City of Paris

DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2012 INTENDED USE PLAN

PROJECT NUMBER 62525

COMMITMENT DATE: September 20, 2012
DATE OF LOAN CLOSING: February 28, 2013

GREEN ESTIMATE AT CLOSING: $3,402,115.00

Subsidy awarded for Green components, $500,778.00
March 9, 2012

Mr. Thomas L. Pruitt, P.E.
City of Paris
4445 SE Loop 286
Paris, TX 75460

Re: SFY 2012 Drinking Water State Revolving Fund
   Green Project Eligibility

Dear Mr. Pruitt:

The Texas Water Development Board (TWDB) received Green Project Information Worksheets from the City of Paris (City) for project #9424 in response to a request letter dated January 13, 2012. The letter states that the City is eligible for loan forgiveness in an amount up to 15% of the green component cost if it can demonstrate that the project has green costs greater than or equal to 30% of the total project cost. After reviewing the worksheets, TWDB staff determined the City meets the 30% green cost threshold based on the following:

- The City’s Green Project Information Worksheets dated January 24, 2012 requested that $3,402,115 of the City’s total project cost be considered eligible for the DWSRF Green Project Reserve (GPR). The green element described includes replacement of approximately 27,821 linear feet of old and deteriorated waterlines in order to increase water efficiency through reduction of water losses within the its water system.
- The Environmental Protection Agency’s (EPA’s) Green Project Reserve Guidance for Determining Project Eligibility (TWDB-0161) lists water efficiency projects including the distribution pipe replacement or rehabilitation to reduce water loss and prevent water main breaks as business case eligible for the GPR (Part B, 2.5-2).
- Information presented on the Green Project Information Worksheets and its attachments provided sufficient information to confirm the eligibility of the proposed replacement of waterlines for the GPR in accordance with TWDB-0161, Part B, 2.5-2.
- Therefore, at this time the TWDB considers project costs in the amount of $3,402,115 to be eligible for the DWSRF GPR. This includes estimated planning, acquisition, design and construction costs as well as contingency and financing costs associated with the project.
- Please note that the City’s application for financial assistance should be consistent with the project scope presented on the Green Project Information Worksheets. Inclusion of the green elements within the project will be verified prior to Board commitment. If the project scope or budget related to the approved green components changes during application review, the City should update and resubmit the Green Project Information Worksheets as necessary.
For SFY 2012, the TWDB is required by federal law to allocate no less than 20% of the capitalization grant toward green component costs (also referred to as the Green Project Reserve). Therefore, the TWDB gives first preference for invitations to entities that have a documented percentage of green component cost of at least 30% of the total project cost. The City has demonstrated that it meets/exceeds the 30% green cost threshold. A letter inviting the City to apply for Mainstream City funding will be sent separately.

If you have any questions regarding green project eligibility, please feel free to contact John Muras, Project Engineer, by phone at 512-463-1706 or by email at john.muras@twdb.texas.gov.

The TWDB appreciates the Paris interest in the DWSRF.

Sincerely,

Stacy L. Barna
Director of Program Development
Project Finance Division

SB:rf

Attachments: 1. Green Project Information Worksheets, Approved
              2. Green Project Cost Summary
The Federal Appropriation Law for the current fiscal year Clean Water and Drinking Water State Revolving Fund programs contains the Green Project Reserve (GPR) requirement. The following Green Project Information Worksheets have been developed to assist TWDB Staff in verifying eligibility of potential GPR projects.

TWDB-0163
Revised 12/2/2010
TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS

PART I – GREEN PROJECT INFORMATION SUMMARY

Check all that apply and complete applicable worksheets:

Categorically Eligible

☐ Green Infrastructure $none
☐ Water Efficiency $none
☐ Energy Efficiency $none
☐ Environmentally Innovative $none

Business Case Eligible

☐ Green Infrastructure $-
☐ Water Efficiency $3,402,115
☐ Energy Efficiency $none
☐ Environmentally Innovative $none

Total Requested Green Amount $3,402,115

Total Requested Funding Amount $3,402,115

Type of Funding Requested:

☐ PAO (Planning, Acquisition, Design)
☐ C (Construction)

Completed by:

Name: Thomas L. Pruitt, P.E.

