Feb 10	9.50	Feb 07 18:00	99.3	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	711	1.09	2.63	Mar 07	12.09	Mar 12 22:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	662	0.68	2.66	Apr 22	12.09	Apr 22 08:00	97.5	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	708	0.35	2.01	May 06	10.08	May 06 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	645	0.25	0.90	Jun 21	4.69	Jun 21 07:00	94.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	705	0.14	1.21	Jul 27	6.36	Jul 27 01:00	99.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	680	0.19	1.28	Aug 18	5.88	Aug 18 06:00	96.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	659	0.08	0.41	Sep 19	3.56	Sep 19 08:00	96.3	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	706	0.19	0.90	Oct 11	5.01	Oct 11 23:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	685	0.40	1.04	Nov 25	7.11	Nov 30 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	708	0.49	2.09	Dec 21	4.50	Dec 21 11:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8210	0.46	3.30	Jan 30	14.27	Jan 30 02:00	98.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00

Table 21. Total Reduced Sulphur (TRS) – Smoky Heights 2011 Summary and Frequency Distribution

Smoky Heights		TRS (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	*AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 1	1 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	>10
January	710	0.37	0.53	Jan 26	0.78	Jan 03 13:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	635	0.31	0.53	Feb 08	0.86	Feb 20 23:00	99.3	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	712	0.38	0.72	Mar 21	1.34	Mar 22 19:00	100.0	0	0	98.31	1.69	0.00	0.00	0.00	0.00
April	663	0.42	0.93	Apr 20	1.45	Apr 20 21:00	97.6	0	0	97.59	2.41	0.00	0.00	0.00	0.00
May	704	0.26	0.63	May 22	1.02	May 22 04:00	100.0	0	0	99.86	0.14	0.00	0.00	0.00	0.00
June	621	0.13	0.40	Jun 05	0.99	Jun 05 23:00	91.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	705	0.15	0.38	Jul 28	0.97	Jul 26 06:00	99.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	660	0.34	0.67	Aug 13	2.25	Aug 13 05:00	93.7	0	0	98.79	1.21	0.00	0.00	0.00	0.00
September	660	0.21	0.47	Sep 08	0.79	Sep 08 23:00	96.3	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	706	0.23	0.51	Oct 04	1.62	Oct 07 00:00	100.0	0	0	99.01	0.99	0.00	0.00	0.00	0.00
November	686	0.26	0.56	Nov 23	1.52	Nov 30 03:00	100.0	0	0	99.42	0.58	0.00	0.00	0.00	0.00
December	708	0.25	0.40	Dec 15	0.78	Dec 15 15:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8170	0.28	0.93	Apr 20	2.25	Aug 13 05:00	98.2	0	0	99.41	0.59	0.00	0.00	0.00	0.00

Table 22. Particulate Matter (PM_{2.5}) – Smoky Heights 2011 Summary and Frequency Distribution

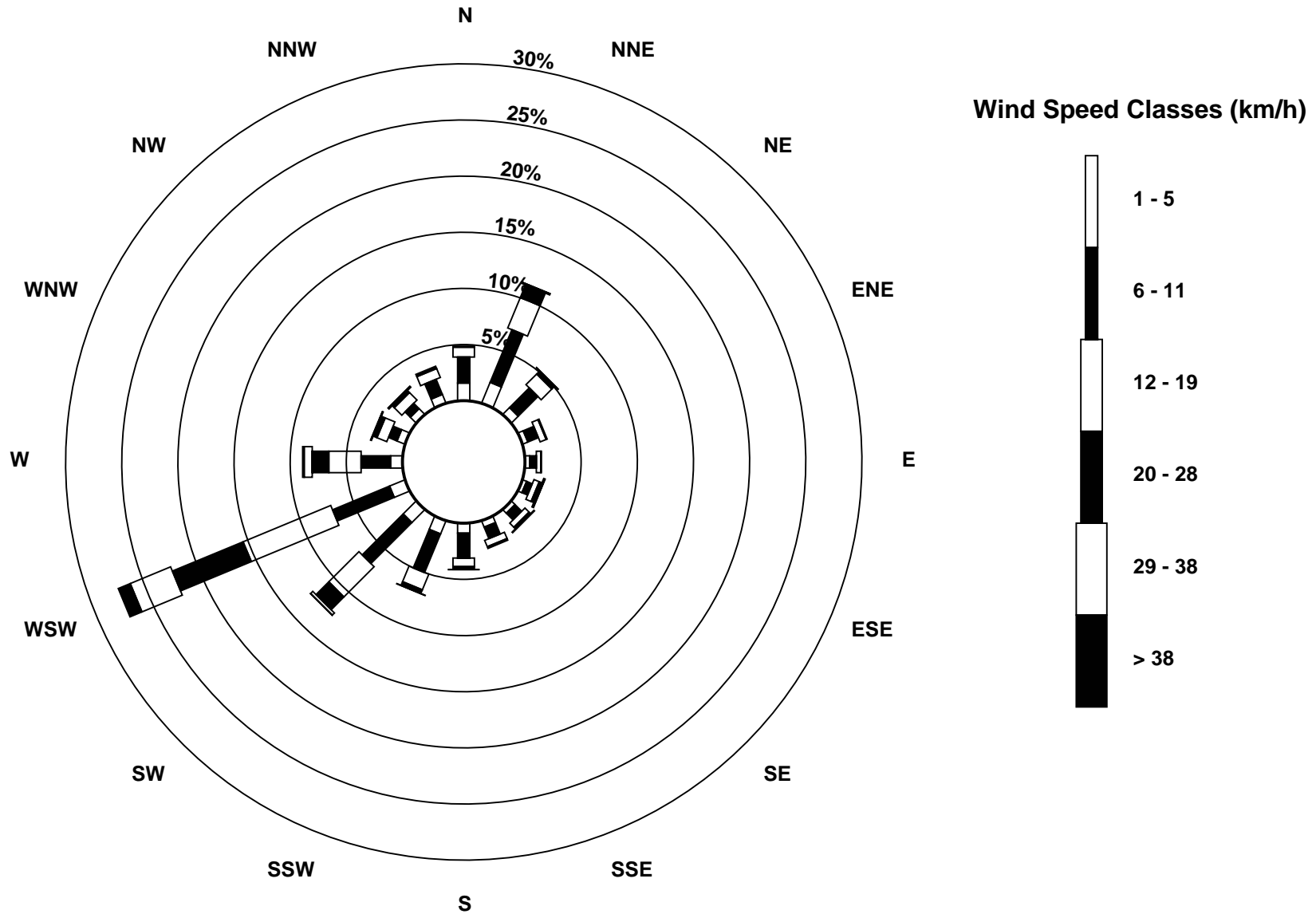
Smoky Heights		PM _{2.5} (µg/m ³)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 6	6 - 11	11 - 17	17 - 30	> 30
January	730	2.38	5.89	Jan 09	48.95	Jan 10 00:00	98.1	0	0	66.71	22.74	7.12	1.92	1.10	0.41
February	662	3.00	9.30	Feb 01	35.47	Feb 17 09:00	98.8	0	0	50.91	35.20	9.67	3.93	0.15	0.15
March	741	6.63	18.32	Mar 28	183.26	Mar 28 20:00	99.9	0	1	17.00	41.30	29.01	8.50	3.10	1.08
April	702	2.62	6.60	Apr 26	22.66	Apr 17 00:00	97.5	0	0	46.72	45.87	6.27	0.85	0.28	0.00
May	742	8.52	58.31	May 28	153.48	May 28 10:00	100.0	1	10	28.57	37.47	14.82	8.09	5.80	5.26
June	671	5.38	16.91	Jun 09	42.19	Jun 02 18:00	93.3	0	0	35.92	33.98	14.75	8.05	6.71	0.60
July	737	2.28	6.44	Jul 05	31.79	Jul 02 22:00	99.5	0	0	58.07	35.55	5.29	0.54	0.41	0.14
August	741	3.30	8.38	Aug 27	38.26	Aug 26 20:00	99.9	0	0	47.10	38.87	9.85	2.83	0.81	0.54
September	690	3.63	10.45	Sep 08	34.22	Sep 15 07:00	96.1	0	0	44.49	37.25	13.19	2.90	1.88	0.29
October	741	2.75	7.70	Oct 04	35.18	Oct 11 19:00	100.0	0	0	49.80	40.08	8.77	0.67	0.54	0.13
November	714	5.49	17.83	Nov 22	59.22	Nov 08 20:00	99.2	0	0	36.55	34.31	14.43	7.00	6.02	1.68
December	742	1.81	5.77	Dec 30	28.87	Dec 28 10:00	99.7	0	0	68.06	27.76	3.23	0.27	0.67	0.00
Annual	8613	3.99	58.31	May 28	183.26	Mar 28 20:00	98.5	1	11	45.83	35.87	11.37	3.78	2.28	0.87

Table 23. Wind Speed and Wind Direction Frequency Distribution – Smoky Heights 2011 Summary

Smoky Heights								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	417	1.57	2.32	0.88	0.08	0.00	0.00	4.85
NNE	974	2.00	5.07	2.93	1.21	0.09	0.02	11.33
NE	437	0.85	2.49	1.34	0.36	0.05	0.00	5.09
ENE	188	0.50	1.01	0.58	0.09	0.00	0.00	2.19
E	125	0.41	0.59	0.42	0.03	0.00	0.00	1.45
ESE	157	0.37	0.55	0.51	0.26	0.10	0.03	1.83
SE	178	0.45	0.84	0.51	0.21	0.02	0.03	2.07
SSE	213	0.61	1.11	0.61	0.16	0.00	0.00	2.48
S	355	0.88	2.21	0.77	0.26	0.01	0.00	4.13
SSW	589	1.26	3.70	1.51	0.36	0.02	0.00	6.85
SW	1073	1.63	5.16	3.81	1.61	0.27	0.02	12.49
WSW	2344	1.47	5.50	8.45	6.82	3.89	1.15	27.28
WSW	764	1.06	2.63	2.87	1.48	0.71	0.14	8.89
WNW	255	0.76	0.81	0.94	0.36	0.06	0.03	2.97
NW	233	0.72	0.67	0.94	0.24	0.08	0.05	2.71
NNW	291	0.83	1.47	0.87	0.22	0.00	0.00	3.39
Totals	8593	15.36	36.13	27.95	13.76	5.31	1.49	100

