

## Middle Republican NRD

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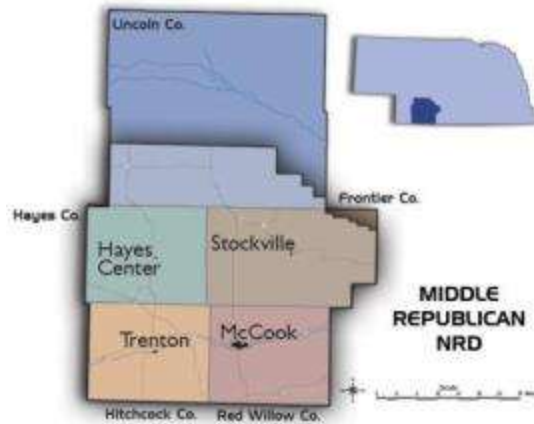
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Department of preliminary

### HISTORY

Following a request by the districts to the Water Resources, the Republican Basin received a designation of being fully appropriated under LB108 in September of 1996. The process for a Joint Action Plan was initiated under those statutes and was placed on hold during the lawsuit with Kansas from May 1998 to July 2003. The boundaries to be used for our management area were part of the negotiated settlement with Kansas and were not a result of any study or depletion lines. In July of 2003 a final determination of conflicts under the LB 108 process was made and the development of rules and regulations began. In July of 2004 a “fully appropriated” designation was made under LB 962 and the Joint Action Plan process was replaced by the Integrated Management Plan process. In October of 2004 a hearing was held on the revised rules and regulations for the existing Ground Water Management Area and the new Integrated Management Plan. The rules and plan were adopted and became effective on January 1, 2005.

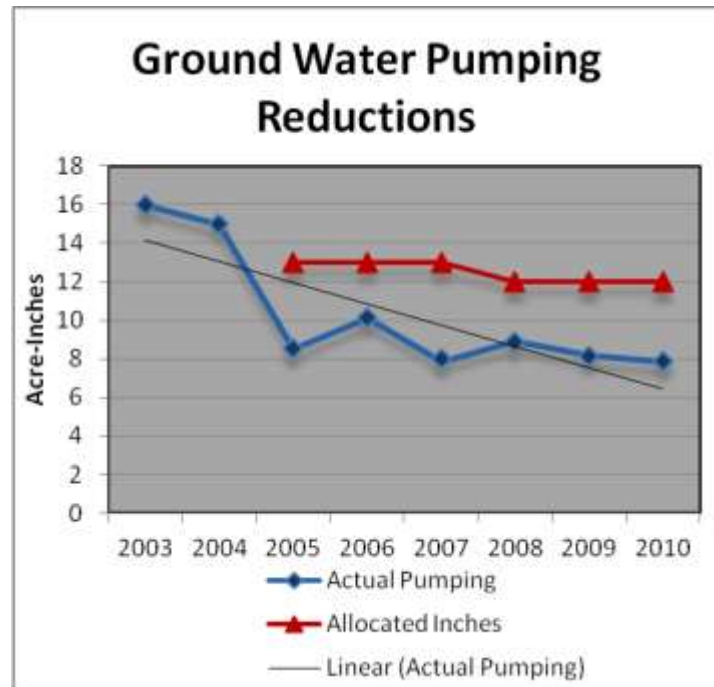
The first Ground Water Management Area was adopted in July of 1998 and has been revised several times to reflect changes in emphasis, legislation and the compact settlement. A Quality Management Area along the main stem of the Republican River in Hitchcock and Red Willow Counties was created and adopted in 1993 and we continue to monitor levels of nitrate contamination in this area. Average levels of nitrates are approximately 7.5 mg/l and have not increased since 1993. Many areas show a reduction in the levels of nitrate.

#### Ground Water Management Area

Established	July 1, 1998
Revised	July 1, 1999
Revised	July 1, 2000
Revised	Nov. 17, 2003
Revised	January 1, 2005
Revised	October 3, 2006
Revised	February 1, 2008
Revised	March 16, 2009
Revised	Fall 2011

#### Integrated Management Plan

Established	January 1, 2005
Revised	October 3, 2006
Revised	January 8, 2008
Revised	August 2, 2010
Effective	November 2010



## MAJOR ACTIONS

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- Temporary Suspension of Drilling                      June 12, 2002
- Certification of Irrigated Acres                              November 2003
- All Water Uses Metered    December 2004
- IMP implemented    January 2005

The IMP included allocations, a moratorium on new wells, and a ban on development of new or expansion of existing irrigated acres. Allocations were adopted for irrigation, municipal and industrial uses. Initial allocation for irrigation uses - 39 inches for three years – 2005, 2006 and 2007.

Revised allocation for the period of 2008 through 2012 is 60 inches for five years. Actual pumping levels throughout the District have been less than the set allocation. Yearly pumping data and irrigated acres are provided to the Department of Natural Resources to be used in compact accounting. **See Figure 1 above.**

**Irrigated acres in MRNRD – 309,532**                              (approximately 1 acre in every 8 is irrigated)

Actual irrigation water use:

2005--8.52 inches	2006--10.32 inches	2007-- 7.98 inches
2008--8.59 inches	2009-- 8.17 inches	2010-- 7.85 inches

## PROGRAMS

- Retirement of Irrigated acres:
 

EQIP -- temporary -- 2,524 acres	Crop years 2005 thru 2008
CREP – temporary – 13,000 acres	10 to 15 years beginning in 2005 and 2006
EQIP – permanent – 1,130 acres	Conservation easements beginning in 2007
ARP – permanent -- 691.1 acres	NRD funded acreage retirement program
AWEP – permanent – 331 acres	Federal Funds in fall of 2009
AWEP – permanent – 808.5 acres	Federal Funds in fall of 2010
AWEP – permanent – 213 acres	Federal Funds in fall of 2011
EQIP – temporary – 1,875 acres	Crop years 2011 – 2015 Fed. Funds
- River Flow Enhancement – The revised authorities provided by LB 862 will be used to fund retirement programs, leases and augmentation. Planned assessment of \$8.50/acre.
- Riparian Projects – River riparian improvements completed. Maintenance efforts continue.
- Augmentation – Studies using funds from the IWMPP have completed preliminary assessment of augmentation possibilities and will continue with site selection evaluation.
- Water Budget Study: Identify and quantify uses and their impacts in the Nebraska portion of the basin. Completed July of 2011.

## 2011 AND BEYOND

Integrated Management Reductions in pumping will continue to be achieved using a combination of regulation, incentive programs, and other authorities. The revised occupation tax authority in LB 862 in 2010 finally makes it possible to move forward with larger scale programs and projects. The MRNRD continues to work with the other districts in the basin and DNR to improve our IMPs and to provide the most accurate data possible for compact accounting. After a year of discussion and planning with DNR, the August revision to our IMP became effective in November of 2010. This revision includes a much more effective forecast and while it does require the curtailment of surface water and some ground water uses, it also provides for the credit of management actions that have been implemented or can be implemented in a dry year. The economic impact of these management actions will be minimal compared to the devastating impact of regulations. The overall goal will be to conjunctively manage the waters of the basin as one water rather than managing ground water and surface water separately.

## FLOOD CONTROL

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The district provides operation and maintenance of 34 flood control structures. These structures are on tributaries to the Republican River and are all dry structures. They capture flood flows and release them over a period of days to minimize the flood effects of significant storms.

## Nemaha NRD

62161 Hwy 136

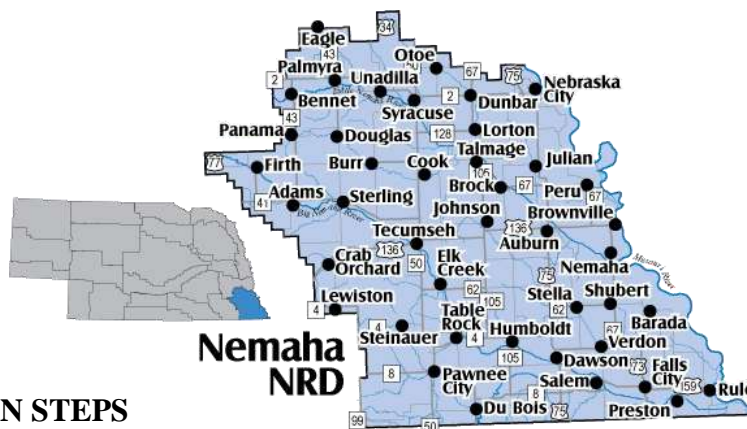
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## GROUNDWATER STATUS & ACTION STEPS

The Nemaha NRD is served by just a few aquifers that yield large amounts of water for the majority of uses in the District. Although irrigation has typically been somewhat limited within the District, the 1970s saw a big jump in new irrigation wells with over 200 constructed during that decade. This compares to approximately 80 from 1950 to 1970 and approximately 65 from 1980 to 2000. Interest in irrigation has peaked again since 2000 with 253 new wells constructed. There are currently 596 registered irrigation wells in the District.

