

State/Industry Ambient Monitoring Network

Air Quality Report

2<sup>nd</sup> Quarter 2009

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SECTION ONE

DISCUSSION OF  
MONITORING RESULTS

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

There were no exceedances of either the state or the federal standards during the quarter. The Department was notified prior to the repairs of the pre-heater. The highest 1-hour concentration was 111 ppb at Hess Tioga #3; the highest 3-hour concentration was 62 ppb at Hess — Tioga #3; and, the highest 24-hour concentration was 26 ppb at Hess — Tioga #3. The highest arithmetic mean was 2.8 ppb at Hess — Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

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

The highest 5-minute concentration was 198 ppb at Hess — Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

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

There were no exceedances of either the state or the federal standards during the quarter. The highest 1-hour concentration was 57.1 ppb at Lostwood NWR; the highest 3-hour concentration was 46.0 ppb at Lostwood NWR; and, the highest 24-hour concentration was 15.0 ppb at Lostwood NWR. The highest arithmetic mean was 1.9 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

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

The highest 5-minute concentration was 144.0 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

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

There was no exceedance of the ozone standard during the quarter. The highest observed 1-hour concentration was 67 ppb at Dunn Center. The highest 4<sup>th</sup> highest 8-hour concentration was 59 ppb at Lostwood NWR. All sites achieved at least an 80% data recovery for the period operated.

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

The highest observed 1-hour concentration was 59 ppb at Beulah-North. The highest arithmetic mean concentration was 6.5 ppb at Bismarck Residential. All sites except DGC #17 achieved at least an 80% data recovery for the period operated. DGC #17 failed to achieve 80% data recovery due to machine malfunction.

### Carbon Monoxide (CO)

The highest observed 1-hour concentration was 1186 ppb at Fargo NW. The highest 8-hour concentration was 700 ppb at Fargo NW. The site achieved at least an 80% data recovery for the period operated.

### Ammonia (NH<sub>3</sub>)

The highest 1-hour concentration was 134.0 ppb at Beulah – North. The site achieved an 80% data recovery for the period.

The data is used as part of the ambient data input used by the newer dispersion models.

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

The highest 24-hour concentration was 13.9  $\mu\text{g}/\text{m}^3$  at Fargo NW. The highest arithmetic mean concentration was 6.5  $\mu\text{g}/\text{m}^3$  at Hannover. All sites achieved at least an 80% data recovery for the period operated.

The analyzer used to collect PM<sub>fine</sub> at the Bismarck Residential site is designated as a FEM (Federal Equivalent Method). The analyzer used to collect the PM<sub>fine</sub> at the remaining sites were required by EPA, but never given the reference or equivalent designation. Therefore, the data can only be used as an indicator of PM<sub>fine</sub> concentrations.

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

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour average concentration was 35.9  $\mu\text{g}/\text{m}^3$  at Fargo NW. The highest weighted mean was 7.21  $\mu\text{g}/\text{m}^3$  at Fargo NW. All sites achieved at least an 80% data recovery for the period.

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

There was no exceedance of the 24-hour standard during the quarter. The highest 24-hour concentration was 37.0  $\mu\text{g}/\text{m}^3$  at Bismarck Residential. The highest arithmetic mean was 11.8  $\mu\text{g}/\text{m}^3$  at Bismarck Residential. All sites achieved an 80% data recovery for the period.

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	NUM OBS	1 1ST	— HOUR 2ND	M A X 1ST	I —	M A HOUR 2ND	24 1ST	— HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Bear Paw - MGP #3	2009	4295	51	45	33		16	6	5	1.3		
Bear Paw - MGP #5	2009	4288	7	6	5		4	2	2	1.0		
Beulah - North	2009	4309	30	26	17		15	5	4	1.6		
Bismarck Residential	2009	4291	32	29	25		22	10	8	2.1		
DGC #12	2009	4323	21	20	11		11	4	4	1.5		
DGC #14	2009	4323	34	26	20		18	4	4	1.4		
DGC #16	2009	4322	58	34	26		21	10	5	1.5		
DGC #17	2009	4324	31	28	19		18	5	5	1.5		
Hannover	2009	4310	59	47	30		21	10	6	1.8		
Hess - Tioga #1	2009	4276	44	39	34		17	6	6	1.4		
Hess - Tioga #3	2009	4265	111	87	62		47	26	18	2.8		
TRNP - SU (Painted Canyon)	2009	4319	11	9	7		5	4	3	1.3		

The highest 1-hour concentration is 111 ppb at Hess - Tioga #3  
 The highest 3-hour concentration is 62 ppb at Hess - Tioga #3  
 The highest 24-hour concentration is 26 ppb at Hess - Tioga #3  
 The highest arithmetic mean is 2.8 ppb at Hess - Tioga #3

