Drinking Water State Revolving Fund Green Project Reserve
- Final -

City of Paris Drinking Water Project

SRF Loan #DW 1403 (pop. 513)

$4,062,600

Final Green Project Reserve Justification

Categorical & Business Case GPR Documentation

1. REPLACES 18,590 FEET OF AGING DISTRIBUTION PIPING (Water Efficiency). Categorical GPR per 2.4-1: *Projects that result from a water efficiency related assessment such as water audits;* also Business Case GPR per 2.4-1…*reducing water consumption*; per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring…fix them…replacing aging infrastructure;* also per 2.5-2: *Distribution pipe replacement …to reduce water loss and prevent water main breaks* ($1,111,700).

Business Case GPR Documentation

2. INSTALLS 24,785 FEET OF NEW PVC AND HDPE WATER TRANSMISSION PIPING AND PRESSURE REDUCING VALVES [PRVS]. Business Case GPR (WATER EFFICIENCY) per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them;* also per 2.5-2: *Distribution pipe replacement …to reduce water loss and prevent water main breaks* ($1,151,100).

Categorical GPR Documentation

3. INSTALL ALTITUDE CONTROL VALVE FOR NEW WATER STORAGE TANK (Water Efficiency). Categorical GPR per 3.5.1*: Energy efficient…upgrades* ($21,000).

Prepared by the State of Idaho SRF Loan Program
July 2015

1. Distribution System Pipe Replacement

Summary

- Replacement of aging metallic distribution piping with 18,590 feet of new 6-inch, 8-inch, 10-inch, and12-inch PVC and HDPE pipes, including installation of four pressure reducing valve stations, to eliminate the loss of approximately 97.8 million gallons of water per year (MGY).
- Loan amount = $3,762,600
- GPR project = $1,111,700 (final installed cost)
- Water saving (GPR) portion of loan = 30%

Background[1]

- The existing water distribution system utilizes piping ranging from 1 ¼ inches to 10-inches in diameter made of HDPE, PVC, cast iron, and galvanized steel. The existing water system has experienced leakage at multiple locations over its history.
- Leaks in metallic pipes have historically been repaired by stuffing leaky joints with a packing material that includes lead. This project will retire many of the older metallic pipes that have been repaired in this manner and replace them with new PVC and/or HDPE pipes that are resistant to corrosion.
- The average winter time flow measurements recorded during the winter of 2009-2010 were about 580 gpm, which is much higher than the average culinary water demand for the city of 50 gpm. Leakage likely constitutes a significant portion of the disparity between the winter time base flow and the estimated culinary demand.
- A public works foreman made 7 to 10 repairs per year from 1980 to 2010. These repairs were primarily to fix leaks in older galvanized and cast iron pipes. Prior water system projects have replaced a portion of the older metallic pipes with newer PVC pipes, yet a large number of old metallic pipes remain in the city. High pressures within the water system contribute to the potential for leakage.
- Approximately 23,000 feet of water lines less than 6-inches in diameter (the optimum minimum size) were identified, and replacement was recommended based on available budget. Reducing pressures in the lower potions of the system via pressure reducing valve(s) was also recommended.

Results

- By replacing 18,590 feet of distribution piping, it is estimated that the City will conserve 97.8 MG/yr. of drinking water, equal to 28% of overall water delivered to the distribution system.
- Four new pressure reducing valves will also be installed in the distribution system to reduce water pressures exerted on water pipes and fittings in the lower elevations of the city.

Conclusion

- By replacing the 18,590 feet of old metallic distribution piping, it is estimated that the City will conserve 97.8 MGY (28% of overall water delivered to distribution network).
- Additional benefits include reductions in operation and maintenance expenditures.
- The project also eliminates potential health hazards associated with waterborne pathogens entering the water distribution system by replacing leaky pipes with new corrosion resistant materials.
- **GPR Costs**:

Replacing 18,590 feet of distribution piping =		$1,039,600
Adding four (4) pressure reducing valves =		$ 72,100
Total GPR Costs =		$1,111,700

- **GPR Justification**: The prioritized replacement of undersized water distribution piping as recommended in the Facility Planning Study is GPR-eligible by a Business Case GPR (Water Efficiency) per the criteria requirements of Section 2.4-1: *Projects that result from a water efficiency related assessment such as water audits;* also Business Case GPR per 2.4-1…*reducing water consumption*; per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring…fix them…replacing aging infrastructure;* also per 2.5-2: *Distribution pipe replacement …to reduce water loss and prevent water main breaks.*[2]

[1] The Facility Planning Study for the City of Paris Public Drinking Water System. 2012. Butler Engineering

[2] 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.