August, 1999 - The entire District was designated as a Phase I Groundwater Management Area (GWMA). Phase I controls require a permit, prior to construction, for wells designed to pump greater than 50 gallons per minute. To date, over 428 wells have received approved permits throughout the District, however only about 299 were ever constructed due to the permit expiring or lack of sufficient groundwater quantity.

May, 2006 - Responding to increased well development and conflicts among some users, the NRD board issued a District-wide, temporary, two-year closure to the issuance of well permits effective May 15, 2006. The closure was blanketed District-wide as defensible data to support delineated aquifer boundaries was not available. Also, during this time the District's Groundwater Management Plan (GWMP) was in the process of being updated in order to better address groundwater quantity issues. A variance process was also established during the two-year closure requiring greater spacing between high capacity wells, drilling of a testhole and Board approval. This allowed the District to better scrutinize each request on a case by case basis. Since the May 15<sup>th</sup>, 2006 temporary closure, 161 applications have been considered, 104 were approved and constructed, 5 were denied, 7 were not constructed due to limited quantity, 29 expired and 21 are currently pending registration.

The District currently has eight active continuous read water level recorder wells and hand measures over 120 wells (irrigation, livestock, domestic, and public water supply) each spring and fall. Forty seven of these wells located in a marginal production aquifer area have been measured weekly or twice monthly for static water level from June through August for the past six years. Two domestic wells in that area had been pumping some air; however increased rainfall amounts the past five growing seasons has resulted in less irrigation use, aquifer depletion and conflicts among users.

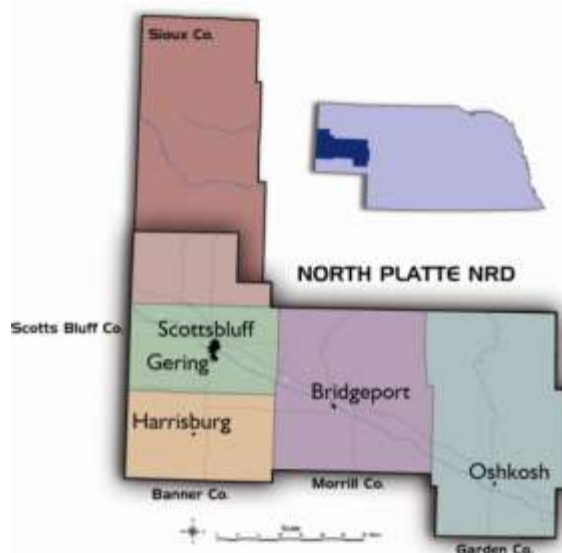
A three year grant application from the Integrated Water Management Policy Program Funds (IWMPPF) was submitted to and approved by the Nebraska Natural Resources Commission in 2006. The funds were used to collect hydrogeologic data, install additional continuous recorder wells and develop a groundwater model in order to delineate aquifer boundaries, develop management areas and regulate groundwater use accordingly. It was the District's goal to have the GWMP updates completed and in place by the May 2008 well permit closure expiration date, however that date was extended until October, 2008. Additional changes to the District's Groundwater Management Plan and associated Rules and Regulations prompted the District to

initiate a temporary 180 day stay on new high capacity well development in lieu of extending the temporary closure rule a second time. The new Groundwater Management Rules and Regulations went into effect on February 1<sup>st</sup>, 2009 thus ending the temporary 180 day stay early.

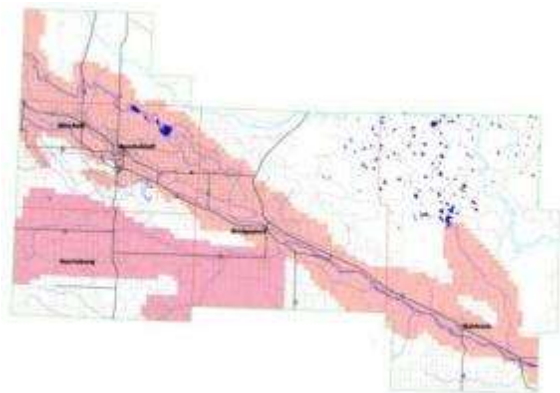
The District is also a partner with the Eastern Nebraska Water Resources Assessment (ENWRA) group that is researching geophysical technologies to delineate the glaciated aquifer regions of eastern Nebraska.

## North Platte NRD

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The NPNRD showing the Overappropriated area in light pink and the Pumpkin Creek Basin sub-area in dark pink. (DNR 2004)



## GROUNDWATER STATUS

- Recharge and return flows in the North Platte Valley are highly dependent on the delivery of irrigation water through the canal system
- The total water in the system is highly dependent upon the snowfall and run off from the Rocky Mountains in Colorado and Wyoming. This also has a direct impact on the amount of water available downstream.

## ACTION STEPS & TIMELINE

The North Platte NRD has been proactive in dealing with the water issues and with the drought:

- **2001** -- A moratorium was placed on the drilling of new wells in the Pumpkin Creek Basin Sub-area (first on Platte River Basin).
- **2002** -- A moratorium was placed on the drilling of new wells in the rest of the NRD.
- **2002** -- All ground water uses in the Pumpkin Creek Basin Sub-area were certified.
- **2003** -- A ground water irrigation allocation of 15 acre-inches per acre was implemented in the Pumpkin Creek Basin Sub-area. A ground water allocation has been maintained each year since, reviewed and adjusted according to water levels and use demand.
- **2004** -- DNR placed a stay on the expansion of irrigated acres.
- **2005** -- Pumpkin Creek Basin Sub-area ground water irrigation allocation is reduced to 14 acre-inches per acre per water year.
- **2006** -- Approximately 2,500 irrigated acres were permanently retired in the Pumpkin Creek Basin Sub-area through a conservation easement.
- **2006** -- Rules and regulations were adopted for the certification of all ground water uses in the District and for the installation of flow meters in the overappropriated portion of the district.
- **2007** -- The allocation for ground water irrigation use in the overappropriated area of the District is set at 18 inches per acre per water year, beginning with Water Year 2009.

- **2007** – The NRD joins with other Panhandle NRDs and counties to form the High Plains Weed Management Association to address the control of invasive plant species in the upper Platte River Basin.
- **2007** – The District begins a cooperative effort with Panhandle NRDs and the NRCS to promote continuous no till farming practices and hold no till producer workshops and an annual no till conference.
- **2007** – Rules for the transfer of ground water within the District, except for the Pumpkin Creek Basin Sub-area, are adopted.
- **2008** – Certification within the District is completed and flow meter installation on wells in the overappropriated area of the District is complete.
- **2008** – The ground water irrigation allocation for the Pumpkin Creek Basin Sub-area was reduced to 12 acre-inches per acre per water year.
- **2008** – The ground water irrigation allocation of 18 acre-inches per acre per water year goes into effect in the overappropriated area of the District.
- **2009** – The Integrated Management Plan is adopted on September 14.
- **2009** – The Basin-wide Plan for the overappropriated portion of the Platte River Basin is adopted and took effect on September 11.
- **2010** – Implementation of the Integrated Management Plan begins.
- **2010** – **The ground water irrigation allocation is set at 56 acre-inches per for the allocation period of Water Year 2010 through 2013.**
- **2011** – 8,347 irrigated acres have been temporarily retired within the District.

## **FUTURE**

The North Platte NRD is actively participating or partnering in several studies, including a canal leakage study with the U.S. Geological Survey. Such studies may result in intentional recharge projects which will help maintain western Nebraska ground water aquifers and improve the base flows of the North Platte River. Work has also continued on the development and improvement of ground water and surface water models.

The District is exploring ways to partner with landowners, local conservation groups, and other agencies to develop and fund the removal of invasive species (Russian Olive and Saltcedar) along the North Platte River and its tributaries. We are also taking a leadership role in educating both adults and children, rural and urban, about the urgency of protecting western Nebraska's water resources.

The District is continuing to seek ways to address the water issues on the North Platte River and is working with other Platte Basin NRD's to meet the obligations established in LB 962. We are evaluating on a continuing basis the effectiveness of our actions in implementing the Integrated Management Plan.

