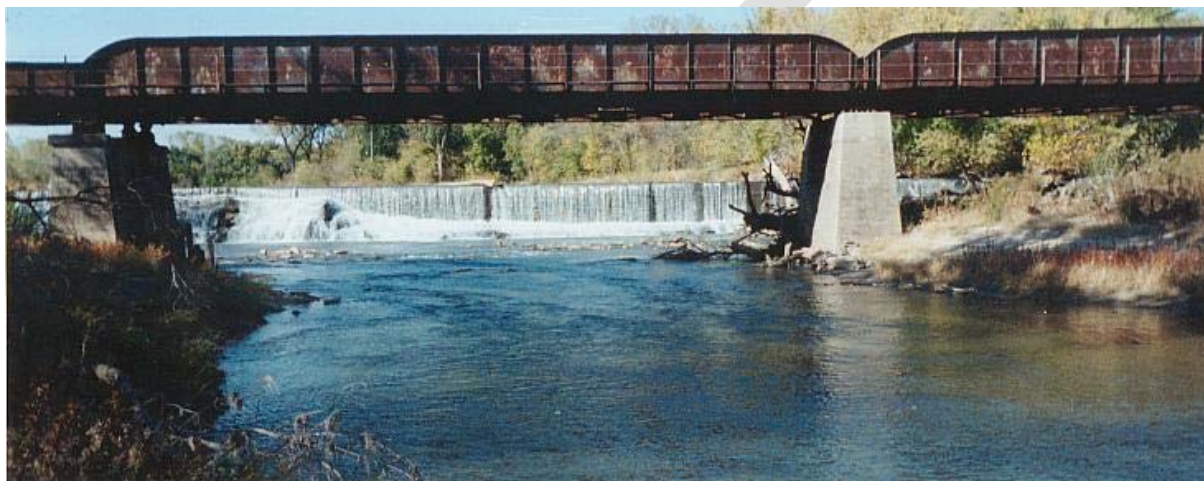


LITTLE BLUE NATURAL RESOURCES DISTRICT VOLUNTARY INTEGRATED MANAGEMENT PLAN



**Cooperatively Developed by the Little Blue Natural Resources
District and the Nebraska Department of Natural Resources
July 2019**



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TABLE OF CONTENTS

LISTING OF TABLES	III
LISTING OF FIGURES	III
CHAPTER 1 AUTHORITY AND EFFECTIVE DATE	1
CHAPTER 2 INTRODUCTION	1
2.1 Overview of IMP.....	1
2.2 Blue River Basin Compact.....	2
CHAPTER 3 LEGISLATIVE BACKGROUND	3
3.1 Fully Appropriated Basins Evaluation	3
3.2 Integrated Management Plans	4
3.2.1 Fully Appropriations Basins Evaluation.....	4
3.2.2 Voluntary Integrated Management Plans.....	4
3.2.3 Components of an Integrated Management Plan	4
3.2.4 Stakeholder Process	5
CHAPTER 4 PUBLIC PARTICIPATION.....	5
CHAPTER 5 IMP GEOGRAPHY AND PHYSICAL DESCRIPTION.....	6
5.1 Geographic Extent of IMP Areas	6
5.1.1 General IMP Area	6
5.1.2 Platte River Special Management Area	6
5.2 Climate	9
5.3 Land Cover and Land Use	9
5.4 Geology.....	10
5.5 Groundwater.....	11
5.6 Surface Water	12
5.6.1 Little Blue River Drainage Areas.....	12
5.6.2 Little Blue River Groundwater and Surface Water Connected Areas.....	13
5.6.3 Surface Water Permits Granted by the Department	13
5.6.4 Stream Gaging Activities.....	15
CHAPTER 6 GOALS, OBJECTIVES, AND ACTION ITEMS	16
6.1 Goal 1, Objectives and Action Items.....	17
6.2 Goal 2, Objectives and Action Items.....	17
6.3 Goal 3, Objectives and Action Items.....	19
CHAPTER 7 INTEGRATED MANAGEMENT PLAN CONTROLS	20
7.1 Groundwater Controls for the General IMP Area.....	20

7.2 Surface Water Controls for the General IMP Area	20
CHAPTER 8 THE PLATTE RIVER SPECIAL MANAGEMENT AREA.....	21
8.1 Introduction.....	21
8.2 Groundwater Controls for the Platte River Special Management Area	22
8.3 Surface Water Controls for the Platte River Special Management Area	23
8.4 Groundwater Transfer Guidelines for the Platte River Special Management Area	23
8.4.1 General guidelines for groundwater transfers	23
8.4.2 Guidelines for municipal, industrial and out-of-state groundwater transfers	24
CHAPTER 9 MONITORING PLAN	24
9.1 Track and Report Groundwater Uses.....	24
9.2 Track and Report Surface Water Uses	25
9.3 Increase Understanding of Hydrologically Connected Groundwater.....	26
CHAPTER 10 FUNDING OPTIONS	26
10.1 Federal Funding Options.....	27
10.2 State Funding Options	27
10.3 Local Funding Options.....	28
CHAPTER 11 INFORMATION CONSIDERED	29
CHAPTER 12 REVIEW PROCESS AND MODIFICATIONS.....	29
APPENDIX A GLOSSARY OF TERMS	A-1
APPENDIX B LETTERS INITIATING THE IMP PROCESS.....	B-1
APPENDIX C PUBLIC INVOLVEMENT PROCESS SUMMARY	C-1
C.1 Background.....	C-1
C.2 Formation of stakeholder group.....	C-1
C.3 Stakeholder Meeting Overviews	C-2
C.3.1 Stakeholder Meeting #1 (joint with Tri-Basin NRD): March 29, 2016	C-2
C.3.2 One-on-One Stakeholder Meetings: April-May 2016.....	C-3
C.3.3 Stakeholder Meeting #2: May 19, 2016.....	C-4
C.3.4 Stakeholder Meeting #3: September 15, 2016	C-4
C.3.5 Stakeholder Meeting #4: December 5, 2016.....	C-5
C.3.6 Stakeholder Meeting #5: March 20, 2017	C-5
C.3.7 Stakeholder Meeting #6: November 16, 2017	C-6
C.3.8 Stakeholder Meeting #7 (joint with Tri-Basin NRD): November 19, 2018...	C-6

APPENDIX D STAKEHOLDER APPROVED “WATER SUSTAINABILITY IN THE LITTLE BLUE NRD” DOCUMENT	D-1
APPENDIX E TRIGGER FOR DEPARTMENT MANDATORY REPORTING.....	E-1

LISTING OF TABLES

Table 5-1: Department granted surface water permits in the District.....	13
Table 5-2: Listing of stream gages in the District.....	15
Table 6-1: Goal 1, Objectives and Action Items.....	17
Table 6-2: Goal 2, Objectives and Action Items.....	18
Table 6-3: Goal 3, Objectives and Action Items.....	19

LISTING OF FIGURES

Figure 3-1: Illustration of hydrologically connected groundwater and surface waters	3
Figure 5-1: Geographic extent of the general IMP Area (whole District) and associated groundwater and surface water controls.	7
Figure 5-2: Geographic extent of the Platte River Special Management Area and associated groundwater and surface water control areas.....	8
Figure 5-3: Generalized land cover in the District.....	9
Figure 5-4: Irrigation distribution in the District.....	10
Figure 5-5: Aquifer saturation in the District	11
Figure 5-6: Watersheds of the Little Blue River Basin in Nebraska	12
Figure 5-7: Liberty Cove Lake near Lawrence, NE	14
Figure 5-8: Distribution of surface water permits and stream gages in the District	14
Figure 8-1: The PRRIP target species (clockwise from upper left) are the Interior Least Tern, Whooping Crane, Piping Plover And Pallid Sturgeon.	21

Little Blue Natural Resources District Voluntary Integrated Management Plan

**COOPERATIVELY DEVELOPED BY THE LITTLE BLUE NATURAL
RESOURCES DISTRICT AND THE NEBRASKA DEPARTMENT OF
NATURAL RESOURCES
JULY 2019**

CHAPTER 1 AUTHORITY AND EFFECTIVE DATE

This Integrated Management Plan (IMP) was approved on **DATE** by the Board of Directors of the Little Blue Natural Resources District (District) and on **DATE**, by the Nebraska Department of Natural Resources (Department). The IMP and surface water and groundwater controls were subsequently adopted by the Department and District, respectively, and the IMP and associated controls were made effective on **DATE**. The IMP was prepared voluntarily in consultation with the Little Blue Natural Resources District Stakeholder Advisory Committee and in accordance with the Nebraska Ground Water Management and Protection Act. The Act assigns the responsibilities and the authority to the Department and the District for management of hydrologically connected groundwater and surface waters.

The District has significant legal authority to regulate activities within its boundaries in a way that ensures natural resources are conserved and protected and that agriculture remains an important industry to the State of Nebraska.

CHAPTER 2 INTRODUCTION

2.1 Overview of IMP

Water resources in the Little Blue River Basin are critical for the long-term viability of the agricultural economy, business and industry, municipalities, fisheries and wildlife, and the society of the river basin as a whole. The District's Board of Directors recognized the value for joint management of groundwater and surface water and initiated the voluntary IMP with the Department, who agreed to work jointly with the District to develop the IMP (see official letters in Appendix B). This plan will serve as a road map for jointly managing hydrologically connected groundwater and surface water in the District for the short term and the long term. It further serves as a framework which enables the District and the Department to coordinate management actions and monitor groundwater and surface water, in order to better protect water resources for future generations.

This document covers two management areas: 1) The general IMP area, which includes all water users and, in effect, covers the whole District, and 2) The Platte River Special Management Area. During the development of the IMP, new data and science on the Platte River revealed that water uses in the Platte River Basin were causing greater impact to streamflows than previously indicated. As a result, the area was subject to management under the Nebraska New Depletions Plan (further discussed in Chapter 8). Instead of writing a separate IMP for that area, the subject matter is incorporated as Chapter 8 of this IMP.

2.2 Blue River Basin Compact

The District and Department participate in the Blue River Basin Compact, which the States of Nebraska and Kansas entered in 1971. The major purposes of the Compact are (from *Neb. Rev. Stat.* § 1-115):

1. To promote interstate comity between the States of Nebraska and Kansas;
2. To achieve an equitable apportionment of the waters of the Big Blue River Basin and to promote orderly development thereof; and
3. To encourage continuation of the active pollution-abatement programs in each of the two States and to seek further reduction in both natural and man-made pollution of the waters of the Big Blue River Basin.

The Blue River Compact Administration (Administration) is made up of one Commissioner each from Nebraska (the Director of the Department of Natural Resources) and Kansas, and a Federal member designated by the President of the United States. The Administration holds an annual meeting each May to report on each State's activities pertaining to the Blue River Basin, and an annual report is assembled and published to commemorate each meeting. The District and other Blue Basin NRDs provide reports for their respective districts that are incorporated into the Nebraska report. A representative from the Department of Environmental Quality also participates in the annual meeting to report on water quality in the Basin. It is interesting to note that the Blue River Compact was the first interstate water related Compact in the United States to address both water quality and water quantity.

As a part of equitable apportionment of Blue River Basin waters between Kansas and Nebraska, surface water users in the Little Blue Basin are subject to terms of water administration that are specified in the Compact. To meet Compact compliance, the Department is required to regulate diversions of surface water during the period of May 1 to September 30. The Compact specifies flow requirements at the Administration's stream gage near the Nebraska-Kansas state line for each specific month. If flows are insufficient to meet Compact requirements, the Department is responsible for closing natural flow surface water users that are junior to (newer than) November 1, 1968. In these times of shortage, surface water users that are senior to (older than) November 1, 1968 are also closely monitored to ensure the water diverted is within allocated amounts of surface water appropriations. Water in storage, regardless of priority, is also monitored, as there is no increase allowed in reservoir storage during times of shortages.

CHAPTER 3 LEGISLATIVE BACKGROUND

3.1 Fully Appropriated Basins Evaluation

On January 9, 2004, the Nebraska Legislature passed LB 962 which charged the Department to annually evaluate the long-term water balance of hydrologically connected river basins and subbasins. The Department report entitled “Annual Evaluation of Availability of Hydrologically Connected Water Supplies” (Annual Report) conveys the results of this evaluation. Through this Fully Appropriated Basins evaluation, a river basin or subbasin is considered “fully appropriated” when current uses of hydrologically connected water supplies 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; or
- 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 Department identifies “hydrologically connected areas”, as a part of the annual Fully Appropriated Basins evaluation. Hydrologically connected groundwater and surface water occurs when an aquifer and stream intersect (Figure 3-1). Here, a stream may supply a portion of its available flow to the underlying aquifer (losing stream), or the aquifer intersects the stream and contributes groundwater to streamflows (gaining stream). The Fully Appropriated Basins evaluations uses the “10/50 rule” to define hydrologically connected areas. These are geographic areas where a groundwater well would deplete river flow by at least 10 percent of the water pumped over a 50-year period. Groundwater models are used to project stream depletions by wells 50 years into the future.

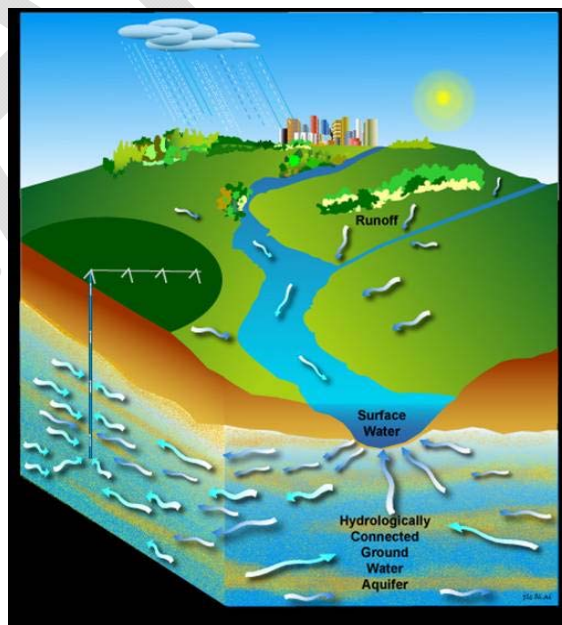


Figure 3-1: Illustration of hydrologically connected groundwater and surface waters

Blue River Compact administration for the Little and Big Blue Basins is tracked as a part of the Department’s Fully Appropriated Basins Evaluation, further discussed in the following sections. If available surface water is insufficient to sustain 65 percent of the net corn crop irrigation requirement

over the long-term (20 years), then that Basin may be subject to a Fully Appropriated Basin Designation. In the Little Blue Basin, surface water must be available for 26 days of irrigation between July 1 and August 31, averaged over 20 years, to maintain the beneficial irrigation use. As of 2018, surface water was available an average of 53 days (9 days of closure for surface water administration), which is far above the 26-day threshold that could trigger a fully-appropriated basin designation.

3.2 Integrated Management Plans

3.2.1 Fully Appropriations Basins Evaluation

If the Department has designated or determined a river basin or subbasin to be fully appropriated, the affected NRD(s) must develop an Integrated Management Plan (IMP) with the Department. This is a joint water quantity management plan developed and implemented by the Department (regulators of surface water) and the NRD(s) (regulators of groundwater). The overarching purpose of the IMP is to manage the river basin or subbasin to achieve and sustain balance between water uses and water supplies for the long term. *Nebraska Revised Statutes (Neb. Rev. Stat.)* §§ 46-715 to 46-717 and portions of § 46-718 describe the process by which the IMP is developed and implemented.

3.2.2 Voluntary Integrated Management Plans

Legislation was enacted in 2010 to provide a framework for voluntary integrated management planning in areas not designated as fully-appropriated. A voluntary IMP is developed under the same statutory framework as a fully-appropriated IMP, but may have different authority to take certain actions as streamflow is still sufficient to sustain, over the long term, the beneficial uses of surface water appropriations and wells in hydrologically connected areas. The voluntary IMP process is an opportunity for NRDs and the Department to work together to proactively manage growth of water uses while protecting existing uses prior to reaching a formal designation.

3.2.3 Components of an Integrated Management Plan

Neb. Rev. Stat. § 46-715(2) specifies five mandatory components that are included in each IMP. Together, these components enable effective implementation of the IMP in order to fulfill the purpose of maintaining and achieving a balance between hydrologically connected groundwater and surface water. These components are:

1. Clear goals and objectives with a purpose of sustaining a balance between uses and supplies so that economic viability, social and environmental health, and safety and welfare of the basin or subbasin is achieved and maintained,
2. A map clearly delineating the geographic extent of the IMP,
3. One or more groundwater controls that are consistent to reach the goals and objectives of the IMP, authorized by the District in accordance with *Neb. Rev. Stat.* § 46-739,
4. One or more surface water controls that are consistent to reach the goals and objectives of the IMP, authorized by the Department in accordance with *Neb. Rev. Stat.* § 46-716,
5. A plan to gather and evaluate data, information, and methodologies to implement the IMP, increase understanding of the surface water and hydrologically connected groundwater system, and test the validity of information and conclusions upon which the IMP is based.

The IMP's groundwater and surface control(s) should be consistent with the goals and objectives of the plan, protect existing groundwater and surface water users in hydrologically connected areas, and be sufficient to ensure the State will remain in compliance with any applicable interstate water compact, decree, or formal agreement. The allowable surface water controls for IMPs are listed in *Neb. Rev. Stat.* § 46-716, and the allowable groundwater controls are listed in *Neb. Rev. Stat.* § 46-739. The general IMP area and Platte River Special Management Area (see Chapter 5 for geographic area descriptions) groundwater and surface water controls for this voluntary IMP are described in Chapters 7 and 8, respectively.

