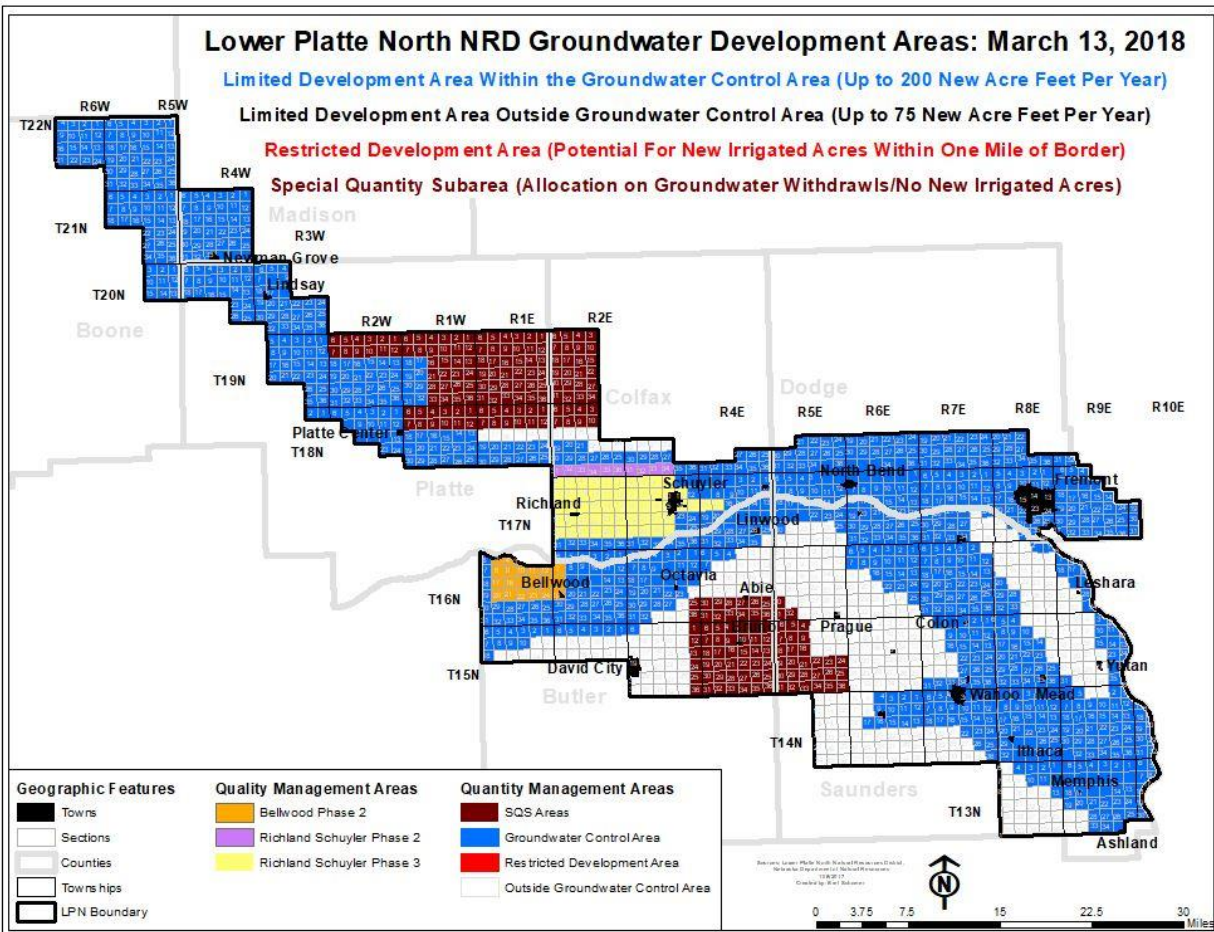


**NEBRASKA WATER SUSTAINABILITY FUND  
GRANT AWARD ANNUAL REPORT  
FOR APPLICATION NO. 4135  
LOWER PLATTE NORTH NRD**

**Groundwater Management for Mid-Summer Declines (Project) / Final Report 2019**

PROJECT DETAILS:

The Water Sustainability Fund (WSF) grant for the Lower Platte North NRD (LPNNRD) was approved in July of 2016 for \$200,000 as a cost share program for the purchase of flow meters by well owners in our Special Quantity Subareas (SQS). During the summer of 2012 the District experienced an intense one-year drought, which caused deep but temporary pressure declines in the ground water levels of confined aquifers (also called artisan aquifers) in selected portions of the LPNNRD. This led to several well interference complaints from domestic, stock, and even irrigation well owners. Two areas were identified as shown by map below; along the Butler – Saunders County line (SQS#1) and the Platte – Colfax border and north of Columbus, Nebraska (SQS#2). The LPNNRD passed Rules and Regulations in our Ground Water Management Area to address these mid-summer decline including the installation of flow meters on wells and encouraging area producers to not all run at the same time.



