

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

October 23, 2018

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

RE: September 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 September 2018. Both outlets discharged continuously with the exception of temporary maintenance shut-downs (**Figure 1**). September combined discharge averaged 373 cfs and a total of 22,219 acre-feet were discharged which brings the 2018 total to 97,286 acre-feet.

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

September 2018 Devils Lake Outlet Discharge Summary

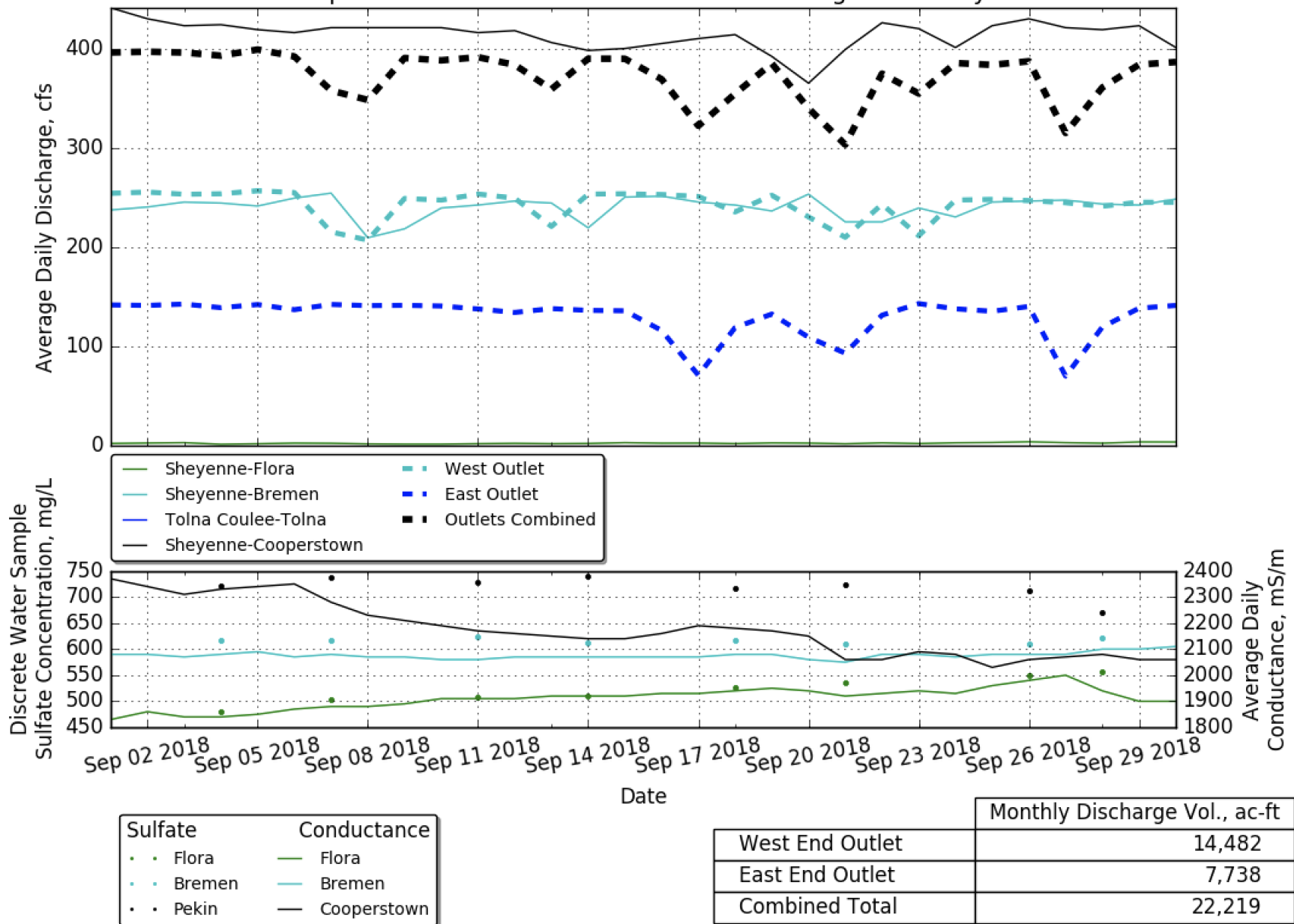


Figure 1: Devils Lake Outlet Discharge Summary

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
9/1/18	9/30/18

LOCATION: Benson Co, ND

Devils Lake West Outlet discharged 14,482 ac-ft over 30 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.74	8.90	8.80	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	µS/cm	Continuous	Recorder
SULFATE	613	631	620	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	615	624	620	mg/L	Average	GRAB
OUTLET DISCHARGE	208	257	243	cfs	Continuous	Recorder
SIGNATURE				10/23/18	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
9/1/18	9/30/18