Signature: [Signature]

Title: Project Manager

Date: January 24, 2012
PART III - BUSINESS CASE ELIGIBLE

Complete this worksheet for projects being considered for the Green Project Reserve (GPR) as business case eligible. Business case eligible projects or project components are described in the following sections of the EPA GPR guidance (TWDB-0161):

- Green Infrastructure: Part B, Section 1.4
- Water Efficiency: Part B, Section 2.4 and 2.5
- Energy Efficiency: Part B, Section 3.4 and 3.5
- Environmentally Innovative: Part B, Section 4.4 and 4.5

Information provided on this worksheet should be of sufficient detail and should clearly demonstrate that the proposed improvements are consistent with EPA and TWDB GPR guidance for business case eligible projects. Refer to Information on Completing Worksheets for additional information.

Section 1 - General Project Information

Applicant: **City of Paris**

PIF #: **9424**

Project Name: **2014 Water Line Improvements**

Contact Name: **Shawn Napier, P.E.**

Contact Phone and e-mail: **(903) 784-9292, snapier@paristexas.gov**

Total Project Cost: **$3,402,115.00**

Green Amount: **$3,402,115.00**

(Business Case Eligible)

Brief Overall Project Description:

The project as submitted proposed the replacement of 15 water distribution lines as identified on the "City of Paris - 2012 TWDB DWSRF Application" map. The new lines include approximately 14,481-feet of 6", 8,100-feet of 14", 4,180-feet of 20", related fittings, valves, hydrants, and other appurtenances.
Section 2 - Green Infrastructure
Certain green infrastructure improvements may be considered business case eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of business case eligible GPR Projects. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed green infrastructure improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:
Specific guidance refers to Part B, Section 2 as it applies to water efficiency. The proposed waterline replacements will fall under Section 2.4-3 (discussing energy savings and chemical savings) and 2.4-4 (discussing water loss and operational and maintenance savings). A worksheet is attached showing calculations and assumptions.

Detailed Description (attach additional pages if necessary):
PLEASE SEE ATTACHED WORKSHEET.

Green amount associated with green infrastructure (business case eligible): $3,402,115.00
(Attach a detailed cost estimate if necessary)
Section 3 – Water Efficiency
Certain water efficiency improvements may be considered business case eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of business case eligible GPR Projects. For all water efficiency business case eligible projects Section 3.1 must be completed. A common water efficiency project that may be considered business case eligible is water line replacements to address water loss. For this type of project complete Section 3.2 of the worksheet. For any other water efficiency improvement being considered for business case eligibility, complete Section 3.3.

Section 3.1 - System and Water Loss Information
Section 3.1 is required for all water efficiency business case eligible projects. Attach a copy of most recent Water Audit, if available. Otherwise, complete and attach Water Audit Worksheet or provide water audit data in a similar format. Additional information on water loss and water audits as well as a copy of the Water Audit Worksheet is available at: http://www.twdb.state.tx.us/assistance/conservation/Municipal/Water_Audit/wald.asp

Reference and attach water loss audit and/or any other completed planning or engineering studies:

- [x] Water Loss Audit - Attached
- [ ]
- [ ]

Section 3.2 - Water Line Replacement

Proposed pipe to be replaced:

<table>
<thead>
<tr>
<th>Length (LF)</th>
<th>Existing Pipe</th>
<th>Proposed Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Age (yr)</td>
<td>Dia. (in)</td>
</tr>
<tr>
<td>PLEASE SEE ATTACHED</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Percent of distribution lines being replaced: 2.10

Number of breaks/leaks/repairs recorded in past 24 months for areas being replaced: 25

