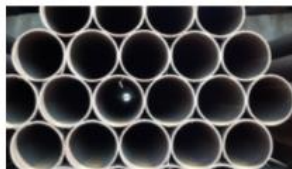


# VOLUNTARY INTEGRATED MANAGEMENT PLAN

For the Little Blue Basin portion of the  
Tri-Basin Natural Resources District



2020

JOINTLY PREPARED by the  
TRI-BASIN NATURAL RESOURCES DISTRICT and  
NEBRASKA DEPARTMENT OF NATURAL RESOURCES  
EFFECTIVE DATE: APRIL 15, 2020

  
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# VOLUNTARY INTEGRATED MANAGEMENT PLAN

JOINTLY PREPARED BY THE  
TRI-BASIN NATURAL RESOURCES DISTRICT AND  
NEBRASKA DEPARTMENT OF NATURAL RESOURCES  
EFFECTIVE DATE: APRIL 15, 2020

## 1. Authority and Effective Date

This integrated management plan (IMP) was prepared voluntarily and adopted on March 10, 2020 by the Board of Directors of Tri-Basin Natural Resources District (TBNRD) and on March 12, 2020 by the Nebraska Department of Natural Resources (NeDNR) after consultation with the TBNRD Stakeholder Advisory Committee and in accordance with the Nebraska Ground Water Management and Protection Act (Act). The Act assigns responsibilities and the authority to NeDNR and TBNRD for management of hydrologically connected groundwater and surface water. The IMP, groundwater controls and surface controls became effective on April 15, 2020.

TBNRD 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.

## 2. Introduction

### 2.1 *Overview of Tri-Basin NRD*

TBNRD encompasses portions of the Republican, Platte and Little Blue River Basins (Figure 1). Each of the three counties in TBNRD also contains numerous non-tributary wetlands, known as “rainwater basins.” Their watersheds range in size from a couple hundred acres up to the 28,000-acre Sacramento Creek Basin. TBNRD also contains a large area spanning portions of all three basins that is characterized by groundwater levels that are higher than historic “pre-development” groundwater elevations. This “groundwater mound,” which was created by canal seepage from Platte River water diversions for irrigation in the Central Nebraska Public Power and Irrigation District (CNPPID) service area in the Platte Basin, extends into the Little Blue Basin (EA Engineering, 2014). In contrast, portions of eastern Kearney County are characterized by highly variable groundwater aquifers, which are susceptible to overdraft. Two townships (May and Grant) in eastern Kearney County have been designated by the

TBNRD Board of Directors as Phase 2 for groundwater quantity management. The designation was made after groundwater levels fell more than five feet below 1981-85 average levels.

The TBNRD’s mission is to “manage, conserve and protect the district’s land and water resources.” This mission will be accomplished by protecting the quality and quantity of surface water and groundwater, reducing soil erosion and flooding, promoting agricultural best management practices, and through forestry and wildlife habitat preservation. These tasks can only be accomplished by working cooperatively with local residents and agencies of local, state and federal government.

The vision (overarching goal) for TBNRD and the NeDNR is to work cooperatively with district residents and others to promote good stewardship of land and water resources in a manner that strives to balance uses and supplies and protect existing users of groundwater and surface water for both the near term and long term.

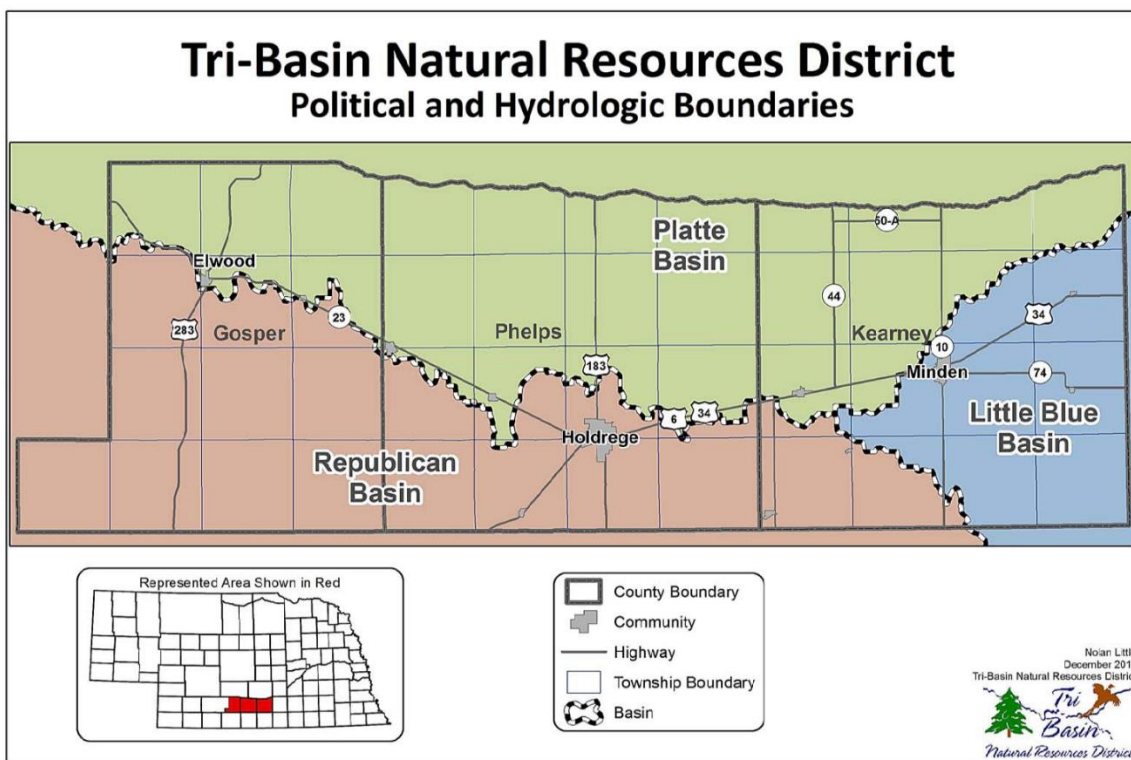


Figure 1. TBNRD political and hydrologic boundaries

## 2.2 *Kansas-Nebraska Big Blue River Compact*

Consideration of Nebraska's obligation to comply with the Big Blue River Compact (Compact) was an important part of the development of this voluntary integrated management plan (VIMP). The States of Nebraska and Kansas entered into the Compact in 1971 to fulfill three major purposes concerning the waters of the Big Blue River and its tributaries (*Neb. Rev. Stat. § A1-115*):

- To promote interstate comity between the States of Nebraska and Kansas;
- To achieve an equitable apportionment of the waters of the Big Blue River Basin and to promote orderly development thereof; and
- 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.

It is interesting to note that the Compact was the first interstate water-related Compact in the United States to address both water quality and water quantity. The Big Blue River drains an area of nearly 10,000 square miles in south-central Nebraska and north-central Kansas. The Little Blue River is a principle tributary of the Big Blue River with the Rivers' confluence occurring near Blue Rapids, Kansas (Figure 2).

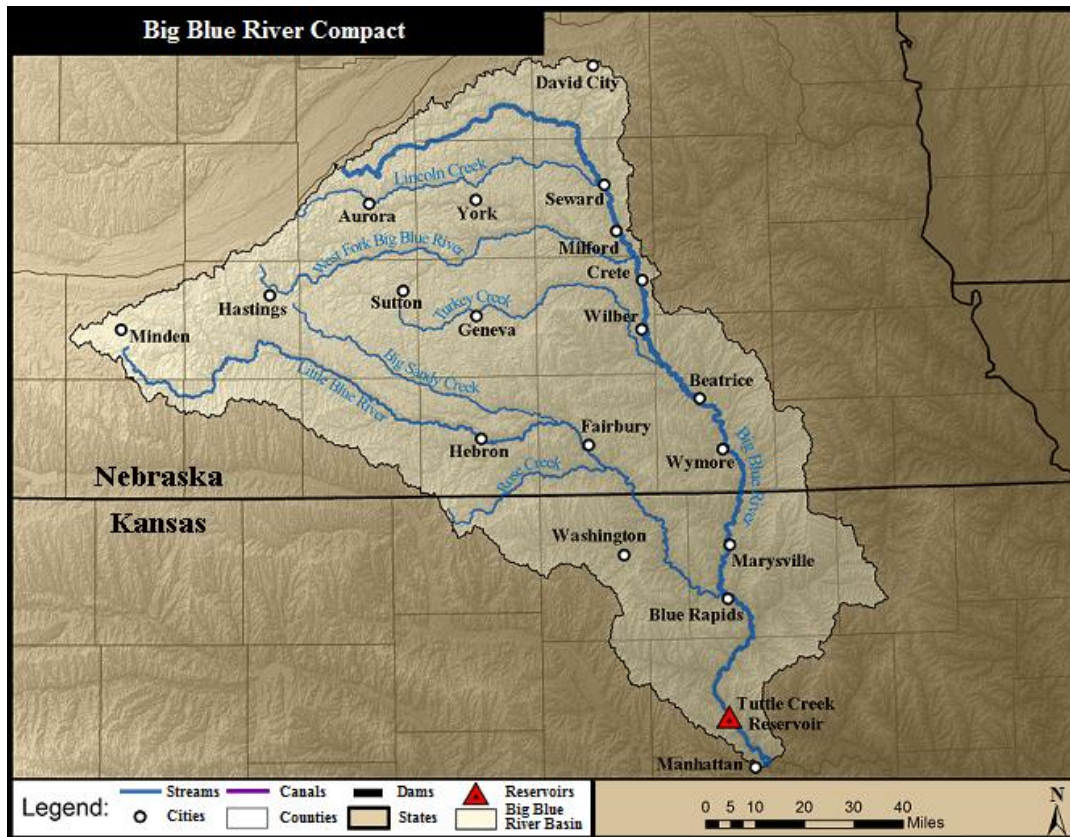


Figure 2. Drainage basin subject to the Big Blue River Compact

The Big Blue River Compact Administration (Administration) is made up of one Commissioner each from Nebraska (the Director of NeDNR) and Kansas, and a Federal member designated by the President of the United States. The Administration holds an annual meeting each May within the Big Blue River Basin in either Kansas or Nebraska. At each annual meeting, reports and data are exchanged between the Nebraska Commissioner, Kansas Commissioner and Administration Committees (Treasurer, Secretary, and Engineering). NRDs in both the Little Blue and Big Blue Basins are invited to provide NRD-specific reports that are submitted as a part of the Nebraska report. Additional streamgaging and water quality reports are provided by the U.S. Geological Survey and Nebraska Department of Environment and Energy, respectively. Annual reports from the past four years of Administration annual meetings can be accessed at: <https://dnr.nebraska.gov/water-planning/big-blue-river-compact>.

