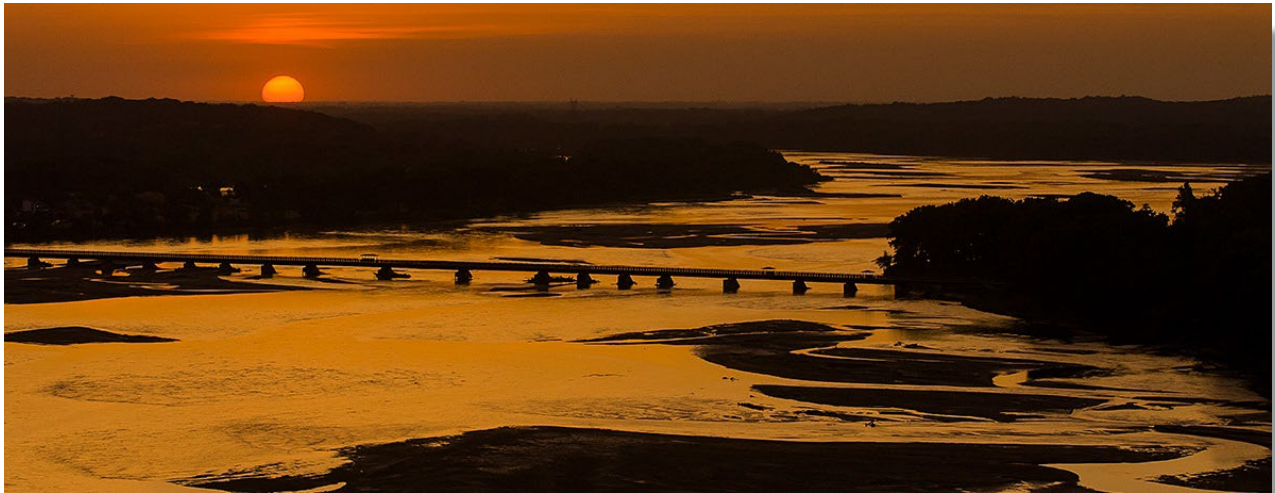


# Nebraska Department of Natural Resources 2023 Annual Report



of 2022 Data for the

Lower Platte River Basin Coalition's  
*Basin Water Management Plan*

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## 1. Introduction

In April 2013, The Nebraska Department of Natural Resources (NeDNR) and seven Natural Resources Districts (NRDs) entered into an Interlocal Cooperative Agreement to form the **Lower Platte River Basin Water Management Plan Coalition** (Coalition). The Nebraska Association of Resource Districts (NARD) serves as the coordinator on behalf of the Coalition. The members of the Coalition are:

- Lower Platte South NRD,
- Lower Platte North NRD,
- Papio-Missouri River NRD,
- Lower Loup NRD,
- Lower Elkhorn NRD,
- Upper Elkhorn NRD,
- Upper Loup NRD, and
- NeDNR.

The Lower Platte River Basin (Basin) overlies portions of central and eastern Nebraska (Figure 1). The Coalition recognizes the hydrologic connectivity of groundwater and surface water resources within the Basin and desires to work together to manage the resources. The Coalition jointly developed and adopted the Lower Platte River Basin Water Management Plan (Plan) in 2018 to protect and sustain the long-term balance between the water uses and water supplies. The Plan requires reporting on an annual basis, which this report serves to fulfill.

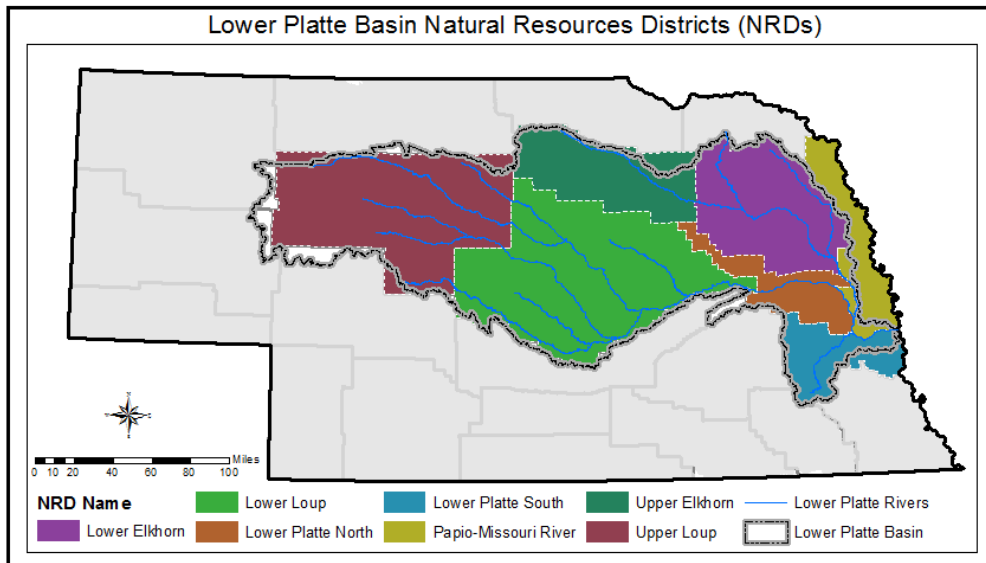


Figure 1. Map of Lower Platte River Basin Coalition NRDs

## 2. Surface Water and Groundwater Monitoring

### A. NeDNR Streamgauge Monitoring

NeDNR is authorized to measure and monitor the water flowing in Nebraska streams. Within the Basin, NeDNR maintains 21 streamgages (Table 1). Additional gages are maintained by the U.S. Geological Survey (USGS). Instantaneous and historical streamflow data for both NeDNR and USGS gages may be accessed by visiting NeDNR's interactive streamgaging map at [Data - NeDNR Real Time Water \(aquaticinformatics.net\)](https://aquaticinformatics.net). All website data are provisional and subject to revision unless otherwise denoted.

*Table 1. A listing of NeDNR maintained streamgages*

NeDNR Streamgages in the Lower Platte River Basin		
Station Name	Station Number	River Basin
Middle Loup River at Rockville	6780000	Loup
Mud Creek near Sweetwater	6783500	Loup
Turkey Creek near Dannebrog	6784800	Loup
Calamus River near Harrop	6787000	Loup
Calamus River near Burwell	6787500	Loup
North Loup River at Ord	6788500	Loup
Mira Creek near North Loup	6788988	Loup
Cedar River near Spalding	6791500	Loup
Cedar River near Fullerton	6792000	Loup
Beaver Creek at Loretto	6793500	Loup
Loup River at Columbus	6794500	Loup
Willow Creek near Pierce	232500	Elkhorn
Elkhorn River near Atkinson	6796973	Elkhorn
South Fork Elkhorn River near Ewing	6798000	Elkhorn
Elkhorn River at Neligh	6798500	Elkhorn
Elkhorn River near Tilden	6798780	Elkhorn
Willow Creek near Foster	6799080	Elkhorn
Union Creek at Madison	6799230	Elkhorn
Pebble Creek at Scribner	6799385	Elkhorn
Logan Creek at Pender	6799450	Elkhorn
Elkhorn River near Winslow	6799510	Elkhorn

## B. NeDNR Irrigation Canal Monitoring

In addition to streamgaging, NeDNR monitors and measures major surface water diversions at 21 sites across the Basin (Table 2). Instantaneous and historical canal diversion data may be accessed at NeDNR’s interactive streamgauge map at: [Data - NeDNR Real Time Water \(aquaticinformatics.net\)](https://data-nebraska.gov/aquaticinformatics).