## Papio-Missouri River NRD

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## GROUNDWATER STATUS

To date, the Papio-Missouri River NRD has not documented any decline in water levels or serious water quality issues. Monitoring results to date reflect the cyclical nature of irrigation well pumping and recharge, but have not shown any significant long-term declines. On December 16, 2008, the Department of Natural Resources made a preliminary determination of fully appropriated for the Lower Platte River Basin and then made a final determination of not fully appropriated on April 8, 2009. Prior to that final determination, legislative bill 483 passed with an emergency provision requiring NRD's, in which a change in status to not fully appropriated occurs, to manage the expansion of groundwater irrigated acres over a four year planning period. The intent is to keep the basin from becoming fully appropriated during that planning period. The P-MRNRD imposed an immediate stay on the construction of new water wells and the expansion of groundwater irrigated acres in the area in which surface water and groundwater are hydrologically connected without a variance from the district and adopted regulations for the granting of those variances. The District has placed a limit on the expansion of groundwater irrigated acres of not more than 10,000 acres in four years or approximately 2,500 acres per year. The District is monitoring 43 wells for quantity and 30 wells and 6 nested wells for water quality.

## ACTION STEPS AND TIMELINE

- 1978 – Initiated static water level monitoring program in the District.
- 1985 – Adopted Groundwater Management Plan (GWMP) as required by law.
- 1994 – Revised GWMP to include triggers for groundwater quantity and groundwater quality.
- 2009 – Imposed stay on new irrigation wells and expansion of groundwater irrigated acres

## FUTURE

The Papio-Missouri River NRD does not anticipate declines in groundwater levels within the District. The District will continue to monitor both quantity and quality to continue to build the database. This information is provided to US Geological Survey and the Conservation and Survey Division at UN-L. The data is permanently stored in the Nebraska Dept. of Natural Resources Data Bank

The District is a partner in the joint Eastern Nebraska Water Resources Assessment (ENWRA) project to better map and manage the groundwater resources in Eastern Nebraska. The District has also partnered with the US Geological Survey, Lower Platte North NRD, Lower Platte South NRD and ENWRA to develop a pilot groundwater flow model in the Ashland area. The model will implement the Farm Process for MODFLOW, a full water budget analysis tool, to help the District better assess the water budget components of the Lower Platte system.



## South Platte NRD

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**GROUND WATER STATUS** – Wet springs at the end of the first decade in the 21st century, coupled with more efficient water use during preceding drought years, have resulted in more stabilized water levels across the District. Despite that progress, ground water levels remain far below those measured 20 years ago, in some areas more than 20 feet lower than historical marks. The District continues to develop a more detailed understanding of ground water, as well as programs to further reduce consumptive water uses. The entire SPNRD is either fully appropriated or overappropriated.

### ACTION STEPS AND TIMELINES

- Since its inception in 1972, the SPNRD has been recording the depth of ground water in a network of observation and recorder wells to monitor ground water trends. The District works with the UNL Conservation and Survey Division to provide data collection, data storage and interpretation.
- 1985-1986 – SPNRD’s Ground Water Management Plan required by LB 1106 (1984) was completed and approved by the Nebraska Department of Natural Resources, which established “trigger mechanisms” for the Ogallala and alluvium aquifers. Due to the complex nature and extreme water table fluctuations, a Brule aquifer observation zone was established in 2002 to enable the District to better monitor this resource.
- 1998 – The Cooperative Hydrology Study (COHYST) was started to develop scientifically supportable hydrologic databases, analyses, models, and other information in the Platte Basin in Nebraska upstream of Columbus. The SPNRD was a sponsor.
- 2001 – The SPNRD Board of Directors revised its Ground Water Management Plan to incorporate a Ground Water Integrated Management Plan and to establish a Districtwide Ground Water Management Area Designation.
- October 2002 – The SPNRD Board of Directors adopted an order to establish a Districtwide Ground Water Management Area to manage ground water for concerns of quantity, integrated management and quality.
- October 2002 – The SPNRD Board of Directors adopted an order establishing the Lodgepole Creek Integrated Ground Water Management Subarea, which placed a moratorium on permits for new wells with a capacity of 50 gallons per minute or greater.
- 2002-2006 – The District completed certification of 133,457 total irrigated acres with 1,312 registered irrigation wells.
- January 2004 – SPNRD Board of Directors ordered a temporary suspension of water well construction for all areas of the District not already in a moratorium.
- January 2004 – Board of Directors approved requirement to have flow meters installed on irrigation wells District wide. Flow meters were installed incrementally through March 2009.
- July 2004 – Because of LB 962 (2004), stays were placed on the drilling of new large capacity wells and expansion of irrigated acres throughout the District.
- August 2004 – To meet requirements of LB962, Board of Directors re-aligned ground water management subcommittees and began forming Integrated Management Plan Committee to help form and make recommendations on IMP.
- September 2004 – Because of LB 962, the entire SPNRD was designated as either fully appropriated or overappropriated.
- November 2006 – The SPNRD board adopted amendments to the Districtwide Ground Water Management Area Rules and Regulations incorporating allocation, transfer and pooling procedures.
- January 2007 – First District-required allocations went into effect for 2007 growing season.
- October 2007 – Under the Districtwide Ground Water Management Rules and Regulations began making adjustments to Certified Irrigated Acres through variance requests, voluntary and conservation program CIA retirements, and well deferments.
- July 2008 – The SPNRD and NDNR Integrated Management Plan (IMP) was adopted and went into effect.
- January 2009 – Allocations began in the last subareas phased in under the District’s requirements.
- April 2009 – The Platte Basin Habitat Enhancement Program set out to increase habitat diversity and the resilience of the Platte River Basin ecosystem . With funding from NET, NDNR, the Nebraska Game and Parks Commission and five Platte Basin NRDs, the program develops projects to reduce consumptive water use or increase benefits to wildlife. Using these and federal funds, the District has developed a number of conservation easements permanently retiring irrigated acres, and participated in water recharge projects.

- July 2009 – The SPNRD, NDNR and Platte Basin NRDs approved and implemented the Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin.
- July 2009 – With approval of the Basin-Wide Plan, the SPNRD and NDNR modified, approved and implemented Rule 9 of the District IMP, relating to overappropriated portions of the District.
- July 2009 – The SPNRD Board adopted amendments to the Districtwide Ground Water Management Area Rules and Regulations, lowering allocations in four subareas in the Lodgepole Valley and Sidney Draw areas beginning in the 2010 irrigation season. The four subareas were the first in the District to be placed under allocation restrictions, which began in March 2007.
- February 2010 – As part of the IMP process, the District began the process to account for industrial/ commercial water uses and establish baselines.
- July 2010 – Platte Basin NRDs and NDNR performed the first review of the Basin-wide Plan, including a public hearing to receive testimony.
- May 2011 – The Board approved the Amended and Restated Districtwide Ground Water Management Area Rules and Regulations, which included provisions under LB 477 (2009) providing that no transfer of certified irrigated acres or certified water use be accepted without the prior approval of any lienholder. The restated rules and regulations also repealed three other ground water management documents relating to both ground water quality and quantity that were incorporated into the new rules and regulations.
- July 2011 – Platte Basin NRDs and NDNR held the second annual review of the Basin-wide Plan, including a public hearing to receive testimony.
- September 2011 – The Board approved the final baselines for municipal water accounting, completing the process to account for most ground water uses within the District.

## **RESEARCH & TECHNOLOGY**

The District is constantly searching for more information on water resources in efforts to manage the resource wisely and fulfill the requirements of state law. Some recent projects include:

- April 2008 – Began aerial geophysical surveys across the District to help determine the feasibility of electronically mapping hydrogeological features. The South Platte, North Platte and Twin Platte NRDs have sponsored the ongoing project, in conjunction with the USGS and the Nebraska Environmental Trust.
- January 2009 – The District commissioned a study from the University of Nebraska Bureau of Business Research entitled “The Economic Impact of South Platte NRD’s Integrated Management Plan and Districtwide Ground Water Management Area Rules and Regulations,” to determine possible impacts and implications the regulations might have on the agricultural community and District economy as a whole.
- February 2009 – In partnership with the North Platte NRD, began development of the Western Water Use Management Model to provide modeling information specific to the SPNRD and NPNRD not included in the COHYST Model. The model will be capable of calculating the success of management actions and options in relation to achieving goals outlined in the IMPs and Districtwide Ground Water Management Area Rules and Regulations, and provide a greater understanding of hydrogeology within the districts.
- July 2009 – Began development of a Water Accounting GIS, which would handle all calculations for irrigation and industrial flow meters and municipal water accounting use. The database will take individual property dynamics into account to more efficiently generate water management reports for both operator and NRDs use.
- April 2010 – Received a grant from the Nebraska Environmental Trust for Expanding the Hydrogeological Framework for Selected Areas of the South Platte NRD to expand the District’s monitoring well network. The expansion will extend the District’s capability to physically monitor ground water quality and ground water levels in areas not previously measured, adding to the information used by the Board for ground water management decisions. Drilling of new wells began in early 2011.
- July 2010 - Under a grant from NET began a study on the economic impact of reduced ground water allocations in the Nebraska Panhandle, and development of educational programming to improve crop management with less water. Partners include the South Platte, North Platte and Upper Niobrara White NRDs.
- July 2010 – The Board of Directors approved an agreement with NDNR for a study of flows in Lodgepole Creek to 1) review historical stream flow data to determine the extent of live stream within the Lodgepole Creek subarea and a hydraulic evaluation of how such flow translates to the South Platte River; 2) refine the stream depletion analysis completed by COHYST (2008) and provide additional assessment of depletions that must be offset in the Lodgepole Creek subarea; 3) evaluate the feasibility of using Lodgepole Creek subarea flows to augment flows in the South Platte River.

