

Drinking Water State Revolving Fund Green Project Reserve - Interim -



Figure 3-1: Spring Complex – View Looking South



City of Lava Hot Springs Drinking Water Project SRF Loan #DW1604 (pop. 410) \$4,400,000

Interim Green Project Reserve Justification Categorical GPR Documentation

1. REPLACING 298 EXISTING MALFUNCTIONING MANUAL READ WATER METERS WITH NEW AMR SYSTEMS (Water Efficiency). Categorical GPR per 2.2-3a: *...replacing existing malfunctioning water meters with Automatic Meter Reading (AMR) systems*; also 2.2-9: *Projects that result from a water efficiency assessment such as water audits.* (\$230,000).

Categorical & Business Case GPR Documentation

2. REPLACES 15,000 FEET OF AGING CAST IRON TRANSMISSION PIPING WITH NEW PVC PIPE (Water Efficiency). Categorical GPR per 2.4-1: *Projects that result from a water efficiency related assessment*; Business Case 2.4-4: *Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure.* (\$1,800,000).
3. REPLACES 11,000 LINEAL FEET OF AGING CAST IRON DISTRIBUTION PIPING WITH NEW 6" & 8" DIAMETER PVC PIPE (Water Efficiency). Categorical GPR per 2.4-1: *Projects that result from a water efficiency related assessment*; Business Case 2.4-4: *Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure.* (\$1,000,000).

1. EXISTING WATER METER REPLACEMENT¹

Summary

- Replacing 298 malfunctioning water meters with an Automatic Meter-Reading system (AMR). In addition to the AMR component, the overall project also includes transmission line replacement and improvements to the distribution system.
- Loan amount = \$4,400,000
- GPR portion of loan (AMR) = 5.2% (\$230,000) (Design cost estimate)

Background

- The existing water meters are approximately 15 years old, are not radio-read, are malfunctioning, and not reliable.
- Increased water loss, due to leaks and inaccurate meter readings, are partly attributed to the old meters.

Results

- A water study conducted by the City indicated the water meters may be one source of the 11% water leakage measured in the audit. The existing meters are not of an automatic meter-reading type.
- The audit indicated the meters were not properly accounting for flows and that this type of meter could not be recalibrated.
- The Facilities Planning Study¹ recommended the replacement of the meters with an AMR system.
- The new AMR system will include built-in leak detection and backflow detection.



Other Benefits

- Replacing the old 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.

Conclusion

- Accurate metering of water consumption is an important conservation measure because providing more accurate water bills sends a strong 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.
- **GPR Costs:** Replacing malfunctioning water meters with AMR meters = \$230,000
- **GPR Justification:**
 - The project is Categorical GPR-eligible (Water Efficiency) per Section 2.2-3a: *replacing existing malfunctioning water meters with Automatic Meter Reading (AMR) systems;*
 - Also GPR-eligible per Section 2.2-9: *projects that result from a water efficiency assessment such as water audits*².

¹ City of Lava Hot Springs Facilities Planning Study, May 2015, Keller Engineers

² 2010 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.

2. TRANSMISSION LINE REPLACEMENT

Summary

- Replacement of 15,000 feet of old lead-jointed cast iron (CI) transmission pipe with new PVC to eliminate water loss and maintenance costs due to leakage.
- Loan amount = \$4,400,000
- Pipe Replacement portion of loan = 41% (\$1,800,000) (Design estimate)

Background

- In 2014 the City repaired 10 or more leaks in the transmission line. The soft lead joints fail on a regular basis. The pipe alignment crosses a creek three times and a canal, where there is potential for contamination.



Exposed Transmission Line

- A Water Facilities Planning Study recommended the replacement of the 8" diameter cast iron transmission line from the spring to the storage tank with 8" diameter PVC pipe.
- The new pipe will eliminate water leaks in the transmission line, prevent entry of contaminated water, and provide a more secure water supply.

Conclusion

- By replacing the 15,000 feet of transmission pipe the City anticipates conserving water and providing a more secure water supply.
- Other benefits include reductions in unnecessary O&M expenditures and eliminating potential health hazards associated with waterborne pathogens entering the water system.
- **GPR Costs:** Replacing 15,000 feet of transmission piping = \$1,800,000 (Design estimate)
- **GPR Justification:**
The project is Categorically GPR-eligible (Water Efficiency) per Section 2.4-1: *Projects that result from a water efficiency related assessment*; also (Water Efficiency) per a Business Case by 2.4-4: *Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure*³.

³ Attachment 2. EPA Guidelines for Determining FY11 Project GPR-Eligibility.

3. DISTRIBUTION PIPE REPLACEMENT

Summary

- Replacement of 11,000 feet of older distribution pipe with new PVC pipe to eliminate water losses, provide requisite system capacity, and eliminate the loss of 6.4 million gallons of water per year (MGY), equal to 11% of total system average annual use.
- Loan amount = \$4,400,000
- Pipe Replacement portion of loan = 23% (\$1,000,000) (Engineer's estimate at design)
- Annual water savings = 6.4 million gallons (MG)

Background

- The City's water distribution system is comprised of a network of thin walled steel, ductile iron, and PVC pipes ranging from 4 to 10 inches in diameter.
- The City's existing water system utilizes a single pressure zone that has typical pressures that range from 50 psi to 110 psi. Older pipes and joints are susceptible to leaks with high pressures.
- Much of the system has been in service for more than 30 years.

Calculated Savings by Eliminating Water Loss

- The total amount of water leakage was determined using a water balance around storage tank outflow compared to metered usage between 2010 and 2013.
- The results of this analysis show that approximately 6.4 MGY is unaccounted for (11% of the water entering the distribution system). Replacing the old distribution pipe will conserve this water.

Conclusion

- By replacing the 11,000 feet of distribution pipe the City anticipates conserving 6.4 MGY. Other benefits include reductions in unnecessary O&M expenditures, and eliminating potential health hazards associated with waterborne pathogens entering the water distribution system.
- **GPR Costs:** Replacing 11,000 feet of distribution piping = \$1,000,000 (Design estimate)
- **GPR Justification:**
The project is Categorically GPR-eligible (Water Efficiency) per Section 2.4-1: *Projects that result from a water efficiency related assessment such as water audits*; also GPR-eligible (Water Efficiency) per a Business Case by 2.4-4: *Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure*⁴.

⁴ Attachment 2. EPA Guidelines for Determining FY11 Project GPR-Eligibility.