In addition, IMPs should include components to provide a process for economic development opportunities and economic sustainability. Procedures are included in the IMP to track depletions and gains to streamflows resulting from changes in water uses, and describe how water may be made available for offsets for potential new uses. In this way, economic development in the river basin or subbasin may continue. Additional details related to these procedures are discussed in Chapter 8—The Platte River Special Management Area. For all other areas covered by the IMP, offsets for new uses are not required as no moratorium is in place.

3.2.4 Stakeholder Process

Neb. Rev. Stat. § 46-717(2) outlines the stakeholder process that is an integral part of IMP development. It specifies the specific stakeholder interest groups that the District and the Department shall consult with during the preparation of the IMP. These interest groups are: irrigation districts, reclamation districts, public power and irrigation districts, mutual irrigation companies, canal companies, and municipalities that rely on water in the affected river basin or subbasin. Other water users and stakeholders that are deemed appropriate by the District or Department may also be consulted during IMP development. The District and Department are also required to solicit public comments and opinions through public meetings and other means. The stakeholder process for this voluntary IMP is described in further detail in the following chapter and in Appendix C.

CHAPTER 4 PUBLIC PARTICIPATION

The IMP process relies on collaboration between the NRDs (groundwater) and the Department (surface water), in consultation with a diverse and broad-based stakeholder group. As a part of voluntary IMP development, the District and the Department convened a group of stakeholders that represented a wide array of water interests including agriculture, industry, public water supply, environment, recreation, and county and city officials. The stakeholders' input was invaluable to the development of the IMP, and their volunteered time and energy was greatly appreciated by both the District and the Department. An overview of the public participation process is included as Appendix C.

The Stakeholder Advisory Committee met a total of seven times from 2016 to 2018. They worked together to identify issues within the Basin, and subsequently developed the goals, objectives, and action items of the IMP. The stakeholder group also helped to prioritize the action items, thus providing a robust set of recommendations for the consideration of the District and Department. The first and the

last stakeholder meetings were held jointly with the Little Blue Basin stakeholder group from the Tri-Basin NRD to address water management at a Basin-wide level, while still maintaining local control. Stakeholder meetings were publicly noticed and included a public comment period as a part of each meeting.

The District and the Department carefully evaluated and considered all recommendations, including the feasibility of action items over a series of meetings. The final goals, objectives, and action items are a carefully constructed mosaic of stakeholder ideas combined with Department and District knowledge, which provide a path forward for effective, long-term management of groundwater and surface water.

CHAPTER 5 IMP GEOGRAPHY AND PHYSICAL DESCRIPTION

5.1 Geographic Extent of IMP Areas

5.1.1 General IMP Area

When the IMP process was initiated, the District and the Department made the decision to include all District water uses in the general IMP area, as allowed by statute (*Neb. Rev. Stat. § 46-715(3)*). Therefore, the geographic boundaries for the IMP area are the legal boundaries of the District (Figure 5-1). The Platte River Special Management Area, further discussed below and in Chapter 8, lies in the extreme northwest corner of the District (Figure 5-2).

5.1.2 Platte River Special Management Area

Recent improvements in Platte River Basin groundwater modeling have indicated that an area of northwest Adams County is subject to certain management actions under the New Nebraska Depletions Plan. It has been determined that groundwater use in this area contributes to streamflow depletions which exceed the threshold for such designation under the Nebraska New Depletions Plan. As such, the area was designated by the District Board and the Department as a special management area for the purpose of this IMP, and hereinafter is referred to as the “Platte River Special Management Area”. Additional regulatory measures for both groundwater and surface water (i.e. “controls”) will be implemented for the Platte River Special Management Area, as a part of this IMP. Figure 5-2 shows the geographic extents of the Platte River Special Management Area and associated controls, and Chapter 8 of this IMP further discusses the specific management actions that will be taken to address depletions to the Platte River.

Geographic Extent of General Voluntary IMP Area

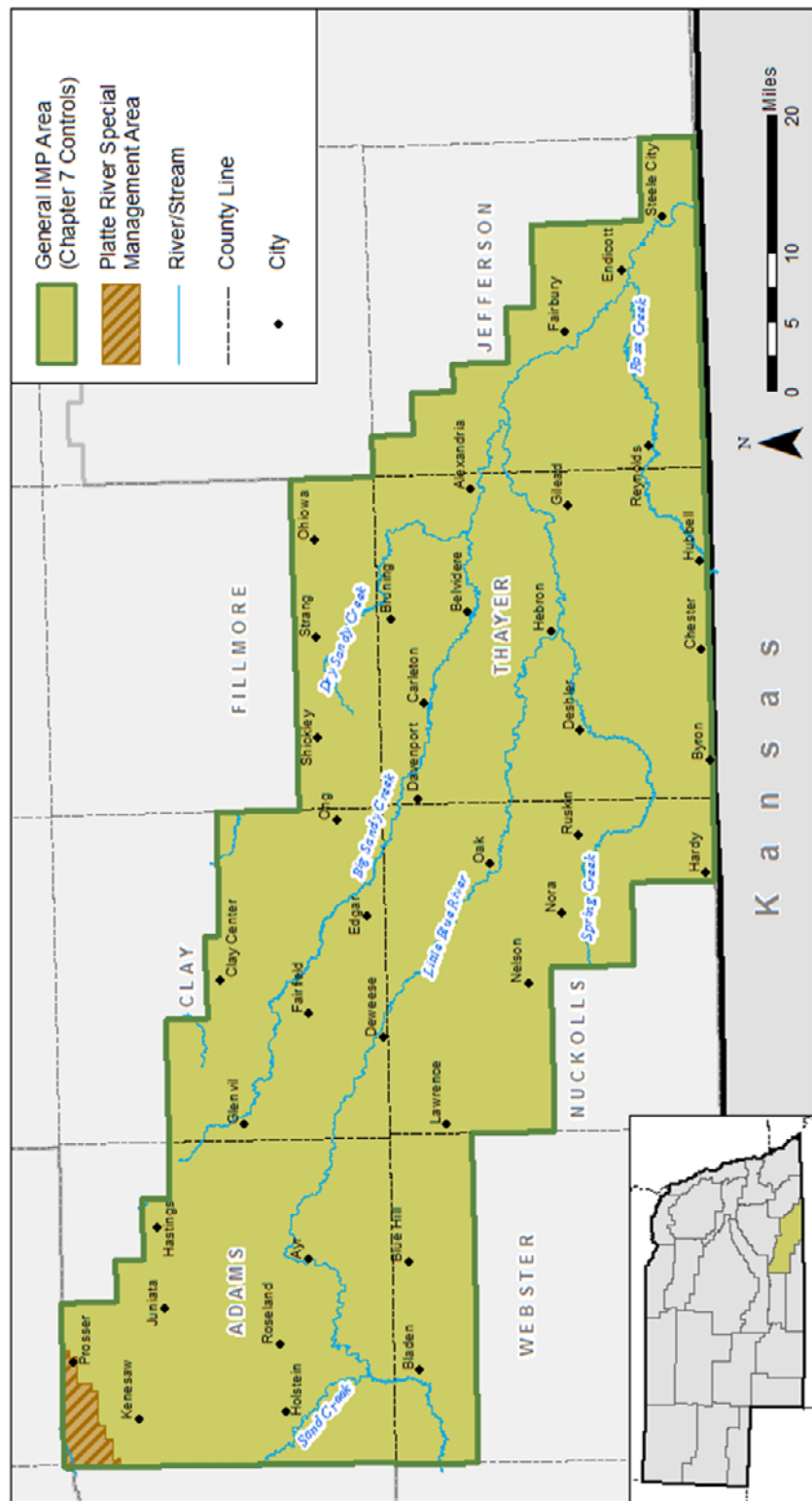


Figure 5-1: Geographic extent of the general IMP Area (whole District) and associated groundwater and surface water controls.

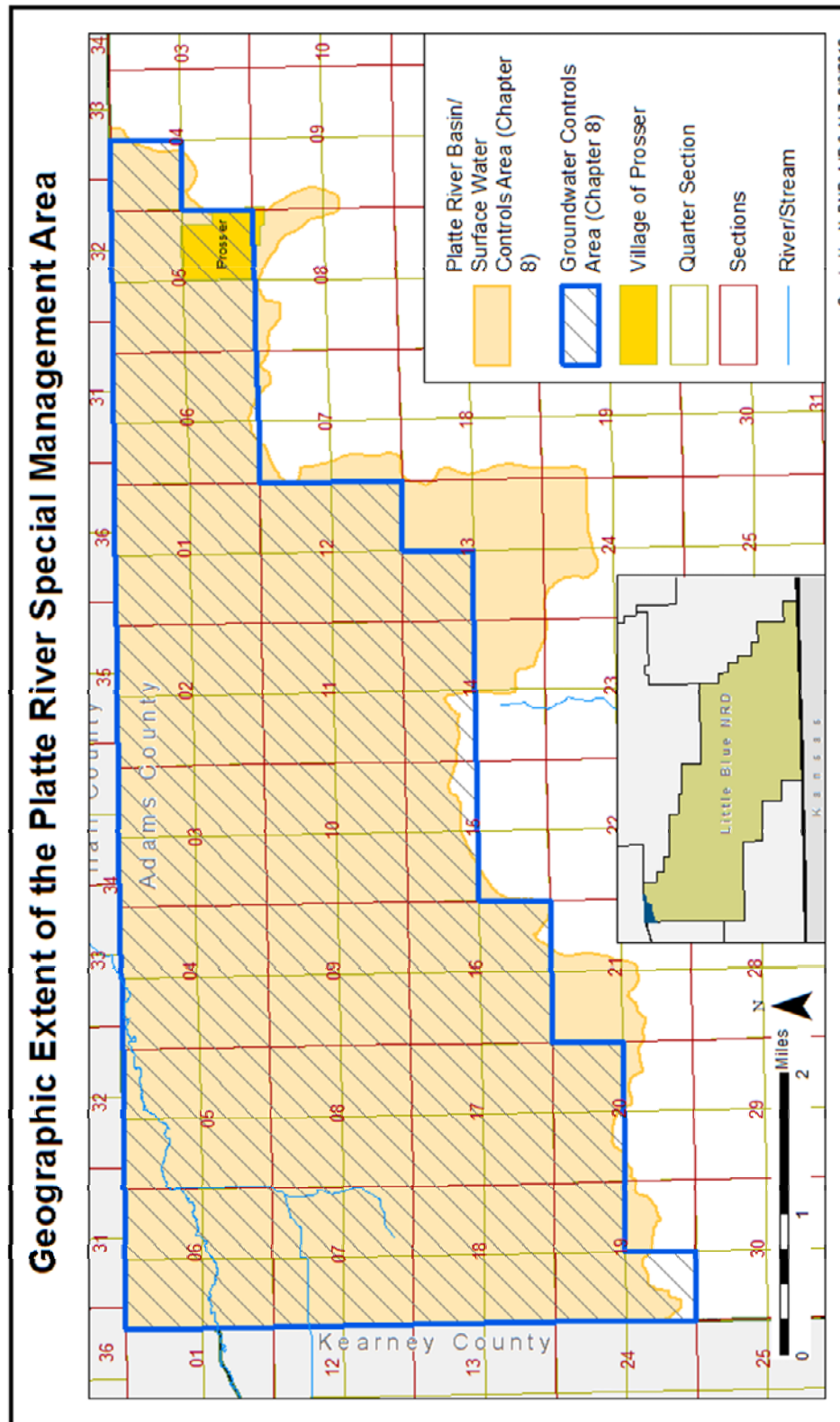


Figure 5-2: Geographic extent of the Platte River Special Management Area and associated groundwater and surface water control areas.

5.2 Climate

The climate of the LBNRD is typical of the plains region, with warm summers and cold winters. Temperatures vary widely between seasons with average July temperatures normally ranging between 64° Fahrenheit (F) and 89° F and January temperatures ranging from 12° F to 36° F.

Average annual precipitation ranges from about 26 inches in western Adams County to about 31 inches in Jefferson County in the southeastern corner of the District. The District's average rainfall is approximately 28 inches overall. On average, about 3,726,000 acre-feet of precipitation falls on the lands of the District annually, with 60 percent occurring during the growing season from May through September. Precipitation is the primary source of surface water flows and is key in replenishing underground water supplies through recharge.

5.3 Land Cover and Land Use

The District area covers approximately 1.5 million acres. The distribution of land use and land cover in this area is shown in Figure 5-3. The land cover is largely agricultural (68 percent) and pasture/grasslands area (22 percent), with small areas of forests, open water, wetlands, and urbanized areas (10 percent). Prominent crop types are corn and soybean at 40 percent and 24 percent, respectively. Irrigated lands make up approximately 700,000 acres of the District (Figure 5-4), although this is an estimate until groundwater irrigated lands certifications are complete. Roughly 97 percent of the irrigated lands are irrigated with groundwater.

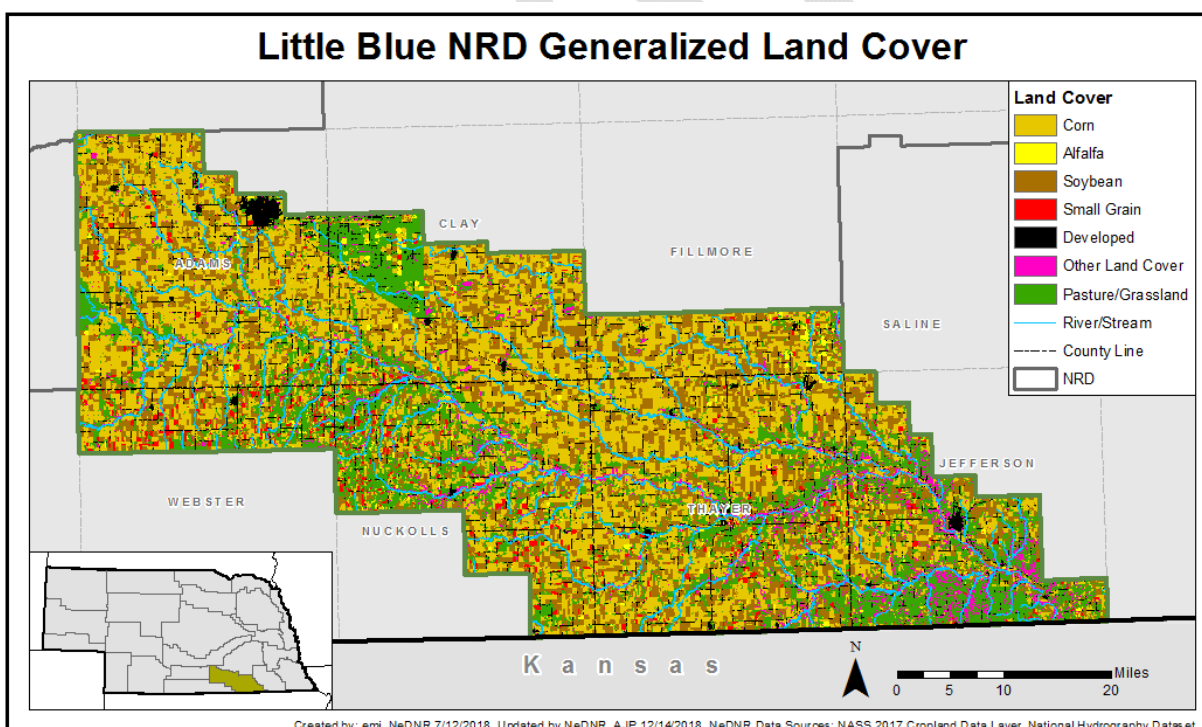


Figure 5-3: Generalized land cover in the District

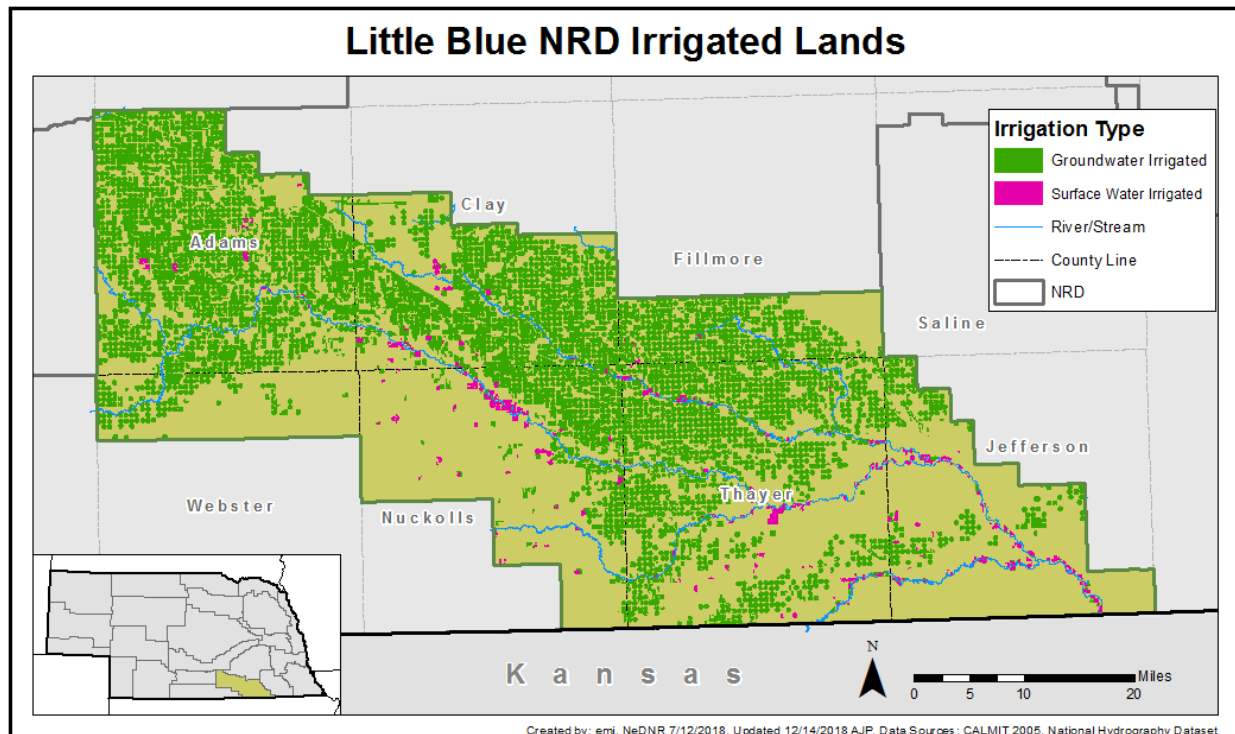


Figure 5-4: Irrigation distribution in the District

5.4 Geology

The District is underlain by several bedrock formations from the Cretaceous age to Tertiary age. They include, from the oldest formations to the youngest, the Dakota sandstones, mudstones, siltstones, and shale; Greenhorn/Graneros limestone and shale; Pierre shale; Niobrara chalky shale and shale; Carlile cretaceous rock; and in some isolated locations in the western portion of the District, the Ogallala consolidated sands, silts, and sandy clay. Because land elevations increase from east to west, the bedrock formations lie in progressively deeper layers extending westerly, with the younger layers above the older layers. Bedrock may be visible in localized outcroppings from the older to younger formations as one moves from east to west across the District.