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### Tri-Basin NRD



## GROUNDWATER STATUS

Tri-Basin NRD includes portions of the Platte, Republican and Little Blue River basins in south-central Nebraska. All irrigated land in the district has been counted and certified. No additional irrigated acres can be developed anywhere within the district. Flowmeters are in place on all wells in the Republican Basin portion of the district and are required on all conditional replacement wells. Transfers of groundwater and certified irrigated acres are regulated under NRD rules.

## ACTION STEPS & TIMELINES

- 1977- Tri-Basin initiated a district-wide groundwater level data observation network.
- 1981-87- Tri-Basin worked with US Geological Survey (USGS) and NE Natural Resources Commission to model groundwater resources in south-central Nebraska. This model was used as a basis for Tri-Basin's first groundwater management plan.
- 1989- Tri-Basin established a groundwater management area to protect groundwater quality.
- 1995- Revised NRD groundwater management plan was approved by Nebraska Department of Water Resources.
- 1996- Tri Basin and other Republican Basin NRDs initiated "LB 108" process for Republican Basin portion of the district to regulate groundwater users to protect Republican River streamflows. It was suspended at the request of Attorney General Don Stenberg after Kansas filed a lawsuit against Nebraska over Republican River Compact compliance in 1998.
- June, 2003- Tri-Basin NRD required flowmeters on all irrigation wells in the Republican Basin portion of the district. Flowmeters are also required on all new wells district-wide.
- July, 2004- Tri-Basin NRD and DNR agreed on a joint action plan for the Republican Basin portion of the district under LB 108 provisions.
- September, 2004- Tri-Basin declared a district-wide groundwater quantity management area and an integrated management area to protect Platte and Republican basin streamflows.
- March, 2006- Tri-Basin expanded the integrated management area to include an area in the Platte Basin designated that same month by DNR.
- October, 2006- Tri-Basin closed the Little Blue Basin portion of the district to development of additional irrigated acres to prevent groundwater declines. Tri-Basin is working with Little Blue and Lower Republican NRDs to develop a joint plan for management of groundwater supplies.
- May, 2008- Nebraska Game & Parks Commission (NGPC), Central Nebraska Public Power and Irrigation District (CNPPID) and Tri-Basin NRD approved an agreement that enables Tri-Basin and NGPC to compensate CNPPID for delivering excess water to Elwood Reservoir. These water deliveries protect the fishery at Elwood Reservoir and provide groundwater recharge that benefits both the Platte and Republican River basins.
- September, 2008- Tri-Basin NRD designated one township in Gosper County as a phase 3 Groundwater Quantity Management Area, due to declining groundwater levels. Groundwater pumping was limited to a total of 27 inches per acre for 2009-2011. An adjacent township was designated as phase 2 for quantity management.

- July, 2009- Tri-Basin NRD and CNPPID approved an agreement for CNPPID to request that DNR re-classify 3000 acres of surface irrigation water rights for instream flow. The water will be delivered to the Platte River near Lexington and will offset groundwater well depletions to streamflows.
- August, 2009- Tri-Basin NRD and NDNR agreed on joint IMP for the Platte Basin portion of the NRD. The IMP and associated NRD rules changes take effect September 15, 2009.
- September, 2010- Tri-Basin NRD board authorized geologic investigation to determine feasibility of construction of a groundwater recharge reservoir at a site east of Minden along Sand Creek in eastern Kearney County. The study determined that the geology at the site is favorable for reservoir construction.
- May, 2011- Tri-Basin NRD launched the first phase of a streamflow augmentation project on North Dry Creek, a tributary of the Platte River in Kearney County. The project involves leasing land at up to three sites for the construction of groundwater wellfields that will be used to augment streamflows into North Dry Creek. The project will help the State of Nebraska fulfill its commitment to the Platte River Recovery Implementation Program to reduce shortages to Platte River flow targets.
- October, 2011- Tri-Basin NRD directors extended groundwater pumping restrictions in one township in Gosper County because groundwater levels in that township have not fully recovered to the 1981-85 average. Groundwater pumping will be limited to a total of 27 inches per acre for 2012-2014.

## **FUTURE**

Tri-Basin NRD has enacted comprehensive regulations to manage groundwater quality and quantity, as well as for integrated management of interconnected groundwater and surface water resources. Protecting domestic water supplies is the top priority under the district Groundwater Management Plan.

## Twin Platte NRD

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### GROUND WATER STATUS

The Twin Platte Natural Resources District (TPNRD) began an extensive ground water levels monitoring program in the mid 1970's and established a Ground Water Management Plan in the mid 1980's. In 2004, the Board of Directors, in consideration of the Cooperative Agreement discussions going on between Nebraska, Colorado, Wyoming, and the U.S. Department of Interior for a Platte River Recovery Implementation Program, and in consideration of the Water Policy Task Force recommendations that resulted in LB962 being enacted by the Nebraska Legislature, approved a temporary suspension on drilling new wells for an area within the 28%/40 years SDF line. In 2006, the Board of Directors took action to approve a Ground Water Management Area for the entire TPNRD that established a stay on the issuance of high capacity water well construction permits for all the TPNRD. In 2007, the Board of Directors took action to adopt a stay on the use of an existing water well to increase the number of acres historically irrigated for all the TPNRD.

### ACTION STEPS & TIMELINES

- **1976**-Began an extensive ground water levels monitoring program.
- **1985**-Established a Ground Water Management Plan.
- **March 12, 1998**- Approved participating in an Interlocal Cooperation Agreement for a Cooperative Hydrology Study (COHYST) for the Platte River Basin in Nebraska.
- **July 1, 2004**
  - TPNRD Temporary Suspension On Drilling New Wells began for the area within 28%/40 Years SDF line
  - Began developing revisions for the Ground Water Management Plan to allow for a Ground Water Management Area for the full TPNRD
- **September 15, 2004**
  - NE DNR Order – Over Appropriated above Kearney Canal diversion for area within 28%/40 Years COHYST line
  - As a result of that designation, additional land area within the TPNRD became subject to Stays on New Wells and Stays on Increases in Irrigated Acres
- **September 30, 2004**- The NE DNR issued an order the all of the TPNRD was fully appropriated.
- **March, 2005**
  - Stakeholders began meeting for preparation of recommendations for an Integrated Water Management Plan (IMP) for the TPNRD
    - **Stakeholders represent**
      - Economic Development
      - Counties
      - Municipalities
      - University of Nebraska
      - Irrigation Districts
      - Chamber of Commerce
      - Financial Institutions
      - Public Power & Irrigation Districts
      - Recreation
      - Rangeland
      - Ground Water Users
      - NE Game & Parks Commission
      - Well Driller
      - Education
- **February 24, 2006**- A Ground Water Management Area became effective for the entire TPNRD which established a stay on the issuance of high capacity water well construction permits for the entire TPNRD.
- **October 27, 2006**- Governor Dave Heineman announced that he would sign the Platte River Recovery Implementation Program.
- **June 18, 2007**- A stay on the use of an existing water well to increase the number of acres historically irrigated became effective for the entire TPNRD.
- **April 20, 2009**- Final meeting of Stakeholders and recommendation completed for the goals, objectives, rules and regulations to present to the TPNRD and the NE DNR for the IMP for the TPNRD
- **July 2, 2009**

- Public Hearing for the TPNRD and the NE DNR for the IMP for the TPNRD
- Public Hearing for the Platte River Basin Plan
- **September 15, 2009-** Effective date for TPNRD IMP

**FUTURE**

TPNRD IMP (LB 962 Required - Effective September 15, 2009)

