



***Lower Niobrara***  
***Natural Resources District***

**Long-Range**  
**Implementation Plan**  
**For Fiscal Years 2023-2028**



***Board Approved 11/6/2023***

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# **I. Introduction**

## **A. Reason For Planning**

The Lower Niobrara Natural Resources District (“District” or “LNNRD”) is one of 23 Natural Resources Districts created in 1972 after the Nebraska Legislature enacting Legislative Bill 1357 in 1969 to combine 154 special purpose agencies and entities. The boundaries of the NRDs are generally consistent with the natural geographic boundaries of the river watersheds of Nebraska. Each Natural Resources District shall prepare and adopt a Long-Range Implementation Plan to summarize activities and to project needs of the District as required by Nebraska Revised State Statute Section §2-3277. The Long-Range Implementation Plan will be reviewed and updated annually, with copies sent to the Nebraska Department of Natural Resources (NDNR) and the Nebraska Game and Parks Commission (NGPC) by October 1 of each year.

The Directors of the LNNRD feel the development and adoption of the plan is necessary to give an organized approach to budgeting and accomplishing the goals of the District. The plan is intended to help guide decisions for the district, inform the public of the district’s plans, and help with budget preparations.

## **B. Purpose of the Plan**

The purpose of the plan shall be to summarize the activities as planned by the LNNRD. It will show the expected financial, personnel, and land rights needs, if any, for the current year and the projected needs for the next five years. Activities are listed by priority as assigned by the directors in October 2023.

The plan will be used by directors in decision making to develop water and land resources for the common good of the people. It is also intended to inform the general public of the goals and purpose of the LNNRD and help with budget preparations.

## **C. Authority and Responsibility of the District**

In accordance with section 2-3229 in the Revised Statutes of Nebraska, the purposes of Natural Resources Districts are 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) conservation; (5) water supply for any beneficial use; (6) development, management, utilization, and conservation of groundwater and surface water; (7) pollution control; (8) solid water 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. Pursuant to Revised Statute 46-715, the District has jointly developed and implemented with the State of Nebraska a Voluntary Integrated Management Plan that is periodically revised to reflect

changing conditions. The LNNRD's Voluntary Integrated Management Plan became effective May 1, 2014. It contains protocols associated with the State's and District's efforts to attain and/or maintain a desired balance between water uses and water supplies of both surface water and groundwater sources so economic viability, as well as social and environmental health, safety, and welfare, can be achieved and maintained in the District for both the near-term and long-term, while also considering effects on existing surface water appropriators and groundwater users.

To execute our responsibilities, NRDs were given authority to levy local property taxes. The current property tax levy is not to exceed 4.5 cents per \$100 valuation plus an additional 1.0 cent per \$100 valuation for Groundwater Management Activities. This funding mechanism has allowed Districts to fund a variety of natural resources programs and hire the personnel needed to successfully execute the programs that address our goals and responsibilities. The local taxing authority allows NRDs the ability to leverage local tax dollars as match for State and Federal grants, making local dollars do more for the resources on the land that is being taxed.

## **D. Description of the District**

### **Location**

The Lower Niobrara Natural Resources District includes 2,641 square miles of central and eastern Keya Paha County, 18% of the District, northern Holt County, 40.5 % of the District, western Knox County, 13.7 % of the District, northeastern Rock County, 7.5% of the District, and Boyd County, 20.3 % of the District. Bordered by South Dakota and the Missouri River on the north, the District is 96 miles long and ranges from 24 to 36 miles wide.

### **Population**

There are 11 municipalities within the District. The largest of these is Verdigre, followed by Spencer, Niobrara, Butte, Springview, Lynch, Naper, Bristow, Winnetoon, Verdel, Monowi, Burton and Gross.

In 2020, the population of the LNNRD was estimated to be 6,043. Boyd County makes up about 31 % of the District population, followed by Knox County at 36%, Holt County at 21%, Keya Paha County at 11%, and Rock County at 1%.

### **Governing Body**

The LNNRD is a political sub-division governed by a board of 17 directors. Directors are elected via general election to four-year terms. One board member is elected every two years to represent each of eight sub-districts (Figure 1) and one board member is elected to represent the District at large every four years. Sub-districts are divided geographically based on equal population as determined by the 2020 census. Every January the Board elects a Chairman, Vice-Chairman, Secretary, Treasurer, NARD Board Representative, and Niobrara River Basin Alliance Representative. Members either volunteer or are appointed to represent the LNNRD Board on Niobrara Council, NE RC&D, NC RC&D, Friends of the Missouri National Recreational River, and Missouri Sedimentation Action Coalition. The LNNRD Board of Directors has 8 standing committees, executive, budget, operations, personnel, variance, erosion and sediment, building and equipment, and groundwater

management. It operates under a set of by-laws, and rules and regulations which are kept on file at the LNNRD office in Butte, Nebraska.

