

North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
(701)-328-2750 • TTY 1-800-366-6888 • FAX (701)-328-3696 • <http://swc.nd.gov>

WATER DEVELOPMENT DIVISION
(701) 328-2752

September 13, 2018

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

RE: August 2018 Devils Lake Outlets Monthly Discharge and Water Quality Report

Division of Water Quality:

Enclosed is the monthly discharge report for the Devils Lake Outlets for the month of August 2018. The West End Outlet discharged steadily at full capacity throughout the month of August (**Figure 1**).

The East End Outlet was shut down on August 2nd to allow repair of an area of erosion at the outfall to Tolna Coulee. The repair was completed and the East Outlet resumed operation on August 22nd at 165 cfs. Discharge was then reduced to 140 cfs on August 29th. Two samples did slightly exceed the 750 mg/L sulfate limitation at Pekin and the East Outlet discharge was reduced to prevent further exceedances. The combined outlet discharge totaled 19,206 acre-feet in July and the 2018 season total discharge was 75,067 ac-ft as of August 31st.

The attached tables contain average daily outlet discharges and water quality results from samples collected from the outlets and the corresponding upstream and downstream locations. Also included are average daily stream flow data and conductivity data obtained from the USGS gaging stations located upstream and downstream of the outlets.

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

Sincerely,

Jonathan Kelsch P.E.
Section Chief of Construction

JK:TD/416-10
Enclosure

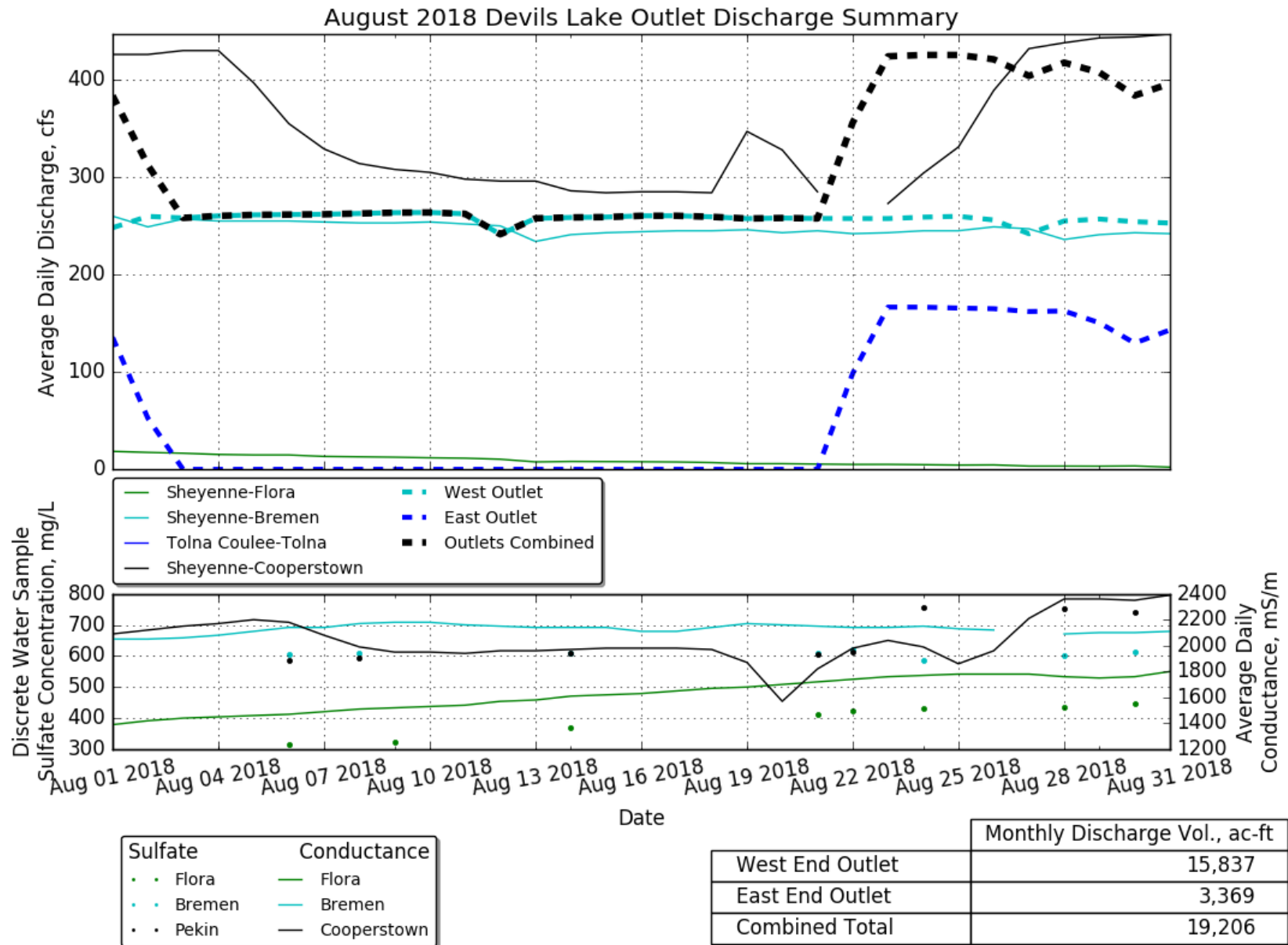


Figure 1: Devils Lake Outlet Discharge Summary

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
8/1/18	8/31/18

LOCATION: Benson Co, ND

Devils Lake West Outlet discharged 15,837 ac-ft over 31 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.71	8.93	8.82	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	µS/cm	Continuous	Recorder
SULFATE	602	622	614	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	606	624	614	mg/L	Average	GRAB
OUTLET DISCHARGE	241	264	258	cfs	Continuous	Recorder
SIGNATURE				9/13/18	701-328-4948	
NAME AND TITLE	JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			DATE	TELEPHONE NUMBER	

COMMENT AND EXPLANATION OF ANY VIOLATIONS