Wind Rose

Wind Speed (WS) (km/h)
Smoky Heights - 2011



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Table 25. Beaverlodge - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Beaverlodge	0.33	5.34	Mar 15	36.05	Mar 15 18:00	99.9	0	0
Nitrogen Dioxide NO₂ measured in ppb	Beaverlodge	3.07	21.04	Jan 31	31.59	Mar 08 11:00	99.6	0	0
Ozone O₃ measured in ppb	Beaverlodge	30.85	55.53	Apr 10	68.67	Apr 25 18:00	99.9	0	0
Particulate Matter PM_{2.5} measured in µg/m³	Beaverlodge	6.72	84.79	May 28	181.31	May 28 10:00	99.4	2	13

Table 26. Sulphur Dioxide (SO₂) – Beaverlodge 2011 Summary and Frequency Distribution

Beaverlodge SO ₂ (ppb) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	699	0.51	1.34	Jan 29	3.57	Jan 29 01:00	99.5	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	633	0.49	1.50	Feb 17	8.28	Feb 27 13:00	99.1	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	707	1.22	5.34	Mar 15	36.05	Mar 15 18:00	99.9	0	0	99.72	0.28	0.00	0.00	0.00	0.00
April	686	0.23	0.69	Apr 02	2.66	Apr 03 00:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	706	0.24	0.92	May 28	4.53	May 28 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	684	0.27	1.53	Jun 18	18.20	Jun 19 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	704	0.11	0.50	Jul 17	5.47	Jul 15 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	710	0.11	0.39	Aug 13	1.30	Aug 25 11:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	687	0.14	0.37	Sep 14	1.55	Sep 10 22:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
October	703	0.10	0.52	Oct 11	3.54	Oct 07 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	687	0.33	1.80	Nov 21	4.61	Nov 23 04:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	710	0.20	0.83	Dec 04	3.07	Dec 04 13:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8316	0.33	5.34	Mar 15	36.05	Mar 15 18:00	99.9	0	0	99.98	0.02	0.00	0.00	0.00	0.00

Table 27. Nitrogen Dioxide (NO₂) – Beaverlodge 2011 Summary and Frequency Distribution

Beaverlodge NO ₂ (ppb) 2011														
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range				
								24-Hr	1-Hr	0 - 25	25 - 50	50 - 110	110 - 210	>210
January	675	5.27	21.04	Jan 31	29.09	Jan 10 13:00	96.4	0	0	98.22	1.78	0.00	0.00	0.00
February	631	3.56	10.90	Feb 19	27.90	Feb 01 01:00	99.1	0	0	99.84	0.16	0.00	0.00	0.00
March	707	5.74	14.02	Mar 08	31.59	Mar 08 11:00	99.9	0	0	99.58	0.42	0.00	0.00	0.00
April	685	1.95	3.97	Apr 03	12.31	Apr 18 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
May	706	1.98	3.54	May 28	10.74	May 16 07:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
June	683	1.47	2.99	Jun 01	7.78	Jun 27 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
July	708	1.38	2.36	Jul 06	9.59	Jul 06 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
August	701	1.68	2.74	Aug 11	11.78	Aug 10 06:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00
September	684	2.38	4.99	Sep 29	14.50	Sep 12 06:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
October	700	2.72	5.54	Oct 19	16.55	Oct 19 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00
November	686	4.89	13.92	Nov 23	26.18	Nov 23 09:00	100.0	0	0	99.71	0.29	0.00	0.00	0.00
December	707	3.91	14.02	Dec 15	26.12	Dec 08 06:00	100.0	0	0	99.86	0.14	0.00	0.00	0.00
Annual	8273	3.07	21.04	Jan 31	31.59	Mar 08 11:00	99.6	0	0	99.77	0.23	0.00	0.00	0.00

Table 28. Ozone (O₃) – Beaverlodge 2011 Summary and Frequency Distribution

Beaverlodge O ₃ (ppb) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 10	10 - 20	20 - 40	40 - 82	>82
January	706	31.05	44.84	Jan 23	48.22	Jan 22 18:00	99.7	0	0	0.57	4.53	7.79	68.56	18.56	0.00
February	633	36.77	42.95	Feb 13	47.37	Feb 21 03:00	99.1	0	0	0.00	0.32	1.11	64.61	33.97	0.00
March	710	36.45	49.35	Mar 31	59.12	Mar 28 18:00	99.9	0	0	0.00	0.14	2.39	69.58	27.89	0.00
April	687	44.75	55.53	Apr 10	68.67	Apr 25 18:00	100.0	0	0	0.00	0.00	0.15	21.69	78.17	0.00
May	709	41.29	54.04	May 28	64.85	May 31 14:00	99.9	0	0	0.00	0.00	1.97	43.02	55.01	0.00
June	685	30.79	45.35	Jun 01	63.11	Jun 01 18:00	100.0	0	0	0.00	0.88	12.41	68.61	18.10	0.00
July	710	21.40	28.45	Jul 02	41.09	Jul 02 18:00	100.0	0	0	0.00	5.63	34.37	59.72	0.28	0.00
August	711	21.49	27.54	Aug 25	38.82	Aug 26 18:00	100.0	0	0	0.14	4.64	38.26	56.96	0.00	0.00
September	685	22.72	29.79	Sep 22	43.37	Sep 23 17:00	100.0	0	0	0.29	4.67	30.07	64.38	0.58	0.00
October	703	26.44	34.48	Oct 22	43.25	Oct 18 17:00	100.0	0	0	0.43	6.26	13.37	78.66	1.28	0.00
November	687	26.88	35.98	Nov 26	41.79	Nov 25 13:00	100.0	0	0	0.15	5.68	11.64	81.22	1.31	0.00
December	710	30.84	40.74	Dec 09	42.73	Dec 01 14:00	100.0	0	0	0.00	2.39	6.76	85.49	5.35	0.00
Annual	8336	30.85	55.53	Apr 10	68.67	Apr 25 18:00	99.9	0	0	0.13	2.95	13.47	63.57	19.88	0.00

Table 29. Particulate Matter (PM_{2.5}) – Beaverlodge 2011 Summary and Frequency Distribution

Beaverlodge PM _{2.5} (µg/m ³) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 6	6 - 11	11 - 17	17 - 30	> 30
January	740	4.90	16.95	Jan 11	27.38	Jan 11 16:00	99.5	0	0	6.89	75.41	11.62	4.19	1.89	0.00
February	664	4.04	9.97	Feb 19	16.30	Feb 19 16:00	98.8	0	0	11.30	73.95	12.50	2.26	0.00	0.00
March	742	10.40	22.43	Mar 28	32.24	Mar 08 12:00	99.9	0	0	0.00	20.89	42.32	24.66	11.99	0.13
April	715	6.24	11.70	Apr 25	14.67	Apr 25 11:00	99.4	0	0	0.84	51.05	45.45	2.66	0.00	0.00
May	743	14.52	84.79	May 28	181.31	May 28 10:00	99.9	2	13	0.27	24.09	35.67	19.92	12.52	7.54
June	699	8.06	26.41	Jun 16	39.37	Jun 16 15:00	97.1	0	0	6.58	38.20	32.62	16.45	4.72	1.43
July	739	4.54	10.25	Jul 13	17.52	Jul 05 09:00	100.0	0	0	12.99	64.41	20.30	2.17	0.14	0.00
August	743	5.37	10.57	Aug 10	15.77	Aug 10 22:00	99.9	0	0	6.06	58.95	31.36	3.63	0.00	0.00
September	713	5.02	12.20	Sep 14	22.24	Sep 14 21:00	99.7	0	0	9.12	62.27	23.98	4.21	0.42	0.00
October	735	4.99	9.23	Oct 05	14.23	Oct 05 01:00	99.1	0	0	7.07	63.54	26.94	2.45	0.00	0.00
November	718	7.77	23.40	Nov 21	39.31	Nov 22 02:00	99.7	0	0	4.74	54.87	21.59	8.08	8.50	2.23
December	743	4.46	8.99	Dec 15	25.80	Dec 11 20:00	99.9	0	0	6.46	77.79	14.40	1.21	0.13	0.00
Annual	8694	6.72	84.79	May 28	181.31	May 28 10:00	99.4	2	13	5.98	55.35	26.63	7.69	3.39	0.95

