

Water Committee Meeting
 Wednesday, August 30, 2023 6:00 PM
 Lower Platte North NRD Office
 P.O. Box 126
 Wahoo, NE 68066

1. UNFINISHED BUSINESS

2. REGULATORY

2.A. GROUND WATER MANAGEMENT AREA

2.A.1. Variance Request in the Hydrologically Connected Area (Limited Development Area)
 Deadline for applications is September 15.

2.A.2. Variance Requests in the Non-Hydrologically Connected Area (Normal Development Area)

The District received 4 applications for new irrigated acres in the Non-Hydrologically Connected Area (NHCA) totaling 68.267 acre feet of new depletion, consisting of 385 acres. Under LPNNRD's Groundwater Management Rules & Regulations, the Board can annually approve up to 75 acre feet of new depletion in the NHCA. Attached is the application list.

2.A.3. Well Permit Program

2.A.3.a. Well Permits Approved

Wells Permits Approved: #

Landowner	Number of Wells	Number of New Irrigated Acres	Type of Well

The total number of approved permits for 2023 is #

Location of Approved Well Permits for 2023: Correct as of #####

County	Irrigation - New	Irrigation - Replacement	Stock
Butler			
Colfax			
Dodge			
Boone			
Madison			
Platte			
Saunders			
Total			

2.A.4. Irrigation Runoff Complaint

2.A.5. Supplemental Well Permit

Jamie Yindrick for David and Jerry Proskovec has applied for a third well on the NW1/4 S2-16N-3E, Butler County. This is the tract of land that LPNNRD approved a transferred of irrigated acres last year..

Attached is a map showing the location.

Jamie was present at the Committee meeting and explained that between the 2 wells presenting the system is pumping about 300 GPM. The supplemental well will be a submersible well to increase the efficiency of the irrigation system. Discussion on the amount of water in the aquifer in that area and concerns about neighboring wells. It would be hard to determine if the new well would contribute any more or less to lowering the water table during pumping.

2.A.6. Flow Meter Discussion

Attached are some graphs and other information on water use within each aquifer sub region. A map showing meter locations and aquifer sub-areas which shows the diversity in the District. Jon Mohr from LRE and staff explained the diverse differences in saturated sands and confining and unconfining aquifers that lie within the District.

2.A.7. Special Quantity Subareas

2.A.8. Cost Share Programs

2.A.8.a. Irrigation Well Sample Kits

325 kits to producers so far in 2023. 251 of these have been returned - twelve of these were in today's mail (August 30, 2023).

2.A.9. Bellwood Phase 2 Area

2023 is the twenty-first year for this Phase 2 Area.

	Nitrate-nitrogen Range	Percent Nitrate-nitrogen 0 to 8.0 ppm	Percent Nitrate-nitrogen 8.01 to 10.00 ppm	Percent Nitrate-nitrogen 10.01 to 15 ppm	Percent Nitrate-nitrogen greater than 15 ppm
	0 to 25 ppm	46.3% (44 of 95)	8.4% (8 of 95)	45.3% (43 of 95)	
	0 to 25 ppm	47% (44 of 94)	15% (14 of 94)	38% (36 of 94)	
	0 to 24 ppm	41% (29 of 71)	14% (10 of 71)	45% (32 of 71)	
	0 to 31 ppm	48% (48 of 100)	9% (9 of 100)	43% (43 of 100)	
	0 to 28 ppm	53.75% (43 of 80)	7.5% (6 of 80)	38.75% (31 of 80)	
	0 to 22 ppm	45.5% (41 of 90)	15.5% (14 of 90)	39% (35 of 90)	
	0 to 35.7 ppm	48.65% (54 of 111)	11.71% (13 of 111)	39.64% (44 of 111)	
	0 to 26.6 ppm	51% (56 of 110)	6% (7 of 110)	43% (47 of 110)	
	0 to 28.9 ppm	57% (61 of 107)	9% (10 of 107)	34% (36 of 107)	

	0 to 25.8 ppm	50% (53 of 107)	9% (10 of 107)	14% (44 of 107)	26%
	0 to 22.3 ppm	51% (55 of 108)	13% (14 of 108)	18% (39 of 108)	20%
	0 to 32.3 ppm	43% (31 of 72)	8% (6 of 72)	14% (35 of 72)	33%
	0 to 35.1 ppm	34% (25 of 74)	11% (8 of 74)	26% (41 of 74)	26%
	0 to 23.5 ppm	36% (27 of 74)	15% (11 of 74)	19% (36 of 74)	22%
	0 to 30.9 ppm	40% (25 of 63)	11% (7 of 63)	22% (31 of 63)	28%
	0 to 24.5 ppm	46% (22 of 48)	10% (5 of 48)	28% (21 of 48)	22%
	0 to 20.5 ppm	33.33% (20 of 60)	13.33% (8 of 60)	35% (21 of 60)	18.33% (11 of 60)
	0.12 to 27.7 ppm	40.6% (26 of 64)	15.6% (10 of 64)	25% (16 of 64)	18.8% (12 of 64)
	0.13 to 23.0 ppm	43.75% (28 of 64)	12.50% (8 pf 64)	26.56% (17 of 64)	17.19% (11 of 64)
	0.34 to 13.3	60% (15 of 25)	20% (5 of 25)	20% (5 of 25)	----

35 more samples for this area have been returned - these are either at HHS Lab or are to be taken to HHS Lab.

2.A.10. Richland - Schuyler Phase 3 Area

2023 is the eighth year of this Phase 3 Area. This Phase 3 area went into effect September 1, 2015. The 55 sections of this area first went into a Phase 2 Area in 2004. The ten sections that were in Phase 2 are now in Phase 3. As such, the 2020, 2021 and 2022 numbers (at bottom of table) are for 65 sections.

Year	Nitrate-nitrogen Range	Percent Nitrate-nitrogen 0 to 8.0 ppm	Percent Nitrate-nitrogen 8.01 to 10.00 ppm
2004	0 to 47 ppm	30% (42 of 139)	10% (14 of 139)
2005	0 to 120 ppm	31.3% (74 of 236)	10.2% (24 of 236)
2006	0 to 53 ppm	28% (50 of 181)	14% (26 of 181)
2007	0 to 99 ppm	32% (75 of 231)	10% (22 of 231)
2008	0 to 46 ppm	28% (53 of 190)	12% (23 of 190)
2009	0 to 57 ppm	33% (72 of 216)	6% (13 of 216)
2010	0 to 57.5 ppm	31% (70 of 229)	7% (15 of 229)
2011	0 to 65.8 ppm	28% (67 of 241)	9% (21 of 241)
2012	0 to 52.6 ppm	29% (70 of 241)	9% (21 of 241)
2013	0 to 94.0 ppm	25% (63 of 252)	9% (23 of 252)
2014	0 to 101.0 ppm	27% (68 of 251)	9% (22 of 251)
2015	0 to 53.3 ppm	23% (55 of 238)	12% (29 of 238)
2016	0 to 50.5 ppm	25% (58 of 228)	10% (22 of 228)
2017	0 to 53.4 ppm	25% (60 of 238)	6% (14 of 238)
2018	0 to 56.9 ppm	26.5% (50 of 189)	6.3% (12 of 189)
2019	0 to 39.4 ppm	25% (53 of 209)	11% (22 of 209)
2020	0 to 50.8 ppm	26% (69 of 261)	6% (15 of 261)
2021	0 to 43.0 ppm	25.5% (67 of 263)	8.4% (22 of 263)
2022	0 to 58.5 ppm	23.0% (57 of 248)	6.45% (16 of 248)
2023	0 to 46.5 ppm	19% (20 of 106)	6% (6 of 106)

85 more samples from this area have been returned - these are either at HHS Lab or are to be taken to HHS Lab.

2.A.11. Lower Platte River Basin Water Management Plan Coalition (LPRBC)
Attached is an invoice for \$10,000 for Coalition dues.

The technical group met and discussed having NeDNR make the necessary updates on the database rather than contract it out. Each group will be

uploading data to test out the database. A discussion was held with each NRD reporting on the plan for adding new acres.

2.A.12. Voluntary Integrated Water Management Plan - LPNNRD

2.B. CHEMIGATION

For 2023 we have 641 renewals and 63 new permit applications for a current total of 704. 245 inspections have been completed. 8 currently remain and need to be inspected.

3. GROUND WATER PROGRAMS

3.A. DECOMMISSIONED WELL PROGRAM

3.A.1. Well Estimates

2 new wells have been reviewed and approved for decommissioning since the last Committee meeting.

Well Owner	Type of Well	Cost Share Estimate	County
Jack Barta	Irrigation	1067.80	Butler
Tim Wiese	Irrigation	1135.50	Platte

3.A.2. Plugged Wells

1 wells have been plugged, reviewed, and ready for cost share payment approval this month.

Well Owner	Type of Well	Cost Share Estimate	County
Jack Barta	Irrigation	1067.80	Butler

3.B. LOWER PLATTE NORTH NRD GROUND WATER STUDIES

3.B.1. Phase Area Update

Cost-share Invoices Received as of 8/29/2023:

Name	Location	Cost-share Item	Amount paid to producer	Amount Reimbursed by Grant
Oehlrich Farm	NW SW 20-17-2, Colfax	Flow Meter	\$1000	\$600
Oehlrich Farm	SW SE 23-17-2, Colfax	Flow Meter	\$1000	\$600
Gene Novak	SW SE 33-18-3, Colfax	Flow Meter	\$1000	\$600

Cost-share Applications as of 8/29/2023:

Application Types	Number of Applications	Approved Dollar Amounts
Flow Meters	62	\$62,000
Gravity/Pivot	2	\$20,000
Gravity to SDI	2	\$20,000
Cover Crops	3	\$1,190
Soil Moisture Sensros	3	\$2,250

LRE invoice for \$3,301.25 per contract on hydrological assessment project. Jon Mohr from LRE and LPN staff presented information on the assessment at the Committee meeting during a prior agenda item.

A research study conducted by UNL on the economic impact of farmland

prices on groundwater regulations is attached. The study concluded that groundwater regulations had no significant impact on farmland prices.

3.B.2. Regenerative Ag Conference

Attached is some information about a Regenerative Ag Conference at Concordia University on February 28, 2024. At the present time, 5 NRDs are hosting, including LPN, with each one being asked for a \$500 contribution for speaker and meal. Other sponsors will be contacted for sponsorship. Does LPN want to be a participating NRD?

The committee was not comfortable in making a recommendation as this subject has been discussed for numerous years with different names.

3.B.3. Lower Platte River Consortium

A call-in meeting for updates was held on September 7 at 10 am. Next meeting is October 17 at MUD west in Omaha.

3.C. Long Range Plan

Attached is the annual long-range plan with the plan to have approval at the Board Meeting.

4. SURFACE WATER PROGRAMS

4.A. USGS STREAM FLOW GAUGING SITES

Attached is an invoice from USGS for \$18,190 for Streamgages at Shell Creek near Columbus and Wahoo Creek at Ashland, and one real-time groundwater level monitoring site. The agreement that was approved at the February 2023 Board Meeting with USGS is attached.

An agreement from USGS for 2023-24 was received on September 5, 2023. The agreement attached is for October 1, 2023 to September 30, 2024 with the new amount with USGS for \$19,010.

5. OTHER

5.A. COMMENTS FROM THE PUBLIC

VarianceNumber	Applicant	ApplicantAlias	ApplicationType	County	SubArea	RankingRegion	RankingScore	Acres	Acre Feet	Section	Township	Range	RangeDir
LPN-V-023-0589	Larry J Scott		new	Saunders	Leshara Uplands	NHCA	382	125	21.71	26	17	7	E
LPN-V-023-0590	JS Acres, LLC	Jeff Scott	expansion	Saunders	Leshara Uplands	NHCA	422	60	7.587	36	17	7	E
LPN-V-023-0591	Eric Nelson		new	Saunders	Leshara Uplands	NHCA	443.2	125	23.82	24	16	8	E
LPN-V-023-0592	John Kremlacek		new	Saunders	Weston	NHCA	399.6	75	15.15	5	14	6	E
								385	68.267				

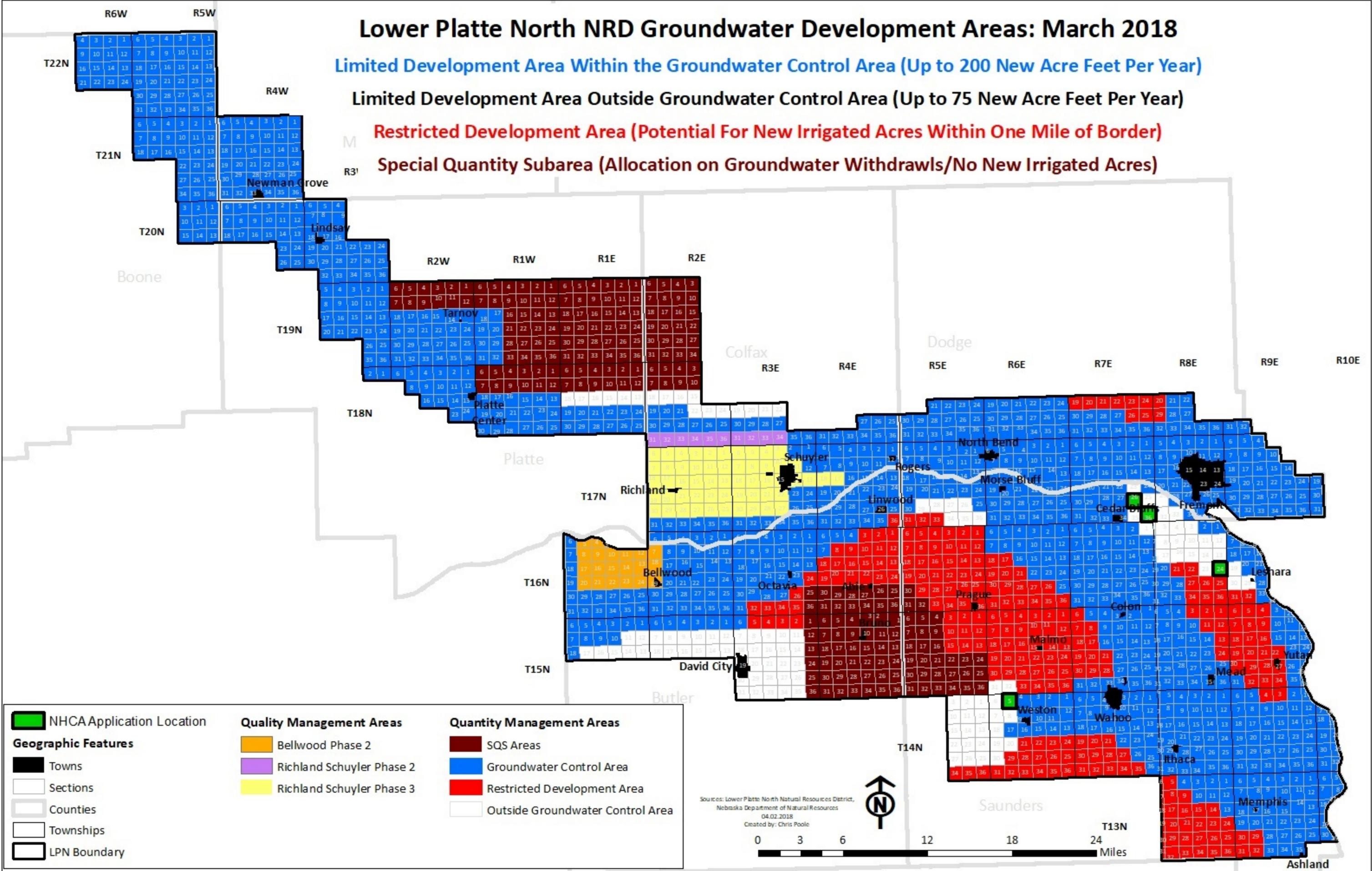
Lower Platte North NRD Groundwater Development Areas: March 2018

Limited Development Area Within the Groundwater Control Area (Up to 200 New Acre Feet Per Year)

Limited Development Area Outside Groundwater Control Area (Up to 75 New Acre Feet Per Year)

Restricted Development Area (Potential For New Irrigated Acres Within One Mile of Border)

Special Quantity Subarea (Allocation on Groundwater Withdrawals/No New Irrigated Acres)



NHCA Application Location	Quality Management Areas	Quantity Management Areas
Towns	Bellwood Phase 2	SQS Areas
Sections	Richland Schuyler Phase 2	Groundwater Control Area
Counties	Richland Schuyler Phase 3	Restricted Development Area
Townships		Outside Groundwater Control Area
LPN Boundary		

Sources: Lower Platte North Natural Resources District, Nebraska Department of Natural Resources
04.02.2018
Created by: Chris Poole



5. SPECIFICATIONS OF INTENDED WELL AND PUMP:

- A. Approximate date when construction will begin (month/day/year): Spring 2024
- B. Expected total well depth: 35 feet.
- C. Well Casing Diameter: ? inches.
- D. Pump Column Diameter: ? inches.
- E. Estimated pumping capacity: 100 to 200 GPM.
- F. Expected total annual water use in Acre Inches / Year _____ or Total Gallons / Year _____
- G. The system is to be powered by Electric Fuel Submersible.
- H. Will the well be used in a system with other wells? Yes. No. If Yes, How many 3 total
- List well registration number and legal description of each well in Section 6 below.
- I. Name of Well Driller: Sargent - Neligh (Please attach test hole log, if available.)

6. List additional information requested in this Section or attached additional sheet.

7. Addition information and requirements for Lower Platte North NRD review.

- Attach current tax assessor records including map, parcel number, and current land use such as irrigated acres.
- Attach aerial photo showing location of water source(s) and area water or reuse water is to be used.
- All new and replacement water wells must install a District approved flow meter and report water pumped annually to the LPNNRD by January 31st of the following year. See approved list in this packet.
- Water well permit conditions maybe required for approval by the Lower Platte North NRD for each individual well.

8. I certify that I am familiar with the information contained in this application, and it's restrictions, rules and regulations and that to the best of my knowledge and belief such information is true, complete and accurate.

Date _____ Signature of Applicant Jerry Pieskovic
Signature of Well System Operator, if different than Applicant _____
NRD Certification Number of Landowner or Operator _____ (Required for irrigation, livestock, domestic (with irrigation on one acre or more of land), industrial, and public water supply wells.)

9. Lower Platte North NRD Use Only. Comments by District Representative.



**VARIANCE REQUEST FOR
NEW WATER WELL IN A STAY MANAGEMENT AREA
OF THE LOWER PLATTE NORTH NRD (LPNNRD)**

Version 1.0 (Final) May 2008

VARIANCE REQUEST FOR IRRIGATED ACRES GREATER THAN 160 ACRES IN SIZE OR TOTAL ANNUAL WATER USE BETWEEN 150 AND 300 ACRE FEET PER YEAR, PROVIDE INFORMATION REQUESTED ON PAGES 1, 2, AND 3. (CLASS 3 VARIANCE)

10. WATER SOURCE INFORMATION:

In a TWO-mile radius around the water source location, provide the following information to the LPNNRD in both paper copy and electronically in Excel Spreadsheet (Microsoft) or Access Database (Microsoft) format.

- A. List of all registered wells in this area giving registration number, well identification number, legal description, latitude / longitude or UTM coordinates in NAD 83, elevation in feet above mean sea level, and well log for each well.
 - B. List of all test holes in the area that have been published by Conservation and Survey Division of the University of Nebraska.
 - C. List of all surface water rights in this area giving appropriation number, priority date, legal description, use, status, current total acres (if applicable), and grant amount.
-

11. WATER USE LOCATION INFORMATION:

In the location where the water will be used, provide the following information to the LPNNRD in both paper copy and electronically in Word (Microsoft) format.

- A. Description of expanded water use including: latitude / longitude or UTM coordinates in NAD 83 of water use location and timeframe or schedule when water will be used.
 - B. Amount of water that can be reused or recycled at this new location.
 - C. Description of how water will be used at this new location, i.e. process water vs. cooling water, etc.
-



VARIANCE REQUEST FOR NEW WATER WELL IN A STAY MANAGEMENT AREA OF THE LOWER PLATTE NORTH NRD (LPNNRD)

VARIANCE REQUEST FOR TOTAL ANNUAL WATER USE EQUAL TO OR GREATER THAN 300 ACRE FEET PER YEAR, REGARDLESS OF NUMBER OF IRRIGATED ACRES, PROVIDE INFORMATION REQUESTED ON PAGES 1, 2, AND 4. (CLASS 4 VARIANCE)

12. WATER SOURCE INFORMATION:

In a FIVE-mile radius around the water source location, provide the following information to the LPNNRD in both paper copy and electronically in Excel Spreadsheet (Microsoft) or Access Database (Microsoft) format.

- A. List of all registered wells in this area giving registration number, well identification number, legal description, elevation in feet above mean sea level, latitude / longitude or UTM coordinates in NAD 83, and well log for each well.
 - B. List of all test holes in the area that have been published by Conservation and Survey Division of the University of Nebraska.
 - C. List of all surface water rights in this area giving appropriation number, priority date, legal description, use, status, current total acres (if applicable), and grant amount.
-

13. WATER USE LOCATION INFORMATION:

In the location where the water will be used, provide the following information to the LPNNRD in both paper copy and electronically in Word (Microsoft) format.

- A. Description of expanded water use including: latitude / longitude or UTM coordinates in NAD 83 of water use location and timeframe or schedule when water will be used.
 - B. Amount of water that can be reused or recycled at this new location.
 - C. Description of how water will be used at this new location, i.e. process water vs. cooling water, etc.
-

14. AQUIFER PUMP TEST:

In the location of the proposed water source an aquifer pump test is to be performed to obtain geologic data that will be used in the ensuing ground water modeling effort. Data from the pump test is to be reported to the LPNNRD in both paper copy and electronically in Excel Spreadsheet (Microsoft) or Access Database (Microsoft) format.

- A. Description of pumping well should include legal description of well, latitude / longitude or UTM coordinates in NAD 83, elevation of well in feet above mean sea level, total amount of water pumped, gallons per minute during pump test, duration of pump test, well construction, well log, water discharge location and method.
 - B. Description of each monitoring well should include legal description of well, latitude / longitude or UTM coordinates in NAD 83, spacing in feet and direction from pumping well, elevation of well in feet above mean sea level, well log, and well construction.
 - C. Depth to bedrock, bedrock material, and name of geologic formation.
-

15. GROUNDWATER MODEL:

In a FIVE-mile radius of the location of the proposed water source a ground water model using MODFLOW software, or similar software approved by LPNNRD, is to be done. Data from the ground water model is to be reported to the LPNNRD in both paper copy and electronically using the appropriate software.

- A. Model should list boundary conditions used, grid size, include all high capacity wells in modeled area, streams and rivers in the modeled area, expected recharge rates, location and flow amounts, hydrologic conductivity and transmissivity values used.
 - B. At least one iteration, reviewed and approved by LPNNRD, should model steady state conditions over a five-year period with a no flow boundary, and little or no recharge to simulate drought conditions.
-

APPLICATION FOR A PERMIT TO CONSTRUCT A WATER WELL
IN THE LOWER PLATTE NORTH NATURAL RESOURCES DISTRICT

PURPOSE OF WELL

IRRIGATION WELLS (SECTION A)

- A. How many acres will be irrigated? _____ acres
B. Crops to be planted: Corn - Soybeans Crop rotation schedule 1/2 - 1/2 switched each year
C. Type of irrigation system. Center Pivot, ___ Gravity, ___ Other (specify) _____
D. The irrigation system is to be powered by Electric ___ Fuel
E. Expected total annual consumptive water use in Acre Inches / Year _____ or
Total Gallons / Year _____
F. Will Fertilizer, Chemicals or Animal waste be applied through the system? ___ Yes, No

DEWATERING WELLS OVER 30 DAYS (SECTION B)

- A. Purpose of dewatering well, such as installation of building foundation, etc. _____
B. Expected total number of days the dewatering well will be in use _____
C. Approximate dates (month/day/year) in operation: Start _____ End _____
D. Legal description of water discharge location: ___ 1/4 of the ___ 1/4 of Section ___, Township ___ North, Range ___ East/West and name of river, stream or water body _____
E. Will discharge water be used for another purpose, such as livestock, irrigation, etc.? ___ Yes, ___ No
If Yes, list purpose, location and expected total amount of water use in acre-inches / year or total gallons / year.