A summary of individual sample results and flow data for both outlets, and upstream & downstream monitoring locations is 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: EAST END OUTLET

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
8/1/18	8/31/18

LOCATION: Ramsey, Benson, Nelson, ND

Devils Lake East Outlet discharged 3,369 ac-ft over 12 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.75	8.93	8.83	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	2590	2920	2807	µS/cm	Continuous	Recorder
SULFATE	957	962	959	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	959	962	960	mg/L	Average	GRAB
OUTLET DISCHARGE	0	167	55	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			9/13/18	701-328-4948	
NAME AND TITLE				DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
A summary of individual sample results and flow data for both outlets, and upstream & downstream monitoring locations is attached.						

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- 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
8/1/18	8/31/18

LOCATION: Benson Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.56	8.85	8.63	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	1,390	1,800	1,624	µS/cm	Continuous	Recorder
SULFATE	314	446	394	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	304	439	386	mg/L	Average	GRAB
FLOW, INSTREAM	2	19	9	cfs	Continuous	Recorder
SIGNATURE				9/13/18	701-328-4948	
NAME AND TITLE	JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
A summary of individual sample results and flow data for both outlets, and upstream & downstream monitoring location is 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)
 UPSTREAM OF THE EAST END OUTLET

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
8/1/18	8/31/18

LOCATION: Eddy Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.67	8.99	8.81	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	2,050	2,180	2,127	µS/cm	Continuous	Recorder
SULFATE	587	621	607	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	601	615	607	mg/L	Average	GRAB
FLOW, INSTREAM	234	260	247	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			9/13/18	701-328-4948	
NAME AND TITLE				DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
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- µS/cm - Microsiemens per Centimeter at 25 degrees Celsius
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- 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 BOTH OUTLETS (PEKIN)