OVERALL PROJECT:

The two area concerns within the LPNNRD had a total of 299 irrigation wells (SQS#1 – 25 and SQS#2 – 274). Both areas have a 27-inch rolling allocation. The average water uses in SQS#1 for 2017 was 2.69 and 2018 was 0.83 inches/acre. SQS#2 water use 2017 – 4.14 and 2018 – 0.61. The awareness for the producers utilizing the flow meters has been very beneficial. The NRD does realize that rainfall has also helped in the decreased in the total water use, but more producers has taken advantage of the rainfall instead of irrigating.

The LPNNRD cost-shared with producers on 185 flow meters for a total of \$140,294 within the two management areas (Platte/Colfax–SQS2 and Butler/Saunders–SQS1). After obtaining permission from the Commission, the LPN expanded the area for cost-share within a 2-mile radius of the SQS boundaries. The purpose of the expansion was to collect additional data from users that might be within the same aquifer. In the expanded area, the LPNNRD has cost-shared with producers on 20 flow meters for a total of \$13,158. This number is a little disappointing, but this area was only a voluntary cost-share for the producers.

LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 4135 WAS REALIZED:

Based on preliminary results provided by water use reports and cost-share applications, the project met the target for achieving the benefits to the LPNNRD as described in the application. The numbers and figures that the NRD can generate is invaluable. The only benefit not realized is for the producers in the 2-mile radius not taking advantage of the cost-share, so they could realize the value of the flow meter as a management tool.

The Lower Platte North conducted mid-season drawdown measurements in the Management Areas during the summer of 2017 to help determine the effects of pumping during the irrigation season. (Figure A) The drawdowns reflect the water use results (Figure B) from the irrigation wells in 2017 and how it relates to the pumping of wells. (-6 means 6 inches pumped) The average pumping as shown in Figure B ranged from 3 to 6 inches per acre. This does correlate back on rainfall amounts received within the area during the irrigation season.

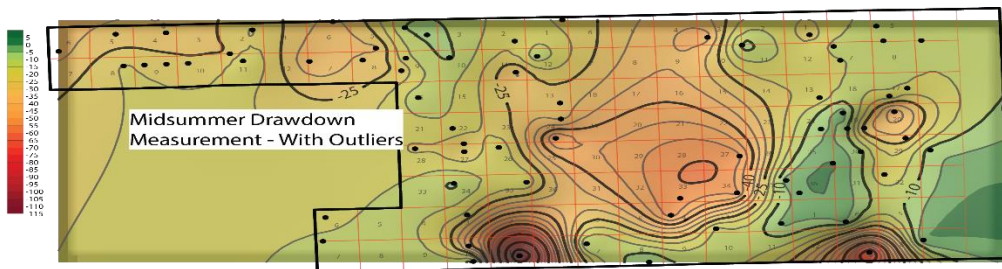


Figure A showing midsummer drawdowns.

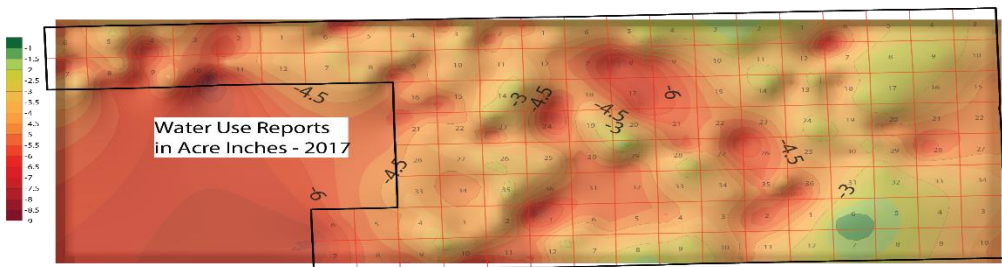


Figure B showing water use in 2017

#### BENEFITS FOR OTHER PROJECTS:

The data collected from the flow meter along with the AEM (Airborne Electromagnetic Survey) flights and other data being collected, the NRD has begun to re-evaluate the boundaries of the original area, along with assisting producers in developing best management practices to conserve water. This information is being utilized by Nebraska Department of Natural Resources and UNL-Conservation and Survey Division in conducting a study to show the effects on confining and unconfining aquifers and the relationship to draw-down and water use. This information is assisting in determining stream depletion factors and the implementation of the voluntary integrated management plan.

#### ACTIVITIES CONDUCTED IN 2018 WITHIN THESE AREAS BECAUSE OF THIS PROJECT:

The NRD conducted a couple of educational opportunities for producers on utilizing all the information received for developing long-term management. The NRD also drilled 3 additional monitoring wells into the Dakota aquifer. The information obtained verified the quality of the water and different geologically layers for future development.

#### FUTURE PLANS AND CONTINUED BENEFITS:

The NRD is in the process for installing remote reads on a select number of wells to provide real-time water levels and meter readings. This information will allow a more pro-active approach in the management of these areas. Management could include draw-down or in-season pumping management. Continue coordination with DNR and UNL-CSD on studying the effects of pumping within these areas and the modeling efforts. Future education efforts to assist producers are small scale weather stations to provide information for management decisions. The benefits of the flow meters and information provided will be invaluable in management decisions by the NRD and the producers.