LIVESTOCK WELLS (SECTION C)

- A. Name of facility _____
B. Type of Livestock: ___ Feeder Cattle, ___ Dairy Cattle, ___ Swine over 55 lbs., ___ Swine under 55 lbs., ___ Sheep, ___ Poultry, ___ Horses
C. Average number of livestock per year _____ and average weight per animal _____ lbs.
D. Peak number of livestock _____ and time of year _____
E. Is facility approved by Nebraska Department of Environmental Quality? ___ Yes, ___ No. If Yes, list NDEQ certification IIS number _____. If No, complete the rest of this section.
F. Type of facility: ___ Open lot, ___ Covered Building
G. If facility is Open lot, list soil type _____
H. Estimated depth to ground water under feedlot _____ ft.
I. Describe manure collection system of feedlot _____

J. Name and distance of nearest surface watercourse from feedlot _____
K. For each manure land application site, list legal description and size in acres, method of application, and distance from feedlot operation. _____

DOMESTIC WELLS WITH IRRIGATION ON ONE ACRE OR MORE (SECTION D)

- A. Check all that apply:
a. Water use: ___ Lawn and number of acres to be irrigated _____ acres.
b. Water use: ___ Commercial garden and number of acres to be irrigated _____ acres.
c. Water use: ___ Tree Farm and number of acres to be irrigated _____ acres.
d. Water use: ___ Type of livestock _____ and number _____
B. Type of irrigation system. ___ Sprinkler, ___ Drip Tape, ___ Other (specify) _____
C. If applicable, give Street address and town _____

* One acre equals 43,560 square feet.

INDUSTRIAL AND COMMERCIAL WELLS**(SECTION E)**

- A. Name of facility _____
- B. Products produced by facility _____
- C. In Section 6 or on a separate sheet of paper, list well registration number and legal description of current wells supplying water to this facility.
- D. In Section 6 or on a separate sheet of paper, provide a short description how water is used within the facility and the expected annual amount of water for each use. For example: "The manufacturing plant will use 45% of total annual water use, or 1.45 million gallons per year, for electroplating of galvanized pipe and the remaining 55% of total annual water use, or 1.77 million gallons per year, will be used for non-contact cooling water throughout the plant".
- E. Will any of the used water or waste water from this facility be re-used for another purpose? Yes, No.
If Yes, list purpose, location and expected total amount of water use in acre-inches / year or total gallons / year.
- _____
- _____

PUBLIC WATER SUPPLY WELLS**(SECTION F)**

- A. On a separate sheet of paper, list the well registration numbers and legal description of current wells supplying water to this community.
- B. Attach a list of the five largest industrial water users that your community supplies water to, and the total annual amount of water supplied to each of these industries for the last five years.
- C. For these same industries list the total annual amount of water returned to the community as waste water for each of the last five years.
- D. Will waste water be used for another purpose, such as livestock, irrigation, etc.? Yes, No
If Yes, list purpose, location and expected total amount of water use in acre-inches / year or total gallons / year.
- _____
- _____
- E. Attach a list of the golf courses that the community supplies water to and list the location and number of acres for each one.

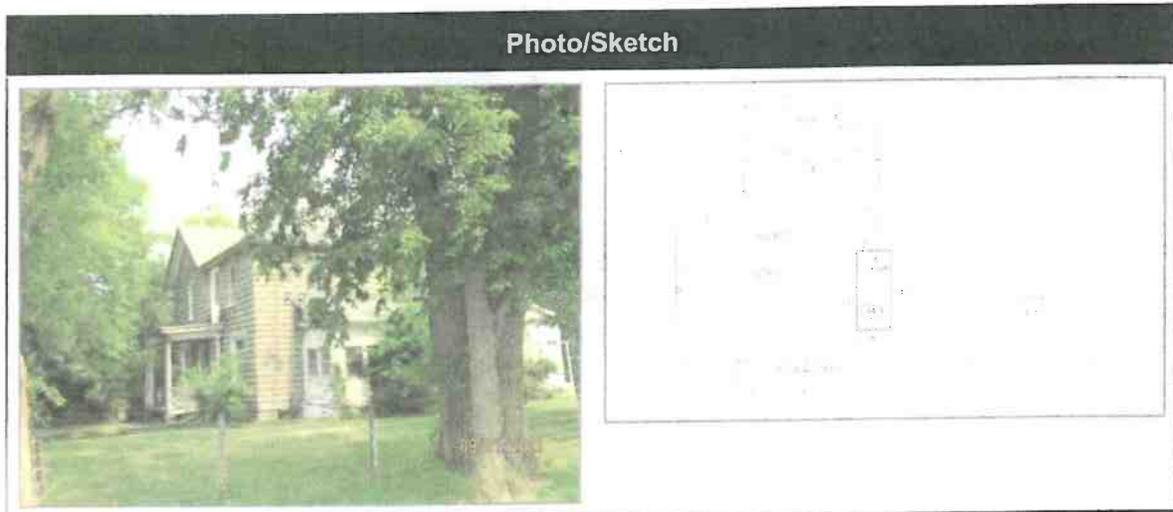
RECOVERY OR REMEDIATION WELLS**(SECTION G)**

- A. Reason for recovery or remediation well, i.e. leaking underground storage tank. _____
- B. Contaminates of concern _____
- C. Treatment method of contaminants _____
- D. Approximate dates (month/day/year) in operation: Start _____ End _____
- E. Legal description of water discharge location: _____ ¼ of the _____ ¼ of Section _____, Township _____ North, Range _____ East/West and name of river, stream or water body _____
- F. Will cleanup water be used for another purpose, such as livestock, irrigation, etc.? Yes, No
If Yes, list purpose, location and expected total amount of water use in acre-inches / year or total gallons / year.
- _____
- _____

OTHER WELLS**(SECTION H)**

- A. Purpose of water use _____
- B. Will the well be used for one calendar year or less? Yes, No
- a. If Yes, list approximate dates (month/day/year) the well will be in operation: Start _____
End _____
- b. If No, list the approximate dates (months) or seasons of the calendar year that well is expected to be in peak or highest use. _____
- C. Legal description of water discharge location: _____ ¼ of the _____ ¼ of Section _____, Township _____ North, Range _____ East/West and name of river, stream or water body _____

Outbuilding Data			
Description	Units	Year Built	Cost
STORAGE BIN	1,483		\$220
UT BLDG-CHICKEN	168		\$30
STORAGE BIN	3,679		\$540
STORAGE BIN	3,679		\$540
FRAME BARN	2,176		\$475
UTILITY BLDG.	840		\$230
QUONSET	2,400	1980	\$1,775
STORAGE BIN	1,090		\$55
DET GAR AVE CON	484		\$1,095
CATTLE SHED	360		\$350
MACH SHED>2000	2,400	1996	\$15,440
UTILITY BLDG.	80		\$35
UTILITY BLDG.	648		\$275
UTILITY BLDG.	484		\$205
CATTLE SHED	484		\$1,505
CATTLE SHED	392		\$915
UTILITY BLDG.	268		\$50
ASTRO SHED>2000	4,000	2010	\$34,190
CONCRETE PAD	300	2011	\$1,210
CATTLE SHED	392	2016	\$1,620
OPEN POLE/CATTLE SHED	400	2020	\$8,950



Agricultural Land Information					
<u>Soil Symbol</u>	<u>Landuse</u>	<u>LVG</u>	<u>Unit Value</u>	<u>Acres</u>	<u>Total Value</u>
FSL	FARM	FSL	\$5,500.00	5.060	\$27,830.00
FS	HOME	FS	\$23,000.00	1.000	\$23,000.00
6518	IRRG	1A	\$6,250.00	142.230	\$888,940.00
RD	ROAD	RD	\$0.00	3.570	\$0.00
Pg	WASTE	5W	\$600.00	2.910	\$1,745.00
Total:				154.77	\$941,515.00

5 Year Sales History

No previous sales information is available (for the past 5 years).

Property Classification			
Status:	Improved	Location:	Rural
Property Class:	Agricultural	City Size:	No Population
Zoning:	N/A	Lot Size:	40.01-160.00 ac.

Residential Datasheet			
Zoning:	N/A	Quality:	Fair
Year Built:	1990	Condition:	Worn Out
Exterior 1:	100% Masonry, Concrete Block	Style 1:	100% Two Story
Exterior 2:	N/A	Style 2:	N/A
Bedrooms:	N/A	Bathrooms:	1.00
Plumbing Fixtures:	N/A	Heating/Cooling:	100% Forced Air Furnace
Basement Size:	1,076 sq. ft	Min Finish:	0 sq. ft
Base Area:	2,152 sq. ft	Part Finish:	0 sq. ft
Total Area:	2,152 sq. ft	Roof Type:	Composition Shingle

Miscellaneous Improvements	
<u>Description</u>	<u>Units</u>
SLAB W/ROOF & STEP	72
KNEE-WALL PORCH	212
KNEE-WALL PORCH	84



Parcel Information	
Parcel ID:	120046662
Map Number	N/A
State Geo Code	2645-02-2-00000-000-6662
Cadastral #	N/A
Images	Photo #1 Photo #2 Sketch #1
Current Owner:	PROSKOVEC/DAVID A & JERRY W 4470 Q RD BELLWOOD, NE 68624
Situs Address:	4470 Q RD BELLWOOD
Tax District:	262
School District:	SCHUYLER 123, 19-0123
Account Type:	Agricultural
Legal Description:	2 16 3 2 16 3 NW1/4 154.77 AC
Lot Width:	N/A
Lot Depth:	N/A
Total Lot Size:	N/A

* Disclaimer: This legal description should not be used to prepare legal documents.

Assessed Values				
Year	Total	Land	Outbuilding	Dwelling
2023	\$1,038,090	\$941,515	\$69,715	\$26,860
2022	\$817,660	\$728,170	\$67,760	\$21,730
2021	\$798,885	\$716,390	\$60,765	\$21,730
2020	\$798,880	\$716,390	\$61,055	\$21,435
2019	\$810,050	\$728,325	\$64,035	\$17,190

Yearly Tax Information		
Year	Amount	Levy
2022	\$11,160.40	1.577569

2022 Tax Levy	
Description	Rate
CENTRAL COMM COLLEGE	0.09027200
BUTLER COUNTY	0.17805200
SCHUYLER 123 K-12 2007	0.09567300
AG. SOCIETY	0.01000000
E.S.U.#7	0.01500000
BONE CREEK TOWNSHIP	0.10000000
LINWOOD #8	0.03499900
SCHUYLER 123	1.02216900
LOWER PLATTE NORTH	0.03140400



Common Land Unit  Tract Boundary

 Non-Cropland
 Cropland

2022 NAIP Ortho Imagery

2023 Program Year
 Map Created December 13, 2022

Farm 8165

Wetland Determination Identifiers

-  Restricted Use
-  Limited Restrictions
-  Exempt from Wetland Provisions

2-16-3E

United States Department of Agriculture (USDA) Farm Service Agency (FSA) maps are for FSA Program administration only. This map does not represent a legal survey or reflect actual ownership; rather it depicts the information provided directly from the producer and/or National Agricultural Imagery Program (NAIP) imagery. The producer accepts the data 'as is' and assumes all risks associated with its use. USDA-FSA assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on this data outside FSA Programs. Wetland identifiers do not represent the size, shape, or specific determination of the area. Refer to your original determination (CPA-026 and attached maps) for exact boundaries and determinations or contact USDA Natural Resources Conservation Service (NRCS).

Processed by State of Nebraska Department of Natural Resources Data(Bank) 7/28/2023 4:19:00 PM
Subsection: SENW Section: 2 Township: 16 Range: 3E
Footage: 1778 feet from the North section line and 2270 feet from the West section line.
Latitude: 41° 23' 22.30" Longitude: -97° 3' 12.30"



Legend (/dynamic/Images/MapGroundWaterLegend.png)

Zooming – 3 options

- Double click on Map to zoom in
- Plus(+) and minus(-) signs in upper left corner of map also zoom in and out. Hover with mouse over area and when pointer disappears, click. Plus is on top and minus is below it.
- Click on map and use mouse wheel to zoom in or out.

Panning – Moving around map

Click on map and hold, drag mouse direction to move map

DISCLAIMER

**Approved List of Propeller Flow Meters
Lower Platte North Natural Resources District (LPNNRD)
Effective: April 11, 2022**



Approved List of Propeller Flow Meters and Required Conditions

LPNNRD requirements for all propeller flow meters:

- Anti-reverse flow feature to prevent backflow.
- Follow manufactures installation **recommendations** taking into account in-pipe jetting or non-jetting flow conditions. (Correct installation of the flow meter is critical to getting an accurate reading. Most meters require a straight pipe before and after the flow meter that is at least equivalent to five times the pipe diameter in order to obtain an accurate flow measurement. Doing the installation correctly the first time saves money in the long run).
- Straightening vanes are required according to manufacturer’s installation **recommendations** for in-pipe jetting or non-jetting flow conditions.
- Meter must be positioned to ensure water totally fills the pipe, such as a level pipe or positioned on a riser.
- Meter must be configured: to inside and outside diameter of the pipe, material of the pipe, meter used that will operate within minimum and maximum output flow rates of the well, horizontal or vertical installations, and unobstructed straight run distance upstream and downstream of meter and in most cases straightening vanes (or other flow straightener) will be necessary.
- Meter totalizes flow in acre inches and flow meter dial is in gallons per minute.
- A flow meter must be dedicated to each individual well. (Exceptions will be made if several wells are used to provide enough water to operate a single irrigation system such as a pivot or gated pipe. In these situations a flow meter placed at the central location where all water can be metered is acceptable).

Manufacturer	Model	Notes
McCrometer	McPropeller	All propeller models
Sparling	Propeller saddle meter	Model 312 propeller meter
Geyser	Saddle meter	All propeller models for Farmland Irrigation

LPNNRD prefers the following added features for all propeller flow meters:

- Over-run bearing (or extra bearing) for smother operation and to extend life of the meter
- Canopy cover to protect meter

LPNNRD will inspect systems for proper installation of flow meters

** Landowners must list new irrigated acres with the County Assessor, update the DNR well registration, and comply with any additional conditions within 90 days of LPNDRD approval of this water well permit. LPNDRD staff may perform a site visit to verify information provided in the well permit application. **

This form must be completed in full and accompanied by a non-refundable \$50.00 filing fee (payable to the Lower Platte North Natural Resources District). In addition, for Class 3 well permits an added fee of \$250.00 is required for District review. For Class 4 well permits an added fee of \$500.00 is required for District review. Forward this application and filing fees to:

Lower Platte North Natural Resources District
P.O. Box 126
Wahoo, NE 68066
Phone: (402) 443-4675

Please take the time and fill out the information correctly. The District will return an incomplete or defective application, with 60 days being allowed for resubmission. The District shall issue all permits with conditions attached, or denied not later than 30 days after receipt of a complete and properly prepared application.

WATER WELL PERMIT RESTRICTIONS

1. A well permit is required prior to the construction of a water well. If construction of a water well is commenced prior to obtaining a permit, a late permit must be completed and accompanied by a \$250.00 application fee. Construction or operation of a new water well without an approved water well permit shall result in the District issuing a 'cease and desist order' against further construction or use of that water well.
2. An irrigation well shall not be constructed within 1000 feet of any registered industrial or public water supply well or within 600 feet of a registered irrigation well; A public water supply well shall not be constructed within 1000 feet of any registered irrigation, industrial or other public water supplier's well; An industrial well shall not be constructed within 1000 feet of any registered irrigation, industrial or public water supply well pursuant to §46-609 and §46-651. These spacing restrictions shall not apply to water wells owned by the same person. Any person may apply to the Nebraska Department of Natural Resources for a special permit to drill a water well without regard to the spacing requirements pursuant to §46-653. The District may adopt stricter well spacing requirements based on different aquifer subareas. Check with the District office if you have any questions.
3. This permit does not register the well with the Department of Natural Resources. All wells are required to be registered by the well driller with the Nebraska Department of Natural Resources within 60 days after the well is completed.
4. A replacement water well is one, which replaces an abandoned water well that has been operated within the last three years, and is constructed to water the same tract of land as the abandoned water well that is being replaced. A replacement water well must be pumping from a comparable aquifer and yield approximately the same gallons per minute and total annual water uses as the original water well it is replacing. As of January 1, 1997, both new and replacement wells need a permit from the Lower Platte North Natural Resources District.
5. Consumptive water use in acre-inches is determined from the Department of Natural Resources (DNR) Net Corn Crop Irrigation Requirement map or a similar map produced by the University of Nebraska.
6. If the well is being replaced it must be properly abandoned according to state guidelines. A copy of these guidelines is available from the Lower Platte North NRD.
7. If the water well is not constructed within a one-year period from the date of approval, a new permit is needed.
8. Water wells may not be drilled within 50 feet of a stream bank without first obtaining a surface water right for that water withdrawal from the Department of Natural Resources pursuant to §46-637.
9. Any person who, on or after January 1, 1997, commences or causes construction of such a well for which the required permit has not been obtained, or who knowingly furnishes false information regarding such a permit, shall be guilty of a Class IV misdemeanor pursuant to §46-602.01 and §46-613.02.
10. Permits are not required for test holes or temporary dewatering wells (30 days or less). Permits are needed for water wells designed to pump 50 gallons per minute or less in Level 3 and Stay management areas.
11. Tax assessor records submitted with water well permit must include map, parcel number and an accurate account of current land use, such as irrigated acres.
12. With the well permit application, submit an aerial photograph with markings to show the location of the water source(s) and the location of where the water is to be used.
13. Any person, who knowingly furnishes false information regarding a water well permit, shall be subject to the imposition of penalties imposed through the controls adopted by the District pursuant to §46-746.
14. All new or replacement water wells must install a District approved flow meter and report water pumped annually in acre-inches per year or total gallons per year on LPNNRD approved forms by January 31st of each following year.
15. If multiple water sources are used, landowner must supply flow records from each water source in acre-inches per year or total gallons per year on LPNNRD approved forms by January 31st of each following year.
16. Water well permit applications require that the applicant or operator of irrigation, livestock, domestic (with irrigation on one acre or more of land), industrial, and public water supply wells by NRD certified.

Processed by State of Nebraska Department of Natural Resources Data(Bank) 7/28/2023 4:19:00 PM
Subsection: SENW Section: 2 Township: 16 Range: 3E
Footage: 1778 feet from the North section line and 2270 feet from the West section line.
Latitude: 41° 23' 22.30" Longitude: -97° 3' 12.30"



Legend (/dynamic/Images/MapGroundWaterLegend.png)

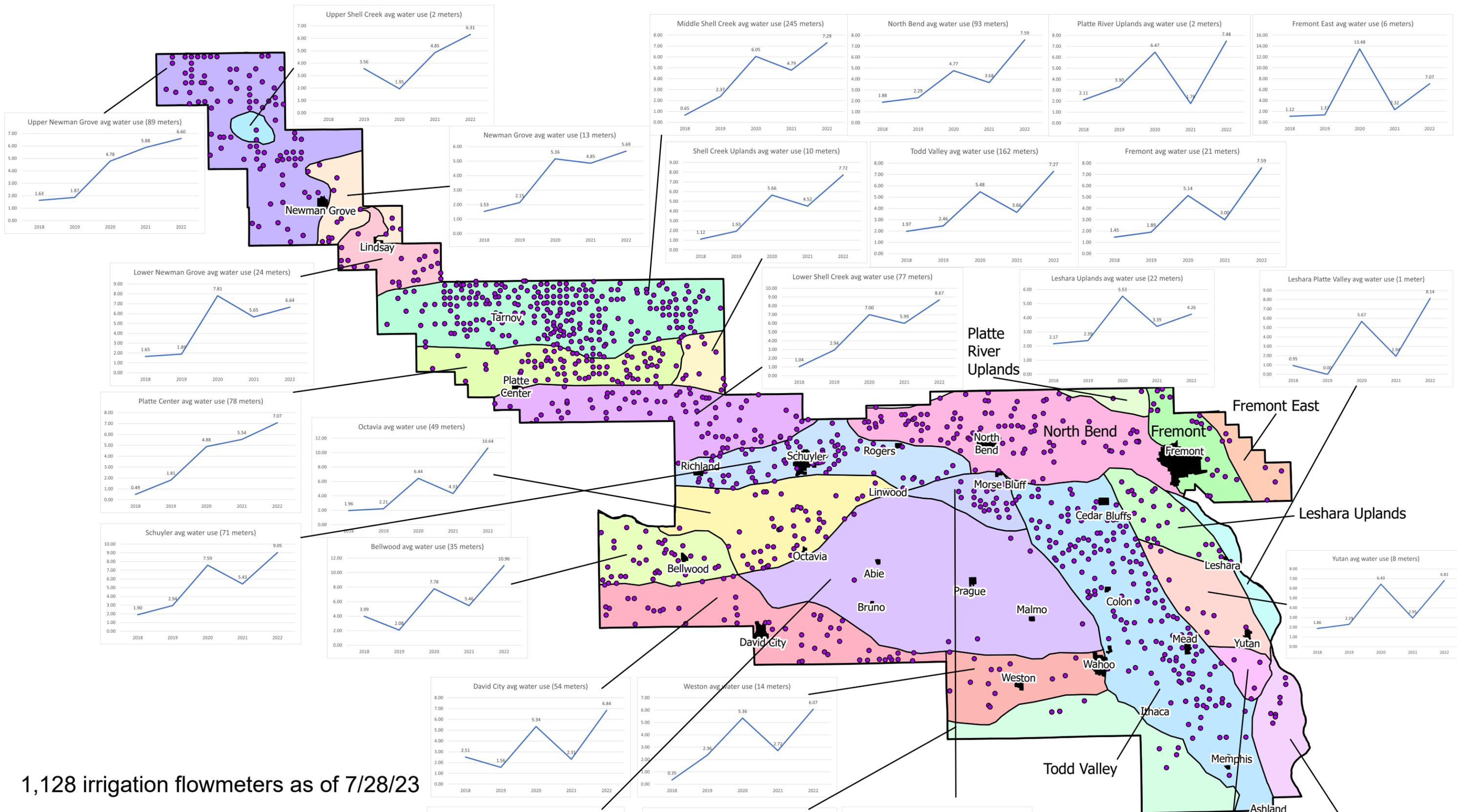
Zooming – 3 options

- Double click on Map to zoom in
- Plus(+) and minus(-) signs in upper left corner of map also zoom in and out. Hover with mouse over area and when pointer disappears, click. Plus is on top and minus is below it.
- Click on map and use mouse wheel to zoom in or out.

