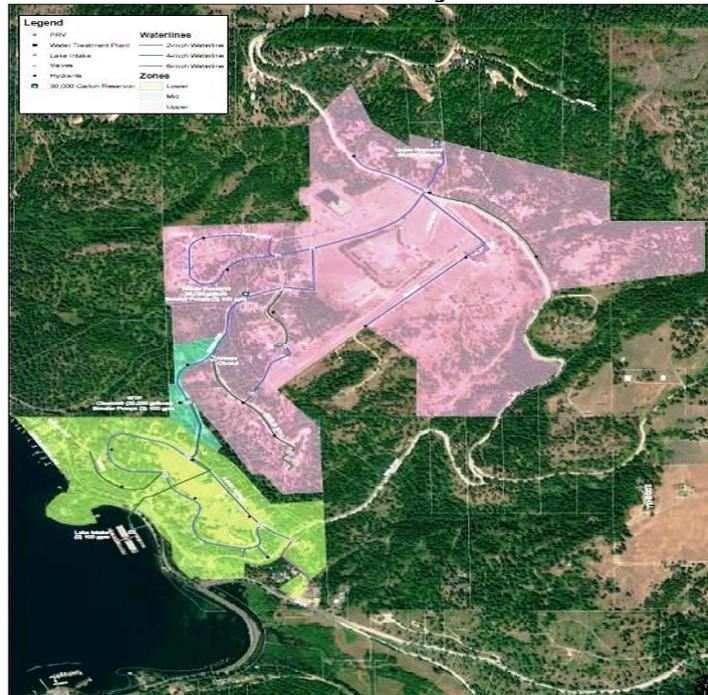


Drinking Water State Revolving Fund Green Project Reserve - Preliminary -



Carlin Bay POA Drinking Water Project SRF Loan #DW 2006 (pop. 428) \$2,500,000

Preliminary Green Project Reserve Justification¹

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.* (\$52,309).
2. INSTALLS ADVANCED FLUORESCENT LIGHTING (Energy Efficiency). GPR Business Case per 3.5-6: *Upgrade of lighting to energy efficient sources (such as...compact fluorescent, light emitting (LED) diode, etc).* (\$5,000)
3. INSTALLS BOOSTER PUMP PREMIUM ENERGY EFFICIENT MOTOR/VFD CONTROLLER (Energy Efficiency). Business Case GPR per 3.5-1: *Energy efficient ...new pumping systems...including VFDs* (\$38,000).

Categorical GPR Documentation

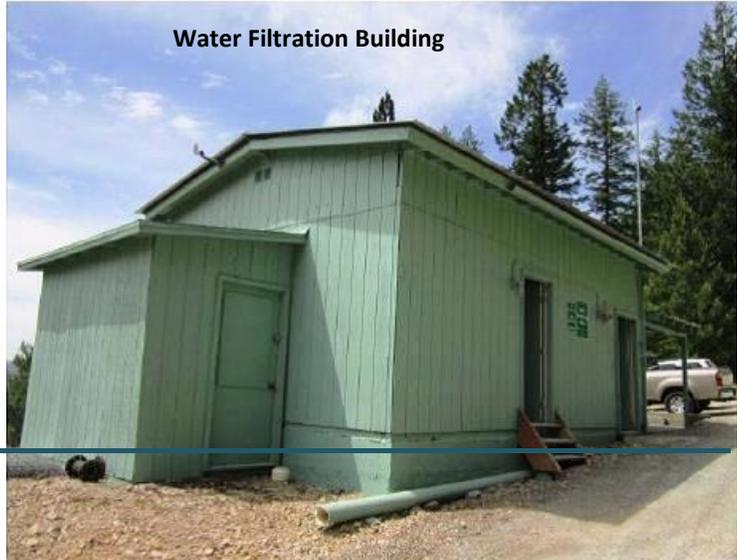
4. INSTALLS PRESSURE SUSTAINING VALVES (Water Efficiency). Categorical GPR per 2.2-12: *Installing water efficient devices.* (\$64,000).

¹ Information in red font—along with all data, including all costs— to be provided by the loan recipient in the GPR Technical Memorandum due at the time of final design approval.

1. SCADA CONTROL TECHNOLOGY (PRELIMINARY)

Summary

- Energy efficiency from the installation of a SCADA system for remote electronic sensing of **the water storage tank and pumping system**.
- Loan amount = \$2,500,000
- Estimated energy efficiency (green) portion of loan = **1.3% (\$52,309)** (**design** estimate)
- Estimated annual energy and labor savings = **\$9,500** per year.



Background/ Results²

- The SCADA system is part of the project **at the well site pump house building**.

Energy Efficiency Improvements

- Remote SCADA monitoring saves labor costs = **1 person 1 hour per day = \$9,500/yr** in labor costs.

