



NEBRASKA
DEPT. OF NATURAL RESOURCES

INTEGRATED MANAGEMENT PLAN

Jointly Developed by the Nemaha Natural Resources District and the Nebraska Department of Natural Resources

May 2022



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1 Authority and Effective Date

This Voluntary Integrated Management Plan (VIMP) was prepared voluntarily by the Board of Directors of the Nemaha Natural Resources District (District) and the Nebraska Department of Natural Resources (Department) in consultation with the District Stakeholder Advisory Committee (SAC) and in accordance with the Nebraska Groundwater 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 Nebraska Revised Statutes (*Neb. Rev. Stat.*) §46-715(1)(b), §46-715 to 46-717, and subsections (1) and (2) of §46-718.

The letters initiating the VIMP process are included in **Appendix A**. This VIMP was adopted by the District on April 14, 2022, and by the Department on April 20, 2022. The effective date of this VIMP is May 20, 2022.

2 Purpose

The District, in collaboration with the Department, developed this VIMP to attain and maintain a desired balance between uses and 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 considering effects on existing surface water appropriators and groundwater users. Should the Department subsequently determine an affected river basin, subbasin, or reach within the District to be fully appropriated, the Department and District may amend this VIMP.

3 Background

3.1 Natural Resource Districts, Nebraska Department of Natural Resources, and Water Management in Nebraska

In 1969, the Nebraska Legislature passed LB 1357 that combined 154 special purpose entities into what are now 23 natural resources districts (NRDs) in 1972. Unique to Nebraska, NRDs are local government entities, governed by an elected board of directors, with broad responsibilities to protect Nebraska's natural resources. NRD boundaries generally follow major river basins, enabling local districts to respond best to local needs.

NRDs are charged with 12 areas of responsibility, including:

1. Development, management, use, and conservation of groundwater and surface water
2. Soil conservation
3. Erosion prevention and control
4. Flood prevention and control
5. Pollution control
6. Water supply for any beneficial uses
7. Prevention of damages from flood water and sediment
8. Development and management of recreational and park facilities



9. Forestry and range management
10. Development and management of fish and wildlife habitat
11. Drainage improvement
12. Solid waste management

In particular, NRDs are responsible for the planning, monitoring, and regulation of groundwater in their districts, while the Department, a state entity, manages and regulates surface waters within the state.

The Department has been in existence since July 1, 2000, when two existing state agencies were merged: the Department of Water Resources and the Nebraska Natural Resources Commission. Since 2000, the Department has had broad responsibilities in the areas of Nebraska's surface water regulation, groundwater well registrations, floodplain management, dam safety, natural resources planning and development, and dissemination of data and information pertaining to these topics. In addition, the Department participates in numerous federal, interstate, state, and local studies and represents Nebraska in connection with interstate compacts and decrees. The Department also administers several state funds used to help conserve, protect, and develop Nebraska's natural resources (Department Newsletter, Issue 1, winter 2000). After the passing of Legislative Bill (LB) 962 in 2004, the Water Planning (WP) division of the Department was formed. The WP division has been steadily growing through the years and currently has 19 full-time, permanent positions and several temporary positions. The employees in these positions have expertise in water planning, groundwater modeling, and hydrology.

The beneficial use of groundwater and surface water in the state of Nebraska is governed by two discrete laws: (1) the common law concept of correlative rights for groundwater, and (2) the prior appropriation doctrine for surface water. The correlative rights rule allows owners to drill wells and extract groundwater from an underlying aquifer for reasonable and beneficial purposes, subject to management by the public. To execute this right, landowners must first obtain a permit to drill a well from their local NRD. Within the District, if approved, the well permit allows the landowner to drill and extract as much groundwater as needed, subject to NRD limitations in place, as long as the use is deemed beneficial. When construction is completed, the well permit is registered with the Department, which places the information in a statewide database. The correlative groundwater rights rule is essentially a "share and share alike" system. Under the prior appropriation doctrine, surface waters of the state are allowed to be diverted based on the date that the application was filed with the Department. Surface water rights entitle landowners or organizations to remove a set amount of water from a specific location, along with other specific terms and conditions. During periods when the overall water supply is insufficient to meet all appropriated water rights, this system protects those who received their water rights first. Thus, the water right for the same use, with the earliest date (or senior priority) is entitled to their full appropriation before a later (or junior) priority date water right receives any water.

3.2 Integrated Management Plans

LB 962 allows the Department and the NRDs to work together to manage groundwater and surface water as a hydrologically connected resource under integrated management plans. With the increasing demand on water resources, it is necessary to recognize the importance of hydrologically connected



groundwater and surface water and the difficulties entailed in the management thereof, because of their properties, distribution, and the interconnection between surface water and the underlying groundwater aquifers.

Under LB 962, an integrated management plan must be developed if the Department determines that a river basin, subbasin, or reach is fully appropriated. Statute defines a fully appropriated condition as follows:

A river basin, subbasin, or reach shall be deemed fully appropriated if the [D]epartment determines [...] that [current] uses of hydrologically connected surface water and ground water in the river basin, subbasin, or reach cause or will in the reasonably foreseeable future cause (a) the surface water supply to be insufficient to sustain over the long term the beneficial or useful purposes for which existing natural-flow or storage appropriations were granted and the beneficial or useful purposes for which, at the time of approval, any existing instream appropriation was granted, (b) the streamflow to be insufficient to sustain over the long term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved, or (c) reduction in the flow of a river or stream sufficient to cause noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws. (*Neb. Rev. Stat. §46-713(3)*)

3.3 Voluntary Integrated Management Plans

LB 764, enacted in 2010 and codified at *Neb. Rev. Stat. § 46-715(1)[b]*, authorized NRDs to voluntarily develop an integrated management plan with the Department to jointly manage groundwater and surface water uses and supplies in areas that have not been designated as fully appropriated. The process is initiated when the District notifies the Department of its intention to develop a VIMP. The objective of a VIMP is to manage the river basins, subbasins, or reaches within the District to attain and/or sustain a desired balance between water uses and water supplies for the long term, while protecting existing users.

The NRDs' authorities focus on groundwater management; the Department administers surface water rights and may issue Groundwater Municipal and Industrial transfer permits. With the increasing demand on water resources, it is necessary to realize the importance and use of hydrologically connected groundwater and surface water. Groundwater and surface water have an intricate relationship, which can be difficult to manage.

Although there is no official determination by the Department that any area of the District is fully appropriated, the District is continuing to be proactive in water management and is voluntarily developing this plan jointly with the Department, in part to reduce the potential that the District be designated as fully appropriated in the future. This VIMP is intended to meet many of the requirements of an integrated management plan required if the District, or part of the District, is determined to be fully appropriated by the Department. If a District develops a VIMP and the Department subsequently determines the affected river basin, subbasin, or reach to be fully appropriated, the Department and the affected NRD may amend the VIMP.



4 Description of Nemaha Natural Resources District

The District encompasses all of Johnson, Nemaha, and Richardson Counties, as well as parts of Otoe, Pawnee, Cass, Gage, and Lancaster Counties. The district covers 2,402 square miles and has a population of 44,560 in 40 communities. The largest cities within the District are Nebraska City (population 7,273) and Falls City (population 4,156).

Basin topography consists of gently sloping to rolling hills in the upper portion, while the lower portion is moderately rolling with steeply rolling slopes in localized areas adjacent to the floodplain valleys, prior to entering the flat valley of the Missouri River floodplain. Shale and limestone outcrops occur in the southern portions of Pawnee and Richardson Counties.

