
2025 ANNUAL INTEGRATED MANAGEMENT PLAN REPORT:

MIDDLE NIOBRARA NATURAL RESOURCES DISTRICT

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NEBRASKA DEPARTMENT OF NATURAL RESOURCES

REPORT OF 2024 DATA AND MANAGEMENT ACTIONS
ANNUAL MEETING HELD APRIL 14, 2025



Purpose

In 2015, the Middle Niobrara Natural Resources District (MNNRD or District) and the Nebraska Department of Natural Resources (NeDNR or Department) began work on a jointly developed voluntary Integrated Management Plan (IMP). IMPs provide a framework for natural resources districts (NRDs) and the Department to collaboratively manage hydrologically connected surface water and groundwater at a local level. The Middle Niobrara voluntary IMP was developed in accordance with the Nebraska Groundwater Management and Protection Act and included consultation with stakeholders from MNNRD. In late 2019, the District and the Department reached agreement on a draft IMP, and a hearing was held to take testimony from the public. After considering testimony provided at the public hearing the District and the Department agreed to adopt the IMP, which became effective on December 20, 2020.

As outlined in the IMP, the District and Department meet annually to share data, exchange annual reports, and discuss actions taken to implement the IMP. Annual IMP reports are intended to facilitate the exchange of information between the MNNRD and NeDNR, and to keep the public informed about integrated water management activities within the district. This report covers the actions and progress made by NeDNR in 2024 to implement the IMP—with a focus on surface water. The MNNRD completed a separate report that describes the actions and progress made in voluntary IMP implementation—with a focus on groundwater.

Department Reporting

The Department annually reports on data related to the following. Items in **bold** are required under the IMP. Other data presented in this report are collected by the Department and shared to present a more complete picture of water management actions in the district.

- **Surface water use**
 - ◇ **Irrigation**
 - ◇ **Municipal**
 - ◇ **Industrial**
- **Surface water permitting**
 - ◇ **New surface water appropriations granted**
 - ◇ **Transfers/cancellations of surface water appropriations**
 - ◇ Pumpsite inspections
 - ◇ Voluntary water use reporting
- **New groundwater permits issued**
- **Streamgage measurements from Department-maintained gages**
- **Surface water administrative actions taken**
- **New depletions accounting report**
- **New data collected or model/study results (conservation measures, riparian ET, etc.)**

1. Surface Water Use

The Nebraska Department of Natural Resources is responsible for issuing surface water permits in the state. In the MNNRD, 73% of all surface water permits are for irrigation, either from a naturally flowing source (IR) or from a reservoir to supplement an existing IR permit (SI). The remaining surface water permits allow for water storage, domestic and industrial uses, and instream flow protections. **Table 1** shows a breakdown of all active surface water permits in the district by use type as of December 31, 2024. It also includes the total number of each permit type, acres approved for irrigation, and the cumulative rate or volume granted for each type of permit.

Table 1. Surface Water Use in the Middle Niobrara NRD as of December 31, 2024.

Active Surface Water Permits in the Middle Niobrara NRD as of December 31, 2024					
Purpose of Permit		Number of Permits	Acres Approved for Irrigation	Grant (cfs)	Grant (af)
Irrigation	(IR) Diversion from naturally flowing source for irrigation	109	49,414.3	696.74	2076.9
	(SI) Diversion from a reservoir for irrigation of land that is also approved to receive water from a naturally flowing source	11	36,655.5*	N/A	5,610
Irrigation Permits Total		120	49,414.3	696.74	7686.9
Storage	(ST) Storage of water in a reservoir	28	N/A	N/A	78,403.8
	(SS) Supplemental storage	2	N/A	N/A	466
Storage Permits Total		30	N/A	N/A	78,869.8
Other	Domestic Use	6	7.4	0.1	6
	Aggregate washing	1	N/A	0.9	N/A
	Fish culture	1	N/A	N/A	98
	Instream Flow	2	N/A	110	N/A
	Livestock Watering	4	N/A	0.52	N/A
All Other Permits Total		14	7.4	111	104
All Surface Water Permits Total		164	49,421.7	808.22	86660.7
* SI permits allow for irrigation with water from storage on land already approved for irrigation from natural flow. Therefore, acres approved under SI permits are not counted in total irrigated acres.					

2. Surface Water Permitting

In 2024, there were five new surface water permits issued by the Department. Detailed information about these permits is presented in **Table 2**. There were no cancelled, expired or dismissed/denied permits in the District in 2024. Two additional permitting actions included a modification and a cancelled variance, shown in **Table 3**. **Figure 1** shows the locations of all 2024 surface water permitting actions within the Middle Niobrara NRD.

Table 2. New surface water permitting actions granted in 2024.

New Surface Water Permitting Actions								
Appropriation Number	Approval Date	Priority Date	Point of Diversion Location	Use	Source	Acres	Grant	Associated Variance
A-19950	5/10/2024	9/22/2023	S35 T33-R31W	IR	Niobrara River	74.3	1.06 cfs 222.90 af	N/A
A-20040	12/2/2024	9/23/2024	S1 T32-R30W	LW ¹	Niobrara River	N/A	0.13 cfs	N/A
A-20041	12/2/2024	9/23/2024	S2 T32-R30W	LW	Niobrara River	N/A	0.13 cfs	N/A
A-20042	12/2/2024	9/23/2024	S3 T32-R30W	LW	Niobrara River	N/A	0.13 cfs	N/A
A-20043	12/2/2024	9/23/2024	S32 T33-R29W	LW	Niobrara River	N/A	0.13 cfs	N/A

Table 3. Summary of surface water modifications in 2024.

