

Water Sustainability Fund Application #4133 – Final Summary

Upper Elkhorn Natural Resource District Electromagnetic Survey of the Bazile Groundwater Management Area

During July of 2016, the partners of the Bazile Groundwater Management Area (BGMA) contracted with Aqua Geo Frameworks (AGF) to conduct Aerial Electromagnetic Surveys (AEM) of the project area. The AEM concept is a valuable tool that is utilized to efficiently collect geologic data using a helicopter and other technical tools without damaging or impacting crops, infrastructure, and other private property. A gas-powered generator provides the electrical current to transmit an electromagnetic signal into the earth, and an onboard receiver simultaneously receives a response signal as the aircraft travels across the landscape. AEM data existed for a small portion of the project area, enabling the partners to utilize some of the available financial resources to collect information in the wellfield recharge areas for the City of Creighton and the West-Knox Rural System on tighter gridlines. Outside of these areas, flight-lines were designed on 3 mile spacing's; allowing for the completion of a 3 x 3 grid over the balance of the project area. The improvement and protection of groundwater in areas that intersect recharge areas for Public Water Supply wells is paramount, and the collection of additional geologic information using AEM will benefit efforts to target beneficial conservation practices. The remainder of the project area is a high priority as well, as groundwater nitrates exceeding the maximum contaminant level (MCL) are prevalent, and the AEM data can be utilized to expose aquifer depths and connections between geologic formations; providing explanations for existing conditions, and allowing for the refinement of future conservation efforts. The results of the investigation were presented by James Cannia (AGF) at a public meeting held on March 15, 2017 in Creighton, NE. Results are also available to the public and may be obtained by visiting the Upper Elkhorn, Lower Elkhorn, Lewis and Clark, and Lower Niobrara Natural Resource Districts websites.