
2020 ANNUAL INTEGRATED MANAGEMENT PLAN REPORT:

NEBRASKA DEPARTMENT OF NATURAL
RESOURCES
&
UPPER NIobrARA WHITE NATURAL RESOURCES
DISTRICT

REPORTING ON 2019 DATA

ANNUAL MEETING HELD ON NOVEMBER 18, 2020

2020 ANNUAL REPORT
BY THE DEPARTMENT OF NATURAL RESOURCES OF 2019 DATA
TO MEET THE REQUIREMENTS OF THE UPPER NIOBRARA WHITE
NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

Purpose

This report fulfills the Department of Natural Resources' (Department or NeDNR) responsibilities as outlined in the Upper Niobrara White Natural Resources District (District or UNWNRD) integrated management plan (IMP) and provide updates to current projects and studies in the area.

Reporting and exchanging information gathered from monitoring projects, streamflow data, or other studies provides a basis for increased understanding of the hydrologically connected surface water and groundwater system. In areas where surface water and groundwater are hydrologically connected, estimates of water quantity of either surface water or groundwater cannot be evaluated separately. The data gathered through the IMP's monitoring plan and reported here are provided to assist evaluation of the success of the IMP's objectives. This information exchange also helps to test the validity of the conclusions and information upon which the IMP is based. This report contains information on variance activities and permit activities from January 1 through December 31, 2019. Also included are canal diversion and streamflow measurements from the 2019 water year, starting October 1, 2018 through September 30, 2019.

Department Reporting

The IMP requires that the Department annually report on the following surface water data within the district:

1. *Surface water permitting*
 - a. Any order of cancellation issued pursuant to Neb. Rev. Stat. § 46-229.04(5) or any assignment of the right to use that portion of an appropriation which was relinquished.
 - b. Variances granted by the Department, facts offered as justification for the variance to be granted and the reasons for the action taken.
2. *Diversions*
 - a. Records of surface water diversions collected by the Department upstream of the Box Butte Reservoir.
3. *Streamflow*
 - a. Records of streamflow measurements taken from non-gaged streams within the District.

2020 ANNUAL REPORT
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NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

1. *Surface Water Permitting*

- a. *Any order of cancellation issued pursuant to Neb. Rev. Stat. § 46-229.04(5) or any assignment of the right to use that portion of an appropriation which was relinquished.***

In 2019, the Department did not act upon any such relinquishment or assignment of right within the surface water control area of the District.

The IMP does not specifically require reporting of cancelled (in-full or in-part) surface water appropriations other than those pursuant to *Neb. Rev. Stat. § 46-229.04(5)*, however, NeDNR is providing this information for a more complete picture of surface water permitting activities within the UNWNRD. During calendar year 2019, four surface water permits expired and one was cancelled in-full. All four of the permits that expired were temporary, one-year permits for road construction held by the Dawes County Road Department. The cancelled in-full appropriation was for irrigation from a naturally flowing source. Table 1 summarizes these actions and appropriations. Figure 1 shows the locations of the permits within the surface water control area.

Table 1: Surface water appropriations that expired or were cancelled in-full during 2019 within the surface water control area of the UNWNRD.

Appropriation Number	Date of Cancellation or Expiration	Location of Diversion	Status	Use	Source	Begin Acres	Begin cfs	Begin af	Cancelled Acres	Cancelled cfs	Cancelled af	Authority
A-10099	2/14/2019	S4-T31-R51W	Cancelled In-Full	Irrigation from a naturally flowing source	White River, Trib. to	19.1	0.27		19.1	0.27		See Item 1 below
A-19609	9/5/2019	S27-T34-R48W	Expired	Temporary Road Construction	Bordeaux Creek		0.78	10.0		0.78	10.0	See Item 2 below
A-19610	9/5/2019	S13-T33-R48W	Expired	Temporary Road Construction	Bordeaux Creek, Little		0.78	10.0		0.78	10.0	See Item 2 below
A-19611	9/5/2019	S3-T31-R52W	Expired	Temporary Road Construction	White River		0.78	10.0		0.78	10.0	See Item 2 below
A-19612	9/5/2019	S24-T32-R52W	Expired	Temporary Road Construction	White River		0.78	10.0		0.78	10.0	See Item 2 below

Authority upon which Department actions were based: in Table 1:

1. The owner signed and submitted a voluntary relinquishment, REL-6931, for the entire surface water appropriation.

Authority upon which the action was based: *Department Rules for Surface Water, Neb. Admin. Code. Title 457, Chapter 3*: Any appropriation, or part of any appropriation, may be voluntarily relinquished. The relinquishment shall be made on a form provided by the Department.

2. The application was for a temporary appropriation which are limited to one year.

Authority upon which the above actions were based is: *Neb. Rev. Stat. §46-233 (8)* Application may be made to the department for a temporary permit to appropriate water. The same standards for granting a permanent appropriation shall apply for granting such temporary permit except when the temporary permit is for road construction or other public use construction and the amount of water requested is less than ten acre-feet in total volume. For temporary permits for public-use construction, the applicant shall include on the application the location of the diversion, the location of use, a description of the project, the amount of water requested, and the person to contact. Temporary permits for public-use construction and for less than ten acre-feet in total volume may be granted without any determination of unappropriated water and shall be considered to be in the public interest. The requirement of filing a map or plans with the application for a temporary permit may be waived at the discretion of the director. In granting a temporary permit, the director shall specify a date on which the right to appropriate water under the permit shall expire. Under no circumstances shall such date be longer than one calendar year after the date the temporary permit was granted. Temporary permits shall be administered during times of shortage based on priority. The right to appropriate water shall automatically terminate on the date specified by the director on the temporary permit without further action by the department.

2020 ANNUAL REPORT
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NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

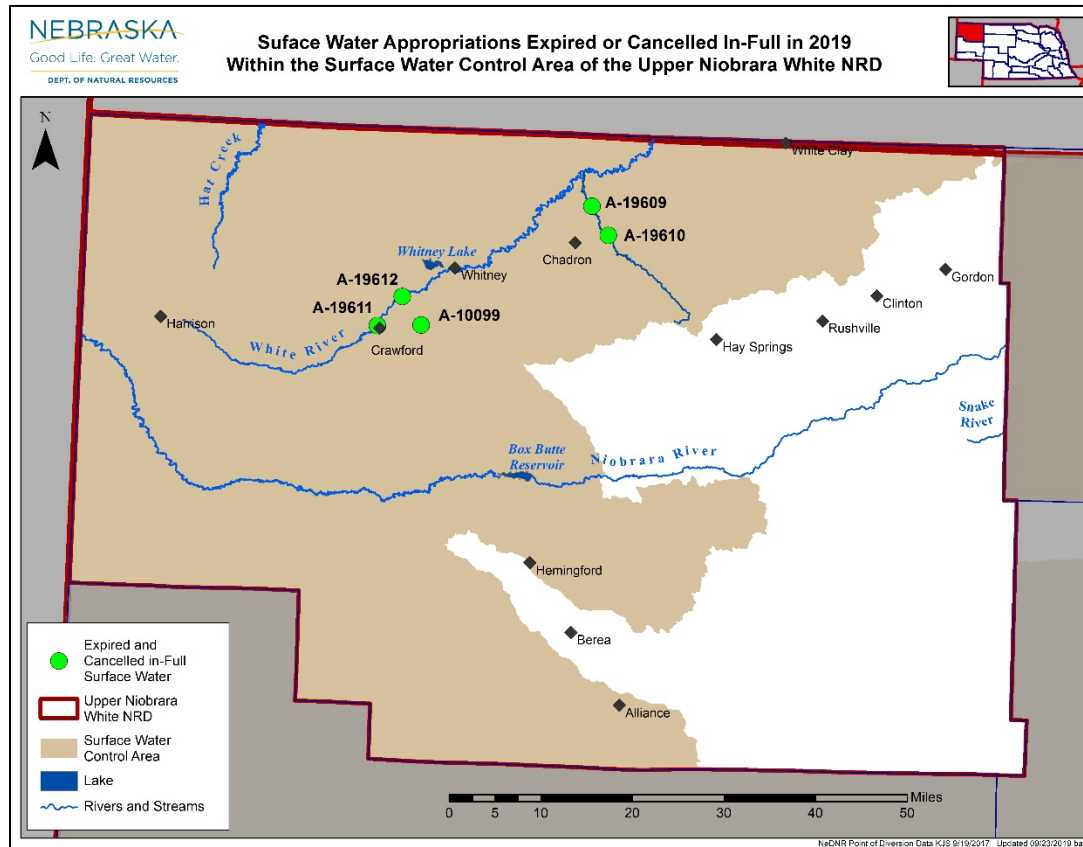


Figure 1: Expired and fully cancelled surface water appropriations within the surface water control area.

2020 ANNUAL REPORT
BY THE DEPARTMENT OF NATURAL RESOURCES OF 2019 DATA
TO MEET THE REQUIREMENTS OF THE UPPER NIOBRARA WHITE
NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

- b. ***Variances granted by the Department, facts offered as justification for the variance to be granted and the reasons for the action taken (Appendix D).***

During calendar year 2019, the Department did not act upon any variance petitions.

2. ***Diversions***

- a. ***Records of surface water diversions collected by the Department upstream of the Box Butte Reservoir***

Surface water diversion records for the water year 2019 are included in Appendix A and their locations are shown in Figure 2. The canals measured include: Bennett-Kay Canal; Cook Canal No. 1; Earnest Canal (North); Earnest Canal (South); Excelsior Canal; Geo. Hitshew Canal; Harris-Neece Canal; Hughes Canal; Johnson Canal; Labelle Canal; Lakota Canal; Lichte Canal (although Lichte Canal is not above Box Butte Reservoir, it is included here for information); McGinley-Stover Canal; McLaughlin Canal; Mettlen Canal; Moore-Kay Canal and the Pioneer Canal.