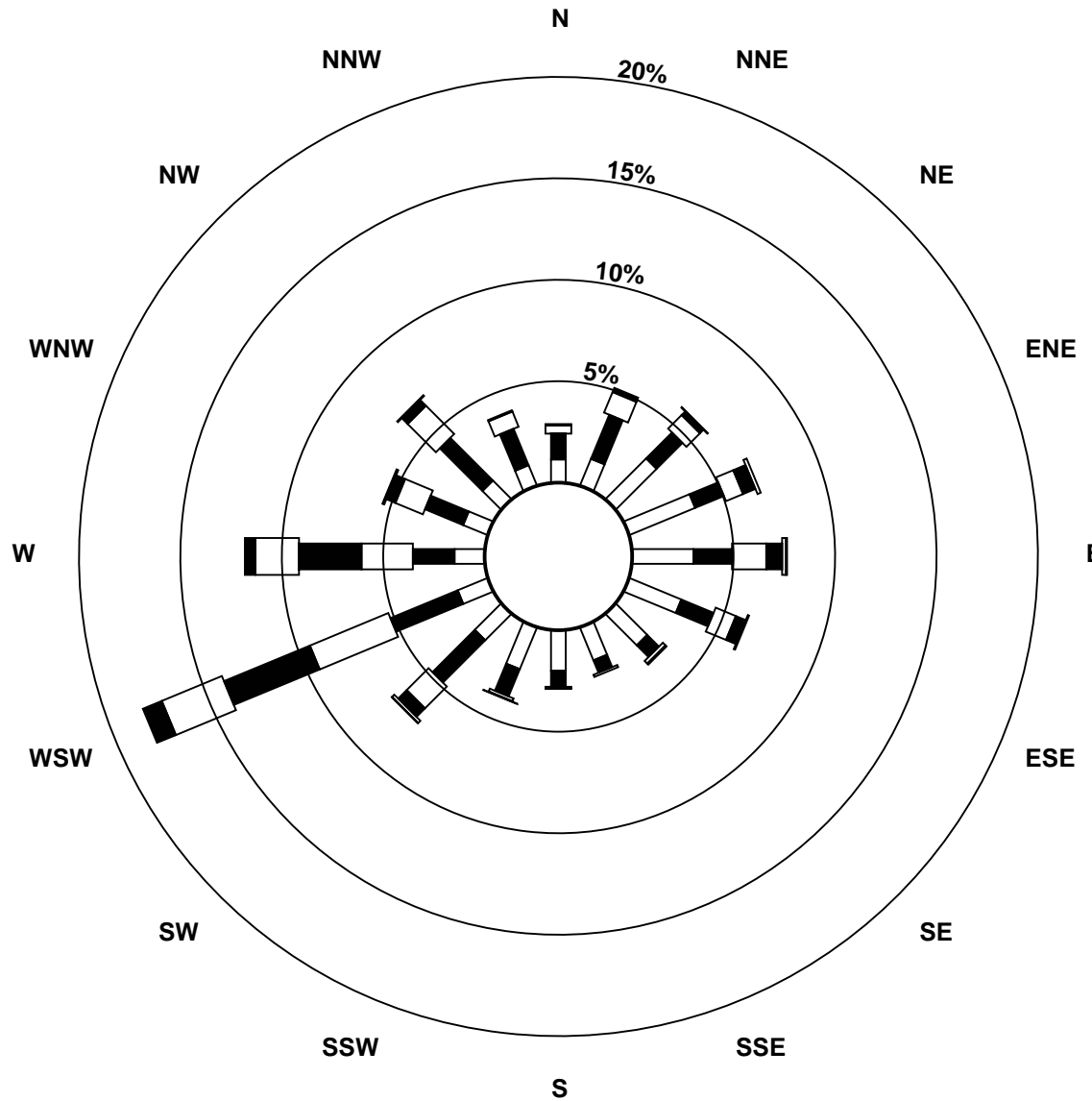
Table 30. Wind Speed and Wind Direction Frequency Distribution – Beaverlodge 2011 Summary

Beaverlodge								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	247	1.15	1.27	0.41	0.06	0.00	0.00	2.89
NNE	436	1.43	2.35	1.10	0.22	0.00	0.00	5.10
NE	502	2.84	1.80	0.95	0.25	0.04	0.00	5.87
ENE	580	3.51	1.53	0.91	0.65	0.18	0.00	6.78
E	653	3.02	1.91	1.68	0.78	0.19	0.06	7.64
ESE	527	2.77	1.72	1.08	0.53	0.07	0.00	6.16
SE	279	2.19	0.82	0.19	0.07	0.00	0.00	3.26
SSE	216	1.75	0.65	0.12	0.00	0.00	0.00	2.53
S	246	2.00	0.78	0.08	0.01	0.00	0.00	2.88
SSW	330	2.22	1.45	0.15	0.02	0.01	0.00	3.86
SW	605	1.84	2.95	1.52	0.60	0.16	0.01	7.07
WSW	1553	1.59	3.59	4.19	4.58	3.20	1.01	18.16
WSW	1011	1.49	2.06	2.53	3.09	2.14	0.53	11.82
WNW	460	1.30	2.03	1.47	0.48	0.06	0.04	5.38
NW	573	1.30	2.97	1.98	0.40	0.06	0.00	6.70
NNW	334	1.09	1.94	0.81	0.07	0.00	0.00	3.91
Totals	8552	31.47	29.83	19.15	11.81	6.10	1.64	100

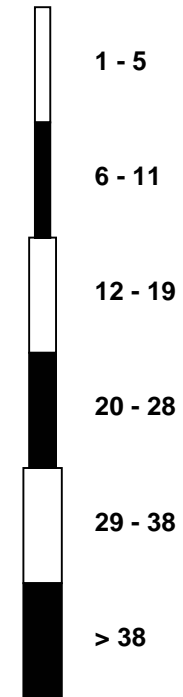
Wind Rose

Wind Speed (WS) (km/h)

Beaverlodge - 2011



Wind Speed Classes (km/h)



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CONTINUOUS AMBIENT AIR MONITORING STATION

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Table 49. Valleyview - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Valleyview	0.75	10.78	Sep 17	80.67	Sep 17 12:00	99.9	0	0
Hydrogen Sulphide H₂S measured in ppb	Valleyview	0.17	1.24	Nov 29	8.31	Jan 26 20:00	99.9	0	0

Table 50. Sulphur Dioxide (SO₂) – Valleyview 2011 Summary and Frequency Distribution

Valleyview		SO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	710	0.95	6.44	Jan 06	31.41	Jan 06 07:00	100.0	0	0	99.44	0.56	0.00	0.00	0.00	0.00
February	641	0.95	5.90	Feb 10	28.27	Feb 10 06:00	100.0	0	0	99.84	0.16	0.00	0.00	0.00	0.00
March	709	1.05	3.10	Mar 30	14.85	Mar 31 22:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	680	0.52	1.18	Apr 11	15.50	Apr 21 10:00	99.2	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	708	0.58	3.64	May 04	45.72	May 06 08:00	100.0	0	0	99.86	0.14	0.00	0.00	0.00	0.00
June	685	0.61	3.66	Jun 30	16.55	Jun 29 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	709	0.77	3.25	Jul 04	16.74	Jul 01 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
August	710	0.66	1.71	Aug 18	13.92	Aug 27 12:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
September	686	0.90	10.78	Sep 17	80.67	Sep 17 12:00	100.0	0	0	99.42	0.44	0.15	0.00	0.00	0.00
October	707	0.72	2.67	Oct 27	14.53	Oct 29 10:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
November	687	0.50	2.33	Nov 08	8.68	Nov 08 04:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
December	708	0.85	4.83	Dec 20	12.99	Dec 24 07:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
Annual	8340	0.75	10.78	Sep 17	80.67	Sep 17 12:00	99.9	0	0	99.88	0.11	0.01	0.00	0.00	0.00

Table 51. Hydrogen Sulphide (H₂S) – Valleyview 2011 Summary and Frequency Distribution

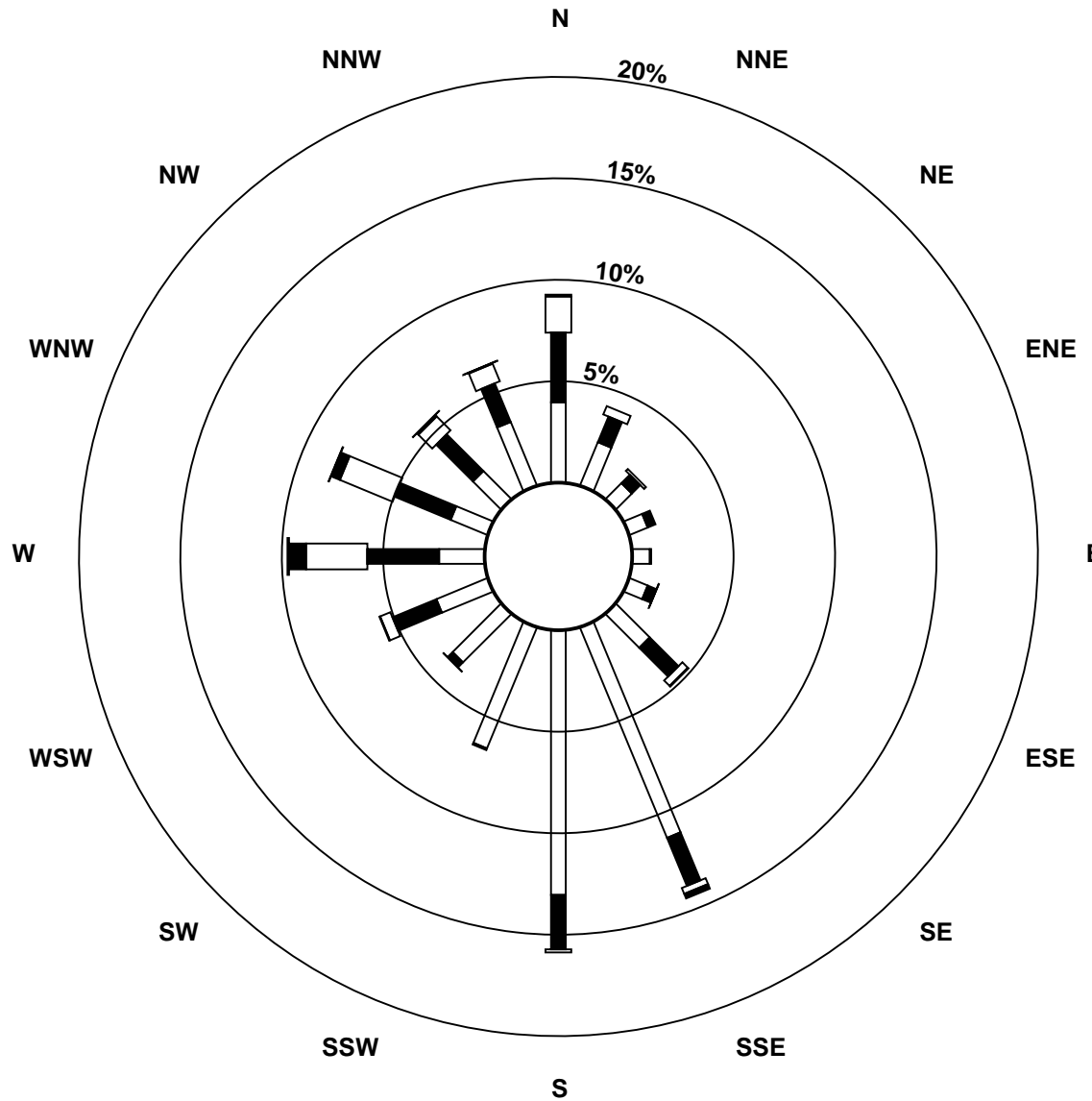
Valleyview		H ₂ S (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 1	1 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	>10
January	702	0.13	0.75	Jan 26	8.31	Jan 26 20:00	99.7	0	0	98.72	0.85	0.28	0.00	0.14	0.00
February	640	0.33	1.14	Feb 10	3.88	Feb 10 06:00	100.0	0	0	94.38	5.00	0.63	0.00	0.00	0.00
March	710	0.20	0.59	Mar 17	1.76	Mar 23 10:00	99.9	0	0	97.61	2.39	0.00	0.00	0.00	0.00
April	679	0.13	0.29	Apr 02	1.99	Apr 21 22:00	99.3	0	0	98.82	1.18	0.00	0.00	0.00	0.00
May	708	0.11	0.34	May 06	2.33	May 06 08:00	100.0	0	0	99.72	0.28	0.00	0.00	0.00	0.00
June	686	0.12	0.35	Jun 23	2.28	Jun 23 05:00	100.0	0	0	99.13	0.87	0.00	0.00	0.00	0.00
July	710	0.14	0.27	Jul 17	2.50	Jul 16 23:00	100.0	0	0	98.45	1.55	0.00	0.00	0.00	0.00
August	709	0.15	0.31	Aug 18	1.76	Aug 18 05:00	100.0	0	0	98.31	1.69	0.00	0.00	0.00	0.00
September	687	0.18	0.72	Sep 17	6.46	Sep 07 22:00	100.0	0	0	95.78	3.35	0.73	0.15	0.00	0.00
October	707	0.13	0.42	Oct 25	3.72	Oct 24 19:00	100.0	0	0	97.88	1.84	0.28	0.00	0.00	0.00
November	686	0.17	1.24	Nov 29	7.72	Nov 02 20:00	100.0	0	0	96.06	2.62	1.02	0.15	0.15	0.00
December	707	0.21	0.57	Dec 10	5.91	Dec 14 00:00	100.0	0	0	92.93	6.36	0.57	0.14	0.00	0.00
Annual	8331	0.17	1.24	Nov 29	8.31	Jan 26 20:00	99.9	0	0	97.32	2.33	0.29	0.04	0.02	0.00