As a part of equitable apportionment of Big Blue River Basin waters between Kansas and Nebraska, surface water users are subject to terms of water administration as specified in the Compact. To meet Compact compliance, NeDNR 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, NeDNR is responsible for closing natural flow surface water users that are junior to (newer than) November 1, 1968, as well as appropriations to store water. The Compact also allows for the closure of groundwater wells in certain areas specified within the Compact if flows are insufficient, but these areas are all downstream of TBNRD. In times of water shortage, surface water users with water rights issued before November 1, 1968 are also closely monitored to ensure the water diverted is within allocated amounts of surface water appropriations.



## 3. Legislative Background

### 3.1 Fully Appropriated Basins Evaluation

On January 9, 2004, the Nebraska Legislature passed LB 962, which charged NeDNR to annually evaluate the long-term water balance of hydrologically connected river basins and subbasins. The NeDNR report entitled “Annual Evaluation of Availability of Hydrologically Connected Water Supplies” conveys the results of this evaluation (NeDNR, 2016). Through this Fully Appropriated Basins (FAB) 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 NeDNR identifies “hydrologically connected areas” as a part of the annual FAB evaluation. Hydrologically connected groundwater and surface water occurs when an aquifer and stream intersect. 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). This concept is shown in Figure 3. The FAB evaluation uses the “10/50 rule” to define hydrologically connected areas. These are the geographic areas where a groundwater well would deplete river flow by at least 10 percent of the cumulative water pumped over a 50-year period. Groundwater models are used to determine the extent of the 10/50 area.

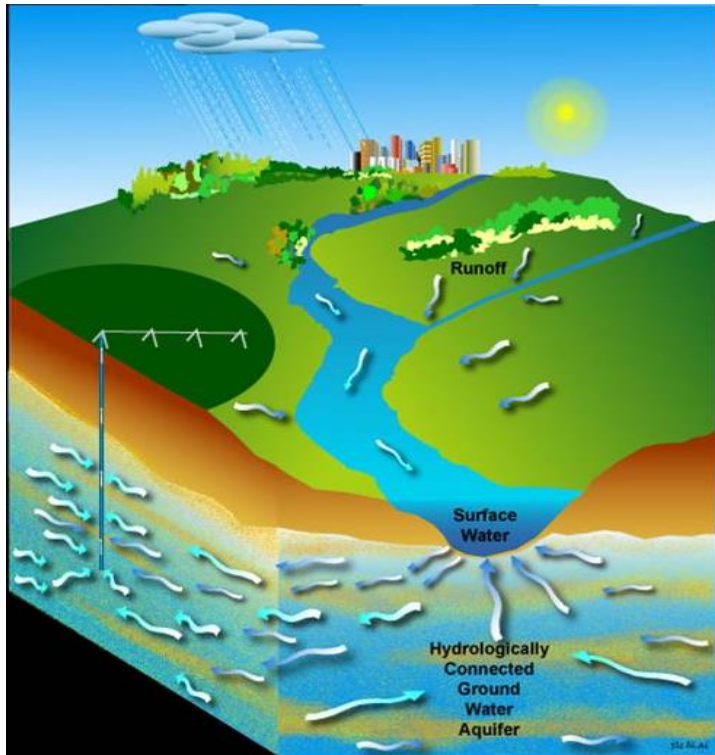


Figure 3. Illustration of hydrologically connected waters

Compliance with the Big Blue River Compact is tracked as a part of the FAB evaluation for the Little Blue River and Big Blue River Basins. To do this, surface water availability is assessed to determine whether there is a sufficient amount of water to sustain a corn crop. If available surface water is not sufficient to sustain a corn crop over the long-term (20 years), the affected river Basin or subbasin may be subject to a FAB Designation<sup>1</sup>. The number of days of surface water administration (closure) due to insufficient supplies is used as an indicator of surface water availability at different points during the growing season.

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<sup>1</sup> At the time of VIMP writing, surface water availability (averaged over 20 years) for the Little Blue River Basin was far above the threshold that could trigger a FAB designation.

## 3.2 *Integrated Management Plans*

### 3.2.1 Relation to FAB Evaluation

If NeDNR has designated or determined a river basin or subbasin to be fully appropriated, the affected NRD(s) must develop an IMP with NeDNR. An IMP is a joint water quantity management plan developed and implemented by NeDNR (regulators of surface water) and the affected NRD (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. *Neb. Rev. Stat.* §§ 46-715 to 46-717 and portions of 46-718 describe the process by which the IMP is developed and implemented. Because the Little Blue Basin is not designated as fully appropriated, an IMP is not required for this area.

### 3.2.2 Voluntary IMPs

TBNRD decided to voluntarily develop an IMP for the Little Blue Basin, even though it was not required, as the Little Blue Basin had never been designated as fully appropriated. 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 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 NeDNR to work together to proactively manage growth of water uses, protect existing water uses and avoid a fully appropriated designation.

### 3.2.3 Components of an IMP

*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 ground and surface water. These components are:

- Clear goals and objectives with a purpose of sustaining a balance between uses and supplies so that economic viability, social and environmental health, safety and welfare of the basin/subbasin is achieved and maintained;
- A map clearly delineating the geographic extent of the IMP;
- One or more groundwater controls that are consistent to reach the goals and objectives of the IMP (these controls must be authorized by TBNRD in accordance with *Neb. Rev. Stat.* § 46-739);

- One or more surface water controls that are consistent to reach the goals and objectives of the IMP (these controls must be authorized by NeDNR in accordance with Neb. Rev. Stat. § 46-716); and
- 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.

To accomplish the objectives set forth in Neb. Rev. Stat. § 46-715(3), this VIMP provides a process that allows for utilization of the best available data and science to understand current supplies and uses, to monitor the effects of new uses, and to explore the potential for new water uses. TBNRD Rules and Regulations allow for transfers of existing groundwater uses, but new uses are prohibited. NeDNR Rules and Regulations allow applicants to apply and seek approval for new surface water rights.

An IMP's groundwater and surface water 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 geographic area of the IMP and controls for groundwater and surface water management are described in Chapters 5 and 7, respectively.

#### [3.2.4 Stakeholder Process](#)

*Neb. Rev. Stat. § 46-717(2)* outlines the stakeholder process that is an integral part of IMP development. It identifies the specific stakeholder interests that TBNRD and NeDNR shall consult with during the preparation of the IMP. These interests 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 TBNRD or NeDNR may also be consulted with during IMP development. TBNRD and NeDNR are also required to solicit public comments and opinions through public meetings and other means. The stakeholder process for this VIMP is described in further detail in the following chapter and in Appendix B.

## 4. Public Participation

In 2015, the TBNRD and Little Blue NRD made the decision to proceed in tandem to work with NeDNR to develop two voluntary VIMPs for the Little Blue River Basin within Nebraska. The NRDs and NeDNR agreed that the stakeholder processes for each VIMP would also be conducted jointly, to the greatest extent possible, to raise awareness and encourage broad community support for water management within the shared Little Blue River Basin. The VIMP for the Little Blue NRD portion of the Basin became effective August 15, 2019 (LBNRD & NeDNR, 2019).

In conformance with state statutes, TBNRD and NeDNR invited CNPPID to participate in the stakeholder meetings. Conservation Director Marcia Trompke was designated to represent CNPPID throughout the stakeholder process. The Nebraska Game and Parks Commission, the City of Minden and the Kearney County Board of Supervisors also designated representatives to participate in the stakeholder process. The other 12 participating stakeholders either submitted their names in response to public notices inviting stakeholder participation, or were recruited by TBNRD or other participants. A majority of stakeholders were actively involved in farming, ranching or other agri-businesses.

The TBNRD VIMP stakeholders' committee met six times over the course of three years. The first meeting was a joint meeting with Little Blue NRD stakeholders and was held in Hastings, NE on March 29, 2016. That was the first of two joint stakeholder meetings during the VIMP development process. The group's final meeting prior to this writing was on August 20, 2019. During that meeting, the committee members who were present achieved consensus on all the goals and objectives included as Chapter 5 of this VIMP. The stakeholders' self-imposed operating rules allowed items to be approved by super-majority vote, if consensus couldn't be reached.

Local concerns and resource management priorities are reflected in this VIMP due to the active participation of the stakeholder group throughout VIMP development. The stakeholders worked together and with TBNRD and NeDNR to define and refine VIMP goals and objectives. As a follow-through, TBNRD and NeDNR intend to regularly consult and communicate with the stakeholders individually and as a group as the VIMP is implemented. In addition, the stakeholders group will be reconvened and consulted with if it becomes necessary to modify the VIMP.

## 5. Geographic Area and Physical Description

### 5.1 Geographic Extent of the VIMP Area

The geographic area of the VIMP, which is also the geographic area where surface water and groundwater controls in Chapter 7 will apply, is the entirety of the Little Blue River Basin within TBNRD as shown in Figure 4.