Depending on the consolidation or fracturing, some of these formations yield groundwater for various beneficial uses. For example, the Dakota in the eastern portion of the District may yield sufficient groundwater for irrigation and domestic water supply. However, the water quality of the Dakota is highly variable and tends to be saline. Groundwater is most commonly derived from the more recent deposits of sand and gravel laid down over the subsurface bedrock as described in Section 5.5.

5.5 Groundwater

The District has two main undifferentiated sand and gravel aquifers of alluvial origin. The largest aquifer is the eastern portion of the High Plains Aquifer which lies beneath approximately two thirds of the District's lands. This aquifer is generally unconfined and varies from just feet below land surface in the river valley, to almost 175 feet below land surface in upland locations. The saturated substrata material is generally unconfined and lies over the bedrock formations in ridges, channels, and pockets and at thicknesses varying from a few feet to nearly 300 feet (Figure 5-5). However, in some areas, the continuity of the sands and gravels is commonly interrupted by silt and clay lenses which produce some confined situations.

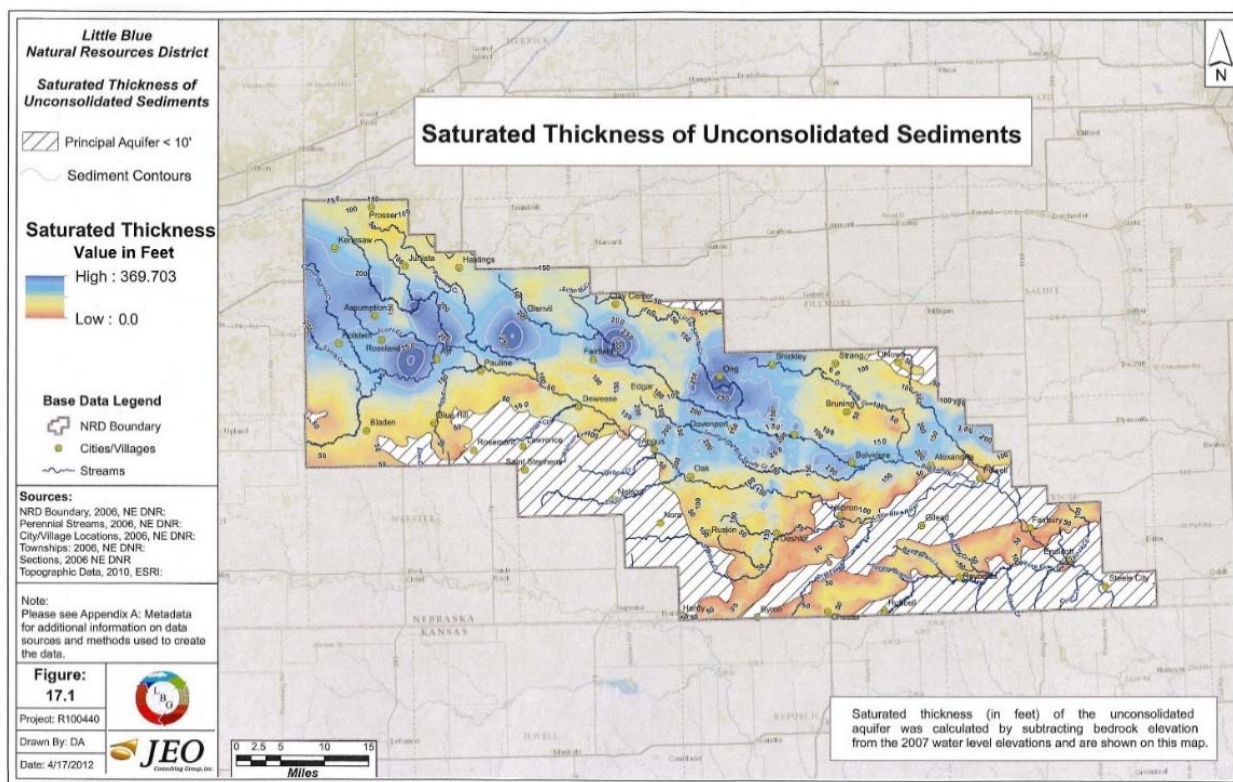


Figure 5-5: Aquifer saturation in the District

In general, the top of the groundwater aquifer slopes from the higher elevations in northwest Adams County at approximately 2010' Above Mean Sea Level (AMSL), to lower elevations in western Jefferson County at approximately 1340' AMSL. Thus, natural groundwater movement through the principal aquifer substrata is down gradient from the northwest to the southeast. The productivity of the well in the High Plains Aquifer range from 100 gallons per minute (gpm) to 2,000 gpm, with 800 to 1,200 gpm wells common.

The smaller aquifer, which extends across southern Thayer and Jefferson Counties, is an ancient alluvial paleovalley aquifer and lies below about six percent of the District's lands. Its sands and

gravels are generally less than 100 feet thick with well productivity varying from 100 gpm to 1,200 gpm. Groundwater in this small paleovalley aquifer generally flows east-northeast, with the top of the aquifer at an elevation of approximately 1,500 feet AMSL near Chester, to 1290 feet AMSL near Fairbury in Central Jefferson County.

Several areas of the District are void of adequate saturated sands and gravels for high-capacity groundwater production. These areas are dominated by windblown silts and clays, and well water is drawn from cracks and fissures in bedrock, or from the clay itself, thus providing for small capacity domestic and livestock uses.

5.6 Surface Water

5.6.1 Little Blue River Drainage Areas

The drainage area of the entire Little Blue River Basin (within Nebraska) totals 2,691 square miles, or 1,722,200 acres, and is composed of sixteen watersheds as shown in Figure 5-6. The District boundaries lie in the lower portion of the Basin and account for roughly 90 percent of the total drainage area of the Little Blue River in Nebraska. The Big Sandy Creek, Spring Creek, and Rose Creek are the largest tributaries to the Little Blue River. The Basin is bounded on the north by the Big Blue River, the west by the Platte River, and the south by the Republican River.

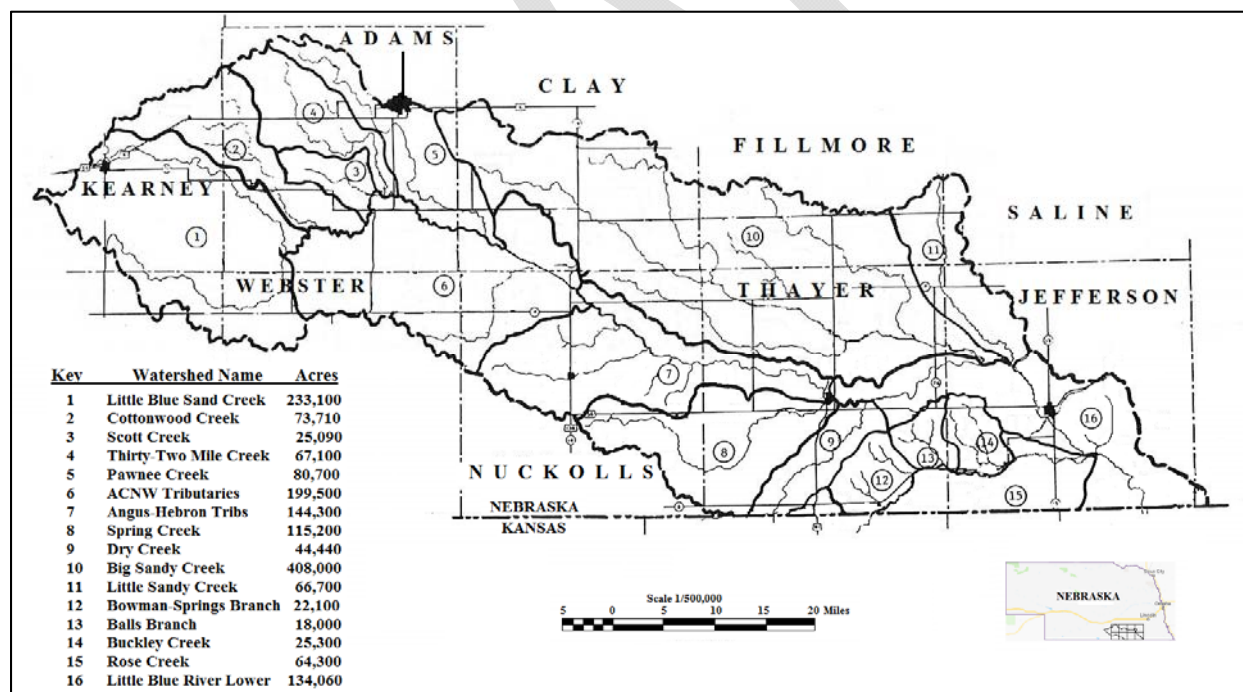


Figure 5-6: Watersheds of the Little Blue River Basin in Nebraska

5.6.2 Little Blue River Groundwater and Surface Water Connected Areas

The Little Blue River is hydrologically connected to the principal aquifer from central Adams County to its discharge point at the Kansas State Line; however, visual observations suggest that sections of the river channel are either gaining or losing from Adams County into western Thayer County. Little Blue River flows are perennial downstream of central Thayer County. Several other streams in the District are incised into streambed and intersect the groundwater table. These streams may provide intermittent or perennial flows, depending on the location and fluctuations in the groundwater table. There are no surface water diversion projects which supplement the Basin's water supply, so streamflow is dependent on precipitation and groundwater discharge.

5.6.3 Surface Water Permits Granted by the Department

The Department has granted surface water permits for both irrigation uses and storage uses, as well as one permit each for a domestic and industrial use. Nearly 550 surface water permits for irrigation have been granted in the District, but only 318 of these actually use surface water from a stream (248 permits) or lake/pond (70 permits). The other 240 "permits" are not actually surface water permits and have not been since 1980. They are groundwater irrigation collected in irrigation reuse pits, and are legally groundwater and statutorily exempt from Department regulation or administration (*Neb. Rev. Stat. §§ 46-285 to 46-287*). The reuse pits were designed to catch groundwater runoff from uphill groundwater irrigated fields due to inefficient irrigation systems in previous decades and are subject only to District regulation, if any. In all, the Department has approved nearly 21,000 acres for irrigation with surface water from a stream or river (13,771 acres) or from a lake or pond (7,225 acres). Table 5-1 and Figure 5-8 provide a table and map, respectively, of Department-granted surface water permits.

Table 5-1: Department granted surface water permits in the District

Surface Water Permits In The Little Blue NRD					
Purpose of Permit	Number of Permits/ (# that are Exempt from Water Administration)	Number of Permits Subject to Water Administration	Irrigated Acres Subject to Water Administration	Grant (cfs)	Grant (AF)
Diversion from a stream or river for irrigation	476/(228)	248	13,771	182	NA
Diversion from a lake or pond for irrigation	74/(4)	70	7,225	NA	3,889
Total Irrigation Permits	550/(232)	318	20,996	182	3,889
Storage of water in a District-owned reservoir	26/(0)	26	NA	NA	8,496
Storage of water in other publicly owned reservoirs	15(0)	15	NA	NA	753
Storage of water in a privately owned reservoir	95/(6)	89	NA	NA	3,695
Supplemental Storage	9(0)	9	NA	NA	455
Total Storage Permits	145/(6)	139	NA	NA	13,399

The Department has also granted 145 storage permits that account for a total of nearly 13,400 acre-feet of reservoir storage. More than half of this storage is for District-owned reservoirs. The largest of the District-owned reservoirs is the Bruning Dam Recreation Area, which accounts for nearly 2,000 acre-feet of surface water storage. Other recreation areas with District-held surface water permits are the Lone Star Recreation Area west of Tobias, the Prairie Lake Recreation Area near Juniata, the Buckley Creek Recreation Area near Reynolds, the Liberty Cove Recreation near Lawrence (Figure 5-7), and the Roseland Lake Recreation Area near Kenesaw. For more information about the District's recreation areas,

please see the District's website at <https://littlebluenrd.org/recreation>.



Figure 5-7: Liberty Cove Lake near Lawrence, NE

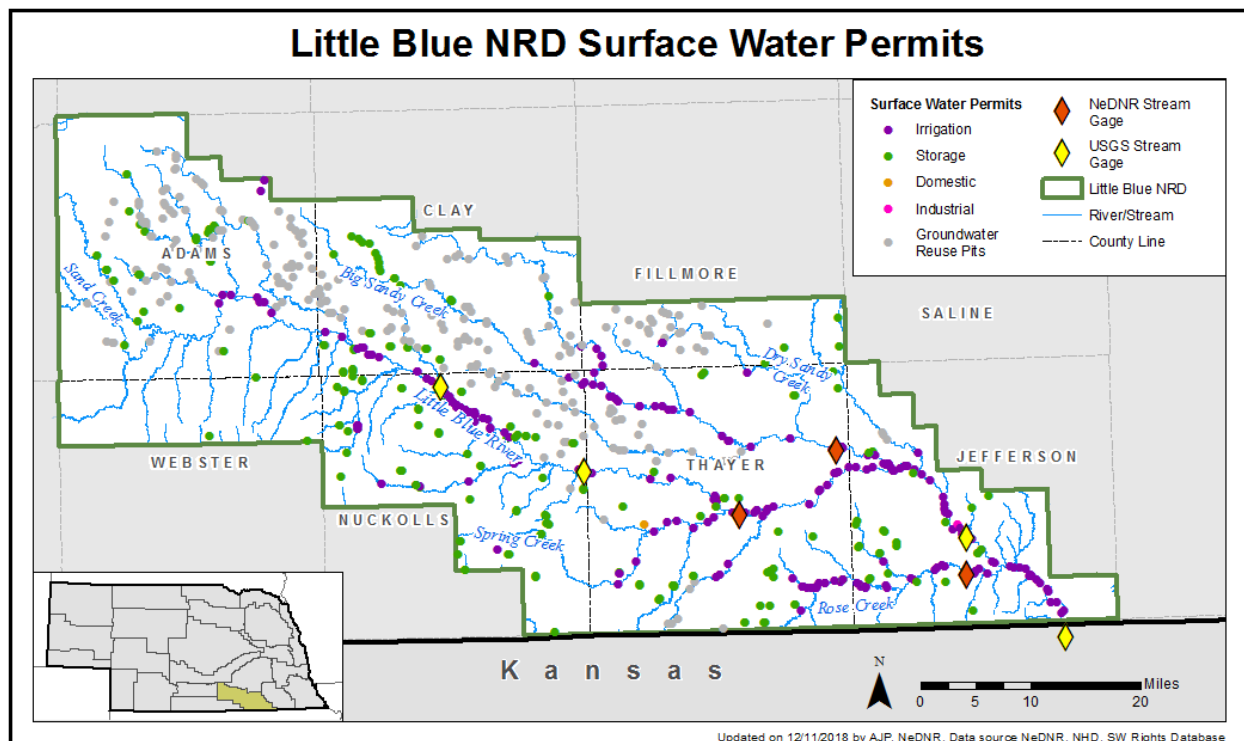


Figure 5-8: Distribution of surface water permits and stream gages in the District

5.6.4 Stream Gaging Activities

There are currently six stream gages in the District, with an additional gage located on the Little Blue River near Hollenburg, Kansas, near the Nebraska-Kansas state line (Table 2, Figure 9). Five of the gages monitor Little Blue River flows, and two gages monitor flows that contribute to the Little Blue River along Big Sandy Creek and Rose Creek. Four gages, including the Hollenburg gage, are operated by the U.S. Geological Survey and the remaining three gages are operated by the Department. Several entities contribute funds to operate and maintain the District's stream gages in addition to the District, Department and U.S. Geological Survey.

Two of the Department-operated gages were installed in 2017 to better monitor flood flows upstream of Fairbury and Hebron and further understand contributing flows along Rose Creek. The remaining Department-operated gage has been in operation since 1979, and collects streamflow data above the confluence of the Big Sandy Creek and the Little Blue River. The U.S. Geological Survey-operated Hollenburg gage has the most extensive record, beginning in 1974, and is used for administration of the Blue River Compact.