Panning – Moving around map

Click on map and hold, drag mouse direction to move map

DISCLAIMER

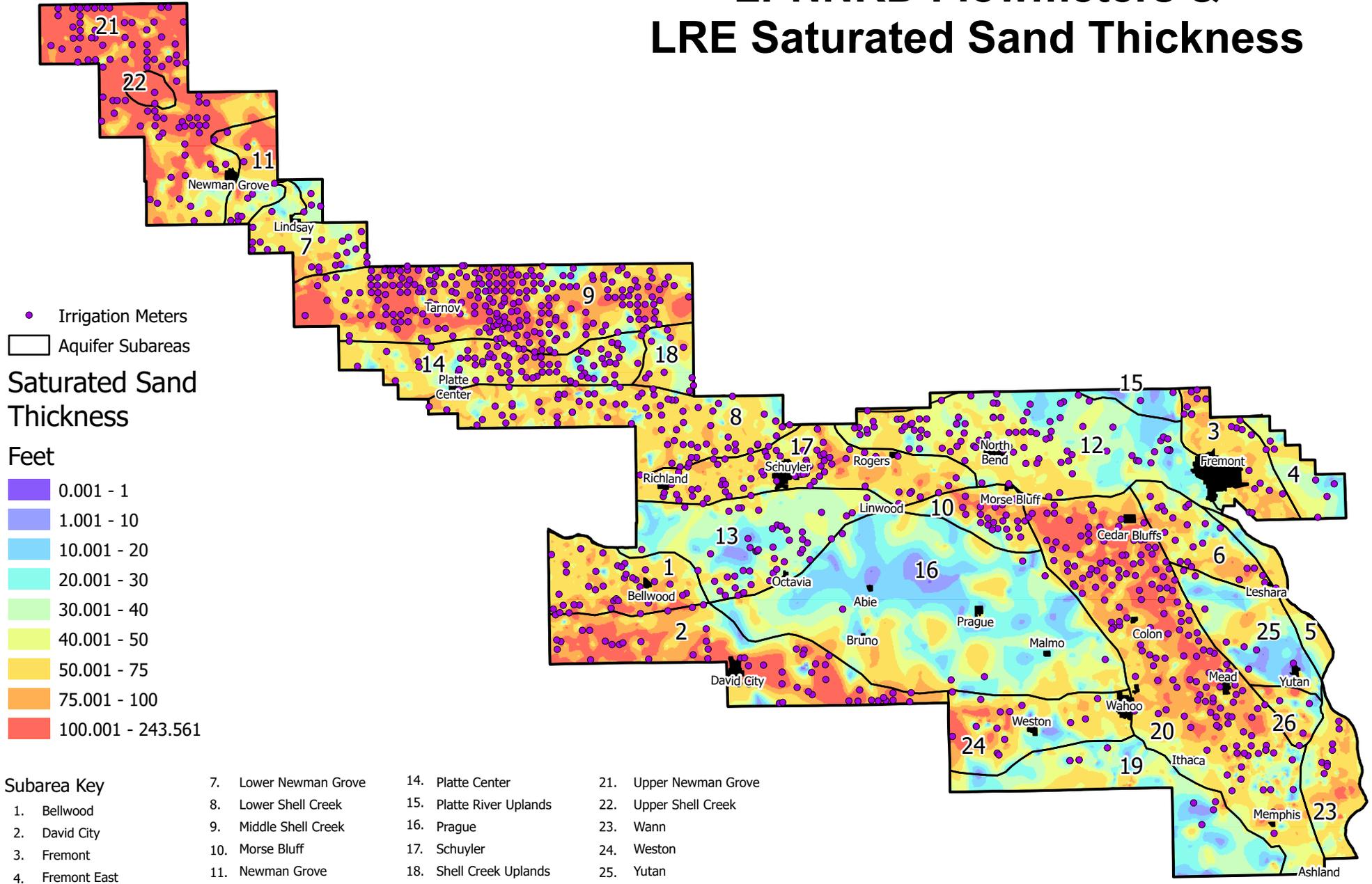


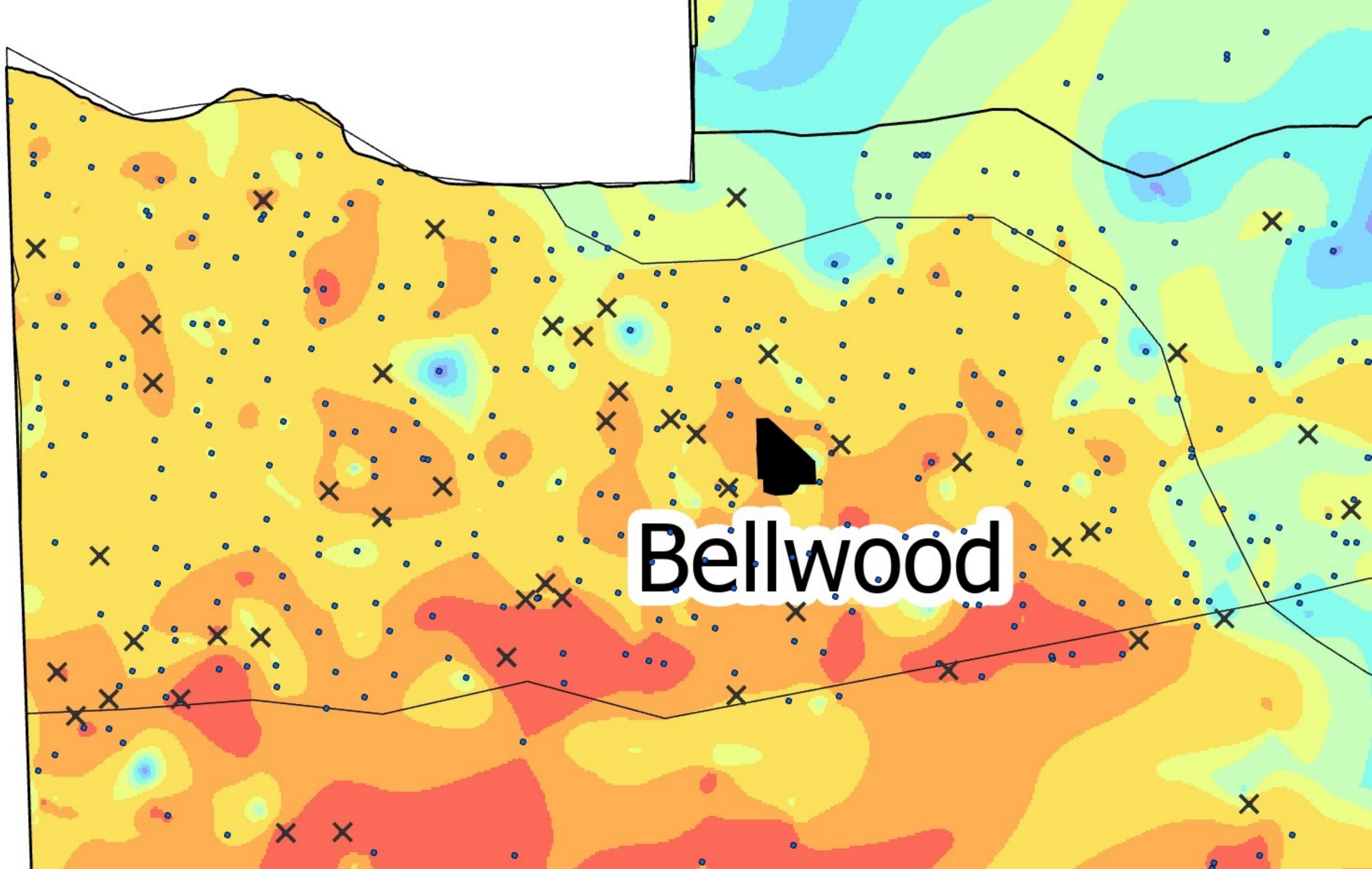
1,128 irrigation flowmeters as of 7/28/23



NAD1983 StatePlane Nebraska FIPS 2600
Created 8/23 by LPNNRD

LPNNRD Flowmeters & LRE Saturated Sand Thickness





Bellwood

Invoice

Bill To
Lower Platte North NRD PO Box 126 Wahoo, NE 68066

Date	Invoice #
8/3/2023	187

Quantity	Description	Rate	Amount
	Lower Platte River Basin Water Management Plan Coalition Dues	10,000.00	10,000.00
Please remit payment to NARD Research - 8100 S. 15th St., Suite B, Lincoln, NE 68512		Total	\$10,000.00



Daryl Andersen
 Lower Platte North NRD
 511 Commercial Park Road
 Wahoo, NE 68066-0126

August 9, 2023
 Project No: 5036LPN02
 Invoice No: 23745

Project 5036LPN02 LPNNRD Hydrogeologic Assessment

Professional Services through July 25, 2023.

Task 01 Project Management and Meetings

Professional Personnel

	Hours	Rate	Amount	
Mohr, Jonathan	1.00	183.00	183.00	
Totals	1.00		183.00	
Total Labor				183.00
				Total this Task \$183.00

Task 02 Hydrogeologic Assessment Framework

Professional Personnel

	Hours	Rate	Amount	
Mohr, Jonathan	2.00	183.00	366.00	
Totals	2.00		366.00	
Total Labor				366.00
				Total this Task \$366.00

Task 03 Deliverables

Professional Personnel

	Hours	Rate	Amount	
Mohr, Jonathan	1.50	183.00	274.50	
Sopiwnik, Roscoe	13.25	187.00	2,477.75	
Totals	14.75		2,752.25	
Total Labor				2,752.25
				Total this Task \$2,752.25
				Total this Invoice \$3,301.25

Project	5036LPN02	LPNNRD Hydrogeologic Assessment	Invoice	23745
---------	-----------	---------------------------------	---------	-------

Outstanding Invoices

Invoice Number	Date	Balance
23438	7/7/2023	5,268.75
		5,268.75

Total Now Due	\$8,570.00
----------------------	-------------------

TERMS: Net 30 days. A finance charge of 1.5% per month is applied to past due amounts.



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Economic Impact of Groundwater Regulation in Nebraska: A Hedonic Price Analysis

Aakanksha Melkani* Taro Mieno† Aaron Hrozencik‡ Renata Rimšaitė§
Shunkei Kakimoto¶ Nicholas Brozovic||

Introduction

Groundwater is vital to agriculture in USA as a primary source of irrigation and/or an important supplement to surface water irrigation during times of water scarcity. Its regulation has increasingly become more common and important due to growing aquifer depletion concerns (Scanlon et al. 2012; Konikow 2015; Babbitt et al. 2018). However, despite the importance of groundwater resources for the agricultural economy and the increasing regulations on its use, a lack of consensus exists within the economic literature regarding whether the benefits of regulation outweigh the costs. We examine this issue in this paper via a hedonic price analysis of farmland values in Nebraska.

Groundwater is the primary source of irrigation in the USA with 60% of irrigated land being partially or wholly irrigated by groundwater in 2017 (U.S. Census Bureau 2017). Since groundwater is more commonly developed for irrigation privately, it has historically been less regulated than surface water which was developed with substantial public intervention. However, in recent years new groundwater regulations have rapidly emerged across different parts of the western USA due to increasing aquifer depletion concerns (Scanlon et al. 2012; Haacker, Kendall, and Hyndman 2016). A well-known example is the adoption of the Sustainable Groundwater Management Act by the state of California in 2014 to manage its groundwater resources. Groundwater depletion has itself been a growing concern due to the unprecedented development of irrigation in parts of USA

*University of Nebraska

†University of Nebraska-Lincoln

‡Economic Research Service, USDA

§University of Nebraska

¶University of Minnesota

||University of Nebraska

to grow high value crops in the latter part of the 20th century (Hornbeck and Keskin 2014) and the frequent and recurring droughts faced in last few decades (Wehner et al. 2017).

There is a rich theoretical literature that discusses the benefits and costs of groundwater regulations for agriculture using hydro-economic models. In their seminal work assessing the economic implications of groundwater management, Gisser and Sanchez (1980), argued that the benefits of groundwater management are too small for justifying its management. This position has been contested and researchers have since argued that benefits of groundwater regulations can be large under certain contexts. These include cases when the marginal value from consumptive use of groundwater use is low (Koundouri 2004) and when the value from non-consumptive use is high (Tomini 2014). Groundwater management may be also be beneficial when there are high and non-linear cost of pumping groundwater as aquifer levels fall and when hydrological connections between water bodies may lead to severe negative externalities from groundwater extraction (Koundouri 2004). An example of such a case was demonstrated by Brozović, Sunding, and Zilberman (2010) in case of large and unconfined aquifers with wells concentrated close to each other. More recent work in this area maintains that groundwater management strategies that have been recently implemented in certain parts of the USA can raise aquifer levels but at some loss of short-term profits to farmers (Hrozencik et al. 2017; Manning et al. 2020). These costs, however, vary across different management strategies and across space (Hrozencik et al. 2017). Overall, we find a lack of consensus in the theoretical literature on the benefits and costs of groundwater management policies.

The econometric literature exploring the benefits and costs of groundwater regulations is relatively thin, perhaps due to the lack of adequate data suitable for such an analysis. For example, Edwards (2016) and Ifft, Bigelow, and Savage (2018) both examine how groundwater use regulations are capitalized into farmland values. While Edwards (2016) finds a positive impact of groundwater management in Kansas for hydrologically connected areas, Ifft, Bigelow, and Savage (2018) find that irrigated land value fell in response to groundwater rules in Nebraska. Using the case of Southern California, Ayres, Meng, and Plantinga (2021) demonstrate water markets as a form of groundwater management that can bring overall net benefits to farmers while also enabling the efficient use of water via trading of water rights. More extensive research has been conducted

in understanding the behavioral responses of farmers to groundwater regulations and institutions in form of changing water use, adopting new technology, and cropping patterns [Pfeiffer and Lin (2014); Mieno et al. (2022); Cobourn et al. (2022); Drysdale and Hendricks (2018); Golden and Leibsch (2018)]. However, the overall effect of regulations on farmers' welfare remains thin and the evidence mixed. In particular, the differential effect of different groundwater management strategies have not been examined via rigorous econometric analysis. Further, existing studies have utilized either survey-based or assessed land value data for analysis. Both of these may suffer from some biases. Survey based land value data may embody hypothetical bias of the respondent since the land values are not based on actual sale value of the land. Assessed land values on the other hand are based on tax assessments of agricultural lands, which vary by state law and are often a lower bound of the true value of the land (Anderson 2012).¹ Conceptually, as dynamic welfare maximizers, farmers may perceive groundwater regulations to be beneficial if they believe that the current rate of groundwater depletion imposes negative externalities on their current or future economic returns. On the other hand, if farmers do not believe the current rate of groundwater extraction to be unsustainable or to negatively affect their economic returns, they may perceive regulations to lower their current and future returns. Thus, theoretically, regulations may be capitalized either positively or negatively into farmland values, making a case for an empirical exploration of this question.

We address these knowledge gaps by assessing the changes in farmland values in the state of Nebraska in response to two types of groundwater regulations: well drilling moratoria (restrictions on future development of land for irrigation) and water allocations (limits on quantity of water that can be pumped for irrigation from existing irrigation structures). We leverage data on observed agricultural land market transactions data between 2005-2021 and information on spatially and temporally heterogeneous groundwater use regulations to assess the costs and benefits of differing groundwater management policies. To the best of our knowledge, this is the first study to examine the economic effect of groundwater regulation through a hedonic price analysis of actual

¹Actual land transactions, as used by us, are also likely to suffer from bias due to sample selection, i.e., only the sample of farmers that sold in a particular year were observed (Bigelow, Ifft, and Kuethe (2020)). This may lead to biased estimates if the selection into selling land was correlated with some unobservables that influences land values. Spatially differentiated market imperfections maybe one cause of concern because they may lead to land values being systematically higher (or lower) depending upon the ease with which land can be transacted. Through our conversations with several land owners in Nebraska, we gathered no evidence of any such market imperfection.

market transaction data. It is also the first study that differentiates between the different types of groundwater regulations thus disentangling their unique impacts.

Background and Context

Nebraska is reliant on groundwater for supporting its vast agricultural sector. It has the most irrigated acres in the USA.; close to 90% of which comes from groundwater (Dieter 2018). Groundwater has been managed in Nebraska historically since the 1970s through 23 locally elected Natural Resources Districts (NRDs). Apart from advisory and educational roles, the NRDs have considerable power to create and enforce regulatory tools (Bleed and Babbitt 2015; Babbitt et al. 2018; Schoengold and Brozovic 2018). One of the unique feature of groundwater management in Nebraska (and few other states overlying the High Plains aquifer) is that they have been developed, adopted, and managed by local authorities. The earliest groundwater regulation in Nebraska came about in 1979 in the Upper Republican NRD. Several new regulations emerged since the early 2000s, starting from South-west Nebraska, and moving to the North and East (Figures 1 and 2). These evolving regulations in the past two decades provide the context of our study.

The NRDs have adopted several different methods for groundwater management. These include strategies to restrict water use such as placing a well moratorium and imposing water allocations. A variety of auxiliary measures have also been adopted to complement and effectively implement these management strategies. These include mandatory establishment of flowmeters on high-capacity wells, restricting the number of acres that can be irrigated, and imposing minimum spacing between adjoining wells. Incentive-based groundwater regulations include cost-share programs that subsidize farmers to adopt water-saving technologies (Zoubek 2015). A tax on irrigated acres has also been imposed in certain parts of Nebraska as a management tool. Although the cost imposed by the tax is deemed insufficient to incentivize farmers to reduce water use, the capital raised through taxation has been used to develop a large scale streamflow management programs that have been instrumental in resolving water related conflicts in the state (Schoengold and Brozovic 2018). Voluntary Integrated Water Management (IWM) plans have also been developed by several NRDs. These are contingent plans that lay down groundwater management policies that the NRDs will adopt if groundwater levels fall below certain pre-determined levels.

In this paper we focus on two types of management techniques – the well moratorium and water

allocations. Well moratorium refers to a prohibition on construction of new high-capacity irrigation wells that can extract large amounts of water from an aquifer. Water allocations refer to placing an upper limit on the volume of water that can be pumped per acre per year from a well. In practice, well allocations are made for a period of 3-5 years such the aggregate water use within those years does not exceed the lump-sum allocation limit. We chose to focus on these two regulations as they have direct implication on current and potential future water use and crop revenues of all producers within NRDs that have implemented them. Secondly, there is some evidence that these regulations can reduce water use (Mieno et al, 2022) and increase the saturated thickness of aquifer (Hrozencik et al. 2017). Thus, they are atleast partially effective in achieving the goals of groundwater management. These regulations are also quite widespread across the state with 15 (8) NRDs having implemented moratoriums (allocations) at some point of time.

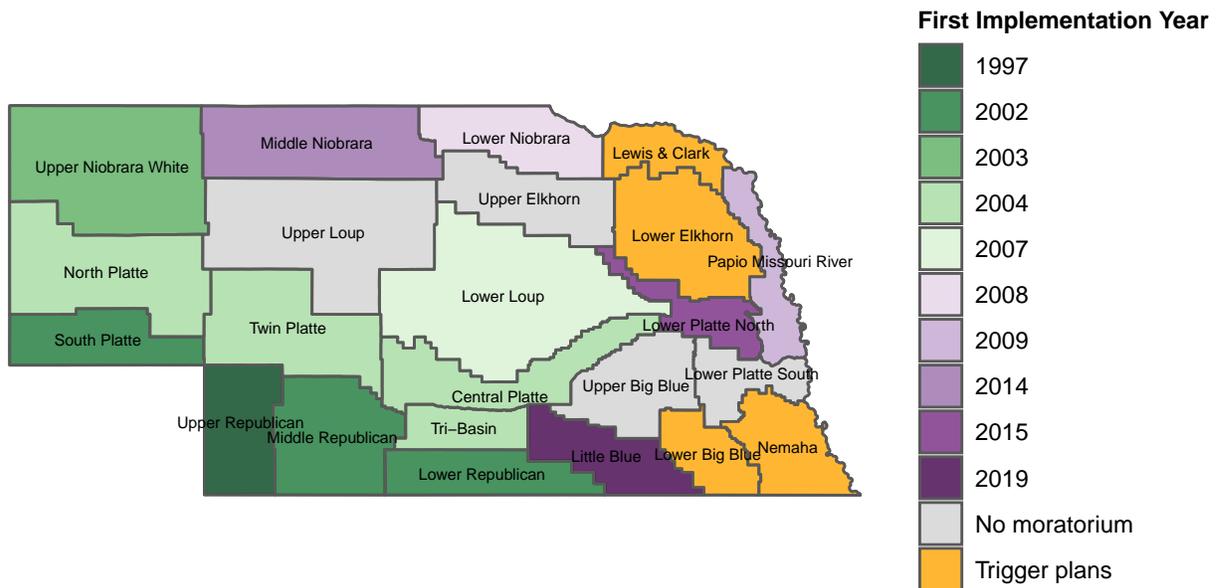


Figure 1: Well moratorium by NRD and year in Nebraska

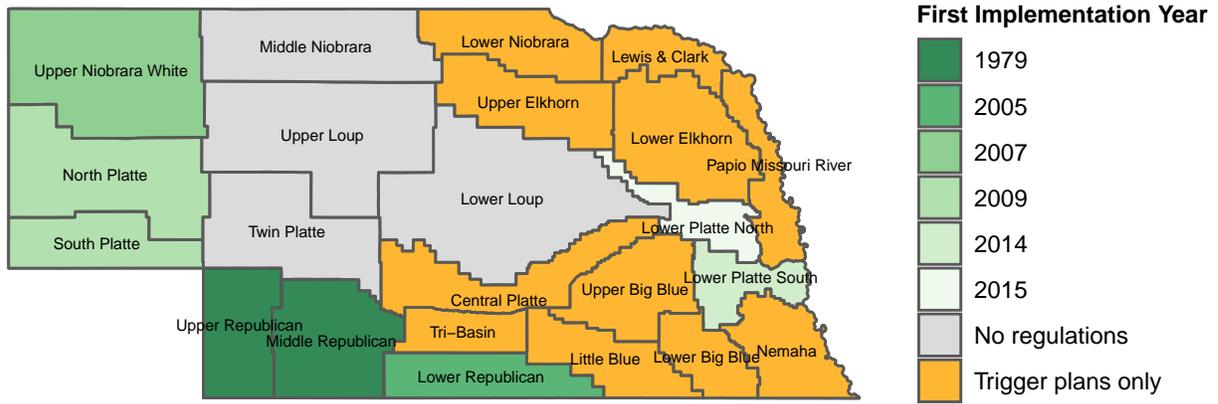


Figure 2: Water allocations by NRD and year in Nebraska

Economic framework and testable hypotheses

We motivate our research question by assigning an economic value to each parcel of land as follows:

$$V = Y(\mathbf{X}, w; z) + \sum \delta[Y(\mathbf{X}, w; z)]$$

where, V is the net present value of land. V comprises of the current land revenue ($Y(\cdot)$) and the stream of future discounted land revenues (with discount factor being δ). The land revenue is a function of the vector of agricultural inputs (\mathbf{X}), irrigation (w), and quasi-fixed factors such as weather and soil characteristics (z). Price of crop output has been normalized to one for easier notation. A farmer's optimal water use for parcel i (w_i^*) is a function of the saturated thickness of the aquifer (h) and the water used by other neighboring farmers (w_j^*) (Peterson and Saak, 2013, Edwards (2016)).

$$w_i^* = f(h, w_j^*) \text{ such that } \frac{\partial w_i^*}{\partial h} > 0 \text{ and } \frac{\partial w_i^*}{\partial w_j^*} < 0$$

The negative relationship between w_i^* and w_j^* represents the negative externality of one farmer's water use on an adjacent farmer's water use. Groundwater management strategies can act as a coordination mechanism that can reduce these negative externalities.

With this framework, we can define the optimal land value of land for parcel i as $V_i^* = g(\mathbf{X}_i^*, w_i^*, z)$. V_i^* is related to w_i^* and w_j^* as follows:

$$\frac{\partial V_i^*}{\partial w_i^*} > 0 \text{ and } \frac{\partial V_i^*}{\partial w_j^*} < 0$$

Intuitively this simply implies that the value of land increases with increase in own use of water and decreases with increase in others' use of water. With this context, we will discuss the expected changes in land values for irrigated and non-irrigated parcels under well-moratorium and water allocations.

Case 1: Effect of well moratorium on irrigated parcels

A well-moratorium does not change the current or future use of own water use (w_i^*). Thus change in water use for irrigated parcels under well-moratorium is zero. However, it does reduce the expected future water use by neighboring farmers that may occur due to more wells being constructed by adjacent farmers. Thus, the value of land for irrigated parcels under well moratorium rises compared to irrigated parcels in no regulation and the overall the land values of irrigated parcels are expected to be higher than the values under open access.

Case 2: Effect of water allocations on irrigated parcels.

The irrigated water use under water allocations is limited by an upper limit. Thus, own water use will reduce under water allocations compared to that under open access ($w_{ia}^* \leq w_i^*$), leading to a potential decline in land revenue, ceteris paribus. On the other hand, water allocations may decrease the negative externalities caused by water use by adjacent irrigators ($w_{ja}^* \leq w_j^*$), thus increasing the value of own land. Since the two effects are in the opposite direction, the overall effect of water allocations on non-irrigated parcels is uncertain.

Case 3: Effect of well moratorium on non-irrigated parcels.

The future potential of developing non-irrigated land to irrigated land is lost when a well-moratorium is placed. This will lead to a decrease in future expected stream of land revenues

thus bringing down the overall cost of land value. Since the land is not irrigated (and cannot be irrigated in the future due to the moratorium), the issue of negative externalities is not applicable here. Thus, overall, well moratorium is expected to lower land values of non-irrigated parcels.

Case 4: Effect of water allocations on non-irrigated parcels

Water allocations will not have any effect on current land revenues of non-irrigated parcels. However, non-irrigated land may be developed into irrigated land in the future and the expected future stream of revenues will be lower under water allocations than under open access. Thus, water allocations are likely to decrease the value of the parcel. Similarly, there are no negative externalities on non-irrigated land due to other’s use of groundwater. However, if a parcel is to be developed for irrigation in the future, water allocations can reduce potential negative externalities and thus lead to a rise and land values. Thus, overall, the effect of water allocations on non-irrigated parcels is uncertain.

Based on the above economic framework, we summarize four testable hypotheses in Table 1:

Table 1: Testable hypotheses based on economic framework

	Irrigated	Non-irrigated
Well moratorium	+	-
Water allocations	Uncertain	Uncertain

Data

The data for our analysis was obtained from several different sources. Information on farmland values, acreage, and geo-codes of farmland parcels in Nebraska for 2005-2021 were obtained Corelogic Inc. These data were extracted by Corelogic Inc. from county land transaction records. After dropping outliers and missing values, our analytical sample consisted of a repeated cross-section of 18,506 observations. Information on groundwater regulations were obtained from a detailed survey of administrative documents of all 23 NRDs. These were supplemented with interview and email communications with various NRD leaders. Data on parcel level irrigation status was obtained from Xie and Lark (2021). Soil characteristics data such as hydraulic conductivity, available water holding capacity, elevation of land and percentage of sand, silt, and clay were obtained from

SSURGO. Weather information was retrieved from data provided by the PRISM climate group and was used to construct 10-year rolling averages of growing season average daily temperatures, growing degree days, precipitation, and potential evapotranspiration. Data on land use, particularly cropping patterns, were obtained from the Cropscape data provided by the USDA. Distance from urban centers were calculated using Census information on population density.