Modifications To Surface Water Permits January 1, 2024 to December 31, 2024				
Appropriation Number	Approval Date	Cancelled Date	Status	Modification Number
A-10592 A-10593 A-14487	5/22/2024	N/A	Approved	MER-10070
A-11095	N/A	1/5/2024	Cancelled	VAR-6125

¹ The abbreviation "LW" is for livestock watering.

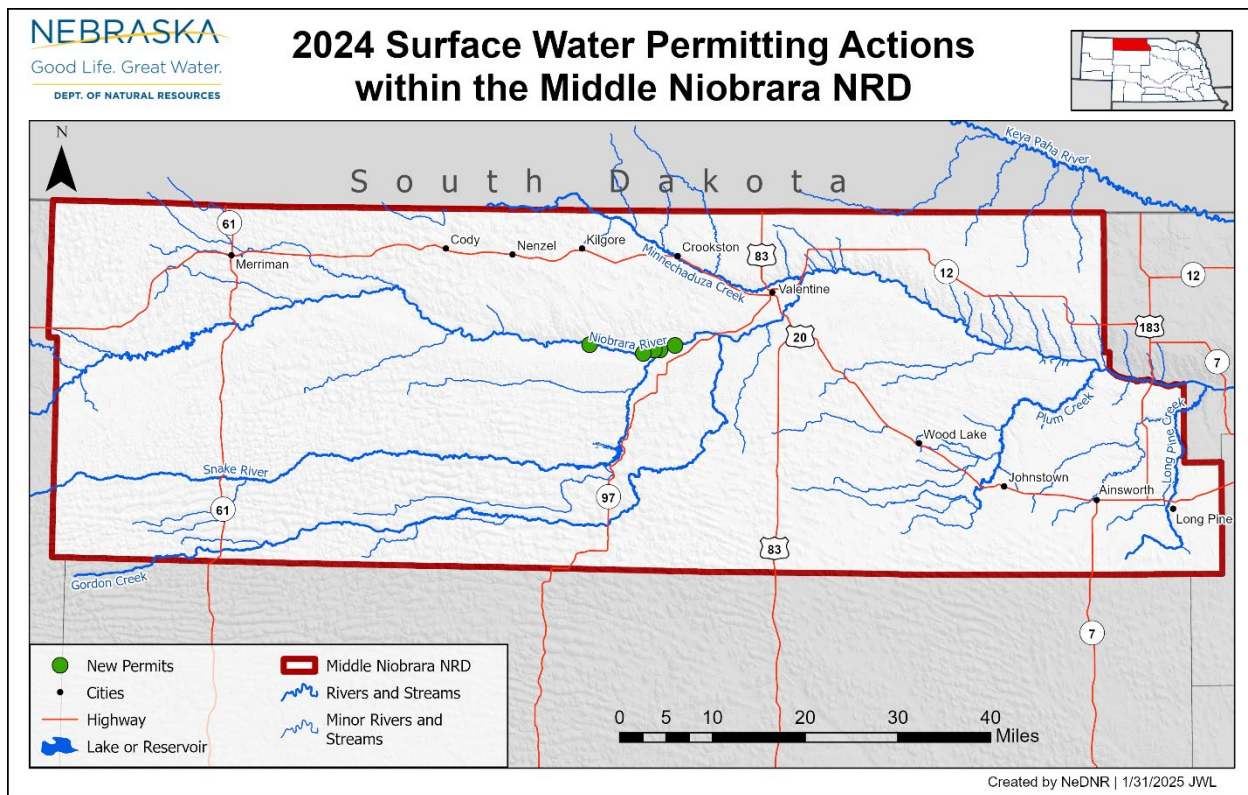


Figure 1. 2024 surface water permitting actions within Middle Niobrara NRD.

3. Pump Site Inspections

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. See **Table 4** and **Figure 2** below. As part of inspections, field staff collect the following data:

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

Table 4. Surface water pump site inspections in the Middle Niobrara NRD in 2024.

2024 Surface Water Pump Site Inspections			
Total number of Irrigation Permits	Number of Pump Sites Inspected	Number of Pump Sites Set up for Irrigation	Total Observations Made ²
109	56	31	56

² Can include multiple visits to the same pump site location.

