

State/Industry Network

Air Quality Report

2<sup>nd</sup> Quarter 1998

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## TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
DISCUSSION OF MONITORING RESULTS .....	1
Sulfur Dioxide (SO <sub>2</sub> ) .....	2
Sulfur Dioxide (SO <sub>2</sub> ) 5-Minute Average .....	2
Hydrogen Sulfide (H <sub>2</sub> S) .....	2
Ozone (O <sub>3</sub> ) .....	3
Nitrogen Dioxide (NO <sub>2</sub> ) .....	3
Inhalable PM <sub>2.5</sub> Particulates .....	3
Inhalable PM <sub>10</sub> Particulates .....	4
Inhalable PM <sub>2.5</sub> Sulfates .....	5
Inhalable PM <sub>10</sub> Sulfates .....	5
PM <sub>2.5</sub> Sulfate/PM <sub>2.5</sub> Analysis .....	5
PM <sub>10</sub> Sulfate/PM <sub>10</sub> Analysis .....	6
AMBIENT AIR QUALITY DATA SUMMARIES .....	8
Sulfur Dioxide .....	9
Sulfur Dioxide 5-Minute Averages .....	11
Hydrogen Sulfide .....	12
Ozone .....	13
Nitrogen Dioxide .....	14
Inhalable PM <sub>2.5</sub> Particulates .....	15
Inhalable PM <sub>10</sub> Particulates .....	16
Inhalable PM <sub>2.5</sub> Sulfates .....	17
Inhalable PM <sub>10</sub> Sulfates .....	17
PM <sub>2.5</sub> Sulfate/PM <sub>2.5</sub> Total Mass Ratio .....	18
PM <sub>10</sub> Sulfate/PM <sub>10</sub> Total Mass Ratio .....	18
EXCEEDANCE LISTINGS .....	20
By Site Date Hour .....	21
By Date Hour Site .....	21



SECTION ONE

DISCUSSION OF  
MONITORING RESULTS

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

There were no exceedances of either the State or Federal standards during the quarter. The maximum 1-hour concentration was 162 ppb on April 12 at Mandan Refinery - SPM; the maximum 3-hour concentration was 89 ppb on April 12 at Mandan Refinery - SPM; and, the maximum 24-hour concentration was 28 ppb on May 1 at Mandan refinery - SPM. All sites achieved at least an 80% data recovery for the period operated.

On May 21 the Fargo Residential site was terminated and moved to a new site, Fargo NW, on May 13 at the NDSU Weed Research Facility. The TRNP - NU site was terminated effective June 30. The SO<sub>2</sub> analyzer will be used at the re-opened TRNP - SU (Painted Canyon) site.

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

The maximum 5-minute concentration was 228 ppb on May 26 at Bear Paw - MGP #5.

### Hydrogen Sulfide (H<sub>2</sub>S)

There were no exceedances of the H<sub>2</sub>S standards during the quarter. The maximum 1-hour concentration was 140 ppb on April 12 at Amerada Hess - Tioga #2; the maximum 24-hour concentration was 35 ppb on April 12 at Amerada Hess - Tioga #2; the maximum 3-month concentration was 3 ppb in May at Amerada Hess - Tioga #2. All sites achieved at least an 80% data recovery for the period operated.

The TRNP - NU site was terminated effective June 30.

### Ozone (O<sub>3</sub>)

There was no exceedance of the ozone standard during the quarter. The maximum observed 1-hour concentration was 86 ppb on May 17 at Fargo NW. The maximum 8-hour concentration was 73 ppb on May 17 at Fargo NW. All sites except TRNP - NU achieved at least an 80% data recovery for the period operated. On June 5, EPA repealed the 1-hour standard for North Dakota.

TRNP - NU failed to achieve 80% data recovery due to an equipment malfunction.

On May 12 the Fargo Residential site was terminated and moved to a new site, Fargo NW, on May 13 at the NDSU Weed Research Facility. The TRNP - NU site was terminated effective June 30.

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

The maximum 1-hour concentration observed was 124 ppb on April 11 at DGC #17. All sites achieved at least an 80% data recovery for the period operated.

On May 12 the Fargo Residential site was terminated and moved to a new site, Fargo NW, on May 13 at the NDSU Weed Research Facility.

