

**Upper Loup  
Natural Resources District  
Voluntary Integrated Management Plan**

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## 1.0 INTRODUCTION

The citizens of the Upper Loup Natural Resources District (Upper Loup NRD) depend on abundant, clean water in their homes for domestic use, on their farms for agricultural production, and for their industries to maintain economic viability. Wildlife that live and migrate through the Upper Loup NRD depend on clean water for sustenance and habitat. Furthermore, human inhabitants of the Upper Loup NRD use water in rivers and lakes for recreation including fishing, hunting, boating, and swimming.

The Upper Loup NRD is located in the northwestern half of the Loup Basin. The Loup Basin is approximately 14,200 square miles in area. The topography of the Loup Basin across the Upper Loup NRD predominately consists of sand hills stabilized by grass cover. Inhabitants of the Upper Loup NRD have relied on the abundant water resources of the area; over time, their water use has increased. In continuing with proactive management of natural resources, the Upper Loup NRD and citizen stakeholders within the area determined that a water use plan needed to be developed to provide a framework for how to wisely manage water resources so they are available now and in the future.

For these reasons, water management planning was voluntarily initiated by the Upper Loup NRD in collaboration with the Nebraska Department of Natural Resources (NDNR). Groundwater and surface water have been managed independently in the past. However, this plan, called an Integrated Management Plan (IMP), is a water planning document that provides a framework for how the Upper Loup NRD and the NDNR will work collaboratively to manage groundwater and surface water within the Upper Loup NRD. The IMP was initiated voluntarily by the Upper Loup NRD to ensure that water use is sustainable into the future.

Not only did the Upper Loup NRD volunteer to initiate an IMP, but local stakeholders and other members of the public also volunteered to represent the wide array of water interests and provide invaluable input during the planning process. These stakeholders were invited to share the insight and discussions necessary to not only develop a plan, but also to carry it forward into the future. The Upper Loup NRD and the NDNR are grateful for their time and energy in helping put this plan together. A list of the stakeholder participants and the meeting schedule is included in Appendix B.

## 1.1 BACKGROUND AND PURPOSE

On April 15, 2004, Nebraska Legislative Bill (LB) 962 was approved, which set the stage for the NDNR and the NRDs to collaborate on the management of groundwater and surface water as a single, integrated resource. LB 962 requires the development of an IMP if a river basin, subbasin, or reach is determined to be fully appropriated by the NDNR. Each year, because of this legislation, NDNR produces a report called the "Annual Evaluation of Availability of Hydrologically Connected Water Supplies." This annual report provides the results of NDNR's evaluation of the expected

long-term availability of hydrologically connected water supplies for both existing and new surface water uses and existing and new groundwater uses in each of the state's river basins.

On December 16, 2008, NDNR made a preliminary determination that the Lower Platte River Basin, which includes the Upper Loup NRD, was fully appropriated. A basin is considered fully appropriated when certain conditions for hydrologically connected surface water and groundwater are met under Neb. Rev. Stat. §46-713(3). The statute states that a basin is fully appropriated when current uses of hydrologically connected surface water and groundwater will, in the reasonably foreseeable future, cause:

- 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;
- 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; and
- 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.

The preliminarily determined area included nearly the entire Upper Loup, Lower Loup, and Upper Elkhorn NRDs, and portions of the Lower Platte North, Lower Platte South, Papio-Missouri River, and Lower Elkhorn NRDs. Prior to making a final determination, NDNR held a public hearing in early 2009. Through this hearing, new information was made available that resulted in NDNR reversing the preliminary determination during the Spring of 2009 (Neb. Rev. Stat. §46-714 (12)).

In 2010, Nebraska Legislative Bill (LB) 764 was passed allowing Natural Resource Districts and the Department to work together in a voluntary integrated management planning process. Then, in 2014, the Board of Directors of the Upper Loup NRD adopted a motion to inform NDNR that the Upper Loup NRD intended to develop a voluntary IMP and requested the NDNR's participation. The NDNR acknowledged the Upper Loup NRD's request and the development of this plan began.

This IMP was developed jointly by the Upper Loup NRD and NDNR with the express purpose of achieving and sustaining a balance between water uses and water supplies for the near and long term. The IMP provides the detailed goals, objectives, and action items, both regulatory and non-regulatory, that were developed with stakeholder involvement. This IMP was developed with the understanding that the Upper Loup NRD is not within a fully appropriated river basin; should that change, the IMP will be reevaluated. Additionally, the Upper Loup NRD is not subject to any interstate compact or decree or any other formal contract or agreement pertaining to surface water or groundwater use or supplies and so, there was no consideration of this in the IMP.

As this IMP is being entered into on a voluntary basis, the IMP area is not currently fully appropriated. The methodology utilized by NDNR to assess the available supplies and uses in the Annual Report will be used to track depletions and gains to streamflow from changes in availability and use. Current supplies are greater than the current level of use and therefore methods to identify water supplies to be used as offsets or for mitigation purposes or an identification of minimum effects are not included in this IMP. Additionally, the IMP area is not subject to any interstate compact or decree, or any other formal contract or agreement pertaining to surface water or groundwater use or supplies.

## **1.2 AUTHORITY**

As authorized in Neb. Rev. Stat. § 46-715(1)(b), “a natural resources district encompassing a river basin, subbasin, or reach that has not been designated as overappropriated or has not been finally determined to be fully appropriated may, jointly with the department, develop an integrated management plan for such river basin, subbasin, or reach located within the district.” As part of the requirements, the Upper Loup NRD notified the NDNR of its intention to develop an IMP. A copy of the letters of intent is included in Appendix A. NDNR acknowledged the request, and this IMP was developed and adopted according to Neb. Rev. Stat. §46-715 to 46-717 and subsections (1) and (2) of section 46-718.