Table 2. A listing of NeDNR irrigation canal measurement sites

NeDNR irrigation Canal Measurement Sites		
Canal Name	Canal Number	River Basin
Calamus Fish Hatchery inlet from Calamus	19800	Loup
Farwell (Sherman Feeder) Canal from Middle Loup River	47000	Loup
Farwell Main Canal from Sherman Reservoir	48000	Loup
Farwell South Canal from Sherman Reservoir	49000	Loup
Fullerton Canal from Davis Creek Reservoir	54700	Loup
Kent Canal from North Loup River	76500	Loup
Loup River Power Canal Return at Columbus	82100	Loup
Inlet Canal to Davis Cr. Res. from Mirdan	88500	Loup
Middle Loup Canal No. 1 from Middle Loup	90000	Loup
Middle Loup Canal No. 1 Pump from Middle	90200	Loup
Middle Loup Canal No. 2 from Middle Loup	91000	Loup
Middle Loup Canal No. 3 from Middle Loup	92000	Loup
Middle Loup Canal No. 4 from Middle Loup	93000	Loup
Middle Loup Canal No. 4 from Sherman Feeder Canal	93200	Loup
Mirdan Canal from Calamus Reservoir	100500	Loup
Taylor-Ord Canal from North Loup River	107000	Loup
Taylor-Ord Canal inlet to Mirdan Canal	107100	Loup
Taylor-Ord Canal outlet from Mirdan Canal	107200	Loup
Burwell-Sumter Canal from North Loup River	108000	Loup
Ord-North Loup Canal from North Loup River	109000	Loup
Sargent Canal from Middle Loup River	130000	Loup

### C. Surface Water Pump Site Monitoring

The NeDNR field office staff regularly inspect pump sites of permitted surface water diversions as a part of surface water monitoring. Depending on conditions and staffing, not all pump sites are inspected every year, and some pump sites may be visited more than one time per year. NeDNR field offices within the Basin are in Lincoln, Norfolk, and Ord, Nebraska. Table 3 provides a listing of surface water pump site inspections conducted in 2022. The data are organized by NRD and provide information about the total number of surface water appropriations, the number of pump sites inspected, and, of those, how many sites were set up for irrigation at the time of the inspection.

*Table 3. Surface water pump site inspections conducted in 2022*

2022 Surface Water Pump Site Inspections			
NRD	Total Number of Permits	Number of pump site Inspections	Number of pump sites set up for irrigation
Lower Elkhorn	350	219	60
Lower Loup	760	616	369
Lower Platte North	153	131	27
Lower Platte South	134	136	8
Papio-Missouri River	49	26	6
Upper Elkhorn	68	65	5
Upper Loup	20	18	2
<b>Total</b>	<b>1534</b>	<b>1211</b>	<b>477</b>

## D. Surface Water Administration

Surface water administration is the enforcement of the prior appropriation doctrine principle of “first in time, first in right”, in times of shortage. Surface water administration began on July 1 and continued through November 29, 2022. Here, NeDNR issued closing notices for the benefit of the instream flow permits held by Nebraska Game and Parks Commission and by Central Platte Natural Resources District. The closures applied to both storage and natural flow appropriations having a priority date junior to November 30, 1993. A summary of 2022 water administration is provided in Table 4.

*Table 4. 2022 Lower Platte River Basin Surface Water Administration*

2022 Lower Platte River Basin Surface Water Administration						
NeDNR Water Division	Date of Closure	Date Reopened	Permit Type	Number of Affected Permits	Reason for closure	Reason for reopening
2A-Loup River Basin	1-Jul	8-Jul	Storage	31	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded
	1-Jul	8-Jul	Natural Flow	137		
	19-Jul	29-Nov	Storage	31		
	19-Jul	29-Nov	Natural Flow	137		
2B-Elkhorn River and Salt Creek	1-Jul	8-Jul	Storage	85		
	1-Jul	8-Jul	Natural Flow	79		
	19-Jul	29-Nov	Storage	85		
	19-Jul	29-Nov	Natural Flow	79		



## E. Surface Water Permits for Induced Groundwater Recharge (Previously Issued)

No new induced groundwater recharge permits were issued and no changes to existing permits occurred in 2022. Induced groundwater recharge permits have no reporting requirements as a condition of the permit. Currently, the City of Lincoln and the Metropolitan Utilities District (MUD) are the only two appropriators holding induced groundwater recharge permits within the Basin.

Table 5 provides a summary of the induced groundwater recharge permits within the Basin. The associated municipal groundwater transfer permits, although not surface water, are also included. For example, the City of Lincoln has one induced groundwater recharge surface water permit, A-17312, with two associated municipal groundwater transfer permits for the Ashland wellfield. MUD has two induced groundwater recharge surface water permits, each with an associated municipal groundwater transfer permit, for each of its two wellfields: A-17310 and A-10538 in the south wellfield and A-17318 and A-17356 in the west wellfield.

*Table 5. City of Lincoln and MUD surface water permits for induced groundwater recharge*

Surface Water Permits for Induced Groundwater Recharge						
Permit Holder	Permit Number	Priority Date	Associated GW Municipal Transfer	Number of Wells	Rate in cubic feet per second (cfs)	Required Reporting
City of Lincoln	A-17312	1/21/1964	A-10367	31	704 - Summer	No
					200 - All Other Seasons	
		1/1/1970	A-16917	7	No additional streamflow	No
		1/1/1980		6	No additional streamflow	
		1/1/1990		2	No additional streamflow	
1/1 /1993	2	No additional streamflow				
MUD	A-17310	1/1/1970	A-10538	38	480	No
		1/1/1990		1	20	
	A-17318	10/6/1993	A-17356	42	160	No

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Table 6 provides a summary of the permitted maximum water withdrawals for the City of Lincoln’s and MUD’s Municipal Groundwater Transfer Permits. The annual reports submitted by City of Lincoln and MUD for these permits are available upon request.

*Table 6. Municipal groundwater transfer permits held by the City of Lincoln and MUD*

Municipal Groundwater Transfer Permits					
Permit Holder	Appropriation Number	Priority Date	Maximum Daily Withdrawal	Total Annual Withdrawal	Required Reporting
City of Lincoln	A-10367	6/15/1931	60 million Gallons	NA	Yes
	A-16917	1/25/1990	50 million Gallons	NA	Yes
MUD	A-10538	2/15/1965	60 million Gallons	NA	Yes
	A-17356	3/1/1994	104 million Gallons	19 billion Gallons	Yes

## F. Groundwater Permits (Previously Issued by NeDNR)

The data provided by permit holders of groundwater pumped in 2022, for the applicable permits listed in Table 7, are available electronically upon request. The types of groundwater permits shown are authorized as follows:

- “Municipal” is a Municipal Groundwater Transfer Permit pursuant to Neb. Rev. Stat. §46-613.01, §§46-639 - 46-650
- “Industrial Transfer” is an Industrial Groundwater Transfer Permit pursuant to Neb. Rev. Stat. §§46-675 – 46-689
- “Municipal Notice of Intent” is a notice pursuant to Neb. Rev. Stat. §46-655.01