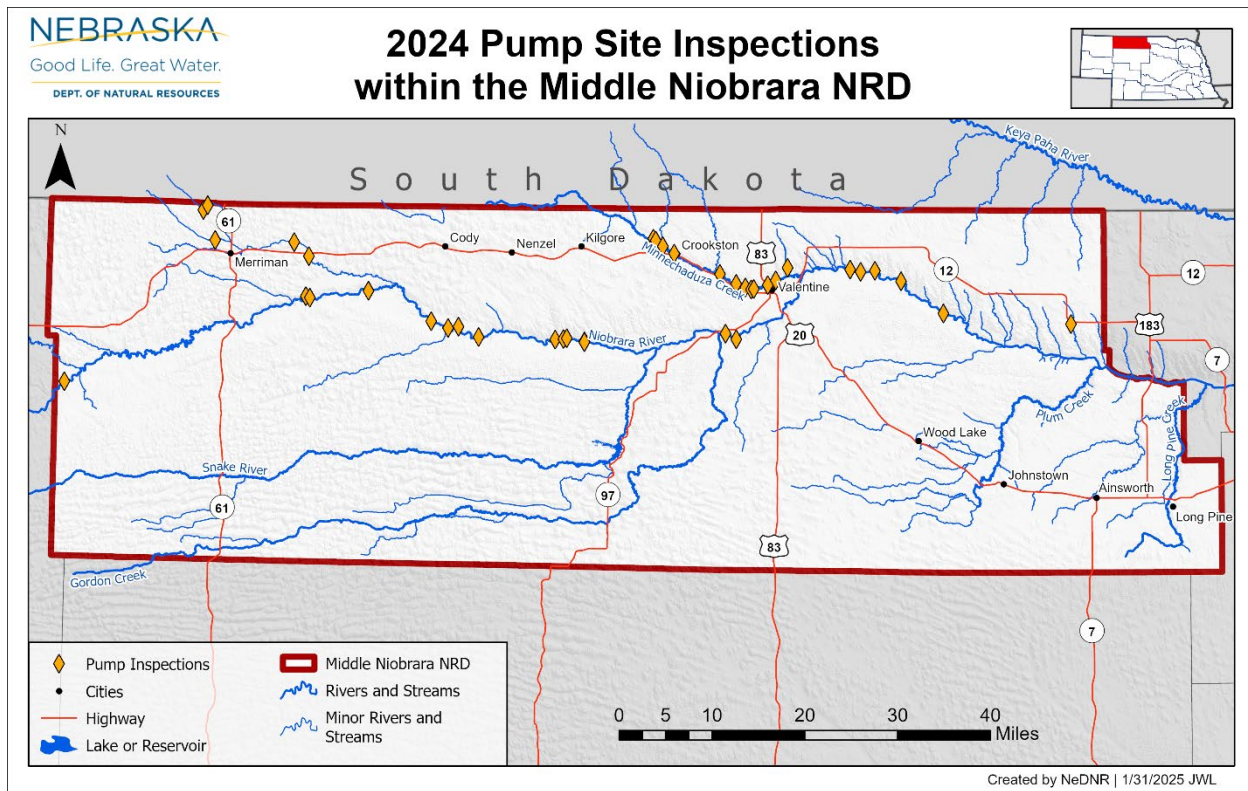


Figure 2. Pump site inspections within the Middle Niobrara NRD in 2024.

4. Voluntary Water Use Reporting

Currently surface water use reporting within the MNNRD occurs on a voluntary basis. NeDNR requests water use data from all irrigation permit holders through surveys that contain questions about use or non-use, acres irrigated, estimated amount of water applied, and type of crops grown. **Table 5** provides a summary of MNNRD's voluntary water use survey responses.

Table 5. Voluntary surface water reporting within the Middle Niobrara NRD in 2024.

2024 Voluntary Surface Water Reporting							
Natural Resources District	No. of Water Rights	No. of Reports	No. of Reports SW Irrigated	No. of Reports Not Used	No. of GW Irrigated Reports	SW Irrigated Acres	SW Inches Per Acre
Middle Niobrara	96	34	27	7	2	2,772	10.1

5. Groundwater Permitting

The Department, in accordance with *Neb. Rev. Stat. § 46-613.01, §§ 46-639 to 46-653*, issues groundwater transfer permits for municipal use. **Table 6** provides a summary of the permitted maximum water withdrawals for the city of Ainsworth's municipal groundwater transfer permit. Annual reports for this permit are provided by the City of Ainsworth and available upon request.

In 2024, there were no new groundwater permits issued by NeDNR in the Middle Niobrara NRD.

Table 6. Department issued groundwater transfer permits in Middle Niobrara NRD.

Department Issued Groundwater Transfer Permits as of December 31, 2024					
Permit Holder	Appropriation Number	Priority Date	Maximum Daily Withdrawal	Total Annual Withdrawal	Required Reporting
City of Ainsworth	MT-3	12/29/2003	1,440,000 Gallons	73,730,000 Gallons	Yes

6. Stream Gage Measurements

The Department maintains four streamgages within the MNNRD portion of the Niobrara River Basin. These gages are located on the Niobrara River near Nenzel, the Snake River at Doughboy, the Snake River near Burge, and the Ainsworth Canal from Merritt Reservoir. The Department also monitors water levels at Merritt Reservoir. Additionally, The USGS operates two streamgages in the district, located on the Niobrara River near Sparks and on Long Pine Creek near Riverview. **Figure 3** shows the location of all active streamgages in the district. Yearly charts for NeDNR and USGS streamgages and water level readings at Merritt Reservoir for the 2024 water year (October 1, 2023, to September 30, 2024) can be found in **Appendix A**. Each streamgage chart contains the following information.

- Mean Daily Discharge for the reporting year and gage lifetime.
- Maximum, median, minimum cumulative volumetric discharge for gage lifetime.
- Reporting year cumulative volumetric discharge.

