



MISSOURI DEPARTMENT OF NATURAL RESOURCES

Linn

Drinking Water State Revolving Fund Green Project Reserve
Business Case

State Fiscal Year 2013 Intended Use Plan

Project Number DW291162-04

Loan Date: January 30, 2013

Green Estimated Costs: \$943,128

Water System Improvements for Linn, Missouri

Business Case

Summary

- The purpose of the water system improvements is to construct a new deep rock well to backup Well No. 4 and construct a new well house for the proposed Well No. 5 which will provide chlorine disinfection and Supervisory Control and Data Acquisition (SCADA) controls. A new well house will replace the existing well house for Well No. 2 to include SCADA controls, and chlorine equipment. The existing well house for Well No. 4 will be expanded to contain chlorine disinfection and SCADA controls. A new 200,000 gallon elevated storage tank will be constructed at the City's main pressure zone. Installing a SCADA system with a Central Terminal Unit (CTU) at City Hall will provide independent control of the well pumping. Construction work at Water Tower No. 4 will consist of re-coating of the inside and outside of the water tower, the installation of a roof vent, screen and overflow flap gate, ladder gate with lock, and a secondary roof access hatch to meet Missouri's Department of Natural Resources standards. The piping in Water Tower No. 4 will be retrofitted to provide a separate inlet and outlet piping configuration. Approximately 3,216 feet of new 10" water mains will connect new the Well No. 5 and storage tank to the distribution system. Approximately 6,950 lineal feet of 6" water lines will replace the old small sized cast iron and transite pipes in the system and 120 feet of 2" water lines will be replaced. All meters will be upgraded to radio-read meters.
- SRF Assistance Amount: \$2,260,620.00
 - pipe replacement = \$674,903 = 29.9%
 - SCADA controls = \$83,470 = 3.7%
 - Meter Replacement = \$184,755 = 8.2%
- Total water saving (green) portion of loan = 41.7%

Background

- The water source for the city's water system comes from two deep bedrock wells with a total pumping capacity of approximately 490 gallons per minute (gpm). In 1989-90, in conjunction with the construction of Well No. 4 and Tank 4, a 10" main was built through the City with several 6" new and replacement lines.
- The distribution system consists of polyvinyl chloride, transite, and cast iron water mains ranging in size from 2" to 10" in diameter. The distribution system also includes two elevated storage tanks with a total storage volume of 300,000 gallons.
- The city's drinking water system currently serves a population of approximately 1,430, with an average daily water demand of 118,140 gallons per day (gpd) and a peak day demand of approximately 150,000 gpd. Recent history indicates that the water demand

for the city has been steadily increasing. The future estimated population to be served for the year 2030 will be approximately 1,580 with an average daily demand of approximately 141,770 gpd and 180,000 gpd for peak daily demand.

- There are currently no SCADA controls within the system. Well pumps are controlled to turn ON and OFF by a pressure transducer.

Results/Conclusion

- Replacing the old, leaking meters will increase water efficiency by decreasing the amount of water lost and by providing more accurate water-use information to customers and the system.
- Accurate metering of water consumption is an important conservation measure because inaccurate metering provides customers with misleading information regarding water consumption. Providing more accurate water bills will send a stronger price signal to customers and will result in more efficient consumption.
- Water leakage and inaccuracy increases with water meter age; therefore, an investment in water meters today will lead to additional water and dollar savings over time. Also, the water savings from the meter replacement will extend the life of the water supply and delay capital expansion projects.
- Additional benefits from water main replacements include reductions in unnecessary pumping and operation and maintenance expenditures, and eliminating potential health hazards associated with waterborne pathogens entering the water distribution system.