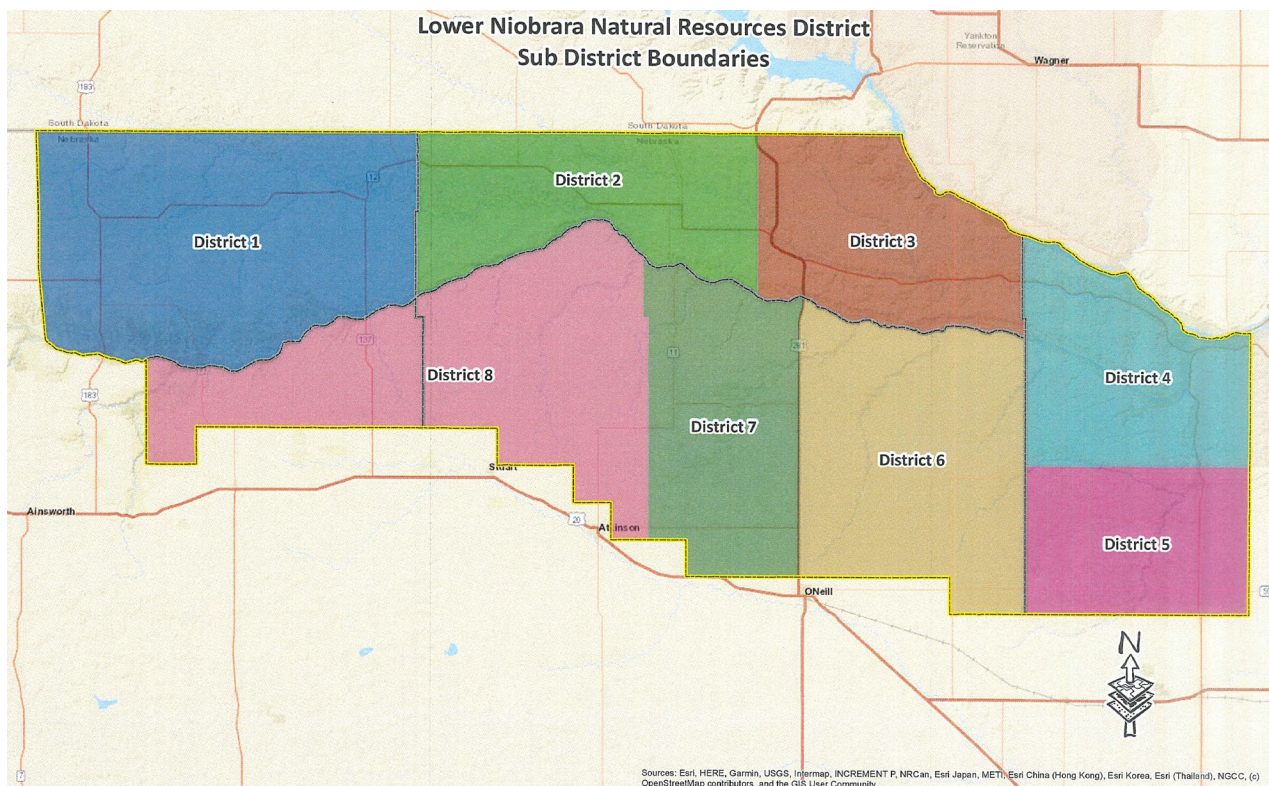


Figure 1: LNNRD Sub District Map

Sub-District	Director	Director
Sub-District 1	Shaunessey Higgins	Karl Connell
Sub-District 2	Shane Lechtenberg	John Engelhaupt-Chairman
Sub-District 3	Linda Hoffman-Treasurer	Steve Mahlendorf
Sub-District 4	Kevin Randa	Randall Klawitter
Sub-District 5	Deborah Hansen	Ray Naprstek
Sub-District 6	Orville Morrow	Brian Kaczor
Sub-District 7	Charles Zeggars	Dwain Marcellus
Sub-District 8	Larry Baumeister-Secretary	Donald Holtgrew-Vice Chair
At Large	J.J. Pritchett	

Table 1: LNNRD Board of Directors

## Geology

The District has four major drainage areas: The Ponca Creek, the Verdigre Creek, the Keya Paha River, the Niobrara River and a small area that drains directly into the Missouri River.

The Niobrara and Pierre formations of the cretaceous age are the oldest geologic exposures in the Lower Niobrara NRD. They are exposed on the bluffs along the Missouri, Niobrara, and Keya Paha Rivers and their tributaries, and along the valley sides of the Ponca and Verdigre Creeks. The most recent geological formation is the Ogallala formation of the

Tertiary age. It overlies the other geological formations except north of the Niobrara River in Boyd and northwestern Knox County where it is generally absent.

Unconsolidated sediments of the Quaternary age overlay the geologic bedrock formations throughout the Lower Niobrara NRD. These deposits of alluvial clay, silt, sand, and gravel along with wind deposited silt and sand have been deposited over most of the landscape in widely different topographic positions. Wind deposited sand called eolian sand is the most common unconsolidated material at the surface in the District.

Along the entrenched rivers and major streams in the area the landscape consists of strong to very steep sloping upland side slopes and narrow bottomlands along the streams. The soils on the upland side of the slopes formed in residuum from shale siltstone and sandstone and in some cases eolian sand and gravel. These soils are well to excessively drained and deep to shallow over the underlying bedrock or gravelly material and subject to severe water erosion when the surface is not protected. The soils on the bottomlands formed in sandy, loamy, and clayey alluvium and are subject to flooding. They are excessively drained to poorly drained with water tables that range from at the surface to 10 feet below the surface.

In the area south of the Niobrara River and to the west of the Keya Paha River the landscape consists of nearly level and gently sloping tablelands, rolling Sandhills and valleys, to very steep sloping dissected uplands. The soils on the tablelands formed in sandy and loamy material and are deep to shallow over gravelly sand and coarse sand. They are well drained to excessively drained and subject to wind erosion when the surface is not protected by vegetative cover. The soils in the rolling Sandhills and valleys formed in eolian sand. The hills are excessively drained, droughty and subject to severe wind erosion when the native grass cover is destroyed. Soils in the valleys are generally poorly drained to with water tables within 1 to 6 feet of the surface during the growing season. On the sloping dissected uplands, the soils were formed in sandy and loamy material and are deep to shallow over gravelly sand, weakly cemented sandstone and shale. They are well drained to excessively drained and subject to wind and water erosion when the surface is left unprotected.

In the area north of the Niobrara River and to the east of the Keya Paha River the landscape consists of nearly level to sloping tablelands surrounded by very steep sloping dissected uplands. The soils on the table lands formed in silty wind deposited material called loess. They are deep and well drained to moderately well drained with the sloping area being subject to water erosion when unprotected. The soils on the dissected uplands formed in loamy and clayey material weathered from shale and in a few places eolian sand. These soils are well drained or excessively drained and moderately deep or shallow over shale bedrock. Water erosion is a severe hazard on unprotected surfaces.

### **Groundwater Supplies**

Groundwater occurrence and extent varies widely in the District. There are two distinctively different groundwater reservoir areas. The area generally north of the Niobrara River is in what is referred to as the North Central Tableland Region. Underlying the upland surface is the eastwardly thinning Ogallala Formation, which is a source of medium to moderately large supplies of good quality water, where the zone of saturation is

thick. The lower lying rough rolling terrain was developed on shale of the Cretaceous age. Throughout this area supplies of water are almost unavailable except by drilling several hundred feet to tap the Dakota Sandstone. Medium to moderately large supplies of good quality water can be obtained from thicker deposits of the Pleistocene sands and gravels underlying the flood plains. In some of the eastern areas of this region wells tapping the Dakota will flow at lower elevations. Dakota water is often highly mineralized.

