



# North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850  
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June 22, 2012

North Dakota Department of Health  
Division of Water Quality  
918 East Divide Avenue  
Bismarck, ND – 58501-1947

RE: May 2012 Devils Lake Outlet Monthly Discharge and Water Quality Reports

Enclosed are the monthly discharge reports for the Devils Lake Outlet for the month of May 2012 and summaries of sample results and flow data. The outlet was operated continuously throughout the reported period. On May 24<sup>th</sup> a repaired pump was installed and the discharge rate was increased from approximately 125 cubic feet per second (cfs) to approximately 175 cfs.

The attached tables contain average daily outlet discharge flow rate and water quality results from samples collected from the West End Outlet, upstream, and downstream locations. Also included are average daily stream flow data and conductivity data obtained from the USGS gaging stations at the upstream and the downstream locations.

If you have any questions, please contact me at 701-328-4948.

Sincerely,

Jonathan Kelsch P.E.  
Head, Construction Section  
JK:MSW:416-10

OUTLET OPERATOR NAME/ADDRESS

NAME: ND State Water Commission  
 ADDRESS: 900 E Boulevard Avenue,  
 Bismarck ND 58505

MONTHLY DISCHARGE REPORT

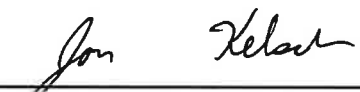
LOCATION: WEST END OUTLET

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
5/1/12	5/31/12

LOCATION: Benson Co, ND

Devils Lake Outlet discharged 8,286 ac-ft over 31 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.33	8.77	8.44	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	µS/cm	Continuous	Recorder
SULFATE	542	586	563	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	545	579	562	mg/L	2 x Week	GRAB
OUTLET DISCHARGE	121	171	135	cfs	Continuous	Recorder
SIGNATURE				6/22/12	701-328-4948	
NAME AND TITLE	JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			DATE	TELEPHONE NUMBER	

COMMENT AND EXPLANATION OF ANY VIOLATIONS

Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.

Notes:

- ac-ft - Acre feet
- SU - Standard Units
- µS/cm - Microsiemens per Centimeter at 25 degrees Celsius
- mg/L - Milligrams per liter or parts per million
- cfs - Cubic feet per second
- NA - Not available

OUTLET OPERATOR NAME/ADDRESS

NAME: ND State Water Commission  
 ADDRESS: 900 E Boulevard Avenue,  
 Bismarck ND 58505

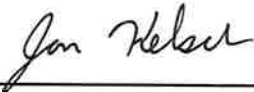
MONTHLY DISCHARGE REPORT

LOCATION: UPSTREAM OF THE WEST END OUTLET (FLORA)

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
5/1/12	5/31/12

LOCATION: Benson Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.21	8.51	8.37	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	1,560	1,640	1,602	µS/cm	Continuous	Recorder
SULFATE	383	416	397	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	385	413	397	mg/L	2 x Week	GRAB
FLOW, INSTREAM	66	136	94	cfs	Continuous	Recorder
SIGNATURE				6/22/12	701-328-4948	
NAME AND TITLE	JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						

Notes:

- SU - Standard Units
- µS/cm - Microsiemens per Centimeter at 25 degrees Celsius
- mg/L - Milligrams per liter or parts per million
- cfs - Cubic feet per second
- USGS streamflow and specific conductance data courtesy of the USGS
- USGS data are provisional and subject to revision

OUTLET OPERATOR NAME/ADDRESS

NAME: ND State Water Commission  
 ADDRESS: 900 E Boulevard Avenue,  
 Bismarck ND 58505


MONTHLY DISCHARGE REPORT

LOCATION: DOWNSTREAM OF THE WEST END OUTLET (BREMEN)

FACILITY: Devils Lake Outlet Project

LOCATION: Eddy Co, ND

MONITORING PERIOD	
START DATE	END DATE
5/1/12	5/31/12

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.15	8.59	8.42	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	1,600	1,760	1,701	µS/cm	Continuous	Recorder
SULFATE	479	515	495	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	479	512	495	mg/L	2 x Week	GRAB
FLOW, INSTREAM	198	262	231	cfs	Continuous	Recorder
SIGNATURE				6/22/12	701-328-4948	
NAME AND TITLE				JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION		
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
Summary of individual sample results and flow data for outlet, upstream & downstream monitoring locations attached.						