Table 5-2: Listing of stream gages in the District

Stream Gages In The Little Blue NRD				
Name of Gage	Funding Source(s)	Gage ID	Years Active	Operated By
Little Blue River near Deweese	U.S. Geological Survey	6883000	1990 to present	USGS
Little Blue River at County Line at Deshler	Little Blue NRD, Thayer and Jefferson Counties, City of Hebron, U.S. Geological Survey	6883530	2017 to present	USGS
Little Blue River at Hebron,	Little Blue NRD and the Nebraska Department of Natural Resources	6883555	2017 to present	NeDNR
Big Sandy Creek at Alexandria	Nebraska Department of Natural Resources	6883940	1979 to present	NeDNR
Little Blue River near Fairbury	U.S. Army Corp of Engineers, U.S. Geological Survey	6884000	1991 to present	USGS
Rose Creek at HWY 15 near Fairbury	Little Blue NRD and the Nebraska Department of Natural Resources	6884005	2017 to present	NeDNR
Little Blue River at Hollenburg, Kansas	U.S. Geological Survey, Big Blue River Compact Administration	6884025	1974 to present	USGS

CHAPTER 6 GOALS, OBJECTIVES, AND ACTION ITEMS

The District and Department, in consultation with the Stakeholder Advisory Committee, developed goals, objectives, and action items for this IMP. The Stakeholders also articulated several bullet points as visionary measures for the management and protection of the resources, as follows:

- Reverse groundwater declines;
- Manage water consumption to a level which allows the aquifer to stabilize and rebound naturally;
- Make sure that rules are strong enough and proactive enough to ensure that the aquifer and surface water will be sustainable for the foreseeable future, while minimizing impacts for profitability of irrigated agriculture; and
- Ensure that all management actions support efforts to comply with the Blue River Compact with Kansas.

As an initial step in the process, the following definitions were discussed and agreed upon:

- Goals are general statements of what will be accomplished;
- Objectives are incremental steps within a goal and ideally have measurable results; and
- Actions items are the specific tasks that the District and/or the Department will undertake.

Throughout the goals and objectives, the term “water supply” refers to water, both surface water and groundwater, which is available for use within the District. While this is primarily a water quantity plan due to authorities, it is recognized that water quality also plays a key role in the value of the water supply.

The goals are presented as a table; that is, one table for each goal to describe the associated objectives and action items for that goal. The responsible party (District, Department, or both) is denoted in parentheses following each action item. It should be noted that the amount of responsibility for each action item denoted as “both” may vary between action items; for example, one or the other entity may take more of a lead or handle the bulk of work. The exact make-up of responsibilities will be discussed further as a part of annual reviews.

6.1 Goal 1, Objectives and Action Items

The first goal established by the District Stakeholder Advisory Committee addresses the need for high-quality scientific data collection, thorough analysis and evaluation, and the prudent application of the data in making holistic and defensible decisions for management of the water resources.

Table 6-1: Goal 1, Objectives and Action Items

Goal 1: Better and more scientific data and methods to support wise management of interconnected groundwater and surface water	
Objectives	Action Items
1.1. Increase groundwater and surface water monitoring to build a more comprehensive database on supplies and uses	1.1.1 Improve and expand collection of groundwater and surface water levels (Both)
	1.1.2. More dedicated monitoring wells equipped with data loggers to fill data gaps (District)
	1.1.3 Acquire additional information about total groundwater and surface water withdrawals and crop water use to better understand impacts on aquifer and streamflow dynamics (Both)
	1.1.4 Continue to develop certified acres database, including information on irrigation system type (District)
	1.1.5 Implement and maintain a water use reporting and monitoring system for groundwater and surface water users (Both)
	1.1.6 Continue to assist the Department in collecting pumpage data from surface water reservoirs, from which the District has storage rights (District)
	1.1.7 Continued collection of stream gaging data to monitor streamflow (Department)
	1.1.8 Continued administration of surface water rights and monitoring of surface water use, according to State law (Department)
1.2. Improve understanding of water supplies and uses through research and studies	1.2.1. Conduct research to resolve discrepancies in aquifer mapping between the Little Blue and Tri-Basin NRDs (District)
	1.2.2 Use the best available data and science (modeling tools, data analysis, etc) to develop and/or refine a scientifically sound water budget for the Blue River Basin (Both)
	1.2.3 Use the best available data and science (modeling tools, data analysis, etc.) to refine delineations of hydrologically connected surface water and groundwater (Both)
	1.2.4. Use the best available data and science (modeling tools, data analysis, etc.) to evaluate how changes in land cover/land use affect groundwater recharge and streamflow (Both)
	1.2.5 Investigate sources and volume of groundwater recharge and discharge and changes over time (Both)

6.2 Goal 2, Objectives and Action Items

The District Stakeholder Advisory Committee's second identified goal focuses on proactive management strategies to conserve the water resources, improve efficiencies of water consumption, and eliminate waste of resources for the purpose of maintaining groundwater levels and improving natural stream health.

Table 6-2: Goal 2, Objectives and Action Items

Goal 2: Scientifically sound, locally-based management actions to protect interconnected groundwater and surface water	
Objectives	Action Items
2.1. Develop proactive management actions to improve water use efficiency, eliminate waste, and provide the best opportunities to protect stream health	2.1.1 Continue to provide technical and financial assistance to support efficient best management irrigation practices (Both)
	2.1.2 Establish groundwater management baseline and triggers which prevent further groundwater declines and, if possible, reverse the groundwater decline trend (District)
	2.1.3 Develop an allocation program which ensures aquifer sustainability and protects stream baseflows while minimizing impacts to agricultural profitability. The following allocation goals were offered for the District Board's consideration: • Establish a three-year initial allocation period which begins in 2018, • Credit each irrigated acre with a beginning balance of 3 acre-inches in a water bank account, • The bank balance remains with the property if the operator changes, • Provide an allocation of an additional 27 acre-inches per irrigated acre which could be used over a three-year allocation period at the operator's discretion, • Allow any water not used from the 27 acre-inches/year allocation to be carried forward into the next allocation period, up to a maximum of 10 acre inches per acre, • LBNRD to reassess spring water levels compared to pre-development levels every three years starting in 2021 to determine if changes in the allocation are necessary to ensure sustainability, and • LBNRD must develop controls for other water users, including municipalities, industry, confined livestock, and fish and wildlife interests. The stakeholder group approved "Water Sustainability in the Little Blue Natural Resources District" document, the basis for the above recommendations, which is attached and is considered part of the goals and objectives (District)
	2.1.4 The Department will work with the District to ensure groundwater and surface water controls are complimentary with respect to the IMP (Both)
2.2. Manage expansion of water uses	2.2.1. Support Department activities related to the Platte River Recovery Implementation Program in the Platte River Special Management Area (District)
	2.2.2 Continue to monitor the development of water uses to prevent a long-term overdraft of the Basin's water budget (Both)
	2.3.1 Investigate and develop water storage, groundwater recharge, and augmentation projects in areas where long-term groundwater level declines exist (Both)
	2.3.2 Investigate and develop cost-effective projects which capture and store storm water runoff, increase groundwater recharge, and support stream baseflow (District)
	2.3.3 Support efforts to prevent invasive species, which consume water resources (District)
2.4 Improve coordination with other entities to enable more consistent water management	2.4.1 Coordinate management actions as much as possible with Tri-Basin NRD for the Little Blue Basin (District)
	2.4.2 Share groundwater level data between other districts of the Blue River Basin (District)
	2.4.3 Conduct annual meetings with all Blue Basin Districts to share information, evaluate trends, and compare to goals (Both)
	2.4.4 Coordinate with appropriate agencies to support activities which foster and enhance water quality (Both)

6.3 Goal 3, Objectives and Action Items

The third goal of the Stakeholders recognizes that the success of everything we do is dependent on a significant public awareness and thorough understanding of the value of our water resources, the interconnectivity of groundwater and surface water, and how the relationships of these resources plays a critical role in sustaining the economic viability, social health, safety and welfare of our citizens and the environment around us.

TABLE 6-3: Goal 3, Objectives and Action Items

Goal 3: Education efforts to raise the level of awareness about finite, interconnected groundwater and surface water resources	
Objectives	Action Items
3.1. Raise level of awareness that water is a finite resource	3.1.1 Continue operator training about resources, uses, trends, and the need for conservation (District)
	3.1.2 Provide learning opportunities, training events, resources, and information to inform the public about water resources (District)
3.2. Raise level of awareness about the connectivity of groundwater and surface water	3.2.1. Jointly participate in public outreach related to integrated water management (Both)
	3.2.2. Jointly participate in public outreach to increase understanding of the Platte River New Depletions Plan (Both).
3.3 Education regarding improved efficiency of irrigation systems and management	3.3.1 Disseminate information about benefits of increased efficiency (District)
	3.3.2 Promote best management practices and new technologies which enhance irrigation efficiency (District)
3.4 Encourage the use of conservation and best management practices, which protect both surface water and groundwater quality	3.4.1 Continue to promote, implement, and enforce District groundwater quality rules (District)
	3.4.2 Educational efforts focused especially in wellhead protection areas (District)
	3.4.3 Educational efforts which focus on reducing surface water pollutants (District)

CHAPTER 7 INTEGRATED MANAGEMENT PLAN CONTROLS

This chapter describes the controls that the District and the Department have chosen to adopt as a part of this voluntary IMP. These controls were selected from the allowed controls listed in *Neb. Rev. Stat.* §§ 46-739 and 46-717 for groundwater and surface water controls, respectively. Per *Neb. Rev. Stat.* § 46-715 (4), the controls are consistent with the goals and objectives of the IMP and will protect groundwater and surface water users in hydrologically connected areas.

7.1 Groundwater Controls for the General IMP Area

The District will implement one groundwater control for the General IMP Area (whole District, see Figure 5-1) as a part of this voluntary IMP. The administrative and procedural implementation of this control is described in the District's Rules and Regulations for the Enforcement of the Groundwater Management Area, which can be obtained by contacting the District. The District groundwater control is as follows:

- A District-wide mandatory annual reporting of groundwater withdrawals by all high-capacity (greater than 50 gallons per minute) groundwater users.

7.2 Surface Water Controls for the General IMP Area

The Department will implement five surface water controls for the General IMP Area (whole District, see Figure 5-1). The first three controls were in place prior to the adoption of this IMP; the fourth and fifth controls were newly developed as a part of this IMP. The Department's surface water controls are as follows:

- The Department will continue to assess surface water irrigation appropriations in the Little Blue Basin, investigate their use, and initiate an adjudication process through preliminary determinations of non-use,
- The Department will continue to enforce Nebraska Statutes and Department Rules and Regulations, as these pertain to surface water appropriations,
- The Department will continue to evaluate proposed transfers of surface water appropriations, in accordance with Nebraska Statutes and Department Rules and Regulations,
- The Department will require metered measuring devices on all new high capacity (greater than 50 gallons per minute) surface water irrigation uses. All measuring devices shall meet Department standards for installation, accuracy, and maintenance, and
- The Department will institute mandatory reporting for all high-capacity (greater than 50 gallons per minute) surface water irrigation uses when a water availability trigger is met. The trigger is 24 average days of closure for surface water administration, between the period of July 1 and August 31. The average days of closure will be calculated using past 20-years of records for surface water administration. For more details on this trigger, please see Appendix E. The Department reserves the right to institute mandatory reporting prior to the trigger being met, if deemed appropriate.

CHAPTER 8 THE PLATTE RIVER SPECIAL MANAGEMENT AREA

8.1 Introduction

The Platte River Recovery Implementation Program (PRRIP), also known as the Platte River Program (Program), was developed by the federal government along with basin states of Nebraska, Colorado, and Wyoming and was signed in 2006. Local, state, and federal government agencies work with groups across the basin to build a framework for a long-term program that will satisfy Endangered Species Act requirements for water users in the basin. The primary focus of the Program is to enhance, restore, and protect habitat lands and flows for the endangered Whooping Crane, Piping Plover, and Pallid Sturgeon and the threatened Interior Least Tern (Figure 8-1).



Figure 8-1: The PRRIP target species (clockwise from upper left) are the Interior Least Tern, Whooping Crane, Piping Plover And Pallid Sturgeon.

The Program calls for implementation of state and federal depletions plans to mitigate, offset, or prevent any new depletion to the Platte River flows within the Program area. The Nebraska New Depletions Plan has been in place for several years and outlines procedures for the State to achieve a set baseline level of development of water use and associated river depletions. To implement this plan, new or expanded uses which result in a stream depletion need to be offset to protect river flows and improve conditions for the target species. The responsibility of implementing the Nebraska New Depletions Plan is shared between the State of Nebraska and Platte River NRDs.

Previously, lands within the District that are within the Platte River Basin were not included in that early work pertaining to the Nebraska New Depletions Plan. However, more recent and updated modeling tools have indicated that stream depletions are occurring to the Platte River from water uses in the northwestern portion of Adams County which lies within the District. As a result, the District Board has designated a special management area, termed the Platte River Special Management Area, for additional regulatory water management actions that pertain to the Nebraska New Depletions Plan.

The primary purpose of the District's regulatory actions is to prevent further streamflow depletions in the Platte River Special Management Area. Groundwater regulatory actions include a moratorium on the development of new groundwater uses through the drilling of new wells or expansion of irrigated acres, unless offsets for such new uses can be achieved. The District may grant a variance from the moratorium if an offset is provided for such new or expanded use, or if there will be no increase in consumptive use due to the new or expanded use. Offsets may be accomplished through various transfer options provided for in the District Rules and Regulations. More specifics about these management actions, as well as the Department's surface water management actions, are provided in the following sections.

8.2 Groundwater Controls for the Platte River Special Management Area

The following groundwater controls as authorized by Neb. Rev. Stat. § 46-739 will be implemented by the District in the Platte River Special Management Area. The geographic extent of this area, including the boundaries for groundwater controls, is further discussed in Chapter 5-1 (Geographic Extents of IMP Areas) and is shown in Figure 5-2. The District's Rules and Regulations will provide the mechanism by which the groundwater controls are implemented and enforced.

Moratorium on new or expanded groundwater uses. In the groundwater control area of the Platte River Special Management Area, the District will require a stay on the issuance of new high-capacity water well construction permits and on any new and expanded use of groundwater.

- **Certification of Ground Water Use.** All existing groundwater uses in the Platte River Special Management Area (groundwater controls area) are certified by the District at the time of implementation of this IMP and are therefore grandfathered in. Certified acres may not be modified unless an offset is provided for any additional consumptive use that occurs as a result of the modification.
- **Variances for new groundwater uses or modification to certified acres.** In order to prevent adverse impacts to existing groundwater or surface water users yet allow for economic viability, the District may grant a variance from the moratorium or modification to certified acres, provided one or more of the following conditions are met:
 - An offset is provided for any new, expanded, or modified use;
 - There no consumptive use increase due to the new, expanded or modified use; or
 - The District will consider the timing, location, and amount of any depletion (and associated offset) for any variance of groundwater use or modification to certified irrigated acres, as well as the State's ability to comply with interstate compacts and decrees, or other agreements. Whenever the District is making a calculation of accretion or discretion, the calculation approach must be consistent with methods used by the other NRDs under the Nebraska New Depletions Plan.
- **Required Permits.** Any person in the Platte River Special Management Area (groundwater controls area) irrigating or seeking to irrigate must first file obtain an approved permit with the District prior to:
 - Changing the use of an existing groundwater well or wells;
 - Commencing construction of any new or replacement ground water well; or
 - Modifying the existing infrastructure for the purpose of expanding the consumptive use of ground water.
 - Transfer of groundwater in accordance with any of the guidelines described in section 8.4.
- **Tracking and Reporting of the Village of Prosser's population.** At the time of the IMP writing, the Village of Prosser was the only municipality within the Platte River Special Management Area, there were no industrial uses, and no significant development was expected in the foreseeable future. As such, water use tracking for the Village of Prosser will not be required at this time. The District will, however, annually track the population using readily available data such as the U.S. Census, American Community Survey, or data collected directly

from the Village of Prosser. The District will report on the population as a part of IMP annual reviews with the Department.

- **Allocation on new municipal and industrial uses.** For purposes of compliance with the Nebraska New Depletions Plan and in accordance with *Neb. Rev. Stat. § 46-740*, the District will be required to provide an offset for any new or expanded municipal or industrial use in the Platte River Special Management Area (groundwater controls area) prior to the year 2026. Further, in accordance with *Neb. Rev. Stat. § 46-740*, starting in the year 2026, any municipality or industry that institutes a new or expanded groundwater use will be required to provide an offset for that use in excess of the amount allocated by the District.

8.3 Surface Water Controls for the Platte River Special Management Area

The following surface water controls are authorized by *Neb. Rev. Stat. § 46-716* and will implemented by the Department in accordance with the Department's Rules [Nebraska Administrative Code (N.A.C.) Title 457]. The geographic area of the surface water controls is the portion of the Platte River Basin within the District, and is shown in Figure 5-2:

- **Surface Water Use Moratorium.** The Department will continue the moratorium on new surface water appropriations in the Platte River Special Management Area (surface water controls area).
- **Variances for New Surface Water Appropriations.** Any person wanting to apply for a new surface water appropriation within the Platte River Special Management Area (surface water controls area) must file a petition requesting leave to file an application in accordance with Chapter 23 of the Department's Rules (457 N.A.C. 23).

8.4 Groundwater Transfer Guidelines for the Platte River Special Management Area

The following section overviews guidelines for various types of groundwater transfers in the Platte River Special Management Area.

8.4.1 General guidelines for groundwater transfers

The purpose of a groundwater transfer is to allow for the consumptive use of groundwater to be changed either in location or purpose. The District may permit, regulate, or take action on the following types of groundwater transfers:

- Physical transfer of groundwater off of the overlying land to an adjacent quarter section within the Platte River,
- Transfer of the type of use or addition of use,
- Transfer of certified irrigated acres,
- Physical transfer of groundwater and transfers of certified irrigated acres between the District's integrated management area and an adjoining NRD,
- Municipal transfers, if the applicant does not have a municipal transfer permit from the Department,

- Industrial transfers, if the applicant does not have an industrial municipal transfer permit from the Department, and
- Out-of-state transfers.