Estimated water loss from pipe being replaced (provide calculations on following page): 10,482,593

Estimated annual water savings (provide calculations on following page): 9,556,788

Estimated annual cost savings (provide calculations on following page): $182,798

TWDB-0163
Revised 12/2/2010
Provide detailed description of the propose improvements and provide supporting calculations. Description should include a description of the methodology used to select pipes for replacement (attach additional pages if necessary):

Green amount associated with water line replacement: $3,402,115.00

(Attach detailed cost estimate if necessary)
Part III, Section 2 – detailed description

The City of Paris proposes to replace various cast iron pipelines within its distribution system. The proposed pipeline replacements are part of the long-term Capital Improvement Plan. The pipelines selected for the TWDB project are heavily tuberculated and maintenance intensive. Further, elevated trihalomethane (THM) levels were recorded in various areas of town. The following reasons should provide improved health and business-case economic benefits:

1. Since AOB (Ammonia Oxidizing Bacteria) proliferate in the biofilm within the tubercules, they reduce the chloramine residual within the system. According to the American Water Works Association Manual of Water Supply Practices M56, "tubercules on the iron pipe may provide a protective environment for the bacteria. AOB were found in numbers as high as 100,000/cm² in distribution system biofilms, suggesting that biofilms may act as reservoir of AOB in the distribution system." As the City would like to replace the old cast iron pipes with new PVC piping, we plan to reduce the chloramine dose at the water treatment plant to further reduce THM levels. Lowering chloramination dosing 0.50 mg/L should therefore reduce THM formation while saving the City $19,413 per year for chlorine and $14,560 for Liquid Ammonium Sulfate (L.A.S.).

2. Energy requirements due to high head lost due to the tuberculation should also be lower after the new piping is installed. An estimated C-factor of 80 was used for the old piping and a value of 140 used for the proposed piping. However, since 5 of the old lines were 2" and 3 of the old lines were originally 4". The expected increase in efficiency due to the improved C-value and increase in line diameter should yield an annual City savings of approximately $2,360.

3. The City currently expects 25 repairs will be necessary on any one of the old lines per year. Proceeding with the average assumption of equipment, labor, and repair materials for any of these repairs, the City could expect an average annual savings of $54,000 for labor, and $56,375 for materials, and $220 for water loss, for a total per year total savings of $110,595.

4. The expected water loss from the project pipelines is estimated at a total of 9,556,788 gallons per year. The water loss would cause a yearly net revenue loss of $38,227 per year at a production cost of water of $0.004 per gallon. The loss of revenue does not consider savings due to the loan incurred because of this project.

Summary:

The combined efficiency improvements, reduction in chemical disinfection requirements, and reduced operation and maintenance costs due to the proposed project should yield the City an annual savings of $182,795. Therefore the expected return on investment would be 14.21 years at an expected annual inflation of 4% per year. Assuming a 20-year payback for a loan at 3.3% interest, the total payback would be $4,712,197.60. Along those same lines, the $182,795 for 20-years at 4% per year would amount to $5,443,300.00. Therefore a total of $731,102.40 could be saved and 191,135,760-gallons of water conserved over the 20-years.
Phase III, Section 2 – water line replacement