Soils are well suited for agriculture and nearly all arable lands are cultivated. Row cropping is the predominant land-use and corn and soybeans are the primary cash grain crops. While this area of the state receives the most rainfall within the state, there is irrigation occurring within the District. Groundwater is the primary source of water for irrigation, drinking water, and industrial uses. There are surface water appropriations for use of the Nemaha River and its tributaries, predominately for crop irrigation.

The District is traversed by two major streams and their tributaries, the Little Nemaha River to the north and the Big Nemaha River to the south. The District lies entirely within the glaciated portions of the state where loess soils lie on undulating glacial deposits.

4.1 Surface Water Resources

The dominant surface water features in the District are the Little and Big Nemaha Rivers. The Nemaha Basin comprises approximately 1,769,000 acres. The Little Nemaha River is approximately 73 miles long and drains 574,000 acres. The stream originates in the southeastern corner of Lancaster County, and follows a southeasterly course through Otoe and Nemaha Counties to its junction with the Missouri River near Nemaha, Nebraska. The two major tributaries, North Fork Little Nemaha River and South Fork Little Nemaha River, have their confluences with the Little Nemaha River near Talmage, Nebraska in Otoe County. The North Fork originates near Elmwood, Nebraska and flows southeasterly for approximately 24 miles to the confluence. The South Fork originates in Lancaster County and flows easterly for approximately 28 miles.

The Big Nemaha River is approximately 96 miles long and drains 1,195,000 acres. It originates along the Southern border of Lancaster County and follows a southeasterly course through Gage, Johnson, Pawnee, and Richardson Counties to its confluence with the Missouri River near the Nebraska/Kansas state line. The two major tributaries, Muddy Creek and South Fork Big Nemaha River, join the Big Nemaha River in Richardson County near the towns of Preston and Salem, respectively. Muddy Creek has its origin in Johnson County and is approximately 47 miles in length. South Fork Big Nemaha River is approximately 66 miles long and originates near the southern border of Nemaha County in Kansas. Approximately 366,500 acres of the watershed are located in Kansas.

The channels of the Little and Big Nemaha Rivers and their tributaries have been substantially altered by man, particularly in the lower portions of the basin. In the early 1900's, many of these lower reaches were dredged and straightened.

The District and other agencies have been active in watershed planning and protection, with currently over 400 dams located throughout the District.

4.2 Groundwater Aquifers

The District's groundwater resources are complex, complicated by past glaciation and associated till deposits. Reliable groundwater sources are difficult to obtain and are often localized small formations that provide minimal yields. The principal stream valleys containing alluvial deposits and the bedrock valleys buried under glacial till deposits are filled with sand, gravel, and finer-grained alluvial sediments and provide moderate yields. Locally, specific layers of bedrock may also be a source of water in discrete locations, but water quality is often poor.

Past studies conducted by the Auburn Board of Public Works indicate a hydraulic connection between the alluvial aquifer where Auburn's primary municipal wells are located and the Little Nemaha River.^{1,2,3} This hydraulic connection with the alluvial aquifer appears to extend downstream within the Little Nemaha River valley and includes the municipal wellfield of Nemaha, as well as the water supply wells of Rural Water District #1. Unlike the High Plains Aquifer of western Nebraska where the aquifer thickness can exceed 1,000 feet, the alluvial aquifer in the Little Nemaha River valley is typically less than 50 feet thick – amplifying the alluvial aquifer's dependence on Little Nemaha River flows for maintaining a reliable groundwater supply.

5 Integrated Management Planning Process

The integrated management planning process uses an adaptive management approach. Thus, it is a work in progress for either attaining or maintaining the desired balance of the hydrologic system. As an affected area or subarea of the District changes and more data become available, the VIMP goals and objectives will be reassessed and changes may be made, as necessary, to accommodate changing circumstances such as hydrology, economics, water demands, and supplies. The VIMP will evolve in incremental phases as elements of the plan are achieved and additional elements to the VIMP are sought by the District, its Stakeholder Advisory Committee, or the Department. The VIMP will be reviewed annually, and the District and the Department will determine if the VIMP needs to be modified to achieve its goals and objectives. This VIMP focuses on hydrologically connected surface water and groundwater but incorporates many aspects that mutually benefit other actions of the District, as set forth in the District's Groundwater Management Plan and findings from other District projects and studies. The integrated management planning process allows for: (1) understanding water supplies and uses within the District; (2) preventing or mitigating water related conflicts within the District; (3)

¹ Auburn Induced Groundwater Recharge Permit Application – DRAFT, *Olsson Associates*

² Final Regional Water Supply Alternatives – August 2020, *Olsson Associates*

³ Auburn Drought Assessment – Technical Memorandum, July 2020, *JEO Consulting Group, Inc*



planning for sustainable growth in water uses and demands; and (4) informing the public of the District's water resources and efforts to effectively manage those resources.

Data, analyses, models, and the best available science are the tools that provide the information that is critical for implementing water management activities and meeting VIMP goals. Among other things, these tools will be used to assess water supplies, water uses, water availability, water shortages for existing water users, and to identify future water needs at the basin level and subbasin level within the District. The District and the Department will seek to ensure that agreed upon methodologies for data collection and analyses, and processes for greater transparency in all decision-making activities, are used.

Pursuant to *Neb. Rev. Stat. § 46-715(2)*,

[a]n integrated management plan shall include the following: (a) [c]lear goals and objectives with a purpose of sustaining a balance between water uses and water supplies so that the economic viability, social and environmental health, safety, and welfare of the river basin, subbasin, or reach can be achieved and maintained for both the near term and the long term; (b) a map clearly delineating the geographic area subject to the integrated management plan; (c) one or more of the ground water controls authorized for adoption by [NRDs] pursuant to section 46-739; (d) one or more of the surface water controls authorized for adoption by the [D]epartment pursuant to section 46-716; and (e) a plan to gather and evaluate data, information, and methodologies that could be used to implement sections 46-715 to 46-717, increase understanding of the surface water and hydrologically connected ground water system, and test the validity of the conclusions and information upon which the integrated management plan is based. The plan may also provide for utilization of any applicable incentive program authorized by law. (*Neb. Rev. Stat. § 46-715(2)*)

Pursuant to *Neb. Rev. Stat. § 46-715(3)*, an integrated management plan shall

provide a process for economic development opportunities and economic sustainability within a river basin, subbasin, or reach, [and] shall include clear and transparent procedures to track depletions and gains to streamflows resulting from new, retired, or other changes to uses within the river basin, subbasin, or reach. The procedures shall:

- (a) Utilize generally accepted methodologies based on the best available information, data, and science;
- (b) Include a generally accepted methodology to be utilized to estimate depletions and gains to streamflows, which methodology includes location, amount, and time regarding gains to streamflows as offsets to new uses;
- (c) Identify a means to be utilized so that new uses will not have more than a de minimis effect upon existing surface water users or ground water users;

- (d) Identify procedures the [District] and the [D]epartment will use to report, consult, and otherwise share information on new uses, changes in uses, or other activities affecting water use in the river basin, subbasin, or reach;
- (e) Identify, to the extent feasible, potential water available to mitigate new uses, including, but not limited to, water rights leases, interference agreements, augmentation projects, conjunctive use management, and use retirement;
- (f) Develop, to the extent feasible, an outline of plans after consultation with and an opportunity to provide input from irrigation districts, public power and irrigation districts, reclamation districts, municipalities, other political subdivisions, and other water users to make water available for offset to enhance and encourage economic development opportunities and economic sustainability in the river basin, subbasin, or reach; and
- (g) Clearly identify procedures that applicants for new uses shall take to apply for approval of a new water use and corresponding offset. *Neb. Rev. Stat. § 46-715(3)*

To accomplish the objectives set forth in *Neb. Rev. Stat. § 46-715(3)*, this VIMP provides a process that allows for utilization of the best available data and science to understand current supplies and uses, to estimate effects of new uses, and to explore the potential for new water uses. There are currently clear processes in place through the District's Rules and Regulations and the Department's Statutes and Rules and Regulations through which new applicants for uses may apply and seek approval.