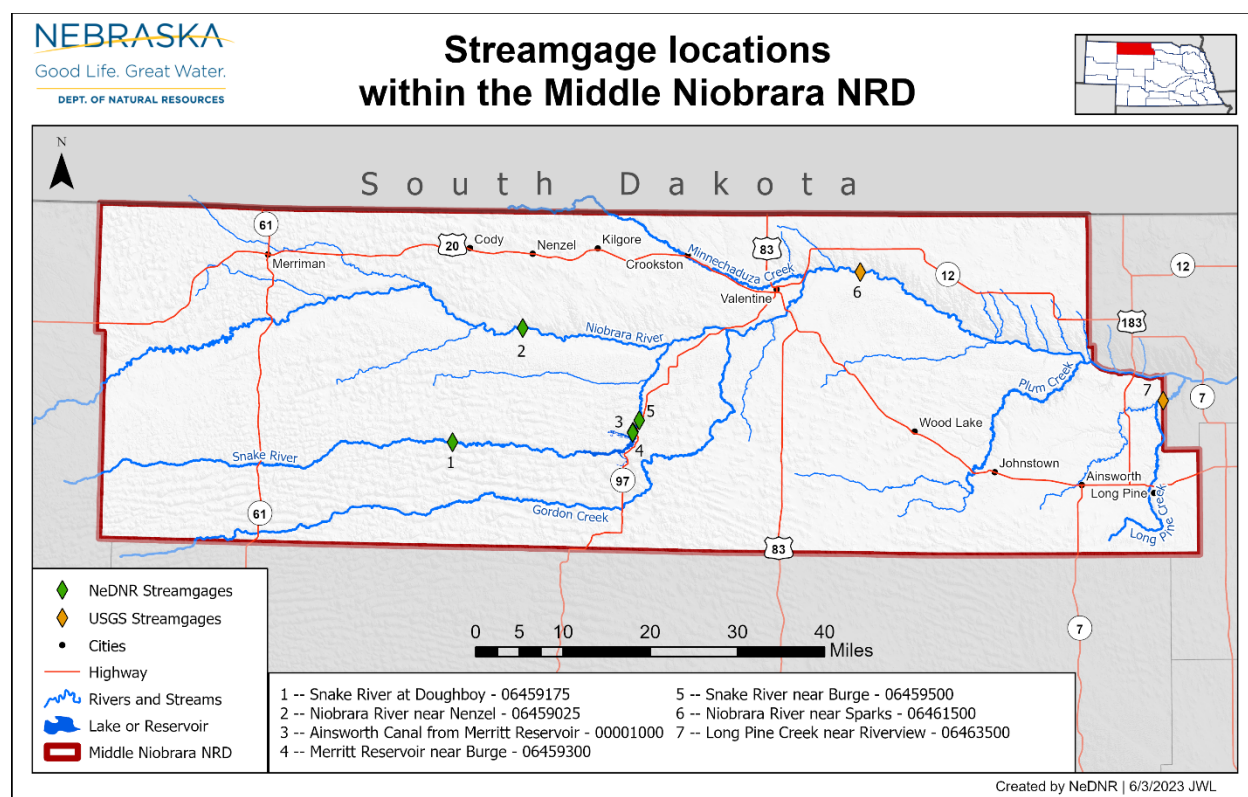


Figure 3. Location of NeDNR and USGS operated stream gages in Middle Niobrara NRD.

Merritt Reservoir started the 2024 irrigation season with a maximum storage volume of 65,900 acre-feet (af) on May 23 and ended the season with a minimum storage volume of 33,900 af that occurred on September 13. The Ainsworth Canal, which supplies water to the Ainsworth Irrigation District, started recording discharges on May 19 and continued until September 23 in which a total of volume of 81,495 af of water passed the gage.

7. Surface Water Administration

Since 1895, Nebraska has had an administrative system overseeing the orderly use of the state's surface water resources. All diversions of surface water for irrigation, hydropower, industrial use, municipal use, domestic use, storage, and other uses require a permit from the State with each having certain responsibilities, limitations, and conditions associated with it. The Department has jurisdiction over all matters pertaining to surface water rights including the distribution of available supply during times of water shortages and adjudication of established water rights. The activity of distributing the supply of surface water on a stream during shortages is called "surface water administration." Rules for surface water administration are set out in Nebraska Revised Statutes, Chapter 46, and operate on a first-in-time, first-in-right principle.

In 2024 the Niobrara Basin, below Box Butte Reservoir and above the confluence of the Niobrara and Missouri Rivers, had a total of 111 days of surface water administration for the period of May 1 to September 30. For the July 1 to August 31 period the Basin had a total of 55 days of administration. See **Table 7** below for a breakdown of the surface water notices.

Table 7. Surface water administration in the Lower Niobrara Basin in 2024.

Surface Water Administration							
Water Division	Date of Closure	Date Reopened	Days Closed	Permit Type	No. Affected	Reason for Closure	Reason for Reopening
2C - Niobrara River	5/17/2024	5/22/2024	6	Direct Flow	163	Instream Basin-Management flows not being met	Instream Basin-Management flows are being met
				Storage	115		
	5/30/2024	6/18/2024	20	Direct Flow	162		
				Storage	113		
	7/8/2024	10/10/2024	85	Direct Flow	154		
				Storage	110		

8. Groundwater and Surface Water Depletions from New Development

Stream depletions are calculated to quantify the impact that groundwater and surface water development has on a stream based on an appropriation's estimated consumptive use and its proximity to the stream. Annual consumptive use for an appropriation is estimated by multiplying its approved acres by the net irrigation requirement (NIR) for corn at that appropriation's location. Consumptive use is then multiplied by the location's stream depletion factor (SDF)³ to estimate the volume of water depleted from the stream by that appropriation over a 50-year time frame.

$$\begin{aligned}
 (\text{acres}) * (\text{NIR}) &= \text{estimated consumptive use (acre-inches of water)} \\
 (\text{acre-inches}) / (12 \text{ inches}) &= \text{estimated consumptive use (acre-feet of water)} \\
 (\text{consumptive use}) * (\text{SDF}) &= \text{stream depletion}
 \end{aligned}$$

Table 8 lists estimated stream depletions resulting from new groundwater development reported by MNNRD in 2024. **Table 9** lists stream depletions associated with pending and approved surface water appropriations dating back to 2012.

³ SDF represents the proportion of water that would come from streamflow (as opposed to groundwater) at a certain location over 50-years of pumping. Surface water appropriations have an SDF of 1.0.

Table 8. Estimated stream depletions for new groundwater permits approved by MNNRD in 2024.