- To incrementally achieve and sustain a fully appropriated condition
  - The first stage is to return the river to the 1997 level or condition
    - Within the first 10 Year Increment, address impacts of streamflow depletions to surface water appropriations due to water use initiated after July 1, 1997.
      - For the Platte River Basin above Elm Creek, that requirement consists of adding 26,200 acre feet of water per year
      - For the TPNRD, that requirement consists of adding 7,700 acre feet of water per year to the stream within the TPNRD
        - The 7,700 acre-feet will have to come from existing uses, as the river is “over appropriated” and there is no new water readily available
  - The second stage is for the NRDs to return the river to the Fully Appropriated condition
    - Within Subsequent Increments, address impacts of streamflow depletions to surface water appropriations due to water use initiated prior to July 1, 1997 (may be addressed prior to a subsequent increment)
      - For the Platte River Basin above Elm Creek, that requirement has been estimated to be 114,750 to 229,500 AF acre feet of water per year
        - The amount of water needed to be added to the river to accomplish this requirement needs to be determined
        - NE DNR and the NRDs are currently working with an Engineering Consultant to determine Methods and to do a Computer Analysis

There are choices available to NRDs to get the necessary water to the river. Four of those choices the TPNRD is considering are:

- 1) Conjunctive Management of Ground Water & Surface Water
- 2) Retime the river flows
- 3) On farm conservation programs
- 4) Acquire and retire water
- 5) Flow meters and allocations

The Board of Directors has recognized

- That there’s probably no one magic bullet
- That it will take several options to get the TPNRD where it needs to be by the various target dates

The Board’s priorities

- To concentrate on Choice 1 and Choice 2 to get all or as much as possible of the needed water with the least impact on irrigated lands

What needs to be done to avoid choice 5 and return the river to the 1997 level or condition

- The TPNRD Integrated Management Plan provides
  - By the end of 2012
    - An accretion to the river equal to or exceeding 5,804 acre feet annually
  - By the end of 2019
    - An accretion to the river equal to or exceeding 6,185 acre feet annually
  - By the period 2043 – 2048
    - An accretion to the river equal to or exceeding 7,700 acre feet annually

What needs to be done to return the river to the Fully Appropriated level or condition

- Reach a Fully Appropriated level or condition As-Soon-As-Possible

The TPNRD is aggressively pursuing water for accretions to the river to avoid regulatory actions.

The TPNRD’s annual budgets to obtain offset water (water for accretions to the river) for the 2009-2010 Fiscal Year, the 2010-2011 Fiscal Year, and the 2011-2012 Fiscal Year provides for the following:

\$1,621,000.00	TPNRD
621,000.00	State of Nebraska - Platte Basin Habitat Enhancement Program (PBHEP)
<u>311,000.00</u>	Nebraska Environmental Trust Grant (PBHEP)
\$2,553,000.00	TOTAL per year

\$7,659,000.00 TOTAL for the three years

This is requiring the TPNRD to levy the maximum funds allowed from local property taxes requiring a TPNRD tax levy of 6.9 cents.

## Upper Big Blue NRD

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### **GROUNDWATER STATUS:** The Upper Big Blue NRD

Groundwater Management Area was the second one established in

Nebraska. That was in 1977, right after the Upper Republican Area. The Upper Big Blue NRD Groundwater Management Area encompasses all or parts of nine counties and has 1/7 of the total irrigated acres in Nebraska. The changes in water levels are closely related to the changes in annual rainfall.

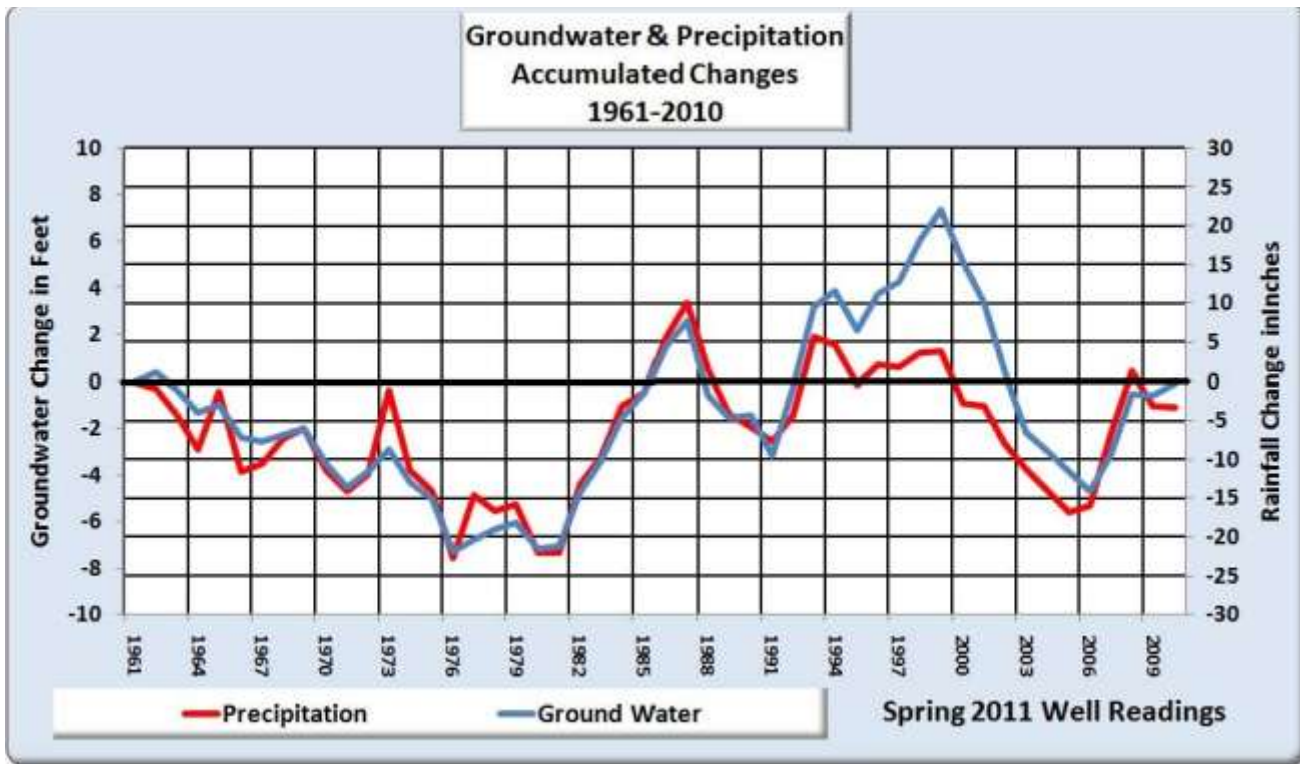
The average irrigation use last year was 5.2 inches compared to 5.0 inches for municipal. The average amount of irrigation water pumped on the 1,163,000 certified irrigated acres in the Upper Big Blue NRD for the last 4 years was 5.4 inches per acre, amounting to about 512,400 acre feet per year. The groundwater in the spring of 2011 was ½ foot higher than it was in 1961. Water conservation is important because one inch of water saved on the irrigated land in the Upper Big Blue NRD amounts to 100,000 acre feet of water.

### **ACTION STEPS & TIMELINE:**

- 1972 – Upper Big Blue NRD created (all 23 NRDs started on the same date).
- 1974-76 - Dry period, drought coupled with increase of groundwater wells being drilled.
- 1975 – Nebraska Groundwater Management Act adopted by the Legislature.
- 1977 - Upper Big Blue Groundwater Management Area established in a cooperative effort between the Nebraska Department of Water Resources and the Upper Big Blue NRD to protect the future.
- **1978 – Upper Big Blue average ground water level hits all-time low of 7 feet below 1961**
- 1979 - Ground Water Management Area regulations go into effect with the goal of keeping the declines to less than ½ foot per year. The rules included well permits, 1,000 foot well spacing, and future allocation if decline rate was exceeded.
- 1980-87; 1991-94; 1997-99; 2007-08 —Wet periods: Abundance of precipitation; groundwater levels rise; rising average groundwater levels mirror rising accumulated rainfall.
- **1990 – Rules changed to hold the Average Ground Water Level at or above the 1978 level (sustainability).**
- 1993 - Water Quality Management Area established in Upper Big Blue through cooperative effort with the Department of Environmental Quality to protect the future.
- 1999 - Rules added to require large groundwater users (withdrawal of 500 acre feet from one parcel of land per year) to conduct a hydrologic study showing the impacts of the groundwater withdrawal. If the impact is not adverse, a permit is granted.
- **2000 – Upper Big Blue average groundwater level hits all-time high of 7 feet above 1961 level.**
- 2001-04 - Dry periods and extreme drought conditions, groundwater levels decline.
- 2004 - Regulations amended establishing a Reporting Trigger (groundwater level declines to a point 3 feet above the 1978 level) and an Allocation Trigger (another 3-foot drop beyond the Reporting Trigger). A flow meter must be installed on any new or replacement well.
- 2005 - Small area in Hamilton County parallel to the Platte River declared fully appropriated with a stay on well drilling and expansion of irrigated acres. District completed groundwater model of area adjacent to the Platte and

submits it to the Department of Natural Resources. The rest of the NRD does not have a well drilling moratorium, but is still subject to the groundwater management regulations.

