



MISSOURI DEPARTMENT OF NATURAL RESOURCES

**Metropolitan St. Louis Sewer District (MSD)
Inflow and Infiltration (I/I) Reduction Program Phase II & III**

**Clean Water State Revolving Fund
Green Project Reserve
Business Case**

**State Fiscal Year 2015 Intended Use Plan
Project Number C295023-37**

**Loan Closing Date: August 18, 2015
Loan Amount: \$75,000,000
Green Amount: \$74,222,650**

I/I REDUCTION PROGRAM

Summary

- This project consists of lining various size existing sewer with cured in place pipe (CIPP), and rehabilitating manholes with both cured in place lining and cementitious liner.
- Total Loan amount = \$75,000,000
- Estimated energy efficient (green) portion of loan = 99% (\$74,222,650)
- Estimated annual savings \$868,000 per year.

Background

The Public Inflow and Infiltration (I/I) Reduction Program consists of the rehabilitation of the existing collection system throughout the entire MSD service area. This will consist of approximately 837,490 linear feet of various sizes of CIPP and the rehabilitation of 837 manholes. This program is part of an ongoing effort to reduce combined sewer overflow (CSO) and sanitary sewer overflow (SSO) occurrences and volumes by reducing the amount of I/I into the sanitary and combined systems. This project also allows MSD to recover some of their existing collection and treatment system capacity.

Energy Efficiency Justification

Removing the I/I will reduce the amount of wastewater needed to be pumped in lift stations and treated at any of their seven wastewater treatment plants. MSD has reviewed projections for I/I removal on representative I/I projects and has determined that a removal factor of 20 gallons per year, per dollar spent on I/I reduction, is a reasonable estimate. Using this estimate, MSD will be removing approximately 1.484 billion gallons per year of I/I from their system (this amount represents approximately 1.2 percent of the annual flows treated by MSD). MSD charges \$3.76 per 1,000 gallons of wastewater collected and treated in their system. Of this amount, certain fixed costs will not be reduced based on a reduction in I/I, but other costs, such as energy use for pumping and treatment, water backup claims, operating expenses for frequency of cleaning, etc. will be reduced. The detailed cost accounting to determine these savings does not exist, but a reasonable estimate is that 1/3 of the cost may be saved by a reduction in I/I, or \$1.24 per 1,000 gallons. Using this value, along with the 1.484 billion gallons per year reduction of I/I, yields a saving of \$1,840,721.72 per year in collection and treatment costs. The payback time frame for this project is 40 years. The expected service life of I/I rehabilitation products is 50 years, making this project cost effective.

- Savings of \$92,036,086 over the expected service life of the project.

- Reduction in the number of CSO and SSO occurrences.
- Recovery of existing system capacity.

Conclusion

- The I/I rehabilitation project saves energy, is cost effective, reduces the number of CSO and SSO occurrences, and recovers some of the existing system capacity.
- Per Section 3.5-4 of EPA's Guidance for Determining Project Eligibility, *"Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective."*

References

- Procedures for Implementing Certain Provisions of EPA's Fiscal Year 2012 Appropriations Affecting the Clean Water and Drinking Water State Revolving Fund Programs. Attachment 2. 2012 Clean Water State Revolving Fund 10% Green Project Reserve: Guidance for Determining Project Eligibility. March 2, 2012.
- MSD facility plan "Inflow/Infiltration Reduction Program" prepared by MSD and sealed on August 23, 2012 and approved on January 8, 2013.
- Calculation factors for the amount of I/I reduction per year per dollar spent and collection and treatment cost per 1,000 gallons were provided by MSD on August 11, 2015.