

Saskatchewan-North Dakota Trans-Boundary Ambient Monitoring Network

Air Quality Report

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## TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
Introduction .....	iii
DISCUSSION OF MONITORING RESULTS .....	1
Sulfur Dioxide (SO <sub>2</sub> ) .....	2
Sulfur Dioxide (SO <sub>2</sub> ) 5-Minute Average .....	2
Nitrogen Dioxide (NO <sub>2</sub> ) .....	2
Inhalable Continuous PM <sub>2.5</sub> Particulates .....	2
Inhalable FRM PM <sub>2.5</sub> Particulates .....	2
Continuous Inhalable PM <sub>10</sub> Particulates .....	3
Inhalable PM <sub>10</sub> Particulates .....	3
AMBIENT AIR QUALITY DATA SUMMARIES .....	5
Sulfur Dioxide .....	6
Sulfur Dioxide 5-Minute Averages .....	6
Nitrogen Dioxide .....	7
Inhalable Continuous PM <sub>2.5</sub> .....	7
Inhalable FRM PM <sub>2.5</sub> Particulates .....	8
Continuous Inhalable PM <sub>10</sub> Particulates .....	8
EXCEEDANCE LISTINGS .....	9
By Site Date Hour .....	10
By Date Hour Site .....	10



## Introduction

The Saskatchewan (SK) - North Dakota (ND) Trans-Boundary Ambient Monitoring Network is a cooperative effort among Environment Canada (EC), US Environmental Protection Agency (EPA), Saskatchewan Environment (SE), North Dakota Department of Health (NDDH), and SaskPower. The working participants are SaskPower (Boundary Dam Power Station) and NDDH (Division of Air Quality). After the initial data sharing details are worked out, data collected by SaskPower at the Boundary Dam Power Station (BDPS) and Estevan site continuous data will be included in this quarterly report.

Section One provides a description of the data collected, by pollutant, and a brief summary of data and any significant action(s) that may affect the data. Section Two presents the data in summary tables comparing the data to the applicable Saskatchewan, North Dakota and US ambient air quality standards. Section Three lists any exceedance of the North Dakota ambient air quality standards first by site and date, then by date and site.



SECTION ONE

DISCUSSION OF  
MONITORING RESULTS

### Sulfur Dioxide (SO<sub>2</sub>)

There were no exceedances of either the Saskatchewan, ND state, or US federal standards during the quarter. The maximum 1-hour concentration was 39 ppb on September 2 at Short Creek, ND; the maximum 3-hour concentration was 22 ppb on September 2 at Short Creek, ND; and, the maximum 24-hour concentration was 6 ppb on September 2 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

### Sulfur Dioxide (SO<sub>2</sub>) 5-Minute Average

The maximum 5-minute concentration was 100 ppb on July 22 at Short Creek, ND.

### Nitrogen Dioxide (NO<sub>2</sub>)

The maximum 1-hour concentration observed was 14 ppb on July 2 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

### Inhalable Continuous PM<sub>2.5</sub> Particulates

The maximum 1-hour concentration was 241.9 µg/m<sup>3</sup> on July 12 at Estevan, SK; the maximum 24-hour concentration was 29.6 µg/m<sup>3</sup> on July 12 at Estevan, SK. An 80% data recovery was achieved for the period operated.

### Inhalable FRM PM<sub>2.5</sub> Particulates

The maximum 24-hour average concentration was 11.4 µg/m<sup>3</sup> on August 13 at Estevan, SK. An 80% data recovery was achieved for the period operated except for Short Creek, ND.

Short Creek, ND failed to achieve 80% do to site operator problems.

### Continuous Inhalable PM<sub>10</sub> Particulates

There was no exceedance of the 24-hour Saskatchewan or ND state standards during the quarter. The maximum 24-hour average concentration was 36.7 µg/m<sup>3</sup> on July 31 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

### Inhalable PM<sub>10</sub> Particulates

The manual sampler at Short Creek was terminated and removed from the site effective June 30.



SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A 3 - HOUR		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD				
Short Creek, ND	2004	JUL-SEP	2176	39 09/02:09	36 07/02:09	22 09/02:11	17 08/27:14	6 09/02	6 08/27	1.6			13.2

The maximum 1-hour concentration is 39 ppb at Short Creek, ND on 09/02:09  
The maximum 3-hour concentration is 22 ppb at Short Creek, ND on 09/02:11  
the maximum 24-hour concentration is 6 ppb at Short Creek, ND on 09/02

\* The air quality standards are:

Sask. Provincial Standards -

- 1) 0.17 ppm maximum 1-hour average concentration.
- 2) 0.06 ppm maximum 24-hour average concentration.
- 3) 0.01 ppm annual arithmetic mean.