2024 Approved Groundwater Permits					
Location (S-T-R)	Source	Acres	Net Irrigation Requirement (in)	Annual Consumptive Use (af)	Calculated Stream Depletion (af)
S9-T31-R21	Groundwater	115	9.50	91.08	77.60
S24-33-R40	Groundwater	150	12.16	152.05	50.31
S1-T34-R28	Groundwater	13	11.91	12.91	2.19
S4-T33-R31	Groundwater	130	11.95	129.51	24.37
S15 & S22-T32-R40	Groundwater	120	12.33	123.31	95.52
S26-T34-R32	Groundwater	132	12.08	132.88	17.56
Total		660		641.74	267.55

Table 9. Estimated stream depletions for surface water applications submitted to NeDNR prior to December 31, 2024, in MNNRD.

Approved and Pending Surface Water Permits							
Location (S-T-R)	Approved Date	Priority Date	Source	Acres	Net Irrigation Requirement (in)	Annual Consumptive Use (af)	Calculated Stream Depletion (af)
35-33-31	5/10/2024	9/22/2023	Niobrara River	74.3	11.69	72.36	72.36
1-32-30	12/2/2024	9/23/2024	Niobrara River	N/A	0.13	N/A	N/A
2-32-30	12/2/2024	9/23/2024	Niobrara River	N/A	0.13	N/A	N/A