Much of the south half of the District lies in what is referred to as the Sandhills Region. Much of this area, though now having yielded to farm development, includes sand covered dunes, some flat inter-dune meadows, and some area of undefined drainage. As the sandy soils absorb precipitation and transmit it downward very little runoff results.

Much of this southern half of the District is underlain by permeable water bearing rock of the Tertiary and Quaternary age. There are two aquifers of importance to the O'Neill five county areas: 1) the Ogallala formation of the Tertiary age and, 2) the overlying sand and gravel deposits of the Pleistocene age.

Although the two aquifers are in hydraulic connection with each other, the hydraulic characteristics are quite different. The Ogallala formation, which is the lower aquifer, is typically tighter and less permeable than the overlying Pleistocene deposits. When a well penetrates both aquifers a large portion of the well's yield may be derived from the upper formation because of its greater permeability. Permeability of the Ogallala formation generally ranges from 50 to 150 gallons per day per square foot, whereas the permeability of the Pleistocene sands and gravels ranges from 500 to more than 2000 gallons per day per square foot. Thus, it is possible for 20 feet of saturated Pleistocene sands to produce as much as 200 feet of the saturated Ogallala formation.

Precipitation, which is a substantial contributor to the recharge of the groundwater reservoir ranges from an average 20 inches in the western part of the District to 26 inches in the east. Approximately two thirds of the total annual precipitation falls during the growing season.

### **Land Use**

The NRCS classifies all soils into eight classes based on their ability to produce crops without eroding. Class I land is the best land with no restrictions while class VIII has the most restrictions for use. Following is a brief description of each capability class and the percentage of each within the District.

- I. These soils have very few limitations that restrict their use. Class I land makes up 1 percent of the Lower Niobrara NRD.
- II. These soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. Class II lands make up 12 percent of the Lower Niobrara NRD
- III. These soils have severe limitations that reduce the choice of plants or that require special conservation practices. Class III land makes up 11 percent of the Lower Niobrara NRD. Fifty percent of this is cropland.

- IV. These soils have severe limitations that reduce the choice of plants and require special conservation practices. Class IV land makes up 27 percent of the Lower Niobrara NRD. Thirty-six percent of this land is used for crop production and presents a serious erosion hazard. These soils can be protected through conservation tillage and good range management.
- V. These soils are not likely to erode but have other limitations that are very impractical to remove. Class V land makes up 2 percent of the Lower Niobrara NRD.
- VI. These soils have severe limitations that make them generally unsuitable for cultivation. Class VI land makes up 39 percent of the Lower Niobrara NRD. Eighty-six percent of this is in permanent vegetation.
- VII. These soils have very severe limitations that make them unsuitable for cultivation. Class VII land makes up 5 percent of the Lower Niobrara NRD. This land is protected by permanent vegetation.
- VIII. These soils have limitations that make them generally unsuitable for commercial use. Class VIII land makes up less than 1 percent of the Lower Niobrara NRD. This land is protected with permanent vegetation.
- Misc. This includes urban and build-up land, rural transportation land, and water areas. Miscellaneous land makes up 3 percent of the Lower Niobrara NRD.

## **E. Other Plans of the District**

The Master Plan for the Lower Niobrara Natural Resources District was prepared by the District staff under the direction of the District Operations Sub-committee and approved by the District Board of Directors in November of 2022. It was submitted to NDNR in December 2022. It replaces a similar Master Plan approved in February of 2012. The Master Plan lists the goals and objectives of the LNNRD Board of Directors to diligently address our responsibilities.

LNNRD Voluntary Integrated Management Plan. This Integrated Management Plan (IMP) was prepared voluntarily by the Board of Directors of the Lower Niobrara Natural Resources District (District) and the Nebraska Department of Natural Resources (Department) in consultation with the Lower Niobrara Stakeholders Committee and in accordance with the Nebraska Ground Water Management and Protection Act. The act assigns the responsibilities and the authority to the Department and the District for management of groundwater and hydrologically connected waters in accordance with Neb. Rev. Stat. §§46-702, 46-703, 46-707, 46-712, 46-715, 46-716, 46-717, 46-718, 46-720, and 46-739. 2. The Lower Niobrara Natural Resources District, in collaboration with the Nebraska Department of Natural Resources, will implement this voluntary IMP to attain and/or maintain a desired balance between water uses and water supplies of both surface water and groundwater sources so economic viability, as well as social and environmental health, safety, and welfare, can be achieved and maintained in the District for both the near-term and long-term, while also considering effects on existing surface

water appropriators and groundwater users. The IMP was approved by the LNNRD Board of Directors on March 3, 2014, approved by NDNR on March 5, 2014, and took effect on May 1, 2014. The Voluntary IMP is reviewed annually with NDNR staff.

The LNNRD Groundwater Management Plan was originally approved on August 11, 1986, with the most current revision being in September 2011. The Groundwater Management and Protection Act, as amended, required that each District shall amend its Groundwater Management Plan to identify to the extent possible the levels and sources of groundwater contamination within the area, groundwater goals, long-term solutions to reduce high levels sufficiently to eliminate health hazards, and practices recommended to stabilize, reduce, and prevent the occurrence, increase or spread of groundwater contamination.

The West Knox Rural Water System (WKRW) Wellhead Protection Plan was approved in 2022. This Wellhead Protection (WHP) plan was prepared for the West Knox Rural Water System headquartered in Verdigre, Nebraska. The plan was developed with technical and financial support from the Nebraska Department of Environment and Energy (NDEE), the Lower Niobrara Natural Resources District (LNNRD) and the U.S. Environmental Protection Agency (EPA). Olsson, under contract with the LNNRD, wrote this WHP Plan, which is intended for the rural water system to use as a guide to implement programs, practices, and activities that will be protective of groundwater in and around the wellhead protection area.

Transfer of NPPD's water rights for the former Spencer hydroelectric facility to the NRBA and NGPC will create future planning needs. A subordination process will need to be developed and administered. Language will need to be developed in all existing plans to define and execute administration of the beneficial uses designation in the order.