Empirical strategy

We conduct a hedonic price analysis of farmland values using a Staggered Difference-In-Difference (DID) approach, closely following the procedure suggested by Wooldridge (2021). In a Staggered DID framework different units receive treatment at different points of time. This setup suits our context well since different NRDs were exposed to groundwater regulations at different times. The NRDs that were never treated serve as the control group. Following the economic framework, we also look at the heterogenous effect of treatment on irrigated and non-irrigated parcels.

The estimating equation is then as follows:

$$\ln Y_{ijt} = \alpha + \beta_r^m D_{it}^m \cdot Ir_i + \beta_r^a D_{it}^a \cdot Ir_i + \beta^m D_{it}^m + \beta^a D_{it}^a + \gamma Ir_i + \mathbf{X}_{ijt} \Delta + c_j + v_t + \epsilon_{ijt}$$

Where, Y_{ijt} are real price per acre of parcel i in county j at time t , $D_{it}^m = 1$ if parcel i was exposed to well moratorium in time t , $D_{it}^a = 1$ if parcel i was exposed to water allocation in time t , $Ir_i = 1$ if parcel was irrigated in 2005 (baseline year), X_{ijt} is the vector of control variables. c_j are the county fixed effects and v_t are the time fixed effects. $\beta_r^m, \beta_r^a, \beta^m, \beta^a$ are the marginal effects of well moratorium on value of irrigated parcels, water allocation on value of irrigated parcel, well moratorium on non-irrigated parcel, and water allocation on non-irrigated parcel respectively. These are the parameters of interest. We estimate this equation using Pooled Ordinary Least Squares (POLS) and cluster the standard errors at the county level. Ideally, the standard errors should be clustered at the level of treatment, which in our case is the NRD (Abadie et al. 2023). However, there are only 23 NRDs (treatment groups) in our sample which does not satisfy the degrees of freedom rule of thumb of atleast 30-50 clusters. Thus, we cluster at the next largest group which is the county.

Identification of the estimates depend on the treatment being exogenous to unobservables that could be correlated to treatment. Groundwater regulations are likely to arise in areas which are

heavily dependent on irrigation, where agriculture is a primary economic activity, and/or where rainfall is scarce. We control for these variables by including variables on irrigation in the baseline year, soil quality indicators and long-term weather means. We also control for the crops being grown on the parcel and the distance of the field from the nearest urban center.

Results

The results of the analysis are summarized in Table 2. Model (1) and (2) are the results without and with controls respectively. Overall, we do not find any statistically significant effect of either type of groundwater regulation on either irrigated or non-irrigated parcels. The magnitude of the estimates of effect of both well moratorium and water allocations are large (a decline of land values by 6.9% and 9.5%, respectively, compared to the control group). These estimates are also robust before and after controlling for explanatory variables. However, since the standard errors are also relatively large, the estimates are not statistically significant.

Table 2: Marginal effect of GwR on farmland values, Pooled OLS estimates

Type of GwR		(1)	(2)
Well-moratorium =1	Irrigated	0.017 (0.0655)	-0.0090 (0.0472)
	Non-irrigated	-0.080 (0.0571)	-0.069 (0.0401)
Water-allocation =1	Irrigated	-0.013 (0.0725)	0.017 (0.0652)
	Non-irrigated	-0.094 (0.0598)	-0.095 (0.0575)
Other controls		No	Yes
County dummies		Yes	Yes
Year dummies		Yes	Yes
Observations		18506	18506

Note: Standard Errors (SE) clustered at county level; GwR: Groundwater; Controls include measures of soil quality (saturated hydraulic conductivity, available water capacity, percentage of sand, silt and clay, and slope), long-term weather (ten years rolling averages of growing season precipitation, potential evapo-transpiration, growing degree days, and mean daily temperature), cropping pattern (share of land cropped with corn, soybeans, winter wheat, other crops and grassland), and distance from urban center.

Conclusion

In this paper we examine whether the groundwater regulations formulated by and imposed within the NRDs in Nebraska had an impact on farmland values. We find that the overall effect of groundwater regulations on farmland values is not statistically significant. The landscape of groundwater management in the western USA is evolving rapidly (e.g., California's Sustainable Groundwater Management Act). Understanding the costs and benefits of regulations seeking to rationalize the groundwater commons has become more urgent and important. This paper contributes to this growing literature by leveraging novel data and the unique institutional setting of Nebraska. Our results

inform future policymaking efforts aiming to minimize the negative externalities of groundwater depletion and conserve aquifer resources for future generations.

References

- Abadie, Alberto, Susan Athey, Guido W Imbens, and Jeffrey M Wooldridge. 2023. “When Should You Adjust Standard Errors for Clustering?” *The Quarterly Journal of Economics* 138 (1): 1–35.
- Anderson, John E. 2012. “Agricultural Use-Value Property Tax Assessment: Estimation and Policy Issues.” *Public Budgeting & Finance* 32 (4): 71–94.
- Ayres, Andrew B, Kyle C Meng, and Andrew J Plantinga. 2021. “Do Environmental Markets Improve on Open Access? Evidence from California Groundwater Rights.” *Journal of Political Economy* 129 (10): 2817–60.
- Babbitt, Christina Hoffman, Katherine EB Gibson, Scott Sellers, Nicholas Brozovic, Anthony Saracino, Ann Hayden, Maurice Hall, and Sandi Zellmer. 2018. “The Future of Groundwater in California: Lessons in Sustainable Management from Across the West.”
- Bigelow, Daniel P, Jennifer Ifft, and Todd Kuethe. 2020. “Following the Market? Hedonic Farmland Valuation Using Sales Prices Versus Self-Reported Values.” *Land Economics* 96 (3): 418–40.
- Bleed, Ann, and Christina Hoffman Babbitt. 2015. “Nebraska’s Natural Resources Districts: An Assessment of a Large-Scale Locally Controlled Water Governance Framework.”
- Brozović, Nicholas, David L Sunding, and David Zilberman. 2010. “On the Spatial Nature of the Groundwater Pumping Externality.” *Resource and Energy Economics* 32 (2): 154–64.
- Cobourn, Kelly M, Xinde Ji, Siân Mooney, and Neil F Crescenti. 2022. “The Effect of Prior Appropriation Water Rights on Land-Allocation Decisions in Irrigated Agriculture.” *American Journal of Agricultural Economics* 104 (3): 947–75.
- Dieter, Cheryl A. 2018. *Water Availability and Use Science Program: Estimated Use of Water in the United States in 2015*. Geological Survey.
- Drysdale, Krystal M, and Nathan P Hendricks. 2018. “Adaptation to an Irrigation Water Restriction Imposed Through Local Governance.” *Journal of Environmental Economics and Management* 91: 150–65.
- Edwards, Eric C. 2016. “What Lies Beneath? Aquifer Heterogeneity and the Economics of Groundwater Management.” *Journal of the Association of Environmental and Resource Economists* 3 (2): 453–91.

- Gisser, Micha, and David A Sanchez. 1980. "Competition Versus Optimal Control in Groundwater Pumping." *Water Resources Research* 16 (4): 638–42.
- Golden, Bill, and K Leibs. 2018. "Monitoring the Impacts of Sheridan County 6 Local Enhanced Management Area. Interim Report for 2013–2016." In *Proceedings of the 30th Annual Central Plains Irrigation Conference, Colby, KS, USA*, 20–21.
- Haacker, Erin MK, Anthony D Kendall, and David W Hyndman. 2016. "Water Level Declines in the High Plains Aquifer: Predevelopment to Resource Senescence." *Groundwater* 54 (2): 231–42.
- Hornbeck, Richard, and Pinar Keskin. 2014. "The Historically Evolving Impact of the Ogallala Aquifer: Agricultural Adaptation to Groundwater and Drought." *American Economic Journal: Applied Economics* 6 (1): 190–219.
- Hrozencik, R Aaron, Dale T Manning, Jordan F Suter, Christopher Goemans, and Ryan T Bailey. 2017. "The Heterogeneous Impacts of Groundwater Management Policies in the Republican River Basin of Colorado." *Water Resources Research* 53 (12): 10757–78.
- Ifft, Jennifer, Daniel P Bigelow, and Jeffrey Savage. 2018. "The Impact of Irrigation Restrictions on Cropland Values in Nebraska." *Journal of Agricultural and Resource Economics*, 195–214.
- Konikow, Leonard F. 2015. "Long-Term Groundwater Depletion in the United States." *Groundwater* 53 (1): 2–9.
- Koundouri, Phoebe. 2004. "Potential for Groundwater Management: Gisser-Sanchez Effect Reconsidered." *Water Resources Research* 40 (6).
- Manning, Dale T, Mani Rouhi Rad, Jordan F Suter, Christopher Goemans, Zaichen Xiang, and Ryan Bailey. 2020. "Non-Market Valuation in Integrated Assessment Modeling: The Benefits of Water Right Retirement." *Journal of Environmental Economics and Management* 103: 102341.
- Pfeiffer, Lisa, and C-Y Cynthia Lin. 2014. "Does Efficient Irrigation Technology Lead to Reduced Groundwater Extraction? Empirical Evidence." *Journal of Environmental Economics and Management* 67 (2): 189–208.
- Scanlon, Bridget R, Claudia C Faunt, Laurent Longuevergne, Robert C Reedy, William M Alley, Virginia L McGuire, and Peter B McMahon. 2012. "Groundwater Depletion and Sustainability of Irrigation in the US High Plains and Central Valley." *Proceedings of the National Academy*

of Sciences 109 (24): 9320–25.

Schoengold, Karina, and Nicholas Brozovic. 2018. “The Future of Groundwater Management in the High Plains: Evolving Institutions, Aquifers and Regulations.” In *Western Economics Forum*, 16:47–53. 1837-2018-2991.

Tomini, Agnes. 2014. “Is the Gisser and Sanchez Model Too Simple to Discuss the Economic Relevance of Groundwater Management?” *Water Resources and Economics* 6: 18–29.

U.S. Census Bureau. 2017. “2017 Census of Agriculture.” U.S. Department of Agriculture.

Wehner, Michael F, Jeff R Arnold, Thomas Knutson, Kenneth E Kunkel, and Allegra N LeGrande. 2017. “Droughts, Floods, and Wildfires.” *Climate Science Special Report: Fourth National Climate Assessment 1* (GSFC-E-DAA-TN49033).

Wooldridge, Jeffrey M. 2021. “Two-Way Fixed Effects, the Two-Way Mundlak Regression, and Difference-in-Differences Estimators.” *Available at SSRN 3906345*.

Xie, Yanhua, and Tyler J Lark. 2021. “Mapping Annual Irrigation from Landsat Imagery and Environmental Variables Across the Conterminous United States.” *Remote Sensing of Environment* 260: 112445.

Zoubek, Gary. 2015. “Nebraska Cost-Share Programs for Irrigation Management Tools.” University of Nebraska-Lincoln.



Proposal for NRD

REGENERATIVE AG CONFERENCE

- **Who:** hosted by Upper Big Blue, Little Blue, Lower Big Blue, Lower Platte South, and Lower Platte North NRDs, in collaboration with Keith Berns/Green Cover Seed (and possible sponsors).
Projected turnout: 300.
- **What:** A full day event for producers and crop consultants to learn about regenerative ag practices (cover crops, crop rotation, no-till, etc) and available funding opportunities
- **Where:** Concordia University Campus
- **When:** February 28, 2023
- **Why:** Education and outreach, opportunity to meet with producers regarding conservation practices/programs

Keynote speaker:

Mitchell Hora,
Farmer & CEO of
Continuum Ag

Event to be organized
& promoted by
cooperating NRDs

Sponsors sought
to offset cost

"THE NATION THAT DESTROYS ITS SOIL
DESTROYS ITSELF."

Franklin D Roosevelt
32nd President



LOWER PLATTE NORTH
Natural Resources District

LONG RANGE IMPLEMENTATION PLAN

Fiscal Year 2024

CONTENTS

Introduction.....	1
Authority and Responsibilities	1
Description of the District.....	1
Governing Body	1
LOWER PLATTE RIVER BASIN	2
FY 2023 Platte River Basin Activities	2
Ice Jam Agreement.....	2
Rock & Jetty Program.....	2
FY 2024 Platte River Basin Objectives	2
FY 2025-2029 Long Range Platte River Basin Objectives	2
GROUND AND SURFACE WATER	4
FY 2023 Ground & Surface Water Activities	4
Ground Water Management Area.....	4
Ground Water Quality Sampling	5
Ground Water Energy Level Monitoring Network	5
Chemigation.....	6
Decommissioned (Abandoned) Wells.....	6
Flow Meter Maintenance Program/Flow Meter Readings	6
Registered Wells	7
Well Permits.....	7
Special Studies	7
Certifying Acres.....	8
Nebraska Ordnance Plant Water Pollution Clean Up at Mead.....	9
Wellhead Protection Program.....	9
Rural Water Districts	9
Geographic Information System (GIS) and Global Positioning System (GPS)	9
FY 2024 Ground and Surface Water Objectives	10
FY 2025-2029 Long Range Ground and Surface Water Objectives	12
SOIL CONSERVATION AND LAND TREATMENT	15
FY 2023 Soil Conservation Activities.....	15
Soil and Water Conservation Programs (SWCP)	15
Wahoo Creek Efforts	15
Shell Creek Watershed Efforts	15
Erosion and Sediment Complaints	16
FY 2024 Soil Conservation Objectives.....	16
FY 2025-2029 Soil Conservation Long Range Objectives.....	17
FLOOD CONTROL AND DAMAGE REDUCTION ACTIVITIES	18
FY 2023 Flood Control and Damage Reduction Activities	18
Wahoo Creek Flood Reduction Efforts	18
Sand Creek Environmental Restoration Project	18
Operation and Maintenance.....	19
Army Corps of Engineers 205 Flood Studies.....	18
FY 2024 Flood Control and Damage Reduction Objectives	19
FY 2025-2029 Flood Control and Damage Reduction Long Range Objectives.....	19
FORESTRY, RANGE AND WILDLIFE HABITAT	21
FY 2023 Forestry, Range and Wildlife Habitat Activities	21

Tree Program	21
Wildlife Program.....	21
Community Forestry Program	21
FY 2024 Forestry, Range and Wildlife Habitat Objectives	21
FY 2025-2029 Forestry, Range and Wildlife Habitat Long Range Objectives	21
RECREATION	23
FY 2023 Recreation Activities.....	23
Czechland Lake Recreation Area	23
Homestead Lake (Skull Creek Site #55).....	23
Lake Wanahoo.....	23
FY 2024 Recreation Objectives.....	24
FY 2025-2029 Recreation Long Range Objectives	24
DRAINAGE IMPROVEMENT AND CHANNEL RECTIFICATION	25
FY 2024 Drainage Improvement & Channel Rectification Objectives	25
FY 2025-2029 Drainage Improvement & Channel Rectification Long Range Objectives	25
WASTE DISPOSAL AND POLLUTION CONTROL	26
FY 2024 Waste Disposal & Pollution Objectives	26
FY 2025-2029 Waste Disposal & Pollution Long Range Objectives.....	26
INFORMATION AND EDUCATION	27
FY 2023 Information & Education Activities.....	27
Publications and Marketing	27
Website	27
Video Promotion	27
Education Programs.....	28
Awards, Contests and Events	29
FY 2024 Information & Education Objectives	30
FY 2025-2029 Information & Education Long Range Objectives.....	30
PERSONNEL	31
LPNNRD Staff.....	31
Staff Support for NRCS Offices.....	31
FINANCES	32
FY 2024 Financial Objectives	32
FY 2025-2029 Long Range Financial Objectives	32
APPENDIX A - Map of the District.....	33
APPENDIX B - Estimated Population by County.....	34
APPENDIX C - Statewide Groundwater Monitoring Network.....	35
APPENDIX D - Ground Water Energy Level Status, Spring 2023.....	36
APPENDIX E - Priority Watershed Boundaries (Water Quality)	37
APPENDIX F - Priority Watershed Boundaries (Flood Reduction).....	38
APPENDIX G - Projected Budget (Income), Fiscal Years 2024-2029.....	39
APPENDIX H - Projected Budget (Expenses), Fiscal Years 2024-2029.....	40-41



Introduction

The Lower Platte North Natural Resources District (LPNNRD) is one of 23 Natural Resources Districts created in 1969 with the passage of LB 1357 by the Nebraska Unicameral. Since its formation in 1972, the LPNNRD has been assisting people in the Lower Platte River Basin in the development and protection of our soil and water resources. Nebraska Statutes require that Natural Resources Districts develop a Long Range Implementation Plan. The purpose of this plan is to summarize accomplishments during fiscal year 2022 (July 1, 2022 to June 30, 2023) and planned District activities for fiscal year 2023. There are also objectives for a five-year period from fiscal years 2024 to 2028. The plan serves as an implementation tool of the district’s Master Plan, which is updated every ten years.

This Long Range Implementation Plan was approved by the LPNNRD Board of Directors on September 11, 2023.

Authority and Responsibilities

The Natural Resources Districts have been given statutory responsibility outlined in Sections 2-3229, R.R.S. 1943. In this section it states that “The purposes of the Natural Resources Districts shall be to develop and execute, through the exercise of powers and authorities contained in this act, plans, facilities, works and programs relating to: (1) erosion prevention and control, (2) prevention of damages from flood water and sediment, (3) flood prevention and control, (4) soil conservation, (5) water supply for any beneficial uses, (6) development, management, utilization, and conservation of groundwater and surface water, (7) pollution control, (8) solid waste disposal and sanitary drainage, (9) drainage improvement and channel rectification, (10) development and management of fish and wildlife habitat, (11)

development and management of recreational and park facilities, and (12) forestry and range management.”

Lower Platte North NRD programs and projects are available to meet the goal of properly developing our water and related land resources.

Description of the District

The Lower Platte North Natural Resources District is located in the Lower Platte River Basin in eastern Nebraska and includes 1,031,000 acres of land. A portion of Saunders, Butler, Platte, Dodge, Colfax, Boone, and Madison Counties are within the district (see Appendix A), which includes twenty-eight cities, towns, and villages. Besides the Platte River, other notable tributaries in the district include: Bone Creek, Clear Creek, Duck Creek, Elm Creek, Loseke Creek, Rawhide Creek, Sand Creek, Shell Creek, Silver Creek, Skull Creek, Taylor Creek, and Wahoo Creek.

The population of the district is approximately 65,000, of which about half is rural and half urban. The Lower Platte North NRD is financed by a tax levy which may be up to four and one-half cents per \$100 valuation for general purposes and another one cent for water programs. The FY 2024 tax levy is 0.028652 cents per \$100 valuation.

Governing Body

The Lower Platte North Natural Resources District (LPNNRD) is governed by a 19-member Board of Directors. The directors are elected at the general election for a term of four years, with half of the members up for election every two years.

The district is divided into nine (9) subdistricts. Two board members are elected from each of the nine subdistricts, and one board member is elected at large every four years.



LOWER PLATTE RIVER BASIN

The district operates by a set of bylaws which are kept on file at the district headquarters at Wahoo, Nebraska.

FY 2023 Platte River Basin Activities

One of the great natural resources of Nebraska is the Platte River. It is the feature that attracted early settlers to our state and guided the wagon trails. Today, we look at the Platte River differently. It is a water source for agriculture and cities like Fremont, Lincoln, and Omaha, a haven for wildlife, and a place for recreation. Issues surrounding the Platte are a top priority at the LPNNRD, since approximately 72 miles of the river flow directly through, or border, the district.

Ice Jam Agreement

In 1994, the LPNNRD entered into an agreement with the Papio-Missouri River NRD, Lower Platte South NRD, and Cass, Douglas, Sarpy and Saunders Counties to more effectively deal with ice jams and their resulting flood damages along the Lower Platte River. This area of concern is primarily from Fremont, Nebraska to the mouth of the Platte River. This group has pooled funds of \$150,000 to retain a contractor to use explosives when needed, to remove ice jams in a timely manner.

During the winter of 2022-2023, there were no ice issues of concern on the lower Platte River.

Rock & Jetty Program

This program was developed to offer cost-share assistance to landowners to construct erosion control devices for stream bank stabilization and to assist Dike and Drainage Districts with maintenance of dikes along the Platte and Elkhorn rivers and perennial streams. In FY22, \$20,000 is budgeted for projects on rivers & streams. We assisted two landowners on maintenance projects in FY 22-23 at a cost of \$5,427.

FY 2024 Platte River Basin Objectives

- Administer \$20,000 in the Rock & Jetty Program to assist with priority stream bank stabilization for cooperators on the Platte and Elkhorn Rivers and Perennial streams. This includes assisting cooperators with meeting the regulations of the Clean Water Act through section 404 permits.
- As a member of the Joint Water Management Advisory Board, provide leadership and assistance to move forward with exploring flood reduction solutions within Dodge County.
- Support the Lower Platte Weed Management Area financially and technically in controlling noxious and invasive weeds.
- Support the Nebraska Land Trust in acquiring easements for the protection and preservation of quality lands.
- Support the Lower Platte River Corridor Alliance by becoming an active voting member.

FY 2025-2029 Long Range Platte River Basin Objectives

- Continue to budget cost-share funds for priority bank stabilization along the Platte and Elkhorn rivers and other perennial streams in the district.
- Continue to be an active member on the Joint Water Management Advisory Board.
- Promote riparian buffer zones along the Platte River and other perennial streams.
- Continue to explore new, innovative and cost-effective ways to protect against stream bank erosion.
- Provide education on stream bank protection and regulations.
- Support and budget annually, as needed, for the Ice Jam Agreement Fund.
- Keep up to date on Clean Water Act and Endangered Species Act regulations.

- Continue to participate with the City of Fremont and Dodge County to study potential nonstructural measures to reduce flooding and economic losses from the Lower Platte River.
- Work with the City of Schuyler as they evaluate the need for future federal funding for completing structural and non-structural approaches to reduce flooding and economic losses from the Platte River through the LPNNRD District-Wide Hazard Mitigation Plan.
- Encourage cities and counties to initiate floodplain management planning to promote wise floodplain development.
- Assist dike and drainage districts within the LPNNRD to properly repair and maintain levy projects.
- Budget annually as needed to support the Lower Platte Weed Management group in controlling noxious weeds.
- Continue to support the Lower Platte River Corridor Alliance as an active voting member.



One of the Lower Platte North NRD's major responsibilities is to conserve and protect our ground and surface water resources. To accomplish this goal, the Lower Platte North continues to participate in water quality studies, ground water level monitoring, and water resource educational activities.

FY 2023 Ground & Surface Water Activities

Ground Water Management Area

LPNNRD implemented a District-wide Groundwater Management Area (GWMA) on January 1, 1997, to address both water quality and quantity concerns. This action was based on data gathered since 1985 indicating where groundwater quality conditions have deteriorated beyond those established as health standards, such as nitrate nitrogen. On that date, groundwater quality Phase I (education) regulations became effective for the entire District.

One primary rule in Phase I requires certification for fertilizer and water use. The District has developed a groundwater program emphasizing a protection-based approach rather than a reactive, corrective approach. Since that time, advanced Phase areas have been determined by trigger levels listed in the rules and regulations of the GWMA. The District has two Phase groundwater quality control areas, those being Bellwood and Richland/Schuyler. The Bellwood Phase 2 Area was established in 2003 and presently covers approximately 30 square miles in the western portion of the Platte Valley in Butler County and includes the town of Bellwood. In 2015 nitrate levels decreased to a point that the trigger levels were not being achieved, so this area was decreased to 20 square miles. The Richland/Schuyler Phase 2 Area was established in 2004. In 2015 this area was raised to Phase 3 because of the rising nitrate levels. This area covers approximately

55 square miles in the Platte Valley of Colfax County and includes the towns of Richland and Schuyler. In 2015, 10 additional sections north of the Richland/Schuyler Area became a Phase 2 area and in 2020 raised to Phase 3. Elevated nitrate-nitrogen levels continue to be the major concern in both Phase areas. Emphasis on awareness is a priority to the District with numerous grants being considered. A grant was received from the Water Sustainability Fund in November 2022. This grant will conduct a geological assessment to go with the AEM flights along with offering cost-share for best management practices in the Schuyler - Richland Phase Area. In July 2023 a WSF grant was approved to determine nitrate legacy from Richland to Fremont.

In June 2018, the District updated its Groundwater Rules and Regulations by adding a Phase Four under Water Quality and managing water by consumptive use or acre feet limitations. As of July 1, 2023, the District had 9424 registered active wells with 4606 irrigation wells and 212 wells in the GWEL network.

