

Texas Water Development Board



City of Gordon

DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2017 INTENDED USE PLAN

PROJECT NUMBER 62724

COMMITMENT DATE: July 20, 2017

DATE OF LOAN CLOSING: October 26, 2017

GREEN ESTIMATE AT CLOSING: \$1,166,157.00

Additional Subsidy: \$728,072

Green Project Reserve

Green Project Information Worksheets

Drinking Water State Revolving Fund

Intended Use Plan

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.

NOTE: These worksheets should only be completed after the Intended Use Plan has been developed and the entity has been notified by the Texas Water Development Board that funding is available for the project.

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**TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS**

OVERVIEW

Background

The Federal Appropriation Law for the current fiscal year Clean Water and Drinking Water State Revolving Fund programs contains certain requirements. The Green Project Reserve (GPR) is included as part of these requirements. The GPR requires that funds be made available from the capitalization grant by the State for projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities. Guidance for determining GPR project eligibility and is available from the Texas Water Development Board as guidance form TWDB-0161.

TWDB GPR Procedures

The selection process for GPR projects involves an initial step in which potential GPR projects are listed in ranked order in the Intended Use Plan (IUP). Project GPR status in the IUP is based on preliminary “Green” information provided by the potential applicant on the Project Information Form (PIF) during the IUP solicitation phase. This is followed by a verification process in which the potential applicant is required to provide adequate documentation to verify the project or project components as either categorically or business case eligible for the GPR. The applicant will be required to provide complete information for approval prior to presentation to the Board for a funding commitment. In accordance with EPA instructions, all approved business cases will be made available to the public and posted on the TWDB website after a funding commitment is made.

To accomplish the above, TWDB staff is providing the attached GPR guidance and Green Project Information Worksheets to communities being considered for funding through the GPR. Information provided on these worksheets will be used by TWDB staff to verify GPR eligibility. TWDB staff may issue comments or request additional information depending on the type of “green” improvements proposed and the adequacy of information provided by the potential applicant on these worksheets. These worksheets will not be considered complete until all TWDB staff comments are addressed and any requested information is provided.

Program requirements for business case eligible GPR projects will be considered met only after the business case submittal is approved. The business case submittal will consist of the completed Green Project Information Worksheets with the applicant’s business case and supporting documents attached. Program requirements for categorically eligible GPR projects will be considered met upon submittal of the completed Green Project Information Worksheets.

**TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS**

Information on Completing Worksheets

Complete the following worksheets for projects being considered for the Green Project Reserve (GPR). Part II should be completed for projects or project components considered categorically eligible. Part III should be completed for projects or project components considered business case eligible. When submitting worksheets, please limit submittals to only those portions completed.

The intent of these worksheets is not to require exhaustive responses or redundant information. Information provided on these forms may be concise but must be of sufficient detail such that the GPR eligibility is clearly demonstrated. Information requested on these forms already provided to the TWDB during the Intended Use Plan (IUP) project solicitation period in the form of a detailed business case may be included by reference.

Many of the worksheets following require a detailed description of the proposed improvements. This description should accomplish various goals. The overall rationale and justification of the project or proposed improvements being considered for the GPR should be clearly demonstrated and the proposed improvements should be sufficiently described such that it is clear that the proposed GPR improvements will achieve the anticipated benefits and savings. Furthermore, certain types of GPR projects may require a more detailed analysis than others to adequately justify GPR eligibility. Although the space provided for responses is limited, additional pages should be attached as necessary.

For questions or additional information on completing worksheets, please contact:

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**TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS**

Additional Guidance for Common GPR Projects

The purpose of this Texas Water Development Board GPR guidance is to provide additional information and clarification for certain types of GPR projects described in EPA's GPR guidance document (TWDB-0161), see link below. Information provided herein should be considered supplemental and is intended to support TWDB-0161 guidance by emphasizing and further describing specific requirements for certain types of GPR projects. For project types not specifically described herein, EPA GPR guidance (TWDB-0161) should be used to evaluate GPR eligibility.

<http://www.twdb.texas.gov/financial/instructions/doc/TWDB-0161.pdf>

Green Infrastructure

Green infrastructure includes a wide array of practices at multiple scales that manage wet weather and that maintains and restores natural hydrology by infiltrating, evapotranspiring and harvesting and using stormwater. On a regional scale, green infrastructure is the preservation and restoration of natural landscape features, such as forests, floodplains and wetlands, coupled with the policies such as infill and redevelopment that reduce overall imperviousness in a watershed. On the local scale, green infrastructure consists of site- and neighborhood-specific practices, such as bioretention, trees, green roofs, permeable pavements and cisterns.