A transfer permit from the District shall be required before any transfer as identified in the above bullets is allowed. The District will consider the timing, location, and amount of any depletion (and associated offset) for transfer, as well as the State's ability to comply with interstate compacts and decrees, or other agreements. Whenever the District is making a calculation of accretion or depletion, the calculation approach must be consistent with methods used by the other NRDs under the Nebraska New Depletions Plan.

8.4.2 Guidelines for municipal, industrial and out-of-state groundwater transfers

- **Municipal Transfer Permits.** Transfers without a municipal and rural domestic transfer permit from the Department will require a transfer permit from the District.
- **Industrial Transfer Permits.** Transfers without an industrial transfer permit from the Department will require a transfer permit from the District. Industrial groundwater transfers off of overlying land are mandatory under the Industrial Ground Water Regulatory Act (*Neb. Rev. Stat.* §§ 46-675 through 46-690).
- **Out-of-state transfers.**
 - Any proposed transfer that that would result in withdrawal of groundwater in the State of Nebraska and transportation for use in another state shall apply to the Department for a permit to do so, pursuant to *Neb. Rev. Stat.* § 46-613.01;
 - As established in the Department's procedures, the Department will consult with the District when considering applications filed to transfer groundwater out-of-state; and
 - A water well construction permit shall not be issued unless and until the District has granted a variance to the moratorium on the issuance of water well construction permits and the Department has approved the transfer permit.

CHAPTER 9 MONITORING PLAN

Per *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 and evaluate effectiveness of the IMP, as well as increase understanding of the hydrologically connected groundwater system. For clear and transparent procedures on how the monitoring plan will function, refer to the Rules and Regulations. As such, the District and the Department have agreed to complete and report on the following actions.

9.1 Track and Report Groundwater Uses

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

- Groundwater level measurements,
- Certification of groundwater uses and any changes to these certifications,
- Municipal, commercial, and industrial annual water uses,

- Irrigation water use data acquired mandatorily or voluntarily by the District, such as metered high-capacity well flow data,
- Water well construction permits issued,
- The number of well permits denied,
- Variances granted by the District and/or the Department that allow an action contrary to an existing rule or regulation, including the purpose, the location, the length of time for which the variance is applicable, and the reasoning behind approval of the variance, and
- 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.

9.2 Track and Report Surface Water Uses

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

- Continue existing stream gaging in the District and look for new opportunities to enhance the stream gage network;
- 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;
- Continue to map and track surface water irrigated acres, and require project maps be submitted and approved prior to obtaining a surface water permit;
- Continued implementation of the voluntary reporting program for surface water irrigation diversions. The reports will include information about the quantity of water pumped, the acres irrigated, and the type of irrigation system (gravity, pivot, etc.) used;
- Continue to evaluate the necessity for mandatory installation of water flow meters on all existing surface water pumps for irrigation, industrial, and municipal uses;
- Continue to evaluate the necessity for mandatory surface water reporting on all existing surface water uses for irrigation, industrial, and municipal uses;
- Continue to implement rules pertaining to transfers of surface water rights according to *Neb. Rev. Stat.* §§ 46-290 to 46-294.04. Should a moratorium be placed on new surface water appropriations in the District, the Department may grant a variance from the moratorium on a case-by-case basis, following the Department rules and regulations; and
- The Department's methodology to assess the available supplies and uses will be used to track depletions and gains to streamflow from changes in availability and use (see paragraph below).

The Department has developed a methodology, in conjunction with several NRDs across the state, to quantitatively assess the hydrologically connected groundwater and surface water balance over time. 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 District and the Department.

The District and the Department will jointly evaluate annually submitted data and information for accuracy and completeness, and from this will identify data or information that requires further review.

In addition, the District and the Department will 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 and perform analyses to determine the impacts of new water uses on existing water users within the District.

9.3 Increase Understanding of Hydrologically Connected Groundwater

The District is participating with the Upper Big Blue, Lower Big Blue, Tri-Basin NRDs and the Department to develop a Blue Basin Groundwater Model. The model is intended to:

- Refine the delineations of hydrologically connected waters of the Blue River Basin;
- Simulate groundwater level changes and their impacts on stream baseflow and assess potential streamflow depletions, both spatially and temporally;
- Support the Department's evaluation of the appropriation status of the Blue River Basin and other management decisions related to how groundwater pumping impacts streamflows; and
- Provide a platform and datasets representing the best available data for evaluation of local-scale water issues.

Although not all inclusive, water issues which may be addressed through the modeling effort include:

- Potential impacts of additional groundwater development to the localized area;
- Questions about the nature and timing of static groundwater level impacts in certain areas related to declines in other areas;
- Impacts to streamflows and the aquifer from developing additional acres under current usage;
- Determining offset requirements for potential large water users; and
- Determining how much additional development can be allowed, and in what areas.

The District and Department will investigate additional research or modeling needs as conditions dictate.

CHAPTER 10 FUNDING OPTIONS

Many of the identified goals, objectives, and action items will be implemented utilizing existing staff time and funding sources. There will be occasions when alternative funding sources will be necessary to move forward with identified action items, in either the primary or long-term goals of this voluntary IMP. Sources of alternative funding that could be utilized include the Natural Resource Conservation Service (NRCS), Nebraska Department of Environmental Quality (NDEQ), Nebraska Environmental Trust (NET), NE Game and Parks Commission (NGPC), Bureau of Reclamation (BOR), the Natural Resources Commission, and others. Synopses of the general criteria and applicability of several funding resources are provided below. It should be noted that information presented here is subject to change as funding sources may change their terms and criteria, or as new funding sources become available.

10.1 Federal Funding Options

Natural Resource Conservation Service (NRCS)

- *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 Security 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 encourage them to do more.
- *Wildlife Habitat Incentives Program (WHIP)*. Through WHIP, technical and financial assistance is provided to landowners and others to develop and improve wildlife habitat on private lands.
- *Wetlands Reserve Program (WRP)*. Eligible landowners may receive technical and financial assistance through the WRP to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands.
- *Grassland Reserve Program (GRP)*. This program emphasizes support for grazing operations, plant and animal biodiversity, and grassland and land containing shrubs and forbs under the greatest threat of conservation.
- *Farm and Ranch Lands Protection Program (FRPP)*. The program is designed to help farmers and ranchers keep their land in agriculture. It provides matching funds to State, Tribal, or local governments and non-governmental organizations with existing farm and ranch land protection programs to purchase conservation easements.
- *Resource Conservation and Development (RC&D)*. Nebraska's RC&D areas assist communities by promoting conservation, development, and use of natural resources; improving the general level of economic activity; and enhancing the environmental standard of living for residents of those communities.

Bureau of Reclamation (BOR)

- *WaterSMART Program*. The BOR's WaterSMART program is focused on improving water conservation and helping water and resource managers make wise decisions about water use. This is achieved through administration of grants, scientific studies, technical assistance, and scientific expertise.

10.2 State Funding Options

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 acts to conserve nongame species and species determined to be endangered or threatened for human enjoyment, scientific purposes, and to ensure their continued existence as a part of our natural world.

Nebraska Resources Commission

- *Water Well Decommissioning Fund.* The objective of the Water Well Decommissioning Fund is to encourage proper decommissioning of illegal 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.
- *Natural Resources Water Quality Fund.* This fund was created to provide State funds to natural resources districts for their water quality programs.
- *Water Sustainability Fund.* LB 1098 was signed into law during the 2014 Legislative Session. This bill created the Water Sustainability Fund, which provides cost-share assistance and can be used to address multiple water management and quality issues across the State of Nebraska. Funding may be applied for projects that develop and enhance flood reduction, improve water use efficiency, improve water quality, help comply with existing compacts and interstate agreements, achieve water supply management goals of the State and/or local units of government, as well as many other uses related to Nebraska water. To be eligible to apply for a Water Sustainability Fund grant, NRDs must have an approved IMP or be in the process of developing an IMP.

Nebraska Environmental Trust

- The Nebraska Environmental Trust (NET) is funded from the proceeds of the Nebraska Lottery. Each year, grants are awarded to applications for various projects focused on the conservation, enhancement, and preservation of natural resources, including surface water and groundwater. The District and/or Department may apply for NET funds when suitable projects or studies associated with this plan warrant it.

10.3 Local Funding Options

Most of the identified goals, objectives, and action items will be implemented utilizing existing staff and financial resources. Occasionally, alternate funding sources will be tapped to assure that identified action items can be accomplished. Funding sources available to the District include:

- *General NRD Taxing Authorities.* The NRDs have been given broad taxing authority under *Neb. Rev. Stat. § 2-3225* to accomplish various natural resources and water management objectives. Section § 2-3226 also identifies an additional funding option available to NRDs through the issuance of revenue bonds for the purpose of financing the construction of authorized facilities. Repayment of such bonds may be accomplished by funds granted by the State or federal government, the occupation tax, or the general levy authority of the District.

Following the protocol and hearings outlined in statutes, an occupation tax would only be used if other funding options available to the District are insufficient to address the resources problem.

- *Statutory Taxing Authorities.* Other funding sources may become available to the District or Department in the future. Such sources will be evaluated and utilized when appropriate and feasible to accomplish actions identified in the IMP.

CHAPTER 11 INFORMATION CONSIDERED

Information used in the preparation of this IMP and to be used in the subsequent implementation of this IMP, can be found in the following:

- Nebraska Ground Water Management and Protection Act,
- The Department's Rules for Surface Water,
- Department and USGS stream gage records,
- Department's registered wells database,
- Department's INSIGHT web tool,
- Department's surface water administrative records,
- District's Groundwater Management Plan,
- District's Rules and Regulations,
- Department's Blue Basin Model,
- Stakeholder Involvement Plan for this voluntary IMP,
- Platte River Recovery and Implementation Program materials,
- Nebraska New Depletions Plan, and
- Other District data sources (ex: well records, groundwater supplies and uses, data on recharge rates, climate or precipitation trend records, land use data, and/ or District studies).

CHAPTER 12 REVIEW PROCESS AND MODIFICATIONS

The IMP implementation utilizes an adaptive management approach. Thus, it is a work in progress for attaining or maintaining the desired balance of the hydrologic system. As an affected area or subarea of the District changes or more data become available, the IMP implementation may be reassessed and modified to accommodate changing circumstances such as hydrology, economics, water demands, and supplies.

The District and Department will hold an annual review to evaluate the IMP. Action items undertaken by the District and Department will be reviewed to determine if these items are fulfilling the goals and objectives of the IMP. The District and Department will jointly determine if amendments to the IMP are necessary and will require an agreement by both parties, in consultation with the Stakeholder Advisory Committee. If amendments to the IMP are necessary, the District and Department will hold a joint hearing and issue the pertinent orders to formally adopt the revised IMP.

APPENDIX A.

APPENDIX A GLOSSARY OF TERMS

Term	Definition
Accretion	Addition to streamflow that results from an offset/mitigation action or project.
Acre-foot (AF)	Volume of water required to cover 1 acre of land to a depth of 1 foot (43,560 cubic feet), equivalent to 325,851 gallons
Action Item	A specific task that the District or Department (or both) will undertake to achieve the goals and objectives of the Integrated Management Plan.
Appropriation	A permit granted by the Department to use surface water for a beneficial use in a specific amount, purpose and location, and is based on first-in-time, first-in-right
Aquifer	A geological formation or structure of permeable rock or unconsolidated materials that stores and/or transmits water, such as to wells and springs
Beneficial Use	That use by which water may be put to use to the benefit of humans or other species
Certified Acres	Lands identified and registered with the District greater than one acre which has water applied for irrigation
Consumptive Use	The amount of water that is consumed under efficient practices, which satisfies the appropriation without waste. The amount of water removed from available supplies without return to a water resources system
Cubic Feet Per Second (CFS)	The rate of discharge representing a volume of one cubic foot passing a given point during one second. It is equivalent to 7.48 gallons per second, or 448.8 gallons per minute.
Department	The Nebraska Department of Natural Resources
Depletion	Reduction to streamflow that results from a new use of either groundwater or surface water
District	The Little Blue River Natural Resources District. A political subdivision of the State responsible for protection and management of the natural resources within the boundaries of the district

Fully Appropriated	From 46-713, subsection (3): A river basin, subbasin, or reach shall be deemed fully appropriated if the department determines, based upon its evaluation conducted pursuant to subsection (1) of this section and information presented at the hearing pursuant to subsection (4) of section 46-714, that then current uses of hydrologically connected surface water and groundwater 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
Gallons Per Minute (GPM)	The rate at which water can be pumped from a well
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
Hydrologically Connected	A geographic area where groundwater and surface water are interconnected and withdrawals of one source may influence the availability of the other. In Nebraska Statutes, hydrologically connected waters are those where deep well pumpage over a 50-year period will deplete stream flows by 10 percent of the amount pumped over that time
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 the Department, U.S. Geological Survey, U.S. Bureau of Reclamation, and local natural resources districts and presented in charts for the following categories: water supplies, water demands, nature and extent of use, and water balance. These 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
Integrated Management Plan (IMP)	A plan cooperatively developed by the Department and District for the purpose of managing a river basin, subbasin, or reach to achieve and sustain a balance between groundwater and surface water uses and water supplies for the long term.
Invasive Species	Introduces flora and fauna species that adversely affect the habitats and bioregions they invade economically, environmentally, and/or ecologically

Irrigation	The artificial application of water to promote the growth of vegetation
Irrigation Well	A well that provides water for purposes of irrigation for more than two acres of crops and other plants
LB 1098	A bill passed by the Nebraska Legislature in 2014 with many functions; one of which created the Water Sustainability Fund.
LB 962	A bill passed by Nebraska Legislature in 2004 that allows leases of surface water, changes administration of surface water rights, establishes a proactive approach to the integrated management of hydrologically connected groundwater and surface water, and creates funds to direct money towards data gathering, research, conservation and implementation of integrated management plans in fully and overappropriated basins.
Moratorium	A legally authorized suspension of drilling of groundwater wells or approval of new surface water appropriations
NDEQ	The Nebraska Department of Environmental Quality
NNDP	Nebraska New Depletions Plan. The plan, in accordance with PRRIP, describes the actions taken to prevent or mitigate for new depletions to target streamflows, to the extent those new depletions are caused by uses begun or expanded on or after July 1, 1997. Responsibility for implementing the plan is shared between the State of Nebraska and the Platte River Natural Resources Districts
Offset	A reduction in water use that corresponds with an increased use of water. An offset may be used as a management strategy to balance uses and supplies. The offset will have a corresponding amount, time, and location. Also referred to as mitigation
PRRIP	Platte River Recovery Implementation Program, also known as the Platte River Program. Developed by the federal government, along with basin states of Nebraska, Colorado, and Wyoming and signed in 2006. Local, state, and federal government agencies work with groups across the basin to build a framework for a long-term program that will satisfy Endangered Species Act requirements for water users in the basin. The primary focus of the Program is to enhance, restore, and protect habitat lands for the endangered whooping crane, piping plover, least tern, and pallid sturgeon
Recharge	A hydrologic process where water moves downward from surface water to groundwater, both naturally through the hydrologic cycle or through intentional practices
Stakeholder Advisory Committee	Representatives of various interest groups and professional fields who provided comments and suggestions on various aspects of the Integrated Management Plan

Storage	The capture and holding of water in natural or man-made structures for subsequent use for various purposes
Streamflow	The discharge that occurs in a natural channel of a surface stream course
Surface Water	The capture and holding of water in above-ground man-made structures, or below ground in geologic strata for subsequent use for various purposes
Transfer	To allow for the historic consumptive use of water to be changed, in location and/ or purpose. Impacts of a transfer may include an increase in depletions to the river or an impact to existing surface water or groundwater uses
Use	The legally accepted use of a well or water appropriation
USGS	United States Geological Survey
Water Bank	A mechanism used to facilitate the transfer of water between parties, often using market-driven transactions. Water banks can be institutional, physical, or mixtures of both
Watershed	An area of land where all of the water that falls in it and drains off of it goes to a common outlet

APPENDIX B.

APPENDIX B LETTERS INITIATING THE IMP PROCESS

DRAFT



"Serving The Public Since 1972"

July 30, 2015

Jim Schnieder, Acting Director
Nebraska Department of Natural Resources
100 Centennial Mall South, 4th Floor
P. O. Box 94676
Lincoln, NE 68509-4676

RECEIVED

AUG 03 2015

DEPARTMENT OF
NATURAL RESOURCES

RE: Voluntary Integrated Management Plan

Dear Jim:

The Little Blue NRD Board of Directors took action on June 9, 2015 to request the initiation of a voluntary integrated management plan for our district in accordance with State Statute 46-715(b). This letter will serve as notice of our intent to enter into the formal process for development of the voluntary IMP with the Nebraska Department of Natural Resources. We understand that this will be a joint planning effort between the Department and the Little Blue NRD, 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.

The District has already given notice of our action to the Tri-Basin NRD Board of Directors and anticipate that we may coordinate the planning process with their district because of our shared interest in the water resources of the Blue River Basin.

We look forward to meeting with you soon to kick off the effort and discuss the next steps for the VIMP process.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Onnen", is written over a horizontal line.

Michael Onnen
Manager

cc. Dean Edson
Dustin Wilcox
John Thorburn

P.O. Box 100
Davenport, NE 68335
E-mail: monnen@littlebluenrd.org

"Protecting Lives, Protecting Property, Protecting the Future"

Phone: (402) 364-2145

Fax: (402) 364-2484

<http://www.littlebluenrd.org>



Pete Ricketts
Governor

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
Gordon W. "Jeff" Fassett, P.E.
Director

August 20, 2015

IN REPLY TO:

Michael Onnen, General Manager
Little Blue Natural Resources District
P.O. Box 100
Davenport, NE 68335

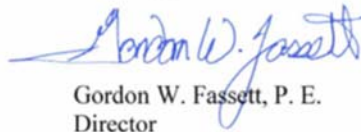
Dear Mr. Onnen,

Thank you for informing us of your intent to jointly develop a Voluntary Integrated Management Plan (IMP). The Department appreciates this opportunity to work collaboratively with the District in proactive management of our water resources. Our past experience with other natural resource districts indicates that it would be beneficial to discuss your District's overarching goals early in the process to ensure that we lay a solid foundation for our joint planning efforts.

