

2016 Annual Report

For the Upper Loup Natural Resources District Integrated Management Plan

Purpose: The purpose of the report is to fulfill the Upper Loup Natural Resources District's (ULNRD) responsibilities under the Integrated Management Plan (IMP) annual reporting obligations and provide updates to current monitoring projects or studies as outlined in the IMP.

Reporting and exchanging information gathered from monitoring projects, streamflow data or other studies provides a basis to increase understanding of the surface water and the hydrologically connected ground water system. As surface and ground water are hydrologically connected throughout much of the district, estimates of water quantity of either surface or ground water cannot be evaluated separately. The data gathered through this IMP's monitoring plan is designed to evaluate and measure the success of the objectives of this IMP. This information exchange also helps to test the validity of the conclusions and information upon which the VIMP is based.

On an annual basis, the ULNRD is responsible for collecting, tracking, evaluating, and reporting of: ground water level measurements; two stream gage measurements; municipal, commercial, industrial, and agricultural water use; certified irrigated acres and any changes to certifications; well water construction permits approved, cancelled or denied; variances granted, cancelled or denied; water transfer permits granted, cancelled, or denied; and water banking transactions.

ULNRD Reporting:

Ground water level measurements.

The ULNRD collected spring static water levels from 115 wells across the District. The wells in Sub-district 1 (southern Cherry above Grant County and Grant Counties) showed no significant changes only a slight incline (less than half a foot) from the previous year. Wells in Sub-district 2 (southern Cherry above Hooker County and Hooker County) showed no changes. No declines or changes of any type in noted in sub-district 3 (southern Cherry above Thomas County and Thomas County). Sub-district 4 (southern Brown County above Blaine County and Blaine County) showed a decline of a little less than half a foot which has been the trend for the past 3 years. Lastly, in sub-district 5 (Logan County and the eastern 1/3 of McPherson County) showed a decline of just under half of foot but unlike sub-district 4 there hasn't been a downward trend.

Even with no notable changes across the District in static water levels the Directors voted to hold off on any irrigated acre expansion in 2017. Primarily because of the several projects and studies we are involved in for example the Upper Loup water budget study, the groundwater discharge study in the Loup Basin and the Lower Platte South Basin planning.

Stream gage measurements.

The ULNRD, along with USGS, operates 4 stream gauges within the District.

Station 06775500 Middle Loup River at Dunning
Station 06781600 South Loup River at Arnold

Station 06775900 Dismal River near Thedford
Station 06785500 North Loup River at Brewster

Streamflow data can be acquired from USGS's National Water Information System at <http://waterdata.usgs.gov/>

Municipal, commercial, industrial water use.

There are 5 municipal water systems in the District.

Thedford: 148.93 acre feet

Hyannis: 158 acre feet

Mullen: 204.28 acre feet

Stapleton: no report for 2016

Dunning: no report for 2016

Agriculture / irrigation water use.

The due date for all irrigation wells within District boundaries to have flowmeters installed is May 1, 2020. The numbers stated below are a combination of producer reported amounts and data collected from ULNRD staff from wells already metered. Total acre feet of reported water use equal 327.45.

County	# of wells that reported	# of wells metered	total inches reported	primary crop
Blaine	67	43	845.64	grass
Brown	28	17	187.36	corn
Cherry	38	30	330.51	corn
Grant	11	3	77.94	grass
Hooker	16	9	151.30	alfalfa
Logan	196	140	1863.61	corn
McPherson	38	23	274.82	corn
Thomas	28	14	198.27	grass/alfalfa

Certified irrigated acres / changes.

For 2016 the Directors opted to grant up to 500 acres per sub-district or 2,500 across the District. The total number of acres certified for 2016 across the District was 981.

Sub-district 1	# of apps	# of Q apps	# of Q acres	# of acres granted	# of acres certified
1	0	0	0	0	0
2	1	1	120	120	120
3	0	0	0	0	0
4	7	4	457	457	393
5	22	10	533	500	468

Q = qualified acres – those scoring on or above the minimum ranking criteria value.

The Upper Loup Board of Directors approved a transfer of certified irrigated acres on Thursday March 10, 2016. Both parcels are owned by the same person. 60.23 acres from Section 13, Township 19, Range 31 in McPherson County was transferred to Section 13, Township 17, and Range 27 in Logan County.

Well water construction permits approved, cancelled or denied.

3 replacement irrigation wells were approved, 1 in Thomas County and 2 in Logan County.

6 new irrigation wells were approved that were associated with the granted irrigated acre expansion.

No permits were denied or canceled.

Variances granted, cancelled or denied.

No variances were granted, cancelled or denied.

Water transfer permits, granted, cancelled, or denied.

No water transfer permits were granted, cancelled or denied.

Water banking transactions. In 2016 no water banking system had been established.

Studies / projects.

Currently the UNLRD is involved in a few studies.

- 1) Investigating the spatial and temporal characteristics of groundwater discharge in the Loup River Basin. Collaborators in this project are Upper Loup NRD, Lower Loup NRD and USGS. This is a 3-year project to collect airborne thermal infrared data, measure and record groundwater levels, to enhance the understanding of special and temporal characteristics of groundwater / surface water interaction in the Loup basin. Four streams reach, approximately 320 river miles, have been identified as priority streams where we hope to recognize focused groundwater discharge areas.
- 2) Groundwater Monitoring to Assess Water Development in Brown County. Collaborators in this project are the Upper Loup NRD and the University of Nebraska Conservation and Survey Division. The principle objectives of this study include drilling test holes, performing geophysical surveys, placing, designing and installing shallow and deep groundwater monitoring wells as well as installing continuous water level recorders and water quality sampling equipment in each well. Three locations were identified and wells drilled. Two wells in Brown County and one in Blaine County.
- 3) Upper Loup Water Budget Study. Collaborators include the Upper Loup NRD, the Department and Upper Loup NRD producers. The goals of this project include to develop and implement information gathering and monitoring process of hydrological and other related data to assess water resources and uses within ULNRD boundaries, as well as to contribute the ULNRD Voluntary Integrated Management Plan objectives regarding water supplies and demands.

Collaboration with other entities.

The Upper Loup NRD maintains in collaboration with the four other NRD's in the Niobrara Basin and the Department to develop or refine management plans for each district in the basin. The Upper Loup NRD continues to collaborate with the six other NRD's in the Lower Platte Basin and the Department to pursue, foster and discuss various components that may potentially lead to a basin plan. As part of this process a common methodology and accounting system, that would provide members guidelines for possible future water bank to support water management activities, is being pursued.

Education / outreach activities.

ULNRD continues to provide cost-share assistance on best management practices and equipment to encourage ground water efficiency. We did not have any NSWCP water management applications in 2016. Through its own cost-share program the District checked out 15 soil moisture sensors to producers throughout the District that requested them. Producers placed 87 flowmeters on their high capacity wells to help gain more accurate water use information that shall be provided to the ULNRD.

The Upper Loup provided information about irrigated acres, water levels, cost-share opportunities as well as on-going, new and potential projects to the general public through several media releases, in our quarterly newsletter and on our website.

The District held its annual Jr. High Field Day in which Chris Hobza from USGS came down and presented information to the students on stream flows and talked some on ground water and surface water interaction. Several programs were done at the local elementary schools going over both water quality and quantity.