Pursuant to *Neb. Rev. Stat. § 46-715(4)*,

[t]he ground water and surface water controls proposed for adoption in the integrated management plan [...] shall, [...] (a) be consistent with the goals and objectives of the plan, (b) be sufficient to ensure the state will remain in compliance with applicable state and federal laws, any applicable interstate water compact or decree, or other formal state contract or agreement pertaining to surface water or ground water use or supplies, and (c) protect the ground water users whose water wells are dependent on recharge from the river or stream involved and the surface water appropriators on such river or stream from streamflow depletion caused by surface water uses and ground water uses begun, in the case of a river basin, subbasin, or reach designated as over appropriated or preliminarily determined to be fully appropriated in accordance with section 46-713, after the date of such designation or preliminary determination. (*Neb. Rev. Stat. § 46-715(4)*)

After the final hearing under *Neb. Rev. Stat. § 46-718(1)-(2)*, the Department and the District agreed to adopt and implement the controls in the groundwater and surface water action items herein to the entire geographical area within the boundaries of the District. Figures 1 and 2 clearly delineate the VIMP Management Control Areas.

6 Stakeholder and Public Involvement

Neb. Rev. Stat. § 46-717(2) outlines the stakeholder process that is an integral part of integrated management plan development. It states the specific stakeholder interests that the District and the Department will consult during the preparation of the VIMP: irrigation districts, public power and irrigation districts, mutual irrigation and canal companies, municipalities, and other water users as deemed appropriate. The VIMP process relies on collaboration between the NRDs and the Department, in consultation with a diverse stakeholder group. As part of the VIMP development, the District and the Department reached out to a group of stakeholders that represented a wide array of water interests, including:

- Large Irrigators (irrigation districts, reclamation districts, public power and irrigation districts, mutual irrigation districts, and canal companies)
- Municipalities
- Industrial Users
- Individual Groundwater Irrigators
- Individual Surface Water Irrigators
- Agencies
- Agricultural Groups
- Other Large Water Users (for example, livestock)
- Rural Water Districts
- Well Drillers
- Recreation Groups
- Economic Development Organizations

From the initial list of identified stakeholders, the District and the Department convened a group that represented the following water interests:

- Municipalities
- Industrial Users
- Individual Groundwater Irrigators
- Individual Surface Water Irrigators
- Other Large Water Users (for example, livestock)
- Well Drillers
- Rural Water Districts

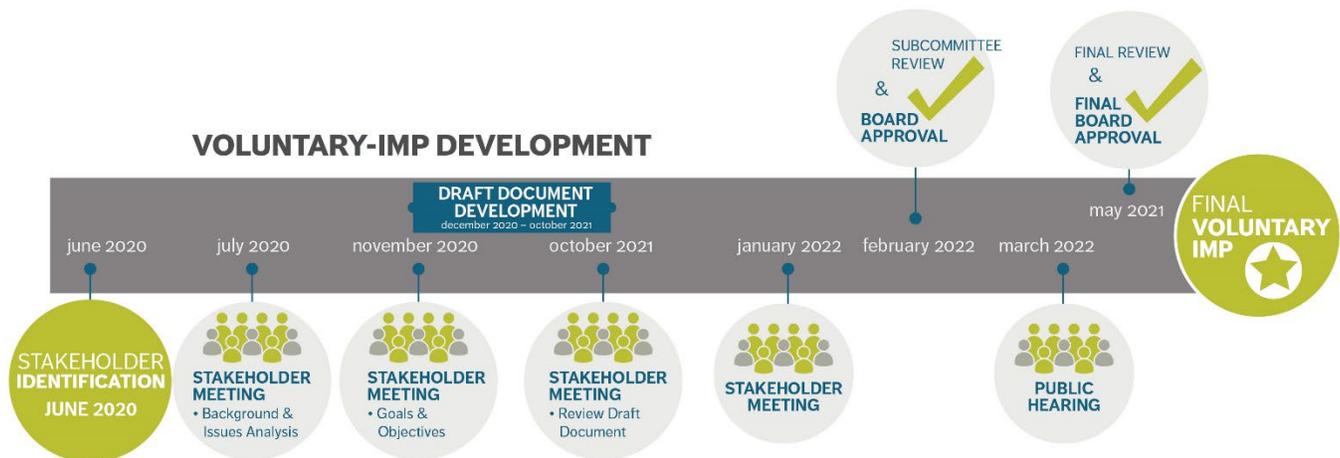
A complete list of representatives from the Stakeholder Advisory Committee (SAC) can be found in **Appendix C**. The stakeholders' input was invaluable in the development of the VIMP, and their time, insights, and efforts were greatly appreciated by both the District and the Department.

The SAC met four times between summer of 2020 and January of 2022 and worked together to identify and inform the District and Department of issues in the District and to develop goals, objectives, and action items of the VIMP. The District and the Department carefully evaluated and considered all recommendations and input received by the SAC. The final goals, objectives, and action items are

intended to serve as a path forward for effective, long-term management of groundwater and surface water throughout the District.

The final SAC meeting was held January 20, 2022. A public hearing was held **[TBD]**. At the hearing, the District and the Department received testimony on the draft VIMP and, following, considered the testimony in their decision to jointly adopt the VIMP.

Stakeholder and public engagement milestones are articulated in the following graphic.



7 Goals, Objectives, and Action Items

The **ultimate goal of the integrated management process is to protect existing investments and interests while facilitating economic growth and well-being across the District.** For the first phase/increment of the integrated management planning process for the District’s VIMP, the goals and objectives focused on understanding the water supplies and uses within the District, resolving potential conflicts between users, planning for future uses, and effectively communicating water resource information and management actions to the general public. These fundamental elements of integrated management planning allowed for tailoring Department and District actions in the following phases of the VIMP process and provided the framework for water management decisions going forward.

A **goal** is a desired outcome of actions taken in support of achieving the overall purpose of the VIMP. An **objective** is an achievable and measurable action taken to attain the desired result stated in the goal it supports. Goals provide a broad picture of intentions, whereas objectives define specific ways to achieve these goals. The objectives are then supported by detailed action items that will get the necessary work accomplished.