## **II. Summary of Planned Activities**

### **A. Administration**

The staff for the LNNRD consists of four full-time employees, General Manager, Administrative Assistant, Water Resources Coordinator, Programs Assistant and one contract employee, Chemigation Inspector. WKRW employs one full-time employee, Project Manager, and two part-time employees, a Secretary and a Project Assistant. LNNRD also provides technical and administrative assistance positions to NRCS in the District. The four positions consist of Boyd County NRCS Clerk, 100%, Knox County NRCS Clerk, 41%, Holt County NRCS Clerk, 50%, and Keya Paha/Brown/Rock County NRCS Clerk, 21%, (currently vacant). One employee working in the Bazile Groundwater Management Area for the specific purpose of educating and promoting conservation to positively impact groundwater nitrate concentrations are financially supported by LNNRD and housed at the Lower Elkhorn Natural Resources District in Norfolk. The position is supported through a combination of financial resources including Lower Elkhorn, Upper Elkhorn, and Lewis and Clark Natural Resources Districts and partnering agencies including NRCS, and Nebraska Department of Environment and Energy (NDEE). All job titles and corresponding employees are listed in Table 2. These individuals execute the programs developed to meet the goals and objectives of the LNNRD Board of Directors.

LNNRD has subscribed to the NRDapp and Producer Connect to help with database management and landowner/producer interaction.

<b>LNNRD Staff</b>	
<b>General Manager</b>	Wade Ellwanger
<b>Administrative Assistant</b>	Britanie Brewster
<b>Programs Assistant</b>	Connie McCarthy
<b>Water Resources Coordinator</b>	Gary Richardson
<b>Chemigation Inspector</b>	Larry Kocian
<b>WKRW Staff</b>	
<b>Project Manager</b>	Bernard Jorgensen
<b>Project Assistant</b>	Dan Ebel
<b>Secretary</b>	Dorothy Mastalir
<b>NRCS Support Staff</b>	
<b>Boyd Co. Clerk</b>	Kim Rust
<b>Holt Co. Clerk</b>	Mary Zakrezweski
<b>Knox Co. Clerk</b>	Jeanne Rosen
<b>Keya Paha/Brown/Rock Co. Clerk</b>	NA
<b>Partnership Position</b>	
<b>BGMA Coordinator</b>	Lisa Lauver

Table 2: LNNRD Staff as of October 1, 2023

## B. Groundwater Irrigation Runoff Control

There is a considerable amount of irrigation in the District with 220,711 acres groundwater irrigated, 36,455 acres surface water irrigated, and 11,973 acres using a combination of ground and surface water to irrigate. Runoff is not a major concern as most irrigation systems are center pivots irrigating porous soils on relatively flat land. There is a higher concern for runoff in Knox County with finer soils and more slope, but with limited water supplies it has not been an issue for the District.

Very little activity is expected in dealing with irrigation runoff. The District has not received any complaints involving irrigation runoff problems over the past several years. If problems arise, staff will investigate complaints and attempt to resolve conflicts. The District will follow the guidelines outlined in the Erosion and Sediment Controls section of the District's Rules and Regulations with legal action taken if appropriate.

## C. Groundwater Quality Management Area/Groundwater Management Plan

Groundwater quality remains a high priority issue. The Groundwater Management Plan was approved by the Nebraska Department of Water Resources in 1986 and revised in 1996 and 2011. The District implemented a Groundwater Quality Management Area (GQMA) on July 1, 1996. The entire District is subject to Phase I requirements.

Phase I emphasizes education and nitrogen management certification. The District holds nitrogen certification classes during the winter and early spring. The District has developed a take-home test to meet the requirement of nitrogen certification. There is also an on-line course for nitrogen certification. Classes have been held every year since 1996.

Because of the continued rise of nitrate levels Phase II requirements went into effect April 2, 2004, in the area north of O’Neill and on March 11, 2006 for the area north of Atkinson & Stuart and a small area in western Boyd County. The portion of the District in the Bazile Groundwater Management area was added in 2014. Even with the increased monitoring and restrictions the areas of high nitrate levels continued to increase and expand. To address this issue, the Board moved all but 10% of the irrigated acres into Phase II status as of 2019. Figure 2 shows the current Phase Areas of LNNRD.

