

Drinking Water State Revolving Fund Green Project Reserve

- Interim -



Mores Creek Water District Drinking Water Project SRF Loan #DW1901 (pop. 175) \$985,000

Interim Green Project Reserve Justification

Business Case GPR Documentation

1. INSTALLS INFILTRATION GALLERY AND BOOSTER STATION WITH ENERGY-EFFICIENT PUMPS (Energy Efficiency). Business Case GPR per 3.5-1: *Energy efficient ...new pumping systems...* (\$19,700).
2. INSTALLS HIGH PERFORMANCE PRE-INSULATED MASONRY UNITS (HI-RH) (Energy Efficiency). Business Case GPR-eligible per Section 3.5-1: *Energy efficient retrofits, upgrades...*(\$6,600).

Categorical GPR

3. INSTALLS PRESSURE REDUCING VALVES (Water Efficiency). Categorical GPR per 2.2-12: *Installing water efficient devices.* (\$15,800).
4. INSTALLS WATER METERS (Water Efficiency). Categorical GPR per 2.2-3a: *...replacing existing malfunctioning water meters ...* (\$9,500).

1. New Premium Energy-efficient Pumps

Summary

- A total of 4 new premium energy-efficient pumps will be installed.
- FY19 Loan amount = \$985,000 (FY20 Amended Total = \$1,500,000)
- Energy savings (green) portion of loan = 1.2% (\$19,700) (Engineer's cost estimate)

Background

- The Mores Creek Rim Ranches Water District (District) supplies municipal drinking water to 67 Equivalent Dwelling Units within the Mores Creek Rim Ranches Subdivision.
- Over its history, the District has battled elevated arsenic levels and diminishing supplies. Currently, the three operating wells run on an alternating schedule to prevent any one well from running dry.
- The District has expressed a desire to augment their available supply while eliminating the need for POU treatment.
- A new infiltration gallery beneath the creek will be added to the system. The gallery will be equipped with 2 premium efficiency submersible pumps to pump to the treatment plant.
- A booster pump station at the treatment plant will also be equipped with 2 premium pumps.

Calculated Cost Effectiveness of Improvements¹

Motors: The Baseline Standard Practice for comparison is a standard Epact motor ²:

(i) Infiltration Gallery Submersible Pumps

- The new motors are premium energy-efficient 7.5-HP models; the motor efficiency will be at least 91.7%³.
- A similar standard efficiency motor would have a motor efficiency of approximately 85.5%⁴.
- Energy savings of the Premium Energy-Efficient motor over the standard efficiency motor (runtime assumed = 1,825 hours/year) = 807 kWh/yr. = \$8.07/yr³.
- On average, standard efficiency motors are approximately \$200 less than the cost of premium efficiency motors. Simple pay-back period for the cost difference of the premium motor over the standard efficiency motor = **25 years**³.

(ii) Booster Pumps

- The new motors are premium energy-efficient 15-HP models; the motor efficiency will be at least 92.4%⁴.
- A similar EPAct motor would have a motor efficiency of approximately 86.6%⁵.
- Energy savings of the Premium Energy-Efficient motor over the EPAct motor (runtime assumed = 1825 hours/year) = 1,479.61 kWh/yr. = \$14.80/yr³.
- On average, standard efficiency motors are approximately \$200 less than the cost of premium efficiency motors. Simple pay-back period for the cost difference of the premium motor over the standard efficiency motor = **13.5 years**³.

¹ WEG Electric Motor Payback Tool, energy cost @ \$0.10/kWh.

² NYS Energy Research and Development Authority, Energy Evaluation Memorandum, Village of Greenport WWTP Upgrade 8-2009.