Table 52. Wind Speed and Wind Direction Frequency Distribution – Valleyview 2011 Summary

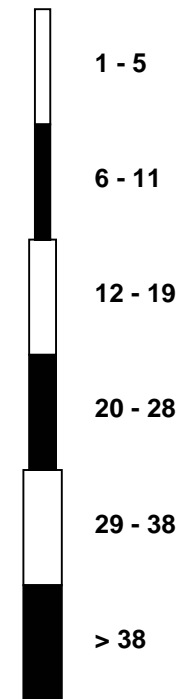
Valleyview								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	713	3.97	3.43	1.78	0.09	0.00	0.00	9.27
NNE	317	2.31	1.37	0.44	0.00	0.00	0.00	4.12
NE	141	1.12	0.59	0.13	0.00	0.00	0.00	1.83
ENE	107	0.98	0.42	0.00	0.00	0.00	0.00	1.39
E	72	0.87	0.07	0.00	0.00	0.00	0.00	0.94
ESE	112	0.98	0.47	0.01	0.00	0.00	0.00	1.46
SE	369	2.35	2.02	0.38	0.05	0.00	0.00	4.80
SSE	1103	11.22	2.56	0.31	0.25	0.00	0.00	14.34
S	1221	13.04	2.68	0.16	0.00	0.00	0.00	15.88
SSW	503	6.45	0.09	0.00	0.00	0.00	0.00	6.54
SW	288	3.38	0.35	0.01	0.00	0.00	0.00	3.75
WSW	435	2.73	2.34	0.55	0.04	0.00	0.00	5.66
WSW	748	2.25	3.54	3.02	0.85	0.08	0.00	9.73
WNW	635	1.96	2.99	2.81	0.47	0.03	0.00	8.26
NW	431	1.96	2.56	0.96	0.10	0.01	0.00	5.60
NNW	495	3.39	2.05	0.94	0.04	0.01	0.00	6.44
Totals	7690	58.97	27.52	11.50	1.89	0.13	0.00	100

Wind Rose

Wind Speed (WS) (km/h)
Valleyview - 2011



Wind Speed Classes (km/h)



PAZA
Portable-Bonanza
CONTINUOUS AMBIENT AIR MONITORING STATION

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Table 53. Portable-Bonanza - Key Parameters – Continuous Monitoring Data – 2011 Summary

Parameter	Monitoring Station	Annual Average	Maximum Values				Operational Time (%)	Readings above AAAQO	
			24-hr	Date	1-hr	Date		24-hr	1-hr
Sulphur Dioxide SO₂ measured in ppb	Bonanza-Portable	0.35	1.13	Jan 17	8.26	Jan 02 00:00	49.6	0	0
Nitrogen Dioxide NO₂ measured in ppb	Bonanza-Portable	3.13	14.21	Jan 31	62.97	Jun 27 07:00	49.1	0	0
Ozone O₃ measured in ppb	Bonanza-Portable	34.90	50.28	Apr 10	64.51	May 31 16:00	49.6	0	0
Total Reduced Sulphur TRS measured in ppb	Bonanza-Portable	0.50	1.75	Jan 10	7.72	Jan 10 13:00	49.6	0	0

Table 54. Sulphur Dioxide (SO₂) – Portable-Bonanza 2011 Summary and Frequency Distribution

Bonanza Portable		SO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 20	20 - 60	60 - 110	110 - 170	170 - 340	>340
January	706	0.44	1.13	Jan 17	8.26	Jan 02 00:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
February	637	0.38	0.82	Feb 19	1.95	Feb 26 20:00	99.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	709	0.61	1.05	Mar 14	6.28	Mar 30 20:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
April	686	0.24	0.57	Apr 25	2.47	Apr 02 11:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	0.00
May	708	0.24	0.60	May 24	4.04	May 24 09:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	0.00
June	670	0.20	0.66	Jun 15	3.31	Jun 15 10:00	99.4	0	0	100.00	0.00	0.00	0.00	0.00	0.00
July	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual	4116	0.35	1.13	Jan 17	8.26	Jan 02 00:00	49.6	0	0	100.00	0.00	0.00	0.00	0.00	0.00

Table 55. Nitrogen Dioxide (NO₂) – Portable-Bonanza 2011 Summary and Frequency Distribution

Bonanza Portable		NO ₂ (ppb)										2011			
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 25	25 - 50	50 - 110	110 - 210	>210	
January	678	3.57	14.21	Jan 31	61.30	Jan 31 20:00	97.3	0	0	99.85	0.00	0.15	0.00	0.00	
February	615	3.26	10.68	Feb 19	23.57	Feb 01 07:00	96.9	0	0	100.00	0.00	0.00	0.00	0.00	
March	707	4.57	13.26	Mar 08	27.03	Mar 08 05:00	100.0	0	0	99.72	0.28	0.00	0.00	0.00	
April	684	1.87	4.63	Apr 03	13.13	Apr 03 06:00	99.9	0	0	100.00	0.00	0.00	0.00	0.00	
May	707	2.55	5.14	May 27	14.51	May 30 07:00	100.0	0	0	100.00	0.00	0.00	0.00	0.00	
June	670	2.97	6.40	Jun 29	62.97	Jun 27 07:00	99.4	0	0	99.70	0.15	0.15	0.00	0.00	
July	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Annual	4061	3.13	14.21	Jan 31	62.97	Jun 27 07:00	49.1	0	0	99.90	0.07	0.02	0.00	0.00	

Table 56. Ozone (O₃) – Portable-Bonanza 2011 Summary and Frequency Distribution

Bonanza Portable O ₃ (ppb) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 2	2 - 10	10 - 20	20 - 40	40 - 82	>82
January	706	30.04	43.80	Jan 23	46.62	Jan 22 17:00	99.9	0	0	0.00	2.12	11.05	74.79	12.04	0.00
February	632	34.99	42.39	Feb 13	45.53	Feb 25 16:00	99.9	0	0	0.00	0.95	3.96	69.30	25.79	0.00
March	710	35.68	48.84	Mar 31	55.32	Mar 28 21:00	100.0	0	0	0.00	0.00	2.82	72.25	24.93	0.00
April	685	41.84	50.28	Apr 10	62.53	Apr 25 18:00	99.9	0	0	0.00	0.00	0.73	33.43	65.84	0.00
May	708	37.79	49.33	May 15	64.51	May 31 16:00	100.0	0	0	0.00	0.56	8.62	45.34	45.48	0.00
June	673	28.96	43.54	Jun 01	60.19	Jun 01 16:00	99.4	0	0	0.00	2.38	17.09	65.68	14.86	0.00
July	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual	4114	34.90	50.28	Apr 10	64.51	May 31 16:00	49.6	0	0	0.00	0.74	6.74	60.59	31.93	0.00

Table 57. Total Reduced Sulphur (TRS) – Portable-Bonanza 2011 Summary and Frequency Distribution