LOCATION: Ramsey, Benson, Nelson, ND

Devils Lake East Outlet discharged 7,738 ac-ft over 30 Days

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.71	9.06	8.84	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	2790	2940	2884	µS/cm	Continuous	Recorder
SULFATE	957	986	973	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	959	986	972	mg/L	Average	GRAB
OUTLET DISCHARGE	70	144	130	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			10/23/18	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:

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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
9/1/18	9/30/18

LOCATION: Benson Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.55	8.67	8.61	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	1,830	2,000	1,911	µS/cm	Continuous	Recorder
SULFATE	480	557	521	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	463	554	514	mg/L	Average	GRAB
FLOW, INSTREAM	2	4	3	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			10/23/18	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 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
9/1/18	9/30/18

LOCATION: Eddy Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.73	9.01	8.81	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	2,050	2,110	2,076	µS/cm	Continuous	Recorder
SULFATE	610	625	616	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	611	621	616	mg/L	Average	GRAB
FLOW, INSTREAM	210	255	241	cfs	Continuous	Recorder
SIGNATURE				10/23/18	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:

- 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 BOTH OUTLETS (PEKIN)

FACILITY: Devils Lake Outlet Project

MONITORING PERIOD	
START DATE	END DATE
9/1/18	9/30/18

LOCATION: Nelson Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.64	8.99	8.74	SU	2 x Week	GRAB
SPECIFIC CONDUCTANCE	NA	NA	NA	µS/cm	Continuous	Recorder
SULFATE	670	740	719	mg/L	2 x Week	GRAB
7 DAY AVERAGE OF SULFATE	691	734	723	mg/L	Average	GRAB
FLOW, INSTREAM	NA	NA	NA	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			10/23/18	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
9/1/18	9/30/18

LOCATION: Griggs Co, ND

PARAMETER	MINIMUM	MAXIMUM	AVERAGE	UNITS	SAMPLING FREQUENCY	TYPE
pH	8.57	8.64	8.62	SU	Weekly	GRAB
SPECIFIC CONDUCTANCE	2,030	2,370	2,174	µS/cm	Continuous	Recorder
SULFATE	685	726	714	mg/L	Weekly	GRAB
7 DAY AVERAGE OF SULFATE	685	726	714	mg/L	Average	GRAB
FLOW, INSTREAM	366	442	415	cfs	Continuous	Recorder
SIGNATURE	 JONATHAN KELSCH, HEAD, CONSTRUCTION SECTION			10/23/18	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