Measurements for Box Butte Reservoir are not required to be included in this report, but because water year 2019 was so significant, they are included in Appendix C. Box Butte Reservoir is owned and operated by the Bureau of Reclamation and provides water for the Mirage Flats Irrigation District.

Streamflow measurements for gaged streams may be found at: <https://waterdata.usgs.gov/ne/nwis/current/?type=flow>.

2020 ANNUAL REPORT
 BY THE DEPARTMENT OF NATURAL RESOURCES OF 2019 DATA
 TO MEET THE REQUIREMENTS OF THE UPPER NIOBRARA WHITE
 NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

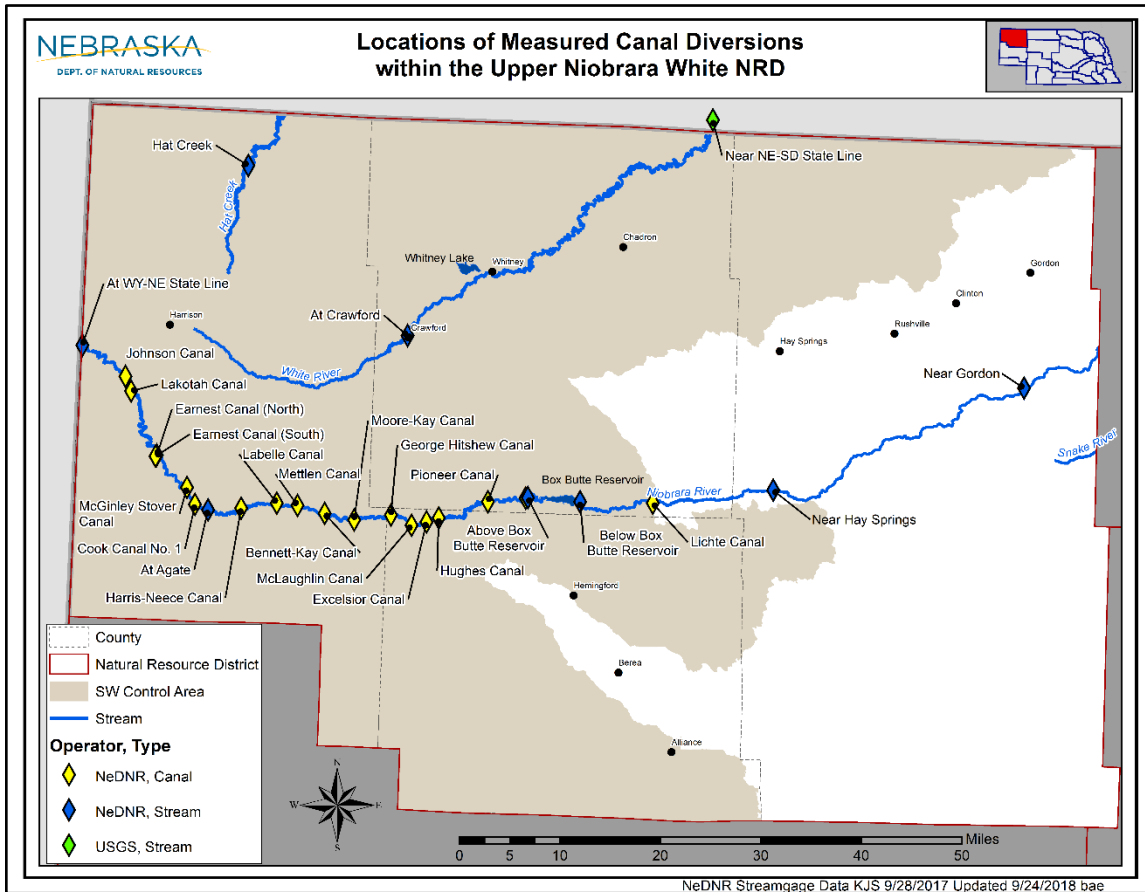


Figure 2: Locations of gaged measurements included in Appendix A.

3. Streamflow

a. Records of field measurements of diversions into canals and of streamflow within the District.

Non-gaged stream locations, pumpsite and reservoir measurements for calendar year 2019 are included in Appendix B. Field measurements were taken at: Niobrara River, Pioneer Canal, and Montague Canal.

4. Monitoring

a. Surface water pump site inspections conducted in 2019.

The NeDNR field office staff regularly inspects pump sites of surface water diversion points as conditions allow. Not all pump sites are inspected every irrigation season, and some pump sites may be visited more than once per season. In 2019, field office staff inspected 100 pump sites (Figure 3), this is in

2020 ANNUAL REPORT
 BY THE DEPARTMENT OF NATURAL RESOURCES OF 2019 DATA
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 NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

in addition to the field measurements of diversions into canals (Appendix B), in the UNWNRD. As a part of inspections, field staff collect the following data:

- Evidence of pump site
- Pumps that are running
- Crops in field
- Irrigation method

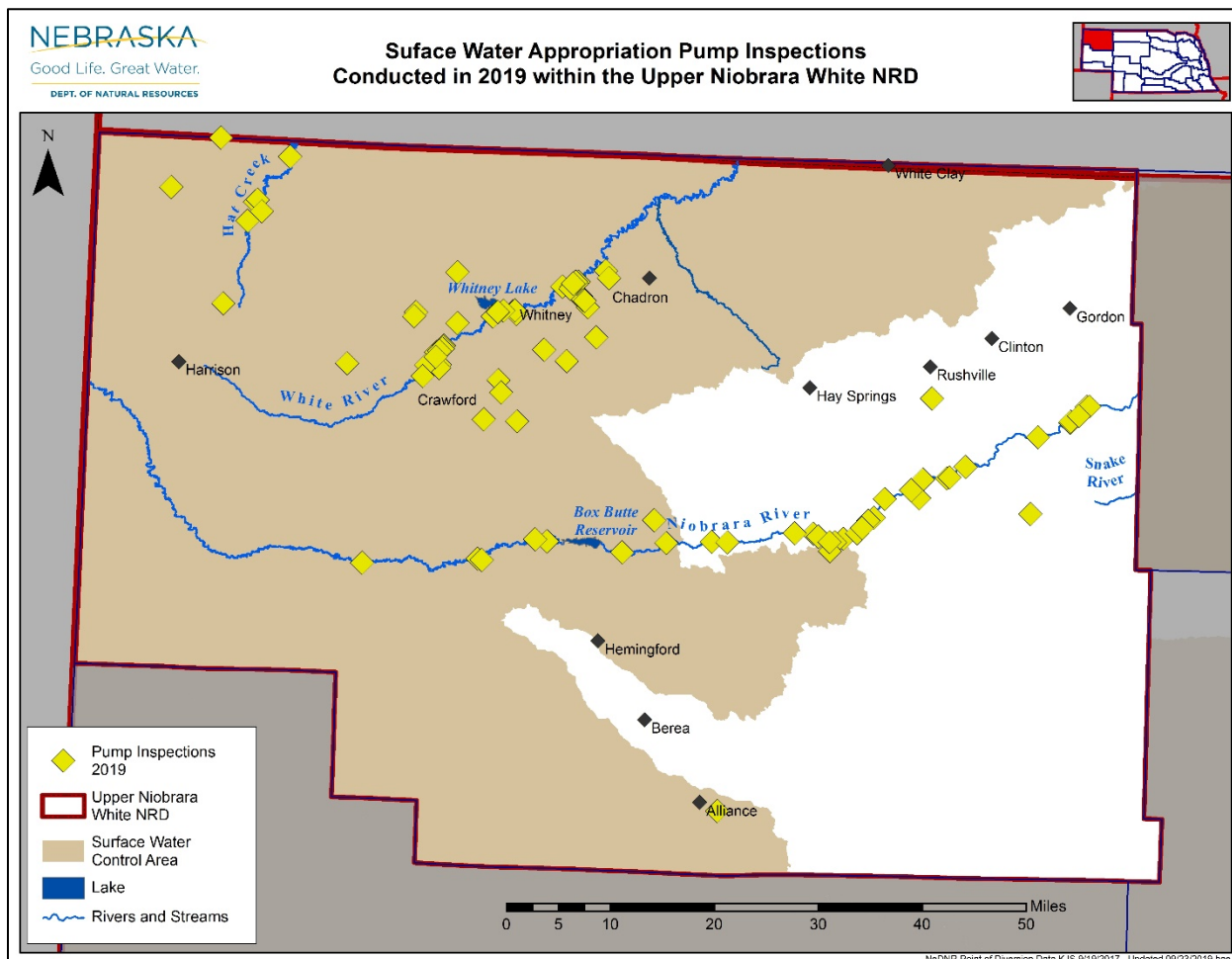


Figure 3: Pump site inspections conducted in 2019

Current Studies

The Upper Niobrara White NRD and the Department worked to prepare a refined hydrogeologic and hydrostratigraphic framework along the Niobrara River between Agate, Nebraska, and the Dunlap diversion for the Mirage Flats irrigation project. The Department contracted with the University of Nebraska-Lincoln’s Conservation and Survey Division to conduct this study, the purpose of which was to gain additional

2020 ANNUAL REPORT
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NATURAL RESOURCES DISTRICT'S INTEGRATED MANAGEMENT PLAN

information regarding groundwater resources in areas presumed, according to geologic maps, to be without aquifers – yet, well registration records indicate that water wells have been drilled and are producing in these areas. The study is complete and report finalized, and the resulting information will be used in considering the extent of groundwater resources and hydrologic connection with surface water in these areas.

In 2019, the NRD and the Department signed a contract with HDR, Inc. (HDR), and HDR began work on a project to assess groundwater recharge potential and identify and prioritize possible recharge project sites within the NRD. This project covers Dawes, Box Butte, the northern one-third of Sheridan, and the northern two-thirds of Sioux Counties. In the final report for this study, HDR identified six possible priority recharge sites with conceptual project costs for each site ranging from \$275,000-400,000 to \$750,000-1,000,000.

