

**Plainfield Charter Township
Drinking Water Revolving Fund Project No. 7287-01
Green Funding and Principal Forgiveness**

Green = Westgate Area Water Main Replacement

Westgate Area Total Construction = \$1,292,088.72
Parallel Mains (non-green) = -185,441.88
Total Green Construction = \$1,106,646.84

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Total Construction = \$5,933,702.43 = 0.18650 = 18.65%

Percent x Loan Total = 18.65% x \$7,750,000 = \$1,445,375

Total Green Costs = \$1,445,375

Green Principal Forgiveness

Total Green Costs x GPR% = \$1,445,375 x 40% = \$578,150
Green Principal Forgiveness = \$578,150

Non-Green Principal Forgiveness

Total Loan – Total Green Costs = \$7,750,000 - \$1,445,375 = \$6,304,625
Non-Green Costs x non-GPR% = \$6,304,625 x 15% = \$945,693.75
Non-Green Principal Forgiveness = \$945,693.75

Total Principal Forgiveness

Green Forgiveness + Non-Green Forgiveness = \$578,150 + \$945,693.75 = \$1,523,843.75
Total Amount of Principal Forgiveness = \$1,523,843.75

**Drinking Water Revolving Fund
Green Project Reserve Qualification Template**

Applicant: Plainfield Charter Township Project No: _____
Project Name: DWRF Project Plan

Identify by page number from the project plan, or attach excerpts, where water efficiency or energy efficiency improvement justification is provided or discussed to support the need for the recommended green project reserve component: Pages 57-59. See attached.

Please ensure all requested information is provided to enable an assessment by the Michigan Department of Natural Resources and Environment (DNRE) of whether the project or project component can qualify for funding from the green project reserve.

Meter Replacements with Conventional Meters

1. Over the last five years, water lost or unaccounted for in the system has averaged _____ gallons per year and is _____ percent of the water produced each year.
2. Identify the source of this information (i.e. water audit, water conservation study, production and billing records): _____
3. Identify the portion of the water loss that is likely due to inaccurate meters: _____
4. The expected reduction in water loss by installing replacement traditional water meters in all or a portion of the system is _____ gallons per year, reducing the water loss percentage to _____.
5. It takes _____ kilowatt hours (kWh) of electricity to produce and distribute 1,000 gallons of water. At a cost of \$ _____ per kWh, the estimated annual electrical cost for the water loss due to inaccurate meters based on the five-year average is \$ _____.
6. Based on the average cost per year for the loss and the estimated cost of _____ for replacing the meters, the project will pay for itself in _____ months/years.
7. Attached all relevant data and calculations that were used to provide answers to these questions.

Water Main Replacement

1. Over the last ten years, _____ water main breaks have occurred on the water mains that are proposed for replacement, an average of _____ breaks/mile/year.
2. Identify the length, diameter, age and type of pipe to be replaced: _____

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3. Each break is estimated to result in the average loss of _____ gallons of water, calculated to total _____ gallons/year of water lost for those water mains.
 4. Present the data indicating how this is a significant source of water loss in the system and how the pipes proposed for replacement are likely to generate the greatest return in leak reduction. _____

 5. The energy savings from pumping/delivering water through the new water mains versus the old ones is estimated at _____ Kwh/year.
 6. Describe the condition of the replaced mains with respect to friction/head loss etc from tuberculation or other deterioration issues. As appropriate, identify if the soils are corrosive and contributing to the deterioration/breaks or leaks in the mains, and how the replacement mains are designed to address future corrosion:

 7. Total projects costs for the water main replacement component of the project are \$ _____.
 8. Identify the source of data used for these calculations: _____

Submitted by:

Chad Sosnowski
Name

4-30-2010
Date

Township Engineer
Title

Water Conservation

The Westgate area water main was the first Township water main and was constructed in the late 1950's. The water main is over 50 years old and is comprised of mainly six and eight inch diameter cast iron pipe.

Plainfield Charter Township has documented an increased number of water main breaks have occurred in the Westgate area. Over the last ten years 84 water main breaks have occurred in Plainfield's water distribution system. Of the 84 water main breaks, 31 breaks occurred in the Westgate area. This is 37 percent of all water main breaks occur in the Westgate area. There are currently 37, 487 feet or approximately 7 miles of water main in the Westgate area, which equates to 0.44 breaks per mile per year. In comparison, the remaining portion of the system has an average of 0.03 breaks per mile per year. The Westgate area is over fourteen times more likely to have a water main break than any other portion of the distribution system.

Based on comments by repair crews, it is well known that the existing cast iron water main and the many repairs do leak. This leaking water causes the distribution system and water treatment plant to become less efficient in its energy use by having to pump more to accommodate leaking water mains.

Township staff has indicated that the existing cast iron main in the Westgate area is cement lined and internal tuberculation is minimal. There is some evidence that corrosive soils may be present in some areas of the existing water main location but shear failures of the brittle cast iron pipe are the predominant reason for the numerous breaks. The proposed water main will be polyethylene encased to protect the water main from any corrosive soils present.

Over the past two years, Plainfield Township produced on average 1.52 billion gallons per year. Plainfield Water Department has determined that approximately 9 percent of the total water produced or 136 million gallons per year is water loss.

It is difficult to assign unaccounted water losses to specific areas of the distribution system without conducting an expensive comprehensive leak detection program. However, it can be assumed that since 37 percent of all breaks in the system occur in the Westgate area, approximately the same percentage could be applied to water losses. The water losses for the Westgate area could be 50 million gallons per year.

The Township is proposing to replace approximately 27 percent of the water main in the Westgate area by installing 4,000 feet of twelve-inch and 5,750 feet of eight-inch diameter ductile iron water main for a total project cost of \$1,899,000. Water savings could be approximately 14 million gallons per year. The cost savings to pump, treat, and fix repairs associated with water loss and water main breaks are estimated to be \$56,000 per year.

Additional energy saving would be expected for pumping less water.

Currently the Township uses approximately 2,675 kilowatt-hours per million gallons of water produced. The Township is expected to save 37,500 kilowatt-hours per year due to the water main replacement project.