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
8/1/18	8/31/18

LOCATION: Nelson Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.56	8.77	8.65	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	µS/cm	Continuous	Recorder
SULFATE	587	756	657	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	590	749	647	mg/L	Average	GRAB
FLOW, INSTREAM	NA	NA	NA	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			9/13/18	701-328-4948	
NAME AND TITLE				DATE	TELEPHONE NUMBER	

COMMENT AND EXPLANATION OF ANY VIOLATIONS

A summary of individual sample results and flow data for both outlets, and upstream & downstream monitoring locations is 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
- NA - Not available

OUTLET OPERATOR NAME/ADDRESS

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


MONTHLY DISCHARGE REPORT

LOCATION: DOWNSTREAM OF BOTH OUTLETS (COOPERSTOWN)

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
8/1/18	8/31/18

LOCATION: Griggs Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.59	8.67	8.63	SU	Weekly	GRAB
SPECIFIC CONDUCTANCE	1,570	2,390	2,045	µS/cm	Continuous	Recorder
SULFATE	556	731	613	mg/L	Weekly	GRAB
7 DAY AVERAGE OF SULFATE	556	731	612	mg/L	Average	GRAB
FLOW, INSTREAM	273	447	350	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			9/13/18	701-328-4948	
NAME AND TITLE				DATE	TELEPHONE NUMBER	
COMMENT AND EXPLANATION OF ANY VIOLATIONS						
A summary of individual sample results and flow data for both outlets, and upstream & downstream monitoring locations is attached.						

Notes:

- SU - Standard Units
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- mg/L - Milligrams per liter or parts per million
- cfs - Cubic feet per second
- NA - Not available