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 developing 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 W. Fassett, P. E.
Director

cc: Charles Rainforth, Chairman

APPENDIX C.

APPENDIX C PUBLIC INVOLVEMENT PROCESS SUMMARY

C.1 Background

The public involvement process for the joint Little Blue Natural Resources District's (District) and Nebraska Department of Natural Resources (Department) voluntary Integrated Management Plan (IMP) was designed to incorporate broad stakeholder values, interests, future needs and priorities, and raise awareness to encourage broad community support for water management within the basin. Facilitated by JEO Consulting Group (Facilitator), the public involvement process was guided by the principles of the International Association for Public Participation's spectrum of public participation. This document, much of which was provided by the Facilitator, summarizes the public involvement process during the development of the voluntary IMP.

The District stakeholder process was coordinated with the Tri-Basin NRD (TBNRD) stakeholder process. Each NRD developed individual voluntary IMPs with the Department, for their respective portion of the Little Blue River Basin. While a "basin-wide plan" was not required, the two districts recognized the value of coordinating water management discussions and activities regarding their shared Little Blue River Basin. As such, the two NRDs developed and conducted their public involvement processes concurrently to encompass broad stakeholder values, interests, future needs, and priorities. The concurrent effort also helped to raise awareness and encourage community support for water management within the shared Little Blue River Basin.

C.2 Formation of stakeholder group

The Stakeholder Advisory Committee was formed through local solicitations and nominations. The District Board and Department felt it was important that anyone who wanted to serve should be included. The District submitted a news release in February 2016 to several area newspapers seeking interested persons to serve on the Stakeholder Advisory Committee. In addition, the District sent out letters to individuals who were nominated as potential members of the Advisory Committee through District contacts to solicit their input and provide diversity to the stakeholder group. In all, forty names were brought forward for consideration and twenty-two individuals indicated a willingness to serve on the Stakeholder Advisory Committee. The Stakeholder Advisory Committee included diverse representation from agriculture, well drillers, public power producers, industry/business, recreation, environmental groups, and educators. A complete listing of stakeholders is provided in the following table.

Little Blue NRD Stakeholder Committee				
First Name	Last Name	Business Name	City	State
Tim	Alfs		Shickley	NE
Mike	Allen	Mary Lanning	Ayr	NE
Rex	Biegert		Shickley	NE
Larry	Consbruck		Juniata	NE
Kerwin	Elting		Edgar	NE
Dave	Endorf		Daykin	NE
Chris	Fangmeier	City of Hebron	Hebron	NE
Clay	Fisher		Clay Center	NE
Russell	Hinds		Davenport	NE
Richard	Kahman		Fairfield	NE
Gary	Kubicek		Oak	NE
Sasha	Lemke	Southeast Valley Irrigation	Bruning	NE
Terry	Madson		Nelson	NE
Tom	McKinney		Juniata	NE
Russ	Ochsner		Roseland	NE
Phil	Odom		Hastings	NE
Drew	Onnen		Hebron	NE
Kevin	Pohlmeier		Lawrence	NE
Tom	Posey	Tom Posey Real Estate	Hebron	NE
Marty	Stange		Hastings	NE
Jesse	VonSpreckelsen		Clay Center	NE
Tim	Waterbury		Blue Hill	NE

C.3 Stakeholder Meeting Overviews

C.3.1 Stakeholder Meeting #1 (joint with Tri-Basin NRD): March 29, 2016

As previously mentioned, while a basin-wide plan was not required, the two Little Blue NRDs (NRDs) saw the value of coordinating water management discussions and activities. As such, the first Stakeholder Advisory Committee meeting was a joint meeting held on March 29, 2016, from 6:30-8:30 p.m. at the Adams County Fairgrounds in Hastings, NE (Figure C-1). A total of 51 people attended the meeting: 20 District stakeholders, 15 TBNRD stakeholders, and 16 members of the public. There were also 11 members of the project team in attendance. The purpose of the meeting was to provide stakeholders an overview of the project and begin identifying stakeholder-identified basin issues and values.

The meeting began with the Facilitator welcoming stakeholders and providing an overview of the meeting agenda. This was followed by the District and TBNRD General Managers each providing a brief overview of their respective district. This overview included district boundaries, geologic information, and groundwater data. The Department then gave a presentation about integrated water management, which addressed the purpose of integrated water management planning, what it means to develop a voluntary IMP, the roles of the Department, NRDs, and stakeholders in the process, and an outline of voluntary IMP components.

Following these presentations, the Facilitator spoke to the public involvement process. The Facilitator clarified that each NRD has its own Stakeholder Advisory Committee. Through the development of goals and objectives, the Stakeholder Advisory Committees would meet five times: jointly three times and individually two times. All the meetings would be open to the public. In addition to these meetings, stakeholders would be asked to complete a 30-minute, one-on-one meeting with the Facilitator so that all stakeholder issues, concerns, and values could be factored

into development of goals and objectives.

The Facilitator then led the stakeholders through a discussion to begin identifying and discussing water issues and values within the Little Blue River Basin. Through this discussion, several recurring themes or topics emerged, including, but not limited to:

- The difference between the two NRDs' rules,
- The need to ensure water for future generations,
- Ensuring all water users (agriculture, recreation, municipal, etc.) are represented in the IMP process,
- The importance of maintaining (or improving) water quantity and quality,
- Frustration with water “abusers”, and
- Specific areas (i.e., May Township) bearing consequences of a comprehensive, basin-wide issue.

At the conclusion of the meeting, stakeholders were asked to verify their contact information and interest in serving as a stakeholder. The Facilitator would use that information to arrange and conduct one-on-one meetings, after which a Stakeholder Advisory Committee meeting would be held for each district in May 2016.



C.3.2 One-on-One Stakeholder Meetings: April-May 2016

Between April 22 and May 4, 2016, the Facilitator conducted 39 one-on-one meetings with individuals of the District and TBNRD Stakeholder Advisory Committees. The Facilitator asked the same 10 questions to each of the 22 District and 17 TBNRD stakeholders. The purpose of these meetings was to provide an opportunity for every stakeholder to express their individual thoughts and concerns about the voluntary IMP project and process. The feedback received from this meeting would be used to inform future Stakeholder Advisory Committee meeting dialogues.

The Facilitator's biggest takeaway from these meetings was that the stakeholders of both NRDs have more common ground than anyone could have imagined after the first joint stakeholder meeting. While most everyone agreed something needs done about the overall sustainability of water supplies in the Little Blue River Basin, it also became clear the stakeholders are seeing a different “picture” of what's happening in the basin. The aggregated notes from these meetings also helped identify what type of technical information and education efforts should supplement the public involvement process.

C.3.3 Stakeholder Meeting #2: May 19, 2016

The second Stakeholder Advisory Committee meeting was held on May 19, 2016 from 7-9 pm at the Davenport Community Center in Davenport, NE. This was an individual stakeholder meeting for District stakeholders only. 18 of the district's 22 stakeholders were in attendance, along with seven members of the public. The focus of this meeting was to establish ground rules and a charter for the Stakeholder Advisory Committee before providing background information, such as technical concepts regarding groundwater, surface water, and the voluntary IMP planning process.

The meeting started with the Facilitator reviewing the results of the one-on-one meetings conducted with each member of both the NRDs' stakeholder advisory committees. The review focused on the common ground the Facilitator had observed between the stakeholders of each NRD. The Facilitator then moved on to establishing ground rules for the Stakeholder Advisory Committee. The Stakeholder Advisory Committee decided that, for future meetings, a majority vote would be 2/3 of the committee in attendance. The Stakeholder Advisory Committee then reviewed, modified, and approved a charter to be used to guide the stakeholder process.



Following the adoption of the charter, technical staff from JEO Consulting Group gave a brief overview of technical concepts as they related to integrated water management. The presentation included clarifying common misconceptions identified in the notes from one-on-one meetings, definitions of technical terms to establish correct and consistent terminology among stakeholders, and a high-level discussion of geology and groundwater. The Stakeholder Advisory Committee was also provided a list of recommended resources for future reference.

The Department then gave a presentation describing a voluntary IMP process. This presentation included details about the purpose of integrated management planning, described the roles of the Department, District, and Stakeholder Advisory Committee in the process, as well as outlined the components of a voluntary IMP. This presentation led into a discussion of what stakeholders wanted to accomplish with this voluntary IMP. The meeting concluded after each stakeholder was given an opportunity, as well as the public, to share their final thoughts from the meeting.

C.3.4 Stakeholder Meeting #3: September 15, 2016

The third Stakeholder Advisory Committee meeting was held for the District stakeholders only on September 15, 2016, from 6:30-8:30 p.m. at the Davenport Community Center in Davenport, NE. Eighteen of the district's 22 stakeholders were in attendance, along with twelve members of the public. The focus of this meeting was to continue discussing technical concepts relevant to integrated water management, as well as begin discussing goals and objectives for the voluntary IMP. Stakeholders were also provided a list of rough draft goals developed by the Facilitator during the review and analysis of one-on-one meeting notes and first stakeholder meeting minutes.

To begin the meeting, the District's General Manager provided stakeholders with a brief update about the District's summer activities and progress. This district update was followed by a technical presentation from JEO Consulting Group, which was developed to answer many of the technical questions posed by stakeholders during the one-on-one meetings. The presentation included maps and an overview of groundwater levels and drought conditions in the District. The presentation also addressed a variety of key technical concepts, including saturated thickness,

transmissivity, hydrologically connected waters, water balance, and the cone of depression, as it relates to pumping wells. The Department followed up this technical presentation with a review of integrated water management and a packet of relevant information.

A group of stakeholders then shared the findings of the research they had done since the last meeting. They also provided and reviewed a “Water Sustainability in the Little Blue NRD” document that included a proposal for an allocation program. The general premise of the proposal was based on 84.9 percent of the irrigated land in the district currently being irrigated with 9 acre-inches or less. Therefore, the group of stakeholders proposed an allocation plan that provides a 3-acre-inch starting bank account for all irrigators and allows for 9 acre-inches per year per irrigated acre, or a total of 27 acre-inches over the course of three years. After discussion, a motion was made and passed by a 2/3’s vote that the Stakeholder Advisory Committee adopt the district-wide allocation presentation as presented, and recommend this as a part of the IMP process, and that all supportive material be forwarded to the District’s Board of Directors. The stakeholder document and supporting materials are provided as Appendix D of the IMP, and the stakeholder recommendations for specific allocations are included in Goal 2 of the IMP.

At the end of the meeting, it was agreed upon that the Department and District would take the draft goals list, which was a mix of goals and objectives, and separate it into a more defined list of goals and objectives that the stakeholder could review at the next meeting. It was also decided that the group would hold off on a second meeting with the TBNRD stakeholders until they had more clearly defined goals and objectives.

C.3.5 Stakeholder Meeting #4: December 5, 2016

The fourth Stakeholder Advisory Committee meeting was held for the District stakeholders only on December 5, 2016, from 6:30-9:20 p.m. at the Davenport Community Center in Davenport, NE. Fifteen of the district’s 22 stakeholders were in attendance, along with seven members of the public. The focus of this meeting was to review, discuss, and revise the draft goals and objectives prepared, with the Stakeholder Advisory Committee’s permission, by the Department and District General Manager, using the goals and objectives identified during previous group and individual stakeholder meetings. While reviewing and revising the draft goals and objectives, there were several topics that evoked substantial discussion from stakeholders, including:

- The importance, or lack thereof, of including the definition of sustainability in the goals and objectives;
- Stakeholder perspectives on whether surface water reporting should be voluntary or mandatory;
- Where, if at all, the 9” allocation plan passed in previous meeting could be incorporated;
- Whether water waste can be eliminated without hindering use; and
- Whether “rules apply across the district” and “address subareas based on specific conditions” are conflicting goals.

Also, during the meeting, a motion was made to disregard the 9” allocation proposal passed during the second District Stakeholder Advisory Committee. The motion failed as it did not achieve the 2/3’s vote. The meeting adjourned with the understanding that the District Stakeholder Advisory Committee would be convened at a later date so it could finalize its goals and objectives.

C.3.6 Stakeholder Meeting #5: March 20, 2017

The fifth Stakeholder Advisory Committee meeting was held for the District stakeholders only on March 20, 2017, from 7-9 p.m. at the Davenport Community Center in Davenport, NE. Fourteen of the district’s 22 stakeholders were in attendance, along with five members of the public. The focus of this meeting was to continue discussing and revising the Stakeholder Advisory Committee’s draft goals and objectives. During the review of the Stakeholder

Advisory Committee's goals and objectives, there were several points of discussion including, but not limited to:

- Interest in surface water meters, in terms of water usage monitoring and allocations,
- Clarification of what and who defines "best available science and data",
- Allocations and triggers,
- Whether to be specific or broad in goals and objectives, and
- A general lack of interest in meeting with the TBNRD Stakeholder Advisory Committee.

Throughout the meeting, stakeholders indicated that they still needed more information from the Department. Stakeholders also wanted to see the results of the District's Board of Directors' upcoming discussions and decisions regarding the District's groundwater management plan. At the end of the meeting, it was agreed upon that the Department would work to address the identified information requests and the Stakeholder Advisory Committee would be reconvened once the District's Board of Directors took definitive action on the groundwater management plan.

C.3.7 Stakeholder Meeting #6: November 16, 2017

The sixth Stakeholder Advisory Committee meeting was held for the District stakeholders only on November 16, 2017, from 6-9 p.m. at the Davenport Community Center in Davenport, NE. Seventeen of the district's 22 stakeholders were in attendance, along with six members of the public. The focus of this meeting was to complete a final review and ratification of the Stakeholder Advisory Committee's goals and objectives for the voluntary IMP.

The meeting started with a presentation from the Department about the Water Administration Division, which is responsible for surface water monitoring and administration in Nebraska. The District's General Manager then provided an update on the District's groundwater management plan, including details about sub-areas and allocation parameters.

During the review of the Stakeholder Advisory Committee's goals and objectives, most of the discussion was about the specificity of some of the goals and objectives. Stakeholders debated whether these specific goals and objectives should be removed, relocated, or rephrased as examples for consideration. Ultimately, the Stakeholder Advisory Committee decided to add a line stating, "The following allocation goals are offered for District Board consideration." The Stakeholder Advisory Committee also voted to approve the incorporation of a support statement related to the Nebraska New Depletions Plan for the Platte River Recovery Implementation Program.

With no additional discussion or changes to the Stakeholder Advisory Committee's draft goals and objectives, the Department provided an overview of next steps. The meeting adjourned with an understanding that the Facilitator would provide a clean draft of the Stakeholder Advisory Committee's goals and objectives, and the District would provide the stakeholders with relevant updates as the plan is written, opened to public review and comment, and undergoes a public hearing for adoption.

C.3.8 Stakeholder Meeting #7 (joint with Tri-Basin NRD): November 19, 2018

The seventh and final Stakeholder Advisory Committee meeting was held as a joint meeting for the combined District and TBNRD stakeholder groups. The meeting took place on December 19, 2018, from 6:30-9:15 p.m. at the Adams County Fairgrounds in Hastings, NE. The meeting was attended by eight stakeholders and five board members from the District, two stakeholders and three board members of the TBNRD, five members of the public and five members of the project team. The objectives of the meeting were to 1) provide a general overview of current conditions in each NRD and any changes in rules and regulations relevant to groundwater management, 2) review and compare the District's and TBNRD's goals and objectives developed through the voluntary IMP process, 3) provide opportunity for discussion, comments, and questions of the goals and objectives, and 4) discuss next steps to complete the process.

The managers of each NRD provided an overview of the current conditions in their NRD and any new groundwater rules in place. The Department provided hard-copies, which compared the two NRDs goals and objectives and discussed similarities and differences. It was interesting that the goals and objectives were fairly similar to each other. The group discussed the goals and asked questions of each other to clarify intent and direction. The discussion was lively, but cordial. Although there were similarities, and obvious efforts to bring the two Districts closer to uniformity in management strategies, the TBNRD urged the District stakeholders and Board to consider more aggressive measures to preserve the resource for all. Conversely, the District stakeholders encouraged the TBNRD to consider metering of all wells as a management tool and way of understanding total water usage.

Following the open discussion, each participant was asked to provide their impressions and level of success of the process and convey any final thoughts or concerns.

APPENDIX D.

APPENDIX D STAKEHOLDER APPROVED “WATER SUSTAINABILITY IN THE LITTLE BLUE NRD” DOCUMENT

PRESENTATION MADE BY A GROUP OF LITTLE BLUE NRD STAKEHOLDERS AT THE SEPTEMBER 15, 2016 STAKEHOLDERS MEETING

WATER SUSTAINABILITY IN THE LITTLE BLUE NATURAL RESOURCE DISTRICT

(1) The purpose of this document is to address the continuing decline of groundwater, and related surface water impacts, in the Little Blue Natural Resources District (LBNRD) and to manage hydrologically connected surface and groundwater resources to achieve and sustain a balance between water use and water supply over the long term.