Goals and Objectives		Responsibility
Goal 1.0 Develop a better understanding of District’s water supplies and uses. This goal is focused on data collection and analysis of supplies and uses fundamental to effectively managing the District’s water resources. The first objective is focused on developing tools and using those tools to assess the interaction of surface and groundwater resources. The second objective is focused on collecting and maintaining database of water uses and supplies within the District.		
Objective 1.1 To conduct studies to identify and define areas of connection of ground/surface water sources within the District for the purposes of integrated management.		
Action Items	1.1.1 Define hydrologically connected areas	NeDNR
	1.1.2 District and Department partner on development of regional numeric groundwater model	Both
	1.1.3 Identify hydrologically distinct sub-areas for the purpose of integrated management. Hydrologically connected areas will be determined based on analysis using modeling tools	Both
	1.1.4 Further investigate the hydrologically connected areas of the Little Nemaha River Valley and uses within those areas that may impact the municipal supplies of Auburn, Nemaha, and Rural Water District #1,	Both
Objective 1.2 Collect and maintain database of water supplies and uses, utilizing the best available information, data, and science		
Action Items	1.2.1 AEM data collection and incorporation into District’s management/evaluation tools	NNRD
	1.2.2 Identify gaps in surface water gage data and supplement with new gages	Both
	1.2.3 Prioritize and develop monitoring protocols for key water uses not currently monitored (non-agricultural)	NNRD
	1.2.4 Collect and report surface water usage from annual voluntary reports	NeDNR
	1.2.5 Monitor changes and trends in supplies and uses within the District	Both
	1.2.6 Continue to assess active surface water appropriations within the District and update surface water permit database as necessary	NeDNR
Goal 2.0 Prevent or mitigate water-related conflicts within the District In areas where there is a hydrologic connection of surface water and groundwater resources, the potential exists for uses to affect one another. These conflicts may arise not only between surface water and groundwater users, but also between types of use: domestic, municipal, industrial, agricultural, environmental, etc. The Department and District will work cooperatively with water users to identify potential conflicts, evaluate those conflicts, and implement/enhance management approaches and solutions to address conflicts.		
Objective 2.1 Assess the potential impact of new surface water and groundwater uses on existing surface water and groundwater users within the District.		
Action Items	2.1.1 Maintain protocols using best available tools and info to assess potential effects of new uses on existing users	Both
	2.1.2 Utilize tools, such as groundwater models and hydrologic tools for the assessment	Both
Objective 2.2 Maintain rules and regulations to enhance equitable water use management.		



Goals and Objectives		Responsibility
Action Items	2.2.1 Maintain/enhance the District's and Department's process for applying for new use; process for evaluation/prioritizing/granting new uses	Both
	2.2.2 Periodically review rules and regs to reflect changes in conditions that occur during plan implementation	NNRD
Goal 3.0 Inform the public of the District's water resources and management efforts.		
Objective 3.1 Develop educational material on the water resources of the District.		
Action Items	3.1.1 Develop outreach material on unique ground water resources in District using recent AEM data.	NNRD
	3.1.2 Identify opportunities to coordinate with other agencies on outreach materials	Both
Objective 3.2 Maintain and expand public outreach activities.		
Action Items	3.2.1 Develop specific outreach program for engaging and educating constituents, especially prioritized target groups	Both
	3.2.2 Identify and participate in public outreach efforts (county fairs, newsletters, etc.) in support of outreach program	Both

8 Geographic Extent of Control Areas

In accordance with *Neb. Rev. Stat.* § 46-715(2), the geographic area of the District's VIMP includes all water users within the boundary of the District (see Figures 1 and 2). The District has designated a groundwater control area that covers the District; the area where groundwater controls described in Section 9 and implemented by the District as part of this VIMP apply (see Figure 1). Surface water controls apply district-wide, with specific controls applying in distinct areas as outlined in Figure 2. The District and Department recognize that, as new information and increased understanding becomes available through new data, models, and analyses, the defined control areas may change. Any changes to the VIMP control areas require agreement between the District and Department, in addition to a statutorily defined public notice period and public hearing.

Nemaha NRD Groundwater Control Area

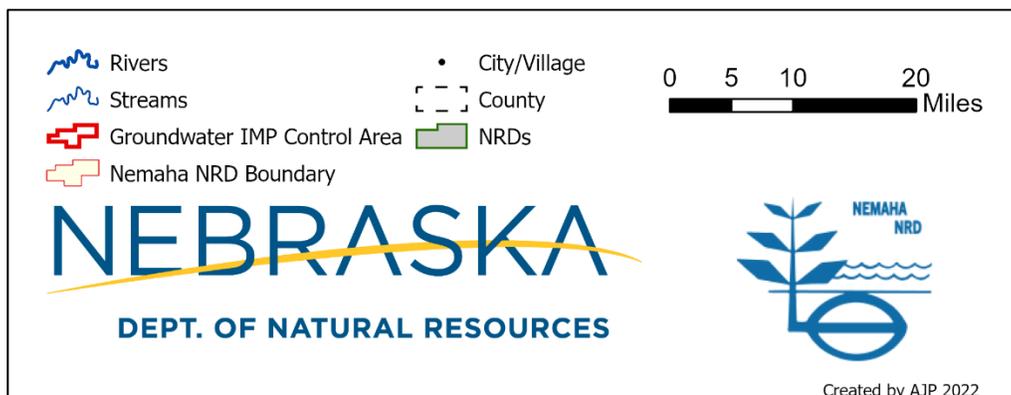
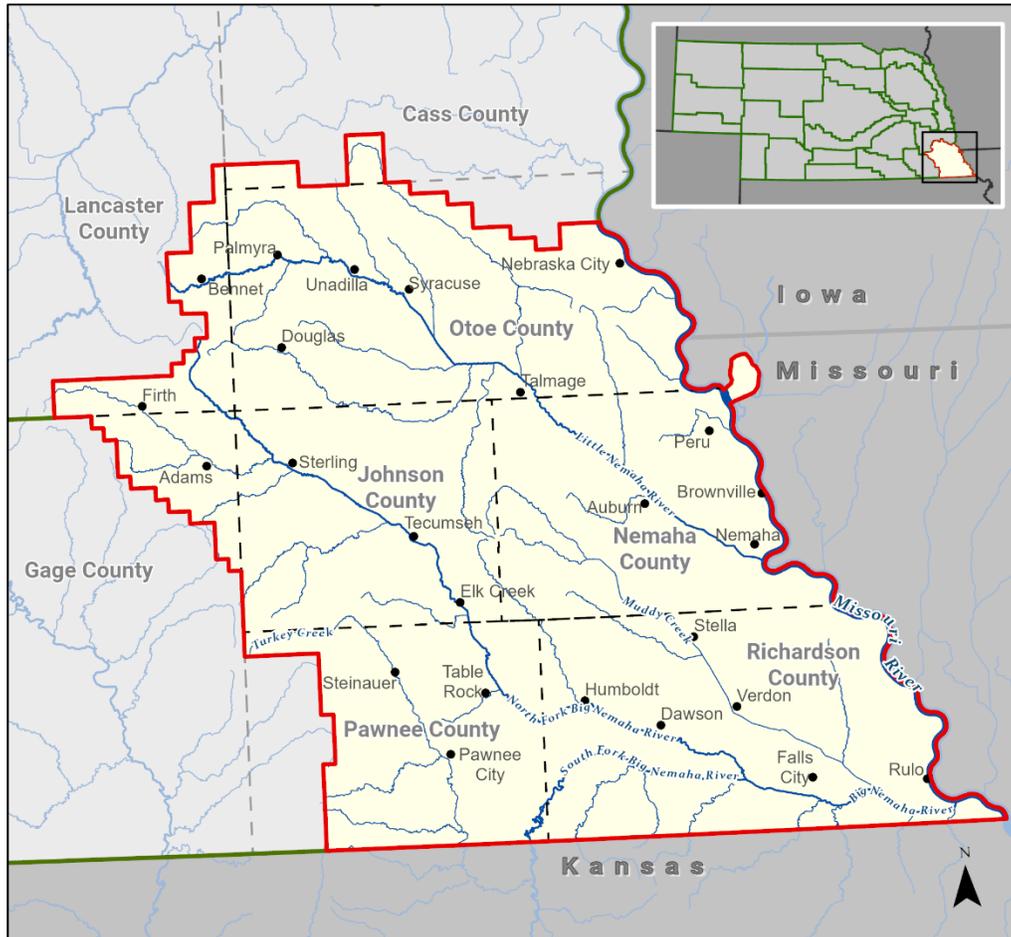


Figure 1: Groundwater control area for NNRD.