Green infrastructure guidance can be found in Part B, Section 1 of the EPA GPR guidance (TWDB-0161).

Water Efficiency

EPA's WaterSense program defines water efficiency as the use of improved technologies and practices to deliver equal or better services with less water. Water efficiency encompasses conservation and reuse efforts, as well as water loss reduction and prevention, to protect water resources. Efficient water use often has the added benefit of reducing the amount of energy required by a drinking water system. A few common types of water efficiency improvements eligible for the Drinking Water SRF GPR are further described below.

Water Line Improvements

Water line replacement projects may be eligible for the GPR, typically under the water efficiency category. Water line replacement projects addressing water loss require a business case to justify GPR eligibility. While the primary purpose of these projects is to enhance water efficiency, these projects will typically also result in a reduction in energy consumption. This energy efficiency aspect should be included in the business case; however, if the primary purpose of the water line improvement project is to reduce energy consumption, then an energy efficiency business case should be made. Part B, Section 2.4 of the EPA GPR guidance (TWDB-0161) provides decision criteria for water efficiency business cases. In accordance with these criteria, TWDB will consider water line replacement projects for the GPR provided the business case for the water line replacement project accomplishes the following:

- 1) Demonstrates that the water system is experiencing significant real water loss as evidenced by water audits, master meter records, billing records, etc. Water loss should be determined using International Water Association (IWA) methodology and should identify and quantify water uses

and losses such as authorized consumption, apparent losses and real losses. Adequate historical data should be provided to demonstrate that a persistent water loss problem exists. Additional information on water loss and IWA methodology can be found at: <http://www.twdb.texas.gov/conservation/municipal/index.asp>

- 2) Demonstrates that a comprehensive and systematic approach was used to evaluate the system and identify the line segments contributing the greatest amount of water loss in the system. Only line segments or areas with a significant amount of documented leaks or breaks should be considered. Examples of supporting documentation include engineering studies, leak detection tests and line break/repair records. Documentation should demonstrate efforts beyond routine system maintenance.
- 3) Provides quantifiable information on existing water loss and proposed water loss reduction. The business case should demonstrate that the proposed improvements will specifically address water loss and that a substantial reduction in water loss is expected. The business case should also quantify any energy and financial benefits.
- 4) Demonstrates that the project is compliant with Safe Drinking Water Act requirements in regards to new or expansion activities. Projects are not eligible to receive DWSRF funds if the primary purpose of the project is to supply or attract growth (31 TAC §371.2(b)). In some cases a reasonable upsizing of the pipe will be allowed

Water Meters

Installation of any type of new water meter in a previously unmetred area is considered categorically eligible for the GPR, provided that the rate structure is based on metered use. For replacement or retrofitting of existing meters and automatic meter reading systems (AMR), Sections 2.2-3 and 2.2-4 of the EPA GPR guidance (TWDB-0161) is applicable. Meter replacements should be for reasons beyond routine system maintenance. TWDB may consider these types of projects for categorical eligibility for the GPR provided the following is met:

For replacement of existing broken/malfunctioning water meters:

- 1) Demonstrates that the water system is experiencing significant apparent water loss as evidenced by water audits, master meter records, billing records, etc. Water loss should be determined using International Water Association (IWA) methodology and should identify and quantify water uses and losses such as authorized consumption, apparent losses and real losses. Adequate historical data should be provided to demonstrate that a persistent water loss problem exists. Additional information on water loss and IWA methodology can be found at: <http://www.twdb.texas.gov/conservation/municipal/index.asp>
- 2) Provide supporting information, such as meter test results, evidencing that the meters to be replaced are broken/malfunctioning. For area-wide replacement of meters, an adequate sample set must be provided. Meters to be replaced must not simply be at the end of their useful life or operating outside of the range of acceptable accuracy.
- 3) Meters should be replaced with AMR systems such as advanced metering infrastructure (AMI), smart meters, or meters with built in leak detection.
- 4) Meter cost would be eligible

For retrofitting existing meters with AMR (not replacing the meter itself):

- 1) Demonstrates that the water system is experiencing significant apparent water loss as evidenced by water audits, master meter records, billing records, etc. Water loss should be determined using International Water Association (IWA) methodology and should identify and quantify water uses and losses such as authorized consumption, apparent losses and real losses. Adequate historical data should be provided to demonstrate that a persistent water loss

problem exists. Additional information on water loss and IWA methodology can be found at: <http://www.twdb.texas.gov/conservation/municipal/index.asp>

- 2) AMR system must provide features and benefits that result in water loss reduction or promote water conservation, such as AMI, smart meters or meters with built in leak detection.