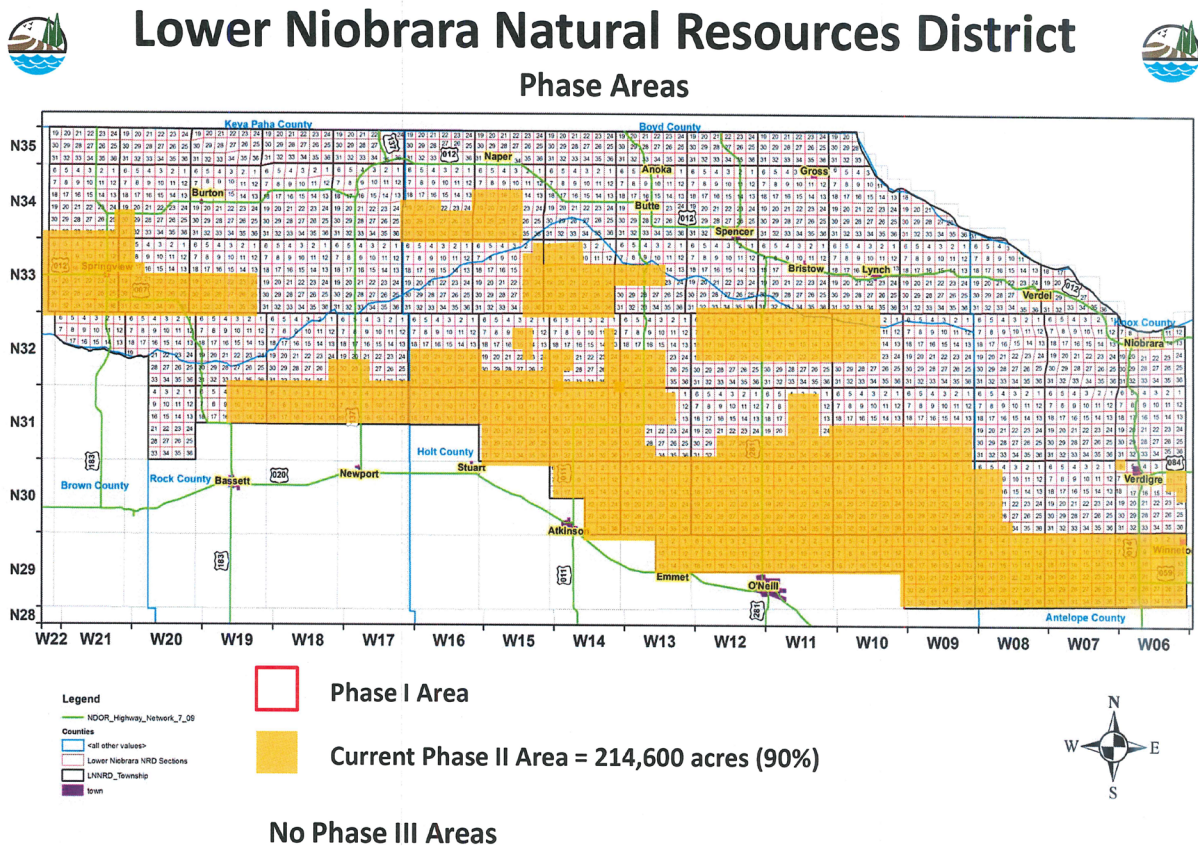


Figure2: LNNRD Phase Areas

Phase II rules change the encouraged practices to required and requires the producers to complete an on-line Phase II reporting form. This form shows the nitrogen credits and the nitrogen applied along with irrigation water pumped and herbicides used. Revised Phase III Rules and Regulations have also been developed if the new Phase II areas do not slow the increasing levels of nitrates in the groundwater.

Groundwater quality monitoring continues with the District sampling roughly 500 irrigation wells to track the nitrate nitrogen levels in the groundwater. The wells are

sampled every other year to establish trends in water quality. The District applied for and received a Nebraska Environmental Trust Grant in 2019 to increase the number of monitoring well locations in the District from 4 to 18. The new wells are currently in their second year of sampling.

In addition to the nitrate level monitoring, a smaller number of wells have been tested for agricultural chemicals and selenium with only a very small trace amount found. The results will help the District determine future GQMA phases and requirements.

The NRD holds public hearings on the establishment of the GQMA, Phase requirements along with the rules and regulations to enforce.

The District continues to emphasize increased use of Best Management Practices by producers in the GQMA. Funding for the GQMA comes from the Natural Resources Enhancement Fund and the NRD. Changes to the fund could and will impact the effectiveness of the overall Groundwater Quality Management Plan (GQMP).

Chemigation is the application of pesticides and fertilizers directly through irrigation systems. As of January 1, 1987, no person may apply chemicals using chemigation without first obtaining an annual permit from the LNNRD for each injection point. Permits are required for each injection location and the District conducts periodic inspections to ensure compliance. Applications for chemigation permits are reviewed by the LNNRD, an inspection conducted, and permits approved or rejected within 45 days of receipt. Prior to approval, the chemigation system must have a check valve and vacuum relief valve in the irrigation pipe, an inspection port for the check valve in the irrigation pipe, an automatic low pressure drain between the main check valve and irrigation pump, a check valve in the chemical injection line, and a simultaneous interlock device between the power system for the injection unit and irrigation pumping plant. In addition, the person operating the equipment must be certified by the NDEE. In 2023 there were 62 new and 1,309 renewal permits issued. All new permit sites are inspected as well as approximately 50% of the renewal sites. 729 chemigation inspections were conducted in 2023. The fee for a new permit is \$100 with an annual renewal fee of \$20. Fines can be leveled for violations.

The District continues to test water samples in house using a HACH Kit. Individuals bringing samples to the NRD Office receive free water nitrate analysis. The kit is also taken to county fairs and trade shows within the District where people can bring their water samples for free testing. Current testing has shown an increase in nitrate in domestic wells of the Ponca watershed. Further investigation is needed to accurately assess the nitrate source and distribution in this watershed.

#### **D. GROUNDWATER QUANTITY ISSUES IN THE DISTRICT**

On January 25, 2008 the Lower Niobrara NRD received an Order of Final Determination from the Department of Natural Resources (DNR) that a portion of the Lower Niobrara River Basin is Fully Appropriated. The Lower Niobrara NRD along with Middle Niobrara NRD, Upper Loup NRD, Upper Elkhorn NRD and one individual filed a petition with the DNR contesting the Order of Final Determination that Portions of the Lower Niobrara River Basin were Fully Appropriated.

The petition challenges the Department's interpretation of the statutes and regulations it utilizes in reaching essentially technical conclusions. It poses the question, if the Department did not sufficiently follow those statutes and regulations, whether the resulting order is invalid as a matter of law. Also the pleadings generally state the cause of action is the Department's January 25, 2008, Order of Final Determination that a Portion of the Lower Niobrara River Basin is Fully Appropriated (Order), and assert that through the particular contested facts alleged in the pleadings for establishing procedural or factual defect, that the Order is arbitrary and capricious, or contrary to the law, and therefore invalid in whole or in part. A hearing was held, and the Director of the Department of Natural Resources upheld the Order.

The four Districts then filed an appeal with the Nebraska Court of Appeals. A petition was then filed to bypass the Appellate Court to have the case heard by the Supreme Court which was granted. In June of 2011, the Supreme Court reversed NDNR determination on the Lower Niobrara Basin being fully appropriated.

In January of 2009, the Lower Platte River Basin was determined to be Fully Appropriated by the Department of Natural Resources which affected the southern portion of the Lower Niobrara NRD. This determination was later reversed by the Department, which allowed the Districts in the basin to use the provision set forth in LB 483. This bill allows up to 10,000 acres of irrigated land to be added in each district over a four-year period using a ranking process adopted by the NRDs. In 2010, the district did not receive any application to add irrigated acres. In October of 2011, January of 2012 and 2013 the District accepted application for up to 2500 acres each year using the provision set forth in LB 483. The District added approximated 7500 new irrigated acres in the three-year period. In the fall of 2013, the District placed a temporary moratorium on new irrigated acres. Approved acres and well permits were allowed to be completed.

In September of 2011, the District sent a letter to the Nebraska Department of Natural Resources to begin the process of developing a Voluntary Integrated Management Plan and on May 1, 2014 the Plan went into effect. This Plan provides for a mechanism to jointly manage both surface and ground water within the District. To enforce the Plan the District revised its Rules and Regulations. The amended Rules and Regulation contained the following: Expanded definition; revised procedures for enforcement; guidelines for cease and desist orders and actions to enforce; establishment of Groundwater Management Areas, sub-areas, phase designation and controls; establishment of the Bazile Groundwater Management Area; certification of all irrigated acres; rules for expansion of irrigated acres and the ability to limit number of acres developed; process to apply for a groundwater well permit; procedures for groundwater transfers; requirements for the installation of flow meters—all new or modified wells after March 1, 2014; variance granting process from the strict application of these rules; how lagoon water can be used for irrigation; triggers to implement groundwater controls for declining aquifers.