Nemaha NRD Surface Water Control Area

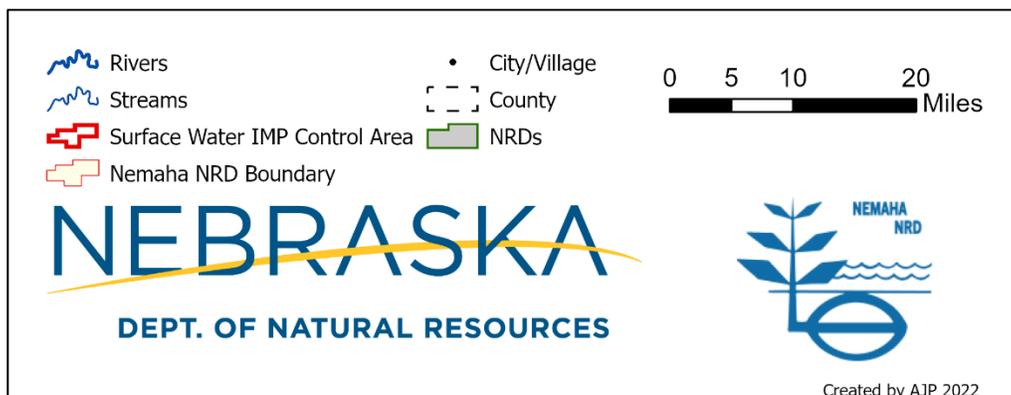
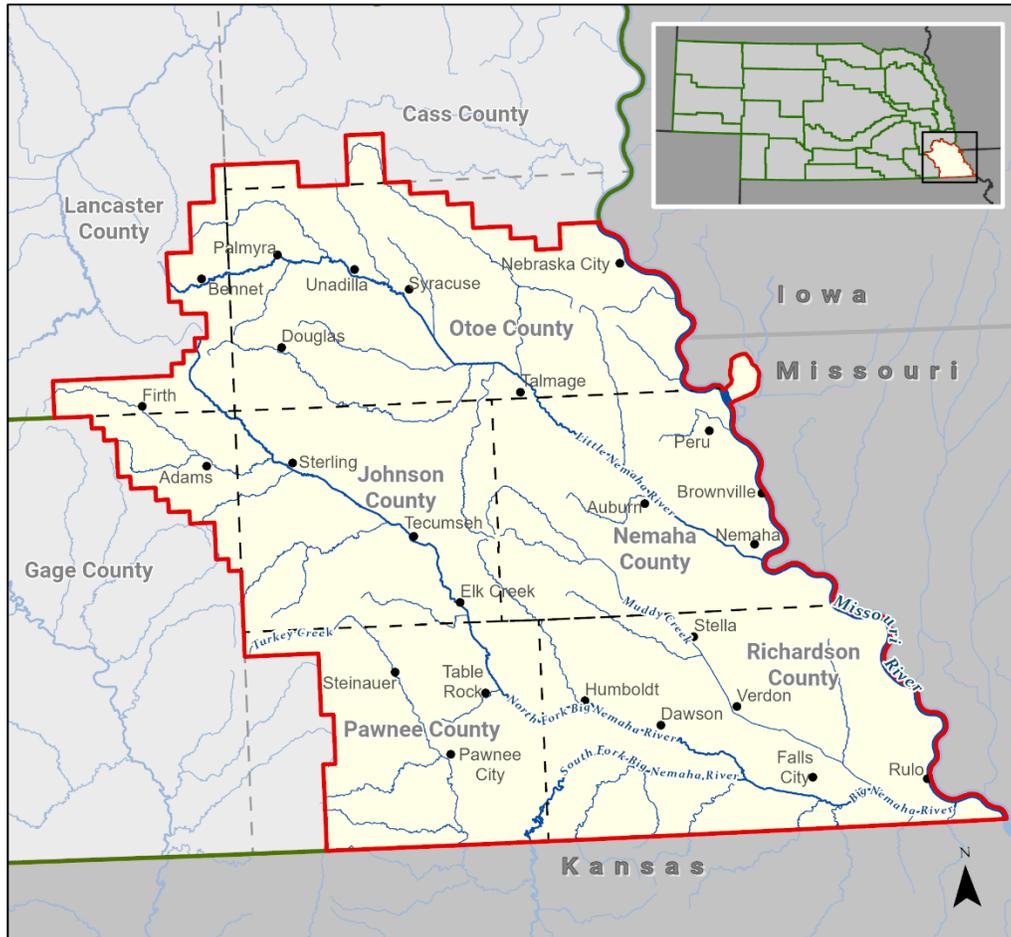


Figure 2: Surface water control area for NNRD.

9 Controls

This section describes the controls that the District and the Department have chosen to adopt as a part of this VIMP. These controls were selected from the allowed controls listed in *Neb. Rev. Stat.*

§§ 46-739 and 46-716 for groundwater and surface water controls, respectively. In accordance with *Neb. Rev. Stat.* § 46-715(4), the controls are consistent with the goals and objectives of the VIMP and will protect groundwater and surface water users.

9.1 Groundwater Controls

- 1. Require metering devices on all new wells.** The District will require the mandatory installation of water flow meters on all new high-capacity (greater than 50 gallons per minute) wells and/or modified irrigation wells and/or irrigation systems, commercial, industrial, or municipal water supply systems. This includes installations of a water flow meter prior to the addition of a helper well(s). The District will encourage the voluntary installation of water flow meters on all existing high capacity well systems. The District will collect data annually from installed meters, compile data and evaluate for anomalies or other inconsistencies that may indicate meter error, and use the meter data for assessing and reporting groundwater use within the District. Meter inconsistencies or errors will be reported to the well owner.

9.2 Surface Water Controls

- 1. Require measuring devices on any new high-capacity surface water irrigators.** The Department will require measuring devices on new surface water appropriations in excess of 50 gpm. The Department will continue to receive voluntary reporting of annual water usage from appropriators and will use that data to assess and report surface water usage within the District. Department staff conduct random periodic checks of appropriators to ensure their water usage is compliant with their respective surface water appropriation.
- 2. Continue to enforce the administration of surface water controls.** The Department will utilize existing records to monitor the use of surface water and to make sure that unauthorized irrigation is not occurring. The Department will also be proactive in initiating subsequent investigations whenever information available to the Department indicates the need for further inquiry as outlined by state statutes.

10 Incentive Programs

The District and the Department will evaluate cost-share incentive programs that promote water conservation practices and implement where feasible. Incentive programs may include any program authorized by state law or federal programs. Water users or landowners who voluntarily participate in such programs may be required to enter into and perform such agreements or covenants concerning the use of land or water as are necessary to produce the benefits for which the incentive program is established. Furthermore, the District and the Department will explore grant opportunities to supplement the annual budgeting process for funding action items for VIMP activities.

11 Funding Options

Additional funding sources may be needed to implement some of the action items listed in this VIMP. This section provides information on a variety of funding options that the District and the Department may use. The general criteria and applicability of each of the funding sources are presented. The funding sources presented here are not necessarily inclusive of all funding options available; information presented here is subject to change as funding sources may change their terms and criteria.

11.1 Federal Funding Options

U.S. Department of Agriculture, Natural Resource Conservation Service

- Agricultural Conservation Easement Program (ACEP). The ACEP provides financial and technical assistance to protect critical wetlands, agricultural lands, and grasslands through easements.
- Conservation Security Program (CSP). The CSP is available in select watersheds across the nation. This program is designed to reward farmers and ranchers who implement conservation on working lands and to encourage them to do more.
- Environmental Quality Incentives Program (EQIP). The EQIP offers technical assistance, cost sharing, and incentive payments available to agricultural producers to implement conservation practices that improve water quality, increase water conservation, and enhance grazing lands.
- Wildlife Habitat Incentives Program (WHIP). The WHIP provides technical and financial assistance to landowners and others to develop and improve wildlife habitat on private lands.