Leak Detection

Distribution system leak detection equipment, portable or permanent, is considered categorically eligible for the GPR. For leak detection equipment or systems, Sections 2.2-10 of the EPA GPR guidance (TWDB-0161) is applicable.

Energy Efficiency

Energy efficiency is the use of improved technologies and practices to reduce the energy consumption of water projects, use energy in a more efficient way, and/or produce/utilize renewable energy. Part B, Section 3.0 of the EPA GPR guidance (TWDB-0161) addresses energy efficiency GPR requirements for the Drinking Water SRF program. Energy efficiency benefits and savings must be clearly identifiable and a substantial part of the rationale or justification for the project and not simply incidental. A few common types of energy efficiency projects eligible for the GPR are further describe below.

Renewable Energy

Renewable energy projects, such as wind, solar, geothermal and micro-hydroelectric, which are part of a larger public health project, are considered categorically eligible for the GPR. These projects are described in EPA GPR guidance (TWDB-0161) Part B, Section 3.2-1.

Pumping Facility Improvements

Pumping facility improvement projects may be eligible for the GPR under the energy efficiency category. The use of National Electric Manufacturers Association (NEMA) Premium energy efficiency motors is considered categorically eligible for the GPR. All other types of pumping facility improvements require a business case to justify GPR eligibility. Refer to Part B, Sections 3.4 and 3.5 of the EPA GPR guidance (TWDB-0161) for business case decision criteria.

For common pumping facility energy efficiency upgrades or retrofits, such as pump/motor replacement, variable frequency drives (VFDs) or instrumentation and control systems (SCADA), the business case must demonstrate that energy efficiency benefits and savings are a substantial part of the rationale for the project. The business case should consider the overall efficiency of a pumping system (including the pumps, motors, drives, etc.) and should demonstrate substantial benefits/savings compared to the average level of efficiency currently available for the project or component. For instance, the addition of VFDs or SCADA does not guarantee substantial energy savings in every application and, therefore, must be justified with a business case. Similarly, simply replacing pumps or other equipment because it's at the end of its useful life with average efficiency equipment is not eligible for the GPR. In the latter case, high efficiency equipment must be used and a business case must adequately justify the project in order for GPR eligibility to be considered.

Other Energy Efficiency Improvements

Other energy efficiency improvements, such as pump refurbishment, projects that cost effectively eliminate pumps or a pumping station, or upgrading lighting to energy efficient sources, may also be eligible for the GPR through a business case.

Projects that propose various system wide improvements resulting in overall operational efficiency may also be considered for GPR eligibility. In this case, the applicant must decide whether to present a business case for only the specific project components that may be individually eligible for the GPR or whether a broader, overall system approach is taken. In either case, it is the applicant's responsibility to develop a business case that satisfies business case decision criteria in the EPA GPR guidance (TWDB-0161) as well as the following fundamental requirement that energy efficiency benefits and savings must be clearly identifiable and a substantial part of the rationale or justification for the project.

Environmentally Innovative

Environmentally innovative projects include those that demonstrate new and/or innovative approaches to delivering services or managing water resources in a more sustainable way. These types of projects are described in EPA GPR guidance (TWDB-0161) Part B, Section 4.0.

Construction of US Green Building Council LEED certified buildings is considered categorically eligible for the GPR. All building costs are eligible and any level of certification is acceptable

**TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS**

PART I – GREEN PROJECT INFORMATION SUMMARY

General Project Information

Applicant: _____ Project #: _____

Project Name: _____

Contact Name: _____

Contact Phone and e-mail: _____

Brief Overall Project Description:

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Check all that apply and complete applicable worksheets:

Categorically Eligible

- Green Infrastructure \$ _____
- Water Efficiency \$ _____
- Energy Efficiency \$ _____
- Environmentally Innovative \$ _____

Business Case Eligible

- Green Infrastructure \$ _____
- Water Efficiency \$ _____
- Energy Efficiency \$ _____
- Environmentally Innovative \$ _____

Total Requested Green Amount \$ _____

Total Requested Funding Amount \$ _____

Type of Funding Requested:

- PAD (Planning, Acquisition, Design)
- C (Construction)

Completed by:

Name: _____

Title: _____

Signature: _____

Date: _____

**TEXAS WATER DEVELOPMENT BOARD
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PART II - CATEGORICALLY ELIGIBLE

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

Green Infrastructure	Part B, Section 1.2
Water Efficiency	Part B, Section 2.2
Energy Efficiency	Part B, Section 3.2
Environmentally Innovative	Part B, Section 4.2

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 categorically eligible projects. Refer to **Information on Completing Worksheets** for additional information.