Since the establishment of the revised Rules and Regulations to June of 2019 the Board has chosen not to allow for the addition of new irrigated acres or for the transfer of irrigated acres. Also, only one supplemental/helper wells have been permitted. In June of 2019, the Board decide to allow up to 500 acres of new irrigated acres. To qualify for these acres an

irrigation system and well needed to be in place and no more than 25% of the current irrigated acres can be added to a field. The primary focus for these acres were to allow the removal of old farmstead so the irrigation system can make a complete circle, improving the nitrogen and water use efficiency of the system. This has been extended until the 500 acres is used. The Directors instructed the staff to take application for new irrigated acres with a maximum of 1000 acres to be approved in 2020 and 2021, 500 acres in 2022, and no irrigated acre expansion in 2023.

To better manage the entire basin and bring the control of the surface water back to the local people, the District joined with the Middle Niobrara, Upper Niobrara-White, Upper Loup and the Upper Elkhorn NRDs to create the Niobrara River Basin Alliance (NRBA). The objective of the collation was to obtain the NPPD Spencer Dam Hydropower surface water rights. To accomplish this effort the NRBA joined with the Nebraska Game and Parks Commission. On October 11, 2022, NDNR transferred appropriations A-359R, A-1725, A-3574, and A-18503, totaling 2,460 cfs, from NPPD to the NRBA and NGPC for fish, wildlife, recreation, and beneficial use. Funds for the purchase of these appropriations came from a joint NET grant and NGPC match.

The District applied for and received a NET Grant in 2011 to assist producers with the purchase of a flow meter. These funds purchased 100+ flowmeters. The flowmeter readings are collected in the fall of each year. This information is helpful in determining actual groundwater pumping for irrigation. The number of flowmeters continues to increase as producers modify their existing wells and systems. Discussion continues on requiring all irrigation wells to install flowmeters, but that this point no action has been taken. Staff are currently investigating grant funding options and match criteria to offer another round of flow meter and soil moisture probe cost-share. An increased number of flow meters is needed in the District to collect accurate data to be used in developing a drought plan.

The District applied for and received a NET Grant in 2019 to expand its monitoring well network. 19 monitoring wells were installed at 14 new locations across the District. The monitoring wells were equipped with pressure transducers and telemetry which allows staff, directors, and constituents the ability to see static water levels across the District in real time at all 18 monitoring well locations. These hydrographs will not only show the current static water levels, but also the levels as they change throughout the irrigation season and off-season recharge. Dashboard view is also available in the application. Constituent access to this technology will be announced in November 2023.

## **E. RURAL WATER DISTRIBUTION SYSTEM**

In 1974, the Niobrara NRD began receiving requests from local residents to develop a rural water distribution system near Verdigre. The District took no action at the time because there didn't seem to be enough interest from residents to support the system.

In 1979, the District received more inquiries and conducted a feasibility study. After a public meeting, the District decided to hire an engineer to develop a plan. One of the most obvious considerations in the development of the rural water system was the source of water.

Construction began in 1984 with the drilling of two wells located 8 miles south of Verdigre just to the west of the intersection of Highway 14 and 59. The West Knox Rural Water System began operation on January 1, 1985 with two communities, Verdigre and Winnetoon and 160 rural Customers. The original project cost \$1,282,000 and was financed through a loan from the Farmer Home Administration; with the final payment made in 2010.

Through the years the Rural Water System continues to update the system. In 2004, chlorination equipment was added. In 2005, a new radio monitoring system was installed to monitor the booster pumps, storage tanks levels and pressures in the system from a single location. It also notifies the operator 24 hours a day if a problem arises. The system averages 70 to 80 million gallons of quality drinking water delivered to its customers each year.

To ensure quality drinking water into the future the Rural Water System has added two new supply wells to the system in 2017. These wells are located one mile south of the existing system on an 80-acre tract of land which was purchased by the District. In addition to the wells there is just over 2 miles of 8 inch mainline, three valve/meter pits, and a completely updated monitoring system, which allows the staff to operate the system via smart phones. The Rural Water System applied for and received a \$1.3 million Drinking Water State Revolving Fund Loan through NDEQ which has 20% loan forgiveness.

In 2010, West Knox RWS applied for and received a grant from the Bureau of Reclamation (BOR) to conduct a Northeastern Nebraska Water Supply System Appraisal. This Appraisal was in cooperation with the communities of Creighton, Center, Niobrara and Santee to assess the need for a regional water supply system. This Appraisal was funded entirely by the BOR and was completed in June 2010. The Appraisal assessment determined a feasibility study should be conducted in the same areas, so an application was submitted to the BOR in July 2011. This study would complete approximately 80% of the engineering and had an 80/20 match requirement. Only three communities participated in the feasibility study, Center, Niobrara and Santee which took eighteen months to complete. Without Creighton as a customer the feasibility study failed to meet the cost/benefit ratio established by BOR. The Wellhead Protection Area was flown with AEM in 2017 as part of the BGMA AEM Study. The WHP Plan was completed and approved in 2022.

WKRW suffered significant damage as a result of the 2019 bomb cyclone flooding event that took out Spencer Dam. 13 projects were identified and submitted for emergency funding through FEMA. Approximately \$600,000 has been received in cost-share funding from FEMA/NEMA. The projects are completed, with closeout and final payment due by the end of 2023.

As nitrates slowly rise in 2 of the 4 wells, discussion has been held on purchasing more land for the consideration of a new well site. Currently well #2 is in the process of trying to be rehabilitated. WKRW has spent \$83,000 over the last 2 years trying to close off the upper screens in the well in an effort to lower the nitrate levels in the well. Should the rehabilitation be unsuccessful, a preliminary water study will need to be completed, and a new well and possible well site will need to be identified.

The current system supplies water to Verdigre, Winnetoon, and 244 rural customers with an estimated population served of 1,390.