3-32-30	12/2/2024	9/23/2024	Niobrara River	N/A	0.13	N/A	N/A
32-33-29	12/2/2024	9/23/2024	Niobrara River	N/A	0.13	N/A	N/A
22-35-23	Pending	2/14/2012	Lost Creek	140	10.61	123.83	123.83*
*Application was filed in 2012 but delayed due to a temporary stay on new development in MNNRD.							

Controls listed in the IMP state that the Department may issue new surface water appropriations as long as the cumulative stream depletions associated with those appropriations are less than or equal to the cumulative depletions associated with new groundwater appropriations reported by the MNNRD. **Table 10** lists the total calculated depletions to the Niobrara River resulting from groundwater permits approved in 2023 and surface water permits approved in 2024, as well any remaining allowable depletions from surface water development.

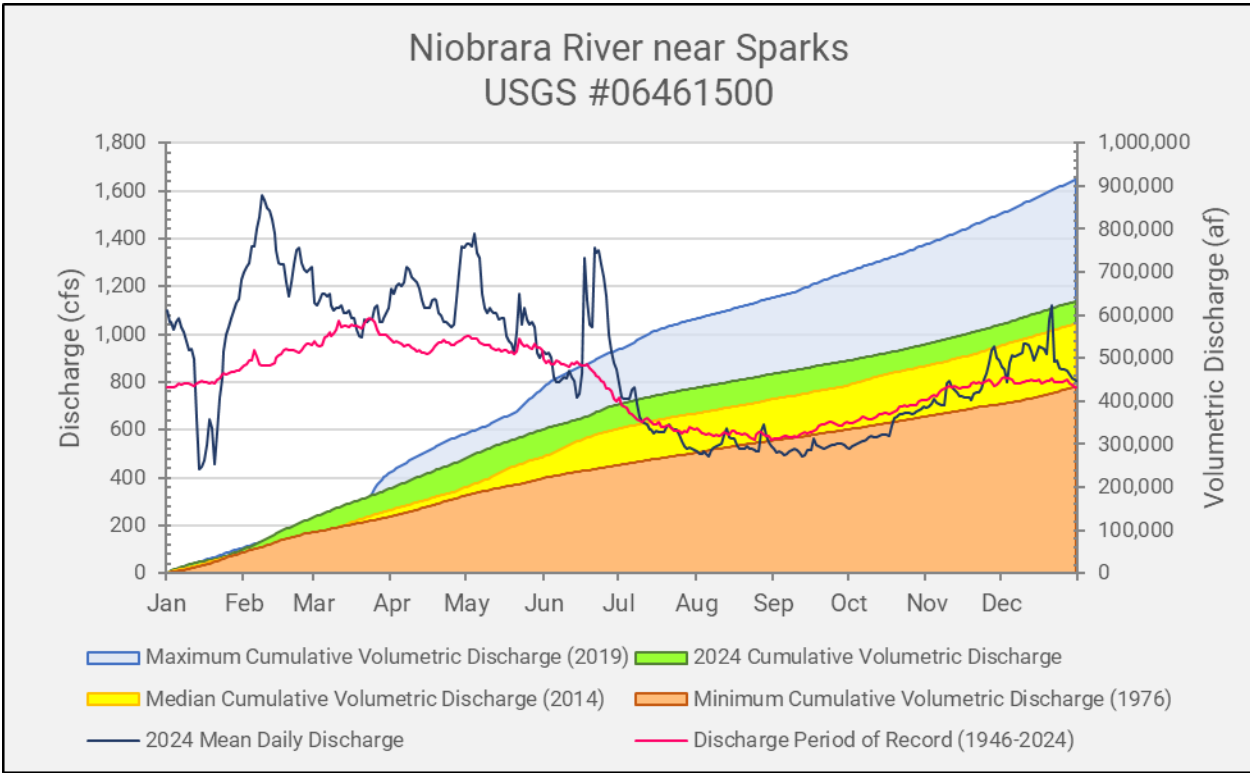
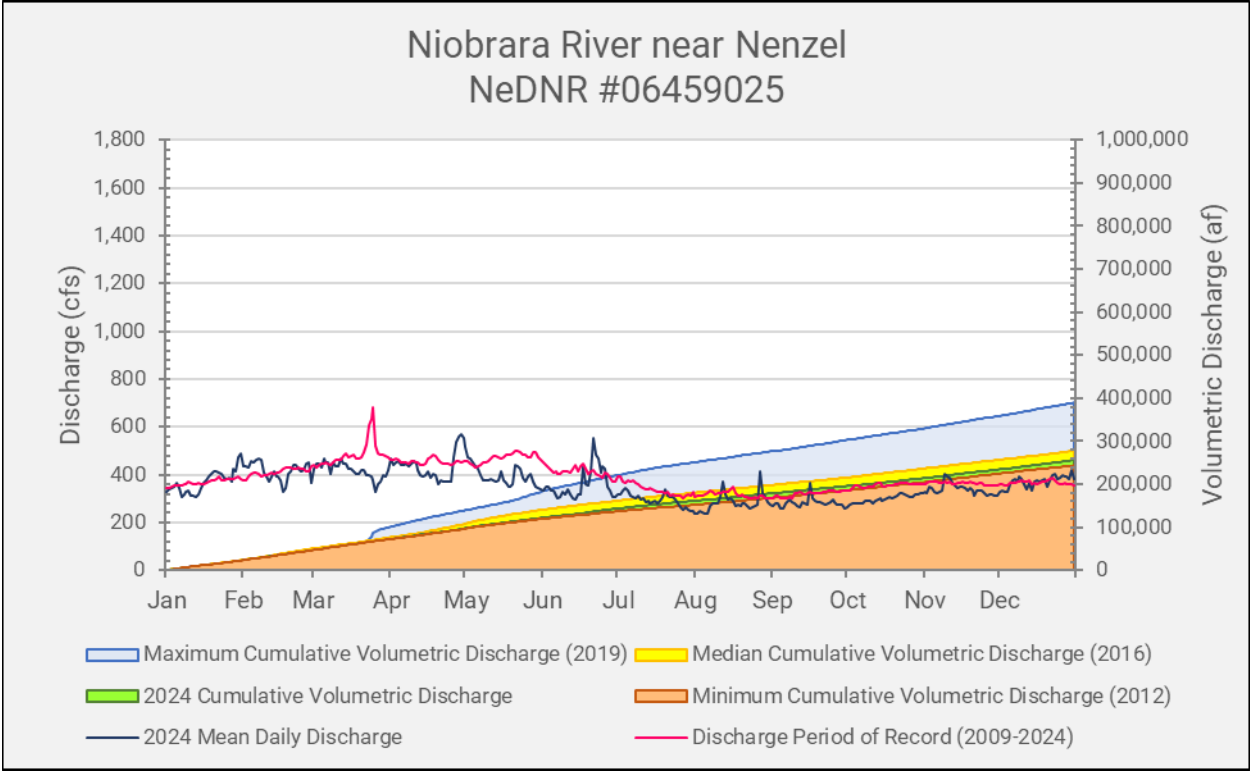
Table 10. Available surface water depletions based on 2023 MNNRD Groundwater development.