### Section 3.2 - Water Line Replacement; Proposed Pipe to Be Replaced:

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Length</th>
<th>Existing Pipe</th>
<th>Proposed Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cedar from SE 6th to SE 8th</td>
<td>1130 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>2</td>
<td>21st NW from South to Cherry</td>
<td>655 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>3</td>
<td>Svyer from 15th SW to 15th SW</td>
<td>725 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>4</td>
<td>Genett 7th NW to 8th NW</td>
<td>530 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>5</td>
<td>Grand Ave, from 7th SW to 8th SW</td>
<td>880 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>6</td>
<td>6th NE from 10th to Grove</td>
<td>910 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>7</td>
<td>7th NW from 2nd SW to 15th SW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>8</td>
<td>6th NE from 2nd SW to 8th NE</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>9</td>
<td>6th NE from 2nd SW to 15th SW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>10</td>
<td>Genett 7th NW to 8th NW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>11</td>
<td>6th NE from 2nd SW to 15th SW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>12</td>
<td>Genett 7th NW to 8th NW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>13</td>
<td>6th NE from 2nd SW to 15th SW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>14</td>
<td>Genett 7th NW to 8th NW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
<tr>
<td>15</td>
<td>6th NE from 2nd SW to 15th SW</td>
<td>4300 ft</td>
<td>Cast Iron</td>
<td>PVC</td>
</tr>
</tbody>
</table>

### Energy Savings Cost Reduction:
- 64.94 Headloss Total at C=63
- 0.79 Headloss Total at C=140

### Chemical Injection Cost Reduction:
- O2: 500 $/100 ft
- Flow: 852 $/gpm total
- O2 Dose: 106.8 mg/L x 95, 000 gpm
- O2 Dose: 53.2 mg/L to get 1/2 mg/L
- Cost: 53.9 $/day
- Cl₂ Cost savings: 19,413.20 $/year

### Water Lost due to a leak:
- Expected flow lost during a leak: 1500 gallons
- Base cost water to customers: 8.38 $ per 1000 gallons
- Lost revenue per leak: 8.38 $/leak
- Lost revenue per year: 230.35 $/year

### Lost Annual Revenue Summary:
- Labor costs due to leaks: $54,000.00
- Material costs due to leaks: $56,376.00
- Water loss during leaks: $220.25
- Chlorine Savings: $19,413.70
- Liquid Ammonium Sulfate savings costs: $14,559.95
- Water loss of replaced pipelines: $38,227.15
- Total estimate per year: $182,785.55 $/year
- Estimated Inflation rate per year: 3.42%
- Return on Investment: 14.21 years
- Project Cost: $3,410,000
- Estimated Annual payback on loan (3%): $230,609.88 $/year/20-years
- Total Annual payout after 20-years: $4,712,196.60
- Total Saved after 20-years: $5,443,260.00

Since the amount saved after 20-years of paying back is greater than the amount actually paid back, the project reduces the City's costs.

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*THOMAS LEE PRUITT*

3-2-12

TBPE FIRM #000315
### Part III, Section 2 – detailed cost estimate

<table>
<thead>
<tr>
<th>Construction</th>
<th>2012 Project Cost</th>
<th>Services</th>
<th>Length [ft]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cedar from SE 5th to 8th</td>
<td>$86,131.66</td>
<td>12</td>
<td>1130</td>
</tr>
<tr>
<td>2 11th NW from Shiloh to Cherry</td>
<td>$78,737.87</td>
<td>20</td>
<td>656</td>
</tr>
<tr>
<td>3 Sperry from 13th SW to 15th SW</td>
<td>$81,106.88</td>
<td>18</td>
<td>735</td>
</tr>
<tr>
<td>4 Garrett 7th NW to 9th NW</td>
<td>$49,007.73</td>
<td>5</td>
<td>530</td>
</tr>
<tr>
<td>5 Grand Ave. from 7th SW to 4th SW</td>
<td>$86,054.18</td>
<td>16</td>
<td>860</td>
</tr>
<tr>
<td>6 8th NE from Tudor to Grove</td>
<td>$76,185.44</td>
<td>9</td>
<td>900</td>
</tr>
<tr>
<td>7 8th NE from Grove to MLK</td>
<td>$80,664.78</td>
<td>11</td>
<td>910</td>
</tr>
<tr>
<td>8 7th NW from Center to Cherry</td>
<td>$333,702.06</td>
<td>31</td>
<td>4300</td>
</tr>
<tr>
<td>9 E. Cherry from 5th NE to 6th NE</td>
<td>$42,869.16</td>
<td>7</td>
<td>450</td>
</tr>
<tr>
<td>10 3rd NE from Henderson to Lamar</td>
<td>$543,347.65</td>
<td>30</td>
<td>4180</td>
</tr>
<tr>
<td>11 3rd SE from Lamar to SE Kaufman</td>
<td>$319,751.52</td>
<td>1</td>
<td>4210</td>
</tr>
<tr>
<td>12 South Church from Washington to Hearn</td>
<td>$128,990.82</td>
<td>24</td>
<td>1400</td>
</tr>
<tr>
<td>13 Neatherly from SE 13th to SE 15th</td>
<td>$176,784.33</td>
<td>1</td>
<td>2700</td>
</tr>
<tr>
<td>14 Walker Park 14&quot; Tie in</td>
<td>$146,546.91</td>
<td>8</td>
<td>1060</td>
</tr>
<tr>
<td>15 Deshong, Lewis, &amp; Stone Avenue</td>
<td>$269,666.24</td>
<td>16</td>
<td>3800</td>
</tr>
</tbody>
</table>