## **1.3 INTEGRATED MANAGEMENT PLANNING PROCESS**

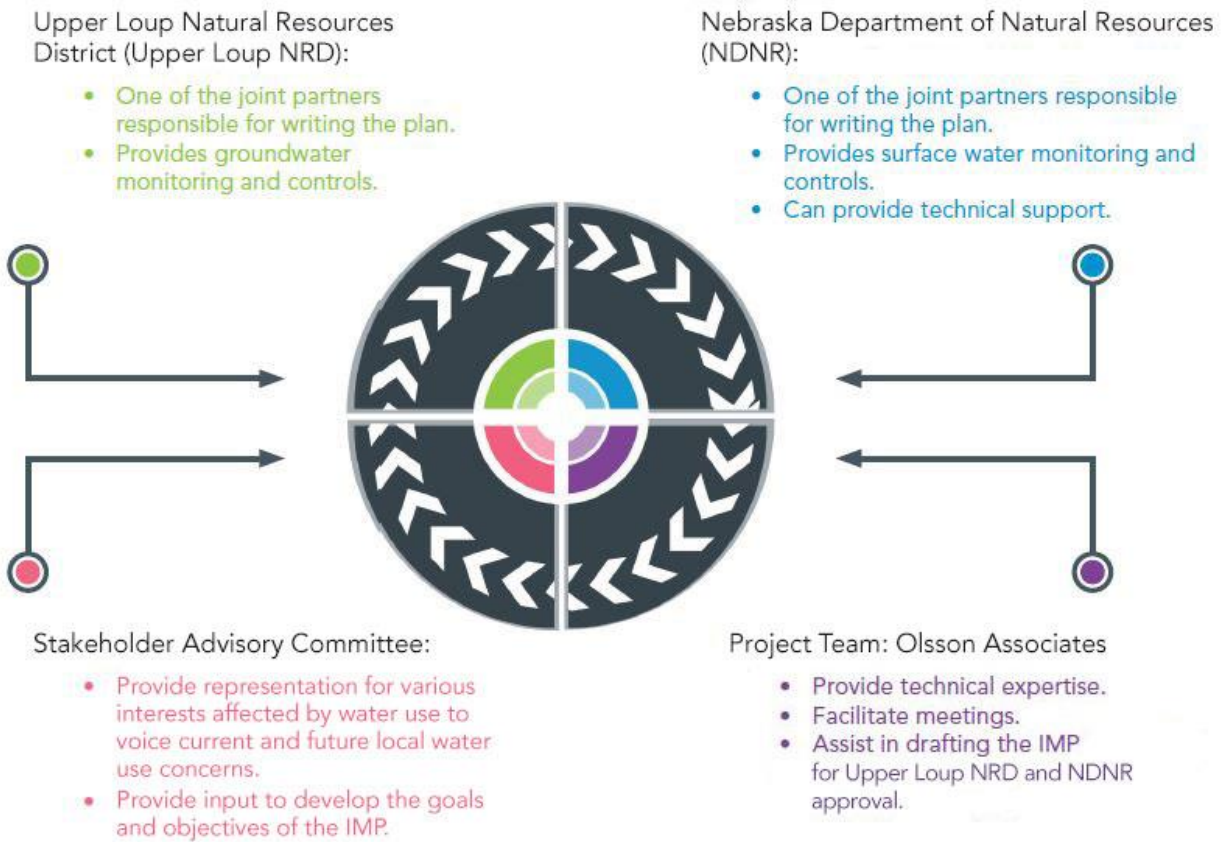
The IMP planning process is an adaptive management approach to managing Nebraska’s hydrologically connected groundwater and surface water. It allows for an integrated inventory of groundwater and surface water supplies and uses; increases collaboration between the entities that manage water resources; enhances public awareness of water resources issues; and increases opportunities to provide input on short- and long-term management of the water resources. An IMP works toward attaining or maintaining a balance between water uses and water supplies. In accordance with Section 7.0 Monitoring Plan and Proposed Studies, this IMP may be altered as the affected area or subarea changes and/or more data becomes available to accommodate changing circumstances including hydrology, economics, water demands, and water supplies.

In accordance with Neb. Rev. Stat. §46-717(2), this IMP was developed collaboratively by the Upper Loup NRD and the NDNR, in consultation with the Upper Loup Stakeholder Advisory Committee. The Stakeholder Advisory Committee consisted of several water users representing the following general interest groups: agriculture industry, groundwater irrigators, surface water irrigators, and water recreation (see Appendix B for a list of participants).

The Stakeholder Advisory Committee met three times throughout 2015 (Appendix B). These meetings helped create and develop the goals, objectives, and action items of this IMP. On March 10<sup>th</sup>, 2016, the Draft Voluntary IMP was made available to the public for review. On April 14<sup>th</sup>, 2016, a public hearing was held and public testimony on the IMP was taken. The NDNR and Upper

Loup NRD reached joint agreement on the IMP on April 14<sup>th</sup>, 2016. The effective date of the IMP is July 15<sup>th</sup>, 2016.

## Who is participating?



### Participants and IMP Development Roles and Responsibilities

## 2.0 MAP AND DESCRIPTION OF THE INTEGRATED MANAGEMENT PLAN AREA

As part of the process used to develop this IMP, multiple data sources were analyzed. These data sources were used to best report the land use, climate, groundwater, and surface water resources of the Upper Loup NRD. Two maps were generated to better illustrate these data sources (discussed below).

## 2.1 MAP OF THE INTEGRATED MANAGEMENT PLAN AREA

The Upper Loup NRD is located in central Nebraska and includes portions of Cherry, Brown, Grant, Hooker, Thomas, Blaine, McPherson, and Logan counties (Figure 1). The Upper Loup NRD is bisected by multiple rivers including the Calamus, North Loup, Middle Loup, Dismal, and South Loup rivers. The Upper Loup NRD is almost completely located within the northwestern half of the Loup Basin.

Figure 1 illustrates the boundary of the area included in this IMP. Also illustrated in Figure 1 are the areas within the Upper Loup NRD where groundwater and surface water are hydrologically connected. As defined by NDNR, a hydrologically connected area is an area where 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). Hydrologically connected areas are published by the NDNR in the “Annual Evaluation of Availability of Hydrologically Connected Water Supplies” report.

## 2.2 LAND USE

The Upper Loup NRD covers approximately 4,299,461 acres. Current land uses in the Upper Loup NRD, as described by the Center for Advanced Land Management Information Technologies (CALMIT 2005), consist of grasslands used as range and pasture (91 percent), open water and wetlands (5 percent), other agricultural and barren land (2 percent), forested areas (1 percent), irrigated crops (1 percent), dryland crops (less than 1 percent), and urbanized areas and roads (less than 1 percent). The most prominent irrigated crops are alfalfa (45 percent of all the irrigated crops in the Upper Loup NRD) and corn (40 percent of all the irrigated crops in the Upper Loup NRD).

## 2.3 LOCAL HYDROLOGY

The amount of average annual precipitation varies across the Upper Loup NRD and increases from west to east. In the semiarid western part of the Upper Loup NRD, the average annual precipitation is about 17 inches, and in the subhumid eastern part of the Upper Loup NRD, the average annual precipitation is about 22 inches. About 50 percent of the annual precipitation falls during the months of May, June, and July. However, local precipitation



North Loup River at Brewster

amounts can vary significantly within the growing season and from year to year. The topography and soil characteristics allow for the precipitation to recharge the groundwater reservoir. Wetlands are common across the Upper Loup NRD, and are primarily associated with riparian areas.

The North Loup River, Middle Loup River, South Loup River, Goose Creek, Calamus River, and Dismal River all originate within the Upper Loup NRD. Streamflow within the Upper Loup NRD is mostly supplied by groundwater. Although most surface water outlets originating within the Upper Loup NRD leaves the Upper Loup NRD unused, some water is diverted into canals for irrigation projects [Upper Loup NRD Groundwater Management Plan (GMP), 1994]. For instance, streamflow from the Middle Loup River is diverted into the Sargent Canal at the Milburn diversion dam and is stored in the Sherman Reservoir. Flow of the North Loup River, Goose Creek, Calamus River, and South Loup River are entirely committed to senior water rights for the purpose of irrigation or hydroelectric power. The Middle Loup River and its tributaries are seasonally entirely committed to senior water rights (GMP, 1994).

## **2.4 GROUNDWATER**

The principal groundwater reservoir of the Upper Loup NRD consists of Quaternary sand and gravelly sand deposits, Pliocene sands and gravels, (Miocene) Ogallala Group sand, gravelly sand, sandstone deposits, and (Miocene-Oligocene) Arikaree Formation sands (GMP, 1994). These units are collectively referred to as the High Plains Aquifer. Total thicknesses of the High Plains Aquifer range from about 350 feet to nearly 1,000 feet, with an average thickness of more than 500 feet. The Upper Loup NRD GMP (1994) defined the base of the principal groundwater reservoir to be the base of the Ogallala and/or Arikaree Formation. The principal groundwater reservoir is underlain by the White River Group and is considered a secondary aquifer in the area. The White River Group consists of thick deposits of fine grained sediments including silt, siltstones, and clays (GMP, 1994).