## **F. NRCS SUPPORT PROGRAM**

The District continues its support of the NRCS by providing clerical assistance to Field Offices. Funding is based on the percentage of the area served by the Field Office that is in the LNNRD. Funding for clerical assistance amounts to 100% for Boyd County, 41% for Knox County, 50% for Holt County and 22% for the BKR area (this position is currently vacant).

In addition to Clerks, the District applied for and received a NACD grant to hire a NRD Technician to assist NRCS with planning and implementing contracts for conservation practices. This position has proven to be very valuable to fill shortfall because of staff changes in the local office. Two individuals have held this position and transitioned into full-time NRCS employees. This grant expired in 2022. Consideration is being given to applying for these grant funds in the future.

## **G. CONSERVATION COST SHARING PROGRAMS**

The District continues to administer the Nebraska Soil and Water Conservation Program (NSWCP). The District's allocation continues to decrease, and the needs continue to increase. These funds are used to cost share conservation practices such as cross fencing, water supply and tanks, windbreaks and grass seedings to name a few. The District annually updates its funding priority list. For the past several years the District has committed 100% of all available NSWCP funds. Each year applications are left unfunded because of limited funding. The priority list ensures those practices considered most beneficial by the District are approved. The current priority system is reviewed periodically by the District Operations Committee.

The NRD will continue to support federal cost sharing programs such as EQIP. In fact, the District took the lead in determining conservation priority areas and priority concerns. These conservation issues were forwarded to state and federal government agencies to help determine funding available for local landowners. The District has secured about 3+ million dollars in long term EQIP contracts since 1997.

Under the previous Farm Bill, federal cost share, such as CRP was used to action many requests for conservation practices. NSWCP provided a backup and actioned request that were not eligible for federal funding. The current Farm Bill does not allow for individual practices. As a result, the entire initial NSWCP allocation has already been committed this fiscal year, with fewer conservation practices installed District-wide.

Water Quality Cost Share Programs are provided by the District. This program includes Nitrogen Management, Well Abandonment, Drip Oil Shutoffs, Automatic Rain Gauge Shutoffs, Manure Sampling, Domestic Wells, Home Treatment Systems and Rural Water System Hookups. A limited number of producers took advantage of these programs, but the District remains committed to providing cost-share for these programs. The nitrogen management program pays 75% of the cost for soil sampling and analysis, plus irrigation

water sampling. This program gives an incentive to producers to account for all nitrogen available to the crop present in the soil and water, and therefore reduces the amount of commercial fertilizer applied. The cost-share provided on the remaining programs is 65%. These cost-share programs are due to be evaluated and updated in 2024.

The Well Abandonment Program is funded through the Water Quality Cost Share Program. With continued education efforts toward water quality an increase in the number of producers applying for well abandonment cost share has been realized the past few years. State requires applicants to hire a licensed well contractor to decommission their water well. The District does not plan to participate in the state well decommissioning program.

The District anticipates \$29,176.22 annually from the Natural Resources Water Quality Fund (NRWQF) for water quality projects and programs. The district provided over \$300,000 in FY 2022-2023 in matching funds to the NRWQF. The District has developed annual and four-year plans with priorities for funding. Future levels of funding provided by the NRWQF will have a direct impact on the effectiveness of the Districts GQMA.

A significant portion of the initial year funding was identified for equipment needed to support the Districts GQMA. The remaining three years allocation has been ear marked for cost share programs, salaries, equipment, information and education efforts, and expenses incurred while carrying out the Districts GQMA and Chemigation.

The four-year plan allows for flexibility and adjustments to programs as the need arises. Use of the NRWQF allows the District to enhance its Water Quality Programs without increasing the burden on property taxes.

## **H. Roadside Erosion**

The District will continue to participate in the prevention of roadside erosion. The District supports the resolution adopted at the 1993 Nebraska Association of Resources Districts Conference which prohibits the use of mulch for roadsides which is not noxious weed seed free.

## **I. Information and Education**

The Program Assistant handles the I&E for the District. I&E duties are also shared by all employees.

The District's Information and Education Program includes a combination of:

- 1) News articles and public services announcements
- 2) Range Judging Contests
- 3) Land Judging Contests
- 4) Eighth Grade Conservation Days
- 5) Conservation Day Essay Contest
- 6) Wonderful World of Water
- 7) Upper Elkhorn Natural Resources Festival
- 8) Annual Newsletter
- 9) NARD Award entries

- 10) Scholarships to Range Youth Camp and Adventure Camp for the Environment (ACE Camp) (16 scholarships available)
- 11) Support of Demonstration Plots
- 12) Fairs, Farm & Home Shows and Special Event Booths
- 13) Groundwater Presentations for Schools
- 14) Support of various I & E Projects with other organizations
- 15) County Government Day
- 16) Publications, brochures, and pamphlets
- 17) Representation on NARD I&E Committee
- 18) Participate in the Nebraska Envirothon
- 19) Participation at the Nebraska State Fair and Husker Harvest Days
- 20) Nitrogen Management Certification
- 21) Regional and State Presentations at Conferences

## **J. Wildlife Habitat Program**

The Wild Nebraska Program is now the Corners for Wildlife Program decreased to 9 contracts, the number of acres enrolled is 218.7. Payments to landowners for the areas enrolled fall under four practices: grasslands, wetlands, woodlands, and general. Payments involve 75% Game & Parks Commission funds and 25% NRD funds. The District assumes the majority of the administration and inspection costs of the program. Funding available from Game and Parks amounts to \$10,000. The NRDs contribution of \$1,083.40 will allow the District to fund the program up to \$11,083.40 for 10-11. Current annual payments have decreased to a total of \$4,333.60. The future direction of WILD NE will depend on landowner interest and program flexibility.

LNNRD is currently entertaining ideas from NRD and NGPC staff to facilitate new wildlife habitat programs. Discussions are focusing on additional one-time, CRP cost-share payments that match NGPC cost-share.

## **K. Forestry and Windbreak Planting**

The District has a tree planting program capable of meeting the needs of area producers. The tree planting crews plant farmstead, livestock protection, and field windbreaks as well as forestry and wildlife projects.

The demand for District machine planted trees has decreased. The contracted crew machine plants between 18,000 and 20,000 trees on approx. 10-15 sites each year. District residents purchased between 10,000 to 12,000 hand plants each year. The majority of stock comes from the Bessey Nursery at Halsey with some from Lincoln Oakes Nursery. The District operates a tree cooler to maintain stock on hand.