³ NEMA Table 12-12 Full Load Efficiencies for 60 HZ NEMA PREMIUM Efficiency Electric Motors

⁴ NEMA MG-1 Table 12-11 Full Load Efficiencies of EPAct Efficient Electric Motors

Conclusion

- **GRP Costs Identified :**

Pumps = \$30,000

Total = \$30,000

Pro-rated for FY19 Loan = **\$19,700**

- **GPR Justification:** The Pumps are Business Case GPR-eligible (Energy Efficiency) per Section 3.5-1: *Energy efficient retrofits, upgrades, or new pumping systems and treatment processes.*

2. HIGH PERFORMANCE PRE-INSULATED MASONRY UNITS (HI-RH)

Summary

- Constructing a new water treatment building.
- FY19 Loan amount = \$985,000 (FY20 Amended Total = \$1,500,000)
- Energy savings (green) portion of loan = <1% (\$6,600) (Engineer's cost estimate)

Background

- The Mores Creek Rim Ranches Water District (District) supplies municipal drinking water to 67 Equivalent Dwelling Units within the Mores Creek Rim Ranches Subdivision.
- Over its history, the District has battled elevated arsenic levels and diminishing supplies. Currently, the three operating wells run on an alternating schedule to prevent any one well from running dry.
- A treatment building will be constructed to contain the water treatment filters, pumps, tanks, and equipment.

Results

- The treatment building will be constructed using Hi-RH Pre-Insulated Masonry Units.
- Hi-RH blocks are specifically designed concrete masonry units with individually molded insulation inserts that provide increased thermal performance over conventional masonry units.
- Higher thermal performance results in reduced heat loss through the walls of the treatment building.
- Reduced heat loss results in significant energy savings associated with heating the treatment building in the winter months.
- Constructing the treatment building with Hi-RH blocks will save approximately 22,000 Kwh per year or approximately \$2,200 per year.



Conclusion

- The pay-back period for the Hi-RH blocks is less than 5 years.
- **GPR Costs:** Installing high energy efficiency masonry units = \$10,000 (Design Estimate)
Pro-rated for FYy19 Original Loan = **\$6,600**
- **GPR Justification:** The masonry blocks are Business Case GPR-eligible (Energy Efficiency) per Section 3.5-1: *Energy efficient retrofits, upgrades...*

3. PRESSURE SUSTAINING VALVES

Summary

- Pressure Reducing Valves will be installed to ensure a preset pressure in the system is maintained.
- FY19 Loan amount = \$985,000 (FY20 Amended Total = \$1,500,000)
- Energy savings (green) portion of loan = 1% (\$15,800) (Design estimate)

Background

- The Pressure Reducing Valve (PRV) on Paloma Dr. separating the upper and lower pressure zones is oversized and located in a small vault making servicing difficult.
- The water pressure on Rimrock Way is well above 80 psi, violating current DEQ standards.

Results

- The PRV and vault on Paloma Drive will be upgraded to provide improved operation and access.
- A PRV should be installed in the lower zone to serve Rimrock Way to reduce pressure at all service connections to less than 80 psi to meet current DEQ standards.



Conclusion

- Pressure Regulating valve (PRV) installation = \$24,000
- The PRVs are categorically GPR-eligible as they qualify as water efficient devices.
- **GPR Costs Identified**
 - PRVs installed = \$8,000 ea x 3 = Total = \$24,000 (Engineer's cost estimate)
 - Pro-rated for FY19 Original Loan = **\$15,800**
- **GPR Justification:** The PRVs are Categorically GPR eligible (Water Efficiency) per Section 2.2-12⁵: *Installing water efficient devices...*

⁵ Attachment 2. April 21, 2011 EPA Guidance for Determining Project Eligibility

4. EXISTING WATER METER REPLACEMENT

Summary

- Replacing old and malfunctioning water meters.
- FY19 Loan amount = \$985,000 (FY20 Amended Loan = \$1,500,000)
- Energy savings (green) portion of loan = <1% (\$9,500) (Engineer's estimate)

Background

- The District's existing 67 water meters are over 20 years old and at the end of their service life. Meter accuracy has diminished over time, resulting in significant under accounting of water usage.
- The existing water meters are approximately 20 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

- The District's existing 67 water meters will be replaced.

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
67 meters = \$14,500 (Design Cost Estimate)
Pro-rated for FY19 Original Loan = **\$9,500**
- **GPR Justification:**
 - The project is Categorical GPR-eligible (Water Efficiency) per Section 2.2-3a: *replacing existing malfunctioning water meters...*⁶.

⁶ 2010 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.