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

13000 Bennett-Kay Canal from Niobrara River
 Q, WATER YEAR OCT 2018 TO SEP 2019
 Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19			
1	0.00	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00			
2	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00			
3	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00			
4	0.00	---	---	---	---	---	---	0.00	0.29	0.00	0.51	0.00			
5	0.00	---	---	---	---	---	---	0.00	1.6	0.06	1.7	0.00			
6	0.00	---	---	---	---	---	---	0.00	2.6	0.00	1.3	0.00			
7	0.00	---	---	---	---	---	---	0.00	0.75	0.00	1.6	0.00			
8	0.00	---	---	---	---	---	---	0.00	0.51	0.00	1.8	0.00			
9	0.00	---	---	---	---	---	---	0.00	1.2	0.33	1.6	0.00			
10	0.00	---	---	---	---	---	---	0.00	1.3	1.4	1.5	0.00			
11	0.00	---	---	---	---	---	---	0.00	1.1	0.86	1.4	0.00			
12	0.00	---	---	---	---	---	---	0.00	0.94	0.50	1.3	0.00			
13	0.00	---	---	---	---	---	---	0.00	0.86	0.91	0.47	0.00			
14	0.00	---	---	---	---	---	---	0.00	0.30	1.9	0.00	0.00			
15	0.00	---	---	---	---	---	0.00	0.30	0.00	1.5	0.00	0.00			
16	0.00	---	---	---	---	---	0.00	1.3	0.00	1.3	0.00	0.00			
17	0.00	---	---	---	---	---	0.00	0.00	0.00	0.43	0.00	0.00			
18	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
19	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
20	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
21	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
22	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
23	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
24	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
25	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
26	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
27	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
28	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
29	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	0.00	0.00			
30	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
31	0.00	---	---	---	---	---	---	0.00	---	0.00	0.00	---			
Total	0.000	0.000	---	---	---	---	0.000	1.66	11.4	9.19	13.2	0.000			
Mean	0.000	0.000	---	---	---	---	0.000	0.053	0.38	0.30	0.42	0.000			
Max	0.00	0.00	---	---	---	---	0.00	1.3	2.6	1.9	1.8	0.00			
Min	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00			
AC-FT	0.00	0.00	---	---	---	---	0.00	3.3	23	18	26	0.00			
CAL YEAR	2018	TOTAL	74.0	MEAN	0.33	MAX	4.0	MIN	0.00	AC-FT	147				
WTR YEAR	2019	TOTAL	35.0	MEAN	0.18	MAX	3.0	MIN	0.00	AC-FT	70				
Legend:	'e' Estimated														
				Created on				10/15/19 09:52				by J A MARBURGER			

NIOBRARA RIVER BASIN

BENNETT-KAY CANAL from Niobrara River, 00013000

LOCATION.- 42.42555. -103.5654 near Agate, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1958 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

**29000 Cook Canal No. 1 from Niobrara River
Q, WATER YEAR OCT 2018 TO SEP 2019
Daily Mean Values**

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	0.97	0.04	0.02	--	--	--	0.05	0.00	0.00	0.00	0.00
2	0.00	0.99	0.03	0.04	--	--	--	0.33	0.00	0.00	0.00	0.00
3	0.00	1.0	0.04	0.55	--	--	--	0.00	0.00	0.00	0.00	0.00
4	0.00	1.0	0.88	1.2	--	--	--	0.00	0.00	0.00	0.00	0.00
5	0.00	1.0	0.84	0.88	--	--	--	0.00	0.00	0.00	0.00	0.00
6	0.00	1.0	0.03	0.16	--	--	--	0.00	0.00	0.00	0.00	0.01
7	0.00	1.0	0.03	0.02	--	--	--	0.00	0.00	0.00	0.00	0.01
8	0.00	1.1	0.03	0.01	--	--	--	0.00	0.00	0.00	0.00	0.01
9	0.03	1.2	0.03	0.00	--	--	0.77	0.00	0.00	0.00	0.00	0.01
10	0.11	1.3	0.03	0.01	--	--	0.80	0.00	0.00	0.00	0.00	0.01
11	0.00	1.0	0.03	0.01	--	--	0.87	0.00	0.00	0.00	0.00	0.01
12	0.00	1.2	0.05	0.00	--	--	1.0	0.00	0.00	0.00	0.00	0.01
13	0.03	1.0	0.03	0.00	--	--	0.74	0.00	0.00	0.00	0.00	0.00
14	0.00	0.99	0.03	0.00	--	--	0.77	0.00	0.00	0.00	0.00	0.00
15	0.00	0.64	0.03	0.00	--	--	0.86	0.00	0.00	0.00	0.00	0.00
16	0.00	0.05	0.03	--	--	--	0.68	0.00	0.00	0.00	0.00	0.00
17	0.00	0.15	0.02	0.00	--	--	0.70	0.00	0.00	0.00	0.00	0.00
18	0.00	0.78	0.02	0.00	--	--	0.65	0.00	0.00	0.00	0.00	0.00
19	0.00	0.13	0.03	0.00	--	--	0.35	0.00	0.00	0.00	0.00	0.00
20	0.00	0.33	0.02	--	--	--	0.18	0.21	0.00	0.00	0.00	0.00
21	0.00	0.47	0.33	--	--	--	0.29	0.18	0.00	0.00	0.00	0.00
22	0.00	0.04	0.02	--	--	--	0.81	0.29	0.00	0.00	0.00	0.00
23	0.00	0.04	0.40	--	--	--	0.51	0.48	0.00	0.00	0.00	0.00
24	0.00	0.04	0.47	--	--	--	0.43	0.40	0.00	0.00	0.00	0.00
25	0.00	0.20	0.99	--	--	--	0.37	0.21	0.00	0.00	0.00	0.00
26	0.00	0.95	0.64	--	--	--	0.17	0.00	0.00	0.00	0.00	0.00
27	0.00	0.04	0.28	--	--	--	0.00	0.00	0.00	0.00	0.00	0.01
28	0.00	0.04	0.14	--	--	--	0.00	0.39	0.00	0.00	0.00	0.01
29	0.02	0.04	0.14	--	--	--	0.00	0.40	0.00	0.00	0.00	0.00
30	0.33	0.04	0.08	--	--	--	0.00	0.13	0.00	0.00	0.00	0.00
31	0.95	--	0.02	--	--	--	--	0.00	--	0.00	0.00	--
Total	1.47	18.7	5.58	2.70	--	--	11.0	3.07	0.000	0.000	0.000	0.090
Mean	0.048	0.63	0.18	0.15	--	--	0.50	0.099	0.000	0.000	0.000	0.004
Max	0.95	1.3	0.99	1.2	--	--	1.0	0.48	0.00	0.00	0.00	0.01
Min	0.00	0.04	0.02	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	2.9	37	11	5.4	--	--	22	6.1	0.00	0.00	0.00	0.2
CAL YEAR	2018	TOTAL	26.0	MEAN	0.091	MAX	1.0	MIN	0.00	AC-FT	51	
WTR YEAR	2019	TOTAL	43.0	MEAN	0.15	MAX	1.0	MIN	0.00	AC-FT	84	
Legend:	'e' Estimated											
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NIOBRARA RIVER BASIN
 COOK CANAL NO. 1 from Niobrara River, 00029000
 LOCATION.- 42.43063, -103.8183
 GAGE.--Continuous stage recorder and concrete flume
 PERIOD OF RECORD.--1956 - 1982, 1985 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

**38200 Earnest Canal (North) from Niobrara River
Q, WATER YEAR OCT 2017 TO SEP 2018
Daily Mean Values**

Day	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
1	0.00	---	---	---	---	---	1.6	0.78	2.0	0.00	0.00	0.00
2	0.00	---	---	---	---	---	1.3	0.78	1.3	0.00	0.00	0.00
3	0.00	---	---	---	---	---	1.3	0.96	0.43	0.00	0.00	0.00
4	---	---	---	---	---	---	1.3	0.99	0.32	0.00	0.00	0.00
5	---	---	---	---	---	---	1.2	0.98	0.27	0.00	0.00	0.00
6	---	---	---	---	---	---	1.3	0.98	0.20	0.00	0.00	0.00
7	---	---	---	---	---	---	1.3	0.78	0.12	0.00	0.00	0.00
8	---	---	---	---	---	---	1.2	0.68	0.03	0.00	0.00	0.00
9	---	---	---	---	---	---	1.2	0.61	0.00	0.00	0.00	0.00
10	---	---	---	---	---	---	1.2	0.56	0.00	0.00	0.00	0.00
11	---	---	---	---	---	---	0.98	0.53	0.00	0.00	0.00	0.00
12	---	---	---	---	---	---	0.74	0.53	0.00	0.00	0.00	0.00
13	---	---	---	---	---	---	1.1	0.54	0.00	0.00	0.00	0.00
14	---	---	---	---	---	---	1.4	0.54	0.00	0.00	0.00	0.00
15	---	---	---	---	---	---	1.7	0.52	0.00	0.00	0.00	0.00
16	---	---	---	---	---	---	1.9	0.47	0.00	0.00	0.00	0.00
17	---	---	---	---	---	---	1.9	0.44	0.16	0.00	0.00	0.00
18	---	---	---	---	---	---	1.7	0.38	0.26	0.00	0.00	0.00
19	---	---	---	---	---	---	1.9	0.98	0.44	0.00	0.00	0.00
20	---	---	---	---	---	1.8	2.0	1.6	0.78	0.00	0.00	0.00
21	---	---	---	---	---	1.6	1.9	2.1	0.74	0.00	0.00	0.00
22	---	---	---	---	---	1.5	1.6	2.0	0.72	0.00	0.00	0.00
23	---	---	---	---	---	1.6	1.6	1.8	0.61	0.00	0.00	0.00
24	---	---	---	---	---	1.7	1.4	1.7	0.47	0.00	0.00	0.00
25	---	---	---	---	---	1.8	1.1	1.9	0.33	0.00	0.00	0.00
26	---	---	---	---	---	1.9	1.1	1.6	0.25	0.00	0.00	0.00
27	---	---	---	---	---	2.1	1.0	1.1	0.19	0.00	0.00	0.00
28	---	---	---	---	---	1.9	0.95	2.0	0.12	0.00	0.00	0.00
29	---	---	---	---	---	1.7	0.82	2.5	0.00	0.00	0.00	0.00
30	---	---	---	---	---	1.5	0.76	2.3	0.00	0.00	0.00	0.00
31	---	---	---	---	---	1.6	---	2.3	---	0.00	0.00	---
Total	0.000	---	---	---	---	20.7	40.4	35.9	9.74	0.000	0.000	0.000
Mean	0.000	---	---	---	---	1.71	1.35	1.16	0.33	0.000	0.000	0.000
Max	0.00	---	---	---	---	2.1	2.0	2.5	2.0	0.00	0.00	0.00
Min	0.00	---	---	---	---	1.5	0.74	0.38	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	41	80	71	19	0.00	0.00	0.00
CAL YEAR	2017	TOTAL	156.0	MEAN	0.79	MAX	4.0	MIN	0.00	AC-FT	309	
WTR YEAR	2018	TOTAL	107.0	MEAN	0.54	MAX	3.0	MIN	0.00	AC-FT	212	
Legend:	e Estimated											
	Created on						01/03/19 10:42			by J A MARBURGER		