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

The maximum 24-hour average concentration was 15.8 µg/m<sup>3</sup> on April 5 at Bismarck Residential. Both sites achieved at least an 80% data recovery for the period operated.

On March 24, a new federal reference method (FRM) PM<sub>2.5</sub> sampler began operating at Bismarck Residential. The purpose is to establish a relationship between the Anderson PM<sub>2.5</sub> cascade impactor and the new federal reference method. For this quarter, the FRM sampler is averaging about 59% of the cascade impactor concentrations. Because the concentrations for both samplers are typically less than 20 µg/m<sup>3</sup>, it can be expected to see FRM concentrations higher than the Graseby-Anderson sampler.

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

There was no exceedance of the 24-hour standard during the quarter. The maximum 24-hour average concentration was 81.0 µg/m<sup>3</sup> on May 5 at Grand Forks - North. All sites achieved at least an 80% data recovery for the period operated.

### Inhalable PM<sub>2.5</sub> Sulfates (SO<sub>4</sub>)

The purpose for sulfate analysis is to aid the Department in assessing the impact of SO<sub>2</sub> emissions on inhalable particulate concentrations and visibility. The maximum 24-hour PM<sub>2.5</sub> sulfate concentration was 4.6 µg/m<sup>3</sup> on April 23 at Bismarck Residential.

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

The purpose for sulfate analysis is to aid the Department in assessing the impact of SO<sub>2</sub> emissions on inhalable particulate concentrations and visibility. The maximum 24-hour PM<sub>10</sub> sulfate concentration was 4.1 µg/m<sup>3</sup> on April 5 at Bismarck Residential. All sites achieved at least an 80% data recovery for the period operated.

### PM<sub>2.5</sub> Sulfate /PM<sub>2.5</sub> Analysis

The PM<sub>2.5</sub> sulfate/PM<sub>2.5</sub> total mass tables present statistics for PM<sub>2.5</sub> sulfate and PM<sub>2.5</sub> total mass when both concentrations are greater than the respective minimum detectable concentration: 0.5 µg/m<sup>3</sup> for PM<sub>2.5</sub> sulfate analysis; 4 µg/m<sup>3</sup> for PM<sub>2.5</sub> total mass. Statistics for the ratio are produced by evaluating the ratio of the PM<sub>2.5</sub> sulfate concentration to the PM<sub>2.5</sub> total mass concentration for each data pair. In the individual summaries, one-half of the minimum detectable concentration is substituted for those concentrations less than the minimum detectable value. However, when the PM<sub>2.5</sub> total mass concentration is less than 4 µg/m<sup>3</sup>, the PM<sub>2.5</sub> sulfate concentration can be higher than the PM<sub>2.5</sub> total mass concentration. This is because of the variability in the sulfate analysis procedure at low concentrations. Therefore, when calculating the ratio of PM<sub>2.5</sub> sulfate concentration to PM<sub>2.5</sub> total mass concentration, only data pairs where both the PM<sub>2.5</sub> sulfate and PM<sub>2.5</sub> total mass concentrations are greater than the minimum detectable concentrations are used. When the ratio is multiplied by 100, it becomes the

percentage of total mass which is sulfate. The maximum  $PM_{2.5}$  Sulfate/ $PM_{2.5}$  total mass ratio was 0.442 (44.2%) on April 29 at Bismarck Residential. The maximum average ratio was 0.179 (17.6%) at Beulah.