U.S. Department of the Interior, Bureau of Reclamation

WaterSMART Program. Grants are provided to irrigation districts, water districts, and other organizations that deliver water or power to cost share on projects that use water more efficiently. The projects should support water sustainability in the west.

11.2 State Funding Options

The Nebraska Environmental Trust.

The Nebraska Environmental Trust was established in 1992 to conserve, enhance, and restore the natural environments of Nebraska. The Trust especially seeks projects that involve public and private sector collaboration to implement high-quality, cost-effective projects.

Nebraska Department of Environment and Energy

Nonpoint Source Water Quality Grants (Section 319). Under Section 319 of the federal Clean Water Act, the federal government awards funds to the Nebraska Department of Environment and Energy to provide financial assistance for prevention and abatement of nonpoint source water pollution. This funding is granted to units of government, educational institutions, and nonprofit organizations for projects that facilitate implementation of the state Nonpoint Source Management Plan.



Nebraska Game and Parks Commission

Nebraska Wildlife Conservation Fund. This fund exists for conservation of nongame species, with particular focus on species determined to be threatened or endangered, ensuring their continued existence for scientific purposes and human enjoyment.

Nebraska Department of Natural Resources

- Water Well Decommissioning Fund. The objective of the Water Well Decommissioning Fund is to provide cost share assistance to encourage proper decommissioning of water wells in the state.
- Nebraska Soil and Water Conservation Fund. This fund provides state financial assistance to landowners for installation of approved soil and water conservation measures meant to improve water quality, conserve water, and control erosion and sedimentation.
- Small Watersheds Flood Control Fund. The purpose of this fund is to assist local sponsors with the acquisition of land rights for flood control projects. Local sponsors use the fund to acquire easements or fee title to tracts that are needed to implement a project.
- Natural Resources Water Quality Fund. This fund was created to provide state funds to NRDs for their water quality programs.
- Water Sustainability Fund. This fund acts to improve water quality and usage, achieve water management goals, evaluate flood control, and comply with existing interstate agreements and compacts.

11.3 Local Funding Options

It is the intent of the District to use qualified projects described in *Neb. Rev. Stat. § 2-3226.04* to provide river flow enhancement to achieve the goals and objectives of the District, and to achieve the goals and objectives of the Department under the Ground Water Management and Protection Act. The District may pay for such projects by using the occupation tax provided in *Neb. Rev. Stat. § 2-3226.05*, funds granted to the District by the state or federal government, or the levy authority authorized by *Neb. Rev. Stat. § 2-3225*.

Occupation Tax (Neb. Rev. Stat. § 2-3226.05). This authority allows the District to levy an occupation tax, not to exceed 10 dollars per irrigated acre, upon the activity of irrigation of agricultural lands on an annual basis. Statute requires a public meeting for the provision of public comments to be held if the District board moves to implement an occupation tax for a qualifying project.

12 Monitoring Plan

In accordance with *Neb. Rev. Stat. § 46-715(2)(e)*, the purpose of the monitoring plan is “to gather and evaluate data, information, and methodologies that could be used to implement sections 46-715 to 46-717, increase understanding of the surface water and hydrologically connected ground water system, and test the validity of the conclusions and information upon which the integrated management plan is based”. As such, the District and the Department have agreed to complete and report on the actions listed in the following subsection.



12.1 Tracking and Reporting Water Uses

To the extent feasible, the District is responsible for collecting, tracking, evaluating, and reporting on the number, location, amount, and timing of the following water use activities:

- (a) Static groundwater level measurements,
- (b) Available data related to the certification of groundwater uses and any changes to these certifications,
- (c) Data collected or reported to the District on public water system uses,
- (d) Irrigation water use data collected by the District, such as from metered high capacity well flow data,
- (e) Water well construction permits issued and denied,
- (f) Variances granted by the District that allow an action contrary to an existing rule or regulation, including the purpose, location, and length of time for which the variance is applicable, and the reasoning behind approval of the variance, and
- (g) Transfer permits granted by the District and/or the Department allowing the point of withdrawal, location of use, type of use, addition of a type of use, or location of certified irrigated acres to be altered, including all information provided with the application and used in the approval of the transfer.

The Department is responsible for collecting, tracking, evaluating, and reporting the following activities:

- (a) Irrigation surface water use,
- (b) Municipal and industrial surface water use,
- (c) New surface water appropriations granted (natural flow, storage, groundwater recharge, etc.),
- (d) New groundwater permits issued,
- (e) Variances granted by the Department that allow an action contrary to an existing rule or regulation, including the purpose, location, and length of time for which the variance is applicable, and the reasoning behind approval of the variance,
- (f) Transfer permits granted by the Department allowing the point of withdrawal, location of use, type of use, or addition of a type of use, including all information provided with the application and used in the approval of the transfer,
- (g) Stream gage measurements from Department-maintained gages,
- (h) Transfers/cancellations of surface water appropriations,
- (i) Surface water administrative actions taken, and
- (j) New data collected or model/study results (conservation measures, riparian ET, etc.).

The District and Department will meet each year to review the VIMP, with the first annual VIMP meeting to occur prior to December 31, 2023. The District and Department will jointly review and evaluate the reports and data gathered for accuracy and consistency, identify data anomalies and probable causes, and flag data and information that may require closer inspection and review. The District and Department will evaluate progress toward completion of identified action items and discuss anticipated activities in support of VIMP implementation for the coming year.

In addition, the District and the Department will work to update and use the Department's Integrated Network of Scientific Information and GeoHydrologic Tools (INSIGHT) system to compare annual water use data to historically reported water use data and information (if available), and perform analyses to determine the effects of new water uses on existing water users within the District.



13 Modifications to the Integrated Management Plan

The District and the Department will hold an annual review to evaluate progress on implementation of the VIMP. The SAC will be invited to participate in the review. The first annual review will be performed by December 31, 2023, and will be performed every year thereafter.

Action items undertaken by the District and the Department will be reviewed to determine if these items are fulfilling the goals and objectives of the VIMP. The District and the Department will jointly determine if amendments to the VIMP are necessary. Amendments to the goals and objectives of the VIMP will require an agreement by both parties, and may require reconvening of the SAC. If amendments to the VIMP are necessary, the District and the Department will hold a joint hearing and issue the pertinent orders to formally adopt the revised VIMP. While the VIMP is under the joint authority of the District and the Department, District Rules and Regulations are under the sole authority of the District and can only be changed with District Board approval and a public hearing.



APPENDIX A

Letters Initiating the Voluntary IMP Process



nemaha

NATURAL RESOURCES DISTRICT

62161 Hwy 136 • Tecumseh, Nebraska 68450
Telephone: (402) 335-3325 • Fax: (402) 335-3265
email: [nnrd@nemahanrd.org](mailto:nnrdsnemahanrd.org)

March 10, 2017

Gordon W. "Jeff" Fassett, Director
Nebraska Department of Natural Resources
P.O. Box 94676
Lincoln, Nebraska 68509-4676

Dear Jeff,

The Nemaha Natural Resources District (District) Board of Directors took action on March 9, 2017 to request the initiation of a voluntary integrated management plan for our district in accordance with Neb. Rev. Stat. 46-715(b). This letter will serve as notice of our intent to enter into the formal process for development of the voluntary Integrated Management Plan (IMP) with the Nebraska Department of Natural Resources (Department). We understand that this will be a joint planning effort between the Department and the District, with the objective of the plan to achieve and sustain a balance between water uses and water supplies for the long term in our district.