*Table 7. NeDNR groundwater permits (previously issued)*

NeDNR Groundwater Permits (Previously Issued)				
Index Number	Permit Holder	Appropriation Number	Approval Date	Permit Type
3	Lincoln, City of	A-10367	5/28/1964	Municipal
4	Fremont, City of	A-10411	8/21/1964	Municipal
8	Wakefield, City of	A-10531	3/8/1965	Municipal
9	Plattsmouth, City of	A-10533	3/8/1965	Municipal
11	Metropolitan Utilities District	A-10538	6/9/1965	Municipal
17	Leigh, Village of	A-10578	5/10/1965	Municipal
18	Laurel, City of	A-10579	5/10/1965	Municipal
24	Ashland, City of	A-10589	5/10/1965	Municipal
26	Lincoln, City of	A-10595	5/10/1965	Municipal
27	Columbus, City of	A-10596	5/10/1965	Municipal
32	Fremont, City of	A-12171	4/29/1971	Municipal
33	Fremont, City of	A-13909	2/19/1976	Municipal
34	Columbus, City of	A-15704	10/17/1980	Municipal
41	Wayne, City of	A-16525	1/16/1987	Municipal
42	Laurel, City of	A-16530	1/16/1987	Municipal
49	Howells, Village of	A-16888	12/8/1989	Municipal
51	Howells, Village of	A-16911	4/6/1990	Municipal
52	Lincoln, City of	A-16917	8/31/1990	Municipal
53	Wayne, City of	A-16927	6/25/1990	Municipal
54	Bruno, Village of	A-16964	7/12/1990	Municipal
57	Howells, Village of	A-17082	9/16/1991	Municipal
58	Valparaiso, Village of	A-17086	9/16/1991	Municipal
63	Valparaiso, Village of	A-17212	9/29/1992	Municipal
71	Columbus, City of	A-17325	12/11/1995	Municipal

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NeDNR Groundwater Permits (Previously Issued)				
Index Number	Permit Holder	Appropriation Number	Approval Date	Permit Type
72	Pleasant Dale, Village of	A-17351	4/11/1994	Municipal
73	Eagle, Village of	A-17352	10/27/1994	Municipal
74	Metropolitan Utilities District	A-17356	12/10/1998	Municipal
78	St. Paul, City of	A-17426	1/4/1996	Municipal
121	Clarkson, City of	A-17556	4/2/1998	Municipal
158	Humphrey, City of	A-17807	3/7/2001	Municipal
194	Palmer, Village of	A-17949	2/19/2002	Municipal
128	Ceresco, Village of	A-18018	8/27/2002	Municipal
199	Cuming County Rural Water District #1	A-18024	6/13/2005	Municipal
218	Weston, Village of	A-18070	6/13/2005	Municipal
212	Springfield, City of	A-18104	4/14/2006	Municipal
225	Cass County Rural Water District #2	A-18163	5/3/2006	Municipal
109	Tyson Fresh Meats, Inc.	I-4	10/22/1996	Industrial Transfer
110	Nebco, Inc.	I-5	9/27/1996	Industrial Transfer
270	Nebco, Inc.	I-5A	7/31/2006	Industrial Transfer
141	Hormel Foods Corp.	I-6	1/5/1999	Industrial Transfer
423	Coleridge, Village of	MNI-22	1/22/2014	Municipal Notice of Intent
261	Waverly, City of	MT-13	9/12/2007	Municipal
262	Cuming County Rural Water District #1	MT-14	6/7/2006	Municipal
263	Pierce, City of	MT-15	7/12/2007	Municipal
264	Madison, City of	MT-16	1/11/2007	Municipal
268	Papillion, City of	MT-18	11/6/2018	Municipal
284	Louisville, City of	MT-23	9/29/2006	Municipal
332	Wayne, City of	MT-24	7/12/2007	Municipal
351	Palmer, Village of	MT-27	10/5/2007	Municipal
375	Broken Bow, City of	MT-35	11/30/2009	Municipal
391	Waverly, City of	MT-38	2/25/2011	Municipal
473	Archer Daniels Midland Company and Vantage Corn Processing, LLC	I-25	5/1/2020	Industrial Transfer

### 3. NeDNR Surface Water and Groundwater Permitting Activities

#### A. Surface Water Permitting Activity

*Details of surface water permitting activities are provided in Table 8 through Table 16. To summarize, the following surface water permitting activities occurred in 2022:*

- Irrigation (IR) – Four permits were approved within the Basin. A total of ten permits were cancelled in full and four were cancelled in part.
- Manufacturing Permits (MF) – Five temporary (one year) manufacturing permits were approved in the basin. There were no permits approved outside the Basin. Three manufacturing permits from 2021 expired in 2022.
- Municipal Permits (MU) – One permit was granted in the Papio-Missouri River NRD.
- Storage-Only Permits (SO) – Within the Basin no permits were approved. One permit was approved outside the Basin, and four were cancelled in part.
- Storage Permits (ST) – Within the Basin, two permits were granted. One permit was approved outside the Basin. One permit was cancelled.
- Supplemental Irrigation (SI) – One permit was granted, and one was cancelled in part.
- Transfers – Eight expedited transfers were approved within the Basin and no non-expedited transfers.
- Irrigation District Filings–Twin Loups Reclamation District filed 19 Relinquishments and 18 Reassignments. Loup Basin Reclamation District filed three Relinquishments and Reassignments.
- District Transfers – Two transfers were approved: Sargent Irrigation District and Farwell Irrigation District.
- Instream Flow (IF) – Four permits were approved within the Basin.
- Domestic (DO) – Two permits were approved within the Basin.

### **New Surface Water Appropriations Granted in 2022**

Table 8 contains the surface water applications approved from January 1, 2022, to December 31, 2022, within the Lower Platte Basin Coalition NRDs and the area within the Lower Platte Basin. Permit use codes within the table are as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation
- MF (Manufacturing) is a permit to divert water for manufacturing, construction, or industrial uses
- ST (Storage) is a permit to store water
- SI (Supplemental Irrigation) is a permit to divert water from a reservoir for irrigation, on lands that are covered by a natural flow application
- IF (Instream Flow) is a permit to augment or maintain the natural flow in a stream
- DO (Domestic) is a permit to divert water for domestic use

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Table 8. Surface water applications approved in 2022 within the Lower Platte River Basin

Surface Water Applications Approved January 1, 2022 to December 31, 2022									
NRD	Appropriation Number	Date Approved	Source	Diversion/ Reservoir Location	Use	Grant (cfs)	Grant in af	Acres	New Acres
Lower Loup	A-19850	6/23/2022	Trib. to Oak Creek	S15 T14N-R12W	DO	0.11	NA	0.1	N/A
	A-19548A	5/24/2022	Loup River	S18 T15N-R09W	IF	1700	NA	NA	N/A
	A-19548B	5/24/2022	Loup River	S18 T15N-R09W	IF	2400	NA	NA	N/A
	A-19548C	5/24/2022	Loup River	S18 T15N-R09W	IF	1700	NA	NA	N/A
	A-19548D	5/24/2022	Loup River	S18 T15N-R09W	IF	1600	NA	Na	N/A
	A-19792	6/29/2022	Middle Loup River	S26 T13N-R12W	IR	1.03	NA	72.2	72
	A-19798	7/19/2022	Middle Loup River	S10 T19N-R18W	IR	0.5	NA	35	35
	A-19830	6/10/2022	Trib. to Turkey Creek	S23 T14N-R11W	IR	0.23	NA	16	16
	A-19856 / A-19855 <sup>1</sup>	9/22/2022	9th Avenue Road Dam	S23 T14N-R11W	SI	NA	17.4	16	16
		9/22/2022	Trib. to Turkey Creek	S23 T14N-R11W	ST	NA	17.4	NA	N/A
A-19851	12/13/2022	Middle Loup River	S14 T18N-R17W	IR	1.37	NA	95.8	95.8	
Lower Platte South	A-19828 <sup>2</sup>	3/23/2022	Trib. to Salt Creek	S01 T08N-R06E	MF	NA	10	NA	NA
	A-19829 <sup>2</sup>	3/28/2022	Salt Creek	S01 T08N-R06E	MF	NA	10	NA	NA
	A-19841 <sup>2</sup>	4/21/2022	Branched Oak Lake	S32 T12N-R05E	MF	NA	10	NA	NA
	A-19832 <sup>2</sup>	4/25/2022	Oak Creek	S06 T11N-R06E	MF	NA	9.6	NA	NA
	A-19848 <sup>2</sup>	5/13/2022	Oak Creek	S06 T11N-R06E	MF	NA	9.6	118.4	NA
Papio-Missouri River	A-19861	8/30/2022	Trib. to Buffalo Creek	S01 T13N-R10E	ST	NA	18	NA	N/A
Upper Elkhorn	A-19842	6/1/2022	Elkhorn River	S11 T29N-R14W	DO	0.11	NA	0.1	0.1

<sup>1</sup> Appropriation Numbers A-19856 and A-19855 are associated storage and supplemental irrigation rights.