\* The air quality standards are:

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

FEDERAL Standards -

- 1) 500 ppb highest 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb highest 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	NUM OBS	5 - M I N U T E M A X I M A			# HOURS >600
			1ST	2ND	3RD	
Bear Paw - MGP #3	2009	4295	122	105	51	
Bear Paw - MGP #5	2009	4288	14	13	9	
Beulah - North	2009	4309	73	66	43	
Bismarck Residential	2009	4292	57	45	43	
Hannover	2009	4257	128	97	92	
Hess - Tioga #1	2009	4276	111	101	93	
Hess - Tioga #3	2009	4265	198	195	187	
TRNP - SU (Painted Canyon)	2009	4319	24	21	11	

The maximum 5-minute concentration is 198 ppb at Hess - Tioga #3

\* No Standard is currently in effect:

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

POLLUTANT : **Trace Level Sulfur Dioxide** (ppb)

LOCATION	YEAR	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99
			1ST	2ND	1ST	2ND	1ST	2ND			
Dunn Center	2009	3949	20.1	17.4	13.0	12.0	6.0	5.0	0.7		
Fargo NW	2009	4144	8.5	8.0	7.0	4.0	3.0	3.0	0.4		
Lostwood NWR	2009	3967	57.1	55.6	46.0	29.0	15.0	11.0	1.9		
TRNP - NU	2009	4322	20.3	11.6	10.0	8.0	4.0	4.0	0.7		

The highest 1-hour concentration is 57.1 ppb at Lostwood NWR  
 The highest 3-hour concentration is 46.0 ppb at Lostwood NWR  
 The highest 24-hour concentration is 15.0 ppb at Lostwood NWR  
 The highest arithmetic mean is 1.9 ppb at Lostwood NWR

\* The air quality standards are:

STATE Standards -

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

FEDERAL Standards -

- 1) 500 ppb highest 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb highest 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 : **Trace Level Sulfur Dioxide 5-Minute Averages** (ppb)

LOCATION	YEAR	NUM OBS	5 - M I N U T E			M A X I M A	# HOURS >600
			1ST	2ND	3RD		
Dunn Center	2009	3860	25.6	22.5	20.5		
Fargo NW	2009	4154	14.6	12.6	11.8		
Lostwood NWR	2009	3967	144	118	113		
TRNP - NU	2009	4202	29.0	17.0	15.2		

The maximum 5-minute concentration is 144 ppb at Lostwood NWR  
 \* No Standard is currently in effect:

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

POLLUTANT : Ozone (ppb)

LOCATION	YEAR	NUM OBS	1 - 1ST	M HOUR 2ND	A X 1ST	I M 2ND	A 8 - 3RD	HOUR 4TH	1HR #>120	8HR #>75
Beulah North	2009	4262	63	61	60	58	56	55		
Bismarck Residential	2009	4287	61	61	58	54	54	54		
Dunn Center	2009	3996	67	61	57	55	55	54		
Fargo NW	2009	4291	64	63	60	60	58	57		
Hannover	2009	4289	65	61	62	57	57	56		
Lostwood NWR	2009	3757	66	63	60	60	59	59		
TRNP - NU	2009	4339	62	60	58	56	56	56		
TRNP - SU	2009	4320	66	63	61	58	56	56		

The highest 1-hour concentration is 67 ppb at Dunn Center  
The 4th highest 8-hour concentration is 59 ppb at Lostwood NWR

\* The air quality standards for ozone are:  
STATE - 120 ppb highest 1-hour not to be exceeded more than once per year.

FEDERAL Standards -

- 1) 120 ppb highest 1-hour concentration with no more than one expected exceedance per year.
- 2) Fourth highest daily highest 8-hour averages for a 3-year period not to exceed 75 ppb.

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

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	NUM OBS	M A X 1 - 1ST	I M A 2ND	ARITH MEAN
Beulah - North	2009	4297	59	51	3.1
Bismarck Residential	2009	4301	47	45	6.5
DGC #12	2009	4304	25	23	2.8
DGC #17	2009	2836	25	24	2.0
Dunn Center	2009	3953	12	12	1.8
Fargo NW	2009	4256	57	54	5.6
Hannover	2009	4295	53	50	2.3
Lostwood NWR	2009	3957	29	26	2.1
TRNP - NU	2009	4313	13	8	1.0

The highest 1-hour concentration is 59 ppb at Beulah North  
The highest Arithmetic Mean concentration is 6.5 ppb at Bismarck Residential

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

FEDERAL - 53 ppb annual arithmetic mean.