Notes:

- SU - Standard Units
- µS/cm - Microsiemens per Centimeter at 25 degrees Celsius
- mg/L - Milligrams per liter or parts per million
- cfs - Cubic feet per second
- USGS streamflow and specific conductance data courtesy of the USGS
- USGS data are provisional and subject to revision

## Daily Outlet Discharge and Upstream and Downstream Flows Devils Lake West End Outlet

Date	Above West End Outlet - Sheyenne River near Flora		Below West End Outlet - Sheyenne River near Bremen		West End Outlet	
	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage ( $\mu$ S/cm)	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage ( $\mu$ S/cm)	Average Daily Outlet Discharge (cfs)	Total Daily Volume (ft <sup>3</sup> )
5/1/12	136	1,560	258	1,600	123	10,612,989
5/2/12	132	1,580	258	1,600	123	10,603,712
5/3/12	123	1,600	254	1,610	123	10,595,188
5/4/12	117	1,600	249	1,620	121	10,444,696
5/5/12	113	1,600	244	1,620	123	10,585,310
5/6/12	117	1,590	238	1,630	125	10,777,937
5/7/12	121	1,590	233	1,620	122	10,543,706
5/8/12	122	1,600	240	1,660	122	10,501,717
5/9/12	124	1,610	246	1,690	123	10,651,221
5/10/12	114	1,620	246	1,690	123	10,598,759
5/11/12	112	1,610	234	1,700	121	10,452,943
5/12/12	111	1,610	229	1,700	124	10,733,640
5/13/12	107	1,610	227	1,710	126	10,901,521
5/14/12	99	1,610	225	1,710	127	10,987,373
5/15/12	91	1,640	220	1,710	128	11,050,361
5/16/12	84	1,640	212	1,730	128	11,059,317
5/17/12	76	1,640	209	1,740	126	10,884,988
5/18/12	72	1,640	203	1,740	128	11,035,584
5/19/12	75	1,630	204	1,720	129	11,091,718
5/20/12	78	1,620	203	1,720	130	11,221,462
5/21/12	79	1,590	203	1,730	129	11,100,245
5/22/12	81	1,580	208	1,740	128	10,996,985
5/23/12	78	1,590	205	1,740	127	10,933,863
5/24/12	69	1,590	198	1,740	138	11,931,161
5/25/12	67	1,610	216	1,750	167	14,378,704
5/26/12	66	1,610	244	1,760	166	14,279,179
5/27/12	68	1,590	262	1,750	171	14,712,264
5/28/12	70	1,600	249	1,750	166	14,344,086
5/29/12	68	1,570	245	1,760	163	14,096,426
5/30/12	71	1,560	242	1,750	166	14,314,876
5/31/12	70	1,560	243	1,750	168	14,509,387
<b>Minimum</b>	66	1,560	198	1,600	121	10,444,696
<b>Maximum</b>	136	1,640	262	1,760	171	14,712,264
<b>Average</b>	94	1,602	231	1,701	135	11,642,946

<b>Total (ft<sup>3</sup>)</b>	360,931,317
<b>Total (Mgal)</b>	2,700
<b>Total (Ac-ft)</b>	8,286

**Notes:**

cfs - cubic feet per second

$\mu$ S/cm - Microsiemens per Centimeter at 25 degrees Celsius

ft<sup>3</sup> - cubic feet

Mgal - Millions of Gallons

Ac ft - Acre Feet

USGS streamflow and specific conductance data are preliminary and courtesy of the USGS



**West End Outlet  
Monthly Water Quality Summary  
Devils Lake West End Outlet**

Date	Time	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling Average
5/1/12	8:25	8.39	575	564	6	7
5/2/12	-	-	-	-	-	-
5/3/12	-	-	-	-	-	-
5/4/12	10:10	8.48	571	573	NA	7
5/5/12	-	-	-	-	-	-
5/6/12	-	-	-	-	-	-
5/7/12	-	-	-	-	-	-
5/8/12	8:35	8.33	586	579	NA	7
5/9/12	12:25	8.77	578	578	NA	7
5/10/12	-	-	-	-	-	-
5/11/12	-	-	-	-	-	-
5/12/12	-	-	-	-	-	-
5/13/12	-	-	-	-	-	-
5/14/12	-	-	-	-	-	-
5/15/12	8:28	8.33	572	575	13	7
5/16/12	-	-	-	-	-	-
5/17/12	10:45	8.52	547	560	NA	7
5/18/12	-	-	-	-	-	-
5/19/12	-	-	-	-	-	-
5/20/12	-	-	-	-	-	-
5/21/12	-	-	-	-	-	-
5/22/12	-	-	-	-	-	-
5/23/12	8:35	8.39	542	545	NA	7
5/24/12	8:30	8.35	547	545	NA	7
5/25/12	-	-	-	-	-	-
5/26/12	-	-	-	-	-	-
5/27/12	-	-	-	-	-	-
5/28/12	-	-	-	-	-	-
5/29/12	8:15	8.33	546	545	17	7
5/30/12	-	-	-	-	-	-
5/31/12	8:35	8.53	565	556	NA	7
<b>Minimum</b>		8.33	542	545	6	
<b>Maximum</b>		8.77	586	579	17	
<b>Average</b>		8.44	563	562	12	