<sup>2</sup> A-19828, A-19829, A-19841, A-19832 and A-19848 are temporary permits that will expire one year from approval date.

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Table 9 provides a listing of new surface water applications that were approved within the seven NRDs in calendar year 2022 but are outside of the Lower Platte Basin. While the permits do not count as new uses within the Basin, these are included to meet the reporting requirements for those NRDs' Integrated Management Plans.

*Table 9. Surface water applications approved in 2022 outside of the Basin*

Surface Water Applications Approved between January 1, 2022, to December 31, 2022 (Outside of the Lower Platte River Basin but Within Coalition NRDs)								
NRD	Appropriation Number	Date Approved	Source	Diversion/ Reservoir Location	Use	Grant (cfs)	Grant (af)	Acres
Lower Platte South	A-19749	1/14/2022	Schlichtemeier Reservoir No. 1	S28 T11N-R13E	SO	NA	20.8	NA
Papio-Missouri River	A-19862	8/2/2022	Missouri River	S05 T18N-R12E	MU	12.48	NA	NA
	A-19858	7/19/2022	East Knight Creek	S14 T16N-R12E	ST	NA	5	NA



## Expired and Cancelled Surface Water Appropriations in 2022

Table 10 provides a listing for Basin surface water appropriations that expired, were cancelled in full, or cancelled in part in 2022. Table 11 lists any expired or cancelled appropriations that are outside of the Lower Platte River Basin but within Coalition NRDs. NeDNR must follow statutory requirements when proceeding with any cancellation, in full or in part, of a surface water appropriation. The “Basis for Action” columns in both tables pertain to one of the authorities listed below.

- BUC (Beneficial Use Cancellation): The field offices investigate all new appropriations after the time period given in the approval order to perfect the water right. If for any reason the appropriation had not been perfected, and water has not been put to beneficial use as stated in the approval order, it may be cancelled in full or in part.
  - Authority upon which the action was based: *Neb. Rev. Stat. §46-229.02(7)* “A water appropriation that has not been perfected pursuant to the terms of the permit may be canceled by the department without complying with sections 46-229.01 to 46-229.04 if the owner of such appropriation fails to comply with any of the conditions of approval in the permit, except that this subsection does not apply to appropriations to which subsection (2) of section 46-237 applies.”
- PDNU (Preliminary Determination of Non-use): After a field investigation found the appropriation had not been used in the last five years, and the owner did not successfully contest the preliminary determination of nonuse.
  - Authority upon which the action was based: *Neb. Rev. Stat. §§ 46-229.02(1) through 46-229.02(6)* which state that if the NeDNR makes a preliminary determination that an appropriation has not been used for more than five consecutive years, and the owner of said appropriation does not successfully contest the determination, then NeDNR may cancel said appropriation in whole or in part.
- REL (Relinquishment): Appropriator filed a voluntary relinquishment of water appropriation.
  - Authority upon which the action was based: Department of Natural Resources *Rules for Surface Water, Neb. Admin. Code. Title 457, Chapter 3*, which specifies that any appropriation, or part of any appropriation, may be voluntarily relinquished.
- Temporary permits: Temporary permits may not be granted for a term of more than one year. These permits expire one year from the order date and are cancelled without further action by the Department as of that date.

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Table 10. Expired or cancelled surface water appropriations in 2022 within the Lower Platte River Basin

Surface Water Appropriations Expired, Cancelled in Full or Cancelled in Part from January 1, 2022 to December 31, 2022												
NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Diversion Location	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Cancelled Grant (af)	Estimated Last Use	Basis for Action
Lower Elkhorn	A-15865	7/27/2022	Logan Creek	Cancelled in Full	S12 T27N- R04E	IR	320.8	320.8	4.58	N/A	1994	PDNU-9666
	A-19752	3/16/2022	Trib. to South Logan Creek	Expired	S26 T26N- R01E	MF	N/A	N/A	0.89	N/A	2021	TEMP
Lower Loup	A-3939	1/28/2022	Middle Loup River	Cancelled in Full	S10 T19N- R19W	IR	56.5	56.5	N/A	0.5	2000	PDNU-9454
	A-4273	8/5/2022	Mud (Beaver) Creek	Cancelled in Full	S11 T14N- R17W	IR	63.6	63.6	0.53	N/A	2009	REL-9698
	A-9957	4/22/2022	Middle Loup River	Cancelled in Full	S09 T17N- R12W	IR	8.2	8.2	0.12	N/A	2021	REL-9623
	A-17361	8/26/2022	Cedar River	Cancelled in Full	S05 T20N- R10W	IR	57	57	0.81	N/A	2009	REL-9581
	A-3662R	2/25/2022	Cedar River	Cancelled in Full	S25 T19N- R08W	IR	81	81	0.58	N/A	1991	REL-9482
	A-19645	12/13/2022	Trib. to Elm Creek	Cancelled in Full	S18 T20N- R13W	SO	164.5	164.5	N/A	9.5	Never Used	BUC-9776
	A-19646	12/13/2022	Trib. to Elm Creek	Cancelled in Full	S18 T20N- R13W	ST	N/A	N/A	N/A	9.5	Never Used	BUC-9777
	A-4628R	10/27/2022	Calamus River	Cancelled in Part	S06 T21N- R16W	IR	244.2	88.5	1.15	N/A	1995	PREL-9632

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NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Diversion Location	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Cancelled Grant (af)	Estimated Last Use	Basis for Action
	A-13625A	8/30/2022	Loup River	Cancelled in Part	S06 T16N- R04W	IR	124	49	0.61	N/A	2021	EXT-9580
	A-19425	4/21/2022	Calamus Reservoir	Cancelled in Part	S06 T21N- R16W	SO	143.9	37.5	N/A	431.7	2017	PREL-9418
	A-19472	10/27/2022	Calamus Reservoir	Cancelled in Part	S06 T21N- R16W	SO	133	2.3	N/A	399	2021	PREL-9641
	A-19477	5/3/2022	Sherman Reservoir	Cancelled in Part	S01 T15N- R14W	SO	340.2	38.5	N/A	273.6	2021	PREL-9625
	A-19621	3/2/2022	Calamus Reservoir	Cancelled in Part	S06 T21N- R16W	SO	431.2	101.5	N/A	1293.6	2018	BUC-9540
Lower Platte North	A-14265	11/9/2022	Wilson Creek	Cancelled in Full	S11 T16N- R01E	IR	83.6	83.6	N/A	1.19	2000	REL-9775
Lower Platte South	A-19760	4/28/2022	Butch Cassidy Pond	Expired	S05 T08N- R07E	MF	N/A	N/A	N/A	10.00	2021	TEMP
	A-19765	4/28/2022	Trib. to Salt Creek	Expired	S05 T08N- R07E	ST	N/A	N/A	N/A	10.00	2021	TEMP
	A-19779	6/14/2022	Salt Creek	Expired	S01 T08N- R06E	MF	N/A	N/A	4.90	N/A	2021	TEMP
Upper Elkhorn	A-19678	3/1/2022	Trib. to Cedar Creek	Cancelled in Part	S22 T24N- R06W	IR	156.4	94	0.89	N/A	2021	REL-9545