Bonanza Portable TRS (ppb) 2011															
Month	# of Readings	Average	24-hr Maximum	Date	1-hr Maximum	Date	Operational Time (%)	*AAAQO		Number of Readings in Concentration Range					
								24-Hr	1-Hr	0 - 1	1 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	>10
January	707	0.56	1.75	Jan 10	7.72	Jan 10 13:00	99.9	0	0	96.89	2.55	0.42	0.00	0.14	0.00
February	639	0.51	0.64	Feb 19	0.81	Feb 16 05:00	99.7	0	0	100.00	0.00	0.00	0.00	0.00	0.00
March	709	0.54	0.69	Mar 10	1.37	Mar 29 08:00	100.0	0	0	99.58	0.42	0.00	0.00	0.00	0.00
April	686	0.55	0.74	Apr 08	1.34	Apr 11 03:00	99.9	0	0	99.56	0.44	0.00	0.00	0.00	0.00
May	707	0.56	0.86	May 20	1.88	May 24 11:00	100.0	0	0	97.31	2.69	0.00	0.00	0.00	0.00
June	674	0.30	0.53	Jun 11	1.81	Jun 11 07:00	99.4	0	0	98.96	1.04	0.00	0.00	0.00	0.00
July	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
October	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual	4122	0.50	1.75	Jan 10	7.72	Jan 10 13:00	49.6	0	0	98.67	1.23	0.07	0.00	0.02	0.00

*No Alberta Environment Objectives or Guidelines for TRS

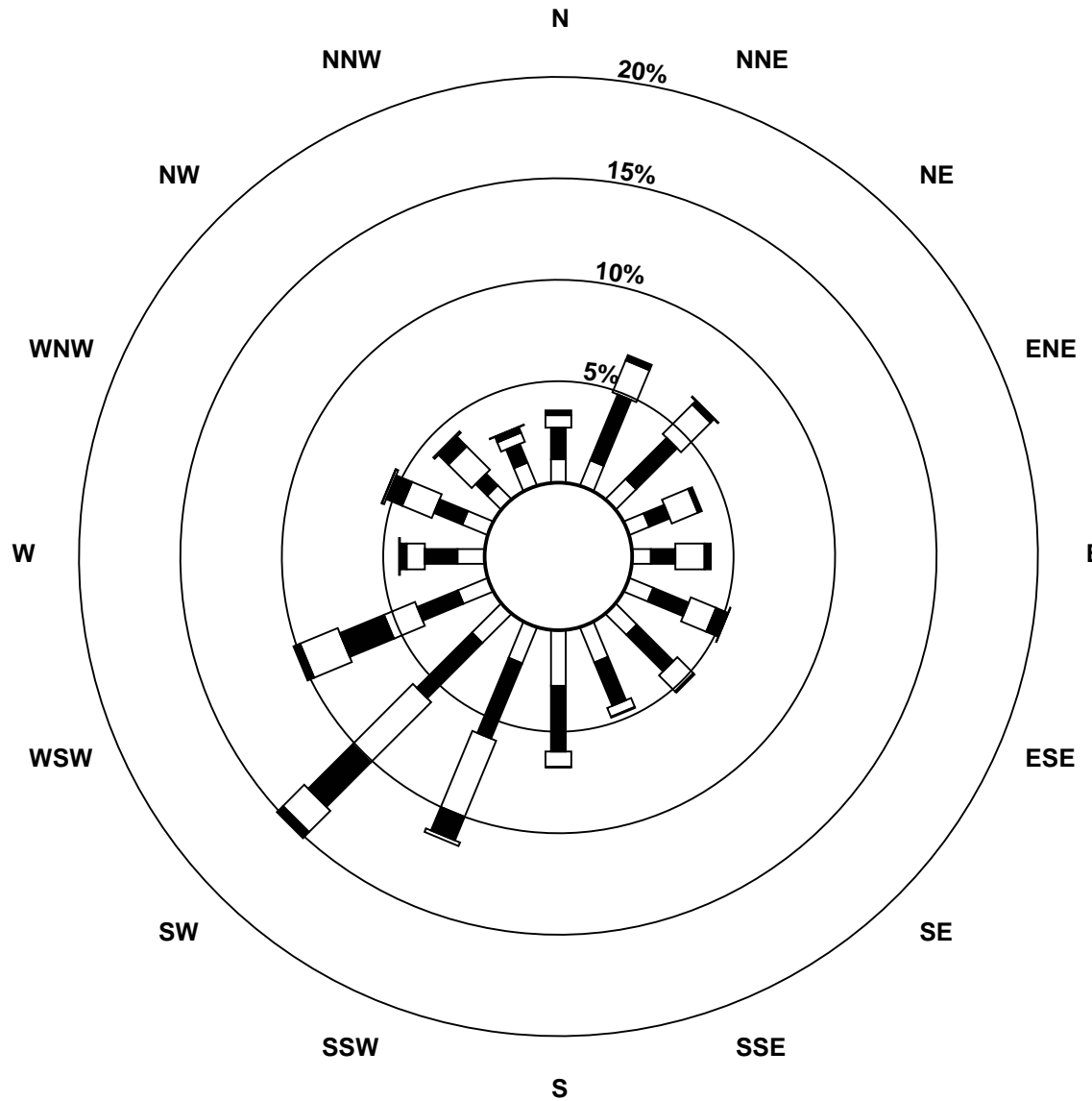
Table 58. Wind Speed and Wind Direction Frequency Distribution – Portable-Bonanza 2011 Summary

Bonanza Portable								2011
Direction	# of Readings	% of wind speed (km/hr)						Totals
		1 - 5	6 - 11	12 - 19	20 - 28	29 - 38	> 38	
N	151	1.16	1.56	0.61	0.24	0.00	0.00	3.57
NNE	290	1.35	3.52	1.70	0.28	0.00	0.00	6.85
NE	280	1.42	2.86	2.05	0.24	0.05	0.00	6.61
ENE	159	1.06	1.09	1.39	0.21	0.00	0.00	3.75
E	164	0.92	1.20	1.44	0.31	0.00	0.00	3.87
ESE	219	1.28	1.89	1.35	0.64	0.02	0.00	5.17
SE	221	1.46	2.55	1.11	0.09	0.00	0.00	5.22
SSE	199	1.87	2.31	0.47	0.05	0.00	0.00	4.70
S	286	2.74	3.23	0.76	0.02	0.00	0.00	6.75
SSW	484	1.91	4.01	4.06	1.25	0.19	0.00	11.43
SW	639	2.03	3.85	4.20	3.09	1.49	0.43	15.09
WSW	429	1.58	2.17	1.65	2.36	2.01	0.35	10.13
WSW	179	1.35	1.61	0.90	0.33	0.05	0.00	4.23
WNW	230	1.35	1.51	1.58	0.85	0.12	0.02	5.43
NW	177	0.97	0.80	1.63	0.68	0.09	0.00	4.18
NNW	128	1.23	0.99	0.50	0.28	0.02	0.00	3.02
Totals	4235	23.66	35.16	25.41	10.93	4.04	0.80	100

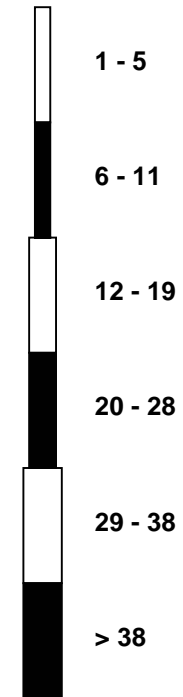
Wind Rose

Wind Speed (WS) (km/h)

Bonanza - 2011



Wind Speed Classes (km/h)