In Summer of 2012, the District saw mid-summer declines in the Bruno area and the uplands of Platte and Colfax Counties. These are now designated as the Butler-Saunders and Platte-Colfax Special Quantity Subareas. The District mandated water flow meters, rolling allocations and annual reports in these areas starting in 2016.

In 2012 seven NRD's agreed to develop a Lower Platte Basin plan, which is a cooperative agreement for the Basin Plan. This plan was approved in December of 2017 with each district assigned a depletion allotment within the Basin. The allotment is in 5-year increments starting in 2016 with a formula to determine the acre feet used for new water uses. The District completed its V-IMP in June of 2018 by adding an additional rule of requiring municipalities to report yearly water use, with an annual report

due to NeDNR. The Coalition contracted with the Flatwater Group to analyze the data that will be used in the next 5-year allotment. The group updated the plan for next 5-years in 2022 with new allotments until 2027.

In 2016 the Lower Platte River Consortium, made up of the Lower Platte South NRD, the Lower Platte North NRD, the Papio-Missouri River NRD, Lincoln Water System (LWS), Metropolitan Utilities District (MUD), and the Nebraska Department of Natural Resources (NeDNR), embarked on an effort to develop a drought contingency plan to maintain/mitigate sustainable water supplies to the Lower Platte River during drought conditions. The final report was finalized in the Spring of 2020. The group has discussed the projects to be considered for supplying water into the Platte River and will be making 5-year updates.

Current rules and regulations of the GWMA are available at the LPNNRD headquarters in Wahoo and via the district website at www.lpnrd.org.

Ground Water Quality Sampling

The Lower Platte North NRD continues efforts to develop a ground water quality inventory. The District has been divided into four primary aquifer regions: Todd Valley, Platte Valley, Shell Creek and the Uplands, and further divided into 26 subareas. Staff samples the same wells each summer, weather permitting, to determine long term trends for nitrate-nitrogen. This is referred to as the Statewide Network. The data collected is provided to the Nebraska Department of Environment and Energy (NDEE). NDEE in turn provides this to the Nebraska Legislature on an annual basis.

In 2022 samples were collected from 52 sites.

Year	Nitrate-Nitrogen Range	% Nitrate-nitrogen 0-8.0 ppm	% Nitrate nitrogen 8.01-10.0 ppm	% Nitrate nitrogen > 10 ppm
2022	0 - 18.7 ppm	69% (36 of 52)	15% (8 of 52)	15% (8 of 52)

Samples for pesticide analysis were collected from ten of these sites (19%). The pesticide analysis was for a suite of 25 parameters, and all results were less than reporting level.

Ground Water Energy Level Monitoring Network

One of the responsibilities of the NRDs in the State is to monitor fluctuations in groundwater levels. With the help of area cooperators, a ground water energy level monitoring network has been established in the LPNNRD. This monitoring network has been established to obtain a better understanding of the groundwater levels throughout the District. As of Spring 2023, the LPNNRD had 212 wells in the groundwater energy level monitoring network. These wells are monitored each spring and fall, with selected wells also measured in late August.

The LPNNRD compares the latest spring reading to the 1987 base-year to determine if a subarea needs to be declared a Level 2 or Level 3 groundwater management area. Level 2 and 3 management areas require flow meters on wells, annual reporting of water use, and establishment of acre-inch allocations. For the 26 sub-areas within the District, 24 subareas are currently at Level 1 management, while the other 2 sub-areas still need additional information before these can be designated. Sub-Areas along the Elkhorn and Platte Rivers are showing some of the wells reaching Level 2 and 3 management. The District prefers at least three years of data before the subarea can be designated as a Level 1, 2, or 3 management area.

Fall readings in 2022 and Spring of 2023 showed a decline from the previous year's measurement. This change was the continuing lack of moisture in the last 2 years. Spring readings in 2023 showed 92% of the wells measured had levels lower in Spring 2023 compared to Spring of 2022. There was a 3% rise in 6 wells from a year ago.

Chemigation

Chemigation is the act of injecting chemicals into the water line of an irrigation system that is then applied onto the crops. It is considered to be one of the most efficient ways of applying essential nutrients in times when the crop is uptaking the most amount of nitrogen through its growing stages. In order to chemigate, a licensed permit holder must obtain a permit through the Lower Platte North NRD. Special equipment must be installed to protect Nebraska's groundwater from possible back-flow of chemicals into the groundwater source. To obtain this permit administered by NDEE, you must pass the Chemigation Certification test taught through the University of Nebraska-Lincoln's certification program. There is an online test option available to producers. The chemigation equipment must be properly equipped, inspected and approved by the NRD before applying any chemicals. The number of chemigation permits continues to slowly rise throughout the district due to chemigation's efficient application rate when the crops are in the most need of nutrients. In sandier soil types, chemigation is extremely effective due to the soil's incapability to hold essential nutrients in the root zone after heavy rainfall events.

Chemigation Permits	Total	Renewal	New	Emergency
November 2022	733	676	56	1
August 2023	704	643	61	0

In 2014, the Legislature approved changes to Title 195 that would allow individual NRDs to set chemigation fees. Chemigation fees for LPNNRD are as follows: \$90 for a New permit, \$30 for a Renewal permit, and \$300 for an Emergency permit. Inspections are required on equipment for new permits. Renewal permits are inspected on a three-year rotation. Failure to renew by June 1st of the following year the permit was obtained will cause the permit to lapse. If a renewal

permit lapses, the producer must obtain a new permit and an inspection is required.

Decommissioned (Abandoned) Wells

Abandoned wells are a health and safety concern and have been ruled as illegal by the Nebraska Legislature. A well not used for three consecutive years or one which is no longer useful is considered to be abandoned and needs to be properly decommissioned.

The Lower Platte North NRD offers up to 75% cost share assistance to landowners to properly decommission abandoned water wells. In addition, the district will assist with up to 75% of the cost for pump and obstruction removal on domestic and stock wells. To receive cost share assistance, the actual decommissioning must be performed by a certified well driller or pump installer. The landowner has six months from the time of application to accomplish this task unless good cause is shown.

Since 1992 the district has administered local and state cost-share dollars to decommission 734 wells. Through this program in FY 22-23, a total of \$11,604.58 was administered by LPNNRD for the plugging of 10 wells. The district will administer approximately \$15,500 of state and local funds to plug additional wells during the current fiscal year.

Flow Meter Maintenance Program/Flow Meter Readings

Since 2008, the LPNNRD has implemented the requirement of installing a District approved flow meter on any new or replacement well. Thereafter in 2012, the District also required the installation of a flow meter on any expansion of acres from an existing well. This pumping information is invaluable to the District to know what has been pumped during years of extended drought. It is vital that the LPNNRD keeps track of this going forward into the future. In order to know the volume of water within our aquifer systems, we need to know the water that is being extracted.

In 2016, the district chose to contract with a

private company through the bidding process. The company was scheduled to maintain the flow meters within the LPNNRD’s SQS areas for the first four years. Since that was completed the District has chosen to open the flow meter maintenance program district wide in 2020. Maintenance on the flow meters will be performed once every four years. The district is in charge of the labor and site visit at each meter. Each mechanical meter site visit is \$60 and each battery operated site visit is \$75. This maintenance includes the regular greasing of the mechanical meters and changing the batteries on the digitally read meters. Along with the regular maintenance the private company also ensures that the meter is not damaged from water or vibration. There are approximately 1,150 irrigation well flow meters that are getting routine maintenance once every four years.

Along with the irrigation wells, the LPNNRD also records meter readings from all of the municipality wells within the District including MUD, Lincoln and Fremont. Livestock wells and commercial wells are required to report if the well was drilled after the 2012 requirement date. Over 1,200 readings are recorded annually throughout the LPNNRD District. This Fiscal year the LPNNRD budgeted \$24,000 for the meter maintenance program.

Registered Wells

The Nebraska Legislature declared that the conservation and the beneficial use of ground water are essential to the future well-being of the State. State Law requires that all water wells in the State of Nebraska be registered with the Department of Natural Resources. Wells that are not registered are illegal and should be registered as soon as possible. A breakdown by decade from 1970 to present shows the growth of active irrigation wells in the District.

Table of Active Irrigation Wells within LPNNRD compiled by Completion Date

Date	Number of Active Irrigation Wells in the District
December 31, 1970	1,428
December 31, 1980	2,756
December 31, 1990	3,241
December 31, 2000	3,686
December 31, 2010	4,307
December 31, 2020	4,554
July 1, 2023	4,606

Well Permits

In May of 2008, the LPNNRD placed a flow meter and water reporting condition on well permits for all permits issued after that date. All well permits require well owners to install a flow meter and report their water use for the calendar year to the LPNNRD by December 15 of each year. This reporting requirement is effective the year the well is drilled and for each year thereafter, until the well is decommissioned. From January 1 to July 1st, 2023, the District has issued 26 well permits with 8 new and 18 replacement irrigation wells.

Special Studies

The LPNNRD has done a number of studies within the District. The following is a list of studies that are currently being conducted within the District.

Aquifer Vulnerability Mapping and Analysis

The Lower Platte North has been working with UNL to collect and analyze data within the LPN Water Quality Management Areas. The first stage involved intensive water sampling of irrigation wells for nitrates. A few isotope nitrate samples were collected for the purpose of determining if the nitrates are from organic or inorganic sources. This was followed-up with vadose soil sampling analysis to assist in determining the amount of nitrates in soil and pore water present in the unsaturated zones above the water table. A nitrate tool was developed utilizing this data, along with

geological information to assist in determining vulnerability. This project was completed in 2021 with informational meetings in the area. The plan is to conduct some age dating of groundwater to help in nitrogen management.

3D Airborne Electromagnetic (AEM) Hydrogeologic Framework and Assessment

Papio-Missouri River NRD, NeDNR and LPNNRD started a study in January 2021 to assess AEM survey information, well logs, and other geological information. The data will be used to characterize different geological layers and assign variables such as hydraulic conductivity. This data will be used in groundwater modeling to better understand, assess, and forecast groundwater. This study was completed in January 2022. Starting August 2023 the process of taking this data along with LPSNRD assessment and completing a groundwater model for the Lower Platte River Basin.

Lower Platte River Consortium Study

Municipal wellfields in the Lower Platte River Basin depend on the Platte River to recharge groundwater for their use. This study looked at long term water supplies in the Lower Platte River Basin, and the ability to enhance streamflow, especially in drought conditions, to sustain these municipal water systems. Sustaining water in the river would also provide a benefit to wildlife and agriculture by lessening the likelihood of a 'call' on the river. Due to different hydrologic conditions in the Platte River, such as gaining and losing segments, siting of future reservoirs, groundwater storage projects, etc. becomes important in order to most effectively move water to a desired location downstream. The plan was completed in Spring 2020 with the group now in the process considering the options from the plan to determine the feasibility of the projects.

Eastern Nebraska Water Resources Assessment

LPNNRD is a partner in the Eastern Nebraska Water Resources Assessment (ENWRA). The ENWRA study has been utilizing Airborne

Electromagnetic (AEM) over eastern Nebraska to better model the geology of the glaciated portion of the State. It has opened several questions concerning bedrock aquifers both in water quantity and water quality such as salinity. New flights were conducted in the summer of 2018 with the final report received in summer 2019. A study is being conducted in the Platte-Colfax Area (SQS#2) utilizing the AEM, additional data loggers and other geologic logs to determine the relationship between confining and unconfined layers along with determining drawdown levels for management decisions. The flights and the results can be found on the ENWRA website at (www.enwra.org).

Elkhorn-Loup Model

The Elkhorn-Loup Model (ELM) project is a study of surface water and groundwater resources in the Elkhorn River basin upstream of Norfolk, Nebraska and the Loup River basin upstream of Columbus, Nebraska. Parts of this basin overlap and cover portions of upper Shell Creek.

Certifying Acres

In July 2009, the District signed a contract with gWorks (formerly GIS Workshop) to develop a database of county assessor records as the preliminary step to certifying irrigated acres. Using these records, LPNNRD staff mailed out letters to landowners to verify irrigated ground. As of January 2022, the majority of the irrigation in the district has been cataloged. The District is still granting new irrigation development. Those new acres are not entered into the certification database until they can be verified by aerial photography and accurately modeled. In March of 2021, the District went through all the approved new irrigation acres and modeled out all those that had yet to be counted. Acre certification provides an inventory of the irrigation needs of the District, which is an important part of present and future groundwater management and planning. In addition to cataloging irrigated acres, LPNNRD

staff have been actively working with the Nebraska Department of Natural Resources (NeDNR), as well as local landowners, to bring all irrigation wells in LPNNRD into compliance with Nebraska Revised Statute 46-602 (7).

Nebraska Ordnance Plant Water Pollution Clean Up at Mead

During the 1940s, 1950s and 1960s, an Army Ordnance Plant near Mead was used to assemble bombs and served as an early Atlas Missile ICBM site. Over time, the soil and groundwater at the plant site became polluted with various explosive residues and solvents. The cleanup has been divided into three basic project areas: Soils (OU1), Ground Water (OU2), and Building contamination (OU3). This area has been under study by the Army Corps of Engineers (COE) since 1988. An open house was held by the Corp, May 2023, with annual tours and open houses conducted regularly.

Wellhead Protection Program

The LPNNRD implemented a wellhead protection program in FY 2001. The goal of the program is to minimize potential polluting activities on the land surrounding a community's public water supply well(s). The District has identified 22 communities with public supply wells and they have been encouraged to become involved in the program. The Communities of Newman Grove and Platte Center have applied for Source Water Protection Grants to re-evaluate and approve their wellhead management areas. Both communities will do a nitrogen assessment for the area to assist in future well locations.

Rural Water Districts

In recent years, the District has worked with communities who have had difficulties with water quality and quantity by forming two rural water systems. The Butler County system linked the village of Bruno in 2006, who was having water quality and quantity problems, to David City. Also in 2006, the Saunders County system linked the village of Colon, who was

experiencing water quality concerns, to Wahoo. The LPNNRD operates both of these systems. The District purchases water from the larger communities and delivers it to the smaller communities; RW staff manage and maintain Colon's system and billing while Bruno manages their infrastructure and household billing. Both systems are designed to serve rural customers along each service route. Combined, the two systems serve over 135 households in Saunders and Butler Counties. To address fiscal concerns both RWDs have implemented a phased rate increase strategy to more diligently manage the financial standings of both districts. The District has been in contact with several other communities and anticipates several more communities and rural customers to be serviced by rural water systems in the future as rural communities face an increased burden at providing adequate quantity, and quality, water while maintaining aging infrastructure. Both systems are greater than 10 years old and repairs/replacements of meters is expected to take up RWD staff's time in 2023-24 as a number of meters and components are nearing the end of their expected service life.

Geographic Information System (GIS) and Global Positioning System (GPS)

LPNNRD has used Geographic Information System (GIS) technology since 1996. GIS is an automated system combining database information and maps. Features on a map, created with GIS technology, contain attribute or feature descriptions that are referenced by location. The data used by a GIS system consists of Vector and Raster Data. Vector data consists of point (wells), line (roads) and polygon data (irrigation boundaries or parcels); with Raster data consisting of pixels, where each pixel on the screen corresponds to a data point. Raster data includes aerial photography and elevation data such as LiDAR (a highly accurate elevation dataset). The District has incorporated the use of GIS into most district functions, including the certification of irrigated acres, maintenance, project planning, modeling of groundwater

availability, and the movement of contaminants such as nitrates through the soil profile.

In addition to in-house GIS activities, LPNNRD GIS staff assist a variety of partners, including projecting FSA aerial photography into Nebraska State Plane Feet coordinates for NeDNR, custom authoring of maps for the Nebraska Land Trust, coordination of helicopter flight lines for invasive species control with the Lower Platte Weed Management Area, and helping other NRDs with GIS questions as they emerge.

LPNNRD entered into an agreement with Phoenix Web Group to create a robust, relational database. GIS will be the backbone of this database and will allow LPNNRD to quickly, and efficiently, look up any information pertaining to any project or cost share that has been completed for any constituent with land in LPNNRD.

The Global Positioning System (GPS) relies on 31 NAVSTAR satellites, which provide world wide positioning and navigation information around the clock. Receivers acquire signals from satellites to determine precise locations on earth. The data obtained from taking GPS positions can be downloaded and mapped with GIS, making the two technologies complementary. LPNNRD partnered with NRCS on the purchase of a sub-centimeter GPS base station. This allows NRCS and NRD staff to quickly and efficiently perform a variety of tasks in the field with survey level precision.

As drone technology continues to evolve, LPNNRD has added a SkyDio2 Autonomous Drone to its inventory. LPNNRD Staff have completed FAA Part 107 certification, which ensures safe operation of drones for commercial purposes. This certification process involves an exam that covers airspace regulations, weather, and aviation safety.

FY 2024 Ground and Surface Water Objectives

- Continue to monitor changes in groundwater levels and quality in the district.
- Continue with LPNNRD Groundwater Management Area (GWMA) programs to help avoid the Lower Platte Basin being designated “fully appropriated.”
- Continue to implement Voluntary Integrated Water Management Plan (V-IMP) for the District and basin-wide plan. Utilize acre feet allotments assigned to the District for the benefit of the basin.
- As part of the GWMA, continue with LPNNRD certification classes, demonstration plots, generation of maps indicating problem areas, and evolving the development of a master database.
- Continue to cooperate with the United States Geological Survey (USGS) in monitoring groundwater levels at two sites.
- Continue to cooperate with the United States Geological Survey (USGS) in monitoring surface water levels at four sites and one site for contamination evaluation.
- Use the Subarea Delineation Study to identify ‘small pocket aquifers’ in the Swedeburg, Prague, Yutan, and Yutan South subareas. Review other aquifer subareas to determine if Stay Management Areas are justified in other portions of our District.
- Continue sampling of approximately 53 wells in our District that are part of the Nebraska State-wide Network.
- Continue to monitor the Phase Areas in Richland-Schuyler and Bellwood for nitrate and elevate these areas as needed.
- Continue implementing extensive sampling of soil and water in the Phase Areas for the purpose of identifying workable best management practices for curbing the rising nitrate trend.
- Implement best management practices within the Phase Areas for the purpose of decreasing nitrate levels.
- Administer \$19,000 of state and local cost-

share funds to decommission abandoned water wells, and provide 100% cost-share assistance within Wellhead Protection Areas to communities that are actively doing projects within its management area.

- Maintain a multi-agency groundwater energy level monitoring network in the Wann Basin of the Platte Valley north of Ashland to pool information from different agencies collecting water level data. This information is being used by the COE and MUD to refine their groundwater modeling efforts.
- Continue to implement the Chemigation Program to inspect safety equipment on permitted irrigation systems in the district.
- Continue with the District's Well Permitting Program and Variance Process throughout the District.
- Continue to review water use reports submitted to the LPNNRD as part of the well permitting process from new and replacement wells.
- Provide information and education on water conservation and safe disposal of farm and household chemicals.
- Continue to map registered and unregistered wells in the district using GPS.
- Promote and sponsor LPNNRD's Spring Conservation Sensation.
- Provide information on Integrated Pest Management in news releases and the "Viaduct" newsletter to encourage reduced use of pesticides.
- Support and promote urban water conservation and chemical disposal throughout the District.
- Assist in organizing the annual NRD Water Programs Conference held each year to update the NRD's on activity of State and Federal Agencies, new research, and Legislative issues.
- Continue to install flow meters on irrigation wells that are part of our Ground Water Energy Level (GWEL) Network.
- Expand the GWEL network to monitor aquifer sub-areas as designated in the 2009

Subarea Delineation Study. This will be done by incorporating additional high capacity wells and the drilling of new monitoring wells.

- Continue to monitor clean up efforts by the COE at the Former Ordnance Plant at Mead, Nebraska.
- Work with the COE to establish spacing requirements for future high capacity irrigation, industrial, and/or municipal wells that are requesting to be installed near known contaminant plumes from the Former Ordnance Plant near Mead, so these wells will not interfere with the COE's clean up efforts.
- Continue to monitor clean up efforts by the University of Nebraska at the Eastern Nebraska Research and Extension Center (ENREC) facilities east of Ithaca, Nebraska.
- Maintain transducers placed in District monitoring wells to record changes in groundwater energy levels and to continue the process of installing real-time remote reads.
- Implement Level 2 or Level 3 Management areas as warranted caused by declining groundwater energy levels in 50% or more of the monitoring wells reaching their trigger levels after three consecutive spring readings.
- Review livestock permits from NDEE.
- Investigate irrigation runoff and groundwater management area complaints as needed.
- Expand the NeRain program within our District.
- Continue to be a sponsor member of the Elkhorn-Loup Model (ELM).
- Continue groundwater studies with the University and NeDNR in the SQS areas. Study will focus on confined and unconfined aquifers and drawdowns within these areas.
- Communicate with well drillers and pump installers on water concerns within the District.
- Continue to assist the Eastern Nebraska Water Resources Assessment (ENWRA) with

the use of AEM (Airborne Electromagnetic) to study the eastern glaciated portions of Nebraska to provide a geologic framework map.

- Improve irrigation efficiency by working with UNL Extension on the Nebraska Agricultural Water Management Network (NAWMN) to install Watermark sensors and ET gauges with producers each year in our District.
- Continue with the process of updating Irrigated Acre Certification within the District.
- Continue working on projects identified within the Shell Creek Watershed Water Quality Plan.
- Update water quality objectives as identified in the Wahoo Creek Watershed and the Shell Creek Watershed Water Quality Plans.
- Continue to increase producer participation in online reporting for entering their data to improve efficiency and quality of data.
- Analyze the real-time water level measurement network in Special Quantity Areas for in-season management decisions for determining warning triggers.
- Start the groundwater modeling process jointly with PMRNRD, LPSNRD and NeDNR within the Lower Platte Basin for updating the Hydrological Connected Area (HCA) and assist in the well permitting process.
- To work with USGS and Lower Loup NRD on assessing legacy nitrate in Platte, Colfax and Dodge Counties, Nebraska by identifying wells to sample.
- To continue to work with UNL and NDEE on an interseeding cover crop project in the Shell and Wahoo Creek Watersheds.

FY 2025-2029 Long Range Ground and Surface Water Objectives

- Continue groundwater quality sampling throughout the LPNNRD, both the State-wide network and intensive sampling of selected regional aquifers.
- Continue water quality education programs based on the goals and objectives of the

LPNNRD Groundwater Management Area, which includes LPNNRD certification classes for landowners, municipal, and industrial water users.

- If needed, designate further Phase II, III, and IV boundaries for the Groundwater Quality Management Areas.
- Educate the need for check valves in protecting the aquifer from contamination.
- Continue with nitrogen application demonstrations and participate with demonstrations on integrated pest management and sustainable agriculture.
- Assist in the proper decommissioning of water wells in the district.
- Continue to use GPS to map registered and unregistered wells within the district.
- If necessary, designate Level II and III boundaries within the district to manage declining groundwater levels.
- If necessary, designate new Special Quantity Subareas (SQS) within the district to manage mid summer declines of groundwater energy levels in aquifers that operate under large pressure swings.
- Continue measurement of ground water energy levels in the district.
- Develop a groundwater model to assist in management for each sub-area. Additional information on water use from all wells will be needed for accurate information.
- Continued partnership with the Eastern Nebraska Water Resources Assessment (ENWRA) and apply information to the glaciated portions of our District.
- Initiate additional studies to identify vulnerable aquifers and modify GWMA rules and regulations to protect these aquifers and their long term sustainability. Continue geophysical work, installation of monitoring wells and test holes to better define these vulnerable sub-areas. Additional AEM flights with ¼ to ⅓ mile spacing would gratefully assist in defining such areas. Eventually cover the entire District with these detailed AEM investigations.
- Continue using AEM (airborne electromagnetic) information to analyze

bedrock aquifers both in water quantity and water quality. Test holes and monitoring wells will have to be installed and sampled to determine these as a possible source of usable groundwater. New management strategies need to be developed for these aquifers such as summer trigger levels for confined bedrock aquifers, especially if these are hydrologically isolated from overlying alluvial aquifers. This could develop into three dimensional management where aquifers at different depths are treated by a separate set of rules for each one. This could become very complex but will likely be the only way to sustain the use of these aquifers far into the future.

- Install precipitation gauges near monitoring wells in important sub-areas.
- Utilize the completed Lower Platte River Consortium Study for possible locations for recharge and reservoir sites to better convey water downstream to municipal wellfields.
- Complete water quality objectives as identified in the Watershed Quality Plans.
- Continue to update the Groundwater Management Plan to include Integrated Management of surface and ground water. It may be necessary to install additional surface water gauging sites coupled with nearby groundwater monitoring wells as tools for integrated water management.
- Expand the GWEL network to have continuous recording monitoring wells in each sub-area to better manage the resource with the ability for remote real-time readings. This is especially important in confined aquifers.
- Continue to update the certification of irrigated acres.
- Continue to assist District communities who have difficulties with water quality and quantity by helping determine rural water system feasibility.
- Keep the Saunders County Rural Water System study as an alternative in the event of changing federal regulations governing municipal water supplies.

