



City of Marlin

DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2011 INTENDED USE PLAN

PROJECT NUMBER 62520

COMMITMENT DATE: June 21, 2012

DATE OF LOAN CLOSING: November 9, 2012

TEXAS WATER DEVELOPMENT BOARD

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.

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 \$ _____
- Water Efficiency \$ 995,000 (Meters)
- Energy Efficiency \$ _____
- Environmentally Innovative \$ _____

Business Case Eligible

- Green Infrastructure \$ _____
- Water Efficiency \$ 1,300,000 (Water Line Replacement)
- 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: Brent Bassett, P.E.

Title: Project Engineer

Signature: *Brent Bassett*

Date: 4/18/2012

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

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: City of Marlin PIF #: 9403

Project Name: City of Marlin Meter Replacement

Contact Name: Brent Bassett, P.E.

Contact Phone and e-mail: 512-342-6868 bbassett@ksaeng.com

Total Project Cost: \$995,000 Green Amount: \$995,000
(Categorically Eligible)

Brief Overall Project Description:

An engineering study will evaluate the water meters and provide recommendations for replacing the meters with a reliable and efficient Automated Meter Reading System. The implemented meter system will permit the meters to be read by a truck and will allow for the meter reading time to be utilized for other public works projects.

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):

The proposed meter system to be installed is a Drive-by Automated Meter Reading System (AMR). The meters used will be equipped with a radio that sends a frequency of information to instrumentation that captures this signal. A vehicle will be equipped with meter reading instrumentation that will be compatible with the specific meters used. When the meters are passed by this vehicle, they will send off a signal composed of the water usage information for each meter connection. The proposed meters will also be able to detect and notify the meter reader if there is a leak, if the meter has been tampered with, and if there is backflow in the meter which indicates water theft.

The City of Marlin has recently replaced some of their meters with AMR ready meters. These meters are not equipped with AMR radios but are capable of being retrofitted with AMR radios in order to be able to send information and be used in the AMR System.

Green amount associated with water meters: \$ _____
(Attach detailed cost estimate 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: City of Marlin PIF #: 9403

Project Name: City of Marlin Water Line Replacement

Contact Name: Brent Bassett, P.E.

Contact Phone and e-mail: 512-342-6868 bbassett@ksaeng.com

Total Project Cost: \$1,300,000 Green Amount: \$1,300,000
(Business Case Eligible)

Brief Overall Project Description:

The City water lines (55 miles) will be surveyed as a part of the engineering study that will evaluate the location that have the highest water loss. The water leaks discovered during the leakage survey will be replaced. Additionally, the loan will include replacement of the most problematic water lines. A majority of the construction funds will go to water line replacement.

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:

- 2010 Water Loss Audit
- 2010 Water Conservation Annual Report
- 2010 Municipal Water Use Survey

Section 3.2 - Water Line Replacement

Proposed pipe to be replaced:

Length (LF)	Existing Pipe			Proposed Pipe	
	Material	Age (yr)	Dia. (in)	Dia. (in)	Material
15,840 (3 miles)	Ductile Iron, Asbestos-Cement	>50	6-12	8	PVC

Percent of distribution lines being replaced: Approximately 6 %

Number of breaks/leaks/repairs recorded in past 24 months for areas being replaced: 300 (entire City) 36 water breaks for area repaired

Estimated water loss from pipe being replaced (provide calculations on following page): 6,906,308 gallons

Estimated annual water savings (provide calculations on following page): 6,906,308 gallons

Estimated annual cost savings (provide calculations on following page): \$74,575

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):

This project includes the replacement of existing pipes with known leaks in order to save water that is being lost in the distribution system (real losses). A leak detection survey will be completed in order to determine the locations of the leaks within the distribution system. This survey will consist of acoustic leak detection, visual inspections, chlorine residual testing, and provide a geographical plot of leak locations. Based upon what is found in the survey, the areas with the most severe leaks will be given a higher priority for water line replacement. In selecting the final lines for replacement, City leakage records and age of water line will also be used to rank water lines for replacement.

Based on the priority list created using the leak detection survey and other selection criteria, water lines will be selected to be replaced for this project. The City of Marlin expects to replace a total of approximately 6% of the water distribution system as a part of this project. The water lines replaced as a part of this project are anticipated to have at least twice the water loss as the system average. Therefore, for replacing 6% of the total water lines, it is anticipated that the project will reduce the real water loss volume by 12% and the total number of water leaks in the City will reduce by 12%.

By replacing water lines that have severe leaks the City of Marlin will save the money that was lost through water loss and energy. Real water losses will be reduced through eliminating pipes that cause water loss through a high frequency of leakage. Energy will be saved through reducing the amount of water that must be produced at the membrane water treatment plant because the plant will no longer have to produce the real losses eliminated by this water replacement project.

