



Water Sustainability Fund #4117 – Project Summary

Hastings Aquifer Storage and Restoration/Nitrate and Uranium Control.

May of 2018, the Hastings Aquifer Storage and Restoration (ASR) project completed the startup of the new \$4.5 million Reverse Osmosis (RO) water treatment facility. The overall project cost of \$12 million spent to date includes the building of the irrigation water storage facility, 5 injection wells, various water and sewer mains, and drilling of an extraction well.

The scope of the project includes extracting groundwater to remove water containing high nitrates up gradient of the Hastings municipal water supply wells. A dual pump system is utilized to extract separately groundwater having higher nitrates found near the top of the aquifer and lower nitrate water found at the bottom of the aquifer. The Reverse Osmosis Facility is capable of treating 1,800 gallons per minute of extracted high nitrate groundwater. The treated water and groundwater extracted, having lower levels of nitrates, is blended and injected into the aquifer through a network of injection wells. This blending process is key to the successful operation of the ASR system as it provides hardness and alkalinity to produce a stable injection water.

The average monthly injection volume is 90 million gallons of potable water with the RO facility operating at 1/3 of its capacity producing 600 gpm of treated water. This treated water is blended with approximately 1,400 gpm of well water for a total flow rate of 2,000 gpm before injection to the aquifer.

Additional injection wells are currently being designed for construction in the fall of 2019 having an additional injection capacity of 2,000 gpm. This project will increase the injection capacity to 4,000 gpm. This ASR Phase III Injection Project is estimated to cost \$3,000,000. After expenditure of these monies it should provide potable water volumes meeting 2/3 of the average annual usage of 6,000 gpm.

During the 2018 growing season, 45 million gallons of water was used from the irrigation water storage facility to irrigate the crop fields that encompasses the 5 injection wells.

Initial signs of project effectiveness has been observed through the monitoring of extraction wells and dedicated monitoring wells. Water tests indicate the contaminate concentrations have decreased. As expected the operation of the ASR system has produced a lot of data which has helped us better understand our aquifer. However, the more we learn the more questions we have. Hastings Utilities has hosted several tours of the facility and continue to share information with local and state agencies. A good working relationship with the Little Blue NRD, Upper Big Blue NRD, University of Nebraska - Lincoln, Nebraska Department of Environmental Quality, and Nebraska Department of Health and Human Services provides a conduit to pass along information which could benefit our peers and governing agencies. We encourage anyone interested in the project to visit our facilities as "Protecting Drinking Water is Everyone's Responsibility".

The following are photos of some of the equipment and facilities constructed to date.



Well 27 Tri-Plex Pump System



RO Skid in RO Facility



Irrigation Water Storage Lagoon



Drilling Well 30



Injection Well 5



**Morning of August 21, 2017
(Solar Eclipse)**