- Keep abreast of updates and new iterations of the Elkhorn-Loup Model (ELM) to determine which areas in the Shell Creek watershed are in hydrologic connection with the Elkhorn or Loup River basins.

In summary, the LPNNRD needs to focus on five areas in the next five years:

1. Using information from the AEM flights and test holes, establish a monitoring well network in these confined aquifers to record continuous ground water energy levels. It is midsummer declines (late July to mid-August) when large drops in aquifer pressure can cause some wells to run low on water. Map locations of potential recharge sites. More flights, test holes and/or monitoring wells might be necessary in areas to provide the necessary information.

2. Establish ground water management rules to better address confined aquifers. This could involve comparing spring to summer ground water energy levels and comparing this to the potentiometric aquifer thickness and the depth of bedrock. The current management rules for unconfined aquifers should be adequate for future conditions. These controls are based on three consecutive spring readings at or below their trigger levels in at least 50% of the GWEL wells in a given subarea.

3. AEM flights have given a new interest in bedrock aquifers such as the Dakota formation. Monitoring wells in selected areas are needed to determine the water quality and quantity of these bedrock aquifers. Also are these bedrock aquifers in hydrologic connection to any overlying aquifers? If this is the case and new high capacity wells are being established in these bedrock aquifers then management should shift focus to the more vulnerable aquifer to sustain long term viability of both aquifers. If these bedrock aquifers are isolated from the overlying aquifer then "three dimensional management" where wells are managed differently due to

their depth may be in order. This could get complex but management needs to take the chemical and physical characteristics of the aquifer in account. For example, what is the salinity of the groundwater and is the bedrock aquifer cemented, unconsolidated, sandstone, limestone, or shale.

4. Horizontal wells. In the immediate future horizontal high capacity irrigation water wells will likely be established in thin aquifers to increase well output or yield. On the plus side, these could replace several vertical wells that are used in series and therefore be a cost savings to the well owner. On the negative side these could quickly dry up thin aquifers less than 20 feet in thickness and affect nearby wells. How do you manage such a system? At the least you could require 600 feet spacing from any point of the lateral to a neighbor's well but again this may not provide much protection in thin aquifers such as the area immediately west of Fremont. Other management options would be to restrict the number of acres irrigated, restrict the length and direction of the laterals, restrict well output such as limit the gallons per minute, establish water allocation, install monitoring wells such as near the end of the laterals to track groundwater levels, etc.

5. Integrated Water Management. Siting of potential recharge sites, storage reservoirs (both surface and groundwater), and potential water reuse projects to enhance the water supply in the District. Additional monitoring wells, streamflow gauging, and precipitation sites will likely be necessary. Effects of climate change will also need to be considered as part of integrated water management.



In response to the Erosion and Sediment Control Act (LB 474), passed in 1986, the Natural Resources Commission developed the Nebraska Soil and Water Conservation Strategy. This strategy outlines a course of action for efficiently conserving and managing the state's natural resources.

The Lower Platte North NRD administers the Erosion and Sediment Act and has patterned its local program after the state strategy. The district administers state and local cost-share funds through Soil and Water Conservation Programs (SWCP) to offer incentives to producers for installation of land treatment practices. LPNNRD staff also worked with NRCS staff to utilize Farm Bill Programs to repair erosion problems.

FY 2023 Soil Conservation Activities

Soil and Water Conservation Programs (SWCP)

Under Soil and Water Conservation Programs (SWCP), the LPNNRD allocated \$83,029.99 of state funds (Dept. Natural Resources) for land treatment practices during fiscal year 2023 in cooperation with 12 different landowner projects. In addition, 3 Buffer Strip contracts were administered with \$12,258 in state funds.

For fiscal year 2024, \$92,179.61 of state funds (from the Nebraska Department of Natural Resources) and \$25,000 of local funds will be allocated for soil and water conservation practices through the LPNNRD Lands for Conservation Program (LFC). The LFC program offers landowners a per/acre payment to set aside production ground to allow for summer construction. This lessens the burden on the fall construction season allowing more conservation work to be implemented.

Wahoo Creek Water Quality Land Treatment Efforts

Wahoo Creek in Saunders County, Nebraska, has resided on the Environmental Protection Agency's (EPA) list of impaired water bodies for decades. To address the impaired status of Wahoo Creek, LPNNRD in partnership with the U.S. Environmental Protection Agency (EPA) and the Nebraska Department of Environment and Energy (NDEE) developed the Wahoo Creek Watershed Water Quality Management Plan in 2013. These plans are updated every 5 years and the District is in the process of completing another update. This plan identifies goals to reduce excess phosphorus, nitrogen, soil sediments, and E. coli bacteria in the Wahoo Creek Watershed. This plan meets the EPA's requirement of containing "Nine Elements" of an effective watershed management plan. The plan identifies water quality goals to protect and enhance the quality of all water resources within the Wahoo Creek. Sub-watersheds within the Wahoo Creek Watershed were prioritized for future water quality projects. LPNNRD in partnership with EPA, NDEE, and the Natural Resource Conservation Service (NRCS) identified four Wahoo Creek sub-watersheds as National Water Quality Initiative (NWQI) areas to receive special EQIP and EPA 319 funding for landowners to complete conservation practices to help achieve the numerous identified water quality goals.

Shell Creek Watershed EPA Section 319 Water Quality Improvement Efforts

Shell Creek is a major tributary of the Lower Platte River. Land use in the approximately 305,000 acre watershed is predominantly row crop agriculture. Portions of Shell Creek are on the Environmental Protection Agency's (EPA) impaired waters list. The most notable impairments include E. coli (bacteria) and Atrazine.

The Shell Creek Watershed Improvement

Group (SCWIG) is a volunteer committee that formed in 1999 to lead local efforts to identify problems and to promote implementation of conservation practices to improve water quality in Shell Creek. This evolved into an advisory group to LPNNRD continuing to provide local leadership toward reducing erosion and water quality impairments in the watershed. A community-based planning approach was used to gather input from the citizens of the watershed for development of the Shell Creek Watershed Environmental Enhancement Plan that emphasizes combinations of practices that improve water quality.

Over the past 23 years, the Shell Creek Watershed has benefited with over \$2 million in EPA Section 319 funds combined with approximately \$4 million in partnering federal and local funds for assisting landowners in establishing Best Management Practices on their farms. These efforts resulted in Shell Creek becoming the first agricultural watershed in the nation to have a segment delisted for atrazine contamination in FY 2018.

In FY 2023, the NRD secured \$779,000 in grants from EPA/NDEE Section 319 and the Nebraska Environmental Trust (NET). These grant dollars matched with local funds are expected to yield over \$1.4 million of water quality work in the watershed over the next three years.

Erosion and Sediment Complaints

The LPNNRD responds to occasional erosion and sediment complaints. In most cases, these complaints are resolved before going through the formal complaint process. Many cases are drainage issues that are resolved between the District and landowners. During FY2022 NRD staff was subpoenaed on a case between two neighbors that could not be resolved amicably. The case has yet to be resolved as both parties continue to work together. During FY2023 LPNNRD was contacted by a landowner concerned about the placement of a tile outlet near his fence/property line. The work being completed on the neighbor's property was not

being done with NRD, or NRCS, approval. The NRD reached out to the neighbor's and through multiple conversations was able to come to an agreement that satisfied both parties.

FY 2024 Soil Conservation Objectives

- Use technical assistance from the NRCS in the planning, design, construction, and maintenance of conservation measures applied to the land.
- Use Federal, state, and local funds to promote and implement land and water treatment projects in priority areas of Wahoo Creek Watershed to reduce erosion and improve water quality. The NRD plans to coordinate with local NRCS through the National Water Quality Initiative (NWQI), NDEE's 319 program, and local funding efforts to achieve the goal.
- Continue encouraging the implementation of summer conservation construction utilizing federal funding within the Wahoo Creek Watershed through the Lands for Conservation program; for FY24 the NRD has approved \$19,600 for the set aside of 85 acres.
- Administer \$92,179.61 of State NSWCP funds and \$25,000 of local cost-share and grant funds to landowners for the construction of terraces, tile outlets, waterways, diversions, small dams, planting of permanent vegetation, and maintaining water quality.
- Continue to promote conservation tillage measures, pasture & range management, sustainable agriculture, and the Conservation Reserve Program (CRP), through news releases and the district's newsletter.
- Recognize the Outstanding Soil and Water Conservationists.
- Continue to assist landowners in resolving soil erosion and sediment complaints.
- Provide financial support and staff time to conservation education activities.

- Continue to work closely with locally-led conservation groups to promote soil and water conservation throughout the district.
- Partner with the Shell Creek Watershed Improvement Group (SCWIG), EPA/NDEE, NET, and NRCS toward continuing implementation of Best Management Practices in the Shell Creek Environmental Enhancement Plan Implementation.
- Work with NRCS, NDEE, NET, Saunders County, and the Wahoo Creek locally led Steering Committee in pursuing additional federal and state funds to assist with land treatment practices as defined in water quality objectives in the Wahoo Creek Watershed Water Quality Plan.
- Assist with the formation of local landowner advisory steering committees in the Wahoo and Bone/Skull Creek Watersheds for planning soil & water conservation practices and flood reduction.
- Use existing and new technology and GIS software programs for implementing and promoting soil conservation practices.
- Promote the use of and make available soil surveys and land use information.
- Continue to support Locally Led Landowner Groups to promote and implement soil and water conservation practices.

FY 2025-2029 Soil Conservation Long Range Objectives

- FY 2024-2028 Soil Conservation Long Range Objectives (Sean, Ryan) DONE
- Maintain existing land treatment practices and programs.
- Continue to work with all counties in the district to reduce roadside erosion.
- Administer NET and NDEE/EPA 319 Grant Programs to improve water quality throughout Wahoo Creek, Shell Creek, and the Lower Platte River Corridor Alliance priority watersheds.
- Look for new and innovative soil and water conservation methods.
- Partner with NRCS, UNL Extension, and landowners to improve all aspects of their water and soil quality.
- Continue to support the Land and Range Judging Contests.
- Continue targeting SWCP land treatment program funds for priority watersheds in the District.



FLOOD CONTROL & DAMAGE REDUCTION ACTIVITIES

Projects have been completed in priority areas in the LPNNRD to help reduce flooding and provide grade stabilization. Projects have been completed in Bellwood, Clear Creek, Cottonwood Creek, Sand and Duck Creek, Swedeburg, and Rawhide Creek watersheds. Current high priority flood reduction areas include Bone Creek, Shell Creek,, Skull Creek, and Wahoo Creek watersheds. On federal and state projects where the LPNNRD acts as project sponsor, the district obtains land rights and is also responsible for operation and maintenance activities on these projects after they are built.

The LPNNRD offers local assistance for the construction of small dams that can help counties and/or landowners protect county roads, control erosion, and provide water for livestock and wildlife.

FY 2023 Flood Control and Damage Reduction Activities

Wahoo Creek Flood Reduction Efforts

The NRD is currently in the process of building ten flood reduction dams in Wahoo Creek watershed, estimated to cost \$19.7 million in 2020. Federal (WFPO) and state funds (JEDI) are expected to fund the entire project including planning, design, permitting, land rights, construction, and construction oversight. Construction will begin in FY2024 on three sites: 26a, 26b, and 27. Construction is expected to begin in FY2025 on the remaining seven sites: 55, 66, 77, 82, 84, 86, and 86. Completion of all ten dam sites is anticipated by the end of FY28.

Sand Creek Environmental Restoration Project (Lake Wanahoo)

With the invaluable assistance of numerous local, state, and federal partners, 2011

witnessed the completion of construction on Lake Wanahoo's earth embankment. The breakwater feature and the fisheries component were completed a few years prior to the embankment. Recreation components were completed for Lake Wanahoo in FY2011. Construction of seven upstream flood reduction/environmental enhancement structures were completed in FY12-14. In FY19, LPNNRD assumed Lake Wanahoo's recreation management responsibilities from the Nebraska Game and Parks Commission.

Operation and Maintenance

District staff completed inspections on 45 watershed structures and special projects in the NRD in FY 23. These inspections help detect problems before they become serious. Also during the 2023 fiscal year, noxious weeds and volunteer trees were sprayed on 45 dams, Clear Creek Levee, and the Rawhide Ditch System. Annual maintenance activities such as removing debris, repairing fences and unplugging risers were completed at many of the dam locations. The District is currently working with NRCS and a Engineer Consultant in the rehabilitation of dam Cottonwood 21-A.

Army Corps of Engineers 205 Flood Studies

Over the past many years, the District has partnered with local entities and the US Army Corps of Engineers to study flood protection alternatives for their areas. In 2004, LPNNRD partnered with Fremont, Inglewood, and Dodge County to look at a potential levee project to remove areas from the Platte River 100-year ice induced floodplain. In FY 2017, the Fremont study evolved into a General Investigation (GI) Study which determined that there is not a feasible structural solution (levee) to the City of Fremont's flood threat from the Platte River. In 2018 the GI Study evolved back to a 205

Non-Structural Study for the City of Fremont and Dodge County. This effort will continue in FY 2024.

In 2005, LPNNRD entered into an interlocal agreement with the City of Schuyler to evaluate levee protection options to protect the city from flooding from the Platte River and Shell Creek. In FY 2012, the Schuyler 205 Study was completed and entered into the project design phase. In FY 2014 the design phase was completed and LPNNRD assisted Schuyler with obtaining needed land rights for the Shell Creek Levee portion of the project which began construction activities in the spring of 2014 and most construction activities were completed in the fall of 2015. LPNNRD continued to assist Schuyler in FY 2018 with closing out the project with the Army Corps of Engineers. Schuyler continues to do a great job in maintaining the levee.

FY 2024 Flood Control and Damage Reduction Objectives

- Continue with accelerated land treatment efforts in identified priority watersheds in the District.
- Complete annual and/or biennial inspections on 45 watershed structures; spray noxious weeds & cut and treat trees on 45 dams, Clear Creek Levee, and Rawhide ditch; complete regular maintenance activities at all sites.
- Continue to be an active partner on the Joint Water Management Advisory Board to explore flood reduction and drainage solutions in portions of Dodge County within LPNNRD.
- Partner with the City of Fremont, Dodge County, and Papio-Missouri River NRD to fund operation and maintenance of established USGS cameras and water gauges at five locations along the Lower Platte River.
- Partner with Dodge County and City of Fremont on FEMA Drainage

Improvement Project.

- Continue to educate the public on watershed management and flood reduction in LPNNRD newsletters, news releases, and our website.
- Cooperate with landowners and counties in evaluating small dam sites for cost-share throughout the district.
- Continue to partner with the Army Corps of Engineers, FEMA, City of Fremont, Englewood, and Dodge County on exploring non-structural opportunities for feasible flood control solutions.
- Support the City of Schuyler for exploring non-structural opportunities for feasible flood control solutions from the Platte River through the LPNNRD District-wide Hazard Mitigation Plan.
- Work with Communities, Counties, and other entities on projects identified in our District-wide All Hazard Mitigation Plan.
- Complete easement acquisition for all ten Wahoo Creek Watershed flood reduction dam sites.
- Complete engineering designs on Wahoo Creek Dam Sites 55, 66, 77, 82, 84, 85, 86.
- Begin construction on Wahoo Creek Dam Sites 26a, 26b, and 27.
- Begin the process of updating LPNNRD's district-wide All Hazard Mitigation Plan.
- Work with Dodge County, City of Fremont, and other JWMAB members toward the completion of the Rawhide Watershed WFPO Planning efforts.
- Partner with NRCS through the Dam Rehabilitation program to rehabilitate dam Cottonwood 21-A.

FY 2025-2029 Flood Control and Damage Reduction Long Range Objectives

- Continue to commit funds and staff time toward completing flood water control/reduction structures in the Wahoo Creek Watershed.

- Continue to budget staff time and funds to maintain and operate completed flood control structures that are sponsored by the LPNNRD.
- Develop a long term plan for Operation and Maintenance costs associated with large structures.
- Continue to explore flood reduction opportunities for Bone Creek, Shell Creek, and Skull Creek Watersheds.
- Continue to encourage cities and counties in the district to accept and implement Floodplain Management Authorities.
- Assist Fremont, Inglewood, and Dodge County with non-structural flood protection projects as identified by the Army Corps of Engineers study and the Hazard Mitigation Plan Flood Resiliency study.
- Assist Schuyler with non-structural Platte River flood protection project opportunities as they become available.
- Assist District Communities in evaluating future flood protection for their communities through updating the District's Hazard Mitigation Plan and assisting with identified projects.
- Construct ten approved Wahoo Creek flood water reduction dams by the end of 2028.
- Continue to work with JWMAB members on the numerous projects identified as flood reduction/drainage improvement projects.
- Partner with NRCS in the Dam Rehabilitation Program on dam Cottonwood 21-A.



The district administers several programs designed to enhance the region’s forest, range, and wildlife land, including the Tree Planting Program, Wildlife Habitat Programs with Nebraska Game & Parks and Pheasants Forever, SWCP Program, and Mitigation Program. The district also sponsors educational activities such as Range Judging and Land Judging contests, and other school-oriented activities.

FY 2023 Forestry, Range, and Wildlife Habitat Activities

Tree Program

One of the most visible and popular programs offered by the LPNNRD is the district’s tree planting program. As a direct result of this program, begun in 1973, an estimated 873,225 trees and shrubs have been planted in the district. Trees and shrubs may be obtained from the NRD for windbreaks, shelterbelts, wildlife habitat, woodlots, and Christmas tree plantings. Besides providing a planting service, the NRD also designs tree planting plans and offers technical advice on ground preparation for tree sites.

During the spring of 2023, 10,475 trees and shrubs were distributed to District residents. Of this total, 3,606 were planted by the NRD field crew at 12 sites.

Wildlife Program

Lower Platte North continues to encourage landowners to set aside land for wildlife habitat by using Federal Programs and Programs provided by Nebraska Game & Parks and Pheasant Forever. These programs include Corners For Wildlife and Wild Nebraska.

Community Forestry Program

In FY 2022-2023 LPNNRD donated 900 seedlings for schools in Fremont and Newman

Grove; provided trees to the District’s annual Spring Conservation Sensation; and provided trees for the Fremont EcoFair. The District budgets \$2,000 for Community tree development projects. The District did not assist a Community during the fiscal year.

FY 2024 Forestry, Range, and Wildlife Habitat Objectives

- Plant and distribute conservation trees and shrubs through the district’s Tree Planting Program.
- Continue to include tree planting as an eligible cost-share practice under the
- SWCP program.
- Offer trees and give staff presentations to elementary students across the district.
- Assist cooperators with signing up for Wildlife Programs.
- Cooperate with the Extension Service and the NRCS in obtaining tree orders from District residents.
- Provide cost-sharing for the conversion of cropland to grassland through the SWCP program.
- Cooperate with Pheasant Forever Chapters to enhance wildlife habitat and establish windbreaks.

FY 2025-2029 Forestry, Range, and Wildlife Habitat Long Range Objectives

- Increase tree and shrub sales and planting each year through the district’s Tree Planting Program for qualified property owners.
- Provide information and education on tree planting, woodland management, grassland management, and proper wildlife habitat enhancement through media, tours, and schools.

- Continue to administer Wildlife Habitat programs in cooperation with the Nebraska Game and Parks Commission and other partnering entities as opportunities arise.



FY 2023 Recreation Activities

Czechland Lake Recreation Area

Czechland Lake Recreation Area is a multipurpose project located one mile north of Prague, Nebraska on Highway 79. Flood control, recreation, and education are the main benefits of the project. Located at a convenient distance from Omaha, Lincoln, Fremont, and Wahoo, the 85 surface acre lake is situated on 265 acres of public access land operated and maintained by the LPNNRD.

State park permits and fees are not required for entrance to the area. Czechland Lake has 11 electrical camper pads at an \$18/night fee for the use of a camping pad. There are also three non-electrical pads. A Nebraska Fishing License is required for anglers. The lake fishery is managed by the Nebraska Game and Parks Commission, which stocks and monitors fish populations. Catfish, Bluegill, Northern Pike, and Largemouth Bass were initially stocked in Czechland Lake.

Originally built as one of twelve floodwater structures in the Cottonwood Creek Watershed, Czechland Lake has developed into one of the area's most popular recreation spots. The reservoir and recreation area development was built at a total cost of \$1.8 million. Funding for the project was shared by the Nebraska Natural Resources Commission, Saunders County, USDA Natural Resources Conservation Service, and LPNNRD. Grant monies from the U.S. Environmental Protection Agency have been used to reduce non-point source pollution entering the lake and to provide educational resources.

The Czechland recreation area was used extensively during FY 2023 generating approximately \$10,000 in camping revenue. Mowing, trash removal, repair, and upkeep of park equipment, and thistle control kept LPNNRD park staff very busy during the spring and summer.

Homestead Lake (Skull Creek Site #55)

Construction was completed on Homestead Lake in 2001. The dam offers flood control for nearby communities, and has been developed for public recreation. Recreation facilities include a shelter, restroom, picnic areas, a boat ramp, and hunting areas. FY 2023 proved to be another very popular year for recreationists as the area was extensively used.

Lake Wanahoo

Work was completed on recreation facilities at Lake Wanahoo one mile north of Wahoo in FY 2012. Recreation facilities at the 1,600 acre site straddle the 662-acre lake, with camping and boating access on the west side and a day use area on the east. A rocky hiking/biking trail winds throughout the park, linking the east and west side recreation areas over a breakwater levee one mile north of the dam. Mowed trails north of the levee provide access to undeveloped areas set aside for wildlife habitat.

The camping area contains 75 camper pads, 54 tent camping sites, and 6 primitive cabins. All camper pads are equipped with electrical hookups and are rock surfaced. All sites have fire rings and picnic tables.

The recreation area offers access to two large boat ramps wide enough to accommodate four boats at a time. Boating on the entire lake is no-wake only.

The day use area on the east side of the lake has two large picnic shelters and two smaller ones, all offering scenic views of the lake. In FY 2017 a dump station for RV's was constructed on the east day use area as well as a disc golf course/nature educational trail.

Both the camping and day use areas provide excellent fishing access, with a total of seven fishing jetties. One jetty on each side has an attached handicapped pier. The lake was stocked with largemouth bass, bluegill, blue

catfish, crappie, northern pike, and walleye beginning in 2008.

Limited hunting opportunities will continue to be available at Lake Wanahoo through the Game & Parks Commission PATH Program, where adults can schedule a time to mentor a youth hunter at designated hunting sites north of the recreation area.

The Lake Wanahoo Recreation Area was opened to the public in spring 2012. An operation and maintenance plan was developed with the assistance of the Nebraska Game and Parks Commission and Pheasants Forever in FY 2014 which identified activities that were implemented in 2015.

In FY 2019, LPNNRD assumed the responsibilities of administering Lake Wanahoo as a public recreation area from the Nebraska Games & Park Commission.

In FY 2020, the Clint Johannes Education Building was completed on the day use portion of the recreation area. This facility provides a protected outdoor education space for LPNNRD education activities, as well as a public rental facility for the public. Also in FY 2020, six new primitive cabins were installed in the primitive camping portion of the park to give visitors a unique alternative to tent camping.

FY 2025-2029 Recreation Long Range Objectives

- Continue to evaluate the development of new outdoor public recreational opportunities as they arise.
- Continue to assist NE Game & Parks and Pheasant Forever in developing new areas offering public access.
- Install a new fish cleaning station on the West side of Lake Wanahoo.

FY 2024 Recreation Objectives

- Continue to budget funds for maintenance, including grass mowing, tree trimming, grading roads, outhouse cleaning, trash removal, painting, and noxious weed control, at Lake Wanahoo, Czechland Lake, and Homestead Lake Recreation Areas.
- LPNNRD will continue managing all recreation at the Lake Wanahoo recreation area.
- Design and installation of 10-14 slip marina on west side of the lake. Marina will enable campers with boats the opportunity to keep their boats on the water during their stay.



It is the general policy of the LPNRRD not to provide financial assistance for drainage improvement and channel rectification unless a project has public benefit and is sponsored by a county, city, Drainage District, or a group of landowners through an established Improvement Project Area. Under this policy, the district has cooperated on several projects that have provided public benefit.