#### $PM_{10}$ Sulfate/ $PM_{10}$ Analysis

The  $PM_{10}$  sulfate/ $PM_{10}$  total mass tables present statistics for  $PM_{10}$  sulfate and  $PM_{10}$  total mass when both concentrations are greater than the respective minimum detectable concentration:  $0.5 \mu\text{g}/\text{m}^3$  for  $PM_{10}$  sulfate analysis;  $4 \mu\text{g}/\text{m}^3$  for  $PM_{10}$  total mass. Statistics for the ratio are produced by evaluating the ratio of the  $PM_{10}$  sulfate concentration to the  $PM_{10}$  total mass concentration for each data pair. In the individual summaries, one-half of the minimum detectable concentration is substituted for those concentrations less than the minimum detectable value. However, when the  $PM_{10}$  total mass concentration is less than  $4 \mu\text{g}/\text{m}^3$ , the  $PM_{10}$  sulfate concentration can be higher than the  $PM_{10}$  total mass concentration. This is because of the variability in the sulfate analysis procedure at low concentrations. Therefore, when calculating the ratio of  $PM_{10}$  sulfate concentration to  $PM_{10}$  total mass concentration, only data pairs where both the  $PM_{10}$  sulfate and  $PM_{10}$  total mass concentrations are greater than the minimum detectable concentrations are used. When the ratio is multiplied by 100, it becomes the percentage of total mass which is sulfate. The maximum  $PM_{10}$  Sulfate/ $PM_{10}$  total mass ratio was 0.333 (33.3%) on April 5 at Dickinson Residential. The maximum average ratio was 0.131 (13.1%) at Beulah.



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		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				
AMERADA HESS - TIOGA #1	1998	APR-JUN	2162	25 06/27:03	23 04/16:15	13 06/27:05	12 04/03:11	5 06/27	4 04/03	1.3			9.8
AMERADA HESS - TIOGA #3	1998	APR-JUN	2165	46 04/17:09	40 04/16:12	38 04/17:11	22 04/30:17	10 04/17	9 04/13	2.1			17.0
BEAR PAW - MGP #3	1998	APR-JUN	2171	34 06/26:10	14 05/02:06	12 06/26:11	8 05/08:14	3 05/04	3 06/18	1.2			5.9
BEAR PAW - MGP #5	1998	APR-JUN	2027	35 05/26:16	29 05/25:06	24 05/26:17	15 05/25:08	5 05/26	4 05/21	1.4			11.3
BEULAH	1998	APR-JUN	1809	30 04/02:10	26 05/29:09	23 04/02:11	15 05/29:11	6 04/02	4 05/25	1.7			18.2
DGC #12	1998	APR-JUN	2172	54 05/19:07	46 05/16:08	34 05/15:17	32 04/02:11	9 04/02	8 05/15	2.4			31.8
DGC #14	1998	APR-JUN	2150	59 05/14:14	54 05/17:09	39 05/18:14	30 04/18:05	10 06/28	10 05/18	2.2			20.5
DGC #16	1998	APR-JUN	2170	81 04/03:09	68 05/17:12	53 04/03:11	49 05/17:14	15 05/17	12 06/23	4.7			77.9
DGC #17	1998	APR-JUN	2145	77 05/20:14	72 04/03:10	46 04/03:11	44 05/20:14	17 05/21	16 05/20	5.2			88.7
DUNN CENTER	1998	APR-JUN	2170	25 04/02:15	22 04/02:16	22 04/02:17	12 04/02:14	6 04/02	3 05/17	1.2			5.9
FARGO NW	1998	MAY-JUN	1000	3 05/14:07	3 06/13:20	2 05/13:16	2 06/20:08	1 05/14	1 06/23	1.0			3.2
FARGO RESIDENTIAL	1998	APR-MAY	994	13 04/30:07	12 04/06:01	8 04/18:08	8 04/25:05	4 04/25	3 04/30	1.6			29.0
HANNOVER	1998	APR-JUN	2104	115 04/15:08	64 05/30:06	48 04/15:08	38 05/30:11	10 04/06	10 05/30	2.4			20.9
MANDAN - SPM	1998	APR-JUN	2172	162 04/12:21	126 05/01:06	89 04/12:23	88 04/13:08	28 05/01	27 04/13	5.0			25.3

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

POLLUTANT : SULFUR DIOXIDE (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1 - HOUR 1ST 2ND MM/DD/HH MM/DD/HH	3 - HOUR 1ST 2ND MM/DD/HH MM/DD/HH	1ST 2ND MM/DD MM/DD	1ST 2ND MM/DD MM/DD						
SHARON	1998	APR-JUN	1873	6 06/27:00	6 06/27:22	5 06/26:05	5 06/30:20	4 06/26	4 06/30	1.3			16.6
TRNP - NU	1998	APR-JUN	2155	23 04/02:18	19 04/02:17	15 04/02:20	11 04/02:17	5 04/02	2 06/08	1.2			6.4
WHITE SHIELD	1998	APR-JUN	2053	33 04/02:11	25 05/09:14	19 04/02:11	16 04/03:14	5 05/09	5 05/21	1.6			13.2

The maximum 1-hour concentration is 162 ppb at MANDAN - SPM on 04/12:21  
 The maximum 3-hour concentration is 89 ppb at MANDAN - SPM on 04/12:23  
 The maximum 24-hour concentration is 28 ppb at MANDAN - SPM on 05/01

\* The air quality standards are:

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.