Attached is the 2010 Water Audit Survey that was provided to the TWDB by the City of Marlin. It documents an real water loss (line 43) of 57,552,571.67 gallons. With the City's current water rates at \$4,282.41 per million gallons (commercial rate), this equates to an annual revenue loss of \$245,461.26 from losing the retail value of the water. Because this project anticipates to reduce real water losses by 12%, the City is anticipated to save approximately \$29,575 ($0.12 \times \$245,461.26$) in cost savings and 6,906,308 gallons ($0.12 \times 57,552,571.67$) in real losses.

According to City of Marlin Public Works, there have been a total of 300 leaks in the past 24 months (150 per year). This water line replacement project will prioritize the most problematic lines with high leakage. Therefore it is anticipated that by replacing 6% of the water lines in the system, 12% of the total water leaks per year will be eliminated. Therefore, it is anticipated that 18 water leaks will be eliminated over each 12 month period (36 over a 24 month period). With each leak repair costing the City \$2,500 in labor and material costs, the City is anticipated to save \$45,000 per year.

TEXAS WATER DEVELOPMENT BOARD
Municipal Water Use Survey for the Calendar Year Ending December 31, 2010
ANSWER SHEET

System Name: City of Marlin, TX
Mailing Address: P.O. Box 980
City / State / Zip: Marlin, TX 76661
TWDB Code: 537650
Primary County: Falls
River Basin: Brazos

for office use only

County Number _____
Survey Number _____
Batch Number _____

PUMPED GROUNDWATER (SELF-SUPPLIED)

	SOURCE 1	SOURCE 2	SOURCE 3	SOURCE 4	SOURCE 5
1. Aquifer Name					
2. County Where Pumped					
3. Number of Active Wells					
	OR	OR	OR	OR	OR

SURFACE WATER UNDER A TCEQ WATER RIGHT (SELF-SUPPLIED)

4. Reservoir or River	Marlin City Lake				
5. County of Diversion	Falls				
6. TCEQ Water Right #	4355				
7. % of Volume not Returned	100				
	OR	OR	OR	OR	OR

PURCHASED WATER

8. Name of Water Provider					
9. Type of Water					
10. Name of Source					
11. Source County					
	AND	AND	AND	AND	AND

VOLUME OF WATER INTAKE (IN GALLONS)

12. January	43,805,000			
13. February	37,932,000			
14. March	41,053,000			
15. April	35,448,000			
16. May	40,849,000			
17. June	43,741,000			
18. July	41,745,000			
19. August	45,597,000			
20. September	43,249,000			
21. October	42,998,000			
22. November	38,681,000			
23. December	40,823,000			
24. Total Annual Volume	495,902,000			
25. Metered or Estimated	metered			
26. % Treated Before Intake	0			
27. Brackish/Saline (Y or N)	N			

REUSE/TREATED EFFLUENT (SELF-SUPPLIED OR PURCHASED)

	SOURCE 1	SOURCE 2	SOURCE 3
28. Reuse Water Source (self-treated or purchased)			
29. Source County			
30. If Purchased, Sellers Name			
31. Direct or Indirect Reuse			
32. If Indirect Reuse, TCEQ Water Right Number			
33. Total Annual Volume (in gallons)			
34. Percent used for Industrial			
35. Percent used for Landscape			
36. Percent used for Agriculture			
37. Percent used for Other			

WHOLESALE WATER SALES TO OTHER WATER SYSTEMS

	38. Name of Buyer	39. Type of Water	40. Source of Water	41. Source County	42. Total Annual
SALE 1					
SALE 2					
SALE 3					

WATER SALES TO INDUSTRIAL PRODUCTION FACILITIES

	43. Name of Buyer	44. Type of Water	45. Source of Water	46. Source County	47. Total Annual
SALE 1					
SALE 2					
SALE 3					

DIRECT RETAIL CONNECTIONS TO ADDITIONAL CITIES/COUNTIES

	CITY 1	CITY 2	CITY 3	CITY 4	CITY 5
48. City Name					
49. Number of Connections					

	COUNTY 1	COUNTY 2	COUNTY 3	COUNTY 4	COUNTY 5
50. County Name					
51. Number of Connections					

WATER SYSTEM INFORMATION

52. What is the estimated total full-time residential population served directly by this system? 6600

	Total Connections/Units (Metered & Unmetered)	Single-Family Residential (Including Duplexes)	Multi-Family Units (NOT Service Connections)	Commercial / Institutional	Other Metered Connections
53. Total Connections	2323	2080		243	N/A
54. Total Annual Volume	N/A	101,174,300		159,205,200	

55. What is the total number of service connections that are unmetered? 0

56. What is the estimated volume (IN GALLONS) of the known unmetered water usage? 190,000

57. What is the water loss volume (in GALLONS) for the system (intake minus all sales, metered sales, metered uses, and known unmetered sources)? 1,350,000

Please complete or make any revisions to the areas below:

Contact Name: James Glenn
 Contact Title: Interim Public Works Director
 Email Address: jglennmarlin@netzero.com
 Phone: 254-883-3371 Phone Extension n/a

Please provide any additional comments or remarks below. Attach additional sheets if needed.