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Surface Water Appropriations Expired, Cancelled in Full or Cancelled in Part from January 1, 2022 to December 31, 2022												
NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Diversion Location	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Cancelled Grant (af)	Estimated Last Use	Basis for Action
	A-19739A <sup>1</sup>	3/1/2022	Kerkman's Kove Reservoir	Cancelled in Part	S21 T24N-R06W	SI	156.4	94	N/A	177.2	2021	REL-9546
Upper Loup	A-2273	1/14/2022	Calamus River	Cancelled in Full	S25 T25N-R21W	IR	37	37	N/A	0.53	2021	REL-9484
	A-2263BR	5/12/2022	North Loup River	Cancelled in Full	S36 T23N-R21W	IR	100.74	100.74	0.72	N/A	2021	REL-9667
	A-2635B	5/12/2022	North Loup River	Cancelled in Full	S36 T23N-R21W	IR	100.74	100.74	0.72	N/A	2021	REL-9667
	A-19478	1/28/2022	Middle Loup River	Cancelled in Part	S32 T21N-R21W	IR	338.3	9.1	4.7	N/A	2018	BUC_9483

<sup>1</sup> A-19739A is associated with storage only (SO) permit A-19739B.

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*Table 11. Expired or cancelled surface water appropriations, outside of the Basin*

Surface Water Appropriations Expired or Cancelled from January 1, 2022 to December 31, 2022										Outside of Basin	
NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Location of Diversion	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Estimated Year of Last Use	Basis for Action
Papio-Missouri River	A-19746 <sup>1</sup>	3/25/2022	Missouri River	Expired	S23 T15N-R13E	MF	N/A	N/A	15.6	2022	Temp
Papio-Missouri River	A-19758 <sup>4</sup>	3/31/2022	Offutt AFB Base Lake	Expired	S07 T13N-R14E	MF	N/A	N/A	4.9	2022	Temp

<sup>1</sup> Permits A-19746 and A-19758 are temporary permits that will expire one year from approval date.

### Transferred Surface Water Permits in 2022

Table 12 summarizes the appropriation granted a “Non-Expedited” transfer, there were no occurrences in 2022 for this type of appropriation.

According to *Neb. Rev. Stat. 46-290(1)(a)* a “Non-Expedited Transfer” is restricted to the following: transfer of the originally stated location of such appropriation; change in the originally stated purpose of the appropriation; and in the use for which the water was originally appropriated.

Table 13 summarizes appropriations granted an “Expedited Transfer.” The permit use code used in Table 13 is defined as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation

According to *Neb. Rev. Stat. §46-291(1)* “Expedited Transfers” are restricted to the following but not limited to: appropriations that are for irrigation; no increase in the number of acres; location of use may only change to adjacent lands; and the point of diversion may not change significantly.

*Table 12. Appropriation(s) approved for a change of appropriation (non-expedited transfer)*

Surface Water Appropriations Approved for Non-expedited Transfer January 1, 2022 to December 31, 2022									
NRD	Permit Number	Approval Date	Source	Use	Diversion Location	Acres Transferred	Grant Transferred (cfs)	Increase in Acres?	Application Number
N/A									

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Table 13. Appropriations granted a location of use transfer (expedited transfer)

Surface Water Appropriations Approved for an Expedited Transfer from January 1, 2022 to December 31, 2022									
NRD	Permit Number	Approval Date	Source	Use	Diversion Location	Acres Transferred	Grant (cfs) Transferred	Increase in Acres?	Application Number
Lower Loup	A-3895	4/7/2022	Mud (Beaver) Creek	IR	S03 T12N-R15W	48.9	N/A	No	EXT-9541
	A-8961	3/23/2022	South Loup River	IR	S09 T12N-R14W	41.2	0.59	No	EXT-9551
	A-13625B	8/30/2022	Loup River	IR	S06 T16N-R04W	106	0.46	No	EXT-9580
	A-3200B	5/3/2022	Mud (Beaver) Creek	IR	S32 T15N-R17W	39.39	0.33	No	EXT-9589
	A-16935	4/22/2022	Mud (Beaver) Creek	IR	S11 T14N-R17W	62	0.89	No	EXT-9591
	A-3119	3/1/2022	Mud (Beaver) Creek	IR	S34 T13N-R15W	30	0.21	No	EXT-9598
	A-8388	5/11/2022	Mud (Beaver) Creek	IR	S34 T13N-R15W	82.2	0.68	No	EXT-9599
	A-18028B	8/30/2022	Loup River	IR	S06 T16N-R04W	116	0.81	No	EXT-9614

## Surface Water Irrigation District Filings with NeDNR

In 2022, the Twin Loups and Loup Basin Reclamation Districts filed twenty-two “Provisional Relinquishments and Reassignment of Acres” with NeDNR. These are listed in Table 14 and Table 15 and are grouped by water source in Table 16 and Table 17. Here, the Reclamation Districts are exercising the latitude provided by *Neb. Rev. Stat. § 46-229.04 (5)* to file, with NeDNR, provisional relinquishments and reassignments of district land. These reassignments must occur within five years after an order of cancellation issued by the department following the filing of a voluntary relinquishment of the water appropriation; to assign the right to use that portion of the appropriation to other land within the district or the area served by the company. The department shall be notified of any such assignment within thirty days after such assignment. Such appropriators are bound by all terms and conditions set forth in the appropriation, and in no way does this relinquishment/reassignment allow any increase in the number of acres irrigated by surface water. There were two district transfers within the Lower Platte Basin. Tables 16 and 17 summarize District Transfers DST-9495 and 9586<sup>1</sup>, respectively. No other types of transfers were acted upon in 2022.

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<sup>1</sup> Pursuant to *Neb. Rev. Stat. §§ 46-2,127 through 46-2,130* “After obtaining approval of an application for transfer and map pursuant to sections 46-2,122 to 46-2,126, the board of directors of any irrigation district, reclamation district, public power and irrigation district, rural water district, or mutual irrigation or canal company may transfer an appropriation of water distributed for agricultural purposes from a tract or tracts of land within the district or served by the company to another tract or tracts of land within the boundaries of the district or served by the company...” The Department does not issue an order for this action. The appropriator is responsible for following statutory requirements related to this type of transfer.