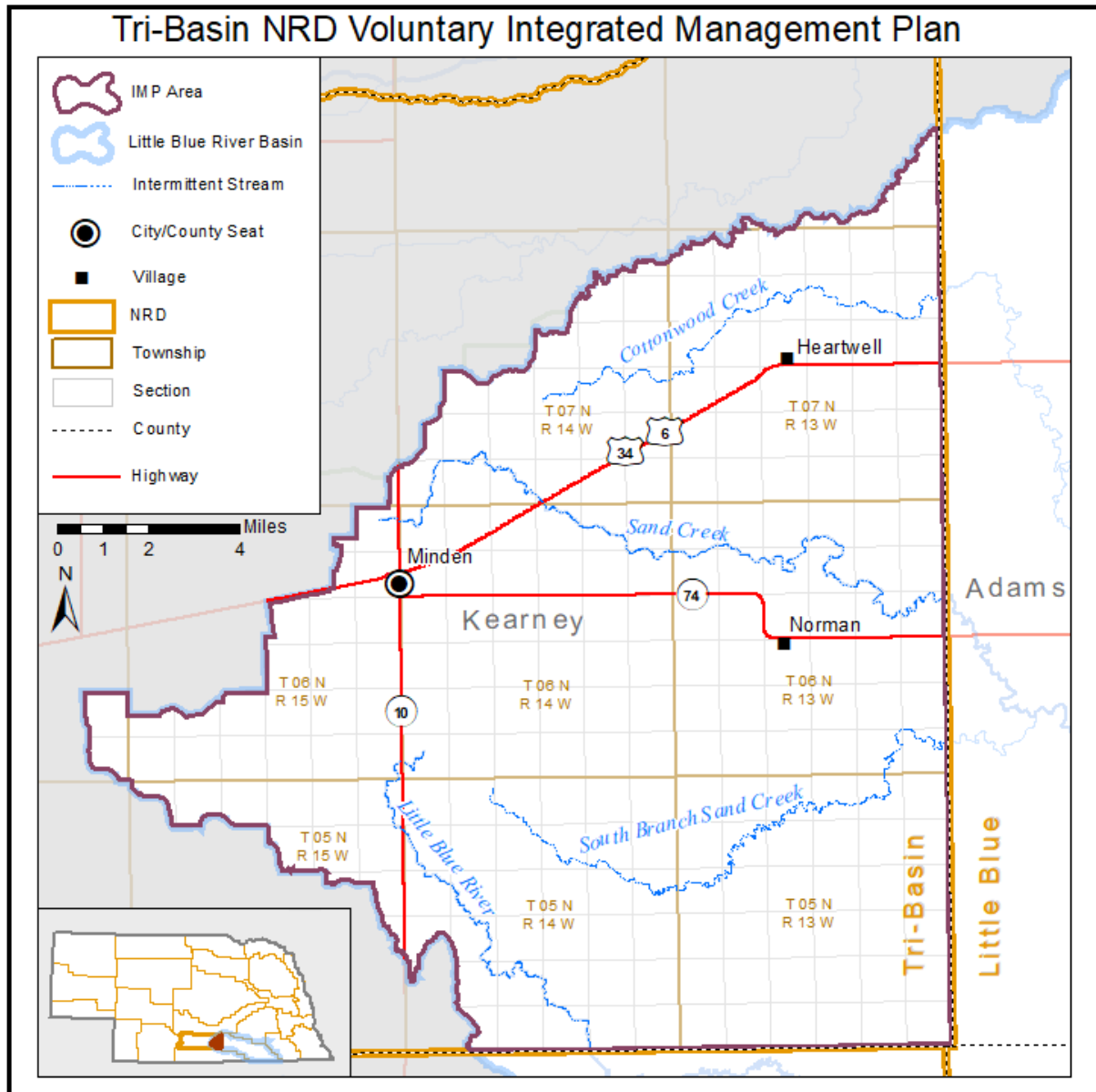


Figure 4. Geographic area of the VIMP

## 5.2 *Climate*

The Little Blue Basin within TBNRD is climatically classified as a humid continental grassland with hot summers (Koppen Climate designation = Dfa). Average annual precipitation at Minden, Nebraska is 24.65". Most of that precipitation falls as rain during the growing season, with 18.95" of rain falling on average between April and September. The hottest average maximum daily temperature occurs in July at 90.1 °F. The coldest average maximum daily temperature occurs in January at 13.5 °F. Weather is highly variable, especially in springtime. Hail, high winds, flash floods and drought are regular natural hazards during the growing season.

## 5.3 *Geology*

The geology of the western portion of the upper Little Blue River basin consists of Pleistocene sediments overlain unconformably on Pliocene (Ogallala formation) sandstone and siltstone. Pliocene deposits are generally absent east of the North-South line dividing Ranges 13 and 14 West in Kearney County. East of that line, Pleistocene sediments lie unconformably upon cretaceous Pierre Shale bedrock. A buried ancestral Platte paleovalley is present in the Heartwell area, trending East-Southeast. The saturated thickness of water bearing strata varies considerably within this area, from 200 feet to less than 50 feet within the span of ten miles. Transmissivity also varies within a wide range, with coarse sands and gravels interspersed with large volumes of silt and apparently discontinuous clay lenses. Geologic cross-sections are included in Appendix C (Divine & Howard, 2019).

## 5.4 Soils

Soils vary considerably in the upper Little Blue Basin. Much of the area consists of nearly level to gently rolling table lands with Holdrege and Kenesaw Silt loam soils formed on Peorian and Sangamon loess. The Sand Creek Valley and nearby sand hills, as the name implies, consist mostly of Valentine Sands. A general soils map for the VIMP area is provided in Figure 5.

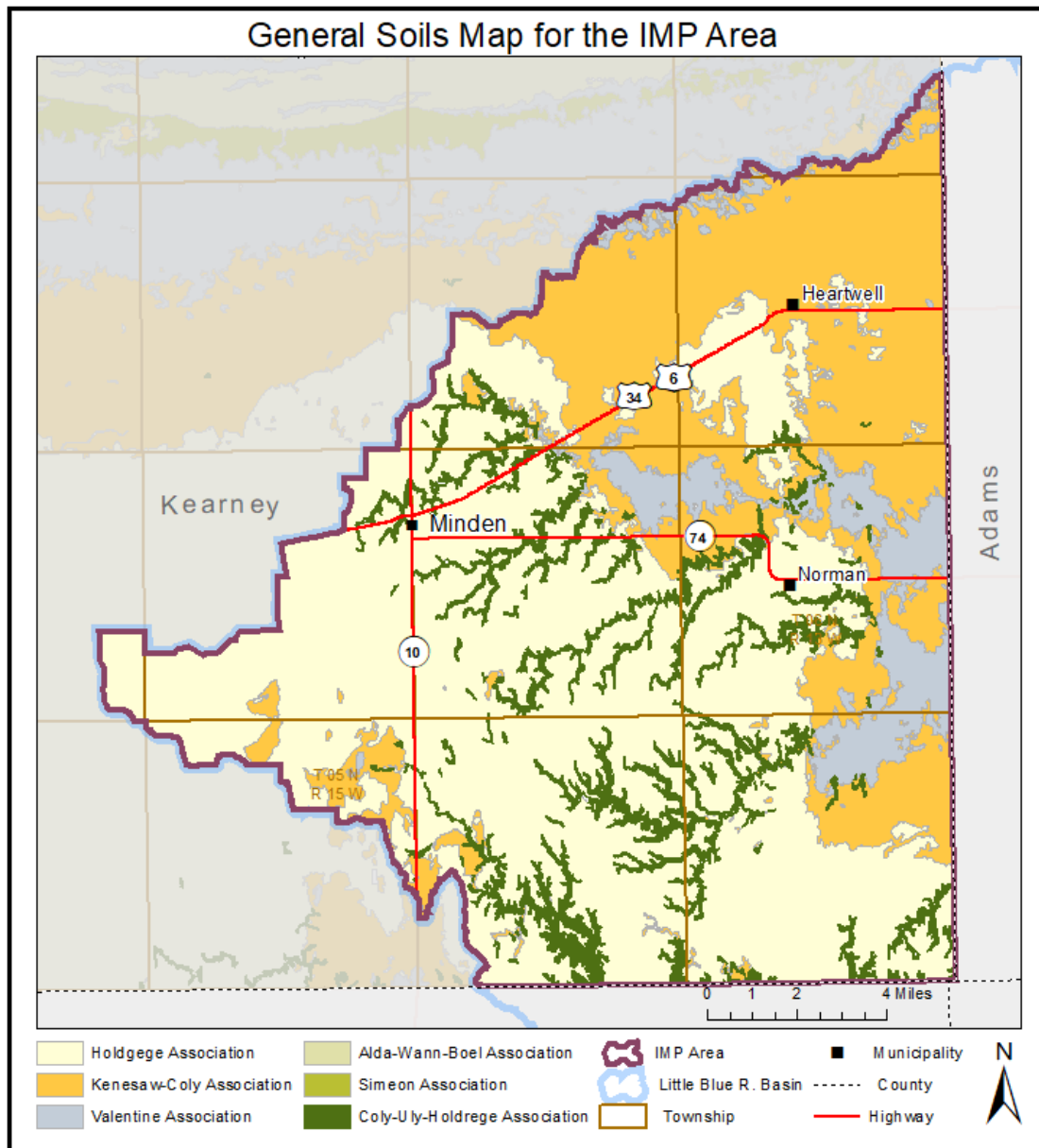


Figure 5. General soils map of VIMP area



## 5.5 Land use and land cover

The primary land use in the Little Blue Basin portion of TBNRD is row-crop agriculture. Within the Little Blue Basin in Kearney County, 91,636 cropland acres are certified for irrigation by TBNRD as of 2018. Corn and soybeans are the primary crops on irrigated land, although potatoes are also grown on sandier soils.

Figure 6 shows generalized land cover in the VIMP area, as of 2018. In 2018, corn and soybean comprised nearly 50 percent and 35 percent, respectively, of total land area in the Little Blue Basin portion of TBNRD. This portion of Kearney County still contains large tracts of rangeland, most of which are also located on sandy soils, and are most common south of Sand Creek in the southeast part of Kearney County. Altogether, rangeland comprised about 13 percent of total land area in the Little Blue Basin portion of TBNRD in 2018.