(2) Current practice by the LBNRD is to monitor groundwater levels comparative to 1974 levels. That practice is flawed because considerable decline had already occurred prior to that year. To accurately depict impact to the aquifer, pre-development measurements must be used. (Attachment 1. LBNRD GROUNDWATER LEVEL CHANGES- PREDEVELOPMENT TO SPRING 2015). Coincidental with declining groundwater levels is the decline and/or cessation of annual stream flows, (page 35 Ground Water Atlas of Nebraska) disappearance of springs and seeps, and shortened duration of flow on intermittent streams. Within the district, numerous cases of domestic and irrigation well failure have occurred due to declining ground water levels. (Attachment 2. INTERPRETIVE GEOLOGIC CROSS SECTION ACROSS A PORTION OF THAYER COUNTY AS PREPARED BY UNL STAFF). There is growing evidence that stream flows are an important indicator of aquifer health. It is widely recognized that surface water and groundwater are connected and each influences the other. (1) Because of this relationship, it is imperative that the Nebraska Department of Natural Resources (NDNR) implement complimentary controls (to groundwater) of surface water use within the LBNRD.

(3) While most irrigators strive to conserve water, inefficiencies exist. Chief among them is the application of more water than the crop can effectively use. Not only is excessive application contributing to groundwater declines, it is also implicated in a growing water quality problem within the district. (Attachment 3. STANGE- SUMMARY OF NITRATE AND URANIUM PROBLEM).

(4) Scientific evidence is abundant that predicts, if usage change does not occur, decline of the High Plains Aquifer will continue. One of the more troubling prediction is the extinction of the aquifer as early as 2063. (Attachment 4. KANSAS STATE UNIVERSITY- DAVID STEWARD 2013). Because widespread concern about water sustainability is increasing, other states and many NRD's within Nebraska have enacted water control policy. (Attachment 5. NRD CONTROL SUMMARY-MAP).

Nebraska law insures landowner right to the use of ground and surface water as long as their use of the water does not adversely affect other water users. The law also states that the water belongs to all citizens. Because of present practices, some land owner and other citizens are being disenfranchised. To halt or reverse the damage and further decline of the aquifer, the LBNRD and the NDNR must active a water management strategy to preserve the resource while there is still a possibility of sustainability. The logical first step is to eliminate inefficiencies and waste. An allocation program should be implemented that is sufficient to sustain irrigation practices without undue economic impact as well as to preserve the opportunity to develop and use the resource indefinitely.

(5) Crops within the LBNRD are dominated by corn production both as irrigated and dry land. Due to the

continued improvement in corn hybrid development, we now have hybrids available that are much more efficient in water utilization than in the past. These improvements support the reduction of water use without serious effects on the economic sustainability of irrigated corn production. (Attachment 6. CORN YIELD DATA, *in addition see UNL Extension NebGuide EC105*).

(6) Based on the fact presented in the maps from New Identified Hydrogeologic Areas (Attachment 7) and Groundwater level elevation of Principal Aquifer in 2007 (Attachment 8) the pool of water in Unit 1 is all hydrologically connected. Therefore, if an area in the center is pumped down (creating a cone of depression) water from the west drains to the low spot in the center faster than normal. Water that should have come to the north and south is diverted to the low spot in the center, and water that should have flowed to the east does not, because it stops in the low spot in the center. Because of this connectivity throughout the unit, what one irrigator in the unit does effect the rest of the water consumers in the unit. The maps in attachments 7, 8 clearly illustrate the connectivity in units 1 and 2.

SUSTAINABILITY DIRECTIVE FROM LBNRD INTEGRATED MANAGEMENT PLAN STAKEHOLDERS FOR DISTRICT-WIDE IMPLEMENTATION BY LBNRD AND NDNR

(7) According to LBNRD data, 84.9% of the irrigated land in the district is irrigated with 9 acre/inches or less. Such a high percentage of viable operations using a conservative irrigation management approach should provide a starting benchmark for a groundwater use control program.

(8) A successful and sustainable plan must provide for flexibility and equitability for producers. One way to enhance flexibility is to incorporate a "bank" of water that may be used at any time within the allocation period. In this case, beginning in 2018, the bank will contain 3 acre/inches per year, and the allocation period is 3 years. This plan allows for 9 acre/inches per year, or a total of 27 acre/inches in the 3 year allocation. Adding the 3 acre/inches from the bank would potentially allow the use of 30 acre/inches in the first 3 years. Usage is not managed by year so it is possible to use far more than 9 acre/inches in a year so long as the 3-year total is not exceeded.

(9) To reward efficiency, usage of less than 27 acre/inches in the 3 year period will result in adding to the bank. If a producer uses less than 27 acre/inches in the 3 year period, the amount used will be subtracted from 27 acre/inches, and the difference (water saved from full allocation) will be added to the bank until 10 acre/inches is reached. The bank can never exceed 10 acre/inches. The bank may be carried to the succeeding 3 year period, and the bank balance remains with the property if operators change.

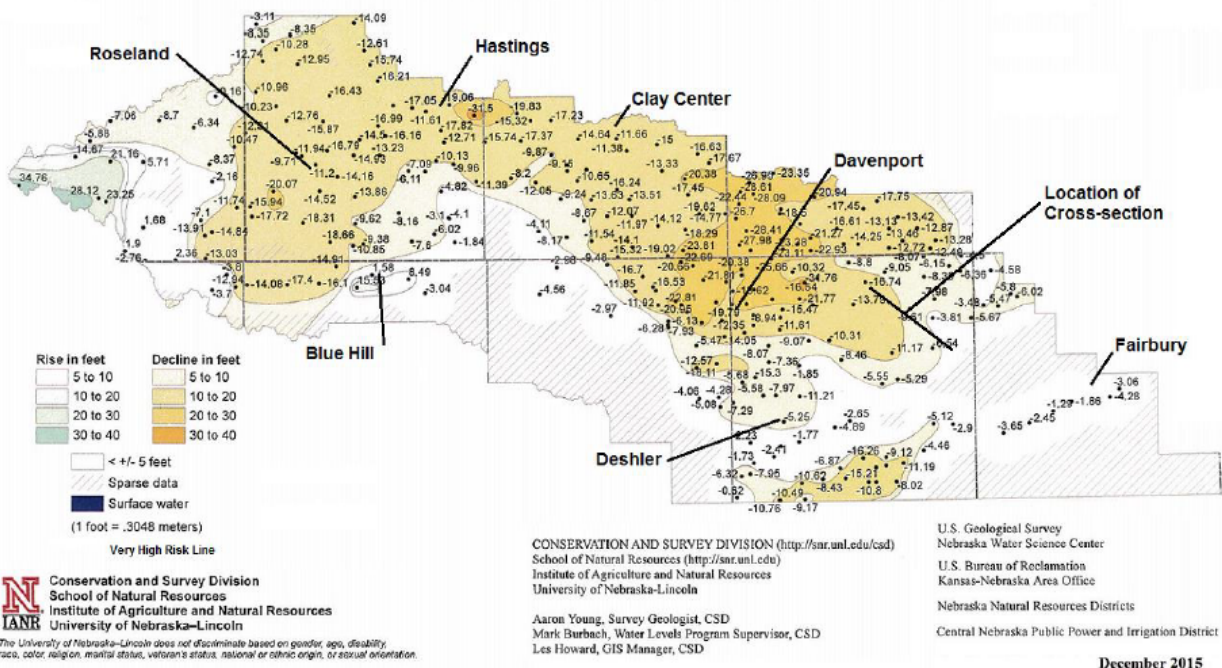
(10) After every 3 year period, starting in 2021, the LBNRD will reassess spring water levels comparative to pre-development levels, and may adjust the allocations to ensure sustainability.

(11) This allocation plan is intended to supplement current LBNRD and NDNR water control regulations. Additionally, to protect equity between irrigated producers and other water consumers, the LBNRD must develop equitable controls for municipalities, industry, confined livestock operations, and fish and wild life interest.

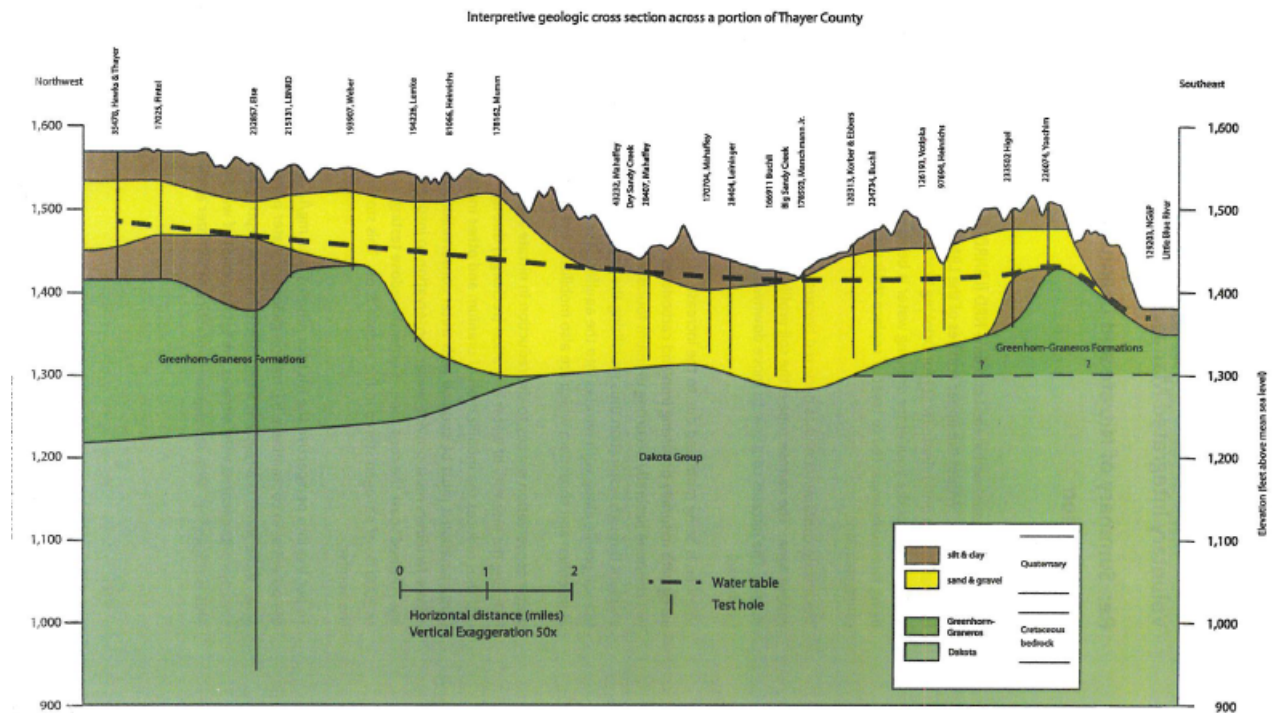
Footnote 1. The Groundwater Atlas of Nebraska, University of Nebraska Conservation and Survey Division; others Paragraphs numbers for ease of reference.

Attachment #1

LITTLE BLUE BASIN GROUNDWATER LEVEL CHANGES PREDEVELOPMENT TO SPRING 2015 VERY HIGH RISK LINE DISPLAYED



Attachment #2



Attachment #3

The aquifer located within the Little Blue NRD (LBNRD) is experiencing nitrate and uranium contamination. Within the upper reaches of the LBNRD it has seen nitrate levels greater than 7.5 times the Maximum Contaminant (MCL) for Drinking Water. Uranium contamination is greater than 10 times the MCL. Use of the aquifer for drinking water is being severely impacted. Several communities are being financially impacted to treat or replace their water supply due to the ongoing nitrate contamination.

The nitrate contamination has occurred because nitrates are passing through the root zone into the vadose zone. The vadose zone is the soil profile between the root zone and aquifer (water bearing strata.) The nitrates continue to move downward towards the aquifer due to the movement of water (recharge).

Uranium is being mobilized due to the increase of nitrates in the vadose zone and aquifer. Nitrates along with naturally occurring iron and carbonates are a food source for soil bacteria. Some soil bacteria will consume naturally occurring uranium found in the soil. The soil bacteria will then release the uranium through respiration thus mobilizing the uranium. The mobilized uranium then moves through the soil profile along with nitrates into the aquifer. The soil bacteria will also release other metals such as selenium and chromium which are also mobilized and can move into the aquifer.

Water conservation is a key to the reduction in nitrate and uranium contamination of the aquifer. By reducing the intensity of water migration (recharge) through the root zone it reduces the loss of nitrates and thus reduces the mobilization of uranium and other metals. To provide for the control of nitrate contamination must be coupled with water conservation. Best management practices related to nitrate fertilizers must provide water conservation to insure the fertilizer that is applied to the land is not "flushed" past the root zone. Currently vadose testing has shown areas in the LBNRD that have 500 to 2000 lbs of nitrogen stored in the vadose zone. This stored nitrogen has the potential to move into the aquifer.

To put this into perspective the MCL for nitrates is 10 mg/l. At 500 pounds of nitrogen per acre it has the potential to contaminate 6.0 million gallons of water per acre. This is a water depth of 18 feet per acre. If the water is already at 5 mg/l then the total depth would be 36 feet. Given the aquifer is already contaminated with nitrates the total amount of water that could be contaminated above the MCL is staggering. Best management practices of fertilizer application must include water conservation.

Attachment #4

Future water levels of crucial agricultural aquifer forecast

Date: August 26, 2013

Source: Kansas State University

Summary:

A study focuses on future availability of groundwater in the High Plains Aquifer. It finds that if current irrigation trends continue, 69 percent of the groundwater stored in the aquifer will be depleted in 50 years.

If current irrigation trends continue, 69 percent of the groundwater stored in the High Plains Aquifer of Kansas will be depleted in 50 years. But immediately reducing water use could extend the aquifer's lifetime and increase net agricultural production through the year 2110.

Those findings are part of a recently published study by David Steward, professor of civil engineering, and colleagues at Kansas State University. The study investigates the future availability of groundwater in the High Plains Aquifer -- also called the Ogallala Aquifer -- and how reducing use would affect cattle and crops. The aquifer supplies 30 percent of the nation's irrigated groundwater and serves as the most agriculturally important irrigation in Kansas.

"Tapping unsustainable groundwater stores for agricultural production in the High Plains Aquifer of Kansas, projections to 2110" appears in the scientific journal *Proceedings of the National Academy of Sciences*, or *PNAS*. The study took four years to complete and was funded by the National Science Foundation, the U.S. Department of Agriculture and Kansas State University's Rural Transportation Institute.

"I think it's generally understood that the groundwater levels are going down and that at some point in the future groundwater pumping rates are going to have to decrease," Steward said. "However, there are lots of questions about how long the water will last, how long the aquifer will take to refill and what society can do."

Steward conducted the study with Kansas State University's Michael Apley, professor of clinical sciences and an expert in cattle production; Stephen Welch, professor of agronomy, who helped with a statistics method called bootstrapping; Scott Staggenborg, adjunct professor in agronomy who studies agricultural production methods; Paul Bruss, a 2011 master's degree graduate in civil engineering; and Xiaoying Yang, a former postdoctoral research assistant who is now at Fudan University in China.

Using measurements of groundwater levels in the past and present day in those regions, Steward and colleagues developed a statistical model that projected groundwater declines in western Kansas for the next 100 years and the effect it will have to cattle and crops.

According to their model, researchers estimated that 3 percent of the aquifer's water had been used by 1960. By 2010, 30 percent of the aquifer's water had been tapped. An additional 39 percent of the aquifer's reserve is projected to be used by 2060 -- resulting in the loss of 69 percent of the aquifer's groundwater given current use. Once depleted, the aquifer could take an average of 500-1,300 years to completely refill given current recharge rates, Steward said.

Although the High Plains Aquifer will continue declining, researchers anticipate even greater efficiencies in water use during the next 15-20 years.

"Society has been really smart about using water more efficiently, and it shows," Steward said.

"Water use efficiencies have increased by about 2 percent a year in Kansas, which means that every year we're growing about 2 percent more crop for each unit of water. That's happening because of increased irrigation technology, crop genetics and water management strategies."

As a result, researchers anticipate that while peak water use will happen around 2025, western Kansas will see increased corn and cattle production until the year 2040. What happens past that time frame depends on what decisions are made about reducing the use of the aquifer's water in the near future, Steward said.

The team conducted several hypothetical scenarios that reduced the current pumping rate by 20 percent, 40 percent, 60 percent and 80 percent. Steward said the researchers went as high as 80 percent because that closely aligned with the aquifer's natural groundwater recharge rate of about 15 percent of current pumping.

"The main idea is that if we're able to save water today, it will result in a substantial increase in the number of years that we will have irrigated agriculture in Kansas," Steward said. "We'll be able to get more crop in the future and more total crop production from each unit of water because those efficiencies are projected to increase in the future."

Steward said he hoped the study helps support the current dialogue about decisions affecting how water can help build resiliency for agriculture in the future.

"We really wrote the paper for the family farmer who wants to pass his land on to his grandchildren

knowing that they will have the same opportunities that farmers do today," Steward said. "As a society, we have an opportunity to make some important decisions that will have consequences for future generations, who may or may not be limited by those decisions."

