City of New Meadows Drinking Water Project
SRF Loan #DW1809 (pop. 475)
$2,845,500

Preliminary Green Project Reserve Justification

Categorical GPR Documentation

1. UPDATE BOOSTER PUMP STATION WITH PREMIUM ENERGY-EFFICIENT PUMPS AND VFDs (Energy Efficiency). Categorical per GPR 3.2-2: projects that achieve a 20% reduction in energy consumption; if a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case; also, per 3.5-9: VFDs can be justified based upon substantial energy savings ($500,000).

2. INSTALLS NEW SCADA SYSTEM TO ENHANCE REMOTE MONITORING (Energy Efficiency). GPR Business Case per 3.5-7: automated and remote control systems (SCADA) that achieve substantial energy savings. ($150,000).

Prepared by the State of Idaho SRF Loan Program
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1 Costs, analyses, and text to be updated by the loan recipient in the GPR Technical Memorandum, due with submission of the Final Design.
Summary

- As part of the upgrade project, the City of New Meadows will refurbish the booster pump station with pumps equipped with premium energy-efficient motors and VFDs.
- Total Loan amount = $2,845,500
- Estimated energy efficient (green) portion of loan = 18% ($500,000) (design cost estimate)

Background

The water system generally consists of the following:

- 2 active municipal wells
- 1 ground-level 250,000 gallon capacity water storage tank
- 1 booster pump station
  - 1 main 15 HP booster pump = 400 gpm
  - 1 10 HP jockey pump = 100 gpm
  - 1 standby pump = 1,000 gpm
- 41,000 feet of water main
- The booster pumps have reached their useful and requirement replacement.

GPR Justification

Motors/VFDs:

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

- Proposed Pumps - no VFD, standard Epact efficiency motor
  - Type: Vertical Turbine Hollow Shaft
  - Motor = 125 hp; Motor type = standard efficiency (93.0% assumed at 75% of full load)
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = 125,078 kW-hr

- Proposed Pumps - no VFD, with premium efficiency motor
  - (95.4% assumed at 75% of full load)
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = 122,076 kW-hr

- Proposed Pumps - VFD operation with premium efficiency motor
  - Motor = 125 hp; Motor type = standard efficiency (95.4% assumed at 75% of full load)
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = 98,703 kW-hr

- Energy Reduction - comparing with VFD to without VFD
  - Energy usage, w/o VFD = 122,076 kW-hr
  - Energy usage, w/ VFD = 98,703 kW-hr

Therefore, the premium motors with VFDs result in a 21.1% energy reduction compared to non-VFD, standard efficiency motors.
Conclusion

- The combined annual energy savings for utilizing premium pumps and VFDs is estimated to be 26,375 kWh/year per motor/VFD system - corresponding to an energy reduction of 21.1% when compared to the Baseline Standard Practice.

- **GRP Costs Identified**: Booster Station = $500,000

- **GPR Justification**: The Pump/VFD system is Categorically GPR eligible (Energy Efficiency) per Section 3.2-2 page 9: Projects that achieve a 20% reduction in energy consumption are categorically eligible for GPR; also, per 3.5-9: VFDs can be justified based upon substantial energy savings.

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5 Attachment 2. April 21, 2010 EPA Guidance for Determining Project Eligibility
2. SCADA (PRELIMINARY)

Summary
- The City of New Meadows will install a new SCADA system to operate the majority of its wells and to collect information on pump operation, pressures, and storage volumes within the system.
- Loan amount = $2,845,500
- Estimated energy efficiency (green) portion of loan = 5% ($150,000) (engineers estimate)
- Estimated annual energy and labor savings = $52,000 per year.

Background
- The current electrical controls are insufficient to meet the monitoring and operational requirements of the water system.
- The SCADA system will be part of the project at the boost pump station and reservoir.

Energy Efficiency Improvements
- Remote SCADA monitoring saves labor costs = 2 people 1 hour per day = $52,000/yr in labor costs.

Conclusion
- Total SCADA savings would be approximately $52,000 per year in labor and energy costs = payback of 2.9 years; therefore SCADA costs are GPR-eligible by 3.5-7.
- GPR Costs: SCADA = $150,000 (engineering estimate)
- GPR Justification: SCADA system costs are GPR-eligible by a Business Case per 3.5-7: automated and remote control systems (SCADA) that achieve substantial energy savings.