NIORARA RIVER BASIN

EARNEST CANAL (NORTH) from Niobrara River, 00038200

LOCATION.- 42.49911, -103.897 near Harrison, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

38100 Earnest Canal (South) from Niobrara River
 Q, WATER YEAR OCT 2017 TO SEP 2018
 Daily Mean Values

Day	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
1	0.00	---	---	---	---	---	0.38	0.14	0.37	0.00	0.00	0.00
2	0.00	---	---	---	---	---	0.31	0.15	0.22	0.00	0.00	0.00
3	0.00	---	---	---	---	---	0.26	0.20	0.14	0.00	0.00	0.00
4	---	---	---	---	---	---	0.28	0.20	0.10	0.00	0.00	0.00
5	---	---	---	---	---	---	0.24	0.19	0.06	0.00	0.00	0.00
6	---	---	---	---	---	---	0.25	0.19	0.01	0.00	0.00	0.00
7	---	---	---	---	---	---	0.25	0.17	0.00	0.00	0.00	0.00
8	---	---	---	---	---	---	0.23	0.13	0.00	0.00	0.00	0.00
9	---	---	---	---	---	---	0.23	0.09	0.00	0.00	0.00	0.00
10	---	---	---	---	---	---	0.24	0.05	0.00	0.00	0.00	0.00
11	---	---	---	---	---	---	0.20	0.03	0.00	0.00	0.00	0.00
12	---	---	---	---	---	---	0.19	0.04	0.00	0.00	0.00	0.00
13	---	---	---	---	---	---	0.26	0.08	0.00	0.00	0.00	0.00
14	---	---	---	---	---	---	0.32	0.11	0.00	0.00	0.00	0.00
15	---	---	---	---	---	---	0.39	0.11	0.00	0.00	0.00	0.00
16	---	---	---	---	---	---	0.44	0.07	0.00	0.00	0.00	0.00
17	---	---	---	---	---	---	0.43	0.06	0.01	0.00	0.00	0.00
18	---	---	---	---	---	---	0.40	0.02	0.06	0.00	0.00	0.00
19	---	---	---	---	---	---	0.44	0.18	0.14	0.00	0.00	0.00
20	---	---	---	---	---	---	0.46	0.26	0.23	0.00	0.00	0.00
21	---	---	---	---	---	0.47	0.44	0.44	0.22	0.00	0.00	0.00
22	---	---	---	---	---	0.45	0.38	0.43	0.21	0.00	0.00	0.00
23	---	---	---	---	---	0.48	0.38	0.30	0.20	0.00	0.00	0.00
24	---	---	---	---	---	0.50	0.35	0.27	0.16	0.00	0.00	0.00
25	---	---	---	---	---	0.55	0.29	0.32	0.11	0.00	0.00	0.00
26	---	---	---	---	---	0.55	0.26	0.27	0.05	0.00	0.00	0.00
27	---	---	---	---	---	0.61	0.25	0.21	0.01	0.00	0.00	0.00
28	---	---	---	---	---	0.55	0.21	0.41	0.00	0.00	0.00	0.00
29	---	---	---	---	---	0.45	0.15	0.67	0.00	0.00	0.00	0.00
30	---	---	---	---	---	0.35	0.11	0.53	0.00	0.00	0.00	0.00
31	---	---	---	---	---	0.36	---	0.53	---	0.00	0.00	---
Total	0.000	---	---	---	---	5.32	9.02	6.85	2.30	0.000	0.000	0.000
Mean	0.00	---	---	---	---	0.48	0.30	0.22	0.077	-0.000	0.000	0.000
Max	0.00	---	---	---	---	0.61	0.46	0.67	0.37	0.00	0.00	0.00
Min	0.00	---	---	---	---	0.35	0.11	0.02	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	11	18	14	4.6	0.00	0.00	0.00

CAL YEAR	2017	TOTAL	272.0	MEAN	1.37	MAX	7.0	MIN	0.00	AC-FT	540
WTR YEAR	2018	TOTAL	23.0	MEAN	0.12	MAX	1.0	MIN	0.00	AC-FT	47

Legend: 'e' Estimated
 Created on 02/04/19 08:20 by Author

NIOBRARA RIVER BASIN
 EARNEST CANAL (SOUTH) from Niobrara River, 00038100
 LOCATION.- 42.4976, -103.8993 near Harison, NE.
 GAGE.--Continuous stage recorder and concrete flume
 PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

46000 Excelsior Canal from Niobrara River
 Q, WATER YEAR OCT 2018 TO SEP 2019
 Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
4	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
5	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
6	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
7	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
8	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
9	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
10	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00
11	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
13	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
14	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
15	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
20	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
21	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
22	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
23	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
24	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
25	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
26	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
27	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
28	---	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.35
29	---	0.00	0.00	0.00	---	0.00	0.00	0.62	-0.00	0.00	0.00	0.44
30	---	0.00	0.00	0.00	---	0.00	0.00	0.64	-0.00	0.00	0.00	0.37
31	---	---	0.00	0.00	---	0.00	---	0.27	---	0.00	0.00	---
Total	---	0.000	0.000	0.000	0.000	0.000	0.000	1.69	0.000	0.000	0.000	2.96
Mean	---	0.00	0.00	0.00	0.00	0.00	0.00	0.055	0.00	0.00	0.00	0.099
Max	---	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.44
Min	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	0.00	0.00	0.00	0.00	0.00	0.00	3.4	0.00	0.00	0.00	5.9
CAL YEAR	2018	TOTAL	0.0	MEAN	0.005	MAX	0.0	MIN	-0.00	AC-FT	0.6	
WTR YEAR	2019	TOTAL	5.0	MEAN	0.014	MAX	1.0	MIN	0.00	AC-FT	9.2	
Legend:	'e' Estimated											
	Created on						10/21/19 07:14			by J A MARBURGER		

NIOBARRA RIVER BASIN

EXCELSIOR CANAL from Niobrara River, 00046000

LOCATION.- 42.41917, -103.3665 near Marsland, NE.

GAGE.--Continuous stage recorder and 28 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

63000 Geo. HitsheW Canal from Niobrara River Q, WATER YEAR OCT 2018 TO SEP 2019 Daily Mean Values												
Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
2	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
3	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
4	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
5	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
6	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
7	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
8	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
11	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
12	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
13	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
14	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
15	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	---	---	---	---	---	0.00	---	0.00	0.00	---
Total	0.000	0.000	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Mean	0.000	0.000	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Max	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Min	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
CAL YEAR	2018	TOTAL	6.0	MEAN	0.028	MAX	3.0	MIN	0.00	AC-FT	13	
WTR YEAR	2019	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
Legend:	'e' Estimated											
	Created on				10/22/19 07:01				by J A MARBURGER			

NIOBRARA RIVER BASIN

GEO. HITSHEW CANAL from Niobrara River, 00063000

LOCATION.- 42.42713, -103.4363 near Marsland, NE.

