

## SYSTEM LINING AND REHABILITATION PROGRAM, CITY OF NEW ALBANY

### Summary

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- To address the system wide inflow and infiltration (I/I) problems, the City will be implementing a lining and rehabilitation program. The lining and rehabilitation will consist of system investigations, inspections, testing, installation of a cured in place pipe (CIPP) liner in deteriorated clay sewer lines ranging in size from 8-inch to 12-inch diameter, manhole lining, and T-lining of private service lateral connections to the main sewer line.
- The first phase of the rehabilitation project consists of an estimated 24,000 lineal feet of CIPP lining to be installed in Basin 16. Additional CIPP lining in the remainder of the system is estimated to be in the hundreds of thousands of lineal feet.
- The estimated SRF Loan amount is \$7,400,000.
- **The GPR Energy Efficiency amount for this project is \$1,173,690.50: \$1,105,314.50 for construction based on the bid amounts and \$68,376 for planning and design.** The GPR amount for this project equates to approximately 16% of the total loan amount. All GPR costs for this project fit into the Energy Efficiency category.
- The total GPR amount for all projects under this SRF Loan is \$5,061,646.70, or 68% of the total loan amount.

### Background

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- The City's sewer system contains approximately 1,093,000 lineal feet of gravity sewer pipe. Per a Sanitary Sewer Evaluation Study (SSES) completed in 1999 it is estimated that 71% (776,000 lineal feet) of system piping is clay. The clay pipe is generally located in the older parts of the City and is deteriorating as it nears or extends beyond its design life.
- The City's sewer system consists of forty (40) mini-basins that make up the sewer service area. Of the forty (40) basins, twenty-seven (27) have a peaking factor above 6.0 with the maximum being 26.1. The high peaking factors caused by excess I/I entering the sewer system contribute to sanitary sewer overflows (SSOs) observed during wet weather events.
- The high peaking factors resulting from the presence of I/I in the City's collection system has resulted in higher energy costs associated with pumping and treating the additional flow.

### Energy Efficiency Discussion

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- I/I removed by the proposed project was calculated based on the methods established in the Robert E. Lee Flow Monitoring Analysis memo prepared by Clark Dietz, Inc. This document was prepared in January 2009 and in accordance with formulas and procedures included in the City's Consent Decree and Memorandum of Understanding for quantifying I/I removal resulting from capital improvements to the sewer system.
- Using the flow monitoring analysis noted above, statistical analysis of rainfall events, the anticipated reduction of I/I resulting from the proposed project is estimated to be 73.3 million gallons per year or 1.7 million gallons per day per rainfall event.
- The reduction in I/I corresponds to a cost savings at the wastewater treatment plant due to a reduction in the flows to be treated. The estimated cost savings is \$66,000 per year based on an

operation and maintenance cost of \$0.90/1000 gal. Of this cost savings, approximately 25% are attributed to energy savings, or approximately \$16,500. In addition to the energy savings at the plant, there would be energy savings in the collection system since less flow would need to be pumped.

- The 73.3 million gallons per year of I/I removed is equivalent to an average daily flow of 201,000 gpd. Treatment capacity at the WWTP being utilized by the current I/I entering the system comes at a cost to the City that will be mitigated as a part of this project. Treatment capacity is estimated to be valued at \$15 per gallon of average flow.
- The table below summarizes the Present Worth Costs associated with the proposed project and an alternative solution of treating the I/I flow and expanded plant capacity. The analysis shows that the proposed project is cost effective.
- The payback period is 18 years which is less than the useful life of the proposed rehabilitation.

<b>COST EFFECTIVE ANALYSIS</b>		
	System Lining and Rehabilitation Project	Alternative-Treat I/I Flows and Expand WWTP Capacity
Capital Cost	\$1,173,700	\$3,015,000
Annual O & M Costs Associated with I/I Treatment	-\$66,000	\$0
Present Worth of O & M Costs (3%, 20 Years)	-\$982,000	\$0
Total Present Worth Cost	\$191,700	\$3,015,000

**Conclusion**

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- The proposed project will result in annual energy cost savings of \$16,500 associated with wastewater treatment.
- The proposed project will immediately result in creating capacity at the WWTP valued at \$3,015,000.
- The proposed project is cost effective.
- The payback period is 18 years.
- The proposed project is effective in that it provides for the elimination of SSOs and a present worth cost that is equivalent to 6% of the alternative present worth cost.

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Reference Material – Green Project Reserve Sustainability Incentive Business Case, Amended Capacity Assurance Plan System Improvements, System Lining and Rehabilitation, City of New Albany, Indiana, dated December 2010, prepared by Clark Dietz, Inc.