The District encourages the use of conservation mulch and provides our cooperators with contact information of installers. Conservation mulch allows for moisture retention, warmer soil, and acts as a weed barrier to provide a better environment for seedlings. The District sells the mulch to the cooperators and stores it until the contractor picks up for installation. The District sells on average 150,000 feet of mulch each year.

The District also sells 4-foot mulch squares. The use of the mulch squares requires more labor during installation but is very economical compared to continuous mulch.

The NRD also offers drip irrigation systems for the newly planted trees. While conservation mulch seems to be replacing this system, drip irrigation is effective, especially in drier years and can be used in conjunction with the mulch to help increase the survival of the seedling trees.

Proper designing and staking are essential for a successful planting. The NRCS prepares the design for most tree plans as the District does not provide a windbreak design service. The Nebraska Game and Parks Commission, and Nebraska Forest Service also provide occasional design input.

## **L. Range and Grassland Management**

Grassland makes up a major portion of the LNNRD. As a result, establishment and management of grassland is a high priority. The District will participate in the promotion of proper range management programs and control of undesirable vegetation.

## **M. Watershed Projects**

LNNRD currently does not have any watershed projects. Preliminary discussions have begun on the WFPO program and processes. LNNRD will access our ability to participate in the WFPO program in the future.

## **N. Road Structures**

There are no existing plans for participation in the construction of road structures. The District gives consideration for assistance in the development of projects on a case by case basis. The District has an on-going program to pay up to \$1,000 on an eligible project. Lack of interest in this program in recent years is causing the District to consider the future of this program.

## **O. Recreation**

The District's activities in recreational facilities are usually minor. The District does have a program which provides assistance to non-profit or governmental agencies in the development or improvement of recreational facilities. The District budgets \$1,000 annually for this program. Assistance has been provided for parks, golf courses, athletic fields, and youth camps in the past. If available, trees are also given to towns and schools who request them.

LNNRD has one director that represents the District on the Niobrara Council. The Council was formed in 1997 to assist the National Parks Service in managing and protecting the natural resources of the Niobrara National Scenic River. Many of the Council's issues deal with preserving public recreation, scenic qualities, rural characteristics, and private ownership.

The District was excited about a potential opportunity for a recreation area at Rock Falls. The first option has been given to the National Parks Service in this endeavor. LNNRD would be interested in participating in a project of historical significance in the future.

## **P. Waste Disposal and Pollution Control**

The LNNRD has one director that represents the District on each of the two RC&D groups in the District. They help plan and promote waste and recycling efforts in the District.

## **V. Assessment of Current Needs**

### **A. Land Purchases**

LNNRD is working with West Knox Rural Water to identify a path forward should well 2 not favorably respond to the current rehab efforts. Discussion has begun on the need to acquire 80 acres of land for a new well field. Ideally, this would be 80 acres adjacently to the west of the current 80 acres owned by LNNRD in rural Knox County.

### **B. Manpower**

The staff for the LNNRD consists of four full-time employees, General Manager, Administrative Assistant, Water Resources Coordinator, Programs Assistant and one contract employee, Chemigation Inspector. WKRW employs one full-time employee, Project Manager, and two part-time employees, a Secretary and a Project Assistant. LNNRD also provides technical and administrative assistance positions to NRCS in the District. The four positions consist of Boyd County NRCS Clerk, 100%, Knox County NRCS Clerk, 41%, Holt County NRCS Clerk, 50%, and Keya Paha/Brown/Rock County NRCS Clerk, 21%, (currently vacant). One employee working in the Bazile Groundwater Management Area for the specific purpose of educating and promoting conservation to positively impact groundwater nitrate concentrations are financially supported by LNNRD and housed at the Lower Elkhorn Natural Resources District in Norfolk. Current staffing is sufficient to meet the needs of the District.

### **C. Funds**

Funding increases were made for FY 2023-2024 through our property taxing authority. The need arose to increase these funds so that LNNRD can continue offer the current programs, goals, and objectives. As well as prepare for future needs to expand services, programs, goals, objectives, and staff in the future. Funding from NSWCP and NRWQF continues to decline as demand for these funds continues to increase.

## **VI. Assessment of Future Needs**

Tables 4.1 – 4.3 project the land rights, personnel, and financial needs of the District over the next 5 years. These projections are based on some assumptions relating to future expansion of programs and staff.

WKRW	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Well Field Land Purchase	\$30,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000

**Table 4.1 Projected Land Purchase Needs FY2023-FY2028**

Program	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
<b>Administration</b>						
Manager	1144	1144	1144	1352	1352	1352
Admin Assistant	1664	1664	1664	1664	1664	1664
<b>Groundwater Management</b>						
Manager	624	624	624	416	416	416
Water Res. Coord.	2080	2080	2080	2080	2080	2080
Programs Asst.	416	416	416	416	416	416
GW Technician	-	720	2080	2080	2080	2080
Chemigation Insp.	440	440	440	440	440	440
<b>NRCS Support</b>						
Manager	104	104	104	104	104	104
Programs Asst.	416	416	416	416	416	416
Clerks	4410	4410	4410	4410	4410	4410
<b>I&amp;E</b>						
Programs Asst.	1248	1248	1248	1248	1248	1248
Admin Assistant	208	208	208	208	208	208
<b>WKRW</b>						
Manager	208	208	208	208	208	208
Admin Assistant	208	208	208	208	208	208
<b>Totals</b>	<b>13,170</b>	<b>13,890</b>	<b>15,250</b>	<b>15,250</b>	<b>15,250</b>	<b>15,250</b>

**Table 4.2: Projected Personnel Needs FY2023-FY2028 (Time in Hours)**  
Does NOT include WKRW staff.

Obligations	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Personnel	\$566,341	\$614,658	\$665,391	\$698,660	\$733,593	\$770,273
GW Quality	\$276,700	\$310,000	\$310,000	\$310,000	\$320,000	\$320,000
GW Quantity	\$20,000	\$90,000	\$90,000	\$75,000	\$75,000	\$85,000
Watershed Activities	\$0	\$0	\$20,000	\$30,000	\$30,000	\$30,000

**Table 4.3: Projected Financial Needs FY2023-FY2028.**  
Does NOT include WKRW operating budget.