FY 2024 Drainage Improvement & Channel Rectification Objectives

- Worked with Colfax County to complete new Shell Creek South Channel Improvement/Benching Projects.
- Partnered with Dodge County and Fremont to support drainage improvements east of Fremont through FEMA.
- Partnered with the North Bend Drainage District, Dodge County, and City of Fremont to support the drainage improvement project for the North Bend drainage ditch through FEMA.
- Continue to oversee the Rawhide Creek West Branch Project to ensure that landowners properly control vegetation.
- Continue providing assistance to Platte Center with stabilizing segments of Elm Creek.

FY 2025-2029 Drainage Improvement & Channel Rectification Long Range Objectives

- Evaluate potential technical and funding assistance to counties, cities, and other entities in the district that sponsor sound drainage and channel improvement projects.



WASTE DISPOSAL & POLLUTION CONTROL

Over 30 years ago, vast changes occurred in Nebraska's solid waste regulations. Landfills that weren't properly designed, operated, or sited were required to shut down, as were unauthorized dumps. In order for a landfill to operate, it must be approved by the State and receive a permit. If a permit is not issued, the landfill cannot legally operate. Currently, the only permitted landfill in the Lower Platte North NRD is a facility near David City.

FY 2024 Waste Disposal & Pollution Objectives

- Promote recycling efforts in the district through education programs, newsletters, and news releases.
- Participate in education efforts to promote the reduction of pollution to our air, water, and soil resources.
- Cooperate and be supportive of other group and agency pollution control efforts, education, and/or regulation.

FY 2025-2029 Waste Disposal & Pollution Long Range Objectives

- Assist and encourage all District communities in establishing collection locations for recyclable wastes.
- Assist District cities and counties in establishing pickup days for hazardous household and farmstead wastes as opportunities arise.
- Promote waste reduction efforts in the district through education and incentives.



A major responsibility of the Lower Platte North NRD is to keep the public aware of the district's various projects and programs, and to inform and educate children and adults about the wise use and management of our natural resources.

FY 2023 Information & Education Activities

During fiscal year 2023, the Lower Platte North NRD conducted many activities to help residents learn the importance of our soil and water resources and to stay informed of issues and concerns regarding natural resources. Some of the highlights included the following.

Publications and Marketing

The NRD distributes two newsletters each fiscal year. The Winter issue of "The Viaduct" newsletter includes an additional page that contains the Annual Report. In FY 2012, the district switched distribution of "The Viaduct" newsletter from direct mail subscriptions to inserts in area newspapers. In FY 2023, more than 20,000 copies of each newsletter were distributed in eight newspapers and via email. Copies of the newsletter are also available on the website at www.lpnrd.org/downloads.

Various brochures describing LPNNRD programs and services were updated as needed in FY 2023. These brochures are displayed in the office and distributed during LPNNRD sponsored events and exhibit booths.

Press releases are distributed to district newspapers, email lists and radio stations. Numerous ads spotlighting different NRD programs and upcoming deadlines air on KTIC Radio throughout the year. Digital ads on the Wahoo newspaper website continued in FY 2023. In FY 2020, the LPNNRD began airing 30-second program commercials on News Channel Nebraska covering the various

departments of the LPNNRD. In FY2023, a recreation video featuring Czechland Lake, Homestead Lake, and Lake Wanahoo was produced and aired on News Channel Nebraska.

The NRD continues to maintain information and education outreach for the district through the use of social media outlets on Facebook, Twitter, and YouTube. These outlets are maintained weekly and provide information along with photos and videos about the district's ongoing activities and events.

Website

The NRD's website at www.lpnrd.org contains information on nearly all of the district's projects and programs, along with staff information, board of directors information, as well as committee and board meeting minutes, and district publications. Online applications and registration forms for various projects and programs are also available. Additionally, online payment capabilities continue to allow customers to pay for trees, rural water bills, and Lake Wanahoo permits. The website continues to be updated frequently.

Video Promotion

Beginning in FY 2018, 60-second, and 30-second videos were created to promote the conservation efforts of departments of the NRD. Past directors, current directors, and current staff have been featured in the videos. Promotional videos have been created for the Water Department, Operations & Maintenance department, Projects department, Information and Education department, and the three LPNNRD recreation areas (Czechland Lake, Homestead Lake, and Lake Wanahoo). Clips from all of the videos are combined to create one video that features portions of each department at the LPNNRD. These videos are shown as educational purposes for presentations, on the LPNNRD website,

commercials through area television stations, and featured on social media platforms.

Education Programs

During FY 2023, the district continued with two year-long programs. The St. Wenceslaus Pre-kindergarten students learn about wildlife, trees, birds, soil and water conservation through books, pictures, stories, and hands-on activities. The students visited Lake Wanahoo at the end of the year for a field trip filled with nature hikes, nature crafts, and disc golf. The district teamed up with Wahoo Public middle school students for the Survival Club program, making a total of three school years of the program. LPNNRD staff and other outdoor enthusiasts met monthly with students during the school year to learn about hiking, knot tying, 2-legged predators, 4-legged predators, fishing, first aid, foraging for wild foods, fire building and other outdoor survival skills. Opening up the program to the whole middle school had student attendance consistent with almost 30 students for the campfire building exercise and an average of 10 students per month. The end of the year camp out at Lake Wanahoo will be a priority in FY 2024. Trinity Lutheran Middle School met with Staff at Lake Wanahoo for a half day event, where we worked through survival club activities such as knot tying, 2 and 4 legged predators, everyday carry kits, foraging for wild foods, campfire building, and campfire cooking.

The district continues to participate in the Career Exploration Opportunities (CEO) Program with Wahoo Public Schools. During the fall semester of 2023, LPNNRD staff hosted one high school senior and he rotated between each department to learn about the LPNNRD responsibilities. The district will host another student during the fall of FY 2024. This student will be with staff every day from 1:30-3:30 but will drop down to three days a week starting in November.

The Clint Johannes Education Building is utilized for events of all kinds. Local teachers and other organizations will use it for their

students and staff as a meeting space with a great view and amenities. The LPNNRD utilizes the building for educational events each month. The event, Coffee Lakeside, has impacted close to 100 people, who meet in the building once a month. Topics included wildflowers, fireflies, animal adaptations, fall activities, phenology, nature based play, lake ecosystems, water flower identification, fungi, and more. All other NRD related events are also hosted in the building or another location at Lake Wanahoo.

Seven new events were held at the LPNNRD with a total of 10 held throughout the fiscal year. Wildflowers and Wine and All About Bees were two repeating events that continue to draw in large crowds. These events center around pollinators, their habitat, and how we can continue to provide natural places on both small and large scales to aid in the conservation of these species. The new events offered were: Trivia and Game Nights; Back to School Night; 1st Annual Fall Festival; Native American Heritage Day; Natural Resources Camp; Community Fishing Event; and Nocturnal Nights. These events drew in participants of all ages with some returning and some new individuals. Staff also participated in the county-wide, Kid's Summer Institute, that ran all of June. Students participated in dip netting for macroinvertebrates; birding; disc golf; nature journaling; and wild about wildflowers. These classes were held at Lake Wanahoo. Staff met with North Bend Public Library and Yutan Public Library for story time hours where owl pellets were dissected and birds were studied. Some of the FY 2023 events were made possible by partnerships with other agencies, organizations, and businesses. Strengthening these relationships and exploring new ones will continue to be a goal for FY 2024.

The Lower Platte North NRD and Lower Platte South NRD rotate in hosting the East Central Land Judging Contest. Land Judging is a competition for high students that challenges them to gain a better understanding of soil structure and land evaluation. The Lower Platte North NRD works with local NRCS employees to choose a site location and help with site

preparation. The Lower Platte North NRD staff and NRCS staff will assist in the preparation, contest monitoring, and scoring efforts during the contest. The East Central Land Judging Contest was held by Lower Platte North NRD on October 5th, 2022. 253 students competed in this event. The Area 5 Range Judging Contest was also held in FY 2023, where staff at the LPNNRD helped host the competition. 260 students competed in this event that was held at Camp Moses Merrill.

The annual LPNNRD Spring Conservation Sensation was held on May 3rd at Lake Wanahoo. Fifth and sixth grade students from Saunders, Butler, and Dodge Counties participated in various activities. Hands-on activities were presented by LPNNRD staff, additional personnel from various agencies and organizations, and volunteers to teach students about the environment, natural resources, tree planting, lake ecosystems, wildlife education and more. 300 students attended the event.

The second annual LPNNRD Natural Resources Camp was held at Lake Wanahoo. For one week, attendees learned how to fish, how to go birding, about the amphibians and reptiles of Nebraska, and insects, both macroinvertebrates they found in the lake and the land dwelling butterflies and moths. Eight boys attended the week-long camp. The hands-on activities were the students favorite parts per their evaluations and they are looking forward to returning next summer. The goal for FY 2024 is a full camp of 15 attendees, and new activities such as fire starting and campfire cooking, and archery.

Test Your Well Event is a program that partners with area FFA chapters to host public events, providing nitrate testing of water samples from private wells at no cost to the attendees. The district held 3 events in FY 2023 that involved over 20 students. The goal for FY 2024 is to have every FFA chapter in our district host a test your well night.

Staff at the LPNNRD went into 29 classrooms, attended 2 outdoor classrooms days, held 6 field trips, and interacted with every grade level Pre-K through 12th. Four new schools,

Aquinas Catholic, Trinity Lutheran, Lindsay Holy Family, and Fishers School (Schuyler), invited us into their classrooms this year amongst other schools we've previously attended. Some of the goals for FY 2024 involve finding teachers in school districts such as North Bend, Mead, or Yutan, where we haven't previously been to, and work with them to bring fun and educational activities to their classrooms. Staff is also pushing Coffee Lakeside out of Wahoo and into other communities. North Bend Public Library will be hosting a Coffee Lakeside in the fall of FY 2024.

District staff provided various presentations and activities during natural resources festivals, field days, out-of-school time programs, school classrooms, online activities on the LPNNRD website, and adult education events. As a result of the district's educational outreach efforts, there was interaction with approximately 2,774 youth and 300 adults in FY 2022. These numbers do not include the 513 students who participated in Land and Range Judging. The interactions this fiscal year brought us to over 1,000 more student participants than the previous year. LPNNRD will strive for even more interactions in the years to come.

Awards, Contests, and Events

In addition to marketing efforts, the LPNNRD provides a physical presence with exhibit booths at local county fairs, agriculture expos and other events across the district. In FY 2023, exhibit booths were displays at the Soybean Day in Wahoo, Fremont Corn Expo, Career Fair at Midland University, Fremont Eco Fair, and Butler County Fair. Donations were provided to the Saunders County Fair and Dodge County Fair. Materials at the events included brochures of the NRD's projects and programs, and various promotional items.

The Lower Platte North NRD offers three \$1,000 scholarships for graduating seniors who have been involved in the Shell Creek Watershed Monitoring Program and plan to pursue higher education relating to science or natural resources. The Shell Creek Watershed

Improvement Group (SCWIG) prioritizes education outreach to improve public awareness of the project and encourage conservation with best management practices. Newman Grove High School, Lakeview Community Schools, and Schuyler Central High School are involved with the conservation efforts in the watershed. The students spend their summers collecting samples and measurements, analyzing data, and reporting results to determine water quality of the stream.

FY 2024 Information & Education Objectives

- Publish the district newsletter "Viaduct" biannually in an electronic format and as a printed newspaper insert in 10 area newspapers.
- Send timely news releases to the local media on various LPNNRD programs, projects, and activities.
- Disperse pamphlets and other publications about LPNNRD programs.
- Update the district's website frequently.
- Continue to provide a display at county fairs or agriculture events (up to five major counties) within the district.
- Continue information and education outreach for the district through the use of tools such as local radio stations, local TV stations, and social media outlets (Facebook, Twitter, YouTube, etc.).
- Continue with the annual awards and recognition program.
- Provide district elementary students with free trees, as requested, in the spring.
- Provide LPNNRD staff as requested to speak to community organizations and schools on NRD activities and environmental topics.
- Provide various education programs, events, and activities to area schools and out-of-school time programs.
- Host the East Central Region Land Judging Contest in the fall of 2022.
- Host the 32nd Spring Conservation

Sensation in May 2023.

- Develop new programs and promotional projects to aid in outreach efforts of the district.
- Develop a video for the three recreation areas in the district.
- Provide assistance and publications for the students involved in the Shell Creek Watershed Monitoring Program.
- Continue to provide a scholarship for graduating seniors in the Shell Creek Watershed Monitoring Program who plan to pursue higher education relating to science or natural resources.

FY 2025-2029 Information & Education Long Range Objectives

- Search for new and effective ways to inform and educate the public on the NRD purpose and programs.
- Participate with the Information & Education Staff Group to coordinate statewide I&E activities and produce statewide products.
- Increase participation in activities sponsored by other agencies relating to the NRD's responsibilities.
- Seek to have conservation/environmental education as a part of the school curriculum.
- Support environmental education activities and events throughout the district, and neighboring NRDs.
- Provide assistance for the East Central Region Land Judging Contest in the fall of 2023, hosted by Lower Platte South NRD.
- Assist in the development of an outdoor classroom for a district school.
- Partner with district schools to host Test Your Well Events annually.



LPNNRD Staff

The staff of the Lower Platte North NRD includes 19 full-time and 11 part-time/seasonal employees. The NRD administers a full-time field technician, four field office assistants in Natural Resource Conservation Service county offices, and a Recreation Facilitator for Czechland & Homestead Lake Recreation Areas.

Included in the part-time positions, the district employs seasonal conservation technicians to assist in the layout of land treatment structures. There are seasonal summer employees hired to help with Lake Wanahoo, water sampling, tree planting, and maintenance of LPNNRD projects. Personnel positions and assigned responsibilities may increase in the future as increased project and program responsibilities increase.

Current staff as of September 1, 2023:

Sydney Abbott, **Education Coordinator**
 Daryl Andersen, **Water Resources Manager**
 Jill Breunig, **Bookkeeping Department Head/Administrative Assistant**
 Will Brueggemann, **Water Resources Specialist**
 Ryan Chapman, **Assistant General Manager**
 Duke Dokulil, **Operations & Maintenance Technician**
 Sean Elliott, **Projects/Rural Water Manager**
 Noah Franzen, **Water Resources Specialist**
 Eric Gottschalk, **General Manager**
 Bob Heimann, **Operations & Maintenance Manager**
 David Moore, **Operations & Maintenance Technician**
 Russell Oaklund, **Lead Water Resources Specialist**
 Dave Odvody, **Recreation Facilitator**
 Karen Rezac, **Department/Administrative Assistant**
 Lacey Sabatka, **Information Coordinator**
 Bret Schomer, **Wanahoo Recreation Supervisor/Water Resources Specialist**
 Drew ten Bensel, **Grants/GIS**

Staff Support for NRCS Offices:

Adam Brockman, **Conservation Technician**
 Kimberly Piitz, **NRD/NRCS Field Office Assistant (Butler County)**
 Kristin Miller, **NRD/NRCS Field Office Assistant (Colfax County)**
 Jessica Marty, **NRD/NRCS Field Office Assistant (Dodge County)**
 Marla Milliken, **NRD/NRCS Field Office Assistant (Saunders County)**

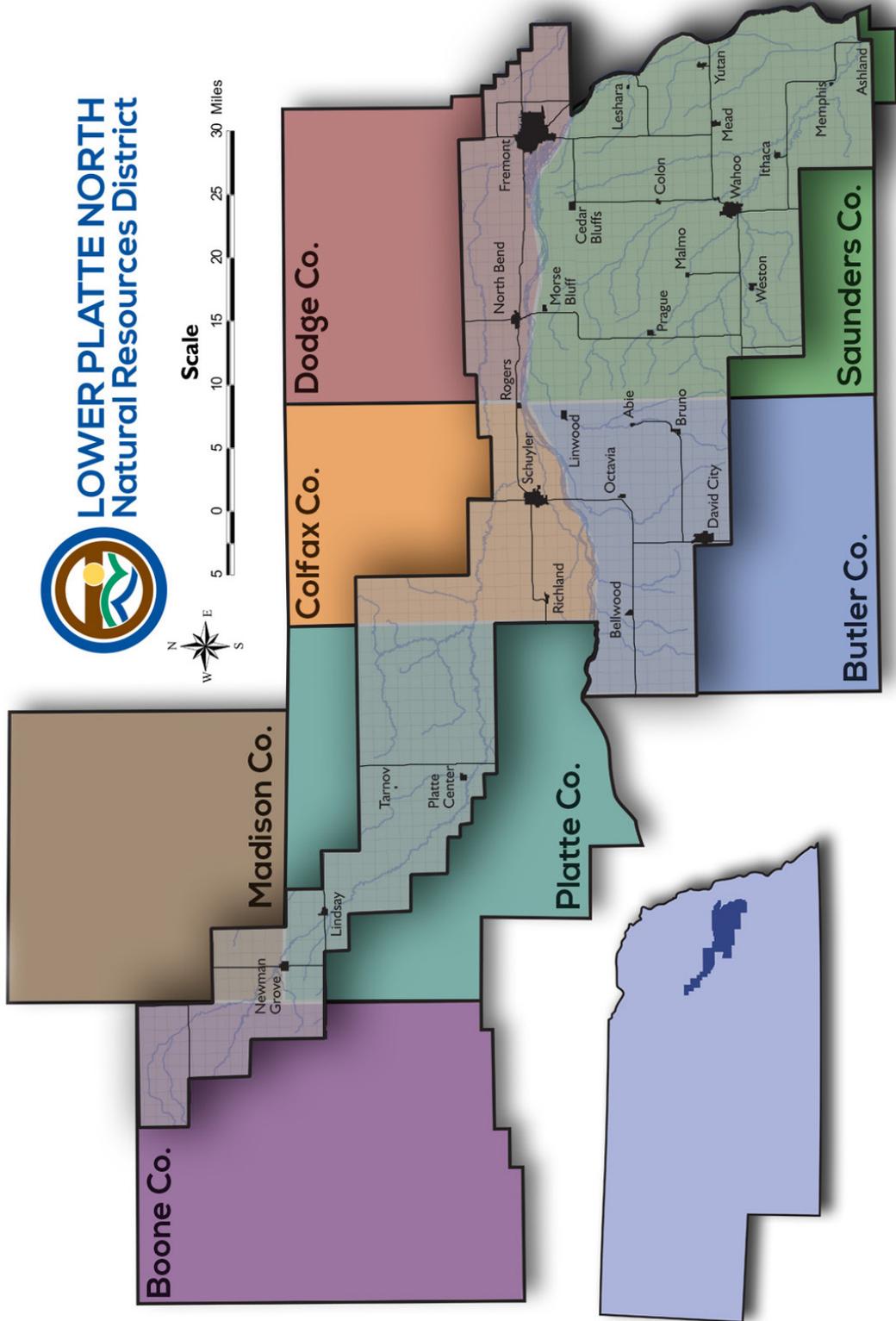


FY 2024 Financial Objectives

- Funding required for the LPNNRD projects and programs for Fiscal Year 2024 requires a general operating budget of \$ 8,761,805 of which \$ 3,480,715 is required from the district's local tax levy. The FY 2024 tax levy of .028652 cents per \$100 actual valuation is required from District property. Projected expenses and income for FY 2024-2029 are shown in Appendix F.
- A tax levy of .028652 means that an owner of a \$150,000 home will pay \$ 42.98 in NRD taxes in FY 2024. An owner of farm land valued at \$7,000 per acre will pay \$ 2.00 an acre/year to the NRD in FY 2024. The LPNNRD levy represents about two percent of the total property tax collected.

FY 2025-2029 Financial Long Range Objectives

- Although it is expected that the amount of revenue from all sources will fluctuate during the next few years, it is anticipated that the LPNNRD will operate at a mill levy between \$0.035 and \$0.055 per \$100 actual valuation as the District continues to assist with flood reduction project priorities and to address our responsibilities with groundwater water quality and quantity management.



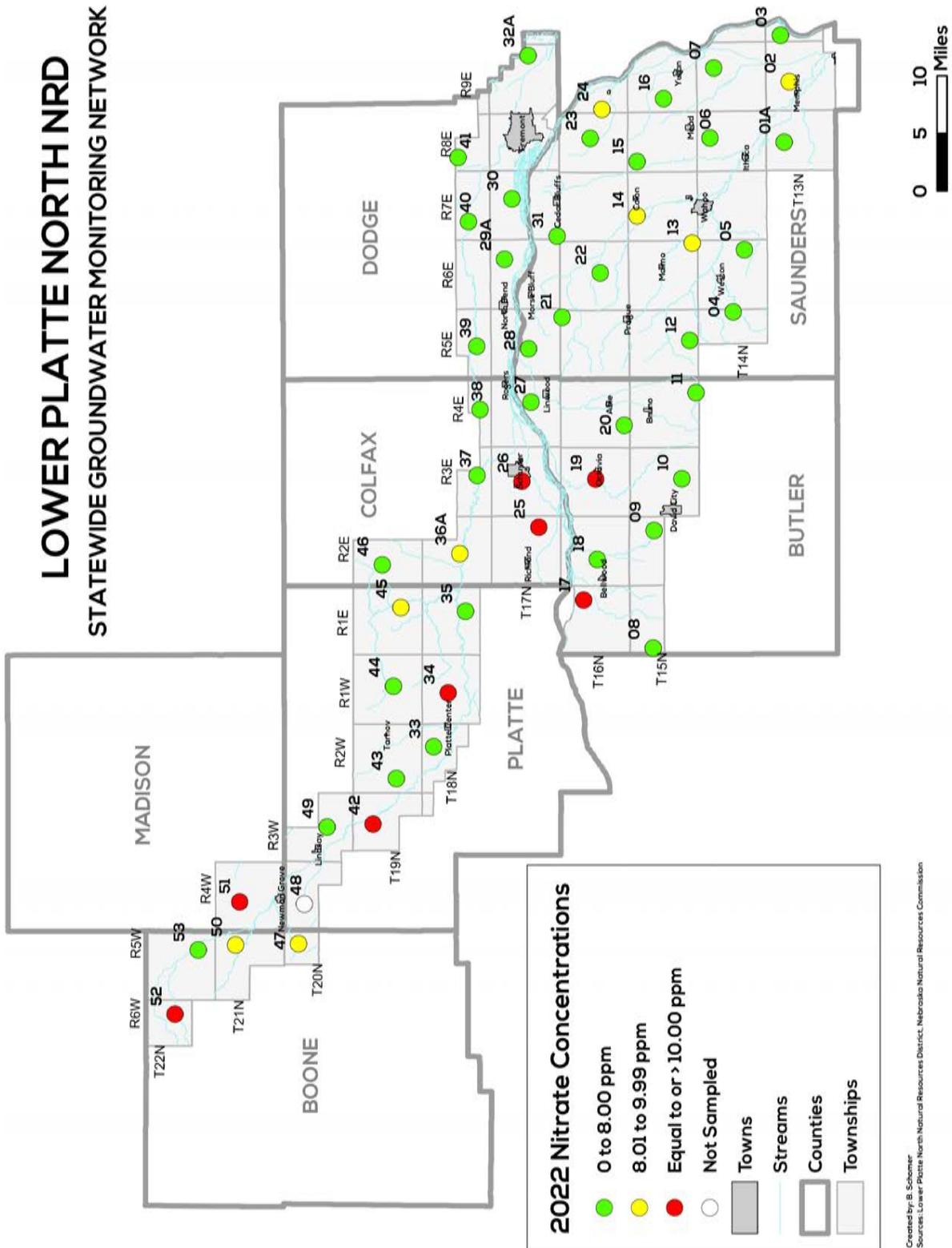


APPENDIX B – Estimated Population by County

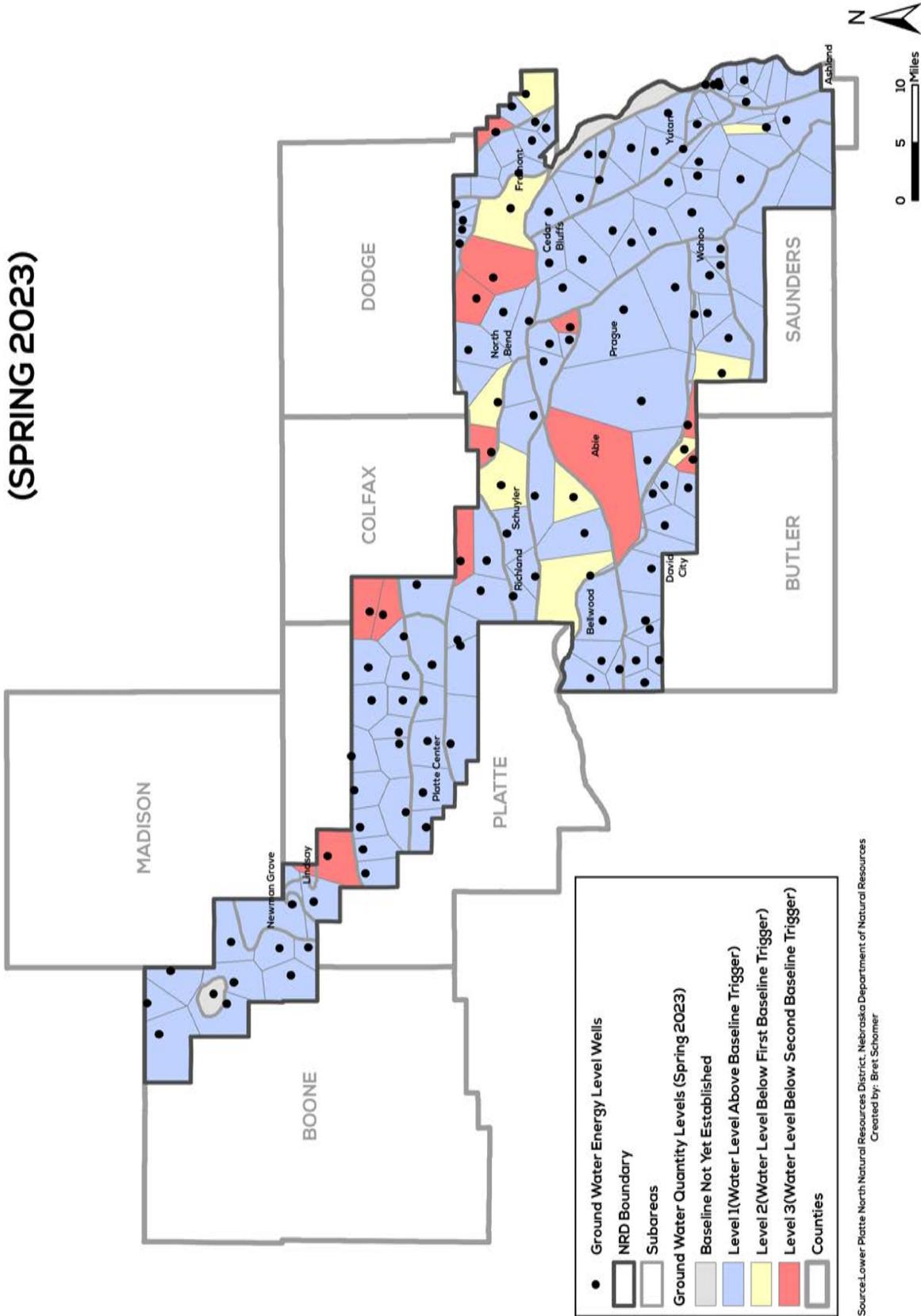
COUNTY	% OF COUNTY IN DISTRICT	ACRES IN DISTRICT	RURAL POPULATION IN DISTRICT	URBAN POPULATION IN DISTRICT	TOTAL
Boone	12.78	56,175	173	0	173
Butler	44.38	167,700	1,815	3,763	5,578
Colfax	40.76	108,582	1,069	6,699	7,768
Dodge	31.96	111,147	3,017	28,800	31,817
Madison	6.25	22,998	155	667	822
Platte	37.78	165,401	2,196	668	2,864
Saunders	81.39	395,098	7,477	8,948	16,425
TOTAL		1,027,101	15,902	49,545	65,447