PAZA

PASSIVE MONITORING

2011

ANNUAL SUMMARY TABLES

Table 59. SO₂ Passive - 2011 Summary

MONITORING SITE		Sulphur Dioxide Passive (parts per billion)												MAXIMUM VALUE	ANNUAL AVERAGE
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1	Silver Valley	0.5	0.6	0.7	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.7	0.3
2	Bay Tree	0.4	0.4	1.0	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	1.0	0.3
3	Forth Creek	0.3	0.6	0.7	0.3	0.1	N/A	0.1	0.1	0.2	0.2	0.2	0.4	0.7	0.3
4	Gordondale	0.4	0.4	0.8	0.3	0.2	0.2	0.1	0.2	0.3	0.1	0.6	0.5	0.8	0.3
5	Boone Creek	0.3	0.4	0.7	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.4	0.2	0.7	0.2
7	Steepprock Creek	0.3	0.4	0.7	0.2	0.1	0.2	BDL	0.2	0.1	0.1	0.3	0.2	0.7	0.3
9	Spirit River	0.3	0.5	0.5	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.5	0.3
10	Woking	0.3	0.8	0.8	0.4	0.2	0.3	0.1	0.3	0.2	0.3	0.4	0.4	0.8	0.4
11	Webber Creek	0.4	0.7	0.7	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.7	0.4	0.7	0.4
12	Hythe	0.3	0.4	0.7	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.3	0.1	0.7	0.3
14	Sylvester	0.1	0.2	0.7	0.1	0.1	0.0	0.1	0.1	BDL	0.1	0.1	0.1	0.7	0.2
16	Beaverlodge	0.3	0.6	1.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	1.1	0.3
17	Poplar	0.4	0.5	1.0	0.2	0.2	0.3	0.1	0.0	0.1	0.2	0.3	0.2	1.0	0.3
18	Saddle Hills	0.3	0.4	0.8	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.8	0.3
19	Wanham	0.3	0.6	0.8	0.4	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.8	0.3
20	Shaftesbury	n/a	0.4	0.6	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.6	0.2
21	Eaglesham	0.2	0.4	0.8	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.8	0.2
23	Bear Lake	0.3	0.7	0.8	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.3	0.2	0.8	0.3
24	Wembley	0.3	0.4	0.7	0.2	0.2	0.2	0.4	0.0	0.1	BDL	0.3	0.1	0.7	0.3
25	Pinto Creek	0.3	0.3	0.8	0.1	0.2	0.1	0.5	0.0	0.1	BDL	0.2	0.1	0.8	0.2
26	Flyingshot	0.3	0.5	0.7	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.7	0.2
27	Grande Prairie I	0.3	0.6	0.9	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.9	0.3
28	Clairmont Lake	0.4	0.6	1.0	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	1.0	0.3
29	Smoky Heights	0.4	0.9	0.9	0.5	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.9	0.4
30	Fitzsimmons	0.2	0.3	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5	0.2
32	Gold Creek	0.3	0.4	0.7	0.2	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.4	0.7	0.3
33	Wapiti	0.2	0.4	0.7	0.2	N/A	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.7	0.2
34	Puskwaskau	0.1	0.3	0.4	0.1	0.1	0.2	BDL	0.1	0.1	BDL	0.1	0.1	0.4	0.2
35	Jean Cote	0.3	0.6	0.5	0.2	0.1	0.2	0.1	0.3	0.6	0.2	0.2	0.2	0.6	0.3
36	Guy	0.2	0.4	0.6	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.6	0.2
37	Crooked Creek	0.2	0.4	0.7	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4	0.7	0.2
38	Karr Creek	0.1	0.2	0.4	0.2	0.1	0.0	0.1	0.1	0.4	0.0	0.1	0.3	0.4	0.2
39	Clouston Creek	0.3	0.4	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.6	0.2
40	McLennan	n/a	0.4	N/A	0.2	0.2	0.1	0.2	0.0	0.1	0.3	0.2	0.2	0.4	0.2
41	Valleyview	0.3	0.5	0.9	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.9	0.3
42	Sunset House	0.3	0.6	0.8	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.2	0.8	0.3
43	High Prairie	0.1	0.5	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.6	0.2
44	Peavine	0.2	0.3	0.5	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.5	0.2
45	Gift Lake	0.1	0.2	0.5	0.1	0.1	0.0	BDL	0.1	0.1	BDL	0.2	0.1	0.5	0.2
46	Little Smoky	0.2	0.4	0.8	0.2	0.2	0.1	BDL	0.2	0.3	0.2	0.2	0.1	0.8	0.3
47	Kinuso	0.1	0.2	0.6	0.1	0.2	0.0	BDL	0.2	0.3	0.2	0.2	0.1	0.6	0.2
48	Deer Mountain	0.2	0.3	0.5	0.2	0.1	0.1	BDL	0.1	0.1	0.1	0.3	0.2	0.5	0.2
49	Grande Prairie HP	0.3	0.4	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.9	0.3
62	East Prairie								0.0	0.1	0.1	0.1	0.1	0.1	0.1
Average		0.3	0.5	0.7	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2		0.3
Peak		0.5	0.9	1.1	0.5	0.4	0.3	0.5	0.3	0.6	0.3	0.7	0.5	1.1	

BDL=Below Detection Limit (>0.02ppm); N/A=Sample not collected (damaged, missing, inaccessible, etc)

Table 60. NO₂ Passive - 2011 Summary

MONITORING SITE		Nitrogen Dioxide Passive (parts per billion)												MAXIMUM VALUE	ANNUAL AVERAGE
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1	Silver Valley	0.9	0.8	N/A	0.1	0.5	0.7	0.3	0.6	0.6	0.9	1.3	1.2	1.3	0.7
2	Bay Tree	0.7	0.5	0.6	0.3	0.5	0.4	0.3	0.3	0.5	0.6	0.9	0.6	0.9	0.5
3	Forth Creek	0.8	0.5	0.3	0.0	0.2	N/A	0.2	0.7	0.7	0.9	0.9	0.7	0.9	0.5
4	Gordondale	1.1	0.6	0.4	0.2	0.5	0.5	0.4	0.3	0.7	1.3	1.5	1.5	1.5	0.7
5	Boone Creek	1.4	1.0	0.8	0.2	0.4	0.4	0.3	0.3	0.9	1.3	1.6	1.3	1.6	0.8
7	Steepprock Creek	0.6	0.4	0.5	0.0	0.3	0.3	0.1	0.2	0.3	0.4	0.9	0.7	0.9	0.4
9	Spirit River	1.0	N/A	0.3	0.3	1.2	1.6	0.4	0.9	0.8	1.3	1.4	1.4	1.6	1.0
10	Woking	0.5	0.5	0.4	0.0	0.6	0.5	0.3	0.4	0.7	0.7	1.2	1.0	1.2	0.6
11	Webber Creek	1.1	1.3	0.7	0.5	1.0	1.1	0.3	0.7	0.7	1.3	1.4	1.7	1.7	1.0
12	Hythe	1.4	1.3	0.9	0.4	2.2	0.8	0.4	0.5	1.3	1.3	1.4	1.3	2.2	1.1
14	Sylvester	1.0	0.8	1.0	0.2	0.9	0.6	0.4	0.5	0.7	0.7	1.6	0.7	1.6	0.8
16	Beaverlodge	2.1	1.9	1.4	0.6	0.8	0.7	0.5	0.8	1.1	1.4	2.4	2.4	2.4	1.3
17	Poplar	1.1	1.2	0.7	0.3	1.3	1.5	0.3	0.5	0.7	1.0	1.8	2.0	2.0	1.0
18	Saddle Hills	1.0	0.5	0.4	0.1	0.3	0.5	0.3	0.4	0.4	1.1	1.4	1.9	1.9	0.7
19	Wanham	0.8	0.6	0.3	0.4	0.6	0.6	0.2	0.3	0.7	0.8	1.3	1.0	1.3	0.6
20	Shaftesbury	N/A	0.5	0.3	0.2	0.7	0.8	0.2	0.3	0.4	0.6	1.2	1.7	1.7	0.6
21	Eaglesham	0.8	0.7	0.2	0.3	0.7	1.5	0.3	0.3	0.3	N/A	1.2	0.7	1.5	0.6
23	Bear Lake	1.5	1.6	0.7	0.6	1.9	1.4	0.3	0.6	1.1	1.7	1.9	2.7	2.7	1.3
24	Wembley	1.8	1.3	1.2	0.5	1.5	1.1	0.3	1.0	0.8	0.9	2.2	1.5	2.2	1.2
25	Pinto Creek	1.0	0.8	0.7	0.3	0.7	0.7	0.3	0.5	0.6	0.6	1.1	0.9	1.1	0.7
26	Flyingshot	2.1	1.5	1.4	0.3	0.8	0.6	0.3	0.6	1.0	1.5	2.6	2.4	2.6	1.3
27	Grande Prairie I	7.8	4.3	6.1	2.2	2.3	1.8	1.0	1.4	0.7	4.3	7.9	8.6	8.6	4.0
28	Clairmont Lake	1.6	1.0	0.4	0.4	0.6	0.7	0.4	0.7	1.1	1.0	2.1	2.3	2.3	1.0
29	Smoky Heights	1.6	1.8	0.7	0.5	0.8	0.7	0.3	0.4	0.8	1.0	2.0	1.5	2.0	1.0
30	Fitzsimmons	1.8	1.1	0.6	0.2	0.7	0.6	0.5	0.5	0.7	1.5	1.9	1.5	1.9	1.0
32	Gold Creek	2.7	1.7	1.2	0.5	0.6	0.5	0.4	0.8	1.3	1.5	3.0	1.0	3.0	1.3
33	Wapiti	1.7	1.6	0.5	0.5	N/A	0.5	0.3	0.7	0.8	0.9	2.1	0.7	2.1	0.9
34	Puskwaskau	0.5	0.8	0.2	0.0	0.2	0.3	0.1	0.3	0.3	0.3	0.6	0.6	0.8	0.3
35	Jean Cote	0.8	0.6	0.3	0.0	1.0	2.2	0.3	0.4	0.6	1.3	1.2	1.1	2.2	0.8
36	Guy	0.8	0.3	0.3	0.2	1.6	2.2	0.4	0.3	0.5	1.1	1.0	1.3	2.2	0.8
37	Crooked Creek	1.6	1.1	0.5	0.0	0.5	0.4	0.3	0.6	0.8	1.0	3.0	1.0	3.0	0.9
38	Karr Creek	0.7	0.7	0.8	0.0	0.7	0.3	0.3	0.4	0.5	0.8	1.0	0.9	1.0	0.6
39	Clouston Creek	0.8	0.6	0.3	0.2	0.4	0.5	0.2	0.5	0.5	0.7	1.4	1.3	1.4	0.6
40	McLennan	N/A	0.5	N/A	0.0	0.8	1.9	0.4	0.2	0.6	1.1	1.4	1.3	1.9	0.8
41	Valleyview	1.1	0.5	0.6	0.0	0.3	0.4	0.3	0.6	N/A	0.8	1.8	1.7	1.8	0.7
42	Sunset House	0.5	0.3	0.2	0.0	0.1	0.3	0.2	0.3	0.4	0.6	0.7	1.4	1.4	0.4
43	High Prairie	1.3	1.0	0.3	0.4	0.9	1.5	0.2	0.3	0.5	0.6	1.5	0.9	1.5	0.8
44	Peavine	0.6	0.5	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.8	0.6	0.8	0.3
45	Gift Lake	0.9	0.6	0.3	0.0	0.3	0.3	0.2	0.3	0.4	BDL	1.1	0.9	1.1	0.5
46	Little Smoky	3.6	2.5	1.4	0.5	0.6	0.6	0.4	BDL	N/A	2.1	4.1	3.8	4.1	2.0
47	Kinuso	1.2	0.5	0.3	0.1	0.2	0.3	0.2	0.3	0.4	BDL	1.0	0.6	1.2	0.4
48	Deer Mountain	0.9	0.6	0.4	0.1	0.3	0.5	0.9	0.7	0.7	BDL	1.1	0.6	1.1	0.6
49	Grande Prairie HP	9.6	6.9	6.1	2.6	2.0	1.8	1.2	1.9	3.2	4.5	11.8	10.7	11.8	5.2
62	East Prairie								0.2	0.4	0.4	0.7	1.0	1.0	0.5
Average		1.6	1.1	0.9	0.3	0.8	0.8	0.3	0.5	0.7	1.2	1.9	1.7		1.0
Peak		9.6	6.9	6.1	2.6	2.3	2.2	1.2	1.9	3.2	4.5	11.8	10.7	11.8	