Story Source:

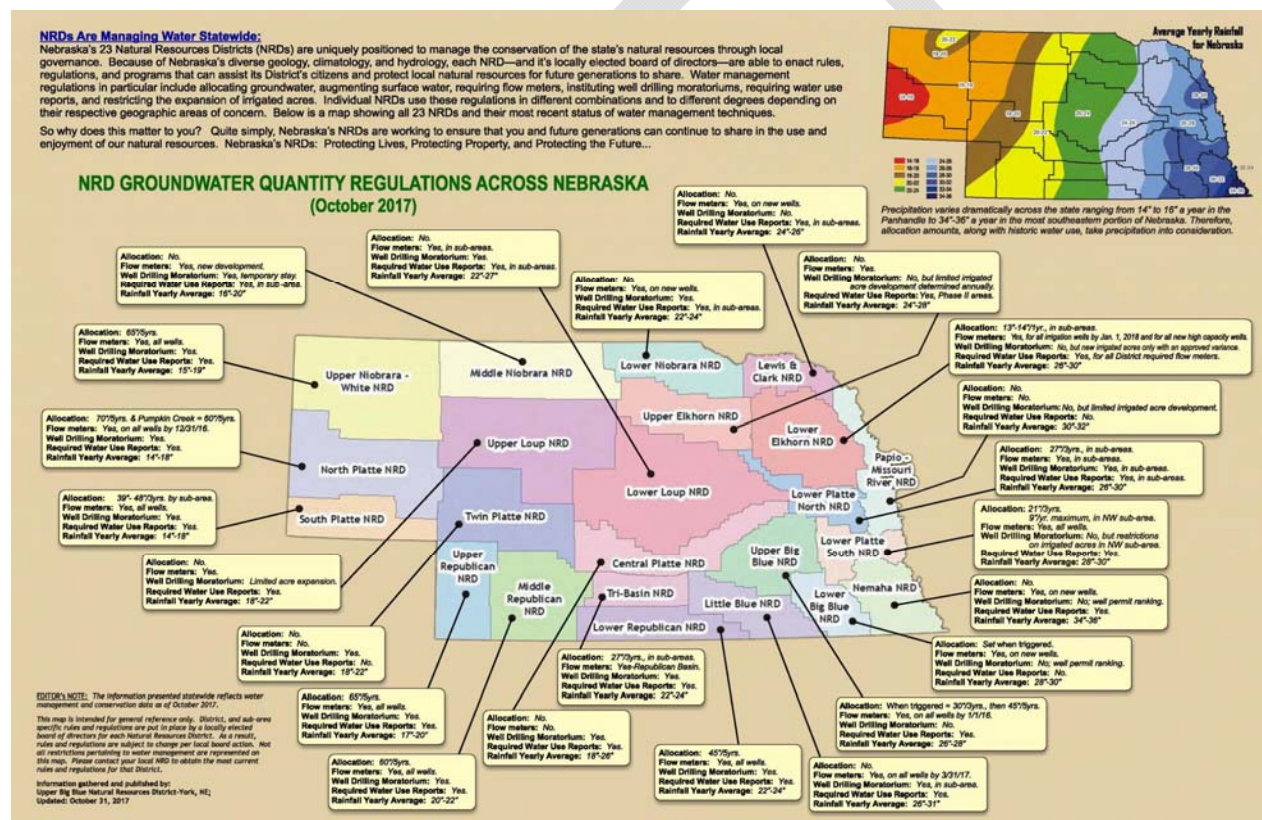
Materials provided by [Kansas State University](#).

Journal Reference:

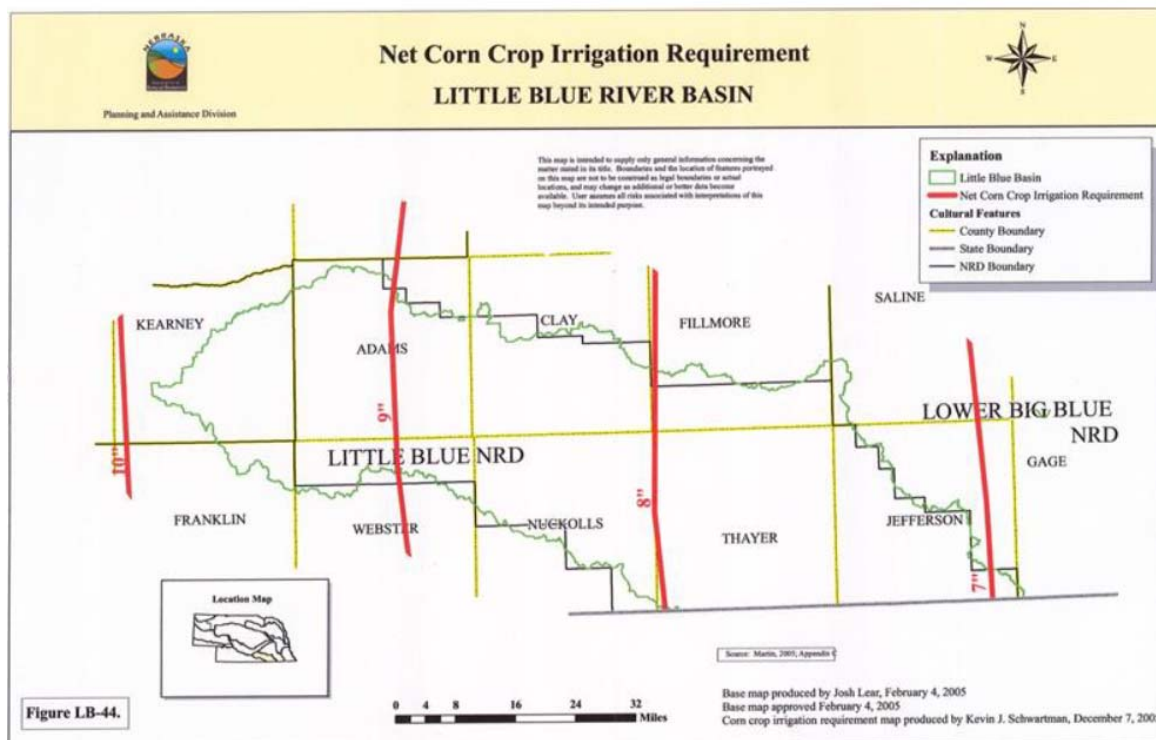
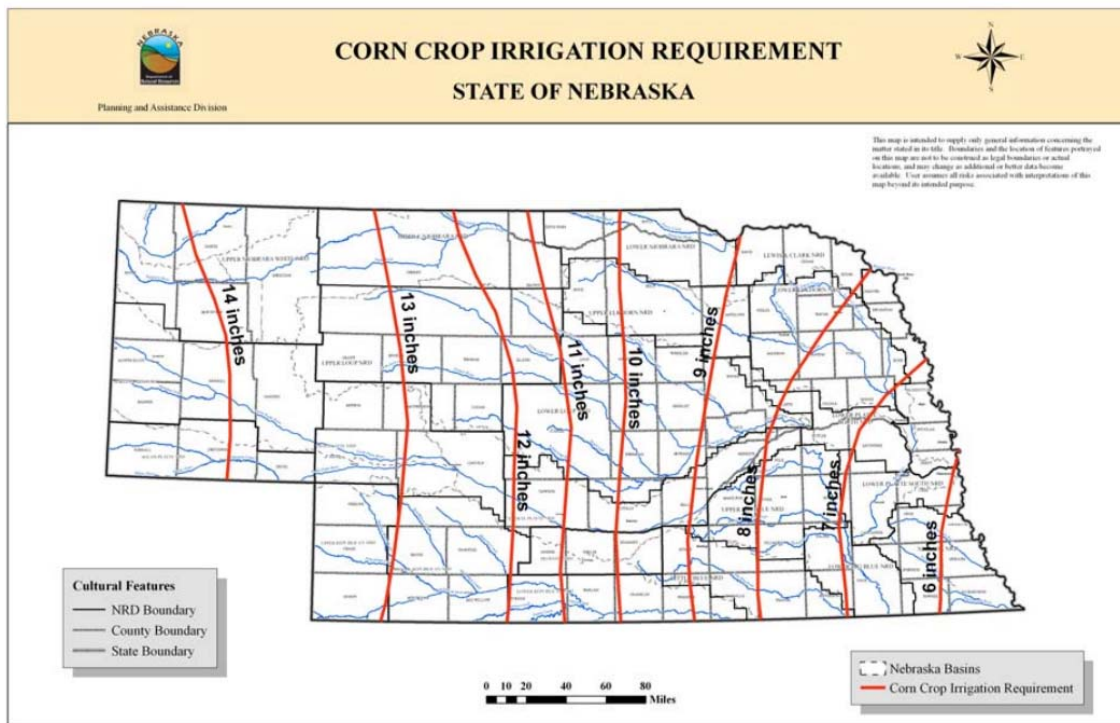
1. David R. Steward, Paul J. Bruss, Xiaoying Yang, Scott A. Staggenborg, Stephen M. Welch, and Michael D. Apley. **Tapping unsustainable groundwater stores for agricultural production in the High Plains Aquifer of Kansas, projections to 2110.** *PNAS*, 2013 DOI: [10.1073/pnas.1220351110](https://doi.org/10.1073/pnas.1220351110)

Kansas State University. "Future water levels of crucial agricultural aquifer forecast." *ScienceDaily*. ScienceDaily, 26 August 2013. <www.sciencedaily.com/releases/2013/08/130826180523.htm>.

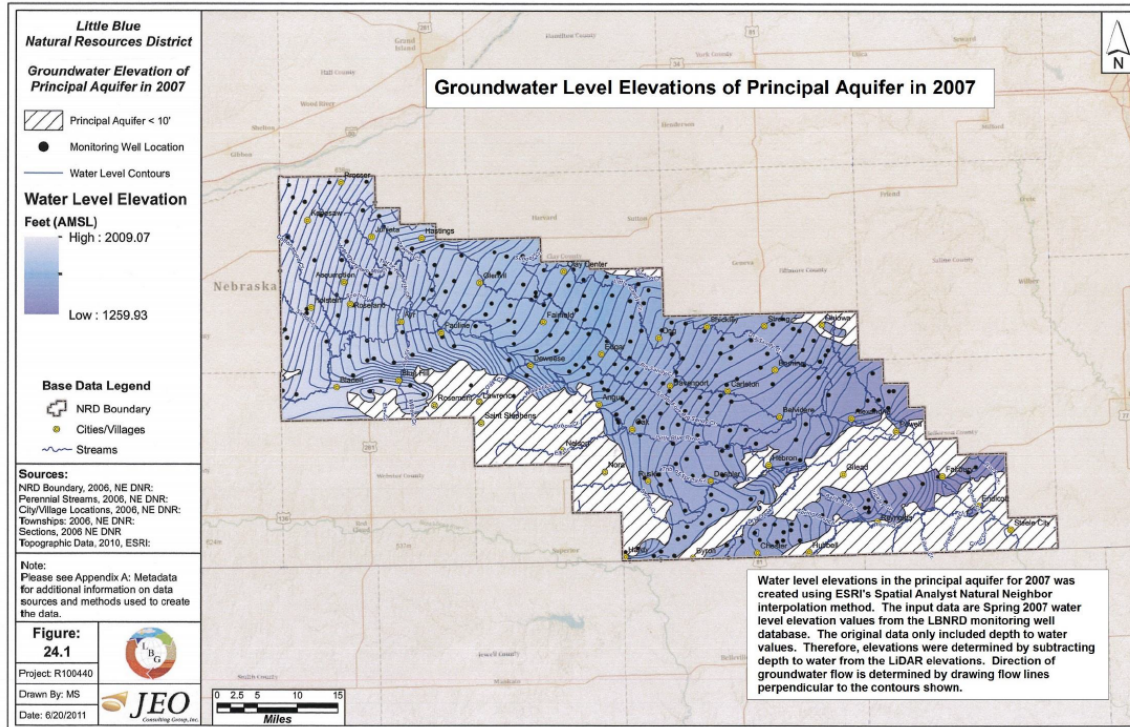
Attachment #5 (online at <https://www.upperbigblue.org/programs/groundwaterquantity>)



Attachment #6 (online at <https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/statewide/FAB/2017AnnualReport/AppendixD.pdf>); also see UNL extension publication *NebGuide EC105*.

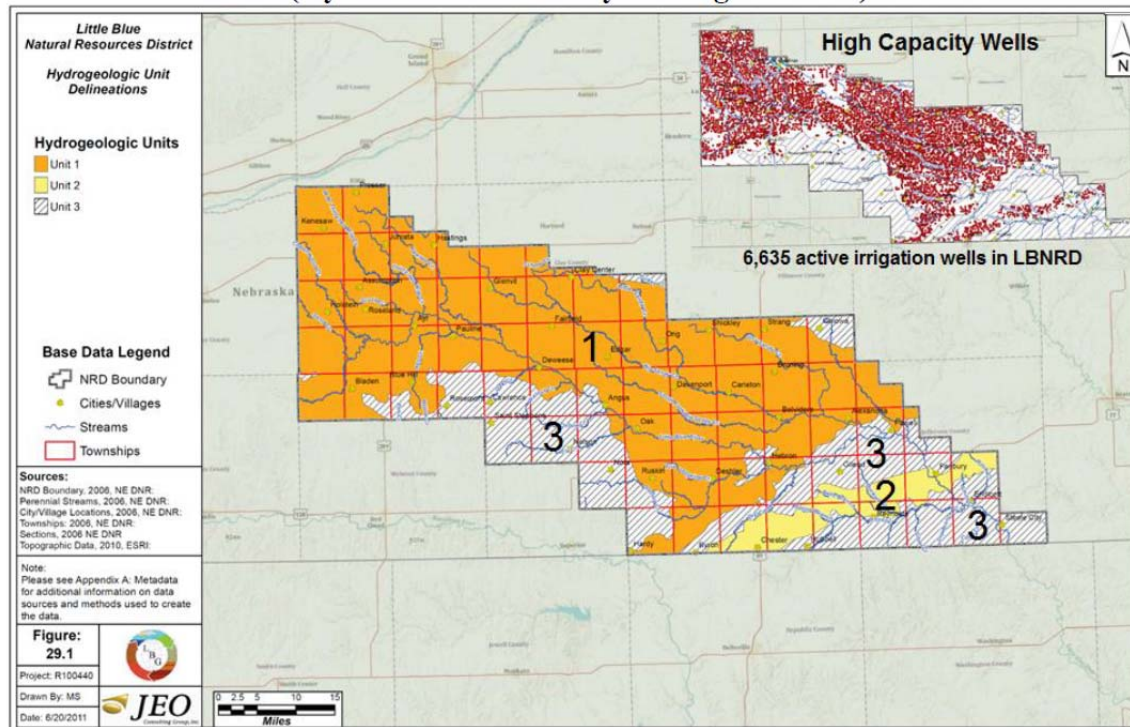


Attachment #7



Attachment #8

New Identified Hydrogeologic Units (Hydraulic Conductivity Throughout Unit)



APPENDIX E.

APPENDIX E TRIGGER FOR DEPARTMENT MANDATORY REPORTING

The following control for the IMP General Area (Chapter 7) utilizes concepts from the Blue River Compact Administration already in place, as an indicator or trigger to require surface water reporting when/if conditions warrant additional monitoring, and to avoid a fully appropriated basins designation.

- *The Department will institute mandatory reporting for all high-capacity (greater than 50 gallons per minute) surface water irrigation uses when trigger is met. The trigger is 24 average days (over the past 20 years of record) of closure for surface water administration, between the period of July 1 and August 31 (for more details on the trigger, see Appendix E). The Department reserves the right to institute mandatory reporting prior to the trigger being met, if deemed appropriate.*

This trigger for mandatory reporting was set by evaluating methods outlined in the Department's Fully Appropriated Basins (FAB) Annual Report, as well as Department records that show actual days of closure for surface water administration. Figure E-1 provides a visual of the concept. The red line in the chart illustrates the water shortage, displayed as days of closure for surface water administration, (36 days during the critical irrigation period of July 1 to August 31) that would result in a FAB designation because surface water irrigators were not able to meet 65 percent of the calculated corn crop irrigation requirement. The average days of closure for surface water administration (blue line in chart) is based on the past 20 years of Department records; this length of record has been statistically shown to capture both wet and dry climate cycles. For the purposes of this IMP, the median between the days of closure for surface water administration that would result in a FAB designation (36 days), and the current (2018) days of closure (11 days) was set as a trigger (warning) to collect additional data, via mandatory reporting, to inform decision making well ahead of a fully-appropriated basin determination. This trigger is 24 days (yellow diamond in chart) of closure for surface water administration, when averaged over the past 20 years.

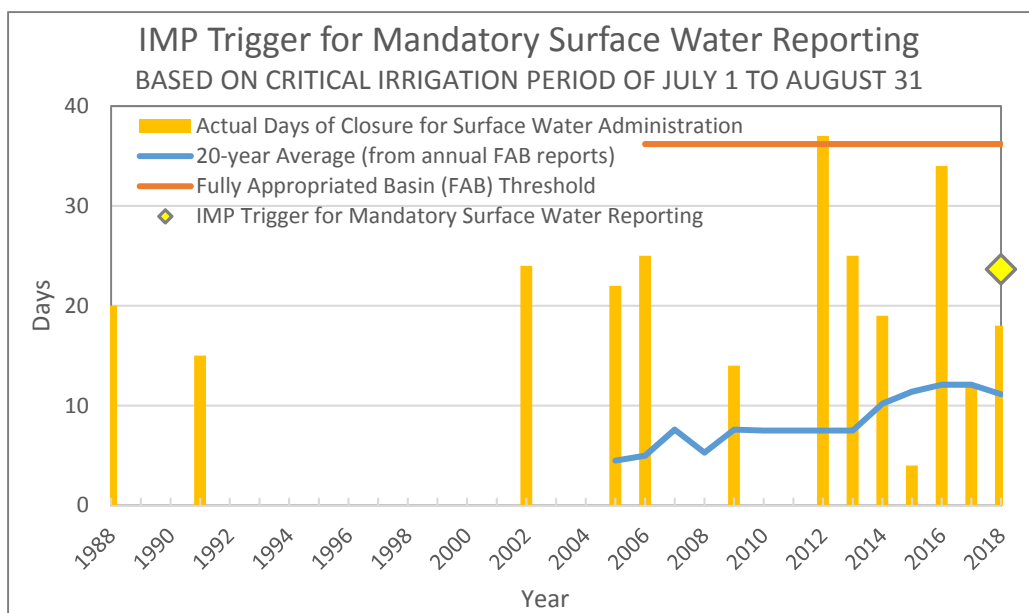


Figure E-1: Historical surface water closures, threshold of surface water closures for the FAB threshold, and the IMP trigger for mandatory surface water reporting.