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Table 14. Twin Loups Reclamation District 2022 filings

Provisional Relinquishments and Reassignments Filed by Twin Loups Reclamation District							
Permit Number	Source	Provisional Relinquishment	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Reassignment	Acres Reassigned	Grant Reassigned
A-9642	Calamus River	PREL-9411	563	8.04	REA-9419	570.8	8.15
A-9642	Calamus River	PREL-9633	316.6	4.52	REA-9643	286.7	4.1
A-4628R	Calamus River	PREL-9632	135.7	1.01	REA-9642	135.7	1.01
A-19626BR	Calamus River	PREL-9696	100	1.43	REA-9697	91.8	1.13
A-19472	Calamus Reservoir	PREL-9641	2.3	N/A	REA-9650	2.3	N/A
A-19425	Calamus Reservoir	PREL-9418	7	N/A	REA-9426	7	N/A
A-18291	Davis Creek Reservoir	PREL-9417	4.6	N/A	REA-9425	4.6	N/A
A-18291	Davis Creek Reservoir	PREL-9640	64.4	N/A	REA-9649	64.4	N/A
A-18290	Calamus Reservoir	PREL-9416	199.1	N/A	REA-9424	199.3	N/A
A-18290	Calamus Reservoir	PREL-9639	92.1	N/A	REA-9648	70.4	N/A
A-17602	Calamus Reservoir	PREL-9415	405.2	N/A	REA-9423	412.8	N/A
A-17602	Calamus Reservoir	PREL-9638	237.5	N/A	REA-9647	216.3	N/A
A-17105	Davis Creek Reservoir	PREL-9414	102	N/A	REA-9422	102	N/A
A-17105	Davis Creek Reservoir	PREL-9637	56.1	N/A	REA-9646	56.1	N/A
A-15089	Calamus River	PREL-9413	41.3	0.59	REA-9421	41.3	0.59

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Provisional Relinquishments and Reassignments Filed by Twin Loups Reclamation District							
Permit Number	Source	Provisional Relinquishment	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Reassignment	Acres Reassigned	Grant Reassigned
A-15089	Calamus River	PREL-9636 <sup>1</sup>	13	0.19	N/A	N/A	N/A
A-15088	North Loup River	PREL-9412	604.3	8.63	REA-9420	612.1	8.74
A-15088	North Loup River	PREL-9635	329.6	4.71	REA-9645	286.7	4.1
A-10234R	Calamus River	PREL-9634	135.7	0.93	9644	135.7	0.93

Table 15. Loup Basin Reclamation District 2022 filings

Provisional Relinquishments and Reassignments Filed by Loup Basin Reclamation District, Farwell Irrigation District							
Permit Number	Source	Provisional Relinquishment	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Reassignment	Acres Reassigned	Grant Reassigned
A-19477	Sherman Reservoir	PREL-9625	38.5	38.5	REA-9626	273.6	273.6
A-11111	Turkey Creek	PREL-9630	9	0.13	REA-9631	9	0.13
A-10454BR	Turkey Creek	PREL-9628	9	0.13	REA-9629	9	0.13

<sup>1</sup> Provisional Relinquishment PREL-9636 has no reassignment on file.

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*Table 16. Twin Loups Reclamation District's 2022 filings grouped by water source*

Twin Loups Reclamation District Provisional Relinquishments and Reassignments Filings by water source				
Water Source	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Acres Reassigned	Grant Reassigned
Calamus River	1305.3	16.71	1262	15.91
Calamus Reservoir	943.2	N/A	908.1	N/A
Loup River, North	933.9	13.34	898.8	12.84
Davis Creek Reservoir	227.1	N/A	227.1	N/A
Sherman Reservoir	38.5	38.5	273.6	273.6
Turkey Creek	18	0.26	18	0.26

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*Table 17. Loup Basin Reclamation District's 2022 filings grouped by water source*

Loup Basin Reclamation District Provisional Relinquishments and Reassignments Filings by water source				
Water Source	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Acres Reassigned	Grant Reassigned
Sherman Reservoir	38.5	38.5	273.6	273.6
Turkey Creek	18	0.26	18	0.26

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*Table 18. District Transfer Approved by the Loup Basin Reclamation District, Sargent Irrigation District*

District Transfer DST-9495: Approved on March 8, 2022 by Loup Basin Reclamation District, Sargent Irrigation District				
Associated Permit Numbers	Use	Source	Total Number of Acres Transferred Out	Total Number of Acres Transferred In
A-4841A	IR	Loup River, Middle	32.6	32.6
A-12433	IR	Loup River, Middle		
A-12632	IR	Loup River, Middle		
A-15029	IR	Loup River, Middle		
A-16498	IR	Loup River, Middle		
A-18421	IR	Loup River, Middle		
A-10260C	SI	Sherman Reservoir		
A-15007	SI	Sherman Reservoir		
A-16499	SI	Sherman Reservoir		
A-16500	SI	George Semler Reservoir		

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Table 19. District Transfer Approved by the Loup Basin Reclamation District, Farwell Irrigation District

District Transfer DST-9495: Approved on June 15, 2022 by Loup Basin Reclamation District, Farwell Irrigation District				
Associated Permit Numbers	Use	Source	Total Number of Acres Transferred Out	Total Number of Acres Transferred In
A-4423	IR	Middle Loup River	185.7	185.7
A-4423A	IR	Middle Loup River		
A-5710	IR	Middle Loup River		
A-10470	IR	Middle Loup River		
A-15660	IR	Turkey Creek		
A-16399	IR	Middle Loup River		
A-16806	IR	Middle Loup River		
A-17306	IR	Middle Loup River		
A-18310	IR	Middle Loup River		
A-10260A	SI	Sherman Reservoir		
A-16400	SI	Sherman Reservoir		
A-16814	SI	Sherman Reservoir		
A-17307	SI	Sherman Reservoir		
A-18311	SI	Sherman Reservoir		

## B. Groundwater Permitting Activity

The following is a listing of all the types of groundwater permits authorized by statute to be issued by NeDNR. In 2022, NeDNR had no groundwater permitting activity within the Basin for the following uses:

- Application to Drill Without Regard to Spacing –No cancellations or new permits issued
- Industrial Groundwater Transfers –No cancellations or new permits issued
- Industrial Transfer Notice –No cancellations or new permits issued
- Municipal Groundwater Transfers –No cancellations or new permits issued
- Municipal Notice of Intent –No cancellations or new permits issued
- Permit to Violate Well Spacing –No cancellations or new permits issued
- Permit to Transfer to Adjoining State –No cancellations or new permits issued

## 4. Estimated Stream Depletions for New Surface Water Permits

The Plan provides an overview of the agreed-upon methodology to calculate stream depletions for newly permitted irrigated acres. NeDNR calculated stream depletions for new surface water uses and acres using this methodology. More details on the new permits are provided above in Chapter 3, Table 8.

The net stream depletion estimates by NRD are provided in Table 20. For permits with new acres, the Net Irrigation Requirement (NIR), based on corn, was applied. For the new acres within the Basin, the NIR was calculated using the average Statewide values from 2018. All permits with a use of "SO" are to divert water from a reservoir for irrigation; therefore, depletions to streamflow are considered to occur in the non-peak season.

The permit use codes shown in Table 20 are defined as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation;
- MF (Manufacturing) is a permit to divert water for manufacturing, construction, or industrial uses;
- SO (Storage-only) Irrigation from a reservoir on lands not covered by a natural flow appropriation ;
- ST (Storage) is a permit to store water;
- SI (Supplemental Irrigation) is a permit to divert water from a reservoir for irrigation, on lands that are also covered by a natural flow appropriation.

Table 21 shows accretions that occurred in 2022. Accretions may be due to 1) any new permits reported in 2016 or later but since expired or were canceled, or 2) other permits that were granted but not used since the plan implementation date. Table 22 provides a summary of depletions and accretions that were reported between the years 2016 through 2021, during the first increments of the plan. Table 23 provides the summary of the depletions and accretions that have occurred thus far in the second increment of the Plan.