## **3.0 GOALS AND OBJECTIVES**

The purpose of an IMP is to achieve and sustain a balance between water uses and water supplies within the Upper Loup NRD for the long term. The Stakeholder Advisory Committee, working with the Upper Loup NRD and NDNR, developed a set of goals, objectives, and action items for the IMP that will facilitate sustainable water management in the NRD. Before work began on developing the goals and objectives, the Stakeholder Advisory Committee agreed upon the following definitions of goals, objectives, and action items.

- Goals are general statements of broad direction or intent with no time limit. Goals set the stage for meaningful objectives.
- Objectives define the measurable results that a group seeks to accomplish. Generally, an objective is a statement of what will be accomplished.



- Actions items are the specific tasks that the Upper Loup NRD and NDNR will undertake to achieve the goals and objectives.

Three goals and corresponding objectives were developed by the Upper Loup NRD and NDNR, in consultation with the Stakeholder Advisory Committee. Generally, these goals and objectives strive to implement water policies that enable sustainable water management, monitor changes in water supply, and develop educational programs that promote conservation and best management practices.

The three goals developed for the IMP are to be implemented simultaneously. As new information is gathered about the water supply and water demands in the Upper Loup NRD, the goals and objectives may be modified; as discussed in Section 8.0. The goals and objectives listed below are supported by detailed action items, as presented in Section 4.0. Action items will be implemented over several years as staff and financial resources are made available for implementation. More information on how progress made toward the goals is measured is provided in Section 7.0.

**GOAL 1 – Maintain water supply and protect to the extent possible existing uses, the local economy, social and environmental health and safety, and recreational uses while allowing for growth and changes in use.**

Objectives

- 1.1. Assess the potential impact of new surface water and groundwater uses on existing surface water and groundwater users within the Upper Loup NRD.
- 1.2. Determine allowable levels of water development for the Upper Loup NRD, and by subarea when designated.
- 1.3. Identify potential water supply enhancement and conjunctive management projects and activities.
- 1.4. Minimize invasive vegetation encroachment in the river channels and associated riparian areas.
- 1.5. Utilize existing policies and authorities of the Upper Loup NRD to address water quantity issues.



Upper Loup NRD Employee and Soil Moisture Sensor

**GOAL 2 – To develop and implement information gathering and monitoring processes of hydrological and other related data to assess water resources and uses within the Upper Loup NRD using the best available information, data and science.**

Objectives

- 2.1 Conduct data collection and analyses of water supplies and demands.
- 2.2 Monitor and track changes in water supply.

**GOAL 3 – To develop, expand, and provide educational opportunities and outreach materials about hydrologically connected surface water and groundwater and water conservation.**

Objectives

- 3.1. Continue to promote water use education at all levels with the goal of increasing general awareness of water availability issues, benefits of implementing water conservation practices, and the influence of water quantity on water quality.
- 3.2. Continue collaboration to share information with other organizations and agencies to conserve resources and prevent duplication of work.
- 3.3. Review current and research new best water conservation practices.

## 4.0 ACTION ITEMS

Action items were developed by the Upper Loup NRD and the NDNR with input from the Upper Loup NRD Stakeholder Advisory Committee. Action items provide a list of the direct tasks to be performed that are necessary to implement the plan. Action items help accomplish the objectives and move toward completion of the goals. Groundwater and surface water controls are action items which are considered regulatory. Action items listed by goal and objective, unless otherwise stated, are considered non-regulatory.

### 4.1 GROUNDWATER AND SURFACE WATER CONTROLS

There are two specific action items that were written in order to comply with Neb. Rev. Stat. §46-715 (2), as the regulatory groundwater and surface water action items (or controls). These two action items are presented first with further description as to their applicability across the Upper Loup NRD. In accordance with the aforementioned statute, the regulatory action items (or controls) must:

- be consistent with the goals and objectives of the plan, and
- be sufficient to ensure that the Upper Loup NRD will remain in compliance with applicable the State and federal laws and with any applicable interstate water compact or decree or other formal State contract or agreement pertaining to surface water or groundwater use or supplies.

### **Groundwater Action Item (Control)**

1. Establish a limit on the expansion of groundwater-irrigated acres.

Groundwater regulatory action items (or controls) implemented by the Upper Loup NRD are set forth in Neb. Rev. Stat. §46-739 and apply to the groundwater control area as shown in Figure 2. The groundwater regulatory action item will work in combination with Upper Loup NRD's Groundwater Management Plan and Rules and Regulations. The Upper Loup NRD's Rules and Regulations will contain procedural details for the control listed in this IMP. Persons desiring to apply for new groundwater-irrigated acres or to increase existing groundwater-irrigated acres should contact the Upper Loup NRD to ensure compliance with this IMP. The limit established on the expansion of groundwater-irrigated acres is for agricultural production land irrigated that is from a new groundwater source, typically an irrigation well, and does not include other types of irrigation use, municipal use, or industrial use.

### **Surface Water Action Item (Control)**

1. Establish a limit on the expansion of surface water-irrigated acres.

Surface water regulatory action items (or controls) implemented by the NDNR are set forth in Neb. Rev. Stat. § 46-716 and apply to the surface water control area as shown in Figure 2. NDNR will establish an annual limit on the expansion of surface water-irrigated acres. The limit on the expansion of surface water-irrigated acres shall be a maximum of one-third of the amount the Upper Loup NRD will allow for the expansion of groundwater-irrigated acres. NDNR will utilize the number of additional groundwater-irrigated acres in place in the IMP area as of January 1 of each year for determining the number of additional acres for surface water-irrigation on each calendar year. The limit established on the expansion of surface water-irrigation acres is for agricultural production land that is irrigated from a new surface water appropriation and does not include other types of irrigation use, municipal use, or industrial use.

This limit will only apply to land within the surface water control area as illustrated in Figure 2. Should the Upper Loup NRD issue a moratorium on any increase in groundwater-irrigated acres, NDNR will issue a similar moratorium to limit development of additional acres for surface water irrigation. The NDNR is the State agency authorized by Nebraska statutes to regulate surface waters. All diversions of surface water require a State permit that is granted through the NDNR. To obtain a surface water permit, applicants may apply through their local NDNR office.

## **4.2 ACTION ITEMS (BY GOAL AND OBJECTIVE)**

### **4.2.1 ACTION ITEMS FOR GOAL 1**

The Upper Loup NRD and NDNR will work together to ensure that they are using their authorities appropriately and collaboratively to manage the groundwater and surface water resources in the Upper Loup NRD. Throughout this section, either the Upper Loup NRD or NDNR are listed as the lead agency for completion of the action item, as noted in parentheses at the end of the action

item. Where they are working together, the lead is listed as “Both”. Additional regulatory action items for the Upper Loup NRD are provided.

**GOAL 1 – MAINTAIN WATER SUPPLY AND PROTECT TO THE EXTENT POSSIBLE EXISTING USES, THE LOCAL ECONOMY, SOCIAL AND ENVIRONMENTAL HEALTH AND SAFETY, AND RECREATIONAL USES WHILE ALLOWING FOR GROWTH AND CHANGES IN USE.**

Goal 1 is designed to promote water management policies and practices that could potentially provide for additional water resources development opportunities while protecting existing surface water and groundwater uses.