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

POLLUTANT : CARBON MONOXIDE (PPB)

LOCATION	YEAR	NUM OBS	1 1ST	M A X 1 - HOUR 2ND	I M A 8 - HOUR 2ND	1HR #>35000	8HR #>9000
Fargo NW	2009	4165	1186.0	1003.0	700.0	500.0	

\* The STATE and FEDERAL air quality standards are:  
1) The highest allowable 1-hour concentration is 35000 ppb not to be exceeded more than once per year.  
2) The highest allowable 8-hour concentration is 9000 ppb not to be exceeded more than once per year.

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

POLLUTANT : Ammonia (ppb)

LOCATION	YEAR	NUM OBS	1ST	M	A	X	I	M	A
				1	2ND	1ST	2ND	3RD	4TH
Beulah - North	2009	4249	134.0	132.0	65.0	55.0			
Lostwood NWR	2009	3779	16.0	11.0	10.0	9.0			

The highest 1-hour concentrations is 134.0 at Beulah - North

\* No Standard is currently in effect:

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

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

LOCATION	YEAR	NUM OBS	1 1ST	M	A	X	I	M	A	24 3RD	24 HOUR	4TH	MEAN	24HR #>35	AM>15
				1	2ND	1ST	2ND								
Beulah - North	2009	4306	35.1	30.3	11.9	10.6	8.8	7.0	3.5						
Dunn Center	2009	3946	38.9	32.5	13.4	8.8	8.6	8.0	3.2						
Fargo NW	2009	4264	47.2	37.9	13.9	12.6	12.4	12.3	4.2						
Hannover	2009	4230	43.5	28.9	13.0	12.9	12.1	11.5	6.5						
Lostwood NWR	2009	3956	29.1	19.4	9.1	9.0	8.7	8.1	3.2						
TRNP - NU	2009	4293	32.0	23.8	9.6	7.6	7.4	7.2	3.0						
TRNP - SU (Painted Canyon)	2009	4260	37.2	29.0	12.8	10.8	10.1	9.9	5.7						

The highest 24-hour concentration is 13.9 µg/m<sup>3</sup> at Fargo NW  
The highest Annual Mean concentration is 6.5 µg/m<sup>3</sup> at Hannover

\* The EPA-required analyzer used to collect this data is not a reference or equivalent method; this data cannot be compared to the PM<sub>fine</sub> standards. This data can only be used as an indicator of the actual PM<sub>fine</sub> ambient concentrations. If this data were to indicate there may be an exceedance of the ambient standards, then the department could be required to install a designated reference or equivalent sampler.

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

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

LOCATION	YEAR	OBS	MIN	M A X I M A			98th %	WTD MEAN	#>35	AM>15
				1ST	2ND	3RD				
Beulah - North	2009	30		13.5	12.0	10.1	13.5	6.03		
Bismarck Residential	2009	60		17.8	15.7	15.1	15.7	6.50		
Bismarck Residential (BAMM)	2009	4781		27.9	26.5	23.6	23.4	6.84		
Fargo NW	2009	52		35.9	19.9	19.7	19.9	7.21		
TRNP - SU (Painted Canyon)	2009	30		9.4	8.0	6.1	9.4	4.19		

The highest 24-hour concentration is 35.9 µg/m<sup>3</sup> at Fargo NW  
The highest Annual Weighted Mean concentration is 7.21 µg/m<sup>3</sup> at Fargo NW

\* The ambient air quality standards are:  
FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 35 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 Continuous PM<sub>10</sub> Particulates (µg/m<sup>3</sup>)

LOCATION	YEAR	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		MEAN	24HR #>150	AM>50
			1ST	2ND	1ST	2ND	3RD	4TH			
Beulah - North	2009	3971	68	65	24.0	23.0	23.0	21.0	9.7		
Bismarck Residential	2009	3956	137	124	37.0	34.0	28.0	23.0	11.8		
Dunn Center	2009	3456	114	89	31.0	24.0	22.0	21.0	8.9		
Fargo NW	2009	3975	90	69	25.0	24.0	22.0	22.0	8.8		
Lostwood NWR	2009	3479	67	59	18.0	18.0	17.0	17.0	7.7		
TRNP - NU	2009	3799	79	73	17.0	16.0	16.0	15.0	7.4		

The highest 24-hour concentration is 37.0 µg/m<sup>3</sup> at Bismarck Residential  
The highest Annual Mean concentration is 11.8 µg/m<sup>3</sup> at Bismarck Residential

\* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m<sup>3</sup> highest 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>fine</sub> and PM<sub>10</sub> (µg/m<sup>3</sup>)

The \* Identifies the Exceedances

By Date Hour Site

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

The \* Identifies the Exceedances

