



# **MISSOURI DEPARTMENT OF NATURAL RESOURCES**

**Metropolitan St. Louis Sewer District (MSD)  
Inflow and Infiltration (I/I) Reduction Program Phase 1**

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

**State Fiscal Year 2014 Intended Use Plan  
Project Number C295564-03**

**Loan Closing Date: October 31, 2013  
Loan Amount: \$52,000,000  
Green Amount: \$35,000,000**

## I/I REDUCTION PROGRAM

### Summary

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- 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 = \$52,000,000
- Estimated energy efficient (green) portion of loan = 67.3% (\$35,000,000)
- Estimated annual savings \$868,000 per year.

### Background

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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 479,915 linear feet of various sizes of CIPP and the rehabilitation of 480 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

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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 700 million gallons per year of I/I from their system (this amount represents approximately one half of one 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 700 million gallons per year reduction of I/I, yields a saving of \$868,000 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 \$43,400,000 over the expected service life of the project.

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

## Conclusion

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- 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

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- 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.