

Project No. 489-C1-002

VILLAGE OF

PLATTE CENTER NEBRASKA

WATER SUSTAINABILITY FUND FINAL REPORT

Prepared by:

MA Miller & Associates
CONSULTING ENGINEERS, P.C.

1111 CENTRAL AVENUE, KEARNEY, NEBRASKA 68847

www.miller-engineers.com

phone: 308-234-6456

cmiller@miller-engineers.com

fax: 308-234-1146



HISTORY

The Village of Platte Center had been proactive in evaluating its water system and monitoring the nitrate levels in its municipal wells. They observed increased levels prior to this project. Platte Center had three active public water supply wells at the onset of the project. These wells are identified as:

- East Well 37-1 (G-087749)
- West Well 78-1 (G-087750)
- Well 2011-1 (G163326)

The East and West Wells are shallow wells (approximately 100 feet) located on the west part of town adjacent to a flood prevention dike. The newest well, Well G-163326, is located outside Village limits east of town and is approximately 300 feet deep. The shallow wells are vulnerable to elevated nitrate levels in groundwater. The federal maximum contaminant level for nitrate in groundwater is 10 milligrams per liter (10 mg/L). On July 5, 2017, the West Well was placed on emergency use status because of consistent high nitrate level readings, which reached as high as 11.6 mg/L. The Village contracted with the University of Nebraska-Lincoln and NDHHS in a research project to isolate the upper elevated nitrate concentrations from the lower level to reduce the nitrates. The West Well was removed from service, the casing was drilled with a specialized tool, and grout cement was injected into the annular space around the well to try to isolate the upper layers of the aquifer and reduce the nitrate concentrations. This effort was unsuccessful, and the East Well nitrate concentration continued to increase. Data from April 22, 2019, showed the East Well nitrate level at 10.5 mg/L.

ALTERNATIVES

Due to the nature of the project, a 20-year life cycle was used to evaluate the alternatives. An evaluation of the capital cost, O&M cost, and salvage value is used to select the least-cost alternative. This analysis takes the present-day capital cost adds the present-day O&M cost over the 20-year period and deducts the present-day salvage value using a uniform discount rate. The discount rate is typically taken from OMB Circular No A-94. The current discount rate from the 2016 circular is 0.1%. An analysis in **Table 1 – 20-Year Cycle Analysis** demonstrates the new source is the lowest-cost option based on a 20-year analysis.

Table 1 – 20-Year Life Cycle Analysis

Alternative	Blending Option	New Source	Consolidation W/Columbus	Centralized Treatment RO
Total Capital Cost	\$500,000	\$350,000	\$2,000,000	\$2,800,000
Annual O&M Cost			\$97,000	\$75,000
Present Worth (O&M)	-	-	\$1,919,800	\$1,484,400
Salvage Value	\$300,000	\$210,000	\$800,000	\$560,000
Present Worth (Salvage Value)	\$294,100	\$205,800	\$784,200	\$548,900
Life Cycle Cost (Net Present Value)	\$205,900	\$144,200	\$3,135,600	\$3,735,500



PROJECT GOALS & BENEFITS

This project aimed to address the nitrate contamination of its groundwater by locating a new source well. Platte Center’s plan was to abandon the two shallow water supply wells and replace the lost capacity with one new lower nitrate well. The scope of the project involved the installation of a new public water supply well and approximately 500 lineal feet of water main. Residents’ quality of life in Platte Center increases because groundwater provides better health, fire control, and sanitation benefits. Platte Center’s public water supply provides water to the entire community, including the fire department, government offices, an elementary school, churches, businesses, and households.

PROJECT COMPLETION

Since it was determined that the two older wells were going to be abandoned, the Village re-used as much of the two-well capacity as possible. The column piping, motor, and VFD were transferred to the new well casing as part of the project. The addition of the new wells did not alter the general operation of the system. The new wells supply the existing 50,000-gallon elevated storage facility, which is maintained by a control system that starts and stops the new and existing well. When the water level in the elevated tank falls below the prescribed elevation the system can call for water from any of the wells based on their call order. If needed, one well will start up to replenish the water level in the tank. If the water use exceeds the pumping of the first well, the water level in the tank will continue to fall until the second level setting, and the system will then call for the second well to start up to meet demand.



The improvements to the water system included a new groundwater supply source, generator, and SCADA upgrades. The Well House is equipped with automatic switchgear, so a backup power supply is available during a power outage. Well 2020-1 was funded by the Drinking Water State Revolving Fund (DWSRF) and Water Sustainability Funds (WSF). The Village installed a new well approximately 350’ north of 1st Street and 700’ east of A Street. The new turbine motor well is connected to the existing water distribution system south on 1st Street. The site’s legal location is indicated in the following **Table 2 – Well Site Location**.

Table 2 – Well Site Location

<i>Well No.</i>	<i>Legal Description</i>
2020-1	SW¼, SW ¼, Section 7, T18N, R1W



The improvements were substantially completed on October 2, 2021, following the NDHHS site inspection and approval to place the new well into service. Following the completion of the project, the Village of Platte Center continues to monitor its Nitrate Levels in the new wells. As seen in **Graph 1 – Platte Center New Well**, Nitrate Levels have remained steady and recently improved following the completion of the project.

Graph 1 – Platte Center New Well