- **2006 - Reporting Trigger reached requiring the certification of all irrigated acres through the use of county assessor records.** Three ethanol plants permitted to drill wells based on minor impacts demonstrated through required large water user studies. One other site deemed not feasible for permit because of impact on other users.
- 2007 – Above average annual rainfall. All water users required to report water use by Dec. 31, 2007. Average reported water use 4.95 inches per acre. 1,109,818 irrigated acres were certified by the Board of Directors. Rules changed to implement more restrictive groundwater transfers. Ground water modeling for Big and Little Blue Basins conducted by District staff. 5<sup>th</sup> proposed ethanol plant still trying to find adequate water after first two large water user studies show adverse impacts to other water users. A city begins required large water user study for proposed city well field.
- 2008 – Additional acres certified bringing the total to 1,147,675 certified irrigated acres. Total irrigation water use was 4.3 inches per acre. Big Blue and Little Blue river basins groundwater modeling completed and submitted to Department of Natural Resources. 5<sup>th</sup> Ethanol plant water study approved but for lesser amount of withdrawal that requested.
- **2009 – LB 483 irrigation growth regulations adopted** for small area along the Platte river in Polk county following cooperative effort by Upper Big Blue NRD and the Department of Natural Resources to protect the future. 1,780 water meters installed with Environmental Trust Grant over last 3 years. Large water user study by a city approved paving the way for future well field.
- **2010 – Integrated Management Plan for part of Hamilton County approved by the Department of Natural Resources and the Upper Big Blue NRD.** Total irrigation water use was 5.2 inches per acre for a total pumpage of 504,009 acre feet on 1,163,000 acres.
- **FUTURE: Meters and allocation:** If the District groundwater level falls to the 1978 groundwater level (3 feet below the point where certification of irrigated acres was required) allocation will be implemented. Municipal allocations are comparable. Industrial allocation is initially set at 100% of historic use. All wells must be equipped with a flow meter before the groundwater user will be granted an allocation.



## Upper Elkhorn NRD

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### GROUNDWATER STATUS

Located in northeast central part of the state, the Upper Elkhorn NRD encompasses approximately 1.9 million acres of cropland, rangeland, and grassland in Antelope, southern Holt, eastern Rock, and northern Wheeler Counties. Irrigated agriculture, cattle, and hay production are vital to the economy of this sparsely populated region. Even with the expansion of groundwater irrigation, no portion of the UENRD has shown a significant continual decline in groundwater levels since annual spring static water levels were first recorded in 1972. The northwest portion of the District was designated as Fully Appropriated by the Nebraska Department of Natural Resources due to the drainage confluence with the Niobrara River. This determination was ultimately reversed by the Nebraska Department of Natural Resources on June 29<sup>th</sup>, 2011. The majority of the District is considered to be part of the Lower Platte River Basin. The Lower Platte was preliminarily labeled as Fully Appropriated in 2008, but this decision was reversed in 2009. Limited irrigated acre expansion continues in the UENRD under the restrictions set forth when LB 483 was passed in 2009.

### ACTION STEPS & TIMELINES

- 1975 – District established static water level monitoring in irrigation wells. Today, the District monitors water levels biannually at 160 irrigation and dedicated monitoring wells.
- 1976 – UENRD established a groundwater quality monitoring program. The District currently samples nearly 600 irrigation wells annually for nitrate-nitrogen concentration.
- 1997 – The entire District was designated as a Phase I Management Area for Groundwater Quality. This designation requires all high capacity (> 50gpm) wells to be permitted by the District. It also requires producers, both commercial and private, to be certified by the District to apply nitrogen. The certification requirements include attending a nitrogen education class and analysis of groundwater for nitrate-nitrogen once every four years. To date, over 1,600 producers have been certified by the District to apply nitrogen fertilizer.
- 1999 – Initial start of construction on the current 55 dedicated monitoring well sites.
- 2001 – Developed 4 weather stations used for gathering evapotranspiration data across District. The data is used to compile crop water use estimates in cooperation with the University of Nebraska-Lincoln Extension.
- 2002 – Two areas of the District are listed as Phase II in the UENRD and require yearly reports submitted by effected landowners regarding irrigation and nitrogen management
- 2004 – Installed 15 pressure transducers in various dedicated monitoring wells across District to provide continuous data on water levels
- 2005 – The 2006 assessment of the Elkhorn River basin shows that 6.0 days are still available above Fully Appropriated in 2030 with Additional Well Development.
- 2005 – UENRD Board of Directors determined that a moratorium on additional high capacity water uses within the District is unnecessary at this time
- 2006 – Preliminary evaluation by DNR included the Elkhorn River Basin with the Loup and Lower Platte Basin and deemed all involved basins as not being Fully Appropriated.
- 2006 – UENRD Water Resource Committee starts modifying the Groundwater Quantity Management Plan to address potential future concerns over groundwater availability.
- 2006 - UENRD initiated a flowmeter cost-share program for all irrigators assisting with either the Quality or Quantity monitoring programs or for those wells located in the Phase II areas.
- 2006 – The UENRD is an active participant in developing the multi-phase Elkhorn-Loup Modeling Project (ELM). Active participants are the USGS, DNR and eight other NRDs working through a local agreement. The ELM will give participating members an accurate depiction and working model of both surface and groundwater resources within the study area. In 2010, this project moved into the Phase III.
- 2007 – Elkhorn River basin NRDs (Upper & Lower Elkhorn) initiated Streambed Tests in the Elkhorn River conducted by Dr. Hong Chen of the School of Natural Resources and Sue Lackey of the Conservation Survey Division. This study was designed to determine the extent of streambed and aquifer connectivity.
- 2007 – UENRD took further steps to monitor groundwater levels and pumping impact by the installation of 15 additional pressure transducers in observation wells around the District.
- 2007 – Niobrara River Basin upstream from Spencer Hydro was labeled as being fully appropriated by the NDNR. This decision affected approximately 150,000 acres in the northwest portion of the UENRD. Through LB 962, a stay was placed high-capacity well construction and expansion of irrigated acres was halted within the Niobrara River Basin 10/50 line.
- 2008 – UENRD received an Environmental Trust Grant for funding to assist with flowmeter cost-share for cooperating landowners

and to better understand water use in the District.

- 2008 – UENRD drilled a series of test holes as part of the ELM Project study
- 2008 – Lower Platte River Basin, which includes the Elkhorn and Loup drainages, was preliminary designated —Fully Appropriated— enacting stays on new irrigation wells, surface water permits and irrigated acre expansion.
- 2009 – LB 483 was approved on April 6, 2009, limiting irrigation development in any NRD that had its fully appropriated status reversed. On April 8, the Lower Platte River Basin Designation was reversed by NDNR. The UENRD developed Rules and Regulations to allow for further irrigation acre development of 2,500 acres per year from 2009-2012.
- 2009 – Three additional observation wells were installed in southern Holt County to further enhance the ELM project and monitor groundwater quality. All three wells are part of the UNL School of Natural Resources Real-Time Groundwater Level Monitoring Network.
- 2010 – The UENRD assisted USGS scientists with geophysics work to enhance the ELM project. These —virtual test holes— will provide more data regarding the geological structure of the aquifer.
- 2010 – The UENRD held several informational meetings and a public hearing on September 13, to receive testimony on changes to District Groundwater Management Plan Rules and Regulations. The major amendments to the District Rules and Regulations included: simplification of the nitrogen recertification requirements, hydrological evaluation of proposed ground water uses exceeding 500 acre feet per year, requirement of flowmeters on all new or replacement wells, certification of all historically irrigated acres within the District, and facilitation of ground water or irrigated acre transfers. These changes were effective October 29, 2010.
- 2011-Contracted with GIS Workshop to develop software to facilitate irrigated acre certification. This process will begin in the fall of 2011 or shortly after January 1<sup>st</sup>, 2012.
- 2011-The Upper Elkhorn NRD is finishing a 319 Grant (NDEQ) in Northern Antelope County (East Branch Verdigriss Creek) to improve water quality issues for ground and surface water. This grant offered assistance to land owners to implement best management practices associated with irrigation and nutrient management practices, well decommissioning and septic system updates.
- 2011 – The UENRD held several informational meetings and a public hearing on September 12, to receive testimony on changes to District Groundwater Management Plan Rules and Regulations due to the Nebraska Department of Natural Resources status change of Lower Niobrara River Basin on June 29, 2011. The major amendments to the District Rules and Regulations included: clarification of not allowing irrigated acre transfers between hydrological areas labeled by the Nebraska Department of Natural Resources, such as Lower Platte River Basin and Lower Niobrara River Basin; allowing limited development (2500 acres) within the area of the Lower Niobrara River Basin and Lower Platte River Basin, requiring a fee to reapply for expansion acres after the application was denied in a previous application period, changing the application period to October instead of January and requiring an official Highly Erodible Land classification from USDS-FSA/NRCS.
- 2011 – The UENRD has approved approximately 7500 acres of ground water expansion due to LB 483 from 2009 through 2011.
- Ongoing – Each year the Upper Elkhorn NRD helps sponsor area water festivals and environmental events to promote the awareness of our natural resources to students across Northeast Nebraska.