**OBJECTIVE 1.1 – Assess the potential impact of new surface water and groundwater uses on existing surface water and groundwater users within the Upper Loup NRD.**

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- Action Item 1.1.1 The Upper Loup NRD and the NDNR will develop and maintain a comprehensive inventory of the location and source of current and future water supplies, water uses and outflow. (Both)
- Action Item 1.1.2 The Upper Loup NRD and the NDNR will continue to monitor and track changes in water uses within the Upper Loup NRD and the effects on groundwater and surface water supplies. (Both)
- Action Item 1.1.3 The Upper Loup NRD and the NDNR will communicate and coordinate with the respective water suppliers and users in the Voluntary IMP area to enhance understanding for present and future water demands. (Both)

**OBJECTIVE 1.2 – Determine allowable levels of water development for the Upper Loup NRD, and by subarea when designated.**

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- Action Item 1.2.1 (Regulatory) The Upper Loup NRD will continue to require that all high capacity wells within the Upper Loup NRD be equipped with flowmeters. (Upper Loup NRD)
- Action Item 1.2.2 (Regulatory) The Upper Loup NRD will continue to require all municipal, industrial, commercial and agricultural groundwater users to submit an annual report to the Upper Loup NRD which includes information about the volume of water pumped and the number of irrigated acres, where applicable. (Upper Loup NRD)
- Action Item 1.2.3 (Regulatory) The Upper Loup NRD will continue to permit, regulate, or take action on the following types of groundwater transfers: physical transfer of groundwater off of the overlying land; transfer of the type of use or addition of use; and transfer of certified irrigated acres. The specifics of the permitting process for transfers are included in the Upper Loup NRD’s Groundwater Management Area Rules and Regulations. The Upper Loup NRD will prohibit transfers of groundwater or certified acre from within the

- Upper Loup NRD to any area that is determined to be fully appropriated or under a well drilling moratorium, permit suspension, or where a groundwater allocation has been established. (Upper Loup NRD)
- Action Item 1.2.4 (Regulatory) On an annual basis, the Upper Loup NRD will determine the number of new irrigated acres which will be allowed for the subsequent year. (Upper Loup NRD)
- Action Item 1.2.5 The Upper Loup NRD will continue to measure, review and evaluate spring static water levels across the Upper Loup NRD on an annual basis. (Upper Loup NRD)
- Action Item 1.2.6 The Upper Loup NRD will continue to evaluate existing best management practices and identify new best management practices. Examples of best management practices include irrigation scheduling, soil sensor use, and revised well spacing requirements. (Upper Loup NRD)
- Action Item 1.2.7 The NDNR will continue any existing stream gaging in the Upper Loup NRD and look for new opportunities to enhance the stream gage network. (NDNR)
- Action Item 1.2.8 The NDNR will continue to administer surface water rights according to State law and monitor use of surface water to make sure that unauthorized irrigation is not occurring. (NDNR)
- Action Item 1.2.9 The NDNR will continue to map and track surface water irrigated acres. The NDNR will also continue to require that project maps are submitted and approved prior to obtaining a surface water permit. (NDNR)
- Action Item 1.2.10 The NDNR will implement a voluntary reporting program for surface water irrigation permit holders in the Upper Loup NRD aimed at identifying the quantity of water pumped, the acres irrigated, and the type of irrigation system used. (NDNR)
- Action Item 1.2.11 The NDNR will continue to evaluate the necessity for mandatory installation of water flow meters on all surface water pumps for irrigation, industrial, and municipal uses. (NDNR)
- Action Item 1.2.12 The NDNR will continue to enforce legislature (Neb. Rev. Stat. §§ 46-290 to 46-294.04) and NDNR rules pertaining to transfers of surface water rights. Should a moratorium be placed on new surface water appropriations in the Upper Loup NRD, the NDNR may grant a variance from the moratorium on a case-by-case basis, following the NDNR's rules and regulations. (NDNR)

### OBJECTIVE 1.3 – Identify potential water supply enhancement and conjunctive management projects and activities.

- Action Item 1.3.1 The Upper Loup NRD and the NDNR will explore and evaluate water supply projects within the Loup Basin that: a) increase groundwater supply, b)

- increase groundwater storage, c) increase stream base flow, and/or d) make water available from an existing source. (Both)
- Action Item 1.3.2 The Upper Loup NRD and the NDNR will investigate the potential for conjunctive management programs or project opportunities within the Loup Basin to protect existing users or mitigate new uses such as water-rights leases, augmentation projects, conjunctive use management, or use retirement. (Both)
- Action Item 1.3.3 The Upper Loup NRD will research various potential funding opportunities to further the goals and objectives of this Voluntary IMP. (Upper Loup NRD)
- Action Item 1.3.4 The Upper Loup NRD and the NDNR will coordinate with entities to help identify and study opportunities for the development of water transfers, water banking, and other various water management activities. (Both)

#### OBJECTIVE 1.4 – Minimize invasive vegetation encroachment in the river channels and associated riparian areas.

- Action Item 1.4.1 The Upper Loup NRD will coordinate with local authorities and entities to identify and inventory areas where invasive species encroachment is a problem. (Upper Loup NRD)
- Action Item 1.4.2 The Upper Loup NRD will provide financial and administrative support for weed management activities in the river channels and associated riparian areas. (Upper Loup NRD)
- Action Item 1.4.3 The Upper Loup NRD will encourage the removal of invasive species to help restore the hydraulic function of the river channels and associated riparian areas. (Upper Loup NRD)

#### Objective 1.5 – Utilize existing policies and authorities of the Upper Loup NRD to address water quantity issues.

- Action Item 1.5.1 Coordinate with entities within and downstream of the Upper Loup NRD to project urban and rural growth and potential effects on the Upper Loup NRD's water supply and use. (Both)
- Action Item 1.5.2 Use the best available scientific data and methods to project land use/land cover change as it relates to water use. (Upper Loup NRD)

GOAL 2 – TO DEVELOP AND IMPLEMENT INFORMATION GATHERING AND MONITORING PROCESSES OF HYDROLOGICAL AND OTHER RELATED DATA TO ASSESS WATER RESOURCES AND USES WITHIN THE UPPER LOUP NRD USING THE BEST AVAILABLE INFORMATION, DATA AND SCIENCE.

Goal 2 is designed to provide valuable water use information to the Upper Loup NRD and NDNR. This information will be used to enhance the understanding of water demands and supply within the Upper Loup NRD.

OBJECTIVE 2.1 – Conduct data collection and analyses of water supplies and demands.

- Action Item 2.1.1 The Upper Loup NRD and the NDNR will continue to identify important data components to monitor in order to ensure the best available datasets are used in water management. (Both)
- Action Item 2.1.2 The Upper Loup NRD will continue to calculate and/or estimate consumptive water use utilizing the best available data and analysis tools. (Upper Loup NRD)
- Action Item 2.1.3 The Upper Loup NRD will continue to gather annual water use reports from villages, irrigators, and other large water users. (Upper Loup NRD)
- Action Item 2.1.4 The Upper Loup NRD and the NDNR will continue to gather and analyze hydrogeological data. (Both)
- Action Item 2.1.5 The Upper Loup NRD and the NDNR will continue to review and analyze gathered data to identify hydrologically distinct subareas within the Upper Loup NRD. (Both)

OBJECTIVE 2.2 – Monitor and track changes in water supply.