As a first step in the planning process, our District wishes to conduct data collection and analysis that will help to inform stakeholders, the District and Department, and thus will aid in overall voluntary IMP development. The District will coordinate our efforts with the Department's data collection and analysis for this area. It appears that the current data collection efforts by the Department and District will take 12 to 18 months to complete. Once that data is collected we expect to be in a better position to make decisions and establish a firm timeline for completing and implementing the IMP.

We understand the benefits of this proactive approach to jointly manage hydrologically connected water. Please advise us on who will be our Department contact to initiate the planning process. Thank you.

Sincerely,

Robert F. Hilske, General Manager

Cc: Amy Zoller, DNR Staff

RECEIVED

MAR 15 2017

DEPARTMENT OF
NATURAL RESOURCES



Pete Ricketts, Governor

March 20, 2017

Robert Hilske, General Manager
Nemaha NRD
62161 Hwy 136
Tecumseh, NE 68450

Dear Mr. Hilske:

The Department is pleased to receive your March 10, 2017 letter stating the Nemaha Natural Resources District's intent to jointly develop a voluntary Integrated Management Plan (IMP) with the Department per *Neb. Rev. Stat. § 46-715(1)(b)*. The Department appreciates this opportunity to work collaboratively with the District in proactive management of water resources.

We understand that it is District's desire to initially focus on coordinated data collection and analysis which will help to inform the IMP process. Although conducting new research is not required to prepare an IMP, we will work with the District within the limits of available funding to collect data and conduct analyses for the first phase of IMP development.

I have assigned Amy Zoller as the Department's Point of Contact for this important planning initiative. Please contact Amy at your earliest convenience to initiate activities related to development of our joint IMP. Amy can be reached by phone at (402) 471-0625, or by e-mail at amy.zoller@nebraska.gov.

We look forward to working with you on this important planning initiative, as well as furthering our relationship between the District and the Department.

Sincerely,

Gordon ("Jeff") Fassett, P.E.

cc: Dan Hodges, Board Chairman

Gordon W. "Jeff" Fassett, P.E., Director

Department of Natural Resources

301 Centennial Mall South OFFICE 402-471-2363
P.O. Box 94676 FAX 402-471-2900
Lincoln, Nebraska 68509

dnr.nebraska.gov



APPENDIX B
Glossary of Terms



Appendix B: Glossary of Terms

Aquifer: A geological formation or structure of permeable rock or unconsolidated materials that stores and/or transmits water, such as to wells and springs. Alluvial aquifers are comprised of unconsolidated materials, such as sand and gravel, while bedrock aquifers are comprised of rock.

Appropriation: A permit granted by the Department to use surface water for a beneficial use in a specific amount, purpose, and location. It is based on first-in-time, first-in-right.

Beneficial Use: That use by which water may be put to use to the benefit of humans or other species.

Certified Irrigated Acre: Lands identified and registered with the District greater than one acre which have water applied for irrigation.

Conjunctive Management: The coordinated and combined process that utilizes the connection between surface water and groundwater to maximize water use, while minimizing impacts to streamflow and groundwater levels in an effort to increase the overall water supply of a region and improve the reliability of that supply.

Consumptive Use: The amount of water that is consumed under appropriate and reasonable efficient practices to accomplish without waste the purposes for which the appropriation or other legally permitted use is lawfully made. The amount of water removed from available supplies without return to a water resources system.

Department: The Nebraska Department of Natural Resources, a state agency

District: The Nemaha Natural Resources District, a political subdivision of the State.

Groundwater: Water which occurs in, or moves, seeps, filters, or percolates through, ground under the surface of the land, and shall include groundwater which becomes commingled with waters from surface sources.

Groundwater Management Plan: The District's plan that identifies the water quantity and quality characteristics, supplies, uses, data collection methods, management objectives, and management areas of groundwater supplies within the District.

Hydrologically Connected: An area where groundwater and surface water are interconnected and withdrawals from one can affect the other. To determine if an area is hydrologically connected (as defined in Department Rules), one calculates if a well pumped for 50 years will deplete the river or a base flow tributary by at least 10 percent of the amount pumped in the 50-year period (the 10/50 area, from Title 457 Nebraska Administrative Code Ch. 24 001.02). Describes a geographic area designated by the Department where the existing amount of groundwater and surface water each has significant influence on the other, and where appropriate regulations exist.

INSIGHT: Developed and maintained by the Department, INSIGHT stands for an Integrated Network of Scientific Information and GeoHydrologic Tools. The purpose of INSIGHT is to provide an annual



snapshot of water conditions across the state. Hydrologic data are consolidated from several different sources, including the Department, U.S. Geological Survey, U.S. Bureau of Reclamation, and local NRDs, and are presented in charts for the following categories: water supplies, water demands, nature and extent of use, and water balance. Data are presented in a consistent format and become more local as the user drills down from the statewide level to the basin-wide and subbasin levels using the database interface.

Irrigation: The artificial application of water to promote the growth of vegetation.

Monitoring Well: A well which is used to withdraw water for purposes of testing for contaminants and/or which is used to check the level of groundwater.

Recharge: A hydrologic process where water moves downward from surface water to groundwater, both naturally through the hydrologic cycle or through intentional practices.

River Basin: The land area that is drained by a river and its tributaries.

Stakeholder Advisory Committee (SAC): Representatives from various interest groups and professional fields who provide consultation on aspects of the Integrated Management Plan.

Surface Water: Water that is on the Earth's surface, such as a stream, river, lake, or reservoir unless such water body has been designated in rule or statute as something else (for example, a water storage lagoon or sand pit lake).

Water Use: The legally accepted use of a groundwater well or surface water appropriation.

Water Quality: The measure of physical, chemical and biological characteristics of water.

Watershed: The area of land where all of the water that drains under or off of it goes to the same outlet.



APPENDIX C
Stakeholder Advisory Committee



Appendix C: Stakeholder Advisory Committee

Invited Stakeholders:

Organization	Name	Title
Nemaha NRD Board of Directors	Mike McDonald	
	Douglas A & Victoria A Damme	
	Michael D & Jodi R Damme	
	Dale & Debbie Damme	
	James R. Gerdes	
	Jay Gerdes	
	Craig A & Lori J Behrends	
	John Hawley	
	Scott Teten	
L & R Farms Inc	Michael Sandfort	
Rieschick Drilling Company	Andrew Rieschick	
E Energy Adams LLC	Joe Oswald	
Kimmel Orchard	Shayna Murrell	
Table Creek Golf Course		
Woodland Hills Golf Course		
Village of Adams	Chris Schiebur	Mayor/Mgr.
Village of Adams	Kendra Jantzen	Clerk
Village of Adams	Darwin Buss	Operator
City of Auburn-	Dave Hunter	Mayor/Mgr.
City of Auburn	Ken Swanson	Operator
Village of Brock	Sam Smith	Mayor/Mgr.
Village of Brock	Corol Woerlen	Clerk
Village of Brock	Lyle Haneline	Operator
Village of Burr	Don Schmidt	Mayor/Mgr.
Village of Burr	Jeanne Speckmann	Clerk
Village of Burr	Jason Brandt	Operator
Village of Cook	Travis Effken	Mayor/Mgr.
Village of Cook	Jeanne Speckmann	Clerk
Village of Cook	Jason Brandt	Operator
Village of Dawson	Charlie Laux	Mayor/Mgr.
Village of Dawson	Jan Richardson	Clerk
Village of Dawson	Ken Kuhlmann	Operator
Village of Dunbar	Mike Doty	Mayor/Mgr.
Village of Dunbar	Patricia Petersen	Clerk
Village of Dunbar	Clyde Draeger	Operator
Village of Elk Creek	Greg Bates	Mayor/Mgr.
Village of Elk Creek	Arlan Beethe	Clerk
Village of Elk Creek	Glenn Plager	Operator
City of Falls City	Ray Luhring	Mayor/Mgr.
City of Falls City	Gary Jorn	Clerk
City of Falls City	David Aitken	Operator