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)			
9/1/18	2	1,830	255	22,018,000	238	2,080	142	12,283,000	-	2,880	442	2,370	397	34,301,000			
9/2/18	3	1,860	256	22,123,000	241	2,080	142	12,242,000	-	-	431	2,340	398	34,365,000			
9/3/18	3	1,840	254	21,935,000	246	2,070	143	12,357,000	-	-	424	2,310	397	34,292,000			
9/4/18	2	1,840	254	21,975,000	245	2,080	139	12,045,000	-	-	425	2,330	394	34,020,000			
9/5/18	2	1,850	257	22,238,000	242	2,090	143	12,316,000	-	-	420	2,340	400	34,554,000			
9/6/18	3	1,870	256	22,081,000	250	2,070	137	11,870,000	-	2,930	417	2,350	393	33,951,000			
9/7/18	3	1,880	216	18,651,000	255	2,080	143	12,325,000	-	-	422	2,280	359	30,976,000			
9/8/18	2	1,880	208	17,935,000	210	2,070	141	12,225,000	-	2,920	422	2,230	349	30,160,000			
9/9/18	2	1,890	250	21,567,000	219	2,070	142	12,250,000	-	2,930	422	2,210	391	33,817,000			
9/10/18	2	1,910	248	21,424,000	240	2,060	141	12,189,000	-	-	422	2,190	389	33,613,000			
9/11/18	2	1,910	254	21,955,000	243	2,060	138	11,932,000	-	2,940	417	2,170	392	33,887,000			
9/12/18	2	1,910	250	21,592,000	247	2,070	135	11,629,000	-	-	419	2,160	385	33,221,000			
9/13/18	2	1,920	221	19,131,000	245	2,070	138	11,964,000	-	2,950	407	2,150	360	31,095,000			
9/14/18	2	1,920	254	21,948,000	220	2,070	137	11,809,000	-	2,940	399	2,140	391	33,757,000			
9/15/18	3	1,920	254	21,975,000	251	2,070	136	11,774,000	-	-	401	2,140	391	33,749,000			
9/16/18	3	1,930	254	21,911,000	252	2,070	116	10,055,000	-	2,830	406	2,160	370	31,966,000			
9/17/18	3	1,930	252	21,745,000	246	2,070	71	6,160,000	-	-	411	2,190	323	27,905,000			
9/18/18	2	1,940	236	20,393,000	243	2,080	119	10,307,000	-	2,880	415	2,180	355	30,700,000			
9/19/18	3	1,950	253	21,851,000	237	2,080	133	11,490,000	-	2,910	393	2,170	386	33,341,000			
9/20/18	3	1,940	231	19,959,000	254	2,060	110	9,465,000	-	2,890	366	2,150	341	29,424,000			
9/21/18	2	1,920	210	18,182,000	226	2,050	94	8,079,000	-	2,880	400	2,060	304	26,261,000			
9/22/18	3	1,930	244	21,066,000	226	2,080	132	11,388,000	-	2,900	427	2,060	376	32,454,000			
9/23/18	2	1,940	212	18,319,000	240	2,080	144	12,399,000	-	2,910	421	2,090	356	30,718,000			
9/24/18	3	1,930	248	21,431,000	231	2,070	138	11,943,000	-	2,910	402	2,080	386	33,374,000			
9/25/18	3	1,960	249	21,485,000	246	2,080	136	11,732,000	-	2,900	424	2,030	384	33,217,000			
9/26/18	4	1,980	247	21,383,000	247	2,080	141	12,150,000	-	2,910	431	2,060	388	33,533,000			
9/27/18	3	2,000	245	21,198,000	248	2,080	70	6,078,000	-	2,830	422	2,070	316	27,276,000			
9/28/18	3	1,940	242	20,890,000	244	2,100	120	10,356,000	-	2,870	420	2,080	362	31,246,000			
9/29/18	4	1,900	246	21,238,000	243	2,100	139	12,000,000	-	2,880	424	2,060	385	33,238,000			
9/30/18	4	1,900	246	21,230,000	249	2,110	142	12,239,000	-	2,910	402	2,060	387	33,469,000			
Minimum	2	1,830	208	17,935,000	210	2,050	70	6,078,000	-	2,830	366	2,030	304	26,261,000			
Maximum	4	2,000	257	22,238,000	255	2,110	144	12,399,000	-	2,950	442	2,370	400	34,554,000			
Average	3	1,911	243	21,027,633	241	2,076	130	11,235,033	-	2,900	415	2,174	373	32,262,667			
				Total (Mgal)	4,719					Total (Mgal)	2,521					Total (Mgal)	7,240
				Total (Ac-ft)	14,482					Total (Ac-ft)	7,738					Total (Ac-ft)	22,219

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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	8:20	1,840	8.59	480	463	NA	2
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	9:40	1,870	8.60	503	492	NA	2
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	8:00	1,900	8.63	507	505	NA	2
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	9:25	1,920	8.67	511	509	NA	2
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	8:10	1,940	8.64	526	519	23	2
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	9:20	1,920	8.64	535	531	NA	2
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	8:20	1,960	8.55	550	543	NA	2
9/27/18	-	-	-	-	-	-	-
9/28/18	9:50	1,940	8.58	557	554	NA	2
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum		1,840	8.55	480	463	23	
Maximum		1,960	8.67	557	554	23	
Average		1,911	8.61	521	514	23	