- Action Item 2.2.1 The Upper Loup NRD and the NDNR will continue to assess the need for additional monitoring and ensure that information gathered on land use changes is evaluated with respect to water use utilizing the best available data and science. (Both)
- Action Item 2.2.2 The Upper Loup NRD and the NDNR will continue to monitor changes in groundwater and surface water levels. (Both)
- Action Item 2.2.3 The Upper Loup NRD and the NDNR will continue to track variability in water use and supply by regularly evaluating data from existing surface water, groundwater, and weather monitoring networks. (Both)
- Action Item 2.2.4 The Upper Loup NRD and the NDNR will explore methods to better monitor and evaluate changes in the respective surface water and groundwater supplies and uses. (Both)

GOAL 3 – TO DEVELOP, EXPAND, AND PROVIDE EDUCATIONAL OPPORTUNITIES AND OUTREACH MATERIALS ABOUT HYDROLOGICALLY CONNECTED SURFACE WATER AND GROUNDWATER AND WATER CONSERVATION.

Goal 3 is designed to increase the knowledge of water conservation and effective use within the Upper Loup NRD. The Upper Loup NRD currently has education and informational programs in place; therefore, any new initiatives developed to achieve Goal 3 will be coordinated with the current programs.



Upper Loup NRD Field Day on the Middle Loup River

OBJECTIVE 3.1 – Continue to promote water use education at all levels with the goal of increasing general awareness of water availability issues, benefits of implementing water conservation practices, and the influence of water quantity on water quality.

- Action Item 3.1.1 The Upper Loup NRD and the NDNR will continue to provide information to the general public through educational materials, media releases, newsletters, pamphlets and website. (Both)
- Action Item 3.1.2 The Upper Loup NRD and the NDNR will tailor specific information, as needed, to audiences through workshops, open houses, demonstration projects, and direct mailings. (Both)
- Action Item 3.1.3 Educational information the Upper Loup NRD and NDNR will provide may include but is not limited to topics such as hydrologically connected areas, IMPs, water conservation practices, Upper Loup NRD water quantity awareness, and funding sources for programs. (Both)



- Action Item 3.1.4 The Upper Loup NRD will continue to collaborate and support school environmental education curriculum and programs. (Upper Loup NRD)
- Action Item 3.1.5 The Upper Loup NRD will study the impacts of water supplies on water quality. (Upper Loup NRD)

**OBJECTIVE 3.2 – Continue collaboration to share information with other organizations and agencies to conserve resources and prevent duplication of work.**

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- Action Item 3.2.1 The Upper Loup NRD will continue to coordinate with public water suppliers on current programs and the development of programs dealing with water supplies and best conservation practices. (Upper Loup NRD)
- Action Item 3.2.2 The Upper Loup NRD will continue to coordinate with public water suppliers as they develop long-term planning activities. (Upper Loup NRD)
- Action Item 3.2.3 The Upper Loup NRD will continue to coordinate with industries, public water suppliers, and agricultural producers to encourage water quantity education and conservation. (Upper Loup NRD)
- Action Item 3.2.4 The Upper Loup NRD will evaluate the potential for partnership programs or projects that support the use of best management practices related to water management. (Upper Loup NRD)

**OBJECTIVE 3.3 – Review current and research new best water conservation practices.**

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- Action Item 3.3.1 The Upper Loup NRD will study and evaluate positive and negative aspects of current available irrigation technologies and practices. (Upper Loup NRD)
- Action Item 3.3.2 The Upper Loup NRD will investigate best applications of native and low water use landscaping materials. (Upper Loup NRD)
- Action Item 3.3.3 The Upper Loup NRD and the NDNR will explore and evaluate potential methods for the reuse of water and resulting benefits. (Both)
- Action Item 3.3.4 The Upper Loup NRD will identify and evaluate the need for additional cost-share opportunities that may include collaborating with other agencies and other NRDs.

## **5.0 INCENTIVE PROGRAMS**

The Upper Loup NRD and the NDNR will explore and evaluate cost-share incentive programs that promote water conservation practices. Incentive programs may include any program authorized by State law or federal programs. Water users or landowners may be required to enter into and perform such agreements concerning the use of land or water as are necessary to produce the benefits for which the incentive programs are established. The Upper Loup NRD will investigate grant opportunities to supplement the annual budgeting process for funding of water conservation practices.

## 6.0 FUNDING OPTIONS

The primary sources of funding for the IMP programs, projects, or activities are the Natural Resources Conservation Service, Nebraska Department of Environmental Quality, Nebraska Environmental Trust, Nebraska Game and Parks Commission, NDNR, and non-profits. The general criteria and applicability of each of the funding sources are presented. It should be noted, however, that the funding sources presented here are not necessarily inclusive of all funding options available. Additionally, information presented here is subject to change as funding sources may change their terms and criteria.

### Federal Funding Opportunities

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**Natural Resources Conservation Service (NRCS).** The 2014 Farm Bill offers conservation programs that benefit both agricultural producers and the environment.

- **Environmental Quality Incentives Program (EQIP).** Through EQIP, technical assistance, cost-share and incentive payments are available to agricultural producers to implement conservation practices that improve water quality, enhance grazing lands, and/or increase water conservation.
- **Conservation Stewardship Program (CSP).** The CSP is available in selected watersheds across the nation. The program is designed to reward farmers and ranchers who are implementing conservation on working lands and to encourage them to do more.
- **Agricultural Management Assistance Program (AMA).** AMA helps agricultural producers use conservation to manage risk and solve natural resource issues.
- **Agricultural Conservation Easement Program (ACEP).** Helps to conserve agricultural lands by preventing the conversions of these lands into non-agricultural lands. This program also acts to protect and restore wetlands.
- **Healthy Forests Reserve Program (HFRP).** The HFRP aids landowners in the restoration, protection, and enhancement of forestland resources on private lands. This program is designed to promote the recovery of endangered/threatened species, improve biodiversity, and enhance carbon sequestration.
- **Regional Conservation Partnership Program (RCPP).** The RCPP provides conservation assistance to producers and landowners by combining the authorities of four former conservation programs, the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, and the Great Lakes Basin Program.

### U.S. Department of the Interior – Bureau of Reclamation

- Water-Smart grants are provided to irrigation districts, water districts, and other organizations with water or power delivery to cost-share on projects that conserve and use water more efficiently. The projects should support water sustainability in the west.

**The Nebraska Environmental Trust (NET).** The Nebraska Environmental Trust was established in 1992 to conserve, enhance, and restore the natural environments of Nebraska. The Trust especially seeks projects that bring public and private partners together collaboratively to implement high-quality, cost-effective projects.

### **Nebraska Department of Environmental Quality (NDEQ)**

- **Nonpoint Source Water Quality Grants (Section 319).** Under Section 319 of the federal Clean Water Act, the federal government awards funds to the NDEQ to provide financial assistance for the prevention and abatement of nonpoint source water pollution. This funding is passed through to units of government, educational institutions, and non-profit organizations for projects that facilitate implementation of the state Nonpoint Source Management Plan.

### **Nebraska Game and Parks Commission (NGPC)**

- **Nebraska Wildlife Conservation Fund.** The purpose of this fund is to conserve nongame species and species determined to be endangered or threatened, for human enjoyment, for scientific purposes, and to ensure their continued existence as a part of our natural world.