Daily Outlet Discharge and Upstream and Downstream Flows Devils Lake Outlets

Date	Above West End Outlet - Sheyenne River near Flora		West End Outlet		Below West End Outlet/Above East End Outlet -Sheyenne River near Bremen		East End Outlet		Below East End Outlet - Tolna Coulee near Tolna		Below East End Outlet - Sheyenne River near Cooperstown		Sum of Outlets	
	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage (µS/cm)	Average Daily Outlet Discharge (cfs)	Total Daily Volume (ft ³)	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage (µS/cm)	Average Daily Outlet Discharge (cfs)	Total Daily Volume (ft ³)	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage (µS/cm)	Average Streamflow USGS Gage (cfs)	Average Specific Conductance USGS Gage (µS/cm)	Average Daily Outlet Discharge (cfs)	Total Daily Volume (ft ³)
8/1/18	19	1,390	248	21,434,000	260	2,050	136	11,714,000	-	-	426	2,090	384	33,148,000
8/2/18	17	1,420	260	22,441,000	249	2,050	53	4,548,000	-	2,900	426	2,120	312	26,989,000
8/3/18	17	1,440	258	22,304,000	257	2,060	0	0	-	2,890	430	2,150	258	22,304,000
8/4/18	15	1,450	260	22,487,000	255	2,080	0	0	-	-	430	2,170	260	22,487,000
8/5/18	15	1,460	261	22,577,000	255	2,110	0	0	-	-	397	2,200	261	22,577,000
8/6/18	15	1,470	262	22,604,000	255	2,140	0	0	-	-	355	2,180	262	22,604,000
8/7/18	13	1,490	262	22,630,000	254	2,140	0	0	-	-	329	2,080	262	22,630,000
8/8/18	13	1,510	263	22,699,000	253	2,170	0	0	-	-	314	1,990	263	22,699,000
8/9/18	13	1,520	264	22,773,000	253	2,180	0	0	-	2,670	308	1,950	264	22,773,000
8/10/18	12	1,530	264	22,789,000	254	2,180	0	0	-	2,650	305	1,950	264	22,789,000
8/11/18	12	1,540	262	22,672,000	252	2,160	0	0	-	2,600	298	1,940	262	22,672,000
8/12/18	10	1,570	241	20,853,000	250	2,150	0	0	-	2,540	296	1,960	241	20,853,000
8/13/18	8	1,580	258	22,266,000	234	2,140	0	0	-	2,520	296	1,960	258	22,266,000
8/14/18	8	1,610	259	22,349,000	241	2,140	0	0	-	-	286	1,970	259	22,349,000
8/15/18	8	1,620	259	22,381,000	243	2,140	0	0	-	2,460	284	1,980	259	22,381,000
8/16/18	8	1,630	260	22,490,000	244	2,110	0	0	-	2,350	285	1,980	260	22,490,000
8/17/18	8	1,650	260	22,494,000	245	2,110	0	0	-	2,100	285	1,980	260	22,494,000
8/18/18	7	1,670	259	22,402,000	245	2,140	0	0	-	2,010	284	1,970	259	22,402,000
8/19/18	6	1,680	258	22,252,000	246	2,170	0	0	-	1,840	347	1,870	258	22,252,000
8/20/18	6	1,700	258	22,296,000	243	2,160	0	0	-	1,850	328	1,570	258	22,296,000
8/21/18	5	1,720	258	22,258,000	245	2,150	0	0	-	1,850	285	1,820	258	22,258,000
8/22/18	5	1,740	258	22,253,000	242	2,140	99	8,516,000	-	2,140	-	1,980	356	30,769,000
8/23/18	5	1,760	258	22,249,000	243	2,140	167	14,390,000	-	2,430	273	2,040	424	36,639,000
8/24/18	5	1,770	259	22,374,000	245	2,150	167	14,387,000	-	2,730	304	1,990	425	36,761,000
8/25/18	4	1,780	260	22,446,000	245	2,130	166	14,312,000	-	2,850	331	1,860	425	36,758,000
8/26/18	5	1,780	256	22,125,000	249	2,120	165	14,252,000	-	2,890	389	1,960	421	36,377,000
8/27/18	3	1,780	242	20,905,000	247	-	162	14,001,000	-	2,920	432	2,210	404	34,906,000
8/28/18	3	1,760	255	22,034,000	236	2,090	163	14,047,000	-	2,910	438	2,360	418	36,081,000
8/29/18	3	1,750	257	22,203,000	241	2,100	150	13,001,000	-	2,910	443	2,360	407	35,204,000
8/30/18	4	1,760	254	21,968,000	243	2,100	130	11,198,000	-	2,900	444	2,350	384	33,166,000
8/31/18	2	1,800	253	21,854,000	242	2,110	143	12,371,000	-	2,880	447	2,390	396	34,225,000
Minimum	2	1,390	241	20,853,000	234	2,050	0	0	-	1,840	273	1,570	241	20,853,000
Maximum	19	1,800	264	22,789,000	260	2,180	167	14,390,000	-	2,920	447	2,390	425	36,761,000
Average	9	1,624	258	22,253,613	247	2,127	55	4,733,452	-	2,533	350	2,045	312	26,987,065
			Total (Mgal)	5,160			Total (Mgal)	1,098					Total (Mgal)	6,258
			Total (Ac-ft)	15,837			Total (Ac-ft)	3,369					Total (Ac-ft)	19,206

Notes:

- cfs - cubic feet per second
- µS/cm - Microsiemens per Centimeter at 25 degrees Celsius
- ft³ - cubic feet
- Mgal - Millions of Gallons
- Ac ft - Acre Feet
- USGS streamflow and specific conductance data are preliminary and courtesy of the USGS
- NC - Not calculated

Sheyenne River Upstream of West End Outlet Near Flora

Monthly Water Quality Summary

Devils Lake Outlet Discharge Report

Date	Time	Specific Conductance USGS Gage (μ S/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	Number of Samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	8:50	1,480	8.85	314	304	NA	2
8/7/18	-	-	-	-	-	-	-
8/8/18	-	-	-	-	-	-	-
8/9/18	8:25	1,520	8.60	322	318	20	2
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	7:55	1,600	8.58	369	346	NA	2
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	7:54	1,710	8.64	411	411	43	1
8/22/18	9:20	1,730	8.63	423	417	NA	2
8/23/18	-	-	-	-	-	-	-
8/24/18	8:55	1,760	8.61	433	422	NA	3
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	8:24	1,760	8.56	437	431	NA	3
8/29/18	-	-	-	-	-	-	-
8/30/18	8:45	1,750	8.58	446	439	NA	3
8/31/18	-	-	-	-	-	-	-
Minimum		1,480	8.56	314	304	20	
Maximum		1,760	8.85	446	439	43	
Average		1,664	8.63	394	386	32	

Notes:

μ S/cm - Microsiemens per Centimeter at 25 degrees Celsius

mg/L - Milligrams per liter or parts per million

NA - Not Analyzed

USGS specific conductance data courtesy of the USGS

USGS data are provisional and subject to revision

Italic font denotes preliminary result



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

Date	Time	Specific Conductance from Telemetry System (µS/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	Number of Samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	8:45	-	8.93	622	624	NA	2
8/7/18	-	-	-	-	-	-	-
8/8/18	-	-	-	-	-	-	-
8/9/18	8:35	-	8.80	616	619	19	2
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	8:05	-	8.71	602	609	NA	2
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	8:05	-	8.77	606	606	16	1
8/22/18	9:40	-	8.82	615	611	NA	2
8/23/18	-	-	-	-	-	-	-
8/24/18	9:15	-	8.87	619	613	NA	3
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	8:35	-	8.80	613	616	NA	3
8/29/18	-	-	-	-	-	-	-
8/30/18	8:55	-	8.89	617	616	NA	3
8/31/18	-	-	-	-	-	-	-
Minimum		NA	8.71	602	606	16	
Maximum		NA	8.93	622	624	19	
Average		NA	8.82	614	614	18	

Notes:

mg/L - Milligrams per liter or parts per million
 NA - Not Analyzed
 Italic font denotes preliminary result



**Sheyenne River Downstream of West End Outlet/Upstream of East End Outlet (Bremen)
 Monthly Water Quality Summary
 Devils Lake Outlet Discharge Report**

Date	Time	Specific Conductance USGS Gage (μ S/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	Number of samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	9:15	1,980	8.87	606	605	NA	2
8/7/18	-	-	-	-	-	-	-
8/8/18	8:00	2,010	8.77	608	607	26	2
8/9/18	-	-	-	-	-	-	-
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	7:30	1,980	8.67	608	608	NA	2
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	7:30	1,990	8.74	609	609	36	1
8/22/18	8:55	1,980	8.81	621	615	NA	2
8/23/18	-	-	-	-	-	-	-
8/24/18	8:30	1,990	8.99	587	606	NA	3
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	8:00	1,940	8.77	603	604	NA	3
8/29/18	-	-	-	-	-	-	-
8/30/18	8:25	1,940	8.84	613	601	NA	3
8/31/18	-	-	-	-	-	-	-
Minimum		1,940	8.67	587	601	26	
Maximum		2,010	8.99	621	615	36	
Average		1,976	8.81	607	607	31	

Notes:

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



East End Outlet Monthly Water Quality Summary Devils Lake Discharge Report

Date	Time	Specific Conductance USGS Gage (μ S/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	Number of samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	-	-	-	-	-	-	-
8/7/18	-	-	-	-	-	-	-
8/8/18	-	-	-	-	-	-	-
8/9/18	-	-	-	-	-	-	-
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	-	-	-	-	-	-	-
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	-	-	-	-	-	-	-
8/22/18	-	-	-	-	-	-	-
8/23/18	-	-	-	-	-	-	-
8/24/18	7:00	2590	8.81	962	962	NA	1
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	10:00	2920	8.75	957	960	NA	2
8/29/18	-	-	-	-	-	-	-
8/30/18	7:00	2910	8.93	958	959	NA	3
8/31/18	-	-	-	-	-	-	-
Minimum		2590	8.75	957	959	0	
Maximum		2920	8.93	962	962	0	
Average		2807	8.83	959	960	NA	