Conclusion

- Total SCADA savings would be approximately **\$9,500** per year in labor costs = payback of **5.3** years, therefore SCADA costs are GPR-eligible.
- **GPR Costs:**
SCADA = **\$52,309**
Total = **\$52,309**
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-7³: *automated and remote-control systems (SCADA) that achieve substantial energy savings.*

² Carlin Bay POA Water System Facility Plan, Updated March 2020 , Welch Comer Engineers

³ Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility

2. Energy Efficient LIGHTING (PRELIMINARY)

Summary

- Energy efficiency from the installation of **light emitting diode (LED) lighting at the interior and exterior of the well site pump house building.**
- **Energy efficiency from the installation of occupancy sensors both interior and exterior of the well site pump house building.**
- Loan amount = \$2,500,000
- Estimated energy efficiency (green) portion of loan = **0.1% (\$5,000) (design estimate)**

Background/ Results

- The lighting system is part of the project **at the well site pump house building.**

Energy Efficiency Improvements

- Occupancy sensors improve efficiency by approximately 91% over no sensors.
- LED lighting is approximately 58% more energy efficient than typical high-pressure sodium lighting for relatively the same light output.



Conclusion

- **GPR Costs:**

Occupancy Sensors = \$ 500
LED Lighting = \$ 4,500
Total = \$ 5,000

- **GPR Justification:** Advanced fluorescent lighting and LED lighting is GPR-eligible by a Business Case per 3.5-7⁵: *Upgrade of Control Building lighting to energy efficient sources such as.....compact fluorescent, light emitting diode (LED).*

3. ENERGY-EFFICIENT PUMP/ VFD (PRELIMINARY)

Summary

- The City will purchase and install premium energy-efficient booster pumps and variable frequency drives (VFDs).
- Loan amount = \$2,500,000
- Estimated energy efficiency (green) portion of loan = **0.9% (\$38,000)** (design estimate)

Background⁴

- The project will replace an aging treatment facility, installed in 1974. The treatment facility processes and treats water from Coeur d'Alene Lake. The project also proposed to extend the raw intake further into the Lake as well as mounting the existing raw intake pumps. The project will also upsize existing source and booster pumps.
- Provision of VFD on the pump will provide a much tighter range for pressure fluctuation. The VFD will save energy by assisting in maintaining constant system pressure; it will also reduce electrical consumption at times of pump start-up.

GPR Justification

Motors/VFDs:

The Baseline Standard Practice for comparison is a standard Epact motor that is not controlled by a VFD⁵. Published operating curves by the pump manufacturer provided VFD efficiency data:

- **Proposed Pump - no VFD, standard Epact efficiency motor**
Type: Vertical Turbine Hollow Shaft
Motor rating = 125 hp; Motor type = standard efficiency. Motor efficiency of 70%
Energy usage = 136,833 kW-hr
- **Proposed Pump - no VFD, with premium efficiency motor**
Motor rating = 125 hp; Motor type = premium efficiency. Motor efficiency of 95.4%
Energy usage = 81,749 kW-hr
- **Proposed Pumps - VFD operation with premium efficiency motor**
The combined annual energy savings for utilizing a VFD with a premium motor is estimated to be 26,158 KWH per year @ \$0.08/KWH = cost savings of \$2,090 per year. This equates to an energy reduction of 36%.



Conclusion

- By installing a premium pumps/VFDs, and at **\$0.08/KWH** the City can save up to **\$4,500/yr.** in energy costs. Based on the savings in energy costs the payback period would be **8.4** years therefore the VFD and premium pumps are GPR eligible.
- **GPR Costs:** VFD/pump = **\$38,000**
- **GPR Justification:** The VFD systems are Business Case GPR-eligible, qualifying per Sect. 3.5-1 (Energy Efficiency)⁶: “Energy efficient... new pumping systems... (including variable frequency drives (VFDs))” which are cost-effective.

⁴ Carlin Bay POA Water System Facility Plan, Updated March 2020 , Welch Comer Engineers

⁵ NYS Energy Research and Development Authority, Energy Evaluation Memorandum, Village of Greenport WWTP Upgrade 8-2009.

⁶ 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2

4. PRESSURE REDUCING VALVES (PRELIMINARY)

Summary

- Pressure Reducing Valves (PRVs) will be installed.
- Loan amount = \$2,500,000
- GPR-eligible = x% (\$64,000) (Preliminary)

Background

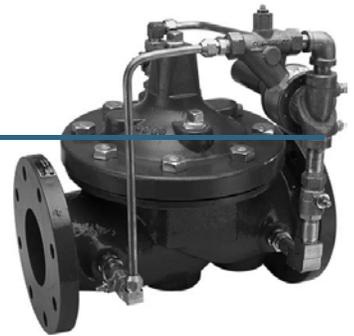
- Pressure reducing valves will be installed to assist in moving water throughout the system efficiently.
- Installing pressure reducing valves will ensure a steady reliable pressure is maintained in supplied water.

Results

- Installing pressure-reducing valves (PRV) – is the most important feature for controlling the pressure in a system, improving reliability and reducing inefficiencies.

Conclusion

- Pressure Reducing Valve installation = \$64,000
- The PRVs are categorically GPR-eligible as they are a water-efficient device.
- **GRP Costs Identified**⁷
 - 3 PRVs installed = \$64,000 (Preliminary)
- **GPR Justification:** PRVs are Categorically GPR-eligible (Water Efficiency) per Section 2.2-12⁷: *Installing water efficient devices...*



⁷ Attachment 2. April 21, 2011 EPA Guidance for Determining Project Eligibility