### **Nebraska Department of Natural Resources (NDNR)**

- **Water Well Decommissioning Fund.** The objective of the Water Well Decommissioning Fund is to encourage proper decommissioning of non-functioning water wells in the state. This is accomplished through providing financial incentives in the form of cost-share assistance.
- **Nebraska Soil and Water Conservation Fund.** This fund provides state financial assistance to Nebraska landowners for installation of approved soil and water conservation measures that improve water quality, conserve water, and help 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.** The Water Sustainability Bill (LB 1098) was signed into law during the 2014 legislative session. This bill creates the Water Sustainability Fund, which will be used to address multiple water management and quality issues. This fund will act to improve water quality and usage, supply water management goals, evaluate flood control, and comply with existing interstate agreements and compacts.

## Local Funding Opportunities

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It is the intent of the Upper Loup NRD to utilize qualified projects described in Neb. Rev. Stat. § 2-3226.04 to provide river-flow enhancement in order to achieve the goals and objectives of the Upper Loup NRD and to achieve the goals and objectives of the NDNR under the Groundwater Management and Protection Act. The Upper Loup NRD may fund projects through one of two ways.

- **Levy Authority (Neb. Rev. Stat. § 2-3225(1) [c]).** This authority allows the Upper Loup NRD to levy an additional property tax of up to three cents per \$100 of taxable value for purposes of administering and implementing groundwater management activities and integrated management activities under the Nebraska Groundwater Management and Protection Act. The Revenue Committee amendment to LB 1032 extended the sunset date to fiscal year 2016–17.
- **Occupation Tax (Neb. Rev. Stat. § 2-3226.05).** This authority allows the Upper Loup NRD to levy an occupation tax upon the activity of irrigation of agricultural lands on an annual basis. This tax is not to exceed ten dollars per irrigated acre.

## Non-Profit Funding Opportunities

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### **The Nature Conservancy (TNC)**

- The Nature Conservancy is the leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. TNC partners with indigenous communities, businesses, governments, multilateral institutions, and other non-profits to pursue non-confrontational, pragmatic solutions to conservation challenges.
- TNC has protected over 107,000 acres in Nebraska through fee-title ownership, easements and deed restrictions, and assisting others with land transactions. TNC works in partnership with farmers and ranchers to promote good stewardship. TNC looks for ways to restore and protect grasslands and rivers.

### **Pheasants Forever (PF)**

- Pheasants Forever is dedicated to the conservation of pheasants, quail and other wildlife through habitat improvements, public awareness, education and land management policies and programs.
- Nebraska has 60 PF chapters and three Quail Forever (QF) chapters with over 10,388 members. In 2012, Nebraska PF and QF chapters have spent over \$4.9 million in the state on 5,456 habitat projects benefiting 148,597 acres.

### **Ducks Unlimited (DU)**

- Ducks Unlimited is the world's leader in wetlands and waterfowl conservation. DU got its start in 1937 during the Dust Bowl when North America's drought-plagued waterfowl populations had plunged to unprecedented lows. Determined not to sit idly by as the

continent's waterfowl dwindled beyond recovery, a small group of sportsmen joined together to form the organization.

- Nebraska includes diverse wildlife habitats like the Sandhills and the Missouri River floodplain. While most waterfowl migrate to wintering habitats further south each fall, large numbers of mallards and Canada geese do remain in Nebraska during the winter, particularly along the Platte River. DU's highest priority in Nebraska is to protect and restore critical migration habitat in the Rainwater Basin and along the Platte River. It is important that waterfowl arrive in their northern breeding habitats in the Prairie Pothole region in good physical condition, ready to undergo the physically demanding reproductive period. This will be accomplished by providing high quality migration habitat in Nebraska's Rainwater Basin and along the Platte River corridor.

## 7.0 MONITORING PLAN AND PROPOSED STUDIES

The overall objective of the monitoring plan is to gather and evaluate data, information, and methodologies that could be used to accomplish the purpose of the IMP.

The Upper Loup NRD and the NDNR have agreed to accomplish the following actions set forth in the monitoring plans as required by Neb. Rev. Stat. § 46-715 (2)(e):

- Gather and evaluate data, information, and methodologies that could be used to accomplish the purpose of this IMP.
- Increase understanding of the surface water and hydrologically connected groundwater system.
- Test the validity of the conclusions and information upon which the IMP is based.

The NDNR will be responsible for collecting, tracking, evaluating, and reporting the following activities within the IMP area on an annual basis:

- NDNR Stream gage measurements on the NDNR's maintained gages;
- Surface water permits issued, cancelled or denied;
- Irrigation water use data; and
- Other data as agreed to.

The Upper Loup NRD will be responsible for collecting, tracking, evaluating, and reporting the following activities within the IMP area on an annual basis:

- Groundwater level measurements;
- Stream gage measurements on the Upper Loup NRD's maintained gages;
- Municipal, commercial and industrial water use;
- Agricultural / irrigation water use;
- Certified irrigated acres and any changes to certifications;

- Well water construction permits approved, cancelled or denied;
- Variances granted, cancelled or denied;
- Water transfer permits granted, cancelled, or denied; and
- Water banking transactions (if a water banking system is established).

The Upper Loup NRD and the NDNR will jointly evaluate the data and information gathered for accuracy and flag data that may require closer inspection and reviews. In addition, the Upper Loup NRD and the NDNR will compare annual water use data to historically reported water usage data to evaluate the impacts of new water users on existing water users within the IMP area.

The Upper Loup NRD and the NDNR will jointly, or separately, issue an Annual Report. The NDNR has developed a methodology, in conjunction with several of the Lower Platte River Basin NRDs, to quantitatively assess the hydrologically connected groundwater and surface water of the State for use in the Annual Evaluation of Hydrologically Connected Water Supplies. This methodology will be used to monitor the balance of water supplies within the IMP Area. This methodology will be updated with the best available data and analysis as provided by the Upper Loup NRD and the NDNR.

## 8.0 MODIFICATIONS TO THE INTEGRATED MANAGEMENT PLAN

The Upper Loup NRD and the NDNR will hold an annual review to evaluate the IMP. Action items undertaken by the Upper Loup NRD and the NDNR will be reviewed to determine if these items are fulfilling the goals and objectives of the IMP. The NDNR and the Upper Loup NRD will jointly determine if amendments to the IMP are necessary. Amendments to the IMP will require agreement by both parties. If amendments to the IMP are necessary, the Upper Loup NRD and the NDNR will hold a joint hearing and issue the pertinent orders to formally adopt the revised IMP.

## 9.0 INFORMATION CONSIDERED IN DEVELOPMENT OF THIS PLAN

The following were sources of information used in the preparation of this IMP:

- Historic data on streamflows in the Upper Loup NRD and adjoining NRDs;
- Past and present surface water use within and bordering the Upper Loup NRD;
- Data on groundwater supplies and groundwater uses within and bordering the Upper Loup NRD;
- Records on climate and precipitation trends within the Upper Loup NRD and adjoining NRDs;
- Records on land use within the Upper Loup NRD and adjoining NRDs;
- Stakeholder Involvement Plan for the Upper Loup NRD(2015); and
- Rules and regulations for groundwater management within the Upper Loup NRD.

## 10.0 GLOSSARY OF TERMS

**Action Item** – A specific task that the Upper Loup NRD or the NDNR (or both) will undertake to achieve the goals and objectives of the IMP.

**Aquifer** – An underground geological formation of sand, soil, gravel, and rock able to store and yield water. Alluvial aquifers are comprised of unconsolidated materials such as sand and gravel. Bedrock aquifers are comprised of rock.

