Drinking Water State Revolving Fund Green Project Reserve

- Interim -

Mountain Home FY18 Drinking Water Project

SRF Loan #DW 1801 (pop. 14,206)

$2,700,000

Interim Green Project Reserve Justification

Business Case GPR Documentation

1. INSTALLS SCADA FOR REMOTE MONITORING (ENERGY Efficiency). GPR Business Case per 3.5-7: *Automated and remote control systems (SCADA) that achieve substantial energy savings plus bypass piping to accommodate Well 16 pumping directly to the tank*. ($25,000)

2. INSTALLS LED LIGHTING (Energy Efficiency). GPR Business Case per 3.5-6: *Upgrade of lighting to energy efficient fixtures (such as light emitting diode (LED), etc).* ($2,000)

3. TANK INLET AND OUTLETS ELIMINATE MECHANICAL TANK MIXING (Energy Efficiency). Business Case GPR per 3.5: *Energy efficiency is the use of improved technologies and practices to reduce the energy consumption of water projects.* ($20,800)

The State of Idaho SRF Loan Program
March 2018

1. SCADA Control Technology

Summary

- Energy efficiency from the installation of a SCADA system for remote electronic sensing of the water storage tank. Historically, Well 16 has not be operated to its full potential because of concerns with entrained air that makes its way to the distribution system. Directing flow from this nearby well directly to the new tank allows the air to escape in the tank. Well 16, which has a lower pumping cost than other wells, will now be able to pump directly to the new tank allowing an increased use of this well (via SCADA controls) for operational cost savings.
- Loan amount = $2,700,000
- Estimated energy efficiency (green) portion of loan < 1% ($25,000) (Engineer's Estimate)
- Estimated annual energy and labor savings = $9,080 per year.

Background/ Results

- The City maintains a SCADA system to remotely monitor operations of its water storage and supply facilities. Tank 1B will be equipped with SCADA monitoring of tank levels and access hatch intrusion alarms. This will allow the City to remotely monitor activity at the tank without visiting the tank at regular intervals throughout the day. The SCADA for Tank 1B will be incorporated into the City's existing SCADA system using equipment in the well house on the site.

Energy Efficiency Improvements

- Remote SCADA monitoring saves labor costs of 1 person 1 hour per week, or $2,080 per year.
- Increased use of Well 16 saves power costs of ≈ $7,000 per year (assumes similar annual production to Well 12 and anticipated power savings over Wells 13 and 14.)

Conclusion

- Total SCADA savings would be approximately $9,080 per year = payback of 2.75 years, therefore SCADA costs are GPR-eligible by 3.5-7.
- **GPR Costs**:

  SCADA = $15,000 (Engineer's Estimate)
  Bypass Piping = $10,000 (Engineer's Estimate)
  TOTAL = $25,000

- **GPR Justification**: SCADA system and operational improvements costs are GPR-eligible by a Business Case per 3.5-7[1]: *Automated and remote control systems (SCADA) that achieve substantial energy savings.*

[1] Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility

2. Energy Efficient LIGHTING

Summary

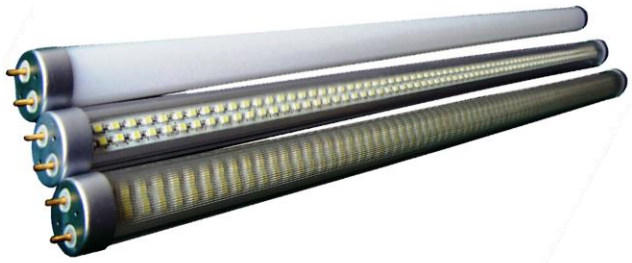
- Energy efficiency from the installation of light emitting diode (LED) lighting at the exterior of Tank 1B.
- Loan amount = $2,700,000
- Estimated energy efficiency (green) portion of loan < 1% ($2,000) (Engineer's Estimate)

Background/ Results[2]

- The lighting system will be used to provide security lighting at the tank. The light is expected to be on from dusk until dawn every day. Security lighting is strategically located to allow a single light to provide the security lighting for both the existing and the new tank.

