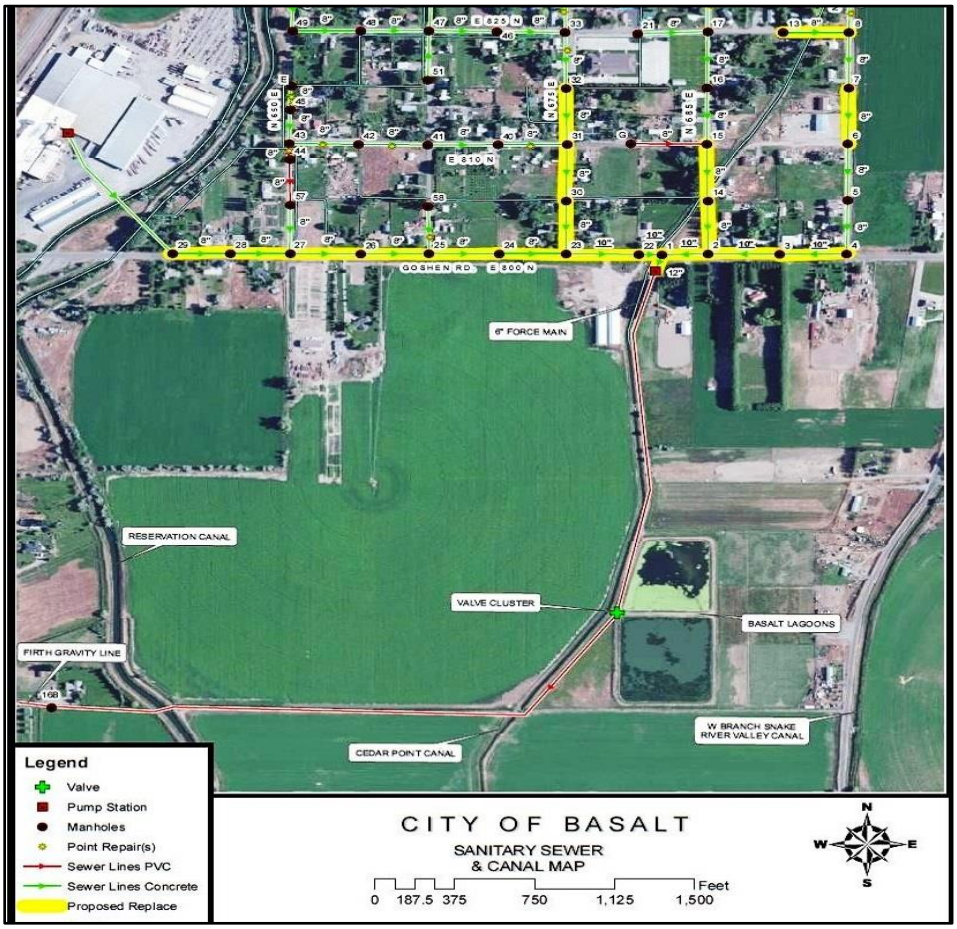


City of Basalt FY17 Wastewater Project (pop. 392)

SRF Loan #WW1702

$1,090,827

Final Green Project Reserve Justification

Business Case GPR Documentation

1. RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM EXPERIENCING EXCESSIVE INFILTRATION (Energy Efficiency). Business Case GPR per 3.5-4: *I/I correction projects that save energy from pumping, chemical usage and WWTP capacity and are cost effective* ($549,200).

2. INSTALL LIFT STATION SCADA SYSTEM (Energy Efficiency). Business Case GPR per 3.5-8: *SCADA systems can be justified based on substantial energy savings.* ($32,047).

1. Renovation of Gravity Wastewater Collection System[1]

Summary

- This project consisted of renovating the City's gravity wastewater collection system to reduce excessive infiltration. The system was installed in 1974.
- Estimated loan amount = $1,090,827
- Estimated energy efficient (green) portion of loan = 50% ($549,200) (based on installed costs)

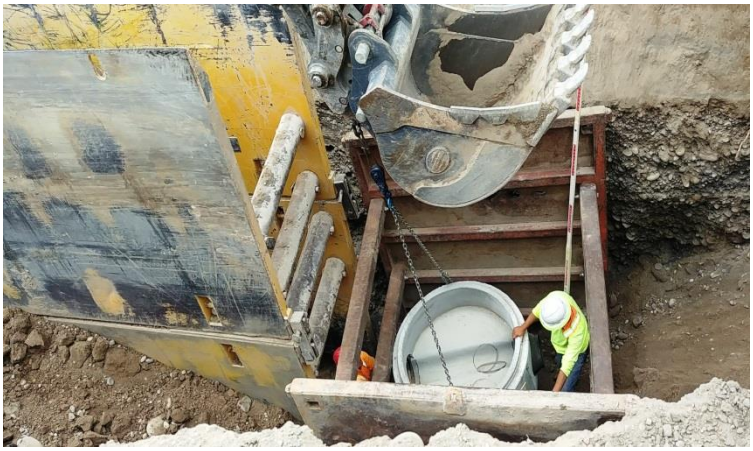
Background

- A 2014 camera survey identified numerous failing pipe sections, as well as 40 individual points requiring repair; an evaluation of flow rates indicates substantial infiltration.
- Infiltration occurs where the sewer mains are adjacent to or cross under ditches and canals. I/I grew in the past substantially due to loss of gaskets in the pipes near the canal as a result of past cleaning operations with a 2,000 psi water jet.