**Appropriation** – A permit to use water that has been perfected in accordance with terms stipulated by the NDNR.

**Conjunctive Management** – An adaptive process that utilizes the connection between surface water and groundwater to maximize water use, while minimizing impacts to streamflow and groundwater levels.

**Fully Appropriated** – A determination made by the NDNR that a river basin, subbasin, or reach has reached a point where water uses are equal to water supplies.

**Goal** – A general statement of broad direction or intent with no time limit.

**Groundwater** – Water that occurs in or moves, seeps, filters, or percolates through ground under the surface of the land.

**Groundwater Control Area** – That portion of the Upper Loup NRD where groundwater is hydrologically connected to surface water (see Figure 2).

**Groundwater Management Plan** – The Upper Loup NRD'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 NRD.

**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 Nebraska State Statute), 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).

**Integrated Management Plan** – A document to manage a river basin, subbasin, or reach to achieve and sustain a balance between water uses and water supplies for the long term.

**Upper Loup NRD** – The Upper Loup Natural Resources District, a political subdivision of the State of Nebraska.

**NDNR** – The Nebraska Department of Natural Resources, a State agency.

**NRD** – Natural Resources District, a political subdivision of the State.

**Objective** – A statement that defines the measurable results that a group seeks to accomplish.

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

**Stakeholder Advisory Committee** – Representatives from various interest groups and professional fields who provide consultation on aspects of the IMP.

**Surface Water** – Water that is on the Earth's surface, such as a stream, river, lake, or reservoir.

**Surface Water Control Area** – That portion of the Upper Loup NRD that drains to the Platte River (see Figure 2).

**Subbasin** – A portion of a river basin that is drained by a waterway.



**APPENDIX A**  
**Letters Initiating the IMP Process**



BLAINE, BROWN, CHERRY, GRANT, HOOKER,  
LOGAN, McPHERSON, & THOMAS COUNTIES

## Upper Loup Natural Resources District

39252 HWY 2  
THEDFORD, NEBRASKA 69166  
PHONE: (308) 645-2250  
FAX: (308) 645-2308  
e-mail: [ulnrd@upperloupnrd.org](mailto:ulnrd@upperloupnrd.org)  
[www.upperloupnrd.org](http://www.upperloupnrd.org)

April 11, 2014

Brian Dunnigan  
Department of Natural Resources  
301 Centennial Mall South  
PO Box 94676  
Lincoln, NE 68509-4676

RECEIVED

APR 14 2014

DEPARTMENT OF  
NATURAL RESOURCES

Dear Brian,

I am writing to let you know that at the Upper Loup Board of Directors meeting last night, Thursday April 10, 2014, our board unanimously voted to proceed with a Voluntary Integrated Management Plan. It was also decided to include our entire District in the management area. We understand the benefits of this proactive approach to jointly managing hydrologically connected waters and are looking forward to working with the Department on this project.

Sincerely,

Anna Baum  
Upper Loup NRD General Manager

UPPER LOUP  
NATURAL RESOURCES DISTRICT

39252 HIGHWAY 2  
THEDFORD, NEBRASKA 69166

NORTH PLATTE NE 691

11 APR 2014 PM 1 L



Brian Dunnigan  
Department of Natural Resources  
301 Centennial Mall South  
PO Box 94676  
Lincoln, NE 68509-4676

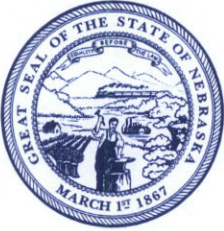
RECEIVED

APR 14 2014

DEPARTMENT OF  
NATURAL RESOURCES

685094676





**Dave Heineman**  
Governor

# STATE OF NEBRASKA

**DEPARTMENT OF NATURAL RESOURCES**  
Brian P. Dunnigan, P.E.  
Director

April 23, 2014

IN REPLY TO:

13047

Wynn Wiens, Chairman  
Upper Loup Natural Resources District  
39252 Highway 2  
Thedford, NE 69166

Dear Mr. Wiens:

The Nebraska Department of Natural Resources (Department) is pleased to receive the Upper Loup Natural Resources District's (District) April 11, 2014, letter stating the District's intent to develop a voluntary integrated management plan (IMP) per *Neb. Rev. Stat. § 46-715(1)(b)*. The Department agrees with the District that developing an IMP is an appropriate step to continue proactive water planning.

The Department looks forward to developing the IMP with the District, in addition to furthering the effective working relationship between the District and the Department.

Sincerely,

Brian P. Dunnigan, P.E.  
Director

cc: Anna Baum, General Manager

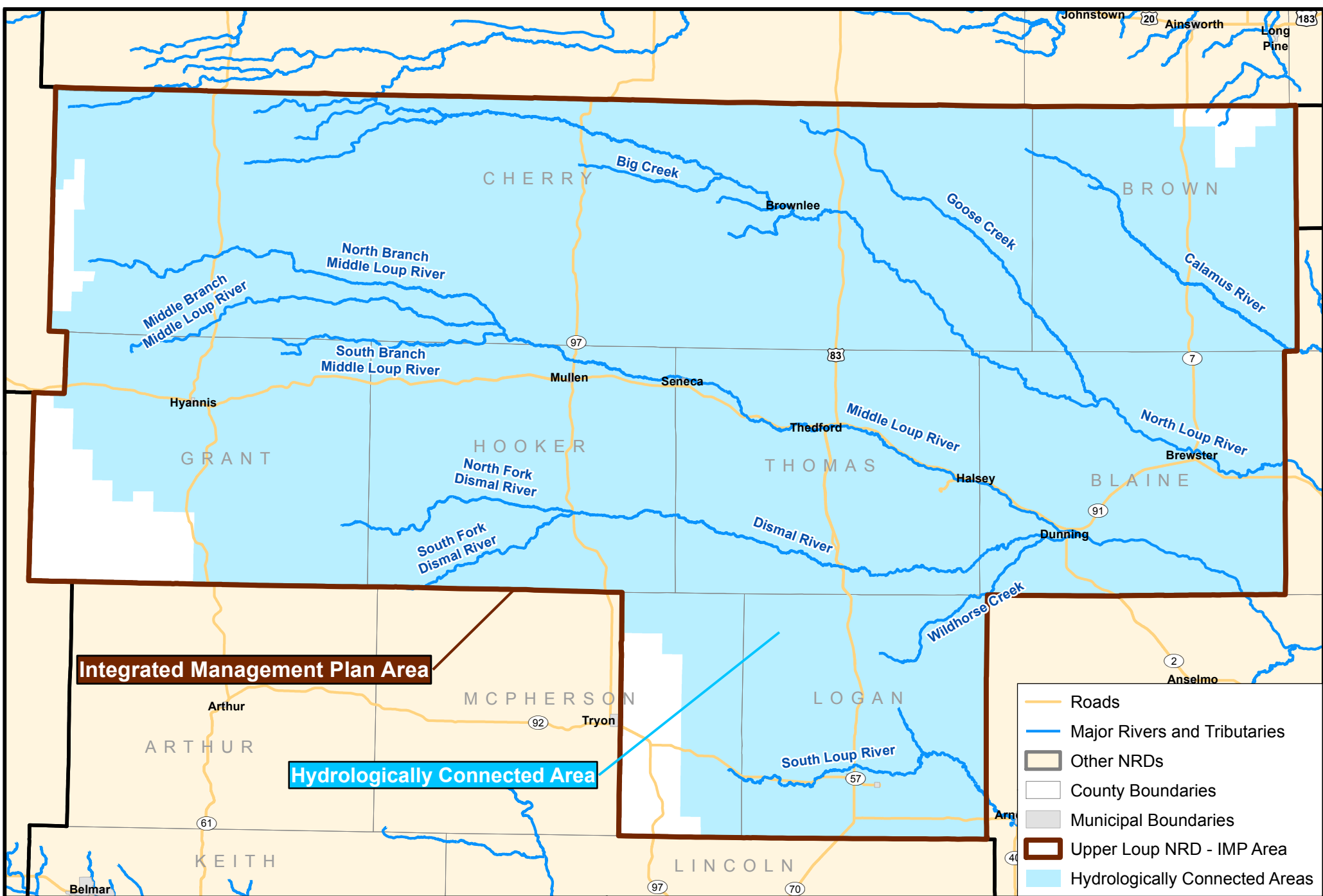
**APPENDIX B**  
**Stakeholder Advisory Committee**