ND STATE Standards -

- 1) 273 ppb maximum 1-hour average concentration.
- 2) 99 ppb maximum 24-hour average concentration.
- 3) 23 ppb maximum annual arithmetic mean concentration.

US FEDERAL Standards -

- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	5 - M I N U T E			# HOURS >600	% >MDV
				1ST DATE MM/DD:HH	2ND DATE MM/DD:HH	3RD DATE MM/DD:HH		
Short Creek, ND	2004	JUL-SEP	1800	100 07/22:07	95 09/02:09	83 09/02:08	0	21.1

The maximum 5-minute concentration is 100 ppb at Short Creek, ND on 07/22:07

\* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST MM/DD:HH	2ND MM/DD:HH		
Short Creek, ND	2004	JUL-SEP	2168	14 07/02:09	12 09/02:09	1.9	95.0

The maximum 1-hour concentration is 14 ppb at Short Creek, ND on 07/02:09

\* The air quality standards are:

Sask. Provincial Standards are:

- 1) 0.2 ppm maximum 1-hour average concentration.
- 2) 0.05 ppm maximum annual arithmetic mean concentration.

ND STATE - 53 ppb maximum annual arithmetic mean.

US FEDERAL - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Inhalable Continuous PM<sub>2.5</sub> (µg/m<sup>3</sup>)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR				24 - HOUR		MEAN	1HR #>150	24HR #>65
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD	3RD MM/DD	4TH MM/DD			
Estevan, SK	2004	JUL-SEP	2055	241.9 07/12:00	212.4 07/14:10	29.6 07/12	19.4 08/16	17.7 08/17	17.1 07/14	6.5		
Short Creek, ND	2004	JUL-SEP	2176	81.7 07/04:22	62.6 07/31:22	21.3 08/16	17.8 08/17	13.3 08/15	11.5 07/23	4.2		

The maximum 1-hour concentration is 241.9 µg/m<sup>3</sup> at Estevan, SK on 07/12:00

The highest 24-hour concentration is 29.6 µg/m<sup>3</sup> at Estevan, SK on 07/12

\* The ambient air quality standards are:

US FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m<sup>3</sup>.
- 2) Annual: 3-year average not to exceed 15 µg/m<sup>3</sup>.

Canadian-Wide Standard -

- 24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m<sup>3</sup>.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Inhalable FRM PM<sub>2.5</sub> Particulates (µg/m<sup>3</sup>)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A			ARITH MEAN	#>150	AM>50	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Estevan, SK	2004	JUL-SEP	14	3.9	11.4 08/13	10.5 09/18	10.1 08/07	7.8			100.0
Lignite, ND	2004	JUL-SEP	15	3.3	8.8 08/13	8.3 07/14	8.0 08/07	5.6			100.0
Raferty Dam, SK	2004	JUL-SEP	16	3.9	9.5 08/13	9.4 09/18	8.2 07/14	6.2			100.0
Short Creek, ND	2004	JUL-SEP	10 ***	3.3	8.3 08/07	7.7 07/14	6.8 08/31	6.0			100.0

The maximum 24-hour concentration is 11.4 µg/m<sup>3</sup> at Estevan, SK on 08/13

\* The ambient air quality standards are:

US FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m<sup>3</sup>.
- 2) Annual: 3-year average not to exceed 15 µg/m<sup>3</sup>.

Canadian-Wide Standard -

24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m<sup>3</sup>.

\*\*\* Less than 80% of the possible samples (data) were collected.

COMPARISON OF AIR QUALITY DATA WITH  
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS \*

POLLUTANT : Continuous Inhalable PM<sub>10</sub> Particulates (µg/m<sup>3</sup>)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		MEAN	#>150	AM>50
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD	3RD MM/DD	4TH MM/DD			
Short Creek, ND	2004	JUL-SEP	1799	228.0 07/31:22	139.0 07/31:23	36.7 07/31	30.3 07/18	26.7 09/18	26.0 09/29	15.3		

The maximum 24-hour concentration is 36.7 µg/m<sup>3</sup> at Short Creek, ND on 07/31

\* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m<sup>3</sup> maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m<sup>3</sup> expected annual arithmetic mean.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),  
Wind Speed (MPH), CO (PPM), and PM<sub>2.5</sub> and PM<sub>10</sub> (µg/m<sup>3</sup>)

The \* Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),  
Wind Speed (MPH), CO (PPM), and PM<sub>2.5</sub> and PM<sub>10</sub> (µg/m<sup>3</sup>)

The \* Identifies the Exceedances

NONE