**Subtotal Construction Cost** $2,499,527.21
# Texas Water Development Board
## SFY 2012 DWSRF IUP Solicitation Packet
### Source Water Assessment and Protection Program Worksheet

**Name of Entity:** City of Paris  
**PWS ID No.:** 1390002

<table>
<thead>
<tr>
<th>Section 10. ESTIMATED COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost Category</strong></td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>A. Treatment</td>
</tr>
<tr>
<td>B. Transmission and Distribution</td>
</tr>
<tr>
<td>C. Source</td>
</tr>
<tr>
<td>D. Storage</td>
</tr>
<tr>
<td>E. Purchase of System</td>
</tr>
<tr>
<td>F. Restructuring</td>
</tr>
<tr>
<td>G. Land Acquisition</td>
</tr>
<tr>
<td>H. Source Water Protection</td>
</tr>
<tr>
<td>I. Engineering</td>
</tr>
<tr>
<td>J. General, Legal, Financial</td>
</tr>
<tr>
<td>K. Contingency</td>
</tr>
<tr>
<td>L. Other (Describe cost.)</td>
</tr>
<tr>
<td>M. Subtotal (Add Lines A-L)</td>
</tr>
<tr>
<td>N. Financing from Local Funds</td>
</tr>
<tr>
<td>O. Financing from Other Sources</td>
</tr>
<tr>
<td>P. Subtotal, SRF-Funded Amount (Subtract Lines N and O from Line M)</td>
</tr>
<tr>
<td>Q. TWDB Loan Origination Fee (Calculate 2.25% of Line P)</td>
</tr>
<tr>
<td>R. Grand Total (Add Lines P and Q)</td>
</tr>
<tr>
<td>S. Financial Assistance Amount (Round up Line R to the nearest $5,000)</td>
</tr>
</tbody>
</table>

**Section 11. AUTHORIZATION AND SIGNATURE**

**Printed Name and Title of Entity's Authorized Representative:** Shawn Napier, P.E.  
**Telephone Number:** 903-784-9292

**Signature of Entity's Authorized Representative:**  
**Date (mm/dd/yyyy):** 02/28/11

If the requested financial assistance amount (Section 10, Line S) is less than or equal to $100,000, include:  
- Statement establishing the basis for the project cost.  
- Signature of system operator.

If the requested financial assistance amount (Section 10, Line S) is greater than $100,000, include:  
- Seal of registered professional engineer.  
- Signature of registered Professional Engineer.
TEXAS WATER DEVELOPMENT BOARD
P.O. BOX 13231, CAPITOL STATION
AUSTIN, TX 78711-3231
WATER AUDIT REPORTING FORM 2010

If further assistance is needed, contact Mark Mathis at Mark.Mathis@twdb.state.tx.us or 512.463.0987.