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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	8:35	-	8.76	613	615	NA	2
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	9:50	-	8.86	631	622	NA	2
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	8:10	-	8.76	616	624	NA	2
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	9:35	-	8.90	622	619	NA	2
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	8:30	-	8.76	622	622	16	2
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	9:30	-	8.79	615	619	NA	2
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	8:30	-	8.74	619	617	NA	2
9/27/18	-	-	-	-	-	-	-
9/28/18	10:00	-	8.84	619	619	NA	2
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum		NA	8.74	613	615	16	
Maximum		NA	8.90	631	624	16	
Average		NA	8.80	620	620	16	

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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	8:00	2,080	8.80	616	615	NA	2
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	9:20	2,070	8.86	616	616	NA	2
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	7:30	2,060	8.77	625	621	NA	2
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	9:00	2,070	8.77	613	619	NA	2
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	7:40	2,040	8.76	616	615	34	2
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	9:00	2,040	8.77	610	613	NA	2
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	8:00	2,020	8.73	611	611	NA	2
9/27/18	-	-	-	-	-	-	-
9/28/18	9:30	2,100	9.01	622	617	NA	2
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum		2,020	8.73	610	611	34	
Maximum		2,100	9.01	625	621	34	
Average		2,060	8.81	616	616	34	

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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	9:50	2870	8.71	960	959	NA	2
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	8:00	2920	8.78	957	959	NA	2
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	9:35	2940	8.74	982	970	NA	2
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	7:40	2920	8.96	970	976	NA	2
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	9:50	2850	8.80	971	971	58	2
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	7:40	2790	8.84	986	979	NA	2
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	9:45	2910	8.80	985	986	NA	2
9/27/18	-	-	-	-	-	-	-
9/28/18	8:15	2870	9.06	971	978	NA	2
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum		2790	8.71	957	959	58	
Maximum		2940	9.06	986	986	58	
Average		2884	8.84	973	972	58	

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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	10:25	-	8.64	722	732	NA	2
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	8:20	-	8.72	738	730	NA	2
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	10:05	-	8.69	728	733	NA	2
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	8:00	-	8.86	740	734	NA	2
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	10:25	-	8.67	717	729	44	2
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	8:00	-	8.67	723	720	NA	2
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	10:15	-	8.70	711	717	NA	2
9/27/18	-	-	-	-	-	-	-
9/28/18	8:40	-	8.99	670	691	NA	2
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum			8.64	670	691	44	
Maximum			8.99	740	734	44	
Average			8.74	719	723	44	

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 (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
9/1/18	-	-	-	-	-	-	-
9/2/18	-	-	-	-	-	-	-
9/3/18	-	-	-	-	-	-	-
9/4/18	11:10	2,330	8.57	723	723	NA	1
9/5/18	-	-	-	-	-	-	-
9/6/18	-	-	-	-	-	-	-
9/7/18	-	-	-	-	-	-	-
9/8/18	-	-	-	-	-	-	-
9/9/18	-	-	-	-	-	-	-
9/10/18	-	-	-	-	-	-	-
9/11/18	10:50	2,170	8.63	721	721	NA	1
9/12/18	-	-	-	-	-	-	-
9/13/18	-	-	-	-	-	-	-
9/14/18	-	-	-	-	-	-	-
9/15/18	-	-	-	-	-	-	-
9/16/18	-	-	-	-	-	-	-
9/17/18	-	-	-	-	-	-	-
9/18/18	11:10	2,180	8.64	726	726	78	1
9/19/18	-	-	-	-	-	-	-
9/20/18	-	-	-	-	-	-	-
9/21/18	-	-	-	-	-	-	-
9/22/18	-	-	-	-	-	-	-
9/23/18	-	-	-	-	-	-	-
9/24/18	-	-	-	-	-	-	-
9/25/18	-	-	-	-	-	-	-
9/26/18	11:00	-	8.64	685	685	NA	1
9/27/18	-	-	-	-	-	-	-
9/28/18	-	-	-	-	-	-	-
9/29/18	-	-	-	-	-	-	-
9/30/18	-	-	-	-	-	-	-
10/1/18	-	-	-	-	-	-	-
Minimum		2,170	8.57	685	685	78	
Maximum		2,330	8.64	726	726	78	
Average		2,227	8.62	714	714	78	

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