The fifth grade festivals focus on laying a foundation for the future caretakers of our natural resources. Children are taught about water quality and quantity and how good clean water can protect lives. They learn about conservation practices to protect property and ways to protect our natural resources for future generations. This year over 500 students attended H2O Daze and the Natural Resources Festival.

The Wonderful World of Water program is a very unique festival because it is the only festival for 9th and 10th grade students in Nebraska. Over 180 students attended the daylong program this year and participated in various hands-on activities while working with resource professionals. This allows students the opportunity to explore natural resources related careers.

The Nebraska Envirothon is a program for 9th-12th grade students designed to promote awareness about our natural environment. Students compete in a contest that tests their knowledge on a wide array of subjects consisting of aquatics, forestry, policy, range, soil, wildlife and a special topic selected by the host state of the National competition. This year 78 students from 16 different area schools participated in the competition.

## **FUTURE**

Further studies such as the Streambed Conductivity Testing and Phase III of the ELM project will be used to assess the current status of water resources within the UENRD. Ongoing monitoring of the District spring static water levels and continuous data collected by observation well pressure transducers will be used to determine future management decisions. One of the UENRD's primary goals is to ensure ample water supply for all existing and potential uses. The Upper Elkhorn NRD is beginning discussions with NDEQ, the Lewis Clark NRD and Lower Niobrara NRD to evaluate ground water quality issues around the Village of Creighton. The Upper Elkhorn NRD will also be providing water quality and quantity data to the Lower Elkhorn NRD in their efforts in determining the cause of toxic algae blooms at the Willow Creek Recreation near Pierce.

## Upper Loup NRD

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### GROUNDWATER STATUS

Upper Loup NRD, part of the Loup River Basin, includes all of Grant, Hooker, Thomas, Blaine, and Logan Counties and parts of McPherson, Brown, and Cherry Counties. The entire sparsely populated area of 4,275,000 acres, is agricultural in character with the main agricultural activity cattle and hay production. The greater part of the district is non-irrigated.

### ACTION STEPS & TIMELINE

- 1970's- Ninety-nine wells measured annually in the fall for static water levels since 1972.
- 1978- Several water quality incentive programs established (soil sampling, leafy spurge control)
- 1985 - Ground Water Management Plan was prepared and approved for the ULNRD.
- 1986 - ULNRD began testing ground water samples for nitrates from domestic, irrigation, and stock wells when requested. Approximately 30 wells on average tested annually.
- 1987- ULNRD began issuing chemigation permits and performing inspections.
- 1990 & 2000- ULNRD help fund and maintain long term two weather stations.
- 1991- A revision of the 1985 plan is completed.
- 1994- Additions to the quality portions of the Ground Water Plan were made (in accordance to §46-673.14 of the Nebraska Groundwater Management and Protection Act).
- 1995- Began to participate in Water Wellhead Decommissioning cost share program.
- 1998- District purchased an Ultrasonic Fuji Flowmeter to test the flow rates on irrigation wells.
- 2004- Began participating in the Nebraska Rainfall Assessment and Information Network. Started to measure static water levels biannually – 101 wells measured across district.
- 2005- ULNRD participating in the Elkhorn-Loup Model study.
- 2006- District began to gather information on irrigated water use by producers within district. ULNRD continues to participate in the Elkhorn-Loup Model study.

- 2007- Developed and adopted Groundwater Area Management Rules and Regulations. New rules include the requirement of well permits and flow meters on all new wells pumping 50gpm or more, certification of irrigated acres, water use reporting, In December of 2007 the very northern portion of Cherry and Brown Counties within the ULNRD District were declared fully appropriated. ULNRD continues to participate in the Elkhorn-Loup Model Study.
- 2008 - District issued 28 new high capacity irrigation well drilling permits and certified 57,000 irrigated acres. District drilled 3 dedicated monitoring wells each with continuous data recorders installed as part of a committed ground water network. Began a cyclic testing schedule for nitrates and bacteria on all registered domestic and irrigation wells throughout the district, with 173 wells tested in 2008. In December of 2008 the remainder of our District was preliminarily declared fully appropriated. Due to this designation no new high capacity wells or irrigated acres will be allowed. ULNRD continues to participate in the Elkhorn-Loup Model Study.
- 2009- In March of 2009 DNR changed determined the Lower Platte Basin to NOT be fully appropriated. ULNRD developed and adopted LB-483 Rules and Regulations which limit the expansion of irrigated acres to 2,500 acres annually or 10,000 over the next 4 years. District drilled 3 more dedicated monitoring wells each with continuous data recorders installed as part of a committed ground water network. To date, as part of the district's cyclic testing schedule for nitrates and bacteria on all registered domestic and irrigation wells throughout the district, 95 wells have been tested. ULNRD continues to participate in the Elkhorn-Loup Model Study.
- 2010-In January of 2010 the ULNRD put into place a District wide limitation on expansion of irrigated acres. Total new groundwater irrigated acres will not exceed 2,500 acres per year. The District installed 2 stream gages, one on the South Loup and one on the North Loup Rivers. Recycling trailers have also been placed in 5 of the villages within the District. The ULNRD drilled 3 more dedicated monitoring wells. Static water levels continue to be monitored in over 110 wells and over 50 domestic and irrigation wells were tested this year for nitrates.
- District certified 70,226 irrigated acres in 2011 up 2,228 acres from 2010. District placed flow meters on 39 irrigation wells this past year to help with more accurate water use data. ULNRD continues to monitor static water levels in spring and fall in over 110 wells and has found a slight increase in the groundwater levels across the district over 2010 levels. 90+ wells were tested for nitrates and bacteria in sub-district 1 of the ULNRD with the average nitrate level being 2.3 ppm, well below the EPA standard of 10 ppm. The ULNRD recycling program remains strong with over 46 tons of recyclable materials being collected within the last year and a half.

## Upper Niobrara White NRD

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### GROUNDWATER STATUS

Portions of the UNWNRD have been experiencing declining static water levels since the early 1970's. The District approved a Ground Water Management Plan in 1984. In July of 1998 the District designated a District-wide Ground Water Management Area and adopted Rules and Regulations for enforcement. In 2003, the UNWNRD imposed a moratorium on the issuance of well permits for wells pumping over 50 gpm. Replacement wells are still allowed with a permit from the District. The UNWNRD is divided into six ground water management sub-areas. By DNR determination, the UNWNRD was preliminarily designated fully appropriated in July 2004. After studies and a hearing a final determination in November 2004, led to ground water management sub-areas 1, 4 and 5 being fully appropriated. In October 2007, DNR preliminarily determined the Lower Niobrara River Basin to be fully appropriated and made a final determination in January of 2008, this fully appropriated determination included ground water management sub-areas 6 and portions of sub-areas 2 and 3. In June 2011, the Nebraska Supreme Court ruled that the Lower Niobrara River Basin was not fully appropriated and the Department's 2008 determination was reversed.

Water quality degradation is not a major issue in the UNWNRD. Water sampling throughout the District has shown very little contamination. The UNWNRD, with the help from the Department of Environmental Quality, has established water quality priority areas where ground water contamination has been indicated or there is a greater potential for contamination.

### ACTION STEPS & TIMELINES

- 1984 – Ground Water Management Plan Developed and Adopted.
- 1995 – Ground Water Management Plan revisions adopted.
- 1998 – Ground Water Management Area Established for the entire District.
- 2003 – The UNWNRD requests DNR study, in consultation with the NRD, the hydrologically connected ground water and surface water in the District and a joint action plan be developed for the integrated management of ground water and surface water resources.
- 2003 – The UNWNRD imposes a temporary suspension on the issuance of new well permits in the entire district.
- 2003 – The UNWNRD appointed a Citizen's Advisory Committee to assist with revisions to the NRD's Ground Water Management Plan and the development of a Joint Action Plan.
- 2004 – The entire UNWNRD preliminarily determined to be fully appropriated by the Department of Natural Resources after the passage of LB 962. State issued stays on the issuance of water well permits and increasing irrigated acres were implemented. The temporary suspension imposed by the NRD was repealed.
- 2004 – DNR held public informational meetings and public hearings in October and released their conclusions in the form of a report entitled: "Report on Hydrologically Connected Groundwater and Surface Water in the Upper Niobrara White Natural Resources District".
- 2004 – The UNWNRD concluding from the report that not all the UNWNRD would be determined to be fully appropriated, and the State issued stays would be lifted in portions of the District. Public

information meetings and a public hearing were held to implement a stay on the issuance of water well construction permits District-wide.