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

62000 Harris-Neece Canal from Niobrara River Q, WATER YEAR OCT 2018 TO SEP 2019 Daily Mean Values												
Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	---	---	---	---	---	---	0.00	0.01	0.00	0.00	7.7
2	0.00	---	---	---	---	---	---	0.00	0.01	0.00	0.00	7.8
3	0.00	---	---	---	---	---	---	0.00	0.01	0.00	0.00	8.3
4	0.00	---	---	---	---	---	---	0.00	0.01	0.00	0.00	8.2
5	0.00	---	---	---	---	---	---	0.00	0.00	0.02	0.00	8.4
6	0.00	---	---	---	---	---	---	0.00	0.01	0.00	0.00	9.4
7	0.00	---	---	---	---	---	---	0.00	0.01	4.4	0.00	9.2
8	0.00	---	---	---	---	---	---	0.01	0.01	12	0.00	9.4
9	0.00	---	---	---	---	---	0.37	0.00	0.01	12	0.00	9.9
10	0.00	---	---	---	---	---	0.53	0.00	0.01	12	0.00	10
11	0.00	---	---	---	---	---	2.6	0.01	0.01	12	0.00	11
12	0.00	---	---	---	---	---	0.19	0.00	0.01	12	0.00	11
13	0.00	---	---	---	---	---	0.00	0.01	0.00	12	0.00	11
14	0.00	---	---	---	---	---	0.00	0.01	0.01	14	2.1	11
15	0.00	---	---	---	---	---	0.00	0.01	0.01	14	7.5	12
16	0.00	---	---	---	---	---	0.00	0.01	0.00	14	8.9	12
17	0.00	---	---	---	---	---	0.00	0.01	0.01	13	9.3	13
18	0.00	---	---	---	---	---	0.00	0.01	0.00	13	8.5	14
19	0.00	---	---	---	---	---	0.00	0.01	0.00	13	8.3	14
20	0.00	---	---	---	---	---	0.00	0.01	0.00	13	8.2	14
21	0.00	---	---	---	---	---	0.00	0.00	0.00	13	8.3	14
22	0.00	---	---	---	---	---	0.00	0.00	0.00	13	8.2	15
23	0.00	---	---	---	---	---	0.00	0.00	0.00	13	8.2	15
24	0.00	---	---	---	---	---	0.00	0.00	0.00	13	7.9	15
25	0.00	---	---	---	---	---	0.00	0.01	0.00	14	7.9	15
26	0.00	---	---	---	---	---	0.00	0.01	0.00	13	7.9	15
27	0.00	---	---	---	---	---	0.00	0.01	0.00	13	7.8	12
28	0.00	---	---	---	---	---	0.00	0.01	0.00	13	7.8	1.8
29	0.00	---	---	---	---	---	0.00	0.01	0.00	12	7.6	0.00
30	0.00	---	---	---	---	---	0.00	0.01	0.00	0.00	7.5	0.00
31	---	---	---	---	---	---	---	0.01	---	0.00	7.5	---
Total	0.000	---	---	---	---	---	3.69	0.17	0.14	287	139	314
Mean	0.000	---	---	---	---	---	0.17	0.005	0.004	9.22	4.49	10.5
Max	0.00	---	---	---	---	---	2.6	0.01	0.01	14	9.3	15
Min	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	---	7.3	0.3	0.3	570	276	623
CAL YEAR	2018	TOTAL	885.0	MEAN	3.99	MAX	12.0	MIN	0.00	AC-FT	1760	
WTR YEAR	2019	TOTAL	745.0	MEAN	3.63	MAX	15.0	MIN	0.00	AC-FT	1480	
Legend:	'e' Estimated											
	Created on				10/22/19 07:09				by J A MARBURGER			

NIOBRARA RIVER BASIN

HARRIS-NEECE CANAL from Niobrara River, 00062000

LOCATION.- 42.42795, -103.7282 near Agate, NE.

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

69000 Hughes Canal from Niobrara River
 Q, WATER YEAR OCT 2018 TO SEP 2019
 Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	-0.00	---	---	---	---	---	---	---	0.39	---	-0.00	---
2	-0.00	---	---	---	---	---	---	---	0.49	---	-0.00	---
3	---	---	---	---	---	---	---	---	0.49	---	-0.00	---
4	---	---	---	---	---	---	---	---	0.42	---	-0.00	---
5	---	---	---	---	---	---	---	---	0.26	---	-0.00	---
6	---	---	---	---	---	---	---	---	0.14	---	-0.00	---
7	---	---	---	---	---	---	---	---	0.04	---	-0.00	---
8	---	---	---	---	---	---	---	---	-0.00	---	---	---
9	---	---	---	---	---	---	---	---	0.04	---	---	---
10	---	---	---	---	---	---	---	---	0.08	0.98	---	---
11	---	---	---	---	---	---	---	---	0.03	1.1	---	-0.00
12	---	---	---	---	---	---	---	---	-0.00	0.99	---	-0.00
13	---	---	---	---	---	---	---	---	-0.00	0.46	---	-0.00
14	---	---	---	---	---	---	---	0.05	-0.00	0.04	-0.00	-0.00
15	---	---	---	---	---	---	---	0.08	-0.00	-0.00	-0.00	-0.00
16	---	---	---	---	---	---	---	0.05	-0.00	-0.00	-0.00	-0.00
17	---	---	---	---	---	---	---	0.06	-0.00	-0.00	-0.00	-0.00
18	---	---	---	---	---	---	---	0.02	0.00	-0.00	-0.00	-0.00
19	---	---	---	---	---	---	---	0.00	0.23	-0.00	-0.00	-0.00
20	---	---	---	---	---	---	---	0.00	0.39	-0.00	-0.00	-0.00
21	---	---	---	---	---	---	---	0.00	0.32	-0.00	-0.00	-0.00
22	---	---	---	---	---	---	---	0.12	0.42	-0.00	-0.00	-0.00
23	---	---	---	---	---	---	---	0.27	0.57	-0.00	---	-0.00
24	---	---	---	---	---	---	---	0.23	0.60	-0.00	---	-0.00
25	---	---	---	---	---	---	1.1	0.23	0.52	-0.00	---	-0.00
26	---	---	---	---	---	---	---	0.47	0.27	-0.00	---	-0.00
27	---	---	---	---	---	---	---	0.78	0.18	-0.00	---	-0.00
28	---	---	---	---	---	---	---	0.14	---	-0.00	---	-0.00
29	---	---	---	---	---	---	---	0.31	---	-0.00	---	-0.00
30	---	---	---	---	---	---	---	0.39	---	-0.00	---	-0.00
31	---	---	---	---	---	---	---	0.39	---	-0.00	---	---
Total	0.000	---	---	---	---	---	1.10	3.59	5.88	3.57	0.000	0.000
Mean	-0.000	---	---	---	---	---	1.12	0.20	0.22	0.16	-0.000	-0.000
Max	0.00	---	---	---	---	---	1.1	0.78	0.60	1.1	0.00	0.00
Min	0.00	---	---	---	---	---	1.1	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	---	2.2	7.1	12	7.1	0.00	0.00
CAL YEAR	2018	TOTAL	7.0	MEAN	0.047	MAX	0.0	MIN	-0.00	AC-FT	14	
WTR YEAR	2019	TOTAL	14.0	MEAN	0.13	MAX	1.0	MIN	0.00	AC-FT	28	
Legend:	'e' Estimated											
	Created on					10/22/19 07:35				by Author: S. Figuric		

2019 WY

NIOBRARA RIVER BASIN

HUGHES CANAL from Niobrara River, 00069000

LOCATION.- 42.42558 , -103.3431 near Marsland, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

72000 Johnson Canal from Niobrara River
Q, WATER YEAR OCT 2018 TO SEP 2019
Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	---	---	---	---	---	---	0.00	4.4	0.00	0.00	0.00
2	0.00	---	---	---	---	---	---	0.00	4.3	0.00	0.00	0.00
3	0.00	---	---	---	---	---	---	0.00	4.1	0.00	0.00	0.00
4	0.00	---	---	---	---	---	---	0.00	4.1	0.00	0.00	0.00
5	0.00	---	---	---	---	---	---	0.00	4.1	0.00	0.00	0.00
6	0.00	---	---	---	---	---	---	0.00	4.0	0.00	0.00	0.00
7	0.00	---	---	---	---	---	---	0.00	4.0	0.00	0.00	0.00
8	0.00	---	---	---	---	---	0.00	0.00	3.2	0.00	0.00	0.00
9	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	---	---	---	---	---	0.00	1.4	0.00	0.00	0.00	0.00
11	0.00	---	---	---	---	---	0.00	3.4	0.00	0.00	0.00	0.00
12	0.00	---	---	---	---	---	0.00	4.1	0.00	0.00	0.00	0.00
13	0.00	---	---	---	---	---	0.00	4.6	0.00	0.00	0.00	0.00
14	0.00	---	---	---	---	---	0.00	4.9	0.00	0.00	0.00	0.00
15	0.00	---	---	---	---	---	0.00	4.9	0.00	0.00	0.00	0.00
16	0.00	---	---	---	---	---	0.00	5.0	0.00	0.00	0.00	0.00
17	0.00	---	---	---	---	---	0.00	5.1	0.00	0.00	0.00	0.00
18	0.00	---	---	---	---	---	0.00	5.1	0.00	0.00	0.00	0.00
19	0.00	---	---	---	---	---	0.00	5.1	0.00	0.00	0.00	0.00
20	0.00	---	---	---	---	---	0.00	5.1	0.00	0.00	0.00	0.00
21	0.00	---	---	---	---	---	0.00	5.4	0.00	0.00	0.00	0.00
22	0.00	---	---	---	---	---	0.00	5.8	0.00	0.00	0.00	0.00
23	0.00	---	---	---	---	---	0.00	5.5	0.00	0.00	0.00	0.00
24	0.00	---	---	---	---	---	0.00	5.6	0.00	0.00	0.00	0.00
25	0.00	---	---	---	---	---	0.00	5.3	0.00	0.00	0.00	0.00
26	0.00	---	---	---	---	---	0.00	6.8	0.00	0.00	0.00	0.00
27	0.00	---	---	---	---	---	0.00	14	0.00	0.00	0.00	0.00
28	0.00	---	---	---	---	---	0.00	5.0	0.00	0.00	0.00	0.00
29	0.00	---	---	---	---	---	0.00	5.0	0.00	0.00	0.00	0.00
30	---	---	---	---	---	---	0.00	4.9	0.00	0.00	0.00	0.00
31	---	---	---	---	---	---	---	4.7	---	0.00	0.00	---
Total	0.000	---	---	---	---	---	0.000	117	32.2	0.000	0.000	0.000
Mean	0.000	---	---	---	---	---	0.000	3.77	1.08	0.000	0.000	0.000
Max	0.00	---	---	---	---	---	0.00	14	4.4	0.00	0.00	0.00
Min	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	---	0.00	231	64	0.00	0.00	0.00
CAL YEAR	2018	TOTAL	322.0	MEAN	1.43	MAX	17.0	MIN	0.00	AC-FT	638	
WTR YEAR	2019	TOTAL	149.0	MEAN	0.73	MAX	14.0	MIN	0.00	AC-FT	295	
Legend:	'e' Estimated											
	Created on						10/22/19 07:16			by J A MARBURGER		

NIOBRARA RIVER BASIN

JOHNSON CANAL from Niobrara River, 00072000

LOCATION.- 42.61062, -103.9648 near Harrison, NE.

