Drinking Water Revolving Fund
Green Project Reserve Qualification Template

Applicant: **Village of Manchester**
2014 DWRF Water Improvements
Project No. xxx-01 7401-01

Identify by page number from project plan, or attached 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 **1-3, 14, 15, 20, 21, 26, 28**

1. Over the last 10 years, **19** water main breaks have occurred on the water mains that are proposed for replacement, an average of **2.45** breaks/mile/year.

2. Identify the length, diameter, age and type of pipe to be replaced: **3280 feet of 4-inch and 800 feet of 6 –inch of pre 1950 cast iron water main. Additionally, 4 existing dead ends will be eliminated requiring 1400 feet of new water main.**

3. Each break is estimated to result in the average loss of **500,000** gallons of water, calculated to total **950,000** gallons/ year water lost for those water mains.

4. Present 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:
Over the last 3 years, the Village has lost approximately 17% of their water. Losses are partially attributed to water main breaks and flushing of dead ends.

Year	Pumped	Sold	Lost %
2011	76.65 mg	63.97 mg	16.5%
2012	83.95 mg	69.20 mg	17.5%
2013	76.65 mg	63.22 mg	17.5%

Dead ends are typically flushed at 150 gallons per minute for 45 minutes on a weekly basis to prevent unacceptable water quality for the users. This equates to approximately 351,000 gallons per year per flushed location. As part of the 2014 DWRF Water Main Improvement Projects, four dead ends will be eliminated resulting in the savings of 1,404,000 gallons of water per year.

The 4-inch and 6-inch water mains proposed for replacement constitute approximately 5% of the 17 miles of distribution mains in the Village of Manchester

During the period from 2004 – 2013, 39 water main breaks occurred in the distribution mains. Of these 39 breaks, 19, or 49% of the breaks occurred in the 4-inch and 6-inch mains proposed for replacement.

Approximately half of the breaks over the last 10 years have been on 5% of the distribution system.

Data indicates approximately 500,000 gallons of water per break is lost. Therefore, for the 19 breaks in the 4-inch and 6-inch water mains, approximately 9.5 million gallons of water have been lost, averaging 950,000 gallons per year.

Eliminating the dead-ends and replacing the proposed 4-inch and 6-inch water mains will result in a savings of 2,354,000 gallons per year, or 17.5% of the current lost water.

5. The energy savings from pumping / delivering water through the new mains versus the old ones is estimated at **3,670** KwH/year.
   Currently the Village uses approximately 1560 KWh to produce 1 million gallons of water (based on 2013 usage). The Village expects to save 3,670 KWh per year due to the reduction of lost water from the 2014 DWRF Water Main Improvements project.

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 replacements mains are designed to address future corrosion.
   The water mains are proposed to be replaced with 8" PVC piping with a C factor of 160. The existing 4-inch and 6-inch mains are reportedly tuberculated and likely have a C factor of 80 or less and reduced flow area. The existing soils are generally not corrosive, however the PVC piping will be able to withstand the environment..

7. Total project costs for the water main replacement component of the project are **$1,100,000.**

8. Identify the source of data used for these calculations:
   Data was obtained from the Village of Manchester water treatment pumpage and sales records, as well as Public Works maintenance records and interviews with Village staff.

Submitted by:

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Name Date

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Title