- 2004 – DNR released its final determination designating Hat Creek Basin, the White River Basin, the portion of the Niobrara River Basin above the Mirage Flats Diversion Dam, The Box Butte Creek Subbasin and the Snake Creek Subbasin fully appropriated. The District and DNR started preparing an Integrated Management Plan for management of water resources for the fully appropriated area.
- 2005 – The UNWNRD amended the Rules and Regulations for the Ground Water Management Area and enforcement of the Ground Water Management Plan. The proposed Regulations include implementation of controls for Reporting Requirements, Compliance Inspections, Certification Training, Certifying Regulated Ground Water Uses, Flow Meter Requirements, Ground Water Transfer Rules, Ground Water Pooling Rules, Ground Water Allocations, Variances and Penalties.
- 2006 – The UNWNRD revisions to the Ground Water Management Plan and amendments to the Ground Water Management Area Rules and Regulations adopted.
- 2007 – The UNWNRD finalized the certification of all regulated uses in the entire District.
- 2007 – Irrigation ground water wells within ground water management sub-areas 4 and 6 are metered and currently restricted to a 16-acre inch per year allocation.
- 2007 – DNR preliminarily determines the Lower Niobrara River Basin to be fully appropriated.
- 2008 – DNR released final determination that the Lower Niobrara Basin is fully appropriated and the portion of the District included in this determination is incorporated into the Integrated Management Plan and Rules and Regulations.
- 2008 – Ground water management sub-area 2 triggered a phase II designation, all high capacity wells required to be metered by March 1, 2009.
- 2008 – The UNWNRD and DNR completed the Final Draft of the Integrated Management Plan. Plan requires meters in ground water management sub-area 5 by March 1, 2010.
- 2008 – UNWNRD is revising GWMA Rules and Regulations to keep consistency between IMP Rules and Regulations and the GWMA Rules and Regulations.
- 2009 – Integrated Management Plan adopted May 14, 2009.
- 2009 – UNWNRD finalizing GWMA Rules and Regulations amendments.
- 2009 – UNWNRD and DNR working with an independent consultant to develop an integrated ground water model and surface water model for the portion of the Niobrara River above the Mirage Flats Diversion.
- 2010 – GWMA Rules and Regulations adopted June 10, 2010.
- 2010 – The 2011-2014 allocation is reduced to 54 acre inches, annualized at 13.5 inches per year.
- 2010 – UNWNRD supports the DNR in a request for a grant from the Bureau of Reclamation’s Basin Study Program to study water management options in the Niobrara River Basin. The Niobrara River Basin study is one of six projects that the Bureau will fund in 2010.
- 2011 – UNWNRD and Department review and modify Integrated Management Plan
- 2011 – Lower Niobrara River Basin is determined to not be fully appropriated by Nebraska Supreme Court ruling. This decision changed the fully appropriated area of the UNWNRD and led the District to modify its rules and regulations to incorporate the LB “483” rules.

FUTURE: The District will continue to monitor, in conjunction with State and Federal agencies, the ground and surface water resources within the district and if declines in these water supplies continue to occur, further restrictions may be placed on some or all of the water users in the District.  
District.

## Upper Republican NRD

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## GROUNDWATER STATUS

In the late 1970's water users from the area were concerned about groundwater declines resulting from irrigation development. Their concerns and efforts played a large part in the formation of the NRDs by the legislature and the original groundwater management and protection act. The Upper Republican NRD aggressively employed the available authorities in the original groundwater management and protection act. It was the first entity in the state and possibly the country to limit agricultural water use, setting an allocation in the late 1970's. Since those early times, the District has continued to lobby for additional necessary tools to deal with the water issues facing the District.

History of Regulations pertaining to irrigation wells in the Groundwater Management Control Area established February 7, 1978:

## ACTION STEPS AND TIMELINES

- 1976 – Ground Water (GW) Management Act Passed
- 1977 – Established GW Management Area and Certified Acres
- 1978 – 1979 – Established GW Metering program
- 1978-1979 – Well Spacing: 3300 ft. from existing irrigation well and 1320 ft. from existing stock or domestic well in townships designated as critical. Allocation set at 20 inches per acre per year including incentives for installing meters prior to 1980.
- 1980-1982 – Meters required on all wells. Allocation is set at 22 inches per year.
- 1983-1987 – Allocation reduced to 20 inches per acre per year for flood irrigation and 16 inches per acre per year for sprinkler irrigation.
- 1988-1992 – Allocation reduced to 15 inches per acre per year for all irrigation wells.
- 1992 – Well spacing in critical townships increased to 5,280 ft. from existing irrigation wells.
- 1993-2004 – Allocation reduced to 14.5 inches per acre per year.
- 1997 – The Board of Directors having found that depletion of the groundwater supply in the Management Area are so excessive that the public interest cannot be protected solely through the implementation of the controls previously adopted, no additional well permits shall be issued for lands within the Management Area. No additional groundwater allocation may be added for wells located within the Management Area.
- 1998-2005–Republican River Compact Lawsuit and Settlement Agreement – The Department of Water Resources preliminarily designated the Republican River Basin NRDs under LB 108 in September of 1996, at the request of the Republican River NRDs. The process for a Joint Action Plan was initiated under LB 108 and was placed on hold during the lawsuit with Kansas from May 1998 to July 2003, at the request of the Nebraska Attorney General. In July of 2003, a final determination of conflicts under the LB 108 process was made and the development of rules and regulations under the Joint Action Planning process began. In July of 2004 a “Fully appropriated” designation was made under LB 962 which replaced the Joint Action Planning process. In May 2005 the Upper Republican Natural Resources

District adopted an Integrated Management Plan, effective for the 2005 thru 2007 irrigation seasons, pursuant to LB 962.

- 2005-2007 – Allocation reduced to 13.5 inches per acre per year.
- 2007– Adopted revised integrated management plan, that through reduced water use and implementation of incentive programs and surface water leases funded through authorities granted in LB701, will ensure the State’s compliance with the Republican River Compact and Settlement. In cooperation with the Middle and Lower Republican NRDs, surface water was leased from Frenchman-Valley, Riverside, and Frenchman-Cambridge Irrigation Districts, allowing the State to maintain its consumptive use within its allocation for the 2007 year, as well as reduce the amount of the State’s overuse in the 2003-2007 five year accounting period.
- 2008– Allocation reduced to 13 inches per acre per year for 5 year allocation period. Involved in ongoing invasive weed removal along Republican River riparian corridor. Continuing study of Republican River basin augmentation project. Developing water short year compliance options for Integrated Management Plan with Department of Natural Resources. Developed district retirement program for certified acres that are not irrigated. Applied for Nebraska Environmental Trust Grant to provide a onetime incentive for pivot end gun removal. Participated in Hazard Mitigation Planning for Perkins, Chase, and Dundy counties. Developed water short year compliance options for Integrated Management Plan with Department of Natural Resources. Developed district retirement program for certified acres that are not irrigated.
- 2010– Adopted a revised Integrated Management Plan that aims to keep the state in compliance with the Republican River Compact during water-short years using a combination of programs and projects to reduce consumptive use. Plan emphasizes acreage retirement and stream flow augmentation projects. Should those steps prove inadequate, rapid response acres could be shut down.
- 2011– District purchases 3,260 irrigated acres that will be retired so a portion of the water that otherwise would have been used to irrigate the land can be piped into Rock Creek, a tributary of the Republican River, to aid Compact compliance. The augmentation project has the potential to provide the majority, and in some cases possibly all of the water, that history suggests the District may need during the driest of times to meet its Compact compliance obligations. In addition to the augmentation project, the District used federal and local dollars to permanently retire from irrigation 1,360 acres. On average, nearly 11 inches of water for irrigation had annually been applied to the acres, and the average stream-flow depletion factor of the retired land is 88 percent

## **FUTURE**

The Upper Republican Natural Resources District will continue to bring water uses into balance with water supplies of the District, in a manner that allows the local economies, which rely heavily upon the beneficial use of the natural resources of the District, to continue to endure the transition.