Organization	Name	Title
Village of Firth	David Hobelman	Mayor/Mgr.
Village of Firth	Jill Hoefler	Clerk
Village of Firth	David Hansmeyer	Operator
City of Humboldt	Bob Mendenhall	Mayor/Mgr.
City of Humboldt	Connie Usher	Clerk
City of Humboldt	Ken Kuhlmann	Operator
Johnson County Rural Water District #1	Leroy Caspers	Mayor/Mgr.
Johnson County Rural Water District #1	Bob Curry	Clerk
Johnson County Rural Water District #1	Jeff Little	Operator
Village of Johnson	Lonnie Swanson	Mayor/Mgr.
Village of Johnson	Rachel Brook	Clerk
Village of Johnson	Ken Swanson	Operator
Village of Julian	Pat Hodges	Mayor/Mgr.
Village of Julian	Carol Woerlen	Clerk
Village of Julian	Ken Burgert	Operator
Lancaster Co. RWD #1 (Bennet)	Jordon Bang	Mayor/Mgr.
Lancaster Co. RWD #1 (Bennet)	Dan Bartels	Operator
City of Nebraska City	Bryan Bequette	Mayor/Mgr.
City of Nebraska City	Randy Dunster	Clerk
City of Nebraska City	Mark Lant	Operator
City of Nebraska City	Marty Stovall	Construction/Facility Manager
Nebraska City Utilities	Jeff Kohrs	General Manager
Nemaha County Rural Water District #1	Jim Biere	Mayor/Mgr.
Nemaha County Rural Water District #1	Teresa Walker	Clerk
Nemaha County Rural Water District #1	Quentin Kieler	Operator
Nemaha County Rural Water District #2	Lee Moerer	Mayor/Mgr.
Nemaha County Rural Water District #2	Pam Alexander	Clerk
Nemaha County Rural Water District #2	Josh Behrends	Operator
Village of Nemaha	Jeannie Montanelli	Mayor/Mgr.
Village of Nemaha	Janice Boden	Clerk
Village of Nemaha	Ken Swanson	Operator
Otoe County Rural Water District #3	Scott Bruns	Mayor/Mgr.
Otoe County Rural Water District #3	Brian Swanson	Clerk



Organization	Name	Title
Otoe County Rural Water District #3	Scott Bruns	Operator
Village of Panama	Jim Craig	Mayor/Mgr.
Village of Panama	Pam Pickard	Clerk
Village of Panama	Rita Shea	Operator
City of Pawnee City	Charlie Hatfield	Mayor/Mgr.
City of Pawnee City	Tamela Curtis	Clerk
City of Pawnee City	Spencer Cumley	Operator
Pawnee County Rural Water District #1	Marc Hunzeker	Mayor/Mgr.
Pawnee County Rural Water District #1	Denise Wolsleben	Operator
City of Peru	David Pease	Mayor/Mgr.
City of Peru	Dough Phillips	Operator
Richardson County Rural Water District #1	Ben Steffen	Mayor/Mgr.
Richardson County Rural Water District #1	Mary White	Clerk
Richardson County Rural Water District #1	Doug Phillips	Operator
Village of Shubert	Gary Hayes	Mayor/Mgr.
Village of Shubert	Jennifer Buchner	Clerk
Village of Shubert	Tracy Milke	Operator
Village of Stella	Jerry Joy	Mayor/Mgr.
Village of Stella	Vicky Owings	Clerk
Village of Stella	Tracy Milke	Operator
Village of Sterling	John Keizer	Mayor/Mgr.
Village of Sterling	Samantha Gordan	Clerk
Village of Sterling	Spencer Pagel	Operator
Village of Syracuse	KC Ortiz	Mayor/Mgr.
Village of Syracuse	Kelly Farmer	Clerk
Village of Syracuse	Jeff Vogt	Operator
Village of Table Rock	Ben Laun	Mayor/Mgr.
Village of Table Rock	Stefanie Rauner	Clerk
Village of Table Rock	John Ticnor	Operator
Village of Table Rock	Ken Edwards	
Village of Talmage	Judy Eichenberger	Mayor/Mgr.
Village of Talmage	Rachel Brook	Clerk
Village of Talmage	Jeremy Griepenstroh	Operator
City of Tecumseh	Jesse Groff	Mayor/Mgr.
City of Tecumseh	Janelle Moran	Clerk
City of Tecumseh	Tracy Milke	Operator
Frontier Co-op	Jeremy Wilhelm	CEO
Village of Verdon	Denise Koso	Mayor/Mgr.



Stakeholder Meeting #1 Attendees:

Organization	Name	Title
Nemaha NRD Board of Directors	Mike McDonald	
	Jay Gerdes	
	Craig A & Lori J Behrends	
Rieschick Drilling Company	Andrew Rieschick	
E Energy Adams LLC	Joe Oswalt	
Auburn Board of Public Works	Dave Hunter	General Manager
City of Auburn	Ken Swanson	Operator
Village of Elk Creek	Glenn Plager	Operator
City of Falls City	Gary Jorn	Clerk
City of Falls City	David Aitken	Operator
Village of Firth	David Hobelman	Mayor/Mgr.
Village of Firth	Jill Hoefler	Clerk
City of Nebraska City	Marty Stovall	Construction/Facility Manager
Nebraska City Utilities	Jeff Kohrs	General Manager
Nemaha County Rural Water District #2	Pam Alexander	Clerk
Village of Nemaha	Janice Boden	Clerk
City of Pawnee City	Tamela Curtis	Clerk
Village of Stella	Jerry Joy	Mayor/Mgr.
Village of Sterling	John Keizer	Mayor/Mgr.
Village of Syracuse	Jeff Vogt	Operator



Stakeholder Meeting #2 Attendees:

Organization	Name	Title
Nemaha NRD Board of Directors	Mike McDonald	
E Energy Adams LLC	Joe Oswald	
Auburn Board of Public Works	Dave Hunter	General Manager
City of Falls City	Gary Jorn	Clerk
Village of Firth	David Hobelman	Mayor/Mgr.
Village of Firth	Jill Hoefler	Clerk
Village of Julian	Ken Burgert	Operator
City of Nebraska City	Marty Stovall	Construction/Facility Manager
Nebraska City Utilities	Jeff Kohrs	General Manager
City of Pawnee City	Tamela Curtis	Clerk
Village of Syracuse	Jeff Vogt	Operator
Frontier Co-op	Jeremy Wilhelm	CEO
	Ken Morrison	



Stakeholder Meeting #3 Attendees:

Organization	Name	Title
Auburn Board of Public Works	Dave Hunter	General Manager
E Energy Adams LLC	Joe Oswalt	
City of Cook	Amber Beard	



Stakeholder Meeting #4 Attendees:

Organization	Name	Title
Auburn Board of Public Works	Dave Hunter	General Manager
E Energy Adams LLC	Joe Oswalt	
City of Cook	Amber Beard	
	Keith Morrison	
Nemaha NRD Board of Directors	Mike McDonald	
	Jon Mohr	
Nebraska City Utilities	Jeff Kohrs	General Manager
	Jeremiah Schutz	
City of Nebraska City	Marty Stovall	Construction/Facility Manager
Nemaha County Rural Water District #2	Pam Alexander	Clerk
Village of Table Rock	Ken Edwards	
Village of Sterling	John Keizer	Mayor/Mgr.