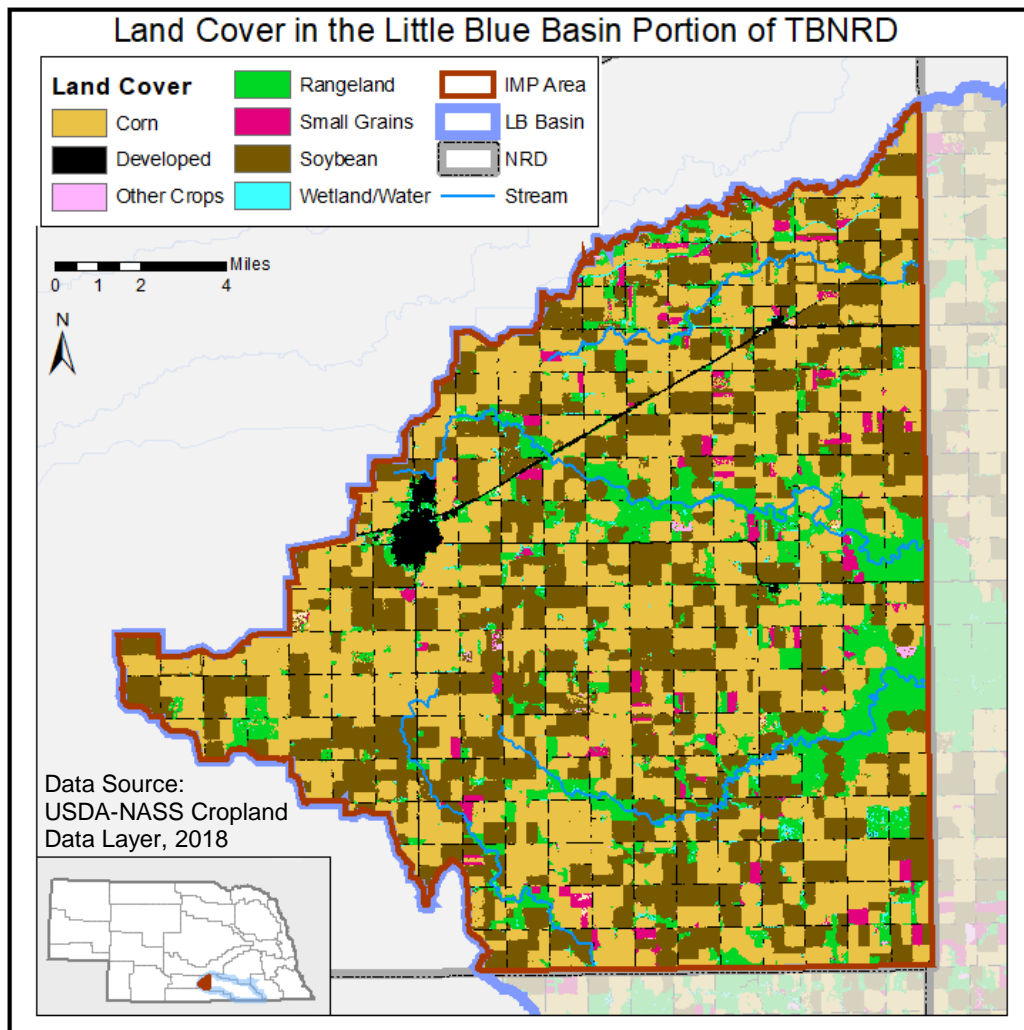


Figure 6. Land cover in the VIMP area

## 5.6 Surface Water

The upper Little Blue basin consists of the Little Blue River, Sand Creek and Cottonwood Creek watersheds. All of these streams rise within Kearney County and are intermittent (no baseflow) within TBNRD. In 2015, NeDNR installed two pressure transducers to monitor streamflow along Sand Creek. One transducer is located on Sand Creek within TBNRD, about three miles northwest of Minden, NE, and the other transducer is located just outside the VIMP area within the LBNRD, about four miles east of Norman, NE (Figure 7). The Little Blue River and tributaries have dedicated streamgages further downstream of the VIMP area, within the LBNRD.

NeDNR has granted a total of 28 surface water permits within the VIMP area (Figure 7 and Table 1). Fifteen of the permits were granted for irrigation from a natural flowing water source (natural stream), nine permits were granted to store water in a reservoir (storage), and four permits were granted to allow the use of water from a reservoir for irrigation (irrigation from storage). Seventeen of the surface water permits fall within the criteria of an “exempt” permit. These permits are statutorily exempt from NeDNR surface water regulation or administration (Neb. Rev. Stat. §§ 46-285 to 46-287), because the surface water primarily originates as runoff from groundwater irrigated lands. All fifteen “irrigated from a stream” permits are exempt because the diversion point is located on an intermittent stream that typically only flows due to groundwater runoff during irrigation season. One storage permit and one storage-use permit are also exempt from administration. These permits represent a recharge pit or small reservoir that is a collection point for groundwater runoff during irrigation season.

The remaining eleven permits are comprised of eight storage and three storage-use permits. The storage permits allow for a combined 447 acre-feet of surface water storage per year. The storage-use permits are for surface water irrigation from a reservoir or pond and allow for a combined 314 acres of surface water irrigated land.

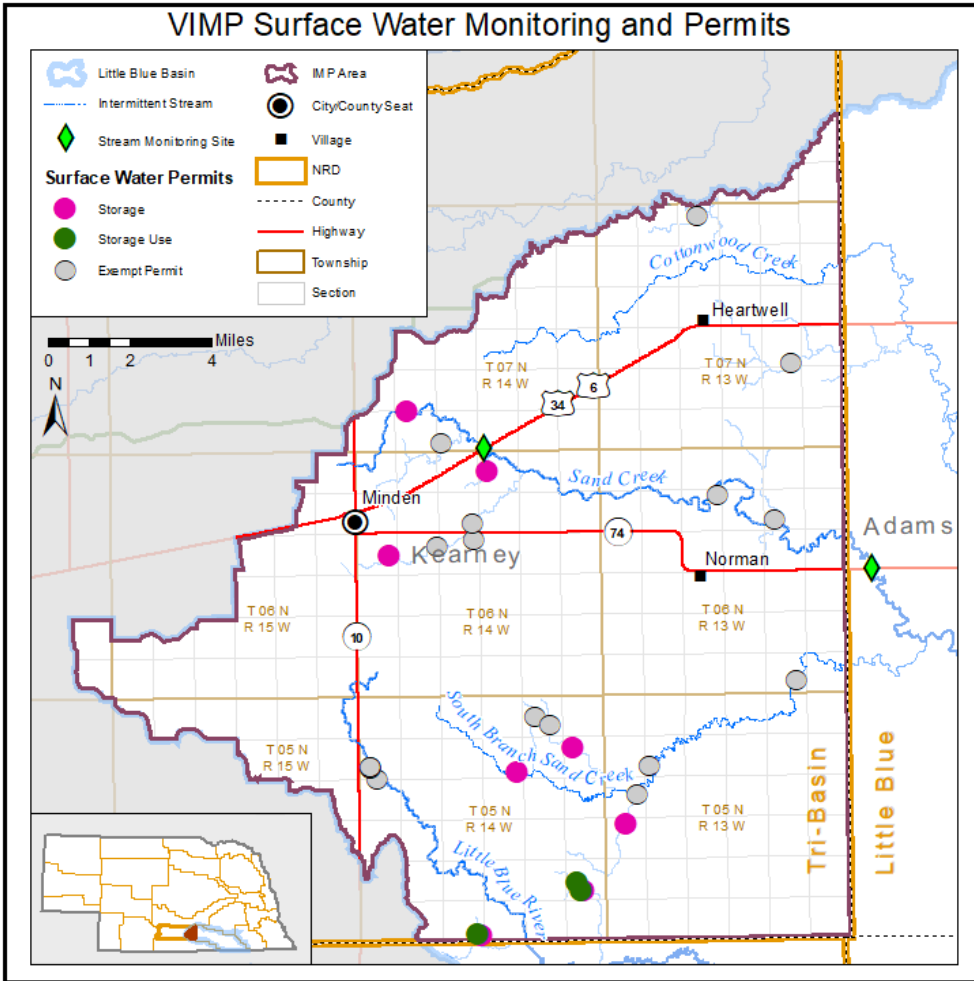


Figure 7. Stream monitoring and surface water permits in the VIMP area

Table 1. Surface water permits in the VIMP area

Surface Water Permits In TBNRD Voluntary IMP Area							
Permit Number	Date Approved	Use	General Location	Source	Exempt	Acres	AF of Storage
A-10107	12/14/1962	Storage	S18-T6N-R14W	Sand Creek, Trib. To	No	0.0	66.59
A-10159	3/29/1963	Irrigation from Natural Stream	S8-T5N-R13W	Sand Creek, Trib. To	Yes	25.0	-
A-10381	10/16/1964	Storage	S10-T5N-R14W	Sand Creek, Trib. To	No	-	76.24
A-11850	2/5/1970	Storage	S3-T6N-R14W	Sand Creek, Trib. To	No	-	18.0
A-12110	5/14/1971	Irrigation from Natural Stream	S2-T5N-R14W	Sand Creek, Trib. To	Yes	40.0	-
A-12111	5/14/1971	Irrigation from Natural Stream	S2-T5N-R14W	Sand Creek, Trib. To	Yes	40.0	-
A-12298	7/7/1971	Storage	S12-T5N-R14W	Sand Creek, Trib. To	No	-	15.1
A-12761	11/10/1972	Storage	S25-T5N-R14W	Blue River, Little, Trib. To	No	-	61.9
A-12942	9/27/1973	Storage	S19-T5N-R13W	Sand Creek, Trib. To	No	-	65.3
A-12948	3/15/1974	Irrigation from Natural Stream	S18-T5N-R13W	Sand Creek, Trib. To	Yes	19.7	-
A-12957	11/30/1973	Storage	S33-T5N-R14W	Blue River, Little, Trib. To	No	-	36.6
A-12967	3/15/1974	Irrigation from Storage	S33-T5N-R14W	Olson Reservoir	No	147.5	32.9
A-12988	3/15/1974	Irrigation from Storage	S25-T5N-R14W	Nelson Reservoir	No	64.0	50.3
A-13036	12/5/1975	Irrigation from Storage	S25-T5N-R14W	Nelson Reservoir	No	102.0	61.9
A-14869	1/31/1978	Irrigation from Natural Stream	S11-T6N-R13W	Sand Creek	Yes	50.0	-
A-15084	11/15/1978	Irrigation from Natural Stream	S9-T6N-R14W	Sand Creek, Trib. To	Yes	99.1	-
A-15359	1/15/1979	Irrigation from Natural Stream	S16-T6N-R14W	Sand Creek, Trib. To	Yes	68.0	-
A-15361	1/15/1979	Irrigation from Natural Stream	S23-T7N-R13W	Cottonwood Creek, Trib.	Yes	17.4	-
A-15376	1/15/1979	Irrigation from Natural Stream	S4-T7N-R13W	Cottonwood Creek, Trib.	Yes	208.0	-
A-15390	2/15/1979	Irrigation from Natural Stream	S9-T6N-R13W	Sand Creek	Yes	30.0	-
A-16513	8/18/1986	Irrigation from Natural Stream	S17-T6N-R14W	Sand Creek, Trib. To	Yes	26.0	-
A-16541	3/16/1987	Irrigation from Natural Stream	S18-T5N-R14W	Blue River, Little	Yes	45.5	-

**Surface Water Permits In TBNRD Voluntary IMP Area**

Permit Number	Date Approved	Use	General Location	Source	Exempt	Acres	AF of Storage
A-17285	6/17/1993	Irrigation from Natural Stream	S35-T6N-R13W	Sand Creek, South Branch	Yes	27.0	-
A-17904	11/14/2001	Storage	S7-T5N-R14W	Blue River, Little	Yes	-	108.0
A-17905	11/14/2001	Irrigation from Natural Stream	S7-T5N-R14W	Blue River, Little	Yes	36.0	-
A-17907	10/10/2000	Irrigation from Natural Stream	S33-T7N-R14W	Sand Creek, Trib. To	Yes	44.0	-
A-17924	1/25/2001	Storage	S32-T7N-R14W	Sand Creek	No	-	107.4
A-17989	11/14/2001	Irrigation from Storage	S7-T5N-R14W	Karen's Pond	Yes	36.0	108.0

## 6. Goals, Objectives, and Action Items

The following goals, objectives, and action items were collaboratively developed by the TBNRD Little Blue Basin Stakeholders committee, TBNRD and NeDNR.

- I. Support basin-level water management that transcends political boundaries.
  1. Improve basin-wide water resources management.
    - a. Encourage TBNRD and Little Blue Natural Resources District (LBNRD) boards to revise groundwater management rules so they are consistent between NRDs (e.g. static water level vs. saturated thickness triggers).
    - b. Encourage TBNRD and LBNRD boards to make management phase triggers and groundwater level baselines based on similar criteria for the two districts.
    - c. Make sure that rules are strong enough and proactive enough to ensure that the aquifer will be sustainable for the foreseeable future, but try to minimize impacts to the profitability of current irrigated agriculture.
    - d. Make sure that rules and triggers are developed using best currently available scientific data that is peer reviewed and/or published.
    - e. Develop common terminology and definitions for measurements between water agencies in the Little Blue Basin.
    - f. Conduct annual meetings with all Blue Basin Districts to share information, evaluate trends, and compare to goals.
    - g. Annually publish a comparative analysis of groundwater management rules, regulations and policies between TBNRD and surrounding NRDs.
  2. Improve basin-wide water resources planning.
    - a. Work on IMPs and make them as similar as possible.
    - b. Resolve discrepancies in aquifer saturated thickness maps between NRDs.
    - c. Identify and encourage development of projects that will recharge groundwater supplies in areas where long-term groundwater level declines exist.
    - d. Identify opportunities to improve and expand collection of groundwater/streamflow levels, groundwater/surface water use and hydrogeology data.

- II. Sustain a balance between water uses and supplies through water management strategies and projects.
  1. Determine cost-effective methods to augment groundwater recharge in areas with long-term groundwater level declines.
    - a. Explore water sources that could be used to augment groundwater recharge, such as diverting excess flows from the Central Nebraska Public Power and Irrigation District (CNPPID) Phelps County Canal into Sand Creek, constructing small detention structures or a recharge reservoir on Sand Creek.
  2. Work with the City of Minden and private landowners to encourage best management practices to protect drinking water supplies.
    - a. Continue to enforce TBNRD groundwater rules.
    - b. Educate the public about risks to groundwater and actions they can take to protect drinking water supplies.
    - c. Promote best management practices for water conservation.
  3. Increase regulatory actions to improve management of finite water supplies.
    - a. Explore the possibility of flow-meters district-wide.
    - b. Groundwater “Irrigation certificate” similar to other certification programs.
    - c. The TBNRD Board will vote on whether or not to require flow-meters District-wide.
- III. Gain a better understanding of water resources through data acquisition and technical analyses.
  1. Conduct additional groundwater and surface water research and data collection.
    - a. Jointly develop a water balance sheet for the Little Blue Basin.
    - b. Create/improve computer models that enable NRD to predict future groundwater and surface water supply levels and to consider potential impacts of proposed management actions and land use/cover changes.
    - c. Gather data on groundwater and surface water chemistry and consider whether there are any implications for human health and soil quality.
    - d. Gather data about transmissivity and volume of groundwater movement.
    - e. Implement and maintain a voluntary water use reporting system for surface water users.
    - f. Continue to map and track irrigated surface water acres.

- g. Use the best currently available scientific data that is peer reviewed and/or published to refine delineations of hydrologically connected surface and groundwater for the Little Blue Basin.
- h. Develop and maintain a comprehensive ground and surface water use and supply database.

IV. Improve public understanding of and participation in integrated water management.

- 1. Illustrate benefits of conservation practices.
- 2. Education efforts to further encourage LBNRD to stop development.
- 3. Find new and better ways to convey information to the public about groundwater and surface water.
- 4. Incentives for adopting new technology (drip irrigation, moisture probes, etc.).
- 5. Jointly participate in public outreach events and/or dissemination of education materials related to integrated water management.

V. Monitor progress of VIMP implementation.

- 1. Share groundwater level data between TBNRD and LBNRD at least annually.
- 2. Share groundwater and surface water use data with NeDNR and between NRDs annually.
- 3. Hold annual progress reporting meeting with NeDNR, invite stakeholders and the public to attend.
- 4. Hold joint committee meetings between TBNRD and LBNRD at least annually.
- 5. Ensure that all management actions support Nebraska's obligation to maintain compliance with the Big Blue River Compact with Kansas.



## 7. Groundwater and Surface Water Controls

### 7.1 Groundwater Controls

TBNRD and NeDNR have already taken several steps intended to protect interconnected groundwater and surface water resources. The following three (3) groundwater regulatory actions are currently being implemented in the Little Blue Basin portion of the TBNRD under the authorities in Neb. Rev. Stat. § 46-739, and will now serve as the IMP controls, and will continue to be implemented in the future:

1. Moratorium on drilling new wells for new water uses,
2. Certification of irrigated land and other non de minimis consumptive water uses, and
3. Regulation of transfers of groundwater and of certified irrigated land.

The groundwater controls that have been adopted and implemented by TBNRD are those found in the Tri-Basin Natural Resources District Rules and Regulations for Management and Protection of Land and Water Resources. The TBNRD will periodically review the controls being implemented with regard to progress towards attaining or maintaining goals and objectives of this VIMP. The TBNRD reserves the right to adopt additional controls identified in state statutes and may adjust or modify the rules used to carry out the listed controls if the board of directors determines that such modifications will help TBNRD achieve the goals and objectives of this VIMP. Any adjustments or modifications to the rules must not be in conflict with the goals and objectives of this VIMP. Any modification to the above listed groundwater controls would require that the TBNRD and NeDNR agree to amend this VIMP. Amendments to the VIMP would require a public hearing and possible reconvening of the stakeholder group.

### 7.2 Surface Water Controls

NeDNR will implement five surface water controls for the VIMP Area (Figure 4). The first three controls were in place prior to the adoption of this VIMP; the fourth and fifth controls were newly developed as a part of this VIMP. NeDNR's surface water controls are as follows:

1. NeDNR 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;
2. NeDNR will continue to enforce Nebraska Statutes and NeDNR Rules and Regulations, as these pertain to surface water appropriations;

3. NeDNR will continue to evaluate proposed transfers of surface water appropriations, in accordance with Nebraska Statutes and NeDNR Rules and Regulations;
4. NeDNR 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 NeDNR standards for installation, accuracy, and maintenance; and
5. NeDNR 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 the past 20 years of records for surface water administration. For more details on this trigger, please see Appendix D. NeDNR reserves the right to institute mandatory reporting prior to the trigger being met, if deemed appropriate.

## 8. 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 VIMP as well as increase understanding of the hydrologically connected groundwater system. As such, TBNRD and NeDNR have agreed to complete and report on the following actions.

### 8.1 Track and Report Water Uses

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

1. Groundwater level measurements;
2. Certification of groundwater uses and any changes to these certifications;
3. Municipal, commercial, and industrial annual water uses;
4. Irrigation water use data required mandatorily or voluntarily by TBNRD, such as metered high capacity well flow data;
5. Water well construction permits issued;
6. The number of well permits denied;
7. Variances granted by TBNRD and/or NeDNR 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

8. Transfer permits granted by TBNRD and/or NeDNR 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.

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

1. Continue any existing stream gaging in TBNRD and look for new opportunities to enhance the stream gage network;
2. 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;
3. Continue to map and track surface water irrigated acres. NeDNR will also continue to require that project maps are submitted and approved prior to obtaining a surface water permit;
4. Continue to implement a voluntary reporting program for unmetered surface water irrigation diversions that pump more than 50 gallons per minute. The reports will include information about the quantity of water pumped, the acres irrigated, and the type of irrigation system (gravity, pivot, etc.) used;
5. Continue to evaluate the necessity for mandatory installation of water flow meters on all surface water pumps for irrigation, industrial, and municipal uses; and
6. 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 TBNRD, NeDNR may grant a variance from the moratorium on a case-by-case basis, following NeDNR rules and regulations.

NeDNR 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 VIMP area. This methodology will be updated with the best available data and analysis as agreed upon by TBNRD and NeDNR. TBNRD and NeDNR will jointly evaluate the data and information gathered for accuracy, identify data anomalies and probable causes for them, and flag data and information that may require closer inspection and review.

## 8.2 *Increase Understanding of Hydrologically Connected Water*

TBNRD is participating with the Little Blue, Upper Big Blue, and Lower Big Blue NRDs and NeDNR to develop a Blue Basin Groundwater Model. The model is intended to:

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

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

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

TBNRD and NeDNR will investigate additional research or modeling needs as conditions dictate.

## 9. 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 VIMP. Sources of funding that could be utilized to help implement portions of this plan include the NRCS, Nebraska Department of Environment and Energy (NDEE), 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.

### 9.1 Federal Funding Options

#### Natural Resource Conservation Service (NRCS)

1. **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.
2. **Conservation Stewardship Program (CSP)** CSP helps agriculture producers build their business while implementing conservation activities that help ensure the sustainability of their entire operation. CSP offers additional opportunities to expand on existing conservation efforts by offering financial and technical assistance to install conservation practices, enhancements, and other conservation activities.
3. **Agricultural Conservation Easement Program (ACEP)** The Agricultural Conservation Easement Program helps landowners, land trusts, and other entities protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation easements.
4. **Regional Conservation Partnership Program (RCPP)** The Regional Conservation Partnership Program (RCPP) promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements. Partners leverage RCPP funding in project areas and report on the benefits achieved.
5. **Watershed and Flood Prevention Operations (WFPO) Program** The WFPO Program helps units of federal, state, local and tribal government (project sponsors) protect and restore watersheds up to 250,000 acres. This program

provides for cooperation between the Federal government and the states and their political subdivisions to work together to address resource concerns related to: 1) erosion and sediment control; 2) watershed protection; 3) flood prevention; 4) water quality improvements; 5) rural, municipal and industrial water supply; 6) water management; 7) fish and wildlife habitat enhancement; and/or 8) hydropower sources.

#### **Bureau of Reclamation (BOR)**

1. **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.

### **9.2 State Funding Options**

#### **Nebraska Natural Resources Commission (NRC)**

1. **Water Sustainability Fund.** The Water Sustainability Fund (WSF) is a source of financial support for programs, projects or activities that can help the State achieve its goals set out in *Neb. Rev. Stat. § 2-1506* for achieving sustainable use of its water resources. The NRC oversees Fund operations including selecting successful applications, and NeDNR oversees administration. Funding is appropriated annually by the Nebraska Legislature.
2. **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.
3. **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.
4. **Natural Resources Water Quality Fund.** This fund was created to provide state funds to natural resources districts for their water quality programs.

#### **Nebraska Department of Environment and Energy (NDEE)**

1. **Nonpoint Source Water Quality Grants (Section 319).** Under Section 319 of the federal Clean Water Act, the federal government awards funds to the NDEE 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)

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

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

### 9.3 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 TBNRD include:

**General NRD Taxing Authorities.** NRDs have broad taxing authority under *Neb. Rev. Stat. § 2-3225* to accomplish various natural resources and water management objectives. TBNRD also intends to use qualified projects described in *Neb. Rev. Stat. § 2-3226.04* to achieve the goals and objectives of TBNRD and of the Nebraska Ground Water Management and Protection Act (*Neb. Rev. Stat. §§ 46-701 to 46-456*). Therefore pursuant to *Neb. Rev. Stat. § 2-3226.01(1)*, TBNRD may issue negotiable bonds and refunding bonds of the district and entitled river-flow enhancement bonds, payable by the occupation tax authorized by *Neb. Rev. Stat. § 2-3226.05* or the levy authorized by *Neb. Rev. Stat. § 2-3225*. TBNRD will confine such occupation tax authorized in this section to the geographic area of the VIMP (see Chapter 5). Following the protocol and hearings outlined in statutes, an occupation tax would only be used if other funding options available to TBNRD were insufficient to address the resources problem.

NRDs are also authorized by *Neb. Rev. Stat. § 2-3252* to establish, after a petition from the public or upon their own motion, Improvement Project Areas (IPAs). These IPAs assess property for projects or programs in relation to the benefit received (units of benefit). This process could prove useful as a way to provide matching funds to state and federal dollars for water resources management projects that benefit specific areas.

**Statutory Taxing Authorities.** Other funding sources may become available to TBNRD or NeDNR in the future. Such sources will be evaluated and utilized, when appropriate and feasible, to accomplish actions identified in the VIMP.

## 10. Information considered in VIMP preparation

The following information was used in the development of the VIMP and will continue to be used in subsequent implementation of the VIMP:

1. Nebraska Ground Water Management and Protection Act
2. Tri-Basin Natural Resources District Rules and Regulations for Management and Protection of Land and Water Resources
3. NeDNR Rules for Surface Water
4. Stakeholder Involvement Plan for this VIMP
5. NeDNR and U.S. Geological Survey stream gage records
6. NeDNR registered wells database
7. NeDNR surface water administrative records
8. NeDNR/NRDs' Blue Basin model
9. NeDNR INSIGHT tool and web portal
10. NeDNR Fully Appropriated Basins report and data
11. Kansas-Nebraska Big Blue River Compact
12. Land cover data (Cropland data layer, CALMIT 2005, TBNRD's certified acres)
13. Other TBNRD data sources (examples: well records, groundwater supplies/uses, recharge rates, climate/precipitation, land use, and/or TBNRD studies).

## 11. Review process and modifications to the VIMP

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

TBNRD and NeDNR will hold annual reviews to evaluate the VIMP and progress made in the previous calendar year. A schedule for taking actions to implement the VIMP will be established as a part of the first annual VIMP review (2021). The schedule and action item priorities will be evaluated and refined, if necessary, to ensure that there is continuous progress towards meeting goals and objectives of the VIMP.

At each annual review, TBNRD and NeDNR will review VIMP action items to determine whether and how they are being implemented and whether they are fulfilling the goals and objectives of the VIMP. If the TBNRD and NeDNR jointly determine that action items are not meeting goals and objectives, they will consult with the Stakeholder Advisory Committee. If amendments to the VIMP are necessary, TBNRD and NeDNR will jointly hold a public hearing and will consider public input prior to issuing the pertinent orders to formally adopt VIMP amendments.



## 12. Glossary of Terms

**Appropriation.** A permit granted by NeDNR 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.

**Depletion.** Reduction to streamflow that results from a new use of either groundwater or surface water.

**Fully appropriated.** From *Neb. Rev. Stat. § 46-713*, subsection (3): A river basin, subbasin, or reach shall be deemed fully appropriated if NeDNR 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.

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

**Hydrologically connected.** The geographic area within which pumping of a well for 50 years will deplete the river or a base flow tributary thereof by at least 10 percent of the amount pumped in that time (NeDNR Surface Water Rules, Chapter 24).

**INSIGHT.** Developed and maintained by NeDNR, 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 NeDNR, 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 NeDNR and individual NRDs for a specific area. The objective of an integrated management plan is to manage such river basin, subbasin, or reach to achieve and sustain a balance between water uses and water supplies for the long term.

**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.

**Natural Resources District (NRD).** A political subdivision of the State that governs the natural resources within the subdivision.

**NeDNR.** The Nebraska Department of Natural Resources; a State Agency

**Stakeholder Advisory Committee.** Representatives of various interest groups and professional fields who provided comments and suggestions on various aspects of the Integrated Management Plan.

**Surface water.** Water that occurs or moves on the surface of the planet such as in a stream, river, lake, wetland, or ocean.

**Use.** The legally accepted use of a well or water appropriation.

**Watershed.** The area of land where all of the water that is under it or drains off of it goes into the same place.

## 13. Works Cited

- Divine, D. P., & Howard, L. M. (2019). *Interpretive geologic maps and cross sections for Phelps, Kearney, and Adams counties*. Conservation and Survey Division, University of Nebraska–Lincoln. Geologic Maps and Charts No. 39 (GMC-39)
- EA Engineering, S. a. (2014). *Groundwater Evaluation Report South Central Nebraska. Technical Report*. Accessed on November 22, 2019, from [https://www.cnppid.com/wp-content/uploads/2014/02/Grounwater\\_Evaluation\\_Final\\_Report.pdf](https://www.cnppid.com/wp-content/uploads/2014/02/Grounwater_Evaluation_Final_Report.pdf)
- LBNRD, & NeDNR. (2019). *Voluntary Integrated Management Plan*. Accessed on November 22, 2019, from [https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/blue-river/LBNRD/20190815\\_LBNRDvoluntaryIMP\\_final.pdf](https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/blue-river/LBNRD/20190815_LBNRDvoluntaryIMP_final.pdf)
- NeDNR. (2016). *Nebraska Department of Natural Resources 2017 Annual Review of Availability of Hydrologically Connected Water Supplies*. Technical Report, Lincoln. Accessed on November 22, 2019, from <https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/statewide/FAB/2017AnnualReport/2017FinalFAB.pdf>

# 14. Appendices

## Appendix A: Letters Initiating the IMP Process

Tri-Basin NRD  
1723 Burlington  
Holdrege, NE 68949



Phone: (308) 995-6688  
Toll Free: 1-877-995-6688  
Fax: (308) 995-6992  
Email: tribasin@tribasinprd.org

General Manager  
JOHN THORBURN

August 19, 2015

Chairman  
DAVID OLSEN  
Minden, Nebraska

Vice Chairman  
BRADLEY LUNDEEN  
Wilcox, Nebraska

Secretary  
TODD GARRELT  
Holdrege, Nebraska

Treasurer  
JOE BILKA  
Holdrege, Nebraska

BRIAN BERGSTROM  
Axtell, Nebraska

MIKE CAVANAUGH  
Minden, Nebraska

ED HARRIS  
Loomis, Nebraska

PHYLLIS JOHNSON  
Bertrand, Nebraska

JOE LARSON  
Loomis, Nebraska

DAVID RAFFETY  
Kearney, Nebraska

LARRY REYNOLDS  
Lexington, Nebraska

RAY WINZ  
Holdrege, Nebraska

Mr. Jeff Fassett, Director  
NE Dep't. of Natural Resources  
POB 94676  
Lincoln NE 68509-4676

Dear Jeff:

During their regular monthly board meeting on August 11, 2015, the Tri-Basin NRD Board of Directors voted unanimously to request that the Department of Natural Resources join with our district and Little Blue NRD to initiate a voluntary integrated management plan (IMP) for the Little Blue basin. My board looks forward to working with your agency and Little Blue NRD to develop an IMP that has as its goal sustaining a balance between water uses and water supplies in the basin.

We appreciate your consideration of this request. We believe that it is useful and timely to develop an IMP for the Little Blue basin because it will enable closer coordination between all three agencies, enabling us to protect our precious water resources more effectively.

Sincerely,

John Thorburn  
Manager

CC: TBNRD Directors  
Dean Edson, NARD  
Mike Onnen, Little Blue NRD

RECEIVED  
AUG 24 2015  
DEPARTMENT OF  
NATURAL RESOURCES



**Pete Ricketts**  
Governor

## STATE OF NEBRASKA

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

September 11, 2015

IN REPLY TO:

John Thorburn, General Manager  
Tri-Basin Natural Resources District  
1723 Burlington Street  
Holdrege, NE 68949

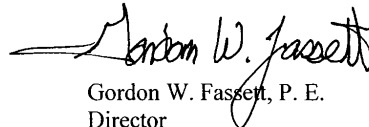
Dear Mr. Thorburn:

Thank you for informing us of your intent to jointly develop a Voluntary Integrated Management Plan (IMP) together with the Little Blue Natural Resources District and the Department. The Department appreciates this opportunity to work collaboratively with the Districts in proactive management of our state's 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](mailto:amy.zoller@nebraska.gov).

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

Sincerely,



Gordon W. Fassett, P. E.  
Director

cc: David Olsen, Chairman

iwm/members/Zoller/2015

## *Appendix B: Public Involvement*

### *B.1 Background*

The public involvement process for the joint Tri-Basin Natural Resources TBNRD's (TBNRD) and Nebraska Department of Natural Resources (NeDNR) Voluntary Integrated Management Plan (VIMP) 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. This document summarizes the public involvement process during the development of the VIMP.

The TBNRD stakeholder process was coordinated with the Little Blue NRD (LBNRD) stakeholder process. Each NRD developed individual VIMPs with the NeDNR, for their respective portion of the Little Blue River Basin. While a "basin-wide plan" was not required, the two NRDs 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.

After reviewing proposals from three firms, LBNRD, TBNRD and NeDNR hired JEO Engineering to facilitate meetings of both stakeholder groups in each NRD. The JEO Consulting Group (Facilitator) utilized the principles of the International Association for Public Participation's spectrum of public participation to guide the public involvement process.

### *B.2 Formation of stakeholder group*

The Stakeholder Advisory Committee was formed through local solicitations and nominations. The TBNRD Board and NeDNR felt it was important that anyone who wanted to serve should be included. The TBNRD submitted a news release in February 2016 to several area newspapers seeking interested persons to serve on the Stakeholder Advisory Committee. In addition, the TBNRD sent out letters to individuals who were nominated as potential members of the Stakeholder Advisory Committee through TBNRD contacts. The stakeholder advisory committee for the TBNRD VIMP is shown in [Table B 1](#).

Table B 1: Stakeholder advisory committee for the TBNRD VIMP.

TBNRD VIMP Stakeholder Advisory Committee				
First	Last	Interest Group	City	State
Terry	Sorensen	Groundwater user	Minden	NE
Andy	Tomsen	Groundwater user	Minden	NE
Ryan	Lutkemeier	Groundwater user	Campbell	NE
Joel	Kuehn	Groundwater user	Heartwell	NE
Brian	Petersen	Groundwater user	Minden	NE
Scot	Jorgensen	Groundwater user	Minden	NE
Greg	Jorgensen	Groundwater user	Minden	NE
Jerry	Lutkemeier	Groundwater user	Minden	NE
John	Kuehn	Groundwater user	Heartwell	NE
George	Joyce	Groundwater user	Heartwell	NE
Ryan	Hurst	Groundwater user	Minden	NE
Kevin	Raun	Groundwater user	Minden	NE
Marcia	Trompke	Central Nebraska Public Power and Irrigation District	Holdrege	NE
Brad	Newcomb	Nebraska Game and Parks Commission	Kearney	NE
Larry	Landstrom	Kearney County Board	Axtell	NE
Larry	Wilcox	Banker	Minden	NE

### B.3 Stakeholder Meeting Overviews

#### B.3.1 Stakeholder Meeting #1 (Joint Meeting with LBNRD): March 29, 2016

As previously mentioned, while a basin-wide plan was not required, the two Little Blue Basin 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 B-1). A total of 51 people attended the meeting: 15 TBNRD stakeholders, 20 LBNRD 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 pinpointing 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 TBNRD and LBNRD General Managers each providing a brief overview of their respective NRD. This overview included NRD boundaries, geologic information, and groundwater data. The NeDNR then gave a presentation about integrated water management, which addressed the purpose of integrated water management planning, what it means to develop a VIMP, the roles

of the NeDNR, NRDs, and stakeholders in the process, and an outline of VIMP 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 six times: jointly two times and individually four 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.



Figure B 1: Joint stakeholder meeting #1: March 29th, 2016, at the Adams County Fairgrounds in Hastings, NE

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 differences 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 NRD in May 2016.



### B.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 TBNRD and LBNRD Stakeholder Advisory Committees. The Facilitator asked the same 10 questions to each of the 17 TBNRD and 22 LBNRD stakeholders. The purpose of these meetings was to provide an opportunity for every stakeholder to express their individual thoughts and concerns about the VIMP project and process. The feedback received from this meeting was 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 to be 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.

### B.3.3 Stakeholder Meeting #2 (TBNRD stakeholders only): May 18, 2016

The first Stakeholder Advisory Committee meeting held for the TBNRD stakeholders was on May 19, 2016, from 6:30-8:30 p.m. at the Kearney County Fairgrounds in Minden, NE (Figure B 2). Twelve of the TBNRD's 17 stakeholders were in attendance, along with nine 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 about technical concepts regarding groundwater, surface water, and the VIMP planning process.

The meeting started with the Facilitator reviewing the results of the one-on-one meetings conducted with each member of both the TBNRD and LBNRD Stakeholder Advisory Committees. The review focused on the vast amount of common ground the Facilitator discovered between the stakeholders of each NRD. The Facilitator then moved on to establishing ground rules for the Stakeholder Advisory Committee. After some deliberation and through a majority vote, the Stakeholder Advisory Committee decided that a majority vote would be 2/3 of the committee (i.e. "super-majority) in attendance. The Stakeholder Advisory Committee then reviewed, modified, and approved a charter for the committee.

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 found 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 NeDNR then gave a presentation describing a VIMP. This presentation included details about the purpose of integrated management planning, described the roles of the NeDNR, TBNRD, and Stakeholder Advisory Committee in the process, and outlined the components of a VIMP. This presentation led into a discussion of what stakeholders wanted to accomplish with a VIMP. The meeting concluded after each stakeholder was given an opportunity to share their final thoughts from the meeting. During the public comment period, a stakeholder from the TBNRD Stakeholder Advisory Committee expressed his concerns about the VIMP planning process.

#### [B.3.4 Stakeholder Meeting #3 \(TBNRD stakeholders only\): Sept. 22, 2016](#)

The second Stakeholder Advisory Committee meeting held for the TBNRD stakeholders was on September 22, 2016, from 6:30-8:30 p.m. at the Kearney County Fairgrounds in Minden, NE. Twelve of the TBNRD's 17 stakeholders were in attendance, along with five 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 VIMP. Stakeholders were also provided an initial draft goals list, 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 TBNRD General Manager provided stakeholders a brief update about TBNRD's summer activities and progress. This update included information about data disconnects between the TBNRD and LBNRD, and what the two NRDs plan to do to reconcile the differences. JEO Consulting Group followed the TBNRD update with a presentation 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 TBNRD. 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. Following this technical presentation, the NeDNR provided a review of the VIMP process and an information packet of information relevant to the VIMP.



**Figure B 2: Stakeholder meeting #2 in Minden, NE**

The presentation included maps and an overview of groundwater levels and drought conditions in the TBNRD. 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. Following this technical presentation, the NeDNR provided a review of the VIMP process and an information packet of information relevant to the VIMP.

The Facilitator then updated stakeholders on the noteworthy decision made during the previous week's LBNRD Stakeholder Advisory Committee meeting. At this meeting, the

LBNRD Stakeholder Advisory Committee voted to adopt and share with the LBNRD Board of Directors a District-wide, allocation proposal (nine inches over three years) and presentation that was developed by a small group of LBRND stakeholders. This information was shared for situational awareness as the TBNRD Stakeholder Advisory Committee was to next discuss goals and objectives for a VIMP about the shared Little Blue River Basin.

For the remainder of the meeting, the Stakeholder Advisory Committee reviewed, discussed, and revised the goals and objectives document drafted by the NeDNR and TBNRD General Manager, using the goals identified during the group's May 18 stakeholder meeting. Several points of discussion included, but were not limited to:

- Consistency of data and terminology between NRDs,
- Water controls, specifically as it relates to water flow meters, and
- Improving public understanding of and participation in integrated water management.

The Stakeholder Advisory Committee also voted by supermajority to limit public comments at the end of TBNRD Stakeholder Advisory Committee meetings to three minutes.

At the end of the meeting, it was agreed upon that the updated draft goals and objectives, including tracked changes, would be distributed via email to the stakeholders. The Stakeholder Advisory Committee would continue revising draft goals and objectives at the next TBNRD meeting.

#### [B.3.5 Stakeholder Meeting #4 \(TBNRD stakeholders only\): Dec. 8, 2016](#)

The third Stakeholder Advisory Committee meeting held for the TBNRD stakeholders was on December 8, 2016, from 6:30-8:30 p.m. at the Kearney County Fairgrounds in Minden, NE. Eight of the TBNRD's 17 stakeholders were in attendance, along with four 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 VIMP.

During the final review of the goals and objectives, there were several points of discussion including, but not limited to:

- Clarification of what and who defines "best available science and data,"
- The desire to see more of TBNRD's dollars spent in the Little Blue River Basin area,
- The need to also consider water quality, as quality also affects quantity, and
- How, or if, the VIMP affects the Big Blue River Compact.

With no additional discussion or changes to the Stakeholder Advisory Committee's draft goals and objectives, a motion was made to accept the amendments made to the current draft. A call for vote was not made, but it was evident from the conversation that the group supported the amendments made. It was also the consensus that an opportunity would be provided to revise their draft goals and objectives after the joint

meeting, should the stakeholder group deem it necessary. After a final stakeholder roundtable and public comment period, the meeting was adjourned.

#### [B.3.6 Stakeholder Meeting #5 \(Joint meeting with LBNRD\): Nov. 19, 2018](#)

The second jointly held Stakeholder Advisory Committee meeting was held for the combined TBNRD and LBNRD stakeholder groups. The meeting took place on November 19, 2018, from 6:30-9:15 p.m. at the Adams County Fairgrounds in Hastings, NE. The meeting was attended by two stakeholders and three board members from the TBNRD, eight stakeholders and five board members from the LBNRD, 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 TBNRD's and LBNRD's goals and objectives developed through the VIMP 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 NeDNR provided hardcopies of the draft VIMPs, 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 NRDs closer to uniformity in management strategies, the TBNRD urged the LBNRD stakeholders and Board to consider more aggressive measures to preserve the resource for all. Conversely, the LBNRD 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 assess the level of success of the process and convey any final thoughts or concerns.

#### [B.3.7 Stakeholder Meeting #6 \(TBNRD stakeholders only\): Aug. 20, 2019](#)

The fourth and final TBNRD Stakeholder Advisory Committee meeting was held on August 20, 2019 at 1:00 pm in Minden, NE. The purpose of the meeting was to review and finalize the goals and objectives and groundwater/surface water controls for this VIMP. A secondary purpose of the meeting was to compare the objectives of the TBNRD VIMP to the LBNRD VIMP that became effective only a few days prior to this meeting.

Four stakeholders from the original group, three members of the public, three TBNRD Board Directors, TBNRD General Manager John Thorburn, LBNRD General Manager Kyle Hauschild, one TBNRD staff member and two NeDNR staff members attended the meeting. Mr. Hauschild answered questions and discussed groundwater management in the LBNRD and encouraged landowners to attend LBNRD Board meetings to voice concerns.

There was discussion about informing the public of the differences in Groundwater Management Rules and Regulations between LBNRD and TBNRD. Hauschild suggested

that additional NRDs be included in comparisons. There was discussion about the voting mechanism for stakeholders present to approve the VIMP and whether the VIMP was to be approved by a super-majority (2/3) vote. The stakeholder committee members agreed that all landowners present (three in addition to stakeholders) should be allowed to vote on motions made during this meeting. John Thorburn would contact absent stakeholders for their comments after the meeting.

The stakeholders and landowners who were present reviewed and discussed the goals, objectives and action items of the VIMP. During this discussion, the stakeholders presented two motions for two amendments to the VIMP as follows:

1. Goal 1, Objective 1: Add an action items to annually publish a comparative analysis of groundwater management rules, regulations and policies between TBNRD and surrounding NRDs. Motion carried unanimously by both stakeholders and landowners present.
2. Goal 2, Objective 3: Add an action item to request a board vote on whether to require flowmeters district-wide. Motion carried unanimously by both stakeholders and landowners present.