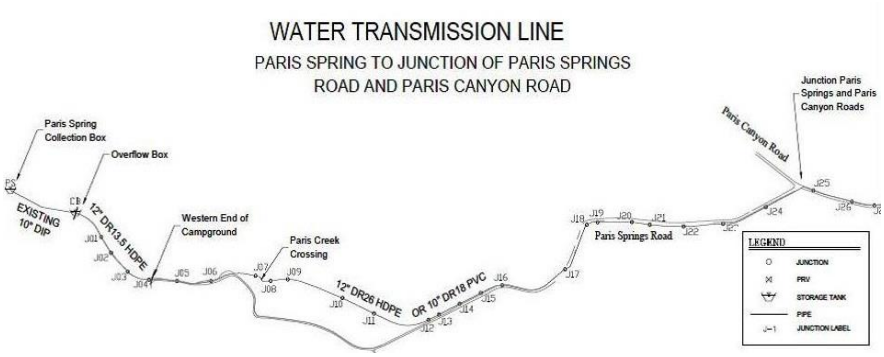
2. Replace Transmission Line

Summary

- Replacement of the aging water transmission line with 24,785 feet of new 10-inch and 12-inch PVC and HDPE pipes, including installation of a new zeroing box, to eliminate the loss of approximately 65.8million gallons of water per year (MGY), equal to 13% of the current total water flow to the transmission line.
- Loan amount = $3,762,600
- Water saving (GPR) portion of loan = 31% ($1,151,100) (final installed cost)

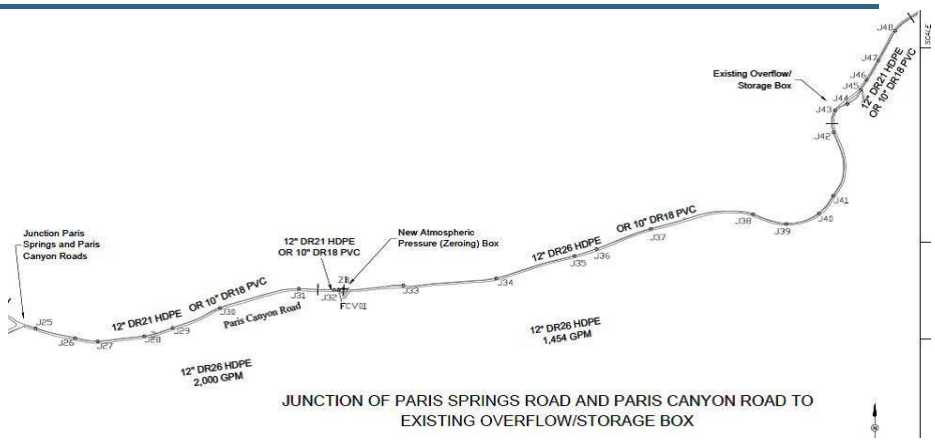
Background[3]

- The water source for the Paris potable water system is Paris Spring. The existing water transmission system delivers water from the spring to the city via a combination of ductile iron, concrete, and cast-iron pipes that were installed between 1937 and 1962.
- The 12-inch concrete pipe portion of the transmission line has been identified as a "suction line" by the Idaho DEQ. This means that the piping has potential for leakage and infiltration.
- The City has made multiple repairs to the transmission line to address leaks; the water system operator made at least 5 repairs to the transmission line during 2013 alone



Results

- A new water transmission line constructed from Paris Spring to a new water storage tank to be constructed near the city.
- 885 feet of new 12-inch HDPE pipe installed from the spring junction box to Paris Creek Campground.
- 23,900 feet of new PVC pipe both 10-inch and 12-inch diameters installed from the campground to new water storage tank.



Conclusion

- By replacing the existing transmission line, it is estimated that the City will conserve 65.8 MGY (13%of water transmitted from Paris Spring).
- Additional benefits include reducing operation and maintenance costs and eliminating potential health hazards associated with waterborne pathogens entering the water distribution system by replacing leaky pipes with new corrosion resistant materials.
- **GPR Costs**: Installation of new transmission line = $1,151,100
- **GPR Justification**: The project is Business Case GPR-eligible (Water Efficient) per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them;* also per 2.5-2: *Distribution pipe replacement …to reduce water loss and prevent water main breaks.*

[3] Facility Planning Study for the City of Paris Public Drinking Water System. 2012. Butler Engineering

Categorical

3. Altitude Control Valve

Summary

- The City of Paris will purchase and install an altitude control valve that does not require electricity to operate, to control flow into the new water storage tank.
- Loan amount = $3,762,600
- GPR portion of loan = 0.6% ($21,000) (final installed cost)

Background[4]

- The existing water distribution system receives flow from Paris Spring via gravity flow. Electrical input is minimal and is currently limited to the chlorination system.
- A new water storage tank requires a control mechanism to open and close flow into the tank. Opening flow to the tank allows replenishing of storage volume; closing flow prevents water from overflowing the tank during normal operating.

Results

- The altitude control valve selected for this project does not require electrical input
- The payback period for the chosen valve is instantaneous since electrically operated altitude valves generally cost more and require power to operate.

Conclusion

- By specifying a flow control valve that does not require electricity, the water system is more sustainable and energy efficient.
- Under normal conditions, the altitude control valve prevents loss of water by maintaining a water level lower than the overflow elevation.
- **GPR Costs**:
  - Installation of altitude control valve = $21,000
- **GPR Justification**: The project is Business Case GPR-eligible (Water Efficient) per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them;* also (Energy Efficiency) Business Case GPR per 3.5-1: *Energy efficient…upgrades;* and per 3.5-5: *Projects that achieve the remaining increments of energy efficiency*.[5]

[4] Facility Planning Study for the City of Paris Public Drinking Water System. 2012. Butler Engineering

[5] 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.