GAGE.--Continuous stage recorder and 1.5 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

78000 Labelle Canal from Niobrara River
 Q, WATER YEAR OCT 2018 TO SEP 2019
 Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
2	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
3	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
4	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
5	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
6	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
7	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
8	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
9	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
31	---	---	---	---	---	---	---	0.00	---	0.00	0.00	---
Total	0.000	---	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Mean	0.000	---	---	---	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Max	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Min	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
CAL YEAR	2018	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
WTR YEAR	2019	TOTAL	0.0	MEAN	0.000	MAX	0.0	MIN	0.00	AC-FT	0.00	
Legend:	'e' Estimated											
	Created on				10/16/19 12:49				by J A MARBURGER			

NIOBRARA RIVER BASIN

LABELLE CANAL from Niobrara River, 00078000

LOCATION.- 42.4375, -103.6592 near Agate, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

79000 Lakotah Canal from Niobrara River Q, WATER YEAR OCT 2018 TO SEP 2019 Daily Mean Values												
Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.06	0.27	e0.59	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
2	0.08	e0.26	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
3	0.09	e0.24	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
4	0.08	e0.25	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
5	0.08	e0.25	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
6	0.11	e0.31	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
7	0.11	e0.31	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
8	0.13	e0.29	e0.00	e0.00	---	---	0.21	0.00	0.00	0.00	0.00	0.00
9	0.15	e0.29	e0.00	e0.00	---	---	0.33	0.00	0.00	0.00	0.00	0.00
10	0.17	e0.28	e0.00	e0.00	---	---	0.34	0.00	0.00	0.00	0.00	0.00
11	0.18	e0.29	e0.00	e0.00	---	---	0.34	0.00	0.00	0.00	0.00	0.00
12	0.18	e0.30	e0.00	e0.00	---	---	0.33	0.00	0.00	0.00	0.00	0.00
13	0.19	e0.31	e0.00	e0.00	---	---	0.33	0.00	0.00	0.00	0.00	0.00
14	0.20	e0.29	e0.00	e0.00	---	---	0.32	0.00	0.00	0.00	0.00	0.00
15	0.20	e0.33	e0.00	---	---	---	0.31	0.00	0.00	0.00	0.00	0.00
16	0.22	e0.36	e0.00	---	---	---	0.31	0.00	0.00	0.00	0.00	0.00
17	0.23	e0.27	e0.00	---	---	---	0.30	0.00	0.00	0.00	0.00	0.00
18	0.22	e0.63	e0.00	---	---	---	0.30	0.00	0.00	0.00	0.00	0.00
19	0.22	e0.33	e0.00	---	---	---	0.08	0.00	0.00	0.00	0.00	0.00
20	0.22	0.75	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
21	0.22	0.80	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
22	0.22	0.59	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
23	0.23	0.54	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
24	0.24	0.68	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
25	0.26	0.81	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
26	0.27	1.6	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
27	0.28	1.2	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
28	0.30	1.8	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
29	0.29	1.3	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
30	0.29	1.2	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
31	e0.30	---	e0.00	---	---	---	---	0.00	---	0.00	0.00	---
Total	6.02	17.1	0.59	0.000	---	---	3.50	0.000	0.000	0.000	0.000	0.000
Mean	0.20	0.57	0.019	0.000	---	---	0.15	0.000	0.000	0.000	0.000	0.000
Max	0.30	1.8	0.59	0.00	---	---	0.34	0.00	0.00	0.00	0.00	0.00
Min	0.06	0.24	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	12	34	1.2	0.00	---	---	6.9	0.00	0.00	0.00	0.00	0.00
CAL YEAR	2018	TOTAL	31.0	MEAN	0.12	MAX	2.0	MIN	0.00	AC-FT	62	
WTR YEAR	2019	TOTAL	27.0	MEAN	0.097	MAX	2.0	MIN	0.00	AC-FT	54	
Legend:	'e' Estimated											
	Created on				10/16/19 12:43				by J A MARBURGER			

NIOBRARA RIVER BASIN

LAKOTAH CANAL from Niobrara River, 00079000

LOCATION.- 42.58989, -103.9525 near Harrison, NE.

GAGE.--Continuous stage recorder and 2 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

81000 Lichte Canal from Niobrara River Q, WATER YEAR OCT 2016 TO SEP 2017 Daily Mean Values												
Day	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---
AC-FT	---	---	---	---	---	---	---	---	---	---	---	---
CAL YEAR	2016	TOTAL	0.0	MEAN		MAX		MIN		AC-FT	0.00	
WTR YEAR	2017	TOTAL	0.0	MEAN		MAX		MIN		AC-FT	0.00	
Legend:	'e' Estimated											
	Created on				03/19/18 12:09				by J A MARBURGER			

NIOBRARA RIVER BASIN

LICHTE CANAL from Niobrara River, 00081000

LOCATION.--NW1/4SW1/4 Sec. 26-29-48 W. near Dunlap

GAGE.--Continuous stage recorder and 3 ft. Parshall flume

PERIOD OF RECORD.--1956-2013 The Site was not visited in Water Year 2017.

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

84000 McGinley-Stover Canal from Niobrara River
 Q, WATER YEAR OCT 2017 TO SEP 2018
 Daily Mean Values

Day	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18			
1	0.00	---	---	---	---	---	---	0.00	2.2	0.00	0.00	0.00			
2	0.00	---	---	---	---	---	---	0.00	2.1	0.00	0.00	0.00			
3	0.00	---	---	---	---	---	---	0.00	2.0	1.3	0.89	0.00			
4	---	---	---	---	---	---	---	0.00	2.0	1.9	1.8	0.00			
5	---	---	---	---	---	---	---	0.00	5.1	1.4	1.7	0.00			
6	---	---	---	---	---	---	---	0.00	6.2	1.7	1.7	0.00			
7	---	---	---	---	---	---	---	0.00	5.1	1.7	1.6	0.00			
8	---	---	---	---	---	---	---	0.00	4.0	1.5	1.6	0.00			
9	---	---	---	---	---	---	---	0.00	3.3	1.5	1.6	0.00			
10	---	---	---	---	---	---	---	5.1	2.4	1.5	1.6	0.00			
11	---	---	---	---	---	---	---	11	1.8	2.2	1.6	0.00			
12	---	---	---	---	---	---	---	8.8	1.4	2.2	1.5	0.00			
13	---	---	---	---	---	---	---	8.8	1.3	2.1	1.5	0.00			
14	---	---	---	---	---	---	---	8.8	1.2	1.9	1.4	0.00			
15	---	---	---	---	---	---	---	8.8	1.1	2.0	1.4	0.00			
16	---	---	---	---	---	---	---	8.6	0.38	2.7	1.3	0.00			
17	---	---	---	---	---	---	---	8.3	0.00	0.70	0.44	0.00			
18	---	---	---	---	---	---	---	8.1	0.00	0.00	0.00	0.00			
19	---	---	---	---	---	---	---	7.3	0.00	0.00	0.00	0.00			
20	---	---	---	---	---	---	---	5.9	0.00	0.00	0.00	0.00			
21	---	---	---	---	---	---	---	5.5	0.00	0.00	0.00	0.00			
22	---	---	---	---	---	---	---	5.1	0.00	0.00	0.00	0.00			
23	---	---	---	---	---	---	---	5.1	0.00	0.75	0.00	0.00			
24	---	---	---	---	---	---	---	3.5	0.00	1.5	0.00	0.00			
25	---	---	---	---	---	---	---	2.5	0.00	1.5	0.00	0.00			
26	---	---	---	---	---	---	---	2.4	0.00	1.6	0.00	0.00			
27	---	---	---	---	---	---	---	2.4	0.00	1.6	0.00	0.00			
28	---	---	---	---	---	---	---	2.3	0.00	0.51	0.00	0.00			
29	---	---	---	---	---	---	---	2.4	0.00	0.00	0.00	0.00			
30	---	---	---	---	---	---	---	2.3	0.00	0.00	0.00	0.00			
31	---	---	---	---	---	---	---	2.2	---	0.00	0.00	---			
Total	0.000	---	---	---	---	---	---	125	41.6	33.8	21.6	0.000			
Mean	0.000	---	---	---	---	---	---	4.05	1.39	1.09	0.70	0.000			
Max	0.00	---	---	---	---	---	---	11	6.2	2.7	1.8	0.00			
Min	0.00	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00			
AC-FT	0.00	---	---	---	---	---	---	248	82	67	43	0.00			
CAL YEAR	2017	TOTAL	136.0	MEAN	0.80	MAX	5.0	MIN	0.00	AC-FT	270				
WTR YEAR	2018	TOTAL	222.0	MEAN	1.42	MAX	11.0	MIN	0.00	AC-FT	441				
Legend:	'e' Estimated														
				Created on				01/14/19 14:30				by Author: S. Figuric			

2018 WY

NIOBRARA RIVER BASIN

McGINLEY-STOVER CANAL from Niobrara River, 00084000

LOCATION.- 42.45577, -103.837 near Agate, NE.