Surface Water/Groundwater Depletions Balance as of 12/31/2024		
2023 Carryover Available SW Depletions	640.47 af	
2023 Groundwater Depletions	267.55 af	
2024 Surface Water Depletions		72.36 af
Remaining Available Surface Water Depletions		835.66 af

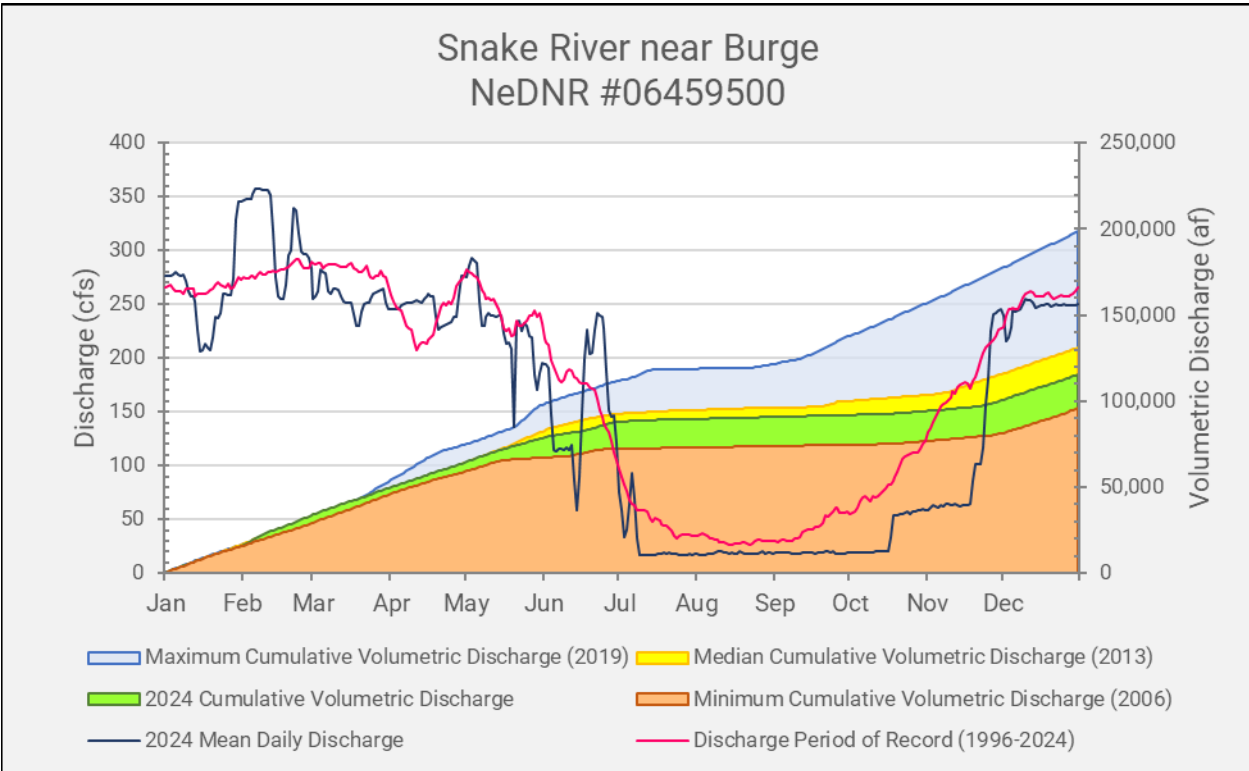
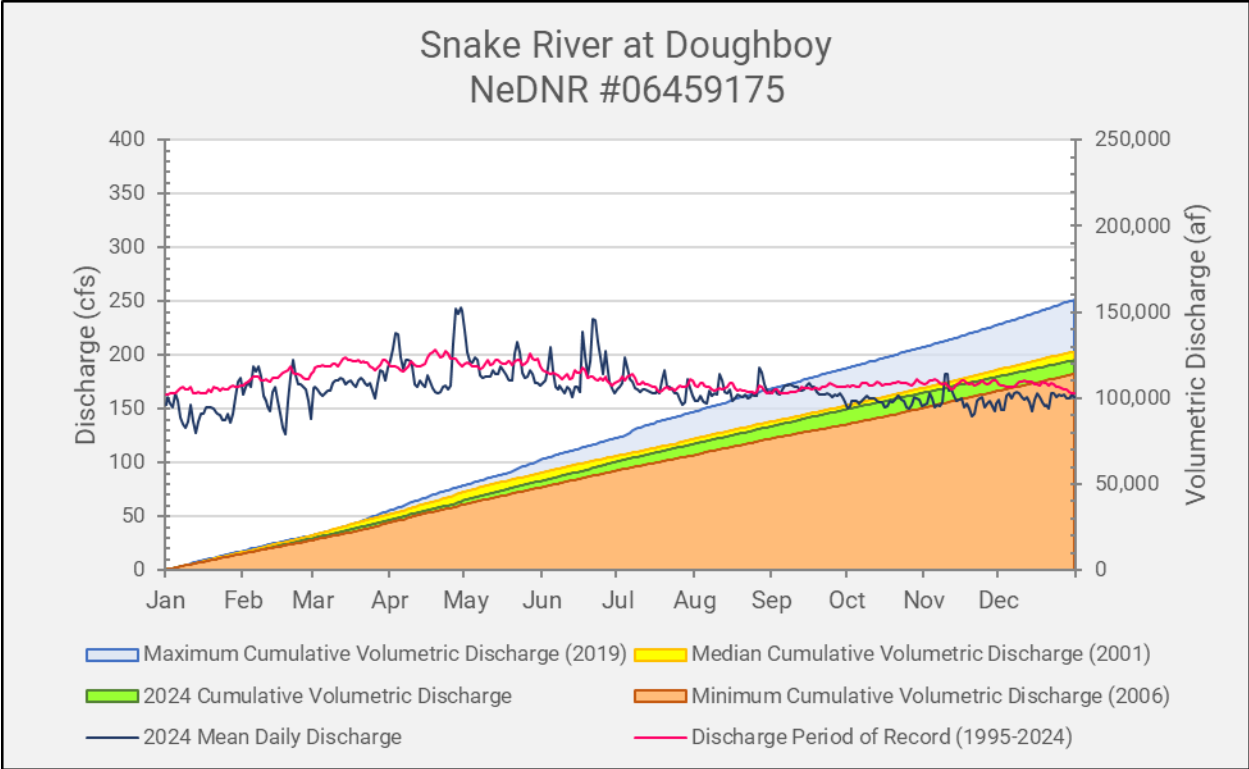
9. Current Studies and Modeling

In 2020, the Department began collaborating with the USGS and National Park Service on the development of a groundwater model that would cover the District. Calibration of this model has been completed and the USGS plans to publish the model in 2025.