A. Water Utility General Information

1. Water Utility Name: CITY OF PARIS

2. Contact:
   2a. Name DOUG HARRIS
   2b. Telephone # (903)-784-2464
   2c. Email Address dharris@paristexas.gov

3. Reporting Period: From 1/1/2010 To 12/31/2010

4. Source Water Utilization, percentage: Surface Water 100.00 % Ground Water 0.00 %

5. Population Served:
   5a. Retail Population Served 25,371
   5b. Wholesale Population Served 25,008

6. Utility’s Length of Main Lines, miles 257.00

Assessment Scale

7. Number of Wholesale Connections Served 5

8. Number of Retail Service Connections Served 10,649

9. Service Connection Density
   (Number of retail service connections/Miles of main lines) 41.44

10. Average Yearly System Operating Pressure (psi) 45.00

11. Volume Units of Measure: G

B. System Input Volume

12. Water Volume from own Sources 4,978,637,000.00

13. Production Meter Accuracy (enter percentage) 100.00 %

14. Corrected Input Volume 4,978,637,000.00

15. Wholesale Water Imported 0.00

4/29/2011 3:09:09 PM
16. Wholesale Water Exported 1,118,328,047.00 5

17. System Input Volume 3,880,308,953.00
   (Corrected input volume, plus imported water, minus exported water)

C. Authorized Consumption

18. Billed Metered 3,459,411,250.00 4
19. Billed Unmetered 0.00 0
20. Unbilled Metered 7,759,933.00 4
21. Unbilled Unmetered 2,317,314.00 1
22. Total Authorized Consumption 3,469,488,497.00

D. Water Losses

23. Water Losses 390,820,456.00
   (Line 17 minus Line 22)

E. Apparent Losses

24. Average Customer Meter Accuracy (Enter percentage) 99.00 % 2
25. Customer Meter Accuracy Loss 34,943,547.98
26. Systematic Data Handling Discrepancy 0.00 2
27. Unauthorized Consumption 9,650,772.38 2
28. Total Apparent Losses 44,594,320.36

F. Real Losses

29. Reported Breaks and Leaks 644,900.00 3
   (Estimated volume of leaks & breaks repaired during the audit period)
30. Unreported Loss 345,581,235.64 1
   (Includes all unknown water loss)
31. Total Real Losses 346,226,135.64
   (Line 29, plus Line 30)
32. Water Losses (Apparent + Real) 390,820,456.00
   (Line 28 plus Line 31) = Line 23
33. Non-revenue Water 400,897,703.00
   (Water Losses + Unbilled Authorized Consumption)
G. Technical Performance Indicator for Apparent Loss

34. Apparent Losses Normalized
   (Apparent Loss Volume/# of Retail Service Connections/365)  11.47

H. Technical Performance Indicators for Real Loss

35. Real Loss Volume (Line 31)  346,226,135.64

36. Unavoidable Annual Real Losses, volume (calculated)  49,031,088.75

37. Infrastructure Leakage Index (calculated)
   (Equals real loss volume divided by unavoidable annual real losses)  7.06140

38. Real Losses Normalized
   (Real Loss Volume/# of Service Connections/365)
   (This indicator applies if service connection density is greater than 32/mile)  89.08

39. Real Losses Normalized
   (Real Loss Volume/Miles of Main Lines/365)
   (This indicator applies if service connection density is less than 32/mile)  3,690.91

I. Financial Performance Indicators

40. Total Apparent Losses (Line 28)  44,594,320.36

41. Retail Price of Water  $0.00400  2

42. Cost of Apparent Losses
   (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)  $178,377.28

43. Total Real Losses (Line 31)  346,226,135.64

44. Variable Production Cost of Water*
   (*Note: In case of water shortage, real losses might be valued at the retail price of water instead of
   the variable production cost.)  $0.00160  5

45. Cost of Real Losses
   (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)  $553,961.82

46. Total Assessment Scale  47

47. Total Cost Impact of Apparent and Real Losses  $732,339.10