Idaho Falls Wastewater Facility Renovation and Upgrade
SRF Loan #WW 1102 (pop. 95,000)
$18,150,000

Final Green Project Reserve Justification
Categorical GPR Documentation

- REPLACEMENT OF AN ABF TOWER/SURFACE TURBINE AERATION SYSTEM WITH A FINE BUBBLE DIFFUSION AERATION SYSTEM (Energy Efficiency). Categorical GPR per Section 3.2-2: projects that achieve a 20% reduction in energy consumption; retrofits to compare existing system to that proposed ($2,873,078).

Prepared by the State of Idaho SRF Loan Program
June 2015
**Categorical**

**TREATMENT PROCESS – FINE BUBBLE AERATION**

**Summary**
- Large-scale wastewater plant renovation project includes replacement of an ABF tower/surface turbine aeration system with fine bubble diffuser aeration & RAS system to ensure compliance with ammonia standards.¹
- Total Loan amount = $18,150,000
- Estimated Categorical energy efficient (green) portion of loan = 15.8% ($2,873,078)
- Annual Energy savings = 43%

**Background**²
- The City of Idaho Falls Wastewater Facility services the communities of Idaho Falls, Uccon, and Iona-Bonneville Sewer District. The total population served is 70,000 people.
- The existing ABF tower/surface turbine aeration system currently used to treat the City’s wastewater is inadequate in meeting effluent regulatory standards for ammonia and the anticipated permit renewal requirements for phosphorus.
- The Facility Plan proposed replacement of the existing system with a new activated sludge system utilizing fine bubble diffusers to allow the City to drastically reduce energy requirements, replace outdated equipment, and meet NPDES permit limits.
- The existing treatment system is 40 years old with a total secondary treatment system HP requirement of 1,120 HP.
- The estimated energy consumed by the existing secondary treatment system is 7,314,600 kW-hr/yr.

**Results**³
- The HP requirements of the new system will be 634 HP.
- The estimated energy consumed by the proposed system will be 4,143,800 kW-hr/yr.

**Energy Efficiency Improvements**
- The resulting reduction in energy requirements with the new system = 1 – (4,143,800 ÷ 7,314,600) = .43 = 43%
- The total system oxygenation efficiency of the existing system is 1.10 lbs. O₂/HP-hr.
- The total system oxygenation efficiency of the proposed system is 2.97 lbs. O₂/HP-hr.
- Pumping power requirements will also be substantially reduced by the new system.

**Conclusion**
- By replacing the current system with a fine bubble diffusion aeration system, the City will approximately triple the oxygen transfer efficiency in the activated sludge basins while reducing energy requirements by 43%.
- **GPR Costs**: RAS System + Fine Bubble Diffusion = $1,025,000 + $1,848,078 = $2,873,078⁴
- **GPR Justification**: Categorically GPR-eligible (Energy Efficiency) per Section 3.2-2⁵: *projects that achieve a 20% reduction in energy consumption.*

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¹ 2/1/11 Discussion with Chris Fredrickson, P.E., Staff Engineer, City of Idaho Falls
² 2011 Facility Wastewater Plan, City of Idaho Falls
³ 2/9/11 & 9/23/13 Correspondence with Shawn Kohtz, P.E., Murray Smith & Associates
⁴ 6-16-15 Correspondence with Craig Anderson, P.E>, Murray Smith & Associates