Section 1 – General Project Information

Applicant: _____ PIF #: _____

Project Name: _____

Contact Name: _____

Contact Phone and e-mail: _____

Brief Overall Project Description:

Section 2 – Green Infrastructure

Proposed green infrastructure improvements such as pervious or porous pavement, bioretention, green roofs, rainwater harvesting, gray water use, xeriscape, landscape conversion programs and moisture and rain sensing irrigation equipment are considered categorically eligible for the GPR according to EPA GPR guidance (TWDB-0161) Part B, Section 1.2. List categorically eligible green infrastructure contained within the project in the table below. Also provide a detailed description of the proposed improvements. The detailed description should provide sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Green Infrastructure Description	Project / Component Cost
Total:	

Detailed Description (attach additional pages if necessary):

Section 3 – Water Efficiency

Certain water efficiency improvements may be considered categorically eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of categorically eligible GPR Projects. A few common types of water efficiency projects that may be considered categorically eligible, such as certain water meter improvements and leak detection are listed below. Complete these sections of the worksheet as applicable. For any other water efficiency improvement being considered for categorical eligibility, complete Section 3.3.

Section 3.1 - Water Meters

Check all that apply:

- Installation of new water meters in area currently receiving unmetered water service (the following must be provided)
 - Attach copy of rate structure for area to be metered

- Replacement of existing broken/malfunctioning meters (the following must be provided)
 - Accuracy of meters being replaced _____
 - Attach supporting documentation (meter accuracy tests, etc.)
 - Provide description below of proposed meters to be installed

- Retrofitting of existing meters (the following must be provided)
 - Provide description below of reason for meter retrofit
 - Provide description below of proposed meter system and benefits, including description of features that will result in water loss reduction or promote water conservation

Describe proposed water meter improvements, include reason for project, description of proposed meters and features, resulting benefits, anticipated savings, etc. (attach additional pages if necessary):

Section 3.2 - Leak Detection

Provide detailed description of leak detection equipment:

Section 3.3- Other Water Efficiency Improvements

Complete this section for water efficiency improvements other than those listed above. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed water efficiency improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:

Detailed description of proposed water efficiency improvements (attach additional pages if necessary):

Section 4.2 – NEMA Premium Efficiency Motors

If NEMA Premium efficiency motors are to be used, provide total motor cost: \$ _____
(attach a list of proposed motors to be installed including horsepower and efficiency rating)

Section 4.3 –Other Energy Efficiency Improvements

Complete this section for energy efficiency improvements other than those listed above. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed energy efficiency improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:

Detailed Description (attach additional pages if necessary):

Section 5 – Environmentally Innovative

Certain environmentally innovative improvements may be considered categorically eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of categorically eligible GPR Projects.

Provide reference to applicable EPA GPR guidance (TWDB-0161) sections that demonstrates GPR eligibility and provide a detailed description of the proposed environmentally innovative project or project components.

Guidance Reference:

Detailed Description (attach additional pages if necessary):

**TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS**

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: _____ PIF #: _____

Project Name: _____

Contact Name: _____

Contact Phone and e-mail: _____

Brief Overall Project Description:

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:

Detailed Description (attach additional pages if necessary):

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):

Section 3.3- Other Water Efficiency Improvements

Complete this section for water efficiency improvements other than those listed above. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed water efficiency improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:

Detailed description of proposed water efficiency improvements (attach additional pages if necessary):

Section 4 – Energy Efficiency

Certain energy 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 energy efficiency business case eligible projects Section 4.1 must be completed. A common energy efficiency project that may be considered business case eligible is pumping facility improvements. For this type of project complete Section 4.2 of the worksheet. For any other energy efficiency improvement being considered for business case eligibility, complete Section 4.3.

Section 4.1 – System Information

Energy efficiency improvements to be considered for business case eligibility should provide reference to completed planning material such as energy assessments, energy audits, optimization studies and design level project information.

