

Saskatchewan-North Dakota Trans-Boundary Ambient Monitoring Network

Air Quality Report

3rd Quarter 2005

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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 (SO₂)

There were no exceedances of either the Saskatchewan, ND state, or US federal standards during the quarter. The maximum 1-hour concentration was 48 ppb on September 28 at Short Creek, ND; the maximum 3-hour concentration was 21 ppb on August 4 at Short Creek, ND; and, the maximum 24-hour concentration was 7 ppb on August 12 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

Sulfur Dioxide (SO₂) 5-Minute Average

The maximum 5-minute concentration was 151 ppb on September 28 at Short Creek, ND.

Nitrogen Dioxide (NO₂)

The maximum 1-hour concentration observed was 13 ppb on July 17 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

Inhalable Continuous PM_{2.5} Particulates

The maximum 1-hour concentration was 38.5 µg/m³ on September 12 at Short Creek, ND; the maximum 24-hour concentration was 16.4 µg/m³ on August 26 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

Inhalable FRM PM_{2.5} Particulates

The maximum 24-hour average concentration was 18 µg/m³ on August 26 at Rafferty Dam. An 80% data recovery was achieved at all sites the period operated except for Rafferty Dam.

Rafferty Dam failed to achieve 80% data recovery due to a misunderstanding of the envelope contents in the Estevan , SK post office.

Continuous Inhalable PM₁₀ Particulates

There was no exceedance of the 24-hour Saskatchewan or ND state standards during the quarter. The maximum 24-hour average concentration was 35.4 µg/m³ on September 9 at Short Creek, ND. An 80% data recovery was achieved for the period operated.

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	2005	JUL-SEP	2193	48 09/28:09	41 08/04:09	21 08/04:11	21 09/06:11	7 08/12	6 08/04	1.9			19.5

The maximum 1-hour concentration is 48 ppb at Short Creek, ND on 09/28:09
 The maximum 3-hour concentration is 21 ppb at Short Creek, ND on 08/04:11
 The maximum 24-hour concentration is 7 ppb at Short Creek, ND on 08/12

* 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 M A X I M A			# HOURS >600	% >MDV
				1ST DATE MM/DD:HH	2ND DATE MM/DD:HH	3RD DATE MM/DD:HH		
Short Creek, ND	2005	JUL-SEP	2193	151 09/28:09	129 08/04:08	75 08/20:08	0	30.1

The maximum 5-minute concentration is 151 ppb at Short Creek, ND on 09/28:09

* 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	2005	JUL-SEP	2189	13 07/17:22	12 08/30:23	1.5	79.1

The maximum 1-hour concentration is 13 ppb at Short Creek, ND on 07/17:22

* 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_{2.5} (µg/m³)

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			
Short Creek, ND	2005	JUL-SEP	2063	38.5 09/12:15	31.1 07/09:19	16.4 08/26	15.0 09/09	13.2 09/04	12.1 07/09	4.0		

The highest 24-hour concentration is 16.4 µg/m³ at Short Creek, ND on 08/26

The highest Annual Mean concentration is 4.0 µg/m³ at Short Creek, ND

* The ambient air quality standards are:

US FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

Canadian-Wide Standard -

24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m³.

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

POLLUTANT : Inhalable FRM PM_{2.5} Particulates (µg/m³)

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	2005	JUL-SEP	15	1.2	17.3 08/26	9.6 07/09	7.6 08/02	6.0			93.3
Lignite, ND	2005	JUL-SEP	15	2.7	17.6 08/26	11.7 07/09	7.6 08/02	6.0			100.0
Rafferty Dam, SK	2005	JUL-SEP	6 ***	3.3	18.0 08/26	6.2 09/07	4.7 09/13	6.6			100.0
Short Creek, ND	2005	JUL-SEP	15	2.7	17.8 08/26	12.0 07/09	9.3 07/03	6.6			100.0

The maximum 24-hour concentration is 18.0 µg/m³ at Rafferty Dam, SK on 08/26
The highest Annual Mean concentration is 6.0 µg/m³ at Rafferty Dam, SK

* The ambient air quality standards are:

US FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

Canadian-Wide Standard -

24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m³.

** 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 PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A				MEAN	#>150	24HR 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	2005	JUL-SEP	2187	153.0 09/10:17	138.0 09/07:20	35.4 09/09	34.7 08/30	31.3 08/07	31.2 08/29	17.0		

The highest 24-hour concentration is 35.4 µg/m³ at Short Creek, ND on 09/09
The highest Annual Mean concentration is 17.0 µg/m³ at Short Creek, ND

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m³ 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_{2.5} and PM₁₀ (µg/m³)

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_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE