

Nebraska Department of Natural Resources
2023 Annual Report
of 2022 Data

for the jointly developed

Tri-Basin Natural Resources District
(Little Blue River Basin portion)
Voluntary Integrated Management Plan



Prepared by the
Nebraska Department of Natural Resources
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INTRODUCTION

Tri-Basin Natural Resources District (TBNRD) and the Nebraska Department of Natural Resources (NeDNR) jointly adopted a voluntary Integrated Management Plan (IMP) for the Little Blue River Basin portion of the district. The IMP, which became effective on April 15, 2020, requires TBNRD and NeDNR to report annually on data collected, management actions taken, and progress made to implement the voluntary IMP.

The Department's 2023 Annual Report focuses on surface water. TBNRD completed a separate report that describes the actions and progress made in voluntary IMP implementation, with a focus on groundwater. These reports are intended to inform the public about integrated water management in the IMP area and to provide transparency between the TBNRD and NeDNR.

Included in this report are the following items required by the voluntary IMP.

1. Data on existing streamgaging in the Little Blue portion of TBNRD.
2. Data on water administration of surface water rights.
3. Data on monitoring the use of surface water.
4. Data on any new surface water appropriations.
5. Data collected through a voluntary reporting program.
6. Transfers of surface water rights.
7. Variances acted upon, should a moratorium be placed on new surface water appropriations in TBNRD.

1. Streamgaging

The upper portion of the Little Blue River Basin consists of the Little Blue River, Sand Creek, and Cottonwood Creek watersheds. All these streams originate within Kearney County and are intermittent, meaning that they have no baseflow within TBNRD. As a result, no permanent streamgages are in operation in TBNRD's portion of the Little Blue River Basin.

In 2015, NeDNR installed two pressure transducers to monitor streamflow along Sand Creek. Pressure transducers are less costly than permanent streamgages and are used to observe trends in water levels. NeDNR typically collects transducer data in the spring and the fall. Though NeDNR does calculate discharge at transducer sites, these calculations are generally less accurate than those from permanent streamgages because fewer measurements are taken.

Figure 1 shows the location of the two transducer sites that monitor streamflow in the Little Blue Basin portion of TBNRD. Transducer site 26, is located on Sand Creek within TBNRD, about three miles northwest of Minden, NE, and has provisional data available through 2022. In 2022 transducer 26 recorded 75 days with 90% or greater coverage, indicating water was in the stream on those days. Transducer site 27 is located just outside the IMP area within the Little Blue Natural Resources District, about four miles east of Norman, NE. Data for transducer site 27 is available through June 26, 2019 (Figure 3). The Little Blue River and tributaries within the LBNRD have dedicated streamgages further downstream of the IMP area.

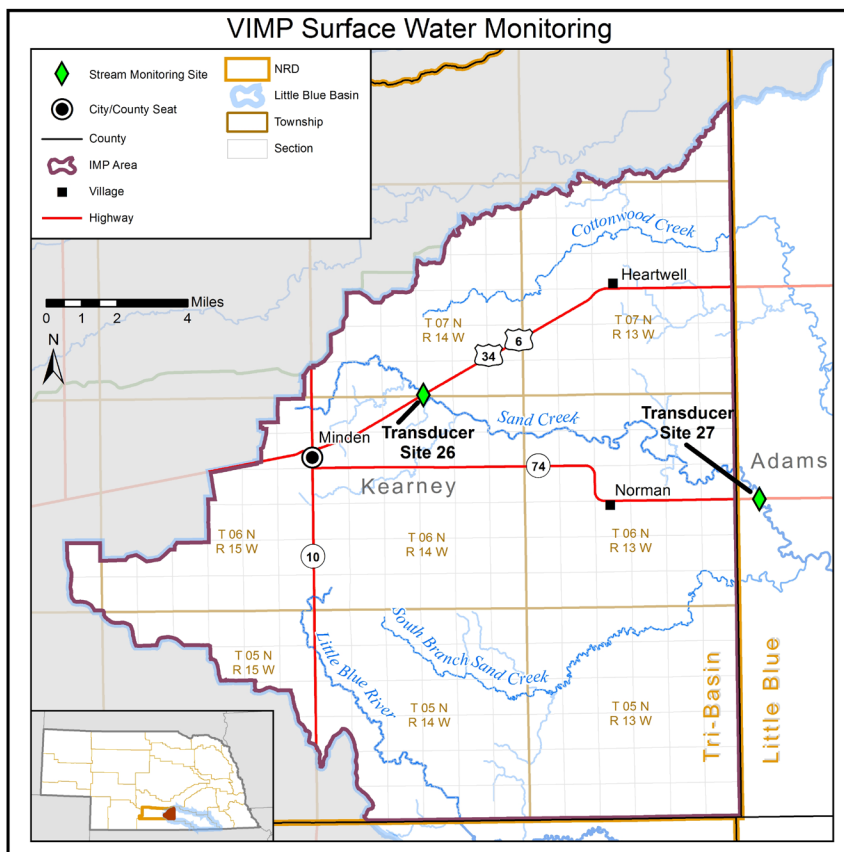


Figure 1: Location of Pressure Transducers within the IMP area

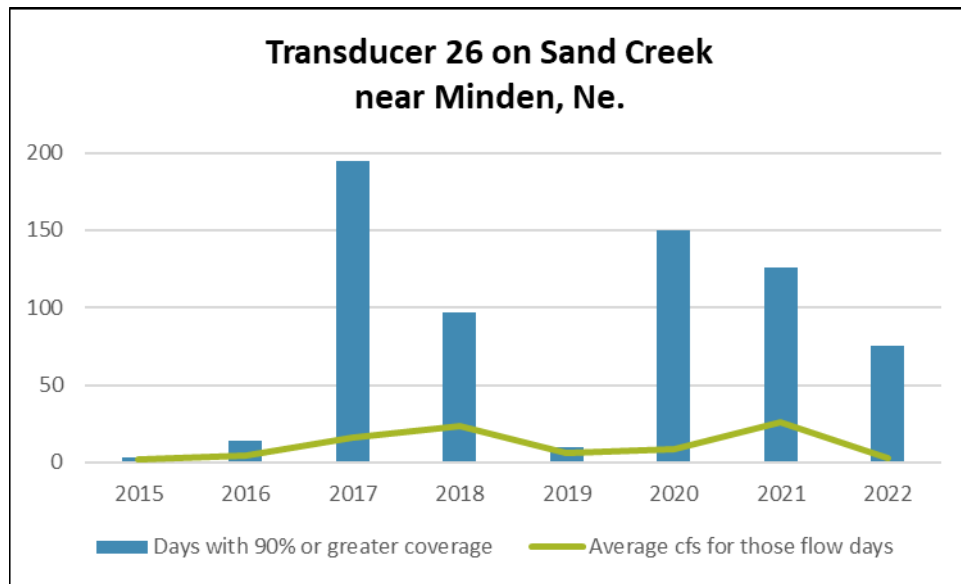


Figure 2: Transducer 26 historical data 2015-2022.

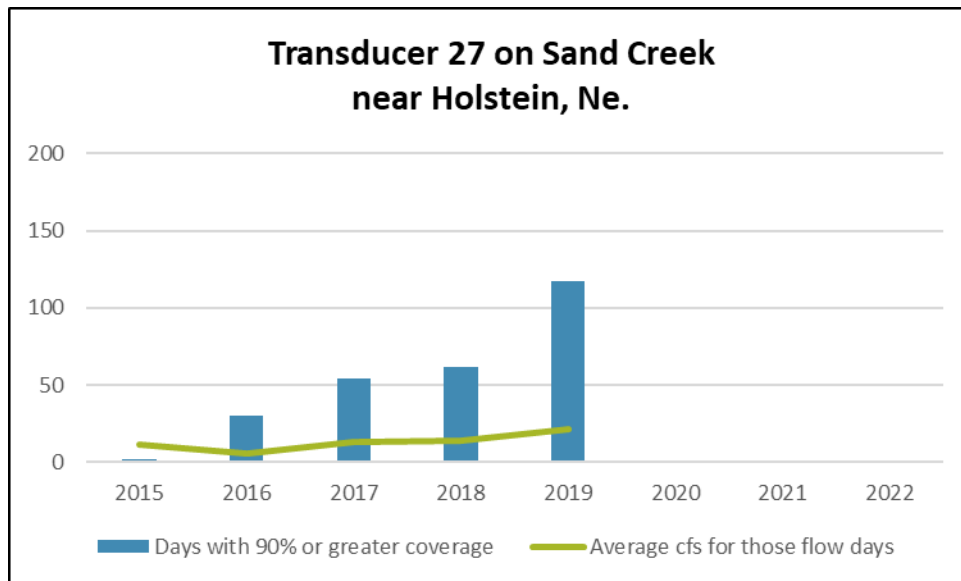


Figure 3: Transducer 27 historical data 2015-2019.

2. Administer surface water rights according to State law.

Currently, all irrigation-use surface water permits in the Little Blue River portion of TBNRD are exempt from administration under Neb. Rev. Stat. §§ 46-285 to 46-287. These exempt permits are for groundwater re-use pits that were built to capture and re-use runoff from groundwater irrigation, and for diversions from ephemeral streams.

However, to maintain compliance with the Kansas-Nebraska Big Blue River Compact, the administration of non-exempt appropriations junior to November 1, 1968, was necessary for 32 days in the period from July 1 to August 31. In total, non-exempt appropriations were closed 62 days for Compact compliance.

3. Monitoring of the use of surface water.

As time and conditions allow, the NeDNR field office staff visit pump sites as mapped for each appropriation to collect various data. In 2022 the Department did not inspect any pump sites in the IMP area due to irrigation permits being exempt from NeDNR surface water regulation or administration according to Neb. Rev. Stat. §§ 46-285 to 46-287.

4. Surface water permitting activity

In 2022 the Department did not act upon any new surface water applications. However, two storage-use (SO) appropriations were canceled by voluntary relinquishment. Table 1 lists additional information about the canceled permits. All active permits as of December 31, 2022, are shown in Table 2.

Table 1: *Cancelled surface water permits in the IMP area in 2022*

SURFACE WATER APPROPRIATIONS CANCELLED IN 2022 TRI-BASIN NRD						
Appropriation Number	Cancellation Date	Use	Source	Acres	Reason for Cancellation	Diversion/ Reservoir Location (S-T-R)
A-12988	2/25/2022	SO	Nelson Reservoir	64	Voluntary Relinquishment	S25-T5-R14W
A-13036	4/4/2022	SO	Nelson Reservoir	102	Voluntary Relinquishment	S25-T5-R14W

Table 2: Current active surface water permits in the IMP 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.	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.	No	-	36.6
A-12967	3/15/1974	Irrigation from Storage	S33-T5N-R14W	Olson Reservoir	No	147.5	36.6
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. To	Yes	17.4	-
A-15376	1/15/1979	Irrigation from Natural Stream	S4-T7N-R13W	Cottonwood Creek, Trib. To	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	-
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

5. Voluntary water use reporting

In 2022 no voluntary water use surveys were sent to appropriators that hold an irrigation use permit in the Little Blue River basin IMP area because the permits are exempt from NeDNR surface water regulation or administration according to Neb. Rev. Stat. §§ 46-285 to 46-287.

6. Transfers of surface water rights

In 2022 the Department did not act upon any transfers subject to *Neb. Rev. Stat.* §§ 46-290 to 46-294.04 in the Little Blue River basin IMP area because the permits are exempt from NeDNR surface water regulation or administration according to *Neb. Rev. Stat.* §§ 46-285 to 46-287.

7. Variances acted upon

In 2022, no moratoria were placed, thus no variances were sought.

Modeling Tools, and Data Analysis

To increase the understanding of hydrologically connected water, TBNRD is participating with the Upper Big Blue, Lower Big Blue, and Little Blue NRDs and NeDNR to develop a new numerical Blue Basin Groundwater Model. The model is intended to:

- Refine the delineations of hydrologically connected groundwater and surface water 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 NeDNR'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.

Much of 2022 was spent working on and finalizing calibration of the model. As of September 2023, model documentation has been completed and is being reviewed by the project partners. The model is expected to be ready for use by the end of 2023.