GAGE.--Continuous stage recorder and 3 ft. Parshall flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

86000 McLaughlin Canal from Niobrara River
 Q, WATER YEAR OCT 2018 TO SEP 2019
 Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
2	0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
3	0.14	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
4	0.71	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
5	1.6	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
6	0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
7	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
8	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
9	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
10	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
11	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
12	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
13	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
14	e0.00	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
15	e0.00	e0.00	e0.00	e0.00	---	---	4.1	0.00	0.00	0.00	0.00	0.00
16	e0.00	e0.00	e0.00	e0.00	---	---	4.1	0.00	0.00	0.00	0.00	0.00
17	e0.00	e0.00	e0.00	---	---	---	4.0	0.00	0.00	0.00	0.00	0.00
18	e0.00	e0.00	e0.00	---	---	---	3.8	0.00	0.00	0.00	0.00	0.00
19	e0.00	e0.00	e0.00	---	---	---	2.1	0.00	0.00	0.00	0.00	0.00
20	e0.00	e0.00	e0.00	---	---	---	3.5	0.00	0.00	0.00	0.00	0.00
21	e0.00	e0.00	e0.00	---	---	---	3.5	0.00	0.00	0.00	0.00	0.00
22	e0.00	e0.00	e0.00	---	---	---	3.7	0.00	0.00	0.00	0.00	0.00
23	e0.00	e0.00	e0.00	---	---	---	2.8	0.00	0.00	0.00	0.00	0.00
24	e0.00	e0.00	e0.00	---	---	---	2.5	0.00	0.00	0.00	0.00	0.00
25	e0.00	e0.00	e0.00	---	---	---	1.6	0.00	0.00	0.00	0.00	0.00
26	e0.00	e0.00	e0.00	---	---	---	1.5	0.00	0.00	0.00	0.00	0.00
27	e0.00	e0.00	e0.00	---	---	---	1.2	0.00	0.00	0.00	0.00	0.00
28	e0.00	e0.00	e0.00	---	---	---	0.67	0.00	0.00	0.00	0.00	0.00
29	e0.00	e0.00	e0.00	---	---	---	0.06	0.00	0.00	0.00	0.00	0.00
30	e0.00	e0.00	e0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
31	e0.00	---	e0.00	---	---	---	---	0.00	---	0.00	0.00	---
Total	2.45	0.000	0.000	0.000	---	---	39.1	0.000	0.000	0.000	0.000	0.000
Mean	0.080	0.000	0.000	0.000	---	---	2.44	0.000	0.000	0.000	0.000	0.000
Max	1.6	0.00	0.00	0.00	---	---	4.1	0.00	0.00	0.00	0.00	0.00
Min	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	4.9	0.00	0.00	0.00	---	---	78	0.00	0.00	0.00	0.00	0.00
CAL YEAR	2018	TOTAL	23.0	MEAN	0.079	MAX	2.0	MIN	0.00	AC-FT	45	
WTR YEAR	2019	TOTAL	42.0	MEAN	0.15	MAX	4.0	MIN	0.00	AC-FT	82	
Legend:	'e' Estimated											
	Created on						10/22/19 10:51			by J A MARBURGER		

NIOBRARA RIVER BASIN

McLAUGHLIN CANAL from Niobrara River, 00086000

LOCATION.- 42.41358, -103.3953 near Marsland, NE.

GAGE.--Continuous stage recorder and 30 inch cutthroat flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

104000 Moore-Kay Canal from Niobrara River
Q, WATER YEAR OCT 2018 TO SEP 2019
Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	0.00	---	---	---	---	---	4.1	2.7	0.00	0.00	0.00
2	0.00	---	---	---	---	---	---	4.4	2.2	0.00	0.00	0.00
3	0.00	---	---	---	---	---	---	4.4	1.6	0.00	0.00	0.00
4	0.00	---	---	---	---	---	---	3.9	1.1	0.00	0.00	0.00
5	0.00	---	---	---	---	---	---	3.3	0.80	1.7	0.00	0.00
6	0.00	---	---	---	---	---	---	2.9	0.32	2.6	0.00	0.00
7	0.00	---	---	---	---	---	---	2.8	1.2	5.1	0.00	0.00
8	0.00	---	---	---	---	---	---	2.8	1.7	5.3	0.00	0.00
9	0.00	---	---	---	---	---	---	2.7	0.89	3.2	0.00	0.00
10	0.00	---	---	---	---	---	---	2.6	0.09	1.7	0.00	0.00
11	0.00	---	---	---	---	---	---	2.5	0.00	0.52	0.00	0.00
12	0.00	---	---	---	---	---	---	2.1	0.00	0.00	0.00	0.00
13	0.00	---	---	---	---	---	---	1.7	0.00	0.00	0.00	0.00
14	0.00	---	---	---	---	---	---	1.3	0.00	0.00	0.00	0.00
15	0.00	---	---	---	---	---	8.1	1.1	0.00	0.00	0.00	0.00
16	0.00	---	---	---	---	---	7.2	0.61	0.00	0.00	0.00	0.00
17	0.00	---	---	---	---	---	6.5	0.12	0.00	0.00	0.00	0.00
18	0.00	---	---	---	---	---	5.8	0.49	0.37	0.00	0.00	0.00
19	0.00	---	---	---	---	---	5.3	0.45	1.3	0.00	0.00	0.00
20	0.00	---	---	---	---	---	4.9	0.65	1.5	0.00	0.00	0.00
21	0.00	---	---	---	---	---	4.8	2.1	3.5	0.00	0.00	0.00
22	0.00	---	---	---	---	---	5.9	3.4	3.2	0.00	0.00	0.00
23	0.00	---	---	---	---	---	5.9	3.9	1.8	0.00	0.00	0.00
24	0.00	---	---	---	---	---	5.8	3.9	1.1	0.00	0.00	0.00
25	0.00	---	---	---	---	---	5.6	3.3	0.78	0.00	0.00	0.00
26	0.00	---	---	---	---	---	5.3	2.7	0.41	0.00	0.00	0.00
27	0.00	---	---	---	---	---	5.0	2.5	0.07	0.00	0.00	0.00
28	0.00	---	---	---	---	---	4.4	3.9	0.00	0.00	0.00	0.00
29	0.00	---	---	---	---	---	3.8	4.2	0.00	0.00	0.00	0.00
30	0.00	---	---	---	---	---	3.7	3.6	0.00	0.00	0.00	0.00
31	0.00	---	---	---	---	---	---	3.2	---	0.00	0.00	---
Total	0.000	0.000	---	---	---	---	88.0	81.6	26.6	20.1	0.000	0.000
Mean	0.000	0.000	---	---	---	---	5.50	2.62	0.89	0.65	0.000	0.000
Max	0.00	0.00	---	---	---	---	8.1	4.4	3.5	5.3	0.00	0.00
Min	0.00	0.00	---	---	---	---	3.7	0.12	0.00	0.00	0.00	0.00
AC-FT	0.00	0.00	---	---	---	---	175	162	53	40	0.00	0.00

CAL YEAR	2018	TOTAL	80.0	MEAN	0.45	MAX	7.0	MIN	0.00	AC-FT	159
WTR YEAR	2019	TOTAL	216.0	MEAN	1.08	MAX	8.0	MIN	0.00	AC-FT	429

Legend: 'e' Estimated Created on 10/21/19 10:19 by J A MARBURGER

NIOBRARA RIVER BASIN
 MOORE-KAY CANAL from Niobrara River, 00104000
 LOCATION.- 42.41793, -103.5075 near Marsland, NE.
 GAGE.--Continuous stage recorder and 2 ft. flume
 PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

89000 Mettlen Canal from Niobrara River
Q, WATER YEAR OCT 2018 TO SEP 2019
Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	0.00	0.00	0.88	1.4	---	---	---	2.0	3.1	1.6	0.58	0.00
2	0.01	0.00	0.84	1.5	---	---	---	2.0	3.0	1.6	0.86	0.00
3	0.01	0.00	0.80	1.5	---	---	---	2.0	3.0	1.6	1.1	0.00
4	0.00	0.00	0.77	1.6	---	---	---	2.0	2.9	1.6	1.3	0.00
5	0.00	0.00	0.81	1.5	---	---	---	2.0	3.4	5.0	1.4	0.00
6	0.00	0.93	0.87	1.5	---	---	---	2.1	3.1	5.2	1.5	0.00
7	0.00	1.6	1.1	1.5	---	---	---	2.2	2.8	3.4	1.4	0.00
8	0.00	1.6	0.94	1.6	---	---	---	2.2	2.6	2.4	1.5	0.00
9	0.00	1.7	0.99	1.6	---	---	1.9	2.2	2.5	1.9	1.4	0.00
10	0.00	1.6	1.2	1.5	---	---	2.0	2.2	2.3	1.6	1.4	0.23
11	0.00	1.7	1.2	1.8	---	---	3.0	2.2	2.2	1.4	1.3	0.31
12	0.00	1.5	1.2	1.9	---	---	2.9	2.2	2.2	1.3	1.2	0.17
13	0.00	1.6	1.2	2.1	---	---	2.3	2.2	2.1	1.4	1.1	0.17
14	0.01	1.8	1.2	1.6	---	---	1.9	2.5	2.0	1.4	1.1	0.31
15	0.01	1.8	1.2	1.8	---	---	1.9	2.7	2.0	1.5	1.0	0.20
16	0.01	1.2	1.2	2.4	---	---	1.9	2.7	2.0	1.4	0.79	0.03
17	0.00	0.86	1.2	---	---	---	1.9	2.8	2.0	1.2	0.21	0.00
18	0.00	0.88	1.1	---	---	---	1.9	2.8	2.2	0.95	0.00	0.04
19	0.00	0.86	1.2	---	---	---	1.9	2.8	2.2	0.64	0.00	0.06
20	0.00	0.91	1.2	---	---	---	1.9	2.8	2.0	0.51	0.00	0.28
21	0.00	0.86	1.1	---	---	---	2.0	3.1	1.9	0.49	0.00	0.33
22	0.00	0.85	1.3	---	---	---	2.0	3.3	2.0	0.49	0.00	0.14
23	0.00	0.84	1.3	---	---	---	2.0	3.3	1.9	0.44	0.00	0.00
24	0.00	0.89	1.2	---	---	---	2.0	3.1	1.9	0.42	0.00	0.08
25	0.00	1.1	1.4	---	---	---	2.0	3.1	1.8	0.43	0.00	0.78
26	0.00	0.90	1.3	---	---	---	2.0	3.1	1.7	0.42	0.00	0.71
27	0.00	0.91	1.2	---	---	---	2.0	3.1	1.7	0.36	0.00	0.63
28	0.00	0.95	0.73	---	---	---	2.0	3.4	1.7	0.34	0.00	0.73
29	0.00	0.91	1.0	---	---	---	2.0	3.4	1.6	0.21	0.00	1.5
30	0.00	0.90	1.2	---	---	---	2.0	3.3	1.6	0.20	0.00	1.5
31	0.00	---	1.3	---	---	---	---	3.2	---	0.55	0.00	---
Total	0.050	29.6	34.1	26.8	---	---	45.4	82.0	67.4	42.0	19.1	8.20
Mean	0.001	0.98	1.11	1.67	---	---	2.06	2.66	2.25	1.35	0.62	0.28
Max	0.01	1.8	1.4	2.4	---	---	3.0	3.4	3.4	5.2	1.5	1.5
Min	0.00	0.00	0.73	1.4	---	---	1.9	2.0	1.6	0.20	0.00	0.00
AC-FT	0.1	59	68	53	---	---	90	163	134	83	38	16
CAL YEAR	2018	TOTAL	273.0	MEAN	0.96	MAX	4.0	MIN	0.00	AC-FT	541	
WTR YEAR	2019	TOTAL	355.0	MEAN	1.25	MAX	5.0	MIN	0.00	AC-FT	704	
Legend:	'e' Estimated											
	Created on						10/21/19 10:38			by J A MARBURGER		