BDL=Below Detection Limit (>0.03ppm); N/A=Sample not collected (damaged, missing, inaccessible, etc)

Table 61. O₃ Passive - 2011 Summary

MONITORING SITE		Ozone Passive (parts per billion)												MAXIMUM VALUE	ANNUAL AVERAGE
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1	Silver Valley	37.4	40.9	48.4	51.9	38.8	29.4	17.9	19.1	23.2	22.2	32.5	37.2	51.9	33.2
2	Bay Tree	37.3	45.2	40.1	43.2	33.8	28.9	21.0	18.4	21.5	24.2	32.1	38.3	45.2	32.0
3	Forth Creek	41.1	48.1	42.7	43.8	45.1	N/A	22.4	22.8	25.7	30.1	33.0	42.7	48.1	36.1
4	Gordondale	35.7	46.0	46.6	46.1	38.4	34.4	20.6	21.1	27.4	24.0	36.6	38.6	46.6	34.6
5	Boone Creek	34.8	44.3	39.9	46.7	35.9	25.4	18.3	16.6	18.3	22.4	27.9	34.6	46.7	30.4
7	Steeprock Creek	40.3	43.0	44.2	46.9	42.4	31.9	23.5	21.6	22.4	28.0	35.2	42.7	46.9	35.2
9	Spirit River	36.7	42.3	45.6	43.0	38.6	33.0	21.6	21.4	23.3	25.3	31.4	38.3	45.6	33.4
10	Woking	37.5	45.4	45.2	44.6	37.7	31.1	20.9	20.6	24.8	27.5	33.1	38.2	45.4	33.9
11	Webber Creek	36.1	47.4	45.7	41.1	41.0	29.5	20.8	19.5	19.8	23.1	31.6	32.9	47.4	32.4
12	Hythe	36.1	46.6	43.9	41.3	38.1	28.1	20.3	20.1	20.7	24.0	31.4	35.5	46.6	32.2
14	Sylvester	37.8	37.2	34.9	39.1	32.8	29.5	16.7	15.1	17.7	20.9	29.5	36.4	39.1	29.0
16	Beavert Lodge	37.2	42.5	43.0	45.5	42.6	39.5	27.8	25.9	25.4	28.0	33.3	44.0	45.5	36.2
17	Poplar	39.3	44.3	47.4	43.0	37.4	28.8	19.8	20.5	19.7	23.5	29.0	34.2	47.4	32.2
18	Saddle Hills	39.9	43.8	46.4	44.4	37.9	31.9	19.2	19.2	22.8	23.0	32.5	36.9	46.4	33.2
19	Wanham	41.6	46.6	42.7	N/A	41.7	33.2	20.5	23.9	27.4	31.3	32.3	36.8	46.6	34.4
20	Shaftesbury	n/a	43.1	38.9	48.9	37.7	32.4	20.6	20.6	23.3	24.6	30.3	36.8	48.9	32.5
21	Eaglesham	34.6	40.7	40.7	38.3	34.1	28.1	15.8	16.9	17.7	17.4	27.8	30.2	40.7	28.5
23	Bear Lake	39.5	48.3	47.5	45.8	38.6	30.6	19.1	18.7	20.1	21.9	29.9	34.0	48.3	32.8
24	Wembley	38.0	45.2	49.6	42.4	33.6	33.0	19.8	16.5	17.8	21.3	27.1	36.1	49.6	31.7
25	Pinto Creek	39.8	43.0	41.6	39.8	36.1	29.3	17.6	19.2	19.0	24.9	29.4	36.3	43.0	31.3
26	Flyingshot	36.2	41.7	40.6	41.2	35.2	27.2	19.1	17.3	18.3	24.7	27.4	33.7	41.7	30.2
27	Grande Prairie I	28.8	35.7	39.0	37.3	39.3	31.6	20.4	20.3	20.5	21.4	25.0	31.6	39.3	29.2
28	Clairmont Lake	42.0	49.9	51.4	41.5	41.4	32.7	22.2	19.9	17.5	24.1	30.8	37.5	51.4	34.3
29	Smoky Heights	36.1	40.9	40.8	45.3	46.0	36.7	26.2	25.5	25.8	27.5	28.4	37.0	46.0	34.7
30	Fitzsimmons	32.3	42.6	47.0	41.4	41.1	25.1	16.1	18.1	17.7	20.1	25.5	28.9	47.0	29.7
32	Gold Creek	28.0	36.3	37.1	34.3	30.2	23.8	14.3	13.5	16.9	17.9	23.0	38.2	38.2	26.1
33	Wapiti	34.5	44.1	48.1	38.2	N/A	31.4	17.0	18.5	18.6	22.1	30.8	42.7	48.1	31.5
34	Puskwaskau	36.6	38.0	43.5	42.3	34.2	24.8	16.4	13.5	16.6	21.7	26.0	33.2	43.5	28.9
35	Jean Cote	41.0	49.7	51.3	50.8	47.5	31.2	18.7	17.5	22.1	21.2	33.5	35.3	51.3	35.0
36	Guy	38.4	42.5	44.5	40.0	42.6	31.0	22.5	19.1	21.8	23.2	30.3	34.4	44.5	32.5
37	Crooked Creek	36.6	46.5	46.5	45.0	41.0	31.1	18.1	17.6	21.0	24.9	23.0	38.2	46.5	32.4
38	Karr Creek	28.5	38.9	36.8	36.4	29.8	24.6	13.4	15.4	13.7	18.2	22.7	36.2	38.9	26.2
39	Clouston Creek	38.6	50.1	44.3	41.7	39.0	27.9	19.5	18.9	20.0	23.7	30.4	34.4	50.1	32.4
40	McLennan	n/a	41.0	N/A	21.6	37.8	28.5	21.1	16.4	21.3	25.6	30.4	34.4	41.0	27.8
41	Valleyview	38.4	45.2	45.5	44.2	43.0	32.7	20.9	27.1	23.1	26.9	33.0	44.3	45.5	35.4
42	Sunset House	42.9	48.2	49.6	49.7	41.6	33.1	22.4	22.6	26.2	30.7	36.1	41.3	49.7	37.0
43	High Prairie	39.1	47.5	49.6	38.9	40.4	30.0	17.4	17.0	21.1	23.6	27.8	37.5	49.6	32.5
44	Peavine	37.9	43.6	41.4	41.3	40.3	31.6	16.0	15.9	18.7	24.2	24.8	33.2	43.6	30.7
45	Gift Lake	33.4	41.3	39.3	38.3	34.7	23.6	14.8	14.6	16.1	19.3	24.1	32.6	41.3	27.7
46	Little Smoky	28.8	43.8	46.4	39.4	38.5	23.7	16.4	BDL	15.5	19.2	26.4	26.8	46.4	29.5
47	Kinuso	34.5	43.8	37.6	38.7	34.9	22.8	16.2	14.8	18.0	21.4	27.4	30.7	43.8	28.4
48	Deer Mountain	37.1	44.7	42.2	45.5	35.5	23.7	16.4	17.4	22.2	23.5	31.1	39.1	45.5	31.5
49	Grande Prairie HP	25.6	32.8	38.5	39.1	41.3	36.0	25.7	26.0	22.0	24.3	22.9	25.5	41.3	30.0
62	East Prairie								16.4	17.4	22.8	29.1	33.2	33.2	23.8
Average		36.5	43.6	43.7	42.1	38.5	29.8	19.4	19.1	20.7	23.6	29.4	35.9		31.8
Peak		42.9	50.1	51.4	51.9	47.5	39.5	27.8	27.1	27.4	31.3	36.6	44.3	51.9	

BDL=Below Detection Limit (>0.01ppm); N/A=Sample not collected (damaged, missing, inaccessible, etc)