Reference Completed Planning/Design Material:

<input type="checkbox"/>	_____

Section 4.2 – Pumping Facility Improvements

Complete for pump and motor upgrades:

Pump Description	Existing Pump			Proposed Pump		
	Pump HP	Efficiency		Pump HP	Efficiency	
		Pump/Motor	Wire to Water		Pump/Motor	Wire to Water
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	

Total estimated energy savings from pump and motor upgrades: \$ _____

Total estimated annual financial savings from pump and motor upgrades: \$ _____

If NEMA Premium efficiency motors are to be used, provide total motor cost: \$ _____

Total pump and motor upgrade cost: \$ _____

List any other energy efficiency improvements to pumping facility (VFDs, lighting, SCADA, etc.):

Component Description	Annual Energy Savings (if known)	Annual Financial Savings (if known)	Component Cost
Total:			

Provide a detailed description on the following page(s) of the proposed energy efficiency improvements. Information should be specific to the equipment being proposed and calculations should be provided demonstrating substantial energy and financial savings.

Detailed Description (attach additional pages if necessary):

Section 4.3 – Other Energy Efficiency Improvements

Complete this section for energy efficiency improvements other than those listed above. Provide reference to applicable sections of EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility.

Provide a detailed description of the proposed energy efficiency improvements indicating the reason for the project, problems being addressed, resulting benefits, anticipated savings, etc. The description should also include information that is specific to the equipment being proposed and calculations demonstrating substantial energy and financial savings. Energy and financial savings should be quantified to the extent possible. If the project consists of multiple green components, individual component costs should be provided. Supporting information, calculations and/or documentation should be attached as necessary.

Guidance Reference:

Detailed Description of proposed improvements:

Section 5 – Environmentally Innovative

Certain environmentally innovative 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 applicable EPA GPR guidance (TWDB-0161) sections that demonstrates GPR eligibility and provide a detailed description of the proposed environmentally innovative project or project components.

Guidance Reference:

Detailed Description (attach additional pages if necessary):

TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2011 Water Audit Report

D. Water Losses

23. Water Losses 16,882,737 gallons
(Line 17 minus Line 22)

E. Apparent Losses

24. Average Customer Meter Accuracy (Enter percentage) 91.00 % 0
25. Customer Meter Accuracy Loss 2,887,220 gallons
26. Systematic Data Handling Discrepancy 0 gallons 0
27. Unauthorized Consumption 117,913 gallons 0
28. Total Apparent Losses 3,005,133 gallons

F. Real Losses

29. Reported Breaks and Leaks 1,000,000 gallons 0
(Estimated volume of leaks & breaks repaired during the audit period)
30. Unreported Loss 12,877,604 gallons 0
(Includes all unknown water loss)
31. Total Real Losses 13,877,604 gallons
(Line 29, plus Line 30)
32. Water Losses (Apparent + Real) 16,882,737 gallons
(Line 28 plus Line 31) = Line 23
33. Non-revenue Water 17,972,303 gallons
(Water Losses + Unbilled Authorized Consumption)
(Line 32, plus Line 20, plus Line 21)

G. Technical Performance Indicator for Apparent Loss

34. Apparent Losses Normalized 26 gallons
(Apparent Loss Volume / # of Retail Service
Connections/365)

H. Technical Performance Indicators for Real Loss

35. Real Loss Volume (Line 31) 13,877,604 gallons
36. Unavoidable Annual Real Losses, volume (calculated) 3,536,850 gallons
37. Infrastructure Leakage Index (calculated) 3.92370
(Equals real loss volume divided by unavoidable annual real losses)
38. Real Losses Normalized 119 gallons
(Real Loss Volume / # of Service Connections /
365)
(This indicator applies if service connection density
is greater than 32 / mile)

TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2011 Water Audit Report

39. Real Losses Normalized 1,408 gallons
 (Real Loss Volume/Miles of Main Lines/365)
 (This indicator applies if service connection density is less than 32/mile)

I. Financial Performance Indicators

		Assessment Scale
40. Total Apparent Losses (Line 28)	<u>3,005,133</u>	gallons
41. Retail Price of Water	<u>\$0.00199</u>	<u>0</u>
42. Cost of Apparent Losses (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)	<u>\$5,980.21</u>	
43. Total Real Losses (Line 31)	<u>13,877,603.70</u>	
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.)	<u>\$0.00075</u>	<u>0</u>
45. Cost of Real Losses (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)	<u>\$10,408.20</u>	
46. Total Assessment Scale		<u>0</u>
47. Total Cost Impact of Apparent and Real Losses	<u>\$16,388.41</u>	