Twenty-eight cities, towns and villages are located within the Lower Platte North NRD, listed below with their populations (according to 2020 United States Census):

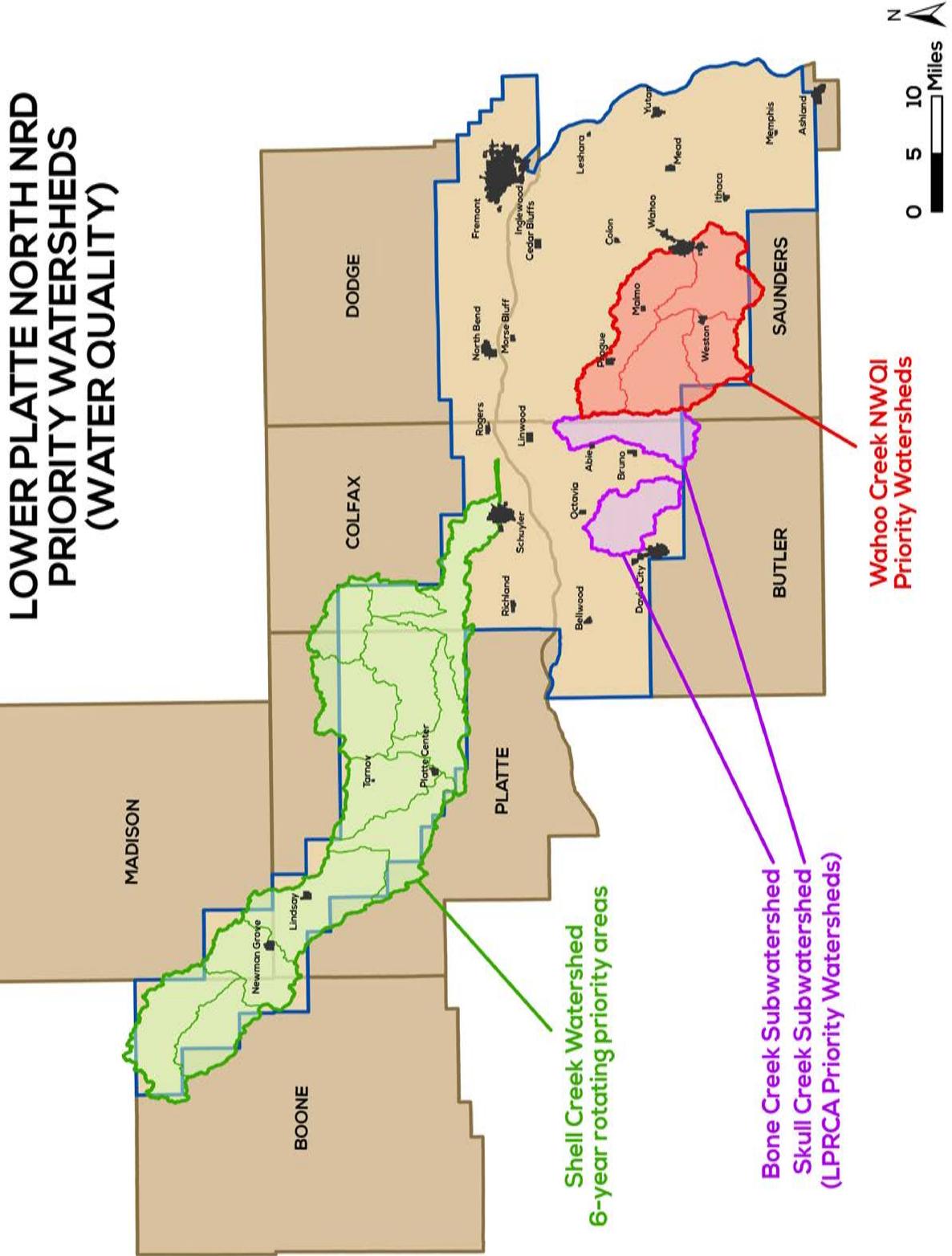
Abie	65	Memphis.....	109
Ashland	3,086	Morse Bluff	117
Bellwood.....	407	Newman Grove.....	667
Bruno	95	North Bend.....	1,279
Cedar Bluffs	615	Octavia	107
Colon.....	107	Platte Center	333
David City.....	2,995	Prague	291
Fremont	27,141	Richland	70
Inglewood.....	380	Rogers.....	82
Ithaca	160	Schuyler	6,547
Leshara	108	Tarnov	52
Lindsay	283	Wahoo	4,818
Linwood	94	Weston	250
Malmo	94	Yutan.....	1,347
Mead.....	617		



LOWER PLATTE NORTH NRD
GROUNDWATER ENERGY LEVEL NETWORK
(SPRING 2023)

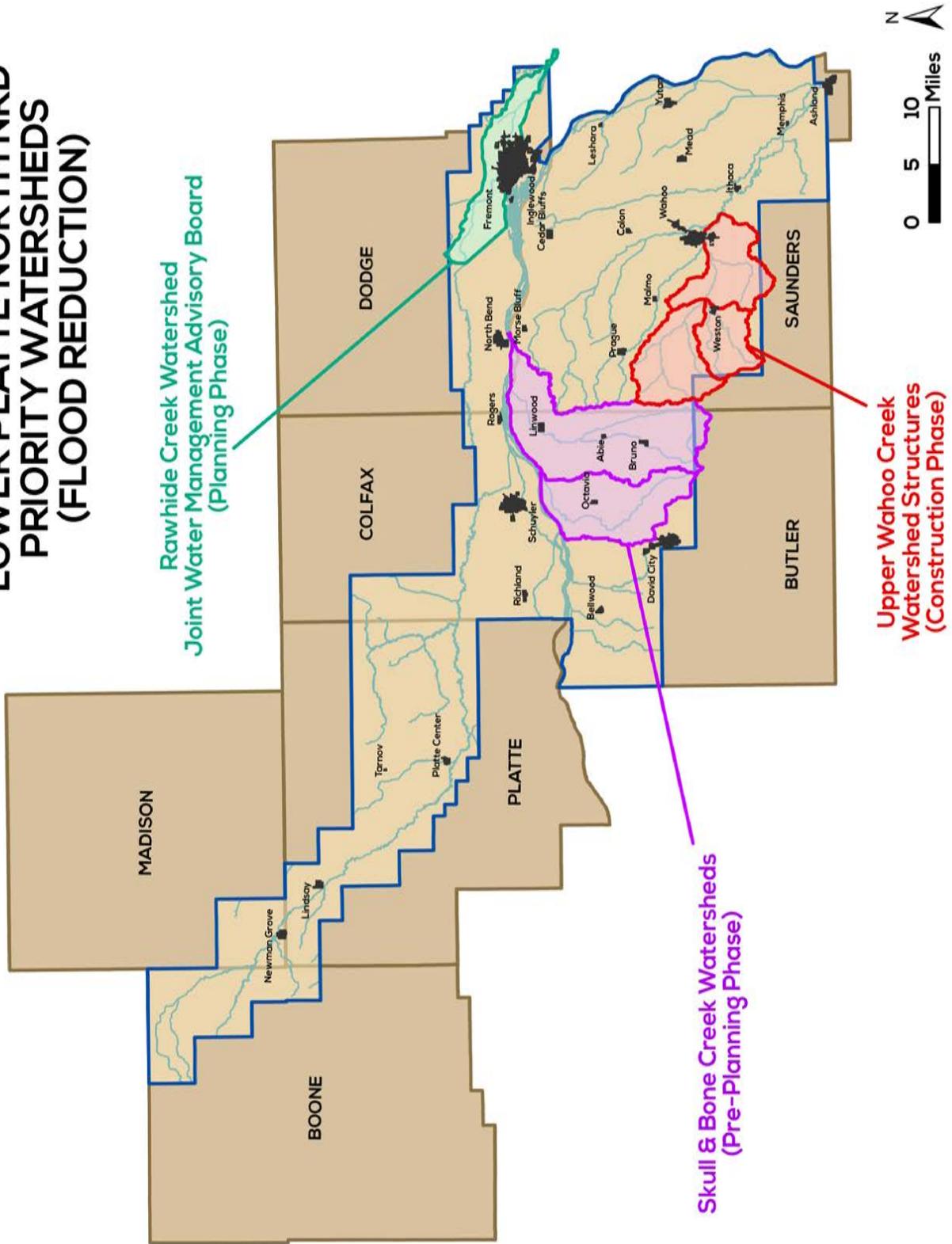


Source: Lower Platte North Natural Resources District, Nebraska Department of Natural Resources
Created by: Bret Schomer





LOWER PLATTE NORTH NRD PRIORITY WATERSHEDS (FLOOD REDUCTION)



APPENDIX G – Projected Budget Income, Fiscal Years 2024-2029



Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
AVAILABLE CASH (Sinking Funds, etc.)	\$304,410	\$812,848	\$869,898	\$913,392	\$959,062	\$1,007,015
FEDERAL INCOME						
NRCS (WFPO & RCPP)	\$499,610	\$3,500,000	\$5,000,000	\$2,000,000	\$0	\$0
FEMA (Stilling Basin)	\$2,709,600	\$0	\$0	\$0	\$0	\$0
FEMA (Flood Funds)	\$392,500	\$0	\$0	\$0	\$0	\$0
NDEE (EPA 319)	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
State JEDI Funds	\$1,000,000	\$2,000,000	\$4,000,000	\$4,000,000	\$4,000,000	\$0
STATE INCOME						
NE Buffer Strip Program	\$52,000	\$54,000	\$56,000	\$58,000	\$60,000	\$0
Decommissioned Well Fund	\$3,500	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Natural Resource WQ Fund	\$52,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Shell Creek Implementation	\$43,829	\$10,000	\$10,000	\$0	\$0	\$0
Water Sustainability Fund	\$133,031	\$500,075	\$500,075	\$500,075	\$0	\$0
Sand Creek - NRDF	\$22,000	\$0	\$0	\$0	\$0	\$0
Lake Wanahoo Other	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Wild NE	\$3,820	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Motor Vehicle Prorate	\$8,400	\$8,400	\$8,400	\$8,400	\$8,400	\$8,400
OTHER INCOME						
Rural Water Income	\$134,000	\$140,000	\$143,000	\$150,000	\$150,000	\$150,000
Property Tax	\$3,480,715	\$3,480,715	\$3,480,715	\$3,480,715	\$3,480,715	\$3,480,715
Investment Income	\$125,000	\$125,000	\$100,000	\$100,000	\$100,000	\$100,000
Equipment, Rent, Parks, Salaries, Etc.	\$625,192	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Local Income	\$118,940	\$130,000	\$130,000	\$130,000	\$130,000	\$130,000
TOTAL	\$9,928,547	\$11,539,038	\$15,078,088	\$12,118,582	\$9,666,177	\$5,654,130



APPENDIX H – Projected Budget Expenses, Fiscal Years 2024-2029

ADMINISTRATION						
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Bonds	\$100	\$100	\$100	\$100	\$100	\$100
Dues & Memberships	\$39,000	\$40,000	\$41,000	\$43,000	\$44,000	\$45,000
Fees & Licenses	\$11,465	\$11,924	\$12,401	\$12,897	\$13,200	\$13,200
GIS	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Insurance	\$76,174	\$79,221	\$82,390	\$85,685	\$89,113	\$92,677
Interest Expense	\$	\$0	\$0	\$0	\$0	\$0
Legal Notices	\$,812	\$2,925	\$3,042	\$3,163	\$3,290	\$3,421
Maintenance Contracts	\$5,356	\$5,570	\$5,793	\$6,025	\$6,266	\$6,516
Office Supply & Expense	\$12,276	\$12,767	\$13,278	\$13,809	\$14,361	\$14,936
Computer Supply & Expense	\$32,000	\$33,000	\$34,000	\$35,000	\$36,000	\$37,000
Postage	\$7,030	\$7,312	\$7,604	\$7,908	\$8,225	\$8,554
Professional Services	\$140,000	\$142,000	\$142,000	\$144,000	\$148,000	\$149,000
Rent Expense	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Support to Organizations	\$1,300	\$1,400	\$1,500	\$1,600	\$1,600	\$1,600
Telephone	\$20,659	\$21,485	\$22,344	\$23,238	\$24,168	\$25,134
Utilities	\$9,194	\$9,561	\$9,944	\$10,342	\$10,755	\$11,185

INFORMATION & EDUCATION						
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Education	\$12,438	\$12,936	\$13,453	\$13,992	\$14,551	\$15,133
Information	\$32,394	\$33,690	\$35,037	\$36,439	\$37,896	\$39,412
Scholarships & Grants	\$3,245	\$3,375	\$3,510	\$3,650	\$3,796	\$3,948
Other	\$10,546	\$10,967	\$11,406	\$11,862	\$12,337	\$12,830

OPERATION & MAINTENANCE						
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Auto & Truck Expense	\$23,795	\$24,747	\$25,737	\$26,766	\$27,837	\$28,950
Building Maintenance	\$10,059	\$10,461	\$10,880	\$11,315	\$11,767	\$12,238
Community Forestry Program	\$2,500	\$2,500	\$3,000	\$3,000	\$3,000	\$3,000
Operation & Maintenance	\$310,149	\$322,555	\$335,457	\$348,875	\$362,830	\$377,343
Project Repairs	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Stream Bank Stabilization	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Wildlife Habitat	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Other	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000

PERSONNEL						
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Directors Expense	\$41,858	\$43,532	\$45,274	\$47,084	\$48,968	\$50,927
Directors Per Diem	\$38,000	\$38,000	\$38,000	\$38,000	\$38,000	\$38,000
Employee Benefits	\$500,781	\$520,812	\$541,645	\$563,310	\$585,843	\$609,276
Payroll Taxes	\$100,589	\$104,612	\$108,797	\$113,149	\$117,675	\$122,382
Personnel Expense	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000	\$40,000
Salaries	\$1,342,880	\$1,383,166	\$1,424,661	\$1,467,401	\$1,490,000	\$1,540,000

APPENDIX H – Projected Budget Expenses, Fiscal Years 2024-2029



PROJECTS

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Inter-governmental	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Special Projects	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Wanahoo	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Other Projects	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000

PLATTE RIVER CORRIDOR ALLIANCE

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
WQ Monitoring	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000

WATER

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Groundwater Management Plan	\$50,000	\$60,000	\$65,000	\$70,000	\$75,000	\$75,000
Groundwater Programs	\$195,932	\$203,769	\$211,920	\$220,397	\$229,213	\$238,381
Regulatory	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Surface Water Programs	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000
Special Projects	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Land Treatment	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000

RURAL WATER DISTRICT

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Rural Water District	\$150,580	\$156,604	\$162,868	\$169,382	\$176,158	\$183,204

CAPITAL IMPROVEMENTS

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Wanahoo Stilling Basin & Oversight	\$0	\$0	\$0	\$0	\$0	\$0
Wanahoo Improvements	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Wahoo Creek Dams	\$1,277,500	\$3,500,000	\$2,450,000	\$2,100,000	\$0	\$0
Land Rights (Wahoo Creek)	\$547,500	\$1,500,000	\$1,050,000	\$900,000	\$0	\$0
Fremont/Dodge County Drainage	\$440,000	\$440,000	\$440,000	\$440,000	\$440,000	\$0
Skull/Bone Creek	\$0	\$0	\$0	\$400,000	\$400,000	\$400,000
Cottonwood 21A Spillway	\$50,000	\$50,000	\$0	\$0	\$0	\$0
Buildings	\$500,000	\$500,000	\$500,000	\$40,000	\$40,000	\$40,000
Large Structure O&M Sinking Fund	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Flood Reduction Sinking Fund	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000

CAPITAL OUTLAY

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Capital Outlay	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000

BUDGET TOTAL

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
BUDGET TOTAL	\$8,514,111	\$11,804,990	\$10,370,038	\$9,929,389	\$7,029,947	\$5,189,749

UNITED STATES DEPARTMENT OF THE INTERIOR
DOWN PAYMENT (BILL) REQUEST

Bill #: 91085210
Customer: 600000136
Date: 07/12/2023
Due Date: 09/10/2023

Make Remittance Payable To: U.S. Geological Survey
Billing Contact: Amanda Flynn, Budget Analyst Phone: 402-328-4144

Remit Payment To: United States Geological Survey
P.O. Box 6200-27
Portland, OR 97228-6200

Payer: LOWER PLATTE NORTH NRD
P.O. BOX 126
WAHOO NE 68066

Additional forms of payment may be accepted. Please email GS-A-HQ_RMS@USGS.GOV or call 703-648-7683 for additional information.

To pay through Pay.gov go to <https://www.pay.gov>.

Checks must be made payable to U.S. Geological Survey. Please detach the top portion or include bill number on all remittances.

Amount of Payment: \$ _____

Date	Description	Qty	Unit Price		Amount
			Cost	Per	
07/12/2023	The streamgages at Shell Creek near Columbus and Wahoo Creek at Ashland, and one real-time groundwater level monitoring site, as agreed to in Joint Funding Agreement 23NRJFA00170 between the Lower Platte North Natural Resources District and the US Geological Survey. JFA 23NRJFA00170 23NRJFA00170	1	18,190.00	1	18,190.00
	Date rec'd <u>8/4/23</u>				

Approved by _____ Amount Due this Bill: 18,190.00

Date approved _____

Accounting Classification:
Sales Order: 112613
Sales Office: GENR
Customer: 600000136
Accounting #: 11357273

Expense acct 400403

Funding source _____

TIN: *****2716

% (amount) _____

Income acct _____



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Discipline
Nebraska Water Science Center
5231 South 19th Street
Lincoln, NE 68512-1271

August 25, 2023

Eric Gottschalk
Lower Platte North Natural Resources District
PO Box 126
Wahoo, NE 68066

Dear Mr. Gottschalk:

Enclosed is a copy of Joint Funding Agreement No. 24NRJFA00170 for the operation of two streamgages at Shell Creek near Columbus and Wahoo Creek at Ashland and one real-time groundwater level monitoring site as listed in the enclosed summary of proposed funding. The total amount of the agreement is \$25,940 or \$6,930 for the U.S. Geological Survey and \$19,010 for the Lower Platte North Natural Resources District. Funds in the amount of \$9,870 from the Federal Priority Streamgages Program (FPS), which are not included in the above amounts, have been used as a supplement to or in place of Cooperative Matching Funds. Please sign the agreement and return by email to aflynn@usgs.gov. Work cannot be continued until we receive the signed agreement.

Work performed with funds from this agreement will be conducted on a fixed-price basis under the authority of statute 43 USC 36C. Billings will be rendered annually in July 2024. The results of all work under this agreement will be available for publication by the U.S. Geological Survey.

For more information or any questions concerning this agreement, please contact Jason Lambrecht at 402-328-4124.

Sincerely,

Steven M. Peterson, Director
USGS Nebraska Water Science Center

2 Enclosures

USGS UEI No. NJQMLNG5LA5

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 600000136
Agreement #: 24NRJFA00170
Project #: NR00GS1
TIN #: 47-0542716

Fixed Cost Agreement YES[X] NO[]

THIS AGREEMENT is entered into as of October 1, 2023, by the U.S. GEOLOGICAL SURVEY, Nebraska Water Science Center, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the LOWER PLATTE NORTH NATURAL RESOURCES DISTRICT, party of the second part.

1. The parties hereto agree that subject to the availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation **streamgages at Shell Creek near Columbus and Wahoo Creek at Ashland, and one real-time groundwater level monitoring site**, herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50, and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) include In-Kind-Services in the amount of \$0.00

- (a) \$6,930 by the party of the first part during the period October 1, 2023 to September 30, 2024
- (b) \$19,010 by the party of the second part during the period October 1, 2023 to September 30, 2024
- (c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of: \$9,870

Description of the USGS regional/national program:
Federal Priority Streamgages Program

- (d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.
- (e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

8. The maps, records or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program, and if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at cost, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records or reports published by either party shall contain a statement of the cooperative relations between the parties. The Parties acknowledge that scientific information and data developed as a result of the Scope of Work (SOW) are subject to applicable USGS review, approval, and release requirements, which are available on the USGS Fundamental Science Practices website <https://www.usgs.gov/about/organization/science-support/science-quality-and-integrity/fundamental-science-practices>

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 600000136
Agreement #: 24NRJFA00170
Project #: NR00GS1
TIN #: 47-0542716

9. Billing for this agreement will be rendered **annually**. Invoices not paid within 60 days from the billing date will bear Interest, Penalties, and Administrative cost at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury.

USGS Technical Point of Contact

Name: Jason Lambrecht
Hydrologic Data Section Chief
Address: 5231 South 19th
Lincoln, NE 68512
Telephone: (402) 328-4124
Fax: (402) 328-4101
Email: jmlambre@usgs.gov

Customer Technical Point of Contact

Name: Eric Gottschalk
General Manager
Address: PO Box 126
Wahoo, NE 68066
Telephone: (402) 443-4675
Fax:
Email: egottschalk@lpnrd.org

USGS Billing Point of Contact

Name: Amanda Flynn
Budget Analyst
Address: 5231 South 19th
Lincoln, NE 68512
Telephone: (402) 328-4144
Fax: (402) 328-4101
Email: aflynn@usgs.gov

Customer Billing Point of Contact

Name: Eric Gottschalk
General Manager
Address: PO Box 126
Wahoo, NE 68066
Telephone: (402) 443-4675
Fax:
Email: egottschalk@lpnrd.org

U.S. Geological Survey
United States
Department of Interior

Lower Platte North Natural Resources District

Signature

Signatures

By _____
Name: Steven M. Peterson
Title: Director

By _____ Date: _____
Name:
Title:

By _____ Date: _____
Name:
Title:

By _____ Date: _____
Name:
Title: