



# North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850  
701-328-2750 • TTY 800-366-6888 • FAX 701-328-3696 • INTERNET: <http://swc.nd.gov>

---

June 29, 2011

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

RE: West End Devils Lake Outlet

The pumping for the West End Devils Lake Outlet started on May 26<sup>th</sup> 2011. Attached to this letter are tables showing average daily releases from the outlet, the average daily stream flow data and the conductivity data obtained from the USGS gaging station at the upstream and the downstream location. Discharge occurred on the days highlighted in yellow. The discharge shown on the table earlier to May 26<sup>th</sup> is the releases of snow melt water that was present in the canal.

Water quality sample was collected from the outlet terminal structure and the upstream location on May 25<sup>th</sup> and the results are attached. Sample at the downstream location was not collected on May 25<sup>th</sup> as it was informed by the sampler that during the weeks of May 23<sup>rd</sup> and May 31<sup>st</sup> the road to the sampling site was closed. On the other days during the outlet operation, which is 3 business days water quality samples were not collected as the sampler was sick and we were not able to find an alternate sampler.

Most of the data in the monthly discharge report is reported as not available, since the data that we do have for the outlet and the upstream location was not collected during the outlet operation period.

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

Sincerely,

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

**Water Quality Results of the samples collected at the outlet**

Deviils Lake Outlet								
Date	Time	Sampler	Average Daily EC from Outlet Telemetry (µS/cm)	Lab pH	Lab Sulfate (mg/L)	7 Day Rolling Average of Sulfate for the operating period (mg/L)	Total Suspended Solids (mg/L)	No. of days included in the 7 day Rolling average
5/25/11	8:50	NDSWC	NA	8.28	768	NA	43	-

NA - Not Available

OUTLET OPERATOR NAME/ADDRESS

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

MONTHLY DISCHARGE REPORT

LOCATION: AT OUTLET

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
5/1/11	5/31/11

LOCATION: Benson Co, ND

Devils Lake Outlet discharged 1,672 ac-ft over 6 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	NA	NA	NA	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	umho/cm	Continuous	Recorder
SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
OUTLET DISCHARGE	56.38	168.6	140.46	cfs	Continuous	Recorder
SIGNATURE				6/29/11	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.						

NA - Not Available

**Daily Outlet Discharge**

<b>Date</b>	<b>Average Daily Outlet Discharge (cfs)</b>	<b>Total Daily Volume (cu-ft)</b>
5/1/11	0	0
5/2/11	0	0
5/3/11	0	0
5/4/11	0	0
5/5/11	0	0
5/6/11	0	0
5/7/11	0	0
5/8/11	0	0
5/9/11	0	0
5/10/11	0	0
5/11/11	0	0
5/12/11	0	0
5/13/11	0	0
5/14/11	0	0
5/15/11	0	0
5/16/11	0	0
5/17/11	0	0
5/18/11	0	0
5/19/11	0	0
5/20/11	0	0
5/21/11	0	0
5/22/11	0	0
5/23/11	9.81	847,584
5/24/11	8.16	705,024
5/25/11	5.08	438,912
5/26/11	56.38	4,871,232
5/27/11	168.6	14,567,040
5/28/11	153.51	13,263,264
5/29/11	157.02	13,566,528
5/30/11	157.18	13,580,352
5/31/11	150.06	12,965,184
<b>Total</b>		<b>72,813,600</b> cu-ft
<b>Total</b>		<b>544.65</b> Mgal
<b>Total</b>		<b>1671.57</b> Ac-ft
<b>Average Flow</b>	<b>140.46</b> cfs	
<b>Minimum</b>	<b>56.38</b>	<b>4,871,232</b>
<b>Maximum</b>	<b>168.60</b>	<b>14,567,040</b>
<b>Average</b>	<b>140.46</b>	<b>12,135,600</b>

OUTLET OPERATOR NAME/ADDRESS

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

MONTHLY DISCHARGE REPORT

LOCATION: UPSTREAM OF THE OUTLET (FLORA)

FACILITY: Devils Lake Outlet Project  
 LOCATION: Benson Co, ND

MONITORING PERIOD	
START DATE	END DATE
5/1/11	5/31/11

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	NA	NA	NA	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	umho/cm	Continuous	Recorder
SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
FLOW, INSTREAM	344	372	353.3	cfs	Continuous	Recorder
SIGNATURE				6/29/11	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.						
Instream samples and measurements for this summary pertain only to time periods when outlet is actually operated.						

NA - Not Available

**Sheyenne River Above Devils Lake Outlet Near Flora**

<b>Date</b>	<b>Time</b>	<b>Sampler</b>	<b>USGS EC (<math>\mu</math>S/cm)</b>	<b>Lab pH</b>	<b>Lab Sulfate (mg/L)</b>	<b>7 Day Rolling Average of Sulfate for the operating period (mg/L)</b>	<b>Total Suspended Solids (mg/L)</b>	<b>No. of days included in the 7 day Rolling average</b>
5/25/11	9:10	NDSWC	1270	8.3	294	NA	13	-

**NA - Not Available**

**Average daily streamflow and conductivity data at the upstream location near Flora  
USGS Gaging Station Data  
Sheyenne River Above Devils Lake Outlet Near Flora**

<b>Date</b>	<b>Streamflow (cfs)</b>	<b>EC (<math>\mu</math>S/cm)</b>
5/1/11	855	959
5/2/11	838	984
5/3/11	800	997
5/4/11	753	1000
5/5/11	713	1000
5/6/11	674	1020
5/7/11	632	1020
5/8/11	585	1030
5/9/11	540	1040
5/10/11	523	1060
5/11/11	504	896
5/12/11	480	767
5/13/11	464	775
5/14/11	452	780
5/15/11	\	
5/16/11	\	
5/17/11	\	
5/18/11	\	
5/19/11	\	
5/20/11	\	
5/21/11	1270	
5/22/11	1280	
5/23/11	1280	
5/24/11	352	1280
5/25/11	349	1270
5/26/11	344	1270
5/27/11	350	1260
5/28/11	348	1270
5/29/11	350	1280
5/30/11	356	1290
5/31/11	372	1300
<b>Minimum</b>	<b>344</b>	<b>1260</b>
<b>Maximum</b>	<b>372</b>	<b>1300</b>
<b>Average</b>	<b>353.33</b>	<b>1278.33</b>

OUTLET OPERATOR NAME/ADDRESS

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

MONTHLY DISCHARGE REPORT

LOCATION: DOWNSTREAM OF THE OUTLET (BREMEN)

FACILITY: Devils Lake Outlet Project

LOCATION: Benson Co, ND

MONITORING PERIOD	
START DATE	END DATE
5/1/11	5/31/11

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	NA	NA	NA	SU	4 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	umho/cm	Continuous	Recorder
SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
7 DAY AVERAGE OF SULFATE	NA	NA	NA	mg/L	4 x Week	GRAB
FLOW, INSTREAM	399	490	461.33	cfs	Continuous	Recorder
SIGNATURE				6/29/11	701-328-4948	
NAME AND TITLE	JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
<p>Summary of individual sample results and flow data for outlet, upstream &amp; downstream monitoring locations attached.</p> <p>Instream samples and measurements for this summary pertain only to time periods when outlet is actually operated.</p>						

NA - Not Available

**Average daily streamflow and conductivity data at the downstream location near Bremen**

**USGS Gaging Station Data**

**Sheyenne River Below Devils Lake Outlet near Bremen**

<b>Date</b>	<b>Streamflow (cfs)</b>	<b>EC (<math>\mu</math>S/cm)</b>
5/1/11	1050	924
5/2/11	1000	955
5/3/11	970	979
5/4/11	925	984
5/5/11	865	979
5/6/11	816	979
5/7/11	772	988
5/8/11	729	996
5/9/11	692	1000
5/10/11	681	1040
5/11/11	640	1170
5/12/11	613	1210
5/13/11	580	1220
5/14/11	565	1230
5/15/11	538	1240
5/16/11	516	1240
5/17/11	501	1250
5/18/11	483	1250
5/19/11	458	1250
5/20/11	436	1260
5/21/11	429	1260
5/22/11	421	1290
5/23/11	417	1320
5/24/11	420	1310
5/25/11	411	1300
5/26/11	399	1300
5/27/11	454	1340
5/28/11	469	1390
5/29/11	470	1390
5/30/11	490	1390
5/31/11	486	1400
<b>Minimum</b>	<b>399</b>	<b>1300</b>
<b>Maximum</b>	<b>490</b>	<b>1400</b>
<b>Average</b>	<b>461.33</b>	<b>1368.33</b>