Energy Efficiency Improvements

- LED lighting is approximately 58% more energy efficient than typical high pressure sodium lighting for relatively the same light output.



Conclusion

- **GPR Costs**:
  LED Lighting = $2,000
- **GPR Justification**: Advanced fluorescent lighting and LED lighting is GPR-eligible by a Business Case per 3.5-7: *Upgrade of Control Building lighting to energy efficient sources such as.....compact fluorescent, light emitting diode (LED).*

[2] 3-12-18 Correspondence with Project Manager, Keller Associates

3. ELIMINATION OF MECHANICAL TANK MIXING[3]

Summary

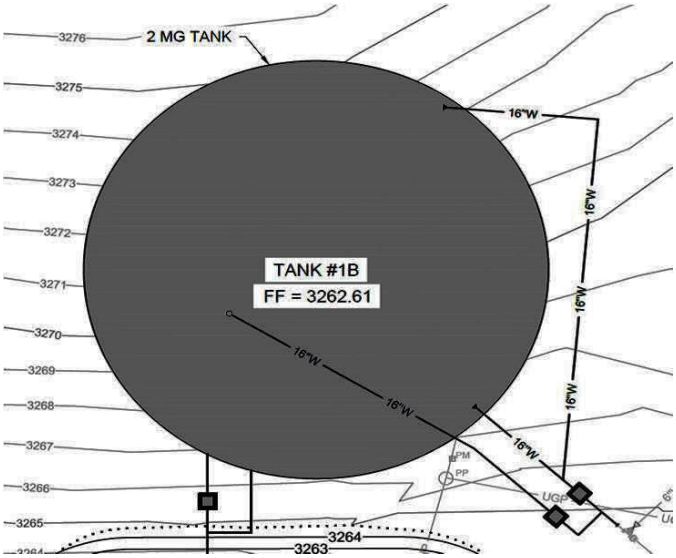
- The City will construct a new water tank designed with multiple inlets and nozzles for mixing as opposed to in-tank mechanical mixing.
- Estimated loan amount = $2,700,000
- Estimated energy efficiency (green) portion of loan = <1% ($20,800) (Engineer's Estimate)

Background

- The project will develop a new 2 million gallon storage tank (Tank 1B) for the City's water system. This water tank will be equipped with a mixing system that encourages mixing in the tank and reduces overall energy costs.

GPR Justification

- Various options were evaluated by the City's engineering design consultants to promote tank mixing to reduce stagnation, thermal stratification, and odors.
- The City chose to use a non-mechanical mixing system consisting of two inlets and one outlet having these advantages:
  - Excellent tank mixing;
  - Hydraulically driven***, no power is required;***
  - Simple design and operation;
  - Lower life-cycle cost;
  - Flexibility.



- The power saving of installing a non-mechanical mixing system over mechanical mixing systems = $20,800[4].
- The mixing system will require minimal maintenance from City staff. Once the system is designed and constructed, it is anticipated that the mixing system will have a life similar to distribution piping outside the tank. This mixing strategy also positions the City for rechlorination should it be determined necessary in the future.

Conclusion

- Designing and installing a non-mechanical mixing system consisting of multiple inlets and single outlet for the new 2 million gallon water storage tank results in power savings of $19,840 over a 30 year design life.
- **GPR Costs:** $20,800
- **GPR Justification**: The energy savings are Business Case GPR-eligible, qualifying per Sect. 3.5-1 (Energy Efficiency)[5]: "*Energy efficient…which are cost-effective.*

[3] City of Mountain Home Tank 1B Preliminary Engineering Report, Keller Associates, December 2016
[4] 30-Year Operation & Maintenance Costs
[5] 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2