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.

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

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

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	PERIOD	OBS	5 - M I N U T E			M A X I M A			# HOURS >600	% >MDV
				1ST	DATE	2ND	DATE	3RD	DATE		
					MM/DD/HH		MM/DD/HH		MM/DD/HH		
BEAR PAW - MGP #3	1998	APR-JUN	2171	143	06/26:10	43	05/02:06	42	06/04:06	0	14.0
BEAR PAW - MGP #5	1998	APR-JUN	2027	228	05/26:16	71	05/26:15	64	05/25:06	0	21.7
BEULAH	1998	APR-JUN	1809	70	04/02:10	62	05/02:10	58	04/28:09	0	30.1
DUNN CENTER	1998	APR-JUN	2170	30	05/17:02	30	04/17:15	26	04/02:16	0	9.1
FARGO NW	1998	MAY-JUN	1000	3	05/14:07	3	06/14:20	3	06/17:11	0	3.2
FARGO RESIDENTIAL	1998	APR-MAY	994	13	04/30:07	12	04/30:01	12	04/26:22	0	29.0
HANNOVER	1998	APR-JUN	2104	195	04/15:08	117	05/15:10	108	05/30:06	0	31.1
MANDAN - SPM	1998	APR-JUN	2172	210	05/18:04	207	04/18:06	205	05/18:03	0	33.4
SHARON	1998	APR-JUN	1873	6	06/27:00	6	06/27:22	6	06/30:16	0	16.6
TRNP - NU	1998	APR-JUN	2155	25	04/02:16	25	04/02:17	24	04/02:18	0	11.1

The maximum 5-minute concentration is 228 ppb at BEAR PAW - MGP #5 on 05/26:16

\* No standard is currently in effect.

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

POLLUTANT : Hydrogen Sulfide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		24 - HOUR		3 - MONTH		ARITH MEAN	1HR #>200	24HR #>100	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD	2ND MM/DD	1ST MM	2ND MM				
AMERADA HESS - TIOGA #2	1998	APR-JUN	2162	140 04/12:09	119 04/12:19	35 04/12	17 04/16	3 05	3 04	2.9			24.8
TRNP - NU	1998	APR-JUN	2162	21 04/02:06	18 04/02:07	5 04/02	2 04/27	1 04	1 06	1.1			3.1

The maximum 1-hour concentration is 140 ppb at AMERADA HESS - TIOGA #2 on 04/12:09  
the maximum 24-hour concentration is 35 ppb at AMERADA HESS - TIOGA #2 on 04/12  
The maximum 3-month concentration is 3 ppb at AMERADA HESS - TIOGA #2 on 05

\* The State air quality standards are:

- 1) 10 ppm maximum instantaneous (ceiling) concentration not to be exceeded.
- 2) 200 ppb maximum 1-hour average concentration not to be exceeded more than once per month.
- 3) 100 ppb maximum 24-hour average concentration not to be exceeded more than once per year.
- 4) 20 ppb maximum arithmetic mean concentration averaged over three consecutive months.

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

POLLUTANT : Ozone (PPB)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A			8 - HOUR			1HR #>120	8HR #>80
				1ST MM/DD/HH	2ND MM/DD/HH	3RD MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	3RD MM/DD/HH		
BEULAH	1998	APR-JUN	2173	68 05/25/16	66 04/22/14	66 04/22/15	62 05/25/10	62 05/25/09	62 04/22/09		
FARGO NW	1998	MAY-JUN	1159	86 05/17/17	84 05/17/16	77 05/17/15	73 05/17/10	66 05/17/11	66 05/17/09		
FARGO RESIDENTIAL	1998	APR-MAY	994	67 04/23/15	67 04/29/12	67 04/23/14	66 04/30/09	58 04/30/10	58 04/29/10		
HANNOVER	1998	APR-JUN	2166	67 05/17/15	66 04/22/16	66 05/17/13	63 04/22/11	61 04/22/10	61 04/22/09		
SHARON	1998	APR-JUN	2173	75 05/17/18	72 05/17/16	72 05/17/17	66 05/17/11	63 05/17/10	63 05/17/12		
TRNP - NU	1998	APR-JUN	1249 ***	69 06/26/13	67 04/21/15	67 04/21/16	66 04/21/09	63 04/22/09	63 04/22/08		