- With the additional I&I, the current percentage of Basalt I/I flow contribution to the Firth WWTP was estimated at 31% or 0.032 MGD.
- Average Daily Flow (ADF) with I/I for the entire year at the Basalt LS was estimated = 0.063 MGD resulting in 3.5 hour daily pump runtimes (to existing Basalt lagoons).
- I/I also resulted in more pumping to the Firth WWTP at Firth and more UV treatment at Firth.

Results

- The project final replaced 7,429 LF of 8" and 10" concrete sewer main, repaired 35 individual points, and installed 17 manholes.
- The project will reduce infiltration flows by an estimated 80% (from .032 MGD to .006 MGD), and daily pump runtimes from 3.5 hours to 2.1 hours.
- Therefore, 9.267 MG will not have to be pumped by Basalt, and pumped and treated at Firth[2].



[1] City of Firth/Basalt Facility Planning Wastewater Study April 2015, Schiess Associates
[2] Savings = (1 - (0.031 MGD + 0.006 MGD) / (0.031 MGD + 0.032 MGD)) *100.

Analysis[3]

Cost Effectiveness

- To determine the overall cost effectiveness and energy savings of the selected alternative, it is compared to a Best Practicable Alternative (BPA). For I/I projects, the BPA consists of continued pumping of the existing wastewater flow (including infiltration) to the Firth collection system, followed by continued downstream pumping and treatment of the increased wastewater I/I volume.
- The BPA is more energy intensive. GPR-eligible costs are the power costs saved by the upgrade project + reduced pumping and treatment costs.

Energy Savings

- Existing Flow: reducing system I/I by 80% results in a direct reduction in energy consumption by the existing Basalt lift station for the 40 year life of the project = 5.6 KW * 1.4 hour/day * 365 day/year * $0.08/KW*hour * 40 years = **$9,200**.
- BPA: Firth must pump this water again (into the plant) and treat with UV disinfection. The pumping and treatment cost Basalt paid to Firth in the year 2016 was $16,870. Assuming 80% of this can be diminished with I&I reduction in Basalt, a 40 year savings of $16,870 * 0.8 = $13,500 per year can be accrued. Carrying this out for 40 years = **$540,000**.

Conclusion

- Eliminating 80% of infiltration in the collection system is GPR-eligible since energy is saved from reduced lift station pumping costs (40% lower for the Basalt lift station), along with reduced pumping and treatment costs at Firth.
- **GPR Costs**: GPR-eligible energy savings = Power Savings from less pumping + reduced treatment costs = $9,200 + + $540,000 = $549,200

  ∴ **GPR costs = $549,200**
- **GPR Justification**: The prioritized replacement of gravity sewer lines by the City is GPR eligible by a Business Case per Section 3.5-4 (Energy Efficient): *Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective*.

[3] Power costs = $0.08/kWh

2. SCADA Control Technology

Summary

- Energy efficiency results from the remote electronic sensing and control of the treatment plant.
- Estimated loan amount = $1,090,827
- Estimated energy efficiency (green) portion of loan ≅ 2.9% ($32,047) (installed costs)
- Estimated annual energy savings $5,255 per year.

Background/ Results[4]

- The SCADA system was upgraded in this project to include the lift station which transfers sewage to the City of Firth wastewater collection system.

Energy Efficiency Improvements

- OPERATORS: Remote SCADA control saves labor and travel costs = One person 30 minutes a day for 250 days a year at $40/hour = $5,000 per year in labor costs; travel cost @ $0.51 per mile @ 2 miles/day = $255 per year = total savings of $5,255/yr.

Lift Station Wet Well, Electrical Panel, and Valve Vault

Conclusion

- Total SCADA savings are around $5,255 per year in energy, labor, and travel costs = payback of 4 years. therefore SCADA system costs are GPR-eligible by 3.5-8.
- **GPR Costs:** SCADA = $32,047
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-8[5]: *SCADA systems can be justified based on substantial energy savings.*

[4] City of Firth/Basalt Facility Planning Wastewater Study April 2015, Schiess Associates
[5] Attachment 2. April 21, 2011 EPA Guidance for Determining Project Eligibility.