**Notes:**

mg/L - Milligrams per liter or parts per million

NA - Not Analyzed

Shading denotes preliminary result



**Sheyenne River Upstream of West End Outlet near Flora  
Monthly Water Quality Summary  
Devils Lake West End Outlet**

Date	Time	Specific Conductance USGS Gage (µS/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling Average
5/1/12	8:05	1,550	8.36	391	392	13	7
5/2/12	-	-	-	-	-	-	-
5/3/12	-	-	-	-	-	-	-
5/4/12	10:00	1,600	8.50	410	401	NA	7
5/5/12	-	-	-	-	-	-	-
5/6/12	-	-	-	-	-	-	-
5/7/12	-	-	-	-	-	-	-
5/8/12	8:25	1,590	8.35	416	413	NA	7
5/9/12	12:35	1,610	8.51	397	408	NA	7
5/10/12	-	-	-	-	-	-	-
5/11/12	-	-	-	-	-	-	-
5/12/12	-	-	-	-	-	-	-
5/13/12	-	-	-	-	-	-	-
5/14/12	-	-	-	-	-	-	-
5/15/12	8:05	1,640	8.34	414	406	27	7
5/16/12	-	-	-	-	-	-	-
5/17/12	10:30	1,630	8.44	394	404	NA	7
5/18/12	-	-	-	-	-	-	-
5/19/12	-	-	-	-	-	-	-
5/20/12	-	-	-	-	-	-	-
5/21/12	-	-	-	-	-	-	-
5/22/12	-	-	-	-	-	-	-
5/23/12	8:25	1,580	8.30	383	389	NA	7
5/24/12	8:15	1,590	8.21	390	387	NA	7
5/25/12	-	-	-	-	-	-	-
5/26/12	-	-	-	-	-	-	-
5/27/12	-	-	-	-	-	-	-
5/28/12	-	-	-	-	-	-	-
5/29/12	8:05	1,570	8.26	384	386	25	7
5/30/12	-	-	-	-	-	-	-
5/31/12	8:25	1,550	8.42	386	385	NA	7
<b>Minimum</b>		1,550	8.21	383	385	13	
<b>Maximum</b>		1,640	8.51	416	413	27	
<b>Average</b>		1,591	8.37	397	397	22	

**Notes:**

µS/cm - Microsiemens per Centimeter at 25 degrees Celsius  
 mg/L - Milligrams per liter or parts per million  
 NA - Not Analyzed  
 USGS streamflow and specific conductance data courtesy of the USGS  
 USGS data are provisional and subject to revision  
 Shading denotes preliminary result



**Sheyenne River Downstream of West End Outlet near Bremen  
Monthly Water Quality Summary  
Devils Lake West End Outlet**

Date	Time	Specific Conductance USGS Gage ( $\mu\text{S}/\text{cm}$ )	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling Average
5/1/12	7:45	1,600	8.42	480	479	15	7
5/2/12	-	-	-	-	-	-	-
5/3/12	-	-	-	-	-	-	-
5/4/12	9:45	1,620	8.52	515	498	NA	7
5/5/12	-	-	-	-	-	-	-
5/6/12	-	-	-	-	-	-	-
5/7/12	-	-	-	-	-	-	-
5/8/12	8:00	1,630	8.40	498	507	NA	7
5/9/12	12:55	1,690	8.59	481	498	NA	7
5/10/12	-	-	-	-	-	-	-
5/11/12	-	-	-	-	-	-	-
5/12/12	-	-	-	-	-	-	-
5/13/12	-	-	-	-	-	-	-
5/14/12	-	-	-	-	-	-	-
5/15/12	7:38	1,710	8.39	495	488	51	7
5/16/12	-	-	-	-	-	-	-
5/17/12	10:15	1,740	8.48	492	494	NA	7
5/18/12	-	-	-	-	-	-	-
5/19/12	-	-	-	-	-	-	-
5/20/12	-	-	-	-	-	-	-
5/21/12	-	-	-	-	-	-	-
5/22/12	8:00	1,740	8.15	487	490	NA	7
5/23/12	7:55	1,740	8.37	479	486	NA	7
5/24/12	-	-	-	-	-	-	-
5/25/12	-	-	-	-	-	-	-
5/26/12	-	-	-	-	-	-	-
5/27/12	-	-	-	-	-	-	-
5/28/12	-	-	-	-	-	-	-
5/29/12	7:40	1,760	8.36	512	496	43	7
5/30/12	-	-	-	-	-	-	-
5/31/12	8:00	1,750	8.48	512	512	NA	7
<b>Minimum</b>		1,600	8.15	479	479	15	
<b>Maximum</b>		1,760	8.59	515	512	51	
<b>Average</b>		1,698	8.42	495	495	36	

**Notes:**

- $\mu\text{S}/\text{cm}$  - Microsiemens per Centimeter at 25 degrees Celsius
- mg/L - Milligrams per liter or parts per million
- NA - Not Analyzed
- USGS streamflow and specific conductance data courtesy of the USGS
- USGS data are provisional and subject to revision
- Shading denotes preliminary result