The maximum 1-hour concentration is 86 ppb at FARGO NW on 05/17/17  
The 4th highest 8-hour concentration is 73 ppb at FARGO NW on 05/17/10

\* The air quality standards for ozone are:

STATE - 120 ppb maximum 1-hour concentration not to be exceeded more than once per year.  
FEDERAL Standards -

- 1) 120 ppb maximum 1-hour concentration with no more than one expected exceedance per year.
- 2) Fourth highest daily maximum 8-hour average for a 3-year period not to exceed 80 ppb.

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

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		
BEULAH	1998	APR-JUN	2170	35 04/22:19	31 04/21:20	4.0	80.1
DGC #12	1998	APR-JUN	2141	38 06/03:22	32 06/03:21	4.8	98.7
DGC #17	1998	APR-JUN	2064	124 04/11:04	115 05/13:00	5.1	100.0
FARGO NW	1998	MAY-JUN	991	44 05/26:23	37 05/20:20	5.4	77.6
FARGO RESIDENTIAL	1998	APR-MAY	991	58 04/22:20	55 04/22:21	8.5	81.2
HANNOVER	1998	APR-JUN	2161	26 05/30:06	23 04/11:05	2.4	57.1
SHARON	1998	APR-JUN	2170	9 04/21:21	9 05/14:22	1.6	43.3

The maximum 1-hour concentration is 124 ppb at DGC #17 on 04/11:04

\* The air quality standards are:  
STATE - 53 ppb maximum annual arithmetic mean.  
FEDERAL - 53 ppb annual arithmetic mean.

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

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

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#> 50	AM>20	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
BEULAH	1998	APR-JUN	15	4.6	13.1 04/23	10.6 05/05	10.4 04/05	7.8			100.0
BISMARCK RESIDENTIAL	1998	APR-JUN	15	7.3	13.6 04/17	13.2 04/05	13.1 04/23	11.0			100.0
BISMARCK RESIDENTIAL FRM	1998	APR-JUN	15	3.6	15.8 04/05	8.2 04/23	7.2 05/23	6.5			100.0

The maximum 24-hour concentration is 15.8 µg/m<sup>3</sup> at BISMARCK RESIDENTIAL on 04/05

FEDERAL Standards -

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

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

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

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>150	AM>50	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
BEULAH	1998	APR-JUN	15	6.3	26.2 04/23	21.2 05/05	15.7 04/17	11.9			100.0
BISMARCK RESIDENTIAL	1998	APR-JUN	15	8.1	19.6 04/17	19.1 04/23	18.4 05/05	14.9			100.0
DICKINSON RESIDENTIAL	1998	APR-JUN	15	7.6	26.9 05/05	23.9 04/23	19.7 04/29	13.3			100.0
DRAGSWOLF	1998	APR-JUN	15	4.0	22.0 04/23	14.0 05/05	13.0 05/17	9.9			100.0
FARGO NW	1998	MAY-JUN	7	12	19.8 06/10	19.1 05/23	14.6 05/29	15.1			100.0
FARGO RESIDENTIAL	1998	APR-MAY	7	15	51.2 04/29	43.4 04/23	29.2 05/05	27.6			100.0
GRAND FORKS - NORTH	1998	APR-JUN	14	4.6	81.0 05/05	59.4 04/26	49.9 05/29	35.6			100.0
SHARON	1998	APR-JUN	14	7.6	52.9 04/23	48.2 04/29	43.0 05/05	22.0			100.0
WHITE SHIELD	1998	APR-JUN	15	6.0	18.0 05/05	17.0 04/23	11.0 04/29	9.7			100.0
WILLISTON RESIDENTIAL	1998	APR-JUN	15	3.8	47.6 04/23	44.8 04/29	28.1 05/05	17.0			93.3

The maximum 24-hour concentration is 81.0 µg/m<sup>3</sup> at GRAND FORKS - NORTH on 05/05

\* 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.

