

## WSF 2020 Final Report # 5206

**PROJECT:** Lower Loup NRD Aquifer Framework Mapping Project –  
WSF Application # 5206 (awarded December 18, 2018)

**DATE:** MAY 27, 2020

### See Application 5206 Section D #2 For Project Tasks Summary and Timeline

#### PROJECT PROGRESS APRIL 2020 TO PROJECT END:

The final Lower Loup NRD (LLNRD) Airborne Electromagnetic Survey (AEM) report from Aqua Geo Frameworks (AGF) was delivered on March 25, 2020 and presented to the Board of Directors on April 23, 2020. The report defines the AEM data collection methodologies, provides AEM results and interpretations, outlines a hydrogeological framework of the surveyed area, estimates aquifer volume and water in storage, and identifies potential recharge areas. Key findings include explanation of groundwater declines, isolated aquifers, water quality, managed aquifer recharge (MAR) areas, and using the AEM results to understand the effect of groundwater management and regulations.

Other deliverables include images of the interpreted cross-sections and 3D profiles, voxels, and supporting geographic information systems (GIS) data and Google Earth KMZ files of the flight lines and interpreted data. The Google Earth files include AEM sounding location points, which are spaced about 60 feet apart along 548.6 miles of flight lines. This dataset allows hydrogeologic information to be expediently retrieved from the report, including depth to groundwater, aquifer thickness, depth to bedrock, cross-section image of the flight line, and more. Delivery of the raw AEM data to the Nebraska GeoCloud web-based system was completed on March 26, 2020 in cooperation with AGF and the Conservation Survey Division at the University of Nebraska-Lincoln.

#### ANTICIPATED ACTIVITIES FROM NOW UNTIL NEXT ANNUAL REPORT:

N/A, this report serves as the final report for the Lower Loup NRD Aquifer Framework Mapping Project – WSF Application # 5206 (awarded December 2018).

#### ANTICIPATED CASH FLOW FOR REMAINDER OF THE PROJECT:

**\$0** – As of March 25, 2020, the LLNRD and Water Sustainability Fund (WSF) met their funding obligations towards this project (\$466,000 total project costs) under grant award # 5206.

#### LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 5206 WILL BE REALIZED:

Benefits of the LLNRD Aquifer Framework Mapping Project were realized. A complete hydrogeologic framework was developed in the surveyed area of Buffalo County, covering groundwater quantity and quality issues. The LLNRD is now positioned to make educated decisions on groundwater management planning in this water decline area of the District, including potential development of targeted groundwater recharge project(s).

The collection of AEM data across this portion of the state now will have applicable, real-world data to be used by LLNRD, NeDNR and other entities for upgrading all area water modeling efforts to determine impacts of groundwater use on surface water availability and hydrologically connected reaches.