NIOBRARA RIVER BASIN

METTLEN CANAL from Niobrara River, 00089000

LOCATION.- 42.43538, -103.6188 near Agate, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - present

APPENDIX A 2019 CANAL MEASUREMENTS

Nebraska Department of Natural Resources

123000 Pioneer Canal from Niobrara River
Q, WATER YEAR OCT 2018 TO SEP 2019
Daily Mean Values

Day	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
1	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
2	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
3	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
4	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
5	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
6	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
7	---	---	---	---	---	---	---	0.00	2.9	0.00	0.00	0.00
8	---	---	---	---	---	---	---	0.00	5.8	0.00	0.00	0.00
9	---	---	---	---	---	---	---	0.00	5.3	0.00	0.00	0.00
10	---	---	---	---	---	---	---	0.00	5.4	0.00	0.00	0.00
11	---	---	---	---	---	---	---	0.00	5.6	0.00	0.00	0.00
12	---	---	---	---	---	---	---	0.00	5.6	0.00	0.00	0.00
13	---	---	---	---	---	---	---	0.00	5.1	0.00	0.00	0.00
14	---	---	---	---	---	---	---	0.00	4.8	0.00	0.00	0.00
15	---	---	---	---	---	---	---	0.00	4.8	0.00	0.00	0.00
16	---	---	---	---	---	---	---	0.00	1.7	0.00	0.00	0.00
17	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
18	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
19	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
20	---	---	---	---	---	---	---	0.00	0.00	0.00	1.7	0.67
21	---	---	---	---	---	---	---	0.00	0.00	0.00	5.1	4.5
22	---	---	---	---	---	---	---	0.00	0.00	0.00	4.7	4.5
23	---	---	---	---	---	---	---	0.00	0.00	0.33	4.6	4.5
24	---	---	---	---	---	---	---	0.00	0.00	4.1	4.6	2.2
25	---	---	---	---	---	---	0.00	0.00	0.00	4.3	4.5	0.01
26	---	---	---	---	---	---	0.00	0.00	0.00	4.3	4.4	0.00
27	---	---	---	---	---	---	0.00	0.00	0.00	4.4	4.3	0.00
28	---	---	---	---	---	---	0.00	0.06	0.00	4.4	4.3	0.00
29	---	---	---	---	---	---	0.00	0.38	0.00	4.3	4.1	0.00
30	---	---	---	---	---	---	0.00	0.17	0.00	4.7	4.0	0.00
31	---	---	---	---	---	---	---	0.02	---	2.0	1.5	---
Total	---	---	---	---	---	---	0.000	0.63	47.0	32.8	47.8	16.4
Mean	---	---	---	---	---	---	0.000	0.021	1.57	1.06	1.54	0.55
Max	---	---	---	---	---	---	0.00	0.38	5.8	4.7	5.1	4.5
Min	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	---	---	---	---	---	---	0.00	1.2	93	65	95	32
CAL YEAR	2018	TOTAL	3.0	MEAN	0.65	MAX	2.0	MIN	0.00	AC-FT	5.2	
WTR YEAR	2019	TOTAL	145.0	MEAN	0.91	MAX	6.0	MIN	0.00	AC-FT	287	
Legend:	'e' Estimated											
	Created on				10/17/19 13:03				by J A MARBURGER			

NIOBRARA RIVER BASIN

PIONEER CANAL from Niobrara River, 00123000

LOCATION - 42.45158, -103.2486 near Marsland, NE.

GAGE.--Continuous stage recorder and concrete flume

PERIOD OF RECORD.--1956 - 1982, 1986 - present

APPENDIX B 2019 FIELD MEASUREMENTS

Date	Site number	Site Name	Discharge
10/10/2018	3740	Niobrara River at Dunlap at Hwy 385	7.42
4/25/2019	2580	Pioneer Canal from Niobrara River	0
5/14/2019	2580	Pioneer Canal from Niobrara River	0
6/5/2019	2580	Pioneer Canal from Niobrara River	0
6/18/2019	2580	Pioneer Canal from Niobrara River	0
7/10/2019	2580	Pioneer Canal from Niobrara River	0
7/22/2019	2585	Montague Canal from Niobrara River	0
7/22/2019	2580	Pioneer Canal from Niobrara River	0
8/14/2019	2580	Pioneer Canal from Niobrara River	0
9/10/2019	2580	Pioneer Canal from Niobrara River	0

APPENDIX C 2019 BOX BUTTE RESERVOIR MEASUREMENTS

Box Butte Reservoir Dimensions			
Parameter	Elevation in feet	Storage Volume in acre-feet	
Active Conservation Pool	4,007.00	29,161	
Box Butte Reservoir Measurements in Water Year 2019			
Date of measurement	Elevation in feet	Volume in acre-feet	Percent of Active Conservation Pool
9/1/18	3,984.50	5,100	17
10/11/18	3,986.12	5,995	20
11/10/18	3,987.75	7,100	24
12/5/18	6,989.60	8,400	29
1/3/19	3,991.05	9,555	33
2/13/19	3,992.80	11,115	39
3/12/19	3,994.00	12,273	42
4/1/19	4,000.48	19,739	68
5/2/19	4,002.05	21,842	75
6/5/19	4,004.18	24,855	85
7/1/19	4,004.59	25,456	87
8/5/19	4,001.10	20,571	67
9/2/19	3,998.60	17,399	60
9/18/19	3,998.41	16,988	58
9/25/19	3,998.80	17,559	60

From March 18, 2019, to March 26, 2019, the 9 day average inflow was 210 cfs per day. From March 20, 2019, to March 26, 2019, the 7 day average inflow was 223 cfs per day. Releases that began on July 14, 2019, through September 11, 2019, totaled 9,400 af. Then releases began again on September 16, 2019, through September 21, 2019. Water year 2020 began with 17,892 af, measured on October 6, 2019

NEBRASKA ADMINISTRATIVE CODE

Title 457 - DEPARTMENT OF NATURAL RESOURCES RULES
FOR SURFACE WATER

Chapter 23 - MORATORIUM AREA VARIANCES FOR SURFACE WATER APPROPRIATIONS

001 PETITION FOR LEAVE TO FILE OR CONSIDER AN APPLICATION. Any person wanting to apply for a new surface water appropriation within a moratorium or stay area must file a petition in the Department requesting leave to file an application. The petition must be accompanied by a copy of the completed proposed application. The application shall not be considered filed at the time it is submitted with the petition. Anyone who currently has an unapproved application on file in the Department for a new appropriation for a project that is within a moratorium or stay area must file a petition requesting a variance to the moratorium or stay. The fee for filing the petitions shall be that described in § 33-105(8) R.R.S. 1943, as amended.

The petition shall include sufficient information to indicate:

001.01 The proposed project is for a non-consumptive use; or

001.02 The applicant has a credible proposal for replacing any consumptive use that will occur in a manner such that the project will not harm other users; or

001.03 The applicant has credible information that indicates there **may be** unappropriated water available at the proposed location at the time the depletion is likely to occur; or

001.04 The project existed prior to any informal moratorium, formal moratorium or stay.

001.05 There is a public safety issue that must be addressed and the proposed project addresses such issue.

001.06 The proposed use is a temporary use for public construction and the total volume requested is less than ten (10) acre-feet.

002 REVIEW. The Department shall review the information provided with the petition and shall make a determination as to whether it is sufficient to indicate good cause for allowing further consideration of the application.

003 DECISION. A written decision shall be issued. The decision shall either deny the petition and state the reasons for such denial, or grant the petition and state either (a) the petitioner may file the application and supporting documentation, or (b) the Department will proceed to process the existing filed application. Any decision approving a petition shall not bind the Director to approve any application to which it relates, or in any way be used as evidence of prejudice for the Director's future decisions

concerning the specific approval requirements of such application. Allowance of a leave to file does not negate the necessity to meet the specific approval requirements for an appropriation.

004 APPEAL. If the petitioner wishes to appeal the decision of the Department, he or she may request a hearing before the Department within 15 days of the date the decision is rendered in accordance with the Department's Rules of Practice and Procedure, Title 454.