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

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

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>15.	AM>5.	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
BEULAH	1998	APR-JUN	15	0.5	2.9 04/05	2.1 04/11	1.9 04/17	1.3			100.0
BISMARCK RESIDENTIAL	1998	APR-JUN	15	0.6	4.6 04/23	4.6 04/29	3.8 04/05	2.0			100.0

The maximum 24-hour concentration is 4.6 µg/m<sup>3</sup> at BISMARCK RESIDENTIAL on 04/23

\* No standard is currently in effect.

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

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

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>15.	AM>5.	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
BEULAH	1998	APR-JUN	15	0.6	3.2 04/05	2.2 04/11	2.1 04/17	1.4			100.0
BISMARCK RESIDENTIAL	1998	APR-JUN	15	0.3	4.1 04/05	2.4 04/17	2.4 05/11	1.6			93.3
DICKINSON RESIDENTIAL	1998	APR-JUN	15	0.3	2.3 04/05	2.3 04/23	2.1 04/17	1.3			93.3
FARGO NW	1998	MAY-JUN	7	0.7	3.0 06/10	1.2 06/22	1.1 05/23	1.2			100.0
FARGO RESIDENTIAL	1998	APR-MAY	7	1.2	3.0 04/05	3.0 05/11	2.7 04/11	2.4			100.0
GRAND FORKS - NORTH	1998	APR-JUN	14	0.2	2.9 04/17	2.9 06/22	2.6 05/17	1.5			78.5
SHARON	1998	APR-JUN	14	0.8	2.5 06/10	2.4 04/05	2.4 04/11	1.6			100.0
WILLISTON RESIDENTIAL	1998	APR-JUN	15	0.4	2.7 04/05	2.4 04/23	2.2 04/11	1.4			93.3

The maximum 24-hour concentration is 4.1 µg/m<sup>3</sup> at BISMARCK RESIDENTIAL on 04/05

\* No standard is currently in effect.

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

POLLUTANT : PM<sub>2.5</sub> Sulfate/PM<sub>25</sub> Total Mass Ratio (Percentage)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A			ARITH MEAN
					1ST MM/DD	2ND MM/DD	3RD MM/DD	
BEULAH	1998	APR-JUN	15	7.5	37.0 05/11	29.6 04/11	27.9 04/05	17.5
BISMARCK RESIDENTIAL	1998	APR-JUN	15	7.1	44.2 04/29	35.1 04/23	28.8 04/05	17.9

The maximum 24-hour ratio is 44.2 percent at BISMARCK RESIDENTIAL on 04/29

\* No standard is currently in effect.

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

POLLUTANT : PM<sub>10</sub> Sulfate/PM<sub>10</sub> Total Mass Ratio (Percentage)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A			ARITH MEAN
					1ST MM/DD	2ND MM/DD	3RD MM/DD	
BEULAH	1998	APR-JUN	12	4.2	26.4 04/05	20.7 05/11	19.8 04/11	13.1
BISMARCK RESIDENTIAL	1998	APR-JUN	15	4.9	24.8 04/05	20.7 05/11	13.2 06/10	11.1
DICKINSON RESIDENTIAL	1998	APR-JUN	14	3.3	33.3 04/05	25.9 04/17	19.7 05/11	11.9
FARGO NW	1998	MAY-JUN	7	5.8	15.2 06/10	8.3 06/22	7.4 06/16	7.9
FARGO RESIDENTIAL	1998	MAY-JUN	7	4.1	19.7 04/05	19.7 05/11	13.2 04/17	11.2
GRAND FORKS - NORTH	1998	APR-JUN	11	1.9	15.6 01/11	12.9 03/30	8.6 03/24	5.9
SHARON	1998	APR-JUN	14	2.5	31.6 04/05	29.1 05/11	24.7 04/11	12.1
WILLISTON RESIDENTIAL	1998	APR-JUN	13	2.9	28.7 04/05	17.8 04/17	17.6 05/29	11.2

The maximum 24-hour ratio is 33.3 percent at DICKINSON RESIDENTIAL on 04/05

\* No standard is currently in effect.



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