Notes:

mg/L - Milligrams per liter or parts per million
 NA - Not Analyzed
 Italic font denotes preliminary result



**Sheyenne River Downstream of Both Outlets near Pekin
Monthly Water Quality Summary
Devils Lake Outlet Discharge Report**

Date	Time	Specific Conductance Laboratory Analysis (µS/cm)	pH	Sulfate (mg/L)	7 Day Rolling Average of Sulfate (mg/L)	Total Suspended Solids (mg/L)	Number of samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	10:20	-	8.77	587	653	NA	2
8/7/18	-	-	-	-	-	-	-
8/8/18	10:20	-	8.70	593	590	53	2
8/9/18	-	-	-	-	-	-	-
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	9:30	-	8.67	609	601	NA	2
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	9:36	-	8.58	606	606	65	1
8/22/18	7:15	-	8.58	613	610	NA	2
8/23/18	-	-	-	-	-	-	-
8/24/18	7:20	-	8.68	756	658	NA	3
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	10:30	-	8.63	751	707	NA	3
8/29/18	-	-	-	-	-	-	-
8/30/18	7:30	-	8.56	741	749	NA	3
8/31/18	-	-	-	-	-	-	-
Minimum			8.56	587	590	53	
Maximum			8.77	756	749	65	
Average			8.65	657	647	59	

Notes:

mg/L - Milligrams per liter or parts per million

NA - Not Analyzed

Italic font denotes preliminary result

Bold font denotes sample sulfate concentration exceeds 750 mg/L



Sheyenne River Downstream of Both Outlets near Cooperstown

Monthly Water Quality Summary

Devils Lake Outlet Discharge Report

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)	Number of samples included in 7- day Average
8/1/18	-	-	-	-	-	-	-
8/2/18	-	-	-	-	-	-	-
8/3/18	-	-	-	-	-	-	-
8/4/18	-	-	-	-	-	-	-
8/5/18	-	-	-	-	-	-	-
8/6/18	-	-	-	-	-	-	-
8/7/18	-	-	-	-	-	-	-
8/8/18	11:05	1,990	8.64	578	578	50	1
8/9/18	-	-	-	-	-	-	-
8/10/18	-	-	-	-	-	-	-
8/11/18	-	-	-	-	-	-	-
8/12/18	-	-	-	-	-	-	-
8/13/18	-	-	-	-	-	-	-
8/14/18	10:20	1,960	8.67	587	583	NA	2
8/15/18	-	-	-	-	-	-	-
8/16/18	-	-	-	-	-	-	-
8/17/18	-	-	-	-	-	-	-
8/18/18	-	-	-	-	-	-	-
8/19/18	-	-	-	-	-	-	-
8/20/18	-	-	-	-	-	-	-
8/21/18	10:25	1,820	8.63	556	556	65	1
8/22/18	-	-	-	-	-	-	-
8/23/18	-	-	-	-	-	-	-
8/24/18	-	-	-	-	-	-	-
8/25/18	-	-	-	-	-	-	-
8/26/18	-	-	-	-	-	-	-
8/27/18	-	-	-	-	-	-	-
8/28/18	11:20	2,370	8.59	731	731	NA	1
8/29/18	-	-	-	-	-	-	-
8/30/18	-	-	-	-	-	-	-
8/31/18	-	-	-	-	-	-	-
Minimum		1,820	8.59	556	556	50	
Maximum		2,370	8.67	731	731	65	
Average		2,035	8.63	613	612	58	

Notes:

mg/L - Milligrams per liter or parts per million

NA - Not Analyzed

Italic font denotes preliminary result

Bold font denotes sample sulfate concentration exceeds 750 mg/L