# Upper Loup Natural Resources District Voluntary Integrated Management Plan Stakeholder Advisory Committee\*

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>
John	Kraye	Agricultural Industry, Groundwater Irrigator
Tim	Maseberg	Groundwater Irrigator
Patrick	Wright	Agricultural Industry, Groundwater and Surface Water Irrigator, Water Recreation








\* This list only includes those who attended one or more meetings.

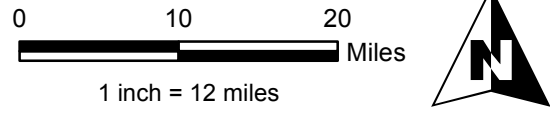
**APPENDIX C**  
**Figures**



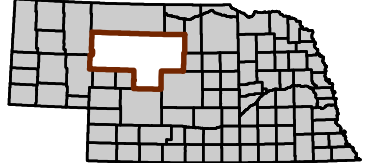
**Integrated Management Plan Area**

**Hydrologically Connected Area**

-  Roads
-  Major Rivers and Tributaries
-  Other NRDs
-  County Boundaries
-  Municipal Boundaries
-  Upper Loup NRD - IMP Area
-  Hydrologically Connected Areas

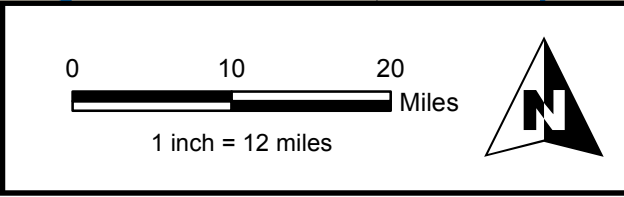
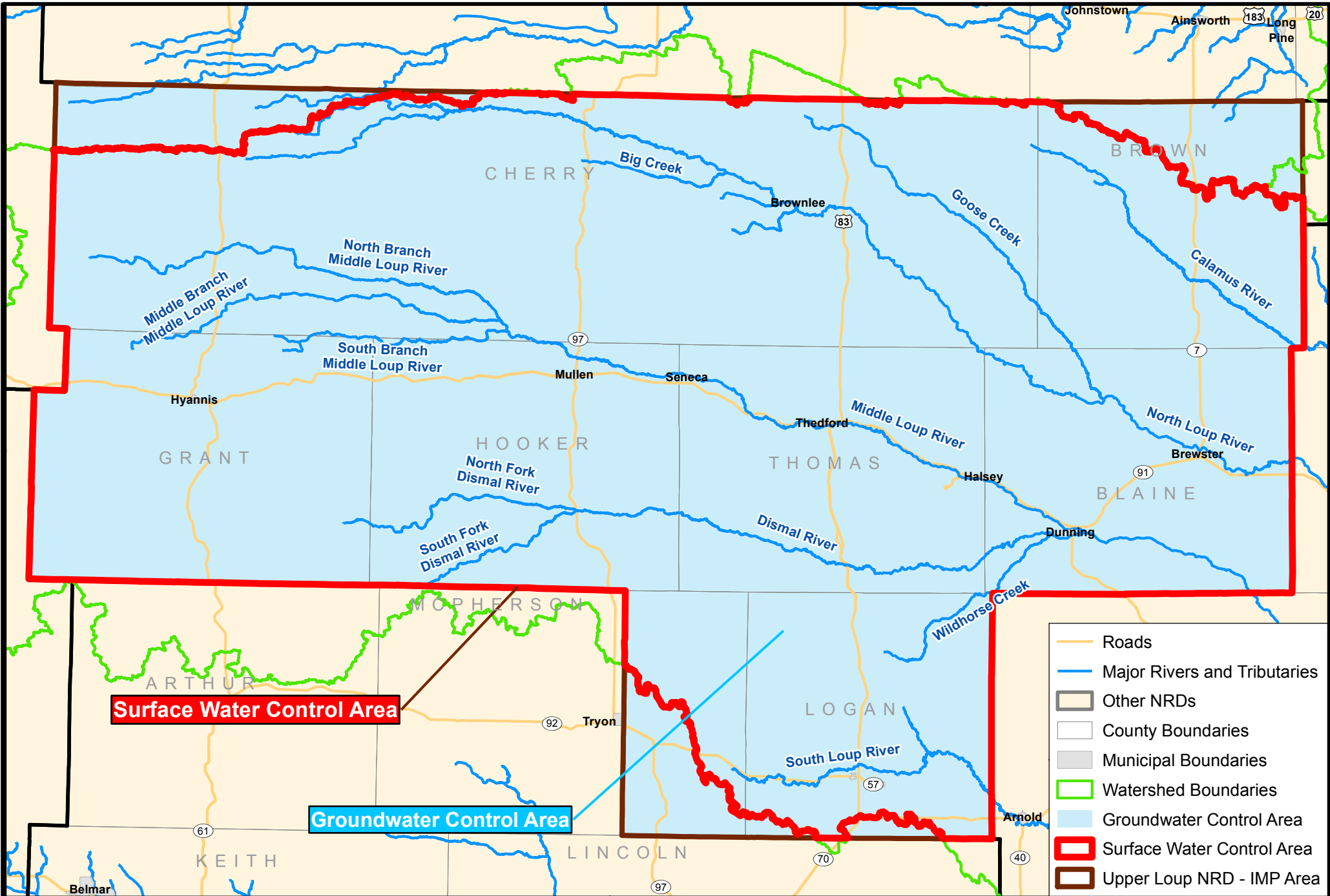


**Figure 1. General Location Map of the Integrated Management Plan Area**

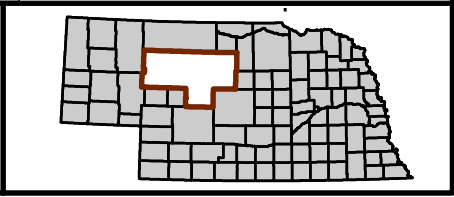


Sources: NDNR - NRD Bound, Hydrologically Connected Areas; USGS - National Hydrography Dataset; U.S. Census Bureau - Roads, County Boundaries, Municipal Boundaries





**Figure 2. Detailed Location Map of the Groundwater and Surface Water Control Areas**



Sources: NDNR - HUC04 Watersheds, NRD Bound, Hydrologically Connected Areas; USGS - National Hydrography Dataset; U.S. Census Bureau - Roads, County Boundaries, Municipal Boundaries