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Table 20. Estimated stream depletion by NRD for newly permitted surface water uses and acres

Estimated Stream Depletion for New Surface Water Permits between January 1, 2022 and December 31, 2022								
NRD	Permit Number	Use	Source	Net Irrigation Requirement (In)	Permitted Acres	Annual Consumptive use in acre feet (af)	Peak Season Depletion (af)	Non-Peak Season Depletion (af)
Lower Loup	A-19792	IR	Middle Loup River	8.19	72.2	72.2*8.19 = 591.318 ac-in	49.28	0
						591.318/12 = 49.28		
	A-19798	IR	Middle Loup River	8.31	35	35*8.31 = 290.85 ac-in	24.23	0
						290.85/12 = 24.23		
	A-19830	IR	Trib. To Turkey Creek	6.26	16	16*6.26 = 100.16 ac-in	8.34	0
						100.16/12 = 8.34		
A-19855 / A-19856 <sup>1</sup>	ST / SI	Trib. To Turkey Creek	Grant = 17.40 af	N/A	17.40 af	0	17.4	
A-19851	IR	Middle Loup River	8.03	95.8	95.8*8.03 = 769.27 ac-in	64.11	0	
					769.27/12 = 64.11			
Lower Platte South	A-19828 <sup>2</sup>	MF	Trib. to Salt Creek	Grant = 10.0 af	N/A	10	10	0
	A-19829 <sup>8</sup>	MF	Salt Creek	Grant = 10.0 af	N/A	10	10	0
	A-19841 <sup>3</sup>	MF	Branched Oak Lake	Grant = 10 af	N/A	10	0	10
	A-19832 <sup>8</sup>	MF	Oak Creek	Grant = 9.6 af	N/A	9.6	9.6	0
	A-19848 <sup>8</sup>	MF	Oak Creek	Grant = 9.6 af	N/A	9.6	9.6	0
Papio-Missouri River	A-19861	ST	Trib. To Buffalo Creek	Grant = 18.0 af	N/A	18	0	18
<b>Total</b>							<b>185.16</b>	<b>45.4</b>

<sup>1</sup> Appropriation Numbers A-19856 and A-19855 are associated storage and supplemental irrigation rights.

<sup>2</sup> Permits A-19828, A-19829, A-19832 and A-19848 are temporary permits that expire one year after the approval date.

<sup>3</sup> A-19841 is a temporary permit for the Nebraska Game & Parks Commission and will expire one year after the approval date. Is for the construction of a wastewater lagoon.

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Table 21. Estimated accretions for previously taken depletions that no longer occur<sup>1</sup>

Estimated Stream Accretions (Corrections) for Previously Taken Depletions that No Longer Occur									
NRD	Permit Number	Use	Source	Acres	WR Approval Year	Estimated Last Use	Original Depletion Peak/Non-Peak (af)	Resulting Stream Accretion (af)-Peak	Resulting Stream Accretion (af)-Non-Peak
Lower Elkhorn	A-19752 <sup>2</sup>	MF	Trib. to South Logan Creek	N/A	2021	2022	10	10	
Lower Loup	A-19645	SO	Trib. To Elm Creek	164.5	2019	Never Used	9.5		9.5
	A-19646	ST	Trib. To Elm Creek	N/A	2019	Never Used	0		0
	A-2635B/ A-2263BR <sup>3</sup>	IR	North Loup River	100.74	1936/ 1932	2022	83.87	83.87	
Lower Platte South	A-19760	MF	Butch Cassidy Pond	N/A	2021	2022	10	10	
	A-19765	ST	Trib. to Salt Creek	N/A	2021	2021	10		10
	A-19779	MF	Salt Creek	N/A	2021	2022	10	10	
<b>Total</b>								<b>113.87</b>	<b>19.5</b>

<sup>1</sup> Note that not all cancelations, relinquishments, and transfers result in attributable accretions. Estimated last use based on field checks, satellite imagery review, landowner statements, etc. may be used to determine eligibility.

<sup>2</sup> Permits A-19752, A-19760 and A-19779 are temporary permits that expire one year after approval date.

<sup>3</sup> Result of a transfer from surface water to groundwater. Both surface water permits covered the same ground. Assigned surface water accretion to LLNRD as it is tracking the subsequent groundwater depletion.

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Table 22. 2016 to 2021 estimated surface water stream depletions and accretions

2016-2021 Estimated Stream Depletions and Accretions for New Surface Water Permits																		
NRD	2016-2017		2018		2019				2020				2021				Net Total Depletions <sup>1</sup>	
	Depletions		Depletions		Depletions		Accretions		Depletions		Accretions		Depletions		Accretions			
	Peak	Non-Peak <sup>2</sup>	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak
Lower Elkhorn	117	NA	97	0	70	60	0	0	0	0	103.6	0	94.65	0	0	0	<b>275</b>	<b>60</b>
Lower Loup	0	NA	228 <sup>3</sup>	0	130	638	0	0	46	339	0	0	45.91	13.63	10.0	0	<b>440</b>	<b>991</b>
Lower Platte North	0	NA	0	0	0	0	0	0	0	61	0	0	7.48	0	0	0	<b>7</b>	<b>61</b>
Lower Platte South	65	NA	10	0	0	0	10	0	2	18	0	0	14.90	10.00	2.0	0	<b>80</b>	<b>28</b>
Papio-Missouri River	67	NA	0.3	0	10	0	0	0	0	0	10.3	0	0	0	0	0	<b>67</b>	<b>0</b>
Upper Elkhorn	0	NA	0	0	0	0	0	0	85	0	0	0	0.39	0	0	0	<b>85</b>	<b>0</b>
Upper Loup	118	NA	345.32	89.41	0	0	65	0	9	0	38	89	0	0	0	0	<b>369</b>	<b>0</b>
<b>Basin Total</b>	<b>367</b>	<b>NA</b>	<b>681</b>	<b>89</b>	<b>210</b>	<b>698</b>	<b>75</b>	<b>0</b>	<b>142</b>	<b>418</b>	<b>152</b>	<b>89</b>	<b>163</b>	<b>24</b>	<b>12</b>	<b>0</b>	<b>1324</b>	<b>1140</b>

<sup>1</sup> Net total depletions by NRD and by Basin have been rounded to the nearest whole number, after calculations.

<sup>2</sup> Non-Peak season depletions were not calculated for the 2016-2017 report for any of the new surface water uses in any NRD and have not been evaluated at this point in time.

<sup>3</sup> Corrected peak annual depletions based on review of past data. Previously reported as 305 AF in 2019 report due to correction of acres. Underlined totals reflect this change.

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*Table 23. 2022 estimated surface water stream depletion and accretions*

2022 Estimated Stream Depletions and Accretions Summary						
NRD	2022				Net Total Depletions	
	Depletions		Accretions			
	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak
Lower Elkhorn	0	0	10	0	-10	0
Lower Loup	145.97	17.4	83.87	9.5	62.1	7.9
Lower Platte North	0	0	0	0	0	0
Lower Platte South	39.2	10	20	10	19.2	0
Papio-Missouri River	0	18	0	0	0	18
Upper Elkhorn	0	0	0	0	0	0
Upper Loup	0	0	0	0	0	0
<b>Basin Total<sup>1</sup></b>	<b>185</b>	<b>45</b>	<b>114</b>	<b>20</b>	<b>71</b>	<b>26</b>

<sup>1</sup> Net Basin Totals have been rounded to the nearest whole number, after calculations.

## 5. Basin Plan Implementation: Research, Projects, and Studies

### A. Coalition annual reporting database

One of the most important aspects of Basin management is annual reporting and data sharing between Basin NRDs and NeDNR. Since development of the Basin Plan, the Coalition has been working with HDR, Inc. to create an annual reporting database and tools to improve consistency of data storage and data sharing between Coalition members<sup>1</sup>. The database and tools will help standardize the reporting of new uses and will thus ensure data integrity and transferability between sources. The integrated groundwater and surface water database will be an asset to future analyses of Basin water uses and water supplies, including determining allowable depletions for future Basin Plan increments, and aiding data assimilation for the Plan's 5-year comprehensive review.