#57 Water loss volume misc. leaks, two large main breaks that drained town, and draining of WTP clearwell due to chlorine level exceedence.

Attachment G-3 Green Components
TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2010 Water Audit Report

A. Water Utility General Information

1. Water Utility Name: CITY OF MARLIN

2. Contact:

2a. Name JAMES GLENN

2b. Telephone # 254.883.3371

2c. Email Address jglennmarlin@netzero.com

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	6,628	
5b. Wholesale Population Served	0	Assessment Scale

6. Utility's Length of Main Lines, miles	100.00	2
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7. Number of Wholesale Connections Served	0	
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8. Number of Retail Service Connections Served	2,323	
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9. Service Connection Density (Number of retail service connections / Miles of main lines)	23.23	
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10. Average Yearly System Operating Pressure (psi)	42.00	2
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11. Volume Units of Measure:	G	
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B. System Input Volume

12. Produced Water	428,800,000.00	3
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13. Production Meter Accuracy (enter percentage)	95.00 %	3
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14. Corrected Input Volume	451,368,421.05	
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15. Water Imported	0.00	3
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16. Water Exported	0.00	3
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17. System Input Volume	451,368,421.05	
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(Corrected input volume, plus imported water, minus exported water)

C. Authorized Consumption

18. Billed Metered	234,479,900.00	3
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19. Billed Unmetered	250.00	1
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20. Unbilled Metered	1,697,345.00	3
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21. Unbilled Unmetered	190,000.00	1
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22. Total Authorized Consumption	236,367,495.00	
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Assessment
Scale

Attachment G-3 Green Components
TEXAS WATER DEVELOPMENT BOARD
 P.O. BOX 13231, CAPITOL STATION
 AUSTIN, TX 78711-3231

2010 Water Audit Report

D. Water Losses

23. Water Losses	<u>215,000,926.05</u>	
(Line 17 minus Line 22)		

E. Apparent Losses

24. Average Customer Meter Accuracy (Enter percentage)	<u>60.00 %</u>	<u>2</u>
25. Customer Meter Accuracy Loss	<u>156,319,933.33</u>	
26. Systematic Data Handling Discrepancy	<u>0.00</u>	<u>1</u>
27. Unauthorized Consumption	<u>1,128,421.05</u>	<u>1</u>
28. Total Apparent Losses	<u>157,448,354.38</u>	

F. Real Losses

29. Reported Breaks and Leaks (Estimated volume of leaks & breaks repaired during the audit period)	<u>1,350,000.00</u>	<u>2</u>
30. Unreported Loss (Includes all unknown water loss)	<u>56,202,571.67</u>	<u>1</u>
31. Total Real Losses (Line 29, plus Line 30)	<u>57,552,571.67</u>	
32. Water Losses (Apparent + Real) (Line 28 plus Line 31) = Line 23	<u>215,000,926.05</u>	
33. Non-revenue Water (Water Losses + Unbilled Authorized Consumption) (Line 32, plus Line 20, plus Line 21)	<u>216,888,271.05</u>	

G. Technical Performance Indicator for Apparent Loss

34. Apparent Losses Normalized (Apparent Loss Volume / # of Retail Service Connections/365)	<u>185.69</u>	
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H. Technical Performance Indicators for Real Loss

35. Real Loss Volume (Line 31)	<u>57,552,571.67</u>	
36. Unavoidable Annual Real Losses, volume (calculated)	<u>13,619,938.50</u>	
37. Infrastructure Leakage Index (calculated) (Equals real loss volume divided by unavoidable annual real losses)	<u>4.22560</u>	
38. Real Losses Normalized (Real Loss Volume / # of Service Connections / 365) (This indicator applies if service connection density is greater than 32 / mile)	<u>67.88</u>	

Attachment G-3 Green Components
TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2010 Water Audit Report

39. Real Losses Normalized 1,576.78
 (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>157,448,354.38</u>	
41. Retail Price of Water	<u>\$0.00500</u>	<u>1</u>
42. Cost of Apparent Losses (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)	<u>\$787,241.77</u>	
43. Total Real Losses (Line 31)	<u>57,552,571.67</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>\$0.00190</u>	<u>1</u>
45. Cost of Real Losses (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)	<u>\$109,349.89</u>	
46. Total Assessment Scale		<u>33</u>
47. Total Cost Impact of Apparent and Real Losses	<u>\$896,591.66</u>	