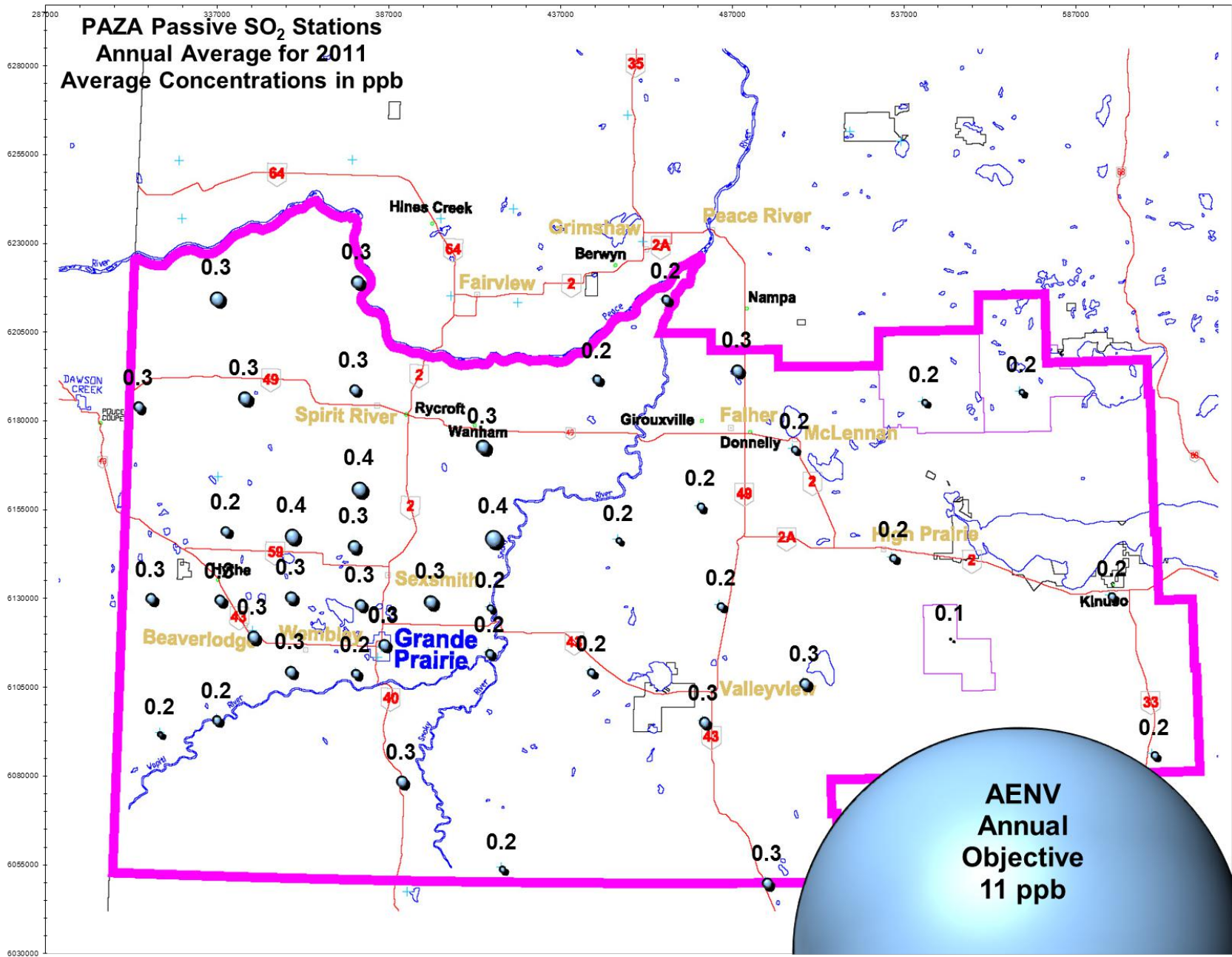


Figure 9. PAZA SO₂ Bubble Chart – 2011 Annual Average

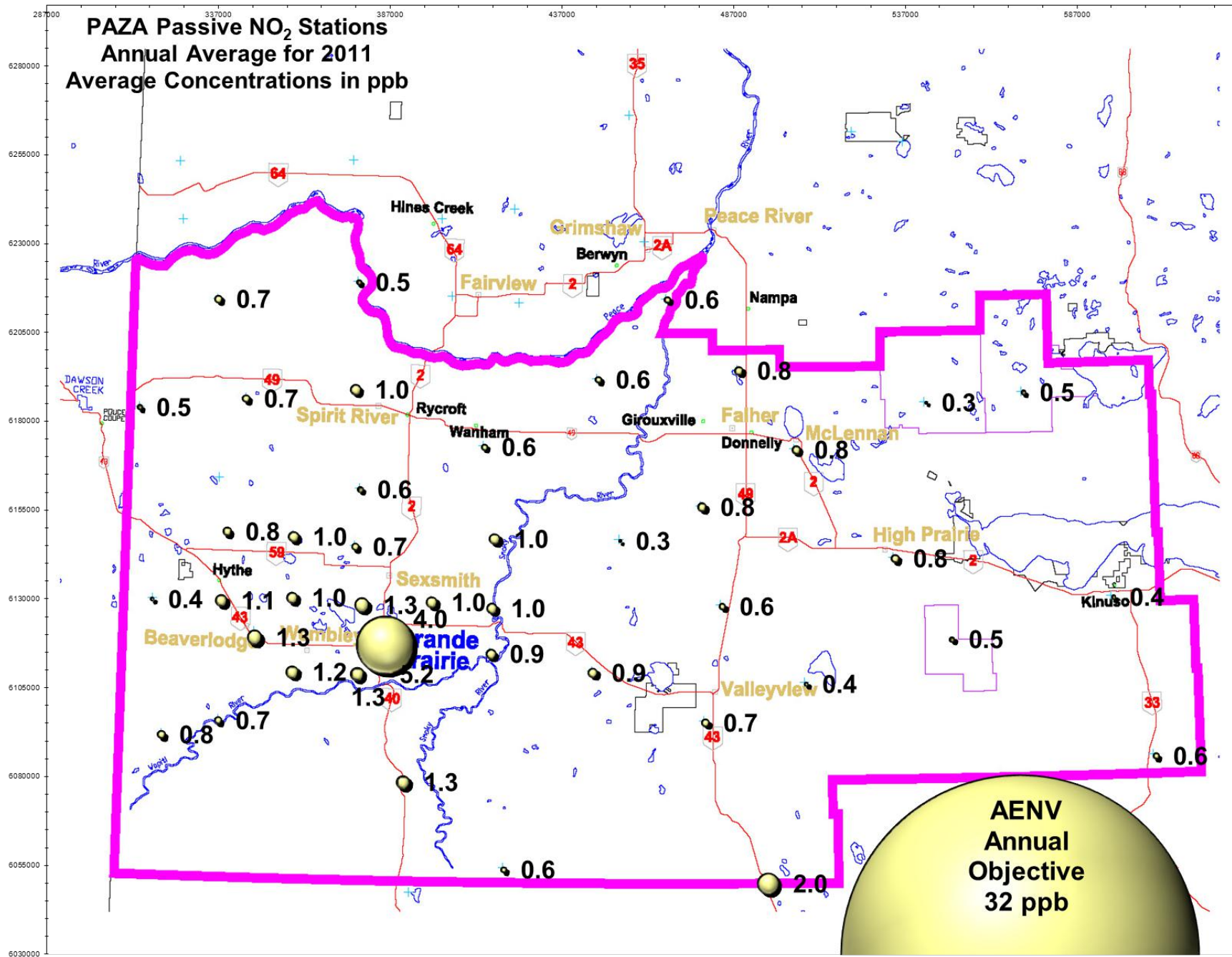


Figure 10. PAZA NO₂ Bubble Chart– 2011 Annual Average

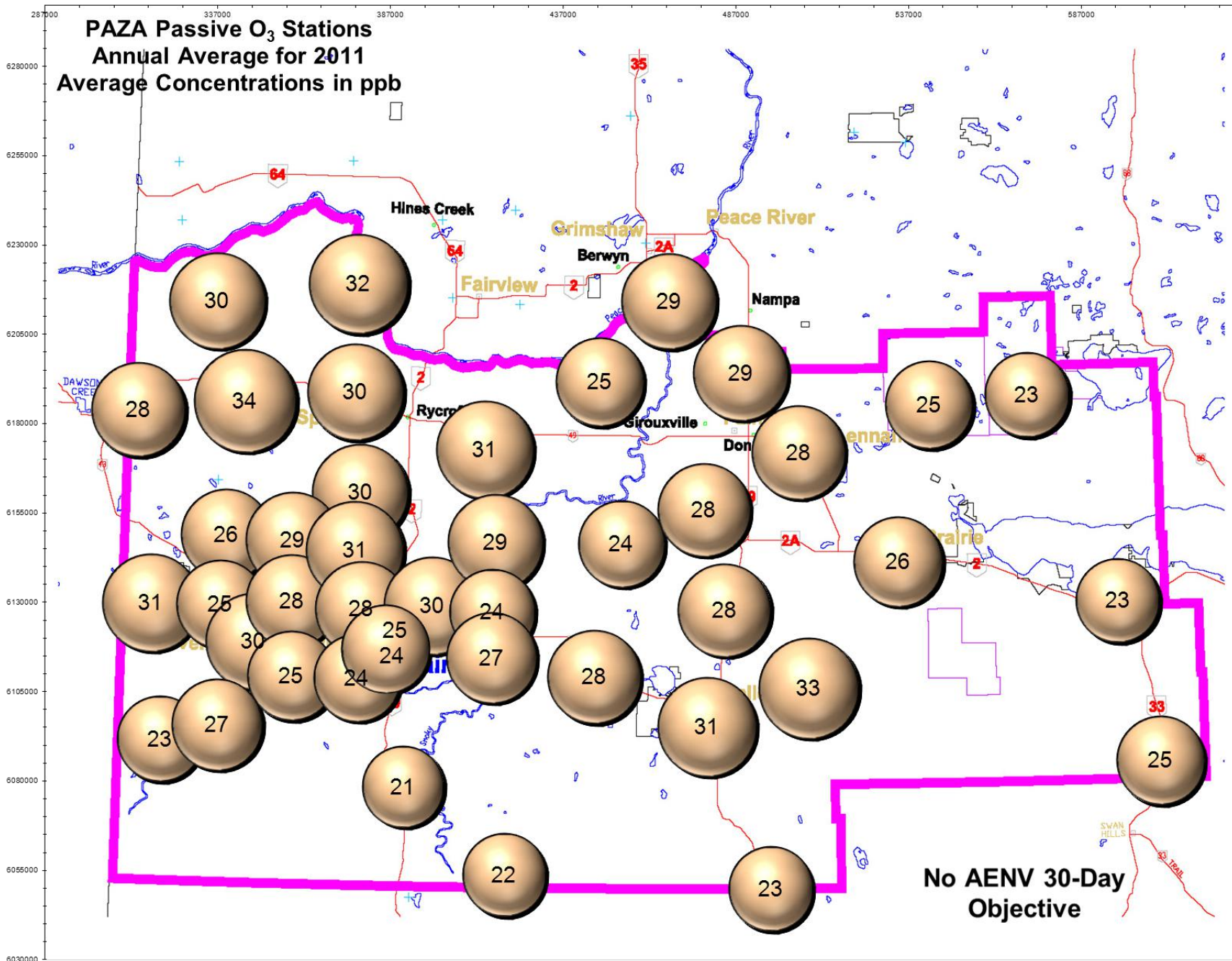


Figure 11. PAZA O₃ Bubble Chart – 2011 Annual Average