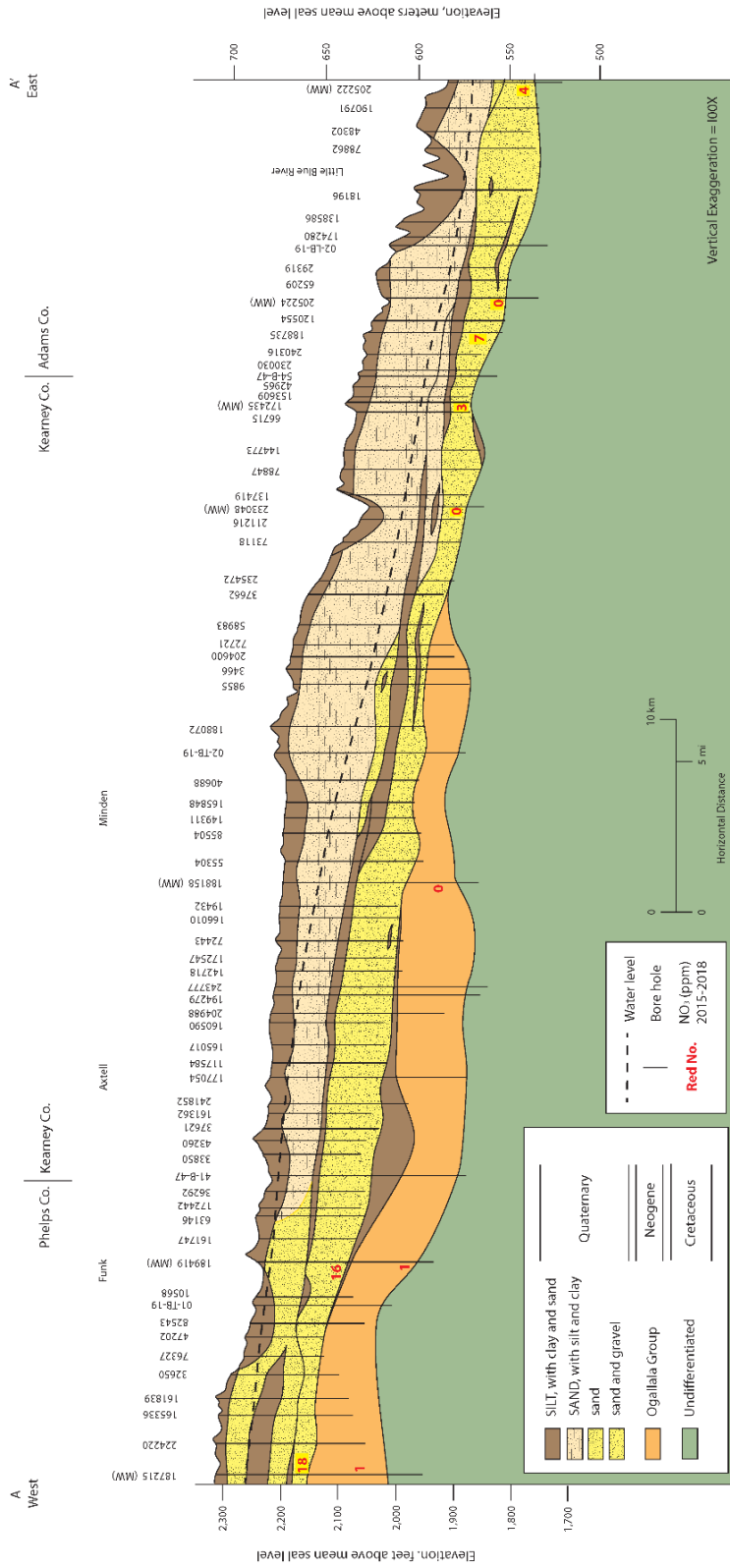
With the addition of these two action items, the stakeholders offered a motion to recommend approval of the VIMP as written:

1. Recommend for consideration by the board, the Voluntary Integrated Management Plan for the Little Blue Basin Portion of Tri-Basin Natural Resources District as amended. Motion carried unanimously by both stakeholders and landowners present.

Minor edits to the VIMP were also discussed and noted. John Thorburn shared groundwater level data and water use data for eastern Kearney County. The meeting was adjourned at 3:42 pm.

# Appendix C: Geologic Cross-Sections

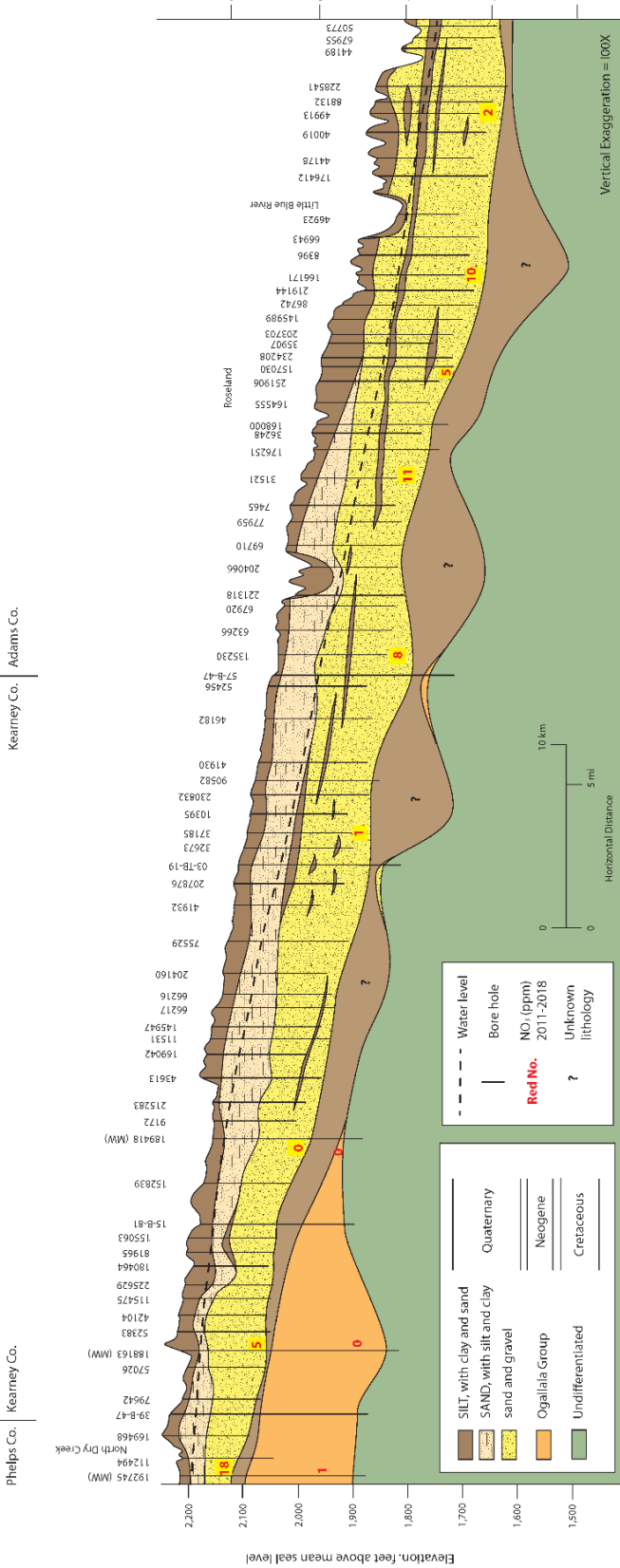
Interpretive geologic cross section: Phelps, Kearney, and Adams counties through Axtell



Interpretive geologic cross section: Kearney and Adams counties through Roseland

B  
East

B  
West



## Appendix D: Trigger for Surface Water Reporting Control

The following control for the TBNRD VIMP utilizes concepts from the Big 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.

- NeDNR will institute mandatory reporting for all high-capacity (greater than 50 gallons per minute) surface water irrigation uses when the 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. NeDNR 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 NeDNR's Fully Appropriated Basins (FAB) Annual Report, as well as NeDNR records that show actual days of closure for surface water administration. Figure D-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 NeDNR records; this length of record has been statistically shown to capture both wet and dry climate cycles. For the purposes of this VIMP, 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.

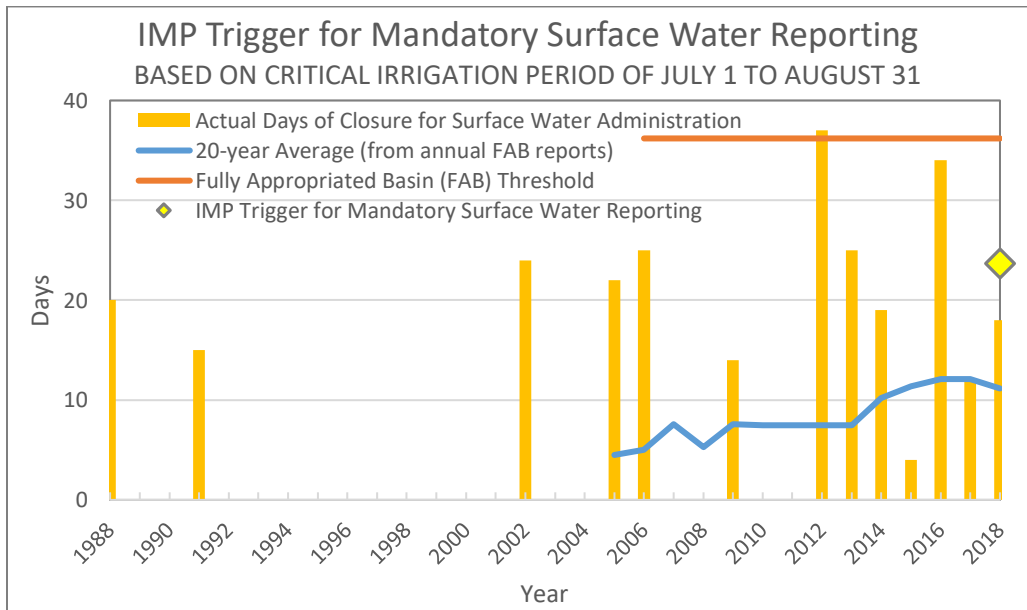


Figure D-1: Historical surface water closures, threshold of surface water closures for the FAB threshold, and the IMP trigger for mandatory surface water reporting