The tool is being designed with added capabilities to assist NeDNR in reporting Basin and statewide of non-irrigation water use for the USGS Water Census. As such, the USGS has provided grant funding towards tool development. Having an annual reporting database with the flexibility and capabilities for multiple purposes helps to reduce redundancy as many reporting initiatives have overlapping components. NeDNR expects to receive the database in Spring 2023 and begin beta-testing.

### B. Groundwater modeling and studies

#### Lower Platte Missouri Tributaries (LPMT) Model and Studies<sup>2</sup>

##### Regional LPMT Model Development

In December 2018, NeDNR published the Lower Platte Missouri Tributaries (LPMT) regional groundwater model which covers the northern and central portions of eastern Nebraska and covers 1960 to 2013. It is NeDNR's first numerical groundwater model for this region, and it provides a robust scientific basis to evaluate stream-aquifer interactions along the Lower Platte and Elkhorn Rivers and tributaries.

In 2022, NeDNR began work to extend the LPMT model through 2021. Additionally, weather data inputs from 2010-2021 will be sourced from PRISM grid locations, rather than from individual weather stations monitored through the High Plains Regional Climate Center. This change in inputs will reduce data gaps, both temporally and spatially, and will reduce the impacts of weather stations going decommissioned. Further, in 2023

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<sup>1</sup> Goal 1, Objective 2, Action Item A: Develop a standard data collection and reporting system for all NRDs in the Lower Platte River Basin for documenting water uses in the Basin.

<sup>2</sup> Goal 1, Objective 1.4, Action Item A: Utilize best available data and tools to develop refined extents of the hydrologically connected ground and surface waters in the Lower Platte River Basin.

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NeDNR plans to update the current model from MODFLOW-2005 to MODFLOW 6. This will facilitate development of sub-regional models and analysis with coupled model scenarios.

Below are descriptions of those projects.

Sub-regional Models

As part of the future development and update to the LPMT model, the NRDs are working to develop sub-regional models which could be coupled with the LPMT to produce regional and local analyses. The models are using locally gathered AEM data and then transforms that data into information that can be utilized by the LPMT regional groundwater model. The sub-regional models have a higher spatial resolution and use the LPMT as a reference. This, combined with the local Airborne Electromagnetic (AEM) interpreted data better informs on the aquifer properties. In 2022, Lower Platte North, Lower Platte South and Papio-Missouri Tributaries NRDs applied for funding for these projects from the Water Smart and Water Sustainability Funds.

Lower Elkhorn NRD Modeling and AEM Investigation

The LENRD and the NeDNR has completed a contract with JEO Consulting Group (JEO) to develop a district-wide groundwater model that incorporates AEM hydrogeologic data previously collected by the NRD and Eastern Nebraska Water Resources Assessment (ENWRA). The, AEM data interpretation, and development, calibration, and publication of the Lower Elkhorn NRD sub-regional model have been completed. Currently the NeDNR is conducting a cycle well analysis to create a stream depletion map using this model.

Lower Platte North NRD Modeling and AEM Investigation

In 2022, progress was made in generating new inversions of raw AEM data, and multiple point statistics were used to generate a hydrologic framework for the model. At this time, a groundwater model is being constructed within this framework, while utilizing inputs from the (LPMT) regional model. This LPNNRD AEM-refined groundwater model is scheduled for completion in Spring 2023.

Papio-MR NRD & LPNNRD Modeling and AEM Investigation

In Spring 2022, the Papio-Missouri River NRD, Lower Platte North NRD, and NeDNR completed work with the contractor LRE to develop a hydrologic framework based on AEM flight data within the two NRDs. This work utilized the same methodology as the LENRD hydrologic framework. This project provides a basis for the sub-regional modeling effort in these NRDs.

Lower Platte South AEM Hydrogeologic Framework Project

In December 2021, LPSNRD received notification that the Natural Resources Commission had approved the District's application for a Water Sustainability Fund (WSF) grant in the amount of \$247,500 for the "Lower Platte South NRD Three-Dimensional Hydrogeologic Framework Project." This grant will be matched by \$165,000 of LPSNRD funds to bring the total project cost to \$412,500 (60% WSF, 40% LPSNRD) for the two-year project.

This project represents the next step in utilization of the airborne electromagnetic (AEM) data collected by the Lower Platte South NRD and other Districts (especially those involved in ENWRA) since 2006 and builds on experience and knowledge gained in the past few years by other NRDs such as Lower Elkhorn, Papio-Missouri River, and Lower Platte North, in similar projects. It will result in a three-dimensional geologic framework for the entire LPSNRD with emphasis on priority aquifers and Wellhead Protection Areas, will prepare existing AEM and other datasets for entry into advanced numerical groundwater models, and will provide a detailed set of recommendations for additional work and analysis.

### C. Drought Planning

In 2022, NeDNR continued participation in the statewide drought plan, led by the Department of Agriculture, and assisted in drought planning efforts throughout the state. Upper Loup NRD worked in conjunction with JEO Consulting Group to finalize and publish their drought management plan. The drought management plan is located on the Upper Loup NRD website: [Drought Mitigation Plan – Upper Loup Natural Resources District \(upperloupnrd.org\)](https://www.upperloupnrd.org). Lower Loup NRD also worked in conjunction with JEO Consulting Group to finalize and publish their drought management plan. The drought management plan is located on the Lower Loup NRD website: [Drought Mitigation Plan – Lower Loup Natural Resources District \(llnrd.org\)](https://www.llnrd.org).

In addition to participating in the Lower Platte River Consortium, NeDNR continues to be available for NRD individual drought plan implementation. In 2022, the Coalition decided to assemble a review of the existing drought actions in the Lower Platte River Basin. NeDNR received and incorporated feedback from the NRDs on the drought review.

#### **Lower Platte River Consortium<sup>1</sup>**

In 2016, Lower Platte South NRD, Lower Platte North NRD, Papio-Missouri River NRD, Omaha Metropolitan Utilities District, Lincoln Water System, and NeDNR entered an Interlocal Cooperative Agreement (ILCA) to form the Lower Platte River Consortium (Consortium). In 2019, the Consortium finalized the Lower Platte River Drought Contingency Plan (LPRDCP). The LPRDCP establishes a framework for coordination and communication amongst Consortium members to address drought across the Lower Platte River Basin. Information regarding the Lower Platte River Drought Contingency Plan is available here: [Lower Platte River Drought Contingency Plan – Lower Platte River Basin](https://www.lowerplatte.org).

In Spring 2022, the Consortium members coordinated to publish press releases encouraging the public to conserve water. A similar press release is planned for Spring 2023 due to ongoing drought conditions in the Basin.

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<sup>1</sup> Goal 1, Objective 1.5-Evaluate variations in water inventory due to climate cycles, and Goal 2, Objective 1-Collaborate with state and local governments to identify opportunities to augment water supplies within the Lower Platte River Basin.

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In 2022, NeDNR continued to update the Lower Platte Drought Monitoring Dashboard. Additions included Platte River cameras from the USGS Hydrologic Imagery Visualization and Information System (HIVIS) and a new Monthly Climate Updates page containing temperature and precipitation records for the previous month. Improvements to performance, data sources, and data representation were made throughout the year. The dashboard can be accessed at: [Lower Platte Drought Monitoring Dashboard](#).