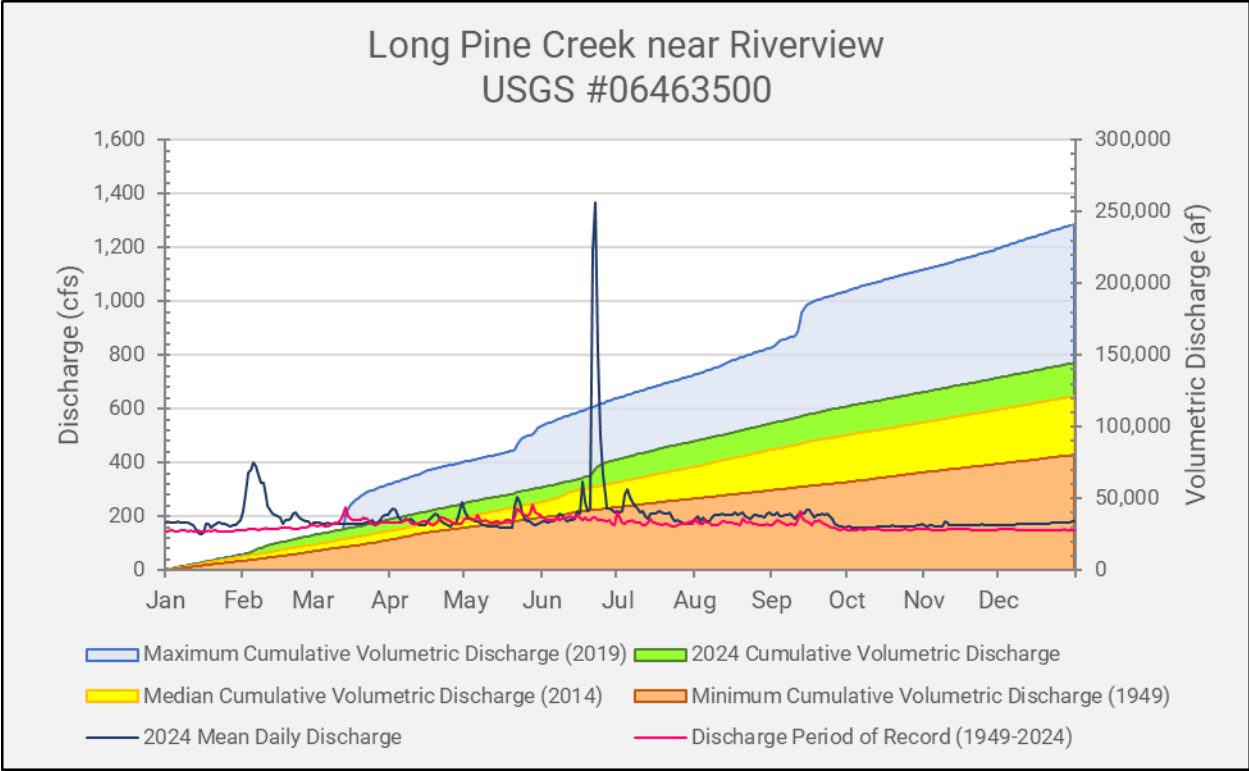
Appendix A STREAMGAGE MEASUREMENTS



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Water Today. Water Tomorrow.
Good Life. Great Water.

USGS Daily Mean

2024 Hydrographic Report - Daily Storage Values with Monthly and Annual Statistic

Oct 23, 2024 | 1 of 2
Period Selected: 2023-10-01 00:00 - 2024-09-30 23:39

Source Data: Total Storage.Storage@06439300, Merritt Reservoir near Burge
UTC Offset: -06:00, Start Time: 1993-05-31 00:00:00, End Time: 2024-10-24 00:00:00

Units: Acre-ft
Data Coverage Threshold: 80%

Oct 2023 - Sep 2024				Cal Year 2023: Total: 22410000 Mean: 61390 Max: 66320 Min: 49030				WY: Total: 21340000 Mean: 38860 Max: 66670 Min: 33830				
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	39200	61400	61640	61430	61910	61400	61780	63400	63860	63600	52120	38740
2	39690	61400	61640	61400	61970	61400	61910	63340	63800	63480	51620	38380
3	60110	61400	61640	61400	62020	61400	62100	63280	63740	63340	51170	38100
4	60590	61400	61590	61400	62160	61340	62210	63140	63740	63860	50680	37560
5	61020	61430	61290	61430	62160	61210	62330	64940	63740	66000	50000	36890
6	61430	61430	61020	61400	62100	61100	62600	63080	63740	66000	49370	36370
7	61910	61430	60830	61400	62100	61130	62830	63140	63800	66060	48680	36190
8	62210	61430	60960	61340	62020	61130	62990	63200	63860	66000	48120	35830
9	62460	61400	60720	61290	61970	61100	63100	63280	63860	65630	47740	35370
10	62600	61400	61780	61400	61830	61100	63180	63340	63860	65200	47330	34920
11	62460	61400	61910	61290	61720	61020	63300	63340	63860	64620	47330	34490
12	63380	61400	61910	61020	61590	61020	63300	63400	63800	63940	46980	34020
13	63440	61430	61830	60830	61590	61020	63440	63400	63800	63300	46480	33830
14	63100	61340	61830	60670	61640	61020	63440	63400	66000	62660	43980	34180
15	62740	61340	61780	60720	61780	61020	63440	63400	66000	62020	43390	34240
16	62410	61290	61720	60830	61910	60960	63690	63480	63940	61430	43020	34320
17	62020	61290	61720	60960	61910	61020	63890	63600	66140	60910	44800	34320
18	61830	61290	61720	61020	61970	61130	64030	63600	63860	60340	44490	34420
19	61640	61290	61640	61130	61970	61130	64080	63630	63800	60330	43990	34330
20	61640	61340	61590	61290	61910	61210	64230	63630	66260	60220	43520	34730
21	61590	61340	61530	61290	61780	61290	64340	63800	66670	59930	42930	34920
22	61590	61290	61530	61340	61720	61210	64420	63800	66320	59380	42330	35130
23	61590	61210	61530	61400	61640	61210	64480	63860	66320	58600	41900	35430
24	61530	61210	61590	61530	61590	61210	64620	63740	66060	57790	41700	35960
25	61590	61340	61590	61640	61590	61210	64680	63740	63940	57040	41280	36480
26	61530	61340	61290	61780	61530	61210	64880	63800	63860	56180	40700	36980
27	61530	61340	61400	61910	61400	61130	63000	63800	63940	55410	40160	37390
28	61530	61400	61430	62100	61400	61100	63340	63740	63940	54630	39340	37900
29	61430	61530	61430	62020	61400	61100	63400	63740	63800	53840	38930	38460
30	61430	61590	61430	62020		61130	63340	63630	63740	53130	38630	38860
31	61430		61430	61970		61340		63630		52590	38740	
Total	1913000	1841000	1907000	1909000	1792000	1896000	1910000	2030000	1978000	1896000	1398000	1079000
Mean	61700	61370	61520	61380	61800	61170	63680	63500	63940	61160	43090	35970
Max	63440	61590	61910	62100	62160	61400	63400	63860	66670	66060	52120	38860
Min	39200	61210	60720	60670	61400	60960	61780	64940	63740	52590	38630	33830